



## TYPE 25LFR2 ISOLATING SWITCH

HIGH VOLTAGE

NEMA CLASS E2

### DESCRIPTION

#### APPLICATION

The Type 25LFR2 Isolating Switch is primarily used in an Ampgard Starter along with an LF25H230 Contactor and motor starting current limiting fuses. THIS ISOLATING SWITCH IS A NON-LOAD BREAK DEVICE. IT MUST NEVER CLOSE OR INTERRUPT A POWER LOAD. However, it does have a very limited capacity for interrupting the single phase control transformer exciting current or a load which does not exceed 750 VA up thru 2500 V.

Ampgard starters manufactured prior to 1976 used a LFM Isolating Switch. This 25LFR2 cannot be used in such starters without modification. Do not attempt this without obtaining instructions from the factory.

This industrial type control is designed to be installed, operated, and maintained by adequately trained workmen. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, check-out, safe operation, or maintenance. Care must be exercised to comply with local, state and national regulations, as well as safety practices, for this class of equipment.

#### INSTALLATION

The assembled Type 25LFR2 Isolating Switch slides into the starter structure on two rails. The isolating switch should be positioned so that all doors close properly, the mounting holes line up, and the mechanical interlock to the contactor is in the proper location. The switch is to be bolted in place using two .312-18 X 1.00 long socket head cap screws.

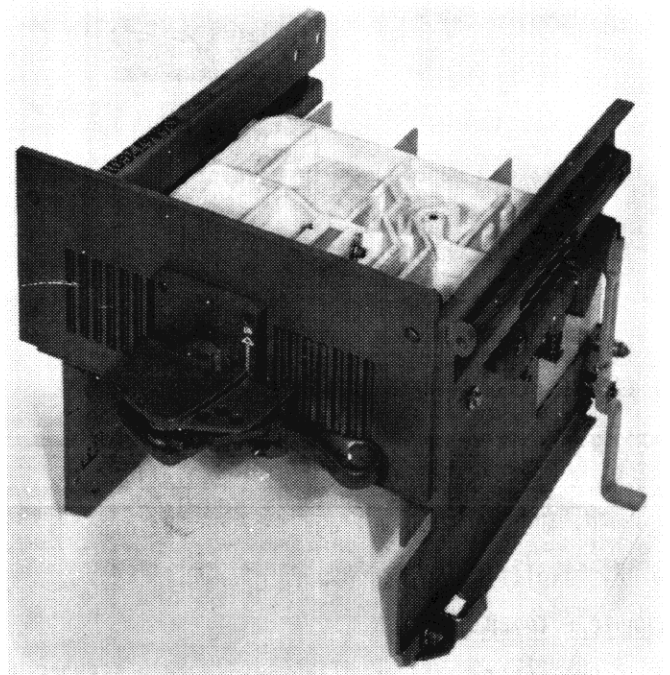
#### RATING

180 Amps continuous (enclosed)  
2500 Volts maximum

#### GENERAL

The Type 25LFR2 Isolating Switch is a high voltage, three pole manually operated device. It consists of an operating mechanism and sliding tray mounted between two steel endplates. The sliding tray is molded insulating material and carries three sets of fuse jaw finger assemblies. One end of the fuse jaw finger assembly grips the upper ferrule of the power fuse while the other end engages the line stab connector which is mounted in the Ampgard Starter. In the open position, the three fuse jaw fingers are grounded.

Arc resistant and flame retarding insulating barriers are mounted between phases and also between the two outside poles and the Isolating Switch end plates.



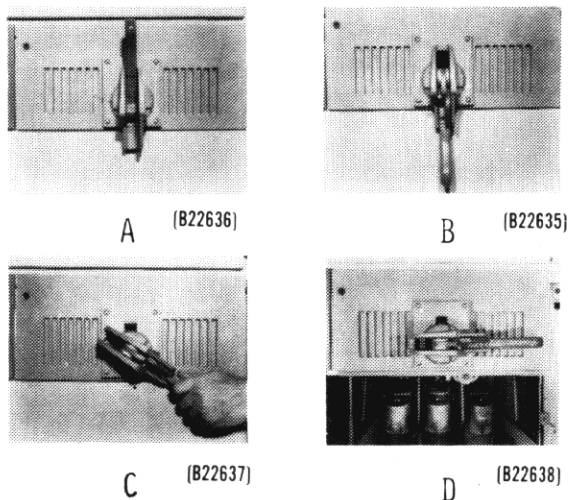
(Photo 75-0547)

Fig. 1. Type 25LFR2 Isolating Switch

**Isolating Switch Handle** (Fig. 2). The starter is shipped with the isolating switch in the ON position. The isolating switch handle is operated by moving it through a vertical arc from the ON to the OFF position. From the OFF position, it can be rotated 90° counterclockwise to the HORIZONTAL position, the door open position.

