

doi:10.13021/xb7g-8z06

2020 Nissan Rogue FE Model

Version 2



October 2022



Vehicle Description

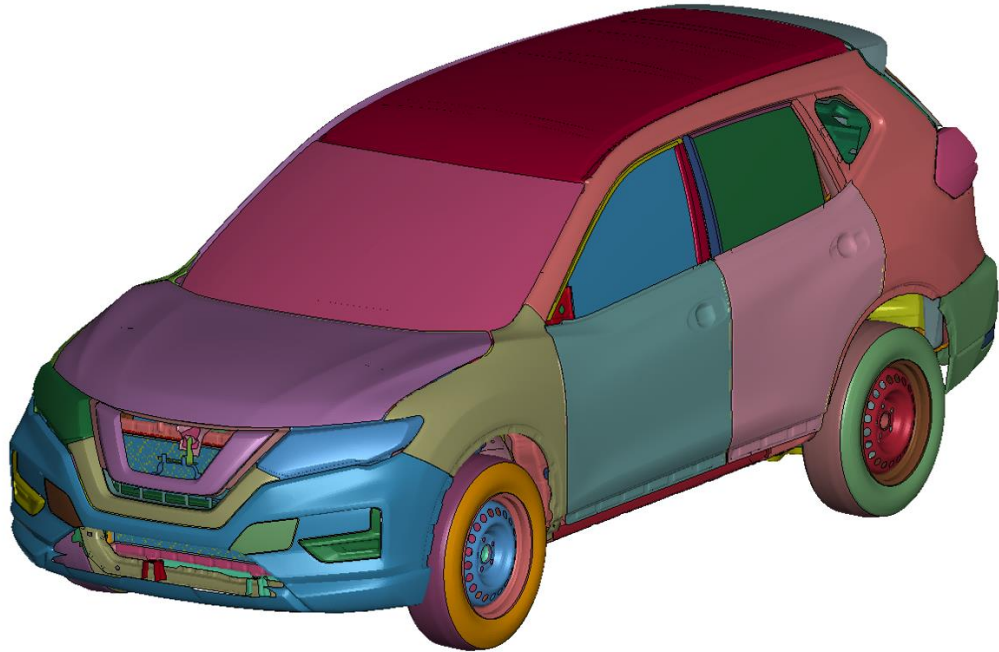
- 2020 Nissan Rogue
 - VIN 5N1AT2MT6LC742896
 - 5-door SUV
 - Engine 2.5L-I4
 - Front Wheel Drive
 - Curb Weight 1609 kg



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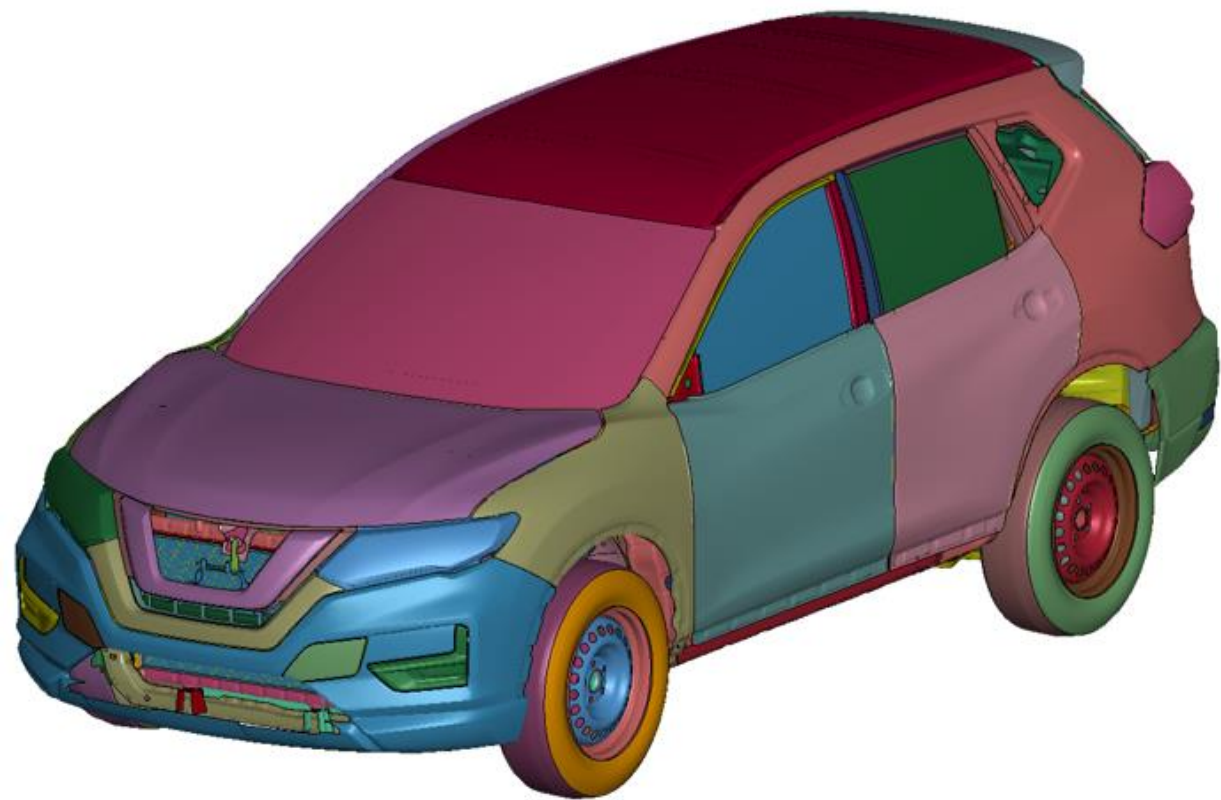
FE Model Information



