Insurance Institute for Highway Safety
Crashworthiness Evaluation

Crash Test Report
1998 Isuzu Amigo (CF98016)

Vehicle identification number: 4S2CM57D4W4342905
Body style: Small two-door utility vehicle
Engine/transmission: Longitudinal 2.2-liter 4-cylinder, 5-speed manual, 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)
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:	246 cm
Overall length:	427 cm
Overall width:	178 cm
Curb weight:	1,625 kg

Vehicle specifications (measured):

Front bumper to firewall:	108 cm
Curb weight:	1,632 kg
Test weight:	1,758 kg
Overall width:	181 cm

Nominal test parameters:

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

Crash test date:

July 8, 1998

Figure 1
Precrash and Postcrash Side Views — 1998 Isuzu Amigo

Summary

A 1998 Isuzu Amigo was crash tested on July 8, 1998 into a fixed deformable barrier at 39.8 mi/h (64.1 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 11-17 cm. Resultant intrusion in the driver footwell measured 36 cm at the footrest and 17-29 cm at other places on the toepan. After the crash, the dummy's left foot was found trapped between the intruded toepan and the clutch pedal. Both doors remained closed during the crash. After the crash, the driver door required tools to open, and the passenger door required additional effort but no tools to open.

The driver dummy was restrained by a three-point lap/shoulder belt and an airbag. During the crash, 5 cm of webbing spooled off the retractor, and the deploying airbag contacted the dummy's face and chest. During rebound, the dummy's head passed through the precrash plane of the side window and approached the window sill. The head then moved upward and inward into contact with the head restraint and later in the crash contacted the B-pillar. After the crash, the upper end of the steering column had moved upward 18 cm and rearward 12 cm.

The resultant head acceleration from the dummy's head contact against the B-pillar was not recorded because the contact occurred late in the crash after data collection had ended. The left leg had a maximum tibia axial force of 7.2 kN and a lower tibia index of 1.03. The left foot had a maximum resultant acceleration of 205 g.

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 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 57 cm behind its center of gravity (177 cm behind the front axle). The vehicle speed recorded just prior to impact was 39.8 mi/h (64.1 km/h), and the actual overlap was 40 percent.

Structural Performance

Both doors remained closed during the crash. The driver door aperture shortened 17 cm as measured at the lower edge of the window. The driver door was found locked after the crash, and it was necessary to pry at the lock linkage with a tool. Once the linkage was moved to the unlocked position, the door opened with additional effort but no tools. The passenger door required additional effort but no tools to open.

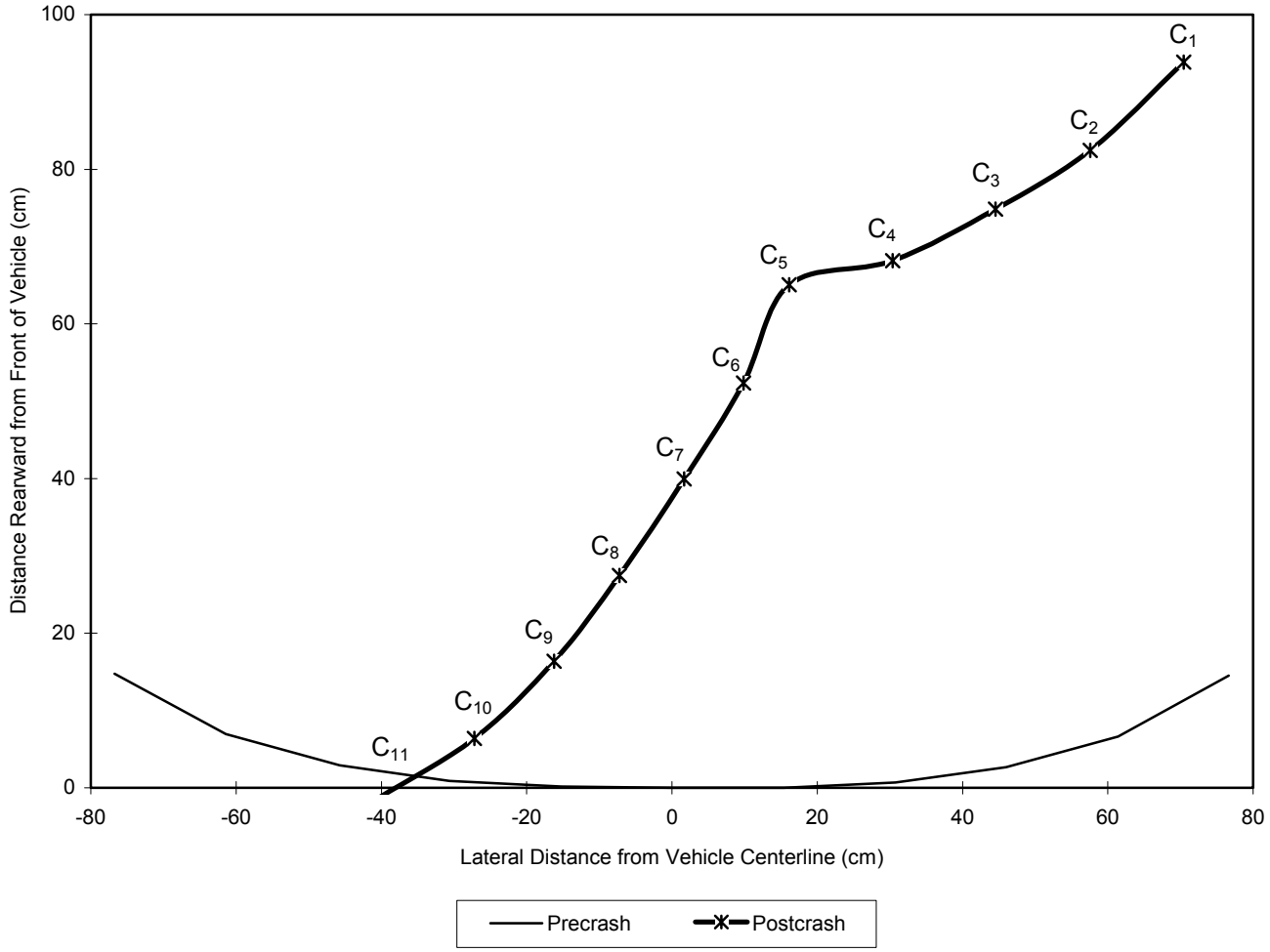
As the left front wheel was forced rearward during the crash, it loaded and deformed the driver door sill. The front portion of the sill and the lower half of the door hinge pillar were torn along the welded seam connecting them to the floorpan and toepan, respectively. The tear's length measured about 76 cm.

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 frame rails, crossmembers, and door sills, which are visible in Figure 5.

Figure 2
Overhead View of Crash Deformation — 1998 Isuzu Amigo

Figure 3
Front Bumper Cover Crush Contour — 1998 Isuzu Amigo



	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)	94	82	75	68	65	52	40	27	16	6	-1
Precrash Contour (cm)	15	7	3	1	0	0	0	1	3	7	15
Resulting Crush (cm)	79	75	72	67	65	52	40	26	13	-1	-16

The bumper cover was torn completely off the vehicle and separated into multiple pieces during the crash. The postcrash contour of the cover was estimated by using the postcrash contour of the underlying bumper bar as a template and modifying it using the precrash longitudinal spacing between the cover and bar (under the assumption that the precrash spacing between cover and bar was maintained). The length of the reference line was 153 cm precrash and 111 cm postcrash, the latter taken from the bumper bar.

Figure 4
Front Bumper Bar and Upper Radiator Support Crossmember Crush Contour — 1998 Isuzu Amigo

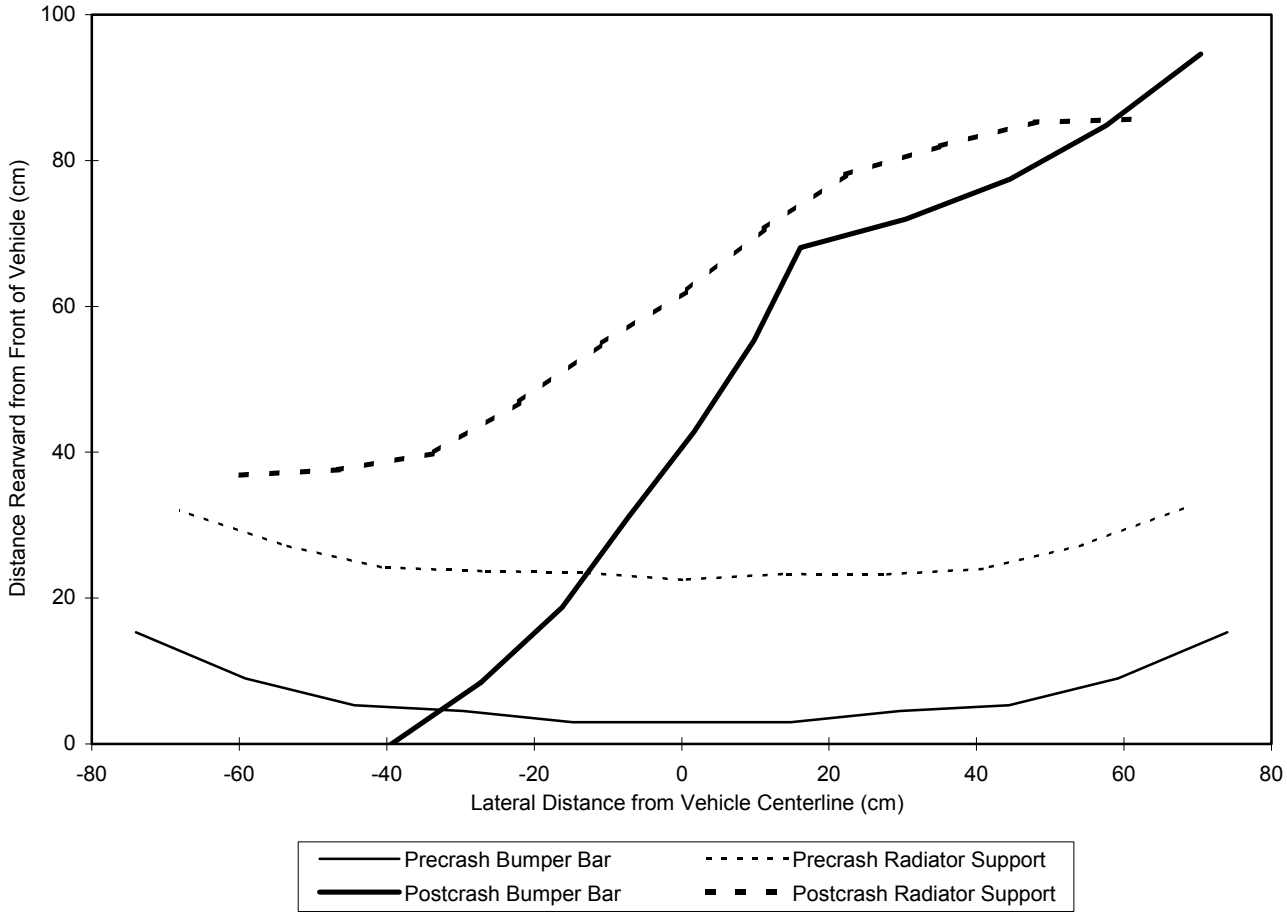


Figure 5
Precrash and Postcrash Views from Below — 1998 Isuzu Amigo

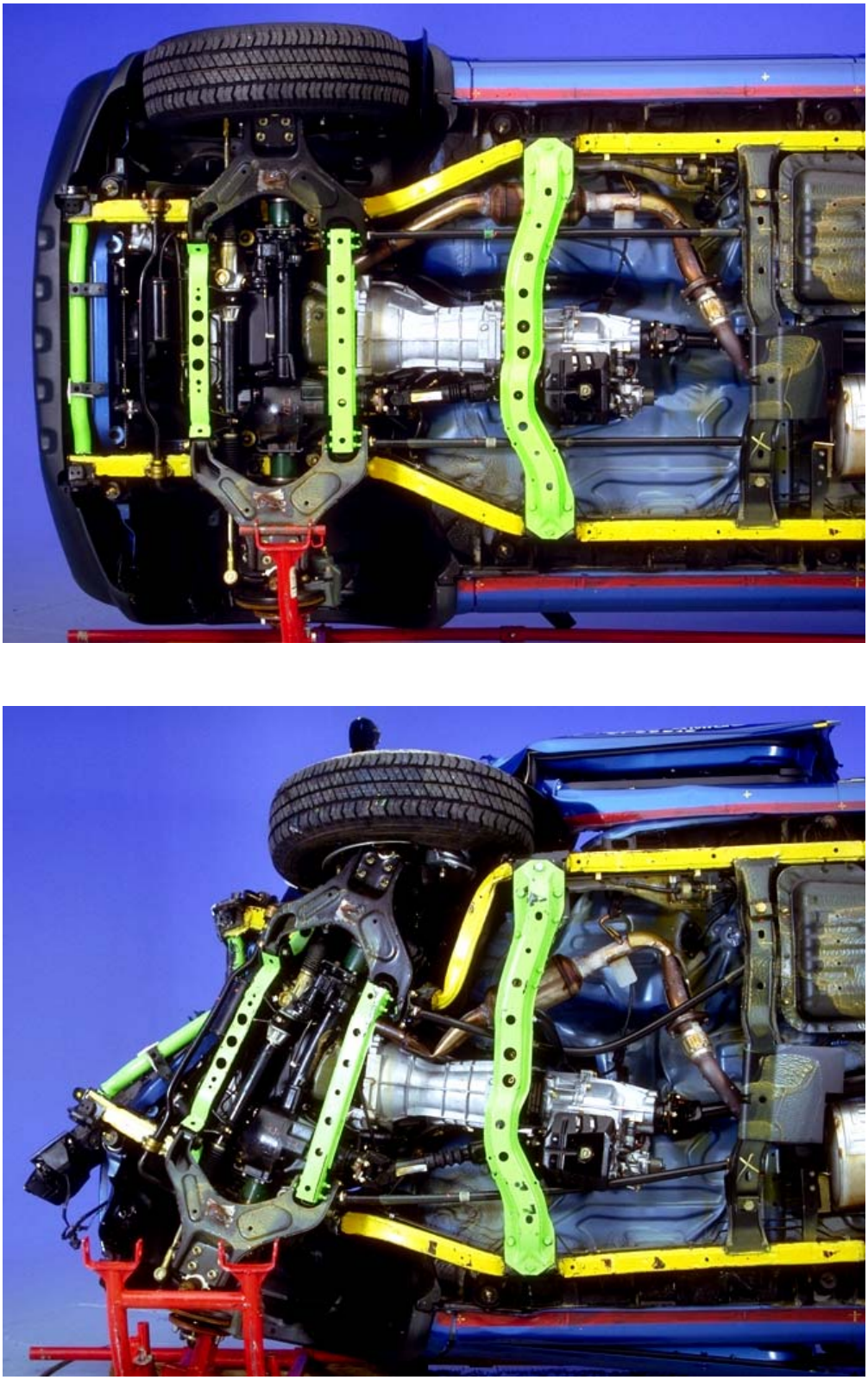
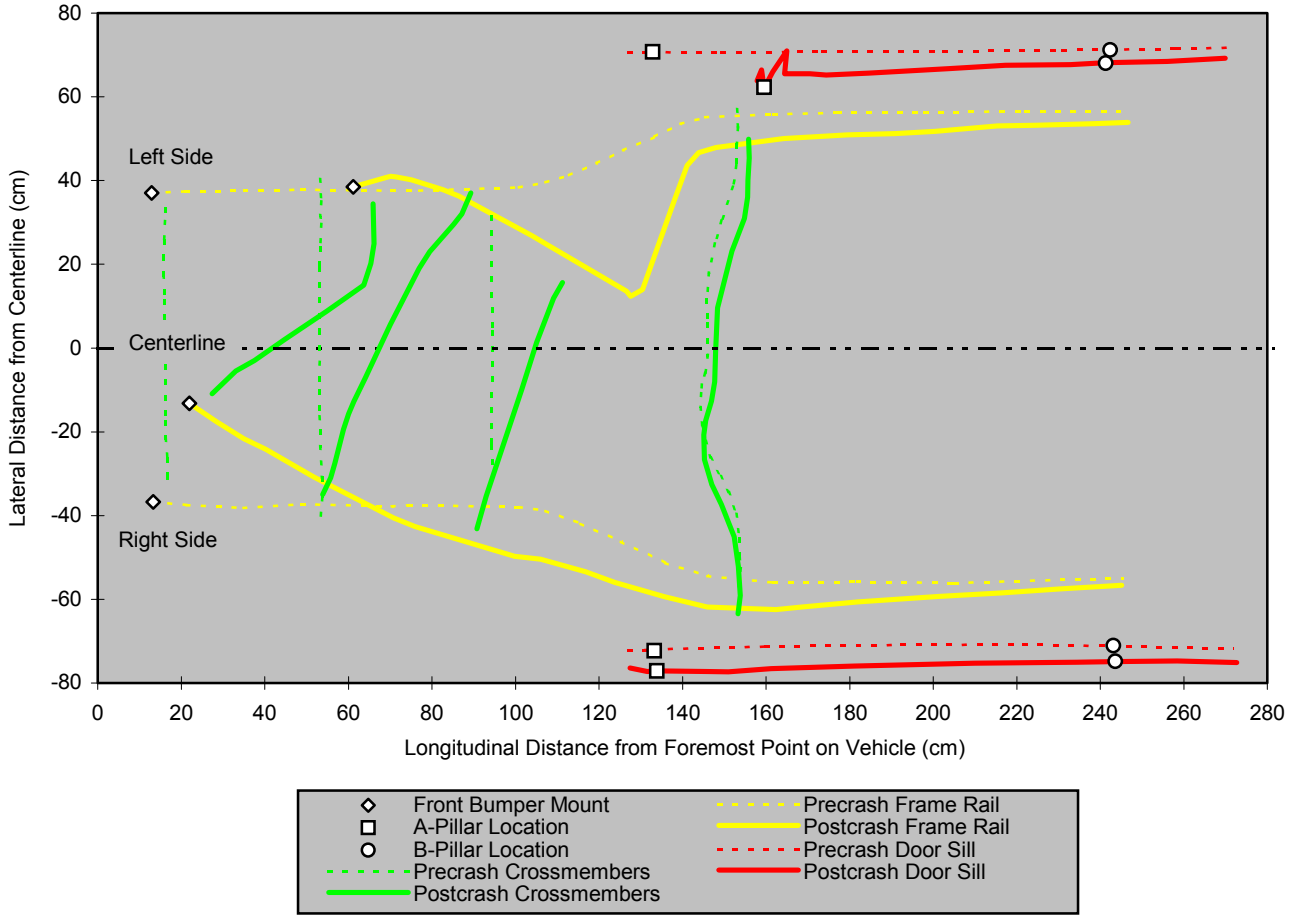
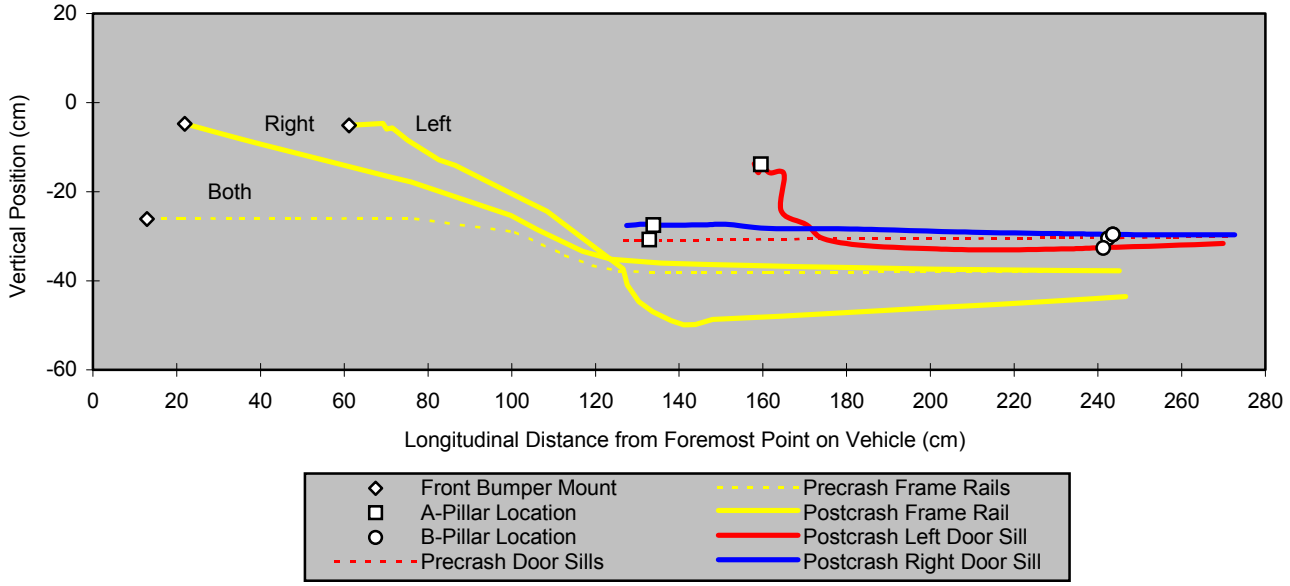


Figure 6
Structural Deformation, Views from Below and Side — 1998 Isuzu Amigo





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 — 1998 Isuzu Amigo

Selected Locations*	Longitudinal	Lateral	Vertical	Resultant
Steering column (cm)	-12	-4	18	22
Left lower instrument panel (cm)	-17	-1	14	21
Right lower instrument panel (cm)	-11	1	11	16
Brake pedal (cm)	-26	3	12	29
Left toepan (cm)	-27	0	12	29
Center toepan (cm)	-21	5	8	23
Right toepan (cm)	-15	6	7	17
Footrest (cm)	-31	-5	7	36
Average displacement of the four seat-attachment bolts from primary reference system (cm)	-4	1	-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 65 cm in diameter, and the excursion of its center when inflated is limited by two 21 cm-long tethers. The airbag is vented by two 40 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 positions D and E indicated the airbag deployed at 54 ms into the crash and appeared to be fully inflated at 76 ms.

