

Bulletin 10-24-2
Whole house transfer switch bonding
Rules 6-310, 10-210

Issued May 2022
Supersedes Bulletin 10-24-1

Scope

- 1) Background
- 2) Whole house transfer switch bonding
 - a) No bonding means between a transfer switch and the existing service
 - b) A compliant bonding means between a transfer switch and the existing service

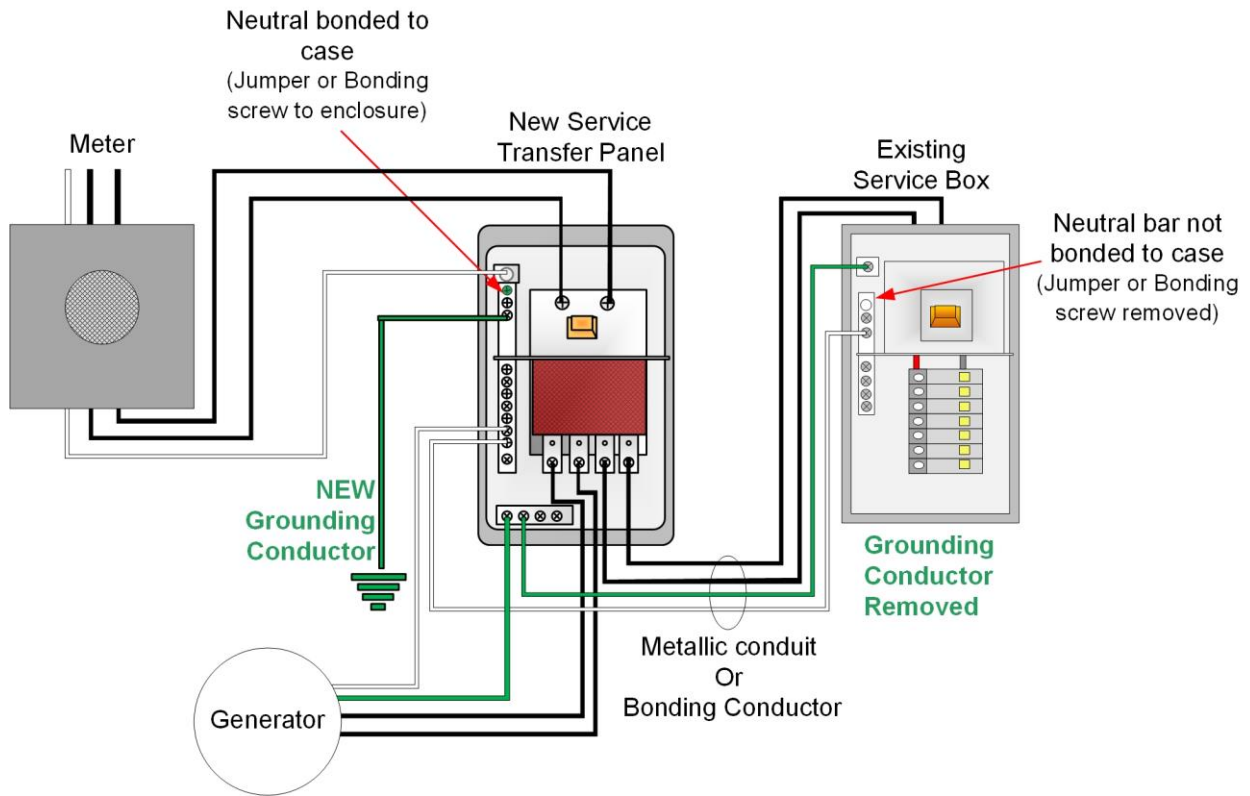
1) Background

The installation of whole home backup generators has resulted in many transfer switches that are service entrance rated being installed on the load side of existing meter bases for residential services. Since the whole home transfer switch becomes the new main service box for the house, Rule 10-210 requires relocating the existing service grounding connection to the new main service box. It would also require removing the neutral bonding connection in the existing service box and adding a bonding connection between the new service box and the old one. Service rated transfer switch enclosures are already bonded to the grounded conductor as part of the product from the factory.

