

SIEMENS

Low Voltage Circuit Breakers

Type RL

Instructions
Installation
Operation
Maintenance
Parts
SG-3068-01

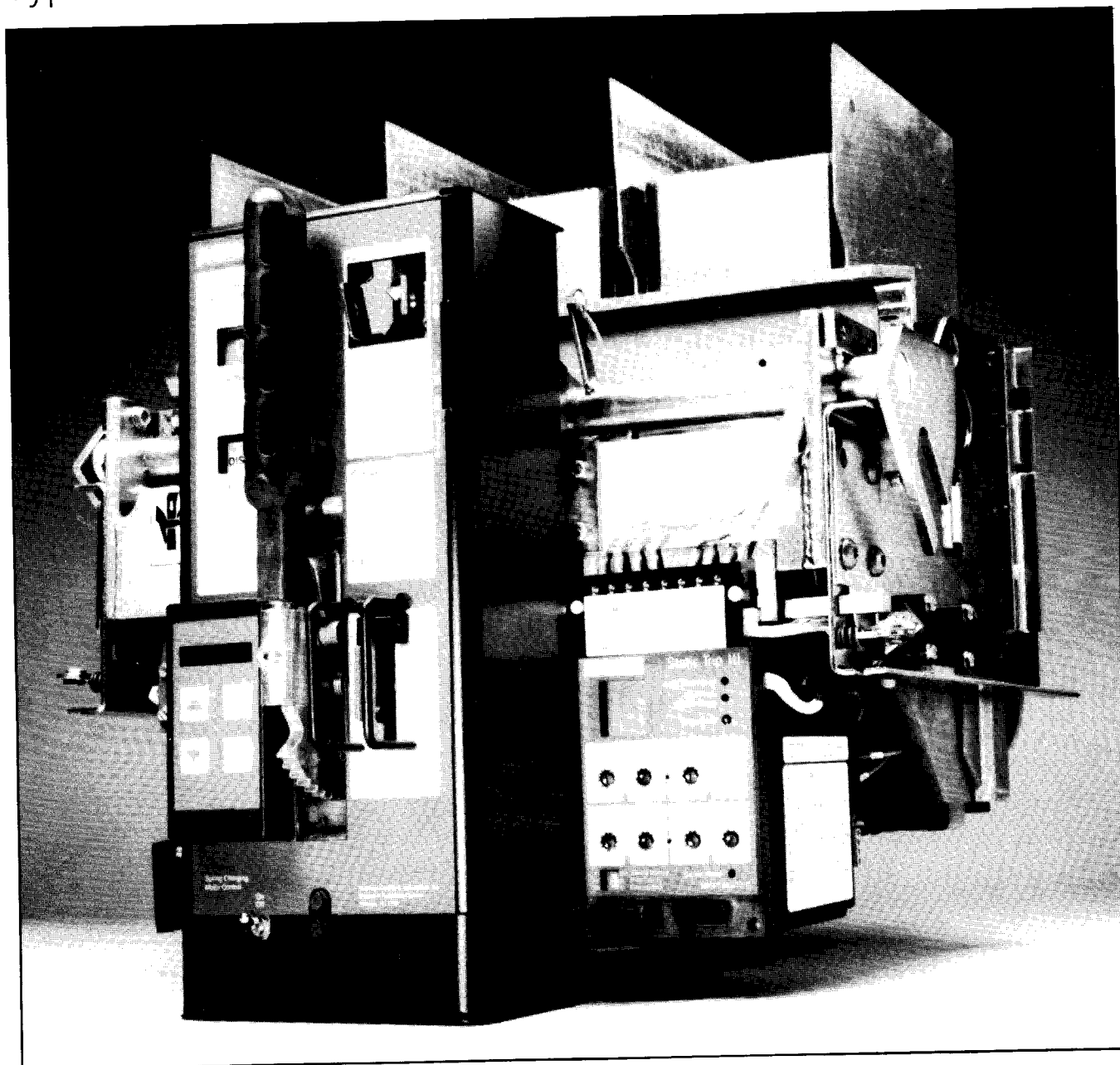


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The information contained within is intended to assist operating personnel by providing information on the general characteristics of equipment of this type. It does not relieve the user of responsibility to use sound engineering practices in the installation, application, operation and maintenance of the particular equipment purchased.



If drawings or other supplementary instructions for specific applications are forwarded with this manual or separately, they take precedence over any conflicting or incomplete information in this manual.

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	 DANGER
	Due to the nature of this product, there is inherent danger in its use through possible exposure to high electrical voltage. Only qualified persons thoroughly familiar with these instructions should be allowed to operate these devices. Improper use or procedures can result in serious personal injury or death.

	 DANGER
	<p>No attempt to operate this equipment should be undertaken without fully reading the instruction manual. Operators must be familiar with the equipment, its operation, and have read these instructions prior to each use. Failure to do so may result in electrical shock or burn causing death or serious personal injury and property damage.</p> <p>Use of the Siemens equipment must be restricted to qualified personnel. A qualified person is one who is familiar with the installation, construction, operation of the equipment and the hazards involved. In addition, this qualified person has the following qualifications.</p> <p>Is trained and authorized to de-energize, clear ground and tag circuits and equipment in accordance with established safety practices.</p> <p>Is trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.</p> <p>Is trained in rendering first aid.</p>

Introduction

Type "RL" Low-voltage AC Power Circuit Breakers may be furnished for mounting in any one of three ways: (1) in metal-enclosed switchgear of the draw-out type; (2) in individual metal enclosures (draw-out type); (3) for stationary mounting in a customer's own enclosing case or switchboard. All "RL" circuit breakers are completely assembled, tested, and calibrated at the factory in a vertical position and must be so installed to operate properly. Customer's primary connections must be adequately braced against the effects of short circuit currents to prevent overstressing the circuit breaker terminals.

Receiving and Inspection of Damage

Immediately upon receipt of this equipment, carefully remove all packing braces. Examine parts and check them against the packing list and note any damages incurred in transit. If damage is disclosed, a carrier inspection must be arranged for by consignee within 15 days of receipt of equipment. If equipment is shipped F.O.B. Destination, the consignee must obtain the original of the carrier inspection report and notify Siemens immediately.

Two shipping methods are used with "RL" circuit breakers:



1. Individually skidded with protective covering.
2. Within a cubicle. Circuit breakers shipped in their cubicles may be open or closed.



Note all caution tags, remove blocking bolts, and open circuit breaker contacts before installation.

Storage

When circuit breakers are stored, wrap or cover them with a non-absorbent material to protect them from plaster, concrete dust, moisture or other foreign matter. Do not expose circuit breakers to the action of corrosive gases or moisture. In areas of high humidity or temperature fluctuations, space heaters or the equivalent should be provided.

Circuit Breaker

	 DANGER
	HAZARDOUS VOLTAGE Do not work on energized equipment. To do so may result in property damage, serious personal injury or death.

	 CAUTION
	Do not accept the statement from any driver that the damaged equipment was not properly packaged by shipper. Do not sign Bill of Lading without notation of visible damage if observed. Our equipment packaging meets the rigid requirements established by the trucking industry. You must obtain carrier inspection within 15 days of receipt on damaged equipment.


Installation

General


The "RL" Low-voltage AC Power Circuit Breaker is completely adjusted, tested, and inspected before shipment. However, a careful check should be made to be certain that shipment or storage has not resulted in damage or change of adjustment. Circuit breakers and their enclosures should be installed in a clean, dry, well-ventilated area in which the atmosphere is free from destructive acid or alkali fumes. For stationary breakers and customer enclosures, the factory should be consulted for minimum clearances and required ventilation openings. If not enclosed, they must be mounted high enough to prevent injury to personnel either from circuit interruption, or from moving parts during automatic opening of the circuit breaker.

Allow sufficient space to permit access for cleaning and inspection, and adequate clearance to insulating barriers above the circuit breaker to prevent damage from arcing during interruption. Before installing, make certain that the circuit breaker contacts are in the open position. Be sure to lubricate primary and secondary disconnect fingers with Siemens electrical contact lubricant supplied with accessories.

Installation Sequence

	CAUTION
	Be certain that you check points 1a through 1f below before placing circuit breaker in compartment.

1. Determine the correct switchgear compartment for each circuit breaker by checking the Three-Line Diagram furnished with the drawings. The Three-Line Diagram shows the following for each circuit breaker compartment:
 - a. Circuit breaker Type (RL-800, RL-1600 etc.)
 - b. Trip "XFMR" or "SENSOR" rating.
 - c. Static Trip Type (RMS-TS, RMS TIG-TZ etc.)
 - d. Type of operator (Manual Operator-M.O. or Electrical Operator-E.O.)
 - e. Circuit Breaker Wiring Diagram Numbers
 - f. Special Accessories (Undervoltage Trip, etc.)
2. On fused breaker make sure trigger fuse linkage is reset. Breaker will remain trip free as long as this linkage is tripped.
3. After the circuit breaker is placed in the compartment, rack it to the TEST position.
4. Close and trip the circuit breaker. Refer to OPERATING PROCEDURE, Pages 4 and 5 for manually and electrical-ly operated breakers.
During the closing operating, observe that the contacts

	DANGER
	HAZARDOUS VOLTAGE Do not work on energized equipment. To do so may result in property damage, serious personal injury or death.

move freely without interference or rubbing between movable arcing contacts and parts of the arc chutes. Then refer to OPERATION, Pages 4 and 5 for a detailed description of the circuit breaker operating characteristics before placing the circuit breaker in service. Make sure circuits are not energized.

5. Trip units and accessory devices should receive a thorough check before placing the circuit breaker in ser-

vice. This check makes certain that adjustments are proper and parts are not damaged. Refer to Static Trip III Instruction Book SG-3118.

6. Circuit breakers are equipped with a draw-out interlock to prevent movement of a closed circuit breaker into or out of the connected position. Circuit breaker interlock operation should be checked before it is energized. See DRAW-OUT INTERLOCK, Page 5, and SPRING DISCHARGE INTERLOCK, Page 8, for a description of these interlocks.
7. After completing the installation inspection, check the control wiring (if any) and test the insulation.
8. Now the circuit breaker is ready to be racked into the CONNECTED position. Refer to RACKING MECHANISM, Pages 7 and 8.
9. The circuit breaker can now be closed to energize the circuit.

Cautions to be Observed in Installation and Operation

1. Read this Instruction Book before installing or making any changes or adjustments on the circuit breaker.
2. Stored-energy closing springs may be charged with circuit breaker contacts in either the open or closed position. Extreme care should be taken to discharge the springs before working on the circuit breaker.
3. When closing manually operated breakers out of the unit, the racking mechanism must be returned to the test position before the closing spring can be charged.
4. When charging manually operated breakers, always hold the handle firmly until it is returned to the normal vertical position. A ratchet insures that the closing stroke must be completed once started.
5. Check current ratings, circuit breaker wiring diagram numbers, circuit breaker type and static trip type, against the Three-Line Diagram to assure that circuit breakers are located in the proper compartments within the switchgear.
6. Check the alignment of the secondary disconnect fingers. This ensures against misalignment due to possible distortion of fingers during the shipment and handling.
7. Close the compartment door and secure door latch(s) prior to racking the circuit breaker to or from the CONNECTED position. Also close and latch the door prior to closing the circuit breaker when in the CONNECTED position. Once the circuit breaker is closed, keep the door closed.
8. Once the circuit breaker is energized, it should not be touched, except for the exterior controls.

Description

The continuous current and interrupting ratings of the circuit breakers are as shown on the circuit breaker rating label.

The circuit breakers are also available with integrally mounted current limiting fuses through 2000A frame size, and with separately mounted fuses for 3200A and 4000A frame size. For 800A, 1600A, and 2000A frame sizes the basic circuit breakers are the same with or without fuses. The fuses mount on a bracket that is bolted to the side plates and upper studs on the back of the circuit breaker. The current limiting fuses increase the interruption rating to that of the fuses. Fused circuit breakers are identified as RLF-800, RLF-1600, RLF-2000, RLF-3200, or RLF-4000. Fused circuit breakers are also equipped with an open fuse trip device to open the circuit breaker if one or more current limiting fuses open.

NOTE

Fused circuit breakers are not physically interchangeable with unfused breakers.

The circuit breakers can also be supplied for stationary mounting in which the racking components are omitted and brackets are provided for mounting to a stationary frame.

All RL circuit breakers use the same basic closing mechanism or operator. The closing springs used vary between sizes.

Three configurations of the operator are available for charging the closing springs. These are:

- A. Manual Charging
- B. Electrical Charging
- C. Combination Manual-Electrical Charging

The manual and electrical operators are identical except for the means of supplying energy to the closing springs. A double-toggle, trip-free mechanism is used. This means that the breaker contacts are free to open at any time if required, regardless of the position of the mechanism.

A. Manually Operated Breakers

The breaker has a center-mounted frame so many of the latches and links are arranged in pairs. For descriptive purposes, they will be referred to as single items. Refer to **Figure 1** and **Table 1**. Detail (A) shows the position of the trip latch and toggle linkage when the circuit breaker is open and the closing springs are discharged.

Table 1.
Operating Procedure Manually Operated Circuit Breakers

Operation	Procedure
Charging Springs	Pull charging handle down all the way (approximately 120°) and return it to normal vertical position. (Engagement of pawl with ratchet teeth prevents handle reversal until the downward stroke is completed.)
Closing	Push down firmly on spring-release latch hood (50) after handle is returned to normal vertical position.
Tripping	Push in manual trip rod (94). OR If shunt trip is provided, operate remote trip control switch (CST). (See Figure 2 .)

Movement of the charging handle downward rotates closing ratchet (140) against roller (43), thus pivoting closing cam (34) clockwise about pin (40). This extends the closing springs through link (41) and spring hanger (58). Rotation of cam (34) allows roller (27) in toggle linkage to be moved into position shown in Detail (B). Kickoff spring (10) moves rollers away from the stop block (7). Then the toggle linkage is moved by torsion spring until latch (15) clears trip latch (12). Spring (13) causes trip flap (12) to reset under latch (15). Trip flap (12) should normally stop against the front surface of latch (15).

When the closing springs are fully charged, roller (43) engages latch (47). Closing ratchet (140) engages a pawl in such a manner that the charging cam must complete the charging stroke before it can return to its normal position.

With the charging handle in its normal upright position, the circuit breaker can be closed. By pressing firmly on hood (50), latch (47) will disengage roller (43). Then closing springs cause cam (34) to rotate against the toggle rollers (27), moving the toggle into its upright position, as shown in detail (C). The closing cycle can be interrupted at any point by operation of one of the tripping means. This will cause rotation of trip latch (12) to a position that releases latch (15), allowing toggle linkage to collapse to the position shown in detail (A).

To manually open the circuit breaker, press in manual trip rod (94). This bar engages the top of trip flap (12), to disengage the latch (15).

B. Electrically Operated Circuit Breaker

The mechanism of the electrically operated circuit breaker is the same as the manually charged circuit breaker, except that

the manual charging handle is replaced by a motor and gear system. Refer to **Figure 1, Table 2**. Power available to the control circuit will start the automatic charging cycle. The motor gear box pinion rotates gear (81) counterclockwise. Cam follower (82) engages an arm of wind and close cam (34), which rotates the cams in the same manner as for the manually charged circuit breaker. When the wind and close cam (34) reaches its charged position, the back of the cam engages switch lever (73), rotating the lever away from the switch operator. Gear switch lever (76) will still be holding the switch in the operate position and the motor will continue to run until the roll pins on the side of gear (81) lifts lever (76) clear. This releases the motor cut-off switch (MCO). When the MCO switch opens, the motor stops, and the closing coil circuit is set up through one side of the MCO switch.

Table 2. Operating Procedures Electrically Operated Circuit Breakers

Operation	Procedure
Charging Springs	Energize control circuit.
Closing	After springs are charged, actuate remote close control switch (CSC). OR Push down firmly on spring-release latch hood (50).
Tripping	Actuate remote trip control switch (CST). OR Push in manual trip rod (94).

The circuit breaker can now be closed by depressing the latch hood (50) or by energizing the closing coil (CC) through the external close control switch (CSC). When the close circuit is energized, the "Y" relay is energized and opens the "Y" contact in the coil circuit. This prevents "pumping" or repeated attempts to close the circuit breaker if a tripping signal or fault is present.

C. Combination E.O. and M.O. Circuit Breaker

The combination manually and electrically operated circuit breaker includes both the motor-gear charging system as well as the manual charge handle.

NOTE

Manual charging handle must be in vertical position during electrical charging.

Draw-Out Interlock

Integral parts of the circuit breaker mechanism include provisions to:

1. Rack the circuit breaker in or out of the cubicle compartment.
2. Interlocking to prevent racking a closed circuit breaker into or out of the connected position.
3. Interlocking to prevent closing a circuit breaker until it is fully racked to the connect position.
4. Interlocking to prevent withdrawing a circuit breaker from the cubicle while the closing springs are charged.

Trip Latch Engagement (See Figure 1)

Toggle latch (15) should engage the full width of trip latch (12) when the circuit breaker is closed in the normal manner. The tension on spring (15) can be increased if required by bending spring tab on trip flap towards the front of the circuit breaker. Too much tension will interfere with the capability of the tripping actuator to move the trip flap, so over-bending should be avoided.

Racking Mechanism

Refer to **Figure 3**. With the circuit breaker resting on the cubicle rail, the following sequence should be used to rack the circuit breaker into the cubicle.

1. Push trip bar in, open racking window and insert racking crank.

NOTE

Racking window cannot be opened unless manual trip bar is pressed in. While the trip bar is pressed in, the circuit breaker is in the TRIP FREE position and cannot be closed.

2. With the racking crank, rotate the racking screw (105) counterclockwise until the racking shaft is in the disconnected position. The clevis can now engage the racking pins in the cubicle. The circuit breaker should now be pushed along the rail into the DISCONNECTED position. Double check that the racking clevis does engage the pins in the cubicle.
3. Clockwise rotation of the racking screw will rack the breaker into the TEST position. At the TEST position, the racking window can be closed, allowing the trip bar to reset and the circuit breaker can be operated. Further

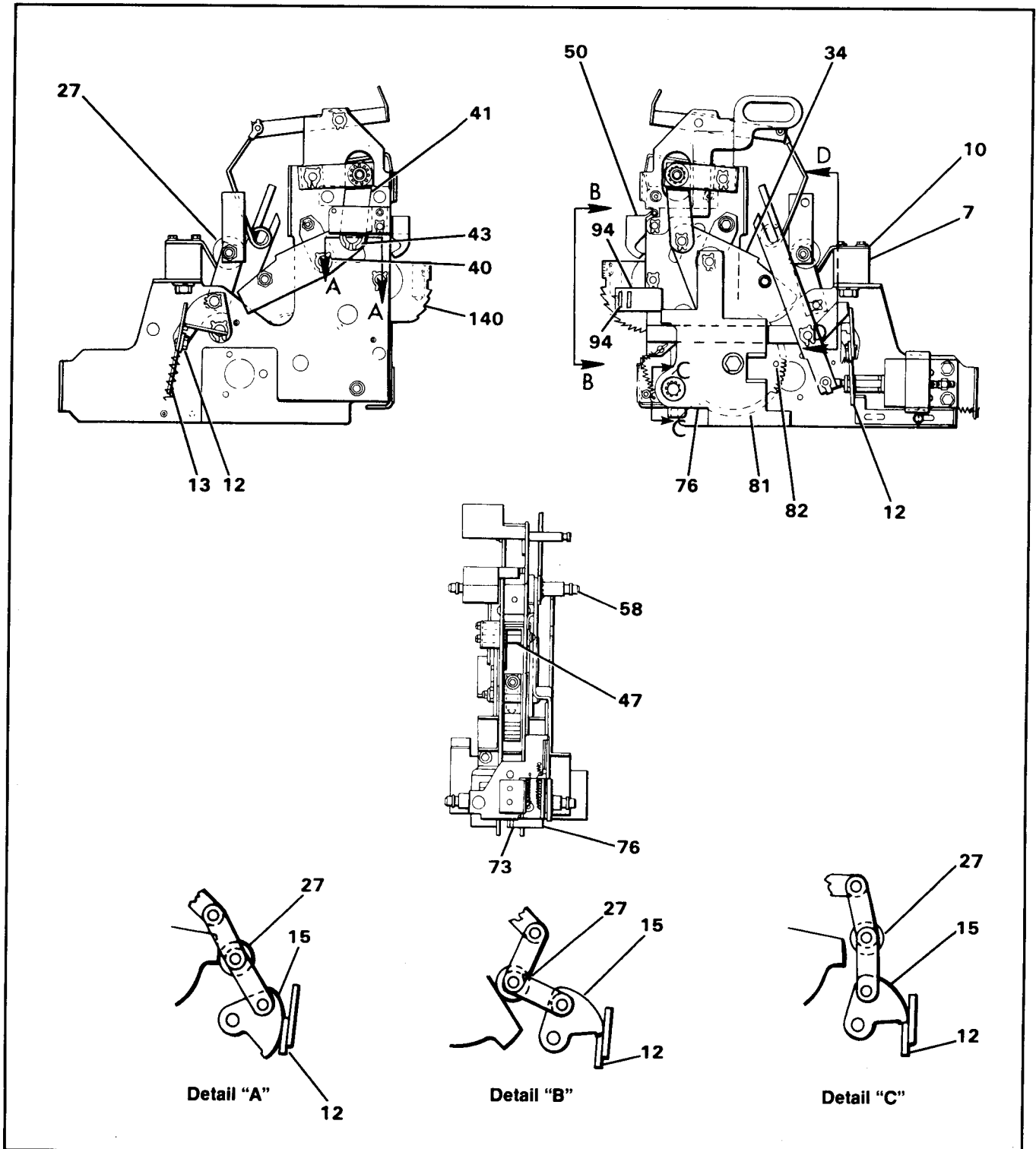


Figure 1. Circuit Breaker Operator

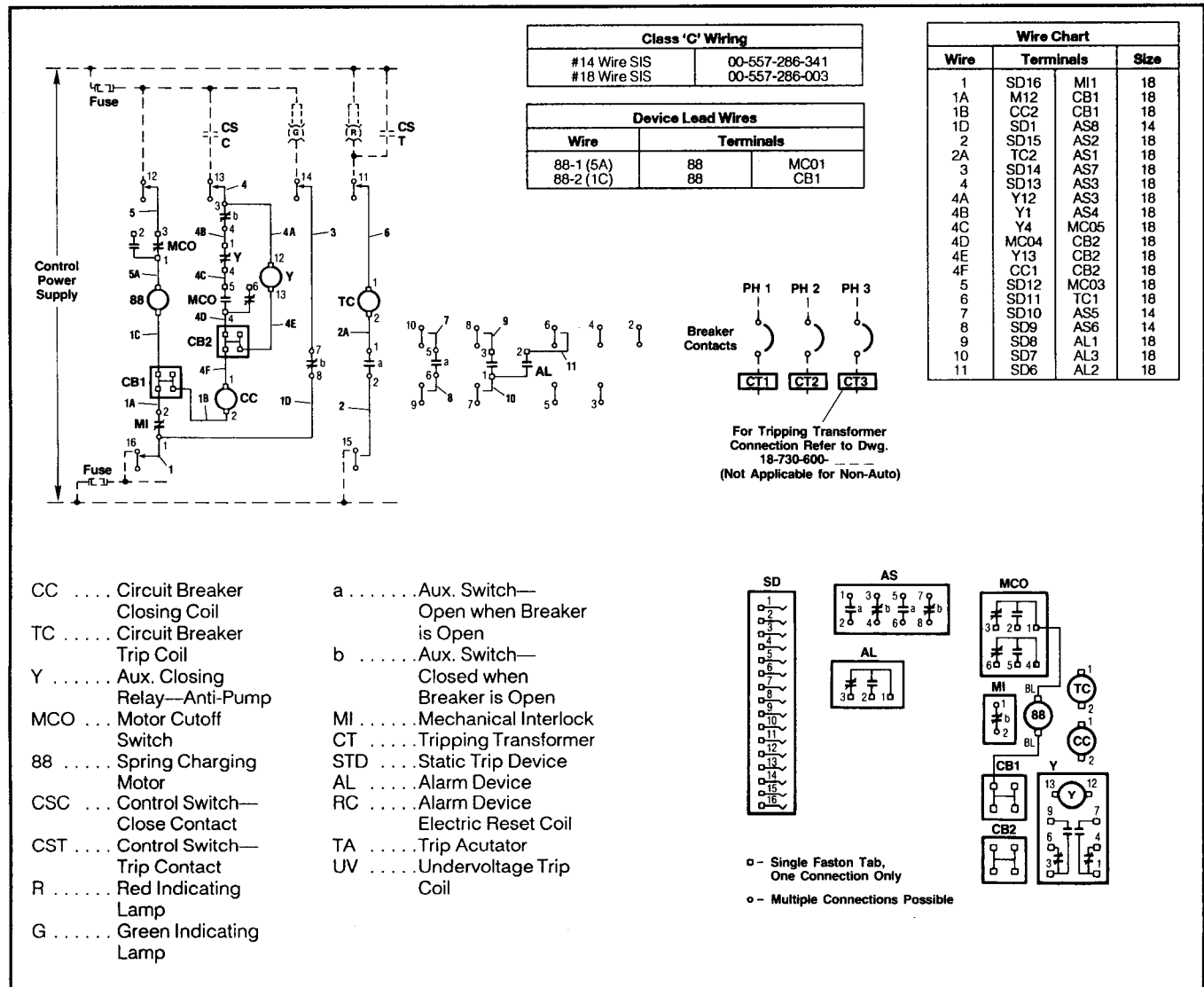



Figure 2. Typical Wiring Diagram—Electrically Operated Breakers
Diagram Shows Breaker in Discharged and Open Position

racking will place the circuit breaker between the test and fully connected positions. Between positions, the interlock bar will not engage the position holes of the cubicle. The breaker will be held TRIP FREE and cannot be closed.

In the CONNECTED position, the interlock will engage the cubicle hole and reset, allowing the circuit breaker to be closed. This prevents closing a circuit breaker which is not in the CONNECTED position.

- To withdraw the breaker from the CONNECTED position, rotate the racking screw counterclockwise.
- Before attempting to operate the circuit breaker, the position of the device should be checked with reference to the holes in the cubicle, to be certain that it is fully connected. Two stop nuts are provided on the racking screw to set the connected position. These are adjusted by setting the angle of the racking clevis, as shown in **Figure 3**, and by tightening the nuts against the stop washer (109), the two nuts (110) should then be locked against each other.

	⚠ CAUTION
	<p>To avoid damage to the racking mechanism, do not, when in the connected position, rotate the racking crank clockwise.</p>

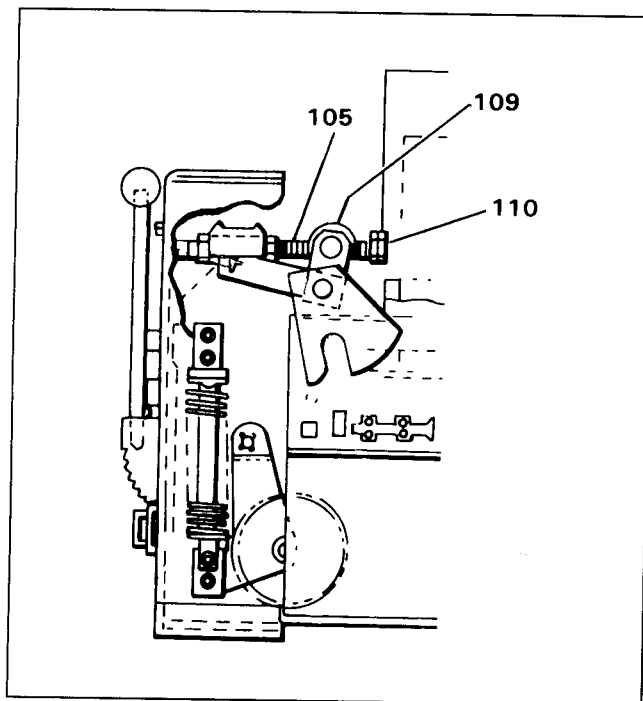


Figure 3. Detail of Typical Racking Mechanism and Drawout Interlock

Spring Discharge Interlock


When racking the circuit breaker out to the DISCONNECTED position, the closing springs will automatically discharge, at


NOTE
<p>Manual charge handle must be in the vertical position during racking. The racking mechanism must be returned to the TEST position before closing springs can be charged (either in the cubicle or when removed from the cubicle).</p>

Note also that the spring discharge interlock produces TRIP FREE operation in which all of the stored energy of the springs is dissipated in the mechanism. It is preferable to turn the motor power off in the TEST position, close and trip the circuit breaker normally in that position and then rack out in the normal manner.

or before reaching the disconnect position. The barrel nut engages the spring interlock. This, in turn, is connected to the manual close hood which releases the closing springs.

Lifting Bar

	⚠ DANGER
	<p style="text-align: center;">HEAVY WEIGHTS</p> <p>The use of the lifting device will place heavy weights overhead. Avoid excessive speeds and sudden starts or stops. Never lift a circuit breaker in an area where personnel are located. Failure to comply may result in property damage, serious personal injury or death.</p>

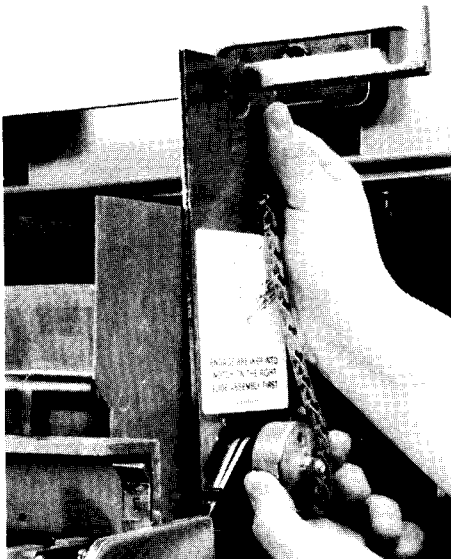
	⚠ CAUTION
	<p>On manually charged breakers, the close hood is interlocked to the manual charge cam, and must be clear before racking the circuit breaker to the DISCONNECT position.</p>



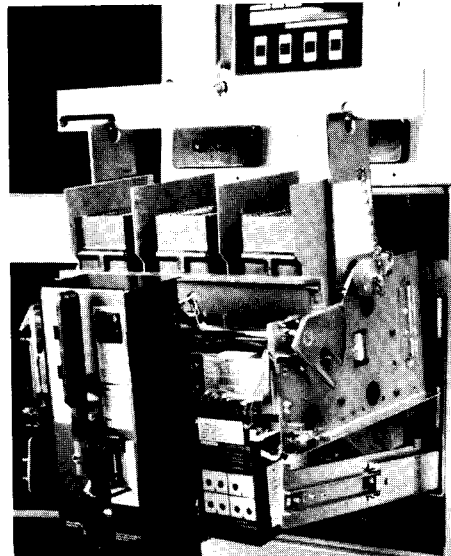
⚠ DANGER

HEAVY WEIGHTS

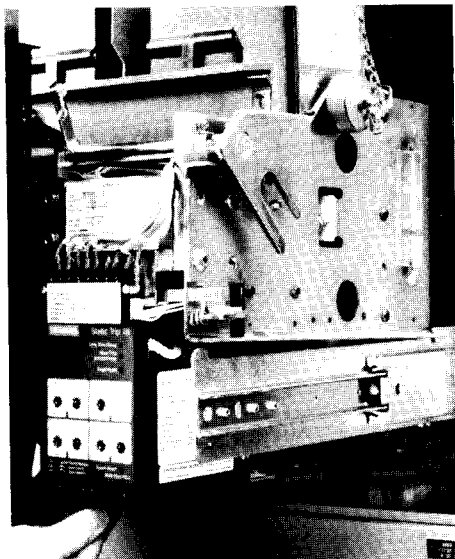
The use of the lifting device will place heavy weights overhead. Follow instructions for use. Avoid excessive speeds and sudden starts and stops. Never lift a circuit breaker above an area where personnel are located. Failure to comply may result in property damage, serious personal injury or death.



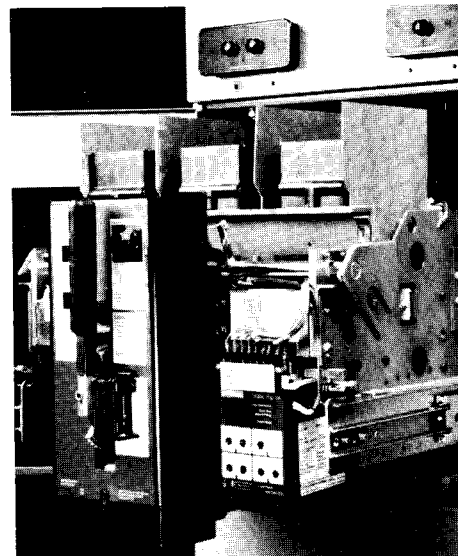
Attach lifting yoke to circuit breaker. Read instruction labels on the lifting yoke.



Raise breaker above the cell's fully extend rails.



Lower circuit breaker onto rails. Important! Tilt rear of circuit breaker down so that the frame engages the notch on the right hand rail.



With circuit breaker securely on the rails, remove the lifting yoke. The circuit breaker is now ready for inserting into the circuit breaker cell.

Figure 4. Handling Instructions

Handling Instructions

Inserting Circuit Breaker

1. Place circuit breaker on rails, check engagement of rails in slots on breaker. The rear of the right hand circuit breaker rail must be located under the protruding hook on the right hand cubicle rail.
2. Push breaker to disconnect position. Interlock bar prevents movement of breaker in cell, unless trip bar is depressed.

3. Use crank to rack breaker into cell.
4. Check door iris for free movement before closing door.

Removing Circuit Breaker



1. With circuit breaker in disconnect position, pull breaker out until stopped by rails, trip bar must be depressed to withdraw interlock bar.
2. Put on lifting bar and lift weight off rails with hoist, use caution in hoisting, and double check engagement of the lifting device.

Maintenance

Occasional checking, cleaning and exercising of the circuit breaker will promote long and trouble-free service. A periodic inspection and servicing, normally at intervals of one year, should be included in the maintenance routine. Circuit breakers located in areas subject to acid fumes, cement dust, or other abnormal conditions, require more frequent servicing. After a severe fault interruption, the circuit breaker should be inspected. Refer to ANSI Standard C37.16, Table 5 for recommended servicing intervals.

The circuit breaker should not remain in either the closed or open position any longer than six months. Maintenance opening and closing operations should be made to ensure freedom of movement of all parts.

A suggested procedure to follow during maintenance inspections:

	 DANGER
	HAZARDOUS VOLTAGE
	<p>Do not work on energized equipment. Unauthorized personnel should not be permitted near energized equipment.</p> <p>Plan the time for maintenance with operating personnel so that the switchgear can be deenergized and safely grounded.</p> <p>Failure to comply may result in property damage, serious personal injury or death.</p>

1. De-energize the primary and control circuits.
2. Rack circuit breakers to the disconnected position.
3. Remove circuit breaker from cubicle.
4. Remove arc chutes and examine for burned, cracked or broken parts.

To remove arc chutes, proceed as follows:

- a. Remove mounting screws for holding clips, remove bar and phase barriers.
- b. Lift arc chutes vertically to clear arc runners.
5. Wipe the contacts with a clean cloth saturated with a non-toxic cleaning fluid.
6. Replace badly burned or pitted contacts. (See Contact Replacement, Page 13, and Lubrication Instructions, Page 21.)
7. Wipe all insulated parts with a clean cloth saturated with a non-toxic cleaning fluid.
8. Bearing pins and other sliding or rotating surfaces should be cleaned and then coated with a light film of grease. (See Lubrication Chart, Page 21.)
9. Charge the springs manually and maintenance close to check latch and linkage movement. (Rotate racking screw to the approximate TEST position to clear spring discharge interlock before attempting to charge closing springs.)
10. Check circuit breaker adjustments. (See Adjustments, Page 12.)

Lubrication

Lubrication should be a part of the servicing procedure. Old grease should be removed from bearing pins and other non-current carrying rotating or sliding surfaces. They should be wiped with a thin film of petroleum-oil-base precision-equipment grease, such as Beacon P-325 (Exxon).

Grease with care to avoid getting grease on insulating members, since it may affect the dielectric strength. Faces or arcing contacts should not be lubricated. The rubbing surfaces of the main contact fingers and hinge contact fingers are lubricated with a coating of Siemens contact lubricant, 15-171-370-002. If dust has accumulated, disassembly may be necessary to clean and relubricate these points. See Contact Replacement, Page 13 and Lubrication Instructions, Page 21.

Maintenance Closing

NOTE

Holding the spring release latch down prevents the stored-energy springs from propping in the charged position. Thus, when the handle is slowly returned to the normal vertical position, the energy in the springs is slowly released against the closing handle assembly.

During inspection prior to installation, and for routine maintenance inspections, the circuit breaker contacts may be closed slowly to check clearances, contact adjustments, and movement of links and latches.

Electrically operated breakers do not have a manual charging handle, but it is available as a maintenance item. When the hole in the charging handle assembly is aligned with the holes in the operating mechanism frame, the pin which is attached to the cam is inserted. This pin holds the assembly in place and acts as a pivot point for the cam. After insertion of the maintenance closing handle assembly on the electrically operated breaker, the actual maintenance closing operations is the same for both the electrically operated and the manually operated circuit breaker. Refer to Table 3, **Figure 5**.

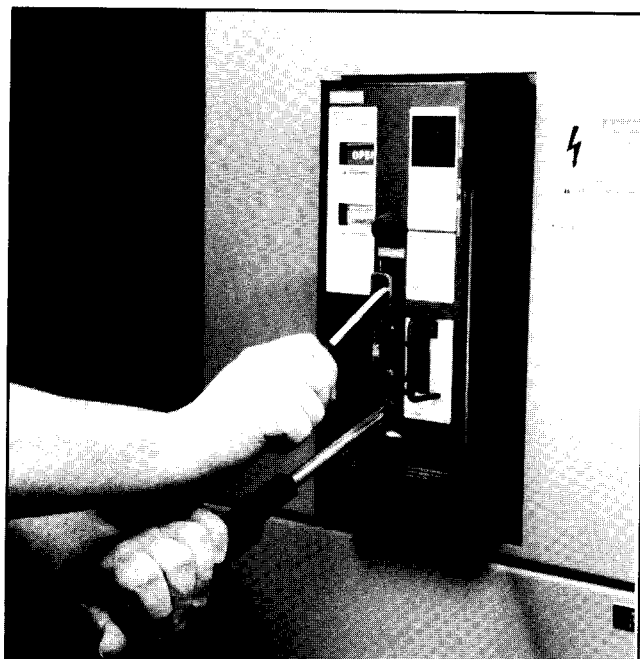


Figure 5. Maintenance Closing

Adjustments

During maintenance inspections, the following items should be checked to ensure that the original settings are maintained:

Table 3. Maintenance Closing

Operation	Procedure
Closing Contacts	<ol style="list-style-type: none"> 1. Verify that racking mechanisms is in TEST position. 2. Pull charging handle DOWN ALL THE WAY (approximately 120°) 3. Place blade of screwdriver between hood and spring release latch and hold it in DOWN position. 4. Slowly return handle to vertical position. Observe contact, touch, mechanical operation, etc.

	CAUTION
	<p>The procedure in Table 3 should be used for maintenance closing only. The circuit breaker must be outside of the cubicle during any maintenance close operation. Maintain a firm grip on the manual charging handle during the closing stroke—the circuit breaker may suddenly latch fully closed and apply unexpected force to the charging handle.</p>

Main Contact Make (See **Figure 6**)

Compression of the contact fingers (46) must be between .093" and .125" (2.4-3.2mm). This is the difference in the 1) measurement from the breaker base to the tip of the finger contact surface when the breaker is open, 2) the measurement in the same place when the breaker is closed. For RLE version breakers, the measurement is made .25" from bottom edge of the finger contact surface. This is checked with a normal closing operation—not maintenance closing. Adjustment is provided by positioning screws (78) after loosening nuts (80). Counterclockwise rotation of screws (78) increases compression. Care should be taken to retighten nuts (80) after adjustment. If it is desired to check contact pressure, a push-type spring scale can be used to compress contact fingers (46) with breaker open. Contact pressure should be between 20 and 30 pounds (9.1-13.6 kg) on each finger.

Arcing Contact Make (See **Figure 6**)

With the movable arcing contact (62) in any one phase touching the mating stationary contact when the circuit breaker is closed by the maintenance closing method (see **Table 5**), the phase-to-phase variation should not exceed .062" (1.6mm). Adjustment may be made by positioning screws (78) as in the previous paragraph. It is essential that the main contact compression be maintained within the tolerance listed in the previous paragraph. Arcing contact pressure should be between 20 and 40 pounds (9.1-18.2 kg) when checked with a pull-type spring scale at the base of the arcing contact tip insert with the circuit breaker contacts closed. Measure each blade separately.

Contact Replacement (See **Figure 6**)

The contact structure consists of main current carrying contacts and arcing contacts arranged so that initial contact make and final contact break is by means of the arcing contacts. The actual contact surfaces are clad with an alloy facing which greatly reduces mechanical wear and arc erosion.

When inspection of the alloy facing indicates that the contacts should be replaced, it should be noted that hinge contact fingers (53, 55) main contact fingers (46) and arcing contacts (61) are spring loaded. Therefore, care must be used in removal and installation of any of the contacts.

Main Contact Fingers (see **Figure 6**)

With the circuit breaker contacts open and the stored energy springs discharged, the main contact fingers (46) may be removed by loosening screws (44, 45) enough to relieve the compression on springs (47, 48). There are two springs behind each finger. It is important that they be positioned properly upon reinstallation. If difficulty is experienced in correctly positioning these springs, the upper and lower primary disconnects (Parts Section **Figure 2**, Item 168), may be removed from each phase and the circuit breaker inverted to rest on the ends of connectors (37) and (49). After the contact fingers are replaced, connector (37) should be positioned in the center of the slot in the molded base to assure correct alignment of the primary disconnect fingers.

Stationary Arcing Contact

(See **Figure 6**)

The stationary arcing contact (146) is a part of a connector (37) and may be replaced by proceeding as above. In this case, screws (44, 45) must be removed. However, to provide clearance for removal of connector the backpanel (33) may have to be loosened by removing screws 58, 59 and 23 (**Figure 2**, Page 26). By removing pin (98 and 99 **Figure 2**, Page 26) the entire assembly can be lifted out.



Hinge Contact Fingers (See **Figure 6**)

Hinge contact fingers (53, 55) may be removed as follows:

Remove backpanel. Remove lower connector (49) and moving contacts by removing screws (59). The springs (54, 56) are unloaded by rotating the moving contacts toward a horizontal position relative to the stationary contact (49). Remove screws (70) to remove moving contacts. Slide fingers (53, 55) sideways to remove. Replace fingers by compressing spring (56, 54) in position and inserting the fingers from the side. Holding connector (49) in a vise aids the operation.

Movable Arcing and Main Contact (See **Figure 6**)

Either movable arcing contact (61), or main contact (62), or both, may be removed and replaced as follows:

	 CAUTION
	Extreme care should be taken to hold the assembly firmly to retain spring guide (81, 83) and spring (81, 82) upon removal of the screws (78).

Removing moving contacts as above. The complete movable contact assembly may now be brought to the bench. The location of spacers should be noted. Loosen nuts (80) and remove screws (78) from pin (71), alternate several turns each side to prevent binding.

The movable arcing contact or main contact may now be replaced. Compress spring (81, 82) to engage screws (78). The reverse procedure is followed for reinstallation. Care should be taken to replace spacers correctly. Check alignment and adjustment of contacts upon reassembly.

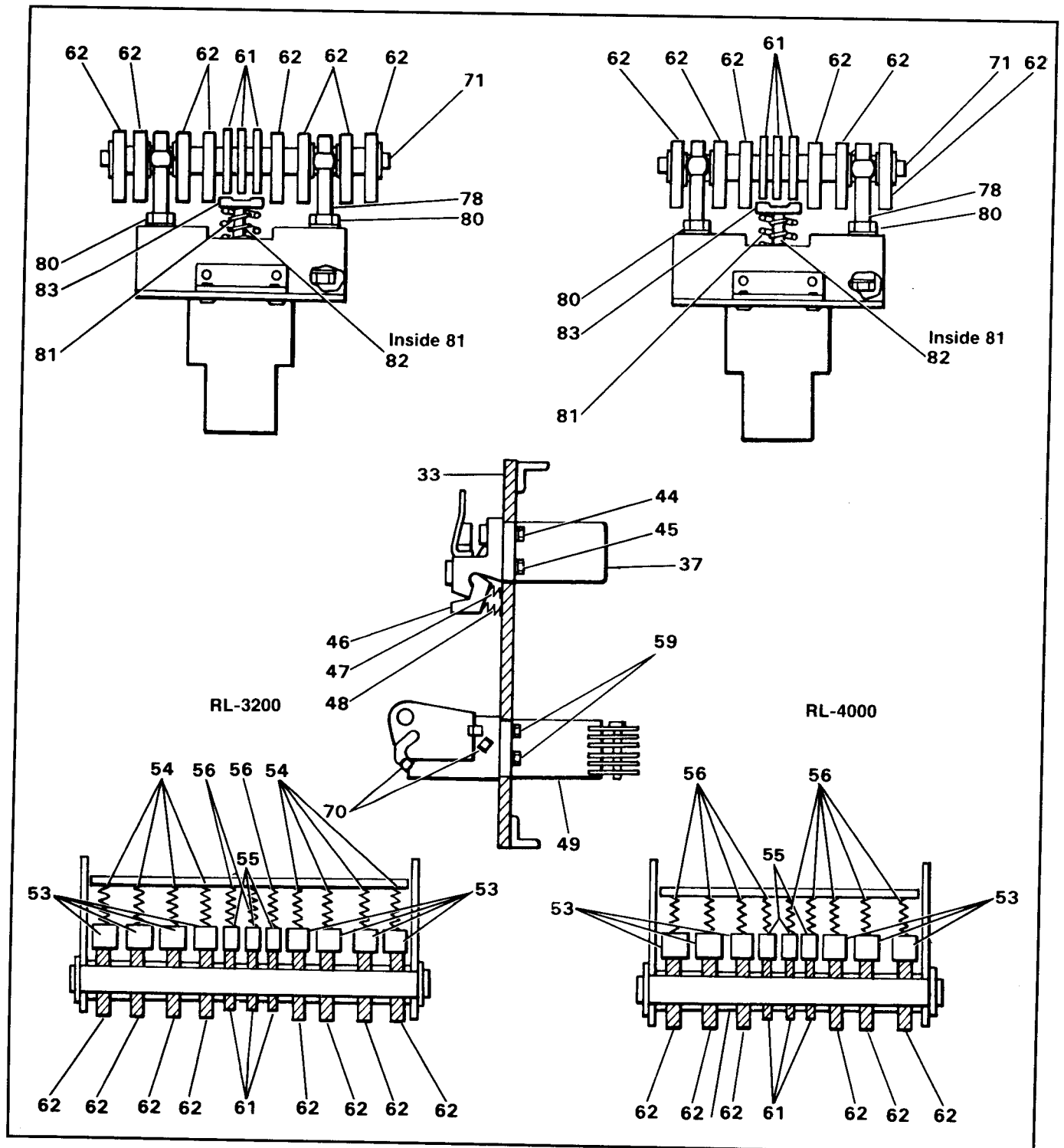


Figure 6. Contact Assembly

Tripping Actuator Replacement

When the static trip device senses a circuit condition that requires the circuit breaker to open, it produces an output that is fed to the tripping actuator. This device then causes the circuit breaker contacts to open and isolate the circuit.

