

2014 Chevrolet Silverado 1500 Finite Element Detailed Mesh Model Validation



[doi:10.13021/f4yf-yd73](https://doi.org/10.13021/f4yf-yd73)

Vehicle Description

- 2014 Chevy Silverado 1500
 - VIN 3GCUKPEC7EG144266
 - 4 door crew cab short box (5 ½ ft) pick-up truck
 - Engine 5.3L-V8 Ecotec3
 - 4x4 Drivetrain
 - Curb weight – 2367 kg



Vehicle Description (cntd)

**CHEVROLET**

**2014 SILVERADO 1500 4WD
1WT CREW**



Scan for vehicle info

**EXTERIOR: SUMMIT WHITE
INTERIOR: JET BLACK / DARK ASH**

**ENGINE, 5.3L V8 ECOTEC3
TRANSMISSION, 6 SPD AUTOMATIC**

Visit us at www.chevy.com

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

- 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS
- 24 HOUR ROADSIDE ASSISTANCE

MECHANICAL

- ENGINE, 4.3L V6 ECOTEC3
- TRANSMISSION, 6 SPD AUTOMATIC
- ELECTRIC POWER STEERING
- TRANSFER CASE, MANUAL
- REAR AXLE, 3.42 RATIO

SAFETY & SECURITY

- AIRBAGS: DRIVER & RT. FRONT PASS - FRONT/SIDE-IMPACT, OUTBOARD FRNT & REAR SEAT
- SIDE HEAD CURTAIN
- AIRBAG SENSING SYSTEM, PASSENGER
- STABILITRAK® STABILITY CONTROL W/ TRAILER SWAY CONTROL &

HILL START ASSIST

- ANTILOCK BRAKES, 4 WHEEL DISC WITH DURALIFE ROTORS (TM)
- TIRE PRESSURE MONITOR SYSTEM (EXCL. SPARE TIRE)
- DAYTIME RUNNING LAMPS

EXTERIOR

- LOCKING TAILGATE
- WHEELS, 17" PAINTED STEEL
- TIRES, ALL SEASON
- SPARE TIRE LOCK
- BED RAIL PROTECTORS
- CORNERSTEP, REAR BUMPER
- RECOVERY HOOPS, FRONT

INTERIOR

- SEATS - FRONT 40/20/40 BENCH
- SEAT 60/40 REAR FOLDING BENCH
- POWER WINDOWS, DRIVER EXPRESS
- POWER DOOR LOCKS
- FLOOR COVERING, RUBBERIZED-VINYL
- AIR CONDITIONING

CRUISE CONTROL

- DRIVER INFORMATION CENTER
- STEERING COLUMN, TILT
- AUDIO SYSTEM, W/ 4.2" DIAGONAL COLOR SCREEN
- USB PORTS

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	\$34,865.00
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(UP TO \$1,000 MORE ALLOWED BY THE MANUFACTURER (MAY VARY BY REGION) STANDARD EQUIPMENT \$-DOWN)

TRAILERING EQUIPMENT PKG INCL: AUTO LOCKING REAR DIFFERENTIAL	770.00
ENGINE, 5.3L V8 ECOTEC3	895.00
CHEVROLET MYLINK AUDIO SYSTEM W/ 4.2" DIAGONAL COLOR TRAILER BRAKE CONTROLLER	300.00
7,200 LB GVW RATING	230.00
REAR AXLE 3.42 RATIO	INC.

FRONT 40/20/40 CLOTH BENCH	INC.
TOTAL OPTIONS	\$2,195.00
TOTAL VEHICLE & OPTIONS	\$37,060.00
DESTINATION CHARGE	995.00
TOTAL VEHICLE PRICE*	\$38,055.00

EPA DOT Fuel Economy and Environment

Fuel Economy

18 MPG
combined city/hwy

16 city 22 highway 5.6 gallons per 100 miles

Driving Range
Gasoline: 470 miles
Ethanol (E85): 340 miles

Annual fuel cost \$2,900

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **4**

Smog Rating (tailpipe only) **6**

This vehicle emits 490 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fuelconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and costs \$11,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.50 per gallon. This is a dual fueled automobile. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

Flexible-Fuel Vehicle Gasoline-Ethanol (E85)

You spend \$3,000 more in fuel costs over 5 years compared to the average new vehicle.

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 40%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 51%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: SILAO, GJ MEXICO
COUNTRY OF ORIGIN: ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

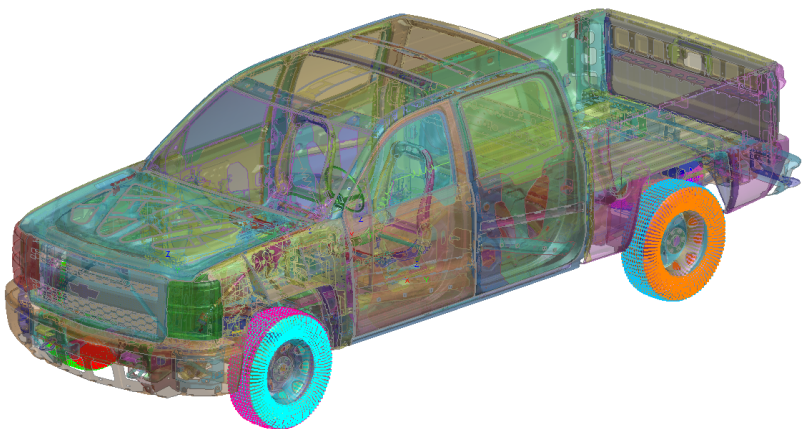
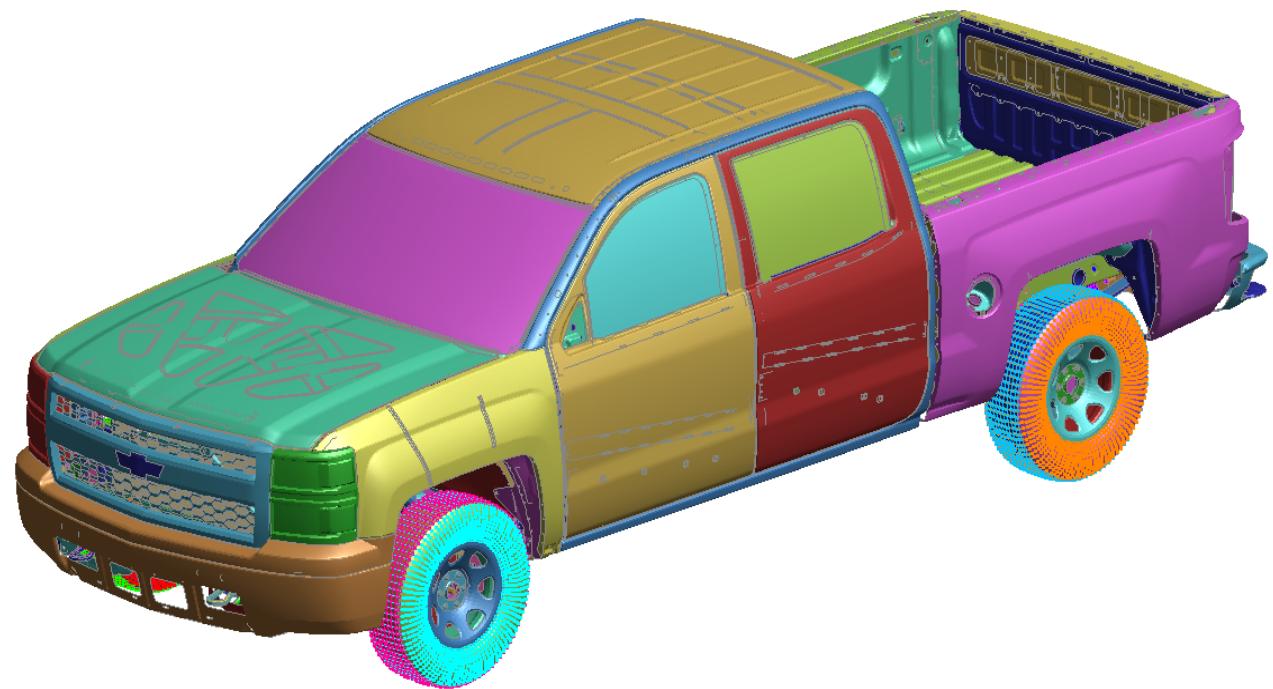
This label has been applied pursuant to Federal law - Do not remove prior to delivery to the ultimate purchaser. Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above. Local taxes or license fees.