Number of parts	1,284
Number of nodes	2,066,137
Number of solid elements	1,514,394
Number of shell elements	1,716,761
Number of beam elements	9,562
Number of elements	3,240,729

FE Model Information

2020 Nissan Rogue FE Model V2

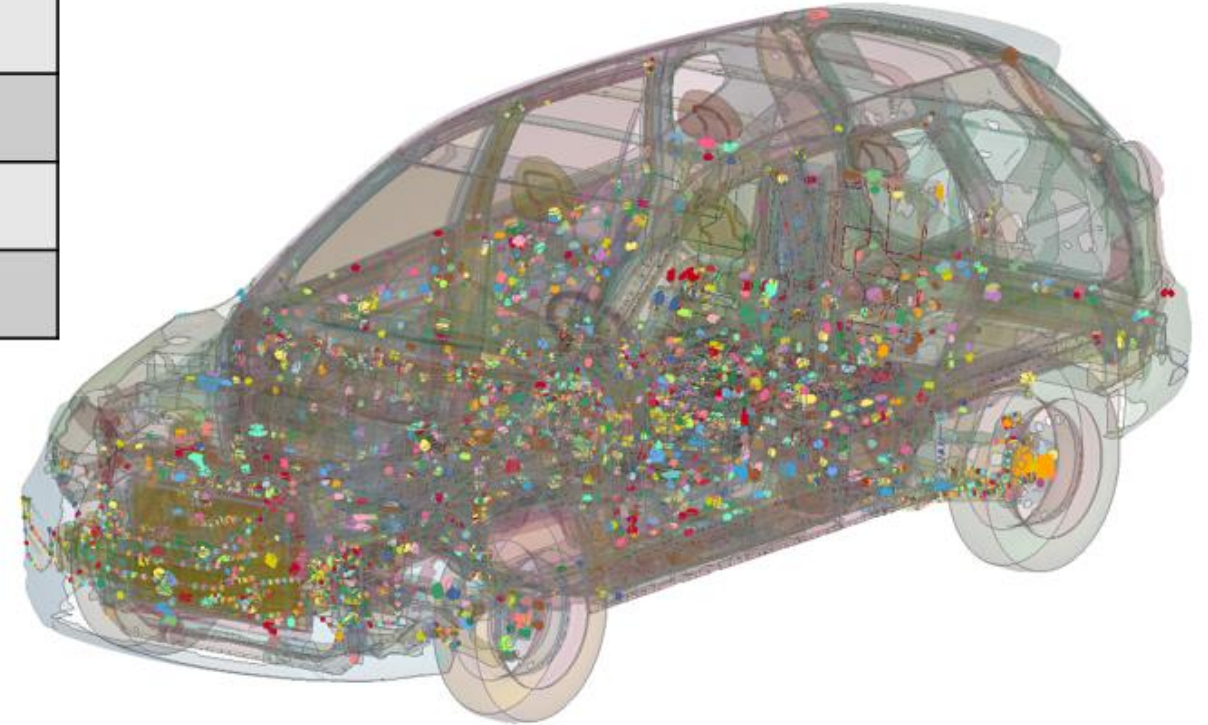


General Info

State:	1		
Nodes:	2066137		
Beams:	9562	Beam Parts:	10
Shells:	1716761	Shell Parts:	1208
TShells:	0	TShell Parts:	0
Solids:	1514394	Solid Parts:	59
SPH Nodes:	0	SPH Parts:	0
Discrete Elements:	12	Discrete Parts:	6
Seatbelt Elements:	0	Seatbelt Parts:	0
Nurbs Elements:	0	Nurbs Parts:	0
Discrete Sphere:	0		
Mass Elements:	0		
Inertia Elements:	0		
Nodal Rigid Bodies:	4190		
Rigid Elements:	8785		
Deformable Elements:	3231944		
Total no. of Elements:	3240729		
Total no. of Parts:	1284		

