

# ASCO 7000 SERIES ADTB

## Automatic Delayed-Transition Transfer & Bypass-Isolation Switches

### H design 600 through 1200 A

## Operator's Manual

381333-195 D  
7/2022

### **⚠ DANGER**

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

### **⚠ WARNING**

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

### **⚠ CAUTION**

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

Refer to the outline and wiring drawings provided with your 7000 SERIES ADTB for all installation and connection details and accessories.

Refer to *Group 5 Controller User's Guide* 381333-126 for ATS status display messages, time delays, pickup & dropout settings, and adjustments.

### **Rating Label**

Each 7000 SERIES 7ADTB contains a rating label to define the loads and fault circuit withstand/closing ratings. Refer to the label on the Transfer Switch for specific values.

### **⚠ WARNING**

Do not exceed the values on the rating label.

Exceeding the rating can cause personal injury or serious equipment damage.

An experienced licensed electrician must install the 7ADTB.



600-1200 amp sizes

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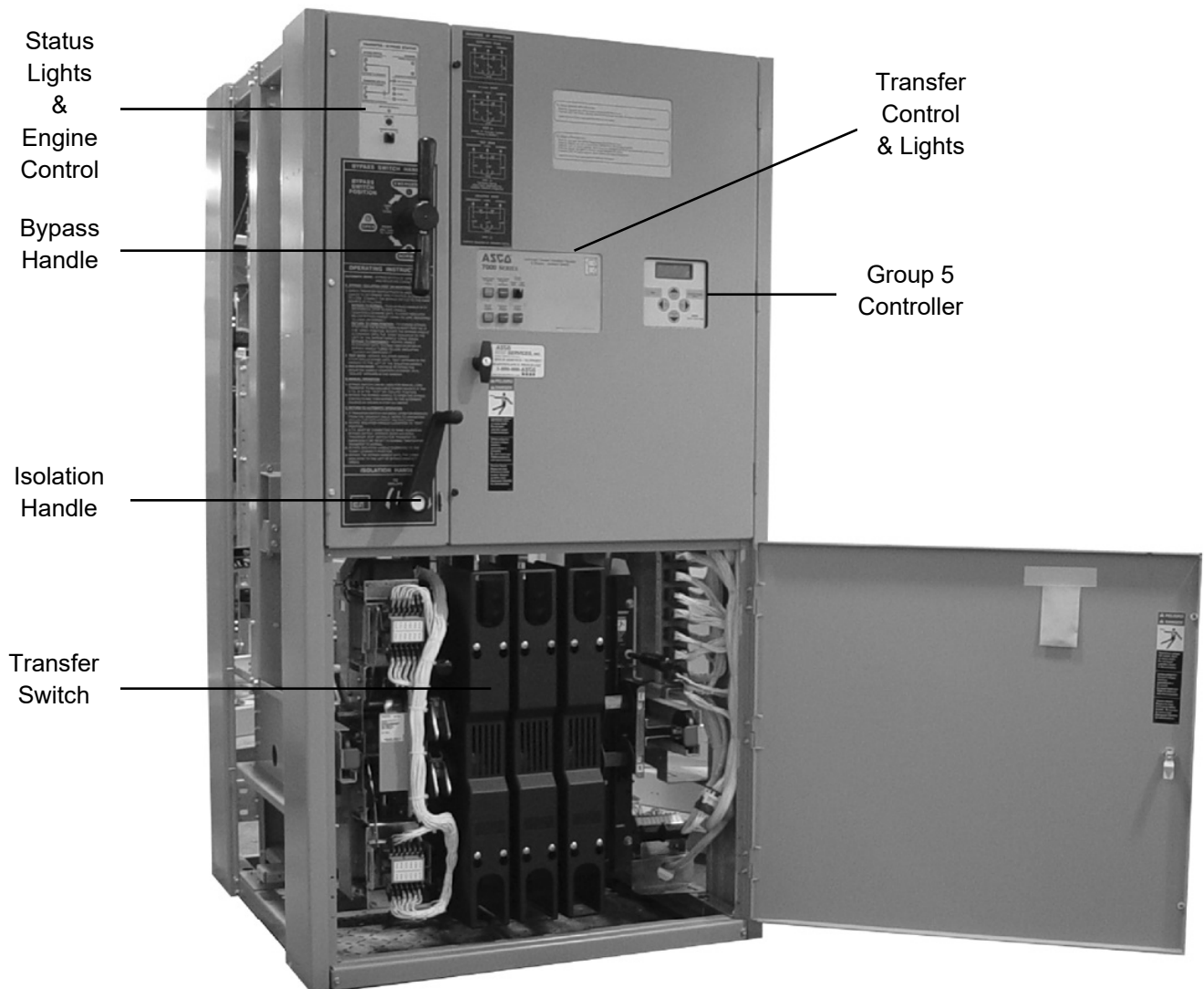
### Nameplate

The Transfer Switch nameplate includes data for each specific 7000 SERIES ADTB. Use the switch only within the limits shown on this nameplate. A typical catalog number is shown below with its elements explained.

### Catalog Number Identification

Typical 7000 SERIES ADTB catalog no. for switched neutral, 3 pole, 600 amp, 480 V, ATS in Type 1 enclosure:

| H 7ADTB        | C        | 3           | 600     | N       |       | 5                                               | C                                                                         |
|----------------|----------|-------------|---------|---------|-------|-------------------------------------------------|---------------------------------------------------------------------------|
| Frame & SERIES | Neutral  | Phase Poles | Amperes | Voltage |       | Controller                                      | Enclosure                                                                 |
|                | A-solid  | 2-single    | 600     | C 208   | K 415 | 5- standard<br>5X- if<br>accessories<br>ordered | C- Type 1<br>F- Type 3R<br>G- Type 4<br>L- Type 12<br>blank- open<br>type |
|                | B-switch | 3-three     | 800     | D 220   | L 440 |                                                 |                                                                           |
|                |          |             | 1000    | E 230   | M 460 |                                                 |                                                                           |
|                |          |             | 1200    | F 240   | N 480 |                                                 |                                                                           |
|                |          |             |         | G 277   | P 550 |                                                 |                                                                           |
|                |          |             |         | H 380   | Q 575 |                                                 |                                                                           |
|                |          |             |         | J 400   | R 600 |                                                 |                                                                           |



open-type H7ADTB with the lower door open (transfer switch shown)

## Installation

ASCO 7000 SERIES Automatic Delayed–Transition Transfer & Bypass–Isolation Switches (7ADTBs) are factory wired and tested. Field installation requires mounting and connection of service cables, and auxiliary control circuits (if required).

### Remove the Shipping Skid

Open the front door and remove the four lag screws (2 in front, 2 in rear) securing enclosure to the shipping skid.

### Supporting Foundation

The supporting foundation for the enclosure must be level and straight. Refer to the applicable enclosure outline drawing included with the switch for all mounting details including door opening space.

If bottom cable entry is used, the foundation must be prepared so that the conduit stubs are located correctly. Refer to the enclosure outline drawing for specified area and location. Provide cable bending space and clearance to live metal parts. When a concrete floor is poured, use interlocking conduit spacer caps or a wood or metal template to maintain proper conduit alignment.

### Mounting

Refer to the applicable enclosure outline drawing furnished with this switch and mount the automatic transfer switch ac

### Line Connections

Refer to the Wiring Diagram provided with the switch. All wiring must be made in accordance with the National Electrical Code and local codes.

Do not remove the interphase barriers from the transfer switch. Always protect the transfer switch, bypass switch, and isolation contacts and mechanisms from construction grit and metal chips when cabling.

## ⚠ DANGER

De–energize the conductors before making any line or auxiliary circuitry connections.

Be sure that Normal and Emergency line connections are in proper phase rotation.

Place engine generator starting control in the OFF position.

Make sure engine generator is not in operation.

### Testing Power Conductors

Do not connect the power conductors to the transfer switch until they are tested. Installing power cables in conduit, cable troughs and ceiling-suspended hangers often requires considerable force. The pulling of cables can damage insulation and stretch or break the conductor's strands. For this reason, after the cables are pulled into position, and before they are connected, they should be tested to verify that they are not defective or have been damaged during installation.

## ⚠ CAUTION

Protect the switch from construction grit and metal chips to prevent malfunction or shortened life of the 7ADTB switch..

### Connecting Power Conductors

After the power cables have been tested, connect them to the appropriate terminal lugs on the bypass switch as shown on the wiring diagram provided with the switch. Make sure the lugs provided are suitable for use with the cables being installed. Standard terminal lugs are solderless screw type and will accept the wire sizes listed on the drawings provided with the 7ADTB. Be careful when stripping insulation from the cables; avoid nicking or ringing the conductor. Remove surface oxides from cables by cleaning with a wire brush. When aluminum cable is used, apply joint compound to conductors. Tighten cable lugs to the torque specified on rating label.

