Insurance Institute for Highway Safety
Crashworthiness Evaluation

Crash Test Report
1999 Subaru Forester (CF98018)

Vehicle identification number: JF1SF6356XH701113
Body style: Small four-door utility vehicle
Engine/transmission: Longitudinal 2.5-liter 4-cylinder, 4-speed automatic, 4-wheel drive

Standard crashworthiness features:

Driver and right front passenger airbags
Dual-locking shoulder belts (front and rear outboard seating positions)
Shoulder belt upper anchorage height adjusters (front seating positions only)
Shoulder belt webbing grabbers (front seating positions only)
Seat belt force-limiting mechanisms (front seating positions only)
Right front and both 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 brakes

Vehicle specifications (provided by manufacturer):

Wheelbase:	252 cm
Overall length:	445 cm
Overall width:	174 cm
Curb weight:	1,406 kg

Vehicle specifications (measured):

Front bumper to firewall:	110 cm
Curb weight:	1,437 kg
Test weight:	1,549 kg
Overall width:	173 cm

Nominal test parameters:

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

Crash test date:

August 28, 1998

Figure 1
Precrash and Postcrash Side Views — 1999 Subaru Forester

Summary

A 1999 Subaru Forester was crash tested on August 28, 1998 into a fixed deformable barrier at 40 mi/h (64.4 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 rearward 5-6 cm. Resultant intrusion in the driver footwell measured 14 cm at the footrest and 17-21 cm at other places on the toepan. All doors remained closed during the crash and opened with ease after the crash.

The driver dummy was restrained by a three-point lap/shoulder belt and an airbag. During the crash, 6 cm of webbing spooled off the retractor. The deploying airbag contacted the dummy's chin and mouth. During rebound, the dummy's head contacted the left roof rail just in front of the B-pillar. After the crash, the upper end of the steering column had moved upward 3 cm and rearward 5 cm.

The dummy's head had a maximum resultant head acceleration of 9 g when it contacted the left roof rail. The right leg had a tibia-femur displacement of 12 mm.

Test Conditions

This test was conducted according to the procedures specified in the IIHS Offset Barrier Crash Test Protocol (Version IV). 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 51 cm behind its center of gravity (171 cm behind the front axle). The vehicle speed recorded just prior to impact was 40 mi/h (64.4 km/h), and the actual overlap was 40 percent.

Structural Performance

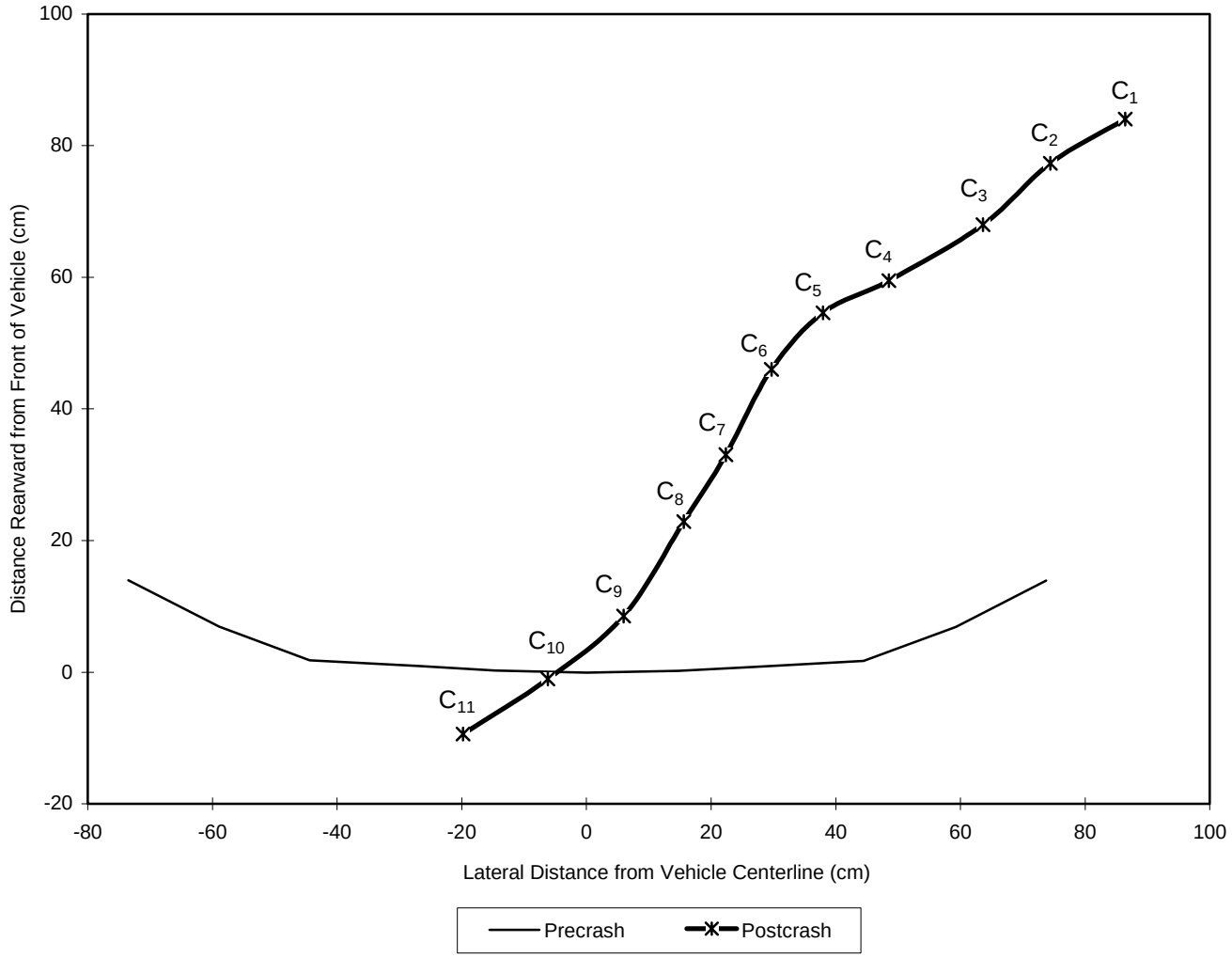
All doors remained closed during the crash. The driver door aperture shortened 9 cm as measured at the lower edge of the window. After the crash, all doors opened with ease.

No fuel system leaks were observed after the crash. In addition, no fuel system leaks were observed when the vehicle was rotated onto its right side to allow postcrash photography.

Figure 2 shows the overhead view of the crash deformation. Figure 3 illustrates the precrash and postcrash contour measures of the front bumper cover and the resulting permanent crush. Figure 4 illustrates the corresponding measures of both the front bumper reinforcement bar and upper crossmember of the radiator support. Figure 5 shows the precrash and postcrash views from below. Figure 6 illustrates the deformation of the side rails, floor rails, and radiator and engine supports, which are visible in Figure 5.

Figure 2
Overhead View of Crash Deformation — 1999 Subaru Forester

Figure 3
Front Bumper Cover Crush Contour — 1999 Subaru Forester



	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)	84	77	68	59	55	46	33	23	9	-1	-9
Precrash Contour (cm)	14	7	2	1	0	0	0	1	2	7	14
Resulting Crush (cm)	70	70	66	58	55	46	33	22	7	-8	-23

The length of the reference line was 147 cm precrash and 106 cm postcrash.

Figure 4
Front Bumper Bar and Upper Radiator Support Crossmember Crush Contour — 1999 Subaru Forester

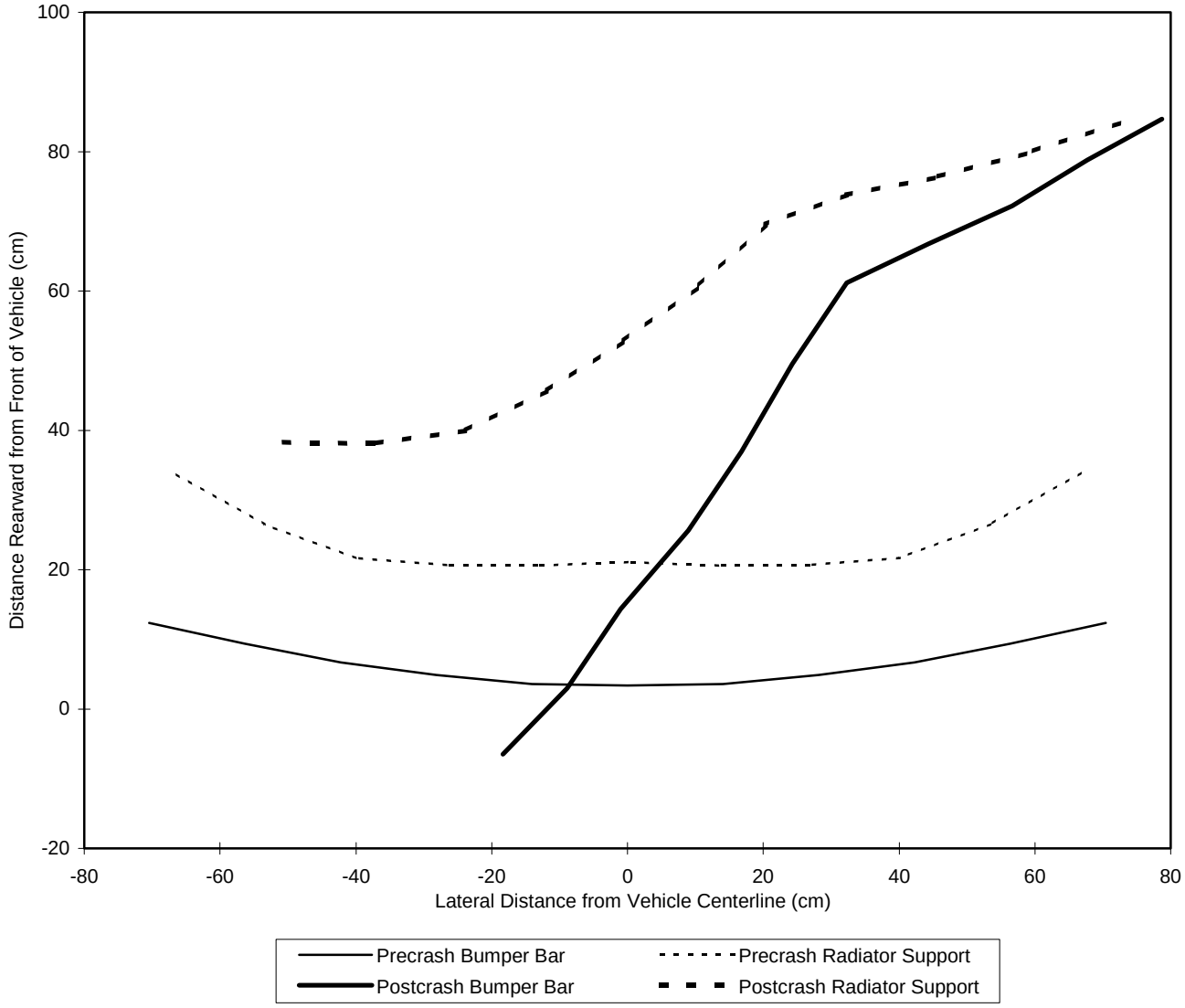


Figure 5
Precrash and Postcrash Views from Below — 1999 Subaru Forester

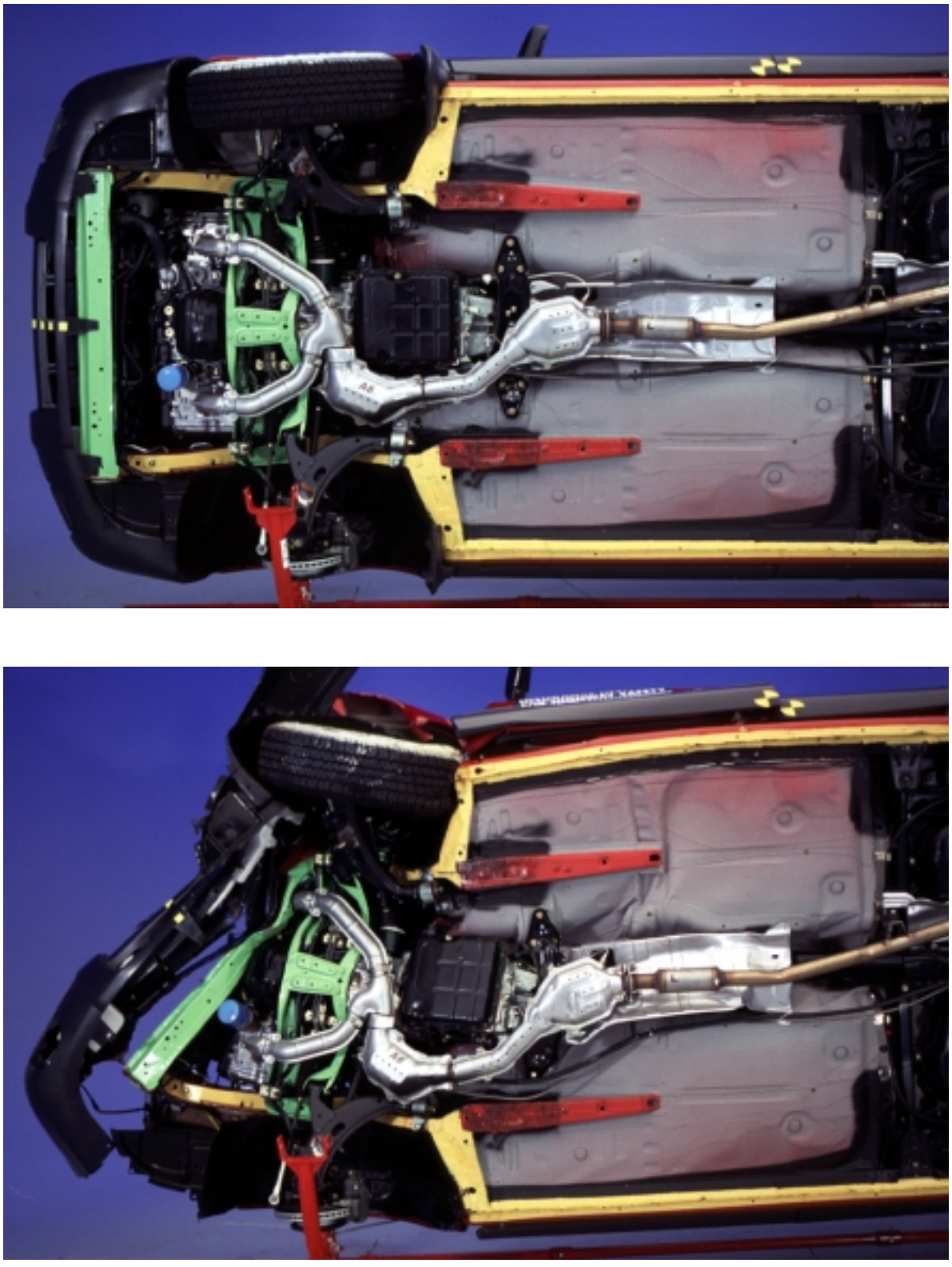
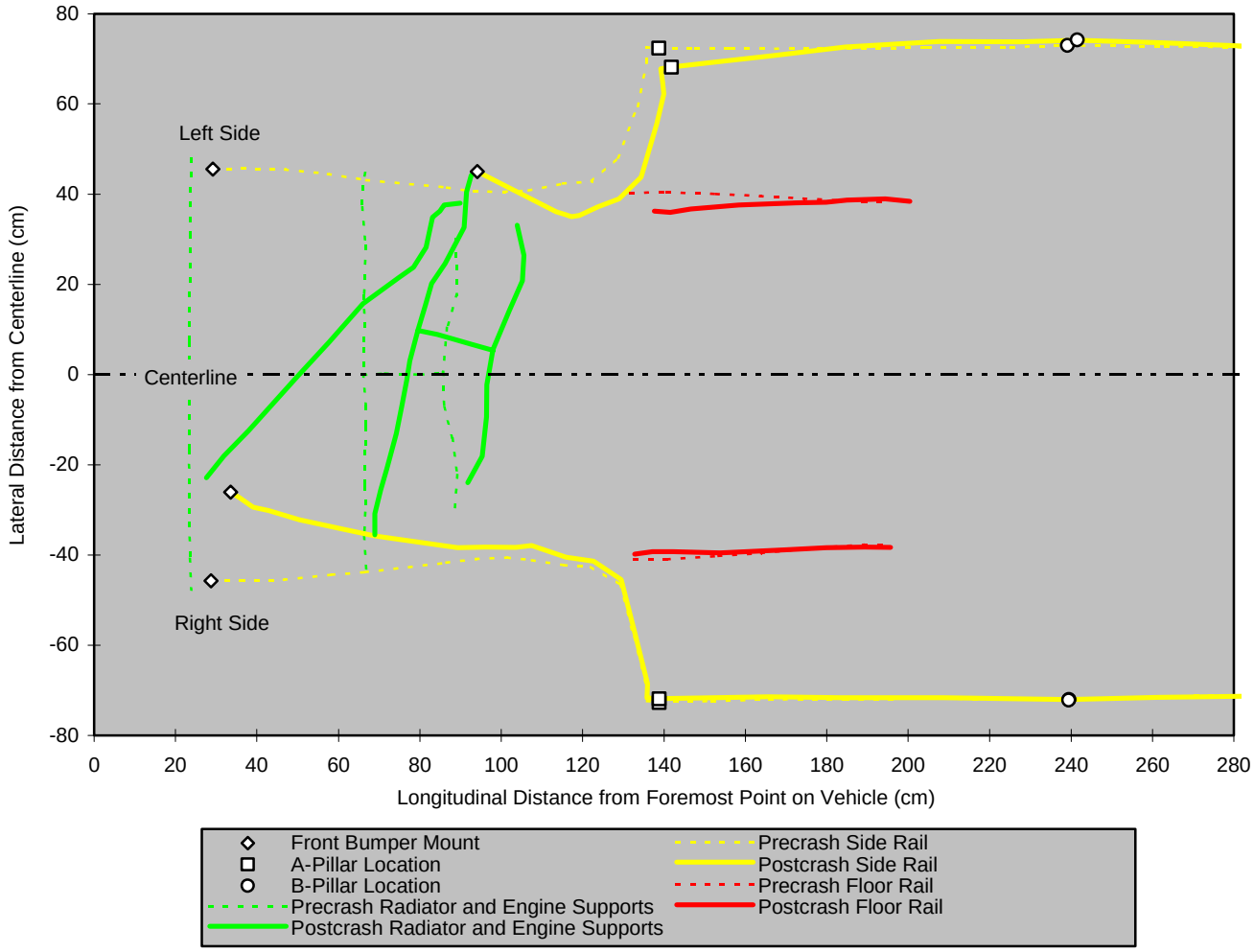
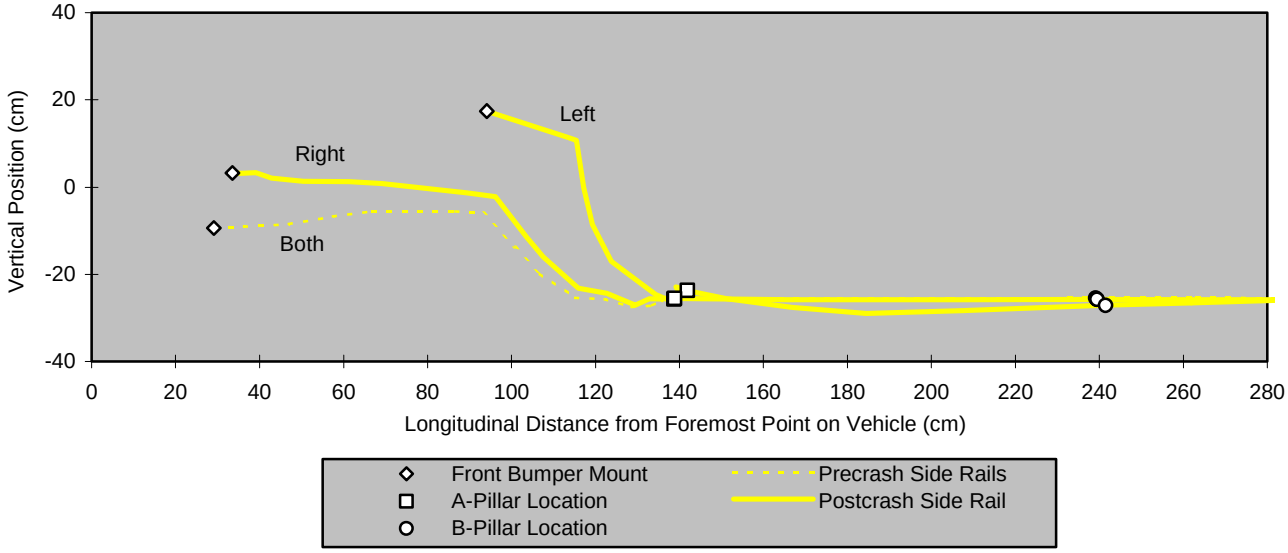


Figure 6
Structural Deformation, Views from Below and Side — 1999 Subaru Forester





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 primary coordinate reference system for these measures is described in the IIHS Offset Barrier Crash Test Protocol (Version IV). 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. This was done by subtracting the average component displacements of the four seat-attachment bolts, which also were measured relative to the primary coordinate system, from the respective components of displacement for each of the target locations. The average displacement of the four seat-attachment bolts relative to the primary reference system also is shown in Table 1.

