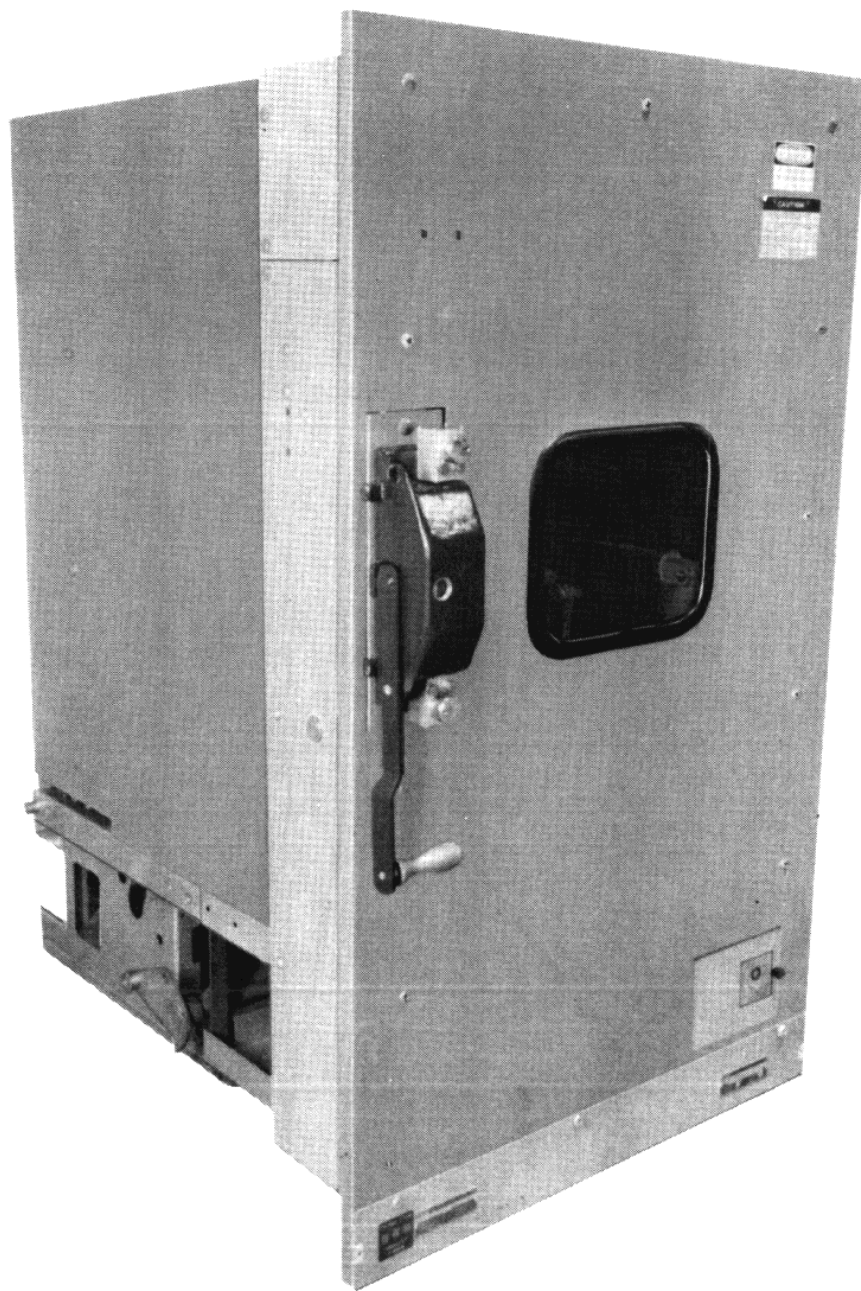


Installation/Maintenance Instructions

Drawout Interrupter Switch Metal-Clad Switchgear

Type HK-HPL-C



Brown Boveri Electric

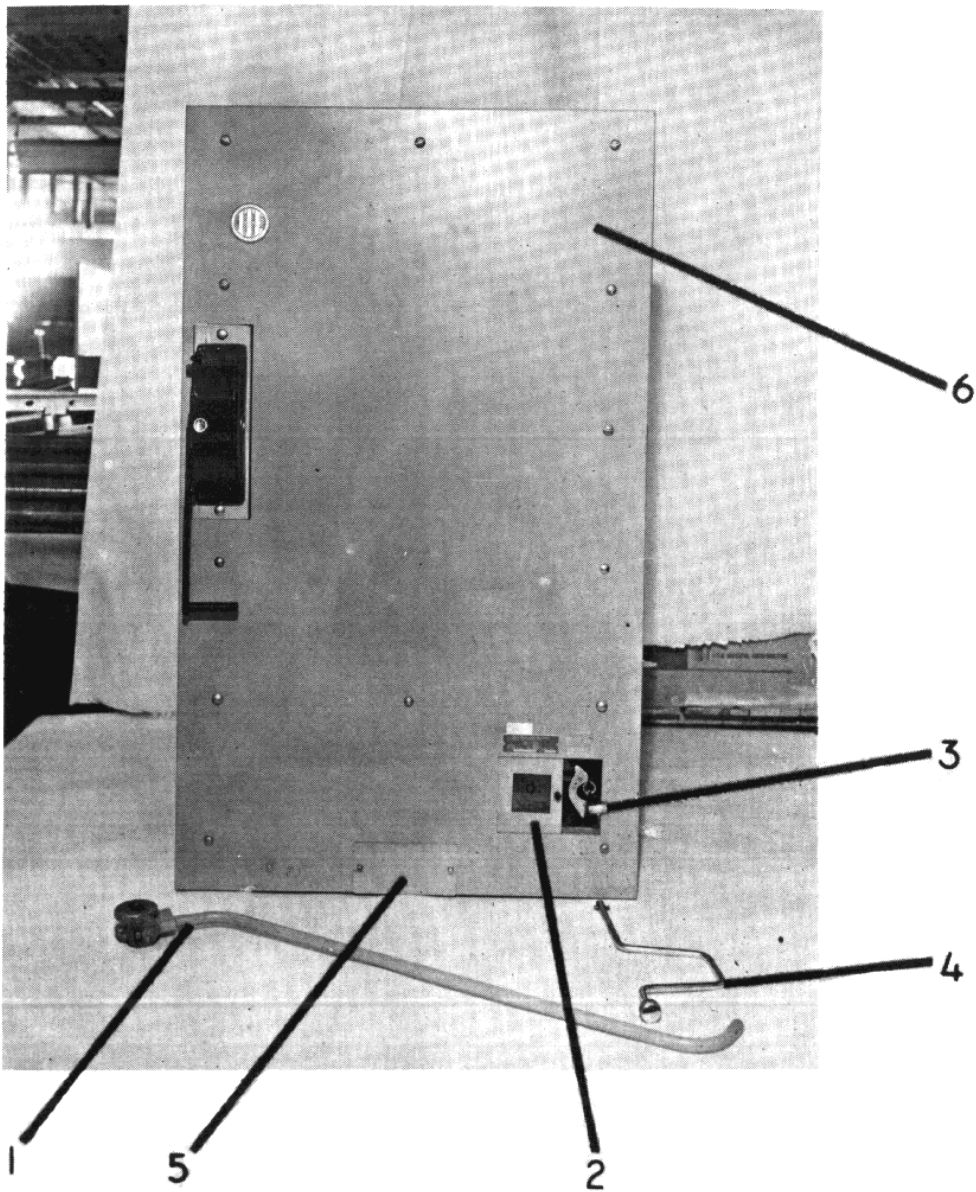


Fig. 1

INSTRUCTIONS FOR HK-HPL-C DRAWOUT INTERRUPTER SWITCH

INTRODUCTION

These instructions for installation, operation and maintenance of HK-HPL-C drawout interrupter switch should be read carefully and used as a guide during installation and initial operation.

The specific ratings of each model are listed on the individual nameplates.

File these instructions in a readily accessible place together with drawings and descriptive data of the switchgear. These instructions will be a guide to proper maintenance of the equipment and prolong its life and usefulness.

