EATON | Cutler-Hammer

O & M Manual for the EATON Generator Ready Loadcenter

Instructional Booklet

New Information

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All possible contingencies that may arise during installation, operation, or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is required by the purchaser regarding a particular installation, application, or maintenance activity, please contact an authorized Eaton sales representative or the installing contractor.

Section 1: Introduction

1.1 Preliminary Comments and Safety Precautions

This technical document is intended to cover most aspects associated with the installation, application, operation, and maintenance of the Generator Ready Loadcenter. It is provided as a guide for authorized and qualified personnel only. Please refer to the specific WARNING and CAUTION in Section 1.1.2 before proceeding. If further information is required by the purchaser regarding a particular installation, application, or maintenance activity, please contact an authorized Eaton sales representative or the installing contractor.

1.1.1 Warranty and Liability Information

No warranties, expressed or implied, including warranties of fitness for a particular purpose of merchantability, or warranties arising from course of dealing or usage of trade, are made regarding the information, recommendations, and descriptions contained herein. In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability, or otherwise for any special, indirect, incidental or consequential damage, or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information and descriptions contained herein.

1.1.2 Safety Precautions

All safety codes, standards, and/or regulations must be strictly observed in the installation, application, operation, and maintenance of this device.

⚠ WARNING

READ AND UNDERSTAND THE INSTRUCTIONS CONTAINED HEREINAFTER BEFORE ATTEMPTING TO UNPACK, ASSEMBLE, OPERATE, OR MAINTAIN THIS EQUIPMENT. HAZARDOUS VOLTAGES ARE PRESENT INSIDE TRANSFER SWITCH ENCLOSURES THAT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY. FOLLOW PROPER INSTALLATION, OPERATION, AND MAINTENANCE PROCEDURES TO AVOID THESE VOLTAGES.

⚠ WARNING

THE WARNINGS AND CAUTIONS INCLUDED AS PART OF THE PROCEDURAL STEPS IN THIS DOCUMENT ARE FOR PERSONAL SAFETY AND PROTECTION OF EQUIPMENT FROM DAMAGE. AN EXAMPLE OF A TYPICAL WARNING LABEL HEADING IS SHOWN ABOVE TO FAMILIARIZE PERSONNEL WITH THE STYLE OF PRESENTATION. THIS WILL HELP TO ENSURE THAT PERSONNEL ARE ALERT TO WARNINGS, WHICH APPEAR THROUGHOUT THE DOCUMENT. IN ADDITION, CAUTIONS ARE ALL UPPER CASE AND BOLDFACE.

CAUTION

READ AND UNDERSTAND THE MATERIAL PRESENTED IN THIS DOCUMENT BEFORE ATTEMPTING INSTALLATION, APPLICATION, OPERATION, OR MAINTENANCE OF THE EQUIPMENT. IN ADDITION, ONLY QUALIFIED PERSONS SHOULD BE PERMITTED TO PERFORM ANY WORK ASSOCIATED WITH THE EQUIPMENT. ANY WIRING INSTRUCTIONS PRESENTED IN THIS DOCUMENT MUST BE FOLLOWED PRECISELY. FAILURE TO DO SO COULD CAUSE PERMANENT EQUIPMENT DAMAGE.

1.2 General Information

Generators are used to protect critical electrical loads against loss of power. This Generator Ready Loadcenter provides the property owner the option of adding an ATS and generator at a future date. The load's utility power source is divided into two sections, designated as critical and non-critical. Once the optional ATS kit has been installed, the critical loads are backed-up by a generator power source. An ATS is connected to both the utility and generator power sources and supplies the critical loads with power from one of these two sources. In the event that power is lost from the utility power source, the ATS transfers the critical loads to the generator power source. Once the utility power is restored, the load is automatically transferred back to the utility power source.

1.3 Environmental and Operational Conditions

Normally, an ATS is applied indoors in an electrical equipment room. It can also be used for normal outdoor applications (with optional NEMA 3R enclosure) where the equipment is subject to falling rain, freezing temperatures, and 95% humidity (non-condensing). The ambient temperature range for operation is between -20 and 70°C (-4 and 158°F).