### Controller Ground

A grounding wire must be connected to the controller's lower left mounting stud. Because the controller is mounted on the enclosure door, a conductive strap must be used between the enclosure and the door. This connection provides proper grounding which does not rely upon the door hinges.

### Harnesses

The transfer switch is connected to the left side of the controller by a plug–in harness (two plugs).

## Engine Starting Contacts

All customer connections, including the engine control contact connections, are located on terminal block TB which is mounted on the top right side of the enclosure. Refer to the wiring diagram provided with the automatic transfer switch and connect the engine start wires to the appropriate terminals. See Figure 1 and Table A.

Table A. Engine start connections.

| When normal source fails | Terminals on transfer switch |
|--------------------------|------------------------------|
| contact closes           | TB1 and TB2                  |
| contact opens            | TB1 and TB3                  |

**Note:** To temporarily disable engine control from the automatic transfer switch you can unplug J3 from the small P3 receptacle at the bottom of the assembly. Be sure to reconnect plug J3 to the P3 receptacle for automatic transfer switch operation.

## Auxiliary Circuits

Connect auxiliary circuit wires to appropriate terminals on transfer switch terminal block TB as shown on the wiring diagram provided with this automatic transfer switch.

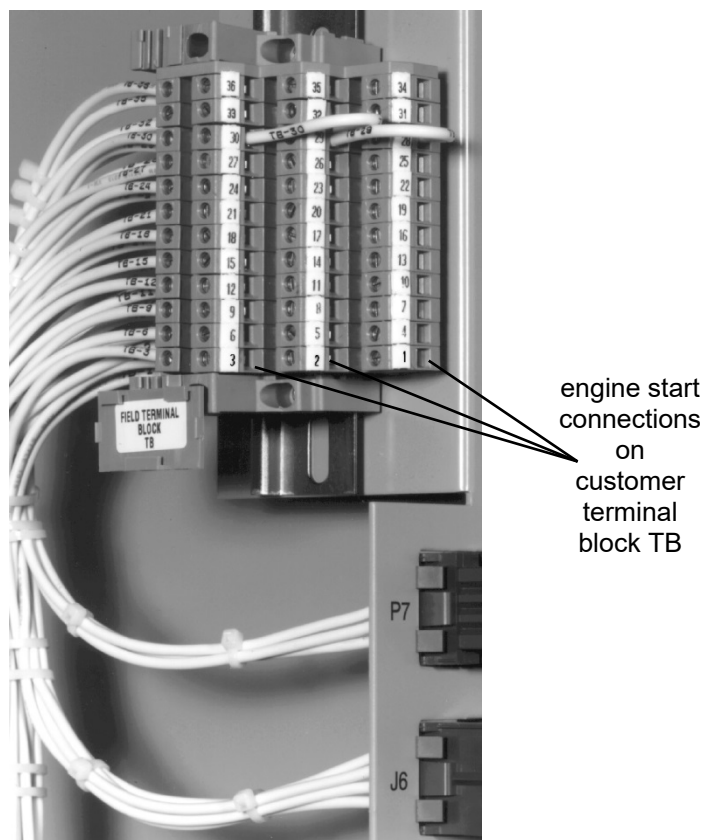


Figure 1. Customer terminal block on the top right side of the enclosure.

## Functional Test

The Functional Test consists of two checks:

- 1 - Voltage Checks, page 7
- 2 - Electrical Operation, page 8

### ⚠ CAUTION

Do these checks in the order presented to avoid damaging the 7ADTB.

Read all instructions on the Wiring Diagram and labels affixed to the automatic transfer switch. Note the control features that are provided and review their operation before proceeding.

Continue to **1 – Voltage Checks** on next page.



# Installation

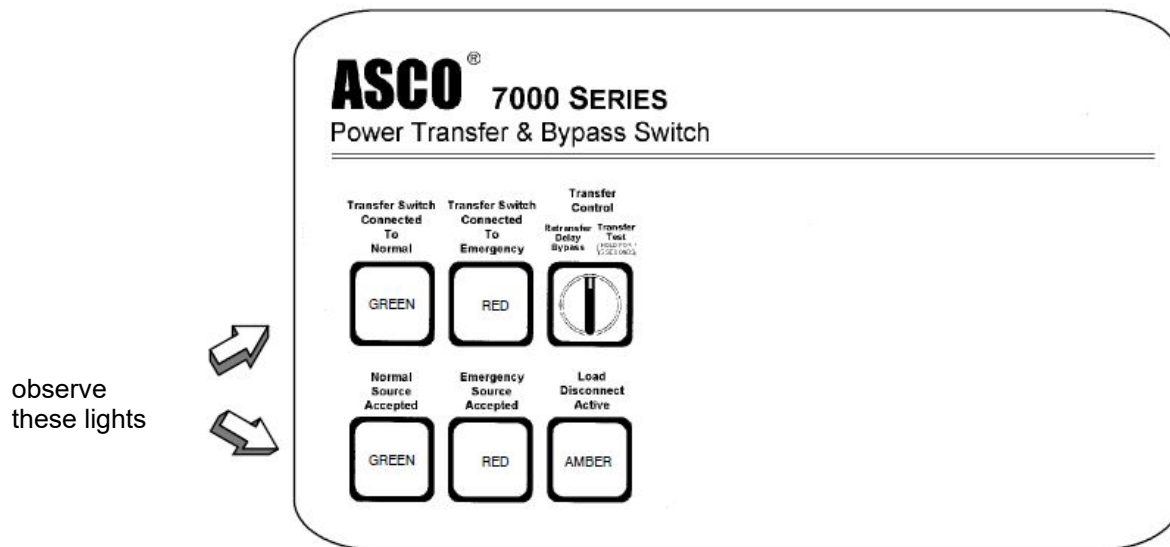


Figure 2. Standard controls and indicators.

## Functional Test

Read all instructions on the *Wiring Diagrams* and labels affixed to the 7ADTB. Note the control features that are provided and review their operation before proceeding.

After installing the 7ADTB check the following:

- Bypass Handle should be in the *NORMAL* position.
- Isolation Handle should be in the *CONN* position.
- CN transfer switch should be *C* (closed)
- CE transfer switch should be *O* (open)

If handles are not in correct positions, follow instructions for Bypassing and Isolating the automatic transfer switch in **Section 3**. **Do not force the handles.** Electrical interlocks prevent a wrong sequence of operation.

### 1 – Voltage Checks

First check nameplate on transfer switch; rated voltage must be the same as normal and emergency line voltages.

#### ⚠ DANGER

Use extreme caution when using a meter to measure voltages.

Do not touch power terminals; shock, burns, or death could result.

Perform steps 1 through 6 at the right. Observe the status lights. See Figure 2.

■ Black square means light is on.

□ White square means light is off.

\* If necessary, adjust voltage regulator on generator per the manufacturer's recommendations. The 7ADTB will respond only to rated voltage specified on the nameplate.

|   |                                                                                                                                                                                                                                       |  |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1 | Close the normal source circuit breaker. The <i>Transfer Switch Connected To Normal</i> and the <i>Normal Source Accepted</i> lights should come on.                                                                                  |  |
| 2 | Use an accurate voltmeter to check phase to phase and phase to neutral voltages present at the transfer switch normal source terminals.                                                                                               |  |
| 3 | Close the emergency source circuit breaker. (Start generator, if necessary.) The <i>Transfer Switch Connected To Normal &amp; Emergency Source Accepted</i> lights should come on.                                                    |  |
| 4 | Use an accurate voltmeter to check phase to phase and phase to neutral voltages present at the transfer switch emergency source terminals.*                                                                                           |  |
| 5 | Use a phase rotation meter to check phase rotation of emergency source; it must be the <u>same</u> as the normal source.                                                                                                              |  |
| 6 | Shut down the engine—generator, if applicable. The <i>Emergency Source Accepted</i> light should go off. Then put the starting control selector switch (on the generator set) in the <i>automatic</i> position. Close enclosure door. |  |

Now continue to 2 – **Electrical Operation** on next page.

