

**REPORT NUMBER: TR-P34007-03-NC**

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

**AUDI AG  
2014 AUDI Q5 2.0T QUATTRO  
5-DOOR MPV**

**NHTSA NUMBER: M20145800TWG3**

**PREPARED BY:  
KARCO ENGINEERING, LLC.  
9270 HOLLY ROAD  
ADELANTO, CA 92301**

**JUNE 4, 2014**

**FINAL REPORT**

**PREPARED FOR:  
ALPHA TECHNOLOGY ASSOCIATE, INC.  
2810 OLD LEE HWY, SUITE 120  
FAIRFAX, VA 22031**



## TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3
<u>Data Sheet No.</u>		<u>Page No.</u>
1	Test Summary	4
2	General Test and Vehicle Parameter Data	5
3	Seat Adjustments	7
4	Dummy Positioning and Airbag Dimensions	8
5	Hybrid III ATD Injury Criteria and Sensor Data	9
6	High Speed Camera Locations and Data	10
<u>Appendix</u>		<u>Page No.</u>
A	Photographs	A
B	Dummy Response Data Traces	B
C	Instrumentation Data Channel Assignments	C
D	Pre-Test and Post-Test Hybrid III Configuration and Performance Verification Data	D

## **SECTION 1**

### **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 out-of-position 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 airbag deployment in a 2014 Audi Q5 2.0T Quattro 5-door MPV with an out-of-position 3-year old dummy were evaluated. The test was performed at KARCO Engineering, LLC. on May 21, 2014. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Two (2) 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 rear 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 and 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 in the upward facing position lying on its back with a foam wedge placed underneath its back and the head against the armrest of the passenger door. The dummy CG was aligned with the deploying trajectory of the airbag. 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 airbag.

The occupant data is summarized below:

ATD Position	HIC <sub>15</sub>	T <sup>1</sup>	T <sup>2</sup>	Avg G	Ntf	Nte	Ncf	Nce
Passenger	177.6	6.2	19.1	45.1	0.18	0.19	0.01	0.67

## SECTION 2

### OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3

Test Program: TWG 3.3.3.3 Test Date: 05/21/14

#### 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 <sup>2</sup>	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

## DATA SHEET NO. 1

### TEST SUMMARY

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3  
Test Program: TWG 3.3.3.3 Test Date: 05/21/14

### TEST DUMMY INFORMATION

Description	Passenger Seat
Dummy Type / Serial No.	3-Year Old / 044
Head Contact	Torso Airbag
Chest Contact	None
Abdomen Contact	None
Pelvis Contact	None
Left Knee Contact	None
Right Knee Contact	None

### VIDEO COVERAGE

Description	Quantity
High Speed Digital	2
Real Time	1
Total	3

### 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 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3  
 Test Program: TWG 3.3.3.3 Test Date: 05/21/14

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA Number	M20145800
Model Year	2014
Make	Audi
Model	Q5 2.0T Quattro
Body Style	5-Door MPV
VIN	WA1LFBFP3EA044520
Body Color	Monsoon Gray Metallic
Odometer Reading (km / mi)	66 / 41
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal 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
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other	Rear Side Airbags

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

No

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Audi AG
Date of Manufacture	Oct-13

GVWR (kg)	2435
GAWR Front (kg)	1180
GAWR Rear (kg)	1350

**VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION**

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Designated Seating Capacity	2	3		5
Capacity Weight (VCW) (kg)				475.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				134.8

A  
B  
A-B

\*Vehicle underwent New Car Assessment Program Frontal Impact Testing on February 5, 2014.

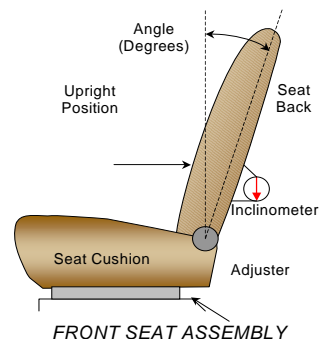


**DATA SHEET NO. 3**  
**SEAT ADJUSTMENTS**

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3  
 Test Program: TWG 3.3.3.3 Test Date: 05/21/14

**SEAT BACK ANGLE**

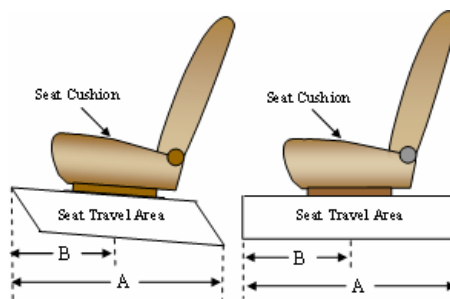
The passenger seat back is positioned per section 3.3.3.3 of the TWG recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags. Seat back angle is measured at the seat back.



