

**TYPE LX CIRCUIT BREAKERS
AND U-RE-LITES**
INSTALLATION, OPERATION & MAINTENANCE
INSTRUCTION BOOK 1250



I-T-E CIRCUIT BREAKER COMPANY
19th AND HAMILTON STREETS
PHILADELPHIA 30, PA

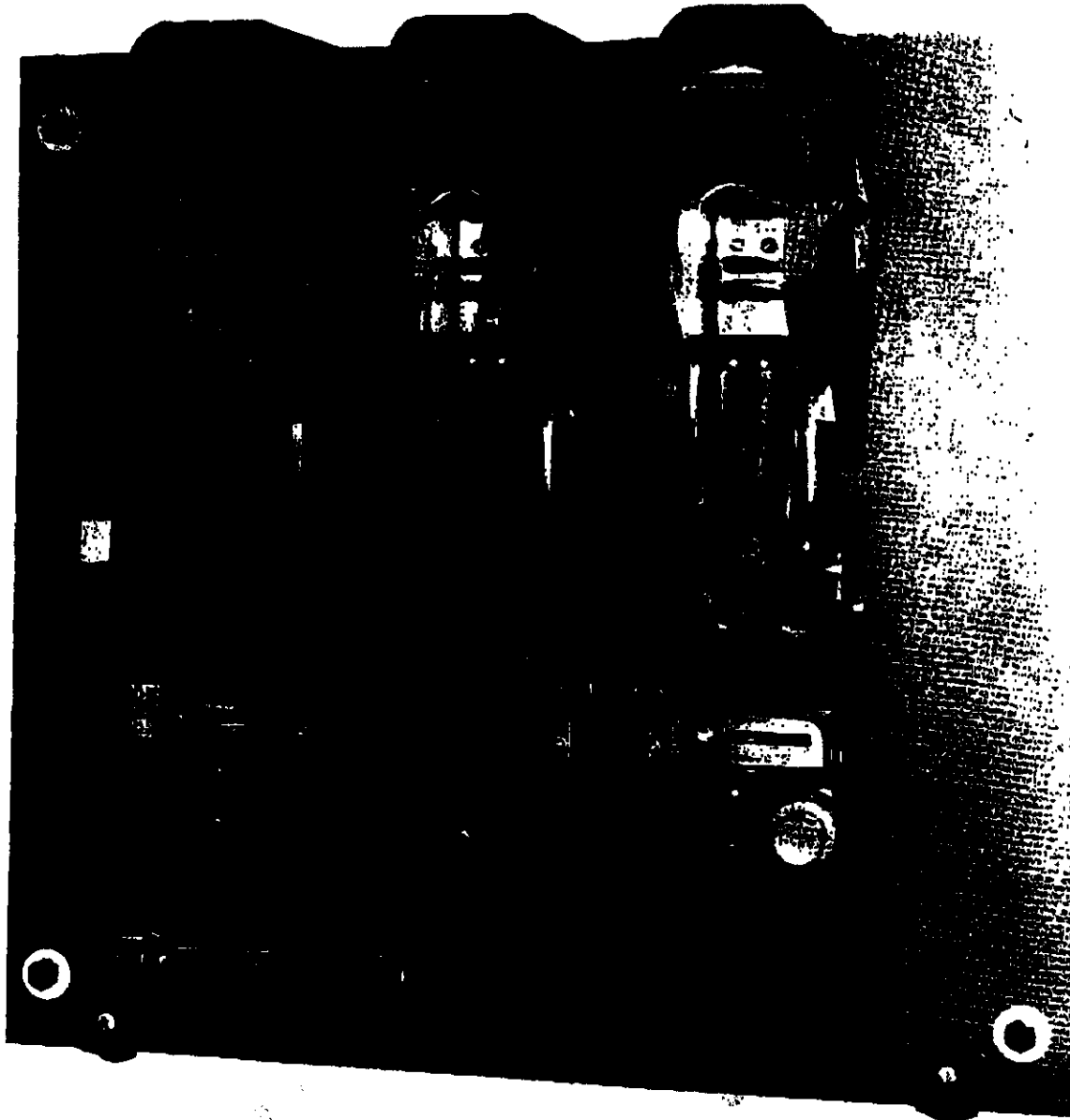
TYPE LX CIRCUIT BREAKER**INSTRUCTION BOOK 1250**

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**FIG. 1—TYPE LX MANUALLY OPERATED
CIRCUIT BREAKER**

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TYPE LX CIRCUIT BREAKER

INSTRUCTIONS FOR INSTALLATION OPERATION AND MAINTENANCE OF TYPE LX CIRCUIT BREAKERS AND U-RE-LITES

INTRODUCTION

This instruction book should be read and its contents followed for the installation, operation and maintenance of type LX circuit breakers. This book should be filed in a convenient place together with all information relative to switchgear. By following these instructions, the operator can prolong the life and usefulness of the equipment.

GENERAL MOUNTING CONSTRUCTION

"U-RE-LITE" is the term applied to an I-T-E circuit breaker enclosed within a steel box. The contacts may be closed or opened by a handle on the outside of the enclosure. The box may be easily removed for inspection of the apparatus.

U-RE-LITES are PULL-BOX MOUNTED when they are supported on a back box so that they can be secured to a wall or column. U-RE-LITES are PANEL MOUNTED when the circuit breaker base or mounting frame is secured to a panel with the studs extending through for back connection.

TRANSPORTATION

All types of LX switchgear prior to shipment, are carefully tested, inspected and crated at the factory. Every crate is plainly marked at convenient places with crate number and position. When size or other reasons make it necessary to divide the equipment for shipment, the unit number of the particular equipment enclosed is also marked on the crate, along with its weight.

Immediately upon receipt of the switchgear an examination should be made for any damage, or loss sustained during transportation. Check the contents against the packing list before discarding any packing material. If any shortage of material is discovered, notify the nearest I-T-E Circuit Breaker Company Office or Representative at once.

If it is found that the shipment has been damaged through indications of rough handling, claim for damage should be filed at once with the carrier, and the I-T-E Circuit Breaker Company promptly notified. Information as to the damaged parts, part number, crate number, purchase order number, etc., should accompany the claim.

The I-T-E Circuit Breaker Company is not responsible for damage after delivery of goods to the carrier. However, if this Company is notified of such claims, there are forms available to lend assistance in securing any adjustment.

UNPACKING

U-RE-LITES (Pull box mounted). The packing case for a pull box mounted U-RE-LITE is shown in section (Figure 2). Felt and corrugated paper act as cushions and protect the enameled surfaces. To remove the case cover and the padded blocking boards, attach a rope sling under the handle and lift the breaker from the case. **CAUTION:** Be sure that the rope sling rests up against the handle and does not interfere with the protruding closing mechanism trigger.

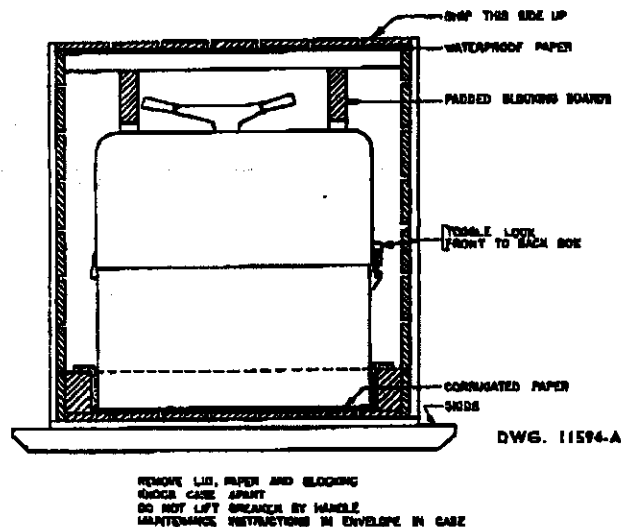


FIG. 2—TYPE LX PULL BOX MOUNTED U-RE-LITE
IN PACKING CASE.

U-RE-LITES (Panel mounted). The packing case for a panel mounted U-RE-LITE is shown in Figure 3. Felt and corrugated paper act as cushions and protect the enameled surfaces. The breakers are shipped with their panels vertical. Turn stenciled side of the case up before unpacking. To remove the circuit breaker from the packing case, remove the stenciled side, attach a rope sling under the handle and lift the breaker from the case. **CAUTION:** Be sure that the rope sling rests up against the handle and does not interfere with the protruding closing mechanism trigger.