# Installation

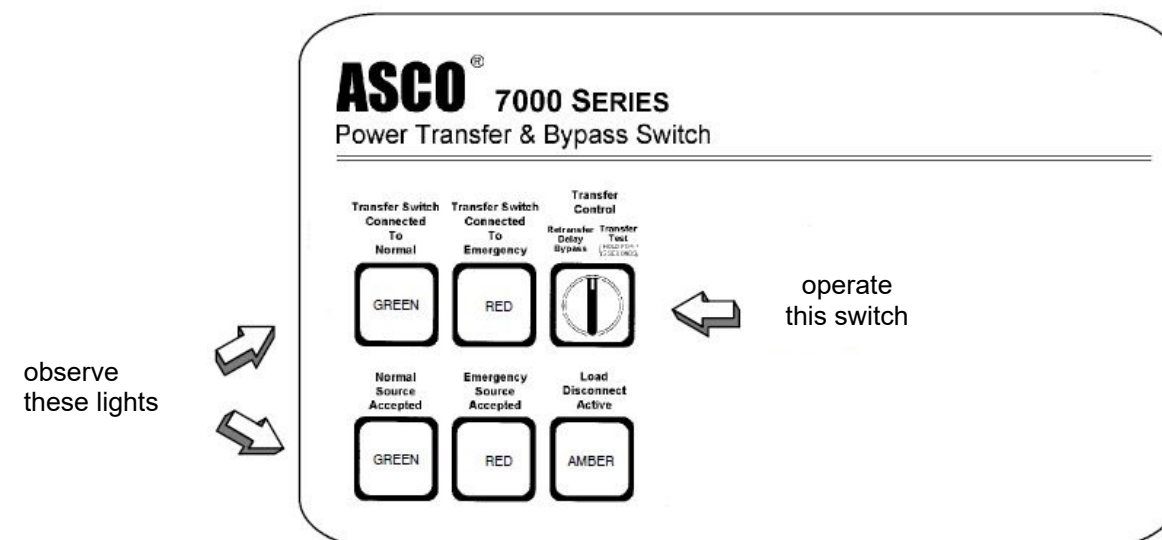


Figure 3. Standard controls and indicators.

## 2 – Electrical Operation

This procedure checks electrical operation of the ADTS.

### ⚠ WARNING

Be sure to close the enclosure door before proceeding to prevent personal injury in case of electrical system fault

### Transfer Test

The ATS should still be bypassed. Both normal and emergency sources must be available and the emergency source generator (if used) must be capable of being started; put engine starting control in *automatic* position. The *Transfer Switch Connected to Normal* light and the *Normal Source Accepted* light should be on.

1. Turn the **Isolation Handle** counterclockwise to the **TEST** position.

**NOTE:** The engine generator may be signaled to start while turning the Isolation Handle. If emergency source is available, the ATS may operate to the emergency position. If it does, operate **Retransfer Delay Bypass** switch.

2. Perform steps 1–5 at right. Observe the status lights. See Figure 3.

■ Black square means light is on.

□ White square means light is off.

3. Turn the **Isolation Handle** clockwise to the **CONN** (connected) position.
4. Turn the **Bypass Handle** clockwise to the **OPEN** position.

**This completes the Functional Test of the 7ADTB.**

|   |                                                                                                                                                                                                                                                                                                                                      |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1 | Turn and <u>hold</u> <b>Transfer Control</b> switch clockwise to <i>Transfer Test</i> until the engine starts and runs (within 15 sec.). <i>Emergency Source Accepted</i> light should come on.                                                                                                                                      |  |
| 2 | Transfer switch CN opens and the Transfer Switch Connected to Normal light should go off and the Load Disconnect Active light should come on. Both CN & CE contacts are now open.                                                                                                                                                    |  |
| 3 | After the delay transition time delay, the CE Transfer switch will operate to the Emergency position. The Transfer Switch Connected To Emergency light should come on and Load Disconnect Active light goes off.                                                                                                                     |  |
| 4 | Transfer switch will operate back to Normal position after Feature 3A time delay. For immediate retransfer turn <b>Transfer Control</b> counterclockwise to <i>Retransfer Delay Bypass</i> . The <i>Transfer Switch Connected To Normal</i> light should come on; <i>Transfer Switch Connected To Emergency</i> light should go off. |  |
| 5 | The engine-generator will stop after the Feature 2E time delay (unloaded running engine cooldown). The <i>Emergency Source Accepted</i> light should go off.                                                                                                                                                                         |  |



## Testing & Service

### TRANSFER TEST

Test the Automatic Transfer Switch portion of the 7000 SERIES 7ADTB at least once a month. This procedure checks the electrical operation of the Transfer Switch and Controller. Put the engine-generator starting control (at the engine-generator set) in automatic mode.

In the following test the generator will start, the load will be transferred to the Emergency source, then back to the Normal source. An interruption to the load will occur unless the Transfer Switch contacts are bypassed before the test. See pages 12-15 for bypassing & isolating instructions if no interruption of load is required.

#### ⚠ WARNING

Be sure to close the enclosure door before proceeding to prevent personal injury in case of electrical system fault.

Perform the five-step **Electrical Operation – Transfer Test** procedure on page 6.

### PREVENTIVE MAINTENANCE

Reasonable care in preventive maintenance will insure high reliability and long life for the 7000 SERIES 7ADTB. An annual preventive maintenance program is recommended.

ASCO Power Services, Inc. is ASCO Power Technologies service organization for the United States and Canada. Call 1-800-800-2726 (ASCO) to request a service call and information on preventive maintenance agreements.

### Annual Inspection Checklist

#### ⚠ DANGER

Hazardous voltage capable of causing shock, burns, or death is used in this switch.

- **Cleaning the 7ADTB enclosure**  
Brush and vacuum away any excessive dust accumulation. Remove moisture with a clean cloth.
- **Check the transfer switch contacts.**  
Bypass, isolate, and withdraw the transfer switch. Then remove the transfer switch interphase barriers and check the condition of the contacts. Replace contacts when pitted or worn excessively. Reinstall the interphase barriers carefully. See page 12.
- **Maintain transfer switch lubrication.**  
If switch is subjected to severe dust or abnormal operating conditions, renew factory lubrication on all movements and linkages. Relubricate solenoid operator if TS coil is replaced. Don't use oil; order **lubrication kit 75-100**
- **Check all cable connections** by either thermal measuring or monitoring, or mechanical check. If any connections are loose, retighten them. See Page 4-5.

## REPLACEMENT PARTS

Replacement parts are available in kit form. When ordering parts provide the Serial No., Bill of Material No. (BOM), and Catalog No. from the transfer switch nameplate. Contact your local ASCO Power Technologies Sales Office or ASCO Power Services, Inc.

**In the United States and Canada**

**call 1 – 800 – 800 – ASCO ( 2726 )**

### DISCONNECTING THE CONTROLLER

The harness disconnect plugs are furnished for repair purposes only and should not have to be unplugged. If the controller must be isolated, follow these steps.

#### ⚠ DANGER

Bypass–Isolation Switch is energized.

Do not touch isolation contact fingers; shock, burns, or death could result.

### Disconnecting the Plugs

1. Bypass and Isolate the Automatic Transfer Switch.
2. Open the upper enclosure door.
3. Separate the two quick disconnect plugs by squeezing the latches. Do not pull on the harness wires.

### Reconnecting the Plugs

1. The ATS should be still bypassed and isolated.
2. The two harness plugs and sockets are keyed. Carefully align the plugs with the sockets and press straight in until the latches click.
3. Close the enclosure doors.
4. Follow *Return to Service* instructions on page 16.

## MANUAL LOAD TRANSFER

This procedure manually transfers load to other source if the Transfer Switch or Control Panel are out of service.

#### ⚠ WARNING

Close enclosure doors to prevent personal injury in case of electrical system fault.

1. Bypass the connected 7ADTB source. Turn Bypass Handle to *EMERGENCY* or *NORMAL* (see page 13).
2. Isolate to Test. Turn the Isolation Handle to *TEST* position (see page 14).
3. Turn the Bypass Handle to *OPEN*, then to the other source (see page 12). The load will be interrupted.
4. Turn the Isolation Handle clockwise to the *CONN* [connected] position (see page 15).

## Testing & Service

### TROUBLE-SHOOTING

Note any optional accessories that may be furnished on the 7ADTB and review their operation. Refer to any separate drawings and/or instructions that may be packed with the 7ADTB. See Table B.

## ⚠ DANGER

Hazardous voltage capable of causing shock, burns, or death is used in this switch.

Do not touch the power or load terminals of the bypass switch or transfer switch.

