

WINGCO

**AUTOMATIC
TRANSFER
SWITCH -UE &
EATS SERIES**

**INSTALLATION, OPERATION, and MAINTENANCE INSTRUCTIONS
OWNERS MANUAL**

MODELS COVERED BY THIS MANUAL

**E60ATS THROUGH E400ATS
and
(UL1008 Approved)
UE60ATS THROUGH UE400ATS**

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INTRODUCTION

The Winco Automatic Transfer Switch is designed for use with a remote start type engine generator set to supply standby power when the prime source fails. The basic system contains an electrically held transfer contactor for transferring the load from a prime source to a standby source and return. A control relay senses prime power failure and initiates the engine starting sequence. When prime power is again available, the engine is stopped and the load retransferred. A battery charger with automatic tapered charge, and charge rate ammeter keeps the cranking battery at full charge. A selector switch, test switch, stop cranking relay, pilot lights, and over cranking relay are part of the basic package.

Factory wired options include mechanically held transfer contactors, voltage sensitive relays, start time delay, retransfer time delay, exerciser clock, voltmeter, frequency meter, and elapsed time meter. Any options supplied are listed on the factory order for the equipment. See Fig. 1 for model number designation. An external view of the ATS with three optional meters in addition to the standard battery charge ammeter is shown in Fig. 2. An internal view of the ATS is shown in Fig. 3. All options are shown plus the basic control. The safety shield is shown over the transfer contactors.

WARNING

There are no exposed conductors outside of the control box. Hazardous voltage exist inside of the box. Even though all terminals are protected by barriers to the maximum extent possible inside the box, care should be exercised when working on the control. Only authorized and experienced personnel should have access to the inside of the box.

Check the control box nameplate rating for voltage, phase, and frequency against the prime and standby power ratings. They must agree before installation is started.

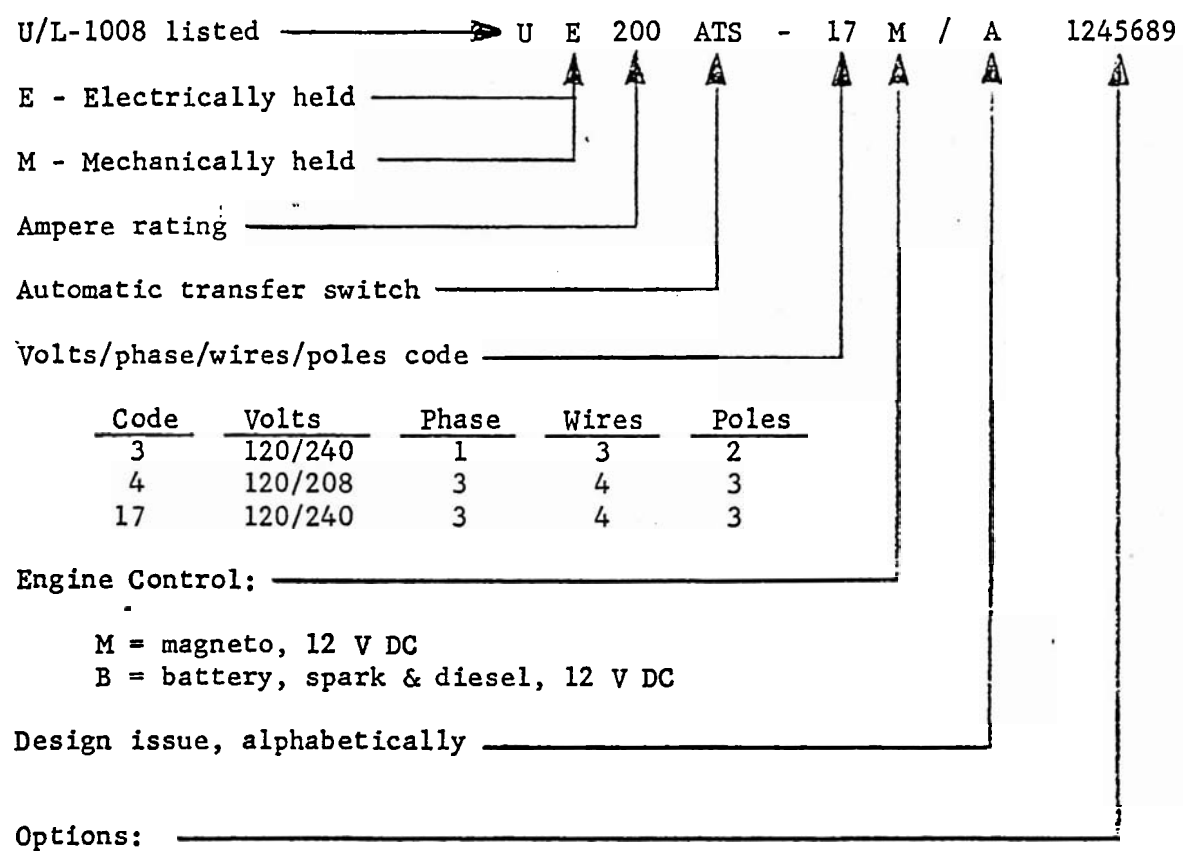
Do not allow metal chips to fall into the control during installation; but clean out thoroughly if they do.

At any time the associated engine generator set is to be serviced, the selector switch in the ATS must be turned to the "off" position to prevent an unexpected engine start. Restore to the "auto" position after servicing.