The interrupter switch is a 600A, 15kV maximum, three-pole two-position (on-off) device which utilizes snap-action, quick-make, quick-break contacts. It is available with or without fuses. Figure 2 shows the device with standard CL-13 or 14 current-limiting fuses installed. Other fuse types can be made available on special order.

The manual close-open handle is mechanically interlocked with the interrupter switch racking mechanism so that it cannot be closed unless it is in the connected or disconnected position and cannot be moved from the connected or disconnected position unless it is open.

RECEIVING AND STORAGE

Immediately upon receipt of the HK-HPL-C interrupter switch, examine the cartons to determine if any damage or loss was sustained during transit. If damage or rough handling is evident, file a damage claim at once with the carrier. However, we will lend assistance if notified of claims.

Unpack the interrupter switch as soon as possible after receipt. If unpacking is delayed, difficulty may be experienced in making a claim for damages not evident upon receipt. Use care in unpacking in order to avoid damaging any of the parts. Check the contents of each carton against the packing list before discarding any packing material. If any shortage of material is discovered, promptly notify the nearest company representative. Information specifying the purchase order number, carton number, and part numbers of the damaged or missing parts should accompany the claim.

HK-HPL-C interrupter switches should be installed in

their permanent locations as soon as possible. If the interrupter switches are not to be placed in service for some time, it is advisable to provide adequate means of protection. This may be done by keeping it in the original shipping carton and storing in a warm, dry and uncontaminated atmosphere. If the interrupter switch cannot be stored properly due to circumstances, it must be thoroughly checked before going into service to insure it has not absorbed moisture, rusted or become generally contaminated in any way.

INITIAL INSPECTION

General

Prior to the initial installation of the interrupter switch into a switchboard, certain preliminary inspections should be made to insure proper operation. Even though each interrupter switch is completely adjusted and tested at the factory, shipping and handling conditions could cause defects.

Insulation Structure

All insulated parts should be checked for damage. Any dust or dirt should be removed by air or wiped with a clean lint-free cloth saturated with an oil-free solvent. This is important because the soot or dirt can accumulate and, with moisture, can place the interrupter switch in jeopardy, dielectrically.

Arc Chute and Contact Examination

With the fuses removed and viewing the interrupter switch from the top, check that the arc chutes are in position and are not cracked or broken. Turn the racking crank to the connected or disconnected position and close the interrupter switch as outlined below. Check that the main contacts are properly engaged and that the auxiliary arc blades are engaged in the arc chutes. Open the interrupter switch.

NOTE: If maintenance is to be performed or it is necessary to have greater access to the arc chutes or contacts for examination, then, it is required to remove two side barriers and at least one inner barrier. Figure 2 shows a side barrier removed. Barriers are removed by removing six screws fastening each barrier.

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.

OPERATING SEQUENCE

1. Check worded and color-coded position indicator built into manual handle housing which indicates switch and spring position.

2. With switch in closed position as in Figure 3, handle is the up position. Rotate handle 180° applying approximately 50 lbs. pressure. A chain-driven sprocket crank compresses the stored-energy spring until completely compressed or charged. When spring is charged, it moves over-center, discharging and driving operating plate which is connected to operating shaft. Switch is opened by porcelain links and cranks attached to shaft.

3. With switch in open position, handle will be in the down position. To close switch, reverse operating procedure.

INSTALLATION OF FUSES

To prevent shipping damage, the fuses and refills, as applicable, are shipped in separate cartons with the interrupter switch.

The CL-13 or 14 type fuses should be installed as shown in Figure 2 with the fuse indicator pin (red end) toward the rear of the interrupter switch. Set fuses down on clip lock supports toward the front of the interrupter switch. Then slide to the rear and push down the clip lock levers (1, Figure 2) to the position shown to lock the fuses in place.

When the SM-5S fuse is supplied, the holder is shipped without the refill installed; however, instructions are furnished with each type "SM" fuse refill for their installation into the fuse holder.

After this is accomplished, the SM-5S fuse holder should be installed in the interrupter switch by holding the fuse holder at approximately a 45 degree angle and engaging the two fuse holder pivot pins with the two slots in the interrupter switch front fuse clips. Then lower the fuse holder to engage the rear fuse clip. Check that the fuse is locked in place by the rear spring holder.

