



# High Speed Rear Impact Crash Test

## Basic Test Notebook

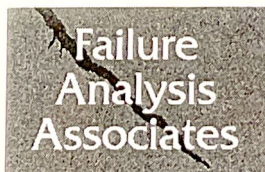
*A Supplement to the High Speed Rear Impact Crash Test Video*

Prepared for the Society of Automotive Engineers by:

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Test and Engineering Center

Phoenix, Arizona



## Preface

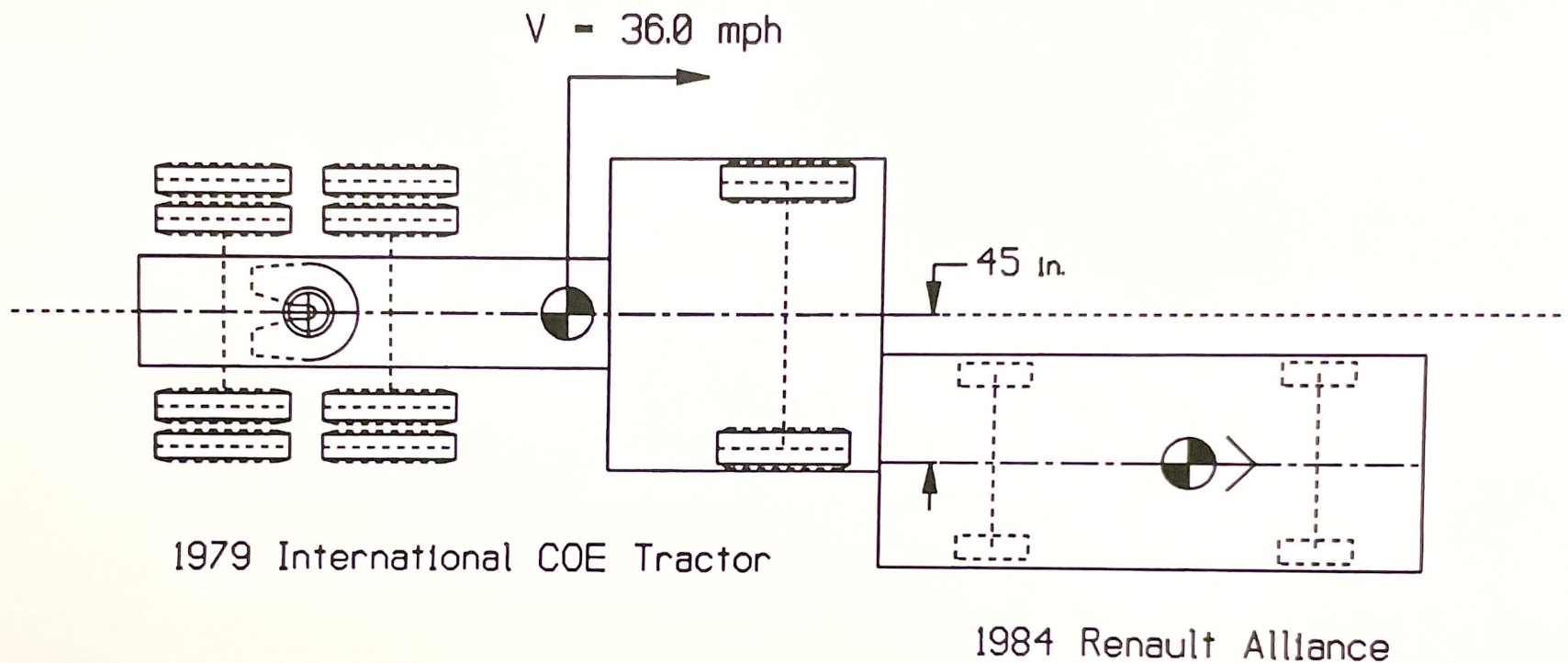
The crash test demonstration captured in this notebook and accompanying videotape was part of the SAE High Speed Rear Impact TOPTEC (TOPical, TEChnical symposium) held in August 1997. The TOPTEC examined issues related to vehicle crashes occurring at 35 mph and above, explored what happens to the vehicle and occupants, and provided an in-depth study of what to look for when analyzing a crash.

