Installation Manual

Our energy working for you.™

Power Generation

Transfer Switch

40-1000 Amps

OTECA (Spec A)
OTECB (Spec A)
OTECC (Spec A)
OTECD (Spec A)

English - Original Instructions 4-2010 962-0617 (Issue 5)

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Safety Precautions

This manual includes the following symbols to indicate potentially dangerous conditions. Read the manual carefully and know when these conditions exist. Then take the necessary steps to protect personnel and the equipment.

DANGER: This symbol warns of immediate hazards that will result in severe personal injury or death.

WARNING: This symbol refers to a hazard or unsafe practice that can result in severe personal injury or death.

CAUTION: This symbol refers to a hazard or unsafe practice that can result in personal injury or product or property damage.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

High voltage in transfer switch components presents serious shock hazards that can result in severe personal injury or death. Read and follow these suggestions.

Keep the transfer switch cabinet closed and locked. Make sure only authorized personnel have the cabinet keys.

Due to the serious shock hazard from high voltages within the cabinet, all service and adjustments to the transfer switch must be performed only by an electrician or authorized service representative.

UTILITY-TO-GENSET APPLICATIONS

If the cabinet must be opened for any reason:

1. Move the operation selector switch on the generator set to Stop.

2. Disconnect the battery charger.

3. Disconnect the starting batteries of the generator set or sets (remove the ground [-] lead first).

4. Remove AC power to the automatic transfer switch. If the instructions require otherwise, use extreme caution due to the danger of shock hazard.

GENERAL PRECAUTIONS

Place rubber insulative mats on dry wood platforms over metal or concrete floors when working on any electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling any electrical equipment.

Jewelry is a good conductor of electricity and should be removed when working on the electrical equipment.

Wear safety glasses whenever servicing the transfer switch and and do not smoke near the batteries.

Do not work on this equipment when mentally or physically fatigued, or after consuming alcohol or any drug that makes the operation of equipment unsafe.

WARNING: INCORRECT SERVICE OR REPLACEMENT OF PARTS CAN RESULT IN DEATH, SEVERE PERSONAL INJURY, AND/OR EQUIPMENT DAMAGE. SERVICE PERSONNEL MUST BE QUALIFIED TO PERFORM ELECTRICAL AND/OR MECHANICAL SERVICE.

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1 Introduction

1.1 Installation Manual

This manual covers models produced under the Cummins®/Onan® and Cummins Power Generation brand names.

This manual provides information necessary for the installation of an OTEC transfer switch. This is an open transition transfer switch that includes an automatic transfer switch (ATS) control. With an open transition switch, there is never a time when both sources are supplying power to the load.

Programmed transition switches pause in the neutral position of the transfer switch, between switched positions, so that transient currents from the load can diminish before the load is switched to the other source.

1.2 Transfer Switch Application

Transfer switches are an essential part of a building's standby or emergency power system. The utility line (normal power), is backed up by a generator set (emergency power). The transfer switch automatically switches the electrical load from one source to the other.

The load is connected to the common of the ATS (**Figure 1**). Under normal conditions, the load is supplied with power from the utility (as illustrated). If utility power is interrupted, the load is transferred to the generator set (genset). When utility power returns, the load is retransferred to the utility. The transfer and retransfer of the load are the two most basic functions of a transfer switch.

1.3 Transfer Switch Function

Automatic transfer switches, capable of automatic operation without operator intervention, perform the basic function of transferring the load to the available power source. The controller monitors each source for allowable voltage and frequency range.

This automatic transfer switch, capable of automatic operation without operator intervention, is designed for utility-to-genset applications. In utility-to-genset applications, the transfer switch performs the following functions:

1. Senses the interruption of utility power.
2. Sends a start signal to the genset.
3. Transfers the load to the genset.
4. Senses the return of utility power.
5. Retransfers the load to the utility.
6. Sends a stop signal to the genset.

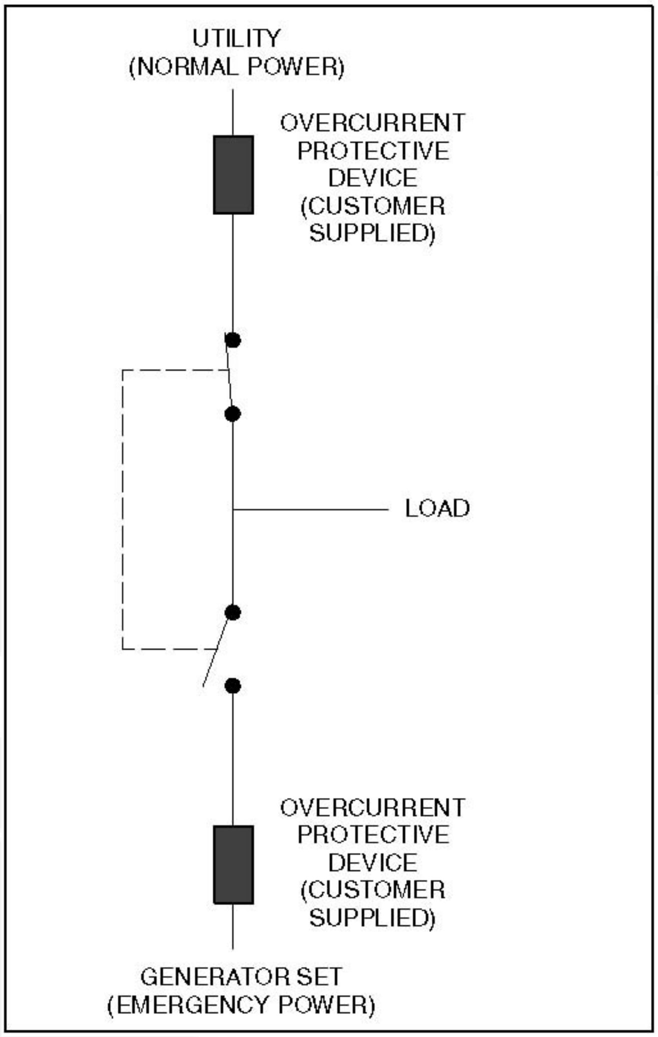


FIGURE 1. LOAD TRANSFER SWITCH (TYPICAL FUNCTION)

1.4 Installation Overview

These installation recommendations apply to typical installations. Whenever possible, these recommendations also cover factory designed options or modifications. However, because of the many variables in any installation, it is not possible to provide specific recommendations for every situation. If there are any questions not answered by this manual, contact your nearest Cummins/Onan distributor for assistance.

1.4.1 Application and Installation

Installations must be carefully planned and correctly installed for proper operation. This involves two essential elements: application and installation.

Application refers to the design of the complete standby power system that usually includes power distribution equipment, transfer switches, ventilation equipment, mounting pads, cooling systems, exhaust systems, and fuel systems. Each component must be correctly designed so the complete system functions as intended. Application and design is an engineering function generally done by specifying engineers or other trained specialists. Specifying engineers are responsible for the design of the complete standby system and for selecting the materials and products required.

Installation refers to the actual set-up and assembly of the standby power system. The installers set up and connect the various components of the system as specified in the system design plan. The complexity of the standby system normally requires the special skills of qualified electricians, plumbers, sheet metal workers, etc. to complete the various segments of the installation. This is necessary so all components are assembled using standard methods and practices.

1.4.2 Safety Considerations

The transfer switch has been carefully designed to provide safe and efficient service when properly installed, maintained, and operated. However, the overall safety and reliability of the complete system depends on many factors outside the control of the manufacturer. To avoid possible safety hazards, make all mechanical and electrical connections to the transfer switch exactly as specified in this manual. All systems external to the transfer switch must comply with all applicable codes. Make certain all required inspections and tests have been completed and all code requirements have been satisfied before certifying the installation is complete and ready for service.

Verify that both power source voltages match the nameplate rating prior to installation.

1.5 Model Identification

Identify your model by referring to the Model and Specification number as shown on the nameplate. Electrical characteristics are shown on the lower portion of the nameplate (see **Figure 2**), which is located on the cabinet door.

If it is necessary to contact a distributor regarding the transfer switch, always give the complete Model, Specification, and Serial number. This information is necessary to properly identify your unit among the many types manufactured.

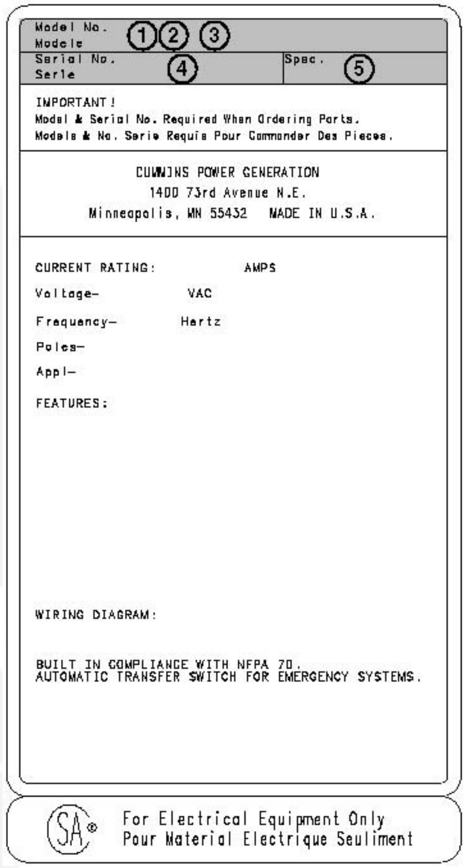
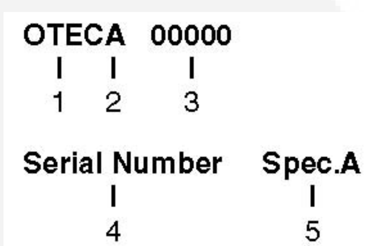


FIGURE 2. NAMEPLATE

The model number is made up of code segments that designate various features or options:



1. OTEC - Open transition transfer switch
2. Ampere Rating:

   A = 40, 70, 125

   B = 150, 225, 260

   C = 300, 400, 600

   D = 800, 1000

   E = 1200
3. Assigned spec number - issued for each specific combination of accessories, voltages, frequency, and standards codes. This number is only repeated for standard product.
4. Serial Number - A unique number assigned to the transfer switch.

5. Specification letter - advances with production modification.

1.6 How to Obtain Service

When the transfer switch requires servicing, contact your nearest Cummins Power Generation distributor. Factory-trained Parts and Service representatives are ready to handle all your service needs.

To contact your local Cummins Power Generation distributor in the United States or Canada, call 1-800-888-6626 (this automated service utilizes touch-tone phones only). By selecting Option 1 (press 1), you will be automatically connected to the distributor nearest you.

If you are unable to contact a distributor using the automated service, consult the Yellow Pages. Typically, our distributors are listed under:

Generators-Electric,
Engines-Gasoline or Engines-Diesel, or
Recreational Vehicles-Equipment,
Parts and Service.

For outside North America, call Cummins Power Generation, 1-763-574-5000, 7:30 AM to 4:00 PM, Central Standard Time, Monday through Friday. Or, send a fax to Cummins Power Generation using the fax number 1-763-528-7229.

When contacting your distributor, always supply the complete Model, Specification, and Serial Number as shown on the generator set nameplate.

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2 Mounting

2.1 Location

The location of the transfer switch in the existing electrical circuit varies with the application and the type of entrance switch. The location and wiring must comply with the contract drawings.

There must be a service disconnect in the commercial power line ahead of the transfer switch.

A typical installation is shown in Figure 3. Cabinet dimensions and weights are listed in Table 2, Table 3, and Table 4.

Choose a vibration-free mounting surface that supports the weight of the switch. Avoid locations that are near flammable liquids or gases, or are hot, moist, or dusty.

WARNING: ***An electrical arc occurs during transfer that can ignite a flammable atmosphere, resulting in severe personal injury or death. The switch must not be located near batteries, fuel tanks, solvents, or other sources of flammable liquids or gases, or in areas sharing ventilation with such sources.***

2.2 Wall Mounting

1. Check the location to be sure that no wires or plumbing, gas, or exhaust lines run behind the wall.
2. Install two mounting bolts in the wall for the top cabinet mounting keyholes.
3. With the shipping box standing so the cabinet is upright, carefully remove the top and sides of the box.
4. Raise the cabinet and mount it on the two mounting bolts in the wall.

WARNING: ***Improper lifting can cause severe personal injury. Have sufficient manpower for lifting and mounting the cabinet.***

5. Install two bottom mounting bolts, but do not tighten. (Do not remove the cabinet support until all bolts are installed.)
6. Push the cabinet against the wall. If the cabinet does not align flush against the wall, shim the mounting bosses as required.
7. Tighten all mounting bolts.

TABLE 2. APPROXIMATE NEMA 1 CABINET DIMENSIONS

Switch Current Rating	Height	Width	Depth With Door		Weight
			Closed	Open	
40, 70, & 125	27 in 686 mm	20.25 in 514 mm	13.6 in 345 mm	31.5 800 mm	82 lb 37 kg
150 & 225	35.5 in 902 mm	25.6 in 651 mm	17.3 in 440 mm	40.6 in 1032 mm	165 lb 74.25 kg
260	43.5 in 1105 mm	28.2 in 715 mm	17.3 in 440 mm	43.2 in 1096 mm	170 lb 76.5 kg

Switch Current Rating	Height	Width	Depth With Door		Weight
			Closed	Open	
300, 400, & 600	53.8 in 1367 mm	25.2 in 639 mm	19.6 in 497 mm	42.2 in 1071mm	225 lb 101.25 kg
800 & 1000	67.6 in 1718 mm	30 in 762 mm	20.6 in 524 mm	48.4 in 1227 mm	360 lb 162 kg
1200	90 in 2286 mm	39 in 991 mm	27.5 in 698 mm	65 in 1644 mm	730 lb 331 kg

TABLE 3. APPROXIMATE NEMA 3R AND 12 CABINET DIMENSIONS

Switch Current Rating	Height	Width	Depth with Door		Weight
			Closed	Open	
40, 70, & 125	33.8 in 859 mm	26.25 in 667 mm	13.75 in 350 mm	36.7 in 931 mm	125 lb 56.3 kg
150 & 225	42.3 in 1075 mm	30.4 in 771 mm	17.6 in 447 mm	44.4 in 1129 mm	190 lb 85.5 kg
260	45.75 in 1162 mm	32 in 814 mm	17.6 in 447 mm	46 in 1170 mm	200 lb 90 kg
300, 400, & 600	58.7 in 1491 mm	27.5 in 697 mm	20.2 in 512 mm	43.9 in 1113 mm	290 lb 130.5 kg
800 & 1000	73.5 in 1867 mm	32.3 in 821 mm	20.8 in 529 mm	49.75 in 1263 mm	410 lb 184.5 kg
1200	90 in 2286 mm	39 in 991 mm	27.5 in 698 mm	65 in 1644 mm	730 lb 331 kg

TABLE 4. APPROXIMATE NEMA 4 CABINET DIMENSIONS

Switch Current Rating	Height	Width	Depth with Door		Weight
			Closed	Open	
40, 70, & 125	33.8 in 859 mm	26.25 in 667 mm	13.75 in 350 mm	37.4 in 949 mm	125 lb 56.3 kg
150 & 225	42.3 in 1075 mm	30.4 in 771 mm	17.6 in 447 mm	45.1 in 1147 mm	190 lb 85.5 kg
260	45.75 in 1162 mm	32 in 814 mm	17.6 in 447 mm	46.7 in 1188 mm	200 lb 90 kg
300, 400, & 600	58.7 in 1491 mm	27.5 in 697 mm	20.2 in 512 mm	44.625 in 1131 mm	290 lb 130.5 kg
800 & 1000	73.5 in 1867 mm	32.3 in 821 mm	20.8 in 529 mm	50.45 in 1281 mm	410 lb 184.5 kg
1200	90 in 2286 mm	39 in 991 mm	27.5 in 698 mm	65 in 1644 mm	730 lb 331 kg

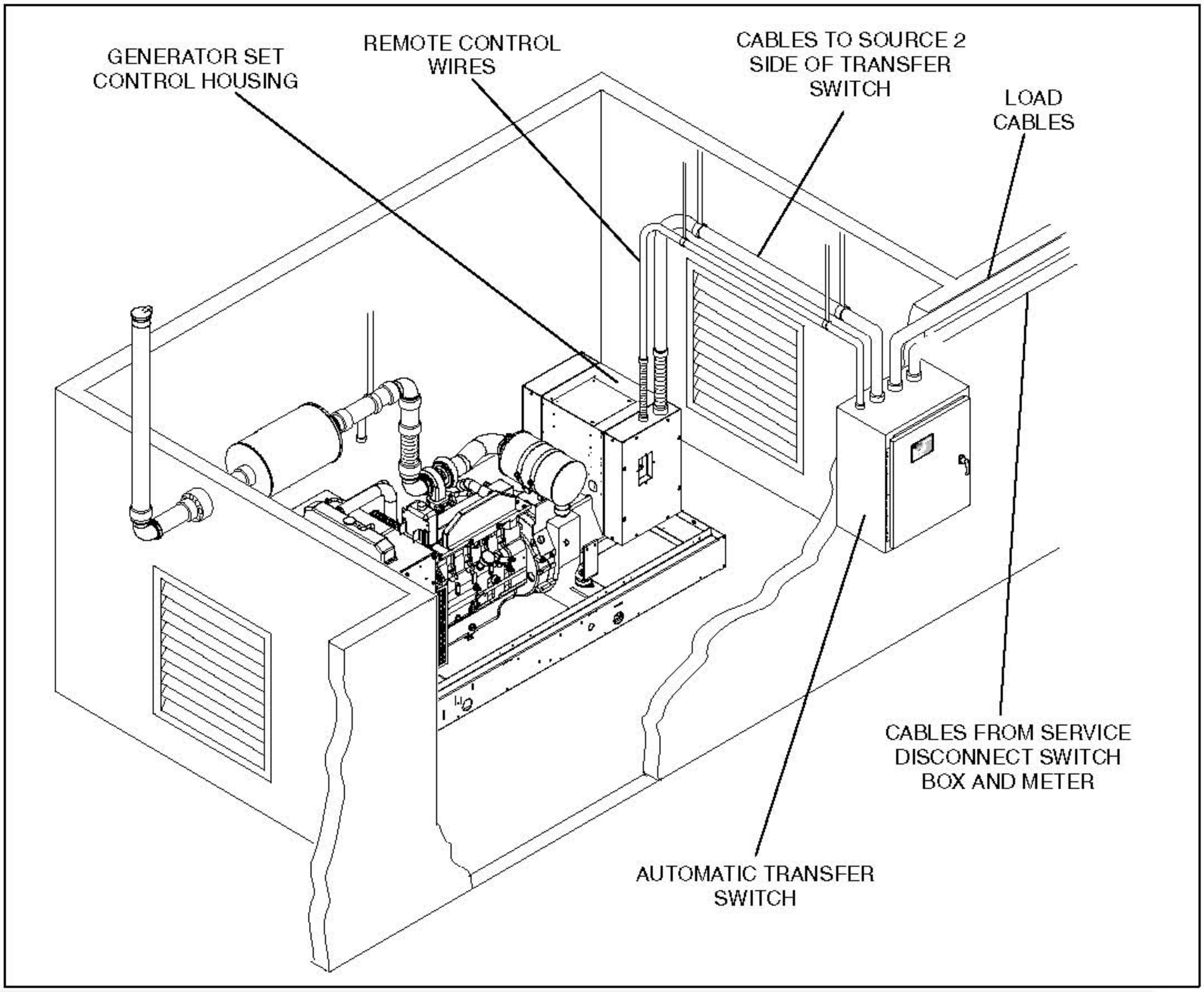


FIGURE 3. TYPICAL WALL-MOUNT INSTALLATION

2.3 Seismically Certified Installations

Seismically certified transfer switch installations (feature code A080-7) have special requirements, as defined by IAA-VMC (Independent Approval Agency, the VMC Group).

1. The design of post-installed anchors in concrete used for the component anchorage; is prequalified for seismic applications in accordance with AC1 355.2 and documented in a report by a reputable testing agency (for example, the Evaluation Service Report issued by the international Code Council).
2. Anchors must be installed to an embedment depth, as recommended in the prequalification test report defined in Note 1. For IBC 2000 and IBC 2003 applications, the minimum embedment must be 8 times the anchor diameter.

3. Anchors must be installed in a minimum of 4000 PSI compressive strength normal weight concrete. Concrete aggregate must comply with ASTM *C*33. Installation in structural lightweight concrete is not permitted unless otherwise approved by the structural engineer of record.
4. Anchors must be installed to the maximum torque specification, as recommended by the anchor manufacturer.
5. Anchors must be installed in the locations specified on the Installation Outline Drawings or on Seismic Requirements Installation Drawing 0179-5288.
6. Wide washers must be installed at each anchor location between the anchor head and the equipment for tension load distribution. Wide steel washers must be Series W of American National Standard Type A plain washers flow carbon steel washers), ANSI B18.22.1- 1965, R1975, with the washer sizes specified on drawing 0179-5288 (Switch Installation; Seismic Requirements, sheet 2 of 3).
7. Concrete floor slab and concrete housekeeping pads must be designed and rebar-reinforced for seismic applications, in accordance with ACI 318.
8. All housekeeping pad thicknesses must be designed in accordance with the prequalification test report, as defined in Note 1 or a minimum of 1.5 times the anchor embedment depth, whichever is largest.
9. All housekeeping pads must be dowelled or cast into the building structural floor slab and designed for seismic application, as per SCI 318 and as approved by the structural engineer of record.
10. Wall mounting equipment must be installed to a rebar-reinforced structural concrete wall that is seismically designed and approved by the engineer of record to resist the added seismic loads from components being anchored to the wall.
11. Floor mounted equipment (with or without a housekeeping pad) must be installed to a rebar-reinforced structural concrete floor that is seismically designed and approved by the engineer of record to resist the added seismic leads from components being anchored to the floor.
12. When installing to a floor or wall, rebar interference must be considered.
13. Attaching seismic certified equipment to any floor ar wall, other than those constructed of structural concrete and designed to accept the seismic loads from said equipment, is not permitted by this specification.
14. Attaching seismic certified equipment to any floor constructed of light weight concrete over steel decking is not permitted by this specification.
15. Attaching seismic certified equipment to any concrete bock walls or cinder block walls is not permitted by this specification.

For special switch installation requirements, see written and tabulated seismic requirements listed on drawing 0179-5288.

The installation of the seismically certified switch should be overseen by the installation project structural engineer of record.

The Site Specific Requirements listed on page one of the "Seismic Certificate of Compliance" should be filled out by the installation project structural engineer of record.

Drawing 0179-5288 and the Seismic Certificate of Compliance for transfer switch and seismic installation requirements are included in the literature package of each seismically certified switch with feature code A080-7.

3 Wiring

Refer to Figure 4 thru Figure 8 for component locations.

WARNING: AC voltages and currents present an electrical shock hazard that can cause severe personal injury or death. Only trained and experienced personnel are to perform the following procedures.

When installing conduit, observe the following precautions:

1. **Before beginning conduit installation, cover the transfer switch to prevent accidental entry of metal chips.**
2. If using rigid conduit between the generator set and the transfer switch, install at least 2 feet (610 mm) of flexible conduit between the rigid conduit and generator set to absorb vibration.
3. Run control circuit wiring in separate conduit from the AC wiring; otherwise, induced currents could cause operational problems within the switch. Cutouts can be made through the top, bottom, or sides of the cabinet. (Refer to the switch outline drawings included in Appendix A.)

CAUTION: Installation debris can cause equipment failure and damage. Use extreme care to keep drill chips and filings out of the relays, contacts, and other parts of the automatic transfer switch when mounting or connecting conduit. Screwdrivers should be used carefully to prevent damage to components.

