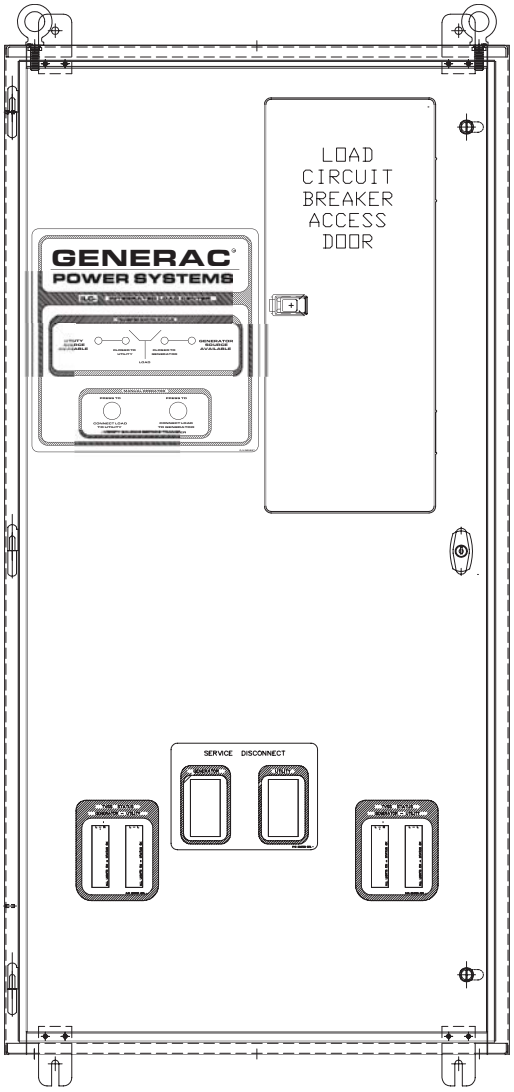
GENERAC®

POWER SYSTEMS, INC.

Owner's Manual



Integrated Load Center

200 Amp, 600 Volts

This manual should remain with the unit.

Read the following information carefully before attempting to install, operate or service this equipment. Also read the instructions and information on tags, decals, and labels that may be affixed to the transfer switch. Replace any decal or label that is no longer legible.

DANGER! Connection of a generator to an electrical system normally supplied by an electric utility shall be by means of suitable transfer equipment so as to isolate the electric system from utility distribution system when the generator is operating (Article 702 Optional Standby Systems, as applicable). Failure to isolate electric system by these means may result in damage to generator and may result in injury or death to utility workers due to backfeed of electrical energy.

Generac cannot possibly anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all-inclusive. If using a procedure, work method or operating technique Generac does not specifically recommend, satisfy yourself that it is safe for others. Also make sure the procedure, work method or operating technique chosen does not render the transfer switch unsafe.

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

DANGER

After this heading, read instructions that, if not strictly complied with, will result in personal injury or property damage.

WARNING

After this heading, read instructions that, if not strictly complied with, may result in personal injury or property damage.

CAUTION

After this heading, read instructions that, if not strictly complied with, could result in damage to equipment and/or property.

NOTE:

After this heading, read explanatory statements that require special emphasis.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the service are essential to preventing accidents.

Four commonly used safety symbols accompany the DANGER, WARNING and CAUTION blocks. The type of information each indicates follows:

This symbol points out important safety information that, if not followed, could endanger personal safety and/or property of others.

This symbol points out potential explosion hazard.

This symbol points out potential fire hazard.

This symbol points out potential electrical shock hazard.

GENERAL HAZARDS

- Any AC generator that is used for backup power if a NORMAL (UTILITY) power source failure occurs, must be isolated from the NORMAL (UTILITY) power source by means of an approved transfer switch. Failure to properly isolate the NORMAL and STANDBY power sources from each other may result in injury or death to electric utility workers, due to backfeed of electrical energy.
- Improper or unauthorized installation, operation, service or repair of the equipment is extremely dangerous and may result in death, serious personal injury, or damage to equipment and/or personal property.
- Extremely high and dangerous power voltages are present inside an installed transfer switch. Any contact with high voltage terminals, contacts or wires will result in extremely hazardous, and possibly LETHAL, electric shock. DO NOT WORK ON THE TRANSFER SWITCH UNTIL ALL POWER VOLTAGE SUPPLIES TO THE SWITCH HAVE BEEN POSITIVELY TURNED OFF.
- Competent, qualified personnel should install, operate and service this equipment. Adhere strictly to local, state and national electrical and building codes. When using this equipment, comply with regulations the National Electrical Code (NEC), CSA Standard; C22.1 Canadian Electric Code and Occupational Safety and Health Administration (OSHA) have established.
- Never handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. DANGEROUS ELECTRICAL SHOCK MAY RESULT.

- Because jewelry conducts electricity, wearing it may cause dangerous electrical shock. Remove all jewelry (such as rings, watches, bracelets, etc.) before working on this equipment.
- If working on this equipment while standing on metal or concrete, place insulative mats over a dry wood platform. Work on this equipment only while standing on such insulative mats.
- Never work on this equipment while physically or mentally fatigued.
- Keep the transfer switch enclosure door closed and bolted at all times. Only qualified personnel should be permitted access to the switch interior.
- In case of an accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor but AVOID DIRECT CONTACT WITH THE VICTIM. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- When an automatic transfer switch is installed for a standby generator set, the generator engine may crank and start at any time without warning. To avoid possible injury that might be caused by such sudden start-ups, the system's automatic start circuit must be disabled before working on or around the generator or transfer switch. For that purpose, a SAFETY DISCONNECT is provided inside the transfer switch. Always set that switch to its MANUAL position before working on the equipment. Then place a "DO NOT OPERATE" tag on the transfer switch and on the generator.

1.1 INTRODUCTION

This manual has been prepared especially for the purpose of familiarizing personnel with the design, application, installation, operation and servicing of the applicable equipment. Read the manual carefully and comply with all instructions. This will help to prevent accidents or damage to equipment that might otherwise be caused by carelessness, incorrect application, or improper procedures.

Every effort has been expended to make sure that the contents of this manual are both accurate and current. Generac, however, reserves the right to change, alter or otherwise improve the product at any time without prior notice.

1.2 EQUIPMENT DESCRIPTION

This Integrated Load Center (ILC) is a combination of individual components that perform four basic functions.

◆ 1.2.1 SERVICE DISCONNECT

This unit is equipped with a 200 amp circuit breaker for each source of supply, UTILITY and GENERATOR. This circuit breaker can serve as the service disconnect for each of the supplies.

◆ 1.2.2 TRANSIENT VOLTAGE SURGE SUPPRESSION

The Transient Voltage Surge Suppression (TVSS) is provided to protect the load from electrical surges and/or transient voltage spikes. This device is physically located next to the service disconnect circuit breakers and electrically connected to the load side of the service disconnect. A TVSS module is standard and protects the utility supply; the generator supply TVSS protection is provided in some models. A 30 amp circuit breaker is provided to disconnect the TVSS from the live ILC for maintenance or replacement.

The TVSS is made up of multiple solid state Metal Oxide Varistors (MOV) connected in parallel for each mode of protection. These devices are equipped with integrated short circuit and individual component level fusing. They are self-resetting and fully automatic.

✧ 1.2.2.1 Modes of Protection

The TVSS provides protection on all modes:

- Single Phase (6) - L-L, L-N, L-N, L-G, L-G and N-G.
- Three Phase (10) - L-L, L-L, L-L, L-N, L-N, L-N, L-G, L-G, L-G and N-G.

✧ 1.2.2.2 Ratings

- Surge Capacity: 88 kA per mode.
- Suppression Level (typical):

  L-N = 330 V

  L-G = 400 V

  N-G = 400V

  L-L = 700 V

✧ 1.2.2.3 Certification

The TVSS is UL recognized to the requirements of UL 1449 2nd edition.

✧ 1.2.2.4 TVSS Disconnect

Each TVSS is provided with a disconnect. The disconnect is a 30 amp circuit breaker, 2-pole for single phase and 3-pole for three phase. This is to allow replacement of the TVSS module without interruption of the electrical supply to the load.

DANGER

REPLACEMENT OF THE TVSS MODULE WHILE THE ATS - ILC IS ENERGIZED SHOULD ONLY BE PERFORMED BY A QUALIFIED ELECTRICIAN.

CAUTION

BE SURE TO TURN ON TVSS DISCONNECT CIRCUIT BREAKER WHEN THE PROCEDURE IS COMPLETE. IF THE CIRCUIT BREAKER IS NOT TURNED ON THE TVSS MODULE WILL NOT PROVIDE ANY SURGE PROTECTION FOR THE CUSTOMER LOAD.

✧ 1.2.2.5 STATUS INDICATORS

Each TVSS module is equipped with a set of LED indicators that are on the cover of the individual module. The LED's are connected internally to indicate that the mode of protection is in working order and providing the indicated mode of protection. The LED's are on when the mode of protection is available and the power source is also available. For the power source to be available, the associated service disconnect circuit breaker must be ON, the associated TVSS disconnect circuit breaker must be ON and the associated source must be present.

The LED status indicators can be viewed from the outside of the enclosure or directly on the TVSS module with the enclosure door open. All four (4) LED's (single phase) or all six (6) LED's (three phase) should be on to indicate the TVSS module is ready to provide protection against surge voltages.

✧ 1.2.2.6 REMOTE ALARM CONTACTS

Each TVSS module is equipped with a set of alarm contacts. These alarm contacts are wired to a two-position terminal strip adjacent to the TVSS module. The internal contacts are normally closed to indicate normal operation. If one of the protection elements become damaged, the contacts will open, indicating the failure.

Contacts are rated 2A @ 125 VAC.

◆ 1.2.3 AUTOMATIC TRANSFER SWITCH

The automatic transfer switch is used for transferring critical electrical load from a NORMAL (UTILITY) power source to a STANDBY (EMERGENCY) power source. Such a transfer of electrical loads occurs electrically when initiated by the operator. The transfer switch prevents electrical feedback between two different power sources (such as the NORMAL and STANDBY sources) and, for that reason, codes require it in all standby electric system installations.

The transfer switch consists of a transfer mechanism and an operator panel.

◆ 1.2.4 PANEL BOARD

This unit is provided with a 42 position panel board (manufactured by Siemens) for mounting of individual branch circuit breakers. Single phase ILC's are equipped with a single phase panel board. Three phase ILC's are equipped with a three phase panel board. It is factory wired and the customer connection is made here.

✧ 1.2.4.1 Voltage Rating

- 240 Volt maximum when used with BL, BLH, and QJH2 branch circuit breakers.

✧ 1.2.4.2 Amperage Rating

The panel interior has been tested to 250 amps, however is limited to 200 amp in this application. The limitation comes from the service disconnect circuit breakers ratings.

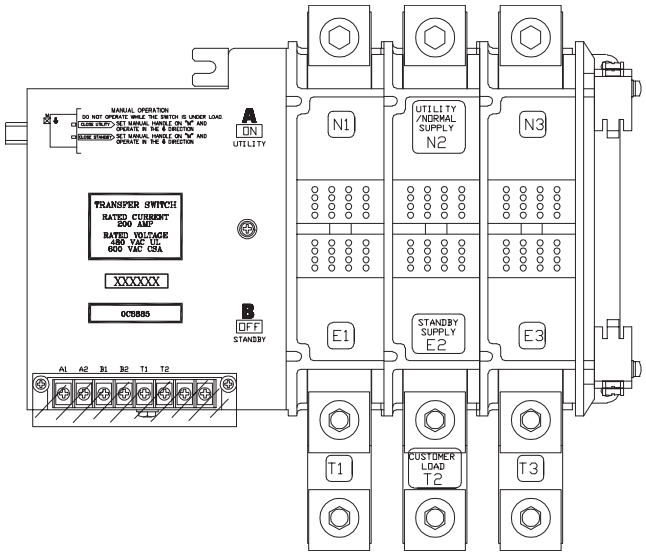
✧ 1.2.4.3 Recommended Circuit Breakers

- Only circuit breakers manufactured by Siemens Energy & Automation, Inc.
- This panel board is UL component recognized only when used with Siemens type BL, BLH, or QJH2 and at a suitable current rating for the branch circuit.
- Blank covers must be installed in all open spaces (no circuit breaker installed), before putting the system in service. Use ONLY Siemens catalog number QF-3.