1.4 Glossary

With respect to their use within this document and as they relate To loadcenter, transfer switch and controller operation, the following terminology is defined.

ATS

Refers to Automatic Transfer Switch.

Available

A source is defined as "available" when it is within its under voltage setpoint ranges for the nominal voltage setting.

Connected

Connected is defined as when the input is shorted by an external contact or connection.

Critical Load

Also referred to as "Emergency Loads", are those loads determined to be essential during a utility power source outage. Once the ATS Kit has been installed, these loads will automatically be powered by the generator during a utility power outage.

Non-Critical Load

Are those loads determined to be non-essential during a utility power source outage. Those loads which during a power outage may result in an inconvenience but will not result in injury, loss of life or property. These loads will not be powered by the generator during a utility power outage.

Failed or Fails

A source is defined as "failed" when it is outside of the applicable voltage setpoint ranges for the nominal voltage and for a time exceeding 0.5 seconds after the time delay emergency fail (TDEF) time delays expires.

Failsafe

Failsafe is a feature that prevents disconnection from the only available power source and also forces a transfer or re-transfer operation to the only available power source.

Generator

Generator is the secondary source (generator emergency source, emergency power source, emergency, standby, or backup source).

Interior Panel Assembly

Interior panel assembly refers to the distribution section of the generator ready loadcenter. It is located in the upper portion of the enclosure and contains provisions for terminating both the critical and non-critical loads.

Power Panel

Power panel refers to the ATS section of the generator ready loadcenter. Also referred to as the ATS kit. Once installed, it is located in the lower portion of the enclosure and provides the automatic switching function from utility power to generator back up power during a utility power outage.

Re-Transfer

Re-transfer is defined as a change of the load connection from the generator to the utility.

Utility

Utility is the primary source (normal source, normal power source, or normal).

Utility: Failed or Fails

Utility is defined as "failed" when it is outside of its undervoltage setpoint ranges for the nominal voltage and frequency setting.

Generator: Failed or Fails

Generator is defined as "failed" when it is outside of its undervoltage/ underfrequency/overfrequency (if applicable) setpoint ranges for the nominal voltage and frequency setting for a time exceeding 0.5 seconds after the Time Delay Emergency Fail (TDEF) time delay expires.

Transfer

Transfer is defined as a change of the load connection from the utility to the Generator power source.

Unconnected

Unconnected is defined as when the input is not shorted by an external contact or connection.

Section 2: Receiving, Handling, and Storage

2.1 Receiving

Every effort is made to ensure that the generator ready loadcenter arrives at its destination undamaged and ready for installation. The packing is designed to protect the internal components as well as the enclosure. Care should be exercised, however, to protect the equipment from impact at all times. Do not remove the protective packaging until the equipment is at the installation site and ready to be installed. When the generator ready loadcenter reaches its destination, the customer should inspect the shipping container for any obvious signs of rough handling and/or external damage that occurred during transportation. Record any external and internal damage for reporting to the transportation carrier and to the Eaton sales representative, once a thorough inspection is complete. All claims should be as specific as possible and include the General Order number. A shipping label affixed to the shipping container includes a variety of equipment and customer information, such as General Order and Catalog numbers. Make certain that this information matches the other shipping paper information. Each generator ready enclosure is packaged in its own box. Do not discard the packing material until the equipment is ready for installation. Once the packaging is removed from the shipment, the enclosure door can be opened. A plastic bag of documents will be found in the enclosure. Important documents, such as wiring diagrams and appropriate instruction leaflets, are enclosed within the bag and should be filed in a safe place.

2.2 Handling

As previously mentioned, the generator ready loadcenter is packaged in its own box. Protect the equipment from impact at all times and do not double stack. Once the equipment is at the installation site and ready to be installed, the packaging material can be removed. Refer to Section 4 of this manual for specific installation instructions.

