

2014 Chevrolet Silverado 1500 Finite Element Coarse Mesh Model Validation



[doi:10.13021/p6mn-hp79](https://doi.org/10.13021/p6mn-hp79)

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**



**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 HOOKS, 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

(OPTIONAL EQUIPMENT IS LISTED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT 3-4-09))

TRAILERING EQUIPMENT PKG INCL: 770.00
AUTO LOCKING REAR DIFFERENTIAL

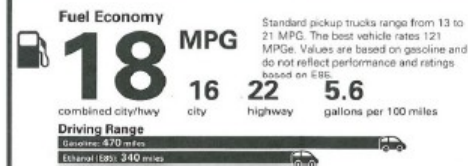
ENGINE, 5.3L V8 ECOTEC3 895.00
CHEVROLET MYLINK AUDIO SYSTEM 300.00
W/ 4.2" DIAGONAL COLOR
TRAILER BRAKE CONTROLLER 230.00
7,200 LB GVW RATING INC.
REAR AXLE 3.42 RATIO INC.

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

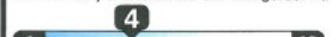
EPA DOT Fuel Economy and Environment



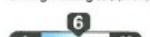
You spend \$3,000 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$2,900

Fuel Economy & Greenhouse Gas Rating (tailpipe only)



Smog Rating (tailpipe only)



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 fuel economy.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.

fuel economy.gov

Calculate personalized estimates and compare vehicles



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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GM, SIL, MKC, 2009 - 607702013

ORDER NO 880052 SALES CODE E
SALES MODEL CODE CK1540
DEALER NO 40001
FINAL ASSEMBLY
SILAO, GJ MEXICO

VIN 3GCUKPEC7E6144266

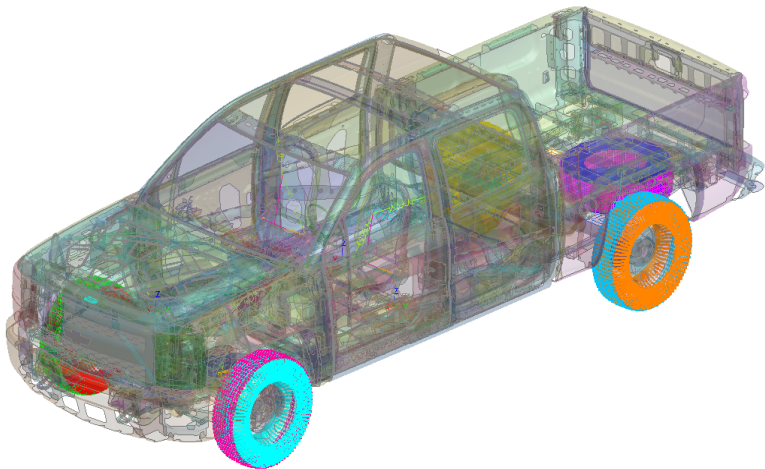
DEALER TO RECEIVE DELIVERED
SHAMEEN CHEVROLET, INC.
632 AMERICAN RD
LANSING, MI 48911-5900



NZ

2GA3730674

Model Information



Number of parts	1503
Number of nodes	958855
Number of solid elements	256085
Number of shell elements	821437
Number of beam elements	22403
Number of elements	1099961

Model Information



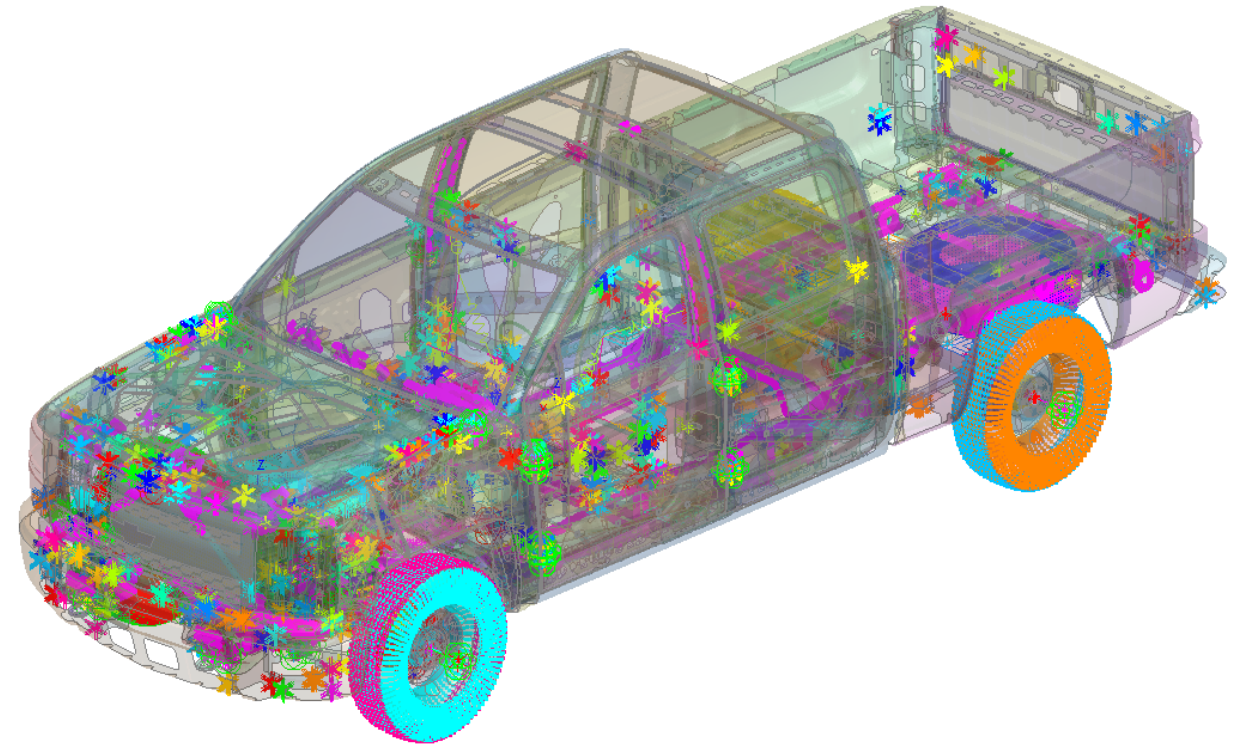
Model Information

General Info

State:	1	
Nodes:	958855	
Beams:	22403	Beam Parts: 18
Shells:	821437	Shell Parts: 1313
TShells:	0	TShell Parts: 0
Solids:	256085	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:	247	
Inertia Elements:	0	
Nodal Rigid Bodies:	476	
Rigid Elements:	164	
Deformable Elements:	1099797	
Total no. of Elements:	1099961	

