

# INSTALLATION GUIDE

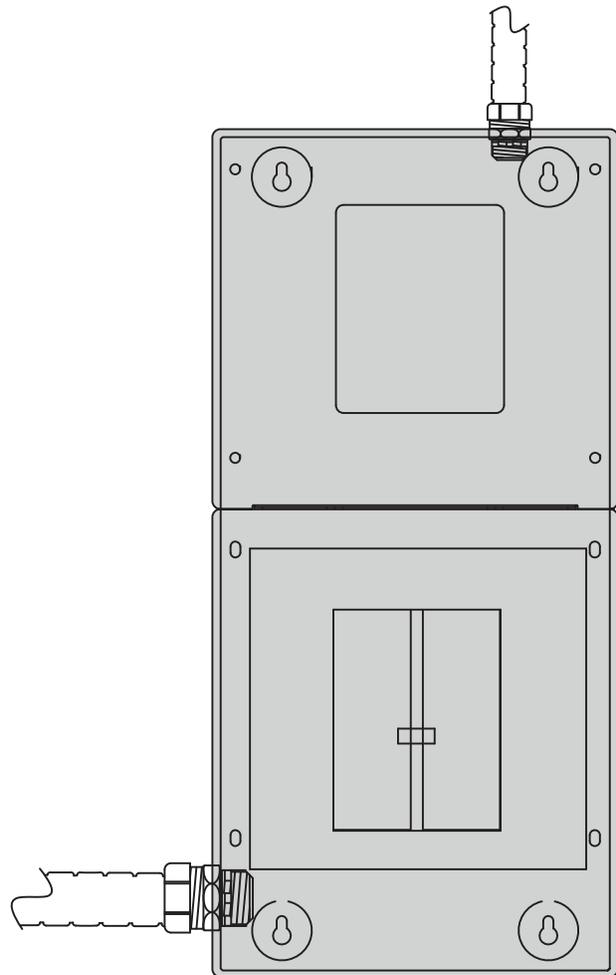
For Pre-wired Automatic Switch/Load Center Models:

10, 12, 14 and 16 Circuit.

Installed with 8, 11, 13, 14, 16, 17kW Generators.

This Automatic Transfer Switch with built-in Load Center includes an Express Install Kit.

- Saves on installation time and cost, in many cases up to 50% compared to traditional transfer switch installations.
- Automatically supplies electricity to essential critical circuits.
- Can be installed prior to, or along with generator installation.



Reference all appropriate documentation.  
This manual should remain with the unit.

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### **WARNING!**

#### **California Proposition 65**

Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

### **WARNING!**

#### **California Proposition 65**

This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm.

## PLEASE NOTE:

This installation guide should be used in conjunction with the “Installation and Owner’s Manual” that is furnished with the Air-cooled Standby Generator. Please review both manuals prior to installation of the generator and transfer switch. This Automatic Transfer Switch/Load Center is not intended for use with the Liquid-cooled Generator product line. This unit is not compatible with other generator manufacturer’s products.

## INTRODUCTION

Thank you for purchasing this pre-wired Automatic Transfer Switch/Load Center with Express Install Kit. The Express Install Kit includes:

- 30 foot, five foot, and two foot pre-wired conduits for making all required wiring runs.
- An outdoor junction box for making connections between outdoor and indoor pre-wired conduits.
- UL listed wire nuts for reconnecting emergency circuits within the main distribution panel.

The Automatic Transfer Switch/Load Center with Express Install Kit can be installed along with a 8, 11, 13, 14, 16, 17 kW Air-cooled Standby Generator, or can be used to pre-wire a home or small business in advance of generator installation. In either case, the Express Install Kit saves installation time and cost, since the majority of labor involved in installing a standby power system is in wiring the generator, automatic transfer switch and emergency circuit subpanel.

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

### **DANGER!**

Indicates a hazardous situation or action which, if not avoided, will result in death or serious injury.

### **WARNING!**

Indicates a hazardous situation or action which, if not avoided, could result in death or serious injury.

### **CAUTION!**

Indicates a hazardous situation or action which, if not avoided, could result in minor or moderate injury.

### **NOTE:**

Notes contain additional information important to a procedure and will be found within the regular text body of this manual.

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

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

 **SAVE THESE INSTRUCTIONS** – The manufacturer suggests that these rules for safe operation be copied and posted near the unit’s installation site. Safety should be stressed to all operators and potential operators of this equipment.

The manufacturer cannot 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 the manufacturer does not specifically recommend, ensure that it is safe for all personnel. Also make sure the procedure, work method or operating technique chosen does not render the equipment unsafe.

## **ELECTRICAL HAZARDS**

- Utility power delivers extremely high and dangerous voltages to the transfer switch as does the standby generator when it is in operation.
- Do not handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. **DANGEROUS ELECTRICAL SHOCK MAY RESULT.**
- In case of 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. **AVOID DIRECT CONTACT WITH THE VICTIM.** Use a non-conducting implement, such as a rope or board to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock, or may get caught in moving components causing injury.

## Automatic Transfer Switch/Load Center with Express Install Kit

### KIT INCLUDES:

- A THE OUTDOOR CONNECTION BOX WITH FIVE FOOT PRE-WIRED LIQUID TIGHT CONDUIT**
- B**

Mounted outside the home or business nearest the planned generator location. This is for connection to generator controls and main line circuit breaker.

- C 30 FOOT FLEXIBLE CONDUIT**

Pre-wired from the automatic transfer switch with built-in emergency load center for connection to the outdoor connection box.

- D PRE-WIRED AUTOMATIC TRANSFER SWITCH AND EMERGENCY LOAD CENTER**
- E**

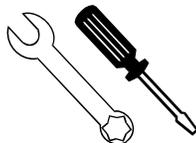
Installed within one (1) foot of the building's main distribution panel. This transfer switch provides smooth and safe transition between utility and generator power.