Seating Position	Degrees	Detent
Passenger Seat	24.1	1 (0-1)

**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	100	11 (0-10)	100	10

**SEAT BELT UPPER ANCHORAGE**

The seat belt upper anchorage is positioned to the uppermost position. Position “H” is the uppermost position, followed by position “M<sub>1</sub>”. Position “L” is the lowermost position.

Seating Position	Total No. of Positions	Placed in Position
Passenger Seat	Fixed	Fixed

\*The seat belt pretensioner was fired prior to this test. The seatbelt was taped to the C-pillar to avoid interference with the Torso airbag.

**DATA SHEET NO. 4**

**DUMMY POSITIONING AND AIRBAG DIMENSIONS**

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3  
 Test Program: TWG 3.3.3.3 Test Date: 05/21/14

**DUMMY POSITIONING**

Code	Measurement Description	Passenger	
		Length (mm)	Angle (°)
SA	Seat Back Angle		24.1
AN	Top of Airbag Module to Head/Neck Junction	123	90.0
HD	Head CG to Door Panel/ Window	120	0.0
HSC	Head to Seat Back Centerline	299	0.0
HB	Head to B-Pillar (C-Pillar)	205	0.0
HZ	Head to Roof (Z)	476	90.0
HH	Head to Header (Right Front Seat Seatback)	532	14.5
ND	Nose to Dash (Right Front Seat Seatback)	532	14.5
NS	Nose to Seat Back	159	0.0
NR	Nose to Header	1321	19.4
CD	Chest to Dash (Right Front Seat Seatback)	556	8.3
CS	Chest to Seat Back	155	0.0
RACL	Right Arm to Seat Back Centerline	58	0.0
LACL	Left Arm to Seat Back Centerline	29	0.0
RA	Right Arm to Door Panel	246	0.0
LA	Left Arm to Door Panel	256	0.0
KK	Knee to Knee	97	0.0
TT	Toe to Toe	55	0.0
KSCR	Right Knee to Seat Cushion Centerline	251	0.0
KSCL	Left Knee to Seat Cushion Centerline	234	0.0
	Head Angle (X Direction)		41.1
	Head Angle (Y Direction)		22.3

**AIRBAG DIMENSIONS**

Code	Measurement Description	Airbag
		Length (mm)
AMW	Curtain Airbag Module Diameter	30
AML	Curtain Airbag Module Length	260
ABL	Curtain Airbag Length	1770
ABW	Curtain Airbag Width	445
AMW	Torso Airbag Module Diameter	20
AML	Torso Airbag Module Length	135
ABL	Torso Airbag Length	340
ABW	Torso Airbag Width	525

**DATA SHEET NO. 5**

**HYBRID III ATD INJURY CRITERIA AND SENSOR DATA**

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3  
 Test Program: TWG 3.3.3.3 Test Date: 05/21/14

**HEAD PEAK ACCELERATIONS**

Location	Axis	Units	Pass. 3 YO			
			Max	Time	Min	Time
Head CG	X	G's	64.4	7.8	-5.4	39.4
Head CG	Y	G's	58.7	6.9	-8.7	4.5
Head CG	Z	G's	32.2	6.8	-13.7	4.5
Head CG Resultant	N/A	G's	75.2	7.7		

**UPPER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Pass. 3 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	11.7	4.7	-374.8	19.4
Neck Force	Y	Newtons	13.4	4.6	-364.9	15.4
Neck Force	Z	Newtons	150.7	39.6	-617.3	11.3
Neck Force Resultant	N/A	Newtons	676.1	11.3		
Neck Moment	X	Nm	6.2	11.8	-3.6	34.2
Neck Moment	Y	Nm	9.7	48.5	-14.2	18.9
Neck Moment	Z	Nm	1.2	106.1	-3.8	60.9
Neck Moment Resultant	N/A	Nm	14.4	18.2		

**LOWER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Pass. 3 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	8.2	5.2	-325.6	19.5
Neck Force	Y	Newtons	3.6	4.9	-252.6	18.5
Neck Force	Z	Newtons	144.9	39.5	-511.6	11.9
Neck Force Resultant	N/A	Newtons	572.7	12.7		
Neck Moment	X	Nm	0.6	139.2	-31.4	19.3
Neck Moment	Y	Nm	24.0	21.3	-1.5	300.0
Neck Moment	Z	Nm	1.2	25.8	-4.4	60.6
Neck Moment Resultant	N/A	Nm	39.3	19.5		

**HEAD INJURY CRITERIA (HIC 15)**

Location	Pass. 3 YO			
	HIC15	T <sup>1</sup>	T <sup>2</sup>	Avg G
Head CG	177.6	6.2	19.1	45.1