SERVICE

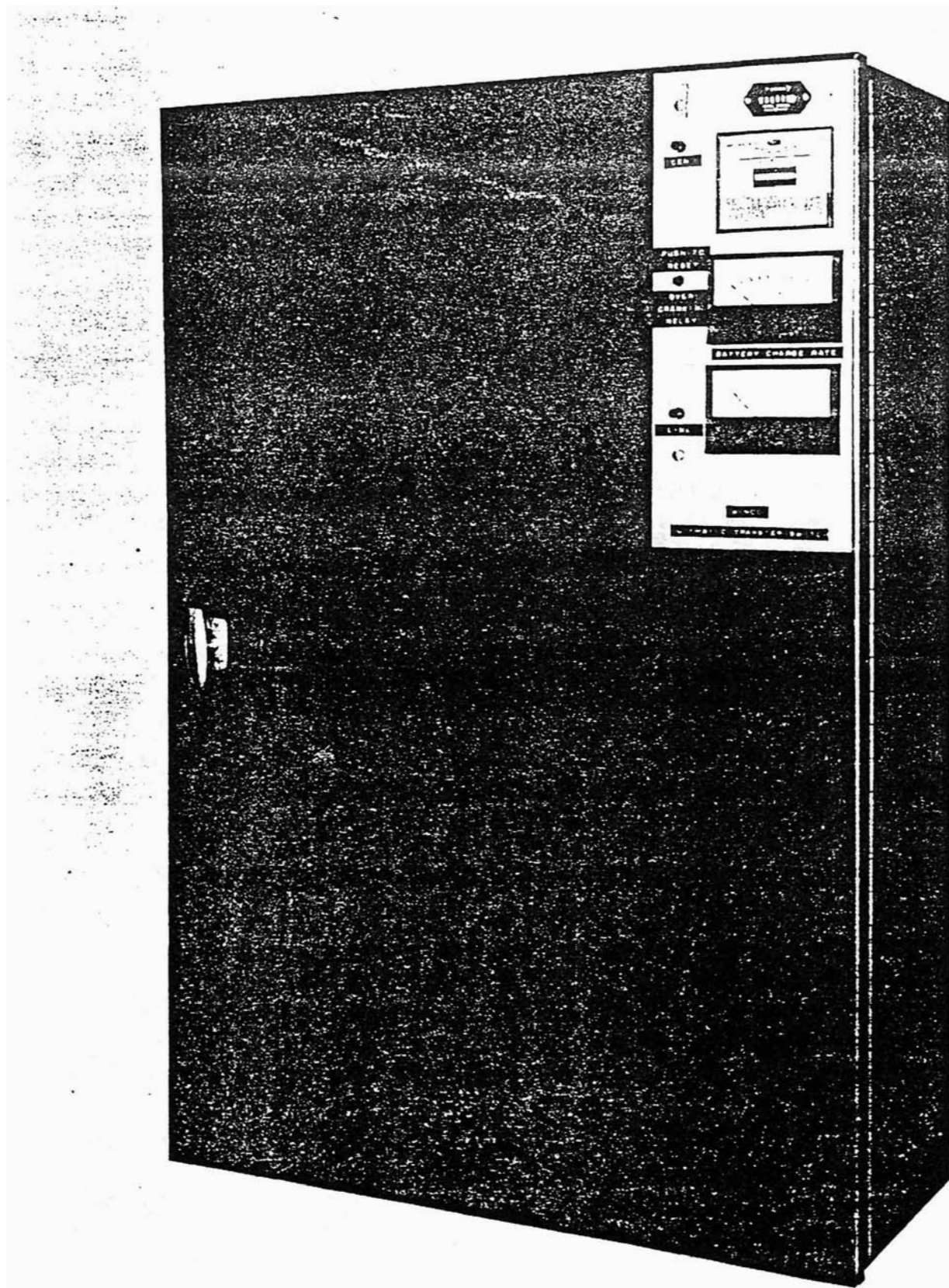
If service parts or assistance are required beyond that provided in this manual, consult the nearest authorized Winco service shop or the factory. Always furnish model number, serial number, and rating when requesting service. Claims for shipping damage should be made directly to the transportation company.

WINCO MODEL NUMBER DESIGNATION
U/L 1008 LISTED AUTOMATIC TRANSFER SWITCHES



1. Retransfer delay (includes override switch)
2. Start delay
4. Exerciser clock
5. Voltage sensitive relays (one on 1 phase, three on 3 phase)
6. Voltmeter
8. Running time meter
9. Frequency meter

