Liquefied Petroleum Gas Vehicles - Refuelling Connector

Preface

The purpose of this standard is to secure safety and compatibility by standardising the refuelling connectors of liquefied petroleum gas vehicles.

1. Scope

This standard specifies the refuelling connectors of liquefied petroleum gas vehicles with design pressure from 1.74 to 2.28 MPa.

2. Normative reference

The following standards, when referred to in this standard, constitute a part of the specifications of this standard. As required, the most recently updated version of the applicable standard (including addenda) shall be applied.

JIS B0100 Glossary of terms for valves
JIS B0116 Glossary of terms for packings and gaskets
JIS B0142 Fluid power systems and components -- Vocabulary
JIS H3250 Copper and copper alloy rods and bars
JIS G4305 Cold-rolled stainless steel plate, sheet and strip
JIS G4314 Stainless steel wires for springs

3. Definitions

Definitions of main terms used in this standard shall be based on **JIS B0100**, **JIS B0116** and **JIS B0142** and as follows.

3.1 Refuelling connector

Charge port for filling fuel. It includes a check valve, protection cap, fitting for connecting the pipe, and parts for fixation on the vehicle body.

3.2 Refuelling connector main body

A main component of refuelling connector that constitutes the connection with the refuelling nozzle.

3.3 Refuelling nozzle

A part of refuelling equipment, used to connect the equipment with the refuelling connector of a vehicle.

3.4 Check valve

Check valve specified by **JIS B0100**.

3.5 Upper stream

Portion from the check valve of refuelling connector to the connection with the refuelling nozzle.

3.6 Lower stream

Portion from the check valve of refuelling connector to the pipe connection point (outlet side).

3.7 Design pressure

Three-fifth of TP value stamped on a container (proof test pressure of container).
(As per the exemplified standard of Safety Regulations for Container under High Pressure Gas Safety Act)

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4. Type

The refuelling connectors are classified according to the design pressure as indicated in **Table 1**.

Table 1 Types of refueling connectors

Unit: MPa

Type	Design pressure	Withstand pressure	Identification symbol
Class 1	1.74	2.9	None
Class 2	2.28	3.8	H

5. Material

The material must have appropriate strength, durability, and corrosion resistance according to the environment of use. It must be selected by an agreement between the delivery/acceptance parties. Some examples are indicated below.

a) Main body — **C3604**, etc. in **JIS H3250** (Copper and copper alloy rods and bars)

b) Valve body — **C3604**, etc. in **JIS H3250** (Copper and copper alloy rods and bars)

c) Spring — **SUS304**, etc. in **JIS G4314** (Stainless steel wires for springs)

d) Spring bearing — **SUS301**, etc. in **JIS G4305** (Cold-rolled stainless steel plate, sheet and strip)

e) Valve seat packing — LP gas resistant rubber (Example: nitrile rubber)

6. Structure and dimensions

The structure and dimensions of a refuelling connector are as indicated in **Figure 1**.

Unit: mm

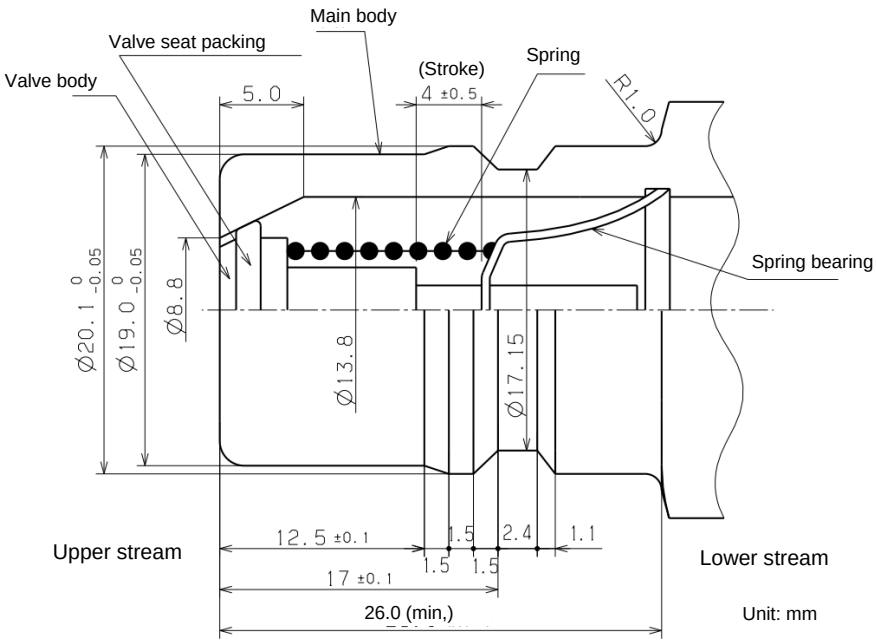

Figure 1 Structure and dimensions of refuelling connector

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7. Shearing force of spring

When the valve of a refuelling connector is fully opened, the shearing force shall be 735 N/mm^2 or less and the load shall be 21.6 N ± 4.3 N.

8. Test

8.1 Pressure test (refuelling connector unit test)

8.1.1 Purpose of test

The test unit shall endure the load of the test pressure.

8.1.2 Test method

Apply pressure using water or oil from the lower stream of the refuelling connector. The test pressure shall be 2.9 MPa or more for class 1 or 3.8 MPa or more for class 2. No abnormality shall be observed (Figure 1).