1.3 TRANSFER MECHANISM

- The transfer mechanism houses the main, current carrying contacts, along with other mechanical and electrical components required for operating the switch (Figure 1.1). Main contacts are actuated by a single solenoid, are electrically operated and mechanically held. Power for that coil's operation is taken from the side to which the LOAD is being transferred. Therefore, transfer to any power source cannot occur unless that power source is available to the switch.
- LOAD (or "T") contacts are bolted to an insulated plastic pole piece and are stationary. The NORMAL (UTILITY) and STANDBY (EMERGENCY) contacts are moveable. The contacts are actuated by means of a closing coil and mechanical linkage. The pole assemblies which retain the stationary moveable main contacts are assembled together and retained by through-bolts. Either 2, 3 or 4-pole assemblies may be used to form a 2, 3 or 4-pole mechanism.

Figure 1.1 — The Transfer Mechanism



1.4 RATINGS — DATA PLATE

This ILC is rated 200 amp at 120/240 or 120/208 VAC single phase or 120/208 VAC three phase. A DATA PLATE is permanently affixed to the transfer switch subplate. Use this ILC only within the specific limits shown on the DATA PLATE and the application decal located on the inside lower left side of the cabinet.

When requesting information or ordering parts for this equipment, make sure to include all information from the DATA PLATE. Record the Model and Serial numbers in the space provided on the top of page 4 for future reference.

MODEL #

SERIAL #

1.5 PANEL BOARD ENCLOSURE

The standard switch enclosure is a National Electrical Manufacturer's Association (NEMA) 1 type. NEMA 1 type enclosures primarily provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.

1.6 SAFE USE OF PANEL BOARD

Before installing, operating or servicing this equipment, read the SAFETY RULES (inside front cover) carefully. Comply strictly with all SAFETY RULES to prevent accidents and/or damage to the equipment. Generac recommends making a copy of the SAFETY RULES and post them near the transfer switch. Also, be sure to read all instructions and information found on tags, labels and decals affixed to the equipment.

Three publications that outline the safe use of transfer switches are the following:

- NFPA 70; National Electrical Code
- UL 1008, STANDARD FOR SAFETY-AUTOMATIC TRANSFER SWITCHES
- UL 67, STANDARD FOR SAFETY-PANEL BOARDS

2.1 INTRODUCTION TO INSTALLATION

This equipment has been wired and tested at the factory. Installing the switch includes the following procedures:

- Unpacking the ILC.
- Mounting the enclosure.
- Connecting power source and load leads.
- Connecting any auxiliary contact (if needed)
- Installing/connecting any options and accessories.
- Testing functions.

2.2 UNPACKING

Carefully unpack the transfer switch. Inspect closely for any damage that might have occurred during shipment. The purchaser must file with the carrier any claims for loss or damage incurred while in transit.

Check that all packing material is completely removed from the switch prior to installation.

Attach any lifting device to the lifting eyes on top of the enclosure. DO NOT LIFT THE SWITCH AT ANY OTHER POINT.

⚠ CAUTION ⚠

⚠ The ILC transfer switch weighs about 300 pounds. DO NOT attempt to lift without the proper equipment.

2.3 MOUNTING

Mounting dimensions for the transfer switch enclosure are in this manual. This enclosure is configured for wall-mounting. This enclosure is a NEMA/UL 1-type design, suitable for indoor installation only.

⚠ CAUTION ⚠

⚠ Handle transfer switches carefully when installing. Do not drop the switch. Protect the switch against impact at all times, and against construction grit and metal chips. Never install a transfer switch that has been damaged.

Install the transfer switch as close as possible to the electrical loads that are to be connected to it. Mount the switch vertically to a rigid supporting structure. To prevent switch distortion, level all mounting points. If necessary, use washers behind mounting holes to level the unit.

2.4 CONNECTING POWER SOURCE AND LOAD LINES

⚠ DANGER ⚠

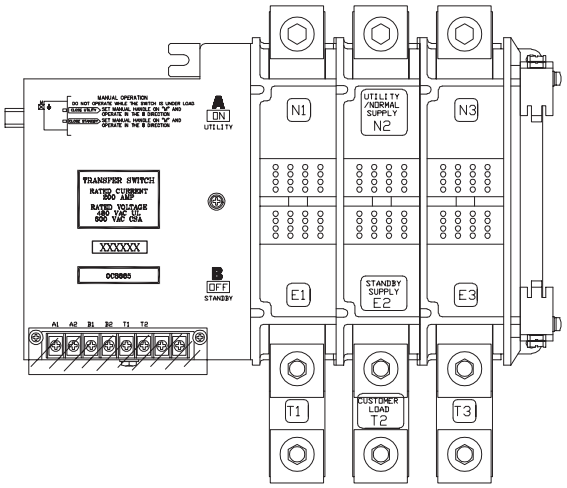
⚠ Make sure to turn OFF both the NORMAL (UTILITY) and STANDBY (GENERATOR) power supplies before connecting to the power source and load lines to the transfer switch. Supply voltages are extremely high and dangerous. Contact with such high voltage power supply lines causes extremely hazardous, possibly lethal, electrical shock.

Wiring diagrams and electrical schematics are provided in this manual. Power source connections are made at the service disconnect circuit breakers located near the bottom of the enclosure. The individual load connections will be made at the panel board, inside the switch enclosure.

◆ 2.4.1 2 & 3-POLE MECHANISM

This switch (Figure 2.1) is used with a three phase system when NEUTRAL is not to be switched. The two pole switch is similar in construction with the N3, E3 and T3 pole removed.

Figure 2.1 — Typical 3-Pole Transfer Mechanism (200 Amp Shown)



DANGER

All power voltage supplies must be turned off before connecting to the power source and load lines. Failure to turn off power voltage supplies will result in extremely dangerous and possibly lethal electrical shock.

All power cables should enter the switch next to the service disconnect circuit breaker terminals. Standard terminal lugs on the service disconnect are solderless, screw-type.

Connect power source and load conductors to clearly marked terminal lugs on the ILC as follows:

- LOAD leads: Connect to individual branch circuit breaker terminals.
- NORMAL (UTILITY) Source Leads: Connect to service disconnect circuit breaker.
- STANDBY (EMERGENCY) Source Leads: Connect to service disconnect circuit breaker.

Conductor sizes must be adequate to handle the maximum current to which they will be subjected, based on the 75°C column of tables, charts, etc. used to size conductors. The installation must comply fully with all applicable codes, standards and regulations.

Before connecting wiring cables to terminals, remove any surface oxides from the cable ends with a wire brush. If ALUMINUM conductors are used, apply corrosion inhibitor to conductors. After tightening terminal lugs, carefully wipe away any excess corrosion inhibitor.

Tighten terminal lugs to the torque values as noted inside the transfer switch door.

CAUTION

Use a torque wrench to tighten the conductors, being sure not to overtighten, or damage to the switch base could occur. If not tightened enough, a loose connection would result, causing excess heat which could damage the switch base.

Terminal Lug	Wire Range	Torque Value
Circuit Breaker	Cu 2/0 AWG - 300 kcmil Al 4/0 AWG - 300 kcmil	250 in-lbs. 250 in-lbs.
Neutral Lug	#6 AWG - 350 kcmil	375 in-lbs.
Ground	#8 AWG #4 - #6 AWG #2 AWG	40 in-lbs. 45 in-lbs. 50 in-lbs.
Branch circuit breakers	Will vary with the size of the individual circuit breaker.	Consult the marking on the circuit breaker.

Be sure to maintain proper electrical clearance between live metal parts and grounded metal. Allow at least 1/2 inch for 100-400 amp circuits.

2.5 AUXILIARY CONTACTS

There is access to Auxiliary Contacts on the transfer switch to operate customer accessories, remote advisory lights, or remote annunciator devices. A suitable power source must be connected to the COMMON (C) terminal. The contacts shown as FACTORY in Figure 2.2 (at the top of page 5), are connected at the factory for operating transfer switch advisory lights. The contacts shown as auxiliary are available for customer use.

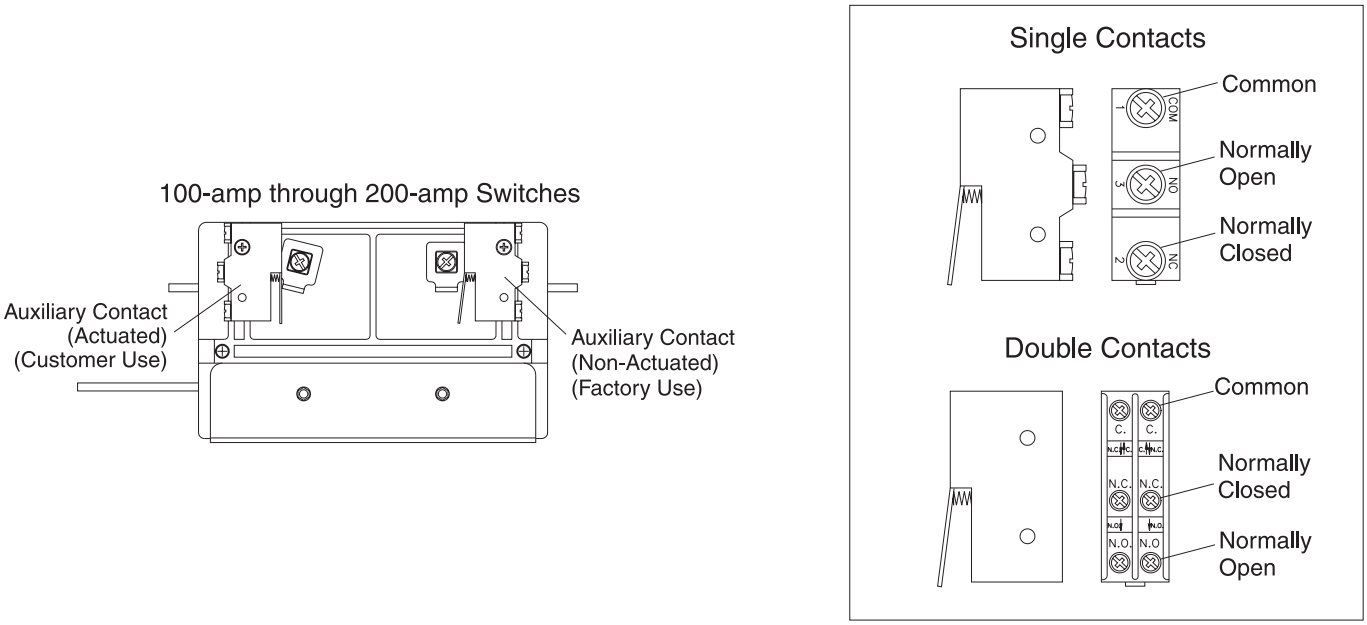
Contact operation is shown in the following chart:

	Switch Position	
	Utility	Standby
Common to Normally Open	Closed	Open
Common to Normally Closed	Open	Closed

NOTE:

Auxiliary Contacts are rated 10 amps at 125 or 250 volts AC. DO NOT EXCEED THE RATED VOLTAGE AND CURRENT OF THE CONTACTS.

Figure 2.2 — Auxiliary Contact Diagram



3.1 FUNCTIONAL TESTS AND ADJUSTMENTS

Following transfer switch installation and interconnection, inspect the entire installation carefully. A competent, qualified electrician should inspect it. The installation should comply strictly with all applicable codes, standards, and regulations. When absolutely certain the installation is proper and correct, complete a functional test of the system. Perform functional tests in the exact order presented in this manual, or damage to the switch could result.

