

# **Shape Corp**

## **GTR09 NA vs EU Vehicle**

### **Modified Round Robin**

# Shape Corp Flex PLI Testing

1. Vehicle #1 Test Setup
2. Vehicle #1 EU & NA
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5. General Testing Observations
6. Ground Line Adjustment Required in CAE

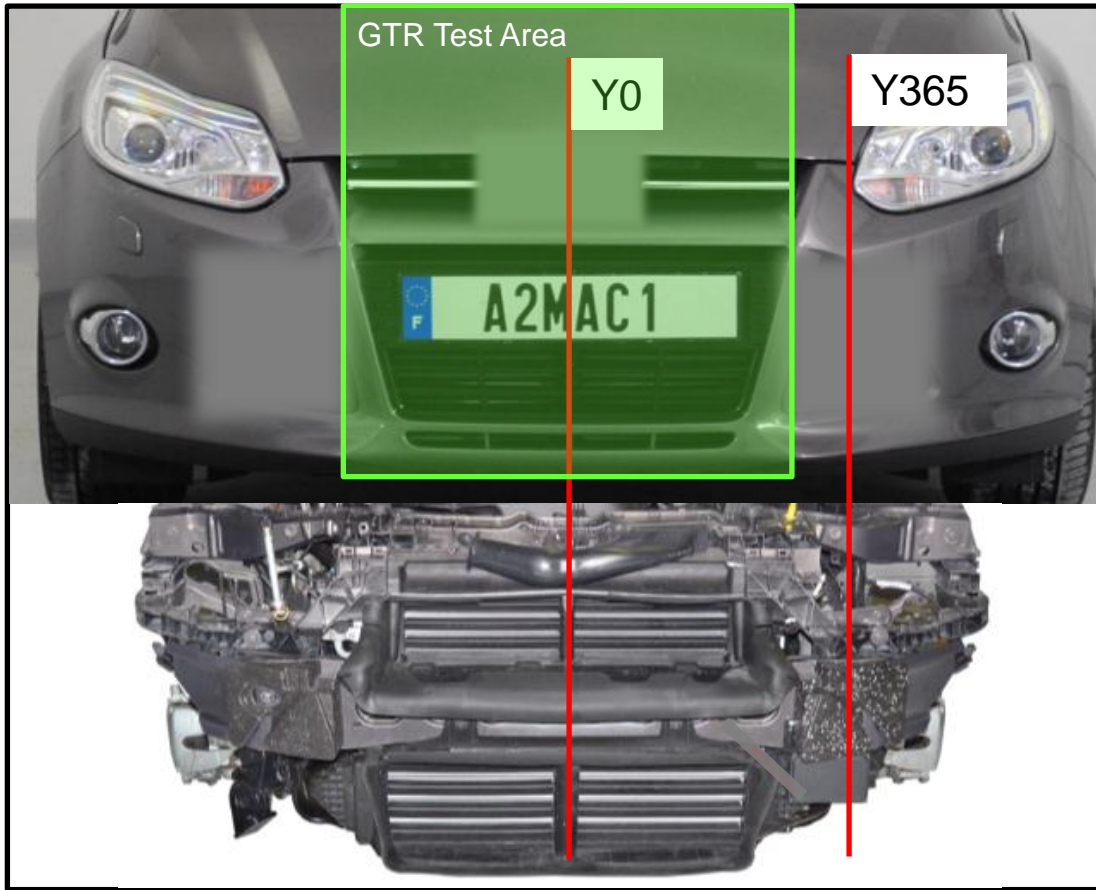
**Legform Detail**

SN	Version	Status*	Mass	Owner
SN01	Flex GTR	Master	13.32kg	Humanetics
VRTC	Flex GTR	Master	13.18kg	NHTSA

