

GENERAC[®]

POWER SYSTEMS, INC.



Owner's Manual



GTS "Y" Type

**Automatic
Transfer Switch**

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 701 Legally Required Standby Systems or 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 you use a procedure, work method or operating technique Generac does not specifically recommend, you must satisfy yourself that it is safe for you and others. You also must make sure the procedure, work method or operating technique that you choose 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 you to special instruction about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:



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



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







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

NOTE:

After this heading, you can 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 you and 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 you must work 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 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.

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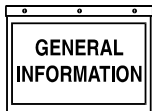
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1.1 INTRODUCTION

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

The automatic transfer switch is used for transferring critical electrical load from a NORMAL (utility) power source to a STANDBY (emergency generator) power source. Such a transfer of electrical loads occurs automatically when the NORMAL power source has failed or is substantially reduced and the STANDBY source voltage and frequency have reached an acceptable level. 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 solid state intelligence circuit, a transfer mechanism and a control panel.

1.3 TRANSFER SWITCH DATA PLATE

A DATA PLATE is permanently affixed to the transfer switch enclosure. Use this transfer switch only with the specific limits shown on the DATA PLATE and on other decals and labels that may be affixed to the switch. This will prevent damage to equipment and property.

When requesting information or ordering parts for this equipment, make sure to include all information from the DATA PLATE.

Record your Model and Serial numbers in the space provided below for future reference.

MODEL #
SERIAL #

1.4 TRANSFER SWITCH 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.

1.5 SAFE USE OF TRANSFER SWITCH

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 you make a copy of the SAFETY RULES and post them near the transfer switch. Also, be sure to read all instructions and information you may find on tags, labels and decals affixed to the equipment.

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

- National Electrical Code
- UL 1008, STANDARD FOR SAFETY-AUTOMATIC TRANSFER SWITCHES



2.1 INTRODUCTION TO INSTALLATION

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

- Mounting the enclosure.
- Connecting power source and load leads.
- Connecting the generator start circuit.
- 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 transfer switch mounting holes or brackets only. **DO NOT LIFT THE SWITCH AT ANY OTHER POINT.**

2.3 MOUNTING

Mounting dimensions for the transfer switch enclosure are in this manual. Enclosures are typically wall-mounted. Components are generally mounted in a standard NEMA 1-type enclosure. A NEMA 12, 3R, 4 & 4X are also available. See TRANSFER SWITCH OPTIONS, Section 3.15.



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



Make sure to turn OFF both the normal (Utility) and standby (generator) power supplies before trying to connect 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.

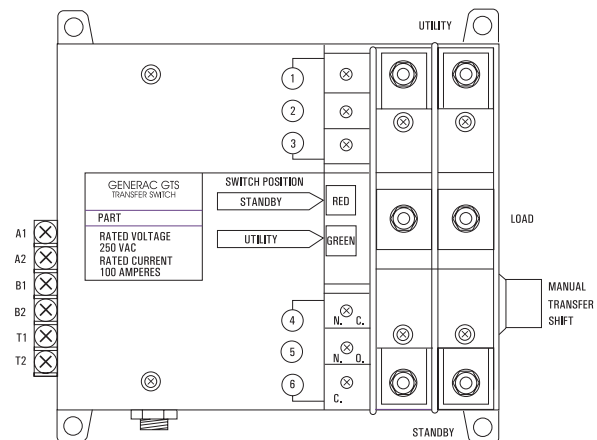
Wiring diagrams and electrical schematics are provided in this manual. Power source and load connections are made at a transfer mechanism, inside the switch enclosure.

◆ 2.4.1 TRANSFER MECHANISMS

The transfer mechanism may be either a 2-pole, 3-pole, or 4-pole type. The switch enclosure may include a NEUTRAL BLOCK for connection of the NEUTRAL line. Connect power source and load leads to transfer mechanism terminal lugs as follows:

- **LOAD Leads:** Connect to terminals T1, T2, T3, etc.
- **NORMAL (utility) Source Leads:** To terminals N1, N2, N3, etc.
- **STANDBY (emergency) Source Leads:** Connect to transfer mechanism terminal lugs E1, E2, E3, etc.

Figure 2.2 — Transfer Mechanism



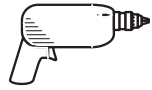
NOTE:

Unless otherwise specified, a NEUTRAL block is not supplied with the transfer switch on single phase, 3-pole units where the NEUTRAL line is to be switched during transfer action. Similarly, a NEUTRAL block is not supplied on 3-phase, 4-pole units where the NEUTRAL line is to be switched during transfer.

Solderless, screw-type terminal lugs are standard. Conductor sizes must be adequate to handle the maximum current to which they will be subjected. 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 wire brush. If ALUMINUM conductors are used, apply joint compound. Tighten terminal lugs to these torque values.

SWITCH RATING	TORQUE VALUE
100 ampere switches	50 inch-pounds (6 N-m)
All other switches	250 inch-pounds (26 N-m)



All power cables should enter the switch next to transfer mechanism terminals. Standard terminal lugs on the transfer mechanism are solderless, screw-type.

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

2.5 CONNECTING START CIRCUIT WIRES

Connect suitable, approved wiring to transfer switch terminals 178 and 183 (see chart below). Route these wires through suitable, approved conduit and connect to identically numbered terminals in the AC connection (lower) panel of Generac power systems (engine-generator set). See Figure 2.4.

Closure of Wire 178/183 circuit by switch circuit action must result in generator engine cranking and startup.

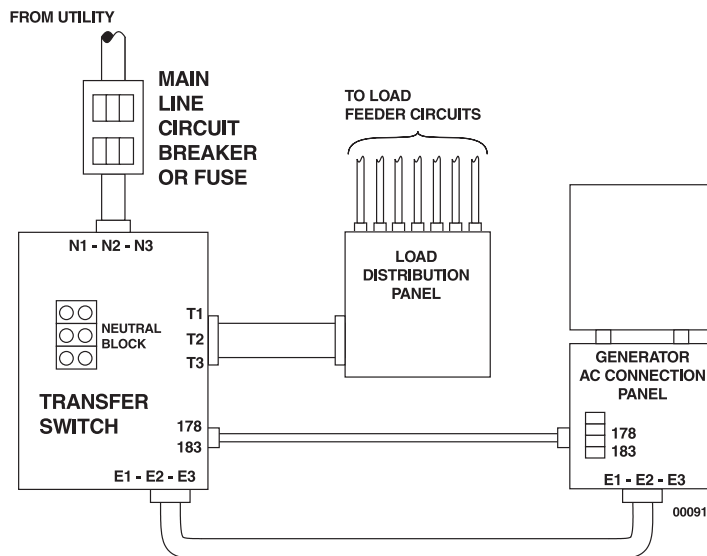
NOTE:

The preceding applies to the standard 2-WIRE START SYSTEM. If a generator having a 3-WIRE START SYSTEM is to be installed, using the optional 3-WIRE START SYSTEM. See TRANSFER SWITCH OPTIONS, Section 3.15.

Recommended wire gauge sizes for this wiring depends on the length of the wire, as recommended below:

MAXIMUM WIRE LENGTH	RECOMMENDED WIRE SIZE
460 feet (140m)	No. 18 AWG.
461 to 730 feet (223m)	No. 16 AWG.
731 to 1,160 feet (354m)	No. 14 AWG.
1,161 to 1,850 feet (565m)	No. 12 AWG.

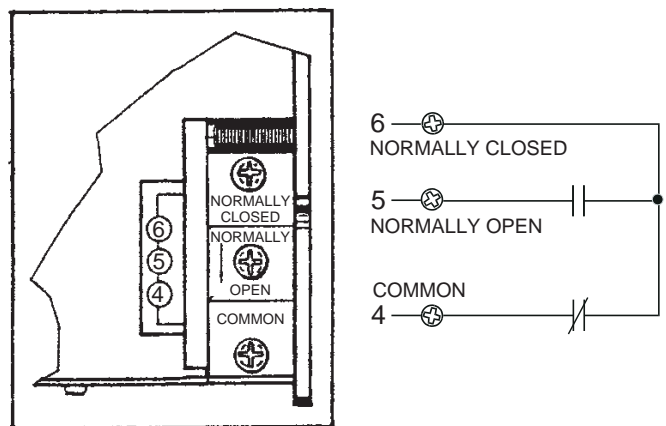
Figure 2.4 — Connection Diagram - 3-Phase With Neutral Shown (Typical)



2.6 AUXILIARY CONTACTS

If desired, you can access a set of 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 labeled 1, 2, and 3 are connected at the factory for operation of transfer switch advisory lights. Contacts 4, 5, and 6 are available for customer use.

Figure 2.5 — Auxiliary Contact Diagram



Auxiliary Contacts are rated 15 amps at 125 or 250 or 480 volts AC; 0.5 amps at 125 volts DC; 0.25 amps at 250 volts DC. **DO NOT EXCEED THE RATED VOLTAGE AND CURRENT OF THE CONTACTS.** Contact operation is shown in the following chart:

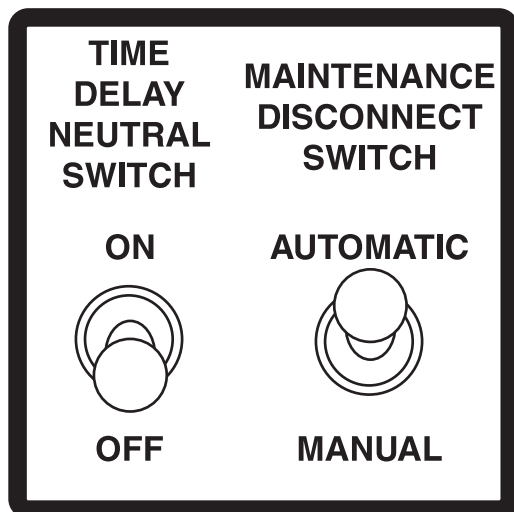
	Switch Position	
	Utility	Standby
Common to Normally Open	Closed	Open
Common to Normally Closed	Open	Closed

2.7 TIME DELAY NEUTRAL ON-OFF SWITCH

The Time Delay Neutral feature extends the time that the main contacts normally disconnect. By permitting the LOAD to remain disconnected from both power sources for a fixed time setting, residual voltages generated by heavy inductive loads will decay to a safe level before reconnecting. This provides some protection against nuisances such as blown fuses or circuit breakers that otherwise might occur during a rapid transfer of motor and other heavy inductive loads.

Units with the Time Delay Neutral feature are equipped with a Time Delay On/Off switch. To eliminate the time delay at neutral during a transfer action, set the switch to OFF.

Figure 2.6 — Time Delay Neutral Switch



2.8 OPTIONAL ACCESSORIES

Note any optional accessories that may be installed on the transfer switch or are to be installed in the standby electric system in conjunction with the switch. Complete the necessary connections for these accessories.

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 you could damage the switch.

IMPORTANT: Before proceeding with functional tests, read and make sure you 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

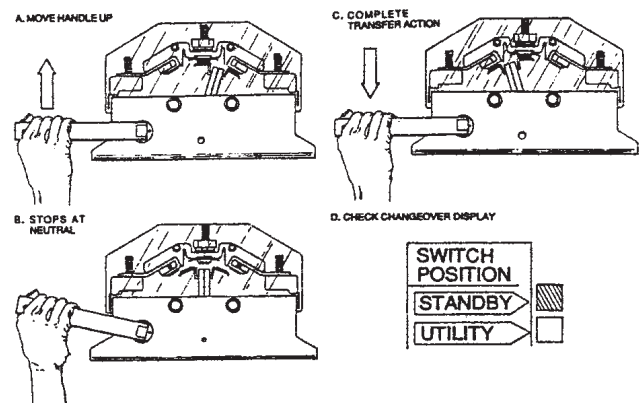


Do NOT attempt manual transfer operation until all power voltage supplies to the transfer switch have been positively turned OFF. Failure to comply with this rule may result in extremely dangerous and possibly lethal electrical shock.

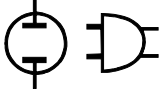
A manual HANDLE was shipped with the transfer switch. To test the manual operation of transfer switch, proceed as follows:

1. Set the Maintenance Disconnect Switch to MANUAL (Figure 3.1).

Figure 3.1 — Manual Operation



2. If so equipped, turn the generator's Auto-Off-Manual switch to MANUAL.
3. Turn OFF both NORMAL and EMERGENCY power supplies to the transfer switch, with whatever means provided (such as the main line circuit breakers).



4. Place the slotted end of the Manual Transfer Handle over the square MANUAL TRANSFER SHAFT, lower corner of the transfer mechanism.
5. Move HANDLE up until it stops at NEUTRAL. Then move HANDLE down to complete transfer action.



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

6. On the transfer mechanism front face, check the SWITCH POSITION indicator. The arrow with the word "STANDBY" should be pointing to a GREEN color band, indicating the LOAD terminals are now connected to the STANDBY terminals. (Arrow with the word "UTILITY" points to RED color band).
7. Repeat steps 5 and 6 several times, making sure the switch main contacts actuate to all positions.
8. When certain that switch operates normally, actuate the main contacts to their UTILITY (normal) positions.
9. Store and retain the manual handle in the place provided in the switch enclosure.

3.3 VOLTAGE CHECKS



Disconnect all loads from the transfer switch until all voltage checks and phase rotation checks have been completed to prevent possible injury to personnel and, or damage to equipment.

For safety, set the maintenance disconnect switch (inside transfer switch enclosure) to its manual position before proceeding with voltage checks.

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. Inside the transfer switch enclosure, set the Maintenance Disconnect switch to MANUAL.
2. If generator is so equipped, set the Manual-Off-Auto switch to OFF.
3. On the switch enclosure door, set SYSTEM TEST switch to AUTOMATIC MODE position.

4. Check that the GREEN indicator is visible in Utility 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.



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.

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



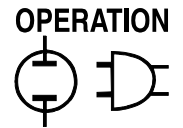
The transfer switch is now electrically hot. Proceed with caution.

6. With UTILITY voltage available to the transfer switch, check that the SWITCH - POSITION UTILITY lamp on the enclosure door is ON. If the SWITCH - POSITION UTILITY lamp is 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".
7. Inside the transfer switch enclosure door, locate the Utility Voltage Sensor Circuit Board. The UTILITY ON light (LED) should be ON.
8. 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, N3 and neutral. SUPPLIED VOLTAGES MUST BE FULLY COMPATIBLE WITH TRANSFER SWITCH RATED VOLTAGE.



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

9. Refer to the standby generator instruction manual. Make sure the generator engine has been properly serviced and prepared for use, as outlined in that manual. Then start the generator engine manually. Let the engine stabilize and warm up for a few minutes.
10. Turn ON the STANDBY (GENERATOR) power supply to the transfer switch by whatever means provided (such as the main line circuit breaker).
11. With the generator running, check that the STANDBY - OPERATING light on the switch enclosure door is ON.



- 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. 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.



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

- 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.
- When supplied voltage and frequency is correct, shut down the engine manually.



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

- 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 circuit breaker(s)], then proceed with the “ELECTRICAL OPERATION” section.

3.4 ELECTRICAL OPERATION

Test transfer system electrical operation as follows:

- On the Utility Voltage Sensor circuit board, check that the UTILITY ON lamp (LED) is ON.
- On the enclosure door, check that the Switch Position-Utility lamp is ON.



The UTILITY ON lamp (on circuit board) and the SWITCH POSITION-UTILITY lamp (on enclosure door) must both be ON before proceeding to Step 3.

- Refer to the appropriate owner’s manual. Be sure the standby generator is prepared for automatic operation.
- In the switch enclosure, set the Maintenance Disconnect switch to AUTOMATIC.

- Set the System Test switch to its NORMAL TEST MODE position. Generator startup and transfer to the STANDBY power source should occur. Refer to the SEQUENCE OF OPERATION, Section 3.13.

NOTE:

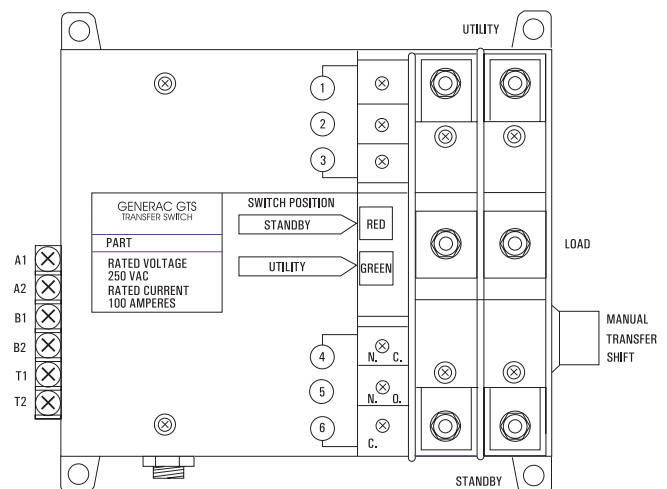
All systems are equipped with the Inphase Monitor Control board, and advisory lights on the circuit board will light up to indicate operation of the various solid state timers that control automatic operation. By observing these lights (LED’s), the operator can check the automatic operating sequences and times. See SENSOR AND TIMER ADJUSTMENTS, Section 3.16. For a detailed description of the automatic operating sequences, see SEQUENCE OF OPERATION, Section 3.13.

