



Transport
Canada

Transports
Canada



ecoTECHNOLOGY for Vehicles
an ecoACTION initiative

Canada

A123SYSTEMS HYMOTION L5 PLUG-IN CONVERSION MODULE

IN PRODUCTION / AVAILABLE IN CANADA

BATTERY SPECIFICATIONS

Weight 85 kg / 187 lb **Width** 0.42 m / 16.3 in
Length 0.84 m / 33.0 in **Height** 0.26 m / 10.3 in

Type (7 modules) **A123Systems Lithium Ion
Nanophosphate™** 616 cells

Voltage 190 V (2.5 - 3.6 V per cell)

Capacity (charged) ~5 kWh

Available Capacity ~4 kWh

Energy Density 59 Wh/kg

FUEL EFFICIENCY

Fuel / Energy Type Gasoline-Electric
Fuel Efficiency¹ L/100 km Cdn mpg
1.57 179.0

**Driving Range in Blended Mode
(Hymotion PCM)** 50 - 65km / 30 - 40mi

CO₂ Emissions **(Electric only)** 0 g/km
(Reg. Prius) ~ 100 g/km

PERFORMANCE

Top Speed
All Electric 55 km/h (34 mph)
Operational
Temperature Range -20 °C to 45 °C (-4°F to 113°F)

CHARGING

Charging Time 5.5 hours (110 V/15 A)
Charge
Temperature Range -20 °C to 45 °C (-4°F to 113°F)

eTV FLEET INFORMATION

Date Acquired February 2009
Current Status Undergoing evaluations

ENVIRONMENTAL BENEFITS OF A PLUG-IN HYBRID ELECTRIC VEHICLE (PHEV)

- **Significant reduction in greenhouse gas emissions**
- **Operating range in electric modes is extended**
- **Vehicle can be charged from electricity generated using clean, renewable resources**

ecoTECHNOLOGY for Vehicles (eTV), in partnership with Environment Canada, installed the A123Systems Hymotion L5 Plug-In Conversion Module (PCM) into a 2008 Toyota Prius to evaluate the viability of plug-in hybrid electric vehicles (PHEVs) in Canada. The PCM module is a high capacity lithium-ion battery that extends the vehicle's ability to operate solely on electric power.

Researched and developed in Concord, Ontario, the L5 PCM can be installed as an aftermarket conversion in series-parallel hybrid vehicles. The L5 PCM is one example of PHEV technologies that may soon be available from major automotive manufacturers. The lithium-ion battery supplies additional power in parallel with the factory installed nickel metal hydride (NiMH) battery pack. The L5 PCM extends the vehicle's operating range in all electric modes.

The L5 PCM is charged using a standard 110V household outlet, but cannot be charged by the vehicle's regenerative braking system. When charged, the PHEV will use electricity from the L5 PCM for propulsion, reducing or eliminating the demands on the vehicle's internal combustion engine. Preliminary tests indicate that a series-parallel hybrid vehicle equipped with a L5 PCM can obtain a fuel consumption of less than 2.0 L/100 km¹ and emissions of less than 50 g/km of CO₂.

eTV is testing the L5 PCM to determine if PHEV technology can help improve vehicle fuel economy and reduce greenhouse gas emissions in Canada.

The eTV program is exploring how advanced technologies can help create a clean transportation system for Canadians.

¹ Results based on a full battery state of charge; averaged results of the UDDS FTP-72 city driving cycle at 22°C (72°F)

www.tc.gc.ca/eTV