30-4000 Amp
Series R340™
Automatic Transfer Switch
Non-Automatic Transfer Switch

Operation and Installation Manual

KOHLER
Transfer Switches

Table of Contents

Switch No. _____

Serial No. _____

Safety Precautions

Read these safety instructions carefully. Failure to follow instructions and safety rules could result in serious bodily injury and/or damage to the transfer switch or test equipment.

⚠WARNING

HIGH VOLTAGE! Remember that wherever electrical energy is present, there is the potential danger of electrocution. Keep everyone away from the set and take precautions to prevent unqualified personnel from tampering. Have the set and electrical circuits serviced only by qualified technicians. Wiring should be inspected frequently—replace leads that are frayed or in poor condition. Do not operate electrical equipment when standing in water, on wet ground, or when your hands are wet.

⚠ WARNING

BODILY INJURY! If not removed, the manual operator handle can result in bodily injury during a load transfer. A detachable operator handle is provided on the Transfer Switch for maintenance purposes only. Return the Transfer Switch to the Normal position. Remove manual operator handle and store it on the Transfer Switch in the place provided when service is completed.

⚠ WARNING

SHOCK HAZARD! To prevent the possibility of electrical shock, de-energize the normal power source branch to be connected to the Transfer Switch before making any line or auxiliary connections.

⚠WARNING

SHOCK HAZARD! The Transfer Switch is energized: proceed with care! High Voltage can cause personal injury, damage equipment, or lead to future failures. Remove watch, rings and jewelry that can cause short circuits.

⚠ WARNING

UNIT STARTS WITHOUT NOTICE! Units with Automatic Transfer Switch start automatically. Potential injury or electrocution can result. De-energize both normal and emergency power source before proceeding. Turn Generator Master Switch on controller to OFF position and disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. Turn the transfer switch selector switch to the OFF position.

⚠ WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection the transformer assembly primary terminals 76, 77, 78, and 79. Terminals are at line voltage!

⚠WARNING

ELECTRICAL SHOCK! The Automatic Transfer Switch is energized; proceed with care! High Voltage can cause personal injury, damage equipment, or lead to future failures. Remove rings, watches, and jewelry that can cause short circuits. This test should be done only by a qualified electrician. Follow manufacturer's instructions when operating tester.

⚠WARNING

SHOCK HAZARD! Disconnect inner panel harness at in-line connector. This will de-energize circuit board and logic circuitry, but allow transfer switch to continue to supply utility power to necessary lighting and equipment. Potential electrocution will exist if any accessories mounted to inner panel are NOT wired through and de-energized by harness separation. Such accessories may be at line voltage.

Introduction

Automatic Transfer Switch Function

An Automatic Transfer Switch is an emergency device used for transferring critical loads from a normal (preferred) source to an emergency (standby) source of power. This transfer automatically occurs when the normal source voltage fails or is substantially reduced, and the emergency source voltage has reached an acceptable level.

Upon normal source failure, the Automatic Transfer Switch signals the start of the generator set. The Automatic Transfer Switch continuously senses for the presence of an acceptable normal source, and will retransfer the load to the normal source after it has been restored to an acceptable level. After retransfer of the load, the start signal from the Automatic Transfer Switch is cancelled and the generator set is allowed to shut down.

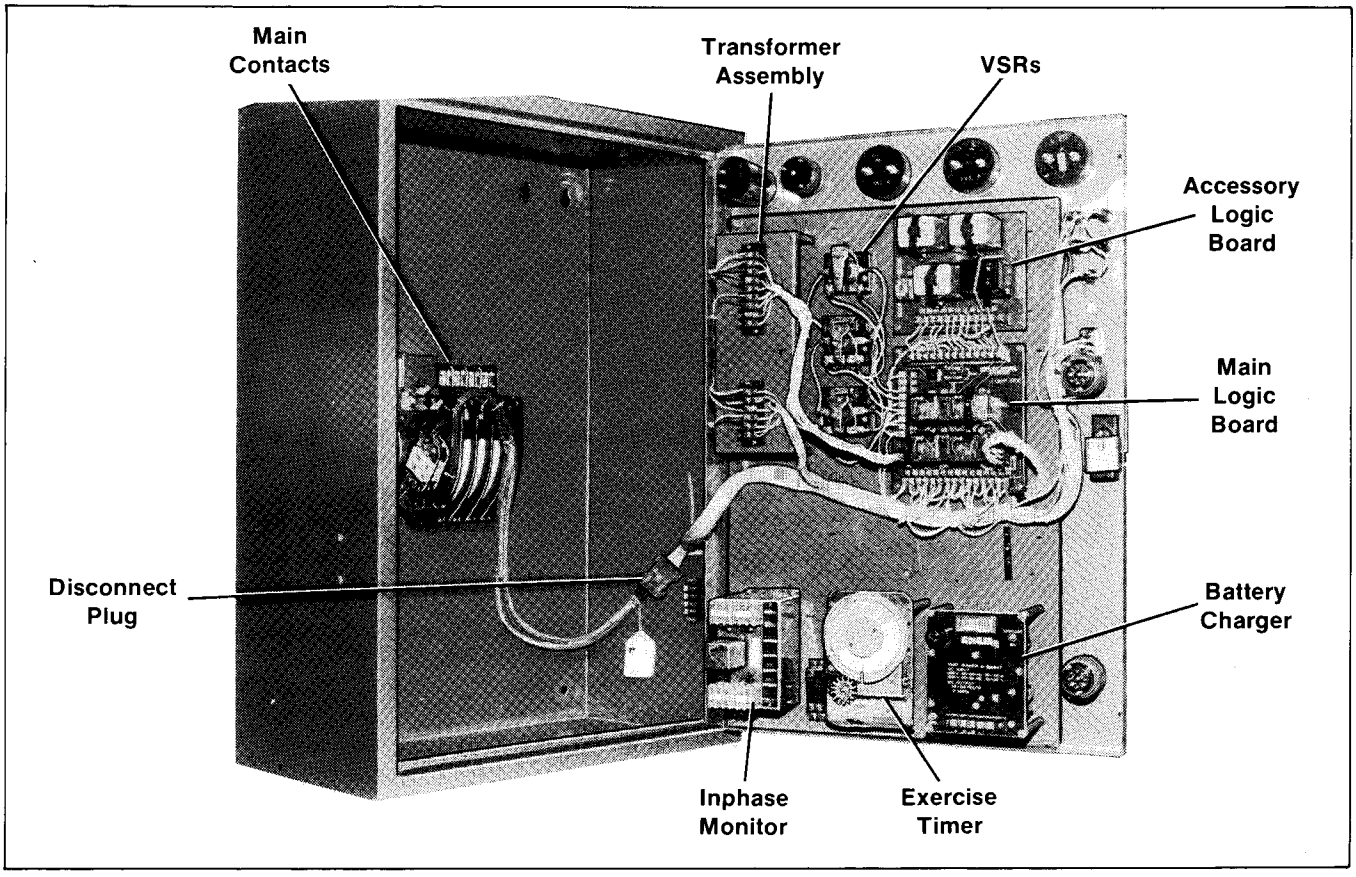


Figure 1. Typical Transfer Switch

Non-automatic Transfer Switch Function (Accessory KA-29)

A toggle or key selector switch selects automatic or non-automatic operation. Depending upon the version of Accessory KA-29 used to create the non-automatic switch, toggle switches may initiate transfers in either direction, or emergency to normal only. If the normal source fails, the emergency source-generator set will start automatically. Transfer to emergency is either automatic, or initiated by a toggle switch to emergency will occur after the generator set's voltage-frequency reaches acceptable levels, and any time delays have timed out.

Transfer to normal is initiated by a toggle switch. Transfer to normal will occur if the normal source voltage-frequency has reached an acceptable level, and any time delays have timed out.

Accessories KA-29-0 to KA-29-V also include a selector switch override circuit, to automatically transfer, if the connected source fails and the other source is available.

Ratings

The rating label is prominently affixed to the Transfer Switch. Data relating to each specific switch is included on the nameplate. Long and trouble-free equipment life is assured by using the switch within the limits shown on the ratings label and nameplate.

Figure 2 shows the location of the Transfer Switch in the system. The switch should be as close as possible to the critical electrical loads connected to it.

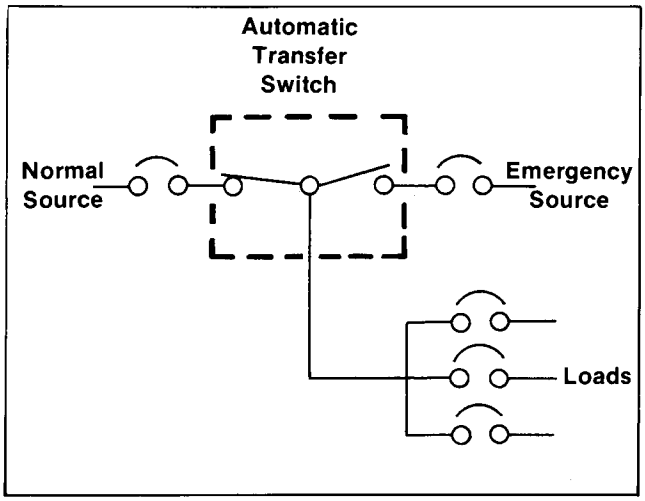


Figure 2. Transfer Switch Connection

Installation

Kohler Transfer Switches are factory wired and tested. Installation simply requires mounting, and connection of service cables and auxiliary control circuits. Do not remove protective packing until ready for complete installation. Protect switch at all times from excessive moisture, construction grit, and metal chips.

Unpacking

Carefully unpack or uncrate switch and check for damage. Report any damage immediately to the Kohler Distributor.

Any lifting devices must be attached to the switch mounting holes only. Do not lift Transfer Switch at any other points. Protect arc barriers at all times from impact.

Mounting

The Transfer Switch must be mounted vertically to a rigid supporting structure. Level all mounting points by using flat washers behind holes to avoid forced distortion of switch. Enclosed switches have the Control Panel mounted on the cabinet door. For open type switches, mount the Control Panel to the right of the Transfer Switch, preferably on the inside surface of the enclosure door. See Installation Drawings for open switch mounting dimensions and spacing requirements.

⚠ WARNING

SHOCK HAZARD! To prevent the possibility of electrical shock, de-energize the normal power source branch to be connected to the Transfer Switch before making any line or auxiliary connections.

Line Connections

Wiring Diagrams are furnished at the back of this manual. One diagram is for 3 pole Transfer Switches and the other is for 2 pole Transfer Switches. Two Harness Wiring Diagrams are furnished to show actual point-to-point wiring. A 3 pole and a 2 pole are provided.

All conductors should enter enclosure adjacent to the Transfer Switch terminals. Protect the Transfer Switch from metal chips and construction grit at all times. Standard terminal lugs are solderless screw type and will accept the conductor sizes listed on the Installation Drawing.

Connect source and load conductors to clearly marked Transfer Switch terminal lugs. Remove surface oxides from conductors by cleaning with wire brush. When aluminum conductor is used, apply joint compound to conductor. Tighten conductor and carefully wipe away excess compound.

Do not run cables behind the Transfer Switch. Cables can be bundled to the side of the switch. Maintain proper electrical clearance between the live metal parts and grounded metal. Use cable spacers provided, on 70, 104, and 150 Amp, 600 Volt class switches. Spacers are not required on 240 Volt class switches.

All internal connections are made at the factory. The Transfer Switch and the Control Panel each have their own wire harness. The two harnesses are joined together by the In-Line Disconnect Plug. The plug is already engaged on enclosed Transfer Switches. For open type switches, the plug must be engaged after installation is completed.

Auxiliary Connections

Connect auxiliary circuit wires to appropriate Control Panel terminals as shown on the appropriate diagram. External circuits can include generator set start signal, auxiliary contacts, signal lights, and Test Switch. The Test Switch is already installed on enclosed Automatic Transfer Switches. For open type switches, the Test Switch is supplied loose.

Note any Optional Accessories that may have been furnished on this switch, and make auxiliary connections if necessary.

Functional Test

Read and understand all instructions and labels affixed to the Transfer Switch. Note any Optional Accessories that may have been furnished on this switch, and review their operation. See "Accessories". The following Manual Operation must be checked before proceeding to Electrical Operation.

⚠WARNING

BODILY INJURY! If not removed, the manual operator handle can result in bodily injury during a load transfer. A detachable operator handle is provided on the Transfer Switch for maintenance purposes only. Return the Transfer Switch to the Normal position. Remove manual operator handle and store it on the Transfer Switch in the place provided when service is completed.

⚠WARNING

UNIT STARTS WITHOUT NOTICE! Units with Automatic Transfer Switch start automatically. Potential injury or electrocution can result. De-energize both normal and emergency power source before proceeding. Turn Generator Master Switch on controller to OFF position and disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. Turn the transfer switch selector switch to the OFF position.

Manual Operation

A detachable manual operator handle is provided on the Transfer Switch for maintenance purposes only. Select the appropriate switch amperage size and follow directions for installing the handle. See Figures 3-6.

Move the installed handle up and down to manually operate the Transfer Switch. The switch should operate smoothly without binding. Return the Transfer Switch to the Normal position. Remove manual operator handle and store it on the Transfer Switch in the place provided.

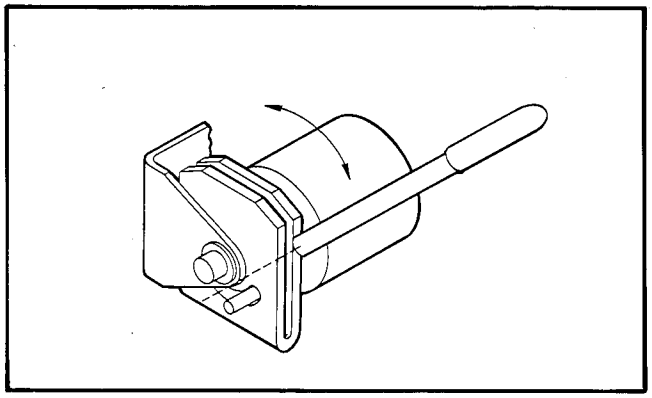


Figure 3. 30-150 Ampere

Insert manual handle between pivot and offset pin (Figure 3).

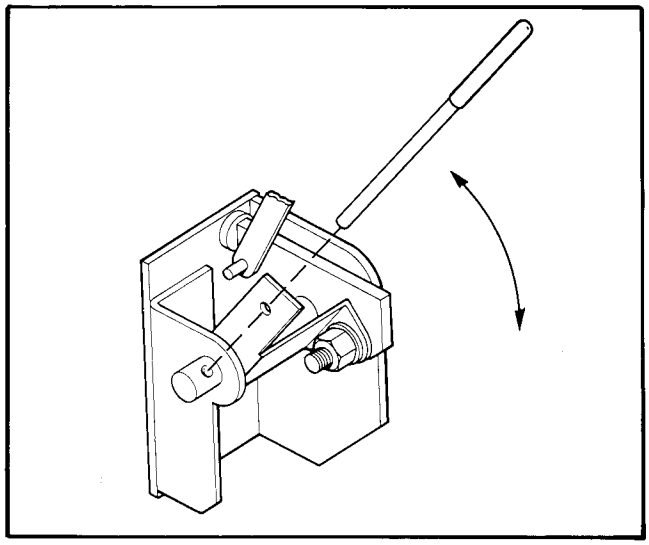


Figure 4. 225-400 Ampere

Insert manual handle in shaft hole as shown (Figure 4).

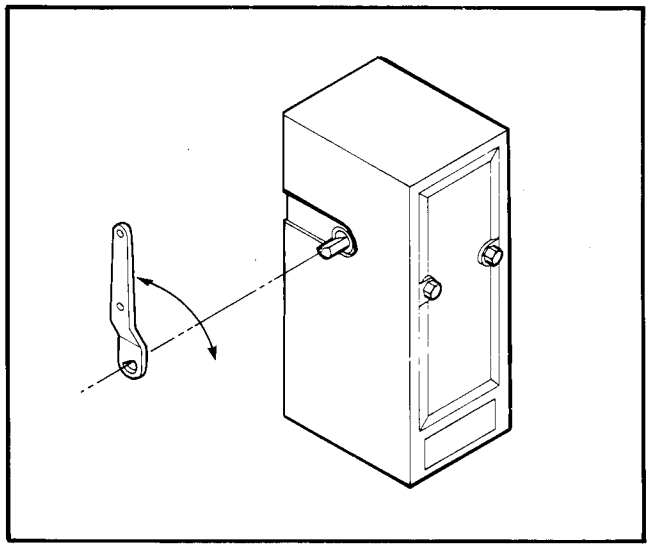


Figure 5. 600-800 Ampere

Insert manual handle into pivot shaft extension, left side of operator (Figure 5).

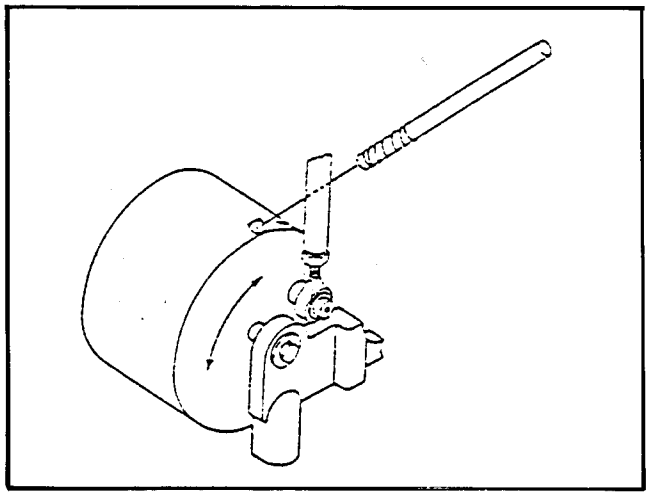


Figure 6. 1000-4000 Ampere

Insert manual handle into hole provided in rotating weight (Figure 6).

Electrical Operation

First check Transfer Switch nameplate for rated voltage. It should be the same as the normal and emergency line voltages. The Transfer Switch should be in the Normal position. The following procedure will check the electrical operation of the Automatic Transfer Switch.

⚠WARNING

ELECTRICAL SHOCK! The Automatic Transfer Switch is energized; proceed with care! High Voltage can cause personal injury, damage equipment, or lead to future failures. Remove rings, watches, and jewelry that can cause short circuits. This test should be done only by a qualified electrician. Follow manufacturer's instructions when operating tester.

1. Close normal source circuit breaker.
2. Use an accurate voltmeter to check phase-to-phase and phase-to-neutral voltages present at the Transfer Switch normal source terminals. Use phase rotation lights to check proper phase sequence at normal source terminals.
3. Close emergency source circuit breaker.
4. Manually start the generator set.
5. Use an accurate voltmeter to check phase-to-phase and phase-to-neutral voltages present at the Transfer Switch emergency source terminals. Use phase rotation lights to check proper phase sequence at emergency source terminals.
6. If necessary, adjust the voltage regulator on the generator set according to the manufacturer's recommendations. The Transfer Switch will respond only to rated voltage and frequency specified on the nameplate.
7. Shut down the generator set, then put starting control in AUTOMATIC position.
8. Place door-mounted Auto-Test Switch in TEST position, the generator set starts and runs. This should happen within 15 seconds.
9. The Transfer Switch will operate to the emergency position. If accessory 1A is used, the transfer will occur after a time delay (up to 60 seconds) depending upon the setting, Time Delay Normal to Emergency (TDNE).
10. Place the selector switch in the AUTO position. The Transfer Switch will operate back to normal after time delay (up to 30 minutes) if Accessory 3C Time Delay Emergency to Normal (TDEN) is used.
11. Acc. 4C Time Delay Engine Cooloff (TDEC) allows the engine to continue to run for an additional unloaded running time (up to 30 minutes).

This completes the functional test of the automatic Transfer Switch. The generator set starting control should be left in the AUTOMATIC position.

General Maintenance

Reasonable care in preventive maintenance will insure high reliability and long life for the Transfer Switch.

⚠WARNING

HIGH VOLTAGE! Remember that wherever electrical energy is present, there is the potential danger of electrocution. Keep everyone away from the set and take precautions to prevent unqualified personnel from tampering. Have the set and electrical circuits serviced only by qualified technicians. Wiring should be inspected frequently—replace leads that are frayed or in poor condition. Do not operate electrical equipment when standing in water, on wet ground, or when your hands are wet.

