INSTRUCTIONS

GEI-93863A
SUPPLEMENT TO
GEI-50299

AK POWER CIRCUIT BREAKERS

ELECTRICALLY AND MANUALLY OPERATED

TYPES

AKF-2-25

AKF-2A-25

GENERAL ELECTRIC

TYPE AKF-2 POWER CIRCUIT BREAKER

The instructions contained herein supplement Instruction Book GEI-50299 and are to be used in conjunction with it.

The AKF-2-25 breaker is a special type of AK-2 breaker. The design is intended to switch shunt field circuits of synchronous generators and synchronous motors. These breakers are usually furnished without series overcurrent tripping devices and have a continuous rating of 600 amperes. The AKF is a two pole air circuit breaker with field discharge contacts located in the center pole position.

The closing of the field discharge contacts connects a field discharge resistor across the field winding of a generator or a motor. This arrangement of main and discharge contacts allows the excitation circuit to open without inducing excessively high voltage in the field winding.

AKF-2
FIELD DISCHARGE MECHANISM
FIGURE 2

When an AKF-2-25 field breaker is opened, the field discharge contacts close before the main contacts of the breaker open; on closing the field discharge contacts open after the main breaker contacts close. This contact overlap prevents opening the field circuit.

The outside pole contacts (1) close when the pin through eccentric bushing (12) is driven toward the pole base by the closing mechanism. The motion is transferred through eccentric bushing (12), link (10), link (14), crossbar (6) and the contact carrier pivoting about pivot pin (3).

Before the center pole contacts (7) open there is a moment of overlap when the center pole and outside poles are simultaneously closed. The motion to the center pole is transferred through eccentric bushing (12) link (10), link (14), cam follower (13), link (15), link (8), pin (20) and contact (7) pivoting about pivot pin (22).

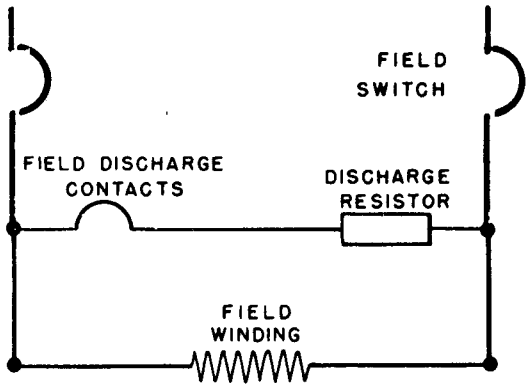


Figure 1. (415A845) Typical Connection Diagram

The opposite operation of opening the outside pole contacts and closing the center pole contacts is effected by the same linkage with a reversal of motion.

The mechanism of the AKF-2-25 is a spring actuated over center toggle type of mechanism. Refer to GEI-50299 for description of the mechanism.

ADJUSTMENTS

The contact wipe on the outside poles is measured and adjusted by following the procedures of GEI-50299 Page 6 and 7. Proper contact wipe must be maintained between 3/32 to 5/32 of an inch.

The center pole is measured in the same manner as the outside poles, and must be maintained between 3/32 to 5/32 of an inch.

The center pole contact wipe is adjusted by shims (18). This is a factory adjustment that is not likely to require field service. Should shims (18) be changed, it is necessary to reposition lower pivot block (17). A check of Lower Pivot Block (17) position is made by moving cam follower (13) in circular arc section of the link cam (15). The center pole contact is closed, and does not move because circular arc of (15) and center pole movable contact (7) have a common center in pin (22).

The AKF-2-25 field breaker has overlap of contacting on all poles for both opening and closing operations. The overlap condition is achieved by adjustments to eccentric bushing (12) and eccentric pins-adjustable (2).

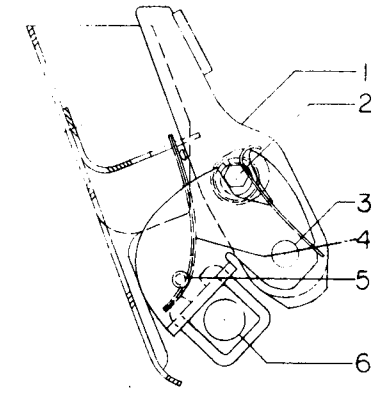
NOTE: The pair of eccentric bushings (12) must be set to the same position before links (10) and tie bolt (11) are replaced.

Replace the links and tie bolt, and measure contact wipes on all poles. The outside poles may have contact wipe adjusted individually by eccentric bushings (12).

