CSA GROUP™

ANSI/IAS NGV 4.4-1999
(reaffirmed 2019) •
CSA 12.54-M99
(reaffirmed 2018)

Breakaway devices for natural gas dispensing hoses and systems

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AMERICAN NATIONAL STANDARD
ANSI/IAS NGV 4.4-1999

CANADIAN STANDARDS ASSOCIATION
CSA 12.54-M99

First Edition - 1999

BREAKAWAY DEVICES FOR NATURAL GAS DISPENSING HOSES AND SYSTEMS

Approved by

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Interprovincial Gas Advisory Council, March 10, 1999

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On behalf of
the Natural Gas Vehicle Coalition

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PREFACE

This publication represents a standard for safe operation, substantial and durable construction and performance testing of breakaway devices for natural gas dispensing hoses and systems, within limitations given below and in the scope of this standard.

This standard is based on proven engineering principles, research and the combined expertise of gas utilities, manufacturers, users, and others having specialized experience.

Nothing in this standard is to be considered in any way as indicating a measure of quality beyond compliance with the provisions it contains. It is designed to allow compliance of products which may exceed that specified in the provisions herein. In its preparation, full recognition has been given to possibilities of improvement through ingenuity of design. This standard is subject to revision as further experience and investigation may show it is necessary and desirable.

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This standard does not apply to fuel system components that will be incorporated during original manufacture of motor vehicles which comply with *Federal Motor Vehicle Safety Standards (FMVSS)* or *Canadian Motor Vehicle Safety Standards (CMVSS)* for Natural Gas Powered Vehicles.

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HISTORY OF DEVELOPMENT OF ANSI/IAS NGV 4.4 · CSA 12.54

(This history is informative and is not part of the standard)

During 1984, there was 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, the 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 current edition incorporates 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 already existed in Canada namely the 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 refuelling 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.

Subsequently, as needs were identified, the following series of standards evolved under the auspices of the Joint NGV Subcommittee. Within this series, these standards are complementary and hence these standards achieve compatibility with regard to application and performance.

STANDARDS FOR:

- *ANSI NGV 4.1-1999·CSA 12.5-M99, NGV DISPENSING SYSTEMS;*
- *ANSI NGV 4.2-1999·CSA 12.52-M99, HOSES FOR NATURAL GAS VEHICLES AND DISPENSING SYSTEMS;*
- *ANSI NGV 4.4-1999·CSA 12.54-M99, BREAKAWAY DEVICES FOR NATURAL GAS DISPENSING HOSES AND SYSTEMS;*
- *ANSI NGV 4.6-1999·CSA 12.56-M99, MANUALLY OPERATED VALVES FOR NATURAL GAS DISPENSING SYSTEMS;* AND
- *ANSI NGV 4.7-1999·CSA 12.57-M99, AUTOMATIC PRESSURE OPERATED VALVES FOR NATURAL GAS DISPENSING SYSTEMS.*

The first edition of the harmonized ANSI/CSA Standard for NGV Breakaway Devices for Natural Gas Dispensing Hoses and Systems, was approved in the U.S. by the American National Standards Institute, Inc. on February 18, 1999, and in Canada by the (Interim CSA) NGV Standards Steering Committee on Natural Gas Vehicles and Fuelling on May 21, 1998, and the Canadian Interprovincial Gas Advisory Council (IGAC) on March 5, 1999.

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

ANSI NGV 4.4/CSA 12.54-1999

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DANGER

Testing described in these requirements may result in the sudden release of test gas at high pressure with dangerous explosive force. Adequate protection from explosion, concussion, and flying debris must be utilized to protect test personnel and facilities.

STANDARD FOR
BREAKAWAY DEVICES FOR NATURAL GAS DISPENSING HOSES AND SYSTEMS (ANSI/IAS NGV 4.4 · CSA 12.54)

PART I

CONSTRUCTION

1.1 SCOPE

1.1.1 This standard applies to newly produced compressed Natural Gas Vehicle (NGV) dispenser shear valves and fueling hose emergency breakaway shutoff devices, hereinafter referred to as devices.

[It is not applicable to "Vehicle Refueling Appliances".]

1.1.2 Devices covered by this standard are intended to:

1. a. Minimize the escape of natural gas by automatically shutting off the flow of gas from the dispenser and control the depressurization of the hose, and;

   b. Minimize damage to the vehicle and dispenser when a vehicle is driven off with the nozzle attached to the vehicle's fueling receptacle.

2. Automatically shut off the flow of gas in the event of a vehicular collision with a fuel dispenser that results in the displacement of the dispenser from its gas supply connection.

1.1.3 All dimensions used in this standard are in metric units [International System of Units (SI)], unless otherwise specified. If a value for a measurement, as given in this standard, is followed by an equivalent value in other units, the first stated is to be regarded as the specification.