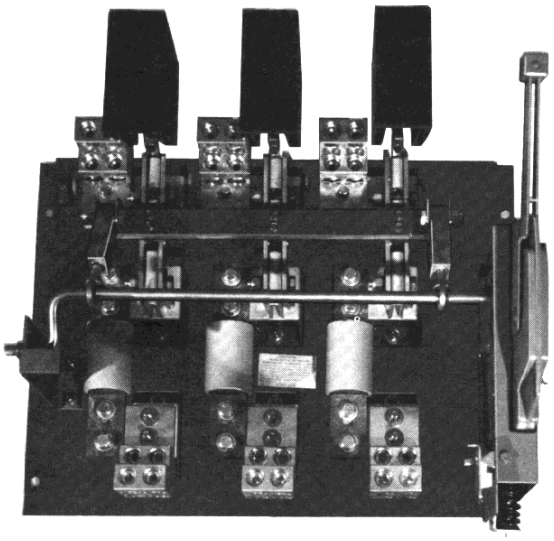
AV Switches—Series E2



CAUTION

BEFORE ATTEMPTING ANY SERVICE WORK, BE SURE SWITCH IS COMPLETELY DE-ENERGIZED.

DESCRIPTION

Class 9820, 800 and 1200 ampere, Type AV switches are available as an open type device with front mounted, manual operator which make it suitable for use in switchboards or as the interior of an enclosed safety switch.

This manual pertains to the **SWITCH AND OPERATOR-INSTALLATION, OPERATION, MAINTENANCE, ADJUSTMENT PROCEDURE AND REPLACEMENT PARTS.**

Unpack the switch carefully and check the nameplate information against similar information listed on order.

Prior to leaving the factory, all switches are carefully inspected and packaged by workmen experienced in the proper handling and packaging of electrical equipment. Upon receipt of the switch, a careful inspection should be made to determine if any damage might have occurred during transit. If damage is evident or there is any visible indication of rough handling, claims for damage should be filed at once with the transportation company. The local Square D field sales office should be notified.

The type AV switch has a quick-make, quick-break operating mechanism. This feature assures anti-tease operation by moving the switch blades at high speed on both opening and closing of the switch, regardless of the speed with which the operating handle is moved.

All fusible type switches have successfully passed the tests as outlined in UL subject 98 standard for enclosed switches.

MAINTENANCE
Lubrication Instructions

Type AV Switches as received from the factory have been properly lubricated. Periodic cleaning and lubrication of the switch will be required and the maintenance interval between lubrications will be dependent upon the amount of usage, ambient conditions, etc. The maximum recommended maintenance intervals should not exceed one year. When performed, lubrication should be applied to all moving parts and the application of Mobilith AW1 (multi-purpose-lithium base) or equivalent should be used on the hinge area and the clip contact surfaces and arc tips. A lightweight oil should be sparingly used on the other moving parts. The operating mechanism should be periodically exercised to ensure proper operation. Lubrication of the mechanism should be performed using Molybdenum Disulfide Grease when required.

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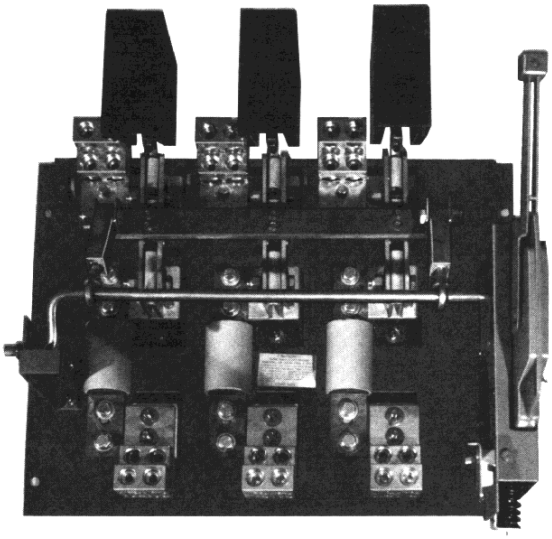
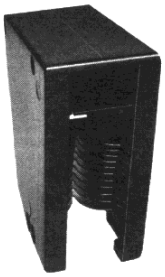
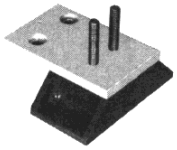


