

According to the U.S. EPA, the transportation sector consumes approximately 28% of all end-use energy in the United States. Substantially improving vehicle efficiency has the potential to drastically increase the country's economic, energy, and environmental security. On-road vehicles account for nearly 60% of total U.S. oil consumption and more than a quarter of the country's greenhouse gas emissions, the major contributor to climate change. Vehicles that utilize efficiency technologies (i.e., emissions reduction, idle reduction, and drivetrain efficiency) while running on lower carbon-emitting fuels are critical to meeting energy goals and has the potential to provide significant return on investment.

Improving Vehicle Efficiency

Continuous research and development on vehicle technologies not only drives innovation while lowering technology costs which accelerates clean technology deployment, but it also reduces the U.S.'s dependence on oil, strengthens the country's economy, and protects the environment. Some vehicle efficiency technologies that reduce dependence on foreign oil are included below.

Hybrid and alternative fuel vehicles: Hybrid-electric, plug-in hybrid-electric vehicles, and battery electric vehicles can significantly improve fuel economy and displace petroleum. Researchers are making batteries more affordable and recyclable while enhancing battery range, performance, and life. The use of various alternative fuels to replace conventional gas and diesel not only helps the U.S. conserve fuel and lower vehicle emissions but offers an economical and environmental benefit for vehicle owners.

Reducing vehicle weight: Directly improves vehicle efficiency and fuel economy and can potentially reduce vehicle operating costs. Cost-effective, lightweight, high-strength materials can significantly reduce vehicle weight without compromising safety.

Improved combustion technologies and optimized fuel systems: Combustion engine research focuses on improving new combustion strategies that can greatly improve engine efficiency and

minimize the emissions formation in the engine itself. Direct fuel injection, when fuel is injected directly into the cylinder barrel, provides more efficient combustion than when fuel and air are mixed outside the cylinder.

Idle Reduction

Idle reduction describes technologies and practices that reduce the amount of time an engine idles. Idling wastes fuel and increases engine wear, so small changes in idling time can lead to noticeable benefits including cost savings, less pollution, and reduced noise.



Light-Duty Vehicle Idle Reduction Strategies

Light-duty vehicles include passenger cars and fleet vehicles, such as police cruisers, livery vehicles, and taxis. For vehicles that must stand for long periods, below are technologies that serve as good alternatives to idling.

- * **Auxiliary Power Systems** – These provide heating, cooling, and electronic device power without running the vehicle's engine. These systems are useful for police vehicles which require power for communications, emergency lighting, and HVAC while stopped.
- * **Air Heaters** – Although they operate on engine fuel, air heaters are separate, self-contained units that blow hot air directly into the vehicle interior and use very little fuel.
- * **Automatic Power Management Systems** – Power management systems allow the driver to turn off the vehicle engine and use battery power to run a vehicle's HVAC. The systems monitor battery power levels while the engine is off, and accessories powered by electricity are on.
- * **Waste-Heat Recovery Systems** – This system uses the vehicle's heat-transfer system in which a small electric pump is connected to the water loop and keeps the vehicle's cooling system and heater operating after the engine is turned off by using engine heat that would otherwise dissipate.

Idle Reduction Benefits

Reducing vehicle idling time saves fuel and money, cuts harmful emissions, and increases U.S. energy security. Decreasing idle time can also reduce engine wear and associated maintenance costs.

- *Saving fuel and money
- *Cutting harmful emissions
- *Increasing energy security
- Complying with laws and ordinances

Anti-Idle Technology for Better Fleet Performance: GRIP Idle Management System

The GRIP Idle Management System is a plug-and-play technology that identifies, analyzes and reduces vehicle idling time, fuel consumption, and emissions while providing operator safety, comfort, and convenience. The system can collect data that is unavailable through normal vehicle operation and telematics. Visit www.gripidlemanagement.com for more information.

System Features

- * **Easy Vehicle Selection** – Users can easily choose from a list of standard applications and apply them to their GRIP System Configuration and the fleet vehicle's make, model, year, engine, displacement, fuel type, turbo, and more.
- * **Optional Configurations** – Users have the option to configure the anti-theft function, automatic climate control, auxiliary heater engine boost, auxiliary heater control, battery monitoring, and humidity control.
- * **Engine Start Options** – Users can configure different engine start options such as driver-door engine start, air pressure engine start, seatbelt engine start, and hydraulic temperature.
- * **Climate Control** – The GRIP System can maintain both a cool and war climate in the cab and rear of the vehicle by monitoring internal and external temperature and controlling the vehicle's heater.

Benefits of GRIP Idle Management Anti-Idle System

- * **Capture Data:** Fleets can better understand when and why their fleet is idling, identify what functions the GRIP system is performing throughout their fleet, and report entire fleet savings from using the system.
- * **ROI-Focused:** Most GRIP users see a full return on investment in 6-24 months using the GRIP System and the GRIP system continues to reap financial gains throughout the entire life of the system.
- * **Fully Customizable:** Fleets can tailor their GRIP System functionality by addressing unique idling requirements, control specific auxiliary functions, and get a full data-view of their custom functions.



The Grip Controller Screen



GRIP Idle Management Idle Data & Analytics

Discover when your fleet is idling: The GRIP Idle Management System provides a full view of a user's fleet idling behavior. This includes the amount of time fleet vehicles are idling, how much fuel is being consumed (and the associative costs), the amount of engine hours, and much more.

Understand why your fleet is idling: The GRIP Idle Management System identifies why a user's fleet is idling – whether it is in park, neutral, or with the emergency brake applied. Users will also learn valuable information about their fleet idling habits and how that impacts their bottom line.

Savings: With the GRIP Idle Management System, users get a detailed view of their savings. This includes fuel consumed and associated fuel costs, engine hours/wear and tear, amount of CO2 emissions, and much more.

FOR MORE INFORMATION, PLEASE CONTACT:

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