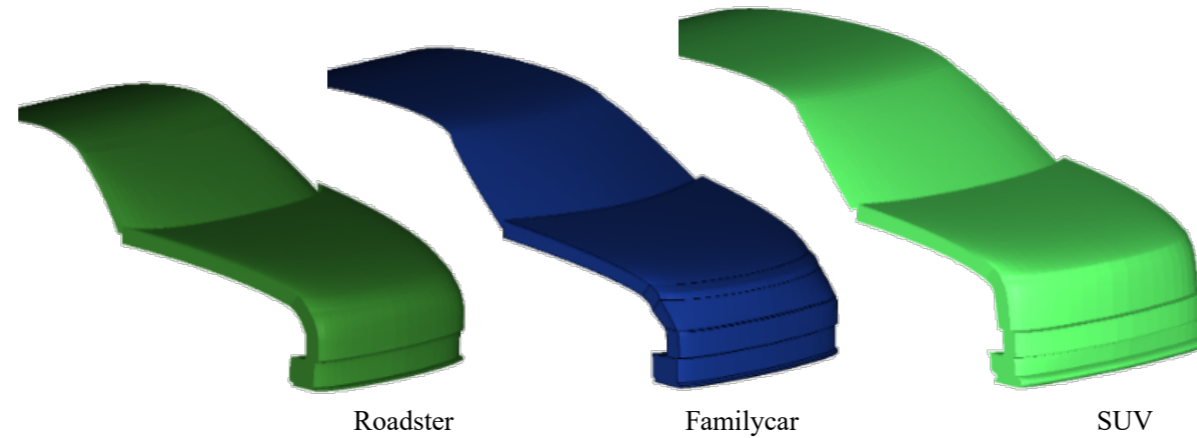
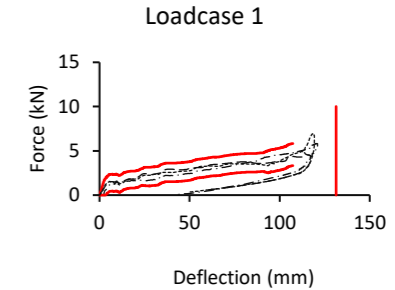
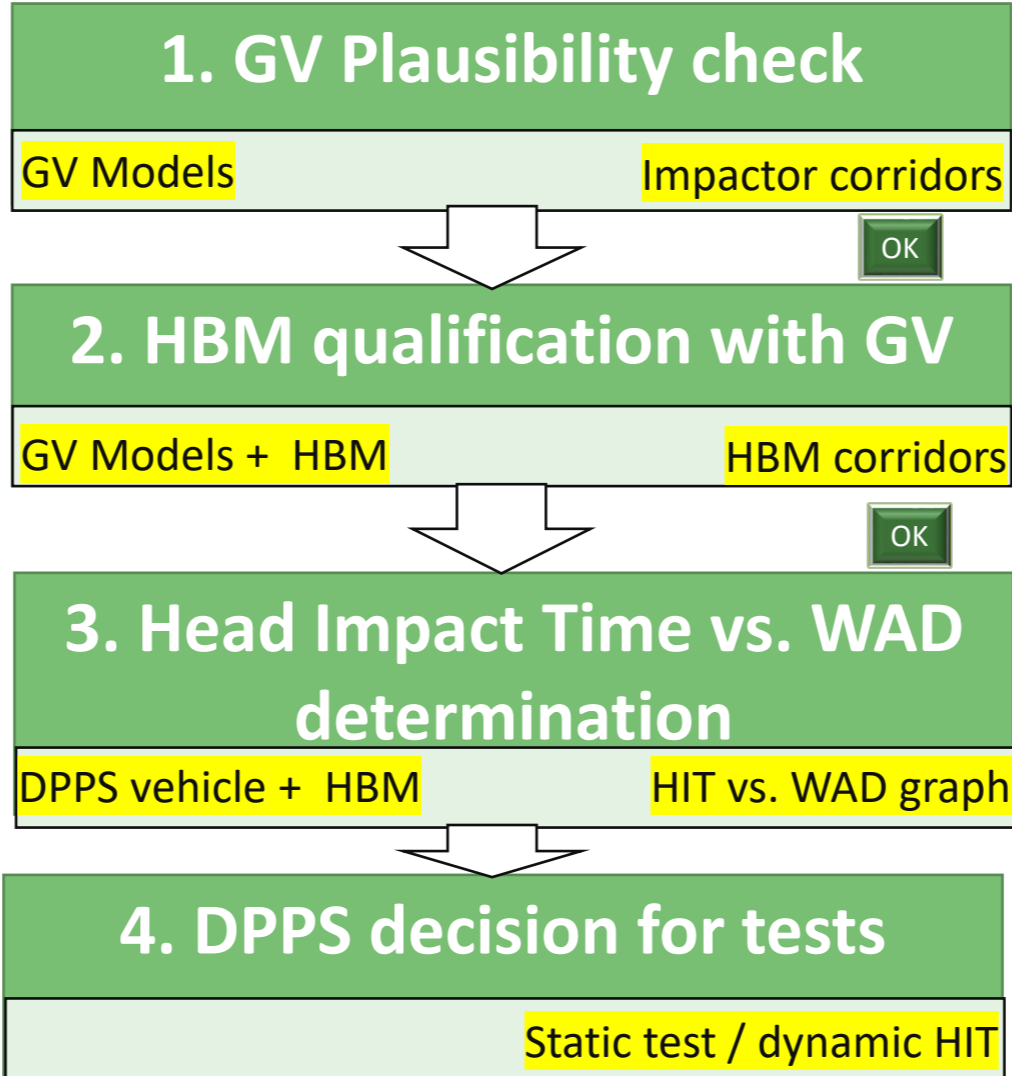