- F TWO FOOT PRE-WIRED CONDUIT FOR EASY CONNECTION TO THE BUILDING'S MAIN DISTRIBUTION PANEL**

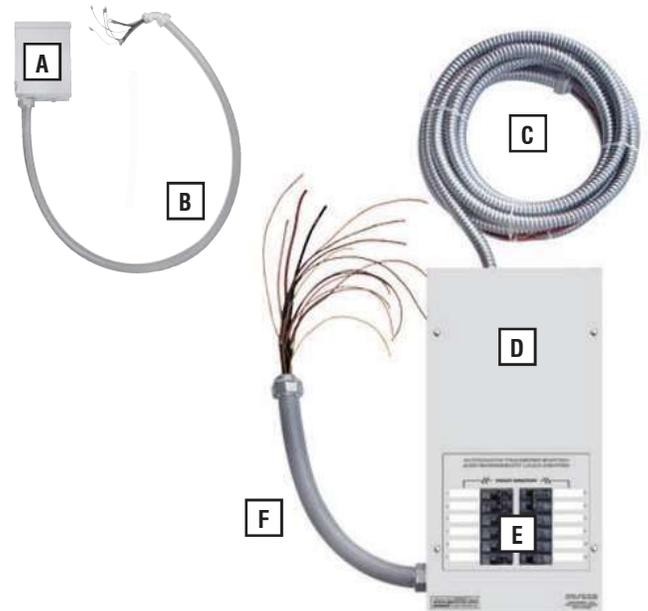
- G UL LISTED WIRE NUTS (not shown)**

### TOOLS REQUIRED:

Drill, drill bits, hole saw (type and length will be determined by the materials to be drilled and cut), open-end wrenches or adjustable wrenches, socket wrenches or nut drivers, standard and Phillips screwdrivers, sledge hammer, level, pencil, channel-lock pliers, appropriate gloves and safety goggles.



*Designed with installation cost savings in mind!*



### ITEMS TO BE PURCHASED OR SUPPLIED FOR COMPLETE INSTALLATION:

- 70 amp or 50 amp (8kW) double pole circuit breaker (must be the same type as in the main electrical distribution panel)
- Silicone caulk
- Fasteners (to mount outdoor connection box and automatic transfer switch)

Typical Standby Generator Placement



1. Plan the generator location.

**NOTE:**

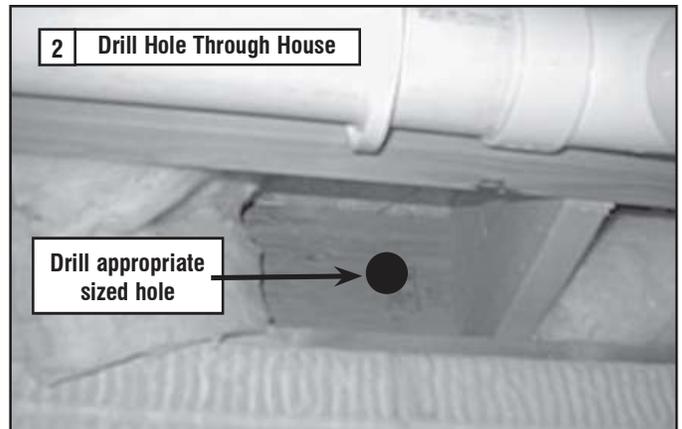
For the generator installation, utilize the standby generator installation and owner's manuals. Ensure that the distance from the structure (Minimum 18 " inches) allows for slack in the five foot pre-wired liquid tight conduit and that it meets the code.

2. Determine where the flexible conduit will pass through the building from inside to outside. When certain there is clearance on each side of the wall, drill a small pilot hole through the wall to mark the location. Drill an appropriate sized hole through the sheathing and siding with hole saw.
3. While adhering to all local electrical codes, route the 30 foot conduit along ceiling/floor joists and wall studs to the location where the conduit will pass through the wall to the exterior of the building.

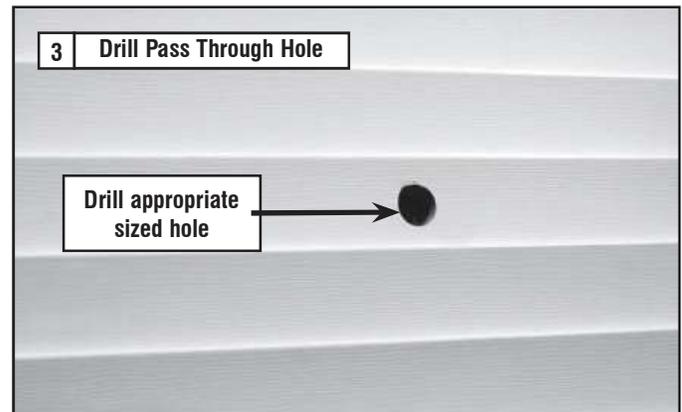
**NOTE:**

The 30 foot flexible conduit can be lengthened a maximum of 15 additional feet using the same conductor size and conduit diameter. The lengthening must comply with local, state and/or federal codes. The splice point must be in an approved junction box per code. The 2 foot and 5 foot conduit cannot be lengthened.

2 Drill Hole Through House

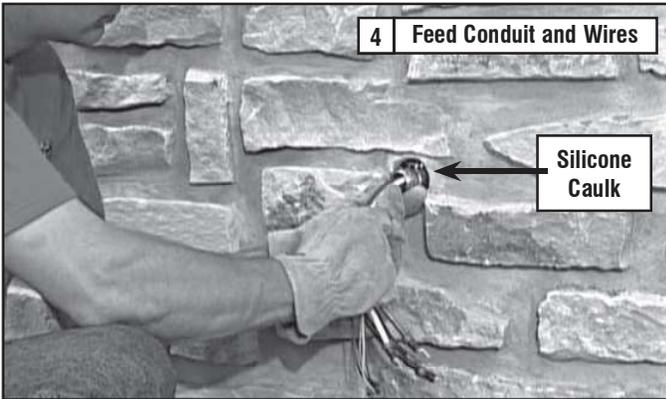


3 Drill Pass Through Hole

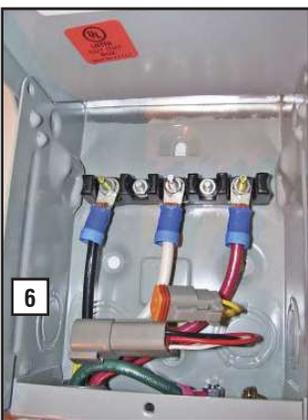
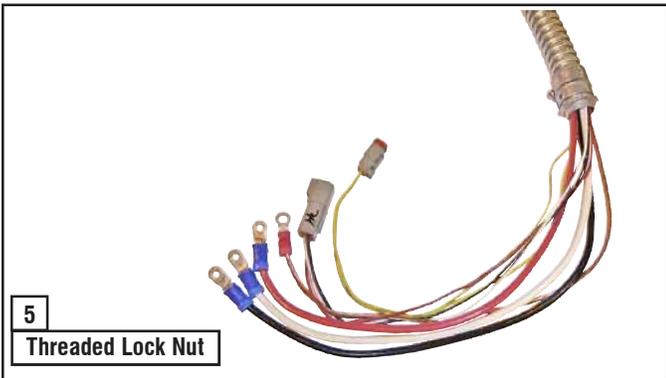


# Residential Transfer Switch Installation Guide

- From inside the building, feed the end of the 30-foot conduit (INCLUDED and pre-wired from transfer switch) through the wall to the outside.