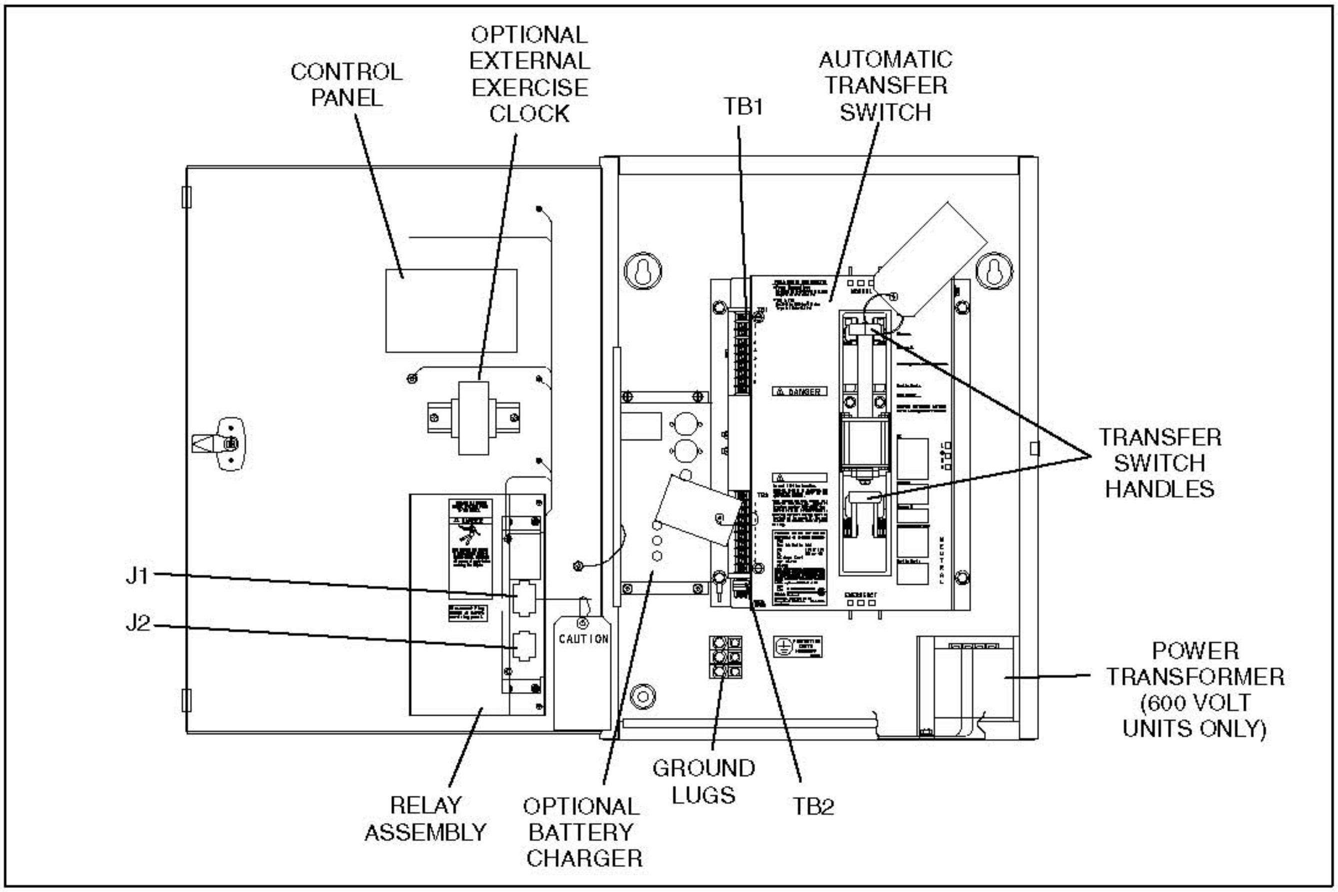


FIGURE 4. INTERIOR/COMPONENTS: 40-125 AMP SWITCH, TYPE 1 CABINET

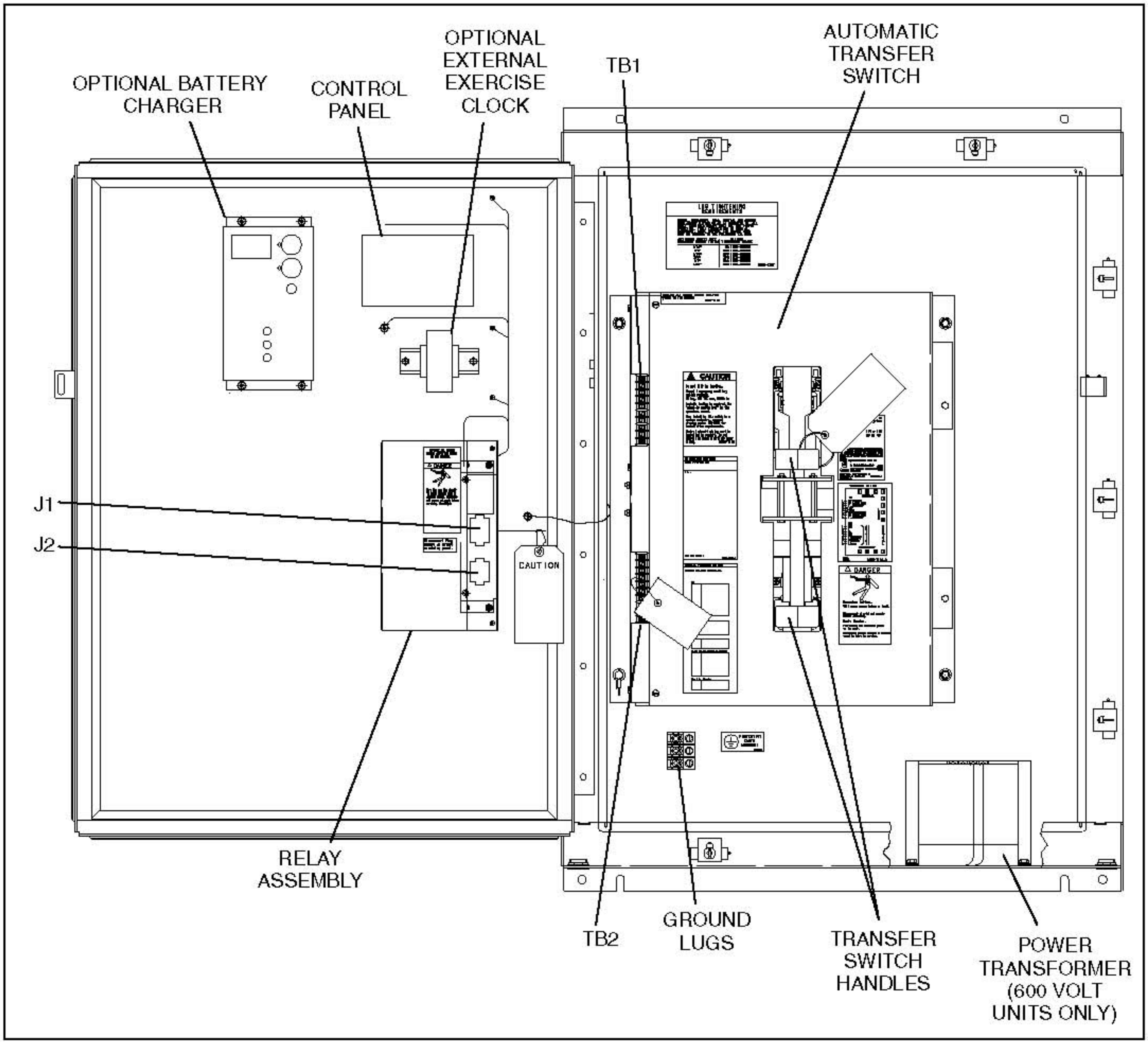


FIGURE 5. INTERIOR/COMPONENTS: 150-225 AMP SWITCH, TYPE 4 CABINET

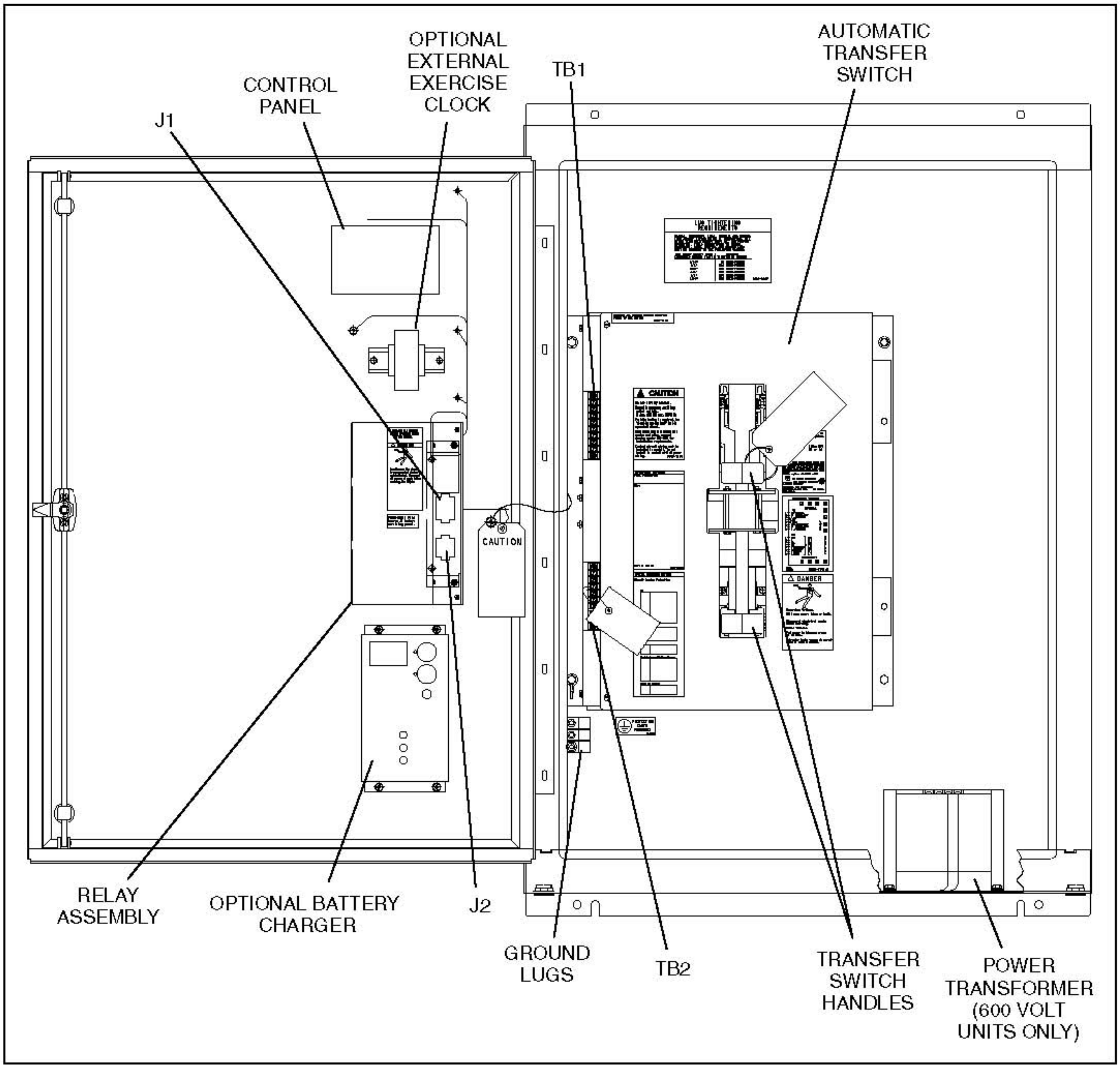


FIGURE 6. INTERIOR/COMPONENTS: 260 AMP SWITCH, TYPE 3R AND 12 CABINET

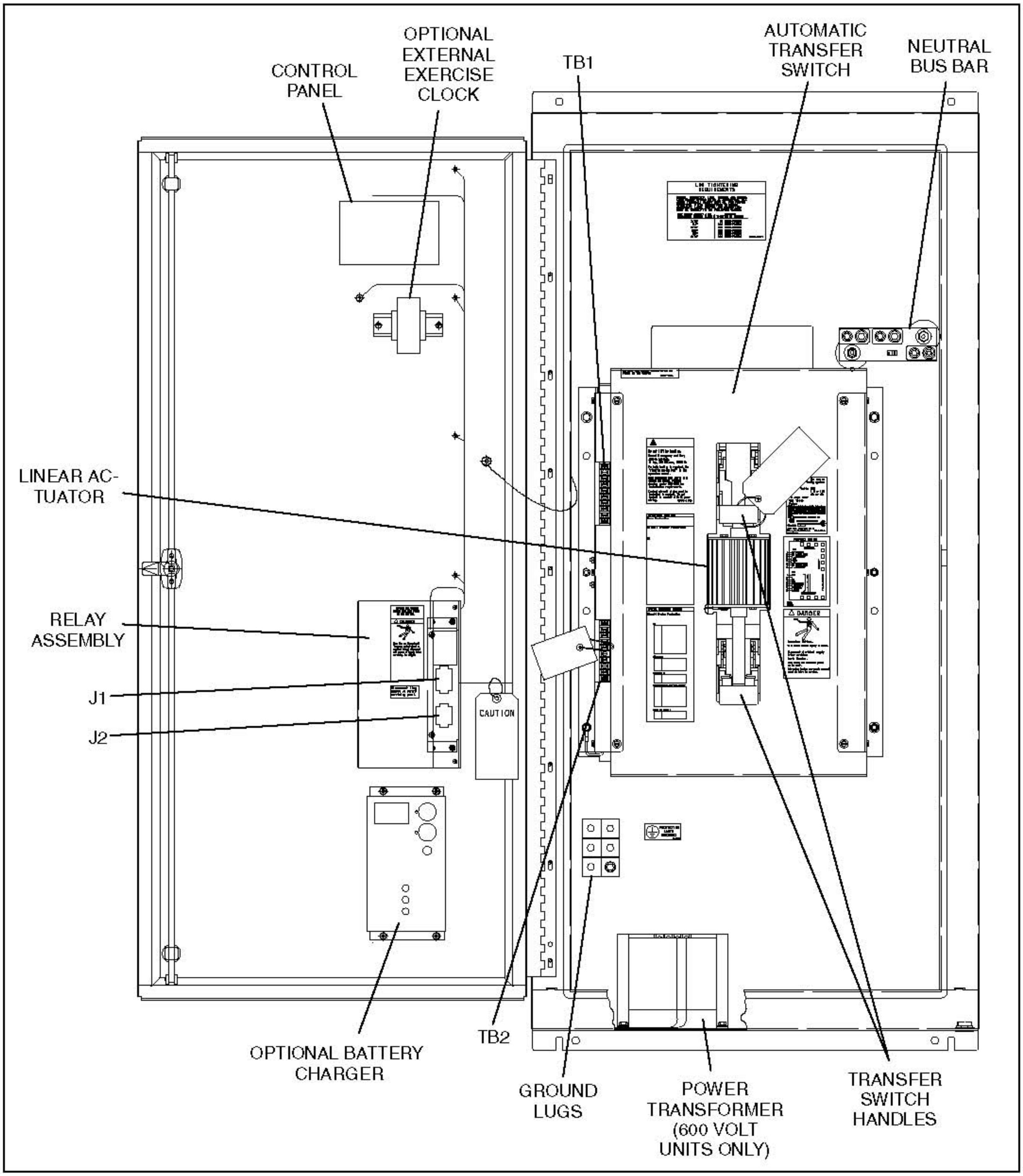


FIGURE 7. INTERIOR/COMPONENTS: 300-600 AMP SWITCH, TYPE 3R AND 12 CABINET (800-1000 AMP SIMILAR)

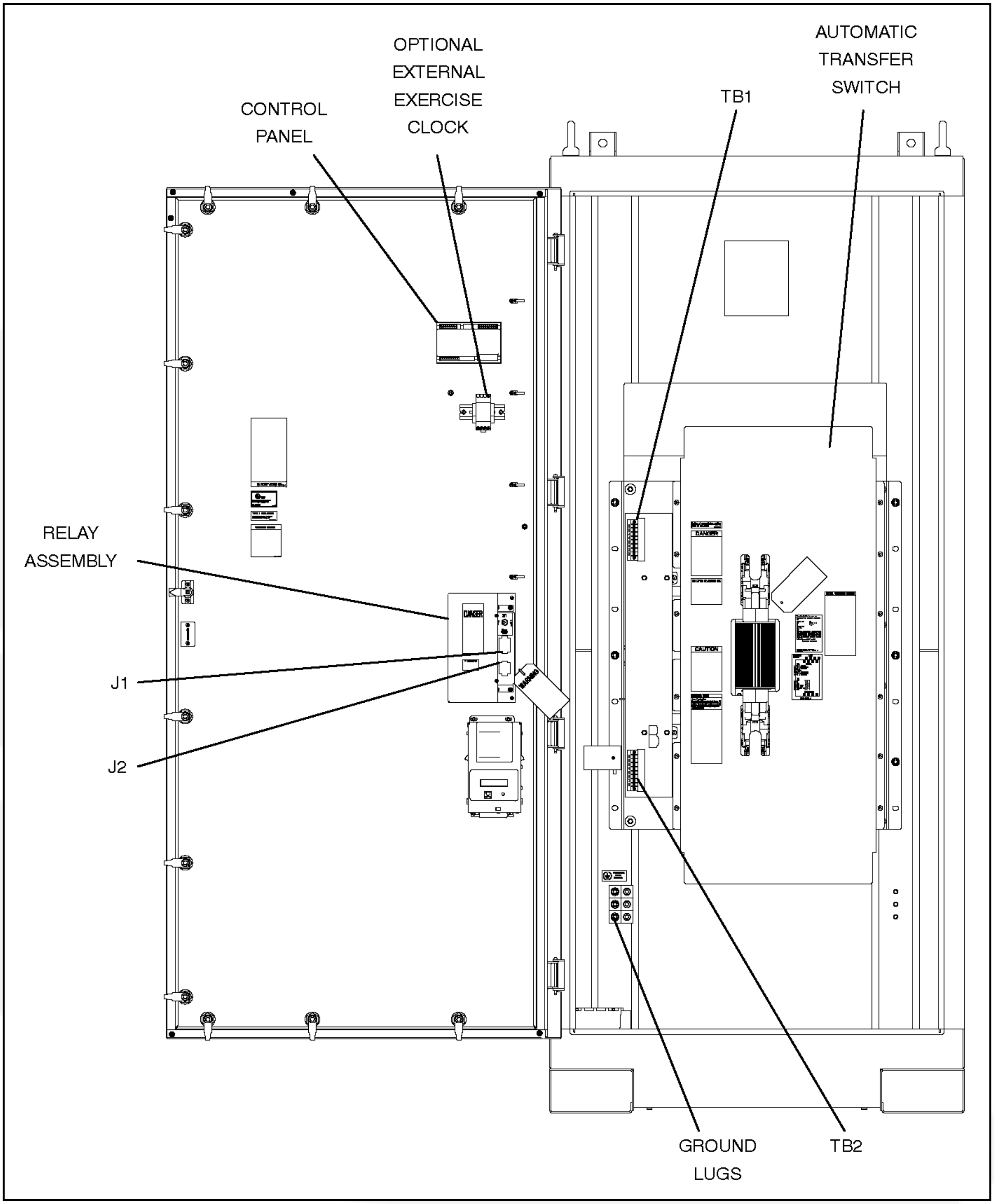


FIGURE 8. INTERIOR/COMPONENTS: 1200 AMP SWITCH, TYPE 1, 3R, 4, 4X CABINET

3.1 Recommended Compression Lugs (OTECE Spec A)

Table 5 through Table 8 list recommended compression lugs in sizes 500, 600, and 750 MCM for the OTECE Spec A switch.

TABLE 5. COMPRESSION LUGS FROM ILSCO

750 MCM	600 MCM	500 MCM
CRA-750L2	CRA-600L2	CRA-500L2
2ACL-750	2ACL-600	2ACL-500
2IACL-750	2IACL-600	2IACL-500
CRA-xxxL2 represents long barrel copper compression lugs. 2ACL-xxx represents aluminum compression lugs. 2IACL-xxx represents narrow tang aluminum compression lugs.		

TABLE 6. COMPRESSION LUGS FROM THOMAS & BETTS (COLOR-KEYED)

750 MCM	600 MCM	500 MCM
54223	54289	54286
60278	60275	60273
60278N	60278N	60278N
54xxx represents short barrel two hole lugs. 60xxx represents two hole lugs - 90° C. 60xxxN represents range taking narrow tongue single barrel lugs. The 60278N lug is from 500 to 750 MCM.		

TABLE 7. COMPRESSION LUGS FROM THOMAS & BETTS (BLACKBURN)

750 MCM	600 MCM	500 MCM
LCN75	LCN600	LCN500
ATL502	ATL6002	ATL5002
LCN represents long barrel 2-hole mount copper lugs. ATL represents 2-hole aluminum lugs.		

TABLE 8. COMPRESSION LUGS FROM BURNDY

750 MCM	600 MCM	500 MCM
YA39-2LN	YA36-2LN	YA34-2LN
YA39-2N	YA36-2N	YA34-2N
YA44L-2NTC-FX	-	YA38L-2NTC-FX
YAG44L-2NTC-LD	-	YAG38L-2NTC-LD
YA44-2N-FXB	-	YA38-2N-FXB
YA39A5 and YA39AM2	YA36A3	YA34A3

YAxx-2LN represents standard length barrel copper compression terminal. YAxx-2N represents long barrel uninsulated copper compression terminal. YAxxL-2NTC-FX represents standard length barrel copper compression terminal for flexible and extra flexible copper cables. YAGxxL-2NTC-LD represents standard length barrel lead plated copper compression terminal. YAGxx-2N-FXB represents long barrel copper compression terminal belled entry for flexible and extra flexible copper cables. YAxxAx and YAxxAMx represent 2-hole and 4-hole uninsulated aluminum compression terminal.

3.2 AC Connections

Perform wiring in the following sequence:

1. Test the operation of the generator set from its own controls.
2. Stop the generator set and remove the negative lead from the cranking battery to prevent starting.

WARNING: Failure to prevent the generator set from starting before wiring procedures are performed presents a shock hazard that can cause severe personal injury or death. Disconnect generator set battery (negative (-) terminal first) before proceeding.

3. Connect conductors of sufficient size (see contract drawings) to carry rated current from the line, load, and generator set directly to the transfer switch terminals, which are marked A, B, and C (A, B, C, and N on 4-pole switches). A neutral bar with lugs is standard on 3-pole switches. Phase rotation must be the same on the utility and genset power sources.

   Table 9 gives the type and maximum conductor size the transfer switch accepts. **Figure 9** through **Figure 12** show transfer switch source and load connections.

TABLE 9. TERMINAL LUG CAPACITY FOR COPPER OR ALUMINUM CONDUCTORS

Switch Current Rating	Wires per Phase	Size Range of Wires
40/70/125 Source	1	12 AWG-2/0 Cu-Al
40/70/125 Load & Neutral	1	14 AWG-2/0 Cu-Al
150/225	1	6 AWG-300 MCM Cu-Al
260	1	6 AWG-400 MCM Cu-Al
300/400	2 1	3/0 AWG-250 MCM Cu-Al 3/0 AWG-600 MCM Cu-Al
600	2	250-500 MCM Cu-Al
800/1000	4	250-500 MCM Cu-Al
1200	4	2 AWG-600 MCM Cu-Al (standard - mechanical lugs)
1200	4	4-1/0-750 MCM Cu-Al (optional - mechanical lugs)
1200	4	500 MCM Cu-Al (optional - compression lugs)
1200	4	600 MCM Cu-Al (optional - compression lugs)

Switch Current Rating	Wires per Phase	Size Range of Wires
1200	4	750 MCM Cu-Al (optional - compression lugs)

4. On 120-volt switches, connect the hot side to the (A) lug and the neutral side to the Neutral lug. On 240-volt single phase switches, connect the two hot lines to the A- and C-lugs and the Neutral line to the Neutral lug.
5. Connect power cables to the load terminals. Tighten the lugs as indicated in **Table 10**.

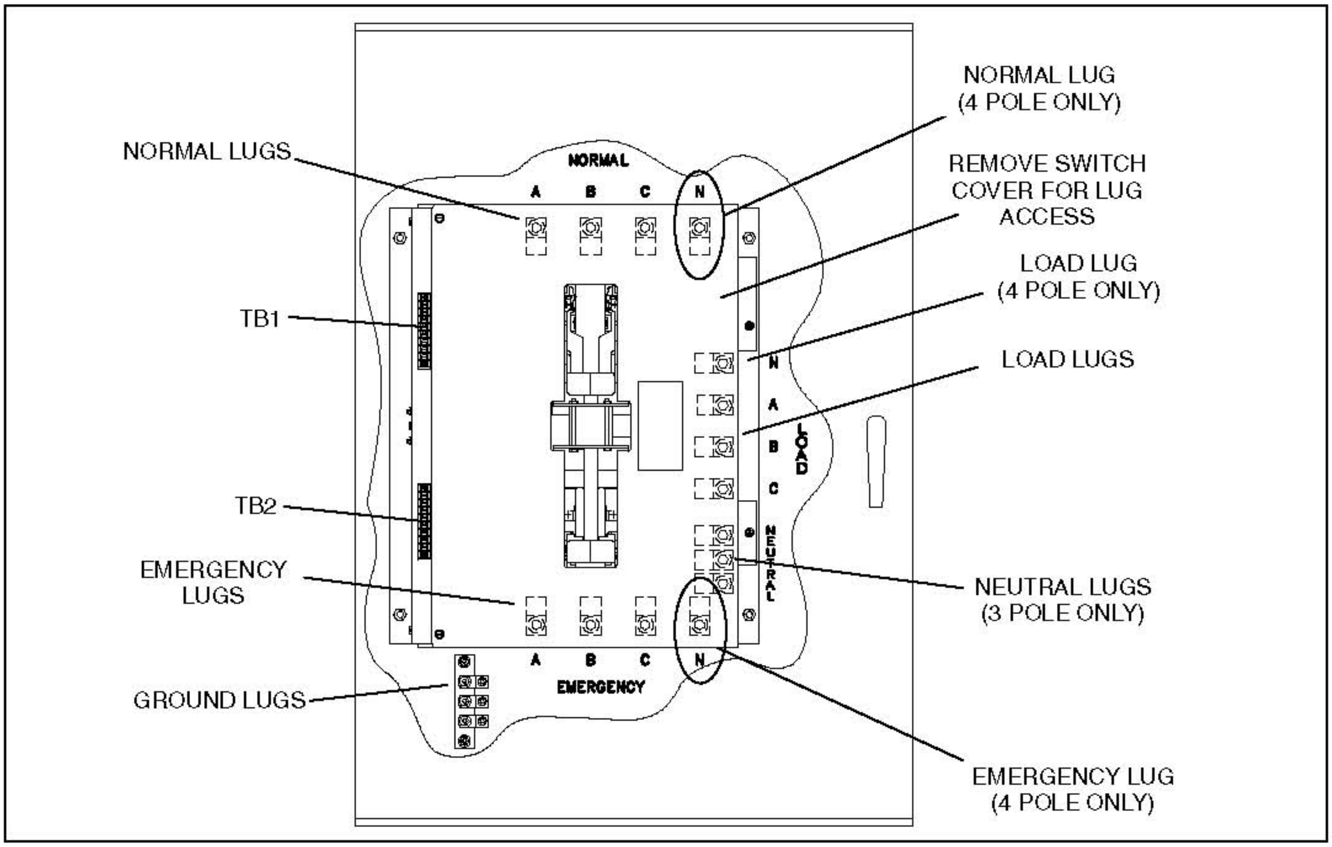
TABLE 10. LUG TORQUES

Set Screw Socket Size (Across Flats)	Minimum Torque For Proper Operation
3/16 In	80 In-lbs (9 N•m)
1/4 In	200 In-lbs (23 N•m)
5/16 In	275 In-lbs (31 N•m)
3/8 In	375 In-lbs (43 N•m)
1/2 In	500 In-lbs (57 N•m)
9/16 In	600 In-lbs (68 N•m)

WARNING: AC voltages and currents present an electrical shock hazard that can cause severe personal injury or death. Make sure that both AC power sources are disconnected.

6. Make sure that both AC power sources are disconnected.
7. For 800-1000 amp transfer switches used on a circuit capable of delivering 50,000 amps @ 600 volts, wrap the line cables together with nominal 1/2-inch nylon rope, or rope having a minimum tensile strength of 4200 pounds, at five inches from the line terminals with four wraps (see **Figure 13**).

FIGURE 9. 150-260 AMPERE, 4 POLE TRANSFER SWITCH TERMINAL LUG ACCESS, TYPE 1 CABINET (3 POLE, TYPE 3R, 4, AND 12 CABINETS ARE SIMILAR)



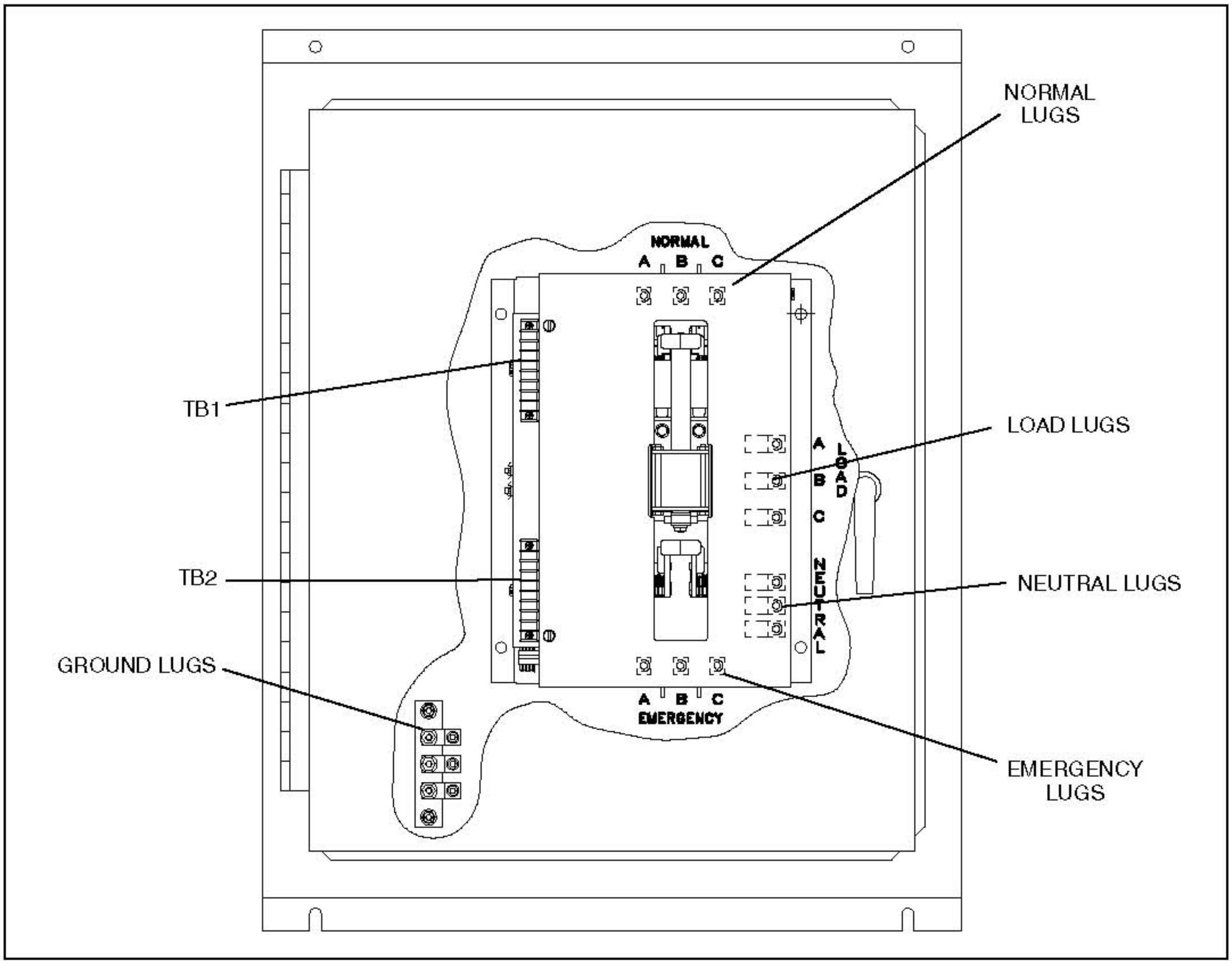


FIGURE 10. 40-125 AMPERE, 3 POLE TRANSFER SWITCH TERMINAL ACCESS (TYPE 3R AND 12 CABINET SHOWN - TYPE 1 AND 4 ARE SIMILAR)

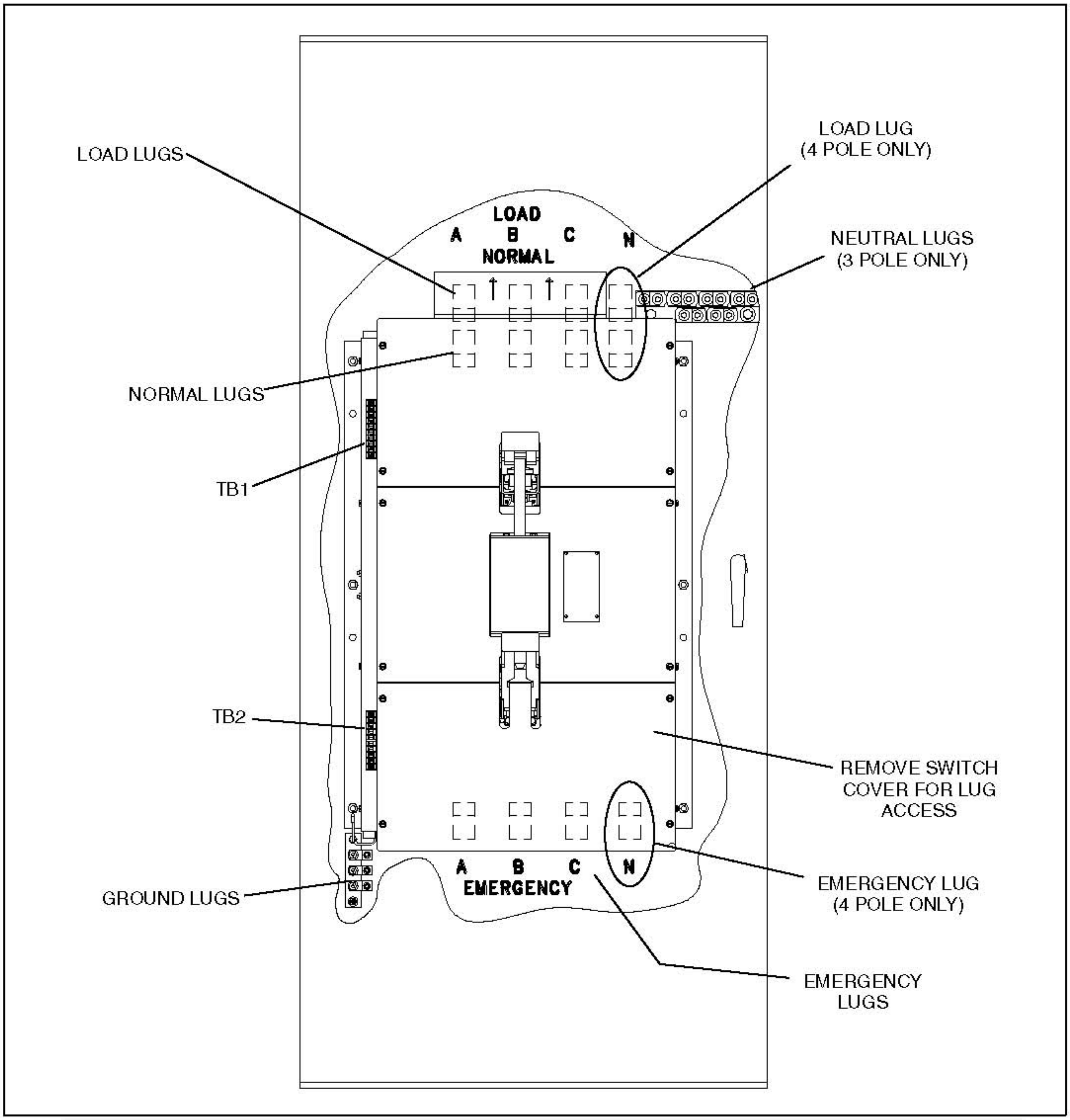


FIGURE 11. 300-1000 AMPERE, 3 AND 4 POLE TRANSFER SWITCH TERMINAL LUG ACCESS (800 AMP TYPE 1 CABINET SHOWN - OTHERS ARE SIMILAR)