Mounted on the circuit breaker, the tripping actuator is held in a charged position by a permanent magnet. It contains a coil that is energized by the output of the static trip device. When energized, the coil causes the magnetic flux to shift to a new path, releasing the stored energy of a spring located inside the tripping actuator. The spring provides the energy to trip the breaker, moving the trip-flap clear of the toggle latch.

If the spring-loaded armature does not reset during trip operation, spacer washers may be added to obtain positive reset of the armature. If adding spacers does not cause the armature to be reset, the tripping actuator should be replaced (if breaker mechanism is not at fault).

NOTE

Do not attempt to disassemble the tripping actuator as this may destroy the magnetic field set up by the permanent magnet and will render the actuator latch inoperative until magnetized.

When replacing a tripping actuator, the coil leads must be connected to the terminal block of the static trip in the correct polarity relationship.

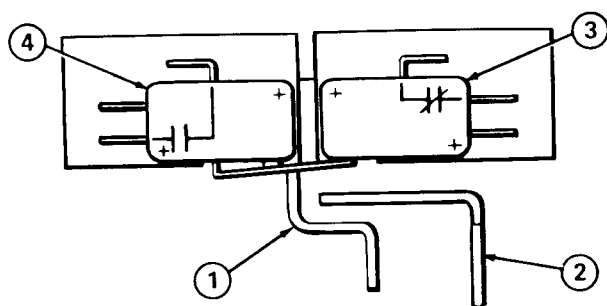
For Static Trip III Devices

The black lead of the coil must be connected to terminal 6 (negative), and the red lead of coil connected to terminal 7 (positive) blue lead to terminal 8, of the static trip device.

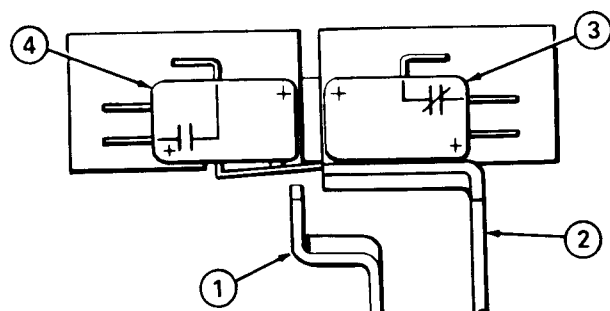
When the tripping actuator has been replaced, the circuit breaker should be given a FUNCTION TEST to ensure proper operation of all components. Refer to Siemens Instruction Book SG-3138 for the procedure of the FUNCTION TEST.

Motor Cutoff Switches (For Electrically Operated Breakers)

Position 1. Springs Discharged; Motor in Run Position.



Position 2. Springs Charging; Motor not yet Cutoff.

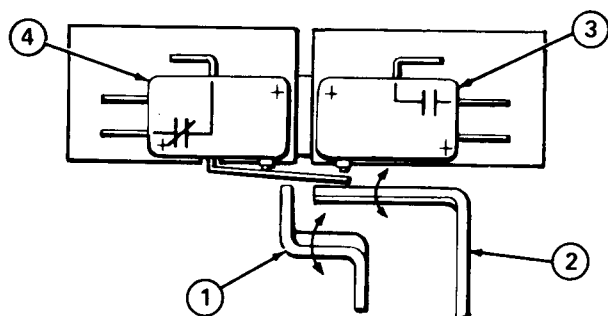


Bottom View

Note that spring position lever (1) is forward actuating both switches. Motor/gear position (2) lever is retracted. Motor cutoff switch (3) is closed. Application of power at this time will cause the motor to start thereby charging the closing springs.

While the springs are charging the motor/gear position lever (2) moves forward applying pressure to the switch actuating leaf. The spring position lever (1) retracts as the springs reach full charge. The motor cutoff switch (3) is closed and the motor is running.

Position 3. Springs Charged; Motor Stopped.



The springs have reached charged position. The motor/gear lever (2) has been retracted by roll pins on the large gear as the cam follower (82, **Figure 1**) on the large spur gear has disengaged from the wind and close cam (34, **Figure 1**). The motor cutoff switch (3) has opened, stopping the motor and the closing coil switch (4) has closed. Upon application of power to the closing circuit the breaker will close. Switches then return to No. 1 position.

NOTE

In position (3) there is clearance between both levers and the switch actuating leaf. Clearance may be minimal (approximately 1/64) or up to 1/16 inch (0.4-1.6mm). It is important to completely remove pressure from the switch actuating leaf to be sure that the switches are free to actuate. Adjustment is made by carefully bending the levers as indicated by arrows (Items 1 and 2). Do not bend the switch actuating leaf.

⚠ CAUTION

If the motor cutoff switch (3) does not open, the motor will continue to run and the cam follower (82, **Figure 1**) will re-engage wind and close cam (34, **Figure 1**) jamming the entire mechanism, possibly stripping gears in the gear motor, blowing the control fuse, or damaging the motor. To free a jammed mechanism it is necessary to remove the gear motor.

⚠ CAUTION

The springs will discharge and the breaker close when the gear motor pinion is disengaged from the sour gear.

Use the manual charging mechanism or the maintenance closing device to prevent this from happening. Move the manual handle towards the charge position, applying force to the closing springs, and allow the ratchet on the charging cam to support load while the motor is removed. This prevents the closing springs from discharging when the motor is removed.



Current Limiting Fuses

Current limiting (C.L.) fuses are used to increase the interruption capacity beyond that of the breaker alone or to the limit the fault "let-thru" current down stream of their installation. The C.L. fuses used with the RL series of circuit breakers are special purpose fuses having NEMA Class "J" or Class "L" characteristics with a 200,000 Amps RMS Symmetrical interrupting capacity.

When fuse replacement is required, only use fuses per Siemens drawing 71-142-200 with the same ratings as supplied with the circuit breaker. Different fuses may not properly mount on the breaker and may have different protective characteristics.

The current limiting fuses for the larger frame sizes, RLF-3200 and RLF-4000 mount on a separate fuse drawn-out assembly, covered in detail in instruction book SG-3078.

Open Fuse Trip Device

	 DANGER
	HAZARDOUS Do not remove trigger fuse cover when circuit breaker is in CONNECT position. Line voltage may be available inside trigger fuse assembly. Failure to observe these precautions could result in property damage, electrical shock, burns, serious personal injury or death.

The Open Fuse Trip mechanism has three functions. First, to trip the circuit breaker mechanically when a C.L. fuse has interrupted.

Second, to indicate which phase C.L. fuse has interrupted. The plunger of the trigger fuse (13), indicates visually which phase C.L. fuse has interrupted.



Third, to retain the breaker in the trip-free position until the trigger fuse is replaced.

Each trigger fuse is wired in parallel with one of the C.L. fuses. When the C.L. fuse interrupts, its associated trigger fuse also

opens and releases a plunger which releases a precompressed spring contained in the trigger fuse housing. On the small breakers, this plunger operates arm (3) which moves the latch (12), releasing the spring-loaded lever (4). This rotates circuit breaker trip flap link (7). This trips the circuit breaker and holds the circuit breaker in the mechanical trip-free position.



On the circuit breakers supplied with a separate fuse carriage the trigger fuses are mounted on the fuse carriage, and are used for visual identification of the faulted phase. Tripping of the breaker is accomplished through a power supply connected across the main fuses of the fuse carriage, the voltage from this supply is applied through the secondary control wiring to the coil of a solenoid mounted open fuse trip device on the circuit breaker. The plunger of the solenoid operates arm (3). The balance of the operation is the same as for the trigger fuse operated device.

The circuit breaker will remain trip free (cannot be closed) until the trigger fuse has been replaced and the associated trip mechanism reset lever (4) has been manually reset (pushed up).

	 CAUTION
	Do not remove trigger fuse cover when breaker is in connected position. Line voltage may be available inside the trigger fuse assembly.

To remove the trigger fuse, remove screws (15) remove plastic cover (5) then the trigger fuse.

To insert the trigger fuse, reverse the above procedure.

	 CAUTION
	The trigger fuse (13) must be inserted with the plunger facing arm (6). The gap dimension of 0-.03" (0.8mm) maximum must be maintained for each fuse. Be sure to replace both the trigger fuse and its corresponding C.L. fuse before the breaker is reset.

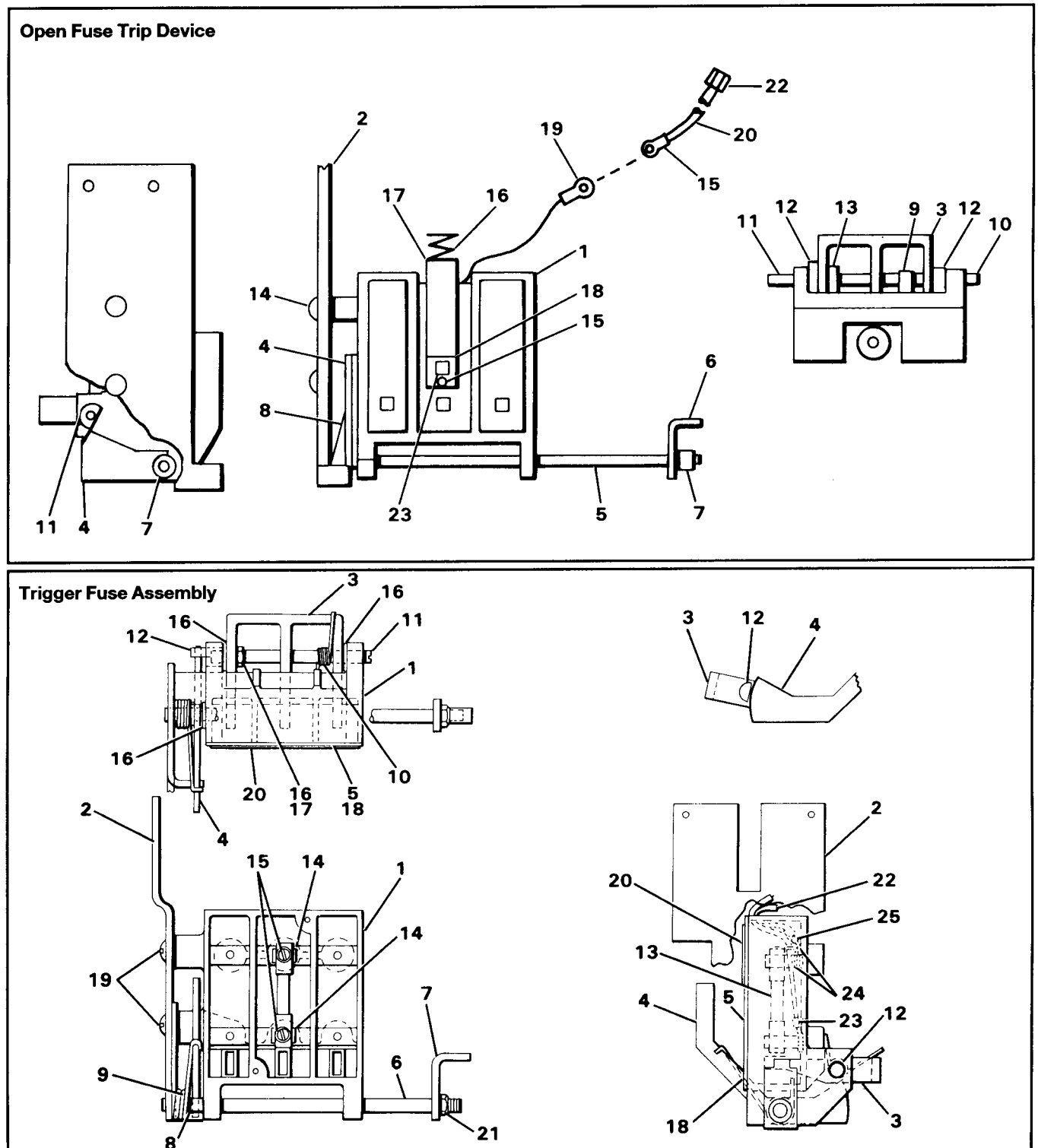


Figure 7. Open Fuse Trip Device, Trigger Fuse Assembly

Operation Counter

This option consists of a mechanically operated counter with a bracket that mounts at the bottom of the breaker mounted auxiliary switch. The counter arm connects through a spring to the switch operating arm. The counter is non-resettable. The breaker must have an auxiliary switch for this option to mount.

Maintenance Closing Device

This device is a manual charging handle assembly arranged for use as a maintenance tool. The charge link is spring loaded and retained to make insertion into the breaker frame less difficult and the pivot pin is retained by a chain. After charging the closing springs, the handle must be manually returned to the vertical position to allow closing the breaker.

Electrically Operated Interlock

These devices amount to an additional solenoid that must be energized before the breaker can be closed. When the device is de-energized the breaker is held TRIP FREE so that it cannot be closed either electrically or manually. The devices are available for 48, 125 and 250 volt DC as well as for 120 and 240 volt AC. They are similar in construction and mount in the same location as the undervoltage trip device. The electrical interlock has a mechanical link from the device to the main shaft of the breaker to hold the device in the picked-up position when the breaker is closed. Once closed the device can be de-energized without tripping the breaker. There are no adjustments for pick-up or drop-out voltages of the device. The devices are designed to be energized continuously.

Undervoltage Trip Device Option

This device automatically trips the circuit breaker on loss of voltage. Either instantaneous or time-delay operation can be supplied. A .06 inches (1.5mm) gap should be maintained between flap extension and pull link when the device is energized. The pick-up and drop-out is set so that the device picks up at a voltage of 85% or less and drops out between

30 and 60% of rated value. The devices are available for 24, 48 and 125 VDC. 48 VAC and 120 VAC.

Latch Check Switch

This option is a small switch mounted on a bracket. The switch operator is adjusted so the switch is operated by and indicates the position of the breaker trip flap. The latch check switch may be used in conjunction with the electrical interlock or undervoltage devices to delay the application of voltage to the close coil until the undervoltage or interlock device has picked-up.

Static Trip III

The Static Trip III device mounts onto a slide-type bracket on the circuit breaker. To remove trip device, the terminal block cover located above it should be removed, exposing the terminal block screws. The lower row of screws can be loosened with a screwdriver allowing the terminal block fanning strip to be removed from the terminal block. Removal of the fanning strip exposes a mounting screw. This screw can be removed, allowing the static trip device to be removed from the circuit breaker. Just pull the trip device towards the front of the circuit breaker. See Instruction Book, SG-3118.

Bell Alarm Switch Option

This unit functions to operate a switch. A single-pole double-throw, or a double-pole double-throw switch is available. The switch operator is connected to and operated by the tripping actuator. The switch operator remains tripped even when the actuator is reset by the circuit breaker. The switch operator must be reset either manually or by an additional optional electrical reset solenoid.

The contacts of the bell alarm switch can be connected in series with the circuit breaker closing coil, to provide a lockout feature to prevent reclosing after a fault.

Mechanical Lockout

This option consists of a manual reset for the tripping actuator, with the normal automatic reset disabled. The breaker is held trip free following an overcurrent trip, until manually reset.

NOTE

Pick-up and drop-out are individually adjustable.
Time delay is adjustable from .04 to 3 seconds
(maximum 2 seconds on 24 VDC version).

Circuit Breaker Lubricating Instructions

Periodic inspections of each circuit breaker is recommended at least once a year.

More frequent inspections are recommended, if severe load conditions, dust, moisture, or other unfavorable conditions exist.

Always inspect a breaker which has interrupted a heavy fault current.

Lubrication Key	Parts Description	Suggested Lubrication at Every * Operations or Every Six Months	Lubrication (Requires Disassembly) Recommended Every 5 Years or Any Complete Overhaul
A	Contact Bar Hinge Assembly Primary disconnect fingers, grounding contact. Secondary disconnect fingers	Wipe clean and apply a film of Siemens contact lubricant 15-171-370-002 in layer 1/32" thick.	
B	Sliding surfaces	Light application of *Molycote 557*.	Wipe clean and apply *Molycote 557* liberally.
C	Pivot pins, rotating parts such as drive pinion, gear.	Light application of *Molycote Penelube* 15-171-270-002	Remove pins, clean and apply *Beacon P-325 15-337-131-001.
D	Ground surfaces such as latches, rollers, props, etc.	Wipe clean and spray with *Molycote 557* 15-171-270-001.	Wash clean and spray with *Molycote 557* 15-171-270-001.
E	Arcing contacts.	Do not lubricate.	Do not lubricate.
F	Springs.	Wipe clean and spray with *Molycote 557* 15-171-270-001.	Wipe clean and spray with *Molycote 557* 15-171-270-001.
G	Dry pivot points.	No lubrication required.	No lubrication required.

Figure 8. Lubrication Chart

*Lubrication should be checked and renewed as follows:

RL-800, RLE-800, RLI-800 operations between lubrications 1750.

RL-1600 operations between lubrications 500.

RLE-2000 and RL-2000, operations between lubrications 500.

RLE-4000 and RL-4000 operations between lubrications 250.

NOTE

For breakers installed in areas where corrosion may develop on current carrying parts refer to Maintenance Guide SG-3388.

During an inspection the breaker should be checked for proper operation, adjustment and lubrication. Adjustment procedures are described in the instruction book. Recommended lubrication points are shown in adjacent chart.

The lubrication chart outlines two methods of lubrication. The first method requires no disassembly and is suggested for the

prevention of problems which could be created by severe environmental or operating conditions.

The second method follows a procedure similar to that performed on the breaker at the factory and should be used only in case of a general overhaul or disassembly.

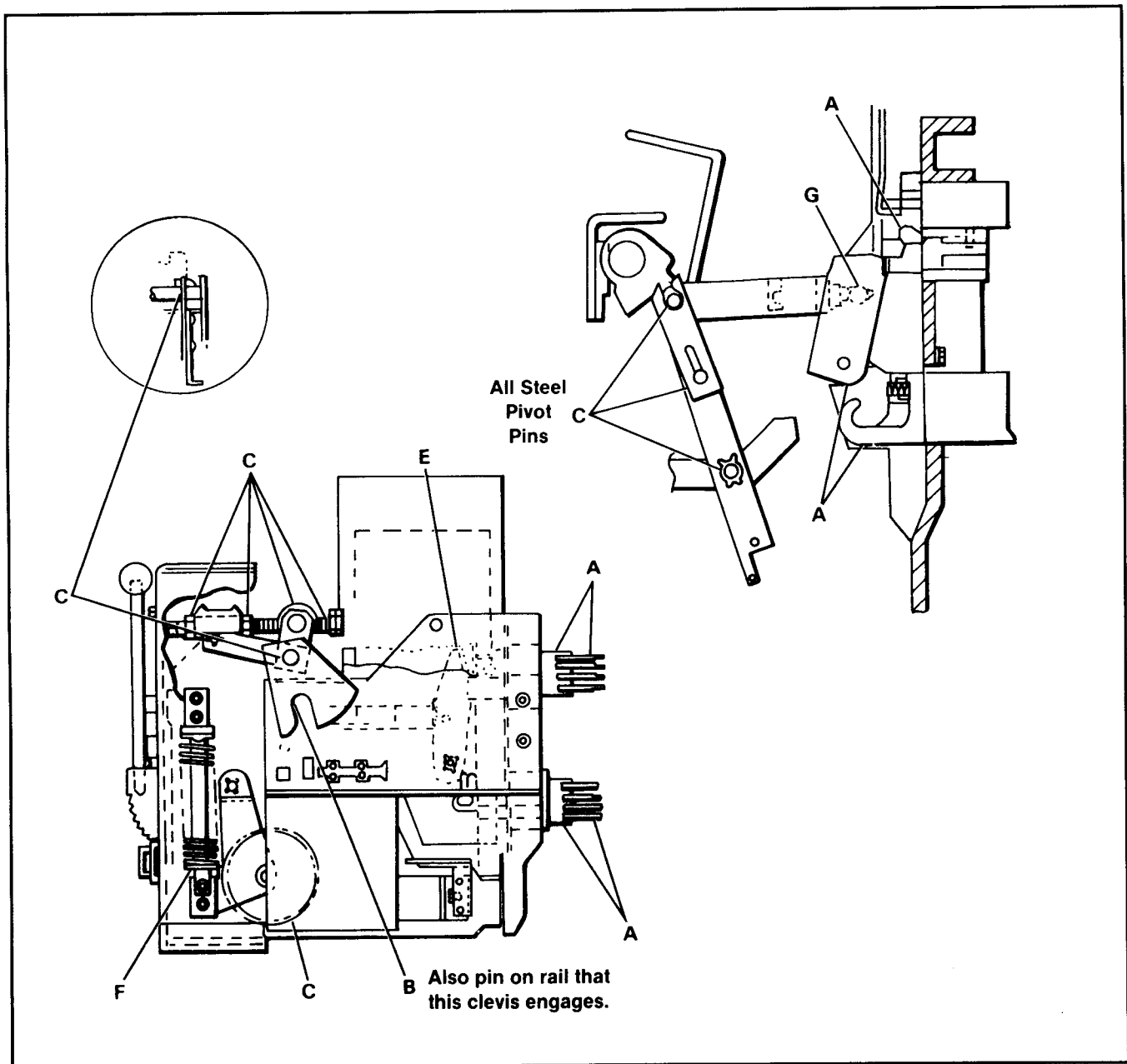


Figure 9. Lubrication Points on Breaker

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How to Use Your Parts Ordering Guide

1. Locate part or parts to be replaced in one of the drawings in this manual.
2. Identify each part by item number, description and part number. Give drawing figure number in which part is shown.
3. Include breaker type, rating and breaker serial number with your order.
4. Place order with your Siemens representative.
5. When ordering relays or other electrical parts, include control voltage (see recommended spare parts list for part numbers).

Ordering Example

Type RL-3200	Rated Amps. 3200		Serial Number R-8888A-2	
Mode of Operation:	Electrical	Manual		
Instruction Manual SG-3068				
<u>Fig.</u>	<u>Item</u>	<u>Description</u>	<u>Part Number</u>	
2	6	Apron	18-732-791-505	
7	147	Pushrod	18-657-768-036	
11	6	Bearing	71-141-995-001	

IF REQUIRED PARTS IS NOT IDENTIFIED IN THIS MANUAL—

1. Make a copy of the drawing figure in which the part would appear.
2. Indicate with arrows or other markings location of part.
3. Describe or sketch required part.
4. Include breaker type, rating and breaker serial number with your order.
5. Place order with your Siemens representative.

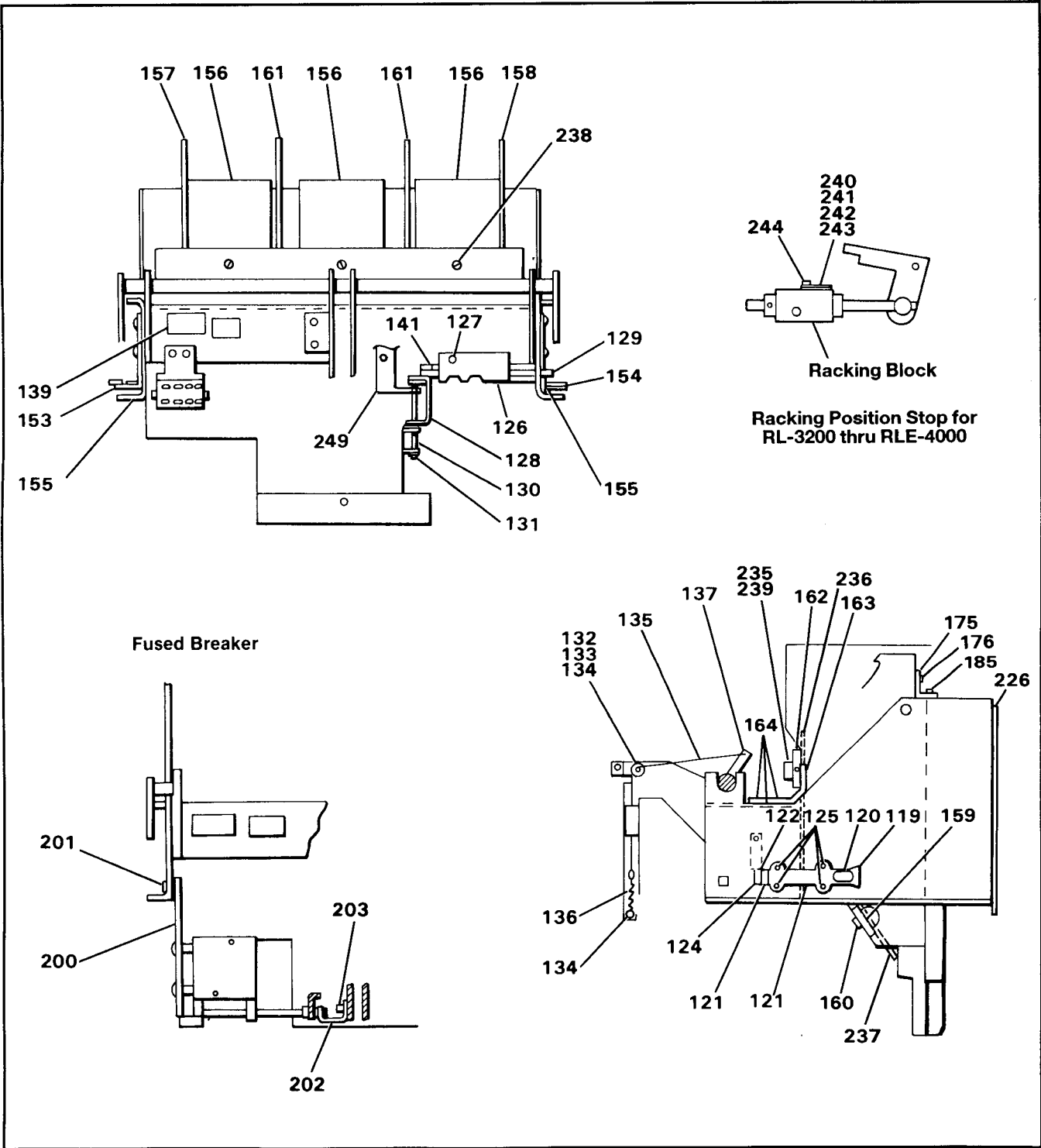


Figure 1.

Refer to **Figure 1.**

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
74	Screw	00-611-315-434	RL-3200, RL-4000 & RLE-4000	159A	Barrier	18-657-941-109	RLE-2000, RL-2000
75	Nut	15-171-063-017	RL-3200, RL-4000	159B	Barrier	18-657-962-124	RL-3200
119	PTO Support	18-732-790-004		159C	Barrier	18-657-962-123	RL-4000, RLE-4000
120	PTO Shaft	18-658-024-152		160	Plastic Rivet	00-671-501-070	
121	Bearing	18-658-110-274		161	Barrier	18-657-941-108	
122	PTO Arm Assy.	18-733-500-518		161A	Barrier	18-657-962-122	RL-3200, RL-4000 & RLE-4000
124	Cotter Pin	00-671-195-117		161B	Barrier	18-657-937-284	RLF-2000
125	Screw	15-171-399-049		162	Support	18-732-790-052	RL-800, RLE-800 & RLI-800
126	Bracket	18-398-936-003		162A	Support	18-732-790-055	RL-1600
127	Screw	00-615-461-371		162C	Support	18-732-790-056	RLE-2000, RL-2000
128	Interlock Assy.	18-658-612-572		162D	Support	18-734-617-002	RL-3200
129	Interlock Bar	18-733-482-001		162E	Support	18-734-617-001	RL-4000, RLE-4000
129A	Interlock Bar	18-733-482-002	RL-3200, RL-4000 & RLE-4000	163	Clip	18-658-110-308	RL-800 to RLE-2000
130	Pin	18-658-110-329		163A	Knob	18-657-961-385	RL-3200, RL-4000, RLE-4000
131	Sichsl	00-000-401-166		164	Screw	15-171-399-010	
132	Pulley Half 1	18-658-143-018		175	Angle	18-658-110-279	RLI-800, RLE-2000
133	Pulley Half 2	18-658-143-019		176	Screw	00-615-650-218	RLI-800, RLE-2000
134	Screw	15-171-399-008		185	Screw	15-171-399-052	RLI-800, RLE-2000
135	Cable Assy.	18-732-791-806		200	Open Fuse Trip	18-399-796-501	
136	Spring	71-142-049-001		200A	Open Fuse Trip	18-399-805-501	RL-3200 & RL-4000
137	Screw	15-171-074-010		201	Screw	15-171-399-010	Fused Versions
139	Label	18-658-024-193		202	Bracket	18-657-961-338	RL-3200 & RL-4000
141	X Washer	00-659-055-156		203	Screw	15-171-399-010	Fused Versions
153	Detent Assy. LH	18-732-791-551		225	Screw	00-615-471-373	RL-3200 & RL-4000
154	Detent Assy. RH	18-732-791-550		226	Stud Brace	18-732-790-130	RL-800 to RLE-2000
155	Spring	18-657-434-169		226A	Stud Brace	18-732-790-180	RLE-800, RLI-800
156	Arc Chute	18-728-500-591	RL-800, RLE-800	236	Front Barrier	18-732-790-160	RLE-2000
156A	Arch Chute	18-732-792-501	RL-1600	236A	Front Barrier	18-658-110-178	RLI-800
156B	Arc Chute	18-398-789-503	RLE-2000, RL-2000	236B	Front Barrier	18-658-110-304	RLE-800
156C	Arc Chute	18-398-789-501	RL-3200	237	Bottom Barrier	18-658-110-177	RLE-2000
156D	Arc Chute	18-398-789-502	RL-4000, RLE-4000	238	Screws	00-615-650-218	RL-800, RLE-2000
156E	Arc Chute	18-732-790-557	RLI-800	239	LK Washer	00-655-067-140	RLI-800, RLE-800
156F	Arc Chute			240	Shim	18-658-024-238	RLE-2000
157	Phase Barrier	18-398-937-001		241	Shim	18-658-024-238	RL-3200 to RLE-4000
157A	Phase Barrier	18-398-937-003	RL-3200, RL-4000	242	Shim	18-658-024-240	RL-3200 to RLE-4000
157B	Phase Barrier	18-732-790-053	RLF-2000	243	Shim	18-658-024-241	RL-3200 to RLE-4000
158	Phase Barrier	18-398-937-002		244	Screw	00-615-641-906	RL-3200 to RLE-4000
158A	Phase Barrier	18-398-937-004	RL-3200, RL-4000	245	Pin Brace	18-658-145-005	
158	Phase Barrier	18-732-790-054	RLF-2000				
159	Barrier	18-657-941-110	RL-800 to RL-1600				

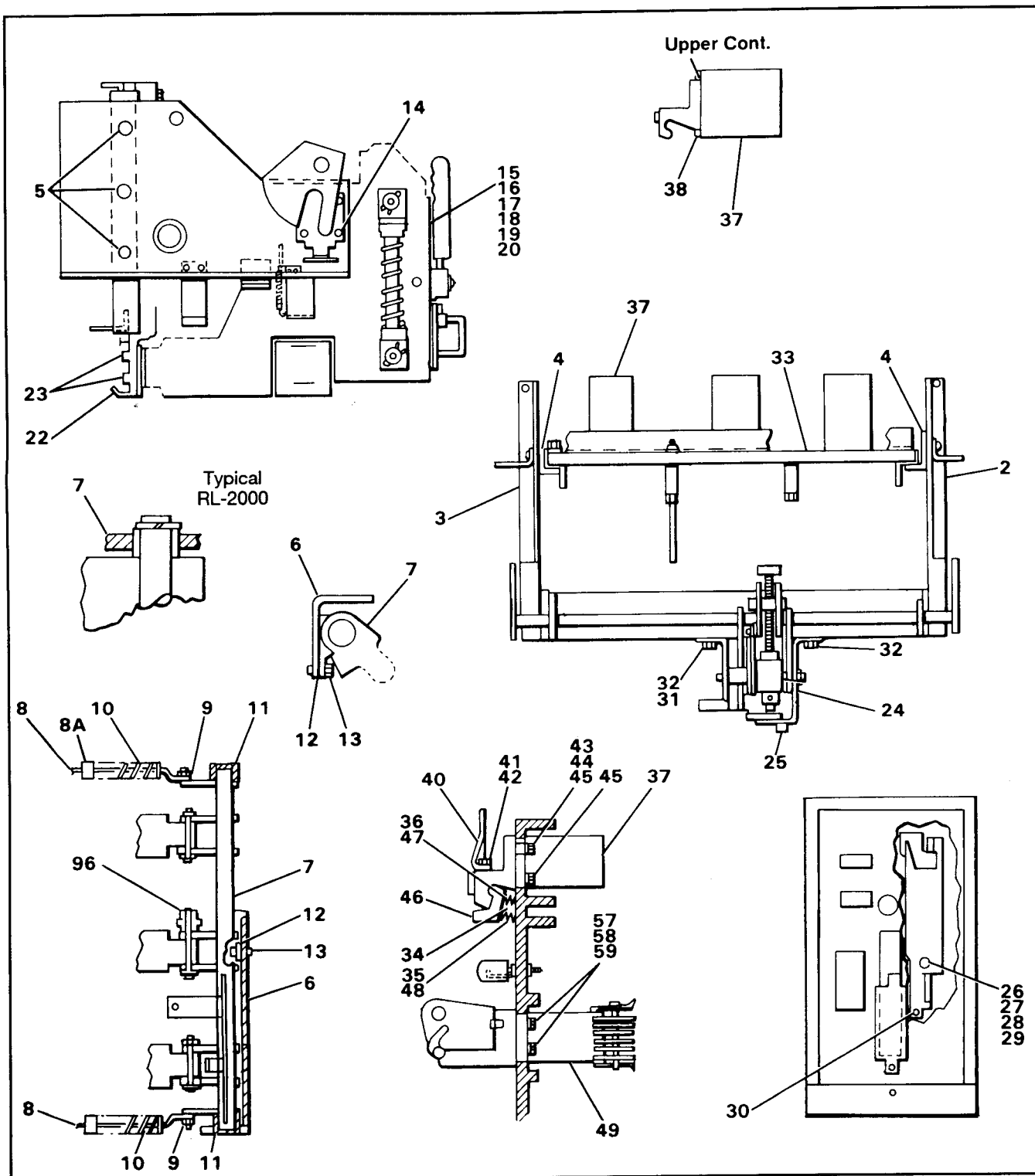


Figure 2.

Refer to **Figure 2**

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
2	RH Sideplate	18-398-289-510		37I	Upper Cont. Assy	18-732-791-528	RLF-2000 Right
3	LH Sideplate	18-398-288-002		37J	Upper Cont. Assy	18-734-434-501	RL-800, RLE-800, RLI-800 Stationary
4	Angle	18-657-937-254	RL-3200, RL-4000	37K	Upper Cont. Assy	18-734-435-501	RL-1600 Stationary
5	Screw	15-615-024-006	Draw-Out Only	37L	Upper Cont. Assy	18-732-791-535	RL-2000, RLE-2000 Stationary
6	Apron	18-732-791-504	RL-800, RLE-800 & RL-1600	37M	Upper Cont. Assy	18-732-791-536	RL-2000, RLE-2000 Stationary
6A	Apron	18-732-790-537	RLI-800	37N	Upper Cont. Assy	18-732-791-537	RL-2000, RLE-2000 Stationary
6B	Apron	18-732-791-521	RL-2000, RLE-2000	37O	Upper Cont. Assy	18-398-289-501	RL-3200
6C	Apron	18-732-791-505	RL-3200, RL-4000 & RLE-4000	37P	Upper Cont. Assy	18-398-289-502	RL-4000, RLE-4000
7	Shaft	18-732-791-503	RL-800, RLE-800 & RL-1600	38	Plastic Button	18-657-854-172	RL-4000, RLE-4000
7A	Shaft	18-732-790-138	RLI-800	40	Arc Runner	71-141-983-001	RL-800, RLE-800
7B	Shaft	18-732-791-508	RLE-2000, RL-2000	40A	Arc Runner	18-732-790-173	RLI-800
7C	Shaft	18-732-791-509	RL-3200	40B	Arc Runner	71-142-053-001	RL-1600
7D	Shaft	18-732-791-510	RL-4000, RLE-4000	40C	Arc Runner	18-657-939-202	RLE-2000, RL-2000
8	Spring Guide	18-732-790-008		40D	Arc Runner	18-727-730-001	RL-3200
8A	Guide	18-658-110-250	RL-800 to RLE-2000	40E	Arc Runner	18-657-840-384	RL-4000, RLE-4000
9	X Washer	00-659-055-156		40F	Arc Runner	18-732-790-175	RLE-2000
10	Spring	71-141-799-001		41	Screw	00-615-124-218	
10A	Spring	71-142-123-001	(1) RLI-800, RL-3200 thru RLE-4000	41A	Screw	00-615-124-220	RLE-2000
11	Bearing	15-171-399-002		42	Lock Washer	00-655-017-022	
12	Bearing Block	18-657-768-050	RL-800, RL-1600	43	Brace	18-657-941-293	RL-800, RLE-800
12A	PR Stop	18-658-110-116	RLI-800	43A	Brace	18-657-941-299	RL-1600
13	Screw	00-615-663-373	RL-800, RL-1600	43B	Washer	00-651-027-170	RL-4000, RL-3200 & RLE-4000
13A	Screw	00-615-405-378	RLI-800	44	Screw	15-171-399-048	RL-800, RLI-800 & RL-1600
14	Screw	15-615-024-007		44A	Screw	15-171-399-048	RLI-800
15-20	Operator	See Sep. Listing		44B	Spacer	18-658-110-284	RLI-800
22	Support	18-732-790-036	RL-3200, RL-4000	44C	Lock Washer	00-655-017-030	RL-4000, RL-3200 RLE-4000
23	Screw	00-615-663-373		45	Screw	15-171-399-011	
24	Support	18-398-288-003		45A	Screw	00-611-315-426	RL-4000, RL-3200
24A	Support	18-752-300-002	Stationary	46	Contact Assy	18-727-833-501	
25	Shutter	18-744-437-501		46A	Contact Assy	18-732-790-599	RL-800, RLE-2000, & RLE-4000
26	Screw	15-171-399-025		47	Spring	71-141-173-001	
27	Pushnut	15-171-399-026		48	Spring	71-141-976-001	
28	Permanut	15-171-035-001		49	Lower Cont. Assy	18-732-789-501	RL-800, RLE-800 & RLI-800
29	Nut	00-633-059-210		49A	Lower Cont. Assy	18-732-789-502	RL-1600
30	Screw	00-615-345-214		49B	Lower Cont. Assy	18-732-791-516	RLE-2000, RL-2000 Left
31	Screw	00-615-663-373	RL-800, RLI-800 & RL-1600	49C	Lower Cont. Assy	18-732-791-517	RLE-2000, RL-2000 Center
32	Screw	15-171-399-052	RLI-800, RL-2000 to RL-4000	49D	Lower Cont. Assy	18-732-791-518	RLE-2000, RL-2000 Right
33	Back Panel	18-551-364-001	RL-800, RLE-800	49E	Lower Cont. Assy	18-734-437-501	RL-800, RLE-800, RLI-800 Stationary
33A	Back Panel	18-551-364-004	RLI-800	49F	Lower Cont. Assy	18-734-443-501	RL-1600 Stationary
33B	Back Panel	18-551-364-002	RL-1600	49G	Lower Cont. Assy	18-732-791-538	RLE-2000, RL-2000 Stationary
33C	Back Panel	18-551-364-003	RL-2000	49H	Lower Cont. Assy	18-732-791-539	RLE-2000, RL-2000 Stationary
33D	Back Panel	18-551-364-006	RLE-2000	49I	Lower Cont. Assy	18-732-791-540	RLE-2000, RL-2000 Stationary
33E	Back Panel	18-398-288-006	RL-3200	49J	Lower Cont. Assy	18-732-791-519	RL-3200
33F	Back Panel	18-398-288-007	RL-4000, RLE-4000	49K	Lower Cont. Assy	18-732-791-520	RL-4000, RLE-4000
34	Roll Pin	00-671-177-321	RL-3200, RL-4000 RLE-4000	57	Washer	00-651-027-170	RL-3200, RL-4000 & RLE-4000
35	Roll Pin	00-671-177-313	RL-3200, RL-4000 RLE-4000	58	Lock Washer	00-655-017-030	RL-3200, RL-4000 & RLE-4000
36	Rivet	00-671-251-085	RL-3200, RL-4000 RLE-4000	59	Screw	15-171-399-011	
37	Upper Cont. Assy	18-732-788-501	RL-800, RLI-800 & RLE-800	59A	Screw	00-611-315-426	RL-3200, RL-4000 & RLE-4000
37A	Upper Cont. Assy	18-732-788-502	RL-1600				
37B	Upper Cont. Assy	18-732-791-511	RLE-2000, RL-2000 Left				
37C	Upper Cont. Assy	18-732-791-512	RLE-2000, RL-2000 Center				
37D	Upper Cont. Assy	18-732-791-513	RLE-2000, RL-2000 Right				
37E	Upper Cont. Assy	18-733-742-501	RLF-800				
37F	Upper Cont. Assy	18-733-742-502	RLF-1600				
37G	Upper Cont. Assy	18-732-791-526	RLF-2000 Left				
37H	Upper Cont. Assy	18-732-791-527	RLF-2000 Center				

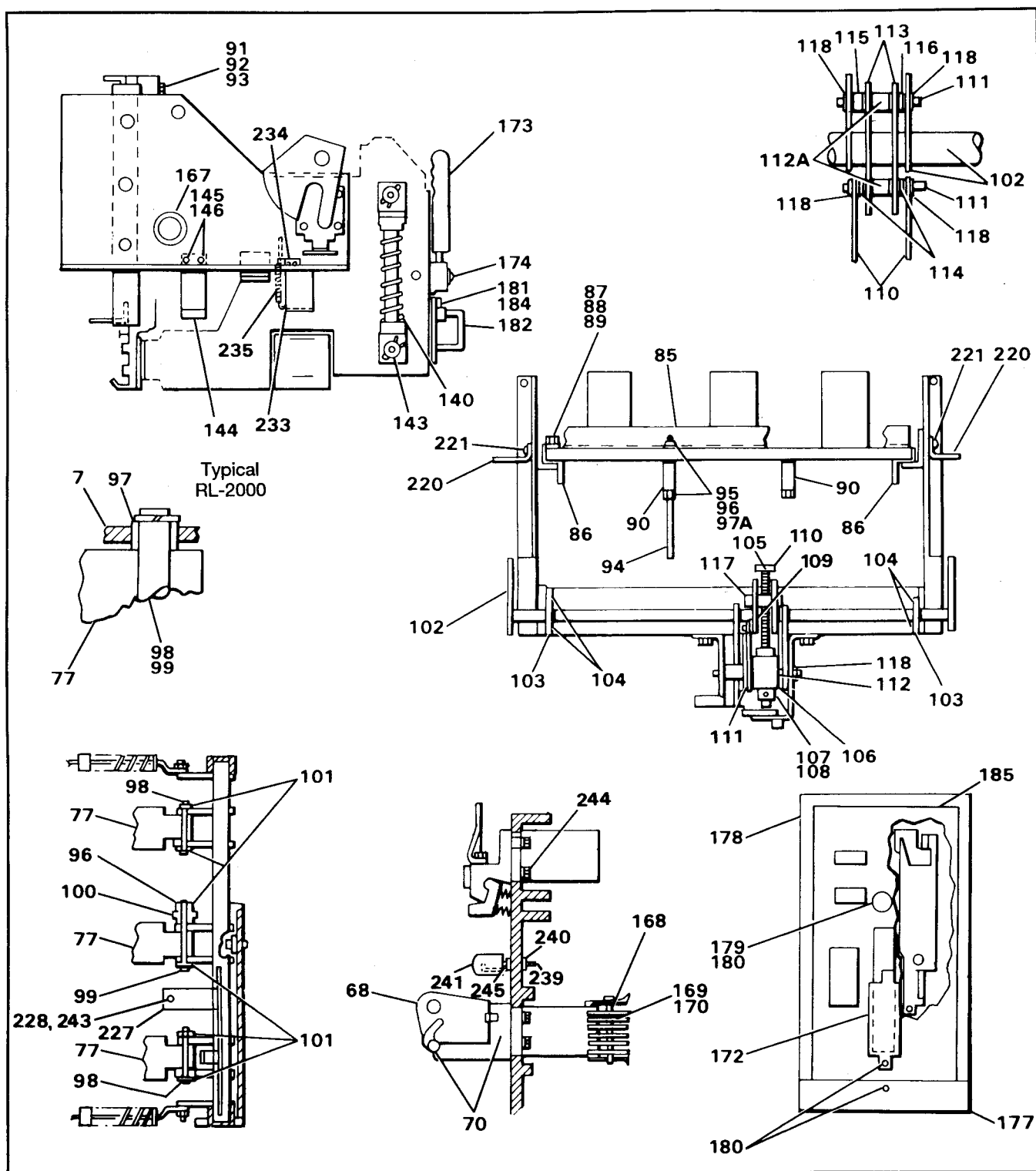


Figure 2. (continued)