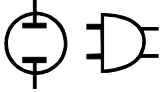
- When the test is complete, return the System Test Switch to its AUTOMATIC MODE position. Retransfer back to the UTILITY (normal) power source. The generator should shut down according to circuit board timers.

3.5 TRANSFER MECHANISM

The transfer mechanism main contacts are actuated by an electro-magnetic coil. Power for that coil’s operation is taken from the side to which the LOAD is being transferred. Thus, transfer to any power source cannot occur unless that power source is available to the switch.

Figure 3.2 — The Transfer Mechanism





3.6 MAIN CONTACTS OPERATION

Often called a "Y-type" transfer mechanism, this unit is a single solenoid, electrically actuated, mechanically held type. Main contacts are 87% silver, 13% cadmium oxide. The illustration shows the main contacts with LOAD connected to UTILITY source (Figure 3.3), LOAD disconnected from both power sources (neutral) (Figure 3.4), and LOAD connected to the STANDBY power source (Figure 3.5).

Figure 3.3 — Main Contacts at Utility

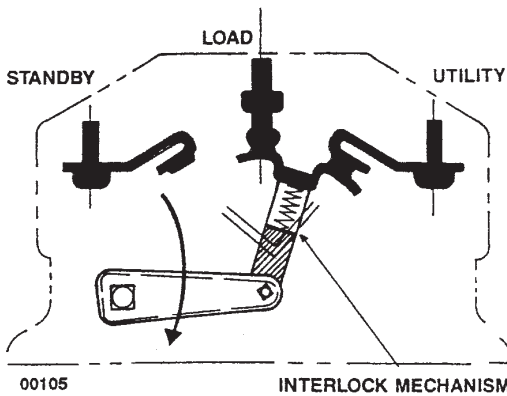


Figure 3.4 — Main Contacts at Neutral

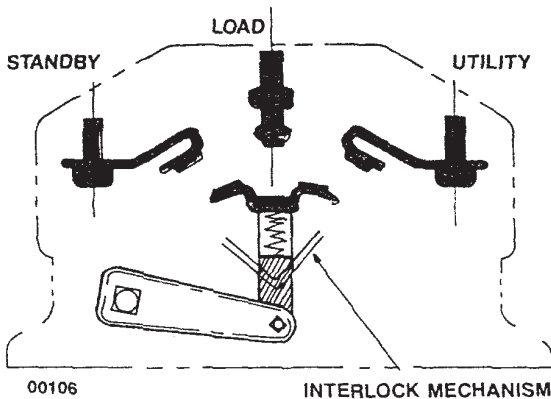
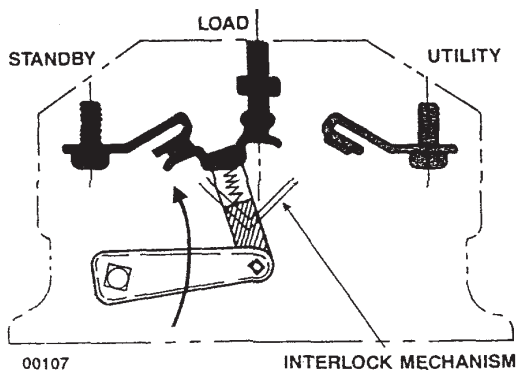


Figure 3.5 — Main Contacts at Standby (Emergency)



3.7 SWITCHES AND ADVISORY LAMPS

This section will familiarize the reader 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 will be covered in the section entitled SENSOR AND TIMER ADJUSTMENTS.

3.8 SYSTEM TEST SWITCH

This switch permits operator selection of AUTOMATIC, NORMAL TEST or FAST TEST mode as follows (Figure 3.6):

◆ 3.8.1 AUTOMATIC MODE

Use this switch position for all normal automatic operations. With AUTOMATIC MODE selected, any NORMAL source voltage that dropped below a pre-set value will result in the automatic sequence of events listed in the chart in Section 3.14.

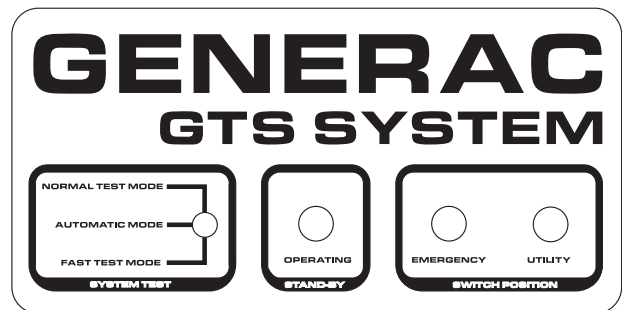
◆ 3.8.2 NORMAL TEST MODE

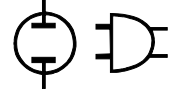
Permits the operator to test automatic operations, just as though an actual drop in NORMAL source voltage had occurred. See the chart in Section 3.14. During the test, observe the lights (LED's) on the transfer switch circuit board to monitor automatic operating sequences.

◆ 3.8.3 FAST TEST MODE

Permits the operator to test system operation with all circuit board timers accelerated to less than five seconds. Switch is spring-loaded back to AUTOMATIC MODE, so continuously press the FAST TEST CONTROL. Following the generator startup, loads are transferred to the EMERGENCY (standby) power source as soon as EMERGENCY source voltage and frequency have reached the settings of STANDBY VOLTAGE and STANDBY FREQUENCY sensors on the SYSTEM CONTROL board.

Figure 3.6 — System Test Switch, Standby Operating Light, and Switch Position Light





3.9 STANDBY-OPERATING LIGHT

This light will go ON to tell the operator that the standby generator is running and that STANDBY (emergency) source power is available to the transfer switch.

3.10 SWITCH POSITION LIGHT

◆ 3.10.1 EMERGENCY

The light will go ON when main current-carrying contacts have actuated to their STANDBY (emergency) position and that power source is available to the transfer switch.

◆ 3.10.2 UTILITY

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

The switch is equipped with the Inphase Monitor Control circuit board. The sensors and timers are adjustable (see SENSOR AND TIMER ADJUSTMENTS).

3.11 SEQUENCE OF OPERATION

When acceptable NORMAL source voltage is available, you can observe the following:

- Utility voltage Sensor circuit board monitor's NORMAL source voltage and UTILITY ON lamp is ON.
- Switch Position - UTILITY lamp is ON.
- Transformer reduced LOAD (T) terminal voltage is delivered to the 7-day exerciser board to operate the 7-day exercise timer.

If you want, you can monitor automatic timers and sensors on the Inphase Monitor Control circuit board, by observing light emitting diodes (LED's) next to the sensor/timer adjustments.

◆ 3.11.1 SEQUENCE 1 - VOLTAGE DROPOUT

- UTILITY source voltage drops below 75-95% of the Voltage Pickup Setting (factory set to about 80%). The UTILITY ON lamp goes OFF.
- Voltage Dropout sensor is factory set to about 80% of “pickup” voltage.
- Voltage dropout below this sensor's setting triggers Sequence 2.

◆ 3.11.2 SEQUENCE 2 - LINE INTERRUPT DELAY

- UTILITY voltage dropout below setting of Voltage Dropout sensor turns on a Line Interrupt Delay Timer.
- Line Interrupt Delay may be set for 0.1 to 10 seconds; has been factory set to about 5 seconds.

- If voltage dropout lasts longer than Line Interrupt Delay setting, circuit board action closes the automatic start circuit (Wires 178 and 183). When that circuit closes, engine cranks and starts as controlled by a circuit board in the generator's control panel.
- Once the standby generator starts, circuit board is turned ON (go to Sequence 3).

◆ 3.11.3 SEQUENCE 3 - ENGINE MINIMUM RUN AND WARMUP TIMERS

- This timer establishes the minimum length of time for the generator to run before you can shut it down. Timer prevents shutdown of a cold engine.
- Timer is adjustable from 5 to 30 minutes; factory setting is about 20 minutes.
- An engine warmup timer is also turned ON. This timer permits engine to stabilize and warm up before loads are transferred to STANDBY. Timer is adjustable from 5 seconds to 3 minutes; factory setting is about 1 minute.

◆ 3.11.4 SEQUENCE 4 - STANDBY VOLTAGE AND FREQUENCY SENSORS

- If generator AC output voltage and frequency is above the setting of these sensors, loads transfer to the STANDBY power source.
- Adjust Standby Voltage Sensor between 80% and 90% or nominal supply frequency; factory setting is about 90%.
- Adjust Standby Frequency Sensor between 80% and 90% or nominal supply frequency; factory setting is about 90%.

NOTE:

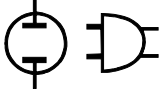
You can bypass the engine warmup timers by setting the Engine Warmup Timer Bypass switch to ON. Loads are transferred to STANDBY as soon as generator AC voltage and frequency have reached the settings of the Voltage and Frequency sensors without having to wait for the engine to warm up.

◆ 3.11.5 SEQUENCE 5 - VOLTAGE PICKUP

- If the UTILITY source voltage is restored above the setting of the Voltage Pickup sensor, Sequence 5 begins.
- Adjust Voltage Pickup between 85% to 95% of the normal supply voltage from the UTILITY source; factory setting is about 90%.

◆ 3.11.6 SEQUENCE 6 - RETURN TO UTILITY TIMER

- This timer prevents re-transfer that a Utility Source voltage surge or transient might cause.
- Adjust timer between 1 to 30 minutes; factory setting is about 5 minutes.



- If UTILITY voltage remains above the setting of the Voltage Pickup Sensor for the time interval of the Return to Utility Timer setting, loads are re-transferred back to the UTILITY source.

NOTE:

Actual time between re-transfer back to UTILITY and engine shutdown is whichever is longer of the Engine Cool Down timer setting or any time remaining on Engine Minimum run timer.

After the switch automatically re-transferred loads back to the UTILITY power source and generator has shut down, the system is "armed" for Sequence 1 again.

◆ **3.11.7 SEQUENCE 7 - ENGINE COOL DOWN TIMER**

- After the switch re-transfers loads back to UTILITY, this timer starts. When the interval has "timed out", the automatic start circuit (Wires 178/183) is opened, and the engine shuts down.
- Timer permits engine to run at no-load for a fixed time, so the engine internal temperature can stabilize before shutting down.
- Set the timer for 1-30 minutes; factory setting is about 10 minutes.

3.13 TRANSFER SWITCH OPTIONS

The transfer switch may be equipped with one or more of the following options:

- 3-wire Start System
- Instrument Package
- Deluxe Exerciser Circuit Board
- NEMA 3R, 4, 4X, or 12 Enclosure

3.12 SEQUENCE OF OPERATION SETTINGS

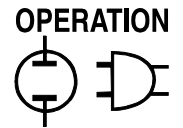
Units with Inphase Monitor Control Circuit Board

SEQUENCE	ACTION	TIMER/SENSOR	ADJUST RANGE	FACTORY SETTING
—*	UTILITY volts available - no action	Voltage Dropout Sensor	75 - 95%	80%
A*	UTILITY voltage drops out	Voltage Dropout Sensor	75 - 95%	80%
B	Line Interrupt Delay Timer Starts	Line Interrupt Delay Timer	0.1 - 10 seconds	5 seconds
C	Line Interrupt Delay Timer Stops	Line Interrupt Delay Timer	.01 - 10 seconds	5 seconds
—	Engine cranks and starts			
D	Engine Minimum Run Timer starts	Engine Minimum Run Timer	5 to 30 minutes	20 minutes
E**	Engine Warmup Timer Starts	Engine Warmup Timer	5 sec. - 3 min.	1 minute
F	STANDBY ON lamp ON			
G**	Engine Warmup Timer stops	Engine Warmup Timer	5 sec. - 3 min.	1 minute
H	Is STANDBY voltage good?	Standby Voltage Sensor	75 - 95%	90%
J	Is STANDBY frequency good?	Standby Frequency Sensor	80 - 90%	90%
K	Time Delay at NEUTRAL	Time Delay Neutral Timer	0.1 - 10 seconds	5 seconds
L	Inphase Transfer	Inphase Transfer Select	None	
—	Transfer to STANDBY			
M	TRANSFER TO STANDBY lamp ON			
—	STANDBY source powers LOAD			
N	UTILITY voltage restored	Voltage Pickup Sensor	85 - 95%	90%
O	Return to UTILITY Timer ON	Return to Utility Timer	1 - 30 minutes	5 minutes
P	Timed Delay at NEUTRAL	Time Delay Neutral Timer	0.1 - 10 seconds	5 seconds
R	Inphase Transfer	Inphase Transfer Select	none	0.1 - 30 seconds
S	Signal Before Transfer LED lights	Signal Before Transfer Timer	1 - 30 seconds	10 seconds
—	Re-transfer to UTILITY source			
T***	Engine Cooldown Timer starts	Engine Cooldown Timer	1 - 30 minutes	10 minutes
U***	Engine Cooldown Timer stops	Engine Cooldown Timer	1 - 30 minutes	10 minutes
—	Engine shuts down			
—	UTILITY volts available - no action			

* 75 - 95% of the Voltage Pickup Sensor setting

** Engine Warmup Timer can be bypassed. See SENSOR AND TIMER ADJUSTMENTS

*** Following re-transfer to UTILITY source, engine shutdown will not occur until both Engine Minimum run and Engine Cooldown timers have timed out.



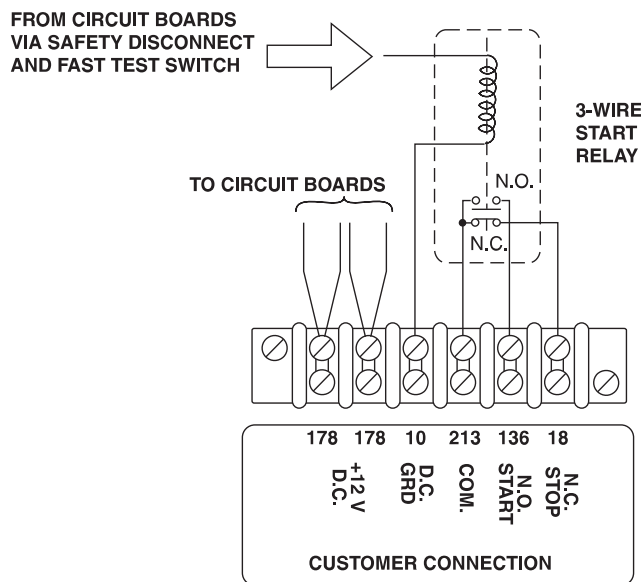
◆ 3.13.1 3-WIRE START SYSTEM

The standard generator start circuit on Generac transfer switches is a “2-wire” type. If the standby generator being installed has a “3-wire” start/stop system, you may need to use a transfer switch with a 3-wire system.

The optional 3-wire start system includes a 6-point terminal strip, a control relay, terminal strip decal and required wiring (Figure 3.7). These components are shown in the REPAIR PARTS section. Terminal strip connections are shown below:

- Terminal 178 - + 12 volts DC supply. On Generac generators, connect to generator Terminal #15.
- Terminal 10 - Common ground. Connect to negative (-) side of the DC supply circuit (to Terminal #10 on Generac generators).
- Terminal 213 - Acts as the COMMON terminal for the normally-open (N.O.) START and the normally-closed (N.C.) STOP relay contacts.
- Terminal 136 - N.O. START terminal. On Generac generators, connect to generator Terminal #136.
- Terminal 18 - N.C. STOP terminal. On Generac generators, connect to generator Terminal #18.

