1. INTRODUCTION

There have been instances where inspection has revealed situations where the existing electrical grounding and bonding means does not meet the requirements of Section 10 of C22.1 The following procedure has been prepared to provide guidance to elevator inspectors when completing inspections on new or altered installations and to inform contractors and mechanics of the need to ensure adequate grounding and bonding.

* See Appendix A for Definitions of terms used in this Bulletin.

2. INTERPRETATION & ENFORCEMENT

Inspectors shall ensure that power is disconnected prior to checking grounding and bonding on controllers, disconnects, door locks, etc.

2.1 Initial Inspection of New Installations

1. Check to ensure that the controller is bonded to the metal enclosure of the disconnect with a bonding conductor which is either; bare copper, or insulated and having a continuous outer finish that is either green or green with one or more yellow stripes.
2. Check all grounding lugs in disconnect, controller, etc. to ensure that they are secure.
3. Check the continuity of the bonding means between the controller and disconnect. (Perform check with disconnect door closed)
4. Randomly pick a minimum of 10% of the landing door locks to ensure that the bonding conductor is present and secure. If any bonding wire is missing, then 100% shall be inspected.
5. Randomly pick a minimum of 10% of the hall call stations to ensure that the bonding conductor is present and secure. If any bonding wire is missing, then 100% shall be inspected.
6. When completing the single ground test it shall be conducted at the furthest point from the controller. For example grounding the bottom floor door lock when the controller is located at the top of the building. The single ground test will result in an instantaneous failure or interruption of the supply voltage. When a single ground occurs the car shall not be permitted to restart. (Where provided, follow manufacturer specific test procedures)

Note: The disconnecting means shall be in the “ON” position (the source of power shall be connected to the controller) when conducting the “single ground” test.

NOTE: The inspector shall remember that flexible conduit cannot be used as a bonding means; however rigid metal conduit or electrical metal tubing (EMT) may. If flex is running to the disconnect, you must have a bonding wire, however if rigid metal conduit or EMT is installed correctly, it may be used as a bond to ground. This is the same for landing door locks and hall call stations.
2.2 Initial Inspection on Alterations

The inspector shall keep in mind the scope of the alteration when completing an inspection on an altered device. All new and modified equipment and wiring shall be installed in accordance with the current Edition of C22.1.

1. **When an alteration includes the controller:**
   - Controller installed as part of an alteration – Clause 8.7.2.27.4
   - Change in type of motion control – Clause 8.7.2.27.5, or
   - Change in type of operation control – Clause 8.7.2.27.6), the following shall be completed:
     1. Check to ensure that the controller is bonded to the metal enclosure of the disconnect with a bonding conductor which is either; bare copper, or insulated and having a continuous outer finish that is either green or green with one or more yellow stripes.
     2. Check all grounding lugs in disconnect, controller, etc. to ensure that they are secure.
     3. Check the continuity of the bonding means between the controller and disconnect. (Perform check with disconnect door closed)

2. **When an alteration includes the landing door locks:**
   - modification, change or replacement with a different make/model

   One of the options below will be followed;

   1. Where a bonding conductor is not provided (e.g. the armour of an existing metal flexible conduit continues to be used as bonding means), the single ground test shall be conducted (see Initial inspection on new installations, Item 6). The single ground test will result in an instantaneous failure or interruption of the supply voltage. The inspector shall visually verify the integrity of the metal flexible conduit at all landings.
   2. If a bonding wire is provided, randomly pick a minimum of 10% of the landing door locks to ensure that the bonding conductor is present and secure. If any bonding wire is missing, then inspect 100% shall be inspected.

3. **When landing call stations,**
   operating at more than 30 V are replaced or installed (added) as part of an alteration:

   One of the options below will be followed;

   1. Where a bonding conductor is not provided (e.g. the armour of an existing metal flexible conduit continues to be used as bonding means), the single ground test shall be conducted (see Initial inspection on new installations, Item 6). The single ground test will result in an instantaneous failure or interruption of the supply voltage.
   2. If a bonding wire is provided randomly pick a minimum of 10% of the landing call stations to ensure that the bonding conductor is present and secure. If any bonding wire is missing, then inspect 100 % of hall call stations to ensure that the bonding conductor is present and secure.

2.3 Incident/Accident Investigation

When an incident occurs which indicates that bonding to ground was not effective, a direction shall be issued to ensure that related components of the elevating device are checked for bonding.
3. EFFECTIVE DATE
This enforcement procedure is effective on alterations and new installations submitted to TSSA on or after October 1, 2007

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This Bulletin has been developed in consultation with the Elevating Devices Advisory Council and the Field Advisory Committee.

APPENDIX – A

Definitions and references

Grounding means a permanent and continuous conductive path to the earth with sufficient ampacity to carry any fault current liable to be imposed on it, and of a sufficiently low impedance to limit the voltage rise above ground and to facilitate the operation of the protective devices in the circuit;

Bonding means a low impedance path obtained by permanently joining all non-current-carrying metal parts to assure electrical continuity and having the capacity to conduct safely any current likely to be imposed on it;

Bonding conductor means a conductor which connects the non-current-carrying parts of electrical equipment, raceways, or enclosures to the service equipment or system grounding conductor;

Raceway means any channel designed for holding wires, cables, or busbars, and, unless otherwise qualified in the Rules of the Canadian Electrical Code, Part I, the term includes conduit (rigid and flexible, metal and nonmetallic), electrical metallic and nonmetallic tubing, underfloor raceways, cellular floors, surface raceways, wireways, cable trays, busways, and auxiliary gutters;

Conduit means a raceway of circular cross-section, other than electrical metallic tubing and electrical nonmetallic tubing, into which it is intended that conductors be drawn;

Flexible metal conduit means a metal conduit which may be easily bent without the use of tools;

Rigid metal conduit means a rigid conduit of metal made to the same dimensions as standard pipe and suitable for threading with standard pipe threads;

Electrical metallic tubing means a raceway of metal having circular cross-section into which it is intended that conductors be drawn and which has a wall thinner than that of rigid metal conduit and an outside diameter sufficiently different from that of rigid conduit to render it impracticable for anyone to thread it with standard pipe thread;

Where rigid metal conduit or other metal raceway is used for bonding, the methods described in Rules 10-600 thru 10-614 of Part I of the Canadian Electrical Code, Part I (C22.1), shall be used.