REPORT NUMBER: TR-P34007-01-NC

SIDE AIRBAG OCCUPANT RISK PROGRAM
OCCUPANT OUT-OF-POSITION TESTS

NISSAN MOTOR CO., LTD.
2014 NISSAN VERSA NOTE S
5-DOOR HATCHBACK

NHTSA NUMBER: M20145205TWG2

PREPARED BY:
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JANUARY 23, 2014

FINAL REPORT

PREPARED FOR:
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This final test report was prepared for the U.S. Department of Transportation, Alpha Technology Associate, Inc., in response to Contract Number DTNH22-12-D-00259.

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Date of Acceptance

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PURPOSE AND SUMMARY OF TEST

PURPOSE

This occupant out-of-position static side airbag deployment test is part of the Technical Working Group Occupant Injury Risk from Deploying Side Airbags Testing Program sponsored by Alpha Technology Associate, Inc. under Contract No. DTNH22-12-D-00259. The purpose of this test was to obtain occupant injury data for a side airbag deployment.

The occupant out-of-position (OOP) side airbag test was conducted in accordance with the Technical Working Group Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

SUMMARY

The effects of a roof mounted curtain airbag and a seat mounted torso/pelvis airbag deployment in a 2014 Nissan Versa Note S 5-door hatchback with an out-of-position 3 year old dummy were evaluated. The test was performed at KARCO Engineering, LLC. on January 9, 2014. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Three (3) high-speed digital cameras and one (1) real time camera were used to document the deployment of the airbags. Camera locations and other pertinent camera information can be found on Data Sheet No.1 and Data Sheet No.6.

A 3 year old anthropomorphic test device (ATD) was placed in the right front passenger seating position facing upward according to the dummy placement instructions (3.3.3.3) in the July 2003 Revision of the Technical Working Group's 'Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags'.

The 3 year old ATD was instrumented with head tri-axial accelerometers, upper and lower neck force transducers.

Fifteen (15) channels of data were recorded using an on-board data acquisition system. Appendix B contains dummy response data traces. Appendix C contains the instrumentation data channel assignments. Appendix D contains ATD calibration sheets.

Orientation of the 3 year old dummy was with the dummy lying on its back with its arms at its sides so that its rearmost arm contacts the seatback. The dummy's back was supported by a foam wedge and the head was resting in a neutral position on the armrest of the door panel. The dummy's head CG was aligned with the vertical centerline of the module. The arm that was closest to the front edge of the seat was parallel to the torso and rests on the foam block with the fingertips just touching the seat cushion. The rearmost upper arm was oriented at 45 degrees forward of the torso centerline and the forearm oriented to 90 degrees to the upper arm. This orientation complies with section 3.3.3.3 of the Technical Working Group (TWG) recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

The passenger side door remained closed during the test, and was operable after the airbag deployed.

The 3 year old dummy's visible contact points were as follows: The ATD's head contacted the torso/pelvis airbag, glovebox and floorpan. The ATD's left arm contacted the floorpan. The right arm, pelvis and abdomen contacted the seat cushion. Both legs contacted the floorpan.

The occupant data is summarized below:

ATD Position	HIC_{15}	T^1	T^2	Avg G	Ntf	Nte	Ncf	Nce
Passenger	277.7	4.1	16.4	55.5	0.20	0.34	0.72	0.47

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.574
Pressure	Tire Pressures	lbf/in^2	kPa	6.895
Temperature	General Use	^oF	^oC	=(Tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

TEST SUMMARY

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

TEST DUMMY INFORMATION

Description	Passenger Seat
Dummy Type / Serial No.	3 Year Old / 044
Head Contact	Yes
Chest Contact	Yes
Abdomen Contact	Yes
Pelvis Contact	Yes
Left Knee Contact	Yes
Right Knee Contact	Yes

VIDEO COVERAGE

Description	Quantity
High Speed Digital	3
Real Time	1
Total	4

DATA CHANNELS

Description	Quantity
3 Year Old ATD Sensors	15
Belt Assessment Sensors	0
Vehicle Structure Accelerometers	0
Total	15

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20145205
Model Year	2014
Make	Nissan
Model	Versa Note S
Body Style	5-Door Hatchback
VIN	3N1CE2CP6EL356775
Body Color	Brilliant Silver
Odometer Reading (km / mi)	108 / 67
Engine Displacement (L)	1.6
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Manual
Transmission Speeds	5
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	No
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensione	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	No

Does Owner's Manual provide instructions to turn off automatic door locks? N/A

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.
Date of Manufacture	Jun-13
Vehicle Type	Passenger Car

GVWR (kg)	1574
GAWR Front (kg)	847
GAWR Rear (kg)	755

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	2	3		5
Capacity Weight (VCW) (kg)				385.0

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

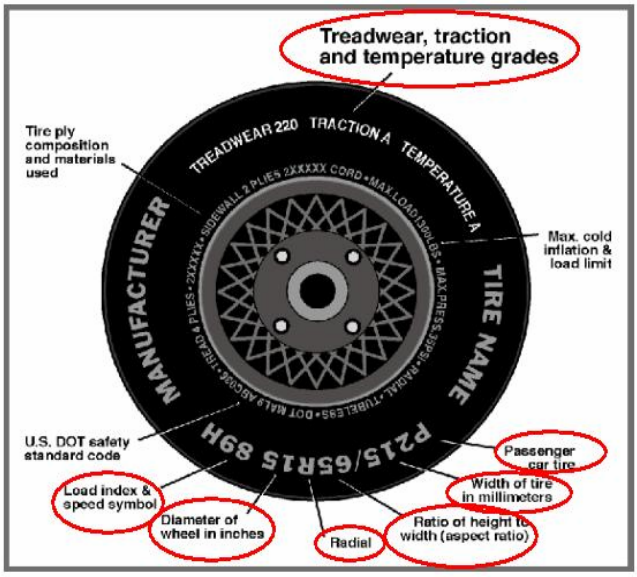
*Vehicle underwent New Car Assessment Program Side Impact Testing on August 15, 2013.

DATA SHEET NO. 2 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	250	250
Recommended Tire Size	P185/65R15	P185/65R15
Tire Size on Vehicle	P185/65R15	P185/65R15
Tire Manufacturer	Continental	Continental
Tire Model	ContiPro Contact	ContiPro Contact
Treadwear	500	500
Traction	AA	AA
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	86H	86H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	P5FP 3YP 2113	P5FP 3YP 2113
DOT Safety Code Right	P5FP 3YP 2113	P5FP 3YP 2113

DATA SHEET NO. 3

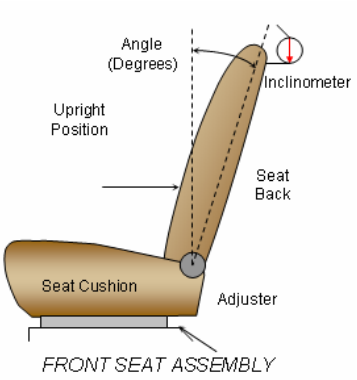
SEAT ADJUSTMENTS

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

SEAT BACK ANGLE

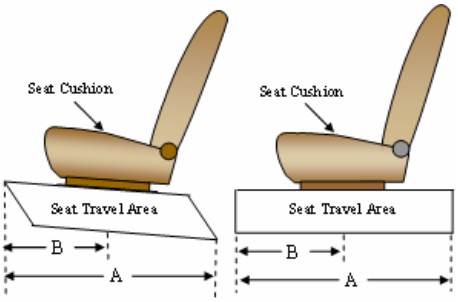
The passenger seat back is positioned per section 3.3.3.3 of the TWG recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags. Seat back angle is measured at the headrest post.



Seating Position	Degrees	Detent
Passenger Seat	0.9	7

SEAT FORE / AFT POSITIONING

The passenger seat track travel is set per section 3.3.3.3 of the TWG recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags. The first or forward most position is counted as zero (0)



Seating Position	Total Fore-Aft Travel		Placed in Position	
	mm	Detents	mm	Detents
Passenger Seat	240	25 (0-24)	200	20 (0-20)

SEAT BELT UPPER ANCHORAGE

The seat belt upper anchorage is positioned to the uppermost position. Position “H” is the uppermost position, followed by position “M1”. Position “L” is the lowermost position.