TYPE LX CIRCUIT BREAKER (GEAR)



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OPEN TYPE CIRCUIT BREAKER: Open type circuit breakers are packed in the case shown in section (Figure 3). The breakers are shipped with their panels vertical. Turn stenciled side of case up before unpacking. To remove the circuit breaker from the packing case, remove the stenciled side, attach a rope sling to the connector bar (Figure 4) and lift the breaker from its packing case.

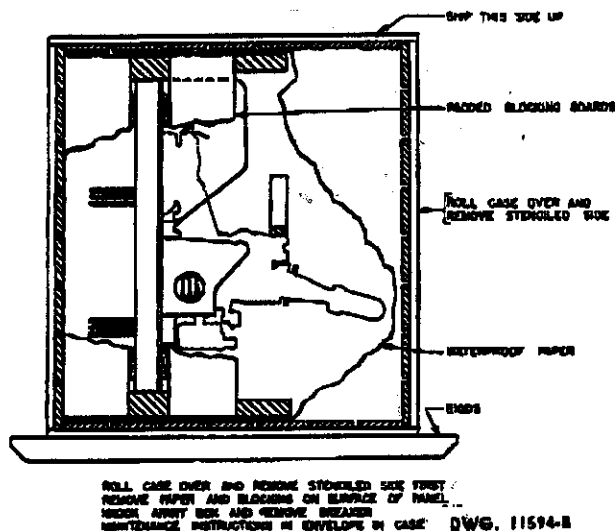


FIG. 3—OPEN TYPE LX CIRCUIT BREAKER IN PACKING CASE. DWG.

ACCESSORIES: Some of the circuit breaker devices require supplies and accessories. If these are necessary, they will be found securely attached to the apparatus. Care should be taken to see that they are removed and held in stock for the installation of the circuit breaker.

STORAGE: If it is found necessary to store the equipment for any length of time, the following precautions should be taken.

- (1) Uncrate the breaker, examine and make sure no loose parts are missing or left in the packing material.
- (2) Cover any part of the circuit breaker susceptible to rust with heavy oil or grease.
- (3) Store in a clean dry place with moderate temperature and cover with heavy wrapping paper to prevent deposits of dirt or foreign matter from settling on movable parts and electrical contact surfaces.

SAFETY PRECAUTIONS

Before making any adjustments or replacements, make certain that all control circuits have been DE-

ENERGIZED. If the circuit breaker is rigidly mounted, DE-ENERGIZE bus. Disconnect cables from leads, if there is a power source on the load side.

INSTALLATION

U-RE-LITES (Pull box mounted). In making the installation of the pull box mounted type, the circuit breaker should be removed from the pull box to facilitate mounting and pulling of cables. The circuit breaker is held in the welded pull box frame by four $\frac{1}{2}$ " bolts. Care should be taken in removing the breaker to eliminate possible damage to the auxiliary switch, or the overcurrent device.

With the circuit breaker removed, the pull box should be mounted with the cover latch at the bottom using four $\frac{1}{2}$ " diameter bolts. Care should be taken to see that the supporting surface is even and approximately vertical. Protect the breaker from dirt or damage during installation of pull box and cables. When the pull box is mounted properly and the cables are pulled into position, the circuit breaker and panel may be lifted into its proper position.

The cables are connected through lugs which are supplied as standard equipment. The circuit breaker should then be placed in the frame and securely fastened with four $\frac{1}{2}$ " bolts.

U-RE-LITES (Panel mounted), OPEN TYPE CIRCUIT BREAKERS: The panel mounted U-Re-Lite and open type circuit breakers are mounted on slate panels. This panel is suitable for mounting on the customer's supporting frame-work or steel panel. The supporting frame-work, either pipe or steel panel, should be prepared in accordance with working drawings furnished with the circuit breaker. The panel is mounted on the supporting frame by four $\frac{1}{2}$ " diameter bolts. The cover must be removed from the U-Re-Lite circuit breaker before installation.

WIRING

MANUAL OPERATED: The wiring of the main circuits should be in exact accordance with the diagram accompanying the breaker. Care should be taken to see that the line cables are connected to the upper studs. Proper lugs are furnished with the pull box mounted type U-Re-Lites.

ELECTRICALLY OPERATED TYPE: In addition to the main wiring the control circuits must be installed in exact accordance with the diagram. Adequate size wires should be used in the control circuits to insure proper operation.

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TYPE LX CIRCUIT BREAKER

The pull box or mounting frame must be properly connected to a good ground. A lug is provided on the left side of the pull box for this purpose.

GENERAL

The circuit breaker may have one, two, three, or more poles which are opened and closed simultaneously. A single throwing arm closes the breaker and a single latch mechanism holds the breaker closed regardless of the number of poles. The operating arms of all poles for multipole breakers are rigidly tied together by an insulating connector bar.

MAIN CONTACTS

DESCRIPTION: The bridge consisting of spring copper laminations initially stressed between plates, engages the upper and lower contacts to carry the load current. This bridge is mounted on a bridge arm pivoted between a pair of housings and is moved in and out of engagement by a force multiplying system of taggles. The bridge is secured to the bridge arm by two cap screws which hold it against adjusting shim plates.

MAINTENANCE: During the final closing movement of the breaker, the inner laminations of the bridge should slide $3/32$ " along the upper and lower contacts and the entire area should be engaged. If the wipe is less than this, due to wear, remove the bridge and place a shim between the bridge and the bronze plate. If this wipe is not corrected, the bridge may heat enough to destroy the spring of the copper, necessitating the installation of a new bridge. Do not use abrasive or metal polish on contacts, wipe with a clean rag, moistened with carbon tetra-chloride. The voltage drop between the stationary contacts should be 6 to 10 millivolts when the breaker is carrying its rated load.

SHUNT AND ARCING CONTACTS

The stationary shunt contact consists of a formed copper plate which serves also as a conductor and support for the arcing contact. The arcing contact is welded to the shunt contact which in turn is bolted to the top of the upper terminal.

The moving shunt contact and arcing contact are supported by levers mounted in the upper end of the contact arm. Flexible conductors carry the current to the shunt and arcing contacts.

MAINTENANCE: Severe operating conditions may result in excessive burning of the arc quencher and of the arcing and shunt contacts. Arc quenchers that have been badly burned by arcing should be replaced. To replace stationary shunt and arcing contacts, re-

move arc quencher, slip iron core from behind shunt contacts, and remove attaching screw by passing screw driver through holes in top of shunt contact.

To replace moving shunt and arcing contacts, remove two pins through flanges in the upper end of contact arm and two screws through back of arm. The arcing contact and the support and conductor to which it is welded must be replaced as a unit. The shunt contact is attached to its support by two screws. In replacing the arcing contact spring note that it is attached to the conductor washer plate by a screw which fits over a projection in back of the arcing contact support.

The shunt contact spring is attached to the contact support by a screw which may be removed after the contact is removed, and to the contact arm by a single screw.

OPERATING MECHANISM

(Refer to Figure 4.) It is required with a circuit breaker that all poles close and open simultaneously. Therefore the poles connected by a connector bar insure this simultaneous operation.

As one external force is applied for closing, and one latching mechanism is required, these particular functions are enclosed in the construction of only one pole for multi-pole breakers. The non-operating poles contain only the arcing structure, main current carrying parts, over-current trip devices, and toggle system associated with these poles. The operating pole contains in addition to the parts, associated with a non-operating pole the closing arm, operating arm, and the latching and tripping members.

With a trip-free breaker, it is necessary to be able to trip the breaker open, regardless of the position of the closing handle. To accomplish this, two latching systems are used. One latching system is associated with freeing the operating from the closing mechanism. The other latching system is designed to hold the breaker in the final closed position.

To close the breaker, the manual closing handle is first lifted to allow the trip free trigger to engage the trip free trigger roller. The trip free trigger tripper falls in place which locks the trip free trigger in position over a roller.