Operate Transfer Switch at Least Once a Month. Use the Test Switch to check the electrical operation of the Transfer Switch. Because the Test Switch only simulates failure of the normal source, service is interrupted only during the actual transfer of the load.

Keep Automatic Transfer Switch Clean. During installation protect the switch from construction grit and metal chips. Once a year brush and vacuum away any excessive dust accumulation.

Maintain Transfer Switch Lubrication. The Transfer Switch has been properly lubricated, and under normal operating conditions no further lubrication is required. Renew factory lubrication if the switch is subject to abnormal operating conditions. Relubricate the operator if the TS coil is replaced. Order lubrication kit 296233.

Inspect Main Current Carrying Contacts. Once a year deenergize all sources, then remove barriers to check condition of contact material. Replace contacts when pitted or worn excessively.

Troubleshooting

⚠WARNING

SHOCK HAZARD! The Transfer Switch is energized: proceed with care! High Voltage can cause personal injury, damage equipment, or lead to future failures. Remove watch, rings and jewelry that can cause short circuits.

Note any Optional Accessories that may have been furnished on this switch, and review their operation. See "Accessories."

GENERATOR SET DOES NOT START WHEN TEST SWITCH IS OPERATED.

1. **Check Operation.** Make sure the Test Switch is placed in TEST position.
2. **Check Generator Set Start Switch.** Make sure switch is in AUTOMATIC position. Make sure batteries are charged and connected.
3. **Check Wiring.** Make sure start signal wires from generator set controller are connected to terminals 3 and 4 on the contactor. See "Wiring Diagram."
4. **Check Single Circuit.** Disconnect and tape engine start wires. Connect ohmmeter between terminals 57 and 58 on main logic board. Reading should indicate an open circuit. Place Test Switch in TEST position. After Time Delay Engine Start (TDES) operates, ohmmeter should indicate a closed circuit.

NOTE

Engine start contacts and circuit may be disabled by removing wires from terminals 57 and 58 at main logic board.

TRANSFER SWITCH DOES NOT RETRANSFER THE LOAD AFTER NORMAL RETURNS OR AFTER TEST SWITCH IS PLACED IN AUTO POSITION.

1. **Check Operation.** Make sure at least 30 minutes have passed to allow for time delay to operate if this accessory is used.
2. **Check Normal Source Voltage Levels.** This reading can be taken on the transformer assembly terminals. On a 3-phase system, voltmeter should read phase-to-phase voltage between terminals NA and NB, NA and NC, NB and NC. On a 1-phase system, voltmeter should read system voltage between terminals NA and NC.
3. **Check Low AC Voltage Circuits.** Check voltage on transformer secondaries. On 3-phase systems voltage at T2-T3 (should be 24 Volts), with 12 Volts at T1-T4 and T1-T5. No voltage at these points indicates a defective transformer. If these voltages are correct, check the circuit board voltages, at terminals 62-S3 — 24 Volts 62-63 — 12 Volts. No voltage at these points indicates interconnection harness problems.

WITH GENERATOR SET RUNNING, TRANSFER SWITCH DOES NOT TRANSFER THE LOAD TO EMERGENCY.

1. **Check Operation.** Make sure at least sufficient time has passed to allow for time delay on transfer to emergency to operate (up to 30 minutes) if this accessory is used.
2. **Check Engine Controls.** Check generator output frequency and voltage. Output should be at least 90% of nominal voltage and 95% of nominal frequency. Make sure generator output circuit breaker is closed.
3. **Check Wiring.** Voltmeter should read phase-to-phase voltage between Transfer Switch terminals EA and EC, and also between terminals EA and EC on transformer assembly.
4. **Check Low Voltage Circuit.** With the proper voltage on the transformer primaries, check the secondary voltage at T6-T7 (should be 24 AC Volts). If this voltage is correct, check the circuit board voltage at terminals 63-67, 12-VAC; 63-55, 12-VDC. No voltage here indicates interconnection harness problems.

TRANSFER SWITCH RETRANSFERS THE LOAD, BUT GENERATOR CONTINUES TO RUN.

1. **Check Operation.** Make sure that sufficient time has passed to allow for time delay, up to 30 minutes, (emergency to normal) to time out if this accessory is used.
2. **Check Engine Controls.** Make sure generator set starting switch is in AUTOMATIC position.
3. **Check Signal Circuit.** Disconnect and tape wires to terminals 57 and 58 on main logic board. Connect ohmmeter between these terminals; reading should indicate an open circuit.

If the problem is isolated to signal circuits on the Control Panel of the Transfer Switch, call your local Kohler Distributor.

Sequence of Operation

Note any Optional Accessories that may have been furnished on this switch, and review their operation. See "Accessories".

Normal Source Failure

Load transfer to the emergency source automatically begins when the voltage sensing relays (VSRs) detect reduced voltage or total loss of the normal source. A VSR will de-energize whenever the voltage level falls below the preset dropout point. An under-voltage condition on any phase of a three-phase system, is detected by the VSRs.

When any VSR de-energizes, signaling a failure, relays NR and NR1 are de-energized.

A contact on the NR1 relay signals the generator set to start. When the emergency source is accepted by the emergency relay EFR it becomes energized and closes the circuit to relay ER.

ER relay energizes and the TS coil is energized, the Transfer Switch operates, and all switch contacts (mains, controls auxiliaries) reverse position. The Transfer Switch is now supplying the load from the emergency source.

The switch will remain in this position until the normal source is restored.

Normal Source Restoration

Load retransfer to the normal source automatically begins when the VSRs detect restoration of the normal source. The voltage level must rise above the present pick-up point on all phases before the relays will accept the normal source again.

When the normal source is accepted by the VSRs, NR and NR1 relays energize. The TS coil is energized, the Transfer Switch operates, and all switch contacts (mains, controls, auxiliaries) reverse position. The Transfer Switch is now supplying the load from the normal source.

The de-energization of relay NR1 signals the engine-driven generator to shut down. All circuits are reset for any future normal source failure

Accessories

Time Delays

All time delay functions are provided with plug in relays. A Mother Board to accept these relays is mounted on the enclosure door directly above the Main Logic Board.

⚠WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection to transformer assembly primary terminals, or terminals 76, 77, 78, 79. Terminals are at line voltage!

☐ **Acc. 01-A Time Delay Normal to Emergency (TDNE)**—adjustable 1-60 sec.

NORMAL SOURCE FAILURE

After the generator set has started and is supplying voltage, time delay relay TDNE begins its timing cycle. After the selected time cycle has been completed, the TDNE contacts close to allow relay ER to become energized (Figure 7). The standard sequence is resumed.

☐ **Acc. 02-A Time Delay on Engine Starting (TDES)**—adjustable 2-20 sec.

☐ **Acc. 02-E Time Delay on Engine Starting (TDES)**—fixed at 2.5 sec.

☐ **Acc. 02-F Time Delay on Engine Starting (TDES)**—adjustable 20-240 sec.

☐ **Acc. 02-G Time Delay on Engine Starting (TDES)**—adjustable 0.5-6 sec.

☐ **Acc. 02-H Time Delay on Engine Starting (TDES)**—adjustable 3-30 min.

NORMAL SOURCE FAILURE

After the NR1 relay has become de-energized and opens its contacts, the TDES time delay begins its timing cycle. After the timing cycle is complete its contacts close, and signal the generator set to start (Figure 8). The standard sequence is then resumed.

☐ **Acc. 03-C Time Delay Emergency to Normal (TDEN)**—adjustable 1-30 min.

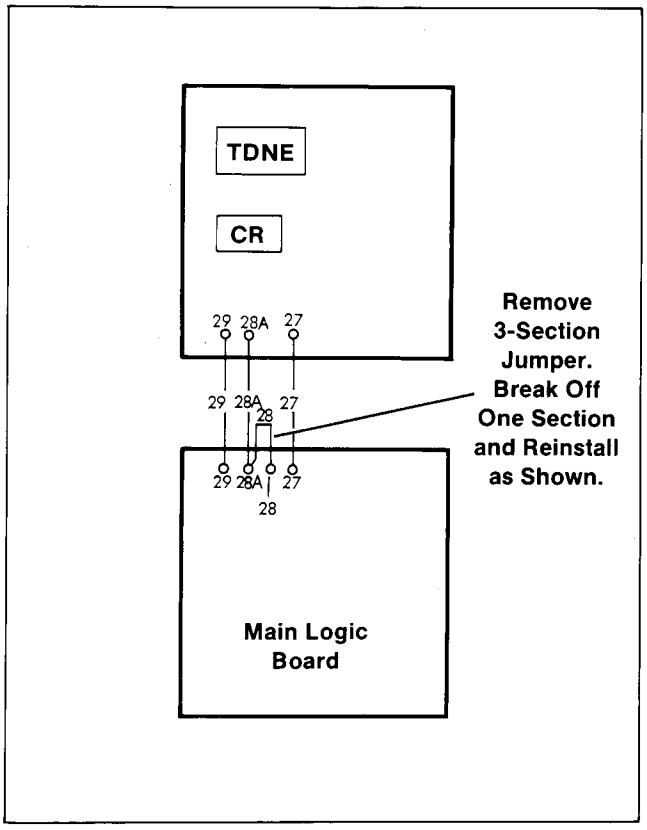


Figure 7. TDNE Connections

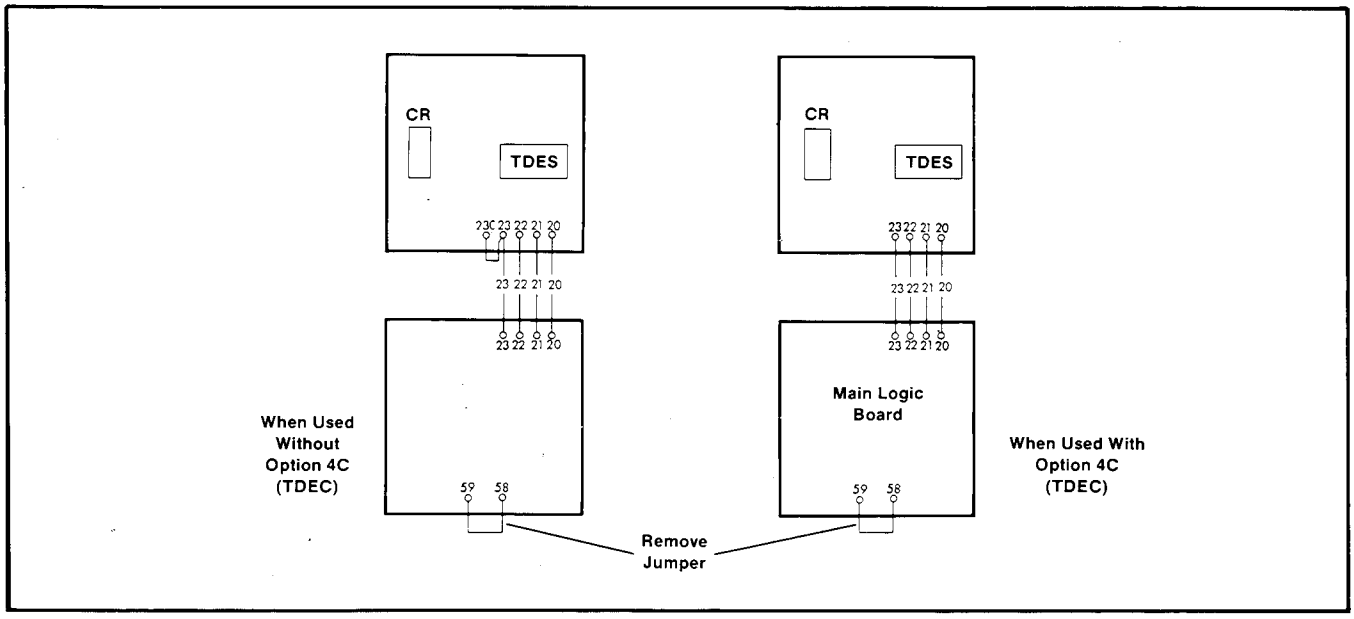


Figure 8. TDES Connections

NORMAL SOURCE RESTORATION

After the VSR relays become energized and their contacts close, time delay relay TDEN will begin timing. Through CR relay contacts, after this timing cycle is complete, the contact of TDEN will close allowing relays NR1 and N to become energized (Figure 9). The standard sequence is then resumed.

- ☐ **Acc. 04-C Time Delay for Engine Cool Off (TDEC)**—adjustable 1-30 min.
- ☐ **Acc. 04-D Time Delay for Engine Cool Off (TDEC)**—set at 5 (±) minutes and locked.

NORMAL SOURCE RESTORATION

After the VSRs become energized and their contacts close, the time delay relay TDEC will begin timing. After the timing cycle is complete, its contacts will signal the generator set to shut down (Figure 10). The standard sequence is then resumed.

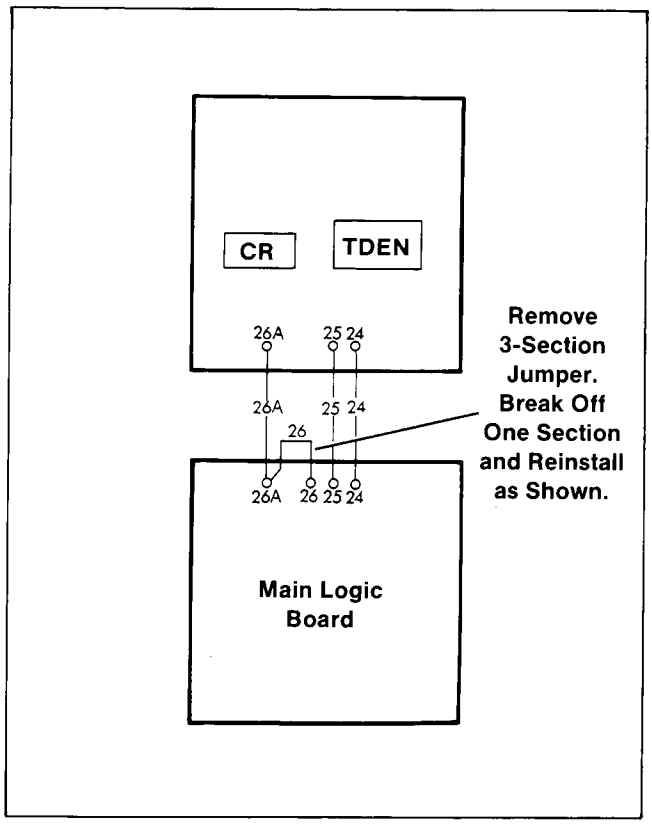


Figure 9. TDEN Connections

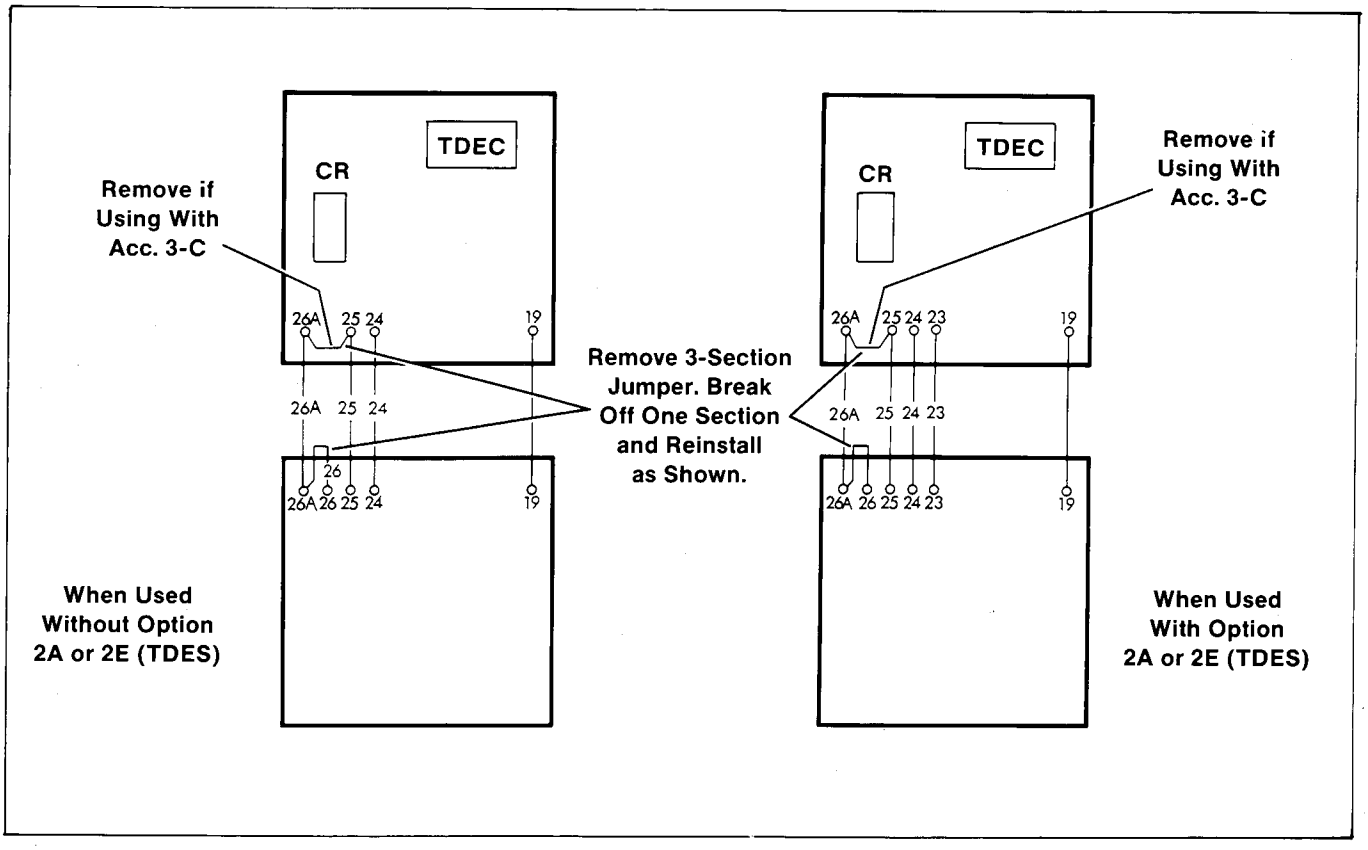


Figure 10. TDEC Connections

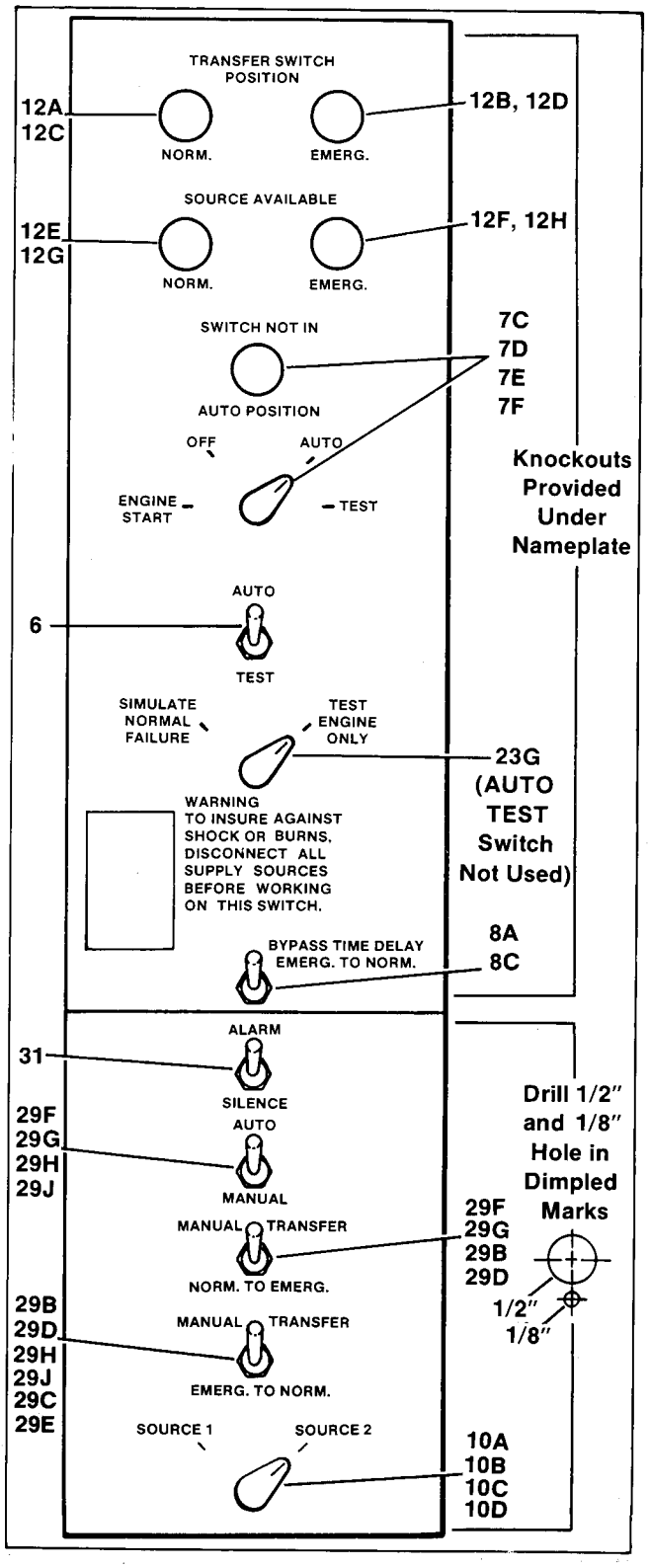


Figure 11. Door-Mounted Accessories

Front Panel Indicators and Controls

The Manual Controls, if furnished, are connected on the enclosure door or shipped loose if so specified. Optional Accessories can be added later in kit form. See Figure 11 for accessory locations on enclosure door.

