Removal and Replacement of Moving and Stationary Conductors and Operating Mechanism in a Systems Pow-R-Breaker

I.L. 15156-A
File 29-800

GENERAL

Encased Systems Pow-R Breakers are designed to be relatively maintenance free. However, because of the variability of application conditions, and the great dependence placed upon these breakers for protection and the assurance of service continuity, inspection and maintenance checks on them should be made regularly. General inspection guidelines are outlined in I.B. 15082, Section 6.

The moving and stationary conductors, with their related main and arcing contact assemblies in the type SPB breaker and operating mechanism, have been designed and tested in a manner that should not require their replacement during a normal service life. Should a breaker be subjected to abnormal service, including known high level fault interruptions, then an inspection should be made of the main and arcing contacts, and, if deemed desirable, the moving and stationary conductor assemblies may be replaced as described herein.

The replacement of moving and stationary conductors requires the disassembly of the breaker into its several subassemblies. Because of this, the disassembly and the reassembly with the related adjustments, should be attempted only by a skilled mechanic following the instructions outlined herein. To avoid assembly complications with minimum fixtures and to insure maximum alignment accuracies, moving conductor assemblies should be replaced as three pole subassemblies with matching stationary conductors.

NOTE: **UL listing is voided when the circuit breaker is modified by replacing parts or by the addition of an accessory not specifically UL listed for field installation.** *Replacement of moving or stationary conductors or operating mechanism voids the UL listing.*

CAUTION: *Before attempting any internal maintenance on the circuit breaker,* **the breaker must be completely deenergized, opened and the stored energy in the mechanism springs discharged. Refer to I.B. 15082, Section 3, for these basic operating instructions. Partial internal examination of a drawout circuit breaker can best be made with the breaker removed from its cell. Any maintenance involving the replacement of moving or stationary conductors must be done at a suitable work station with proper tools available.**

MOVING AND STATIONARY CONDUCTOR CONTACT INSPECTION

Front Cover Removal

To inspect the main and arcing contact assemblies, the breaker charging handle and front cover must first be removed. To remove the charging handle, remove the two screws as shown in Fig. 1 and pull the handle downward as shown in Fig. 2. The transparent cover over the trip unit need not be removed separately, since it will be removed intact with the front cover. A front view of a typical 1600 amp drawout breaker, with the front cover removed is shown in Fig. 3. A top view is shown in Fig. 4, and a bottom view in Fig. 5.

CAUTION: Refer to Fig. 3. There is a small projection on the charging mechanism hub that serves as a positioning guide for installing the front cover. If the mechanism is manually charged with the front cover removed, care should be exercised to avoid over extending the charging lever – either upwards or downwards – which could breakoff the projection. With the front cover in place, the hub stops against the cover and this condition will not occur.

NOTE: The "Caution" above applies only to systems Pow-R Breakers manufactured before June, 1981.

Partial Inspection

With the front cover removed, the main and arcing contacts can be partially seen with the arc chutes in place as indicated in Fig. 3. For a closer inspection, additional disassembly will be required. To facilitate the removal of the arc chute barriers and the arc chute assemblies, the top primary stabs on drawout breakers and/or the Rear Tee Connectors on fixed mounted breakers should be removed.

Fig. 6 illustrates the installation/removal of the primary stabs on drawout breakers. Fig. 7 illustrates the installation/removal of a rear tee connector on a fixed mounted 1600 amp breaker.

Arc Chute Barrier Removal (Not Required for Operating Mechanism Replacement)

The arc chute barriers should be removed as shown in Fig. 8. Cement has been added to the barriers to hold

them in position and to eliminate vibration. A slight pressure in the direction indicated should overcome this bond. When the barrier is re-installed, new epoxy cement may be added.

For convenience during maintenance inspections, a simple support frame as illustrated in Fig. 9 can be used to balance the breaker and prevent possible damage to the secondary disconnect blocks.

Arc Chute Removal (Not Required for Operating Mechanism Replacement)

Arc chutes can readily be removed from fixed mounted breakers; on drawout breakers, the secondary control disconnect block mounting frame must be partially removed to gain access to the arc chute retention screws. With the breaker frame in the upright position, remove four mounting bolts securing the support frame to the rear of the breaker, as shown in Fig. 10. With the four mounting bolts removed, position the frame so that the arc chute retention screws, shown in Fig. 11, can be reached. From the rear side, remove two retention screws from each of the three arc chute assemblies as shown for the SPB65, 1600 amp breaker.

With the frame in either the vertical position, or resting in a support frame as illustrated in Fig. 9, remove the three arc insulators, as illustrated in Fig. 12. These insulation pieces are installed between the stationary conductors – extending to the main contacts – and the arc chute assembly. They are formed and held in position between the top portion of the arc chute assembly and the top end barrier.

Next, remove the three arc chute assemblies as illustrated in Fig. 13.

Full Contact Inspection

With the arc chute assemblies removed, the stationary and moving contacts are clearly visible for a complete inspection. Contacts that have seen extensive switching duties will have some discoloration and pitting. A large number of operations will give the contacts, especially the arcing contacts, a mottled, dirty, eroded appearance. This appearance is the normal result of arc burning and in itself is no cause for concern.

Contacts that have seen severe interrupting duties, as evidenced by extensive discoloration, pitting and possible molten metal spewed in the contact area, should be replaced. The exact condition will be a factor of the operating conditions that the breaker has been subjected to, including the number of previous fault interruptions and the level of the latest fault interrupted.

Arc Chute Inspection

Arc chute assemblies vary in design, depending upon the continuous current and interrupting rating of the breaker. Typical arc chute assemblies for the 1600 amp, SPB-65 and SPB-100/150 are shown in Fig. 14. Each assembly uses a supplementary piece of insulation.

The De-ion® grids in each arc chute assembly fit closely around the arcing contacts. These steel grids have an irregular shaped "V" notch and are designed to attract, stretch, cool, and eventually interrupt the arc.

The irregular V shaped notches will undergo slow erosion with arc interruptions. Switching operations will give them a pitted, mottled and sooty appearance. This is normal. Heavy fault interruptions will cause greater erosions. Should the condition of the contacts as described above dictate replacements, then possibly the erroded condition of the arc chute assemblies may likewise dictate replacement.

Removal and Replacement of Moving and Stationary Conductors

The degree of difficulty involved in replacing the moving and stationary conductors and associated contacts, will be a direct factor of the type of breaker mounting-fixed or drawout – and the number of accessories installed. Figs. 3, 4 and 5 are three views of a typical 1600 amp drawout breaker having an assortment of accessories installed.

Each accessory must be either removed, or its related wiring connections disconnected, and, temporarily set aside to gain access to the moving and stationary conductors. With the wiring disconnected, some of the accessories attached to the mechanism frame can be removed intact with the mechanism assembly. Complete disassembly and reassembly of each accessory can best be accomplished by referring to one of the following related instruction leaflets:

Description	Instruction Leaflet
General Instructions	I.B. 15082
Pow-R Trip and Trip Device	I.L. 15044
Shunt Trip Device	I.L. 15158
Spring Release Device	I.L. 15161
Undervoltage Release Device	I.L. 15162
Auxiliary Switch	I.L. 15159
Electrical Operator	I.L. 15160
Connection Diagrams	I.S. 15262

For the purpose of this leaflet, it will be assumed that all internally mounted accessories have been removed as described in the above leaflets. Fig. 15 is a view of a typical 1600 amp breaker with the front cover removed, with the Pow-R Trip 7 trip unit and flux transfer shunt trip device in place. Additional disassembly will be done as follows:

Disconnect Flux Transfer Shunt Trip Control Wires

Refer to Figs. 16 and 17. Using a small screwdriver, disconnect the two black and white control wires from terminals No. 10 and 11. (Disregard numbering sequence on mold-count terminals beginning from bottom of breaker). Pull the wires free from the terminal stab base and underneath the mechanism frame as shown in Fig. 18. Leave hanging loose. The flux transfer shunt trip device need not be removed from the mechanism frame to remove the mechanism.

Removing Tripping Interlock Assembly

The tripping interlock assembly is actuated by the rotating tripper shaft, as illustrated in Fig. 19. It is supplied only on drawout breakers or on fixed mounted breakers equipped with either a Kirk Keylock or mechanical interlock assembly. Its purpose is to transfer the rotary motion of the rotating tripper into a breaker opening operation and a spring discharge operation. Movement of the "opening" flag in Fig. 19 causes the breaker to be opened and movement of the "closing" flag releases the stored energy in the closing springs.

Refer to Fig. 20. Remove the interlock trip rod assembly by lifting up and pulling out of the mounting hole, located in the interlock rod mounting arm.

Removing Operating Mechanism

Refer to Fig. 21. With the breaker in the upright position, remove four hex head mounting bolts (0.312-18 x 2.75) from the rearside of the top end of the operating mechanism.

With the breaker in the horizontal position, as shown in Fig. 22, remove the two front cover mounting posts using a pair of channel lock pliers. Next, remove the two locknuts and bolts (0.132-18 x 2.75) from the bottom end of the operating mechanism as shown in Fig. 23.

After all mechanism mounting bolts have been removed, lift the operating mechanism from the breaker frame as shown in Fig. 24.

Fig. 25 is a view of a 1600 amp breaker frame with the operating mechanism removed, and the Pow-R Trip 7 mounting plate pivoted to the side.

If operating mechanism is to be replaced without removal of moving or stationary contacts, proceed to instructions for "Reinstalling Operating Mechanism", page 5.

Removing Center Mounting Barrier

The center mounting barrier shown in Fig. 25 is used for two main purposes: partial pole isolation and mounting surface for internal accessories. This latter function includes the rotating tripper and auxiliary switch assemblies in the right hand pole and the trip unit mounting plate assembly in the left pole.

To remove the center mounting barrier, the trip unit mounting plate need not be removed; however, with the mounting plate pivoted out of the way as illustrated in Fig. 25, reinstallation of the mechanism will be easier.

To pivot the trip unit mounting plate, remove two screws (0.164-32 x 0.5 pan head) shown in Fig. 25. With the screws removed, pivot the mounting plate with the control wires attached to the side of the frame. Once the mechanism has been removed, the center barrier may be lifted straight off the breaker frame and rotated to the left side as shown in Fig. 26.

Removing the Moving Contact Cross Arm Stop Plates

Two sets of stop plates are used to stop the moving contact cross arm assembly at the end of the breaker opening operation. These plates are held captive by two slots in the molded base and by the operating mechanism mounting flanges. Lift stop plates up to remove as shown in Fig. 27.

Removing the Moving Contact Cross Arm Assembly

To remove the moving contact cross arm assembly, rotate the breaker to the vertical position, and remove the four conductor mounting bolts per pole, as shown in Fig. 28 (0.250-20 x 1.0 hex head). Next, remove the three conductor clinch screws per pole (0.190-32 x 1.0 pan head) as shown in Fig. 29.

CAUTION: With the conductor clinch screws removed, the cross arm assembly is loose, and care should be exercised to avoid damaging the assembly when rotating the breaker for the next operation.

With the breaker in the horizontal position, as shown in Fig. 30, lift up on the three pole cross arm assembly and pull towards the top end, to remove from the breaker frame.

A view of the underneath side of a 1600 amp, SPB-65 moving contact arm assembly is shown in Fig. 31.

Fig. 32 is a view of a 1600 amp breaker with the moving contact arm assembly removed.

Removing Stationary Conductors

Refer to Fig. 33. With the breaker in the upright position, remove six stationary conductor mounting bolts per conductor. Lift each stationary conductor from the breaker as the bolts are removed.

Contact Arm Replacements

As indicated under the "General" heading above, the moving contact arm assembly should be replaced as a three pole subassembly to avoid assembly complications when using limited fixtures, and to insure maximum alignment accuracies. For convenience, the style numbers of these three pole subassemblies along with the matching stationary conductors are shown in Table 1.

For information purposes only, the further disassembly of the moving contact arm assembly of a 1600 amp, SPB-65 breaker is illustrated in the following figures.

Disassembly of Moving Contact Arm Assembly

Fig. 34 is a view of the top side of an SPB-65, 1600 amp, moving contact arm assembly. To disassemble, first remove each of the single pole conductor subassemblies by removing the four pan head screws (0.164-32 x 1.0) as shown in Fig. 34 from the cross bar clamps.

Fig. 35 is a view of the underneath side of the above assembly, shown with one single pole conductor subassembly removed and inverted.

Refer to Fig. 36. Observe the location of 12 gray separators and 4 red separators. Remove all red and gray separators, by removing the upper contact arm pin. Note: the pins in the outside poles are slightly longer than the pin in the center pole.

To gain access to the individual contact arms, remove the contact arm bracket, as shown in Fig. 37, by removing the lower contact arm pin.

NOTE: Both the upper and lower contact arm pins are held in position by the breaker base mold when the moving contact arm assembly is mounted in place in the base. Some care should be exercised to insure that the pins do not dropout when the contact assemblies are out of the base.

Refer to Fig. 38. Observe the position of the eight retention springs. The spring ends are assembled on each contact arm, so as to point towards the center of the assembly. This figure illustrates the single arcer design used in the 1600 amp, SPB-65 and SPB-100 breakers.

Remove the main and arcing contact arms, as shown in Fig. 39, by spreading the contact arms slightly and sliding them off the hinge joint of the lower conductors.

Contact Arm Design Variations

Both the moving contact arm and matching stationary contact assemblies will vary depending upon the continuous current rating, and the interrupting ratings of the breaker. Generally, as the ratings increase, the number of main contact arms and/or arcing contact arms increases. The disassembly techniques will be essentially the same as described above for the 1600 amp SPB-65 breaker.