- Remove the threaded lock nut from the conduit coupling.



- Lift cover. Remove internal cover plate screw and internal cover. Remove the knock out in the lower right corner of the external connection box. From the rear of the connection box, feed wires, 4-pin and 2-pin plugs into box. Slip the lock nut over wires and plugs and tighten securely onto conduit coupling. Using appropriate fasteners, mount external connection box over pre-drilled hole to fully conceal the hole. Seal around the hole and conduit with silicone caulk from both

the inside and outside of the building. Also, caulk around the sides and top of the box to seal the edges to the siding or wall. Connect wires to lugs; black to black, white to white, and red to red. Torque nuts to 20 in/lbs. Snap together the 4-pin and 2-pin plug connector. Loosen nut from grounding lug and attach ground wire (green) from conduit. Reinstall nut and tighten to 45 in/lbs. Reinstall internal cover plate and screw. Close cover and install lock. This wiring is complete.

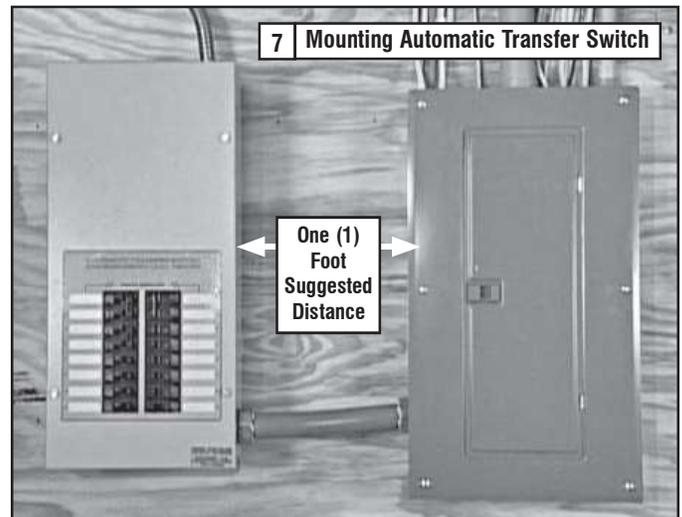
## ⚠ WARNING!

⚠ The outdoor connection box must be locked to ensure safety and to discourage tampering.

- Locate automatic transfer switch with built-in emergency load center in close proximity to the main distribution panel. The transfer switch can be located to the left or right of the main distribution panel. One (1) foot is the suggested distance. The transfer switch may be located a different distance from the main panel depending on available mounting area. Using the two (2) foot conduit connected straight across to the main panel is another option. Always adhere to local electrical codes during installation. Hold transfer switch against the mounting surface. Level the transfer switch and mark the mounting holes. Drill the appropriate size pilot holes. Mount transfer switch with built-in load center to mounting surface with appropriate fasteners.

## NOTE:

Transfer Switch box **MUST** be mounted vertically as shown in Figure 7.

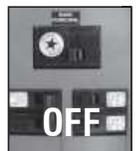


## ⚠ WARNING!

⚠ The manufacturer recommends that a licensed electrician or an individual with complete knowledge of electricity perform these procedures.

## ⚠ WARNING!

⚠ Switch service main circuit breaker to the OFF (OPEN) position prior to removal of cover or removal of any wiring of the main electrical distribution panel. The wires connected to the service main circuit breaker remain LIVE or HOT. Avoid contact with these wires and the service main circuit breaker connection lugs.

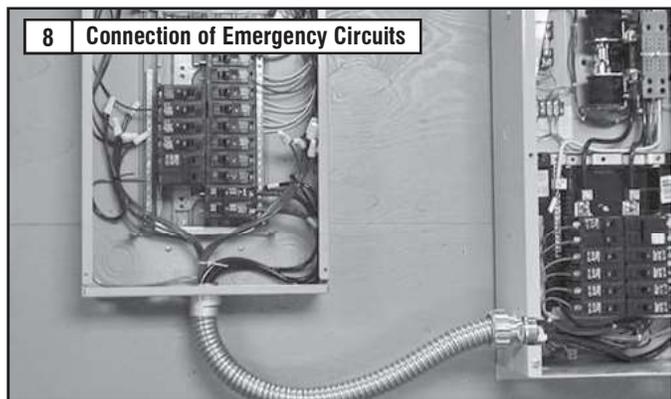


# Residential Transfer Switch Installation Guide

**NOTE:**

Balance must be maintained when moving circuit locations from main electrical distribution panel to emergency load center. Circuit breaker positions alternate buss bars vertically. Circuits sharing a neutral wire should either be moved together to adjacent positions in emergency load center or not moved. If unsure of the proper procedure or if the installation differs from that described in this guide, consult a licensed professional at this time.

- Remove the main electrical distribution panel cover. Remove appropriate size knockout from the bottom or side of the main panel. (A two foot flexible conduit is pre-wired from the transfer switch with built-in load center). Remove threaded lock nut from conduit coupling. Feed all wires through knockout into main panel. Slip lock nut over wires and tighten securely onto conduit coupling.



**NOTE:**

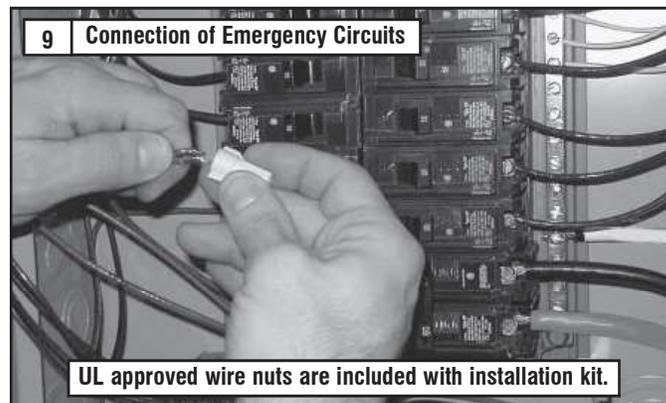
Circuits to be moved must be protected by same size breaker. For example, a 15 amp 120 volt circuit in emergency load center will replace a 15 amp 120 volt circuit in main electrical distribution panel.

- In the main panel, remove the black (hot) wire from the circuit breaker that protects a circuit to be powered in the event of a power failure. Wire nut the black wire to the matching circuit lead wire from the emergency circuit breaker in the load center in the transfer switch. (All circuit wires are color coded and labeled for easy identification). **UL listed wire locknuts are included in installation kit.** Trace each black (hot) wire connected and wire nut the white (neutral) wire from the same Romex cable (circuit) to the matching circuit number on the white (neutral) wire from the emergency load center. Repeat for each circuit. Repeat this process with the remaining circuits to be powered by the generator.

