

Insurance Institute for Highway Safety Crashworthiness Evaluation

Crash Test Report 2000 Lincoln LS (CF00017)

Vehicle identification number: 1LNHM87AXYY878774
Body style: Large 4-door sedan
Engine/transmission: Longitudinal 3.9-liter V-8, 5-speed automatic,
rear-wheel drive

Standard crashworthiness features:

- Driver and right front passenger front airbags
- Driver and right front passenger seat-mounted side airbags (designed to protect head and thorax)
- Dual-locking shoulder belts (all seating positions)
- Shoulder belt upper anchorage height adjusters (front seating positions only)
- Seat belt crash tensioners (pyrotechnic, front seating positions only)
- Seat belt force-limiting mechanisms (front seating positions only)
- Center rear lap/shoulder belt
- Right front and all rear shoulder belt retractors are convertible from emergency to automatic locking for ease of child restraint use
- Rear seat head restraints (outboard seating positions)

Other standard safety features:

- Four-wheel antilock brake system

Vehicle specifications (provided by manufacturer):

- Wheelbase: 291 cm
- Overall length: 492 cm
- Overall width: 186 cm
- Curb weight: 1,630 kg (base model)

Vehicle specifications (measured):

- Front bumper to firewall: 126 cm
- Curb weight: 1,732 kg
- Test weight: 1,837 kg (51% front, 49% rear)
- Overall width: 186 cm

Nominal test parameters:

- 40.0 mi/h (64.4 km/h), 40% overlap, deformable barrier face with slotted bumper

Crash test date:

- May 9, 2000

Figure 1
Precrash and Postcrash Side Views — 2000 Lincoln LS



Summary

A 2000 Lincoln LS was crash tested on May 9, 2000 into a fixed deformable barrier at 39.8 mi/h (64.0 km/h) and a 40 percent overlap on the driver side. A Hybrid III 50th percentile male dummy was positioned in the driver seat with the lap/shoulder belt fastened.

Measures of intrusion taken after the crash indicated the lower instrument panel in front of the dummy moved forward 1-3 cm. Resultant intrusion in the driver footwell measured 12 cm at the footrest and 11-14 cm at other places on the toepan. The driver seat was pitched forward and tipped inboard due to considerable buckling of the floorpan under the seat. All doors remained closed during the crash. After the crash, the driver door and left rear door required tools to open, the right front door required additional force to open, and the right rear door opened with ease.

During and immediately after the crash, a small amount (less than 2 g) of Stoddard solvent leaked from a pressure relief valve located on top of the gas tank. No additional solvent leaked when the vehicle was rotated on to its side.

The driver dummy was restrained by a three-point lap/shoulder belt and an airbag. During the crash, 2 cm of shoulder belt webbing was pulled off of the retractor due to dummy loading before the belt crash tensioner activated and retracted 4 cm of webbing. A net amount of 12 cm of webbing (or a total of 14 cm including the tensioner-retracted length) spooled off the retractor, including about 9 cm from the force-limiting mechanism. During rebound from the airbag, the dummy's head moved downward and outward toward the window sill and then moved upward and inboard and contacted the left forward edge of the head restraint. After the crash, the upper end of the steering column had moved forward 4 cm but not upward or downward.

None of the injury measures exceeded the published threshold values.

Test Conditions

This vehicle had been tested previously in the Institute's Low-Speed Crash Test Program and subjected to an impact on the front corner of the passenger side at 5 mi/h (8 km/h) into a 30 degree angle barrier and a rear impact at 5 mi/h (8 km/h) into a flat barrier. All structural damage on the front was repaired prior to this test (see Appendix, Low-Speed Crash Test Damage Repair Estimate).

This test was conducted according to the procedures specified in the IIHS Offset Barrier Crash Test Protocol (Version VII). The Hybrid III dummy positioned in the driver seat was equipped with instrumented lower legs that included feet modified to include two accelerometers and to have a 45 degree dorsiflexion range with soft stops at all extremes of foot-ankle motion. All dummy seating parameters were set according to the procedures specified for Federal Motor Vehicle Safety Standard 208 compliance testing (49 *CFR* Part 571.208 § 11). The dummy's left foot was placed on the footrest.

Seat back, shoulder belt upper anchorage, and steering column adjustments were set according to the manufacturer's specifications for government crash testing. Other adjustments were set according to the procedure specified for Federal Motor Vehicle Safety Standard 208 compliance testing (49 *CFR* Part 571.208 § 7 and 8). After final positioning of the dummy, measurements from various parts of the dummy to a number of vehicle interior points were made. These measurements and the seat back, shoulder belt upper anchorage, and steering column adjustments are described in the Appendix, Dummy Clearance Measurements.

Vehicle acceleration measurements were made by a triaxial arrangement of accelerometers mounted on the vehicle's longitudinal centerline and 47 cm behind its center of gravity (190 cm behind the front axle). The vehicle speed recorded just prior to impact was 39.8 mi/h (64.0 km/h), and the actual overlap was 40 percent.

Structural Performance

All doors remained closed during the crash. The driver door aperture shortened 4 cm, as measured at the lower edge of the window. After the crash, the driver door and left rear door required tools to open, the right front door required additional force to open, and the right rear door opened with ease.

During and just after the crash, 1.3 g of Stoddard solvent leaked from a pressure regulating relief valve located on top of the gas tank. No additional leakage was recorded after 6 minutes following the crash. No additional fuel system leaks were observed when the vehicle was rotated onto its right side to allow postcrash photography. When the tank was removed from the vehicle, there was Stoddard solvent on the outside of the tank in the vicinity of the valve; when the tank was tipped from back to front, the valve still leaked.

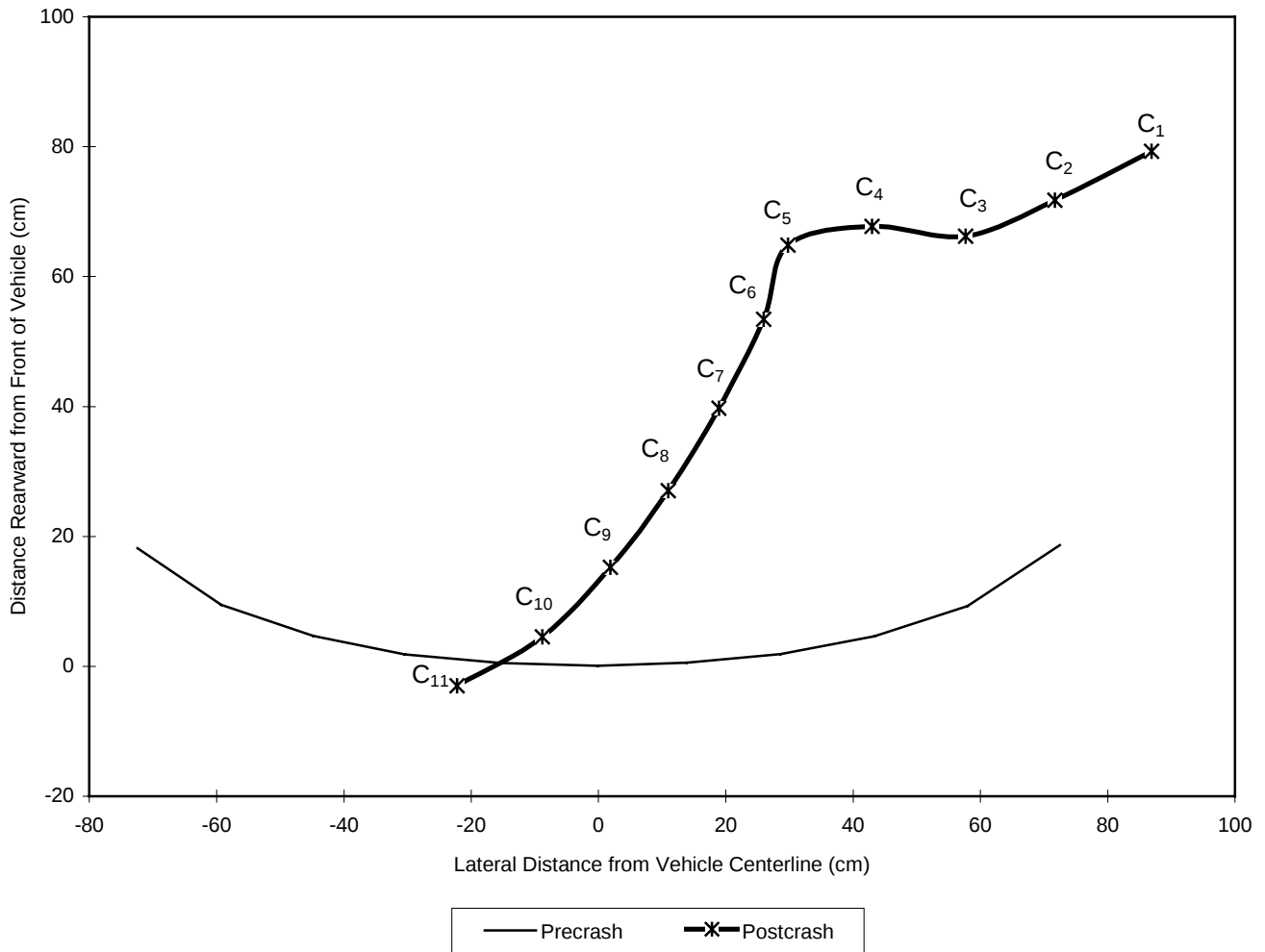
The floor underneath and behind the driver's seat was severely buckled. A 51-cm length of the spot-welded seam between the left side of the floorpan and rocker panel, under the B-pillar, was split apart.

Figure 2 shows the overhead view of the crash deformation. Figure 3 illustrates the precrash and postcrash contour measures of the front bumper cover profile and the resulting permanent crush. Figure 4 shows the precrash and postcrash views from below. Figure 5 illustrates the deformation of the side rails, doorsills, and engine cradle, which are visible in Figure 4.

Figure 2
Overhead View of Crash Deformation — 2000 Lincoln LS



Figure 3
Front Bumper Cover Crush Contour — 2000 Lincoln LS



	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉	C ₁₀	C ₁₁
Postcrash Contour (cm)	79	72	66	68	65	53	40	27	15	5	-3
Precrash Contour (cm)	19	9	5	2	1	0	1	2	5	9	18
Resulting Crush (cm)	60	63	61	66	64	53	39	25	10	-4	-21

The length of the reference line was 145 cm precrash and 109 cm postcrash.

Figure 4
Preocrash and Postocrash Views from Below — 2000 Lincoln LS

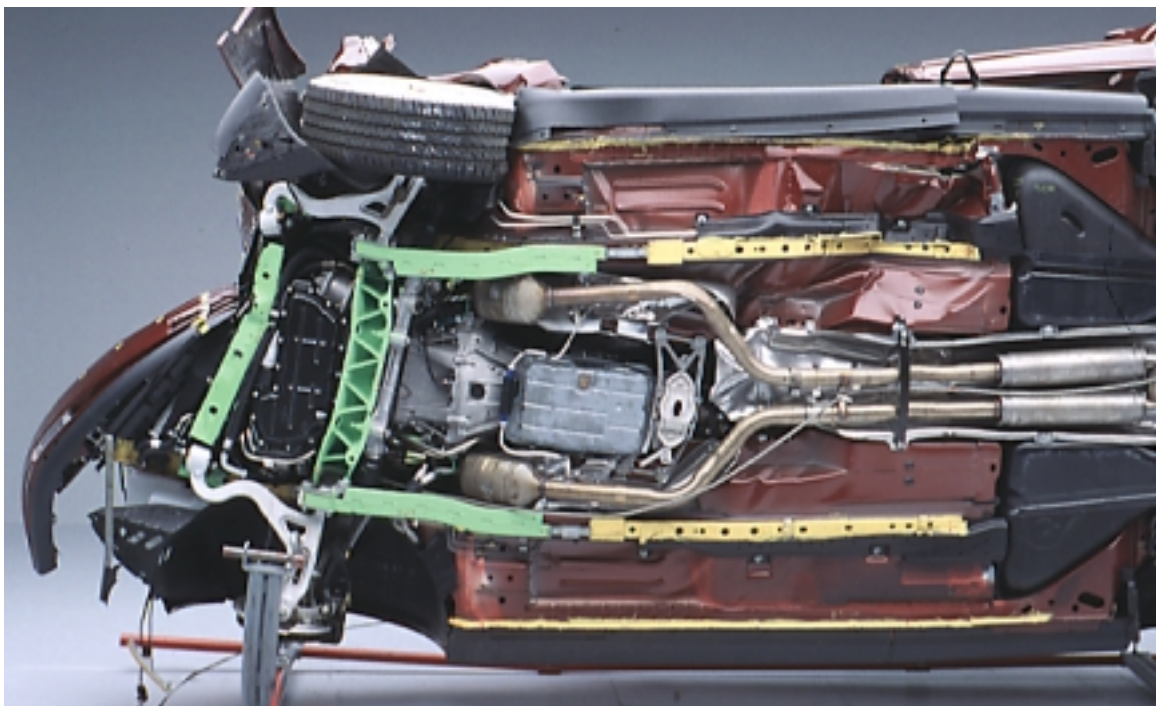
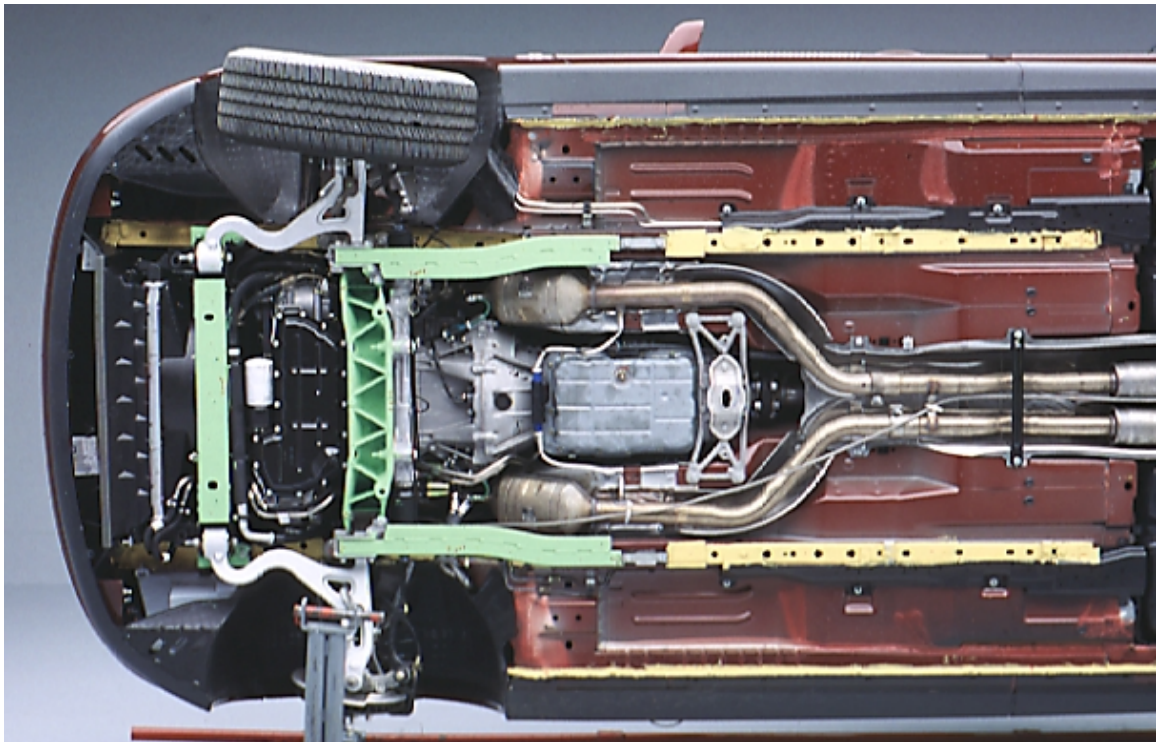
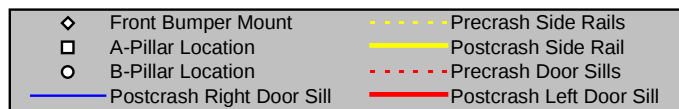
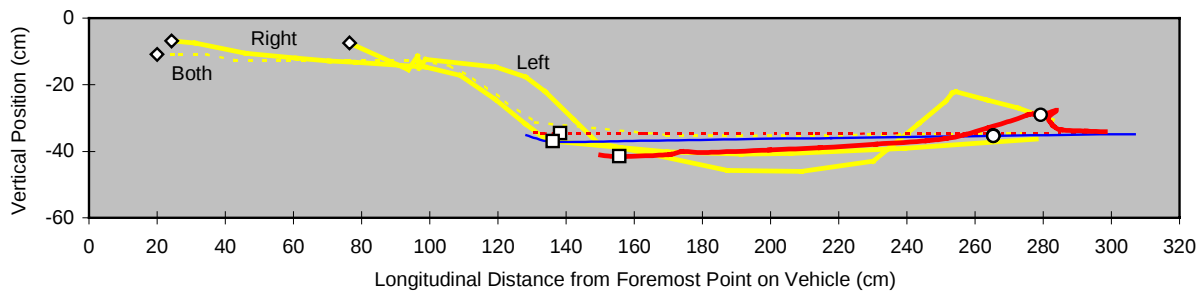
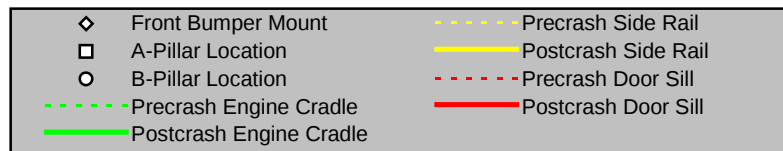
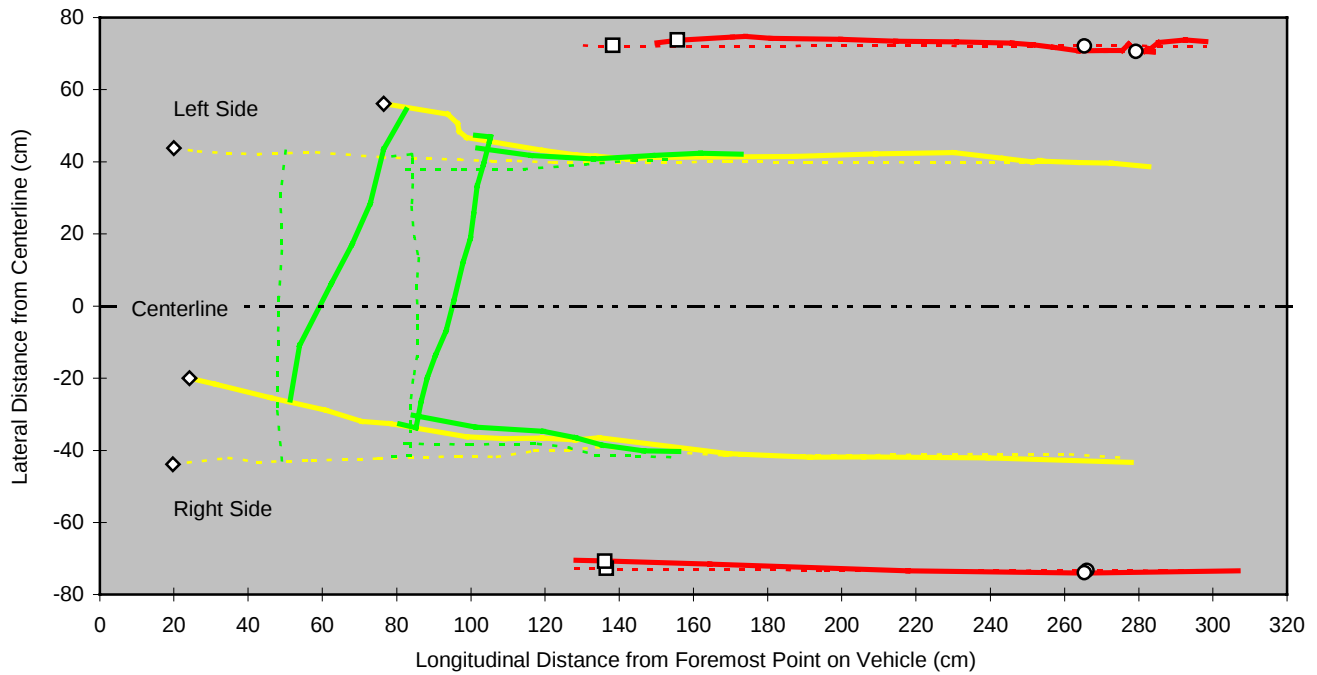


Figure 5
Structural Deformation, Views from Below and Side — 2000 Lincoln LS



Various measures of intrusion were made after the crash. These residual measures of intrusion typically are less than the maximum deformation that occurs during the crash. The coordinate reference system for these measures is described in the IIHS Offset Barrier Crash Test Protocol (Version VII). The measures of deformation shown in Table 1 have been adjusted to better reflect the displacement of the various target locations relative to the driver, based on the locations of the four driver seat-attachment bolts. The average displacement of the seat-attachment bolts relative to the reference system also is shown in Table 1.