Seating Position	Total No. of Positions	Placed in Position
Passenger Seat	4	H

*

*The pretensioner was fired prior to this test. The seatbelt was removed to not have interference with the Torso/Pelvis airbag.

DATA SHEET NO. 4

DUMMY POSITIONING AND AIRBAG DIMENSIONS

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

DUMMY POSITIONING

Code	Measurement Description	Passenger	
		Length (mm)	Angle (°)
SA	Seat Back Angle		0.9
AN	Top of Airbag Module to Head/Neck Junction	167	90.0
HD	Head CG to Door Panel/ Window	119	0.0
HSC	Head to Seat Back Centerline	232	0.0
HB	Head to B-Pillar (first contact)	68	0.0
HZ	Head to Roof (Z)	555	90.0
HHD	Head to Header (measured from back of head)	660	50.2
ND	Nose to Dash (measured from back of head)	651	2.2
NS	Nose to Seat Back	131	0.0
NR	Nose to Header (measured from back of head)	660	50.2
CD	Chest to Dash (measured from back)	636	11.1
CS	Chest to Seat Back	165	0.0
RACL	Right Arm to Seat Back Centerline	35	0.0
LACL	Left Arm to Seat Back Centerline	37	0.0
RA	Right Arm to Door Panel	235	0.0
LA	Left Arm to Door Panel	335	0.0
KK	Knee to Knee	89	0.0
TT	Toe to Toe	84	0.0
KSCR	Right Knee to Seat Cushion Centerline	323	0.0
KSCL	Left Knee to Seat Cushion Centerline	323	0.0
	Head Level (X Direction)		38.2
	Head Level (Y Direction)		12.3

AIRBAG DIMENSIONS

Code	Measurement Description	Airbag
		Length (mm)
AMW	Curtain Airbag Module Diameter	23
AML	Curtain Airbag Module Length	176
ABW	Curtain Airbag Width	1662
ABL	Curtain Airbag Length	450
AMW	Torso/Pelvis Airbag Module Diameter	36
AML	Torso/Pelvis Airbag Module Length	197
ABW	Torso/Pelvis Airbag Width	355
ABL	Torso/Pelvis Airbag Length	582

DATA SHEET NO. 5

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Pass. 3 YO			
			Max	Time	Min	Time
Head CG	X	G's	30.1	8.1	-22.9	155.0
Head CG	Y	G's	114.1	7.8	-20.8	154.4
Head CG	Z	G's	36.5	8.9	-35.9	7.9
Head CG Resultant	N/A	G's	119.2	7.8		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. 3 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	182.0	8.1	-74.8	156.5
Neck Force	Y	Newtons	293.4	165.2	-466.0	15.7
Neck Force	Z	Newtons	551.5	8.7	-1260.7	163.2
Neck Force Resultant	N/A	Newtons	1295.8	163.2		
Neck Moment	X	Nm	10.8	7.5	-22.7	28.5
Neck Moment	Y	Nm	11.3	168.9	-4.2	74.5
Neck Moment	Z	Nm	5.0	8.3	-4.6	162.4
Neck Moment Resultant	N/A	Nm	22.9	28.4		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. 3 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	97.5	6.6	-73.0	8.7
Neck Force	Y	Newtons	243.3	166.6	-433.7	19.8
Neck Force	Z	Newtons	659.7	8.7	-1178.3	163.5
Neck Force Resultant	N/A	Newtons	1200.5	163.5		
Neck Moment	X	Nm	16.2	163.4	-65.7	20.8
Neck Moment	Y	Nm	5.8	156.7	-5.7	61.2
Neck Moment	Z	Nm	9.7	26.1	-5.0	169.9
Neck Moment Resultant	N/A	Nm	66.1	20.8		

HEAD INJURY CRITERIA (HIC 15)

Location	Pass. 3 YO			
	HIC15	T^1	T^2	Avg G
Head CG	277.7	4.1	16.1	55.5

UPPER NECK NIJ VALUES

Location	Pass. 3 YO			
	Ntf	Nte	Ncf	Nce
Upper Neck	0.20	0.34	0.72	0.47

DATA SHEET NO. 6

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback NHTSA No.: M20145205TWG2

Test Program: TWG 3.3.3.3 Test Date: 01/09/14

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	High Speed Front View	2120	-250	-1740	-18.5	50	1000
2	High Speed 3/4 View	1350	-1450	-1735	-21.9	35	1000
3	High Speed Side View	130	-2630	-945	-2.5	35	1000
4	Real Time	230	-2655	-940	-2.0		30