When the handle is pressed down, it becomes necessary that the operating arm casting to which roller is attached, follow the motion of the closing arm to which the trip free trigger tripper is attached. The operating arm acting as a part of the toggle system, co-operate with a toggle to force the bridge arm

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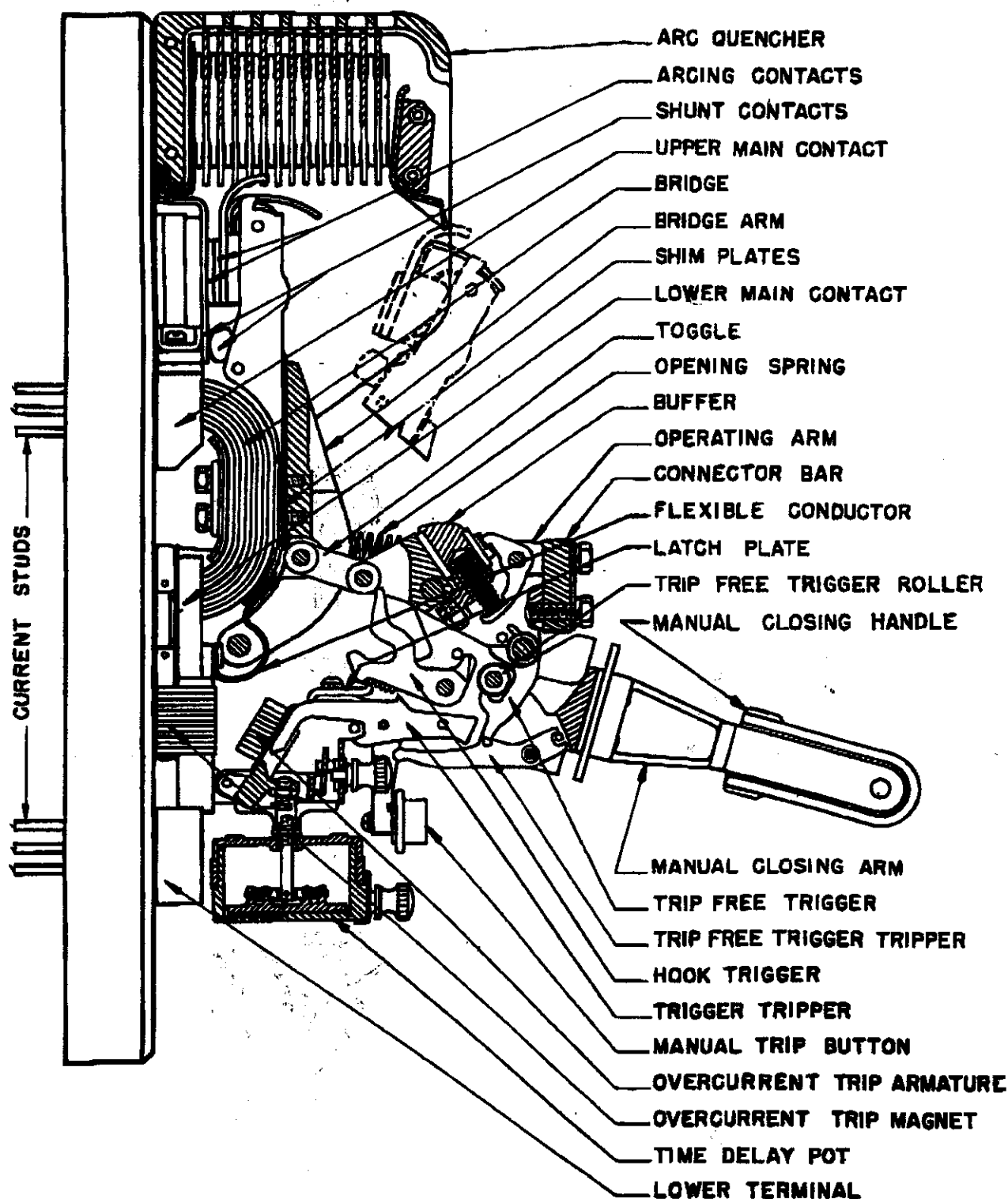


FIG. 4—TYPE LX CIRCUIT BREAKER. ARC QUENCHER, CONTACTS, MECHANISM AND OVERCURRENT TRIP DEVICE

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TYPE LX CIRCUIT BREAKER

towards a closed contact position. The bridge arm pivoted on a pin is shown with a flexible conductor.

At any point of the closing stroke, the trip free trigger tripper may be made to release the trip free trigger, and the trip free trigger roller to free the toggle system from the closing arm. At the end of the closing stroke, when the contacts are fully engaged, the hook trigger mounted on a stationary pin engages a latch plate. Until the hook trigger engages the latch plate, the handle could be backed off allowing the contacts to open, as slowly as the handle is moved (this procedure may damage the breaker). With the hook trigger engaged the breaker may be opened only through the unlatching of the trip free mechanism.

The breaker may be tripped from a closed position, by the action of the trigger tripper on the trip free trigger tripper. The trigger tripper is carried on a pivoted insulated tripper bar which extends the entire width of the breaker. This tripper bar may be operated on the overcurrent armature associated with any one of the poles, the manual trip button, or by any auxiliary devices, such as a shunt trip, undervoltage trip, or reverse current trip.

When the breaker trips open from a fully closed position, the hook trigger remains engaged with the latch plate, which locks the manual closing arm in a down position.

During an opening motion, however, a pin on the operating arm strikes the hook trigger which unlatches the latch plate and frees the closing arm. The closing arm may be lifted to reengage the trip free latching mechanism and the operating arm.

All latches are inspected at the factory. No adjustments should be required.

The buffer located on the operating arm, operates as a self-energizing friction stop.

MAINTENANCE: During inspection be sure that all parts are free with no gummed oil on the pins, springs active, and cotter pins in place. See that latch surfaces are smooth and the tripper bar connections are tight.

CLOSING OPERATION

MANUALLY OPERATED CIRCUIT BREAKERS: To close the open type circuit breaker, lift the handle to its limit and then press down with enough force and speed to close the breaker smartly but without slamming. A manual trip button is provided on all manually operated breakers.

To close the U-Re-Life type circuit breaker, lift trigger beneath handle, rotate handle clockwise to permit latches to engage, then counter-clockwise to

close. The breaker is tripped manually by lifting the trigger beneath the U-Re-Life handle and rotating handle clockwise.

A breaker equipped with back-up trip will trip if the closing motion of the handle is not continuous and smooth. A breaker that has opened on operation of back-up trip may be reclosed if the closing motion is continuous. Do not, however, mistake automatic electrical tripping for tripping on back-up trip.

ELECTRICALLY OPERATED CIRCUIT BREAKERS: Type LX circuit breakers can be furnished for electrical operation. Solenoid mechanisms are standard and when the control voltage is a-c are equipped with proper rectifiers.

All solenoid mechanisms are equipped with air cushion checks to control speed of closing and impact. The mechanisms are mechanically trip free from the circuit breaker at any point of the closing stroke. Electrically operated breakers are equipped with a non-repeat trip free relay. Also included are: a shunt trip device for remote tripping of a timed "b" switch to operate the trip free relay and a six-contact auxiliary switch.

OVERCURRENT TRIP DEVICE

DESCRIPTION: The overcurrent trip may be instantaneous or with time delay. Refer to Figure 5.

A conductor passes from the lower stationary main contact around a laminated magnet and through the panel to the current studs. A laminated armature fastened on a pivot arm is attracted to the magnet. An extension of the pivoted arm strikes the tail of the trigger tripper to open the breaker.

The surfaces of both the sucker and the cup bottom are in the shape of a two blade fan so that the surfaces are only partly in contact. Oil in the cup causes the sucker plate to be restrained momentarily when an overload occurs. The knob serves to turn and lock the cup in position.

MAINTENANCE: The normal air gap between the armature and the magnet is adjusted by clamp block sliding in the horizontal slot of the calibration adjusting plate.

Marks on the front of the supporting ring indicate the time delay position. Zero gives instantaneous tripping and three gives maximum time delay. When a heavy duty time delay is furnished, the full areas of the sucker and cup are engaged and no time adjustment is provided.