Refer to **Figure 2.**

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
68	Support	18-657-937-261		110A	Link	18-657-942-092	RL-3200, RL-4000 & RLE-4000
68A	Support	18-657-940-150	RL-3200 thru RLE-4000	111	Spacer	18-657-823-356	
70	Screw	00-615-663-373		111A	Pin	18-747-678-006	RL-3200, RL-4000 & RLE-4000
74	Screw	00-611-315-434	RL-3200 thru RLE-4000	112	Spacer	18-731-274-002	
75A	Nut	15-171-063-017	RL-3200 thru RLE-4000	112A	Spacer	18-724-503-004	RL-3200, RL-4000 RLE-4000
85	Angle	18-657-937-255	RL-3200, RL-4000 & RLE-4000	113	L-Link	18-657-941-297	RL-3200, RL-4000 & RLE-4000
86	Angle Plastic	18-657-941-294	RL-3200	114	Spacer	18-724-503-005	RL-2000, thru RLE-4000
86A	Angle Plastic	18-657-941-062	RL-4000, RLE-4000	115	Spacer	18-731-274-001	RL-3200, RL-4000 & RLE-4000
87	Washer	00-651-027-170	RL-3200, RL-4000 & RLE-4000	116	Spacer	18-731-274-002	RL-3200, RL-4000 & RLE-4000
88	Lock Washer	00-655-017-030	RL-3200, RL-4000 RLE-4000	117	Barrel Nut	18-657-962-344	
89	Screw	00-611-315-426	RL-3200	118	Sichsl	00-000-401-166	
89A	Screw	00-611-315-428	RL-4000, RLE-4000	140	Closing Spring	18-399-526-502	RL-800, RLE-800
90	Brace	18-657-937-256	RL-3200, RL-4000 & RLE-4000	140A	Closing Spring	18-399-526-503	RL-1600
91	Screw	00-611-315-396	RL-3200, RL-4000 & RLE-4000	140B	Closing Spring	18-398-297-504	RLI-800, RLE-2000 & RL-2000
92	Washer	00-651-027-139	RL-3200, RL-4000 & RLE-4000	140C	Closing Spring	18-726-870-501	RL-3200, RL-4000 & RLE-4000
93	Nut	15-171-063-016	RL-3200, RL-4000 & RLE-4000	143	Sichsl	00-000-401-141	
94	Stud	14-135-915-008	RL-3200, RL-4000 & RLE-4000	144	Ground Strap	18-657-916-579	Omitted on Stationary
95	Washer	00-651-027-139	RL-3200, RL-4000 & RLE-4000	145	Screw	15-171-399-010	Omitted on Stationary
96	Lock Washer	00-655-067-140	RL-3200, RL-4000 & RLE-4000	146	Nut	00-633-059-210	Omitted on Stationary
96A	Washer	00-651-007-900	RLE-2000, RL-2000	167	Grommet	15-171-890-001	
97	Bushing	18-657-765-395	RLE-2000, RL-2000	168	Primary Disc	18-734-618-502	RL-800
97A	Nut	00-631-059-104	RL-3200, RL-4000 & RLE-4000	168A	Primary Disc	18-732-790-594	RLE-800, RLI-800
98	Pin	18-747-678-006		168B	Primary Disc	18-734-618-501	RL-1600, RL-2000
98A	Pin	18-727-832-001	RL-3200, RL-4000 & RLE-4000	168C	Primary Disc	18-732-790-551	RLE-2000
99	Pin	18-747-678-011		168D	Primary Disc	18-733-481-501	RL-3200
99A	Pin	18-727-832-002	RL-3200, RL-4000 & RLE-4000	168E	Primary Disc	18-733-481-502	RL-4000, RLE-4000
100	Spacer	18-657-942-300		169	Screw	00-615-114-373	RL-3200, RL-4000 & RLE-4000
100A	Spacer	18-727-838-002	RL-3200, RL-4000 & RLE-4000	170	Lock Washer	00-655-017-026	RL-3200, RL-4000 & RLE-4000
101	Sichsl	00-000-401-166		172	Cover Filler	18-658-133-032	E.O. Models Only
101A	X Washer	15-171-399-035	RL-3200, RL-4000 & RLE-4000	173	Man. Chg. Handle	18-398-288-066	Manual Chg. Only
102	Rack Shaft	18-732-791-506	RL-800 thru RL-1600	173A	Man. Chg. Handle	18-398-288-067	Manual Chg. Only
102A	Rack Shaft	18-732-791-522	RLE-2000, RL-2000	174	Set Screw	18-658-110-173	RL-3200, RL-4000
102B	Racking Shaft	18-732-791-507	RL-3200, RLE-4000 & RL-4000	177	Bottom Cover	18-736-830-501	
103	Retainer	15-171-399-012	RL-800 thru RL-1600	177A	Bottom Cover	18-736-830-502	RL-3200, RL-4000
103A	Retainer	18-657-822-197	RL-2000 thru RLE-4000	178	Cover	18-394-426-080	
104	Screw	00-615-663-373		178A	Cover	18-394-426-079	RL-4000, RL-3200
105	Racking Screw	18-735-641-059		179	Bumper	15-171-399-007	
105A	Racking Screw	18-735-641-060	RL-3200, RL-4000 & RLE-4000	180	Screw	15-171-399-010	
106	BBlock	18-658-110-361		181	Clip	18-658-133-031	
106A	Block	18-658-024-237	RL-3200, RL-4000 & RLE-4000	182	Guard	18-748-962-001	
107	Collar	18-658-110-024		184	Screw	00-615-641-910	
108	Driv-Pin	18-658-110-036		185	Label	18-487-118-001	
109	Washer	00-651-007-902		185A	Label	18-487-117-001	Breaker Display Unit
109A	Washer	00-651-007-214	RL-3200, RL-4000 & RLE-4000	185B	Label	18-487-908-001	
110	Nut	00-631-177-108		220	Bracket	18-734-436-001	Stationary
				221	Screw	15-615-024-005	Stationary
				227	Trip Shaft	18-732-790-528	RLI-800
				228	Trip Wire	18-658-110-174	RLI-800
				233	Spring Anchor	18-658-110-145	RLI-800
				234	Screw	15-171-399-010	RLI-800
				235	Spring	71-113-504-001	RLI-800
				239	Stud	18-658-110-283	RLI-800
				240	Nut	15-171-063-016	RLI-800
				241	Spring Cover	18-398-288-061	RLI-800
				243	Stop Nut	00-633-043-106	RLI-800
				245	Spring	15-171-431-001	RLI-800

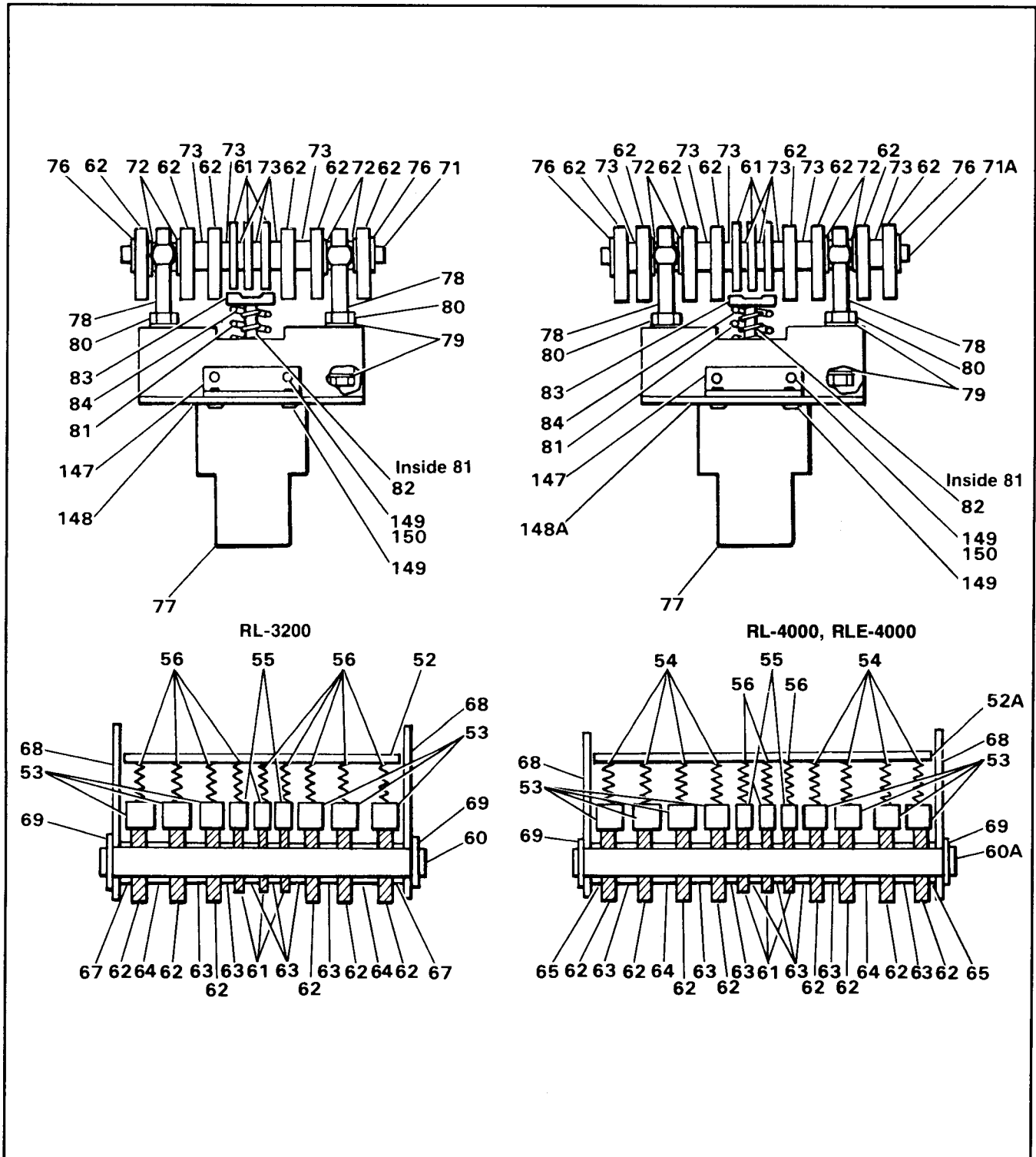
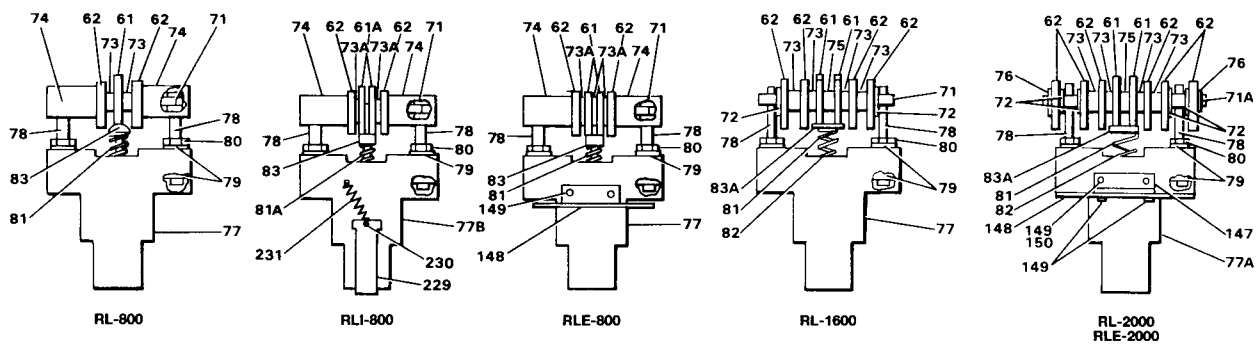


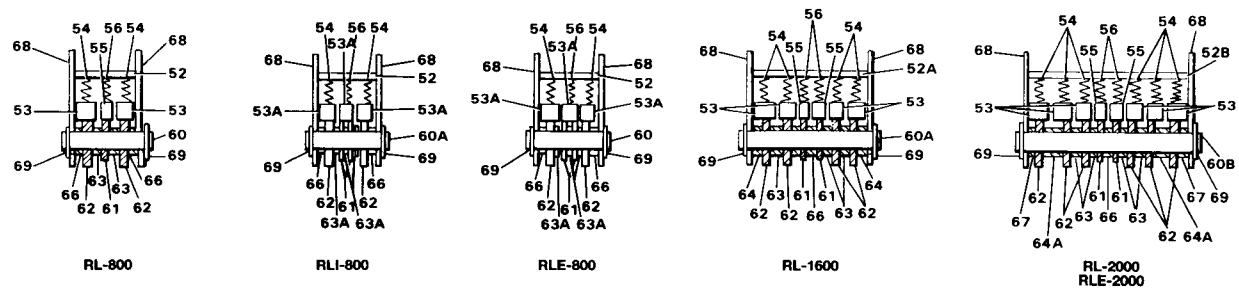
Figure 3.

Refer to **Figure 3**

Item	Description	Part Number	Usage
52	Spring Seat	18-657-822-171	RL-3200
52A	Spring Seat	18-657-854-166	RL-4000, RLE-4000
53	Contact .531	18-727-825-002	
54	Spring	71-141-173-001	
55	Contact .38	18-727-825-001	
56	Spring	71-141-976-001	
60	Pin	18-750-059-002	RL-3200
60A	Pin	18-750-059-003	RL-4000, RLE-4000
61	Arching Contact	18-727-729-502	
62	Main Contact	18-727-729-503	
62A	Main Contact	18-732-790-598	RLE-4000
63	Spacer	18-747-421-004	
64	Spacer	18-747-421-008	
65	Spacer	18-747-421-005	RL-4000, RLE-4000
67	Washer	00-651-027-357	RL-3200
68	Support	18-657-940-150	
69	Sichsl	00-000-401-141	
71	Pin	18-658-143-029	RL-3200
71A	Pin	18-658-143-030	RL-4000, RLE-4000
72	Washer	18-657-941-295	
73	Spacer (.18)	18-747-421-001	
76	Sichsl	00-000-401-141	
77	Pushrod	18-398-288-008	
78	Screw (Spec.)	18-657-937-268	
79	Washer	00-651-007-910	
79A	Washer	00-651-027-170	RL-4000, RLE-4000
80	Nut	00-631-143-205	
81	Spring	18-657-823-358	
82	Spring	71-141-799-001	
83	Spring Seat	18-657-822-184	
84	Spring Seat	18-657-822-196	
147	Barrier Sups.	18-657-963-214	
148	Barrier	18-734-619-002	RL-3200
148A	Barrier	18-734-619-003	RL-4000, RLE-4000
149	Screw	15-171-074-010	
150	Lock Washer	00-655-067-060	



Upper Contact Detail



Lower Contact Detail

Figure 3A.

Refer to **Figure 3A.**

Item	Description	Part Number	Usage
52	Spring Seat	18-657-938-303	RL-800, RLE-800 & RLI-800
52A	Spring Seat	18-657-938-304	RL-1600
52B	Spring Seat	18-657-938-305	RLE-2000, RL-2000
53	Contact .531	18-727-825-002	
54	Spring	71-141-173-001	
55	Contact .38	18-727-825-001	
56	Spring	71-141-976-001	
53A	Contact	18-727-825-005	RLE-800, RLI-800
60	Pin	18-750-059-005	RL-800, RLE-800 RLI-800
60A	Pin	18-750-059-001	RL-1600
60B	Pin	18-750-059-006	RLE-2000, RL-2000
61	Arching Contact	18-727-729-502	
61A	Arching Contact	18-727-729-505	RLI-800
62	Main Contact	18-727-729-503	
62A	Main Contact	18-732-790-598	RLE-800, RLE-2000
63	Spacer	18-747-421-004	
63A	Washer	00-651-017-357	RLI-800, RLE-800
64	Spacer	18-747-421-007	RL-1600
64A	Spacer	18-747-421-008	RLE-2000
66	Spacer	18-747-421-006	RLE-2000
67	Washer	00-651-027-357	RL-2000, RLE-2000
68	Support	18-657-937-261	RLE-2000
69	Sichsl	00-000-401-141	
71	Pin	18-657-922-147	RL-800 to RL-1600
71A	Pin	18-658-143-028	RLE-2000, RL-2000
72	Washer	18-657-941-295	RL-1600, RL-2000
73	Spacer (.18)	18-747-421-001	
73A	Washer	00-651-017-288	RLI-800, RLE-800
74	Pin Cover Spacer	18-657-765-368	RL-800, RLI-800, RLE-800
75	Spacer	18-747-421-003	RLE-2000, RL-2000 RL-1600
76	Sichsl	00-000-401-141	RL-2000, RLE-2000
77	Pushrod	18-398-288-009	RL-800, RL-1600
77A	Pushrod	18-657-954-580	RLE-2000, RL-2000 & RLE-800
77B	Pushrod	18-398-288-054	RLI-800
78	Screw (Spec.)	18-657-937-268	
79	Washer	00-651-007-910	
80	Nut	00-631-143-205	
81	Spring	71-142-123-001	
81A	Spring	18-658-110-147	RLI-800
82	Spring	71-142-139-001	RL-1600, RL-2000 RLE-2000
83	Spring Seat	18-657-940-290	RL-800, RLE-800
83A	Spring Seat	18-657-939-170	RL-1600 to RLE-2000
83B	Spring Seat	18-658-583-522	RLI-800
147	Barrier Sups.	18-657-963-214	RL-2000, RLE-2000
148	Barrier	18-734-619-001	RL-2000, RLE-2000
148A	Barrier	18-658-110-120	RLE-800 LH
148B	Barrier	18-658-110-121	RLE-800 Center
148C	Barrier	18-658-110-122	RLE-800 RH
148D	Barrier	18-658-110-285	RLI-800
149	Screw	15-171-074-010	
150	Lock Washer	00-655-067-060	
229	Latch Box	18-732-790-529	RLI-800
230	Cotter Pin	00-671-195-197	RLI-800
231	Spring	18-658-110-175	RLI-800

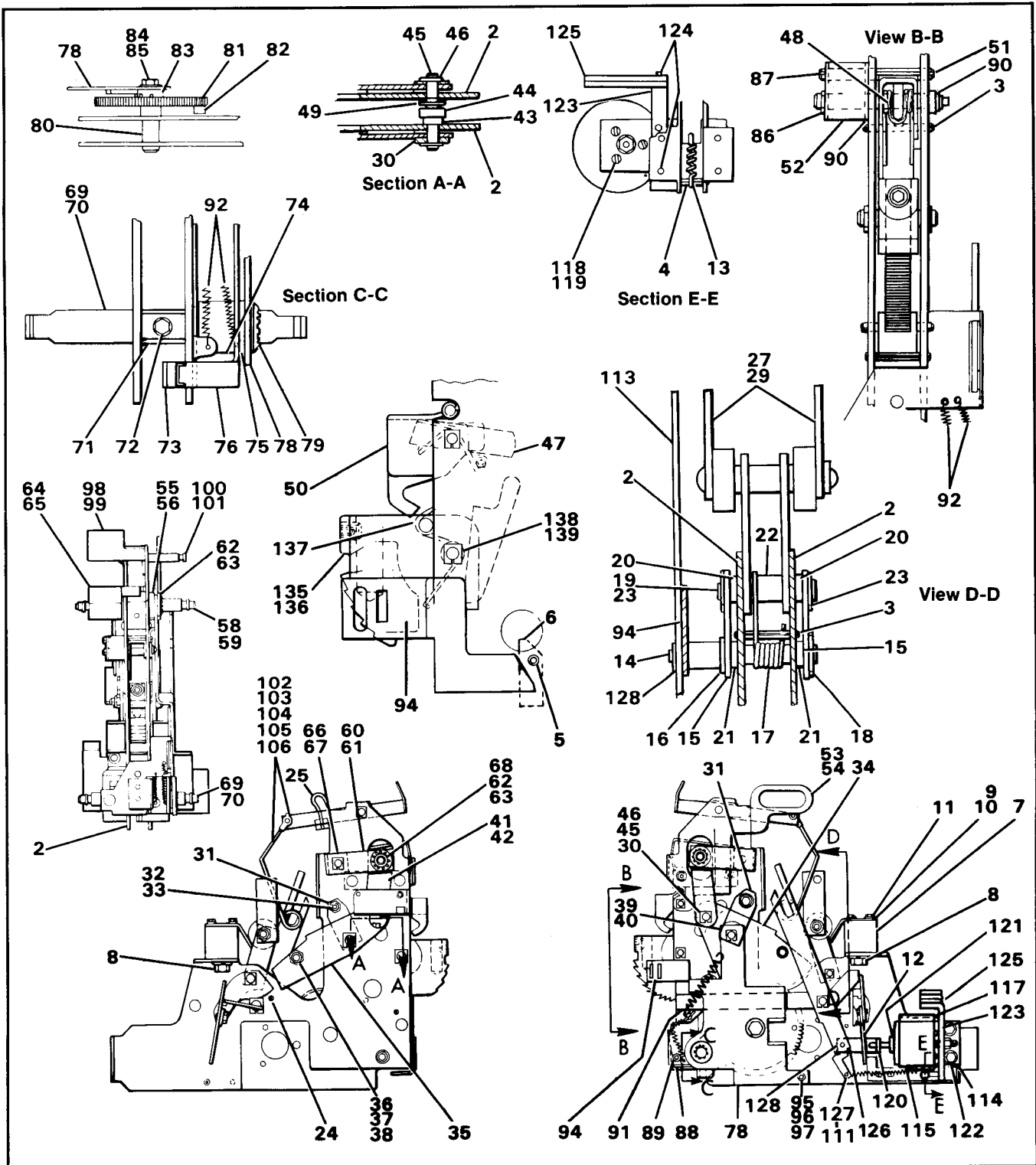


Figure 4. Operator

The following item numbers refer to **Figure 4**, and are common parts used on all models except as noted.

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
2	Frame	18-469-506-501		61	Guide Link	18-657-854-171	RL-3200 to RL-4000
3	Rollpin	00-671-176-195		62	Retainer	00-673-285-063	RL-800 to RL-2000
4	Rollpin	00-671-176-195		63	Retainer	15-171-399-057	RL-3200 to RL-4000
5	Rollpin	00-671-176-257		64	Flag	18-724-498-001	
6	Pawl	18-658-024-123		65	Decal	18-657-800-116	
7	Stop Block	18-657-768-039		66	Pin	18-747-678-009	
8	Screw	15-171-259-004		67	Sichsl	00-000-401-166	
9	Back-Up	18-657-765-130		68	Bearing	18-658-110-320	Omit RL-3200 & 4000
10	Spring	18-657-768-038		69	Spring Hanger	18-658-110-292	RL-800 to RL-2000
11	Screw	15-171-074-010		70	Spring Hanger	18-658-110-293	RL-3200 to 4000
12	Trip Flap Assy.	18-727-727-504		71	Clip	18-657-768-014	
13	Spring	72-140-324-001		72	Screw	15-171-074-010	
14	Shoulder Pin	18-658-110-296		73	Switch Lever	18-657-768-037	Elec. Charge Only
15	Latch	18-658-110-325		74	Bearing Spacer	18-657-768-031	
16	Washer	00-651-007-900		75	Spacer	18-747-421-010	
17	Spring	18-657-768-033		76	Switch Lever	18-657-768-032	Elec. Charge Only
18	Sichsl	00-000-401-166		78	Gear Brace	18-732-790-191	
19	Pin	18-747-678-004		79	Retainer	00-673-285-063	
20	Spacer	18-657-823-356		80	Gear Pin	18-657-768-371	Elec. Charge Only
21	Bushing	18-658-110-342		81	Gear	18-724-505-501	Elec. Charge Only
22	Spacer	18-658-110-344		82	Cam Follower	18-657-768-026	Elec. Charge Only
23	Sochsl	00-000-401-166		83	Spacer	18-658-024-151	Elec. Charge Only
24	Rollpin	15-171-233-008	RL-3200, RL-4000	84	Screw	00-611-315-461	Elec. Charge Only
25	Spring	18-658-024-197		85	Lock Washer	00-655-017-032	Elec. Charge Only
26	Washer	00-651-007-214		86	Sichsl	00-000-401-166	
27	Toggle Link Assy.	18-732-790-565	RL-800 - RL-2000	87	Rollpin	00-671-176-327	
29	Toggle Link Assy.	18-732-791-555	RL-3200 - RL-4000	88	Bracket	18-732-790-007	
30	Bearing	18-658-110-330		89	Screw	15-171-074-010	
31	Spacer Link	18-657-768-372		90	Washer	71-152-809-002	
32	Screw	00-615-114-428		91	Spring	15-837-455-002	
33	Nut	15-171-063-017		92	Spring	00-837-455-026	Elec. Charge Only
34	Cam Wind & Close	18-724-492-001		93			
35	Cam Close	18-724-493-001		94	Trip Bar	18-732-790-194	
36	Spacer	18-657-768-053		95	Screw	00-611-315-384	
37	Screw	00-611-315-476		96	Spacer	18-733-309-001	
38	Nut	15-171-063-018		97	Nut	15-171-063-016	
39	Pin	18-747-678-005		98	Flag	18-728-500-005	
40	Sichsl	00-000-401-166		99	Decal	71-141-817-001	
41	Link	18-658-110-321	RL-800 thru RL-2000	100	Pin	18-747-678-015	
42	Link	15-657-961-340	RL-3200 thru RL-4000	101	Sichsl	00-000-401-166	
43	Spacer	18-658-110-327		102	Retainer Ringer	00-673-173-018	
44	Bearing	15-171-399-061		103	Rod End Clip	15-171-399-029	RL-800 to RL-2000
45	Pin	18-747-678-008		104	Rod End Clip	15-171-399-003	RL-3200 to RL-4000
46	Sichsl	00-000-401-166		105	Close Flag Link	18-733-435-001	RL-800 to RL-2000
47	Latch Assembly	18-657-765-564		106	Close Flag Link	18-657-822-353	RL-3200 to RL-4000
48	Spring	18-657-939-020		111	S Hook	18-658-110-305	800A Only
49	Washer	00-651-007-214		113	Reset Lever	18-734-620-502	
50	Close Hood Assy.	18-657-943-560		114	Actuator Bracket	18-657-768-022	
51	Pin	18-658-110-295		115	Actuator	18-809-575-504	
52	Close Lever	18-657-768-020		116	Washer	00-651-007-909	Non-Auto Only
53	Spring Interlock	18-732-790-045	RL-800 - RL-2000	117	Shield	18-657-937-287	Omit on 800A
54	Spring Interlock	18-657-852-575	RL-3200 - RL-4000	118	Screw	00-615-513-220	
55	Bumper	18-658-143-031	RL-800 - RL-2000	119	Lock Washer	00-655-067-100	
56	Bumper	18-657-854-169	RL-3200 - RL-4000	120	Reset Assembly	18-732-791-545	
57	Bearing	00-813-109-037	RL-3200 - RLE-4000	121	Washer	72-140-000-001	
58	Spring Hanger	18-658-110-292	RL-800 - RL-2000	122	Screw	00-615-663-373	
59	Spring Hanger	18-658-110-294	RL-3200 - RL-4000	123	Shield Support	18-657-939-200	Omit on 800A
60	Guide Link	18-658-110-322	RL-800 - RL-2000	124	Screw	15-171-399-025	Omit on 800A

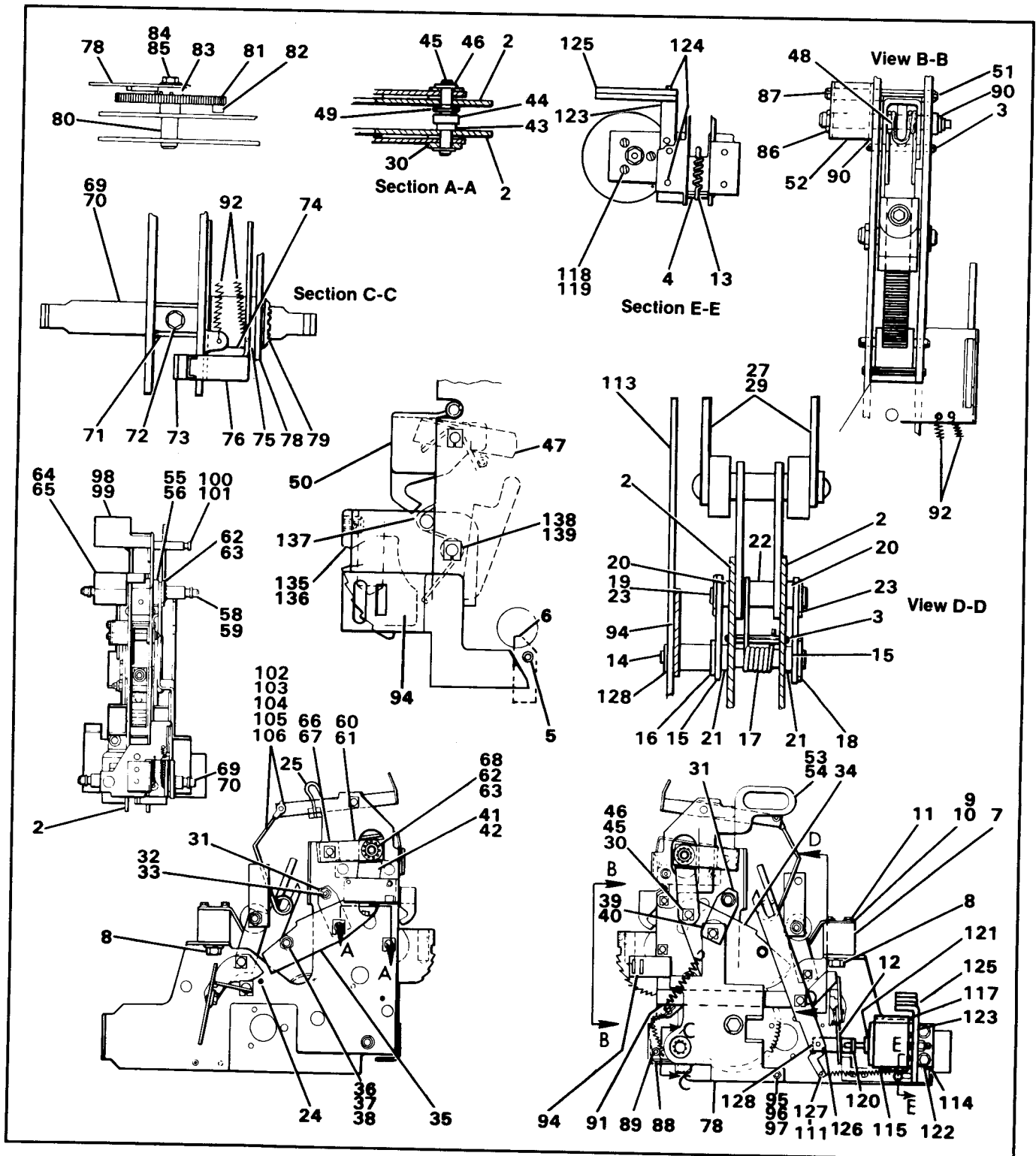


Figure 4. Operator (continued)

Refer to **Figure 4.**

Item	Description	Part Number	Usage
125	Shield	18-657-940-182	Omit on 800A
126	Sichsl	00-000-401-158	
127	Spring	71-113-503-001	
128	X Washer	00-659-055-187	
135	Charge Cam	18-732-791-501	

Item	Description	Part Number	Usage
136	Charge Link	18-732-791-544	
137	Spring	18-657-937-288	
138	Pin	18-747-678-001	
139	Sichsl	00-000-401-166	

18-484-760	Used On Breaker	
MK NO 801	RL-1600, RL-2000, RLE-2000	MO (STD)/MO (STATION.)
	RLF-1600, RLF-2000	MO (FUSED)
802	RL-1600, RL-2000, RLE-2000	EO (STD)/EO (STATION.)
	RLF-1600, RLF-2000	EO (FUSED)
803	RL-1600, RL-2000, RLE-2000	EOMO (STD)/EOMO
	RLF-1600, RLF-2000	EOMO (FUSED)
804	RL-1600, RL-2000, RLE-2000	MO (NON-AUTO)
	RLF-1600, RLF-2000	MO (NON-AUTO FUSED)
805	RL-1600, RL-2000, RLE-2000	EO (NON-AUTO)
	RLF-1600, RLF-2000	EO (NON-AUTO FUSED)
806	RL-1600, RL-2000, RLE-2000	EOMO (NON-AUTO)
	RLF-1600, RLF-2000	EOMO (NON-AUTO FUSED)
807	RL-800, RLE-800, RLI-800	MO (STD)/MO (STATION.)
	RLF-800	MO (FUSED)
808	RL-800, RLE-800, RLI-800	EO (STD)/EO (STATION.)
	RLF-800	EO (FUSED)
809	RL-800, RLE-800, RLI-800	EOMO (STD)/EOMO
	RLF-800	EOMO (FUSED)
810	RL-800, RLE-800, RLI-800	MO (NON-AUTO)
	RLF-800	MO (NON-AUTO FUSED)
811	RL-800, RLE-800, RLI-800	EO (NON-AUTO)
	RLF-800	EO (NON-AUTO FUSED)
812	RL-800, RLE-800, RLI-800	EOMO (NON-AUTO)
	RLF-800	EOMO (NON-AUTO FUSED)
813	RL-3200, RL-4000, RLE-4000	MO (STD)/MO (FUSED)
814	RL-3200, RL-4000, RLE-4000	EO (STD)/EO (FUSED)
815	RL-3200, RL-4000, RLE-4000	EOMO (STD)/EOMO (FUSED)
816	RL-3200, RL-4000, RLE-4000	MO (NON-AUTO)/MO (NON-AUTO FUSED)
817	RL-3200, RL-4000, RLE-4000	EO (NON-AUTO)/EO (NON-AUTO FUSED)
818	RL-3200, RL-4000, RLE-4000	EOMO (NON-AUTO)/EOMO (NON-AUTO FUSED)

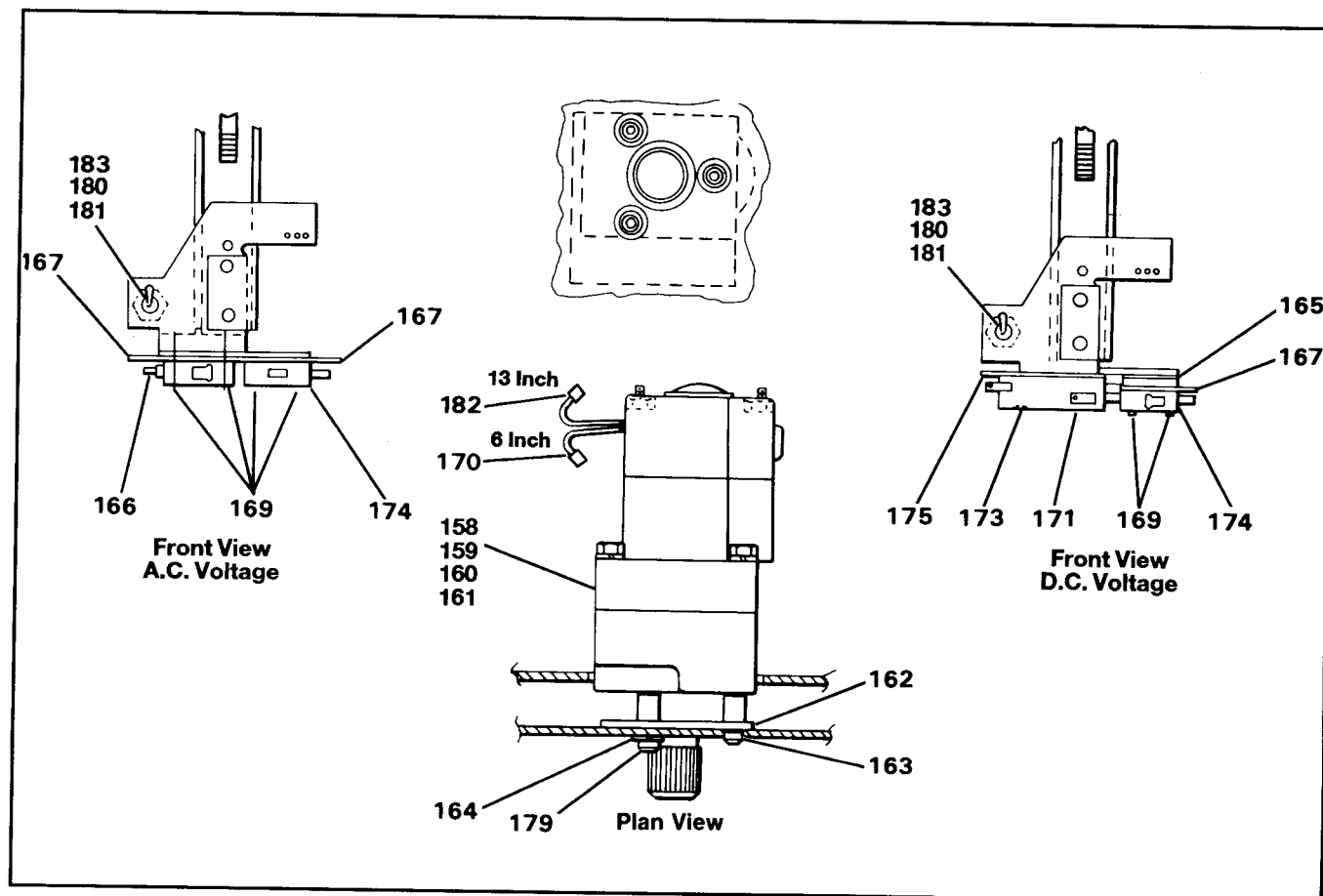


Figure 5. Motor Group

The following item numbers refer to **Figure 5**, and are common parts used on all models.

Item	Description	Part Number	Usage
158	Motor 24 VDC	71-340-297-006	
159	Motor 48 VDC	71-340-297-005	
160	Motor 120 VAC		
	and 125 VDC	71-340-297-001	
161	Motor 240 VAC		
	and 250 VDC	71-340-297-002	
162	Spacer	18-657-768-030	
163	Screw	00-615-245-218	1 Req. per Motor
164	Lock Washer	00-655-017-022	
165	Sw. Spacer	18-657-941-061	
168	Switch (A.C.)	15-171-399-013	

Item	Description	Part Number	Usage
167	Insulator	18-657-783-362	
169	Screw	15-171-399-008	
170	Terminal, Faston	15-172-099-005	
171	Switch (DC)	15-171-323-003	
173	Screw	15-171-399-041	
174	Switch (AC & DC)	15-171-186-010	
175	Insulator	18-657-800-327	
179	Screw	00-615-124-220	2 Req. per Motor
180	Toggle Switch	00-871-523-008	
181	Non-Turn Ring	15-171-399-047	
182	Terminal	15-172-099-023	
183	Screw	18-658-110-031	

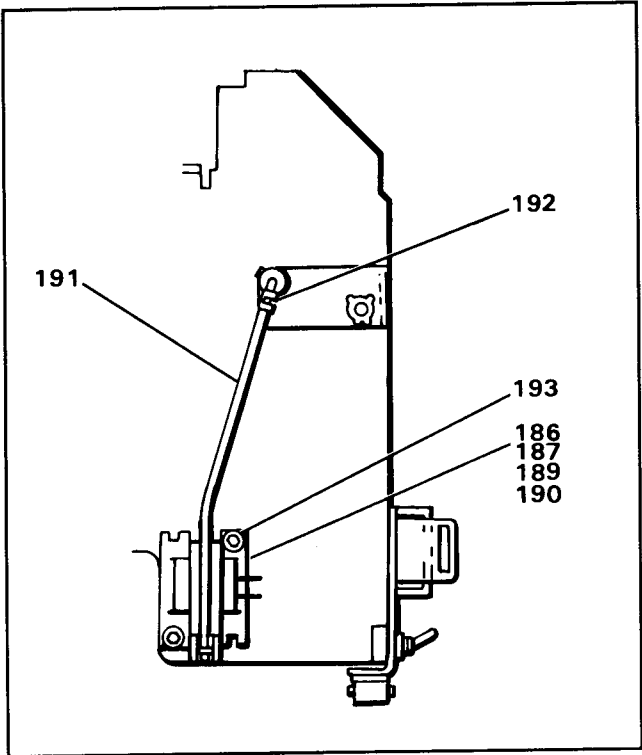


Figure 6. Close Solenoid Group

The following item numbers refer to **Figure 6**, and are common parts used on all models.

Item	Description	Part Number	Usage
186	Solenoid 24VDC	18-724-513-006	
187	Solenoid 48 VDC		
	and 120 VAC	18-724-513-001	
189	Solenoid 240 VAC		
	and 125 VDC	18-724-513-002	
190	Solenoid 250 VDC	18-724-513-004	
191	Close Linkage	18-724-511-001	
192	Clip	15-171-399-003	
193	Screw	15-171-399-010	

The following item numbers refer to **Figure 6A**, and are common parts used on all models.

Item	Description	Part Number	Usage
201	Relay "Y" 48 VDC	15-171-399-027	
202	Relay "Y" 120 VDC	15-171-399-014	
203	Relay "Y" 240 VDC	15-171-399-015	
204	Relay "Y" 125 VDC	15-171-399-016	
205	Relay "Y" 250 VDC	15-171-399-017	
206	Bracket	18-657-961-290	
207	Nut	00-633-059-108	
208	Screw	15-171-094-010	

Some applications
require 2 of this relay

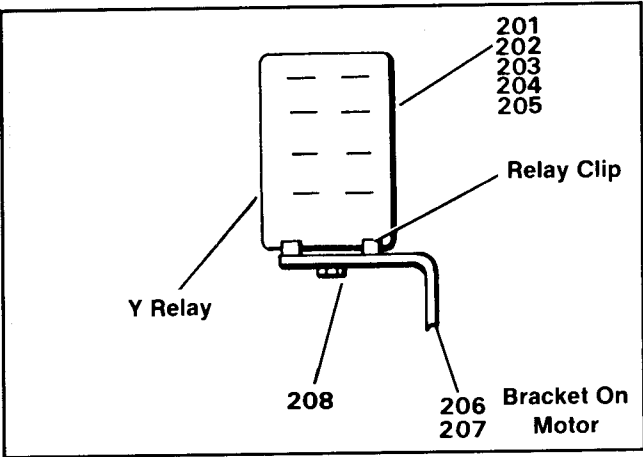


Figure 6A. Anti-Pump "Y" Relay

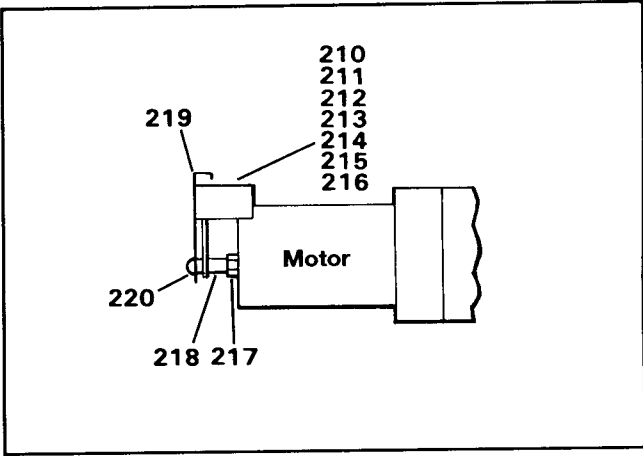


Figure 6B. Anti-Pump "Y" Relay

The following item numbers refer to **Figure 6B**, and are common parts used on all models.

Item	Description	Part Number	Usage
210	Relay "Y"		
	24V AC/DC	18-746-073-501	
211	Relay "Y" 48V		
	AC/DC	18-746-073-502	
212	Relay "Y"		
	120VAC/125VDC	18-746-073-503	
213	Relay "Y"		
	240VAC/250VDC	18-746-073-504	
214	Relay "Y" 24V		
	AC/DC	18-749-238-501	Remote Close
215	Relay "Y" 48V		
	AC/DC	18-749-238-502	Remote Close
216	Relay "Y"		
	120VAC/125VDC	18-749-238-503	Remote Close
217	Nut	00-633-059-108	
218	Spacer	15-172-624-001	
219	Cover	18-732-790-210	
220	Screws	00-615-641-905	

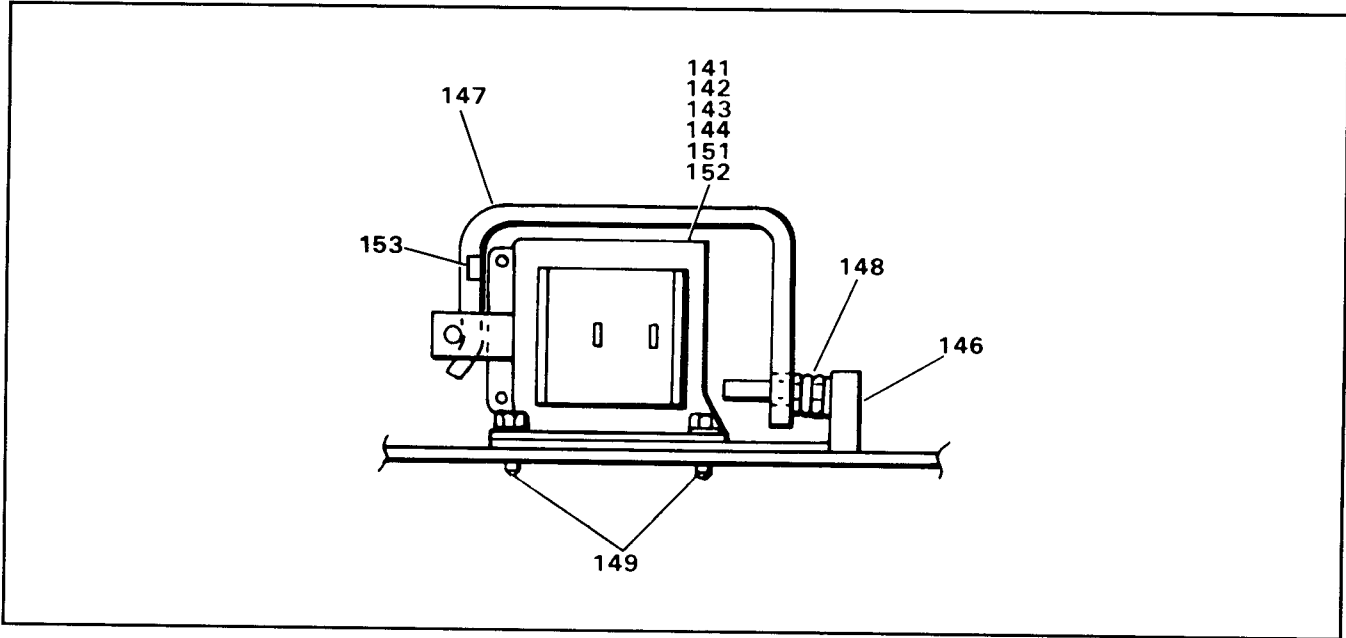


Figure 7. Shunt Trip Group

The following item numbers refer to **Figure 7**, and are common parts used on all models.