Coordinates: +X = forward of vehicle relative to dummy's head CG

+Y = right of vehicle relative to dummy's head CG

+Z = into ground

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

FIGURE 1. Right Front ¾ View, As Received

FIGURE 2. Vehicle Certification Label

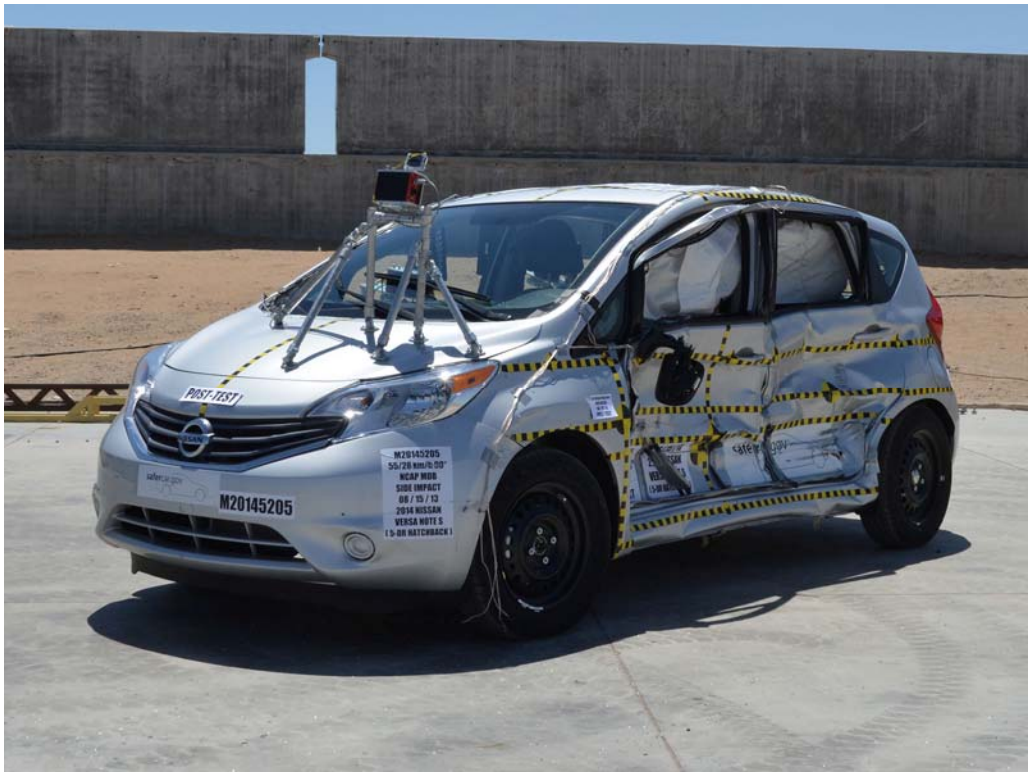


FIGURE 3. Post-Test Left Front ¾ View of NCAP Side MDB Impact Test

FIGURE 4. Post-Test Left Side View of NCAP Side MDB Impact Test

FIGURE 5. Post-Test Left Rear ¾ View of NCAP Side MDB Impact Test

FIGURE 6. Post-Test Right Side View of NCAP Side MDB Impact Test

FIGURE 7. Pre-Test Dummy Position, Left Side View

FIGURE 8. Post-Test Dummy Position, Left Side View

FIGURE 9. Pre-Test Dummy Position, ¾ View

FIGURE 10. Post-Test Dummy Position, ¾ View

FIGURE 11. Pre-Test Dummy Position, Front View

FIGURE 12. Post-Test Dummy Position, Front View

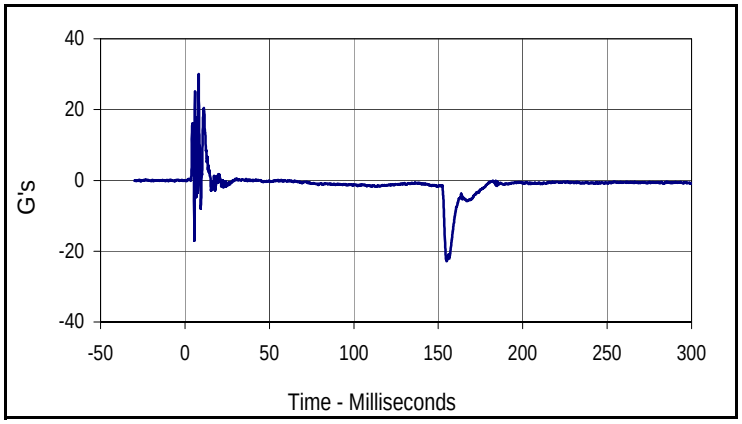
FIGURE 13. Post-Test Airbags, Left Side View

FIGURE 14. Post-Test Airbags, Left Front ¾ View

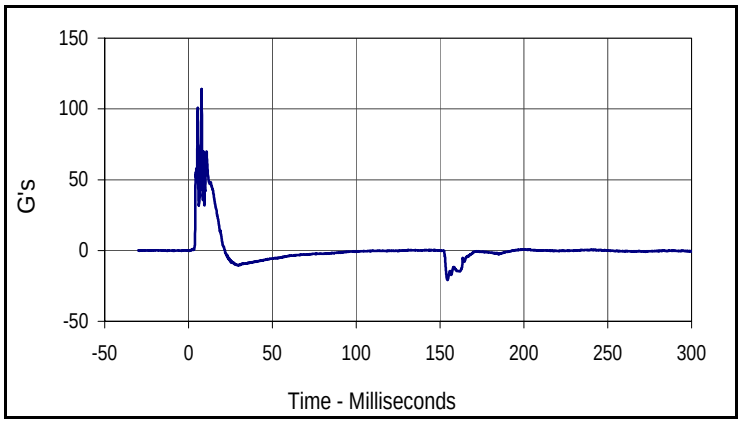
APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

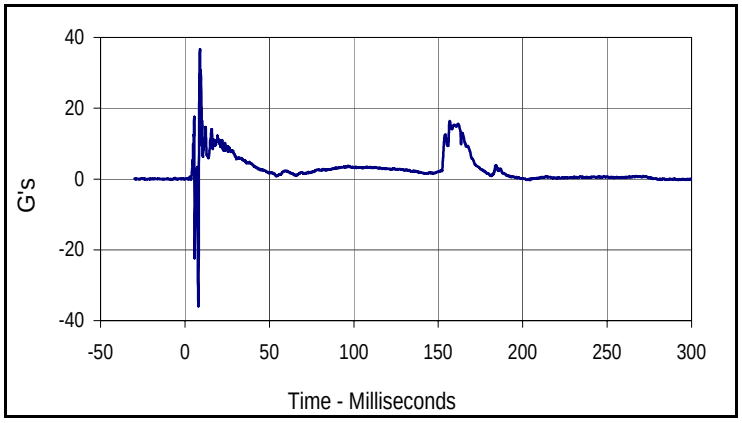
Test Vehicle:	2014 Nissan Versa Note S 5-Door Hatchback	Test Date:	1/9/14
Test Program:	TWG 3.3.3.3	NHTSA No.:	M20145205TWG2



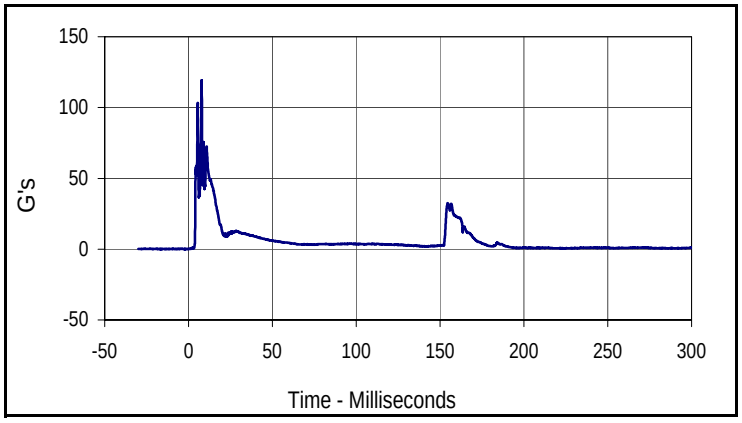
Curve Description			
3 Yr. Old Head X			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
30.1	8.1	-22.9	155.0



Curve Description			
3 Yr. Old Head Y			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
114.1	7.8	-20.8	154.4



Curve Description			
3 Yr. Old Head Z			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
36.5	8.9	-35.9	7.9



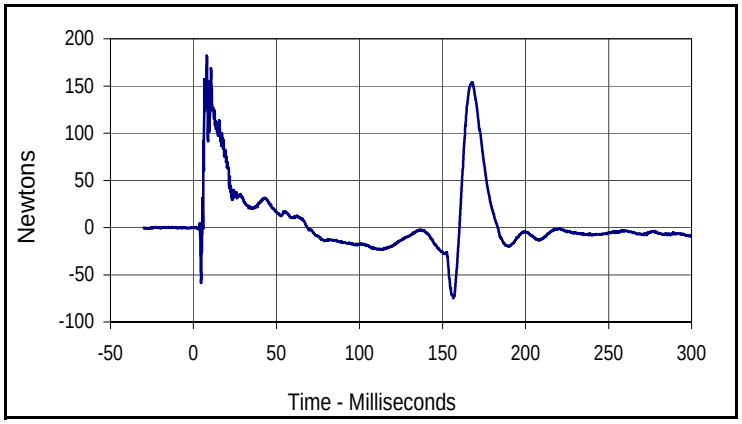
Curve Description			
3 Yr. Old Head Resultant			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
119.2	7.8	0.1	1.5