Table 1 Residual Measurements of Intrusion Relative to Driver Seat — 2000 Lincoln LS				
Selected Locations*	Longitudinal	Lateral	Vertical	Resultant
Steering column (cm)	4	-7	0	8
Left lower instrument panel (cm)	1	-3	0	3
Right lower instrument panel (cm)	3	-3	-3	5
Brake pedal (cm)	-8	-1	-2	9
Left toepan (cm)	-13	-2	-4	14
Center toepan (cm)	-13	-2	-4	14
Right toepan (cm)	-10	-2	-4	11
Footrest (cm)**	-11	-2	-4	12
Average displacement of the four seat-attachment bolts relative to reference system (cm)	-7	2	2	N/A

* All measurements taken on driver side. From the driver's position, positive is forward, left, and up.

** Footrest point was taken 2.5 cm below the point described in the Protocol to avoid placement of the point on an plastic electrical housing mounted on the toepan.

Restraint System Performance

Airbags

Driver: The uninflated driver airbag is approximately 53 cm in diameter, and the excursion of its center when inflated is limited by two tethers. The airbag is vented by two holes located at positions corresponding to 11 and 1 o'clock on the forward-facing surface of the airbag. Analysis of the high-speed film taken from camera position D indicated the airbag deployed at 34 ms into the crash and appeared to be fully inflated at 54 ms. The seat-mounted side airbag did not deploy during the crash.

Passenger: The top-mounted passenger airbag deployed at an angle, and the excursion of its center when inflated is limited by two tethers. The cylinder-shaped airbag is vented by two holes located at the lateral ends. The airbag did not contribute to windshield damage during deployment. The seat-mounted side airbag did not deploy during the crash.

Seat Belts

This vehicle is equipped with dual-locking lap/shoulder belts with sliding latch plates at all seating positions and adjustable upper anchorage points at both front seating positions. The front belts also are equipped with pyrotechnic crash tensioners and mechanical force-limiting mechanisms. The front inboard and outboard lower anchorage points are attached to and move with the seats. During the crash, 2 cm of shoulder belt webbing was initially pulled through the D-ring due to dummy loading before the belt crash tensioner activated and retracted 4 cm of webbing back through the D-ring, as determined by film analysis of the movement of a tape strip on the belt webbing near the dummy's shoulder. A net amount of 12 cm of webbing (or a total of 14 cm including the tensioner-retracted length behind the starting point) was pulled from the retractor through the D-ring, as measured by a pull-string mounted between the retractor housing and the webbing beyond the retractor. Postcrash investigation of the force-limiting torsion bar within the retractor spool indicated it was twisted about 225 degrees from its precrash orientation. This measure, combined with the estimated diameter of the retractor spool and stowed webbing (48 mm), suggested the force limiter contributed about 9 cm of webbing to the total amount pulled through the D-ring.

Seat

Postcrash examination of the driver seat rails indicated no discernible movement of the seat in its tracks during the crash. Deformation of the floor under and behind the driver seat caused the seat to tip inboard and pitch forward.

Steering Column

The upper end of the steering column moved forward 4 cm but not upward or downward relative to the driver seat.

Dummy Kinematics

Head, Neck, and Torso

Analysis of the high-speed film taken from camera position D indicated the dummy's head began to load the airbag at 56 ms (2 ms after the airbag was fully inflated). Paint transferred from the dummy's face indicated the nose contacted the airbag 6 cm above and 4 cm to the right of its center. During rebound from the airbag, the dummy's head rotated to the right and moved outward and downward toward the window sill without contacting it. The head then moved upward, and the right rear of the head contacted the left forward edge of the head restraint at approximately 214 ms. Table 2 provides the timing of these events.

Table 2 Restraint System Performance and Dummy Kinematics — 2000 Lincoln LS	
Event	Time (ms)
Deployment of airbag	34
Airbag fully inflated	54
Face begins to load airbag	56
Head contacts head restraint	214-336

Figure 6
Dummy and Vehicle Interior, Postcrash — 2000 Lincoln LS



Legs and Feet

Left leg and foot: Paint transferred from the dummy's left knee indicated the knee contacted the knee bolster approximately 3 cm below the left instrument panel intrusion reference point. The knee also contacted the left side of the steering column trim and lightly contacted the steering column adjustment button. Paint transferred from the dummy's left shin indicated the shin contacted the bolster directly below the knee impact location on the bolster. The left foot was found slightly dorsiflexed and considerably everted, with the back of the heel in a downward buckle of the floormat and the sole at the medial toe against the intruded toepan to the right of the footrest.

Right leg and foot: Paint transferred from the dummy's right knee indicated the knee contacted the knee bolster approximately 5 cm below and 4 cm to the left of the right instrument panel intrusion reference point. The knee also contacted the right side of the steering column trim. Paint transferred from the dummy's right shin indicated the shin contacted the bolster directly below the knee impact location on the bolster. The right foot was found slightly dorsiflexed and slightly everted, with the back of heel against a downward buckle of the floormat. The sole of the heel was pressed against the intruded toepan left of the accelerator pedal, as was the sole of the forefoot.

Dummy Injury Measures

Head

The maximum vector resultant head accelerations were recorded and the HICs were calculated during an interval that corresponds with the dummy's head excursion into the airbag. Table 3 provides a summary of the maximum head injury measurements recorded during the crash.

Table 3 Head Injury Measurements – 2000 Lincoln LS			
Measure	Published Tolerance Threshold	Result	Time (ms)
Vector resultant acceleration (g)	80	58	100
Vector resultant acceleration – 3 ms clip (g)	80	58	99-102
Head Injury Criterion (HIC)	1000	494	83-119
Head Injury Criterion – 15 ms interval (HIC-15)*	700	333	94-109

* Canadian Motor Vehicle Safety Regulations (Standard 208) allow the resultant head acceleration to exceed 80 g in airbag-equipped vehicles if HIC-15 is less than 700 (Transport Canada, 1998).

Neck

Table 4 provides a summary of the maximum neck injury measurements recorded during the crash. None of the recorded neck force measures exceeded the magnitude-duration injury criteria (Figures A-13 to A-16).

Table 4 Neck Injury Measurements — 2000 Lincoln LS			
Measure	Published Tolerance Threshold	Result	Time (ms)
A-P shear force (kN)	±3.1	-0.3	65
Axial compression force (kN)	4.0	0.1	142
Axial tension force (kN)	3.3	1.8	100
Flexion bending moment (Nm)	310	31	86
Extension bending moment (Nm)	122	18	259

Chest

Table 5 provides a summary of the maximum chest injury measurements recorded during the crash.

Table 5 Chest Injury Measurements — 2000 Lincoln LS			
Measure	Published Tolerance Threshold	Result	Time (ms)
Vector resultant spine acceleration — 3 ms clip (g)	60	43	97-100
Rib compression (mm)	-50	-28	112
Sternum deflection rate (m/s)	-8.2	-1.2	58

Legs and Feet

Table 6 provides a summary of the maximum leg and foot injury measurements recorded during the crash.

Table 6 Leg and Foot Injury Measurements — 2000 Lincoln LS					
Measure	Published Tolerance Threshold	Left		Right	
		Result	Time (ms)	Result	Time (ms)
Femur axial force (kN)	-9.1*	-2.9	103	-1.5	77
Tibia-femur displacement (mm)	-15	-8	102	-5	102
Upper Tibia					
L-M moment (Nm)	±225	59	147	-64	101
A-P moment (Nm)	±225	89	93	-88	86
Vector resultant moment (Nm)	225	92	93	88	86
Index	1.00	0.42	93	0.48	86
Lower Tibia					
L-M moment (Nm)	±225**	52	90	-51	103
A-P moment (Nm)	±225**	68	91	63	105
Vector resultant moment (Nm)	225**	84	91	81	104
Axial force (kN)	-8.0**	-1.6	82	-3.3	87
Index	1.00	0.39	91	0.41	103
Foot					
A-P acceleration (g)	±150	-57	68	-54	79
I-S acceleration (g)	±150	-50	80	-52	83
Vector resultant acceleration (g)	150	67	80	65	79

* This critical value is for instantaneous loading. Femur loads are compared with magnitude-duration injury criteria in Figures A-24 and A-37.

** These published thresholds are for fractures of the tibia. Ankle and foot injuries have been associated with bending moments as low as 50-100 Nm, and heel fractures have been associated with axial forces as low as -6.0 kN.

References

- Backaitis, S.H. and Mertz, H.J. (eds). 1994. *Hybrid III: The First Human-Like Crash Test Dummy*. Warrendale, PA: Society of Automotive Engineers.
- Begeman, P.C. and Prasad, P. 1990. Human ankle impact response in dorsiflexion (SAE 902308). *Thirty-fourth Stapp Car Crash Conference Proceedings*, 39-53. Warrendale, PA: Society of Automotive Engineers.
- Begeman, P.; Balakrishnan, P.; Levine, R.; and King, A. 1993. Dynamic human ankle response to inversion and eversion (SAE 933115). *Thirty-seventh Stapp Car Crash Conference Proceedings*, 83-93. Warrendale, PA: Society of Automotive Engineers.
- Mertz, H.J. and Patrick, L.M. 1971. Strength and response of the human neck (SAE 710855). *Biomechanics of Impact Injury and Injury Tolerances of the Head-Neck Complex*, 821-46. Warrendale, PA: Society of Automobile Engineers.
- Parenteau, C.S. 1995. Foot-ankle injury: epidemiology and method to investigate joint biomechanics. Gothenburg, Sweden: Chalmers University of Technology.
- Prasad, P. and Mertz, H.J. 1985. The position of the United States delegation to the ISO Working Group 6 on the use of HIC in the automotive environment (SAE 851246). *Biomechanics of Impact Injury and Injury Tolerances of the Head-Neck Complex*, 373-83. Warrendale, PA: Society of Automotive Engineers.
- Transport Canada. 1998. Motor Vehicle Safety Regulations – Canadian Motor Vehicle Safety Standards, Schedule IV Part III Standard 208, Occupant Restraint Systems in Frontal Impact. Ottawa, Ontario.
- Welbourne, E.R. 1994. Vehicle performance requirements for head injury protection: a comparison of the head injury criterion with an 80 g limit on resultant acceleration. Technical Memorandum. Ottawa, Ontario: Transport Canada, Vehicle System Division.
- Zeidler, F. 1984. The significance of lower limb injuries of belted drivers. *Journal of Orthopedics* [German].

Appendix

Low-Speed Crash Test Damage Repair Estimate

Dummy Clearance Measurements

Graph Index — index to graphs of time plots of dummy and vehicle data

Manufacturer's window sticker

Low-Speed Crash Test Damage Repair Estimate

2000 Lincoln LS Large Four-Door Sedan: 5 mi/h Front into Angle Barrier

Test Number: LA00011

VIN: 1LNHM87AXYY878774

Mileage: 77

Features: Driver and passenger front airbags, driver and front passenger side impact airbags, four-wheel antilock brakes, traction control, air conditioning, automatic transmission, heated power mirrors, keyless entry system, power door locks, power windows, power driver and passenger seats, heated back glass, power tilt and telescoping steering wheel, cruise control, front fog lamps, moonroof, three-stage paint.

Description	Part		Labor	
	Mfg. No	Price	Operation	Hours
Bumper reinforcement, front	XW4Z17757AA	\$110.00	Replace*	2.0
Bumper cover, front	XW4Z17D957AA	372.90	Replace	1.8
Bumper cover, front			Refinish	3.6
Add for 3-stage finish on bumper cover			Refinish	0.5
Bumper absorber, front	XW4Z17754AA	71.62	Replace	
Headlamp assembly, right			Repair*	0.5
Headlamps			Aim	0.5
Unibody, right front			Set up/pull/align*	1.0
Frame sidemember, right front			Repair*	2.0
Frame sidemember, right front			Refinish	0.3
Paint and materials		73.80		
Total Parts		\$628.32		
Total Labor		414.80		12.2
Grand Total		\$1,043.12		

* This item was repaired or replaced as indicated before the 40 mi/h frontal offset test.

Dummy Clearance Measurements

Test Number: CF00017
Vehicle Make/Model: Lincoln LS
Vehicle Model Year: 2000
Seat Type: Electrically adjusted bucket seat (fore/aft, height, and seat back angle)

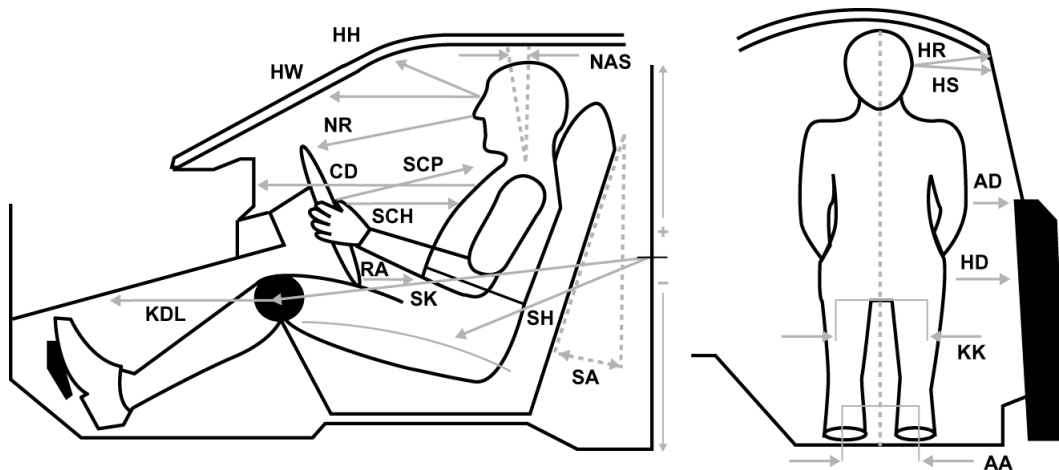
Manufacturer's Specifications

Seat Back Information: Reclined to 22.8°, as measured on seat back 33 cm up from seat back pivot
Upper Belt Anchorage: Set to 2nd of 4 positions from top
Steering Column Adjustment: Set to midpoint of tilt and telescopic adjustment ranges

Location	Code	Measure	Location	Code	Measure
Head to header	HH	338	Neck angle, torso 90	NAT90	21.3°
Head to windshield	HW	698	Neck angle, seated	NAS	6.1°
Nose to rim	NR	372	Torso angle (NAT90 - NAS)	TA	15.2°
Chest to dash	CD	654	Striker to knee*	SK	559
Rim to abdomen	RA	194	Striker to knee angle*	SKA	-2.5°
Knee to dash, left	KDL	182	Striker to H-point, horizontal	SHH	175
Knee to dash, right	KDR	175	Striker to H-point, vertical	SHV	-140
Steering wheel to chest, horizontal	SCH	290	Ankle to ankle	AA	330
Steering wheel to chest, perpendicular	SCP	372	Knee to knee	KK	345
Steering wheel to chest, reference	SCR	350	Arm to door	AD	40
Hub to chest, minimum	HCM	230	H-point to door	HD	133
Pelvic angle	PA	25°	Head to A-pillar	HA	545
Seat back angle	SA	22.8°	Head to roof	HR	218
			Head to side window	HS	284

All distance measurements are in millimeters (mm).

* These measurements were made in a vertical plane containing the striker and parallel to the driver doorsill.

