Idling Reduction for Emergency and Other Service Vehicles

Emergency vehicles, such as police cars, ambulances, and fire trucks, along with other service vehicles such as armored cars, are often exempt from laws that limit engine idling. However, these vehicles can save fuel and reduce emissions with technologies that allow them to perform vital services without idling.

Police Vehicles

Police cruisers spend much of their time parked and running while officers monitor traffic, help at accident scenes, write reports, and wait to be called. Officers commonly require lights, radios, computers, radar, and video cameras.

In one recent report about police vehicle fuel consumption, the cruiser studied was found to idle 60% of the time during normal operation and used 21% of its total fuel while parked.[1] While the engine provided 250 horsepower (hp), together all of the accessories needed less than 2 hp. (Air conditioning consumed the most power, followed by external lighting.)

Several idling-reduction systems, with varying capabilities and costs, are available for police vehicles. Power-management systems may significantly reduce (but not eliminate) idling. They allow the vehicle's battery to power auxiliaries in engine-off mode and monitor the battery's state-of-charge. When the battery charge falls below a preset threshold, the system restarts the vehicle's engine to recharge the battery.

Another option is a heat-recovery device, which uses a small pump to circulate coolant from the warmed engine, providing heat to the passenger compartment after the engine has been turned off.

Battery auxiliary power units (APUs) are another option for police vehicles. These units store power when the engine is running and supply it to the vehicle's electrical devices for 4 hours or more when the engine is off.

Police vehicle auxiliaries can be powered by a battery pack that fits in the trunk. *Used with permission of ZeroRPM, Inc.*

Ambulances

Ambulance engines are idled to maintain lighting, communications equipment, computers, refrigeration for medication, and life-support equipment, as well as the vehicle's heating and cooling systems. Idling these diesel engines outside hospital emergency rooms while the drivers complete paperwork and await their next call not only wastes fuel but produces significant air pollution that can exacerbate respiratory or cardiovascular problems in sensitive populations.

On-board battery-powered APUs that can supply power for all needed functions are available for ambulances. Drivers can plug in the APU to charge at the hospital, or the vehicle engine can charge it while the ambulance is being driven. Solar panels can be installed on the roof to provide additional power. Stationary systems can be installed near the emergency room to enable ambulances to plug in for power and receive conditioned air through a window duct.

Ambulance hooked up to a MediDock, which provides power and conditioned air. *Used with permission of American Idle Reduction, LLC.*

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Fire Engines and Trucks

Only about 20% of fire dispatch calls are for fires; most are for medical emergencies or accidents. For any call, the vehicle is often idled to provide power for emergency lights and other accessories. Both battery-powered and diesel APUs can reduce fuel use, emissions, and noise for nonfire calls. These APUs, which can be factory-installed or installed as a retrofit, can supply power for all services, except for water pumping, which requires additional power.

Armored Cars

Armored cars make frequent stops for pickups and deliveries. Because the vehicles cannot be left unattended and the windows do not open, drivers generally leave the engine idling at stops to provide climate control. Battery-powered air-conditioning systems are available as an alternative to idling.

Power Sources Available for Stationary Emergency and Other Service Vehicles

Vehicle	Power Source	Services	Fuel Use* gal/h	Typical Equipment Cost ($)	Added Maintenance ($/yr)	Payback (yr)
Police Car	Idling[1]	All	0.5–1.0	0	350	
	Power Management System[1]	**Restarts engine if battery low**	**0.02–0.38**	**1,200**	**0**	**0.2**
	Heat Recovery System[2]	**Heat**	**0**	**700**	**0**	**0.1**
	Battery APU[3]	**Power**	**0.6**	**3,300–4,300**	**0**	**0.6**
Fire Truck/ Engine	Idling[4,5]	All	1.25–1.5	0	600	
	Diesel APU[4,5]	**All but pumping**	**0.25**	**14,000**	**200**	**2.9**
Ambulance	Idling[6]	All	1.5	0	1,000+	
	Battery Power Pack[7]	**All**	**0.9**	**16,000**	**0**	**2–8**
	Electrified Parking Space[8]**	**All**	**0**	**0**	**30**	**2.5**
Armored Car	Idling[9]	All	0.5–1.5	0	200	
	Battery APU[9]	**All**	**0.4**	**15,000**	**0**	**3.8**

APU = auxiliary power unit; gal = gallon(s); h = hour(s); IR = idle reduction; yr = year(s).

** Fuel use is lowest for low idle with no accessories on and rises with RPM and load.*

*** Infrastructure cost per space is ~$17,500.*

1. Eric Rask, et al., Argonne National Laboratory, *Final Report: Police Cruiser Fuel Consumption Characterization,* for the Illinois State Toll Highway Authority (February 2013).
2. Mike Trickey, Autotherm, personal communication with L. Gaines (5/6/2014).
3. Bastien Buchaca, Stealth Power, LLC, personal communication with P. Weikersheimer (11/25/2014).
4. GreenStar, *http://www.rosenbaueramerica.com/green_star* (accessed 11/6/2014).
5. Neil Chaney, Rosenbauer America, personal communication with L. Gaines (6/10/2014).
6. Power Pack Aims to Reduce Engine Idling, *American City & County*, October 19, 2012, *http://americancityandcounty.com/fleets-content/power-pack-aims-reduce-engine-idling-related-video* (accessed 1/05/2015).
7. Bastien Buchaca, Stealth Power, LLC, personal communication with L. Gaines (11/20/2014).
8. Medic Aire, LLC, letter to Community Hospital, Munster, Indiana, quote no. 313113 (10/31/2013).
9. Garet Ford, Griffin, Inc., personal communication with L. Gaines (5/15/2014).

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