Passenger: The corner-mounted passenger airbag deployed rearward and is untethered. The cylinder-shaped airbag is vented by two 50 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 at both front seating positions. The front inboard lower anchorage points are attached to and move with the seats. The front outboard lower anchorage points are bolted to the lower B-pillars. During the crash, 5 cm of webbing was pulled from the retractor through the D-ring, as measured by a pull-string mounted between the B-pillar and the webbing just beyond the D-ring. The force-limiting mechanism consists of two coiled wires attached to outer rings on each side of the retractor spool. No wire was pulled from either coil, and the alignment pin for the ring on one side was intact; the pin on the other side had just begun to shear. Thus it was concluded that the force limiter did not contribute to the amount of webbing pulled from the retractor.

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 back and head restraint to tip outward and contact the B-pillar.

Steering Column

The upper end of the steering column moved upward 18 cm and rearward 12 cm relative to the driver seat. The portion of the steering column between the instrument panel and firewall has a tube-in-tube, energy-absorbing design and was found compressed 2 cm following the crash. Separation of the shear modules on the upper portion of the column measured zero on the left side and 1 cm on the right side.

Dummy Kinematics

Head, Neck, and Torso

Analysis of the high-speed film taken from camera positions D and E indicated the deploying airbag contacted the dummy's chest at 58 ms into the crash and the dummy's face at 62 ms. The face remained in contact with the airbag until the airbag became fully inflated at 76 ms. Paint transferred from the dummy's face onto the airbag indicated the nose loaded the fully inflated airbag 18 cm above and 2 cm to the right of its center. During rebound, the dummy's head moved outside the precrash plane of the side window, and the back of the head approached but did not contact the window sill. The head then moved upward and inward, and the right rear side of the head contacted the upper outboard portion of the head restraint at about 280 ms and came very close to the B-pillar. The head then moved inward, swung back outward as the vehicle's rear wheels landed (both had left the ground during the crash), and the right rear of the head contacted the forward edge of the B-pillar at about 600-650 ms. The back of the head also may have contacted the upper outboard part of the head restraint at about the same time. Table 2 provides the timing of these events.

Table 2
Restraint System Performance and Dummy Kinematics — 1998 Isuzu Amigo

Event	Time (ms)
Deployment of airbag	54
Airbag contacts chest during deployment	58
Airbag contacts face during deployment	62
Airbag fully inflated and face begins to load airbag	76
Right rear side of head contacts head restraint	280
Right rear of head contacts forward edge of B-pillar	600-650

Figure 7
Dummy and Vehicle Interior, Postcrash — 1998 Isuzu Amigo

Legs and Feet

Left leg and foot: Paint transferred from the dummy's left knee indicated the knee contacted the knee bolster at and just to the left of the outboard edge of the bolster's protrusion around the steering column, about 2 cm above and 6 cm to the right of the left instrument panel intrusion reference point. The medial edge of the knee contacted the lower left corner of the steering column trim. Paint transferred from the dummy's left shin indicated the shin contacted the knee bolster directly below the left knee impact location. The left foot was found slightly dorsiflexed, fully everted, and trapped between the intruded toepan and the clutch pedal. The sole at both the heel and lateral edge of the forefoot was pressed against the intruded toepan, and the clutch pedal and arm were against the dorsal surface of the foot. To extract the foot, the toe was first pushed to the right, then downward pressure was applied to the dorsal foot, and finally the back portion of the heel was lifted as the entire foot was pulled rearward from underneath the pedal.

Right leg and foot: Paint transferred from the dummy's right knee indicated the knee contacted the flat portion of the knee bolster to the right of the steering column, 2 cm above and 1 cm to the left of the right instrument panel intrusion reference point. Paint transferred from the dummy's right shin indicated the shin contacted the knee bolster directly below the right knee impact location. The right foot was found in neutral flexion and slightly inverted. The sole of the forefoot was still on the accelerator pedal, suspended above the toepan. The rear edge of the heel was against the toepan, and the lateral edge of the heel was against the transmission tunnel.

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 head acceleration from the dummy's head contact against the B-pillar was not recorded because the contact occurred after data collection had ended. Table 3 provides a summary of the maximum head injury measurements recorded during the crash.

Table 3 Head Injury Measurements — 1998 Isuzu Amigo			
Measure	**Published Tolerance Threshold**	**Result**	**Time (ms)**
Vector resultant acceleration (g)	80	69	85
Vector resultant acceleration — 3 ms clip (g)	80	67	85-89
Head Injury Criterion (HIC)	1000	682	76-110
Head Injury Criterion — 15 ms interval (HIC-15)*	700	475	83-98

* 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 — 1998 Isuzu Amigo			
Measure	**Published Tolerance Threshold**	**Result**	**Time (ms)**
A-P shear force (kN)	±3.1*	-0.5	92
Axial compression force (kN)	4.0*	0.4	137
Axial tension force (kN)	3.3*	2.0	84
Flexion bending moment (Nm)	190**	25	90
Extension bending moment (Nm)	57**	31	119

* 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 — 1998 Isuzu Amigo

Measure	Published Tolerance Threshold	Result	Time (ms)
Vector resultant spine acceleration — 3 ms clip (g)	60	37	85-88
Rib compression (mm)	50	36	86
Viscous criterion (m/s)	1.0	0.3	76

Legs and Feet

Left leg and foot: The left leg had a maximum lower tibia L-M bending moment of -180 Nm at 67 ms, a maximum tibia axial force of 7.2 kN at 62 ms, and a lower tibia index of 1.03 at 62 ms. The left foot had a maximum I-S acceleration of 188 g at 59 ms and a maximum vector resultant acceleration of 205 g at 60 g.

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

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

Table 6
Leg and Foot Injury Measurements — 1998 Isuzu Amigo

Measure	Published Tolerance Threshold	Left		Right	
		Result	Time (ms)	Result	Time (ms)
Axial femur force (kN)	9.1*	2.8	62	3.0	71
Tibia-femur displacement (mm)	15	10	78	9	72
Upper Tibia					
L-M moment (Nm)	±225	116	112	-34	67
A-P moment (Nm)	±225	-128	77	-83	76
Vector resultant moment (Nm)	225	151	113	83	76
Index	1.00	0.73	62	0.40	74
Lower Tibia					
L-M moment (Nm)	±225**	-180	67	16	86
A-P moment (Nm)	±225**	114	67	53	71
Vector resultant moment (Nm)	225**	213	67	54	71
Axial force (kN)	8.0**	7.2	62	3.4	69
Index	1.00	1.03	62	0.32	68
Foot					
A-P foot acceleration (g)	±150	-141	61	-56	63
I-S foot acceleration (g)	±150	188	59	85	70
Vector resultant foot acceleration (g)	150	205	60	85	69

* 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.

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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

1998 Isuzu Amigo Small Two-Door Utility Vehicle: 5 mi/h Front into Angle Barrier

Test Number: LA98014
VIN: 4S2CM57D4W4342905
Mileage: 17
Features: Driver and passenger airbags, four-wheel antilock brakes, air conditioning, manual transmission, power steering, bumper-mounted fog lamps, mud flaps, fender flares, moonroof, soft top (over rear seat only), tailgate-mounted full-size spare tire with cover, two-stage paint.

	Part		Labor	
Description	**Mfg. No**	**Price**	**Operation**	**Hours**
Bumper reinforcement, front	8971388194	$106.44	Replace*	
Bumper cover, front	8971381126	94.25	Replace	2.2
Bumper mounting bracket, right front	8971388202	30.72	Replace*	
Bumper cover end bracket, right front	8971257843	8.05	Replace*	
Parking, turn signal, and side marker lens, right front	8971239982	36.65	Replace*	
Fog lamp assembly, right front			Repair/align	0.2
Headlamps			Aim	0.5
Radiator support			Repair/align*	4.0
Radiator support			Refinish	0.8
Coolant recovery tank			Remove/reinstall	0.3
Fender, right front	8971480152	253.71	Replace**	2.5
Fender, right front			Refinish	2.9
Hood			Repair/align*	2.0
Hood			Refinish	3.8
Inner fender panel, right front			Repair/align*	2.0
Fender skirt, right front			Remove/reinstall	
Frame rail end, right front			Repair/align*	1.0
Windshield washer reservoir			Remove/reinstall	0.4
Grille assembly			Touch up	0.1
Paint and materials		129.20		
Total Parts		$659.02		
Total Labor		749.10		22.7
Grand Total		$1,408.12		

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

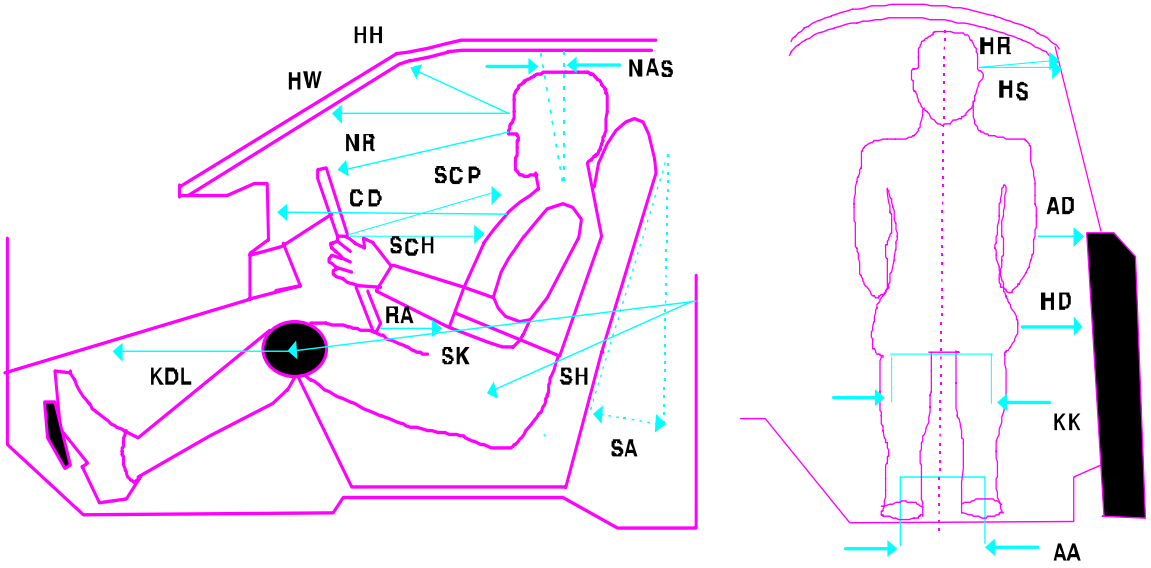
Dummy Clearance Measurements

Test Number: CF98016
Vehicle Make/Model: Isuzu Amigo
Vehicle Model Year: 1998
Seat Type: Manually adjusted bucket seat (fore/aft and seat back angle)

Manufacturer's Specifications
Seat Back Information: Reclined to 5th position from most upright
Upper Belt Anchorage: Set to midpoint of 5 positions
Steering Column Adjustment: Fixed

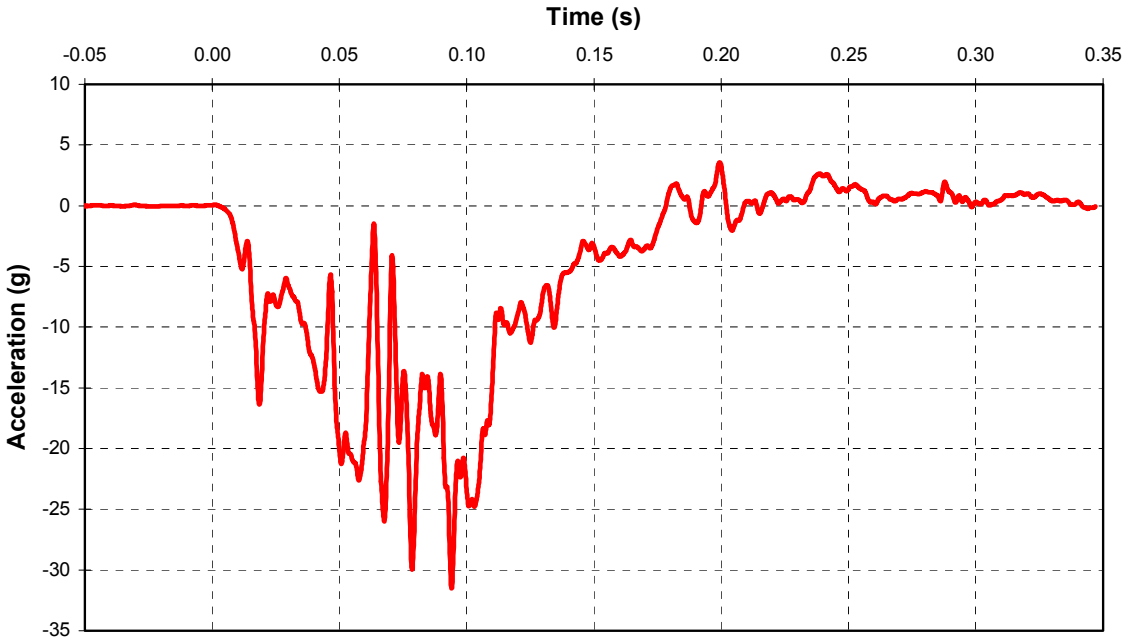
Location	Code	Measure	Location	Code	Measure
Head to header	HH	379	Neck angle, torso 90	NAT90	20.9°
Head to windshield	HW	561	Neck angle, seated*	NAS	2.0°
Nose to rim	NR	407	Torso angle (NAT90 – NAS)	TA	18.9°
Chest to dash	CD	586	Striker to knee**	SK	648
Rim to abdomen	RA	191	Striker to knee angle**	SKA	2.8°
Knee to dash, left	KDL	195	Striker to H-point, horizontal	SHH	266
Knee to dash, right	KDR	197	Striker to H-point, vertical	SHV	88
Steering wheel to chest, horizontal	SCH	306	Ankle to ankle	AA	318
Steering wheel to chest, perpendicular	SCP	401	Knee to knee	KK	317
Steering wheel to chest, reference	SCR	391	Arm to door	AD	100
Hub to chest, minimum	HCM	252	H-point to door	HD	149
Pelvic angle	PA	23.7°	Head to A-pillar	HA	541
Seat back angle	SA	17°	Head to roof	HR	217
			Head to side window	HS	220

All distance measurements are in millimeters (mm).
* Dummy's neck bracket was adjusted to +3.5 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.

