

1. Module details

Module name

Appliance Diagnostic Tools

Suggested structured learning time

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 18 to 20 hours.

Module code

NUE146

Field of Education code

031315

2. Module purpose

This module provides the knowledge and skills to identify, operate, install, perform safety and operational checks using appliance diagnostic tools.

Learners will gain an understanding and develop skills in testing domestic appliances using a range of appliance diagnostic tools.

It covers the types, construction, operation, application, installation, adjustments and safety requirements of appliance diagnostic tools. It also covers service, fault finding and repair of domestic appliances using appliance diagnostic tools.

3. Learning pathway

Intended use in the structured learning program

This module is intended to supplement extensive workplace exposure to domestic appliance servicing work. In particular it applies to the appliance diagnostic tools used to identify faults and service domestic appliance equipment. Therefore before undertaking this module an apprentice should have a clear understanding and experience of:

- problem solving series, parallel and series/parallel circuits
- the fundamental concepts of alternating current and sinusoidal waveforms
- electro-magnetism its application to the operation of electrical motors and generators.
- safe working with electrical wiring and equipment
- common cable types and the basic skills to terminate those cables and the selection and application of fixing devices in installing cables, cable enclosures and accessories.

Recommended prerequisites

For the most effective learning this module should be undertaken only after modules in Electrical Concepts and Applications; and Electrical Wiring and Equipment 1 have been completed.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from EEQSB.

5. Content

Summary of content

1. Types, construction, operation and application
 - Electrical / electronic diagnostic tools
 - Appliance manufacturer specific diagnostic tools
 - Binary code via LED display
 - Generic appliance diagnostic tools, including:
 - Test instruments - multimeters, clamp meters, insulation resistance meters, power analysers, high voltage testers, etc.
 - Data loggers
 - Microwave leak detectors
 - Gas (hydrocarbon) detectors
 - Mechanical diagnostic tools
 - Appliance manufacturer specific diagnostic tools
 - Generic appliance diagnostic tools, including:
 - Sound meters
2. Installation requirements, adjustments and safety
 - Manufacturers' instructions and data
 - Installation safety
 - Effects and risks of electrical current and mechanical movement
 - Protection against indirect contact
3. Computer and paper based diagnostic tools
 - Appliance manufacturers programs
 - Binary code via LED display
 - Remote fault diagnosis via phone access
 - Internet
 - Books - Text books and manufacturers data

4. Service, fault finding and repair
 - Manufacturers' data
 - Safety checks
 - Operating sequence
 - Typical symptoms
 - Fault identification using diagnostic tools
 - Confirm fault diagnosis
 - Mechanical
 - Electrical
 - Electronic
 - Repairs
 - Customer communication
 - Respect for customers premises

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Normally learning and assessment will take place in a formal learning environment.

7. Learning outcome details

Learning outcome 1

Describe and list the types, construction and basic operation of appliance diagnostic tools.

Assessment criteria

- 1.1 Identify and explain the purpose of appliance diagnostic tools used on domestic appliances.
- 1.2 Describe and list the basic types, construction and operation of appliance diagnostic tools.

Learning outcome 2

Describe and list installation requirements and make necessary adjustments asrequired to the appliance diagnostic tool.

Assessment criteria

- 2.1 Ensure that all the manufacturers instructions relating to the installation of appliance diagnostic tools are adhered to.
- 2.2 Describe and list all the necessary safety checks required for the installation of appliance diagnostic tools.

Learning outcome 3 Demonstrate and explain the use of computer and paper based appliance diagnostic tools.

- Assessment criteria**
- 3.1 Demonstrate the use of computer and paper based appliance diagnostic tools.
 - 3.2 Explain the use of computer and paper based appliance diagnostic tools.

Learning outcome 4 Use appropriate resources to service and fault find domestic appliances using appliance diagnostic tools.

- Assessment criteria**
- 4.1 Carryout safety checks prior and during use of diagnostic tools.
 - 4.2 Using manufacturers' data, select and use appropriate diagnostic tools to fault find domestic appliances.
 - 4.3 Isolate services and make safe components and the overall appliance.
 - 4.4 Identification of faults using appliance diagnostic tools.
 - 4.5 Confirmation of fault diagnosis.
 - 4.6 Prepare a report to the customer.
 - 4.7 Safety inspection and labelling as per AS/NZS 3760:Latest Edition.

8. Delivery of the module

Delivery strategy Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require a learning outcome sequence other than that indicated in the module.

Resource requirements Resources should be sufficient for students to carry out exercises on an individual basis.

Useful references include:

**Occupational health
and safety requirements**

Standards Australia, Standards New Zealand:

AS/NZS 3760 (Latest edition) *In-service Safety Inspection and Testing of Electrical Equipment*

AS/NZS 4836 (Latest edition) *Safe Working Practice on Low-voltage Electrical Installations*

WorkCover NSW, *WorkCover Code of Practice - Low Voltage Electrical Work Local electricity distributor and authority regulations*

Internet Addresses

www.pcapliancerepair.com

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EE-Oz Training Standards¹ **User Guides** (these outline in detail what training and work performance the Learner is required to undertake for the program).

A safe and healthy environment will be provided for learners and teachers. Safety procedures for the particular learning facilities shall be followed as part of the learning / teaching activity and assessment.

¹ EE-Oz Training Standards – ElectroComms and EnergyUtilities Industry Skills Council Ltd formally EEQSBA