Figure 3.7 — 3-Wire Start System



◆ 3.13.2 INSTRUMENT PACKAGE

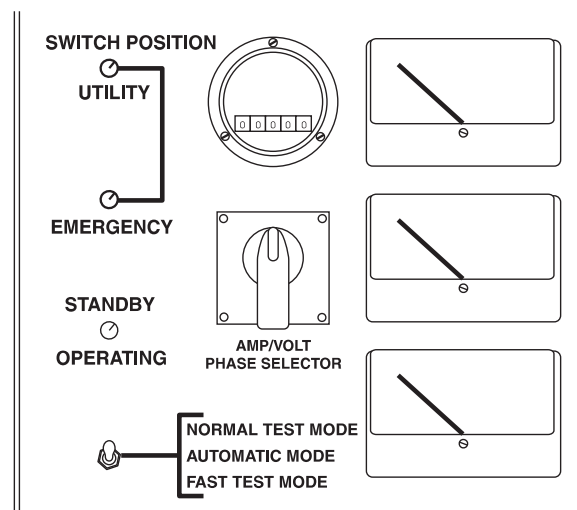
The optional instrument package includes (a) an AC voltmeter, (b) an AC ammeter, (c) an AC frequency meter, (d) an hourmeter, and (e) a phase selector switch. Several current transformers are required to operate the instrument package, i.e., two for single phase systems, three for 3-phase systems. Use the phase selector switch to select the 1-phase voltage and current being read as follows:

SWITCH OPERATION	CURRENT READING	VOLTAGE READING
1	Line 1	Line 1 to Neutral
2	Line 2	Line 2 to Neutral
3	No reading	Line 1 to Line 2
OFF	No reading	No reading

For 3-phase systems use the switch as follows:

SWITCH OPERATION	CURRENT READING	VOLTAGE READING
1	Phase A	Phase A to Phase B
2	Phase B	Phase B to Phase C
3	Phase C	Phase C to Phase A
OFF	No reading	No reading

Figure 3.8 — Instrument Package



◆ 3.13.3 OPTIONAL DELUXE EXERCISER CIRCUIT BOARD

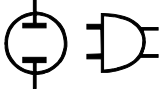
See OPTIONAL DELUXE EXERCISER CIRCUIT BOARD SETTINGS, Section 3.21.

◆ 3.13.4 NEMA 12 ENCLOSURE

National Electrical Manufacturer’s Association (NEMA) 12 enclosure. This type of enclosure is intended for use indoors to provide a degree of protection against dust, falling dirt, and dripping, non-corrosive liquids. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.5 NEMA 3R ENCLOSURE

National Electrical manufacturer’s Association (NEMA) 3R enclosure. This type of enclosure is intended for use outdoors to protect enclosed parts from windblown dust and water. The enclosure is sealed for dust, rain or sleet and is ice resistant. Ask your Dealer/Distributor or consult the factory for details.



◆ 3.13.6 NEMA 4 ENCLOSURE

National Electrical Manufacturer's Association (NEMA) 4 enclosure. This type of enclosure is intended for use indoors or outdoors to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water: undamaged by the formation of ice on the enclosure. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.7 NEMA 4X ENCLOSURE

National Electrical Manufacturer's Association (NEMA) 4X enclosure. This type of enclosure is intended for use indoors and outdoors to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water: undamaged by the formation of ice on the enclosure. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.8 ADDITIONAL OPTIONS

For information on additional options not covered in this manual, ask you Dealer/Distributor or consult the factory.

3.14 SENSOR AND TIMER ADJUSTMENTS – SENSING CIRCUIT BOARD

◆ 3.14.1 VOLTAGE DROPOUT SENSOR

This sensor (Figure 3.9) establishes the NORMAL power source voltage which generator startup and transfer to STANDBY (Emergency) power source occurs. Adjust the sensor to any voltage between 75-95% of the nominal voltage Pickup Sensor setting, by turning the adjusting knob to the desired setting (in percent). Sensor is factory set to about 80% of the Voltage Pickup Sensor setting.

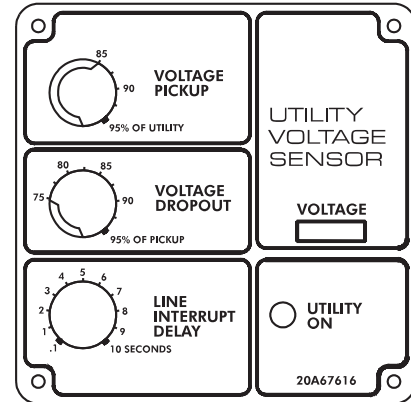
◆ 3.14.2 VOLTAGE PICKUP SENSOR

Establishes the NORMAL power source voltage at which re-transfer back to that power source occurs. Turn knob to adjust setting to 85-95% of the nominal NORMAL source supply voltage. Sensor has been factory set to about 90% of nominal rated NORMAL source voltage.

◆ 3.14.3 LINE INTERRUPT DELAY TIMER

Established a definite time interval between NORMAL source voltage dropout below the setting of the Voltage Dropout Sensor and generator startup. This time interval is necessary to prevent false generator starts that voltage transients might otherwise cause. Adjust timer from 0.1 to 10 seconds; is factory set to about five seconds.

Figure 3.9 — Sensing Circuit Board Panel



3.15 ADJUSTMENTS ON INPHASE MONITOR CONTROL CIRCUIT BOARD

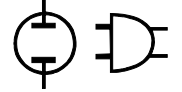
The Inphase Monitor Control board is operational only when the generator set is running. Transfer will occur when UTILITY and GENERATOR voltage and phase are comparatively equal with a maximum difference of 20° between the power sources. To assure precision matching control, minimum voltage and frequency ranges are specified by the operator. In addition, each inphase control is programmed with the use of an onboard DIP switch to match the actuation time of the corresponding switch. Inphase transfer is used only between two live power sources and NOT during a UTILITY source failure. The Inphase Monitor Control board (Figure 3.10) is designed to transfer loads under the following conditions:

- When generator set frequency is between 58-62 Hz (48-52 Hz for 50 Hz systems).
- When generator set and utility power source frequencies are within 2 Hz.
- When the generator set and utility source voltage are within 85-100 percent of normal voltage.
- When both power sources are able to come into phase within 10 seconds.
- When less than 10 seconds has elapsed since the engine warmup timer has indicated "go ahead."

If any one of the preceding conditions are not met within 30 seconds, the system will automatically revert to Time delay Neutral (if selected). If Time Delay Neutral is not selected, the switch will transfer immediately after failing to do an inphase transfer within the 30 second window.

◆ 3.15.1 ENGINE WARMUP TIMER

Permits the engine to warm up before transferring LOAD from NORMAL to STANDBY power. Reset timer to any time interval between 5 seconds and 3 minutes; factory set to about 1 minute.



◆ **3.15.2 ENGINE MINIMUM RUN TIMER**

Establishes the minimum length of time the generator must run before it can be shut down automatically. Timer prevents a cold engine from being shut down. It is factory set to about 20 minutes, but you can reset the interval between 5 and 30 minutes.

◆ **3.15.3 RETURN TO UTILITY TIMER**

Establishes time interval between restoration of NORMAL source voltage above the setting of the Voltage Pickup Sensor and re-transfer back to that source. This time interval is necessary, to prevent re-transfer that otherwise might occur as a result of transient voltages. Timer may be reset to any interval between 1 and 30 minutes; factory set to about 5 minutes.

◆ **3.15.4 ENGINE COOL DOWN TIMER**

Provides a time delay between automatic re-transfer back to the NORMAL source and engine shutdown. This permits internal engine-generator temperatures to stabilize at "no-load" prior to shutdown. Set timer between 1 and 30 minutes; factory set to about 10 minutes.

NOTE:

The actual time interval between re-transfer back to NORMAL and generator shutdown, is the time remaining on Engine Minimum Run timer or time setting of the Engine Cool Down Timer, whichever is longer.

◆ **3.15.5 STANDBY VOLTAGE SENSOR**

After engine starts automatically, the system does not transfer LOAD to STANDBY power source until generator AC output voltage has reached the setting of this sensor. Factory set to about 90% of the nominal rated voltage, but you can reset between 75% and 95% of the unit's rated voltage.

◆ **3.15.6 STANDBY FREQUENCY SENSOR**

This adjustment allows the installer or operator to select the minimum required frequency of the standby power source. It is adjustable between 80-90%. Factory set to 90%.

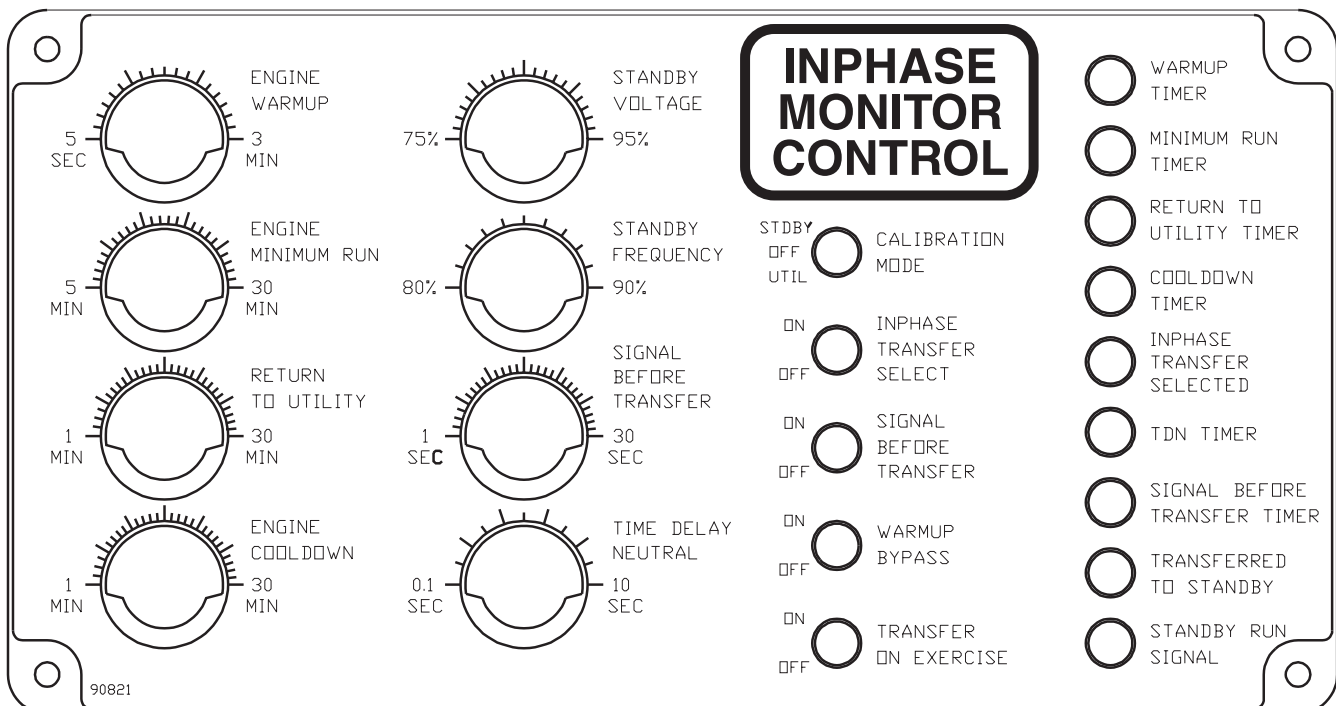
◆ **3.15.7 SIGNAL BEFORE TRANSFER TIMER**

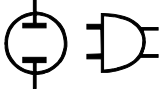
If you select this function, this timer will control the amount of time signal remains active. Timer is adjustable from 1 to 30 seconds; factory set to about 10 seconds.

NOTE:

The "Signal Before Transfer" feature provides a time delay that allows elevators to continue operating before transfer to another power supply occurs.

Figure 3.10 — Inphase Monitor Control Panel





◆ 3.15.8 TIME DELAY NEUTRAL

This timer holds the transfer mechanisms main contacts in the “Neutral” position for the time you have selected. “Neutral” is the main contacts position where the LOAD is disconnected from both UTILITY and STANDBY power supplies. Timer is adjustable from 0.1 and 10 seconds; factory set to about 5 seconds.

◆ 3.15.9 CALIBRATION MODE SWITCH

This switch has three positions, identified as “STDBY”, “OFF” and “UTIL”. The switch allows the installer or operator to calibrate the circuit board to the existing generator set output voltage and to the existing UTILITY power source voltage. The board must be calibrated to both power source voltages in order to initiate transfer and re-transfer at the correct voltages. To calibrate the circuit board to the correct voltage, see “Calibrating the Circuit Board.”

◆ 3.15.10 INPHASE TRANSFER SELECT SWITCH

This switch allows the operator or installer to select either “Inphase Transfer” or “Time Delay Neutral” operation. The switch may be positioned as follows:

- Switch at ON: Inphase transfer operation is selected.
- Switch at OFF: Time Delay Neutral is activated if selected.

◆ 3.15.11 SIGNAL BEFORE TRANSFER SWITCH

This switch allows the operator or installer to select the “Signal Before Transfer” feature or to turn OFF the feature. To activate the feature, set the switch to ON. To turn off the feature, set the switch to OFF.

◆ 3.15.12 ENGINE WARMUP TIMER BYPASS SWITCH

To bypass Engine Warmup Timer and transfer as soon as generator voltage and frequency have reached the setting of the Standby Voltage and Frequency Sensors, set switch to ON. To place engine warmup Timer back into the automatic operating system, set the switch to OFF.

◆ 3.15.13 TRANSFER ON EXERCISE SWITCH

For transferring LOAD to the STANDBY source during the 7-day exercise cycle, set switch to ON. For no transfer during the exercise, set switch to OFF.

◆ 3.15.14 ADVISORY LAMPS

The advisory lamps on the Inphase Control board consist of 9 LED’s (light emitting diodes) and include the following:

- The four red timer lamps will turn ON when their respective timers are activated.

- The “Inphase Transfer Selected” lamp goes ON when Inphase Transfer Select switch is set to ON, indicating the system will operate in its “Inphase” mode (and NOT in Time Delay Neutral mode).
- The Time Delay Neutral (TDN) Timer lamp will turn ON when the TDN timer is running.
- The Signal Before Transfer Timer lamp will turn ON for the duration of the Signal Before Transfer Timer, when it is turned ON.
- Transfer to Standby Lamp goes ON when LOAD has been transferred to STANDBY power source.
- Standby run Signal will go ON when the generator is running and the Inphase Monitor Control circuit board is operational and controlling the generator.

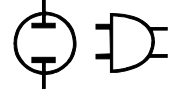
3.16 CALIBRATING THE INPHASE MONITOR CONTROL CIRCUIT BOARD

The Inphase Monitor circuit board must be calibrated to existing STANDBY and UTILITY source voltages if the system is to operate properly. To calibrate the circuit board, two adjustment potentiometers (R102 and R107) are provided in the lower left corner of the circuit board (Figure 3.11). The board must be calibrated as follows:

1. Check that UTILITY supply voltage is available to the system.
2. Start the generator, let it stabilize and warm up.
3. Set the Calibration Mode Switch to “STDBY” and observe the four top LED’s on the circuit board (Warmup Timer, Minimum Run Timer, Return to Utility Timer and Cool down Timer). These are the RED lamps.
 - If the two upper LED’s are illuminated, calibration is set too low.
 - If the two bottom LED’s are illuminated, calibration is set too high.
4. On the circuit board, adjust potentiometer R102 until only the two center LED’s are illuminated (Minimum Run and Return to Utility timers).
5. Now, set the Calibration Mode switch to “UTIL” and observe the four upper LED’s on the circuit board.
6. Adjust potentiometer R107 until only two center LED’s are illuminated (Minimum Run and Return to Utility).
7. Set the Calibration Mode Switch to “OFF”. The Inphase Monitor Control board is calibrated.

NOTE:

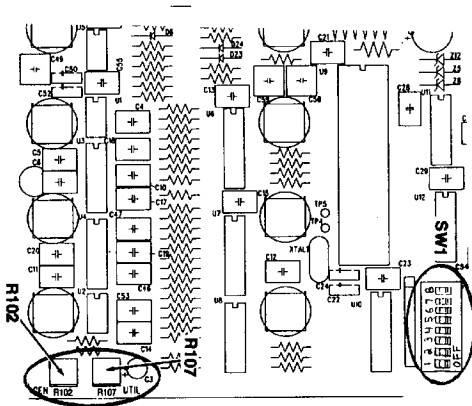
With the Calibration Mode Switch set to “STDBY” or “UTIL”, the four top LED’s should turn ON in sequence. That is, the lights should sweep on and off, from one light to the next. Calibration is obtained when the two center lamps of the four (Minimum Run and Return to Utility) are illuminated. This establishes 100% rated voltage.



NOTE:

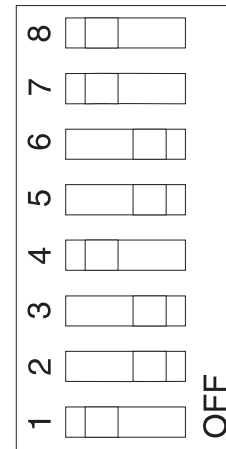
The Inphase Monitor Control circuit board should be calibrated when the transfer switch has been installed as part of an operating system. Also, replacement circuit boards must be calibrated.