As an example of an alternate design, Fig. 40 illustrates a 1600 amp, single pole moving and stationary conductor assembly used with SPB-150 breaker.

NOTE: Observe the dual arcing contact arms on the moving contact arm assembly and the addition of the arc runner, arc insulation and extra arcing contact on the stationary conductor assembly.

Arc Chute Assembly Design Variations

Design variations also occur in the arc chute assemblies as the continuous current and interrupting ratings of the breakers increase. Fig. 14 illustrates a pair of arc chute assemblies used for the 250/800/1600 amp breakers. As the interrupting rating increases, additional and/or revised details are added, as shown in the right hand portion of the figure.

Fig. 42 illustrates a pair of arc chute assemblies used for the 2000/2500/3000/4000 amp breakers. As the interrupting rating increases, additional and/or revised details are added as shown in the right hand portion of the figure. In the 4000 amp breaker, two sets of arc chutes per pole are used.

Steps in Reassembling an SPB Breaker

The reassembly of an SPB breaker can be readily accomplished by following the disassembly steps and reference figures in reverse order. Only a few comments are required to supplement the original instructions.

Figure 38

Retention springs for the main and arcing contact arms will require the use of a pair of needle nose pliers to install them in breakers rated 1600 amps and less because of the short length of the contact arms. In the higher rated breakers, the equivalent springs can be added without tools, by manually squeezing the two contact arms together. Observe the mounting relationship of the springs and contact arms as cited relative to Fig. 38.

Mounting Hardware Tightening Torques

All assembly hardware, including washers, lockwashers, etc. should be reassembled in the exact manner as it was disassembled. All screws and bolts should be sufficiently tightened. Generally accepted torque values are suggested in Table 2. The only critical torque values are those required for assembling the moving and stationary conductors to the base mold as shown in Figs. 28 and 33. These bolts (0.25-20 hex head) should be torqued to a maximum of 50 inch pounds to avoid damaging the molded flange.

Figure 31

Note the two opening spring guides. These guides must be placed inside the two matching opening springs shown in Fig. 32, as the moving contact arm assembly is installed in the breaker. In Fig. 30, the right hand spring guide can be seen installed in its matching spring.

Figure 30

When installing the moving contact arm assembly in breakers rated 1600 amps and below, the conductors will slip through the three current sensors easily as shown. In the higher rated breakers, the three sensors will have to be spaced up temporarily for the conductors to clear the sensor openings. This can be easily done by lifting each of the three sensors with a long screwdriver or similar tool.

Current Sensor Polarities

There should be no reason to remove or disconnect any of the three current sensors shown in Fig. 32, in the process of changing moving and stationary conductors. Should one be removed, it is essential that proper polarities be maintained for proper operation of the trip unit – particularly when ground fault protection is included.

Proper polarity will be maintained on the primary, when the sensors are installed so that the secondary leads exit on the top left side as shown in Fig. 32. The secondary polarity lead will be either the white or orange lead in the 1600 amp and lower rated sensors, and white in the higher rated sensors. The black secondary leads will be the non-polarity leads in either case.

Should any reconnections be required, refer to I.S. 15262 or the proper connection diagram indicated in the shop order label on the left side of the breaker.

Figure 27

Reassemble the two sets of stop plates in the base as shown in Fig. 27. Note the position of the stop plates in relationship to the two opening guides. The stops are installed in the two slots in the base and on the outboard sides of the opening guides. The spaces on the inboard side of the opening guide are reserved for the two lower links from the operating mechanism, as shown in Fig. 45.

Reinstalling Operating Mechanism

Fig. 43 illustrates the operating mechanism held in a position in preparation for reassembly to the breaker frame after the center mounting barrier has been installed. Note the position of the two lower links. Next, position the operating mechanism as shown in Fig. 44. The two lower links should straddle the cross arm in the spaces indicated in Fig. 27. The arm and link assembly – which operates the cut-off switches and "Open", "Closed", mechanical indicators – passes through the cutout in the center mounting barrier and rests against the center cross bar clamp shown in Fig. 34.

NOTE: The Pow-R Trip 7 mounting plate has been moved aside for handling clearances.

With the operating mechanism in position, reinstall the two mounting bolts shown being removed in Fig. 23. These bolts should be added and tightened with the breaker frame in the horizontal position.

Next, reinstall the two cover mounting posts, shown being removed in Fig. 22. Prior to installing these posts, a small amount of epoxy may be added to the ends of the two mounting bolts after the locknuts have been tightened

to prevent their loosening during subsequent breaker operations.

With the breaker frame in a vertical position, reinstall the four top side mechanism bolts, shown being removed in Fig. 21.

NOTE: In the process of removing and reinstalling the operating mechanism from the breaker frame, no mechanism adjustments should have been affected. Should there be any question relative to any specific adjustment, contact the factory for advice.

Figure 20

Reassemble the interlock trip rod assembly, as shown in Fig. 20. No adjustments should be necessary. However, for inspection reasons, critical dimensions are provided in Fig. 45.

Figure 17

Reconnect the two control wires of the Flux Transfer Shunt Trip to the Pow-R Trip 7 Terminal Stab Base, as shown in Fig. 17. Route the wires under the mechanism mounting flange as shown in Fig. 18.

Test procedure for mechanism. (See Figure Below)

A. Charge and close breaker.

B. With breaker closed, verify that middle link is against middle link stop per figure below.

C. If a gap is present between middle link and stop loosen mech mounting bolts and place .010 shim stock between mechanism and center mounting barrier on the side that gap is present.

WARNING: Do not put breaker back in service if middle links do not come in contact with stop. Breaker may open or the loss of contact pressure will occur causing arcing or increased contact resistance.

D. Retighten mechanism mounting bolts.

Retesting Following Final Assembly

When the breaker has been completely reassembled, and all control wiring reinstalled and checked, the breaker should be tested per I.L. 15094 before it is returned to service. Both the simulated and primary injection test methods – with the breaker out of the cell – should be used.

Should there be any problems, consult the factory for further instructions.

NOTE: Westinghouse assumes no responsibility for damage to circuit breakers during field modifications.

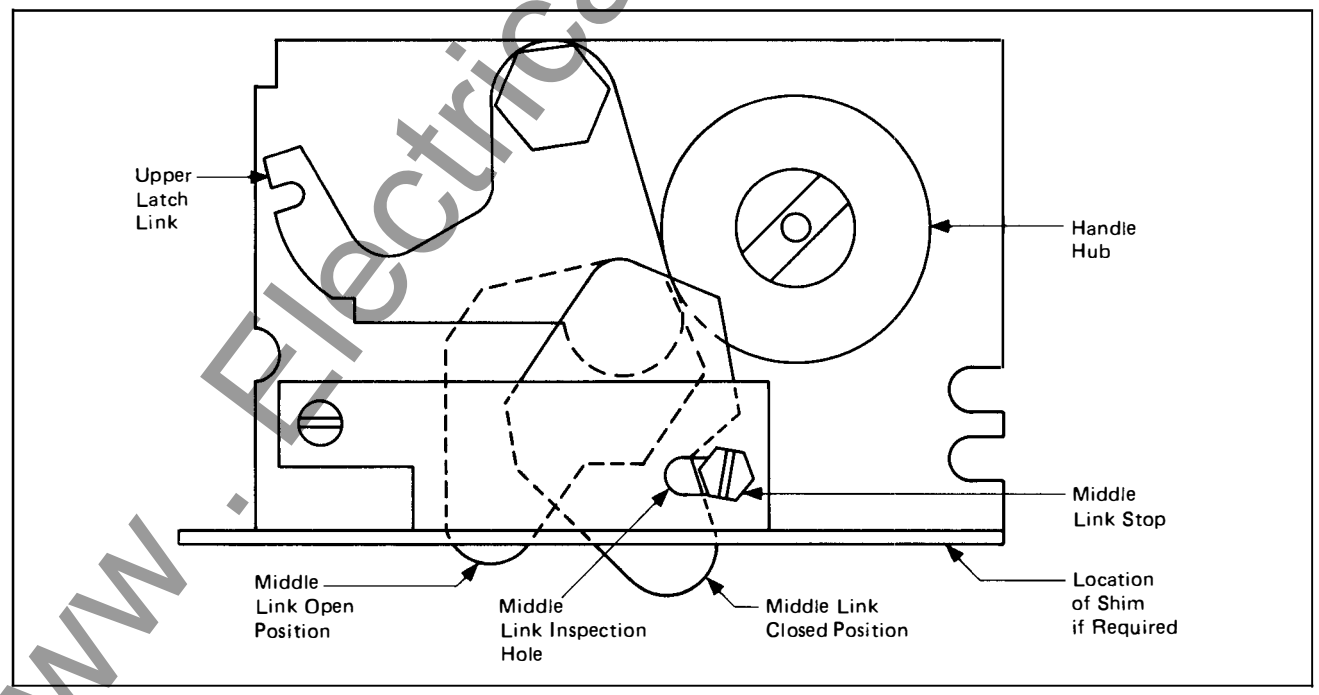

Table 1 – SPB Contact Assembly Styles for Renewal Parts
Includes Moving and Stationary Contacts
Arc Chutes, Arc Runners and Mounting Hardware

Breaker Frame	SPB Type Designation	Type Connected*	Renewal Style Number	Breaker Frame	SPB Type Designation	Type Connected*	Renewal Style Number
250	50	R, F, D	1294C89G01	2000C	65	R, F, D	1294C90G02
	100	R, F, D	1294C89G03		100	R, F, D	1294C90G02
	150	R, F, D	1294C90G01		150	R, F, D	1294C90G01
	N	R, F, D	1294C89G01		N	R, F, D	1294C90G02
	NH	R, F, D	1294C90G01		NH	R, F, D	1294C90G01
800	50	R, F, D	1294C89G01	2000-3000	100	R, D	1294C91G02
	100	R, F, D	1294C89G01		100	F	1294C91G01
	150	R, F, D	1294C90G01		150	R, D	1294C91G04
	N	R, F, D	1294C89G01		150	F	1294C91G03
	NH	R, F, D	1294C90G01		N	R, D	1294C91G02
					N	F	1294C91G01
1200	65	R, F, D	1294C89G02		NH	R, D	1294C91G04
	100	R, F, D	1294C89G03		NH	F	1294C91G03
	150	R, F, D	1294C90G01				
	N	R, F, D	1294C89G01	4000	100	R, D	1294C92G09 (1)
	NH	R, F, D	1294C90G01		100	F	1294C92G08 (1)
					150	R, D	1294C92G03 (1)
1600	65	R, F, D	1294C90G03		150	F	1294C92G02 (1)
	100	R, F, D	1294C90G02		N	R, D	1294C92G06 (1)
	150	R, F, D	1294C90G01		N	F	1294C92G05
	N	R, F, D	1294C90G02		NH	R, D	1294C92G06
	NH	R, F, D	1294C90G01		NH	F	1294C92G05
				5000	100	R, D	1294C92G07 (1)
					150	R, D	1294C92G01 (1)
					N	R, D	1294C92G04
					NH	R, D	1294C92G04

*R – Rear Connected F – Front Connected D – Drawout (1) Includes Current Monitor

Table 2 – Suggested Torque Values

Bolt/Screw Size (In Inches)	Type Head	Tightening Torque (In Inch-Pounds)
0.164-32	Flat/Pan	20
0.190-32	Flat/Pan	32
0.250-20	Hex Head Cap Pan Head	75
0.312-18	Hex Head Cap	180
0.375-16	Hex Head Cap	180

© Changed or added since previous issue.