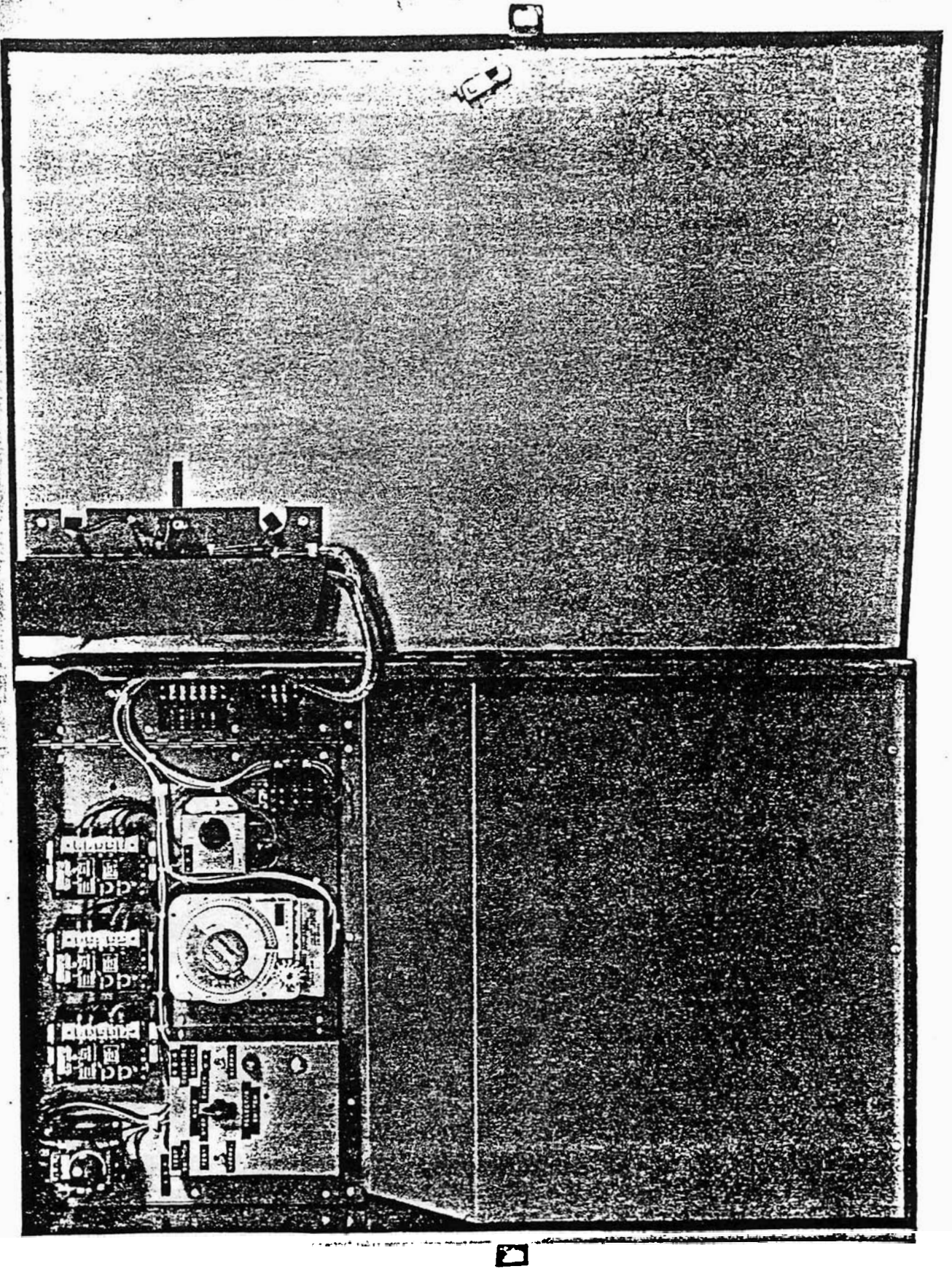
Fig. 1



Complete ATS

Fig. 2

External View



Control Box Interior

Fig. 3

Contacteur Shield in Place

12 MONTH Limited Warranty

WINCO, Incorporated warrants to the original purchaser for 12 months that goods manufactured or supplied by it will be free from defects in workmanship and material, provided such goods are installed, operated and maintained in accordance with WINCO written instructions.

WINCO's sole liability, and Purchaser's sole remedy for a failure under this warranty, shall be limited to the repair of the product. At WINCO's option, material found to be defective in material or workmanship under normal use and service will be repaired or replaced. For warranty service, return the product within 12 months from the date of purchase, transportation charges prepaid, to your nearest WINCO Authorized Service Center or to WINCO, INC. at Le Center Minnesota.

THERE IS NO OTHER EXPRESS WARRANTY.

To the extent permitted by law, any and all warranties, including those of merchantability and fitness for a particular purpose, are limited to 12 months from date of purchase. In no event is WINCO liable for incidental or consequential damages.

Note: Some states do not allow limitation on the duration of implied warranty and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply in every instance. This warranty gives you specific legal rights which may vary from state to state.

WINCO reserves the right to change or improve its products without incurring any obligations to make such changes or improvement on products purchased previously.

EXCLUSIONS:

WINCO does not warrant engines, batteries, or other component parts that are warranted by their respective manufacturers.

WINCO does not warrant modifications or alterations which were not made by WINCO, INC.

WINCO does not warrant products which have been subjected to misuse and/or negligence or have been involved in an accident.

This warranty does not include travel time, mileage, or labor for removal or reinstallation of WINCO product from its application.

INSTALLATION

LOCATION: The control should be located in a clean, dry, indoor place near the generator. It must be mounted on a solid vertical surface which is relatively free of vibration. Electrically held contactors may produce an audible hum, which can be minimized by careful installation. Avoid mounting on a thin wall which may produce a sounding board effect. Allow room for the door, hinged on the right side, to swing open a minimum of 135° for ease in connecting and servicing.

CODES: Wiring must conform to applicable electrical codes. Separate conduit openings must be cut in the metal box for the line, load, generator and control leads. A flexible section of conduit is required at the generator to absorb generator set vibration.

