



Government of **Western Australia**
Department of **Commerce**
EnergySafety

Guidelines for Class E Gasfitting Work Training in Western Australia

Issued by:
EnergySafety
1 November 2011

Class E Gasfitting Work Training

Purpose

The aim of any training based on these guidelines is to provide adequate skills and knowledge to a person (trainee) to qualify for a gasfitting permit to be able to carry out all or part of gasfitting work in Class E for Liquefied Petroleum Gas (LP Gas), Compressed Natural Gas (CNG) or Liquefied Natural Gas (LNG).

The intention of the guideline is to outline the training required to achieve these outcomes.

Scope

This guideline outlines the training required to obtain a Class E gasfitting permit. It presents the information a training provider needs to consider when developing training packages/units intended to achieve a licensing outcome from the Department of Commerce, EnergySafety Division (EnergySafety). It includes regulatory requirements, training outcomes, training prerequisites, required course content (training topics and essential requirements) and the recognition process.

Class E gasfitting, in accordance with Schedule 5: Classes of gasfitting work, of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 (regulations), is:

Class E “Gasfitting work associated with a mobile engine.”

In general terms, this means installation, commissioning and servicing of gas vehicle systems or gas engines that have their own portable gas supply. The gas system may comprise dedicated gas, liquefied and high pressure gas, gas and other fuel independent operation or gas and other fuel mix used concurrently.

The type of gas and supply can comprise:

- Liquefied Petroleum Gas (LP Gas);
- Compressed Natural Gas (CNG); and/or
- Liquefied Natural Gas (LNG).

“Mobile engine” in the regulations means a gas fuelled engine that is:

- mounted in or on any vehicle, craft or portable appliance; and
- supplied by fuel from a container(s), cylinder(s) or tank(s) mounted on or in the vehicle, craft or portable appliance.

“Gas installation” in the Act means any appliance, pipes, fittings or other apparatus installed or to be installed for purposes incidental to the conveyance, control, supply or use of gas.

“Commissioning” means bringing into operation.

“Servicing” in the regulations means in relation to a consumer’s gas installation; maintenance involving the adjustment and cleaning of any appliance or apparatus in the installation in accordance with the recommendations of the manufacturer or repair involving the exchange of components, but not requiring modification of the installation.

Regulatory requirements

Any person carrying out gasfitting on a consumer’s gas installation is required to have current registration with EnergySafety to do such work, or work in a prescribed capacity under a gasfitting authorisation.

In applying for a permit to carry out gasfitting work, an applicant is required to satisfy the Director of Energy Safety that they can comply with the legislation by:

- having adequate theoretical and practical knowledge and adequate skills to carry out the gasfitting;
- having adequate knowledge of the *Gas Standards Act 1972* (Act) and the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 (regulations); and
- being a fit and proper person to carry out the gasfitting.

The technical compliance requirements (skills and knowledge) are set out in Schedules 6 and 7 of the regulations. Any training package or course based on these guidelines must focus on the current regulations and standards. Applicable Australian Standards are as follows:

- AS/NZS 1425: LP Gas for fuel systems for vehicle engines.
- AS/NZS 2739: Natural gas (NG) fuel systems for vehicle engines.
- AS 4732: LP Gas systems for marine engines.
- AS 4983: Gas fuel systems for forklifts and industrial engines.

Note: All authorised premises under a Motor Vehicles Repairers Certificate must comply with Australian Standard AS 2746: Working areas for gas fuelled vehicles.

Regulation 18 of the regulations mandates specific requirements for the gas fitter, that is, gasfitting work must be carried out:

- in a safe manner;
- to a trade finish; and
- in compliance with the regulations and left safe to use.

Any training course must include these fundamental requirements.

Restrictions, limitations or endorsements

A permit or authorisation may be restricted, limited or endorsed in any way considered appropriate by the Director of Energy Safety. In the case of Class E permits or authorisations, the following aspects may apply:

- installation and servicing;
- servicing;
- LP Gas or Compressed Natural Gas (CNG) and/or Liquefied Natural Gas (LNG);
- mobile engines;
- forklift; and
- marine or small engines.

Training packages/units may be designed to meet all the licensing requirements to obtain a Class E Permit or may be designed to cover one aspect.