Table 1
Residual Measurements of Intrusion Relative to Driver Seat — 1999 Subaru Forester

Selected Locations*	Longitudinal	Lateral	Vertical	Resultant
Steering column (cm)	-5	1	3	6
Left lower instrument panel (cm)	-6	-2	1	7
Right lower instrument panel (cm)	-5	-2	0	5
Brake pedal (cm)	-21	-4	9	23
Left toepan (cm)	-14	-5	8	17
Center toepan (cm)	-19	-4	9	21
Right toepan (cm)	-15	-2	7	17
Footrest (cm)	-13	-4	7	14
Average displacement of the four seat-attachment bolts from primary reference system (cm)	-4	3	-4	n/a

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

Restraint System Performance

Airbags

Driver: The uninflated driver airbag is 63 cm in diameter, and the excursion of its center when inflated is limited by two 27 cm-long tethers. The airbag is vented by two 25 mm-diameter holes located at positions corresponding to 10 and 2 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 32 ms into the crash and appeared to be fully inflated at 60 ms.

Passenger: The corner-mounted passenger airbag deployed at an angle and is untethered. The cylinder-shaped airbag is vented by two 60 mm-diameter holes located at the lateral ends. The airbag did not contribute to windshield damage during deployment.

Seat Belts

This vehicle is equipped with dual-locking lap/shoulder belts with sliding latch plates at the outboard seating positions and adjustable upper anchorage points and webbing grabbers at both front seating positions. The front belts also are equipped with mechanical force limiters designed to release the webbing grabbers under sufficient belt loads. The front inboard lower anchorage points are attached to and move with the seats. The front outboard lower anchorage points are bolted to the sills at the base of the B-pillars. During the crash, 6 cm of webbing 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 inspection of the force limiter, which incorporates deformable metal elements above the retractor spool that disengage the webbing grabber mechanism, indicated it activated during the crash and likely contributed to some proportion of the total amount of spool-out measured.

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 the driver seat caused the seat to tip outward against the B-pillar.

Steering Column

The upper end of the steering column moved upward 3 cm and rearward 5 cm relative to the driver seat. The portion of the steering column between the instrument panel and toepan uses a tube-in-tube, energy-absorbing design. Because the toepan intruded rearward beyond the bottom end of the lower tube, the amount of compression could not be readily determined. Comparison with a reference vehicle indicated the amount of compression was greater than zero but no more than 10 cm. The upper portion of the column does not have shear modules, and there was no apparent relative longitudinal movement between the instrument panel and steering column on either side of the column.

Dummy Kinematics

Head, Neck, and Torso

Analysis of the high-speed film taken from camera positions C, D, and E indicated the deploying airbag contacted the dummy's chin at 40 ms into the crash (20 ms before the airbag was fully inflated). The airbag then receded from the chin and mouth by 48 ms. Paint transferred from the dummy's face onto the airbag indicated the nose loaded the fully inflated airbag 5 cm above and 1 cm to the right of its center. During rebound, the top center of the dummy's head initially contacted the left roof rail plastic trim just in front of the B-pillar at 300 ms. The head continued to graze the roof rail, and at about 400 ms, the head and torso began to drop downward. As the vehicle's rear wheels landed (both had left the ground during the crash), the head moved inward and slightly rearward, and the right rear portion of the head contacted the upper inboard portion of the head restraint at 660-680 ms. Table 2 provides the timing of these events.

Table 2 Restraint System Performance and Dummy Kinematics — 1999 Subaru Forester	
Event	**Time (ms)**
Deployment of airbag	32
Airbag contacts chin during deployment	40
Airbag fully inflated	60
Face begins to load airbag	62
Top of head initially contacts left roof rail	300
Back of head contacts head restraint	660-680

Figure 7
Dummy and Vehicle Interior, Postcrash — 1999 Subaru Forester

Legs and Feet

Left leg and foot: Paint transferred from the dummy's left knee indicated the knee contacted the knee bolster just to the left of the steering column, about 3 cm above and 3 cm to the right of the left instrument panel intrusion reference point. The plastic bolster trim was cracked from this contact, and the U-shaped steel bracket supporting the bolster reinforcement plate on the left side of the steering column was crushed forward 3 cm. The medial edge of the knee contacted the tilt adjustment lever on the left side of the steering column. Paint transferred from the dummy's left shin indicated the shin contacted the knee bolster below and slightly to the left of the left knee impact location, extending outward to the right edge of the fuse panel door in the bolster. The left foot was found fully dorsiflexed, slightly everted, and internally rotated about 25 degrees, with the lateral sole against the intruded footrest and the back of the heel on the floorpan.

Right leg and foot: Paint transferred from the dummy's right knee indicated the knee contacted the knee bolster just below and to the right of the steering column, about 3 cm directly to the left of the right instrument panel intrusion reference point. The plastic bolster trim was cracked from this contact, and the U-shaped steel bracket supporting the bolster reinforcement plate on the right side of the steering column was crushed forward less than 1 cm. The knee also contacted the lower right side of the steering column trim just below the ignition switch. Paint transferred from the dummy's right shin indicated the shin contacted the knee bolster just below the right knee impact location. The right foot was found slightly dorsiflexed and considerably everted, with the medial sole from heel to toe pressed against the intruded toepan to the left of the accelerator pedal. The back of the heel was pressed against the floorpan. (The brake pedal was located to the left and well behind the right foot.)

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. The dummy's head had a maximum resultant head acceleration of 9 g at 310 ms when it contacted the left roof rail. Table 3 provides a summary of the maximum head injury measurements recorded during the crash.

Table 3 Head Injury Measurements — 1999 Subaru Forester			
Measure	**Published Tolerance Threshold**	**Result**	**Time (ms)**
Vector resultant acceleration (g)	80	48	107
Vector resultant acceleration — 3 ms clip (g)	80	47	106-109
Head Injury Criterion (HIC)	1000	369	86-122
Head Injury Criterion — 15 ms interval (HIC-15)*	700	201	101-116

* A proposed amendment to the Canadian Motor Vehicle Safety Regulations suggests calculating HIC during a 15 ms interval rather than the 36 ms interval specified by the U.S. standard. The Canadian proposal includes an injury threshold of 700 for front-seat occupants protected by airbags.

Neck

Table 4 provides a summary of the maximum neck injury measurements recorded during the crash.

Table 4 Neck Injury Measurements — 1999 Subaru Forester			
Measure	**Published Tolerance Threshold**	**Result**	**Time (ms)**
A-P shear force (kN)	±3.1*	0.5	171
Axial compression force (kN)	4.0*	0.7	317
Axial tension force (kN)	3.3*	1.7	108
Flexion bending moment (Nm)	190**	34	179
Extension bending moment (Nm)	57**	19	111

* These values are for instantaneous loading. Neck loads are compared with magnitude-duration injury criteria in Figures A-13 to A-16.

** These published thresholds are recommended injury assessment reference values from Backaitis and Mertz (1994), but significant neck injury may occur at lower bending moments. Mertz and Patrick (1971) report that bending moments of 47 Nm in extension and 88 Nm in flexion would be non-injurious for occupants represented by the Hybrid III 50th percentile adult male dummy.

Chest

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

Table 5
Chest Injury Measurements — 1999 Subaru Forester

Measure	Published Tolerance Threshold	Result	Time (ms)
Vector resultant spine acceleration — 3 ms clip (g)	60	38	105-108
Rib compression (mm)	50	46	115
Viscous criterion (m/s)	1.0	0.3	101

Legs and Feet

Left leg and foot: None of the injury measures approached the reference values.

Right leg and foot: The right leg had a maximum tibia-femur displacement of 12 mm at 89 ms.

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

Table 6
Leg and Foot Injury Measurements — 1999 Subaru Forester

Measure	Published Tolerance Threshold	Left		Right	
		Result	Time (ms)	Result	Time (ms)
Axial femur force (kN)	9.1*	4.4	76	2.8	81
Tibia-femur displacement (mm)	15	7	92	12	89
Upper Tibia					
L-M moment (Nm)	±225	-19	125	54	74
A-P moment (Nm)	±225	-83	92	-94	87
Vector resultant moment (Nm)	225	83	92	96	87
Index	1.00	0.38	92	0.46	82
Lower Tibia					
L-M moment (Nm)	±225**	57	73	122	75
A-P moment (Nm)	±225**	104	102	73	82
Vector resultant moment (Nm)	225**	105	102	124	81
Axial force (kN)	8.0**	1.3	72	2.8	77
Index	1.00	0.48	102	0.62	76
Foot					
A-P foot acceleration (g)	±150	-74	71	-49	76
I-S foot acceleration (g)	±150	50	69	33	71
Vector resultant foot acceleration (g)	150	81	71	54	78

* This critical value is for instantaneous loading. Femur loads are compared with magnitude-duration injury criteria in Figures A-23 and A-34.

** 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

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Appendix

Dummy Clearance Measurements

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

Manufacturer’s window sticker

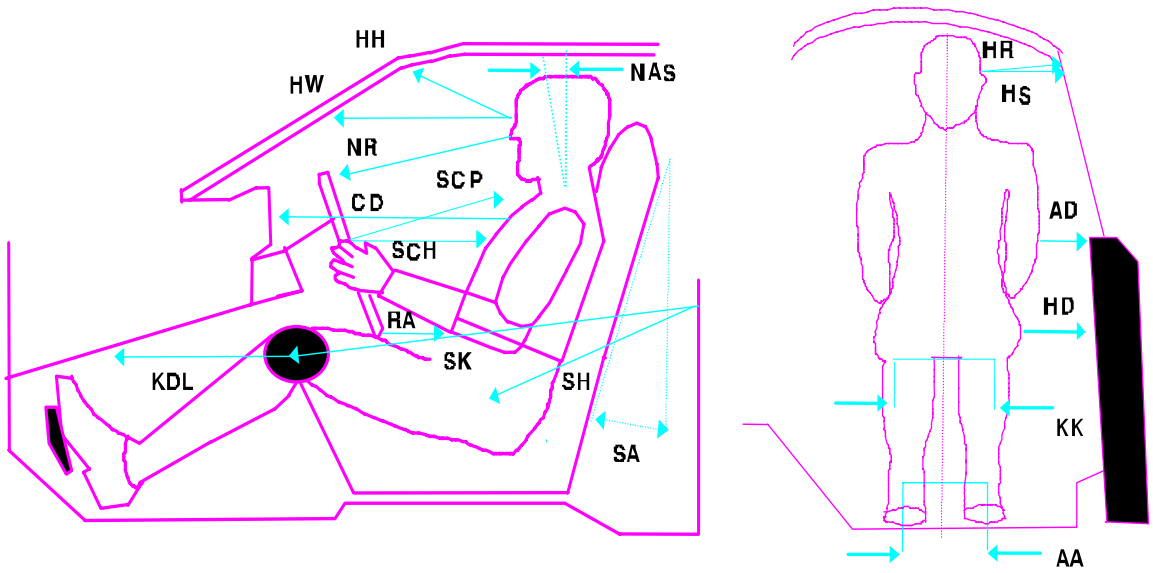
Dummy Clearance Measurements

Test Number: CF98018
Vehicle Make/Model: Subaru Forester
Vehicle Model Year: 1999
Seat Type: Manually adjusted bucket seat (fore/aft, height, and seat back angle)

Manufacturer's Specifications
Seat Back Information: Reclined to 4th position from most upright
Upper Belt Anchorage: Set to 2nd position from top
Steering Column Adjustment: Set to midpoint of tilt adjustment range

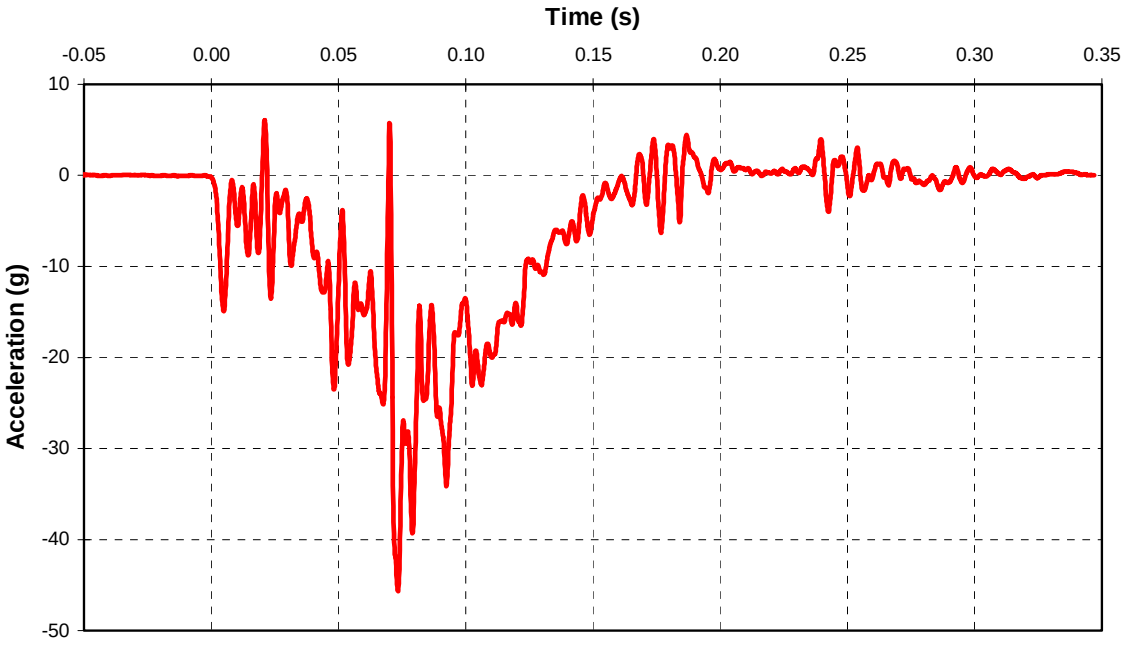
Location	Code	Measure	Location	Code	Measure
Head to header	HH	420	Neck angle, torso 90	NAT90	20.9°
Head to windshield	HW	635	Neck angle, seated*	NAS	7.6°
Nose to rim	NR	405	Torso angle (NAT90 – NAS)	TA	13.3°
Chest to dash	CD	576	Striker to knee**	SK	53
Rim to abdomen	RA	196	Striker to knee angle**	SKA	0.5°
Knee to dash, left	KDL	215	Striker to H-point, horizontal	SHH	149
Knee to dash, right	KDR	218	Striker to H-point, vertical	SHV	83
Steering wheel to chest, horizontal	SCH	296	Ankle to ankle	AA	299
Steering wheel to chest, perpendicular	SCP	394	Knee to knee	KK	306
Steering wheel to chest, reference	SCR	371	Arm to door	AD	102
Hub to chest, minimum	HCM	252	H-point to door	HD	106
Pelvic angle	PA	23.9°	Head to A-pillar	HA	570
Seat back angle	SA	7.2°	Head to roof	HR	240
			Head to side window	HS	235

All distance measurements are in millimeters (mm).
* Dummy's neck bracket was adjusted to –5.3 degrees to achieve a level instrumentation plane.
** These measurements were made in a vertical plane containing the striker and parallel to the driver door sill.