8.1.3 Requirements

No leak shall occur from the valve body.

8.2 Airtightness test and connection test (Refuelling connector connection test)

8.2.1 Purpose of test

No leak shall occur from the connection with the refuelling coupling (test jig).

8.2.2 Test method

Connect a refuelling coupling (female) (Figure 3) as the test jig as shown in Figure 2 before performing the test. Apply pressure up to the design pressure value using air or inert gas from the lower stream of the refuelling connector. No leak shall occur while increasing and decreasing the pressure. In addition, no leak shall occur from the O-ring. The steel ball shall come into contact evenly.

8.2.3 Requirements

The connection shall be smooth.

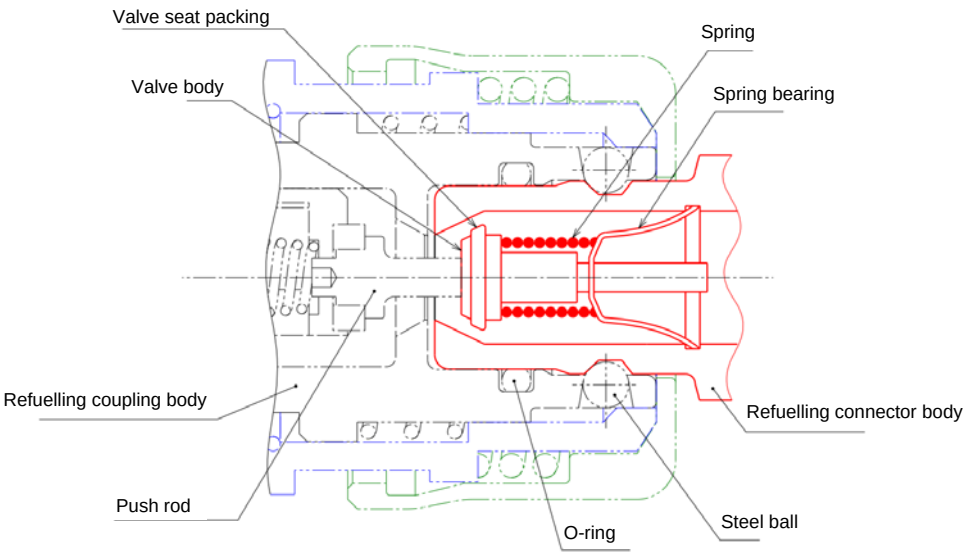

Figure 2 Assembly for airtightness test

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Unit: mm

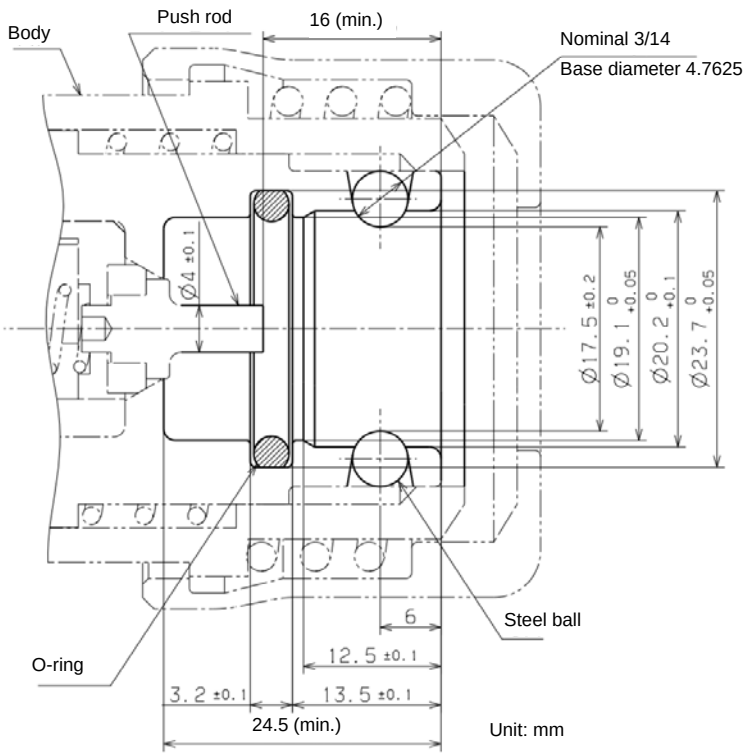

Figure 3 Structure and dimension of refuelling coupling (female)

8.3 Leak test for refuelling connector (refuelling connector unit test)

8.3.1 Purpose of test

To check that no leak occurs from the valve seat of the refuelling connector.

8.3.2 Test method

Apply pressure up to the design pressure value using air or inert gas from the lower stream of the refuelling connector. No leak shall occur from the valve seat packing while increasing and decreasing the pressure.

8.3.3 Requirements

Check for leak using soapy water, etc. while applying pressure.

9. Indications

The following information must be indicated on a refuelling connector at a position easy to view so that the indications cannot be erased easily.

a) Manufacturer name or trademark

b) Year/month of manufacturing or its abbreviation

c) No symbol for class 1 or "H" for class 2.

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10. Maintenance and inspection

The maintenance and inspection of a refuelling connector shall be as follows.

a) Check for any dent, deformation, wear, or scratch externally and internally which affects the airtightness inspection.

b) Check the seating surface for the (female) coupling steel balls to see if any wear or deformation exists.

c) Always keep clean the external surface.

d) Always attach the dustproof protection cap after refuelling.

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