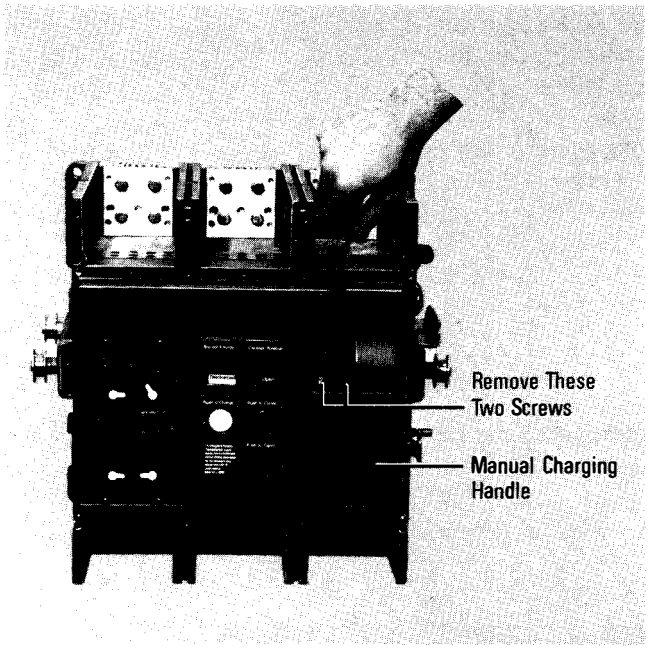

Fig. 1 *Removing Charging Handle Screws From an SPB Breaker.*

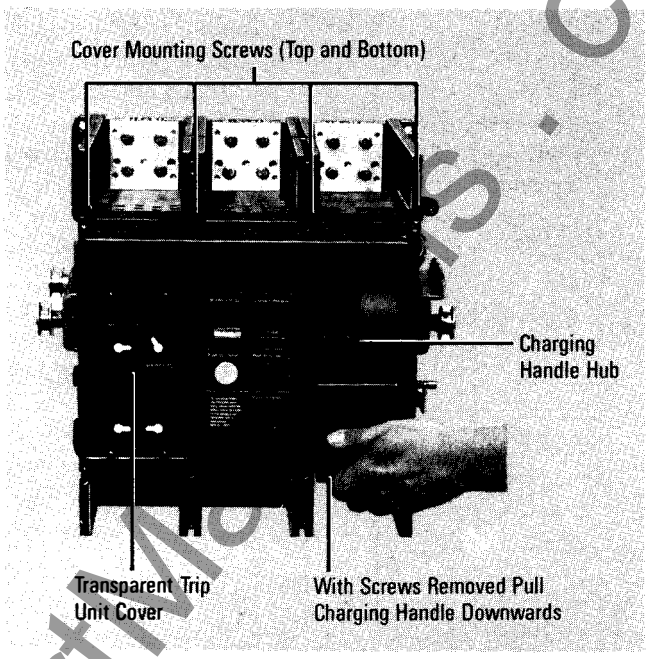

Fig. 2 *Removing Charging Handle.*

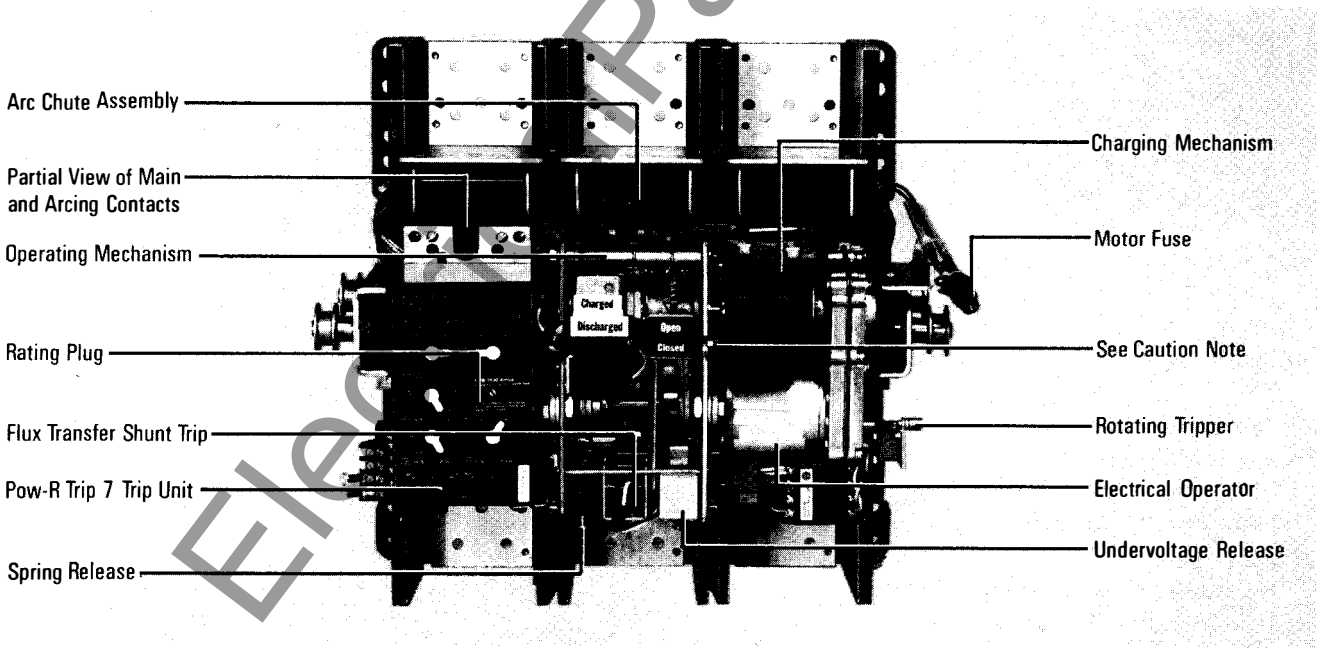

Fig. 3 *Front View of 1600 Amp Drawout Breaker With Front Cover Removed.*

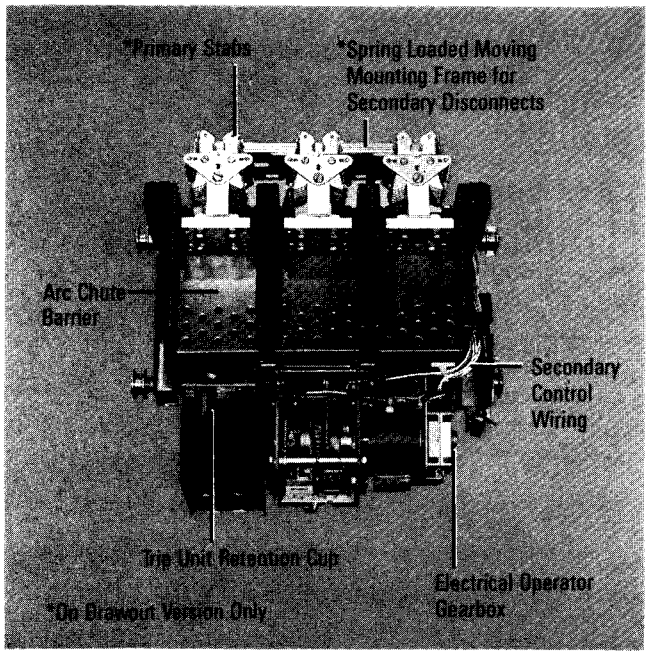

Fig. 4 *Top View of 1600 Amp Drawout Breaker With Front Cover Removed.*

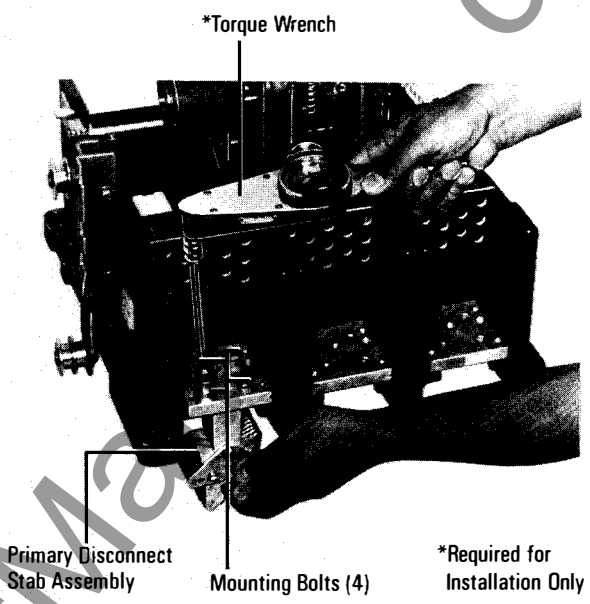

Fig. 6 *Installation/Removal Drawout Primary Disconnect Stab.*

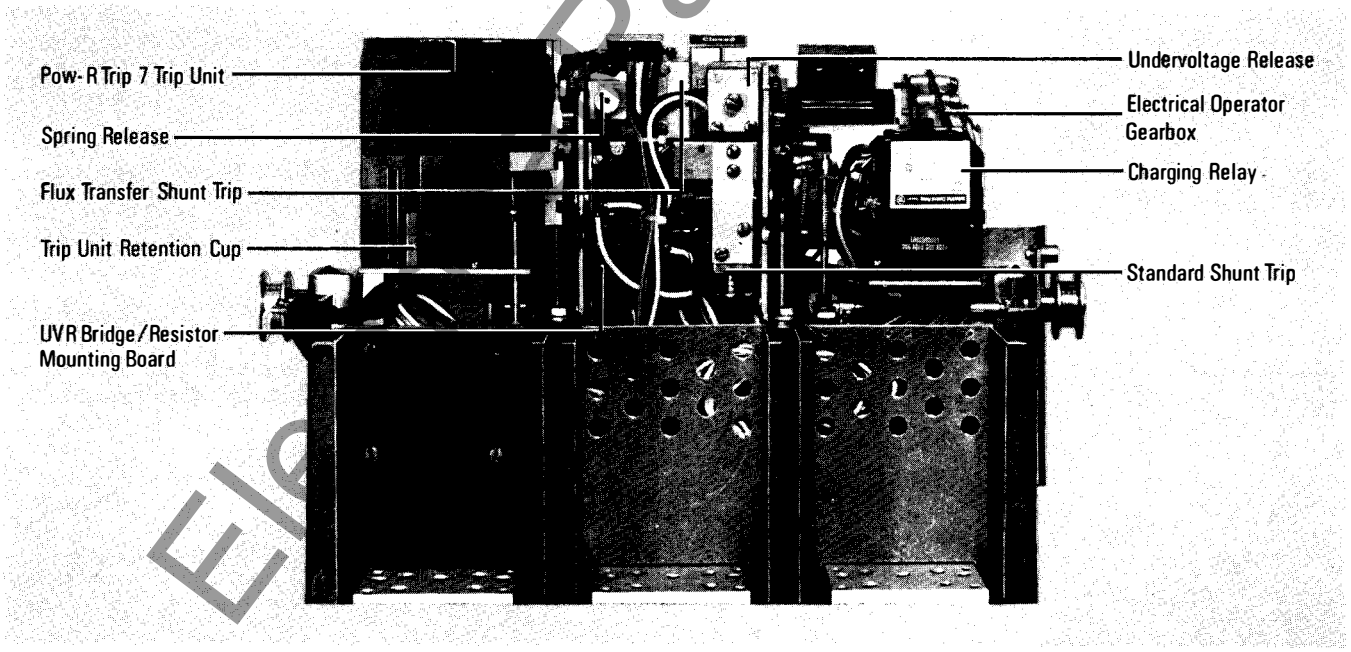

Fig. 5 *Bottom View of Breaker With Front Cover Removed.*

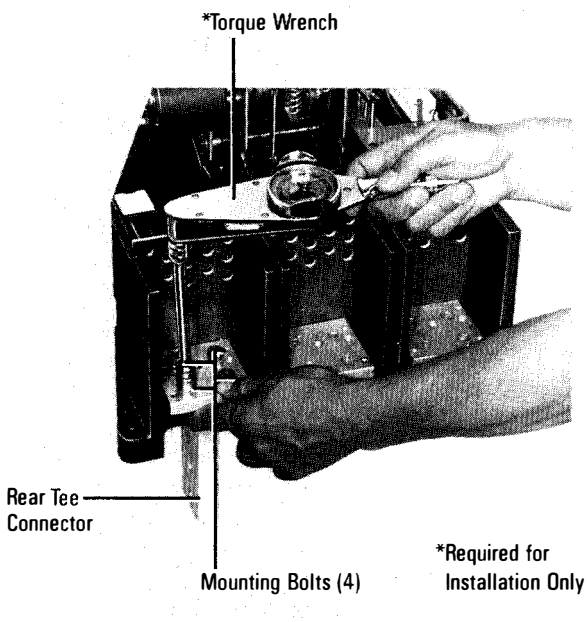

Fig. 7 *Installation/Removal of Rear Tee Connector on Fixed Mounted 1600 Amp Breaker.*

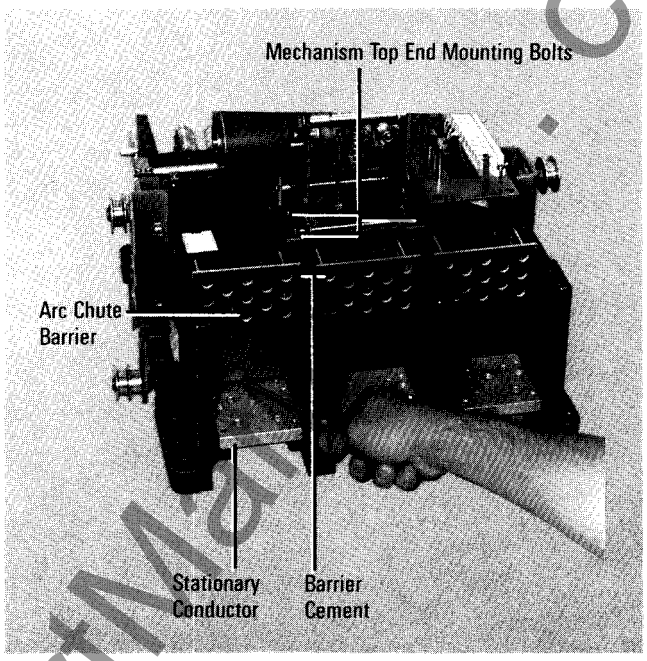

Fig. 8 *Removing Arc Chute Barrier From 1600 Amp Breaker.*

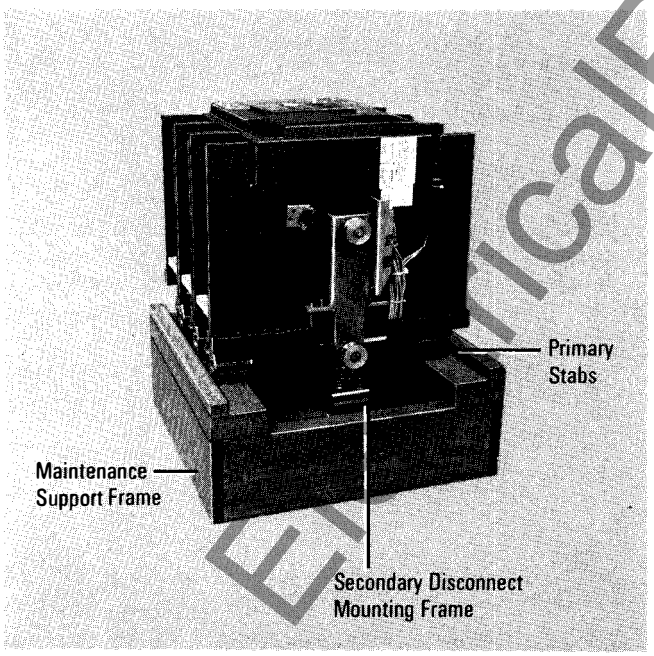

Fig. 9 *Typical Drawout Breaker Resting in a Maintenance Support Frame.*

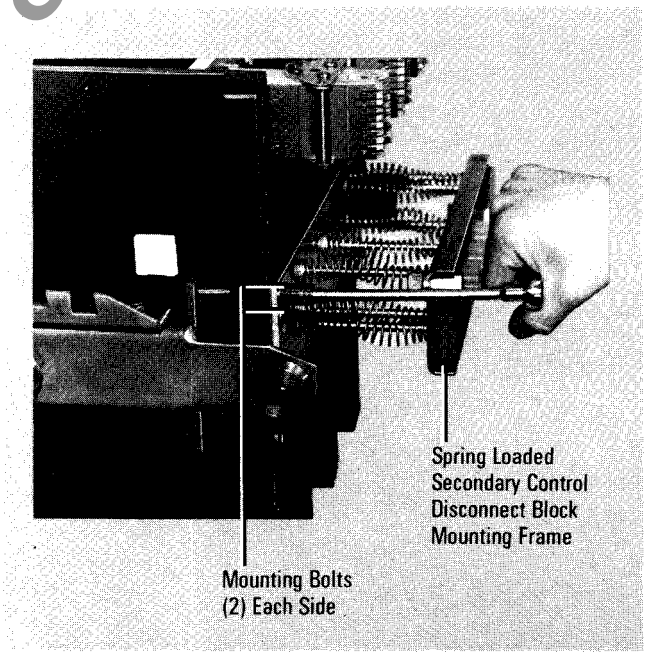

Fig. 10 *Installing/Removing Secondary Control Disconnect Block Mounting Frame From Rear of Breaker.*

