



We Dare To Do It Different

## Case Study

### WILLIS AUXILARY POWER SYSTEMS

#### Product Developers

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## About Product:

Auxiliary Power System is a power unit designed for class 7 and 8 diesel trucks that would permit the main engine to be shut down and yet provide all the necessary power for driver's comfort. Now utilizing this power unit, drivers can shut down their main diesel engine and can still have an operation of appliances, battery charging, maintain engine block temperature to prevent problems associated with "Cold Starts" and can keep the diesel fuel at recommended temperatures to prevent gelling.

**Background:** Today's transportation of goods throughout the USA is largely accomplished by Class 7 and 8 diesel trucks (18 wheelers) that for driver safety and per state and federal regulations must stop to permit the driver to rest usually 10 hours after each 10-hour driving segment. Common practice during these 'rest stops' is to keep the main diesel engine running at idle to provide power for the driver's comfort (air conditioning and heating), operation of appliances, battery charging, maintain engine block temperatures to prevent problems associated with 'cold starts' and to keep the diesel fuel at recommended temperature to prevent 'gelling' when the ambient temperature is too cold or freezing.

**Problem:** Diesel engines are least efficient when operating at idle consuming more fuel and emitting higher levels of pollution; (e.g. NOx, Particulate Matter, CO<sub>2</sub>, CO, and Volatile Organic Compounds). Long duration idling of diesel engines wastes over 1 billion gallons/year of diesel fuel not to mention additional wear and tear on the engine itself.

**Solution:** There is an on-going national effort to reduce diesel idling to conserve limited fuel supplies and reduce idling emissions to protect human health and the environment. GID designed and built a completely functional prototype APU (Auxiliary Power Unit) ready for installation on Class 7 & 8 tractors that would permit the main engine to be shut down and yet provide all the necessary power for driver comfort, use of auxiliary equipment, and maintenance of required engine block and diesel fuel temperatures. The APU consumes 0.2 gal/hr. compared to the main engine at idle which consumes 0.8- 1.5 gal/hr. Also the APU provides significant emission reductions compared to the idling of the main engines which according to DOE estimates are responsible 7.6 million tons/yr. of CO<sub>2</sub>, 140,000 tons/yr. of NOx and 2,400 tons/yr. of CO. Particulate matter is completely eliminated via special filtration of the exhaust from the APU's small diesel power plant.



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## Product Features:

The Auxiliary Power System is highly fuel efficient and consumes only 0.2gal/hr. compared to the main engine at idle, which consume 0.8-1.5gal/hr. Also the APU provides significant emission reductions compared to the idling of the main engines which according to DOE estimates are responsible 7.6 million tons/yr. of CO<sub>2</sub>, 140,000 tons/yr. of NO<sub>x</sub> and 2,400 tons/yr. of CO. Particulate matter is completely eliminated via special filtration of the exhaust from the APU's small diesel power plant.