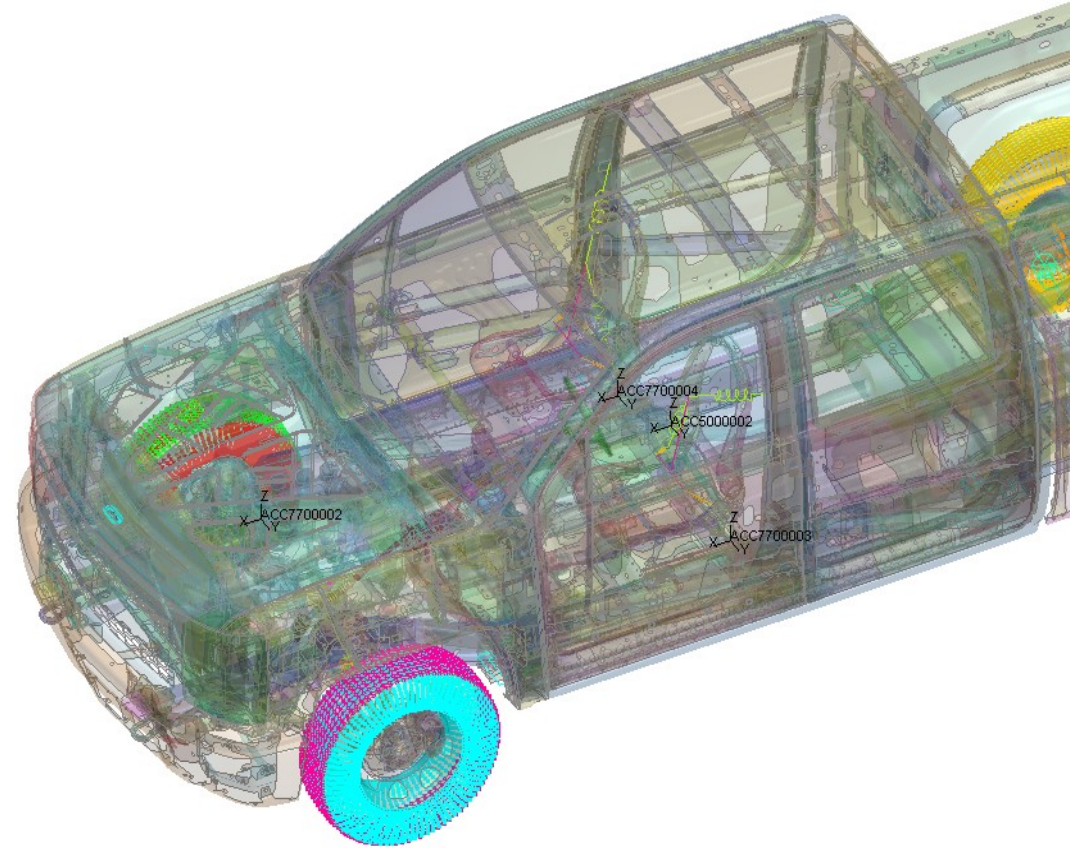
Connections

● NODAL_RIGID_BODY	476
● EXTRA_NODES	368
● JOINTS	60
● RIGID_BODIES	289
● SPOTWELD	6371

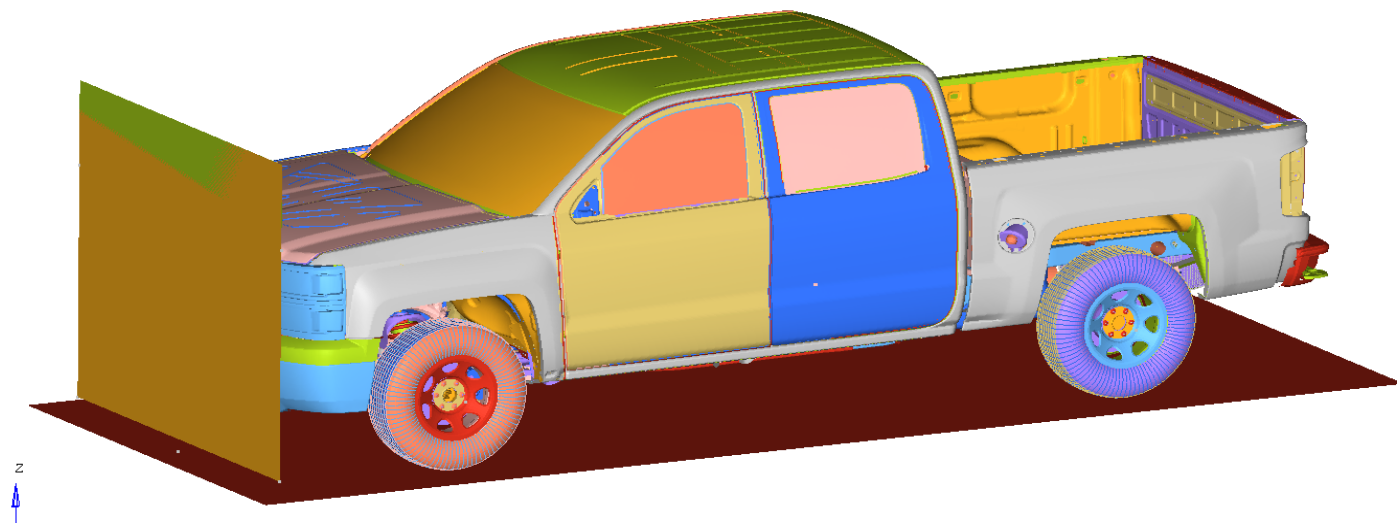


Accelerometers

- Left Rear Seat (Node 5001203)
- Right Rear Seat (Node 5001303)
- Engine Top (Node 5001102)
- Vehicle C.G. Local (Node 5000101)
- Vehicle C.G. Global (Node 5000100)

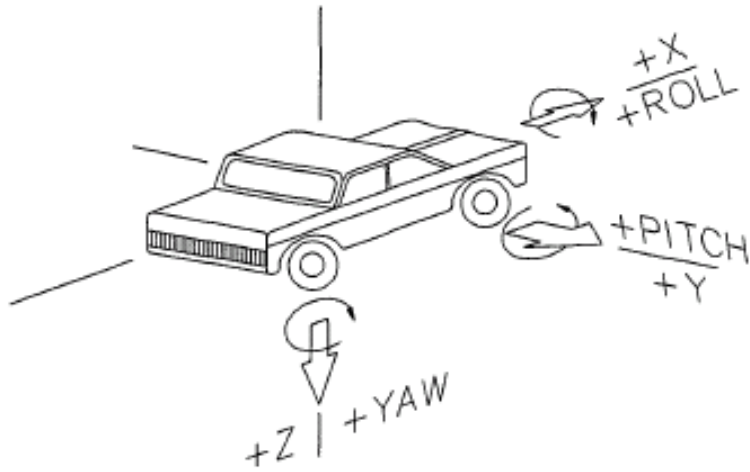


Simulation Benchmark



LS-DYNA	
Platform	Linux RHEL 5.4
Version	mpp s R8.0.0
Revision	95309
Precision	Single precision (I4R4)
Time to simulate 100 ms	2 hours 53 min
Number of processors	16