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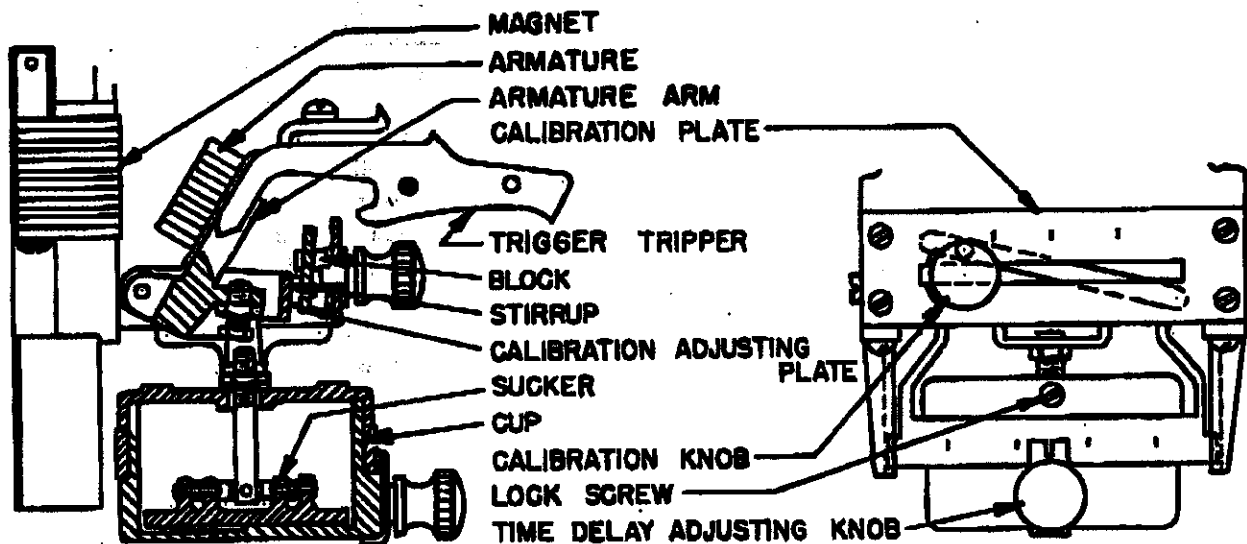
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Before putting breaker into service, clean cup and sucker thoroughly with a volatile solvent. To disassemble the cup remove the lock screw, loosen the knob, and unscrew the cup from the lid. Do not change screw adjustment between sucker and armature arm. Be careful not to damage surfaces as the delaying action will be changed. When reassembling be sure that holes are in perfect alignment, insert in the lock screw hole the proper oil from the container supplied and replace the lock screw. A half ounce of oil is sufficient. Set the calibration pointer at the proper

tripping current, turn the cup to the desired time delay index and clamp.

The time delay cup should be cleaned once a year otherwise its service might be impaired. When fresh oil is required send circuit breaker name plate data with order for new oil to factory.

SPARE PARTS: It is recommended that sufficient spare parts be carried in stock to enable the operators of circuit breakers to promptly replace any worn, broken or damaged parts. Should renewal parts be required, refer to Renewal Parts Bulletin 46917-A.



DWG. 11593

FIG. 5—TYPE LX OVERCURRENT TRIP WITH TIME DELAY.

RENEWAL PARTS FOR TYPE LX CIRCUIT BREAKERS

BULLETIN 46917-A



Note: When ordering Renewal Parts, always give the Type Letter and Serial Number shown on name plate of circuit breaker or U-Re-Lite for which parts are desired, in addition to Index Number and name of part shown on this Bulletin.

Parts marked * not shown.

Prices furnished on request.

UPPER TERMINAL ASSEMBLY (FIG. 1)

INDEX No.	NAME OF PART	PRICE PER PART
2	Upper terminal assembly (1600 Amp.)	
2A	Upper terminal assembly (1200-1000 Amp.)	
2B	Upper terminal assembly (800 Amp. and under)	
3	Stationary arc contact assembly (1600 Amp.)	
3A	Stationary arc contact assembly (1200 Amp. and under)	
4	Blowout iron core	
5	Arc quencher assembly	
5A	Arc chute assembly (750 Volts d-c)	
6	Barrier stud	
7	Barrier stud washer	

BRIDGE ARM ASSEMBLY (FIG. 1)

9	Moving arc contact support	
10	Shunt contact support	
11	Shunt contact conductor tail shield	
12	Shunt contact conductor tail	
13	Shunt contact conductor tail nut plate	
14	Bridge arm insulation	
15	Moving arc contact insulation washer	
16	Moving arc contact conductor tail (rigid)	
17	Moving arc contact spring	
17A	Shunt contact spring	
18	Moving arc hinge pin (1/4" x 1 1/4" lg.)	
19	Shunt contact hinge and stop pin (1/4" x 2-7/32" lg.)	
20	Arcing contact support insulation bushing	
21	Bridge bushing (1600 Amp. and under)	
22	Toggle pin (bridge arm)	
23	Bridge arm (1600 Amp. and under)	
24	Toggle	
25	Shunt contact block	
26	Moving arc contact assembly	
27	Braid tail plate (upper)	
28	Bridge bolt plate insulator	
29	Braid tail	
30	Bridge arm pin bushing	
31	Bridge bolt	
32	Bridge (main contact) (1600-800 Amp.)	
32A	Bridge (main contact) (600 Amp. and under)	
33	Bridge bolt plate (1600-800 Amp.)	
33A	Bridge bolt plate (600 Amp. and under)	
34	Bridge arm pin (1/2" x 4-15/16" lg.)	
34A	Operating arm pin (1/2" x 4-15/16" lg.)	
35	Bridge shim plate	

TRIPPER BAR ASSEMBLY (FIG. 1)

39	Trigger tripper stop stud (1/4" x 1-7/16" lg.)	
40	Trigger tripper spring	
41	Trigger tripper (1, 2, 3 and 4 pole)	
42	Tripper bar coupling (2, 3 and 4 pole)	
43	Tripper bar (molding)	
44	Hand trip lever and trigger tripper spacer (1, 2, 3 and 4 pole)	
45	Hand trip knob (molding)	
46	Hand trip lever	
47	Lift-up trip cam	

THROW-IN ARM ASSEMBLY (FIG. 1)

49	Trip free tripper stop pin (open) (3/16" x 1 1/4" lg.)	
49A	Trip free tripper stop pin (enclosed) (3/16" x 1-7/16" lg.)	
50	Handle support insulation bushing	
51	Hook trigger stop pin (1/4" x 6-9/32" lg.)	
52	Trip free tripper pin (open) (1/4" x 1-5/16" lg.)	
52A	Trip free tripper pin (enclosed)	
53	Hook trigger pin (1/4" x 3-13/16" lg.)	
54	Trip free tripper spring	
55	Main latch roller pin (1/4" x 3-13/16" lg.)	
56	Handle support insulator	

INDEX No.	NAME OF PART	PRICE PER PART
57	Handle support bolt head insulator (L.H.)	
58	Handle support bolt head insulator (R.H.)	
60	Hook trigger	
61	Trip free tripper	
62	Hook trigger spring	
63	Main latch roller	
64	Nameplate	
65	Throw-in arm (open)	
65A	Throw-in arm (enclosed)	
66	Molded handle	
67	Handle stud (3/8" x 4-31/32" lg.)	
68	Handle stud screw	
69	Handle support	
70	Handle support mounting stud plate	
71	Handle support extension (open) (4 and 5 pole)	
73	Handle support extension (dead front)	
74	Handle support joint (dead front)	
75	Auxiliary arm pin (enclosed) (1/4" x 2 1/4" lg.)	
76	Closing roller pin (enclosed) (9/16" x 4-23/32" lg.)	
77	Auxiliary throw-in arm spring (enclosed)	
78	Spring post (enclosed)	
79	Closing roller	
80	Auxiliary throw-in arm	

OVERCURRENT AND TIME DELAY ASSEMBLY (FIG. 1)

