Comments to proposed crash pulses at 3:rd RESS meeting

Autoliv Research

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Crash pulses of modern small cars

Examples from:

- Frontal impact against deformable barrier
- Frontal impact against stiff barrier
- Vehicle to vehicle frontal impact

Comment: Small vehicles have been chosen for the study since the major part of the first EV's that have reached the market belongs to this category. A large part of future EV's can be expected to have properties similar to vehicles found in current small vehicle category.

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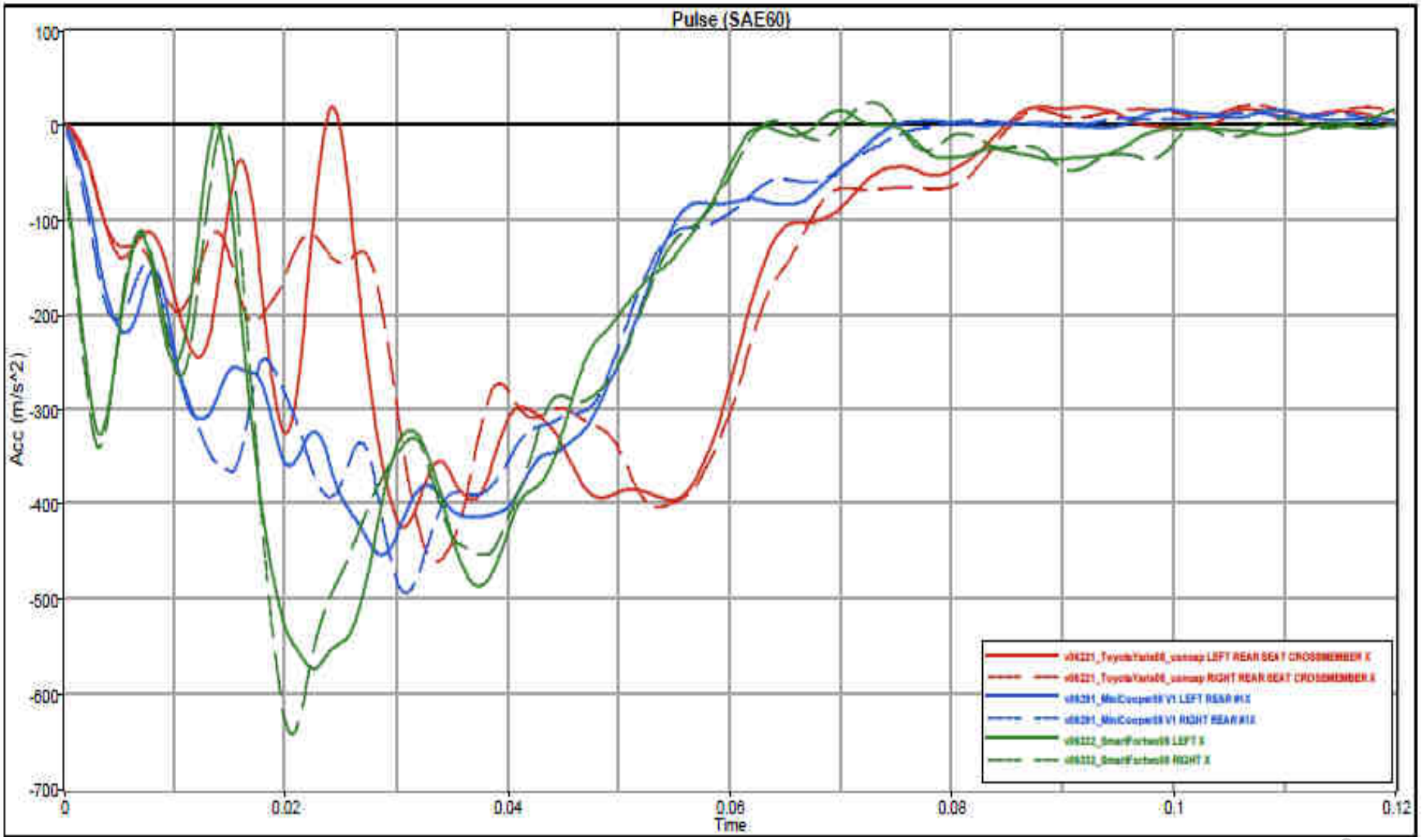
Crash pulses of small cars

