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Compressed natural gas (CNG) vehicle workshop and personnel requirements

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Foreword

This Technical Reference was prepared by the Working Group on Compressed Natural Gas (CNG) Vehicles appointed by the Technical Committee on Engineering Support under the direction of the General Engineering and Safety Standards Committee. It is now endorsed under the national standardisation programme, which is coordinated by the Enterprise Singapore and guided by an industry-led Singapore Standards Council.

This Technical Reference is not to be regarded as a Singapore Standard. It is made available for provisional application over a period of two years, but does not have the status of a Singapore Standard. The aim is to use the experience gained to modify the Technical Reference so that it can be adopted as a Singapore Standard. Users of the Technical Reference are invited to comment on its technical content, ease of use and any ambiguities or anomalies. These comments can be submitted using the feedback form provided at the end of the Technical Reference and will be taken into account in the review of the publication. At the end of the two years, the Technical Reference will be reviewed by the CNG WG to discuss the comments received and to determine its suitability as a Singapore Standard. Submission for approval by the Standards Council as a Singapore Standard will be carried out only upon agreement after review.

This Technical Reference has been compiled from a number of established national and international standards and codes of practices, taking into account the latest developments in the technology and work practices, as well as Singapore's industrial and regulatory conditions. To ensure a high level of safety, it is essential that effective management of work procedures and systems are established early. Thus this Technical Reference provides comprehensive coverage of workshop and personnel requirements not known to be available in other CNG-related national standards.

The Technical Reference covers a wide range of requirements related to training, equipment levels, safety and the certification of automotive CNG personnel and workshops.

It is intended that work on the gas system of CNG vehicles is performed only by certified automotive CNG personnel in certified CNG vehicle workshops. They are to use only approved components and techniques, which are covered in TR 11 – 'Compressed natural gas (CNG) vehicle component and installation'.

The certified CNG vehicle workshop is classified in accordance with the activities it is intended to be engaged in. For example, a workshop certified only for gas system inspection does not need to be equipped with engine tuning equipment such as dynamometers and exhaust gas analysers.

The CNG vehicle workshop may contain an area for storing CNG vehicles. The garaging of large CNG vehicles, e.g. buses and trucks, up to a large aggregated size of on-board fuel storage can potentially present a safety hazard. For such workshops, the safety requirements of gas cylinder storage areas must be taken into consideration. Among the measures recommended at the workshop planning and design stage is a qualitative risk assessment to ensure that potential safety issues are identified and resolved.

The terms "normative" and "informative" have been used in this Technical Reference to indicate the status of an annex. A "normative" annex is a provision for mandatory compliance under the Technical Reference, while an "informative" annex is only for information and guidance.

Attention is drawn to the possibility that some of the elements of this Technical Reference may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

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Technical reference for compressed natural gas (CNG) vehicle workshop and personnel requirements

1 Scope and general

1.1 Scope

This Technical Reference sets out requirements for the premises, personnel and procedures for the following types of work on compressed natural gas (CNG) vehicles:

(a) Installation of the CNG fuel system on a vehicle.

(b) Inspection, maintenance, servicing and repairs to the gas fuel system.

(c) Routine vehicle maintenance not involving the gas fuel system, e.g. lubrication, brake repair, wheel alignment, etc.

The CNG work area may in some cases be incorporated into an existing vehicle workshop which is already provided with a certain level of equipment, ventilation provisions, management and safety systems. In such cases, the requirements specified for CNG may already be partially fulfilled, and they would likely only have to be met by adaptation of, upgrading or additions to the existing systems.

1.2 Objective

The objective of this Technical Reference is to provide workshop designers and constructors, vehicle installers, service and inspection personnel, and the regulatory authorities with the technical requirements for work area, management, personnel, certification and procedures for CNG vehicles in order to ensure that work on the vehicles is carried out in a safe and effective manner.

1.3 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AS/NZS 2430.3.4	Classification of hazardous areas. Part 3.4: Examples of area classification – Flammable gases
AS 4332	The storage and handling of gases in cylinders
CGA S-1.1	Pressure relief device standards – Part 1: Cylinders for compressed gases
ISO 15500-17	Road vehicles – Compressed natural gas (CNG) fuel system components : Part 17 : Flexible fuel line
CP 5	Code of practice for electrical installations
CP 13	Code of practice for mechanical ventilation and air-conditioning in buildings
CP 29	Code of practice for fire hydrant systems and hose reels
SS 217	Specification for industrial safety signs
SS 232-1	Specification for portable fire extinguishers – Description, duration of operation, Class A and B fire tests
TR 11	Compressed natural gas (CNG) vehicle component and installation
TR 12	Compressed natural gas (CNG) vehicle refuelling stations

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