81	Magnet (1600-1000 Amp.)	
81A	Magnet (800 Amp.)	
81B	Magnet (600 Amp.)	
81C	Magnet (500-400 Amp.)	
81D	Magnet (300-125 Amp.)	
82	Armature arm pivot stud (1/4" x 1-3/16" lg.)	
83	Time delay cylinder guide (R.H. and L.H.)	
85	Armature support adjusting screw	
86	Armature support pivot stud nut	
87	Armature (1600 Amp.)	
87A	Armature (1200-1000 Amp.)	
87B	Armature (800-400 Amp.)	
87C	Armature (300 Amp. and under)	
88	Armature support (1600-350 Amp.)	
88A	Armature support (300 Amp. and under)	
89	Nut (armature supt. adj. screw) (1600 Amp.)	
89A	Nut (armature supt. adj. screw) (1250 Amp. and under)	
90	Armature shim	
91	Kick-off spring (instantaneous) (1600-350 Amp.)	
91A	Kick-off spring (instantaneous) (300 Amp. & under)	
92	Time delay swivel pin (7/16" x 19/32" lg.)	
93	Calibration plate	
94	Calibration block index	
95	Calibration block	
96	Calibration knob	
97	Time delay cylinder	
98	Time delay cylinder cap	
99	Time delay stirrup	
100	Time delay armature adjusting plate	
101	Time delay stirrup stud	
102	Time delay calibration index	
103	Time delay adjusting plate screw	
104	Time delay adhesive disc	
105	Time delay universal bearing	
106	Time delay cylinder support	
107	Time delay plunger bearing stud (3/32" x 21/32" lg.)	
108	Time delay plunger post pin (3/32" x 29/32" lg.)	
109	Time delay plunger nut	
110	Time delay armature adjusting plate washer	
111	Time delay plunger post	
112	Time delay swivel	
113	Lower terminal support (1600-400 Amp.)	
113A	Lower terminal support (350 Amp. and under)	
114	Braid tail plate (lower) (1600 Amp.)	
114A	Braid tail plate (lower) (1200 Amp. and under)	

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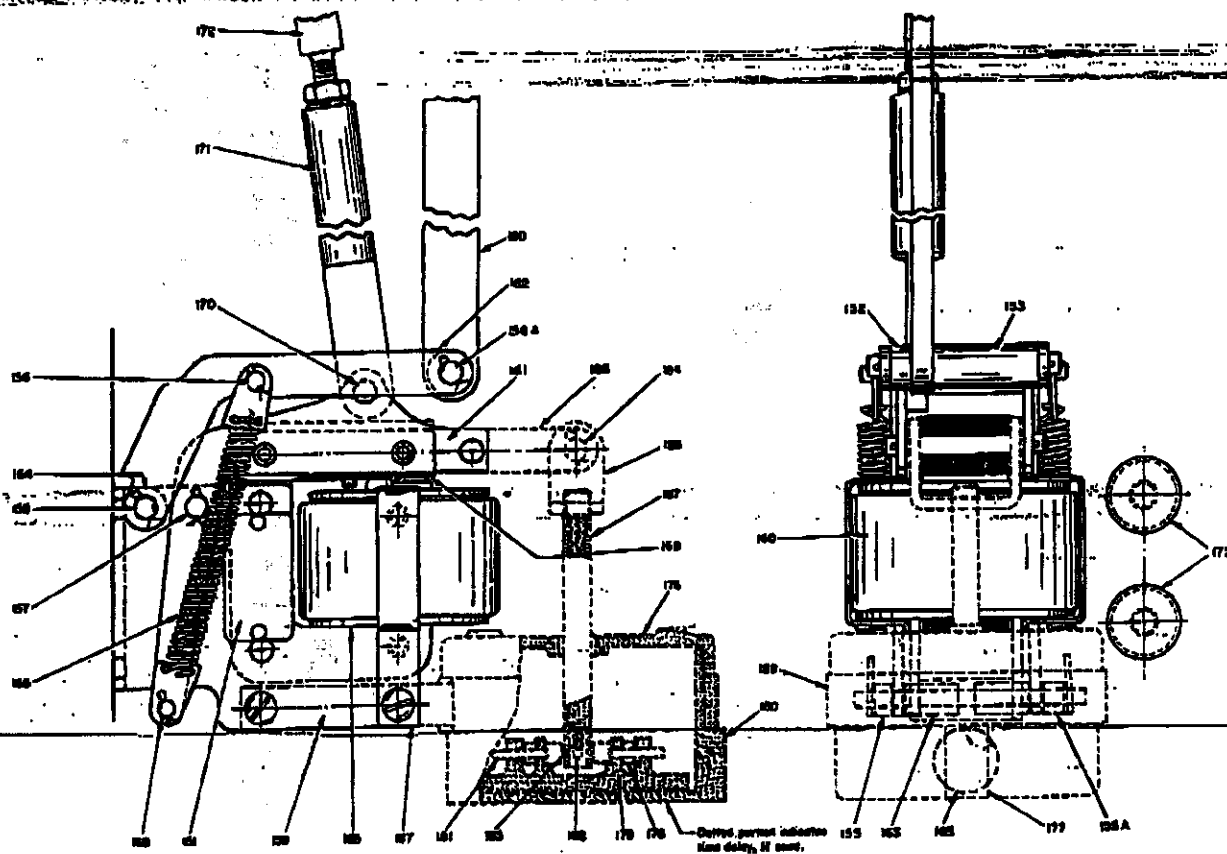