Frontal impact USNCAP (stiff barrier)



Source of data: NHTSA

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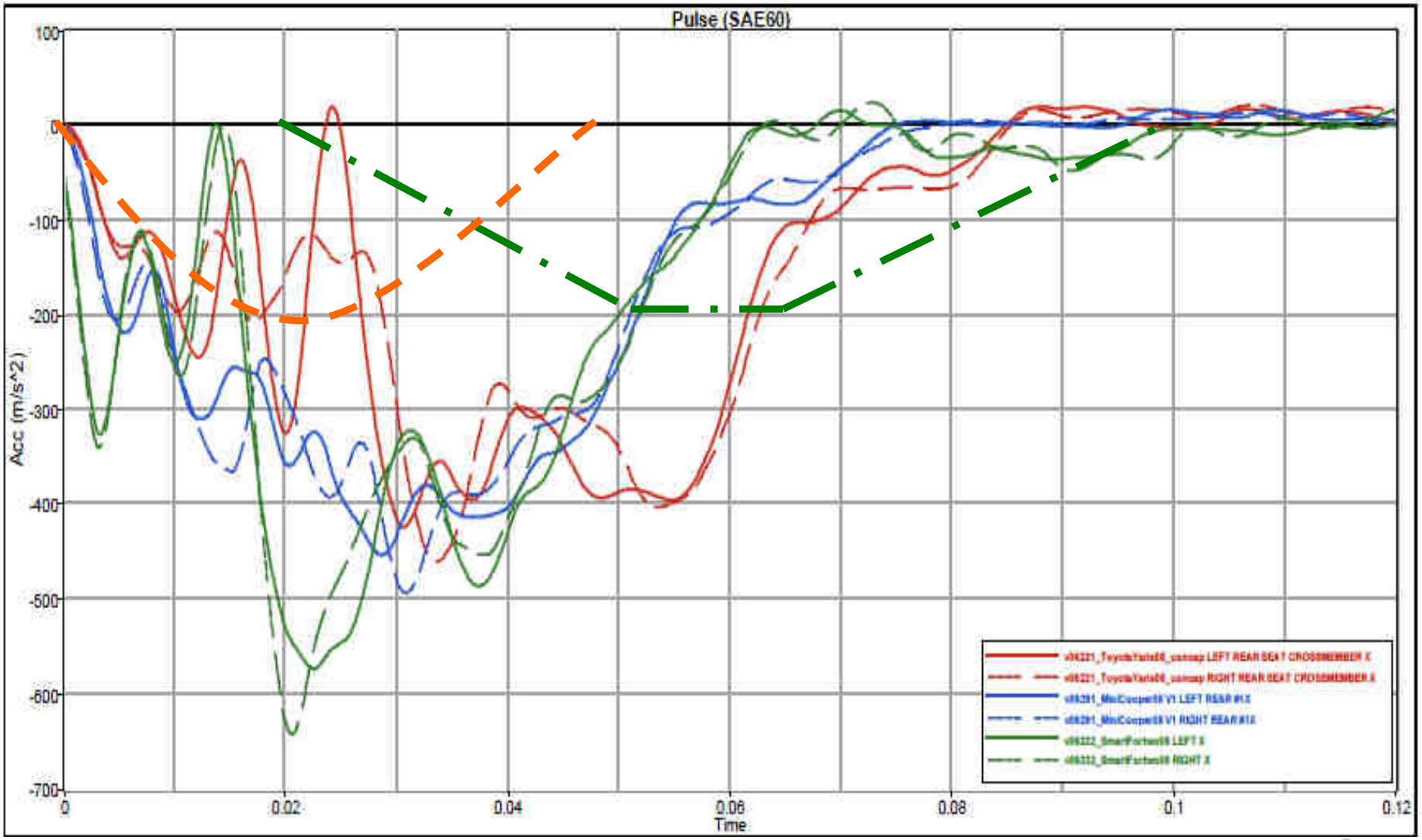
Crash pulses of small cars