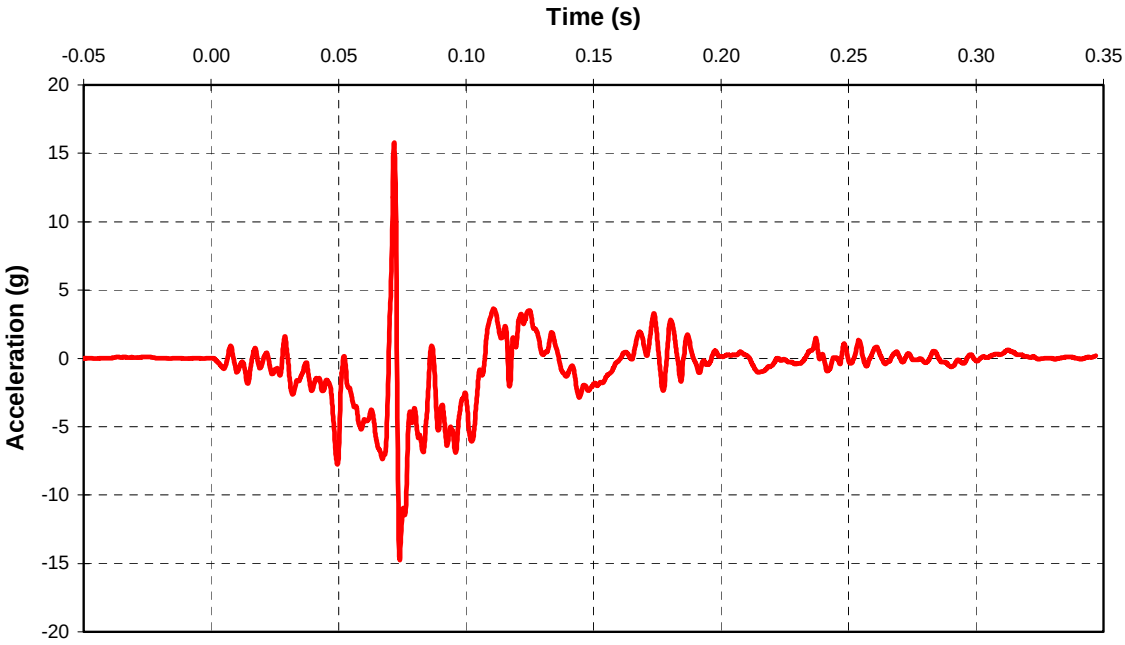


Graph Index

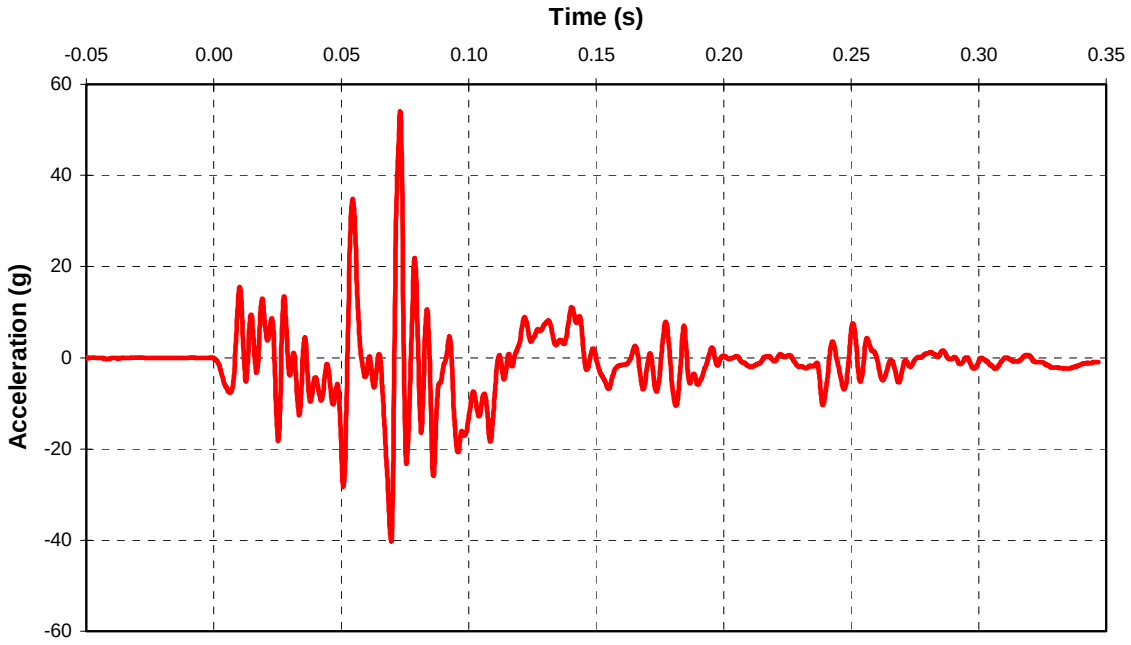
A- 1 CF98018 1999 Subaru Forester Vehicle Longitudinal Acceleration



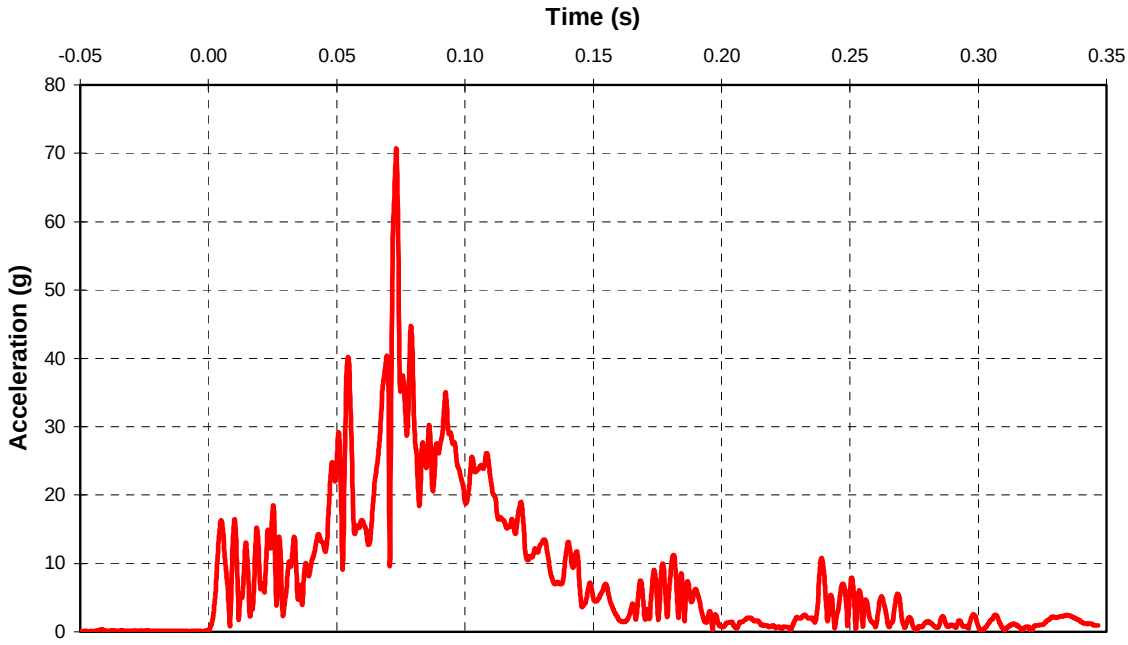
A- 2 CF98018 1999 Subaru Forester Vehicle Lateral Acceleration



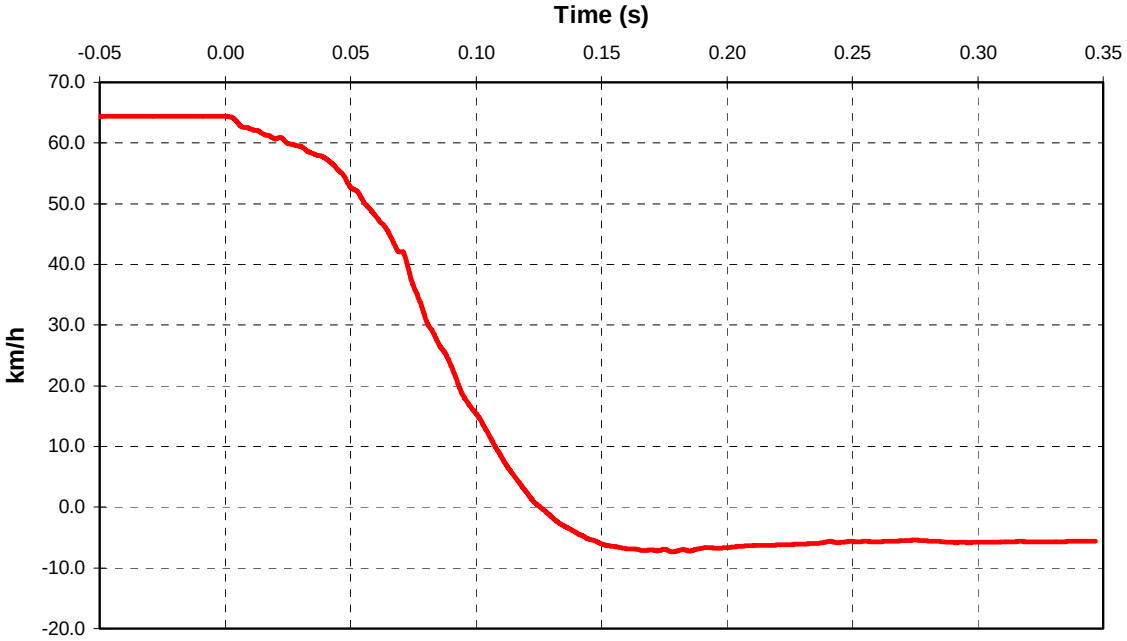
A- 3 CF98018 1999 Subaru Forester Vehicle Vertical Acceleration



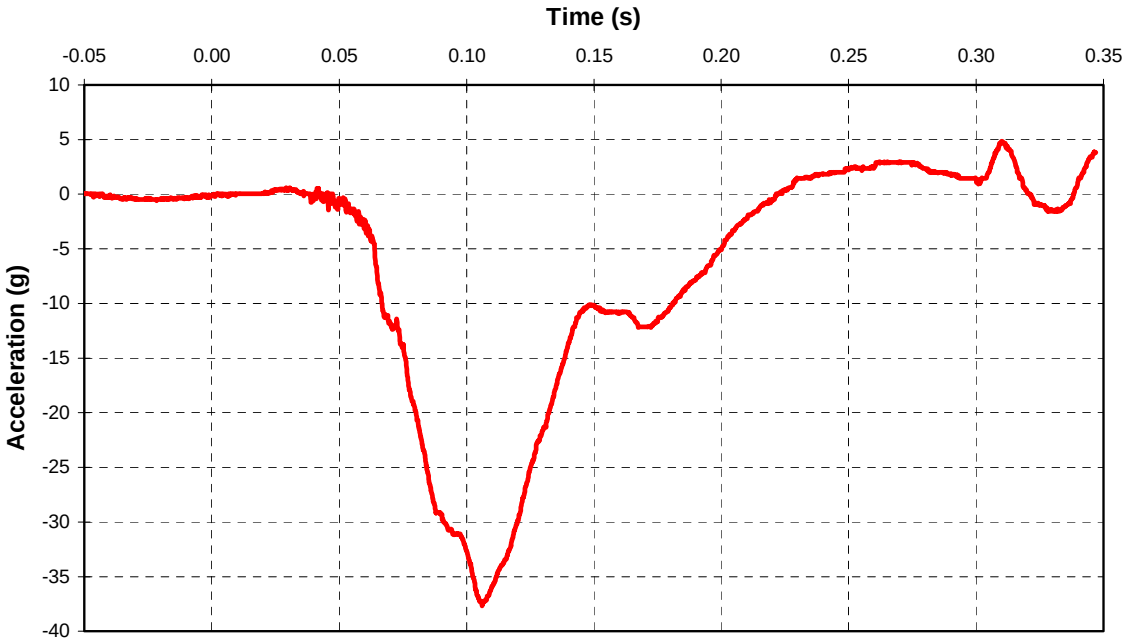
A- 4 CF98018 1999 Subaru Forester Vehicle Vector Resultant Acceleration



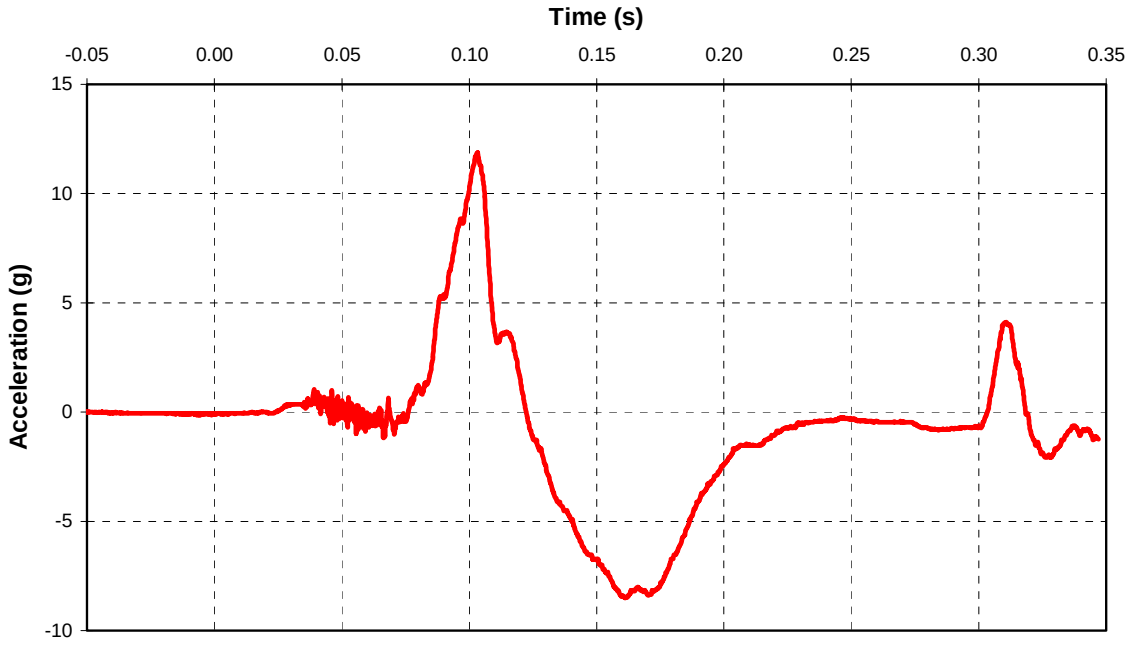
A- 5 CF98018 1999 Subaru Forester Integration of Vehicle Longitudinal Acceleration



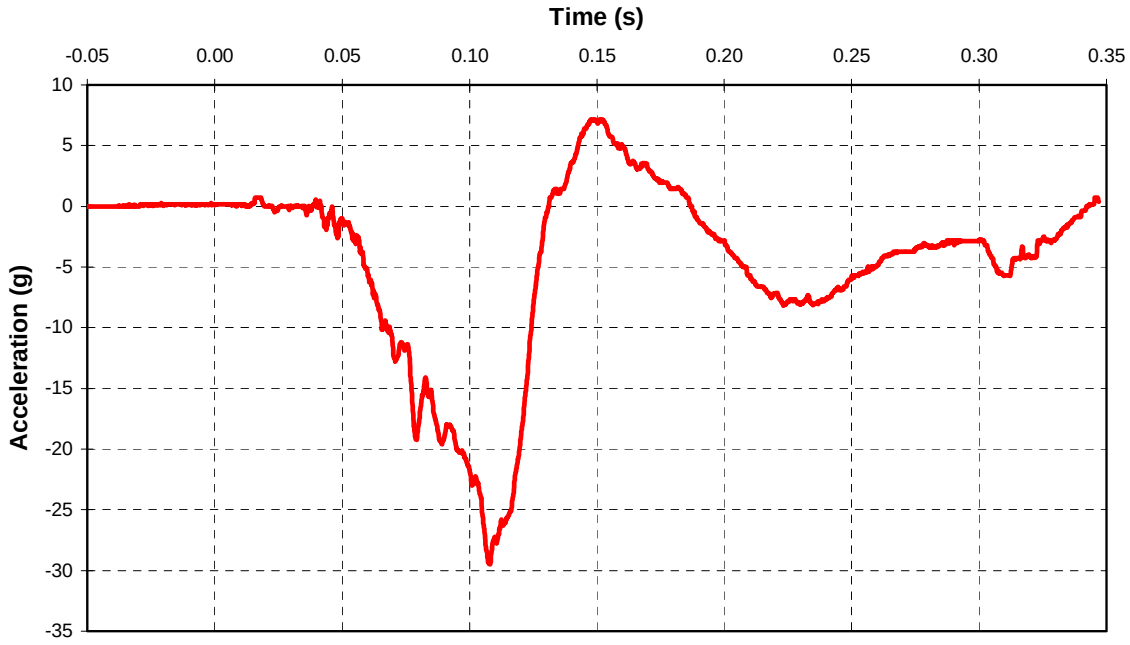
A- 6 CF98018 1999 Subaru Forester Head A-P Acceleration



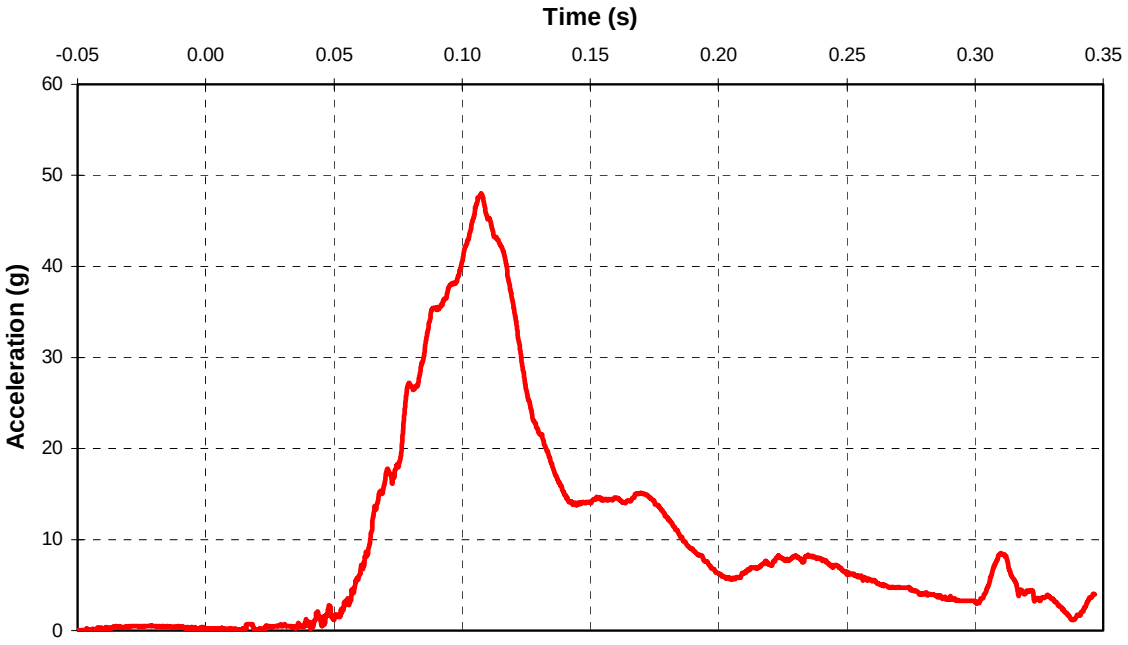
A- 7 CF98018 1999 Subaru Forester Head L-M Acceleration



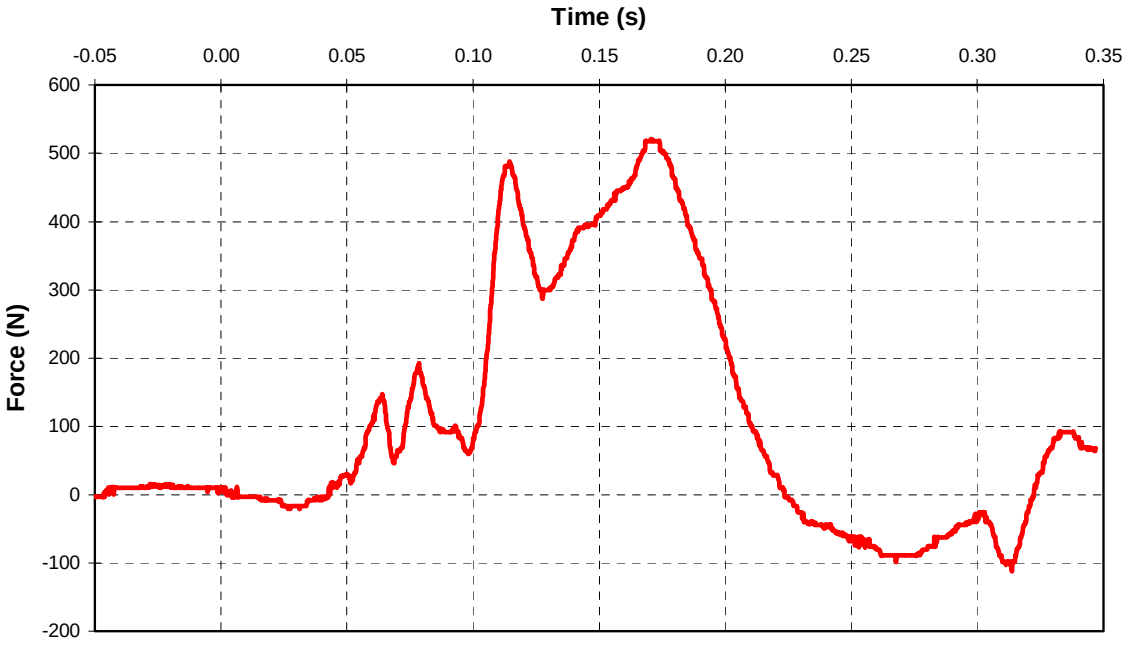
A- 8 CF98018 1999 Subaru Forester Head I-S Acceleration