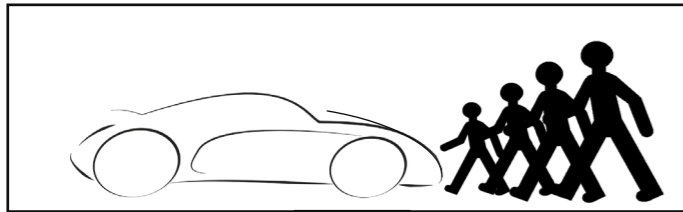
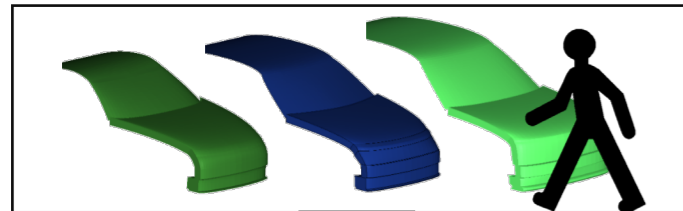
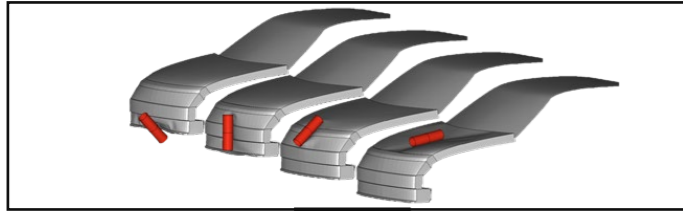