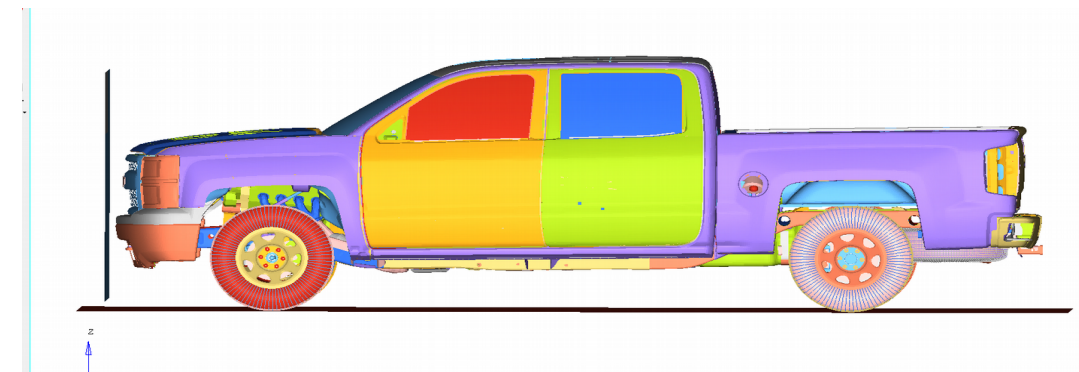
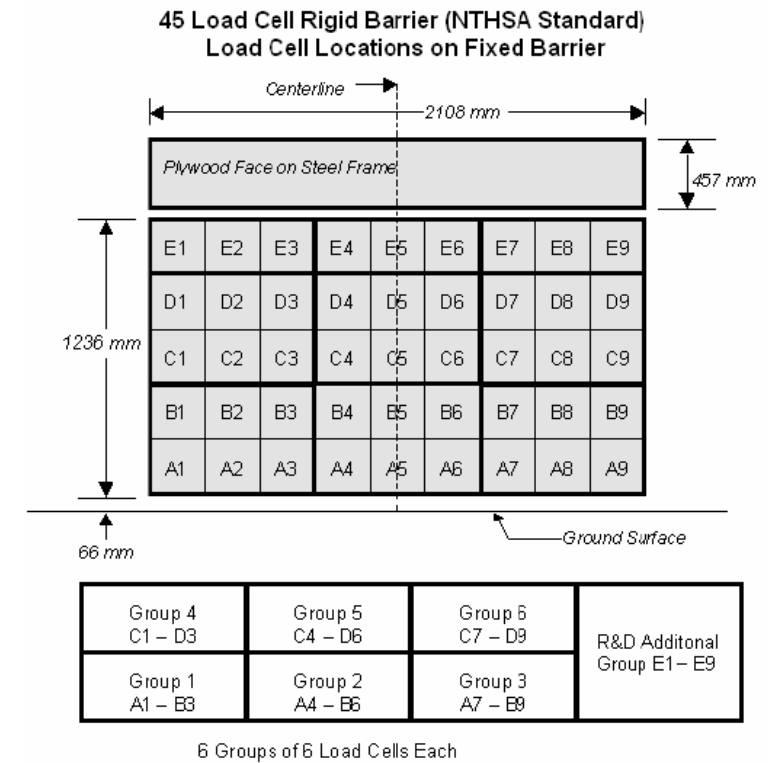
Inertia Comparisons



	Actual Vehicle	Coarse FE Model
Weight, Kg	2337	2265
Pitch inertia Kg-m ²	6155	5947
Yaw inertia Kg-m ²	6453	6320
Roll inertia Kg-m ²	1051	982
Vehicle CG Z mm	710.1	717.4

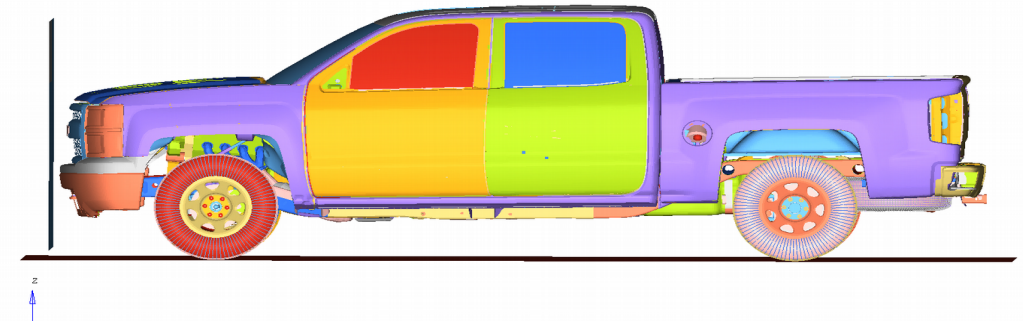
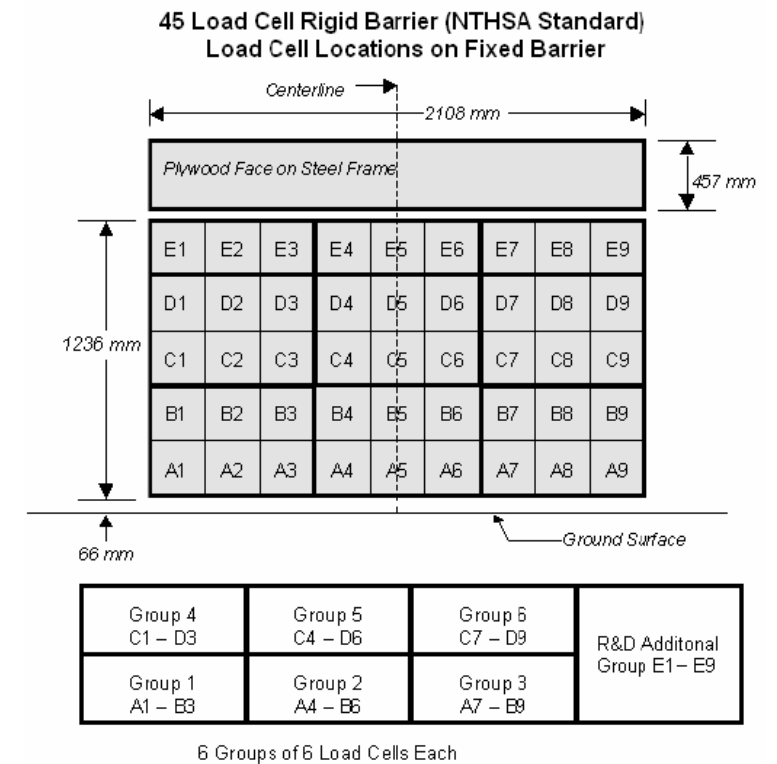
Frontal Full Wall – 56 km/hr