Table B. Trouble-Shooting Checks.

| PROBLEM                                                                                                                                                      | CHECK IN NUMERICAL SEQUENCE                                                                                                                              |                                                                                                                                        |                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                              | 1 OPERATION                                                                                                                                              | 2 GEN-SET                                                                                                                              | 3 VOLTAGE                                                                                                                                                                        |
| Engine-generator set does not start when the <b>Transfer Control</b> switch is turned and held in <b>Transfer Test</b> position or when normal source fails. | Hold <i>Transfer Test</i> switch 15 seconds or the outage must be long enough to allow for Feature 1C time delay plus engine cranking and starting time. | Starting control must be in the automatic position. Batteries must be charged and connected. Check wiring to engine starting contacts. | -                                                                                                                                                                                |
| Transfer switch does not transfer the load to the emergency source after the engine-generator set starts.                                                    | Wait for Feature 2B time delay to time out (if used)                                                                                                     | Generator output circuit breaker must be closed. Generator frequency must be at least 95% of nominal (57 Hz for a 60 Hz system.) *     | Voltmeter should read at least 90% of nominal phase to phase voltage between transfer switch terminals EA and EC (or EL1 and EL2 for 2 pole switches). *                         |
| Transfer switch does not transfer the load to normal source when normal returns or when the <b>Transfer Control</b> switch is released.                      | Wait for Feature 3A time delay to time out (if used)                                                                                                     | -                                                                                                                                      | Voltmeter should read at least 90% of nominal phase to phase voltage between transfer switch terminals NB and NC, NC and NA, and NA and NB (or NL1 and NL2 for 2 pole switches). |
| Gen. does not stop after load retransfer to normal source.                                                                                                   | Wait for Feature 2E time delay to time out (if used)                                                                                                     | Starting control must be in the automatic position.                                                                                    |                                                                                                                                                                                  |
| <i>Load Disconnect Active</i> light comes on.                                                                                                                | Wait for load disconnect time delay to time out.                                                                                                         | Explanation: Transfer switch in delayed transition transfer mode. Load disconnect time delay is adjustable from 0 to 5 min. 59 sec     |                                                                                                                                                                                  |
| <i>Load Disconnect Active</i> light stays on longer than 6 min.                                                                                              | Check load disconnect time delay setting. Call ASCO Power Services                                                                                       | Explanation: Transfer switch contacts are open longer than 5 min. 59 sec (maximum setting). Load remains disconnected.                 |                                                                                                                                                                                  |

\* These are factory settings. Refer to the **Controller User's Guide**.

If the problem is isolated to circuits on the controller or the transfer switch, call your local ASCO Power Technologies sales office or ASCO Power Services, Inc.: in the United States or Canada, call 1-800-800-2726. Furnish the Serial No., Catalog No., and Bill of Material (BOM) No. from the transfer switch nameplate.

### MAINTENANCE HANDLE

## ⚠ DANGER

Bypass and isolate the Transfer Switch before using the maintenance handle, See pages 12-15.

Remove the maintenance handle after using it; store it inside.

1. Bypass, isolate, and withdraw the transfer switch (pages 12 through 15). Then locate and remove the maintenance handle from the clip (inside lower left side). Insert the handle onto the shaft on the left side of the operator of the transfer switch. See Figures 4, 5, 6 and Table C.
2. Move the maintenance handle up or down as shown to manually operate the transfer switch. Operate both upper and lower contact shafts. Observe the window indicators (right side). Remove the maintenance handle and store it on the lower left side.

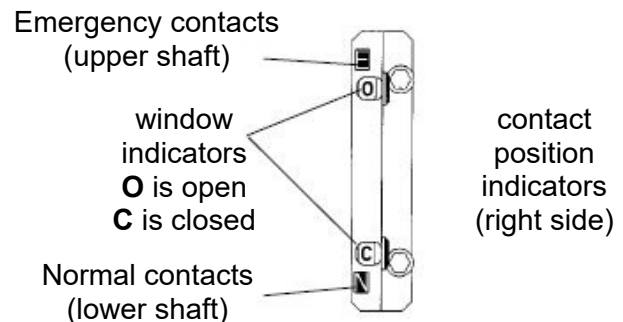


Figure 4. Contact position indicators

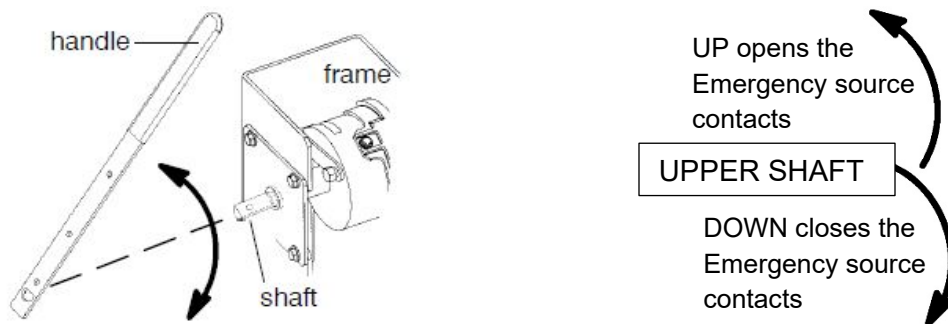


Figure 5 Maintenance handle operation for Emergency source contacts (upper shaft).

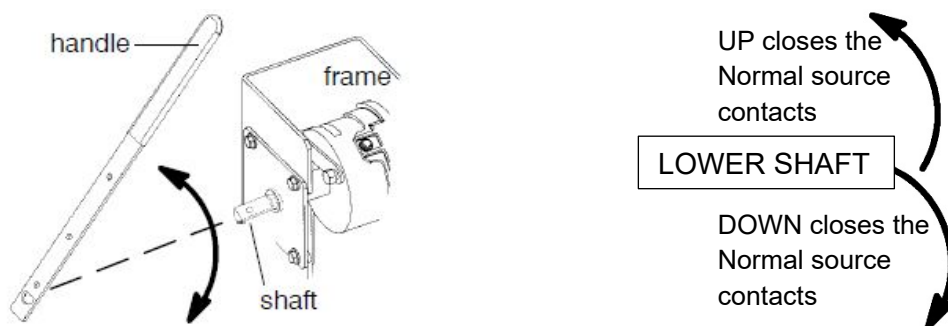


Figure 6. Maintenance handle operation for Normal source contacts (lower shaft).

Table C. Maintenance handle positions

| Transfer Switch Position |  | Interlocked Weights<br>Lobes prevent closing<br>both N & E contacts | Maintenance Handle | Shaft Indicators                                                   |
|--------------------------|--|---------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|
| Normal                   |  |                                                                     | up                 | E = O<br>upper contacts open<br><br>N = C<br>lower contacts closed |
|                          |  |                                                                     | up                 |                                                                    |
| Load Disconnected        |  |                                                                     | up                 | E = O<br>upper contacts open<br><br>N = O<br>lower contacts open   |
|                          |  |                                                                     | down               |                                                                    |
| Emergency                |  |                                                                     | down               | E = C<br>upper contacts closed<br><br>N = O<br>lower contacts open |
|                          |  |                                                                     | down               |                                                                    |

## Bypassing & Isolating

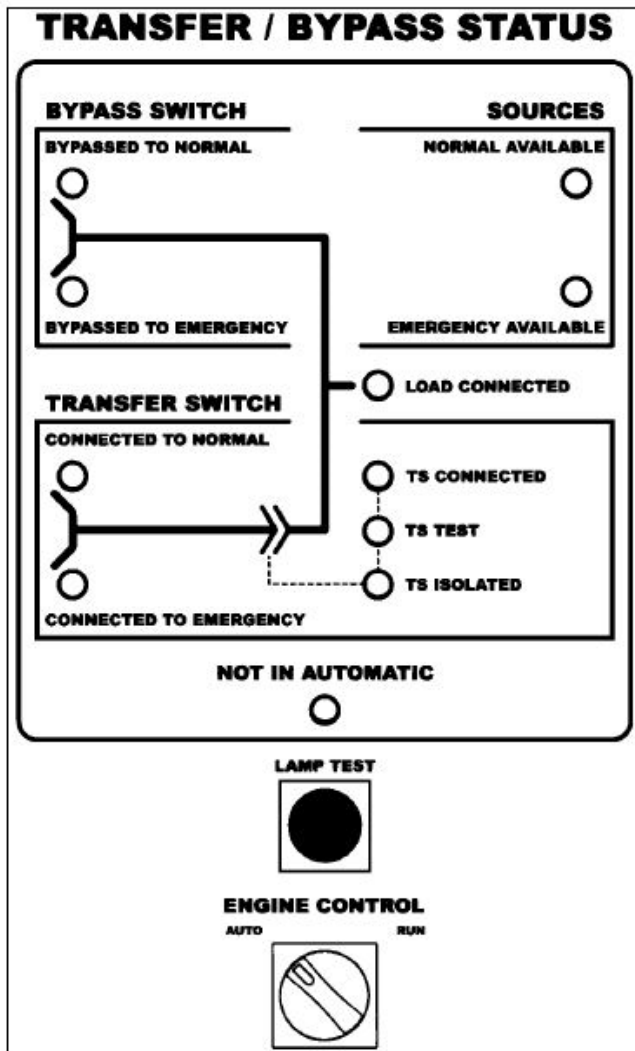


Figure 7. Status lights and Engine Control.