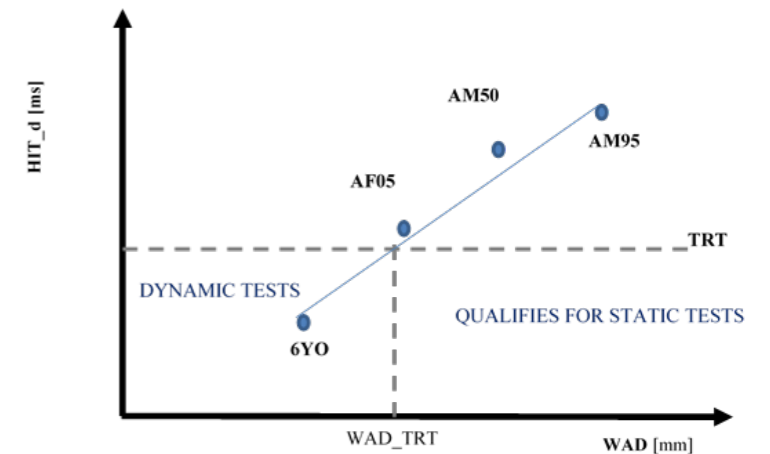
Generic Vehicle Models for MR1



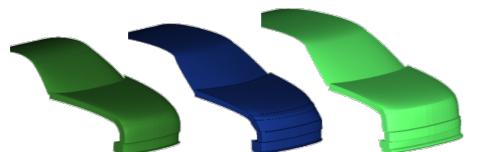
Overall DPPS Process



GV Type	Velocity (km/h)	HIT (ms)		HCx (mm)		HCz (mm)	
		Min	Max	Min	Max	Min	Max
FCR	30	152	197	-1438	-1005	1019	1117
	40	127	150	-1489	-1105	1006	1158
	50	107	121	-1504	-1179	1024	1169
RDS	30	163	199	-1574	-1104	931	1125
	40	133	156	-1659	-1191	931	1178
	50	112	127	-1665	-1283	981	1183
SUV	30	127	144	-1000	-624	1092	1193
	40	101	116	-1032	-737	1103	1187
	50	86	99	-1110	-799	1109	1191



Building Blocks



Roadster Familycar SUV

Finite Element Software

(supplied by code-houses to Industry)



Generic Vehicle Models
available on UNECE website
– MR1



Human Body Models
(openly available or by suppliers)



Vehicle Simulation Models
of vehicle **with DPPS** of
Vehicle Manufacturer

1. Plausibility check

2. Human Body Model qualification

3. HIT vs. WAD determination

4. Use HIT for DPPS decision

What are Generic Vehicle Models?

FE Code	Unit System	Master files	File ID
LS-Dyna	mm, kg, ms	GV_FCR_R3_1_mm_kg_ms.key	D-GV-1
		GV_RDS_R3_1_mm_kg_ms.key	D-GV-2
		GV_SUV_R3_1_mm_kg_ms.key	D-GV-3
	mm, to, s	GV_FCR_R3_1_mm_to_s.key	D-GV-4
		GV_RDS_R3_1_mm_to_s.key	D-GV-5
		GV_SUV_R3_1_mm_to_s.key	D-GV-6
RADIOSS	mm, kg, ms	GV_FCR_R3_1_mm_kg_ms.0000.rad	R-GV-1
		GV_FCR_R3_1_mm_kg_ms.0001.rad	R-GV-10
		GV_RDS_R3_1_mm_kg_ms.0000.rad	R-GV-2
		GV_RDS_R3_1_mm_kg_ms.0001.rad	R-GV-20
		GV_SUV_R3_1_mm_kg_ms.0000.rad	R-GV-3
		GV_SUB_R3_1_mm_kg_ms.0001.rad	R-GV-30
	mm, to, s	GV_FCR_R3_1_mm_to_s.0000.rad	R-GV-4
		GV_FCR_R3_1_mm_to_s.0001.rad	R-GV-40
		GV_RDS_R3_1_mm_to_s.0000.rad	R-GV-5
		GV_RDS_R3_1_mm_to_s.0001.rad	R-GV-50
		GV_SUV_R3_1_mm_to_s.0000.rad	R-GV-6
		GV_SUV_R3_1_mm_to_s.0001.rad	R-GV-60
VPS	mm, kg, ms	GV_FCR_R3_1_mm_kg_ms_VPS.inc	V-GV-1
		GV_RDS_R3_1_mm_kg_ms_VPS.inc	V-GV-2
		GV_SUV_R3_1_mm_kg_ms_VPS.inc	V-GV-3
	mm, to, s	GV_FCR_R3_1_mm_to_s_VPS.inc	V-GV-4
		GV_RDS_R3_1_mm_to_s_VPS.inc	V-GV-5
		GV_SUV_R3_1_mm_to_s_VPS.inc	V-GV-6

**Human readable text files
interpreted by the different FE
software**

✓ no executables (software)

How does a GV Model file look like?

Example:

```
*KEYWORD
$*****
$ FILE ID: D-GV-1 *
$ *
$ DESCRIPTION: *
$ *
$ Generic Vehicle Models for the qualification of Human Body Models *
$ as described in M.R.1 - Mutual Resolution No. 1 of the 1958 and the 1998 *
$ Agreements ECE/TRANS/WP.29/1101 Addendum 5 *
$ *
$ =====
$ NODE cards
$ =====
$
*NODE
1000000      -116.12      -587.      224.81
1000101      -262.54999     -587.      701.16998
1000102      -252.04385     -579.58826  701.16998
1000103      -243.27393     -579.58801  692.83368
```

Differences between Dummies and GV Models in Mutual Resolution 1 (MR1)