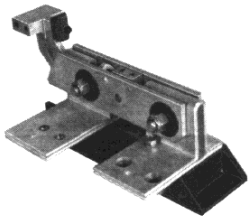
Switch



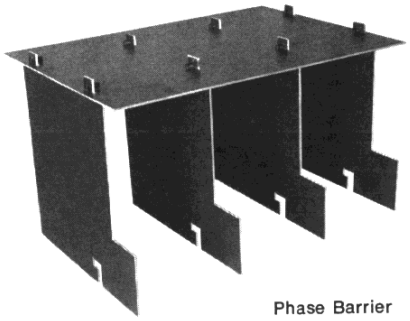
Arc
Quencher
Assembly



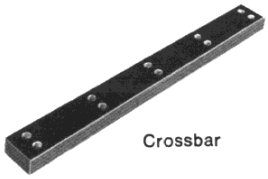
Fuse Terminal
Assembly



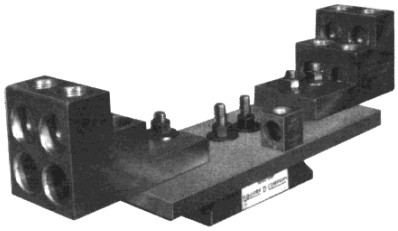
Clip, Hinge &
Blade Assembly



Phase Barrier



Crossbar



Neutral
Assembly

AV Switches—Series E2

SINGLE-THROW, LOAD-BREAK, DEAD FRONT

Ratings: Type AV switches are available in current ratings of 800 and 1200 amperes at 240 and 600 volts AC. When equipped with NEMA Class L fuses these switches are 80% rated and are suitable for use on systems with fault capacity of 200,000 amperes at 240 VAC and at 600 VAC. Fusible Type AV switches with quick-make, quick-break operators are listed by the Underwriters' Laboratories.

The Type AV switch is an economical load break device which incorporates the proven reliability of the Square D safety switch with the high fault capacity of the Square D BOLT-LOC® switch. Type AV switches are particularly suited for use as service entrance or circuit protecting equipment.

Construction Details: Type AV switches are front connected. All current-carrying parts are assembled with high-conductivity copper which is silver-plated before assembly.

Multiple plate type arc-quenchers and replaceable high temperature melting alloy arc-tips are supplied on the 600-volt versions of the switch. Unique elongated construction of the expendable blades of the 240-volt switch confines pitting and burning to the non-current-carrying ends of the blades. Phase barriers are made of flame-retardant, glass-polyester material.

Fusible switches are supplied with provisions for NEMA Class L fuses. Fuse mounting bolts are supplied with each fusible switch.

Switches are supplied without lugs or fuses.

OPEN TYPE SWITCHES WITHOUT LUGS

AVAILABLE RATINGS:

Volts	Ampere Rating	2 Pole—2 Wire		3 Pole—3 Wire	
		Type	Weight	Type	Weight
FUSIBLE (DOES NOT INCLUDE FUSES)					
240 VAC	800	AVO-22080	80	AVO-32080	90
	1200	AVO-22120	85	AVO-32120	95
600 VAC	800	AVO-26080	90	AVO-36080	100
	1200	AVO-26120	95	AVO-36120	105
NOT-FUSIBLE					
240 VAC	800	AVO-22080-U	75	AVO-32080-U	85
	1200	AVO-22120-U	80	AVO-32120-U	90
600 VAC	800	AVO-26080-U	85	AVO-36080-U	95
	1200	AVO-26120-U	90	AVO-36120-U	100

NEUTRAL ASSEMBLY

Volts	Ampere	Type
240/ 600 VAC	800	H800SN5
	1200	H1200SN5

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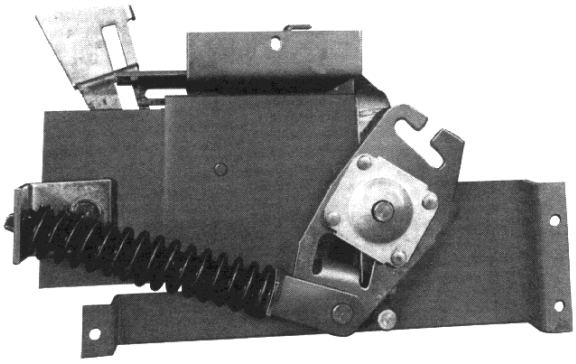

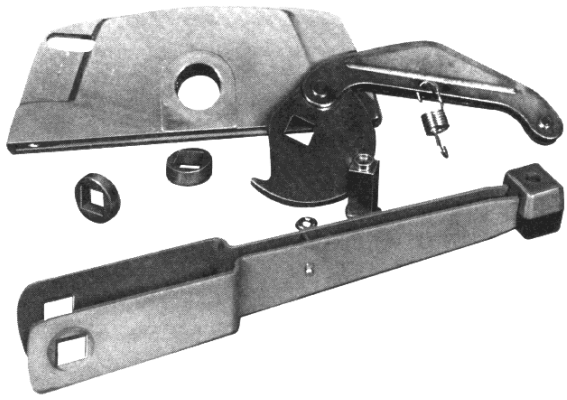

OPERATING MECHANISM

The manual operator consists of an over-toggle spring driven mechanism to open and close the switch. The mechanism is designed to prevent teasing of the switch blades and assures a quick-make or quick-break operation. The quick-make or quick-break operation is unrelated to the speed with which the operator handle is moved.