Figure 3.11 — Inphase Monitor Control Circuit Board



The individual switches on SW1 are numbered from "1" (bottom) through "8" (top), as shown in figures 3.11 and 3.12. To make the circuit board compatible to the specific transfer switch assembly, set the switches as indicated in the chart below. Improper settings may cause transfer outside the 20-degree specification.

Figure 3.12 — Circuit Board Switch SW1



3.17 CIRCUIT BOARD SWITCH SW1

On the Inphase Monitor Control Board, a switch assembly consisting of a bank of eight miniature switches is identified as "SW1" is usually set up at the factory and should require no additional configuring (Figure 3.12).

NOTE:

On boards not installed at the factory, SW1 must be set by the installer. SW1 must be set to match the type of transfer switch in which the board is installed.

3.18 ADJUSTMENTS ON 7-DAY EXERCISER CIRCUIT BOARD

◆ 3.18.1 SET EXERCISE DAY AND TIME OF DAY

On the day and at the time of day you want the system to start and exercise, press the GENERATOR EXERCISE switch and hold it there for about 15 seconds. The generator will start and exercise 7 days later at the selected time of day.

DIP Switch Settings - Y-Type Transfer Switches

TRANSFER SWITCH	SWITCH RATED 208								SWITCH RATED 240							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
105 amps, 2-pole (63302)	*	on	off	on	on	off	on	off	*	on	off	on	on	on	on	off
105 amps, 3-pole (62642)	*	on	off	on	off	on	on	on	*	on	off	on	on	off	on	on
105 amps, 4-pole (63597)	*	on	off	on	off	off	on	off	*	on	off	on	off	on	on	off
150 amps, 2 pole (63312)	*	on	off	on	on	off	off	on	*	on	off	on	on	on	off	off
150 amps, 3-pole (62643)	*	on	off	on	off	on	off	on	*	on	off	on	on	off	on	off
150 amps, 4-pole (63599)	*	on	off	on	off	off	off	off	*	on	off	on	off	on	off	off
200 amps, 2-pole (62677)	*	on	off	on	off	off	on	off	*	on	off	on	off	on	on	off
200 amps, 3-pole (64198)	*	on	off	off	on	on	off	on	*	on	off	on	off	off	on	on
200 amps, 4-pole (63598)	*	on	off	on	off	off	on	on	*	on	off	on	on	off	off	on
300 amps, 2-pole (62645)	*	on	off	on	off	on	off	off	*	on	off	on	off	on	on	on
300 amps, 3-pole (62646)	*	on	off	on	off	on	on	on	*	on	off	on	on	on	off	off
300 amps, 4-pole (64100)	*	on	off	on	off	on	on	on	*	on	off	on	on	on	off	off
420 amps, 2-pole (62647)	*	on	off	on	off	on	off	off	*	on	off	on	off	on	on	on
420 amps, 3-pole (62648)	*	on	off	off	on	on	on	off	*	on	off	on	off	off	on	on
420 amps, 4-pole (64344)	*	on	off	on	off	off	on	off	*	on	off	on	on	off	off	on

* Set Switch 1 to OFF for 60 Hz systems; set Switch to ON for 50 Hz systems

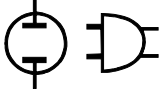
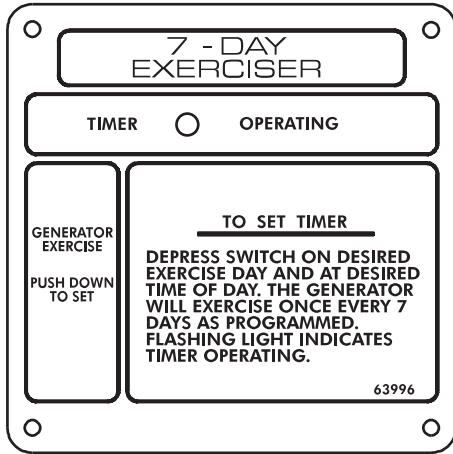


Figure 3.13 — 7-Day Exerciser

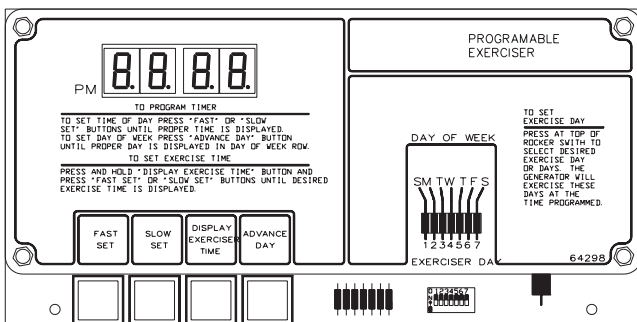


3.19 OPTIONAL DELUXE EXERCISE CIRCUIT BOARD SETTINGS

Always adjust the board in the exact order given (Figure 3.14).

1. Set Actual Day of Week: Locate the switch above which appears the words "ADVANCE DAY". Press this Advance Day switch while watching the lighted DAY OF WEEK indicator. That indicator advances one day each time you press the switch. You can stop when the actual current day of the week is displayed.
2. Set Actual Time of Day: Hold FAST SET switch down while watching the lighted chronograph at left side of circuit board. When close to actual current time of day, release the FAST SET switch. Then, use the SLOW SET switch to complete adjustment of actual time of day.

Figure 3.14 — Deluxe 7-Day Exerciser



3. Select Dat (or Days) of Exercise: A bank of eight miniature rocker switches is provided at right side of circuit board. Switches 1 through 7 correspond to days of the week (Sunday through Saturday respectively). Switch 8 is not used. To select a day of the week for system exercise, move the correct numbered switch to its ON position. A lighted band appears next to that day. In this manner, the system can be set to exercise one, two or more days each week.
4. Select Exercise Time of Day: Push down on switch below the words DISPLAY EXERCISE TIME. While holding that switch down, press FAST SET and SLOW SET switches until the time you want is displayed. A red dot next to the letters "PM" indicates p.m. times.

3.20 CALIBRATE UTILITY VOLTAGE SENSING CIRCUIT BOARD

The utility sensing interface reduces utility source voltage at a fixed ratio. Thus, if utility voltage varies from the nominal, sensing voltage to the circuit board also varies. For that reason, you may need to calibrate the circuit board to match the system.



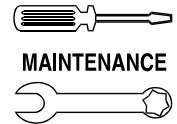
The installed transfer switch must be rated at a voltage and phase that is compatible with the utility and standby power supplies. DO NOT attempt to calibrate any utility voltage sensor board on any non-compatible unit trying to make the unit compatible.

Once the circuit board has been properly calibrated, the voltage that was present during calibration establishes 100 percent utility voltage for "pickup" and "dropout" settings. Utility source voltage must be available to the transfer switch during calibration.

NOTE:

You must also use this procedure to calibrate a replacement circuit board. Follow these instructions:

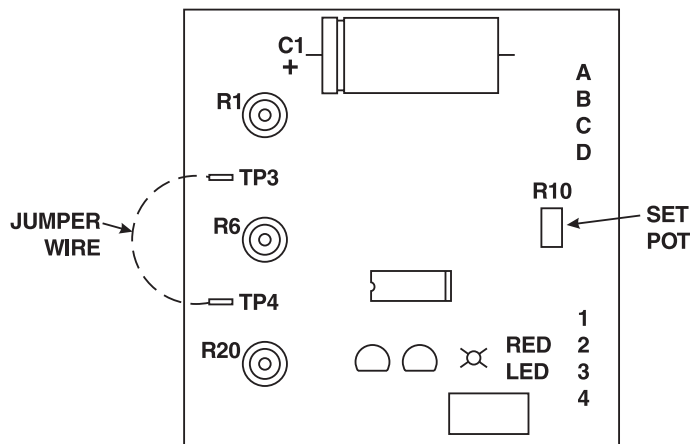
1. In the transfer switch enclosure, set the Safety Disconnect Switch to "Manual".
2. On the Utility Voltage Sensor circuit board, locate test points "TP3" and "TP4" and install a jumper lead.
3. Locate the small potentiometer "R10". Turn the potentiometer fully counterclockwise.
4. Now, turn the "R10" potentiometer SLOWLY clockwise until the "Utility On" light emitting diode (LED) just turns ON.
5. Remove the jumper wire from "TP3" and "TP4".
6. Reset the Maintenance Disconnect switch to AUTOMATIC.



RESULTS:

- If the “Utility On” LED does NOT go on as described above, replace the utility voltage sensor board. Calibrate the new board and perform a “Normal Test” of the system.
- If the “Utility On” LED goes ON, discontinue the test.

Figure 3.15 — Utility Voltage Sensing Circuit Board



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 7-DAY EXERCISER

On each transfer action, the LOAD will be disconnected from both power sources for a brief interval. During such brief intervals, the exercise timer is powered by the 9 volt battery. However, the timer will not advance during the transfer. For that reason, it may be necessary to reset the exercise timer periodically.

4.4 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.



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 bus-bars).
 - 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)

4.5 MAIN CURRENT CARRYING CONTACTS

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

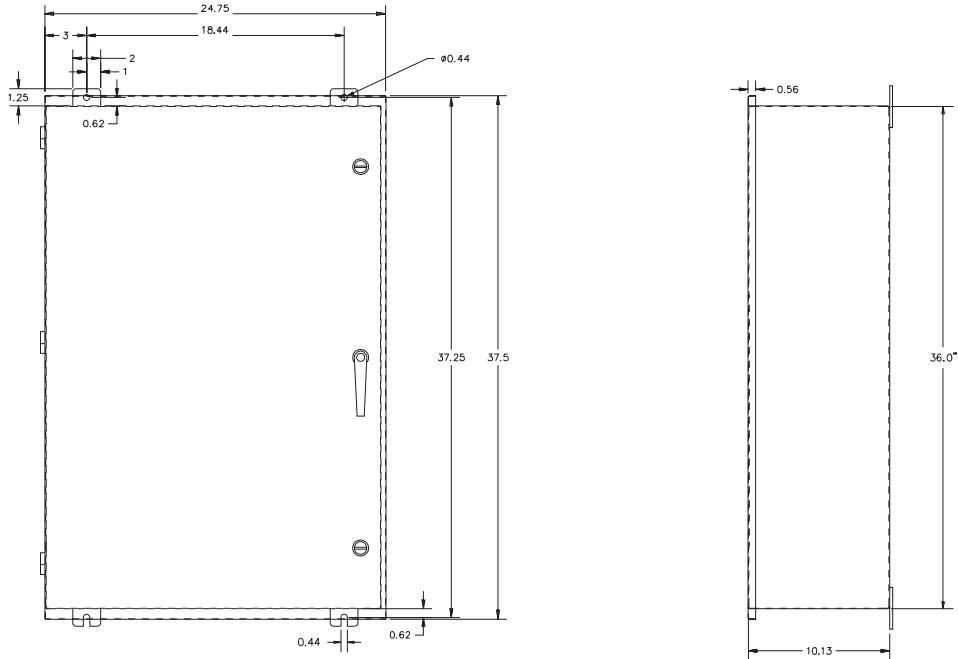
4.6 NINE-VOLT BATTERY

The transfer switch is equipped with an adjustable Inphase Monitor Control circuit board. The battery connects to a separate 7-day exerciser circuit board. Battery power for Exercise Timer operation is only needed during the short time interval when the transfer mechanism main contacts are at NEUTRAL position (LOAD disconnected from both power sources). It is recommended that the 9 volt battery be replaced once each year.

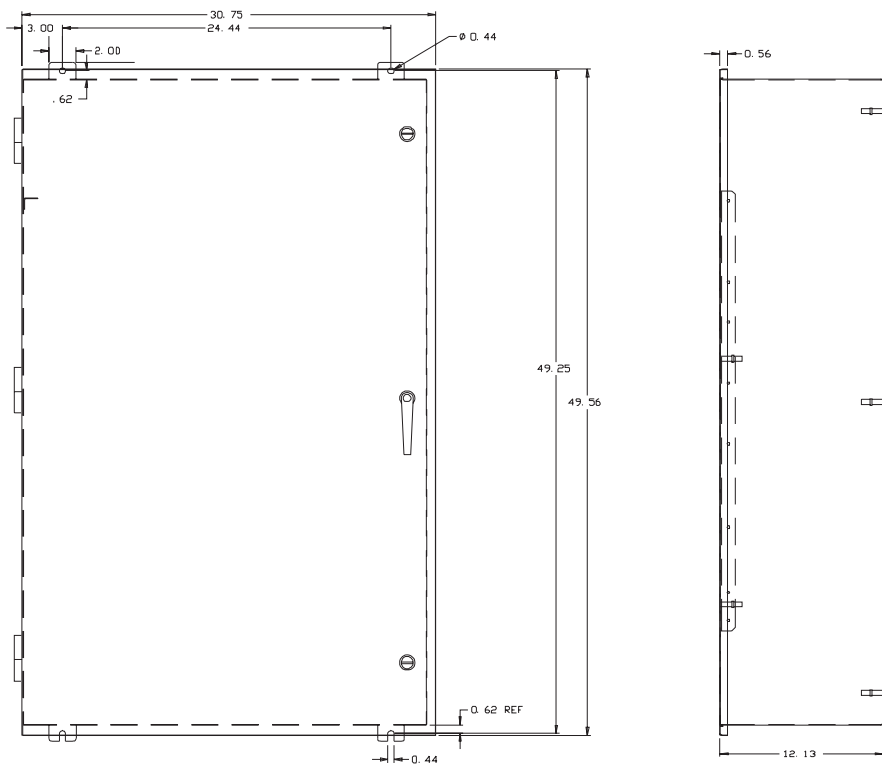


Section 6 – Mounting Dimensions
Generac GTS "Y" Type Transfer Switch

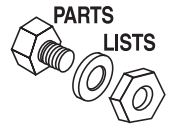
100-150 Amp NEMA 1 Units



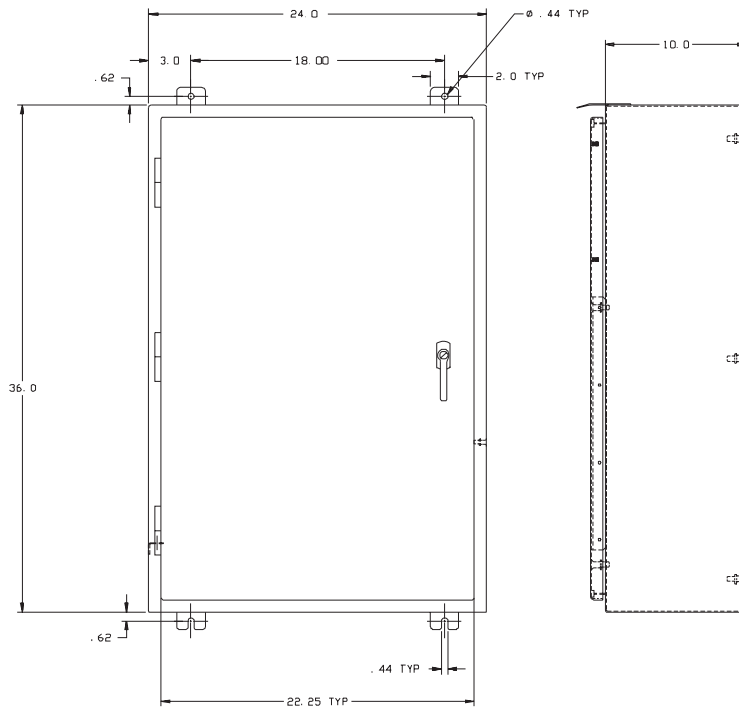
200-400 Amp NEMA 1 Units



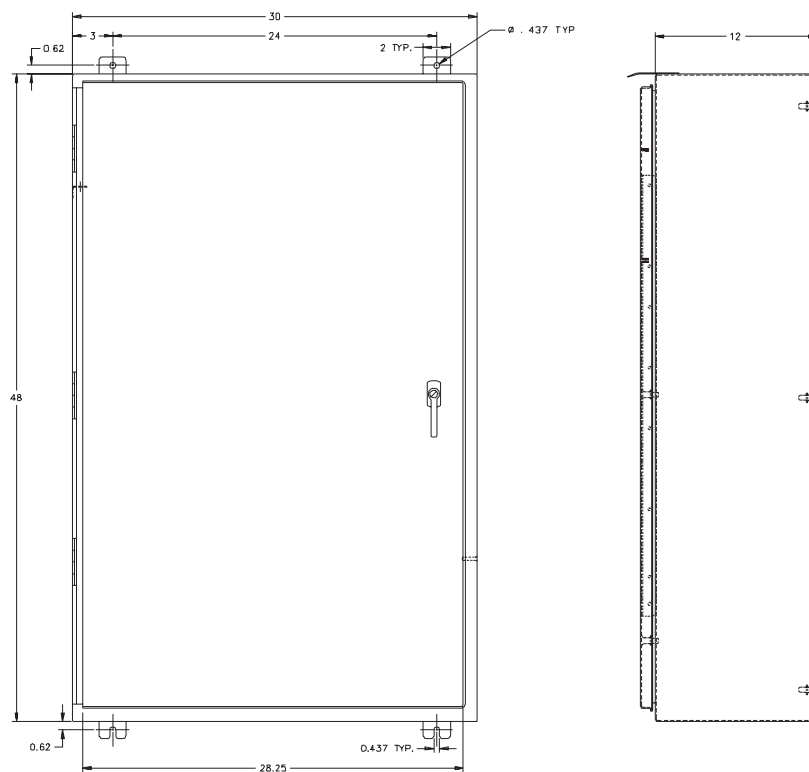
Section 6 – Mounting Dimensions
Generac GTS "Y" Type Transfer Switch