☐ **Acc. 6-C thru H Two-Position Switch** either momentary or maintained contact; toggle or key operated.

- **Auto**—Enables automatic transfer switch operation.
- **Test**—Simulates a normal source failure, for as long as the switch is held or left in the "Test position. See Figure 12 for connections.

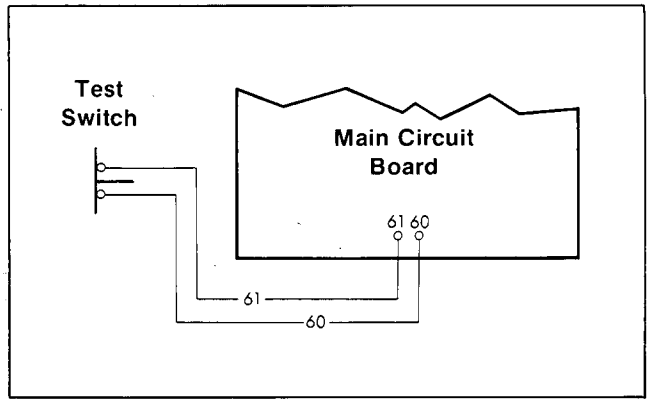
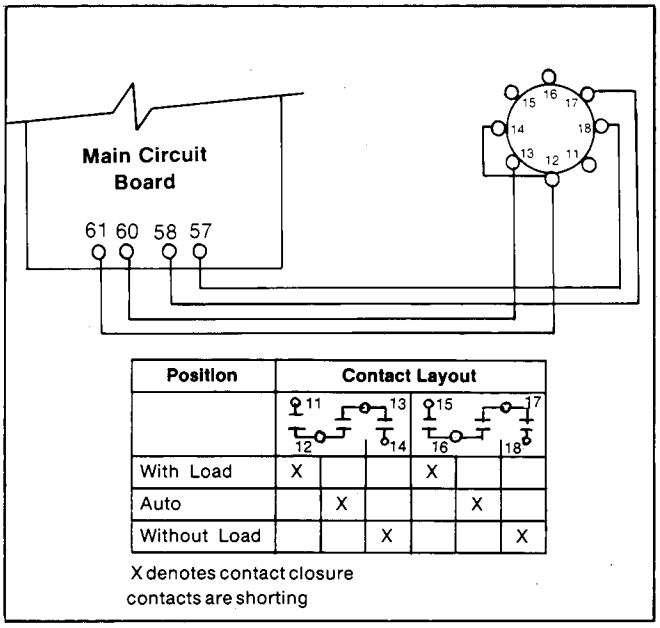


Figure 12. Maintained Test Switch Connections

☐ **Acc. 6-L, M Three-Position Switch** selects one of three modes of operation:

- **Auto**—Enables automatic transfer switch operation.
- **Test with load**—generator set starts, and load is transferred to the generator set.
- **Test without load**—generator set starts, and runs unloaded. See Figure 13 for connections.



Position	Contact Layout					
	11 12		13 14	15 16		17 18
With Load	X			X		
Auto		X			X	
Without Load			X			X

X denotes contact closure
contacts are shorting

Figure 13. Three-Position Switch Connection

NOTE

Mount switch in hole with wording as shown in table. Mount lock ring in off center hole. Place pointer on knob to face one of positions shown, then put stop screws in end holes 2 and 6 on selector switch. Small J's denote jumpers.

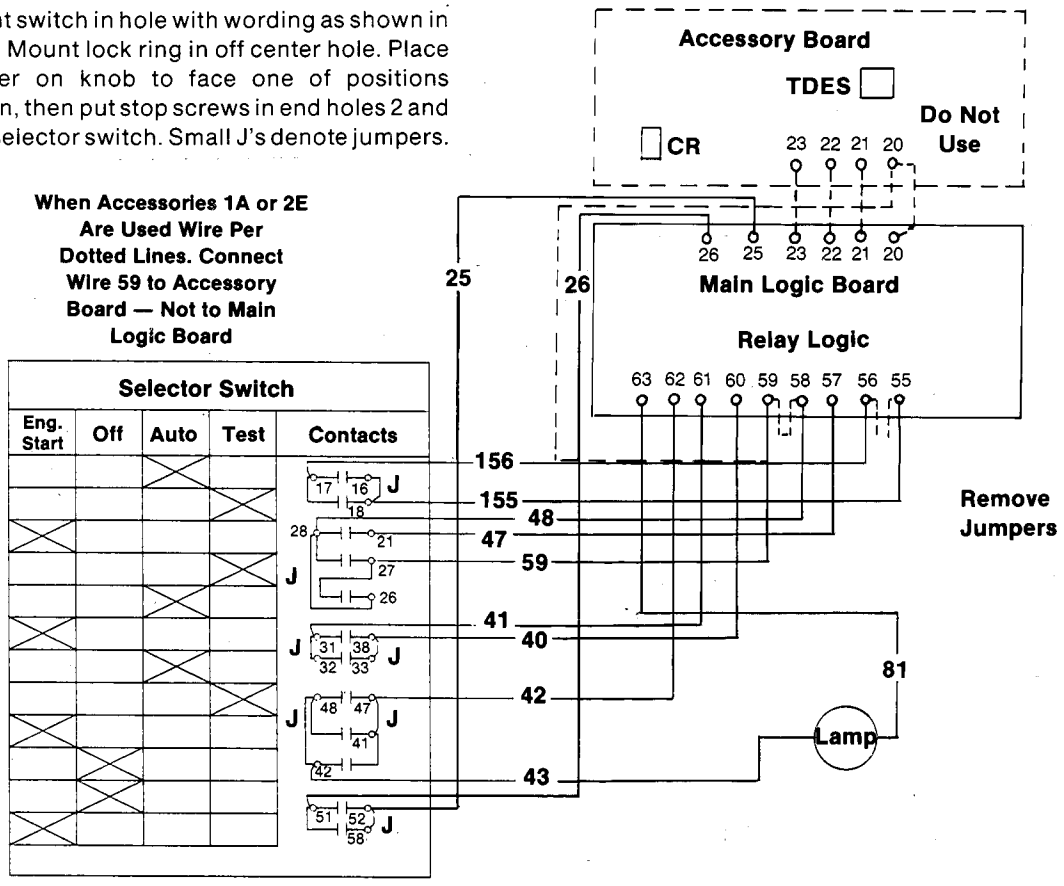


Figure 14. Four Position Switch Connection

Operation Mode Selector Switches

☐ **Acc. 7-C, D, E, F Four-Position Switch With Lamp** selects one of four operation modes.

- **Engine Start**—Closes the engine-start circuit to test run generator set. The transfer switch will not transfer, unless the normal source fails.
- **Off**—De-energizes control circuits, and opens the engine-start circuit. The transfer switch will not operate.
- **Auto**—Enables automatic transfer switch operation.
- **Test**—Simulates normal source failure. See Figure 14 for connections.

NOTE

Be sure to connect all (8) switch contact jumpers. Remove standard auto-test switch.

☐ **Acc. 8-A, C Bypass Time Delay** Emergency to Normal may be used to override the standard Time Delay Emergency to Normal in transferring to the normal source. See Figure 15 for connections.

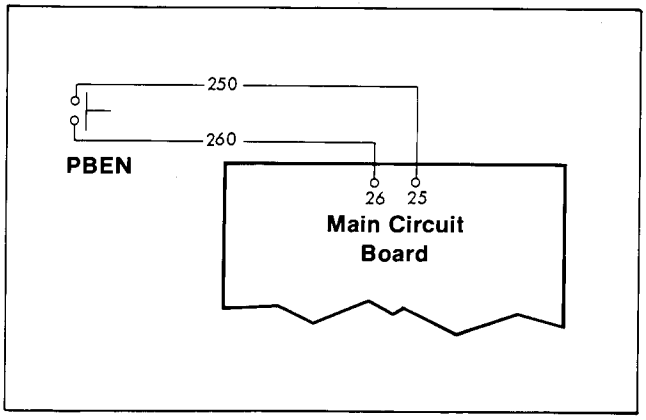


Figure 15. Bypass Switch Connection

☐ **Acc. 10-A-E Source Selector Switch** allows selection of either source as the preferred source. The preferred source is the one that the switch will transfer to, if that source is available. Sources may both be utilities, generator sets, or utility and generator set.

☐ **Acc. 29-B, D—Normal-to-Emergency and Emergency-to-Normal Toggle Switches** may be used to manually cause transfer to either the normal or emergency position. See Figure 16 for Connections.

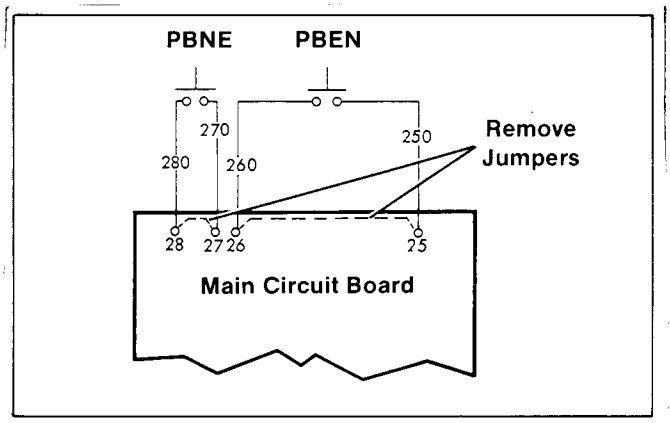


Figure 16. Manual (PBNE, PBEN) Switch Connection

NORMAL SOURCE FAILURE

After the generator set has started and generator voltage is available, momentarily depress the Push Button Normal to Emergency (PBNE) Switch. Relay ER will energize the TS Coil. The standard sequence will then be resumed.

NORMAL SOURCE RESTORATION

When the normal source is accepted by the voltage sensing circuit, depress the Push Button Emergency to Normal (PBEN) Switch. The NR relay energizes. The standard sequence of operation is resumed.

☐ **Acc. 29-C, E—Reset Switch** to manually retransfer the Automatic Transfer Switch to the normal source. See Figure 17 for connections.

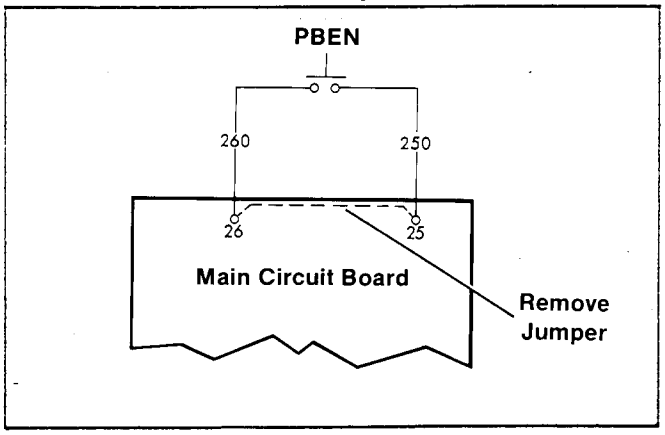


Figure 17. Manual (PBEN) Switch Connection

NORMAL SOURCE RESTORATION

When normal source returns and is accepted by the voltage sensing circuit, the NR relay remains de-energized until the PBEN switch is momentarily closed. The standard sequence of operation is resumed after the NR relay is energized.

☐ **Acc. 29-F, G—Switch** to select either AUTO or MANUAL mode of operation from normal to emergency or emergency to normal. AUTO has standard sequence of operation. When in manual position sequence of operation same as in Acc. 29-B, D. See Figure 18 for connections.

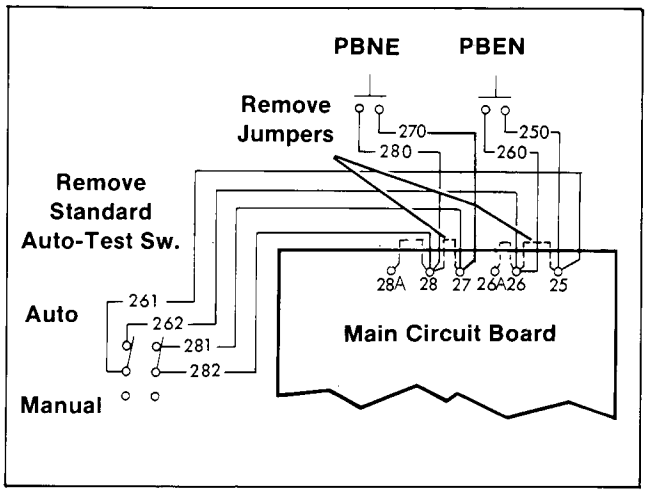


Figure 18. 29-F, G Connections

☐ **Acc. 29-H, J—Switch** to select either AUTO or MANUAL mode of operation from emergency to normal. AUTO has standard sequence of operation. When in manual position sequence of operation same as in Acc. 29-C, E. See Figure 19 for connections.

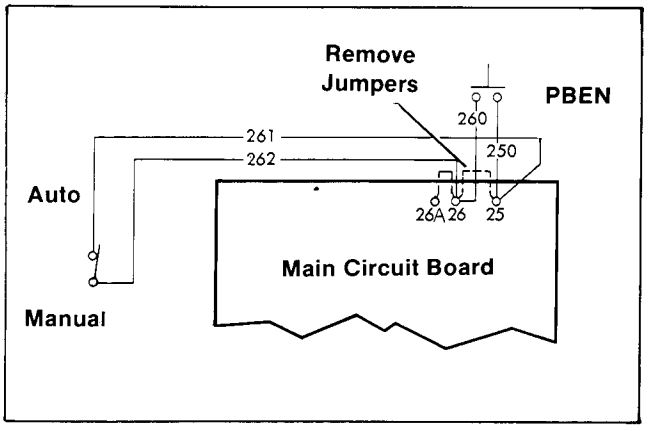


Figure 19. 29-H, J Connections

Panel Lamps

All panel lamps if furnished, are mounted on the Transfer Switch enclosure door or shipped loose as specified. See Figures 20 thru 23 for connections.

☐ **Acc. 12-A, C Normal Position,** light to show transfer switch connected to normal source. See Figure 20 for connections.

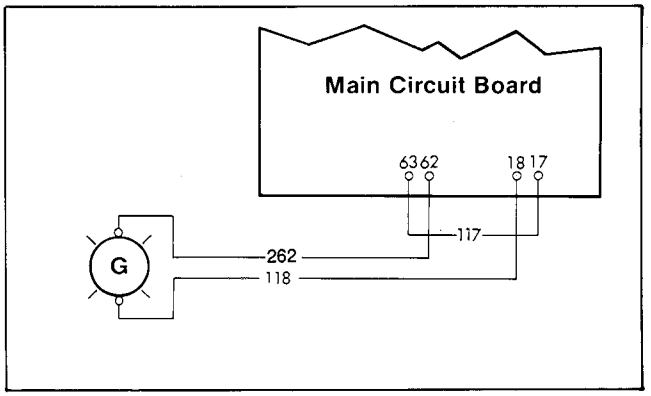


Figure 20. 12-A, C Connections

☐ **Acc. 12-B, D Emergency Position,** lights to show transfer switch connected to emergency source. See Figure 21 for connections.

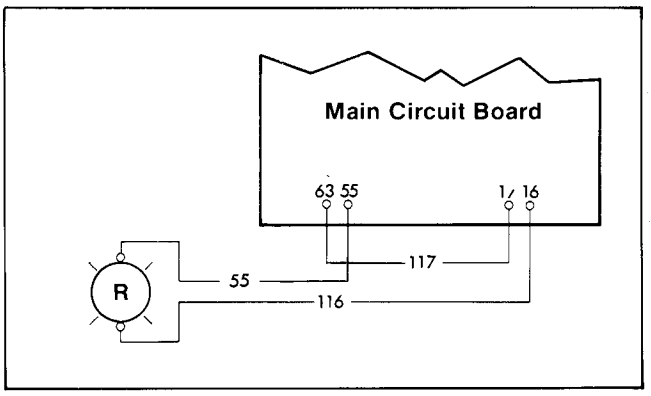


Figure 21. 21-B, D, Connections

Source-Available Lamps

☐ **Acc. 12-E, G Normal Source,** lights to show normal source available. See Figure 22 for connections.

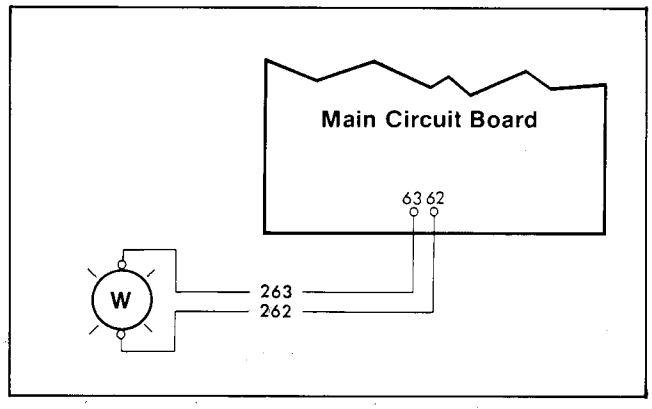


Figure 22. 12-E, G Connections

☐ **Acc. 12-F, H Emergency Source,** lights to show emergency source available. See Figure 23 for connections.

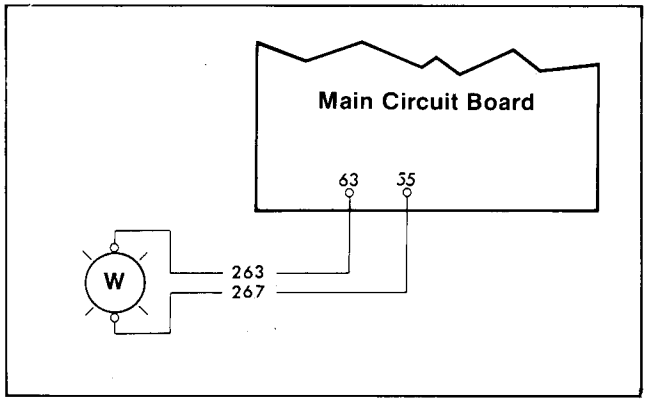


Figure 23. 12-F, H Connections

☐ **Acc. 31-A, B Audible Alarm-Silence Switch** alarm sounds when transfer switch is in the emergency position. Switch is used to silence alarm. Alarm is mounted on outside of enclosure, with switch nearby. See Figure 24 for connections.