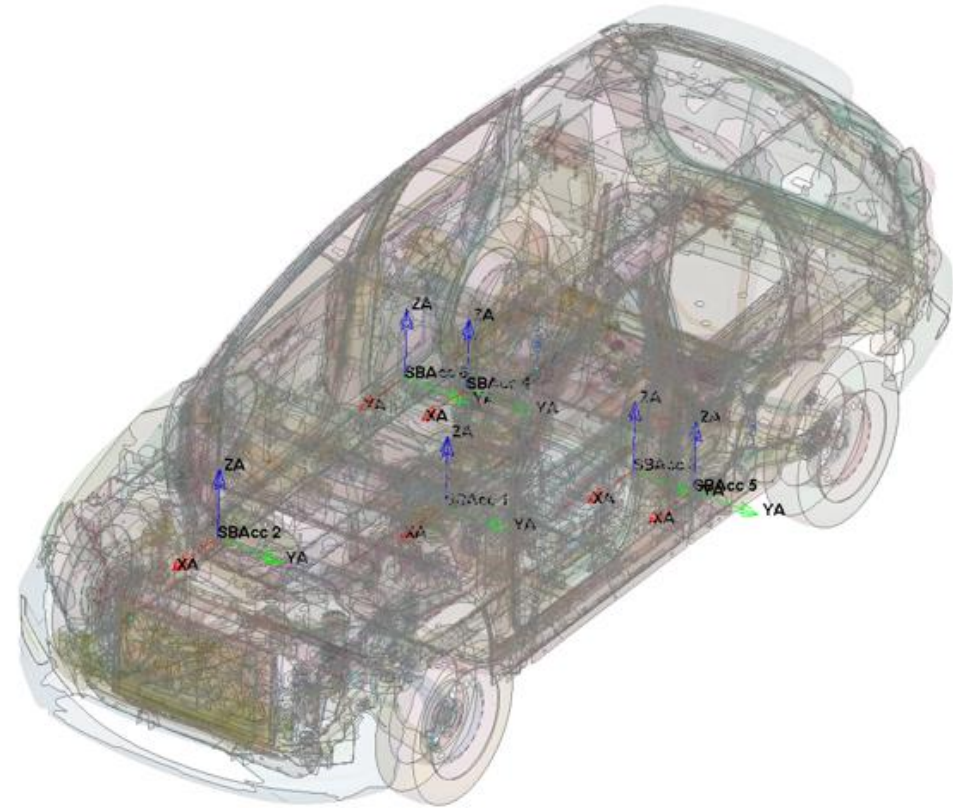
FE Model Connections

NODAL_RIGID_BODY	4190
JOINTS	30
RIGID_BODIES	8
SPOTWELD	5754



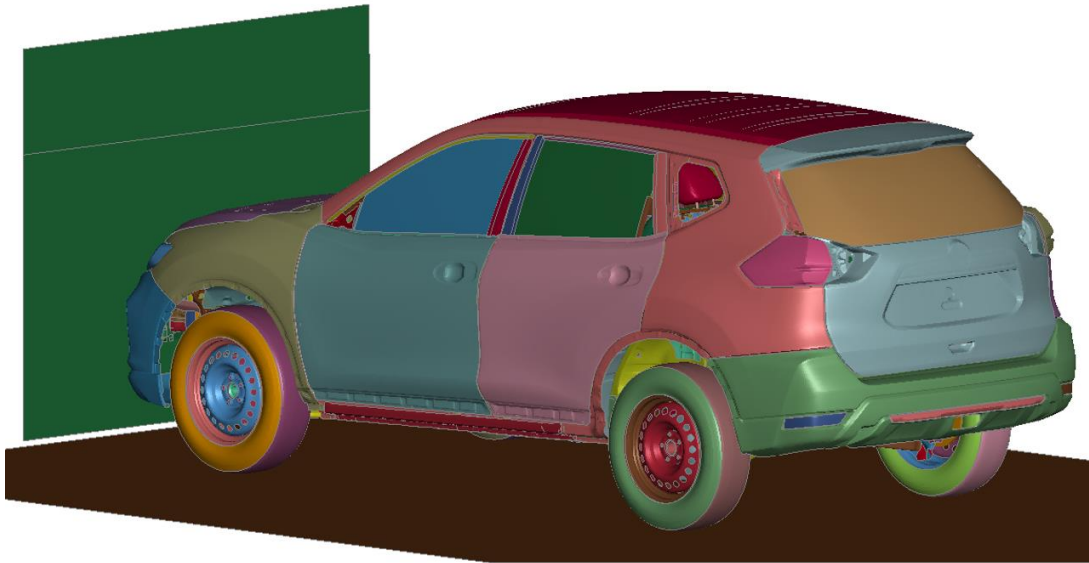
FE Model Accelerometers

- Vehicle C.G. Local (Node 3881152)
- Engine Top (Node 3881154)
- Left Rear Crossmember (Node 3881155)
- Right Rear Crossmember (Node 3881156)
- Left Rear Sill (Node 3881120)
- Right Rear Sill (Node 3881127)



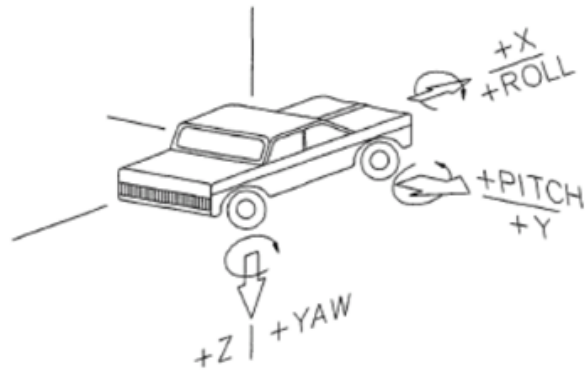
Simulation Benchmark

2020 Nissan Rogue FE Model V2



LS-DYNA	
Platform	Intel-MPI 2018 Xeon64
Version	mpp s R11.2.2
Revision	R11.2-290-g768d145fcb
Precision	Single precision
Time to simulate 120 ms	3 hours 22 mins
Number of processors	32

Inertia Comparisons



	Actual Vehicle	FE Model
Weight, kg	• 1609	• 1632
Pitch inertia, kg-m ²	• 2707	• 2878
Yaw inertia, kg-m ²	• 2957	• 3081
Roll inertia, kg-m ²	• 634	• 586
Vehicle CG Z, mm	• 638	• 660