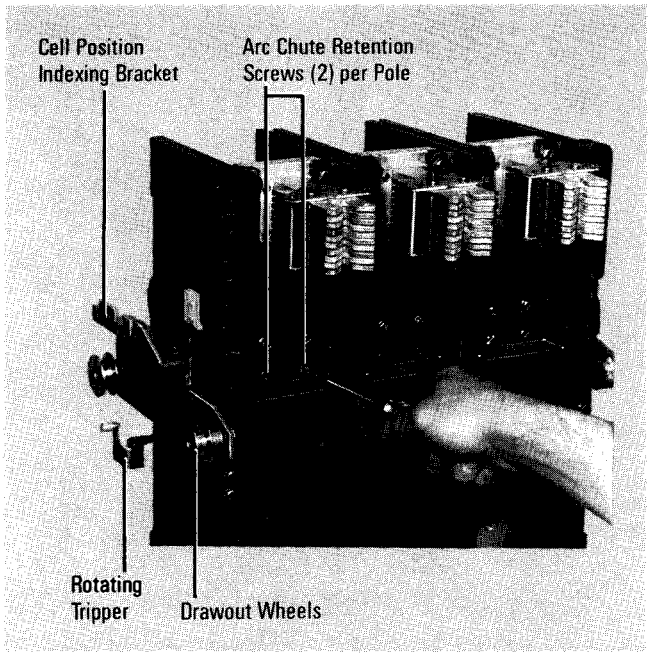

Fig. 11 *Removing Arc Chute Retention Screws.*

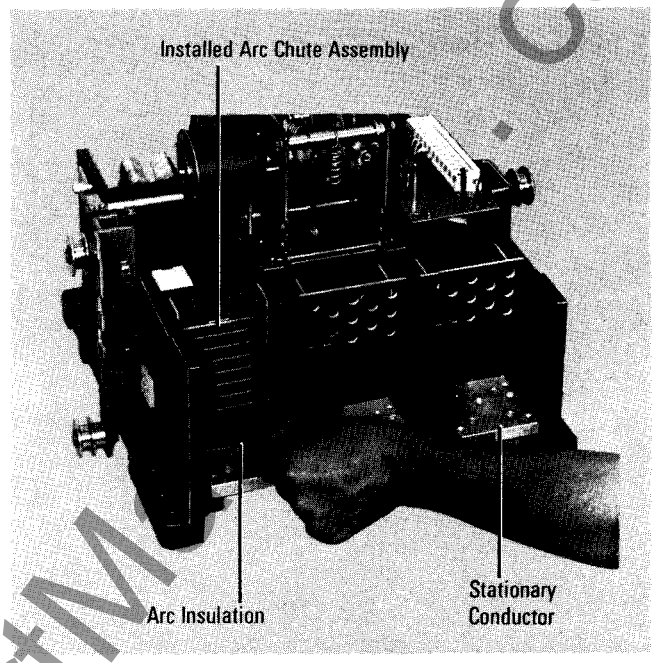

Fig. 12 *Installing/Removing Arc Insulation.*

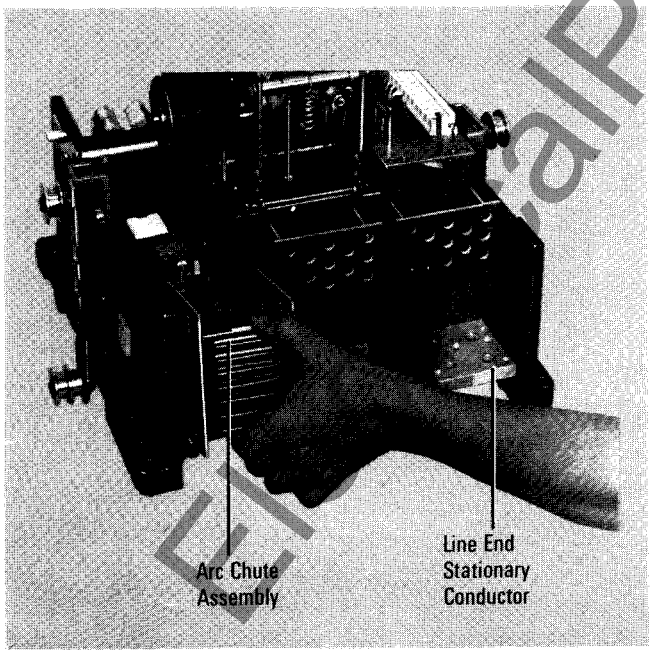

Fig. 13 *Installing/Removing Arc Chute Assembly.*

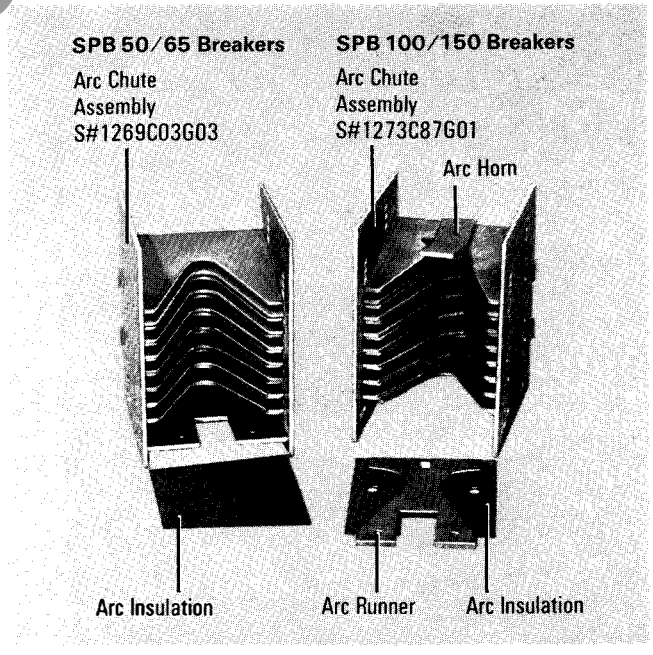

Fig. 14 *Typical Arc Chute Assemblies for 250/800/1600 Amp Breakers.*

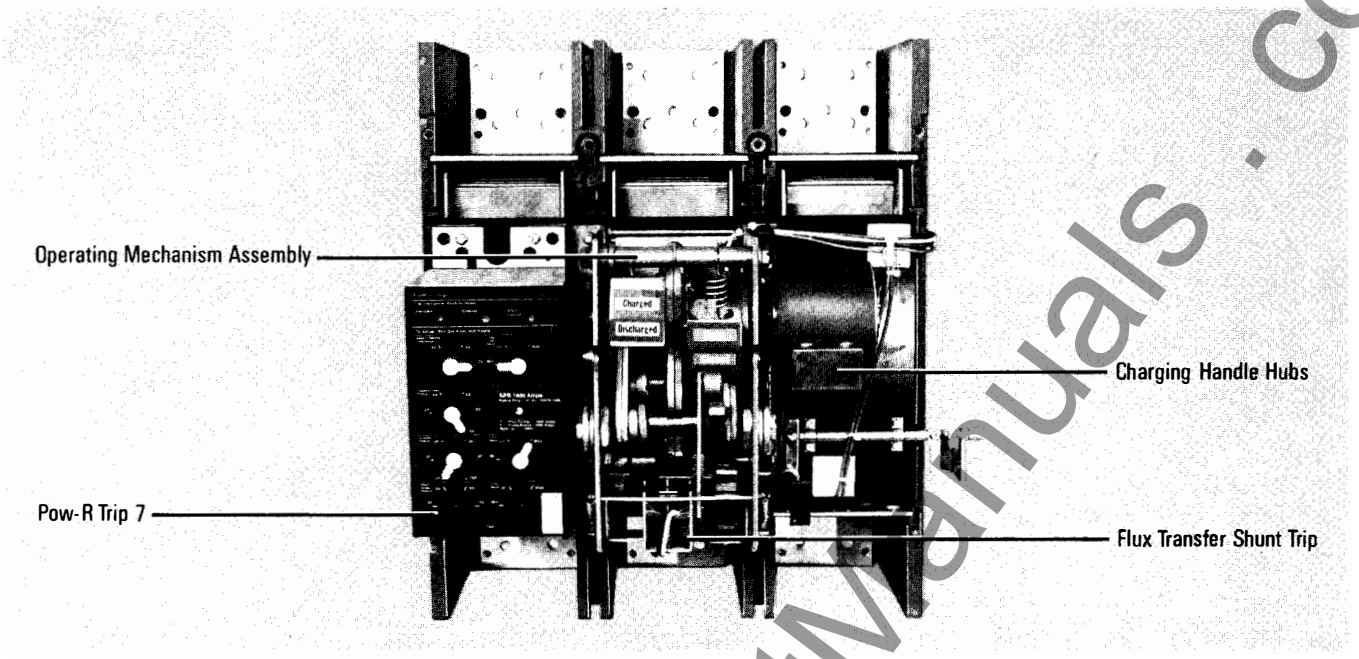

Fig. 15. *1600 Amp Breaker With Front Cover Removed.*

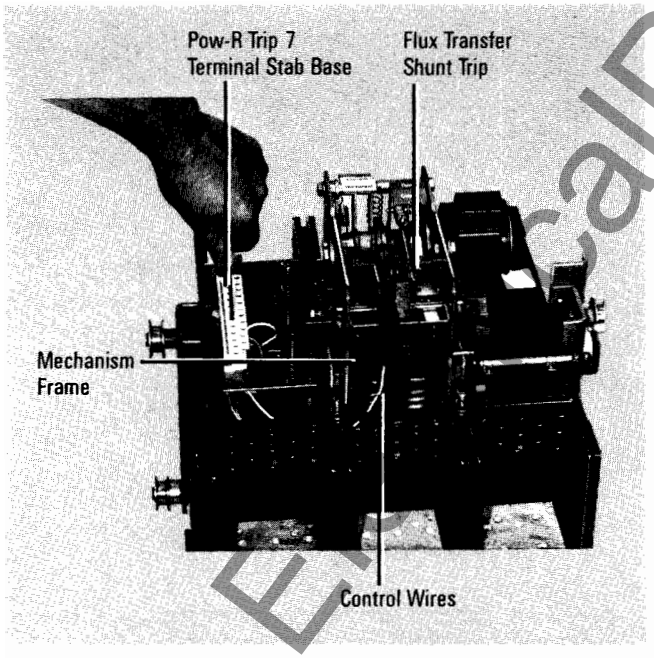

Fig. 16 *Disconnecting Flux Transfer Shunt Trip Control Wires From Terminal Block.*

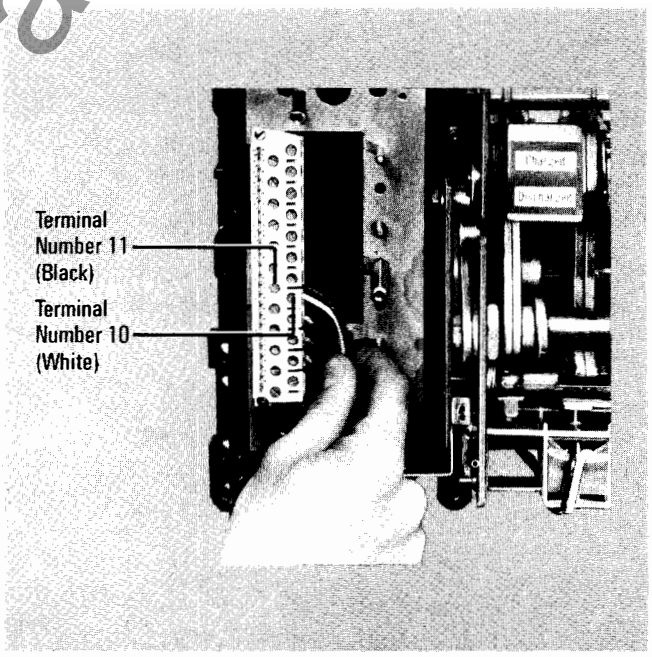

Fig. 17 *Flux Transfer Shunt Trip Control Wire Termination Locations (Pow-R-Trip 7).*