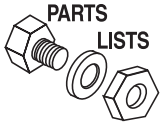


100-150 Amp NEMA 12, 3R, 4, and 4X Units (Typical)



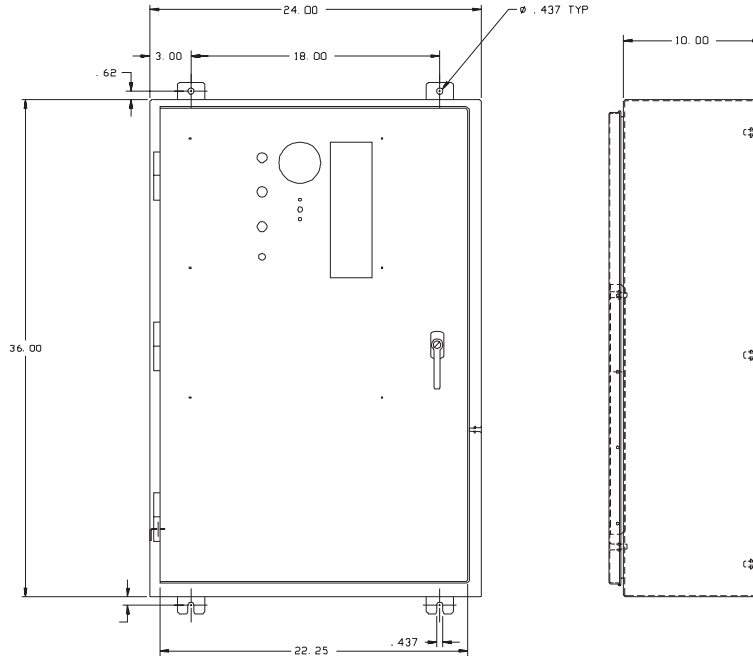
200-400 Amp NEMA 12, 3R, 4 and 4X Units (Typical)



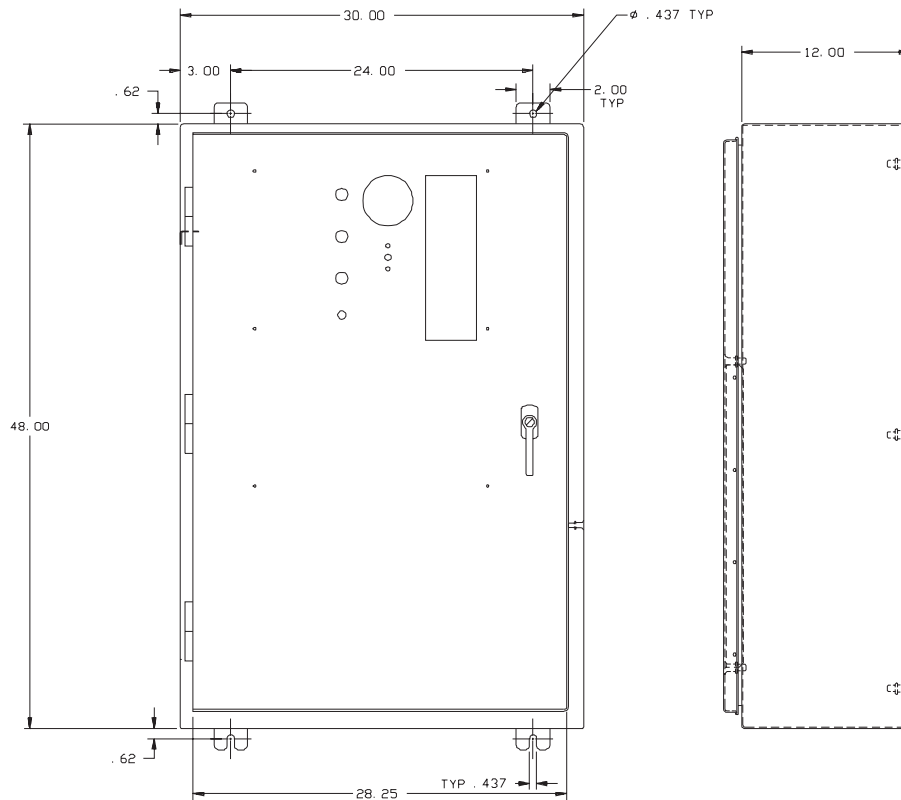


Section 6 – Mounting Dimensions
Generac GTS “Y” Type Transfer Switch

100-150 Amp NEMA 12 Units With Instrument Package



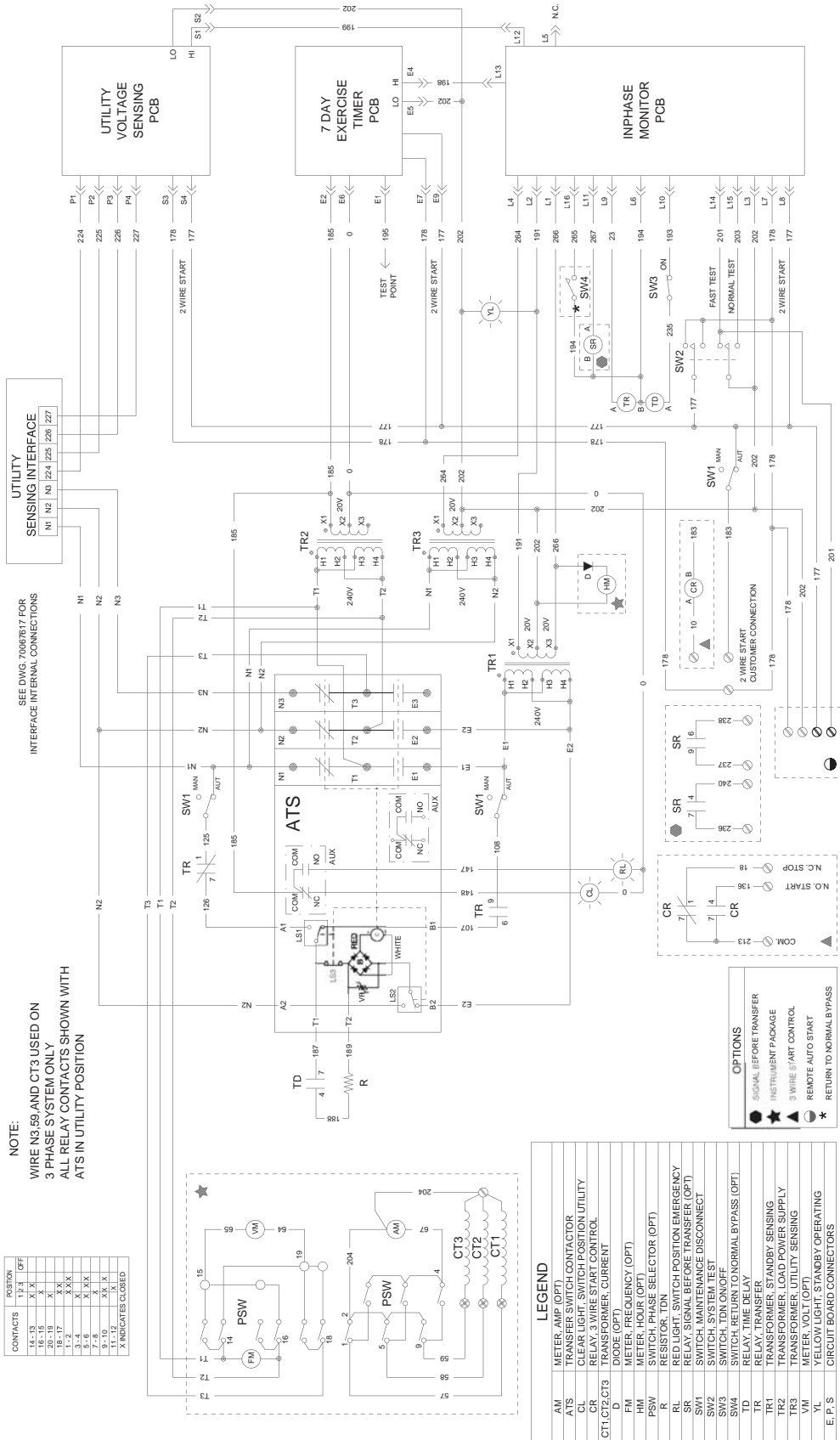
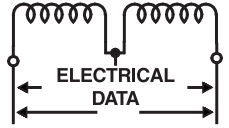
200-400 Amp NEMA 12 Units With Instrument Package



Section 7 – Electrical Schematics and Wiring Diagrams

Generac GTS "Y" Type Transfer Switch

Electrical Schematic - 240V Transfer Switch - Drawing No. 91286

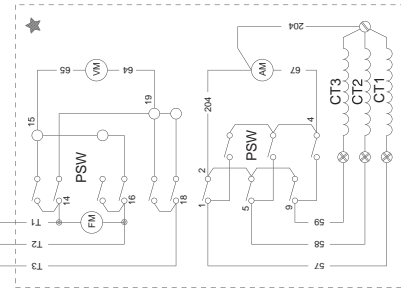


UTILITY SENSING INTERFACE

SEE DWG. 70007617 FOR INTERFACE INTERNAL CONNECTIONS

NOTE:
 WIRE N3, S9 AND CT3 USED ON 3 PHASE SYSTEM ONLY
 ALL RELAY CONTACTS SHOWN WITH ATS IN UTILITY POSITION

CONTRACTS	POSITION
12-1	OFF
16-15	X1
18-17	X2
20-19	X3
15-17	X4
3-4	X1
5-6	X2
7-8	X3
9-10	X4
11-12	X5
13-14	X6
15-16	X7
17-18	X8
19-20	X9
21-22	X10
23-24	X11
25-26	X12
27-28	X13
29-30	X14
31-32	X15
33-34	X16
35-36	X17
37-38	X18
39-40	X19
41-42	X20
43-44	X21
45-46	X22
47-48	X23
49-50	X24
51-52	X25
53-54	X26
55-56	X27
57-58	X28
59-60	X29
61-62	X30
63-64	X31
65-66	X32
67-68	X33
69-70	X34
71-72	X35
73-74	X36
75-76	X37
77-78	X38
79-80	X39
81-82	X40
83-84	X41
85-86	X42
87-88	X43
89-90	X44
91-92	X45
93-94	X46
95-96	X47
97-98	X48
99-100	X49
101-102	X50
103-104	X51
105-106	X52
107-108	X53
109-110	X54
111-112	X55
113-114	X56
115-116	X57
117-118	X58
119-120	X59
121-122	X60
123-124	X61
125-126	X62
127-128	X63
129-130	X64
131-132	X65
133-134	X66
135-136	X67
137-138	X68
139-140	X69
141-142	X70
143-144	X71
145-146	X72
147-148	X73
149-150	X74
151-152	X75
153-154	X76
155-156	X77
157-158	X78
159-160	X79
161-162	X80
163-164	X81
165-166	X82
167-168	X83
169-170	X84
171-172	X85
173-174	X86
175-176	X87
177-178	X88
179-180	X89
181-182	X90
183-184	X91
185-186	X92
187-188	X93
189-190	X94
191-192	X95
193-194	X96
195-196	X97
197-198	X98
199-200	X99
201-202	X100



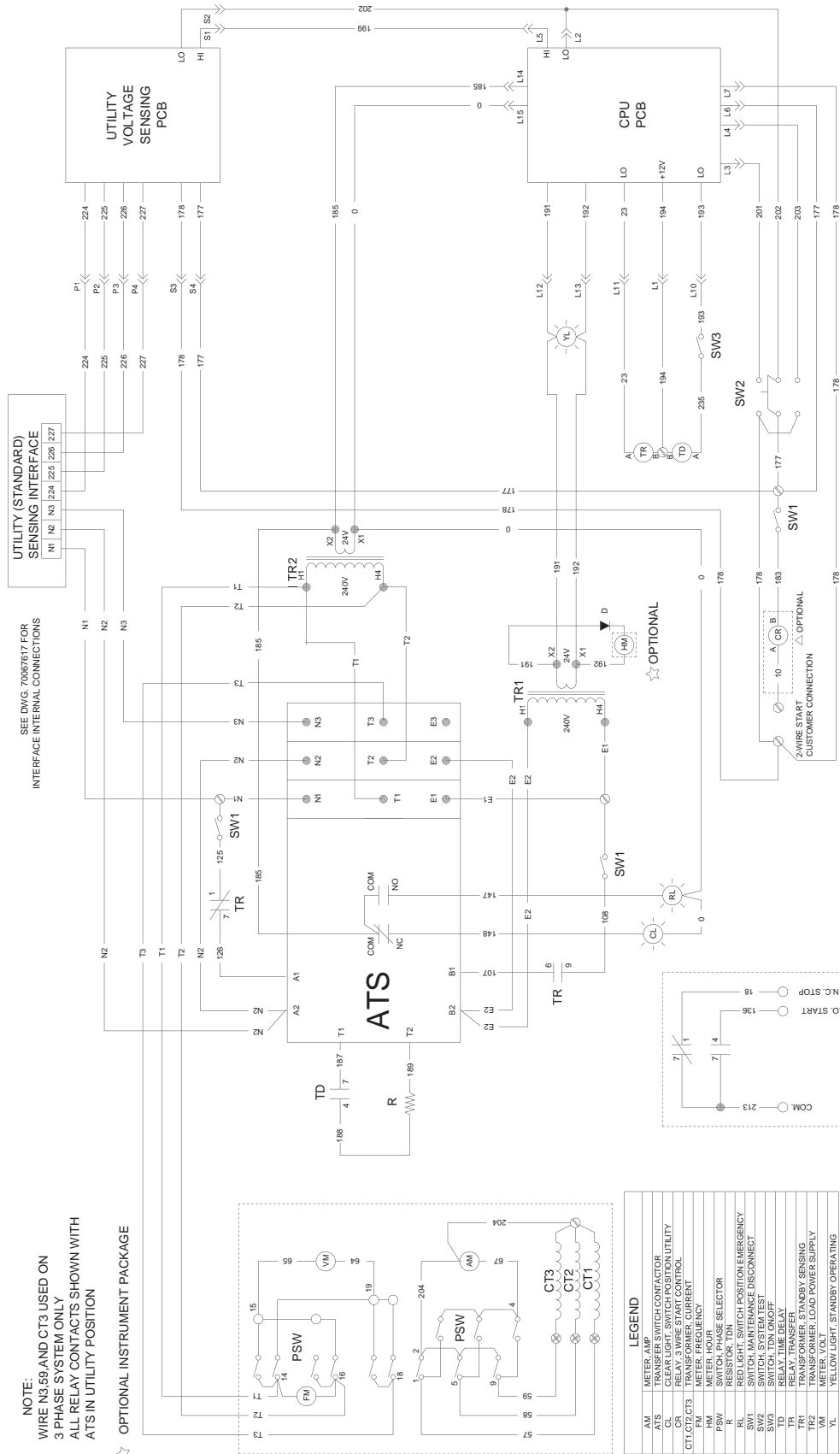
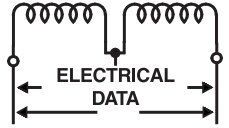
LEGEND	
AM	METER, AMP (OPT)
ATS	TRANSFER SWITCH CONTACTOR
CL	CLEAR LIGHT, SWITCH POSITION UTILITY
CR	RELAY, 3 WIRE START CONTROL
CT1, CT2, CT3	TRANSFORMER, CURRENT
D	DIODE (OPT)
H	HEATER, EMERGENCY (OPT)
HW	METER, HOUR (OPT)
PSW	SWITCH, PHASE SELECTOR (OPT)
R	RESISTOR, TON
RL	RED LIGHT, SWITCH POSITION EMERGENCY
SR	RELAY, SIGNAL BEFORE TRANSFER (OPT)
SW1	SWITCH, MAINTENANCE DISCONNECT
SW2	SWITCH, SYSTEM TEST
SW3	SWITCH, RETURN TO NORMAL BYPASS (OPT)
SW4	SWITCH, TIME DELAY
TR	RELAY, TRANSFER
TR1	TRANSFORMER, STANDBY SENSING
TR2	TRANSFORMER, LOAD POWER SUPPLY
TR3	TRANSFORMER, UTILITY SENSING
VI	METER, VOLT (OPT)
VO	METER, VOLT, STANDBY OPERATING
E.P.S	CIRCUIT BOARD CONNECTORS

