Subject: Motor Vehicle Accident Reconstruction
Instructors: Rudy Limpert, Dennis Andrews, Franco Gamero

Text: Motor Vehicle Accident Reconstruction and Cause Analysis, 5th Edition by Rudy Limpert
& Short Papers 1 through 11, e-published by PC-Brake, Inc.
Software: MARC 1, distributed by PC-Brake, Inc.
Text and MARC 1 orders, or free downloads of Short Papers, visit: www.pcbrakeinc.com

Five-Day Motor Vehicle Accident Reconstruction Seminar (40 hours)

Day 1: Objectives, Autopsy of a Crash, Critical Scene Data, Motion Analysis

1.1. Objectives and Elements of Accident Investigation and Reconstruction
1.2. Accident Reconstruction Quality: Scientific and Practical Side
1.3. The Autopsy of a Crash
1.4. Accident Scene Data Collection - Recognizing Critical Data
   1.4.1. Accident Scene Data
       1.4.1.1. Descriptive
       1.4.1.2. Measurable
       1.4.1.3. Determinable
   1.5. Speed, Time and Distance Analysis Made Easy – The Velocity/Time Diagram
   1.6. EDR Records Made Clear with the Velocity/Time Diagram
   1.7. Braking to Avoid Crash: Stop at POI or Arrive Too Late
   1.8. View Obstruction Time Analysis
   1.9. Driver Reaction Time
   1.10. Fundamentals and Limitations of Computerized Accident Reconstruction
   1.11. Applications/MARC 1

Day 2: Pre-Crash Braking, Turning; Rollover

2.1. Braking Analysis of Cars
2.2. Braking Analysis of Heavy Trucks and Trailers
2.3. Skid Marks, Brake Maintenance, ABS and Wheel Hop
2.4. Steering to Avoid
2.5. Speed from Yaw Marks/Mistakes to Avoid
2.6. Speed from Spin Marks
2.7. Car/SUV Rollover
2.8. Truck/Trailer Rollover
2.9. Data Collection in Turning/Rollover Accidents
2.10. Applications/MARC 1
Day 3: Crash Physics, Inline Collisions, Car-Pedestrian Crash

3.1 Collision Analysis – Energy Balance and Linear Momentum
3.2 Inline Collisions – Elastic versus Plastic
3.3 Fixed Barrier Impact
3.4 How to Access NHTSA Crash Data
3.5 A and B Stiffness Coefficients
3.6 Crush Damage, Crush Measurements, Crush Energy and Delta-V
3.7 Head-on Collision
3.8 Rear-end Collision/Under-ride Crash
3.9 Review of Low-Speed Rear Impact Physics with Braking
3.10 Car-Pedestrian Accident
3.11 Applications/MARC 1

Day 4: Sideswipe, Linear Momentum, Delta-V and PDOF

4.1 Sideswipe with Fixed Object (wall/guard rail)
4.2 Frontal Side (Under) Swipe/ Vehicle-to-Vehicle
4.3 Trailer Side Under-Ride Crash
4.4 Accident Scene and Vehicle Data Measurement in Sideswipe Accidents
4.5 Linear Momentum Method (LMM)
4.6 Delta-V and PDOF Calculations in Linear Momentum Analysis
4.7 Crush Damage Evaluation for Delta-V and PDOF
4.8 Limitations of Standard Linear Momentum Method
4.9 When Weight Differences and Departure Angles are Critical
4.10 Accident Scene and Vehicle Data Measurement for LMM
4.11 Applications/MARC 1

Day 5: Linear and Rotational Momentum, When Scene Data Are Missing

5.1 Linear and Rotational Momentum (LRMM)
5.2 Car-Motorcycle Crash With LRMM
5.3 Impact Speed Analysis When Critical After-Impact Data are Missing
5.4 Rest Position of one Vehicle Unknown – Car in the Wrong Quadrant!
5.5 Only Angles Rotated After Impact are Known
5.6 Calculate After-Impact Data from Known Impact Speeds – “Crash Test on Paper”
5.7 Accident Scene and Vehicle Data Measurement for LRMM
5.8 The Unique Crash – What to Do When Nothing Seems to Work
5.9 Fundamentals for Questioning Witnesses/Tool for Reconstruction Data Collection
5.10 Applications/MARC 1
5.11 Written Review Test