Master = Latest eng level (bone cores/long rubber) & meets cert corridors

# Vehicle #1

## Test Locations

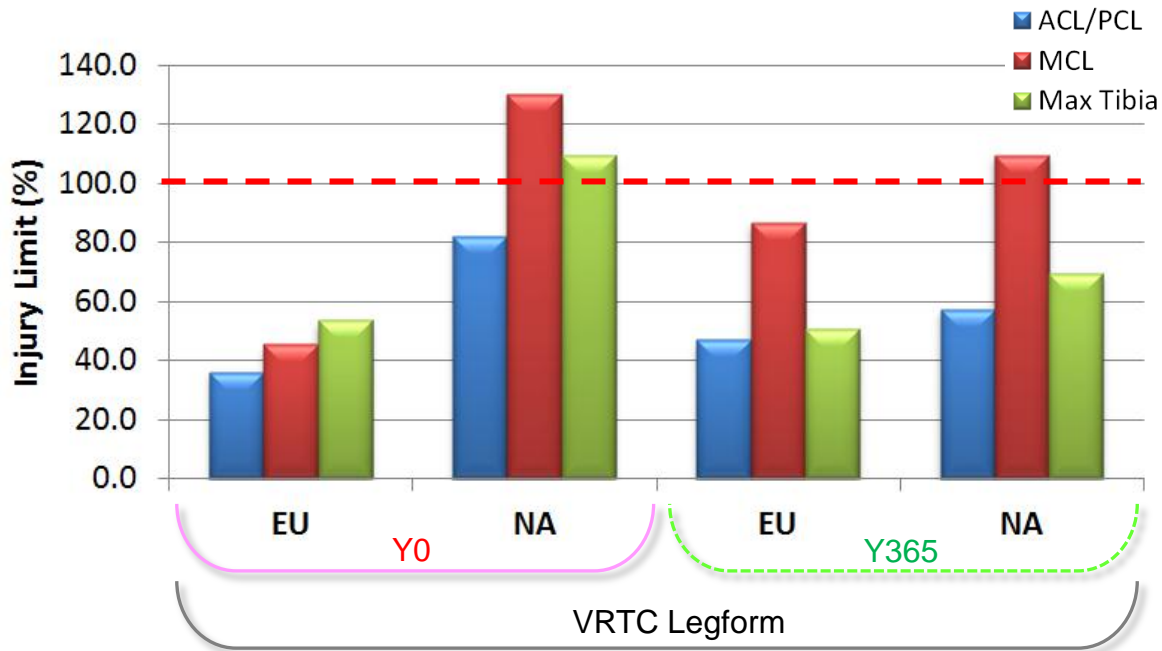


NA vehicle w/ EU system applied



\*Offset location established from EuroNCAP protocol

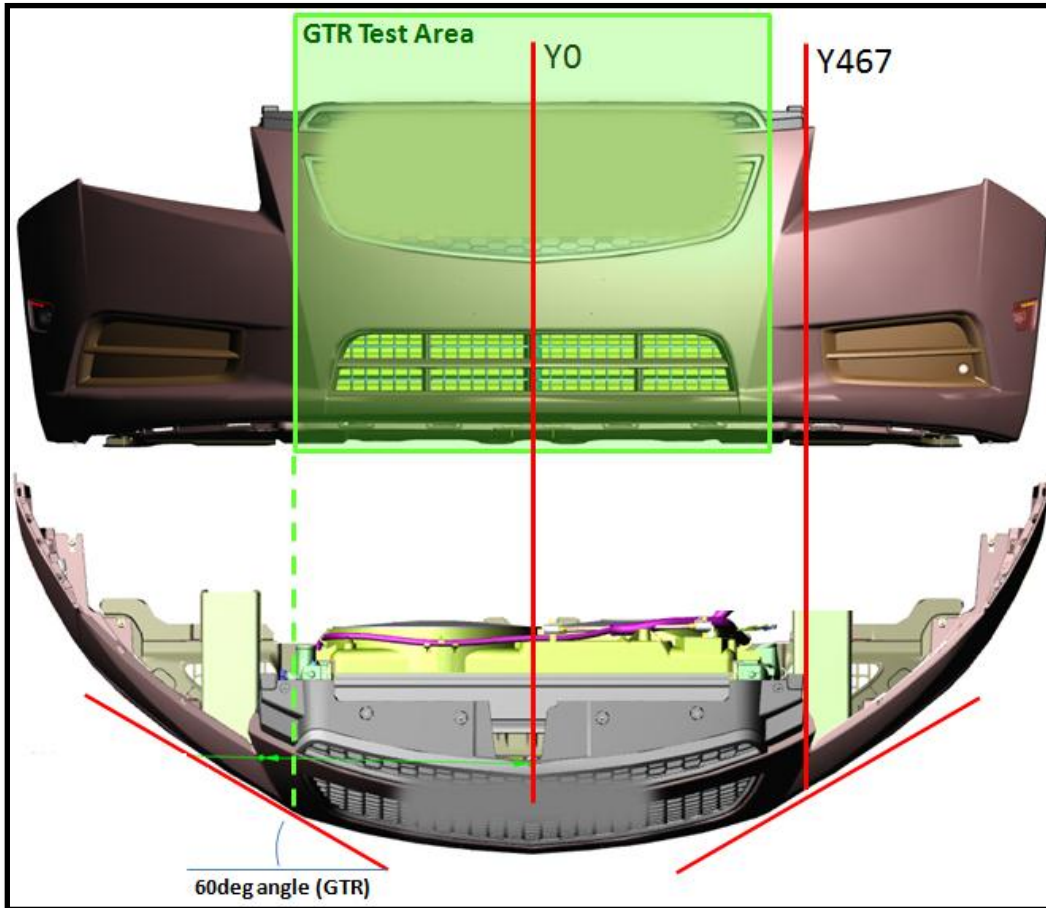
# Vehicle #1: EU & NA



VEHICLE #1	Location	Leg	ACL/PCL	MCL	Max Tibia	GTR9
			13	22	340	
EU	Y0	VRTC	4.7	10.0	182.2	
NA	Y0	VRTC	10.7	28.6	372.0	
EU	Y365	VRTC	6.1	19.1	172.4	
NA	Y365	VRTC	7.5	24.1	236.4	