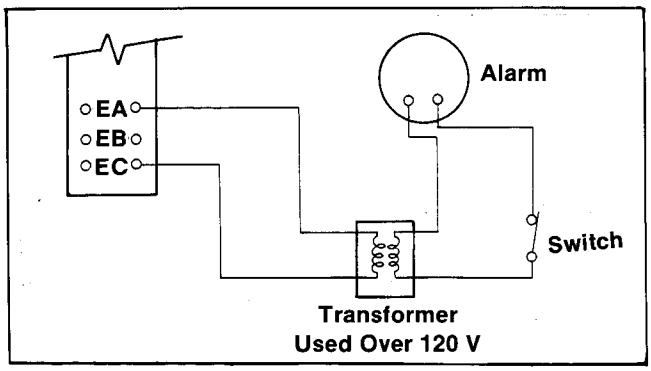


Figure 24. Audible Alarm Connection

Auxiliary Relay Contacts

These relay contacts operate from the voltage source and, therefore, are energized as soon as normal or emergency power is available. They are located on the lower left hand side of the inner control panel mounted on the door. Contacts are 10 Amps 1/3 hp at 120 Volts AC.

☐ **Acc. 14-C—Three Sets of Contacts Available on Normal Side.** This relay is provided with accessories 29-C, 29-E, 29-H, and 29-J which then allows only 2 sets of contacts available for other use. See Figure 25 for connections.

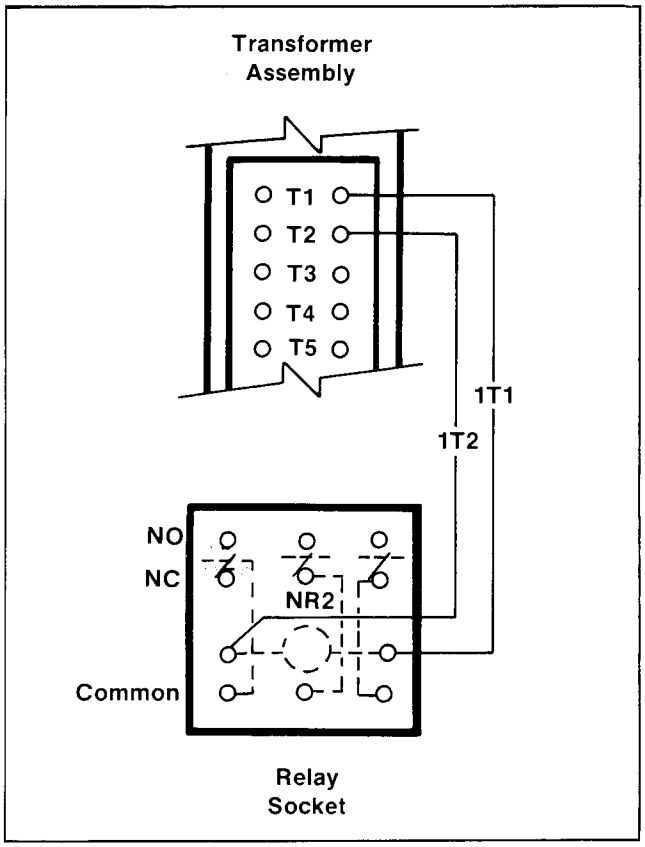


Figure 25. 14-C Connections

☐ **Acc. 14-D—Three Sets of Contacts on Emergency Side.** This relay is provided with accessory 29-B, 29-D, 29-F, and 29-G which then allows only 2 sets of contacts available for other use. See Figure 26 for connections.

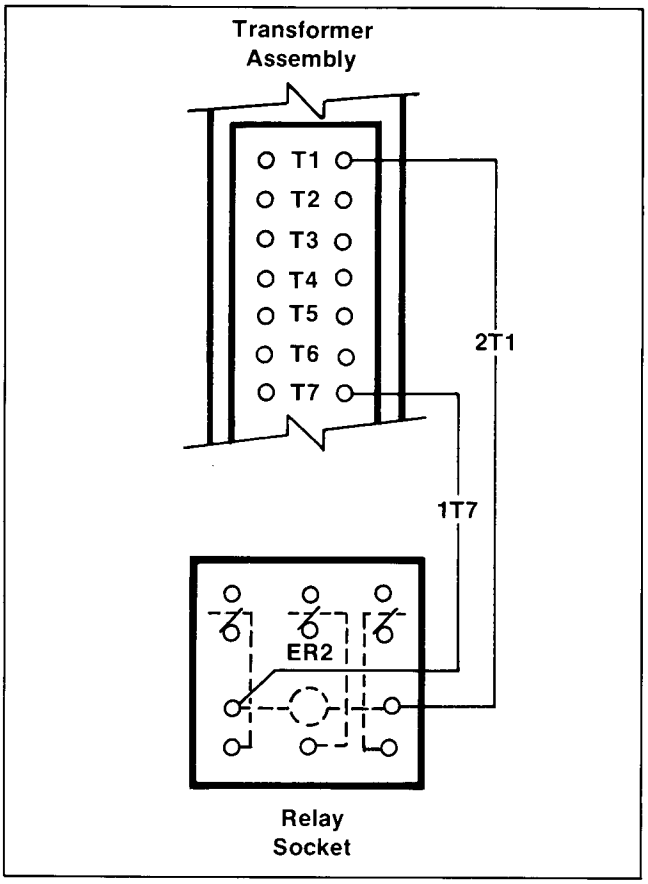


Figure 26. 14-D Connections

Acc. 15 Auxiliary Contacts on Contactor

One Acc. 15-A is supplied standard on all Kohler Transfer Switches. The following table provides the terminal numbers for standard and optional contacts.

30-800 Amp

STANDARD		1ST SET	2ND SET	3RD SET	SPDT SET
Normal Side	12-13	31-32	35-36	37-38	19-20-21
Emerg. Side	None	29-30	33-34	None	

1000-4000 Amp

STANDARD		1ST SET	2ND SET
Normal Side	12-13	31-32	35-36
Emergency Side	10-11	29-30	33-34

Figure 27 shows the location of the various auxiliary contacts.

All auxiliary contacts are rated 10 Amps at 480 Volts.

NOTE

Contacts 10 and 11 are not to be used if accessory 23-D or G is selected (accessory connected at terminals 74 and 75 of logic panel terminal strip).

NOTE

Contacts, 16, 17, and 18 are not to be used if accessories 12-A, B, C, or D have been selected (accessories connected at terminals 16, 17, and 18 of main logic board).

NOTE

Contacts 14 and 15 are connected to engine-start circuit, and should not be used for auxiliary connections.

⚠WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection to transformer assembly primary terminals, or terminals 76, 77, 78, and 79. Terminals are at line voltage!

Auxiliary Contact Rating: 10 Amps 480 VAC

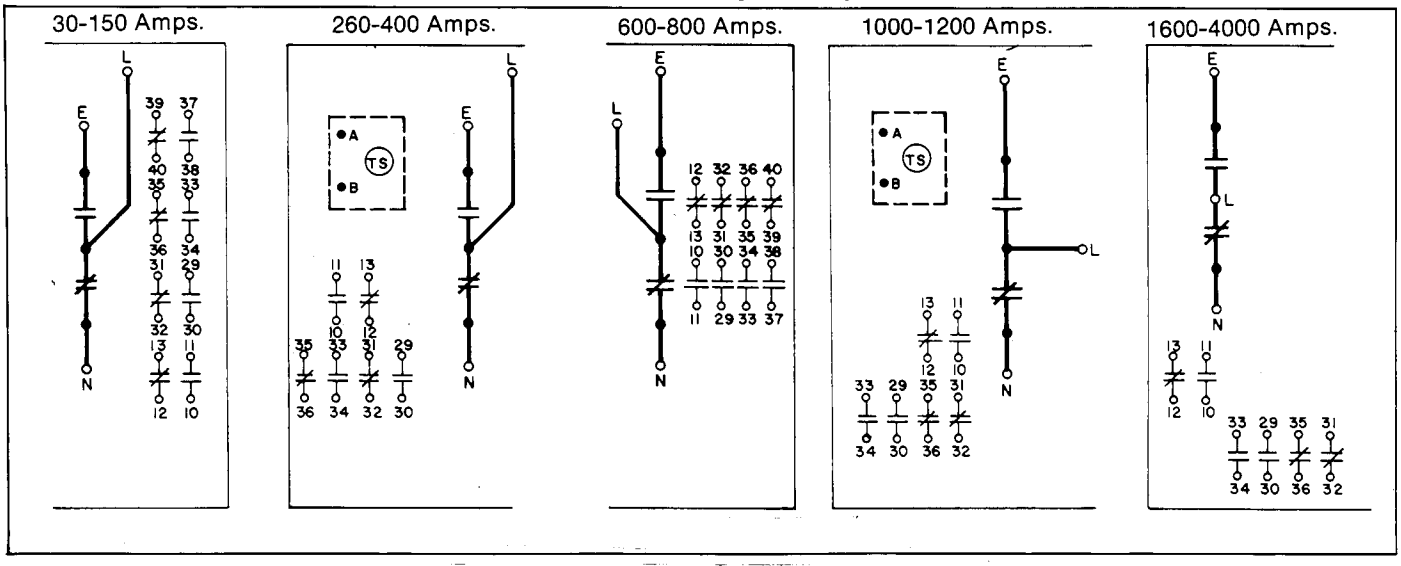


Figure 27. Contactor Auxiliary Locations

Acc. 23 Generator Set Exercising Timer

This timer, if furnished, is used for periodic exercising of the generator set. This timer is factory set for a 30-minute minimum exercise period once a week. The time period can be lengthened and can be set to occur more often than once a week. The generator set should be exercised under load once a week for a minimum of 30 minutes. Optional Accessory 23 can be added later in kit form. Include Serial Number and Catalog Number of Transfer Switch when ordering kit.

⚠ WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection to transformer assembly primary terminals 76, 77, 78, and 79. Terminals are at line voltage!

☐ **Acc. 23-C** timer does not simulate a normal source failure. The Transfer Switch is not affected. The engine-generator plant is signalled to run unloaded for the set time period.

☐ **Acc. 23-D** timer simulates a normal source failure. The Transfer Switch transfers the electrical load to the generator set during the exercise period.

NOTE

Accessories 23-D and G have an override circuit to return switch to normal should emergency source fail during an exercise run. Normal LED's on logic cards will stay off until exerciser completes timing.

TO ADJUST:
SET EXERCISE DAY

1. Decide what day (or days) of the week to exercise the plant.
2. Remove the screw from the star wheel lobe marked with the decided day.

SET EXERCISE PERIOD

1. Decide what time of the day to start the exercise period. Position red trip screw on inner dial edge at decided start time. Tighten knurled screw. Note trip screws have left hand thread.
2. Decide what time of the day to stop the exercise period. Position black trip screw on outer dial edge to decided stop time. Tighten knurled screw. Note trip screws have left hand thread.

SET PRESENT TIME AND DAY

1. Find the present time of day on the dial. Turn the dial clockwise (direction of arrow) until the present time is adjacent the "time" arrow.
2. Find the star wheel lobe marked with the present day. Turn the star wheel clockwise until present day lobe is adjacent to the indicating pointer.

TROUBLESHOOTING—Figures 28, 29.

If Acc. 23-C timer contact 3-5 does not close during the set exercise period, the generator set will not be signalled to run. If the contact remains closed beyond the set exercise period, the generator set will continue running. In either case, Acc. 23-C timer is malfunctioning.

If Acc. 23-D timer contact does not open during the set exercise period, the generator set will not be signalled to run, and the load will not be transferred to the emergency source. If the contact remains open beyond the set exercise period, the generator set will continue running and the load will remain connected to the emergency source.

Immediate retransfer may be accomplished by manually stopping the generator set. Make sure that full rated normal source voltage is available before doing this. In either case, Acc. 23-D timer is malfunctioning.

☐ **Acc. 23-G Plant Exerciser With Selector Switch**—to select a simulation of power failure or engine test mode. Select a 23-C or 23-D type of operation. See Figure 29 for connections.

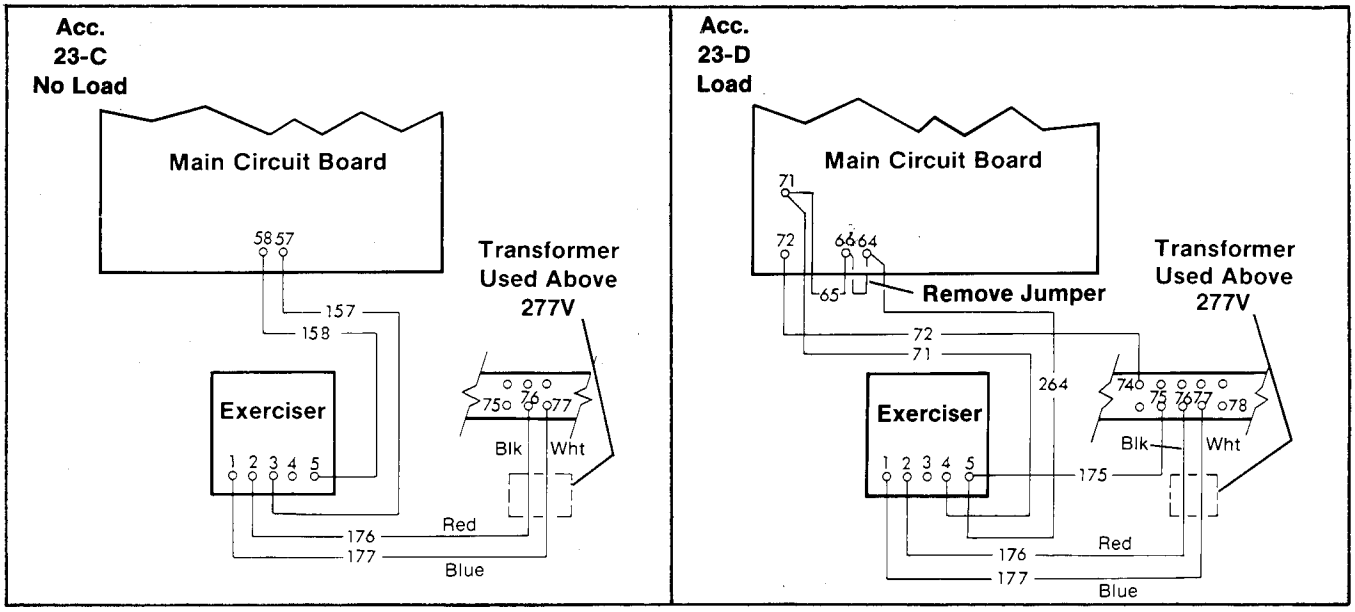


Figure 28. Exercise Timer Connections

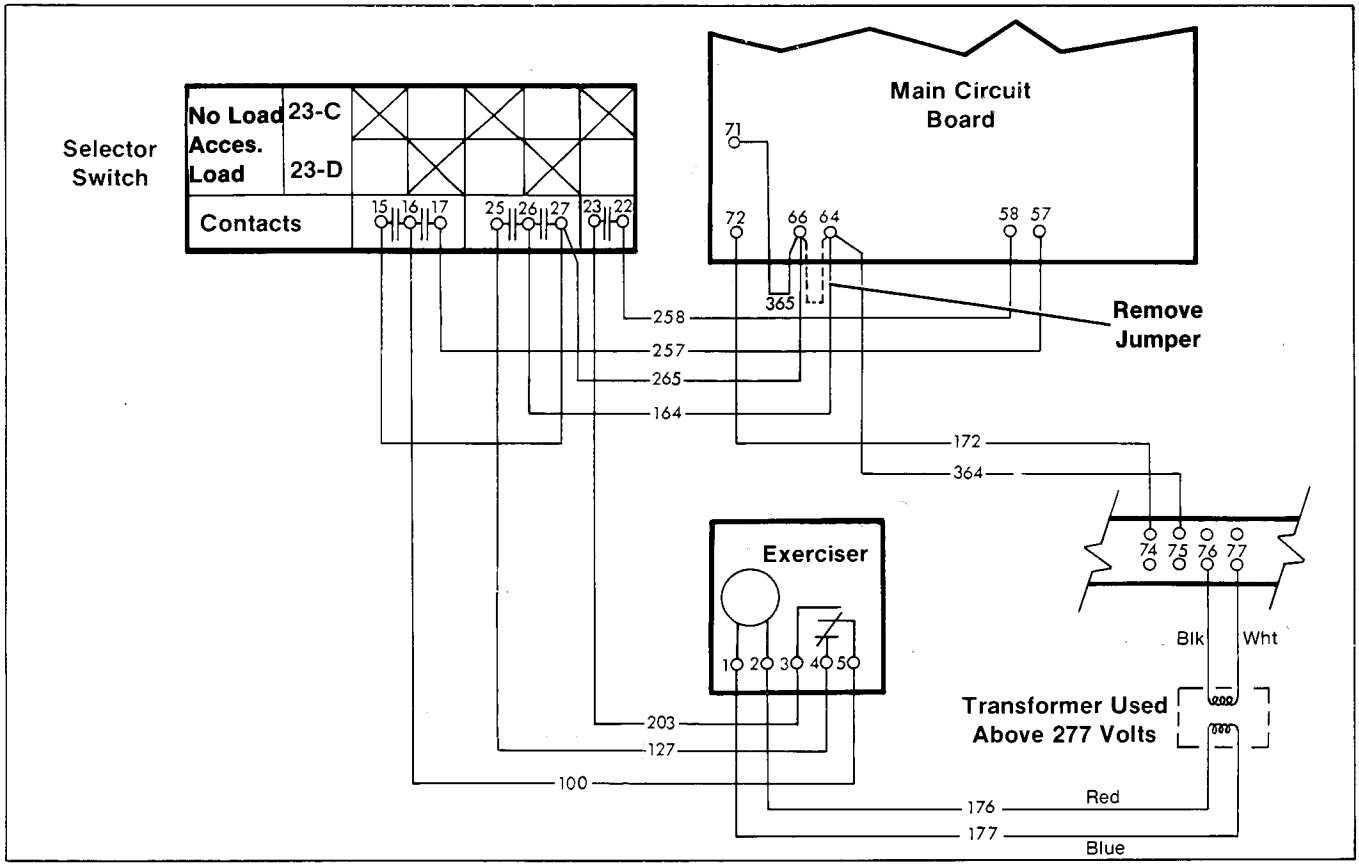


Figure 29. Exercise Timer (with Transfer/No-Transfer) Selector Switch Connections

Acc. 24—Battery Charger

Kohler Battery Chargers are mounted below the main circuit board on the enclosure door. Select charger by normal line-to-line voltage. Switch at rear of charger selects output voltage. See Figure 30 for connections.

⚠WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection to the transformer assembly primary terminals 76, 77, 78, and 79. Terminals are at line voltage!

- ☐ **Acc. 24-C** 110/120 volt 50/60 Hz, 12 or 24-Volt output
- ☐ **Acc. 24-D** 220/240 volt 50/60 Hz, 12 or 24-Volt output
- ☐ **Acc. 24-E** 208 volt 50/60 Hz, 12 or 24-Volt output
- ☐ **Acc. 24-F** 480/600 volt 50/60 Hz, 12 or 24-Volt output
- ☐ **Acc. 24-G** 190/220 volt 50 Hz, 12 or 24-Volt output
- ☐ **Acc. 24-H** 380 volts 50 Hz, 12 or 24-Volt output
- ☐ **Acc. 24-J** 416 volt 50 Hz, 12 or 24-Volt output

These chargers are solid state float type, designed to keep lead acid starting batteries fully charged. Switch at rear of charger selects output voltage.

