TROUBLESHOOTING INSTRUCTIONS FOR AK-2A BREAKER "LANYARD" TYPE RACKOUT MECHANISMS IN AKD-5 SWITCHGEAR

I. GENERAL

A. Before installing breakers in the drawout equipment it is extremely important that both the stationary primary contacts in the house and the primary disconnects on the breaker be wiped clean and recoated with D50H47 zinc chromate contact grease. Failure to coat both surfaces with grease immediately prior to the installation of the breakers into the equipment will result in galling of the silver plated surfaces of the primary disconnects and possible damage to the rackout mechanism because of the excessive force built up. Damage will also occur if the improper grease is used. The D50H47 grease supplied with the equipment and breakers should be the only lubricant used for sliding contact surfaces of the primary disconnects.

B. An exploded view of the rackout mechanism is shown on Page 21, Figure 10 in GEK-7315. All reference numbers in these instructions can be found in this illustration.

II. FAILURE TO RACK IN

A. If the breaker after engagement of the primary disconnects cannot be racked to the full in position, the following procedure should be observed:

1. Release the breaker track lock latches (97) and then continue to operate the rackout mechanism. With the latches released, pulling on the rackout operating handle (29) will move the mechanism to the full in position and the red knob (160) will retract. The mechanism should then be reset by pulling the red knob (160) to the release position. Operation of the mechanism by the rackout handle (29) will then move the mechanism outwardly until it is again engaged with the track (94) to which the breaker is fixed. Further operation of the mechanism will then move the breaker to the test position. At this point, the red knob should again be pulled to reset the mechanism. When the mechanism reaches the full out position, the breaker should be pushed forward until the track latches (97) can be reset.

Since the failure to rack in has been found to be a sporadic malfunction which usually will correct itself once the breaker has been racked completely into the disconnects, it is recommended that the breaker should be racked in and out four to six times after the procedure outlined above has been followed.

III. FAILURE TO RACK OUT

A. If the breaker has been fully racked in and reached a point (while still engaged in the primaries approximately 0" to 1/2" out from the full in position) at which the force required on the racking handle becomes excessive, (maximum force should be 90 lbs.) and further motion of the breaker cannot be obtained, the following procedure should be observed:

1. Operate the breaker several times (manually, with the maintenance handle, or electrically if control power is available). Since the red knob is out in the release position, this will result in trip free operation of the breaker. This jarring of the breaker will usually align the primary disconnects sufficiently to break the grip of the stationary fingers on the breaker studs and permit removal of the breaker by the racking mechanism.

2. If operating the breaker mechanism fails to dislodge the primary disconnects the breaker can be removed. To do this, the track latches (97) should be rotated to release the inner track and the breaker from the rackout mechanism. The AK-2A-25 and AK-2A-50 breakers can be removed by pulling the breaker. The larger breakers, the AK-2A-75 and AK-2A-100, may require the use of a block and tackle. A rope can be looped over the bottom front channel member of the breaker frame and the block and tackle or a "come-along" can be used to pull the breaker out of the housing. It is extremely important that the track latches (97) are released when using this method for removing the breaker. Otherwise damage to the rackout mechanism stop pins will result.

IV. The rackout mechanism can also be damaged if both of the track latches (97) are not engaged when attempting to rack the breaker into the house.

V. The rackout mechanism is designed to automatically lock the breaker into the house when in the full position. To be certain that this locking feature is functioning properly the following procedures should be followed:

1. Rack the breaker to the fully in (connected) position. When this position is reached, the red knob (160) will automatically retract. The position of the inner housing bottom plate with respect to the stationary horizontal barrier should be marked. The red knob (160) should then be pulled to the "release" position and the rackout handle operated The initial motion of the breaker and mechanism should be to move the breaker further into the house. This motion is very slight (1/64 to 1/32) and can be detected with respect to the stationary horizontal barrier.

MODIFICATION INSTRUCTIONS FOR REPLACEMENT OF AK-2A BREAKER "LANYARD" TYPE RACKOUT MECHANISMS IN AKD-5 SWITCHGEAR WITH NEW TYPE JACK-SCREW RACKOUT MECHANISM

TOOLS REQUIRED

FLAT END PUNCHES
- 3/32" dia.
- 3/16" dia.
- 1/4" dia.

WRENCHES
- 7/16 socket, open end or box
- 9/16 socket, 18" extension, ratchet handle
- 9/16 open end

TRU ARC PLIERS
- Size 2

SCREW DRIVER
- 6" blade

NOTE: Use of a drop cloth in the breaker compartment to catch miscellaneous hardware may be desirable.

The exploded view of the rackout mechanism, Figure 10, in GEK-7315 should be used. Reference numbers in these instructions correspond with those in the illustration.