**UPPER NECK NIJ VALUES**

Location	Pass. 3 YO			
	Ntf	Nte	Ncf	Nce
Upper Neck	0.18	0.19	0.01	0.67

**DATA SHEET NO. 6**

**HIGH SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800TWG3

Test Program: TWG 3.3.3.3 Test Date: 05/21/14

**CAMERA LOCATIONS**

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	High Speed 3/4 View	1445	2010	1120	-3.5	50	1000
2	High Speed Side View	170	2690	1105	-2.6	35	1000

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

<u>Figure</u>		<u>Page</u>
1	Right Front $\frac{3}{4}$ View, As Received	A-1
2	Vehicle Certification Label	A-1
3	Post-Test Right Front $\frac{3}{4}$ View of NCAP Frontal Impact Test	A-2
4	Post-Test Front View of NCAP Frontal Impact Test	A-2
5	Post-Test Left Front $\frac{3}{4}$ View of NCAP Frontal Impact Test	A-3
6	Post-Test Right Side View of NCAP Frontal Impact Test	A-3
7	Pre-Test Dummy Position, Left Side View	A-4
8	Post-Test Dummy Position, Left Side View	A-4
9	Pre-Test Dummy Position, $\frac{3}{4}$ View	A-5
10	Post-Test Dummy Position, $\frac{3}{4}$ View	A-5
11	Pre-Test Dummy Position, Front View	A-6
12	Post-Test Dummy Position, Front View	A-6
13	Post-Test Airbags, Left Side View	A-7
14	Post-Test Airbags, Left Front $\frac{3}{4}$ View	A-7
15	Post-Test Dummy Final Resting Position	A-8
16	Post-Test Dummy Final Resting Position	A-8



FIGURE 1. Right Front 3/4 View, As Received



FIGURE 2. Vehicle Certification Label



FIGURE 3. Post-Test Right Front 3/4 View of NCAP Frontal Impact Test

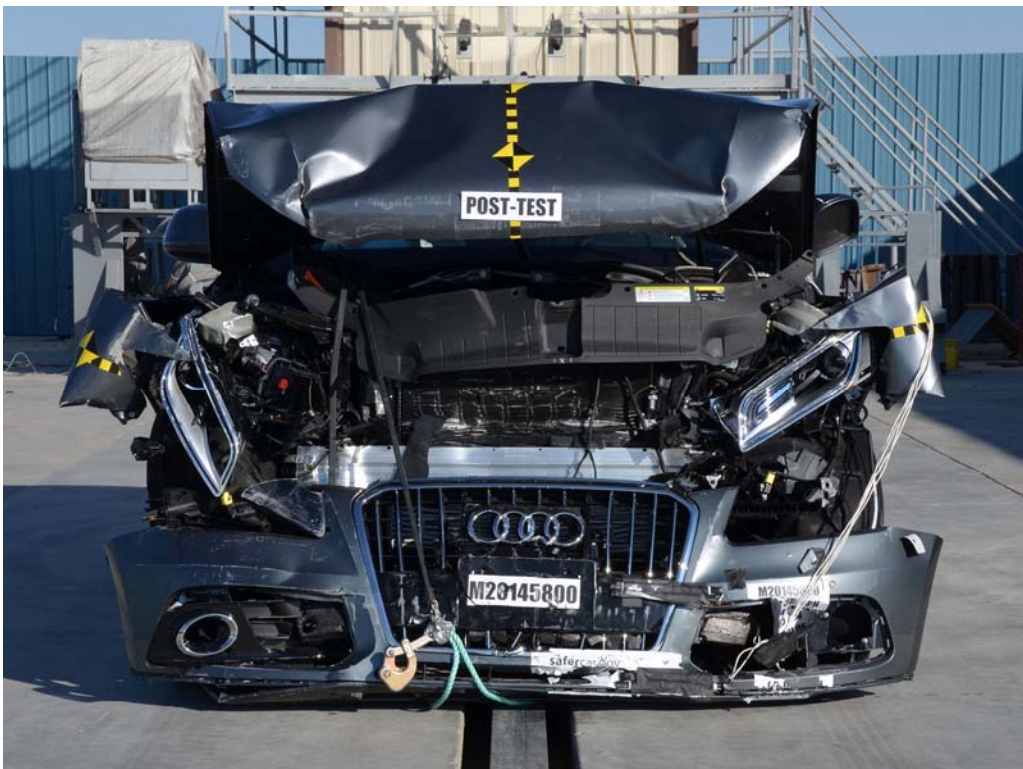


FIGURE 4. Post-Test Front View of NCAP Frontal Impact Test



FIGURE 5. Post-Test Left Front 3/4 View of NCAP Frontal Impact Test



FIGURE 6. Post-Test Right Side View of NCAP Frontal 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,  $\frac{3}{4}$  View