Crash-test Physical Dummies

1. Drawings specified in MR 1
 - products purchased at suppliers
2. Certification specified in MR1.
 - If not fulfilled, replacement parts will be purchased at suppliers.
3. Not sensitive to the lab environments they are used within specified conditions.
4. Issues with specific Dummies reported to suppliers.
 - General issues with dummies are reported to GRSP by CP or NGOs

Generic Vehicle Models

1. Directly provided by UNECE
 - Downloaded from website
2. Certification specified in MR1.
 - If not fulfilled, OEM can change this model. However, this should be avoided as much as possible to ensure comparability of the models.
3. Simulation models are sensitive to the simulation environment they are used in.
4. Issues to be collected dynamically
 - depend on simulation environment
 - need to be addressed in updated versions of GV models

Proposal for reporting and technical support

Who is the contact for users if they encounter issues in the usage?

- **UN Contact form** for technical support on Generic Vehicle Models
 - forwarded to Austrian experts

How to ensure that any issues are addressed in updated versions of the GV models?

- clarify in MR1 that any identified issues which require changes + the required changes must be reported to GRSP through a Contracting Party

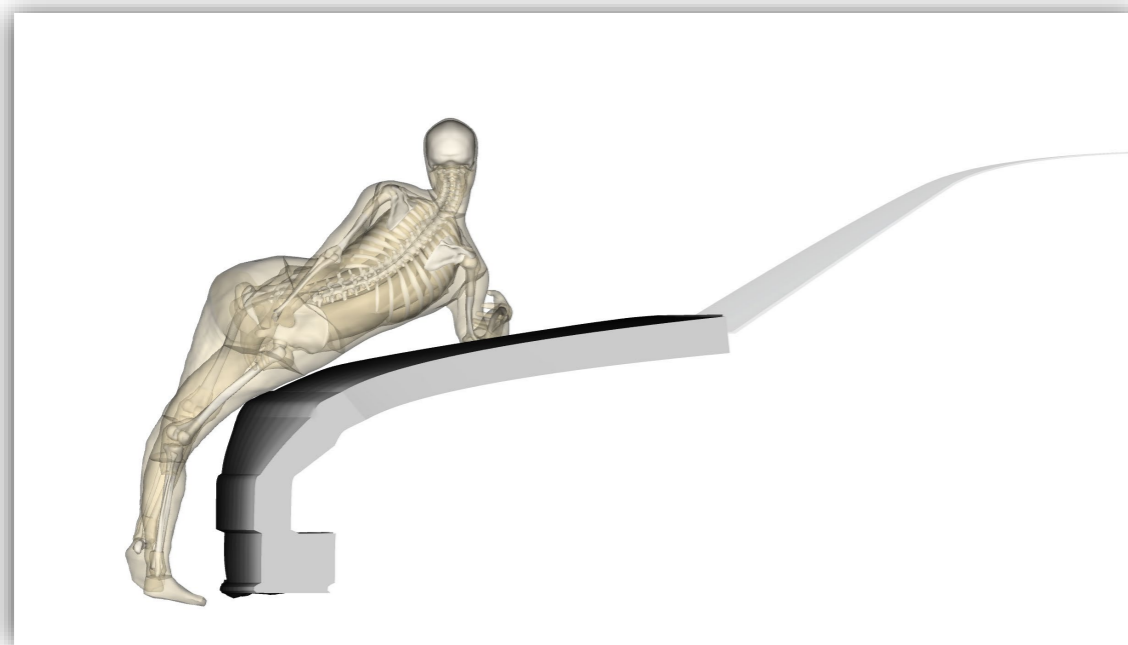
Draft of MR1 GRSP-73-10e_rev1

4.1. ~~The certification of~~ **Impactor simulations on** the generic vehicle models may be performed if the user has any doubt that the generic vehicle models work properly with the solver version and control cards used **as plausibility check**. If issues (i.e. ~~significant~~ **the** deviations to the reference curves **outside of the** provided **corridors shown in red**) are identified, the user shall switch to another solver version, ~~and~~ **review the control settings** ~~and report the issue to gv.vsi@tugraz.at.~~ **GRSP through a Contracting Party**.

4.4. **If modifications of the models are required, they shall comply with the specified corridors and be documented and reported to** **GRSP through a Contracting Party**.

Copyright of GV Models

- ✓ All stakeholders (funding Organisations & Contributors) of GV models have formally agreed (signed) confirmations to enable usage and upload of GV models by UNECE
- ✓ Letter by Graz University of Technology on its way



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