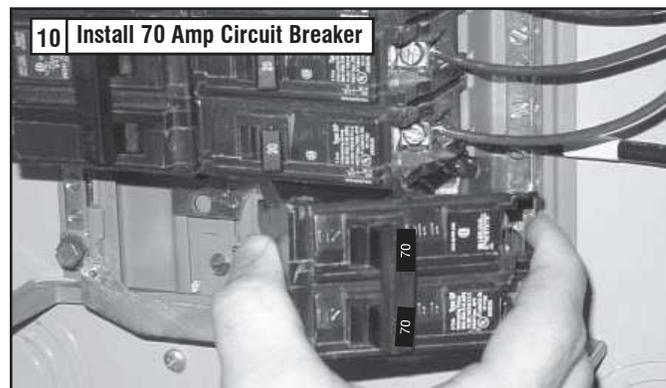
**NOTE:**

Both grounded and ungrounded conductors must be moved to the emergency panel and connected to the new wiring from the emergency panel using supplied wire nuts.

Models		10 Circuit	12 Circuit	14 Circuit	16 Circuit
Circuits	50A, 240V	-	-	-	1
	40A, 240V	-	1	1	1
	30A, 240V	1	1	-	-
	20A, 240V	1	-	1	1
	20A, 120V	3	3	6	5
	15A, 120V	3	5	4	5



- Install the 70 amp double pole circuit breaker; **11, 13, 14, 16, and 17kW units** or the 50 amp double pole breaker; 8kW units (purchased or supplied separately), into main electrical distribution panel. This circuit breaker **must be compatible with the main electrical distribution panel.** It may be necessary to reposition remaining circuit breakers or remove circuit breakers that have been disconnected to accommodate the insertion of the 70 amp or 50 amp double pole circuit breaker. Connect white wire to the main distribution panel neutral bar. Connect solid green wire to main electrical panel ground bar. Connect the black and red wires to the 70 amp or 50 amp double pole circuit breaker. Reinstall the main distribution panel cover.



## THE AUTOMATIC TRANSFER SWITCH/LOAD CENTER IS NOW INSTALLED!

### NOTE.

**15 amp breakers utilize 12 gauge wire to allow for easy replacement with 20 amp breakers if required by the installation without the need to replace/upgrade the wire gauge.**

If a generator is being installed at this time, proceed to step 15. If a generator will not be installed at this time, perform steps 11 through 14 to complete the pre-wiring project.

11. Open the outdoor connection box and unplug the 4-pin and 2-pin connector. Remove the black, white, red, and green wires that lead from the five foot pre-wired conduit. Make sure the mating wires from the 30 foot conduit are on the connection box terminal lugs (or ground screw), re-install all washers and nuts and secure them in place.
12. Remove the lock nut holding the five foot pre-wired conduit coupling to the outdoor connection box. Slip the lock nut over the wires and plug, then remove the conduit from the connection box. Use a knockout plug to close off the opening where the conduit was removed.

### **⚠ WARNING!**

**⚠ The external connection box must be locked to ensure safety and to discourage tampering.**

13. For pre-existing buildings, switch the service main circuit breaker back on to provide utility power to the building.
14. Save the five foot pre-wired conduit for re-installation at time of generator installation. At that time, re-install the conduit by reversing steps 14 and 15. The grounding strap will also be installed with the generator. Save this guide for reference at time of generator installation.

### **⚠ DANGER!**

**⚠ Be sure the service main circuit breaker is switched OFF at time of generator installation.**

This completes the pre-wiring portion of the Automatic Transfer Switch/Load Center Installation. Proceed with step 15 for generator installation.

15. Place the generator and mounting pad in the location prepared utilizing the Standby Generator Installation and Owner's Manuals. Ensure that the distance from the structure (minimum 18" inches) allows for slack in the five foot pre-wired liquid tight conduit and that it meets code.



16. Ground unit in accordance with local codes.

### NOTE.

**The generator mode switch should be placed in the OFF position. Generator main line circuit breaker should be switched to the OFF or OPEN position.**

17. Access wiring connections for installation of five foot harness at the generator. To gain access to wiring connections and the circuit breaker you must remove the cover plate (black) over the control module. Remove the two screws retaining the cover plate. Lift the cover plate up and towards the front of the generator to remove.

Remove the small silver cap from back of enclosure. Remove threaded lock nut from conduit coupling (with 90° elbow) and wires. Feed wires into the hole. Place threaded lock nut over wires and onto conduit coupling. Tighten securely with screwdriver and hammer to ensure lock nut is tight. Connect power leads (red & black) to the circuit breaker lugs. Connect the neutral wire (white) to terminal bar labeled "Neutral". Connect the ground wire (green) to terminal bar labeled "GROUND". Connect sensing wires to terminal strips as follows: Yellow - N1, Yellow - N2, Blue - T1 / White - 23, Red - 194.

## 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. Manual operation must be checked BEFORE the transfer switch is operated electrically. To check manual operation, proceed as follows:

1. Put the generator into the OFF mode.
2. Turn OFF both UTILITY and EMERGENCY power supplies to the transfer switch, with whatever means provided (such as the main line circuit breakers).
3. Note position of transfer mechanism main contacts by observing the moveable contact carrier arm.
  - Manual operation handle towards the top of switch mechanism - LOAD terminals (T1, T2) are connected to utility terminals (N1, N2).
  - Manual operation handle towards the bottom of switch mechanism - LOAD terminals (T1, T2) are connected to emergency terminals (E1, E2).

### **⚠ CAUTION!**

**⚠ Do not use excessive force when operating the transfer switch manually or damage could be done to the manual handle.**

#### CLOSE TO NORMAL SOURCE SIDE

Before proceeding, verify the position of the switch by observing the position of manual operation handle. If the handle is UP, the contacts are closed in the NORMAL position, no further action is required. If the handle is DOWN, proceed with Step 1.

Step 1: With the handle inserted into the actuating shaft, move handle UP. Be sure to hold on to the handle as it will move quickly after the center of travel.

#### CLOSE TO EMERGENCY SOURCE SIDE

Before proceeding, verify the position of the switch by observing the position of the manual operation handle. If the handle is DOWN, the contacts are closed in the EMERGENCY (STANDBY) position. No further action is required. If the handle is UP, proceed with Step 1.

Step 1: With the handle inserted into the actuating shaft, move the handle DOWN. Be sure to hold on to the handle as it will move quickly after the center of travel.

#### RETURN TO NORMAL SOURCE SIDE

Manually actuate switch to return manual operating handle to the UP position.