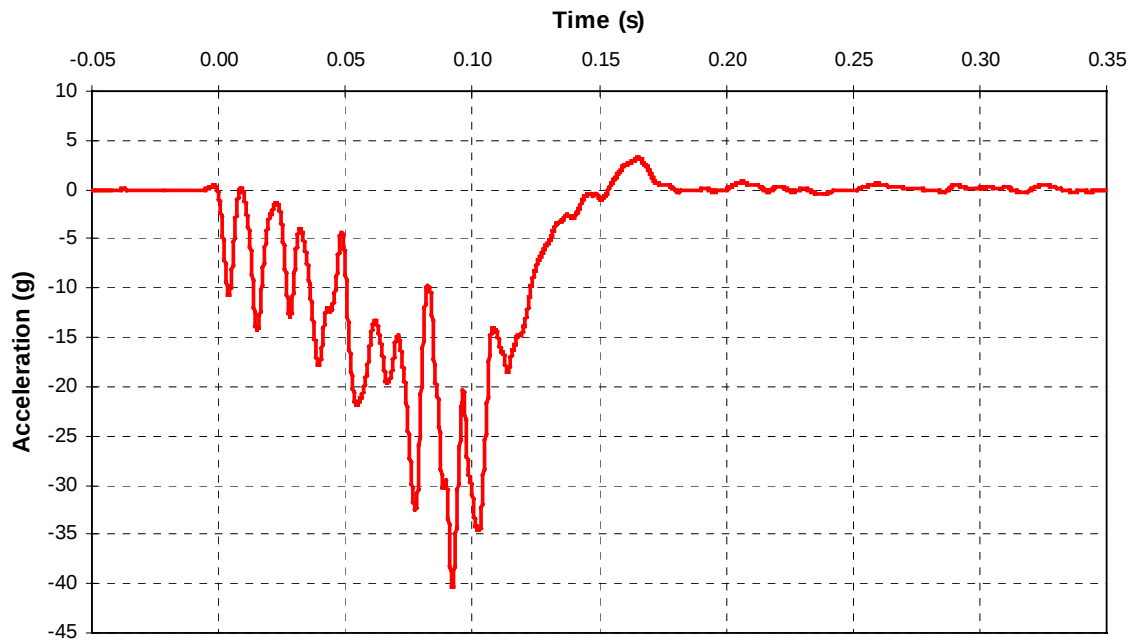


Graph Index

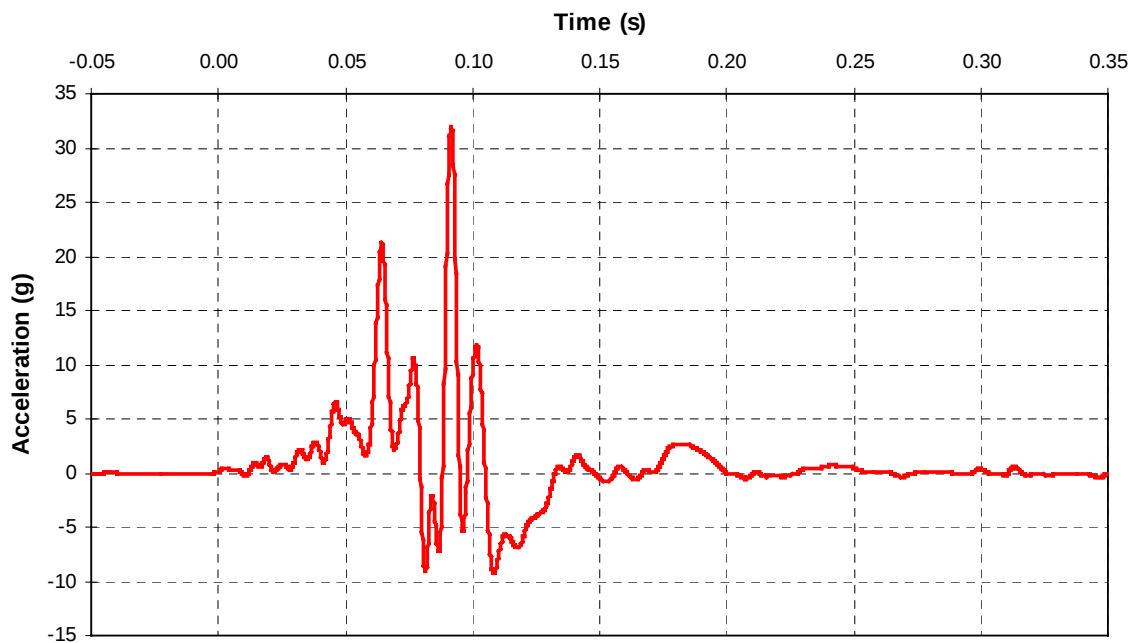
A-1	Vehicle longitudinal acceleration (X)
A-2	Vehicle lateral acceleration (Y)
A-3	Vehicle vertical acceleration (Z)
A-4	Vehicle vector resultant acceleration
A-5	Integration of vehicle longitudinal acceleration (X)
A-6	Head A-P acceleration (X)
A-7	Head L-M acceleration (Y)
A-8	Head I-S acceleration (Z)
A-9	Head vector resultant acceleration
A-10	Neck A-P force (X)
A-11	Neck axial force
A-12	Neck occipital A-P bending moment
A-13	Neck tension — force by duration analysis
A-14	Neck compression — force by duration analysis
A-15	Neck shear (positive) — force by duration analysis
A-16	Neck shear (negative) — force by duration analysis
A-17	Chest compression
A-18	Chest A-P acceleration (X)
A-19	Chest lateral acceleration (Y)
A-20	Chest I-S acceleration (Z)
A-21	Chest vector resultant acceleration
A-22	Sternum deflection rate
A-23	Left femur axial force
A-24	Left femur — force by duration analysis
A-25	Left tibia-femur displacement
A-26	Left upper tibia L-M bending moment
A-27	Left upper tibia A-P bending moment
A-28	Left upper tibia vector resultant bending moment
A-29	Left lower tibia L-M bending moment
A-30	Left lower tibia A-P bending moment
A-31	Left lower tibia vector resultant bending moment
A-32	Left lower tibia axial force
A-33	Left foot vector resultant acceleration
A-34	Left foot A-P acceleration
A-35	Left foot I-S acceleration
A-36	Right femur axial force
A-37	Right femur — force by duration analysis
A-38	Right tibia-femur displacement
A-39	Right upper tibia L-M bending moment
A-40	Right upper tibia A-P bending moment
A-41	Right upper tibia vector resultant bending moment
A-42	Right lower tibia L-M bending moment
A-43	Right lower tibia A-P bending moment
A-44	Right lower tibia vector resultant bending moment
A-45	Right lower tibia axial force
A-46	Right foot vector resultant acceleration

A-47 Right foot A-P acceleration
A-48 Right foot I-S acceleration

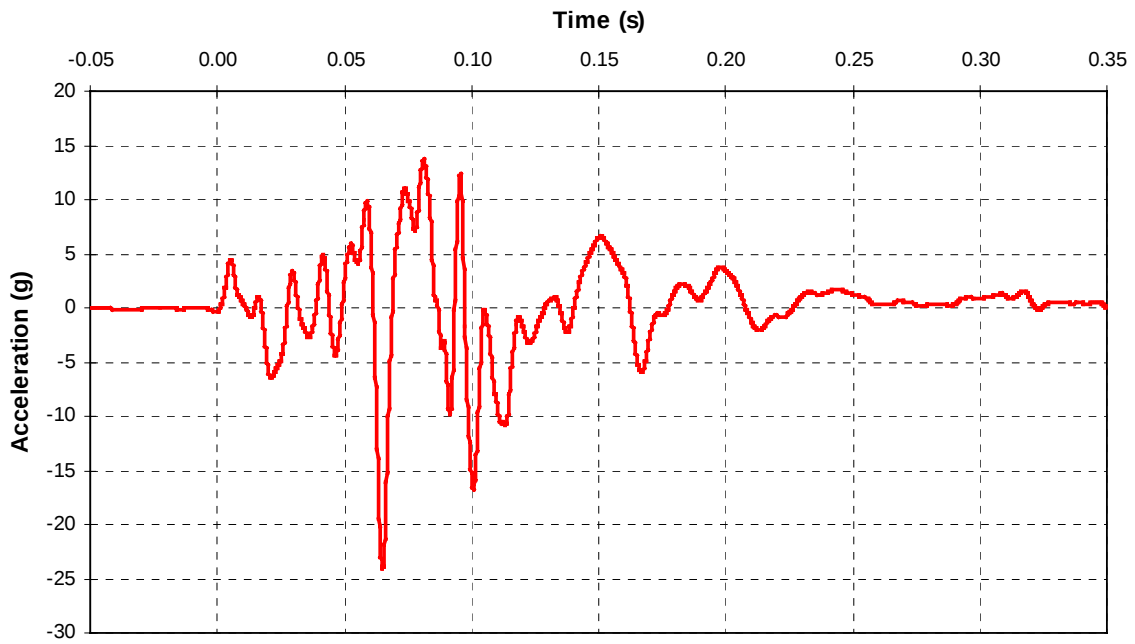
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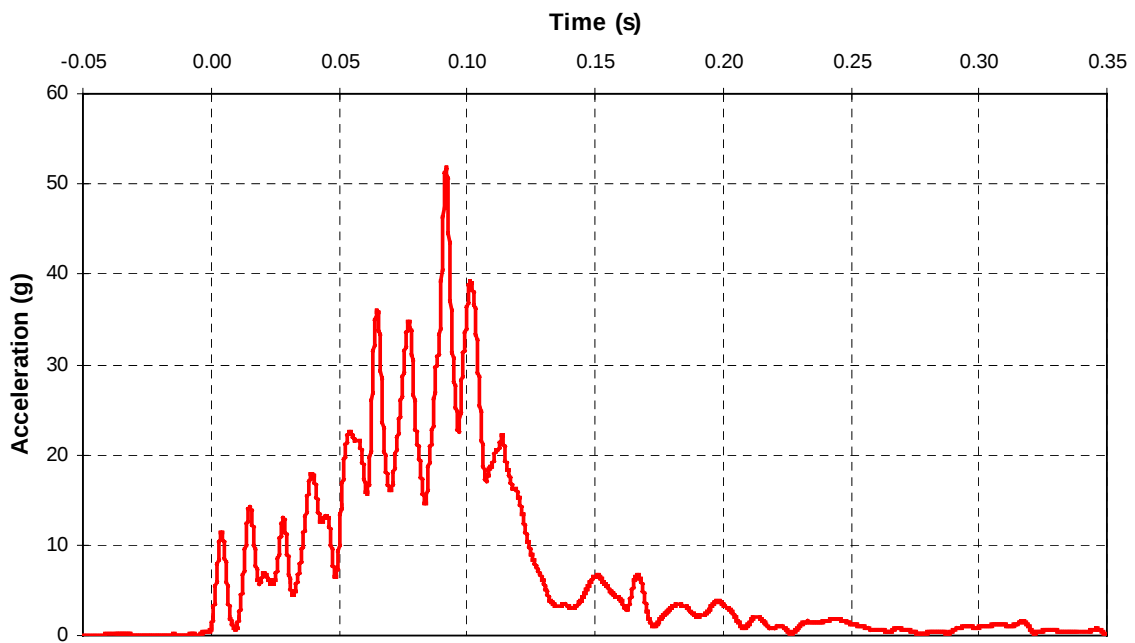
A- 2 CF00017 2000 Lincoln LS Vehicle Lateral Acceleration



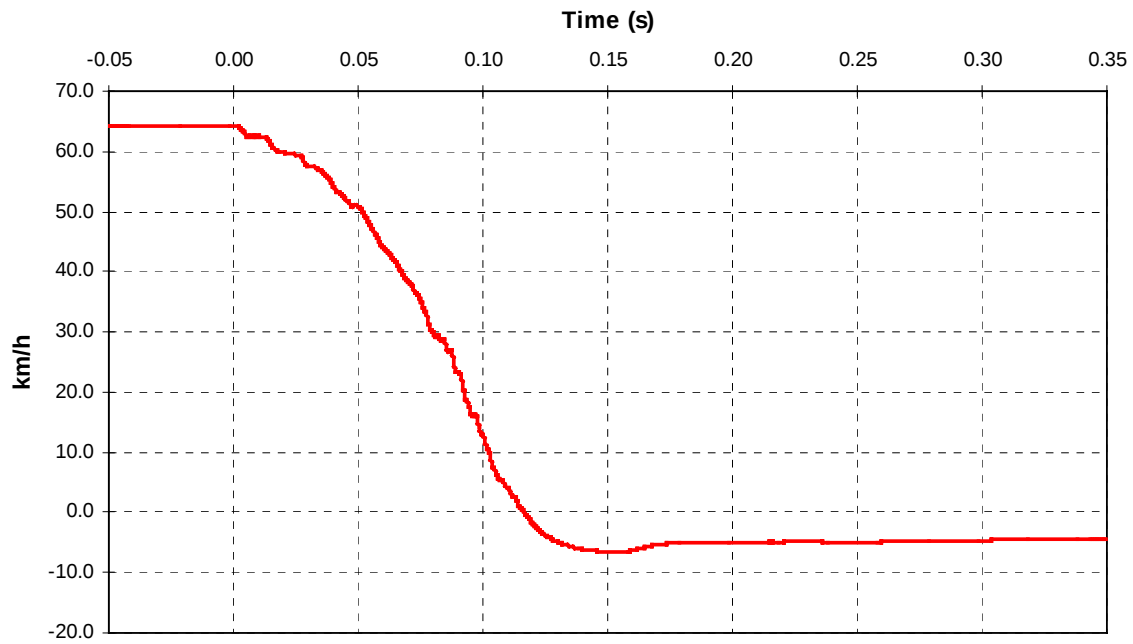
A- 3 CF00017 2000 Lincoln LS Vehicle Vertical Acceleration



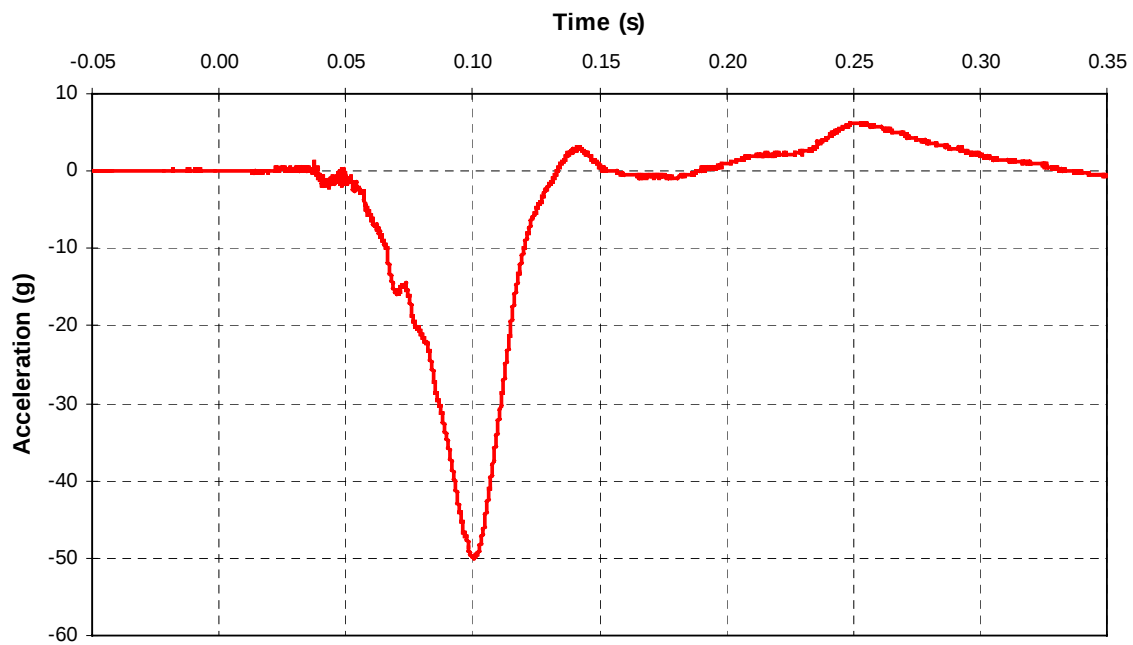
A- 4 CF00017 2000 Lincoln LS Vehicle Vector Resultant Acceleration



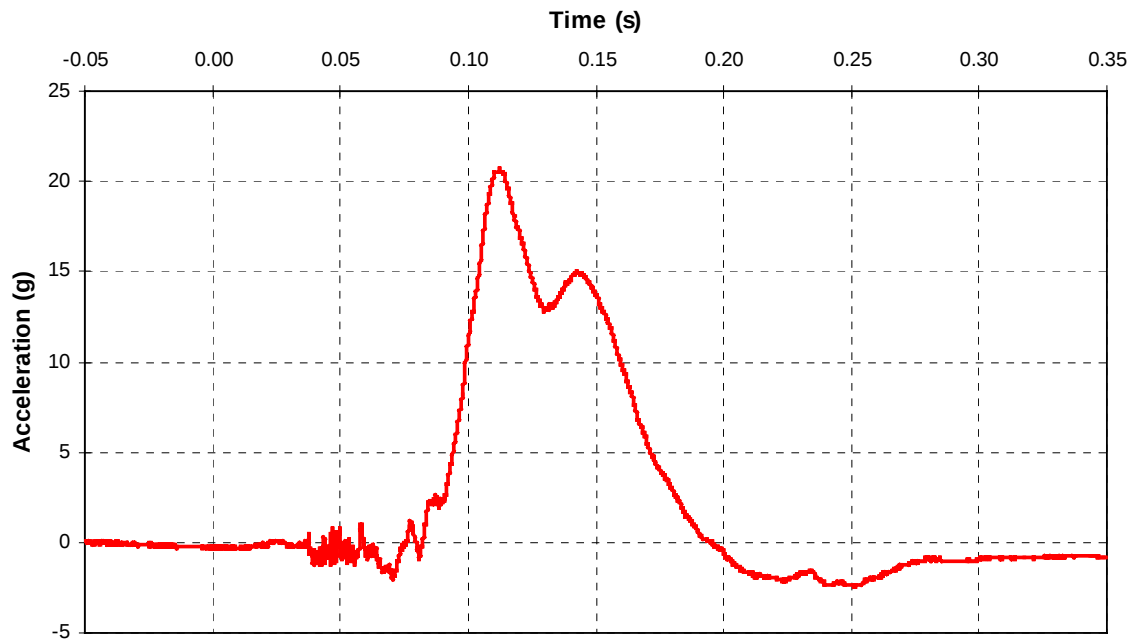
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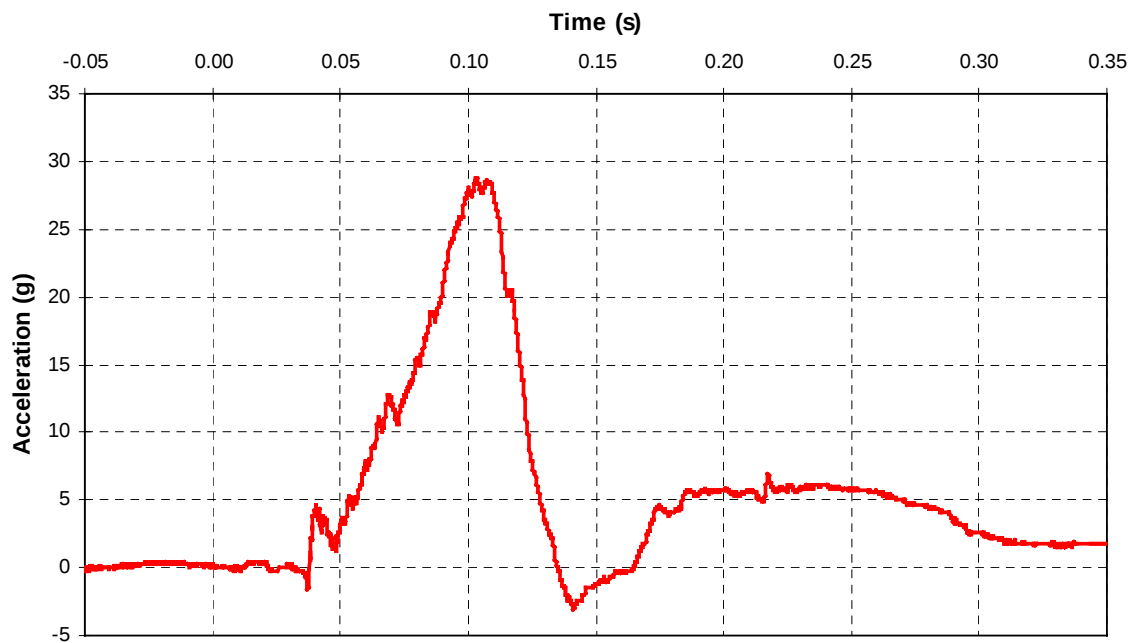
A- 6 CF00017 2000 Lincoln LS Head A-P Acceleration



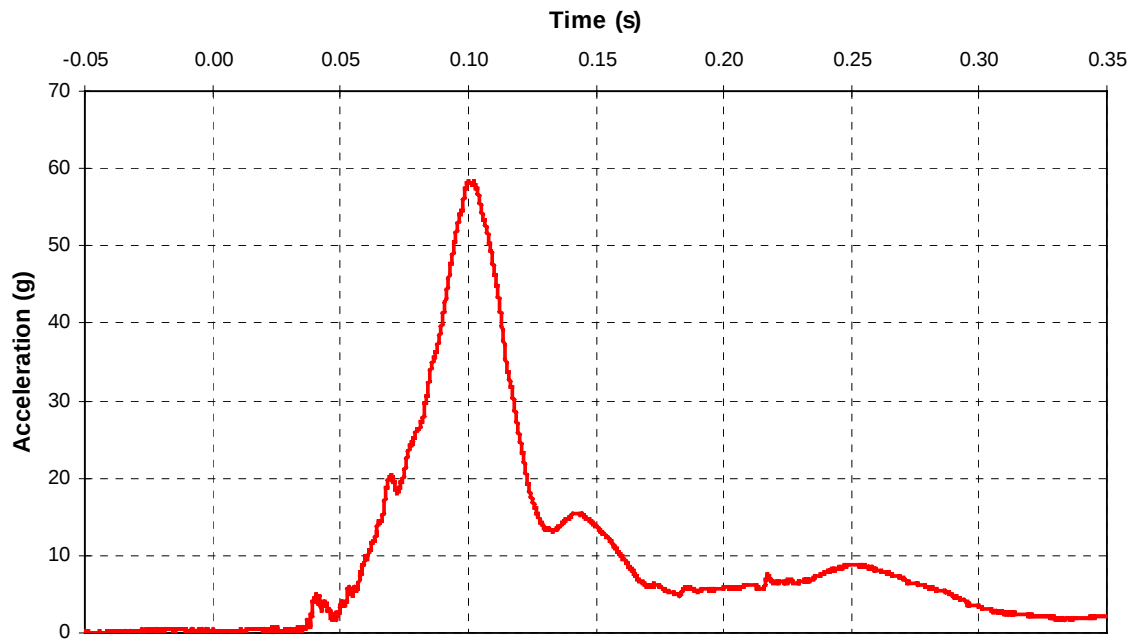
A- 7 CF00017 2000 Lincoln LS Head L-M Acceleration