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

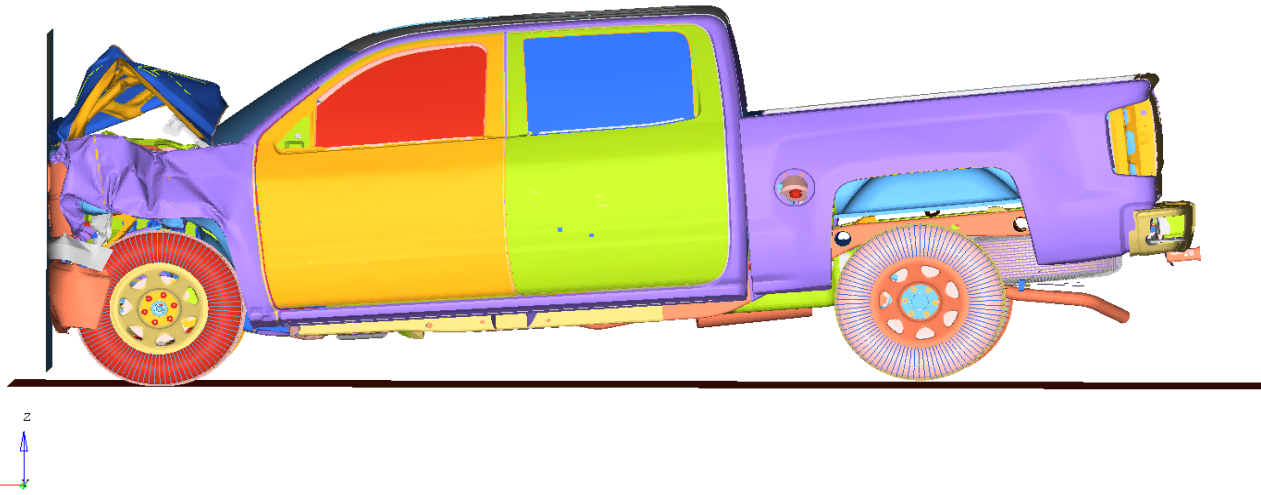


Frontal Full Wall – 56 km/hr

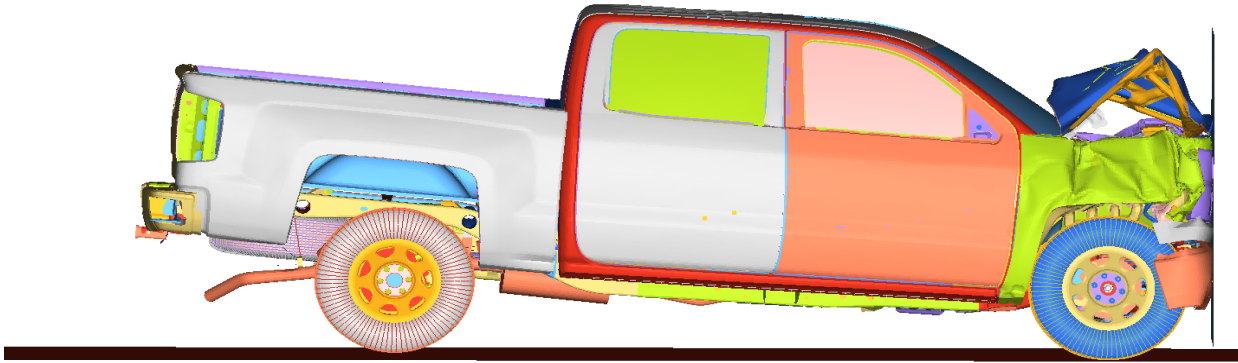
- NHTSA Test 8456 (56.4 km/hr) – Frontal NCAP
- 2014 Chevy Silverado NCAP test
- 45 load cell fixed wall



Full-scale Crash Testing – Front NCAP

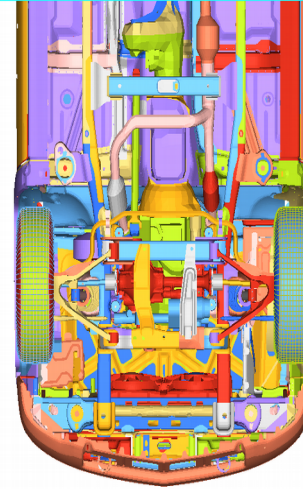


Full-scale Crash Testing – Front NCAP

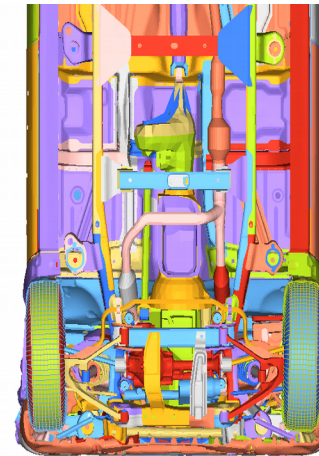


Full-scale Crash Testing – Front NCAP 8316 Crush Mode

Pre-Test



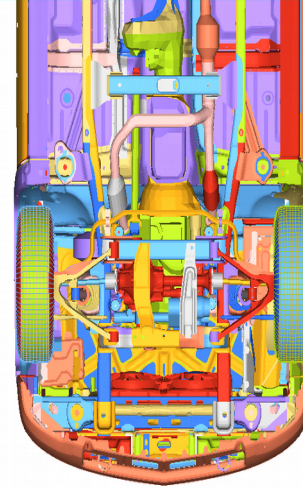
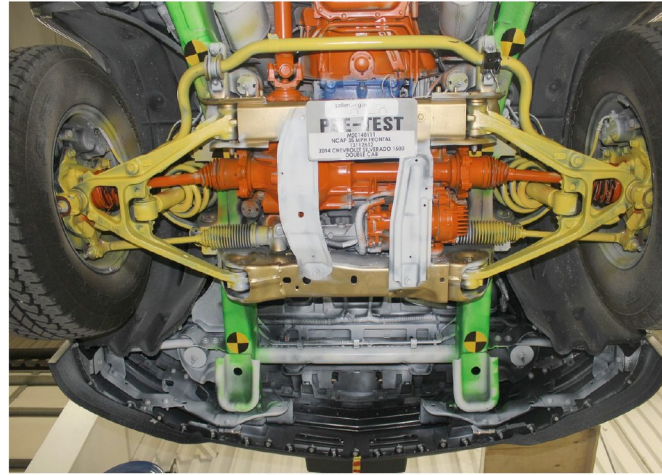
Post-Test



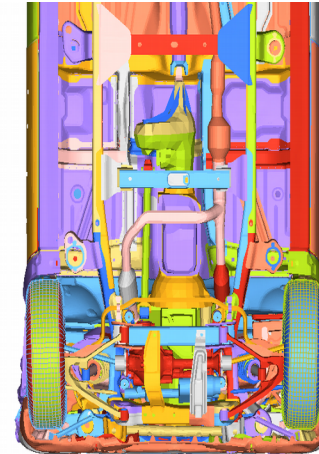
Full-scale Crash Testing – Front NCAP 8456