LAYOUT: A typical wiring diagram is shown in block format in Fig. 4

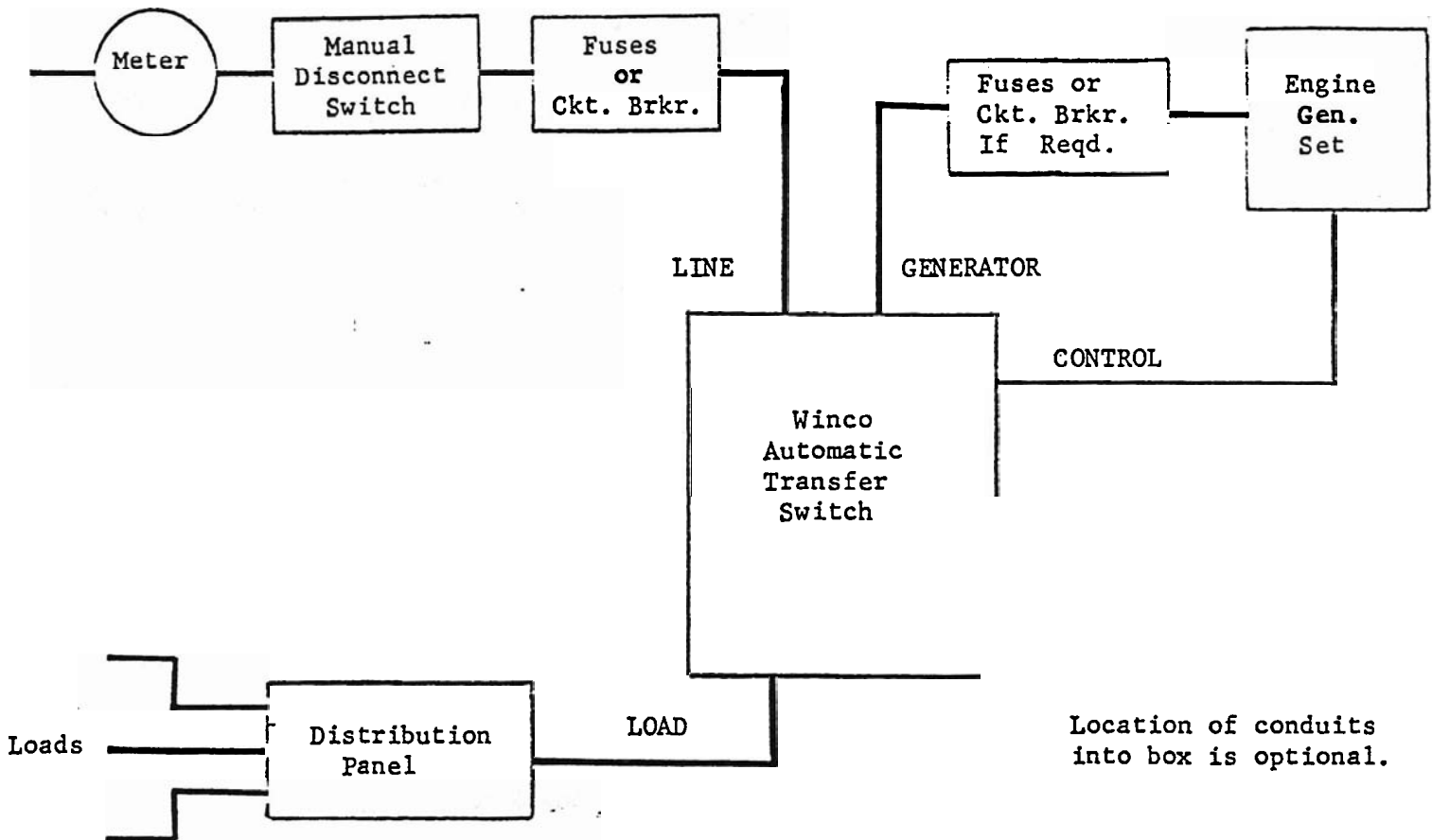


Fig. 4 Typical Wiring System

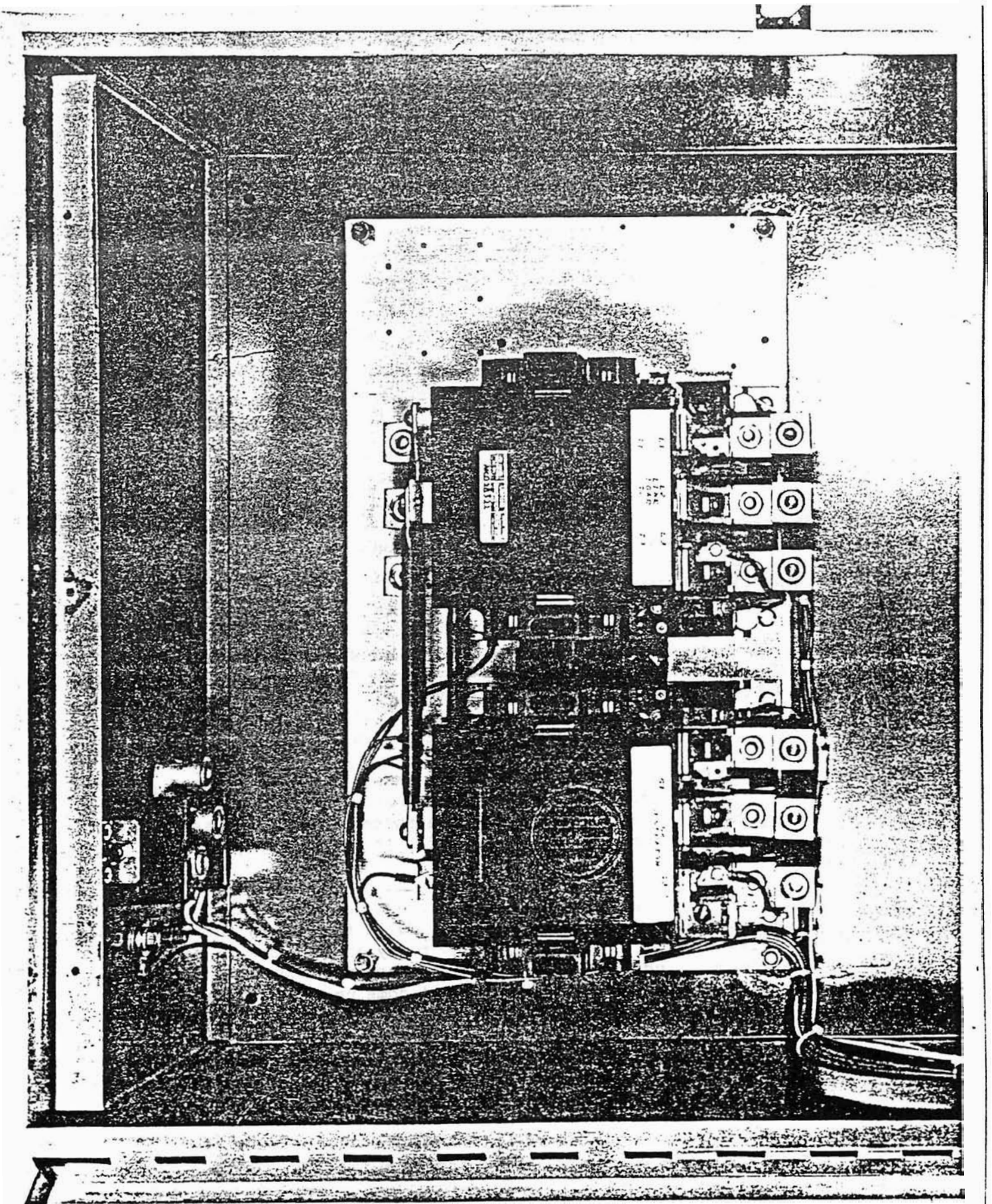
PANEL: The supervisory control is mounted on a hinged panel at the top of the box. Swing out the panel for access to wiring space behind it. Remove the guard over the transfer contactor at the bottom for terminal access, and replace when wiring is complete. See Fig. 5 for illustration of wiring access.

