

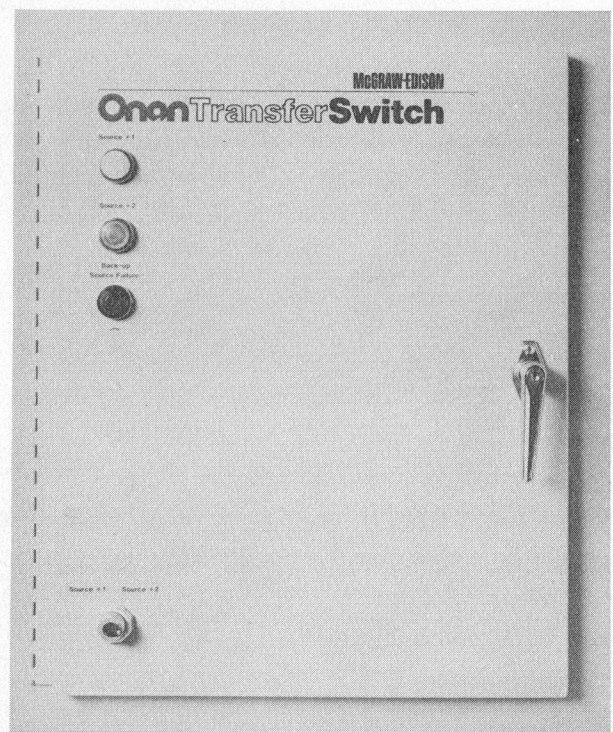


# **Operators Manual**

## **OT II Switches**

**Utility-to-Utility  
Automatic Control**

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# Safety Precautions

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This manual includes the following symbols to indicate potentially dangerous conditions to the operator or equipment. Read the manual carefully and know when these conditions exist. Then take the necessary steps to protect personnel and the equipment.

## **WARNING**

*This symbol is used through the text to warn of possible injury or death.*

## **CAUTION**

*This symbol is used to warn of possible equipment damage.*

The Series OT transfer switch has components with high voltages which present serious shock hazards. For this reason, read the following suggestions.

Keep the transfer switch cabinet closed and locked. Make sure only authorized personnel have the cabinet and operational keys.

Remove AC power sources from the automatic transfer switch before performing any maintenance or adjustments. Tag any disconnect switches.

Use the rubber insulative mats placed on dry wood platforms over floors which are metal or concrete when working on any electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling any electrical equipment.

Jewelry is a good conductor of electricity and should be removed when working on electrical equipment.

Do not work on this equipment when mentally or physically fatigued.

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# Introduction

## OPERATORS MANUAL

This manual covers Series OT transfer switches with an automatic, utility-to-utility control. The OT Series includes transfer switches with continuous current ratings from 40 to 1000 amperes at standard distribution voltages up to and including 600 volts. The utility-to-utility control automatically directs transfer of the load between either of two utility power sources, providing nearly continuous power.

The body of this manual is divided into four main chapters described below. A troubleshooting guide and information on parts and service follow these chapters.

**Installation:** This chapter assumes that an experienced and qualified electrical contractor installs the transfer switch, complying with all local codes governing electrical installations. The emphasis is on customer connections. Here the operator will find descriptions of common circuits, such as transfer inhibit, area protection, etc., that are external to the transfer switch.

**Description:** Description is important because this manual covers transfer switches with different current ratings, operating procedures, features, etc. The description helps to identify these differences.

**Operation:** This chapter includes the sequence of operation for a utility-to-utility automatic control as well as operating procedures for automatic, test, and manual operation. The sequence of operation will also help the operator with adjustments and troubleshooting.

**Adjustments:** This chapter includes step-by-step procedures for making adjustments which an operator may need to do.

## AUTOMATIC TRANSFER SWITCHES

Transfer switches are an essential part of a building's standby or emergency power system. The normal power source is backed up by an emergency power source. A transfer switch supplies the electrical load with power from one of these two power sources. The load is connected to the common of the transfer

switch as in Figure 1. Under normal conditions the load is supplied with power from the normal source as illustrated. If normal power is interrupted, the load is transferred to the emergency power source. When normal power returns, the load is retransferred to the normal power source. The transfer and retransfer of the load are the two most basic functions of a transfer switch.

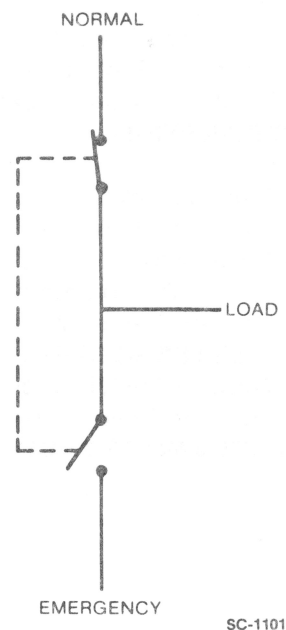


FIGURE 1. LOAD TRANSFER SWITCH  
(TYPICAL FUNCTION)

Automatic transfer switches are capable of operation without operator involvement. During automatic operation, automatic transfer switches perform the following basic functions:

1. Senses the interruption of the normal power source.
2. Transfers the load to the emergency power source.
3. Senses the return of the normal power source.
4. Retransfers the load to the normal power source.



If it is necessary to contact a dealer or the factory regarding the transfer switch, always give the complete Model, Spec, and Serial number as listed on the nameplate. Also give the number(s) of any options that may be listed on a label below the nameplate. This information is necessary to properly identify your unit among the many types manufactured.

A typical model number with explanation is given below.

<b>OT</b>	<b>B</b>	<b>B</b>	<b>A</b>	<b>260</b>	<b>-</b>	<b>4X</b>	<b>U</b>	<b>/</b>	<b>31</b>	<b>01</b>	<b>E</b>
<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>		<b>T</b>	<b>T</b>		<b>T</b>	<b>T</b>	<b>T</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>		<b>6</b>	<b>7</b>		<b>8</b>	<b>9</b>	<b>10</b>

1. Basic model series.  
OT indicates OT II transfer switch series.
2. Number of switched conductor poles.  
B-indicates 3-pole.
3. Basic control group.  
B-indicates utility to utility standby.
4. Enclosure type.  
A-indicates general purpose NEMA 1.
5. Ampere rating.
6. Voltage code and frequency.  
4X or 54X (50 Hz) = 277/480, 3-phase, 4-wire.
7. Agency Certification.  
U-Underwriters' Laboratories, Inc.
8. Control option group number.
9. Meter option group number.
10. Specification letter: advances with production modification.

