

Title	Demonstrate knowledge of appliance isolation, connection, and testing procedures for EST – B		
Level	3	Credits	2

Purpose	<p>'EST – B' refers to 'Electrical Service Technician – B', a class of electrical registration for people who need to work on electrical appliances directly connected to fixed wiring, and rated at no more than 460 volts. Registration is the responsibility of the Electrical Workers Registration Board.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> –demonstrate knowledge of isolation procedures for use with electrical appliances; –describe methods of connecting appliances to the electricity supply; and demonstrate knowledge of testing appliances.
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Classification	Electrical Engineering > Core Electrical
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Available grade	Achieved
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Prerequisites	Unit 10934, <i>Demonstrate knowledge of safety, protection, and testing for Electrical Service Technicians – A</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

- 1 This unit standard has been developed for learning and assessment off-job.
- 2 This unit standard, together with Unit 10937, *Demonstrate knowledge of electrical theory for Electrical Service Technician – B*, Unit 10939, *Demonstrate knowledge of regulations and codes of practice for Electrical Service Technicians – B*, and Unit 10940, *Demonstrate practical skills required for Electrical Service Technicians – B*, and their prerequisites, are designed to meet the *safety instruction, theory examination, and practical assessment* requirements for registration as an Electrical Service Technician 'B' (EST-B). For details of additional registration requirements, that is, work experience, candidates should contact the Electrical Workers Registration Board, PO Box 10156, Wellington, telephone: 0800 661 000.
- 3 Training courses designed to prepare candidates for credit in this unit standard must meet the requirements of the *Electricity Regulations 1997, Schedule 2*, and the *Teaching Guidelines for Electrical Service Technician 'B'*, issued by the Electrical Workers Registration Board.

- 4 Assessment against this unit standard must be in accordance with the associated Assessment Guide issued by The Skills Organisation.
- 5 Definition
Industry practice – practice used and recommended by organisations involved in the electrotechnology industry.
- 6 References
Electricity Act 1992;
Electricity Regulations 1997;
AS/NZS 3760:2003A1, *In-service safety inspection and testing of electrical equipment: Amendment 1 (AS/NZS 3760:2003A1)*;
and all subsequent amendments and replacements.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of isolation procedures for use with electrical appliances.

Performance criteria

- 1.1 The difference between 'switching an electrical appliance off' and 'isolating an electrical appliance' is explained in accordance with industry practice.
- 1.2 Commonly used methods of achieving continued isolation are described in accordance with industry practice.
- Range tripping of circuit breaker, removal of fuses, lock-off isolation switch, removal of plug from socket, disconnection of circuit conductors by a registered person, personal locks, warning tags.
- 1.3 Switches that are not acceptable as isolating devices are identified, and the reasons stated as to why they are unacceptable.
- Range push button switches, switches on control stations, emergency stop buttons.
- 1.4 Test method and instruments for ensuring that the supply is disconnected are described.
- Range instruments – volt meter or solenoid type voltage tester, rated for 450 volts or more;
method – test before touch, prove-test-prove, test each phase to earth, test between phases, visually check to ensure that all contacts have opened.
- 1.5 Demonstration identifies possible causes for incorrect isolation procedure.

Range wrong circuit isolated, wrong isolation device operated, damaged insulation between different circuits, appliance supplied from two sources, isolation device not in the phase conductor, unreliable indicator lamps, not all phases of a polyphase appliance are isolated, inoperative test instrument used.

1.6 The consequences of incorrect isolation procedure are identified.

Range electric shock through failure to isolate correct circuit, electric shock through failure to isolate all live conductors, disruption to equipment operation and possible injury through isolating wrong circuit, damage or injury through removing a fuse that is still carrying current.

1.7 Fittings which may still be live after having been switched off are identified.

Range ceiling rose, thermostat, control sensor, control wiring.

1.8 Actions to be taken if isolation cannot be achieved are described.

Range appliance not to be worked on, electrician called to correct.

1.9 The demonstration highlights the need to inform the supervisor or person in charge of the reason for, extent of, and estimated duration of the work.

Outcome 2

Describe methods of connecting appliances to the electricity supply.

Performance criteria

2.1 Description includes the definition of the terms 'electrical appliance' and 'electrical fitting', in accordance with the Electricity Act 1992.

2.2 Description includes an explanation of why appliances must be connected in a parallel configuration, in accordance with industry practice.

2.3 Methods of connection, and their application, are described in accordance with industry practice.

Range methods – flexible cord using approved plugs and sockets, flexible cord from a ceiling rose, flexible cord or cable from connectors in an approved box, switch, or terminal unit, or from a purpose built connecting unit, direct connection of the fixed wiring cables to the electrical appliance terminal box;
applications – portability of the apparatus, moist environment, vibration, special tariff circuits, unusually high loading, multi-phase requirements.

Outcome 3

Demonstrate knowledge of testing appliances.

Range appliances – single-phase, three-phase, fixed-wired, plug-in, maximum rating of 460 volts.

Performance criteria

3.1 The legal requirements for appliance testing according to Electricity Regulation 38 and AS/NZS 3760:2003A1 are identified.

3.2 Mechanical, electrical, or physical damage is visually identified in accordance with AS/NZS 3760:2003A1.

3.3 Tests to be made, instruments used, and acceptable results for each test are described, in accordance with the Electricity Regulations and AS/NZS 3760:2003A1.

3.4 Demonstration includes an explanation as to why a multimeter cannot be used for insulation resistance tests, in accordance with the Electricity Regulations.

3.5 The safety procedures to be followed when using instruments to test 'live' circuits are described in accordance with industry practice.

Range not energising a circuit until appropriate instrument connections have been made, maintaining adequate insulation and clearances between instrument clips, probes, or leads, avoiding personal contact with either live conductors or earth while using instruments on live circuits.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 June 1997	31 December 2022
Revision	2	3 April 2001	31 December 2022
Revision	3	14 August 2002	31 December 2022
Rollover and Revision	4	25 February 2008	31 December 2022
Review	5	28 January 2021	31 December 2022

Consent and Moderation Requirements (CMR) reference	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.