IMPORTANT: Before proceeding with functional tests, read and make sure to understand all instructions and information in this section. Also read the information and instructions of labels and decals affixed to the switch. Note any options or accessories that might be installed and review their operation.

3.2 MANUAL OPERATION

DANGER

Do NOT manually transfer under load. Disconnect transfer switch from all power sources by approved means, such as a main circuit breaker(s).

A manual HANDLE is shipped with the transfer switch and attached to the inside of the door. Manual operation must be checked BEFORE the transfer switch is operated electrically. To check manual operation, proceed as follows:

1. If so equipped, turn the generator's AUTO-OFF-MANUAL switch to OFF.
2. Turn OFF both NORMAL and STANDBY service disconnect circuit breakers.
3. Note position of transfer mechanism main contacts by observing display windows in "A" and "B" in Figure 3.1 as follows:
   - Window "A" ON, Window "B" OFF - LOAD terminals (T1, T2, T3) are connected to NORMAL terminals (N1, N2, N3).
   - Window "A" OFF, Window "B" ON - LOAD terminals (T1, T2, T3) are connected to STANDBY terminals (E1, E2, E3).

CAUTION

Do not use excessive force when operating the transfer switch manually or damage to the manual handle could result.

◆ 3.2.1 CLOSE TO NORMAL SOURCE SIDE

Before proceeding, verify the position of the switch by observing window "A" in Figure 3.1. If window "A" reads "ON", proceed with Step 1, and if it reads "OFF", proceed with Step 2.

Step 1: With the handle attached to the actuating shaft, move handle in the direction of the arrow on the switch cover until it stops — DO NOT FORCE. Release handle slowly to release the spring in the switch box. "OFF" now appears in Window "A" and "ON" appears in Window "B". (Proceed with Step 2).

Step 2: With the handle attached to the actuating shaft, move handle in the direction of the arrow on the switch cover until it stops — DO NOT FORCE. Release handle slowly to release the spring in the switch box. “ON” now appears in Window “A” and “OFF” appears in Window “B”. (Proceed with B: Close to STANDBY Source Side).

◆ 3.2.2 CLOSE TO STANDBY SOURCE SIDE

Before proceeding, ensure that Section 3.2.1, “Step 2” Close to NORMAL Source Side is completed. See Figure 3.1. This will ensure that Window “B” on the switch reads “OFF”. With the handle attached to the actuating shaft, move the handle in the direction of the arrow on the switch cover until it stops - DO NOT FORCE. Release handle slowly to release the spring in the switch box. “OFF” now appears in Window “A” and “ON” appears in Window “B”.

◆ 3.2.3 RETURN TO NORMAL SOURCE SIDE

Manually actuate switch to return Window “A” to the “ON” position.

3.3 VOLTAGE CHECKS

DANGER

Disconnect all loads from the transfer switch by turning OFF all panel board branch circuit breakers until all voltage checks and phase rotation checks have been completed. This is to prevent possible injury to personnel and, or damage to equipment.

Before proceeding, check the transfer switch data PLATE for switch rated voltage. Make sure the data plate voltage is compatible with NORMAL and STANDBY power source voltages.

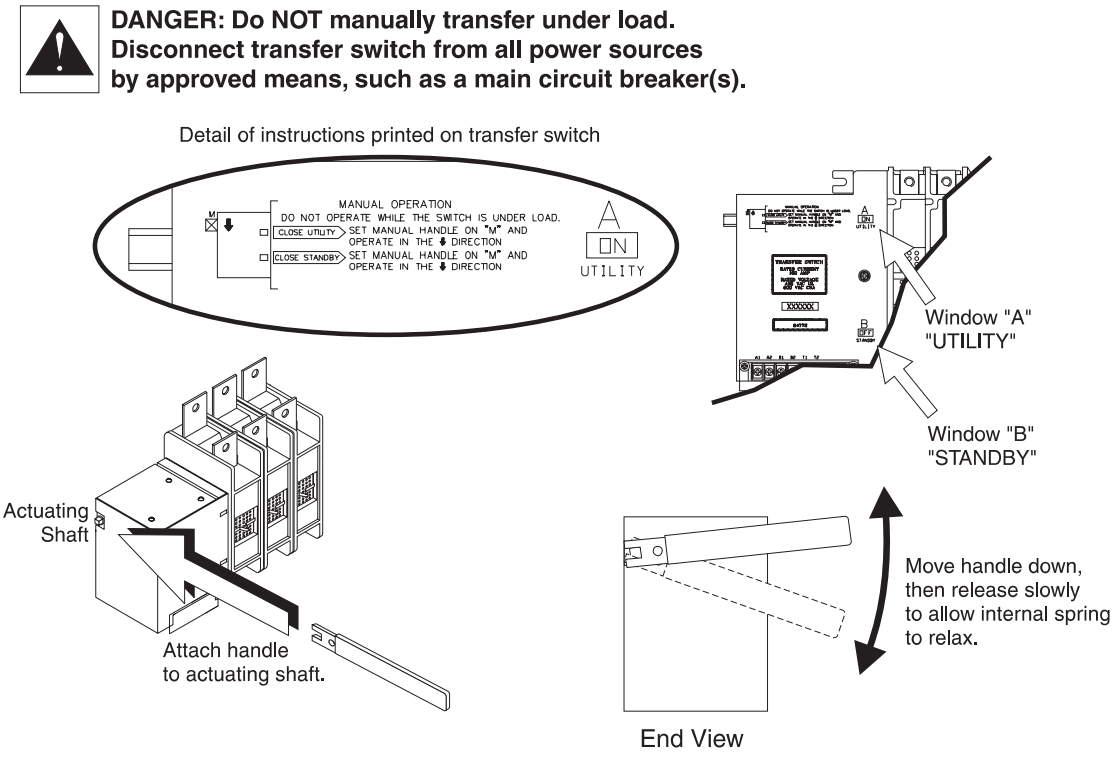
Proceed with caution. Do not touch electrically hot terminals, wires, etc. During the voltage checks, the transfer switch is electrically energized.

Perform voltage checks as follows:

1. If generator is so equipped, set the AUTO-OFF-MANUAL switch to OFF.
2. On the ATS mechanism, check that the word “ON” is visible in Window “A”, the word “OFF” in Window “B”. See MANUAL OPERATION for location of “A” and “B” windows.

IMPORTANT: DO NOT PROCEED UNTIL STEPS 1, 2, 3, AND 4 HAVE BEEN COMPLETED.

Figure 3.1 — Actuating Transfer Switch



NOTE: Return handle to storage position in enclosure when finished with manual transfer

CAUTION

Before proceeding to voltage checks, manually connect the load to NORMAL power supply. window "A" must indicate ON, Window "B" must indicate OFF before proceeding.

3. Turn ON the NORMAL (UTILITY) power supply to the transfer switch, with whatever means provided (such as the main line circuit breaker).

DANGER

The transfer switch is now electrically hot. Proceed with caution.

4. With UTILITY voltage available to the transfer switch, check that the UTILITY SOURCE AVAILABLE and SWITCH - POSITION UTILITY LED on the enclosure door are ON. If either of these two LED's are OFF, turn off the utility power supply to the transfer switch by whatever means provided (such as the main line circuit breaker), then proceed back to Step 1 of "VOLTAGE CHECKS".
5. With an accurate AC voltmeter, check the phase-to-phase (line-to-line) and phase-to-neutral (line-to-neutral) voltages present at transfer mechanism terminals N1, N2, and N3 (if so equipped), and neutral. SUPPLIED VOLTAGES MUST BE FULLY COMPATIBLE WITH TRANSFER SWITCH RATED VOLTAGE.

DANGER

Ensure that the phase rotation of NORMAL (UTILITY) power lines and transfer switch load power lines are compatible.

6. Refer to the standby generator instruction manual. Make sure the generator engine has been properly serviced and prepared for use, as outlined in the generator owner's manual. Then start the generator engine manually. Let the engine stabilize and warm up for a few minutes.
7. Turn ON the STANDBY (GENERATOR) power supply to the transfer switch by whatever means provided (such as the main line circuit breaker).
8. With the generator running, check that the GENERATOR SOURCE AVAILABLE LED on the enclosure door is ON.
9. With an accurate AC voltmeter, check phase-to phase (line-to-line) and phase-to neutral (line-to neutral) voltages present at transfer mechanism terminals E1, E2 and E3 (if so equipped). Also check AC frequency at those terminals. If frequency is incorrect, the engine governor may require adjustment. Generator AC output voltage and frequency must be compatible with transfer switch rated voltage and frequency.

DANGER

Ensure that the phase rotation of STANDBY (GENERATOR) power lines and transfer switch NORMAL (UTILITY) and load power lines are compatible.

10. If supplied voltage or frequency is incorrect, refer to standby generator Owner's Manual. If AC frequency is incorrect, adjust engine governed speed. If voltage is incorrect, adjust generator's voltage regulator or correct the problem.
11. When supplied voltage and frequency is correct, shut down the engine manually.

DANGER

Supplied voltages from both NORMAL (UTILITY) and STANDBY (GENERATOR) power sources must be compatible with transfer switch rated voltage before proceeding.

12. Connect the transfer switch load to the transfer switch when "voltage checks" section has been completed. Connect the load to the transfer switch by whatever means provided [such as panel board branch circuit breaker(s)], then proceed with the "ELECTRICAL OPERATION" section.

3.4 ELECTRICAL OPERATION

Test transfer system electrical operation as follows:

1. On the enclosure door, check that the door mounted CLOSED TO UTILITY and the UTILITY SOURCE AVAILABLE LED's are ON.
2. Refer to the appropriate generator owner's manual. Be sure the generator is prepared for automatic operation.
3. Start the generator and allow to warm up for about one minute. Verify the generator source available LED is ON.
4. Locate the two pushbuttons on the door labeled MANUAL OPERATOR.
5. Press the pushbutton labeled PRESS TO CONNECT LOAD TO GENERATOR. Verify CLOSED TO GENERATOR (red) LED is ON and CLOSED TO UTILITY (green) LED is OFF.

NOTE:

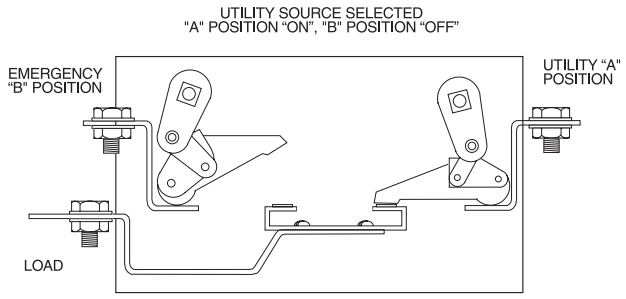
The generator is now supplying the load. Verify normal and proper function of the generator with the available load.

6. Press the pushbutton labeled PRESS TO CONNECT LOAD TO UTILITY. Verify CLOSED TO UTILITY (green) LED is ON and CLOSED TO GENERATOR (red) LED is OFF.
7. Allow the generator to cool down for several minutes. Turn off generator.

3.5 MAIN CONTACTS AT NORMAL (UTILITY)

The illustration shows the LOAD terminals connected to the NORMAL (UTILITY) terminals. window “A” will display the word “ON”; Window “B” the word “OFF” (Figure 3.2).