Item	Description	Part Number	Usage
141	Solenoid 48VDC and 120VAC	18-724-513-001	
142	Solenoid 240VAC and 125 VDC	18-724-513-002	
143	Solenoid 24VDC	18-724-513-006	
144	Solenoid 250VDC	18-724-513-004	
146	Bracket	18-657-781-264	

Item	Description	Part Number	Usage
147	Pushrod	18-657-768-036	
148	Spring	14-128-784-001	
149	Screw	15-171-399-010	
151	Solenoid 28VDC	18-724-513-007	
152	Solenoid 32VDC	18-724-513-008	
153	Clip	18-658-110-309	

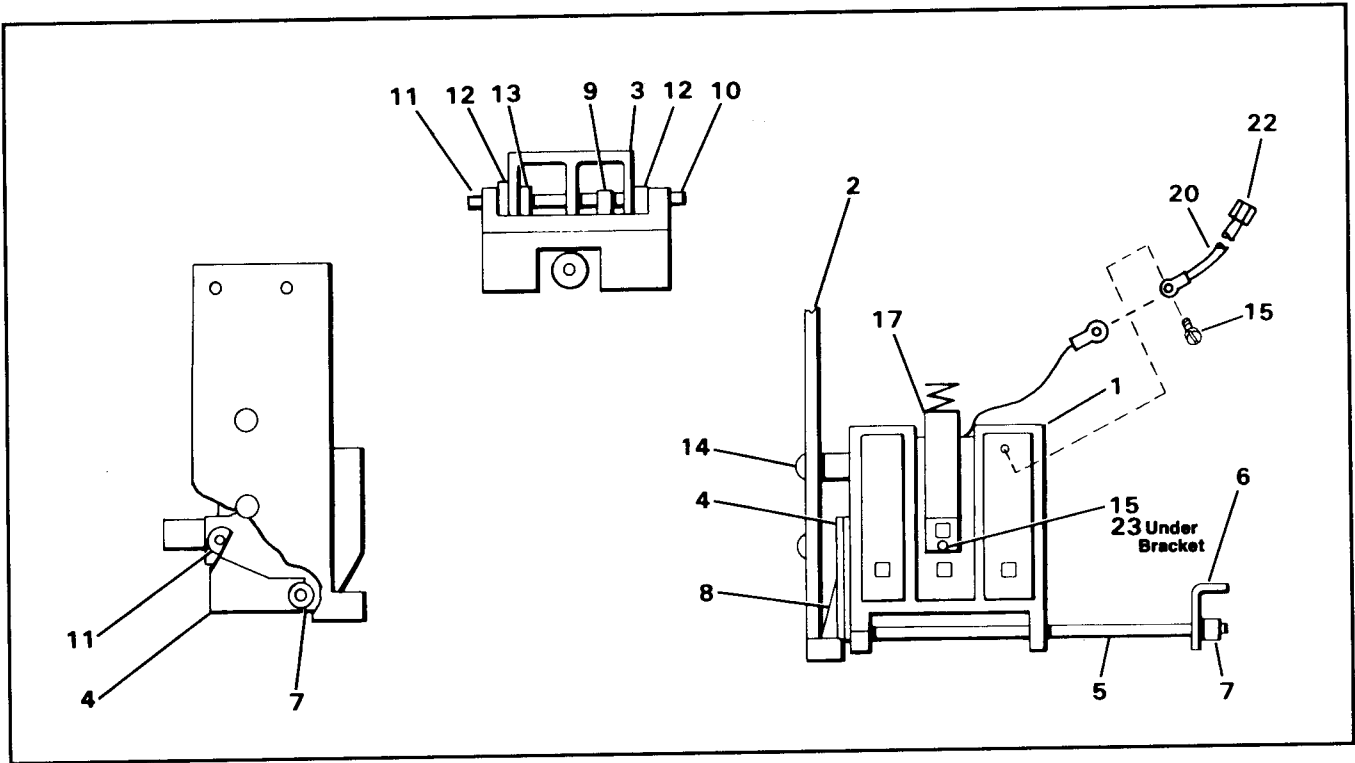


Figure 8. Blown Fuse Trip
Assembly 18-399-805-501

The following items refer to **Figure 8**. Applies to RLF-3200 and RLF-4000 fused models.

Item	Description	Part Number	Usage
1	Housing	18-734-445-001	
2	Base	18-657-961-284	
3	Lever	18-734-444-001	
4	Latch Plate	18-657-961-285	
5	Shaft	18-657-961-281	
6	Arm	18-657-961-288	
7	Spacer Nut	18-657-961-280	
8	Spring	18-657-961-279	
9	Spring	18-657-961-278	
10	Shaft	18-657-961-286	

Item	Description	Part Number	Usage
11	Latch	18-657-961-283	
12	Washer	00-651-007-146	
13	Nut	00-631-143-204	
14	Screw	15-615-024-006	
15	Screw	00-615-641-904	
17	Solenoid Assy.	18-658-583-569	
20	Wire	00-557-286-003	
21	Terminal	15-172-099-003	
22	Terminal	15-172-099-007	
23	Washer	00-651-027-072	

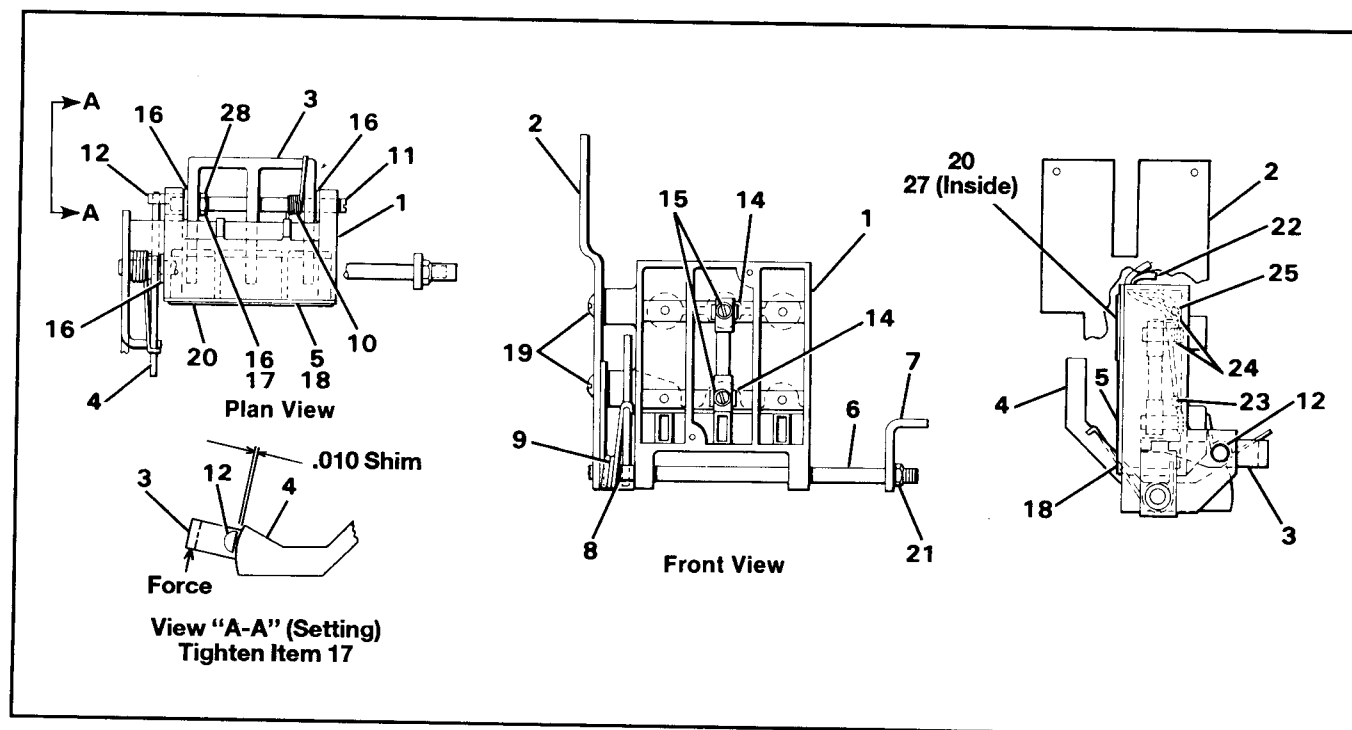


Figure 8A. Trigger Fuse
Assembly 18-399-796-501

The following items refer to **Figure 8A**, Applies to RLF-800, RLF-1600 and RLF-2000.

Item	Description	Part Number	Usage
1	Housing	18-399-759-001	
2	Base	18-657-961-284	
3	Lever	18-734-444-001	
4	Latch Plate	18-657-961-285	
5	Cover	18-657-961-287	
6	Shaft	18-657-961-289	
7	Arm	18-657-961-288	
8	Spacer Nut	18-657-961-280	
9	Torsion Spring	18-657-961-279	
10	Torsion Spring	18-657-961-278	
11	Shaft	18-657-961-286	
12	Latch	18-657-961-283	
13	Actuator Fuse	72-140-317-001	
14	Fuse Clip	18-732-790-159	
15	#8-32 x .25 Lg.		
16	SEMS SCR	00-615-641-904	
17	Washer	00-651-007-146	

Item	Description	Part Number	Usage
17	.25-28 Hex		
18	Jam Nut	00-631-143-204	
19	#6-32 x .25 Lg Rd.		
20	Hd. Mach. Scr.	00-615-511-120	
21	.25-20 x .50 Lg.		
22	Butt. Hd. Scr.	15-615-024-006	
23	Caution Label	15-171-185-002	
24	.25-28 Elastic		
25	Stopnut	00-633-025-216	
26	Wire #18	00-557-286-003	
27	Terminal	15-172-099-003	
28	Faston Tab	15-171-949-049	
29	Faston Terminal	15-172-099-007	
30	Terminal	15-172-099-017	
31	Label	18-658-024-196	
32	Lock Washer	00-655-067-140	

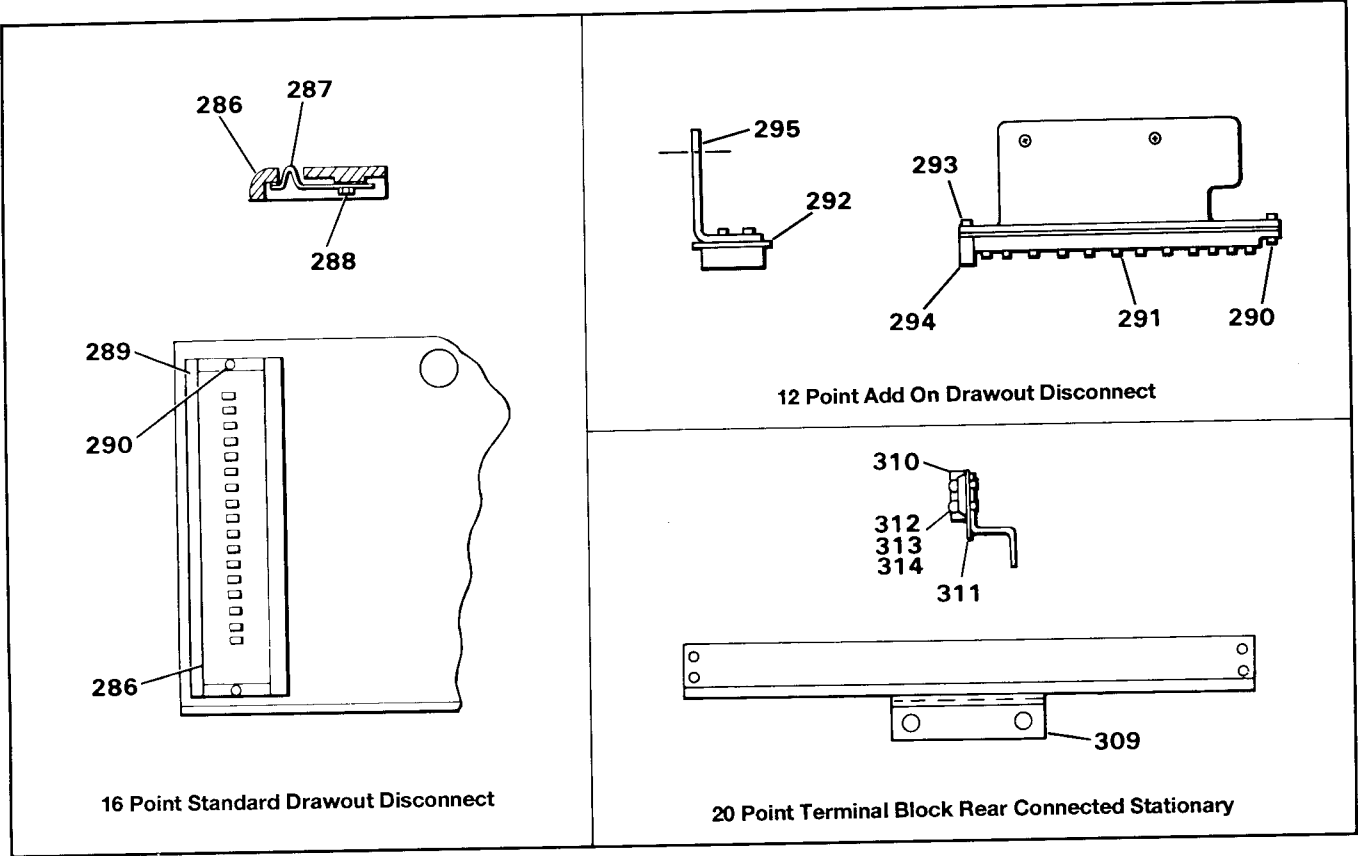


Figure 9. Drawout Secondary Disconnect Group

The following item numbers refer to **Figure 9**, and are common parts used on all models.

16 Point Drawout 18-398-790-501

Item	Description	Part Number	Usage
286	Block	18-398-288-004	Assembly 18-398-790-501
287	Contact	18-657-937-266	
288	Rivet	18-658-110-026	
289	Insulator	18-657-937-270	
290	Screw	15-171-399-010	

12 Point Add On Drawout 18-398-288-811 to 2000A
18-398-288-812 3200 to 4000

Item	Description	Part Number	Usage
291	Block Assembly	18-732-790-572	In IT291
287	Contact	18-657-937-266	
288	Rivet	18-658-110-026	
292	Insulator	18-658-110-331	
290	Screw	15-171-399-010	RL-800/2000 RL-3200/4000
293	Screw	15-171-074-010	
294	Clip	18-658-110-271	
295	Support	18-732-790-176	
295A	Support	18-732-790-177	

20 Point Stationary 18-732-791-556

Item	Description	Part Number	Usage
309	Bracket	18-732-790-043	Stationary RL-800S thru RL-2000S
310	Block	15-171-051-009	Stationary RL-800S thru RL-2000S
311	Marking Strip	15-857-036-002	Stationary RL-800S thru RL-2000S
312	Screw	00-615-471-178	Stationary RL-800S thru RL-2000S
313	Lock Washer	00-655-047-080	Stationary RL-800S thru RL-2000S
314	Washer	00-651-027-072	Stationary RL-800S thru RL-2000S

16 Point Stationary Front Conn. 18-752-300-501

Item	Description	Part Number	Usage
317	Bracket	18-658-143-060	Stationary
317	Terminal Block	15-171-051-013	Stationary
319	Screw	00-615-581-174	Stationary
320	Screw	00-615-663-373	Stationary
321	Screw	15-171-074-012	Stationary

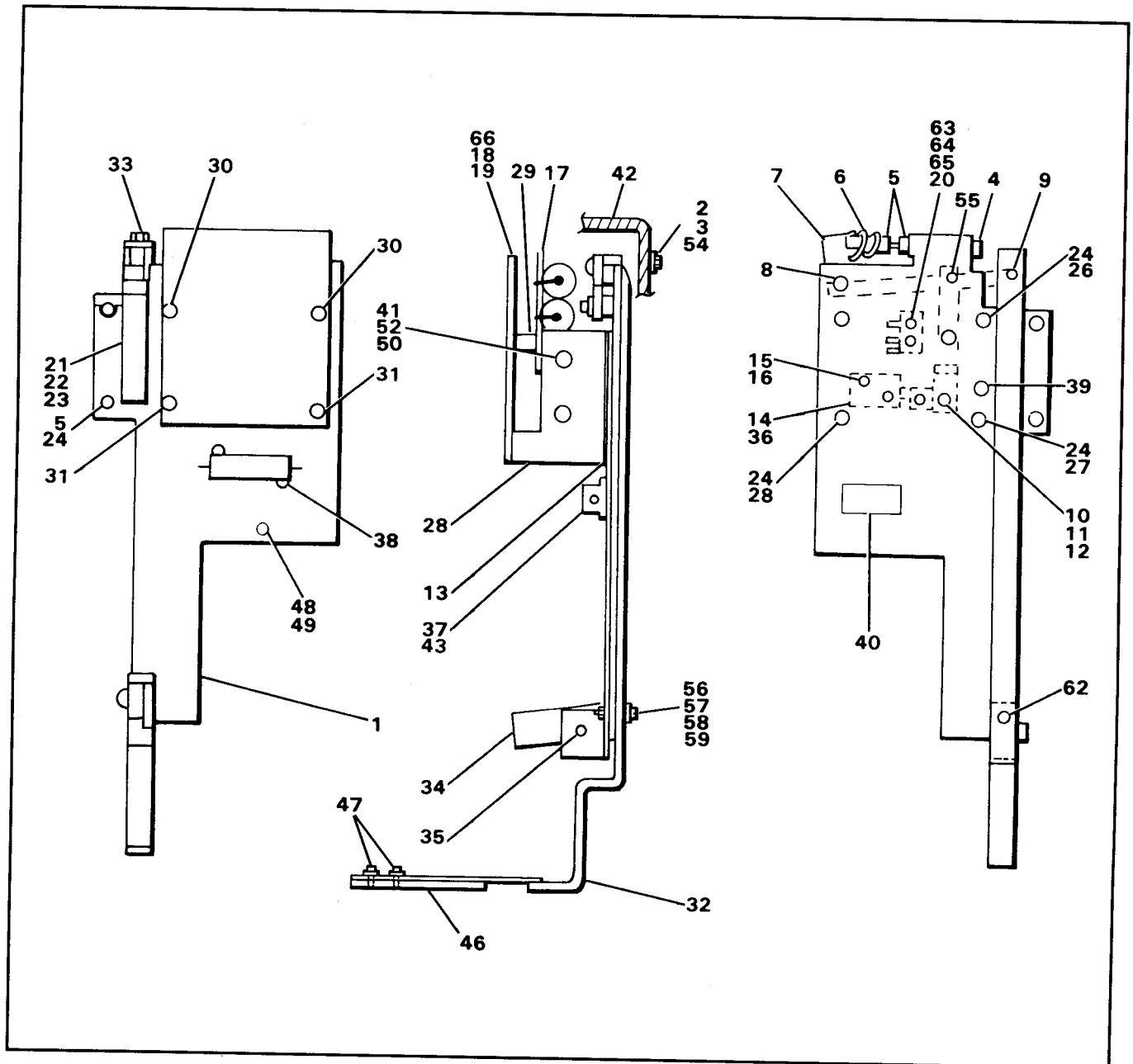


Figure 10. Undervoltage Trip

The following item numbers refer to **Figure 10**.

Item	Description	Part Number	Usage
1	UV Base		
	River Assy	18-658-056-543	
2	Screw	15-171-399-025	
3	Lock Washer	00-655-017-022	
4	Screw #10-32 x 2	00-615-485-233	
5	EL Stop Nut #10-32	00-633-059-210	
6	Spring	18-657-903-282	
7	Lever	18-657-942-096	
8	X Washer	00-659-055-156	
9	Roll Pin .093	00-671-176-117	
10	Latch UV	18-657-942-097	
11	UV Latch Link	18-732-791-529	
12	Rivet	18-657-961-383	
13	Insulator	18-658-024-039	
14	Solenoid	18-721-497-003	
15	Screw	00-615-471-122	
16	Lock Washer	00-655-047-060	
17	Capacitor Assy.	18-732-791-553	
18	UV Circuit Bd 125V	18-802-170-501	
19	UV Circuit Bd 48V	18-802-170-502	
20	Screw #2-56	00-615-471-045	
21	Solenoid	18-732-790-520	120V
22	Solenoid	18-732-790-521	48V
23	Solenoid	18-732-790-535	24V Only
24	Screw #10-32	00-615-485-218	
25	EL Stop Nut #10-32	00-633-059-210	
26	Stand Off	18-658-024-041	
27	Stand Off	18-658-024-042	
28	Terminal Support	18-658-024-043	
29	Spacer	18-658-024-044	
30	Screw	00-615-471-130	

Item	Description	Part Number	Usage
31	Screw	15-171-074-010	
32	Pull Link	18-732-790-042	
33	Screw	15-171-399-010	
34	Guide Lever	18-658-024-045	
35	Washer	00-651-021-092	
36	Solenoid	18-721-497-002	24V Only
37	Resistor 750Ω	15-873-139-033	120V
38	Screw #6 x .38	00-615-581-122	
39	Screw #10	00-615-199-216	
40	Label	15-172-313-001	
41	Terminal	15-172-099-001	
42	Cover	18-398-288-016	
43	Resistor	15-873-139-036	48V
46	Trip Flap Extension	18-657-854-174	
47	Screw	15-171-074-010	
48	Screw	00-615-663-373	
49	Screw	15-171-399-052	
50	Wire #18	00-557-286-003	
51	Terminal	15-172-099-001	
52	Screw	00-615-635-120	
54	Washer	00-651-007-087	
55	Rollpin	00-671-177-116	
56	Lock Washer	00-655-067-060	
57	Screw	00-615-471-126	
58	Washer	00-651-027-050	
59	Nut	00-631-133-040	
62	Rollpin	00-671-176-185	
63	Nut #2	00-631-109-102	
64	Lock Washer	00-655-047-020	
65	Spacer	18-658-110-231	
66	UV Circuit Board	18-802-170-503	24V

Complete Undervoltage Device
18-474-540-(Plus MK No. from Table)

MK No.	V ₁ Dropout Voltage	V ₂ Pickup Voltage	V ₃ Rated Voltage	Time Delay
501	60 VAC	100 VAC	120 VAC	3 Sec.
502	24 VDC	40 VDC	48 VDC	3 Sec.
503	62 VDC	105 VDC	125 VDC	3 Sec.
504	60 VAC	100 VAC	120 AC	0
505	24 VDC	48 VDC	48 VDC	0
506	62 VDC	125 VDC	125 VDC	0
507	12 VDC	20 VDC	24 VDC	2 Sec.
508	12 VDC	20 VDC	24 VDC	0

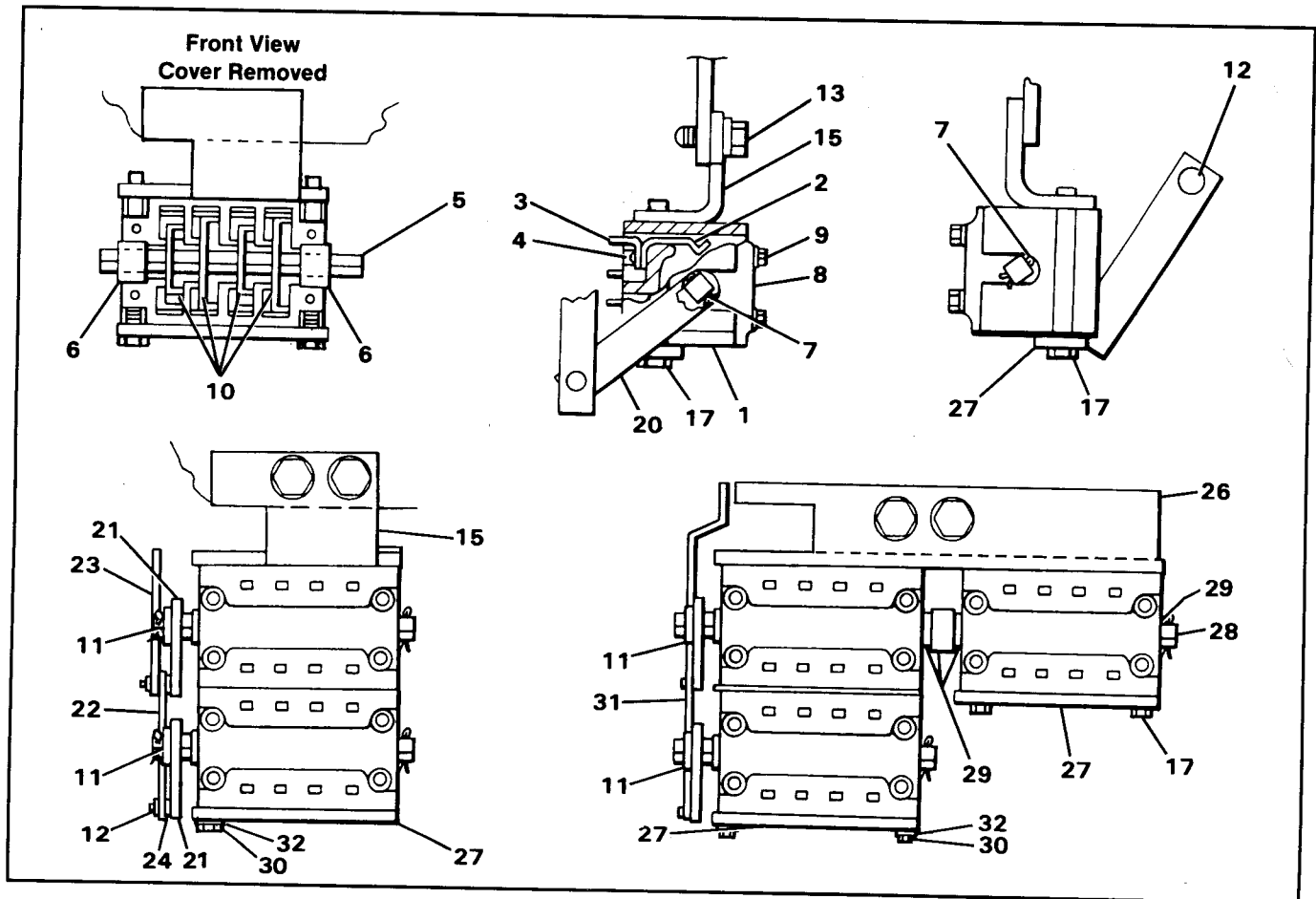


Figure 11. Auxiliary Switch Group

The following item numbers refer to **Figure 11**, and are common parts used on all models.

Item	Description	Part Number	Usage
1	Case	71-240-524-001	
2	Contact	71-141-994-001	
3	Terminal	15-171-949-049	
4	Screw	00-615-641-904	
5	Shaft	18-729-789-001	
6	Bearing	71-141-995-001	
7	Cotter Pin	00-671-195-049	
8	Cover	71-141-952-001	
9	Screw	15-171-074-001	
10	Rotor	18-657-961-381	
11	Retainer	15-171-399-055	
12	X Washer	00-659-055-156	
13	Screw	00-615-663-373	
15	Bracket	18-658-143-036	Single and Dual

Single Switch Assembly 18-398-788-501
 Dual Switch Assembly 18-398-788-506
 Triple Switch Assembly 18-817-175-500
 Contacts are adjustable. Undervoltage Trip not available with Triple Switch Version.

Item	Description	Part Number	Usage
17	Screw	15-171-399-045	Single and Triple
20	Arm	18-732-791-562	Single
21	Arm	18-732-791-572	Dual
22	Link	71-141-962-001	Dual
23	Link	18-657-940-289	Dual
24	Washer	00-651-007-909	Dual
26	Bracket	18-732-790-178	Triple
27	Retainer	18-658-110-275	Triple
28	Shaft	18-658-110-290	Triple
29	Bearing	18-658-110-274	Triple
30	Screw	00-611-315-398	Triple and Dual
31	Arm	18-732-790-570	Triple
32	Lock Washer	00-655-067-140	Triple and Dual

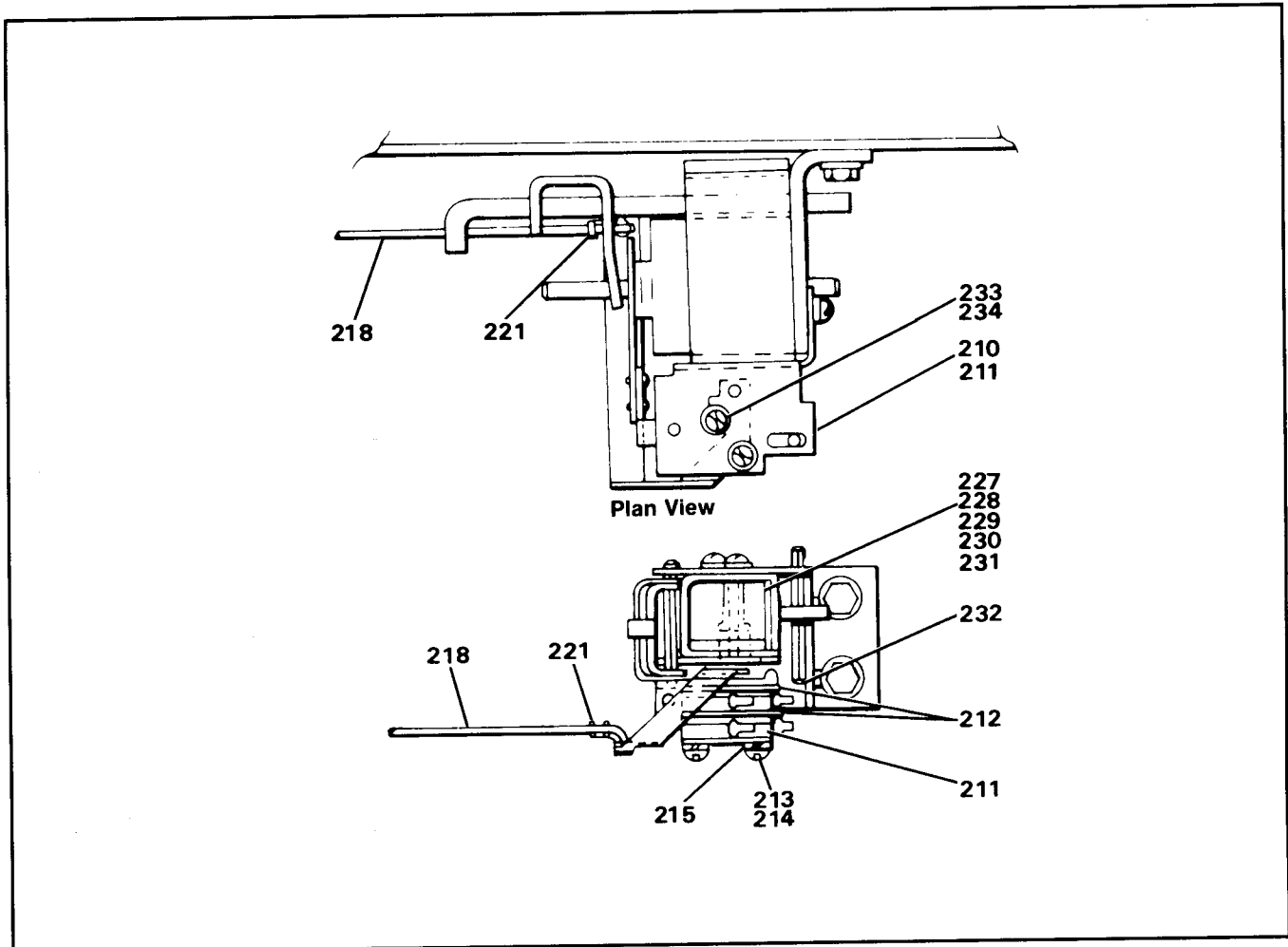


Figure 12. Optional Bell Alarm Switch Group

The following item numbers refer to **Figure 12**, and are common parts used on all models.

Item	Description	Part Number	Usage
210	Bracket Assy.	18-392-075-504	Four Switch
211	Bracket Assy.	18-805-296-502	
212	Switch	15-171-186-010	
213	Insulator	18-657-783-362	
214	Screws	15-171-399-008	Single Switch
215	Screws	00-615-471-082	
218	Lock Washer	00-855-047-040	Mounts on Breaker Cover
221	Manual Reset Rod ..	18-658-024-006	
223	Clip	15-171-399-003	
224	Label	18-658-125-298	
227	Solenoid 24VDC Int. .	18-721-497-006	Elec. Reset Option

Single Switch Assembly	18-392-075-505
Dual Switch Assembly	18-392-075-506
Four Switch Assembly	18-805-296-501

Electrical Reset not Available for Four Switch Model.

Item	Description	Part Number	Usage
227	Solenoid 48VDC Int. .	18-721-497-005	Elec. Reset Option
228	Solenoid 120VAC Int. .	18-721-497-001	Elec. Reset Option
229	Solenoid 240VAC Int. .	18-721-497-003	Elec. Reset Option
230	Solenoid 125VDC Int. .	18-721-497-002	Elec. Reset Option
231	Solenoid 250VDC Int. .	18-721-497-004	Elec. Reset Option
232	Rollpin	15-171-233-006	Elec. Reset Option
233	Screw	00-615-471-120	Elec. Reset Option
234	Lock Washer	00-655-047-060	Elec. Reset Option

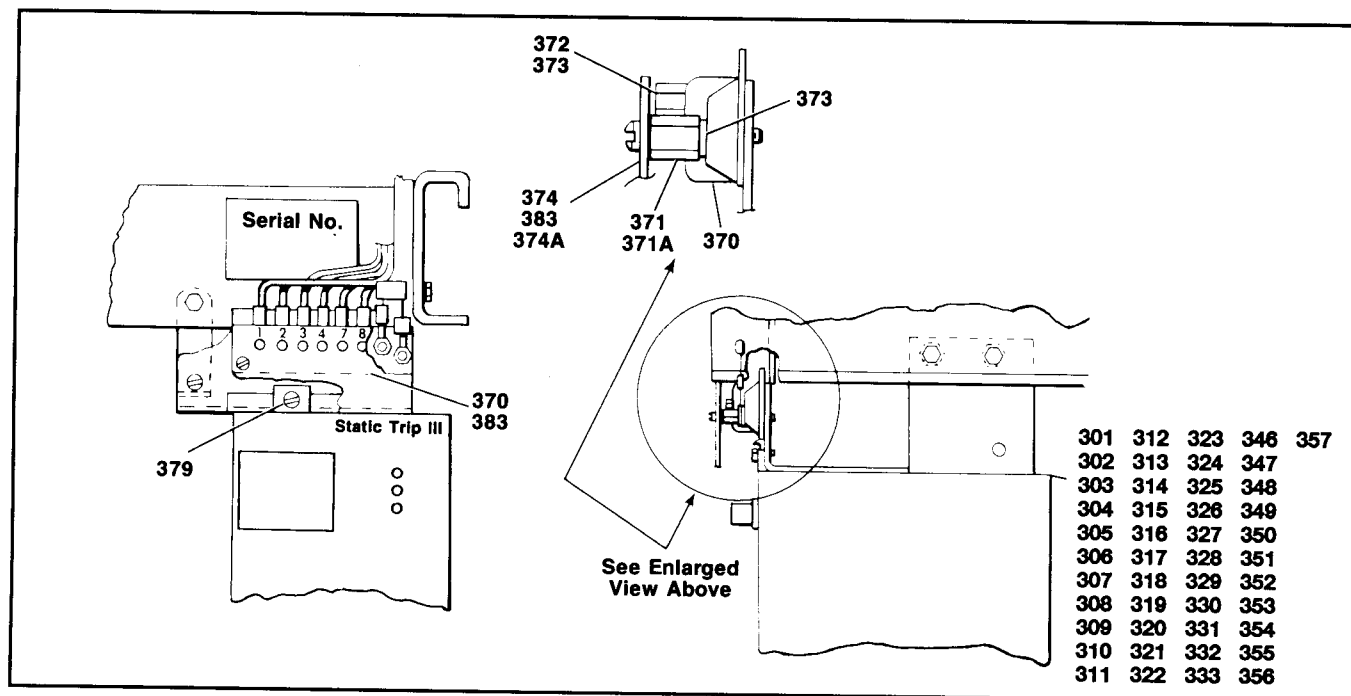


Figure 13. Static Trip Group

The following item numbers refer to **Figure 13**, and are common parts used on all models.

Item	Description	Part Number	Usage
Trip Device Type		Order Part No.	
301	RMS-TI	18-483-905-501	18-751-349-501
302	RMS-TSZ	18-483-905-502	18-751-349-502
303	RMS-TSIZ	18-483-905-503	18-751-349-503
304	RMS-TI-T	18-483-905-504	18-751-349-504
305	RMS-TS-TZ	18-483-905-505	18-751-349-505
306	RMS-TSI-TZ	18-483-905-506	18-751-349-506
307	RMS-TIG-TZ	18-483-905-507	18-751-349-507
308	RMS-TSG-TZ	18-483-905-508	18-751-349-508
309	RMS-TSIG-TZ	18-483-905-509	18-751-349-509
310	RMS-TI-TC	18-483-905-510	18-751-349-510
311	RMS-TS-TZC	18-483-905-511	18-751-349-511
312	RMS-TSI-TZC	18-483-905-512	18-751-349-512
313	RMS-TIG-TZC	18-483-905-513	18-751-349-513
314	RMS-TSG-TZC	18-483-905-514	18-751-349-514
315	RMS-TSIG-TZC	18-483-905-515	18-751-349-515
316	RMS-TI-TCN	18-483-905-516	18-751-349-516
317	RMS-TS-TZ-CN	18-483-905-517	18-751-349-517
318	RMS-TSI-TE-CN	18-483-905-518	18-751-349-518
319	RMS-TIG-TE-CN	18-483-905-519	18-751-349-519
320	RMS-TSG-TE-CN	18-483-905-520	18-751-349-520
321	RMS-TSIG-TE-CN	18-483-905-521	18-751-349-521
322	RMS-TI-T-CP	18-483-905-522	18-751-349-522
323	RMS-TS-TZ-CP	18-483-905-523	18-751-349-523
324	RMS-TSI-TZ-CP	18-483-905-524	18-751-349-524
325	RMS-TIG-TZ-CP	18-483-905-525	18-751-349-525
326	RMS-TSG-TZ-CP	18-483-905-526	18-751-349-526
327	RMS-TSIG-TZ-CP	18-483-905-527	18-751-349-527

Item	Description	Part Number	Usage
Trip Device Type		Order Part No.	
328	RMS-TI-T-CNP	18-483-905-528	18-751-349-528
329	RMS-TS-TZ-CNP	18-483-905-529	18-751-349-529
330	RMS-TSI-TZ-CNP	18-483-905-530	18-751-349-530
331	RMS-TIG-TZ-CNP	18-483-905-531	18-751-349-531
332	RMS-TSG-TZ-CNP	18-483-905-532	18-751-349-532
333	RMS-TSIG-TZ-CNP	18-483-905-533	18-751-349-533
346	RMS-TI-T-CPX	18-483-905-546	18-751-349-546
347	RMS-TS-TZ-CPX	18-483-905-547	18-751-349-547
348	RMS-TSI-TZ-CPX	18-483-905-548	18-751-349-548
349	RMS-TIG-TZ-CPX	18-483-905-549	18-751-349-549
350	RMS-TSG-TZ-CPX	18-483-905-550	18-751-349-550
351	RMS-TSIG-TZ-CPX	18-483-905-551	18-751-349-551
352	RMS-TI-T-CNPX	18-483-905-552	18-751-349-552
353	RMS-TS-TZ-CNPX	18-483-905-553	18-751-349-553
354	RMS-TSI-TZ-CNPX	18-483-905-554	18-751-349-554
355	RMS-TIG-TZ-CNPX	18-483-905-555	18-751-349-555
356	RMS-TSG-TZ-CNPX	18-483-905-556	18-751-349-556
357	RMS-TSIG-TZ-CNPX	18-483-905-557	18-751-349-557
Item	Description	Part Number	Usage
370	Terminal Block	15-171-051-010	Neutral Metering
371	Standoff Screw	18-657-465-036	
371A	Standoff Screw	18-658-143-026	
372	Terminal Screw	18-657-465-035	
373	Lock Washer	00-655-047-060	Neutral Metering
374	Cover	18-658-100-045	
374A	Cover	18-658-143-027	
379	Screw	00-615-641-901	
383	Label	18-658-100-046	Actuator Leads
384	Insulation	00-413-615-182	

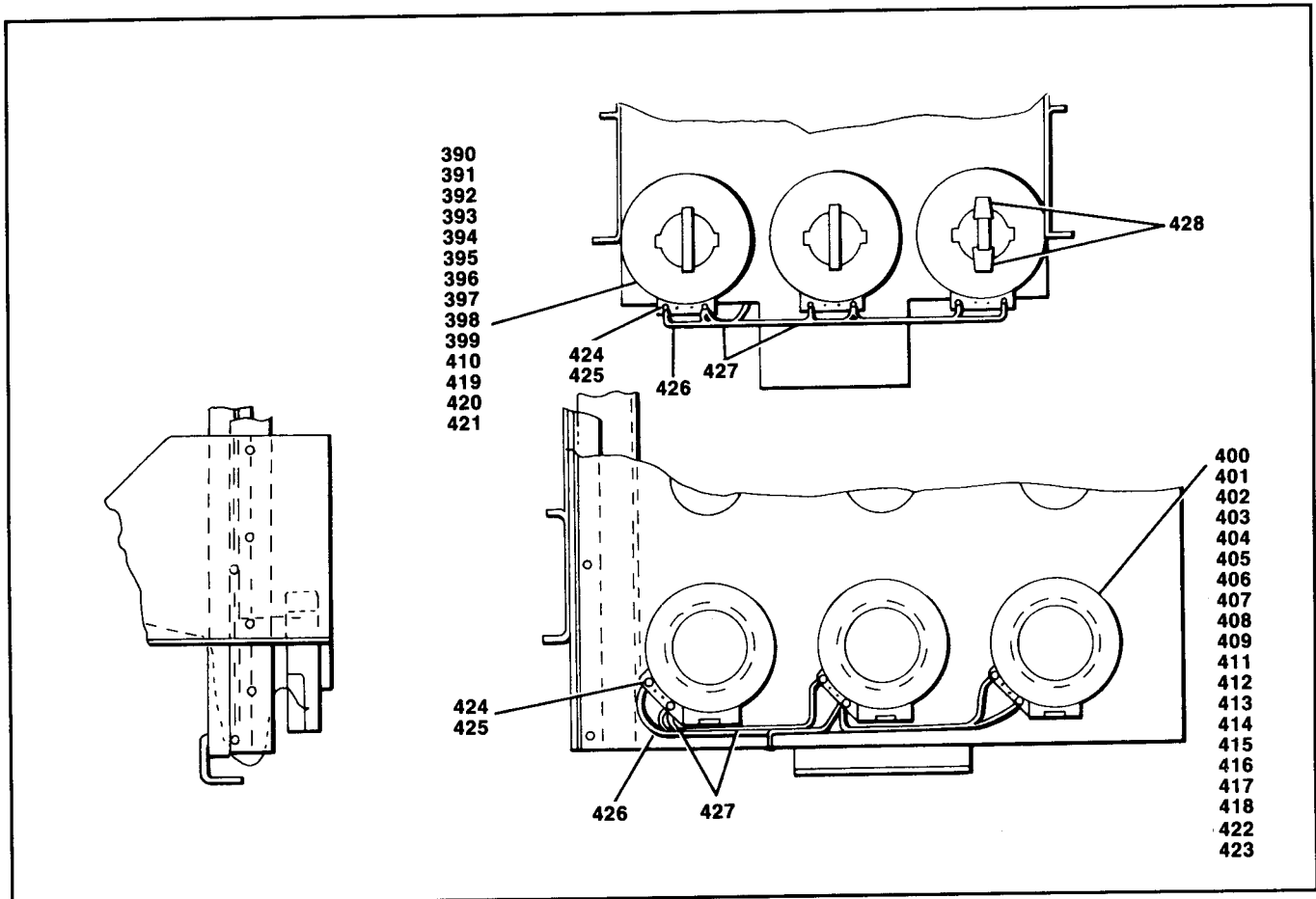


Figure 14. Tripping Transformer Group

The following items refer to **Figure 14**, RL-Breakers with Static Trip III Trip Device.