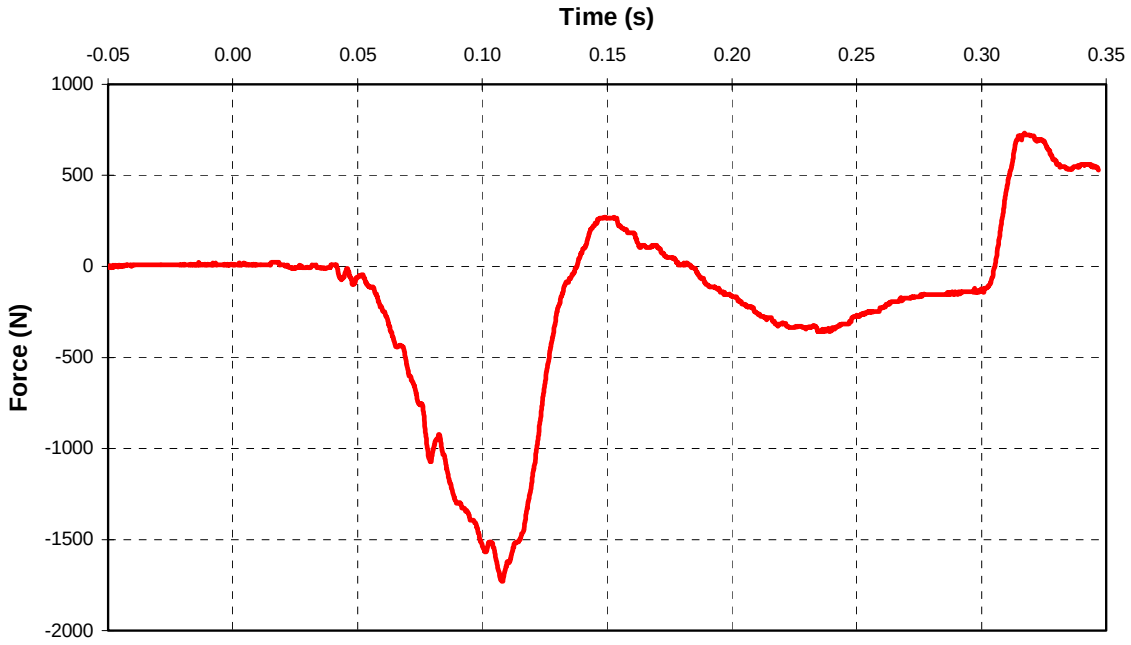
A- 9 CF98018 1999 Subaru Forester Head Vector Resultant Acceleration



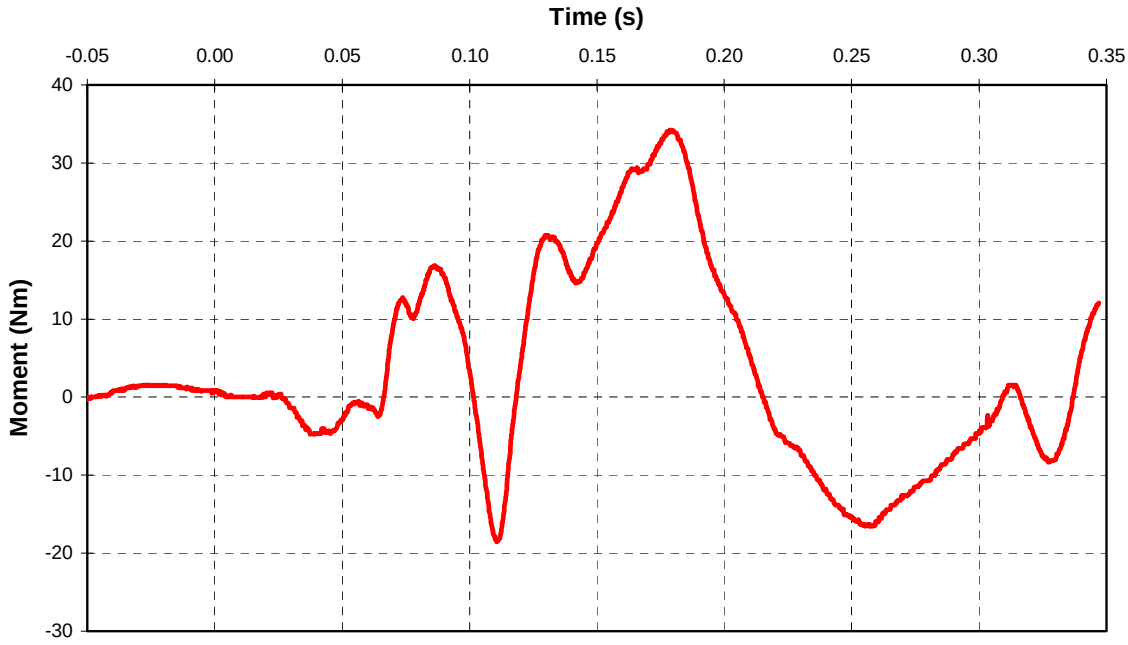
A- 10 CF98018 1999 Subaru Forester Neck A-P Shear Force



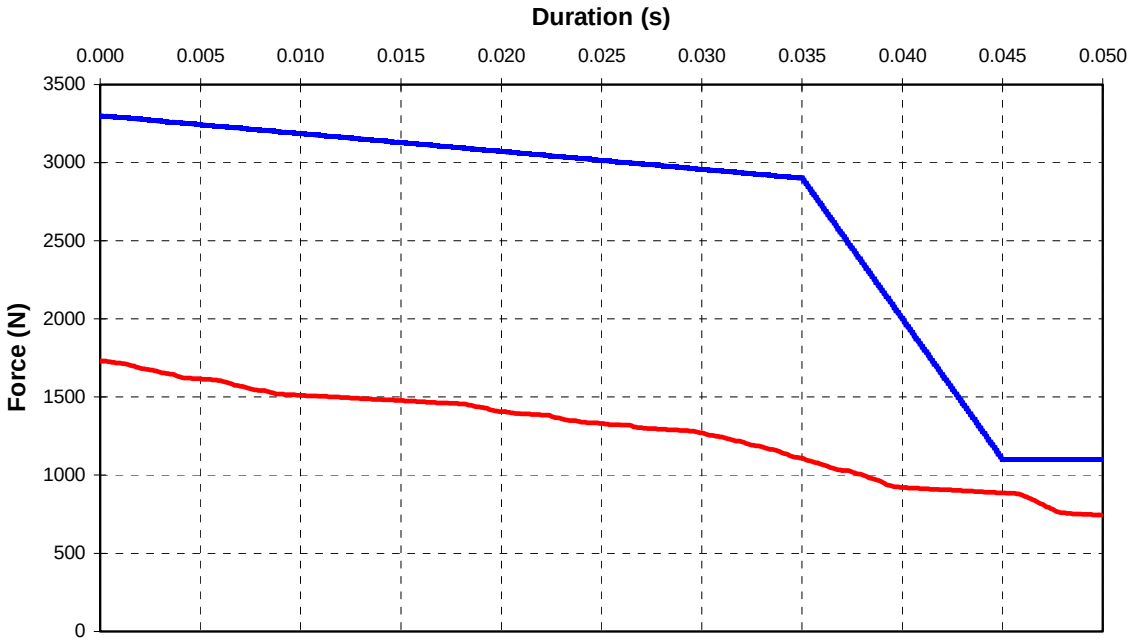
A- 11 CF98018 1999 Subaru Forester Neck Axial Force



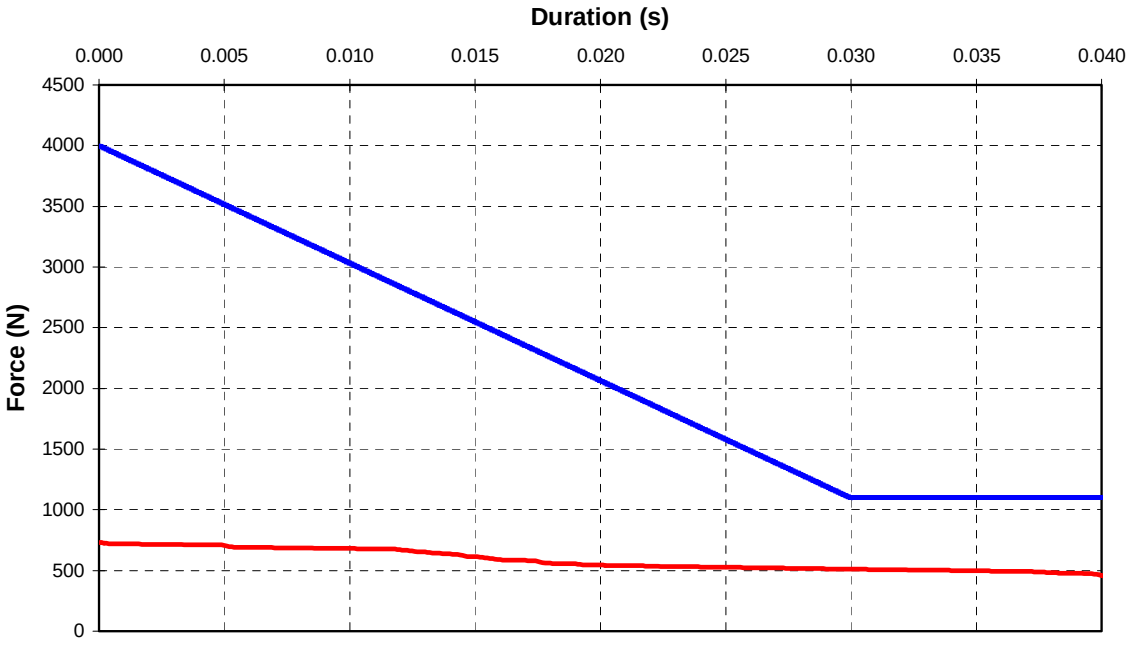
A- 12 CF98018 1999 Subaru Forester Neck Occipital A-P Moment



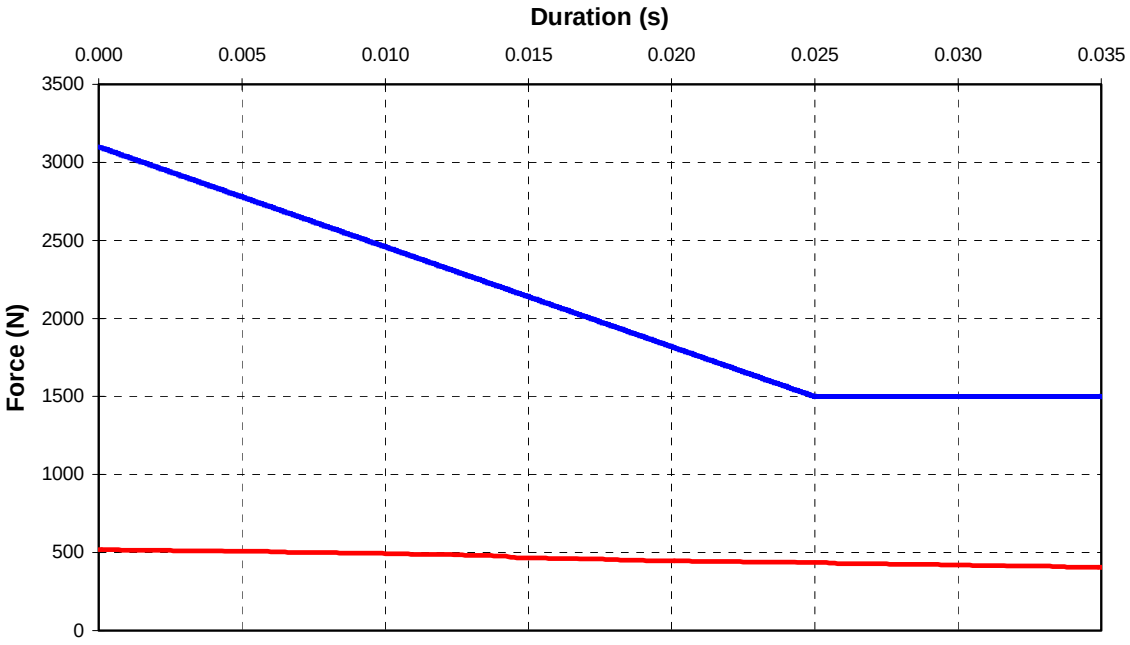
A- 13 CF98018 1999 Subaru Forester Neck Tension Analysis



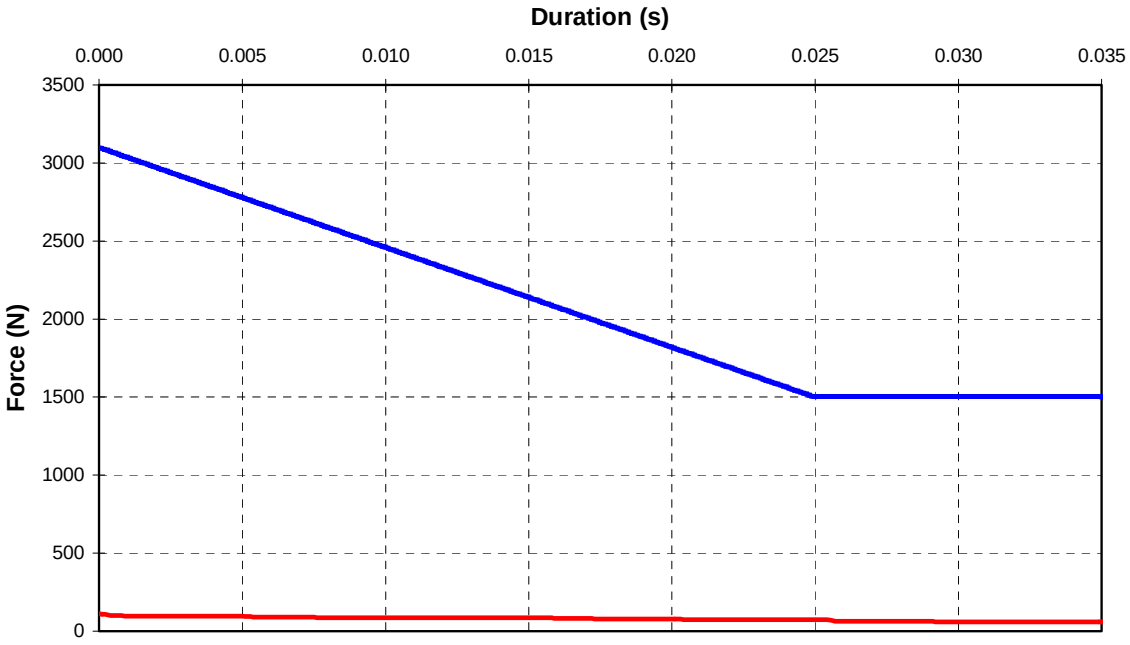
A- 14 CF98018 1999 Subaru Forester Neck Compression Analysis



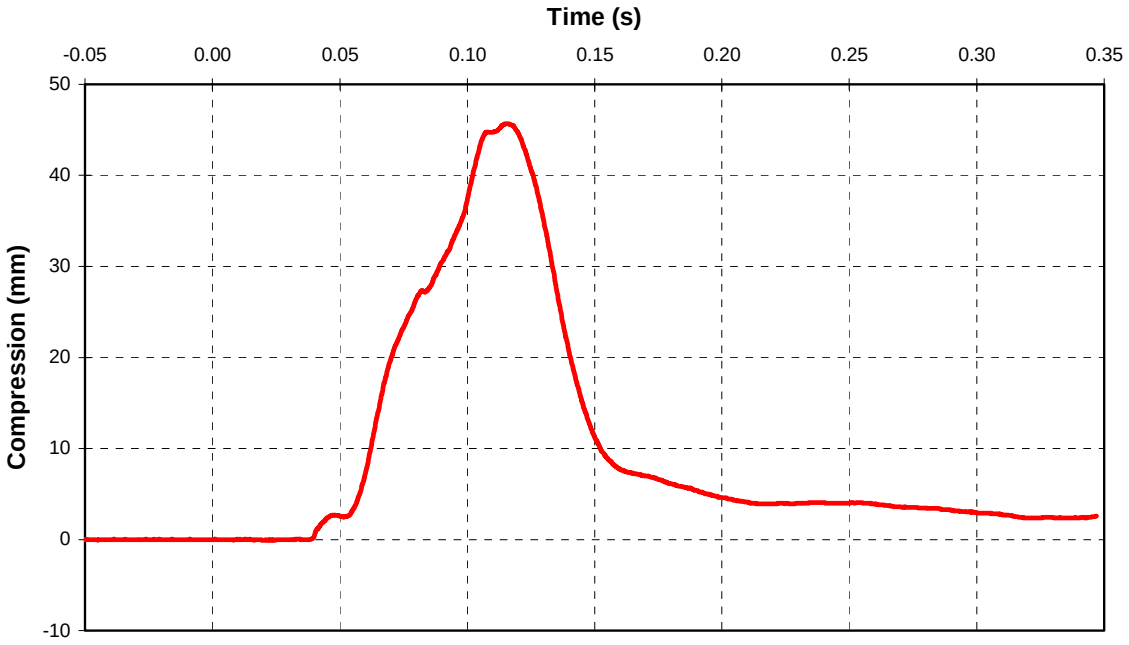
A- 15 CF98018 1999 Subaru Forester Neck A-P Shear (Positive) Analysis



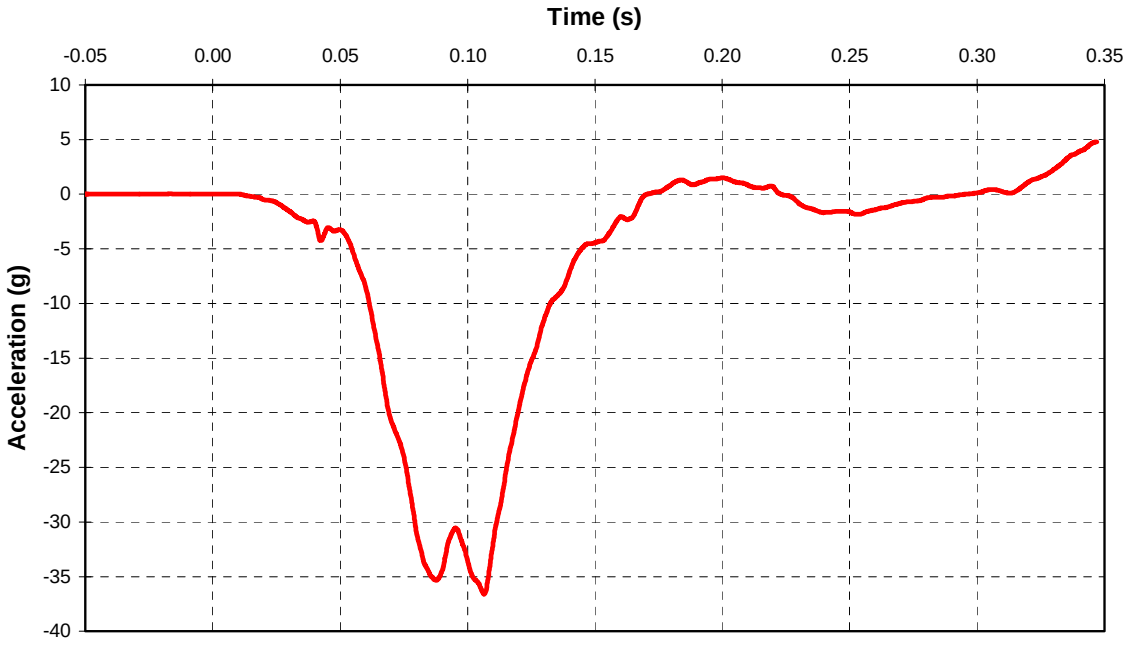
A- 16 CF98018 1999 Subaru Forester Neck A-P Shear (Negative) Analysis



