



City of Portland Green Purchasing Case Study

Diesel Coolant Heaters

Purchasing Green

From 2009 to 2011, CityFleet installed 149 Espar coolant heaters in medium and heavy duty diesel vehicles such as service trucks, dump trucks, sewer cleaning trucks, and utility trucks. Most diesel engines require 30-60 minutes of idling to warm up the engine prior to usage. Coolant heaters, however, work independently of the engine.

Instead, they use the coolant system to warm the engine. The generated heat is also circulated through the vehicle's air vents as forced hot air, warming the passenger cab. The coolant heaters are equipped with internal electronic controls that can be set to an ambient temperature and programmed to turn on or off based on temperature, time of day, day of the week, or any combination of these factors. CityFleet installed the coolant heaters to reduce excessive vehicle idling times at the start of a worker's shift, on the job site, and during snow and ice events.

CityFleet is so satisfied with the heaters that they now require all purchases of one-ton vehicles and mid-to-heavy duty trucks to be installed with coolant heaters, and have added an additional 121 heaters to the fleet since 2011.

Benefits

Coolant heaters reduce fuel consumption associated with engine starts. Diesel engines equipped with these heaters use 0.2 gallons of fuel to start the engine, while diesel engines without the heaters use 1-3 gallons of fuel per hour of warm-up idling. Additionally, because coolant heaters eliminate unnecessary idling and allow the engine to warm prior to starting, they reduce wear and tear on the engine.

Employees benefit as well. Due to safety concerns, workers are not permitted to stand on the front tire to remove snow and ice on windows and windshields. Therefore, drivers had to wait for the cab's defrosters to melt it off. Now, radiant heat from the coolant heaters keeps cabs warm, preventing snow and ice from building up on the glass.

Since engines do not have to be left idling all day at job sites to keep cabs warm, coolant heaters significantly improve air quality. The coolant heaters create nearly instantaneous warmth during breaks on cold days. The heaters automatically kick on whenever the engine temperature drops below a certain threshold specified by the user. The coolant heaters then shut off when the correct temperature is reached.



A diesel coolant heater warms a vehicle's engine prior to starting, reducing idling time.

At a glance –

Who –

- CityFleet

Product –

- Espar diesel coolant heaters

Cost –

- \$3,000-\$6,000

Benefits –

- Saves fuel
- Improves air quality
- Improves employee safety & comfort
- Reduces engine wear & tear

“We believe in taking care of our employees and our equipment. The coolant heaters do both.”

Don DePiero,
Vehicle Maintenance Superintendent,
CityFleet

Cost

Although each heater costs \$3,000–\$6,000 to add to an engine, they are not as cost prohibitive as other technologies, and pay for themselves in a relatively short period of time in saved fuel costs. CityFleet fully funded the initial installation of diesel coolant heaters through grants from the U.S. Environmental Protection Agency (EPA), American Recovery and Reinvestment Act (ARRA), Oregon Business Energy Tax Credits (BETC), and Diesel Emission Reduction Act (DERA). Today, diesel coolant heaters are required as part of the technical specifications for new heavy duty vehicles. The new vehicle manufacturer does not offer the diesel coolant heaters as an option, so the City pays to have the vehicle “upfitted” after the vehicle is built. The cost to purchase the vehicle new with the heaters, or retrofit after the fact, is essentially the same.

Performance

CityFleet finds that the coolant heaters significantly improve the vehicles’ fuel mileage. CityFleet examined fuel usage of 11 vehicles that were retrofitted with the coolant heaters. When comparing fuel usage during a two-year period prior to installation (2007-2009) to the two years of fuel usage after the retrofit (2011-2013), they discovered a 7 percent increase in fuel mileage for those vehicles.

Lessons Learned

The coolant heater timers are difficult to reprogram after installation. Therefore, CityFleet recommends working with drivers before installing the heaters to determine the operating parameters that best meet everyone’s needs. Knowing the best timing prior to installation saves a lot of time and effort.

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About CityFleet

CityFleet’s seven repair facilities maintain Portland’s 3,150 vehicles and equipment. This includes parking patrol vehicles, sedans, pick-ups, vans, police sedans, dump trucks, back hoes, and heavy construction equipment. They perform oil, lube, and filter changes; DEQ emission inspections; and engine, transmission, drive train, electrical, suspension, heating, cooling, and air conditioning diagnoses and repairs. CityFleet garages are also certified Eco-Biz Automotive Shops, a designation that recognizes their commitment to minimizing their environmental impacts. CityFleet was also named one of the Top Elite Fleets by Government Fleet Magazine from 2011-2016, after being named the number one fleet in 2010. In 2015 CityFleet became a GFMA Certified Management Operation and Clean Fleet Certified. As a result, CityFleet was the first government fleet in North America to obtain a Master Certification.

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