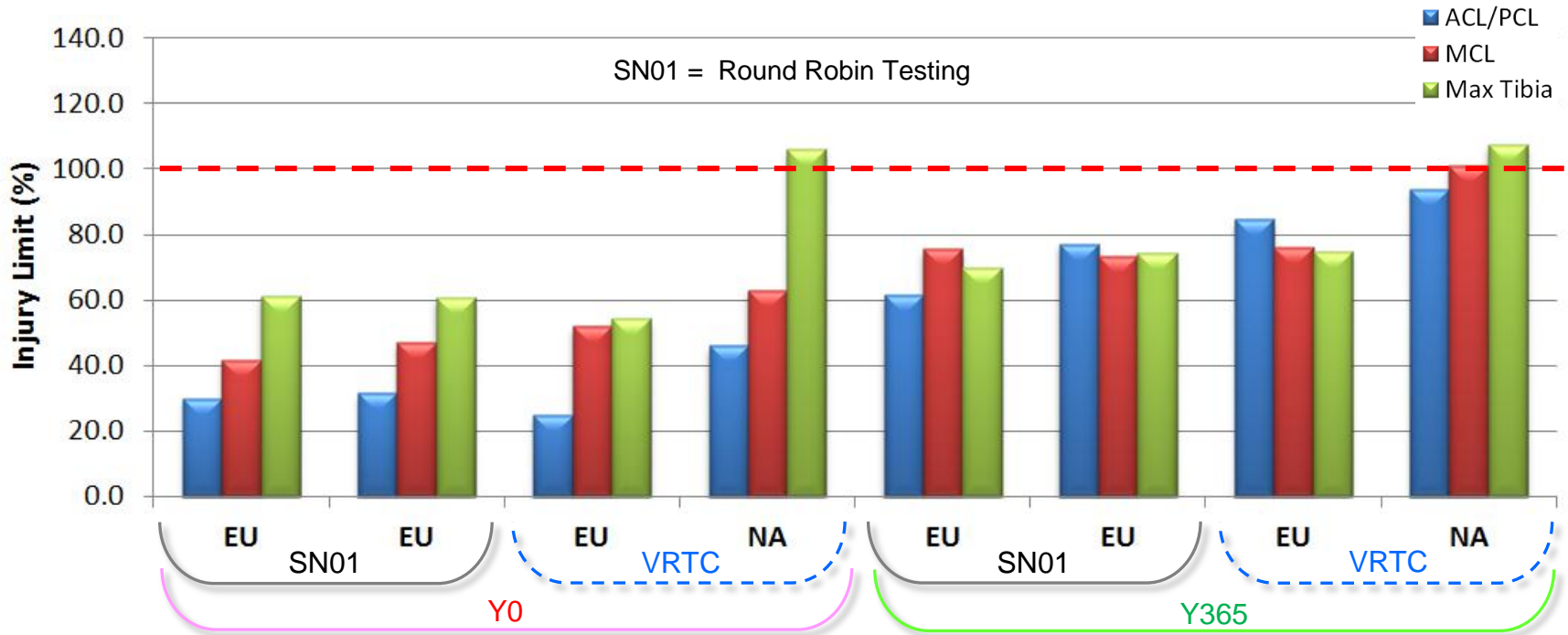
## Vehicle #2

### Test Locations



\*Offset location established from EuroNCAP protocol

# Vehicle #2: EU & NA + IWG RR Tests



VEHICLE #2		Location	Leg	ACL/PCL	MCL	Max Tibia
				13	22	340
EU	Y0	SN01		3.9	9.2	208.5
EU	Y0	SN01		4.1	10.4	206.4
EU	Y0	VRTC		3.3	11.4	184.9
NA	Y0	VRTC		6.0	13.9	360.6
EU	Y467	SN01		8.0	16.6	238.0
EU	Y467	SN01		10.0	16.1	252.3
EU	Y467	VRTC		11.0	16.8	253.6
NA	Y467	VRTC		12.2	22.3	366.1

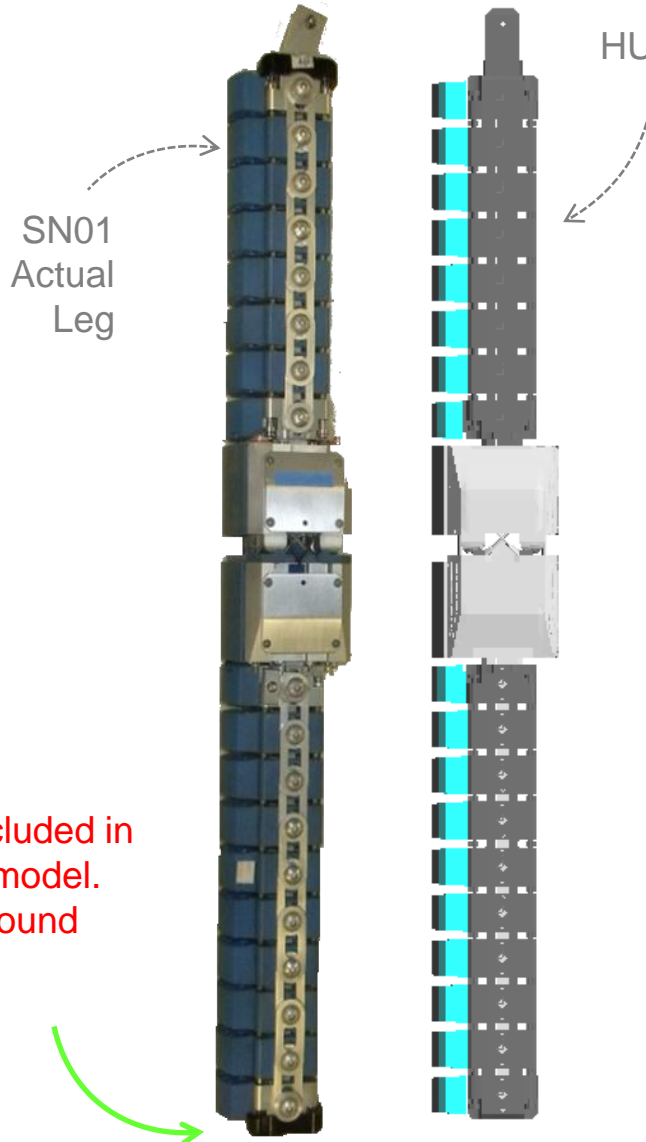
GTR9

## Shape Corp: General Observations

- Both VRTC & SN01 legforms at “**master**” level containing updated bone cores, tibia long rubber and within newly defined certification corridors
- Slight **launch plate modifications required** to keep tibia bending below 10Nm during free flight.
  - (a) bottom plate extension
  - (b) material removed at center for knee joint clearance
- Friction differences in roller bracket required **launch pressure differences** between legs
- Wire exit base/clamp (top of tibia) were **not being used** on either legform (wires loose)
- DAS cable connection **socket damaged** when impacting floor.
- Zipper durability is an issue, several openings occurred during Y-offset tests
- During CAE correlation it was discovered the LS-DYNA Flex PLI Ver2 legform does not include the plastic endcap at tibia bottom. Measurement to ground line should be compensated by 8.6mm (see next page).

# Ground Line Adjustment Required in CAE

HUMANETICS\_FLEX\_PLI\_GTR\_V2.0\_S3\_DYNA.key



End cap not included in V1 or V2 CAE model. Adjust leg to ground line by 8.6mm