§3.4.1.2.1 Proposed pulses vs. frontal impacts USNCAP (stiff barrier)



Source of data: NHTSA

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Test results from IIHS tests

Offest crash tests at 40 mph

Frontal impact against deformable barrier

Nissa Cube 2009

Mazda 2 2011

Smart Fortwo 2008

Vehicle to Vehicle: Smart Fortwo 2008 against MB C-class

Source of data: IIHS

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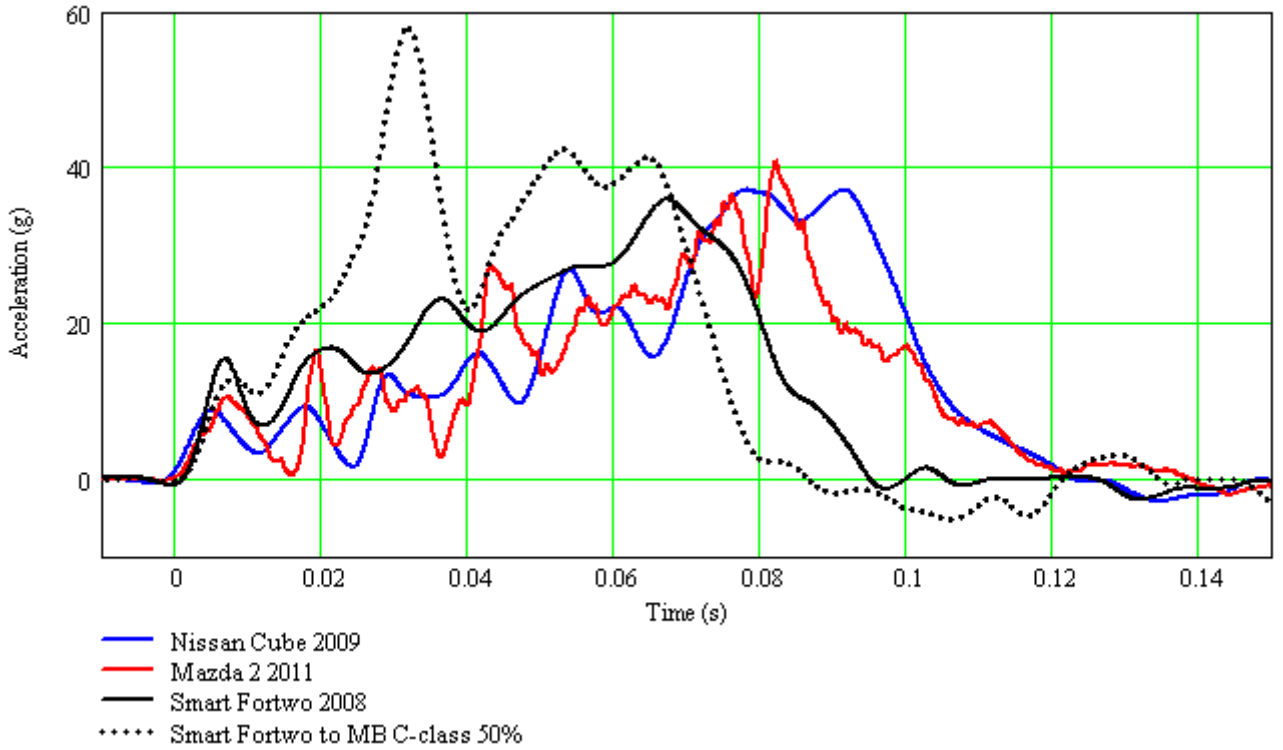
Test results from IIHS tests

Offest crash tests at 40 mph



Comment: In the impact to the relatively soft offset deformable barrier (ODB), a considerable amount of the impact energy is absorbed by the ODB. The acceleration levels reaches approx. 35g (solid curves). In the vehicle to vehicle crash, the smaller vehicle experiences considerably higher acceleration levels than in the ODB test (dotted curve).

