REPORT NUMBER: TWG-MGA-2007-006

NEW CAR ASSESSMENT PROGRAM
SIDE AIRBAG OUT-OF-POSITION INJURY TESTING

NISSAN MOTOR CO., LTD.
2007 NISSAN ALTIMA
NHTSA NUMBER: M75202TWG2

PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Date: May 2, 2007

Final Report Date: May 30, 2007

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-12005.

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: Jessica Gall
Jessica Gall, Project Engineer

Date: 5/30/07

Reviewed by: David Winkelbauer
David Winkelbauer, Facility Director

Date: 5/30/07

Technical Report Documentation Page

1. Report No. TWG-MGA-2007-006	*2. Government Accession No.*	*3. Recipient's Catalog No.*	
4. Title and Subtitle Final Report 2007 Nissan Altima NHTSA No.: M75202TWG2		*5. Report Date* May 30, 2007 *6. Performing Organization Code* MGA	
7. Author(s) Jessica Gall, Project Engineer		*8. Performing Organization Report No.* TWG-MGA-2007-006	
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-03-D-12005	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards 400 Seventh Street, SW, Room 5311 Washington, D.C. 20590		*13. Type of Report and Period Covered* 5/02/07 – 5/30/07 *14. Sponsoring Agency Code* NVS-111	
15. Supplementary Notes			
16. Abstract This side impact out-of-position test was performed in conjunction with a New Car Assessment Program (NCAP). This test was conducted at MGA Research Corporation in Burlington, Wisconsin, on May 2, 2007.			

HIC 15	HIC 36	NIJ NTF	NIJ NTE	NIJ NCF	NIJ NCE
11.3	13.5	0.05	0.29	0.54	0.42

17. Key Words New Car Assessment Program (NCAP) Side Airbag Out-of-Position		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Admin., Technical Ref. Division, Room 5108 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590	
19. Security Classif. (of this report) Unclassified	*20. Security Classif. (of this page)* Unclassified	*21. No. of Pages* 39	22. Price

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

Section		Page No
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3

Data Sheet No.		Page No.
1	Test Summary	3
2	Test Vehicle Information	4
3	Dummy Positioning in Vehicle	5
4	Dummy Injury Criteria Values	6

Appendix

A	Photographs	A
B	Dummy Response Data Traces	B
C	Instrumentation Calibration Data	C

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

The purpose of this test was to obtain data in a static out-of-position side airbag deployment. These data constitute part of the general consumer information collected by the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-03-D-12005.

SUMMARY

The effects of both a curtain and torso airbag deployment in a 2007 Nissan Altima with an out-of-position SID-IIs Build Level D were evaluated. The test was performed by MGA Research Corporation on May 2, 2007. Pre and post test photographs of the vehicle and dummy can be found in Appendix A.

One real-time camera (24 fps) and three high-speed cameras (1000 fps) were used to document the side airbag deployment event. The following camera locations were used:

- Left Side Through Removed Driver Door
- Front Through Windshield
- Left Side ¾ View Through Windshield

One SID-IIs Build Level D dummy (Serial Number 032) was placed in the right front passenger seat situated in the inboard-facing position per Section 3.3.3.6 according to dummy placement instructions specified in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags as prepared by the Side Airbag Out-of-Position Injury Technical Working Group (TWG).

The dummy was instrumented with the following instrumentation:

- Head Accelerations
- Upper Neck Load Cell
- Lower Neck Load Cell
- Upper Spine Accelerations
- Lower Spine Accelerations
- Rib Displacements
- Rib Accelerations
- Spine Box Accelerations
- Pelvic Accelerations

The 43 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy data traces. Appendix C contains the instrumentation calibration data.

The SID-IIs dummy's visible contact points were as follows: The curtain airbag to the top and back of the head. The torso bag to the left shoulder, torso, and pelvis of the dummy.

The SID-IIs dummy was placed in the right front passenger seat facing toward the center of the vehicle with its arm against the seatback. The dummy's pelvis was adjusted until the dummy contacted the door trim panel. The arm was rotated to a horizontal orientation. The dummy's pelvis was then adjusted forward/rearward, with respect to the vehicle, to lean the dummy rearward to align the center of the first thoracic rib with the top edge of the airbag module. The dummy's spine was aligned such that a vertical plane through the centerline of the dummy's shoulder rib stiffener and shoulder bolt was parallel to the longitudinal plane of the vehicle. Masking tape was wrapped around the dummy's neck bracket to hold the dummy in place, if necessary.

This orientation complies with Section 3.3.3.6 of the TWG Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags as defined by Lund, et al and the Technical Working Group First Revision dated July, 2003.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

TEST SUMMARY

	Test Data	Description
Seating Position	P2	Right Front Seating Position
Test	3.3.3.6*	Side-facing SID-IIs dummy
Curtain Airbag	Roof-Rail Mounted	Side airbag
Torso Airbag	Seat Mounted	Side airbag
ATD Type/Serial No.	SID-IIs Build Level D / 032	5th Percentile Adult Female

* Procedure as defined by Lund, et al and the Technical Working Group dated July, 2003

Number of Data Channels	43
Number of Real-Time Video	1
Number of High-Speed Video	3

Visible Dummy Contact Points	
Head Contact	Curtain airbag to top and back of head
Left Shoulder Contact	Torso bag
Left Torso Contact	Torso bag
Left Pelvis Contact	Torso bag

DATA SHEET NO. 2

TEST VEHICLE INFORMATION

Please note that this vehicle had previously been tested in an NCAP Frontal Impact on December 4, 2006.

TEST VEHICLE INFORMATION

Manufacturer	Nissan
Model	Altima
Body Style	Sedan
NHTSA No.	M75202TWG2
VIN	1N4AL21E57C109067
Color	Super Black
Delivery Date	11/13/06
Odometer Reading (mile)	59
Dealer	Boucher Nissan
Transmission	Automatic
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.5
Engine Placement	Lateral
Automatic Door Lock (ADL)	No
Owners Manual Details Instructions on Disabling ADLs	N/A
Bucket Seats	Yes

TEST VEHICLE OPTIONS

Front Airbag	Yes
Driver Side Curtain Airbag	Yes
Driver Side Torso Airbag	Yes
Rear Passenger Side Curtain Airbag	Yes
Rear Passenger Side Torso Airbag	No
Force Limiter	Yes
Pretensioner	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Anti-lock Brakes	Yes
Traction Control	Yes
All Wheel Drive	No
Power Seats	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.
Date of Manufacture	10/06

GVWR (kg)	1941
GAWR Front (kg)	1017
GAWR Rear (kg)	993

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				408
Cargo Wt. (RCLW) (kg)				68

DATA SHEET NO. 3

DUMMY POSITIONING IN VEHICLE

Measurement		Value
Seat Position		Rearmost
Seat Height Position		Non-adjustable
Placed in Position No. 2		---
Seat Back Angle	SA (°)	25
Top of Airbag Module to Head/Neck Junction	AN (mm)	204
Head CG to Door Panel/Window	HD (mm)	188
Head to Seat Back Centerline	HSC (mm)	125
Chest to Dash	CD (mm)	---
Chest to Seatback	CS (mm)	---
Right Arm to Seat Back Centerline	RACL (mm)	---
Left Arm to Seat Back Centerline	LACL (mm)	---
Right Arm to Door Panel	RA (mm)	162
Left Arm to Door Panel	LA (mm)	78
Knee to Knee	KK (mm)	132
Toe to Toe	TT (mm)	55
Right Knee to Seat Cushion Centerline	KSCR (mm)	---
Left Knee to Seat Cushion Centerline	KSCL (mm)	---
Right Toe to Seat Cushion Centerline	TSCR (mm)	---
Left Toe to Seat Cushion Centerline	TSCL (mm)	---
Nose to Dash	ND (mm)	---
Nose to Seatback	NS (mm)	---
Top of Head to Headliner	HH (mm)	111

DATA SHEET NO. 4

DUMMY INJURY CRITERIA VALUES

NHTSA No. M75202TWG2

		MAXIMUM VALUE			
		Position No. 2			
DESCRIPTION	UNIT	MAXIMUM	TIME (ms)	MINIMUM	TIME (ms)
Head X	g	25.2	16.1	-11.0	31.0
Head Y	g	8.6	15.4	-14.0	18.5
Head Z	g	39.1	15.2	-12.2	25.3
Head Resultant	g	40.6	15.3		
Head X Redundant	g	28.1	16.1	-11.0	31.0
Head Y Redundant	g	8.9	15.3	-14.6	14.6
Head Z Redundant	g	38.6	15.1	-12.1	25.2
Head Resultant Redundant	g	40.3	15.2		
Upper Neck Fx	N	426.0	19.1	-113.5	31.5
Upper Neck Fy	N	412.9	24.5	-112.4	184.8
Upper Neck Fz	N	127.9	168.1	-1265.1	21.6
Upper Neck F Resultant	N	1363.2	21.6		
Upper Neck Mx	N-m	7.4	72.9	-19.6	12.6
Upper Neck My	N-m	41.4	19.1	-20.5	32.3
Upper Neck Mz	N-m	10.8	22.4	-9.1	78.6
Upper Neck M Resultant	N-m	42.6	19.1		
Lower Neck Fx	N	492.3	14.4	-188.3	35.2
Lower Neck Fy	N	366.7	11.4	-104.5	201.2
Lower Neck Fz	N	125.4	167.9	-1104.5	22.9
Lower Neck F Resultant	N	1119.9	19.6		
Lower Neck Mx	N-m	41.4	30.3	-23.7	185.7
Lower Neck My	N-m	33.0	24.6	-22.6	69.3
Lower Neck Mz	N-m	18.9	12.6	-11.2	77.8
Lower Neck M Resultant	N-m	46.3	30.3		
Upper Spine X	g	39.0	13.1	-10.7	21.2
Upper Spine Y	g	31.7	9.5	-5.0	13.3
Upper Spine Z	g	6.0	24.0	-4.1	6.5
Upper Spine Resultant	g	39.6	13.1		

DATA SHEET NO. 4 (continued)

DUMMY INJURY CRITERIA VALUES

NHTSA No. M75202TWG2

		MAXIMUM VALUE			
		Position No. 2			
DESCRIPTION	UNIT	MAXIMUM	TIME (ms)	MINIMUM	TIME (ms)
Lower Spine X	g	17.6	7.4	-37.0	12.9
Lower Spine Y	g	15.8	6.8	-7.1	30.8
Lower Spine Z	g	8.1	9.1	-7.4	13.9
Lower Spine Resultant	g	38.8	12.9		
Upper Thorax Spine Y	g	21.8	9.6	-5.9	29.9
Middle Thorax Spine Y	g	18.3	10.2	-6.2	30.1
Lower Thorax Spine Y	g	16.9	6.9	-6.5	30.4
Upper Abdomen Spine Y	g	15.8	6.8	-7.1	30.8
Lower Abdomen Spine Y	g	16.9	12.1	-9.0	18.0
Shoulder Rib DY	mm	0.7	201.7	-9.1	21.5
Upper Thorax Rib DY	mm	0.3	37.5	-14.2	11.3
Mid Thorax Rib DY	mm	0.1	37.3	-13.9	10.1
Lower Thorax Rib DY	mm	0.1	274.7	-14.5	9.6
Upper Abdominal Rib DY	mm	0.7	19.9	-10.5	12.4
Lower Abdominal Rib DY	mm	0.6	299.7	-9.9	12.3
Upper Thorax Rib Y	g	349.0	5.3	-175.3	11.7
Mid Thorax Rib Y	g	580.7	5.2	-186.4	9.3
Lower Thorax Rib Y	g	626.8	5.1	-208.4	9.1
Upper Abdominal Rib Y	g	328.0	5.0	-219.8	8.4
Lower Abdominal Rib Y	g	449.8	4.6	-215.2	8.3
Pelvis X	g	6.9	4.8	-3.4	6.3
Pelvis Y	g	14.2	4.8	-1.9	68.6
Pelvis Z	g	8.1	5.3	-4.6	29.3
Pelvis Resultant	g	16.2	4.9		

DATA SHEET NO. 4 (continued)

DUMMY INJURY CRITERIA VALUES

NHTSA No. M75202TWG2

	HEAD INJURY CRITERIA (HIC)					
	HIC15			HIC36		
ATD position	HIC	T^1 (msec)	T^2 (msec)	HIC	T^1 (msec)	T^2 (msec)
No. 2 Right Front	11.3	14.5	22.8	13.5	14.5	33.4

Position 2 Neck Injury Summary (SID-IIs Build Level D – Out-Of-Position)

	Nij	Time (msec)	Z Force (N) (CFC 600)	X Force (N) (CFC 600)	Y Moment (N-m) (CFC 600)
Ntf	0.05	179.90	76.43	-33.48	4.85
Nte	0.29	31.00	0.96	-106.07	-17.40
Ncf	0.54	19.20	-1228.31	419.41	33.87
Nce	0.42	34.70	-443.75	-30.79	-18.40
Peak Tension (CFC1000)		**127.9 N**	**Peak Compression (CFC 1000)**		**-1265.1 N**

Critical Values

Nij Intercepts				Peak Limits	
Tension (CVt)	3880 N	Extension (mCVe)	61 N-m	Tension	2070 N
Compression (CVc)	3880 N	Flexion (mCVf)	155 N-m	Compression	2520 N
Condyle Offset	**0.01778 m**				

APPENDIX A

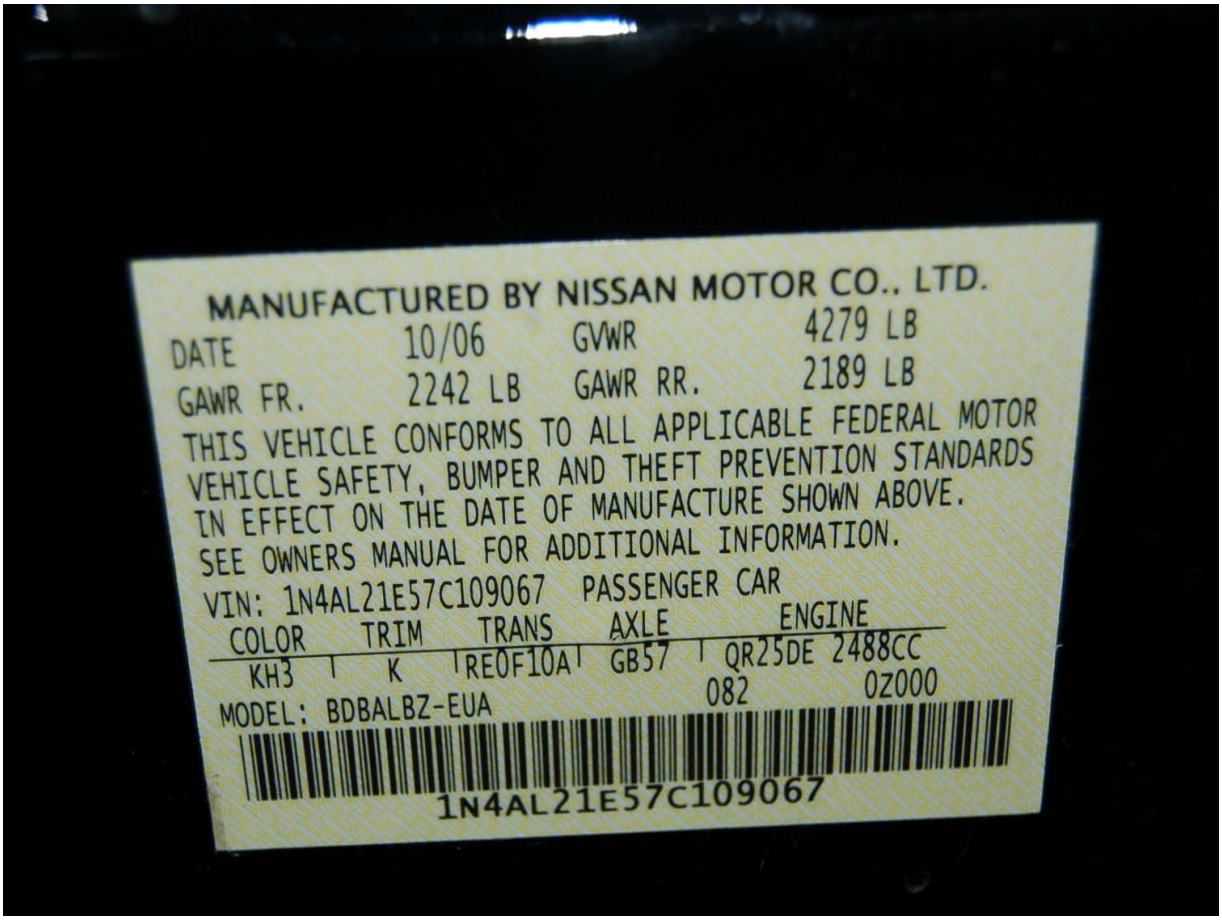
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