WARNING WARNING WARNING WARNING
NOTE: IT IS RECOMMENDED THAT THE SNUFFLER UNIT ON SM-5S TYPE FUSES BE REPLACED WITH EACH REFILL IF THE CURRENT INTERRUPTED WAS OVER 50% OF THAT AVAILABLE.

INSTALLING DRAWOUT INTERRUPTER SWITCH INTO COMPARTMENT

(See Figure 1)

NOTE: CLOCKWISE ROTATION of racking crank for inserting interrupter switch. **COUNTERCLOCKWISE ROTATION** of racking crank for removal.

Move the sliding door (2) to the left. Engage racking crank (4) and push racking unlocking lever (3) to left, then rotate racking crank counterclockwise only until resistance

to motion is felt. (DO NOT FORCE.)

Remove cover (5) and engage the fifth wheel (1) with hole inside the opening; guide and push interrupter switch into compartment until stopped. Again engage racking crank and rotate clockwise until racking mechanism automatically stops at "DISCONNECT" position. (Switch is now held captive in compartment.)

Push unlocking lever (3) to left and turn racking crank (4) approximately 1/4 turn clockwise, then release unlocking lever. Continue cranking until racking mechanism automatically stops at "CONNECTED" position.

CAUTION CAUTION CAUTION CAUTION
DO NOT ATTEMPT TO RACK ANY FURTHER.

The interrupter switch now may be put in service and be operated as required.

DRAWOUT INTERRUPTER SWITCH REMOVAL

(See Figure 1)

To remove interrupter switch from "CONNECTED" position, open the switch as required.

Move sliding door (2) to the left. Engage racking crank (4) and push racking unlocking lever (3) to the left. Rotate racking crank (4) counterclockwise (approximately 1/4 turn) then release unlocking lever. Continue cranking counterclockwise until racking mechanism automatically stops at "DISCONNECT" position.

To position the racking mechanism for withdrawal of the interrupter switch from the switchboard, again push the racking unlocking lever to the left and turn the racking crank counterclockwise only until resistance to motion is felt. (Approximately 2-3 turns DO NOT FORCE.) The interrupter switch may now be removed from the compartment.

MAINTENANCE AND ADJUSTMENTS

Periodic Maintenance Inspection

The safe and successful functioning of the connected apparatus depends upon the proper operation of the interrupter switch. Therefore, it is recommended that a maintenance program be established that will provide for a periodic inspection of the interrupter switch after 100 normal load-interrupting operations.

If 100 operations are not completed in the first year of service, the interrupter switch should be inspected regardless. The interrupter switch should also be inspected after a fuse interruption, during the fuse change over, or after 30 full load interrupting operations regardless of time period or number of operations.

Where unusual service conditions exist, it must be assumed that these conditions were considered at the time

of order; that the equipment supplied was designed for the special application; and that an appropriate supplemental maintenance program has been developed. These maintenance instructions only cover interrupter switches used under the standard usual service conditions.

The inspection should include opening and closing the interrupter switch. The unit should be visually inspected for loose or damaged parts. Arc chutes, contacts and insulation structure should be inspected as described below.

ARC CHUTES AND CONTACT MAINTENANCE

1. Access to Arc Chutes and Contacts

For access to the parts, remove two side barriers and at least one inner barrier. Figure 2 shows a side barrier removed. Barriers are removed by removing six screws fastening each barrier.

2. Lubrication of Contacts

Switches that are normally closed, only require lubrication of jaw contacts approximately every 200 close-open operations. Use NO-OX-ID special grade "A" grease manufactured by Dearborn Chemical Company.

Switches that are open long periods of time should have jaw contacts cleaned and greased lightly with NO-OX-ID as service conditions dictate.

3. Arc Chute and Arc Contact

If the moving arcing electrode (on the tip of the auxiliary, quick-break blade) shows excessive erosion, Figure 4 (approximately one-third burned away), the arc chute and quick-break blade should be replaced. To replace arc chute, loosen locknuts holding arc chute to support, (Figure 6), pull arc chute away from switch base, rotating toward hinge, and remove. Discard and replace with new unit. To replace quick-break blade, remove bolt P (Figure 5) and lift off used blade.