Outcomes

Trainees shall, at the end of the training, be able to demonstrate adequate skills and knowledge in:

- installation and/or servicing;
- LP Gas and/or CNG and/or LNG; and
- mobile engines or forklift, marine and/or small engines.

Prerequisites

Prerequisites are applicable to candidates for the following training packages/courses:

All

Before undertaking training (either unrestricted to installation and servicing or restricted to servicing), all candidates must have successfully completed courses and assessments recognised by EnergySafety in the following:

- Gas standards legislation (Western Australia);
- gas safety; and
- basic combustion, fluing and exhaust principles.

Before undertaking training the following training provider prerequisites apply to both restricted and unrestricted candidates:

Installation and servicing

Before undertaking training as a Class E gas fitter restricted to installation and servicing a registered training provider may set their own prerequisites where they consider the applicant needs to be at a certain skills level to do the training package (For example, an applicant may need to have skills and knowledge in engine management systems before being permitted to enrol in a training package).

Servicing

Before undertaking training as a Class E gas fitter restricted only to servicing (and not having previously completed a unit of competency in installation of fuel systems), a candidate must have successfully completed assessment prerequisites acceptable to the training provider in the following:

- Certificate III in Automotive Light, Automotive Heavy and Automotive Electrical and is currently working in the automotive industry.
- Non - Certificate III holder with relevant and long term (three year minimum) automotive industry experience and satisfactory completion of a recognised prior learning procedure by the registered training provider.
- Apprentice working in a specialist gasfitting workshop and satisfactory completion of a recognised prior learning procedure by the registered training provider.
- LNG servicing, where the holder is seeking gap training in CNG to enable servicing of liquefied and high pressure natural gas systems (Westport Power Inc.).

Course content

The attached Essential Requirements (Refer Appendix 1) and Training Topics (Refer Appendix 2) shall be included in the course or training package and shall be considered the minimum scope of training that a person will need to obtain a Class E permit in Western Australia.

Where applicable, the training structure will need to be set out to include:

- safe working practices;
- gas safety, emergency procedures and combustion principles;
- legal compliance with regulations and standards; and
- assessment of technical ability to complete the gasfitting work in a safe manner, to a trade finish and left safe to use.

Training shall provide a suitable balance between theoretical and practical applications. Suitable resources shall be provided for competency based training.

EnergySafety reserves the right to reject any training package/unit/module that is considered as not meeting an acceptable licensing outcome.

For further information, contact:

Principal Engineer Gas Utilisation - EnergySafety

- Postal: PO Box 135, Cannington WA 6987
- Office: 303 Sevenoaks Street, Cannington WA 6107
Phone: (08) 9422 5200
Fax: (08) 9422 5244
- Website: www.energysafety.wa.gov.au

Recognition of training

Only training packages/units/modules that are recognised by EnergySafety will be acceptable for gasfitting licensing purposes.

To obtain recognition, a trainer will need to provide:

- A training package/course/module/outline setting out the course in competency-based format and where possible, based on and with reference to, national competency standards.
- A list of the competency units that the training includes. The list must be consistent with the EnergySafety licensing requirements and any agreement made between EnergySafety and the Training Authority.
- Detailed delivery notes including training notes and handouts.
- Identification of where the attached essential requirements and training topics will be covered in the training and competency to equated requirement mapping.
- Qualifications of the presenter and technical ability to deliver the training.
- Training resources to be used by trainees to obtain each gas competency.
- Assessments, both theoretical and practical. End-of-training assessment will be required, based on safety, technical and regulatory provisions. Provide papers with answers expected on written theory assessment and where applicable a copy of the quality delivery and assessment strategy (QDAS) document and assessment flow chart.
- The reporting process (documentation that will be given at the end of the training package/course/module) which will state the competencies attained and the Class/type of licence for which the trainee can apply. EnergySafety will prepare appropriate proformas in liaison with training providers.

For a training package/course/module designed to obtain a licence, a co-examiner/independent assessor acceptable to EnergySafety may need to be nominated to review the assessment of trainees. This would normally occur after the training has been endorsed by the Director.

EnergySafety reserves the right to view the delivery of training at any stage and accept or reject a qualification issued by an EnergySafety recognised training provider.

Class E Gas Fitter Training - Essential Requirements

Installation or servicing of mobiles relevant to the intended training outcomes must cover all the listed essential requirements in the course or training package/units.