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback

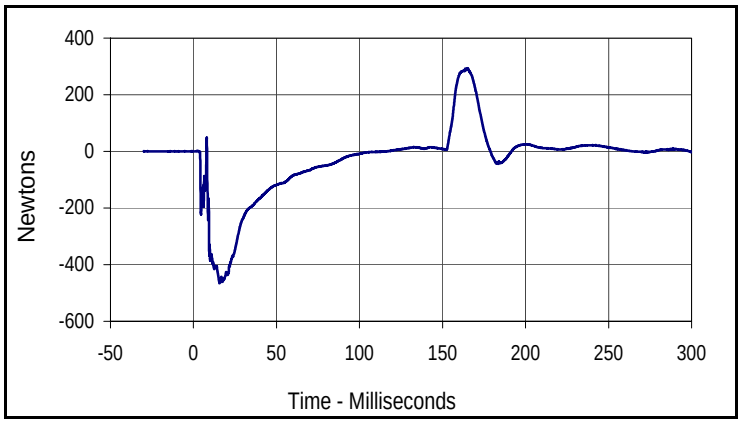
Test Program: TWG 3.3.3.3

Test Date: 1/9/14

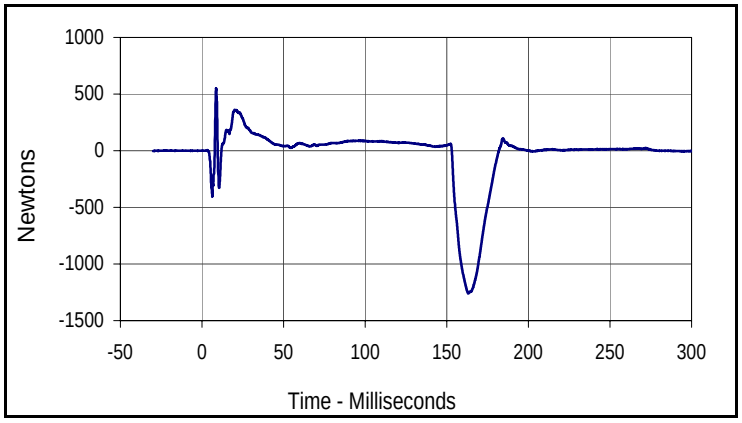
NHTSA No.: M20145205TWG2



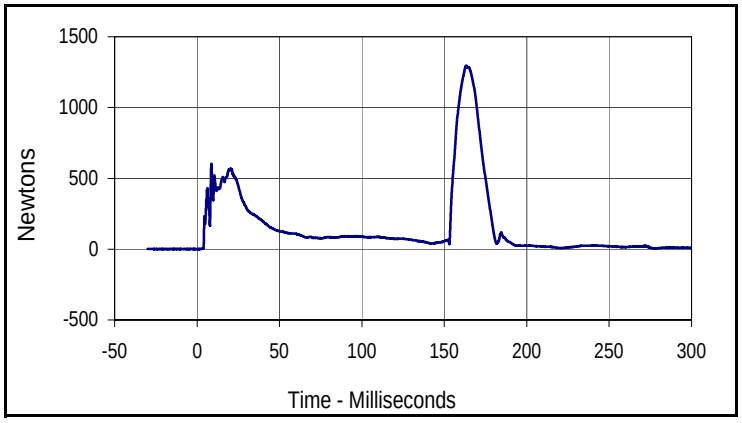
Curve Description			
3 Yr. Old Upper Neck Force X			
Plot No.	Type	SAE Class	Units
005	FIL	1000	Newtons
Max	Time	Min	Time
182.0	8.1	-74.8	156.5



Curve Description			
3 Yr. Old Upper Neck Force Y			
Plot No.	Type	SAE Class	Units
006	FIL	1000	Newtons
Max	Time	Min	Time
293.4	165.2	-466.0	15.7

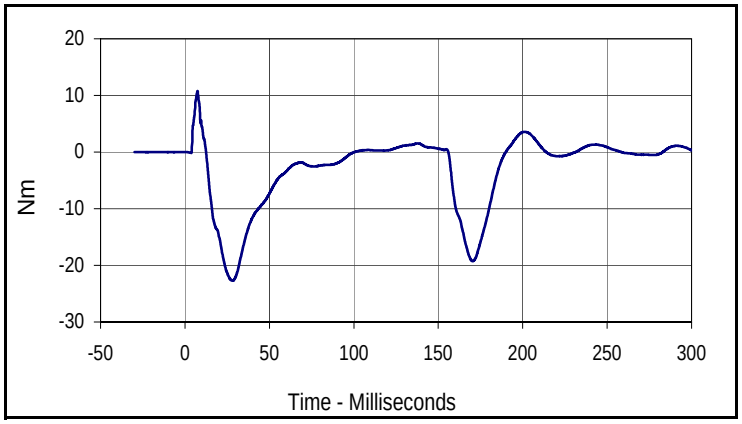


Curve Description			
3 Yr. Old Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
551.5	8.7	-1260.7	163.2

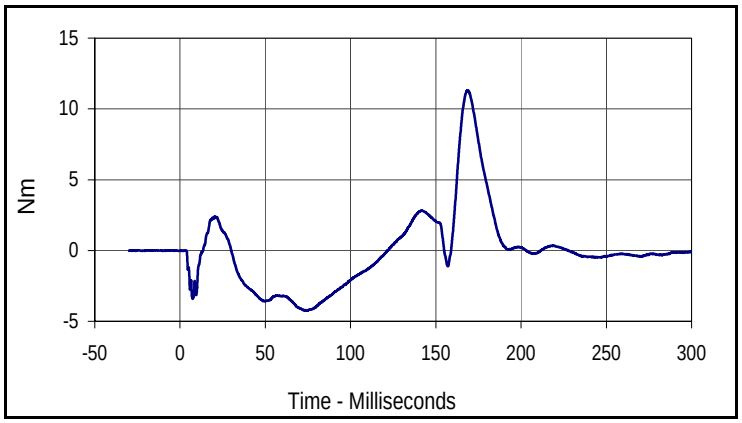


Curve Description			
3 Yr. Old Upper Neck Force Resultant			
Plot No.	Type	SAE Class	Units
008	RES	1000	Newtons
Max	Time	Min	Time
1295.8	163.2	0.3	0.0

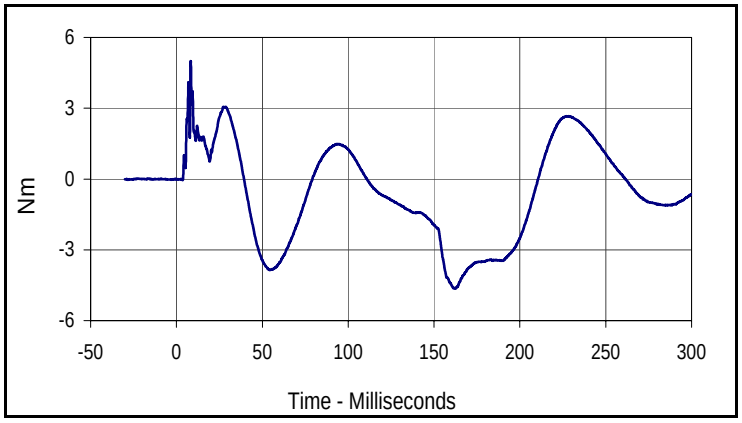
Test Vehicle:	2014 Nissan Versa Note S 5-Door Hatchback	Test Date:	1/9/14
Test Program:	TWG 3.3.3.3	NHTSA No.:	M20145205TWG2



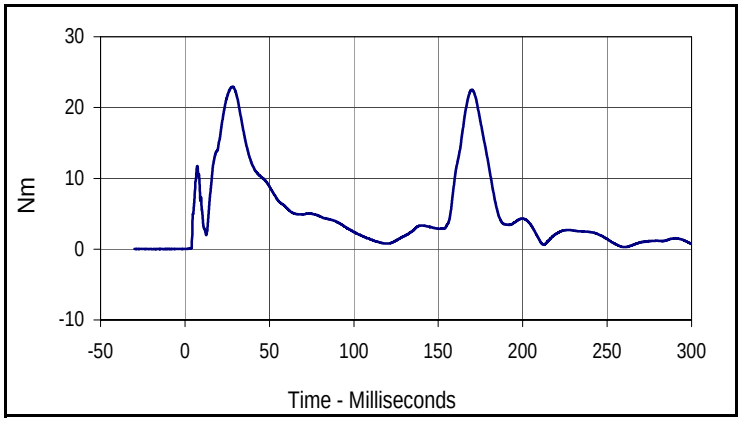
Curve Description			
3 Yr. Old Upper Neck Moment X			
Plot No.	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
10.8	7.5	-22.7	28.5



Curve Description			
3 Yr. Old Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
11.3	168.9	-4.2	74.5



Curve Description			
3 Yr. Old Upper Neck Moment Z			
Plot No.	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
5.0	8.3	-4.6	162.4



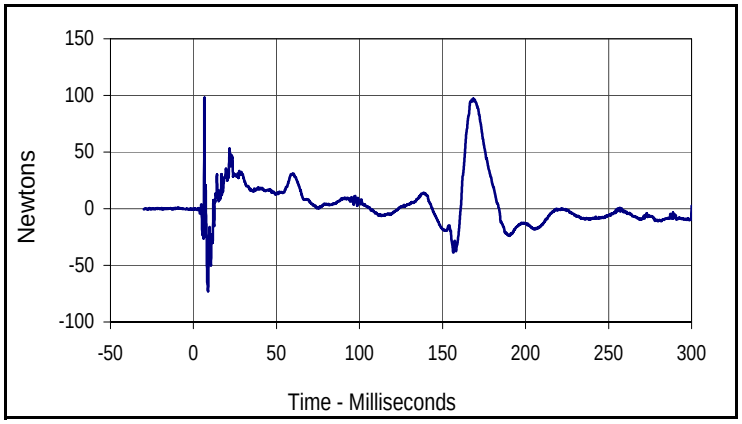
Curve Description			
3 Yr. Old Upper Neck Moment Resultant			
Plot No.	Type	SAE Class	Units
012	RES	600	Nm
Max	Time	Min	Time
22.9	28.4	0.0	0.8

Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback

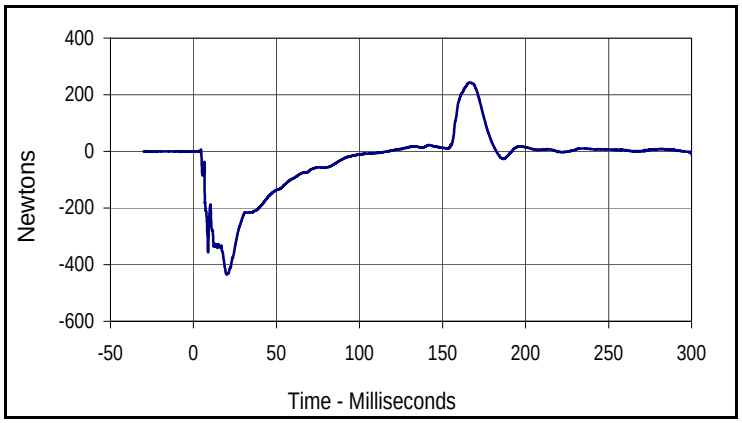
Test Program: TWG 3.3.3.3

Test Date: 1/9/14

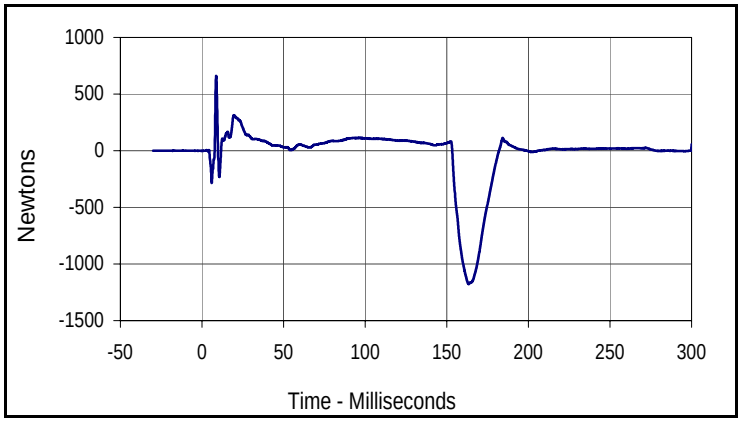
NHTSA No.: M20145205TWG2



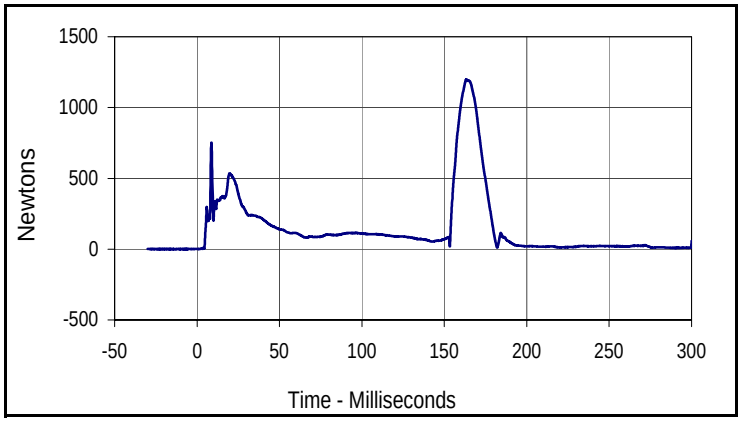
Curve Description			
3 Yr. Old Lower Neck Force X			
Plot No.	Type	SAE Class	Units
013	FIL	1000	Newtons
Max	Time	Min	Time
97.5	6.6	-73.0	8.7



Curve Description			
3 Yr. Old Lower Neck Force Y			
Plot No.	Type	SAE Class	Units
014	FIL	1000	Newtons
Max	Time	Min	Time
243.3	166.6	-433.7	19.8

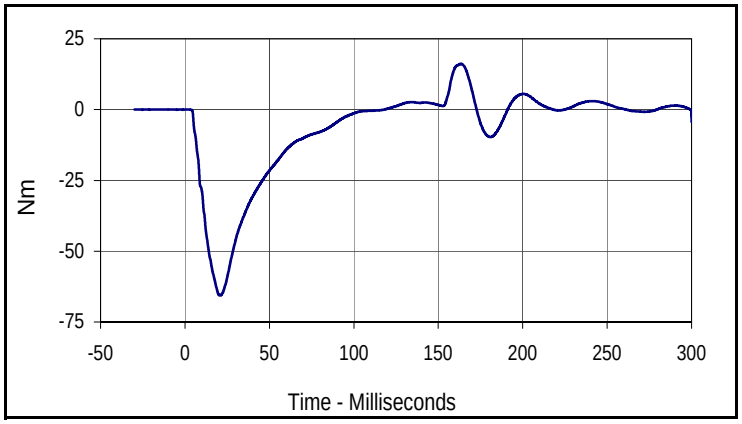


Curve Description			
3 Yr. Old Lower Neck Force Z			
Plot No.	Type	SAE Class	Units
015	FIL	1000	Newtons
Max	Time	Min	Time
659.7	8.7	-1178.3	163.5

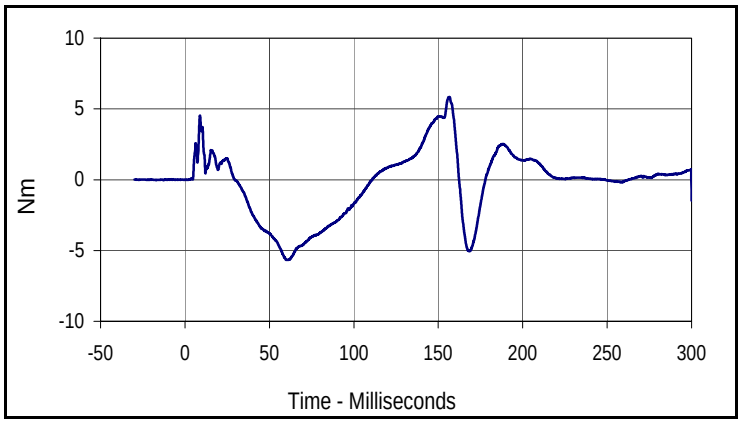


Curve Description			
3 Yr. Old Lower Neck Force Resultant			
Plot No.	Type	SAE Class	Units
016	RES	1000	Newtons
Max	Time	Min	Time
1200.5	163.5	0.4	1.0

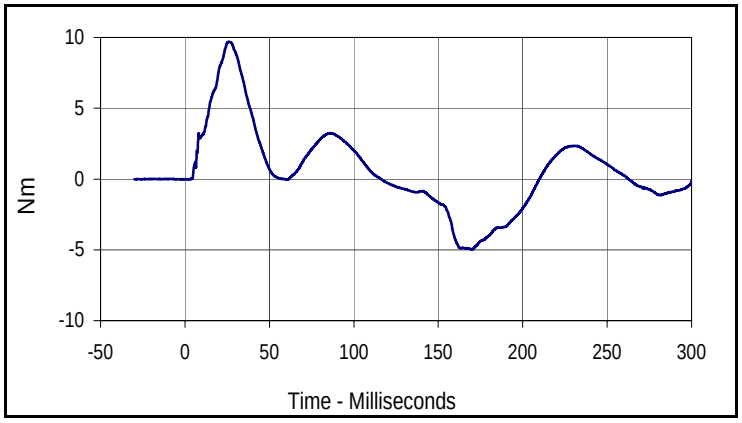
Test Vehicle: 2014 Nissan Versa Note S 5-Door Hatchback
Test Date: 1/9/14
Test Program: TWG 3.3.3.3
NHTSA No.: M20145205TWG2