Single Winding Transformer

Item	Description	Part Number	Usage
390	Trip Transformer 80A	61-300-053-527	to RL-2000
391	Trip Transformer 150A	61-300-053-501	to RLE-2000
392	Trip Transformer 200A	61-300-053-502	to RLE-2000
393	Trip Transformer 300A	61-300-053-503	to RLE-2000
394	Trip Transformer 400A	61-300-053-504	to RLE-2000
395	Trip Transformer 600A	61-300-053-505	to RLE-2000
396	Trip Transformer 800A	61-300-053-506	to RLE-2000
397	Trip Transformer 1200A	61-300-053-507	1600 to RLE-2000
398	Trip Transformer 1600A	61-300-053-508	1600 to RLE-2000
399	Trip Transformer 2000A	61-300-053-509	2000 to RLE-2000
400	Trip Transformer 1200A	61-300-053-510	RL-3200
401	Trip Transformer 1600A	61-300-053-511	RL-3200
402	Trip Transformer 2000A	61-300-053-512	RL-3200
403	Trip Transformer 2400A	61-300-053-525	RL-3200
404	Trip Transformer 3000A	61-300-053-526	RL-3200
405	Trip Transformer 3200A	61-300-053-513	RL-3200
406	Trip Transformer 1600A	61-300-053-514	RL-4000-RLE-4000
407	Trip Transformer 2000A	61-300-053-515	RL-4000-RLE-4000
408	Trip Transformer 3200A	61-300-053-516	RL-4000-RLE-4000
409	Trip Transformer 4000A	61-300-053-517	RL-4000-RLE-4000

Dual Winding—Separate 2000A Ground Winding

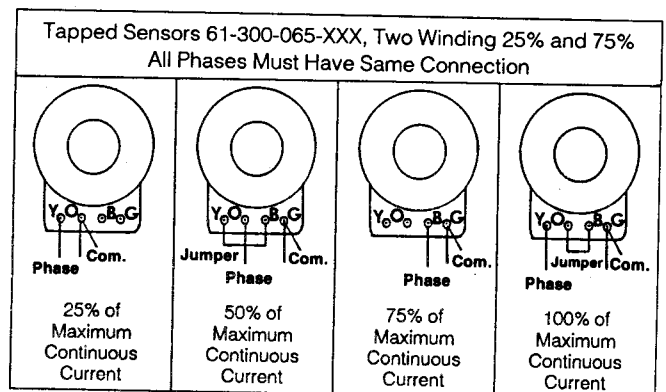
Item	Description	Part Number	Usage
410	Trip Transformer 2000A	61-300-059-509	RL-2000-RLE-2000
411	Trip Transformer 1200A	61-300-059-501	RL-3200
412	Trip Transformer 1600A	61-300-059-502	RL-3200
413	Trip Transformer 2000A	61-300-059-503	RL-3200
414	Trip Transformer 3200A	61-300-059-504	RL-3200
415	Trip Transformer 1600A	61-300-059-505	RL-4000, RLE-4000
416	Trip Transformer 2000A	61-300-059-506	RL-4000, RLE-4000
417	Trip Transformer 3200A	61-300-059-507	RL-4000, RLE-4000
418	Trip Transformer 4000A	61-300-059-508	RL-4000, RLE-4000

Dual Winding Tapped Configuration

Item	Description	Part Number	Usage
419	Trip Transformer	61-300-065-501	RL-, RLE-, RLI-800
Taps for 200A, 400A, 600A and 800A			
420	Trip Transformer	61-300-065-502	RL-1600, RL-2000
Taps for 400A, 800A, 1200A and 1600A			
421	Trip Transformer	61-300-065-503	RL-2000-RLE-2000
Taps for 500A, 1000A, 1500A and 2000A			
422	Trip Transformer	61-300-065-504	RL-3200
Taps for 800A, 1600A, 2400A and 3200A			
423	Trip Transformer	61-300-065-505	RL-4000, RLE-4000
Taps for 1000A, 2000A, 3000A and 4000A			

Hardware Common to All Versions

Item	Description	Part Number	Usage
424	Terminal	15-172-099-003	
425	Screw 10-32	00-615-649-216	
426	Wire #18	00-557-286-003	
427	Tyrap	00-857-271-230	
428	Spacer	18-658-024-052	RL-800, RLI-800, RLE-800
429	Screw 6-32	00-615-641-901	Dual Winding Ground



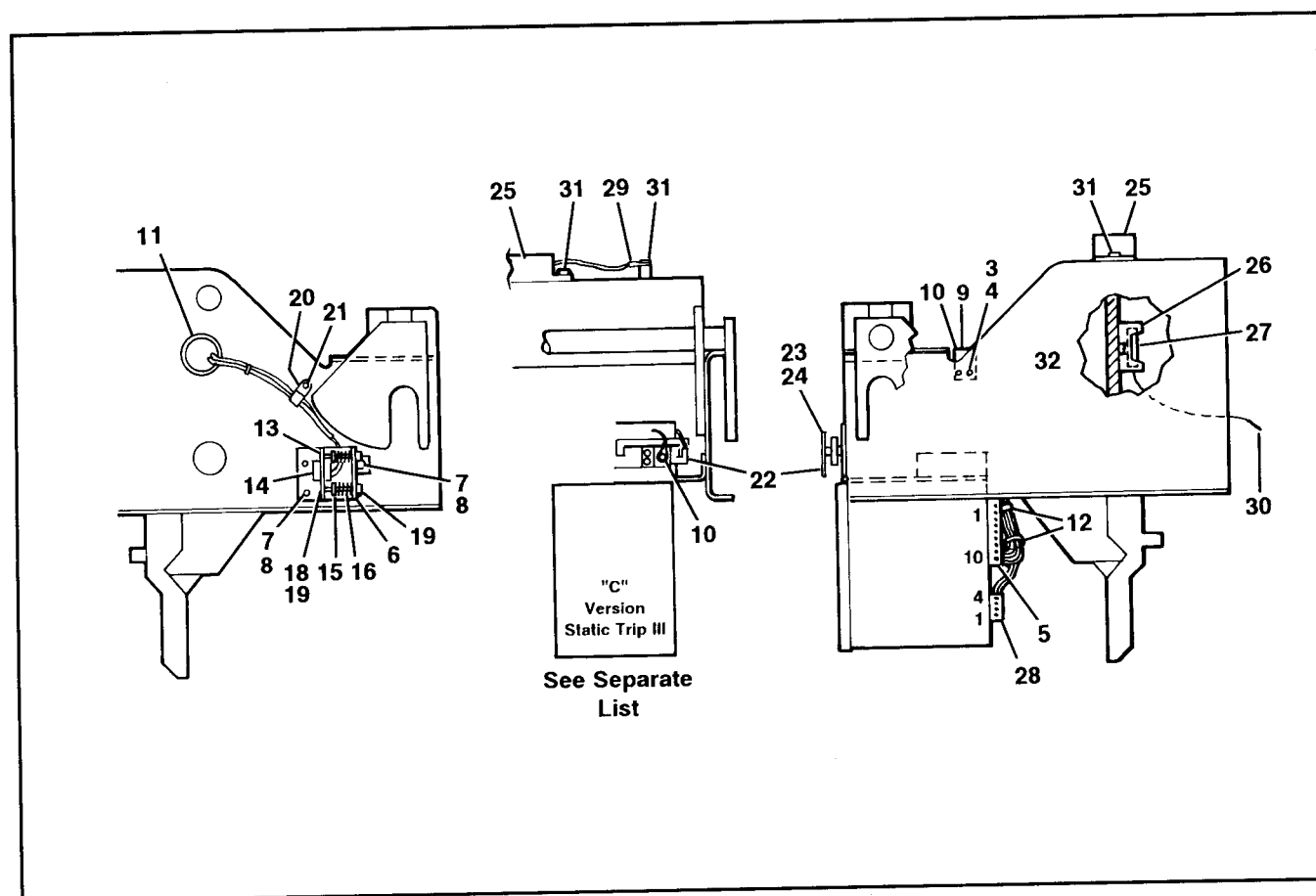


Figure 15. Communications Options

The following item numbers refer to **Figure 15**, and are common parts used on all models.

Item	Description	Part Number	Usage
1	Switch	00-000-466-771	
2	Insulator	18-658-110-126	
3	Screw	00-615-471-130	
4	Nut	00-633-043-106	
5	Plug 10 Pt.	18-658-110-150	
6	Plug Bracket	18-732-790-142	
7	Screws	15-171-399-010	
8	Nut	00-633-059-210	
9	Terminal	15-172-099-007	
10	Terminal	15-172-099-001	
11	Grommet Mtg.	15-171-890-001	
12	Tyrap	00-857-271-230	
13	Guide Plate	18-658-110-152	
14	Sub-D 15 Pin	15-172-245-015	
15	Pin Guide	18-658-110-151	
16	Spring	71-141-173-001	
17	Nut	00-633-059-210	

Item	Description	Part Number	Usage
18	Screw	00-615-471-072	
19	Lock Washer	00-655-017-014	
20	Cable Hanger	00-857-275-006	
21	Screw	00-615-581-174	
22	Term. Conn.	18-732-790-592	Neutral Metering
23	Cover	18-658-143-027	Neutral Metering
24	Standoff	18-658-143-026	Neutral Metering
25	PT Module	18-817-157-501	
26	Fuse Block	15-172-704-001	
27	Fuse	15-172-704-002	
28	Plug 4 Pin	15-172-638-248	
29	Terminal	15-172-099-004	
30	Terminal	15-172-099-022	
31	Screw #10	15-171-399-010	
32	Screw #6	00-615-641-903	

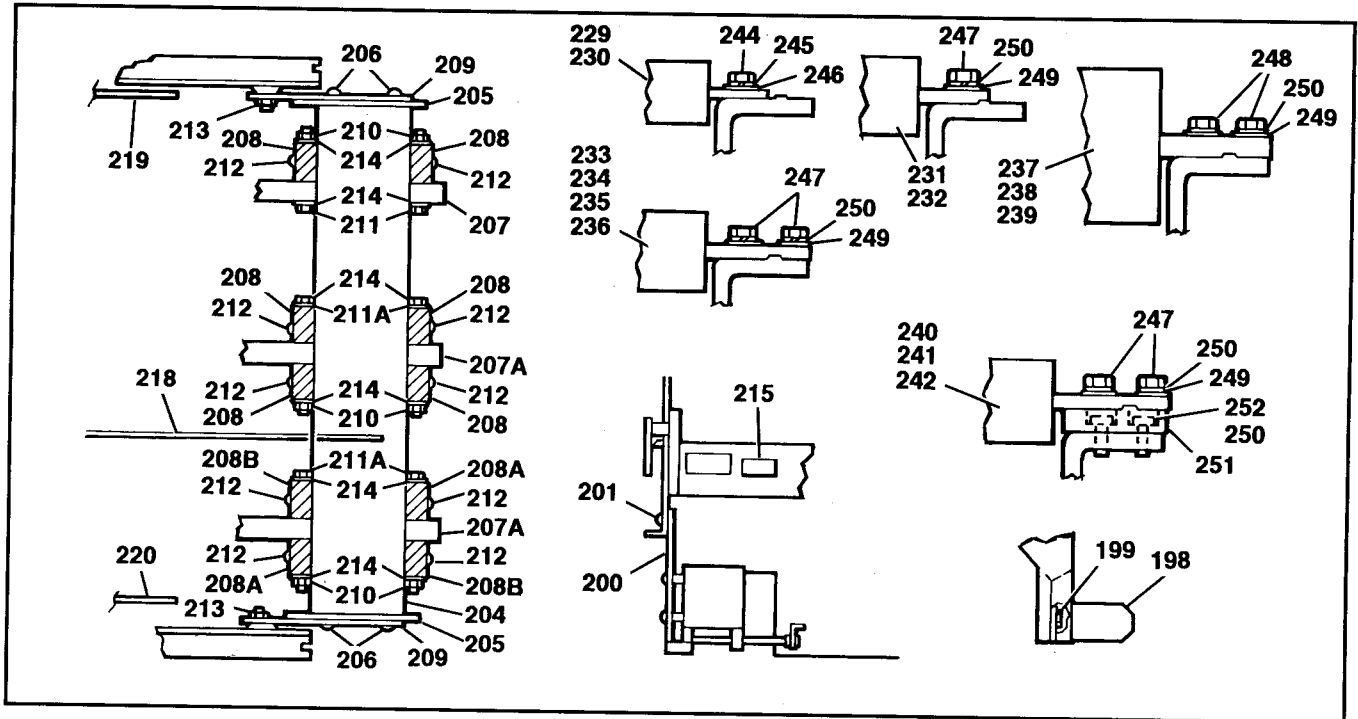


Figure 16. Integrally Fused Breakers

The following items refer to **Figure 16**. Used on RLF-800 thru RLF-2000 Breakers.

Item	Description	Part Number	Usage
198	Bracket	18-657-937-283	
199	Screw	15-171-399-011	
200	Open Fuse Trip	18-399-796-501	See Sep. List
201	Screws	15-171-399-010	
204	Insulator	18-732-790-025	
205	Insulator	18-657-947-202	
206	Screw	15-615-024-004	
207	Connector	18-657-942-090	RLF-800
207A	Connector	18-657-942-091	
208	Bracket	18-398-288-010	
208A	Bracket	18-399-523-001	RLF-2000
208B	Bracket	18-399-523-002	RLF-2000
209	Bracket	18-732-790-026	
210	Nut	15-171-063-016	
211	Screw	00-615-114-388	RLF-800
211A	Screw	00-615-114-395	
212	Screw	15-171-399-011	
213	Nut	00-631-059-104	
214	Washer	00-651-007-146	
215	Label	18-657-765-208	
218	Barrier	18-657-937-284	RLF-2000
219	Barrier	18-732-790-053	RLF-2000
220	Barrier	18-732-790-054	RLF-2000

Item	Description	Part Number	Usage
229	Fuse 250A	71-142-200-001	
230	Fuse 400A	71-142-200-002	
231	Fuse 600A	71-142-200-003	
232	Fuse 800A	71-142-200-004	
233	Fuse 1000A	71-142-200-013	
234	Fuse 1200A	71-142-200-005	
235	Fuse 1600A	71-142-200-006	
236	Fuse 2000A	71-142-200-007	
237	Fuse 2500A	71-142-200-008	
238	Fuse 3000A	71-142-200-009	
239	Fuse 4000A	71-142-200-010	
240	Fuse 1600A	71-142-200-015	
241	Fuse 2000A	71-142-200-016	
242	Fuse 2500A	71-142-200-019	
244	Screw	00-611-315-421	
245	Lock Washer	00-655-017-030	
246	Washer	00-615-007-900	
247	Screw	00-611-315-546	
248	Screw	00-611-315-548	
249	Washer	00-651-007-285	
250	Lock Washer	00-655-017-036	
251	Adapter	18-732-791-586	
252	Screw	00-615-114-542	

} Welder Fuses

Breaker Type	Maximum Fuse
RLF-800	1600A
RLF-1600	3000A
RLF-2000	4000A

SIEMENS

Siemens Energy
& Automation, Inc.
Switchgear Division

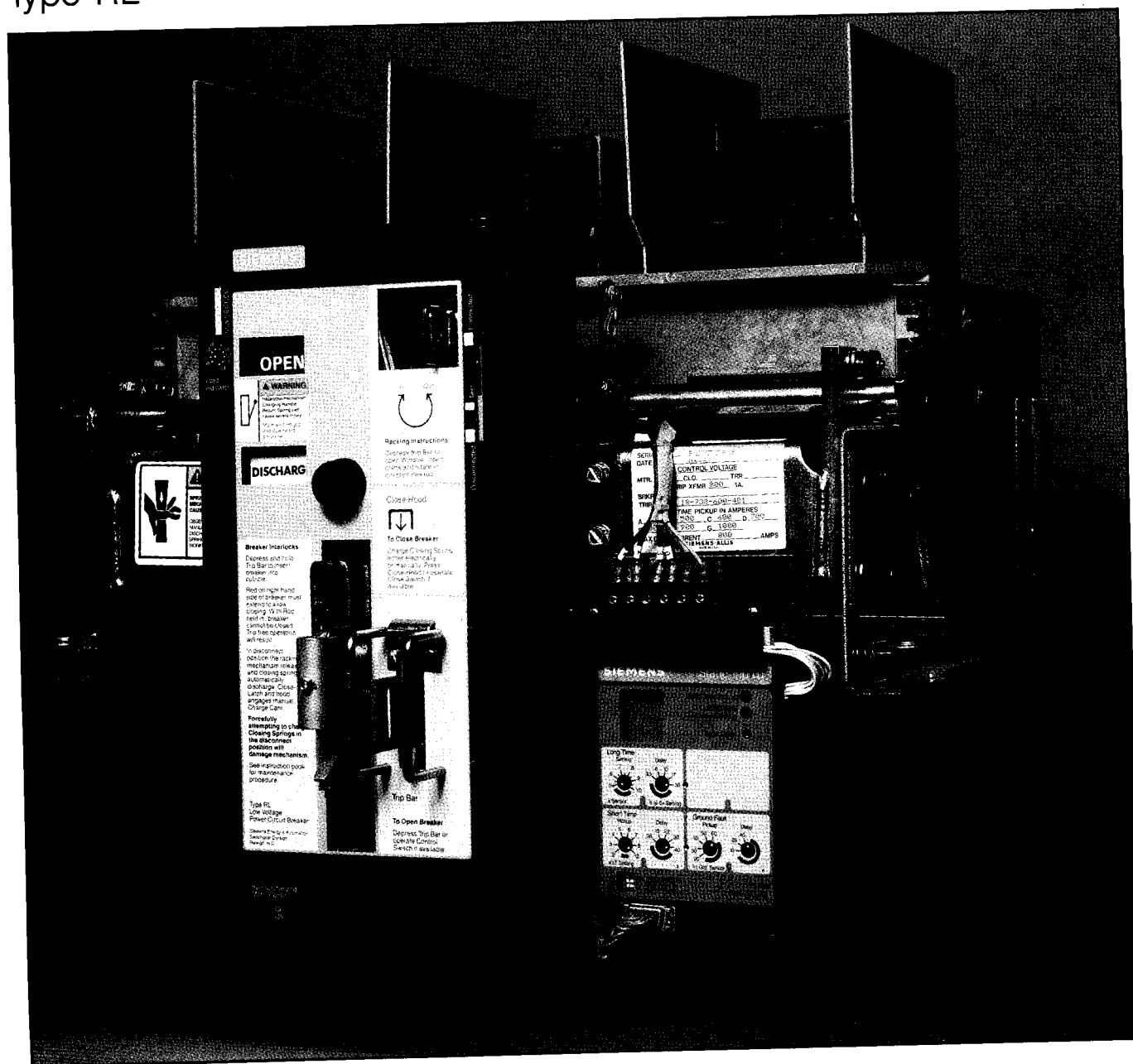
P.O. Box 29503
Raleigh, NC 27626
(919) 365-6660

SIEMENS

Low Voltage Circuit Breakers

Type RL

Instructions
Installation
Operation
Maintenance
Parts
SG-3068



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The information contained within is intended to assist operating personnel by providing information on the general characteristics of equipment of this type. It does not relieve the user of responsibility to use sound engineering practices in the installation, application, operation and maintenance of the particular equipment purchased.



If drawings or other supplementary instructions for specific applications are forwarded with this manual or separately, they take precedence over any conflicting or incomplete information in this manual.

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	 DANGER
	<p>Due to the nature of this product, there is inherent danger in its use through possible exposure to high electrical voltage. Only qualified persons thoroughly familiar with these instructions should be allowed to operate these devices. Improper use or procedures can result in serious personal injury or death.</p>

	 DANGER
	<p>No attempt to operate this equipment should be undertaken without fully reading the instruction manual. Operators must be familiar with the equipment, its operation, and have read these instructions prior to each use. Failure to do so may result in electrical shock or burn causing death or serious personal injury and property damage.</p> <p>Use of the Siemens equipment must be restricted to qualified personnel. A qualified person is one who is familiar with the installation, construction of operation of the equipment and the hazards involved. In addition, this qualified person has the following qualifications:</p> <p>Is trained and authorized to de-energize, clear ground and tag circuits and equipment in accordance with established safety practices.</p> <p>Is trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.</p> <p>Is trained in rendering first aid.</p>

Introduction

Type "RL" Low-voltage AC Power Circuit Breakers may be furnished for mounting in any one of three ways: (1) in metal-enclosed switchgear of the draw-out type; (2) in individual metal enclosures (draw-out type); or (3) for stationary mounting in a customer's own enclosing case or switchboard. All "RL" circuit breakers are completely assembled, tested, and calibrated at the factory in a vertical position and must be so installed to operate properly. Customer's primary connections must be adequately braced against the effects of short circuit currents to prevent overstressing the circuit breaker terminals.

Receiving and Inspection for Damage

Immediately upon receipt of this equipment, carefully remove all packing braces. Examine parts and check them against the packing list and note any damages incurred in transit. If damage is disclosed, a carrier inspection must be arranged for by consignee within 15 days of receipt of equipment. If equipment is shipped F.O.B. Destination, the consignee must obtain the original of the carrier inspection report and notify Siemens immediately.

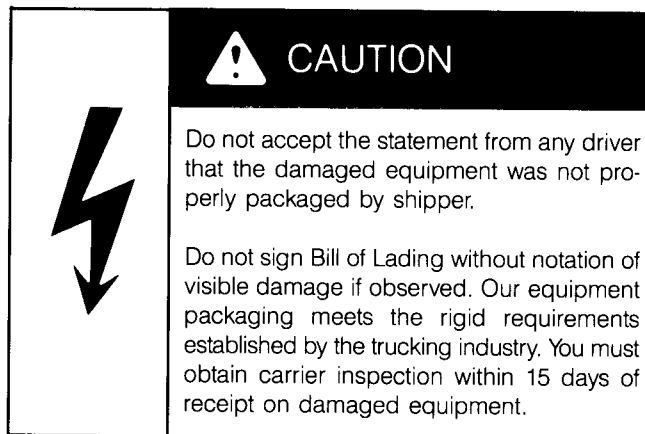
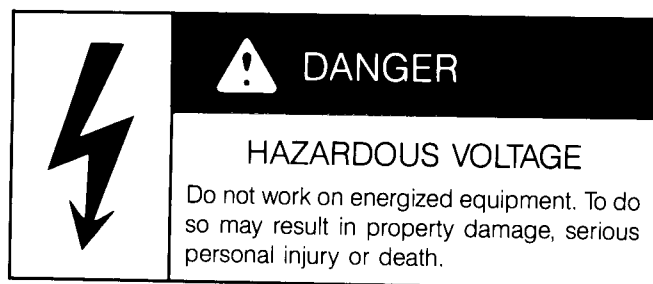
Two shipping methods are used with "RL" circuit breakers:

1. Individually skidded with protective covering.
2. Within a cubicle. Circuit breakers shipped in their cubicles are blocked to prevent accidental tripping during shipment. Note all caution tags, remove blocking bolts, and open circuit breaker contacts before installation.

Storage

When circuit breakers are stored, wrap or cover them with a non-absorbent material to protect them from plaster, concrete dust, moisture or other foreign matter. Do not expose circuit breakers

Circuit Breaker



to the action of corrosive gases or moisture. In areas of high humidity or temperature fluctuations, space heaters or the equivalent should be provided.

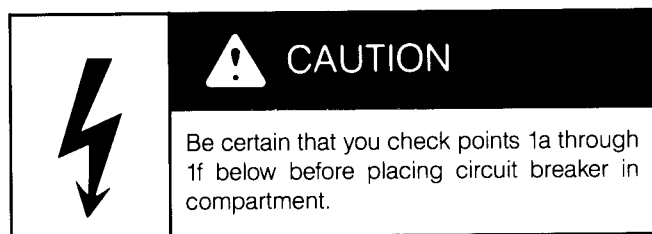
Installation

GENERAL

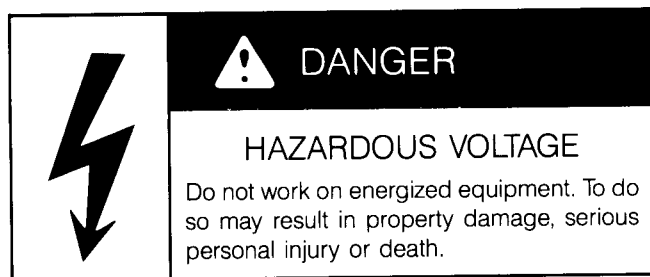
The "RL" Low-voltage AC Power Circuit Breaker is completely adjusted, tested, and inspected before shipment. However, a careful check should be made to be certain that shipment or storage has not resulted in damage or change of adjustment. Circuit breakers and their enclosures should be installed in a clean, dry, well-ventilated area in which the atmosphere is free from destructive acid or alkali fumes. For stationary breakers and customer enclosures, the factory should be consulted for minimum clearances and required ventilation openings. If not enclosed, they must be mounted high enough to prevent injury to personnel either from circuit interruption, or from moving parts during automatic opening of the circuit breaker.

Allow sufficient space to permit access for cleaning and inspection, and adequate clearance to insulating barriers above the circuit breaker to prevent damage from arcing during interruption. Before installing, make certain that the circuit breaker contacts are in the open position. Be sure to lubricate primary and secondary disconnect fingers with Siemens electrical contact lubricant supplied with accessories.

INSTALLATION SEQUENCE



1. Determine the correct switchgear compartment for each circuit breaker by checking the Three-Line Diagram furnished with the drawings. The Three-Line Diagram shows the following for each circuit breaker compartment:
 - a. Circuit breaker Type (RL-800, RL-1600 etc.)
 - b. Trip "XFMR" or "SENSOR" rating.
 - c. Static Trip Type TS, TIG, TSG, etc.
 - d. Type of operator (Manual Operator-M.O. or Electrical Operator-E.O.)
 - e. Circuit Breaker Wiring Diagram Numbers
 - f. Special Accessories (Undervoltage Trip, etc.)
2. On fused breaker make sure trigger fuse linkage is reset. Breaker will remain trip free as long as this linkage is tripped.
3. After the circuit breaker is placed in the compartment, rack it to the TEST position.
4. Close and trip the circuit breaker. Refer to OPERATING PROCEDURE, pages 4 and 5 for manually and electrically operated breakers.



During the closing operation, observe that the contacts move freely without interference or rubbing between movable arcing contacts and parts of the arc chutes. Then refer to OPERATION, pages 4 and 5 for a detailed description of the circuit breaker operating characteristics before placing the circuit breaker in service. Make sure circuits are not energized.

5. Trip units and accessory devices should receive a thorough check before placing the circuit breaker in service. This

check makes certain that adjustments are proper and parts are not damaged. Refer to Static Trip II Instruction Book SG-3098.

6. Circuit breakers are equipped with a draw-out interlock to prevent movement of a closed circuit breaker into or out of the connected position. Circuit breaker interlock operation should be checked before it is energized. See DRAW-OUT INTERLOCK, page 5, and SPRING DISCHARGE INTERLOCK, page 8, for a description of these interlocks.
7. After completing the installation inspection, check the control wiring (if any) and test the insulation.
8. Now the circuit breaker is ready to be racked into the CONNECTED position. Refer to RACKING MECHANISM, pages 7 and 8.
9. The circuit breaker can now be closed to energize the circuit.

CAUTIONS TO BE OBSERVED IN INSTALLATION AND OPERATION

1. Read this Instruction Book before installing or making any changes or adjustments on the circuit breaker.
2. Stored-energy closing springs may be charged with circuit breaker contacts in either the open or closed position. Extreme care should be taken to discharge the springs before working on the circuit breaker.
3. When closing manually operated breakers out of the unit, the racking mechanism must be returned to the test position before the closing spring can be charged.
4. When charging manually operated breakers, always hold the handle firmly until it is returned to the normal vertical position. A ratchet insures that the closing stroke must be completed once started.
5. Check current ratings, circuit breaker wiring diagram numbers, circuit breaker type and static trip type, against the Three-Line Diagram to assure that circuit breakers are located in the proper compartments within the switchgear.
6. Check the alignment of the secondary disconnect fingers. This ensures against misalignment due to possible distortion of fingers during the shipment and handling.
7. Close the compartment door and secure door latch(es) prior to racking the circuit breaker to or from the CONNECTED position. Also close and latch the door prior to closing the circuit breaker when in the CONNECTED position. Once the circuit breaker is closed, keep the door closed.
8. Once the circuit breaker is energized, it should not be touched, except for the exterior controls.

Description

The continuous current and interrupting ratings of the circuit breakers are as shown on the circuit breaker rating label.

The circuit breakers are also available with integrally mounted current limiting fuses through 2000A frame size, and with separately mounted fuses for 3200A and 4000A frame size. For 800A, 1600A, and 2000A frame sizes the basic circuit breakers are the same with or without fuses. The fuses mount on a bracket that is bolted to the side plates and upper studs on the back of the circuit breaker. The current limiting fuses increase the interruption rating to that of the fuses. Fused circuit breakers are identified as RLF-800, RLF-1600, RLF-2000, RLF-3200, or RLF-4000. Fused circuit breakers are also equipped with an open fuse trip device to open the circuit breaker if one or more current limiting fuses open.

NOTE

Fused circuit breakers are not physically interchangeable with unfused breakers.

The circuit breakers can also be supplied for stationary mounting in which the racking components are omitted and brackets are provided for mounting to a stationary frame.

All RL circuit breakers use the same basic closing mechanism or operator. The closing springs used vary between sizes.

Three configurations of the operator are available for charging the closing springs. These are:

- A. Manual Charging
- B. Electrical Charging
- C. Combination Manual-Electrical Charging.

The manual and electrical operators are identical except for the means of supplying energy to the closing springs. A double-toggle, trip-free mechanism is used. This means that the breaker contacts are free to open at any time if required, regardless of the position of the mechanism.

A. MANUALLY OPERATED BREAKERS

The breaker has a center-mounted frame so many of the latches and links are arranged in pairs. For descriptive purposes, they will be referred to as single items. Refer to Figure 1, page 6, and Table 1, page 4. Detail (A) shows the position of the trip latch

and toggle linkage when the circuit breaker is open and the closing springs are discharged.

**Table 1. Operating Procedure
Manually Operated Circuit Breakers**

Operation	Procedure
Charging Springs	Pull charging handle down all the way (approximately 120°) and return it to normal vertical position. (Engagement of pawl with ratchet teeth prevents handle reversal until the downward stroke is completed.)
Closing	Push down firmly on spring-release latch hood (50) after handle is returned to normal vertical position.
Tripping	Push in manual trip rod (94). OR If shunt trip is provided, operate remote trip control switch (CST). (See Fig. 2).

Movement of the charging handle downward rotates closing ratchet (140) against roller (43), thus pivoting closing cam (34) clockwise about pin (40). This extends the closing springs through link (41) and spring hanger (58). Rotation of cam (34) allows roller (27) in toggle linkage to be moved into position shown in Detail (B). Kickoff spring (10) moves rollers away from the stop block (7). Then the toggle linkage is moved by torsion spring until latch (15) clears trip latch (12). Spring (13) causes trip flap (12) to reset under latch (15). Trip flap (12) should normally stop against the front surface of latch (15).

When the closing springs are fully charged, roller (43) engages latch (47). Closing ratchet (140) engages a pawl in such a manner that the charging cam must complete the charging stroke before it can return to its normal position.

With the charging handle in its normal upright position, the circuit breaker can be closed. By pressing firmly on hood (50), latch (47) will disengage roller (43). Then closing springs cause cam (34) to rotate against the toggle rollers (27), moving the toggle into its upright position, as shown in detail (C). The closing cycle can be interrupted at any point by operation of one of the tripping means. This will cause rotation of trip latch (12) to a position that releases latch (15), allowing toggle linkage to collapse to the position shown in detail (A).

To manually open the circuit breaker, press in manual trip rod (94). This bar engages the top of trip flap (12), to disengage the latch (15).

B. ELECTRICALLY OPERATED CIRCUIT BREAKER

The mechanism of the electrically operated circuit breaker is the same as the manually charged circuit breaker, except that the manual charging handle is replaced by a motor and gear system. Refer to Figure 1, Table 2. Power available to the control circuit will start the automatic charging cycle. The motor gear box pinion rotates gear (81) counterclockwise. Cam follower (82) engages an arm of wind and close cam (34), which rotates the cams in the same manner as for the manually charged circuit breaker. When the wind and close cam (34) reaches its charged position, the back of the cam engages switch lever (73), rotating the lever away from the switch operator. Gear switch lever (76) will still be holding the switch in the operate position and the motor will continue to run until the roll pins on the side of gear (81) lifts lever (76) clear. This releases the motor cut-off switch (MCO). When the MCO switch opens, the motor stops, and the closing coil circuit is set up through one side of the MCO switch.

**Table 2. Operating Procedures
Electrically Operated Circuit Breakers**

Operation	Procedure
Charging Springs	Energize control circuit
Closing	After springs are charged, actuate remote close control switch (CSC). OR Push down firmly on spring-release latch hood (50).
Tripping	Actuate remote trip control switch (CST). OR Push in manual trip rod (94).

The circuit breaker can now be closed by depressing the latch hood (50) or by energizing the closing coil (CC) through the external close control switch (CSC). When the close circuit is energized, the "Y" relay is energized and opens the "Y" contact in the coil circuit. This prevents "pumping" or repeated attempts to close the circuit breaker if a tripping signal or fault is present.

C. COMBINATION E.O. & M.O. CIRCUIT BREAKER

The combination manually and electrically operated circuit breaker includes both the motor-gear charging system as well as the manual charge handle.

NOTE

Manual charging handle must be in vertical position during electrical charging.

DRAW-OUT INTERLOCK

Integral parts of the circuit breaker mechanism include provisions to:

1. Rack the circuit breaker in or out of the cubicle compartment.
2. Interlocking to prevent racking a closed circuit breaker into or out of the connected position.
3. Interlocking to prevent closing a circuit breaker until it is fully racked to the connect position.
4. Interlocking to prevent withdrawing a circuit breaker from the cubicle while the closing springs are charged.

Trip Latch Engagement

SEE FIGURE 1.

Toggle latch (15) should engage the full width of trip latch (12) when the circuit breaker is closed in the normal manner. The tension on spring (15) can be increased if required by bending spring tab on trip flap towards the front of the circuit breaker. Too much tension will interfere with the capability of the tripping actuator to move the trip flap, so over-bending should be avoided.

RACKING MECHANISM

Refer to Figure 3, page 8. With the circuit breaker resting on the cubicle rail, the following sequence should be used to rack the circuit breaker into the cubicle.

1. Push trip bar in, open racking window and insert racking crank.

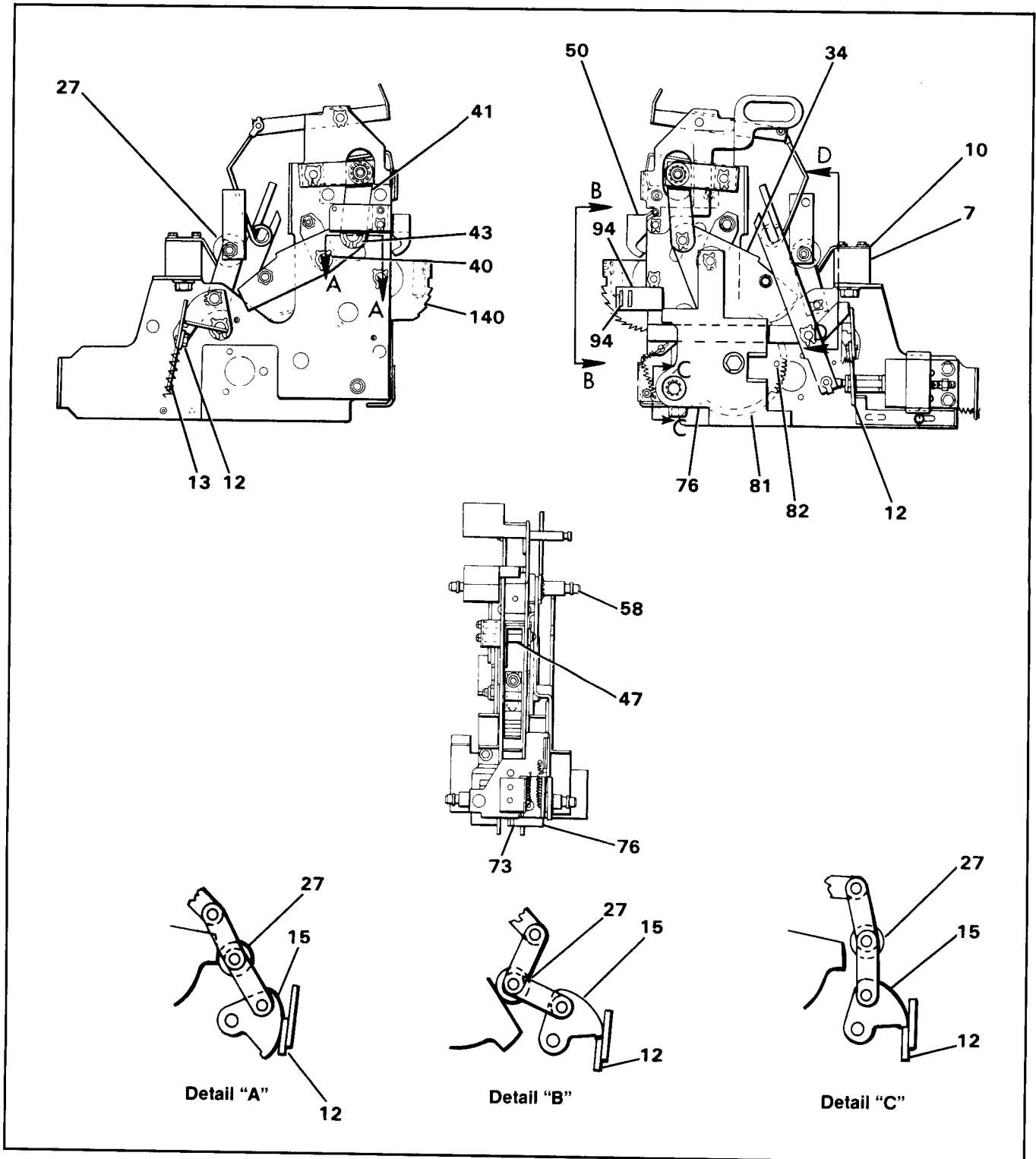


Figure 1. Circuit Breaker Outline

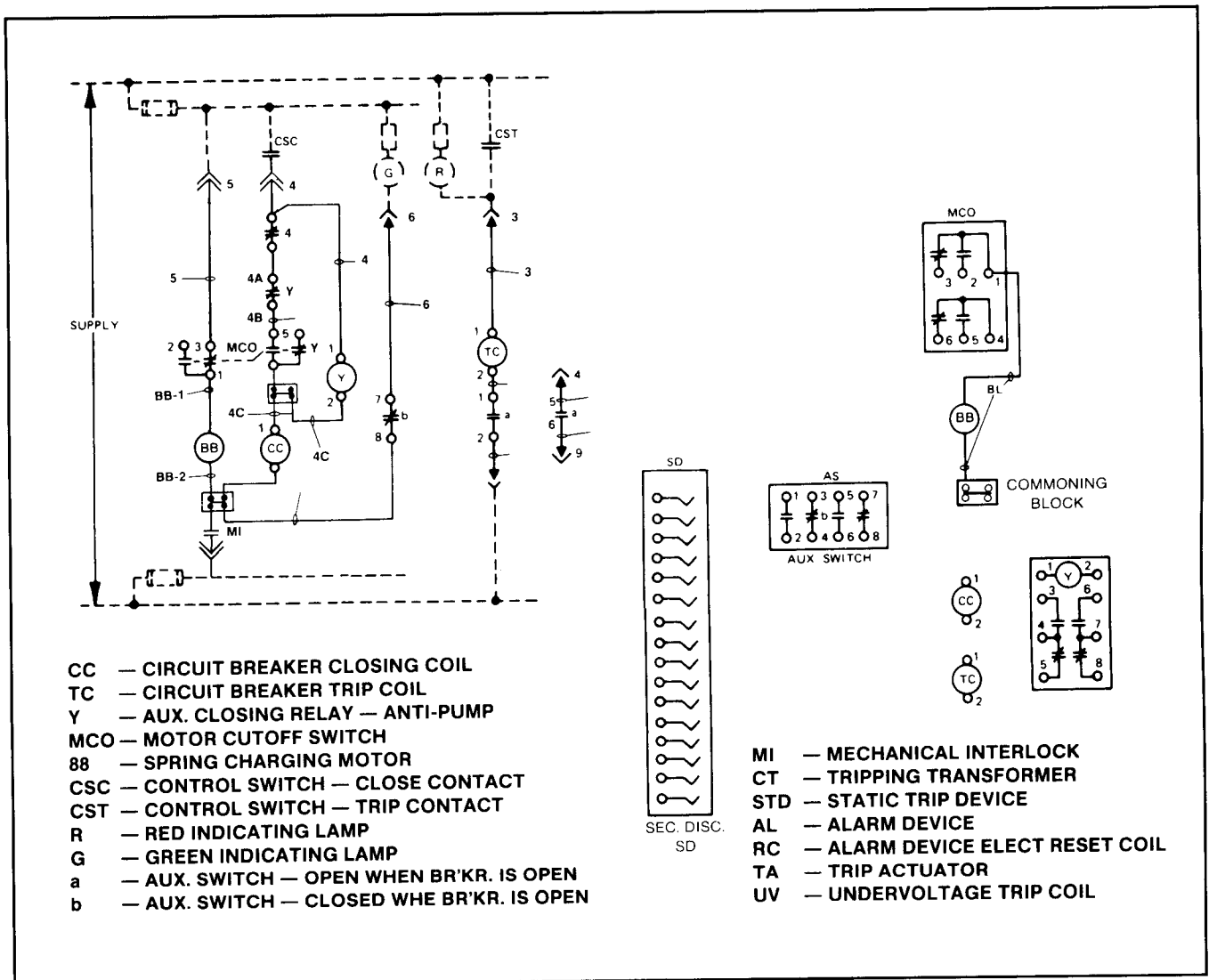


Figure 2. Typical Wiring Diagram — Electrically Operated Breakers

NOTE

Racking window cannot be opened unless manual trip bar is pressed in. While the trip bar is pressed in, the circuit breaker is in the TRIP-FREE position and cannot be closed.

2. With the racking crank, rotate the racking screw (105) counterclockwise until the racking shaft is in the disconnected position. The clevis can now engage the racking

pins in the cubicle. The circuit breaker should now be pushed along the rail into the DISCONNECTED position. Double check that the racking clevis does engage the pins in the cubicle.

3. Clockwise rotation of the racking screw will rack the breaker into the TEST position. At the TEST position, the racking window can be closed, allowing the trip bar to reset and the circuit breaker can be operated. Further racking will place the circuit breaker between the test and fully connected positions. Between positions, the interlock bar will not engage the position holes of the cubicle. The breaker will be held TRIP-FREE and cannot be closed.

In the CONNECTED position, the interlock will engage the cubicle hole and reset, allowing the circuit breaker to be closed. This prevents closing a circuit breaker which is not in the CONNECTED position.

4. To withdraw the breaker from the CONNECTED position, rotate the racking screw counterclockwise.
5. Before attempting to operate the circuit breaker, the position of the device should be checked with reference to the holes in the cubicle, to be certain that it is fully connected. Two stop nuts are provided on the racking screw to set the connected position. These are adjusted by setting the angle of the racking clevis, as shown in Figure 3, and by tightening the nuts against the stop washer (109), the two nuts (110) should then be locked against each other.

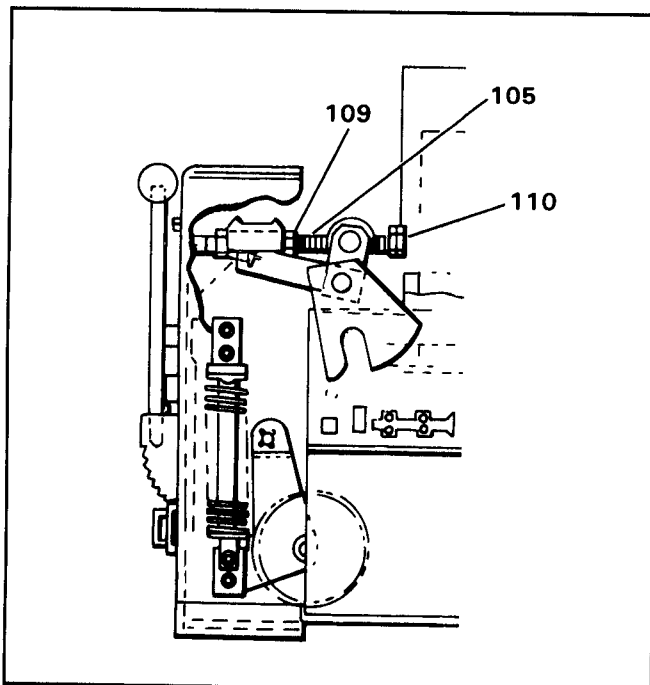
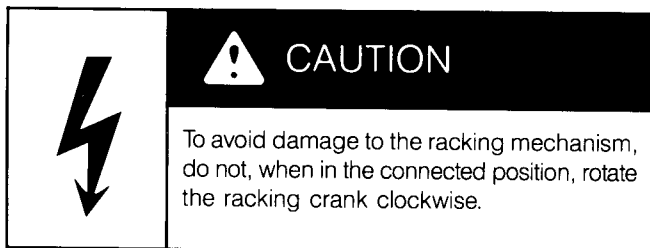
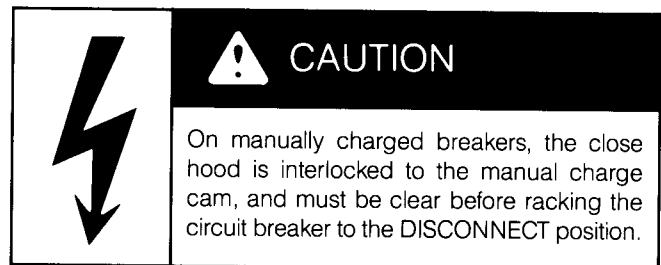


Figure 3. Detail of Typical Racking Mechanism and Drawout Interlock

SPRING DISCHARGE INTERLOCK

When racking the circuit breaker out to the DISCONNECTED position, the closing springs will automatically discharge, at or before reaching the disconnect position. The barrel nut engages the spring interlock. This, in turn, is connected to the manual close hood which releases the closing springs.



NOTE

Manual charge handle must be in the vertical position during racking. The racking mechanism must be returned to the TEST position before closing springs can be charged (either in the cubicle or when removed from the cubicle.)

Note also that the spring discharge interlock produces a TRIP-FREE operation in which all of the stored energy of the springs is dissipated in the mechanism. It is preferable to turn the motor power off in the TEST position, close and trip the circuit breaker normally in that position and then rack out in the normal manner.

Lifting Bar

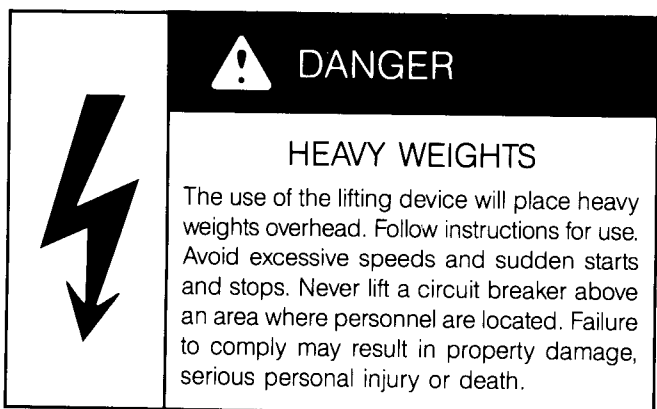


Figure 4 shows the standard lifting bar connection.

Handling Instructions



Place circuit breaker in front of unit and attach the lifting yoke.

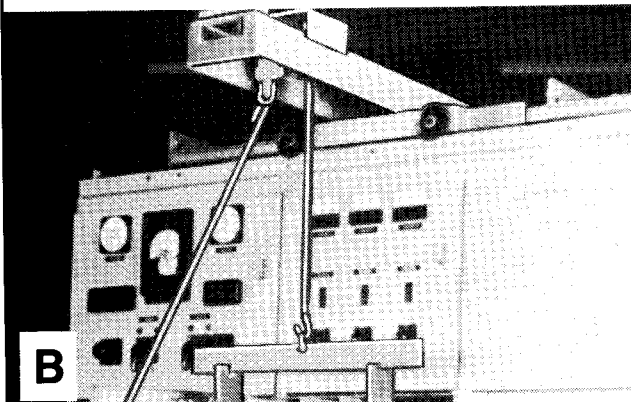
A



DANGER

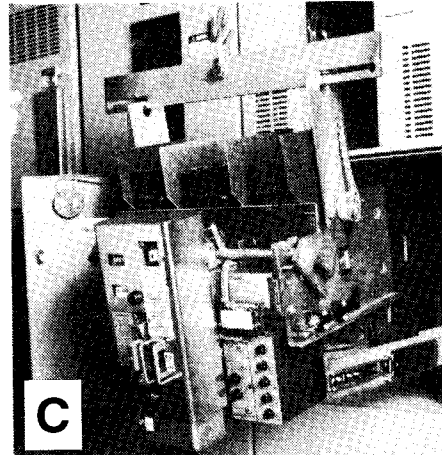
HEAVY WEIGHTS

The use of the lifting device will place heavy weights overhead. Avoid excessive speeds and sudden starts or stops. Never lift a circuit breaker in an area where personnel are located. Failure to comply may result in property damage, serious personal injury or death.