**WARNING**

**INCORRECT SERVICE OR REPLACEMENT OF PARTS MIGHT RESULT IN SEVERE PERSONAL INJURY AND/OR EQUIPMENT DAMAGE. SERVICE PERSONNEL MUST BE QUALIFIED TO PERFORM ELECTRICAL AND/OR MECHANICAL SERVICE.**

# Installation

The installation of a Series OT transfer switch must meet the requirements of all applicable codes governing electrical installations and the requirements of the authority having jurisdiction for enforcement of those codes.

## LOCATION

Locating the transfer switch in the existing electrical circuit varies with application and type of entrance switch. There must be a switch and fuses in the commercial power line before the transfer switch. A typical installation is shown in Figure 2.

Choose a vibration-free mounting surface. Avoid hot, moist, or dusty locations.

**TABLE 1. APPROXIMATE CABINET DIMENSIONS**

Switch Amp Rating	Height (H)	Width (W)	Depth W/Door—	
			Closed (D)	Open (D <sub>0</sub> )
40, 70, 100	30.5-in (775mm)	23.0-in (584mm)	13.5-in (343mm)	32.75-in (832mm)
150, 260	63.0-in (1600mm)	30.0-in (762mm)	21.6-in (549mm)	44.2-in (1122mm)
400	78.0-in (1981mm)	30.0-in (762mm)	22.6-in (574mm)	46.2-in (1173mm)
600, 800, 1,000	84.0-in (2134mm)	36.0-in (914mm)	22.6-in (574mm)	51.7-in (1313mm)

## MOUNTING

### Wall Mount, 40-100 Ampere

1. Install two mounting bolts in the wall for the bottom cabinet mounting keyholes.
2. With the shipping box standing so the cabinet is upright, carefully remove the top and sides of the box.
3. Raise cabinet and mount on the two mounting bolts in the wall.

#### **WARNING**

*Have sufficient manpower for lifting and mounting cabinet to prevent serious personal injury.*

4. Tighten two bottom mounting bolts.
5. Install two top mounting bolts and tighten.

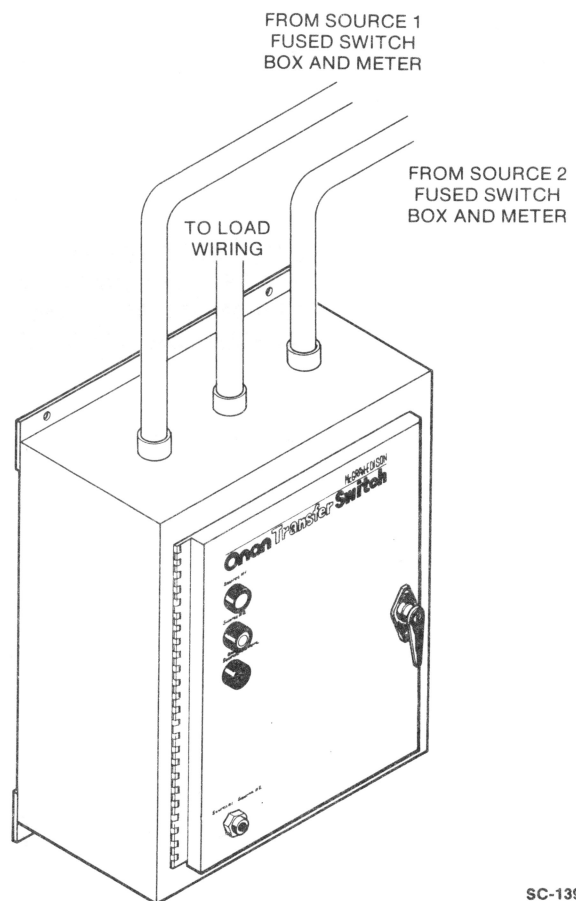
### Floor Mount, 150-1000 Ampere

1. With the shipping box standing so the cabinet is upright, carefully remove the top and sides of the box.
2. Connect a hoist or similar lift to the two lifting eyebolts on the cabinet top.

#### **WARNING**

*Do not attempt to lift manually because of the danger of serious personal injury.*

3. Carefully raise the cabinet and move it to its installation location. Mounting bolts are usually placed in concrete when floor is poured. Bolts should protrude about one inch (25 mm) from floor. Secure the cabinet to the floor.



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**FIGURE 2. TYPICAL WALL MOUNT INSTALLATION**

## WIRING

Wiring must be performed only by qualified personnel. Figure 3 shows power and load connections (load connections may be moved to bottom of switch if desired as explained later in text).

**CAUTION** Use extreme care to keep drill chips and fillings out of the relays, contacts, and other parts of the automatic transfer switch when mounting or connecting conduit. Also, screwdrivers should be used carefully to prevent damage to the resistors, coils, and contacts.

### Power and Load Wiring

Connect wires of sufficient size to carry rated current from the line, load, and emergency power source directly to the transfer switch terminals which are marked A, B, and C (A and B on single-phase switches). Table 2 gives the type and maximum wire size the transfer switch will accept.

For transfer switches with an AC ammeter, the load wires must pass through a current transformer three times for 40-ampere OT, twice (two primary turns) for

a 70-and 100-ampere OT, once (one primary turn) for any 150- through 1000-ampere OT. See Figure 4.