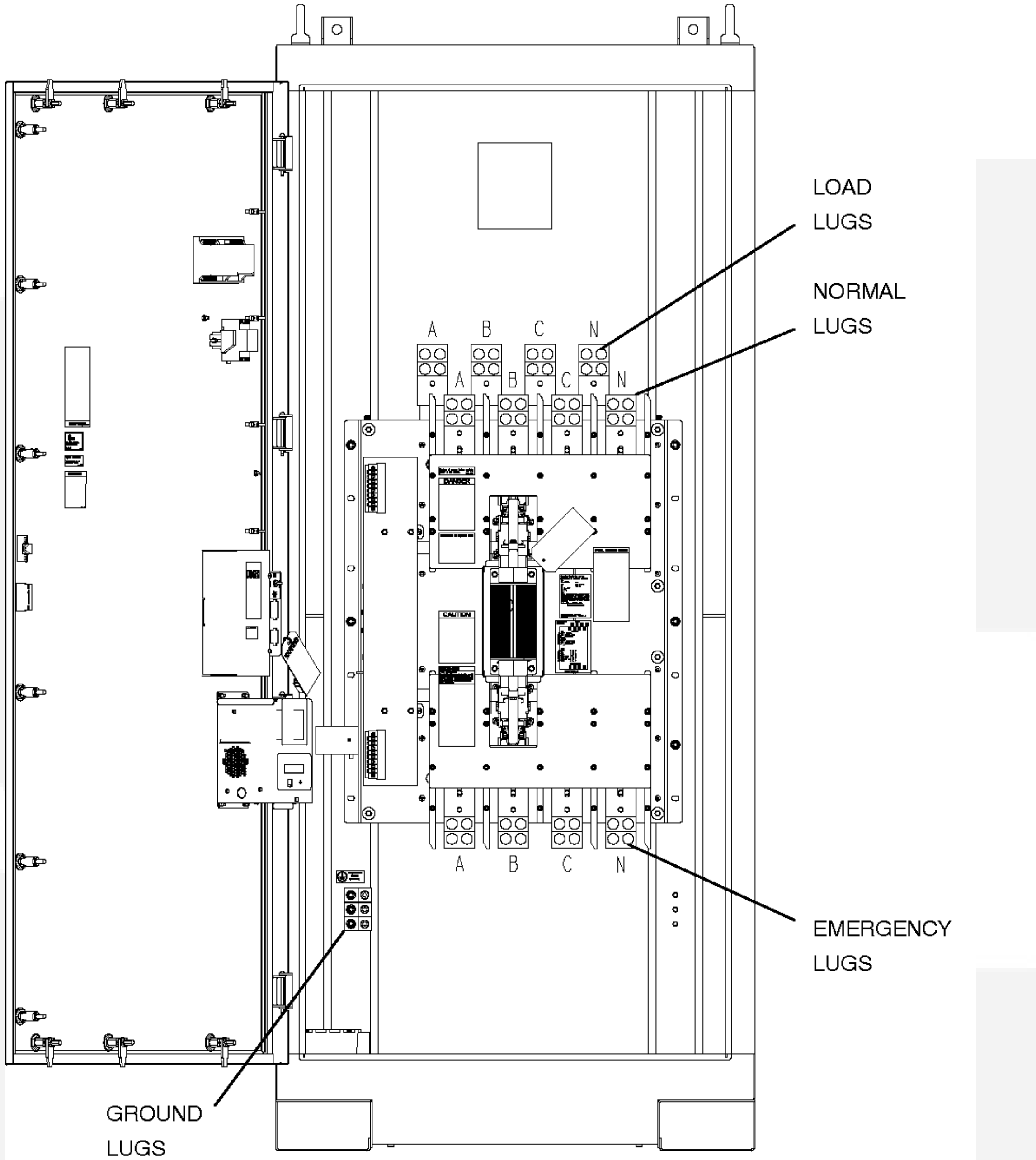


FIGURE 12. 1200 AMPERE, 4 POLE TRANSFER SWITCH TERMINAL LUG ACCESS

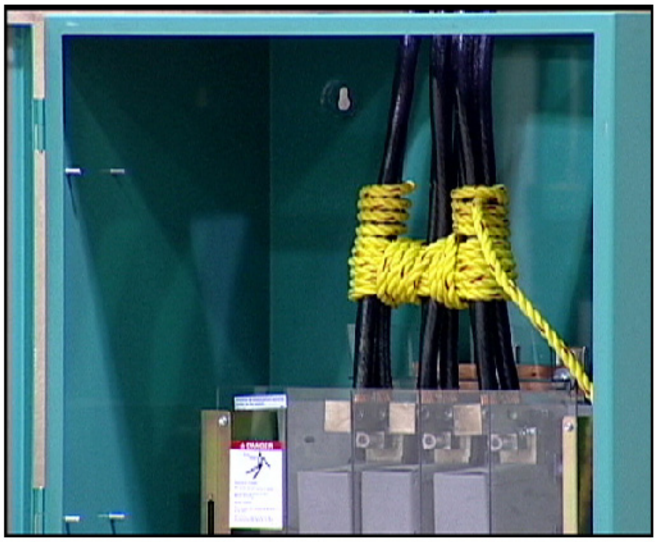


FIGURE 13. SECURE THE POWER CABLES

3.3 Control Connections

Connections of standard and optional control wiring are made at terminal blocks TB1, TB2, and TB3; and directly at the (optional) auxiliary relays.

TB1 is located near the top left side on the front of the transfer switch. TB2 is located below TB1, near the bottom left side of the transfer switch. TB3 and auxiliary relays are located inside, on the upper left wall of the cabinet on the DIN rail (see **Figure 14**).

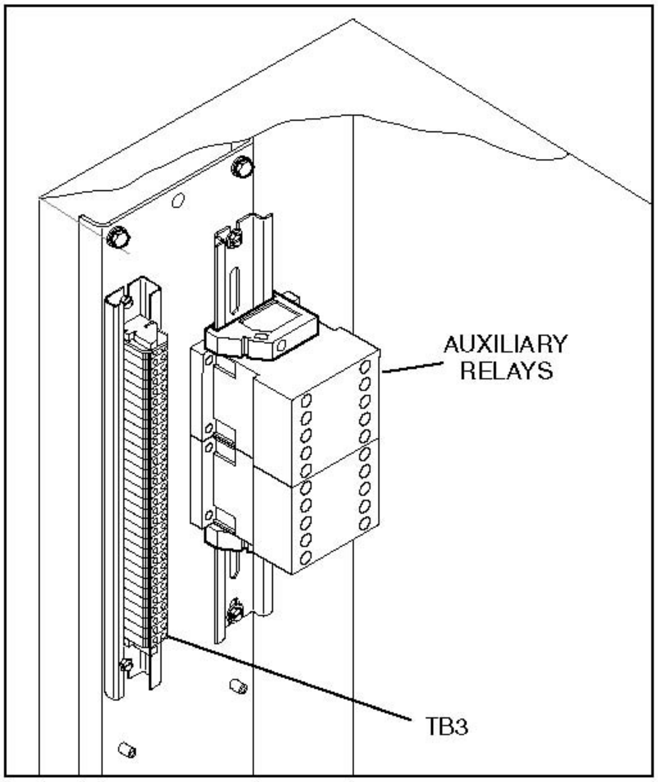


FIGURE 14. CONTROL WIRING CONNECTIONS

3.3.1 Connecting Transfer Switch to Genset

WARNING: AC voltages and currents present an electrical shock hazard that can cause severe personal injury or death. Disconnect the AC power source.

Wire size depends on the distance and the type of battery charger installed in the transfer switch. Refer to Table 11 to determine the wire size required.

- Use Column A for connections to TB2-2, 4, 5, 6, 7, 8, and, if equipped, the annunciator.
- Use Column B for connections to TB2-1 (GND) and TB2-3 (B+) if no battery charger is installed in the transfer switch.
- Use Column C for connections to TB2-1 (GND) and TB2-3 (B+) if a 2-Amp battery charger is installed in the transfer switch.
- Use Column D for connections to TB2-1 (GND) and TB2-3 (B+) if a 10-Amp battery charger is installed in the transfer switch.

TABLE 11. WIRE SPECIFICATIONS

Wire Size (AWG)	Distance in Feet, One Way (Multiply by 0.3 for Meters)			
	Column A	Column B	Column C	Column D
16	1000	425	125	25
14	1600	675	200	40
12	2400	1080	300	60
10	4000	1715	500	100

Wire resistance must not exceed 0.5 ohm per line. Use stranded wire only. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

Remote starting (for Cummins Power Generation water-cooled generator sets only) uses terminals B+, GND (ground), and RMT of terminal block TB2 (**Figure 16**). Connect these terminals to like terminals on the generator set. Refer to Interconnect Wiring diagram shipped with the switch. A jumper is shipped with the transfer switch and is in a small envelope attached to TB2.

- For PCC 3100 and PCC 2100 genset controls, install a jumper between TB2-1 and TB2-2 for ground-to-start connection.
- For Detector 12 genset controls, install a jumper between TB2-2 and TB21-3 for B+ start.
- For PCC 3200 genset controls requiring a dry contact start, do not install a jumper.

Be sure to check the Interconnect Wiring diagram shipped with the transfer switch.

3.3.2 Auxiliary Contacts

Auxiliary contacts, for external alarm or control circuitry, are available for the Normal (utility power) and Emergency (genset power) sides of the transfer switch. Connections for the auxiliary contacts can be made on terminal block TB1 (**Figure 15**). The contacts have ratings of 10 amperes at 250 VAC. **Figure 15** shows the normally open and normally closed positions of the auxiliary contacts with the transfer switch in the neutral position. Moving the transfer switch to Normal or Emergency actuates the corresponding auxiliary contacts.

Use number 22 to number 12 AWG wire. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

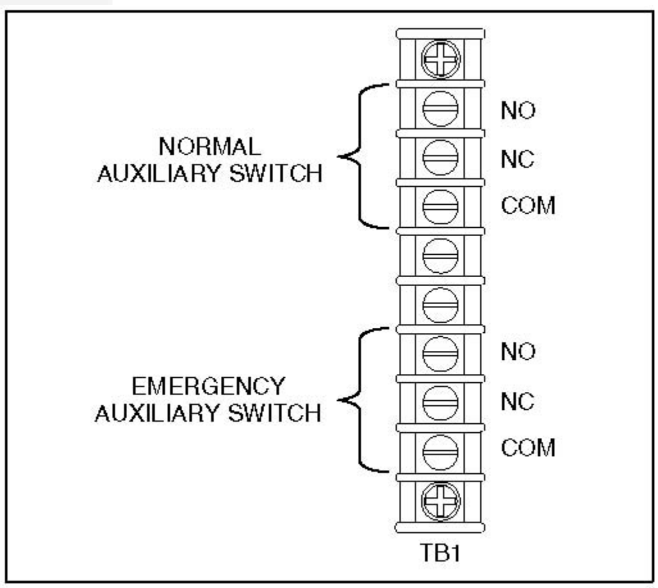


FIGURE 15. TERMINAL BLOCK TB1

3.3.3 Remote Start-Stop Connections

Use number 18 to number 12 AWG wire. Resistance must not exceed 0.5 ohm per line. Stranded wire is recommended. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

Remote starting (for Onan water-cooled generator sets only) uses terminals B+, GND (ground), and RMT of terminal block TB2 (**Figure 16**). Connect these terminals to like terminals on the generator set. Refer to your generator set wiring diagrams.

Connect the supplied jumper between terminals 1 and 2 for PowerCommand control systems. Connect the jumper between terminals 2 and 3 for Detector Control systems. Do not use the jumper for all other systems.

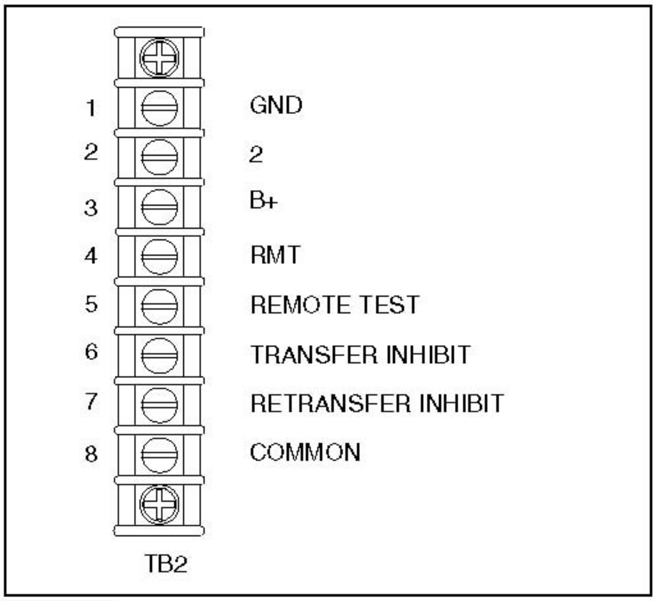


FIGURE 16. TB2: START CONNECTIONS, REMOTE TEST, AND TRANSFER/RETRANFER INHIBIT

3.3.4 Remote Test Input

To add remote test, connect a normally open, dry contact between terminals 5 and 8 of TB2 (see **Figure 17**). Closing the contact activates the feature and opening the contact deactivates it.

Use number 22 to number 12 AWG wire. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

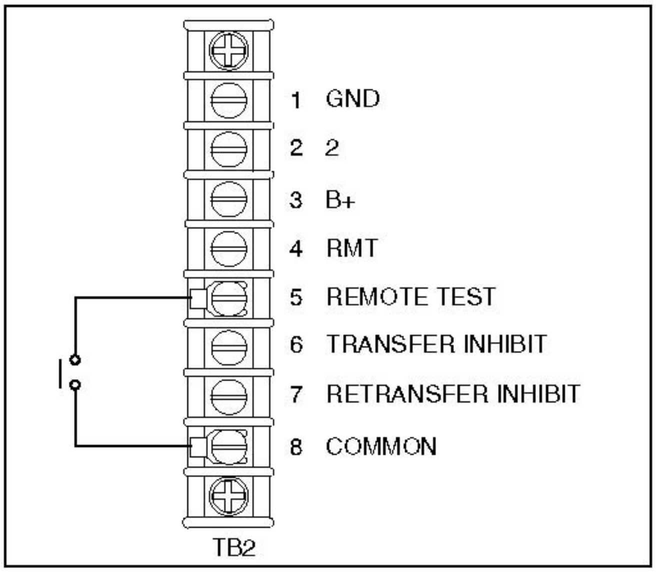


FIGURE 17. TB2 CONNECTIONS FOR REMOTE TEST TRANSFER

3.3.5 Transfer Inhibit Input

To add transfer inhibit, connect a normally open, dry contact between terminals 6 and 8 of TB2 (see **Figure 18**). Closing the contact enables the feature and opening the contact disables it.

Use number 22 to number 12 AWG wire. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

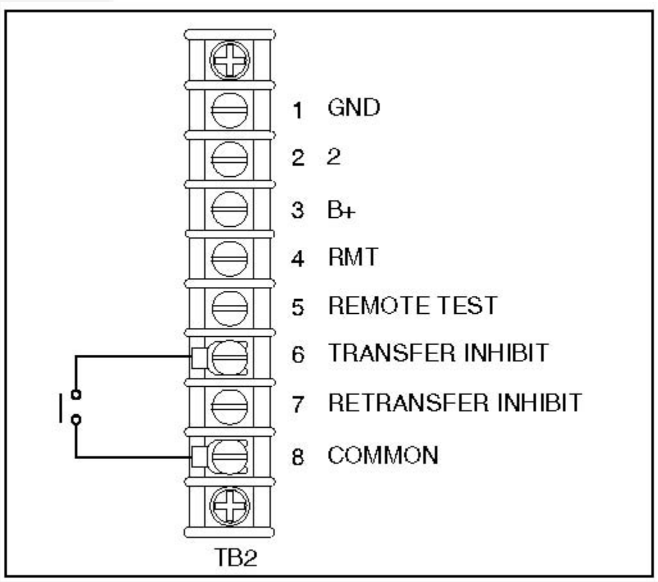


FIGURE 18.

3.3.6 Retransfer Inhibit Input

To add retransfer inhibit, connect a normally open, dry contact between terminals 7 and 8 of TB2 (see **Figure 19**). Closing the contact enables the feature and opening the contact disables it.

Use number 22 to number 12 AWG wire. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

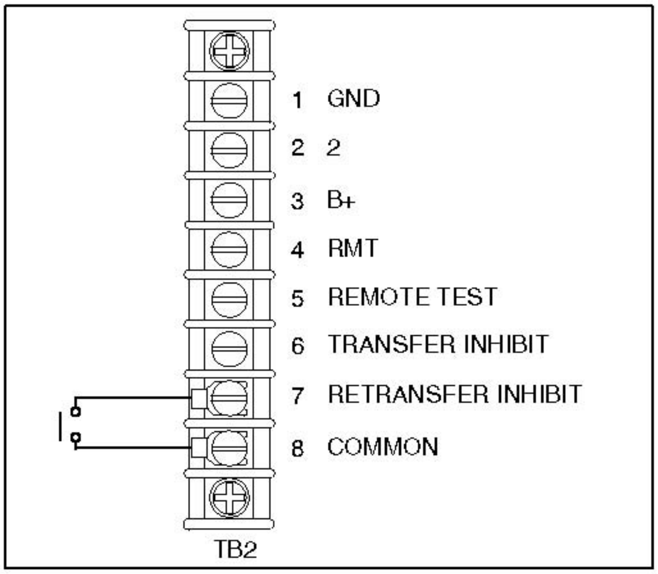


FIGURE 19. TB2 CONNECTIONS FOR RETRANSFER INHIBIT

3.3.7 Remote Override Input

To add remote override, connect a normally open, dry contact between P4-2 on the back of the control panel and TB2-8 (see **Figure 20**). Closing the contact enables the feature and opening the contact disables it.

Use number 22 to number 12 AWG wire. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

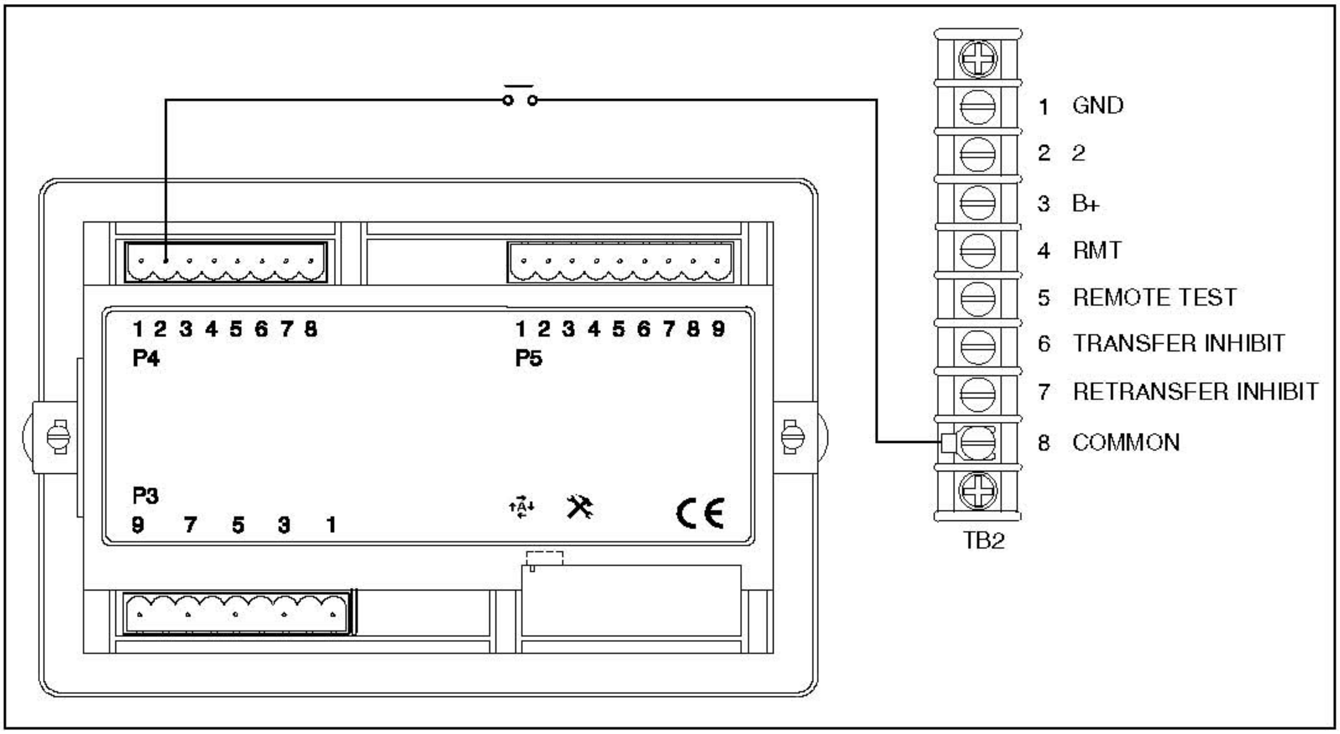


FIGURE 20. CONNECTIONS FOR REMOTE OVERRIDE INPUT

3.3.8 Auxiliary Relays and Elevator Relay Options

Connections to the auxiliary and elevator relays are made directly to the relay terminals. Figure 14 shows the location of the Auxiliary Relays on the options panel. The terminals accept wire sizes from one number 18 AWG wire to two number 12 AWG wires. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

There are two types of auxiliary relay coils (12 VDC and 24 VDC).

Table 12 lists the available auxiliary relay and elevator signal relay options, along with their feature codes.

All relays have two normally open and two normally closed contacts that are rated for 6 amperes at 600 VAC (see Figure 21).

TABLE 12. AUXILIARY AND ELEVATOR RELAYS

Code	Coil type	Description
L101 L102 L103	24 Vdc Coil 24 Vdc Coil 24 Vdc Coil	Installed, Not Wired Emergency position Relay Normal position Relay
L201 L202 L203	12 Vdc Coil 12 Vdc Coil 12 Vdc Coil	Installed, Not Wired Emergency position Relay Normal position Relay
M032	12 or 24 vdc coil	Elevator Signal Relay

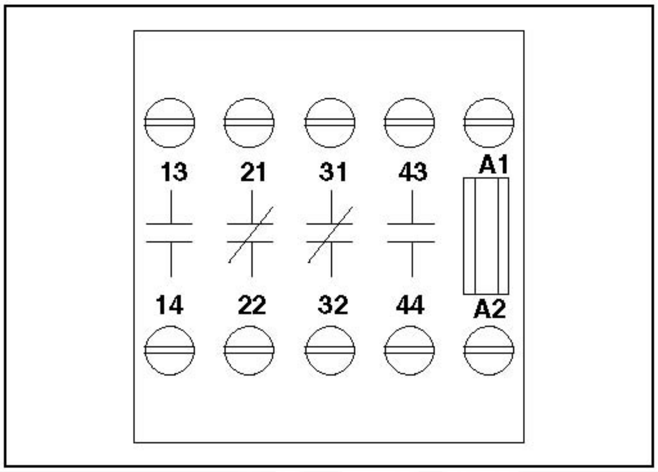


FIGURE 21. RELAY TERMINALS

3.3.9 Battery Charger Options

When so equipped, a battery charger can be used for charging genset starting and control batteries. These chargers are current limiting and supply automatic constant voltages.

When the battery approaches the full charge preset voltage, the charging current automatically tapers to zero amperes or to a steady-state load on the battery.

A float-charge battery charger regulates its charge voltage to continuously charge without damage to the battery. As the battery approaches full charge, the charging current automatically tapers to zero amperes or to steady-state load on the battery.

Two battery chargers are available (see Figure 22). One battery charger is rated for 2 amperes at 12 or 24 VDC. The other battery charger is rated for 15 amperes at 12 VDC or 12 amperes at 24 VDC.

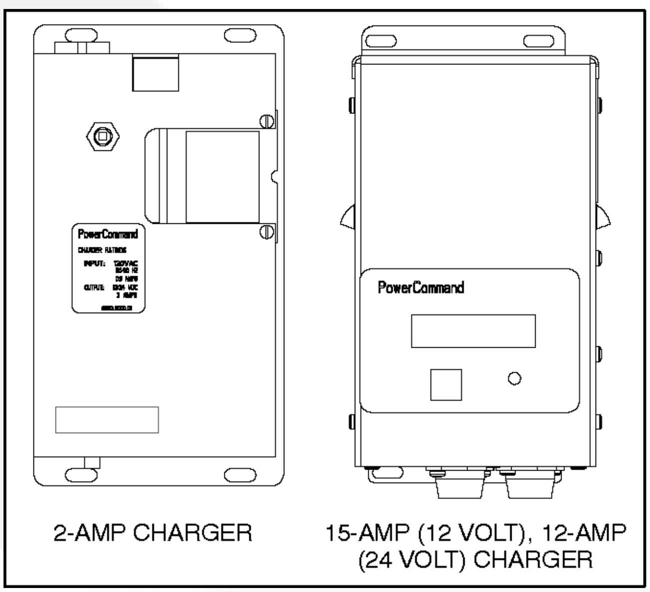


FIGURE 22. CURRENT BATTERY CHARGERS

3.3.9.1 2-Amp Battery Charger

The 2-ampere battery charger {see **Figure 23**) has a 5 amp DC output circuit breaker switch on the front of the battery charger. The charger also includes a 5 amp AC fuse *to* protect the battery charger circuit.

Under normal operating conditions, the Low Bat and AC Fail relays are energized and the High Bat relay is de-energized. In response to a Low Bat or AC Fail condition, the appropriate normally energized relay (Low Bat or AC Fail) drops out. In response to a High Bat condition, the normally de-energized High Bat relay is energized.

Control Panel - The 2-amp charger control panel includes a digital display, a RESET button, and an LED status indicator (see **Figure 24**).

- The 2-line X 16-character digital display displays menus and faults.
- The RESET button is used to select menu options and to clear fault messages.
- The status LED displays the appropriate color for the following conditions.
  - **Green** - On solid indicates unit is charging
  - **Red** - On solid indicates a fault condition. The fault number is sown on the digital display.

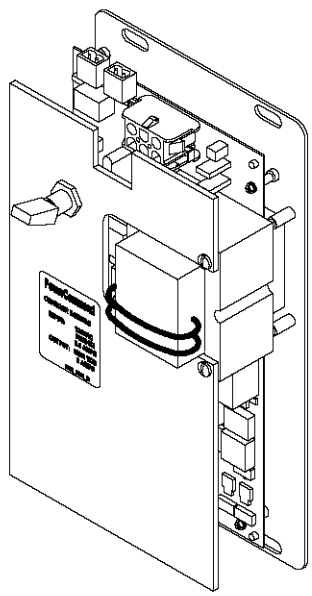


FIGURE 23. 2-AMP POWERCOMMAND BATTERY CHARGER

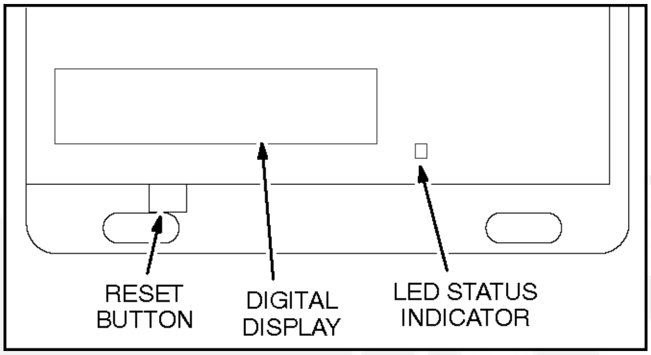


FIGURE 24. 2-AMP CHARGER CONTROL PANEL

Battery Charger Configuration - The RESET button on the control panel (see **Figure 24** is used to configure the battery charger for the correct battery voltage. (More information on Setup menus is included in the Battery Charger Operator's Manual.)

3.3.9.2 15/12-Amp Battery Charger

There are two types of 15/12-amp PowerCommand battery chargers (see **Figure 26**). All l5/12-amp battery chargers have a 20 amp DC circuit breaker switch on the front of the battery charger. The 120, 208, and 240 VAC battery chargers include two 10 amp AC circuit breaker switches and a circuit breaker guard, while the 277, 380, 416, and 600 VAC battery chargers include two AC fuse holders.

Control Panel - The 15/12-amp charger control panel includes a digital display, a Reset button, and an LED status indicator *(see* **Figure 25**).

- The 2-line x 16-character digital display displays menus and faults.
- The Reset button is used to select menu options and to clear fault messages.
- The status LED is displays the appropriate color for the following conditions.
  - **Green** - On solid indicates unit is charging
  - **Amber** - On solid indicates Equalizing
  - **Red** - On solid indicates a fault condition. The fault number is shown on the digital display.

Optional Battery Temperature Sensor - A connector for an optional battery temperature sensor is located on the front of the battery charger. When used to monitor battery temperature, the optional battery temperature sensor is connected from the battery charger to the positive terminal of the battery. A fault message (fault code 2263) is displayed if the battery temperature is too high (reaches 131 degrees F (55 degrees C)).

Battery Charger Configuration - The RESET button on the control panel *(see* **Figure 25**) is used to configure the battery charger, (More information on Setup menus is included in the Battery Charger Operator's Manual .)

- **Battery Voltage and Type** - The battery charger must be correctly configured, using the Setup menus, for the correct battery voltage and type before it is connected to the battery. The battery voltage can be set for 12 or 24 VDC (default = 12 VDC). The battery type can be set for Lead-Acid, Gel, or AGM batteries (default = Lead-Acid) .

NOTE: A factory installed battery charger is set up for the proper DC battery voltage requested on the production order, with the Lead-Acid battery type selected as the default.

- **Battery Equalization** - Battery equalization is available for lead-acid batteries that are completely charged, using the Equalize Battery screen in the Setup menus. When batteryequalization is in process, the LED status indicator turns amber.