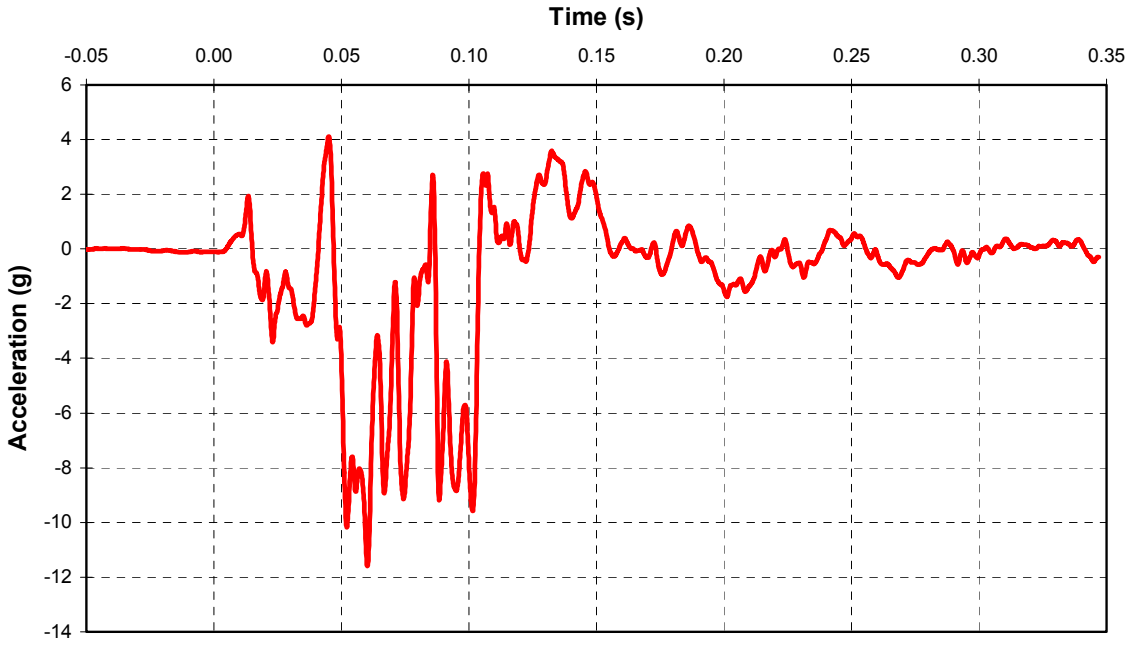


Graph Index

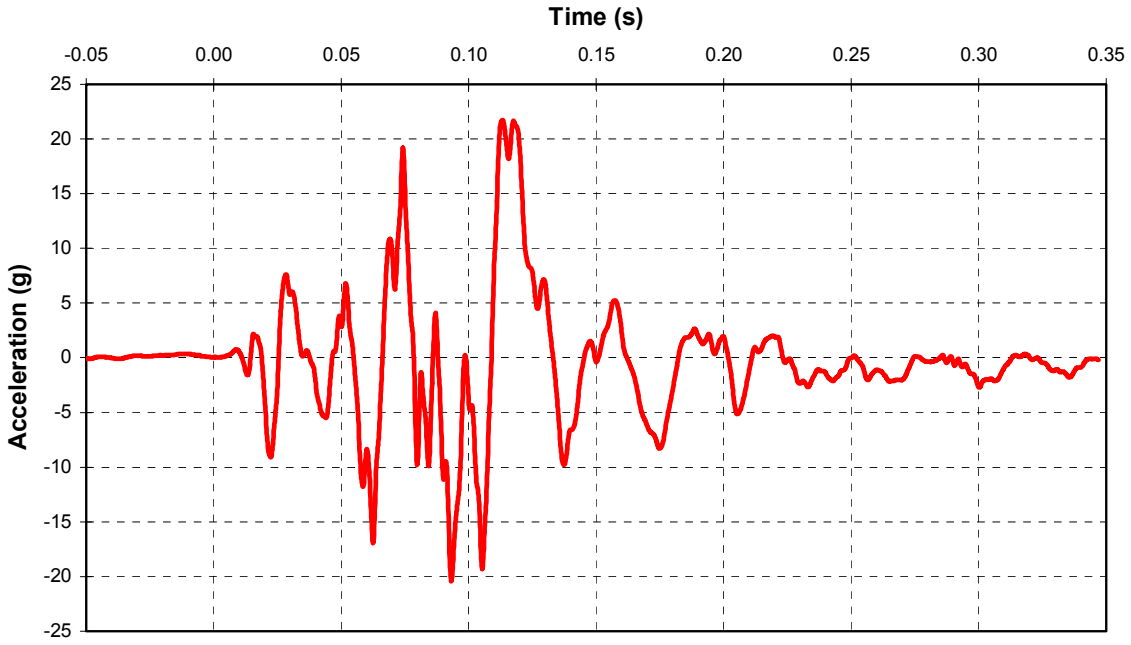
A- 1 CF98016 1998 Isuzu Amigo Vehicle Longitudinal Acceleration



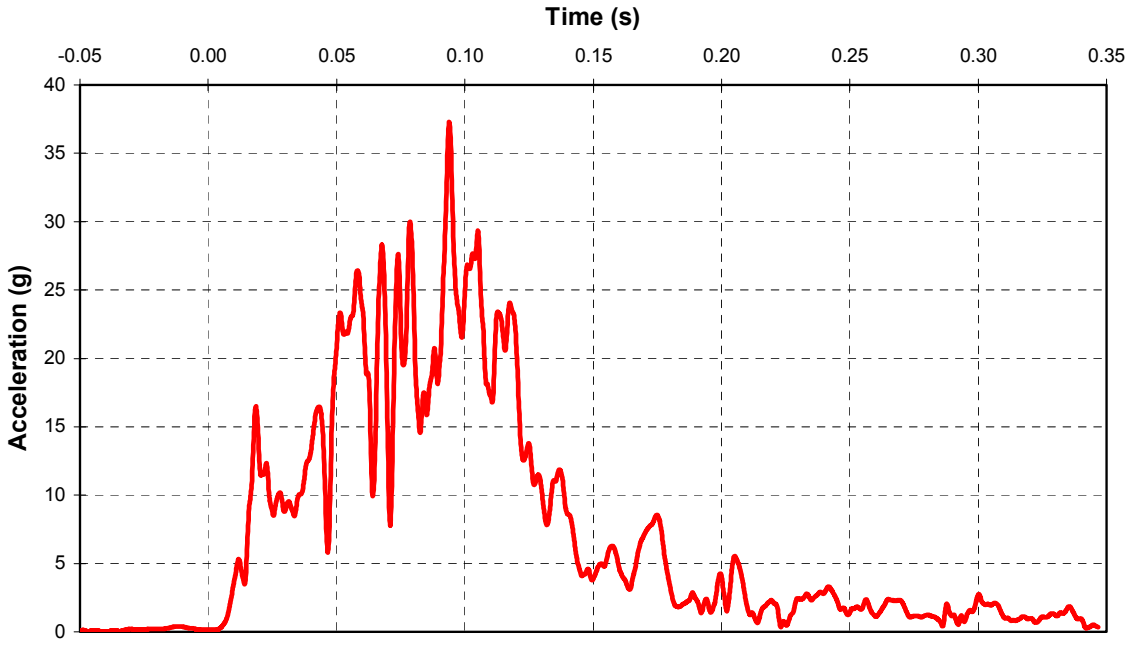
A- 2 CF98016 1998 Isuzu Amigo Vehicle Lateral Acceleration



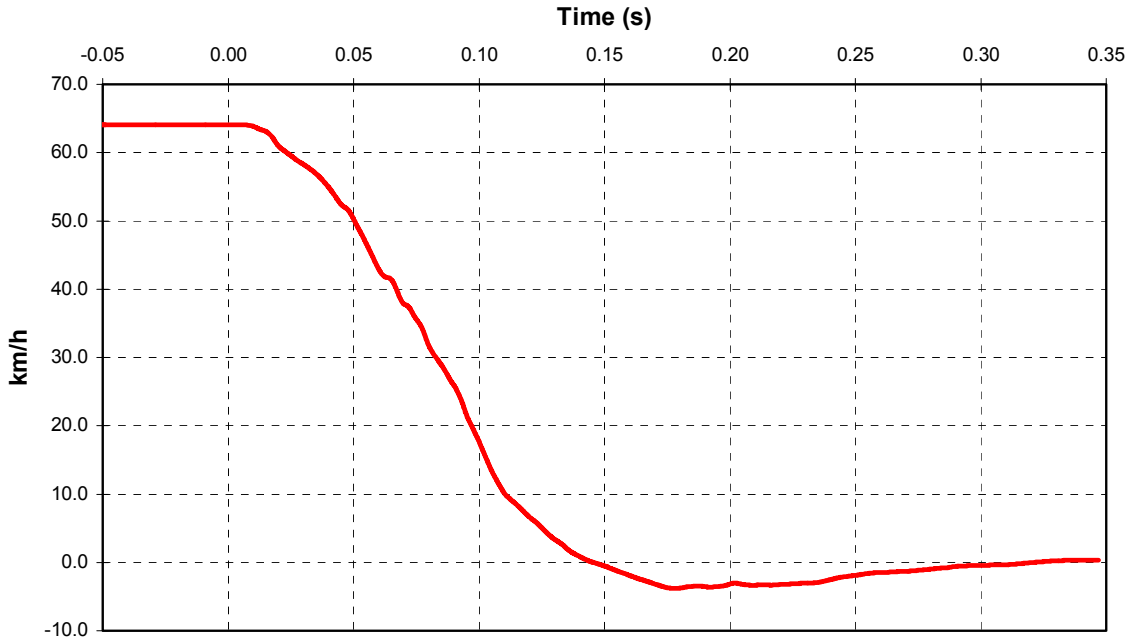
A- 3 CF98016 1998 Isuzu Amigo Vehicle Vertical Acceleration



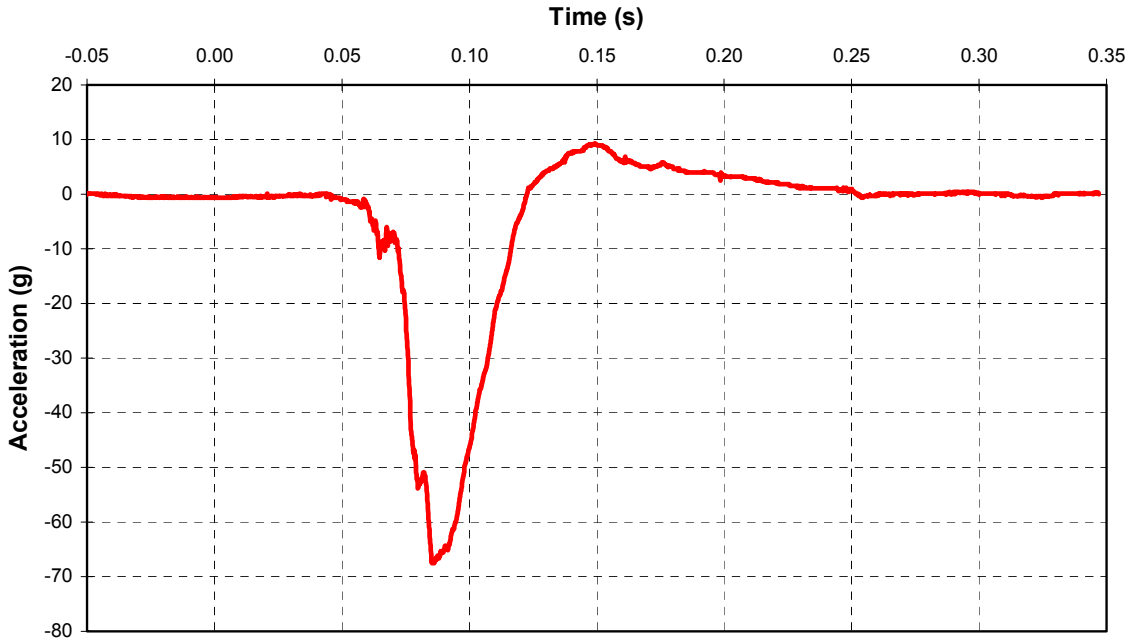
A- 4 CF98016 1998 Isuzu Amigo Vehicle Vector Resultant Acceleration



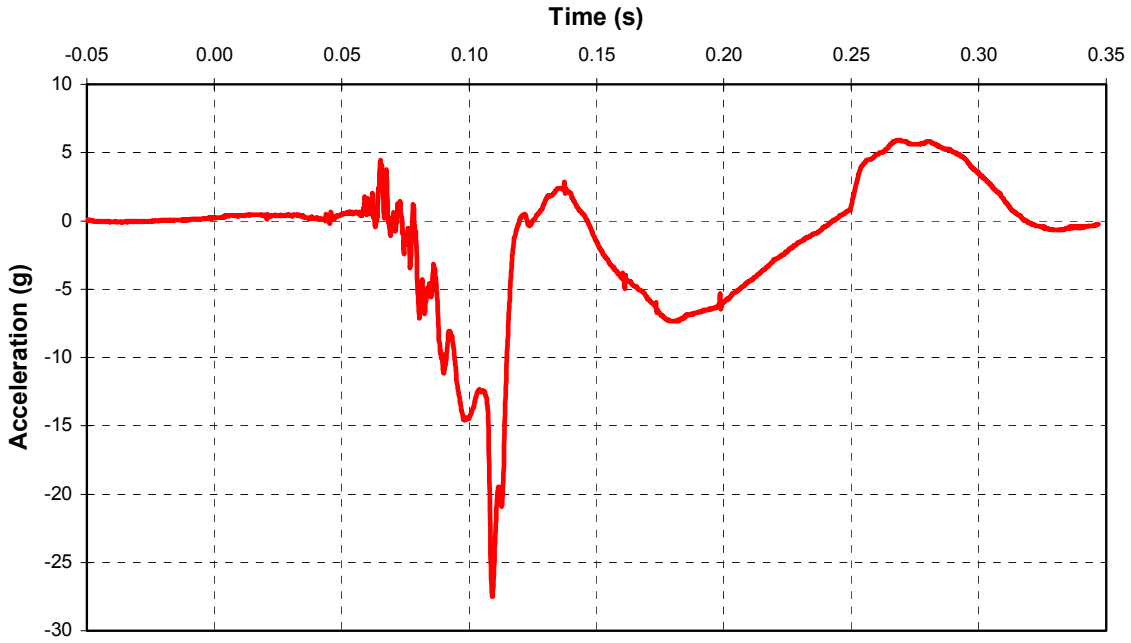
A- 5 CF98016 1998 Isuzu Amigo Integration of Vehicle Longitudinal Acceleration



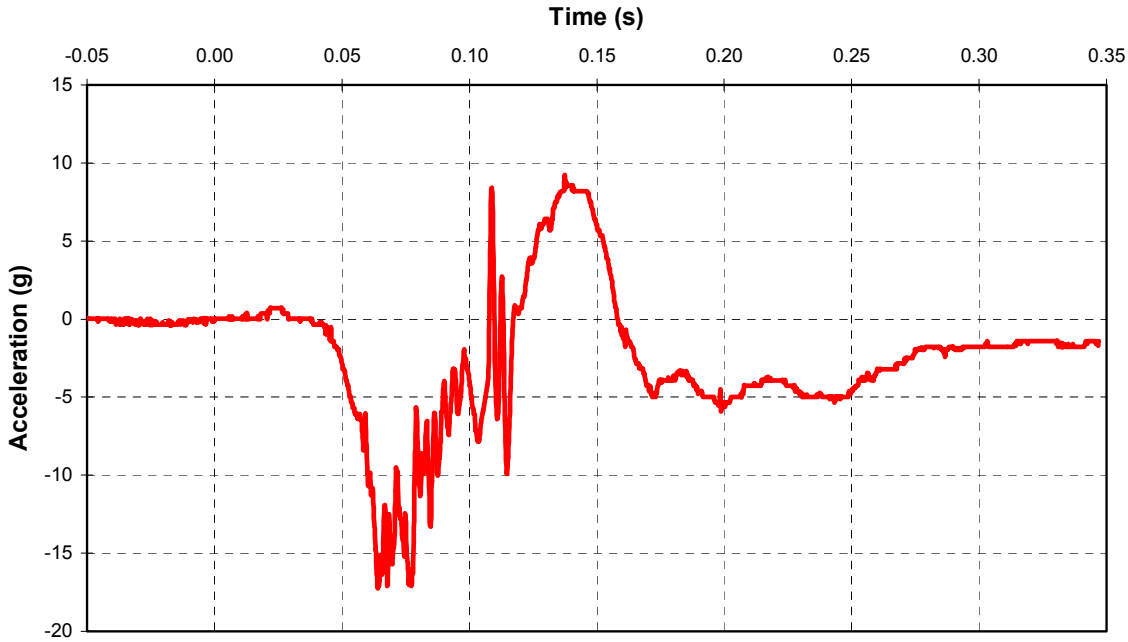
A- 6 CF98016 1998 Isuzu Amigo Head A-P Acceleration



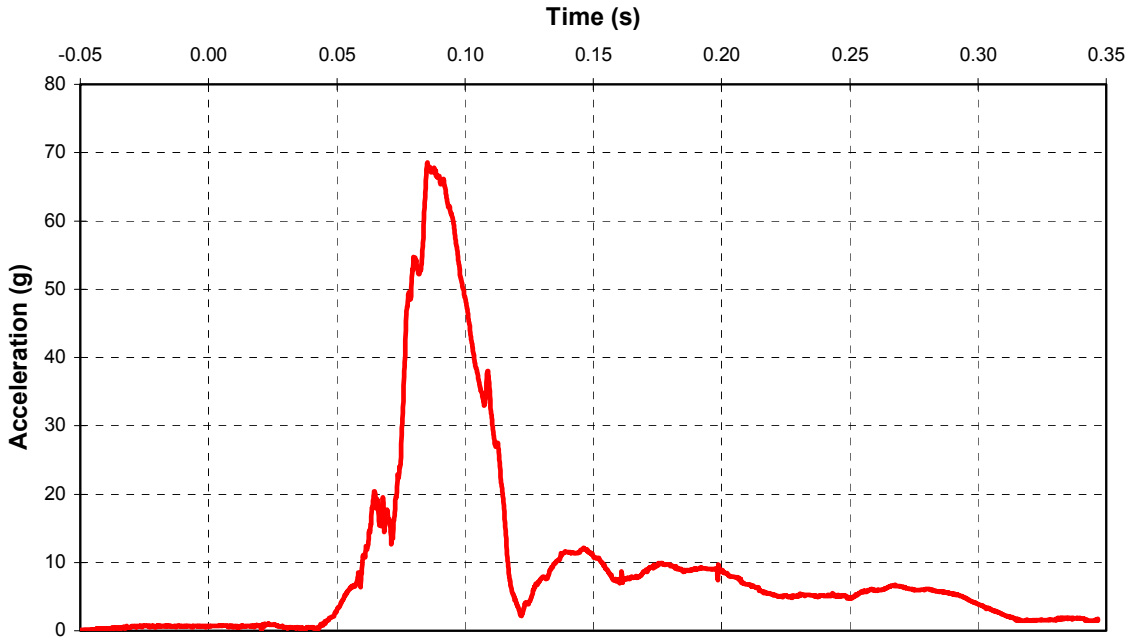
A- 7 CF98016 1998 Isuzu Amigo Head L-M Acceleration



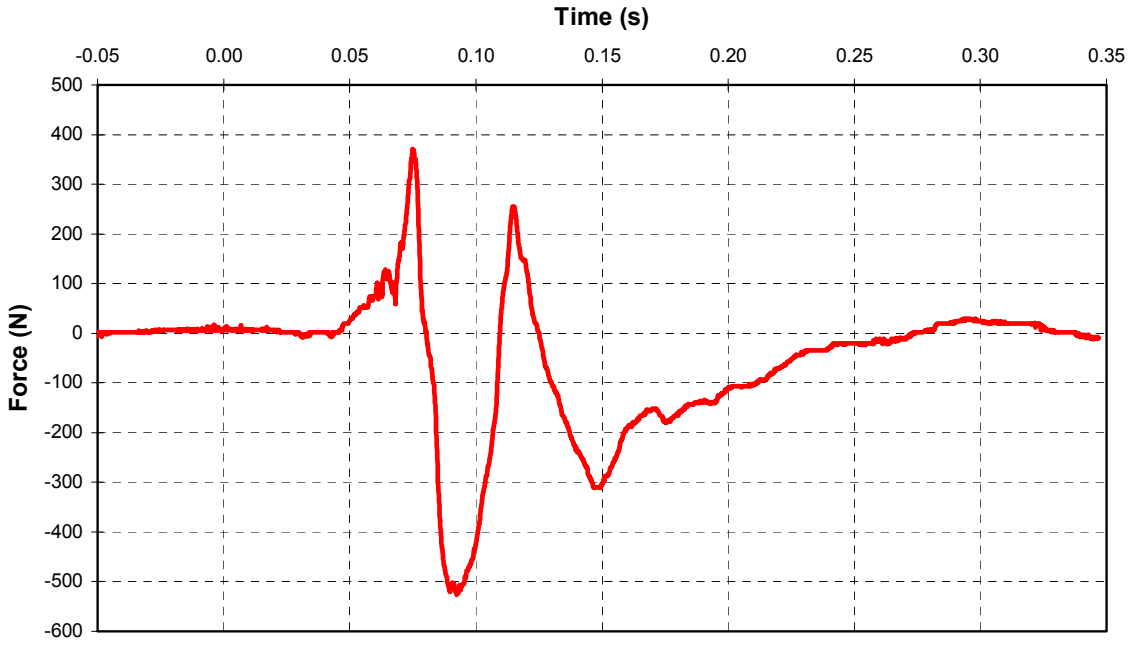
A- 8 CF98016 1998 Isuzu Amigo Head I-S Acceleration