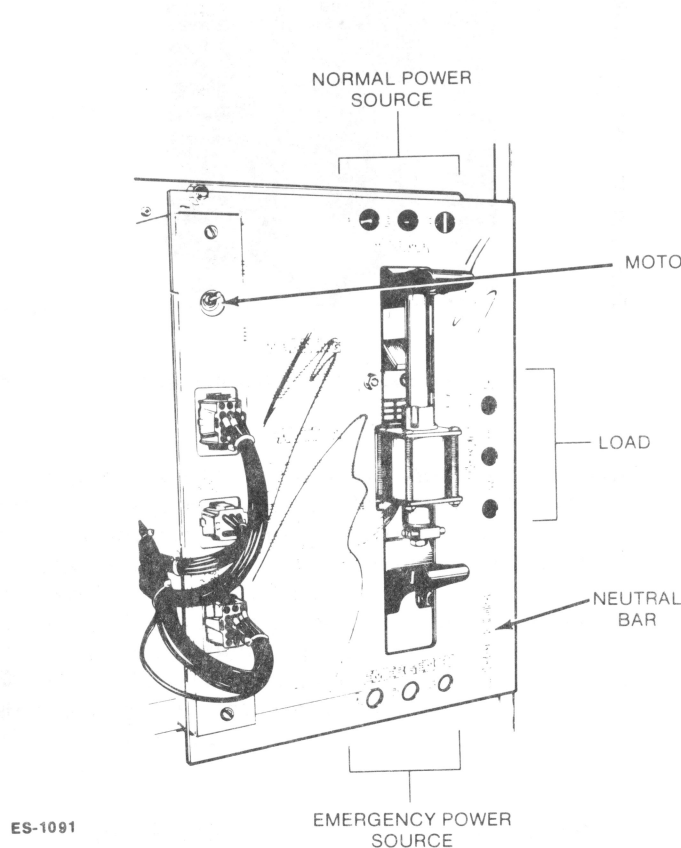
The phase rotations of the normal and emergency sources must agree. Check and correct, if necessary.

Neutral bar with lugs is standard on switches supplied with cabinet. See Table 2 for wire sizes.

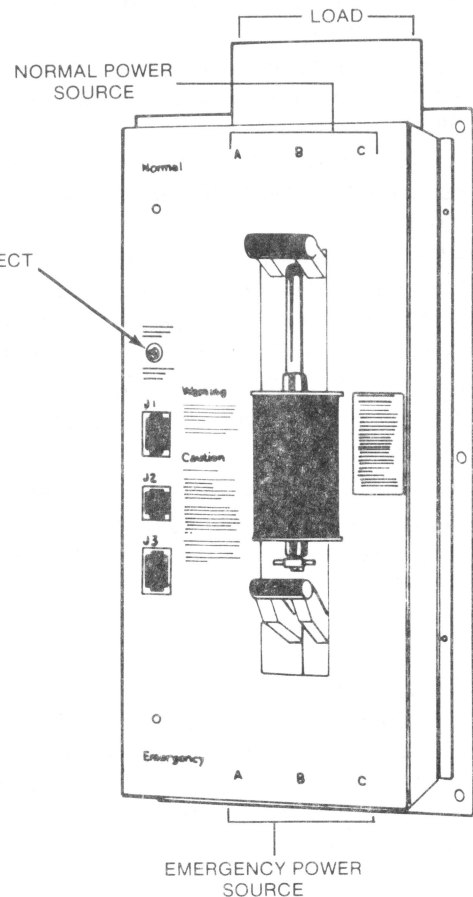
**TABLE 2. TERMINAL LUG CAPACITY**

**For Copper or Aluminum Conductors**

Switch Amp Rating	Number of Conductors	Size Range of Conductors
40	1	#0 AWG to #14 AWG
70	1	#0 AWG to #14 AWG
100	1	#0 AWG to #14 AWG
150	1	#6 AWG to 350 MCM
260	1	#4 AWG to 500 MCM
400	1	350 MCM to 1000 MCM
600	2	#2 AWG to 600 MCM
800	4	#4 AWG to 600 MCM
1000	4	#4 AWG to 600 MCM



40/70/100 AMPERE



150-1000 AMPERE

**FIGURE 3. TRANSFER SWITCH WIRE CONNECTIONS**

40-AMPERE OT (THREE TURNS)

70-100 AMPERE OT (TWO TURNS)

150 THROUGH 1000 AMPERE OT (ONE TURN)

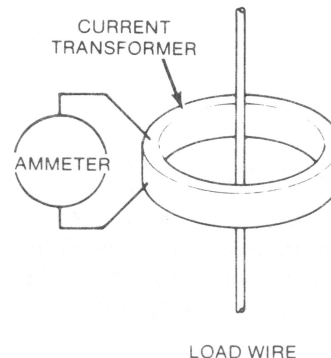
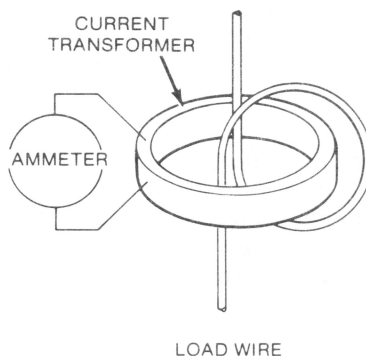
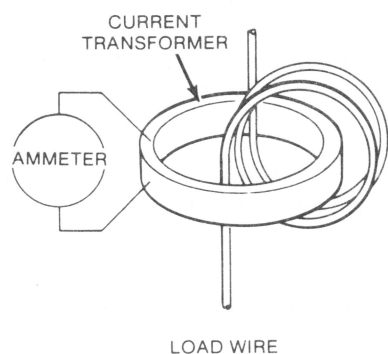


FIGURE 4. CURRENT TRANSFORMER WIRING

OT transfer switches of 150 to 1000 ampere size are factory assembled with the load terminal lugs at the top. The load terminal lugs may be moved for a bottom connection using this procedure:

- Remove switch covers, and load cover on front connect units. See Figure 6. On units in the 600 and 1000 ampere range, the end assemblies on each end of the actuator rod must be removed to facilitate removal of the switch cover.
- Remove nuts and lockwashers from jumper strap at center of switch (leave bolts in place). See Figure 6.
- Remove screw, lockwasher and flatwasher securing the standoff insulator to the mounting base.
- Reverse position of load strap and replace hardware removed in Step B. Be sure electrical joint compound is applied before assembly.
- Secure standoff insulator at bottom of switch with hardware removed in Step C.
- Torque screws and nuts to values shown in Figure 6.
- Replace load cover and switch covers.
- Replace end assemblies on actuator rod and torque screws to value shown (600 and 1000 ampere units only).