Crush Mode

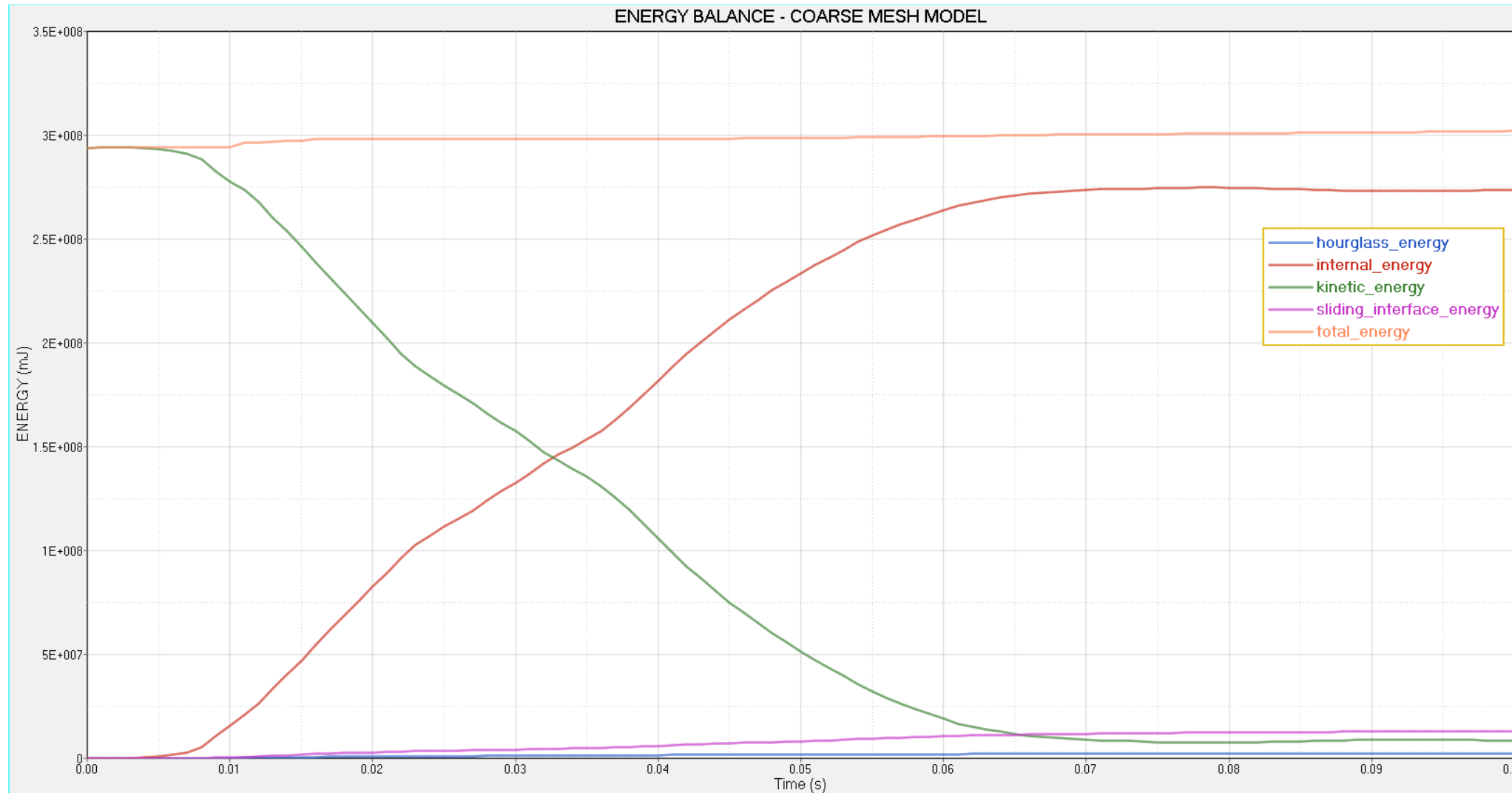
Pre-Test



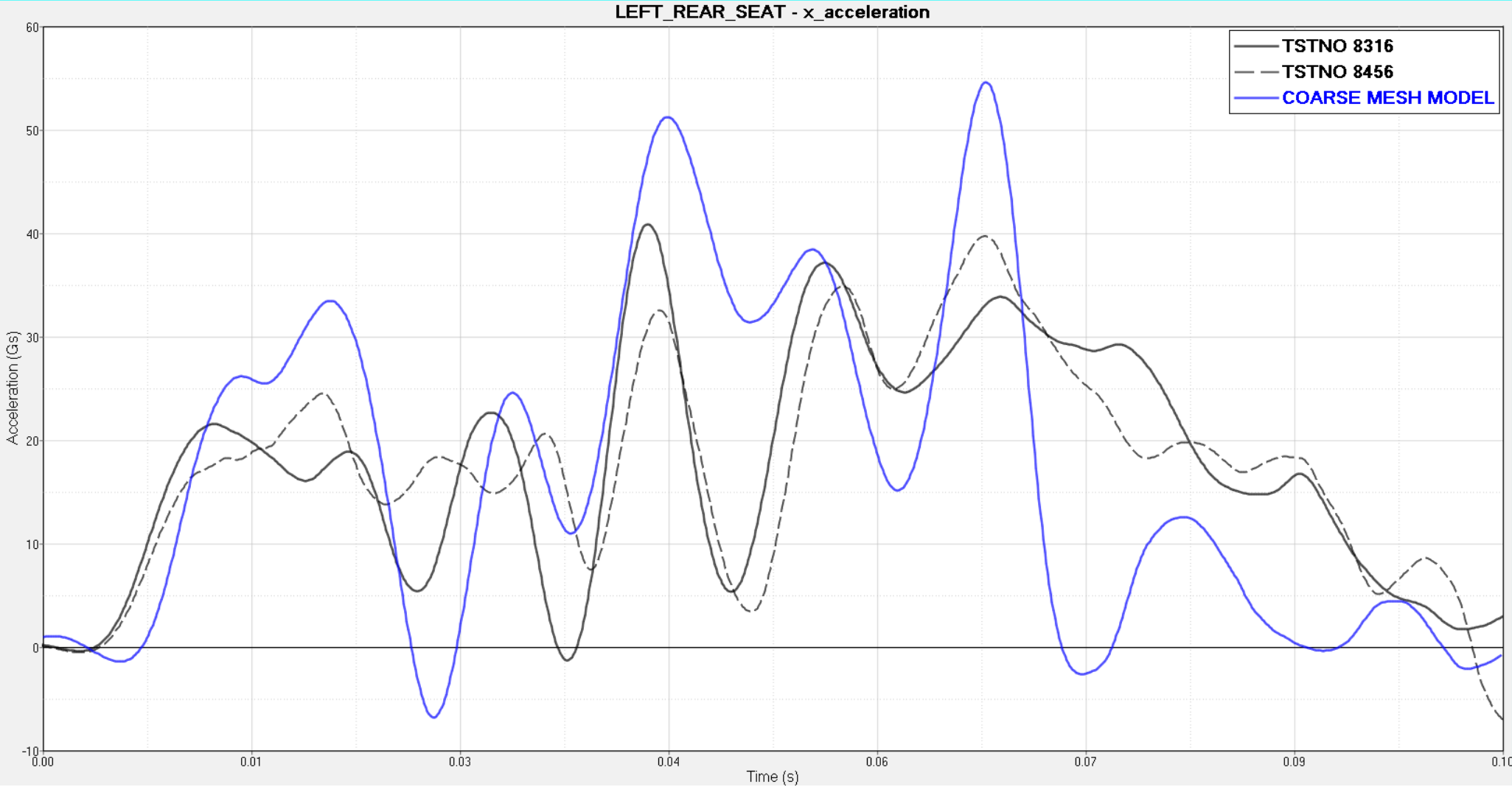
Post-Test



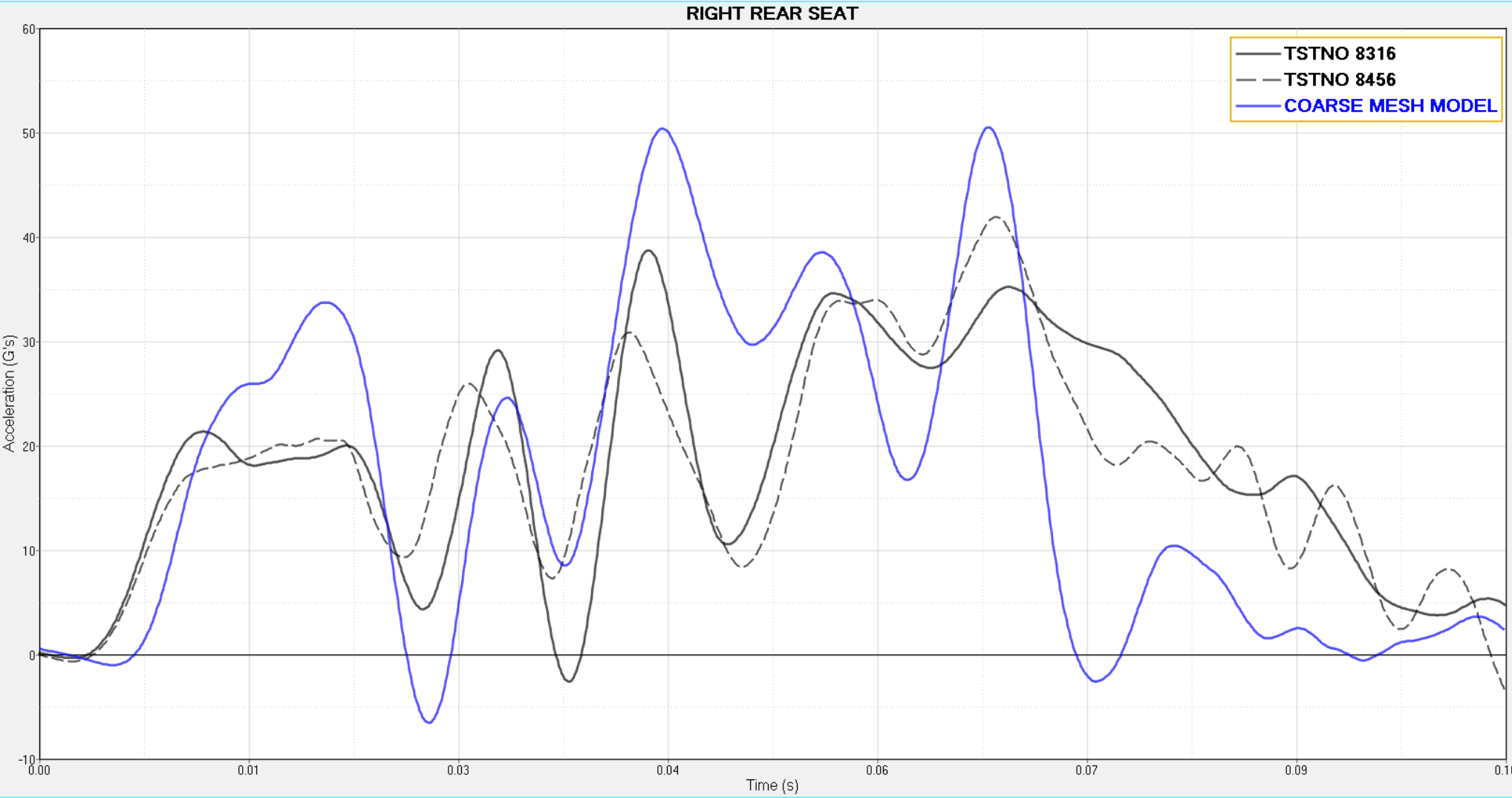