Operate switch to check sequence on opening. Quick-break blade should not release until its hinge end contacts latch hook O (Figure 5). On closing, quick-break blade should not leave flipper C (Figure 7) until jaw and blade have made contact at R.

4. Main Contact Adjustment

Should it ever be necessary to adjust the hinge contact pressure, loosen pressure adjusting nut S (Figure 7) until there is negligible contact pressure (no clearance) then tighten one turn. This is equivalent to approximately 30 inch pounds.

The main contact engagement should be set to (Dimension "A", Figure 3), 1/8", plus or minus 1/32".

INSULATION STRUCTURE

Insulated parts should be checked for damage. Dust and dirt should be removed by air or wiped with a clean, lint-free cloth. Do not use any oil base solvents.

DIELECTRIC TESTS

If it is desired to make dielectric tests during maintenance periods, the following test values should be used and are to be applied for a one-minute period.

	60Hz	DC
Primary Circuit	21.5kV	30kV

LUBRICATION

The interrupter switches are lubricated during factory assembly as follows:

1. All mating surfaces of moving current-carrying joints and the jaw contacts have been lubricated with NO-OX-ID special grade "A" grease manufactured by Dearborn Chemical Company.

2. All other mechanism parts, bearings, pins, etc., have been lubricated with ANDEROL 757 manufactured by Tenneco Chemical, Inc., Intermediate Division.

The interrupter switch, except as noted in "Arc Chutes and Contact Maintenance", requires no lubrication during its normal service life. However, if the grease should become contaminated or if parts are replaced, any relubrication should be done with NO-OX-ID or ANDEROL grease as applicable.

NOTES:

1. Do not use NO-OX-ID grease on the arcing contact surfaces.

2. It is recommended that the primary disconnects be maintained by renewing the NO-OX-ID grease during maintenance periods.

3. Do not use light oil to lubricate any mechanism parts.

RENEWAL PARTS

Brown Boveri Electric recommends only those renewal parts be stocked that will be required to insure proper and timely maintenance for normal operation of the interrupter switch. Copies of the applicable Renewal Parts Bulletin will be furnished on request.

The minimum quantity of assemblies and items recommended in these bulletins are predicated on infrequent replacement of parts based on accumulated tests and operating experience.