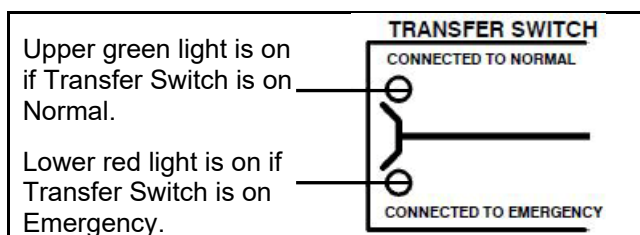


Figure 8. Status lights for Transfer Switch main contact position.

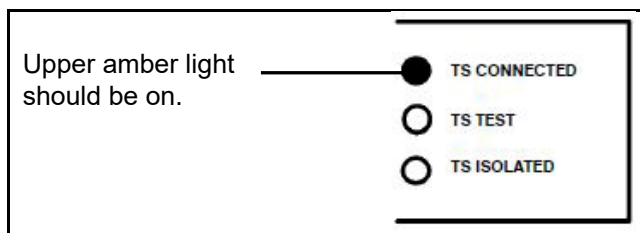


Figure 9. Status lights for Transfer Switch isolation contact position.

### BYPASSING THE ATS\*

This procedure explains how to Bypass the closed transfer switch contacts. Bypassing is required before the Transfer Switch can be tested or isolated. The Bypass Switch Handle must be in the *OPEN* position (green window indicator) and the Isolation Handle must be in the *CONN* [connected] position (window indicator). The *TS Connected* light must be on. See Figures 7, 8, and 9

### CAUTION

You can only bypass to the same source that the Transfer Switch is connected.

Solenoid interlock prevents incorrect operation.

1. Observe which *Transfer Switch Connected To* light is on (*Normal* or *Emergency*) on the door. This is the position of the transfer switch (see Figure 8).
2. Follow the directions on next page to Bypass to the same source as connected to transfer switch (select Normal or Emergency).

Window indicator shows yellow when ATS is bypassed to Emergency.

Window indicator shows green when the ATS is not bypassed.

Window indicator shows yellow when ATS is bypassed to Normal.



Figure 10. Bypass Handle and three position window indicators.

**Allowable Positions of the Bypass Switch in relation to Positions of the Transfer Switch**  
(with Isolation Handle in the *Conn* [connected] position and *TS Connected* light on)

| Transfer Switch                              | Bypass Switch can be in either |           |
|----------------------------------------------|--------------------------------|-----------|
| If Transfer Switch is in Normal position     | Open or                        | Normal    |
| If Transfer Switch is in Emergency position. | Open or                        | Emergency |



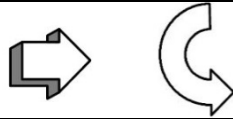
## Bypassing & Isolating

### To Bypass Normal Source\*

(Load connected to Normal Source)

The *Transfer Switch Connected To Normal* light is on and *Transfer Switch Connected To Emergency* light is off.

Push in the handle and turn it counterclockwise.\*



Push in\* the Bypass Handle all the way, then turn it counterclockwise until *Bypass Switch Position* shows closed on NORMAL (yellow window indicator). The green light *Bypassed to Normal* will come on and the amber light *Not In Automatic* will flash.

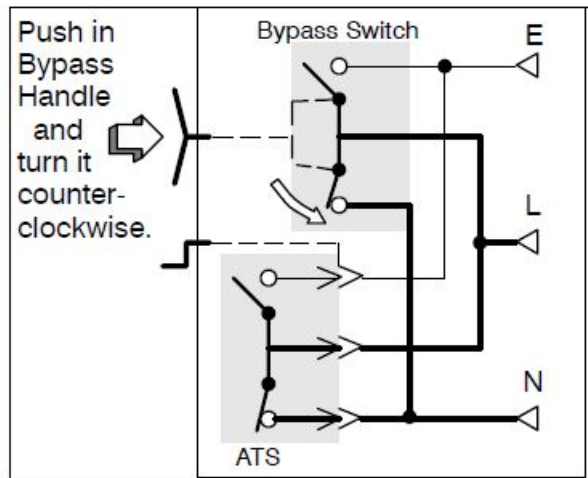


Figure 11. Bypass to Normal diagram.

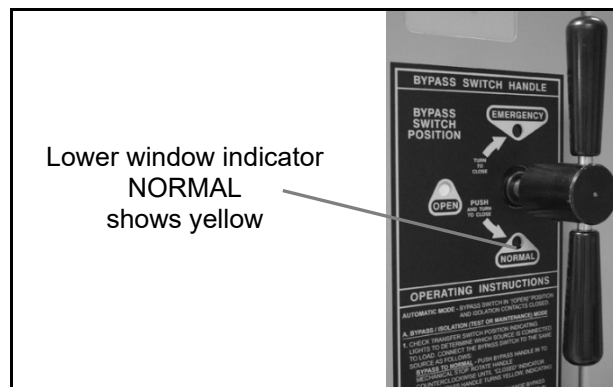
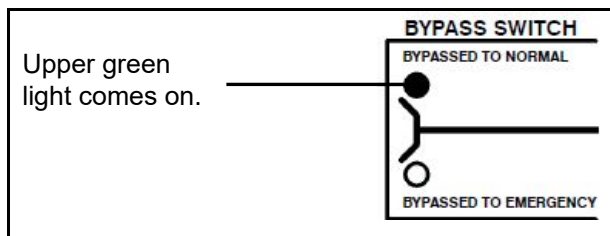


Figure 12. Status light and window indicator for Bypassed to Normal Source.

### To Bypass Emergency Source\*

(Load connected to Emergency Source)

The *Transfer Switch Connected To Emergency* light is on and *Transfer Switch Connected To Normal* light is off.

Turn the handle clockwise.\*



Turn\* the Bypass Handle clockwise until *Bypass Switch Position* shows closed on EMERGENCY (yellow window indicator). The red light *Bypassed to Emergency* will come on and the amber light *Not In Automatic* will flash.

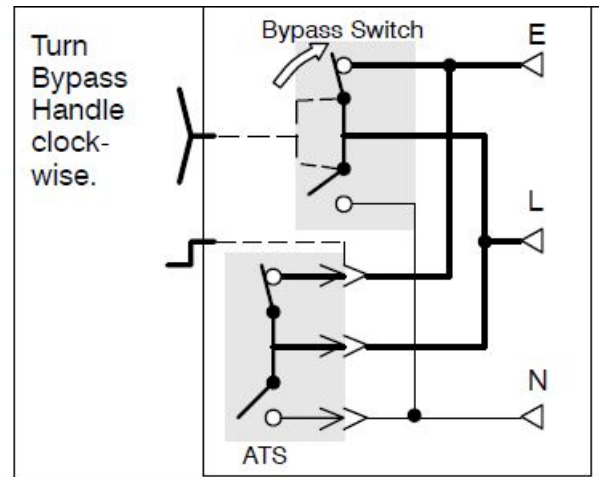


Figure 13. Bypass to Emergency diagram.

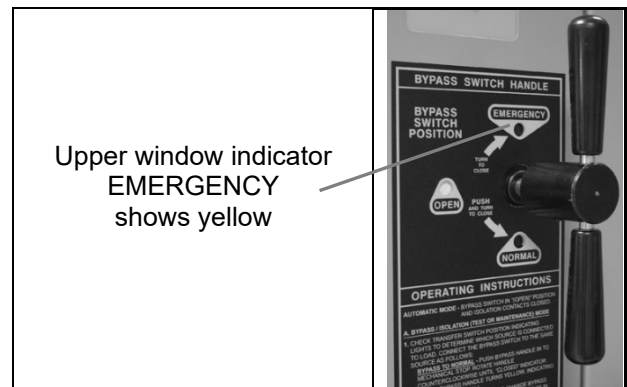
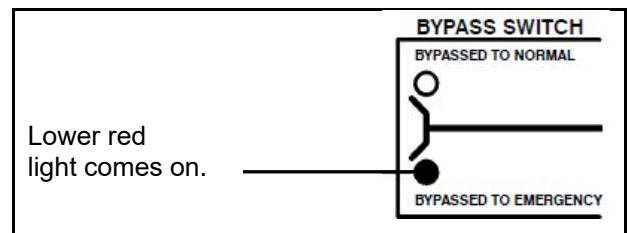


Figure 14. Status light and window indicator for Bypassed to Emergency Source.