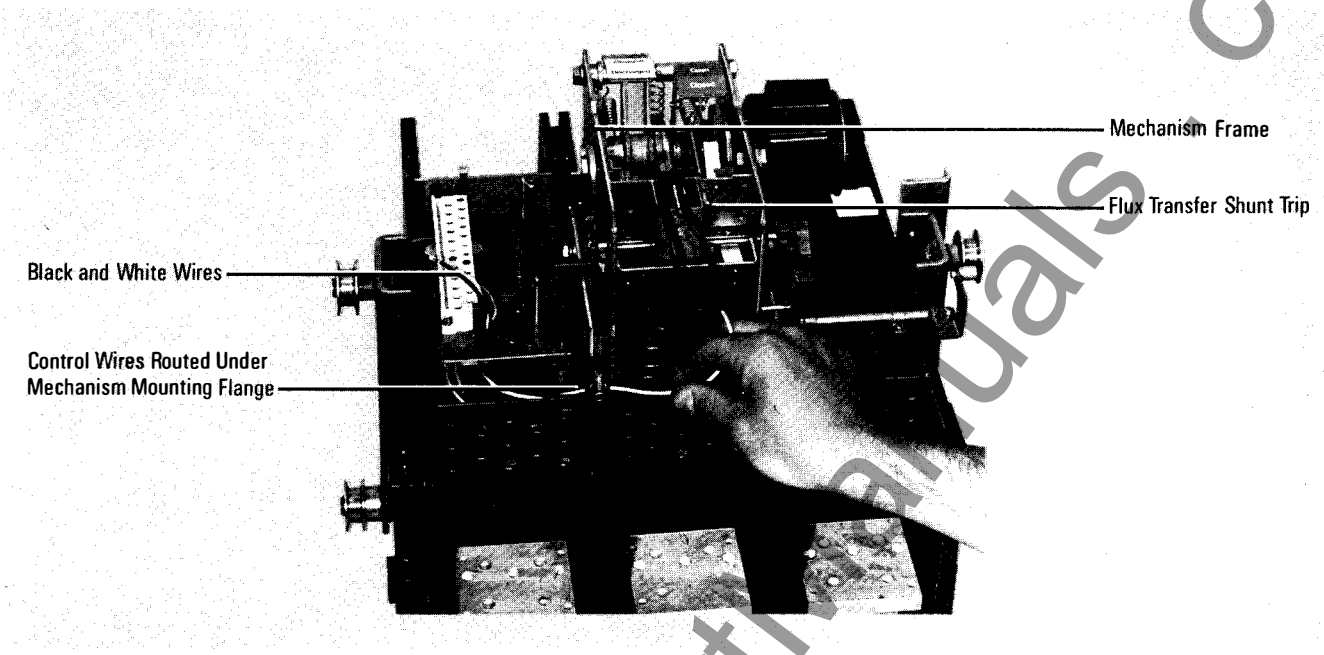

Fig. 18 *Flux Transfer Shunt Trip Control Wire Routing.*

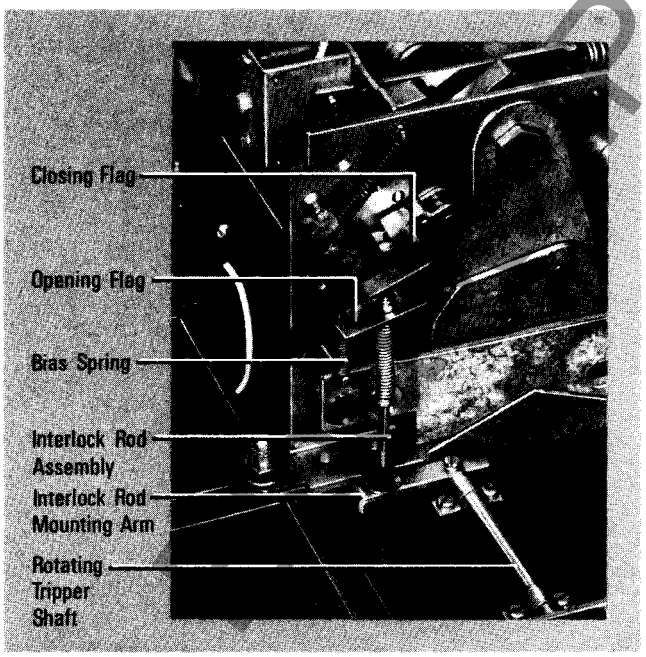

Fig. 19 *View of Installed Tripping Interlock Assembly.*

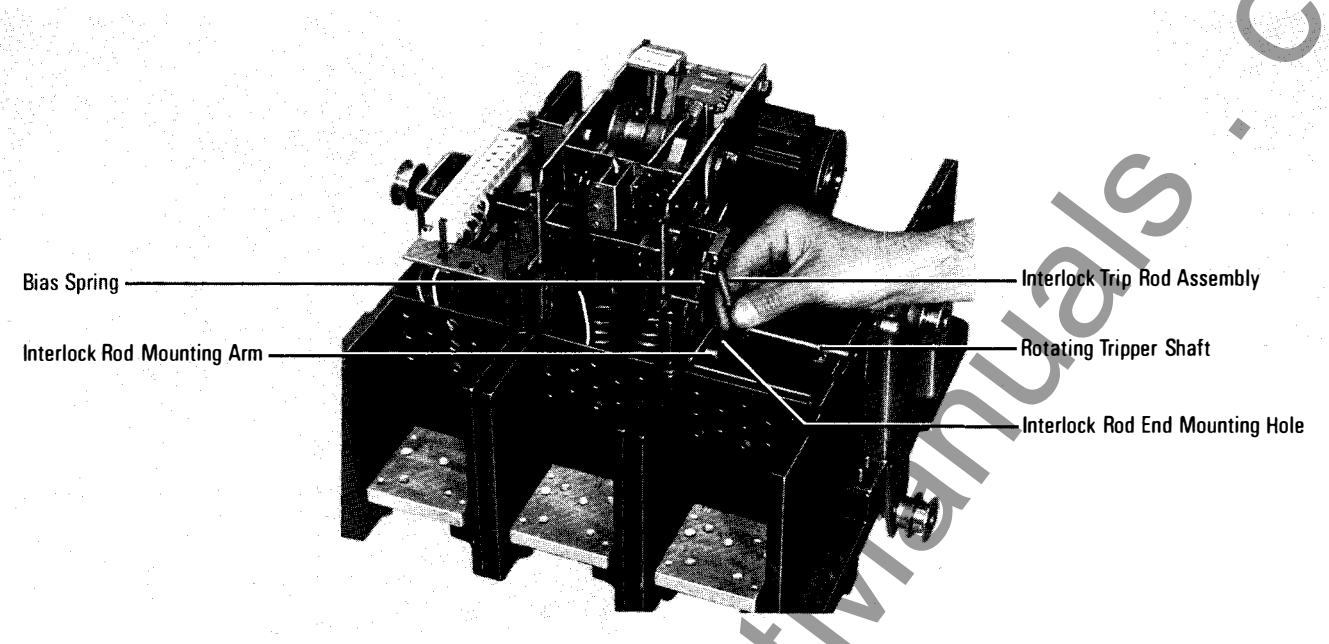

Fig. 20 *Removal of Tripping Interlock.*

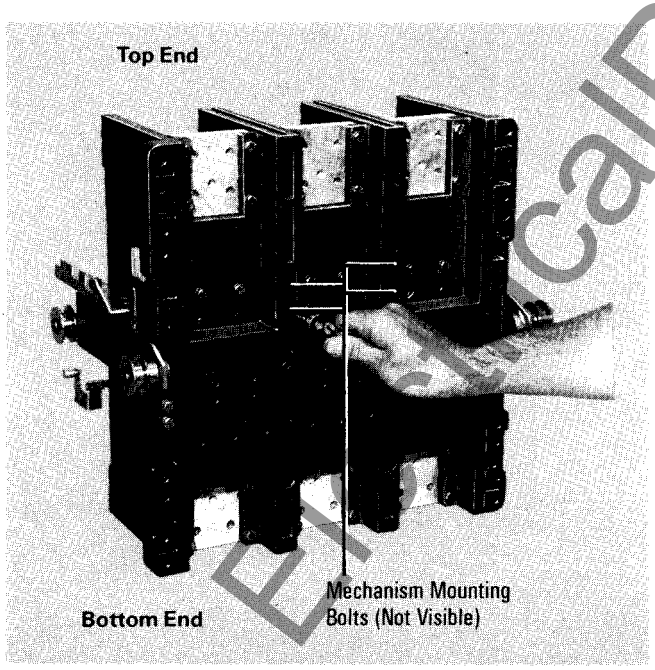

Fig. 21 *Removing Top Side Mechanism Mounting Bolts From Rear of 1600 Amp Breaker.*

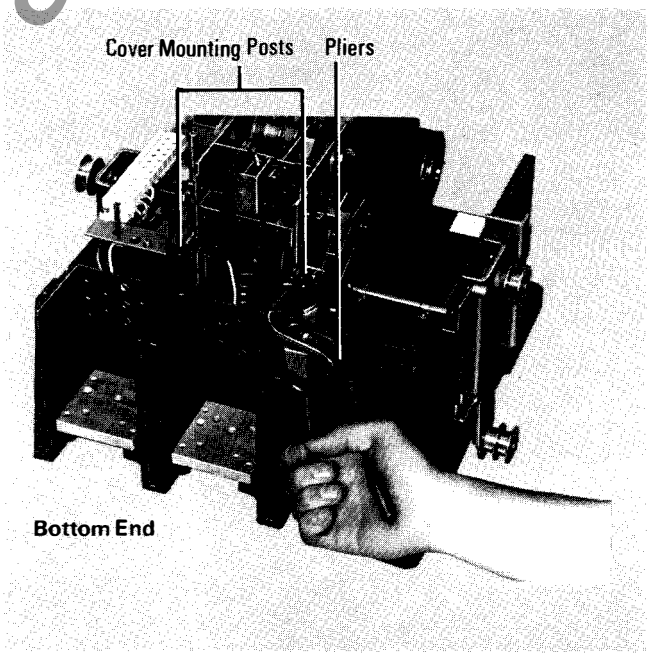

Fig. 22 *Removal of Front Cover Mounting Posts From a 1600 Amp Breaker.*

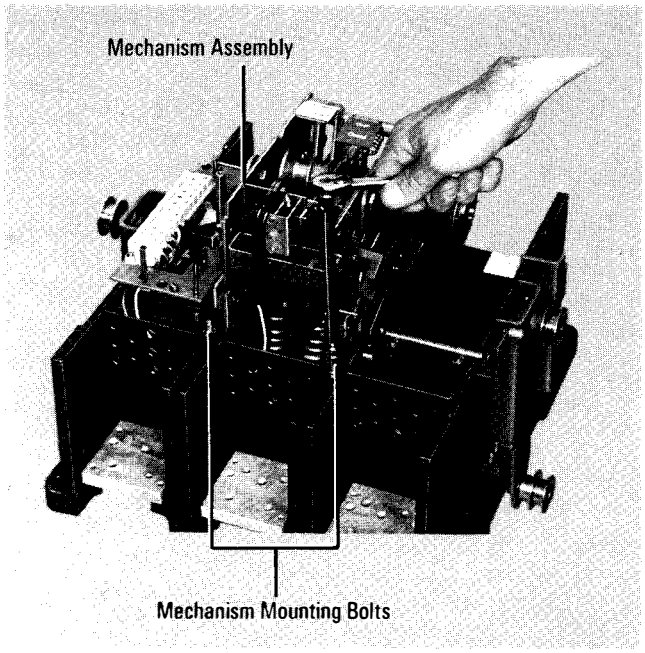

Fig. 23 *Removal of Mechanism Bottom End Mounting Bolts From a 1600 Amp Breaker.*