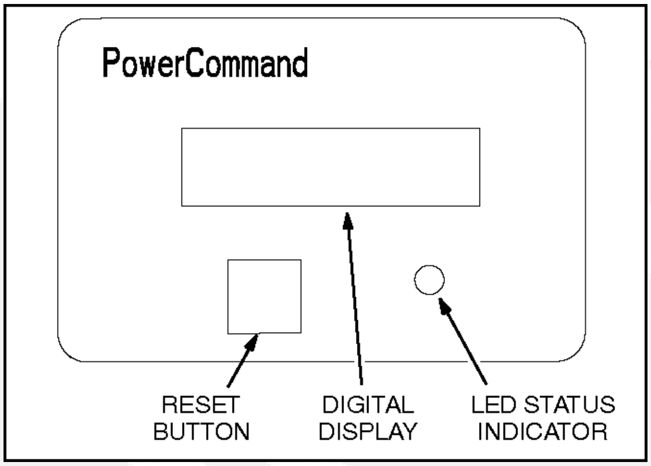


FIGURE 25. 15/12-AMP CHARGER CONTROL PANEL

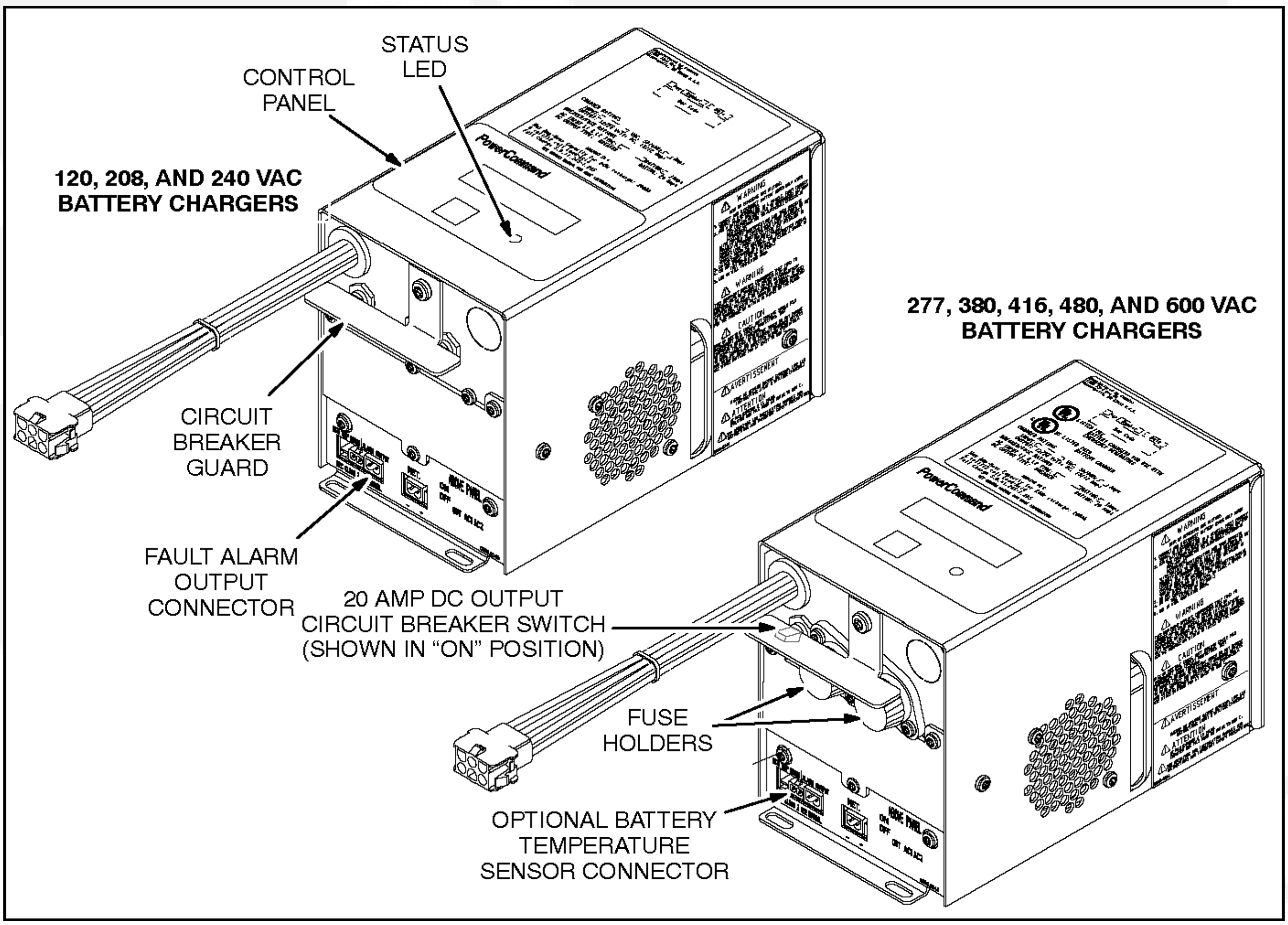


FIGURE 26. 15/12-AMP POWERCOMMAND BATTERY CHARGERS

3.3.10 Battery Charger Alarm Contacts Option

The optional 10-ampere battery charger can include three sets of Form-C relay contacts, as an additional option.

Under normal operating conditions, the Low Bat and AC Fail relays are energized and the High Bat relay is de-energized. In response to a Low Bat or AC Fail condition, the appropriate normally energized relay (Low Bat or AC Fail) drops out. In response to a High Bat condition, the normally de-energized High Bat relay is energized.

The contacts are rated for 4 amperes at 120 VAC or 30 VDC. Connections to these contacts are made at terminals 41-42-43 (AC failure), 44-45-46 (high battery voltage), and 47-48-49 (low battery voltage) of TB3 (**Figure 27**). See **Figure 14** for the location of TB3 on the option panel.

Use number 22 to number 12 AWG wire. For connection to the screw terminal, strip the insulation back 3/8 inch (10 mm).

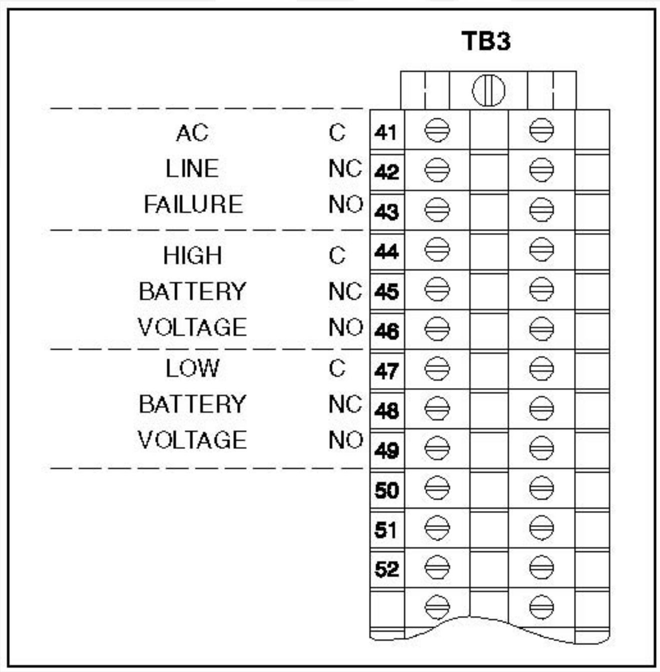


FIGURE 27. BATTERY CHARGER ALARM CONTACTS

3.4 Inspection and Cleanup

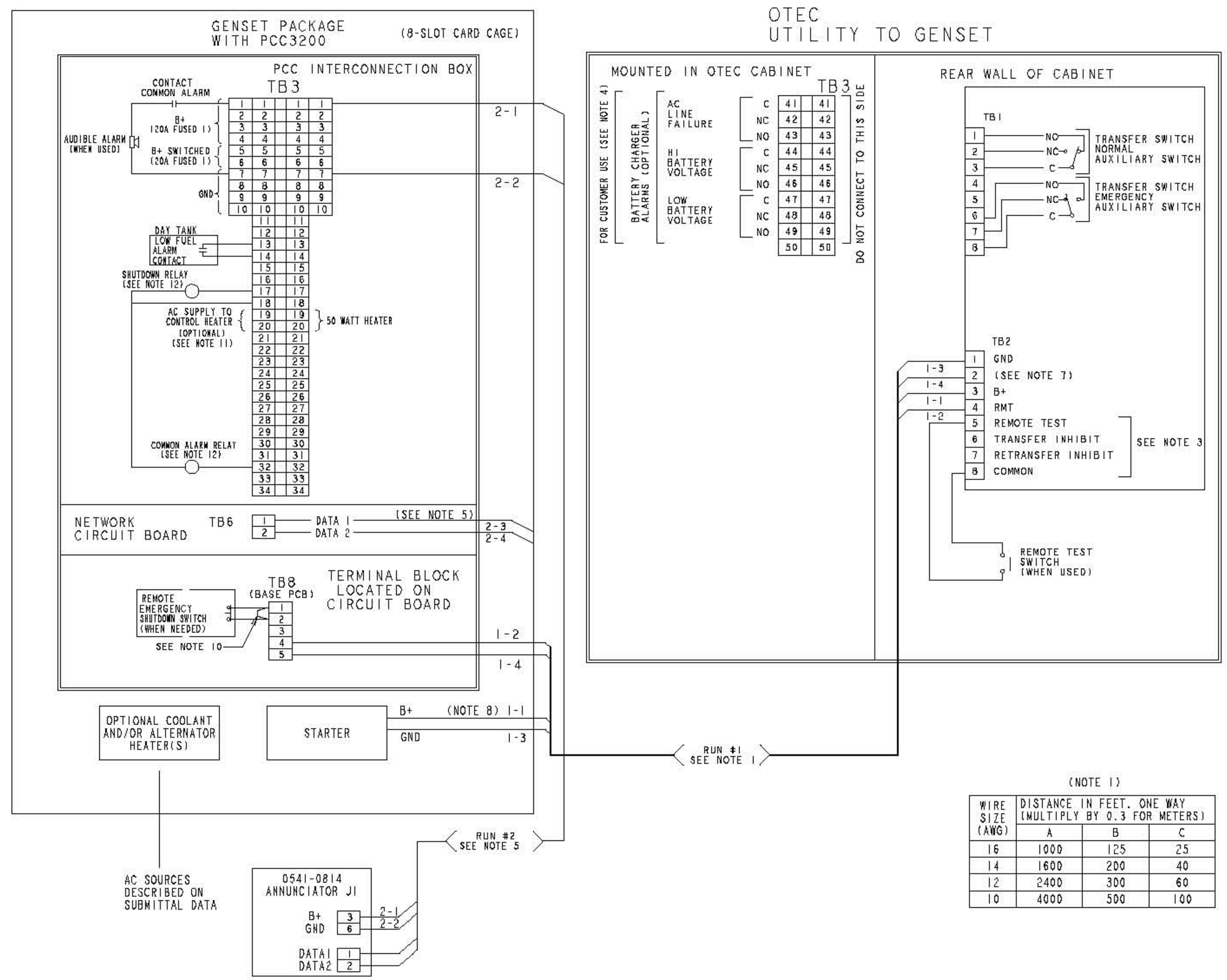
- Inspect all wiring to be certain that:
  - Wiring does not interfere with switch operation
  - Wiring is not damaged as the door opens and closes
  - Wiring does not contact sharp or abrasive surfaces
  - No wiring is left loose and unconnected
- After mounting and wiring the cabinet, clean the interior with a vacuum cleaner to remove any chips, filings, or dirt from the cabinet interior and components.
- Double check the power supply voltages to make sure they match the voltages listed on the nameplate.

- Double check the phase rotation. The Normal side phase rotation must match the Emergency side phase rotation.
- Verify that the remote start connections are correct for your application. For more information on jumper replacement, determine the control type and refer to information provided earlier in this section.
- Manually operate the ATS with power off to make sure it operates smoothly, with no binding. If it does not operate smoothly, check for damage that may have occurred during shipping or installation. Also check for installation debris.

Appendix A. Interconnect Diagrams and Outline Drawings

Table of Contents

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-1,-2,-3,-4,-5 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
3. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.
4. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
5. REFER TO ONAN 900-0529 POWERCOMMAND NETWORK INSTALLATION & OPERATION MANUAL FOR WIRING INSTRUCTIONS, WIRE SIZE, AND LENGTH. USE STRANDED TWISTED PAIR WIRES WHEN CONNECTING DATA1 AND DATA2 TO NETWORK. PART # 0334-1350 OR EQUAL.
6. INPUTS FOR CUSTOMER FAULTS. GROUNDED SIGNAL REQUIRED TO ACTIVATE INPUT (MAX 50 MA.)
7. ON PCC 3200 CONTROLS NO JUMPER IS REQ'D BETWEEN TB1-1 & TB1-2.
8. CONFIGURATION SHOWN IS FOR ATS-MOUNTED BATTERY CHARGER. IF WALL-MOUNTED CHARGER IS USED, CONNECT B+ AND GND FROM CHARGER DIRECTLY TO BATTERY OR STARTER.
9. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
10. OPEN CONNECTION TO INITIATE EMERGENCY STOP THESE TERMINALS MUST BE SHORTED TOGETHER IF REMOTE EMERGENCY STOP OPTION NOT USED. JUMPER SHOWN BETWEEN TB8-1 AND TB8-2 NOT SUPPLIED WITH UNIT.
11. 120VAC OR 240VAC AT 50W.
12. CUSTOMER SUPPLIED EITHER 12 OR 240VDC RELAYS OUTPUT SIGNAL 20ma @ 24VDC MAX.

(NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET. ONE WAY (MULTIPLY BY 0.3 FOR METERS)		
	A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

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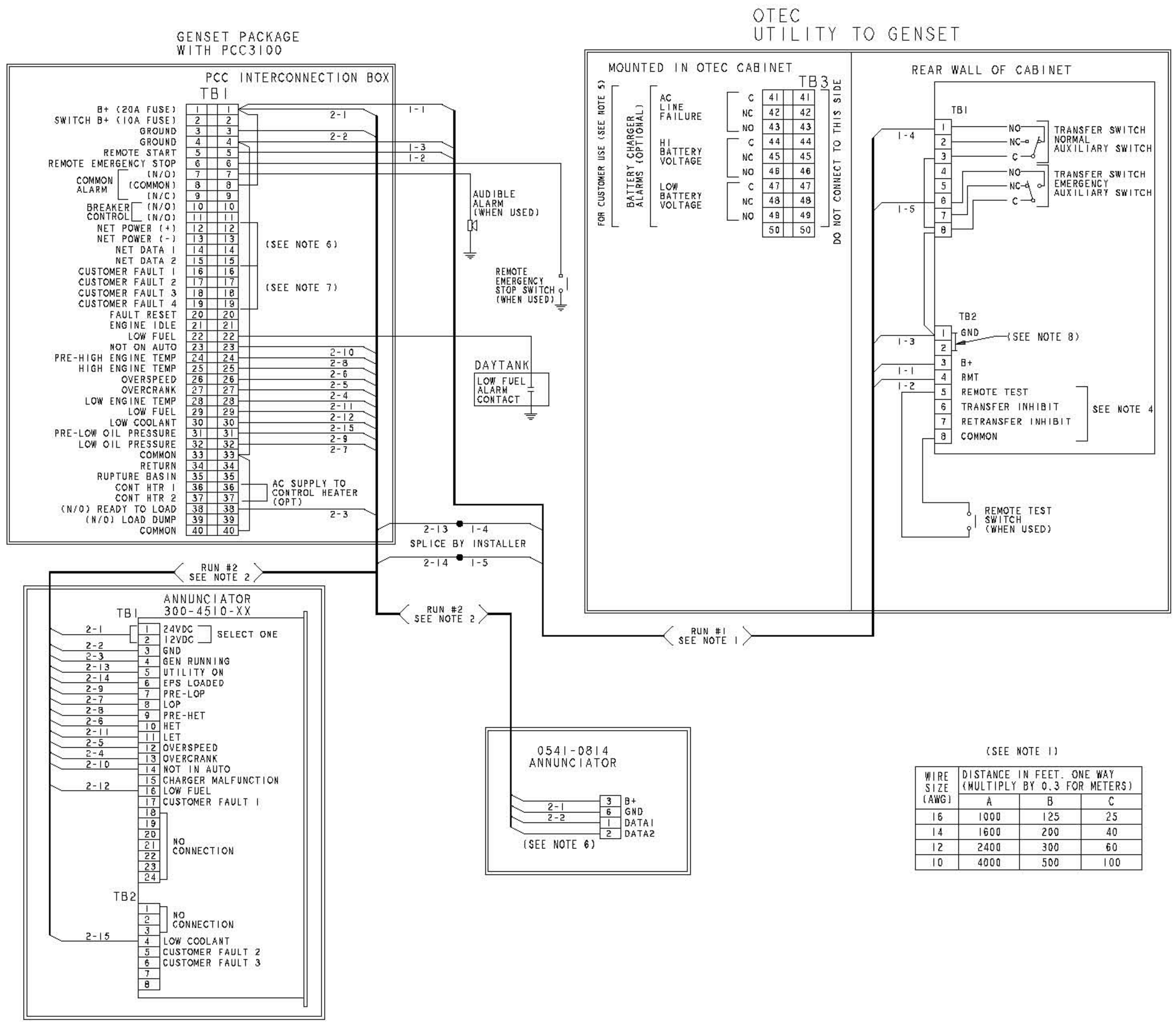
FIGURE 28. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 1 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-1,-2,-3,-4,-5 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR 300-4510 ANNUNCIATOR, RUN #2-GENSET TO ANNUNCIATOR-ALL LEADS, USE COL. A.
3. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH) SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
4. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.
5. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
6. REFER TO ONAN 900-0529 POWERCOMMAND NETWORK INSTALLATION & OPERATION MANUAL FOR WIRING INSTRUCTIONS, WIRE SIZE, AND LENGTH. USE STRANDED TWISTED PAIR WIRES WHEN CONNECTING DATA1 AND DATA2 TO NETWORK. PART # 0334-1350 OR EQUAL.
7. INPUTS FOR CUSTOMER FAULTS. GROUNDED SIGNAL REQUIRED TO ACTIVATE INPUT (MAX 50 MA.)
8. INSTALL JUMPER BETWEEN TB2-1 & TB2-2. FOR SETS WITH PCC 3100 CONTROL.
9. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
10. CONTACTS RATED: 2 AMPS AT 30 VDC OR 0.60 AMPS AT 120 VAC.

(SEE NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET. ONE WAY (MULTIPLY BY 0.3 FOR METERS)		
	A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

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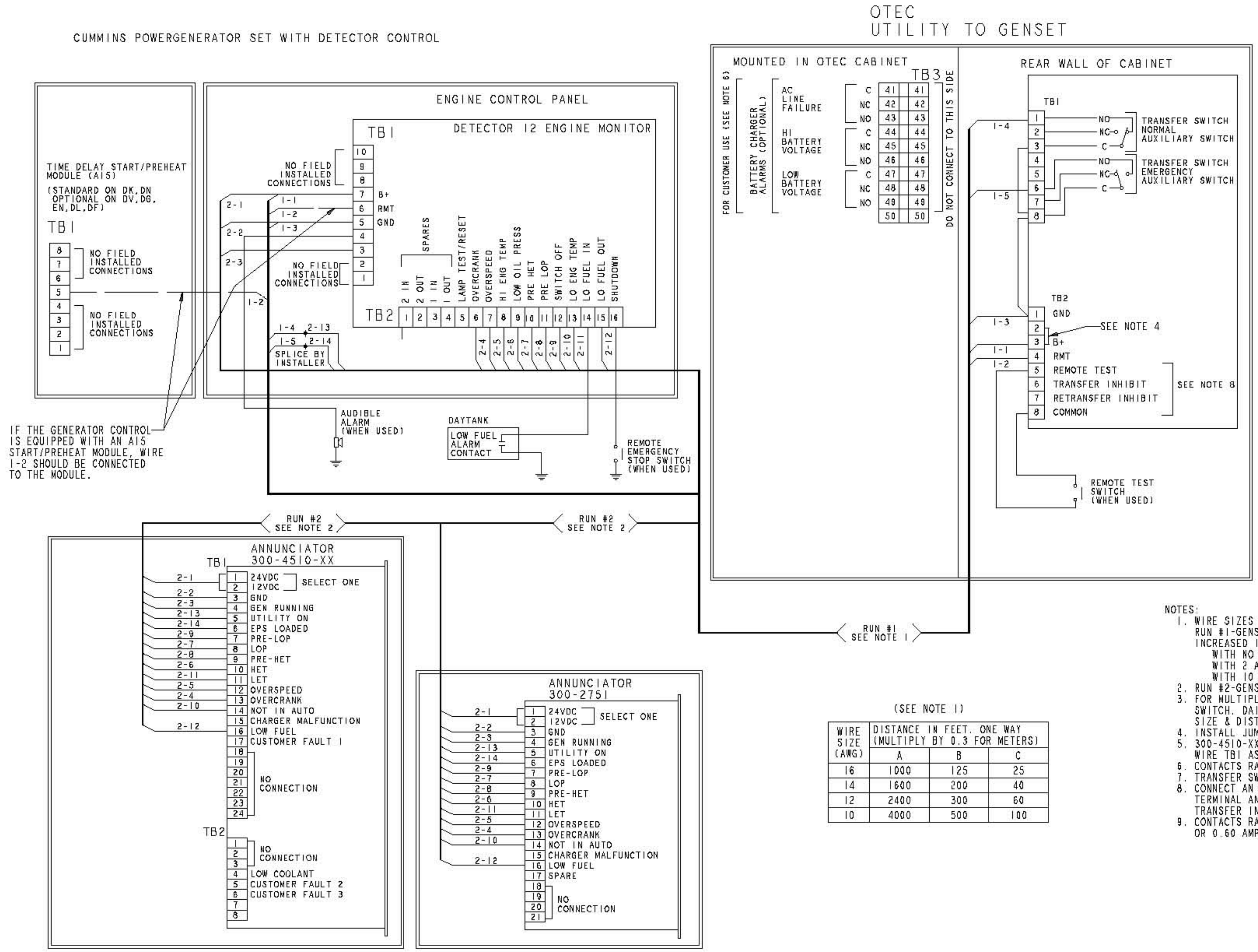
FIGURE 29. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 2 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



(SEE NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET, ONE WAY (MULTIPLY BY 0.3 FOR METERS)		
	A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.
   WITH NO BATT CHARGER-LEADS 1-1,-2,-3,-4,-5 USE COL A.
   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B
   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. RUN #2-GENSET TO ANNUNCIATOR-ALL LEADS, USE COL. A.
3. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
4. INSTALL JUMPER BETWEEN TB2-2 & TB2-3.
5. 300-4510-XX ANNUNCIATOR MAY BE USED ALSO. WIRE TB1 AS SHOWN.
6. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
7. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
8. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.
9. CONTACTS RATED: 2 AMPS AT 30 VDC OR 0.60 AMPS AT 120 VAC.

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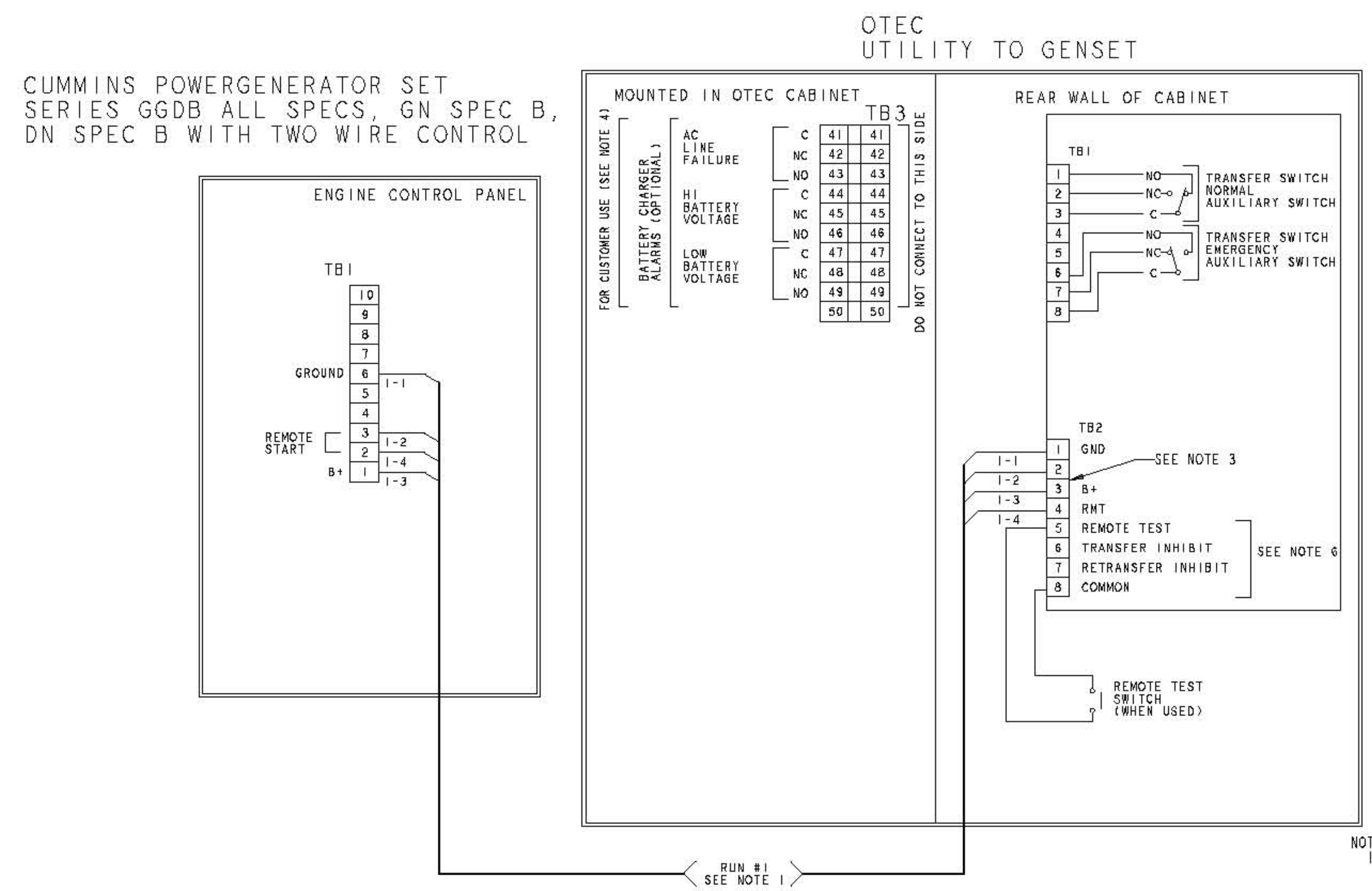
FIGURE 30. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 3 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



(SEE NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET, ONE WAY (MULTIPLY BY 0.3 FOR METERS)		
	A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-2, -4 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
3. DO NOT INSTALL JUMPER BETWEEN TB2-2 & TB2-3 OR BETWEEN TB2-2 & TB2-1.
4. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
5. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
6. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.

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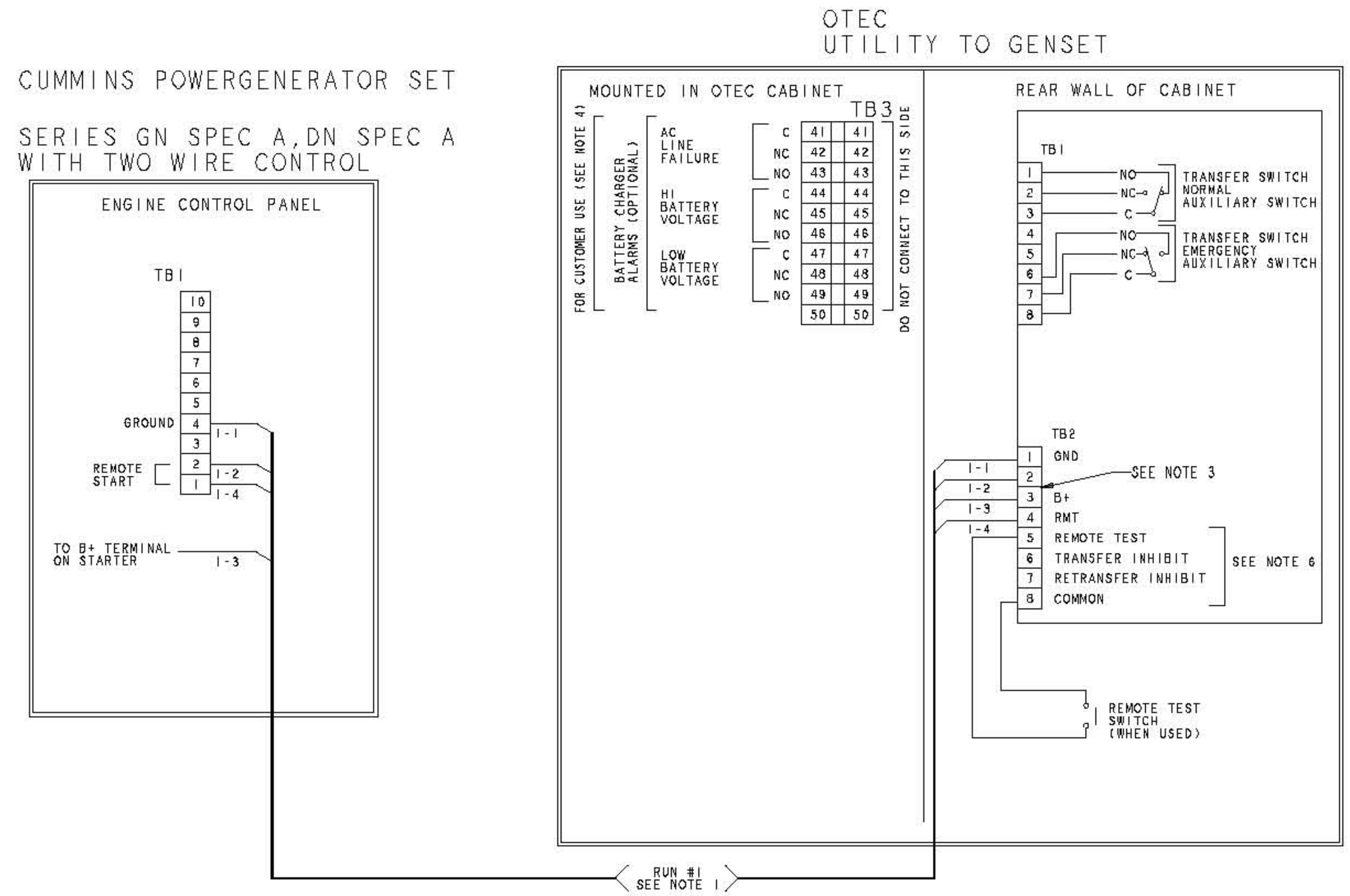
FIGURE 31. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 4 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



(SEE NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET, ONE WAY (MULTIPLY BY 0.3 FOR METERS)		
	A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-2, -4 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
3. DO NOT INSTALL JUMPER BETWEEN TB2-2 & TB2-3 OR BETWEEN TB2-2 & TB2-1.
4. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
5. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
6. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.

