

**1997**

# **FutureCar Challenge**

**SAE** SP-1359  
INTERNATIONAL



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## PREFACE

The papers in this Special Publication, 1997 FutureCar Challenge (SP-1359), were originally written to fulfill competition requirements from the 1997 FutureCar Challenge. These papers document the design, construction, and performance of ten advanced technology vehicles, which represent the second year of the FutureCar Challenge sponsored by the U.S. Department of Energy and the U.S. Council on Automotive Research (Chrysler, Ford, and General Motors). The sponsors invited these universities to use the most advanced vehicle technologies available to them to modify a mid-size vehicle that approaches 80 miles per gallon (mpg) while still offering the same comfort, safety, and affordability that consumers expect from conventional vehicles. The goals of the competition mirror those set by the Partnership for a New Generation of Vehicle program, a cooperative effort between the federal government and the domestic automobile industry.

Beginning with a conventional Lumina, Intrepid, or Taurus, each university team made whatever modifications were necessary within the constraints of the existing vehicle to approach 80 mpg. Most teams made dramatic changes to the powertrain, added energy storage capability, improved aerodynamics, and attempted to reduce vehicle weight. Safety, energy efficiency, improved emissions characteristics, affordability, and the use of advanced technologies are the cornerstones of the FutureCar Challenge. These vehicles represent some of the most innovative advanced technology vehicles ever attempted. The technical reports that were a scored event in this competition are presented in this volume to record design rationale, engineering features, and performance of these unique vehicles. The vehicle's technical specifications and performance summary from the competition are shown in Table A; the results summary is shown in Table B.

These teams competed in a series of dynamic and static events at the GM Technical Center in Warren, Michigan. Emissions testing and fuel economy assessment took place at the U.S. Environmental Protection Agency National Vehicle and Fuel Laboratory in Ann Arbor, Michigan. The teams then embarked on an over-the-road endurance event from Warren to Washington, DC, where they participated in a vehicle display and awards ceremony on Capitol Hill.

The papers in this publication cannot fully convey the dedication and considerable effort demonstrated by the students and faculty to design and build not only an advanced car, but a concept for a new generation of vehicles. On behalf of all the participants and organizers of these competitions, we extend many thanks to those companies that made these competitions possible through financial contributions, in-kind support, and the dedication of their staffs.

Key Sponsors of the 1997 FutureCar Challenge included the U.S. Department of Energy, United States Council for Automotive Research, Chrysler Corporation, Ford, and General Motors. Other sponsors included the U.S. Environmental Protection



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