WIRING: The load current carrying wires must be of adequate size to carry rated current. If aluminum conductors are preferred, check marking on contactor terminals to make certain that they are rated for aluminum as well as copper conductors. See Fig. 6 for illustration of 200 ampere, 3 pole transfer contactor. The control wires may be #16 or larger for any distance up to 100 feet. They connect the control terminal strip in the transfer control box to a similarly marked terminal strip in the generator set control box.

PROTECTION: Circuit protection must be provided as required. The prime power source should be protected (fuses or circuit breaker) for the rating of the service or of the transfer contactor, whichever is lower. The input from the generator should be protected for the rating of the generator or the transfer contactor, whichever is lower. If applicable codes permit and the generator is inherently protected or has its own circuit breaker or fuses of the correct rating, additional protection is not required. A manual disconnect switch should be placed in the line between the meter and the transfer switch.

INSTALLATION - Sequence of Installation:

1. Mount the control box. Disconnect engine cranking battery.
2. Connect the generator power leads to the upper terminals on the contactor marked "GEN."
3. Connect the control leads between control box and generator.
4. Connect the load leads to the bottom terminals on the contactor. The two contactors are factory interwired on the load side, and one set of terminals is provided.
5. Connect the prime power leads to the upper terminals on the contactor marked "LINE".
6. Connect the battery to the engine generator set as instructed with the set.
7. Note: The neutral from line, load, and generator is unswitched and should be solidly interconnected. Use insulated neutral terminal.
8. If a remote test switch is to be used, remove the jumper on the two-point terminal strip on the right hand side of the panel and run two #16 wires to an on/off toggle switch.



200 Ampere, 3 Pole Transfer Contactor

Fig. 6

OPERATION

INSTALLATION CHECKS:

The standby system should be checked after the engine generator set has been installed in accordance with the instructions for the set and the Automatic Transfer Switch has been installed per this instruction manual. See Fig. 7 for control panel layout. Proceed with the checking sequence as follows:

1. Set the selector switch on "Stop". The selector switch is the three position switch inside the control box.
2. Connect the engine cranking battery, if it has not previously been connected. If the ATS was energized before connecting the battery, the battery charger would cause hazardous sparking at the battery terminal.
3. Close the circuit breaker or manual switch in the line leading from the prime source to the ATS. The line contactor should close and feed power to the load. If a retransfer time delay is included as an option in the ATS, move the retransfer delay override toggle switch momentarily to the "O.R." (override) position to close the line contactor.
4. Turn the selector switch to "Check". The engine should start and run. The cranking circuit is automatically de-energized as the engine comes up to rated speed. Check generator voltage.
5. Turn the selector switch to "Auto". Engine will stop.
6. When installing a three phase transfer panel, be sure to check phase rotation on the load lines with prime power, and then standby power. Use a phase rotation tester or a three phase motor. If phase rotation is wrong, interchange any two leads of that supply - not the load leads.
7. Simulate a power failure by moving the test toggle switch to "Test". The line contactor opens and the engine will start when the test switch is operated. If a start delay relay is included as an option, the engine will not start for this time interval, normally 2.5 to 15 seconds. The generator voltage will come up to rated value and the "Gen." contactor will close. The load is now supplied by the generator.
8. Return the test switch to "Auto". The engine will stop and the transfer contactor will transfer the load from the generator to the prime source. Refer back to step 3 if a retransfer delay is included.
9. Check charge rate on the battery charge ammeter. It should read two amperes if the battery is low and automatically taper towards zero as full charge is reached.

10. If an exerciser clock is included as an option, set the time of day on the large dial. Set the day of the week on the small dial, lower left. This is a 14 day dial and pins are omitted for each Monday. Change pins in this dial to choose another day for exercise. These pins have a left-hand thread. The time at which the set is to be exercised is set for 9:00 to 9:15 A.M. Reset the left-hand threaded pins in the large dial for a different exercise time. The inner circle starts and the outer circle stops the exercise. Exercise periods of 15 to 30 minutes once a week are recommended. The load is not transferred to the generator during exercise unless a power failure occurs.
11. If an exerciser clock is not included in the ATS, the engine generator set should be started and run at weekly intervals for 15 to 30 minutes. Set the selector switch at "Check" to operate the engine. Return selector to "Auto" at end of exercise.
12. CAUTION: Always turn selector switch to "Off" before servicing the engine, generator, or the ATS.

