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New Digital Rotary Control Valve to Boost Fuel Economy, Reduce Emissions, Competing for People's Choice Design Award at NPE

Troy, Michigan, June 10, 2009 – Traditional “analog” thermostat temperature-control systems for vehicles will soon be a technology of the past if inventor Tom Hollis has his way. Switching to digital can manage critical fluid systems in a way that significantly improves fuel economy, reduces emissions and engine, driveline wear to help extend the life of fluids critical in the operation of engine components.

“When you think of the sophisticated systems in a vehicle today, it comes as a surprise that we still use analog systems to control the interaction of the engine with the radiator system,” said Hollis, director of Advanced Research for MileageMatrix, Inc. “After all, those fluids protect the vehicle’s most important operating systems – the engine and driveline – and running them too high or too low simply wastes energy.”

The Digital Rotary Control Valve (DRCV) will provide a “true” powertrain thermal management system that, after mapping, will always allow the engine/transmission to function at their “known” optimum operating temperatures, under all driving conditions. The computer-regulated system monitors temperatures at several under-hood locations and controls the single DRCV to maintain optimum engine and transmission temperatures, throughout all engine load conditions and extreme ambient temperature ranges.

It is nominated for an International Plastics Design Competition People's Choice Award, which will be announced at the NPE in Chicago later this month.

Developed by Hollis and manufactured by the Minco Group, which includes All Service Plastic Molding, for MileageMatrix Inc., the component relies on DuPont™ Zytel® HTN PPA for the valve body, tube and diverter. The materials’ resistance to continuous exposure to hot long-life coolant up to 130°C, and moisture proved optimal for this application.



“We had to be very sensitive to expansion and contraction because all surfaces are always ‘wet’ and we needed a ‘fluid bearing’ to prevent sticking,” said Hollis. “Zytel® HTN PPA performed well in these conditions, allowing us to take advantage of the lightweight nature of plastics and overall cost advantage over metals.”

Critical to the components’ success is its ability to provide precision temperature function between engine/transmission and radiator. “Every BTU that exits through the radiator, provides ZERO heat energy value,” said Hollis.

Results from an initial, three-year test program shows fuel economy can improve 8 percent during the winter, and Hollis said they expect year-round fuel economy improvements greater than 5 percent. The component is currently being tested to rigorous OEM specifications.

“The key to improving fuel economy and reducing emissions is getting the engine/transmission fluid temperatures up to optimum operating temperatures fast and maintaining known optimum temperatures,” said Hollis. “Current analog thermostat systems are optimized to meet mandated US EPA cold-start test procedures, which are conducted at a warm 23°C ambient temperature. But not many of us reside year around in this optimum environment.”

Hollis also noted that engine oil temperature is always maintained well above the “dew” point, greatly extending the oil-change interval as moisture quickly evaporates. This could result in reduced oil use and fewer used oil filters for disposal.

Digital technology for this component was developed several years ago, but the benefits – improved fuel economy and reduced CO2 emissions – were not as valued as they are in today’s market. “We used the time to optimize the performance and ensure this technology is adaptable to all IC engines and is ideal for hybrid engines, which function better within specific, optimized temperature ranges,” said Hollis. “In short, this technology’s time has arrived.”

[MileageMatrix™ Inc.](#), Bellevue, Wa., is an emerging global leader in advanced fuel economy and emissions reduction innovation and technology.

[All Service Plastic Molding, Inc.](#), Dayton, Ohio, is part of the Minco Group, which also includes Minco Tool and Mold, Inc. For 50 years, The Minco Group has supplied ever-increasing services to the plastic's industry, ranging from product design through assembly. The markets served include automotive, appliance, consumer, electrical, medical, office and business equipment, and telecommunications.

DuPont Automotive offers more than 100 products to the global automotive industry and through its global application development network is committed to delivering cost-effective solutions to help reduce vehicle weight for better fuel economy and CO2 emission reductions, to integrate part functionality to simplify assembly and eliminate cost; and help bring invention to market fast, better and more cost-effectively.

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6/10/09

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