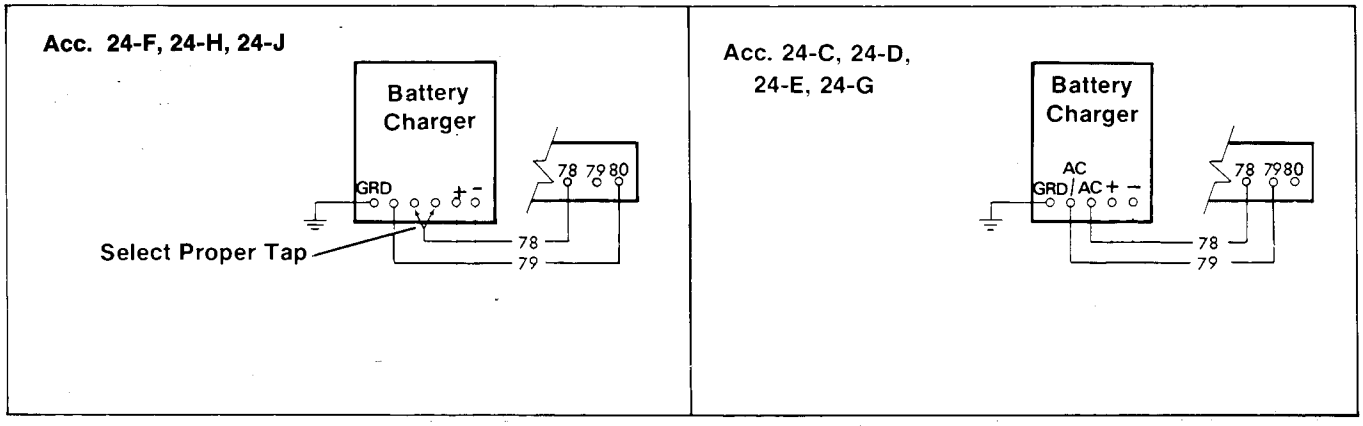


Figure 30. Battery Charger Connections

Acc. 26-DR—Area Protection With Override

Area Protection controls are provided by other manufacturers. This accessory provides the override circuit (loss of generator output) and connection to an area protection control (Figures 31 thru 33).

⚠WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection to transformer assembly primary terminals 76, 77, 78, and 79. Terminals are at line voltage!

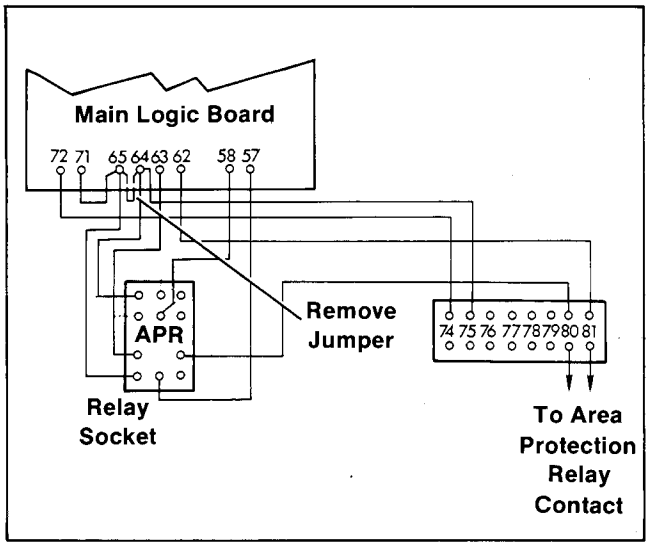


Figure 31. Area Protection without Accessories

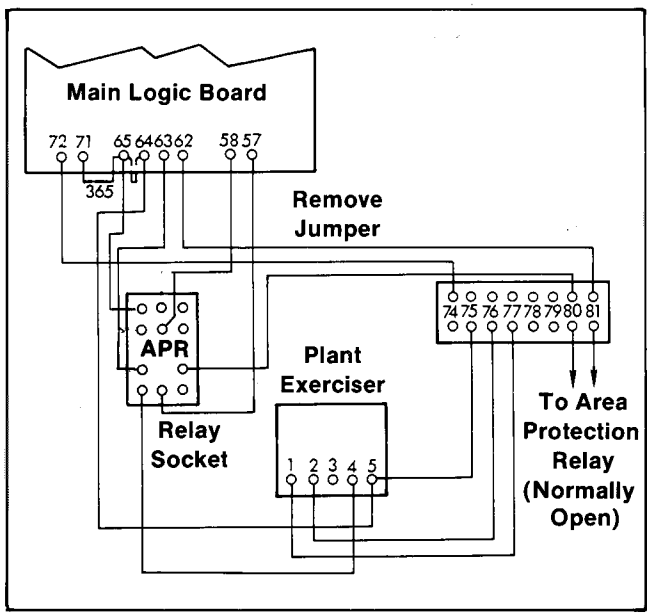


Figure 32. Area Protection with Acc. 23-D

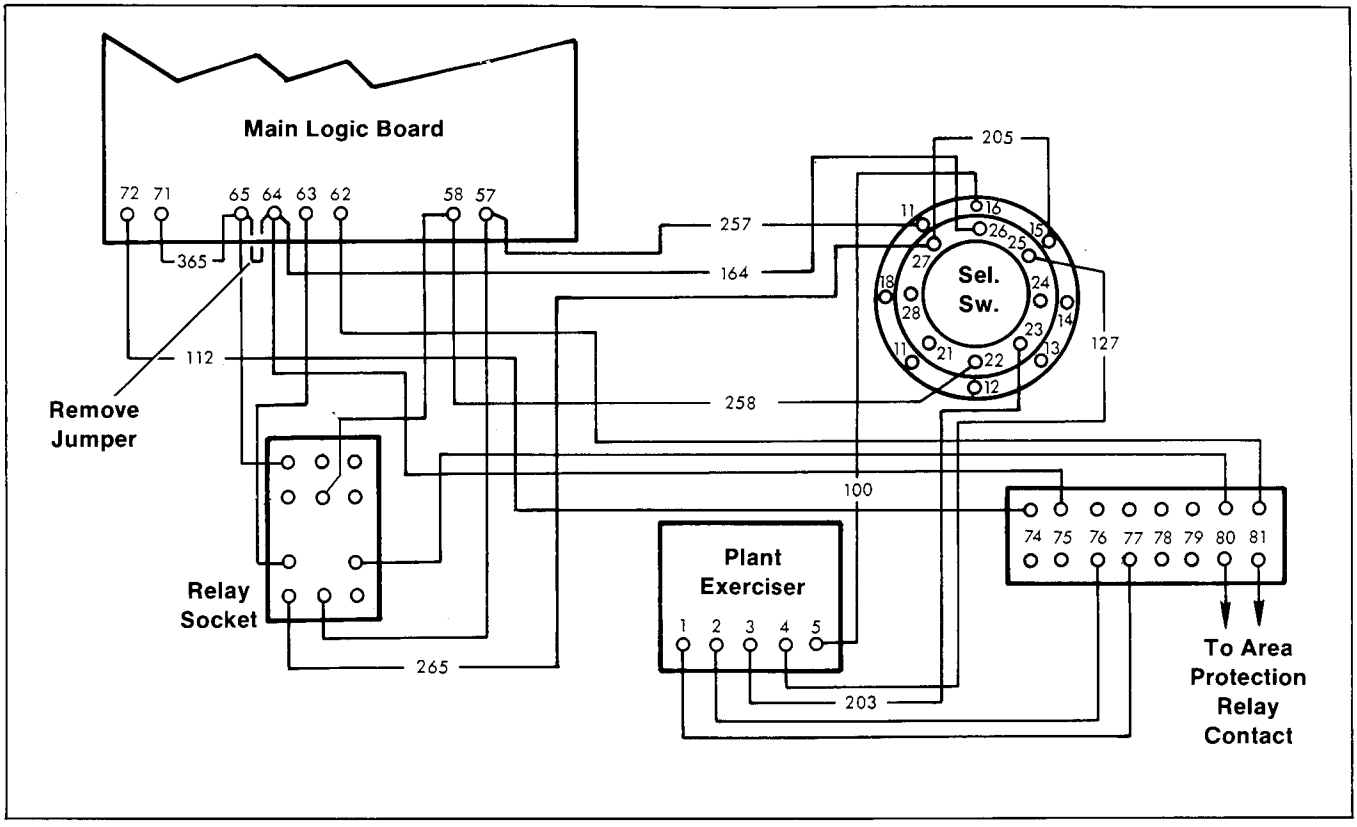


Figure 33. Area Protection with Acc. 23-G

1. The Area Protection Control initiates closing of the generator set starting contacts.
2. Closing of the engine starting contacts activates the engine starting control to start the generator set.
3. As soon as the generator set starts, the emergency lights go on.
4. When the generator set is up to voltage and frequency, as measured by relays within the Kohler Transfer Switch, the transfer switch transfers the connected load to the generator set.
5. An extra contact on relay APR can be used to help provide an audible or visual signal to indicate which circuit has shorted or failed.
6. The generator set will keep running, and the transfer switch will remain connected to the generator set even though the normal source is available. When the fault has been corrected and the circuit breaker has been reclosed, then the area supervisory relay is energized, and the transfer switch returns to its normal position. The generator set shuts down.
7. If the generator set should fail while it is carrying the load, Acc. 26 will bypass the time delay circuits and the transfer switch will retransfer the load to the normal source immediately upon availability.

☐ **Acc. 30-A, B Cranking Limiter** is used with generator set without a cranking limiter in its controller. See Figure 34 for connections.

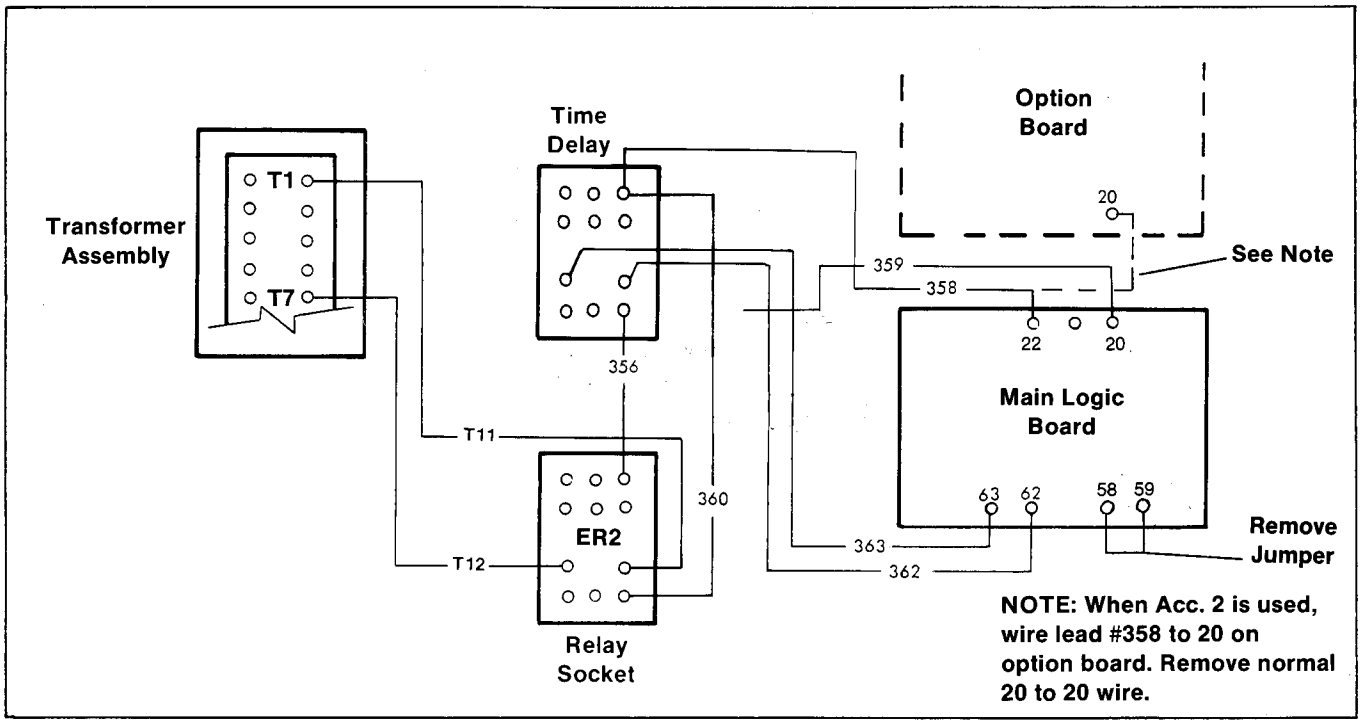


Figure 34. Cranking Limiter Connections

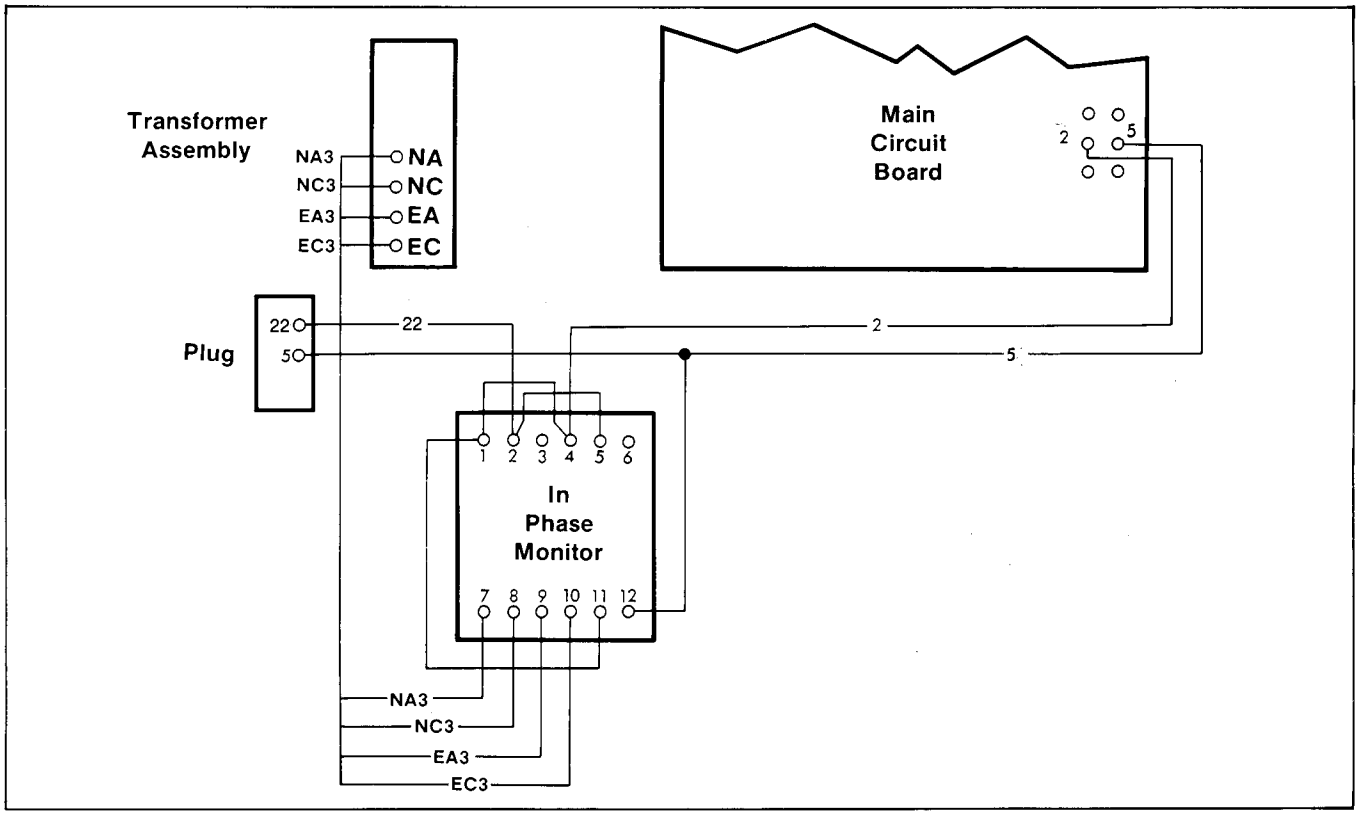


Figure 35. Inphase Monitor Connections

Motor Load Transfer/Inphase Monitor or Synch-Check Relay

Acc. 34, if furnished, is a control for transfer and retransfer of motor loads, so that inrush currents do not exceed normal starting currents, to avoid nuisance tripping of circuit breakers and possible mechanical damage to motor couplings.

☐ **Acc. 34-A Inphase Monitor.** Monitors the normal and emergency sources and will not permit transfer in either direction until the phase voltages are within ±15° and have a frequency difference within ±2 cycles. If the source supplying the load fails or drops below 70% the monitor will override itself and permit immediate transfer. See Figure 35 for connections.

NORMAL SOURCE RESTORATION

NR relay energizes and ER relay is dropped out. After approximately 2 seconds the inphase monitor senses both sources of power, and its output relay energizes to initiate inphase transfer. The TS coil is energized and the standard sequence of operation is resumed.

When the test switch is used, the inphase monitor senses both sources of power approximately 2 seconds after the ER relay energizes. The TS coil is energized and the standard sequence of operation is resumed.

If either source of power is not available when the inphase monitor starts its sensing mode, the output relay picks up after 2 seconds and allows the TS coil to be energized.

Optional Accessory 34-A can be added later in kit form. Include Serial Number and Catalog Number of Transfer Switch when ordering Acc. 34-A.

☐ **Acc. 34-B, C, D Synch-check relay.** Monitors normal and emergency sources and will not permit transfer until phase voltages have been within 10° for approximately 60 milliseconds. If source supplying load drops 10% to 30% (adjustable), the relay will override itself, permitting immediate transfer. Accessory operates in either direction or emergency-to-normal or normal to emergency direction only. See Figure 36 for connections.

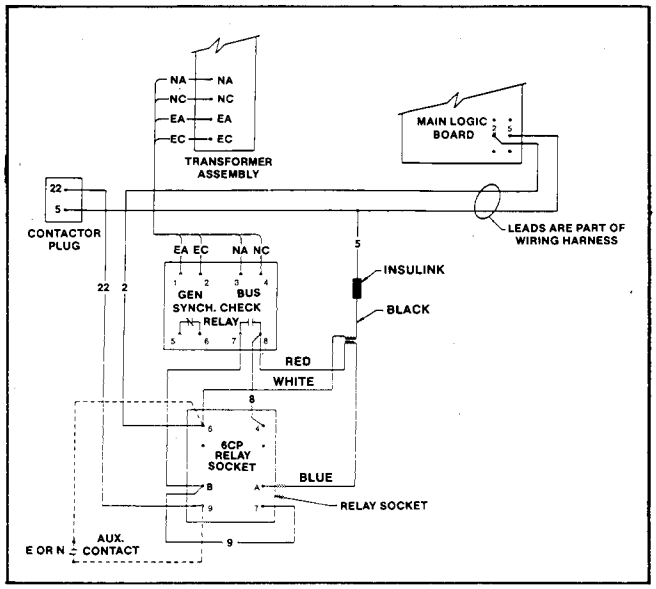


Figure 36. Synch-Check Relay Connections

In Case Of Trouble

1. Connect a voltmeter between terminals NA and EA on the Transfer Switch. Set the meter scale to at least twice the system phase-to-phase voltage.
2. Manually start the generator set. After it has reached maximum output voltage, the meter needle should sweep back and forth at a regular rate between 0 volts and about twice the system voltage.
3. Place Test Switch in TEST position. The load should transfer to the emergency source when the meter needle is near 0 volts. If transfer does not occur, Acc. 34 is malfunctioning.
4. Place Test Switch in AUTOMATIC position. The load should retransfer back to the normal source after time delay. The retransfer should occur when the needle is near 0 volts. If retransfer does not occur after time delay, Acc. 34 is malfunctioning.
5. Immediate retransfer may be accomplished by manually stopping the generator set. Make sure that full rated normal voltage is available before doing this.
6. Disconnect and remove voltmeter.

Load-Shedding Contacts (Acc. 35)

As the transfer switch contactor coil is signaled to operate, the relay that controls contacts at terminals 90 through 95 is energized. See Figure 37.