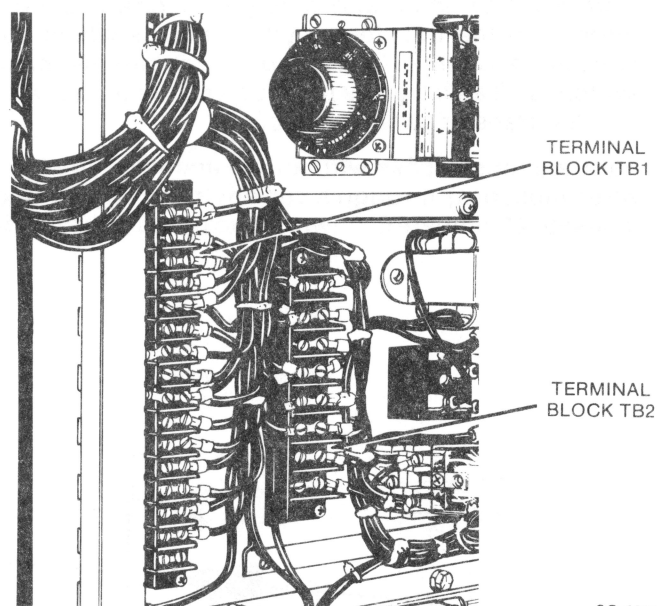


FIGURE 5. CONTROL TERMINAL BLOCKS

**Auxiliary Contacts (if used):** Auxiliary contacts are located on the Normal and Emergency sides of the transfer switch for external alarm or control circuitry. Connections for auxiliary contacts can be made on terminal block TB1 terminals 10 through 15. The contacts have ratings of 10 amperes at 480 VAC. Listed below are open and closed positions of auxiliary contacts with transfer switch in neutral position. Moving the transfer switch to Normal or Emergency only affects the corresponding auxiliary contacts.

#### NORMAL AUXILIARY CONTACT

TB1-10—N/O  
TB1-11—N/C  
TB1-12—COM

#### EMERGENCY AUXILIARY CONTACT

TB1-13—N/O  
TB1-14—N/C  
TB1-15—COM

### Control Circuit Connections

**Source 1 Power Failure Signal:** A power failure of the source 1 (Normal) line closes a set of relay contacts. These can be used for a signal circuit external to the transfer switch. Make connection to terminals TB1-6 and TB1-7. See Figure 5.

Contact ratings are:

10 amp @ 28 VDC/120 VAC, 80% PF  
6 amp @ 240 VAC, 80% PF  
3 amp @ 480/600 VAC, 80% PF



