

Installation and Operator's Manual

16 Circuit 100 Amp Automatic Transfer Switch with AC Control Module™



Thank you for your purchase of this Briggs & Stratton® automatic transfer switch. This product is designed for use with specific home standby generators and may not function with generators produced by other manufacturers. Seek a qualified electrical professional to determine applicability of this equipment to generators manufactured by others. When operated and maintained according to the instructions in this manual, your power management system will provide many years of dependable service.

This manual contains safety information to make you aware of the hazards and risks associated with this system and how to avoid them. We have made every effort to provide for a safe, streamlined and cost-effective installation. As each installation is unique, it is impossible to know of and advise of all conceivable procedures and methods by which installation might be achieved. We do not know all possible hazards and/or the results of each possible method or procedure. It is important that you read and understand these instructions thoroughly before attempting to install or operate this equipment. **Save these instructions for future reference.**

This transfer switch requires professional installation before use. Refer to the *Installation* section of this manual for instructions on installation procedures. Only licensed electrical contractors should install transfer switches. Installations must strictly comply with all applicable federal, state and local codes, standards and regulations. Your installer should follow the instructions completely.

Where to Find Us

You never have to look far to find Briggs & Stratton support and service for your system. Consult your Yellow Pages. There are many authorized service dealers who provide quality service. You can also contact Technical Service by phone at 800 732-2989 between 8:00 AM and 5:00 PM CT, or use the Service Center Locator at BRIGGSandSTRATTON.COM, which provides a list of authorized dealers.

For Future Reference

Please fill out the information below and keep with your receipt to assist in unit identification for future purchase issues.

Transfer Switch

Model Number

--	--	--	--	--	--	--	--	--	--

Revision

--	--

Serial Number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Date Purchased

--	--	--	--	--	--

⚠ WARNING This product can expose you to chemicals including used engine oil, which is known to the State of California to cause cancer, and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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Save These Instructions

Important Safety Instructions

SAVE THESE INSTRUCTIONS - This manual contains important instructions that should be followed during installation and maintenance of the equipment.


Safety Symbols and Meanings





Electrical Shock



Read Manual

 The safety alert symbol indicates a potential personal injury hazard. A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to designate a degree or level of hazard seriousness. A safety symbol may be used to represent the type of hazard. The signal word NOTICE is used to address practices not related to personal injury.

 **DANGER** indicates a hazard which, if not avoided, *will* result in death or serious injury.

 **WARNING** indicates a hazard which, if not avoided, *could* result in death or serious injury.


 **CAUTION** indicates a hazard which, if not avoided, *could* result in minor or moderate injury.

NOTICE addresses practices not related to personal injury.

The manufacturer cannot possibly anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and the tags and decals affixed to the unit are, therefore, not all-inclusive. If you use a procedure, work method or operating technique that the manufacturer does not specifically recommend, you must satisfy yourself that it is safe for you and others. You must also make sure that the procedure, work method or operating technique that you choose does not render the equipment unsafe.

 **WARNING** Only qualified electricians should attempt installation of this equipment, which must strictly comply with applicable codes, standards and regulations.

 **WARNING** Certain components in this product and related accessories contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. **Wash hands after handling.**

 **WARNING** Low voltage wire cannot be installed in same conduit as power voltage wiring.



- Failure to follow above warning could cause personal injury, damage and/or malfunction of equipment.

 **WARNING** Failure to properly ground equipment can result in electrocution.



- Do not touch bare wires.
- Do not use equipment with worn, frayed, bare or otherwise damaged wiring.
- Do not handle electrical cords while standing in water, while barefoot, or while hands or feet are wet.
- If you must work around a unit while it is operating, stand on an insulated dry surface to reduce shock hazard.
- Do not allow unqualified persons or children to operate or service equipment.
- In case of an accident caused by electrical shock, immediately shut down all sources of electrical power and contact local authorities. **Avoid direct contact with the victim.**

 **WARNING** Equipment contains high voltage that can cause personal injury or death.



- Despite the safe design of the system, operating this equipment imprudently, neglecting its maintenance or being careless can cause possible injury or death.

NOTICE Improper treatment of equipment can damage it and shorten its life.

- Use equipment only for intended uses.
- If you have questions about intended use, ask dealer or contact Briggs & Stratton
- Do not expose equipment to excessive moisture, dust, dirt, or corrosive vapors.
- Remain alert at all times while working on this equipment. Never work on the equipment when you are physically or mentally fatigued.
- If connected devices overheat, turn them off and turn off their circuit breaker/fuse.

Installation

We sincerely appreciate your patronage. For this reason, we have made significant effort to provide for a safe, streamlined and cost-effective installation. Because each installation is unique, it is impossible to know of and advise the trade of all conceivable procedures and methods by which installation might be achieved. Neither could we know of possible hazards and/or the results of each method or procedure. For these reasons,

Only current licensed electrical professionals should attempt system installations. Installations must strictly comply with all applicable codes, industry standards and regulations.

Your equipment is supplied with this combined “Installation and Operator’s Manual.” This is an important document and should be retained by the owner after the installation has been completed.

Every effort has been made to make sure that the information in this manual is both accurate and current. However, the manufacturer reserves the right to change, alter or otherwise improve the system at any time without prior notice.

Home Owner Responsibilities

To help you make informed choices and communicate effectively with your installation contractor(s),

Read and understand *Owner Orientation* before contracting or starting your equipment installation.

To arrange for proper installation, contact the store at which you purchased your equipment, your dealer, or your utility power provider.