The mechanism is built into a support frame which is bolted to the switch mounting pan. When properly installed, the mounting pan, operating mechanism, and operator handle are at ground potential.

Proper operation of the switch consists of a fast steady movement of the operator handle.

A mechanical interlock prevents closing the switch blades if the enclosure door is open. It also prevents opening the enclosure door if the switch blades are closed.

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AV Switches—Series E2

INSTALLATION INSTRUCTIONS

ADJUSTMENTS

Every AV switch goes through a routine test procedure before leaving the factory. The design is such that only two places of adjustment are built into the switch.

1. The connecting link on the operator.
2. The lock nut on the blade assembly.

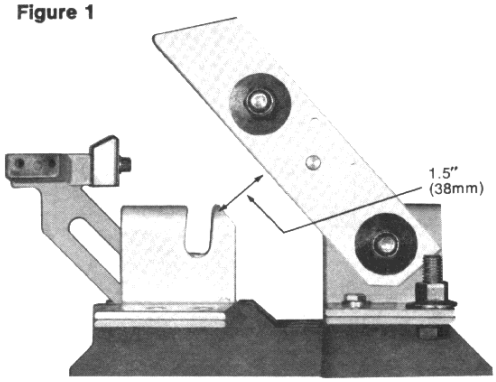
I. Operate the switch to the open and closed positions several times. When the handle is in the closed position the switch blades should be fully closed. Operate the handle to the open position and check the open gap dimension of 1.5" min. (38mm) which is the shortest distance through air between the blade and clip (refer to Figure 1). The open gap can be adjusted by removing the ⅜-16 locknuts and bolts and rotating the crossbar connector to obtain the specified open gap. (Check all three phases.)

II. The lock nut (Figure 2) when rotated clockwise causes the Belleville washers to exert pressure between the blades and the clip and hinge contact area. The proper adjustment of the clip and hinge nut is made by measuring the contact resistance in micro-ohms. The switch is properly adjusted when the ducter reading from the clip terminal to the hinge terminal is 7.0 to 9.0 micro-ohms. The resistance test must be on the 0 to 100 micro-ohm scale, with 100 amps D.C. on a biddle-ductor.

The proper adjustment of this clip and hinge nut is made with the switch blades in the closed position; check the tension of the Belleville washer under the lock nut. The Belleville washer should just barely be able to be turned by hand. Adjust the lock nut accordingly. When this initial tension adjustment on the washer has been reached, place two ¾" wrenches on the head of the bolt and the lock nut. Position both wrenches even. Holding one wrench steady turn the other wrench ¼ to ½ turn in a clockwise direction. Repeat the above steps on all phases until all lock nuts have been properly tightened. Refer to Figure 3.

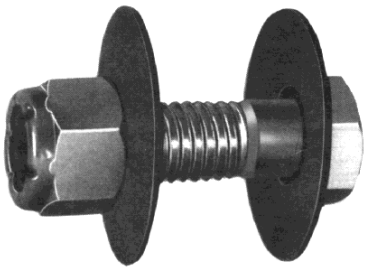
If the lock nut is too loose, improper contact pressure will result and the switch will heat up. If the lock nut is too tight, the switch will be sluggish on opening and closing.