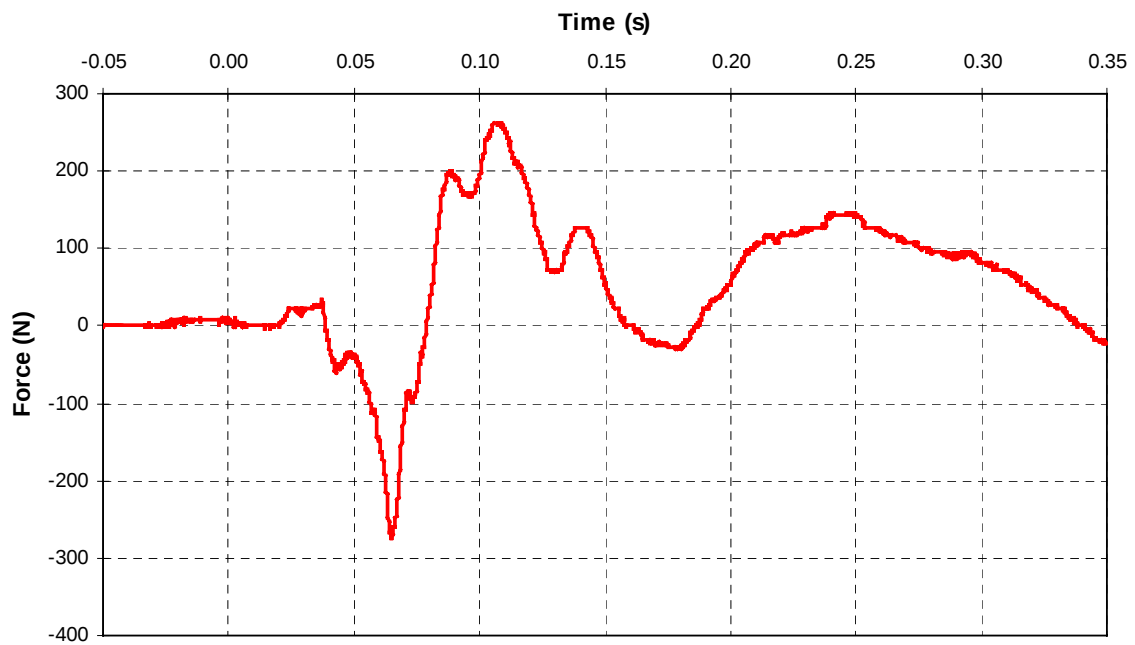
A- 8 CF00017 2000 Lincoln LS Head I-S Acceleration



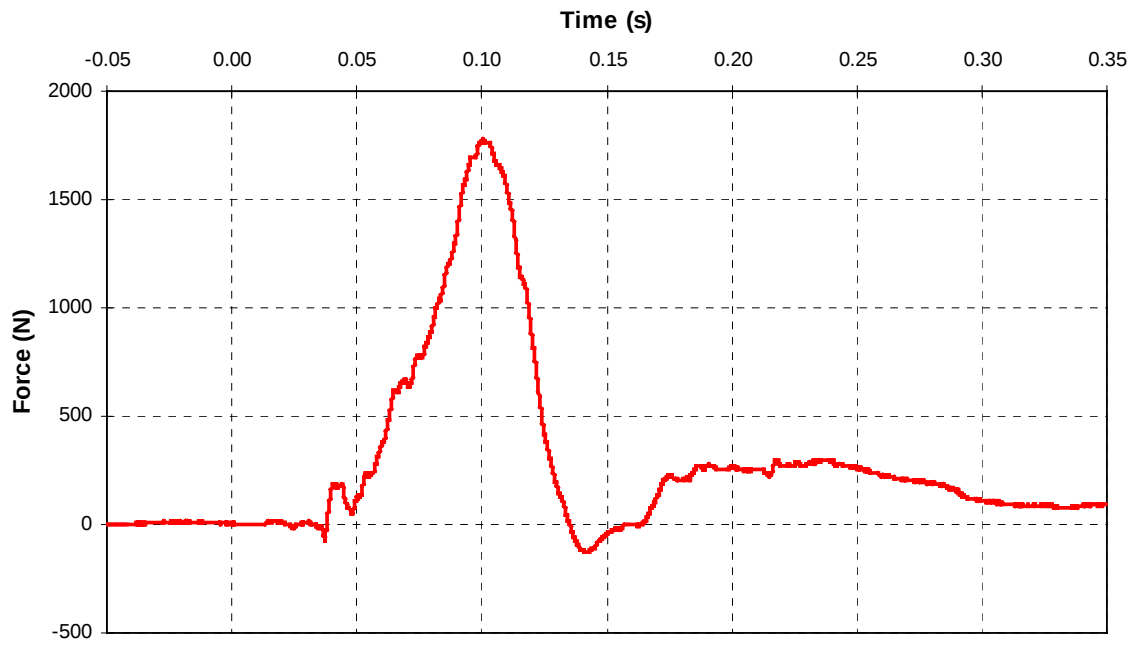
A- 9 CF00017 2000 Lincoln LS Head Vector Resultant Acceleration



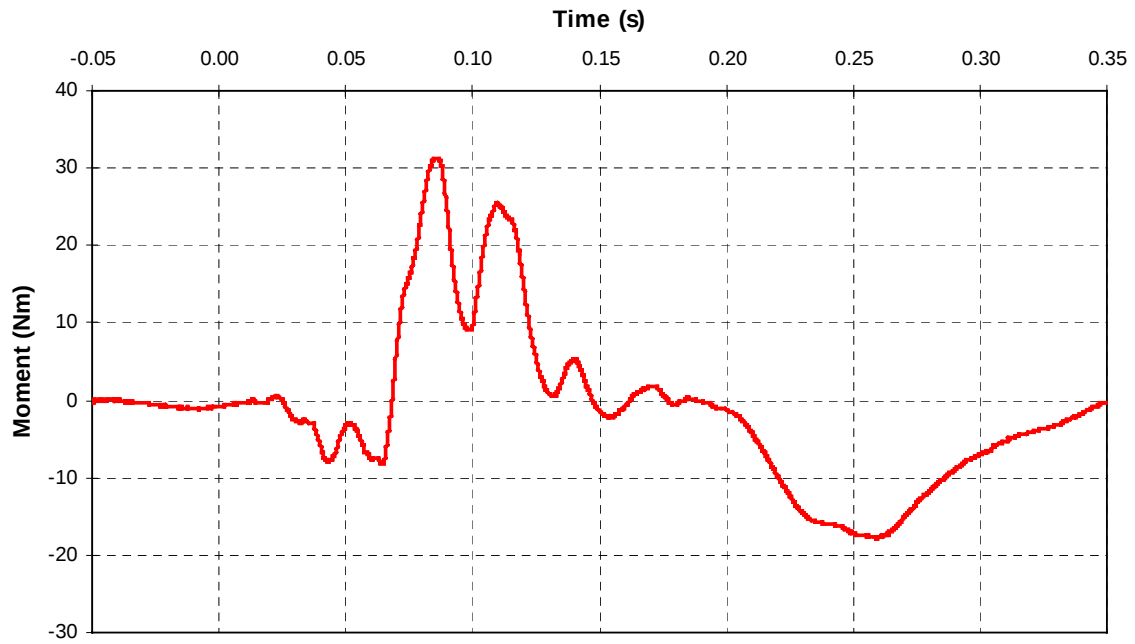
A- 10 CF00017 2000 Lincoln LS Neck A-P Shear Force



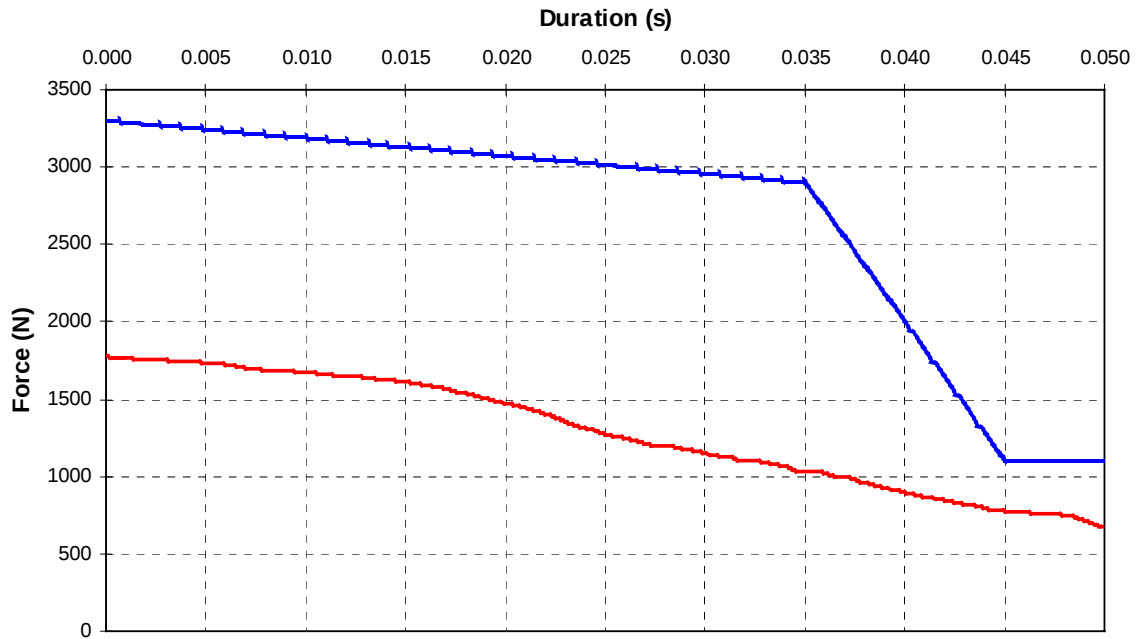
A- 11 CF00017 2000 Lincoln LS Neck Axial Force



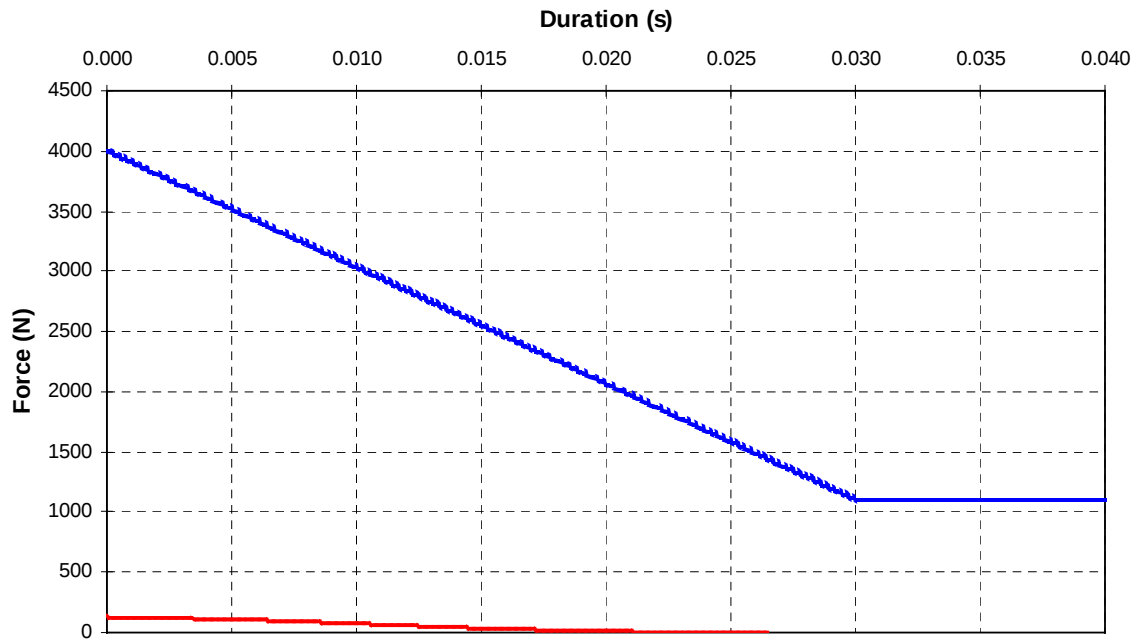
A- 12 CF00017 2000 Lincoln LS Neck Occipital A-P Moment



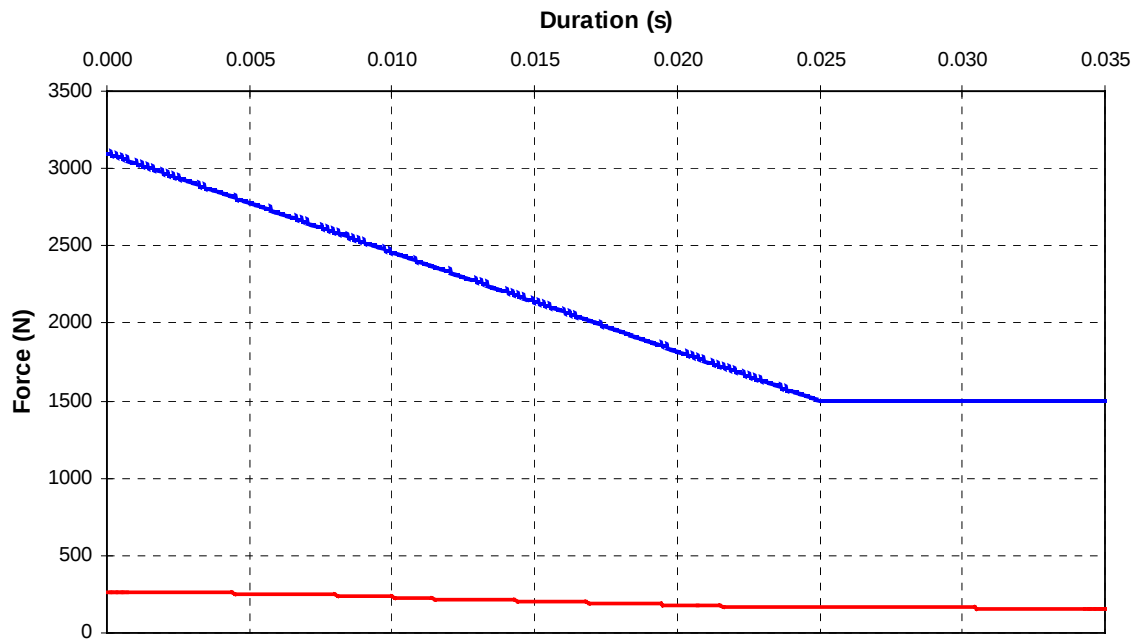
A- 13 CF00017 2000 Lincoln LS Neck Tension Analysis



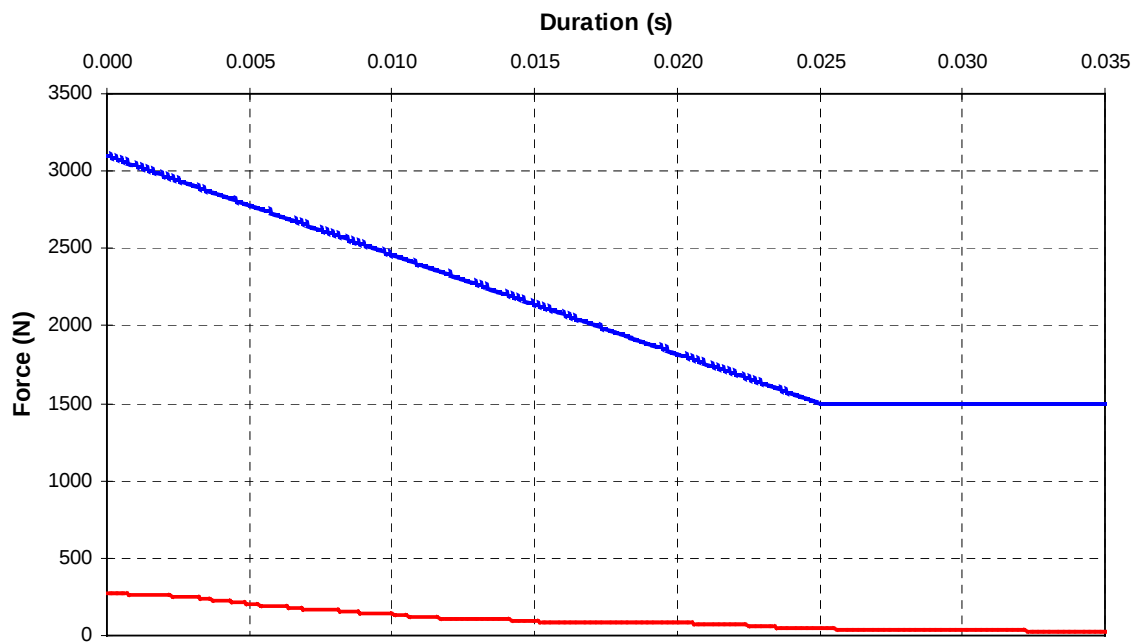
A- 14 CF00017 2000 Lincoln LS Neck Compression Analysis



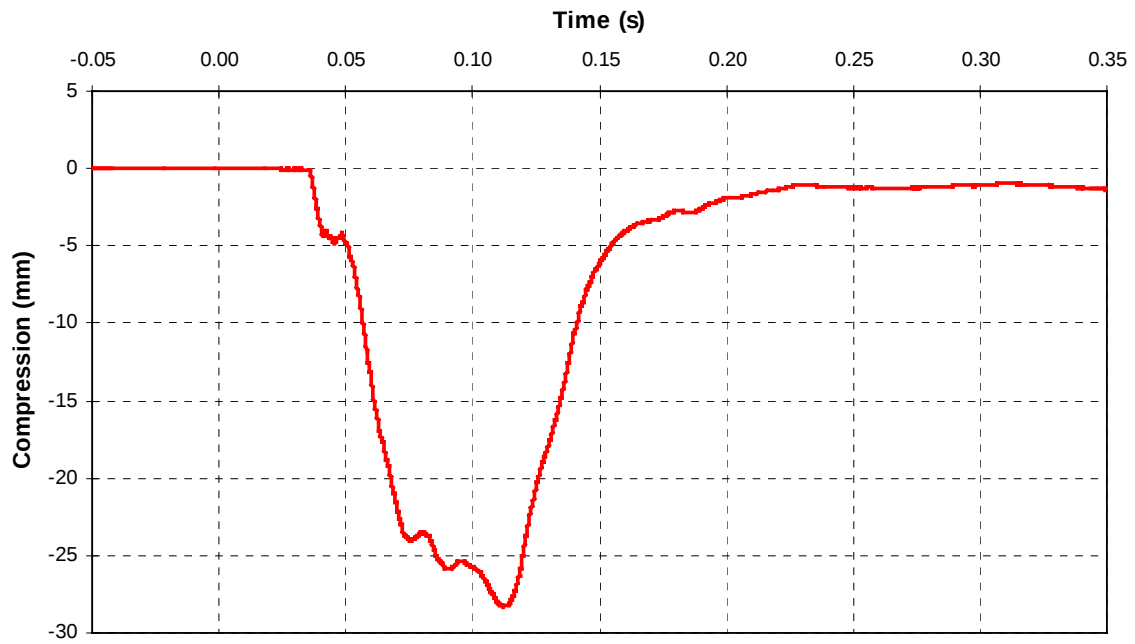
A- 15 CF00017 2000 Lincoln LS Neck A-P Shear (Positive) Analysis