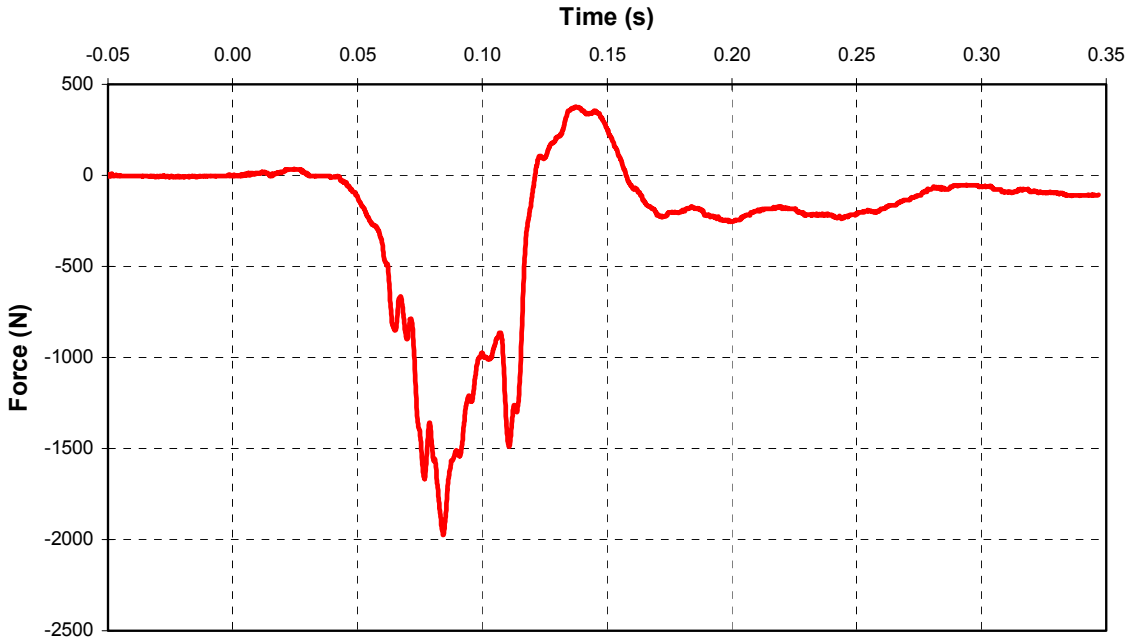
A- 9 CF98016 1998 Isuzu Amigo Head Vector Resultant Acceleration



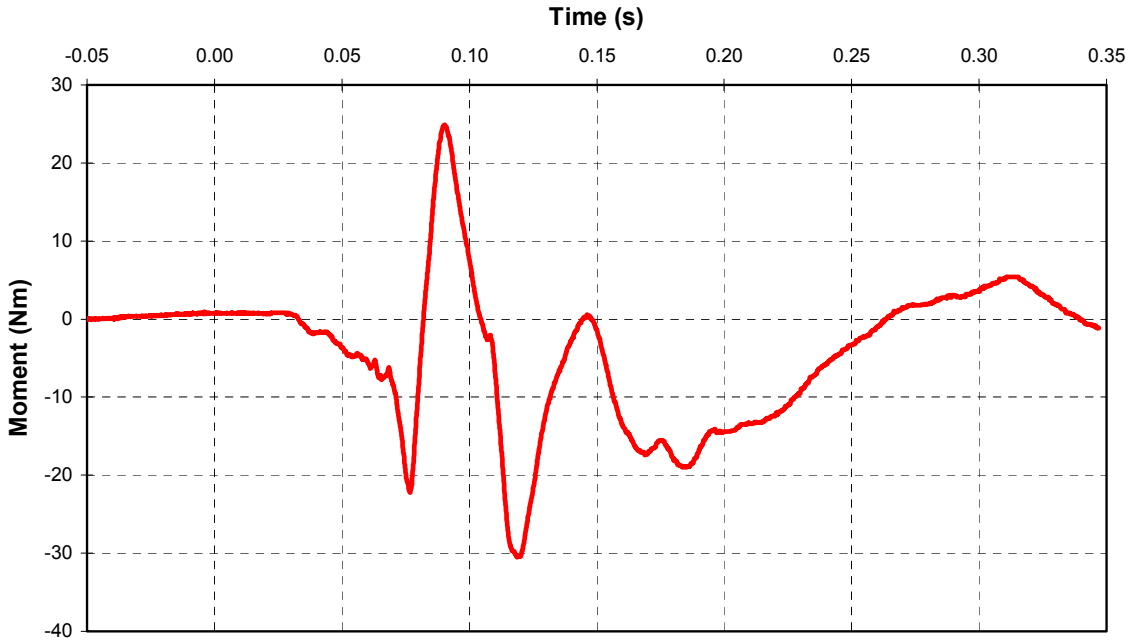
A- 10 CF98016 1998 Isuzu Amigo Neck A-P Shear Force



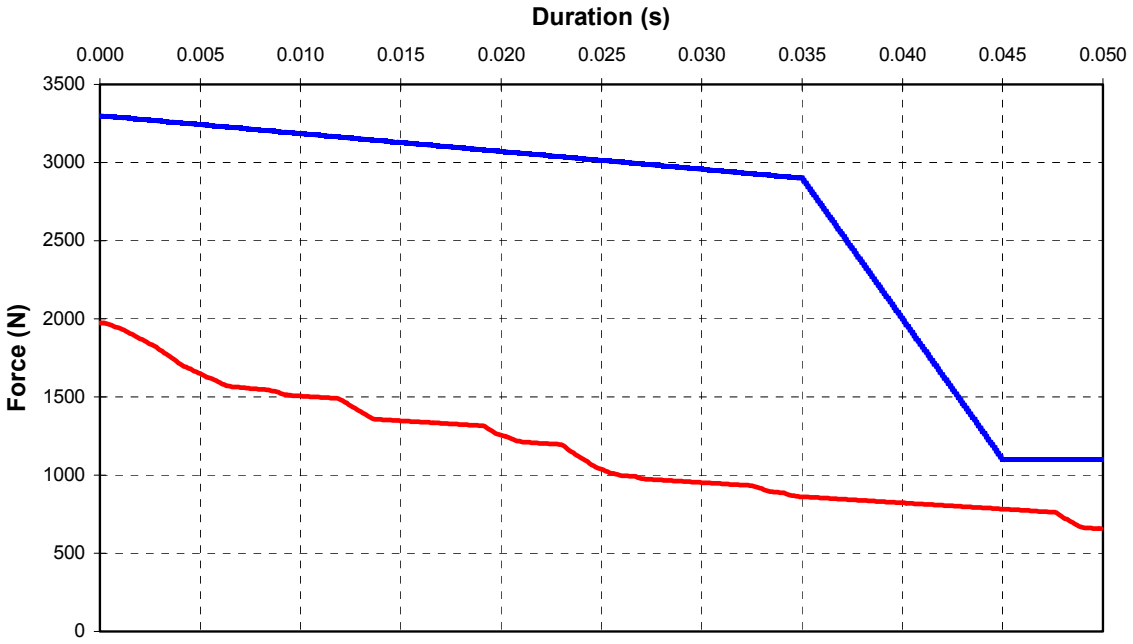
A- 11 CF98016 1998 Isuzu Amigo Neck Axial Force



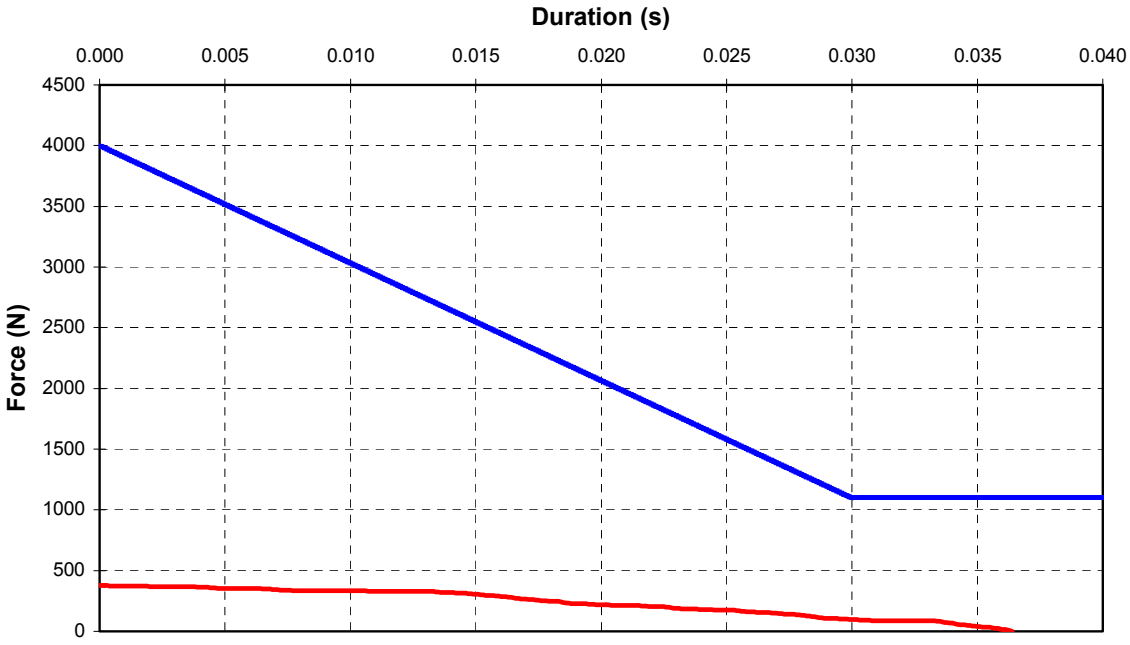
A- 12 CF98016 1998 Isuzu Amigo Neck Occipital A-P Moment



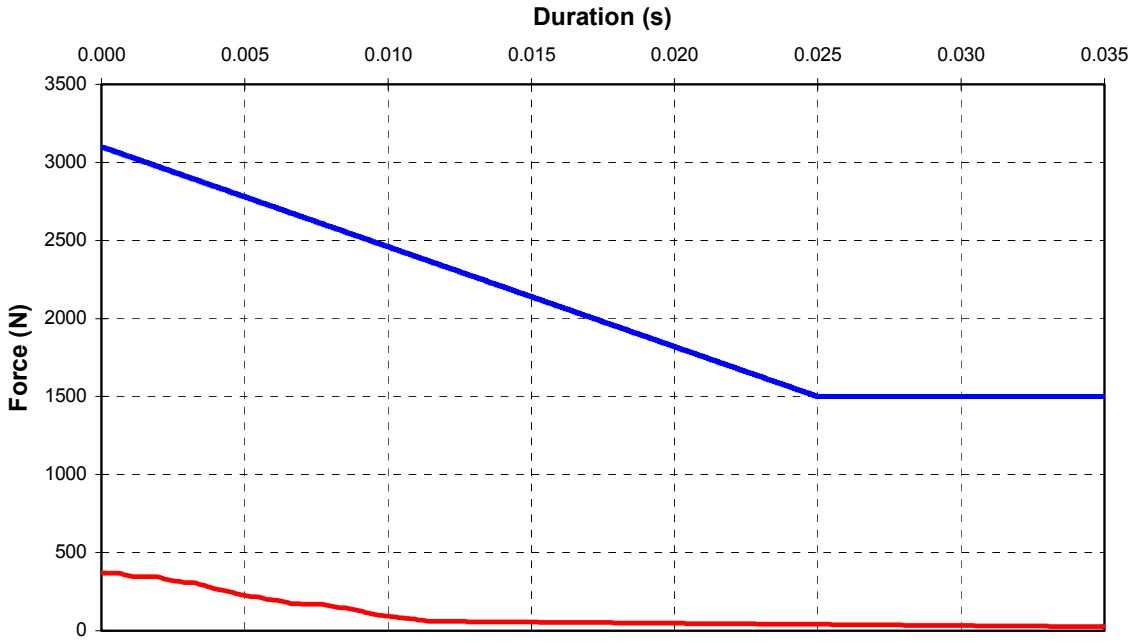
A- 13 CF98016 1998 Isuzu Amigo Neck Tension Analysis



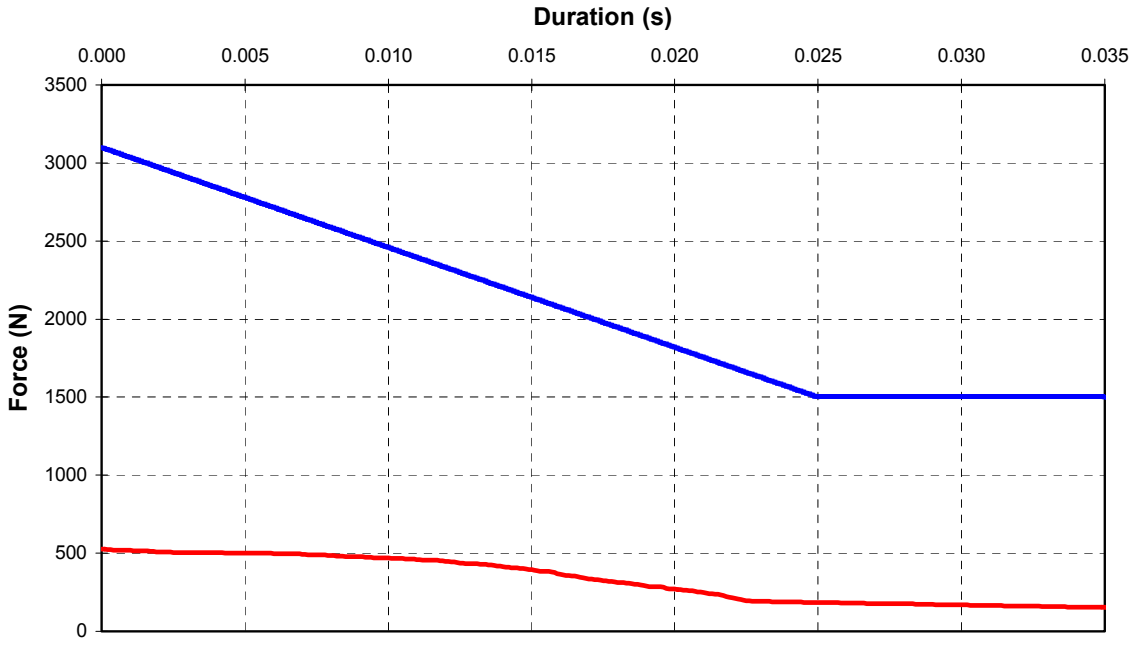
A- 14 CF98016 1998 Isuzu Amigo Neck Compression Analysis



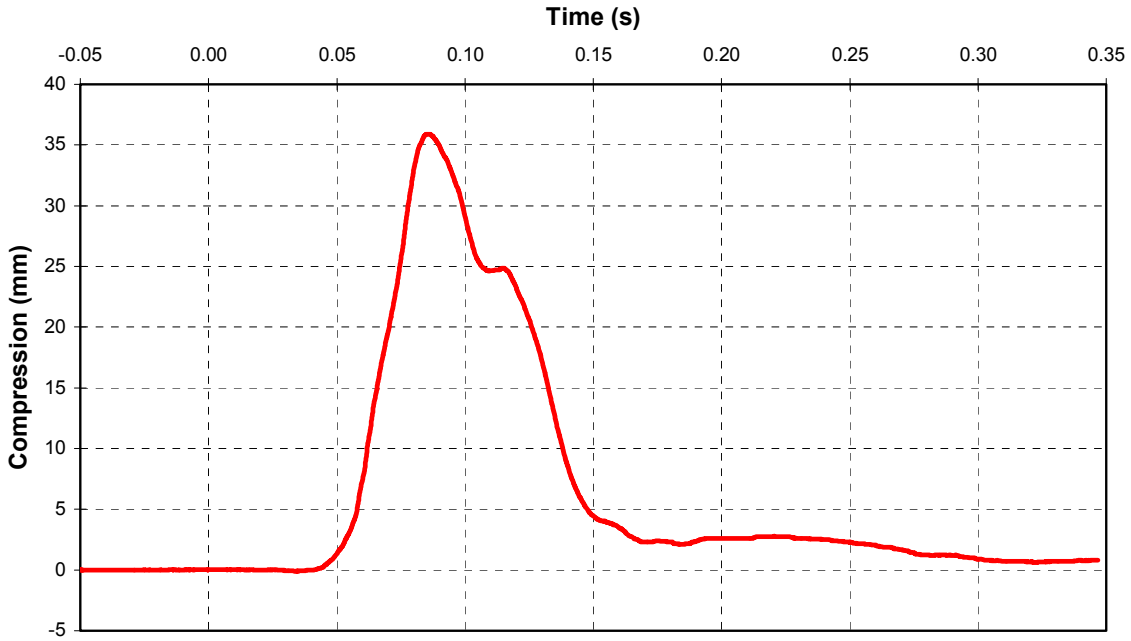
A- 15 CF98016 1998 Isuzu Amigo Neck A-P Shear (Positive) Analysis



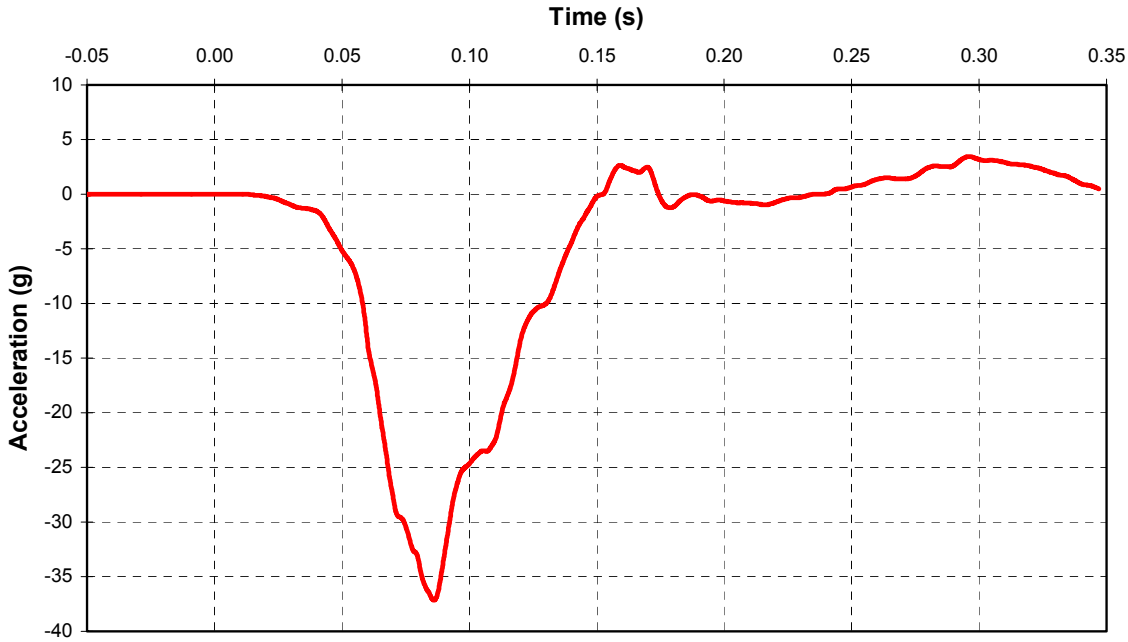
A- 16 CF98016 1998 Isuzu Amigo Neck A-P Shear (Negative) Analysis