Figure 1



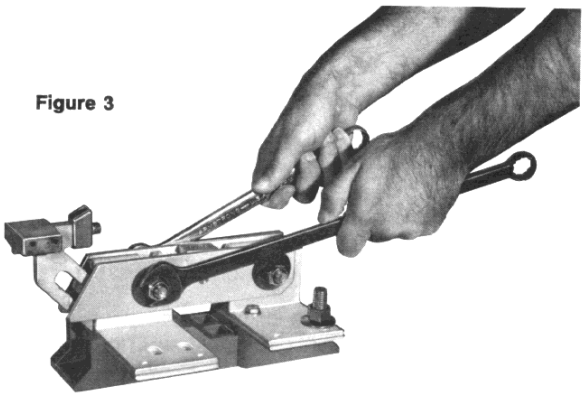
Open Gap

Figure 2



Clip & Hinge Bolt

Figure 3



Clip & Hinge Bolt Adjustment

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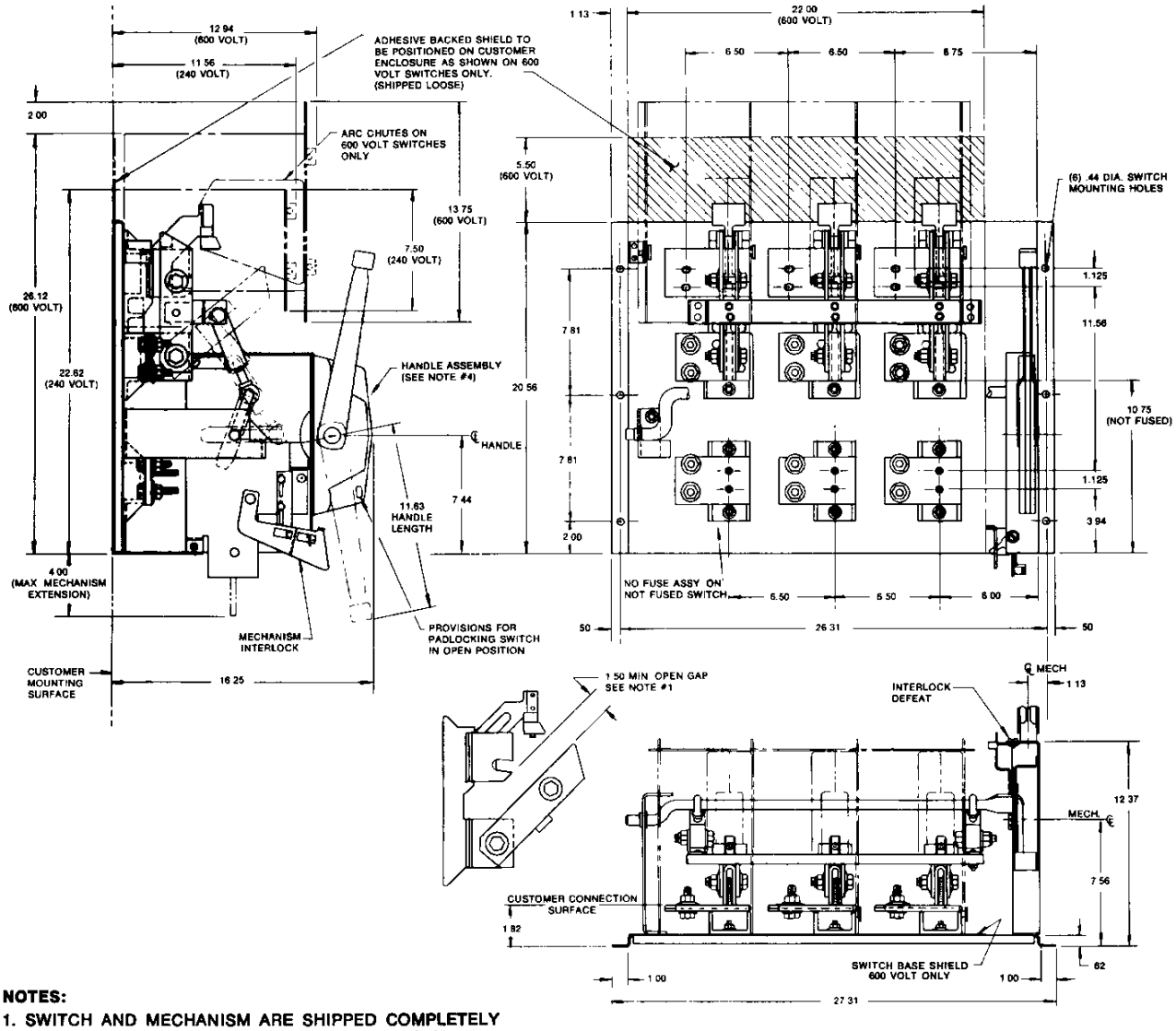

NOTES:

1. SWITCH AND MECHANISM ARE SHIPPED COMPLETELY ADJUSTED. HOWEVER IF ADDITIONAL ADJUSTMENT IS REQUIRED, SEE PAGE 5.
2. FOR TWO POLE SWITCHES OMIT CENTER POLE.
3. FOR RECOMMENDED ENCLOSURE FABRICATION AND MINIMUM DIMENSIONS SEE PAGE 10.
4. FOR HANDLE ASSEMBLY REMOVAL AND INSTALLATION SEE PAGES 8 AND 9.
5. FOR NEUTRAL INSTALLATION SEE DWG. #C44010-828.