Frontal Full Wall – 56 km/hr – Energy Balance



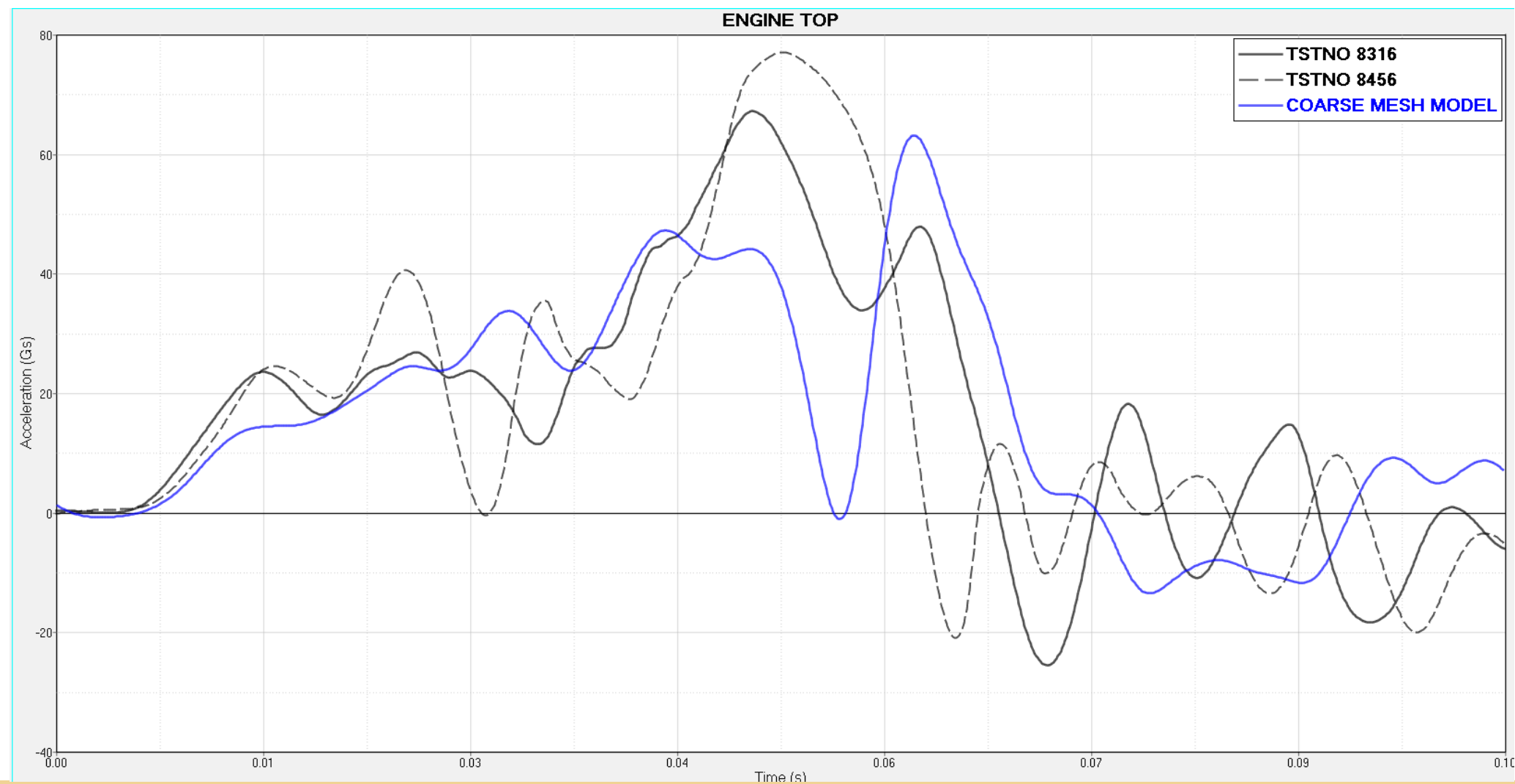
Frontal Full Wall – 56 km/hr – Acceleration