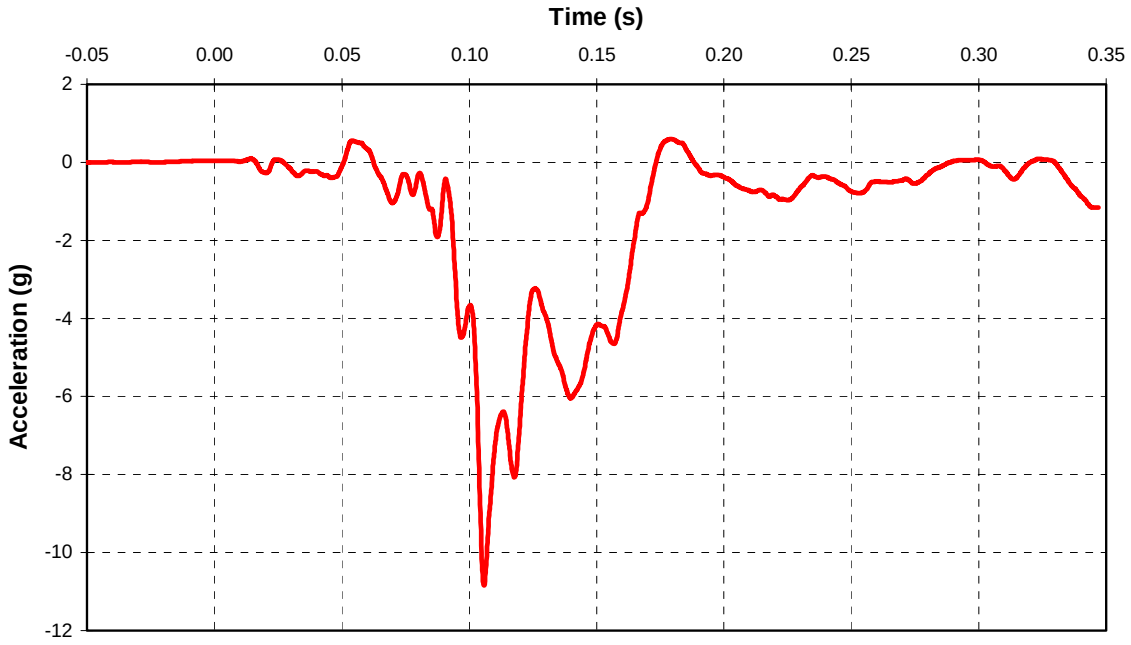
A- 17 CF98018 1999 Subaru Forester Chest Compression



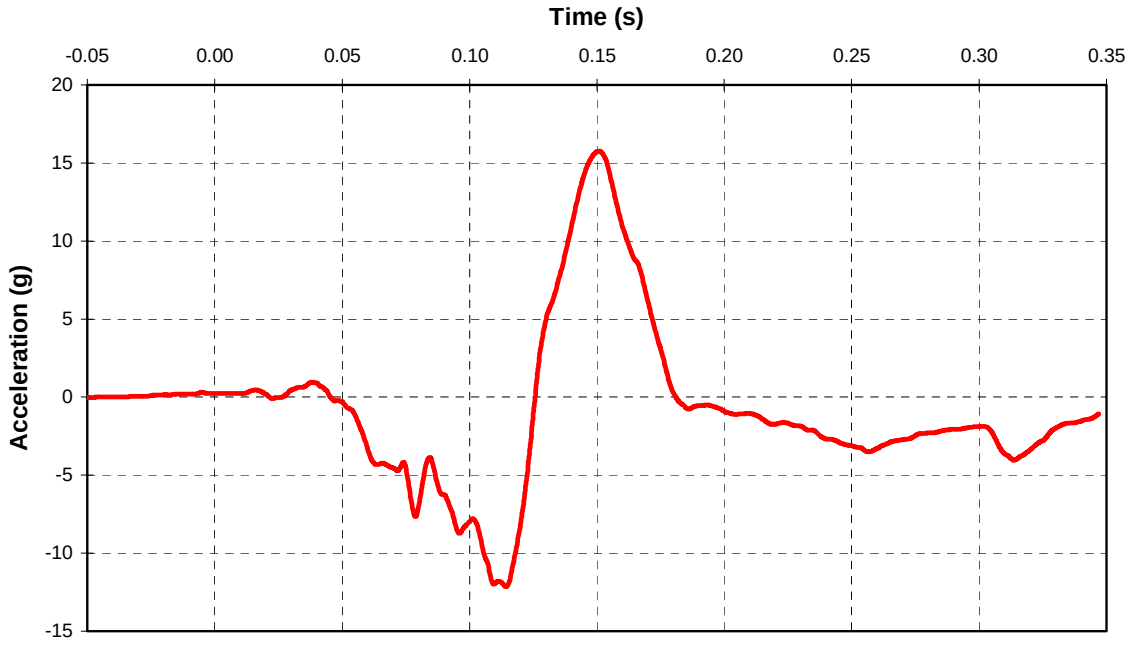
A- 18 CF98018 1999 Subaru Forester Chest A-P Acceleration



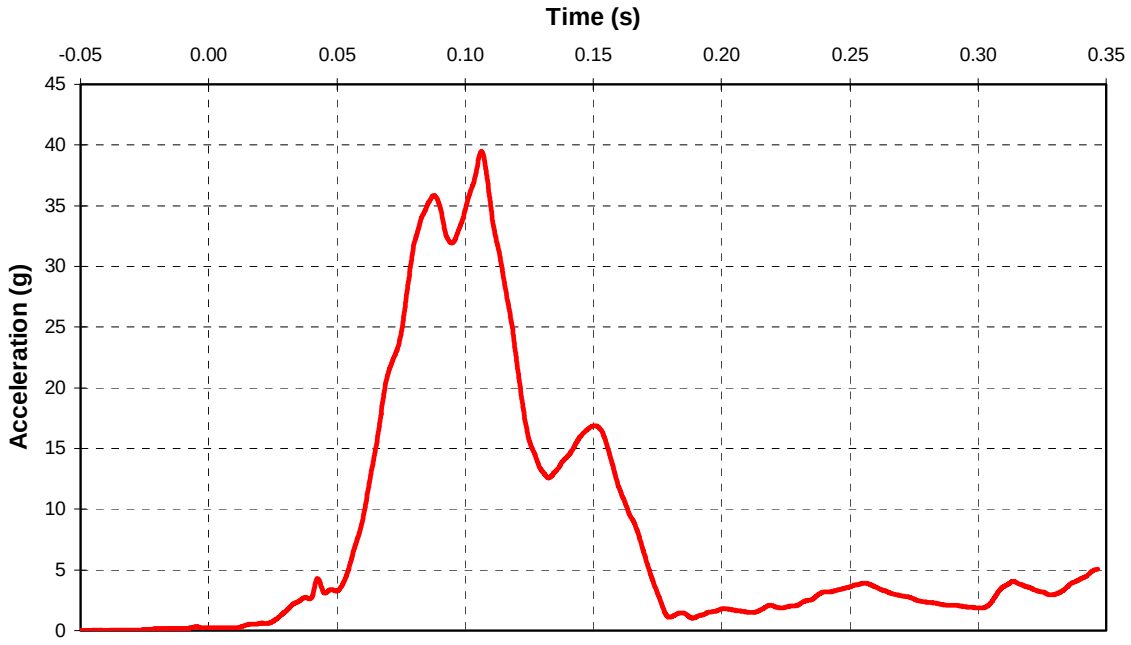
A- 19 CF98018 1999 Subaru Forester Chest L-M Acceleration



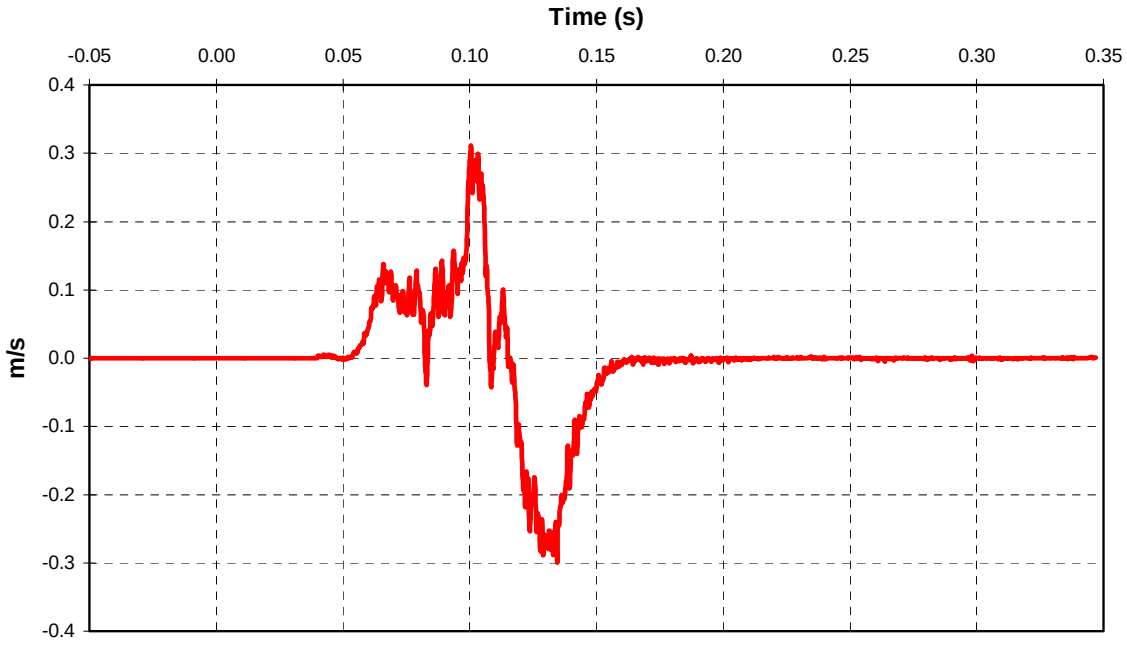
A- 20 CF98018 1999 Subaru Forester Chest I-S Acceleration



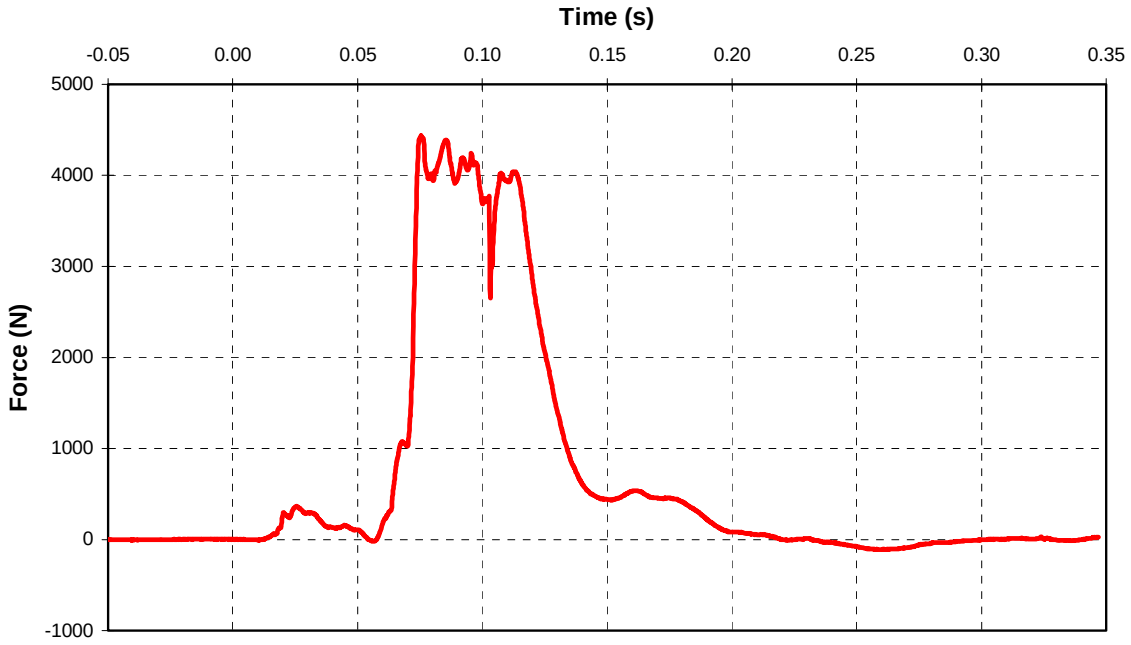
A- 21 CF98018 1999 Subaru Forester Chest Vector Resultant Acceleration



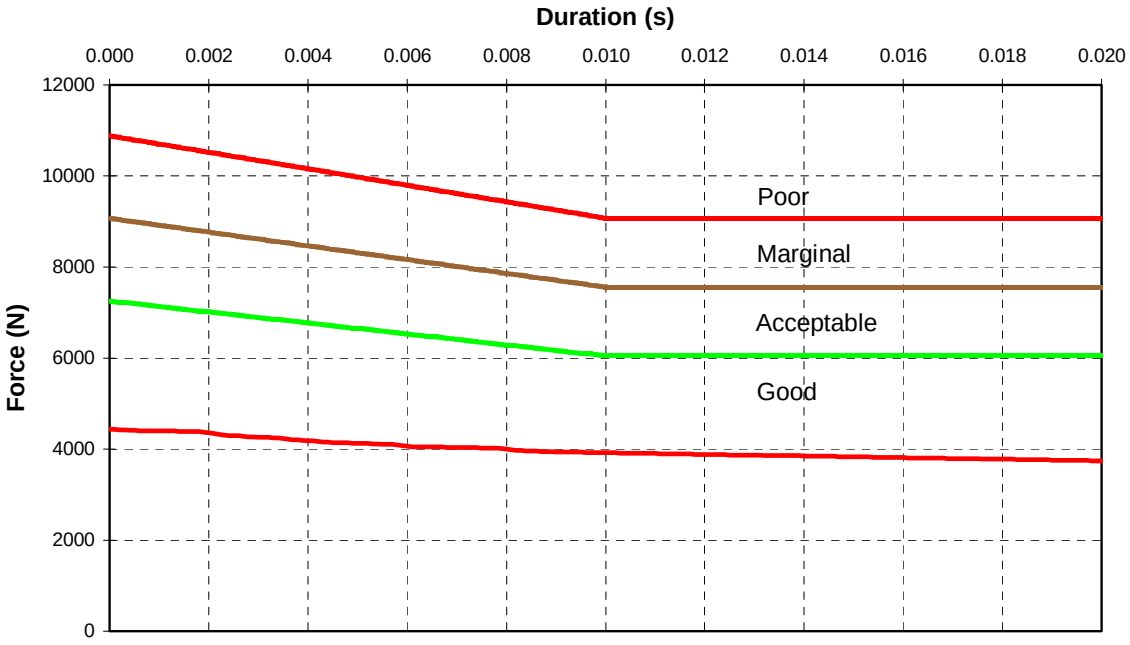
A- 22 CF98018 1999 Subaru Forester Viscous Criterion



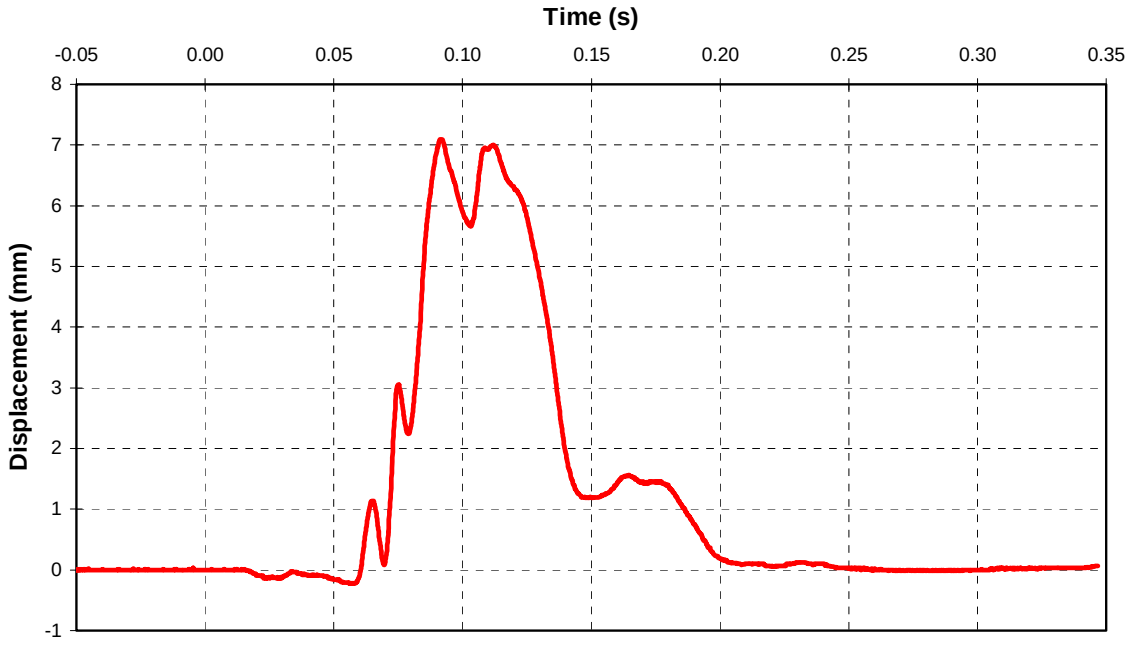
A- 23 CF98018 1999 Subaru Forester Left Femur Axial Force



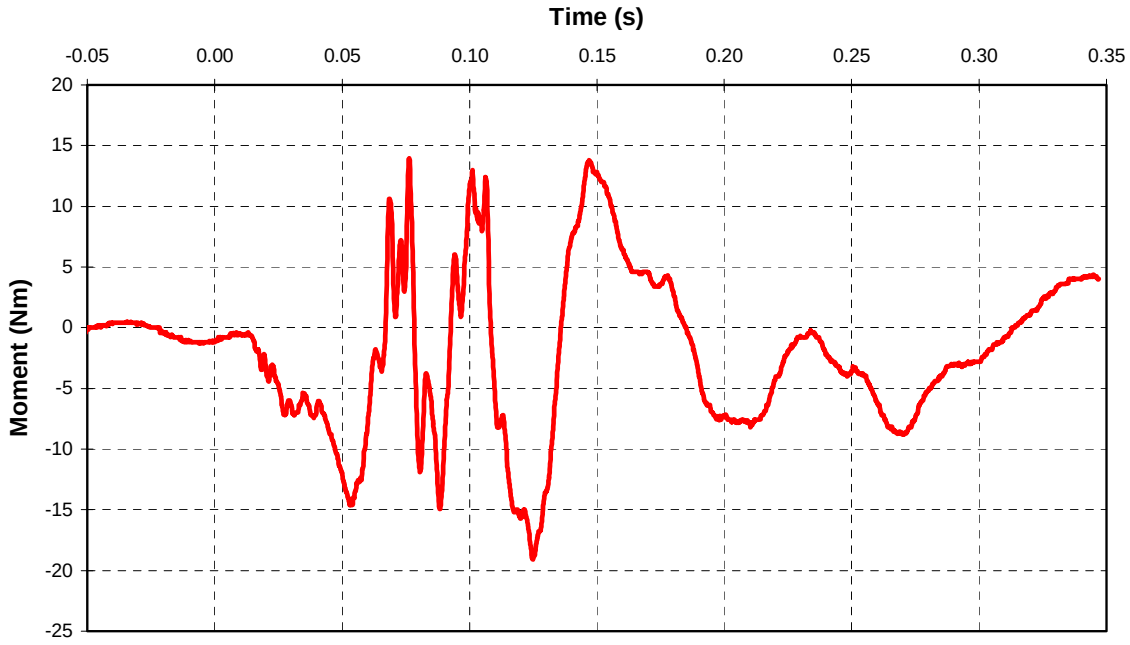
A- 24 CF98018 1999 Subaru Forester Left Femur Axial Force Analysis