		Page No.
Photo No. 1.	Pre-Test Vehicle Left Side View	A-2
Photo No. 2.	Post-Test Vehicle Left Side View	A-2
Photo No. 3.	Vehicle Certification Placard	A-3
Photo No. 4.	Vehicle Tire Placard	A-3
Photo No. 5.	Pre-Test SID-IIs Dummy Frontal View	A-4
Photo No. 6.	Post-Test SID-IIs Dummy Frontal View	A-4
Photo No. 7.	Pre-Test SID-IIs Dummy Frontal Closeup View	A-5
Photo No. 8.	Post-Test SID-IIs Dummy Frontal Closeup View	A-5
Photo No. 9.	Pre-Test SID-IIs Dummy Right ¾ Front View	A-6
Photo No. 10.	Post-Test SID-IIs Dummy Right ¾ Front View	A-6
Photo No. 11.	Pre-Test SID-IIs Dummy Right Side Head View	A-7
Photo No. 12.	Post-Test SID-IIs Dummy Right Side Head View	A-7
Photo No. 13.	Post-Test Right Front Passenger Compartment View	A-8
Photo No. 14.	Post-Test Curtain and Torso Airbag View	A-8

Pre-Test Vehicle Left Side View

Post-Test Vehicle Left Side View



Vehicle Certification Placard

Vehicle Tire Placard

Pre-Test SID-IIs Dummy Frontal View

Post-Test SID-IIs Dummy Frontal View

Pre-Test SID-IIs Dummy Frontal Closeup View

Post-Test SID-IIs Dummy Frontal Closeup View

Pre-Test SID-IIs Dummy Right¾Front View

Post-Test SID-IIs Dummy Right¾Front View

Pre-Test SID-IIs Dummy Right Side Head View

Post-Test SID-IIs Dummy Right Side Head View

Post-Test Right Front Passenger Compartment View

Post-Test Curtain and Torso Airbag View

APPENDIX B

DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

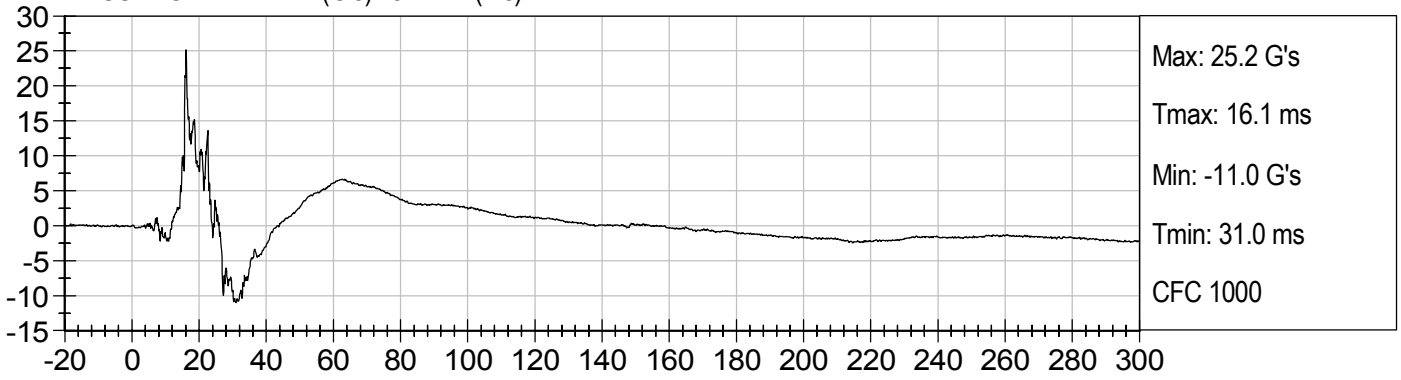
		Page No.
Figure No. 1.	Passenger Head X Acceleration vs. Time	B-3
Figure No. 2.	Passenger Head Y Acceleration vs. Time	B-3
Figure No. 3.	Passenger Head Z Acceleration vs. Time	B-3
Figure No. 4.	Passenger Head Resultant Acceleration vs. Time	B-3
Figure No. 5.	Passenger Head X Redundant Acceleration vs. Time	B-4
Figure No. 6.	Passenger Head Y Redundant Acceleration vs. Time	B-4
Figure No. 7.	Passenger Head Z Redundant Acceleration vs. Time	B-4
Figure No. 8.	Passenger Head Resultant Redundant Acceleration vs. Time	B-4
Figure No. 9.	Passenger Upper Neck X Force vs. Time	B-5
Figure No. 10.	Passenger Upper Neck Y Force vs. Time	B-5
Figure No. 11.	Passenger Upper Neck Z Force vs. Time	B-5
Figure No. 12.	Passenger Upper Neck Resultant Force vs. Time	B-5
Figure No. 13.	Passenger Upper Neck X Moment vs. Time	B-6
Figure No. 14.	Passenger Upper Neck Y Moment vs. Time	B-6
Figure No. 15.	Passenger Upper Neck Z Moment vs. Time	B-6
Figure No. 16.	Passenger Upper Neck Resultant Moment vs. Time	B-6
Figure No. 17.	Passenger Lower Neck X Force vs. Time	B-7
Figure No. 18.	Passenger Lower Neck Y Force vs. Time	B-7
Figure No. 19.	Passenger Lower Neck Z Force vs. Time	B-7
Figure No. 20.	Passenger Lower Neck Resultant Force vs. Time	B-7
Figure No. 21.	Passenger Lower Neck X Moment vs. Time	B-8
Figure No. 22.	Passenger Lower Neck Y Moment vs. Time	B-8
Figure No. 23.	Passenger Lower Neck Z Moment vs. Time	B-8
Figure No. 24.	Passenger Lower Neck Resultant Moment vs. Time	B-8
Figure No. 25.	Passenger Upper Spine X Acceleration vs. Time	B-9
Figure No. 26.	Passenger Upper Spine Y Acceleration vs. Time	B-9
Figure No. 27.	Passenger Upper Spine Z Acceleration vs. Time	B-9

		Page No.
Figure No. 28.	Passenger Upper Spine Resultant Acceleration vs. Time	B-9
Figure No. 29.	Passenger Lower Spine X Acceleration vs. Time	B-10
Figure No. 30.	Passenger Lower Spine Y Acceleration vs. Time	B-10
Figure No. 31.	Passenger Lower Spine Z Acceleration vs. Time	B-10
Figure No. 32.	Passenger Lower Spine Resultant Acceleration vs. Time	B-10
Figure No. 33.	Passenger Upper Thorax Spine Y Acceleration vs. Time	B-11
Figure No. 34.	Passenger Middle Thorax Spine Y Acceleration vs. Time	B-11
Figure No. 35.	Passenger Lower Thorax Spine Y Acceleration vs. Time	B-11
Figure No. 36.	Passenger Upper Abdomen Spine Y Acceleration vs. Time	B-12
Figure No. 37.	Passenger Lower Abdomen Spine Y Acceleration vs. Time	B-12
Figure No. 38.	Passenger Shoulder Rib Y Displacement vs. Time	B-13
Figure No. 39.	Passenger Shoulder Deflection Rate vs. Time	B-13
Figure No. 40.	Passenger Upper Thorax Rib Y Displacement vs. Time	B-13
Figure No. 41.	Passenger Upper Thorax Rib Deflection Rate vs. Time	B-13
Figure No. 42.	Passenger Mid Thorax Rib Y Displacement vs. Time	B-14
Figure No. 43.	Passenger Mid Thorax Rib Deflection Rate vs. Time	B-14
Figure No. 44.	Passenger Lower Thorax Rib Y Displacement vs. Time	B-14
Figure No. 45.	Passenger Lower Thorax Rib Deflection Rate vs. Time	B-14
Figure No. 46.	Passenger Upper Abdominal Rib Y Displacement vs. Time	B-15
Figure No. 47.	Passenger Upper Abdominal Rib Deflection Rate vs. Time	B-15
Figure No. 48.	Passenger Lower Abdominal Rib Y Displacement vs. Time	B-15
Figure No. 49.	Passenger Lower Abdominal Rib Deflection Rate vs. Time	B-15
Figure No. 50.	Passenger Upper Thorax Rib Y Acceleration vs. Time	B-16
Figure No. 51.	Passenger Mid Thorax Rib Y Acceleration vs. Time	B-16
Figure No. 52.	Passenger Lower Thorax Rib Y Acceleration vs. Time	B-16
Figure No. 53.	Passenger Upper Abdominal Rib Y Acceleration vs. Time	B-17
Figure No. 54.	Passenger Lower Abdominal Rib Y Acceleration vs. Time	B-17
Figure No. 55.	Passenger Pelvis X Acceleration vs. Time	B-18
Figure No. 56.	Passenger Pelvis Y Acceleration vs. Time	B-18
Figure No. 57.	Passenger Pelvis Z Acceleration vs. Time	B-18
Figure No. 58.	Passenger Pelvis Resultant Acceleration vs. Time	B-18

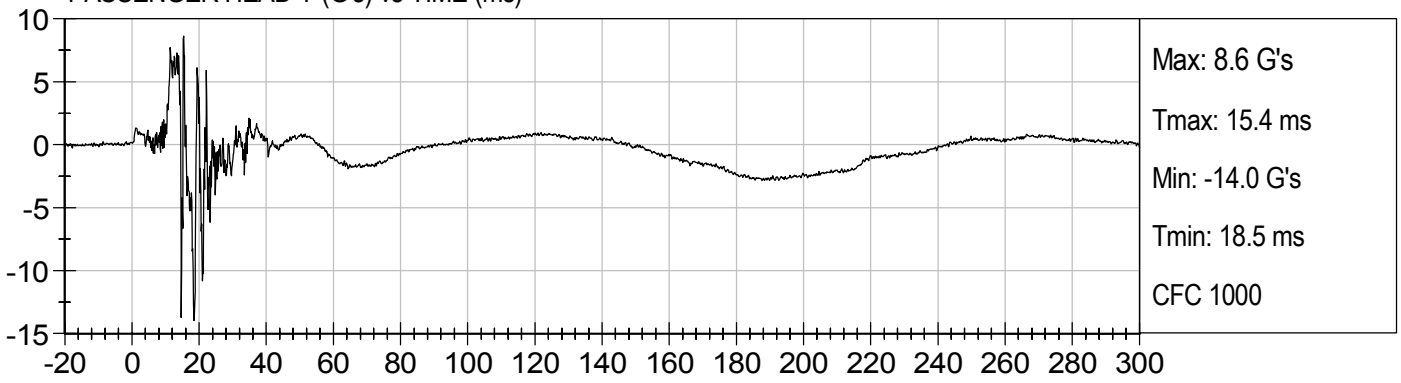
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

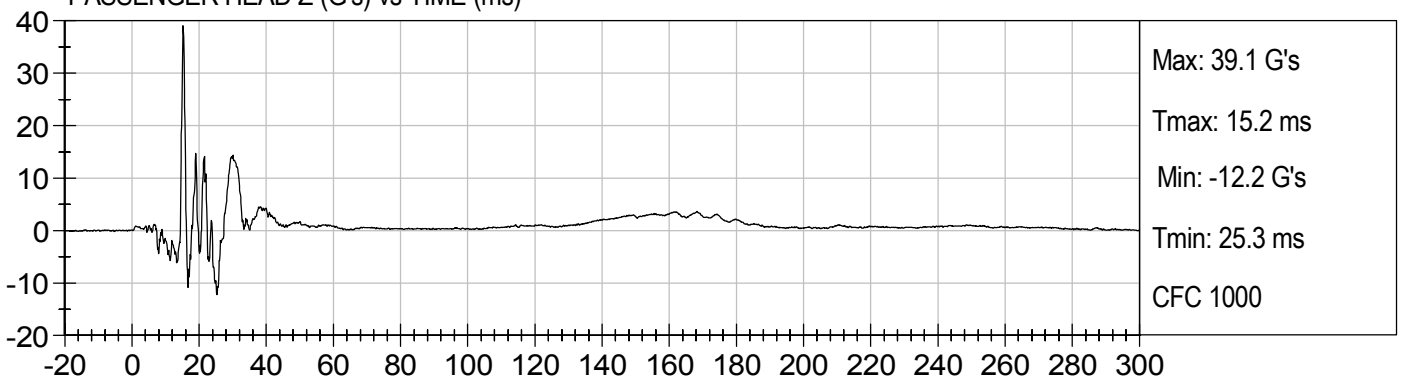
PASSENGER HEAD X (G's) vs TIME (ms)



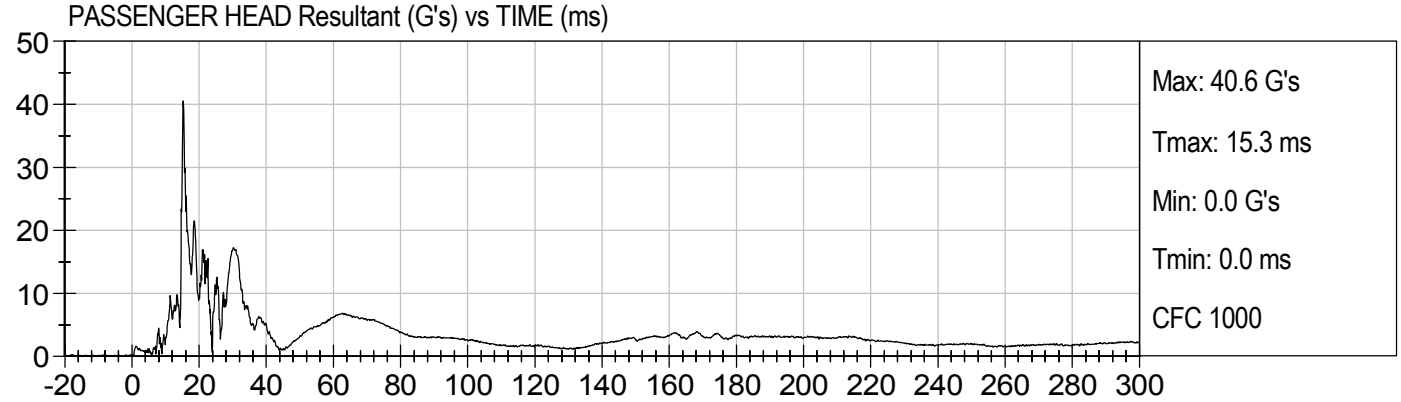
PASSENGER HEAD Y (G's) vs TIME (ms)



PASSENGER HEAD Z (G's) vs TIME (ms)



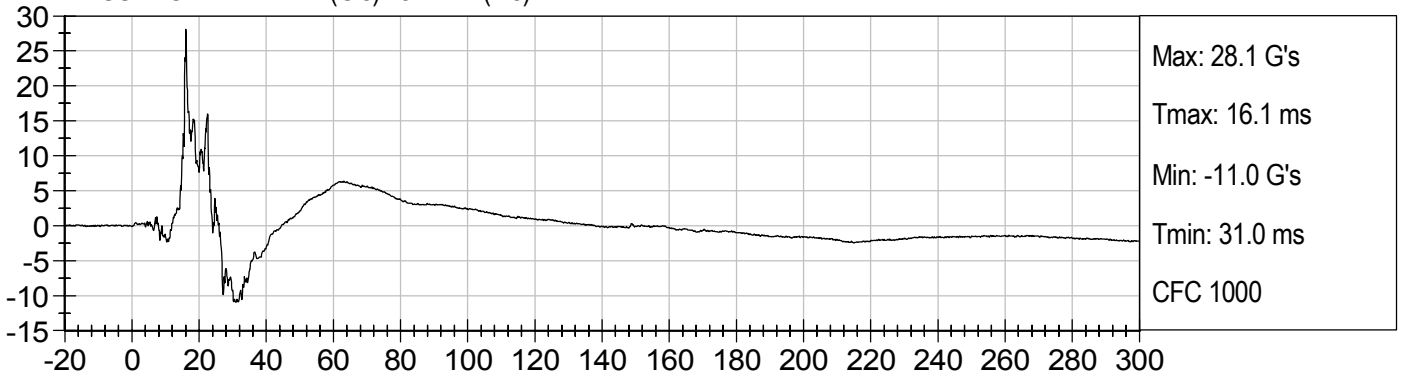
PASSENGER HEAD Resultant (G's) vs TIME (ms)



