PHOTO: XANTREX

IDLE TIPS FOR

EIGHT TIPS ARE SHARED TO HELP MITIGATE IDLING AND REDUCE FUEL SPEND IN MODERN WORK TRUCK FLEETS.

BY SHELLEY MIKA

As record-high fuel costs threaten to annihilate even the most thoughtfully planned budgets, many fleets look for ways to reduce fuel consumption or cut other costs to compensate. Reducing idling does both.

When an engine idles, fuel economy drops to zero. Most light and medium truck engines burn between 0.6 and 1.2 gallons of fuel per hour when idling. Reducing idling can significantly reduce wasted fuel — and with fuel prices ringing in at around $6 per gallon, the associated savings can add up quickly.

That's not all idle reduction efforts do. Reducing idling also minimizes vehicle wear and tear, extends the vehicle's life, and reduces total cost of ownership (TCO). So putting new idle reduction tactics in place can have the ripple effects fleets need in the current economy.

These tips can help fleets make the most of the latest technology to whittle down idling more than ever before, even for assets that require idling.

TIP 1 MICRO-HYBRIDIZE

Work trucks are unique; some must idle to get the job done.

"For work trucks, idling means access to power and, often, comfort. Because workers need significant power at job sites, many work trucks spend about 70% or more of their time idling," said Jack Johnson, CTO and co-founder of Volta Power Systems. "If we can eliminate idling entirely, we can virtually eliminate up to 70% of fuel costs — sometimes even more — for vehicles spending most of their time doing stationary work."

Johnson said using an auxiliary system to power tools and equipment can significantly reduce or even eliminate idling.

Micro-hybridization is one such solution. With these systems, a secondary alternator under the hood converts the main engine's waste energy from driving into usable energy. This energy can then be stored in power packs and used to power tools and equipment when the engine is off.

"These systems can use stored energy to run all necessary auxiliary power loads. Completely separate from the drivetrain, operators can use the power for booms, power tools, cabin A/C, and more without idling the vehicle's engine," Johnson explained. "We call this micro hybridization because it takes over the power demand for all traditional idle power loads including A/C, hydraulics, lighting, onsite power, and more."

Johnson said Volta's power systems could charge from a standard electrical 120V or 240V outlet without requiring specialized EV charging infrastructure. They can also be integrated into new vehicle purchases or retrofitted into older fleet vehicles as a long-term anti-idling solution.

"Adding secondary power generation to an engine doesn't have much impact, if any, on fuel economy," Jackson said. "Most engines don't operate on their efficiency curve, which is why many work trucks

REDUCTION: TODAY'S WORK TRUCK FLEETS

have the same fuel economy regardless of if they're loaded or unloaded. By adding power generation, though, they can capture energy normally lost in a traditional large displacement vehicle."

After Volta Power Systems customer Oklahoma Gas & Electric ran a successful micro-hybridization pilot, the utility provider micro-hybridized 14 utility fleet vehicles. Now, each hybrid auxiliary power system provides 12,500-watt hours of energy on a single charge, enough to run hydraulic lifts, power tools, and 120/240V worksite power — often for an entire shift — without idling.

Using conservative runtime estimates of eight hours per day per vehicle, these systems look to yield annual savings of approximately $275,800 in fuel and maintenance costs. It also reduces CO_2 emissions by about 587,000 lbs.

"Simply put, if the engine doesn't run, it isn't burning fuel," Johnson said.

The Xantrex Freedom eGEN is another solution to micro-hybridize a work truck. This system pairs a lithium-ion battery bank, inverter/charger, and a secondary alternator specifically designed to charge lithium-ion batteries in RVs and work trucks.

Tread Connection, a mobile tire service company, swapped its generator for Freedom eGEN because it was noisy, took up space, and ran on fuel. Now, the company uses the Freedom eGEN to power the tools necessary to service customers because it is smaller, quieter, and doesn't require gas to operate.

TIP 2 LEVERAGE AN IDLE MITIGATION SYSTEM WITH ENERGY STORAGE

Idle mitigation systems pair an automatic engine start/stop kit with a Stealth Energy Module (SEM) for energy storage; they are modular and can be configured to fit just about anywhere in a truck.

An example of this automatic idle reduction technology and power is Stealth Power's Vehicle Power System, which is often installed under a seat. When the vehicle is in park with the engine running for a predetermined time (typically two minutes), the system automatically stops the engine, thereby eliminating unnecessary idling. At the same time, the Stealth Energy Modules power all vehicle equipment and auxiliary loads with the engine off. The system turns on and off to provide continuous power, recharging off the vehicle's alternator, solar panels, or plug-in shoreline power.

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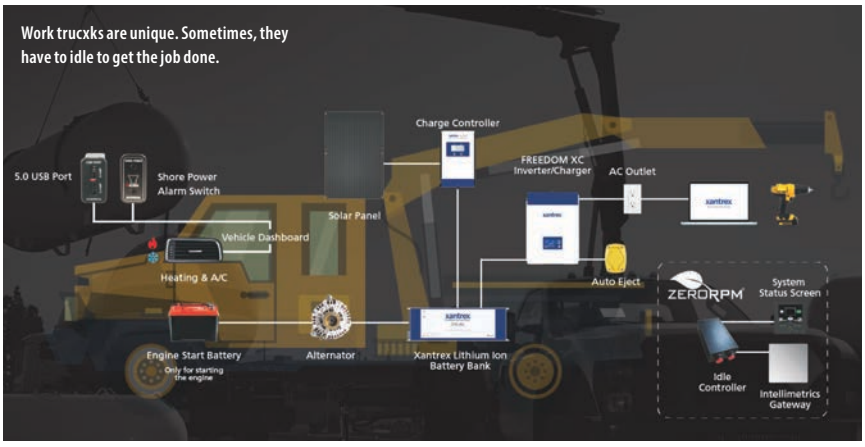
"Fleets that have high idle times can employ several strategies that focus on reduced idling. These strategies range from manual actions by operators to advanced technologies that remove the burden on those operators," said Stealth Power COO Shannon Sentell, Ph.D. "Automatic idle reduction technologies focus on optimizing the engine run time to support auxiliary energy sources while the engine is off. This is the most successful strategy, as it focuses on operator comfort while automatically controlling the stopping and starting of the engine."