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ORDER NO R100522 SALES CODE E
SALES MODEL CODE CK15540
DEALER NO 44001
FINAL ASSEMBLY PT:
SILAO, GJ MEXICO
VIN 3GCUKPEC7EG144266
DEALER TO WHOM DELIVERED:
SHAHEN CHEVROLET, INC.
832 AMERICAN RD
LANSING, MI 48911-5980

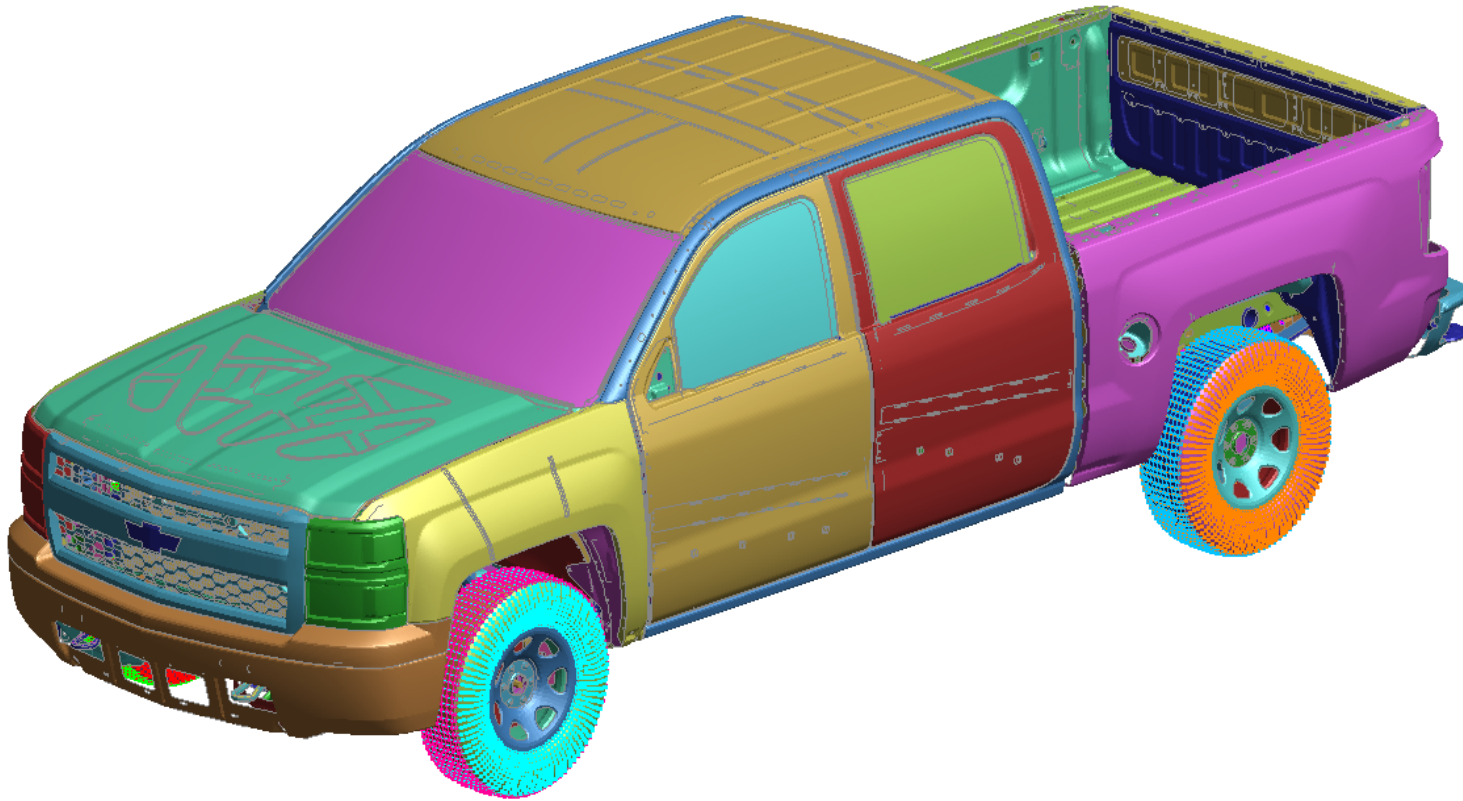
NZ
2GA3730674

Model Information



Number of parts	1501
Number of nodes	2809811
Number of solid elements	284289
Number of shell elements	2654053
Number of beam elements	22403
Number of elements	2960781

Model Information



Model Information

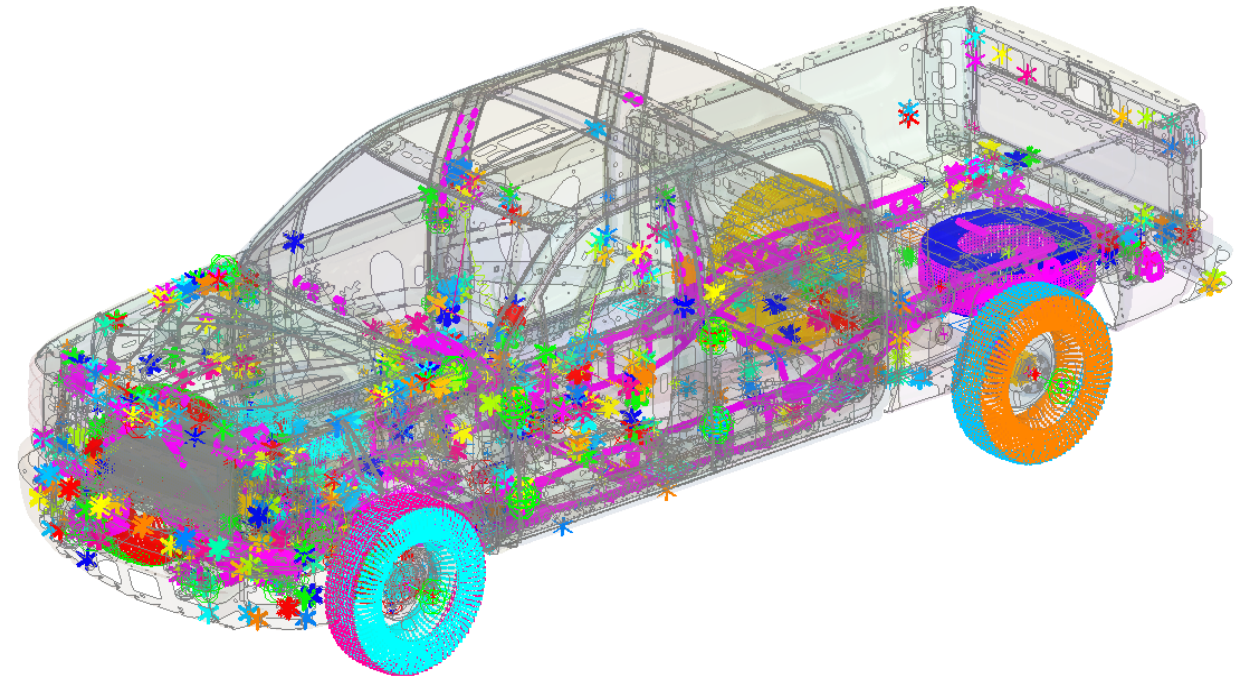
General Info

State:	1		
Nodes:	2809811		
Beams:	22403	Beam Parts:	18
Shells:	2654053	Shell Parts:	1311
TShells:	0	TShell Parts:	0
Solids:	284289	Solid Parts:	160
SPH Nodes:	0	SPH Parts:	0
Discrete Elements:	36	Discrete Parts:	12
Seatbelt Elements:	0	Seatbelt Parts:	0
Nurbs Elements:	0	Nurbs Parts:	0
Discrete Sphere:	0		
Mass Elements:	217		
Inertia Elements:	0		
Nodal Rigid Bodies:	494		
Rigid Elements:	200		
Deformable Elements:	2960581		
Total no. of Elements:	2960781		

