Reconstruction of Motor Vehicle Accidents: A Technical Compendium

PT - 34
Edited by S.H. Backaitis

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PREFACE

Reconstruction of Motor Vehicle Accidents: A Technical Compendium reflects the SAE's aim to develop, collect and disseminate knowledge on mobility technologies. The articles contained in this book provide ready references on the fundamentals used to develop motor vehicle accident reconstruction technologies and their current applications.

This 34th book in the SAE "Progress in Technology" series is based on selected, previously published technical articles, including those of non-SAE origin. The articles were collected from the SAE database and also from the files of a dozen professionals who are active and prominent in the fields of accident investigation and reconstruction.

Articles were selected for reprinting in this compendium through a two stage evaluation process. The evaluations were performed by an invited peer review panel made up of nationally and internationally distinguished scientists and researchers in the field of automotive accident reconstruction. The first stage of selection consisted of evaluation and nomination from a list of 251 papers that, in the judgement of the reviewers, met the criteria of technical integrity, usefulness for the intended purpose, scholarship, long term value and historical perspective. Each paper had to fall into one of five topical categories. The results from the first selection were tabulated by topical category, and any paper that received two or more nominations became a candidate for selection in the second review cycle. This process yielded a listing of 107 SAE and 12 non-SAE papers. The reviewers were then asked to reevaluate the reduced list with particular emphasis on avoiding duplication of subject matter, assuring that papers fit into topical categories and were of superior quality and usefulness. The final selection resulted in the nomination of 56 SAE and 11 non-SAE papers. Further review of these final nominations revealed that several papers overlapped closely in technical content. Upon further consultation with a number of reviewers, the final selection for full text printing was reduced to 30 SAE and 3 non-SAE papers. The remaining papers that had received two or more nominations were selected for listing in the Bibliography (Appendix 1), which includes each paper's abstract. The bibliography has been arranged in alphabetical order by first author's name. Appendix 2 is a comprehensive source of additional accident reconstruction-related technical papers, also arranged in alphabetical order by first author's last name. The abstracts are not included in Appendix 2.

While the reprinted papers in this book are intended to provide the selection of the best articles on accident reconstruction technology, their inclusion does not in any way reduce the value of similar articles reviewed but not selected. In a number of instances, the selection was a "judgement call" based on the consideration of the number of votes received, their relevance to current state-of-the-art, and their fit within a particular topical category. Initial intentions to address all areas of accident reconstruction had to be narrowed to the coverage of vehicle-vehicle and vehicle-highway interactions. The number of papers dealing with the reconstruction of occupant-vehicle interactions and with pedestrian and motorcycle accidents were found to be much in excess of what could be included in one volume. These topics merit a separate volume in the "Progress in Technology" series at a later date.

The paper review panel consisted of the following individuals:

Kennerly Digges, Associate Administrator, Research & Development
National Highway Traffic Safety Administration
Washington, DC

Donald Friedman, President
Liability Research, Inc.
Santa Barbara, CA

Mike Holcomb, Scientist
General Motors Corp.
Warren, MI

A. Jack McLean, Scientist
University of Adelaide
Adelaide, Australia

Charles A. Moffatt, Scientist
Indiana University
Bloomington, IN

Peter Niederer, Professor
Eidgenossische Technische Hochschule
Zurich, Switzerland
J. Rolly Kinney, President
Kinney Engineering
Corvallis, OR

Russell A. Smith, Professor
U.S. Naval Academy
Annapolis, MD

Raymond R. McHenry, President
McHenry Consultants, Inc.
Cary, NC

Charles Y. Warner, President
Collision Safety Engineering, Inc.
Orem, UT

The editor is grateful to all reviewers for their excellent cooperation, timely response and constructive participation in the time consuming review process. It is hoped that the selection of articles reflect their best judgements in spite of some compromises that had to be made to achieve consensus. The editor is especially grateful to David C. Viano of General Motors Research Laboratories for his consultation and advice on many occasions.

Sincere thanks for excellent cooperation are due to a number of other people who helped to bring this compendium to reality, particularly to Larry Schneider, Leslie Boss and Amy Haugh of the SAE staff in Warrendale.