Note

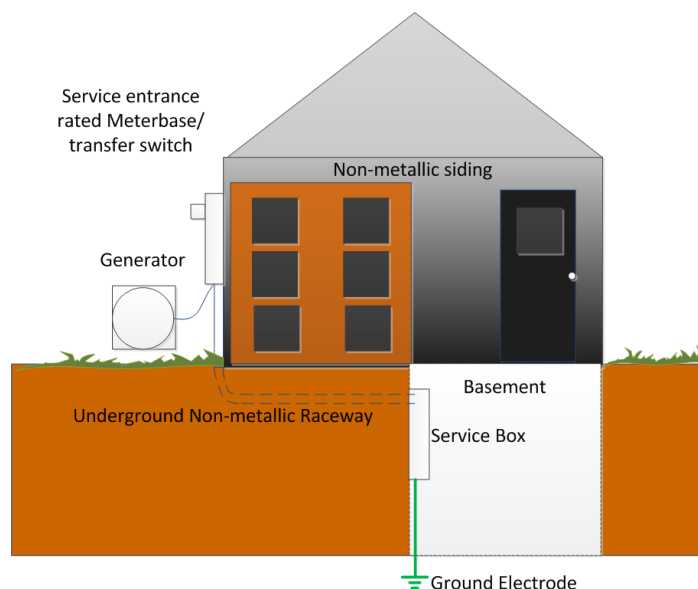
Where the meter is on the supply side of the service box as permitted by Rule 6-402, the service neutral conductor is permitted to be connected to the meter enclosure as per Bulletin 10-15-*

Diagram B1 – Code Compliant Installation
(As required by Rule 10-210)



This can be very difficult when the existing service conduit runs underground and will not allow the addition of a bonding conductor, as per Diagram B2. Considering the existing arrangement has the service neutral connected to the meter base enclosure and bonded to the service box, questions have been asked as to whether it can be permitted to replicate this in the new service box (transfer switch) and allow the existing service ground and neutral bond to remain as is, in the existing service box.

