Vanner Takes Next Step In Hybrid Bus Evolution

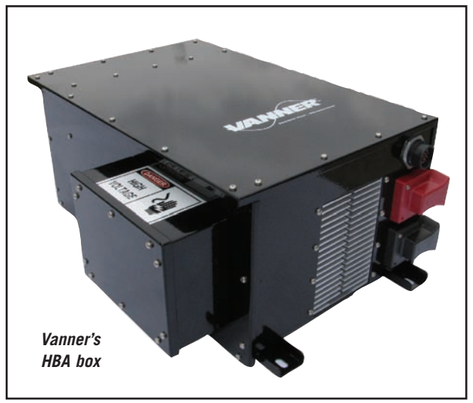
The logic behind the big push for hybrid-powered transit buses is simple. Hybrid technology increases fuel economy and lowers exhaust emissions. Even a one or two mpg improvement in fuel consumption for a large fleet of transit buses can translate into millions of dollars in savings annually. These operational cost savings and environmental improvements have driven transit hybrid bus production volume up over 30 percent from previous year's volumes.

Although cost savings are important to offset reduced budgets and escalating fuel costs, it is equally important to continue to reduce exhaust emissions, improve air quality, improve energy efficiency for the transit authority, and reduce our dependence on imported fuel.

Advantages Of Electrically-powered Components

Electrification of hybrid buses makes sense if the overall energy efficiency is greater than its mechanical counterpart. For example, the current mechanical belt-driven alternators on buses must be oversized to compensate for their low speed inefficiencies. Compare this to a highly efficient solid state DC-DC converter that gets its electricity from the bus' hybrid system. The efficiency gained from the DC-DC converter causes the engine not to have to work as hard.

This reduces exhaust emissions, noise and fuel consumption. Electrically-powered components require less maintenance and have longer life-cycles than mechanically-powered components. This can significantly lower maintenance costs and improve vehicle uptime and availability.



Vanner's HBA box

Vanner: A Problem-solver For The Bus Industry

Today's hybrid systems have addressed the propulsion technology leap necessary to reduce fuel consumption that powers buses. There is still room for improvement in efficiency and operational cost savings. Vanner Inc., headquartered in Hilliard, Ohio, is leading the bus industry in cutting edge technology to increase power efficiency and reduce operational and maintenance costs with the introduction of the Vanner Hybrid Beltless Alternator (HBA). The HBA is a high voltage DC-DC converter that will power all of the accessory loads currently being supported by the alternator.

A Partnership: GM-Allison Hybrid And Vanner

In a partnership with GM-Allison Hybrid, Vanner is launching the HBA on production buses designed with the Allison EP Hybrid System.

Chris Collet, product sales manager, GM-Allison Hybrid says, "Allison began working with Vanner in 2005 on smart ways to electrify vehicles' electrical systems with the GM-Allison EP Hybrid System. Vanner and GM-Allison Hybrid have been doing extensive engineering testing on a DC-DC converter that eliminates belt driven alternators on buses.

"Our engineers have been testing the complete system on dynamometers, our engineering hybrid vehicles and at Death Valley. There has not been a single service interruption with the Vanner DC-DC Converter. The superior energy efficiency, voltage cleanliness and cost effectiveness will be impressive for transit agencies and OEMs."

The Benefits Of DC Power

The Vanner HBA converts DC power from the output of a high-voltage motor to supply 24V power to the electrical accessories. Hybrid systems designed with the Vanner HBA supply power for electrical accessories with a solid-state device, not a mechanical one.

Solid-state technology is a more efficient and stable DC power source than traditional mechanical solutions and it is less susceptible to temperature changes. Powering accessory loads with the Vanner HBA is 25 percent-30 percent more efficient than traditional alternators. Additional cost savings are realized on the production of new buses when specifying the Vanner HBA—high-maintenance, belt-driven components can be removed from the bus, including the alternator, V-belts, voltage regulator, pulleys, belt tensioner, and hydraulic oil lines.

Air ducts required to cool alternators in high-temperature, under-hood environments can also be eliminated, further reducing the cost of a new bus. Future benefits of electrification include up to 50 percent increased engine cooling fan efficiency, further improving fuel economy, and reducing exhaust emissions and maintenance costs. There is also a significant safety bonus to removing mechanical devices that can potentially cause thermal issues.