## VOLTAGE CHECKS

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

### **⚠ DANGER!**

**⚠ PROCEED WITH CAUTION. THE TRANSFER SWITCH IS NOW ELECTRICALLY HOT. CONTACT WITH LIVE TERMINALS RESULTS IN EXTREMELY HAZARDOUS AND POSSIBLY FATAL ELECTRICAL SHOCK.**

2. With an accurate AC voltmeter, check for correct voltage.  
**Single-phase utility supply:**  
Measure across ATS terminal lugs N1 and N2. Also check N1 to NEUTRAL and N2 to NEUTRAL.
3. When certain that UTILITY supply voltage is correct and compatible with transfer switch ratings, turn OFF the UTILITY supply to the transfer switch.
4. Set the generator to the MANUAL mode. The generator should crank and start.
5. Let the generator stabilize and warm up at no-load for at least five minutes.
6. Set the generator's main circuit breaker (CB1) to its ON or CLOSED position.

### **⚠ DANGER!**

**⚠ PROCEED WITH CAUTION. GENERATOR OUTPUT VOLTAGE IS NOW BEING DELIVERED TO TRANSFER SWITCH TERMINALS. CONTACT WITH LIVE TERMINALS RESULTS IN EXTREMELY DANGEROUS AND POSSIBLY FATAL ELECTRICAL SHOCK.**

7. With an accurate AC voltmeter and frequency meter, check the no-load, voltage and frequency.  
**Single-phase generator supply:**  
Measure across ATS terminal lugs E1 to E2. Also check E1 to NEUTRAL and E2 to NEUTRAL.
  - a. Frequency..... 60-62 Hertz
  - b. Terminals E1 to E2 ..... 240-246 VAC
  - c. Terminals E1 to NEUTRAL ..... 120-123 VAC
  - d. Terminals E2 to NEUTRAL ..... 120-123 VAC
8. Set the generator's main circuit breaker (CB1) to its OFF or OPEN position.
9. Set the generator to the OFF mode to shut down the generator.

#### **NOTE:**

**Do NOT proceed until generator AC output voltage and frequency are correct and within stated limits. If the no-load voltage is correct but no-load frequency is incorrect, the engine governed speed probably requires adjustment. If no-load frequency is correct but voltage is not, the voltage regulator may require adjustment.**

# Residential Transfer Switch Installation Guide

## GENERATOR TESTS UNDER LOAD

1. Set the generator's main circuit breaker to its OFF or OPEN position.
2. Set the UTILITY SERVICE DISCONNECT circuit breaker to the OFF or OPEN position.
3. Manually actuate the transfer switch main contacts to their EMERGENCY (STANDBY) position. Refer to the "Manual Operation" section.
4. To start the generator, put it into the MANUAL mode. When engine starts, let it stabilize for a few minutes.
5. Turn the generator's main circuit breaker to its ON or CLOSED position. The generator now powers all LOAD circuits. Check generator operation under load as follows:
  - Turn ON electrical loads to the full rated wattage/ampere capacity of the generator. DO NOT OVERLOAD.
  - With maximum rated load applied, check voltage and frequency across transfer switch terminals E1 and E2. Voltage should be greater than 230 volts and frequency should be greater than 59 Hertz. Also, verify that the gas pressure remains within acceptable parameters (see the generator Installation Guidelines manual).
  - Let the generator run under rated load for at least 30 minutes. With unit running, listen for unusual noises, vibration, overheating, etc., that might indicate a problem.
6. When checkout under load is complete, set main circuit breaker of the generator to its OFF or OPEN position.
7. Let the generator run at no-load for several minutes. Then shut down by putting it into the OFF mode.

## CHECKING AUTOMATIC OPERATION

To check the system for proper automatic operation, proceed as follows:

1. Ensure that the generator is in its OFF mode.
2. Install front cover of the transfer switch.
3. Turn ON the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).

### NOTE:

#### Transfer Switch will transfer back to utility position.

4. Set the generator's main circuit breaker to its ON (or CLOSED) position.
5. Push the generator's AUTO mode button. The system is now ready for automatic operation.
6. Turn OFF the utility power supply to the transfer switch.

With the generator ready for automatic operation, the engine should crank and start when the utility source power is turned OFF after a 10 second delay (factory default setting). After starting, the transfer switch should connect load circuits to the standby side after a five (5) second delay. Let the system operate through its entire automatic sequence of operation.

## INSTALLATION SUMMARY

1. Ensure that the installation has been properly performed as outlined by the manufacturer and that it meets all applicable laws and codes.
2. Test and confirm proper operation of the system as outlined in the appropriate installation and owner's manuals.
3. Educate the end-user on the proper operation, maintenance and service call procedures.

**Important! If the end user ever finds it necessary to turn the generator off during prolonged utility outages to conserve on fuel, educate them on these simple, but important steps:**

To turn the generator OFF (while running in AUTO and online):

1. Turn OFF (or OPEN) the main Utility disconnect.
2. Turn OFF (or OPEN) the Main Line Circuit Breaker (MLCB) on the generator.
3. Turn the generator OFF.

To turn the generator back ON:

1. Put the generator back into AUTO and allow to start and warm-up for a few minutes.
2. Turn ON (or CLOSE) the MLCB on the generator.

The system will now be operating in its automatic mode. The main utility disconnect can be turned ON (or CLOSED), but to shut the unit off, this complete process must be repeated.

# Residential Transfer Switch Installation Guide

## 1 Testing Transfer Switch Manually

Attach handle to actuating shaft.



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

Move handle UP for the NORMAL (UTILITY) position.