Full Frontal Impact (56 km/h) – Test 1

- NHTSA Test 8987 (56.3 km/h) – Frontal NCAP
- 2015 Nissan Rogue S AWD SUV

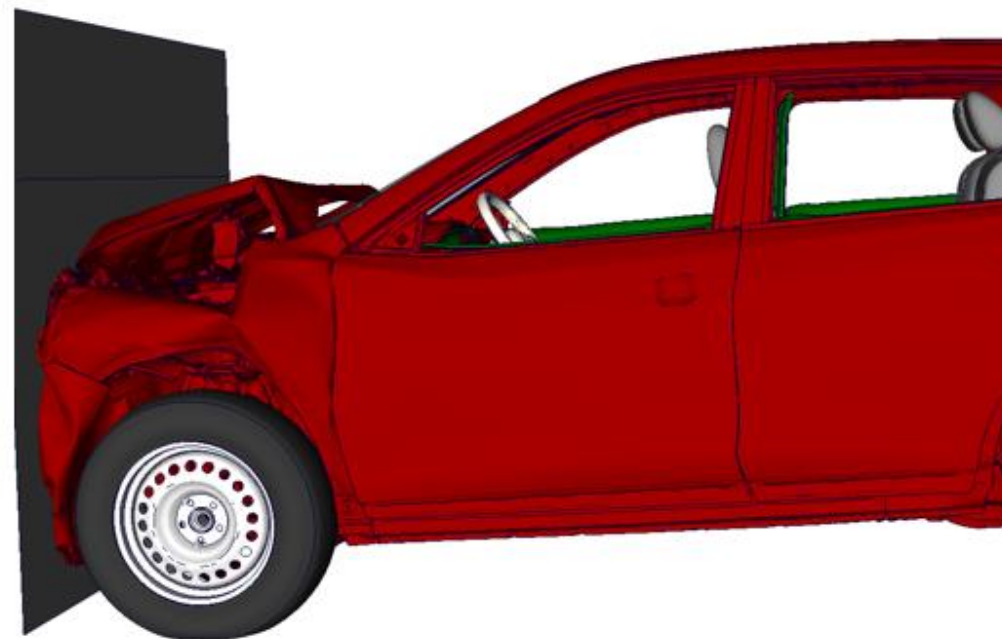


Full Frontal Impact (56 km/h) – Test 2

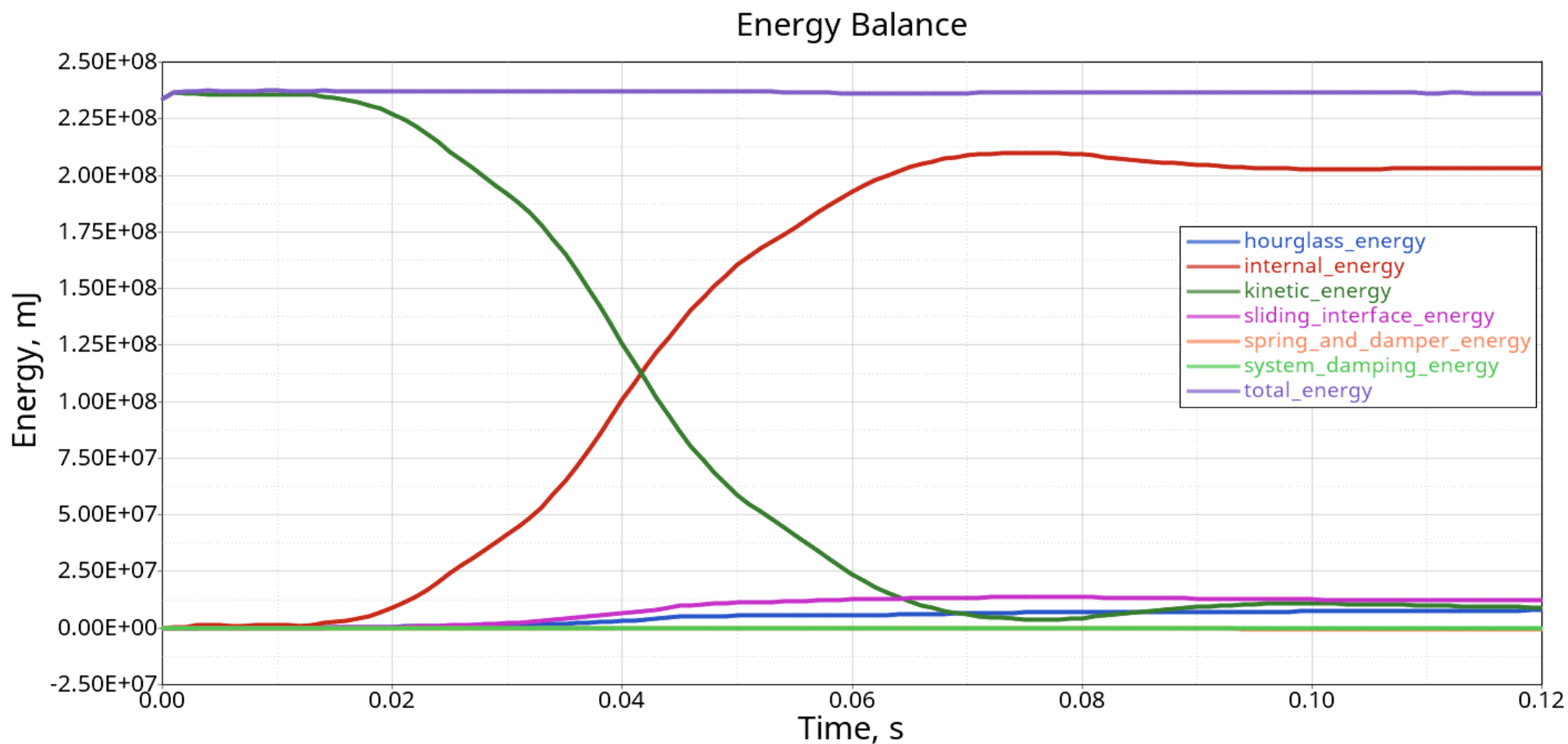
- NHTSA Test 9569 (56.3 km/h) – Frontal NCAP
- 2016 Nissan Rogue AWD SUV



