

Crash Pulse Scaling Applied to Accident Reconstruction

Ronald L. Woolley

Woolley Engineering Research Corporation

Provo, Utah

Copyright © 2008 SAE International

ABSTRACT

A crash pulse representative of the accident event is often requested in addition to the reconstructed speed, *delta V*, and PDOF. One approach to crash pulse generation is to scale available test data to the accident condition.

Scaling formulas for time and acceleration are derived based upon commonly available accident reconstruction information from the crush profiles, closing speed, and vehicle *delta V*. Scaling is based upon the compression phase of the crash pulse.

A crash test similar to the accident may not be readily available unless a crash test is performed that is designed to represent a specific accident. Available test results may not reproduce the accident but may approximate it in several important aspects. In such situations it is necessary to scale a reconstructed crash pulse from the most representative test available based upon the test parameters and the reconstruction estimates.

Selected NHTSA tests are compared one with another after scaling in order to illustrate both the potential and limitations of scaling crash pulses.