Ok Update Summary

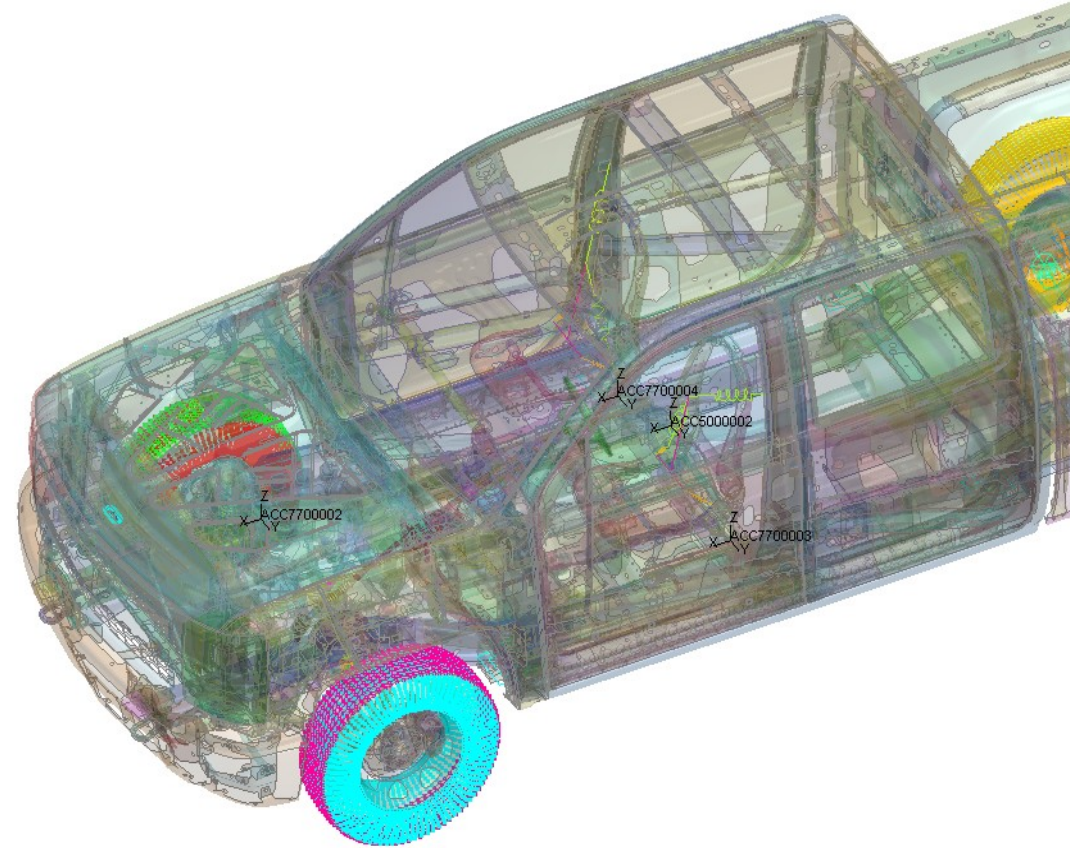
Connections

● NODAL_RIGID_BODY	10380
● EXTRA_NODES	760
● JOINTS	108
● RIGID_BODIES	587
● SPOTWELD	13776

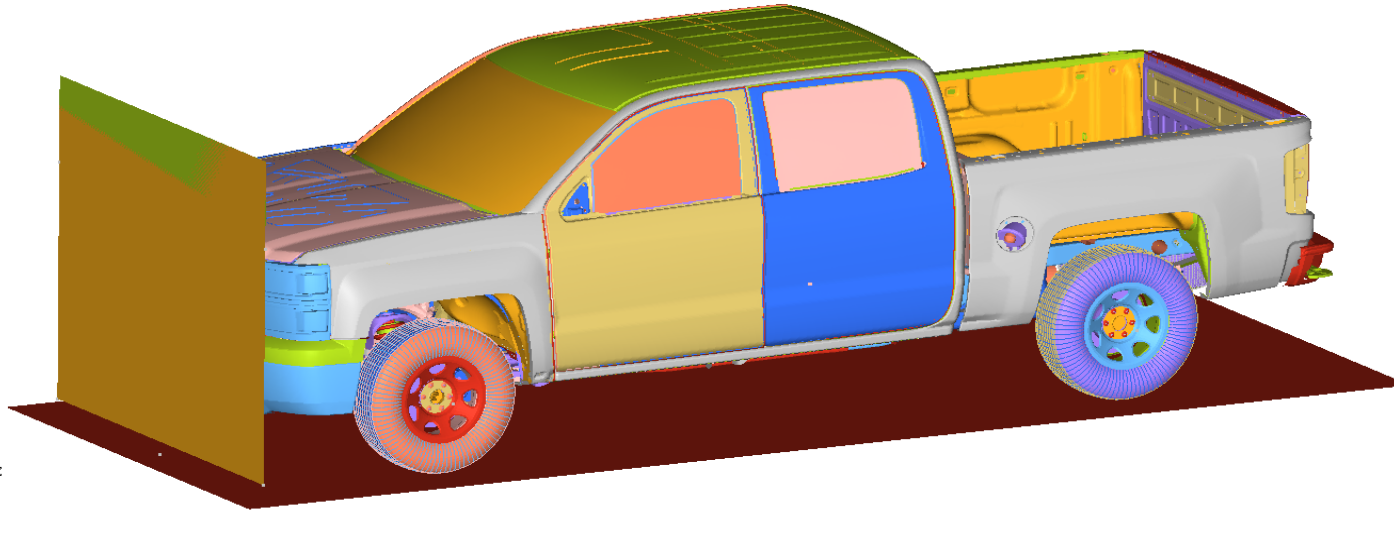


Accelerometers

- Left Rear Seat (Node 1000203)
- Right Rear Seat (Node 1000303)
- Engine Top (Node 1000102)
- Vehicle C.G. Local (Node 5000101)
- Vehicle C.G. Global (Node 5000100)

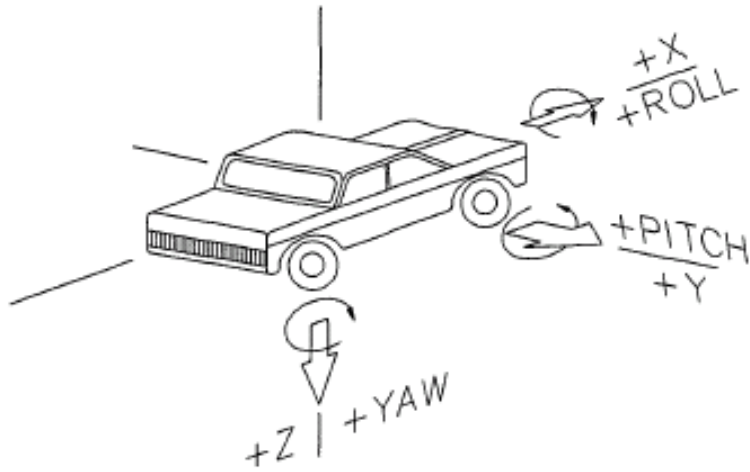


Simulation Benchmark



LS-DYNA	
Platform	Linux RHEL 5.4
Version	mpp s R8.0.0
Revision	95309
Precision	Single precision (I4R4)
Time to simulate 100 ms	25 hours 17 min
Number of processors	16