NORMAL OPERATION - BASIC CONTROL:

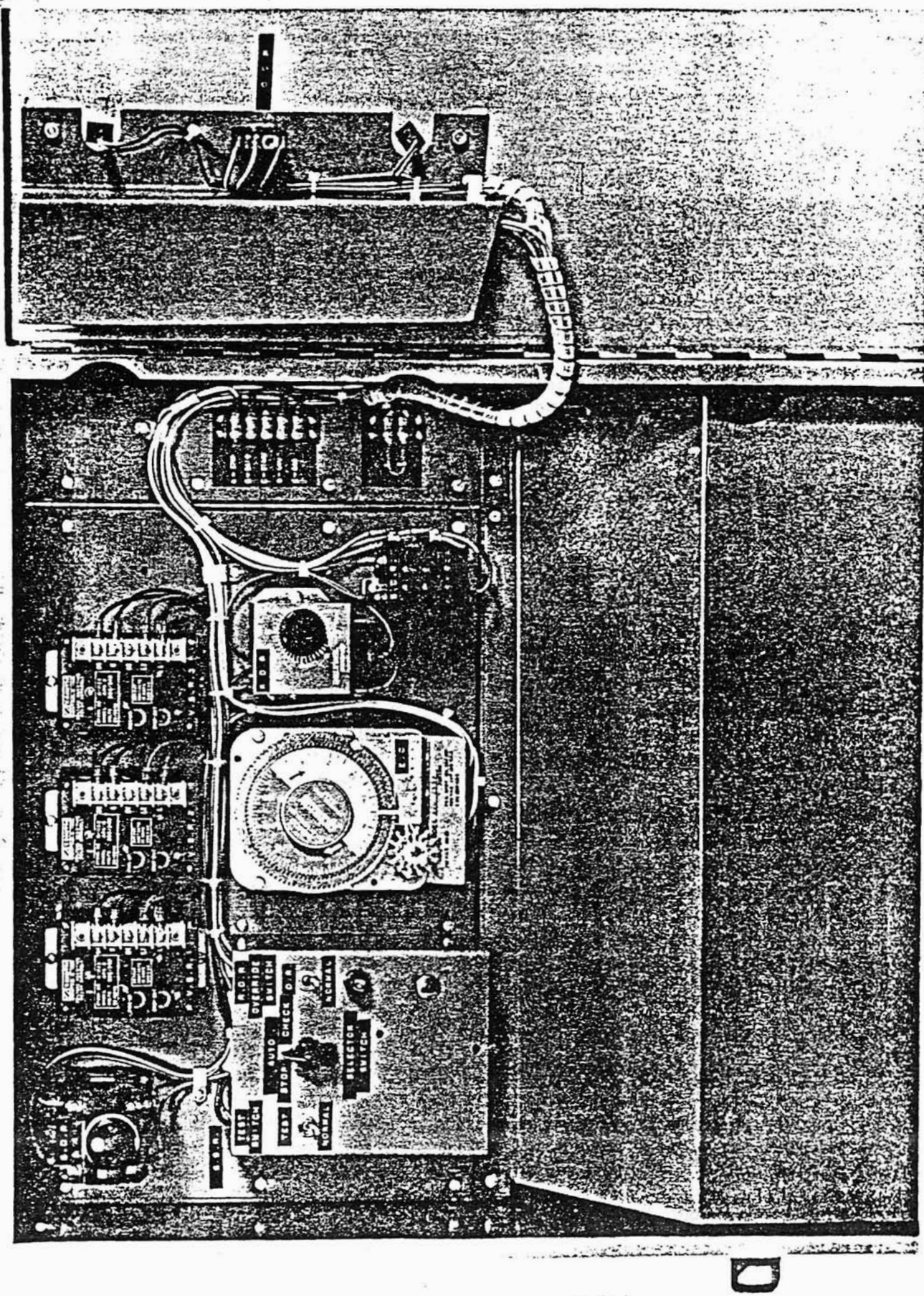
A start/stop relay is energized when prime power is available. When this relay is de-energized upon prime power failure, the engine starting sequence is initiated. The engine will crank until it starts, or until the over-cranking relay opens the cranking circuit in 60 seconds. The over cranking relay is mounted in the door of the cabinet. It has a red reset button which must be pushed in to restore the cranking circuit, in the event the relay has functioned. If engine fails to start after several attempts, refer to the generator set service manual for corrective action.

On three phase systems a phase failure relay is used in conjunction with the start/stop relay to assure the transfer operation if any phase fails.

When the prime power fails, it also de-energizes the line contactor to disconnect the line from the load. This contactor is mechanically and electrically interlocked with the generator contactor so that only one contactor of the transfer contactors can be closed at one time. This is essential so that the generator cannot be connected to the line under any circumstances.

As the engine reaches operating speed, the generator reaches operating voltage. This voltage is applied to the stop cranking relay, which closes and de-energizes the engine cranking circuit. This same voltage is applied to the generator contactor, which closes and connects the load to the generator.

The three position selector switch permits the engine to be stopped, run for a check without load transfer, or set for automatic operation. This is described in the installation check above.



ATS Control Panel

Fig. 7

A test toggle switch can simulate a line power failure by de-energizing the total line control circuit. The engine will start and the load will transfer to the generator when the toggle switch is moved to the "test" position. Returning the switch to "normal" restores the normal standby condition with the line power supplying the load.

An automatic tapered battery charger will supply a two ampere charge to a low battery and taper to almost zero at full charge. The primary of the transformer is protected by a fuse and the rectified output has an automatic reset circuit breaker for additional protection. A DC ammeter on the panel indicates the actual charge current.

Pilot lights are provided to indicate power source being used. The long life gas discharge pilot lights indicate green for prime power to the load, or red for standby power. The extended lens makes them visible through a wide angle.