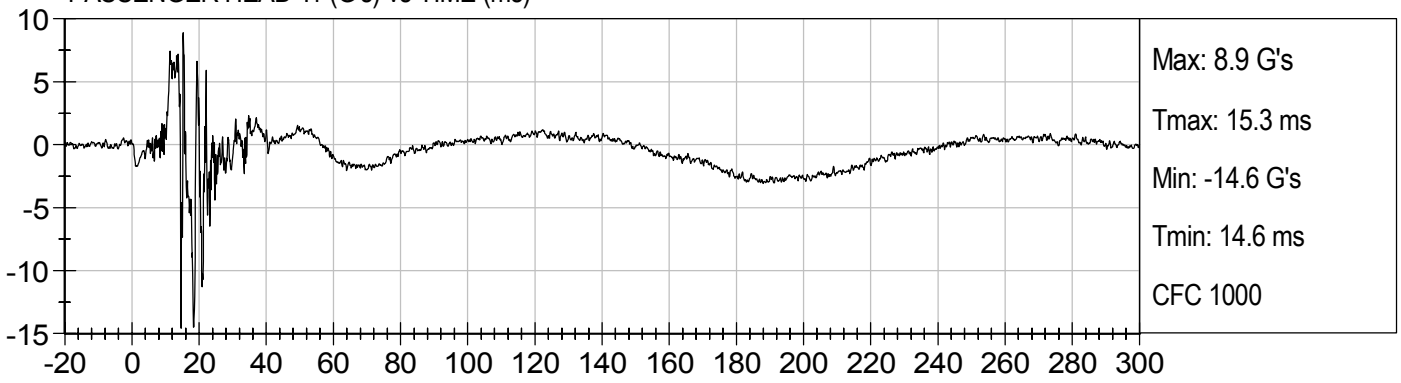
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

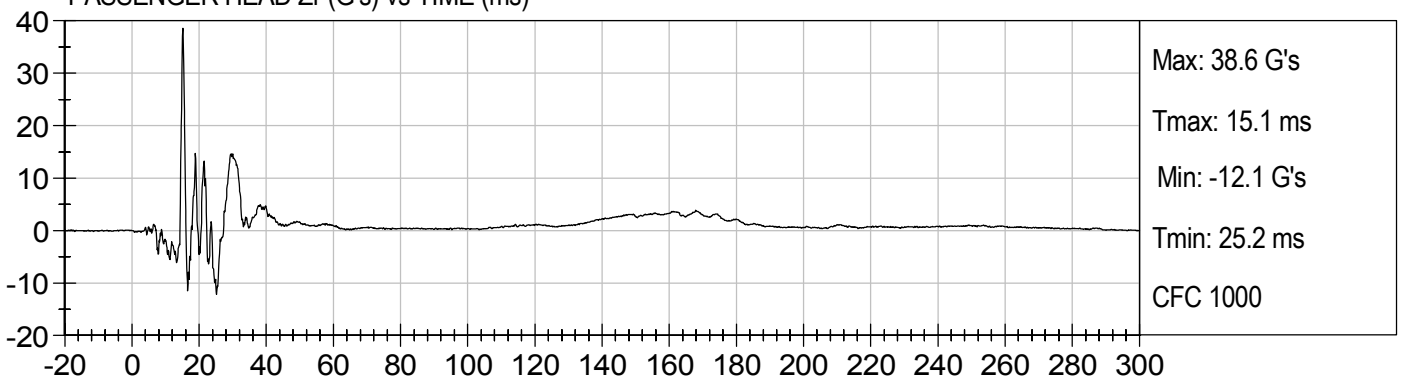
PASSENGER HEAD Xr (G's) vs TIME (ms)



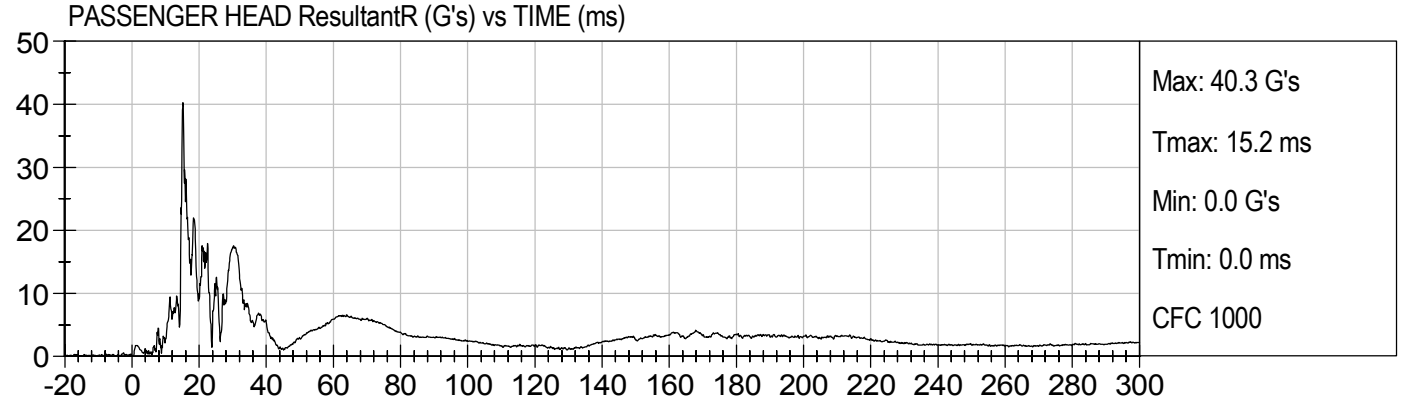
PASSENGER HEAD Yr (G's) vs TIME (ms)



PASSENGER HEAD Zr (G's) vs TIME (ms)



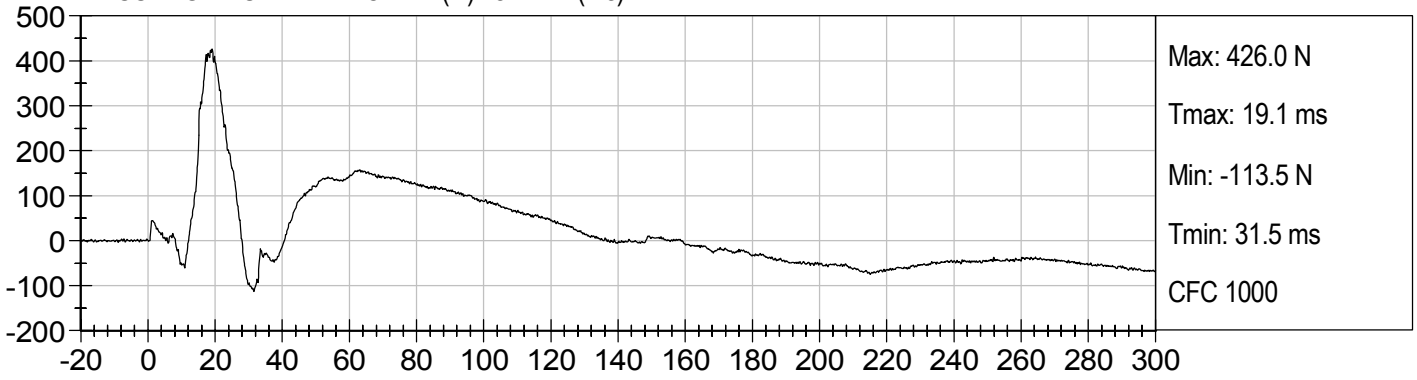
PASSENGER HEAD ResultantR (G's) vs TIME (ms)



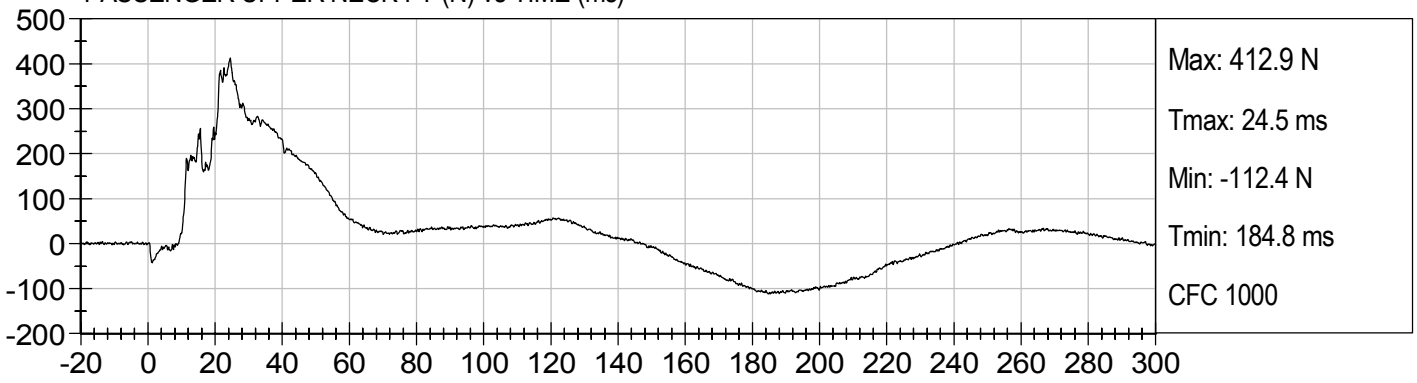
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

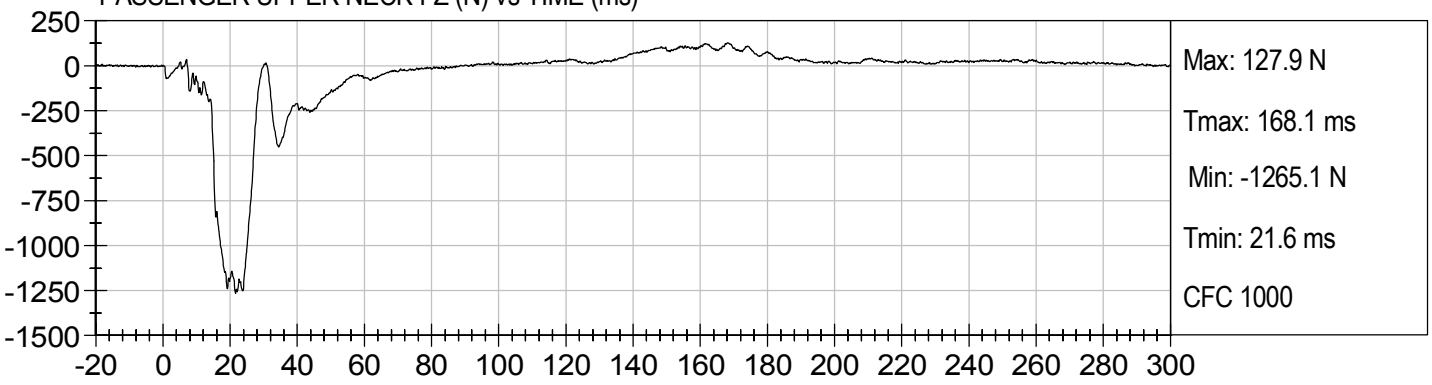
PASSENGER UPPER NECK FX (N) vs TIME (ms)



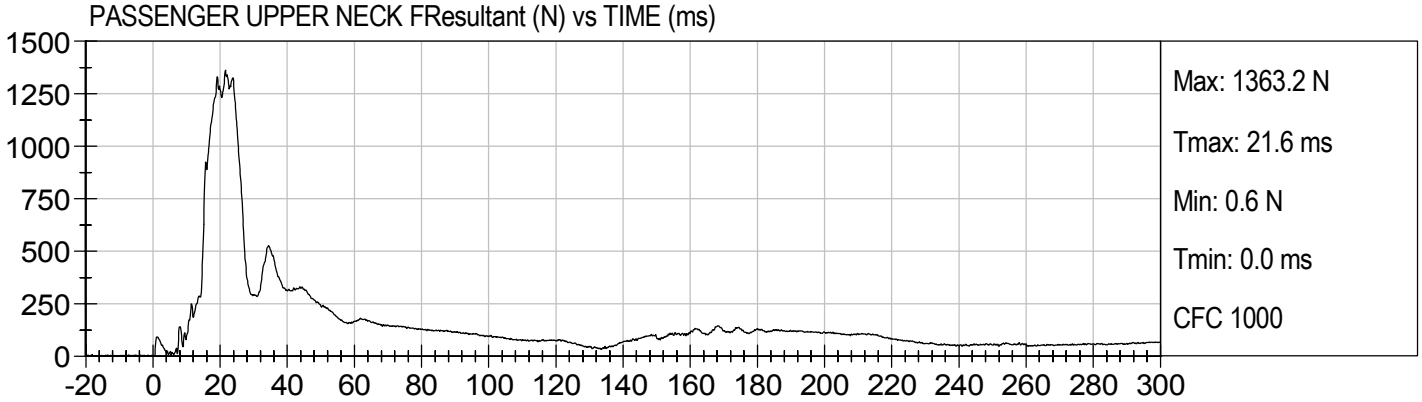
PASSENGER UPPER NECK FY (N) vs TIME (ms)



PASSENGER UPPER NECK FZ (N) vs TIME (ms)



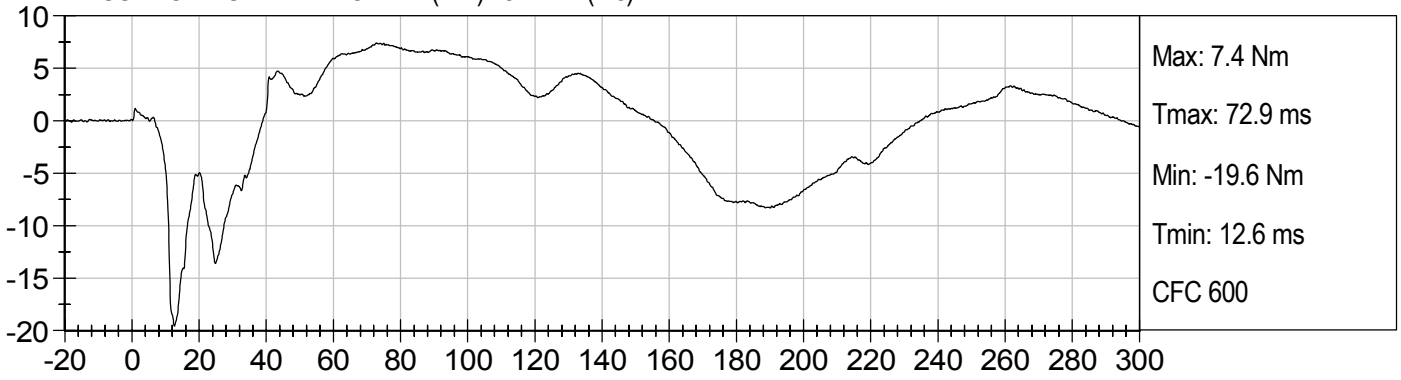
PASSENGER UPPER NECK FResultant (N) vs TIME (ms)



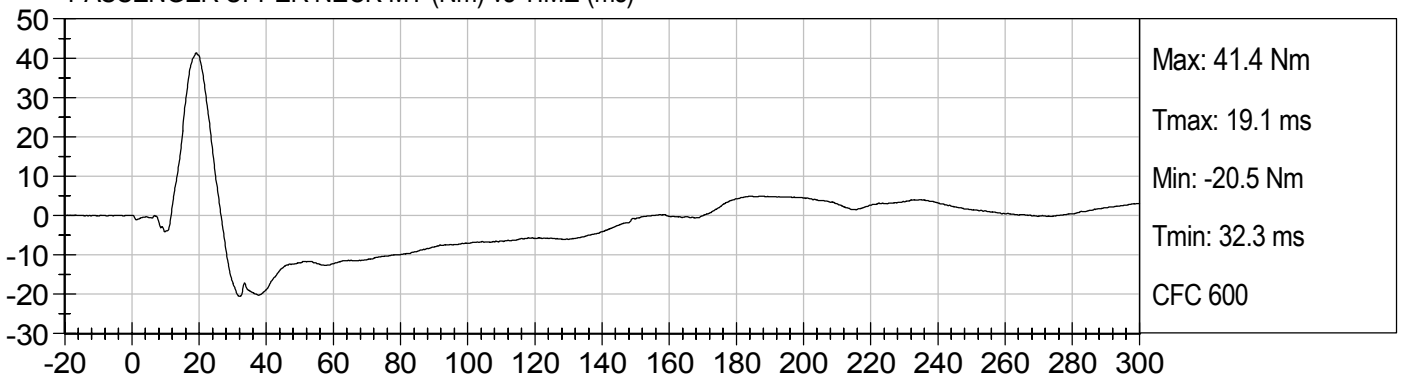
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