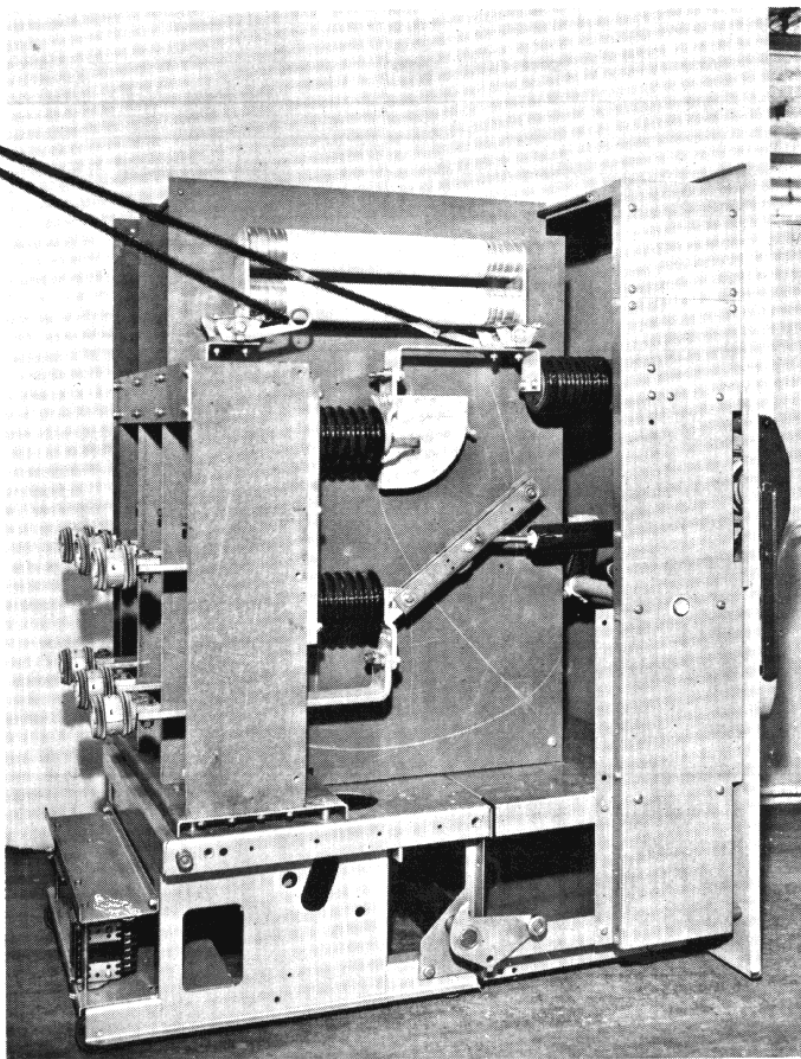


Fig. 2

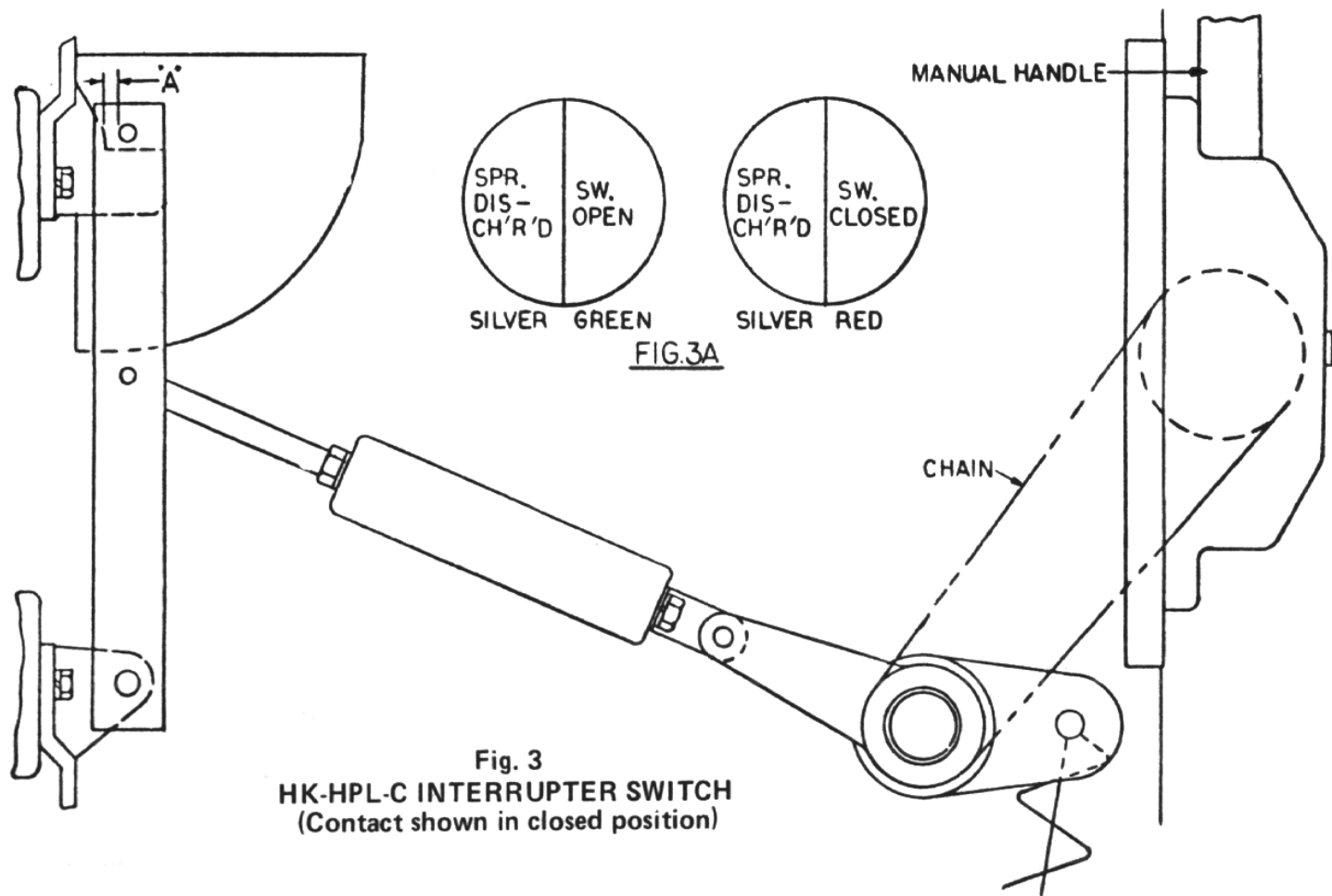
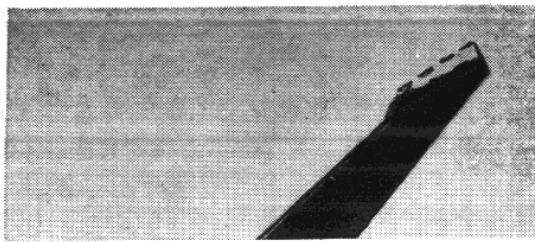