Fig. 2. LX UNDERVOLTAGE TRIP

Dwg. S-11189

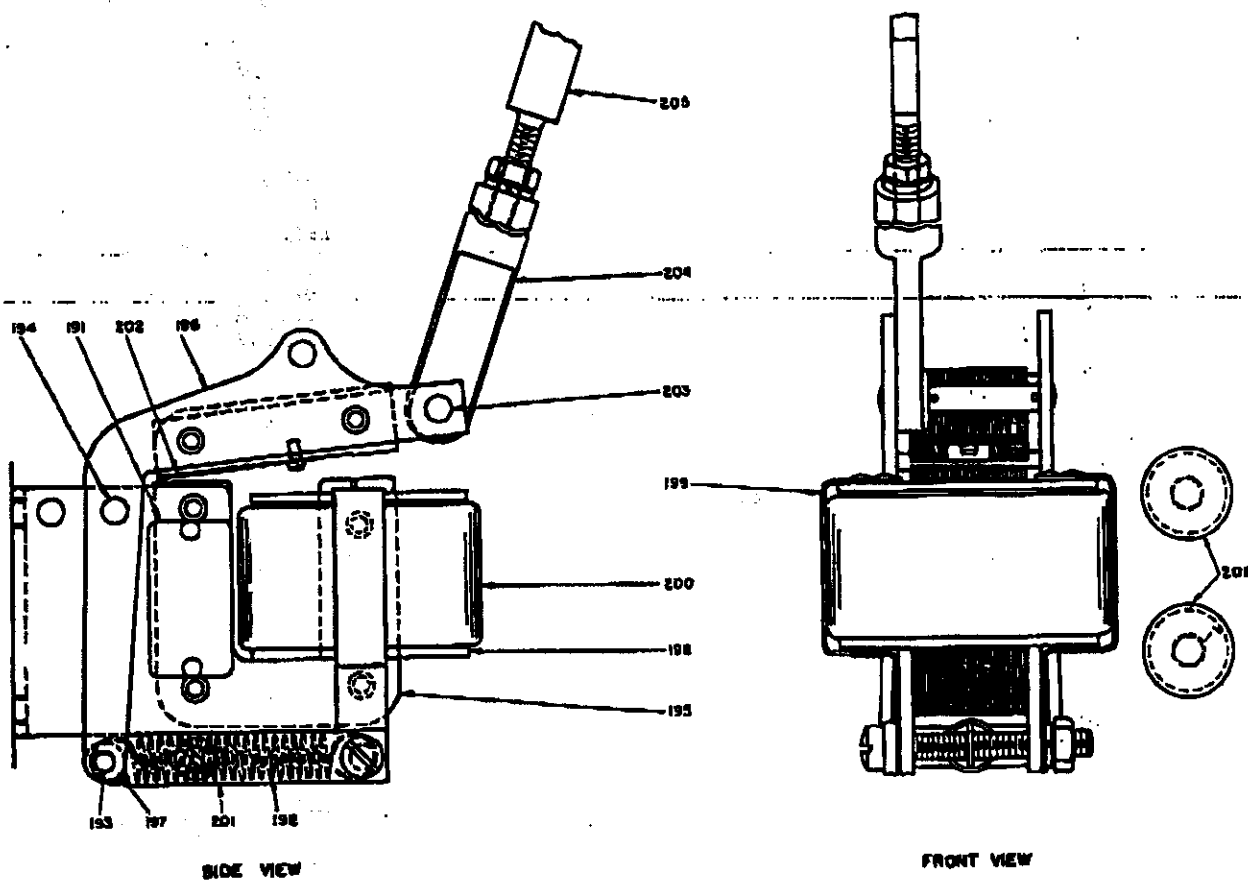


Fig. 3. LX SHUNT TRIP

Dwg. S-11402



INDEX No.	NAME OF PART	PRICE PER PART	INDEX No.	NAME OF PART	PRICE PER PART
269	Centering spring		295	Swivel stud	
270	Washer		296	Armature shim	
271	Locking bolt pin (5/32" x 1-17/32" lg.)		297	Magnet (1600-800 Amp.)	
272	Insulating plug		297A	Magnet (600 Amp.)	
273	Spring spacer		297B	Magnet (500-400 Amp.)	
274	Operating shaft key		298	Armature (1600 Amp.)	
	*PUSH BUTTON TRIP ON BREAKER—DEAD FRONT		298A	Armature (1200-1000 Amp.)	
275	Return spring		299	Dual armature (1600 Amp.)	
276	Push rod		299A	Dual armature (1200 Amp.)	
277	Push button guide		299B	Dual armature (1000 Amp.)	
278	Push button trip support		299C	Dual armature (800-400 Amp.)	
279	Hand trip knob		300	Lower terminal (1600 Amp.)	
	*PUSH BUTTON TRIP ON DOOR OR SHEET—DEAD FRONT		300A	Lower terminal (1200-1000 Amp.)	
275	Return spring		300B	Lower terminal (800-600 Amp.)	
280	Housing		300C	Lower terminal (500-400 Amp.)	
281	Escutcheon plate		301	Time delay swivel	
282	Push button		302	Time delay cylinder	
	DUAL OVERCURRENT TRIP ASSEMBLY (FIG. 5)		303	Time delay cylinder cap	
283	Armature kick-off spring		304	Time delay stirrup	
284	Time delay cylinder guide		305	Time delay stirrup stud	
285	Housing (R.H.)		306	Time delay calibration index	
286	Trip rod adjusting nut		307	Time delay adhesive disc	
287	Trip rod		308	Time delay bearing	
288	Armature arm pivot stud		309	Time delay cylinder support	
289	Armature arm adjusting screw		310	Time delay universal bearing pin (3/32" x 1/4" lg.)	
290	Calibration stirrup (L.H.)		311	Time delay swivel pin (5/32" x 2" lg.)	
290A	Calibration stirrup (R.H.)		312	Time delay adhesive disc post	
291	Trip rod guide and support		313	Time delay adhesive disc post pin (1/4" x 1-27/32" lg.)	
292	Dual magnet		315	Time delay calibration knob	
293	Trigger tripper		315A	Dual calibration knob	
294	Armature arm		315B	Instantaneous calibration knob	
			316	Calibration plate	
			316A	Dual calibration plate	
			317	Calibration block index (overcurrent setting)	
			317A	Calibration block index (instantaneous setting)	

RECOMMENDED SPARE PARTS

Note: Where many LX circuit breakers are installed, operation frequent, interrupting duty severe and when length of outage serious, the following spare parts are recommended for stock.

When ordering coils, give voltage A.C. or D.C. and the frequency of the circuit to which the coil is to be connected.

If possible give the circuit breaker nameplate data.

Recommended quantities are based on 3 pole circuit breakers.

For each additional 10 breakers installed above 25 refer to quantities listed under group 1 to 5.

INDEX	NAME OF PART	QUAN. OF CIRCUIT BREAKERS INSTALLED			INDEX	NAME OF PART	QUAN. OF CIRCUIT BREAKERS INSTALLED		
		1-5	6-10	11-25			1-5	6-10	11-25
3	Stationary arc contact assem. (1600 amp.)	3	6	9	77	Auxiliary throw-in arm spring (enclosed rotary handle)	1	2	3
3A	Stationary arc contact assem. (1200 amp. and under)	3	6	9	91	Kick-off spring (instantaneous) (1800-350A)	1	2	3
5	Arc quencher assembly	0	0	1	91A	Kick-off spring (instantaneous) (300A and under)	3	6	9
5A	Arc chute assem. (750 V. D.C.)	0	0	1	128	Operating spring assembly	6	6	12
9	Moving arc contact support	0	0	3	135	Buffer spring	3	6	9
10	Moving shunt contact support	0	0	3	145	Main latch spring (trip free trigger)	1	2	3
11	Shunt contact conductor tail shield	0	0	3		Undervoltage trip assembly (complete)	0	0	1
12	Shunt contact conductor tail	0	0	3	160	Undervoltage trip coil (state AC or DC)	1	1	1
16	Moving arc contact conductor tail (rigid)	0	0	3		Shunt trip assembly (complete)	0	0	1
17	Moving arc contact spring	3	6	9	200	Shunt trip coil (state AC or DC)	1	1	1
17A	Moving shunt contact spring	3	6	9		Reverse current trip assem. (complete)	0	0	1
25	Shunt contact block	3	6	9	220	Reverse current trip coil	1	1	1
26	Moving arc contact assem.	3	6	9	266	Trigger spring	1	1	1
40	Trigger tripper spring	1	2	3	269	Centering spring (Box part)	1	1	1
54	Trip free tripper spring	1	2	3	275	Push button trip return spring	1	1	1
62	Hook trigger spring	1	2	3					

PRICE PER		PRICE PER	
INDEX NO.	NAME OF PART	INDEX NO.	NAME OF PART
117	Lower terminal (1600 Amp.)	186	Time delay armature assembly
117A	Lower terminal (1200-1000 Amp.)	187	Time delay adhesive disc post
117B	Lower terminal (800-600 Amp.)	188	Time delay swivel
117C	Lower terminal (500-350 Amp.)	189	Time delay cylinder support
117D	Lower terminal (300-250 Amp.)	190	Operating link
117E	Lower terminal (225-175 Amp.)		
118	*Armature adjusting plate screw (instantaneous)		
119	*Armature adjusting plate spacer bushing		
120	*Armature adjusting plate support (L.H.)		
121	*Armature adjusting plate support (R.H.)		
CONNECTING BAR AND HOUSING ASSEMBLY (FIG. 1)		SHUNT TRIP ASSEMBLY (FIG. 3)	
122	Connecting bar washer plate	191	Nameplate (also index 151)
123	Connecting bar (2 pole)	192	Armature spring
123A	Connecting bar (3 pole)	193	Armature spring pin (3/16" x 1-29/32" lg.)
124	*Trigger tripper pin (1 pole) (1/4" x 2-1/32" lg.)	194	Armature hinge pin (1/4" x 1-29/32" lg.)
124A	*Trigger tripper pin (3 pole) (L.H.) (1/4" x 2-1/32" lg.)		(also index 157)
124B	*Trigger tripper pin (3 pole) (R.H.) (1/4" x 2-1/32" lg.)	195	Magnet assembly
124C	*Trigger tripper pin (3 pole) (center) (1/4" x 2-5/16" lg.)	196	Armature assembly (also index 161)
125	*Housing (L.H.)	197	Armature spacer bushing (also index 163)
126	*Housing (R.H.)	198	Coil washer (also index 165)
127	Holding latch (2 and 3 pole)	199	Coil retainer assembly (also index 167)
128	Operating spring assembly	200	Coil (requires eng. information) (also index 160)
		201	Armature stop
		202	Armature shim (also index 169)
		203	Trip link pin (lower) (1/4" x 1-1/4" lg.)
			(also index 170)
		204	Trip link head (also index 171)
		205	Trip link
		206	*Trigger pin support (also index 174)
		207	*Auxiliary trigger tripper (also index 173)
		208	Binding post (also index 175)
MAIN OPERATION ARM ASSEMBLY (FIG. 1)		REVERSE-CURRENT-ASSEMBLY (FIG. 4)	
130	Toggle pin (7/16" x 2-19/32" lg.)	211	Shunt coil core
131	Buffer lever pin (1/4" x 1-1/4" lg.)	212	Calibration stirrup
132	Buffer set screw	213	Calibration block stud
133	*Visual (enclosed)	214	Armature tripper
135	Buffer spring	215	Pole piece weight (R.H.)
136	Main latch stop pin (1/4" x 1-11/16" lg.)	216	Pole piece stop stud (1/4" x 2" lg.)
137	*Trigger pin (1/4" x 1-11/16" lg.)	217	Pole piece connector
139	Lock nut (buffer set screw)	218	Armature shim
140	Operating arm	220	Coil (shunt) (requires eng. information)
141	Main latch	221	Calibration block
142	Buffer lever	222	Pole piece pivot screw
143	Buffer brake shoe	223	Set screw (shunt coil)
144	Buffer slide assembly	225	*Stud (5/16" x 3/4" lg.)
145	Main latch spring	226	Armature
146	Buffer lever pin bushing	227	*Auxiliary trigger tripper
147	Operating arm spacer	228	Housing (L.H.)
		229	Housing (R.H.)
		230	Binding post (also index 175)
		231	Pole piece weight (L.H.)
		232	Series coil combination (1600 Amp.)
		232A	Series coil combination (1200-1000 Amp.)
		232B	Series coil combination (800-Amp.)
		232C	Series coil combination (600 Amp.)
		232D	Series coil combination (500 Amp.)
		232E	Series coil combination (400 Amp.)
		232F	Series coil combination (300 Amp.)
		232G	Series coil combination (225 Amp.)
		232H	Series coil combination (125 Amp.)
UNDERVOLTAGE TRIP ASSEMBLY (FIG. 2)		*BOX PARTS	
151	Nameplate	250	Cover (2 pole) (lined)
152	Reset link spacer bushing (1/2" x 1/4" lg.)	250A	Cover (3 pole) (lined)
153	Reset link spacer bushing (1/2" x 1 1/4" lg.)	250B	Cover (2 pole) (complete with closing mech.)
154	Spring arm spacer bushing (L.H.) (1/2" x 3/16" lg.)	250C	Cover (3 pole) (complete with closing mech.)
154A	*Spring arm spacer bushing (R.H.)	251	Back box (2 pole)
155	Reset spring spacer bushing (L.H.)	251A	Back box (3 pole)
155A	Reset spring spacer bushing (R.H.)	252	Monogram (I-T-E)
156	Reset spring pin (upper) (3/16" x 2-13/32" lg.)	253	Visual glass holder
157	Armature hinge pin (1/4" x 1-29/32" lg.)	254	Visual glass
158	Spring arm pin (lower) (1/4" x 2-9/32" lg.)	255	Ground lug
158A	Spring arm pin (upper) (1/4" x 2-9/32" lg.)	256	Nameplate
159	Magnet assembly	257	Baffle plate
160	Coil (requires eng. information)	258	Baffle plate support
161	Armature	259	Felt gasket (cover)
162	Spring arm	260	Closing mechanism
163	Armature spacer bushing	261	Closing cam
165	Coil washer	262	Closing handle
166	Reset spring assembly	263	Trigger (non-automatic trip)
167	Coil retainer assembly	264	Trigger spring nut plate (non-automatic trip)
168	Reset spring pin (lower) (3/16" x 2-19/32" lg.)	265	Plate stop (non-automatic trip)
169	Armature shim	266	Trigger spring (non-automatic trip)
170	Trip link pin (lower) (1/4" x 1 1/4" lg.)	267	Spring stud (non-automatic trip) (1/4" x 2-1/16" lg.)
171	Trip link head	268	Shaft set screw
172	Trip link		
173	*Auxiliary trigger tripper		
174	*Trigger pin support (L.H.)		
175	Binding post (complete)		
176	Time delay cylinder cap (also index 98)		
177	Time delay calibration index (also index 102)		
178	Time delay universal bearing (also index 105)		
179	Time delay adhesive disc		
180	Time delay cylinder		
181	Time delay universal bearing pin (3/32" x 21/32" lg.) (also index 107)		
182	Time delay plunger post pin (3/32" x 29/32" lg.) (also index 108)		
183	Time delay spring		
184	Time delay swivel pin (1/4" x 1-29/32" lg.)		
185	Time delay calibration knob (also index 96)		

