# INSTRUCTIONS

FOR

# OPERATION AND MAINTENANCE

FOR

# HO-3 MANUAL OPERATING MECHANISM

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These instructions do not attempt to cover all details or variations in equipment or every possible contingency. If further information is desired or problems arise which are not covered sufficiently for the purchaser's purpose, refer to the manufacturer.

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RECEIVING AND UNPACKING

This apparatus is carefully tested, inspected and packed by workmen experienced in the proper handling and packing of electrical equipment. Immediately upon receipt, an examination should be made for any damage sustained during shipment. If damage or rough handling is evident, a damage claim should be filed at once with the transportation company and the manufacturer notified promptly.

STORING:

If the apparatus cannot be installed in the proper location immediately, and it is necessary to store this equipment, it should be kept in a clean, dry place. It must not be exposed to dirt, to the action of corrosive gases, such as chlorine, or to possible mechanical injury.

Stored apparatus should be thoroughly examined from time to time to see that rust has not started and to ensure good mechanical condition. Particular care should be taken to protect insulating parts, which might absorb moisture. Dust or dirt collected on the outside of the cases may find its way inside when the cases are opened and cause trouble in operation.

GENERAL INFORMATION:

The HO-3 Circuit Breaker closing mechanism is used for manual operation of circuit breakers. It is a substantially built toggle mechanism that operates by giving a "Push" operation to the circuit breaker. It is completely trip free at all parts of its travel. Provision is made for up to four electrical trip coils.

The mechanism is normally supplied mounted on the circuit breaker ready for use. It is attached to the circuit breaker by four 1/2" studs and nuts and, if fitted, auxiliary switch connecting link.

OPERATION:

By raising the operating handle 30°, the breaker is tripped. Continuing the lifting motion of the handle to approximately 90° the mechanism resets and is ready for closing.

By pushing the handle smartly downwards, the main operation shaft and lever rotate, and a push is transmitted to the circuit breaker through the toggle links, thus closing the breaker.

On operation of the trip coil, or raising of the operating handle, the linkage collapses and allows the breaker to open.



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OPERATION: (contd.)

If the closing motion is reversed, a friction driven link on the main operating shaft lifts the trip bar, thus allowing the linkage to collapse and the circuit breaker to open. The trip bar is also lifted by a trip coil lifting its plunger.

The tripping of the circuit breaker by a reverse closing motion is a feature that protects the operator when closing on to a fault.

This mechanism must always be closed smartly with a maximum of effort.

ADJUSTMENTS:

This mechanism is completely adjusted at the Factory and no further adjustments should be made. If for some reason these adjustments have been disturbed, they should be reset as follows:-

There are four points where adjustment may be made and all these adjustments are generally interrelated. Re-adjustment of one may disturb adjustment of another and the adjusting process may have to be repeated.

The back adjusting screw is located on the rear mounting plate of the mechanism. This screw is adjusted until there is 1/16" space between the roller and the end of the adjusting screw with the circuit breaker closed.

The bottom adjusting screw is located underneath the mechanism. This screw is adjusted until there is 1/16" space between the bottom toggle link and the end of the adjusting screw with the circuit breaker closed.

Sensitivity Adjustment. This screw is located on the top of the right hand trip coil retaining place and raises or lowers the tripping bar. Raising the tripping bar makes the mechanism more sensitive because the tripping lever roller does not engage as far on its mating screw head. The sensitivity screw and the bottom toggle link screw may have to be adjusted together.

Important: With the circuit breaker open and the operating mechanism reset, always have a gap of 1/8" minimum between the roller on the end of the operating mechanism swing link and the circuit breaker push nut. Do not reduce this gap or damage will result to the operating mechanism.



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TRIP COILS:

To remove a trip coil, first disconnect the leads. Next, unscrew the calibration tube at the bottom of the mechanism and remove the trip coil plunger. Remove the trip coil retaining plate and pole piece by undoing the screws on the front of the mechanism. The trip coil may now be removed.

Adjustments are made to the pick up value of the trip coil by raising or lowering the plunger by the adjustment tube underneath the mechanism. Do not set the trip plunger below the nameplate rating for series trip coils or minimum voltage rating for shunt trip coils.

AUXILIARY SWITCH:

These are mounted on the right hand side of the mechanism and operate directly from the circuit breaker, not from the mechanism. They may be converted from A to B switches and made either lagging or leading in 15° steps as follows:-

Lagging or leading of the complete auxiliary switch is accomplished by shortening or lengthening the connection link to the breaker. It may also be done by rotating the main operating lever on the hexagon shaft of the auxiliary switch. Take care that the auxiliary switch operating lever does not go into toggle and thus lock the mechanism and breaker open or closed.

Individual stages may be adjusted by first withdrawing the main hexagon shaft and then rotating the rotor one notch (30°). For 15° steps, reverse the rotor 180°.

MAINTENANCE:

The mechanism should be inspected at regular intervals and all nuts, screws, pins, etc. checked for tightness. Occasional oiling of the pivots with colloidal graphite (not a water solution) or automotive oil SAE20 may be required, but should not be excessive.

Dust, dirt or grit must be kept off the mechanism. Check operation at intervals (one every four months minimum)electrically.

SPARES:

This will depend on the number, location and frequency of operation of the mechanism. A suggested item is a Trip Coil.