The equipment warranty is VOID unless the system is installed by licensed electrical professionals.

Owner Orientation

The illustrations provided are for typical circumstances and are meant to familiarize you with the installation options available with your system.

Local codes, appearance, and distances are the factors that must be considered when negotiating with an installation professional. As the distance from the existing electrical service increases, compensation in wiring materials must be allowed for. This is necessary to comply with local codes and overcome electrical voltage drops.

These factors will have a direct effect on the overall price of your equipment installation.

Your installer must check local codes AND obtain permits before installing the system.

- Read and follow the instructions given in this manual.
- Follow a regular schedule in caring for and using your equipment, as specified in this manual.

Installing Dealer/Contractor Responsibilities

- Read and observe the safety rules.
- Read and follow the instructions given in this manual.
- Consult with home generator owner(s) to discuss their selection of “Essential Circuits.”
- The installer may need to provide appropriate rated contactors based on loads to be controlled.
- Check federal, state and local codes and authority having jurisdiction, for questions on installation.
- Make sure that the generator is not overloaded with selected loads.

If you need more information about the transfer switch, call 800 7322989 between 8:00 AM and 5:00 PM CT.

Equipment Description

The transfer switch is designed to transfer the selected loads found in normal residential installations when used with the supervisory contacts provided. The load is connected either to utility power (normal) or home standby power (generator). The transfer switch monitors utility and generator voltages and will automatically connect to the appropriate source of power.

This switch makes it easy for a licensed electrician to complete a home standby installation. The transfer switch contains an automatic transfer switch and control circuitry, and can accommodate up to 16 circuits.

Major components of the transfer switch are a 2 pole double throw transfer switch, control circuit board, fused utility terminals, branch circuit breakers and bus, and interconnecting wiring. The control board also has two inputs for current transformers that sense generator current. These components are housed in a NEMA 3R enclosure that is suitable for both indoor and outdoor installations.

The transfer switch is solenoid-operated from utility or generator inputs and contain suitable mechanical and electrical interlock switches to eliminate the possibility of connecting the utility service to the generator output. It has ratings capable of switching full utility power into the essential circuits. In addition, a manual override lever is provided for the transfer function.

The control board has active circuits sensing utility and generator voltages. It creates a signal for generator start-up, switch transfer and retransfer when utility is restored. The control board also contains red and green LED’s indicating the power sources available and two relay operated contacts that provide supervisory control of external loads.

Delivery Inspection

After opening the carton, carefully inspect the transfer switch components for any damage that may have occurred during shipment.

If loss or damage is noted at time of delivery, have the person(s) making delivery note all damage on the freight bill and affix his signature under the consignor's memo of loss or damage. If loss or damage is noted after delivery, contact the carrier for claim procedures. Missing or damaged parts are not warranted.

Shipment contents

- Automatic transfer switch (1)
- Installation and operator's manual (1)

To be supplied by installer:

- Connecting wire and conduit
- Various specialty tools/equipment

Essential Circuit Identification

Essential electrical loads are loads that will be powered by the home generator. Essential loads are grouped together and wired into the transfer switch.

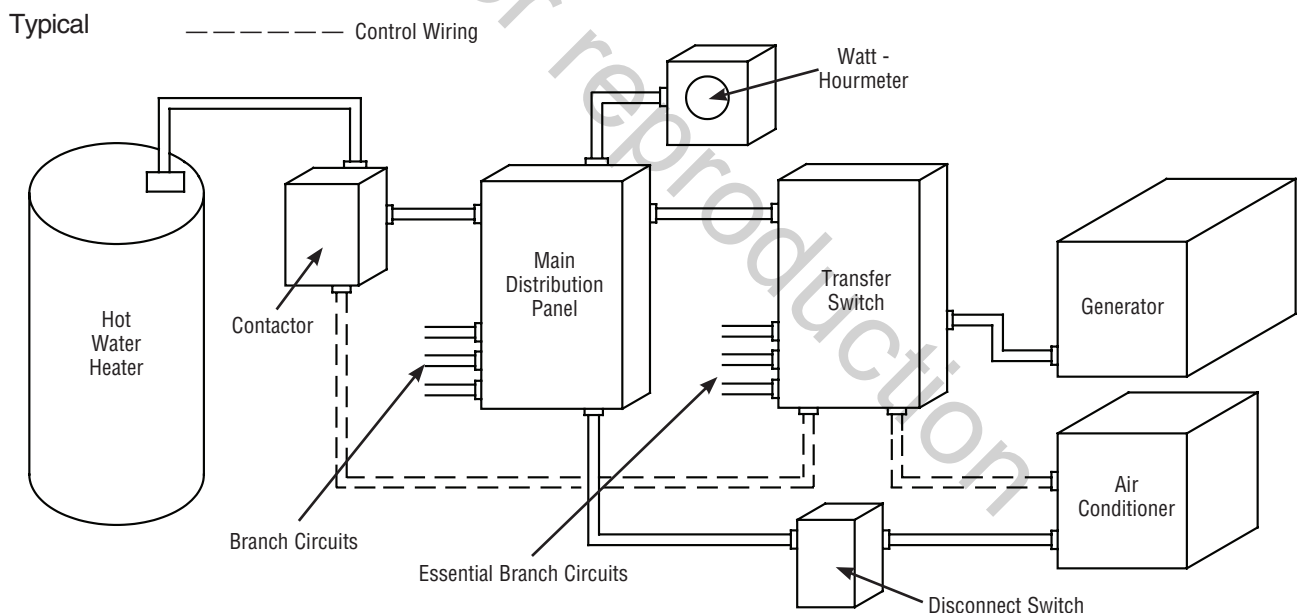
TO THE INSTALLER: Consult with home generator owner(s) to discuss their selection of "Essential Circuits," as described in the generator operator's manual.