The automatic transfer switch can now be put in the *TEST* or *OPEN* position. See **ISOLATING** on page 14.

\* **NOTE:** When Accessory 40\*B (reversed Normal & Emergency connections) is specified, the handle operation is reversed. Follow instructions on the door.

# Bypassing & Isolating

## ISOLATING THE ATS

Isolating is required before any service work can be performed on the automatic transfer switch (ATS). Refer to Figures 15, 16, 17 and 18.

1. Bypass the closed automatic transfer switch contacts. See **BYPASSING** on pages 12 and 13.
2. Turn the Isolation Handle counterclockwise (approx. 8 turns) until window shows **TEST**. The **TS Test** amber light should come on. The ATS can be tested now without load interruption (see page 9).

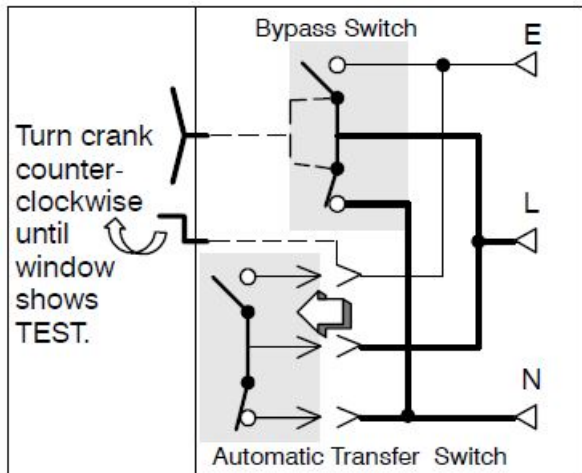
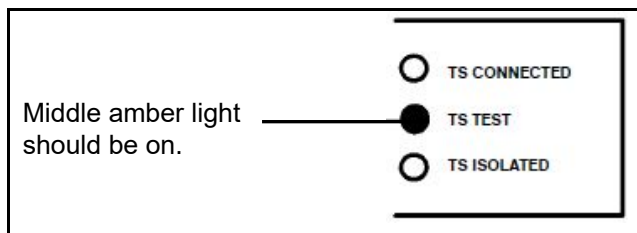


Figure 15. **CONNECTED** to **TEST** position.



**NOTE:** In the **TEST** position the transfer switch solenoid operator circuit is energized through secondary disconnects.

## ⚠ DANGER

Hazardous voltage capable of causing electrical shock, burns, or death; do not touch any control circuit terminals.

3. Continue turning Isolation Handle counterclockwise (approx. 6 turns) until the window shows **ISOLATE**. The **TS Isolated** amber light should come on.

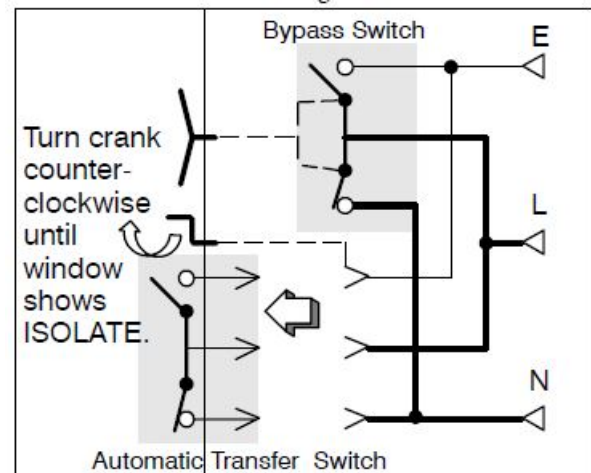


Figure 17. **TEST** to **ISOLATE** position.

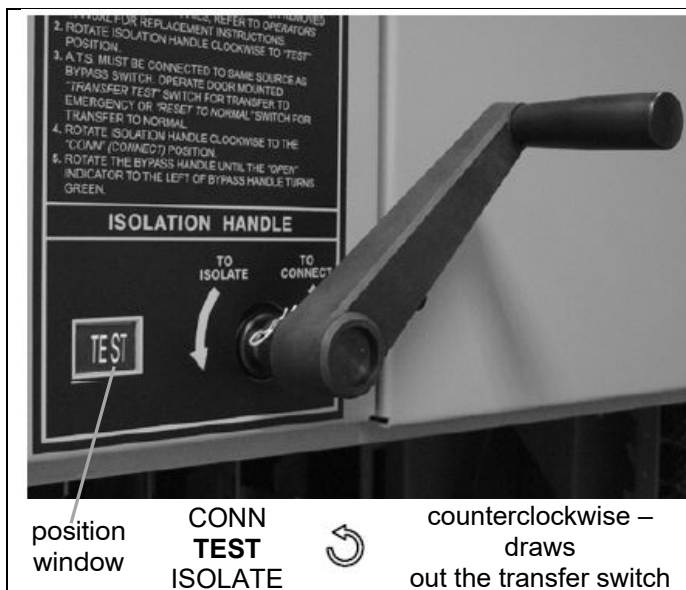
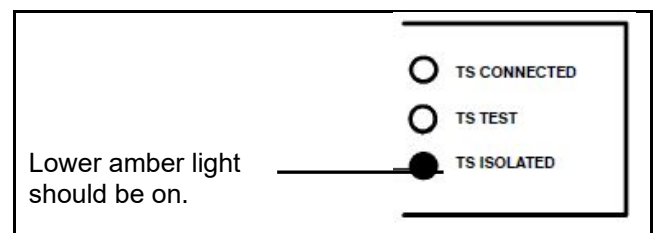


Figure 16. Isolation Handle turned to **TEST**.

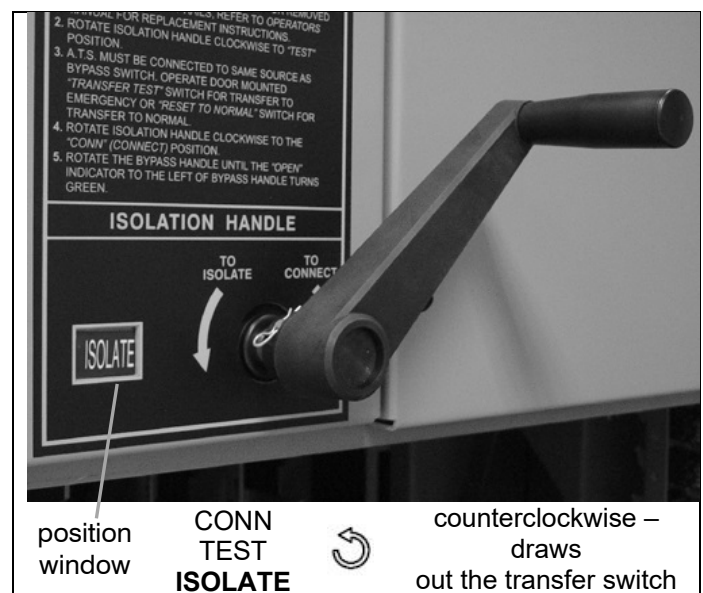


Figure 18. Isolation Handle turned to **ISOLATE**



## Bypassing & Isolating

**NOTE:** Provisions are provided for locking the transfer switch in the isolate position. When the switch is in the isolate position, pull the lockout tab out to expose the hole in the tab and insert a padlock (padlock not provided). This prevents the transfer switch from returning to service until the padlock is removed.

4. Open the lower enclosure door. Pull out both left and right side rails then use the two tab handles to roll out the transfer switch. It can be safely inspected in this position. The transfer switch can also be removed for easier maintenance operations. See Figure 19.

### ⚠ DANGER

Hazardous voltage capable of causing electrical shock, burns, or death; do not touch any control circuit terminals.

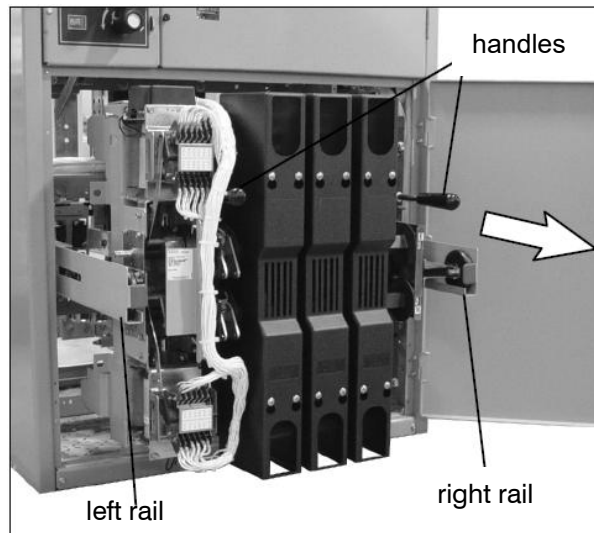


Figure 19. Transfer switch isolated and pulled out for inspection.