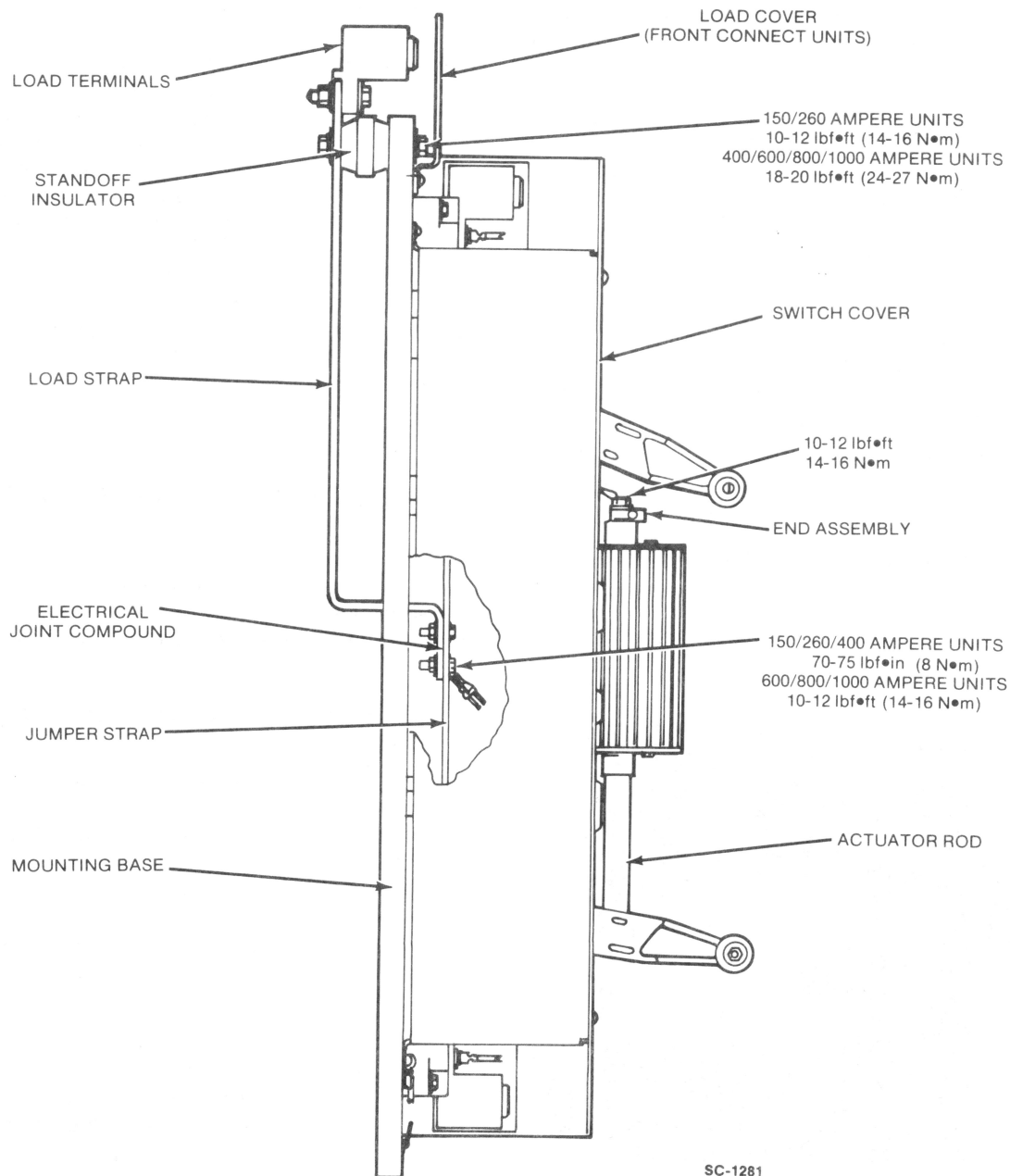


FIGURE 6. TRANSFER SWITCH LOAD TERMINALS (SIDE VIEW)  
150-1000 AMPERE

## CLEANING OF CABINET

After mounting and wiring of cabinet are completed, clean the interior with a vacuum cleaner to remove any chips, filings, or dirt from the cabinet interior and components.

## CHECKOUT PROCEDURES

After the automatic transfer switch is properly installed, check the various switch functions.

### Programmed Transition (if equipped)

1. Locate the programmed transition time delay on the left inside wall of the cabinet (Figure 8). It normally has factory settings for a few seconds. If the setting is satisfactory, proceed to next check. Otherwise, proceed to Step 2.
2. The programmed transition has either a time range of 0.5 to 5 seconds, 1.5 to 15 seconds, or 5 to 50 seconds (three timers are available). Turn the knob clockwise to increase delay, counter-clockwise to decrease time delay. Increments are marked on the knob.

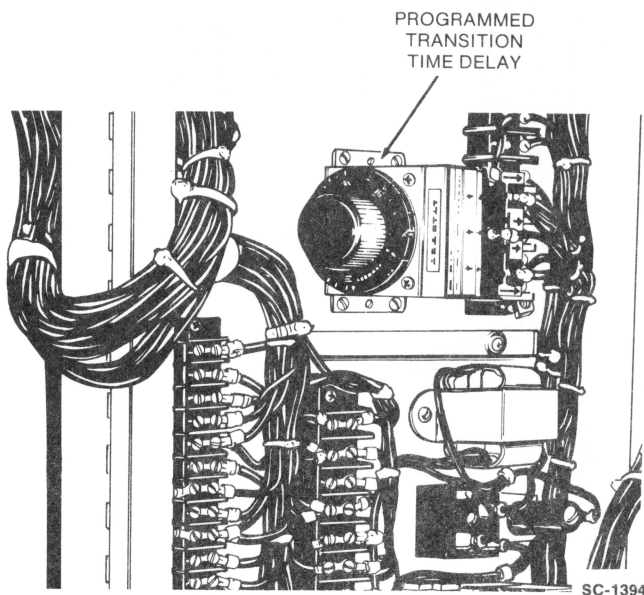


FIGURE 7. LOCATION OF PROGRAMMED TRANSITION TIME DELAY

### Motor Disconnect Switch

Manually close the transfer switch to the Normal side. Move the motor disconnect toggle switch to the up position for automatic operation and close transfer switch cabinet door.

### Connect AC Line

Place front panel switch in the Source #1 (Normal)

position. Connect AC line power to the automatic transfer switch. The Source #1 lamp on the cabinet front door should light.

To test transfer switch operation, simulate a power failure by removing Source #1 (Normal power) from the transfer switch. After any set time delay, the transfer switch should transfer to power Source #2 (Emergency power) and light Source #2 lamp. Placing the preferred source switch in Source #2 position should light the Back-up Source Failure lamp.

Restoring Source #1 power to transfer switch should turn off the Back-up Source Failure lamp. Return preferred source switch to Source #1 position. After any set time delay, the load power should be transferred to Source #1.

## ELECTRONIC CONTROL SETTINGS

**WARNING** *High voltages are present within the control cabinet which might cause serious personal injury or death. Proceed with care!*

### Time Delay/Undervoltage/Overvoltage/Frequency

The adjustments on the electronic modules are factory set and normally do not require field adjustment. If desired, the Pickup, Dropout and Time Delay settings may be adjusted to other than factory settings as outlined below. However, the calibration (Cal) adjustments should be changed only if the nominal voltage is significantly different than the nameplate rating, or when installing a replacement sensor module.

**CAUTION** *Haphazard setting of the module calibration (Cal) adjustments might result in abnormal operation of the transfer switch.*

Complete all installation procedures before any adjustments are made. All adjustments are made with a screwdriver through openings in the module panels by turning a potentiometer (see Figures 9 and 10).

A separate voltage sensor is used for each power source. They are located on each side of the time delay module (Figure 8).

Place the Motor Disconnect Switch (Figure 3) in the down position when making adjustments. Return switch to up position after adjustments are completed.

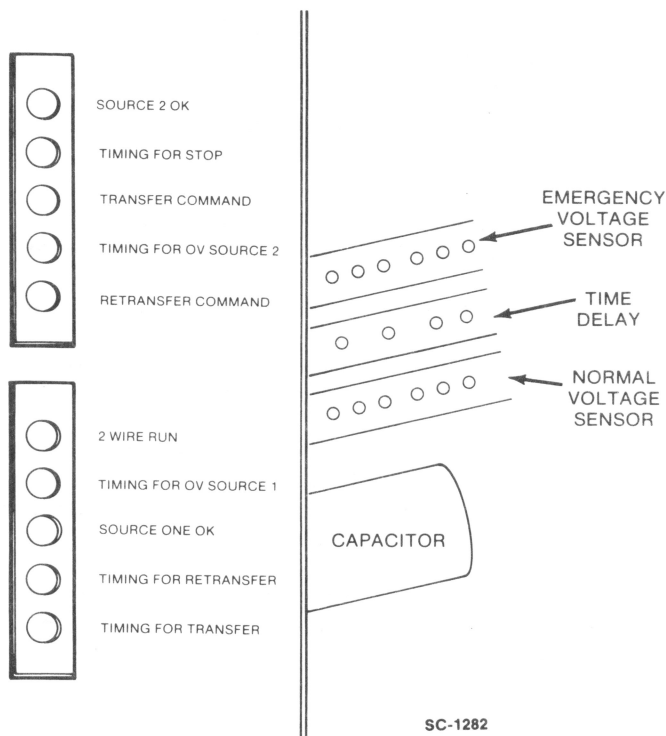


FIGURE 8. CONTROL PANEL LAMPS AND MODULES

**Time Delay Module:** The time delay module controls the following functions:

- Transfer time delay
- Retransfer time delay

If other than factory setting is desired, align the slot on the potentiometer to the desired markings on the module panel. See Figure 9. Range of adjustments and factory settings are as follows:

