



6771 W. Charleston Blvd., Suite C
Las Vegas, Nevada, 89146
702-254-4180
www.ngvi.com

NGV Maintenance Facilities Modification Requirements



*By Leo Thomason,
Executive Director,
Natural Gas Vehicle Institute (NGVi)*

Contents

Introduction	2
NGV Maintenance Facilities Modification Requirements	3
NGVi Options	5
Helpful Links	5

Introduction

Leo Thomason, co-founder of NGVi, has over 25 years of direct natural gas vehicle and fueling infrastructure development experience. He is known world-wide as an expert in natural gas fueling and vehicle technology. A professional trainer and experienced technical consultant, Leo helps fleet managers, technicians and drivers understand the nuances of using natural gas as a transportation fuel. He has worked for dozens of clients to assist them in solving technical and design problems that could not/would not be solved by equipment manufacturers. In addition, he has assisted customers in designing and specifying fueling stations and working with them through the proposal selection and construction processes to make sure the stations meet their needs.

NGV Maintenance Facilities Modification Requirements

Vehicle maintenance facilities where natural gas vehicles are serviced must be modified or constructed to conform to safety requirements related to the unique properties of natural gas. These modifications must meet the basic safety requirements, but do not need to be expensive.

Existing vehicle maintenance facilities are constructed to ensure safety when dealing with liquid fuels which, when leaked, pool on the ground. Natural gas, on the other hand, rises in the event of a leak because it is lighter than air. This primary difference is the principle behind the requirements for NGV maintenance facility modifications.

While there are others, the National Fire Protection Association (NFPA) is the overarching organization responsible for the codes that govern NGV maintenance facilities. The codes must be applied based on the unique characteristics of each facility. Regardless of whether an existing facility is being modified for NGV maintenance, or a new facility is being constructed, there are three primary considerations.

Ventilation

In a maintenance facility designed for liquid fueled vehicles, NFPA defines the area from the floor to 18" above the floor as a Class 1 Division 2 Group D area. In these facilities, ventilation air is introduced at a higher level and exhausted in the lower 18" area inside the facility.

Because natural gas is lighter than air, NFPA defines the Class 1 Division 2 Group D area in NGV maintenance facilities as the area extending from the ceiling down 18". In these facilities, air must be introduced lower and exhausted at the ceiling.

Measures or equipment to ensure appropriate ventilation for NGV maintenance include:

- Methane detectors
- Modified HVAC Systems
- Supplemental exhaust system
- Appropriate exhaust fan(s) over the vehicle maintenance bays where NGVs will be maintained.

Heating System

In a facility where NGVs will be maintained, NFPA codes indicate that open flame heaters are not allowed within the 18" cavity. NFPA further indicates that if an open flame heater is mounted below 18" from the ceiling, it is considered to be located in a general purpose area and is allowed. However, best practices recommend that NGVs never be parked below any open flame heater area under any circumstances.

To meet the code requirements for heating systems in NGV maintenance facilities, sealed combustion, catalytic or infrared heaters with a skin temperature below 800 degrees Fahrenheit may be used. The ignition temperature of natural gas is 1080 degrees Fahrenheit—which allows these heaters to operate safely.

Potential Ignition Sources, Including Lighting and General Electrical Equipment

No potential source of ignition that could create an arc or spark that would ignite natural gas should be located 18” from the ceiling or higher in an NGV maintenance facility. This includes lighting systems. Special lighting systems can be used, or traditional lighting can be pendant mounted below the 18” cavity from the ceiling.

General electrical equipment also should not be located within the 18” space below the ceiling. For example, motors that operate roll up electrical doors that are located in that 18” space must either be relocated or must be Class 1 Division 2 Group D rated.

NGVi Options

NGVi offers training and consulting services on natural gas as a transportation fuel.

- **Vehicle Maintenance Facility Safety Evaluation and Required Modifications for Natural Gas Vehicles**

NGVi can ensure your vehicle maintenance facility that is used to maintain natural gas vehicles meets or exceeds National Fire Protection Association (NFPA) safety codes and industry standards through a maintenance facility site visit. Following the visit, NGVi will provide a written report detailing the modifications needed to safely accommodate vehicles with compressed natural gas fuel on-board.

- **Driver & Mechanic Safety Training for CNG Powered Vehicles**

You will receive detailed training on the safe operation of dispensing equipment and safety systems located at the fueling station and on vehicles. Mechanics receive in-depth instruction regarding safe maintenance practices, fire safety systems located at the maintenance facility, the fueling station and on NGVs, as well as safe operation of natural gas dispensing equipment.

For more information about these and other consulting services, contact Leo Thomason at 702-254-4180 or via email at info@ngvi.com.

Helpful Links

National Fire Protection Association (NFPA)
<http://www.nfpa.org/index.asp>