(Continued)

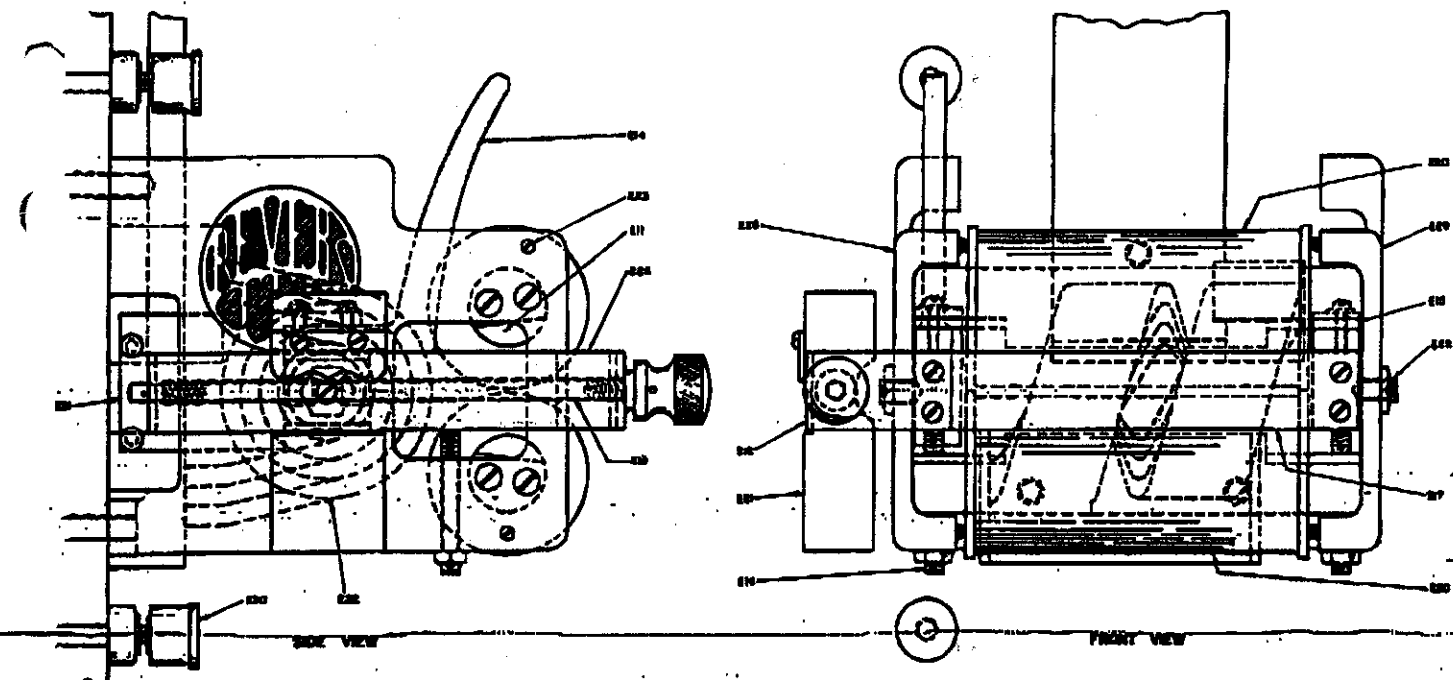
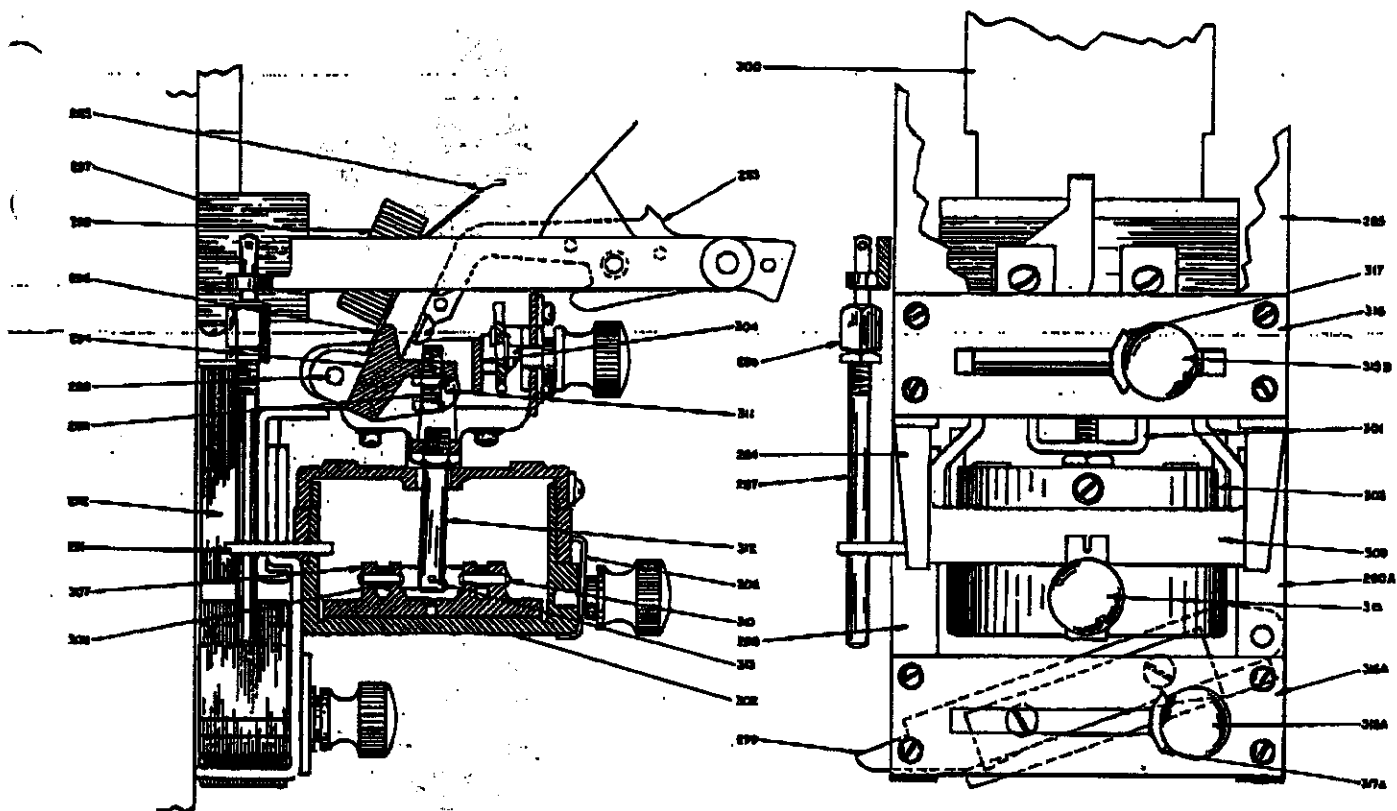


