ANSI NGV 3.1-2014
(reaffirmed 2019) •
CSA 12.3-2014
(reaffirmed 2019)

Fuel system components for compressed natural gas powered vehicles

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ANSI NGV 3.1-2014 • CSA 12.3-2014
March 2014

Title: *Fuel system components for compressed natural gas powered vehicles*

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ANSI NGV 3.1-2014 • CSA 12.3-2014

Fuel system components for compressed natural gas powered vehicles

American National Standards Institute, Inc.

IGAC

Interprovincial Gas Advisory Council

Approved on February 25, 2014 by ANSI
Approved on February 27, 2014 by IGAC
Effective in Canada October 1, 2015
Published in March 2014 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3

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ISBN 978-1-77139-433-8

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Preface

This is the third edition of ANSI NGV 3.1 • CSA 12.3, *Fuel system components for compressed natural gas powered vehicles*. It supersedes the previous editions published in 2012 and 1995.

This Standard was prepared by the NGV 3/HGV 3 Technical Subcommittee on Standards for Fuel System Components for Compressed Natural Gas and Hydrogen Powered Vehicles, under the jurisdiction of the Joint Automotive Technical Committee and the Technical Committee on Natural Gas Powered Vehicles and Fuelling, and had been formally approved by the Technical Committee(s), American National Standards Institute, and the Interprovincial Gas Advisory Council.

Notes:

1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
3) *This publication was developed by consensus, which is defined by CSA Policy governing standardization – Code of good practice for standardization as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity." It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.*
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History of the development of NGV 3.1 • CSA 12.3

Note: *This history is informative and is not part of the standard.*

In 1984 there was a growing need in the U.S. natural gas vehicle industry for guidelines pertaining to the assembly of aftermarket equipment installed on motor vehicles in order to operate alternatively on either gasoline or natural gas. The American Gas Association Laboratories (AGAL), in response to this need developed an A.G.A. Requirement for Natural Gas Vehicle (CNG) Conversion Kits, No. 1-85. This requirement was intended to help promote the safe development and installation of NGV conversion systems by manufacturers and installers. The first draft of A.G.A. Requirement No. 1-85 was developed during 1984 and 1985, with the final version dated August 20, 1985.

At the time of its issuance, A.G.A. No. 1-85 was in compliance with NGV equipment and fueling stations specifications published by the National Fire Protection Association (NFPA) under its Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems, NFPA 52. The first edition of NFPA 52 was issued in 1984. A second edition was issued in 1988.

In 1988 a group of U.S. gas utilities formed the Natural Gas Vehicle (NGV) Coalition (the Coalition) to promote widespread use of compressed natural gas as a transport fuel. The Coalition organized committees to address technical, marketing and legislative issues which would affect the future expansion of a U.S. transportation industry fueled by natural gas.

The Coalition recognized that an important consideration in the successful commercialization of natural gas as a vehicle fuel was the issue of codes and standards (or the lack of codes and standards, or harmonized codes and standards) pertaining to both fuel stations and vehicle fuel systems. The Coalition's Technology Committee was established to achieve the goal of an organized family of coordinated codes, standards and regulations addressing natural gas vehicles and fueling stations. To help achieve this goal, the Technology Committee established the Standards and Standardization Subcommittee.

Subsequently, the third edition of NFPA 52 was published in 1992. This edition incorporated many changes developed and recommended by the NGV Coalition's task groups.

During August 1992, an NGV Conversion Equipment Task Group was established to coordinate with the AGAL for requirements for compressed NGV conversion kits. The task group agreed the phrase “NGV fuel system” should replace “NGV conversion kits.” (An NGV fuel system is comprised of all major components required to supply, manage, and/or control fuel flow, enabling a vehicle to operate on natural gas.) The task group continued to meet during August, October and December 1992 to promulgate the development of a standard to cover both dedicated and bi-fuel natural gas systems for light and medium duty vehicles.

A standard for NGV fuel system components existed in Canada, National Standard of Canada CAN/CGA 12.3 Fuel System Components for Natural Gas Powered Vehicles. The genesis for this Canadian document was the Amendment to the 1982 CGA B149.1 Natural Gas Installation Code which added to the Code provisions for Natural Gas for Vehicles (NGV) fuel system components on highway vehicles, as well as coverage of NGV refueling stations, Subsequently, these NGV aspects evolved into stand-alone Canadian documents, one being the CAN/CGA-12.3 which was first published in February 1991.

In order to further common goals for North American harmonization, the task group and the Canadian Gas Association (CGA) NGV Steering Committee on Natural Gas Powered Vehicles, initiated formation of a joint activity involving the CGA Steering Committee's Subcommittee on

Fuel System Components for Natural Gas Powered Vehicles and the Coalitions NGV Conversion Equipment Task Group.