Stanley H. Backaitis, Editor
Co-Chairman, SAE Occupant Protection Committee
National Highway Traffic Safety Administration
# TABLE OF CONTENTS

## HISTORICAL PERSPECTIVE AND THEORY OF ACCIDENT RECONSTRUCTION

- Energy Loss in Vehicle Collisions, Raymond M. Brach (871993) .................................................. 3
- Friction Applications in Accident Reconstruction, Charles Y. Warner, Gregory S. Smith, Michael B. James and Geoff J. Germane (830612) .................................................. 29
- Computer Aids for Accident Investigation, Raymond R. McHenry (760776) .................................. 43
- Energy Basis for Collision Severity, Kenneth L. Campbell (740565) ............................................. 55
- Vehicle Mechanics of Intersection Collision Impact, Richard I. Emori (700177) .............................. 69
- Analytical Approach to Automobile Collisions, Richard I. Emori (680016) ................................. 75
- An Overview of Selected Computer Programs for Automotive Accident Reconstruction, Ronald L. Woolley, Charles Y. Warner and Thomas R. Perl (Transportation Research Record 1068) .................................................. 85

## GENERAL TECHNIQUES AND CONSIDERATIONS

- A Review of Impact Models for Vehicle Collision, Raymond M. Brach and R. Matthew Brach (870048) .................................................. 103
- Measurement Protocol for Quantifying Vehicle Damage From an Energy Basis Point of View, Nicholas S. Tumbas and Russell A. Smith (880072) ................................................. 119
- Least Squares Collision Reconstruction, Raymond M. Brach (870429) ............................................. 143
- Photogrammetric Mapping of Vehicle Deformations, Larry G. Gillen (861421) .............................. 153
- Diagnosis of Seat Belt Usage in Accidents, Charles A. Moffatt, Edward A. Moffatt and Ted R. Weiman (840396) .................................................. 163
- Computer Dimensioning of Skid Marks from Photographs, A. W. Thebert ............................................. 179

## PASSENGER CAR COLLISIONS

- Brake Light Filament Deformation Analysis for Vehicular Collisions, A. Tancer Keskin, Walter S. Reed and Richard L. Friedrich (880233) .................................................. 195
- Elastic Properties of Selected Vehicles, Francis Navin, Michael MacNabb and Grant W. Miyasak (880223) .................................................. 201
- Accident Victim Interaction with Vehicle Interior: Reconstruction Fundamentals, Gerald W. Nyquist and Everett P. Kennedy (870500) .................................................. 213
- Rollover Potential of Vehicles on Embankments, Sideslopes and Other Roadside Features, N. J. DeLeys and C. P. Brinkman (870234) .................................................. 227
- The “IMPAC” Program for Collision Analysis, Ronald L. Woolley (870046) .................................................. 237
- Generalizing CRASH for Reconstructing Specific Accidents, Donald E. Struble (870041) ................. 251
- A Revised Damage Analysis Procedure for the CRASH Computer Program, Raymond R. McHenry and Brian G. McHenry (861894) .................................................. 259
- Computer Simulation of Automobile Collision — Reconstruction of Accidents, Hiroshi Ishikawa (851729) .................................................. 271
- Computer Aided Automobile Accident Reconstruction — Theory, Graphics, Animation, J. Ed. Martinez (850250) .................................................. 287
- Inaccuracies in the CRASH3 Program, Ronald L. Woolley, Charles Y. Warner and Melanie D. Tagg (850255) .................................................. 321
Velocity Histories as an Accident Reconstruction Tool,
Charles E. Strother (850249) ............................................. 341
Evaluation of a Method for Determining the Velocity Change in Traffic
Accidents, Anna Nilsson-Ehle, Hans Norin and Christer Gustafsson (826081) ............................................. 367
The Accuracy and Usefulness of SMLAC, Charles Y. Warner
and Thomas R. Perl (780902) ............................................. 377
Car-to-Car Side Impacts: Computer Crash Reconstruction,
August L. Burgett and Michael W. Monk (751154) ............................................. 393
Frontal Crush Energy and Impulse Analysis of Narrow Object
Impacts, Gregory C. Smith, Michael B. James, Thomas R. Perl and
Donald E. Struble (87-WA/SAF-5) ............................................. 405

TRUCK AND ARTICULATED VEHICLE COLLISIONS

Analysis of Truck Braking Accidents, Rudolf Limpert and
Dennis F. Andrews (870504) ............................................. 419
Impact of Articulated Vehicles, Raymond M. Brach (860015) ............................................. 431
Computer Aided Accident Reconstruction of Tractor-Semi Trailers,
J. Ed. Martinez and Jerry G. Wallingford (851529) ............................................. 447
A Comparison of Automobile and Truck Decelerations During Emergency
Braking, Walter S. Reed and A. Taner Keskin (870502) ............................................. 465

Bibliography — Appendix 1 ............................................. 471
Related Reading — Appendix 2 ............................................. 483
Index ............................................. 489