Make sure that the total of the selected load circuits fed by this transfer switch are within the generator's rated capacity.

The following requirements apply to this type of isolation system:

- The automatic transfer switch is installed after the main distribution panel.
- The automatic transfer switch has a load rating of 100 Amps. This is the maximum load rating of the total essential load.
- All wiring must conform to national, state and local codes.

The illustration below depicts a typical system installation and assumes the utility is supplying 120/240 Volt, single-phase electrical service.



Mounting Guidelines

The system circuitry is enclosed in a NEMA Type 3R enclosure suitable for indoor/outdoor use. Guidelines for mounting the enclosure include:


- Install enclosure on a firm, sturdy supporting structure.
- The enclosure must be installed with minimum NEMA 3R hardware for conduit connections.
- To prevent switch contact distortion, level and plumb the enclosure. This can be done by placing washers between the enclosure and the mounting surface.
- NEVER install the switch where any corrosive substance might drip onto the enclosure.
- Protect the switch at all times against excessive moisture, dust, dirt, lint, construction grit and corrosive vapors.

It is best if the transfer switch is mounted near the utility meter, either inside or outside. Discuss layout suggestions/changes with the owner before beginning the system installation process.

NOTICE Before drilling conduit entry holes, or any other holes, cover and protect the switch and electronics to prevent dirt and metal fragments from entering the mechanical and electrical components. Failure to do so may result in damage or malfunction of the switch.

NOTICE Use a vacuum to clean any dirt or metal shavings inside the transfer switch. Do not use a blower or compressed air to clean the inside of the transfer switch because debris may become lodged in the electrical and mechanical components causing damage or malfunction.

Power Wiring Interconnections

 **WARNING** Low voltage wire cannot be installed in same conduit as power voltage wiring.



- Failure to follow above warning could cause personal injury, damage and/or malfunction of equipment.

Utility and generator conduits must enter enclosure above circuit breaker bus in transfer switch. No conductors shall pass over top of control board. Branch circuit conduits must enter sides or bottom of enclosure adjacent to circuit breaker terminals. Do Not use large knockouts in bottom of enclosure.

All wiring must be the proper size, properly supported and protected by conduit. All wiring should be done per applicable federal, state and local codes, standards and regulations. Obey wire type and torque specifications printed on the terminal blocks and neutral/ground connector.

Approved for copper and aluminum conductors.

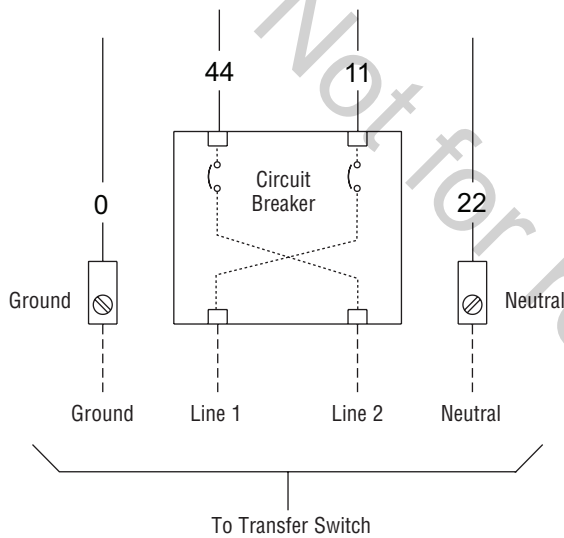
Complete the following connections between the transfer switch, main distribution panel and generator. Use installer-supplied 300VAC or greater wire that complies with Table 310.16 in the National Electric Code. Apply the necessary correction factors and wire size calculations.

NOTICE Improper installation can cause damage to the circuit boards and shorten their life. Installing circuit boards in live circuits will damage the board and is not covered by warranty. ALWAYS disconnect ALL sources of power prior to servicing.

- Remove all power prior to installing this equipment. Failure to do so could cause internal damage to the board when making electrical connections.
- Turn generator to **OFF** position.
- Turn off utility power to the standby generator and transfer switch.

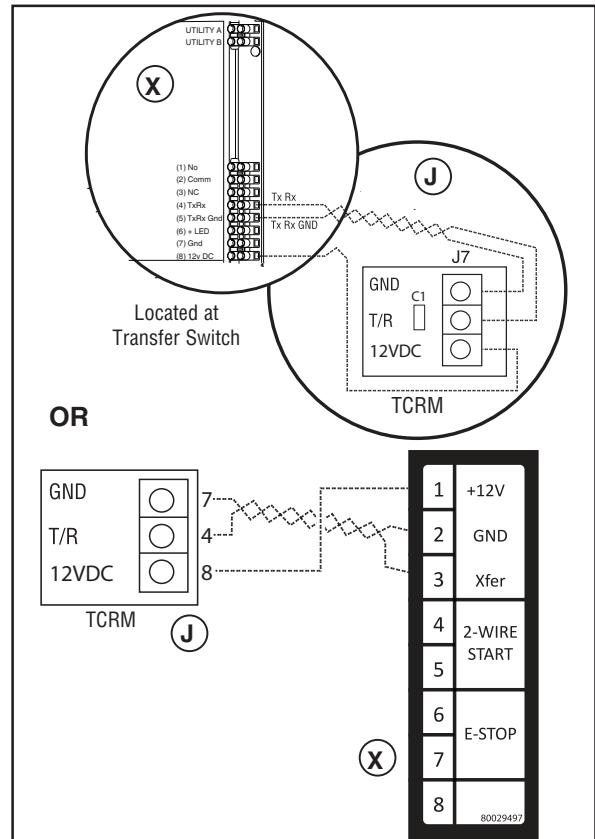
1. Set generator's circuit breaker to **OFF** (open) position.
2. Set generator's system switch to **OFF** position and remove 15 Amp fuse from system control panel.
3. Turn off utility power to the standby generator and transfer switch.
4. Using installer supplied 300VAC or greater conductor, connect utility source from an installer-supplied 100 Amp two pole "essential circuit breaker" installed in main distribution panel to transfer switch contactor terminals marked "UTILITY. Make sure that the circuit breaker is turned **OFF**.
5. Using installer supplied 300VAC or greater conductor, connect main distribution panel ground to transfer switch GROUND bus.
6. Using installer supplied 300VAC or greater conductor, connect main distribution panel neutral to transfer switch NEUTRAL bus.