OPTIONAL FEATURES

VOLTAGE SENSITIVE RELAYS:

One to three voltage sensitive relays may be furnished in the prime power supply line to sense a voltage drop. They will open the control circuit and initiate the transfer to standby power at a pre-set voltage. The drop-out and pick-up voltages are pre-set at the factory but can be adjusted after installation. They permit a finer control of the standby system.

START DELAY RELAY:

The start delay relay prevents starting of the engine for a period up to 60 seconds after power failure. It is factory set for 2.5 to 15 seconds but can be adjusted after installation. It prevents nuisance starting of the engine until the prime power has been unavailable for the time interval the timer is set for.

RETRANSFER DELAY RELAY:

The retransfer delay relay is a motor driven timer to provide up to 30 minutes time delay in the shutdown of the engine and the retransfer of the load after the prime power is available. It is adjusted for 15 minutes delay at the factory but can be re-adjusted after installation. It prevents nuisance engine stops and load retransfer until prime power has been assured for the pre-set time. An override toggle switch is used in conjunction with the timer. When the momentary contact toggle switch is moved to the retransfer position, the transfer is immediately accomplished and the engine stopped.

EXERCISER CLOCK:

This option will automatically start, run for 15 minutes, and stop the engine generator set. It can be set for any time, time interval, and day of the week. It is essential that engines be run at least once a week to insure a reliable system, whether they be controlled by a clock or manually.

VOLTMETER:

An optional voltmeter can be mounted in the control box door. It will indicate the load voltage - 240 volts single phase or one of three phases - from either the prime source or the generator, whichever is supplying the load.

FREQUENCY METER:

This meter indicates frequency in Hertz with a vibrating reed. It is mounted in the control box door.

RUNNING TIME METER:

This option indicates total hours of engine generator operation. It is mounted in the control box door.

MECHANICALLY HELD TRANSFER CONTACTOR:

The electrically held transfer contactor can be replaced with a mechanically held transfer contactor, both line and generator sides. The contactor is electrically operated to either close and latch, or unlatch and open. There is no noise or heat generated or any power loss when either contactor is closed. A control relay is included with the contactor. Both electrical and mechanical interlocks are provided.

All options are available for factory installation only.

MAINTENANCE

The most essential maintenance is to assure a dry and clean control box. Water must never be allowed to drip on the control box. If dust and dirt accumulate in the interior, de-energize the circuits and brush or wipe clean or use a suction hose to remove dirt.

Check periodically for loose connections and any deterioration of contacts. Any damage could only be caused by external or internal malfunction. The high quality components and their conservative application keep maintenance at a minimum.

TROUBLESHOOTING

Any troubleshooting must be done with the use and thorough understanding of the wiring diagram and schematic. Servicing under any other conditions could be extremely hazardous to personnel and property.

Engine Doesn't Start On Test Or At Time Of Power Failure

- a) Try to start engine at engine control panel. If engine doesn't start here, trouble is not in the ATS.
- b) If engine starts in "a", trouble is in wiring to or in the ATS. Set the selector switch in "check" position and press reset button in over cranking relay on door of box. Next check wiring of low voltage DC cranking control circuit per wiring diagrams.
- c) If engine starts in "check" position but not in "auto" position with test switch in "test" position, the start/stop relay is defective. Repair or replace.

Engine Won't Stop When Prime Power Returns

- a) If a retransfer time delay is included, be sure it has timed out. Then check start/stop relay and exerciser clock operation, if latter is included.
- b) Terminal "A" on control terminal strip must be grounded for engine to stop. Follow wiring diagrams to check for this condition.

Line Contactor Won't Close When Prime Source Is Available

- a) If a retransfer time delay is included, operate retransfer delay override toggle switch.
- b) Refer to wiring diagrams and check voltage at line contactor operation coil. If there is voltage at coil, the coil is open or mechanical interlock is jammed. If there is no voltage at coil, check circuits to find open circuit.