DELAY	ADJUSTMENT RANGE	FACTORY SETTING
Transfer	0-120 seconds	2 seconds
Retransfer	0-30 minutes	15 minutes

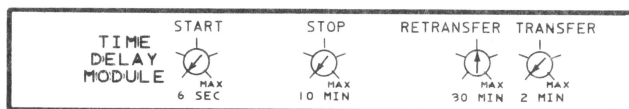


FIGURE 9. TIME DELAY MODULE

**Undervoltage Sensor:** The standard voltage sensor modules monitor the Normal and Emergency power source for an undervoltage condition. The undervolt-

age range of adjustment is shown below. If other than factory setting is desired, align the slot on the potentiometer to the desired markings on the module panel.

FUNCTION	ADJUSTMENT RANGE	FACTORY SETTING
Dropout	75% to 98%	85%
Pickup	85% to 100%	95%

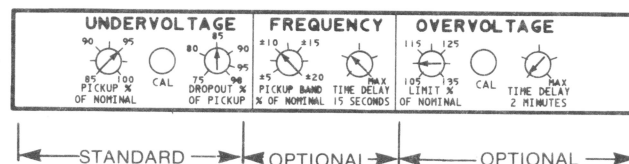


FIGURE 10. VOLTAGE/FREQUENCY SENSOR MODULE

If necessary, the undervoltage sensor for either the Normal or Emergency sources may be calibrated as follows (see Figure 8 for location):

1. Ensure that nominal voltage is present on all phases of the source being calibrated (Normal or Emergency). On voltage sensors with the frequency sensing option, the source frequency must be within the limits set by the Frequency Pickup Band potentiometer.
2. Turn the Undervoltage Pickup and Dropout potentiometers on the voltage sensor fully clockwise.
3. Turn the Undervoltage calibration (Cal) potentiometer fully clockwise. The Source OK lamp corresponding to source sensor being calibrated should be on (Source One OK-Normal source, Source 2 OK-Emergency source). If the Source OK lamp fails to come on, and the voltage sensor has an overvoltage sensing option, turn overvoltage Limit and Cal potentiometers fully clockwise.
4. Turn the Cal potentiometer counterclockwise until the Source OK lamp turns off.
5. Slowly turn the Cal potentiometer until the Source OK lamp just turns on again.
6. The Undervoltage sensor is now calibrated. If the Overvoltage sensor was adjusted in Step 3, then recalibrate it by using the Overvoltage Sensor calibration procedure.

After calibration, reset the Pickup and Dropout potentiometers to the factory settings or to desired setting.

**Overvoltage Sensor:** The optional overvoltage sensor detects when the source voltage has exceeded the overvoltage limit.

If other than factory setting is desired, align the slot on the potentiometer to the desired markings on the module panel. See Figure 10. Range of adjustments and factory settings are shown below.

FUNCTION	ADJUSTMENT RANGE	FACTORY SETTING
Limit	105 to 135%	110%
Time Delay	0 to 2 minutes	5 seconds

The overvoltage pickup point is fixed at 5 percent below the Limit setting. The adjustable dropout Time Delay overrides momentary overshoots in voltage.

If necessary, the Overvoltage sensor may be calibrated as follows:

**If the Undervoltage sensor has not been calibrated, do so before proceeding.**

1. Ensure that nominal voltage is present on all phases of the source being calibrated (Normal or Emergency). On voltage sensors with the frequency sensing option, the source frequency must be within the limits set by the Frequency Pickup Band potentiometer.
2. Turn the overvoltage Limit and Time Delay potentiometers fully counterclockwise.
3. Turn the Overvoltage Cal potentiometer fully clockwise. The Source OK lamp for the selected

source should light (Figure 8).

4. Turn the Cal potentiometer counterclockwise until the Source OK lamp turns off.
5. Slowly turn the Cal potentiometer clockwise until the Source OK lamp just turns on again.

After calibration, reset the Overvoltage Limit and Time Delay potentiometers to the desired values.

**Frequency Sensor:** The optional frequency sensor detects when the source frequency is within an acceptable band. This band is centered about the nominal system frequency (50 or 60 hertz).

If other than factory setting is desired, align the slot on the potentiometer to the desired markings on the module panel. See Figure 10. Range of adjustments and factory settings are shown below.

FUNCTION	ADJUSTMENT RANGE	FACTORY SETTING
Pickup Band	$\pm 4$ to $\pm 20\%$	$\pm 10\%$
Time Delay	0 to 15 Seconds	5 Seconds

The dropout bandwidth is always 2.5% wider (on each end) than the pickup bandwidth.

The adjustable dropout Time Delay allows the control to ignore momentary dips or rises in frequency.



# Description

Onan automatic transfer switches basically control transfer of the load to either Source #1 (Normal power) or to Source #2 (Emergency power) without operator involvement.

**Standard items and features of the transfer switch are covered in the first part of this section. Descriptions of options and accessories appear in the second part.**

## CABINET

The standard Onan OT cabinet meets requirements of the National Electrical Manufacturers Association (NEMA) for a "Type 1" cabinet. This type is designated as a general purpose, indoor cabinet. Exterior items on a typical OT cabinet are shown in Figure 11.

### Indicator Lamps

Two lamps on the cabinet door indicate which power source is connected to the load. When Source #1 lamp is on, it indicates the Normal power source is supplying the load. The Source #2 lamp will light when the Emergency power source is supplying the load.

