

**SECTION 639R
RETROFIT OF MIAMI-DADE COUNTY TRAFFIC SIGNAL
CABINETS WITH MANUAL TRANSFER SWITCH AND
EMERGENCY GENERATOR INTERFACE**

PART 1 GENERAL

1.01 SUMMARY

A. Description

1. This specification sets forth the minimum requirements for retrofitting existing Miami-Dade County MD-552 and MD-660 series traffic signal cabinets with an externally mounted enclosure containing a manual transfer switch and emergency generator interface.

B. Related Sections

1. FDOT Specification Section 620 (Grounding and Lightning Protection)

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. Transfer Switch and Enclosure

1. Manual Transfer Switch and Emergency Generator Interface must be a Reliance Controls Corporation Pro/Tran Signa Series transfer switch Model C51A1L-C1 (with #2 key) or approved equal.
2. Manual Transfer Switch and Emergency Generator Interface must be a UL 1008 Listed non-automatic transfer switch.
3. The enclosure must meet the requirements of NEMA 3R, 4, or 4X as rated for outdoor environments. NEMA 3R aluminum, or NEMA 4 or 4X stainless steel may be left unpainted. The enclosure must be constructed of heavy-duty, 12 gauge, Type 5052-H32 aluminum or rust and corrosion-resistant stainless steel rated for outdoor use. The transfer switch must be constructed to prevent cross connection of power sources.
4. The transfer switch enclosure must have a lockable door with tamper-resistant hinge to completely enclose all components, and be furnished with a lock with two #2 keys. The door must have a movable plate to cover the opening for the generator cable when the generator is not connected.
5. An integrally mounted NEMA L5 male power inlet rated at 125V must be provided inside a lockable enclosure at the front of the transfer switch.
6. The transfer switch shall be capable of being operated manually under fully rated load conditions.
7. The generator and utility supply source neutral leads are tied together in the cabinet. The transfer switch only switches the phase conductor (hot) and not the neutral.

8. The transfer switch enclosure outside cover must be labeled "Emergency Generator Connector" in red.
9. Provide a "utility-on" light that can be observed from outside of the transfer switch enclosure when a generator is connected to indicate that the utility power has been restored.
10. The transfer switches must be sized to meet the amperage rating of the AC power service overcurrent protection rating and shall be provided with manually operated toggle type transfer switches.

B. Materials

1. Flat Washers: 1/4", min 5/8" outer diameter, stainless steel 18/8 (304)
2. Hex Head Bolts: 1/4" – 20, 1" inch length, full thread, stainless steel 18/8 (304)
3. Blind Threaded Inserts: 1/4" – 20, low profile head, round knurled shank, closed end thread, sealant under the head, Atlas® SpinTite® PEM-AELS8-420-165BS or Approved Equal.
4. Ground Hub: 1 inch; Aluminum with captive sealing washer; Eaton's Crouse-Hinds Division Myers Ground Hub Model STAG3 or Approved Equal.
5. Chase Nipple, Zinc Die Cast, Rigid/IMC Conduit, 1 in.: Arlington Industries, Inc. Model 503 or Approved Equal.
6. Sealing Washer: Neoprene Rubber Seal with 18-8 Stainless Steel Backing, Fits 1 Inch; or PTFE, 1 Inch, 2" OD x 0.062". Placed between the transfer switch enclosure and the outside of the traffic signal cabinet where the ground hub penetrates the cabinet.
7. Pre-Insulated Connector (hex): UL Listed 486B Wire Connector; 1/0-14 AWG; Cold temperature rated to -45 °C, rated 600V, 90 °C; Polaris™ Model IT-1/0 connector or Approved Equal.
8. Fire-retardant edge trim and tie-wraps as needed.

PART 3 EXECUTION

3.01 INSTALLATION

A. Attachment of the Transfer Switch Enclosure (general).

1. Use the materials listed in Part 2 above for installation of the transfer switch enclosure.
2. The transfer switch enclosure must be mounted on the side of the traffic signal cabinet, as close as possible to the AC main circuit breaker, away from any pedestrian walkway and must not be mounted on a controller cabinet door. If the orientation of an existing traffic signal cabinet is such that the transfer switch enclosure would face the pedestrian walkway if installed, ensure that with the enclosure door in a closed position that:
 - a. A minimum of 42" of walking surface is maintained in front of the enclosure; and
 - b. That the enclosure does not protrude more than 4" from the existing traffic signal cabinet into the walking path.
3. Ensure that upon final installation, the paved level working area in front of the transfer switch enclosure be at least 30-inches wide with a minimum clearance in front of the enclosure of at least 3 feet.