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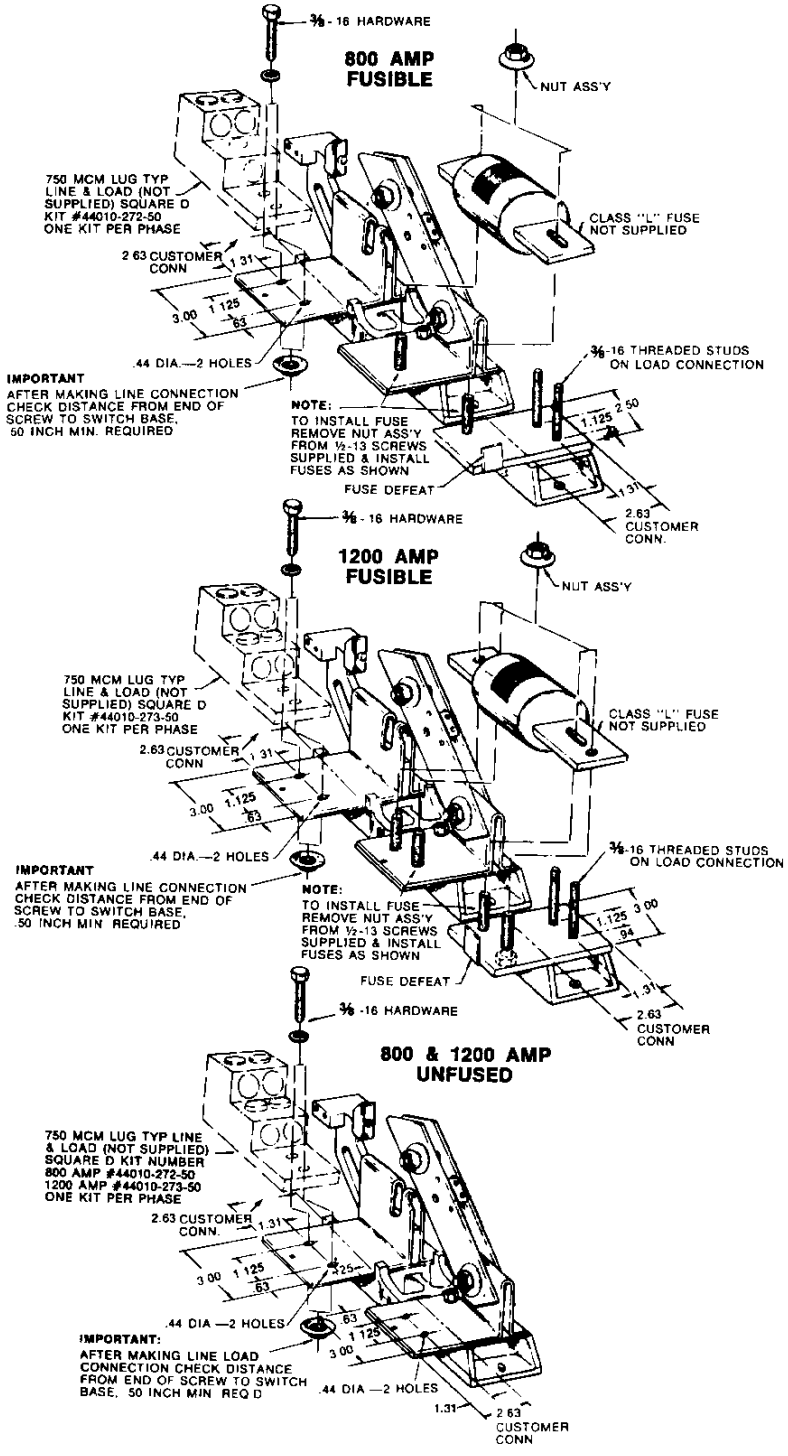