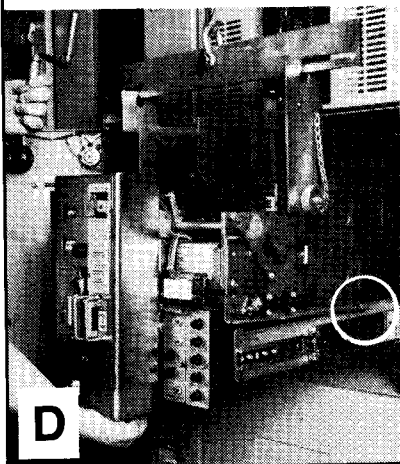
B

Attach crane cable yoke and insert crank into the crane eye.



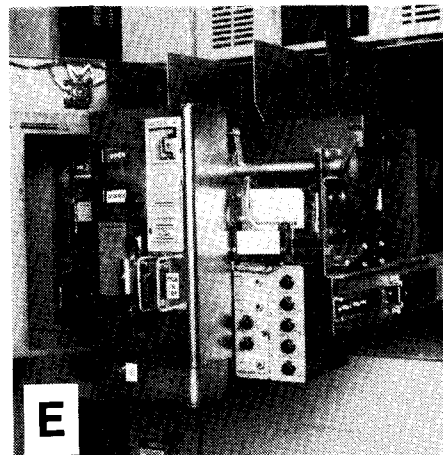
C

Raise breaker above compartment rails and fully extend rails.



D

Lower breaker onto rails. Important! The rear of the breaker must be tilted downward so that the breaker engages the notch on the right hand rail.



E

With breaker securely on rails, remove the lifting yoke. Breaker is now ready for inserting into compartment.

Figure 4. Handling Instructions

Maintenance Closing

NOTE

Holding the spring release latch down prevents the stored-energy springs from propping in the charged position. Thus, when the handle is slowly returned to the normal vertical position, the energy in the springs is slowly released against the closing handle assembly.

During inspection prior to installation, and for routine maintenance inspections, the circuit breaker contacts may be closed slowly to check clearances, contact adjustments, and movement of links and latches.

Electrically operated breakers do not have a manual charging handle, but it is available as a maintenance item. When the hold in the charging handle assembly is aligned with the holes in the operating mechanism frame, the pin which is attached to the cam is inserted. This pin holds the assembly in place and acts as a pivot point for the cam. After insertion of the maintenance closing handle assembly on the electrically operated breaker, the actual maintenance closing operations is the same for both the electrically operated and the manually operated circuit breaker. Refer to Table 3, Figure 5.

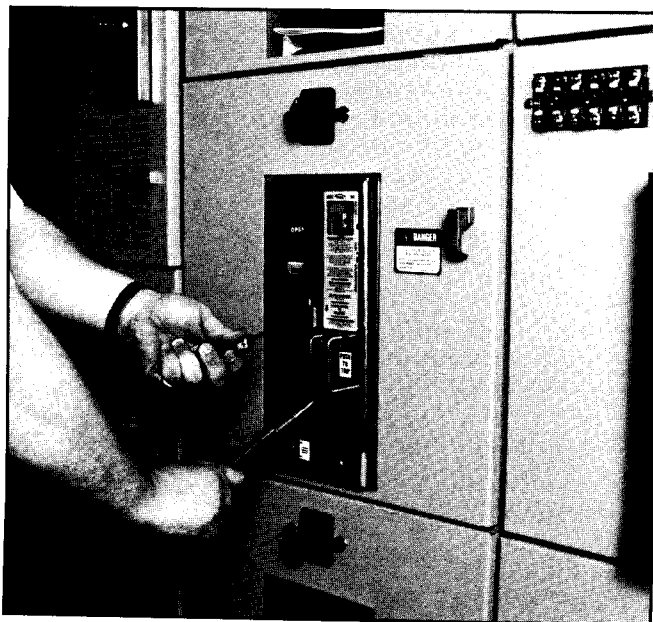


Figure 5. Maintenance Closing

Adjustments

During maintenance inspections, the following items should be checked to ensure that the original settings are maintained:

Table 3. Maintenance Closing

Operation	Procedure
Closing Contacts	<ol style="list-style-type: none"> 1. Verify that racking mechanisms is in TEST position. 2. Pull charging handle DOWN ALL THE WAY (approximately 120°). 3. Place blade of screwdriver between hood and spring release latch and hold it in DOWN position. 4. Slowly return handle to vertical position. Observe contact, touch, mechanical operation, etc.
Opening Contacts	Push in manual trip rod.

CAUTION

The procedure in Table 3 should be used for maintenance closing only. The circuit breaker must be outside of the cubicle during any maintenance close operation. Maintain a firm grip on the manual charging handle during the closing stroke — the circuit breaker may suddenly latch fully closed and apply unexpected force to the charging handle.

Main Contact Make

SEE FIGURE 6.

Compression of the contact fingers (46) must be between .093 " and .125 " (2.4-3.2mm). This is the difference in the 1) measurement from the breaker base to the tip of the finger contact surface when the breaker is open, 2) the measurement in the same place when the breaker is closed. This is checked with a normal closing operation — not maintenance closing. Adjustment is provided by positioning screws (78) after loosening nuts (80). Counterclockwise rotation of screws (78) increases compression. Care should be taken to retighten nuts (80) after adjustment. If it is desired to check contact pressure, a push-type spring scale can be used to compress contact fingers (46) with breaker open. Contact pressure should be between 20 and 30 pounds (9.1-13.6 kg) on each finger.

Arcing Contact Make

SEE FIGURE 6.

With the movable arcing contact (62) in any one phase touching the mating stationary contact when the circuit breaker is closed by the maintenance closing method (see Table 5), the phase-to-phase variation should not exceed .062 " (1.6 mm). Adjustment may be made by positioning screws (78) as in the previous paragraph. It is essential that the main contact compression be maintained within the tolerance listed in the previous paragraph. Arcing contact pressure should be between 30 and 40 pounds (13.6-18.2 kg) when checked with a pull-type spring scale at the base of the arcing contact tip insert with the circuit breaker contacts closed. Measure each blade separately.

Contact Replacement

SEE FIGURE 6.

The contact structure consists of main current carrying contacts and arcing contacts arranged so that initial contact make and final contact break is by means of the arcing contacts. The actual contact surfaces are clad with an alloy facing which greatly reduces mechanical wear and arc erosion.

When inspection of the alloy facing indicates that the contacts should be replaced, it should be noted that hinge contact fingers (53,55) main contact fingers (46) and arcing contacts (61) are spring loaded. Therefore, care must be used in removal and installation of any of the contacts.

Main Contact Fingers

SEE FIGURE 6.

With the circuit breaker contacts open and the stored energy springs discharged, the main contact fingers (46) may be removed by loosening screws (44,45) enough to relieve the compression on springs (47,48). There are two springs behind each finger. It is important that they be positioned properly upon reinstallation. If difficulty is experienced in correctly positioning these springs, the upper and lower primary disconnects (Parts Section Figure 2, Item 168), may be removed from each phase and the circuit breaker inverted to rest on the ends of connectors (37) and (49). After the contact fingers are replaced, connector (37) should be positioned in the center of the slot in the molded base to assure correct alignment of the primary disconnect fingers.

Stationary Arcing Contact

SEE FIGURE 6.

The stationary arcing contact (146) is a part of connector (37) and may be replaced by proceeding as above. In this case,

screws (44,45) must be removed. However, to provide clearance for removal of connector the backpanel (33) may have to be loosened by removing screws 58, 59 and 23 (Figure 2, Page 26). By removing pints (98 & 99 Figure 2, Page 26) the entire assembly can be lifted out.

Hinge Contact Fingers

SEE FIGURE 6.

Hinge contact fingers (53,55) may be removed as follows:



Remove backpanel. Remove lower connector (49) and moving contacts by removing screws (59). The springs (54,56) are unloaded by rotating the moving contacts toward a horizontal position relative to the stationary contact (49). Remove screws (70) to remove moving contacts. Slide fingers (53,55) sideways to remove. Replace fingers by compressing spring (56,54) in position and inserting the fingers from the side. Holding connector (49) in a vise aids the operation.

Movable Arcing And Main Contact

SEE FIGURE 6.

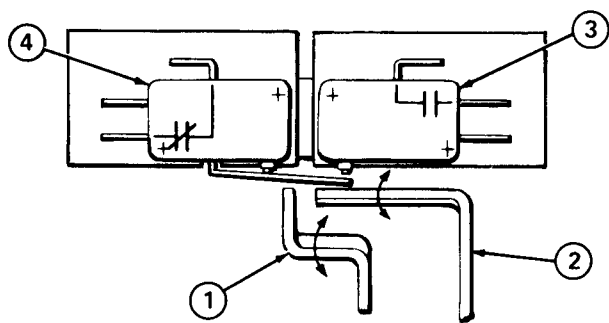
Either movable arcing contact (61), or main contact (62), or both, may be removed and replaced as follows:

Removing moving contacts as above. The complete movable contact assembly may now be brought to the bench. The location of spacers should be noted. Loosen nuts (80) and remove screws (78) from pin (71), alternate several turns each side to prevent binding.

	<div data-bbox="1023 1522 1485 1606"> CAUTION</div> <p data-bbox="1023 1617 1485 1753">Extreme care should be taken to hold the assembly firmly to retain spring guide (81,83) and spring (81,82) upon removal of the screws (78).</p>
---	--

The movable arcing contact or main contact may now be replaced. Compress spring (81,82) to engage screws (78). The reverse procedure is followed for reinstallation. Care should be taken to replace spacers correctly. Check alignment and adjustment of contacts upon reassembly.

Position 3. Springs Charged; Motor Stopped.



The springs have reached charged position. The motor/gear lever (2) has been retracted by roll pins on the large gear as the cam follower (82, Figure 1) on the large spur gear has disengaged from the wind and close cam (34, Figure 1). The motor cutoff switch (3) has opened, stopping the motor, and the closing coil switch (4) has closed. Upon application of power to the closing circuit the breaker will close. Switches then return to No. 1 position.

NOTE

In position 3 there is clearance between both levers and the switch actuating leaf. Clearance may be minimal (approx. 1/64) or up to 1/16 inch (0.4-1.6mm). It is important to completely remove pressure from the switch actuating leaf to be sure that the switches are free to actuate. Adjustment is made by carefully bending the levers as indicated by arrows (Items 1 and 2). Do not bend the switch actuating leaf.

**CAUTION**

If the motor cutoff switch (3) does not open, the motor will continue to run and the cam follower (82, Figure 1) will re-engage wind and close cam (34, Figure 1) jamming the entire mechanism, possibly stripping gears in the gear motor, blowing the control fuse, or damaging the motor. To free a jammed mechanism it is necessary to remove the gear motor.

**CAUTION**

The springs will discharge and the breaker close when the gear motor pinion is disengaged from the spur gear.

Use the manual charging mechanism or the maintenance closing device to prevent this from happening. Move the manual handle towards the charge position, applying force to the closing springs, and allow the ratchet on the charging cam to support load while the motor is removed. This prevents the closing springs from discharging when the motor is removed.

Current Limiting Fuses

Current limiting (C.L.) fuses are used to increase the interruption capacity beyond that of the breaker alone or to limit the fault "let-thru" current down stream of their installation. The C.L. fuses used with the RL series of circuit breakers are special purpose fuses having NEMA Class "J" or Class "L" characteristics with a 200,000 Amps RMS Symmetrical interrupting capacity.



When fuse replacement is required, only use fuses per Siemens drawing 71-142-200 with the same ratings as supplied with the circuit breaker. Different fuses may not properly mount on the breaker and may have different protective characteristics.

The current limiting fuses for the larger frame sizes, RLF-3200 and RLF-4000 mount on a separate fuse drawn-out assembly, covered in detail in instruction book SG-3078.

On the circuit breakers supplied with a separate fuse carriage the trigger fuses are mounted on the fuse carriage, and are used for visual identification of the faulted phase. Tripping of the breaker is accomplished through a power supply connected across the main fuses of the fuse carriage, the voltage from this supply is applied through the secondary control wiring to the coil of a solenoid mounted open fuse trip device on the circuit breaker. The plunger of the solenoid operates arm (6). The balance of the operation is the same as for the trigger fuse operated device.

The circuit breaker will remain trip free (cannot be closed) until the trigger fuse has been replaced and the associated trip mechanism reset lever (3), has been manually reset (pushed up).

Open Fuse Trip Device



	 DANGER
	HAZARDOUS VOLTAGE Do not remove trigger fuse cover when circuit breaker is in CONNECT position. Line voltage may be available inside trigger fuse assembly. Failure to observe these precautions could result in property damage, electrical shock, burns, serious personal injury or death.

The Open Fuse Trip mechanism has three functions. First, to trip the circuit breaker mechanically when a C.L. fuse has interrupted.

Second, to indicate which phase C.L. fuse has interrupted. The plunger on top of the trigger fuse (12), indicates visually which phase C.L. fuse has interrupted.



Third, to retain the breaker in the trip-free position until the trigger fuse is replaced.

Each trigger fuse is wired in parallel with one of the C.L. fuses. When the C.L. fuse interrupts, its associated trigger fuse also opens and releases a plunger which releases a precompressed spring contained in the trigger fuse housing. On the small breakers, this plunger operates arm (6) which moves the latch (11), releasing the spring-loaded lever (3). This engages circuit breaker trip flap link (7). This trips the circuit breaker and holds the circuit breaker in the mechanical trip-free position.

	 CAUTION
	Do not remove trigger fuse cover when breaker is in connected position. Line voltage may be available inside the trigger fuse assembly.

To remove the trigger fuse, remove screws (15) remove plastic cover (5) then the trigger fuse.

To insert the trigger fuse, reverse the above procedure.

	 CAUTION
	The trigger fuse (13) must be inserted with the plunger facing arm (6). The gap dimension of 0.03" (0.8 mm) maximum must be maintained for each fuse. Be sure to replace both the trigger fuse and its corresponding C.L. fuse before the breaker is reset.

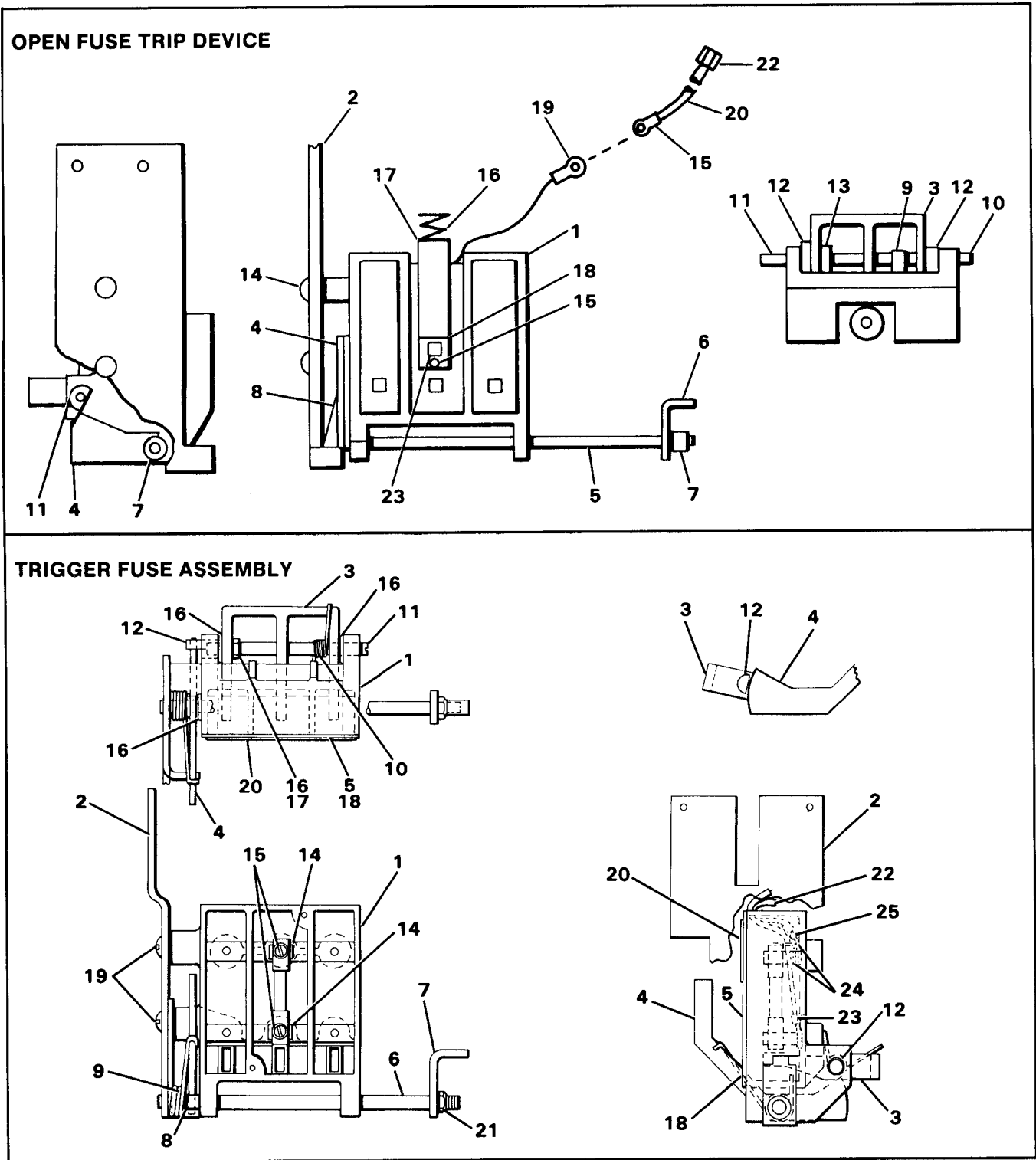


Figure 7. Open Fuse Trip Device, Trigger Fuse Assembly

Operation Counter

This option consists of a mechanically operated counter with a bracket that mounts at the bottom of the breaker mounted auxiliary switch. The counter arm connects through a spring to the switch operating arm. The counter is non-resettable. The breaker must have an auxiliary switch for this option to mount.

Maintenance Closing Device

This device is a manual charging handle assembly arranged for use as a maintenance tool. The charge link is spring loaded and retained to make insertion into the breaker frame less difficult and the pivot pin is retained by a chain. After charging the closing springs, the handle must be manually returned to the vertical position to allow closing the breaker.

Electrically Operated Interlock

These devices amount to an additional solenoid that must be energized before the breaker can be closed. When the device is de-energized the breaker is held trip-free so that it cannot be closed either electrically or manually. The devices are available for 48, 125 and 250 volt D.C. as well as for 120 and 240 volt A.C. They are similar in construction and mount in the same location as the undervoltage trip device. The electrical interlock has a mechanical link from the device to the main shaft of the breaker to hold the device in the picked-up position when the breaker is closed. Once closed the device can be de-energized without tripping the breaker. There are no adjustments for pick-up or drop-out voltages of the device. The devices are designed to be energized continuously.

Undervoltage Trip Device Option

This device automatically trips the circuit breaker on loss of voltage. Either instantaneous or time-delay operation can be supplied. A .06 inches (1.5 mm) gap should be maintained between flap extension and pull link when the device is energized with the pick-up and drop-out is set so that the device picks up at a voltage of 85% or less and drops out between 30 and 60% of rated value.

NOTE

Pick-up and drop-out are individually adjustable. Time delay is adjustable from .04 to 4 sec.

Latch Check Switch

This option is a small switch mounted on a bracket. The switch operator is adjusted so the switch is operated by and indicates the position of the breaker trip flap. The latch check switch may be used in conjunction with the electrical interlock or undervoltage devices to delay the application of voltage to the close coil until the undervoltage or interlock device has picked-up.

Static Trip II

The Static Trip II device mounts onto a slide-type bracket on the circuit breaker. To remove trip device, the terminal block cover located above it should be removed, exposing the terminal block screws. The lower row of screws can be loosened with a screwdriver allowing the terminal block fanning strip to be removed from the terminal block. Removal of the fanning strip exposes a mounting screw. This screw can be removed, allowing the static trip device to be removed from the circuit breaker. Just pull the trip device towards the front of the circuit breaker. See Instruction Book SG-3098 for operating instructions.

Bell Alarm Switch Option

This unit functions to operate a switch. A single-pole double-throw, or a double-pole double-throw switch is available. The switch operator is connected to and operated by the tripping actuator. The switch operator remains tripped even when the actuator is reset by the circuit breaker. The switch operator must be reset either manually or by an additional optional electrical reset solenoid.

The contacts of the bell alarm switch can be connected in series with the circuit breaker closing coil, to provide a lockout feature to prevent reclosing after a fault.

Circuit Breaker Lubricating Instructions

Periodic inspections of each circuit breaker is recommended at least once a year.

Always inspect a breaker which has interrupted a heavy fault current.

More frequent inspections are recommended, if severe load conditions, dust, moisture, or other unfavorable conditions exist.

Lubrication Key	Parts Description	Suggested Lubrication At Every * Operations or Every Six Months	Lubrication (Requires Disassembly) Recommended Every 5 Years or Any Complete Overhaul
A	Contact Arm Hinge Assembly. Primary disconnect fingers, grounding contact. Secondary disconnect fingers.	Wipe clean and apply a film of Siemens contact lubricant 15-171-370-002 in layer 1/32 " thick.	
B	Sliding surfaces.	Light application of *Molycote 557*.	Wipe clean and apply *Molycote 557* liberally.
C	Pivot pins, rotating parts such as drive pinion, gear.	Light application of *Molycote Penelube* 15-171-270-002.	Remove pins, clean and apply *Beacon P-290* 00-337-131-001.
D	Ground surfaces such as latches, rollers, props, etc.	Wipe clean and spray with *Molycote 557* 15-171-270-001.	Wash clean and spray with *Molycote 557* 15-171-270-001.
E	Arcing contacts.	Do not lubricate.	Do not lubricate.
F	Springs	Wipe clean and spray with *Molycote 557* 15-171-270-001.	Wipe clean and spray with *Molycote 557* 15-171-270-001.
G	Dry pivot points.	No lubrication required.	No lubrication required.

Figure 8. Lubrication Chart

*Lubrication should be checked and renewed as follows:

RL-800, RLX-800, RLH-800 operations between lubrications 1750.

RL-1600, RLX1600 operations between lubrications 500.

RL-2000, operations between lubrications 500.

RL-2400 operations between lubrications 500.

RL-3200 operations between lubrications 250.

RL-4000 operations between lubrications 250.

NOTE

For breakers installed in areas where corrosion may develop on current carrying parts refer to Maintenance Guide SG-3388.

During an inspection the breaker should be checked for proper operation, adjustment and lubrication. Adjustment procedures are described in the instruction book. Recommended lubrication points are shown in adjacent chart.

The lubrication chart outlines two methods of lubrication. The first method requires no disassembly and is suggested for the

prevention of problems which could be created by severe environmental or operating conditions.

The second method follows a procedure similar to that performed on the breaker at the factory and should be used only in case of a general overhaul or disassembly.

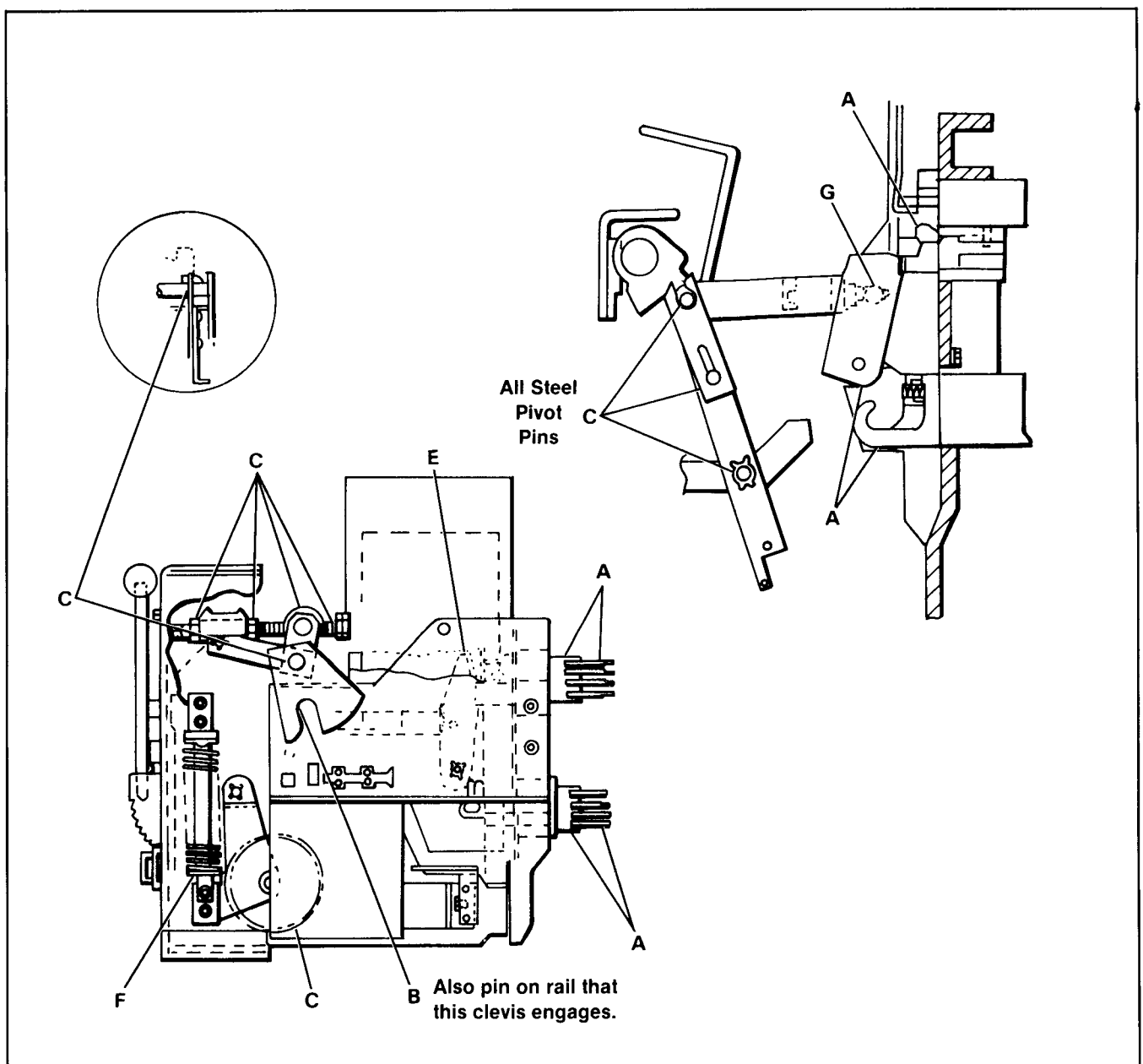


Figure 9. Lubrication Points On Breaker

How To Use Your
Parts Ordering Guide

1. Locate part or parts to be replaced in one of the drawings in this manual.

2. Identify each part by item number, description and part number. Give drawing figure number in which part is shown.

3. Include breaker type, rating and breaker serial number with your order.
4. Place order with you Siemens representative.

5. When ordering relays or other electrical parts, include control voltage (see recommended spare parts list for part numbers.)

Ordering Example

Type	RL-3200	Rated Amps.	3200	Serial Number	S-8888A-2
Mode of Operation:	Electrical	Manual			
Instruction Manual	SG-3068				
	<u>Fig.</u>	<u>Item</u>	<u>Description</u>	<u>Part Number</u>	
	1	6	Apron	18-732-791-504	
	7	147	Pushrod	18-657-781-264	
	11	7	Bearing	71-141-995-001	

- IF REQUIRED PART IS NOT IDENTIFIED IN THIS MANUAL—

1. Make a copy of the drawing figure in which the part would appear.

2. Indicate with arrows or other markings location of part.
3. Describe or sketch required part.

4. Include breaker type, rating and breaker serial number with your order.

5. Place order with your Siemens representative.

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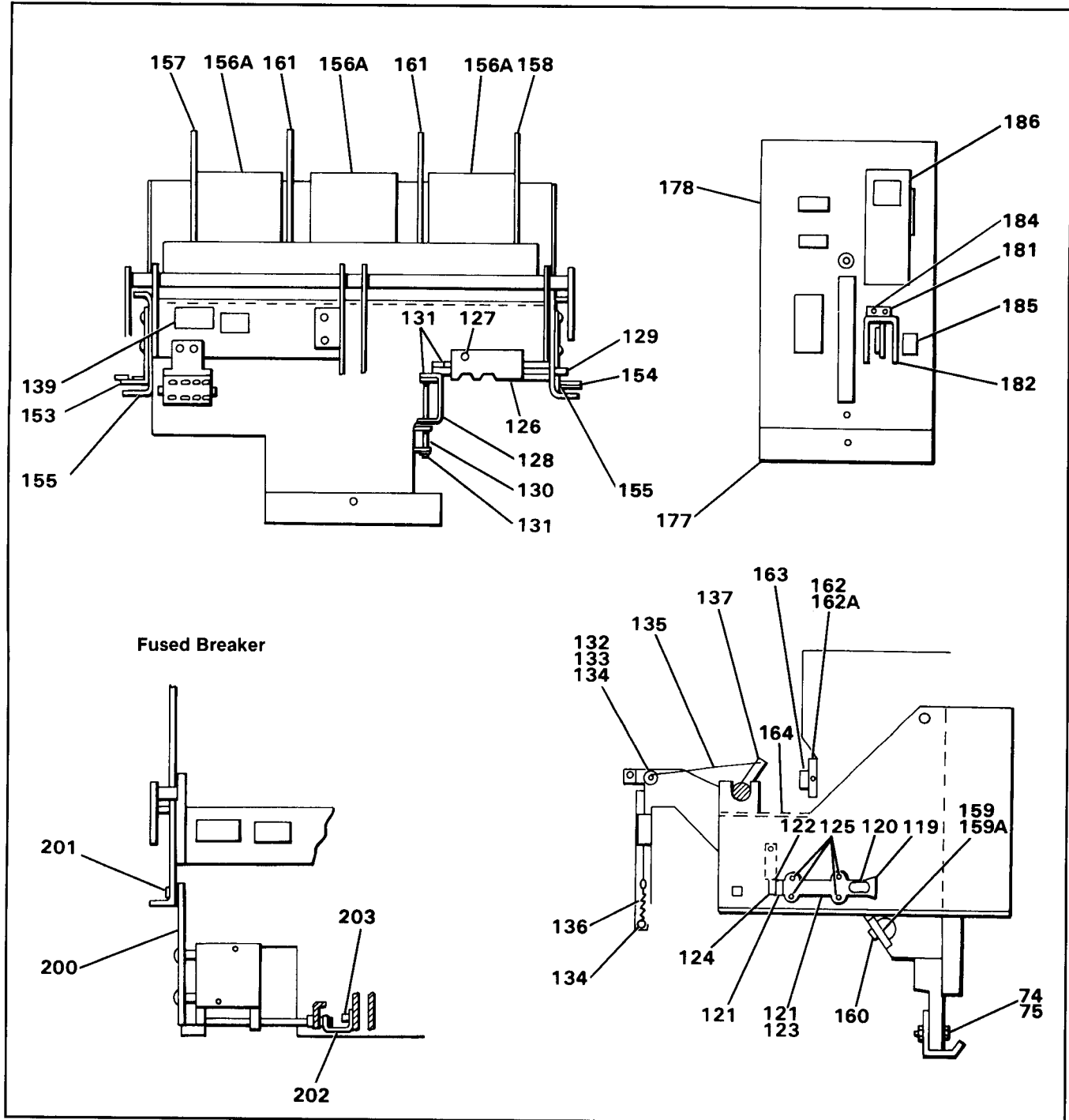


Figure 1.

Refer to Figure 1.

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
74	Pin Cover Spacer	18-657-765-368	RL-800	158A	Phase Barrier	18-398-937-004	RL-3200 & RL-4000
74A	Screw	00-611-315-434	RL-3200 & RL-4000	159	Barrier	18-657-941-110	RL-800, RLX-800 & RL-1600
75	Spacer (.15)	18-727-838-005	RLX-800 Thru RL-2000	159A	Barrier	18-657-941-109	RLX-1600, RL-2000
75A	Nut	15-171-063-017	RL-3200 & RL-4000	159B	Barrier	18-657-962-124	RL-3200
119	PTO Support	18-732-790-004		159C	Barrier	18-657-962-123	RL-4000
120	PTO Shaft	18-732-790-005		160	Plastic Rivet	00-671-501-070	
121	Bearing	71-141-995-001		161	Barrier	18-657-941-108	
122	PTO Arm Assy.	18-733-500-518		161A	Barrier	18-657-962-122	RL-3200 & RL-4000
123	Rollpin	00-671-173-906		162	Support	18-732-790-052	RL-800
124	Cotter Pin	00-671-195-117		162A	Support	18-732-790-055	RLX-800, RLH-800, RL-1600
125	Screw	15-171-399-049		162C	Support	18-732-790-056	RLX-1600, RL-2000
126	Bracket	18-398-936-001		162D	Support	18-734-617-002	RL-3200
127	Screw	00-615-663-373		162E	Support	18-734-617-001	RL-4000
128	Interlock Assy.	18-657-935-557		163	Clip	18-657-962-343	
129	Interlock Bar	18-733-482-001		163A	Knob	18-657-961-385	RL-3200, RL-4000
129A	Interlock Bar	18-732-482-002	RL-3200 & RL-4000	164	Screw	15-171-399-010	
130	Pin	18-657-940-184		167	Grommet	15-171-890-001	
131	X Washer	00-659-055-156		168	Primary Disc	71-240-055-509	RL-800
132	Pulley	18-658-024-023		168A	Primary Disc	18-734-618-501	RLX-800 Thru RL-2000
134	Screw	15-171-399-008		168B	Primary Disc	18-733-481-501	RL-3200
135	Cable Assy.	18-732-791-549		168C	Primary Disc	18-733-481-502	RL-4000
136	Spring	71-142-049-001		169	Screw	00-615-114-373	RL-3200 & RL-4000
137	Screw	15-171-074-010		170	Lk. Washer	00-655-017-026	RL-3200 & RL-4000
139	Label	71-141-867-001		172	Cover Filler	18-657-942-095	E.O. Models Only
140A	Closing Spring	18-399-526-502	RL-800	173	Man. Chg. Handle	18-732-791-541	Manual Chg. Only
140B	Closing Spring	18-399-526-503	RLX-800, RLH-800, RL-1600	173A	Man. Chg. Handle	18-732-791-542	Manual Chg. Only RL-3200 & RL-4000
140C	Closing Spring	18-726-870-501	RLX-1600, RL-2000	174	Set Screw	00-617-031-367	Manual Chg. Only
143	X Washer	15-171-399-035	RL-4000 & RL-3200	177	Bottom Cover	18-729-792-501	
144	Ground Strap	18-657-916-579	RL-3200 & RL-4000	177A	Bottom Cover	18-729-792-502	RL-3200 & RL-4000
145	Screw	15-171-399-010	Omitted on Stationary	178	Cover	18-398-288-011	
146	Nut	00-633-059-210	Omitted on Stationary	178A	Cover	18-398-288-012	RL-4000 & RL3200
147	Barrier Sups.	18-657-963-214	RLX-1600 Thru RL-4000	179	Bumper	15-171-399-007	
148	Barrier	18-734-619-001	RLX-1600, RL-2000	180	Screw	15-171-399-010	
148A	Barrier	18-734-619-002	RL-3200	181	Clip	18-657-854-175	
148B	Barrier	18-734-619-003	RL-4000	182	Guard	18-729-785-001	
149	Screw	15-171-074-010	RLX-1600 Thru RL-4000	184	Screw	00-615-641-901	
150	Lk. Washer	00-655-067-060	RLX-1600 Thru RL-4000	185	Label	18-657-838-287	
153	Detent Assy. LH	18-732-791-551		186	Label	18-657-940-180	
154	Detent Assy. RH	18-732-791-550		200	Open Fuse Tip	18-399-796-501	
155	Spring	18-657-434-169		200A	Open Fuse Tip	18-399-805-501	RL-3200 & RL-4000
156	Arc Chute	18-728-500-591	RL-800	201A	Screw	15-171-399-010	Fused Versions
156A	Arc Chute	18-732-792-501	RLX-800, RLH-800, RL-1600	202A	Bracket	18-657-961-338	Fused Versions RL-3200 & RL-4000
156B	Arc Chute	18-398-789-503	RLX-1600, RL-2000	203A	Screw	15-171-399-010	Fused Versions RL-3200 & RL-4000
156C	Arc Chute	18-398-789-501	RL-3200	220	Bracket	18-734-436-001	Stationary, Not on RL-3200 & RL-4000
156D	Arc Chute	18-398-789-502	RL-4000	221	Screw	15-615-024-005	Stationary, Not on RL-3200 & RL-4000
157	Phase Barrier	18-398-937-001					
157A	Phase Barrier	18-398-937-003	RL-3200 & RL-4000				
158	Phase Barrier	18-398-937-002					

Parts

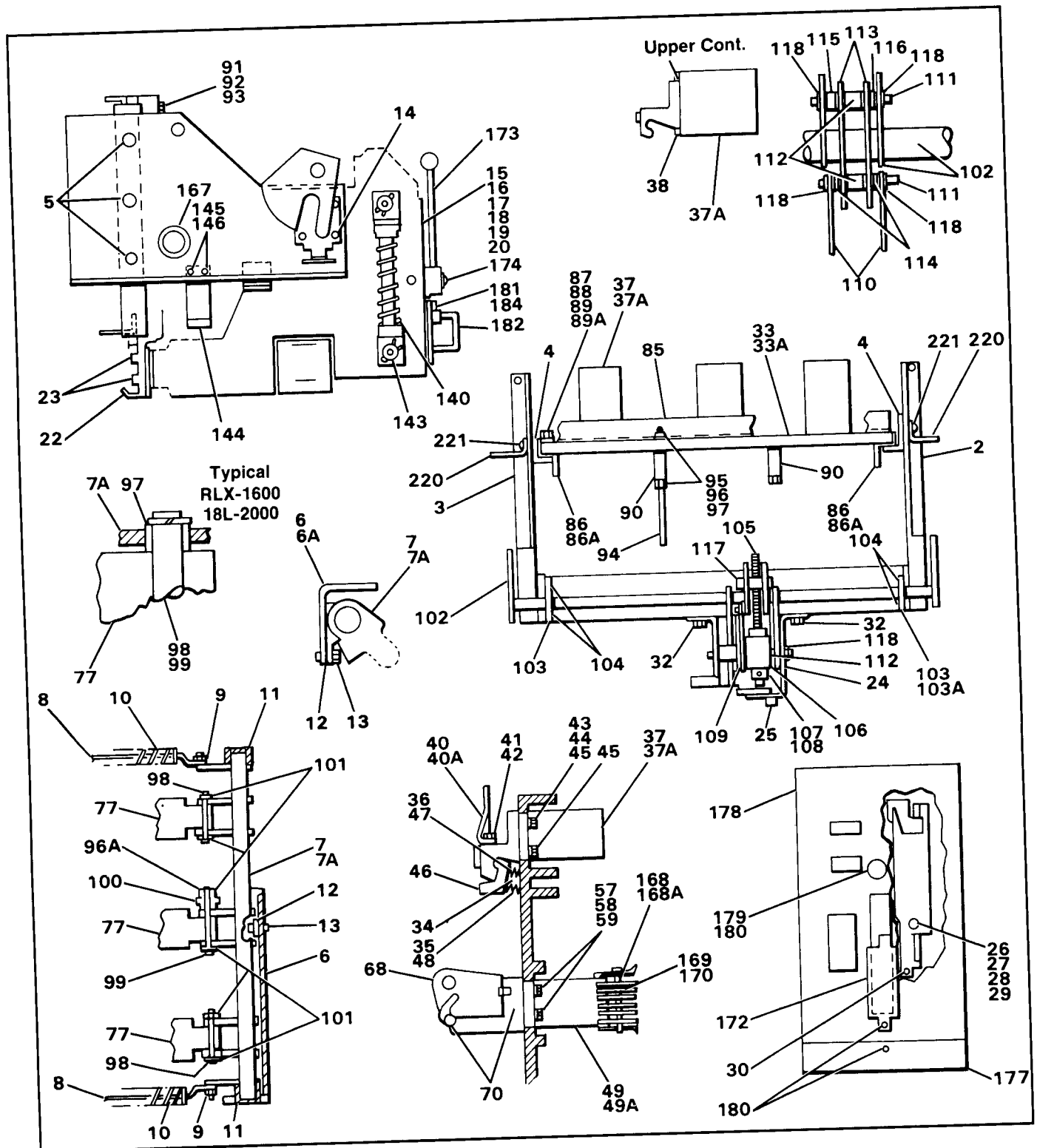


Figure 2.

Refer To Figure 2.

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
2	RH Sideplate	18-398-288-001		37N	Upper Cont. Assy.	18-732-791-537	RLX-1600, RL-2000 Stationary
3	LH Sideplate	18-398-288-002		37O	Upper Cont. Assy.	18-398-289-501	RL-3200
4	Angle	18-657-937-254	RL-3200 & RL-4000	37P	Upper Cont. Assy.	18-398-289-502	RL-4000
5	Screw	15-615-024-006	Draw-out Only	38	Plastic Button	18-657-854-172	RL-4000
6	Apron	18-732-791-504	RL-800, RLX-800 & RL-1600	40	Arc Runner	71-141-983-001	RL-800 All Models
6A	Apron	18-731-791-521	RLX-1600 & RL-2000	40A	Arc Runner	71-142-053-001	RLX-800, RLH-800, RL-1600
6B	Apron	18-732-791-505	RL-3200 & RL-4000	40B	Arc Runner	18-657-939-202	RLX-1600, RL-2000
7	Shaft	18-732-791-503	RL-800, RLX-800 & RL-1600	40C	Arc Runner	18-727-730-001	RL-3200
7A	Shaft	18-732-791-508	RLX-1600 & RL-2000	40D	Arc Runner	18-657-840-384	RL-4000
7B	Shaft	18-732-791-509	RL-3200	41	Screw	00-615-124-216	
7C	Shaft	18-732-791-510	RL-4000	42	Lk. Washer	00-655-017-022	
8	Spring Guide	18-732-790-008		43	Brace	18-657-941-293	RL-800
9	X Washer	00-659-055-156		43A	Brace	18-657-941-299	RLX-800, RLH-800, RL-1600
10	Spring	71-141-799-001		43B	Washer	00-651-027-170	RL-4000 & RL-3200
10A	Spring	71-142-123-001	(2)RL-3200 & RL-4000	44	Screw	15-171-399-048	RL-800, RLX-800 & RL-1600
11	Bearing	15-171-399-002		44A	Lk. Washer	00-655-017-030	RL-4000 & RL-3200
12	Bearing Block	18-657-768-050	RL-800, RLX-800 & RL-1600	45	Screw	15-171-399-011	
13	Screw	00-615-663-373	RL-800, RLX-800 & RL-1600	45A	Screw	00-611-315-426	RL-4000 & RL-3200
14	Screw	15-615-024-007		46	Contact Assy.	18-727-833-501	
15-20	Operator	See Sep. Listing		47	Spring	71-141-173-001	
22	Support	18-732-790-036	RL-3200 & RL-4000	48	Spring	71-141-976-001	
23	Screw	00-615-663-373		49	Lower Cont. Assy.	18-732-789-501	RL-800
24	Support	18-398-288-003		49A	Lower Cont. Assy.	18-732-789-502	RLX-800, RLH-800, RL-1600
25	Shutter	18-732-790-029		49B	Lower Cont. Assy.	18-732-791-516	RLX-1600, RL-2000 Left
26	Screw	15-171-399-025		49C	Lower Cont. Assy.	18-732-791-517	RLX-1600, RL-2000 Center
27	Pushnut	15-171-399-026		49D	Lower Cont. Assy.	18-732-791-518	RLX-1600, RL-2000 Right
28	Permanut	15-171-035-001		49E	Lower Cont. Assy.	18-734-437-501	RL-800 Stationary
29	Nut	00-633-059-210		49F	Lower Const. Assy.	18-734-443-501	RLX-800, RLH-800, RL-1600 Stationary
30	Screw	00-615-345-214		49G	Lower Cont. Assy.	18-732-791-538	RLX-1600, RL-2000 Stationary
31	Screw	00-615-663-373	RL-800, RLX-800 & RL-1600	49H	Lower Const. Assy.	18-732-791-539	RLX-1600, RL-2000 Stationary
32	Screw	15-171-399-052	RLX-1600 Thru RL-4000	49I	Lower Cont. Assy.	18-732-791-540	RLX-1600, RL-2000 Stationary
33	Back Panel	18-551-364-001	RL-800	49J	Lower Cont. Assy.	18-732-791-519	RL-3200
33A	Back Panel	18-551-364-002	RLX-800, RLH-800, RL-1600	49K	Lower Cont. Assy.	18-732-791-520	RL-4000
33B	Back Panel	18-551-364-003	RLX-1600, RL-2000	52	Spring Seat	18-657-938-303	RL-800
33C	Back Panel	18-398-288-006	RL-3200	52A	Spring Seat	18-657-938-304	RLX-800, RLH-800, RL-1600
33D	Back Panel	18-398-277-007	RL-4000	52B	Spring Seat	18-657-938-305	RLX-1600, RL-2000
34	Roll Pin	00-671-177-321	RL-3200 & RL-4000	52C	Spring Seat	18-657-822-171	RL-3200
35	Roll Pin	00-671-177-313	RL-3200 & RL-4000	52D	Spring Seat	18-657-854-166	RL-4000
36	Rivet	00-671-251-085	RL-3200 & RL-4000	53	Contact .531	18-727-825-002	
37	Upper Cont. Assy.	18-732-788-501	RL-800	54	Spring	71-141-173-001	
37A	Upper Cont. Assy.	18-732-788-502	RLX-800, RLH-800, RL-1600	55	Contact .38	18-727-825-001	
37B	Upper Cont. Assy.	18-732-791-511	RLX-1600, RL-2000 Left	56	Spring	71-141-976-001	
37C	Upper Cont. Assy.	18-732-791-512	RLX-1600, RL-2000 Center	57	Washer	00-651-027-170	RL-3200 & RL-4000
37D	Upper Cont. Assy.	18-732-791-513	RLX-1600, RL-2000 Right	58	Lk. Washer	00-655-017-030	RL-3200 & RL-4000
37E	Upper Cont. Assy.	18-733-742-501	RLF-800	59	Screw	15-171-399-011	
37F	Upper Cont. Assy.	18-733-742-502	RLF-1600	59A	Screw	00-611-315-426	RL-3200 & RL-4000
37G	Upper Cont. Assy.	18-732-791-526	RLF-2000 Left	60	Pin	18-727-750-005	RL-800
37H	Upper Cont. Assy.	18-732-791-527	RLF-2000 Center	60A	Pin	18-727-750-001	RLX-800, RLH-800, RL-1600
37I	Upper Cont. Assy.	18-732-791-528	RLF-2000 Right	60B	Pin	18-727-750-006	RLX-1600, RL-2000
37J	Upper Cont. Assy.	18-734-434-501	RL-800 Stationary	60C	Pin	18-727-750-002	RL-3200
37K	Upper Cont. Assy.	18-734-435-501	RLX-800, RLH-800, RL-1600 Stationary	60D	Pin	18-727-750-003	RL-4000
37L	Upper Cont. Assy.	18-732-791-535	RLX-1600, RL-2000 Stationary				
37M	Upper Cont. Assy.	18-732-791-536	RLX-1600, RL-2000 Stationary				

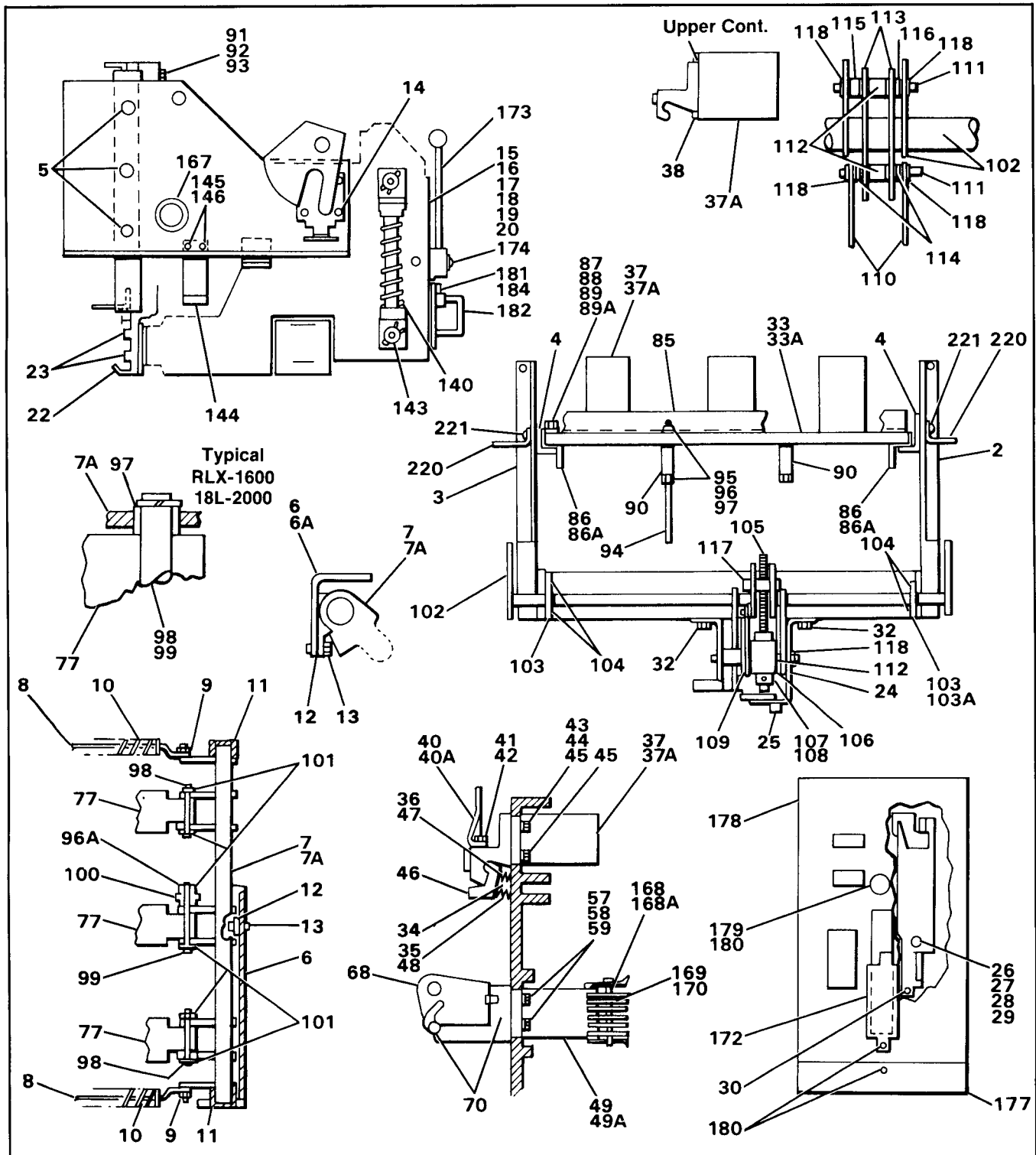


Figure 2. Continued

Refer To Figure 2.