OPTIONS	
●	SIGNAL BEFORE TRANSFER
★	INSTRUMENT PACKAGE
▲	3 WIRE START CONTROL
○	REMOTE AUTO START
*	RETURN TO NORMAL BYPASS

Section 7 – Electrical Schematics and Wiring Diagrams

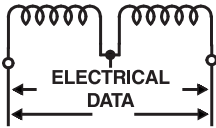
Generac GTS "Y" Type Transfer Switch

Electrical Schematic - 240V Transfer Switch - Drawing No. 75017



NOTE:
 WIRE N3, S9 AND CT3 USED ON
 3 PHASE SYSTEM ONLY
 ALL RELAY CONTACTS SHOWN WITH
 ATS IN UTILITY POSITION

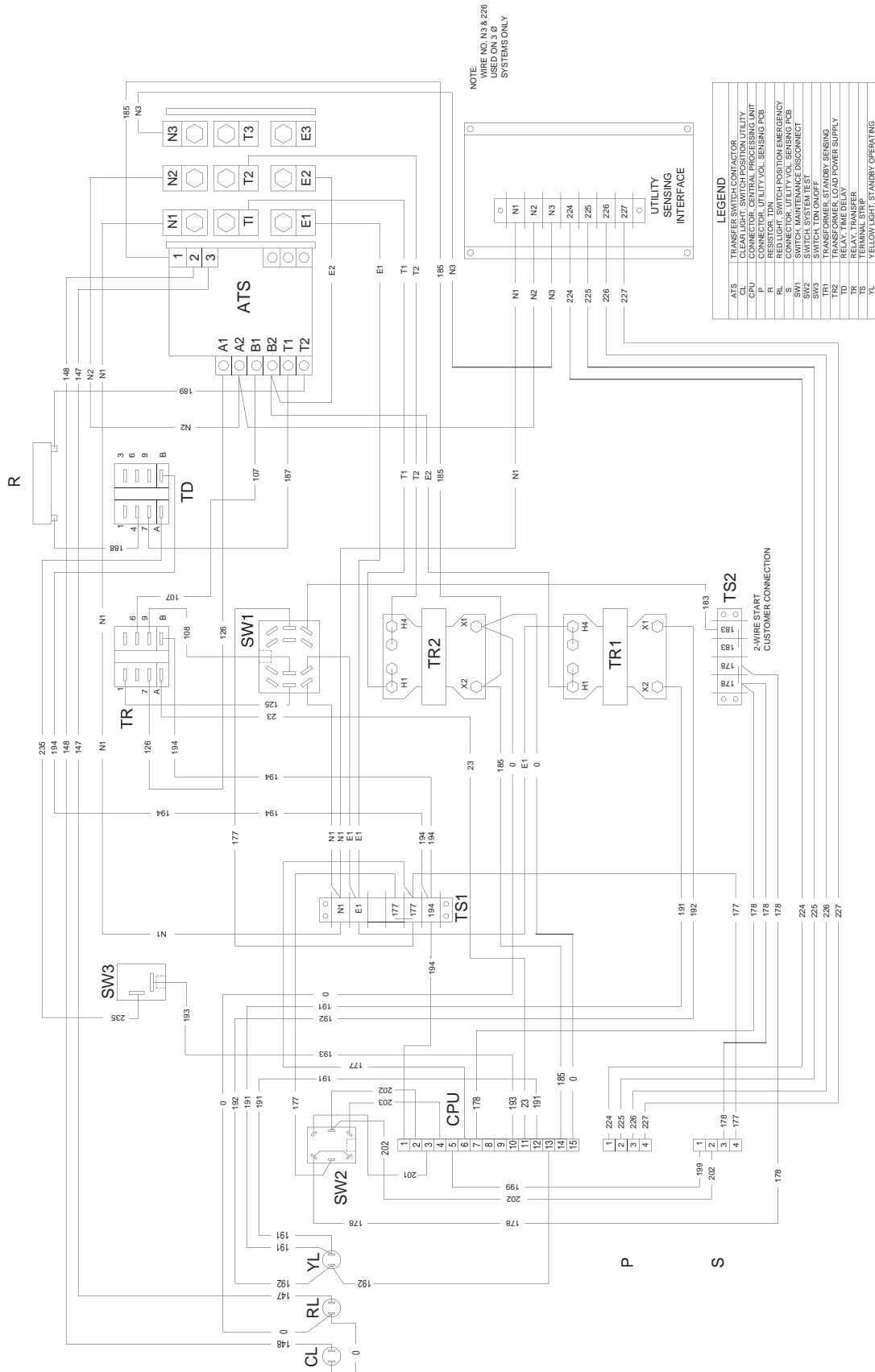
LEGEND	
AM	METER, AMP
ATS	TRANSFER SWITCH CONTACTOR
CL	CLEAR LIGHT, SWITCH POSITION UTILITY
CR	RELAY, 3 WIRE START CONTROL
CT1, CT2, CT3	TRANSFORMER, CURRENT
FM	METER, FREQUENCY
HM	METER, HOUR
PSW	SWITCH, PHASE SELECTOR
RL	RELAY, TIME DELAY
SW1	SWITCH, POSITION EMERGENCY
SW2	SWITCH, MAINTENANCE DISCONNECT
SW3	SWITCH, SYSTEM TEST
TD	RELAY, TIME DELAY
TR	RELAY, TRANSFER
TR1	TRANSFORMER, STANDBY SENSING
TR2	TRANSFORMER, LOAD POWER SUPPLY
VM	METER, VOLT
YL	YELLOW LIGHT, STANDBY OPERATING



Section 7 – Electrical Schematics and Wiring Diagrams

Generac GTS "Y" Type Transfer Switch

Wiring Diagram - 2105-420A Transfer Switch - Drawing No. 74699



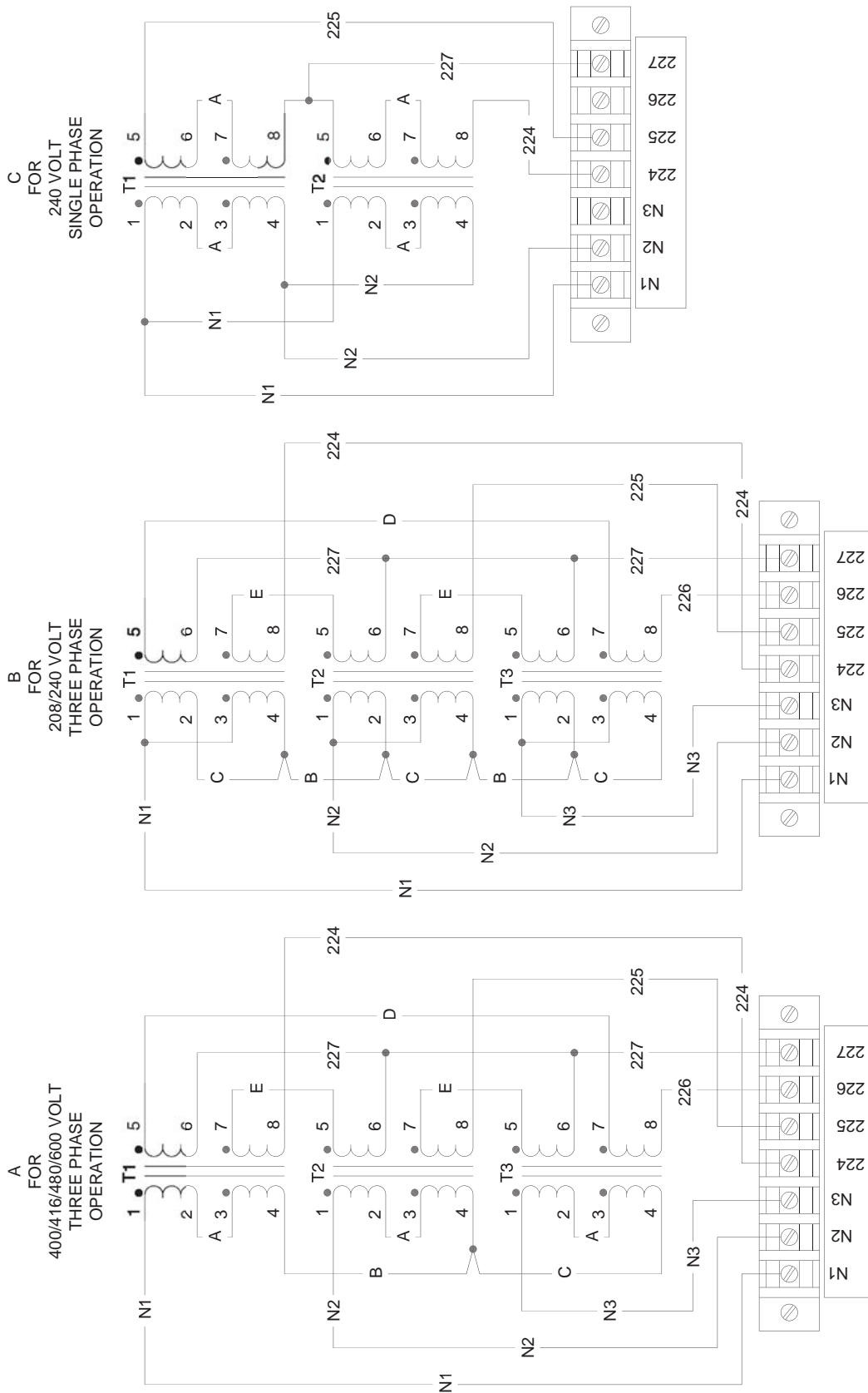
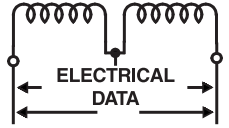
NOTE:
WIRE NO. N3 & 226
APPLY ONLY TO
SYSTEMS ONLY

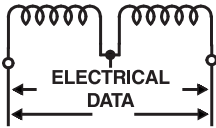
LEGEND	
ATS	TRANSFER SWITCH CONTACTOR
CL	CLEAR LIGHT, SWITCH POSITION UTILITY
CU	CUSTOMER UTILITY
P	CONNECTOR, UTILITY VOL. SENSING PCB
R	RESISTOR, 10K
RL	RED LIGHT, SWITCH POSITION EMERGENCY
SL	RED LIGHT, SWITCH POSITION STANDBY
SW1	SWITCH, MAINTENANCE DISCONNECT
SW2	SWITCH, SYSTEM TEST
SW3	SWITCH, TRANSFORMER STANDBY SENSING
TR1	TRANSFORMER, LOAD POWER SUPPLY
TR2	TRANSFORMER, STANDBY SENSING
TD	RELAY, TIME DELAY
TS	TERMINAL STRIP
YL	YELLOW LIGHT, STANDBY OPERATING

Section 7 – Electrical Schematics and Wiring Diagrams

Generac GTS "Y" Type Transfer Switch

Electrical Schematic - Utility Interface - Drawing No. 700-67617-B





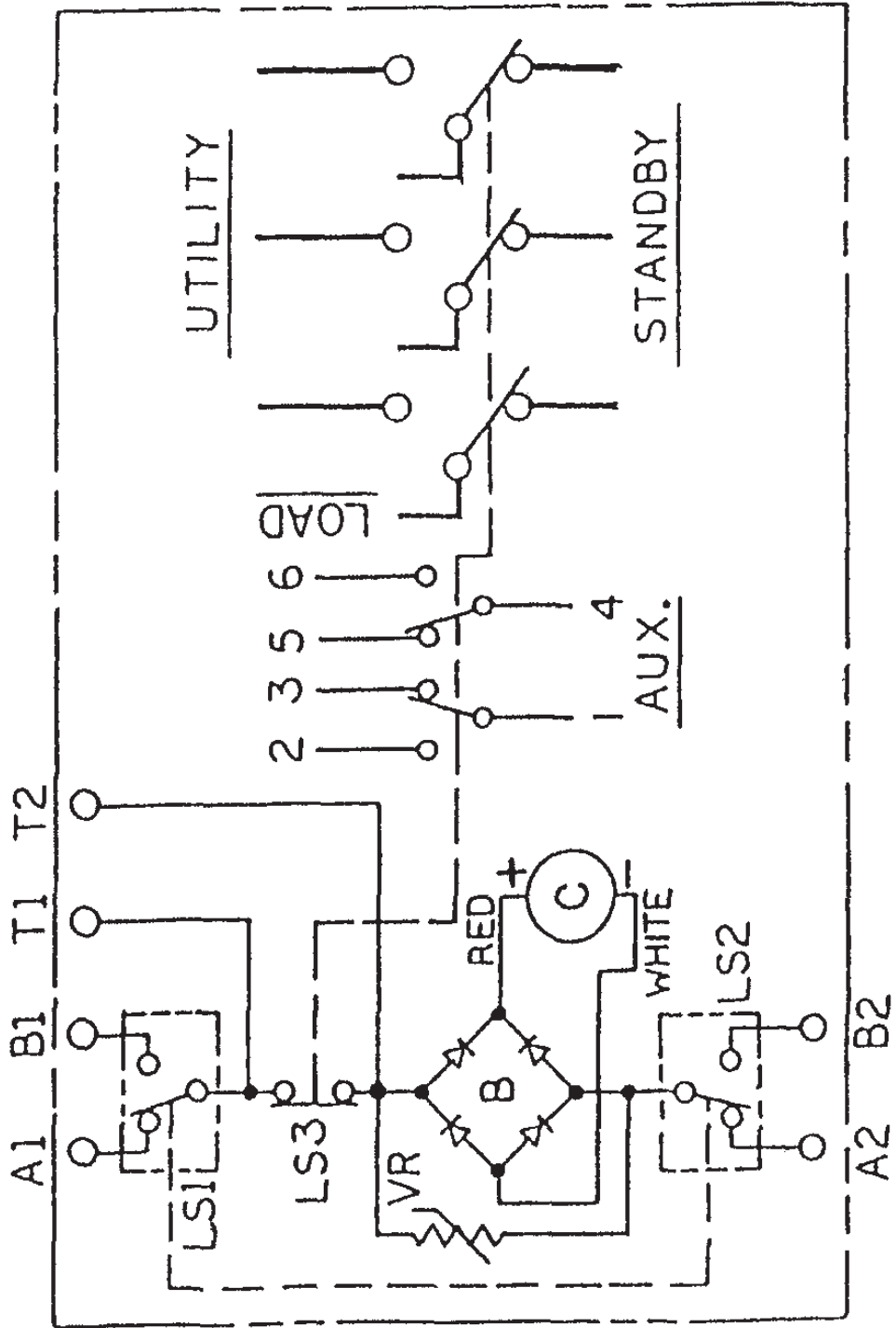
Section 7 – Electrical Schematics and Wiring Diagrams

