

Low-Speed Automobile Accidents: Investigation and Documentation

Second Edition

Errata

Peter H. Rast
Robert E. Stearns

Contributing Authors

Robert Fried, M.S.FS
Rick Robertson, Ph.D.
Patrick J. Robins, Ph.D.
George Ripsom, DABFE

8. Occupant Kinematics—“Your Head Hit What?”	105
8.1 Newton’s First Law of Motion—The Foundation of Occupant Kinematics	105
8.2 Occupant Kinematics in Low Speed Collisions	107
8.3 Applying Newton’s First Law of Motion—Three Rules for Analysis	110
8.4 Seat Rebound	111
8.5 Case Studies	112
A. The case of the rocket-powered delivery truck	112
B. Your head hit what?	113
C. The case of the severe sideswipe	114
8.6 Conclusion and Review	115
References	116
9. Injury Biomechanics in Low-Speed Collisions	117
<i>Rick N. Robertson, Ph.D.</i>	
9.1 Introduction	117
9.2 The Study of Biomechanics	117
9.3 Anatomical Considerations in Injury Assessment	118
9.4 The Vertebral or Spinal Column	120
9.5 Cervical or Neck Region	122
9.6 Mechanical Considerations	122
9.7 Biomechanical Analysis	125
9.8 Areas of Special Consideration	130
A. The brain	130
B. Shoulder injuries	131
C. Thoracic outlet syndrome	131
D. Knee injuries	131
E. Carpal tunnel syndrome	132
F. Temporomandibular joint disorder	132
References	133
10. Using Statements and Photographs	135
10.1 Target Vehicle Stopped, Bullet Vehicle Braking	135
A. Estimating impact speed	135
B. Estimating target vehicle speed change	136
10.2 Target Vehicle Stopped, Bullet Vehicle Stopped, Bullet Vehicle Moves Forward under Idle Acceleration	137
10.3 Target Vehicle Stopped, Bullet Vehicle Stopped, Bullet Vehicle Moves Forward under Normal Acceleration	138
10.4 Two Stopped Vehicles—First Stopped Vehicle Is Struck in the Rear and Pushed into the Vehicle Ahead	139

10.5 Both Vehicles Moving before Collision	139
10.6 Bringing Photographs into the Analysis	140
References	143
11. Case Studies in Fraud Detection	145
11.1 Lights! Camera! Action!	145
11.2 Information—The Key to Fighting Fraud	149
11.3 Making the Best of a Bad Situation	150
11.4 A Little Here, a Little There—Pretty Soon It Adds Up to Real Money	151
11.5 A Little Larceny on the Side	154
11.6 Back to the Future	155
12. Motor Vehicle Event Data Recorder Systems	159
<i>George F. Ripsom, DABFE</i>	
Appendices	
A. Idling Acceleration Factors for Calculation of Impact Speeds in Low-Speed, Rear-End Collision Tests conducted by Peter Rast and Robert Stearns	173
B. Acceleration Factors and Maximum Speeds under Conditions of Idle Acceleration	175
C. “Must Have” Information	179
D. Red Flag Indicators of Accident Fraud	181
E. Research Findings—Low-Speed Collisions	183
About the Authors	185
Index	189

