

1. Module details

Module name **Service Clothes Washers and Dryers (Revised)**

Suggested structured learning time A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 54 to 60 hours.

Module code NUE012.1

Field of Education code 031315

2. Module purpose

This module will provide students with the underpinning knowledge and skills necessary to install, test, fault find and repair clothes washers and clothes dryers.

Learners will gain an understanding of the principles of operation of clothes washers and dryers.

It covers basic clothes washers and dryers fundamentals, types and applications, OH&S, installation, repairs, tests and service reports.

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 testing and servicing of clothes washer and dryers to ensure they comply with requirements and are safe to use. Therefore before undertaking this module an apprentice should have a clear understanding and experience of:

- the basic operation of various domestic appliances.
- servicing and fault finding single and three phase motors and their associated circuits, applicable to appliance, refrigeration and air conditioning applications.
- servicing and fault finding appliance timers and controllers.

Recommended prerequisites

For the most effective learning this module should be undertaken only after modules in Appliance Motors; Timers and Controllers and Domestic Appliance Principles 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 EEQSBA.

5. Content

Summary of content

Codes and Regulations
Plumbing - water supply, drainage, back siphoning.
Electrical insulating, earthing
Manufacturers data
Types and Applications
Washing Machines
Principles of operation
Types of washing machines
- Automatic washers: top load, front load and other
- Twin tub washers
- Washer / dryer combinations
Application and significant differences
Clothes Dryers
Principles of operation
Types of clothes dryers
- Tumble
Application
Washing and Drying Principles
Powders and softeners
Mechanical, electrical and hydro

Fault Diagnosis
OH&S procedures
Manufacturers data
Test instruments
Tools
Service report, customer advice
Access to appliance
Electrical / Electronic testing: motors, controllers, timers, operational and safety thermostats
Mechanical testing: safety locks, soiled clothes, out of balance, not draining or filling and noisy
Confirm fault diagnosis
- Mechanical
- Electrical
- Electronic / control
Disconnect services: water, electricity
Manual handling
Repair/replace faulty components
Select components from manufacturers data
Removal and replacement of electrical controls, motors, capacitors, thermostats, switches, heaters, lead, plug, timer, wiring
Removal and replacement of various mechanical items; belts, bearings, door locks, filters, hoses, pumps, float switch, clutch, brake, dispenser, levelling feet, balance control, gaskets, lint screens
Adhesives and water sealants
Cleaning of cabinets and components
Minor repairs to cabinets
Touching up paint work
Test
Set operational and safety controls
Check electrical components
Operate system and adjust cycle controls, etc.
Carry out leak tests
Electrical test and label

	<p>Service report</p> <p>Information and advice to equipment owners</p> <p>Equipment labels</p> <p>Service reports</p> <p>Documentation</p> <p>Warranty reports and obligations</p>
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	List statutory requirements relating to washing machines and clothes dryers.
Assessment criteria	<p>1.1 Identify relevant codes, regulations and statutory requirements.</p> <p>1.2 List requirements for electrical safety and water supply and drainage.</p>
Learning outcome 2	Identify types, application and operating principles of typical washing machines and clothes dryers.
Assessment criteria	<p>2.1 List typical types of washing machines and clothes dryers.</p> <p>2.2 Identify the principles of operation of the various types of washing machines and dryers.</p> <p>2.3 List significant differences between the various types of washing machines and clothes dryers.</p>
Learning outcome 3	Describe the principle elements of washing machines and dryers.
Assessment criteria	3.1 Identify the principles of operation of detergents and softener action.

	3.2 Describe the principle of operation of a washing and drying process.
Learning outcome 4	Carry out test procedures to diagnose faults.
Assessment criteria	4.1 Test the appliance in accordance with industry standards (electrically and mechanically). 4.2 Identify the fault and faulty component. 4.3 Tag the appliance in the approved manner.
Learning outcome 5	Repair/relace faulty components in washing machines and clothes dryers in accordance with manufacturer's specifications.
Assessment criteria	5.1 Remove and replace a given component (electrical, control, mechanical, water hose etc.) 5.2 Reseal components using adhesive, gasket. 5.3 Carry out minor cabinet repairs, and paint touch up.
Learning outcome 6	Test repaired appliance to ensure it meets company standards and customer satisfaction.
Assessment criteria	6.1 Set operational and safety controls. 6.2 Test electrical components. 6.3 Adjust controls and check system operation.
Learning outcome 7	Compete service report and required documentation
Assessment criteria	7.1 Complete customer service report. 7.2 Complete warranty/company documentation. 7.3 Change equipment labels.
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:

Domestic Whitegood Service Industry - Code of Practice.
NSW Department of Fair Trading, Sydney.

Kleinert E. *Troubleshooting & Repairing Major Appliance.*
TAB Books McGraw Hill Inc., USA. 1995

Standards Australia, Standards New Zealand:

AS/NZS 3100 (Latest edition) *Approval and Test Specifications - General Requirements for Electric Equipment*

AS/NZS 3350.2.7 (Latest edition) *Approval and Test Specifications - Safety of Household or Similar Appliances - Particular Requirements - Dishwashers*

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*

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).

Occupational health and safety requirements

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