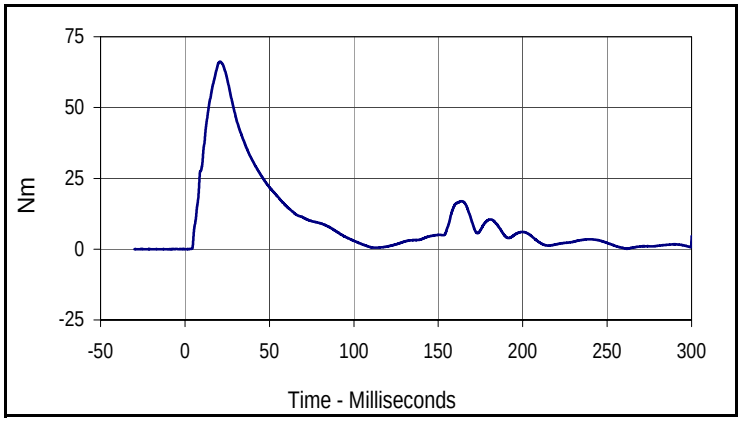
Curve Description			
3 Yr. Old Lower Neck Moment X			
Plot No.	Type	SAE Class	Units
017	FIL	600	Nm
Max	Time	Min	Time
16.2	163.4	-65.7	20.8



Curve Description			
3 Yr. Old Lower Neck Moment Y			
Plot No.	Type	SAE Class	Units
018	FIL	600	Nm
Max	Time	Min	Time
5.8	156.7	-5.7	61.2



Curve Description			
3 Yr. Old Lower Neck Moment Z			
Plot No.	Type	SAE Class	Units
019	FIL	600	Nm
Max	Time	Min	Time
9.7	26.1	-5.0	169.9



Curve Description			
3 Yr. Old Lower Neck Moment Resultant			
Plot No.	Type	SAE Class	Units
020	RES	600	Nm
Max	Time	Min	Time
66.1	20.8	0.0	2.0

APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

TWG 3.3.3.3
Instrumentation Data Channel Assignments
A.T.D. Serial Number 044
1/9/14
2014 Nissan Versa Note S 5-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD	X	P58808	Accel.,full bridge	ENDEVCO	7264C-2000	G
2	HEAD	Y	P49189	Accel.,full bridge	ENDEVCO	7264C-2000	G
3	HEAD	Z	P58861	Accel.,full bridge	ENDEVCO	7264C-2000	G
4	UPPER NECK FORCE	X	212	Load cell, six axis neck	R. A. Denton	3303	N
5	UPPER NECK FORCE	Y	212	Load cell, six axis neck	R. A. Denton	3303	N
6	UPPER NECK FORCE	Z	212	Load cell, six axis neck	R. A. Denton	3303	N
7	UPPER NECK MOMENT	X	212	Load cell, six axis neck	R. A. Denton	3303	Nm
8	UPPER NECK MOMENT	Y	212	Load cell, six axis neck	R. A. Denton	3303	Nm
9	UPPER NECK MOMENT	Z	212	Load cell, six axis neck	R. A. Denton	3303	Nm
10	LOWER NECK FORCE	X	93	Load cell, six axis neck	R. A. Denton	3303	N
11	LOWER NECK FORCE	Y	93	Load cell, six axis neck	R. A. Denton	3303	N
12	LOWER NECK FORCE	Z	93	Load cell, six axis neck	R. A. Denton	3303	N
13	LOWER NECK MOMENT	X	93	Load cell, six axis neck	R. A. Denton	3303	Nm
14	LOWER NECK MOMENT	Y	93	Load cell, six axis neck	R. A. Denton	3303	Nm
15	LOWER NECK MOMENT	Z	93	Load cell, six axis neck	R. A. Denton	3303	Nm

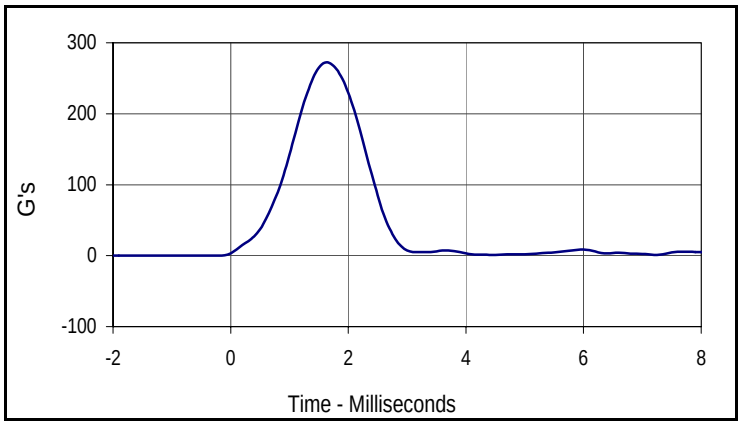
APPENDIX D

PRE-TEST AND POST-TEST HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA

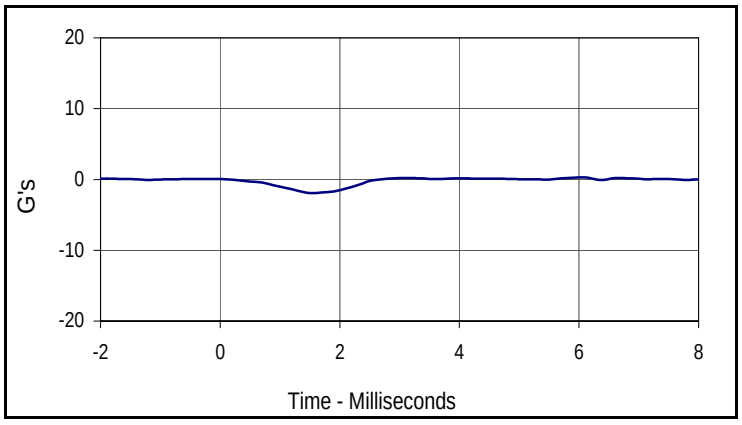
APPENDIX D
PRE-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	Hybrid III 3 Yr Old Head Drop Test	Test Date:	1/3/14
ATD Serial No.:	044	Test I.D.:	044HD030

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Peak Resultant Acceleration	G's	250.0 to 280.0	271.9	Pass
Peak Lateral Acceleration	G's	≤15.0	1.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



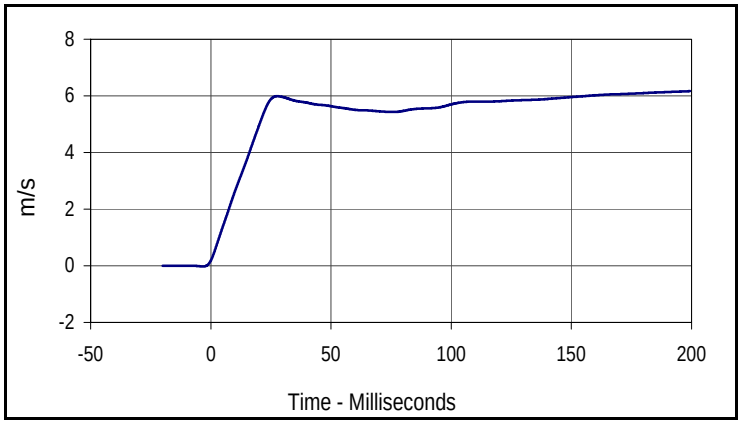
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
271.9	1.6	0.0	-0.9