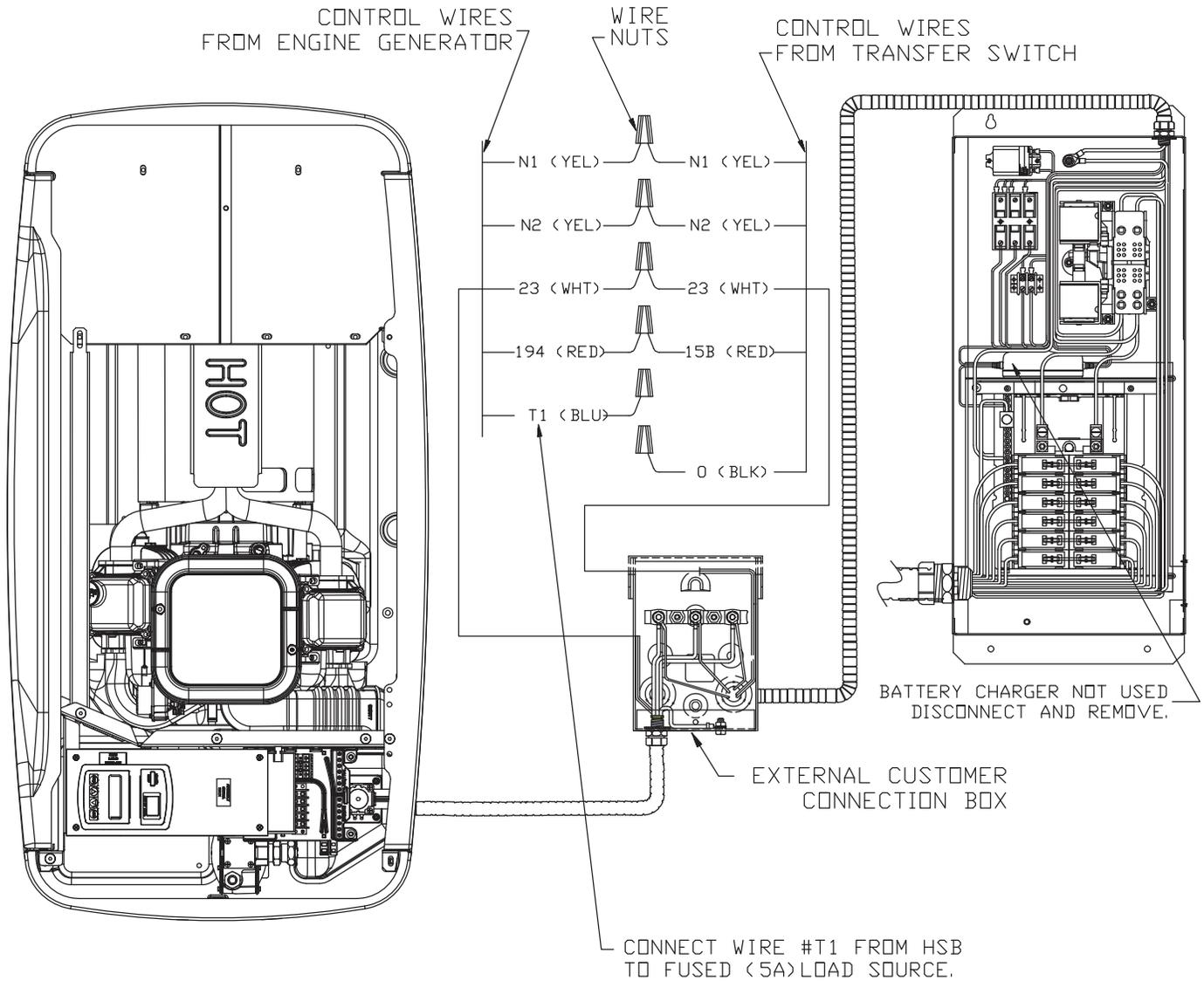


Move handle DOWN for the EMERGENCY (STANDBY) position.