In both the ON and OFF positions, a portion of the handle housing extends over the high voltage door preventing the high voltage door from being opened. To open this door, the handle must be rotated to the HORIZONTAL position.

With the handle in the OFF position, up to three padlocks can be used to lock the switch, preventing the handle from being moved to either the ON or the HORIZONTAL POSITION. This prevents both unauthorized entry into the high voltage compartment and accidental closing of the isolating switch while maintenance work is being done. From the HORIZONTAL position, the handle cannot be moved to the ON position, without first moving to the OFF position.



The operating handle has three distinct positions.

In the ON position (A), the isolating switch is closed, the high voltage door is interlocked shut, and the starter may be energized.

In the OFF position (B), the isolating switch is open, the high voltage door is interlocked shut and the starter is de-energized and grounded.

With the handle rotated 90° counterclockwise (C) to the HORIZONTAL POSITION (D), the isolating switch is open, the starter is de-energized, grounded, and the high voltage door may be opened.

Fig. 2. Isolating Switch Handle Operation

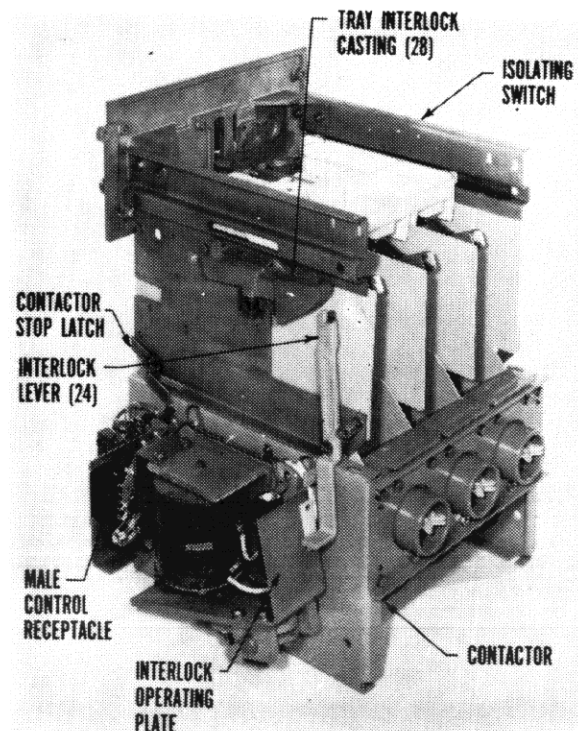
#### MECHANICAL INTERLOCKS

BEFORE PUTTING THE ISOLATING SWITCH INTO SERVICE, IT IS RECOMMENDED THAT THE USER BECOME FAMILIAR WITH THE MECHANICAL INTERLOCKS.

**Door Interlock.** With the isolating switch handle in the HORIZONTAL position, the high voltage door can be opened. As soon as the door opens, a mechanical interlock becomes effective. It is designed to prevent the user from accidentally operating the isolating switch handle and closing the starter on to the line with the high voltage door open.

This interlock is a spring loaded plunger located just below the handle housing (Fig. 2D). This prevents the handle from being accidentally returned to the OFF position. This interlock may be deliberately cheated by depressing the plunger with a screwdriver so that the handle can be moved to the OFF position to observe the operation of the isolating switch during installation or maintenance. To do this, it is necessary to deliberately cheat the interlock. The handle must be returned to the HORIZONTAL position by again depressing the interlock plunger before the high voltage door can be closed. The operator must be aware of what he is doing and take appropriate safety precautions.