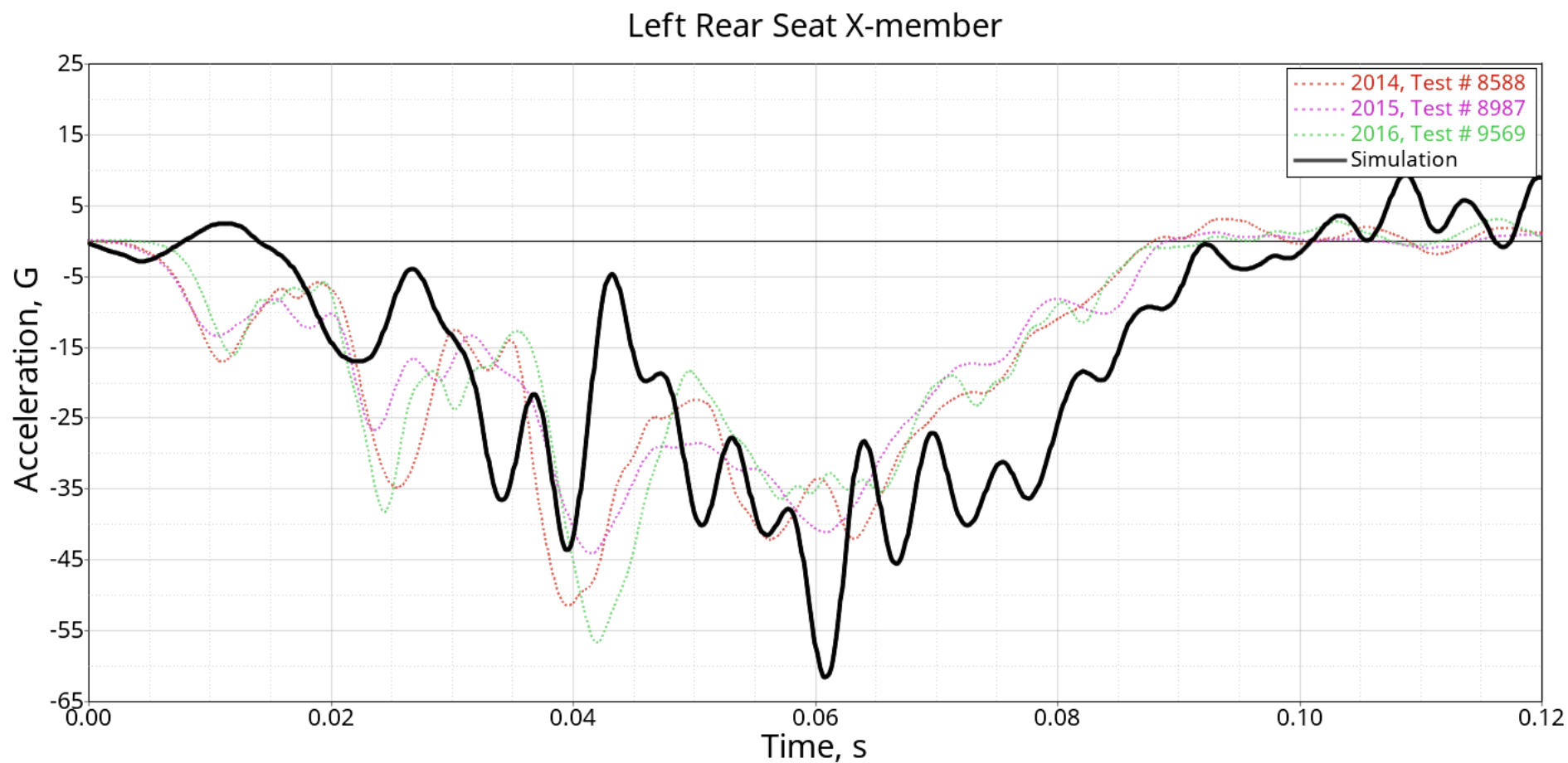
Full Frontal Impact (56 km/h) – Test versus Simulation



Full Frontal Impact (56 km/h) – Simulation Energy Balance



Full Frontal Impact (56 km/h) – Test versus Simulation: Acceleration Pulse



Full Frontal Impact (56 km/h) – Test versus Simulation: Velocity Pulse

