Cab Comfort Units Reduce Idling of Heavy-Duty Trucks & Buses

ENERGY EFFICIENCY AND RENEWABLE ENERGY

OFFICE OF TRANSPORTATION TECHNOLOGIES

Transportation

FOR THE 21ST CENTURY

Background

Throughout the United States, it is customary for freight haulers to idle the engines of their heavy-duty trucks for climate control (heating and cooling) while they are sleeping or resting on long-distance runs. This idling reduces fuel economy, increases vehicle maintenance costs, increases emissions, and leads to a negative image of the trucking industry. Although 15 states now have anti-idling regulations, it is estimated that diesel truck and bus idling wastes 600 million gallons of fuel and produces significant levels of emissions (see box at right). Fortunately, many of these problems can be solved without sacrificing driver comfort by using cost-effective, environmentally friendly cab comfort units, which eliminate the need for long-term idling.

The Analysis

The U.S. Department of Energy (DOE) commissioned Argonne National Laboratory (ANL) to complete an independent analysis on the energy and environmental effects of truck idling. ANL concluded that each hour a cab comfort unit is used saves about 1 gallon of fuel because it is about 5 times as efficient as a large idling diesel engine. Use of the cab comfort unit also extends the life of the engine and increases the mileage between oil changes. In any given year, it is not uncommon for long-haul truck drivers to travel 150,000 miles and to idle for about 1800 hours. Depending on the fuel consumption rate, idling the heavy vehicle costs about $1.25 per hour in fuel use, $0.07 in preventive maintenance (oil changes) costs and another $0.07 in overhaul costs. A cab comfort unit would therefore save about $1.15 per hour of idling. This represents a savings of about $2,100 annually.

Commercialization

ANL's analysis has led the DOE Office of Heavy Vehicle Technologies to team with manufacturers, heavy vehicle manufacturers, and trade associations to increase the use of cab comfort units to reduce idling emissions, decrease petroleum use, and increase the profit margins for truckers. While still in a nascent phase, these efforts have ascertained that cab comfort units are efficient, inexpensive to operate, and widely available. These units can enhance driver comfort and convenience while reducing average annual fuel and maintenance costs by $2,100 per truck. This leads to a payback period of approximately between 1.5 and 3 years based on purchase costs ranging from $2,800 to $7,000. Additionally, the cab comfort unit provides a back-up alternator and air conditioner compressor for emergencies. Truckers have found they are hassle-free to install, weighing only 300 pounds and occupying 24 inches of frame rail space.

Benefits

- **Increase fuel economy by up to 0.5 mpg**
- **Reduce emissions by up to 30%**
- **Save $1,800 in diesel fuel costs per vehicle per year**
- **Extends oil changes and engine overhauls**

Every Year, Idling Diesel Trucks and Buses Emit:

- **10.4 million tons of Carbon Dioxide**
- **59,000 tons of Nitrogen Oxides**
- **97,000 tons of Carbon Monoxide**

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