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

Part 22: Power supply bushing (fuel pump/ actuators/fuel level sensor)

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

Partie 22: Douille d'alimentation (pompe à carburant/ actionneurs/capteur de niveau de carburant)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

Part 22: Power supply bushing (fuel pump/actuators/fuel level sensor)

1 Scope

This document specifies general requirements and definitions for power supply bushing (fuel pump/actuators/fuel level sensor), a liquefied petroleum gas (LPG) fuel component, intended for use on the types of motor vehicles 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) that use gaseous fuels in accordance with ISO 9162. It is not applicable to:

— fuel containers;

— stationary gas engines;

— container mounting hardware;

— electronic fuel management;

— refuelling receptacles.

Miscellaneous components not specifically addressed in this document can be examined for conformity with the criteria of any applicable part of the ISO 20766 series, including testing to the appropriate functional tests.

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

This document applies to devices that have a service pressure in the range of 110 kPa (butane rich at 20 °C) and 840 kPa (propane rich at 20 °C). 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 20766-1, *Road vehicles — Liquefied petroleum gas (LPG) fuel systems components — Part 1: General requirements and definitions*

ISO 20766-2, *Road vehicles — Liquefied petroleum gas (LPG) fuel systems components — Part 2: Performance and general test methods*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20766-1 apply.

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

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

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

4 Markings

The power supply bushing (fuel pump/actuators/fuel level sensor) shall bear the following identification markings, which shall be clearly legible and indelible and consist of characters, figures or symbols:

a) the manufacturer or agent's name, trademark or symbol;

b) the model designation (part number);

c) the working pressure and temperature range;

d) the year and month of fabrication;

e) electrical ratings (if applicable).

The following additional markings are recommended:

— the type of fuel;

— the symbol of the certification agency;

— the type approval number;

— the serial number or date code;

— a reference to this document.

5 Construction and assembly

5.1 The power supply bushing (i.e. fuel pump/actuators/fuel level sensor) shall withstand the maximum designed operating pressure.

5.2 The power supply bushing (i.e. fuel pump/actuators/fuel level sensor) shall withstand a temperature between the minimum designed operating temperature and the maximum operating temperature.

5.3 To prevent electric sparks on the surface, in case of fracture of the component, the electrically operated power supply bushing (i.e. fuel pump/actuators/fuel level sensor) shall:

a) be insulated in a manner that no current is conducted through parts that contain LPG;

b) have the electrical system of the device isolated from the body.

Isolation resistance shall be >10 MΩ.

5.4 If a power supply bushing (i.e fuel pump/actuators/fuel level sensor) is activated by an electric or external power, the power supply bushing shall not be connected to a live wire when its power is switched off.

5.5 If the power supply bushing is located in the boot or and the passenger compartment, the electrical connections shall comply with protection degree class IP 40 and IP 54 in accordance with IEC 60529.

5.6 The power supply bushing (i.e. fuel pump/actuators/fuel level sensor) shall be of a hermetic sealed type in order to establish an isolated and tight electrical connection.

6 Tests

6.1 Applicability

Table 1 indicates the tests that shall be carried out.

Table 1 — Applicable tests

Test	Applicable	Test procedure as required by ISO 20766-2	Specific test requirements of this document
Hydrostatic strength	X	X	X (see 6.2)
External leakage	X	X	
High temperature	X	X	
Low temperature	X	X	
Non-metallic material immersion (LPG compatibility)	X[a]	X	
Corrosion resistance	X[b]	X	
Compatibility with heat exchange fluids of non-metallic parts	X[a]	X	
Insulation resistance	X	X	
Electrical overvoltage	X	X	
Oxygen ageing	X[a]	X	
Ozone ageing	X[a]	x	
Resistance to dry-heat	X[a]	X	
Brass material compatibility	X[c]	X	
Creep	X[a]	X	
Temperature cycle test	X[a]	X	
Automotive fluids	X	X	

[a] Only if non-metallic material is used.

[b] Only if steel materials are used.

[c] Only if brass material is used.

6.2 Hydrostatic strength

Test the power supply bushing (i.e. fuel pump/actuators/fuel level sensor) in accordance with the procedure for testing hydrostatic strength specified in ISO 20766-2:2018, Clause 5. The test pressure shall be 2,25 times the working pressure. For the overpressure test, the component shall be mounted inside the LPG tank as intended by the manufacturer.

Bibliography

[1] ISO 3833, *Road vehicles — Types — Terms and definitions*

[2] ISO 9162, *Petroleum products — Fuels (class F) — Liquefied petroleum gases — Specifications*