

1. Module details

Module name

Domestic Gas Appliance Principles and Regulations

Suggested structured learning time

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

Module code

NUE144

Field of Education code

040327

2. Module purpose

This module provides the prerequisite underpinning knowledge and skills required to service domestic gas appliances.

Learners will gain an understanding of the principles of operation and the Codes, Acts and Regulations that cover domestic gas appliances.

It covers safe working practices, regulations governing gas appliances, components and operation of gas appliances and testing of gas equipment.

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 domestic gas appliance principles and regulations that cover domestic gas appliances. Therefore before undertaking this module an apprentice should have a clear understanding and experience of:

- Occupational Health and Safety and the safe procedures for working in the electrical/electronic environment
- the use of hand and power tools in installing, maintaining and repairing electrical or electronic systems and equipment.
- the basic skills of tool selection and use, fabrication techniques and mechanical fitting as applied to electrical or electronic work.
- the types of tubing available, flaring techniques, job preparation, refrigerant isolation/pump down, types of gauges and types of gasket material.

Recommended prerequisites

For the most effective learning this module should be undertaken only after modules in Refrigeration Procedures, Workshop Practices and Occupational Health and Safety 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

1. Safe working practices
 - Codes, Acts, Regulations
 - Detecting and handling unburnt gases
 - Procedures in a carbon monoxide gas environment
 - Electrical safety
 - Safety equipment
 - Appliance isolation and reconnection
2. Components and operation
 - Safety controls
 - Ignition devices
 - Appliance regulators
 - Thermostats
 - Controllers
 - Burners
 - Flues
 - Fans
 - Principles of combustion
 - Adjustments for optimum performance
 - Component connections and methods of connection
3. Test Equipment
 - Typical electrical test equipment
 - Manometer
 - Leak testers
 - Gas and electrical safety tests
 - Tests and /or adjustments
4. Gas identification
 - Types of gases and their applications
 - Conversion procedures
 - Methods of identification

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	Apply safe working practices to domestic gas appliances.
Assessment criteria	<ul style="list-style-type: none">1.1 Identify the appropriate Codes, Acts and Regulations for servicing and fault finding domestic gas appliances.1.2 Describe and demonstrate safe working practices when working on domestic gas appliances.1.3 Carry out gas and electrical safety checks.
Learning outcome 2	Identify the major components and explain the principle of operation of a domestic gas appliance.
Assessment criteria	<ul style="list-style-type: none">2.1 Identify the major components and describe their construction and operation within the system.2.2 Describe the overall system operation of a typical domestic gas appliance.2.3 Describe the purpose and requirements for ventilation and fluing with domestic gas appliances.2.4 Identify and describe the principles of combustion.2.5 Identify the different connection methods used on domestic gas appliances.2.6 Identify the reasons why some domestic gas appliances and/or components are classified as 'Unapproved'.
Learning outcome 3	Select and use test equipment to test and make adjustments to domestic gas appliances.
Assessment criteria	<ul style="list-style-type: none">3.1 Identify and explain the purpose of test equipment used on domestic gas appliances.3.2 Select and use typical test equipment to test and make adjustment to domestic gas appliances.

Learning outcome 4	Identify the type of gas connected to a domestic appliance.
Assessment criteria	<p>4.1 State the types of gases and their application relevant to domestic gas appliances.</p> <p>4.2 Identify the procedures to convert a domestic appliance from one gas type to another.</p> <p>4.3 Use appropriate methods to identify the type of gas connected to a domestic gas appliance.</p>
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	<p>Resources should be sufficient for students to carry out exercises on an individual basis.</p> <p>Useful references include:</p> <p>Australian Gas Association and LPG Association, <i>Installation Code for Gas Burning Appliances and Equipment</i>, Melbourne, Victoria, 1987.</p> <p>Australian LPG Association, <i>Installation Code for Gas Burning Appliances and Equipment</i>, Milsons Point, New South Wales, 1987.</p> <p>Langley, B.C., <i>Electric Controls for Refrigeration and Air Conditioning</i>, Prentice Hall, New Jersey</p> <p>Langley, B.C, <i>Major Appliances - operation, maintenance, troubleshooting and repair</i>, Prentice Hall, New Jersey, 1992</p> <p>Standards Australia, Standards New Zealand:</p> <p>AS/NZS 3760 (Latest edition) <i>In-service Safety Inspection and Testing of Electrical Equipment</i></p> <p>AS/NZS 4836 (Latest edition) <i>Safe Working Practice on Low-voltage Electrical Installations</i></p> <p>WorkCover NSW, <i>WorkCover Code of Practice - Low Voltage Electrical Work Local electricity distributor and authority regulations</i></p>

Videos:

Bi-metal Flame Failure Device, Plumbing Development Panel, TAFE Victoria, 198?, 5 minutes.

Constant Pressure Appliance Regulator, Swinburne Institute of TAFE (Vic), 1982, 7 minutes

Gas Appliance Commissioning, Moorabbin College of TAFE (Vic), 1986, 9 minutes

Gas - The Natural Choice, Natural Gas Company, Sydney, 1991, 11 minutes.

Thermo - Electric Flame Failure Device, Swinburne Institute of TAFE (Vic), 198?, 11 minutes

Quaser Gas, Gable Summertime, Melbourne, 1984, 12 minutes.

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