"10" & LATER HSB  
AIR-COOLED GENERATORS  
SINGLE & V-TWIN ENGINES

PRE "10"  
LOAD CENTER  
TRANSFER SWITCH

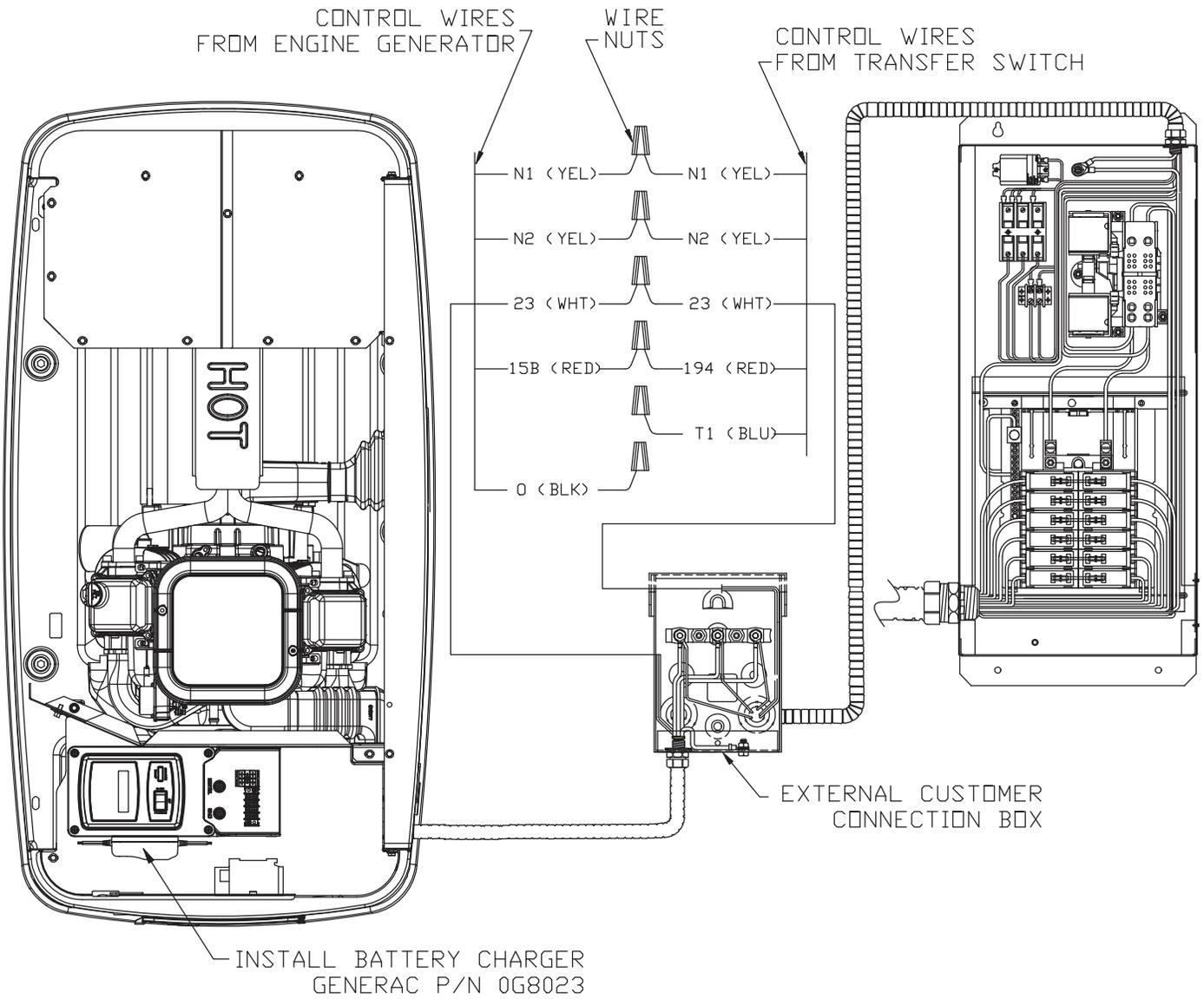


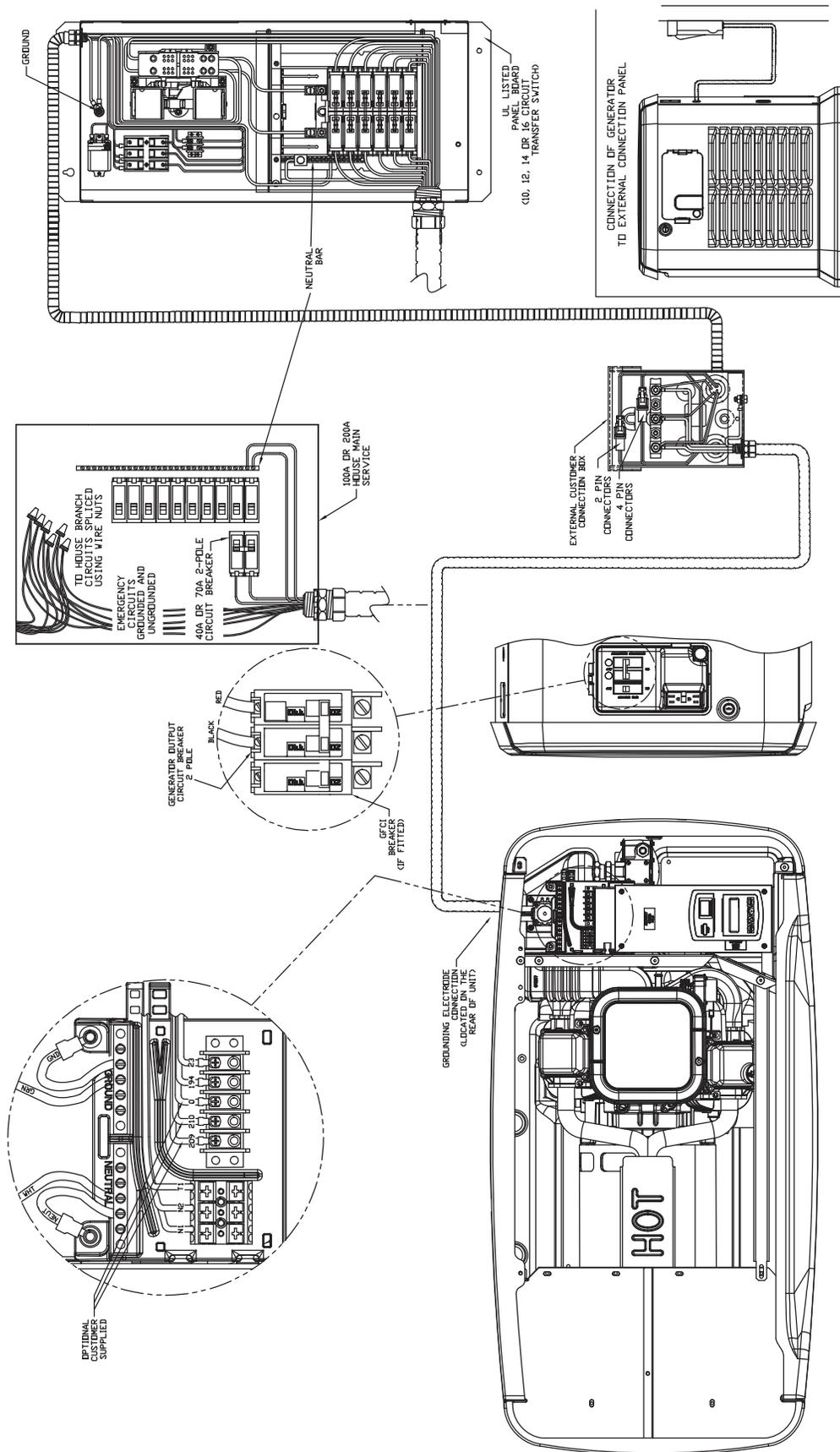
- 1) INSTALL KIT PART NO. OG9254 ON ATS. ROUTE T1 WIRE (FUSED LOAD SUPPLY) IN 30 FT. CONDUIT TO EXT. CONNECTION BOX. CONNECT TO T1 WIRE FROM HSB OR,
- 2) ROUTE 120 VAC 15A CIRCUIT FROM GENERATOR PROTECTED PANELBOARD TO T1 IN THE GENERATOR CONTROL PANEL. NEUTRAL TO NEUTRAL TERMINAL.

# Installation Drawing 0H6393-A

PRE "10" HSB  
AIR-COOLED GENERATORS  
SINGLE & V-TWIN ENGINES

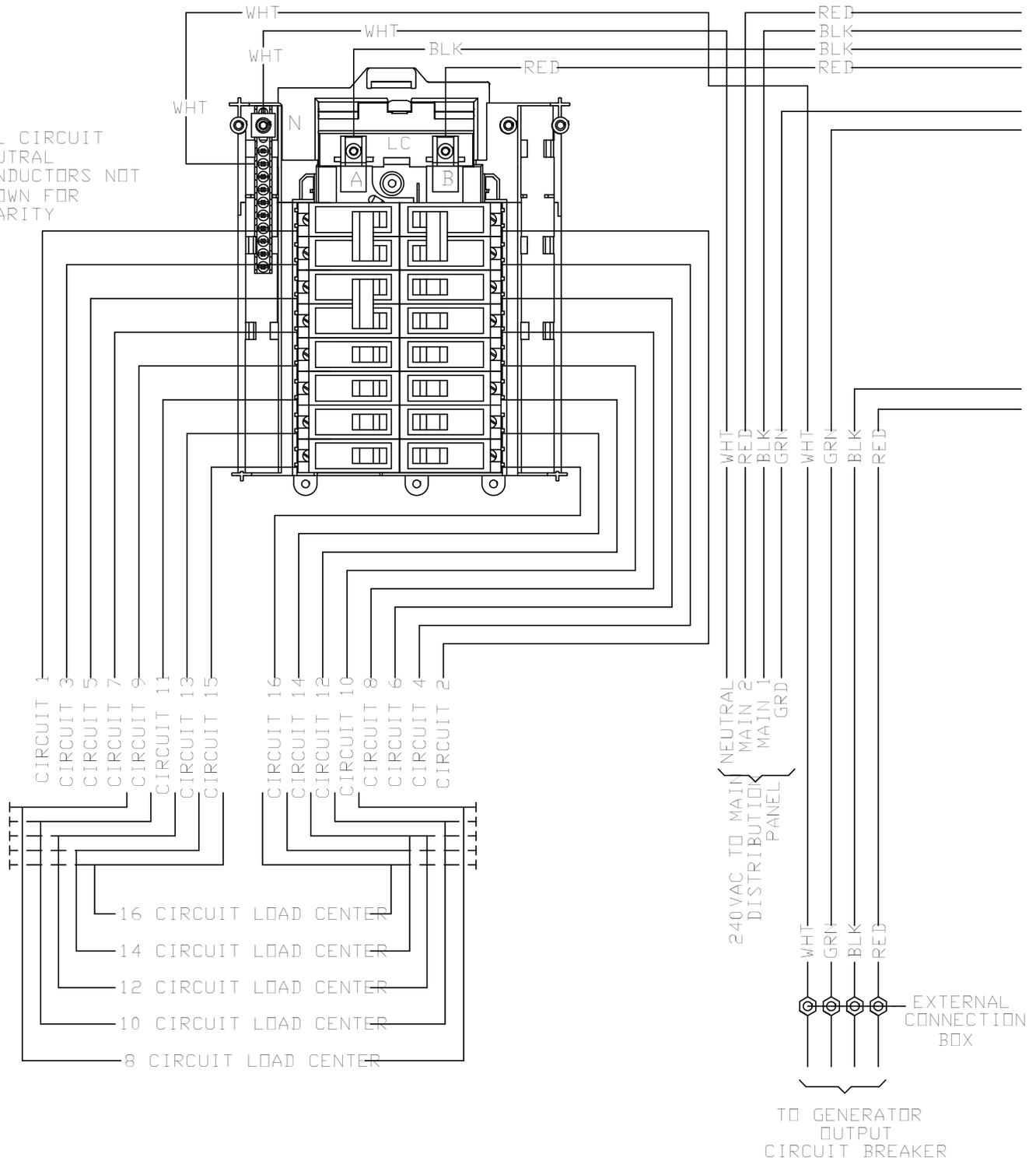
"10" & LATER  
LOAD CENTER  
TRANSFER SWITCH