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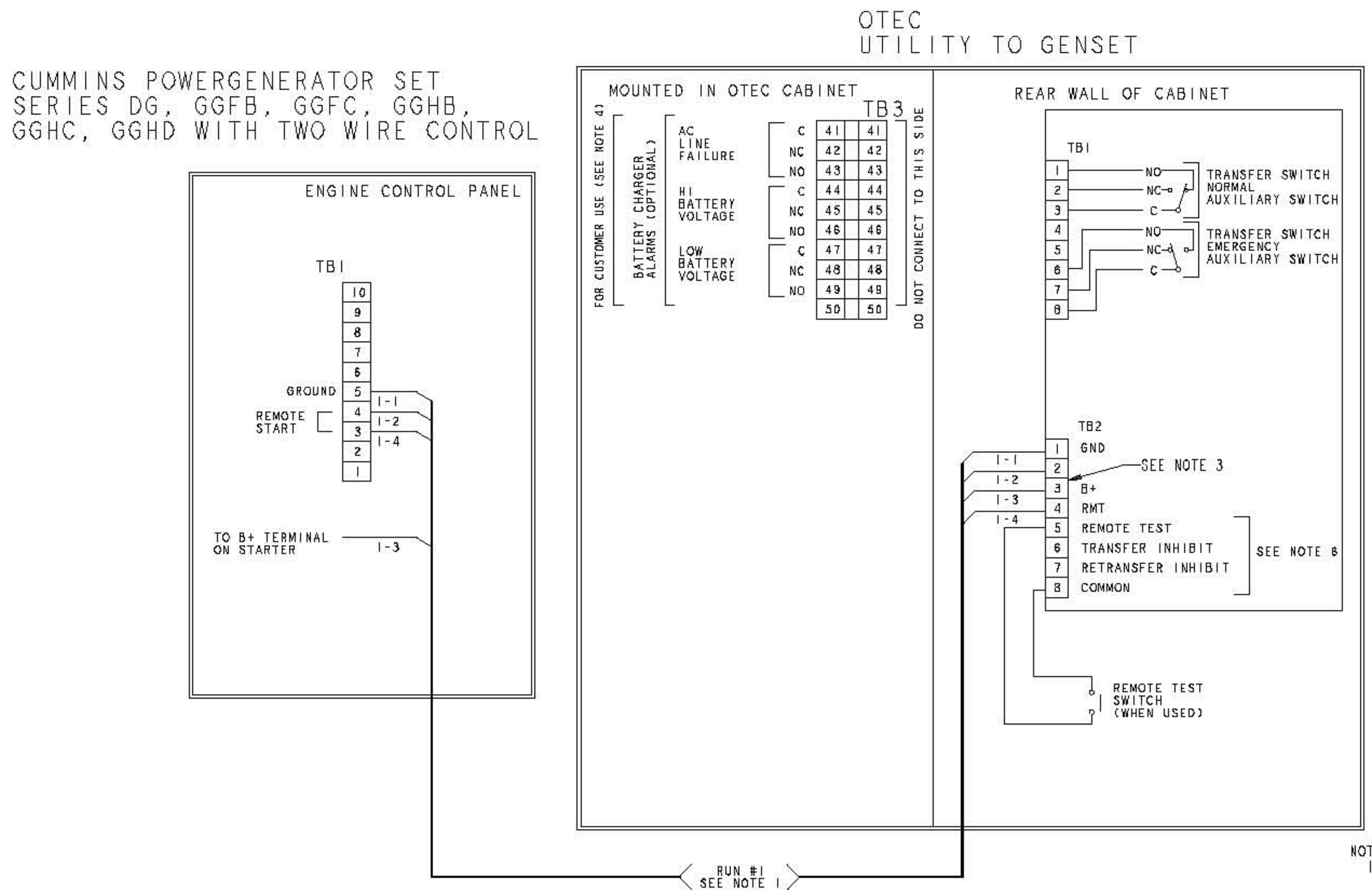
FIGURE 32. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 5 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



(SEE NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET, ONE WAY (MULTIPLY BY 0.3 FOR METERS)		
	A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-2, -4 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
3. DO NOT INSTALL JUMPER BETWEEN TB2-2 & TB2-3 OR BETWEEN TB2-2 & TB2-1.
4. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
5. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
6. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.

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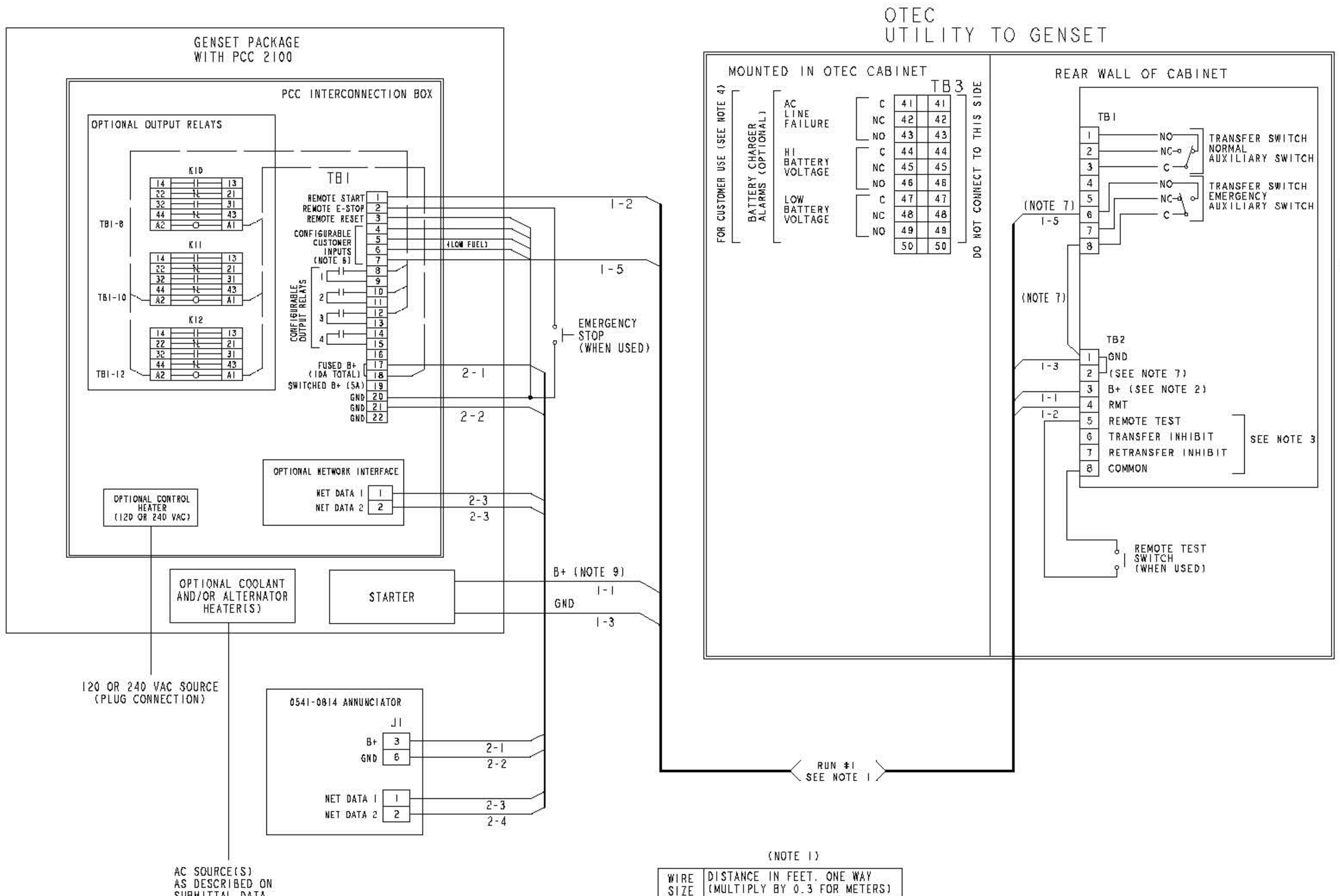
FIGURE 33.   40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 6 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



(NOTE 1)

WIRE SIZE (AWG)	DISTANCE IN FEET, ONE WAY (MULTIPLY BY 0.3 FOR METERS) A	B	C
16	1000	125	25
14	1600	200	40
12	2400	300	60
10	4000	500	100

NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-1,-2,-3,-4,-5 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
3. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE EACH TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, WIRE TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.
4. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
5. REFER TO ONAN 900-0529 POWERCOMMAND NETWORK INSTALLATION & OPERATION MANUAL FOR WIRING INSTRUCTIONS, WIRE SIZE, AND LENGTH. USE STRANDED TWISTED PAIR WIRES WHEN CONNECTING DATA1 AND DATA2 TO NETWORK. PART # 0334-1350 OR EQUAL.
6. CONNECTIONS TO TB1-4 THRU 7 ON GENSET ARE FOR CUSTOMER USE AND MAY BE CONFIGURED TO DISPLAY CUSTOM ALARM MESSAGES ON GENSET CONTROL. LOW FUEL IS REQUIRED FOR NFPA110 COMPLIANCE.
7. INSTALL JUMPER BETWEEN TB2-1 & TB2-2.
8. THIS CONNECTION IS USED IF ATS POSTION DISPLAY IS DESIRED IN REMOTE ANNUNCIATOR & ATS DOES NOT HAVE NETWORK INTERFACE. CONFIGURABLE INPUT IS PROGRAMMED "EPS SUPPLYING LOAD" & BOUND TO ANNUNCIATOR OVER NETWORK.
9. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
10. CONFIGURATION SHOWN IS FOR ATS-MOUNTED BATTERY CHARGER. IF WALL-MOUNTED CHARGER IS USED, CONNECT B+ AND GND FROM CHARGER DIRECTLY TO BATTERY OR STARTER.

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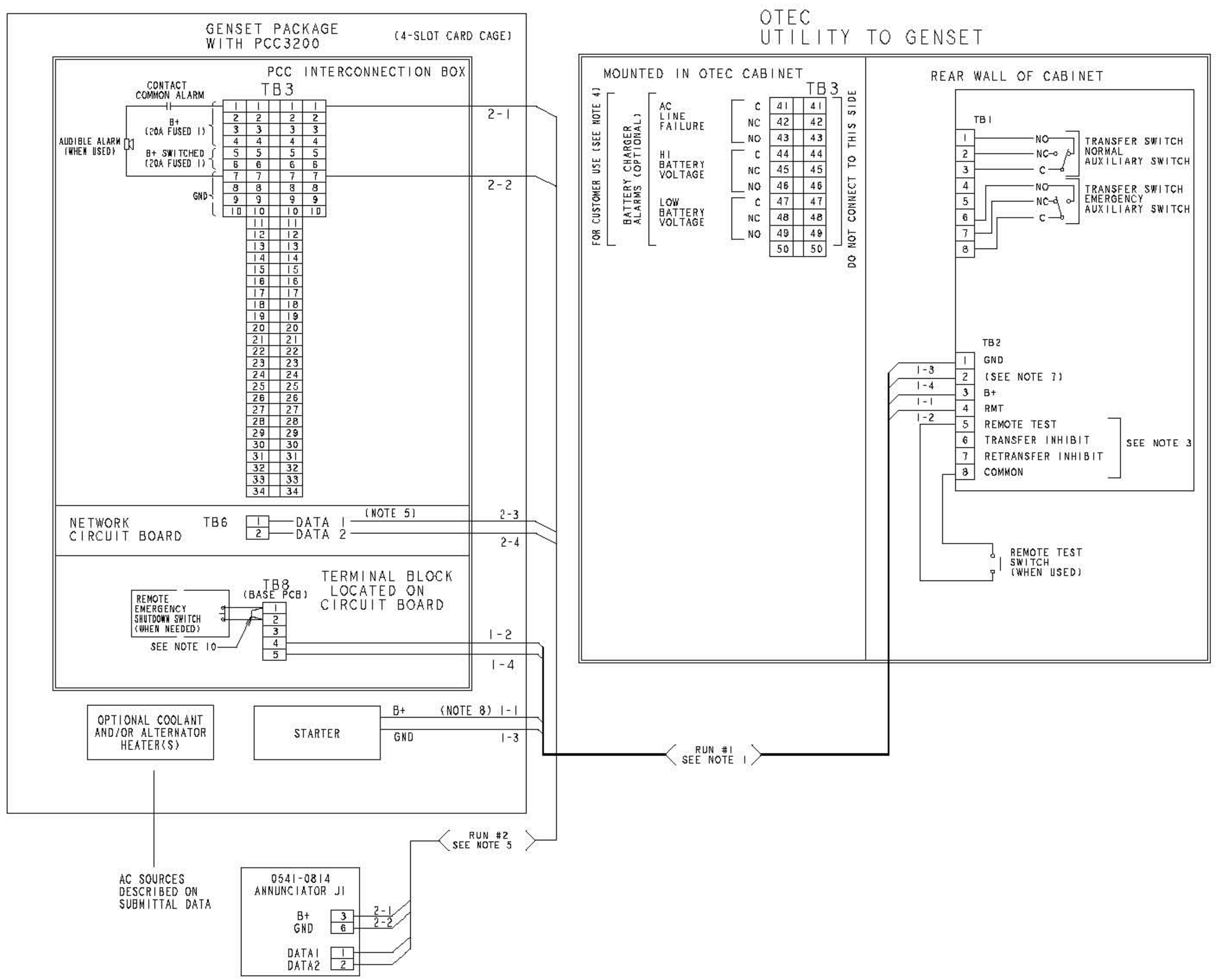
FIGURE 34. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 7 OF 8)

THIS IS A REPRESENTATIVE (GENERIC) SCHEMATIC/WIRING DIAGRAM. FOR TROUBLESHOOTING, REFER TO THE SCHEMATIC AND WIRING DIAGRAM PACKAGE THAT WAS SHIPPED WITH THE TRANSFER SWITCH.



NOTES:

1. WIRE SIZES MUST BE AS FOLLOWS:
   RUN #1-GENSET TO TRANSFER SWITCH-LEAD SIZE MUST BE INCREASED IF A BATTERY CHARGER IS INSTALLED IN THE SWITCH.

   WITH NO BATT CHARGER-LEADS 1-1,-2,-3,-4,-5 USE COL A.

   WITH 2 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. B

   WITH 10 AMP CHARGER-LEADS 1-1 & 1-3, USE COL. C
2. FOR MULTIPLE TRANSFER SWITCHES, DUPLICATE RUN #1 FOR EACH SWITCH. DAISY CHAIN CONNECTION IS ACCEPTABLE PROVIDED WIRE SIZE & DISTANCE TO THE LAST SWITCH MEET THE SPECS IN NOTE 1.
3. CONNECT AN OPEN DRY CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). FOR REMOTE TEST, TRANSFER INHIBIT AND RETRANSFER INHIBIT TO ACTIVATE.
4. CONTACTS RATED: 4 AMPS AT 30 VDC OR 120V MAX.
5. REFER TO ONAN 900-0529 POWERCOMMAND NETWORK INSTALLATION & OPERATION MANUAL FOR WIRING INSTRUCTIONS, WIRE SIZE, AND LENGTH. USE STRANDED TWISTED PAIR WIRES WHEN CONNECTING DATA1 AND DATA2 TO NETWORK. PART # 0334-1350 OR EQUAL.
6. INPUTS FOR CUSTOMER FAULTS. GROUNDED SIGNAL REQUIRED TO ACTIVATE INPUT (MAX 50 MA.)
7. ON PCC 3200 CONTROLS NO JUMPER IS REQ'D BETWEEN TB1-1 & TB1-2.
8. CONFIGURATION SHOWN IS FOR ATS-MOUNTED BATTERY CHARGER. IF WALL-MOUNTED CHARGER IS USED, CONNECT B+ AND GND FROM CHARGER DIRECTLY TO BATTERY OR STARTER.
9. TRANSFER SWITCH SHOWN CLOSED TO NORMAL.
10. OPEN CONNECTION TO INITIATE EMERGENCY STOP THESE TERMINALS MUST BE SHORTED TOGETHER IF REMOTE EMERGENCY STOP OPTION NOT USED. JUMPER SHOWN BETWEEN TB8-1 AND TB8-2 NOT SUPPLIED WITH UNIT.

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FIGURE 35. 40-1200 AMP TYPICAL INTERCONNECTION DIAGRAM 630-2810 (SHEET 8 OF 8)

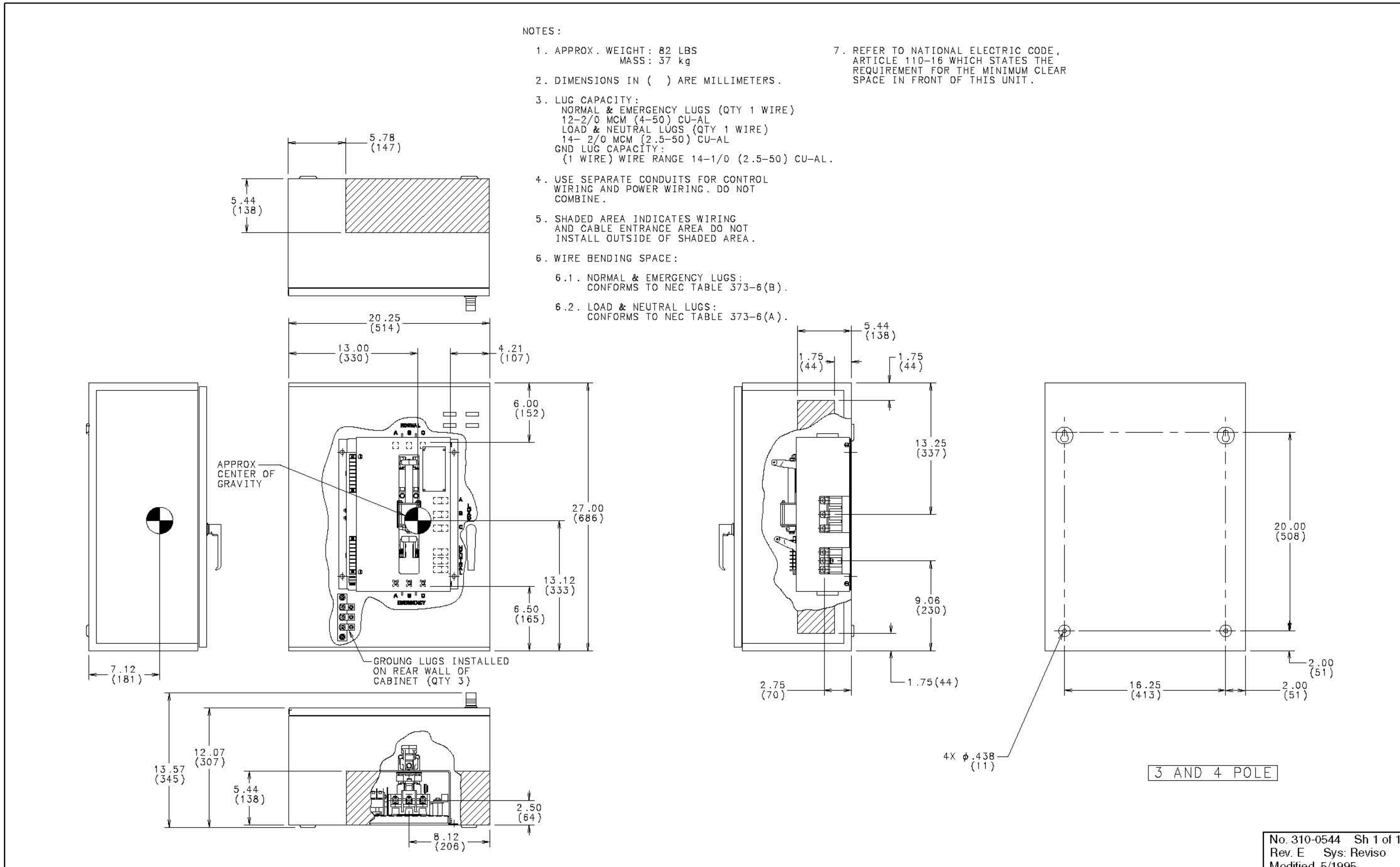


FIGURE 36. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0544, 40-125 AMP

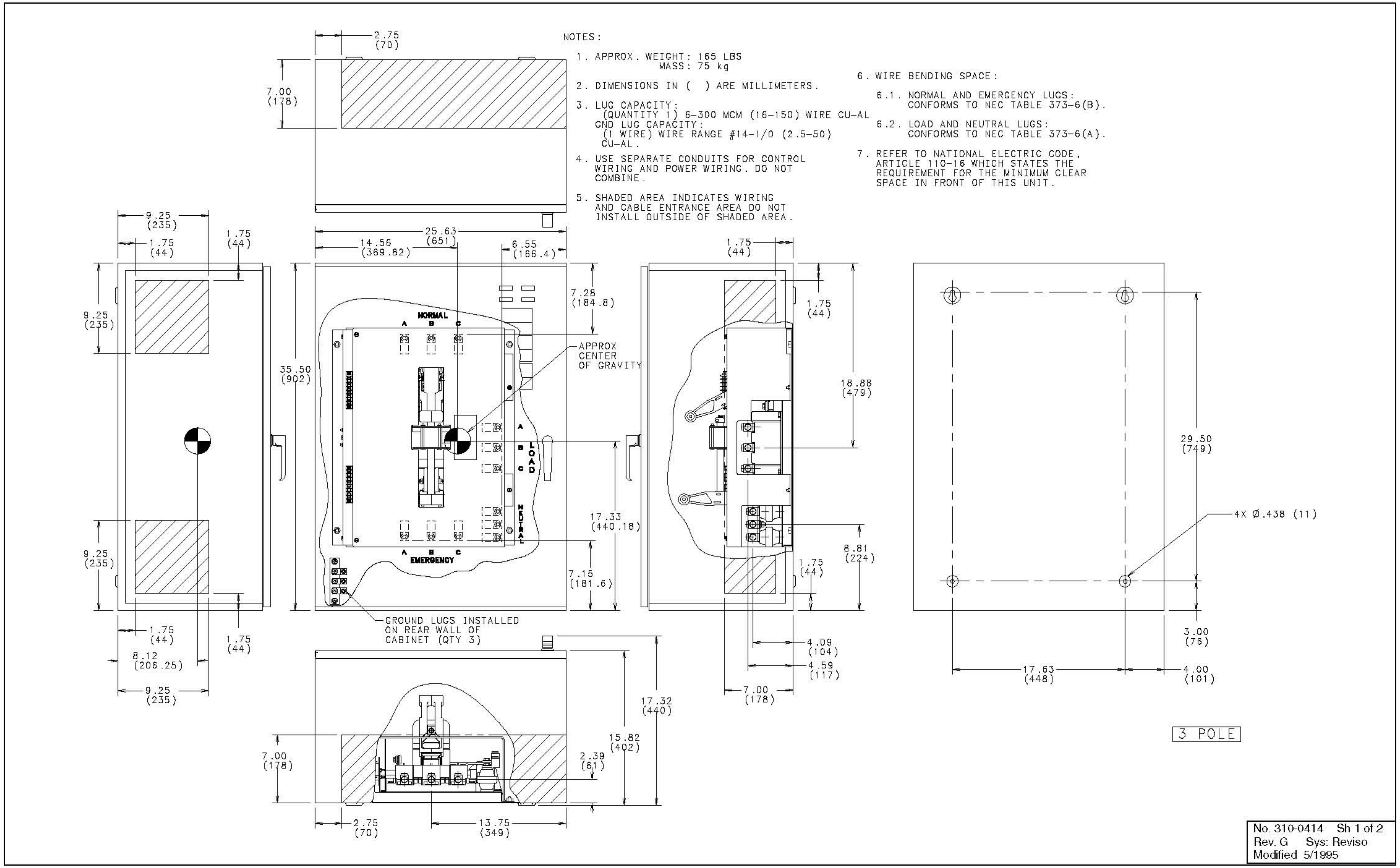


FIGURE 37. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0414, 150-225 AMP (SHEET 1 OF 2)

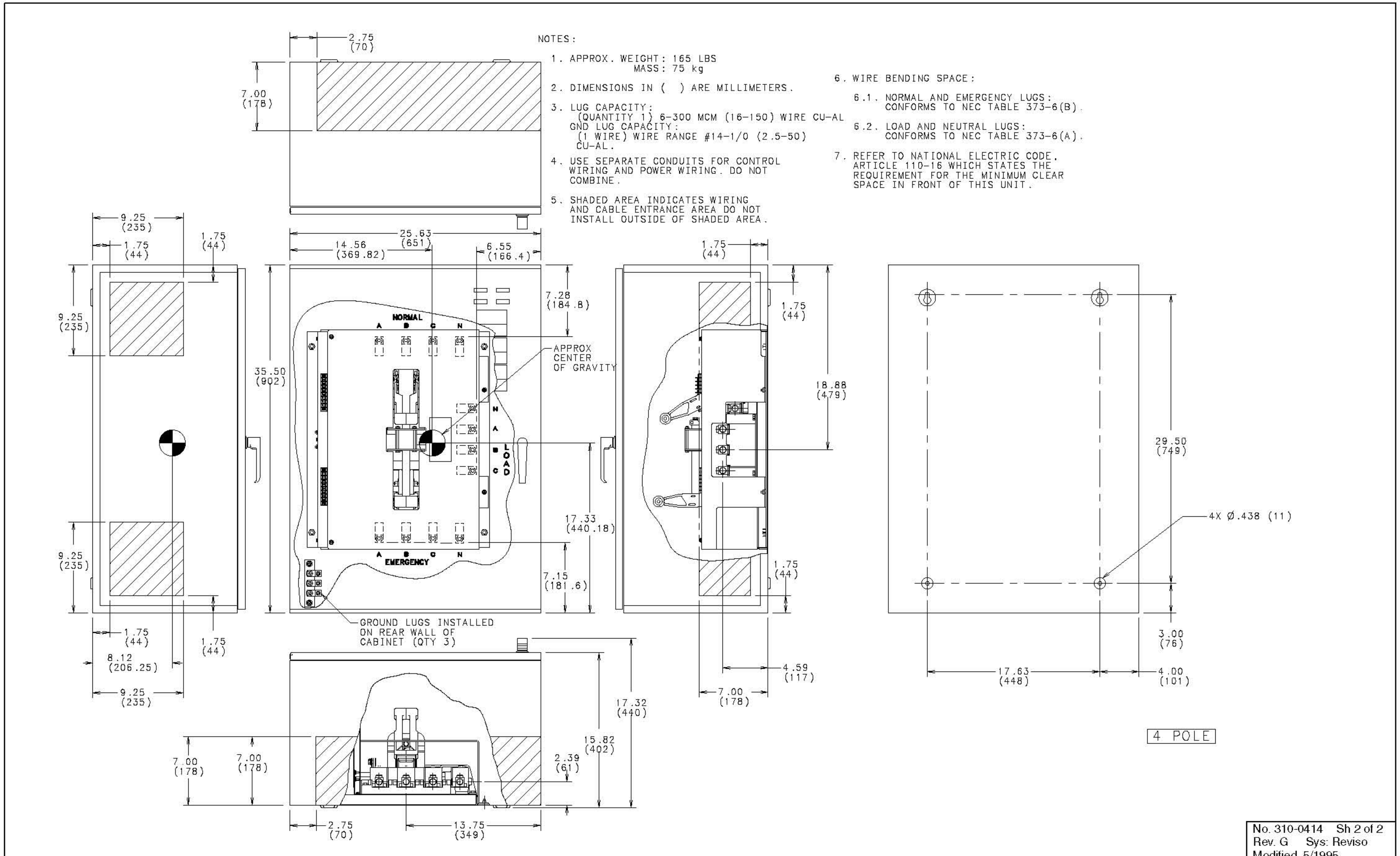


FIGURE 38. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0414, 150-225 AMP (SHEET 2 OF 2)