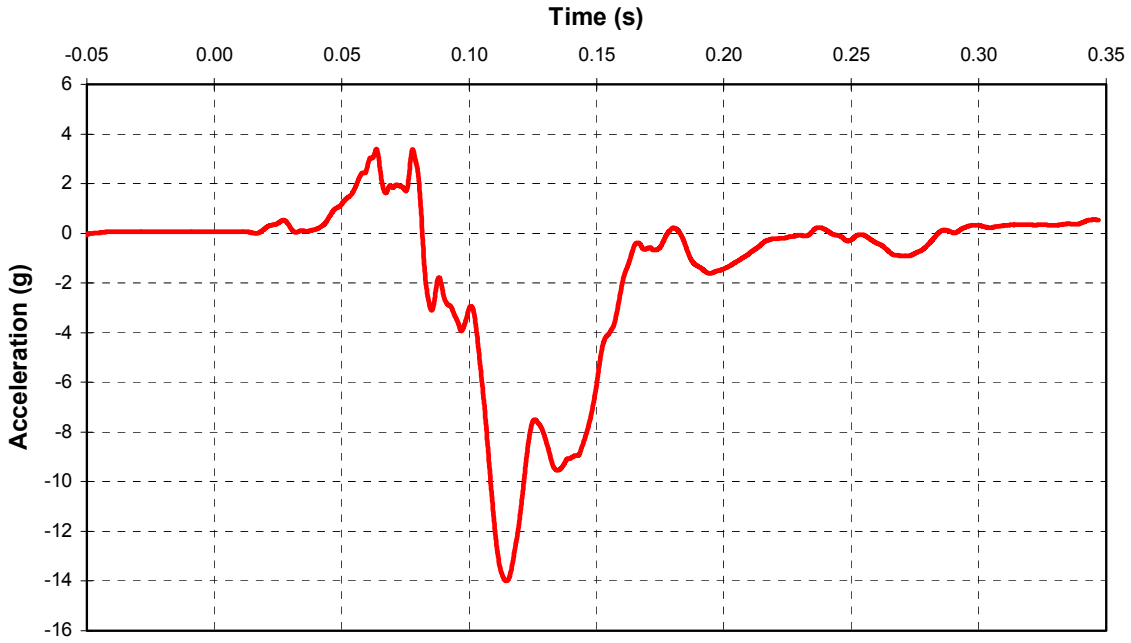
A- 17 CF98016 1998 Isuzu Amigo Chest Compression



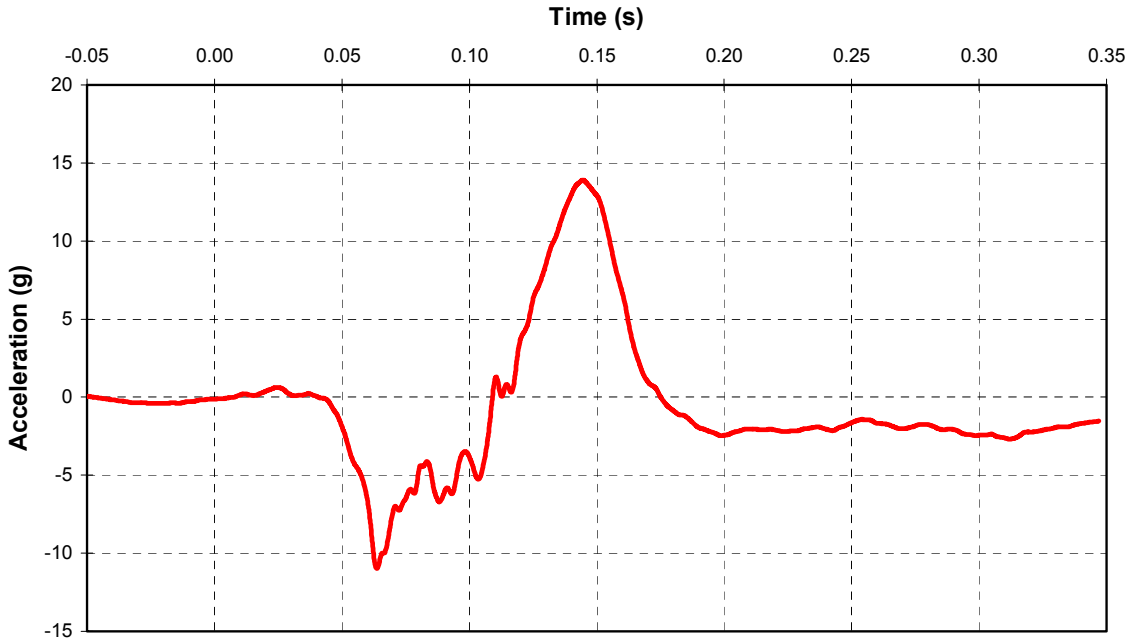
A- 18 CF98016 1998 Isuzu Amigo Chest A-P Acceleration



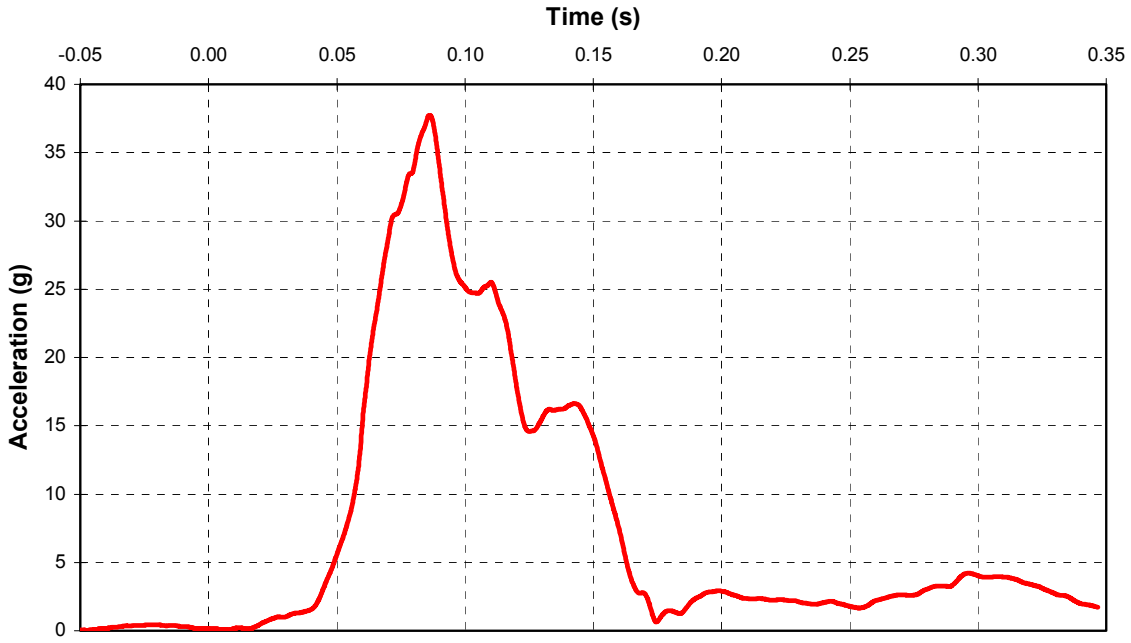
A- 19 CF98016 1998 Isuzu Amigo Chest L-M Acceleration



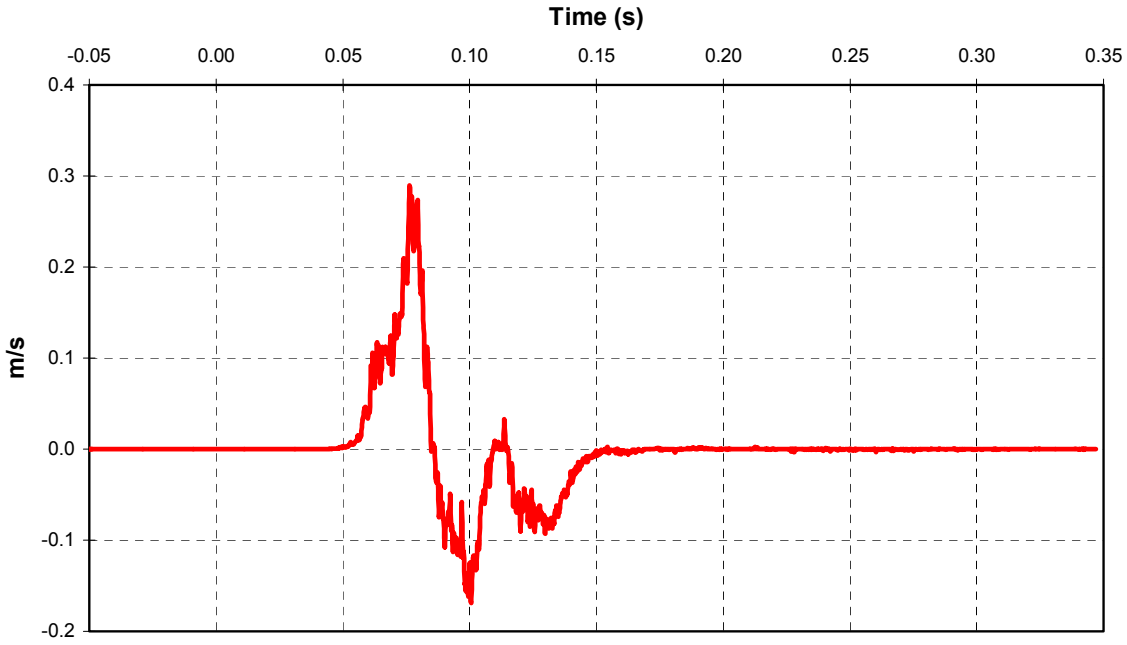
A- 20 CF98016 1998 Isuzu Amigo Chest I-S Acceleration



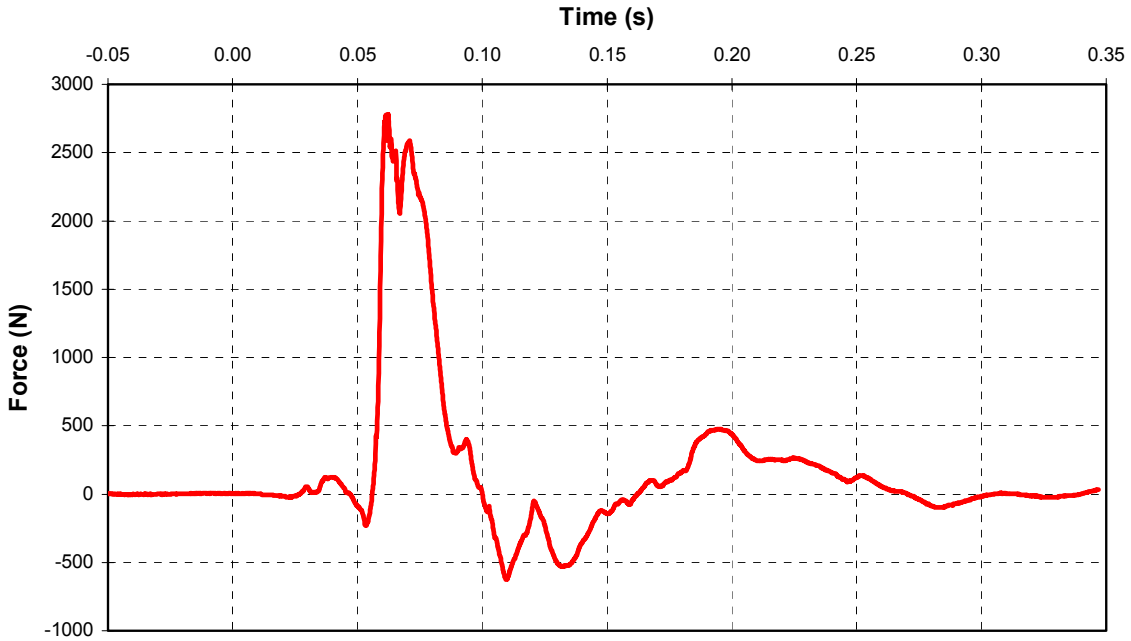
A- 21 CF98016 1998 Isuzu Amigo Chest Vector Resultant Acceleration



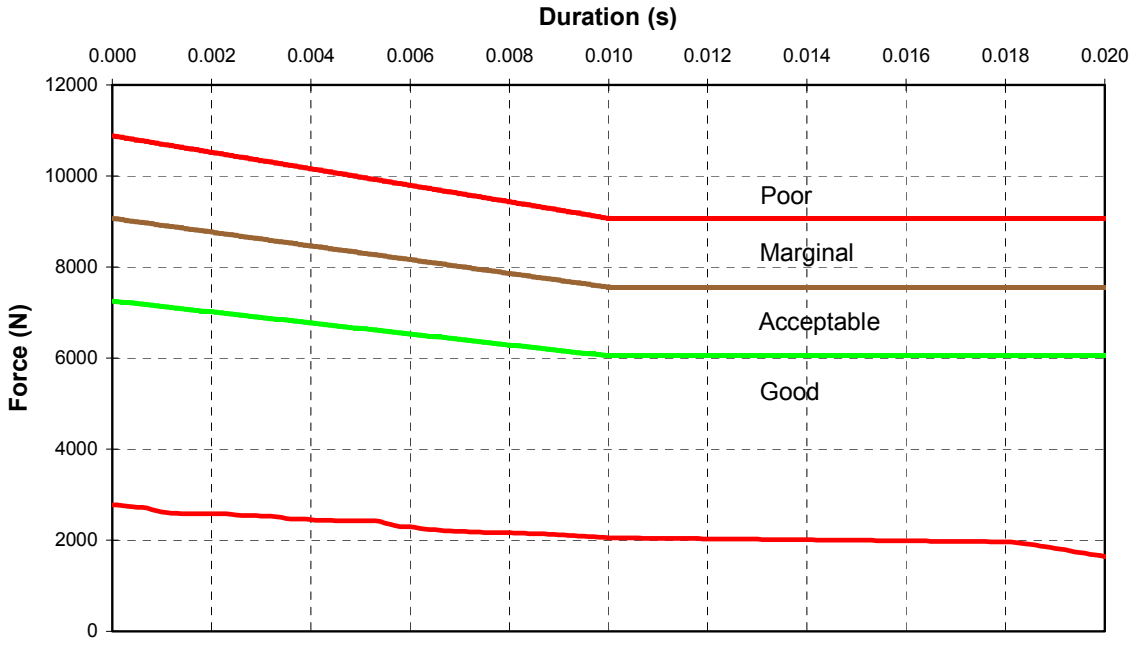
A- 22 CF98016 1998 Isuzu Amigo Viscous Criterion



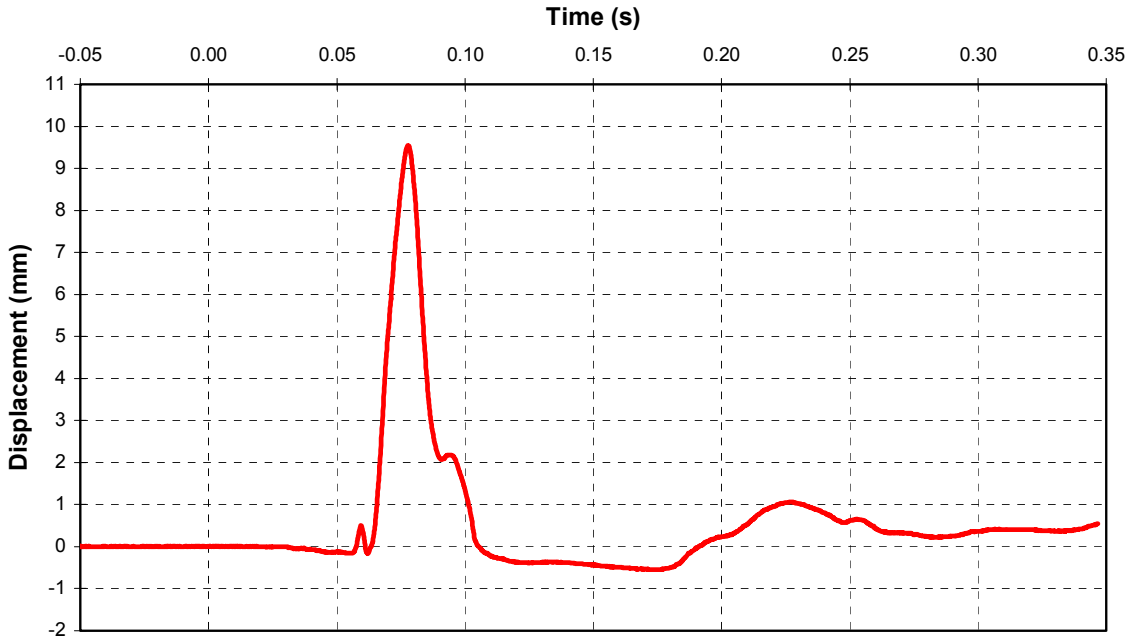
A- 23 CF98016 1998 Isuzu Amigo Left Femur Axial Force



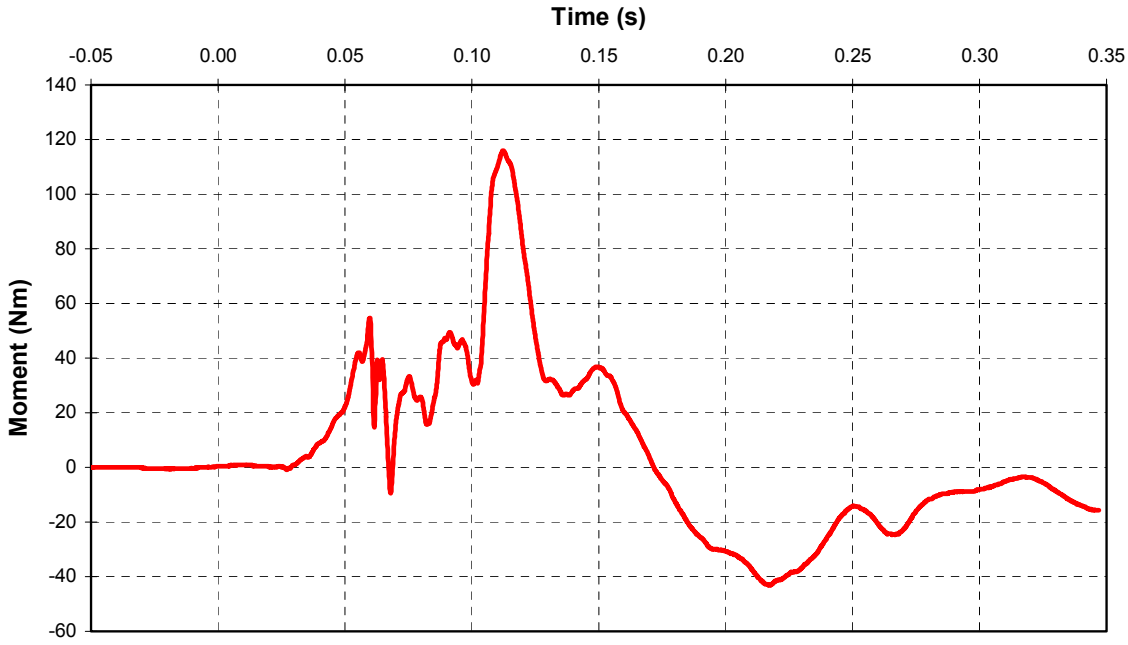
A- 24 CF98016 1998 Isuzu Amigo Left Femur Axial Force Analysis



