PRIME by Prevost

(Power Recovery by Intelligent Management of Energy)

PRIME

Prevost has introduced the innovative PRIME energy management system to their premium Prevost motorcoaches. The PRIME (Power Recovery by Intelligent Management of Energy) system, which is exclusive to the motorcoach market, will be standard on the H3-45 VIP and X3-45 VIP conversion coaches, and be will available as an option on the H3-45 and X3-45 passenger coaches.

PRIME will significantly reduce fuel consumption by using the engine's down time (during braking, deceleration and other negative torque situations) to transfer energy to the vehicle's batteries. Typically, the energy created by the engine during these conditions results in wasted energy. The PRIME system employs this "down time" energy to charge the vehicle's batteries, recovering under-utilized energy.

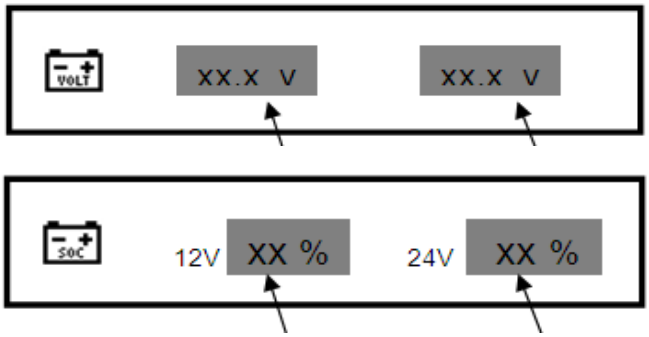
As part of this project, Prevost developed new logic for controlling the alternators and air dryer so that they are energized when the engine is under minimal load. The system detects negative torque on the engine and triggers the alternators to charge the batteries and the air dryer to fill the air tanks, which provides engine braking.

This system is classified as a "low-power regenerative braking system" and it marks a milestone in the electrification of Prevost motorcoaches.

"We choose an easily obtainable AGM battery with an 800CCA, 100Ah specification, with 190 minutes reserve capacity," says Prevost Director of Marketing, Michael Power. "We use AGM batteries that can take repetitive deep discharges and have proven to be very durable over 400 cycles. These batteries require no maintenance. They are sealed and spill-proof."

AGM batteries are becoming more affordable and are readily available to motorcoach operators, and they last up to four times longer than lead-acid batteries. Prevost also adds a new equalizer to monitor the state-of-charge (SOC) and the state-of-health (SOH) of the batteries. The system monitors battery temperature to prevent overcharging and overheating,

and provides information to the driver on the battery state-of-charge. The operator will be explicitly notified when the batteries have reached their life expectancy and need replacement.



The integrated cluster displays the battery state-of-charge percentage to the driver. Based on the state of charge of the batteries, the software will determine if the batteries need immediate charging or if the system can wait until the next “zero load” on the engine to trigger battery charging using free energy.

There is also a new feature in the cluster. With the engine running and the vehicle not moving, the percentage of trip made with regenerated electricity is shown in the cluster.

This value is reset each time the ignition is turned off. This feature will act as an incentive to the driver to adopt fuel-efficient driving habits. When the vehicle is in movement, the instantaneous fuel consumption bar graph is displayed. The intelligent management of energy allows Prevost to maximize the battery life of their coaches.

Coaches without PRIME

On coaches without PRIME, the alternators are constantly charging the batteries, which means a constant load on the engine. Today, alternators represent a permanent parasitic load on the engine, up to 14hp. This parasitic load represents fuel consumption, up to 2.4 L/h.

Standard batteries cannot stand deep discharges. Electrical loads on the coach are directly linked to the engine, as the batteries need to be kept at optimal charge level when conventional lead-acid batteries are used.

Benefits of PRIME

Increased Fuel economy

The level of fuel savings depends on the duty cycle of the coach. PRIME has an estimated average fuel savings of 2%. Motorcoaches that travel an average of 100,000 miles per year could save more than 250 gallons of fuel each year by utilizing PRIME. Results from testing of the PRIME system have been validated in real driving conditions and with various duty cycles. Some test vehicles showed up to 5% fuel savings.

The maximum fuel economy will be obtained on a ride when the mix of hilly and flat portions allows the batteries to be charged only when the vehicle is in “free wheel”. This means that batteries are charged with free energy and that no fuel consumption is dedicated to charging the batteries.

PRIME is an essential cost-saving feature which was developed through the innovative efforts of Prevost Engineering R & D.

Decreased Lifecycle Costs

AGM Batteries have a longer lifecycle and require less maintenance.

An absorbed glass mat battery has the electrolyte absorbed in a fiber-glass mat separator. These batteries are sealed and require no maintenance during its lifetime. They ensure no acid spilling and require no adding of water. The extended lifecycle of AGM batteries (four times that of conventional lead-acid batteries) greatly outweighs their increased cost (about two times that of conventional batteries).

Improved Environmental

Greater fuel economy leads to decreased emissions, continuing Prevost’s commitment to the environment.

Availability

PRIME will be standard on 2014 model H3-45 VIP and X3-45 VIP conversion coaches. PRIME will be an option on upcoming 2014 model H-Series seated coaches and X-Series seated coaches.

Other fuel and weight saving components to be introduced by Prevost at UMA

New Aluminum Luggage Bay Doors

Prevost aluminum luggage bay doors have been tested in a very tough Canadian winter environment over several years.

Advantages include a reduced weight of 38% (265 lbs. per vehicle); reduced fuel consumption, especially for stop and go applications; a very high-quality feel; and high-quality structure and precision compared to a welded-tube structure. The new doors also have an improved dent resistance (2.6 mm aluminum thickness compared to 1.3 mm stainless) and the door has a Class A finish.

The door handle has been redesigned to have the lock integrated to the plastic casing.

Another advantage is that aluminum is easily recyclable, following the Prevost value of concern for the environment.

The use of aluminum results in a brighter luggage compartment compared to the dark grey of the previous doors. These aluminum components reduce the weight of the vehicle, are less expensive to replace, are easier to repair, and improve overall fuel economy and lifecycle costs.

The aluminum doors also feature a new innovative door seal. The seal is one-piece with rounded corners and has a multi-lip seal. This new water management re-directs water away from the inside of the luggage bay, greatly improving water tightness. The seal is easily installed and does not use glue. A deflector has been added, which means there is no direct access to the seal from water spraying from outside the coach. Due to the design of the water management system, if water gets inside the door handle, the water drains outside the coach.

About Prevost

Prevost is a leading manufacturer of premium intercity touring coaches and the world leader in the production of conversion coaches for high-end motorhome and specialty conversion. A company in the Volvo Group of Companies, it has access to the financial strength, research capability, and manufacturing expertise of the group. The Volvo Group is one of the world's leading manufacturers of heavy-duty diesel engines. Prevost has its main manufacturing facilities in Sainte-Claire, Quebec, Canada and has seven Parts and Service Centers located in the United States and Canada. www.prevostcar.com

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