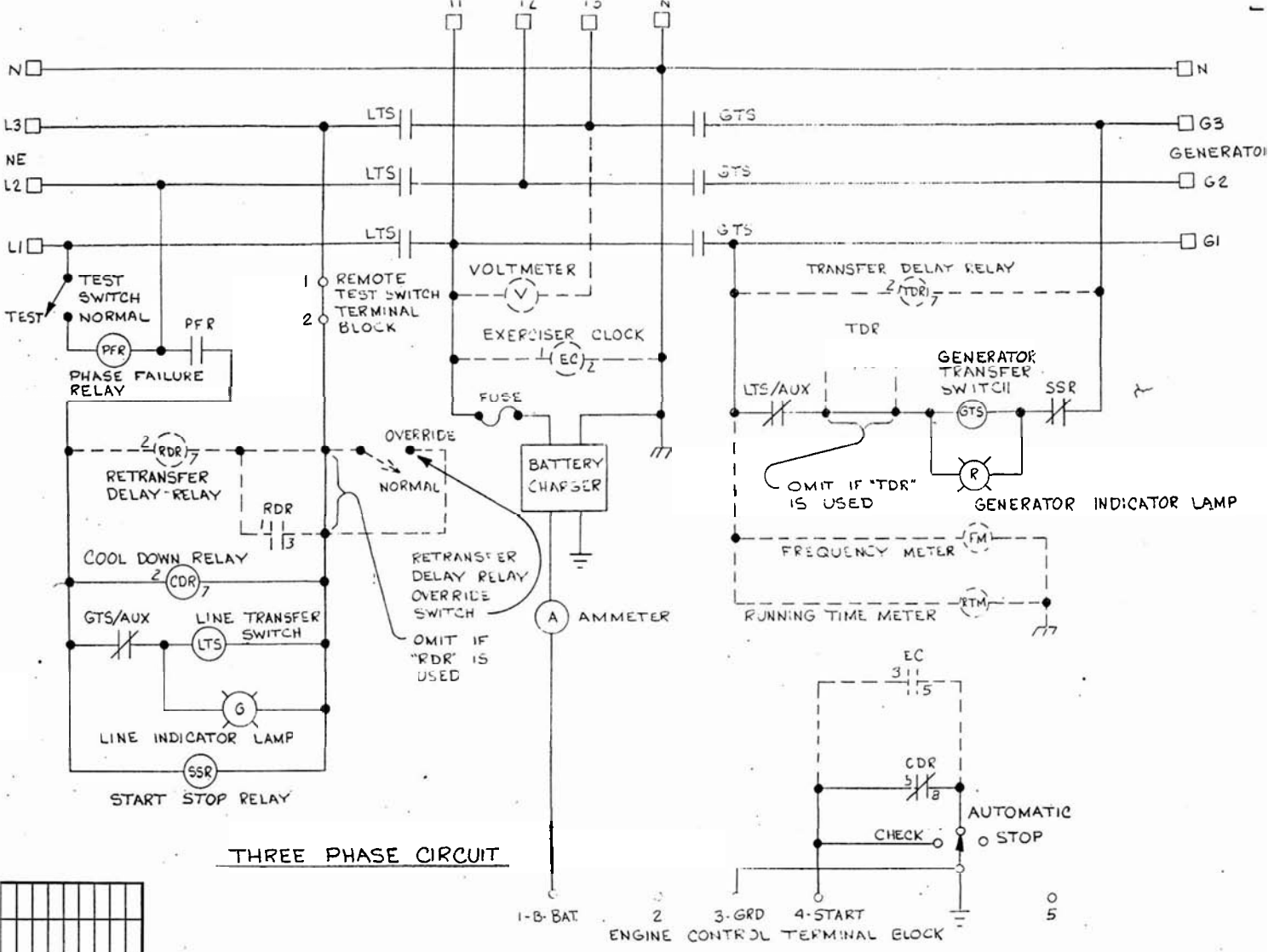
Generator Contactor Won't Close When Generator Is Running

- a) Check generator voltage at contactor terminals. If no voltage, generator or its wiring is defective. If there is generator voltage, check voltage at generator contactor operating coil. Refer to (b) above.

Battery Doesn't Charge

- a) Charger automatically goes to zero current when battery is charged.
- b) If battery is low, check fuse in charger primary circuit.
- c) If 120 volts AC is applied to the transformer and there is no DC output, replace the charger unless some obvious repair can be made.

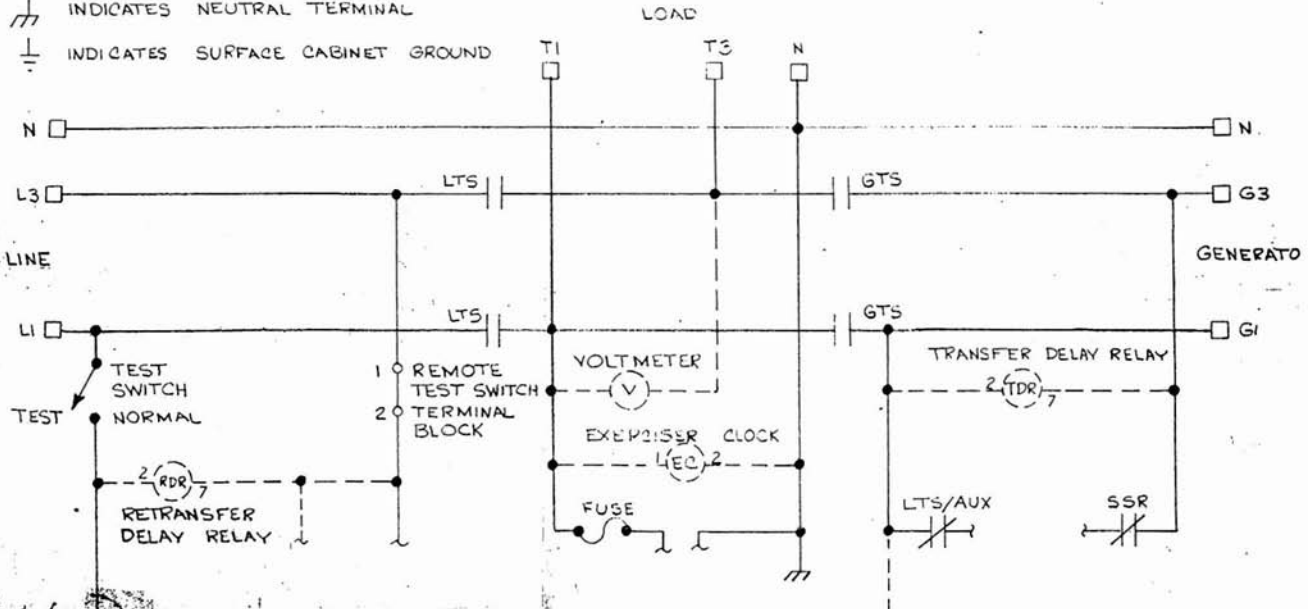
If any other malfunction exists, refer to the wiring diagrams. Note that the schematic shows the circuits grouped by function; line side control, generator side control, DC engine control, and load side instrumentation and battery charger control. A careful study of any other symptoms and the wiring diagrams should enable a qualified electrician to correct any malfunction. A voltmeter and continuity checker are essential troubleshooting tools.



THREE PHASE CIRCUIT

DASHED LINES --- INDICATE OPTIONAL EQUIPMENT.

- ⏏ INDICATES NEUTRAL TERMINAL
- ⏏ INDICATES SURFACE CABINET GROUND



SINGLE PHASE VARIATION

REV	DATE	BY	CHKD	APP'D
1	8-18-80	EDJ
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SCHEMATIC