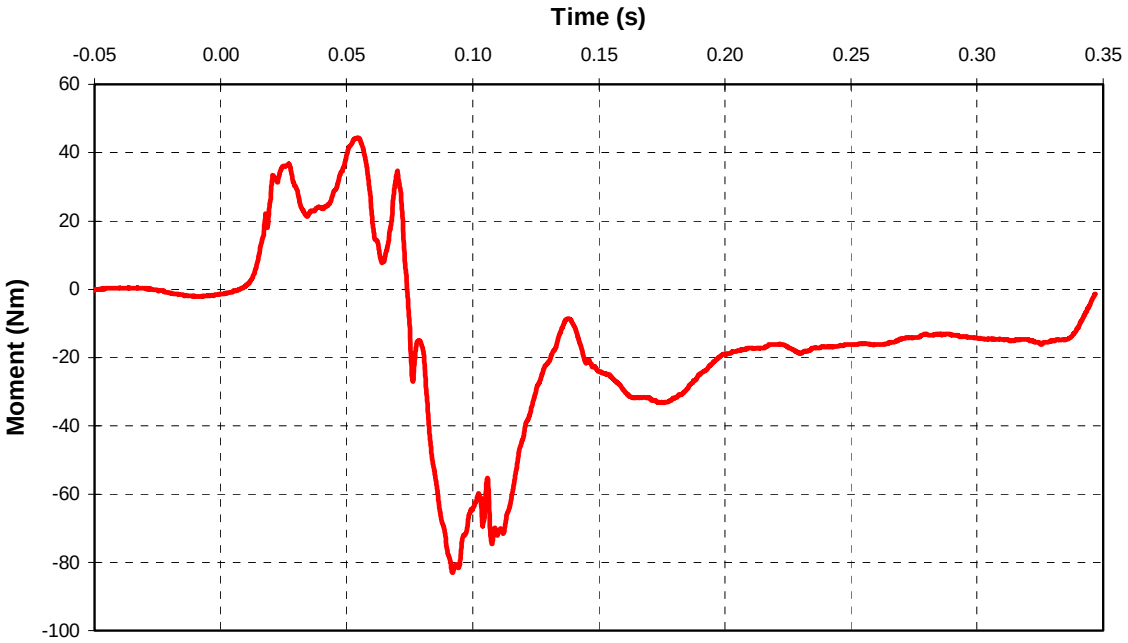
A- 25 CF98018 1999 Subaru Forester Left Tibia-Femur Displacement



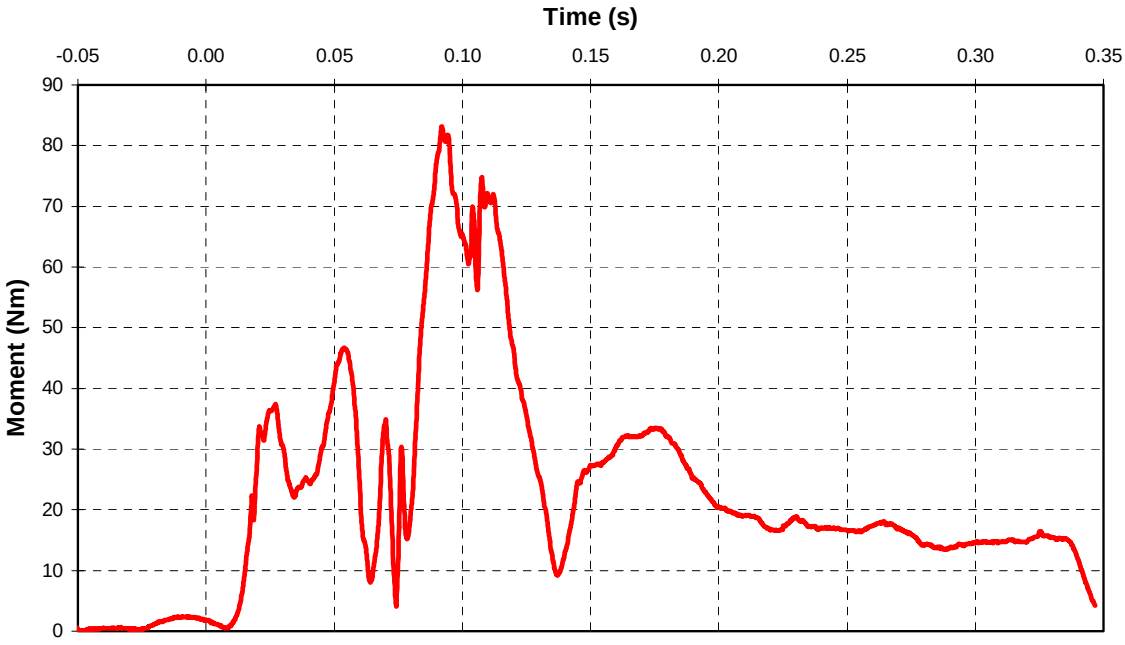
A- 26 CF98018 1999 Subaru Forester Left Upper Tibia L-M Moment



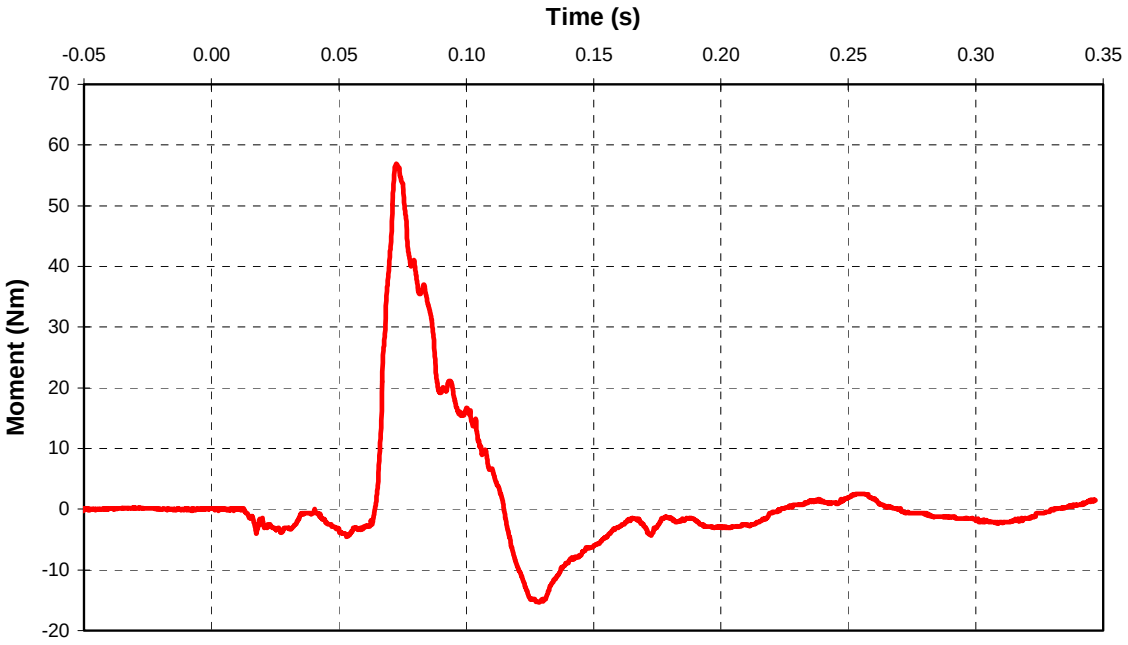
A- 27 CF98018 1999 Subaru Forester Left Upper Tibia A-P Moment



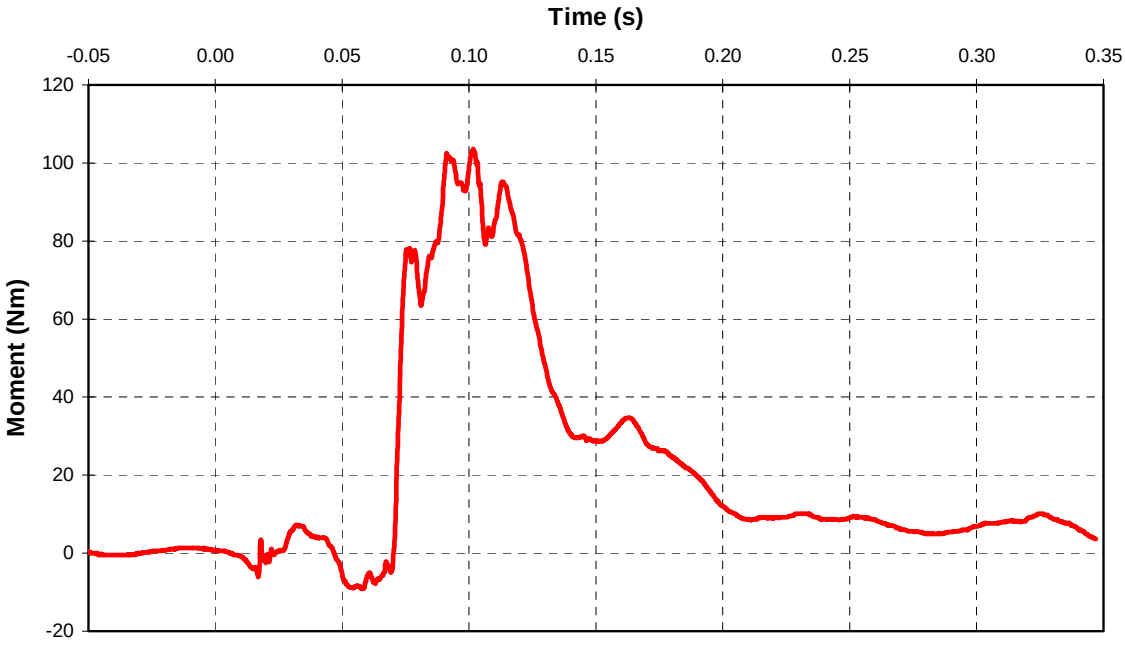
A- 28 CF98018 1999 Subaru Forester Left Upper Tibia Vector Resultant Moment



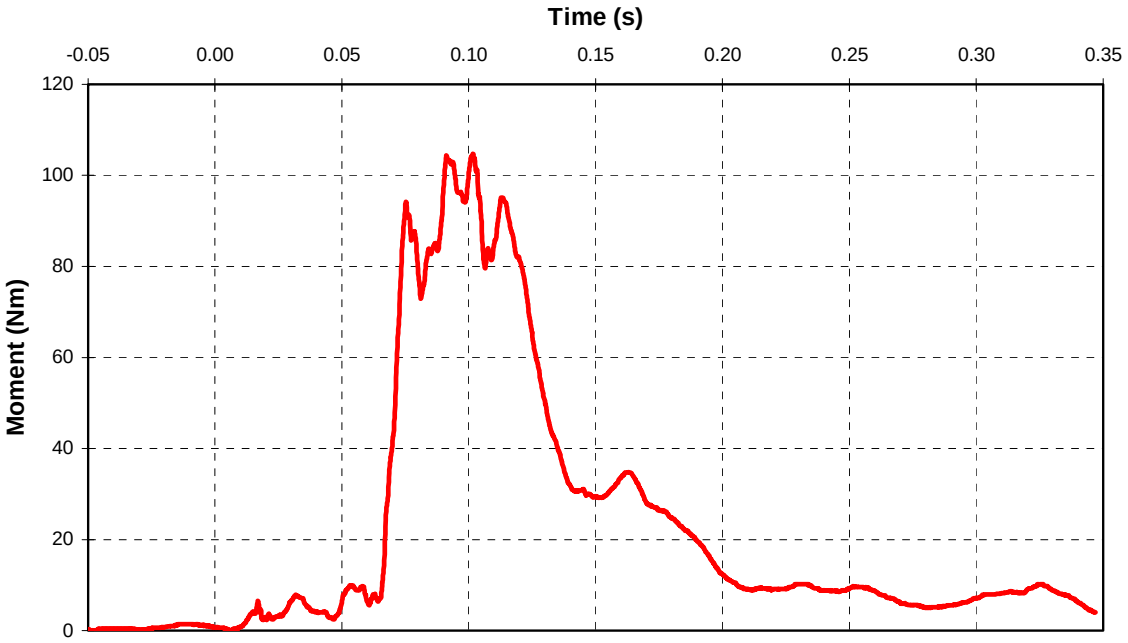
A- 29 CF98018 1999 Subaru Forester Left Lower Tibia L-M Moment



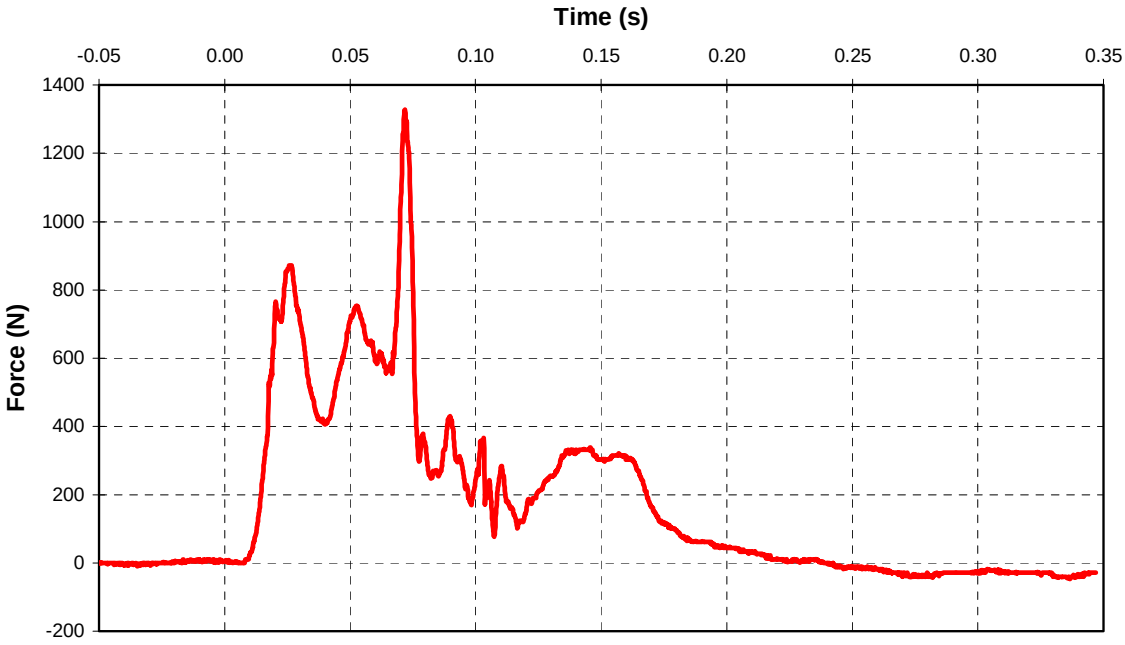
A- 30 CF98018 1999 Subaru Forester Left Lower Tibia A-P Moment



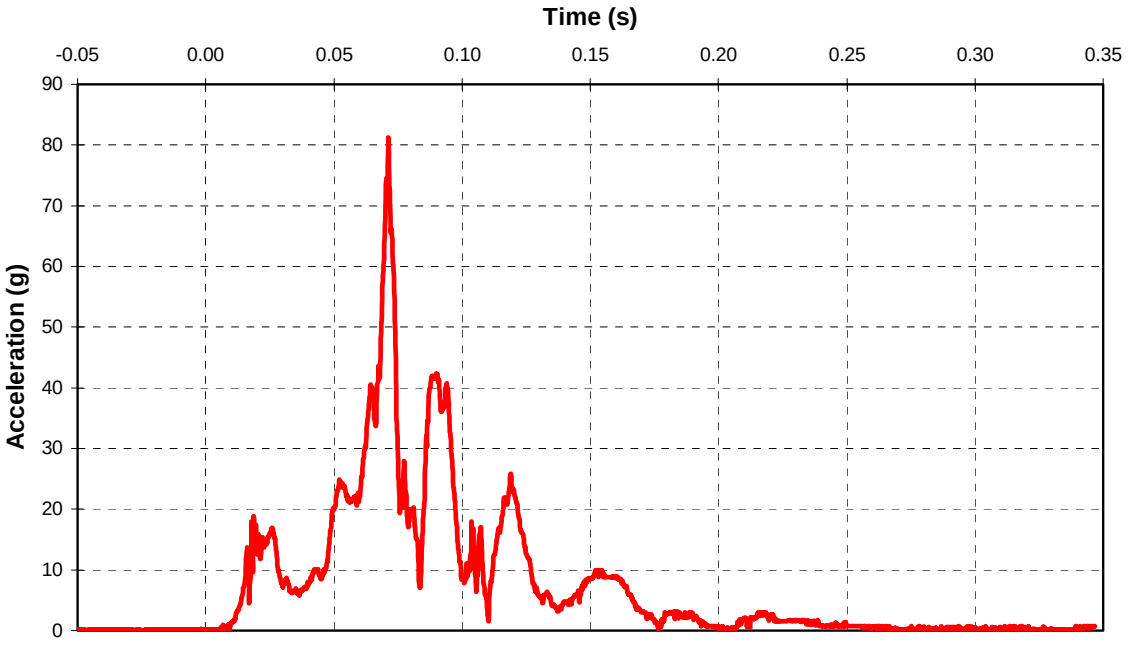
A- 31 CF98018 1999 Subaru Forester Left Lower Tibia Vector Resultant Moment



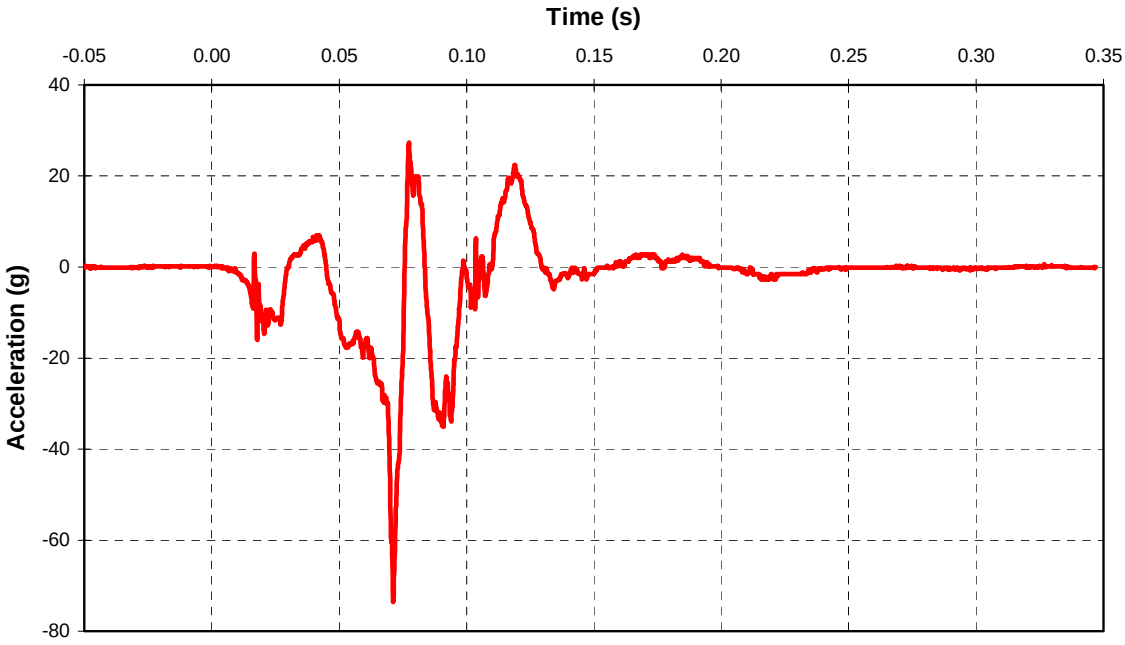
A- 32 CF98018 1999 Subaru Forester Left Lower Tibia Axial Force