On February 17, 1993, the first joint meeting of the NGV Conversion Equipment Task Group and the CGA 12.3 Standards Subcommittee on Fuel System Components for Natural Gas Powered Vehicles was held. As a result the U.S. Task Group and Canadian Subcommittee agreed to establish the Joint NGVC/ CGA Subcommittee on Natural Gas Vehicle Conversion Equipment, to develop harmonized requirements for a North American Bi-National standard. The newly established subcommittee agreed to proceed with harmonization of the Canadian Standard for Fuel System Components for Natural Gas Powered Vehicles, CAN/CGA-12.3, which was first published in February 1991, and A.G.A. requirement 1-85. In light of the different approaches in Canada and the U.S. (i.e., systems vs. components), the joint subcommittee agreed that separate harmonized standards be developed for both complete fuel systems and individual system components. Two joint working groups were established to draft the standards requirements for NGV conversion fuel system components and NGV conversion fuel systems, for consideration and final approval by the joint subcommittee.

A standard was prepared by the Joint U.S./Canadian Conversion Component Working Group during several meetings over a period of two years and involved four drafts.

At its July 1994 meeting, the Joint NGVC/CGA Conversion Equipment Subcommittee reviewed and modified the fourth draft of the proposed harmonized standard and voted affirmatively to initiate an ANSI Canvass Ballot and Canadian Public Review and Comment to initiate national recognition and approval of the standard.

During August 1994 the A.G.A. Laboratories and Canadian Gas Association initiated a 60 day ANSI Canvass Ballot and Canadian Public Review and Comment of proposed AGA NGV3.1/CGA 12.3 - Draft 5. At its November 29, 1994 meeting, the joint subcommittee considered and resolved all comments and criticism's received during public review, and accepted several minor editorial modifications of the draft.

The first edition of the harmonized U.S/Canadian Standard for Fuel System Components for Natural Gas Powered Vehicles, was approved by the American National Standards Institute, Inc. on May 10, 1995, the CGA NGV Standards Steering Committee on Natural Gas Vehicles and Fuelling on April 17, 1995, and by the Canadian Interprovincial Gas Advisory Council (IGAC) on June 16, 1995.

In 2007, in response to industry requests, the standard was revised and rewritten in its entirety, and was published as the second edition of ANSI NGV 3.1 • CSA 12.3.

The second edition of the Standard for Fuel System Components for Compressed Natural Gas Powered Vehicles was approved by the American National Standards Institute, Inc. on February 14, 2012 and by the Harmonized Joint Automotive Technical Committee on March 25, 2010.

This, the third edition of the Standard for Fuel system components for compressed natural gas powered vehicles was approved by the American National Standards Institute, Inc. on February 25, 2014, the Joint Automotive Technical Committee on February 20, 2014, the Technical Committee on Natural Gas Powered Vehicles and Fuelling on January 24, 2014, and by the Canadian Interprovincial Gas Advisory Council (IGAC) on February 27, 2014.

Previous editions of this standard, approved by the American National Standards Institute and the Joint Automotive Technical Committee are as follows:

ANSI/AGA NGV3.1/CGA 12.3-1995	ANSI NGV3.1-2012 • CSA 12.3-2012

The following identifies the designation and the year of the harmonized standard:

ANSI NGV3.1-2014 • CSA 12.3-2014

ANSI NGV 3.1-2014 • CSA 12.3-2014
Fuel system components for compressed natural gas powered vehicles

1 Scope

1.1

This Standard establishes requirements for newly produced compressed natural gas fuel system components, intended for use on natural gas powered vehicles, as listed in Table 1, below:

Table 1
Fuel system components
(See Clauses 1.1 and 1.5.)

Check valve
Manual valve
Manual container valve
Automatic valve
Gas injector
Pressure indicator
Pressure regulator
Gas flow adjuster
Gas/air mixer
Pressure relief valve
Pressure relief device
Excess flow valve
Gas tight housing and ventilation hoses
Rigid fuel line
Flexible fuel line, hoses and assemblies
Filter
Fittings
Discharge line closures

1.2

This Standard applies to devices that have a service pressure of either 16 500 kPa (2 400 psi), 20 700 kPa (3 000 psi), or 24 800 kPa (3 600 psi), hereinafter referred to in this Standard as the following:

“P24” - 16 500 kPa (2 400 psi)

“P30” - 20 700 kPa (3 000 psi)

“P36” - 24 800 kPa (3 600 psi)

The Standard also applies to components downstream of the first stage of pressure reduction with a working pressure designated by the manufacturer in kPa (psi).