The Back-up Source Failure lamp comes on anytime there is a failure of the back-up source. The back-up source is determined by position of the preferred source switch.

## Preferred Source Switch

This two-position switch selects which source is preferred and which source shall be back-up. In the Source #1 position, the Normal power source of the transfer switch supplies the load power until a source failure occurs.

## TRANSFER SWITCH

The transfer switch opens and closes the contacts that transfer the load between Source #1 and Source #2 power. The switch is mechanically interlocked to prevent simultaneous closing to both power sources. The main parts of the transfer switch discussed here are the contact assemblies, linear actuator, motor disconnect switch, and auxiliary contacts.

### Contact Assemblies

Series OT transfer switches are two or three pole, with a neutral block. The contact assemblies make and break the current flow. When closed to either Normal or Emergency power source, the contacts are mechanically held. A mechanical interlock prevents them from closing to both power sources at the same time.

### Linear Actuator

The linear actuator is a linear induction motor that actuates the contact assemblies. It moves the contact

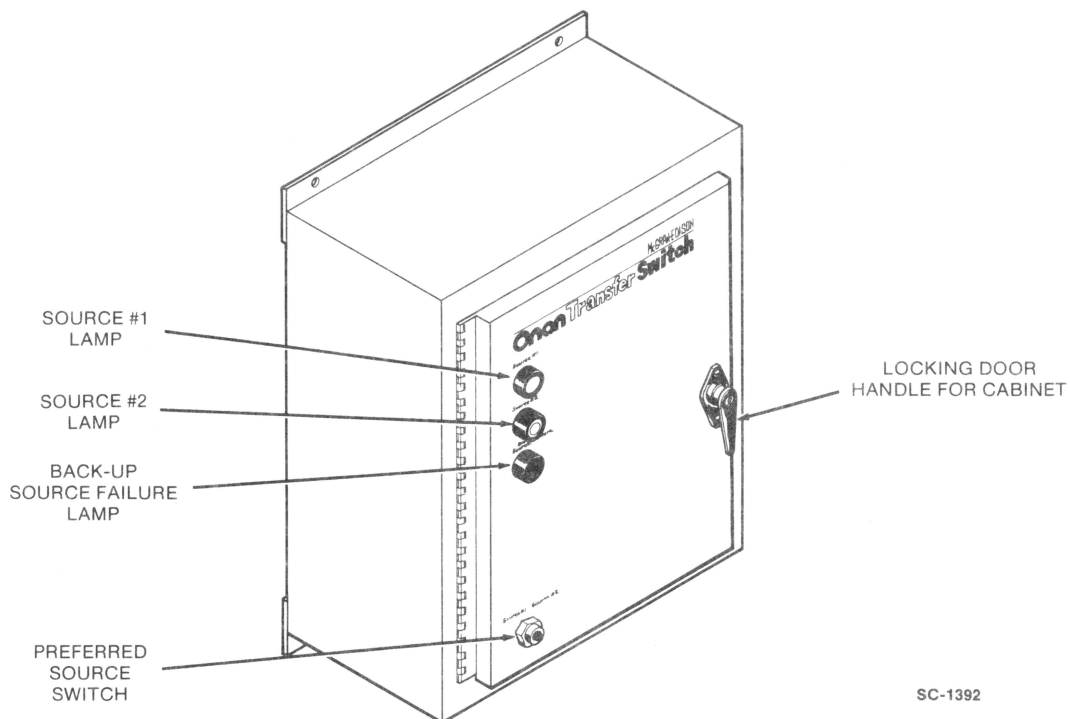


FIGURE 11. STANDARD OT TRANSFER SWITCH CABINET

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assemblies between the Normal power source and Emergency power source as required. The linear actuator operation is initiated automatically with automatic transfer switches. Manual operation of the transfer switch is possible. Refer to manual operation in the OPERATION section.

### Motor Disconnect Switch

The motor disconnect toggle switch opens and closes the linear actuator circuit. It is located on the transfer switch panel as in Figure 3. It is placed in the down position for manual operation and the up position for automatic operation.

### Auxiliary Contacts

Auxiliary contacts are provided on the Normal and Emergency side of the transfer switch. They are actuated by operation of the transfer switch during transfer and retransfer. The auxiliary contacts have current ratings of 10 amperes at 480 VAC.

## ELECTRONIC CONTROL

This section describes the standard electronic control. A description of the basic circuits follows:

### Time Delays

**Transfer Time Delay:** An adjustable setting on the Time Delay Module preventing "nuisance" transfers to the back-up power source due to line fluctuations shorter than the set time. This brief time delay (factory set at two seconds) is adjustable from zero to two minutes. See Installation section "Electronic Control Settings" for step-by-step procedure.

**Retransfer Time Delay:** The timing of this adjustable delay begins when the preferred power source stabilizes. The delay is factory set for 15 minutes, and is adjustable from 0 to 32 minutes. See Installation section "Electronic Control Settings" for step-by-step procedure.

### Undervoltage Sensing

If the preferred source voltage falls to the dropout setting, a signal from the time delay module transfers the load to the back-up power source (if present and within acceptable limits). The time delay module logic looks at the source OK signals from both sources and decides which one to transfer to after the appropriate time delay. The undervoltage sensor decides if the source it is monitoring is OK.

The sensors are factory set to pick up at 95 percent of the nominal voltage and drop out at 85 percent. The pickup setting is adjustable from 85 to 100 percent of the nominal voltage, and the dropout setting from 85 to 98 percent of the pickup voltage.

To retransfer load to the preferred power source, for example, the preferred source voltage would have to be 95 percent of the nominal voltage. Once

connected, the voltage sensor would not signal for a drop of load unless the preferred voltage fell below 85 percent of the pickup voltage.

The standard OT has undervoltage sensing for all phases of the Normal and Emergency power sources.

### Options

**Meters:** Onan has meter options as operating indicators of the power sources. These include an AC voltmeter, AC ammeter and frequency meter.