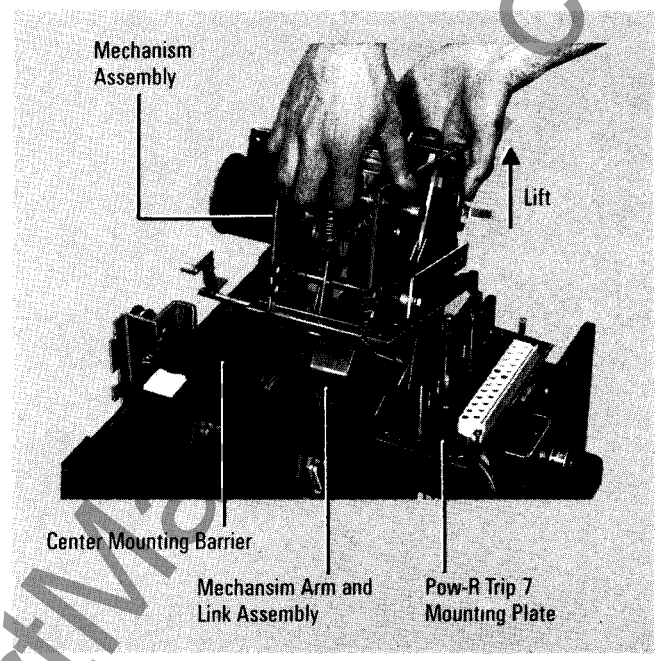

Fig. 24 *Removing Operating Mechanism From Breaker Frame.*

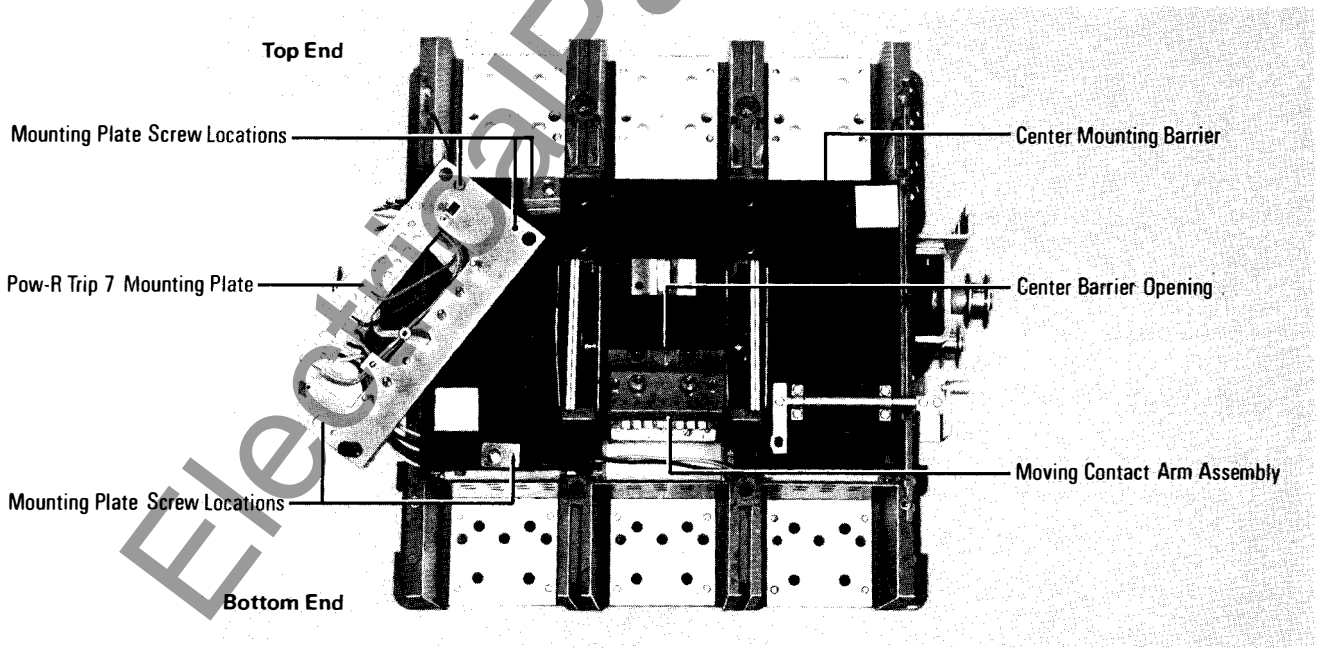

Fig. 25 *1600 Amp Breaker With Operating Mechanism Removed and Pow-R-Trip 7 Mounting Plate Pivoted to The Side.*

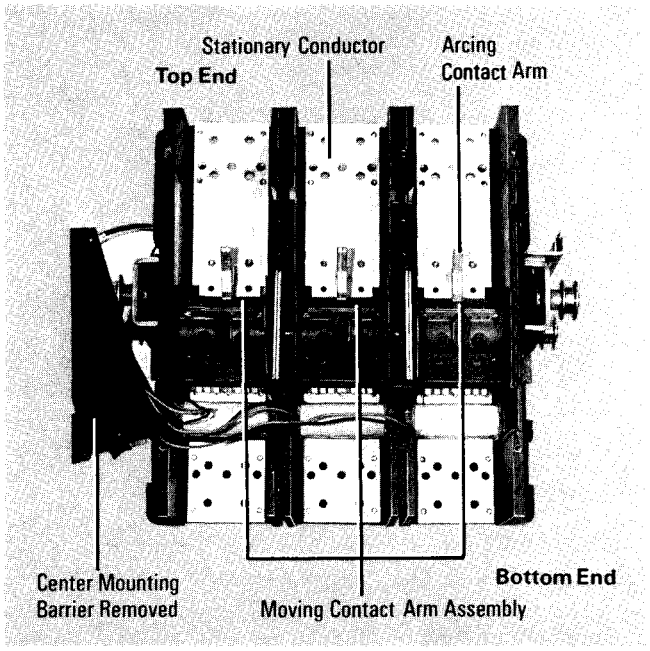

Fig. 26 *View of 1600 Amp Breaker With Center Mounting Barrier Removed.*

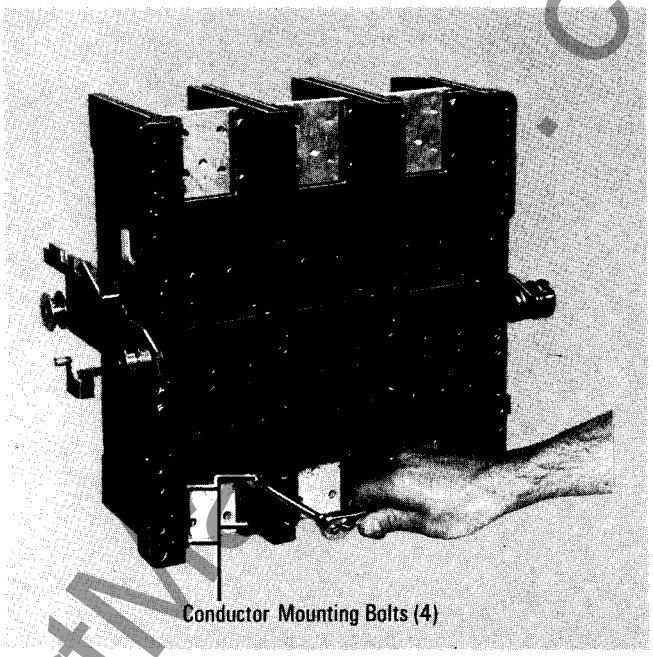

Fig. 28 *Removing Lower Moving Conductor Mounting Bolts From 1600 Amp Breaker Frame.*