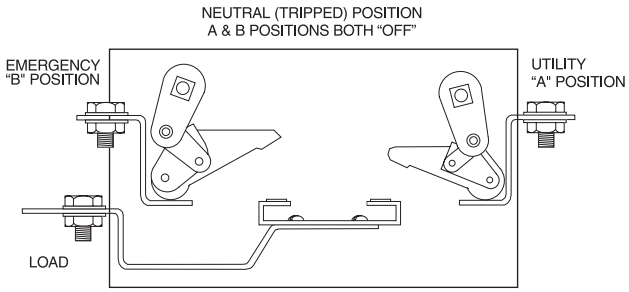
Figure 3.2 — Main Contact at Normal (Utility)



3.6 MAIN CONTACTS AT NEUTRAL

LOAD terminals are disconnected from both power supply terminals. The word “OFF” will be displayed in both Windows “A” and “B” (Figure 3.3). This occurs when the solenoid coil is kept energized.

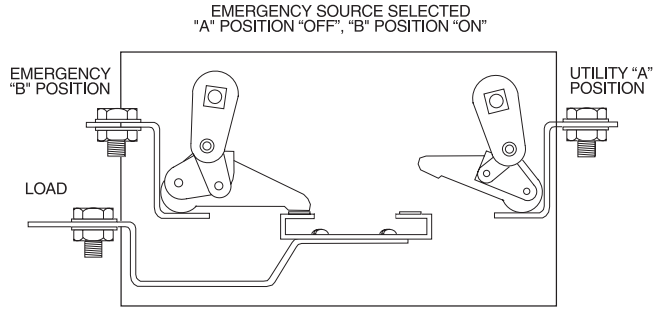
Figure 3.3 — Main Contacts at Neutral



3.7 MAIN CONTACTS AT STANDBY (EMERGENCY)

LOAD terminals are connected to the standby (EMERGENCY) power supply. Window “B” will display the word “ON”; Window “A” the word “OFF” (Figure 3.4).

Figure 3.4 — Main Contacts at Standby (Emergency)



3.8 SWITCHES AND ADVISORY LAMPS

This section will familiarize personnel with switches and advisory lights on the transfer switch enclosure door, as well as with the Safety Disconnect Switch inside the switch enclosure.

Circuit board inside the switch door may also mount several switches. Operation of these switches is covered in the section entitled SENSOR AND TIMER ADJUSTMENTS.

3.9 SOURCE AVAILABLE LED

◆ 3.9.1 UTILITY

This LED will go ON when the UTILITY (NORMAL) supply voltage is available to the transfer switch.

◆ 3.9.2 GENERATOR

This LED will go ON when the GENERATOR (STANDBY) supply voltage is available to the transfer switch.

3.10 SWITCH POSITION LED

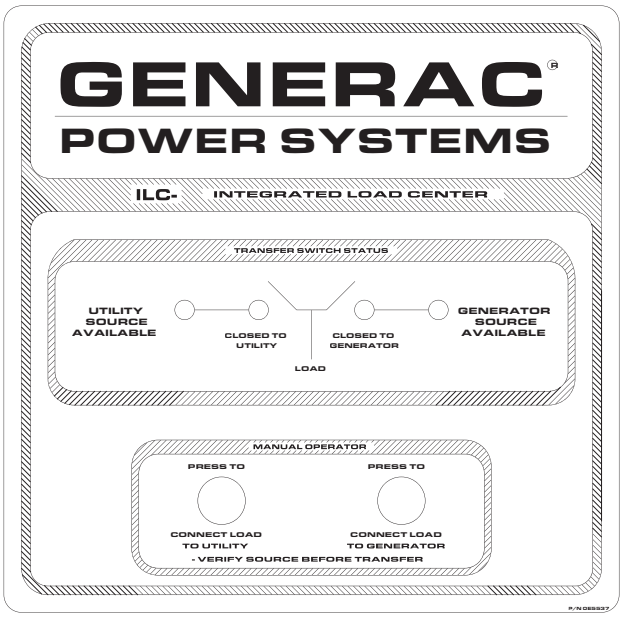
◆ 3.10.1 CLOSED TO GENERATOR

This LED will go ON when main current carrying contacts have actuated to their STANDBY (GENERATOR) position and that power source is available to the transfer switch (Figure 3.5).

◆ 3.10.2 CLOSED TO UTILITY

This LED will go ON when main contacts have actuated to NORMAL (UTILITY) position and that power supply is available to the transfer switch.

Figure 3.5 — Manual Operator Panel and ATS Status



4.1 OPERATE TRANSFER SWITCH

Operate the transfer switch at least once each month. This can be done by performing a NORMAL TEST of the system. Because the System Test switch only simulates failure of the UTILITY power source, service will be interrupted only during the actual transfer of the load.

4.2 CLEAN AND INSPECT TRANSFER SWITCH

Protect the transfer switch against construction grit, metal chips, excessive moisture and other harmful dirt at all times. At least once each year, turn OFF all power supplies to the switch, then brush and vacuum away dust and dirt that has accumulated inside the enclosure. After cleaning, inspect the transfer switch carefully. Look for evidence of arcing, burning, hot spots, charring and other damage. If any of these are found, have the switch assembly checked by an authorized service technician.

4.3 LUBRICATION

Operating parts inside the transfer mechanism have been properly lubricated at the time of assembly. Under normal conditions no additional lubrication should be required. The service technician should lubricate all recommended points whenever major transfer mechanism components are replaced.

CAUTION

Use only specified greases to lubricate contactor parts. DO NOT USE ANY SUBSTITUTES.

Use the following lubricants for the:

1. Main Contacts (Between movable contact and busbars).
   - Dow Corning (Molykote) BR2 Plus; (Mfg. by Dow Corning Co., USA)
   - Liqui-Moly (Mfg. by DAI TO Co., Ltd., Japan)
2. Operating Mechanism (Used on the actuator and other parts of the contactors. Excluding the movable contacts).
   - Mobilgrease 28 (Mfg. by Mobil Oil Co.)
   - Mobiltemp SHC 32 (Mfg. by Mobil Oil Co.)
   - Polo Moly Complex Grease #NLG12 (Mfg. by Polo Lubricants, USA)
   - Rheolube 363 (Mfg. by Nye Lubricants Inc., USA)

4.4 MAIN CURRENT CARRYING CONTACTS

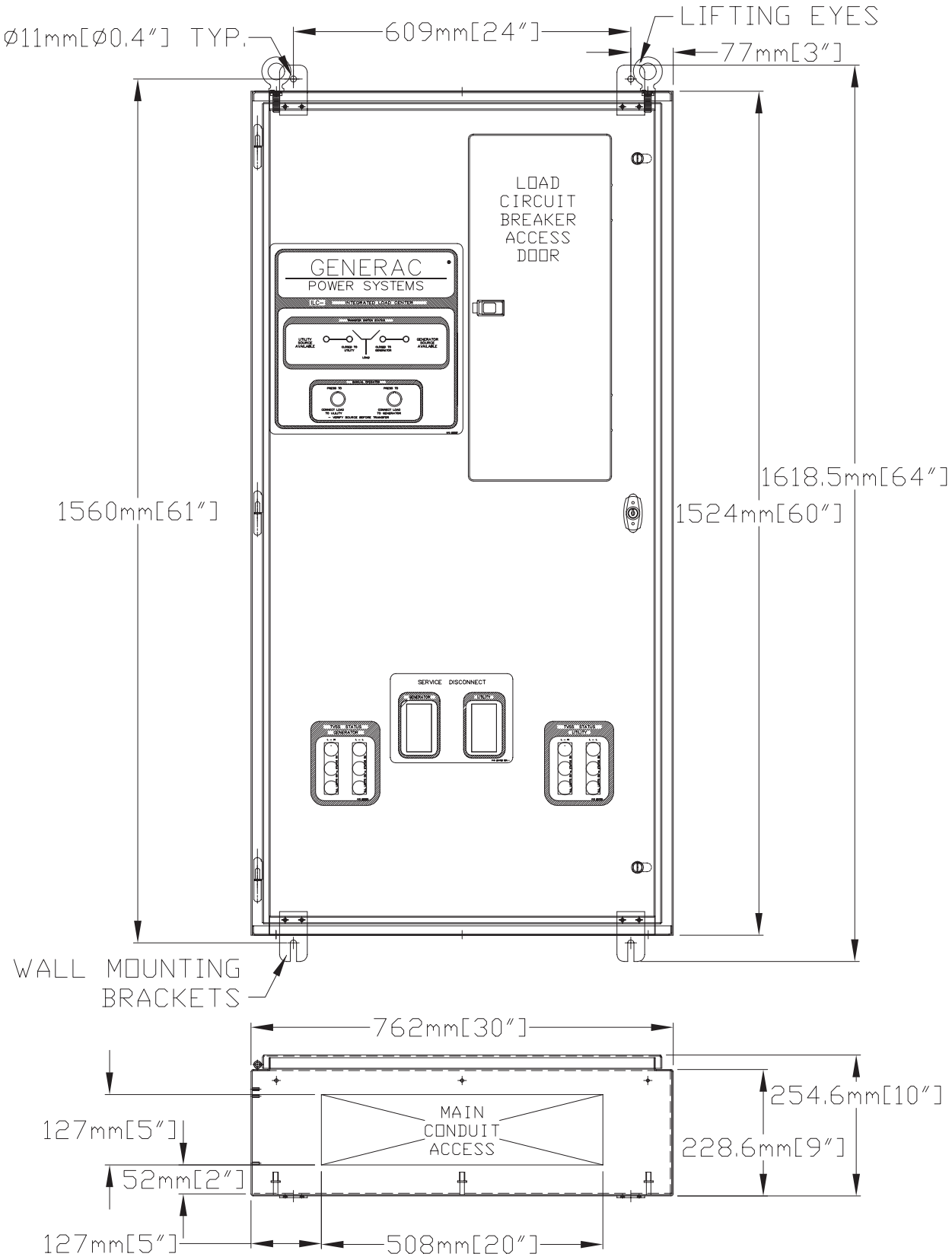
At least once annually, have an Authorized Service Technician check the main current carrying contacts in the transfer mechanism. They will repair or replace major components that have been found defective.