FIGURE 10. Post-Test Dummy Position,  $\frac{3}{4}$  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 3/4 View



FIGURE 15. Post-Test Dummy Final Resting Position



FIGURE 16. Post-Test Dummy Final Resting Position

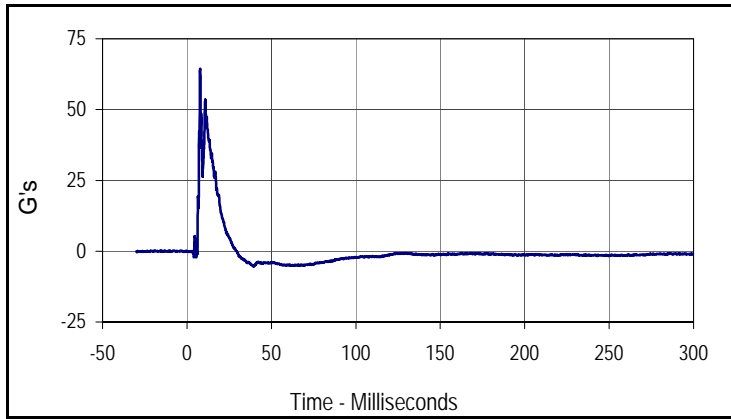
**APPENDIX B**  
**DUMMY RESPONSE DATA TRACES**

## TABLE OF DATA PLOTS

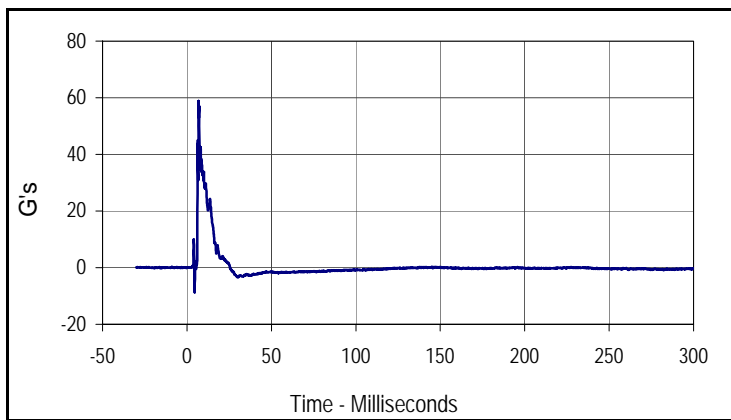
<u>Plot</u>		<u>Page</u>
1	3 Yr. Old Head X	B-1
2	3 Yr. Old Head Y	B-1
3	3 Yr. Old Head Z	B-1
4	3 Yr. Old Head Resultant	B-1
5	3 Yr. Old Upper Neck Force X	B-2
6	3 Yr. Old Upper Neck Force Y	B-2
7	3 Yr. Old Upper Neck Force Z	B-2
8	3 Yr. Old Upper Neck Force Resultant	B-2
9	3 Yr. Old Upper Neck Moment X	B-3
10	3 Yr. Old Upper Neck Moment Y	B-3
11	3 Yr. Old Upper Neck Moment Z	B-3
12	3 Yr. Old Upper Neck Moment Resultant	B-3
13	3 Yr. Old Lower Neck Force X	B-4
14	3 Yr. Old Lower Neck Force Y	B-4
15	3 Yr. Old Lower Neck Force Z	B-4
16	3 Yr. Old Lower Neck Force Resultant	B-4
17	3 Yr. Old Lower Neck Moment X	B-5
18	3 Yr. Old Lower Neck Moment Y	B-5
19	3 Yr. Old Lower Neck Moment Z	B-5
20	3 Yr. Old Lower Neck Moment Resultant	B-5

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door Hatchback  
 Test Program: TWG 3.3.3.3

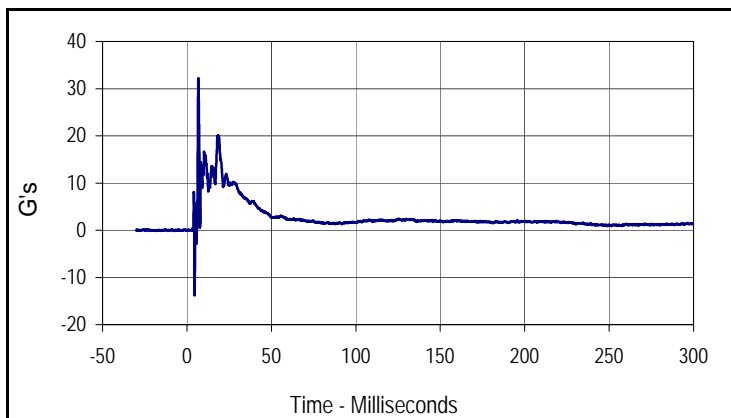
Test Date: 5/21/14  
 NHTSA No.: M20145800TWG3