7. Connect all essential branch circuit wiring to appropriate circuit breakers in transfer switch.
8. Connect essential branch circuit Neutral conductors to transfer switch NEUTRAL bus.
9. Connect essential branch ground conductors to transfer switch GROUND bus.
10. Connect feeder conductors from transfer switch contactor "GENERATOR" terminals to generator circuit breaker LINE1 and LINE2 terminals. Each conductor must pass through hole of current transformer before making connection.
11. Plug current transformer leads into "CT1" and "CT2" connectors on transfer switch control board.
12. Connect conductor from transfer switch NEUTRAL bus to generator NEUTRAL terminal. **Observe generator control panel labeling for terminal identification.**



13. Connect conductor from transfer switch GROUND bus to generator control panel GROUND terminal.
- Make sure that the generator and transfer switch equipment grounding conductor is connected per applicable federal, state and local codes, standards and regulations.

14. Connect the transfer switch "UTILITY 240 VAC" terminals to generator's "240 VAC" terminals using installer supplied 300VAC or greater wire, minimum #14 AWG conductors via two-pin connector supplied with generator.
15. Connect "T/R" and "GND" terminals on transfer switch control board (J) to the generator's control panel (X) "TxRx" and "TxRx GND" terminals using #18 AWG twisted pair conductors, no greater than 200 ft in length, 300 volt 75°C-90°C via eight-pin connector supplied with generator.

