# CGA V-10—2017

# HIGH PRESSURE GAS TRAILER CONNECTIONS

## SIXTH EDITION

CGA
Compressed Gas Association
*The Standard For Safety Since 1913*

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Work Item 20-043
Cylinder Valve Committee

NOTE—Technical changes from the previous edition are underlined.

SIXTH EDITION: 2017
FIFTH EDITION: 2015
FOURTH EDITON: 2010
THIRD EDITION: 2006

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# 1 Introduction

This publication provides standard CGA connections for high pressure gas trailers. These connections allow the higher flow rates in trailer operations that are not provided by existing connections in CGA V-1, *Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections* [1].[1] Although most, if not all, of the fittings in common use on high pressure gas trailers are believed to be designed and manufactured to be safe for their intended use, a high potential for hazardous cross-connections and incompatible uses of the various fittings exists due to the lack of standards.

Several incidents and numerous near misses have been reported related to the partial engagement of similar but not identical fittings and the use of adapters to interconnect the various trailer fittings in use. Also, since various gas providers and users did not have a common fitting for high pressure gas trailer service, they frequently removed fittings and replaced them to be able to perform filling or to use the trailer. Typically, these fittings are attached to the trailer or equipment by a standard tapered pipe thread. Tapered pipe threads are not designed for repeated use and therefore can become worn and unsafe with a high potential to catastrophically discharge when pressurized. Unsafe practices such as changing the fittings at every use to connect trailers or using equipment having different fittings can cause serious accidents due to worn threads or incompatible gases or equipment. These potentially hazardous situations can be minimized or eliminated by the adoption and promulgation of standard CGA connections for the various high pressure gas trailer services.

The maximum pressure ratings for high pressure gas trailer connections as detailed in the fourth edition of this publication were modified as outlined in Table 1.

When the first edition of CGA V-10 was published, the standard gas trailer connections addressed were limited to a maximum pressure rating of 3000 psi at 120 °F (20 680 kPa at 48.9 °C), which is approximately 2640 psi at 70 °F (18 200 kPa at 21.1 °C) [1].[2] This pressure rating is similar to pressure ratings specified in CGA V-1 [1]. However, tube manufacturing companies currently offer tubes at higher pressure ratings, which can result in higher supply pressures.

In order to use the existing connections at these higher pressures, the pressure ratings of the connections were increased based on original test data, instead of creating new connections for these high pressure gas trailers. The existing connections were originally tested and qualified for a pressure rating at 70 °F (21.1 °C) using CGA V-1 testing criteria [1].

**Table 1—Maximum pressure ratings for high pressure gas trailer connections**

| CGA connection number | Original rating | New rating |
|---|---|---|
| 1340, 1350, 1440, 1450, 1550 | 3000 psi at 120 °F (20 680 kPa at 48.9 °C) | 3500 psi at 70 °F (24 130 kPa at 21.1 °C) |
| 1540 | 3000 psi at 120 °F (20 680 kPa at 48.9 °C) | 3000 psi at 70 °F (20 680 kPa at 21.1 °C) |

# 2 Scope

This publication provides guidelines for standard CGA connections for various high pressure gas trailer services. It defines the main outlet connection of the trailer unit only.

[1] References are shown by bracketed numbers and are listed in order of appearance in the reference section.

[2] kPa shall indicate gauge pressure unless otherwise noted as (kPa, abs) for absolute pressure or (kPa, differential) for differential pressure. All kPa value are rounded off per CGA P-11, *Metric Practice Guide for the Compressed Gas Industry* [2].

# 3 Definitions

For the purpose of this publication, the following definitions apply.

## 3.1 Publication terminology

### 3.1.1 Shall
Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

### 3.1.2 Should
Indicates that a procedure is recommended.

### 3.1.3 May
Indicates that the procedure is optional.

### 3.1.4 Will
Is used only to indicate the future, not a degree of requirement.

### 3.1.5 Can
Indicates a possibility or ability.

# 4 Standard connections

A reasonable attempt has been made to accept fittings already in common use after successful completion of specified manufacturing drawings and qualification testing as prescribed in CGA V-1 [1].

Four fittings were identified and tested successfully. Additionally, two new fittings were designed, specified, and tested successfully. The six connections are nominally described as follows:

- CGA 1340—1.00-11.5 NPS–RH–EXT for pressures up to 3500 psi at 70 °F (24 130 kPa at 21.1 °C) for argon, helium, krypton, neon, nitrogen, tetrafluoromethane, and xenon. See Connection No. 1340;
- CGA 1350—1.00-11.5 NPS–LH–EXT for pressures up to 3500 psi at 70 °F (24 130 kPa at 21.1 °C) for ethane, ethylene, hydrogen, methane, and natural gas. See Connection No. 1350;
- CGA 1440—1.4375-12 UN–RH–EXT for pressures up to 3500 psi at 70 °F (24 130 kPa at 21.1 °C) for breathing air. See Connection No. 1440;
- CGA 1450—1.4375-12 UN–LH–EXT for pressures up to 3500 psi at 70 °F (24 130 kPa at 21.1 °C) for air (not for breathing). See Connection No. 1450;
- CGA 1540—1.25-11.5 NPS–RH–EXT for pressures up to 3000 psi at 70 °F (20 680 kPa at 21.1 °C) for oxygen. See Connection No. 1540; and
- CGA 1550—1.25-11.5 NPS–LH–EXT for pressures up to 3500 psi at 70 °F (24 130 kPa at 21.1 °C) for carbon monoxide. See Connection No. 1550.

# 5 Conformance and implementation

There can be slight variations of the new standard connections already in existence and use. Therefore, it is important that these connections be replaced as soon as practicable with the approved standard connections with adherence to the gas assignments specified.

Users of high pressure gas trailers shall verify that all components that could be exposed to the supply pressure are rated for at least the marked service pressure of the gas trailer. The marked service pressure is located on the data plate attached to the gas trailer. Components include but are not limited to hoses, pressure regulators, pressure gauges, valves, piping, flanges, fittings, gaskets, etc.