Fig. 3
HK-HPL-C INTERRUPTER SWITCH
(Contact shown in closed position)



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Fig. 4. End of auxiliary quick-break blade showing erosion at arcing tip.

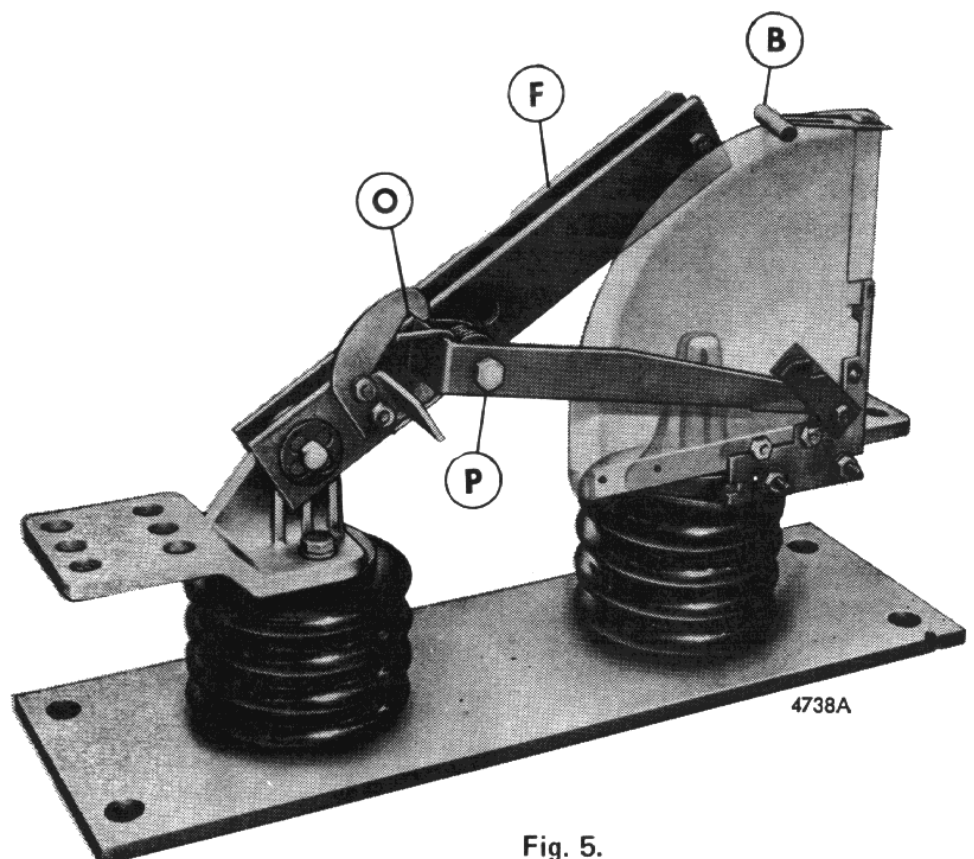


Fig. 5.
Main blade opening, auxiliary blade about to be released.