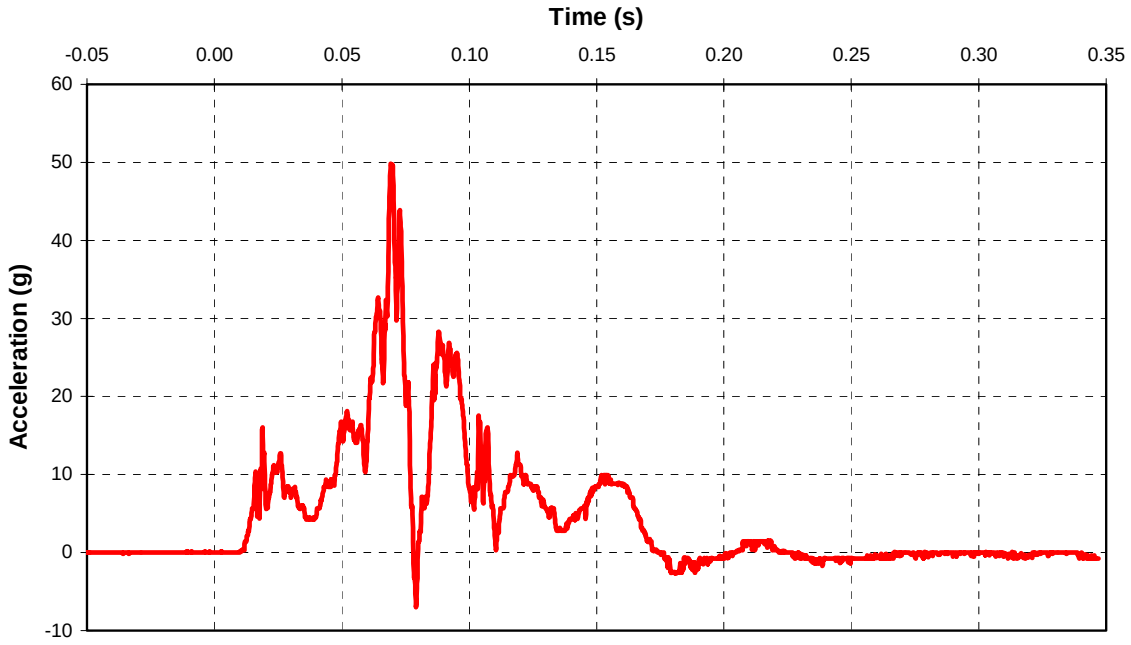
A- 33 CF98018 1999 Subaru Forester Left Foot Vector Resultant Acceleration



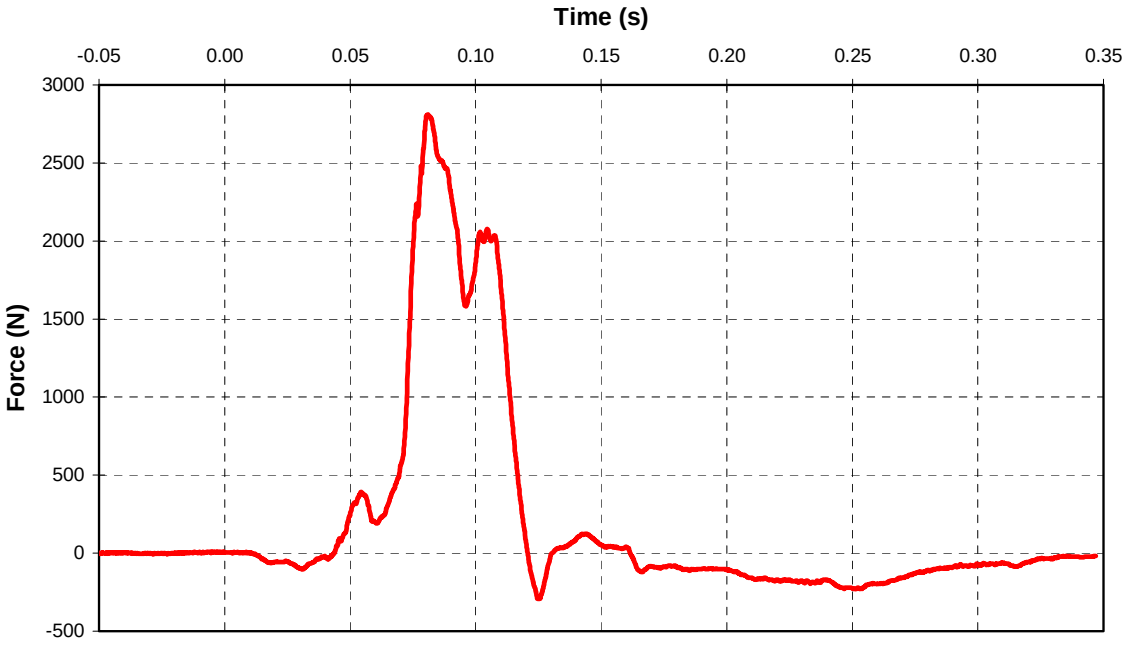
A- 34 CF98018 1999 Subaru Forester Left Foot A-P Acceleration



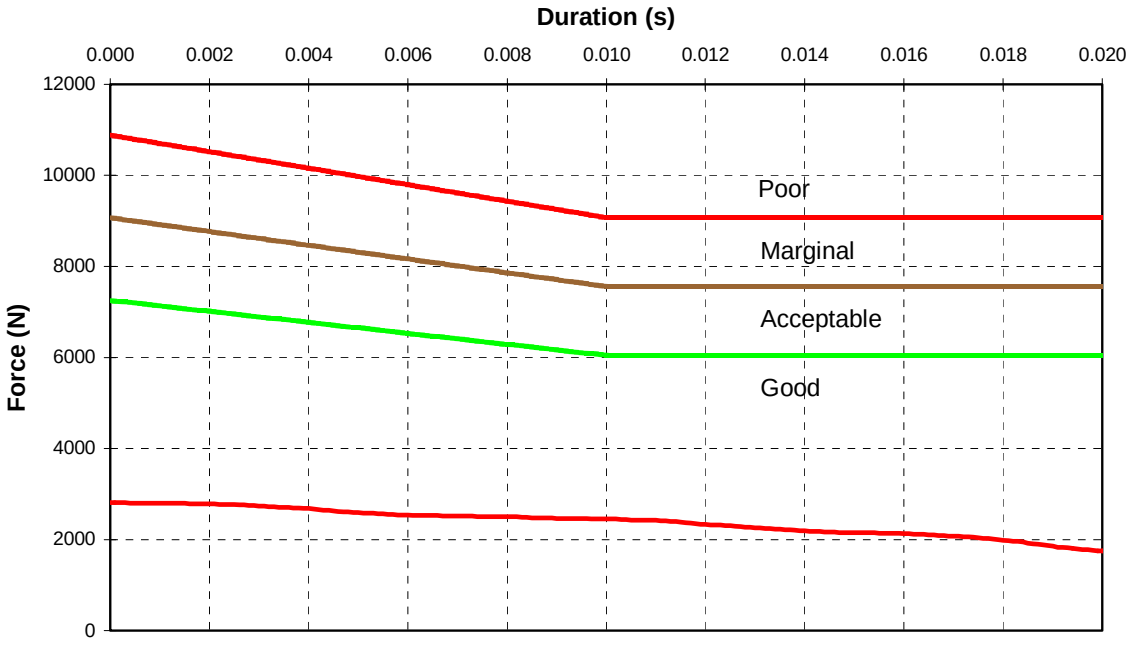
A- 35 CF98018 1999 Subaru Forester Left Foot I-S Acceleration



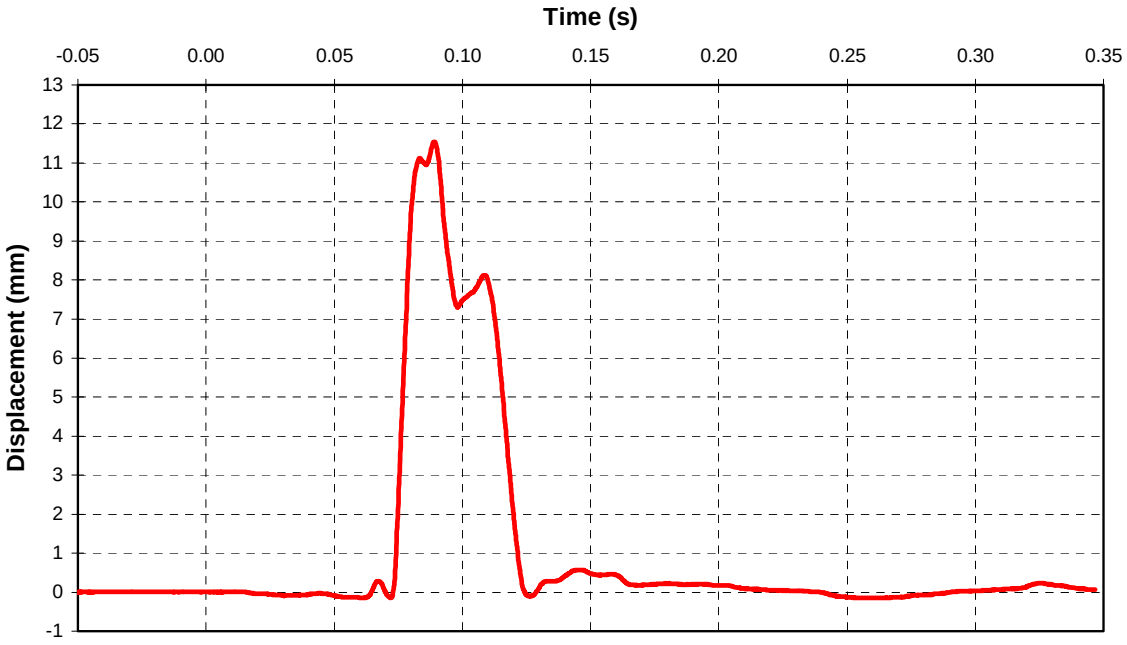
A- 36 CF98018 1999 Subaru Forester Right Femur Axial Force



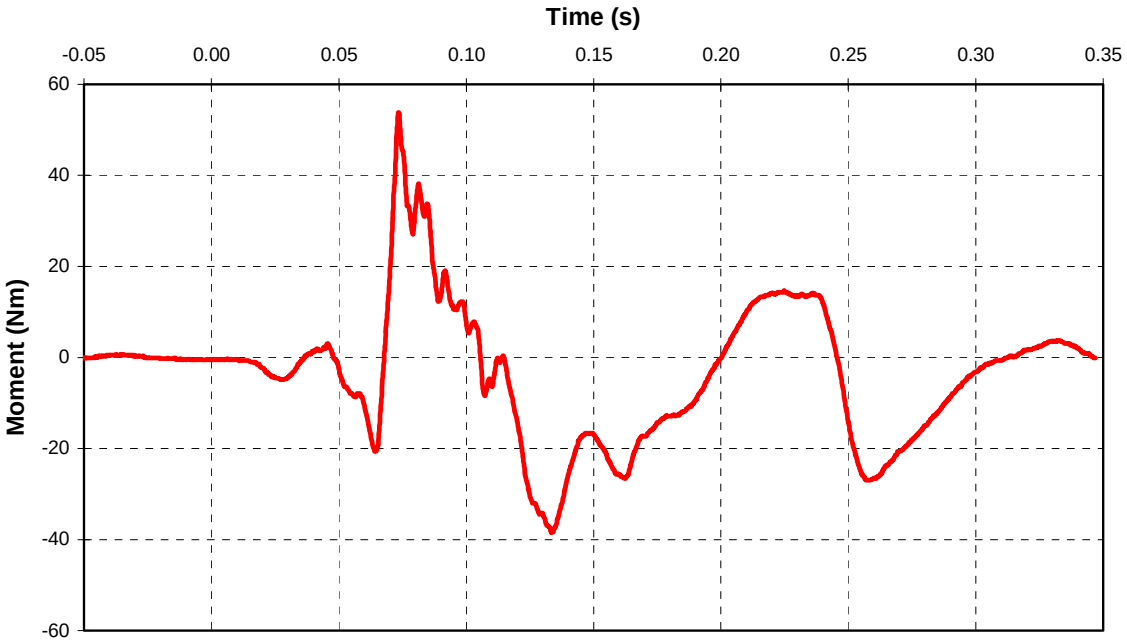
A- 37 CF98018 1999 Subaru Forester Right Femur Axial Force Analysis



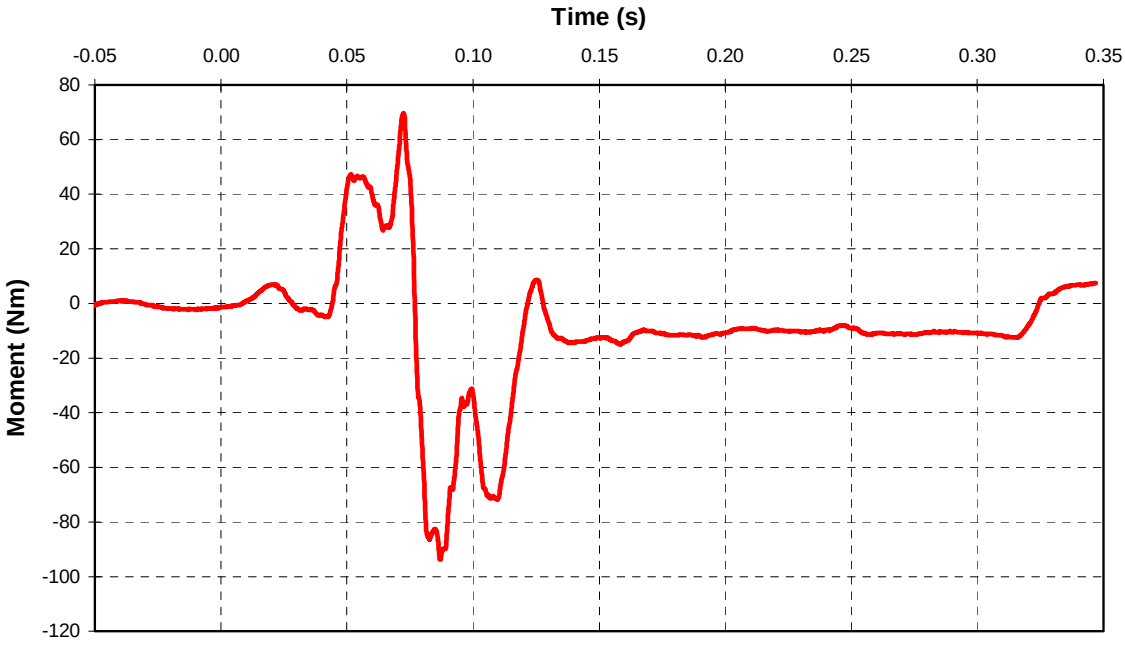
A- 38 CF98018 1999 Subaru Forester Right Tibia-Femur Displacement



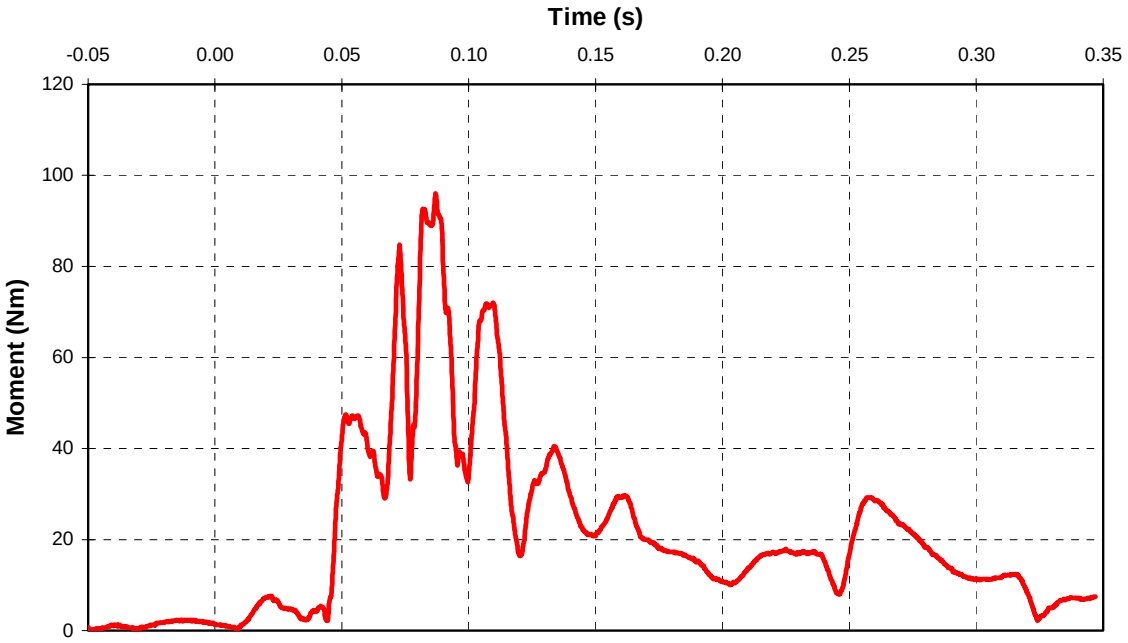
A- 39 CF98018 1999 Subaru Forester Right Upper Tibia L-M Moment



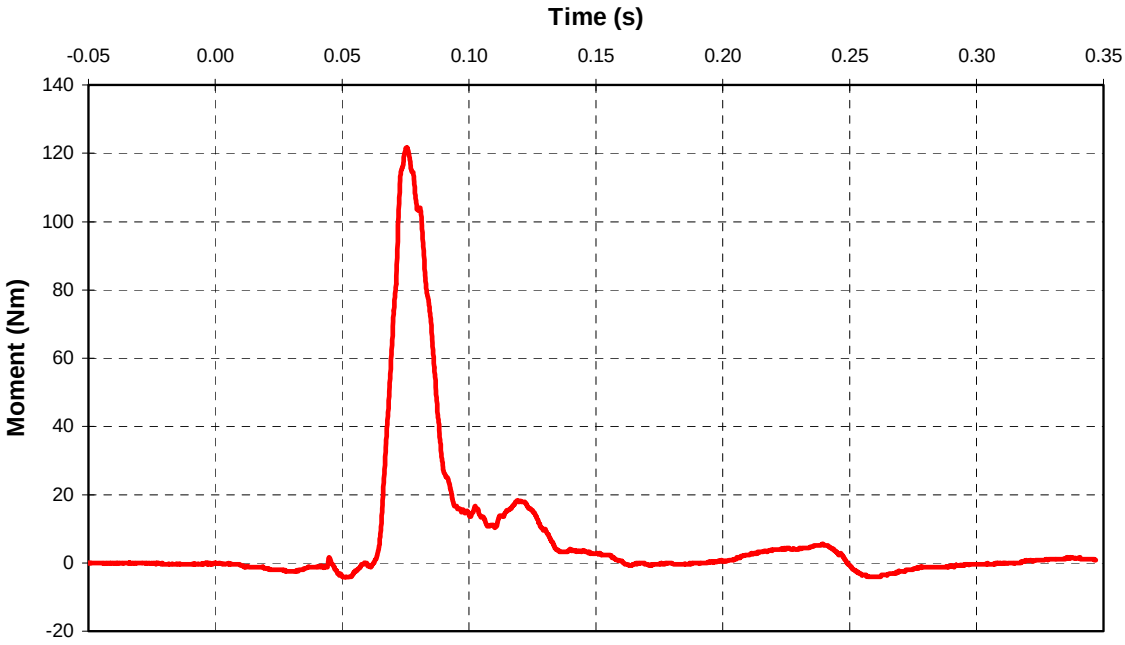
A- 40 CF98018 1999 Subaru Forester Right Upper Tibia A-P Moment