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
68	Support	18-657-937-261		103	Retainer	15-171-399-012	RL-800 thru RL-1600
68A	Support	18-657-940-150	RL-3200 & RL-4000	103A	Retainer	18-657-822-197	
69	X Washer	15-171-399-035		104	Screw	99-615-663-373	
70	Screw	00-615-663-373		105	Racking Screw	18-727-842-503	
71	Pin	18-657-922-147	RL-800, RLX-800 & RL-1600	105A	Racking Screw	18-727-842-504	RL-3200
71A	Pin	18-657-937-278	RLX-1600 & RL-2000	106	Block	18-657-823-359	
71B	Pin	18-657-937-279	RL-3200	107	Collar	72-140-028-002	
71C	Pin	18-657-937-280	RL-4000	108	Rollpin	00-671-185-901	
72	Washer	18-657-941-295		109	Washer	00-651-007-902	
73	Spacer (.18)	18-727-838-001		109A	Washer	00-651-007-214	RL-3200, RL-4000
74	Pin Cover Spacer	18-657-765-368	RL-800	110	Nut	00-631-177-108	
74A	Screw	00-611-315-434	RL-3200 & RL-4000	110A	Link	18-657-942-092	RL-3200 & RL-4000
75	Spacer (.15)	18-727-838-005	RLX-800 Thru RL-2000	111	Spacer	18-657-823-356	
75A	Nut	15-171-063-017	RL-3200 & RL-4000	111A	Pin	18-724-501-012	RL-3200 & RL-4000
76	X Washer	00-659-055-250	RLX-1600 Thru RX-4000	112	Spacer	18-731-274-002	
77	Pushrod	18-398-288-009	RL-800, RLX-800 & RL-1600	112A	Spacer	18-724-503-004	RL-3200 & RL-4000
77A	Pushrod	18-657-954-580	RLX-1600 & RL-2000	113	L-Link	18-657-941-297	RL-3200 & RL-4000
77B	Pushrod	18-398-288-008	RL-3200 & RL-4000	114	Spacer	18-724-503-005	RL-3200 & RL-4000
78	Screw (Spec.)	18-657-937-268		115	Spacer	18-731-274-001	RL-3200 & RL-4000
79	Washer	00-651-007-910		116	Spacer	18-731-274-002	RL-3200 & RL-4000
79A	Washer	00-651-027-170	RL-4000	117	Barrell Nut	18-657-962-344	
80	Nut	00-631-143-205		118	X Washer	00-659-055-250	
81	Spring	71-142-123-001		140A	Closing Spring	18-399-526-502	RL-800
81A	Spring	18-657-823-358	RL-3200 & RL-4000	140B	Closing Spring	18-399-526-503	RLX-800, RLH-800, RL-1600
82	Spring	71-142-139-001					RLX-1600, RL-2000
82A	Spring	71-141-799-001	RL-3200 & RL-4000	140C	Closing Spring	18-726-870-501	RL-4000 & RL-3200
83	Spring Seat	18-657-940-290	RL-800	143	X Washer	15-171-399-035	RL-3200 & RL-4000
83A	Spring Seat	18-657-939-170	RLX-800 Thru RL-2000	144	Ground Strap	18-657-916-579	Omitted on Stationary
83B	Spring Seat	18-657-822-184	RL-3200 & RL-4000	145	Screw	15-171-399-010	Omitted on Stationary
84	Spring Seat	18-657-822-196	RL-3200 & RL-4000	146	Nut	00-633-059-210	Omitted on Stationary
85	Angle	18-657-937-255	RL-3200 & RL-4000	167	Grommet	15-171-890-001	
86	Angle Plastic	18-657-941-294	RL-3200	168	Primary Disc.	71-240-055-509	RL-800
86A	Angle Plastic	18-657-941-062	RL-4000	168A	Primary Disc.	18-734-618-501	RLX-800 Thru RL-2000
87	Washer	00-651-027-170	RL-3200 & RL-4000	168B	Primary Disc.	18-733-481-501	RL-3200
88	Lk. Washer	00-655-017-030	RL-3200 & RL-4000	168C	Primary Disc.	18-733-481-502	RL-4000
89	Screw	00-611-315-426	RL-3200	169	Screw	00-615-114-373	RL-3200 & RL-4000
89A	Screw	00-611-315-428	RL-4000	170	Lk. Washer	00-655-017-026	RL-3200 & RL-4000
90	Brace	18-657-937-256	RL-3200 & RL-4000	172	Cover Filler	18-657-942-095	E.O. Models Only
91	Screw	00-611-315-396	RL-3200 & RL-4000	173	Man. Chg. Handle	18-732-791-541	Manual Chg. Only
92	Washer	00-651-027-139	RL-3200 & RL-4000	173A	Man. Chg. Handle	18-732-791-542	Manual Chg. Only RL-3200 & RL-4000
93	Nut	15-171-063-016	RL-3200 & RL-4000				
94	Stud	14-135-915-008	RL-3200 & RL-4000	174	Set Screw	00-617-031-367	Manual Chg. Only
95	Washer	00-651-027-139	RL-3200 & RL-4000	177	Bottom Cover	18-729-792-501	
96	Lk. Washer	00-655-067-140	RL-3200 & RL-4000	177A	Bottom Cover	18-729-792-502	RL-3200 & RL-4000
96A	Washer	00-651-007-900	RLX-1600 & RL-2000	178	Cover	18-398-288-011	
97	Bushing	18-657-765-395	RLX-1600, RL-2000	178A	Cover	18-398-288-012	RL-4000 & RL3200
97A	Nut	00-631-059-104	RL-3200 & RL-4000	179	Bumper	15-171-399-007	
98	Pin	18-724-501-012		180	Screw	15-171-399-010	
98A	Pin	18-727-832-001	RL-3200 & RL-4000	181	Clip	18-657-854-175	
99	Pin	18-724-501-009		182	Guard	18-729-785-001	
99A	Pin	18-727-832-002	RL-3200 & RL-4000	184	Screw	00-615-641-901	
100	Spacer	18-657-942-300		185	Label	18-657-838-287	
100A	Spacer	18-727-838-002	RL-3200 & RL-4000	186	Label	18-657-940-180	
101	X Washer	00-659-055-250		220	Bracket	18-734-436-001	Stationary. Not on RL-3200 & RL-4000
101A	X Washer	15-171-399-035	RL-3200 & RL-4000				
102	Rack Shaft	18-732-791-506	RL-800, RLX-800 & RL-1600	221	Screw	15-615-024-005	Stationary. Not on RL-3200 & RL-4000
102A	Rack Shaft	18-732-791-522	RLX-1600 & RL-2000				
102B	Racking Shaft	18-732-791-507	RL-3200				

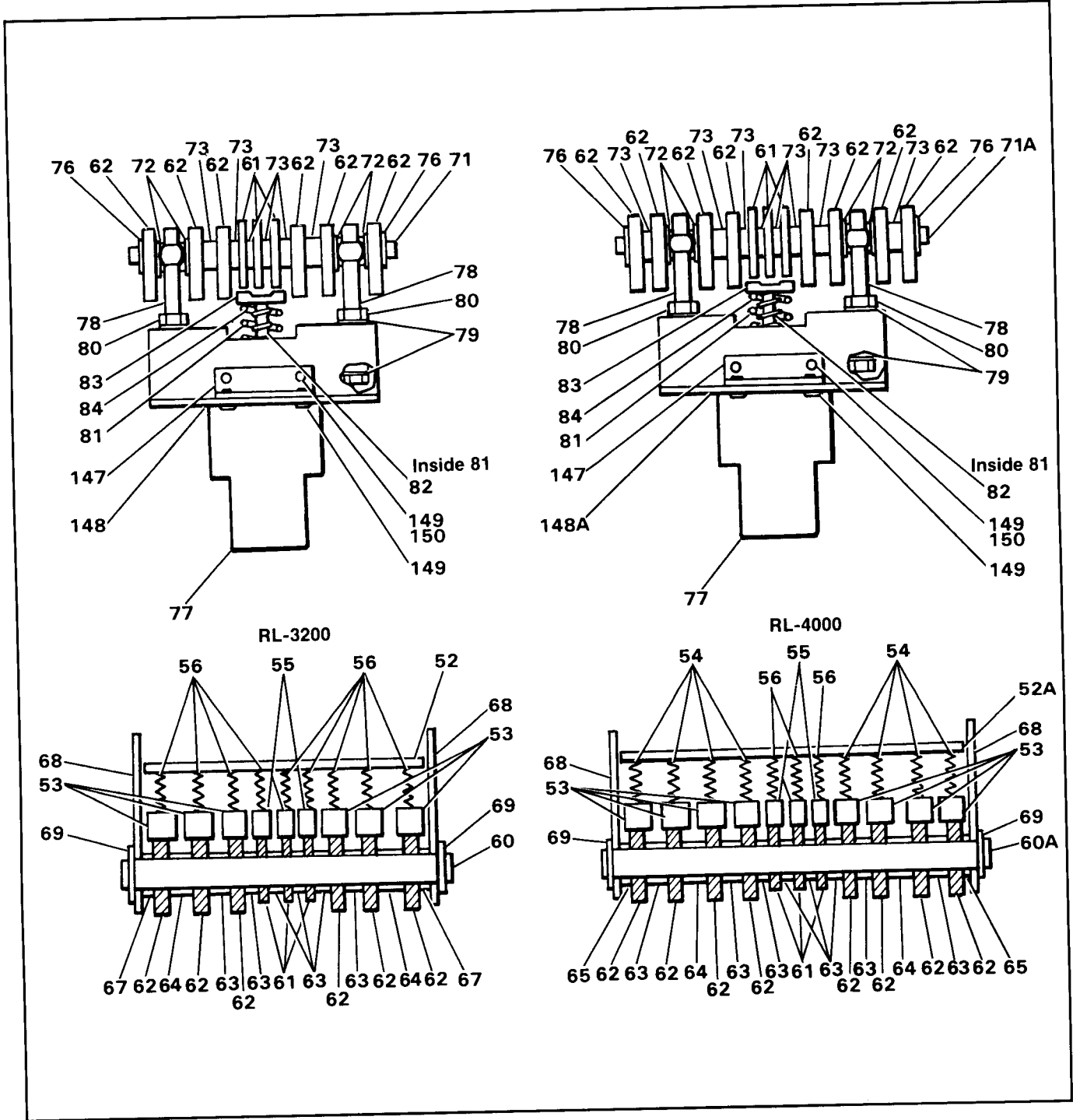


Figure 3.

Refer To Figure 3

Item	Description	Part Number	Usage
52	Spring Seat	18-657-938-303	RL-800
52A	Spring Seat	18-657-938-304	RLX-800, RLH-800, RL-1600
52B	Spring Seat	18-657-938-305	RLX-1600, RL-2000
52C	Spring Seat	18-657-822-171	RL-3200
52D	Spring Seat	18-657-854-166	RL-4000
53	Contact .531	18-727-825-002	
54	Spring	71-141-173-001	
55	Contact .38	18-727-825-001	
56	Spring	71-141-976-001	
57	Washer	00-651-027-170	RL-3200 & RL-4000
58	Lk. Washer	00-655-017-030	RL-3200 & RL-4000
59	Screw	15-171-399-011	
59A	Screw	00-611-315-426	RL-3200 & RL-4000
60	Pin	18-727-750-005	RL-800
60A	Pin	18-727-750-001	RLX-800, RLH-800, RL-1600
60B	Pin	18-727-750-006	RLX-1600, RL-2000
60C	Pin	18-727-750-002	RL-3200
60D	Pin	18-727-750-003	RL-4000
61	Arcing Contact	18-727-729-502	
62	Main Contact	18-727-729-503	
63	Spacer	18-727-839-002	
64	Spacer	18-727-839-009	RLX-800 & RL-1600
64A	Spacer	18-727-839-010	RLX-1600 Thru RL-4000
65	Spacer	18-727-839-006	RL-4000
66	Spacer	28-737-849-007	RL-800 Thru RL-2000
67	Washer	00-651-027-357	
68	Support	18-657-937-261	
68A	Support	18-657-940-150	RL-3200 & RL-4000
69	X Washer	15-171-399-035	
70	Screw	00-615-663-373	
71	Pin	18-657-922-147	RL-800, RLX-800 & RL-1600

Item	Description	Part Number	Usage
71A	Pin	18-657-937-278	RLX-1600 & RL-2000
71B	Pin	18-657-937-279	RL-3200
71C	Pin	18-657-937-280	RL-4000
72	Washer	18-657-941-295	
73	Spacer (.18)	18-727-838-001	
74	Pin Cover Spacer	18-657-765-368	RL-800
74A	Screw	00-611-315-434	RL-3200 & RL-4000
75	Spacer (.15)	18-727-838-005	RLX-800 Thru RL-2000
75A	Nut	15-171-063-017	RL-3200 & RL-4000
76	X Washer	00-659-055-250	RLX-1600 Thru RL-4000
77	Pushrod	18-398-288-009	RL-800, RLX-800 & RL-1600
77A	Pushrod	18-657-954-580	RLX-1600 & RL-2000
77B	Pushrod	18-398-288-008	RL-3200 & RL-4000
78	Screw (Spec.)	18-657-937-268	
79	Washer	00-651-007-910	
79A	Washer	00-651-027-170	RL-4000
80	Nut	00-631-143-205	
81	Spring	71-142-123-001	
81A	Spring	18-657-823-358	RL-3200 & RL-4000
82	Spring	71-142-139-001	
82A	Spring	71-141-799-001	RL-3200 & RL-4000
83	Spring Seat	18-657-940-290	RL-800
83A	Spring Seat	18-657-939-170	RLX-800 Thru RL-2000
83B	Spring Seat	18-657-822-184	RL-3200 & RL-4000
84	Spring Seat	18-657-822-196	RL-3200 & RL-4000
147	Barrier Sups.	18-657-963-214	RLX-1600 Thru RL-4000
148	Barrier	18-734-619-001	RLX-1600, RL-2000
148A	Barrier	18-734-619-002	RL-3200
148B	Barrier	18-734-619-003	RL-4000
149	Screw	15-171-074-010	RLX-1600 Thru RL-4000
150	Lk. Washer	00-655-067-060	RLX-1600 Thru RL-4000

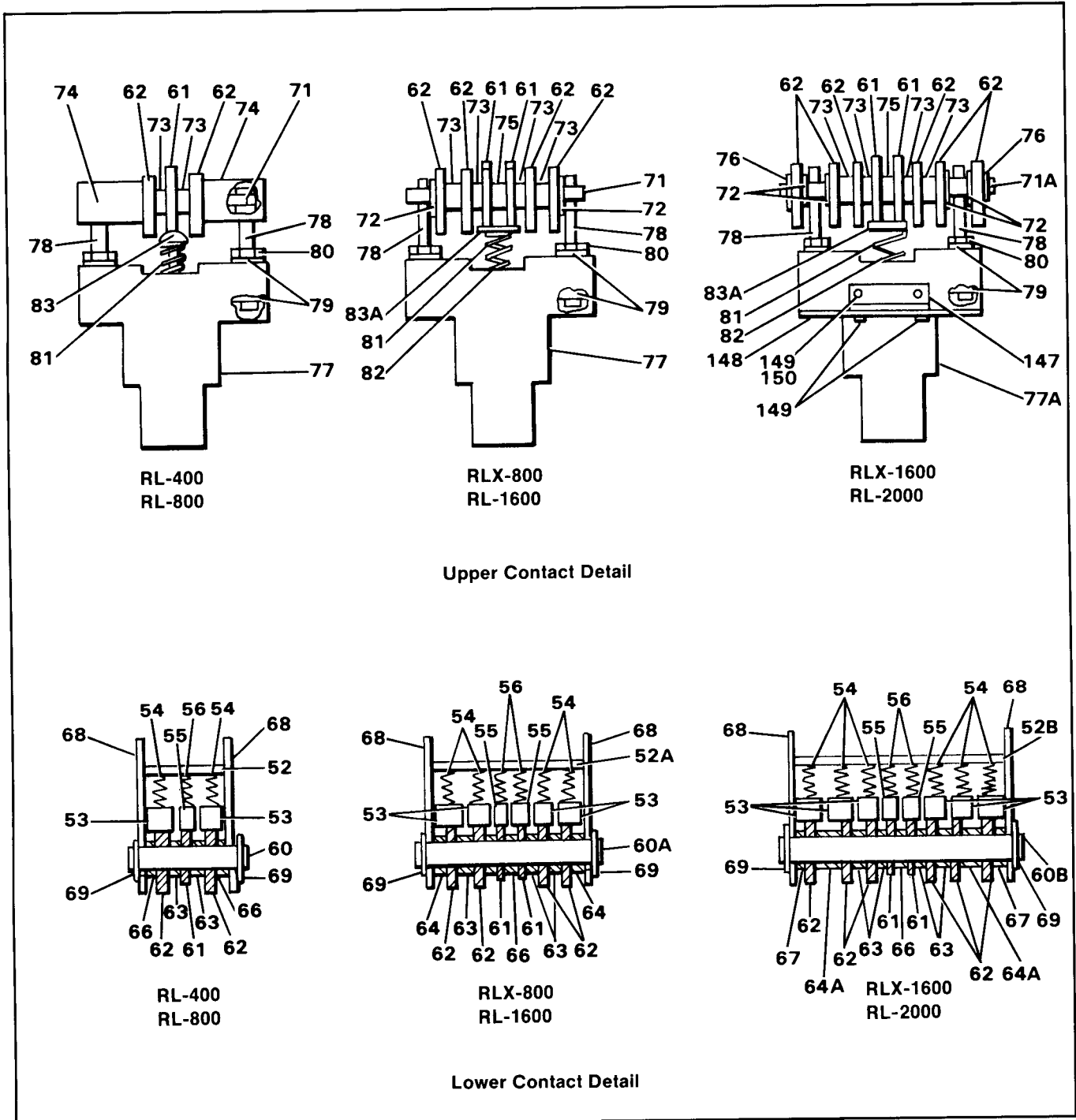


Figure 3A.

Refer To Figure 3A.

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
52	Spring Seat	18-657-938-303	RL-800	71A	Pin	18-657-937-278	RLX-1600 & RL-2000
52A	Spring Seat	18-657-938-304	RLX-800, RLH-800, RL-1600	71B	Pin	18-657-937-279	RL-3200
52B	Spring Seat	18-657-938-305	RLX-1600, RL-2000	71C	Pin	18-657-937-280	RL-4000
52C	Spring Seat	18-657-822-171	RL-3200	72	Washer	18-657-941-295	
52D	Spring Seat	18-657-854-166	RL-4000	73	Spacer (.18)	18-727-838-001	
53	Contact .531	18-727-825-002		74	Pin Cover Spacer	18-657-765-368	RL-800
54	Spring	71-141-173-001		74A	Screw	00-611-315-434	RL-3200 & RL-4000
55	Contact .38	18-727-825-001		75	Spacer (.15)	18-727-838-005	RLX-800 Thru RL-2000
56	Spring	71-141-976-001		75A	Nut	15-171-063-017	RL-3200 & RL-4000
57	Washer	00-651-027-170	RL-3200 & RL-4000	76	X Washer	00-659-055-250	RLX-1600 Thru RL-4000
58	Lk. Washer	00-655-017-030	RL-3200 & RL-4000	77	Pushrod	18-398-288-009	RL-800, RLX-800 & RL-1600
59	Screw	15-171-399-011		77A	Pushrod	18-657-954-580	RLX-1600 & RL-2000
59A	Screw	00-611-315-426	RL-3200 & RL-4000	77B	Pushrod	18-398-288-008	RL-3200 & RL-4000
60	Pin	18-727-750-005	RL-800	78	Screw (Spec.)	18-657-937-268	
60A	Pin	18-727-750-001	RLX-800, RLH-800, RL-1600	79	Washer	00-651-007-910	
60B	Pin	18-727-750-006	RLX-1600, RL-2000	79A	Washer	00-651-027-170	RL-4000
60C	Pin	18-727-750-002	RL-3200	80	Nut	00-631-143-205	
60D	Pin	18-727-750-003	RL-4000	81	Spring	71-142-123-001	
61	Arcing Contact	18-727-729-502		81A	Spring	18-657-823-358	RL-3200 & RL-4000
62	Main Contact	18-727-729-503		82	Spring	71-142-139-001	
63	Spacer	18-727-839-002		82A	Spring	71-141-799-001	RL-3200 & RL-4000
64	Spacer	18-727-839-009	RLX-800 & RL-1600	83	Spring Seat	18-657-940-290	RL-800
64A	Spacer	18-727-839-010	RLX-1600 Thru RL-4000	83A	Spring Seat	18-657-939-170	RLX-800 Thru RL-2000
65	Spacer	18-727-839-006	RL-4000	83B	Spring Seat	18-657-822-184	RL-3200 & RL-4000
66	Spacer	28-737-849-007	RL-800 Thru RL-2000	84	Spring Seat	18-657-822-196	RL-3200 & RL-4000
67	Washer	00-651-027-357		147	Barrier Sups.	18-657-963-214	RLX-1600 Thru RL-4000
68	Support	18-657-937-261		148	Barrier	18-734-619-001	RLX-1600, RL-2000
68A	Support	18-657-940-150	RL-3200 & RL-4000	148A	Barrier	18-734-619-002	RL-3200
69	X Washer	15-171-399-035		148B	Barrier	18-734-619-003	RL-4000
70	Screw	00-615-663-373		149	Screw	15-171-074-010	RLX-1600 Thru RL-4000
71	Pin	18-657-922-147	RL-800, RLX-800 & RL-1600	150	Lk. Washer	00-655-067-060	RLX-1600 Thru RL-4000

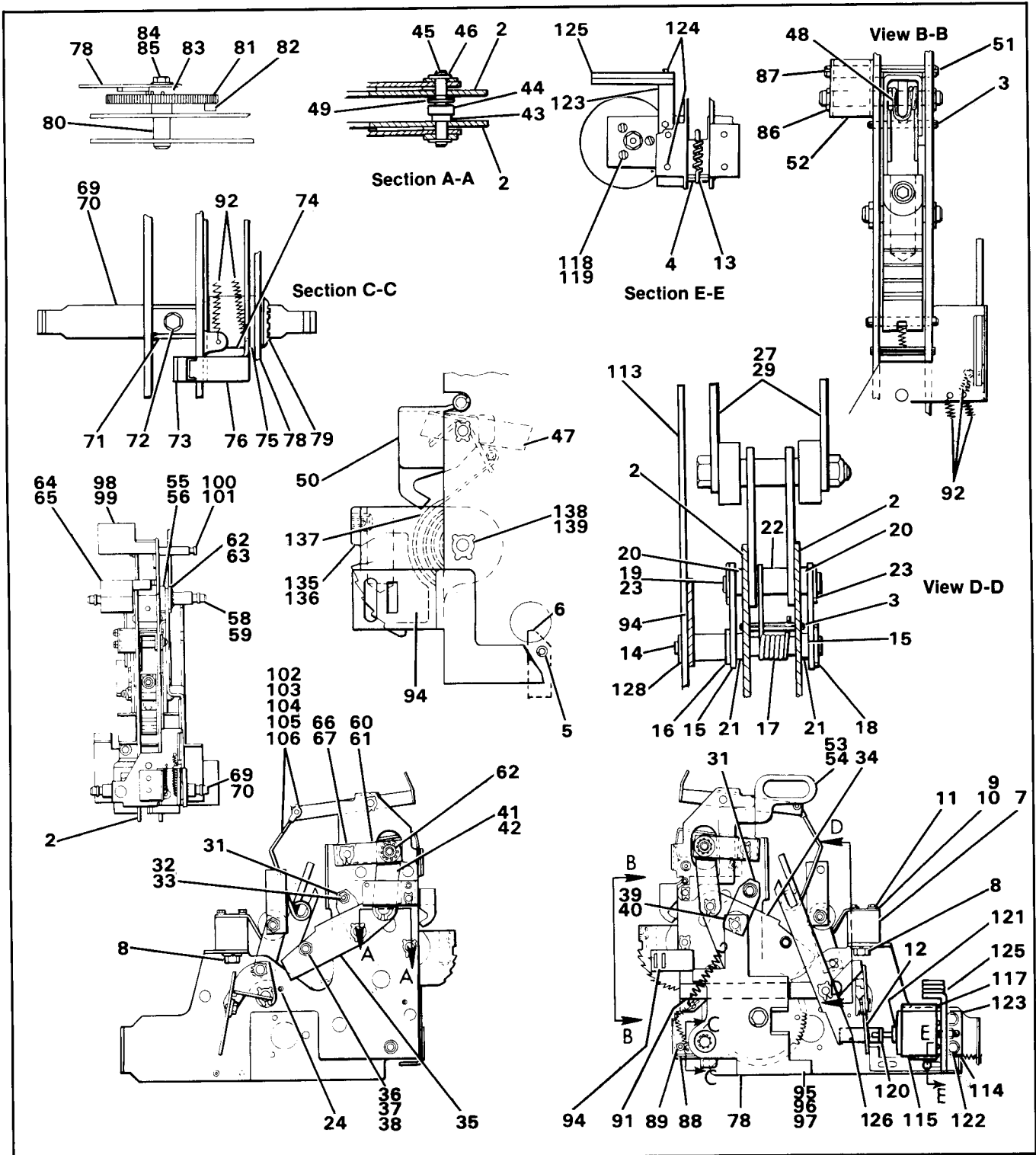


Figure 4. Operator

The Following Item Numbers Refer to Figure 4, and Are Common Parts Used on All Models Except as Noted.

Item	Description	Part Number	Usage	Item	Description	Part Number	Usage
2	Frame	18-469-506-501		61	Guide Link	18-657-854-171	RL-3200 Thru RL-4000
3	Rollpin	00-671-176-195		62	Retainer	00-673-285-063	RL-800 Thru RL-2000
4	Rollpin	15-171-399-020		63	Retainer	15-171-399-057	RL-3200 Thru RL-4000
5	Rollpin	15-171-399-021		64	Flag	18-724-498-001	
6	Pawl	18-658-024-123		65	Decal	18-657-800-116	
7	Stop Block	18-657-768-039		66	Pin	18-724-501-007	
8	Screw	15-171-259-004		67	X Washer	00-659-055-250	
9	Back-Up	18-657-765-130		69	Spring Hanger	18-727-726-002	RL-800 Thru RL-2000
10	Spring	18-657-768-038		70	Spring Hanger	18-727-726-001	L-3200 Thru RL-4000
11	Screw	15-171-074-010		71	Clip	18-657-768-014	
12	Trip Flap Assy.	18-727-727-502		72	Screw	15-171-074-010	
13	Spring	72-140-324-001		73	Switch Lever	18-657-768-037	Electric Charge Only
14	Shoulder Pin	18-658-024-076		74	Bearing Spacer	18-657-768-031	
15	Latch	18-657-765-398		75	Spacer	18-727-839-006	
16	Washer	18-657-768-374		76	Switch Lever	18-657-768-032	Electric Charge Only
17	Spring	18-657-768-033		78	Gear Brace	18-732-790-006	
18	X Washer	00-659-055-250		79	Retainer	00-673-285-063	
19	Pin	18-724-501-002		80	Gear Pin	18-657-768-371	Electric Charge Only
20	Spacer	18-657-823-356		81	Gear	18-724-505-501	Electric Charge Only
21	Bushing	18-657-765-397		82	Cam Follower	18-657-768-026	Electric Charge Only
22	Spacer	18-731-274-001		83	Spacer	18-727-839-005	Electric Charge Only
23	X Washer	00-659-055-250		84	Screw	00-611-315-461	Electrical Charge Only
24	Rollpin	00-671-177-323		85	Lk. Washer	00-655-017-032	Electrical Charge Only
27	Toggle Link Assy.	18-732-791-554	RL-800 Thru RL-2000	86	X Washer	00-659-055-187	
29	Toggle Link Assy.	18-732-791-555	RL-3200 Thru RL-4000	87	Rollpin	15-171-399-022	
30				88	Bracket	18-732-790-007	
31	Spacer Link	18-657-768-732		89	Screw	15-171-074-010	
32	Screw	00-615-114-428		91	Spring	15-837-455-002	
33	Nut	15-171-063-017		92	Spring	00-837-455-026	Electrical Charge Only
34	Cam Wind & Close	18-724-492-001		93			
35	Cam Close	18-724-493-001		94	Trip Bar	18-732-790-011	
36	Spacer	18-657-768-053		95	Screw	00-611-315-384	
37	Screw	00-611-315-476		96	Spacer	18-733-309-001	
38	Nut	15-171-063-018		97	Nut	15-171-063-016	
39	Pin	18-724-501-004		98	Flag	18-728-500-005	
40	X Washer	00-659-055-250		99	Decal	71-141-817-001	
41	Link	71-142-071-001	RL-800 Thru RL-2000	100	Pin	18-724-501-011	
42	Link	15-657-961-340	L-3200 Thru RL-4000	101	X Washer	00-659-055-250	
43	Spacer	71-915-695-013		102	Ret. Ring	00-673-173-018	
44	Bearing	15-171-399-061		103	Rod End Clip	15-171-399-029	RL-800 Thru RL-2000
45	Pin	18-724-501-006		104	Rod End Clip	15-171-399-003	RL-3200 Thru RL-4000
46	X Washer	00-659-055-250		105	Close Flag Link	18-733-435-001	RL-800 Thru RL-2000
47	Latch Assy.	18-657-765-564		106	Close Flag Link	18-657-822-353	RL-3200 Thru 4000
48	Spring	18-657-939-020		113	Reset lever	18-734-620-501	
49	Washer	00-651-007-214		114	Actuator Bracket	18-657-768-022	
50	Close Hood Assy.	18-657-943-560		115	Actuator	18-387-921-504	
51	Pin	18-657-769-367		116			
52	Close Lever	18-657-768-020		117	Shield	18-657-937-287	
53	Spring Interlock	18-732-790-045	RL-800 Thru RL-2000	118	Screw	00-615-513-220	
54	Spring Interlock	18-657-852-575	RL-3200 Thru RL-4000	119	Lk. Washer	00-655-067-100	
55	Bumper	71-142-102-001	RL-800 Thru RL-2000	120	Reset Assy.	18-732-791-545	
56	Bumper	18-657-854-169	RL-3200 Thru RL-4000	121	Washer	72-140-000-001	
58	Spring Hanger	18-727-726-002	RL-800 thru RL-2000	122	Screw	00-615-663-373	
59	Spring Hanger	18-729-782-001	RL-3200 Thru RL-4000	123	Shield Support	18-657-939-200	
60	Guide Link	18-657-768-024	RL-800 Thru RL-2000	124	Screw	15-171-399-025	

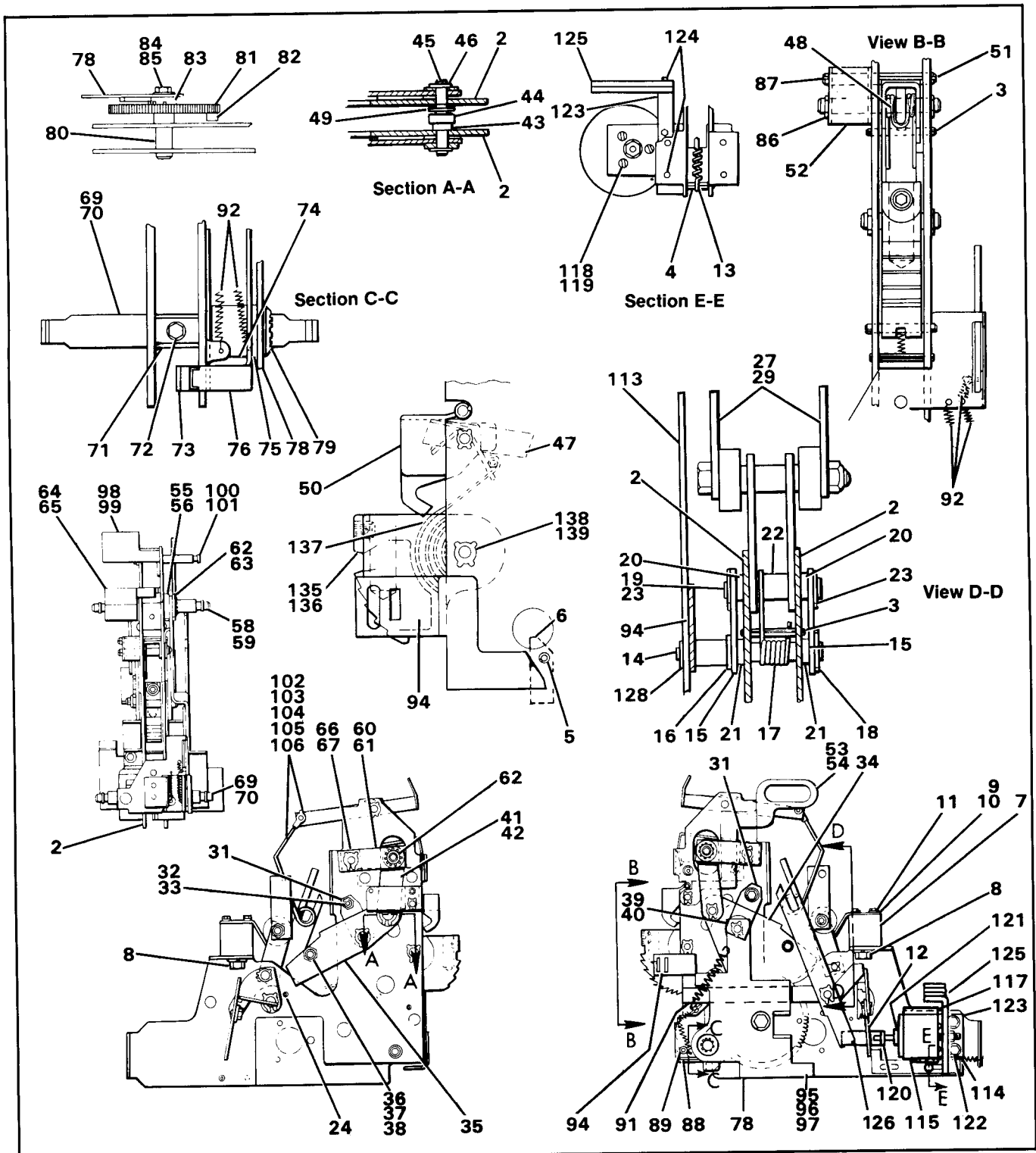


Figure 4. Operator (Continued)

Refer to Figure 4.

Item	Description	Part Number	Usage
125	Shield	18-657-940-182	
126	X Washer	00-659-055-187	
127	Spring	71-113-503-001	
128	X Washer	00-659-055-187	
135	Charge Cam	18-732-791-501	

Item	Description	Part Number	Usage
136	Charge Link	18-732-791-544	
137	Spring	18-657-937-288	
138	Pin	18-724-501-001	
139	X Washer	00-659-055-250	

18-473-704		USED ON BREAKER	
MR NO 801	RL/RLX-800, RL/RLX-1600, RL-2000	MO (STD)/MO (STATION.)	
	RL-800, RL/RLX-1600, RL-2000	MO (FUSED)	
802	RL/RLX-800, RL/RLX-1600, RL-2000	EO (STD)/EO (STATION.)	
	RL-800, RL/RLX-1600, RL-2000	EO (FUSED)	
803	RL/RLX-800, RL/RLX-1600, RL-2000	EOMO (STD)/EOMO	
	RL-800, RL/RLX-1600, RL-2000	EOMO (FUSED)	
804	RL/RLX-800, RL/RLX-1600, RL-2000	MO (NON-AUTO)	
	RL-800, RL/RLX-1600, RL-2000	MO (NON-AUTO FUSED)	
805	RL/RLX-800, RL/RLX-1600, RL-2000	EO (NON-AUTO)	
	RL-800, RL/RLX-1600, RL-2000	EO (NON-AUTO FUSED)	
806	RL/RLX-800, RL/RLX-1600, RL-2000	EOMO (NON-AUTO)	
	RL-800, RL/RLX-1600, RL-2000	EOMO (NON-AUTO FUSED)	
813	RL-3200, RL-4000	MO (STD)/MO (FUSED)	
814	RL-3200, RL-4000	EO (STD)/EO (FUSED)	
815	RL-3200, RL-4000	EOMO (STD)/EOMO (FUSED)	
816	RL-3200, RL-4000	MO (NON-AUTO)/MO (NON-AUTO FUSED)	
817	RL-3200, RL-4000	EO (NON-AUTO)/EO (NON-AUTO FUSED)	
818	RL-3200, RL-4000	EOMO (NON-AUTO)/EOMO (NON-AUTO FUSED)	

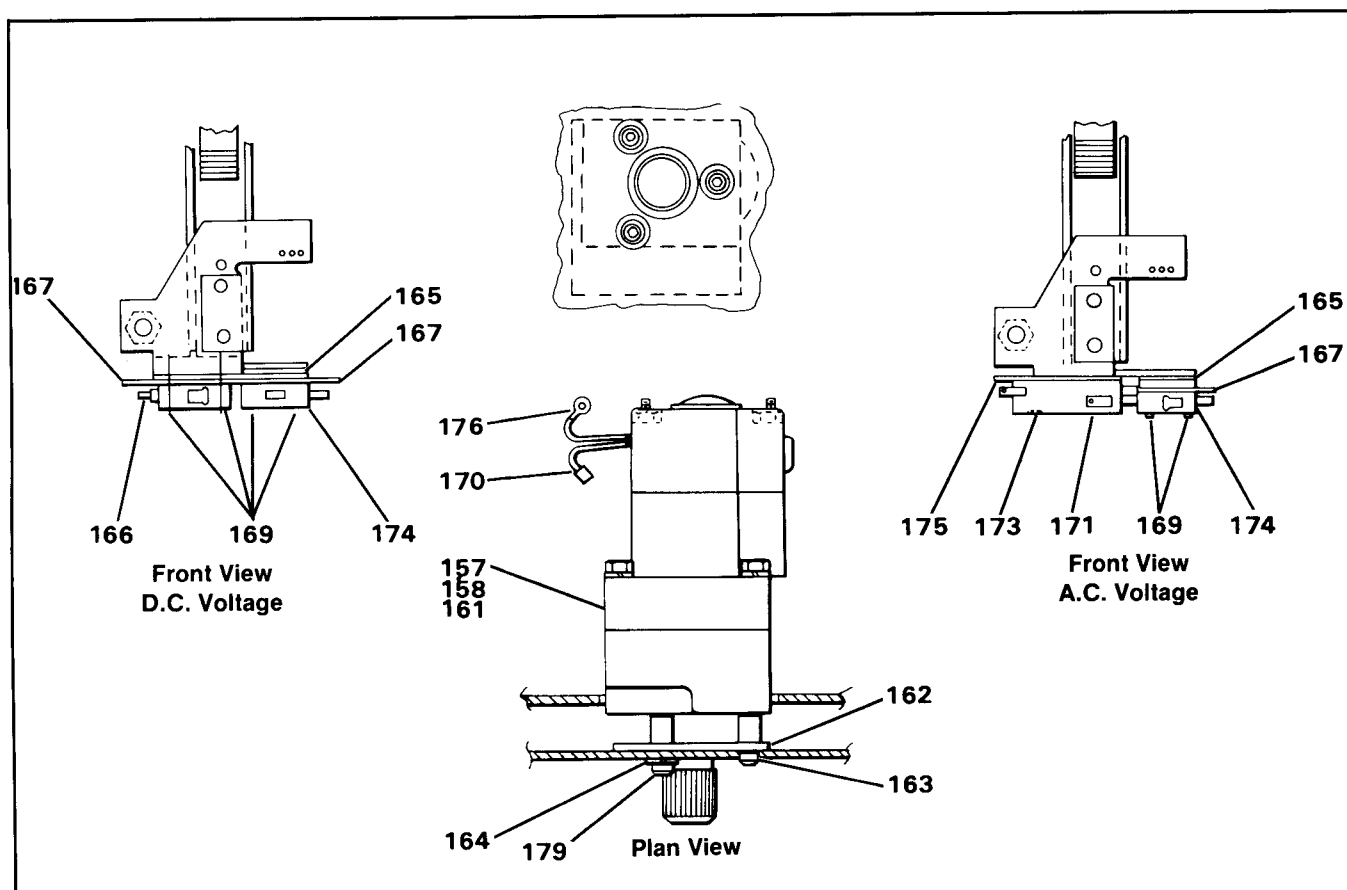


Figure 5. Motor Group

The following Item Numbers Refer To Figure 5, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
157	Motor 120 VAC and 125 VDC	71-340-297-001	
158	Motor 240 VAC and 250 VDC	71-340-297-002	
161	Motor 48 VDC	71-340-297-005	
162	Spacer	18-657-768-030	
163	Screw	00-615-245-218	1 Req. per Motor
164	Lk. Washer	00-655-017-022	
165	Sw. Spacer	18-657-941-061	
166	Switch (A.C.)	15-171-399-013	

Item	Description	Part Number	Usage
167	Insulator	18-657-783-362	
169	Screw	15-171-399-008	
170	Terminal, Faston	15-172-099-005	
171	Switch (D.C.)	15-171-323-003	
173	Screw	15-171-399-041	
174	Switch (A.C. & D.C.)	15-171-186-010	
175	Insulator	18-657-800-327	
176	Terminal Ring	15-172-099-001	
179	Screw	00-615-124-220	2 Req. per Motor