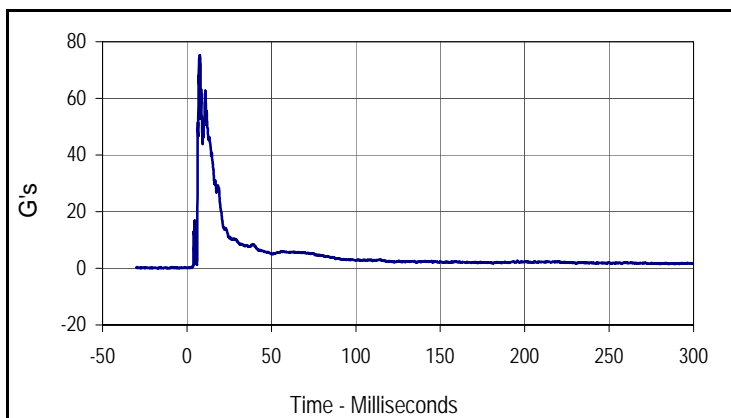
Curve Description			
3 Yr. Old Head X			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
64.4	7.8	-5.4	39.4



Curve Description			
3 Yr. Old Head Y			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
58.7	6.9	-8.7	4.5



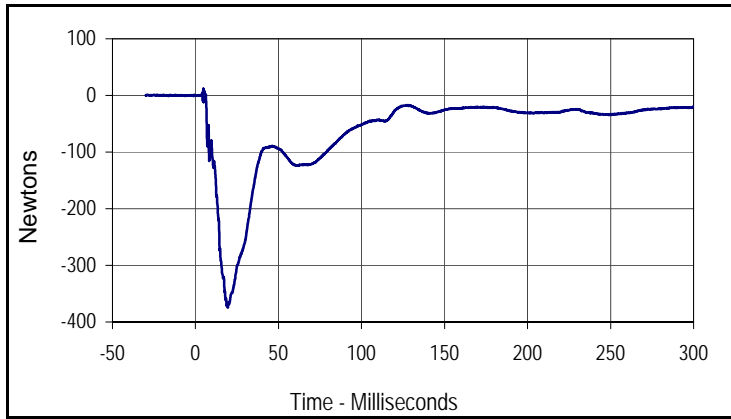
Curve Description			
3 Yr. Old Head Z			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
32.2	6.8	-13.7	4.5



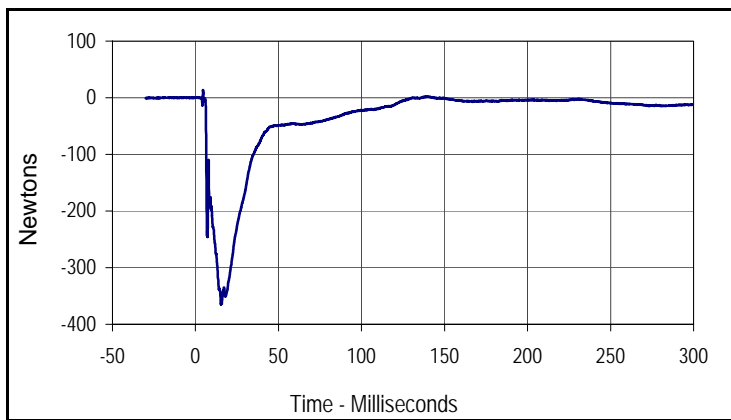
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3 Yr. Old Head Resultant			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
75.2	7.7	0.1	0.1

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door Hatchback  
 Test Program: TWG 3.3.3.3

