

<b>Title</b>	<b>Demonstrate practical skills required for Electrical Service Technicians – B</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>3</b>

<b>Purpose</b>	<p>'Electrical Service Technician – B' (EST – B) refers to 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: connect and test – three-phase flexible cord plugs and sockets; fluorescent lights; electric motors; three-phase direct-on-line motor starters; disconnect and reconnect permanently connected appliances; and test electrical appliances.</p>
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<b>Classification</b>	Electrical Engineering > Core Electrical
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<b>Available grade</b>	Achieved
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<b>Prerequisites</b>	Unit 10936, <i>Demonstrate practical skills 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 10938, *Demonstrate knowledge of appliance isolation, connection, and testing procedures for EST – B*, and Unit 10939, *Demonstrate knowledge of regulations and codes of practice 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 Candidates seeking credit for this unit standard will find much useful information in the booklet *Electrical Service Technician 'B' Handbook*, issued by the Electrical Workers Registration Board.
- 5 Assessment against this unit standard must be in accordance with the associated Assessment Guide issued by The Skills Organisation, and must be conducted by, or in conjunction with, a Supervisor of Electrical Work (as defined in the Electricity Act 1992) who holds electrical registration appropriate to the nature of the work.
- 6 **Definition**  
*Industry practice* – practice used and recommended by organisations involved in the electrotechnology industry.
- 7 **References**  
Electricity Act 1992;  
Electricity Regulations 1997;  
AS/NZS 3000:2007, *Electrical installations (known as the Australian/New Zealand Wiring Rules)* (AS/NZS 3000:2007);  
AS/NZS 3008.1.2:1998, *Electrical installations – Selection of cables – Cables for alternating voltages up to and including 0.6/1 kV – Typical New Zealand installation conditions* (AS/NZS 3008.1.2:1998);  
AS/NZS 3760:2003A1, *In-service safety inspection and testing of electrical equipment. Amendment 1* (AS/NZS 3760:2003A1);  
*Electrical Service Technician 'A' Handbook*, Electrical Workers Registration Board; and all subsequent amendments and replacements.

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## Outcomes and performance criteria

### Outcome 1

Connect and test three-phase flexible cord plugs and sockets.

### Performance criteria

- 1.1 Flexible cord is selected to match the fittings, in accordance with AS/NZS 3000:2007, AS/NZS 3008:1.2:1998, and industry practice.

**Range** length, current rating, number of cores, outside diameter and shape, insulation quality to suit voltage, operating temperature, requirement for rigidity or flexibility.

- 1.2 Fittings are connected to the flexible cord in accordance with industry practice.

**Range** phasing and colours, conductors follow their designed path within the fitting, strands are not cut from the wire, no stray strands protruding, strands are twisted and doubled over when necessary, terminal screws are tightened, earth conductor installed so that it will suffer least (or last) under cord tension, cord clamp arrangement is secured so that conductors are not strained, cord protector shroud is replaced.

- 1.3 Cord sets are tested and documented in accordance with AS/NZS 3760:2003A1.

## **Outcome 2**

Connect and test fluorescent lights.

### **Performance criteria**

- 2.1 Fluorescent light is connected to the electricity supply in accordance with industry practice.
- 2.2 Tests are completed and documented in accordance with AS/NZS 3760:2003A1.
- 2.3 Operation of the light is verified and tested in accordance with industry practice.
- Range tests – live rated-voltage test, starter operation, current rating tests.

## **Outcome 3**

Connect and test electric motors.

Range single phase capacitor-start motor, universal motor, three-phase squirrel cage induction motor.

### **Performance criteria**

- 3.1 Motor is connected to the electricity supply in accordance with industry practice.
- 3.2 Tests are completed and documented in accordance with AS/NZS 3760:2003A1.
- 3.3 Motor operation is checked for smooth running and direction, and voltage and current are verified against name plate specification.
- 3.4 Direction of rotation is reversed in accordance with industry practice.

## **Outcome 4**

Connect and test three-phase direct-on-line motor starter.

Range direct-on-line starter for a three-phase induction motor with overload protection, start and stop buttons, one remote start-stop station.

### **Performance criteria**

- 4.1 Starter is connected to the motor and electricity supply, in accordance with industry practice.

- 4.2 Tests are completed and documented in accordance with AS/NZS 3760:2003A1.
- 4.3 Operation of the starter is verified and tested against specification and in accordance with industry practice.
- Range live rated-voltage test, current rating tests, operation of overload, operation of local and remote start-stop stations, no-volt protection test, direction of motor rotation.

### Outcome 5

Disconnect and reconnect permanently connected appliances.

#### Performance criteria

- 5.1 Appliance is isolated prior to disconnection, in accordance with industry practice.
- Range isolation switch operated, disconnected from supply, isolator locked where possible, warning tag fitted.
- 5.2 Fixed wiring is made safe and conductors are labelled after disconnection of the appliance in accordance with industry practice.
- 5.3 Appliance is verified as being still isolated prior to reconnection in accordance with industry practice.
- 5.4 Appliance is reconnected to the electricity supply, in accordance with industry practice.
- Range terminations are sound, wires are in correct terminals, warning tag removed, locks removed where used, reconnected to supply, plugged in at point of use, isolation switch operated.

### Outcome 6

Test electrical appliances.

Range at least three appliances, one of which is three-phase, are to be tested, and the results recorded and retained for the purposes of electrical registration.

#### Performance criteria

- 6.1 Tests are completed and documented in accordance with AS/NZS 3760:2003A1.
- 6.2 Appliance operation is checked against operating instructions, and voltage and current are verified against name plate specification.

**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

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.