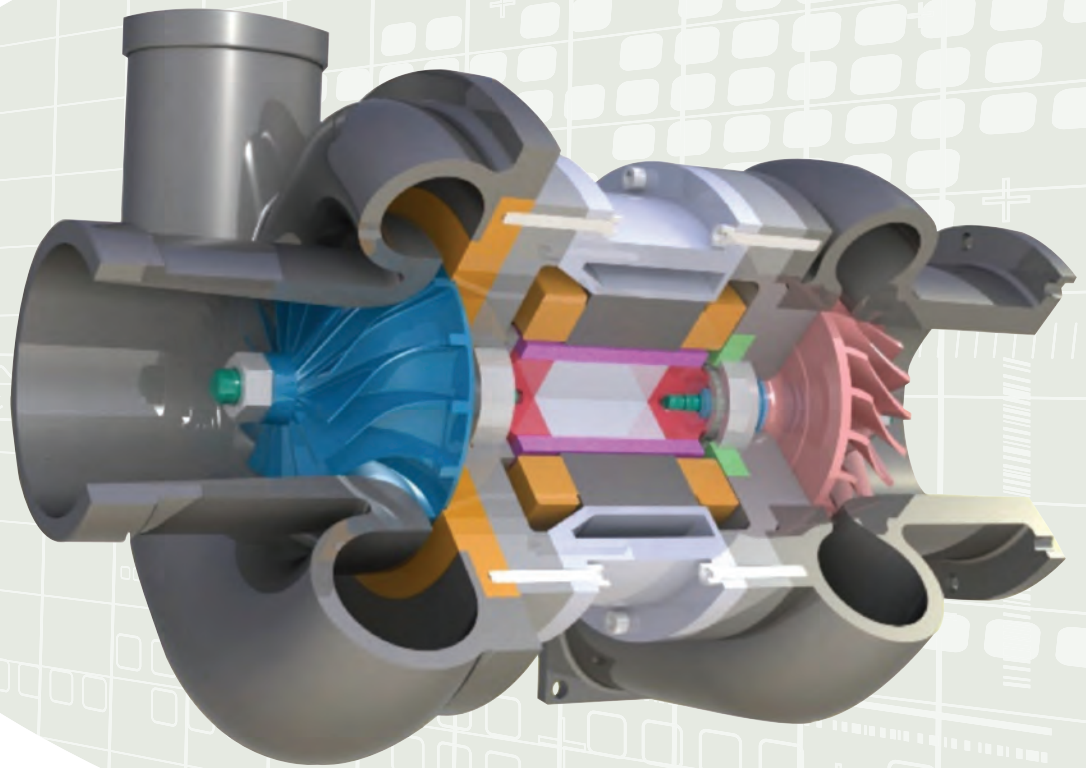




Innovation That Drives Industries™

Calnetix Advanced Power Systems With Magnaforce™ Motor Generator Technology For Internal Combustion Engines

