

Magnetics: Industry Overview *by* Walt Benecki

The Automotive Transition to 42V has hardly gotten in gear.....why?

During the early 1990's a stir was created when the need for standards was recognized for the anticipated automotive transition to 42-volt systems. The increasing demand for more and more safety and performance features was the driving force behind the initiative. For the past ten years, 42-volt advocates have justified the expected transition because of anticipated requirements for increased fuel efficiency, enhanced emission controls, additional safety and chassis controls, comfort and convenience features and potential telecommunication and internet systems. Industry experts anticipated that cost of implementation would be an issue to be dealt with, but the promised bonus of as much as 15% improved fuel efficiency seemed to be adequate incentive for a crisp transition. Ten years later, the word "crisp" can hardly be associated with the 42-volt transition.

It took until 1998 for The MIT and European Consortiums to set the necessary standards for 42-volt systems and provide a technical roadmap of where the automotive industry was headed. Activity began to accelerate in the development laboratories of automotive suppliers and anticipation began to build regarding opportunities for new materials and components. Millions have been spent over the past five years to position hundreds of automotive suppliers for the changeover. But little has happened to evidence tangible change. Frustration levels within the automotive supplier community are high, but they have little choice but to "hang in there" with their automotive customers.

As automotive executives began facing the economic reality of 42-volt systems, the generally agreed upon \$300-500 premium has stood as a significant roadblock to change. Short term solutions were identified to minimize costs and yet meet current needs for power management. The additional phenomenon that occurred in parallel during this time period was the consumer's love affair with the SUV. In spite of all the political and economic rhetoric regarding the need for fuel efficiency and reducing our dependence on foreign oil, consumers have been on a SUV buying rampage. So much for the fuel efficiency benefit of 42-volt systems!

Without customer demand for improved fuel efficiency, the long awaited transition will likely be just that. If gasoline were to suddenly jump to \$5 per gallon, only then might we witness a weakening of the SUV love affair and the emergence of true economic incentives to help fuel the 42-volt transition. Fuel prices in this range would likely influence consumers to purchase smaller cars which typically have lower electrical loads than their luxury and SUV counterparts. Without such motivation in the United States, it is likely that measurable 42-volt transition will occur primarily in Europe and Japan.

The transition in Europe is being influenced by more than fuel prices. The European Commission and the European Association of Automobile Manufacturers have agreed that all new cars registered in the year 2008 must have a 25% reduction in carbon dioxide emissions over the 1995 models.

For those interested in the myriad of details that chronicle the history and current status of the 42-volt transition (or lack thereof), it may be worth to consider a recent report published by Intertech Corporation entitled, "Power Management in Today's and Future Automotive Systems. The study team was led by Randy Frank, an SAE Fellow with over 30 years at Chrysler and Motorola and John West, a noted British consultant with 35 years as chief electrical machine designer at GEC and Lucas-TRW. Frank acknowledges that financial considerations are behind the slow transition: "Economics has determined the pace of transition (to 42-volt), consumers have not demanded 42-volt systems and financial consideration has given the nod to short term alternate solutions." Frank also notes that another challenge facing the automotive industry is battery technology. The report points out that, aside from performance issues, 36-volt batteries are having difficulty meeting targeted cost requirements. This provides additional motivation to automobile manufacturers to delay a conversion as long as possible. For more additional information on this comprehensive Intertech report, contact Jerry Giordano at ggiordano@intertechusa.com.

As a closing note, it is interesting to see the current rhetoric in Washington regarding our country's dependence on foreign oil. One of Washington's responses is fuel cell technology. In essence, our leaders have tended to overlook the technically feasible short-term gains available with 42-volt systems and have focused on higher-tech answers that may approach reality in twenty (or more) years, especially in the US. The author wonders how many barrels of oil savings are currently being forfeited by not providing consumers with certain short-term incentives to demand higher efficiency vehicles.....now.

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