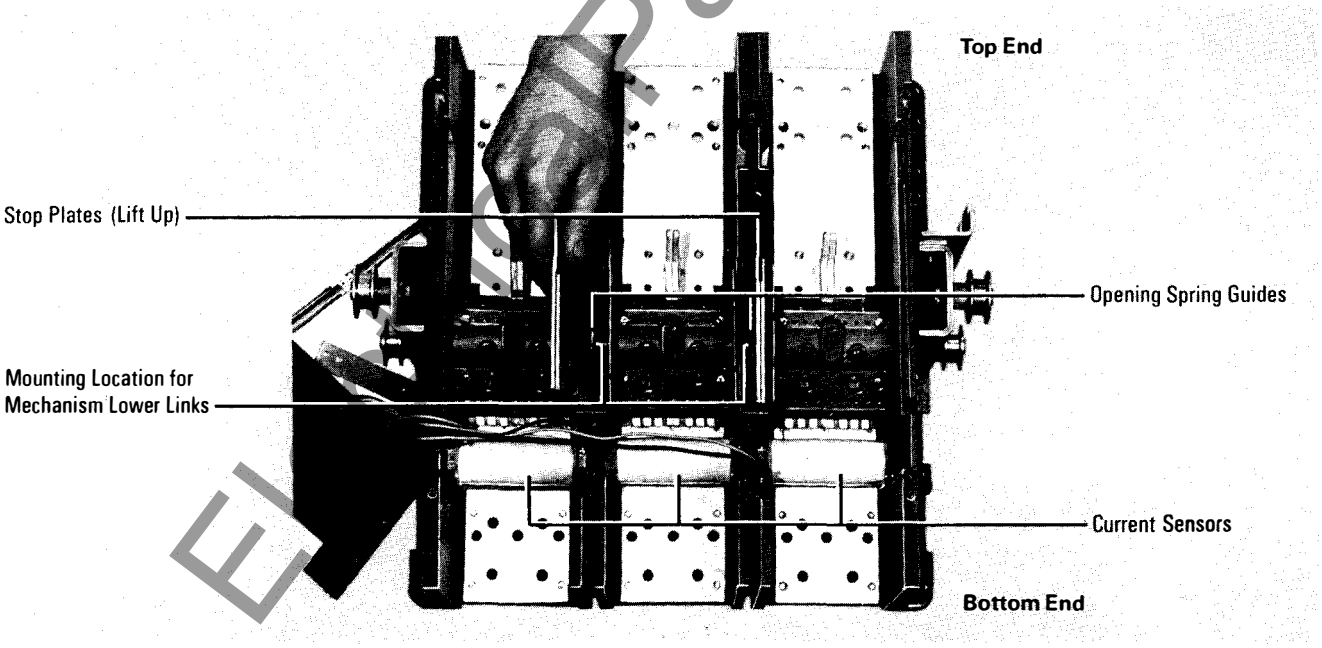

Fig. 27 *Removal of Stop Plates From 1600 Amp Breaker.*

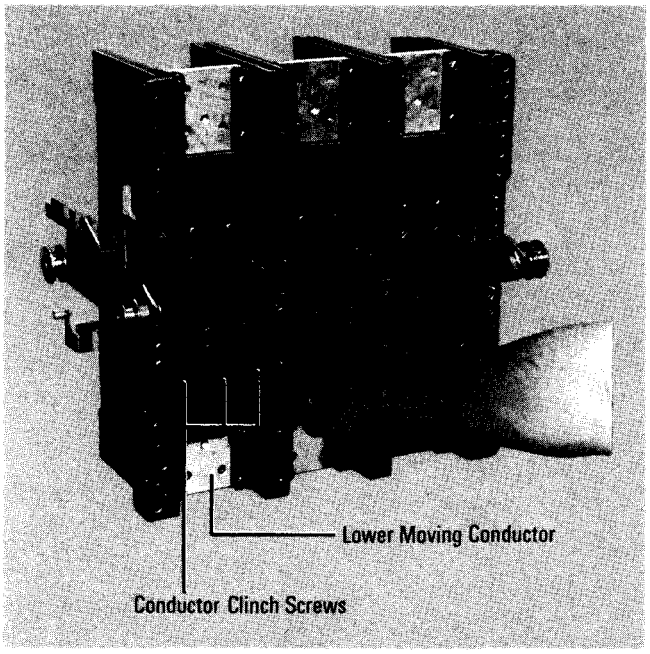

Fig. 29 *Removing Lower Moving Conductor Clinch Screws From a 1600 Amp Breaker.*

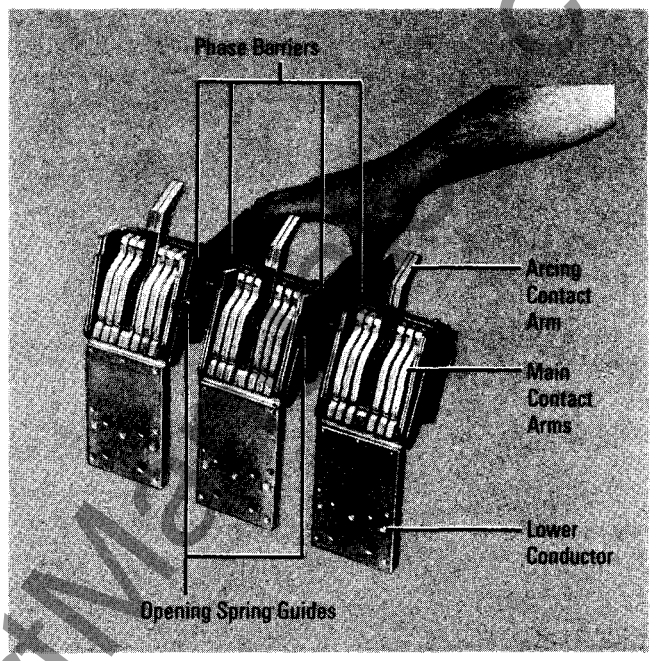

Fig. 31 *Underneath Side of SPB-65, 1600 Amp Moving Contact Arm Assembly.*

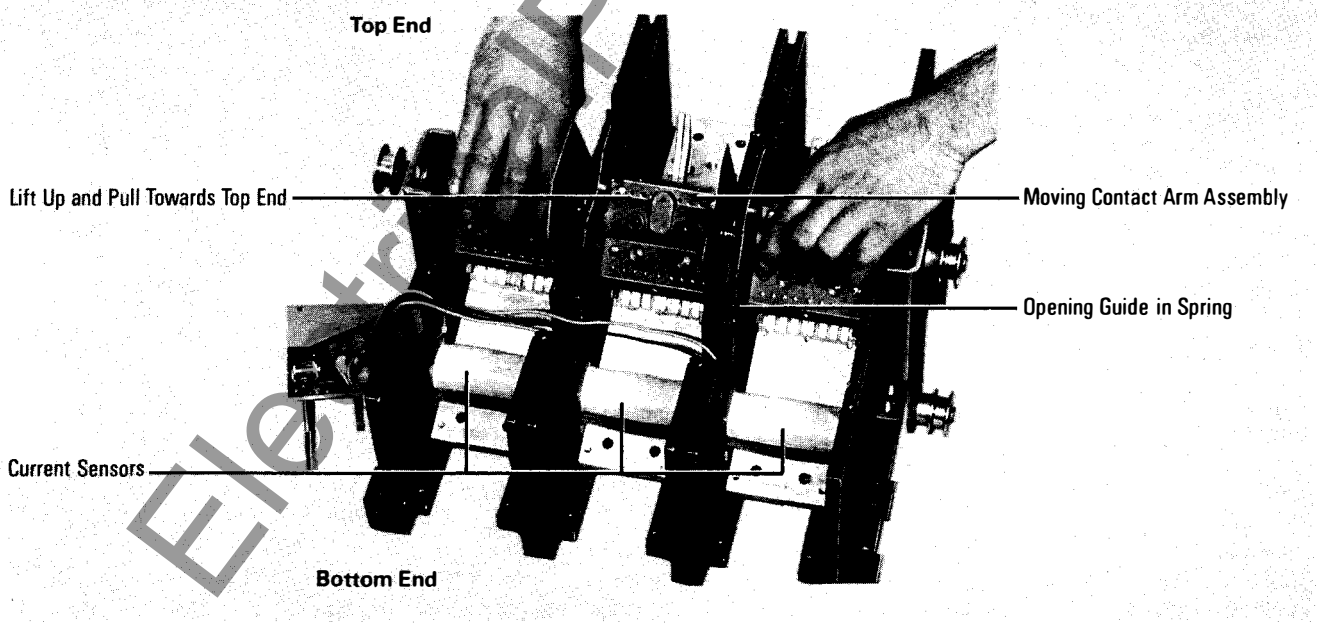

Fig. 30 *Removal of Moving Contact Arm Assembly.*

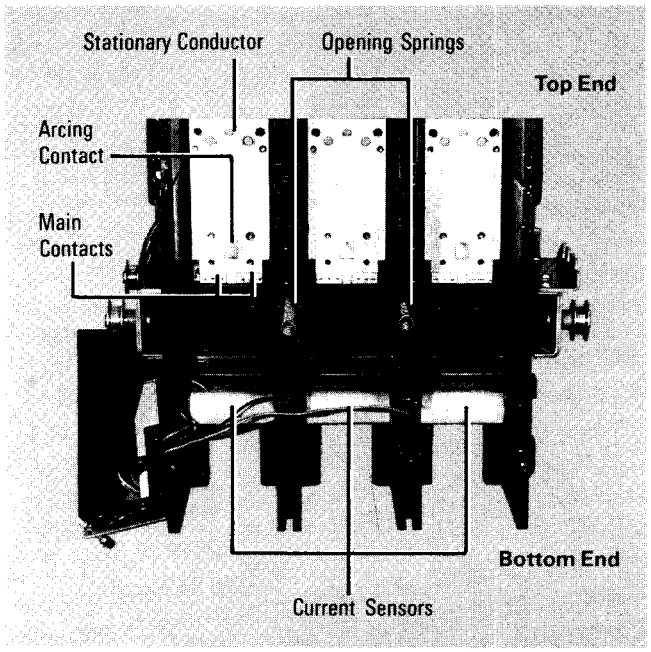

Fig. 32 *1600 Amp Breaker With Moving Contact Arm Assembly Removed.*

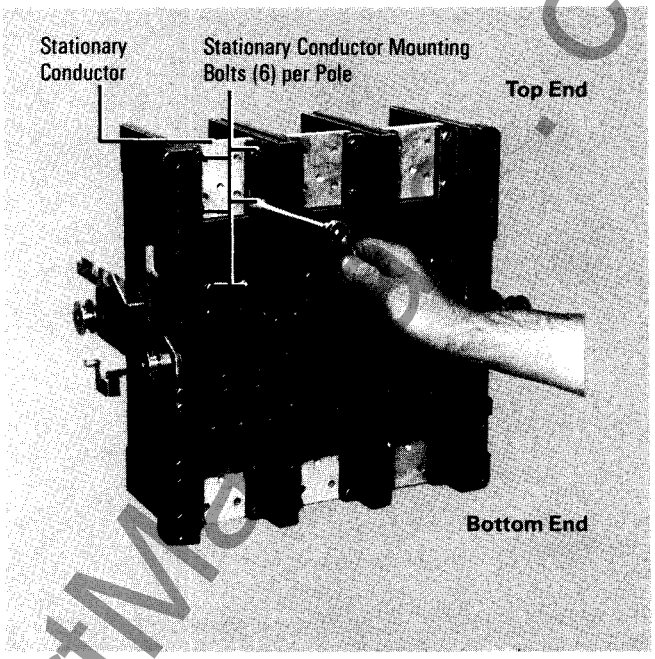

Fig. 33 *Removing Stationary Conductor Mounting Bolts (1600 Amp Breaker).*

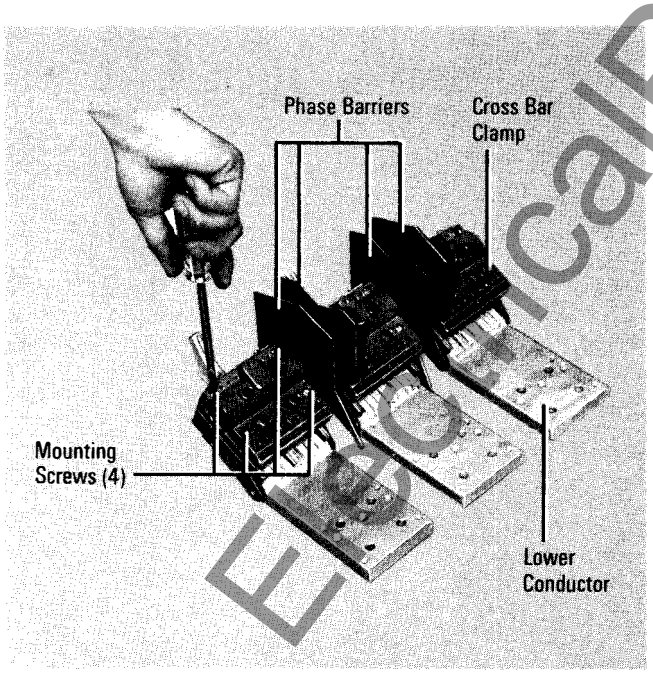

Fig. 34 *Removal of Single Pole Conductor Sub-Assembly From Moving Contact Arm Assembly.*

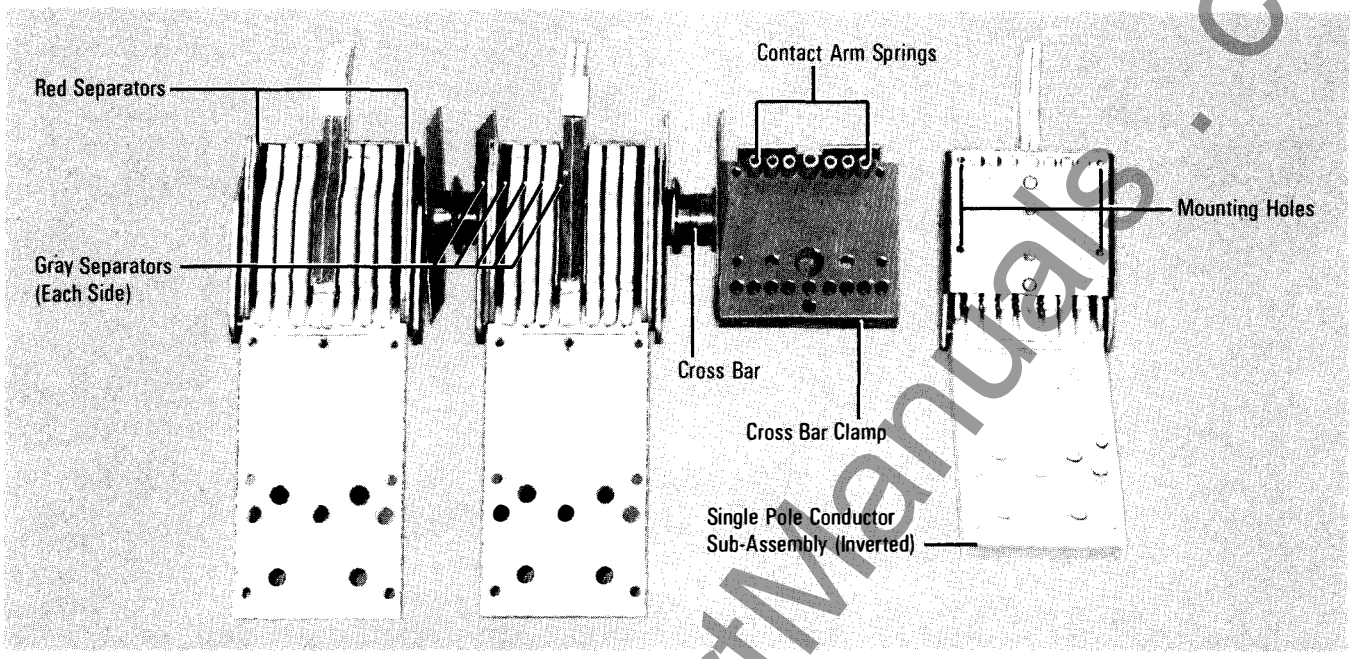

Fig. 35 *Moving Contact Arm Assembly With One Single Pole Conductor Sub-Assembly Removed.*

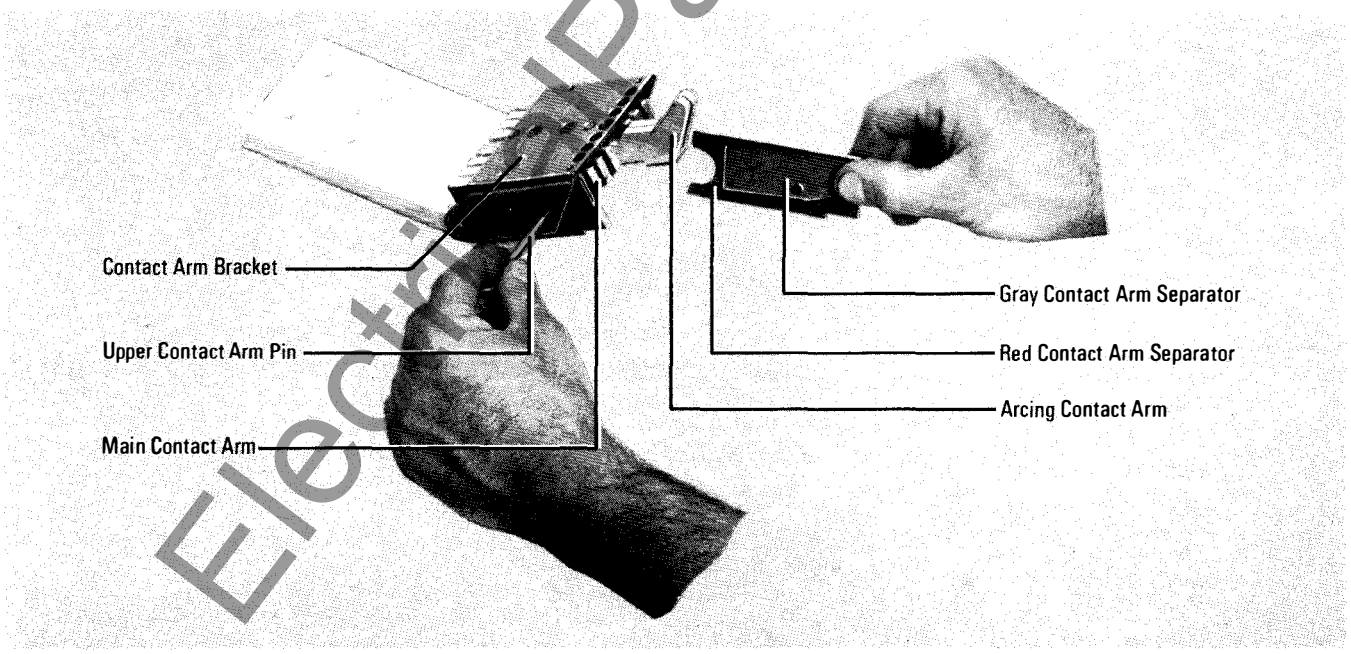

Fig. 36 *Removal of Upper Contact Arm Pin and Contact Arm Separator.*

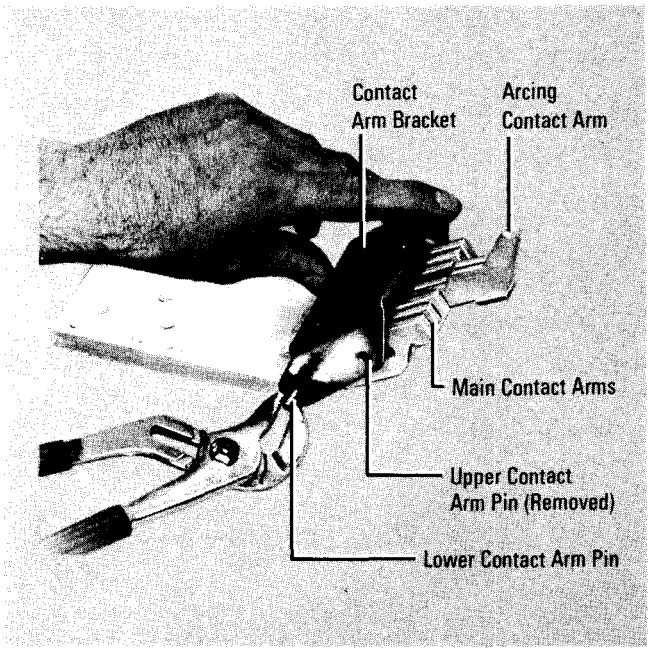

Fig. 37 *Removal of Lower Contact Arm Pin From Single Pole Conductor Sub-Assembly.*