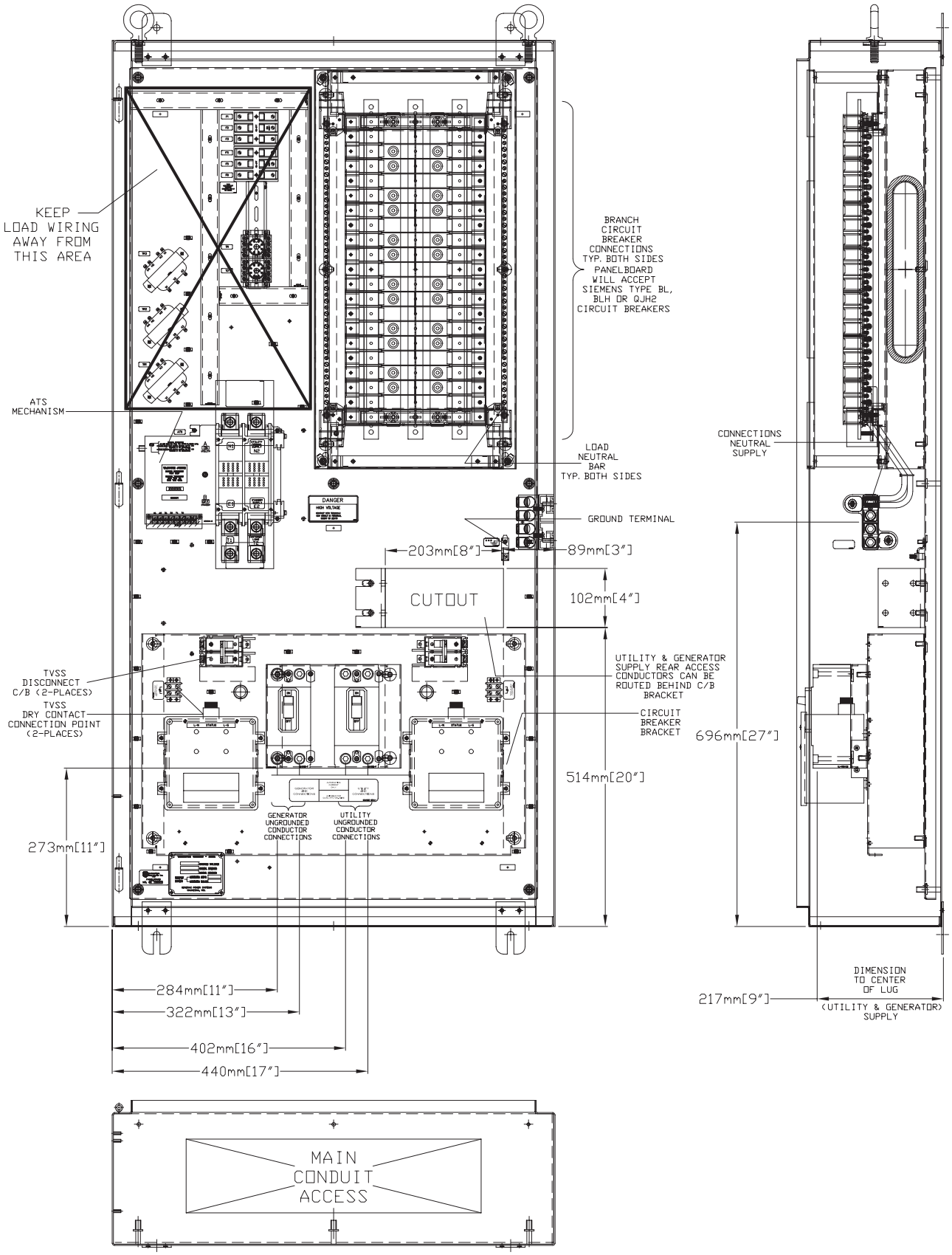
NOTES

Section 6 — Installation Diagram

Generac ILC Type Transfer Switch

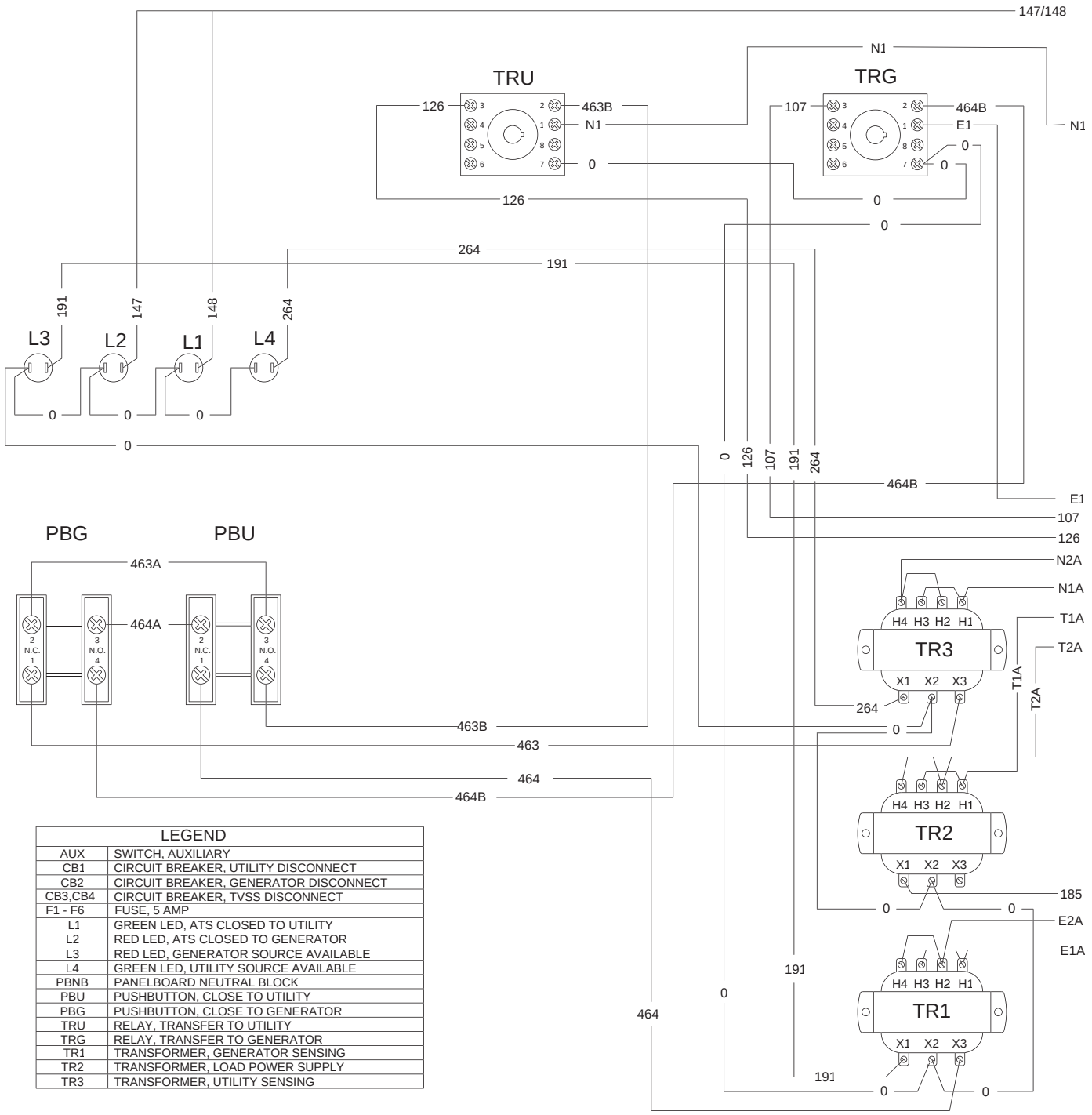
Drawing No. 0E5544




KEEP LOAD WIRING AWAY FROM THIS AREA
ATS MECHANISM
BRANCH CIRCUIT BREAKER CONNECTIONS TYP. BOTH SIDES
PANELBOARD WILL ACCEPT SIEMENS TYPE BL, BLH OR QJH2 CIRCUIT BREAKERS
LOAD NEUTRAL BAR TYP. BOTH SIDES
GROUND TERMINAL
CONNECTIONS NEUTRAL SUPPLY
203mm[8"]
89mm[3"]
CUTOUT
102mm[4"]
TVSS DISCONNECT C/B (2-PLACES)
TVSS DRY CONTACT CONNECTION POINT (2-PLACES)
UTILITY & GENERATOR SUPPLY REAR ACCESS CONDUCTORS CAN BE ROUTED BEHIND C/B BRACKET
CIRCUIT BREAKER BRACKET
696mm[27"]
514mm[20"]
273mm[11"]
GENERATOR UNGROUNDED CONDUCTOR CONNECTIONS
UTILITY UNGROUNDED CONDUCTOR CONNECTIONS
284mm[11"]
322mm[13"]
402mm[16"]
440mm[17"]
217mm[9"]
DIMENSION TO CENTER OF LUG
(UTILITY & GENERATOR) SUPPLY
MAIN CONDUIT ACCESS

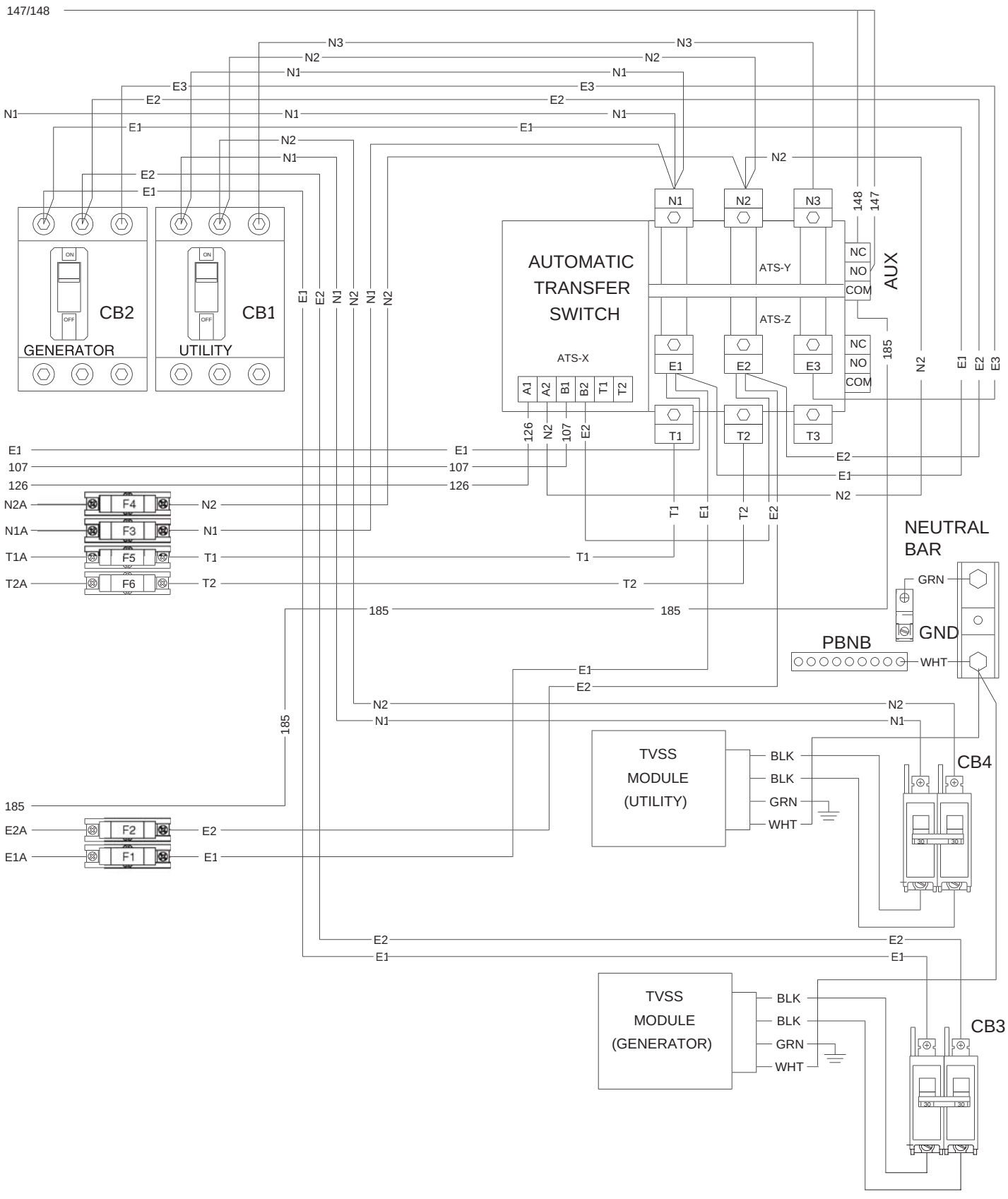
Generac ILC Type Transfer Switch

Wiring Diagram - Drawing No. 0E5540



LEGEND	
AUX	SWITCH, AUXILIARY
CB1	CIRCUIT BREAKER, UTILITY DISCONNECT
CB2	CIRCUIT BREAKER, GENERATOR DISCONNECT
CB3,CB4	CIRCUIT BREAKER, TVSS DISCONNECT
F1 - F6	FUSE, 5 AMP
L1	GREEN LED, ATS CLOSED TO UTILITY
L2	RED LED, ATS CLOSED TO GENERATOR
L3	RED LED, GENERATOR SOURCE AVAILABLE
L4	GREEN LED, UTILITY SOURCE AVAILABLE
PBNB	PANELBOARD NEUTRAL BLOCK
PBU	PUSHBUTTON, CLOSE TO UTILITY
PBG	PUSHBUTTON, CLOSE TO GENERATOR
TRU	RELAY, TRANSFER TO UTILITY
TRG	RELAY, TRANSFER TO GENERATOR
TR1	TRANSFORMER, GENERATOR SENSING
TR2	TRANSFORMER, LOAD POWER SUPPLY
TR3	TRANSFORMER, UTILITY SENSING