2.3 Storage

Although well packaged, this equipment is not suitable for outdoor storage. The equipment warranty will not be applicable if there is evidence of outdoor storage. If the equipment is to be stored indoors for any period of time, it should be stored with its protective packaging material in place. Protect the equipment at all times from excessive moisture, construction dirt, corrosive conditions, and other contaminants. It is strongly suggested that the package-protected equipment be stored in a climate-controlled environment of -20 to 70°C (-4 to 158°F), with a relative humidity of 80% or less. Do not, under any circumstance, stack other equipment on top of an ATS equipment enclosure, whether packaged or not.

Section 3: Equipment Description

3.1 Introduction

The Eaton Residential generator ready loadcenter is assembled and tested at the factory. It is designed to be used in conjunction with standby power distribution equipment to provide an alternate source of power to critical circuits in the event that the primary power source is interrupted. Once installed, the ATS monitors both utility and generator power sources and automatically transfers critical load circuits between the two sources, depending on which source is available. The utility power source is preferred and will remain connected to the switch if it is available.

3.2 Interior Panel Assembly

The interior panel assembly is used for making load, power, and neutral connections. The interior panel assembly is mounted on a steel backplate and is divided into to two sections. The upper section (non critical loads) and lower section (critical loads).

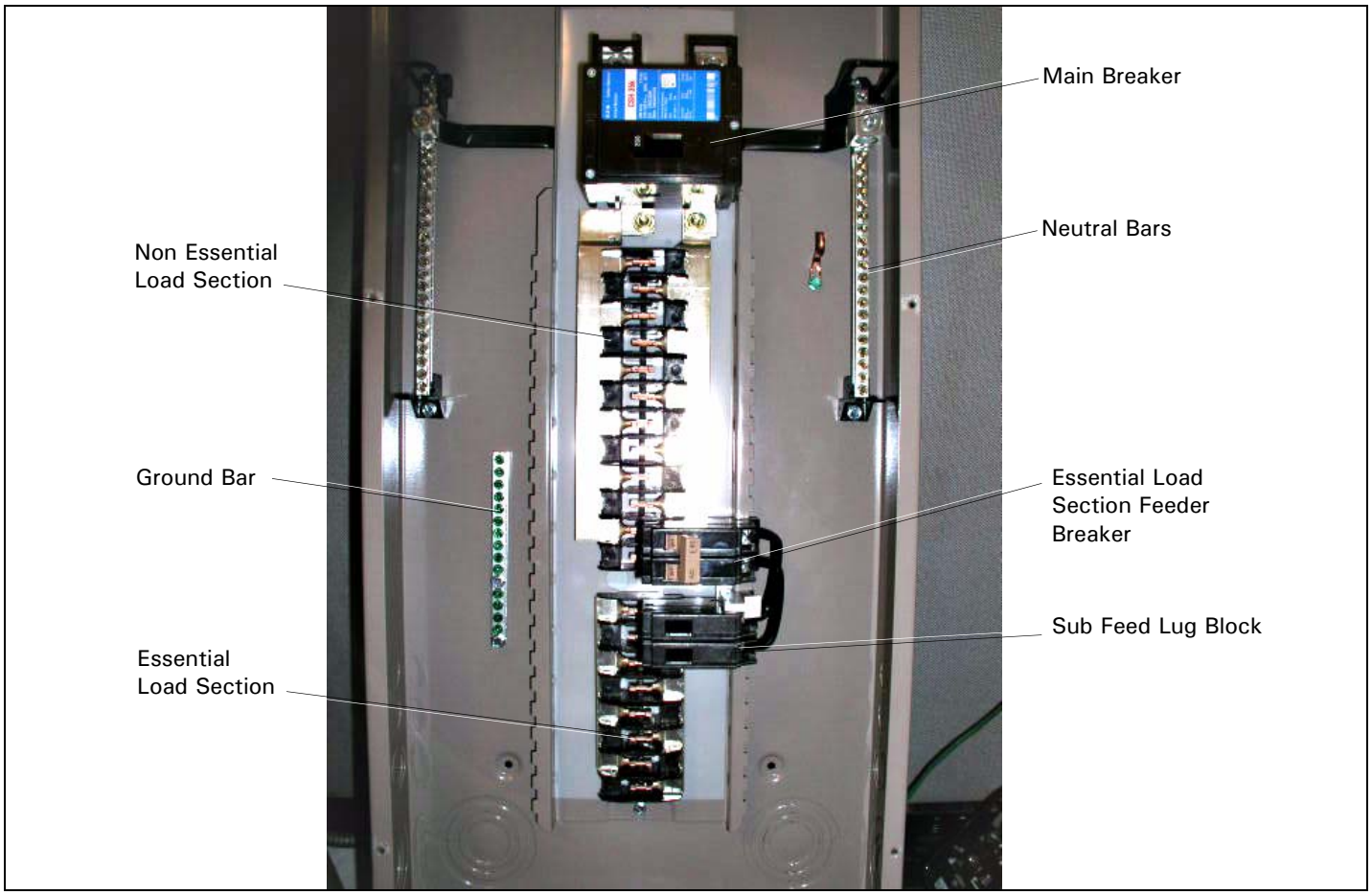

Figure 1. Interior Panel Assembly.

3.3 Standards

Eaton Generator ready equipment is listed for application by UL in file E8741. In addition, Eaton ATSs are listed in File E315201 by Underwriters Laboratories, Inc. under Standard UL 1008. This standard covers the requirements for ATSs intended for use in ordinary locations to provide lighting and power as follows:

- In standby systems, in accordance with article 702 of the National Electrical Code.

Eaton ATSs are available to meet NFPA 110 for standby power systems.

Eaton ATS equipment are listed for application by CSA. In addition, Eaton ATSs are listed in the Legacy File LR96245 Master Contract 163545 by Canadian Standards Association under Standard 22.2 #178-1978.

Section 4: Installation and Wiring

4.1 General

Eaton generator ready loadcenters are factory wired and tested. Installation requires solidly mounting the enclosed unit and connecting the power cables. Physical mounting procedures and power cable connections are covered in this section. Once a generator ready loadcenter is properly installed and wired, it should be mechanically and electrically checked for proper installation and operation.

Check to ensure there are no pipes, wires, or other mounting hazards in the immediate mounting area that could create a problem. Carefully remove all packing material from the generator ready enclosure at the installation site. Even though an equipment inspection was performed when the equipment was received, make another careful inspection of the enclosure as the packing material is removed and the enclosure readied for mounting. Be especially alert for distorted metal, loose wires, or damaged components.

4.2 Mounting Location

Choose a location that offers a flat, rigid mounting surface capable of supporting the weight of the enclosed generator ready equipment. Protect the loadcenter at all times against excessive moisture, dust, dirt, lint, and corrosive vapors.

4.3 Mounting Procedure

With the enclosed equipment unpacked and ready for mounting, proceed with the following steps.

For Type 1:

Step 1: Remove eight screws from both trim pieces and remove (Figure 2).

Step 2: Use the knockouts for cable entry.