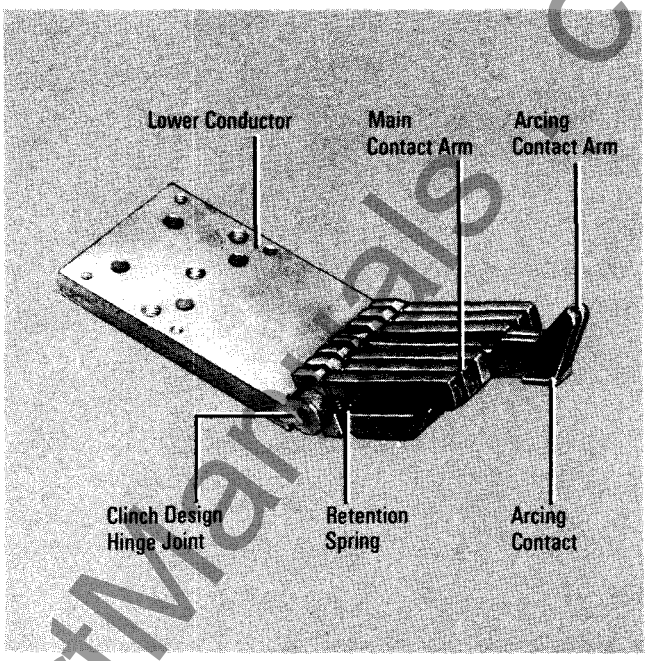

Fig. 38 *Single Pole Moving Contact Conductor Sub-Assembly (Single Arcer Design).*

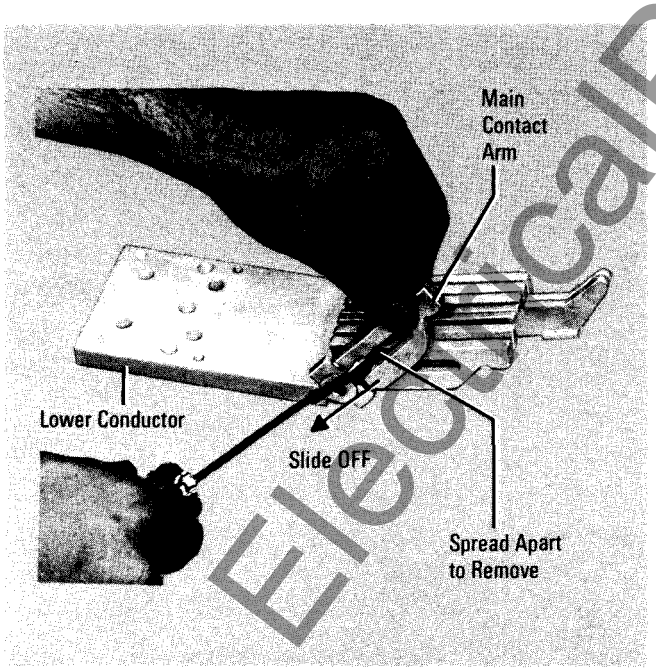

Fig. 39 *Removal of Main Contact Arm.*

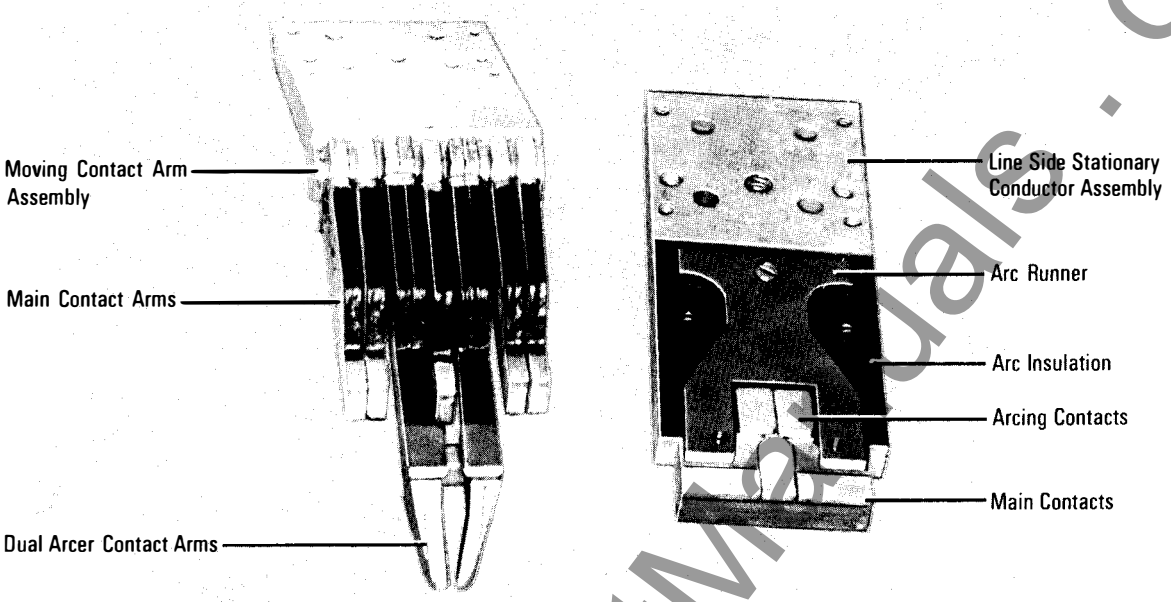

Fig. 40 *1600 Amp Single Pole Moving and Stationary Conductor Assemblies for SPB 150 Breakers.*

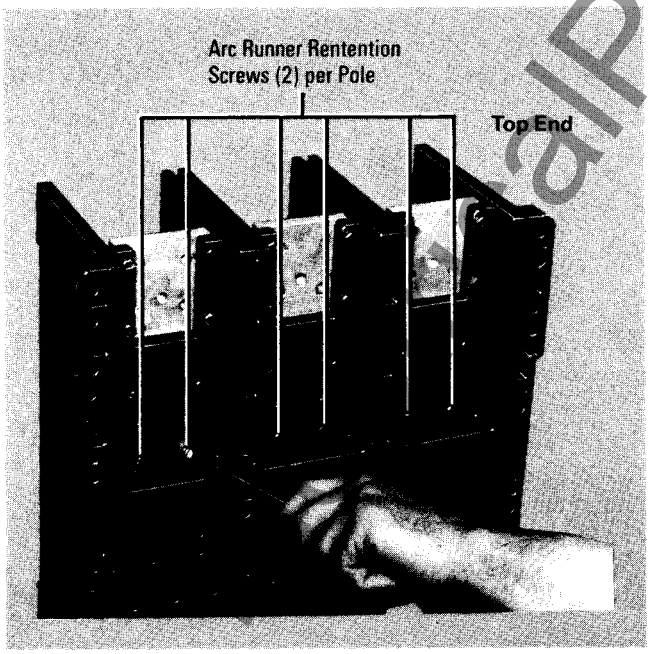

Fig. 41 *Removing Arc Runner Retention Screws From 1600 Amp SPB 100/150 Breaker.*

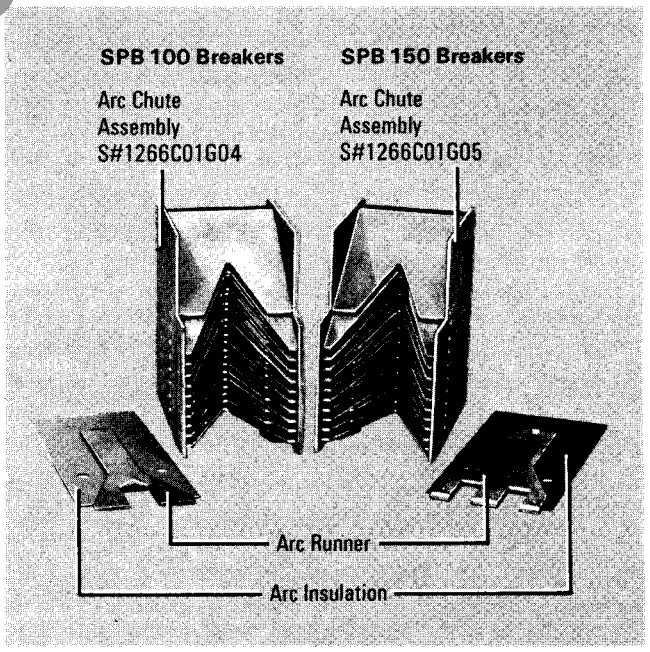

Fig. 42 *Typical Arc Chute Assemblies for 2000/2500/3000/4000/ Amp Breakers.*

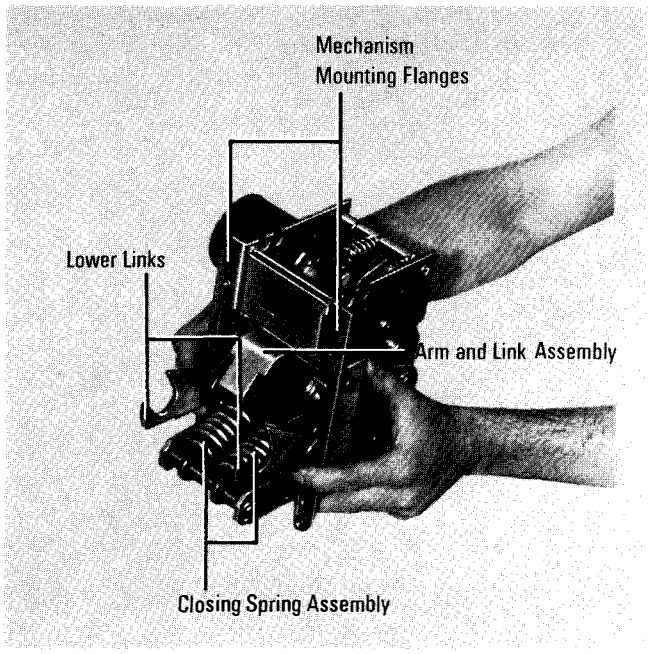

Fig. 43 *Operating Mechanism With Lower Links Positioned for Installation to Breaker.*

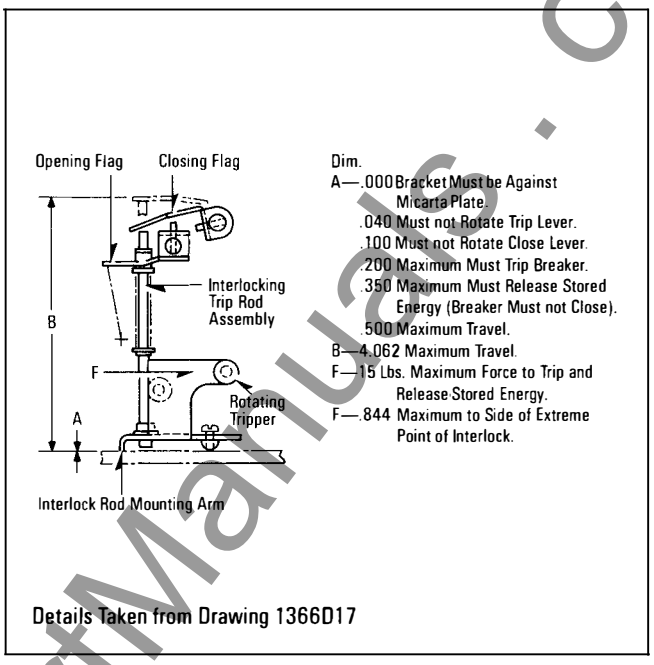

Fig. 45 *Interlock Trip Rod Adjustment Dimensions.*

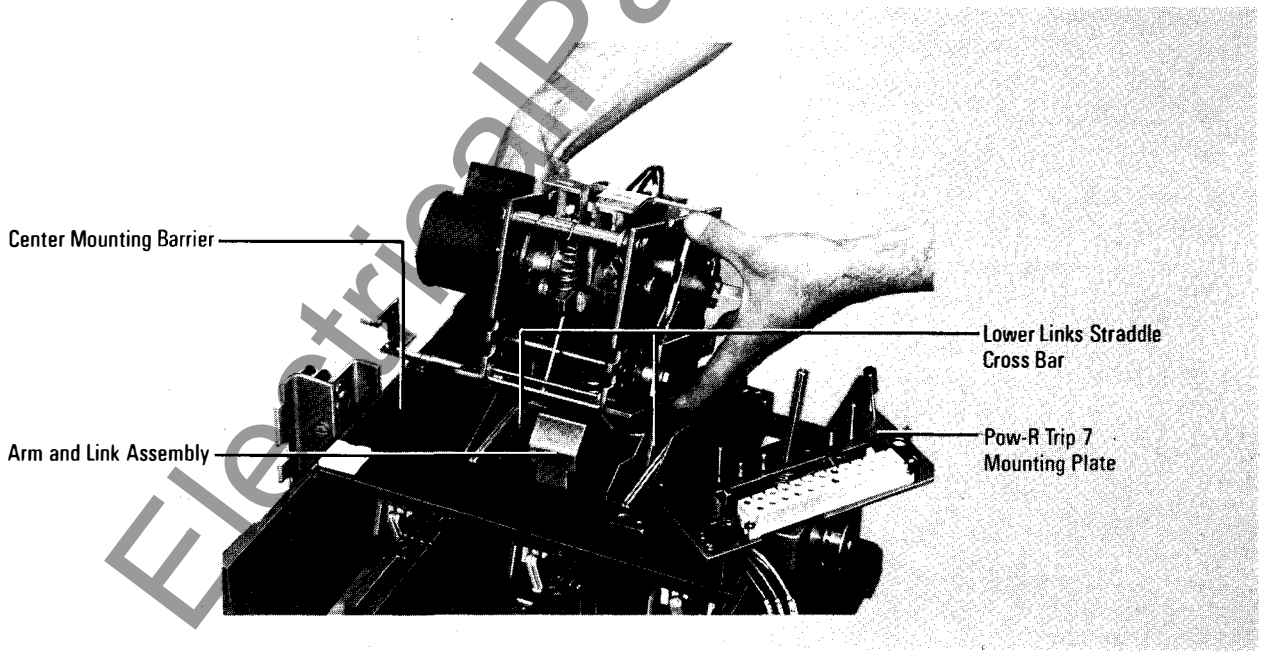

Fig. 44 *Installing Operating Mechanism on Breaker.*

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