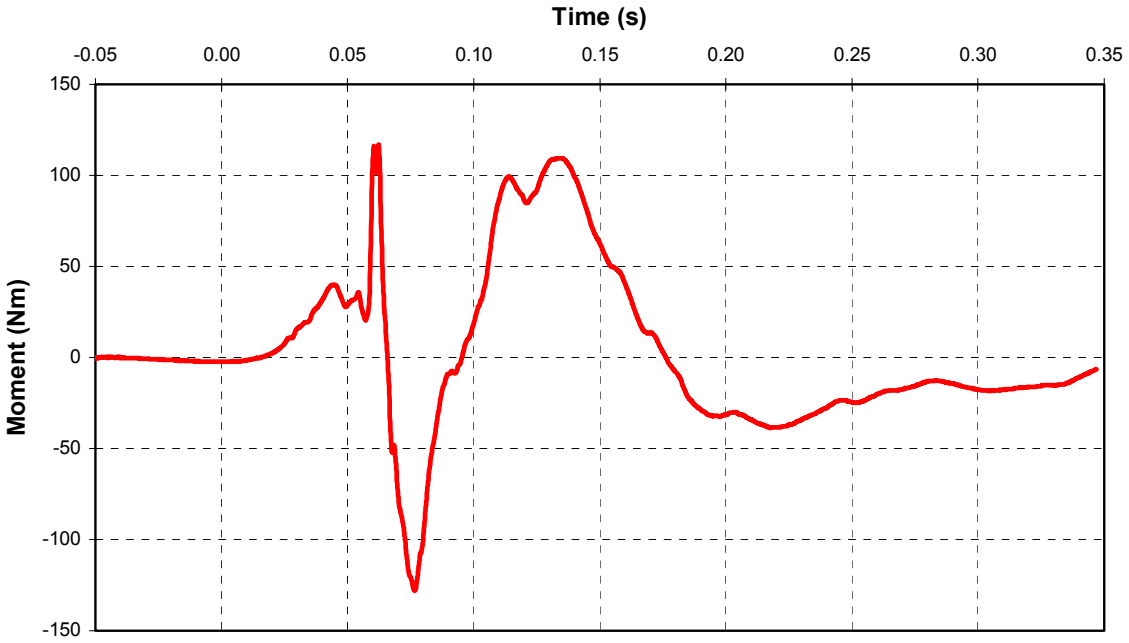
A- 25 CF98016 1998 Isuzu Amigo Left Tibia-Femur Displacement



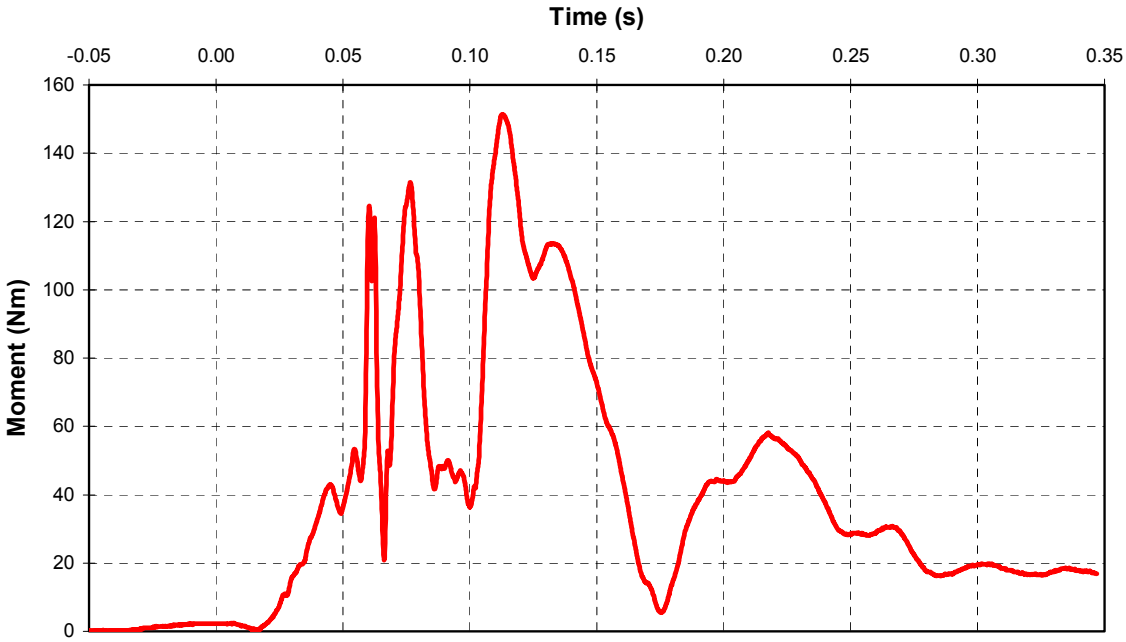
A- 26 CF98016 1998 Isuzu Amigo Left Upper Tibia L-M Moment



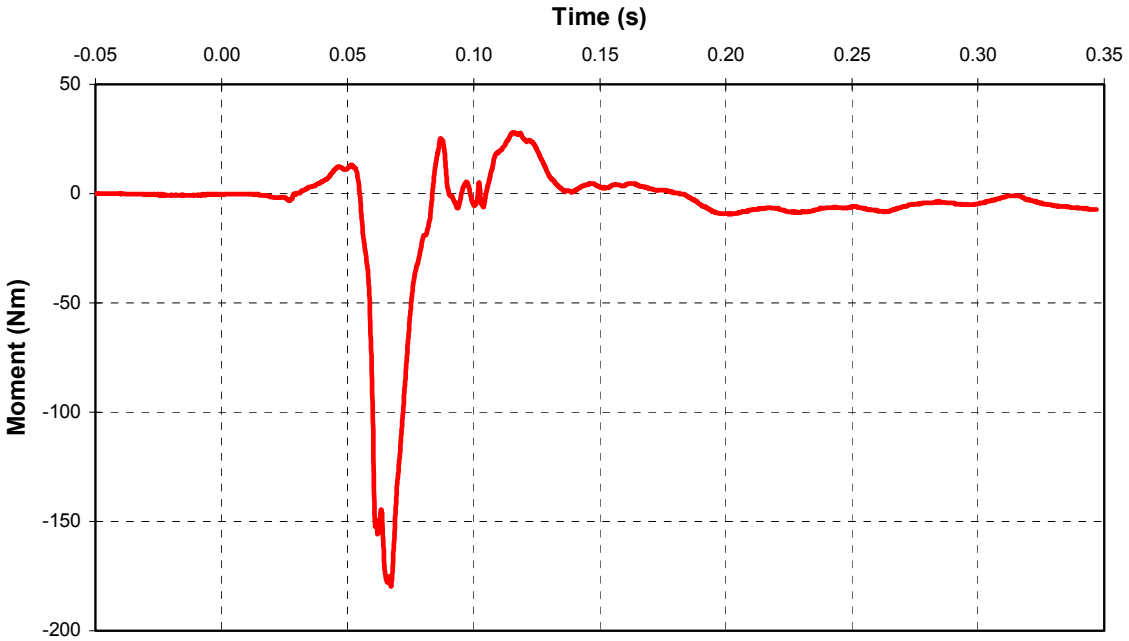
A- 27 CF98016 1998 Isuzu Amigo Left Upper Tibia A-P Moment



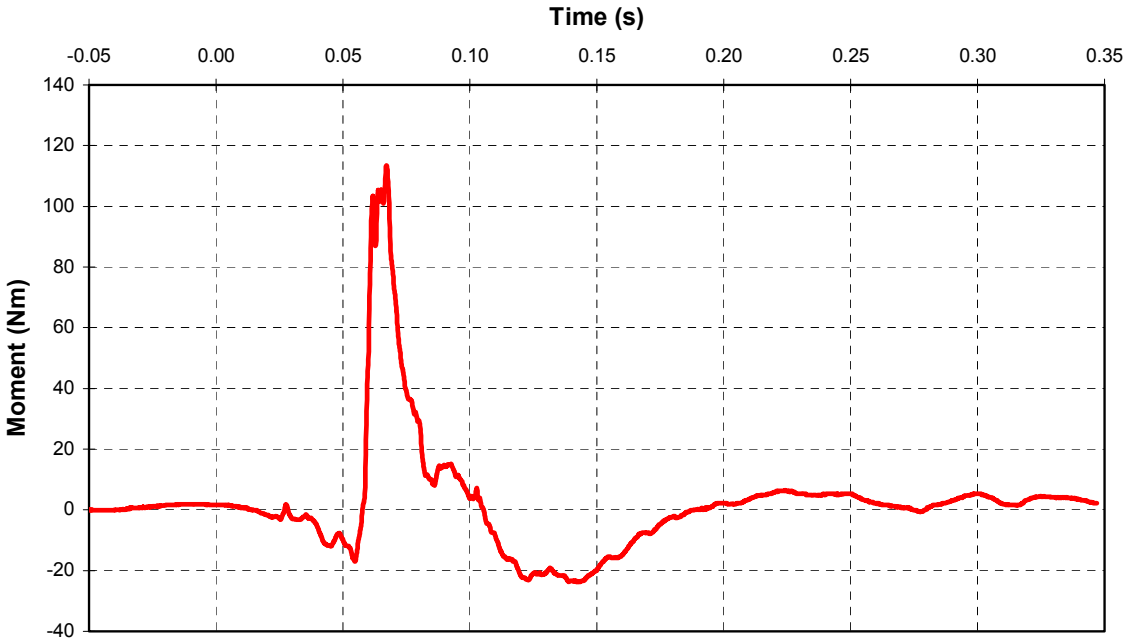
A- 28 CF98016 1998 Isuzu Amigo Left Upper Tibia Vector Resultant Moment



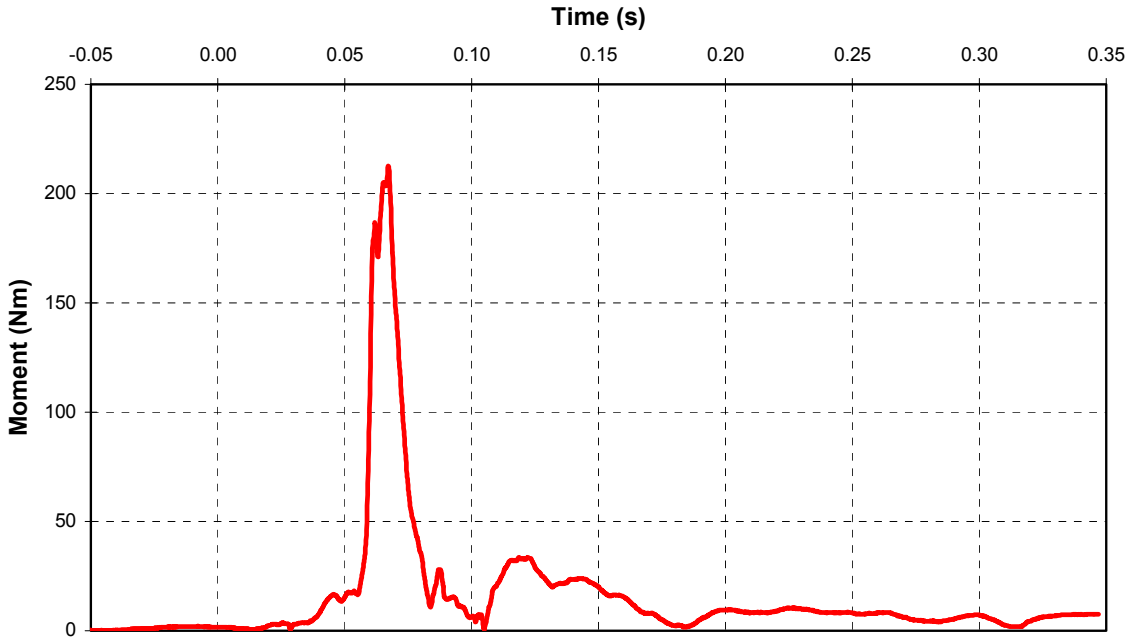
A- 29 CF98016 1998 Isuzu Amigo Left Lower Tibia L-M Moment



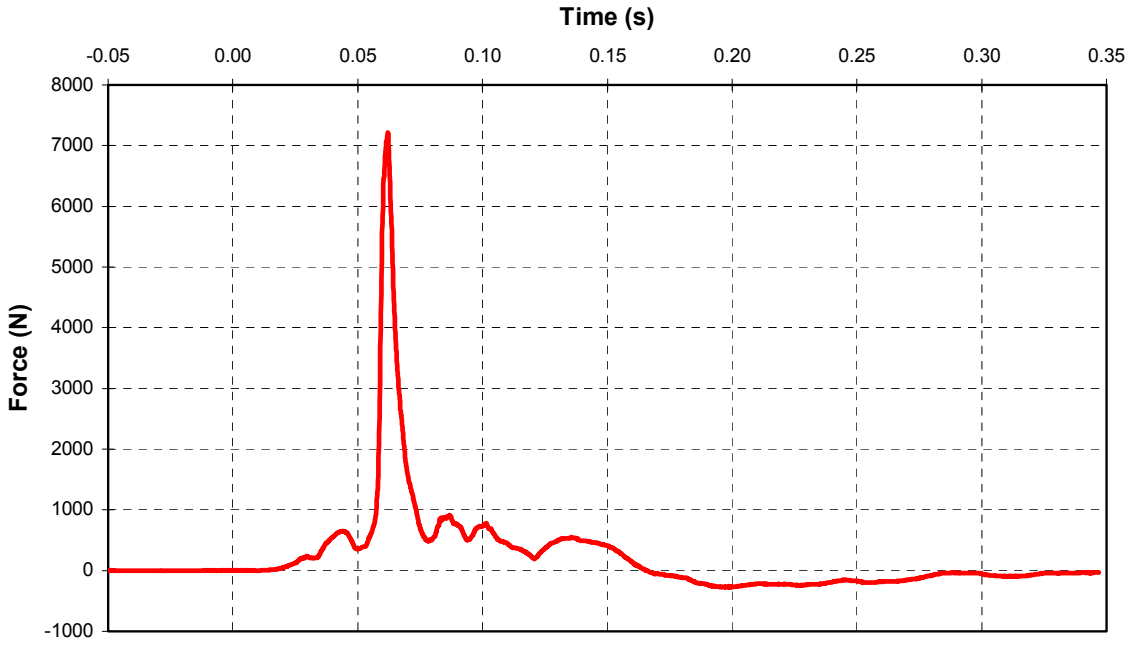
A- 30 CF98016 1998 Isuzu Amigo Left Lower Tibia A-P Moment



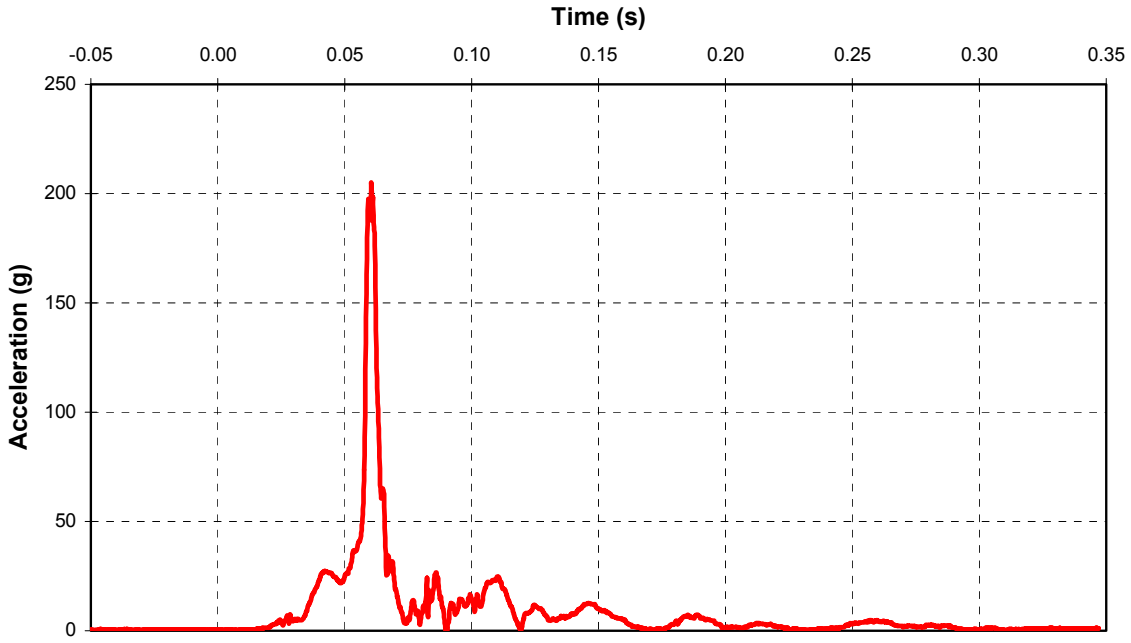
A- 31 CF98016 1998 Isuzu Amigo Left Lower Tibia Vector Resultant Moment



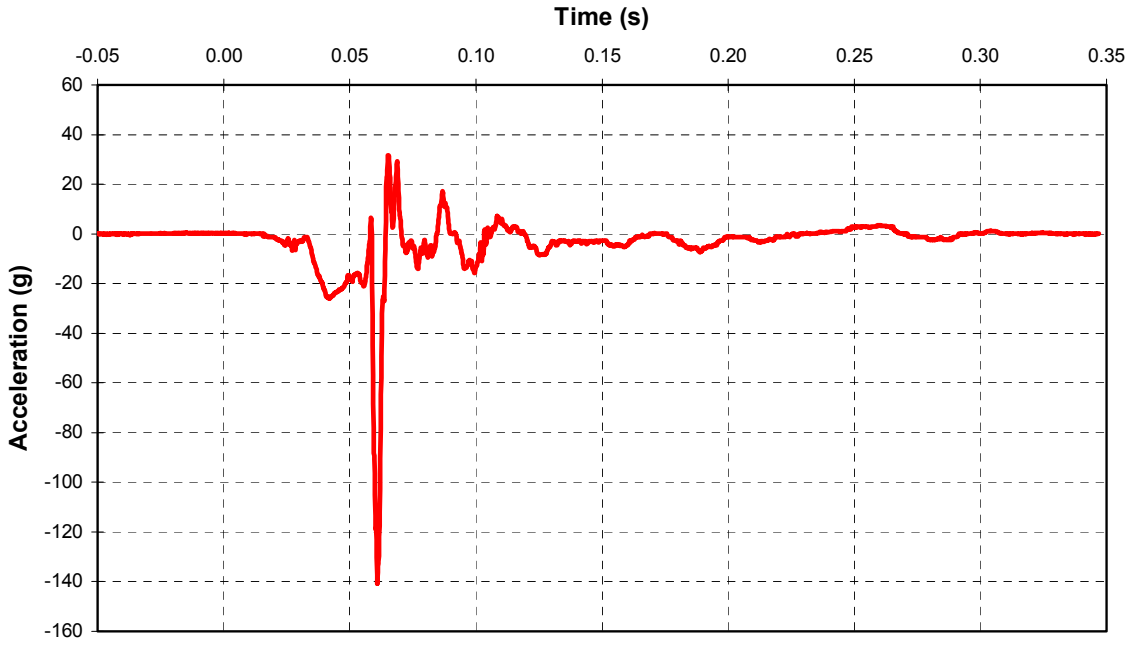
A- 32 CF98016 1998 Isuzu Amigo Left Lower Tibia Axial Force