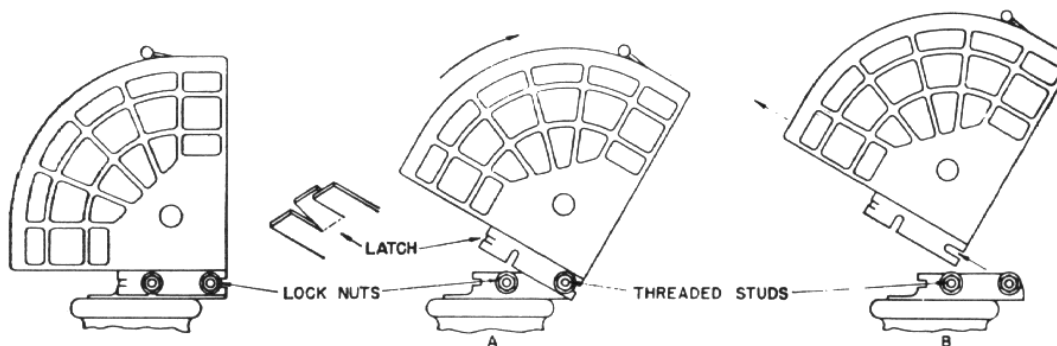


Fig. 6
Progressive steps in arc-chute removal

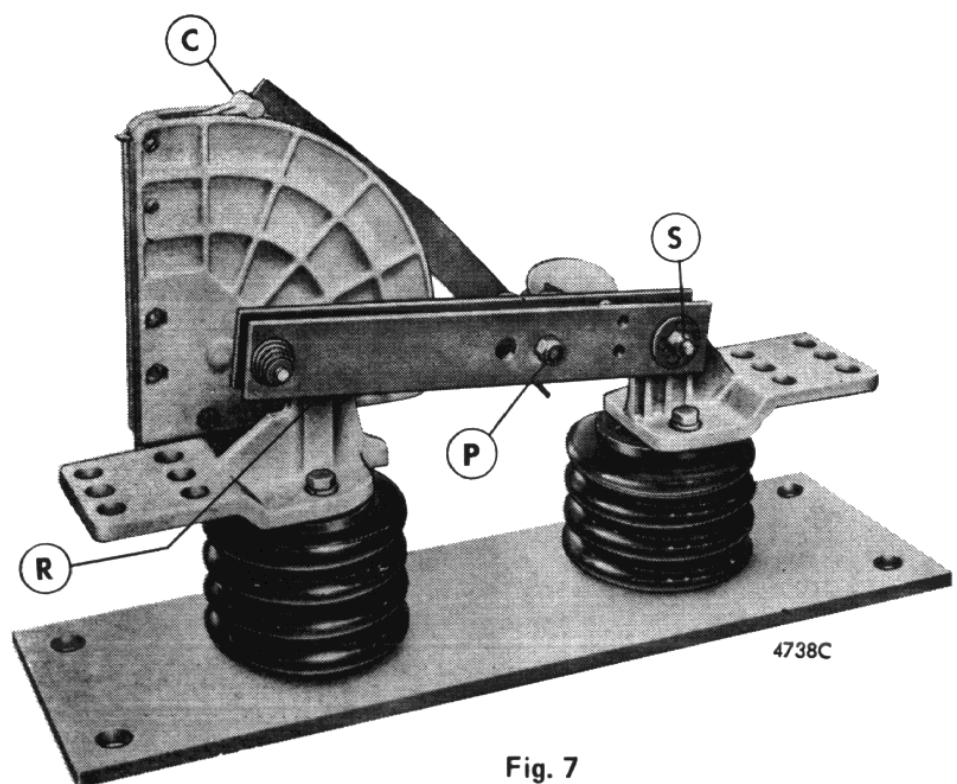


Fig. 7
Main blade closing, auxiliary blade restrained
and about to be released for closing.



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