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Road vehicles — Liquefied petroleum gas (LPG) fuel systems components —

Part 1: General requirements and definitions

Véhicules routiers — Équipements pour véhicules utilisant le gaz de pétrole liquéfié (GPL) comme combustible —

Partie 1: Exigences générales et définitions

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 41, *Specific aspects of gaseous fuels*.

A list of all parts in the ISO 20766 series can be found on the ISO website.

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Road vehicles — Liquefied petroleum gas (LPG) fuel systems components —

Part 1: General requirements and definitions

1 Scope

This document specifies general requirements and definitions of liquefied petroleum gas fuel system components, intended for use on the types of motor vehicles as defined in ISO 3833. It also provides general design principles, and specifies requirements for instructions and marking.

This document is applicable to vehicles (mono-fuel, bi-fuel or dual-fuel applications) using gaseous fuels in accordance with ISO 9162. It is not applicable to the following:

a) fuel containers;

b) stationary gas engines;

c) container mounting hardware;

d) electronic fuel management; and

e) refuelling receptacles.

NOTE 1 It is recognized that miscellaneous components not specifically addressed herein can be examined for compliance with the criteria of any applicable part of ISO 20766, including testing to the appropriate functional tests.

NOTE 2 All references to pressure in this document are considered gauge pressures unless otherwise specified.

NOTE 3 This document applies to devices which have a service pressure in the range of 110 kPa (Butane rich at 20 °C) and 840 kPa (Propane rich at 20 °C), hereinafter referred to in this document. Other service pressures can be accommodated by adjusting the pressure by the appropriate factor (ratio).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6722-1, *Road vehicles — 60 V and 600 V single-core cables — Part 1: Dimensions, test methods and requirements for copper conductor cables*

ISO 6722-2, *Road vehicles — 60 V and 600 V single-core cables — Part 2: Dimensions, test methods and requirements for aluminium conductor cables*

ISO 20766 (all parts)[1)], *Road vehicles — Liquefied petroleum gas (LPG) fuel systems components*

1) Under preparation.

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1 Valves

3.1.1
valve
device by which the flow of a fluid can be controlled

3.1.2
manual valve
valve which is operated manually

3.1.3
remotely controlled (automatic) valve
valve which is not operated manually and controlled by Electronic control unit (ECU)

3.1.4
remotely controlled (automatic) container valve
automatic valve rigidly fixed to the container which controls the flow of gas to the fuel system and controlled by ECU

3.1.5
non return valve or check valve
automatic valve which allows gas to flow in only one direction

3.1.6
excess flow valve
valve which automatically shuts off, or limits, the gas flow when the flow rate exceeds a set design value

3.1.7
manual container valve
manual valve rigidly fixed to the container

3.1.8
pressure relief valve
PRV
self-closing device which opens to prevent a pre-determined pressure being exceeded

3.1.9
service valve
manual valve which is closed only when servicing the vehicle

3.2 Fuels

3.2.1
liquefied petroleum gas vehicle
road vehicle powered by LPG

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3.2.2
mono-fuel
road vehicle which operates on liquefied petroleum gas only

Note 1 to entry: It is designed primarily for permanent running on LPG, but may still have a petrol system for emergency purposes.

Note 2 to entry: Also known as "Dedicated Liquefied petroleum gas Vehicle".

3.2.3
bi-fuel
vehicle that has two independent fuel systems (one of them for LPG) and that can run alternatively on either fuel, but only on one at a time

Note 1 to entry: The simultaneous use of both fuels is limited in amount or duration.

3.2.4
dual-fuel
vehicle that has two independent fuel systems (one of them for LPG) and can run on both fuels simultaneously

Note 1 to entry: It also may run on one fuel alone.

3.3 General

3.3.1
filter unit
protective device which removes foreign debris or substances from the gas stream

3.3.2
fitting
connector used in joining a piping, tubing, or hose system

3.3.3
hose
non-metallic flexible tubing through which liquefied petroleum gas flows

3.3.4
gas mixing device
device for mixing the gaseous fuel and intake air for the engine

3.3.5
gas dosage unit
gas flow restricting device, installed downstream of a pressure regulator, controlling gas flow to the engine

3.3.6
gas tight housing
device which vents gas leakage to outside the vehicle including the gas ventilation hose

3.3.7
level indicator
device which indicates the LPG volume level in the container

3.3.8
pressure regulator
device used to control the delivery pressure of gaseous fuel to the engine

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3.3.9
pressure relief device
PRD
one time use device triggered by excessive temperature which vents gas to protect the container from rupture

3.3.10
rigid fuel line
gas tube
metallic tubing which has been designed not to flex in normal operation and through which liquefied petroleum gas flows

3.3.11
test pressure
pressure to which a component is taken during acceptance testing

3.3.12
working pressure
maximum pressure to which a component is designed to be subjected to and which is the basis for determining the strength of the component under consideration

3.3.13
burst pressure
pressure which causes failure and consequential fluid loss through the component envelope

3.3.14
injector
device for introducing gaseous fuel, as either a gas or liquid, into the engine or associated intake system

3.3.15
air
<dry> air with moisture content such that the dew point of the air at the required test pressure is at least 11 °C below the ambient test temperature.

3.3.16
hydrostatic pressure
pressure to which a component is taken to verify the structural strength of the component by means of an incompressible fluid

3.3.17
Liquefied Petroleum Gas
LPG
autogas
any product essentially composed of the following hydrocarbons: propane, propene (propylene), normal butane, isobutene, isobutylene, butane (butylene) and ethane

3.3.18
80 % container valve
device that limits the filling at maximum 80 % of the volumetric capacity of the container

3.3.19
remotely controlled service valve with excess flow valve
device which allows the establishment and interruption of LPG supply to the vaporizer/pressure regulator; remotely controlled means that the service valve is controlled by ECU with an integrated excess flow valve

3.3.20
vaporizer
device intended to vaporize LPG from a liquid to a gaseous state

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3.3.21
fuel pump
device to establish the supply of liquid LPG from the container to the engine

3.3.22
shut-off valve
device to cut-off the flow of LPG

3.3.23
multivalve
device consisting of all or part of the accessories of the container

3.3.24
gas-tube relief valve
device to prevent the pressure from increasing above a pre-set value in an isolated section of the fuel delivery system

3.3.25
pressure and/or temperature sensor
device which measures pressure and/or temperature

3.3.26
service coupling
coupling in the fuel line between the fuel container and the engine that permits connection to an additional container

3.3.27
fuel rail
fuel system component, typically a pipe, tube or conduit, that delivers fuel to the fuel injection devices

3.3.28
power supply bushing
device which establishes an isolated and gas-tight electrical connection through the pressure boundary of the fuel container to provide power for the fuel pump, actuators and fuel level sensor

3.3.29
gas connections
connector used in joining a piping, tubing, or hose system

3.3.30
fuel selection system and electrical installations
device intended for selecting the fuel in case of a dual-fuel or bi-fuel systems

4 Construction and assembly

4.1 Components shall be made of materials suitable for use with LPG.

4.2 Jointing components shall provide gas tight sealing performance according to the requirements of the specific part of this document.

4.3 Threads for components attached to the container shall be clean cut, even, without surface discontinuities, to gauge and conform to International Standards applied to the LPG container threaded ports.

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