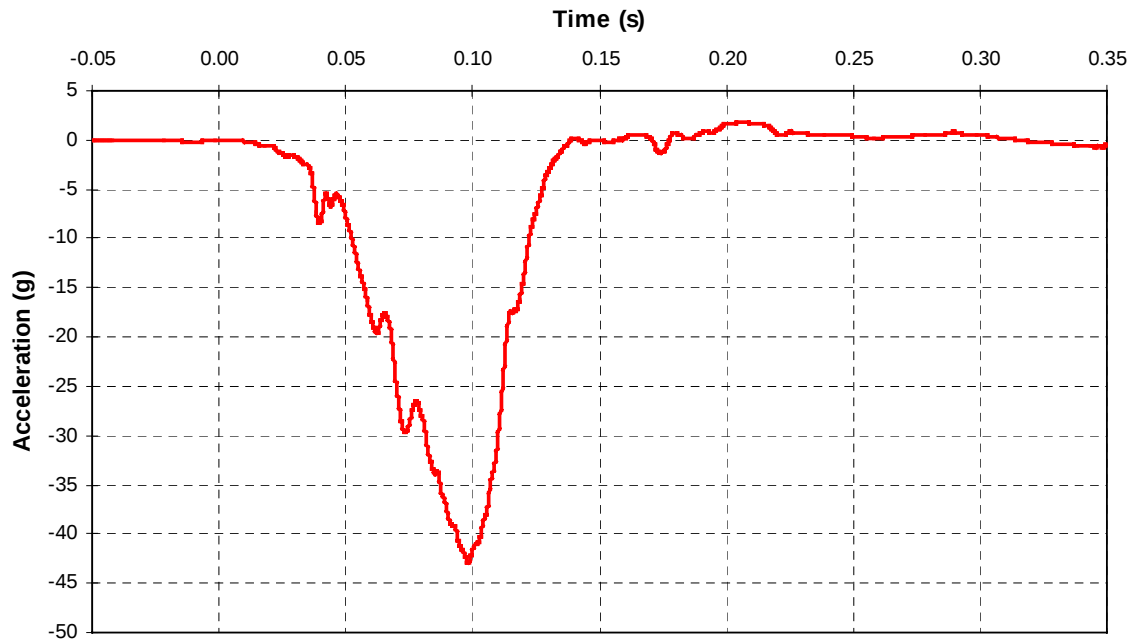
A- 16 CF00017 2000 Lincoln LS Neck A-P Shear (Negative) Analysis



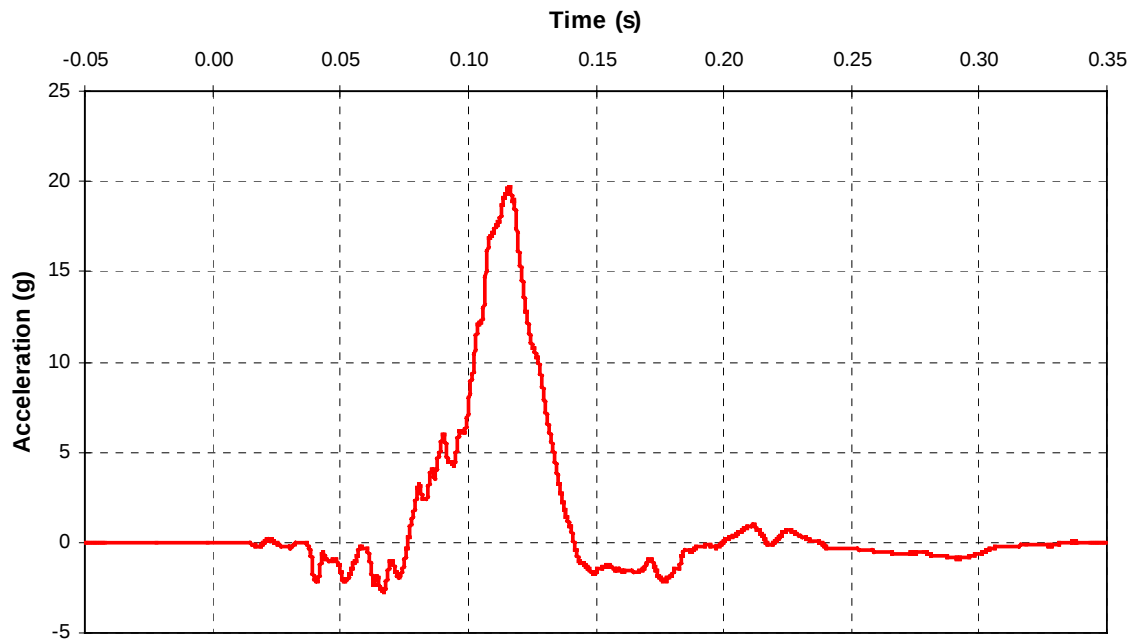
A- 17 CF00017 2000 Lincoln LS Chest Compression



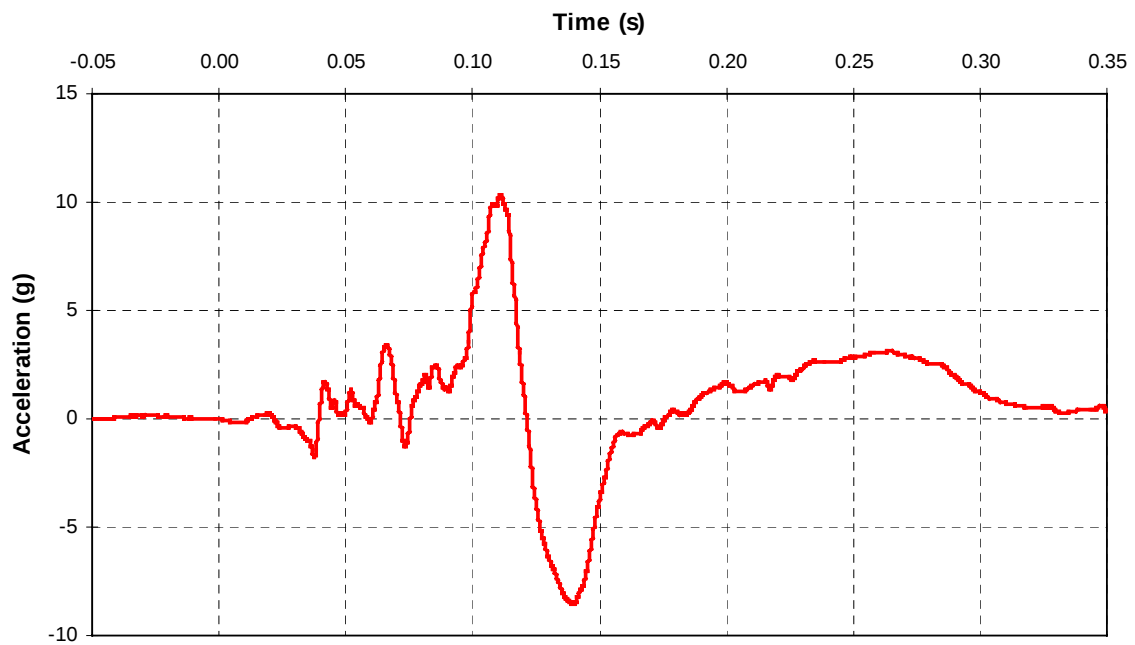
A- 18 CF00017 2000 Lincoln LS Chest A-P Acceleration



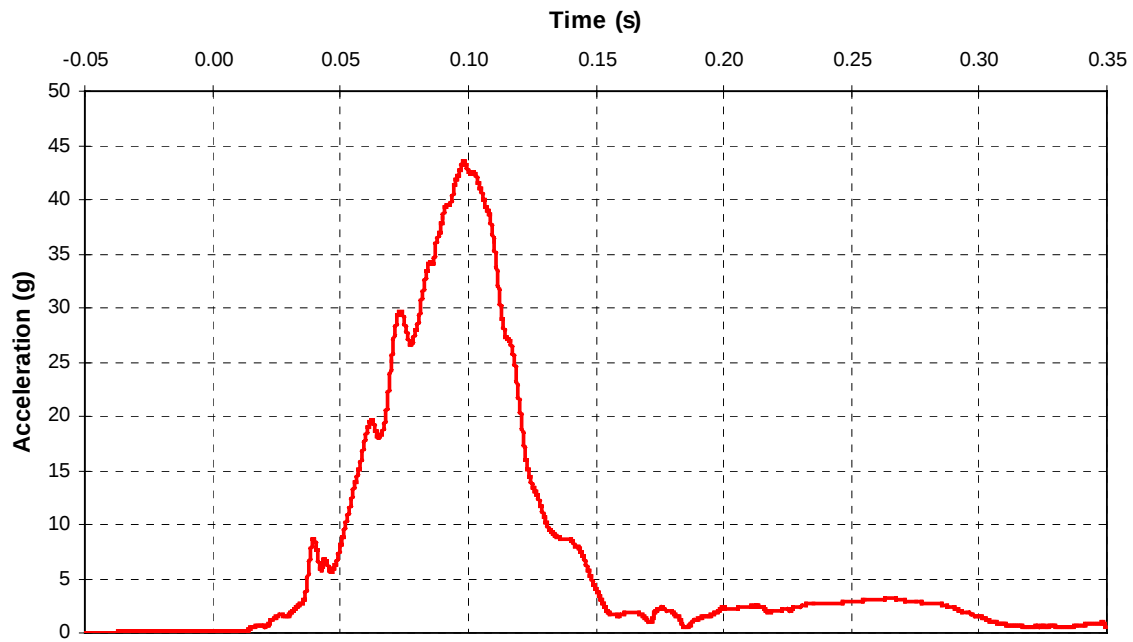
A- 19 CF00017 2000 Lincoln LS Chest L-M Acceleration



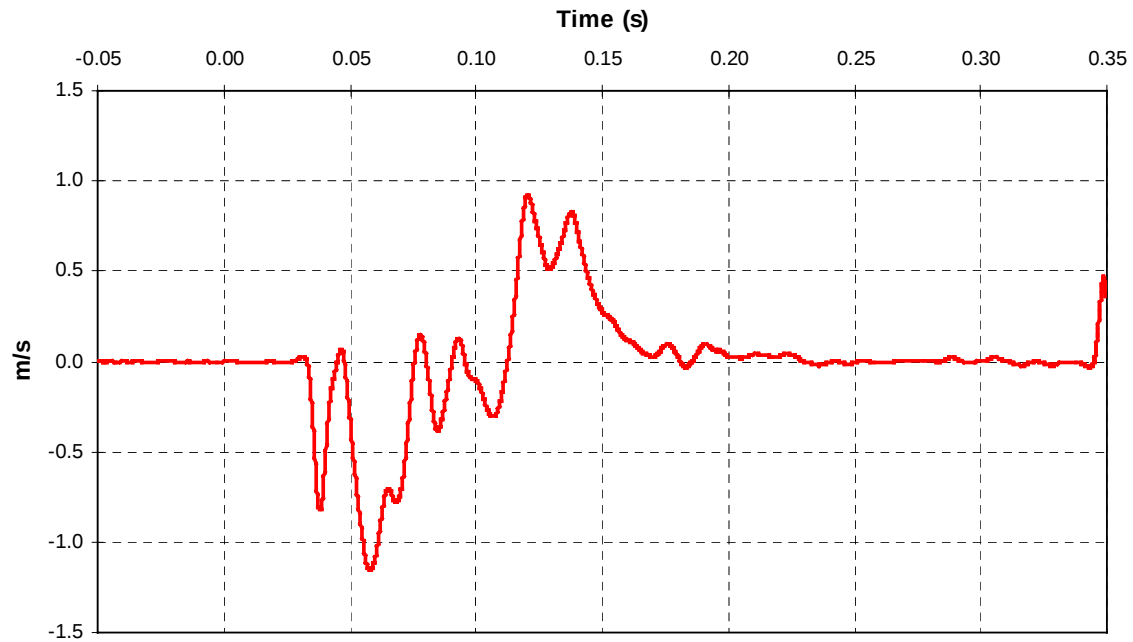
A- 20 CF00017 2000 Lincoln LS Chest I-S Acceleration



A- 21 CF00017 2000 Lincoln LS Chest Vector Resultant Acceleration

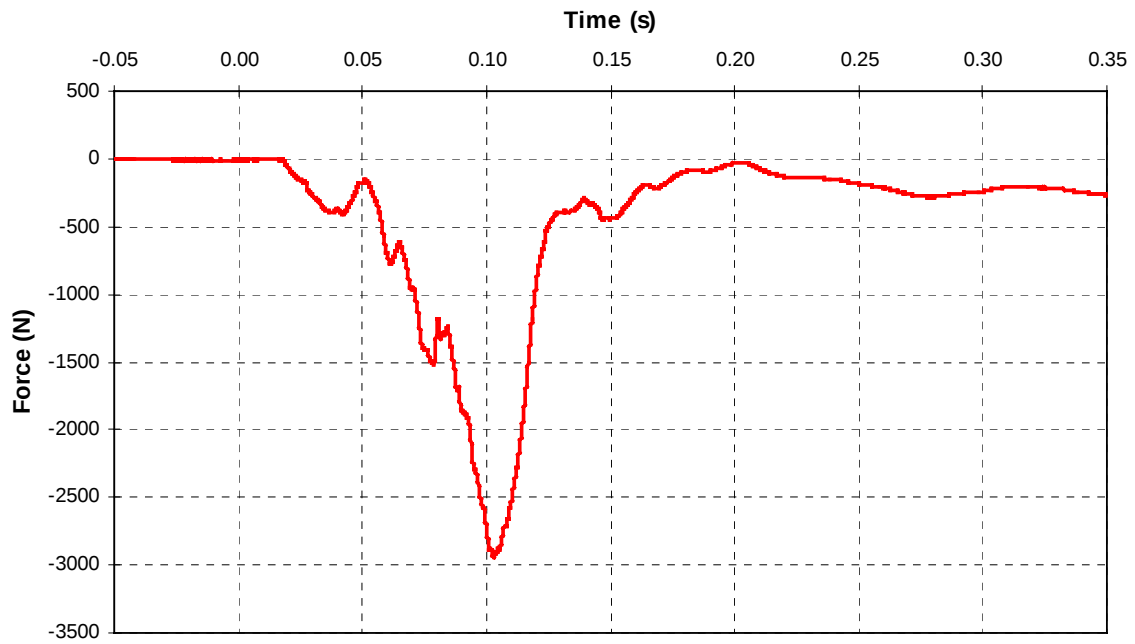


A- 22 CF00017 2000 Lincoln LS Sternum Deflection Rate

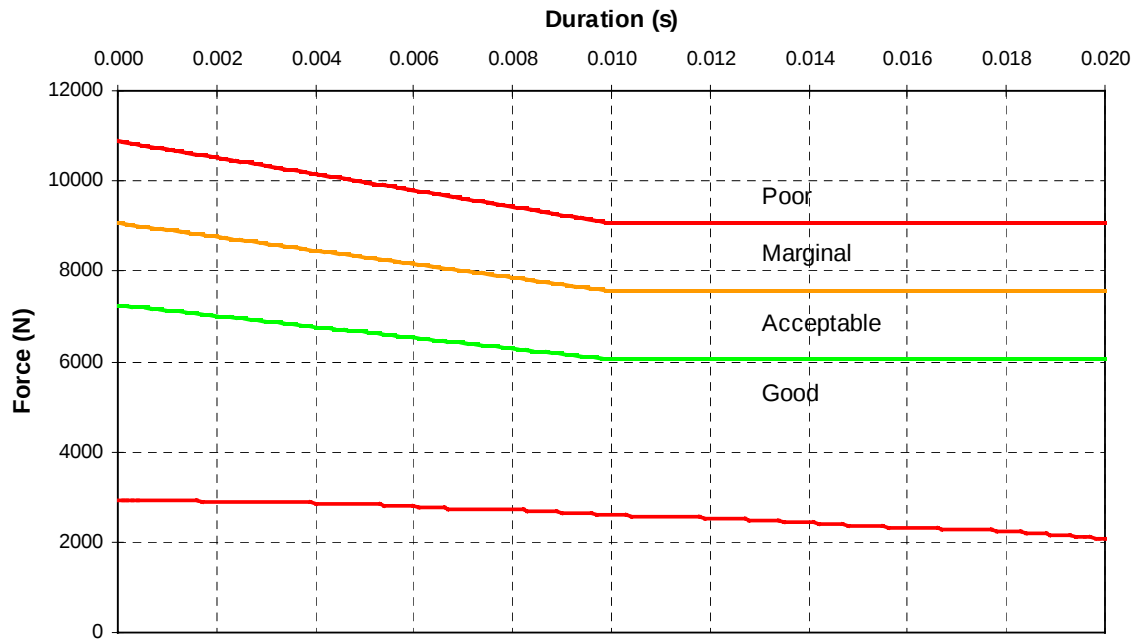


Sternum deflection rate is calculated from the sternum deflection filtered to CFC 60

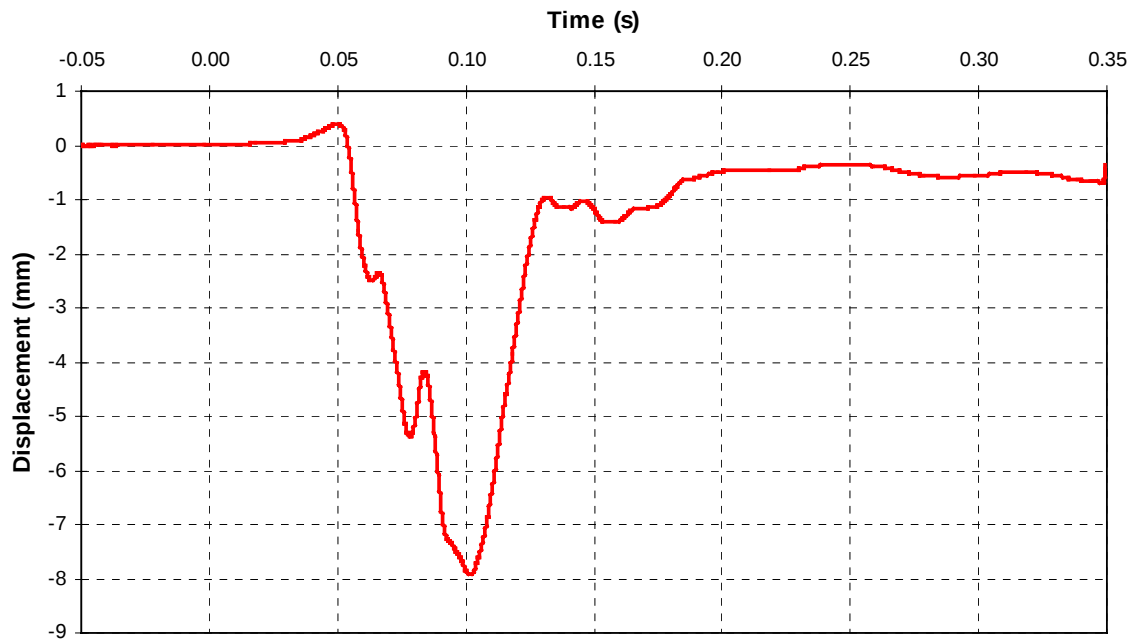
A- 23 CF00017 2000 Lincoln LS Left Femur Axial Force



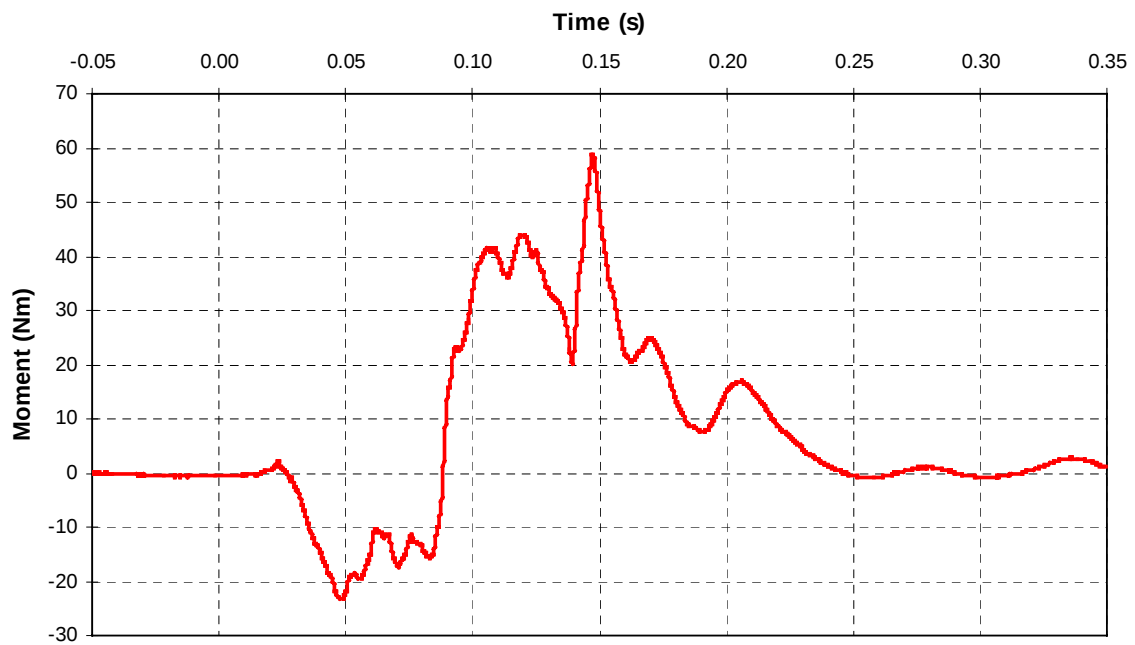
A- 24 CF00017 2000 Lincoln LS Left Femur Axial Force Analysis