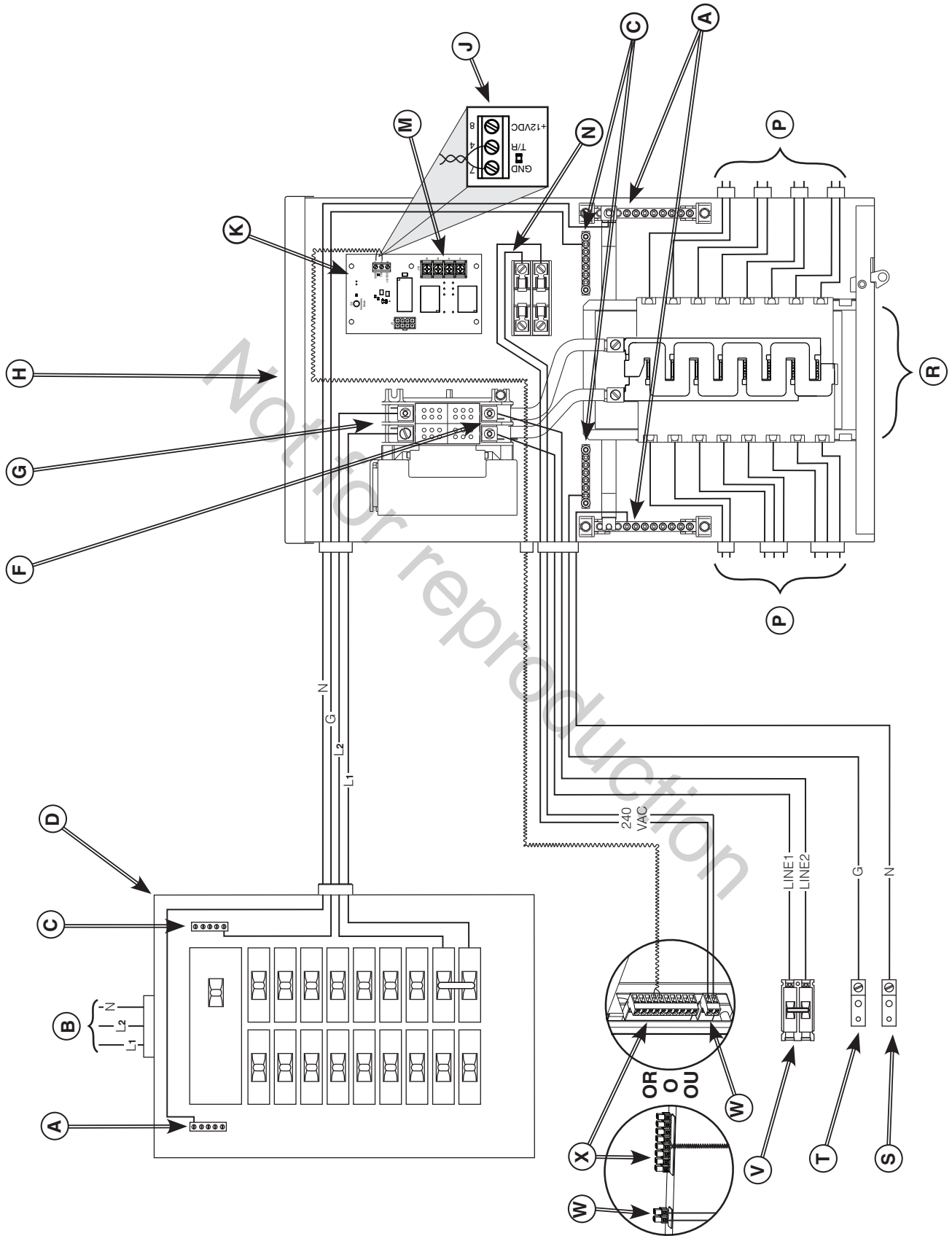


16. Tighten all wire connections/fasteners to proper torque. See label inside transfer switch enclosure for proper torque values. If removed, replace all protective barriers.

The illustration on the facing page shows a typical completed installation - your actual layout will vary. Illustration callouts are:

- A - NEUTRAL bus
- B - Utility source
- C - GROUND bus
- D - Main distribution panel
- F - GENERATOR terminals
- G - UTILITY terminals
- H - Transfer switch assembly
- J - T/R and GND to generator
- K - Transfer switch control board
- M - Supervisory contacts
- N - UTILITY 240VAC to generator
- P - Essential branch circuit loads
- R - Location to install circuit breakers
- S - Generator NEUTRAL terminal
- T - Generator GROUND terminal
- V - Generator circuit breaker
- W - Two-pin connector
- X - Eight-pin connector

NOTE: Wires between generator and transfer switch need to be enclosed in conduit.

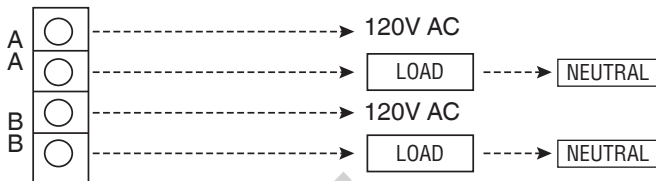


Supervisory Control Wiring (A-A and B-B)

1. A-A and B-B are NC contacts that are used as lockouts when the transfer switch is switched to generator power.

NOTE: There are two circuits provided to keep the supervisory loads separated from each other.

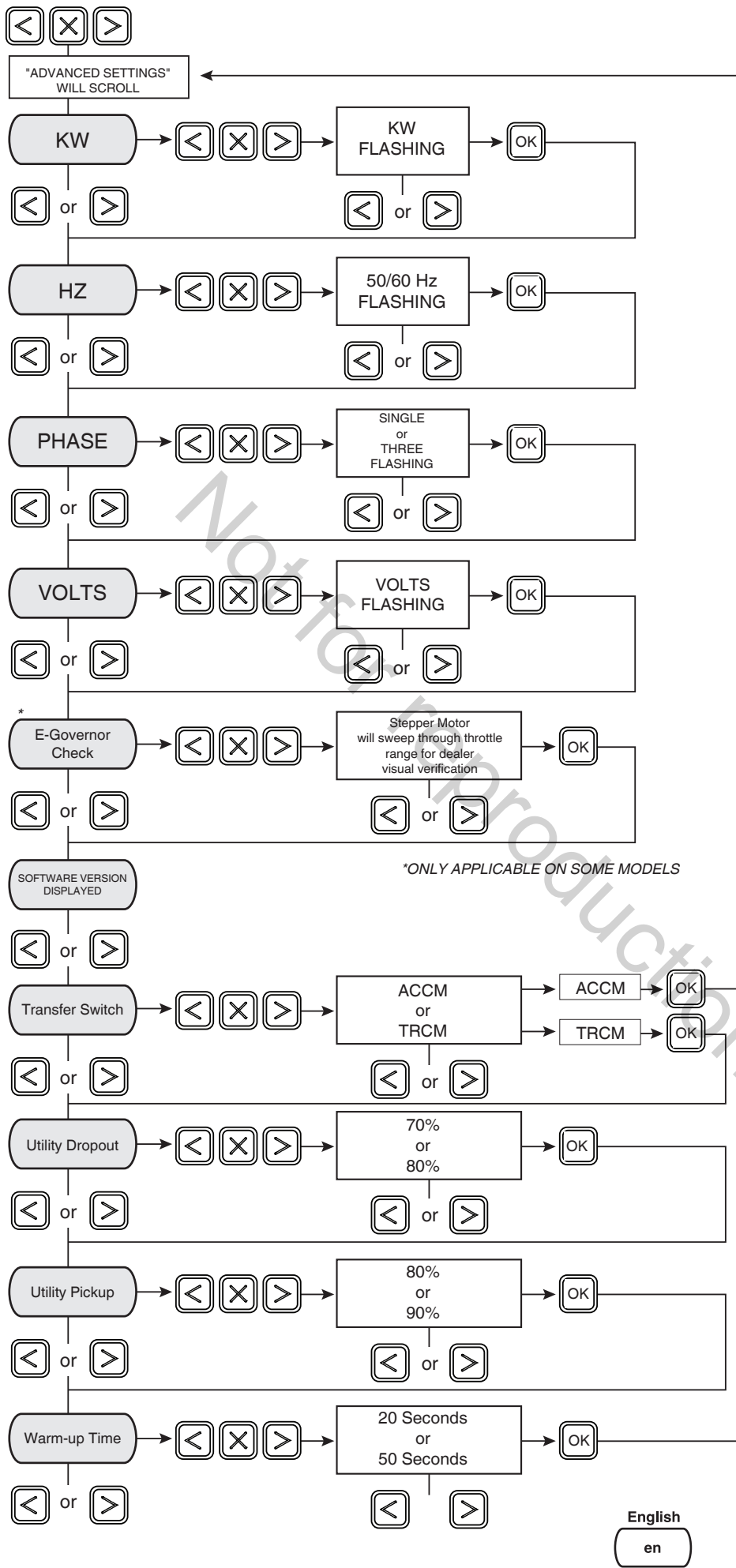
2. Air conditioning control wiring or larger loads can be connected to A-A or B-B.
3. A-A and B-B are rated 120V AC, 1A



