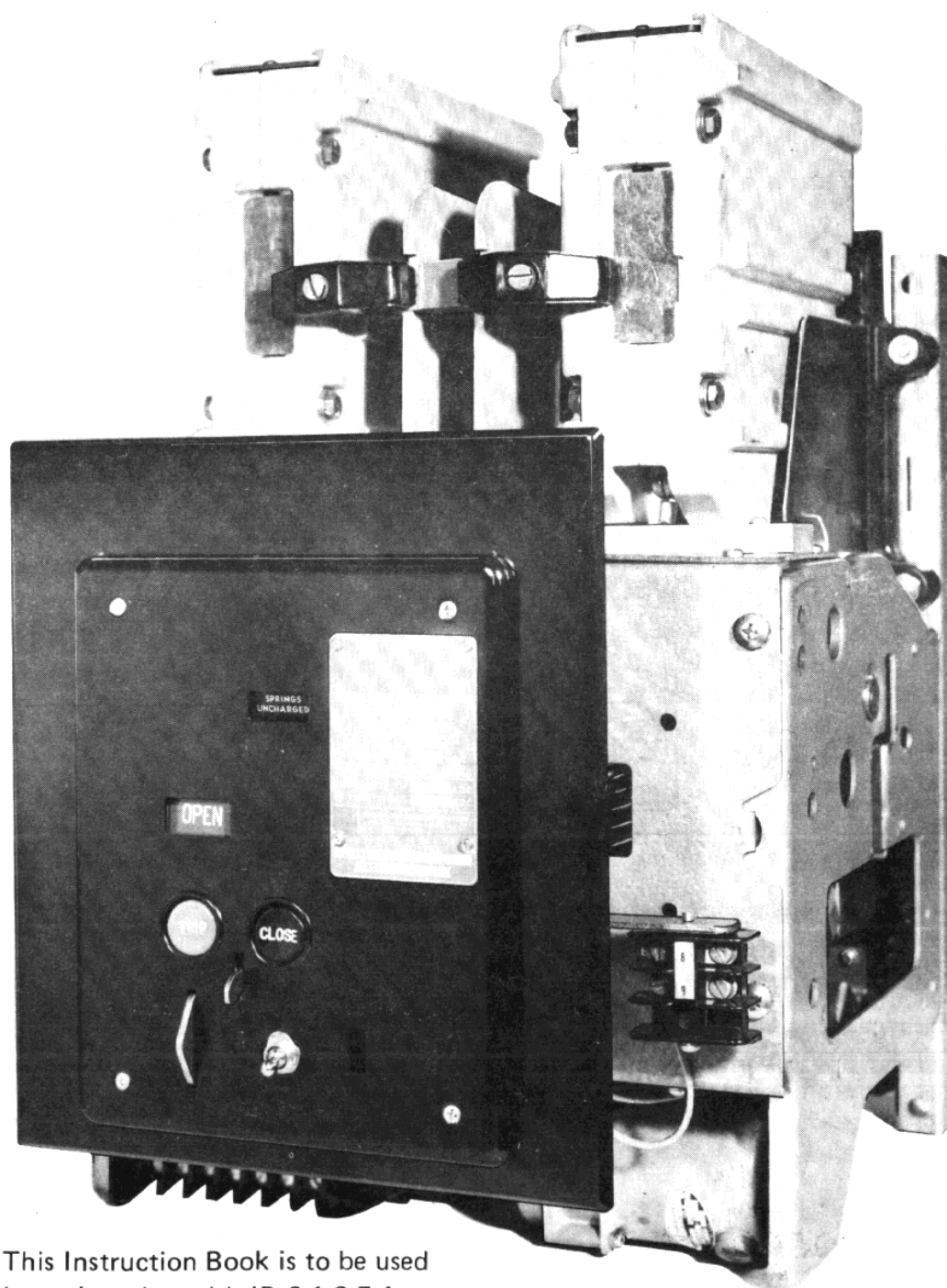


Installation/Maintenance Instructions

D-C Low-Voltage Power Circuit Breakers

Type KF-600 and KF-1000 Field-Discharge Circuit Breakers



This Instruction Book is to be used
in conjunction with IB 6.1.2.7-1

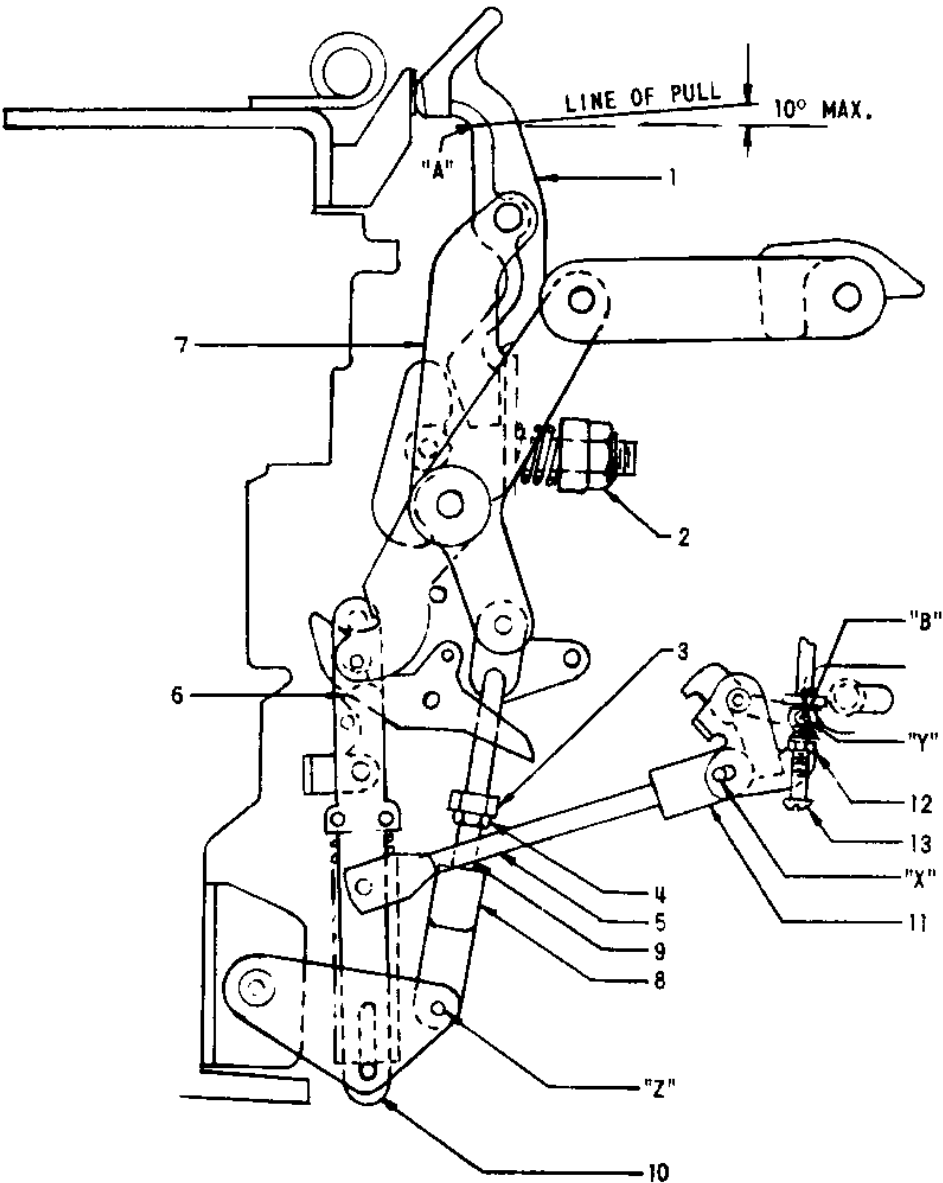


Fig. 1—Field-Discharge Contact

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes the matter should be referred to the nearest District Office.

INTRODUCTION

The field-discharge circuit breaker is primarily designed to protect the field of a generator or motor from damage due to high induced voltage surges. The contacts, of the field-discharge pole assembly, short circuit the field through a resistor an instant before the contacts of the circuit breaker open; and disconnect the field from the short-circuiting resistor an instant after the contacts of the circuit breaker close.

The field-discharge circuit breakers are rated in accordance with NEMA Standards SG3-1965 Part 18 for 250 V dc nominal voltage.

Refer to the basic instruction and renewal parts bulletins as listed at the bottom of this page.

INSTALLATION

Follow the installation procedures as described in the instruction bulletins listed below.

DESCRIPTION AND OPERATION

The field-discharge circuit breaker is a two-pole circuit breaker having a field-discharge pole assembly mounted between the two main poles on the same base.

The field-discharge pole assembly, as shown in Fig. 1, consists of an arc-chute assembly, movable-contact assembly, support bracket, stationary-contact assembly, opening and closing springs, operating linkages, and the necessary assembly hardware. The assembly is constructed and adjusted so that the field-discharge contacts and the contacts of the circuit breaker "overlap" as described in the following paragraphs.

FOR SAFETY: Keep hands clear of all operating parts. The center pole is spring loaded and latched in both the "OPEN" and "CLOSED" positions. The action of the center pole is opposite to that of the outside poles.

When closing the field-discharge circuit breaker, the field-discharge contacts must open the instant immediately following the closing of the circuit-breaker contacts.

When opening the field-discharge circuit breaker, the field-discharge contacts must close the instant immediately before the opening of the circuit-breaker contacts.