See page 10 for maintenance handle use. A lifting yoke 734408 is available to facilitate lifting by using an overhead crane or similar equipment. See **WARNING**

### ⚠ WARNING

The Transfer Switch weighs 165–235 lbs. depending upon the number of poles. Use lifting device 734408 or other device capable of lifting this weight to avoid personal injury or equipment damage. Two persons are recommended.

### Contact Inspection

The main contacts are protected by arcing contacts. The arcing contacts make first and break last to avoid arcing at the main contacts. Contact condition should be checked annually. Contacts should be replaced when contact material becomes severely worn. Discoloration is normal. Do not file contacts because it wastes material. Instead use light emery paper to clean up the contact surfaces.

If the contacts need to be replaced see page 10

### ⚠ DANGER

To prevent the possibility of fatal electrical shocks and burns, bypass, isolate, and withdraw the transfer switch before working on it.

The top Bypass Switch and rear stabs are still energized

Do not touch these parts; shock, burns, or death could result.

The contact assemblies (two for each pole) are located to the right of the operator mechanism.

1. **Bypass, isolate, and withdraw transfer switch** (pages 12 thru 15). Bypassing, isolating and withdrawing the transfer switch located in the lower part of the enclosure will remove power from the lower transfer switch. Use a voltmeter to verify that no electrical power is present at the transfer switch terminals.
2. **Use the maintenance handle** (page 10). Open the contacts that will be inspected by using the detachable maintenance handle.
3. **Remove the interphase barriers** (Figure 20). Use a blade screwdriver to loosen (ccw) four round-head screws holding each barrier to the arc chutes. Slide barrier up until keyholes clear the round-head screws, then remove it.

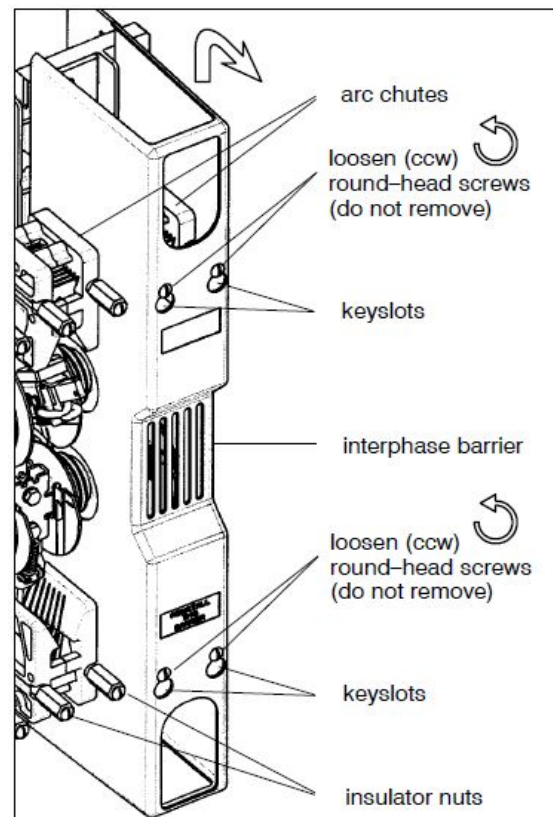


Figure 20. Interphase barrier removal

## Bypassing & Isolating

### 4. Remove the arc chutes.

Use a 5/8" nutdriver to remove (ccw) two long insulator nuts. Then pull the arc chute outward (off the long threaded rods). See Figure 20.

### 5. Remove the movable contact cover.

Use your thumb and fingers to squeeze the sides inward until the contact cover is released from the shaft clamp (both sides). Then remove the movable contact cover. See Figures 21 and 22.

Squeeze movable contact cover to release it

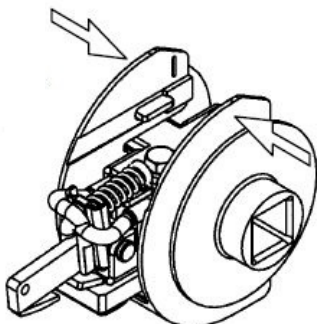


Figure 21. Movable contact cover release

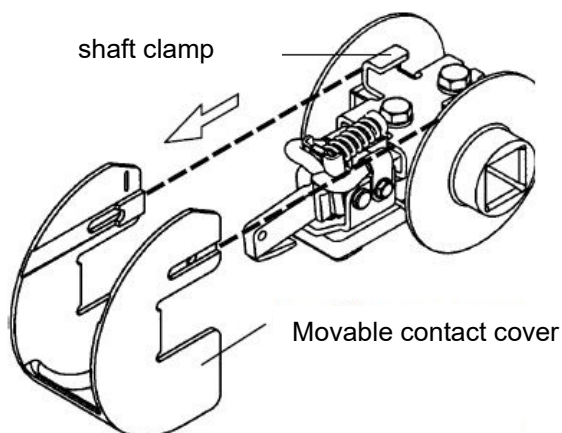


Figure 22. Movable contact cover removal

### 6. Reinstall the movable contact cover.

After inspection reinstall the movable contact cover onto the movable contact assembly. Use your thumb and fingers to squeeze the sides inward until the contact cover is latched onto the metal bracket (both sides). Figures 21 and 22.

### 7. Reinstall the arc chute.

Slide the arc chute (arc splitters toward the contacts and recess for nuts outward) between the two long threaded rods. Reinstall the two long insulator nuts (round shoulder in) and use a 5/8" nutdriver to GENTLY tighten (cw) until snug. Do not overtighten these nuts. See Figure 20.

### 8. Reinstall the interphase barrier.

Install the barrier over the arc chutes and slide it up until the four round-head screws align in the four keyholes in the barrier. Then slide the barrier down. Use a blade screwdriver to tighten (cw) the four round-head screws to secure the barrier to the arc chute insulator nuts. See Figure 18.

## RETURN TO SERVICE

This procedure explains how to return the automatic transfer switch (ATS) to service after inspection and maintenance. Observe the *Bypass Switch Position* indicator and lights).

1. Use the two tab handles to roll the transfer switch into the enclosure (isolation contacts facing inward) until the crank bearings stop against the draw-in plates. Next push in both side rails and close the enclosure door.

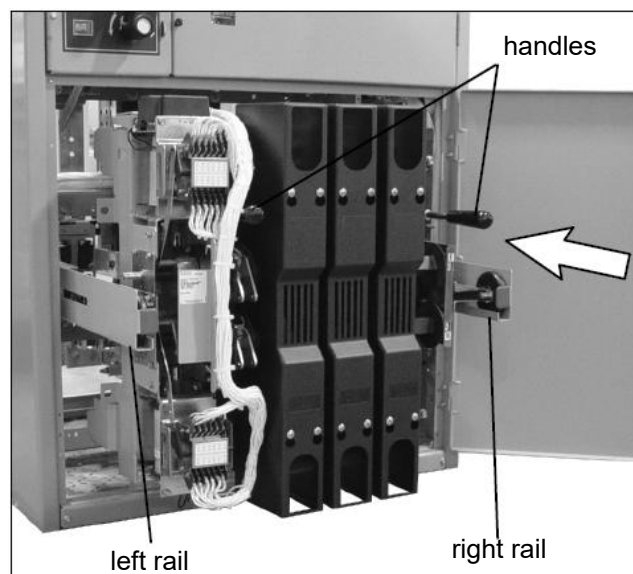


Figure 23. Transfer switch isolated and pulled out for inspection.

## ⚠ WARNING

Close the enclosure door to prevent personal injury in case of electrical system fault.

2. Turn Isolation Handle clockwise (approx. 6 turns) until the window shows *TEST* and *TS TEST* light comes on.

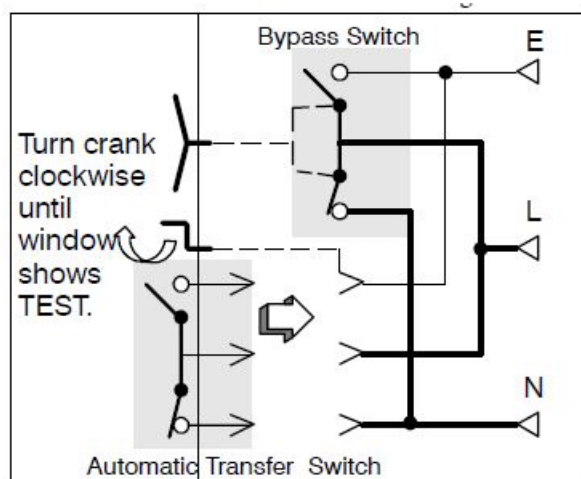
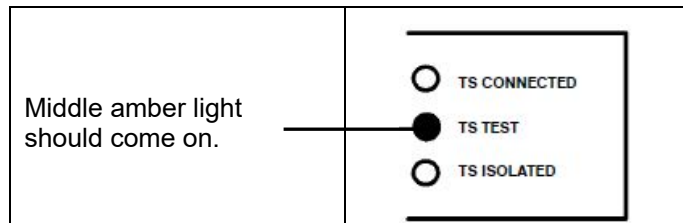


Figure 24 *ISOLATE* to *TEST* position.