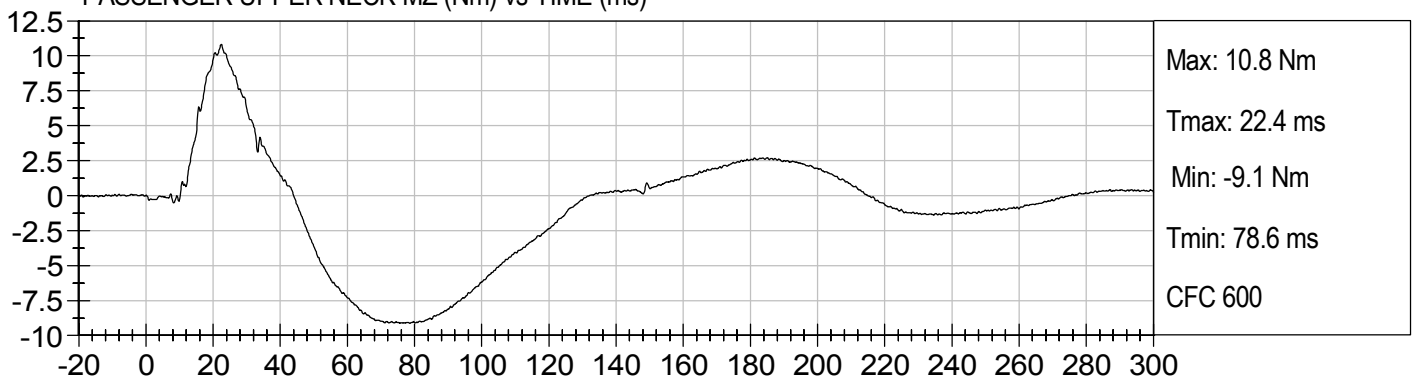
PASSENGER UPPER NECK MX (Nm) vs TIME (ms)



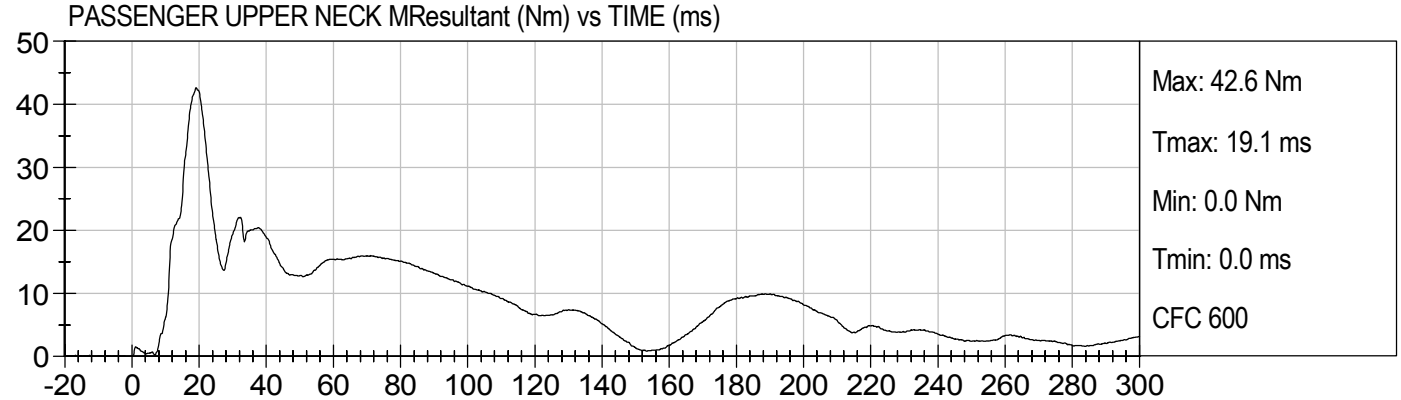
PASSENGER UPPER NECK MY (Nm) vs TIME (ms)



PASSENGER UPPER NECK MZ (Nm) vs TIME (ms)



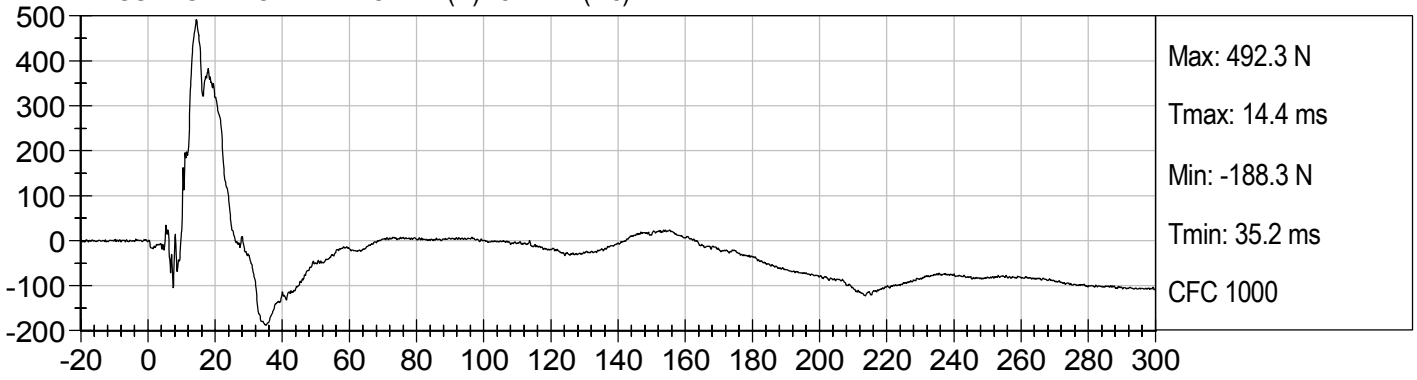
PASSENGER UPPER NECK MResultant (Nm) vs TIME (ms)



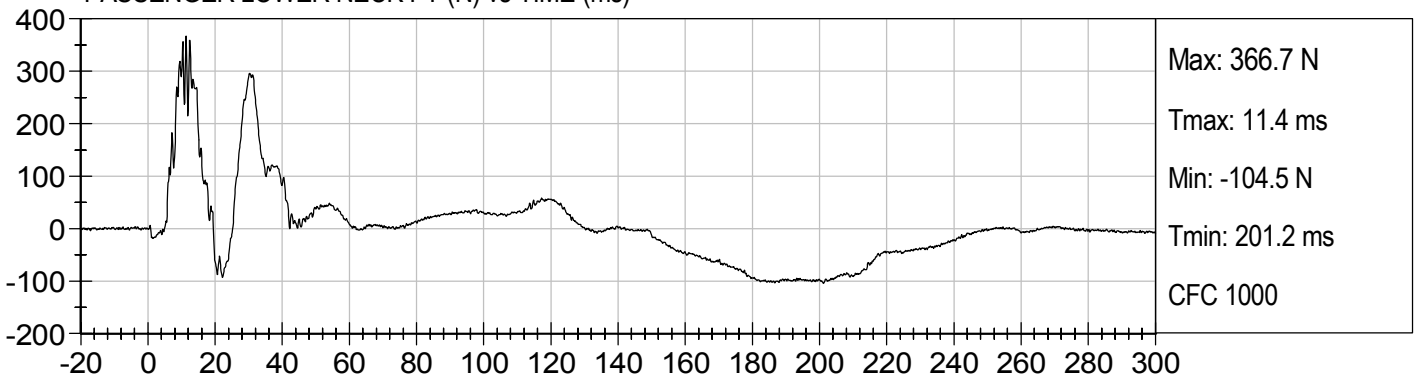
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

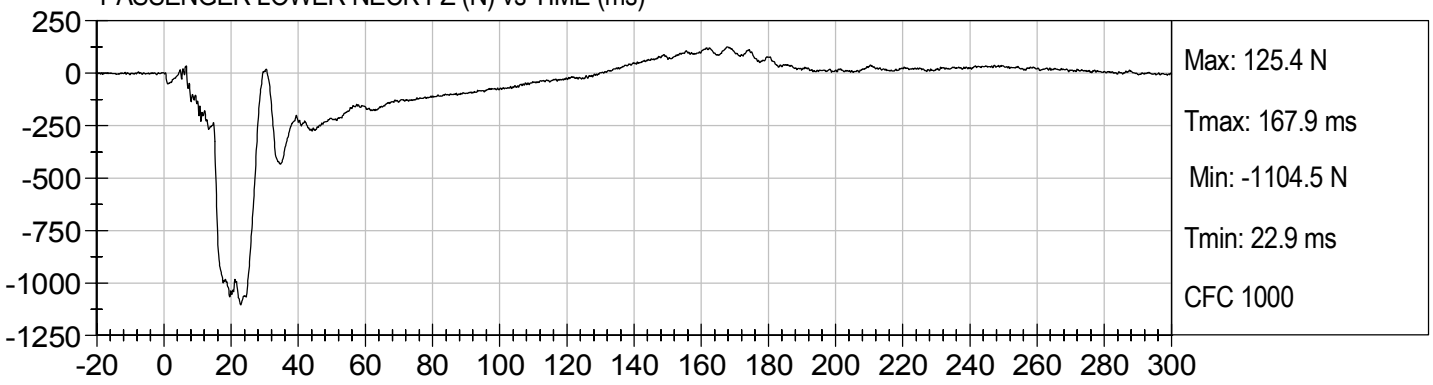
PASSENGER LOWER NECK FX (N) vs TIME (ms)



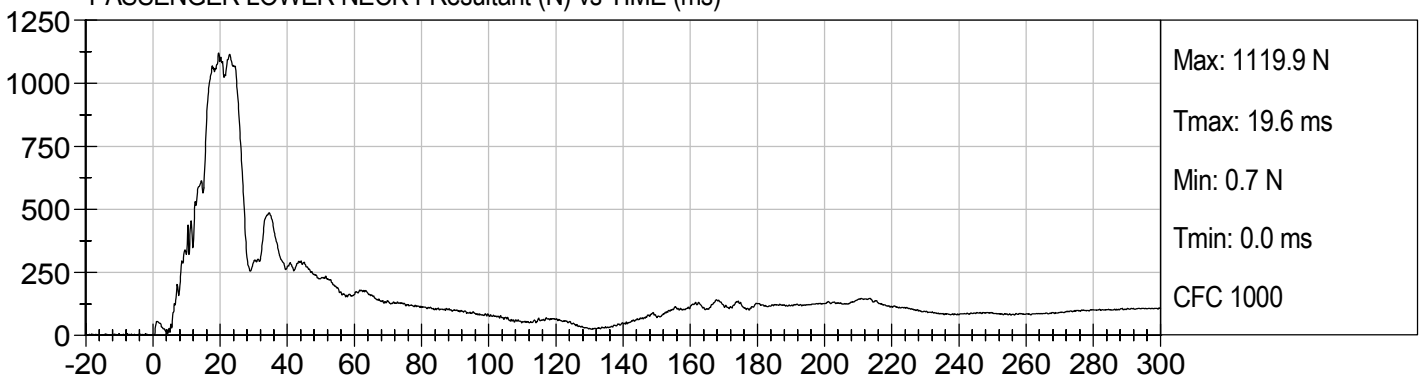
PASSENGER LOWER NECK FY (N) vs TIME (ms)



PASSENGER LOWER NECK FZ (N) vs TIME (ms)



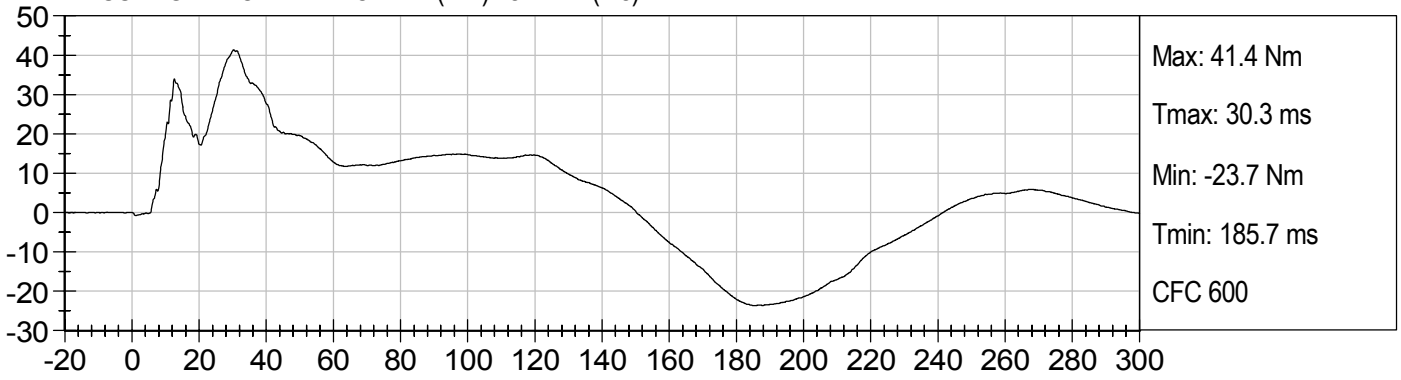
PASSENGER LOWER NECK FResultant (N) vs TIME (ms)



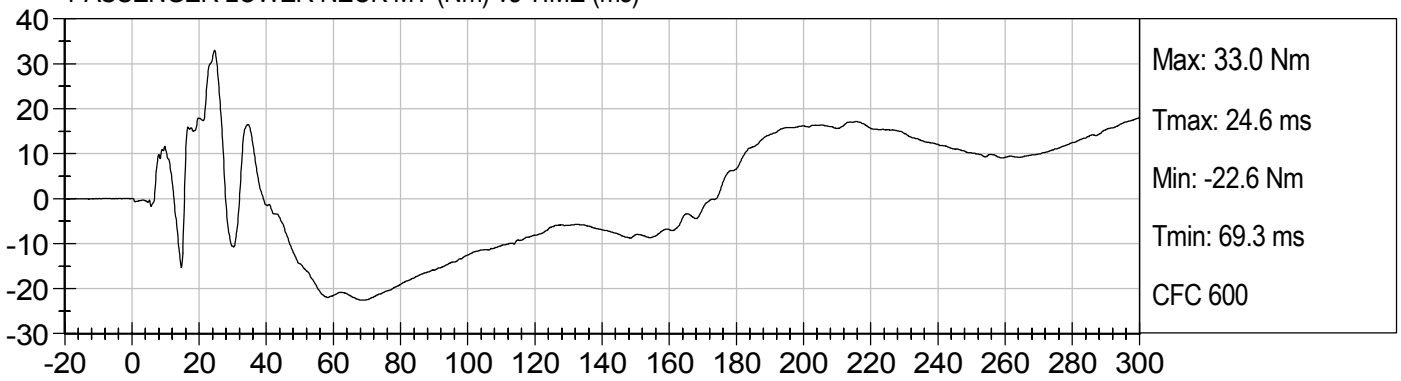
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

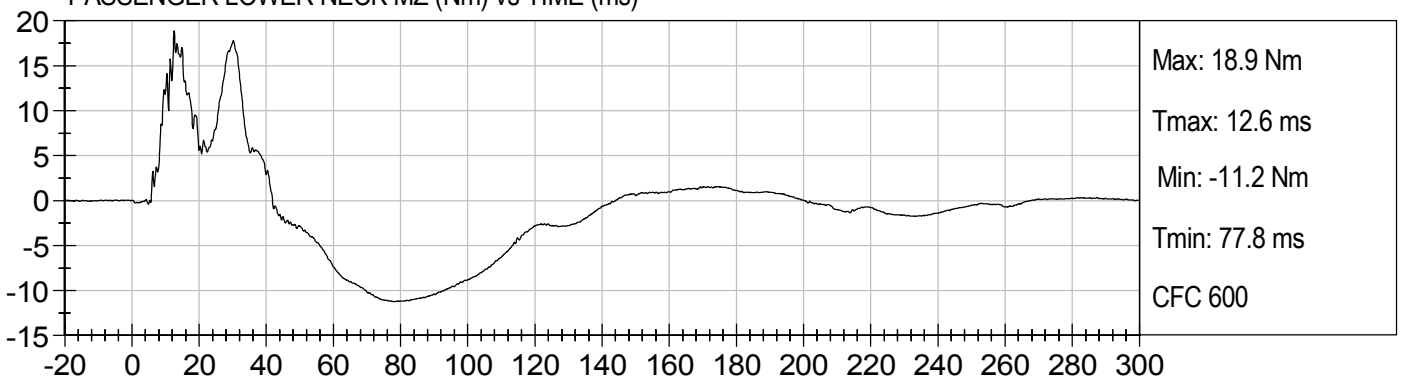
PASSENGER LOWER NECK MX (Nm) vs TIME (ms)