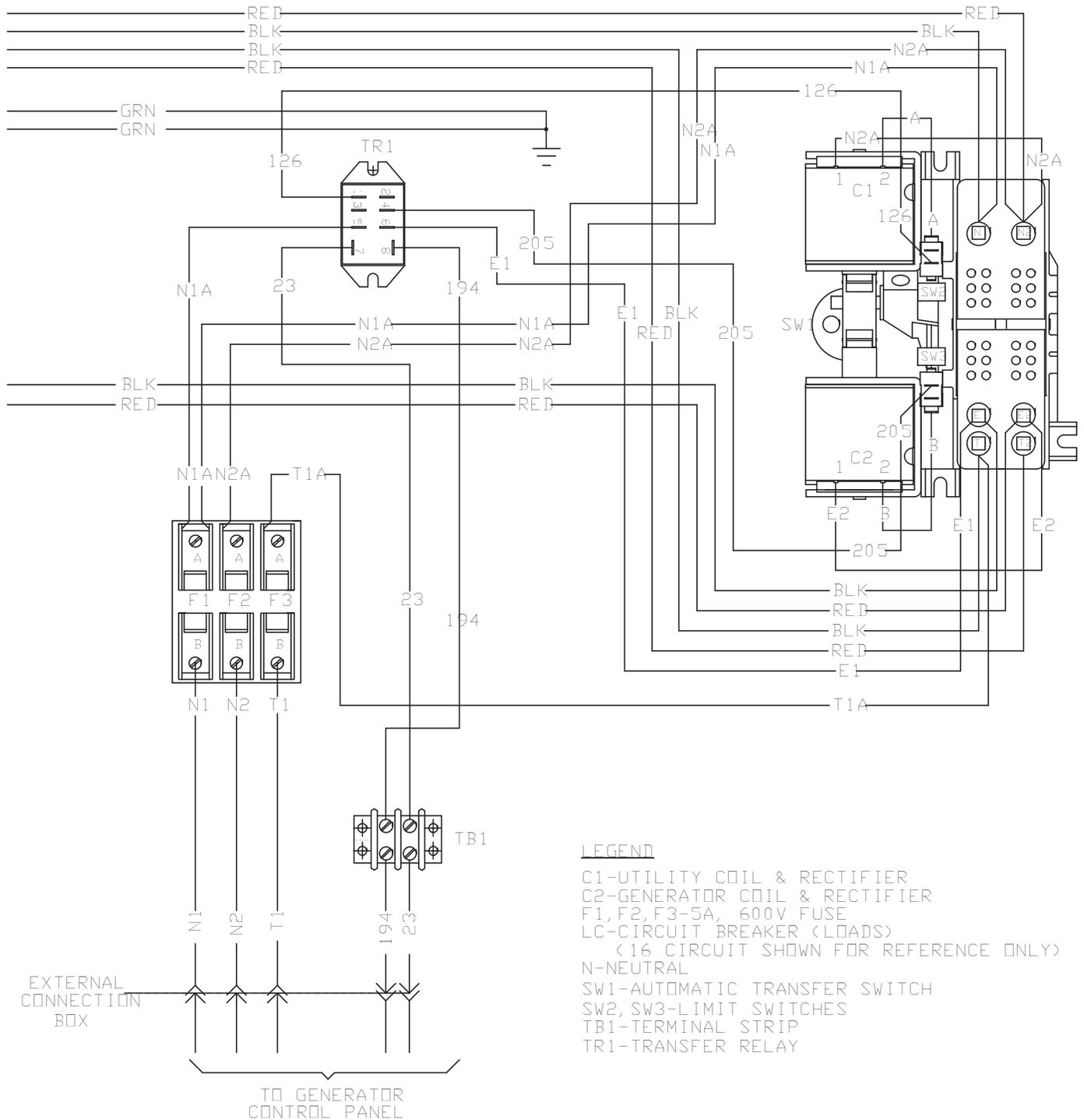


# Wiring Diagram Drawing 0H6453-B

ALL CIRCUIT  
NEUTRAL  
CONDUCTORS NOT  
SHOWN FOR  
CLARITY



# Wiring Diagram Drawing 0H6453-B



**LEGEND**

- C1-UTILITY COIL & RECTIFIER
- C2-GENERATOR COIL & RECTIFIER
- F1,F2,F3-5A, 600V FUSE
- LC-CIRCUIT BREAKER (LOADS)  
(16 CIRCUIT SHOWN FOR REFERENCE ONLY)
- N-NEUTRAL
- SW1-AUTOMATIC TRANSFER SWITCH
- SW2, SW3-LIMIT SWITCHES
- TB1-TERMINAL STRIP
- TR1-TRANSFER RELAY

# Electrical Schematic Drawing 0H6454-B