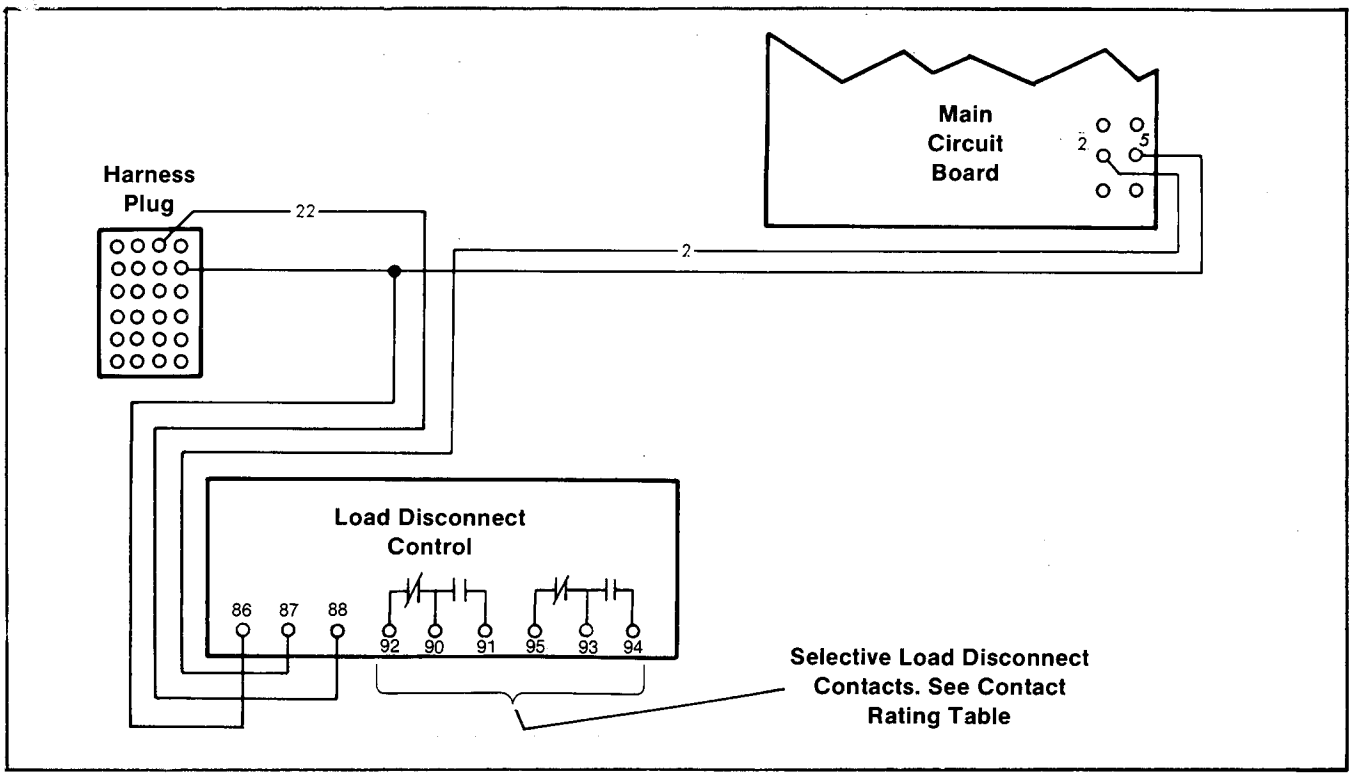


Figure 37. 35-G, H, L Connections

After a time delay, the load disconnect control will energize the contactor coil. As the transfer switch contactor operates, the relay that controls contacts 90 through 95 will de-energize, and contacts will return to normal positions shown in Figures 37 and 38.

⚠ WARNING

SHOCK HAZARD! Disconnect harness plug before installing any accessories involving connection to transformer assembly primary terminals 76, 77, 78, and 79. Terminals are at line voltage!

☐ **Acc. 35-G**—two sets, NO/NC contacts

☐ **Acc. 35-H**—two sets, NO/NC contacts

☐ **Acc. 35-J**—two sets, NO/NC contacts

☐ **Acc. 35-L**—two sets, NO/NC contacts

Relay Contact Ratings

Service Voltage	Amps 2 Poles
120 AC	10
240 AC	10
480 AC	10
600 AC	7.5
12 DC	10
24 DC	10
32 DC	10
120 DC	0.4

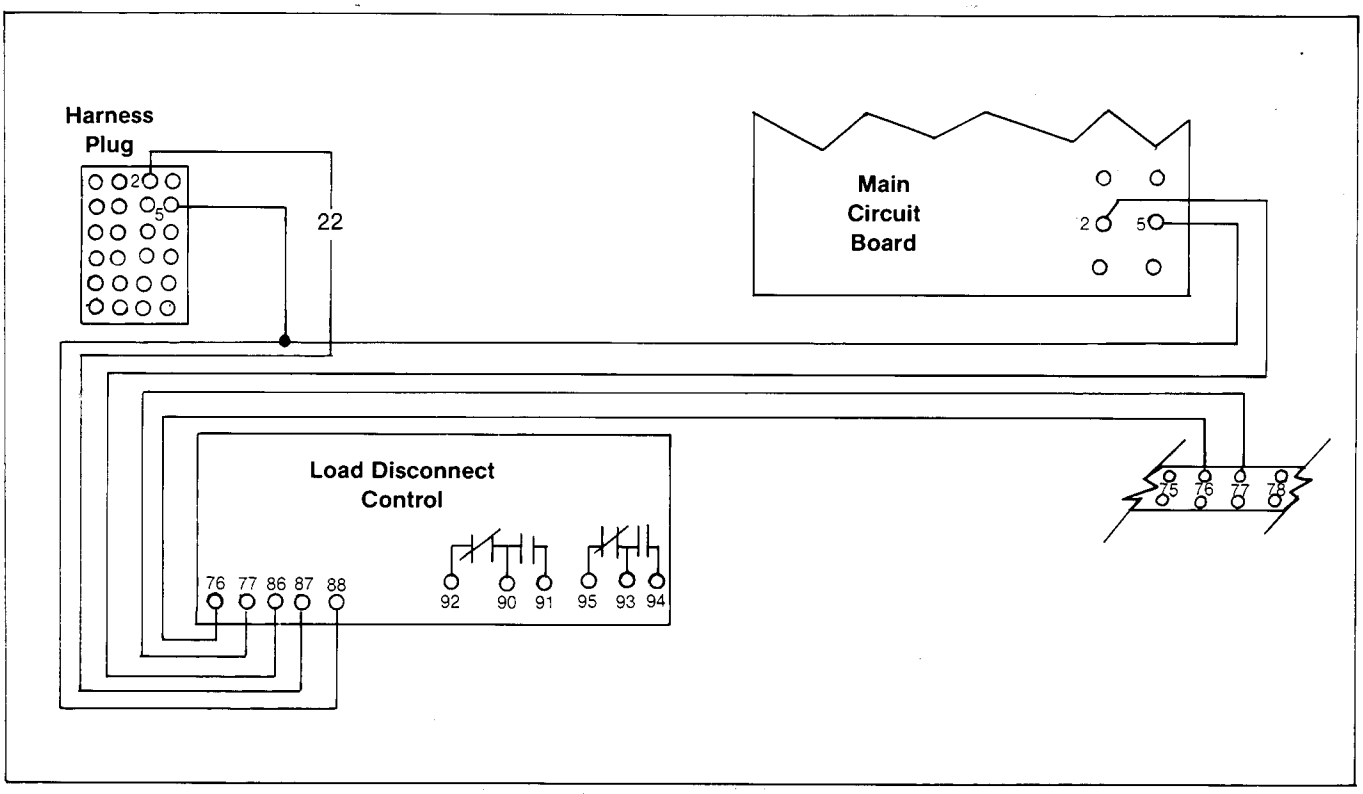


Figure 38. 35-J Connections

Disconnecting the Inner Control Panel Assembly

The In-Line Disconnect Plug is furnished for repair purposes only and should not have to be separated. If it must be separated, follow these steps carefully. See Figure 1.

⚠WARNING

SHOCK HAZARD! Disconnect inner panel harness at in-line connector. This will de-energize circuit board and logic circuitry, but allow transfer switch to continue to supply utility power to necessary lighting and equipment. Potential electrocution will exist if any accessories mounted to inner panel are NOT wired through and de-energized by harness separation. Such accessories may be at line voltage.

CAUTION

Follow Steps 1a. and 1b. before disconnecting or reconnecting the plug, and observe the position of the Transfer Switch.

To Disconnect the Plug

1a If the Transfer Switch is in the Normal position, place the generator set starting switch in the OFF position. Then open the emergency source circuit breaker.

1b. If the Transfer Switch is in the emergency position, open the normal source circuit breaker. Place the generator set starting switch in the TEST or RUN position.

2. Separate the In-Line Disconnect Plug by grasping and squeezing the plug. Do not pull on the wires.

3. Remove and tape the signal wires connected to the engine start terminals on the contactor (Terminals 3 and 4).

To Reconnect the Plug

1a. If the Transfer Switch is in the Normal position, place the generator set starting switch in the OFF position. Then open the emergency source circuit breaker.

1b. If the Transfer Switch is in the Emergency position, open the normal source circuit breaker.

2. Reconnect the signal wires to the appropriate engine start terminals.

3. Engage the In-Line Disconnect Plug by grasping and pressing together.

4a. If the Transfer Switch is in the Normal position, place the generator set starting switch in the AUTOMATIC position. Then close the emergency source circuit breaker.

4b. If the Transfer Switch is in the Emergency position, close the normal source circuit breaker. The load will be automatically retransferred to the normal source after time delay. For immediate retransfer, open and then reclose the emergency source circuit breaker. Place the generator set starting switch in the AUTOMATIC position.

Manual Load Transfer

1. Open the normal and emergency source circuit breakers.
2. Install the manual operator handle (refer to Functional Test, Manual Operation) and manually operate the Transfer Switch to the emergency position. Remove handle.
3. Manual start the generator set and then close the emergency source circuit breaker.

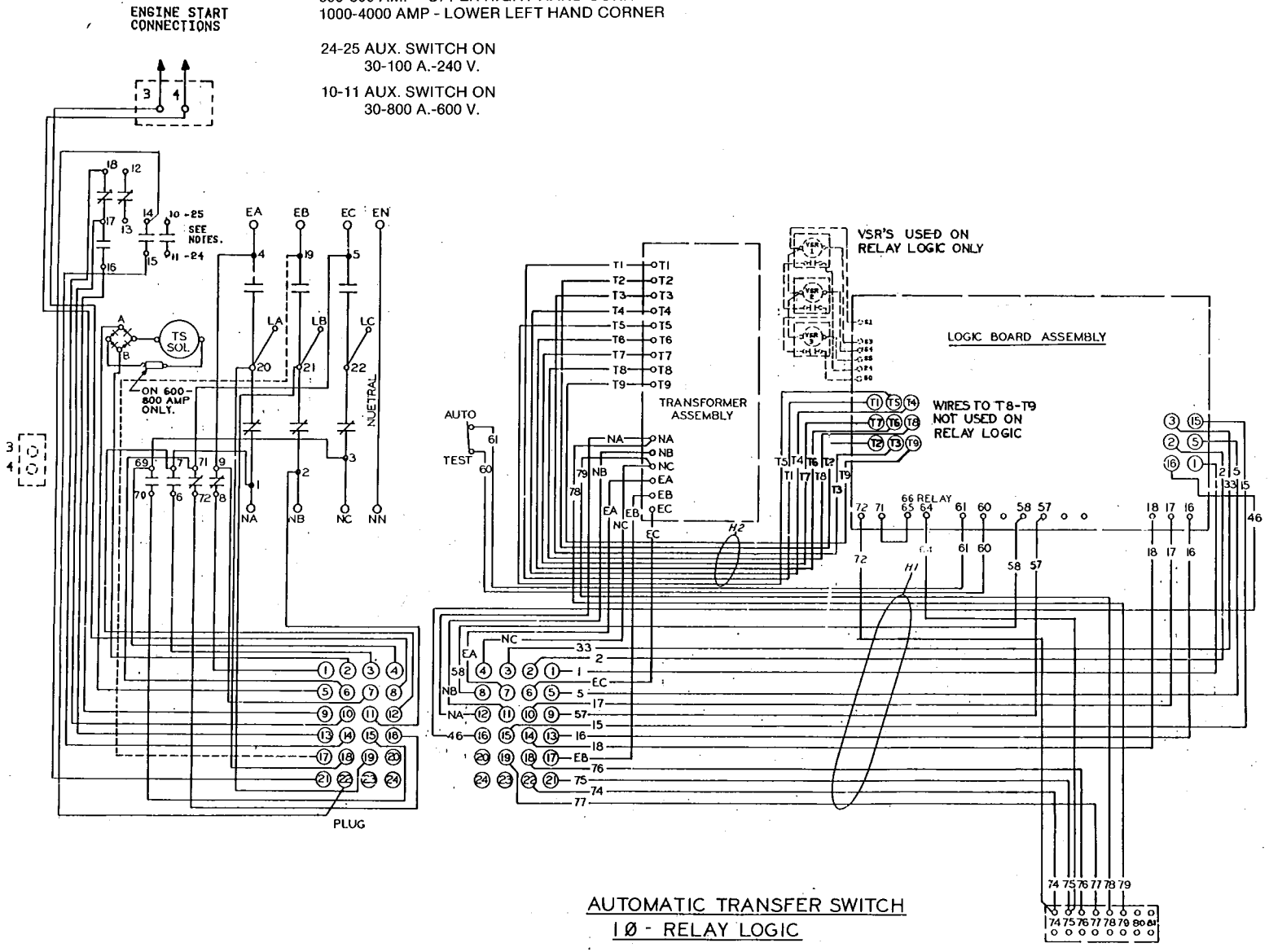
NOTES

NOTE:
ENGINE START TERMINALS 3 & 4
ARE LOCATED ON THE CONTACTOR.

30-150 AMP - LOWER LEFT SIDE
260-400 AMP - ABOVE TS COIL
600-800 AMP - UPPER RIGHT HAND CORNER
1000-4000 AMP - LOWER LEFT HAND CORNER

24-25 AUX. SWITCH ON
30-100 A.-240 V.

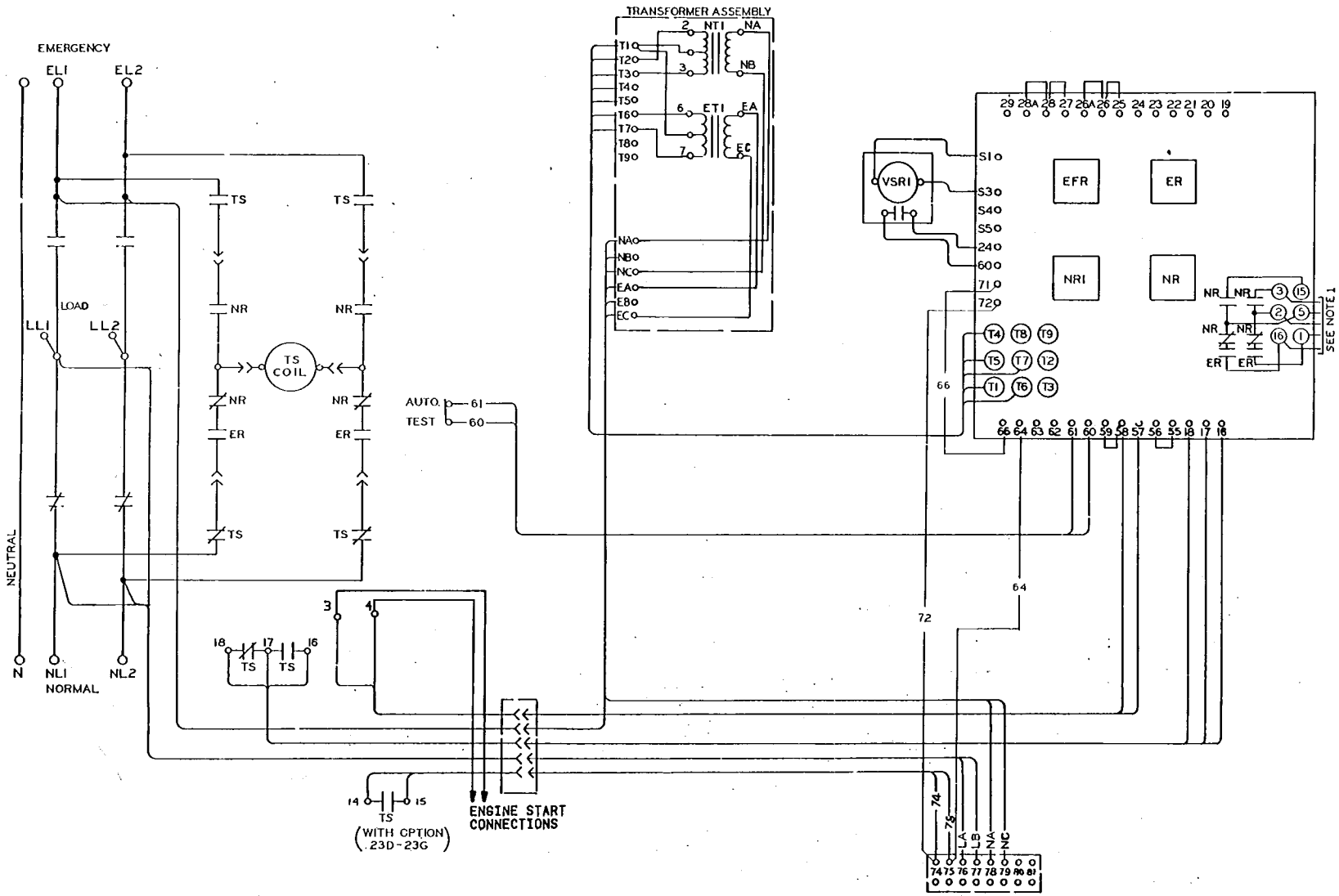
10-11 AUX. SWITCH ON
30-800 A.-600 V.



AUTOMATIC TRANSFER SWITCH
1Ø - RELAY LOGIC

295079

1-Ø Wiring Harness



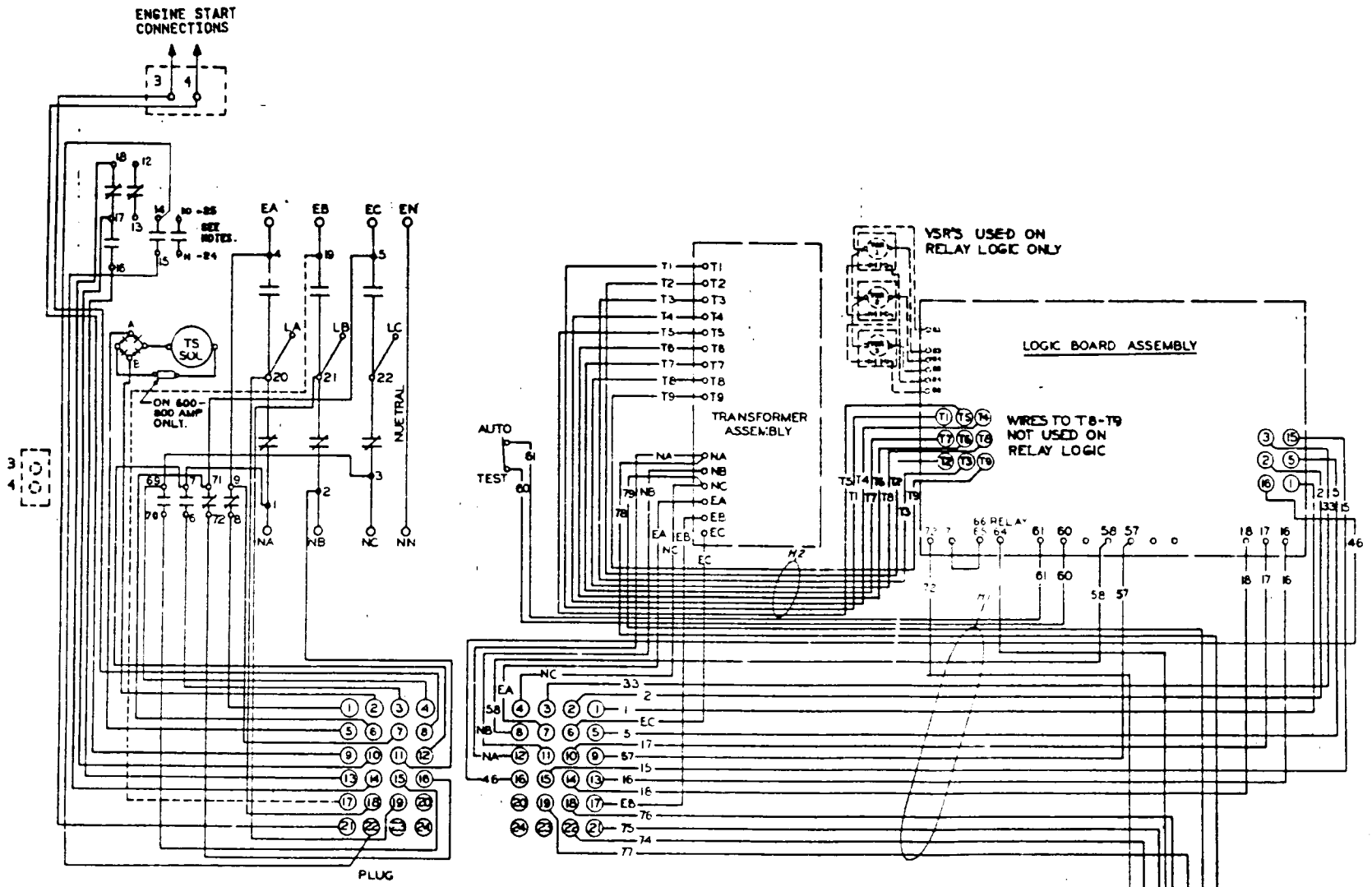
NOTE:

1. CONTACTS CONNECTED TO TS CONTACTOR AND COIL VIA HARNESS AND DISCONNECT PLUG, SEE DWG. 295079 FOR DETAILS OF HARNESS WIRING.
2. ENGINE START TERMINALS 3 & 4

30-1500 AMP - LOWER LEFT SIDE
260-400 AMP - ABOVE TS COIL
600-800 AMP - UPPER RIGHT HAND CORNER
1000-4000 AMP - LOWER LEFT HAND CORNER

1 - Ø, 3, or 4 Wire
30 - 4000 Amp

295077



NOTE:

1. CONTACTS CONNECTED TO TS CONTACTOR AND COIL VIA HARNESS AND DISCONNECT PLUG. SEE DWG. 295078 FOR DETAILS OF HARNESS WIRING.
2. ENGINE START TERMINALS 3 & 4 ARE LOCATED ON THE CONTACTOR

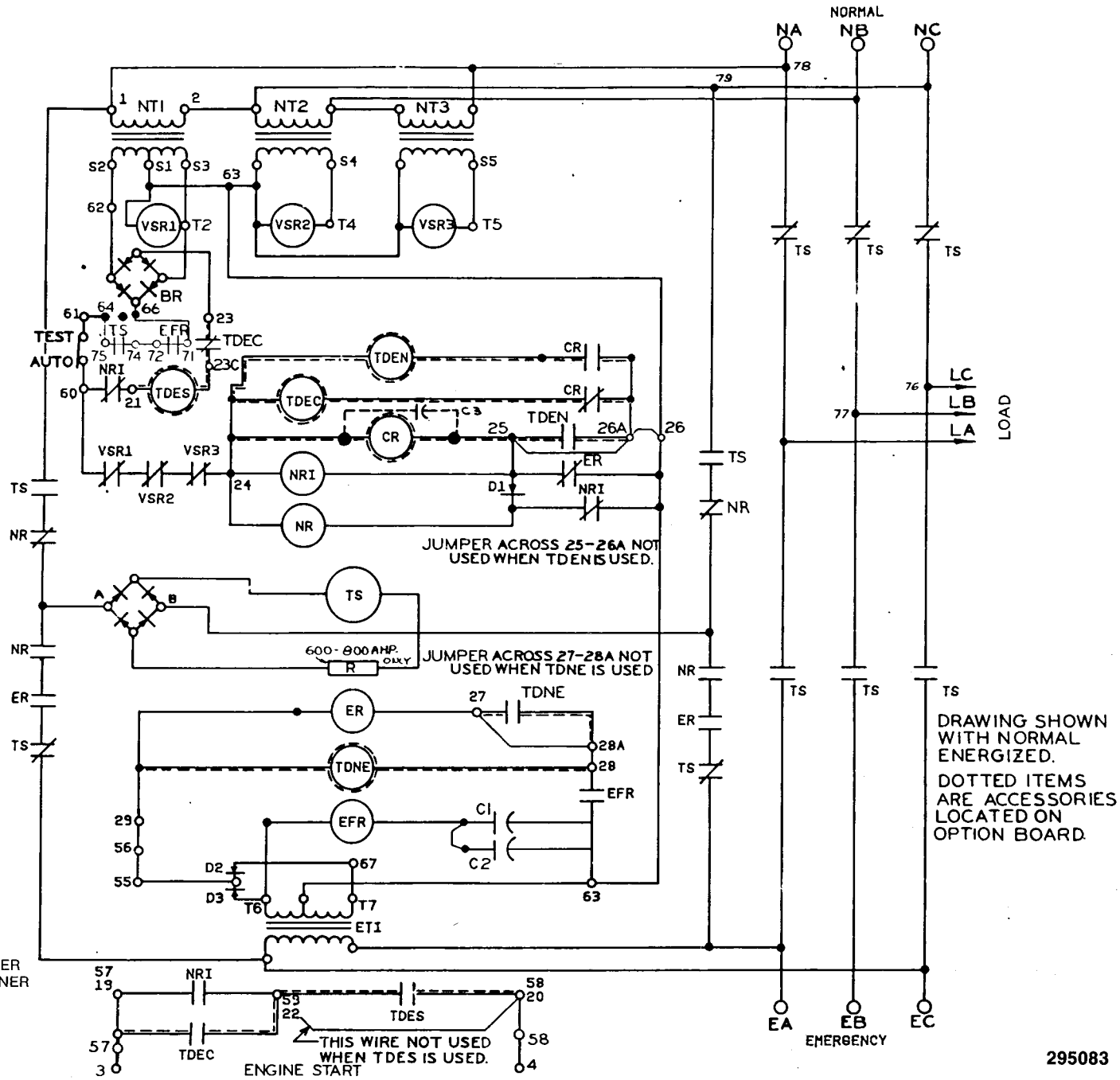
   30-150 AMP - LOWER LEFT SIDE
   260-400 AMP - ABOVE TS COIL
   600-800 AMP - UPPER RIGHT HAND CORNER
   1000-4000 AMP - LOWER LEFT HAND CORNER

24-25 AUX. SWITCH ON 30-100 A.-240 V.

10-11 AUX. SWITCH ON 30-800 A.-600 V.

295078

3-Ø Wiring Harness

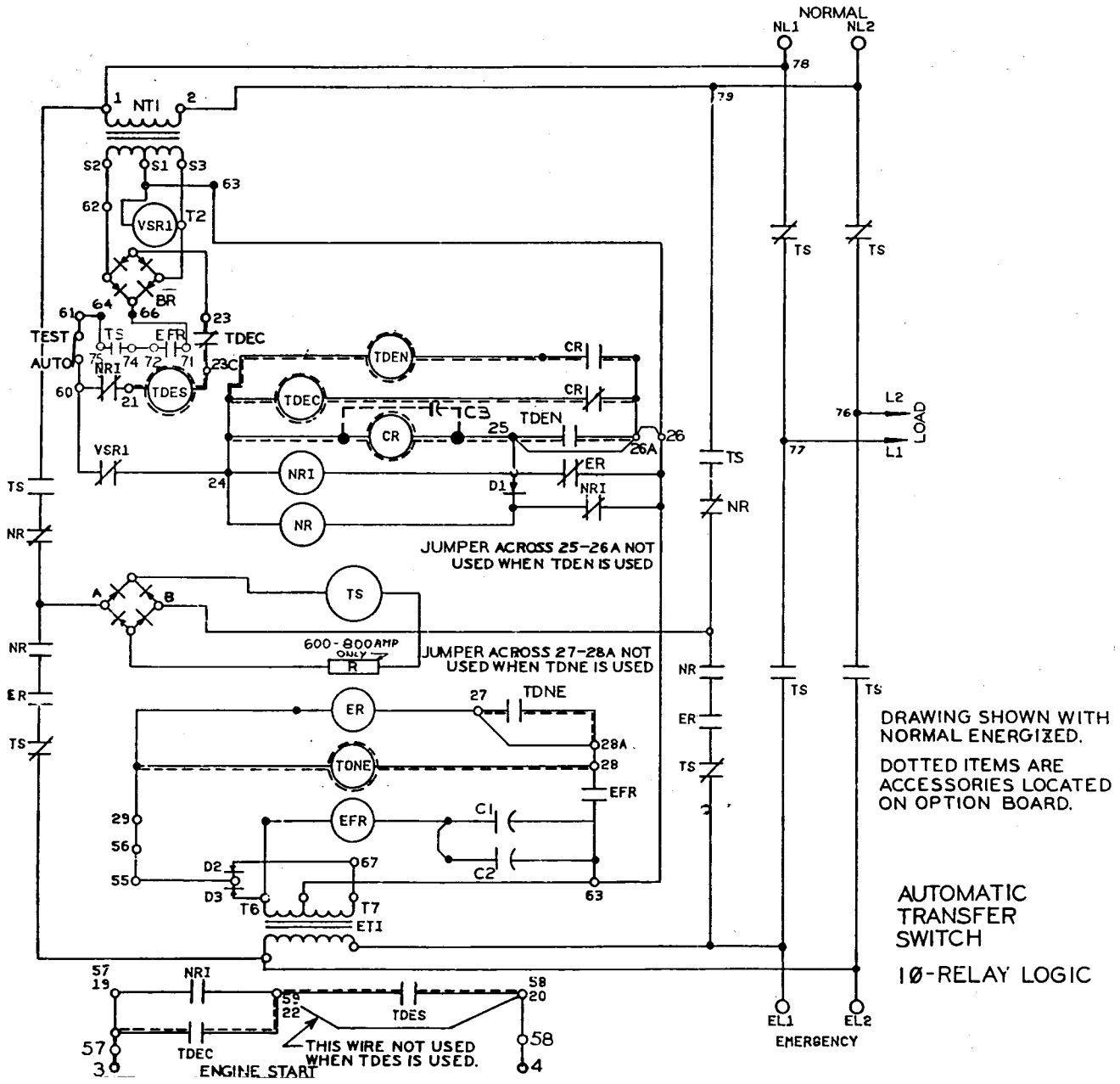


NOTE:
ENGINE START TERMINALS 3 & 4 ARE LOCATED ON CONTACTOR.

30-150 AMP - LOWER LEFT SIDE
260-400 AMP - ABOVE TS COIL
600-800 AMP - UPPER RIGHT HAND CORNER
1000-4000 AMP - LOWER LEFT HAND CORNER

3 - Ø, 2 or 3 Wire
30-4000 Amp

295083



DRAWING SHOWN WITH NORMAL ENERGIZED.

DOTTED ITEMS ARE ACCESSORIES LOCATED ON OPTION BOARD.

AUTOMATIC TRANSFER SWITCH

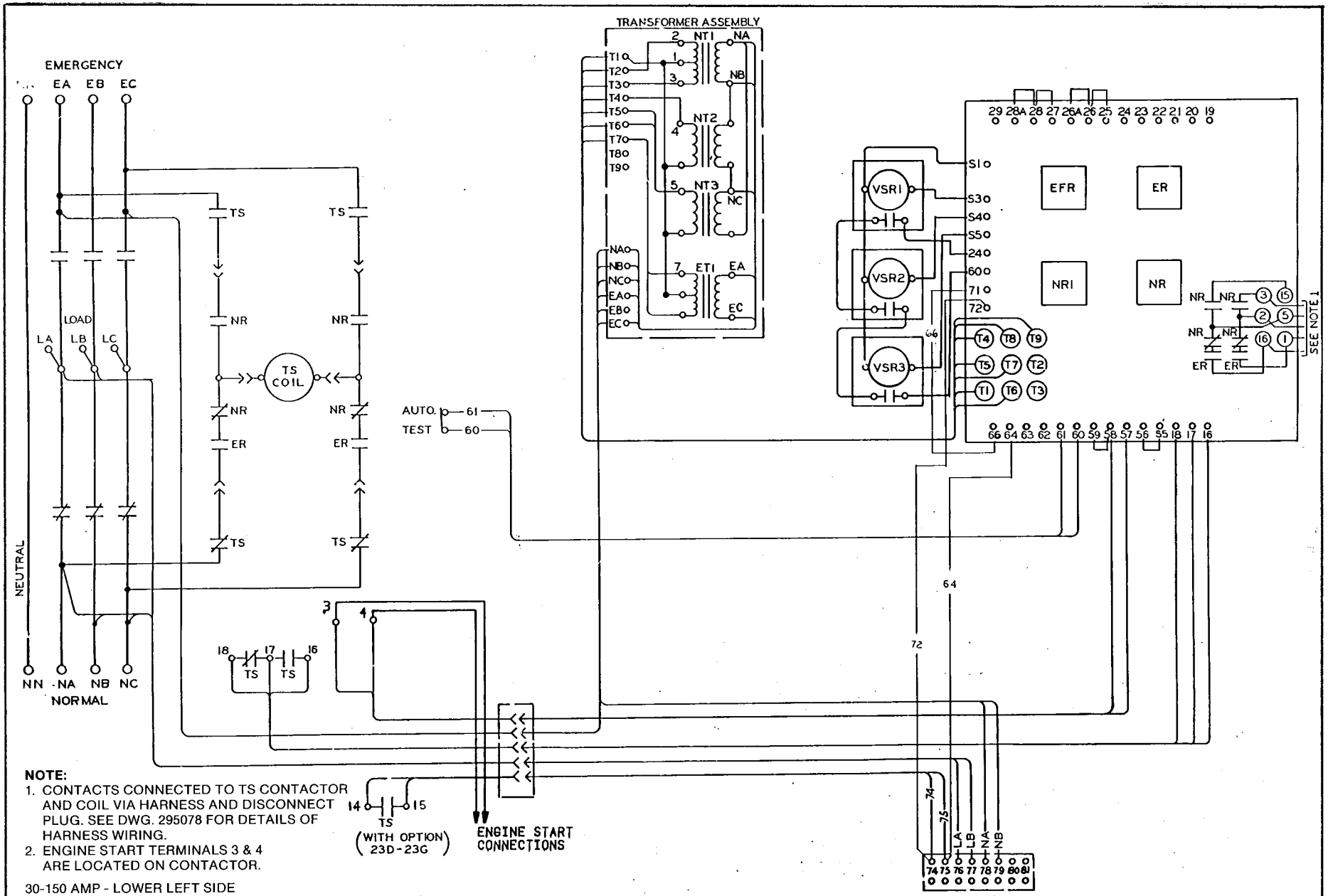
1Ø-RELAY LOGIC

NOTE:
ENGINE START TERMINALS 3 & 4 ARE LOCATED ON THE CONTACTOR.

30-150 AMP
LOWER LEFT SIDE
260-400 AMP
ABOVE TS COIL
600-800 AMP
UPPER RIGHT HAND CORNER
1000-4000 AMP
LOWER LEFT HAND CORNER

1 - Ø, 2, or 3 Wire
30 - 4000 Amp

295084



NOTE:

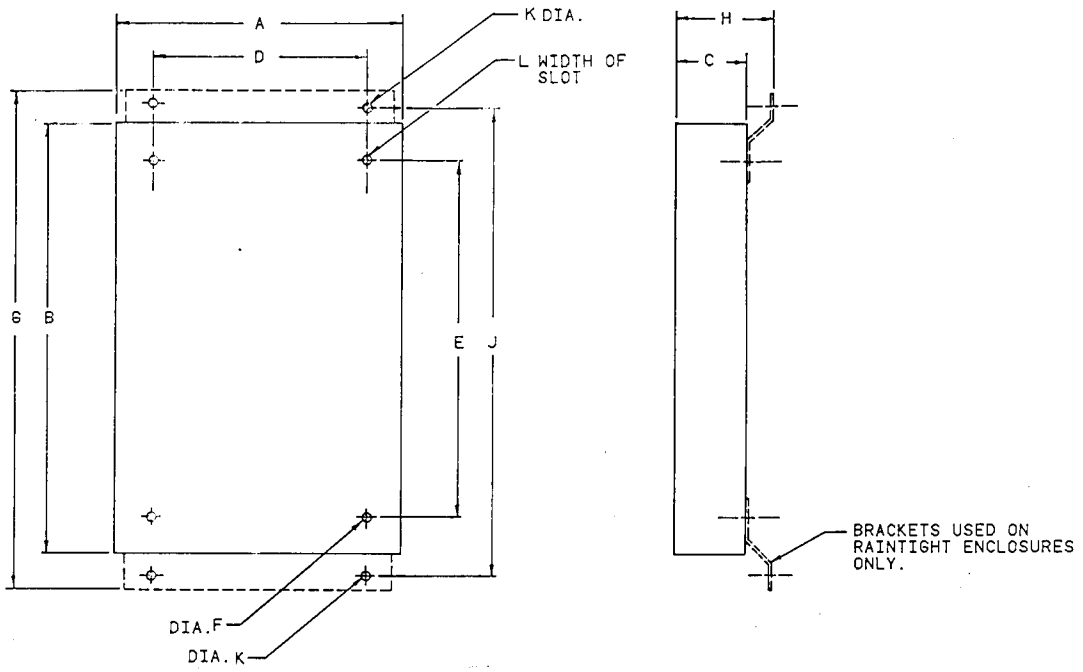
1. CONTACTS CONNECTED TO TS CONTACTOR AND COIL VIA HARNESS AND DISCONNECT PLUG. SEE DWG. 295078 FOR DETAILS OF HARNESS WIRING.
2. ENGINE START TERMINALS 3 & 4 ARE LOCATED ON CONTACTOR.

30-150 AMP - LOWER LEFT SIDE
260-400 AMP - ABOVE TS COIL
600-800 AMP - UPPER RIGHT HAND CORNER
1000-4000 AMP - LOWER LEFT HAND CORNER

3 - Ø, 3, or 4 Wire
30 - 4000 Amp

AUTOMATIC TRANSFER SWITCH
3Ø RELAY LOGIC

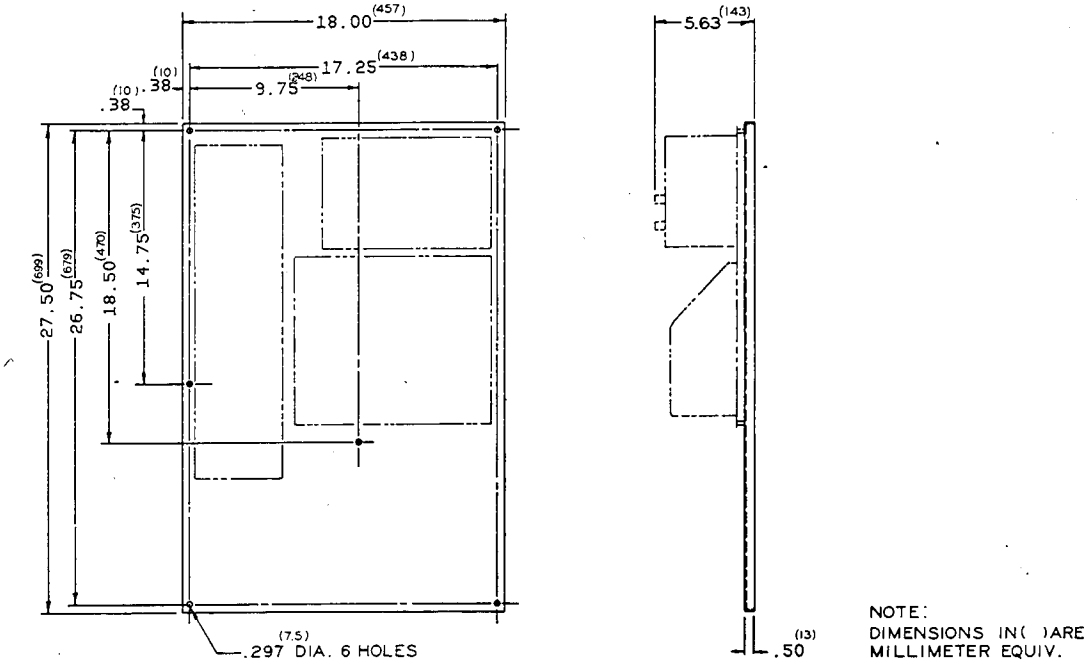
295076



	ALL ENCLOSURES			NEMA 1 ONLY				RAINTIGHT ONLY				
	A	B	C	D	E	F	L SLOT	G	H	J	K	D
30-150 AMP	23.90 (607)	33.75 (857)	13.32 (338)	18.25 (464)	25.00 (635)	.531 (13.5)	.406 (10.3)	35.96 (913)	14.48 (368)	34.50 (876)	406 (10.3)	18.25 (464)
225-400 AMP	23.90 (607)	47.15 (1197)	15.58 (396)	18.25 (464)	38.40 (975)	.531 (13.5)	.406 (10.3)	49.36 (1254)	16.74 (425)	47.90 (1217)	.406 (10.3)	18.25 (464)

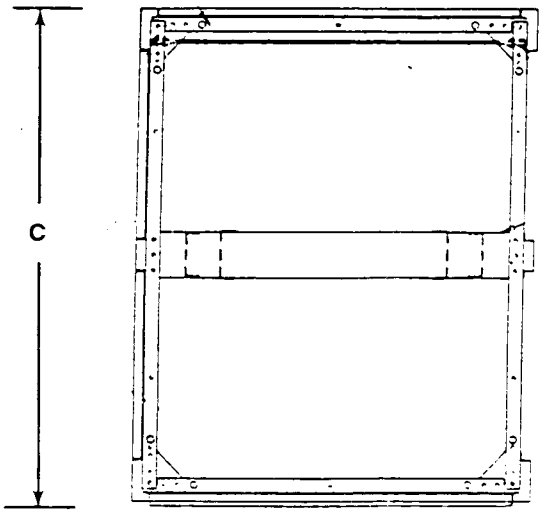
NOTE:
NUMBERS IN TOP RIGHT CORNERS ARE MILLIMETERS.