The Stealth System is "modular" because fleets have the option to add functionality to the core solution. For instance, energy modules can be sized and configured per vehicle needs, fleets can opt for scalable AC power, an auxiliary hydronic heater, an auxiliary DC-powered compressor for cooling, or a solar kit that serves as an additional charging source.

"These advanced energy storage systems are modular, scalable, and can provide all OEM direct current power and integrate with inverters for alternating current power



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for various power tools and applications," Sentell said. "Scalable energy storage systems do the work of the engine while the vehicle is stationary, including auxiliary power tools and climate control systems."

Sentell said fleets with high idle times could save up to 70% of their idling fuel costs by implementing advanced idle reduction technologies. These savings vary by truck type due to several factors, including the engine size, auxiliary power requirements, and geography-based climate control needs. Maintenance savings factor into the equation, too, including "ghost miles," which represent the hypothetical distance the vehicle would have driven in the same amount of time that the vehicle idled.

"Every minute the engine is off, it provides direct savings in fuel and maintenance costs," Sentell said. "Heavy-duty work vehicles can burn more than 1.25 gallons per hour when sitting idle and accumulate over 30 ghost miles that increase the maintenance cost and frequency of service."

One Stealth customer with a fleet of 400 vehicles employed 24 hours per day, every day of the year, saw significant savings by using advanced idle reduction technology. So far, the customer has reduced overall engine time by approximately 30%. This 30% reduction in their fuel and maintenance use leads to a daily savings of $19,430 (at $5.30 per gallon for diesel) during normal operations, allowing them to achieve an ROI in 13 months.

TIP 3 REPLACE GENERATORS WITH A LITHIUM-ION BATTERY PACK

Another way trucks can avoid using engine power or a gas-powered generator to operate tools and equipment is to equip them with a lithium-ion battery bank.

"One of the easier ways work truck fleets can reduce idling and generator use is to have a dedicated lithium-ion battery pack," said Mitul Chandrani, Vice President, Marketing, Mission Critical Electronics. "The advancement of the technology allows fleets to have a power-dense battery box. A traditional truck battery is twice the weight of a lithium-ion battery, and only 50% of its capacity is used for power. But the Freedom eGEN lithium-ion battery offers twice the capacity in the same physical size of a traditional battery, puts out 100% power, and lasts 6-8 times longer."

A lithium power battery pack in conjunction with a power inverter can power everything from laptops, phone chargers, equipment, and onsite tools instead of powering these things from an idling truck.

"Many specialty vehicle manufacturers like Draxxon and Matthew Specialty vehicles install different versions of the Freedom eGEN system in their builds depending on application and power needs," Chandrani said.

"Lithium-ion batteries are safe, have come down in price, and pack a lot of power in a relatively small package,"

TIP 4 INTEGRATE LITHIUM ION CHARGING WITH THE VEHICLE'S ENGINE

Work truck fleets can take lithium-ion battery power one step further by integrating it with the vehicle's engine using Zero RPM's idle mitigation technology.

When trucks are equipped with Zero RPM, putting a truck in park will automatically shut off the engine, preventing idling. The engine can then be turned back on to charge the lithium-ion battery power bank at the system's heart. Even though the engine is off, electronics, AC, and other electrical will continue to operate as if the engine is one.

"Zero RPM integrates with the vehicle so that when batteries are extremely low, the engine will turn on to charge the battery — it's an automatic integration," Chandrani said. "That means the work truck can be turned off completely, whether someone is working in or out of work truck, they have power when they need it. It's zero emissions power anytime, anywhere."

The City of Memphis Fire Department opted to use ZeroRPM on its 12-unit ambulance fleet to reduce fuel consumption and emissions. This has reduced idle time by 68-69% and saved the fleet $6,000-$7,000 per truck in annual fuel costs. The fleet also reduced engine maintenance by 30% due to reduced engine hours, which totaled another $1,500-$2,000 in savings.

Jonathan Haley, Lieutenant, City of Memphis FD, said fleets can offset the initial costs through grant funding but should expect to see a positive ROI either way. With the current fuel prices, ROI is currently two years on ZeroRPM. The fleet is now looking to install the system on its fire trucks.

Using ZeroRPM's telemetrics solution, fleets can see how much idling is reduced, how many engine hours and gallons of gas are saved, CO_2 emission reduction on one dashboard. These data can be viewed for a single truck or across the fleet.

"Idle mitigation systems have become very attractive to fleets now that fuel has reached record prices," Chandrani said. "When investing dollars, it's very powerful to see the payback."

TIP 5 ADD SOLAR POWER INTO THE MIX

Although solar panels can't directly power tools and equipment, they can be used to charge a battery.

"It's free energy from the sun," Chandrani said. "Even if it adds 5 or 10% to overall available capacity for the power, it's still extra power."

Solar panels provide continuous trickle charging to batteries when sun is available, which helps extend battery life. The