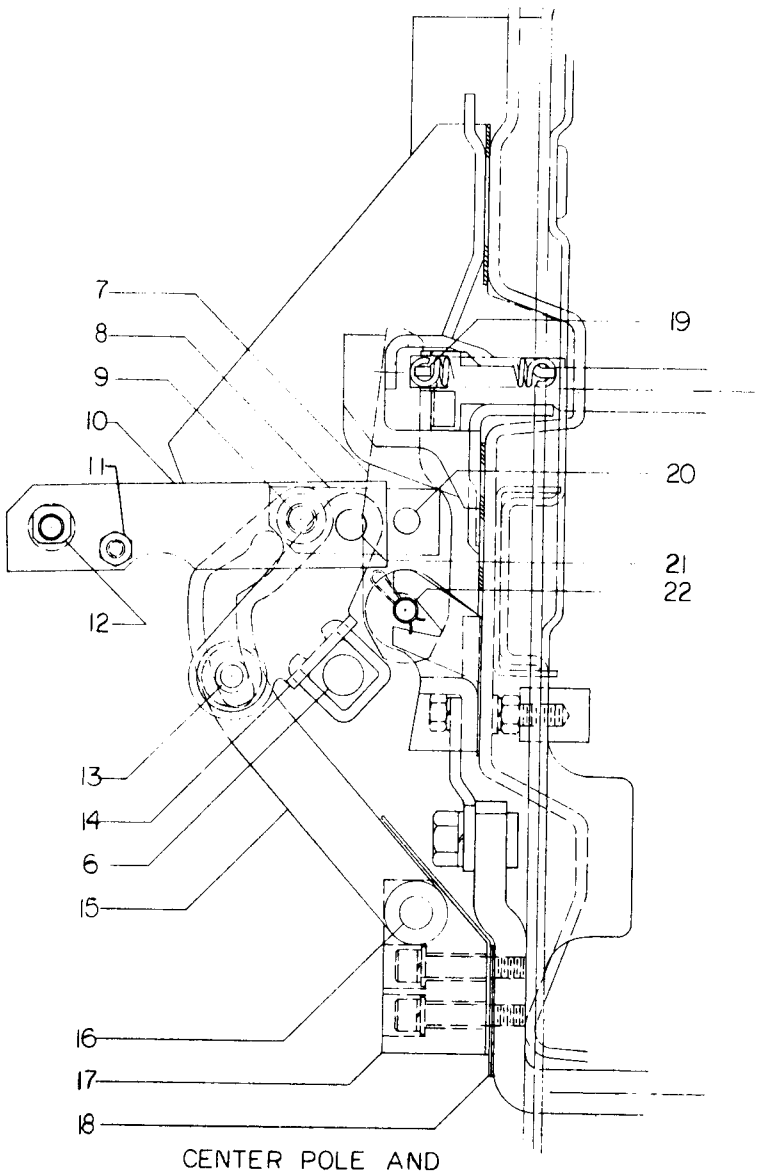
Open the center pole, and press toward back frame with fingers to check slight detenting action between cam follower (13) and link-cam (15). This force is acceptable if over five pounds. Adjustment of eccentric bushing-adjustable (12) will achieve the position of the detent action for open center pole contact.

Check all contact wipes.

Test the overlap by connecting all poles in series. Check continuity of circuit for overlap during both closing and opening operations. A gas discharge lamp or an oscilloscope can be used to detect overlap action.



OUTSIDE POLE
CONTACTS AND BARRIER



CENTER POLE AND
FIELD SWITCH MECH.

1 MOVABLE CONTACT - OUTSIDE POLES
2 ECCENTRIC PIN - ADJUSTABLE
3 PIVOT PIN
4 SPRINGS
5 PIN
6 CROSS BAR
7 MOVABLE CONTACT - CENTER POLE
8 LINK
9 PIN
10 LINK
11 TIE BOLT
12 ECCENTRIC BUSHING - ADJUSTABLE
13 CAM FOLLOWER
14 LINK AND CROSS BAR CLAMP
15 LINK AND CAM
16 PIVOT PIN
17 LOWER PIVOT BLOCK
18 SHIMS
19 STATIONARY CONTACT
20 PIN
21 PIN
22 PIVOT PIN

Figure 2. (121C2873) Field Switch Mechanism and Contact Assemblies.

CONTACT OVERLAP (See Fig. 2)

Contact overlap is a factory setting that is obtained by adding or removing shims under the lower pivot block (17) during assembly. When the proper overlap is obtained the lower pivot block (17) is pinned at the factory and should not be changed in the field.

REPLACEMENTS

MOVABLE CONTACT SPRINGS (4) (See Fig. 2)

1. With contact (1) in the open position, take a screwdriver and push upward on the bottom of the "U" shaped springs (4) freeing them from pin (5) and contacts (1).

2. Remove the one end of pin (5) from its mounting in the contact carrier and slide new springs (4) into proper position.

NOTE: If springs (4) are not going to be changed at this time. They should be reformed to original shape before installing. To check springs place closed end of springs on a level table and measure the open end of springs to the table top. This dimension should be approximately 5/16 of an inch. Form springs until this dimension is obtained.

3. With spring (4) in proper position push down on pin (5) and slide pin (5) into its mounting hole in the contact carrier.

MOVABLE CONTACTS (1,7) (See Fig. 2).

1. Remove arc quencher (See "Replacement" under "Arc Quencher", page 6 of GEI-50299).

2. Remove operating mechanism (See "Replacement" under "Mechanism", page 10 of GEI-50299).

3. Remove movable contact springs (4) (see above).

4. Remove movable contacts (See "Movable Contacts" under "Contact Replacement", page 8 of GEI-50299).

5. Replace new contacts in reverse order.

6. Replace operating mechanism.

7. Adjust contact wipes. (See Adjustments).

8. Replace arc quenchers.

STATIONARY CONTACTS (19) (See Fig. 2).

1. Remove stationary contacts (See "Stationary Contacts" under "Contact Replacement", page 7 of GEI-50299).

2. Replace contacts in reverse order (See "Reassembly" under "Contact Replacement", page 8 of GEI-50299).

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