Generac GTS "Y" Type Transfer Switch

Electrical Schematic - Drawing No. 63373

Legend

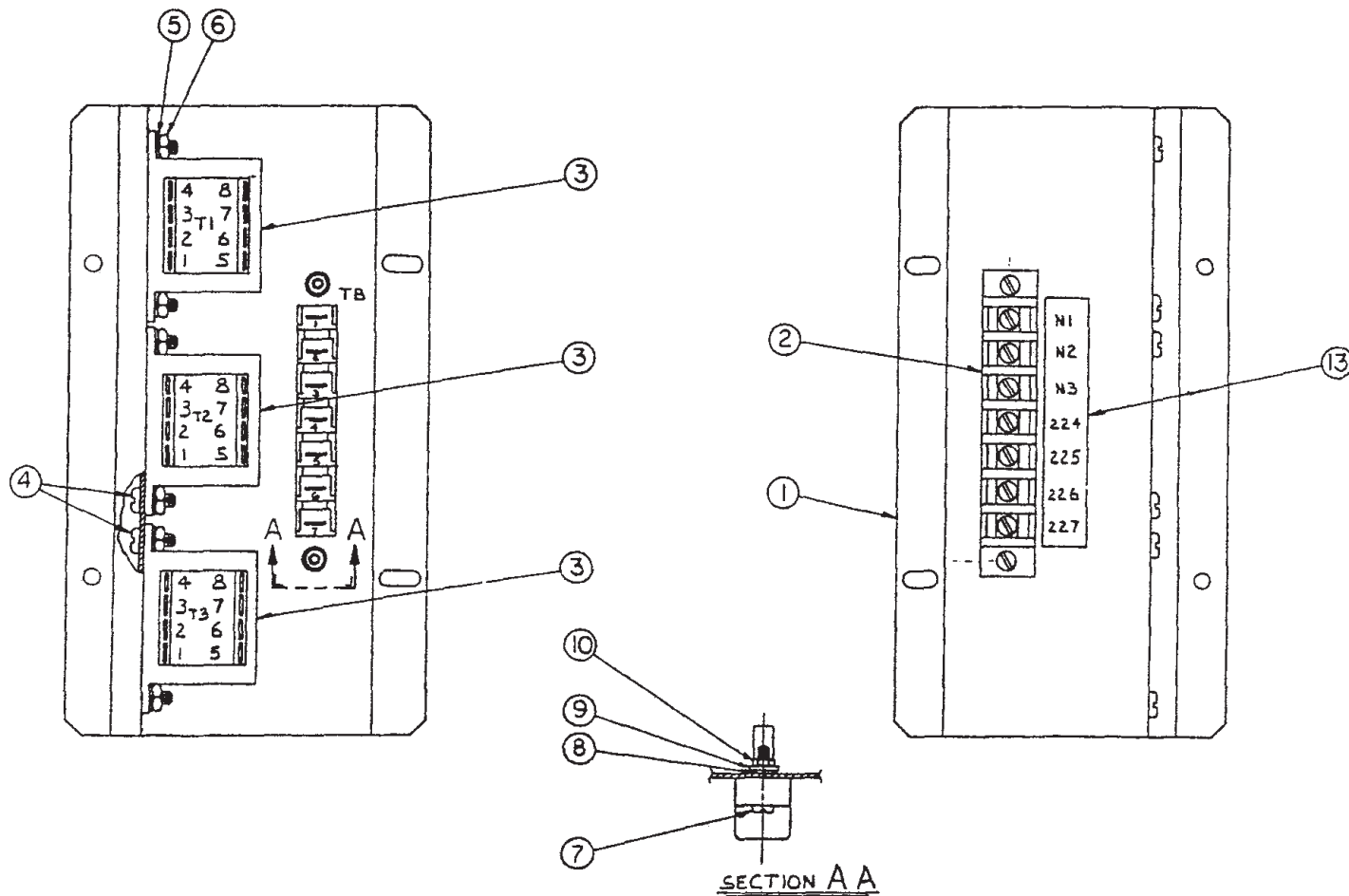
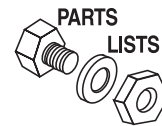
- B = Bridge Rectifier
- C = Solenoid Coil
- LS1, LS2 = Limit Switch (Switch Operation)
- LS3 = Limit Switch (Neutral Position)
- VR = Varistor



Section 8 – Exploded Views & Parts Lists

Generac GTS "Y" Type Transfer Switch

Interface Assembly - Drawing No. 67617



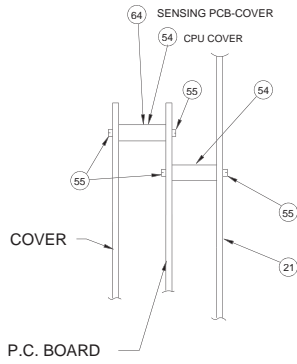
ITEM PART NO. QTY. DESCRIPTION

1	20A67621	1	BRACKET, TRANSFORMER MOUNTING
2	20A67615	1	BLOCK, TERMINAL
3	20A67614	3	TRANSFORMER, DUAL
4	33514	6	SCREW, PAN HEAD MACHINE - NO. 8-32 X 1/2"
5	22264	6	LOCKWASHER, NO. 8
6	22471	6	NUT, HEX - NO. 8-32
7	33502	2	SCREW, PAN HEAD MACHINE - NO. 6-32 X 3.4"
8	22155	2	LOCKWASHER, NO.6
9	22985	2	FLATWASHER, NO.6
10	22188	2	NUT, HEX - NO. 6-32
12	55199-A	6 FT.	WIRE, INSULATED - NO 18 AWG. (TEW)
13	20A67931	1	DECAL, INTERFACE

Section 8 – Exploded Views & Parts Lists

Generac GTS "Y" Type Transfer Switch

105-420A Assembly - Drawing No. 75000-C



P.C. BOARD INSTALLATION

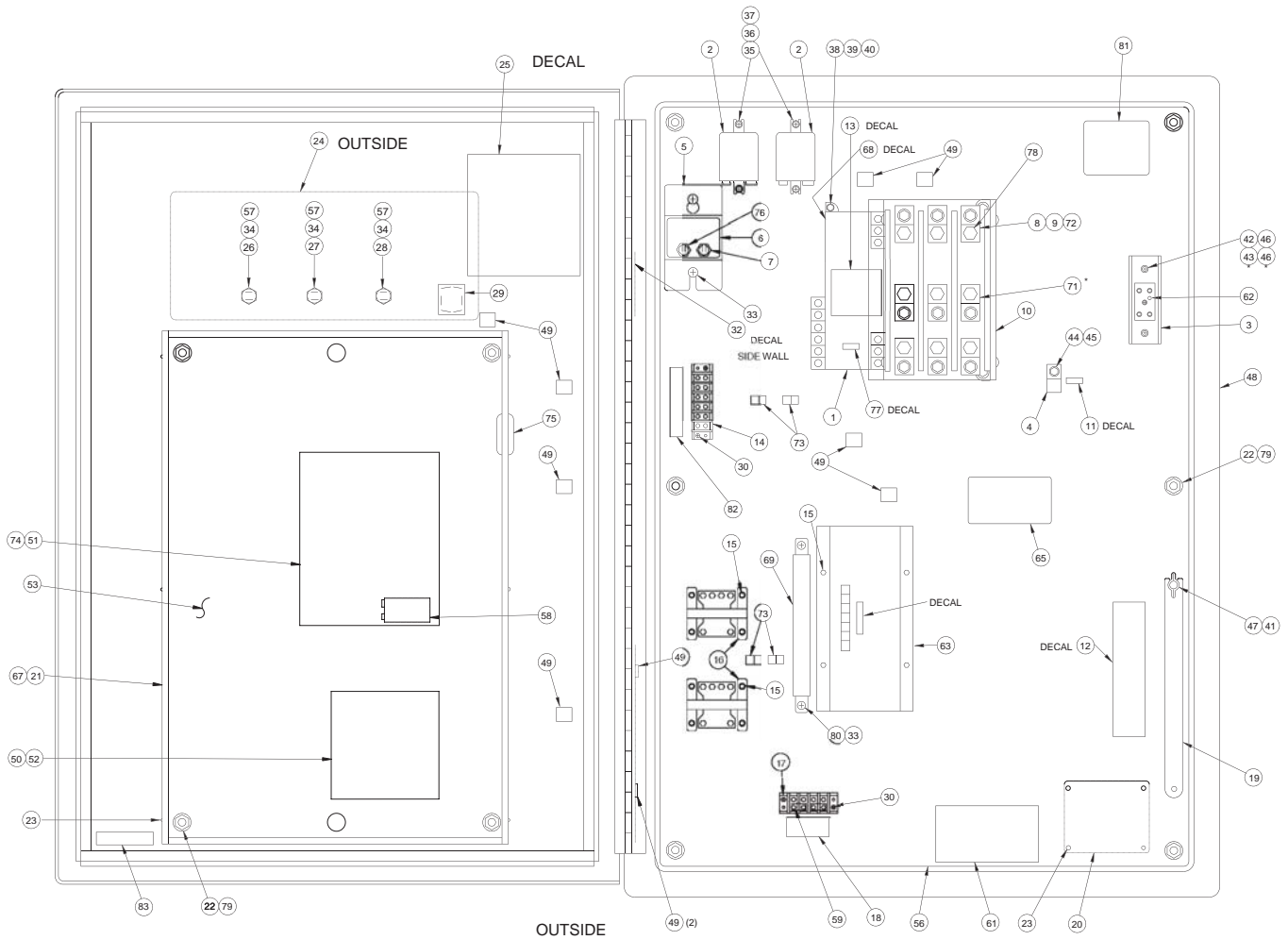
TYPICAL

LUG TO SWITCH STUD TORQUE SPEC.

OUTSIDE LUGS 110-115 IN-LB

INSIDE LUGS 80-85 IN-LB

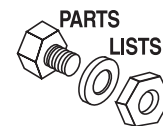
* 200,300,420 AMP 3-POLE SWITCH



Section 8 — Exploded Views & Parts Lists

Generac GTS "Y" Type Transfer Switch

105-420A Assembly - Drawing No. 75000-C

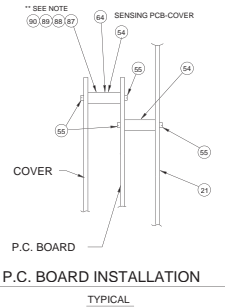


ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	63302	1	TRANSFER SWITCH-105A, 2-POLE	40	22097	3	M6 LOCK WASHER
	62642	1	TRANSFER SWITCH-105A, 3-POLE	41	58000-L	1	M6-1.0 TRIC-NUT
	63597	1	TRANSFER SWITCH-105A, 4-POLE	42	A2312	2	#10-32 X 1" FASTENER
	63312	1	TRANSFER SWITCH-150A, 2-POLE	43	A2311	2	1/4"-20 X 1" SCREW
	62643	1	TRANSFER SWITCH-150A, 3-POLE	44	24526	1	5/16-18 X 3/4" TAPTITE
	63599	1	TRANSFER SWITCH-150A, 4-POLE	45	22129	1	5/16" LOCK WASHER
	62677	1	TRANSFER SWITCH-200A, 2-POLE	46	22678	1CC	LOC-TITE (TYPE A)
	64198	1	TRANSFER SWITCH-200A, 3-POLE	47	64133	1	STUD (INCLUDES WING NUT)
	63598	1	TRANSFER SWITCH-200A, 4-POLE	48	63558	1	ENCLOSURE 100-150A SWITCH
	62645	1	TRANSFER SWITCH-300A, 2-POLE				(INSTRUMENT PACKAGE)
	62646	1	TRANSFER SWITCH-300A, 3-POLE		73959	1	ENCLOSURE 100-150A SWITCH (NEMA 12)
	64100	1	TRANSFER SWITCH-300A, 4-POLE		73961	1	ENCLOSURE 100-150A SWITCH (NEMA 1)
	62647	1	TRANSFER SWITCH-420A, 2-POLE		73961-C	1	ENCLOSURE 100-150A SWITCH (NEMA 3R)
	62648	1	TRANSFER SWITCH-420A, 3-POLE		63559	1	ENCLOSURE 200-420A SWITCH
	64344	1	TRANSFER SWITCH-420A, 4-POLE				(INSTRUMENT PACKAGE)
2	63617	2	RELAY, TRANSFER		73960	1	ENCLOSURE 200-420A SWITCH (NEMA 12)
3	63384	1	LUG, NEUTRAL-105 & 150 A SWITCH		73962	1	ENCLOSURE 200-420A SWITCH (NEMA 1)
	63657	1	LUG, NEUTRAL-200 & 300 A SWITCH		73962-C	1	ENCLOSURE 200-420A SWITCH (NEMA 3R)
	62633	1	LUG, NEUTRAL-420 A SWITCH	49	57593	13	TIE-DOWN, CABLE
4	62684	1	LUG, GROUNDING-105 & 150A SWITCH	50	67629	1	BOARD, UTIL. VOLT. SENS. -MULTI VOLTAGE
	57329	1	LUG, GROUNDING-200, 300 & 420A SWITCH	51	67626	1	BOARD, SYSTEM CONTROL (CPU)
5	74509	1	BRACKET, SAFETY DISCONNECT SWITCH	52	20A67616	1	COVER, UTILITY VOLT. SENSING BOARD
6	74511	1	DECAL, SAFETY DISCONNECT SWITCH	53	63582	1	DOOR, PRINTED CIR. BRD COMPARTMENT
7	55868	1	SWITCH, SAFETY DISCONNECT-4PDT	54	64525	12	SUPPORT, PRINTED CIRCUIT BOARD
8	99084	-	LUG-105 & 150A SWITCH (3 PER HOLE)	55	64526	32	#6-32 X 3/8" SELF-TAPPING SCREW
	62704	-	LUG-200 & 300 SWITCH (2 PER HOLE)	56	64152	1	SUBPLATE - 105 & 150A SWITCH
	62705	-	LUG 400A SWITCH (2 PER HOLE)		63655	1	SUBPLATE - 200, 300 & 420A SWITCH
9	21591	1	LUG ADAPTOR PLATE (1 PER HOLE FOR EACH 100A SWITCH USED ON CENTER LUG)	57	40587	3	LAMP, 28 VOLTS
	21591	3	LUG ADAPTOR PLATE (3 PER HOLE FOR EACH 150A SWITCH)	58	63998	1	BATTERY, 9 VOLTS
				59	46669	2	JUMPER, TERMINAL BLOCK
10	64109-A	1	COVER-105 & 150A, 2-POLE SWITCH	60	72956	-	HARNESS, WIRING-105 & 150A SW. (NOT SHOWN)
	64109-B	1	COVER-105 & 150A, 3-POLE SWITCH		73957	-	HARNESS, WIRING 200, 300 & 420A SW. (NOT SHOWN)
	64109-C	1	COVER-105 & 150A, 4-POLE SWITCH				
	64109-G	1	COVER-200, 300 & 420A, 2-POLE SWITCH	61	62209	1	DECAL, UL
	64109-H	1	COVER-200, 300 & 420A, 3-POLE SWITCH	62	26902	1	#8-32 X 1/4" TAPTITE (105 & 150A SWITCH ONLY)
	64109-I	1	COVER-200, 300 & 420A, 4-POLE SWITCH	63	30B61617	1	INTERFACE, UTILITY (208/240 V 3-PHASE)
11	67210-A	1	DECAL, GROUND		86961	1	INTERFACE, UTILITY (240 V 1-PHASE)
12	74525	1	DECAL, MANUAL OPERATION	64	68337	4	STAND-OFF, HEX 1" LG. (STANDARD SENSING ONLY)
13	74510-A	1	DECAL, 105A TRANSFER SWITCH				DECAL, HIGH VOLTAGE
	74510-B	1	DECAL, 150A TRANSFER SWITCH	65	54199	1	TIE WRAP, 5 5/8" LG. (NOT SHOWN)
	74510-C	1	DECAL, 200A TRANSFER SWITCH	66	64761	-	GUIDE, SIDE
	74510-D	1	DECAL, 300A TRANSFER SWITCH	67	63981	2	DECAL, MAC DT GTS
	74510-E	1	DECAL, 420A TRANSFER SWITCH	68	63357	1	RESISTOR-250 OHM, 100 WATT
14	46357	1	BLOCK, TERMINAL - 6 POSITION	69	63971	1	LUG, TERM. 200 & 300A SW. ONLY (1 PER POLE REQ.)
15	56893	12	#10-24 X 1/2" CRIMPTITE	71	62702	-	LUG, TERM. 420A SW. ONLY (1 PER POLE REQ.)
16	47616	2	TRANSFORMER				#8-32 X 1/4" TAPTITE
17	46689	1	BLOCK, TERMINAL - 4 POSITION		62703	-	TIE-DOWN, CABLE
18	63580	1	DECAL, TERMINAL BLOCK	72	26902	-	COVER, CPU
19	63321	1	HANDLE, MANUAL TRANSFER	73	63378	4	GROMMET
20	63578	1	PLATE, DATA	74	71775	1	SWITCH, TIME DELAY NEUTRAL BYPASS
21	68212	1	COMPARTMENT, PRINTED CIRCUIT BOARD	75	72252	1	SWITCH P/N 63302
22	64101	10	3/8"-16 FLANGED LOCK NUT	76	28199	1	SWITCH P/N 62642
23	36261	10	POP RIVET		74514-A	1	SWITCH P/N 63597
24	73681	1	DECAL, GTS		74514-B	1	SWITCH P/N 63312
	56298	1	DECAL, GENERAC NEMA 3R ONLY		74514-C	1	SWITCH P/N 62643
	90257	1	DECAL, OLYMPIAN NEMA 3R ONLY		74514-D	1	SWITCH P/N 63599
	87227	1	DECAL, OLYMPIAN		74514-E	1	SWITCH P/N 62677
25	63385	1	DECAL, AUTOMATIC SEQUENCE		74514-F	1	SWITCH P/N 64198
26	57328	1	LENS, LAMP - CLEAR		74514-G	1	SWITCH P/N 63598
27	57327	1	LENS, LAMP - RED		74514-J	1	SWITCH P/N 62645
28	57325	1	LENS, LAMP - YELLOW		74514-K	1	SWITCH P/N 62646
29	55142	1	SWITCH, MODE - DPDT		74514-L	1	SWITCH P/N 64100
30	A1661	4	POP RIVET		74514-M	1	SWITCH P/N 62647
32	63595-A	1	DECAL, TESTING SEQUENCE 105 & 150A		74514-N	1	SWITCH P/N 62647
	63595-B	1	DECAL, TESTING SEQUENCE 200 & 300A		74514-P	1	SWITCH P/N 62647
	63595-C	1	DECAL, TESTING SEQUENCE 420A		74514-R	1	SWITCH P/N 62647
33	A2111	4	#10-32 X 5/16" FASTENER		74514-S	1	SWITCH P/N 64344
34	57514	3	HOLDER, LAMP	78	67989	18	M8-1.25 LOCK FLANGE NUT
35	38150	4	#8 FLAT WASHER	79	22131	10	3/8" FLAT WASHER
36	A2284	4	#8-32 X 1/2" FASTENER	80	63324	2	MOUNTING BRACKET, RESISTOR
37	22264	4	#8 LOCK WASHER	81	64510	1	DECAL, TERMINAL NOTE
38	90388	3	M6-1.0 X 12 TAPTITE	82	64110	1	DECAL, TERMINAL STRIP LOW VOLTAGE
39	49811	3	M6 FLAT WASHER	83	77228	1	DECAL, ENCLOSURE NOTE