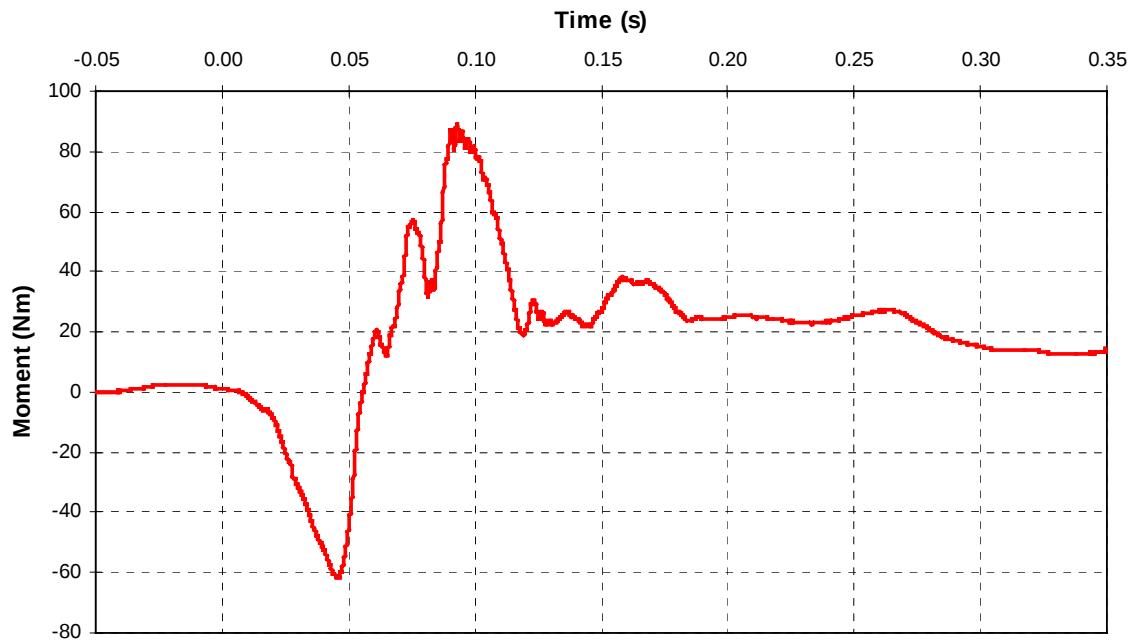
A- 25 CF00017 2000 Lincoln LS Left Tibia-Femur Displacement



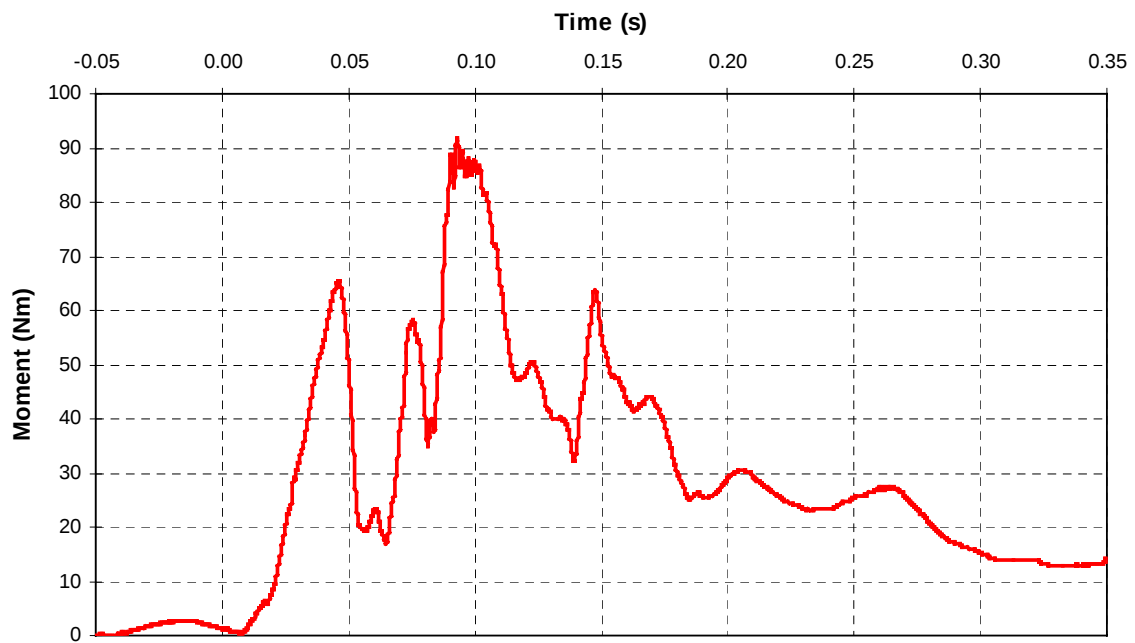
A- 26 CF00017 2000 Lincoln LS Left Upper Tibia L-M Moment



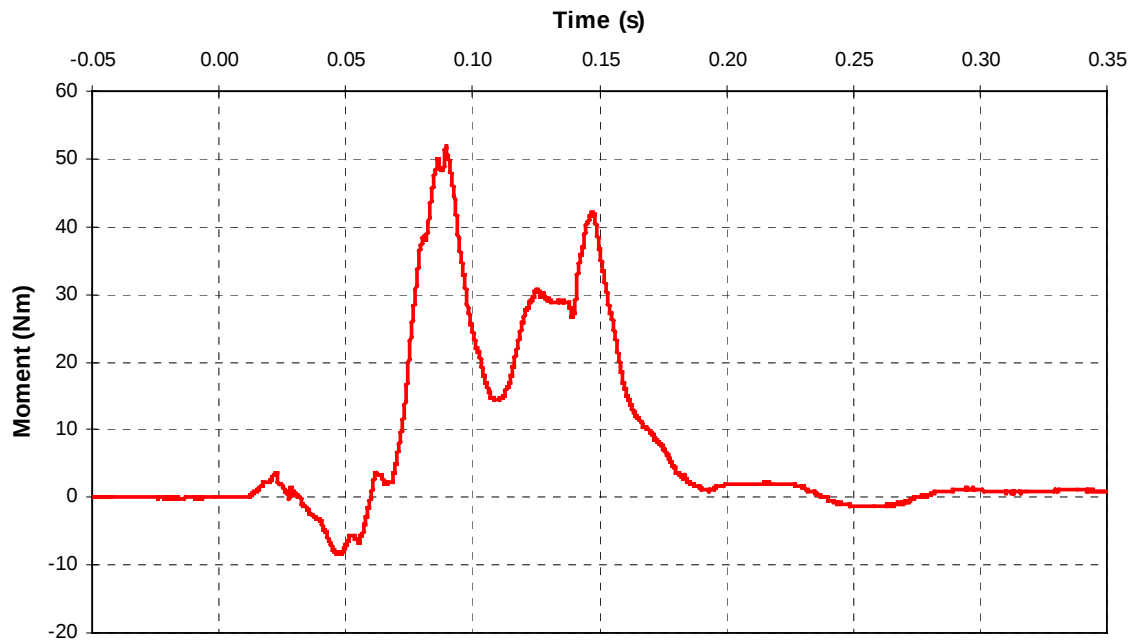
A- 27 CF00017 2000 Lincoln LS Left Upper Tibia A-P Moment



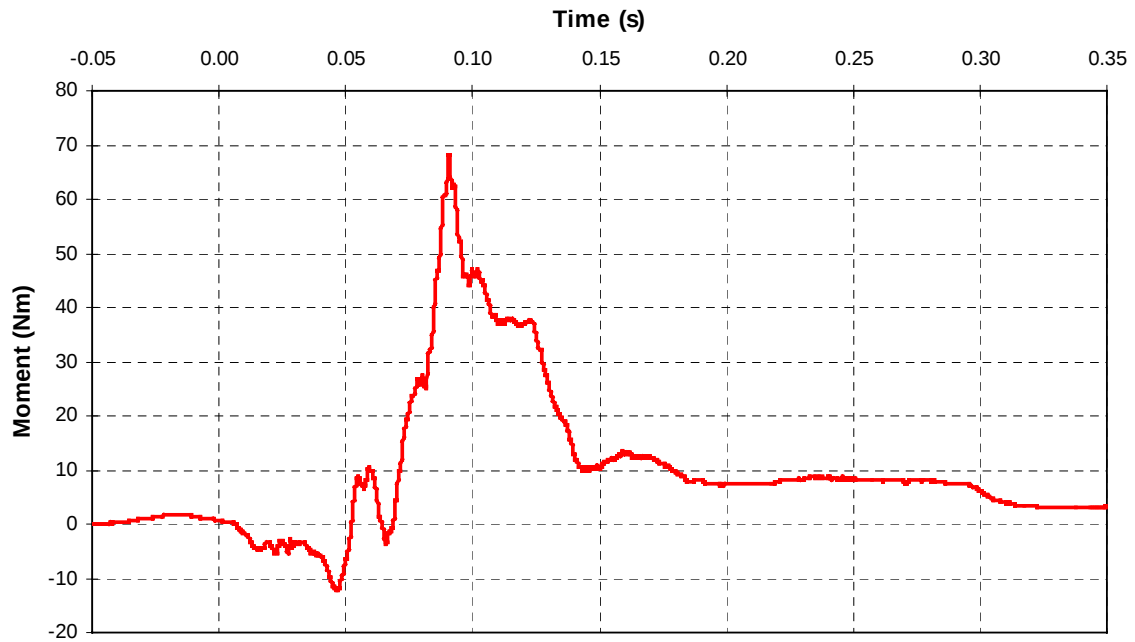
A- 28 CF00017 2000 Lincoln LS Left Upper Tibia Vector Resultant Moment



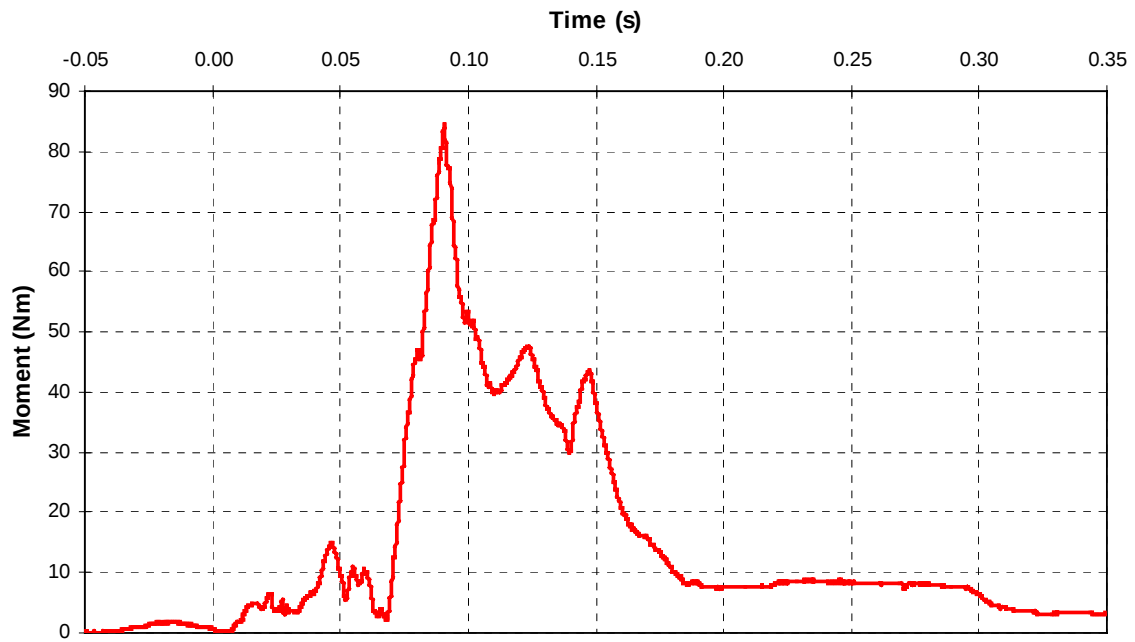
A- 29 CF00017 2000 Lincoln LS Left Lower Tibia L-M Moment



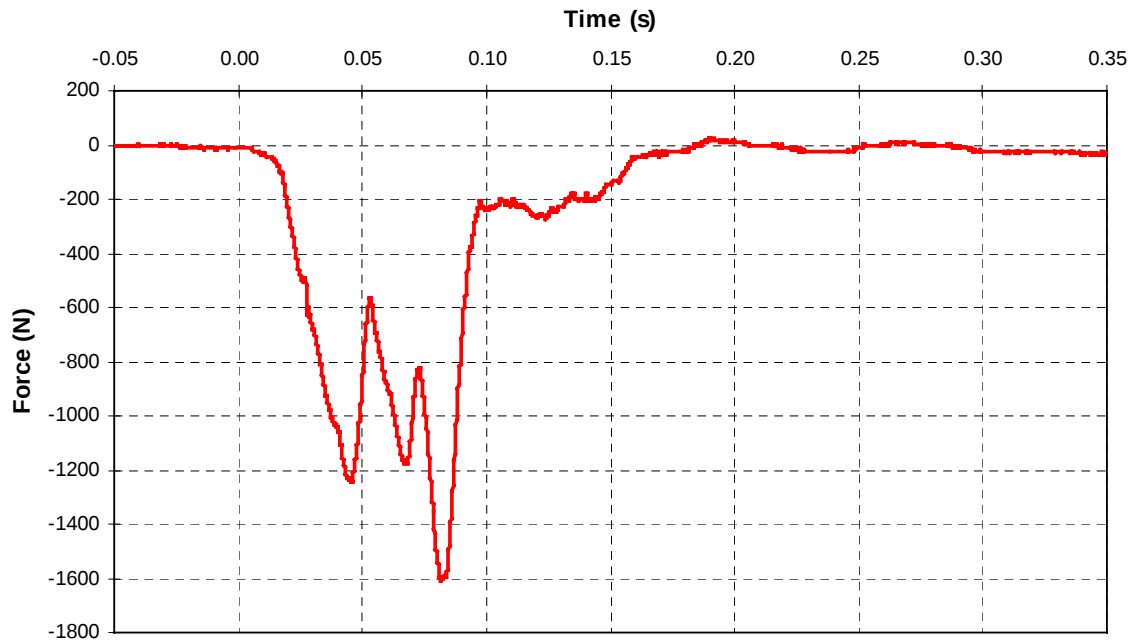
A- 30 CF00017 2000 Lincoln LS Left Lower Tibia A-P Moment



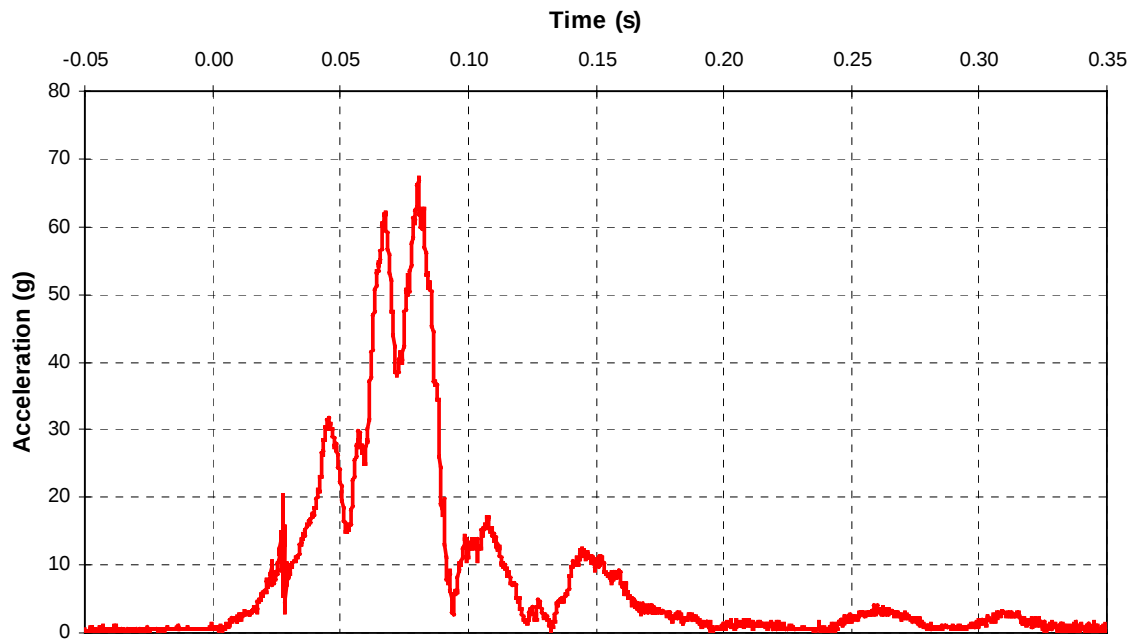
A- 31 CF00017 2000 Lincoln LS Left Lower Tibia Vector Resultant Moment



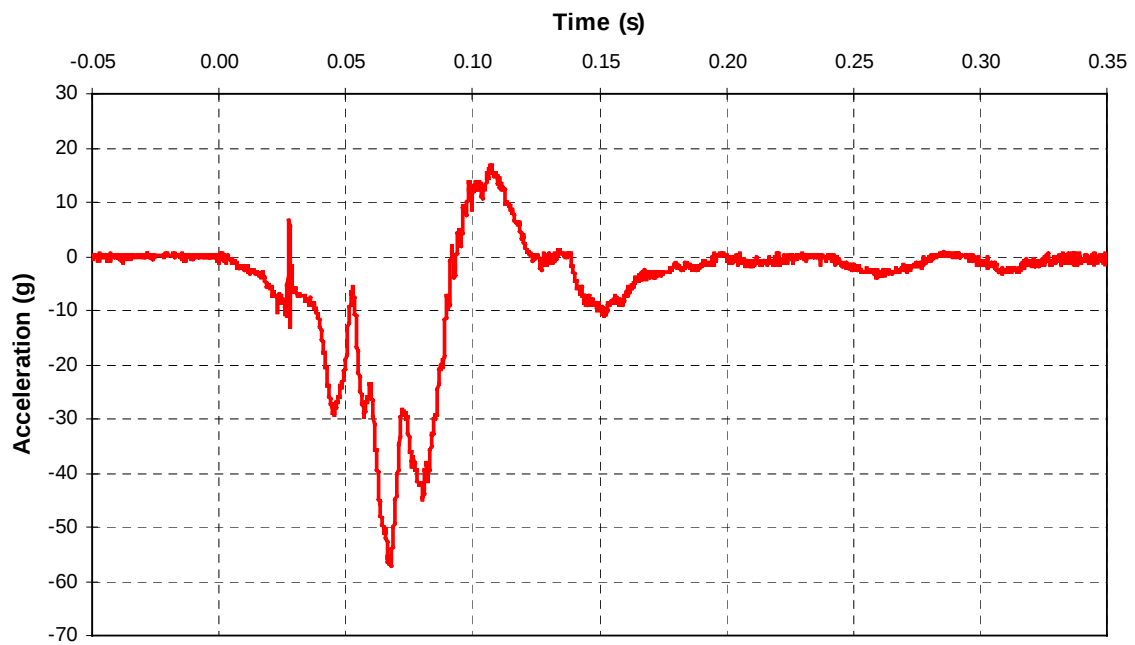
A- 32 CF00017 2000 Lincoln LS Left Lower Tibia Axial Force



