

# Advanced Natural Gas Vehicle Training

## **Module 1: Safety Review**

### **Lesson 1: Physical Properties of Natural Gas**

**Lecture: 30 Minutes**

**Lab: None**

### **Classroom Instructional Objectives:**

Upon completion of this unit of instruction the student will be able to:

- Describe the physical properties of natural gas.
- State the purpose of adding odorant to natural gas.
- Compare and contrast the state of natural gas at 100 degrees, 50 degrees, and -280 degrees Fahrenheit.
- Describe the relationship between pressure, temperature and volume of natural gas.
- Compare and contrast the specific gravity and relative density of natural gas, gasoline, diesel, and methanol.
- Compare and contrast the upper and lower limits of flammability between natural gas, gasoline, and diesel.
- Identify the stoichiometric air/fuel ratio of natural gas by weight.
- State four health effects of natural gas.

### **Key Classroom Points:**

- Explain the physical properties of natural gas.
- State the importance of adding mercaptan to natural gas.
- Explain how over-exposure to mercaptan can lead to desensitization to mercaptan odor.
- Provide specific examples of the state of natural gas at different temperatures and pressures.
- Explain the difference in density between natural gas, gasoline, methanol, and diesel.
- Explain the upper and lower limits of flammability between natural gas, gasoline, methanol, and diesel.

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- Explain the relationship between temperature, pressure, and volume of natural gas.
- Explain the health effects of natural gas
- Introduce Boyles, Charles, and the ideal gas laws.

## **Lab Skill Objectives:**

Upon completion of this unit of instruction the student will be able to:

- None

## **Key Lab Points:**

- None

## **Classroom Materials:**

- Attendance sheet
- Power Point Presentation CD
- Lap-top
- Projector
- Instructor's guide
- White board marking pens
- Projection screen

## **Handouts:**

- Power Point slide materials

Instructor's notes:

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