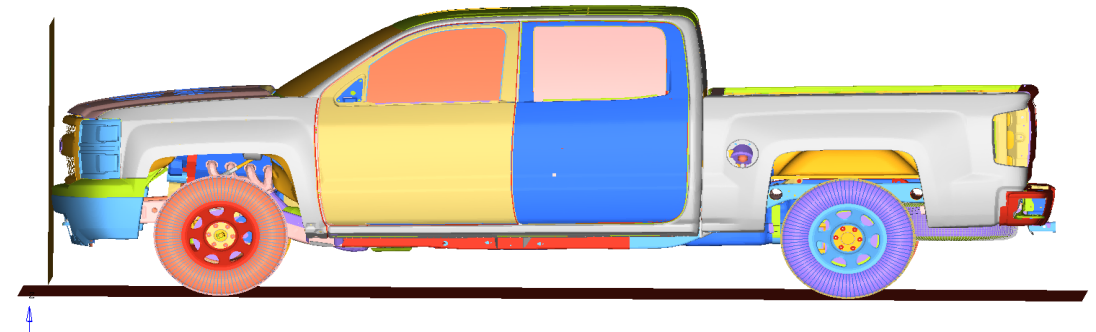
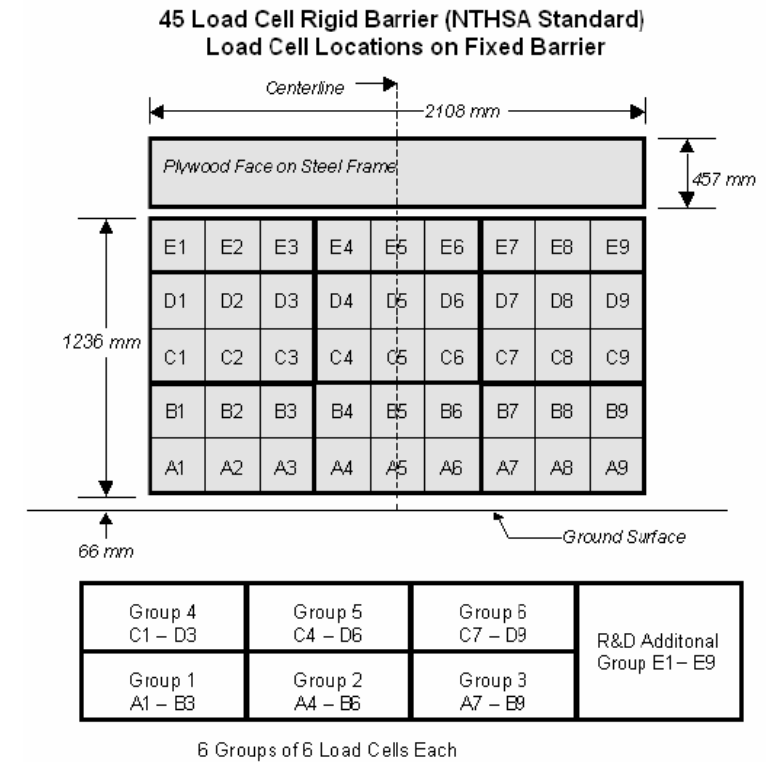
Inertia Comparisons



	Actual Vehicle	Detailed FE Model
Weight, Kg	2337	2279
Pitch inertia Kg-m ²	6155	6005
Yaw inertia Kg-m ²	6453	6383
Roll inertia Kg-m ²	1051	990
Vehicle CG Z mm	710.1	716.4

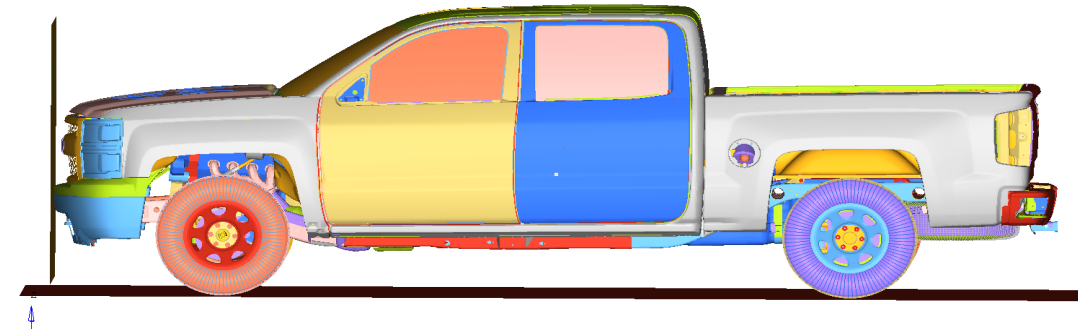
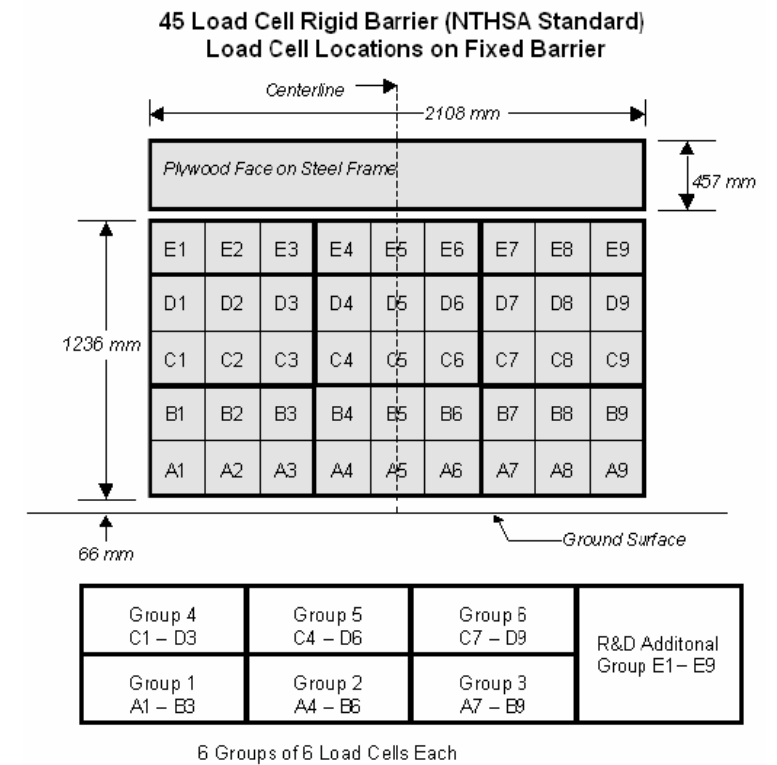
Frontal Full Wall – 56 km/hr

- NHTSA Test 8316 (56.6 km/hr) – Frontal NCAP
- 2014 Chevy Silverado NCAP test
- 45 load cell fixed wall