Vanner: Patented Power Conversion Technology

Designed with Vanner's patented power conversion technology, and J-1939 CAN Bus communication, the HBA can be combined with Vanner's Vann-Bus™ Battery Equalizer with internal MBBM™ battery monitoring to create a "closed loop" system for hybrids that manages the high-voltage and low-voltage batteries as one cohesive system.

Bruce Beegle, Vanner's vice president of sales and marketing says, "The combination of the Vanner HBA and Vann-Bus Battery Equalizer provides the next level of power management for the hybrid bus. Bus OEMs benefit from the ease of integration into their existing GM-Allison EP Hybrid Systems and transit authorities benefit from the increased low-voltage battery life and prognostic maintenance information available to reduce maintenance costs and improve overall system reliability. The J-1939 CAN-Bus communication provides the capability to communicate with on-board telemetry systems, to broadcast 'real-time' notification of critical information from the electrical system."

Gillig: Investing In New Technology

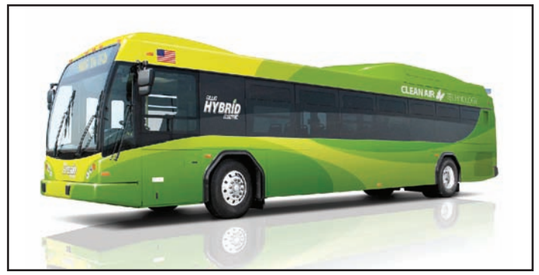
The initial investment in a hybrid bus is significant and costs approximately $200,000 more than a traditional diesel powered transit bus. Bus manufacturers, in an effort to boost their value proposition, are anxious to support power conversion solutions that improve fuel economy and reduce emissions.

Gillig has partnered with Vanner and Allison to be the first OEM to offer this cutting-edge technology on production buses starting in January 2011. Gillig will be unveiling the Vanner HBA system for the first time on a COTA hybrid bus at the APTA Bus Display on May 3, 2010 in Cleveland, Ohio.

The Next Step: DC To AC Power

The next step in the evolution of hybrid power conversion is to use the modular Vanner DC to AC inverter for the electrification of the air conditioning compressor, the power steering pump, and the water pump.

Electrically driven compressors and pumps are sealed at the motor and require less maintenance, they are more reliable than mechanically driven compressors and pumps.



The Final Step: The Grid

The final step in the electrification evolution is to plug the hybrid vehicle into the electric power grid (PHEV). This requires AC to DC power from a controlled rectifier to create a variable DC supply of electrical power from an AC power source. Plugging into the grid can serve a variety of functions, such as cool-down of transit buses in warm climates, saving hundreds and/or thousands of idling hours daily.

Electrification Technology In Ohio

Ohio is considered an emerging Silicon Valley for vehicle electrification. With The Ohio State University Center for Automotive Research (CAR), Vanner, Inc., hybrid power train manufacturers, fuel cell companies, and utility (grid) companies working together, CAR will help bring new technology to market, create jobs, strengthen the economy, and move vehicle electrification into the forefront of the commercial vehicle marketplace.

The Ohio State University Center For Automotive Research

Donald Butler, assistant director of research projects, says, "Vanner is collaborating with Ohio State University Center for Automotive Research to install a heavy duty chassis dynamometer and battery emulator system. The CAR Center of Excellence for Electric and Plug-in Hybrid Vehicle Technology is being funded by a $3M grant from the Ohio Third Frontier Wright Projects Program. Vanner's access to this state-of-the-art facility will allow it to optimize its power converter designs and accelerate product development by reducing the cycle time in half.

"We see significant growth for power converters in the light, medium and heavy-duty truck and bus markets as these applications offer the greatest opportunities for fuel economy improvements. The application of DC-DC and other power converters increases the efficiency of these vehicles to provide electric service versus conventional engine-driven alternators. The CAR heavy duty chassis dyno is designed to accommodate vehicles ranging from Class 8 trucks to four-wheel-drive buses."

Vanner Products: Rugged, Reliable And Safe

Vanner invented the battery equalizer and has provided rugged, reliable, and safe power conversion products to the transit industry for more than 30 years. Many of the Vanner battery equalizers installed on new buses provide dependable service for the life of the buses, with most lasting well through the buses' mid-lives. The HBA, being a solid-state design, will also provide the same level of dependability that you have come to expect from Vanner.

Gillig And Vanner At The APTA In May 2010

The future is now; transit authorities and bus OEMs can now take the next step towards vehicle electrification seamlessly, economically, and immediately. See the future on the Gillig COTA bus at the APTA this May.

Call 800-AC POWER for more information, or visit www.vanner.com.