A person undertaking training based on these guidelines shall at the conclusion of training be able to demonstrate they have adequate skills and knowledge to carry out Class E gasfitting.

Training shall provide the trainee with adequate skills and knowledge where appropriate in the following:

- fuelling system;
- gas supply (storage);
- piping;
- fuel control;
- installing gas systems to engines;
- installation testing;
- commissioning; and
- servicing and repair of mobile engine systems.

Training must include the specific legislation associated with Class E gasfitting. In particular the trainee must be able to:

- state which act and regulations deal with a consumer's gas installation;
- identify the authority responsible for ensuring compliance with the *Gas Standards Act 1972* and its regulations;
- state the purpose of a gasfitting permit for Class E gasfitting;
- state what class of gasfitting permit the trainee will be able to apply for on successfully completing the training;
- state how to apply for a gasfitting permit;
- describe the compliance process for (or state the compliance requirements for):
 - new installations; and
 - existing installations.
- state the approvals requirements for "mobile engine" installations;
- state the standards called up in the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 and their purpose;
- state the requirements for complying with a Notice of Defects; and
- outline the roles and responsibilities of the:
 - gas fitter;
 - consumer;
 - employer;
 - gas supplier;
 - authority; and
 - gas inspectors.

National competencies

National competencies must be used as part of a training package, but they will need to include, or be supplemented to include, all the listed Essential Requirements and Training Topics in this guideline to be acceptable for licensing.

Only those competences identified by EnergySafety as specific to obtain a gasfitting licence will be considered.

National competency training packages/units:

AURT304231A Install LPG fuel systems
AURT304266A Repair LPG fuel systems
AURT304270A Service LPG fuel systems

AURT33831A Install gas fuel systems (CNG/NGV)
AURT3835A Repair gas fuel systems (CNG/NGV)
AURT2833A Service gas fuel systems (CNG/NGV)

AURT304431A Install LNG fuel systems
AURT304466A Repair LNG fuel systems
AURT304470A Service LNG fuel systems

Assessment

Each trainee will be required to demonstrate to the trainer/assessor that they have achieved adequate skills and knowledge to carry out gasfitting work safely to a trade finish in compliance with regulations.

The topics listed in this document are suggested as being the minimum scope of training a person will need to obtain a Class E permit. It is not intended that this is an exhaustive or definitive list; a training package may include more topics.

The trainee will need to demonstrate 'on-the-job' competency validation in all essential requirements, consistent with national competency training principles.

Assessment methodology

Training assessments after completion of the institutional based training shall be sufficient to demonstrate that the trainee can operate within the scope of the permit for which the trainee will apply.

Assessments of the trainee's practical competence must be established in the workplace or in realistically simulated workplace environments.

The scope of the permits for which the trainee will apply are as follows:

- Installation and servicing; or
- Servicing.

Installation and servicing

There are two options available initially that lead to assessment for an installation and servicing permit:

- Work under the supervision of a registered gas fitter ('Workplace Assessment Method')

Work under the supervision of a registered gas fitter and complete a logbook with a minimum of ten installations on different types of vehicles within a 12 month or shorter period.

Note: This is the preferred option (where the trainee is issued with an Interim Certificate by the Training Provider after satisfactorily completing the institutional based training course and applies for and is issued with an interim Class E permit by EnergySafety to work under supervision).

Where a work logbook or journal is utilised they must be auditable. Energy Safety requires the logbook or journal to identify:

- supervising gasfitter's name and gas fitter number;
- trainees restricted gasfitting number;
- Notice of Completion number for installations undertaken;
- work carried out by the student with supporting evidence;
- registration number of vehicle or marine craft;
- owners name and contact details;
- if the work was inspected by the assessor/vehicle examiner/authorised gas inspector;
- if a Notice of Defects was issued for the work;
- if the assessment was simulated; and
- the assessor's name and contact details.

A copy of the Notice of Completion attached to the logbook for each job, may provide most of the required information.

- Work as an independent gas fitter ('Simulated Assessment Method')

Work as an independent gas fitter after satisfactorily carrying out a minimum of three simulated conversions on different types of vehicles within a month under direct supervision in a workshop training environment. This option is used only if the trainee resides in the country or in circumstances where obtaining work for the trainee under supervision of a licensed gas fitter is impracticable and the Training Provider is satisfied that this is the only available option.