**This crash test is not intended to model a typical vehicle crash. It is an example of a high energy end point, or non-survivable, rear end crash.** However, thanks to the skillful staff at Failure Analysis Associates, Inc, it is an excellent illustration of the techniques, procedures, operation plans, photography, cinematography, instrumentation, and instrument package and location that constitute a well-executed crash test. The notebook provides those interested in gaining an understanding of the crash test process with the time histories of accelerations and displacements in high speed rear end situations with severe override conditions. Those familiar with the crash testing experience may see the package as a research tool or training aid where critical parameters were measured for research purposes only.

Some of the data gathered from the test includes:

- In this type of collision, maximum mutual crush is achieved in approximately 270ms.
- The rear of the overridden vehicle produced nearly linear acceleration until 80ms–100ms.
- Intrusion into the stationary car progressed approximately 40 inches prior to the head, neck and chest being loaded by the intruding vehicle. The Dummy readings are valid to that point.
- Head rearward movement was approximately 12 inches, while torso rearward movement was approximately 8 inches prior to direct contact.
- Head and torso were contacted at approximately 120ms.
- Upper neck moment values prior to direct contact were 170-180 in-lbf.

Although the type of crash demonstrated in the test is uncommon, so is the availability of this type of high-speed and real-time crash footage and analysis data. Those involved in the area of seat back failure may find the sequence of events particularly revealing.

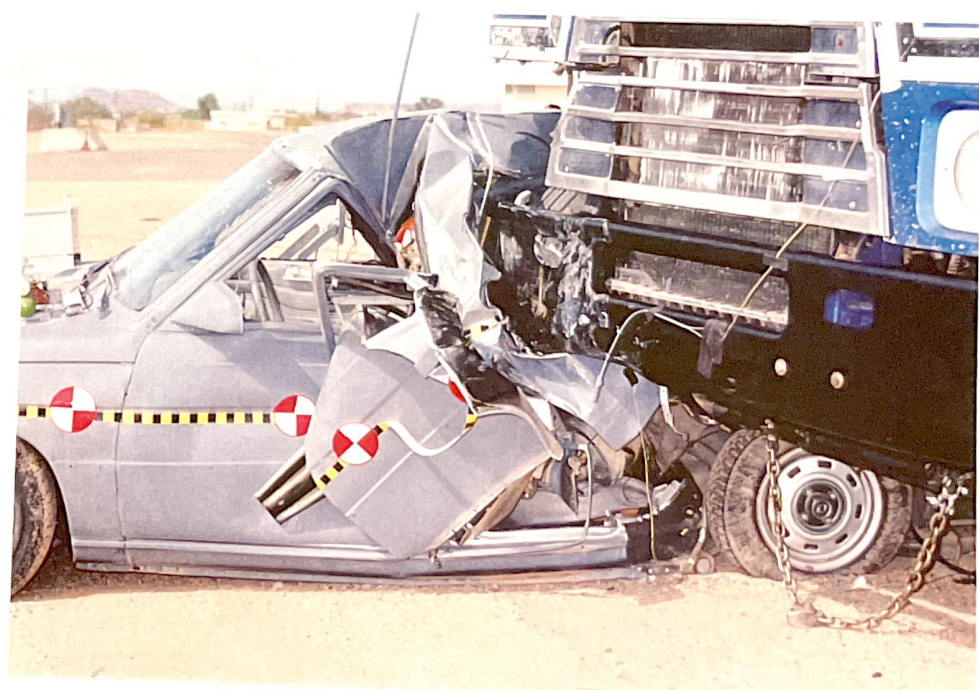
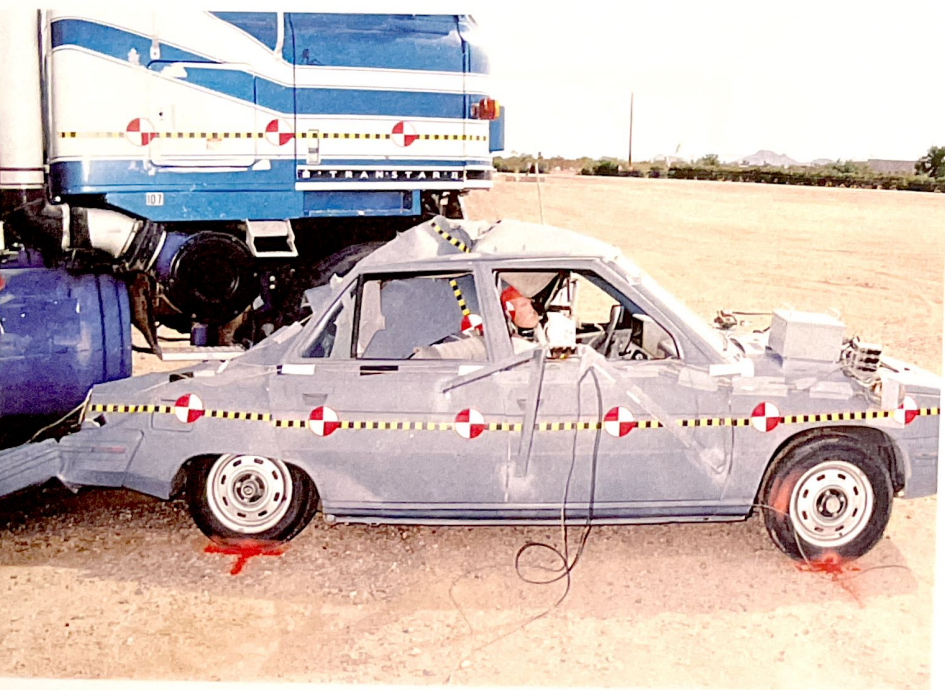