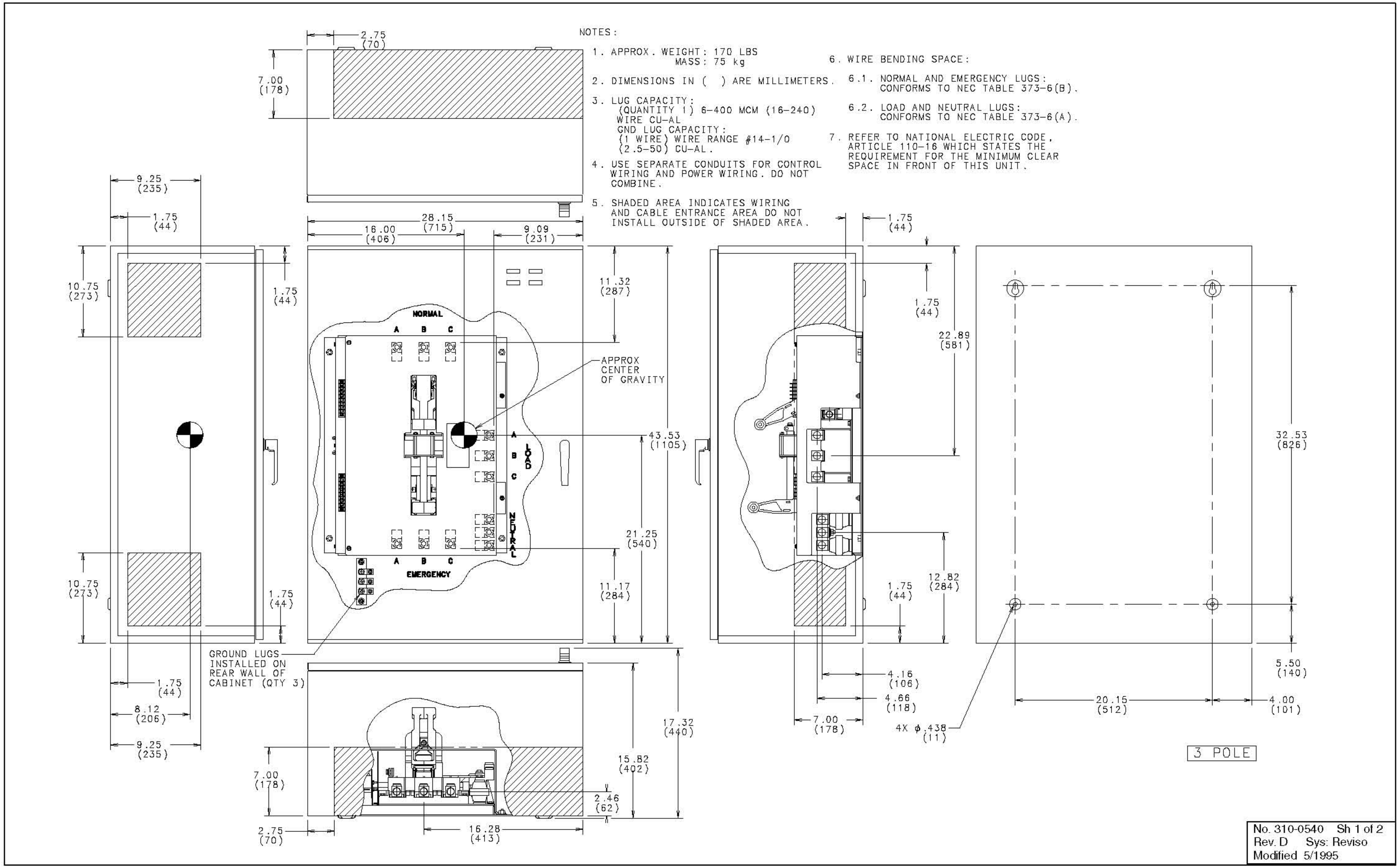


FIGURE 39. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0540, 260 AMP (SHEET 1 OF 2)

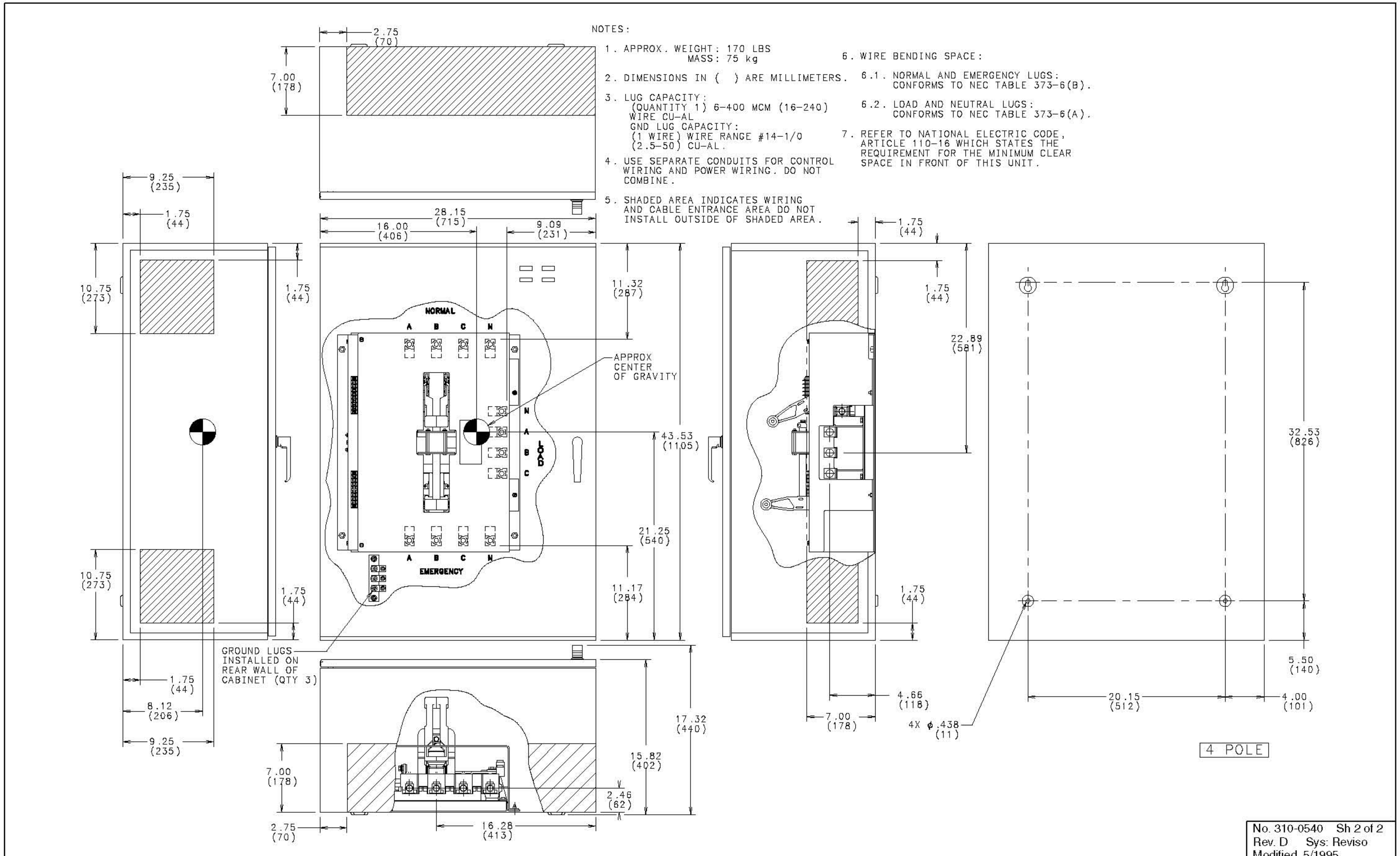


FIGURE 40. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0540, 260 AMP (SHEET 2 OF 2)

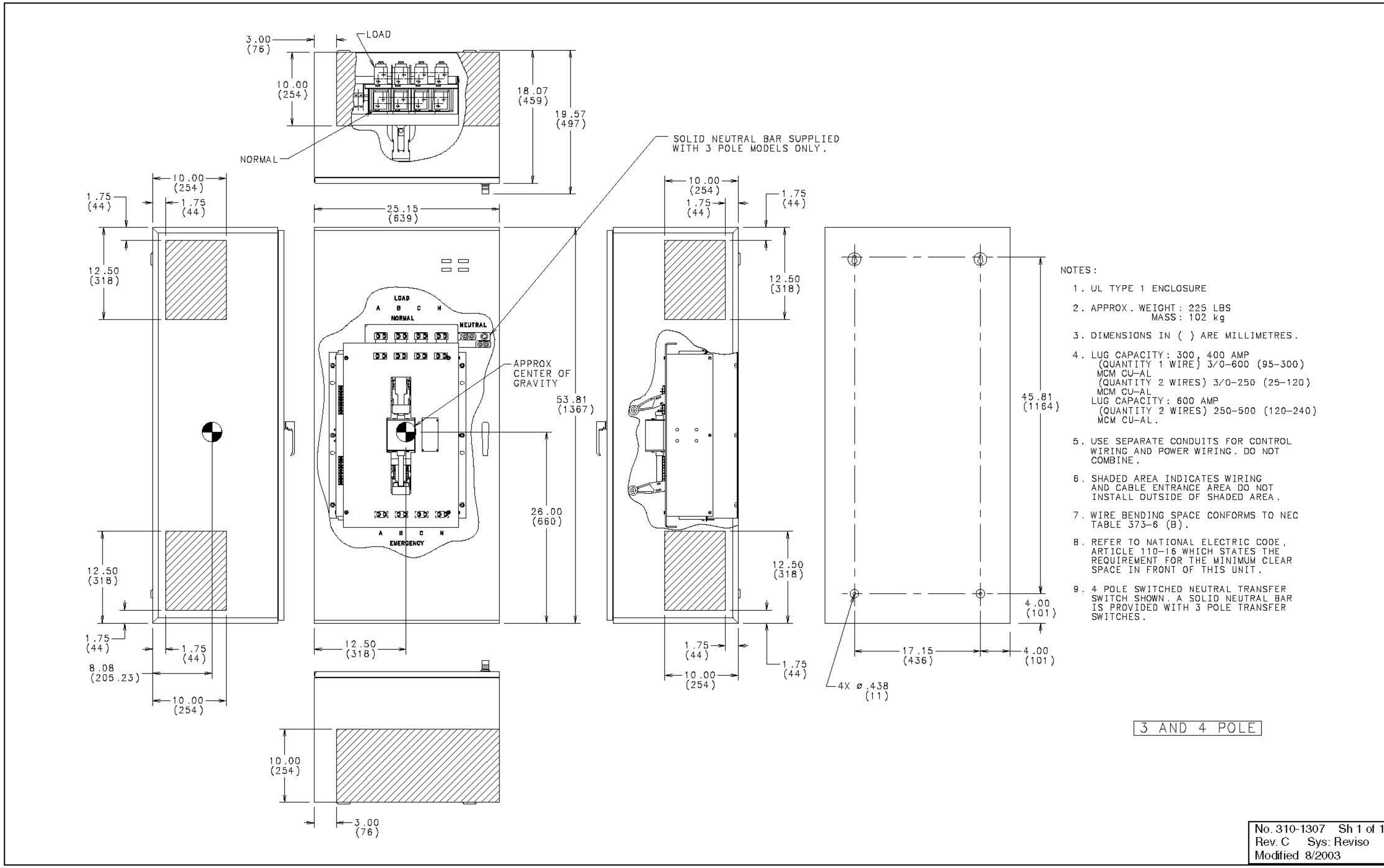


FIGURE 41. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-1307, 300-600 AMP

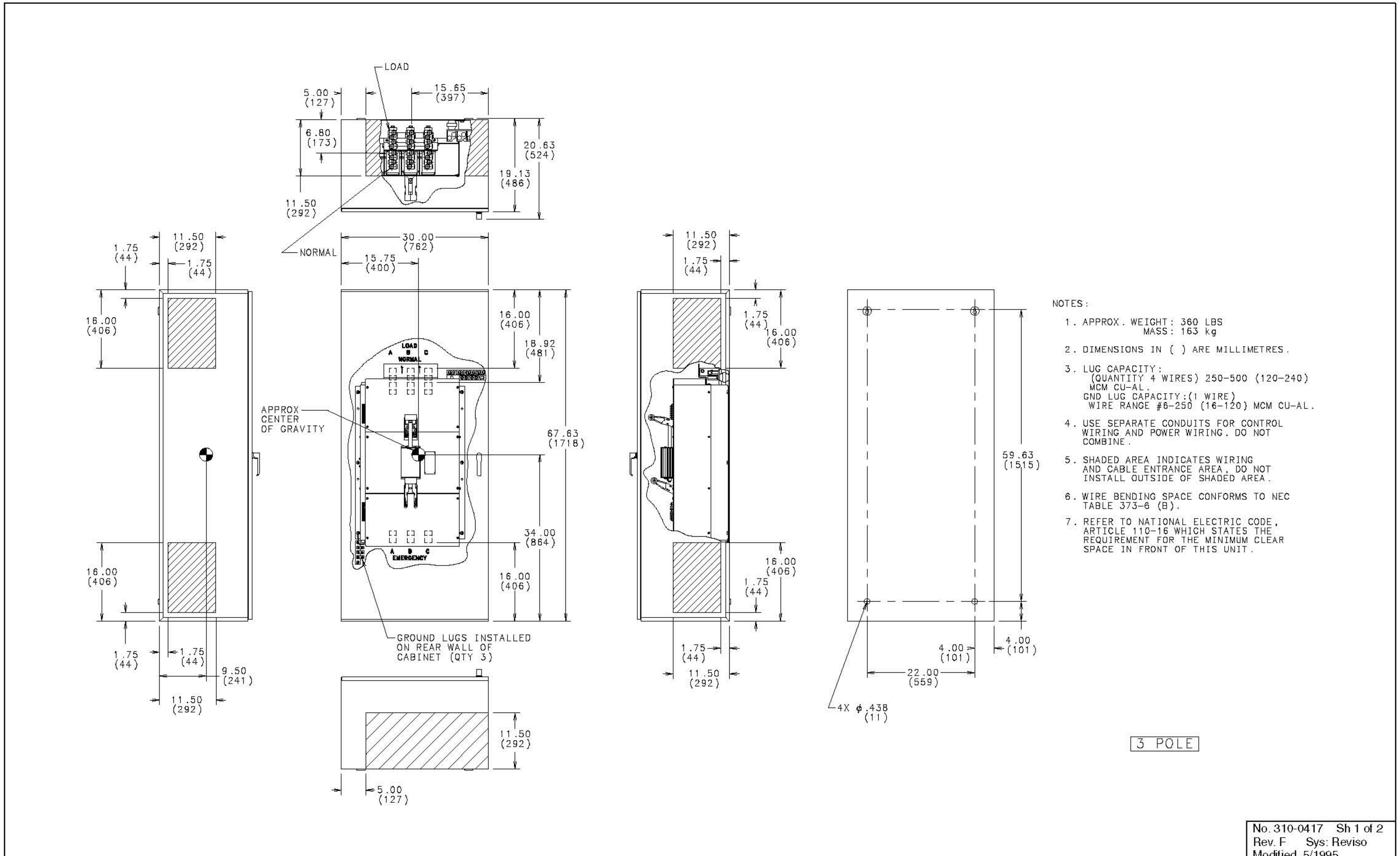


FIGURE 42. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0417, 800 AND 1000 AMP (SHEET 1 OF 2)

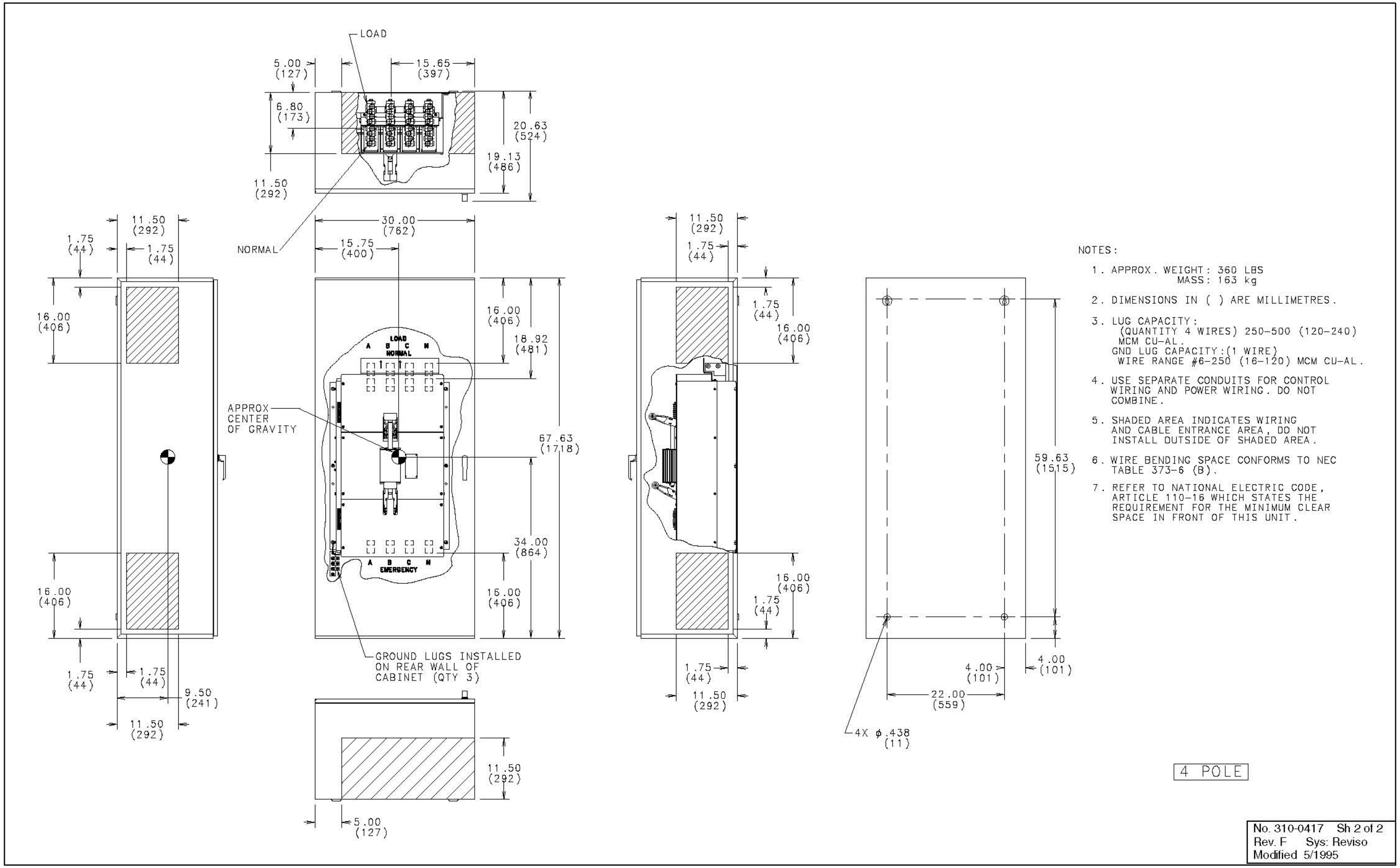


FIGURE 43. NEMA 1 CONTROL BOX OUTLINE DRAWING 310-0417, 800 AND 1000 AMP (SHEET 2 OF 2)

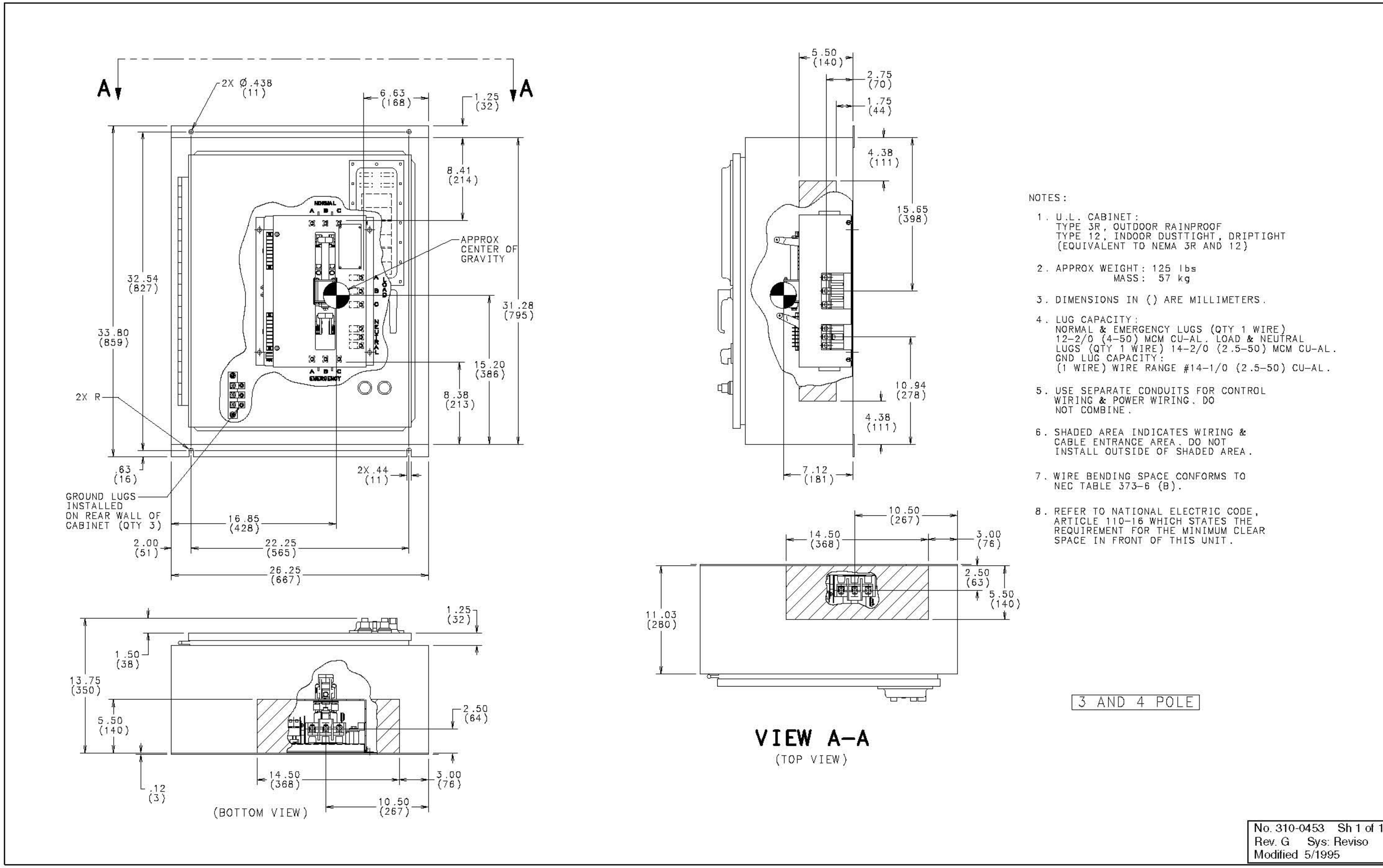


FIGURE 44. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0453, 40-125 AMP

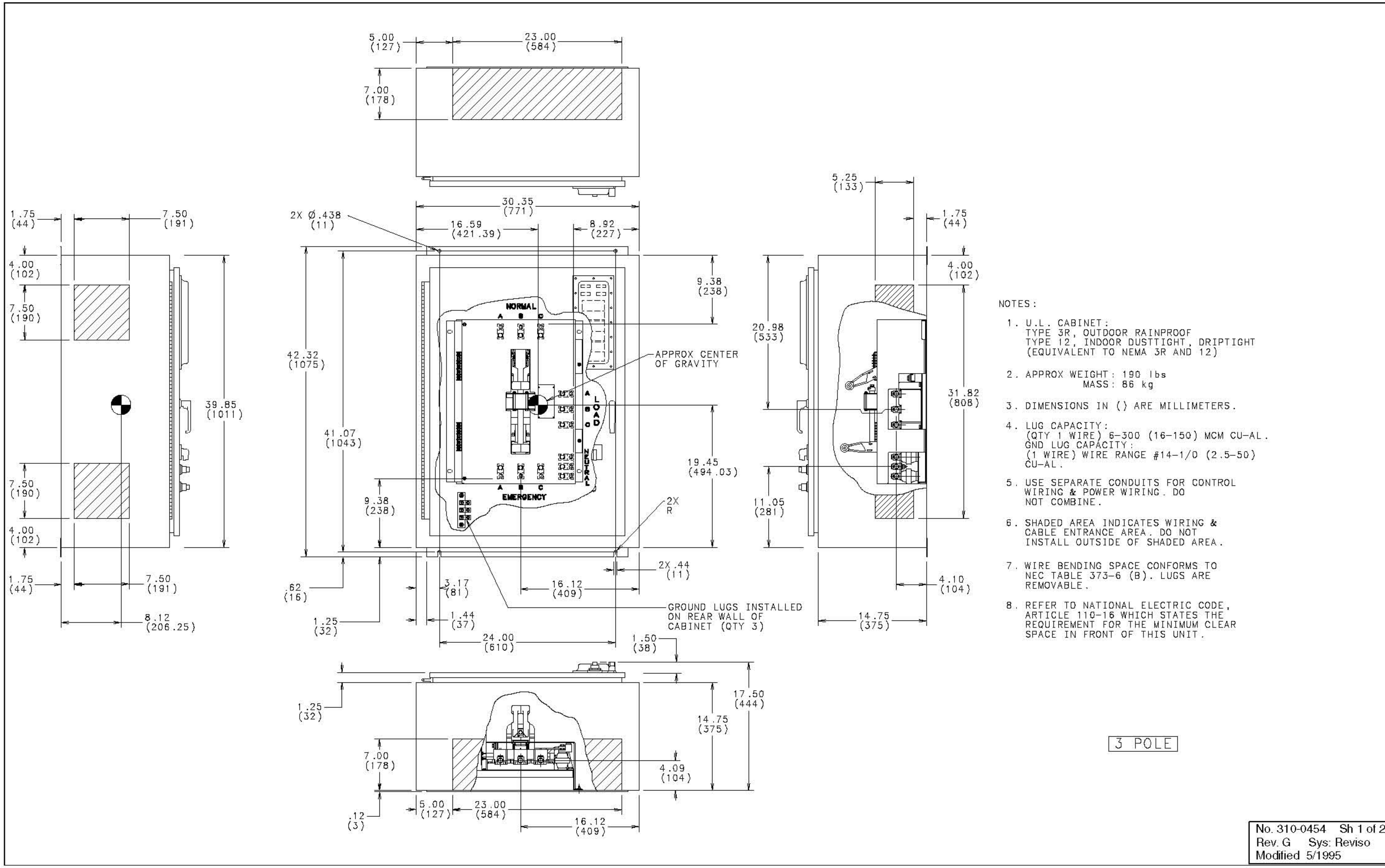


FIGURE 45. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0454, 150-225 AMP (SHEET 1 OF 2)

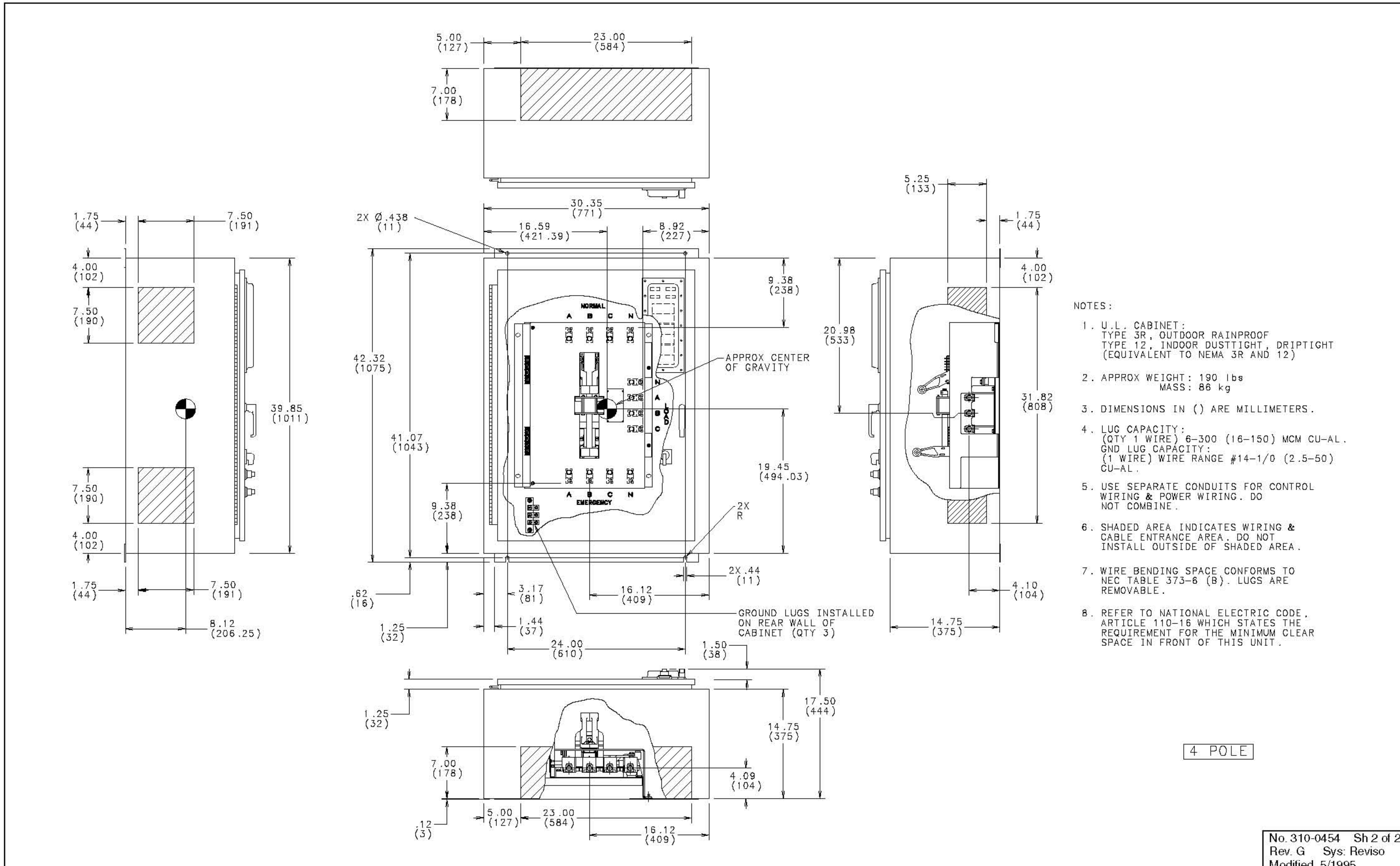


FIGURE 46. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0454, 150-225 AMP (SHEET 2 OF 2)