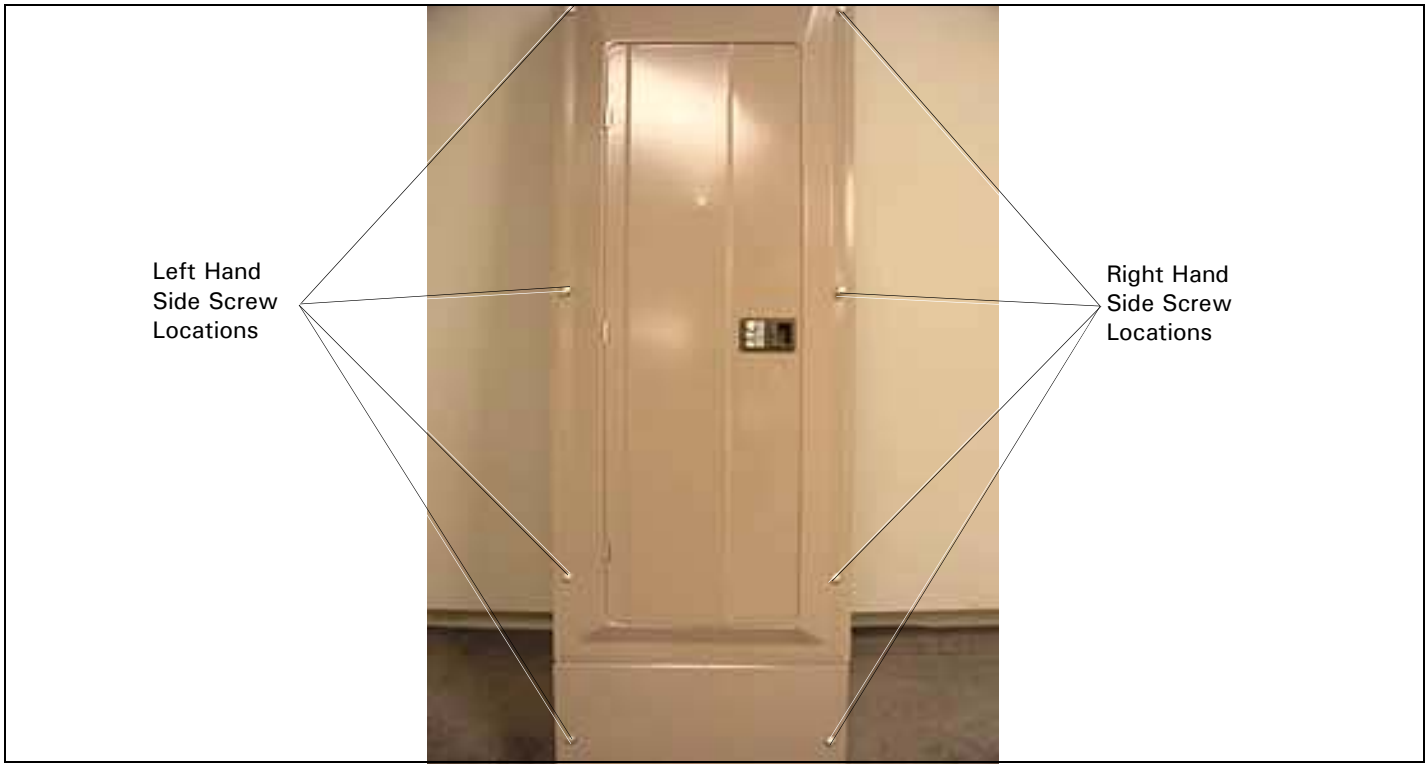

Figure 2. Trim Screw Locations.

4.4 Power Cable Connection

Test all power cables prior to connection to the unit to ensure that the conductors or cable insulation has not been damaged while being pulled into position.

Power cables are to be connected to solderless, screw type lugs located on the main breaker installed on the power panel. Verify that the lugs supplied will accommodate the power cables being used. Also verify that the cables comply with all local electrical codes. Cable requirements/restrictions are posted on the internal door Publication. Torque requirements are included on the publication.

⚠ CAUTION

EXTREME CARE SHOULD BE TAKEN TO PROTECT THE ENCLOSURE FROM DRILL CHIPS, FILINGS, AND OTHER CONTAMINANTS WHEN MAKING THE CABLE ENTRY HOLES AND MOUNTING THE ENCLOSURE TO PREVENT COMPONENT DAMAGE OR A FUTURE MALFUNCTION.

NOTICE

THE INSTALLATION MUST FULLY COMPLY WITH ALL APPLICABLE CODES, STANDARDS, AND REGULATIONS.