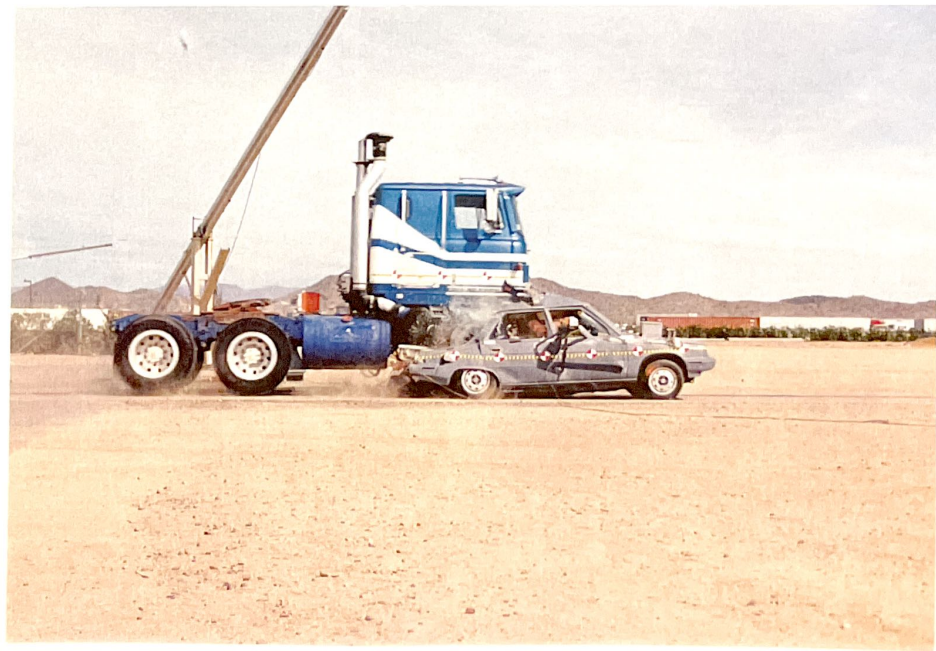
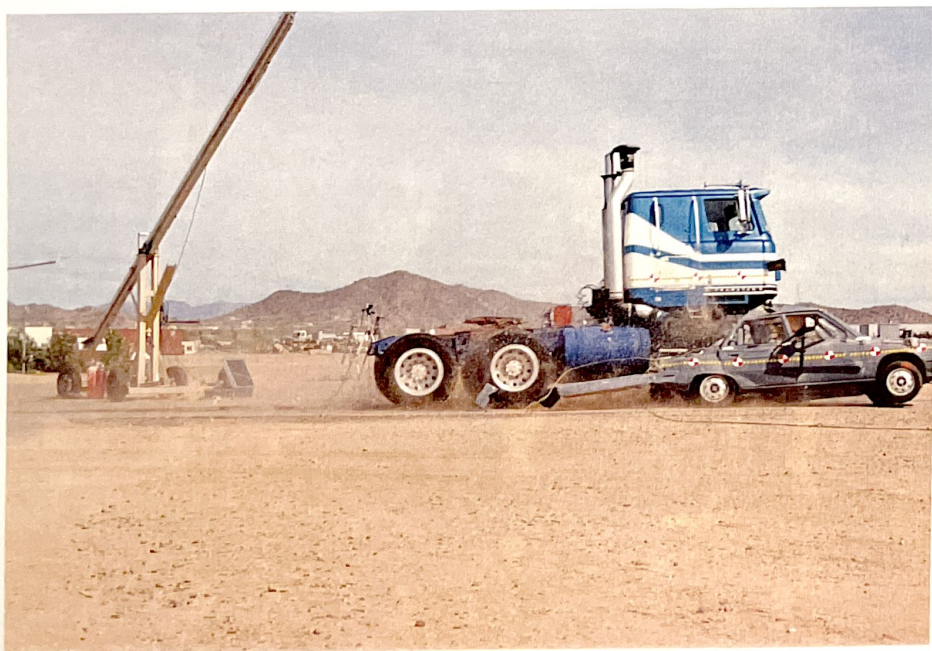
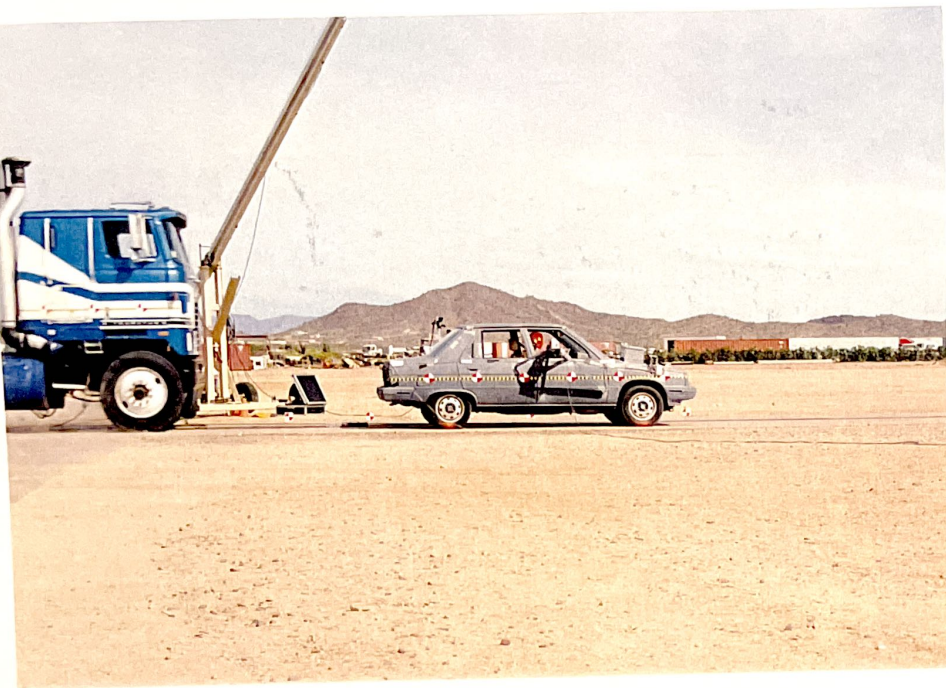
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