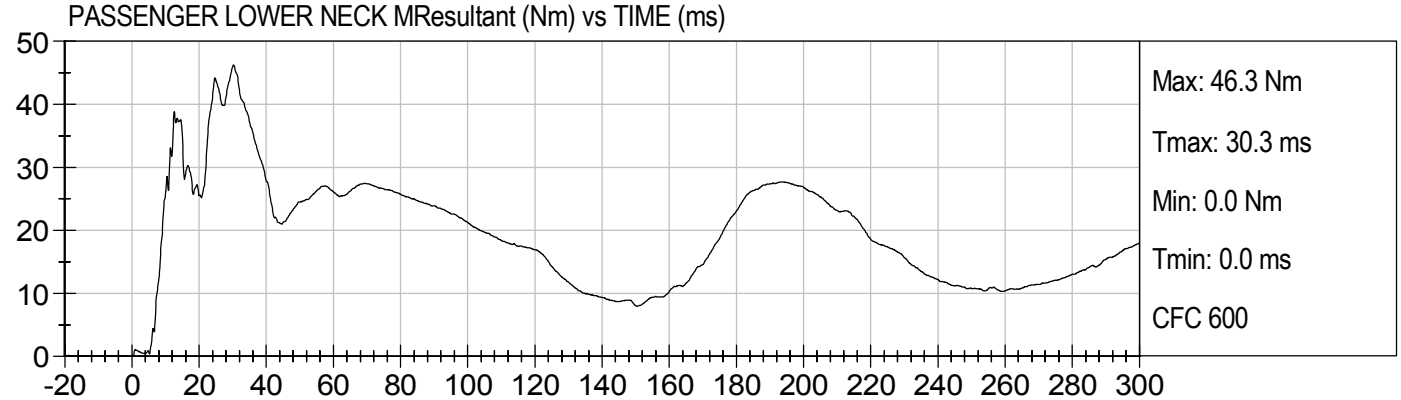
PASSENGER LOWER NECK MY (Nm) vs TIME (ms)



PASSENGER LOWER NECK MZ (Nm) vs TIME (ms)



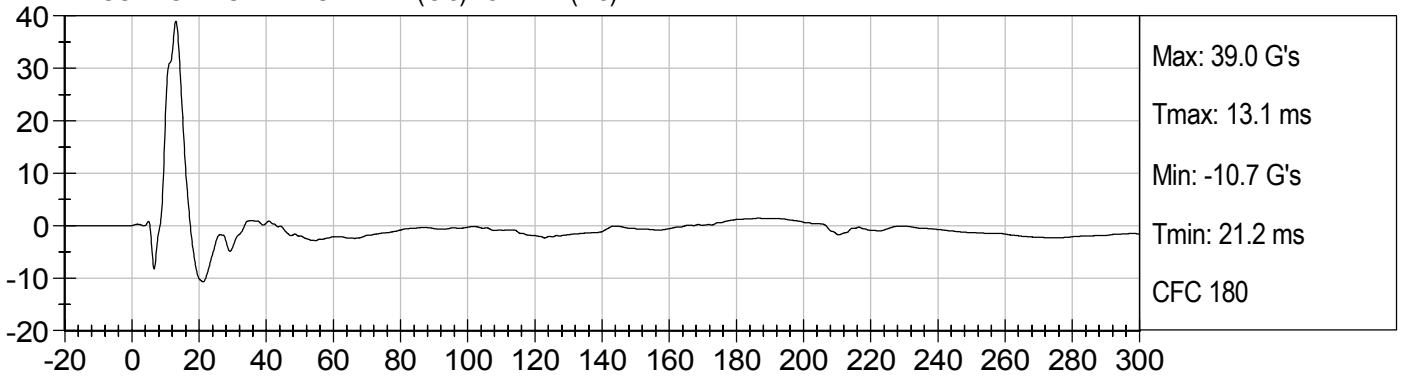
PASSENGER LOWER NECK MResultant (Nm) vs TIME (ms)



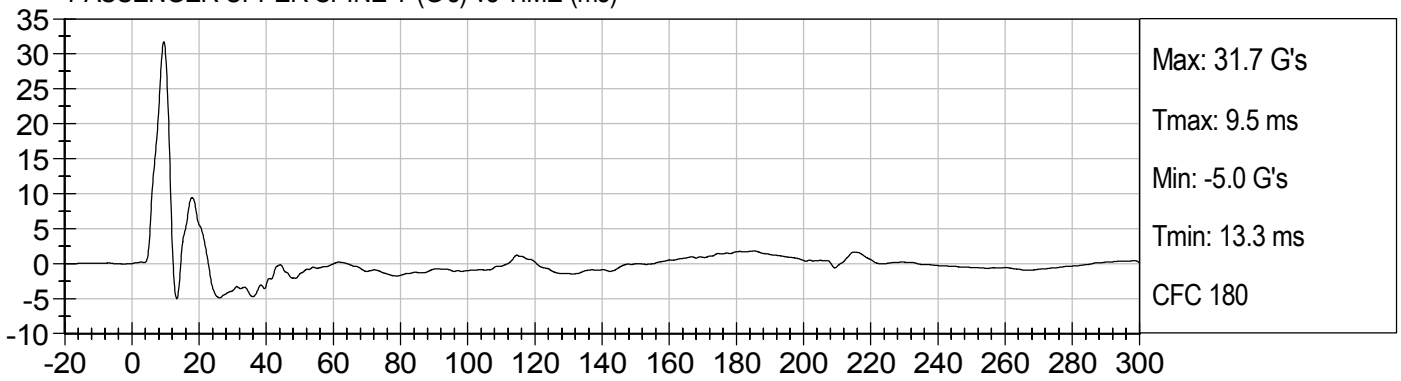
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

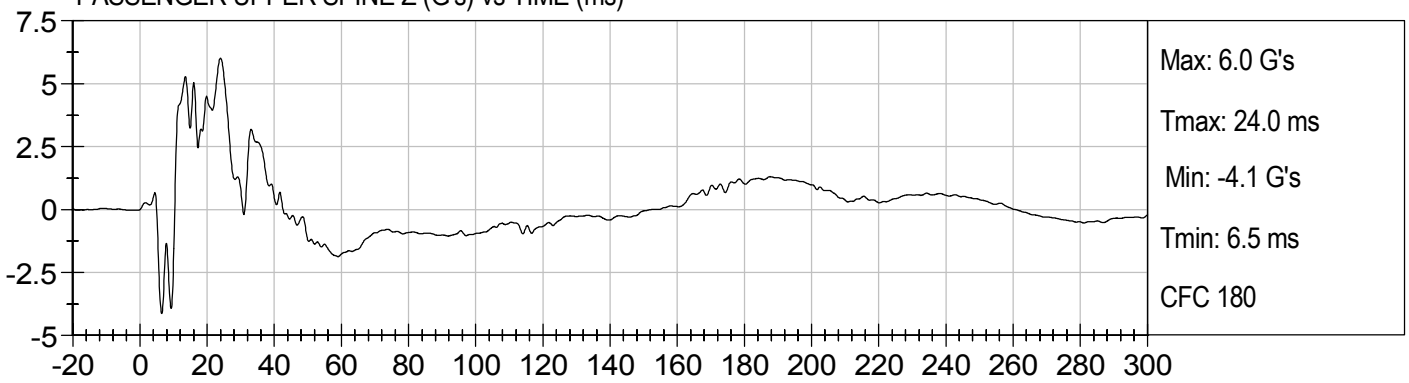
PASSENGER UPPER SPINE X (G's) vs TIME (ms)



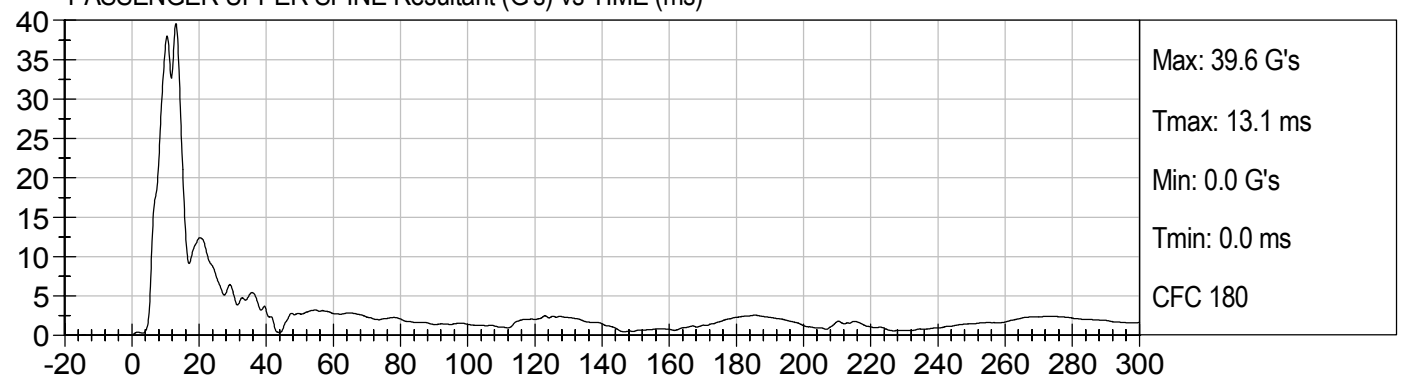
PASSENGER UPPER SPINE Y (G's) vs TIME (ms)



PASSENGER UPPER SPINE Z (G's) vs TIME (ms)



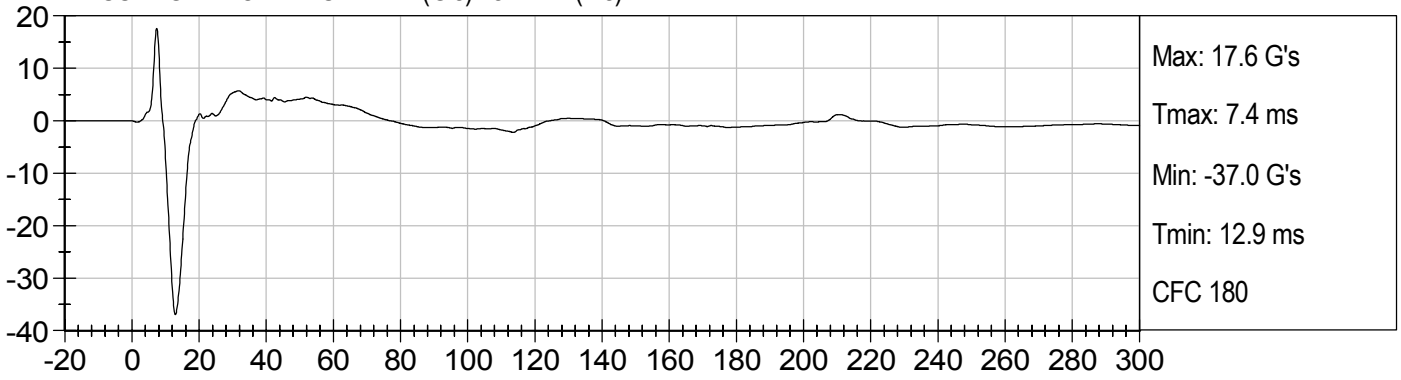
PASSENGER UPPER SPINE Resultant (G's) vs TIME (ms)



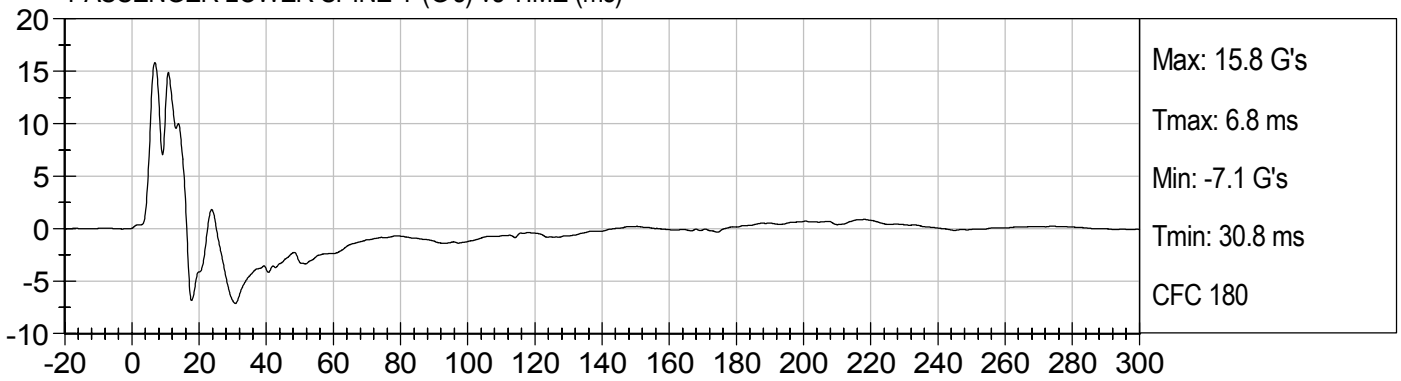
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

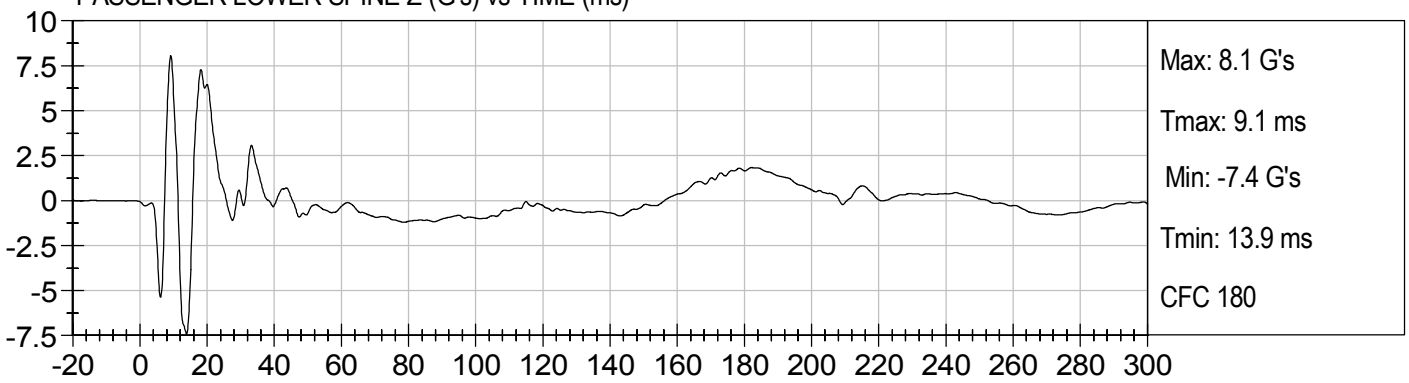
PASSENGER LOWER SPINE X (G's) vs TIME (ms)



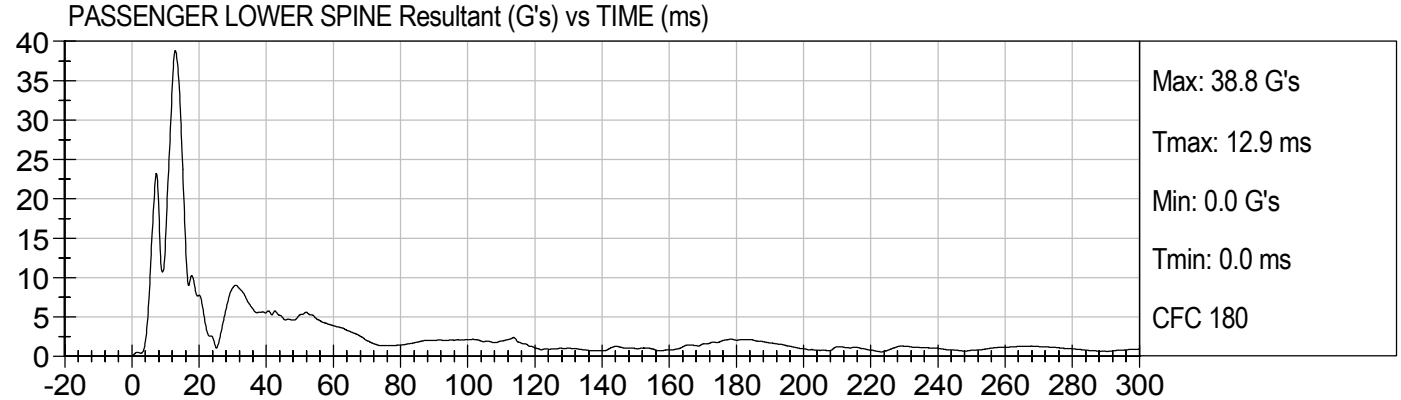
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



PASSENGER LOWER SPINE Z (G's) vs TIME (ms)