⚠ WARNING

POWER CONDUCTORS MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL POWER OR CONTROL CIRCUIT CONDUCTORS TO BE CONNECTED TO THE EQUIPMENT BEFORE BEGINNING TO WORK WITH THE CONDUCTORS AND/OR TERMINATING THEM TO THE EQUIPMENT

⚠ CAUTION

TO HELP PREVENT COMPONENT DAMAGE OR FUTURE MALFUNCTIONS, USE EXTREME CARE TO KEEP CONTAMINANTS OUT OF THE EQUIPMENT WHEN MAKING THE POWER CABLE CONNECTIONS.

4.5 Wiring

All wiring of the Eaton generator ready loadcenter shall be done in accordance with the latest accepted version of NFPA 70 National Electric Code. All field wiring shall be completed through the top of the enclosure. This allows for the acceptable clearances for the installation of the ATS.

4.6 Installation EATON Generator Ready Loadcenter

In a typical installation, the non-critical loads are installed in the upper non-critical section of the power panel. The critical (emergency) loads are installed in the lower critical section of the power panel. Under normal operation, with utility power available, these loads will receive utility power supply (see Figure 1).

When the utility power fails, the ATS will sense the failure, the generator will start, and when sufficient generator voltage is available, all emergency loads (see Figure 1). will receive power from the generator. A circuit breaker is required between the generator power source and the transfer switch (typically included with the generator). When utility power returns, the ATS will switch the essential load back to utility power and the generator will shut down.

4.7 Installation of the ATS KIT

Step 1: Open, (turn off) the utility power source main breaker (see Figure 1). Using a voltmeter, measure the line-to-line and line-to-neutral voltages across the utility line terminals to ensure the utility voltage is zero (Off).

⚠ WARNING

POWER CONDUCTORS MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL POWER CONDUCTORS BEFORE BEGINNING TO PERFORM ANY WIRING ACTIVITY TO OR WITHINTHE EQUIPMENT.

Step 2: Remove the trim assembly and cover from lower ATS section of the enclosure. Eight screws are used to secure trim and cover to the enclosure (see Figure 2).

Step 3: Turn off the lower bus supply breaker (60 Amp, 2 pole) located in positions 22 and 24 on the power panel. Loosen the lug screws and remove the factory installed bus jumpers located in positions 22, 24, 28 and 30 on the power panel.

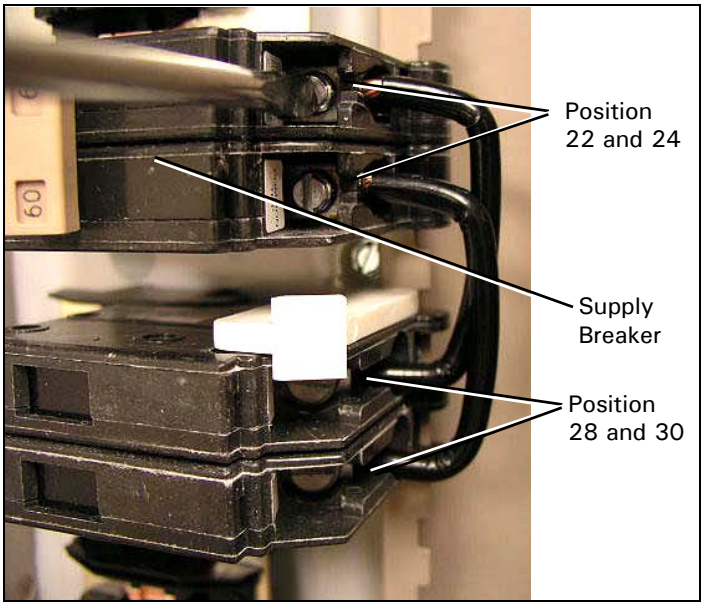

Figure 3. Position Locations.

Step 4: Remove the barrier assembly (see Figure 4). Keep the barrier and screw for reinsertion.