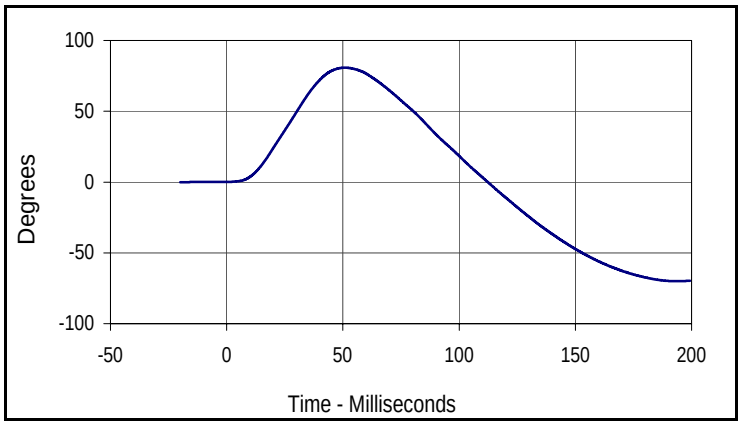
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.3	6.0	-1.9	1.5

Test Program:	Hybrid III 3 Yr Old Neck Flexion Test	Test Date:	1/3/14
ATD Serial No.:	044	Test I.D.:	044NF030

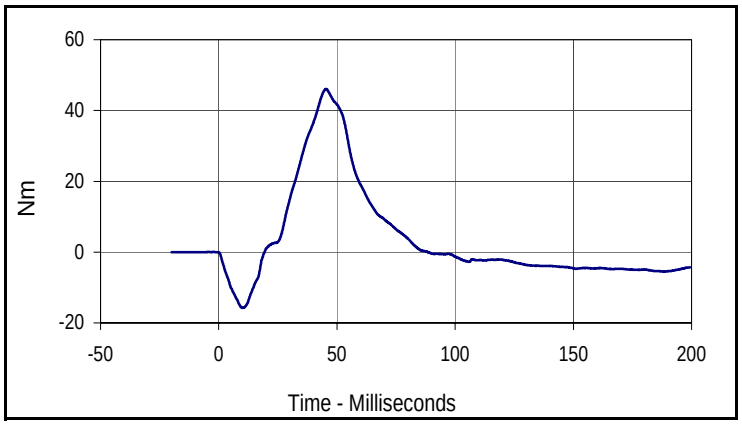
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	17	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.42	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.5	Pass
	15 Msec.	m/s	3.0 to 4.0	3.6	Pass
	20 Msec.	m/s	4.0 to 5.1	4.8	Pass
"D" Plane Rotation	Max	Degrees	70.0 to 82.0	80.8	Pass
Peak Moment in Rotation	Max	Nm	42.0 to 53.0	46.0	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	60.0 to 80.0	69.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.2	199.3	0.0	-3.3



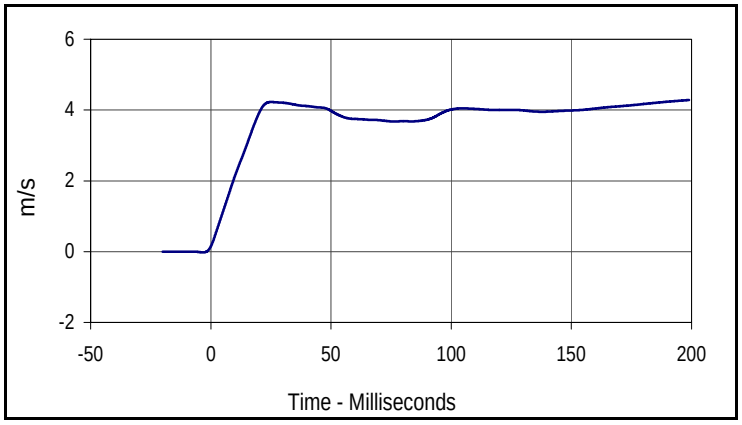
Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
80.8	50.8	-70.0	193.6



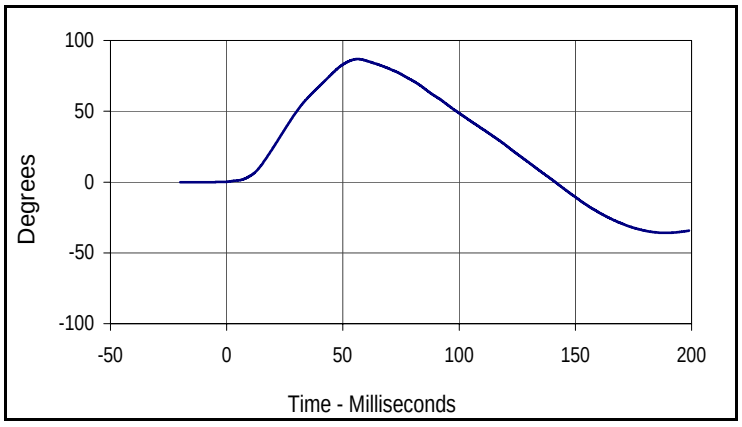
Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
46.0	45.3	-15.8	9.9

Test Program:	Hybrid III 3 Yr Old Neck Extension Test	Test Date:	1/3/14
ATD Serial No.:	044	Test I.D.:	044NE030

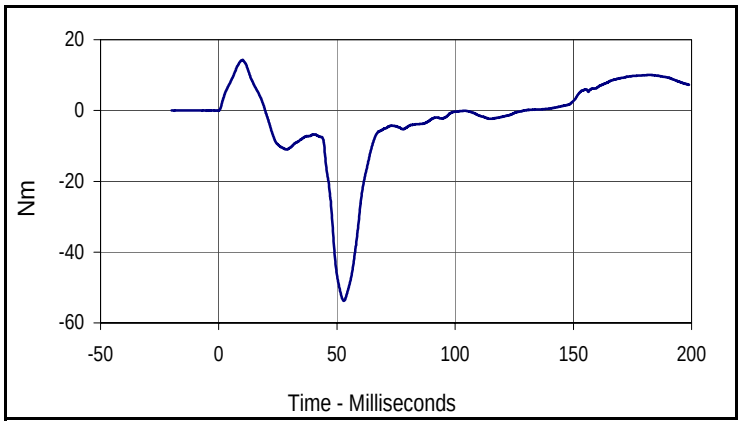
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Velocity		m/s	3.55 to 3.75	3.67	Pass
Pendulum Deceleration	6 Msec.	m/s	1.0 to 1.4	1.3	Pass
	10 Msec.	m/s	1.9 to 2.5	2.1	Pass
	14 Msec.	m/s	2.8 to 3.5	2.8	Pass
"D" Plane Rotation	Max	Degrees	83.0 to 93.0	86.9	Pass
Peak Moment in Rotation	Max	Nm	-43.7 to -53.3	-45.3	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	60.0 to 80.0	64.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.3	0.0	0.0	-3.2



Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
86.9	56.4	-35.9	188.7



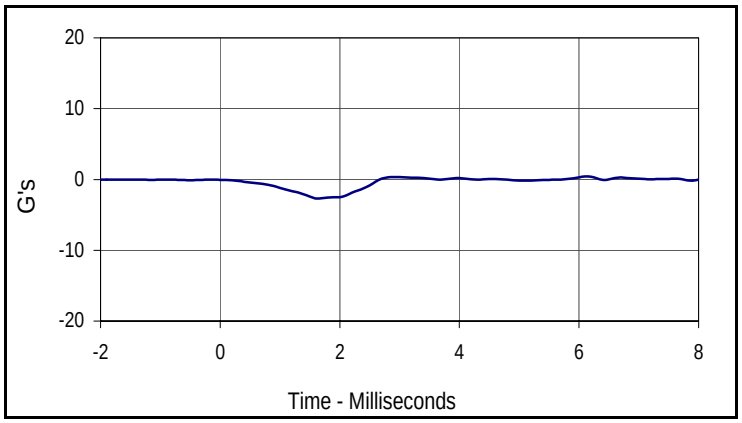
Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
14.3	10.1	-53.7	52.9

APPENDIX D
POST-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	Hybrid III 3 Yr Old Head Drop Test	Test Date:	1/13/14
ATD Serial No.:	044	Test I.D.:	044HD031

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Peak Resultant Acceleration	G's	250.0 to 280.0	270.8	Pass
Peak Lateral Acceleration	G's	≤15.0	2.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