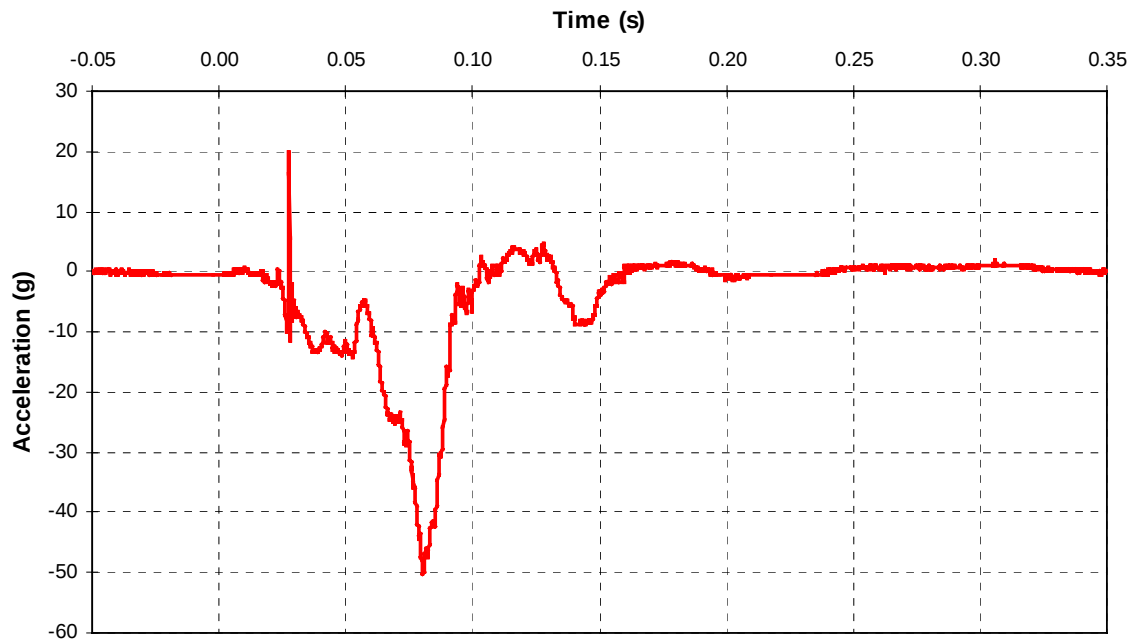
A- 33 CF00017 2000 Lincoln LS Left Foot Vector Resultant Acceleration



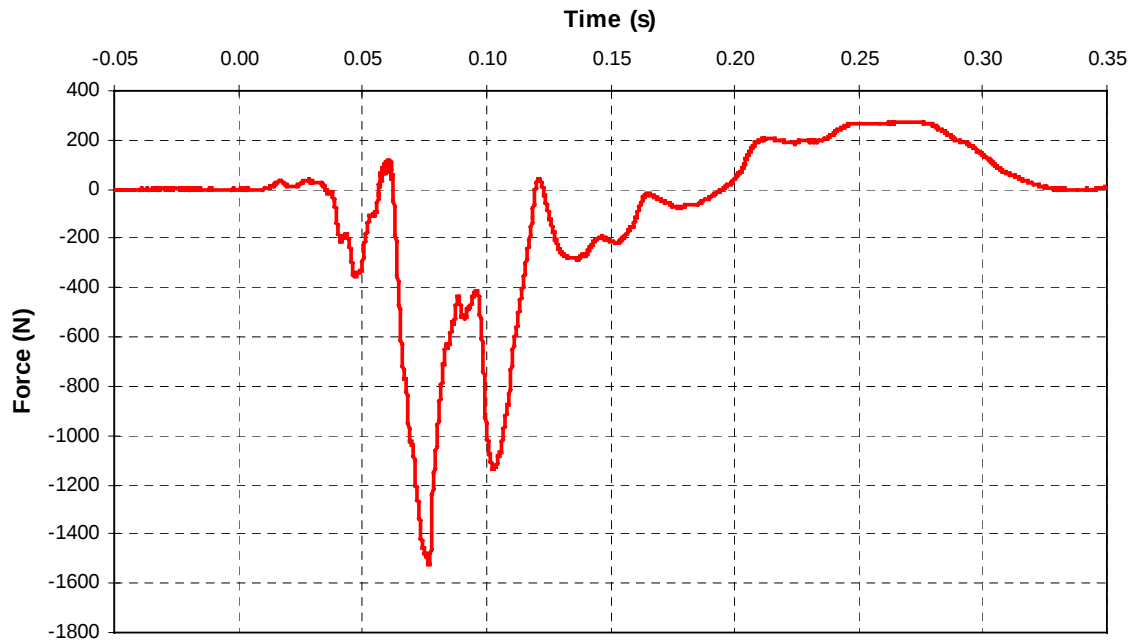
A- 34 CF00017 2000 Lincoln LS Left Foot A-P Acceleration



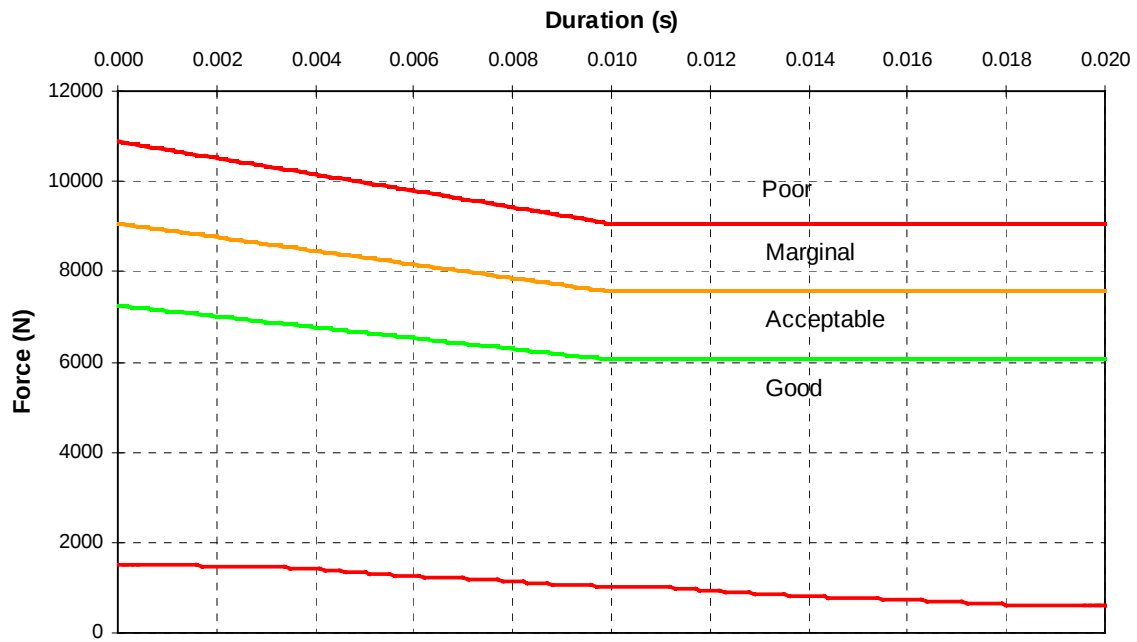
A- 35 CF00017 2000 Lincoln LS Left Foot I-S Acceleration



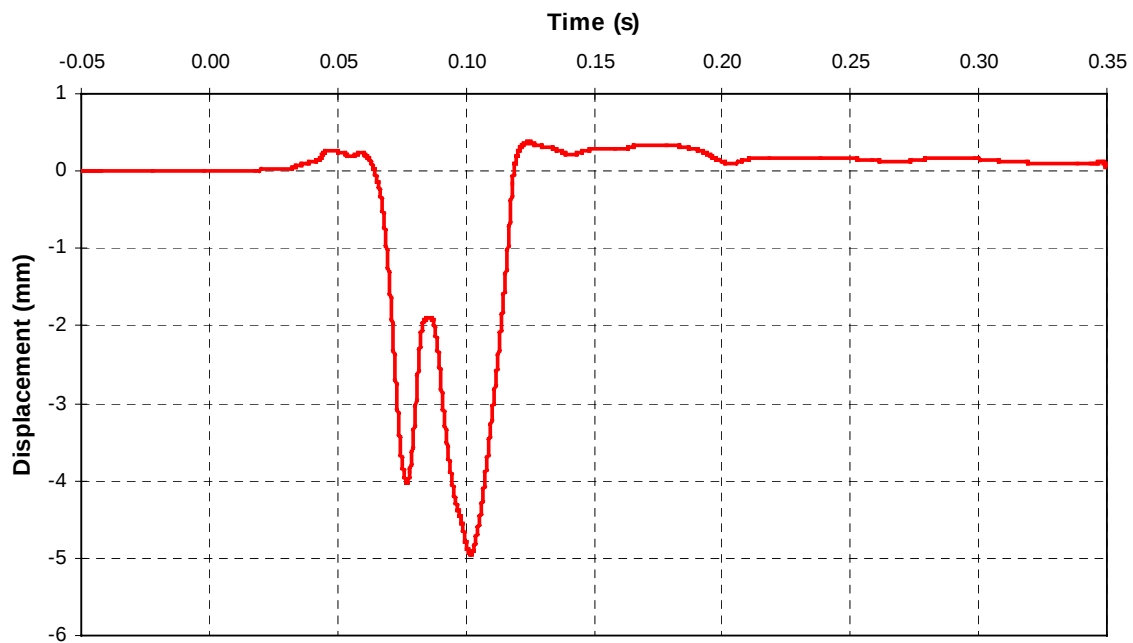
A- 36 CF00017 2000 Lincoln LS Right Femur Axial Force



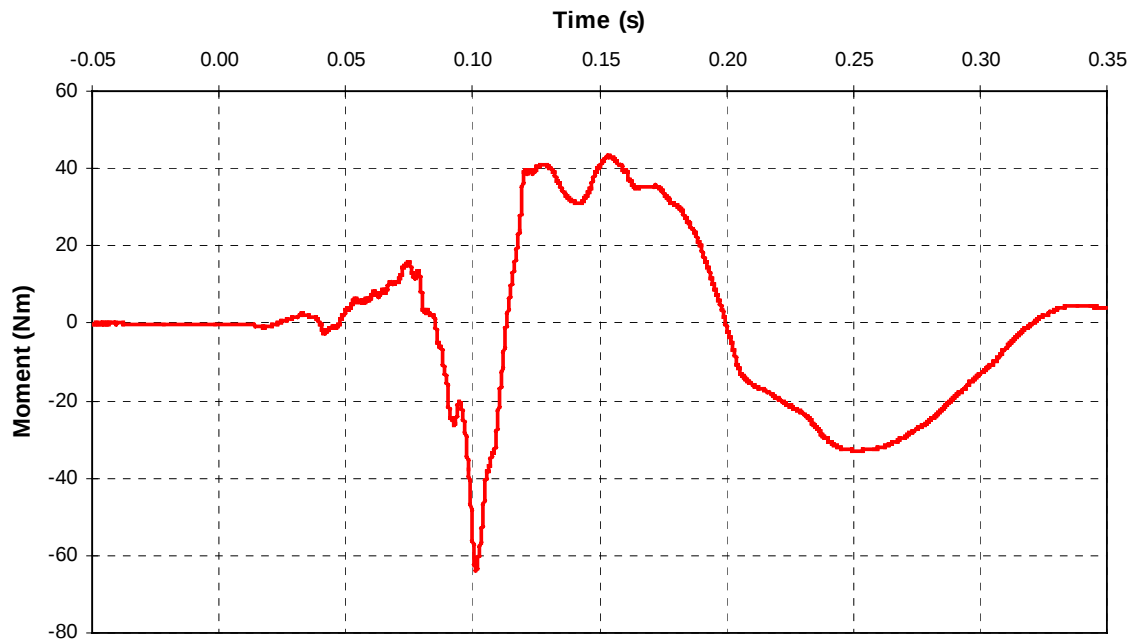
A- 37 CF00017 2000 Lincoln LS Right Femur Axial Force Analysis



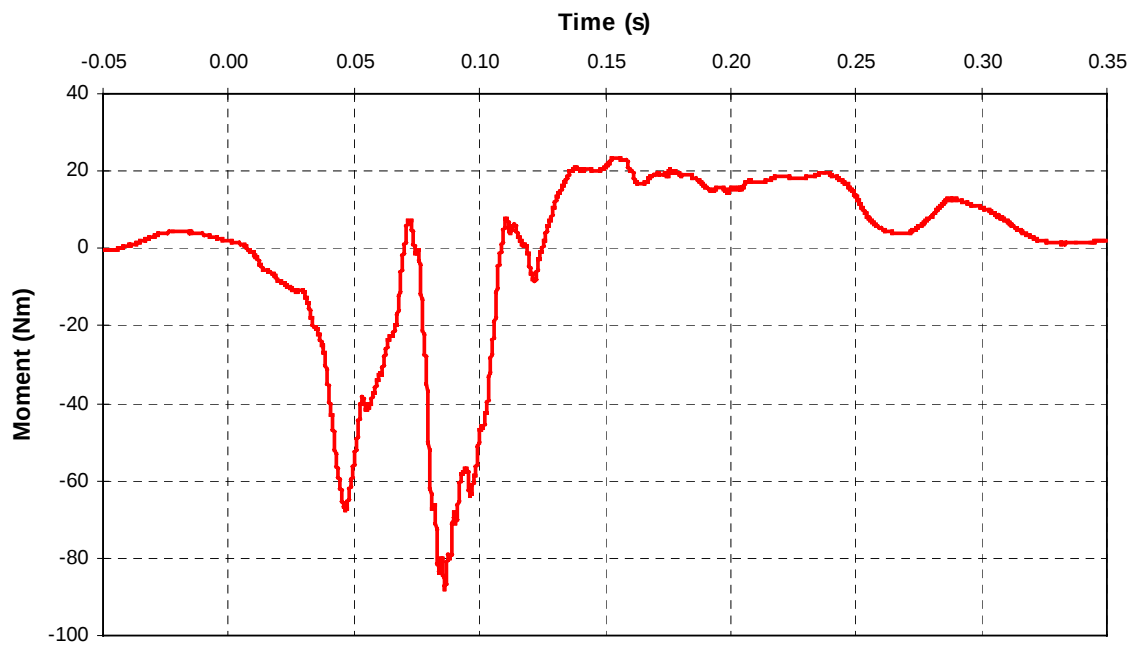
A- 38 CF00017 2000 Lincoln LS Right Tibia-Femur Displacement



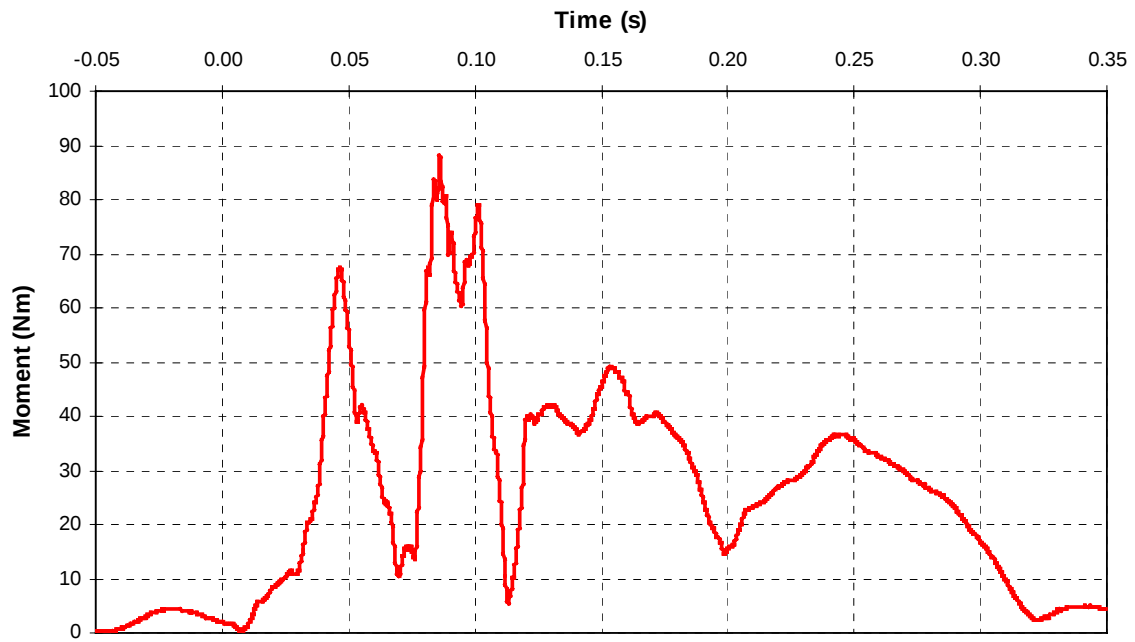
A- 39 CF00017 2000 Lincoln LS Right Upper Tibia L-M Moment



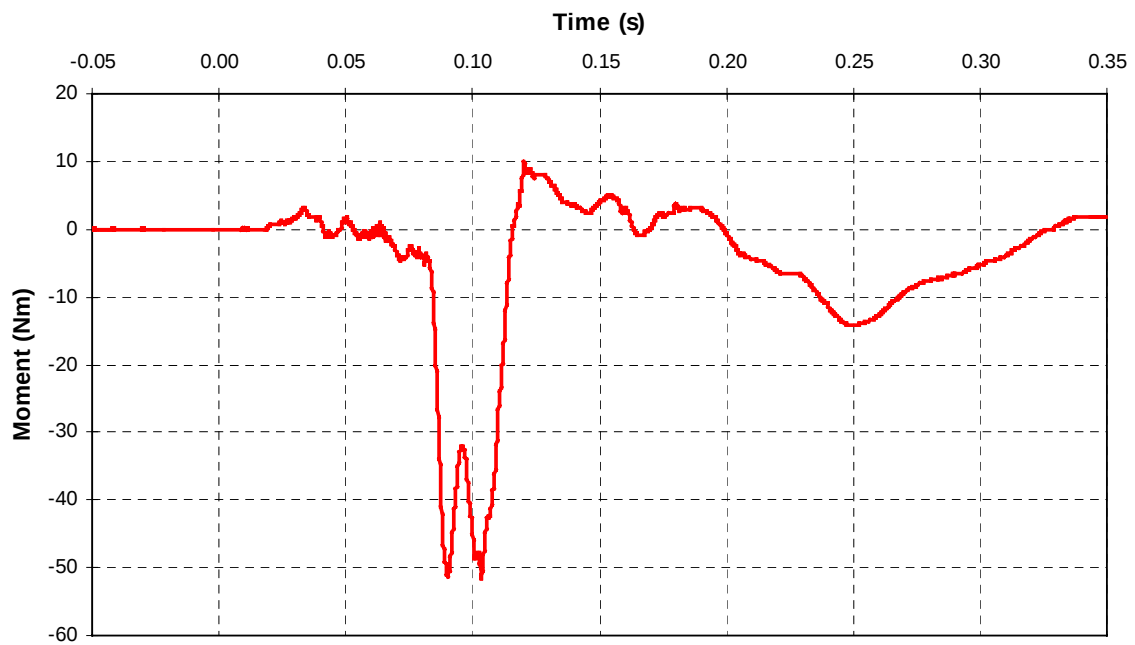
A- 40 CF00017 2000 Lincoln LS Right Upper Tibia A-P Moment