Source of data: IIHS

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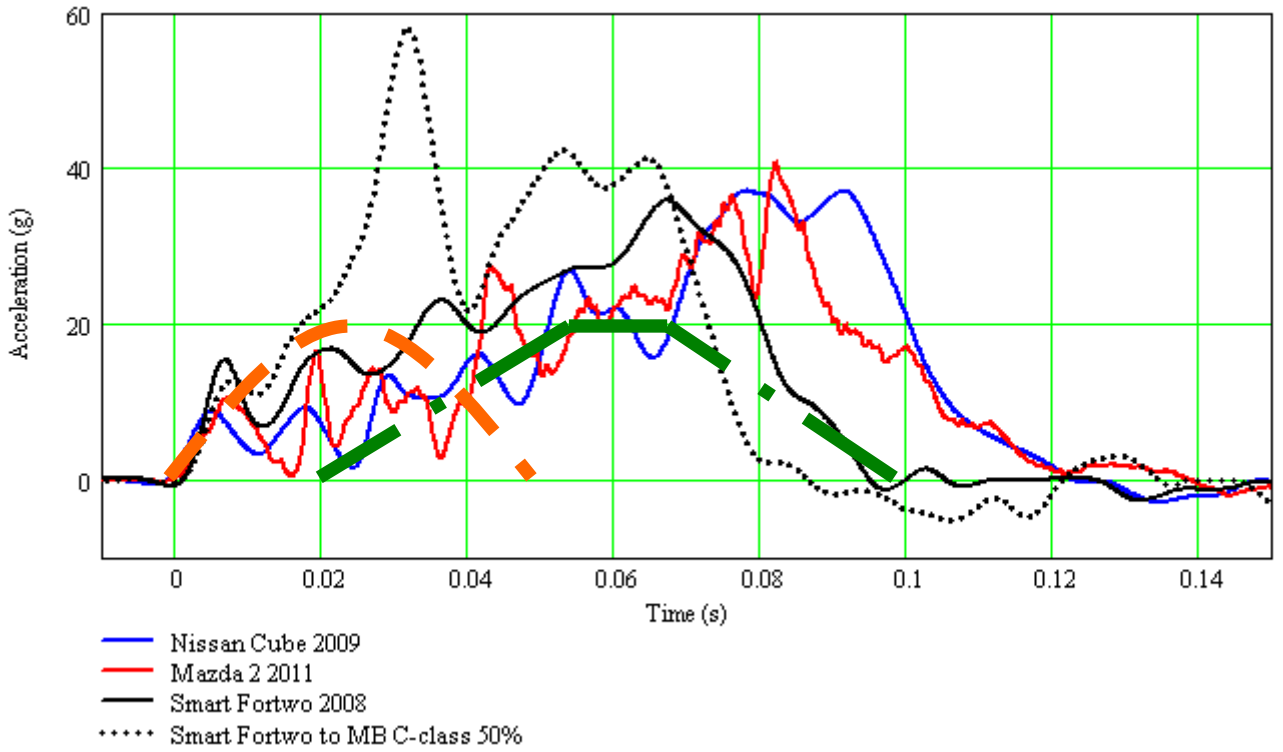
Test results from IIHS tests

§3.4.1.2.1 Proposed pulses vs. frontal impact IIHS tests



Source of data: IIHS

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Full scale vehicle to vehicle impact

Small new (09) vs. large old (96)

