

To  
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Subject  
Shocktable DRI device evaluation

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This memo presents the results of a tests series where the DRI device was positioned on a seat system attached to a shock-table. The shock-table allows to apply a vertical acceleration to the seat system. The table was set to three nominal peak acceleration levels of 300, 600 and 800 g's which corresponds to a maximum velocity of respectively 6.3, 9.4 and 13.5 m/s.

The tests with the DRI device are part of a larger test series where the shocktable method was evaluated using a shock attenuating seat system and the 50<sup>th</sup> percentile Hybrid III. DRI scores resulting from the DRI device are compared to the DRI calculated by the mathematical model using:

- the acceleration of the DRI device base
- the pelvis acceleration of the ATD for the tests with a corresponding input load.

#### DRI Device

During the seat shock-table test-series the DRID, DRI Device was evaluated The DRID is a mechanical equivalent of the DRI mathematical model developed by AUTOMATICA ENGINEERING LTD. / A.N. Protection Solutions Ltd.

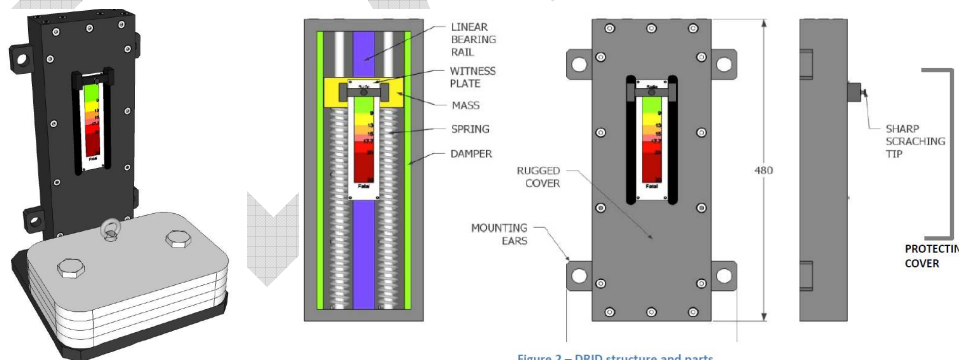


Figure 1 Illustration of the DRI Device , DRID

The DRID illustrated in Figure 1, is mounted on a metal frame. This frame allows fixation of the DRID on the seat by a standard safety belt. Figure 2. A scribe attached to the moving in mass of the DRID is used to record the maximum displacement of the moving mass. A scale coming with the DRID allows to concert

the maximum recorded to displacement to the corresponding DRI score. The weight on the seat panel was brought to 67 kg by an adding a 25 kg weight to the DRID. This corresponds to the effective weight of the ATD used in the test series.

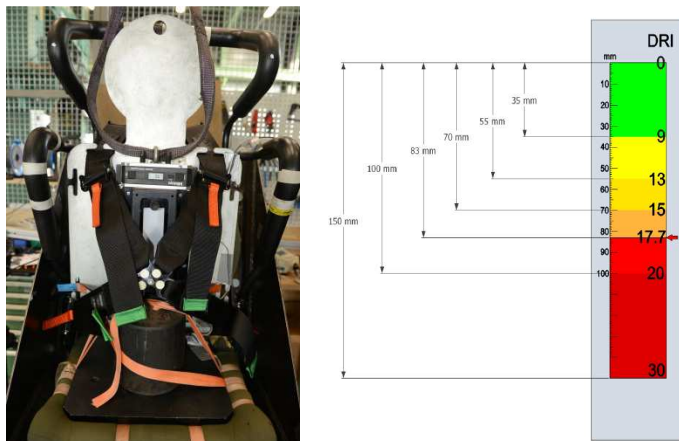


Figure 2 DRID with additional 25 kg on the seat panel and the displacement-DRI scale.

The DRI score of the DRID is compared to the DRI calculated from the acceleration of the base plate of the DRID and to the DRI calculated by the pelvis acceleration of the ATD of corresponding tests. Results are presented in Table 1.

The maximum difference between the DRID score and the accelerometer based DRI is 0.9 at 800 g input load level. The maximum difference with the corresponding Hybrid III tests 1.1. These differences are within the range to be expected for these type of tests.

Table 1 DRI scores resulting from the DRI device, the acceleration of the DRI device and the corresponding tests with the Hybrid III with 4 point belt

Test	Nominal [g]	DRID		Accel. DRIz	Δ	Test	HIII DRIz	Δ
		Scribe [mm]	DRI					
34	300	22	6.1	6.8	-0.7	7	5.7	+0.4
35	600	45	10.9	10.2	+0.7	8	10.1	+0.8
37	300	25	6.8	7.0	-0.2	7	5.7	+1.1
38	600	37	9.4	9.3	+0.1	8	10.1	-0.7
39	800	62	13.9	14.8	-0.9	9	14.3	-0.4