**AC Voltmeter:** A selector switch allows measurement of either power source, and of all three-phase voltages.

**AC Ammeter:** The ammeter measures load line currents, and of three-phase systems by use of a selector switch.

**Frequency Meter:** A selector switch allows measurement of either power source in hertz.

**Frequency Sensing:** Optional frequency sensing for the Normal and Emergency power source detects when frequency is within an adjustable bandwidth ( $\pm 4$  to  $\pm 20\%$ ). If the frequency goes above or below the bandwidth, the automatic transfer switch will initiate transfer of load to the other source. An adjustable dropout time delay allows the control to ignore momentary dips or rises in frequency.

**Overvoltage Sensing:** Optional overvoltage sensing of all lines is available along with undervoltage and frequency sensing.

The overvoltage sensing limit is adjustable from 105 to 135 percent of the nominal voltage, and is factory set at 110 percent. The overvoltage pickup point is fixed at 5 percent below the limit setting. An adjustable time delay overrides momentary overshoots in voltage.

**Programmed Transition:** Programmed transition is an optional feature of Onan Series OT transfer switches. Programmed transition is the capability of the transfer switch to assume a mid-transition position, for an adjustable interval of time, when the load is neither connected to the Normal power source nor to the Emergency power source. This feature allows residual voltages in a motor load to decay to an acceptable level before transition is completed. The length of time that the transfer switch is in the mid-position can be adjusted from 0.5 to 5 seconds, 1.5 to 15 seconds, or 5 to 50 seconds depending on the timer option. The proper adjustment is a function of the motor and its connected load.

Time interval is based on the motor and load characteristics. It is recommended that electric motors up to and including 200 horsepower have the program transition time set at 0.5 second.

# Operation

## AUTOMATIC OPERATION

The automatic function of the OT transfer switch can only be disabled by the Motor Disconnect switch on the transfer switch cover. This switch must be in the up position for automatic operation.

## MANUAL OPERATION

The transfer switch has operator handles for manually transferring of the load. Use the following procedure:

### WARNING

*Some terminals within the transfer switch cabinet and door present a shock hazard which might cause serious personal injury or death if touched. For this reason, stay clear of exposed terminals while performing manual operation of the transfer switch.*

1. Open the cabinet door.
2. Move the motor disconnect switch to the down or manual position. See Figure 12.

### WARNING

*The transfer switch linear motor might operate causing rapid movement of the operator handles and present a hazard of serious personal injury. Be sure to move the motor disconnect switch down to the manual operation position before beginning manual operation.*

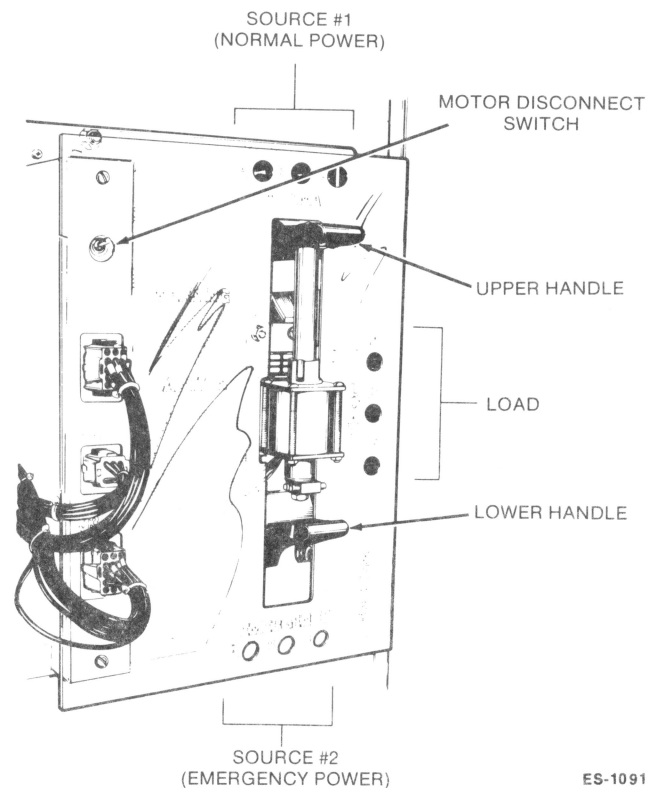
3. Transfer - from Source 1 to Source 2:
  - A. Pull the upper manual operator handle down.
  - B. Push the lower manual operator handle down.
4. Retransfer - from Source 2 to Source 1:
  - A. Pull the lower manual operator handle up.
  - B. Push the upper manual operator handle up.
5. Before moving the Motor Disconnect switch back to the up or automatic position, remember the transfer switch will transfer load to the active

power source. If both power sources are available, transfer will occur to the selected preferred source if voltage is satisfactory.

### WARNING

*Automatic transfer switch operation results in rapid movement of the manual operator handles and presents a hazard of serious personal injury. Keep hands clear of handles when switching back to automatic operation.*

6. Move the Motor Disconnect switch to the up or automatic position.
7. Close the cabinet door.



ES-1091

FIGURE 12. TRANSFER SWITCH, 40/70/100 AMPERE

# Troubleshooting

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## **TRANSFER SWITCH DOES NOT TRANSFER AUTOMATICALLY**

1. Check the Motor Disconnect switch, should be in up/automatic position.
2. Has the transfer time delay expired?
3. Has the programmed transition relay time delay expired (if equipped)?
4. Emergency source voltage may not be sufficient to trigger the Emergency source voltage sensor.

## **TRANSFER SWITCH DOES NOT RETRANSFER AUTOMATICALLY**

1. Check the Motor Disconnect switch, should be in up/automatic position.
2. Is the preferred source switch in Source #1 position?
3. Has the retransfer time delay expired?
4. Has the programmed transition relay time delay expired (if equipped)?
5. Normal source voltage may not be sufficient to trigger the Normal source voltage sensor.



# Parts and Service Information

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Because of the individuality of each automatic transfer switch, contact the dealer from whom you purchased this equipment for service and parts. Remember to give the complete model and serial number when requesting service or parts information. Also note if the cabinet contains a modification

label inside which lists any added options. If it does, give the information listed on the label to your dealer too. The wiring diagrams furnished with your Series OT transfer switch should be kept with your instruction manual.



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