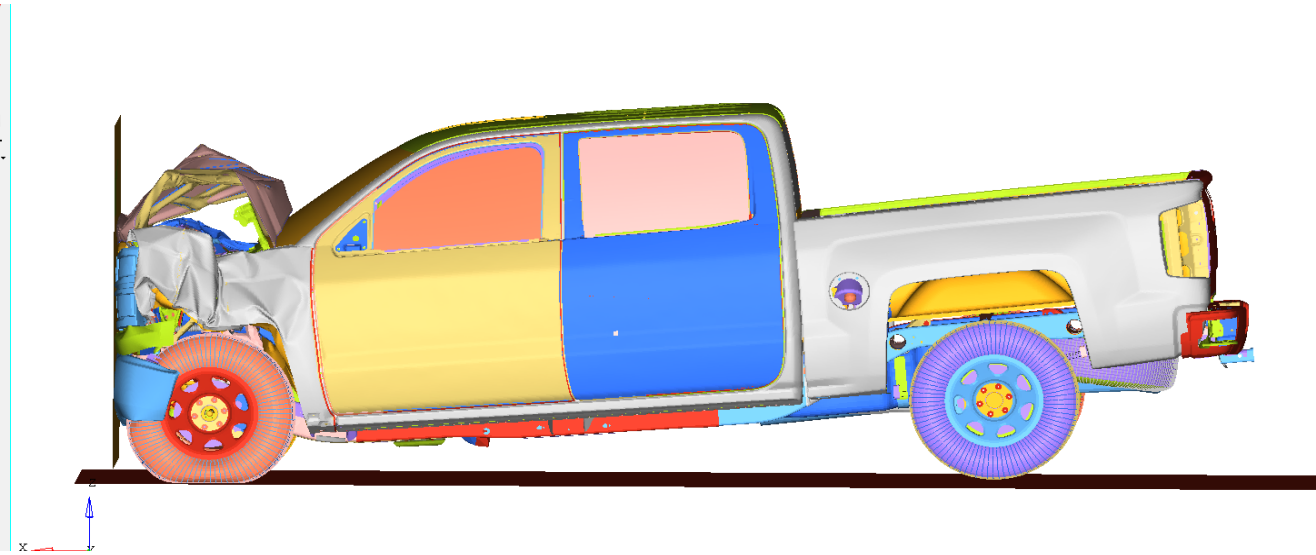


Frontal Full Wall – 56 km/hr

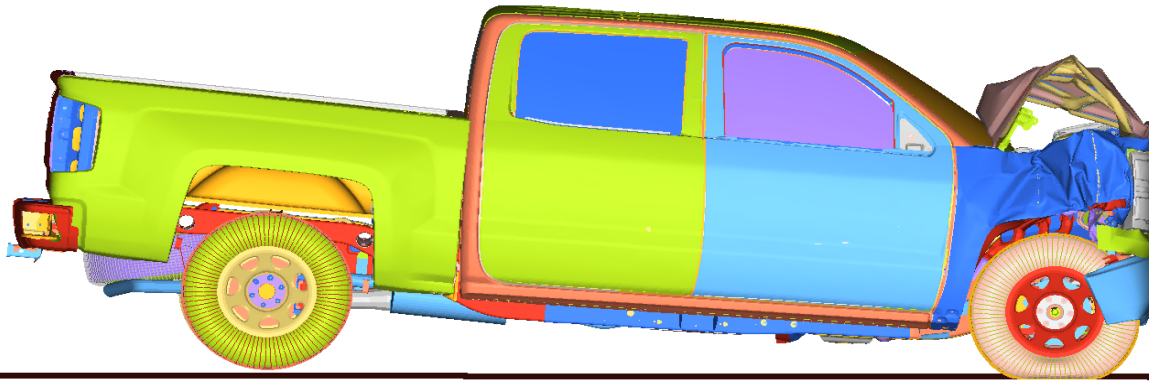
- NHTSA Test 8456 (56.4 km/hr) – Frontal NCAP
- 2014 Chevy Silverado NCAP test
- 45 load cell fixed wall



Full-scale Crash Testing – Front NCAP

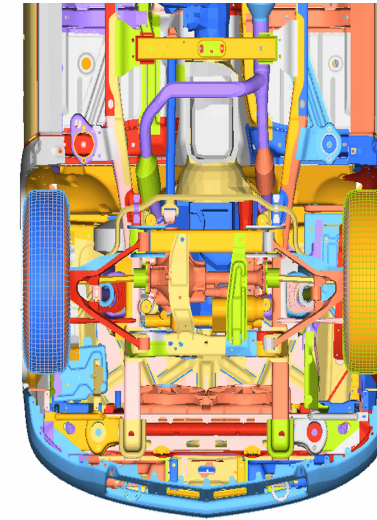


Full-scale Crash Testing – Front NCAP

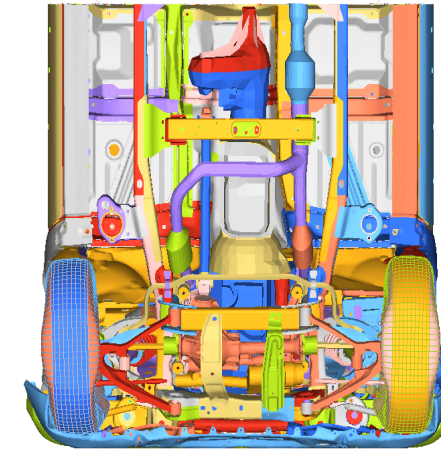


Full-scale Crash Testing – Front NCAP 8316 Crush Mode

Pre-Test

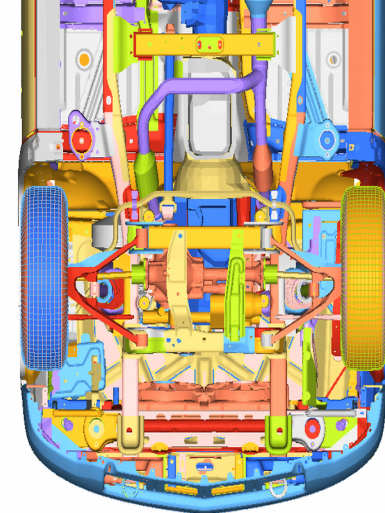
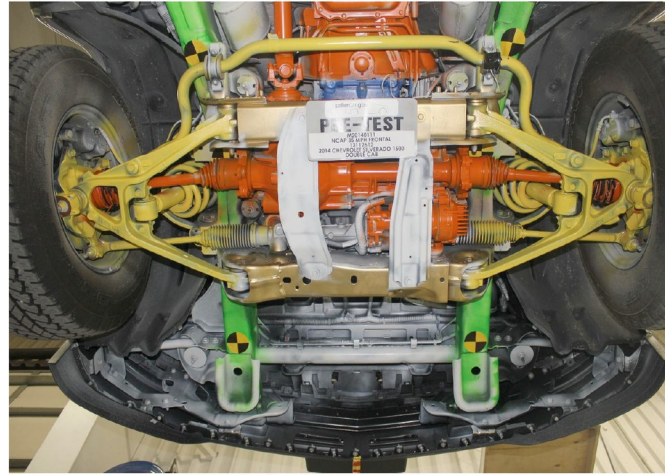