4. Unless otherwise shown on approved site Plans, the enclosure must be centered on the side of the traffic signal cabinet.
5. Use a 25/64" drill bit or as specified by the manufacturer of the blind threaded inserts to achieve hole in sheet within the tolerances specified by the manufacturer. Use tools and method for installation of blind threaded inserts specified by its manufacturer consistent with the requirements of these specifications.
6. Ground hub:
 - a. The bottom of the opening for the ground hub must be approximately 2.5 to 3 inches above the top of the field service panel inside the traffic signal cabinet (Figure 1).
 - b. The ground nut is placed in the transfer switch enclosure (Figure 2).
 - c. The hub with captive o-ring gasket and chase nipple is placed in the traffic signal cabinet (Figure 3).
 - d. A sealing washer is sandwiched between the back of transfer switch enclosure and the outside of the traffic signal cabinet where the ground hub is located. If the washer has only a single sided sealing surface, the sealing surface must face the transfer switch enclosure.

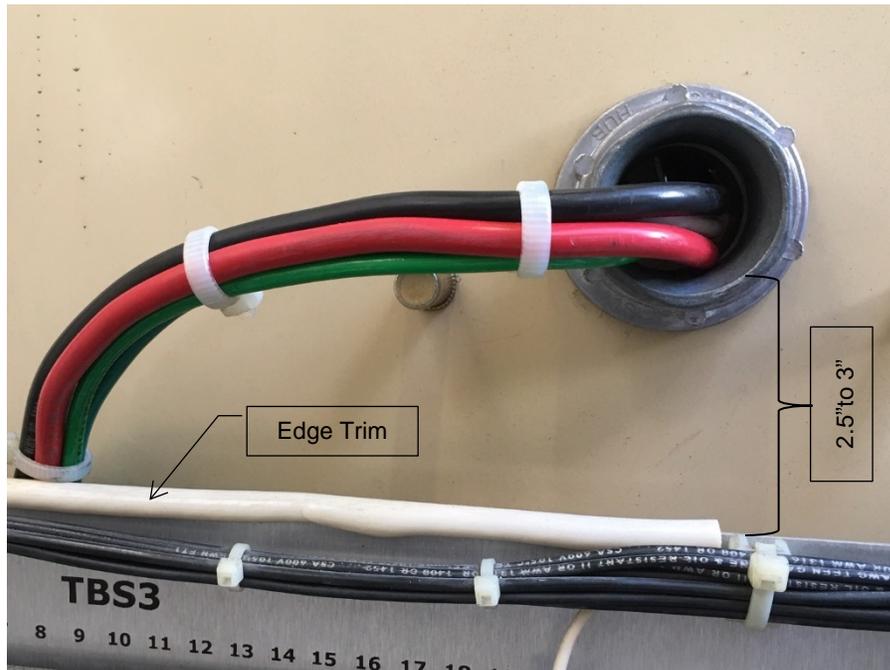


Figure 1 Ground hub Inside Traffic Signal Cabinet

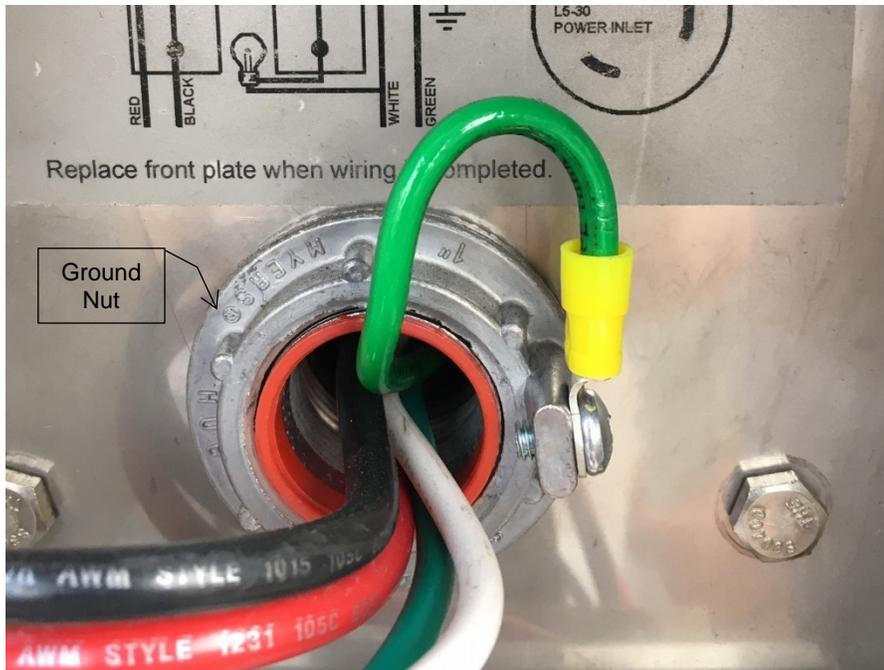


Figure 2 Ground Nut inside Transfer Switch Enclosure

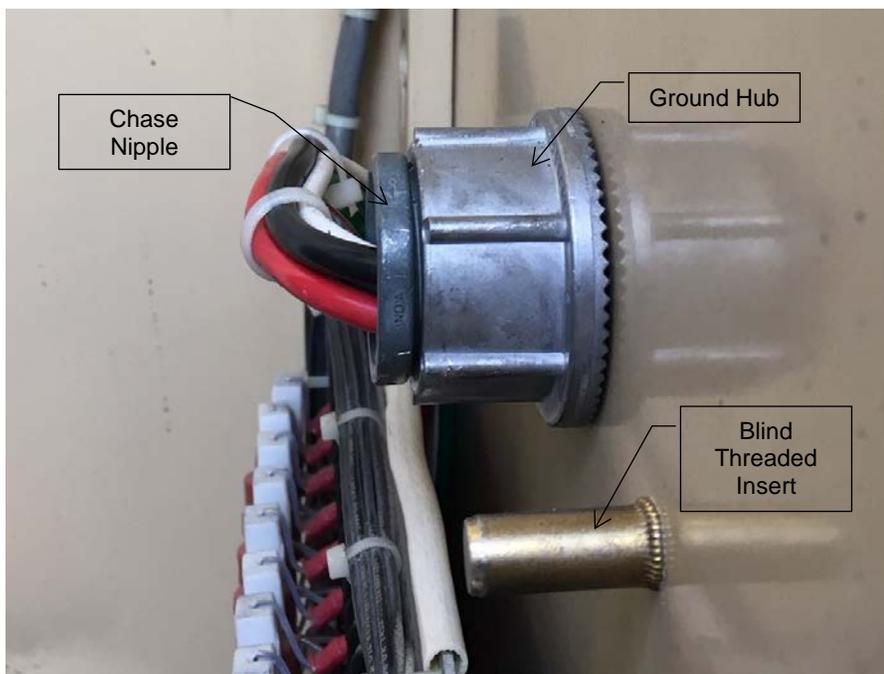