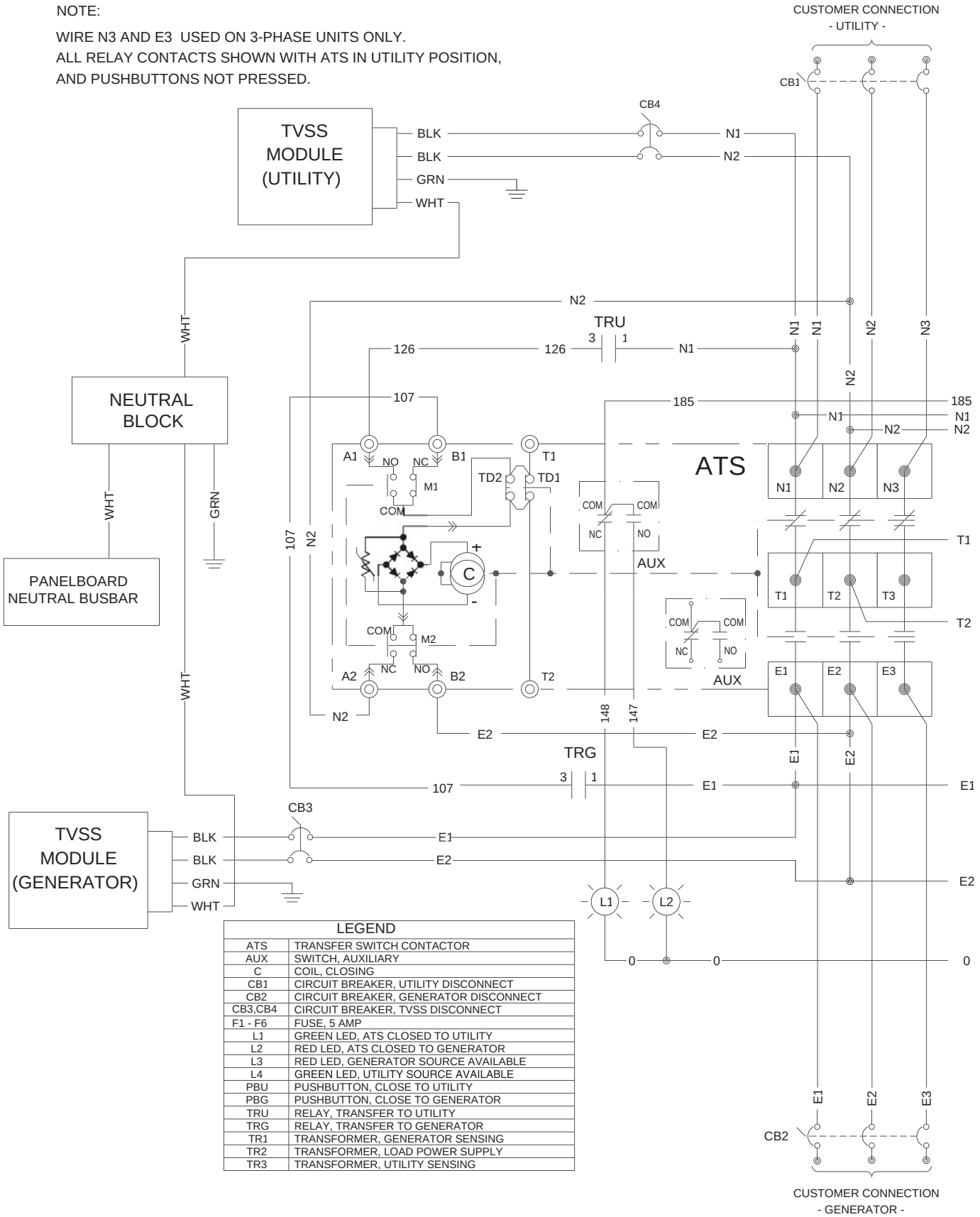
NOTE: N3 AND E3 WIRES ONLY USED ON THREE PHASE.


147/148
N3
N2
N1
E3
E2
E1
CB2
CB1
GENERATOR
UTILITY
AUTOMATIC
TRANSFER
SWITCH
ATS-X
ATS-Y
ATS-Z
A1
A2
B1
B2
T1
T2
NC
NO
COM
AUX
148
147
185
126
107
F4
F3
F5
F6
F2
F1
N2A
N1A
T1A
T2A
E2A
E1A
NEUTRAL
BAR
GRN
GND
WHT
PBNB
TVSS
MODULE
(UTILITY)
BLK
BLK
GRN
WHT
CB4
TVSS
MODULE
(GENERATOR)
CB3

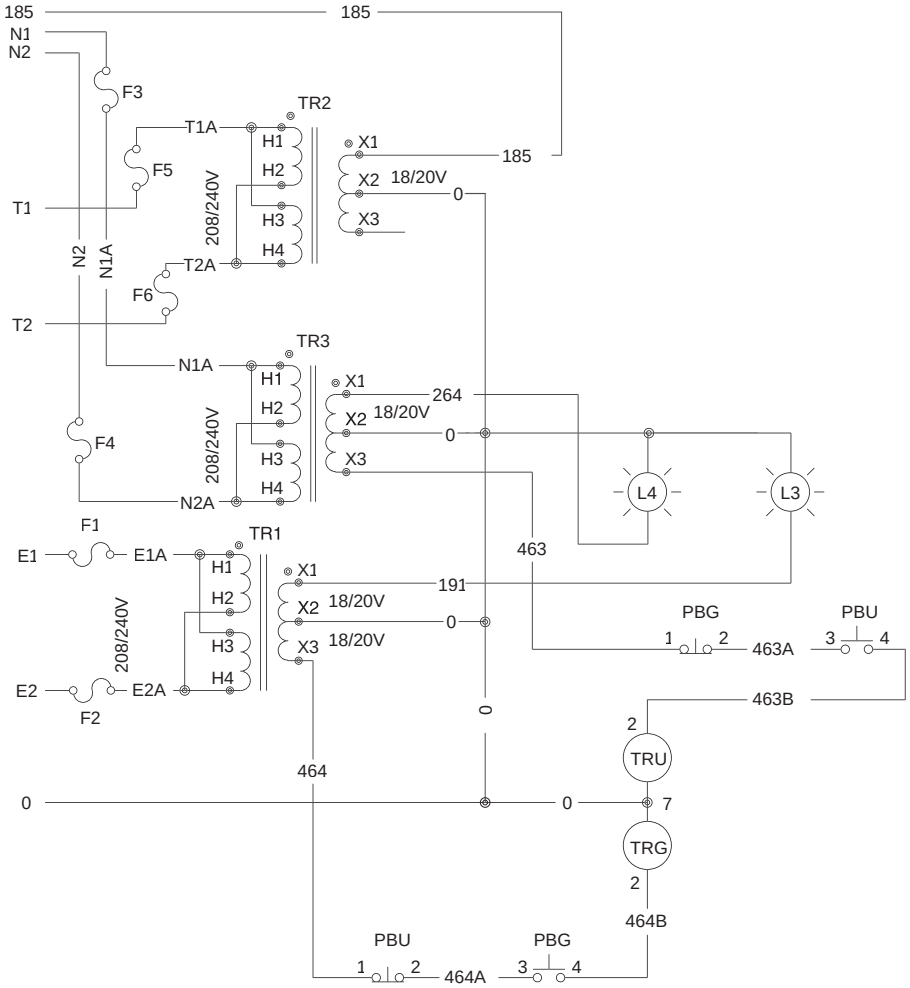
Electrical Schematic - Drawing No. 0E5539

NOTE:

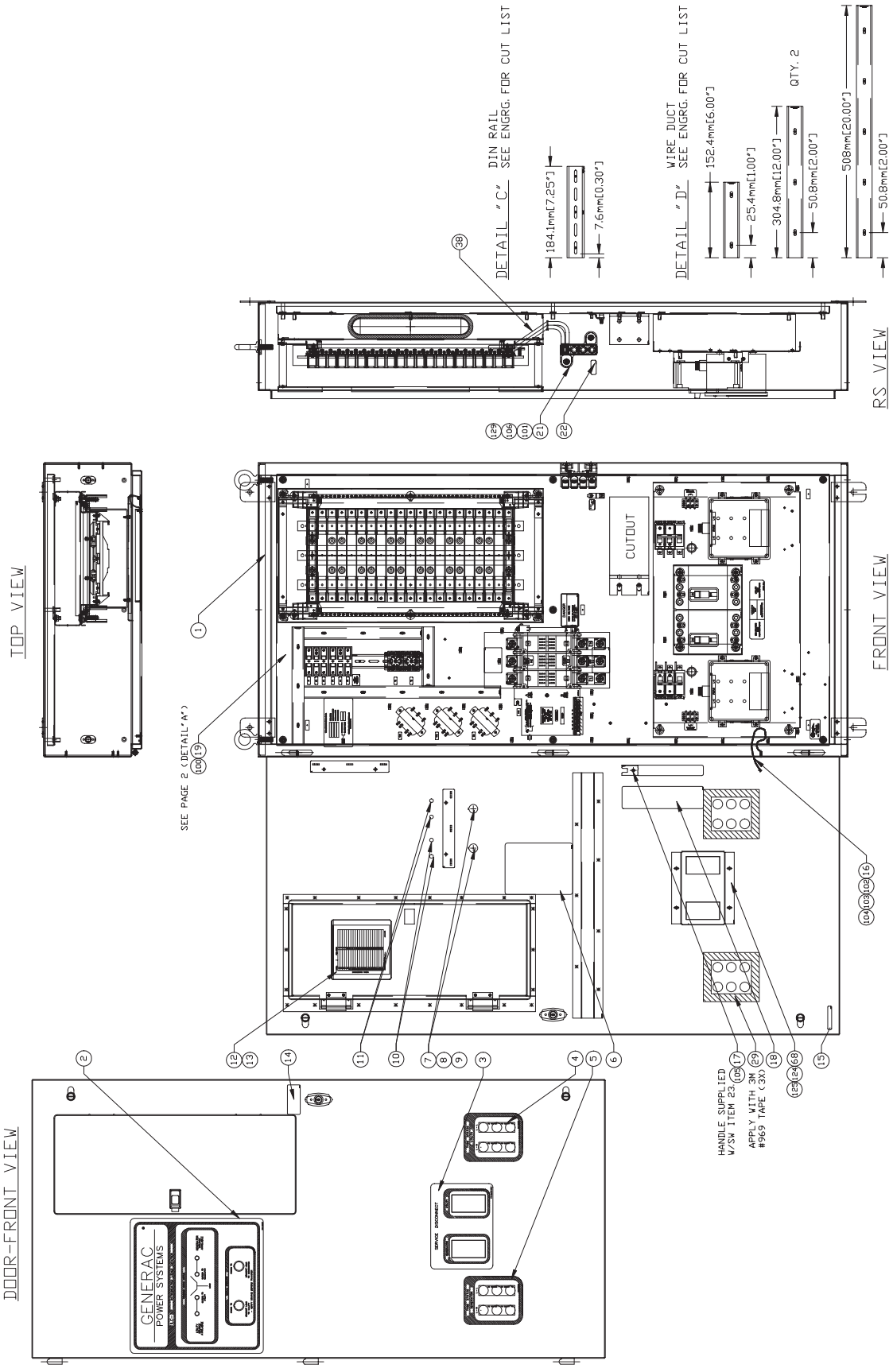
WIRE N3 AND E3 USED ON 3-PHASE UNITS ONLY.
ALL RELAY CONTACTS SHOWN WITH ATS IN UTILITY POSITION,
AND PUSHBUTTONS NOT PRESSED.