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VOLVO
Volvo Car Corporation

CHALMERS

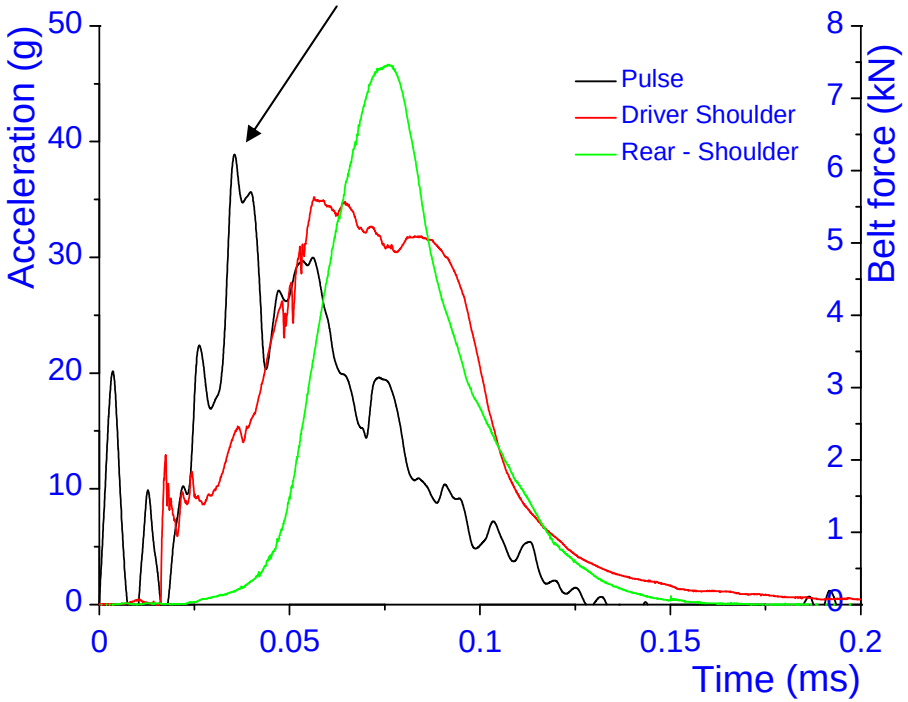
VINNOVA

SAFER

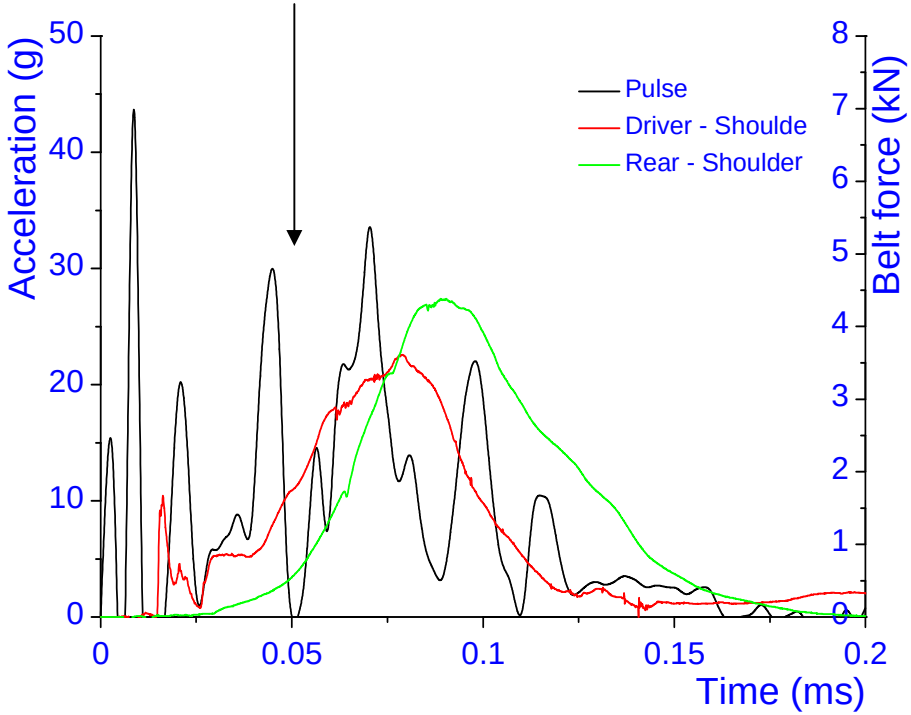
Full scale vehicle to vehicle impact

Small new (09) vs. large old (96)

”Stiff modern” vehicle pulse



”Soft old” vehicle pulse



Comment: The smaller vehicle experiences high acceleration levels, even though the counterpart is soft in comparison to the small car. The small vehicle would experience even higher acceleration levels if the counterpart would be of more modern design (often higher stiffness).

Folksam published data

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Heavy vehicle crashes

Crash pulse

Stiff crash pulses in chassis in collisions to objects and other heavy vehicles, due to short deformation zones.

Comments: Heavy objects, incl. battery packs, normally are mounted to chassis.

Picture from public internet site

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