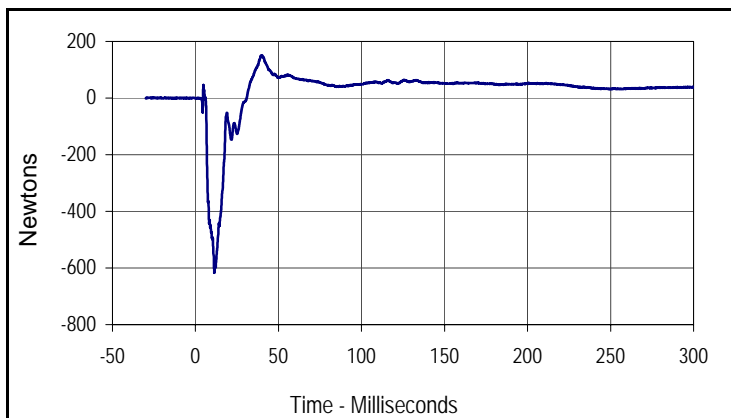
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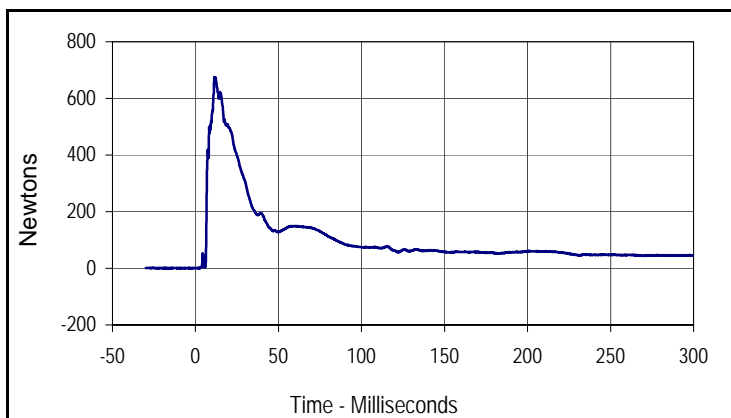
Curve Description			
3 Yr. Old Upper Neck Force X			
Plot No.	Type	SAE Class	Units
005	FIL	1000	Newtons
Max	Time	Min	Time
11.7	4.7	-374.8	19.4



Curve Description			
3 Yr. Old Upper Neck Force Y			
Plot No.	Type	SAE Class	Units
006	FIL	1000	Newtons
Max	Time	Min	Time
13.4	4.6	-364.9	15.4



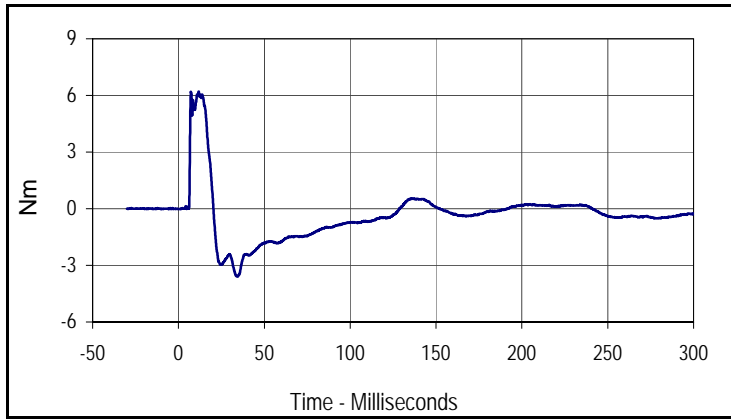
Curve Description			
3 Yr. Old Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
150.7	39.6	-617.3	11.3



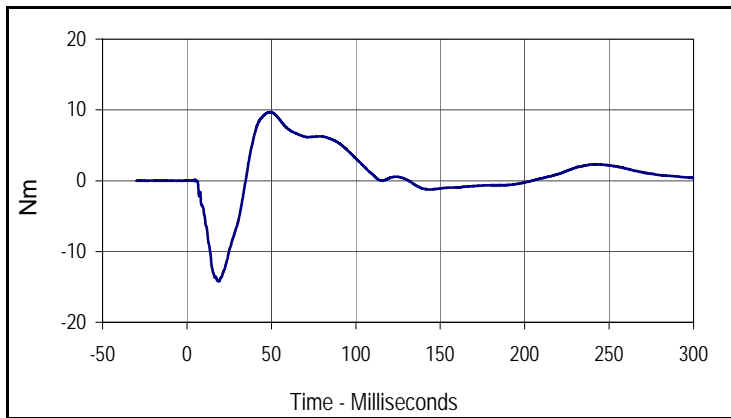
Curve Description			
3 Yr. Old Upper Neck Force Resultant			
Plot No.	Type	SAE Class	Units
008	RES	1000	Newtons
Max	Time	Min	Time
676.1	11.3	0.1	1.0

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door Hatchback  
 Test Program: TWG 3.3.3.3