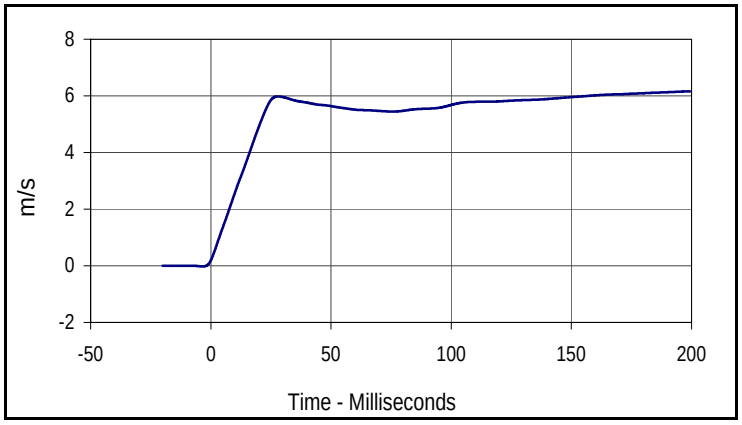
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
270.8	1.7	0.1	-2.0



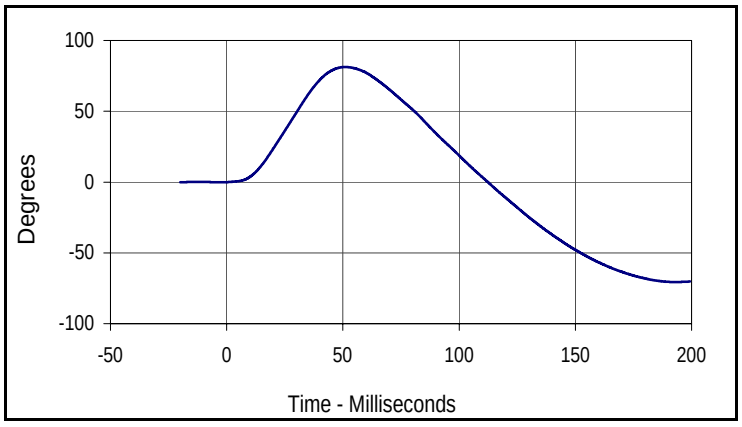
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.3	2.9	-2.7	1.6

Test Program:	Hybrid III 3 Yr Old Neck Flexion Test	Test Date:	1/13/14
ATD Serial No.:	044	Test I.D.:	044NF031

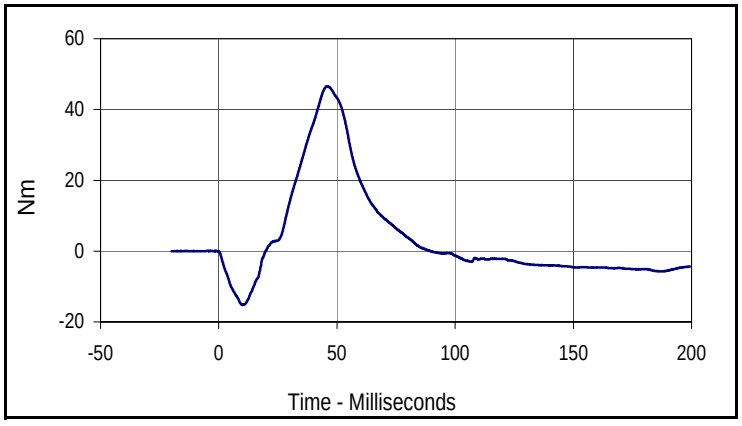
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.43	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.4	Pass
	15 Msec.	m/s	3.0 to 4.0	3.6	Pass
	20 Msec.	m/s	4.0 to 5.1	4.8	Pass
"D" Plane Rotation	Max	Degrees	70.0 to 82.0	81.3	Pass
Peak Moment in Rotation	Max	Nm	42.0 to 53.0	46.5	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	60.0 to 80.0	69.6	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.2	199.3	0.0	-3.3



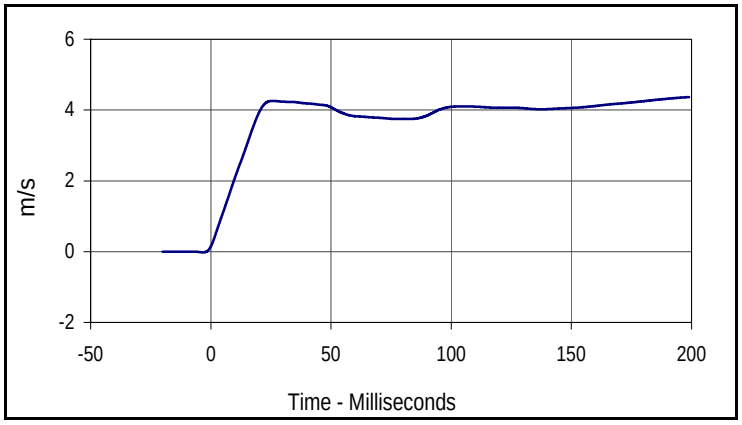
Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.3	51.0	-70.6	193.1



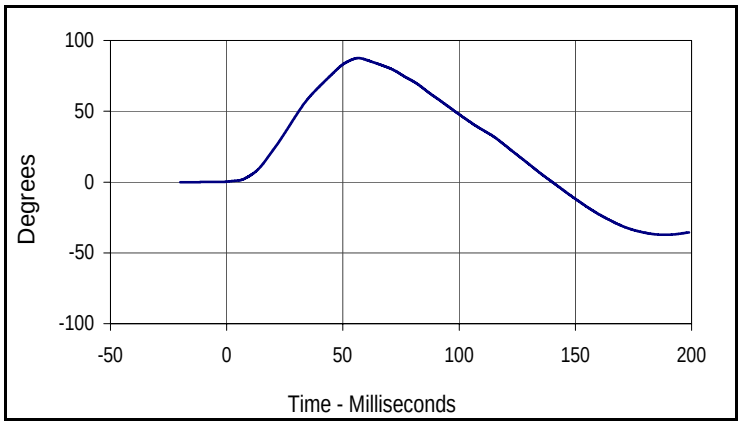
Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
46.5	45.8	-15.3	10.1

Test Program:	Hybrid III 3 Yr Old Neck Extension Test	Test Date:	1/13/14
ATD Serial No.:	044	Test I.D.:	044NE031

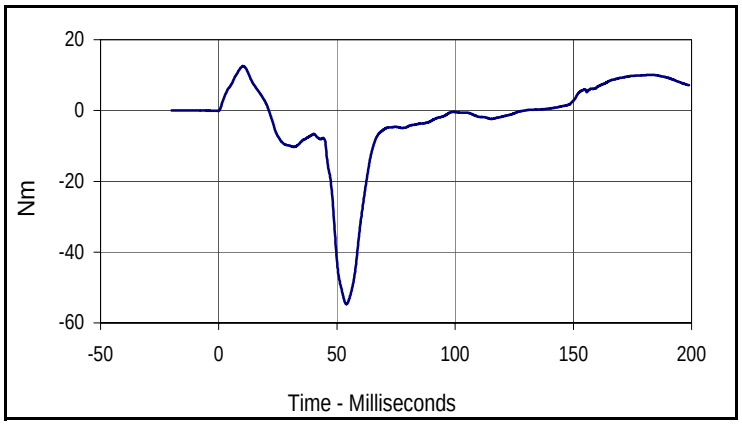
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	16	Pass
Pendulum Velocity		m/s	3.55 to 3.75	3.67	Pass
Pendulum Deceleration	6 Msec.	m/s	1.0 to 1.4	1.3	Pass
	10 Msec.	m/s	1.9 to 2.5	2.1	Pass
	14 Msec.	m/s	2.8 to 3.5	2.8	Pass
"D" Plane Rotation	Max	Degrees	83.0 to 93.0	87.5	Pass
Peak Moment in Rotation	Max	Nm	-43.7 to -53.3	-48.9	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	60.0 to 80.0	65.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.4	0.0	0.0	-3.3



Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
87.5	56.7	-37.3	188.4



Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
12.5	10.1	-54.7	54.0