**Contactor to Isolating Switch Mechanical Interlock** (Fig. 3). The Type 25LFR2 Isolating Switch functions only as a disconnect; it must never close, or interrupt a power load. To prevent this, a mechanical interlock between contactor and isolating switch is provided. If the contactor is closed, the interlock operating plate on the contactor armature actuates the interlock lever (24) that blocks the handle operating mechanism of the switch at the tray interlock casting (28).



(Photo 75-0543)  
Fig. 3. Mechanical interlocking between 25LFR2 Isolating Switch, and LF-25H230 Contactor

If the contactor is closed, the Isolating Switch cannot be moved either from the OFF to the ON, or from the ON to the OFF positions. This is a positive interlock, it cannot be cheated without disassembly of the interlocking parts.

**Line Stab Insulating Shutter.** Both the shutter and the rear line stab barrier are mounted in the starter structure and are intended to prevent accidental access to the line bus. As the isolating switch is opened, the molded cam surface of the sliding tray mechanically drives the insulating shutter closed across the three line stab openings in the rear barrier. As the shutter closes the openings, green and white striped labels are uncovered to visually indicate that the shutter is closed. With the isolating switch in the fully open position, the fuse jaw finger assemblies and the line side of the main fuses are connected to the ground bar.

As a final precaution before touching any of the electrical parts of the starter, visually check to make certain that the shutter is closed, the green and white striped labels are visible, the grounding fingers are in contact with the ground bar, and the tips of the fuse fingers are visible.

When the isolating switch is removed from the starter structure, a latch lever (32, Fig. 4) on the shutter assembly is activated. It is designed to hold the insulating shutter closed. This latch may be deliberately cheated and the shutter moved to the open position. CAUTION should be observed since the exposed line terminal stabs of the starter may be energized at line potential.

When the Isolating Switch is replaced in the structure, the latch member is automatically released to allow the shutter to operate normally.

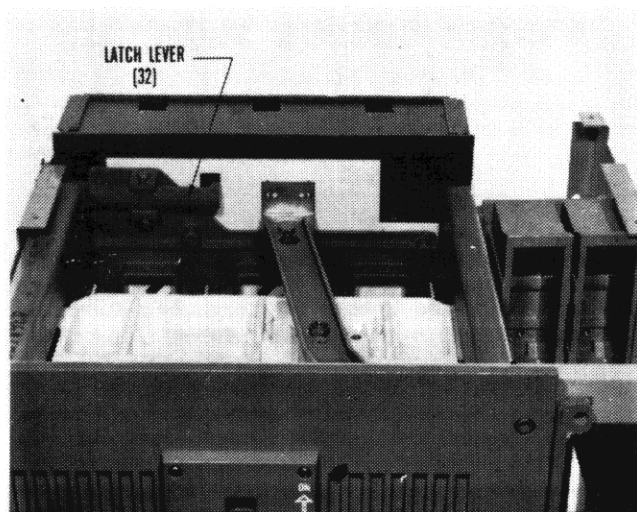


Fig. 4. Shutter Operating Mechanism (Photo 75-0550)

#### AUXILIARY SWITCH

An electrical interlock can be provided on the isolating switch which is designed to operate before the fuse jaws open as the handle is moved from the ON position. This electrical interlock is mounted behind the front plate and is actuated by a spring finger that is moved by the clevis (27, Fig. 5). The contacts of this interlock are normally used to disconnect the load of a control circuit transformer, space heaters, or auxiliary circuits when the load is in excess of 750 VA. Both contacts must be the same polarity.

MAX. AUX. SWITCH RATING

AC Volts	Amperes	
	Cont. and Interrupt	Inrush
115	15	40
230	10	20

## MAINTENANCE AND REPAIR

### GENERAL

This industrial type control is designed to be installed, operated, and maintained by adequately trained workmen. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, check-out, safe operations, or maintenance. Care must be exercised to comply with local, state, and national regulations, as well as safety practices, for this class of equipment.

A maintenance program should be established as soon as the isolating switch has been installed and put into operation. After the isolating switch has been inspected a number of times at monthly intervals and the conditions noted, the frequency of inspection can be increased or decreased to suit the conditions found, since this will depend upon the severity of the duty.

**Examination.** With the isolating switch on a table or bench and the interlock lever (24) overhanging the edge check the following points and adjust as required:

- 1) Move the operating handle through its full range of operation from the HORIZONTAL position, through OFF to ON (door interlock has to be cheated manually). The handle should move freely, without binding, and the top insulating tray should glide smoothly in the guides.
- 2) With the handle in the ON position, the ends of the fuse jaws will project beyond the endplates. Move these jaws by hand. They should be loose and pivot freely up and down.