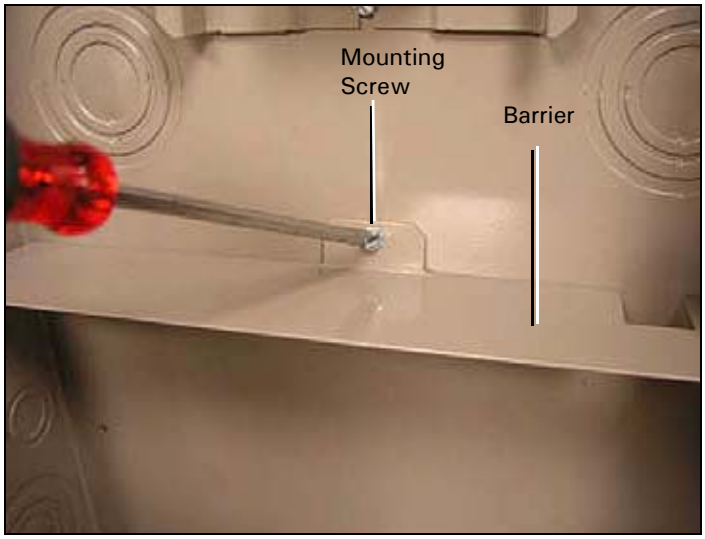

Figure 4. Barrier.

Step 5: Align the new ATS KIT with the mounting holes in the enclosure. Secure with (4) #10-32 X 3/8" hex head screws provided.

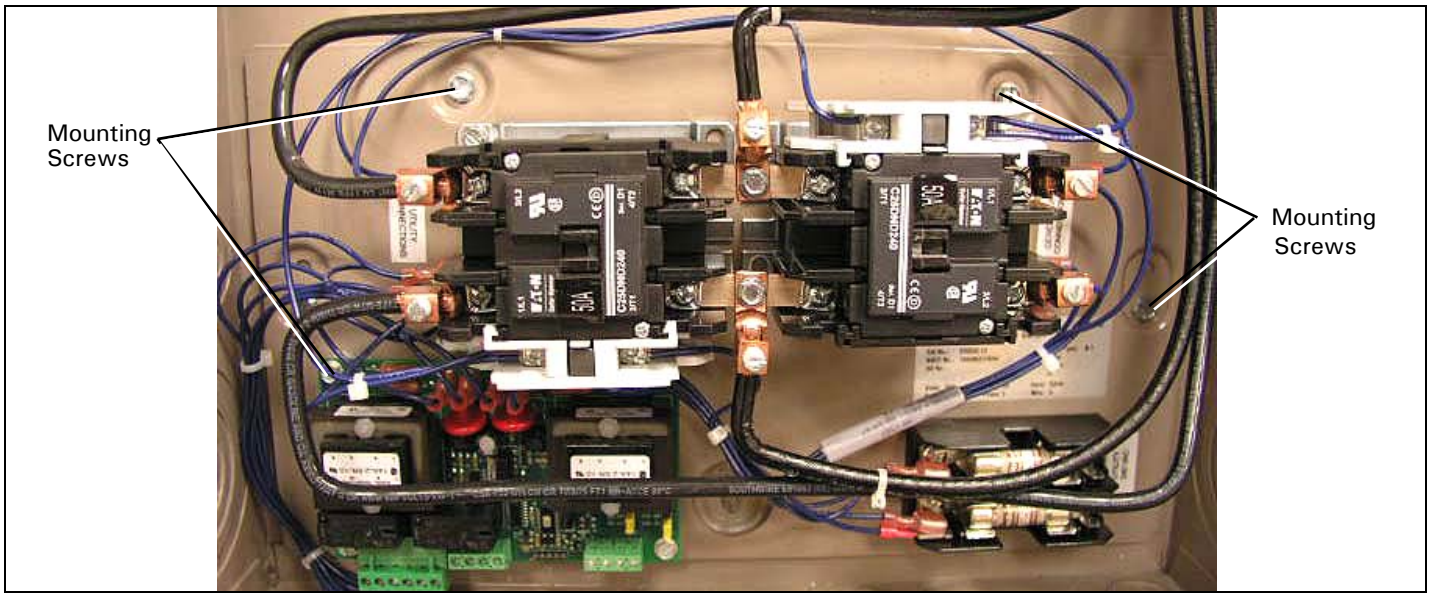

Figure 5. Mounting Locations for Transfer Switch.