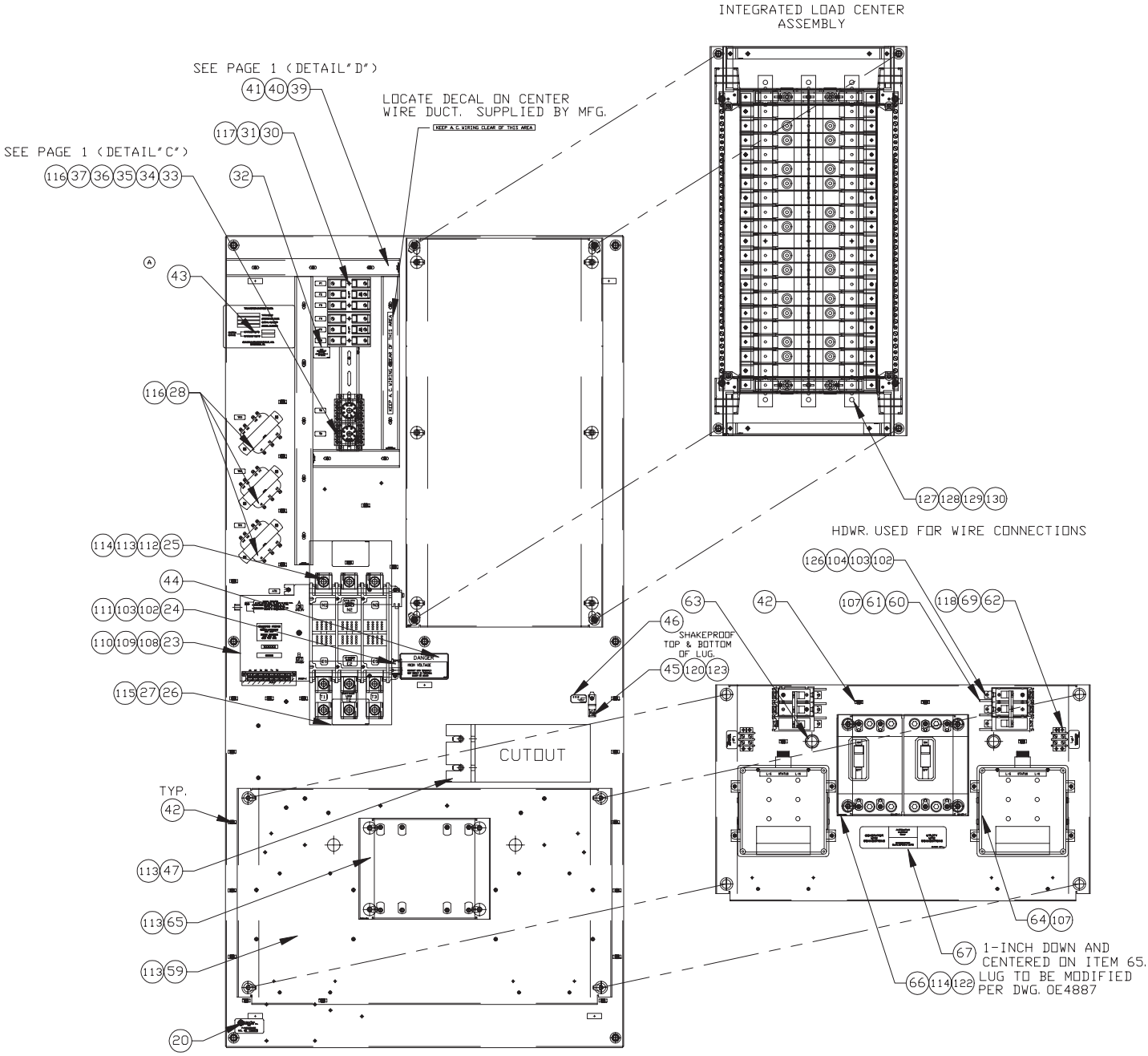


LEGEND	
ATS	TRANSFER SWITCH CONTACTOR
AUX	SWITCH, AUXILIARY
C	COIL, CLOSING
CB1	CIRCUIT BREAKER, UTILITY DISCONNECT
CB2	CIRCUIT BREAKER, GENERATOR DISCONNECT
CB3,CB4	CIRCUIT BREAKER, TVSS DISCONNECT
F1 - F6	FUSE, 5 AMP
L1	GREEN LED, ATS CLOSED TO UTILITY
L2	RED LED, ATS CLOSED TO GENERATOR
L3	RED LED, GENERATOR SOURCE AVAILABLE
L4	GREEN LED, UTILITY SOURCE AVAILABLE
PBU	PUSHBUTTON, CLOSE TO UTILITY
PBG	PUSHBUTTON, CLOSE TO GENERATOR
TRU	RELAY, TRANSFER TO UTILITY
TRG	RELAY, TRANSFER TO GENERATOR
TR1	TRANSFORMER, GENERATOR SENSING
TR2	TRANSFORMER, LOAD POWER SUPPLY
TR3	TRANSFORMER, UTILITY SENSING

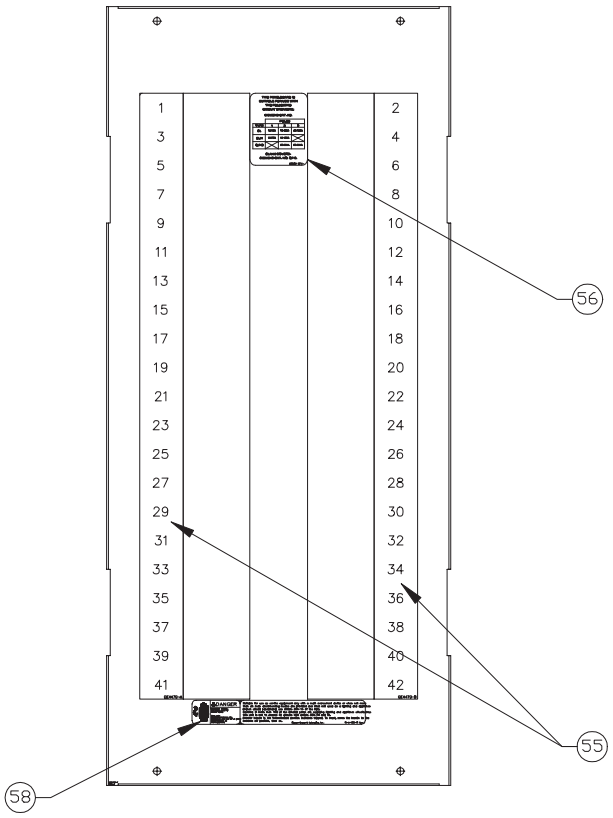

185
185
N1
N2
F3
TR2
T1A
H1
H2
H3
H4
X1
X2
X3
18/20V
208/240V
185
0
T1
F5
N2
N1A
T2A
F6
T2
TR3
N1A
264
F4
N2A
L4
L3
F1
E1
E1A
TR1
463
191
PBG
PBU
1
2
3
4
463A
463B
E2
E2A
F2
2
TRU
464
0
7
TRG
464B
464A

ILC Assembly- Drawing No. 0E4451-A (Page 1 of 4)



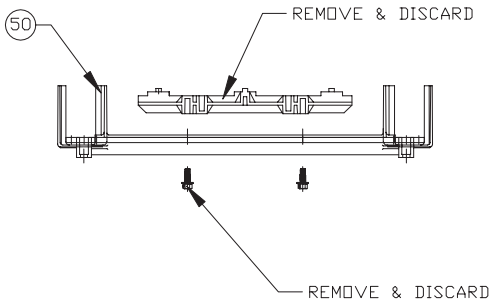

INTEGRATED LOAD CENTER ASSEMBLY
SEE PAGE 1 (DETAIL"D")
41 40 39
LOCATE DECAL ON CENTER WIRE DUCT. SUPPLIED BY MFG.
KEEP A.C. WIRING CLEAR OF THIS AREA
117 31 30
SEE PAGE 1 (DETAIL"C")
116 37 36 35 34 33
32
A
43
116 28
114 113 112 25
44
111 103 102 24
110 109 108 23
115 27 26
DANGER
HIGH VOLTAGE
CUTOUT
TYP.
42
113 47
113 65
113 59
20
127 128 129 130
HDWR. USED FOR WIRE CONNECTIONS
126 104 103 102
63
46
SHAKEPROOF TOP & BOTTOM OF LUG.
45 120 123
42
107 61 60
118 69 62
64 107
67
1-INCH DOWN AND CENTERED ON ITEM 65.
66 114 122
LUG TO BE MODIFIED PER DWG. 0E4887

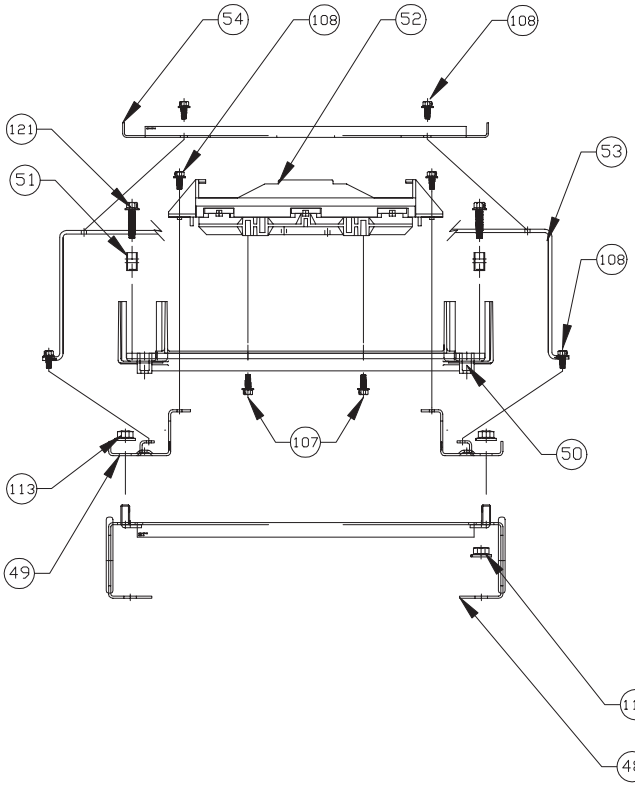
DETAIL "A"