Section 8 – Exploded Views & Parts Lists

Generac GTS "Y" Type Transfer Switch

105-420A Inphase Assembly - Drawing No. 91392-C

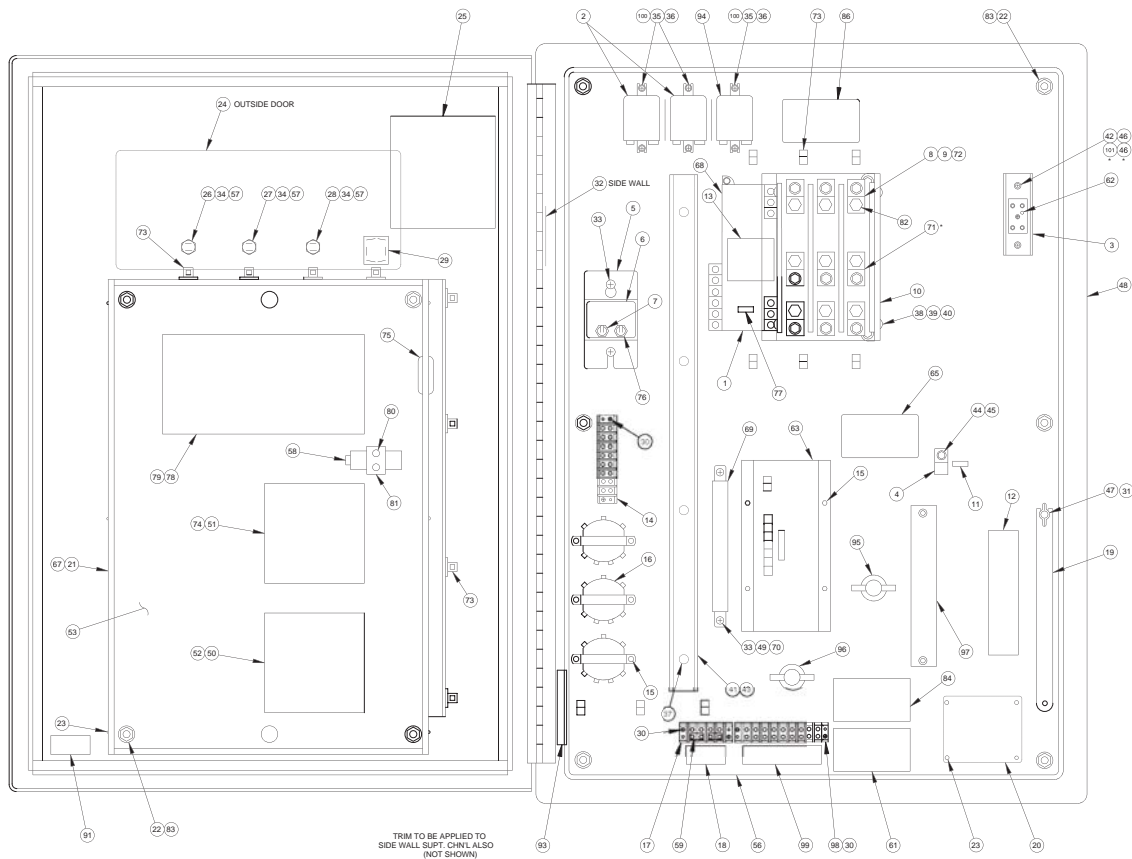


LUG TO SWITCH STUD TORQUE SPEC.

OUTSIDE LUGS 110-115 IN-LB
INSIDE LUGS 80-85 IN-LB

* 200,300,420 AMP 3-POLE SWITCH

** USED ONLY WITH #63919 BOARD



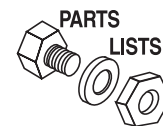
ITEM	PART NO.	QTY.	DESCRIPTION
1	63302	1	TRANSFER SWITCH-105A, 2-POLE
	62642	1	TRANSFER SWITCH-105A, 3-POLE
	63597	1	TRANSFER SWITCH-105A, 4-POLE
	63312	1	TRANSFER SWITCH-150A, 2-POLE
	62643	1	TRANSFER SWITCH-150A, 3-POLE
	63599	1	TRANSFER SWITCH-150A, 4-POLE
	62677	1	TRANSFER SWITCH-200A, 2-POLE
	64198	1	TRANSFER SWITCH-200A, 3-POLE
	63598	1	TRANSFER SWITCH-200A, 4-POLE
	62645	1	TRANSFER SWITCH-300A, 2-POLE
	62646	1	TRANSFER SWITCH-300A, 3-POLE
	64100	1	TRANSFER SWITCH-300A, 4-POLE
	62647	1	TRANSFER SWITCH-420A, 2-POLE
	62648	1	TRANSFER SWITCH-420A, 3-POLE
	64344	1	TRANSFER SWITCH-420A, 4-POLE
2	63617	2	RELAY, TRANSFER

ITEM	PART NO.	QTY.	DESCRIPTION
3	63384	1	LUG, NEUTRAL - 105 & 150A SWITCH
	63657	1	LUG, NEUTRAL - 200 & 300A SWITCH
	62633	1	LUG, NEUTRAL - 420A SWITCH
4	62684	1	LUG, GROUNDING-105 & 150A SWITCH
	57329	1	LUG, GROUNDING-200, 300 & 420A SWITCH
5	74509	1	BRACKET, SAFETY DISCONNECT SWITCH
6	74511	1	DECAL, SAFETY DISCONNECT SWITCH
7	55868	1	SWITCH, SAFETY DISCONNECT-4PDT
8	99084	-	LUG-105 & 150A SWITCH (3 PER HOLE)
	62704	-	LUG-200 & 300A SWITCH (2 PER HOLE)
	62705	-	LUG 400A SWITCH (2 PER HOLE)
9	21591	1	LUG ADAPTOR PLATE (1 PER HOLE FOR EACH 100A SWITCH USED ON CENTER LUG)

Section 8 – Exploded Views & Parts Lists

Generac GTS "Y" Type Transfer Switch

105-420A Inphase Assembly - Drawing No. 91392-C



ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
		3	LUG ADAPTOR PLATE (3 PER HOLE FOR EACH 150A SWITCH)	53	63582	1	DOOR, PRINTED CIRCUIT BRD. COMPT.
10	64109-A	1	COVER-105-150A, 2-POLE SWITCH	54	64525	12	SUPPORT, PRINTED CIRCUIT BOARD
	64109-B	1	COVER-105-150A, 3-POLE SWITCH	55	64526	36	SCR., TAPTITE #6-32 X 3/8"
	64109-C	1	COVER-105-150A, 4-POLE SWITCH	56	64152	1	SUBPLATE, 105-150 AMP SWITCH
	64109-G	1	COVER-200-420A, 2-POLE SWITCH		63655	1	SUBPLATE, 200-420 AMP SWITCH
	64109-H	1	COVER-200-420A, 3-POLE SWITCH	57	40587	3	LAMP, 28 VOLT
	64109-I	1	COVER-200-420A, 4-POLE SWITCH	58	63998	1	BATTERY, 9 VOLT
11	67210-A	1	DECAL, GROUND	59	46669	2	JUMPER, TERMINAL BLOCK
12	85636	1	DECAL, MANUAL OPERATION	60	72956	-	HARNESS-WRG 105-150A SW (NOT SHOWN)
13	74510-A	1	DECAL, 105A TRANSFER SWITCH		73957	-	HARNESS-WRG 200-400A SW (NOT SHOWN)
	74510-B	1	DECAL, 150A TRANSFER SWITCH	61	62209	1	DECAL, UL
	74510-C	1	DECAL, 200A TRANSFER SWITCH	62	26902	1	SCR. TAPTITE #8-32 X 1/4" 105-150A SW
	74510-D	1	DECAL, 300A TRANSFER SWITCH	63	30B67617	1	INTERFACE, UTILITY 208/240V 3-PHASE
	74510-E	1	DECAL, 420A TRANSFER SWITCH		86961	1	INTERFACE, UTILITY 240V 1-PHASE
14	57701	1	BLOCK TERMINAL - 8 POS.	64	68337	4	STANDOFF, HX SPCR 1.0"L (STD SENS.)
15	56893	10	SCR., CRIMPTITE #10-24 X 1/2"	65	54199	1	DECAL, HIGH VOLTAGE
16	90975	3	TRANSFORMER - 25VA	66	64761	-	TIE-WRAP, 5 5/8" LG (NOT SHOWN)
17	46689	1	BLOCK, TERMINAL - 4 POS.	67	63981	2	GUIDE, SIDE
18	91466	1	DECAL, TERMINAL BLOCK	68	63357	1	DECAL, MAC DT GTS
19	63321	1	HANDLE, MANUAL TRANSFER	69	63971	1	RESISTOR, 250 OHM 100 WATT
20	63578	1	PLATE, DATA	70	22152	2	WASHER, LOCK #10
21	68212	1	COMPARTMENT, PRINTED CIRCUIT BOARD	71	62702	-	LUG, TERM 200-300A SW (1-POLE REQD)
22	64101	10	NUT, FLANGED LOCK 3/8"-16		62703	-	LUG, TERM 420A SW (1-POLE REQD)
23	36261	10	RIVET, POP 1/8" X .23" SS	72	26902	-	SCR., TAPTITE #8-32 X 1/4"
24	73681	1	DECAL, GTS	73	63378	31	TIE-DOWN, CABLE
	56298	1	DECAL GRS NEMA 3R ENCLOSURE	74	63996	1	CVR, EXERCISER CIRCUIT BRD. (STD.)
	90257	1	DECAL, CTS NEMA 3R ENCLOSURE		64298	1	CVR, EXERCISER CIRCUIT BRD. (DLX.)
	87227	1	DECAL, CTS		72252	1	GROMMET
25	91478	1	DECAL, AUTOMATIC SEQUENCE		28199	1	SWITCH, TIME DELAY NEUTRAL BYPASS
26	57328	1	LENS, LAMP CLEAR	77	74514-A	1	SWITCH PART #63302
27	57327	1	LENS, LAMP RED		74514-B	1	SWITCH PART #62642
28	57325	1	LENS, LAMP YELLOW		74514-C	1	SWITCH PART #63597
29	55142	1	SWITCH, MODE DPDT		74514-D	1	SWITCH PART #63312
30	A1661	6	RIVET, POP .156 D X .5 LG.		74514-E	1	SWITCH PART #62643
31	58000-L	1	TRIC-NUT M6 X 1.0 THD.		74514-F	1	SWITCH PART #63599
32	63595-A	1	DECAL, TESTING SEQUENCE 105, 150A		74514-G	1	SWITCH PART #62677
	63595-B	1	DECAL, TESTING SEQUENCE 200, 300A		74514-J	1	SWITCH PART #64198
	63595-C	1	DECAL, TESTING SEQUENCE 420A		74514-K	1	SWITCH PART #63598
33	A2111	4	10-32 - 5/16 FASTENER		74514-L	1	SWITCH PART #62645
34	57514	3	HOLDER, LAMP		74514-M	1	SWITCH PART #62646
35	38150	6	WASHER, FLAT #8		74514-N	1	SWITCH PART #64100
36	A2284	6	8-32 X 1/2" FASTENER		74514-P	1	SWITCH PART #62647
37	91477	5	RIVET, NYLON "PUSH"		74514-R	1	SWITCH PART #64344
38	90388	3	M6-1.0 X 12 TAPTITE		74514-S	1	SWITCH PART #64344
39	49811	3	WASHER, FLAT M6	78	88019	1	PCB, IN-PHASE MONITOR
40	22097	3	WASHER, LOCK M6	79	91434	1	COVER, IN-PHASE CONTROL
41	91472	1	DUCT, WIRE 24 1/4" LG.	80	29357	2	RIVET
	91472	1	DUCT, WIRE 33 1/2" LG.	81	63982	2	CLIP, BATTERY
42	A2312	2	10-32 - 1" FASTENER	82	67989	9	NUT, FLANGED LOCK M8-1.25
43	91472-A	1	COVER, WIRE DUCT 24 1/4" LG.	83	22131	10	WASHER, FLAT 3/8"
	91472-A	1	COVER, WIRE DUCT 33 1/2" LG.	84	83736	1	DECAL, CSA
44	24526	1	SCR., TAPTITE 5/16" - 18 X 3/4"	86	64510	1	DECAL, TERMINAL NOTE
45	22129	1	WASHER, LOCK 5/16"	87	33139	4	SCR., HEX HD. MACH. #6-32 X 3/4"
46	22678	1 CC	LOCK-TITE (TYPE A)	88	22188	4	NUT, HEX #6-32
47	64113	1	STUD (INCLUDES WING NUT)	89	22155	4	LOCKWASHER, #6
48	63558	1	ENCLOSURE, 105-150 AMP INST. PKG.	90	64210	4	TUBE, NYLON Ø .17 X .43
	73959	1	ENCLOSURE, 105-150 AMP NEMA 12	91	77228	1	DECAL, ENCLOSURE TYPE
	73961	1	ENCLOSURE 105-150 AMP NEMA 1	92	64153-A	4	WIRE, XFORMER JUMPER (NOT SHOWN)
	73961-C	1	ENCLOSURE 105-150 AMP NEMA 3R	93	56326	2	TRIM, VINYL 1/8" GAP X 7.0 LG.
	63559	1	ENCLOSURE, 200-420 AMP INST. PKG.		56326	1	TRIM, VINYL 1/8" GAP X 9 1/8" LG.
	73960	1	ENCLOSURE, 200-420 AMP NEMA 12	94	71315	1	RELAY FL MT - 10A 240 VAC
	73962	1	ENCLOSURE, 200-420 AMP NEMA 1	95	51576	1	THERMOSTAT, 20-40 DEG.
	73962-C	1	ENCLOSURE, 200-420 AMP NEMA 3R	96	51576A	1	KLIXON T-STUT 3/16
49	63324	2	BRACKET, RESISTOR MTG.	97	61170	1	STRIP HEATER 150 WATT
50	67629	1	BRD., UTIL. VOLT. SENS. MULTI-VOLT	98	61520	1	TERMINAL BLOCK 9 PT
51	64217	1	BOARD, CIRCUIT EXERCISER (STD.)	99	97597	1	DECAL, TERMINAL STRIP GTS
	63919	1	BOARD, CIRCUIT EXERCISER (DELUXE)	100	22264	6	WASHER, LOCK #8
52	20A67616	1	CVR., UTIL. VOLT SENS. BOARD	101	A2311	2	1/4-20-1, SCREW



Section 9 – Warranty

Generac GTS "Y" Type Transfer Switch

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, 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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