- 3) When the interlock lever (24) is rotated under the tray interlock casting (28), the handle mechanism is blocked. It is intended to prevent the fuse jaws from being moved from either the ON to OFF or OFF to ON position.

Adjustment (See Figs. 3 and 5). Normally the isolating switch will not require any adjustment; however, if for any reason parts are removed or replaced, it will be necessary to adjust the position of the top insulating tray (20) and the .250-20 socket head cap screw on top of the interlock lever (24).

- 1) Place operating handle in OFF position and remove tray pin (25).
- 2) Position tray (20) 4.30 inches from rear edge of end plates (29) measuring at center rib of tray per Fig. 5.
- 3) Hold operating handle against stop surface (OFF position) and turn rod end (26) into or out of clevis (27) until hole in rod end (26) lines up with hole in tray (20).
- 4) Replace tray pin (25).
- 5) The vertical position of tray interlock casting (28) must be same in both OFF and ON handle positions within .06 inches.
- 6) Check by marking one pencil line on the end plate along the top rear edge of the casting (28). RAPIDLY move the operating handle alternately between ON and OFF. Observe vertical location of interlock casting (28) in both handle positions using pencil line as a guide. Re-adjust rod end (26), if necessary, to obtain the same end position within .06 inches. Note that INITIAL 4.30 inch dimension will vary.
- 7) Replace washer and hitch pin on tray pin (25) to make .250-20 socket head cap screw adjustment on lever (24).
- 8) Place operating handle in ON position.
- 9) Rotate interlock lever (24) completely under interlock casting (28) and hold during step 10.
- 10) Adjust .250-20 socket head cap screw to permit interlock casting (28) to move down .06 to .12 inches before interfering with screw head. This movement can be observed and measured by using the previously drawn pencil line as a reference.
- 11) Place operating handle in OFF position and recheck .06 to .12 inch clearance. Re-adjust .250-20 socket head screw, if necessary.

- 12) Lock .250-20 socket head cap screw in place with lock nut.
- 13) It is important to have .06 to .12 inches clearance in both ON and OFF handle positions. Too small a clearance may result in interlock lever (24) jamming under tray interlock casting (28) and too large a clearance may allow fuse jaws to leave stab assembly and interrupt a power load.

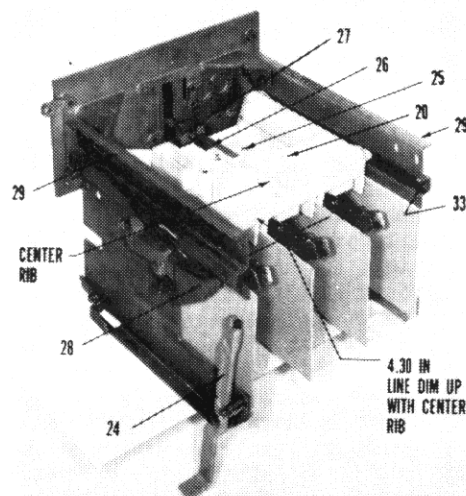


Fig. 5. Type 25LFR2 Isolating Switch  
Mechanical Interlock Adjustment

(Photo 75-0546)

#### LUBRICATION

Periodically, apply a light coating of Dow Corning DC-4 high temperature silicone grease (or equiv.) to the tips of the fuse jaw fingers where they engage the line terminal stabs. Also clean and lubricate the tray guide rails (33, Fig. 5).

Opening the High Voltage Door Under Abnormal Conditions. In the unlikely event that either the isolating switch fuse jaws or the contactor contacts should weld closed, or if an event should occur so that the isolating switch handle cannot be moved from the ON to the OFF position, provision has been made so that the high voltage door can be opened by the following procedure:

- 1) MAKE SURE THAT THE MAIN INCOMING POWER LINE IS DEENERGIZED to avoid a hazardous situation when the high voltage door is opened.
- 2) Remove the four slotted screws holding the rectangular handle housing of the isolating switch to the front casting.
- 3) The complete handle housing can now be pushed up far enough to provide clearance for opening the door. Maintenance may be carried out as required.