4. A-A and B-B wire range 12 - 22 AWG. Torque 12 lb/in.

System Setup (Refer to diagram on next page)

1. TCRM board. This is only applicable to Briggs & Stratton® generator controller software version E1 or higher, hardware E4 or higher.
 - Go to the generator control panel.
 - Access advanced menu/screen settings. For explanation on how to do this, read the *Control Panel* section of the generator manual.
 - In the advanced menu, scroll to transfer switch settings as shown.
 - Set to TRCM and press OK.
2. You must perform the following before operating the system:
 - If generator is installed in an area regularly subjected to temperatures below 40°F(4°C), select a 50 second warm up time at the advanced menu settings. Factory default is set to a 20 second warm up.
 - Insert the 15A ATO fuse into the fuse holder of the generator controller. Measure voltage across terminal labeled GND and +12V DC at generator electrical box. Voltage measured should be around +12V DC.
 - If no voltage is measure across terminal labeled GND and 12V DC check to make sure hardware revision of control panel is E4 or higher.



System Test

With the generator system switch in **AUTO**, turn the 100 Amp circuit breaker feeding the transfer switch to the **OFF** position. After a few minutes the generator will start and the transfer switch will transfer essential loads to generator power.

To return to utility power, turn the 100 Amp circuit breaker feeding the transfer switch **ON**.

Controls

Other than a Manual Override lever, there are no operator controls because this is an automatic transfer switch. The manual override is to be used only by licensed professionals. Information on handle use can be obtained by calling Technical Service at 800 743-4115.

Operation

To select automatic transfer operation, do the following:

1. In main distribution panel, set 100 Amp circuit breaker that sends utility power to transfer switch to **"ON"** position.
2. Install 15 Amp fuse in generator's control panel.
3. Set generator's circuit breaker to **"ON"** position.
4. Set generator's system switch to **"AUTO"** position.

The system will now be in automatic operation mode.

When the generator is providing power to the transfer switch, the transfer switch control board is constantly monitoring generator power. If the air conditioner is called to run, and there is sufficient generator power available, the controller will close contacts "A-A" to air conditioner contactor. Contacts "B B" will open before contacts A-A close. If loads are too great for the generator, contacts A-A and/or B-B will open. When air conditioning is not needed, A-A will open. If enough power is available, B-B will close.

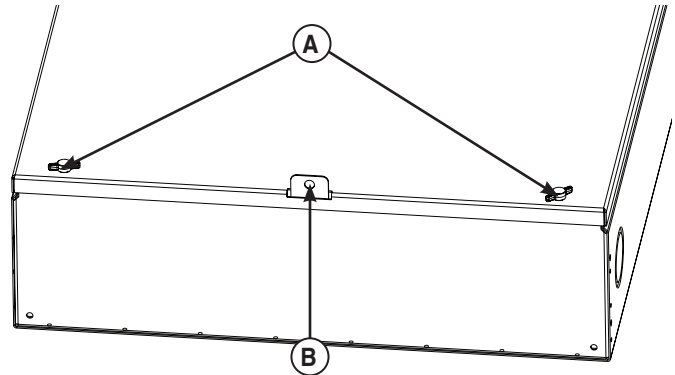
Enclosure Door

⚠ WARNING Shock Hazard. Equipment contains high voltage that could cause electrocution resulting in death or serious injury.



- Testing must only be performed by qualified personnel.
- Do not operate this equipment imprudently, carelessly or neglect its maintenance.

To open the transfer switch door, remove the two exterior thumb screws (A) and carefully lift off door.



To close and secure the door, push door closed against enclosure making sure that the tab on the enclosure fits into the slot on the door. While in this position, the door can rest on the tab (B) at the bottom of the enclosure. Reinstall both thumb screws to finger tight. Enclosure door **MUST** be closed and secured at all times except when system is being serviced.

Testing the Automatic Transfer Switch

Turn the main distribution panel circuit breaker feeding the transfer switch to the “OFF” position. The system’s automatic sequence will initiate. To return to utility power, turn the main distribution panel circuit breaker to the “ON” position.

Utility Fail

The generator senses when utility voltage is below 70 percent of nominal. Engine start sequence is initiated after 6 second time delay.

Engine Warm-Up

Time delay to allow for engine warm-up before transfer. Use jumper on transfer switch control board to select delay of 20 seconds or 50 seconds.

Transfer

Transfer from utility to generator supply occurs after voltage is above set levels. Minimum engine run time is 5 minutes after transfer.

Utility Pickup

Voltage pickup level is 80 percent of nominal voltage.

Retransfer

Retransfer from generator to utility power is approximately 10 seconds after utility voltage supply is above pickup level and minimum run time is completed.

Engine Cool Down

Engine will run for 60 seconds after retransfer.