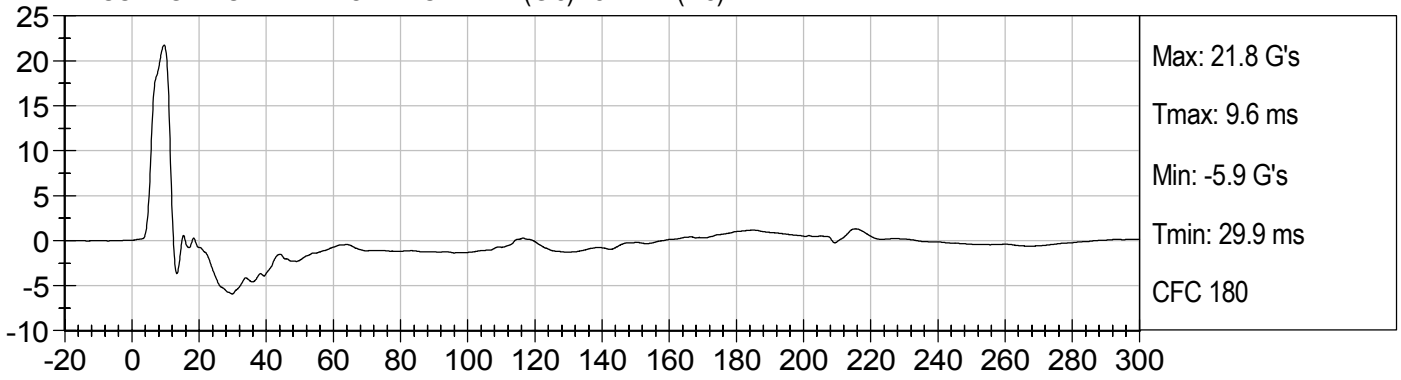


PASSENGER LOWER SPINE Resultant (G's) vs TIME (ms)

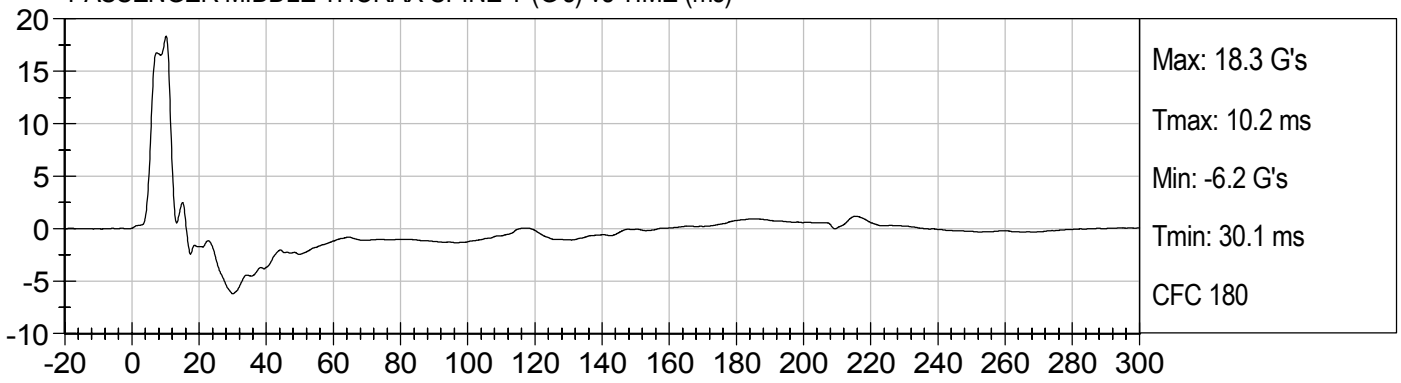


NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6 Test Date: 05/02/2007
2007 NISSAN ALTIMA M75202 Speed: 0.0 mph (0.0 km/h)

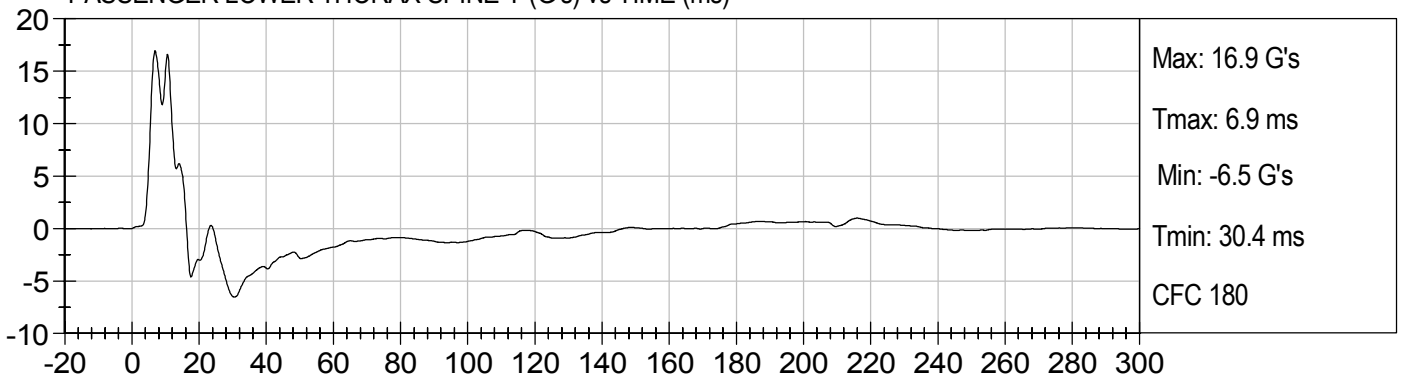
PASSENGER UPPER THORAX SPINE Y (G's) vs TIME (ms)



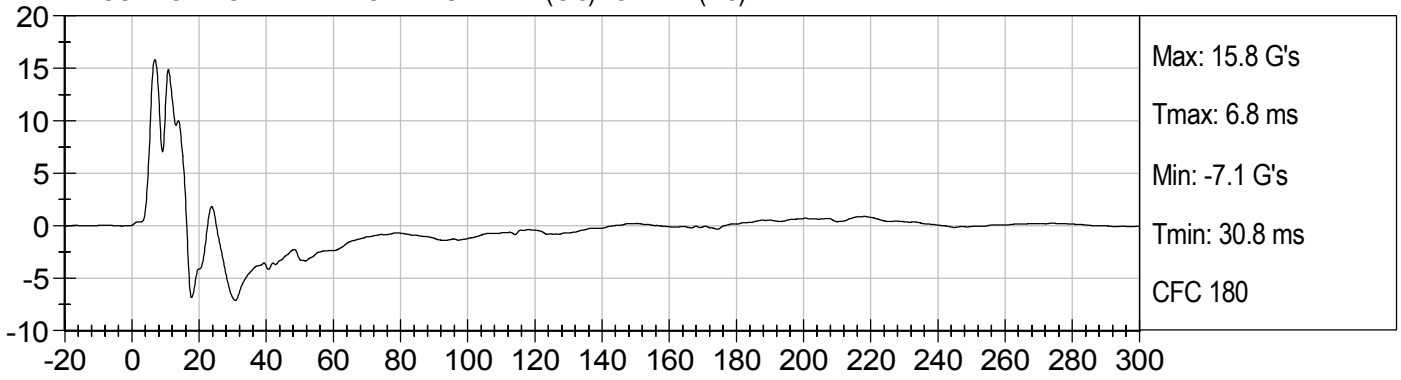
PASSENGER MIDDLE THORAX SPINE Y (G's) vs TIME (ms)



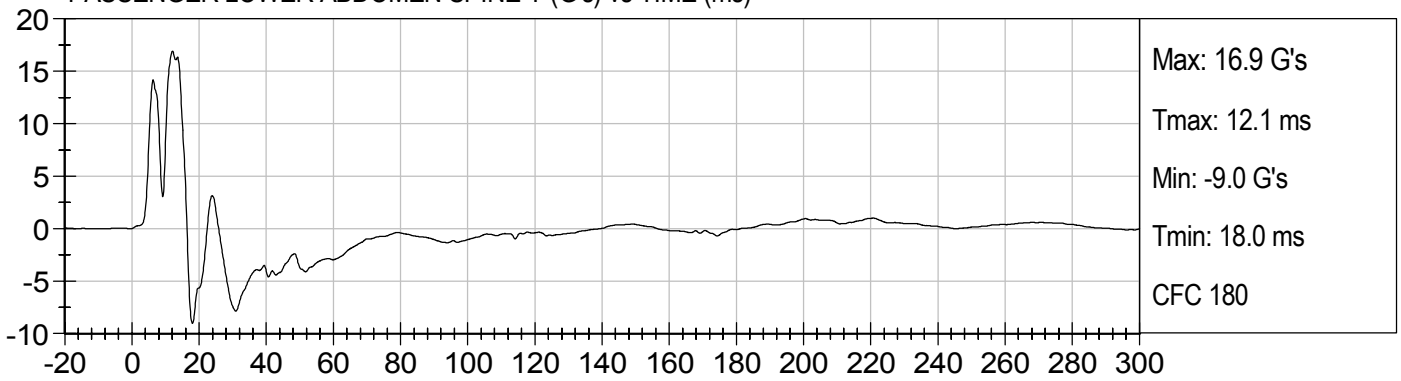
PASSENGER LOWER THORAX SPINE Y (G's) vs TIME (ms)



PASSENGER UPPER ABDOMEN SPINE Y (G's) vs TIME (ms)



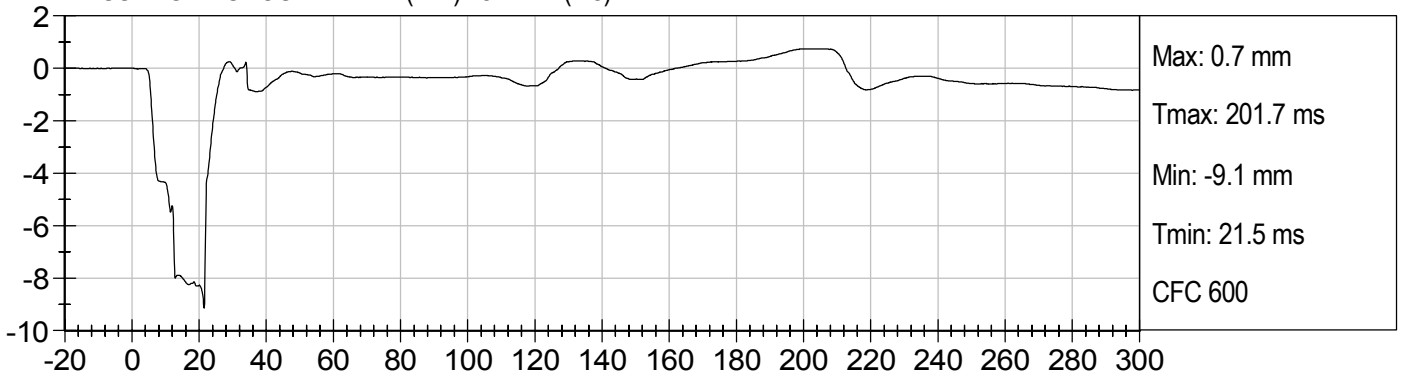
PASSENGER LOWER ABDOMEN SPINE Y (G's) vs TIME (ms)



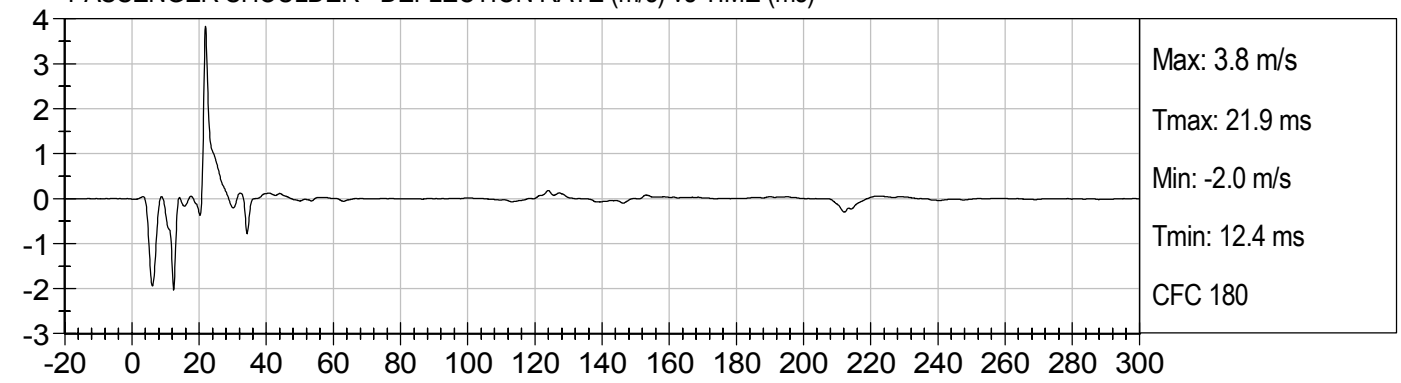
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

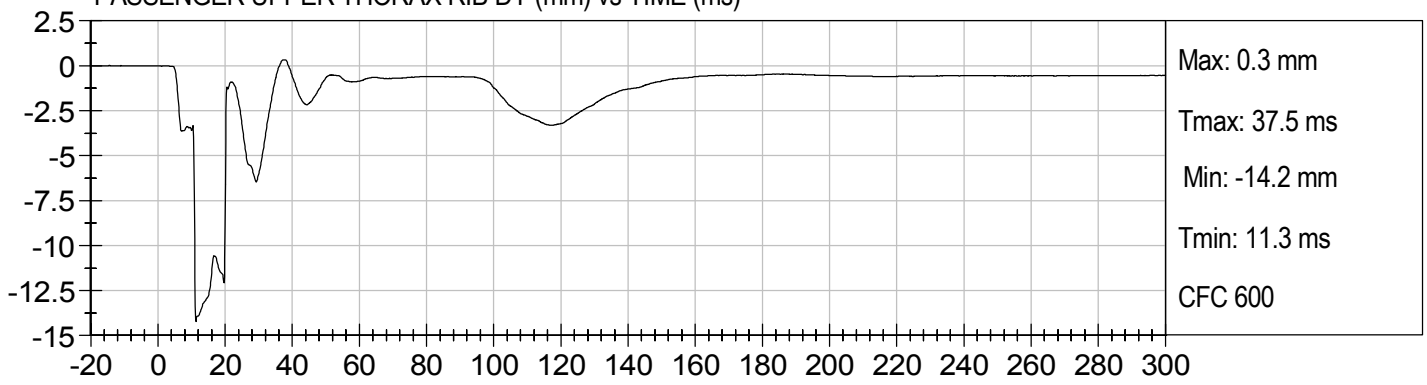
PASSENGER SHOULDER DY (mm) vs TIME (ms)



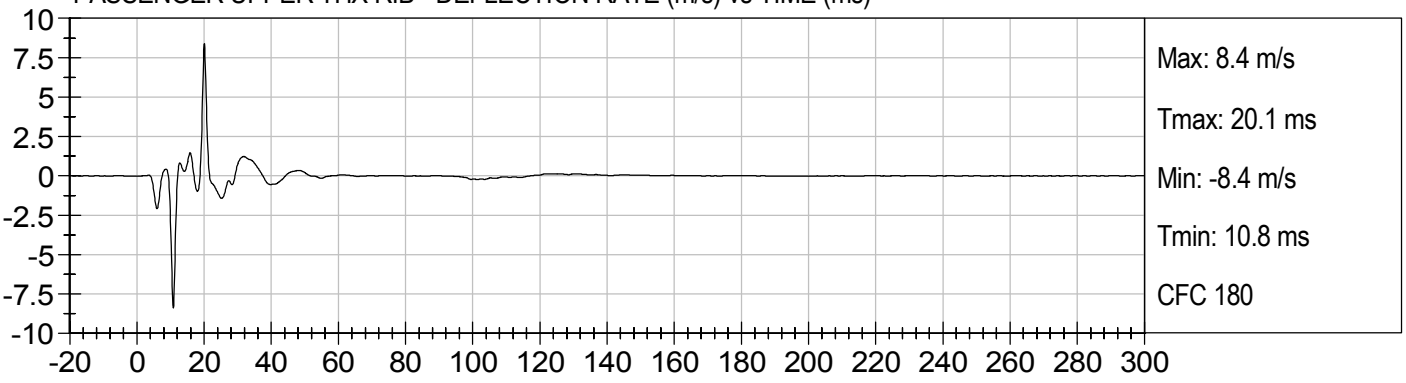
PASSENGER SHOULDER - DEFLECTION RATE (m/s) vs TIME (ms)



PASSENGER UPPER THORAX RIB DY (mm) vs TIME (ms)