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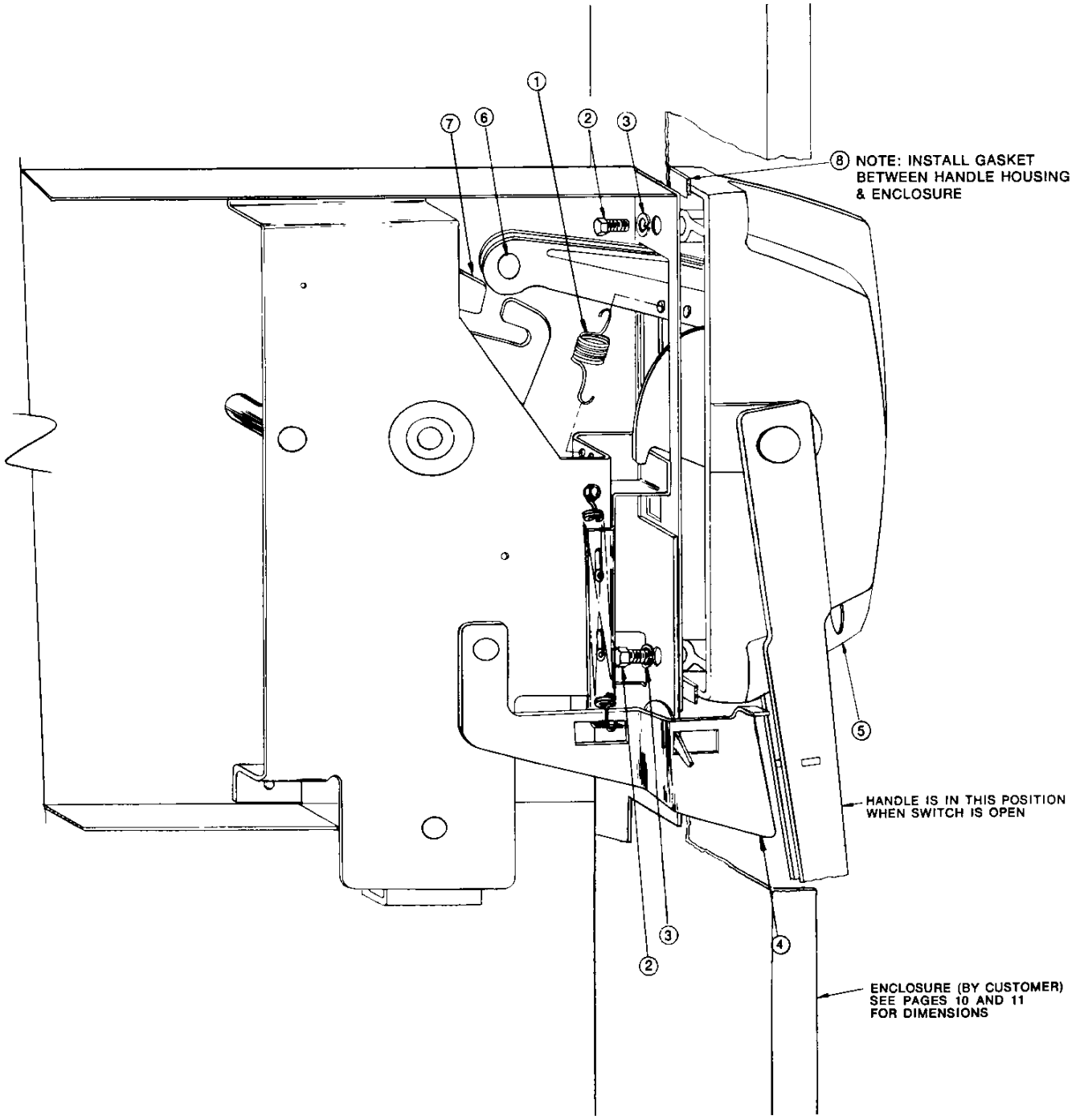

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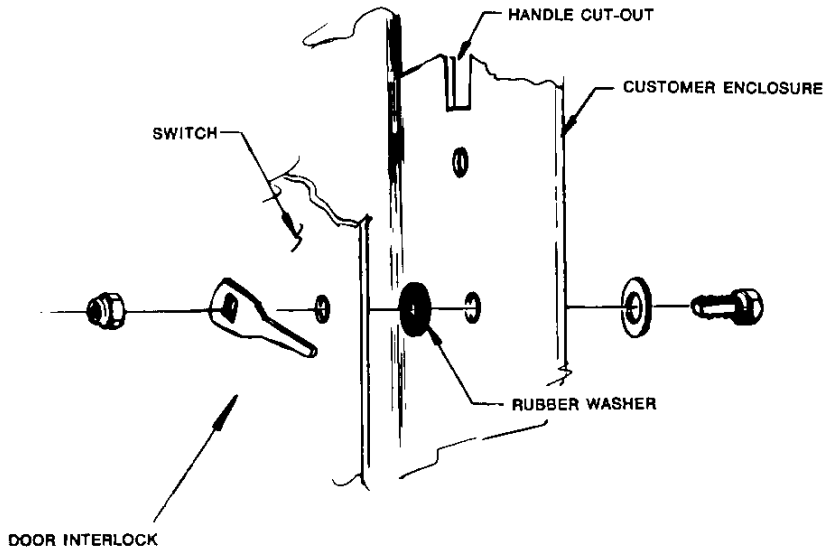
AV Switches—Series E2

PROCEDURE FOR REMOVING HANDLE ASSEMBLY

1. PUT SWITCH IN OPEN POSITION (HANDLE DOWN)
2. DISCONNECT SPRING (1)
3. REMOVE BOLTS (2) & REMOVE LOCKWASHERS (3)
4. DEPRESS LEVER (4)
5. WITHDRAW HANDLE ASS'Y (5) APPROX. ½ INCH
6. DISENGAGE PIN (6) FROM CAM (7)
7. WITHDRAW HANDLE ASS'Y COMPLETELY
8. REMOVE HANDLE HOUSING GASKET (8)

TO INSTALL HANDLE ASSEMBLY, REVERSE ABOVE PROCEDURE

DOOR INTERLOCK INSTALLATION PROCEDURE



REMOVE ASS'Y. ABOVE, LOCATED BELOW HANDLE, AND INSTALL SWITCH IN THE ENCLOSURE.