Figure 3 Ground Hub and Chase Nipple Inside Traffic Signal Cabinet

B. Wiring of the Transfer Switch.

1. Neatly route all conductors to their point of termination.

2. Using the color coding (GREEN, WHITE, RED, and BLACK) for the conductors provided with the Reliance Controls Corporation Pro/Tran Signa Series transfer switch Model C51A1L-C1:
 - a. Terminate the GREEN color conductor to the grounding bus bar near the base of the signal cabinet.
 - b. Terminate the WHITE color conductor to the neutral bus bar near the base of the cabinet.
 - c. Splice the RED color conductor with the utility service line conductor (AC+) using the Polaris™ connector. Neatly coil and tie-wrap the spliced conductors. Secure the Polaris™ connector so that it remains at least 12 inches above the bottom of the cabinet (Figure 4).
 - d. Terminate the BLACK color conductor (load) to the input side of the TBS1(1) terminal on the signal cabinet's field service panel (Figure 5).

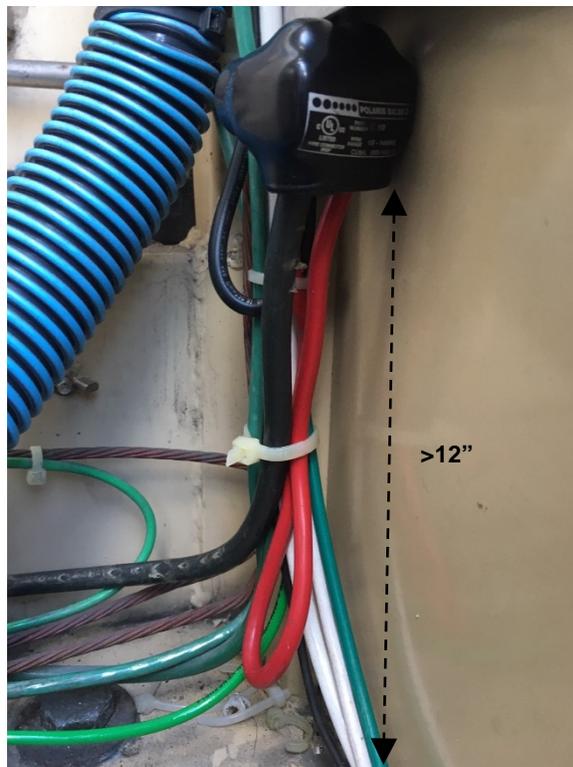


Figure 4 Splice Connector Inside Traffic Signal Cabinet



Figure 5 TBS1 Terminal Inside the Traffic Signal Cabinet

3. Connect a green insulated No. 10AWG copper equipment grounding conductor from the ground hub grounding screw in the transfer switch enclosure to the grounding bus bar near the base of the traffic signal cabinet.

END OF SECTION 639R