Diagram B2 – Typical installation of whole house transfer switch



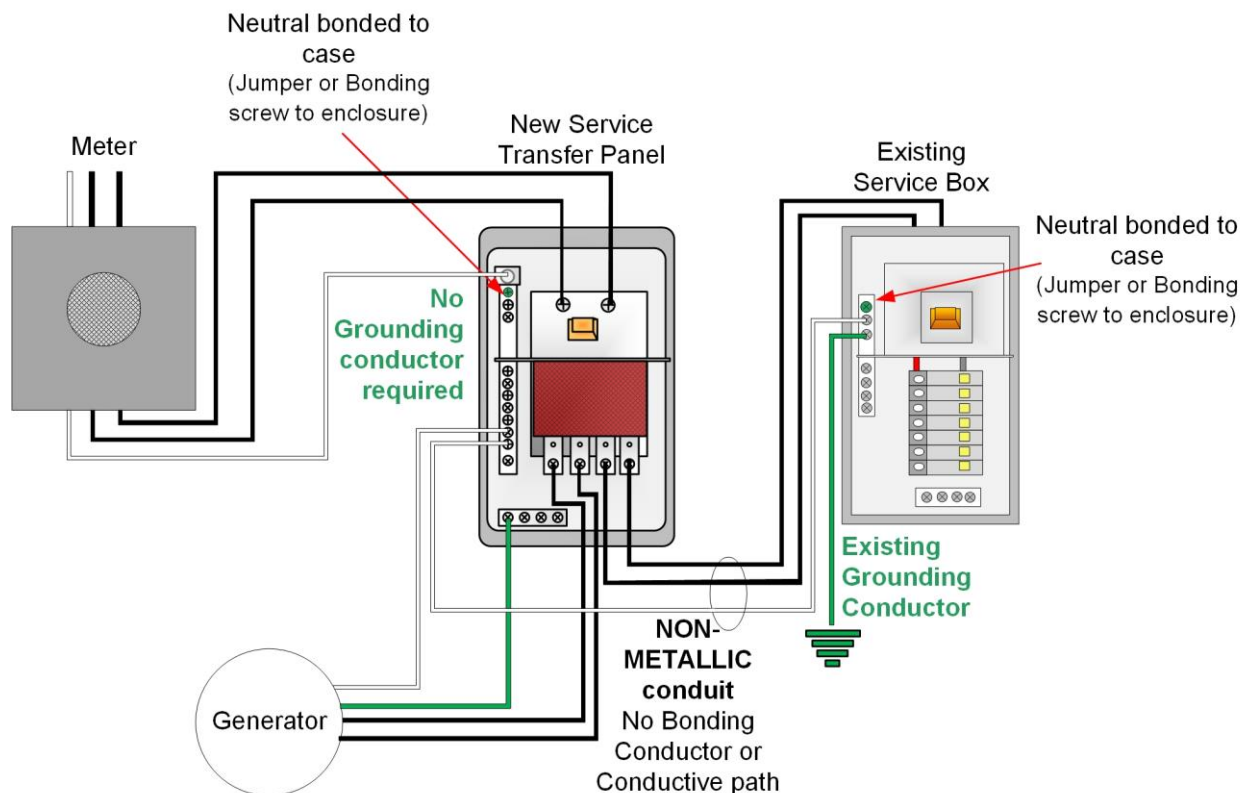
2) Whole house transfer switch bonding

a) No bonding means between a transfer switch and the existing service

Question 1

When a service rated transfer switch is installed on the load side of an **existing** meter base or replaced with a combination transfer switch/meterbase on the exterior of a residential dwelling (or any other suitable location, such as pole), can the service neutral be permitted to be bonded to the transfer switch enclosure without a ground electrode connection, and remain bonded to the existing service box in lieu of transferring neutral bonding and grounding to the new main service box, as shown in Diagram B3?

Diagram B3 – Alternative Grounding Method



Answer 1

- Yes, notwithstanding Rules 6-310, 10-210, it shall be permitted to install a new service/transfer panel, without a connection to a grounding conductor, provided:
- the existing service conductors and raceway are reused between the transfer switch and panelboard.
- the conduit between the new service box is non-metallic and there is no metallic/conductive siding that could provide a parallel metallic path between the existing and the new service box;
- there is a system bonding connection (i.e. bonding screw) between the neutral and case in the new service box; and;
- the existing service box bonding connection and grounding conductor/electrode remains.

Rationale 1

According to the Ontario Electrical Safety Code, “the object of grounding the electrical system and non-current-carrying metal parts is to connect the earth to the equipotential plane, thereby minimizing any potential difference to earth.” There is no evidence to suggest relocating the ground electrode to the exterior will improve the electrodes ability to meet its objective. There will be no reduction in the ability of overcurrent devices to clear faults as interior overcurrent devices will continue to operate through the interior bonding screw and external overcurrent devices can clear faults through the bonding

screw in the exterior service box. However, there shall be no parallel metallic paths for the neutral current between the existing and the new service box.

b) A compliant bonding means between a transfer switch and the existing service

Question 2

When a compliant bonding means exists between a transfer switch and the existing service (such as the metallic conduit), is it permitted to leave the grounding conductor connected to the neutral at the existing service box?

Answer 2

Yes, it is permitted to leave the grounding conductor connected to the neutral at the existing service box and not relocate it outside provided that:

- The grounding conductor is connected directly to the neutral block that is isolated from the existing panelboard (service box) enclosure (the bonding jumper or screw is removed in the existing service box)
- If bare, the grounding conductor is insulated from the existing panelboard enclosure; and
- A neutral bond (i.e. Bonding screw) between the neutral and case is present in the new outdoor service box\transfer switch.

Note:

Any existing bonding connections to things such as gas pipes or water pipes must be connected to the bonding bus or panel enclosure, and not to the grounding conductor.

Diagram B4 - Outdoor transfer switch with metallic conduit as bond