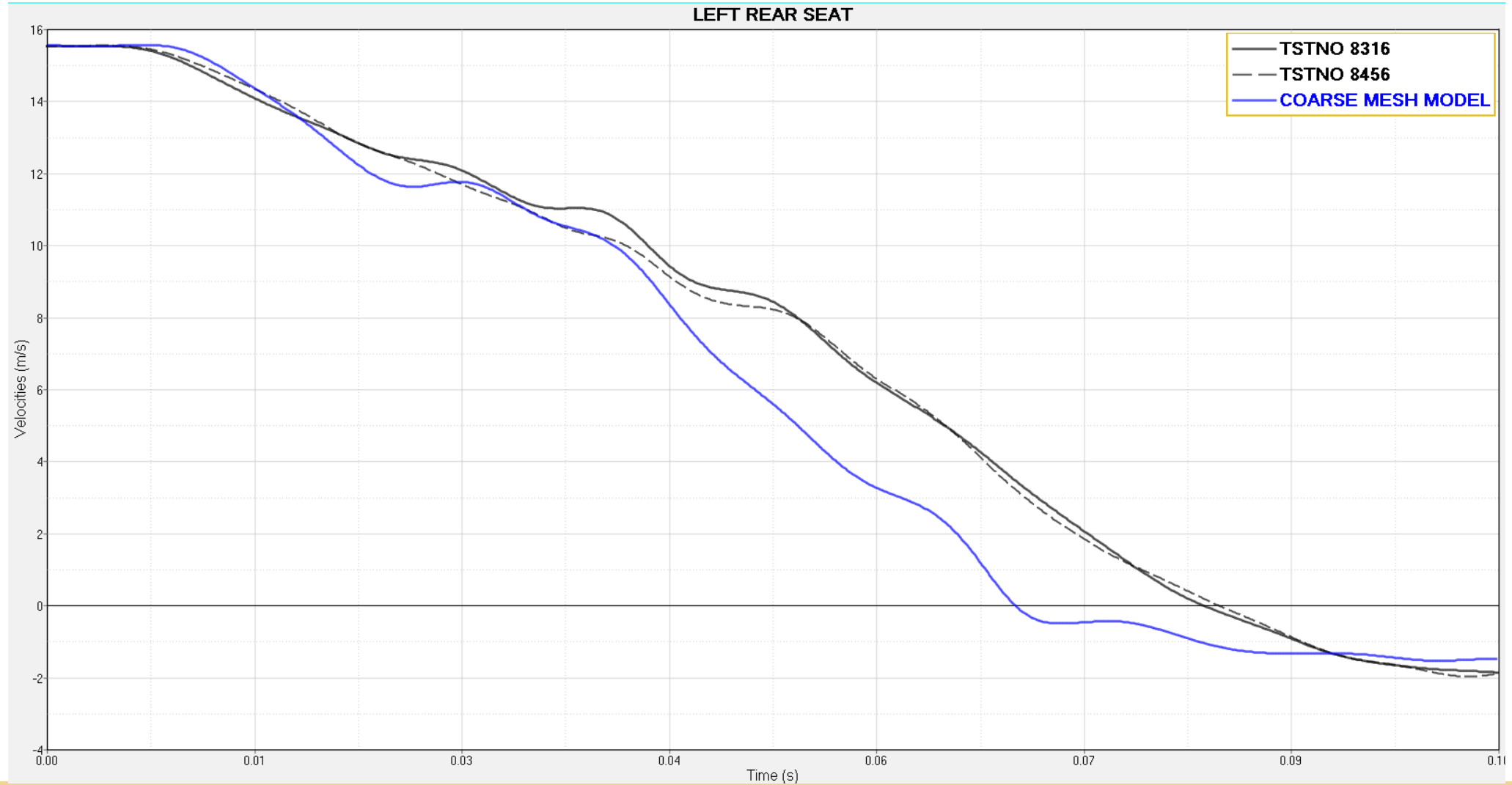
Frontal Full Wall – 56 km/hr – Acceleration