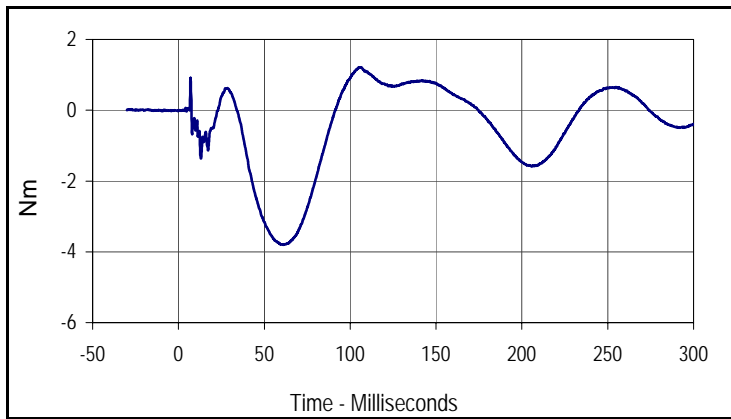
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 NHTSA No.: M20145800TWG3



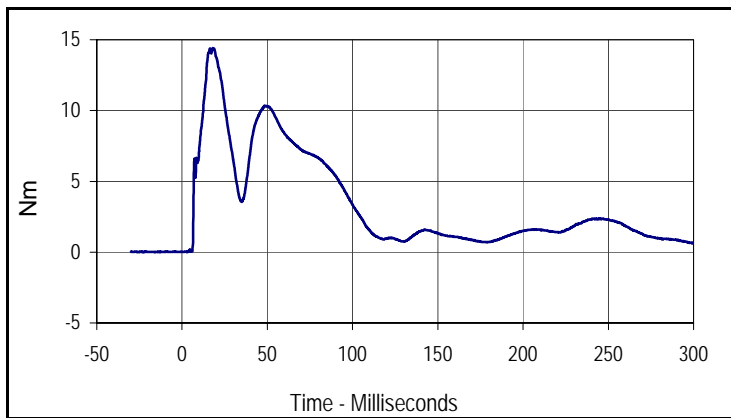
Curve Description			
3 Yr. Old Upper Neck Moment X			
Plot No.	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
6.2	11.8	-3.6	34.2



Curve Description			
3 Yr. Old Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
9.7	48.5	-14.2	18.9



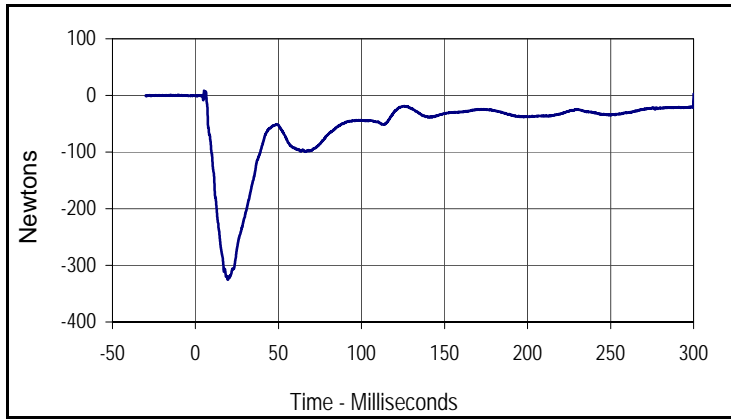
Curve Description			
3 Yr. Old Upper Neck Moment Z			
Plot No.	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
1.2	106.1	-3.8	60.9



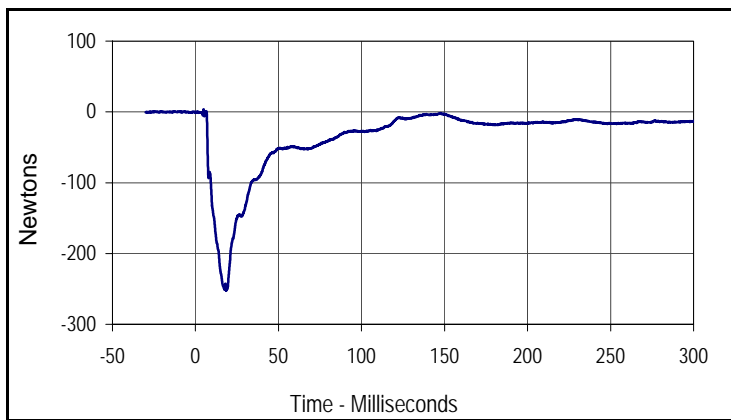
Curve Description			
3 Yr. Old Upper Neck Moment Resultant			
Plot No.	Type	SAE Class	Units
012	RES	600	Nm
Max	Time	Min	Time
14.4	18.2	0.0	3.0

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door Hatchback  
 Test Program: TWG 3.3.3.3