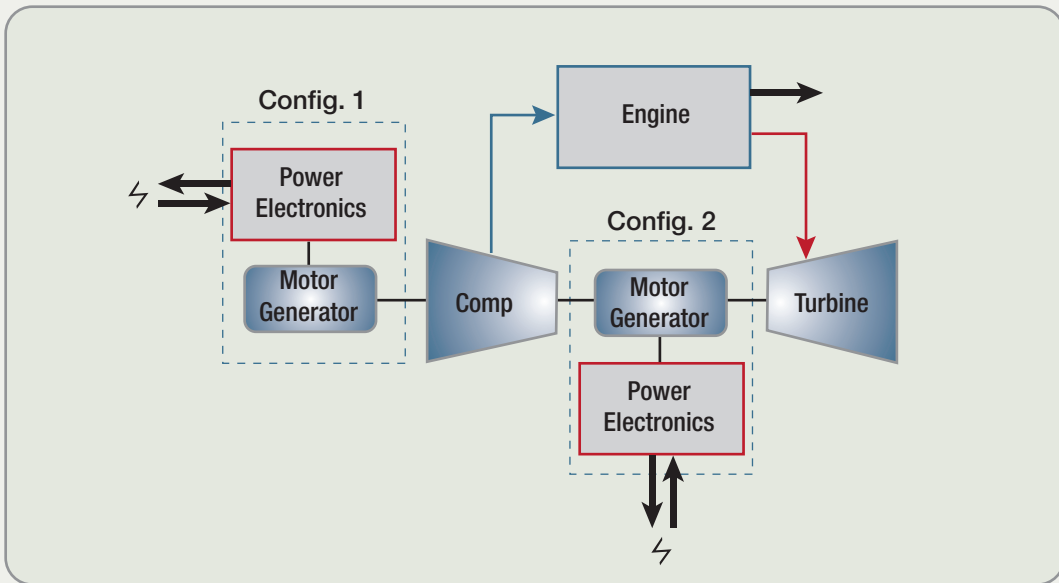
Get More Power and Performance from Your Engine under All Operating Conditions with Less Fuel and Emissions



Turbocharger Applications

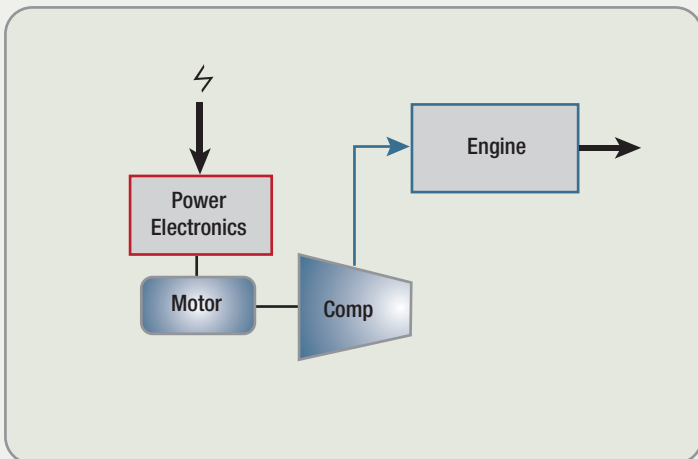
Calnetix Technologies' Advanced Power Systems enable the turbocharger to perform independently of the engine exhaust conditions. This means the compressor performance is decoupled from the exhaust turbine performance, and can therefore, provide the necessary air/fuel ratio for optimum engine performance under all load, speed, start/stop and ramp up conditions.

Turbocharger Motor Generator Assist - Also known as e-assist, turbo assist or turbo-generator. Directly coupled to the turbo shaft, the motor accelerates the turbo to maximum speed in a fraction of a second at startup and low-speed operation to create the necessary boost to optimize engine performance. When the turbocharger is at steady-state operation, the same motor can be used in generator mode to produce electrical power from the excess exhaust pressure.



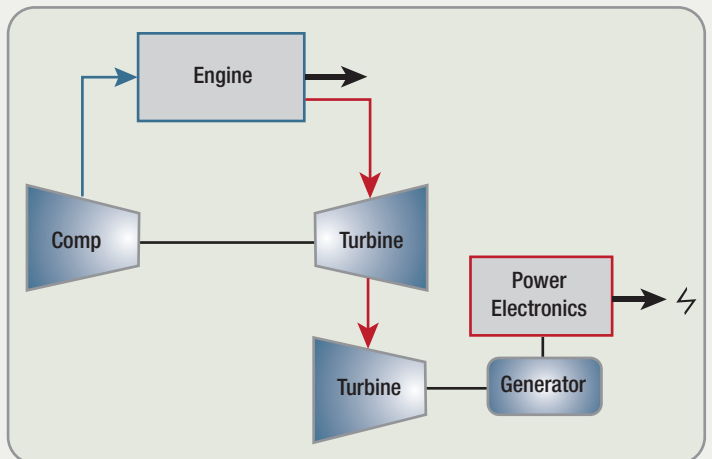
Supercharger Applications

Centrifugal Supercharger Motor - Also known as e-booster, e-charger or electric blower. Drives the compressor of an independent supercharger to create steady boost (and power) mostly during startup, transients and low-speed operation. The motor can be turned on and off as needed.



