DESIGN INNOVATIONS IN Electric AND Hybrid Electric Vehicles

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Design Innovations in Electric and Hybrid Electric Vehicles

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PREFACE

The papers in this SAE special publication, Design Innovations in Electric and Hybrid Electric Vehicles (SP-1089), cover technology for both electric and hybrid electric vehicles. As is well accepted, to have a good hybrid electric vehicle requires first having a good electric vehicle. Major manufacturers have initiated the effort required to take electric vehicle technology from the laboratory through the required development steps to provide an automotive product. This work will provide a foundation for the development of hybrid electric vehicles.

Unique engines, unique operating strategies and unique packaging solutions will all be the hallmark of successful hybrid electric vehicles. Over the past several years, the hybrid-electric vehicle concept has been gaining attention as a possible way to reduce emissions and increase fuel efficiency compared to a conventional vehicle. Hybrid-electric vehicles contain a hybrid power supply system - one that incorporates a minimum of two independent power sources to supply the drivetrain. The main advantage of this concept is it permits flexibility in power system design and power distribution between sources. This versatility enables greater flexibility in designing the powertrain to meet the required performance of the vehicle. The challenge is to combine the different power sources such that the advantages outweigh the increased cost of this configuration. These papers cover some of the latest technical developments related to the engine aspect of hybrid-electric vehicle development. Topics included in this year's session are: development of hybrid-electric vehicle design code; optimization of vehicle and engine control strategies; and novel engines for hybrid-electric vehicles.

Also critical to the automotive products of the future is the engineering talent required to produce the innovative designs. One of the programs aimed at exciting students to the new automotive opportunities is the HEV Challenge. This program is well represented by papers in this book. Experience has shown that the HEV Challenge is not only motivating students, but also surfacing innovative automotive engineering solutions to difficult problems. We are pleased to be able to share some of this excitement through this publication.

All of these subjects and the design methodologies required to achieve them, are covered by papers in this collection. We hope that this year's papers will trigger your imagination and provide the foundation for innovative developments that will help electric and hybrid electric vehicles play an important role in our transportation system.

Bradford Bates
Ford Motor Co.
Chairman, Electric Vehicle Committee

Frank Stodolsky
Argonne National Laboratory

Session Organizers

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