Step 6: Install utility line N1 and N2 designated as lead 22 and 24 on the wiring harness to the solderless, screw type lugs located on the branch breaker installed on the power panel in positions 22 and 24. Refer to screw torque requirements detailed on the publication installed on the inside of the door.

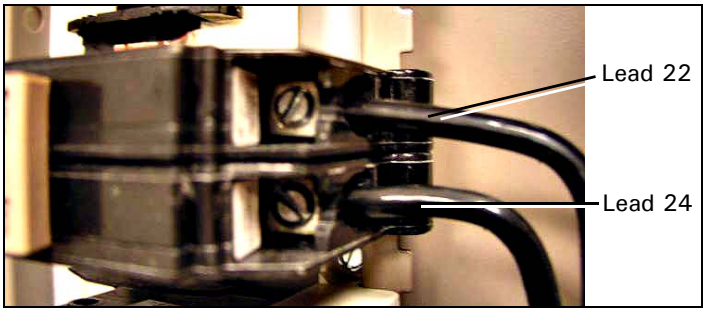

Figure 6. Utility Line Wire Harness Installation.

Step 7: Install load lug wires, designated as lead 28 and 30, on the wiring harness to the solderless, screw type lugs located on the branch mounted sub-feed lug block installed on the power panel in positions 28 and 30. Refer to screw torque requirements detailed on the publication installed on the inside of the door.

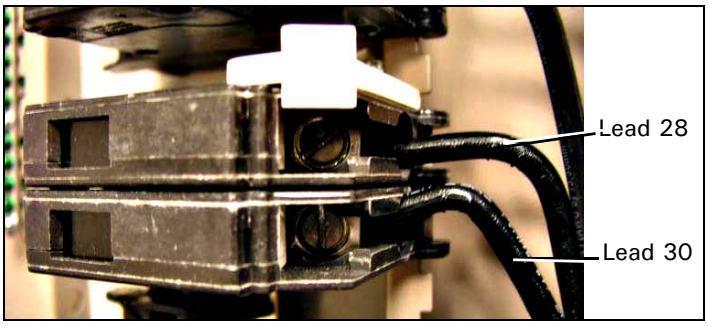

Figure 7. Sub-feed Block Wire Harness Installation.

Step 8: Reinstall the previously removed barrier assembly as shown in Figure 8.

Figure 8. Barrier Installation.

Step 9: Apply the supplied labels to the transfer switch as shown in Figures 9 and 10. All of the labels will be applied to the transfer switch cover ONLY.

Figure 9. Label Application on Front of the Transfer Switch Cover.

Figure 10. Label Application on BACK of Transfer Switch Cover.

Step 10: Install the transfer switch cover using two screws (saved from removal of cover). Install the loadcenter trim using six screws (saved from removal of cover). Turn the 60 amp breaker (turned OFF in STEP 3) to the ON position. Turn the utility main breaker to the ON position to re-energize the loadcenter panel.

From this point, all further directions, testing, adjustments, and descriptions are found in the **O & M Manual for the EGS Automatic Transfer Switch with RTC-50 Control and Integral Loadcenter** included with the **Generator Ready Loadcenter Kit** starting with Section 4.5 - Wiring on page 12.

⚠ WARNING

BE CERTAIN THAT THE DEADFRONT IS PROPERLY INSTALLED BEFORE THE EQUIPMENT IS PUT INTO SERVICE. THE DEADFRONT PROVIDES PROTECTION FROM DANGEROUS VOLTAGES AT THE LINE AND LOAD TERMINALS WHEN THE EQUIPMENT IS IN OPERATION. FAILURE TO DO SO COULD RESULT IN PERSONAL INJURY OR DEATH.

Notes

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