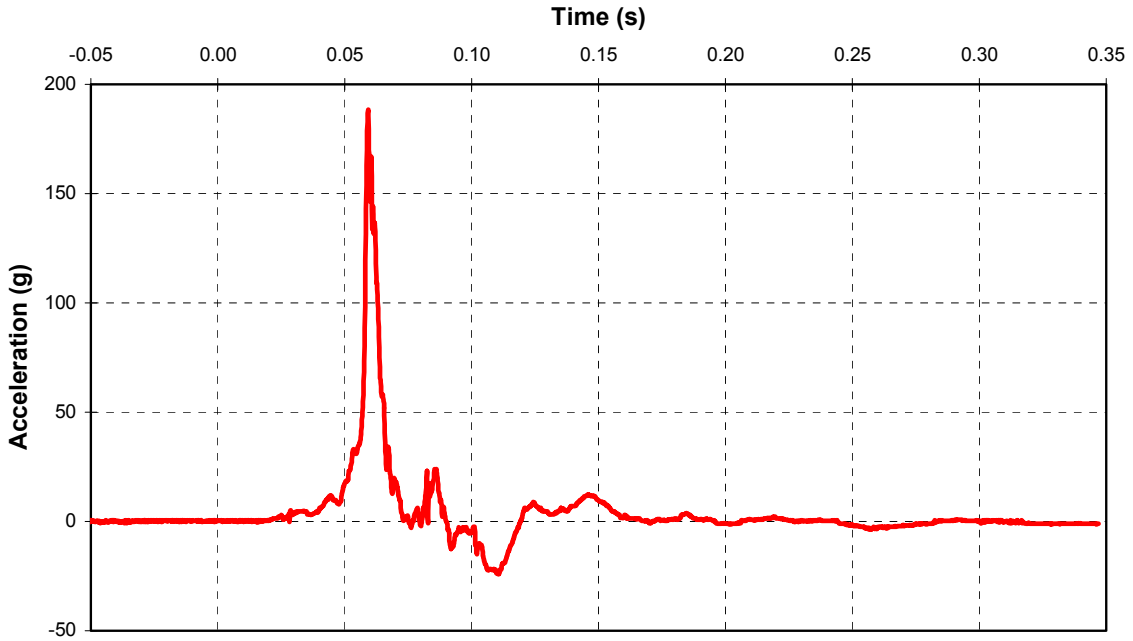
A- 33 CF98016 1998 Isuzu Amigo Left Foot Vector Resultant Acceleration



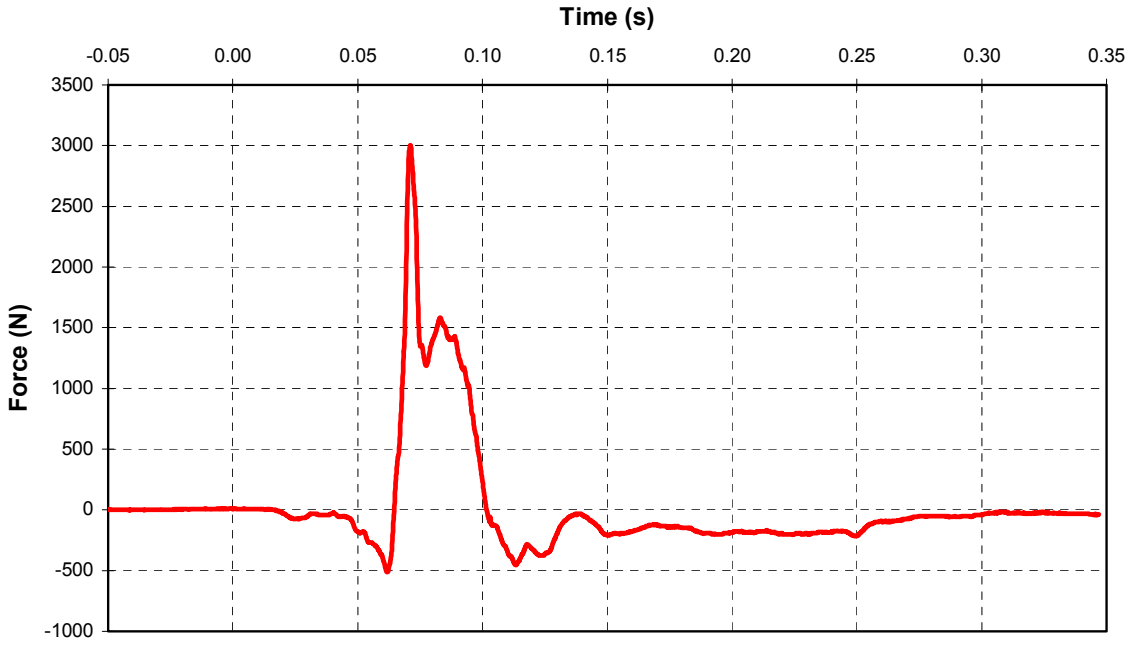
A- 34 CF98016 1998 Isuzu Amigo Left Foot A-P Acceleration



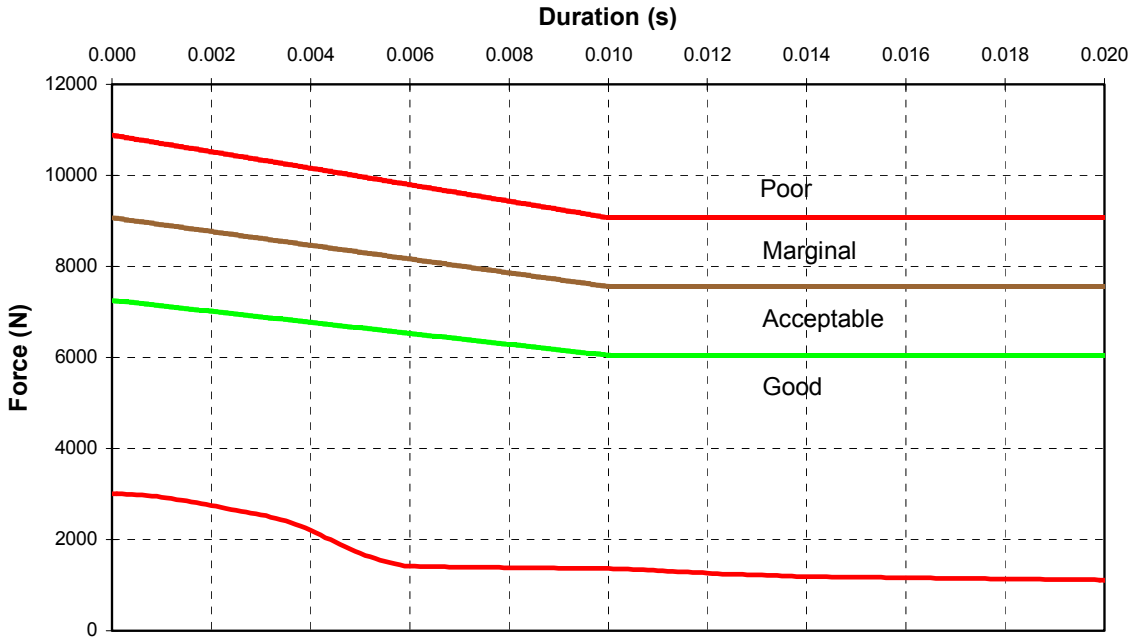
A- 35 CF98016 1998 Isuzu Amigo Left Foot I-S Acceleration



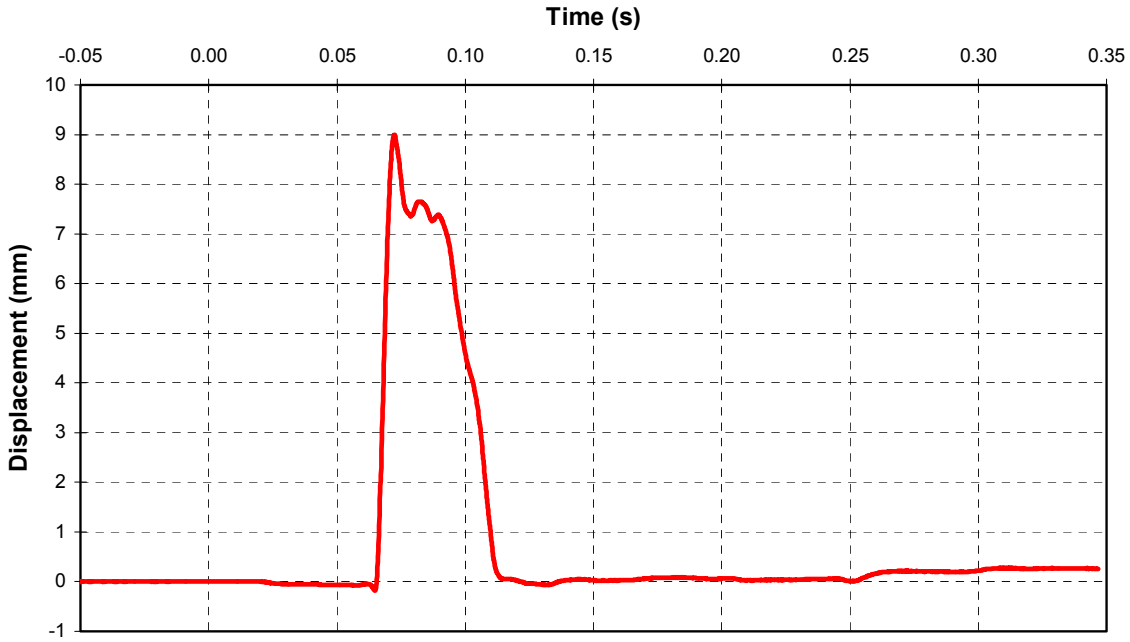
A- 36 CF98016 1998 Isuzu Amigo Right Femur Axial Force



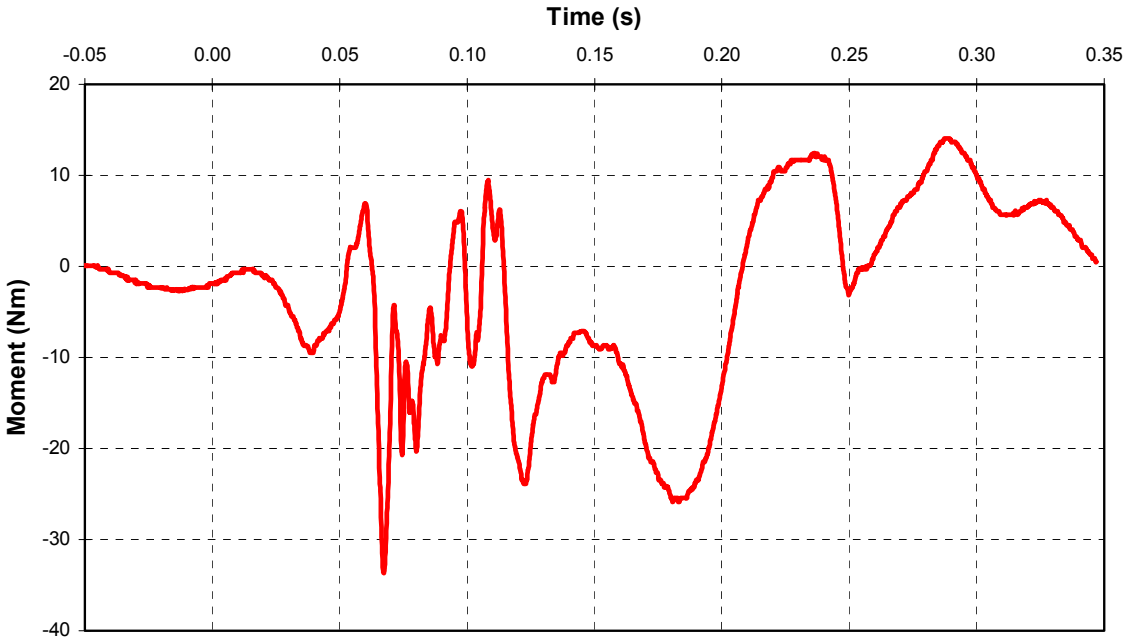
A- 37 CF98016 1998 Isuzu Amigo Right Femur Axial Force Analysis



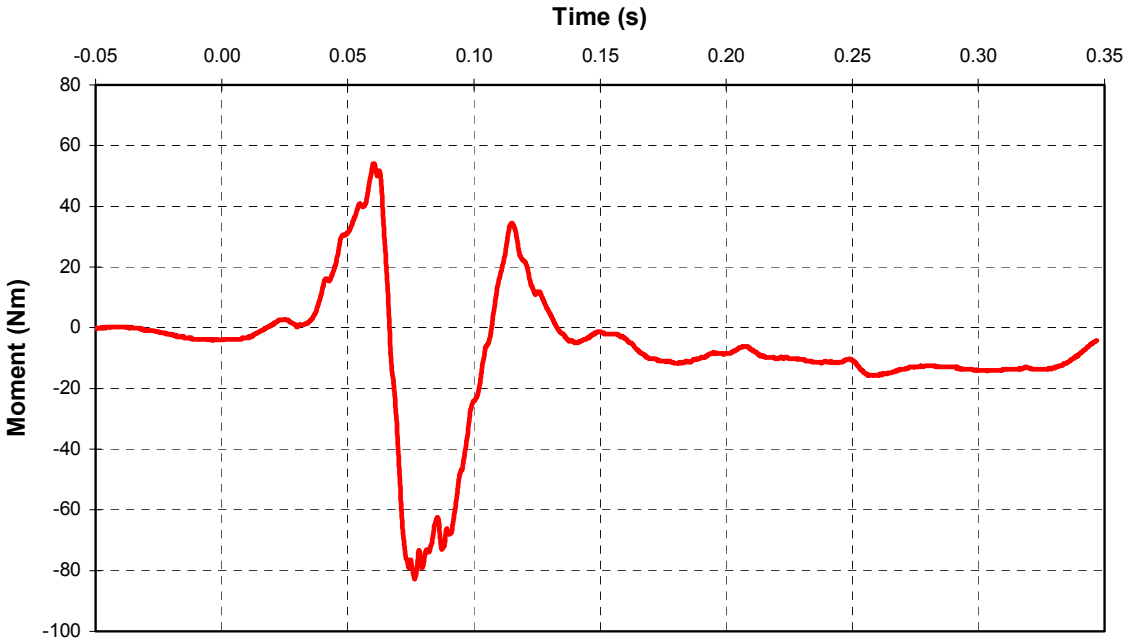
A- 38 CF98016 1998 Isuzu Amigo Right Tibia-Femur Displacement



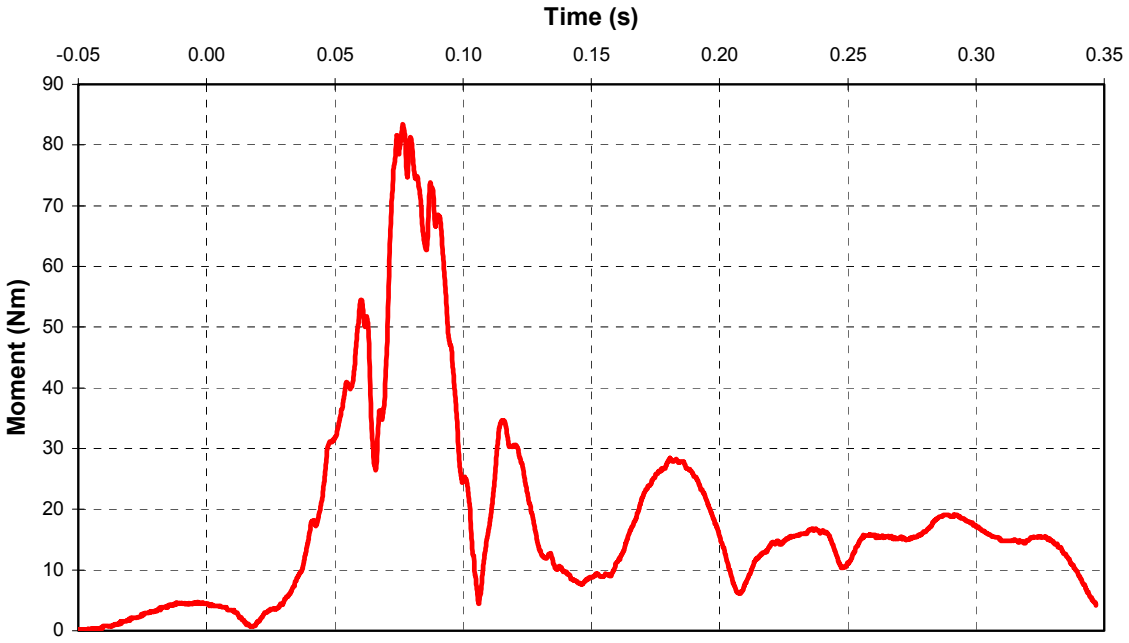
A- 39 CF98016 1998 Isuzu Amigo Right Upper Tibia L-M Moment



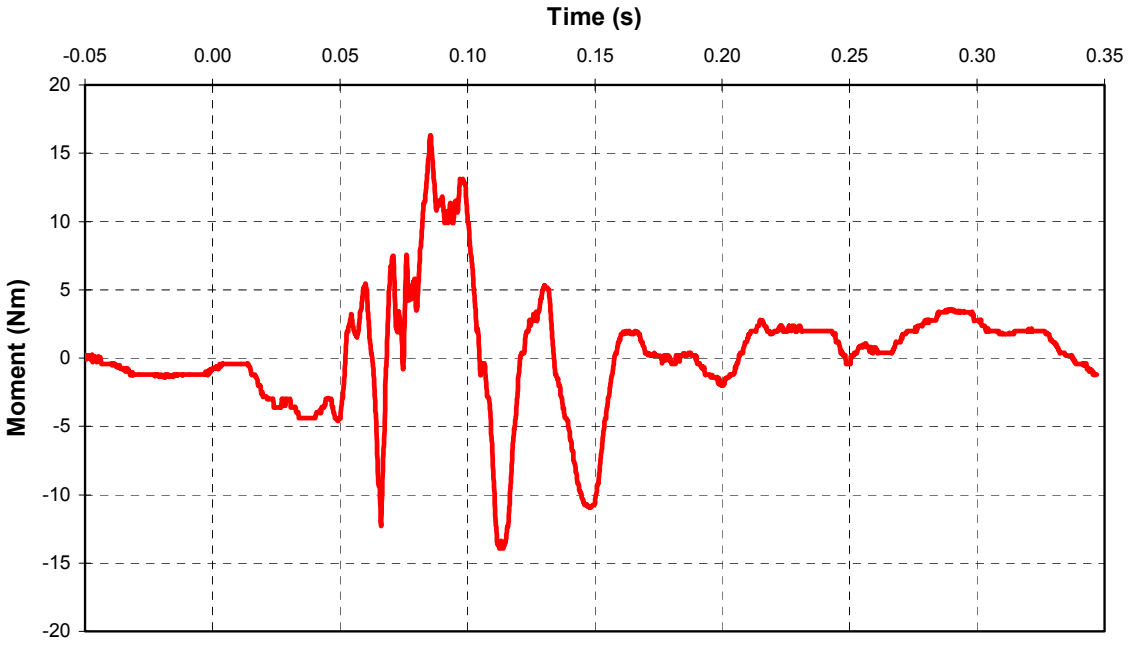
A- 40 CF98016 1998 Isuzu Amigo Right Upper Tibia A-P Moment