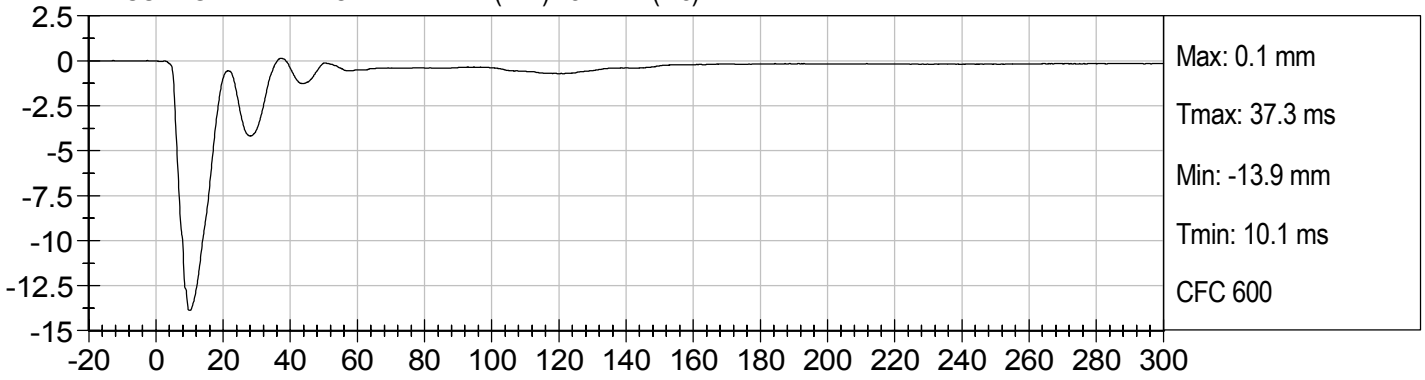
PASSENGER UPPER THX RIB - DEFLECTION RATE (m/s) vs TIME (ms)



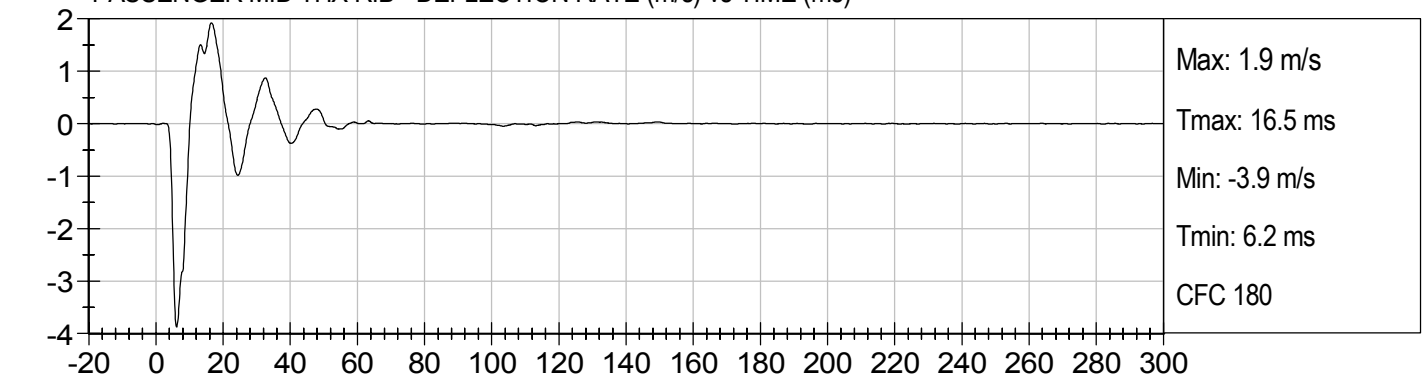
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

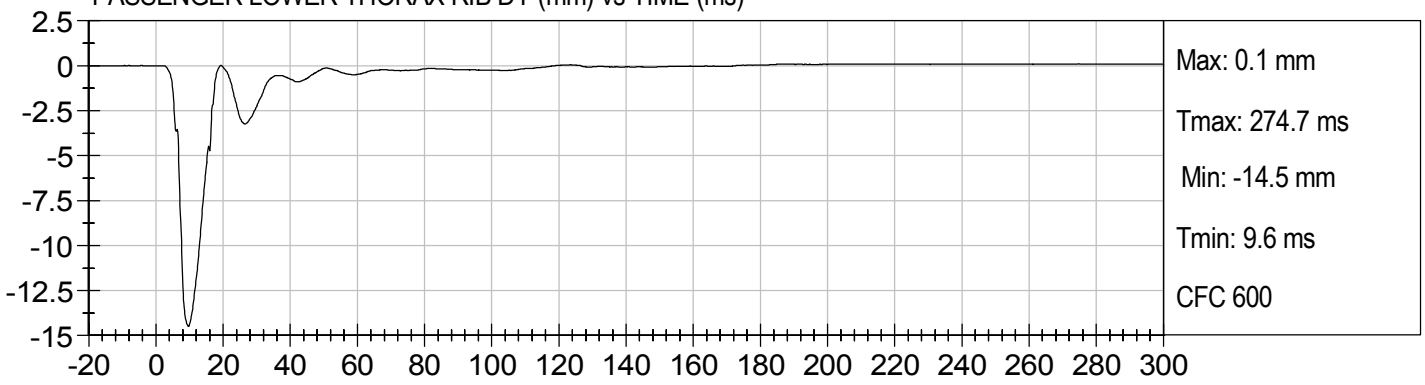
PASSENGER MID THORAX RIB DY (mm) vs TIME (ms)



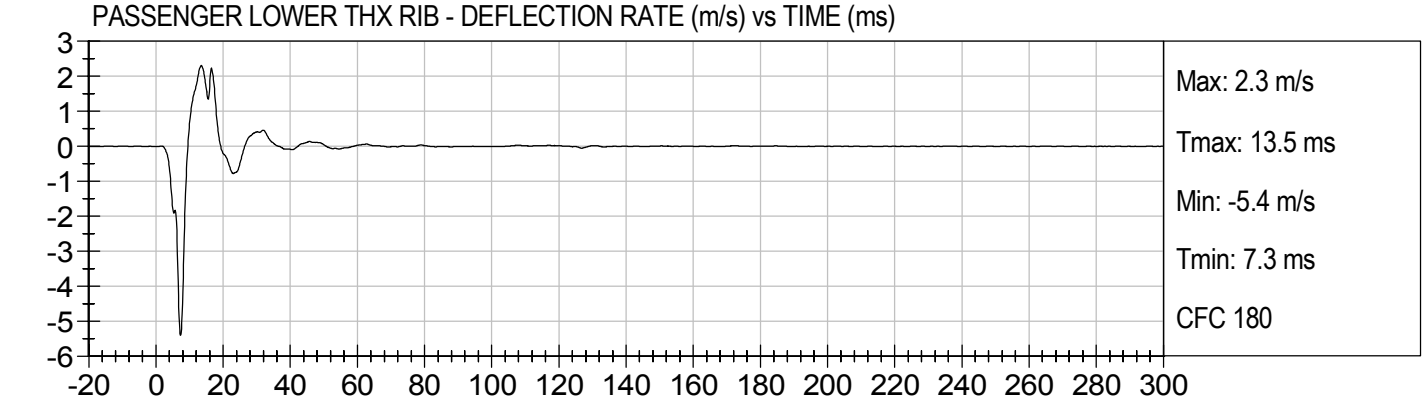
PASSENGER MID THX RIB - DEFLECTION RATE (m/s) vs TIME (ms)



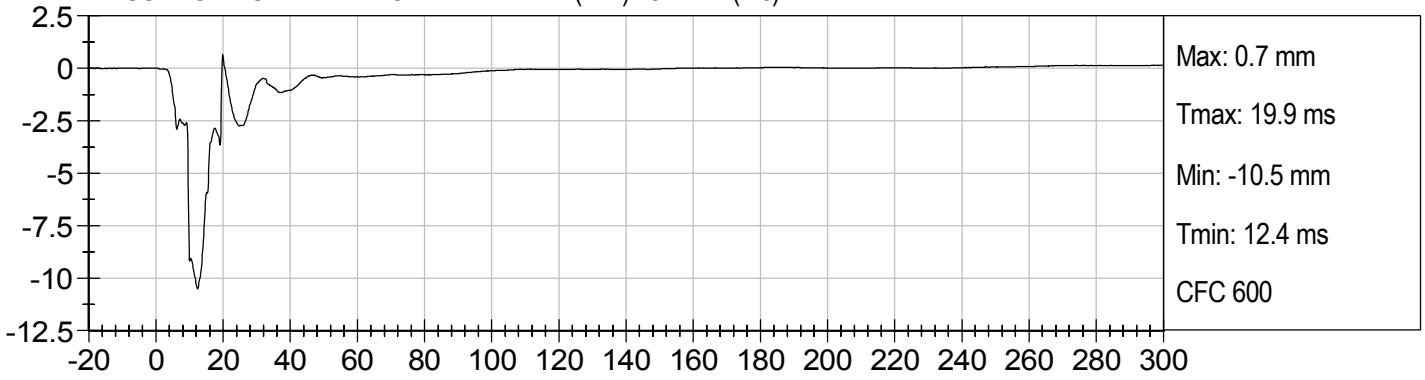
PASSENGER LOWER THORAX RIB DY (mm) vs TIME (ms)



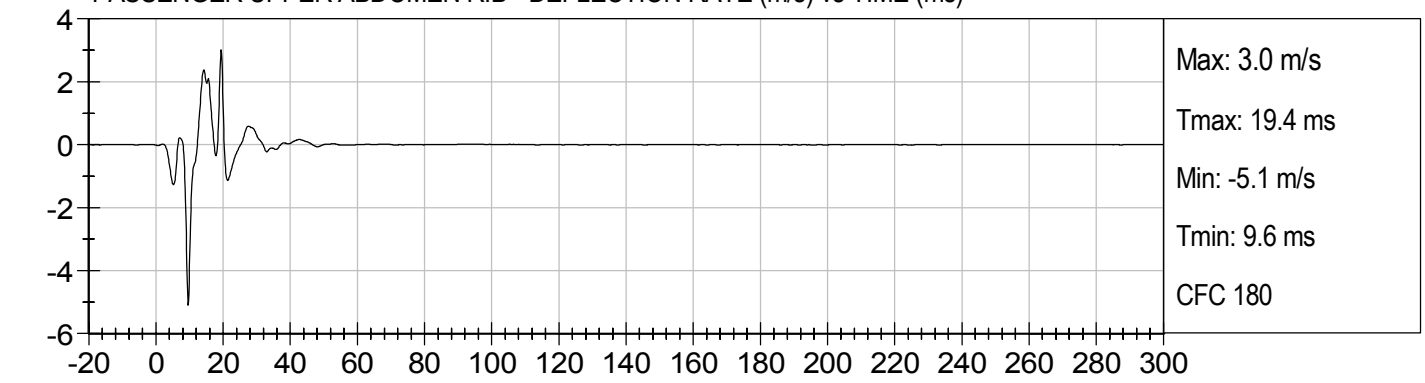
PASSENGER LOWER THX RIB - DEFLECTION RATE (m/s) vs TIME (ms)



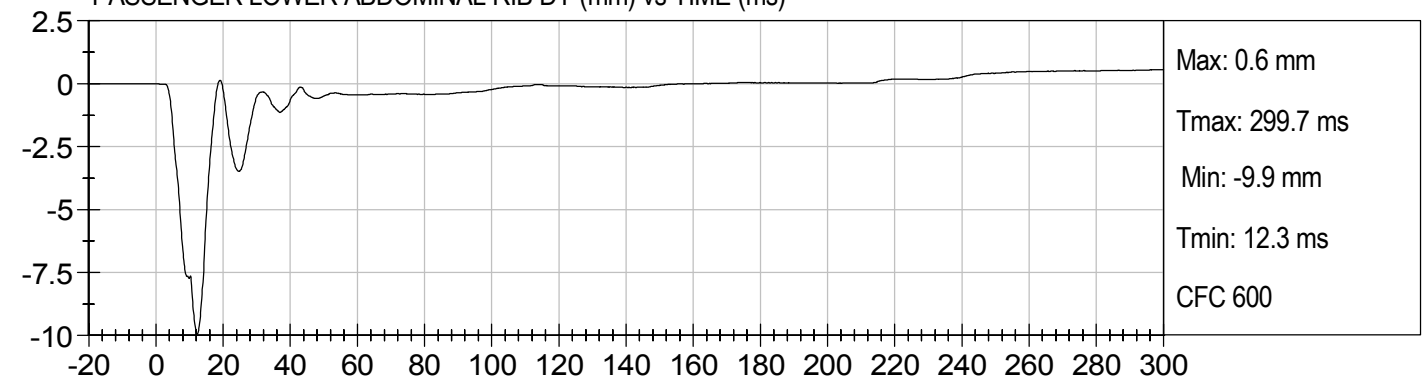
PASSENGER UPPER ABDOMINAL RIB DY (mm) vs TIME (ms)



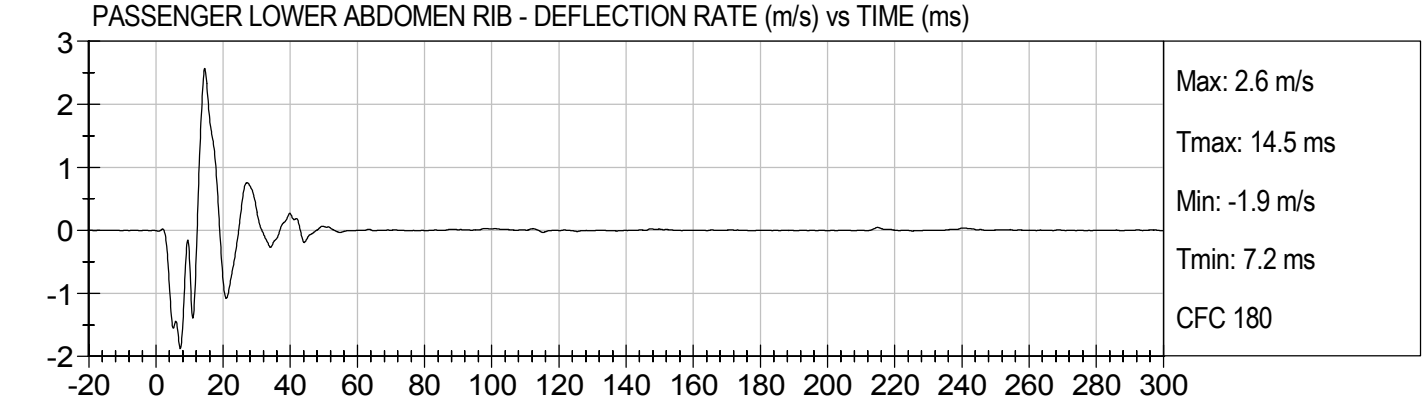
PASSENGER UPPER ABDOMEN RIB - DEFLECTION RATE (m/s) vs TIME (ms)



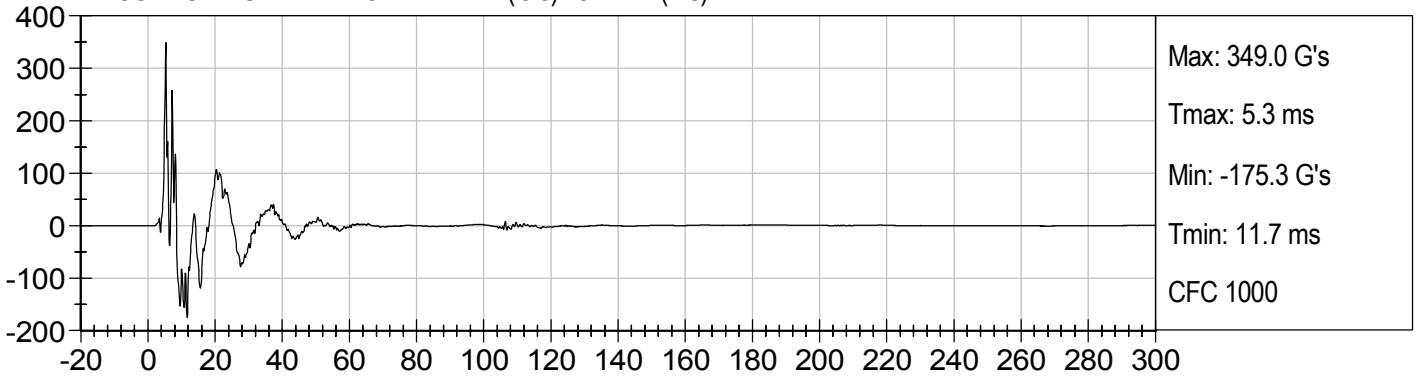
PASSENGER LOWER ABDOMINAL RIB DY (mm) vs TIME (ms)