1. Remove 1/4"-20 bolts from CT's and lower CT's to permit access to main shaft. If necessary to disconnect leads from CT's, the leads should be marked and the polarity markings on the CT's should be noted.

2. Remove cable cover. This cover is mounted on the left side of the cubicle and covers the cable to the operating handle. It is secured to the horizontal barrier with three 1/4" x 20 screws.

3. Remove CT brackets and replace with brackets with larger mounting holes. CT's must be lowered to accommodate larger shaft. Brackets should be removed and replaced one at a time to minimize distortion of primary disconnect alignment.

4. Remove Spirolox rings (205) from the main shaft (109). Rings have small notch in end into which a screwdriver blade or the tip of a knife blade can be inserted. By carefully lifting the end of the ring and at the same time moving the ring laterally along the shaft, the ring can be removed from the groove. With the rings removed, the pins in the shaft can be driven out with a flat 3/16" diameter punch.

5. Next, the tru arc rings (209) should be removed from the 1/4" diameter pins (2 each side) on the pulley support plates (82). The four (1/4"-20) bolts (226) lockwashers (227) and washers (228) should be removed from the front edge of the pulley support plates (82). The rivets (211) should be removed from bracket (84) and the brackets removed from left side only. The rivets can be removed by driving the center pin through with a 3/32" diameter punch and prying out the rivets. The four 3/8"-16 bolts (224) and lockwashers (225) should next be removed from the back edge of the pulley support plates (82).

6. The ratchets (38) can now be moved in toward the center on the shaft (109).

7. When the rollers (41) are clear of the cams in the rear of track (89) the mechanism can be turned and lifted out of the house.

8. Six rivets (210) should be removed from the top and bottom of the inner house side sheet (138). These rivets can be removed by driving the center pin through the rivet with 3/32" diameter punch from the head side. When the pins have been removed the rivets can be collapsed and pried out or driven out from the clinch side with a 3/16" diameter punch.

9. The mounting plate (73) is secured to the side of the housing with 6 drive rivets (210). These rivets are removed by driving the expansion pins out from the clinch side. The rivets can then be collapsed and driven out with a punch. There are two 3/8"-16 bolts which secure the mounting plate (73) to the rear barrier. These bolts must be removed from the rear using a 9/16" socket and a ratchet extension wrench.

10. The entire left hand side of the track and mechanism can now be removed.

11. The new assembly can be replaced by lining up the holes in the mounting plates with the holes in the side barriers. Drive rivets are used to mount the plate (73) to the side sheet. The heads of these rivets will now be on the inside. The rivets are set by driving the center pins flush with the heads. A 1/4" diameter punch should be used. The 3/8"-16 bolts should be replaced from the rear of the gear.

12. The new shaft should be assembled on the ratchet shafts. The Spirolox rings should be placed on the new main shaft before it is assembled to the ratchets. Do not secure the new shaft to the ratchets at this time.

13. The inner house and track should be pushed into the house as far as they will go. Rotate the ratchets to the extreme rear horizontal position and lift the mechanism into the house. Fit the cam followers into the cam slots in the rear most position and slide the ratchets out of the shaft until the cam followers (41) are completely engaged. The pulley support plate on the right side should be lined up with the 1/4" diameter pins (63) projecting out from the track rollers (64). Where the support plate has been lined up on these pins, the 3/8"-16 bolts can be placed in the rear holes and secured. The bracket (84) can be replaced and riveted. The 1/4"-20 bolts can be placed in the front of the support plate and secured.

14. The left hand support plate can be lined up with the 1/4" diameter pins and the pulley pin (161) should be aligned with its mating hole in the mounting plate. Care should be exercised to be certain that the cable between the differential pulleys is not caught between the pulley support plate and the bracket at the rear of the mounting plate. This cable must be inside the tab on the mounting plate. Replace the 3/8"-16 bolts in the rear of the plate taking particular notice that the lower bolt is shorter than the upper one. It is important that this short bolt be used in the proper place, otherwise interferences with the pulleys will result. Replace the bracket (84) using drive rivets (211) to secure in place. Replace the 1/4"-20 bolts in the front of the pulley support plate.

15. Replace the 4 tru arc rings on the pin in the support plates. Line up the shaft holes and pin with new longer pins. Secure the pins in the shaft by sliding the Spirolox rings into the grooves provided in the shaft.

16 Replace the four tru arc rings on the 1/4" diameter pins extending through the pulley support plates.

17. Replace the CT's. Move brackets down to the limit of the over-sized holes for CT's mounted below the shaft. Move those on the center pole up to the limit of the holes. This will permit maximum clearance to the main operating shaft.

18. Replace the cable cover.

19. Operate the mechanism through several cycles as indicated in the instruction book under "Operation" pages 17 and 19. Check operation again after the breaker has been replaced on the tracks. The breaker should be racked in and out 5 or 6 times to be sure that the rackout mechanism is functioning properly.