Maintenance

The transfer switch is designed to be maintenance free under normal usage. However, inspection and maintenance checks should be made on a regular basis. Maintenance will consist mainly of keeping the transfer switch clean.

Visual inspections should be done at least once a month. Access to transfer switch must not be obstructed. Keep 3 feet (92 cm) clearance around transfer switch. Check for an accumulation of dirt, moisture and/or corrosion on and around the enclosure, loose parts/hardware, cracks and/or discoloration to insulation, and damaged or discolored components.

Exercise the transfer switch at least once every three months as described in Testing the Automatic Transfer Switch unless a power outage occurs and home generator system has gone through an automatic sequence. Allow generator to run for at least 30 minutes.

Contact a licensed electrical professional to inspect and clean the inside of the enclosure and other components of your home generator system at least once a year.

When Calling for Assistance

You must have the Model Number and Serial Number from the unit ID label at hand if it is necessary to contact a local service center regarding service or repair of this unit. Obtain this information from the unit ID label located on or inside the enclosure.

To contact Briggs & Stratton call 800 743-4115, between 8:00 AM and 5:00 PM CT.

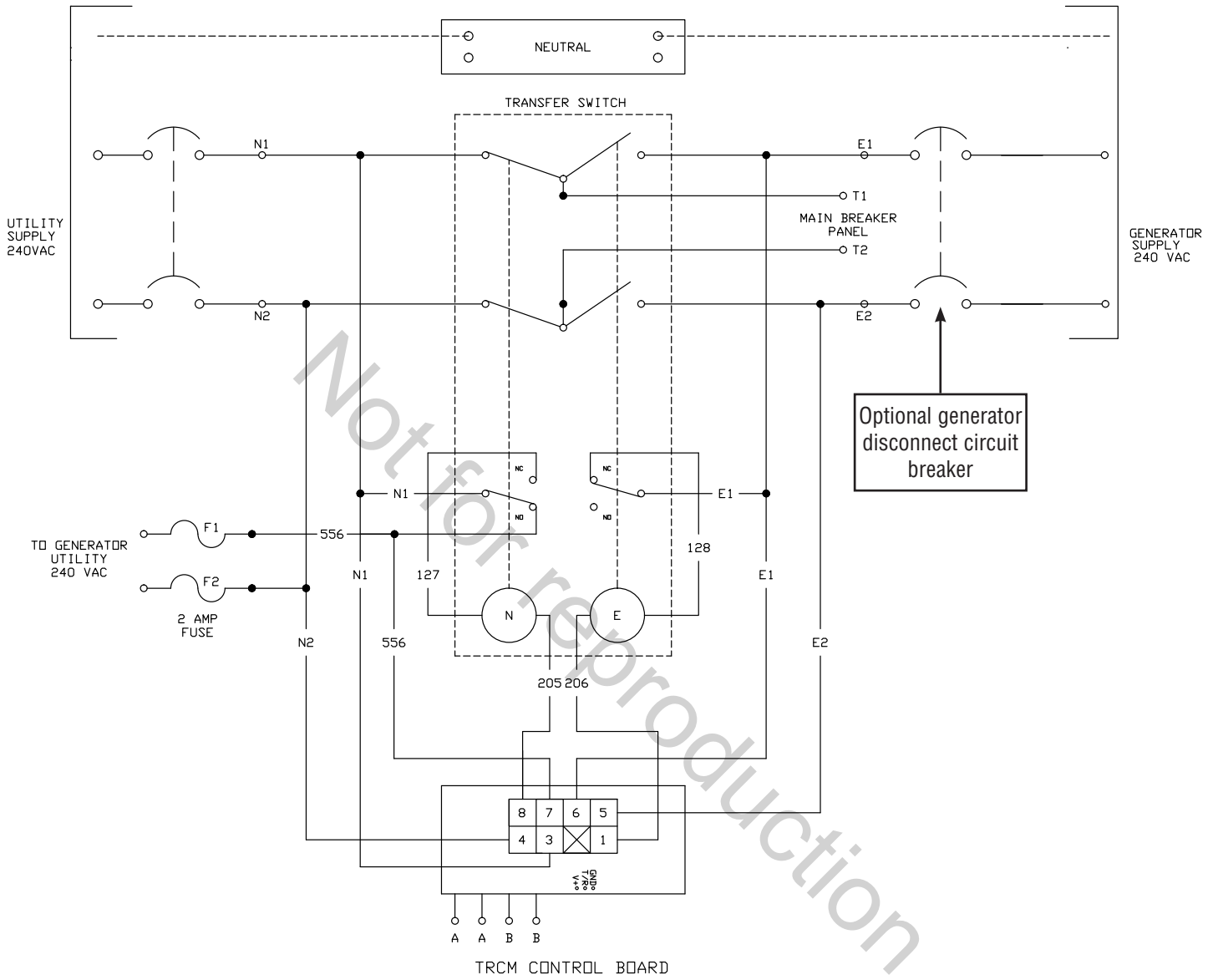
Installation Inspection

Before placing the system into service, inspect the entire installation carefully.