This contact overlap is important if the field of the generator or motor is to be protected. Adjustment, when required, should be made as described under ADJUSTMENTS.

MAINTENANCE

The field-discharge circuit breaker requires the same maintenance as described in IB 6.1.2.7-1.

ADJUSTMENTS

The adjustments described in IB 6.1.2.7-1, for the K-Line® circuit breakers, also apply to type KF circuit breakers with the following exceptions:

1. Contact adjustments apply only to the outside poles (follow procedure for K-600 circuit breakers on page 11). Center-pole adjustments are described below in section FIELD-DISCHARGE ASSEMBLY.
2. Omit the mechanism adjustment, except the Latch Engagement (Bite) on page 13.
3. Omit the overcurrent-trip device adjustments.
4. Omit the shunt-trip device adjustment, and adjust as described below in section SHUNT-TRIP DEVICE.

TRIP TRAVEL (See Fig. 1)

1. Remove nylon rod head (11) from pin "X".
2. Charge breaker closing springs either manually or electrically. After springs are charged, manually close the breaker.
3. Insert a .250 gauge between screw (13) and trip pin "Y". Slowly, but firmly, depress breaker trip button to its maximum trip position. The breaker should trip. If the breaker does not trip, loosen lock nut (12) and adjust trip screw (13) so that breaker will trip.
4. Follow procedure in Step 2. Insert a .234 gauge between screw (13) and trip pin "Y". Slowly, but firmly, depress breaker trip button to its maximum trip position. The breaker should not trip.
5. After checking adjustments for Steps 3 and 4, lock trip screw (13).
6. Attach rod head (11) to pin "X" and replace its retainer.
7. With the breaker closing springs discharged, and breaker in open position (outer poles open), force the center-pole spring guide (10) up to its limit. Check that pin "Z" fits freely in hole for lower rod head (8). To adjust rod (9) for proper length, remove pin "Z" and spacer bushing and turn rod head (8) so that pin "Z" can be easily inserted. Replace spacer bushing and pin and secure pin with its retainer.

BASIC INSTRUCTION AND RENEWAL PARTS BULLETINS

Type	Instructions	Repair Parts
KF - 600 and KF - 1000	IB 6.1.2.7-1	RP 6.1.2.8-1
Urelite® Enclosure	IB 6.1.2.7-7	None

FIELD-DISCHARGE ASSEMBLY (See Fig. 1)

Contact Pressure

1. The breaker should be in the "OPEN" position (center pole closed).
2. Hook spring scale to contact arm (1) at Point "A". The required pull to part the contacts should be between 7 and 10 pounds. Note: A low-voltage bell and battery circuit may be connected across the center-pole upper and lower current studs to determine when the contacts separate.
3. Should adjustments be required, turn nut (2) clockwise to increase contact pressure or counterclockwise to decrease pressure. Recheck contact pressure after making adjustments.

Contact Overlap

Check breaker closing contact overlap as follows:

1. Remove arc chutes.
2. Slow close the breaker as described in IB 6.1.2.7-1, page 11. When the outside-pole movable contacts just touch, the center-pole contacts should remain closed.
3. Continue the slow-close operation until the outer bridge or movable contacts have moved approximately one-half the travel distance from the point of contact for the arcing contacts to fully closed position. The center pole should release or open.
4. Should the center pole not release as described above, make adjustments by loosening lock nut (4) and turning adjusting nut (3). Should the center pole release too late, turn adjusting nut clockwise. If the release is too early, (before the outside poles touch), turn the adjusting nut (3) counterclockwise. Lock the adjusting nut (3) with lock nut (4) after making adjustments.

To check for contact overlap in opening, proceed as follows:

1. Close the circuit breaker (center pole open).
2. Use a screw driver or bar to hold back the contact holder (7).
3. Depress the manual-trip button on the escutcheon, to release latch (6).
4. Allow the center-pole contact to move slowly towards its closed position until it touches its stationary contact.
5. The outside poles should trip open when the center-pole gap is within the range of touching with normal contact wipe to 5/32 inch distance between the moving and stationary contacts.
6. If adjustment is necessary, lengthen or shorten the connecting rod (5) as required. Making the rod (5) longer will make the outside poles open later, and shortening the rod (5) will make the outside poles open earlier.

SHUNT-TRIP DEVICE (See Fig. 10, IB-6.1.2.7-1)

Excess Trip Travel

1. Back off trip rod (1) until it will not strike the trip pin ("B", Fig. 1) with the armature pushed up as far as the travel will allow.
2. Close the breaker.
3. Push up armature (6) at "A" as far as the armature travel will allow.
4. Hold the armature as positioned in Step 3 and turn trip rod (1) down until the breaker just trips.
5. Release armature (6) and turn trip rod (1) down an additional two turns.