Post-Test

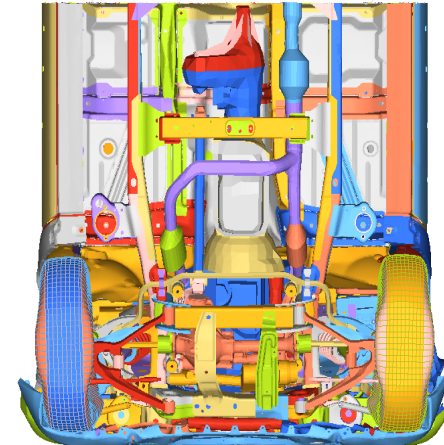


Full-scale Crash Testing – Front NCAP 8456 Crush Mode

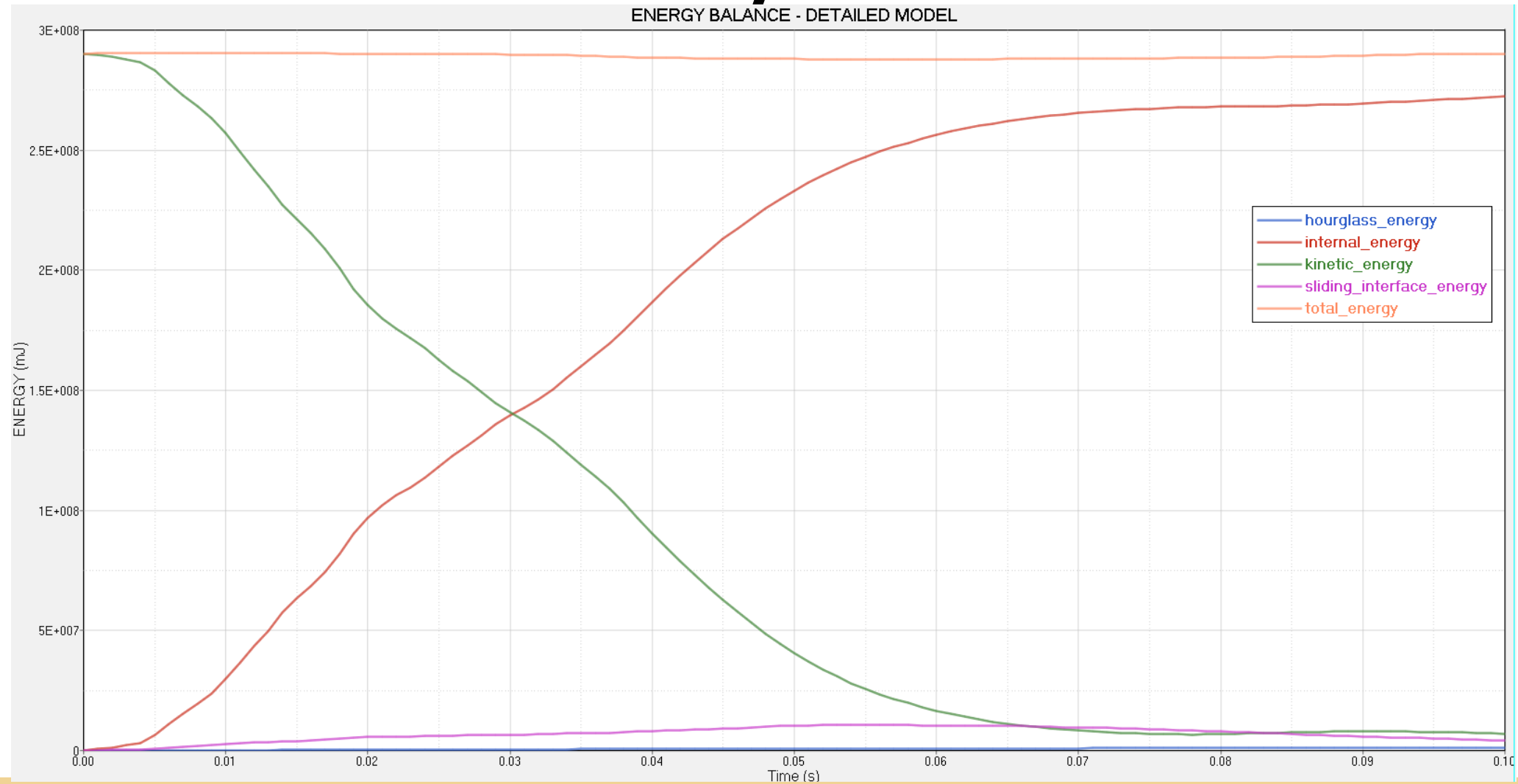
Pre-Test



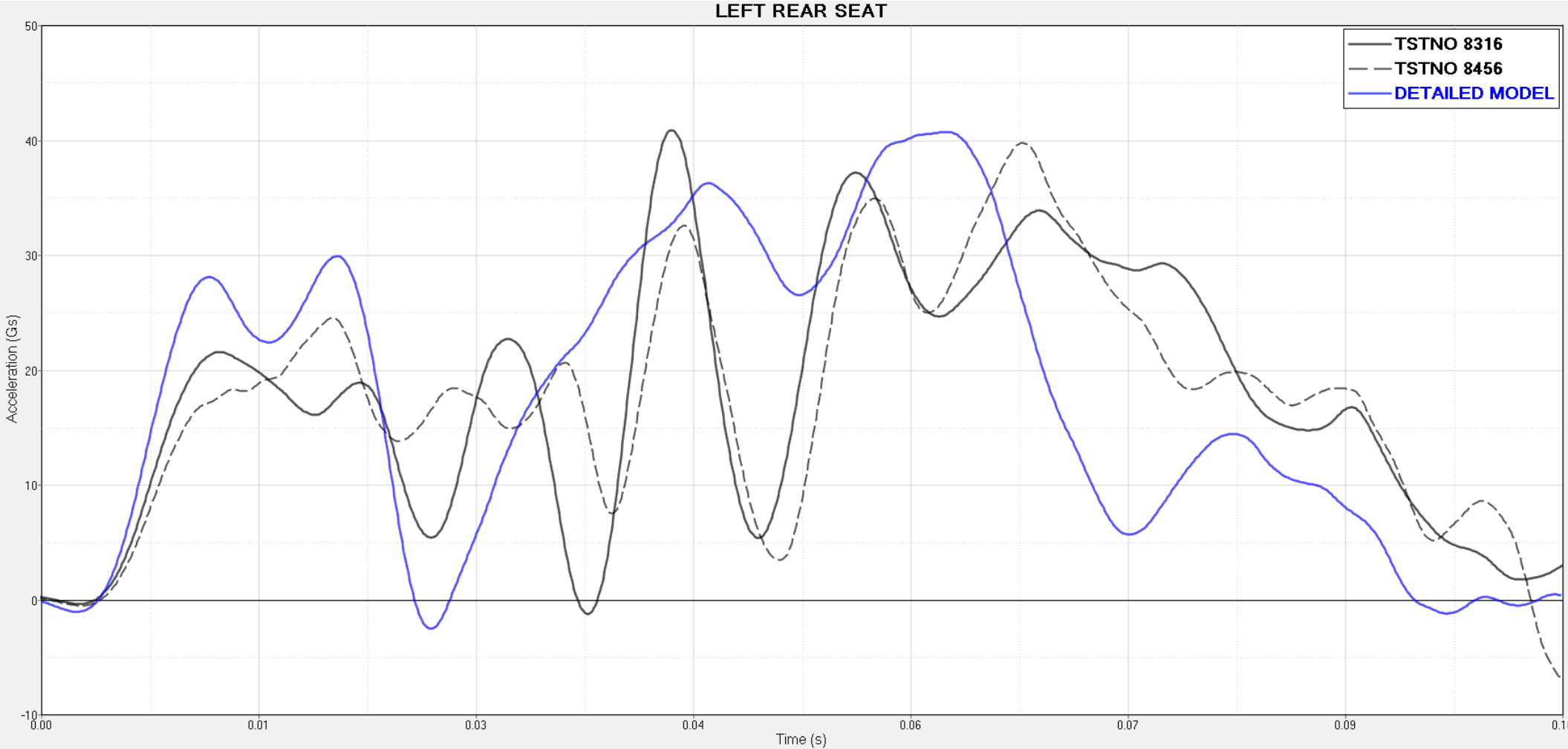
Post-Test