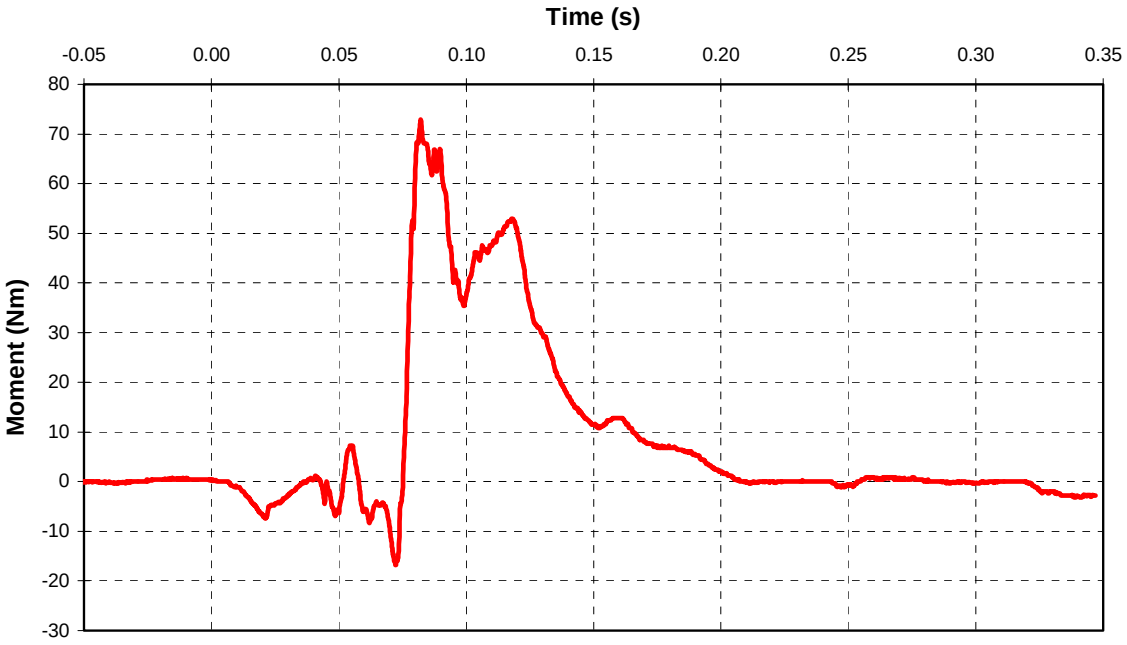
A- 41 CF98018 1999 Subaru Forester Right Upper Tibia Vector Resultant Moment



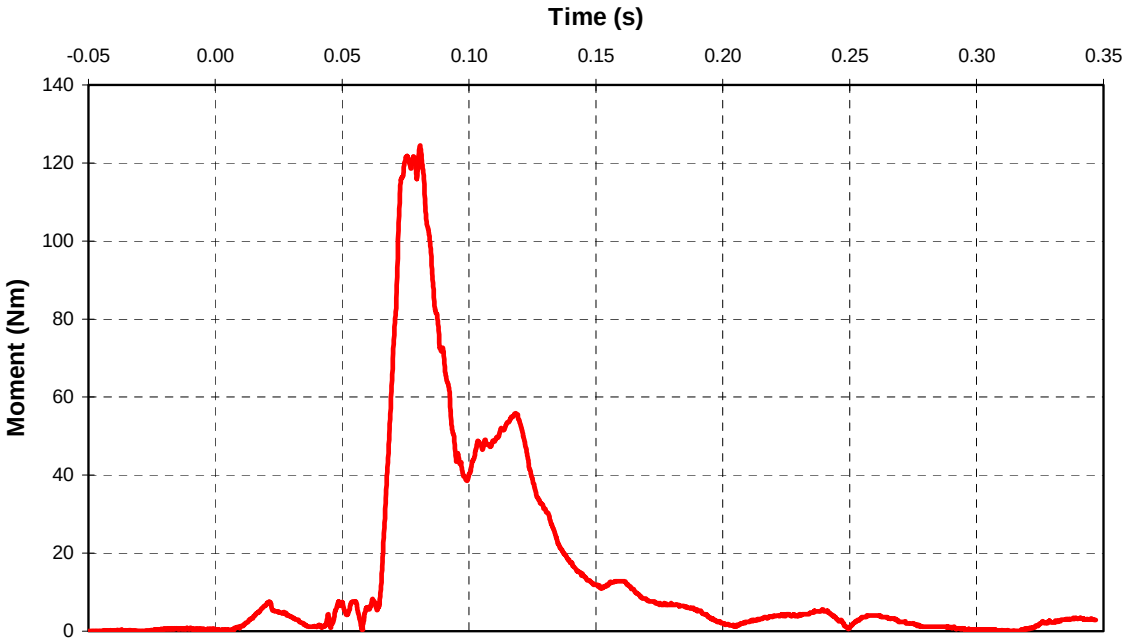
A- 42 CF98018 1999 Subaru Forester Right Lower Tibia L-M Moment



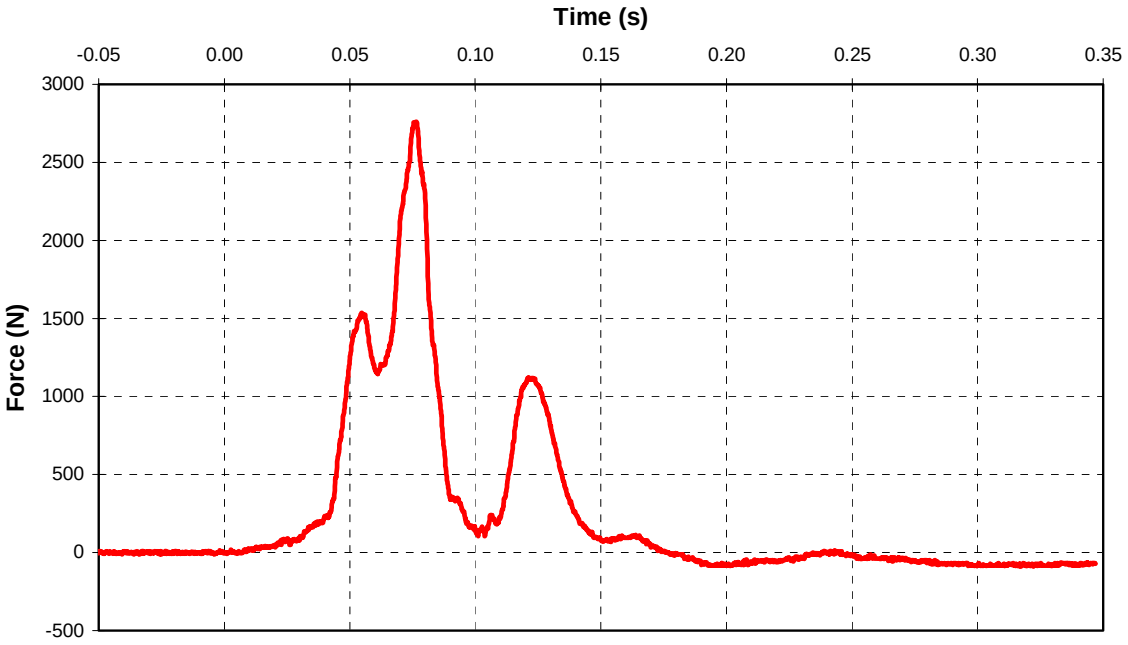
A- 43 CF98018 1999 Subaru Forester Right Lower Tibia A-P Moment



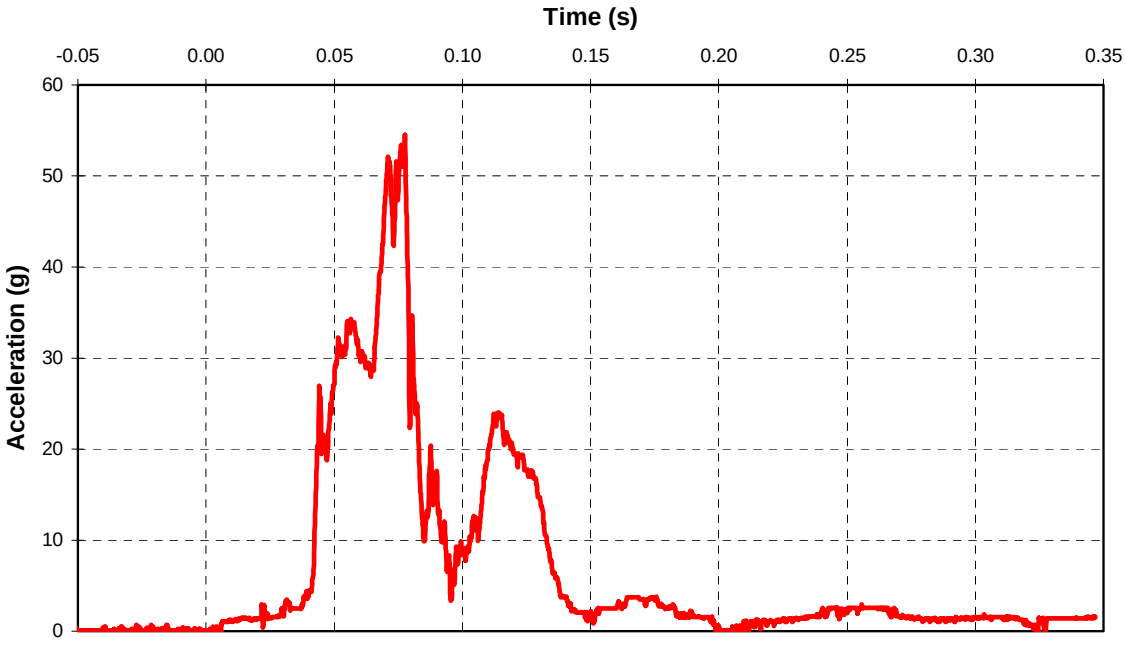
A- 44 CF98018 1999 Subaru Forester Right Lower Tibia Vector Resultant Moment



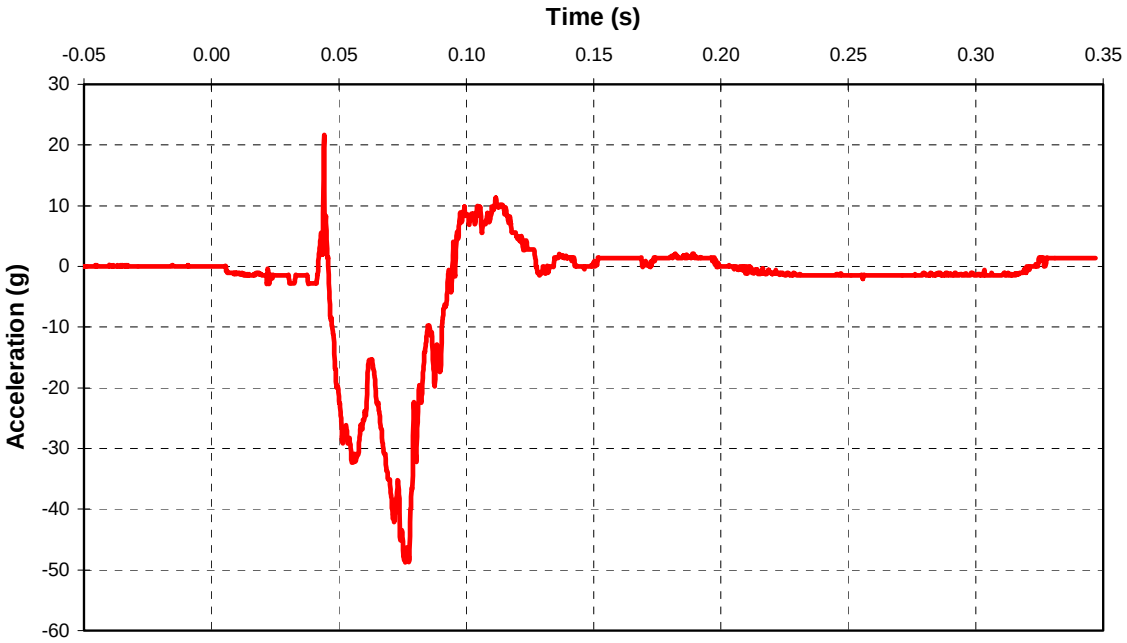
A- 45 CF98018 1999 Subaru Forester Right Lower Tibia Axial Force



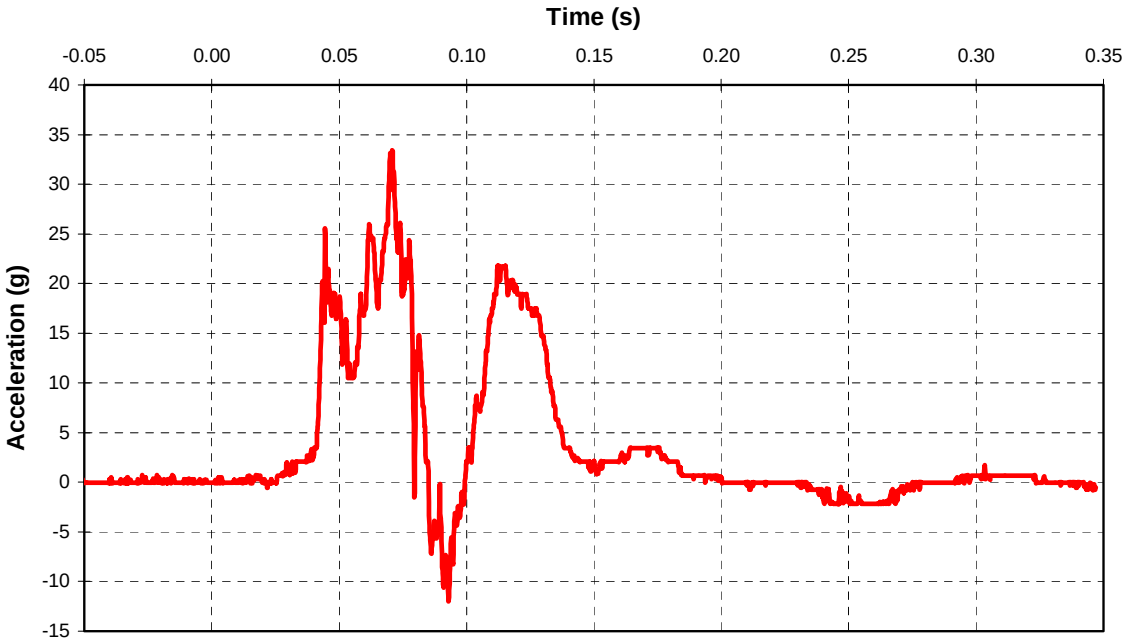
A- 46 CF98018 1999 Subaru Forester Right Foot Vector Resultant Acceleration



A- 47 CF98018 1999 Subaru Forester Right Foot A-P Acceleration



A- 48 CF98018 1999 Subaru Forester Right Foot I-S Acceleration



SUBARU

The ... ity of All-Wheel Drive.

**** 1999 SUBARU FORESTER L ALL-WHEEL DRIVE**
4-SPEED AUTOMATIC TRANSMISSION
CANYON RED PEARL PAINT

FO...

STANDARD FEATURES

Items featured below are included at NO EXTRA CHARGE in the Subaru Vehicle Price shown at right.

**************** SAFETY ****************
ALL-WHEEL DRIVE (AWD)
DRIVER & FRONT PASSENGER AIR BAGS
4-CHANNEL ANTI-LOCK BRAKING SYSTEM (ABS)
SIDE-IMPACT DOOR BEAMS
CHILD SAFETY LOCKS, REAR DOORS
OUTBOARD REAR SEAT HEADRESTS

**************** PERFORMANCE ****************
2.5L HORIZONTALLY OPPOSED SOHC ENGINE
4-WHEEL INDEPENDENT HVY-DUTY SUSPENSION
205/70 R15 ALL-SEASON WHT LTR TIRES
FRONT & REAR STABILIZER BARS

**************** WARRANTIES ****************
3YR/36,000 MILE BASIC NEW CAR
5YR/60,000 MILE POWERTRAIN
5YR/UNLIMITED MILEAGE RUST PERFORATION
SEE WARRANTY BOOK FOR DETAILS

******** KEY FORESTER FEATURES *********
AIR CONDITIONING (NON-CFC REFRIGERANT)
AM/FM STEREO CASSETTE WITH 4-SPEAKERS
POWER WINDOWS, MIRRORS AND DOOR LOCKS
ROOF RACK
FOG LIGHTS
OVERHEAD CONSOLE W/ MAP LIGHTS & STORAGE
DRIVER'S SEAT HEIGHT, TILT & LUMBAR ADJ.
SPLIT FOLD-DOWN & RECLINING REAR SEAT
CARGO AREA LIGHT & 12-VOLT POWER OUTLET
REMOVABLE, WASHABLE CARGO TRAY
CARGO AREA SUBFLOOR STORAGE COMPARTMENTS
REAR BUMPER STEP PAD
FULL-SIZE SPARE TIRE
SPLASH GUARDS
CARPETED FLOORMATS
HEADLIGHTS OFF VIA IGNITION SWITCH

Compare this vehicle to others in the FREE GAS MILEAGE GUIDE available at the dealer.

CITY MPG
21

Gas Mileage Information
DOE EPA

HIGHWAY MPG
26

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
17 *and* **25** *mpg in the city, and between*
21 *and* **31** *mpg on the highway.*

1999 SUBARU AWD FORESTER
2.5 LITRE ENGINE, 4 CYLINDERS,
4-SPD AUTO TRANS,

MULTI-POINT FUEL INJECTION,

(FEEDBACK FUEL SYSTEM)

ESTIMATED ANNUAL FUEL COST:
$ 750.00

For Comparison Shopping, all vehicles
SPECIAL PURPOSE 4WD
have been issued mileage ratings ranging from **0** *to* **0** *mpg city and* **0** *to* **0** *mpg highway.*
NOT AVAILABLE

STANDARD VEHICLE PRICE

Manufacturer's Suggested Retail Price
$19,995.00

OPTIONAL EQUIPMENT AND OTHER ITEMS

****SUBARU ALL-WHEEL DRIVING SYSTEM ****
To achieve maximum Traction and Performance, every Subaru integrates a unique system combining All-Wheel Drive with a symmetrically balanced horizontally opposed engine and an optimally tuned independent suspension The result is superior Handling and Control in all driving conditions.
STANDARD ON ALL SUBARU VEHICLES

4-SPEED AUTOMATIC TRANSMISSION **$ 800.00**

TOTAL VEHICLE & OPTIONS **$ 20,795.00**
DESTINATION AND DELIVERY **$ 495.00**

TOTAL SUGGESTED RETAIL PRICE

$ 21,290.00

Forester shown may have optional equipment.

SHIP TO:
INSURANCE INSTITURE FOR HIGHWAY SAFETY
RUCKERSVILLE,VA 22968

SOLD TO:
SUBARU OF AMERICA INC.
2235 RT. 70 WEST
CHERRY HILL,NJ 080346000

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