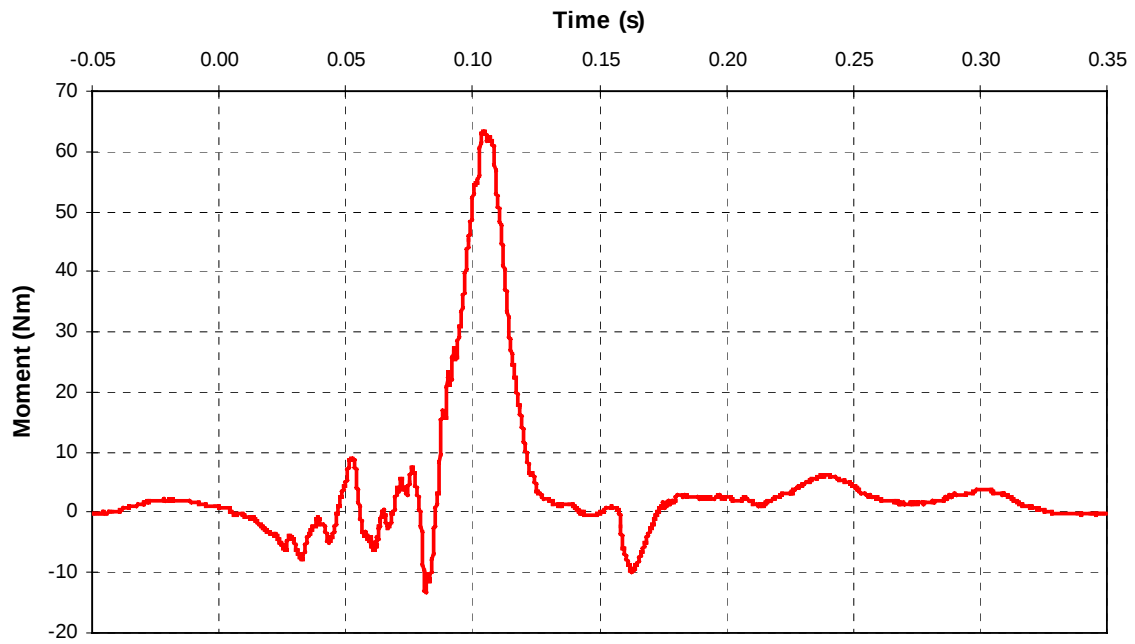
A- 41 CF00017 2000 Lincoln LS Right Upper Tibia Vector Resultant Moment



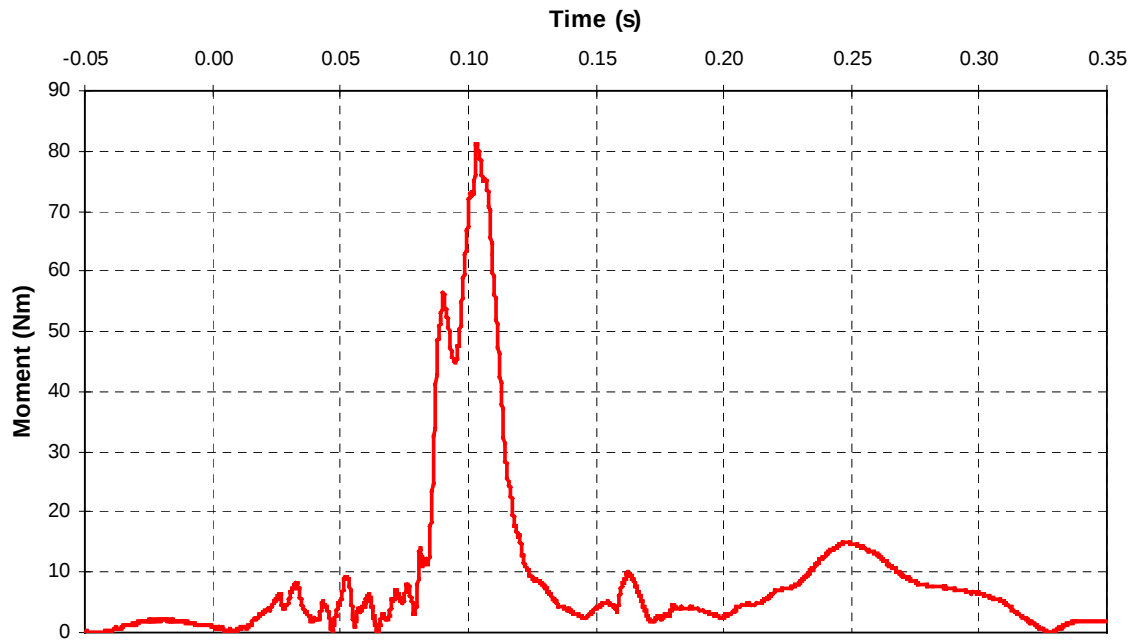
A- 42 CF00017 2000 Lincoln LS Right Lower Tibia L-M Moment



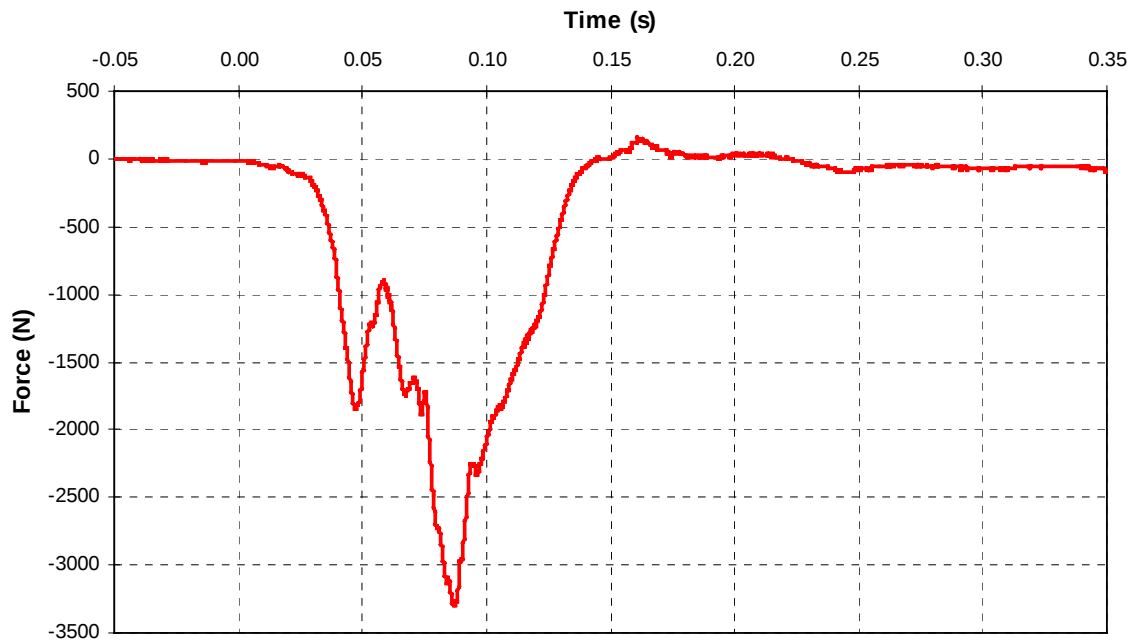
A- 43 CF00017 2000 Lincoln LS Right Lower Tibia A-P Moment



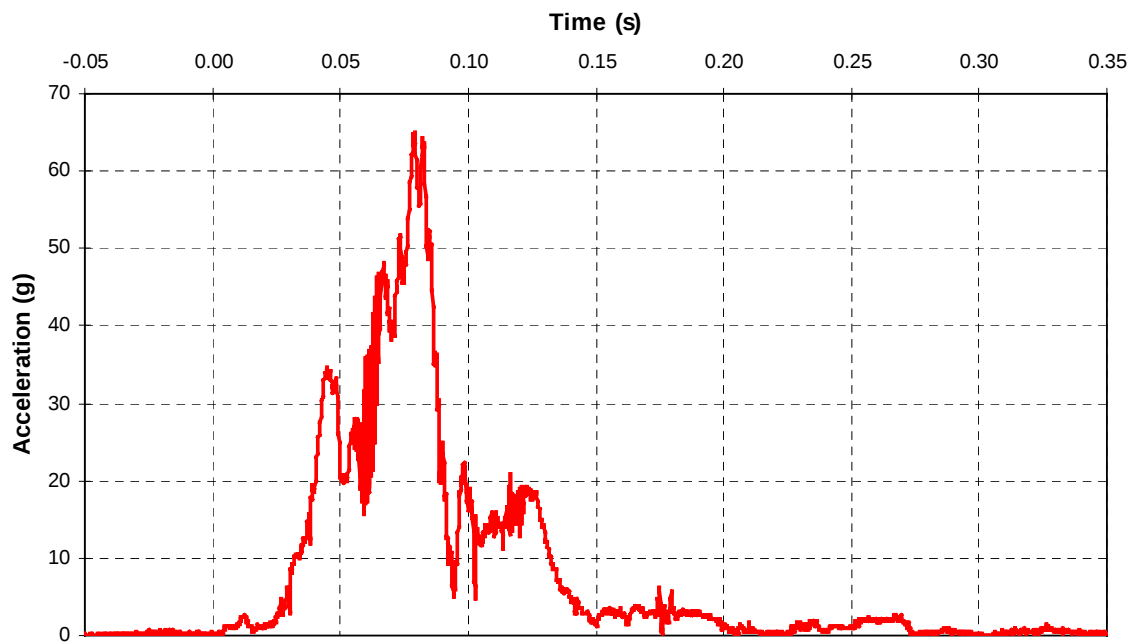
A- 44 CF00017 2000 Lincoln LS Right Lower Tibia Vector Resultant Moment



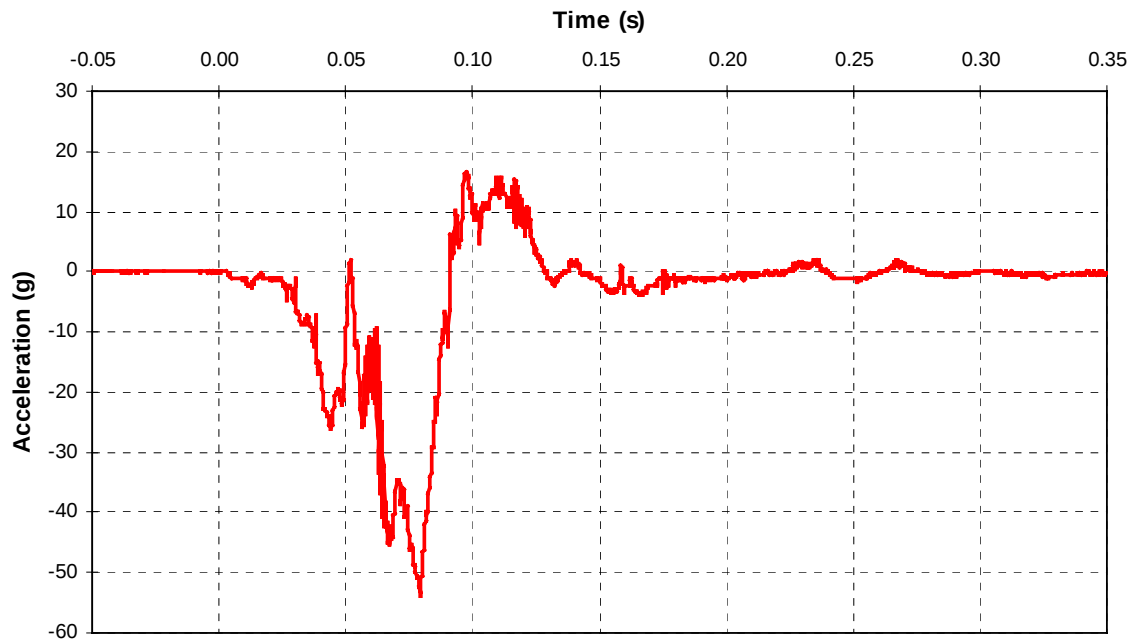
A- 45 CF00017 2000 Lincoln LS Right Lower Tibia Axial Force



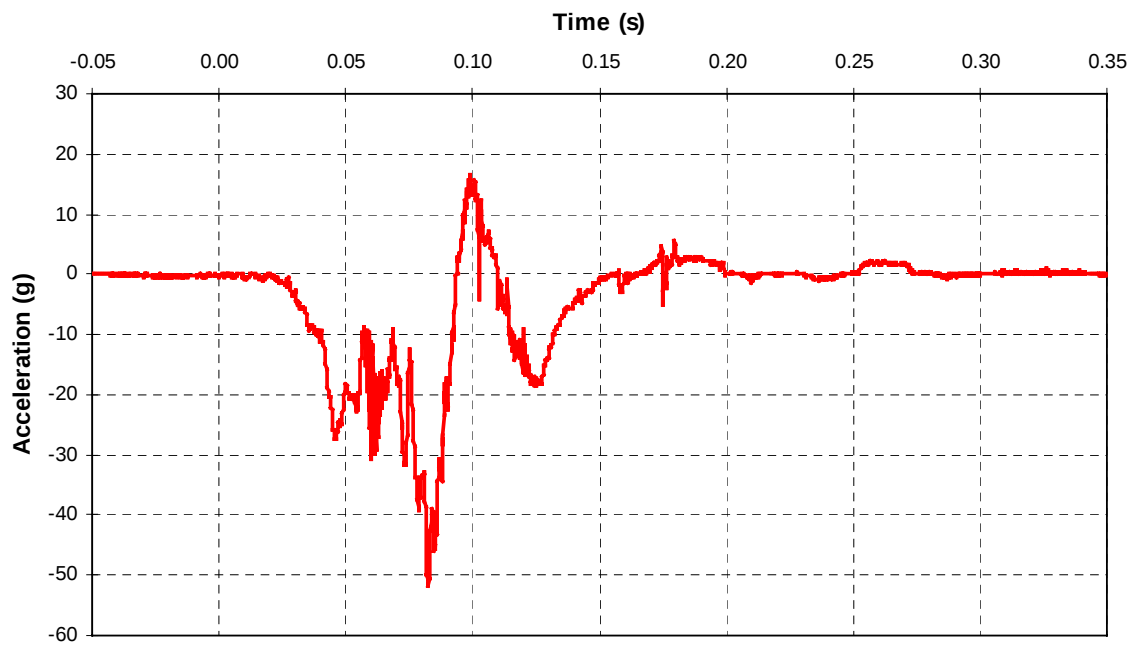
A- 46 CF00017 2000 Lincoln LS Right Foot Vector Resultant Acceleration



A- 47 CF00017 2000 Lincoln LS Right Foot A-P Acceleration



A- 48 CF00017 2000 Lincoln LS Right Foot I-S Acceleration



LINCOLN

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VEHICLE DESCRIPTION

LINCOLN LS

3.9L V8-32V

2000 4 DOOR
5-PASSENGER LUXURY
3.9L DOHC EFI V8 ENGINE
5 SPEED AUTO TRANSMISSION

VIN 1LNHM87AXY878774
EXTERIOR
AUTUMN RED CLEARCOAT
INTERIOR
MEDIUM PARCHMENT LEATHER SE

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE

- SAFETY/SECURITY**
 - DRIVER & PASS SIDE AIR BAGS
 - DRIVER & PASS SIDE AIR BAG
 - PWR 4 WHL DISC BRAKES
 - CHILD LOCKS REAR SEAT
 - 3 POINT REAR SAFETY BELTS
 - REMOTE KEYLESS ENTRY SYST.
 - PERIMETER ALARM W/LED IND
 - FALL SAFE COOLING
 - FUNCTIONAL 3.9L 4V V8 ENG
 - 5-SPEED AUTOMATIC OD TRANS
 - INDEND, FRONT AND REAR
 - SUSPENSION
 - 16" BRUSHED ALUM 5-SPOKE
 - P215/60HR BSW 16" TIRE
 - ALL SPEED TRACTION CONTROL
 - CONVENIENCE PACKAGE
 - DUAL AUTO TEMPERATURE CTL
 - PAS COMPARTMENT PARTICLE AIR FILTER
- EXTERIOR**
 - CFC FREE AIR CONDITIONING
 - POWER TILT STEERING WHL
 - GLOBAL OPEN/CLOSE WINDOWS
 - DUAL EXHAUST
 - ELECTRONIC MESS. CENTER
 - FRONT FOG LAMPS
- INTERIOR**
 - 5 PASS LEATHER SEATING
 - 60/40 FOLD DOWN R SEATS
 - FRT & RR CARPETED FL MATS
 - POWER LOCKS
 - AM/FM CASS W/PREMIUM SND
 - REAR ARM REST CUP HOLDERS
 - REAR SEAT ADJ. HEAD RESTS
 - AUTO DIMMING MIRROR
 - 8-WAY POWER SEAT W/LUMBAR
 - THE LINCOLN COMMITMENT
 - 4 YR/50,000 MILE WARRANTY
 - 24 HR ROADSIDE ASSISTANCE

Compare this vehicle to others in the FREE FUEL ECONOMY GUIDE available at the dealer.

CITY MPG

17

HIGHWAY MPG

23



Actual Mileage will vary with options, driving conditions, driving habits and vehicle's condition. Results reported to EPA indicate that the majority of vehicles with these estimates will achieve between

14 and 20 mpg in the city and between 19 and 27 mpg on the highway.

2000 LS
3.9 LITER ENGINE
(FEEDBACK FUEL SYSTEM)
8 CYLINDERS FUEL INJECTION
CATALYST AUTOMATIC TRANSMISSION

Estimated Annual Fuel Cost: \$1065

For Comparison Shopping
all vehicles classified as
MIDSIZE
have been issued mileage ratings
ranging from 15 to 26 mpg city
and 21 to 32 mpg highway.



Lincoln Extended Service Plan is the ONLY service contract backed by Ford and honored by over 5,100 Ford and Lincoln Mercury Dealers. Ask your dealer for prices and additional details.

SOLD TO

Purvis Ford Inc

Fredericksburg

VA 22402

VEHICLE IDENTIFICATION NO.

1LNHM87AXY878774

DEALER NO.

28A 573

FINAL ASSEMBLY POINT

WIXOM

SHIP TO (IF OTHER THAN SOLD TO)

METHOD OF TRANSFER

RAIL

ONE

RF03

TWO

VEHICLE & DRIVER MUST BE 18 YEARS OF AGE. A LICENSE TO DRIVE IS REQUIRED. THE FOLLOWING ARE NOT INCLUDED: GROUND, LICENSE AND TITLE FEES, STATE AND LOCAL TAXES AND DEALER INSTALLED OPTIONS ARE NOT INCLUDED.

YC031 N RD 2X 019 000338 03 03 00

SHIP THROUGH

ITEM#: 28-9301 O/T 1

PRICE INFORMATION

STANDARD VEHICLE PRICE

Manufacturer's
Suggested Retail Price
\$34,990.00

SPORT PACKAGE

- P235/50VR BSW17 ALL-SEASON
- EURO SPORT SUSPENSION
- 17" 5 SPOKE ALUM WHEEL
- SELECTSHIFT
- ADVANCE TRAC
- POWER MOONROOF
- FRONT LICENSE PLATE BRACKET
- CALIFORNIA EMISSIONS SYSTEM
- STATE: 16" BLACK ALUMINUM
- HEATED SEATS
- CD CHANGER (6-DISC/GLOVEBOX MT)

TOTAL VEHICLE & OPTIONS 38,695.00
DESTINATION & DELIVERY 560.00



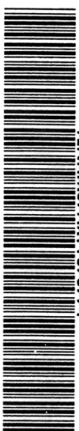
Motor Trend

Car of the Year

The LINCOLN COMMITMENTSM is a comprehensive owner benefits package designed to provide you with services to support your every driving need. It includes: 24-hour Roadside Service Assistance, Service Loaners, a Customer Assistance Center, Travel Planning and much more.

TOTAL MSRP

\$39,255.00



1LNHM87AXY878774