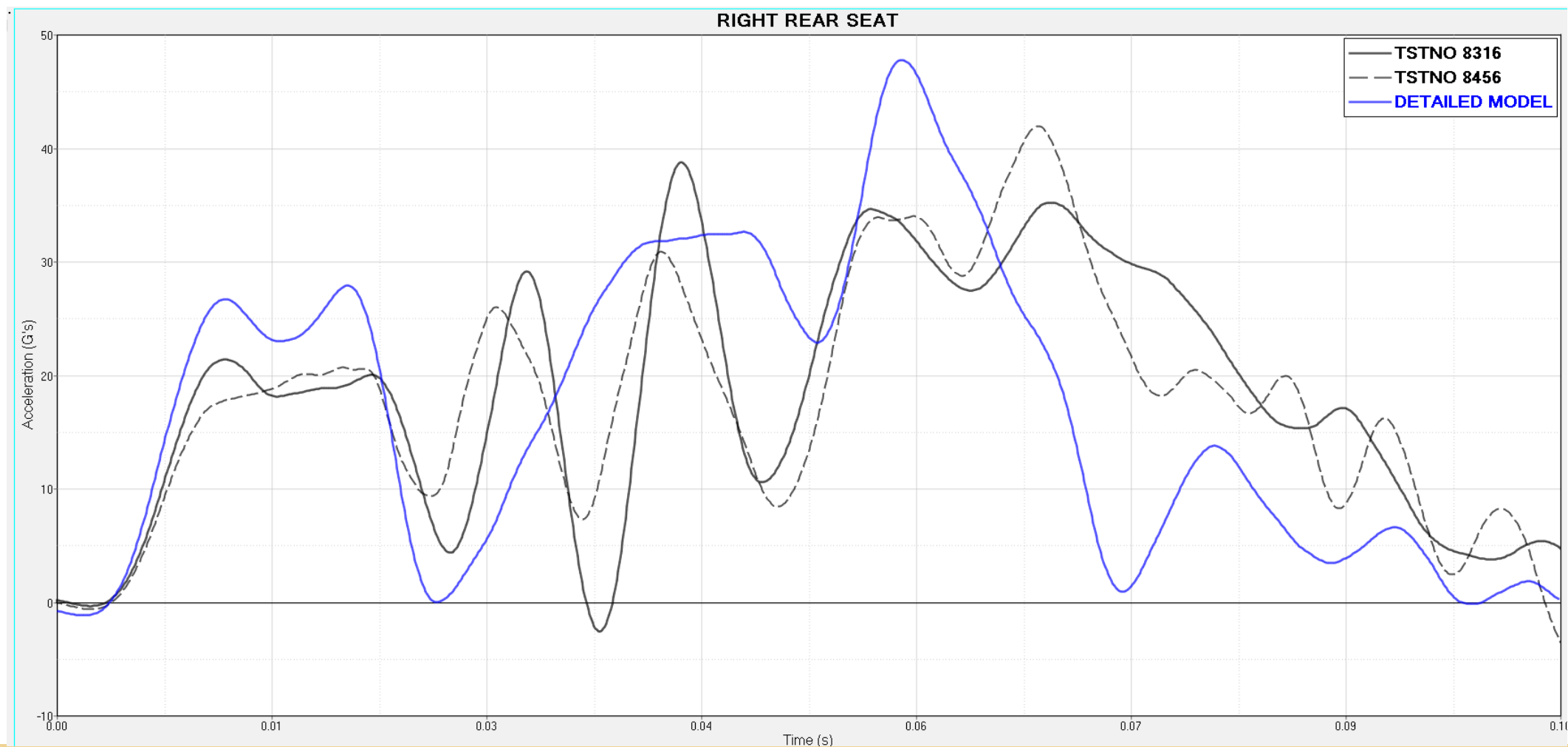
Frontal Full Wall – 56 km/hr



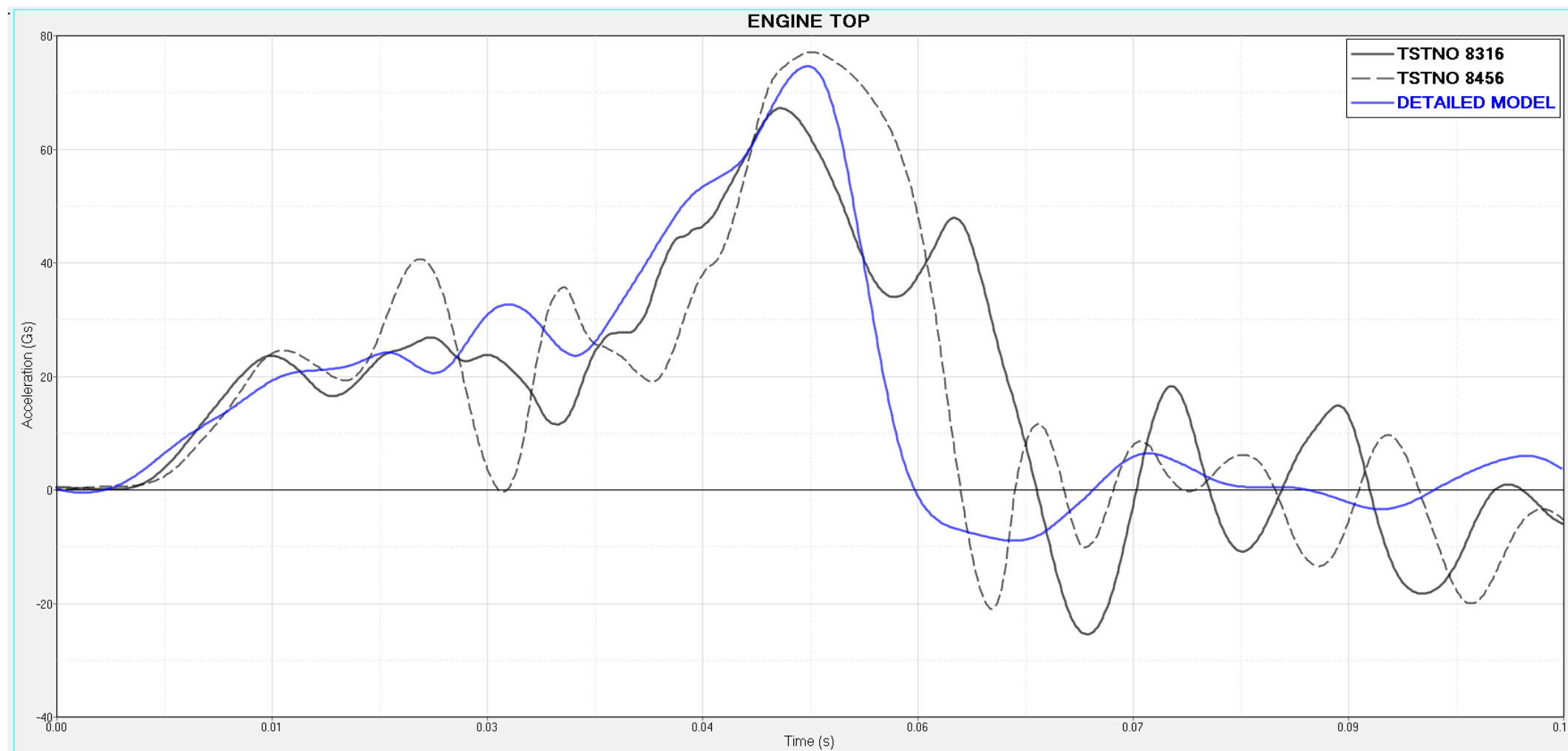
Frontal Full Wall – 56 km/hr – Acceleration



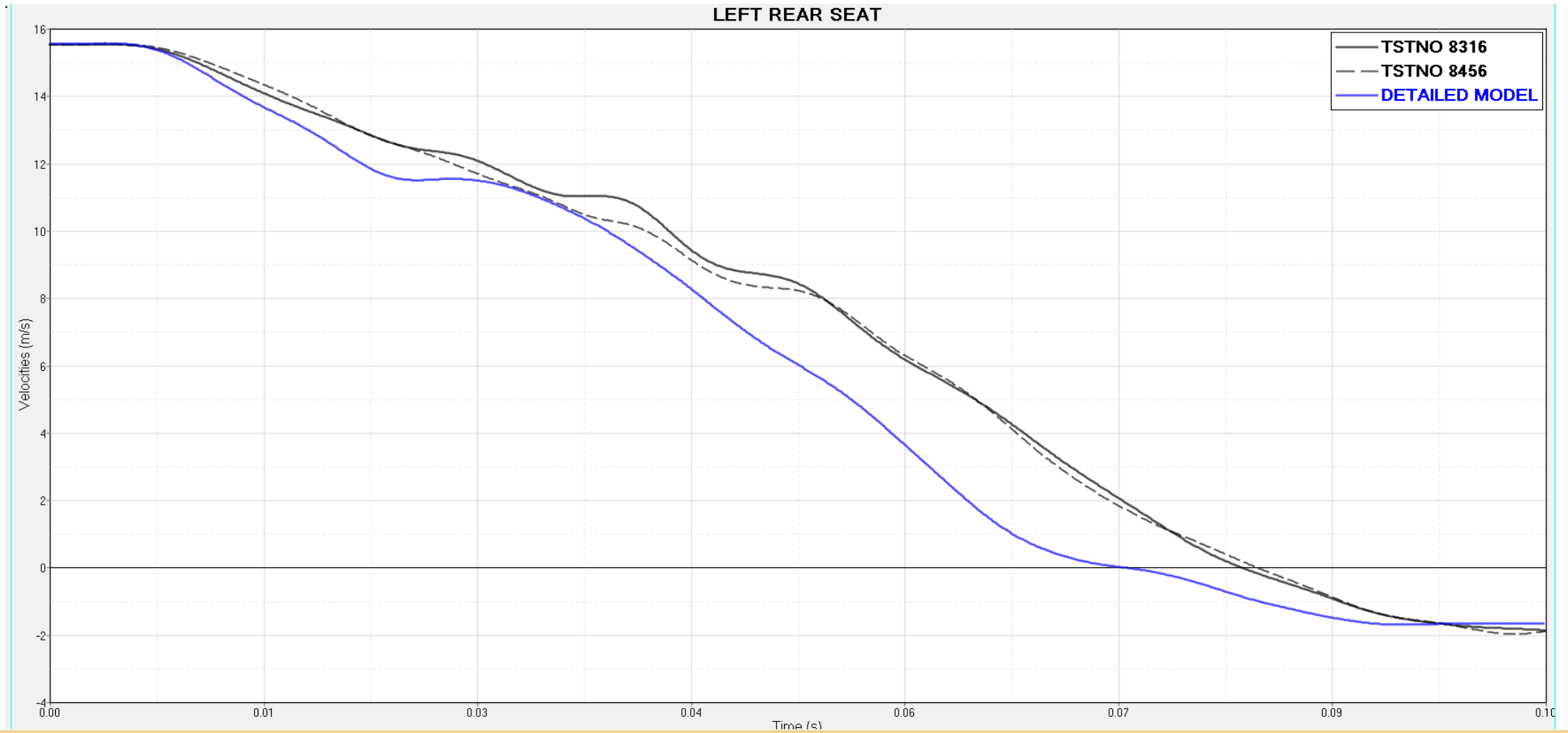
Frontal Full Wall – 56 km/hr – Acceleration