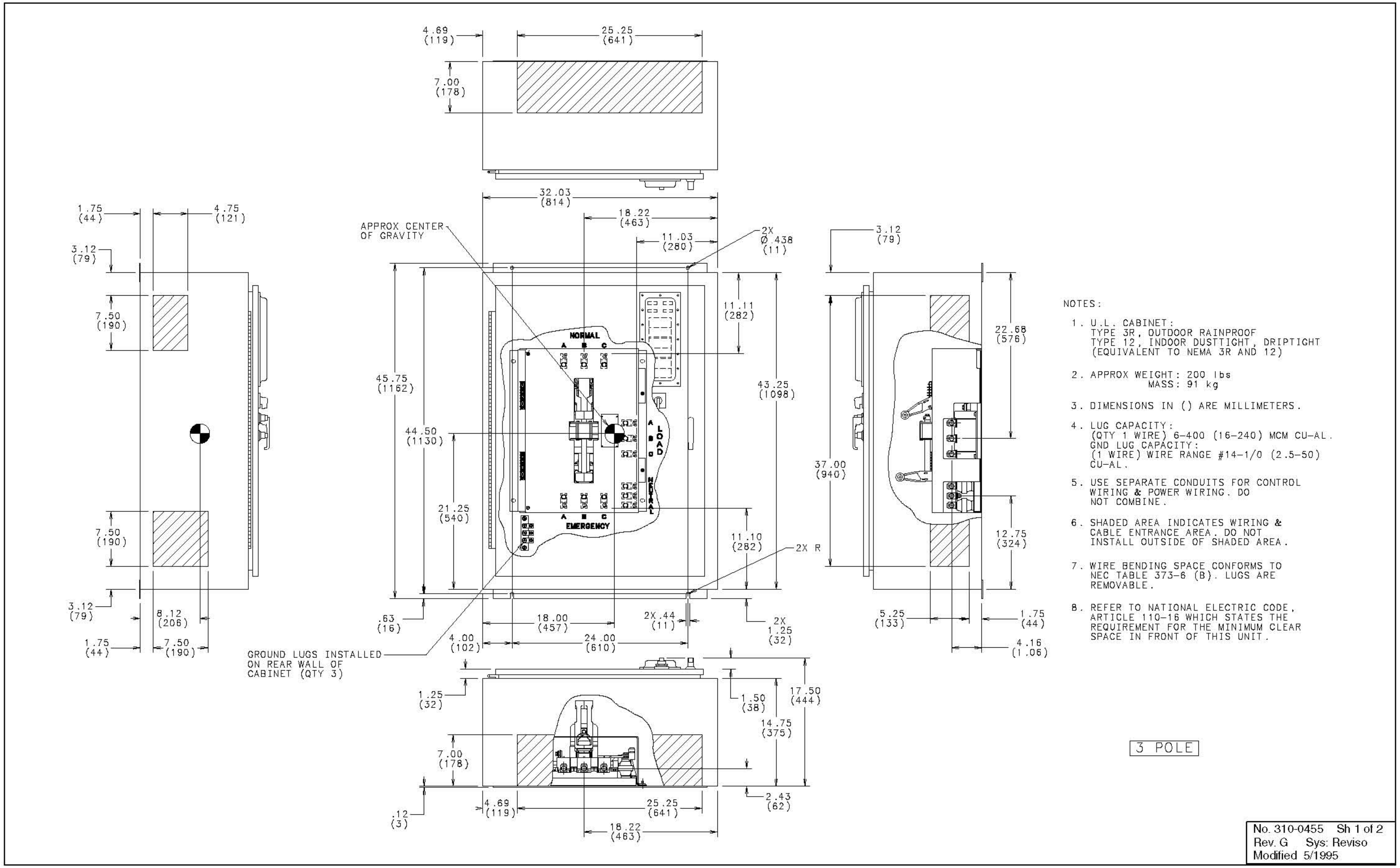


FIGURE 47. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0455, 260 AMP (SHEET 1 OF 2)

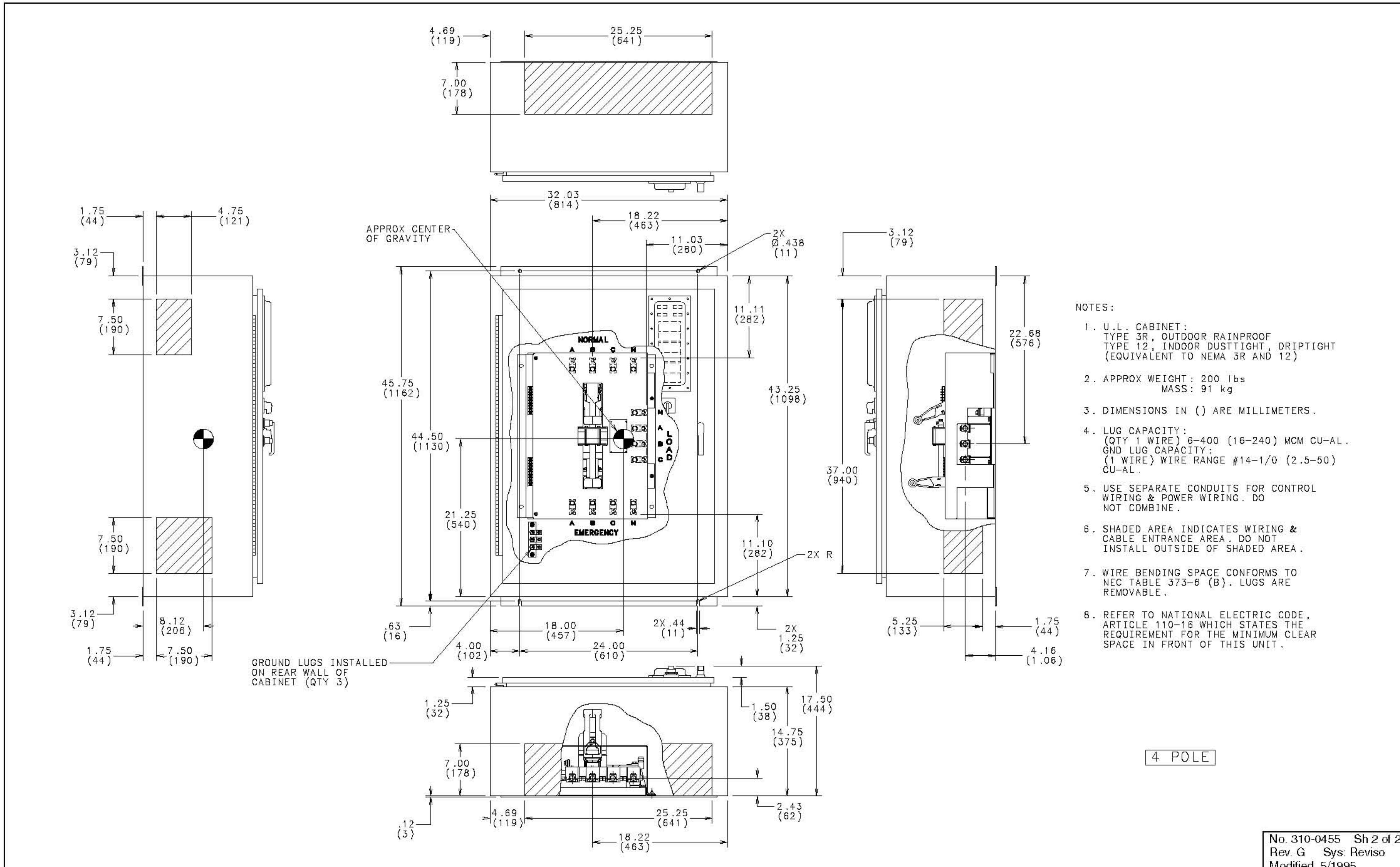


FIGURE 48. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0455, 260 AMP (SHEET 2 OF 2)

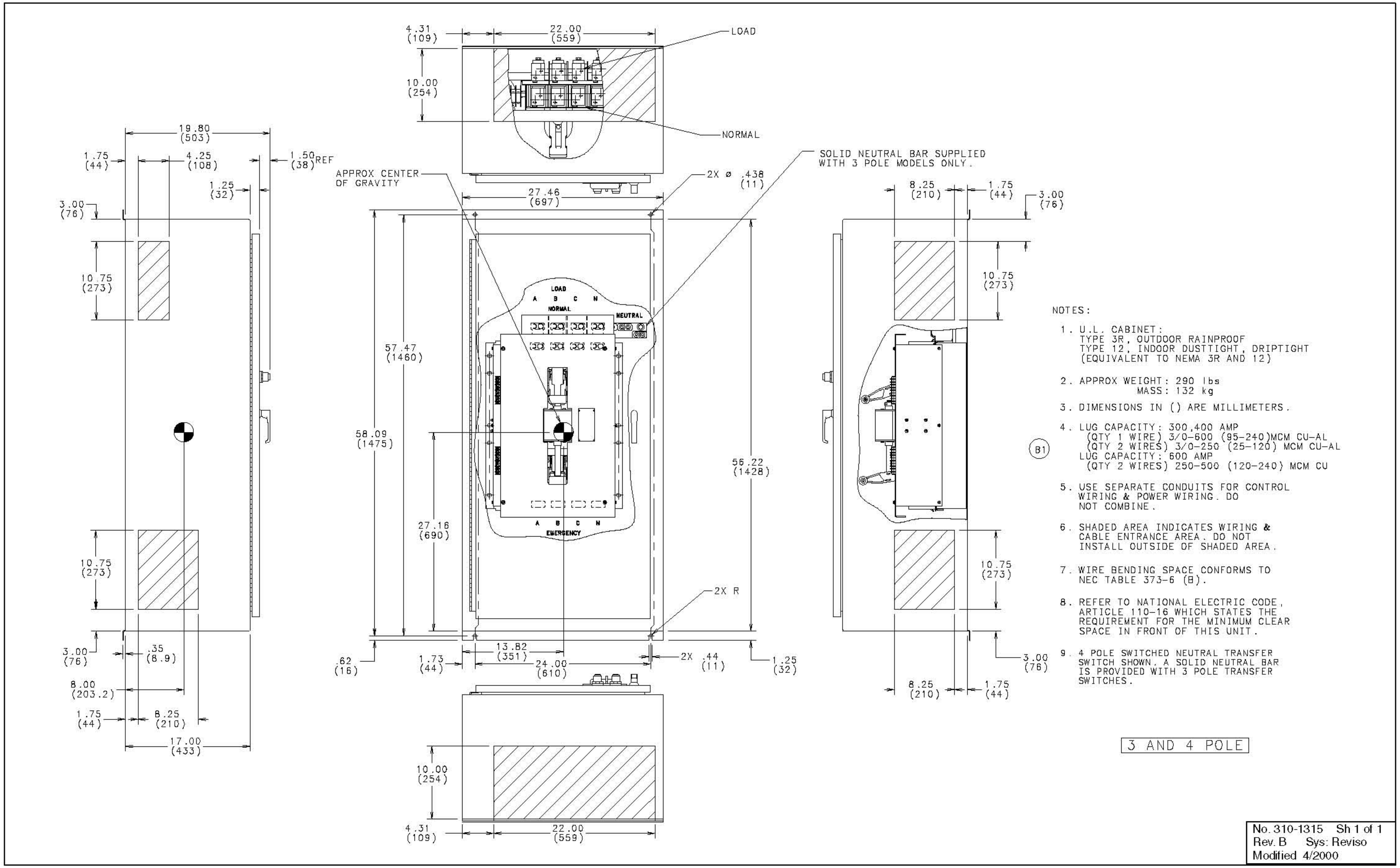


FIGURE 49. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-1315, 300-600 AMP

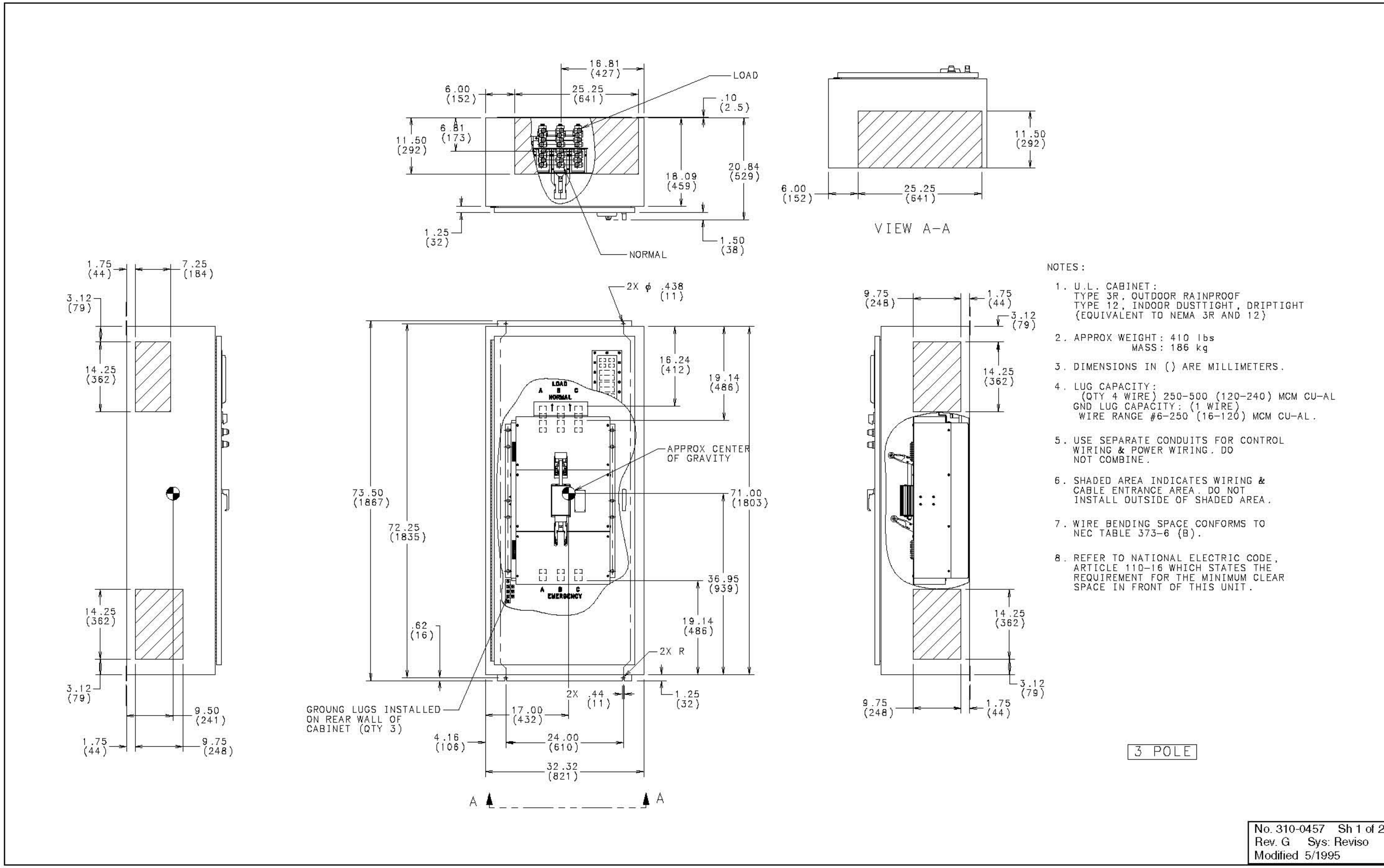


FIGURE 50. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0457, 800 AND 1000 AMP (SHEET 1 OF 2)

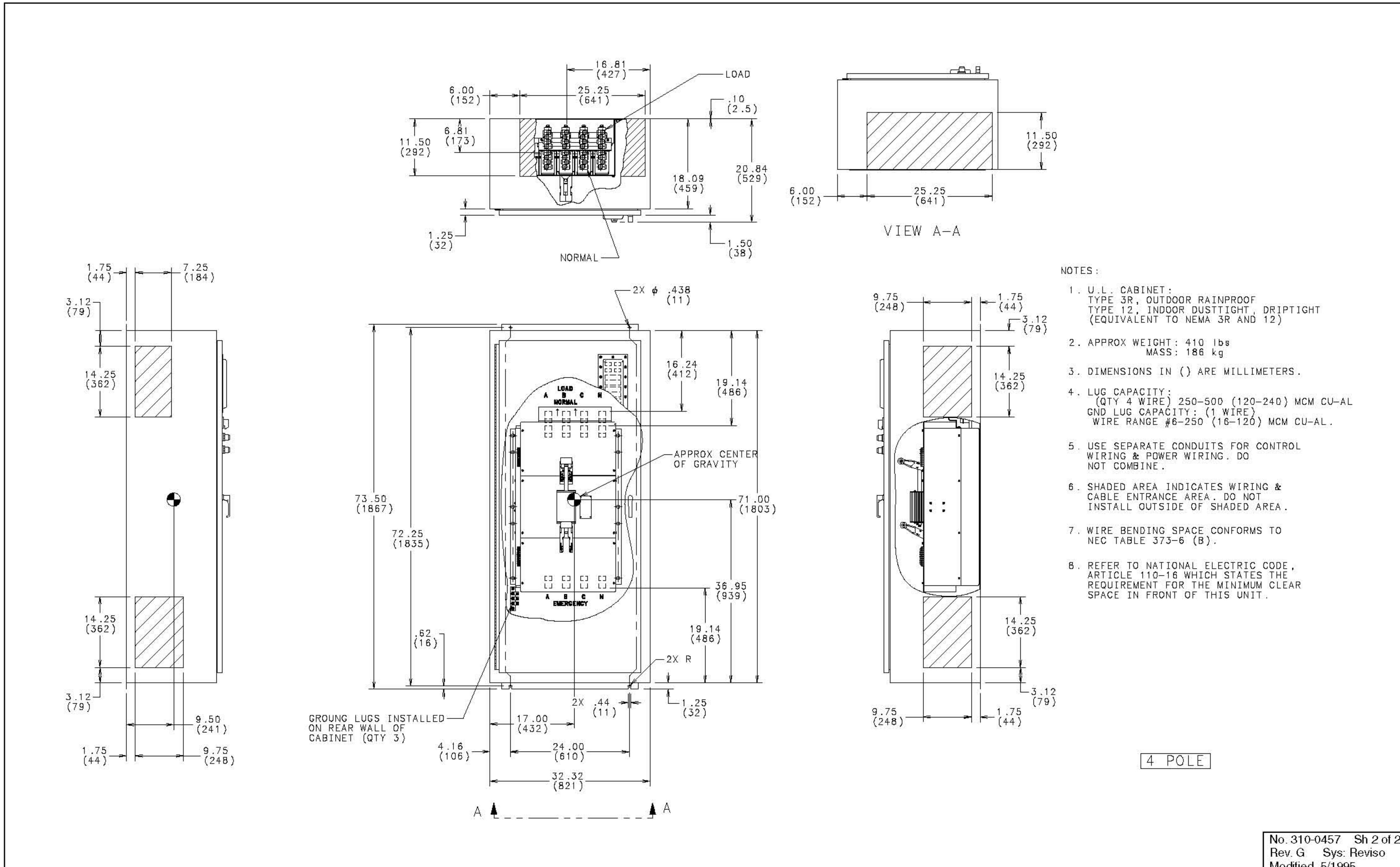


FIGURE 51. NEMA 3R AND 12 CONTROL BOX OUTLINE DRAWING 310-0457, 800 AND 1000 AMP (SHEET 2 OF 2)

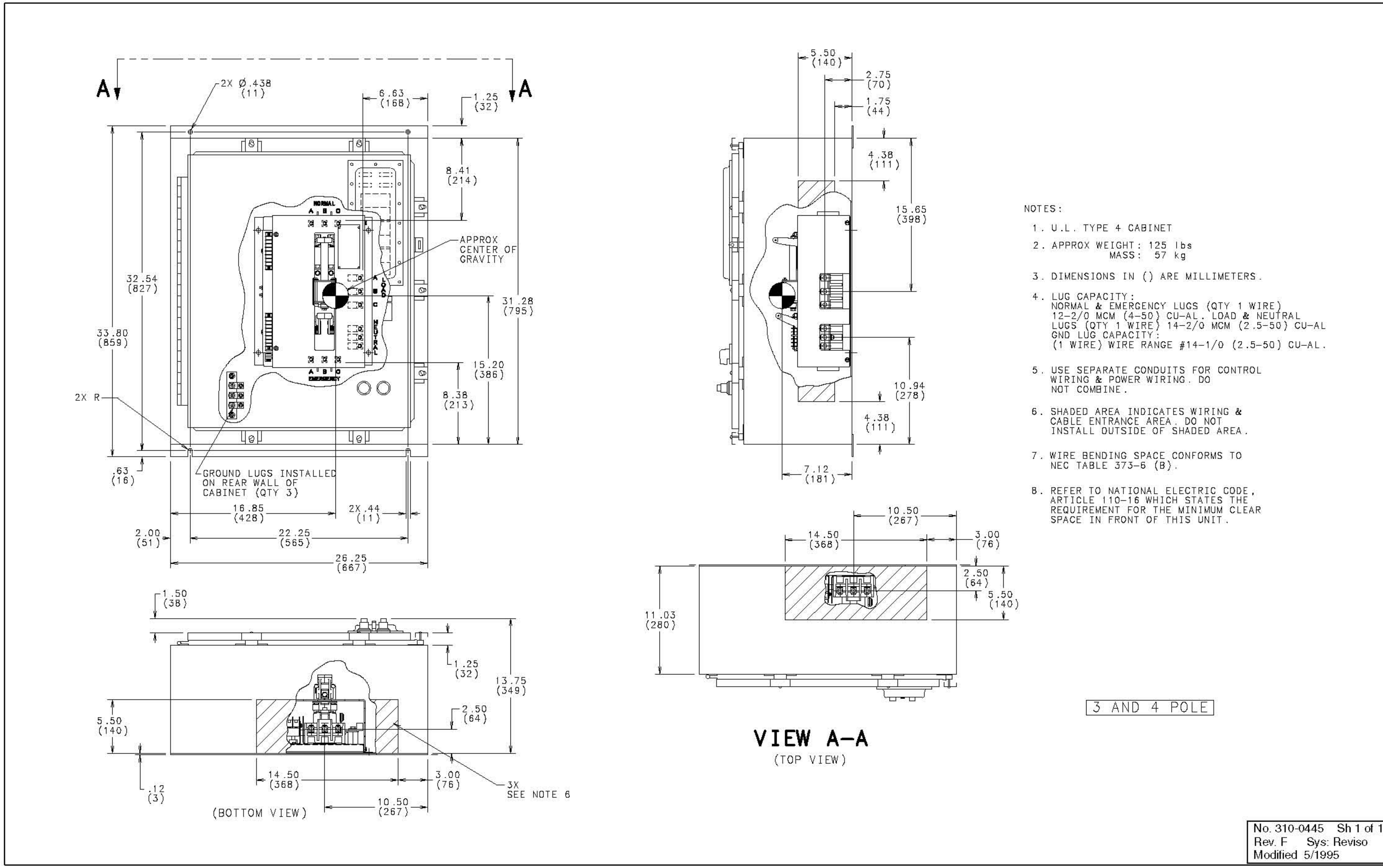


FIGURE 52. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0445, 40-125 AMP

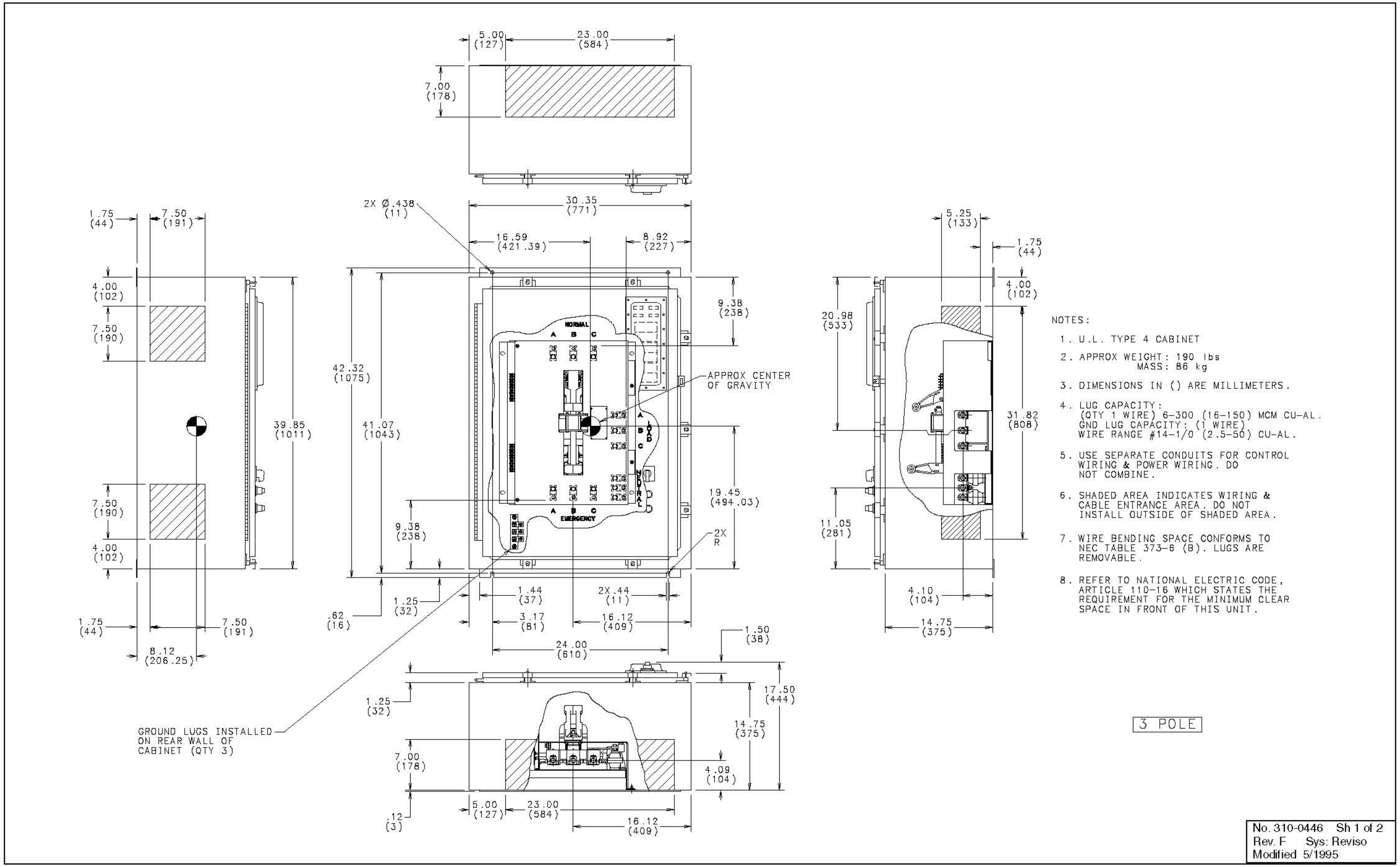


FIGURE 53. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0446, 150-225 AMP (SHEET 1 OF 2)

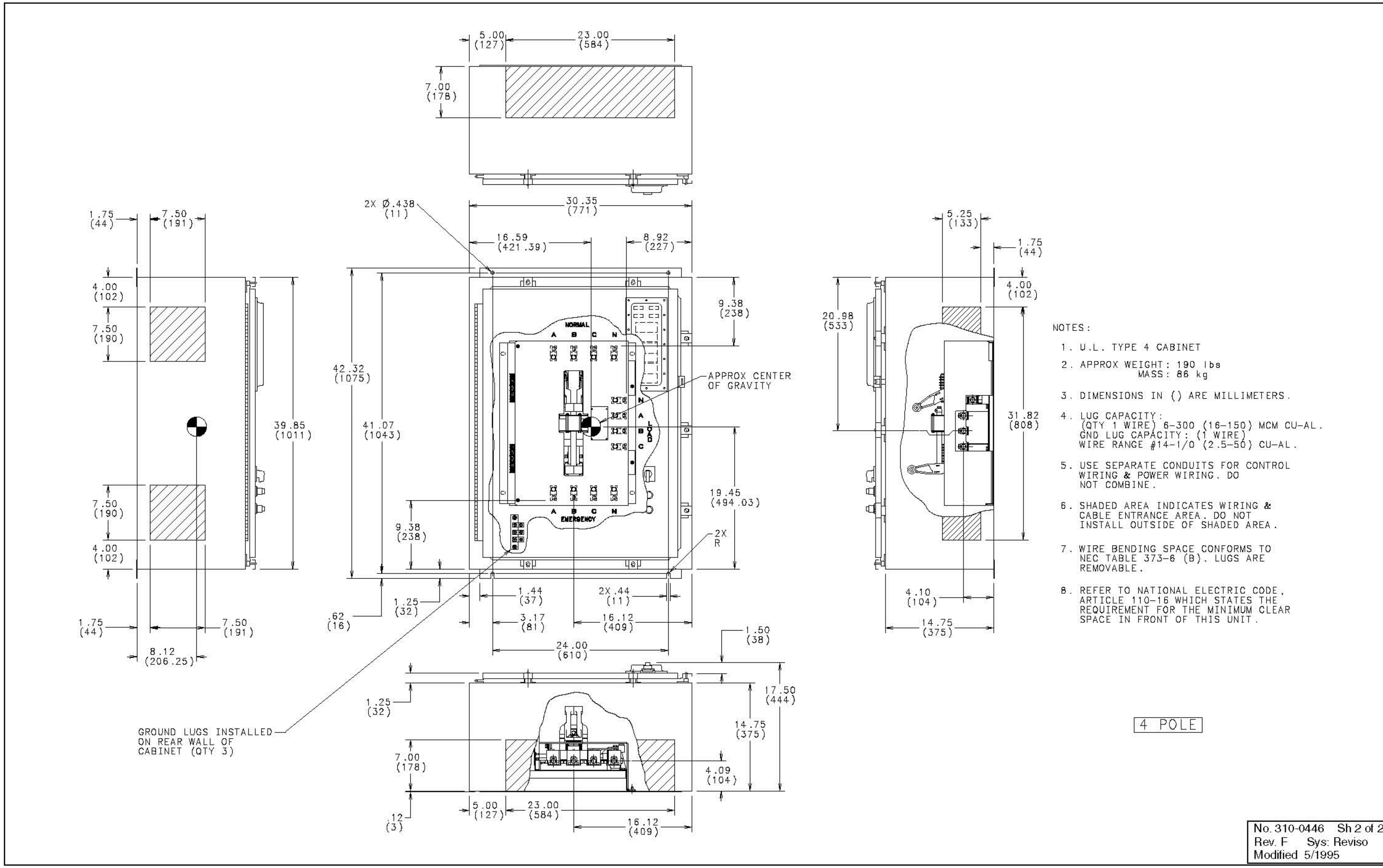


FIGURE 54. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0446, 150-225 AMP (SHEET 2 OF 2)