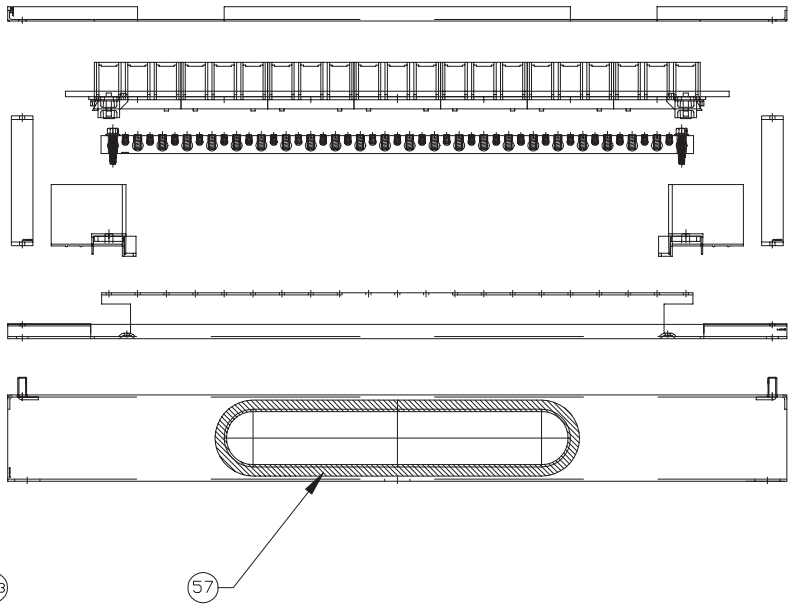


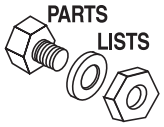
INTEGRATED LOAD CENTER ASSEMBLY PROCEDURE 1.5X SCALE

PRE-ASSEMBLY OPERATION









ITEM	PART NO.	QTY.	DESCRIPTION
1	0E5531	1	ASSY.ENCL.NEMA 1 MTS 1-TVSS
	0E5532	1	ASSY.ENCL NEMA 1 MTS 2-TVSS
2	0E5537	1	DECAL,POSITION IND/MTS SW.
3	0E4708	1	DECAL CIRCUIT BREAKER
4	0E4709	1	DECAL 1-TVSS
5	0E5359	0 / 1	DECAL,TVSS-GENERATOR
6	073619U	1	DECAL,TEST SEQUENCE/SW.INFO
7	0E5538	2	SWITCH PB NON-ILL. W/LATCH
8	0E2693B	2	CONTACT BLOCK NO
9	0E2693C	2	CONTACT BLOCK NC
10	0C2163B	2	LED RED WITH HOLDER
11	0C2163A	2	LED GRN WITH HOLDER
12	0E5361	1	CIRCUIT BREAKER,DIRECTORY CARD
13	0E5480	1	VINYL POUCH-C/B DIRECTORY CARD
14	0E4984	1	DECAL-WARNING/LIVE CIRCUIT
15	077228	1	DECAL-ENCLOSURE NOTE
16	0536210193	1	GROUND WIRE-ENCLSR DOOR
17	072164	1	MNL HNDL 6-1600A WN
18	0D4545	1	DECAL MANUAL OPERATION
19	0E4449	1	SUBPLATE - 200A 2P/3P
20	0E4987	1	DECAL-UL PANELBOARD
21	0E3717A	1	ASSY-NEUT BLK 250-400A W/TAP
22	0A9457	1	DECAL NEUTRAL
23	0C8884	1	TRANSFER SW-W 200A600V2P
	0C8885	1	TRANSFER SW-W 200A600V3P
24	074672A	1	LMT SW-WN SEL & AUX2PL
25	0A9949	9	LUG SLDLSS 400-#4 X 1/4-20 CU7AL
26	0C7907H	2	COVER LUG 2P 150/200AMP
	0C7907D	2	COVER LUG 3P 150/200AMP
27	0C8308	2	DECAL TERMINAL SHOCK HAZARD
28	090975	3	TRANSFORMER 240/40V 25VA
29	0E4999	1 / 2	SHIELD-1-TVSS MODULE
30	0D2572	2	FUSEBLOCK 30A 600V 3POS W/SQ
31	073590A	6	FUSE 5A X BUSS
32	0E4415G	1	DECAL FUSE RATING 5A 600V
33	0C3211G	2	SOCKET RELAY 8 PIN
34	0C3211R	2	RELAY DPDT 24VAC 10A 8PIN
35	0C3211H	4	SPRING RELAY RETAINING
36	0A9992B	2	BRACKET DIN TERM END
37	0C3996	FT	RAIL DIN ALUMINUM BULK (SEE DETAIL "C")
38	0E5178	1	ASSEMBLY NEUTRAL CABLE
39	091472	FT	DUCT WIRING (SEE DETAIL "D")
40	091472A	FT	COVER WIRE DUCT 1 IN (REF. DETAIL "D")
41	091477	13	RIVET WIRE DUCT MNT
42	063378	38	HOLDER CABLE TIE
43	063578	1	PLATE DATA - GTS
44	054199	1	DECAL DANGER HIGH VOLTAGE
45	0E5020	1	LUG SLDLSS #2-#8
46	067210A	1	DECAL GROUND LUG
47	0E4650	1	SUPPORT GLASTIC
48	0E4462	1	BRACKET 42 POS. PANELBOARD
49	0E4465	2	Z-RAIL 42 POS. PANELBOARD
50	0E4717	2	BUS SUPPORT ASSY P1-250
51	0E4469	2	NEUTRAL BAR 45 POS.
52	0E4466	1	INTEGRATED LOAD CENTER 42 POS. 1PH
	0E4648	1	INTEGRATED LOAD CENTER 42 POS. 3PH
53	0E4464	2	SUPPORT DEAD FRONT 42 POS.
54	0E4463	1	DEAD FRONT 42 POS. PANELBOARD
55	0E4470	1	DECAL LOAD CENTER BRK 1-42
56	0E5010	1	DECAL-BREAKERS/BLANKS
57	056326	1	TRIM VINYL BLACK 1/8 GP 74" (52.8" LG)
58	0E4649	1	DECAL (DANGER) ILC
59	0E4461	1	BRACKET,CIRCUIT BREAKER W/TVSS
60	0E4147	1 / 2	MTG TRACK BQ SIEMENS CB 2P
	0E6002	1 / 2	MTG TRACK BQ SIEMENS CB 3P
61	0D5535	1 / 2	CB 0030A 2P 240V S BQ2 LL
	0E5997D	1 / 2	CB 0030A 3P 240V S BQ3 LL
62	048766	1 / 2	BLOCK TERM 20A 2 X 6 X 1100V
63	023484D	2	BUSHING SNAP SB-875-11
64	0E4453	1 / 2	TVSS MODULE 1PH ATLANTIC SC.
	0E4454	1 / 2	TVSS MODULE 3PH ATLANTIC SC
65	0E4460	1	BRACKET,CIRCUIT BREAKER
66	0E4458	2	CB 200A 240VAC 2P QJ22B200HL
	0E4459	1 / 2	CB 200A 240VAC 3P QJ23B200HL
67	0E4985	1	DECAL-LINE CONNECTION
68	0E5143	1	SHIELD CIRCUIT BREAKER
69	0E4872	1 / 2	DECAL,TVSS ALARM CONTACTS
100	064101	7	NUT LOCK FL 3/8-16
101	022097	2	WASHER LOCK M6-1/4
102	038150	7 / 11	WASHER FLAT #8 ZINC 1-TVSS
103	022264	5 / 7	WASHER LOCK #8-M4 1-TVSS
104	022471	4 / 6	NUT HEX #8-32 STEEL 1-TVSS
105	025870	1	NUT WING 1/4-20
106	022127	2	NUT HEX 1/4-20 STEEL
107	0C2267	10 / 16	SCREW HHTT M5-0.8 X 12 BP 1-TVSS
108	074908	25	SCREW HHTT M5-0.8 X 10 BP
109	051713	3	WASHER FLAT M5
110	022152	3	WASHER LOCK #10
111	092980	1	SCREW PPHM M4-0.7 X 25
112	0C4896	9	SCREW FHM M8-1.25 X 20MM CR
113	067989	29	NUT LOCK FL M8-1.25 YEL CHR
114	026902	11 / 13	SCREW HHTT #8-32 X 1/4 CZ 1-TVSS
115	0C8275	4	SCREW PPHM DSEMS M4-7 X 10 ZNC
116	045764	10	SCREW HHTT M4-0.7 X 8 BP
117	0C2265	4	SCREW PHTT M4-0.7 X 12 ZYC
118	0A1661	4 / 6	RIVET POP .156 X .675 AL 1-TVSS
120	026850	2	WASHER SHAKEPROOF EXT 1/4 STL
121	092079	4	SCREW HHTT M6-1.0 X 25 BP
122	036962	8	SCREW PPHM 1/4-20 X 2-3/4
123	052857	1	NUT LOCK FL M6-1.0
124	022769	4	WASHER SHAKEPROOF INT #10
125	028430	4	NUT HEX #10-24 STEEL
126	036917	2 / 4	SCREW PPHM #8-32 X 3/8 1-TVSS
127	030795	2	SCREW HHC 5/16-18 X 1 G5
128	022259	2	NUT HEX 5/16-18 STEEL
129	022473	6	WASHER FLAT 1/4-M6 ZINC
130	022129	2	WASHER LOCK M8-5/16

QUANTITIES REQ'D FOR 1-TVSS / 2-TVSS

GENERAC POWER SYSTEMS STANDARD TWO-YEAR LIMITED WARRANTY FOR GENERAC TRANSFER SWITCH SYSTEMS

NOTE: ALL UNITS MUST HAVE A START-UP INSPECTION PERFORMED BY AN AUTHORIZED GENERAC DEALER.
For a period of 2 (two) years from the date of sale/start date, Generac Power Systems, Inc. will, at its option, repair or replace any part(s) which, upon examination, inspection, and testing by Generac Power Systems or a Generac Power Systems Authorized Warranty Service Facility, is found to be defective under normal use and service, in accordance with the warranty schedule set forth below. Any equipment that the purchaser/owner claims to be defective must be returned to, and examined by the nearest Generac Power Systems Authorized Warranty Service Facility. All transportation costs under the warranty, including return to the factory, are to be borne and prepaid by the purchaser/owner. This warranty applies only to Generac Power Systems Transfer Switch applications, as Generac Power Systems, Inc. have defined Transfer Switch application, provided said Transfer Switch has been initially installed and inspected on-site by a Generac Power Systems Authorized Service Dealer or branch thereof. A scheduled maintenance agreement with a local Authorized Generac Power Systems Dealer is highly recommended to verify adequate service has been performed on the unit throughout the warranty period.

WARRANTY SCHEDULE

- **YEAR ONE** — 100% (one hundred percent) coverage on mileage*, labor, and parts listed.
- **ALL COMPONENTS**
- **YEAR TWO** — 100% (one hundred percent) coverage on parts listed.
- **ALL COMPONENTS — *PARTS ONLY**
- *Travel allowance is limited to 300 miles maximum, or 7.5 hours maximum (per occurrence), **round trip**, to the nearest authorized Generac Service Facility.
- A Generac Power Systems, Inc. Transfer Switch is highly recommended to be used in conjunction with the genset. If a non Generac genset is substituted for use and directly causes damage to the Generac Transfer Switch, no warranty coverage shall apply.
- All warranty expense allowances **are** subject to the conditions defined in Generac Power Systems Warranty, Policies, and Procedures Flat Rate Manual.
- Units that have been resold **are not** covered under the Generac Power Systems Warranty, as this Warranty **is not** transferable.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

1. Any unit built/manufactured prior to January 1, 2002.
2. Unit enclosure is only covered against rust or corrosion the first year of the warranty provision.
3. Costs of normal maintenance i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up.
4. Use of Non-Generac replacement part(s) will void the warranty in its entirety.
5. Any failure caused by contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oils or coolants/antifreeze.
6. Failures due, but not limited to, normal wear and tear, accident, misuse, abuse, negligence, or improper installation or sizing.
7. Failures caused by any external cause or act of God such as collision, fire, theft, freezing, vandalism, riot or wars, lightning, earthquake, windstorm, hail, volcanic eruption, water or flood, tornado, hurricane, terrorist acts or nuclear holocaust.
8. Products that are modified or altered in a manner not authorized by Generac Power Systems in writing.
9. Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
10. Failure due to misapplication, misrepresentation, or bi-fuel conversion.
11. Telephone, telegraph, teletype or other communication expenses.
12. Living or travel expenses of person(s) performing service, except as specifically included within the terms of a specific unit warranty period.
13. Rental equipment used while warranty repairs are being performed i.e. rental generators, cranes, etc..
14. Overtime labor or more than one person performing repairs.
15. Any and all expenses incurred investigating performance complaints unless defective Generac materials and or workmanship were the direct cause of the problem.
16. *Engine coolant heaters (block-heaters), heater controls and circulating pumps after the first year.
17. *Starting batteries, fuses, light bulbs, and engine fluids, tires, brakes and overnight freight cost for replacement part(s).

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, SPECIFICALLY, GENERAC POWER SYSTEMS MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

GENERAC POWER SYSTEMS ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC POWER SYSTEMS BE LIABLE FOR ANY INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC POWER SYSTEMS, INC. NEGLIGENCE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. Purchaser/owner agrees to make no claims against Generac Power Systems, Inc. based on negligence. This warranty gives you specific legal rights. You also may have other rights that vary from state to state.

GENERAC® POWER SYSTEMS, INC. · P.O. BOX 8 · WAUKESHA, WI 53187
PH: (262) 544-4811 · FAX: (262) 544-4851

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