REPLACE ASS'Y. AS SHOWN WITH A RUBBER WASHER, USED AS A SPACER BETWEEN THE ENCLOSURE AND SWITCH.

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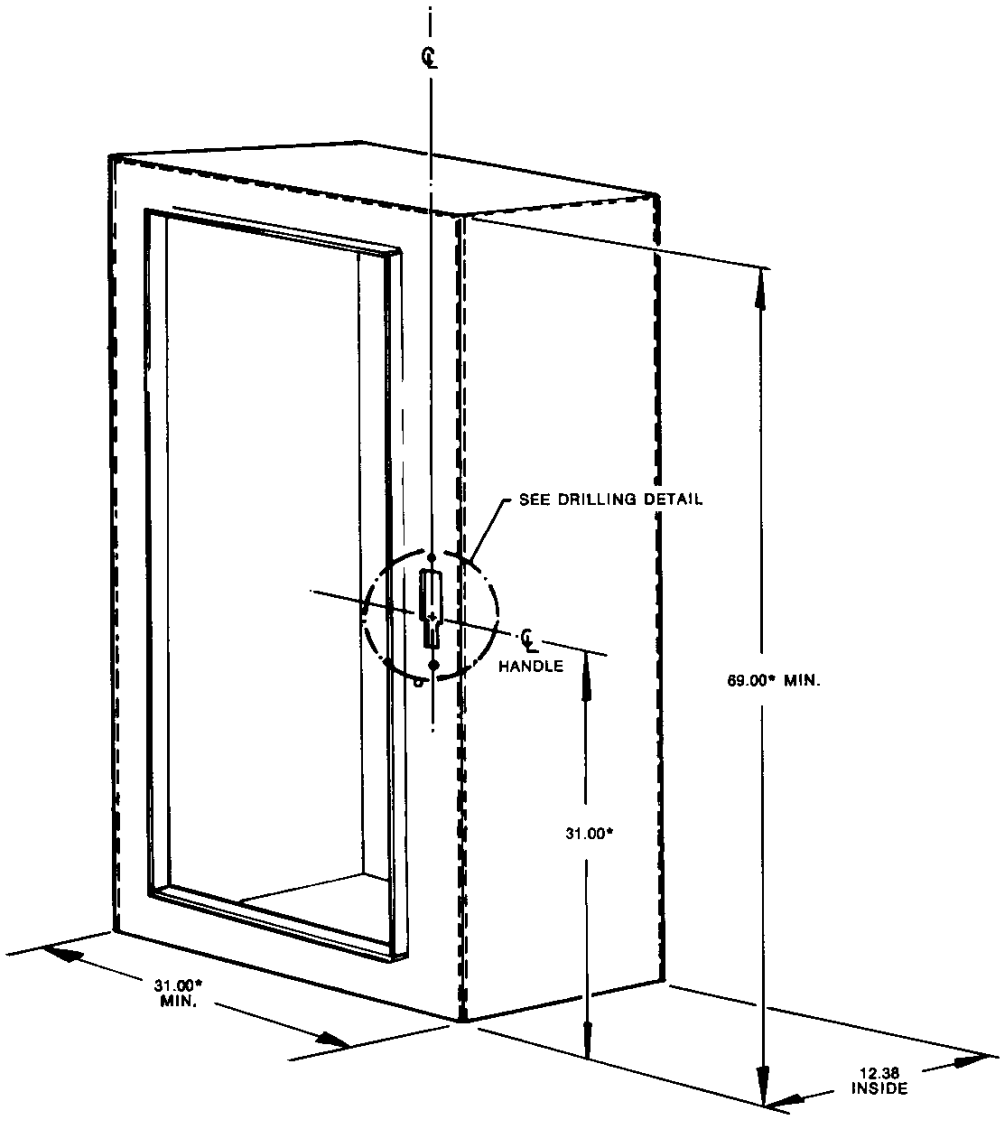

***NOTE:**
DIMENSIONS NOTED ARE MINIMUMS FOR A 1200 AMP RATED SWITCH WITH CABLE BENDING SPACE FOR (4) 750 MCM CU/AL CABLES AND 60°C TEMPERATURE RISE FOR NON-VENTILATED ENCLOSURE PER U.L. 98 STANDARD. (OPTIONAL EQUIPMENT NOT INCLUDED).