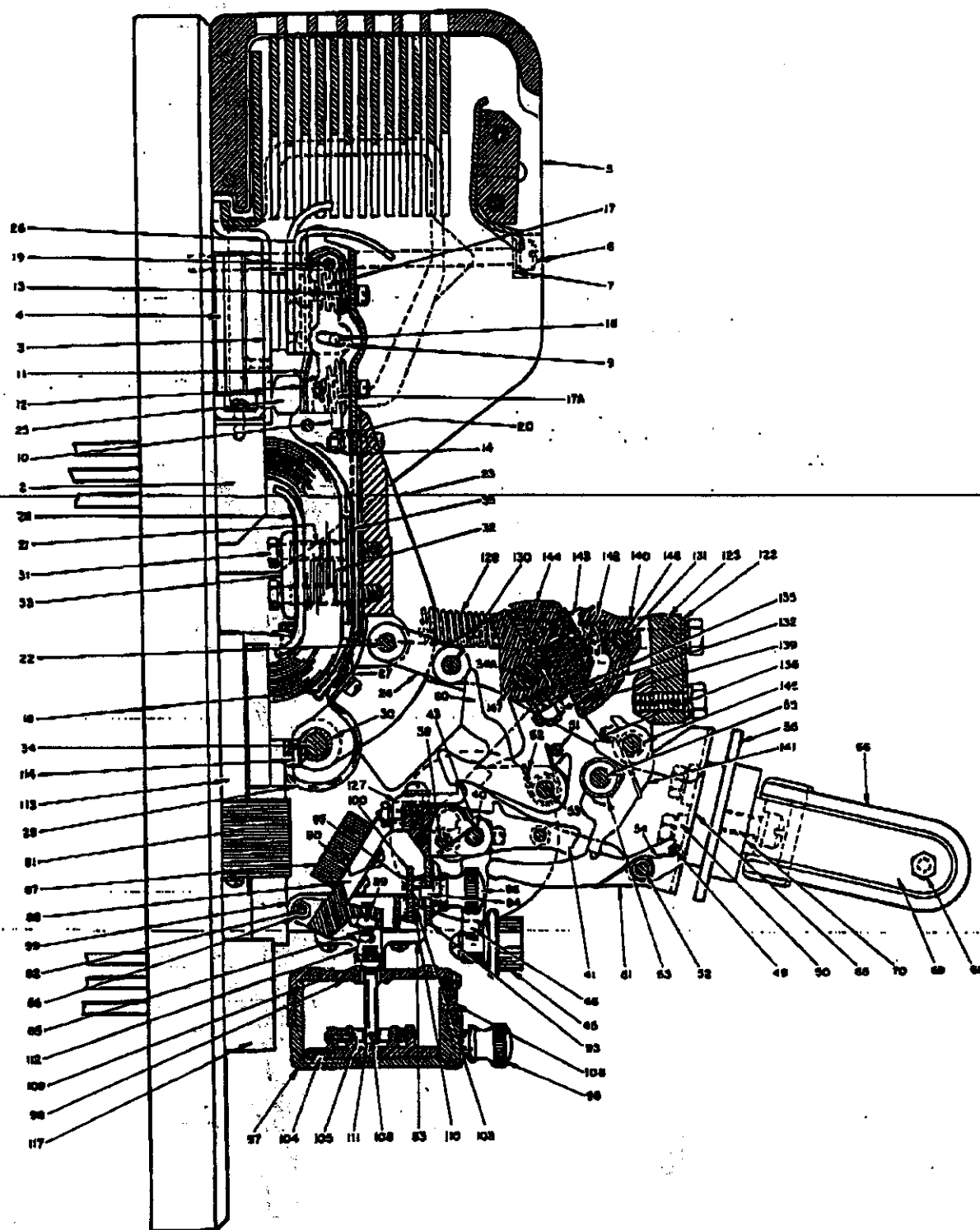
Fig. 4. LX REVERSE CURRENT TRIP

Dwg. S-11401

Fig. 5. DUAL OVERCURRENT TRIP UNIT
TYPE LX CIRCUIT BREAKER

Dwg. S-11101





**Fig. 1. TYPE LX CIRCUIT BREAKER
SECTION VIEW**

Dwg. S-11188



GENERAL ORDERING INFORMATION FOR RENEWAL PARTS

Send all correspondence and orders to the nearest office of the I-T-E Circuit Breaker Company's Representative.

When ordering renewal parts, always give the type, serial number stamped on the circuit breaker nameplate, together with the ampere and voltage rating. The renewal parts bulletin number, the index number and name of part must be given, or send sample of the part required.

DELIVERY

Unless otherwise specified, all products are shipped F.O.B. cars at plant of manufacture regardless of transportation costs being "allowed", "prepaid", or "collect". Claims for shortages, breakage or damage in shipment must be made by the Purchaser as Consignee.

FREIGHT SHIPMENTS

On shipments of 100 lbs. or over freight will be allowed to nearest railroad freight station in the Continental United States, with delivery service (store-door delivery) where common carrier provides such service. The I-T-E Circuit Breaker reserves the right to specify method of transportation and routing of shipment.

EXPRESS SHIPMENTS

On shipment of 100 lbs. or over an allowance equal to the expense of freight shipment will be made.

PARCEL POST SHIPMENT

No allowance regardless of weight.

DEFECTIVE MATERIAL AND WORKMANSHIP WARRANTY

Should latent defects in materials and workmanship develop within one year from date of shipment, the Company will either repair the defective part or parts, free of charge, F.O.B. point of shipment, provided the Company is given the opportunity to confirm the existence of defects.

The Company is not liable for contingent or consequential damages or expense in connection with the operation of apparatus.

REPAIR POLICY

Extensive repairs to circuit breaker devices should be made at the factory. Upon receipt of the device at the factory (carrying charges prepaid), an estimate of total cost will be made and authorization requested before proceeding with the work.

When repairs must be made in the field, spare part information and recommendations will be furnished upon receipt of the serial number and complete name plate information.

See note under heading *Returned Material* as any repair transaction will be expedited if handled in the proper manner.

RETURNED MATERIAL

The return of apparatus will not be permitted under any condition without proper authorization and instructions from the factory. Goods returned without complete identification in accordance with our instructions or without charges prepaid will not be accepted.

CONDITIONS OF SALE

We are not responsible for any loss, damage, detention or delay caused by fire, strike, civil or military authority, or by insurrection, or by any other cause which is unavoidable or beyond our reasonable control; nor for consequential damages.

We are not responsible for charges for installing apparatus which has been repaired or replaced, or for resulting loss of service.

I-T-E CIRCUIT BREAKER CO., PHILADELPHIA 30, PA.
19TH AND HAMILTON STREETS