Compounder Applications

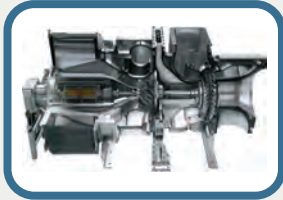
Turbocompounder Generator - Utilizes the waste energy exhaust stream downstream of the turbocharger, in most cases, to produce electric power via a standalone turbine generator configuration. The additional power produced is approximately 7 to 8 percent of the engine capacity.



Benefits Of Calnetix Advanced Power Systems

General

- » Optimal air/fuel ratio under any given engine condition for enhanced performance
- » Engine down-sizing technology for same power output
- » Electric power production from waste heat/pressure
- » No turbo-lag
- » Increased fuel economy
- » Reduced emissions
- » Compact, power dense footprint minimizes space required for motor generator systems
- » Low cost integration
- » Rapid payback



On-Road Applications

Calnetix has expertise in both mechanical and electrical system integration for diesel and gas engines. Our unique technology meets and exceeds the acceleration of smaller turbochargers, following engine load requirements in real time. Calnetix Advanced Power Systems also provide steady state electric power generation from waste heat/ pressure during continuous engine operation.



Motorsports / Hypercars

When it comes to harvesting energy or boosting performance, Calnetix has the leading edge, unsurpassed technology in the high-speed motor generator world. No industry demands more high-performance systems in the shortest amount of time than motorsports. Calnetix has successfully developed, manufactured and raced the most advanced energy recovery systems in the most demanding races in the world.



Off-Road Applications

For off-road applications, Calnetix Advanced Power Systems are all about savings. Our systems save valuable operating time and increase productivity by decreasing ramp up and ramp down time. They save operating costs by improving fuel efficiency, and they save local air quality by reducing harmful emissions and eliminating black smoke.



Marine

From engine exhaust pressure to jacket water heat to turbocharger scavenge air, there are numerous opportunities to generate electric power from wasted energy aboard marine vessels, and Calnetix can help do so efficiently and cost effectively. The power produced using any of Calnetix's generator systems, including its Hydrocurrent™ Organic Rankine Cycle (ORC) system, offsets the costs associated with running and maintaining the ship's auxiliary gensets. What's more, through motor assist, Calnetix can help improve engine performance (emissions/black smoke, fuel efficiency and life span, maintenance cycle), reduce engine maintenance, and eliminate the need for auxiliary blowers.



Locomotive

Less is more for locomotive engines using Magnaforce™ Advanced Power Systems. Our systems enable more power to be produced from a smaller engine using less fuel, making the train lighter, more efficient and compliant with stringent emission standards.



Power Generation

Calnetix Advanced Power Systems enable 7 to 8 percent more power to be produced from existing gensets or the same power to be produced from smaller gensets. The improvements in fuel efficiency help keep the engines cleaner, reducing emissions, including black smoke, and reducing maintenance costs.



About Calnetix Technologies

Calnetix provides innovative, high-performance solutions for rotating machinery, power generation and control systems to equipment manufacturers in a wide spectrum of industries through its core products, which include high-speed motor generators, advanced magnetic bearing systems and high-frequency power electronics. From 1 to 15,000 HP, Calnetix has numerous systems in operation today in applications ranging from motorsports to marine transportation.



Innovation That Drives Industries™

Calnetix Technologies
16323 Shoemaker Avenue
Cerritos, CA 90703
+1 562 293 1660
info@calnetix.com
www.calnetix.com

© Calnetix Technologies, August 2014