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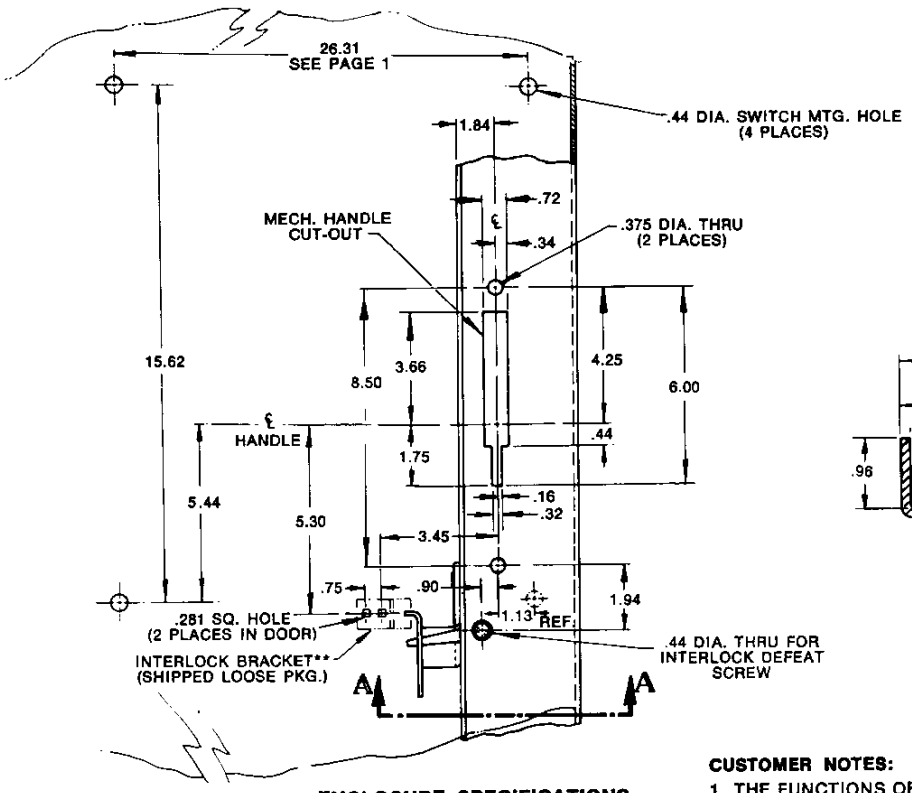
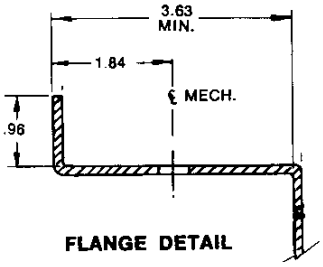
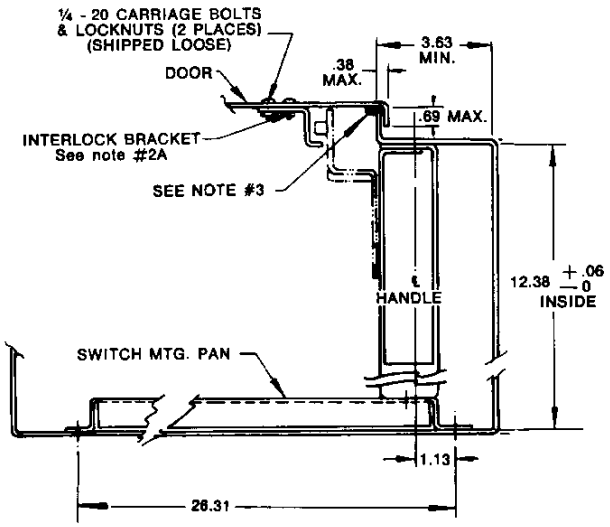




FLANGE DETAIL

ENCLOSURE SPECIFICATIONS & DRILLING INSTRUCTIONS



CUSTOMER NOTES:

1. THE FUNCTIONS OF THE INTERLOCK FOR SAFETY PURPOSES ARE AS FOLLOWS: —
   A) PREVENTS CLOSING THE SWITCH WITH THE ENCLOSURE DOOR OPEN.
   B) PREVENTS OPENING THE DOOR WHILE THE SWITCH IS IN THE CLOSED POSITION (ENERGIZED).
2. THE INTERLOCK CAN BE DEFEATED BY ROTATING THE INTERLOCK DEFEAT, LOCATED BELOW THE MECHANISM HANDLE, COUNTER-CLOCKWISE.
   **A) INTERLOCK BRACKET IS MOUNTED ON THE DOOR (SHIPPED LOOSE).
3. CLOSED CELL NEOPRENE GASKET .25 x .50 IS RECOMMENDED WHEN REQUIRED FOR NEMA 3, 3R & 12 APPLICATION.

- ENCLOSURE WALL THICKNESS:
  MIN.—14 Ga. (.078)
  MAX.—11 Ga. (.120)

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