Where simulated workplace assessment is used, typical real vehicles or very closely simulated scenarios that require the trainee to apply the appropriate skill and knowledge to a given situation are required.

Both the 'Workplace Assessment Method' and the 'Simulated Assessment Method' consist of projects additional to those completed during the institutional based training.

Servicing

Although assessment for a restricted permit (servicing) does not require work experience, it is considered to be offset by the prerequisites for applicants to be at a certain higher skills level to undertake the course.

The assessment of theoretical skills and knowledge can be established in a number of ways, such as in written question and answers. As a minimum, the trainee must demonstrate a working knowledge and understanding of regulations and appropriate industry standards. Trainees must be able to demonstrate the ability to reference regulations and standards by sections and clauses and identify that a gas installation is compliant.

The training provider agrees to retain evidence for a period of five years that the trainee obtained the relevant competences before being issued the documentation which allows the trainee to obtain a gasfitting permit. The training provider must retain the evidence of competence for a period of five years from the date of issuing of the documentation.

Guidelines for Class E Gasfitting Work Training in Western Australia

The following training topics where appropriate must be covered in the course or training package.

Fuelling system

Training topics:

- Characteristics:
 - LP Gas;
 - compressed natural gas; and
 - liquefied natural gas.
- Gas safety:
 - handling of LP Gas and/or compressed natural gas and/or liquefied natural gas; and
 - use.
- Vehicle refuelling.
- Filling connection.
- Components;
 - location; and
 - safety aspects.
- Replacement of containers.

Gas supply (fuel storage)

Training topics:

- Principles of liquid and vapour phases and the temperature relationship.
- Safety aspects of location for gas storage containers.
- Identify that containers comply with current standards and codes.
- Multiple containers.
- Components:
 - location;
 - operation; and
 - safety aspects.
- Sub-compartments.
- Mounting of fuel container.
- Safety relief device operation.
- Piping connection.
- Installing.
- Testing.

- Commissioning.
- Maintenance and replacement.

Piping

Training topics:

- Safety aspects for the installation and protection of piping.
- System design.
- Complying materials for use (rigid and flexible piping).
- Non-complying materials for use.
- Jointing and connections.
- Installing.
- Testing.
- Commissioning.
- Maintenance and repair.

Fuel control

Training topics:

- Understanding pressure in fuel control systems.
- Safety aspect for fuel control systems.
- Automatic fuel shut-off devices.
- Fill limiting systems.
- Principles of component operation:
 - regulators; and
 - vaporiser.
- Multiple fuel systems.
- Fuel selectors.
- System components:
 - mechanical;
 - electrical;
 - safety;
 - operation; and
 - installation.
- Engine management systems.
- Installing and modifying a fuel control system.
- Testing.
- Commissioning.

- Maintenance and repair.

Installing gas systems to engines

Training topics:

- Install piping.
- Gas – air mixers:
 - operation; and
 - installation.
- Fuel injection systems:
 - operation; and
 - installation.
- Checking and testing.
- Commissioning.
- Maintenance and repair.

Installation testing

Training topics:

- Testing installation for gas tightness.
- Testing installation for safe operation.

Commissioning

Training topics:

- Identify installation complies with regulations and relevant standards.
- Commission installation for correct operation.
- Advising the consumer of their obligations.

Servicing and repair of mobile engine systems

Training topics:

- Characteristics:
 - LP Gas;
 - compressed natural gas; and
 - liquefied natural gas.
- Gas safety:
 - handling of LP Gas, compressed natural gas or liquefied natural gas; and
 - use.
- Principles of liquid, vapour and temperature relationship.
- Identify installation complies with regulations and relevant standards.
- Safety aspects for mobile engines:
 - fuelling;

- fuel storage;
 - piping;
 - fuel control; and
 - operation.
- Fault finding and system analysis.
 - Servicing and repair of mobile engine components.
 - Testing installation for safe operation.
 - Commission installation for correct operation.
 - Advising consumers of their obligations.

The information in this document is provided for guidance only.
The delivery of any training based on information in this document does not, without prior agreement, mean recognition by EnergySafety.

© **Copyright laws apply**