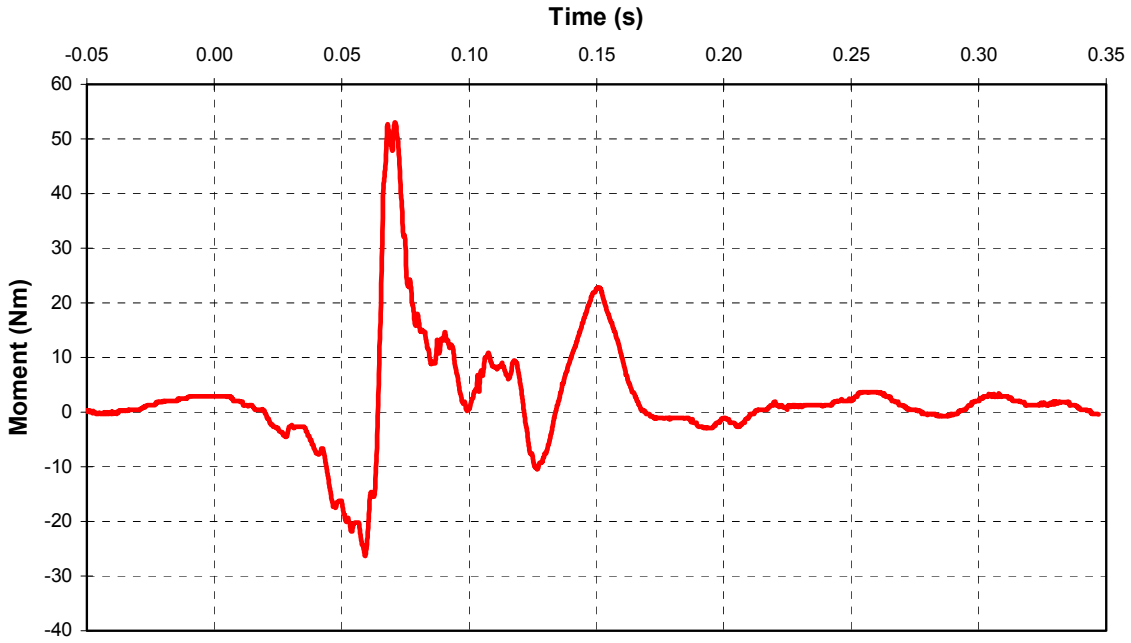
A- 41 CF98016 1998 Isuzu Amigo Right Upper Tibia Vector Resultant Moment



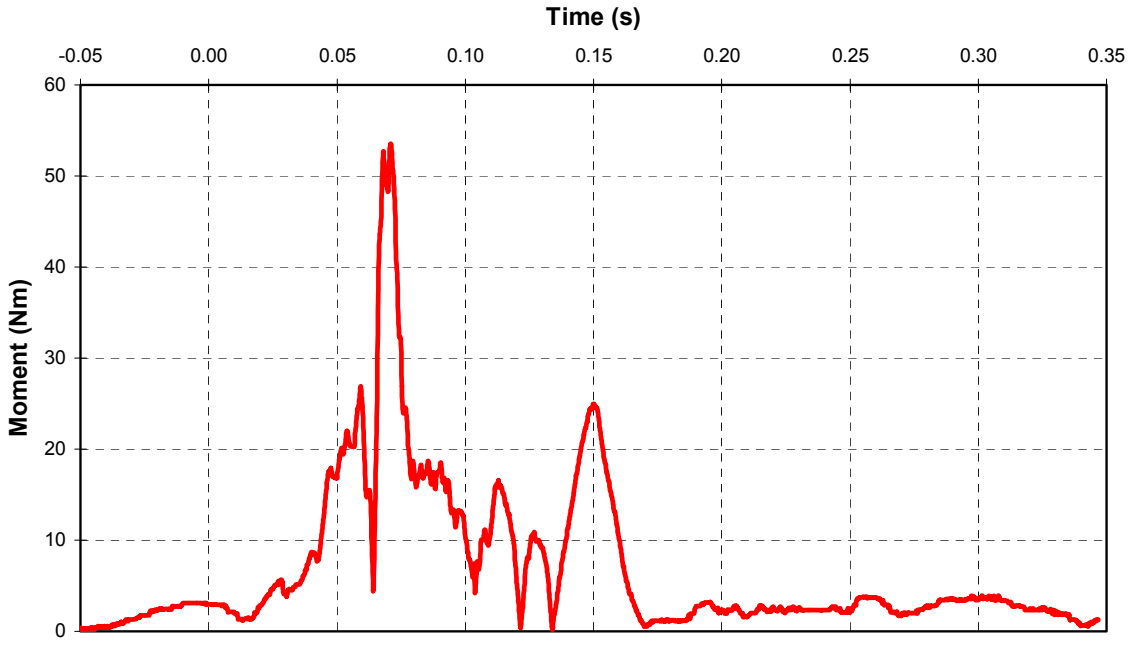
A- 42 CF98016 1998 Isuzu Amigo Right Lower Tibia L-M Moment



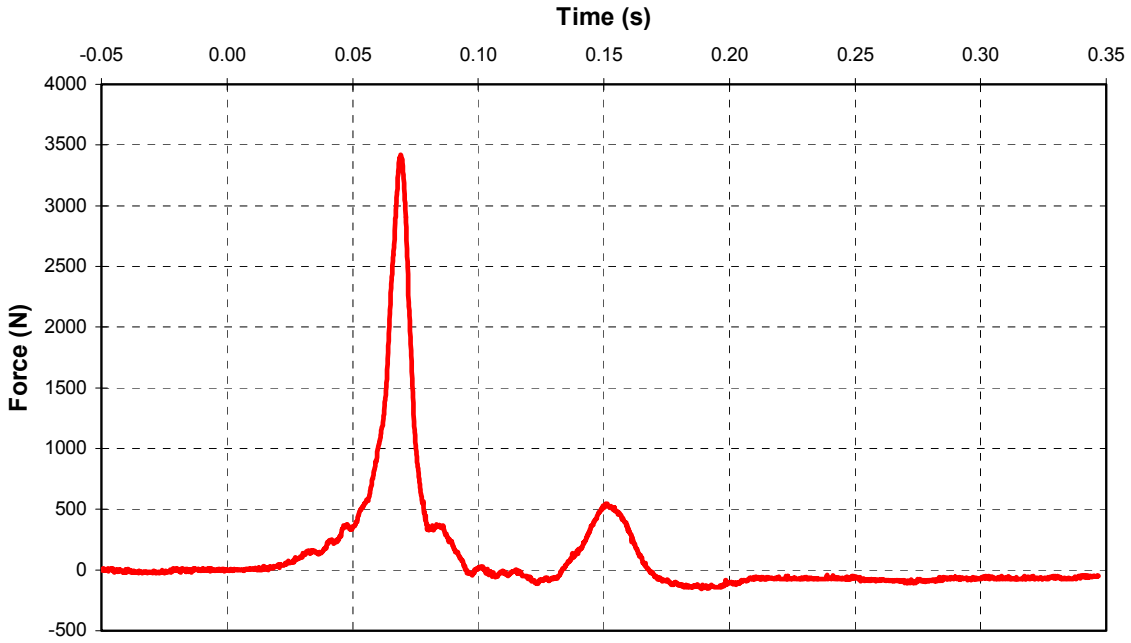
A- 43 CF98016 1998 Isuzu Amigo Right Lower Tibia A-P Moment



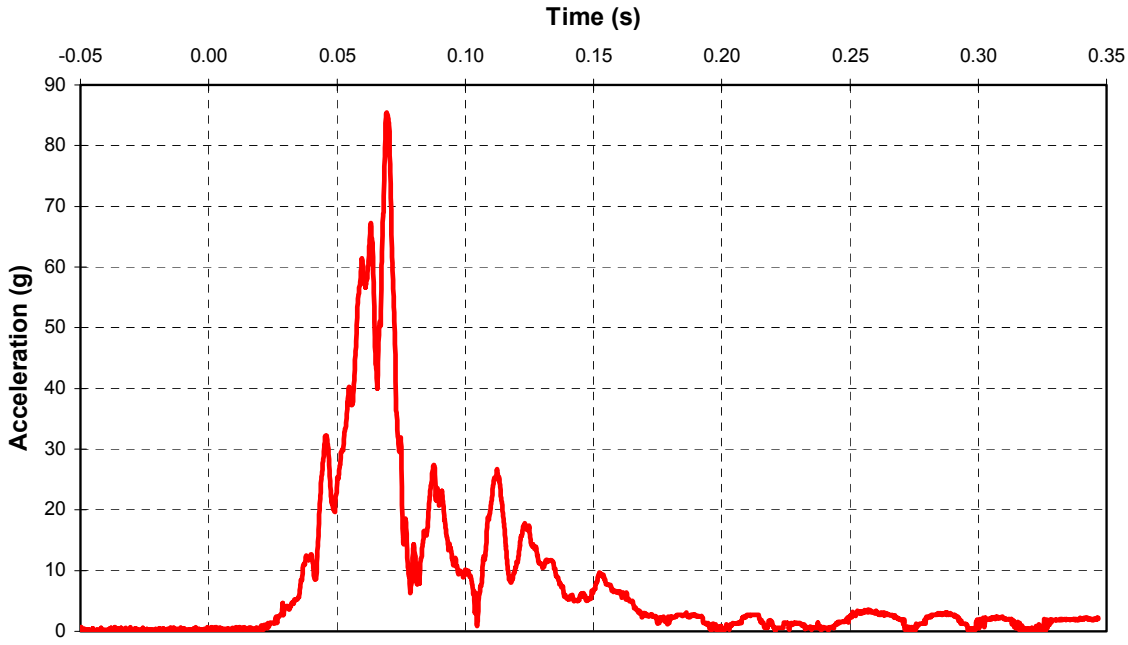
A- 44 CF98016 1998 Isuzu Amigo Right Lower Tibia Vector Resultant Moment



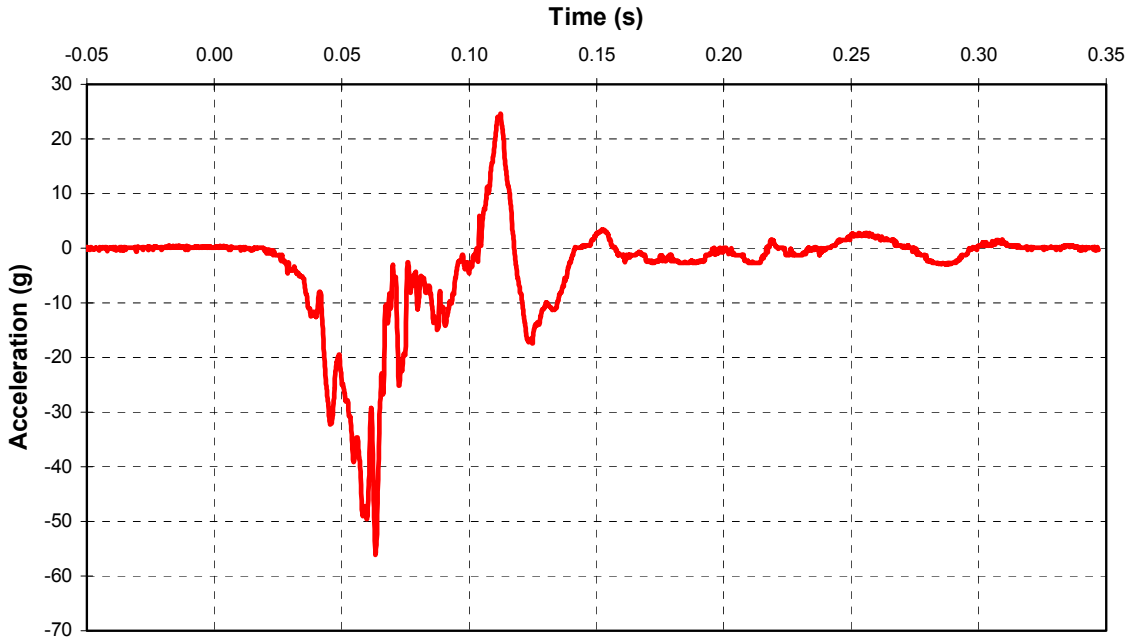
A- 45 CF98016 1998 Isuzu Amigo Right Lower Tibia Axial Force



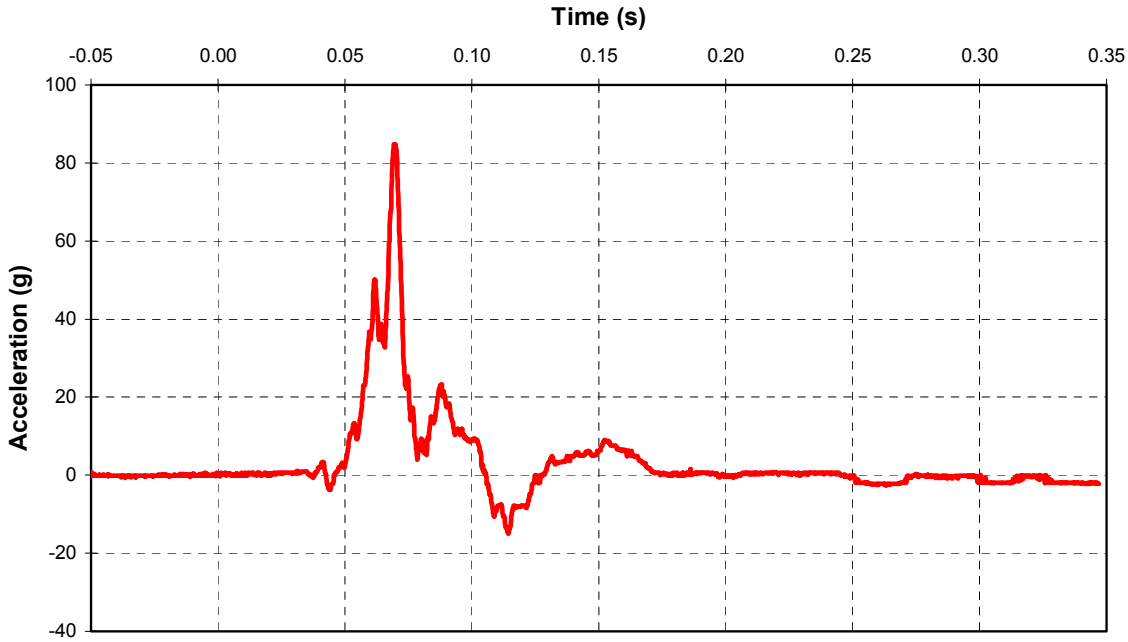
A- 46 CF98016 1998 Isuzu Amigo Right Foot Vector Resultant Acceleration



A- 47 CF98016 1998 Isuzu Amigo Right Foot A-P Acceleration



A- 48 CF98016 1998 Isuzu Amigo Right Foot I-S Acceleration



ISUZU

YEAR MODEL DESCRIPTION

'98 AMIGO

4WD, 5-SPEED MANUAL TRANS. SOFT TOP

EXTERIOR COLOR	INTERIOR COLOR	MODEL	ENGINE TYPE
CAPRICE BLUE METALLIC	GRAY	C15	2.2 DOHC

STANDARD EQUIPMENT

MECHANICAL

- 2.2L DOHC 16 Valve 130-HP 4-Cyl. Engine
- Push-Button Shift-On-The-Fly 4WD
- 5-Speed Manual Transmission w/Overdrive
- Power-Assisted Front & Rear Disc Brakes
- Rack&Pinion Variable-Assist Power Steering
- 5-Link Coil/Shock Rear Suspension
- Stainless Steel Exhaust
- Maintenance Free Battery
- Padded Rear Sport Bar
- 17.7 Gallon Fuel Tank
- Complimentary Tank of Fuel

SAFETY

- Driver & Front Passenger Air Bags
- 4-Wheel Anti-Lock Brakes
- Audible Front Brake Pad Wear Indicators
- Side-Guard Door Beams
- Under Body Skid Plates
- Dynamic Safety Cage
- Collapsible Steering Column
- Adjustable Fr. Seat Belt Anchors
- Auto-Retract Belts for ChildSeat
- Dual Outside Mirrors
- 2-Speed Front Wiper/Washer w/Mist
- Roadside Assistance 60 Mo./60,000 Mi.

INTERIOR

- Reclining Fr. Bucket Seats-Adj. Headrests
- Folding Rear Seat w/Adj. Headrests
- Tilt-Up, Removeable Moonroof w/Sunshade
- 4-Speaker AM/FM Stereo Cassette Player
- Center Console with Cassette/CD Storage
- Front and Rear Cupholders
- Tachometer
- Sun Visors w/Vanity Mirrors
- Cargo Area & Front Console Power Points
- Dome and Map Lights
- Cargo Area Tie-Down Hooks
- Remote Hood Release w/Lock
- Passenger Assist Grips
- Cut-Pile Floor Carpeting and Floor Mats
- Gray Flat Woven Cloth Material
- Tailgate & Side Door Pockets
- Passenger Seatback Pocket

EXTERIOR

- Convertible Top w/Zip-Out Vinyl Windows
- Tinted Windows / Color Keyed Grille
- Mud Flaps
- Full Size Spare Tire w/Cover

WARRANTY

- 36 Mo./50,000 Mi. Limited Basic
- 60 Mo./60,000 Mi. Limited Powertrain
- 72 Mo./100,000 Mi. Limited Anti-Corrosion

36 MONTHS 50000 MILES

MANUFACTURER'S SUGGESTED RETAIL PRICE	**$17,500**
OPTIONAL INSTALLED EQUIPMENT	
Air Conditioning (CFC Free)	950
Limited Slip Differential	250
16" Alloy Wheels w/P245 Tires	500
Fog Lamps	70
Fender Flares & Black Ctr. Post	200
Destination and Handling	**445**
TOTAL VEHICLE PRICE	**$19,915**

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

CITY MPG

20

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

- 17 and 23 mpg in the city and between
- 19 and 27 mpg on the highway

1998 4WD AMIGO, 2198 CC ENGINE, 4 CYLINDERS, MULTI-POINT FUEL INJECTION, 5-SPEED MANUAL TRANSMISSION, CATALYST

Estimated Annual Fuel Cost $892

FOR COMPARISON SHOPPING, all vehicles classified as SPECIAL PURPOSE have been issued mileage ratings ranging from

- 12 and 24 mpg in the city and between
- 16 and 29 mpg on the highway

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./CANADIAN PARTS CONTENT: 55%
MAJOR SOURCES OF FOREIGN PARTS CONTENT:
Japan 30%

FOR THIS VEHICLE
FINAL ASSEMBLY POINT: Lafayette,IN,USA
COUNTRY OF ORIGIN:
ENGINE PARTS: AUSTRALIA
TRANSMISSION: Japan

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

Gasoline, License And Title Fees State And Local Taxes And Dealer Installed Options And Accessories Are Not Included In The Manufacturer's Suggested Retail Price.

Manufacturer's Suggested Retail Price Includes Manufacturer's Recommended Predelivery Inspection.

This Label Has Been Affixed To This Vehicle Pursuant To The Requirements of U.S.C. 15. #1231 Et Seq. Which Prohibits Its Removal Or Alteration Prior To Delivery To The Ultimate Purchaser.

DEALER NAME:

BOB DUNN ISUZU
3915 WEST WENDOVER AVENUE
GREENSBORO NC 27407

PORT/PLANT: LAFAYETTE

DEALER CODE: 31050 026442

SHIPPED TO: (SAME UNLESS OTHERWISE INDICATED)

VIN NO. 4S2CM57D4W4342905