ADV-5238



NOTE:
DIMENSIONS IN( ) ARE MILLIMETER EQUIV.

ADV-5239

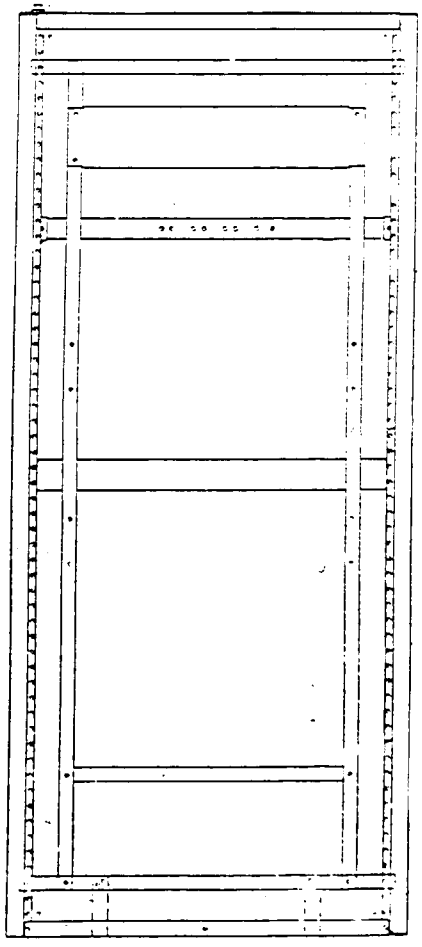


TOP VIEW

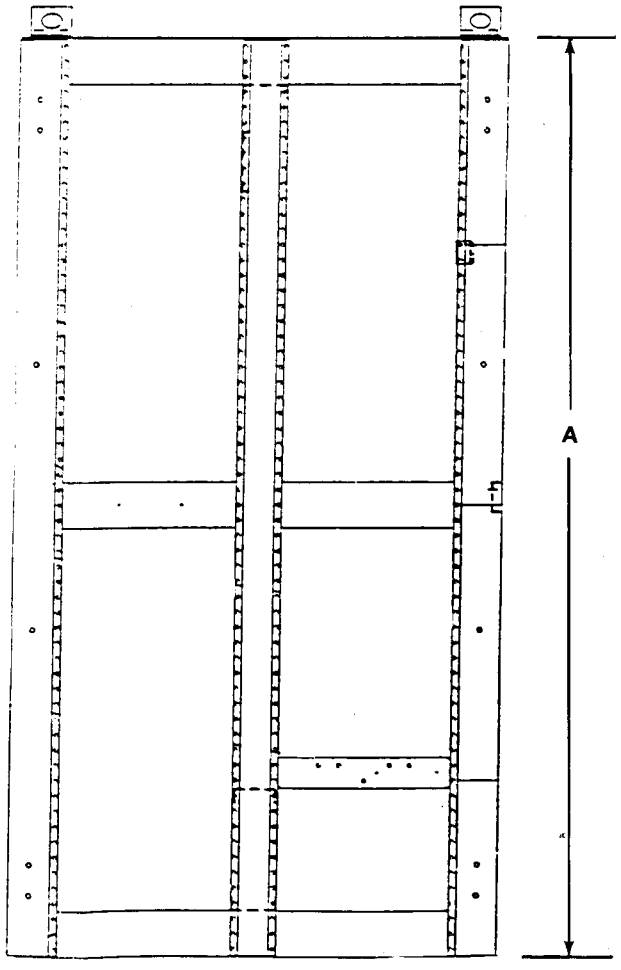
ENCLOSURES	A	B	C
1000-1200 AMP	90.00[2286]	46.25[1175]	26.50[673]
1600-2000 AMP	90.00[2286]	38.25[971.5]	48.00[1219]
3000-4000 AMP	90.00[2286]	48.00[1219]	48.00[1219]

NOTE:

Numbers in top right corners are millimeters.

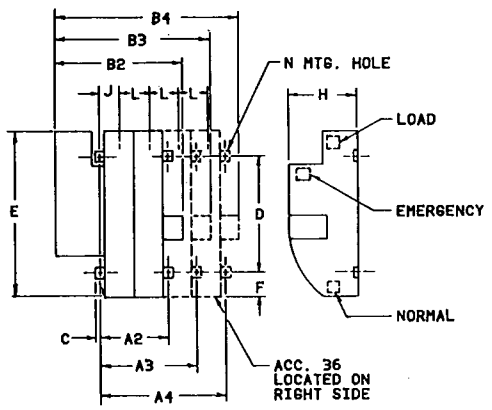


FRONT VIEW



SIDE VIEW

30-150 AMPERES



2 POLE

AMP SIZE	OPEN TYPE DIMENSIONS IN INCHES													
	A2	B2	C	D	E	F	H	J	L	N				
30	2.31	6.31	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
70	2.31	6.31	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
104	2.31	6.31	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
150	2.81	6.81	0.31	5.50	9.75	2.18	5.00	0.98	0.96	0.27				

3 POLE

AMP SIZE	OPEN TYPE DIMENSIONS IN INCHES													
	A3	B3	C	D	E	F	H	J	L	N				
30	3.06	7.06	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
70	3.06	7.06	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
104	3.06	7.06	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
150	3.81	7.78	0.31	5.50	9.75	2.18	5.00	0.98	0.96	0.27				

3 POLE WITH ACC. 36 (OVERLAPPING NEUTRAL TRANSFER CONTACT)

AMP SIZE	OPEN TYPE DIMENSIONS IN INCHES													
	A4	B4	C	D	E	F	H	J	L	N				
30	3.78	7.78	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
70	3.78	7.78	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
104	3.78	7.78	0.25	4.87	8.87	1.53	4.75	0.80	0.73	0.27				
150	4.75	8.75	0.31	5.50	9.75	2.18	5.00	0.98	0.96	0.27				

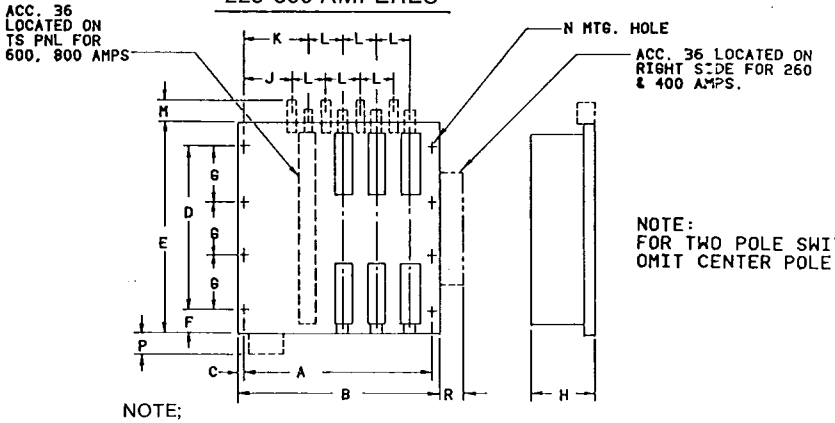
SIZES OF AL-CU, UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTIONS.

SWITCH RATING (AMPS)	RANGE OF WIRE SIZES
30	ONE #14 TO #6
70	ONE #14 TO 1/0
104	ONE #14 TO 2/0
150	ONE #8 TO 3/0

GENERAL INFORMATION

1. WHEN INSTALLING,CONNECT NORMAL, EMERGENCY AND LOAD CONDUCTORS TO TERMINALS AS MARKED
2. ALL INTERNAL CONNECTIONS ARE MADE AT FACTORY TO STANDARD WIRING HARNESS.
3. MAINTAIN ELECTRICAL CLEARANCE OF .50 IN.MIN. BETWEEN LIVE METAL PARTS AND GROUNDED METAL WHEN MOUNTING 30 THRU 400 AMP.SIZES AND 1" MIN. FOR 600 THRU 800 AMP. SIZES.
4. THE TRANSFER SWITCH IS SUPPLIED WITH A 16 WIRE INTERCONNECTING HARNESS TERMINATED IN A 24 POINT IN-LINE DISCONNECT PLUG.

225-800 AMPERES



NOTE:
FOR TWO POLE SWITCHS, OMIT CENTER POLE.

NOTE;
"P" DIMENSION APPLIES WHEN ADDITIONAL AUX. CONTACTS ARE SUPPLIED ON 225 & 400 AMPS.

2 AND 3 POLE

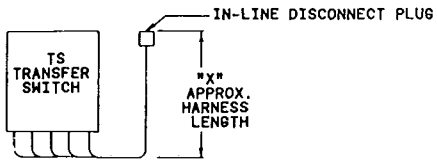
AMP SIZE	OPEN TYPE DIMENSIONS IN INCHES													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
225/260	10.00	11.00	0.50	11.00	12.00	0.50	-	5.87	4.93	3.87	2.12	1.50	0.31	5.00
400	10.00	11.00	0.50	11.00	12.00	0.50	-	6.75	4.93	3.87	2.12	2.75	0.31	5.00
600	18.37	19.25	0.43	-	25.00	1.25	7.50	11.00	5.31	7.00	3.37	1.75	0.50	-
800	18.37	19.25	0.43	-	25.00	1.25	7.50	11.00	5.12	6.75	3.50	1.75	0.50	-

3 POLE WITH ACC.36 (OVERLAPPING NUETRAL TRANSFER CONTACT)

AMP SIZE	OPEN TYPE DIMENSIONS IN INCHES														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
225/260	10.00	11.00	0.50	11.00	12.00	0.50	-	5.87	4.93	3.87	2.12	1.50	0.31	5.00	2.00
400	10.00	11.00	0.50	11.00	12.00	0.50	-	6.75	4.93	3.87	2.12	2.75	0.31	5.00	3.00
600	21.87	22.75	0.43	-	25.00	1.25	7.50	11.50	5.12	6.87	3.50	1.75	0.50	-	-
800	21.87	22.75	0.43	-	25.00	1.25	7.50	11.50	5.12	6.87	3.50	1.75	0.50	-	-

SIZES OF AL-CU, UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTIONS.

SWITCH RATING (AMPS)	RANGE OF WIRE SIZES
225/260	ONE # 4 TO 400 MCM
400	TWO #1/0 TO 250 MCM OR ONE #4 TO 600 MCM
600	TWO #2 TO 600 MCM
800	THREE #2 TO 600 MCM



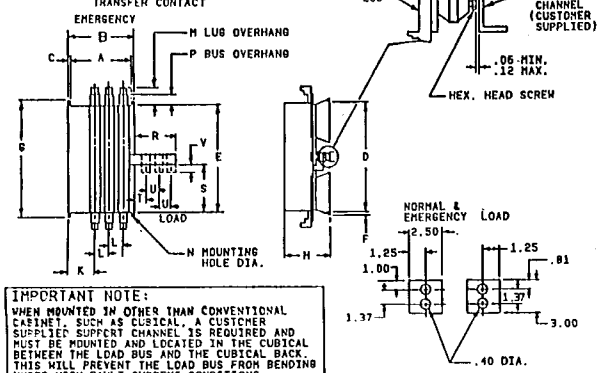
TRANSFER SWITCH HARNESS DIMENSIONS-INCHES	
AMP SIZE	"X"
30	28.0
70	28.0
104	28.0
150	28.0
260	36.0
400	50.0
600	50.0
800	50.0

ADV-5240

Contact Mounting and Wiring

1000 THRU 1200 AMP.

OPEN TYPE DIMENSIONS WITHOUT ACC. 36 OVERLAPPING NEUTRAL TRANSFER CONTACT

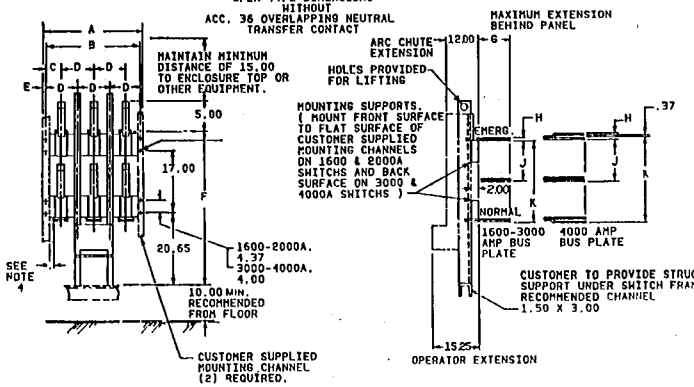


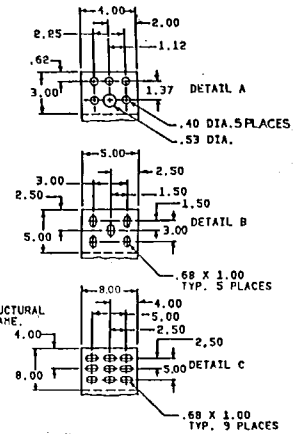
IMPORTANT NOTE:

WHEN MOUNTED IN OTHER THAN CONVENTIONAL CABINET, SUCH AS CUBICAL, A CUSTOMER SUPPLIED SUPPORT CHANNEL IS REQUIRED AND MUST BE MOUNTED AND LOCATED IN THE CUBICAL BETWEEN THE LOAD BUS AND THE CUBICAL BACK. THIS WILL PREVENT THE LOAD BUS FROM BENDING UNDER HIGH FAULT CURRENT CONDITIONS. AN INSULATOR IS MOUNTED ON THE LOAD BUS. DO NOT FASTEN THE INSULATOR TO THE CHANNEL. A HEX HEAD SCREW IS SUPPLIED ON ONE END OF THE INSULATOR. IT MAY BE ADJUSTED TO BUILD UP THE INSULATOR LENGTH OR COMPLETLY REMOVED TO ATTAIN AN INSTALLED CLEARANCE OF .06 MIN. TO .12 MAX.

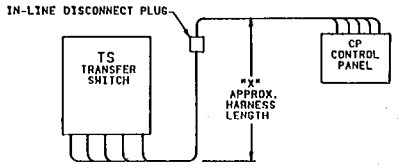
1600 THRU 4000 AMP.

OPEN TYPE DIMENSIONS WITHOUT ACC. 36 OVERLAPPING NEUTRAL TRANSFER CONTACT





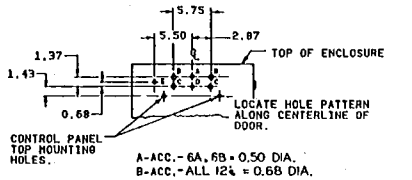
AMPS	DIM. "X"
1000-1200	60.0 IN.
1600-4000	96.0 IN.



AMP SIZE	OPEN TYPE DIMENSIONS- INCHES																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
1000	18.87	19.62	0.37	31.25	30.00	0.62	32.50	13.00	-	7.50	4.28	5.06	0.43	3.00	11.87	12.62	3.18	3.68	1.37
1200	18.87	19.62	0.37	31.25	30.00	0.62	32.50	13.00	-	7.50	4.28	5.06	0.43	3.00	11.87	12.62	3.18	3.68	1.37

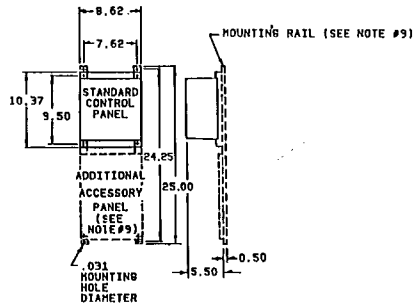
AMP SIZE	A	B	C	D	E	F	G	H	J	K	L
1600 & 2000	28.50	27.00	4.50	9.00	0.75	43.46	4.00	0.50	11.62	23.75	TWO 0.25 X 4.00 BUS BAR PER PHASE BOLTING SURFACE (SEE DETAIL A)
3000	31.50	30.00	5.00	10.00	0.75	43.62	12.00	0.75	12.00	24.00	TWO 0.37 X 5.00 BUS BAR PER PHASE BOLTING SURFACE (SEE DETAIL B)
4000	41.00	39.00	6.50	13.00	1.00	44.00	15.00	1.12	12.18	24.37	TWO 0.37 X 8.00 BUS BAR PER PHASE BOLTING SURFACE (SEE DETAIL C)

RECOMMENDED ENCLOSURE DOOR MOUNTING HOLE LAYOUT FOR TOGGLE SWITCHES, PILOT LIGHTS ETC.



A-ACC.- 6A, 6B = 0.50 DIA.
B-ACC.- ALL 12's = 0.68 DIA.
C-AVAILABLITY LIGHTS.= 0.68 DIA.
D-ACC.- 29C, 29E, 08A, 08C & 6C = 0.50 DIA.
E-ACC.- 07C, 10A & 10C = 0.50 DIA.

OPEN TYPE DIMENSIONS- INCHES.



STANDARD CONTROL PANEL WITH ADDITIONAL ACCESSORY MOUNTING PANEL AND CHANNELS USED WITH 1000-4000AMP TRANSFER SWITCH.

GENERAL NOTES

1. FOR TWO POLE SWITCHES, OMIT CENTER POLE
2. WHEN INSTALLING, CONECT NORMAL, EMERGENCY, AND LOAD CONDUCTORS TO CLEARLY MARKED TERMINALS.
3. ALL INTERNAL CONNECTIONS ARE MADE AT THE FACTORY.
4. MAINTAIN ELECTRICAL CLEARANCE OF 1.00 IN. MINIMUM BETWEEN LIVE METAL PARTS AND GROUNDED METAL WHEN MOUNTED.
5. LOAD LUGS CAN BE FACTORY ASSEMBLED FOR OPTIONAL BOTTOM CONNECTION, 1000 AND 1200 AMP SWITCHES.
6. WHEN OPEN TYPE ATS's ARE INTENDED FOR ENCLOSURE TYPE MOUNTING BY OTHERS, MOUNT THE TRANSFER SWITCH UNIT ON THE INSIDE BACK SURFACE AND THE CONTROL PANEL(S) ON THE INSIDE DOOR SURFACE. REFER TO LAYOUT FOR RECOMMENDED TOGGLE SWITCH, PILOT LIGHT, ETC. DOOR MOUNTING HOLE PATTERN
7. THE CONTROL PANEL IS CONNECTED TO THE TRANSFER PANEL BY TWO WIRE HARNESSES IN A COMMON IN-LINE QUICK DISCONNECT PLUG. CONSULT FACTORY FOR AVAILABLE EXTENSION HARNESSES.
8. REQUIRED FRONT TOP AND BOTTOM ENCLOSURE VENTILATION FOR 1600 THRU 4000 AMP SWITCHES IS 140 SQ. INCHES TOTAL.
9. MOUNTING RAILS ARE SUPPLIED WITH OPEN TYPE SWITCHES, ONLY WITH ADDITIONAL ACCESSORY MOUNTING PANEL AS REQUIRED FOR MOUNTING OPTIONAL TIME DELAYS, RELAYS, AND MONITORS.
10. OPERATORS MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF SWITCH.

SWITCH RATING (AMPS)	RANGE OF WIRE SIZES
1000-1200	FOUR #2 AWG TO 600 MCM
1600-4000	SUITABLE FOR BUS BAR

SIZES OF AL-CU, UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL POWER CONNECTIONS

5240

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