Troubleshooting

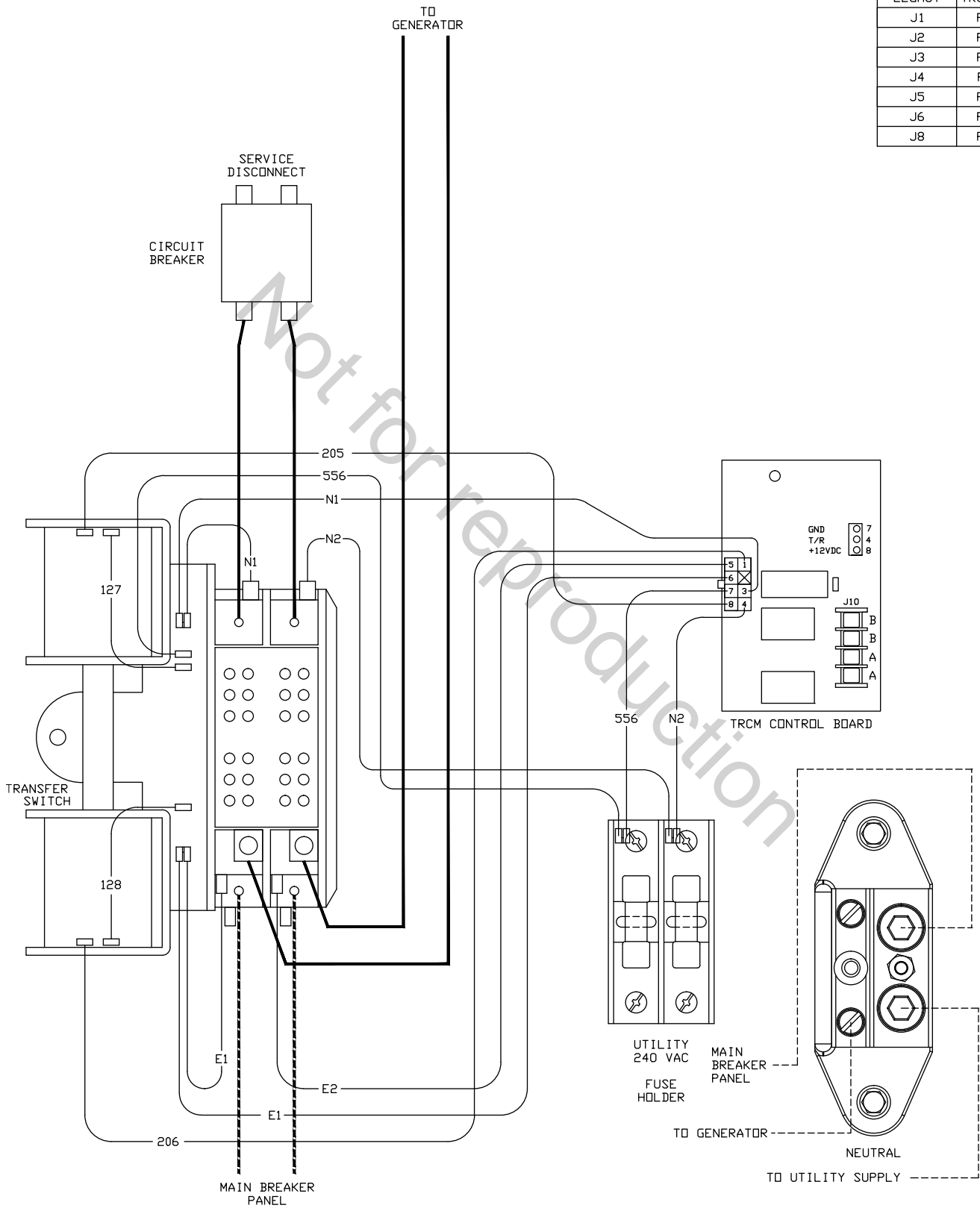
Problem	Cause	Correction
Automatic transfer switch does not transfer to generator	<ol style="list-style-type: none"> 1. Generator breaker open. 2. Generator voltage not acceptable. 	<ol style="list-style-type: none"> 1. Reset generator circuit breaker. 2. Refer to generator manual.
Automatic transfer switch does not transfer to utility	<ol style="list-style-type: none"> 1. Main distribution panel circuit breaker open. 2. Utility voltage not acceptable. 	<ol style="list-style-type: none"> 1. Reset circuit breaker in main distribution panel. 2. Wait for utility voltage to return to normal.
Generator is still running after switch transfers to utility power	Engine cool down period.	Engine should stop after 1 minute.
Generator or supervised loads (air conditioner, etc.) are operating improperly when generator is supplying power	<ol style="list-style-type: none"> 1. A-A or B-B contacts not operating correctly. 	<ol style="list-style-type: none"> 1. Contact local authorized service center.
Generator is still running after utility power is restored	<ol style="list-style-type: none"> 1. Minimum engine run time has not elapsed. 2. Transfer switch fuse(s) defective. 	<ol style="list-style-type: none"> 1. Wait five minutes for transfer switch to retransfer to utility power. 2. Contact local authorized service center.

Transfer Switch Schematic Diagram



Transfer Switch Wiring Diagram

LEGEND	
LEGACY	TRCM PIN#
J1	PIN 8
J2	PIN 3
J3	PIN 4
J4	PIN 1
J5	PIN 5
J6	PIN 6
J8	PIN 7



Product Specifications

Rated Maximum Load Current (at 25°C/77°F)	100 Amps
Rated AC Voltage	250 Volts
Poles	2
Frequency	60 Hz
Fault Current Rating	22,000 RMS Symmetrical Amperes
Supervisory Contacts Rating:	
A-A Terminals	120 Volt 1Amp
B-B Terminals	120 Volt 1Amp
Normal Operating Range	-20°F (-28.8°C) to 104°F (40°C)
Weight	40 lbs. (18 kg)

* This transfer switch is certified in accordance with UL (Underwriters Laboratories) 1008 (transfer switch equipment).

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