

Warrants of Electrical Fitness for Imported Recreational Vehicles having electrical systems that operate at 110 volts.

This information release is to inform electrical inspectors of their responsibilities with respect to the issue of WoEFs and to inform potential purchasers of the possible safety compromises of imported installations.

Background

The Electricity (Safety) Regulations 2010 (the Regulations) require that all electrical installations and appliances are designed, constructed, and used so that they are electrically safe.

Recreational Vehicles, (caravans, motorhomes, boats, etc), with Connectable Installations (including their appliances), are recognised to pose a higher risk from both electric shock and fire and as a consequence these installations are subject to additional safety provisions including ongoing safety re-verification. This is the Warrant of Electrical Fitness (WoEF).

While the Regulations make provision for alternative systems to be employed, these departures are expected to be made as a result of the application of new technologies rather than a desire to reduce costs by utilising practices that deliver a lesser level of safety. A level safety playing field is a necessary part of an effective regulatory environment.

The Ministry is concerned that the importation and use of Recreational Vehicles containing wiring systems and appliances not designed to meet NZ's regulatory expectations creates safety risks that exceed the level generally expected by the NZ society and constitute an electrical hazard as a result of four factors:

- The small space and close conditions inside a connectable installation,
- The presence of expanses of conductive materials,
- The supply of electricity through a plug and socket arrangement, and
- The use of the vehicle as sleeping accommodation.

Appliance Safety

New Zealand has some specific mandatory requirements for the construction of electrical appliances and fittings that deviate (extend) from the relevant international Standards.

- Household and similar appliances are required to pass additional tests for Resistance to Flame and Ignition (Clause 30 AS/NZS 60335.1),
- Lighting fittings and appliances for domestic and similar use are required to pass additional requirements for Resistance to Flame and Ignition (Sub-clause 13.3 of AS/NZS 60598),
- Audio and Video Appliances for domestic and similar use are required to pass additional tests for Resistance to Flame and Ignition (Sub-clause 20.021 of AS/NZS 60065).
- Class 0 and 01 appliances and fittings are not allowed in NZ — Portable Low Voltage Appliances are required to be fitted with plugs (AS/NZS 3820),
- Low voltage (< 1000 Volts) plugs are required to have insulated pins that comply with Appendix J of AS/NZS 3112 and meet with the safety dimensional requirements of AS/NZS 3112.

Equipment designed to operate at 110 volts, 60 Hz in the North American, Japanese and other markets are not likely to meet with these requirements and, unless it does so, its use is unsafe and its sale constitutes an offence.

Installation Safety

New Zealand has some specific mandatory requirements for the construction of installations that deviate from the relevant North American and Japanese Standards.

Recreational Vehicles converted to operate at 230 Volts are likely to have safety deficiencies:

- **Operation of protective devices (Circuit Breakers)**

Protective devices used to protect against fire and electric shock due to overloads, short circuits and earth faults are required to operate within specified operating times. In the case of earth faults the operating time is required to be less than 0.4 seconds.

Where a transformer is installed, the available fault current would not be adequate for any standard protective device to function within an acceptable time.

- **RCD's**

New Zealand has specific requirements for the operational characteristics of RCDs. GFCIs (Ground Fault Current Interrupters) used in North America and RCDs (Earth Leakage Circuit Breakers) used in Japan are not likely to meet with the requirements applying in NZ.

- **Rating of wiring insulation (Cables)**

All wiring systems have a rated voltage above which the insulation properties are not adequate. The minimum rated voltage for 230 volt ac systems recognised for safety is 450 volts ac. Only cables rated at or above 450 volts ac could be retained for use on circuits reconfigured to supply NZ fittings at 230 volts ac. The use of single strand cables would not be in accordance with AS/NZS 3001 although this is not generally considered to be a safety deficiency provided the cable is constructed and installed to reduce the effects of movement.

- **Standards for isolation**

If a transformer, or converter, is being used to reduce the voltage to 110 volts the transformer must be designed to a Standard that ensures appropriate and reliable separation of the primary and secondary. Type test results and production testing information is critical in establishing the compliance of any transformer/converter used.

- **Requirements for isolated supplies**

Two options are available for the configuration of the 110 volt supply if derived from a converter or transformer:

- Floating (Isolated) – in which case all switches and protective devices must be two pole and co-incidentally interrupt both the two current carrying conductors.
- Earthed – in which case the earth connection must be referenced correctly to the incoming earth connection in the same way as a main switchboard in an ordinary installation.

- **Certification**

All wiring work above Extra Low Voltage (230 and 110 volts) must be performed by a licensed worker – the “home owner” exemption does not apply to Connectable

Installations. Any installation work requires certification, which covers the safety of the installation, including appliances connected to it.

To be acceptable as a safe installation, any Recreational Vehicle or Caravan must demonstrably be able to meet all of the mandatory requirements of the Electricity (Safety) Regulations, AS/NZS 3000 and AS/NZS 3001, and all the appliances that form part of that connectable installation, or are supplied with it, must comply with AS/NZS 3820 (or the appropriate product standard listed in Schedules to the Regulations) and the Declared Article and Supplier Declaration Regulations. Where this is not the case, the supplier, and user, and any party supplying electricity to the Recreational Vehicles risk compliance and enforcement action.

Issuing of Warrants of Electrical Fitness

Excepting for pleasure vessels and mobile medical facilities, the WoEF for connectable installations in Recreational Vehicles are required to be issued in accordance with AS/NZS 3001.

For imported installations, the AS/NZS 3001 checks can only be completed after an assessment for compliance with Part 1 of AS/NZS 3000. Part 1 provides uniform essential elements that constitute the minimum regulatory requirements for a safe electrical installation. It provides 'high level' safety performance outcomes/conditions but also includes some prescriptive requirements such as disconnection times.

Questions and Answers

Q1 How does this bulletin apply to RVs that do not connect to the mains but use internal generators?

All appliances and wiring systems are required to be safe. While there are some differences when a vehicle is supplied from a separate generator, the same safety principles apply. It is still probable that the RV and its appliances will not meet the expected safety levels for NZ use.

Q2 How does this bulletin apply to RVs already in the country and issued with WoEFs?

If the WoEF was issued incorrectly to an RV that did not meet the requirements previously it will not be able to meet the requirements for a WoEF in the future! The WoEF establishes an acceptable level of safety which must be met for the vehicle's use in a public place and for its sale.