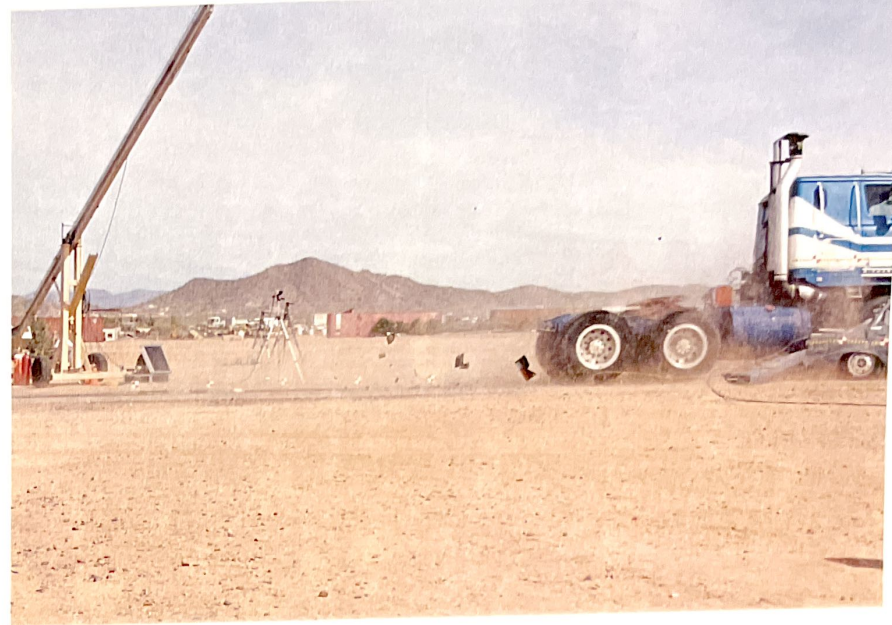
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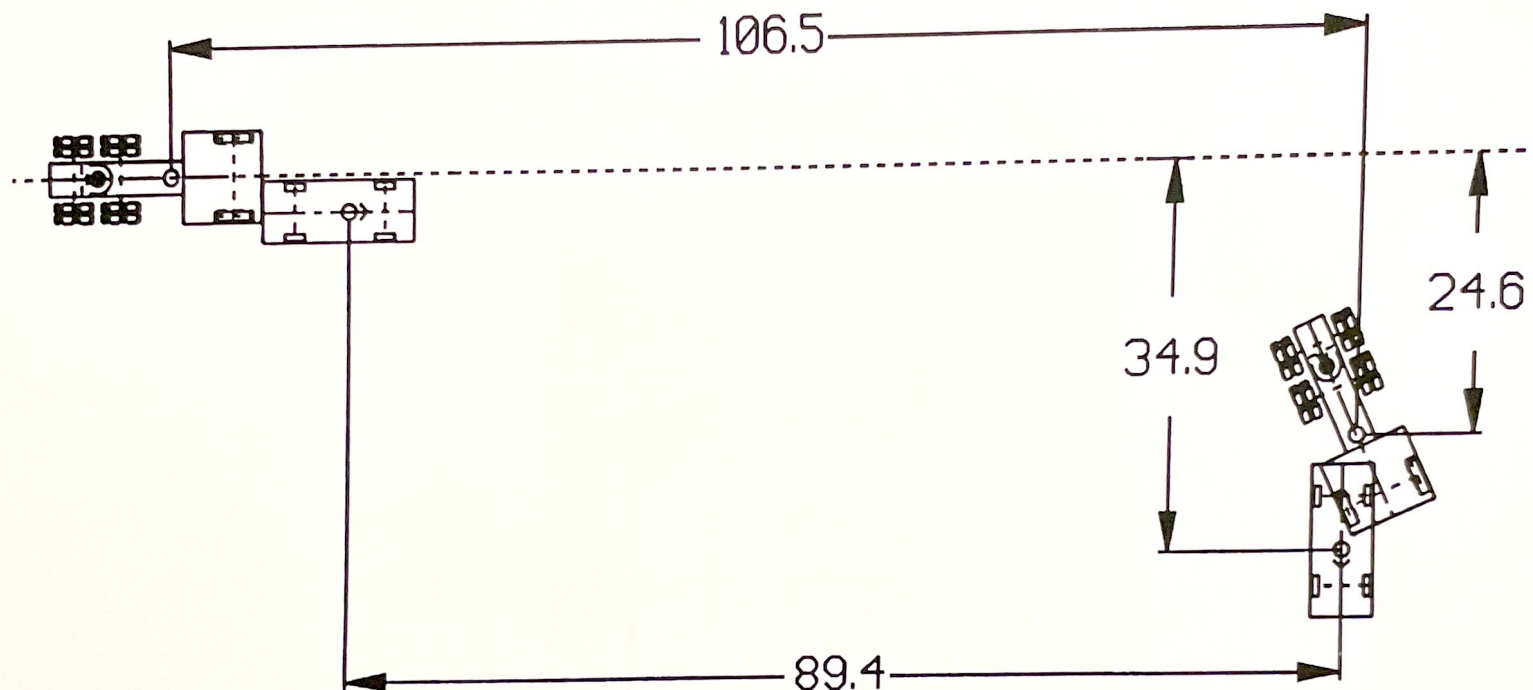
TEST DATE  
10-27-97











ALL DIMENSIONS IN FEET

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IMPACT AND REST POSITIONS

TEST DATE  
10-27-97