## Bypassing & Isolating



position window **TEST** clockwise – draws in the transfer switch

Figure 25 Isolation Handle turned to *TEST*

- The ATS can be tested now without load interruption (see page 9).

### CAUTION

Solenoid interlock prevents you from closing the isolation contacts until the ATS is in the same position as the Bypass Switch.

- Observe which *Bypass Switch Position* window indicator is yellow (*NORMAL* or *EMERGENCY*) at the Bypass Switch Handle. This indicates the source connected to the load.
- Observe which *Transfer Switch Connected To* light is on (*Normal* or *Emergency*) on the door. This is the position of the Transfer Switch. If it is not in the same position as the Bypass Handle change the position of the Transfer Switch as follows:

#### To change the position of transfer switch

| Operate to NORMAL                                                       | Operate to EMERGENCY                                                            |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Turn <b>Transfer Control</b> switch to <i>Retransfer Delay Bypass</i> . | Turn <b>Transfer Control</b> switch to <i>Transfer Test</i> (hold 15 seconds).* |
| <i>Connected To Normal</i> light should come on.                        | <i>Connected To Emergency</i> light should come on.                             |

\* If Feature 2B time delay is used, there will be a delay before transfer to Emergency

**NOTE:** With Normal available, the automatic transfer switch will not stay in the emergency position unless Feature 3A time delay is used (at least 30 seconds).

### WARNING

Do not close the isolation contacts unless the Transfer Switch (ATS) and Bypass Switch are in the same position.

- When the transfer switch is in the same position as the Bypass Switch handle, continue turning the Isolation Handle clockwise (about 8 turns) until the window shows *CONN* (connected).

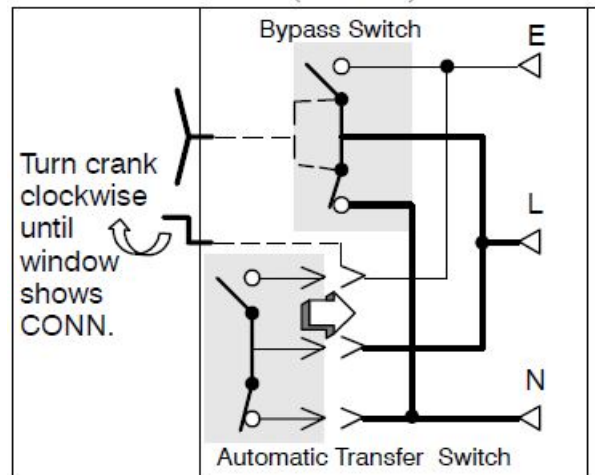


Figure 26. *TEST* to *CONN* (connected) position.

Upper amber light should be on.



position window **CONN** clockwise – draws in the transfer switch

Figure 27. Isolation Handle turned to *CONN*



## Bypassing & Isolating

### RETURN TO SERVICE continued\*

This procedure explains how to return the Bypass Switch Handle to the OPEN position. The Bypass Handle must be in the *CLOSED* position (yellow indicator on *NORMAL* or *EMERGENCY*) and the Isolation Handle must be in the *CONN* position (window). See Figures 28, 29 and 30.

### ⚠ CAUTION

You can only bypass to the same source that the ATS is connected. Solenoid interlock prevents incorrect operation.

1. Observe which Bypass Switch Position indicator is yellow (*NORMAL* or *EMERGENCY*) at the Bypass Switch Handle. This indicates the source connected to the load
2. Un-Bypass to same source as the Bypass Switch Position as follows (select Normal or Emergency).

#### To Un-Bypass Normal Source\*

(Load connected to Normal Source)

The *Transfer Switch Connected To Normal* light is on & *Transfer Switch Connected To Emergency* light is off.

Turn the handle clockwise.\*



Turn\* the Bypass Handle clockwise until the *Bypass Switch Position* shows OPEN (green window indicator). The *Bypassed to Normal* light should go off and the *Not In Automatic* light should go off.

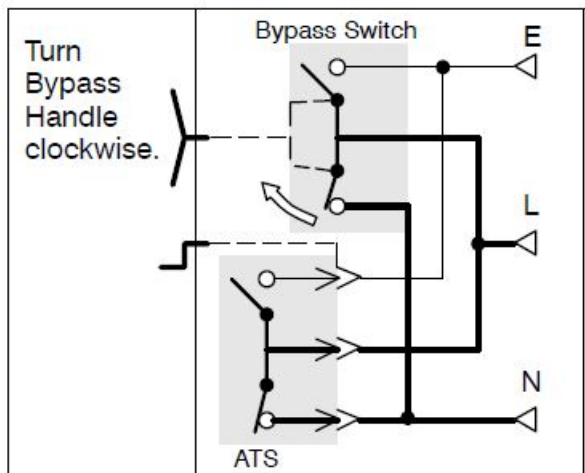


Figure 29. Un-Bypass Normal diagram.

The Automatic Transfer & Bypass-Isolation Switch should be left in this position.

\* **NOTE:** When Accessory 40\*B (reversed Normal & Emergency connections) is specified, the handle push-pull operation is reversed. Follow instructions on the door.

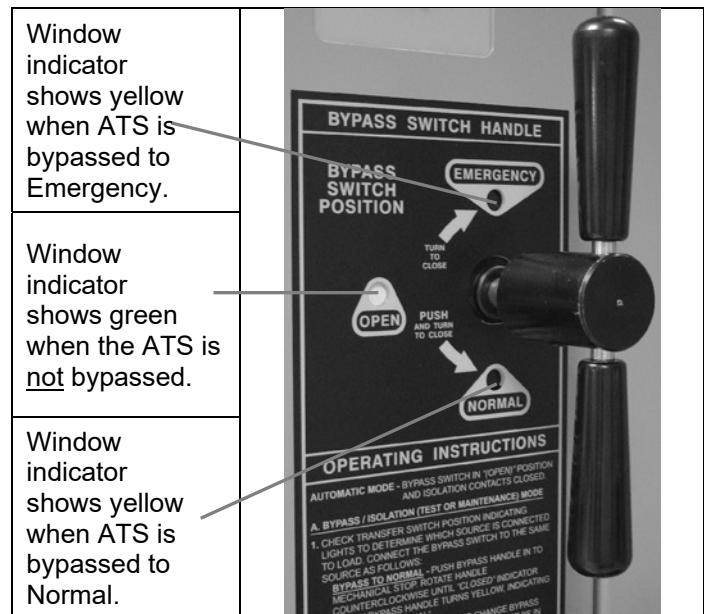


Figure 28. Bypass Handle and window indicators.

#### To Un-Bypass Emergency Source\*

(Load connected to Emergency Source)

The *Transfer Switch Connected To Emergency* light is on & *Transfer Switch Connected To Normal* light is off.

Turn the handle counterclockwise.\*



Turn\* the Bypass Handle counterclockwise until the *Bypass Switch Position* shows OPEN (green window indicator). The *Bypassed to Emergency* light should go off and the *Not In Automatic* light should go off.

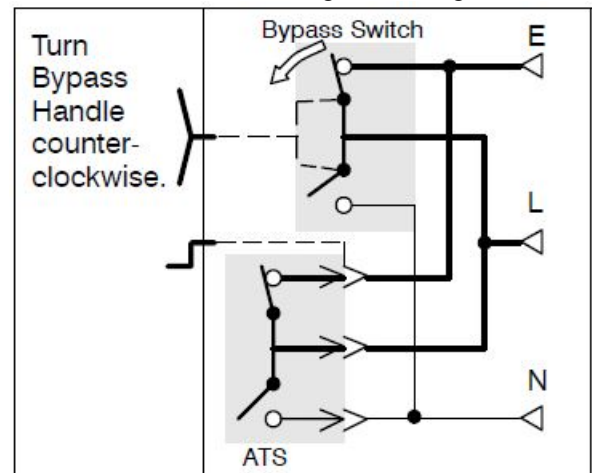


Figure 30. Un-Bypass Emergency diagram.

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