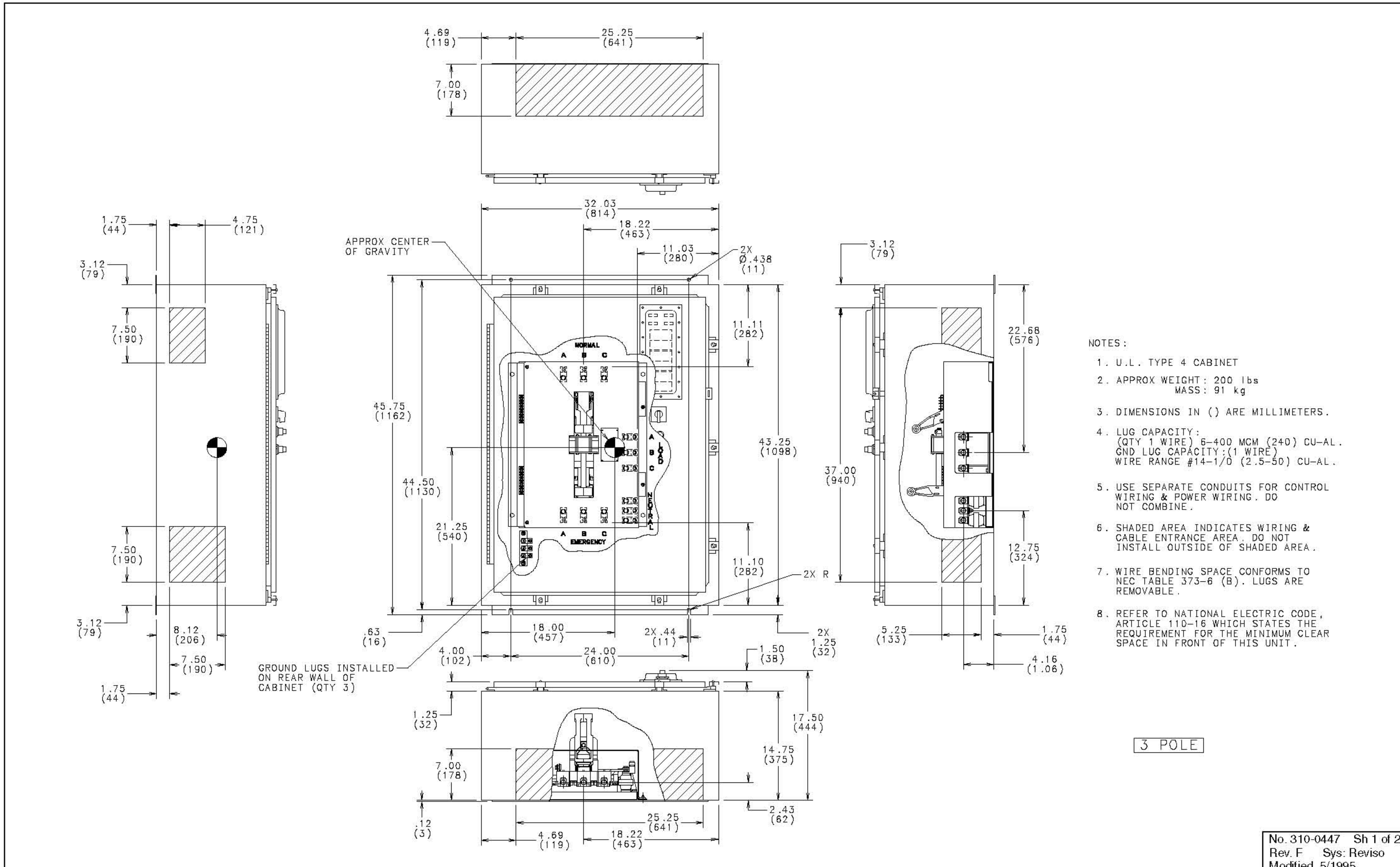


FIGURE 55. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0447, 260 AMP (SHEET 1 OF 2)

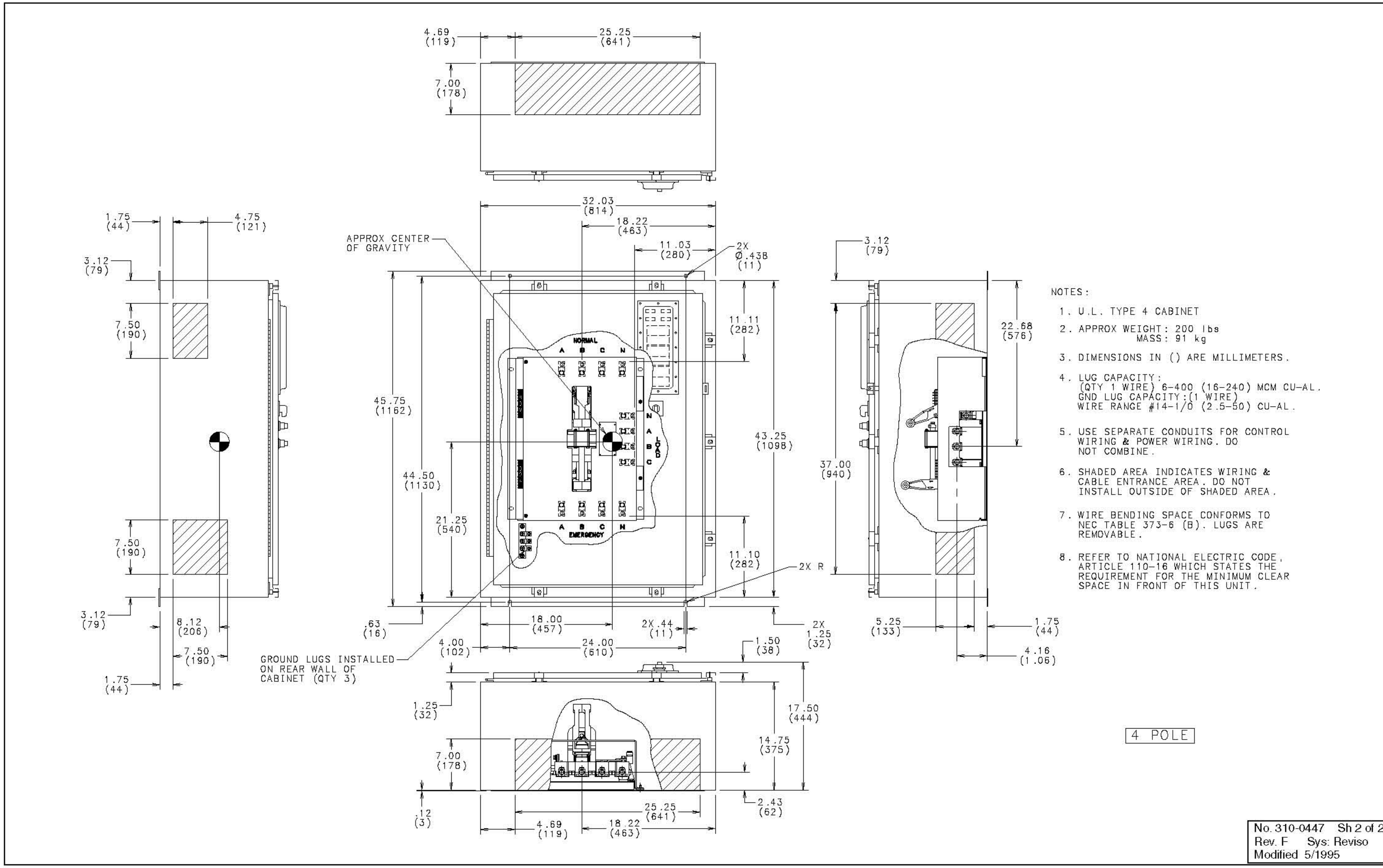


FIGURE 56. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0447, 260 AMP (SHEET 2 OF 2)

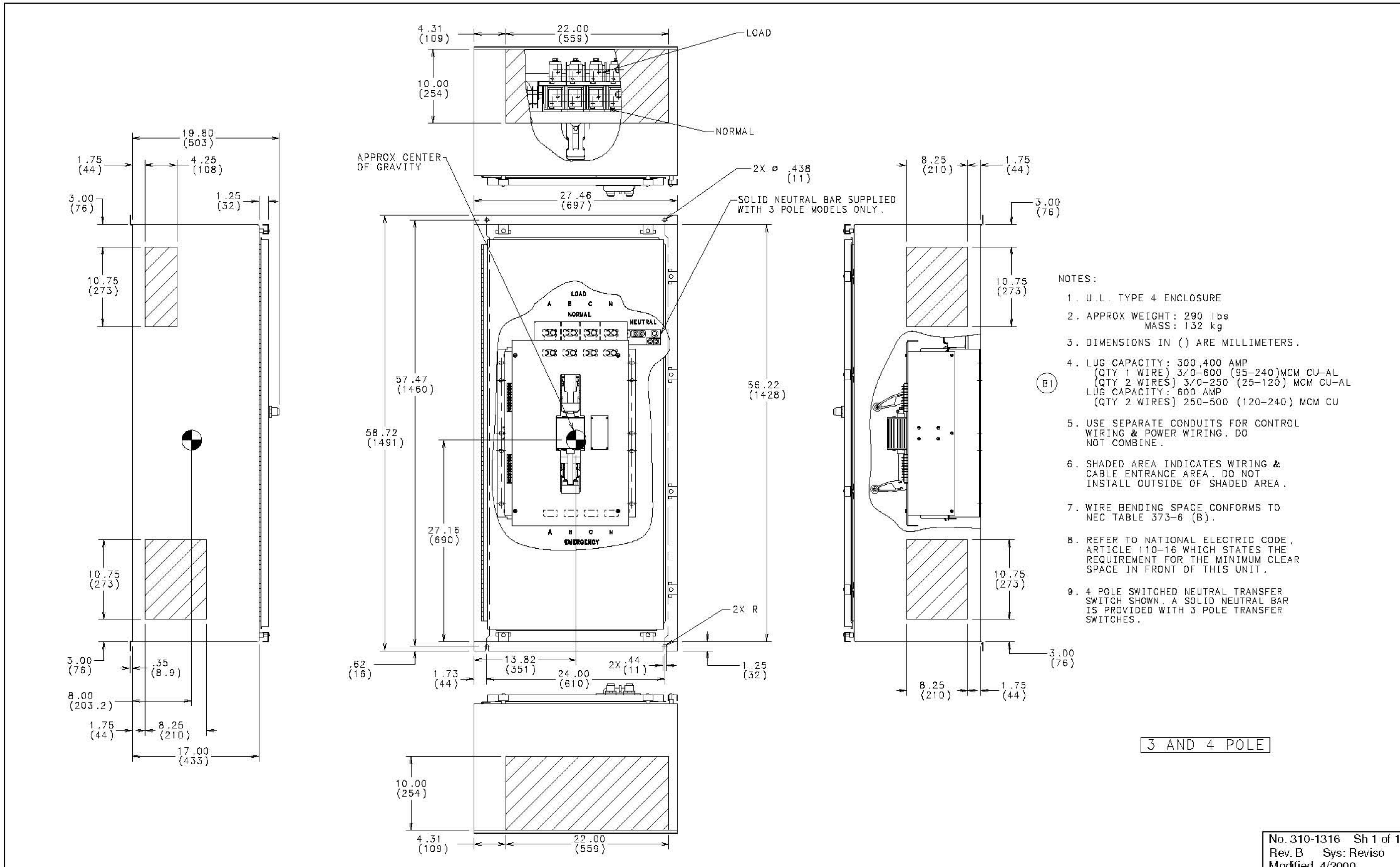


FIGURE 57. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-1316, 300-600 AMP

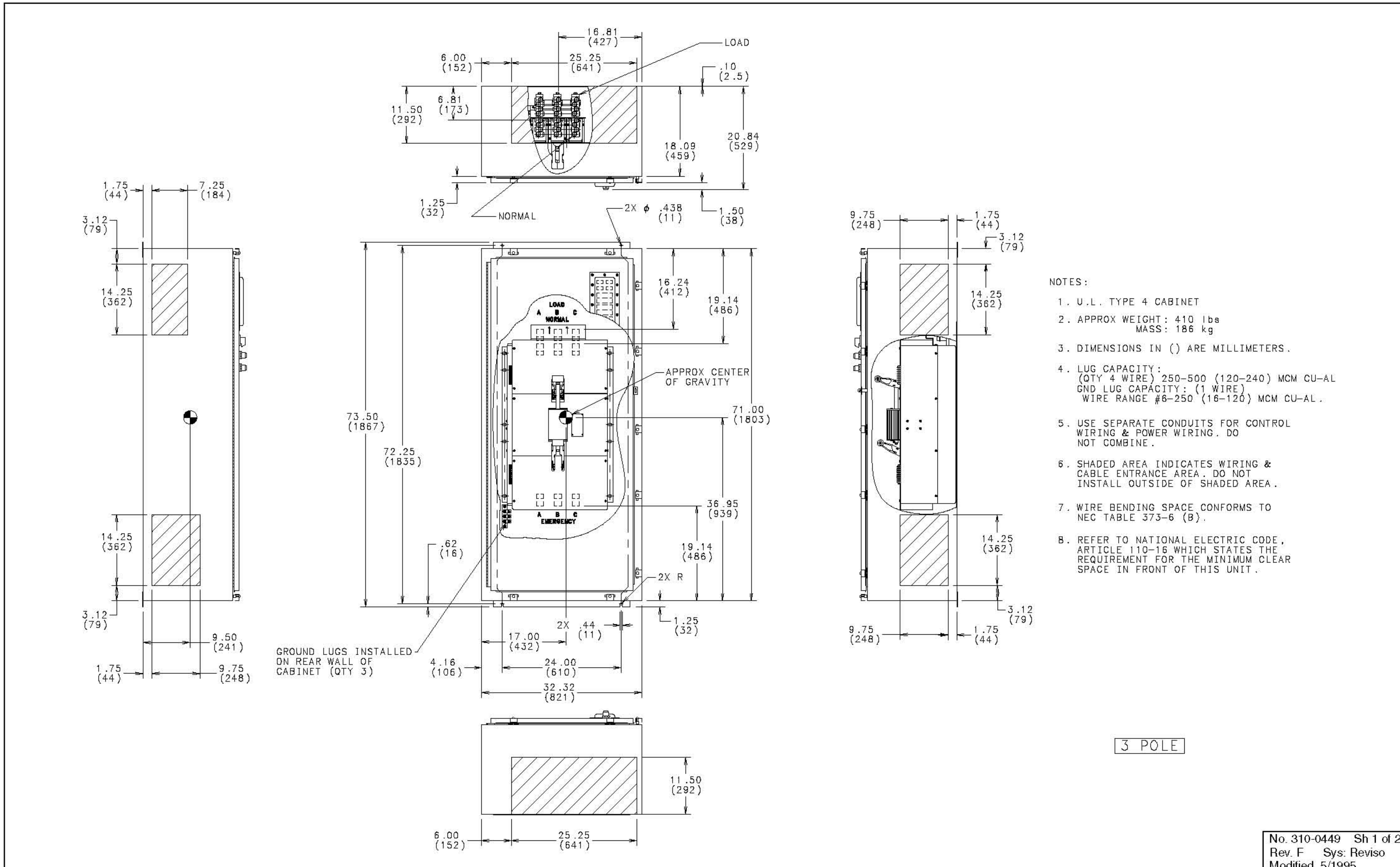


FIGURE 58. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0449, 800 AND 1000 AMP (SHEET 1 OF 2)

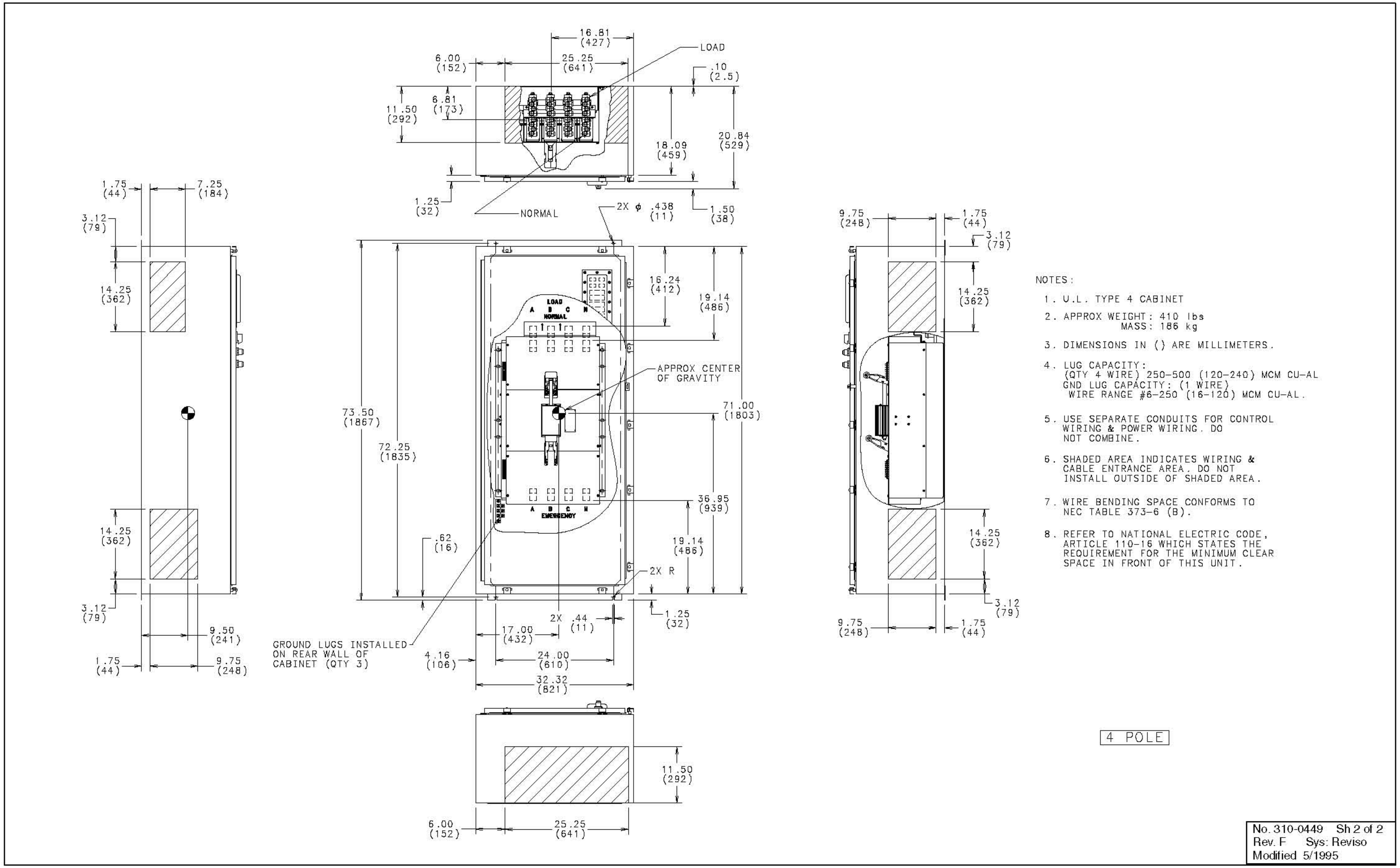
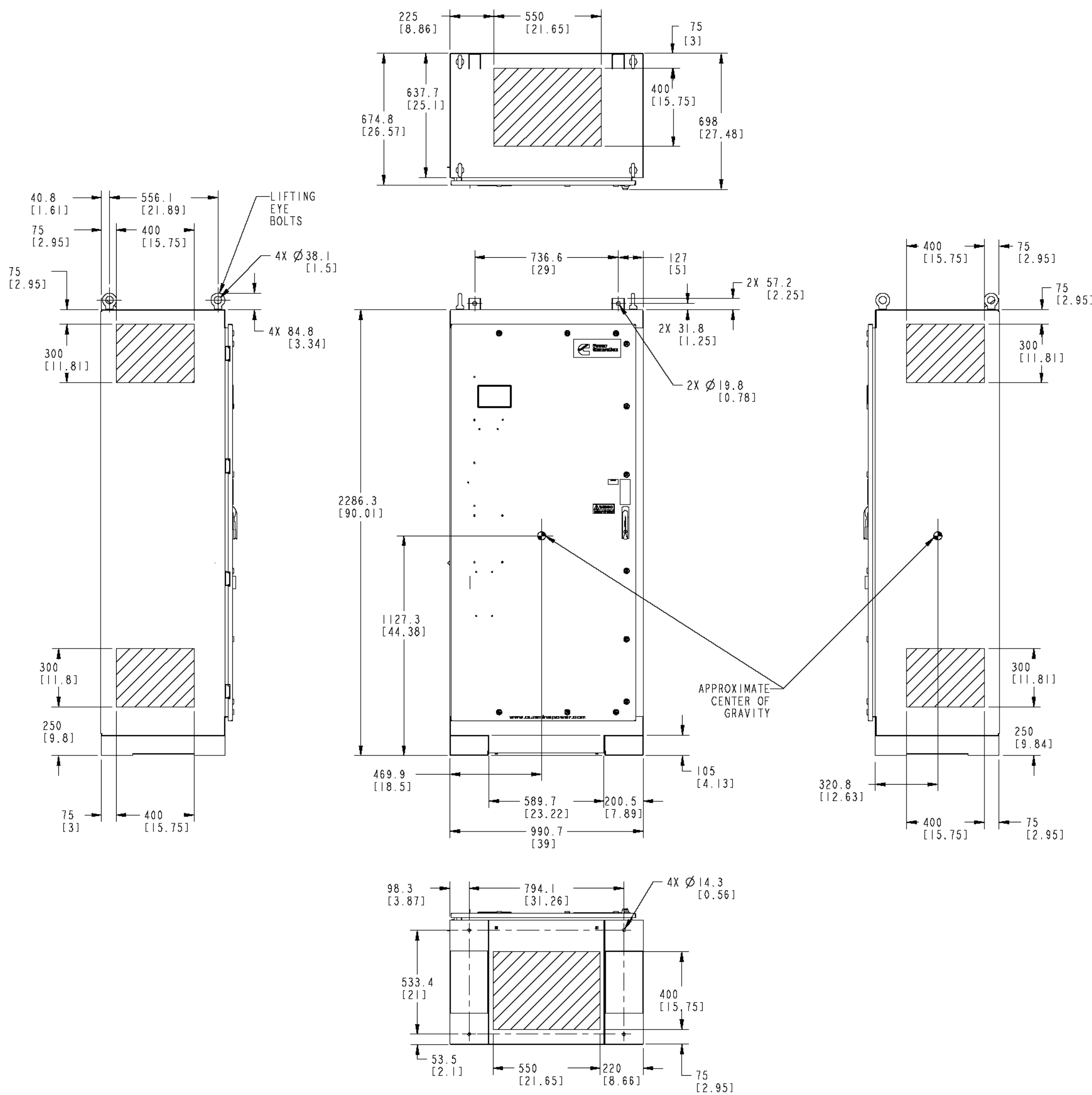
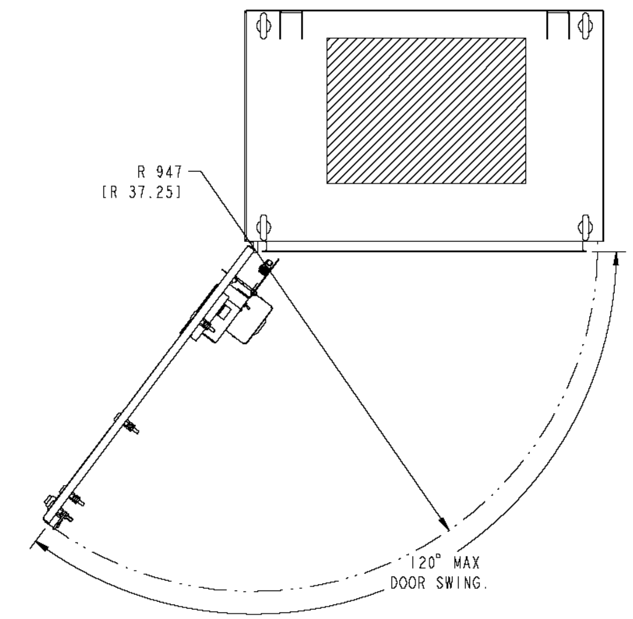


FIGURE 59. NEMA 4 CONTROL BOX OUTLINE DRAWING 310-0449, 800 AND 1000 AMP (SHEET 2 OF 2)





NOTES:

1. APPROX. WEIGHT: 730 LBS [331 KGS].
2. DIMENSIONS IN [] ARE INCHES.
3. THE FOLLOWING LUG OPTIONS ARE AVAILABLE. CU/AL WIRES CAN BE USED.

QUANTITY OF WIRES	LUG TYPE	SIZE
4	MECHANICAL	#2 TO 600MCM
4	MECHANICAL	4-1/0 TO 750MCM
4	COMPRESSION	500MCM
4	COMPRESSION	600MCM
4	COMPRESSION	750MCM

GROUND LUGS: #6-250 MCM (3) CU/AL.

4. COMPRESSION LUGS ARE NOT FURNISHED. FOR COMPRESSION LUG APPLICATION, BUS ADAPTERS AND LUG MOUNTING HARDWARE WILL BE FURNISHED.
5. USE SEPARATE CONDUITS FOR CONTROL WIRING AND POWER WIRING. DO NOT COMBINE.
6. SHADED AREA INDICATES WIRING AND CABLE ENTRANCE AREA, DO NOT INSTALL OUTSIDE OF SHADED AREA.
7. WIRE BENDING SPACE CONFORMS TO NATIONAL ELECTRIC CODE (NFPA70).
8. REFER TO THE NATIONAL ELECTRIC CODE FOR MINIMUM CLEAR SPACE IN FRONT OF THIS ENCLOSURE.

9 MECHANICAL LUGS SHOWN.

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FIGURE 60. NEMA 1, 3R, 4, AND 12 CONTROL BOX OUTLINE DRAWING A030L411, 1200 AMP (SHEET 1 OF 2)

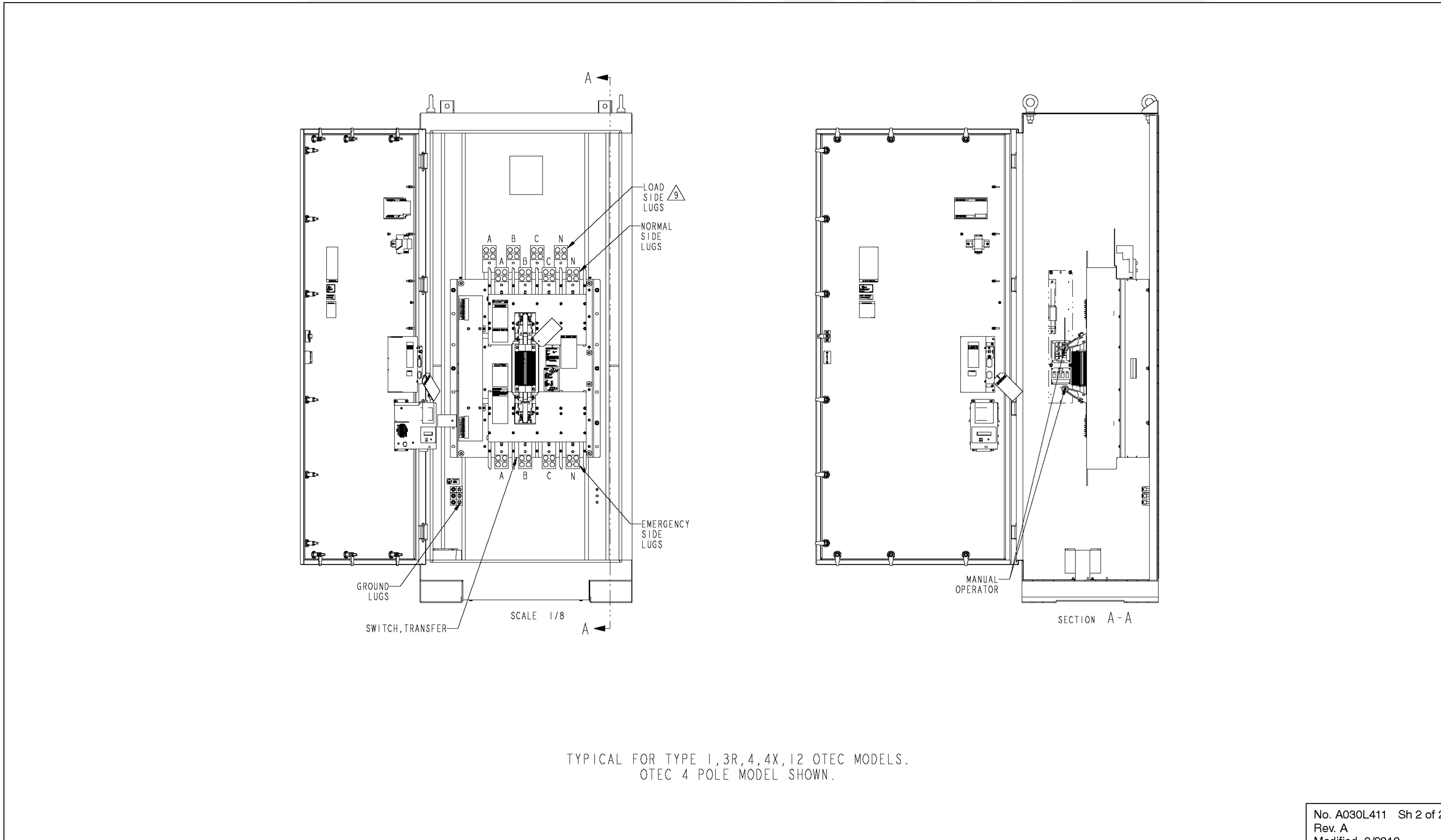

FIGURE 61. NEMA 1, 3R, 4, AND 12 CONTROL BOX OUTLINE DRAWING A030L411, 1200 AMP (SHEET 2 OF 2)

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