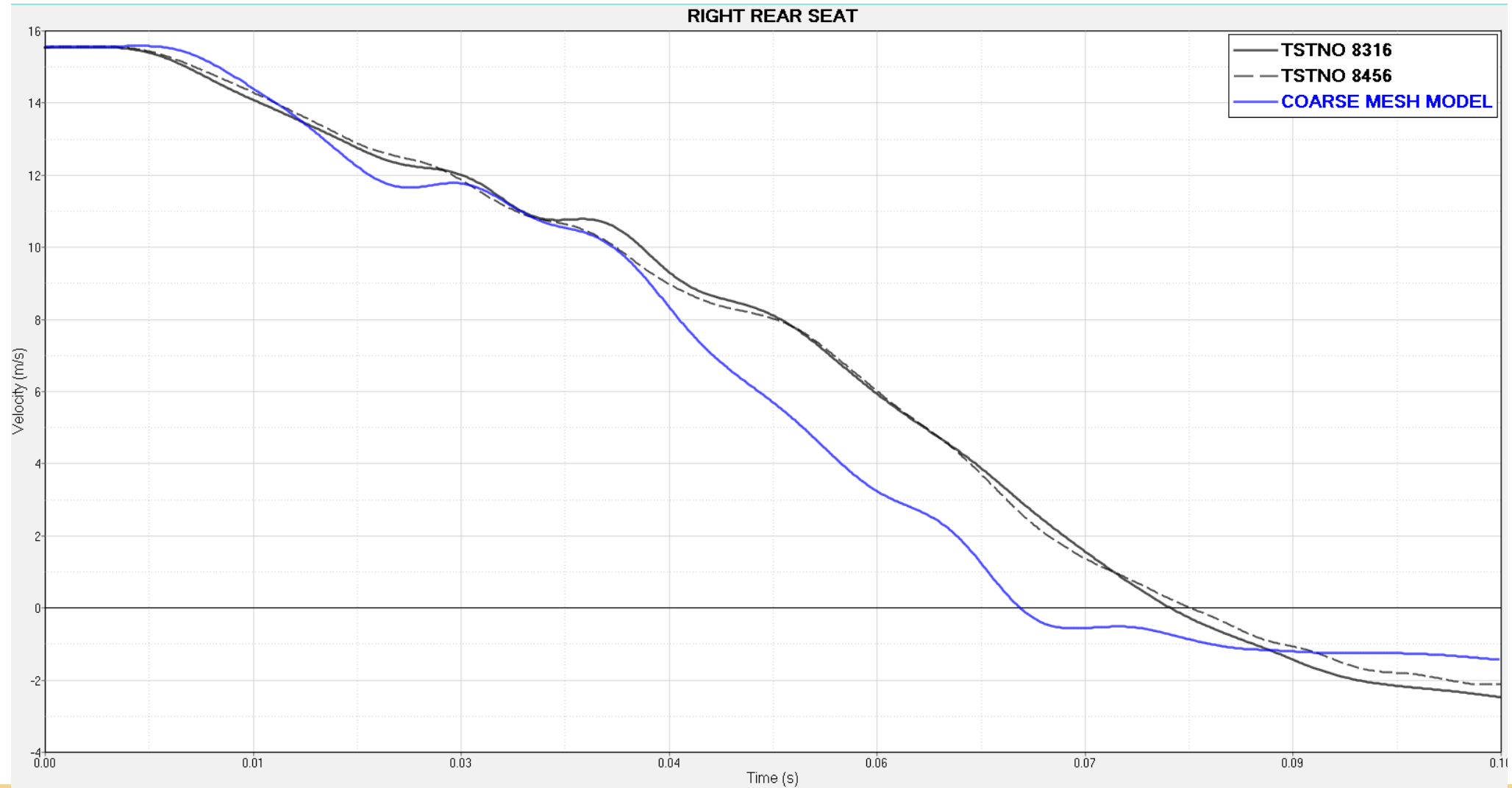
Frontal Full Wall – 56 km/hr – Acceleration



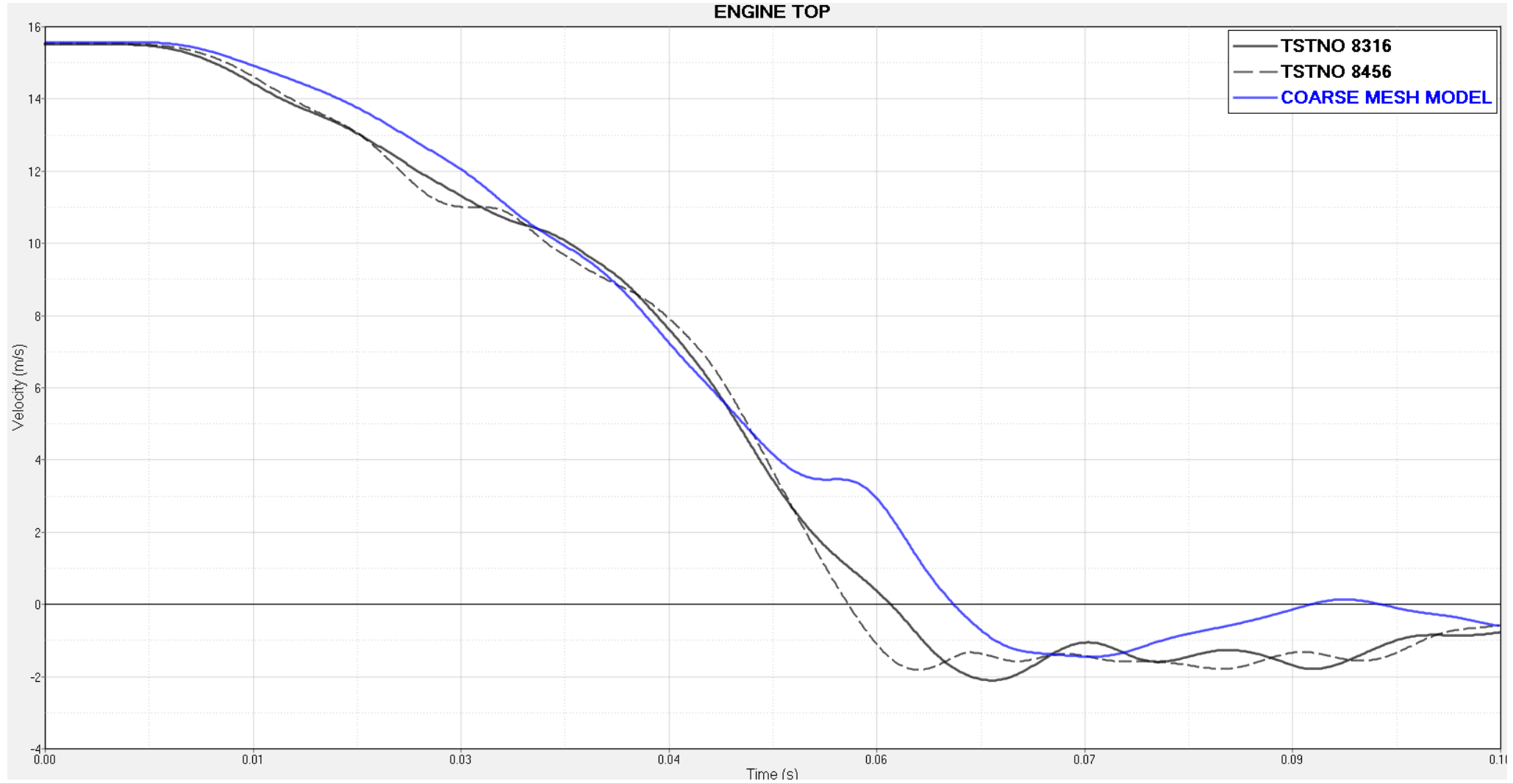
Frontal Full Wall – 56 km/hr – Velocity



Frontal Full Wall – 56 km/hr – Velocity



Frontal Full Wall – 56 km/hr – Velocity



Frontal Full Wall – 56 km/hr – Wall Force