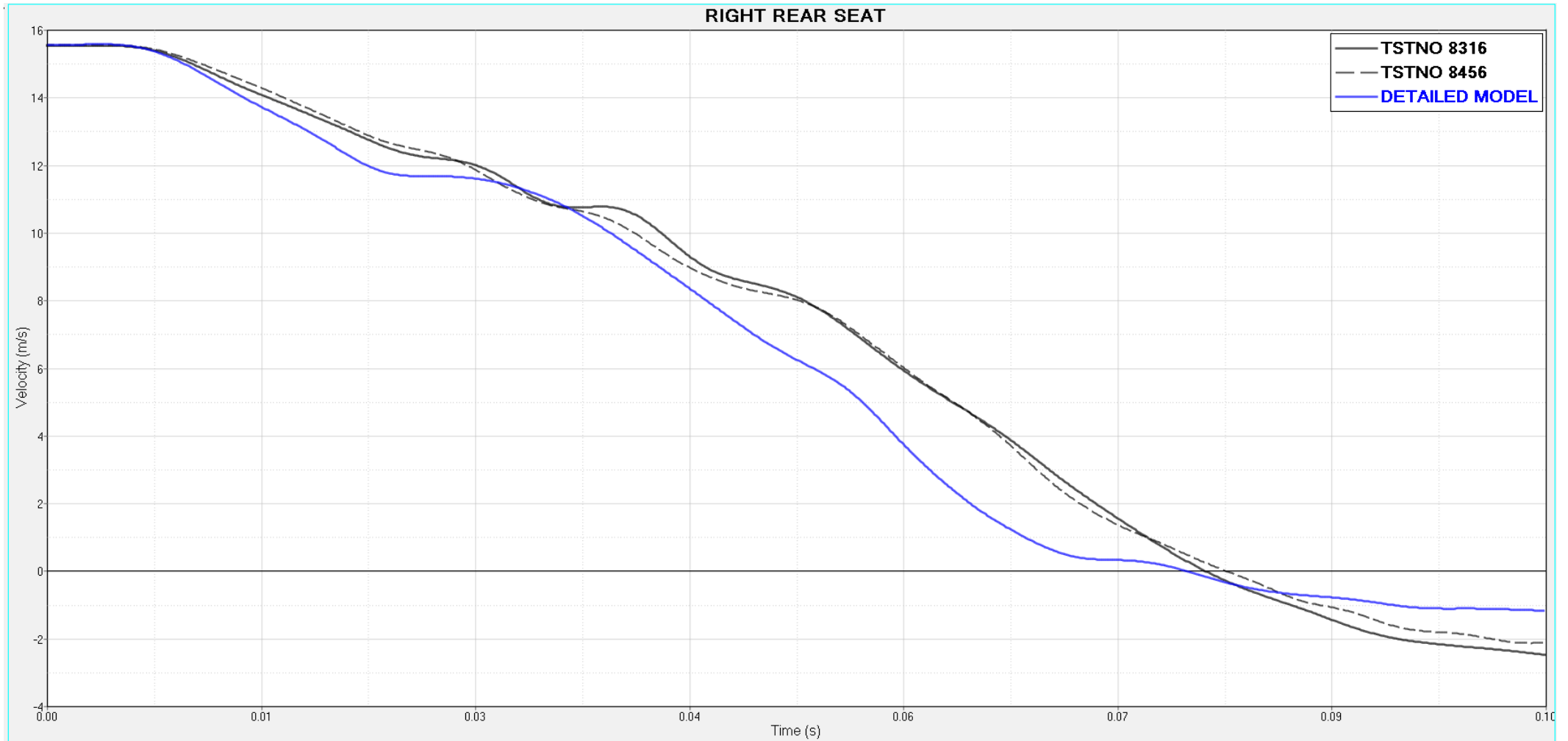
Frontal Full Wall – 56 km/hr – Acceleration



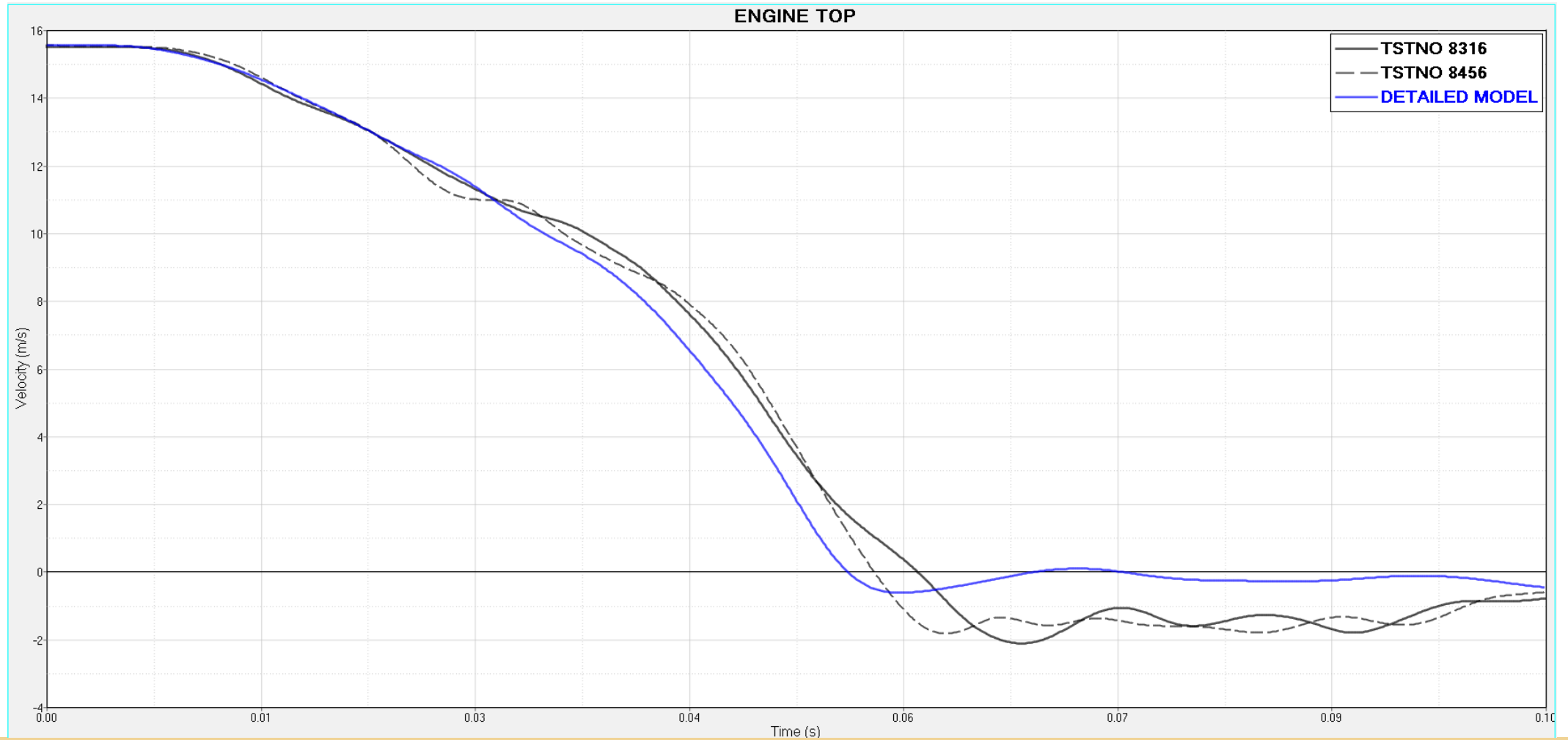
Frontal Full Wall – 56 km/hr – Velocity



Frontal Full Wall – 56 km/hr – Velocity



Frontal Full Wall – 56 km/hr – Velocity



Frontal Full Wall – 56 km/hr – Wall Force