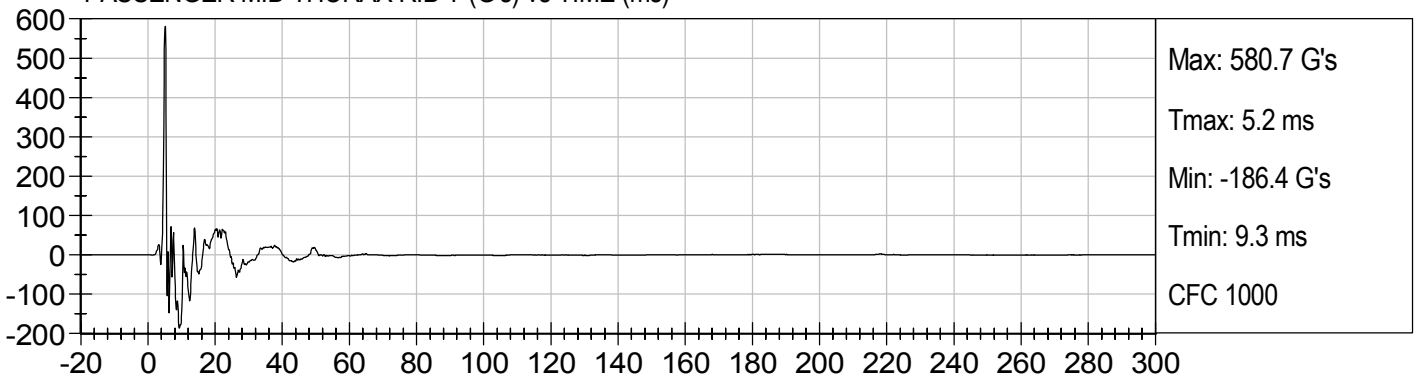
PASSENGER LOWER ABDOMEN RIB - DEFLECTION RATE (m/s) vs TIME (ms)



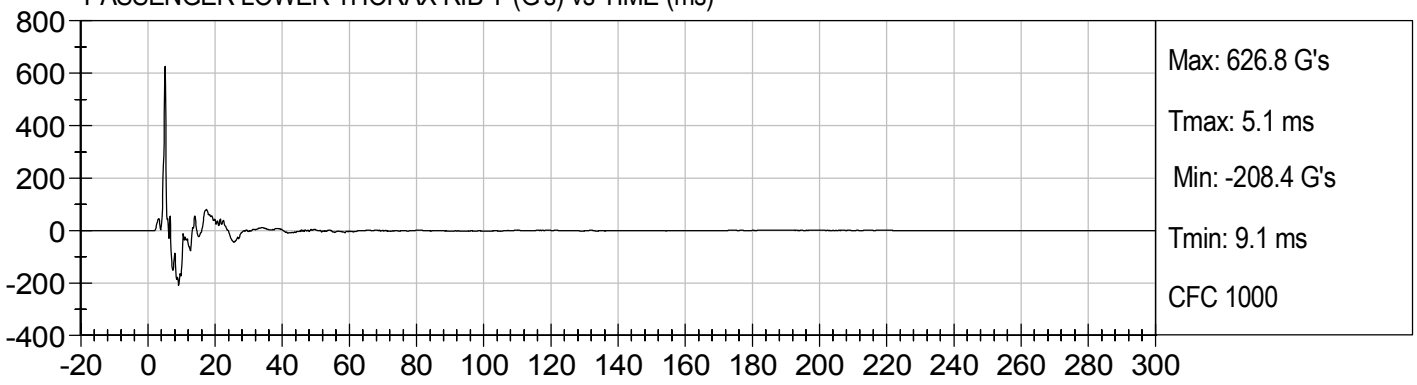
PASSENGER UPPER THORAX RIB Y (G's) vs TIME (ms)



PASSENGER MID THORAX RIB Y (G's) vs TIME (ms)

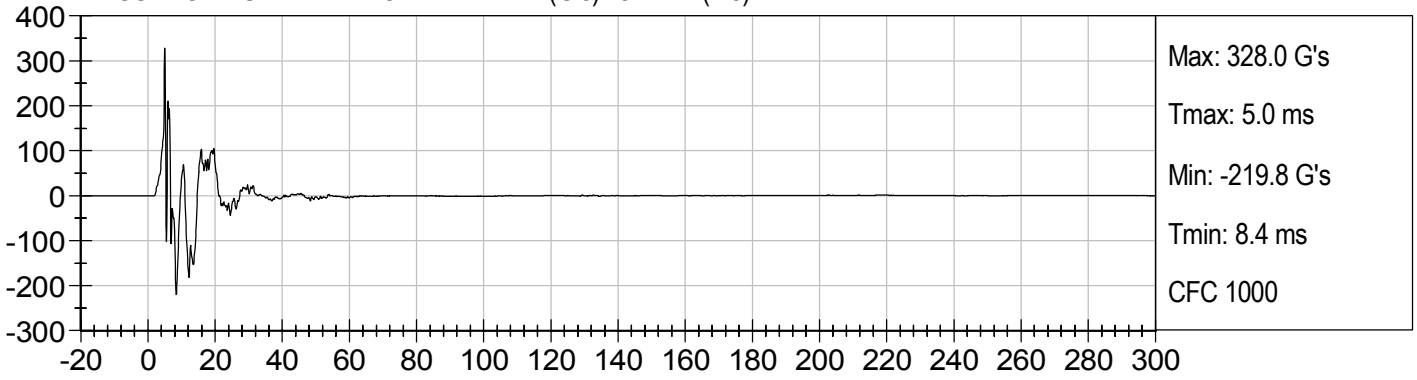


PASSENGER LOWER THORAX RIB Y (G's) vs TIME (ms)

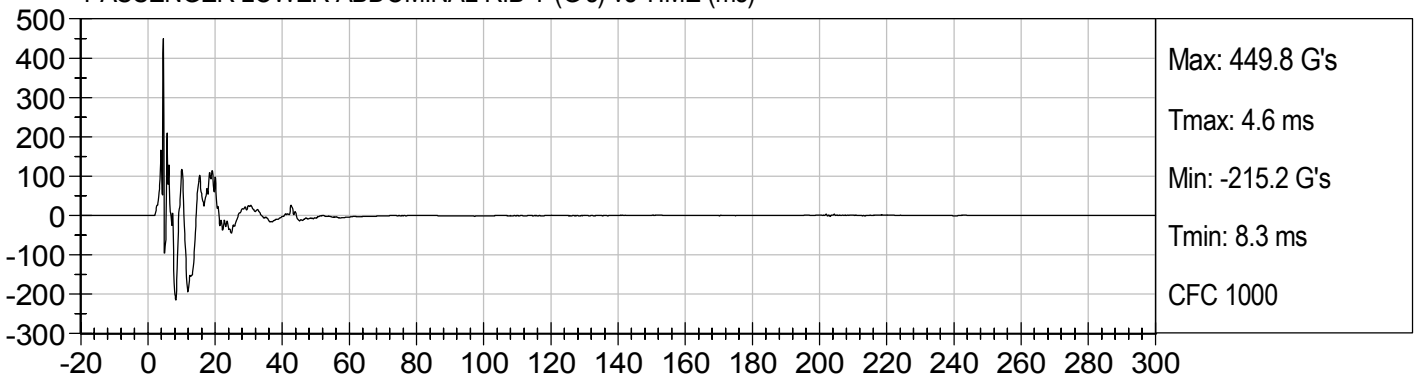


NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6 Test Date: 05/02/2007
2007 NISSAN ALTIMA M75202 Speed: 0.0 mph (0.0 km/h)

PASSENGER UPPER ABDOMINAL RIB Y (G's) vs TIME (ms)



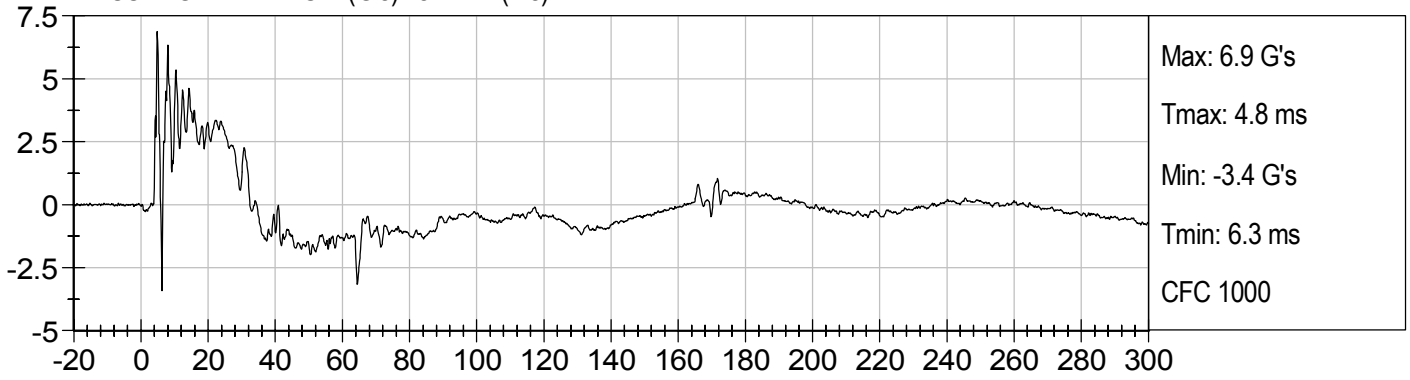
PASSENGER LOWER ABDOMINAL RIB Y (G's) vs TIME (ms)



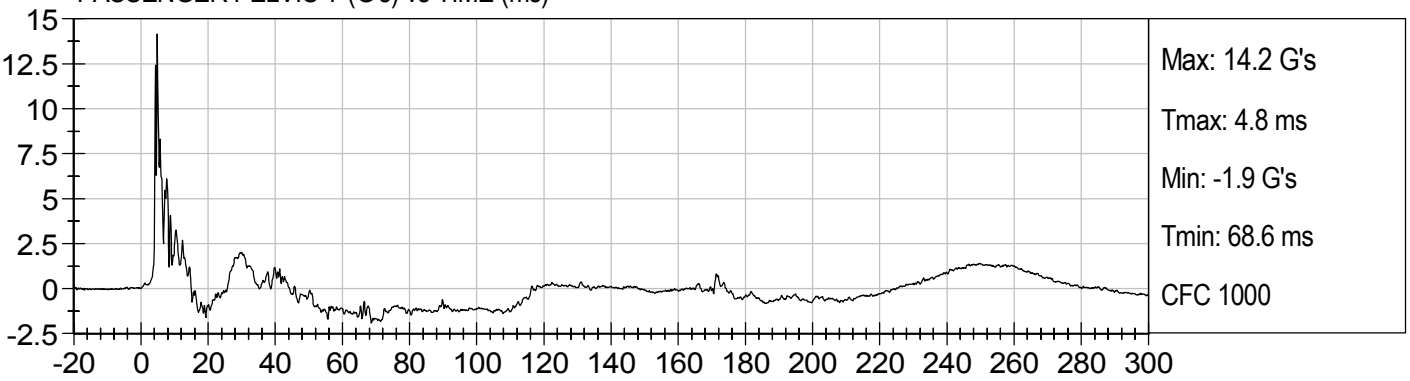
NCAP SIDE OOP SID-IIsD POSITION 3.3.3.6
2007 NISSAN ALTIMA M75202

Test Date: 05/02/2007
Speed: 0.0 mph (0.0 km/h)

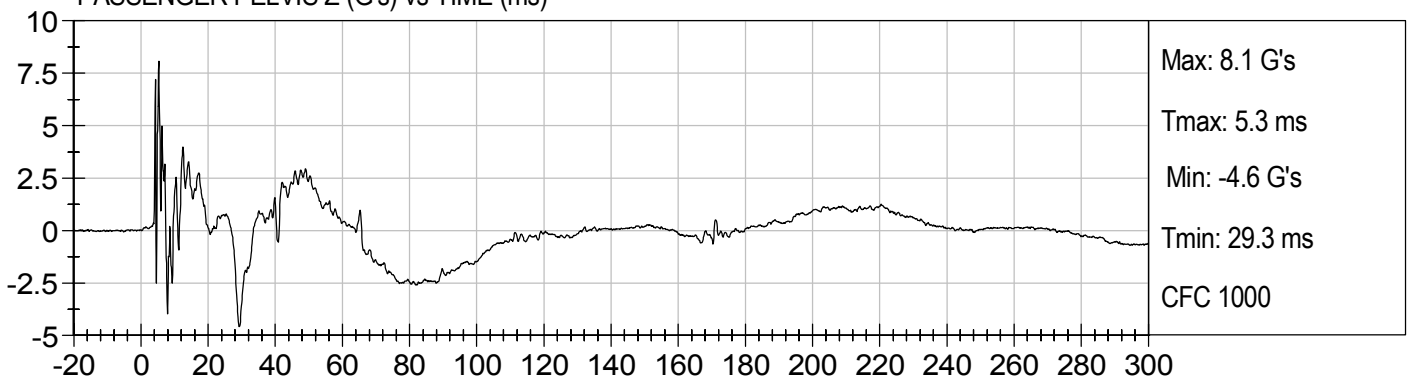
PASSENGER PELVIS X (G's) vs TIME (ms)



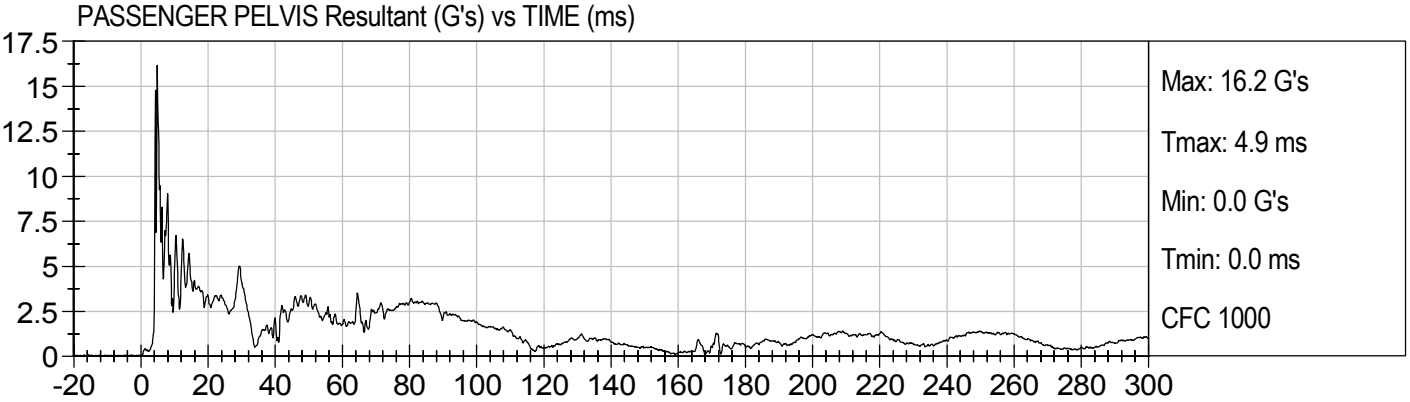
PASSENGER PELVIS Y (G's) vs TIME (ms)



PASSENGER PELVIS Z (G's) vs TIME (ms)



PASSENGER PELVIS Resultant (G's) vs TIME (ms)



APPENDIX C

INSTRUMENTATION CALIBRATION DATA

SID-IIs Build Level D – Serial Number 032

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	P47837	Endevco	4/19/2007
Head Y	P47845	Endevco	4/19/2007
Head Z	P47835	Endevco	4/19/2007
Upper Neck Load Cell	NG180	FTSS	3/13/2007
Lower Neck Load Cell	LNG101	FTSS	3/19/2007
Upper Spine X	A12-A11	Entran	3/30/2007
Upper Spine Y	A05-A23	Entran	3/30/2007
Upper Spine Z	A27-Z07	Entran	3/30/2007
Lower Spine X	P52174	Endevco	1/19/2007
Lower Spine Y	P52172	Endevco	1/19/2007
Lower Spine Z	P52173	Endevco	1/19/2007
Shoulder Displacement	032SHLD	Servo	4/25/2007
Upper Thorax Rib Displacement	032RIB1	Servo	4/25/2007
Mid Thorax Rib Displacement	032RIB2	Servo	4/25/2007
Lower Thorax Rib Displacement	032RIB3	Servo	4/25/2007
Upper Abdominal Rib Displacement	032RIB4	Servo	4/25/2007
Lower Abdominal Rib Displacement	032RIB5	Servo	4/25/2007
Upper Thorax Rib Y	L17-Z13	Entran	4/03/2007
Mid Thorax Rib Y	C15-Z01	Entran	4/19/2007
Lower Thorax Rib Y	ET21191	Entran	4/03/2007
Upper Abdominal Rib Y	ET21248	Entran	3/30/2007
Lower Abdominal Rib Y	ET21158	Entran	3/30/2007
Upper Thorax Spine Y	P47109	Endevco	3/30/2007
Middle Thorax Spine Y	P47108	Endevco	3/30/2007
Lower Thorax Spine Y	P47110	Endevco	3/30/2007
Upper Abdomen Spine Y	P52172	Endevco	1/19/2007
Lower Abdomen Spine Y	L20-B17	Entran	4/02/2007
Pelvis X	P52171	Endevco	1/19/2007
Pelvis Y	P52169	Endevco	1/19/2007
Pelvis Z	P52170	Endevco	1/19/2007
Head X Redundant	P47846	Endevco	4/19/2007
Head Y Redundant	P47844	Endevco	4/19/2007
Head Z Redundant	P47838	Endevco	4/19/2007