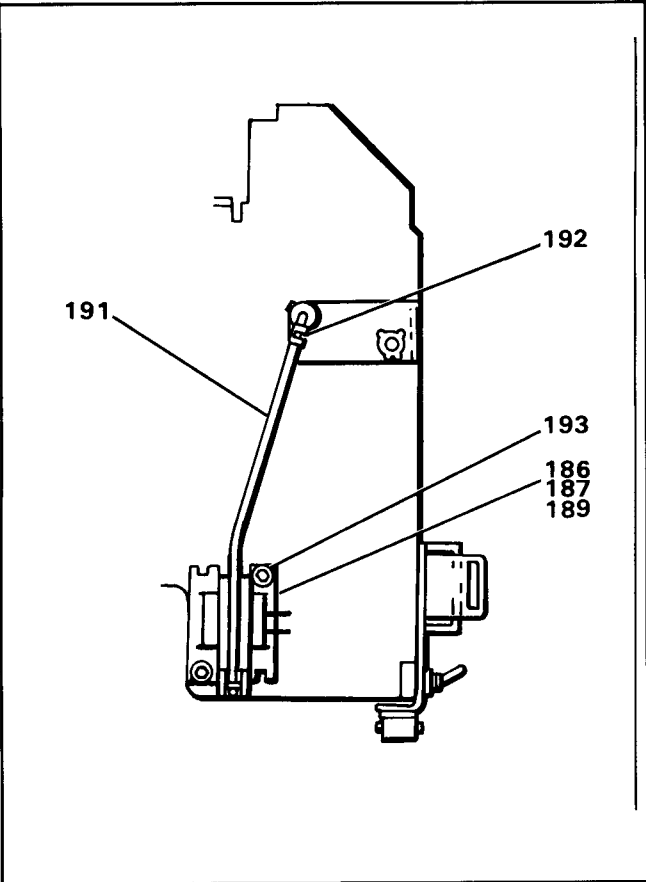


Figure 6. Close Solenoid Group

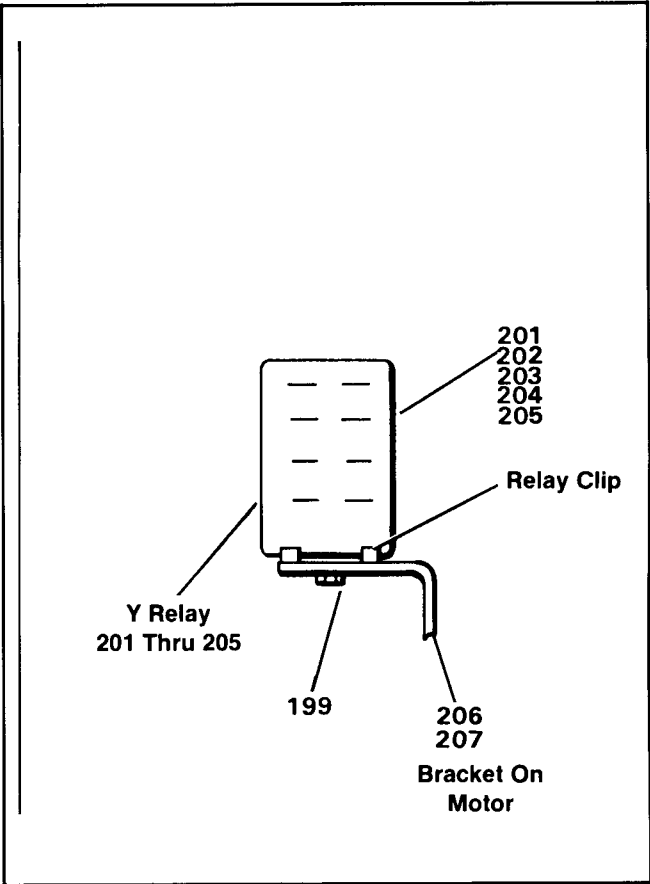


Figure 6A. Anti-Pump "Y" Relay

The Following Item Numbers Refer to Figure 6 and 6A, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
186	Solenoid 48 VDC and 120 VAC	18-724-513-001	
187	Solenoid 240 VAC and 125 VDC	18-724-513-002	
189	Solenoid 250 VDC	18-724-513-004	
191	Close Linkage	18-724-511-001	
192	Clip	15-171-399-003	
193	Screw	15-171-399-010	
199	Screw	15-171-074-007	

Item	Description	Part Number	Usage
201	Relay "Y" 120 VAC	15-171-399-014	Some applications require 2 of this relay.
202	Relay "Y" 240 VAC	15-171-399-015	
203	Relay "Y" 125 VDC	15-171-399-016	
204	Relay "Y" 250 VDC	15-171-399-017	
205	Relay "Y" 48 VDC	15-171-399-027	
206	Bracket	18-657-961-290	
207	Nut	00-633-059-108	

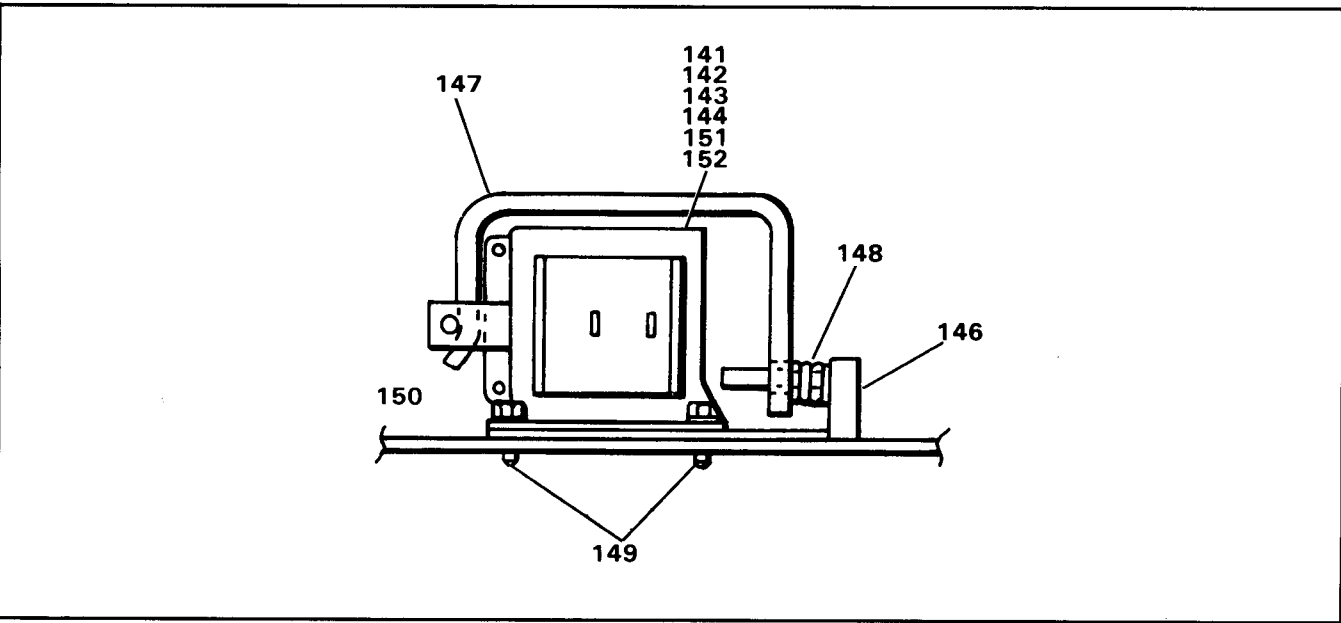


Figure 7. Shunt Trip Group

The Following Item Numbers Refer to Figure 7, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
141	Solenoid 48 VDC and 120 VAC	18-724-513-001	
142	Solenoid 240 VAC and 125 VDC	18-724-513-002	
143	Solenoid 24 VDC	18-724-513-006	
144	Solenoid 250 VDC	18-724-513-004	

Item	Description	Part Number	Usage
146	Bracket	18-657-781-264	
147	Pushrod	18-657-768-036	
148	Spring	14-128-784-001	
149	Screw	15-171-399-010	
151	Solenoid 28 VDC	18-724-513-007	
152	Solenoid 32 VDC	18-724-513-008	

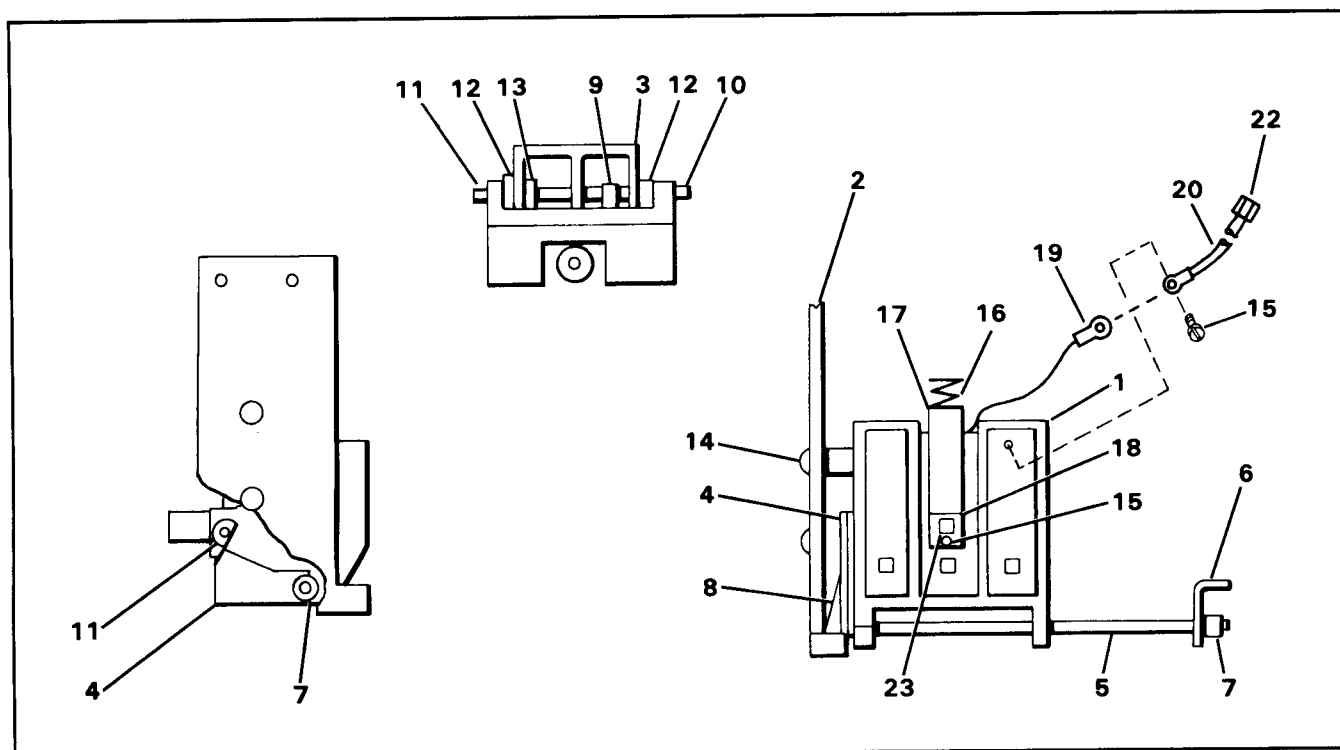


Figure 8. Blown Fuse Trip

The Following Items Refer to Figure 8, and Apply to All Fused Models.

Item	Description	Part Number	Usage
1	Housing	18-734-445-001	
2	Base	18-657-961-284	
3	Lever	18-734-444-001	
4	Latch Plate	18-657-961-285	
5	Shaft	18-657-961-281	
6	Arm	18-657-961-288	
7	Spacer Nut	18-657-961-280	
8	Spring	18-657-961-279	
9	Spring	18-657-961-278	
10	Shaft	18-657-961-286	
11	Latch	18-657-961-283	
12	Washer	00-651-007-146	

Item	Description	Part Number	Usage
13	Nut	00-631-143-204	
14	Screw	15-615-024-006	
15	Screw	00-615-641-904	
16	Spring	18-657-961-339	
17	Solenoid	15-171-399-050	
18	Support	18-657-961-337	
19	Terminal	15-172-099-003	
20	Wire	00-557-286-003	
21	Terminal	15-172-099-003	
22	Terminal	15-172-099-007	
23	Ret. Ring	00-673-173-018	

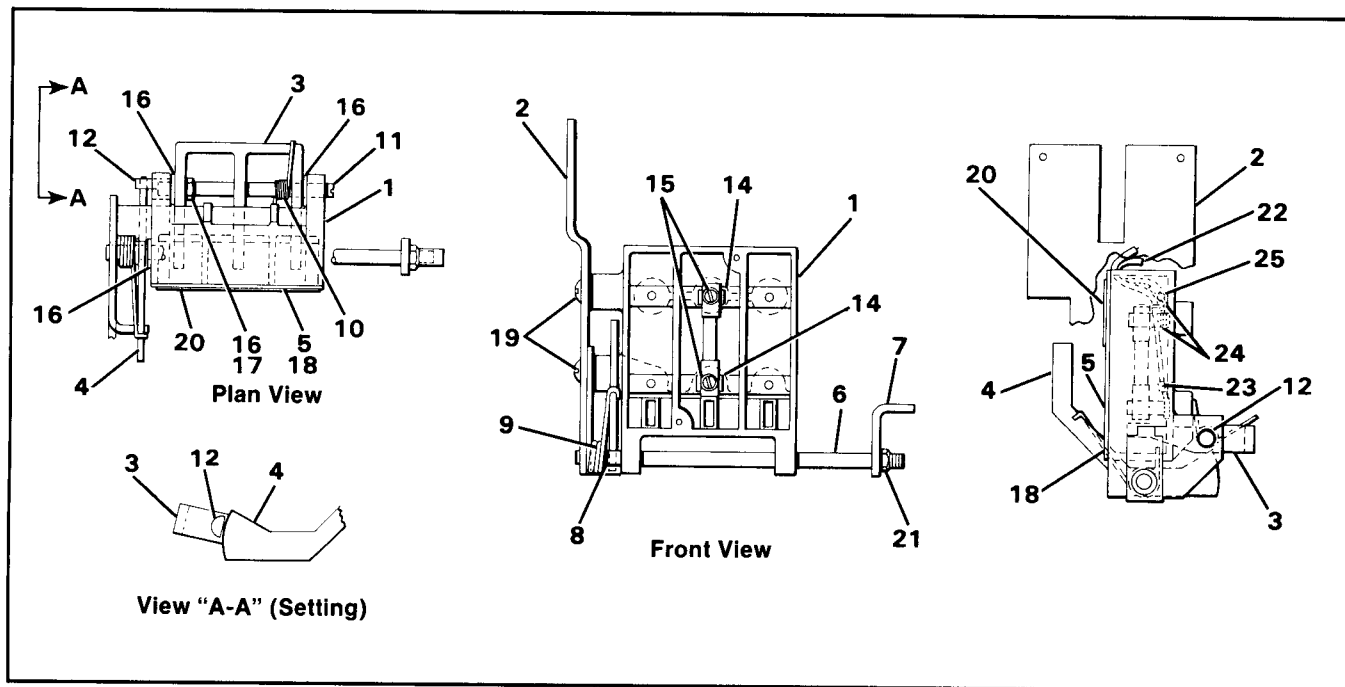


Figure 8A. Trigger Fuse Assembly

The Following Items Refer to Figure 8A.

Item	Description	Part Number	Usage
1	Housing	18-399-759-001	
2	Base	18-657-961-284	
3	Lever	18-734-444-001	
4	Latch Plate	18-657-961-285	
5	Cover	18-657-961-287	
6	Shaft	18-657-961-289	
7	Arm	18-657-961-288	
8	Spacer Nut	18-657-961-280	
9	Torsion Spring	18-657-961-279	
10	Torsion Spring	18-657-961-278	
11	Shaft	18-657-961-286	
12	Latch	18-657-961-283	
13	Actuator Fuse	72-140-317-001	
14	Fuse Clip	00-871-262-103	
15	#8-B2 x .25 Lg. SEMS SCR	00-615-641-904	

Item	Description	Part Number	Usage
16	Washer	00-651-007-146	
17	.25-28 Hex Jam Nut	00-631-143-204	
18	#6-32 x .38 Lg. Rd. Hd. Mach. Scr.	00-615-511-122	
19	.25-20 x .50 Lg. Butt. Hd. Scr.	15-615-024-006	
20	Caution Label	15-171-185-002	
21	.25-28 Elastic Stopnut	00-653-025-216	
22	Wire #18	00-557-286-003	
23	Terminal	15-172-099-003	
24	Faston Tab	15-171-949-049	
25	Faston Terminal	15-172-099-007	
26	Terminal	15-172-099-017	

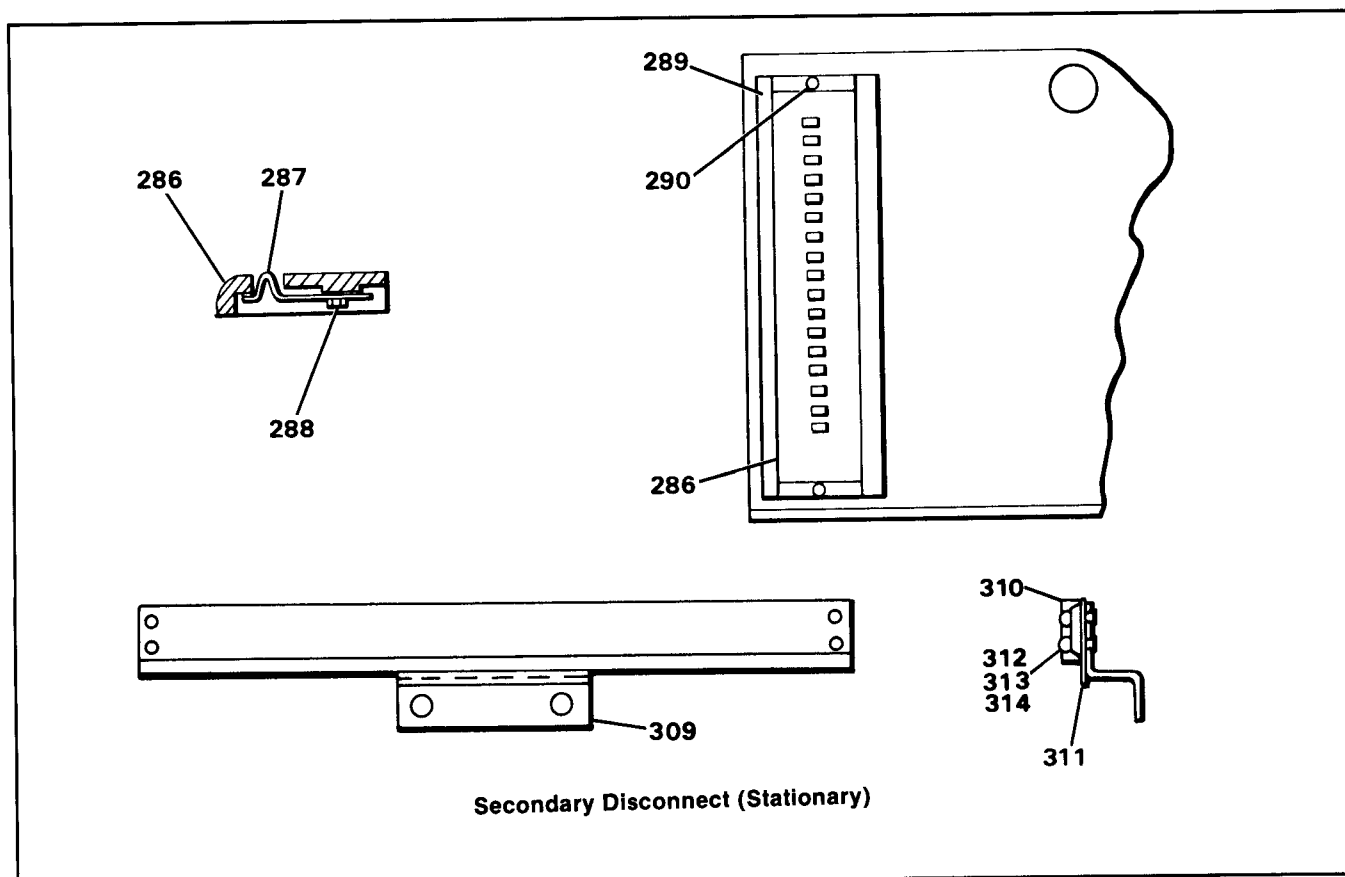


Figure 9. Drawout Secondary Disconnect Group

The Following Item numbers Refer to Figure 9, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
286	Block	18-398-288-004	
287	Contact	18-657-937-266	
288	Screw	15-171-399-063	
289	Insulator	18-657-937-270	
290	Screw	15-171-399-010	
309	Bracket	18-732-790-043	Stationary

Item	Description	Part Number	Usage
310	Block	15-171-051-009	Stationary
311	Marking Strip	15-857-036-002	Stationary
312	Screw	00-615-471-178	Stationary
313	Lk. Washer	00-655-047-080	Stationary
314	Washer	00-651-027-072	Stationary

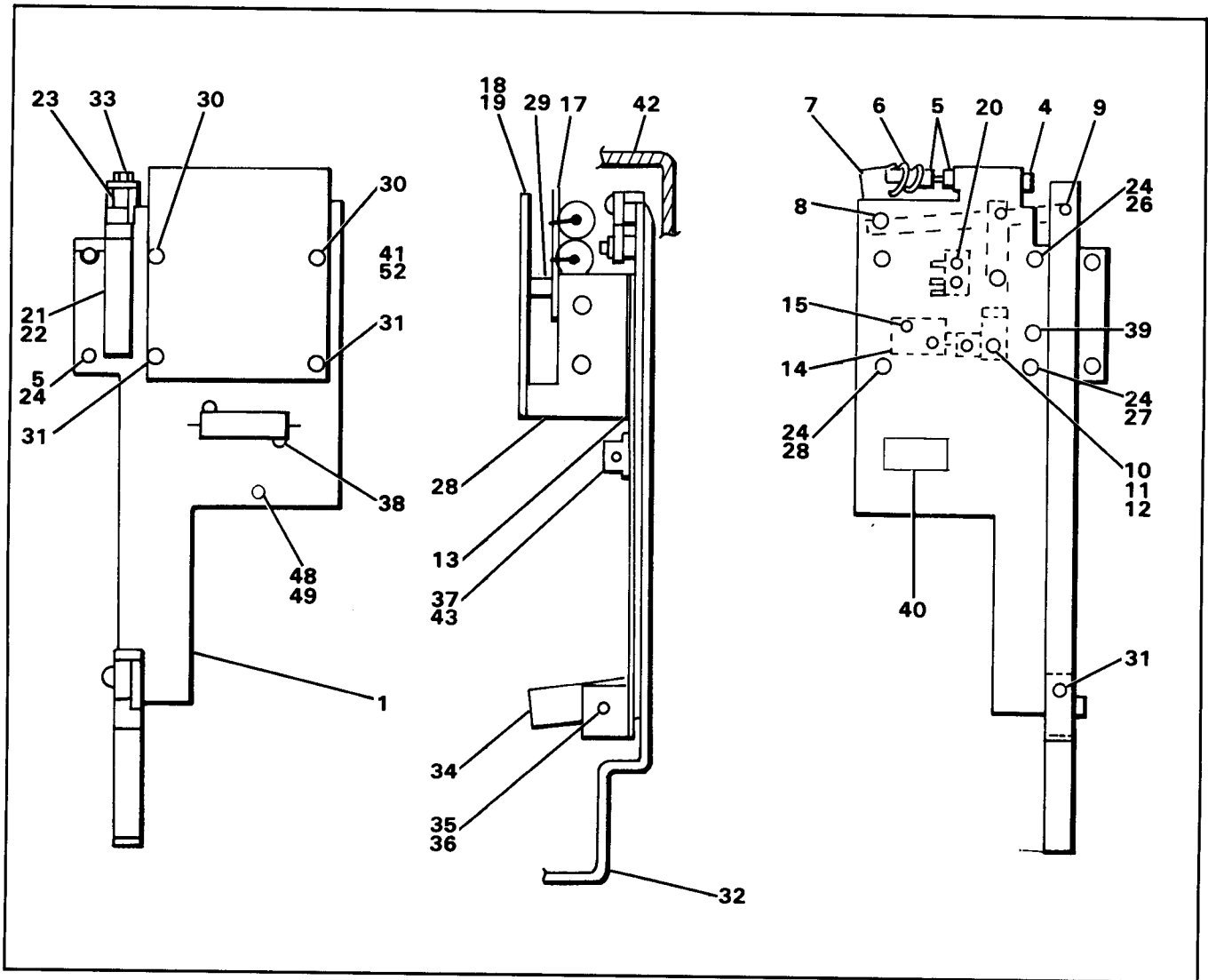


Figure 10. Undervoltage Trip

The Following Item Numbers Refer to Figure 10.

Item	Description	Part Number	Usage
1	UV Base Rivet Assy.	18-658-056-543	
2			
3			
4	Screw #10-32 x 2	00-615-485-233	
5	EL Stop Nut #10-32	00-633-059-210	
6	Spring	71-141-976-001	
7	Lever	18-657-942-096	
8	X Washer	00-659-055-156	
9	Roll Pin .033	00-671-177-119	
10	Latch UV	18-657-942-097	
11	UC Latch Link	18-732-791-529	
12	Rivet	18-657-961-383	
13	Insulator	18-658-024-039	
14	Solenoid	18-721-497-003	
15	Screw	15-171-074-007	
16	Lk. Washer		
17	Capacitor Assem.	18-732-791-553	
18	UV Circuit Bd. 125V	18-802-170-501	
19	UV Circuit Bd. 48V	18-802-170-502	
20	Screw 4-40X	15-171-399-008	
21	Solenoid	18-724-513-007	
22	Solenoid	18-724-513-001	
23	Block	18-658-024-040	
24	Screw #10-32.5	00-615-485-218	
25	El Stop Nut #10-32	00-633-059-210	
26	Stand Off 15 Lg.	18-658-024-041	

Item	Description	Part Number	Usage
27	Stand Off 20 Lg.	18-658-024-042	
28	Terminal Support	18-658-024-043	
29	Spacer	18-658-024-044	
30	Screw	15-171-399-009	
31	Screw	15-171-074-010	
32	Pull Link	18-732-790-042	
33	Screw	15-171-399-010	
34	Guide Lever	18-658-024-045	
35	Washer	00-651-021-092	
36	Spring	18-658-024-047	
37	Resistor 750 Ω	15-873-139-033	
38	Screws #6-10 x .38	00-615-581-122	
39	Screw #10-16 x .33	00-615-199-216	
40	Label	18-658-024-050	
41	Terminal	15-172-099-001	
42	Cover	18-398-288-016	
43	Resistor	15-873-139-036	
44	RL UV Schematic	18-733-500-435	
45	UV Trip Device	18-474-540-501	
46	Trip Flap Extension	18-657-854-174	
47	Screw	15-171-074-010	
48	Screw	00-615-663-373	
49	Screw	15-615-024-008	
50	Wire #18	00-557-286-003	
51	Terminal	15-172-099-001	
52	Screw	00-615-635-120	

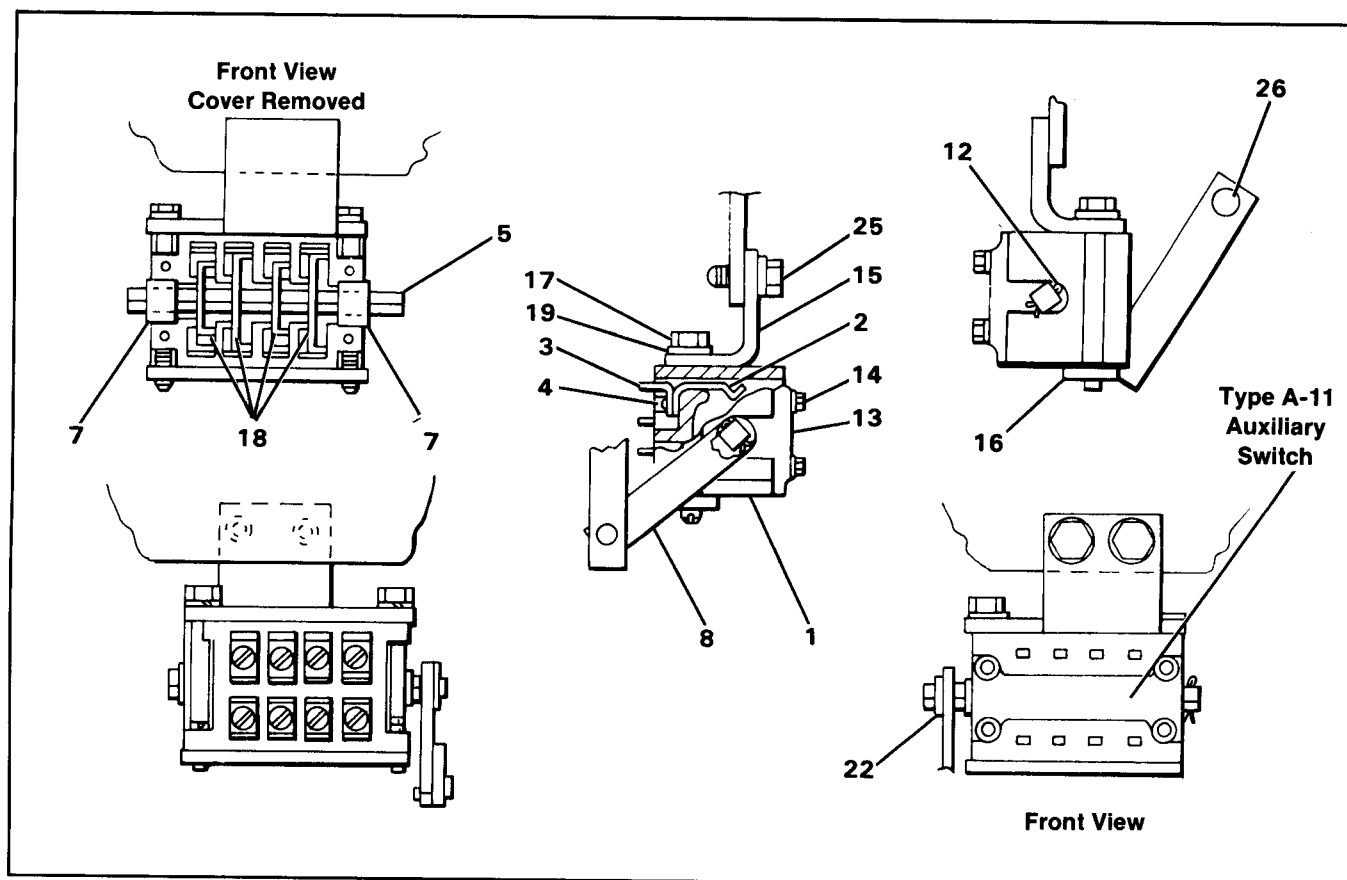


Figure 11. Auxiliary Switch Group

The Following Item Numbers Refer to Figure 11, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
1	Case	71-240-524-001	
2	Contact	71-141-994-001	
3	Terminal	15-171-949-049	
4	Screw	00-615-641-904	
5	Shaft	18-729-789-001	
7	Bearing	71-141-995-001	
8	Arm	18-732-791-562	
12	Cotter Pin	00-671-195-049	
13	Cover	71-141-952-001	

Item	Description	Part Number	Usage
14	Screw	15-171-074-001	
15	Bracket	18-657-941-065	
16	Strap	18-657-940-288	
17	Screw	15-171-399-045	
18	Rotor	18-657-961-381	
19	Lockwasher	00-655-017-026	
22	Retainer	15-171-399-055	
25	Screw	00-615-663-373	
26	X Washer	00-659-055-156	

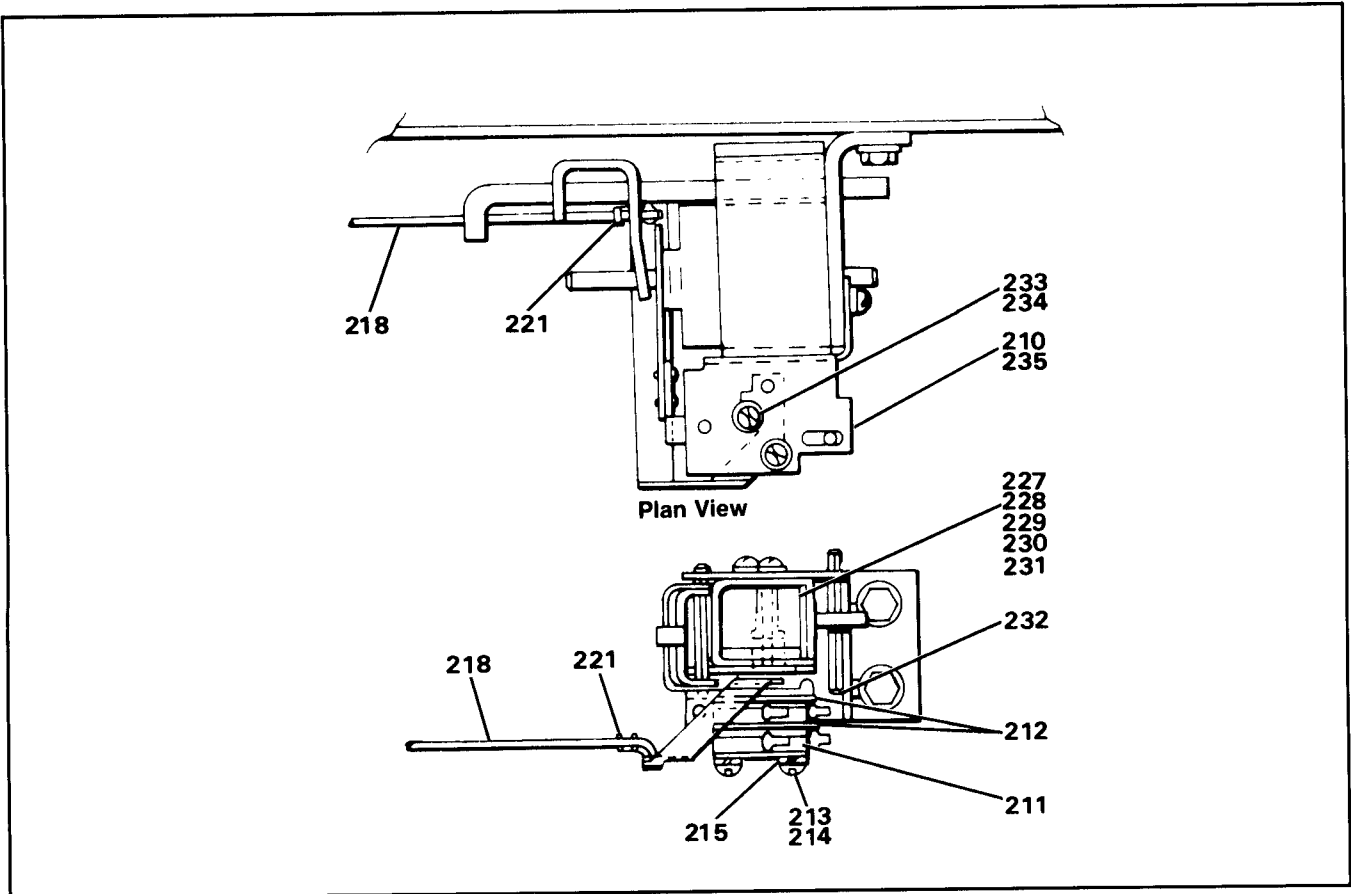


Figure 12. Optional Bell Alarm Switch Group

The Following Item Numbers Refer to Figure 12, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
210	Bracket Assy.	18-392-075-505	
211	Switch	15-171-186-010	
212	Insulator	18-657-783-362	
213	Screws	15-171-399-008	
214	Screws	00-615-471-082	Dual Switch Mod.
215	Lk. Washer	00-855-047-040	
218	Manual Reset Rod . . .	18-658-024-006	
221	Clip	15-171-399-003	
223	Label	71-142-151-001	

Item	Description	Part Number	Usage
227	Solenoid 48 VDC Int. . .	18-724-497-005	Electric Reset Option
228	Solenoid 120 VAC Int. .	18-724-497-001	Electric Reset Option
229	Solenoid 240 VAC Int. .	18-724-497-003	Electric Reset Option
230	Solenoid 125 VDC Int. .	18-724-497-002	Electric Reset Option
231	Solenoid 250 VDC Int. .	18-724-497-004	Electric Reset Option
232	Rollpin	15-171-233-006	Electric Reset Option
233	Screw	00-615-471-120	Electric Reset Option
234	Lk. Washer	00-655-047-060	Electric Reset Option
235	Bracket Assy.	18-392-074-506	

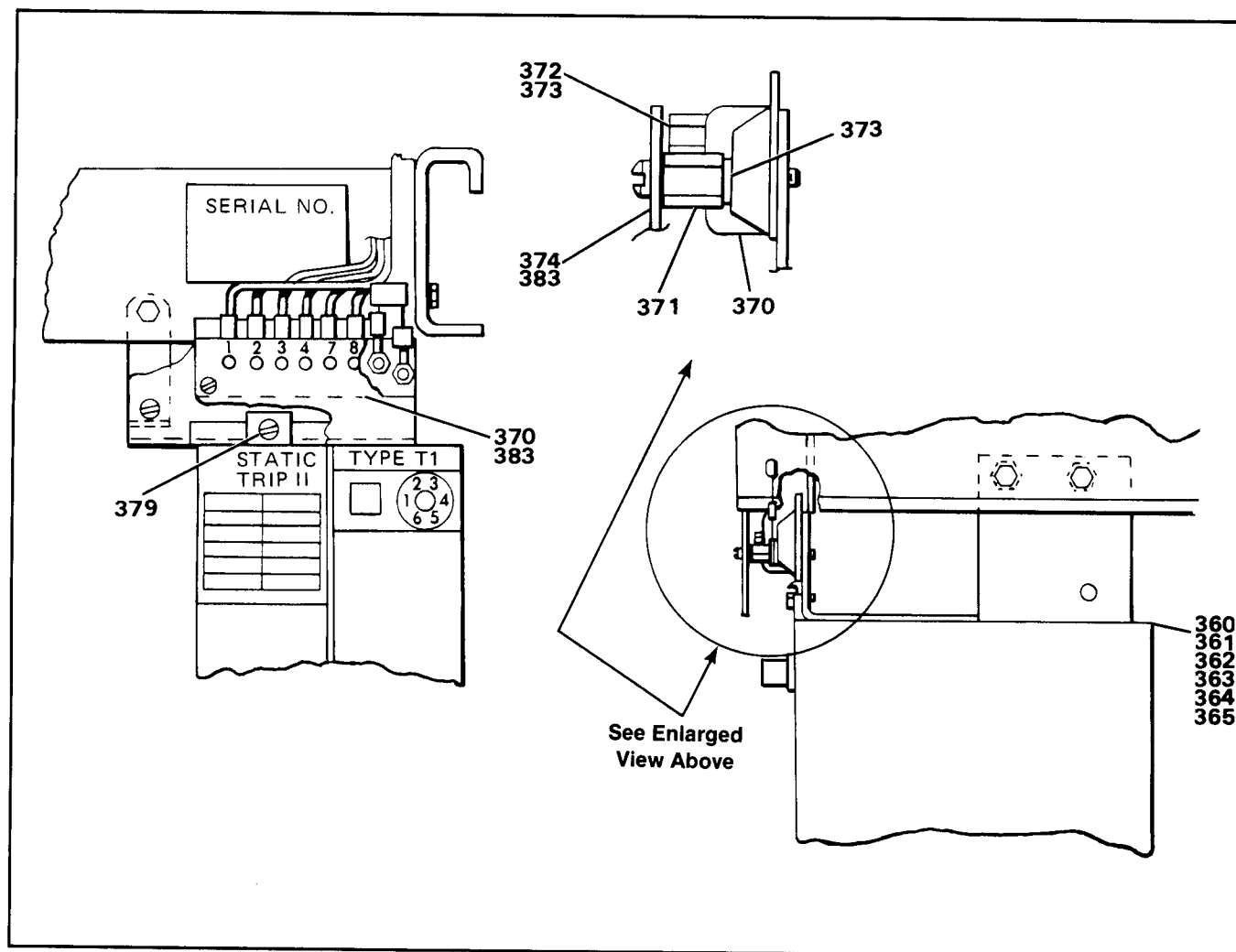


Figure 13. Static Trip Group

The Following Item Numbers Refer to Figure 13, and Are Common Parts Used on All Models.

Item	Description	Part Number	Usage
Ordering Part Number			
360	Type TI(2T) Trip Dev.	18-471-112-515	18-734-167-515
361	Type TS(2T) Trip Dev.	18-471-112-516	18-734-167-516
362	Type TSI(2T) Trip Dev.	18-471-112-517	18-734-167-517
363	Type TIG(3T) Trip Dev.	18-471-112-507	18-734-167-507
364	Type TSG(3T) Trip Dev.	18-471-112-508	18-734-167-508
365	Type TSIG(3T) Trip Dev.	18-471-112-509	18-734-167-509

Item	Description	Part Number	Usage
370	Terminal Block	15-171-051-005	
371	Standoff Screw	18-657-465-036	
372	Terminal Screw	18-657-465-035	
373	Lk. Washer	00-655-047-060	
374	Cover	18-657-822-165	
379	Screw	00-615-641-903	
383	Label	18-657-822-350	

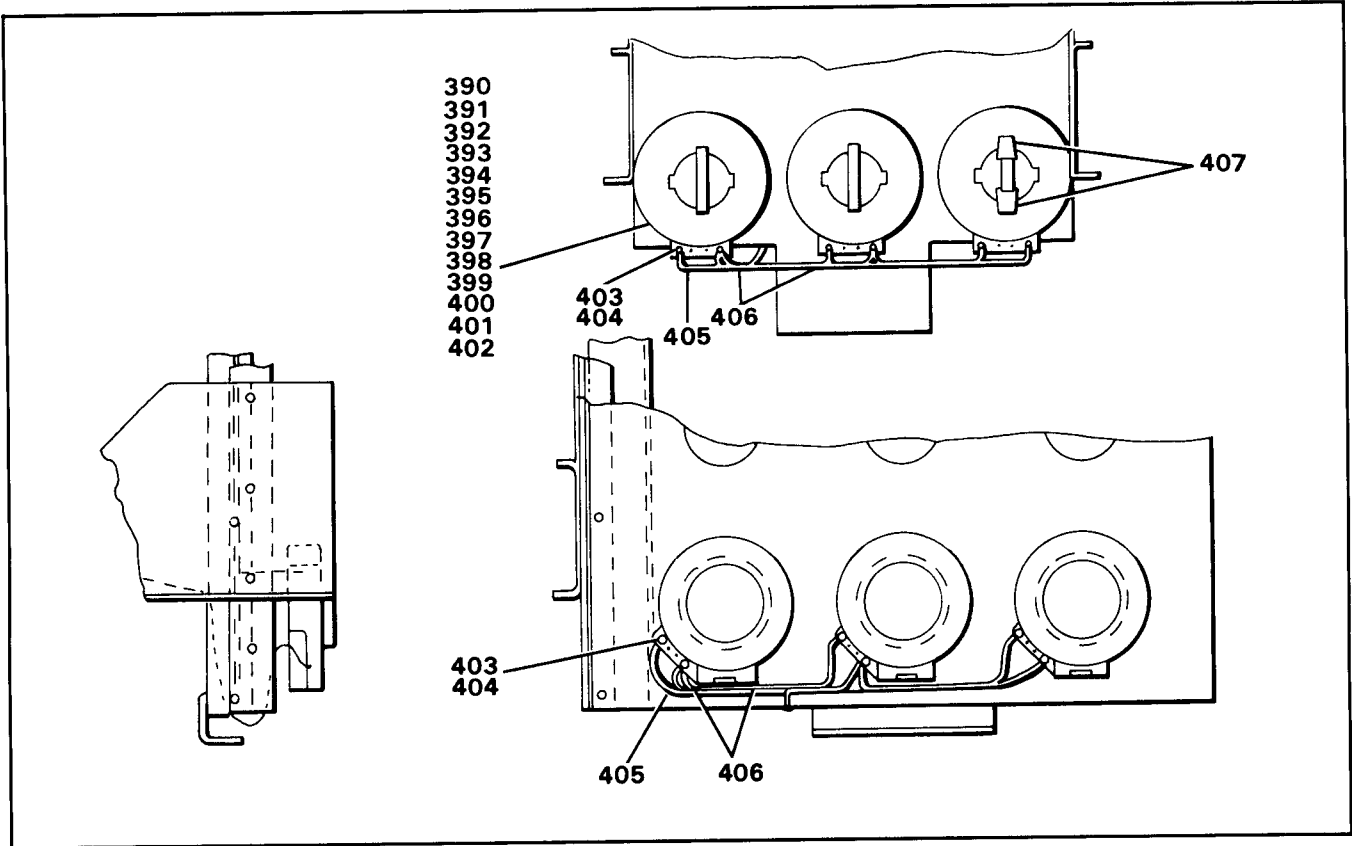


Figure 14. Tripping Transformer Group

The Following Items Refer to Figure 14, RL-400 and RL-800 Breakers With Static Trip II Trip Device.

Item	Description	Part Number	Usage
391	Tripping Transformer 200/1	61-300-052-502	RL-400 Thru RL-2000
392	Tripping Transformer 400/1	61-300-052-503	RL-400 Thru RL-2000
393	Tripping Transformer 800/1	61-300-052-504	RL-800 & RL-2000
394	Tripping Transformer 1600/1	61-300-052-505	RL-1600 & RL-2000
395	Tripping Transformer 2000/1	61-300-052-506	RL-2000 & RLX-1600
390	Tripping Transformer 80/1	61-300-052-501	RL-400 & RL-800
396	Tripping Transformer 1600/1	61-300-052-510	RL-2400 & RL-3200
397	Tripping Transformer 2000/1	61-300-052-511	RL-2400 & RL-3200

Item	Description	Part Number	Usage
398	Tripping Transformer 2400/1	61-300-052-512	RL-2400 & RL-3200
399	Tripping Transformer 3000/1	61-300-052-513	RL-2400 & RL-3200
400	Tripping Transformer 3200/1	61-300-052-514	RL-2400 & RL-3200
401	Tripping Transformer 3200/1	61-300-052-515	RL-4000
402	Tripping Transformer 4000/1	61-300-052-516	RL-4000
403	Terminal	15-172-099-003	
404	Screw	00-615-649-216	
405	Wire #18	00-557-286-003	
406	Tyrap	00-857-271-230	
407	Spacer	18-658-024-052	RL-400 & RL-800 Only

Notes

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