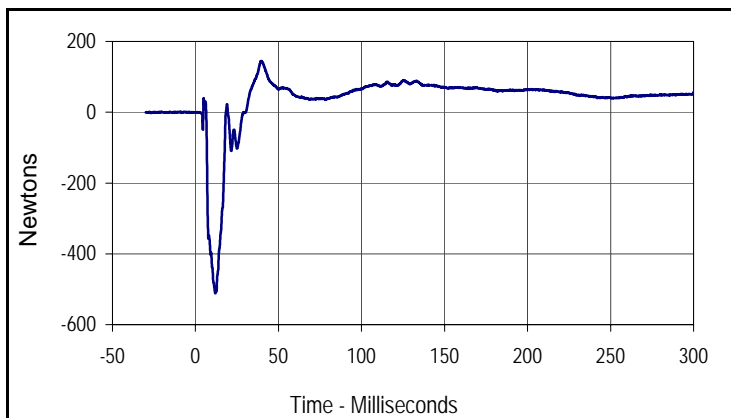
Test Date: 5/21/14  
 NHTSA No.: M20145800TWG3



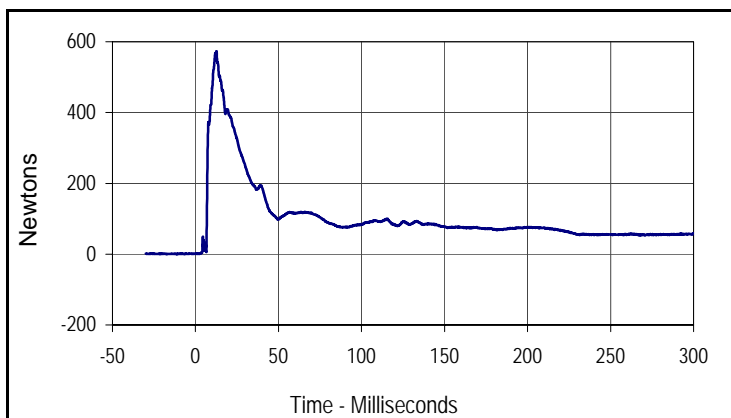
Curve Description			
3 Yr. Old Lower Neck Force X			
Plot No.	Type	SAE Class	Units
013	FIL	1000	Newtons
Max	Time	Min	Time
8.2	5.2	-325.6	19.5



Curve Description			
3 Yr. Old Lower Neck Force Y			
Plot No.	Type	SAE Class	Units
014	FIL	1000	Newtons
Max	Time	Min	Time
3.6	4.9	-252.6	18.5



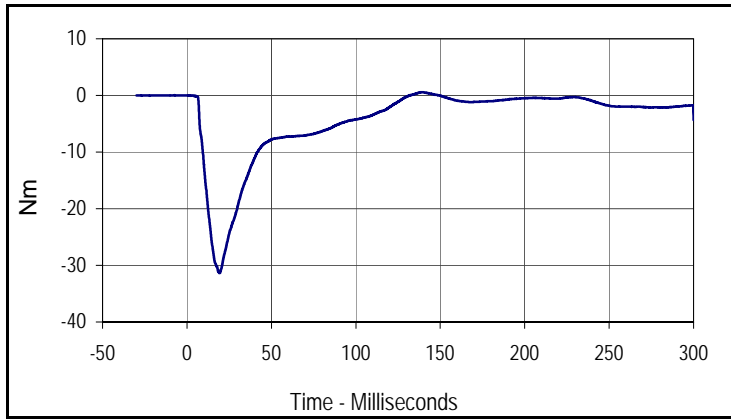
Curve Description			
3 Yr. Old Lower Neck Force Z			
Plot No.	Type	SAE Class	Units
015	FIL	1000	Newtons
Max	Time	Min	Time
144.9	39.5	-511.6	11.9



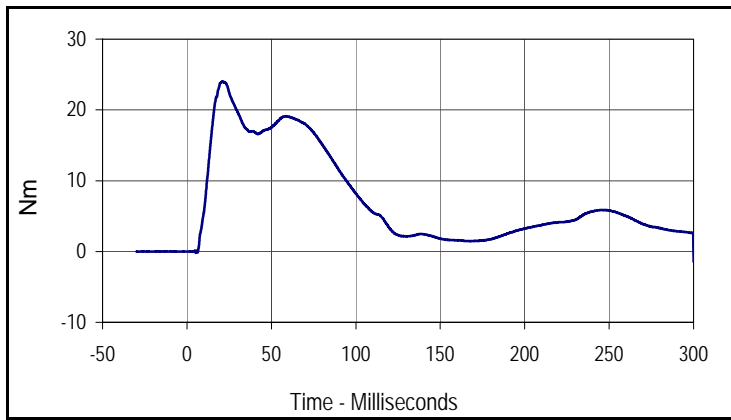
Curve Description			
3 Yr. Old Lower Neck Force Resultant			
Plot No.	Type	SAE Class	Units
016	RES	1000	Newtons
Max	Time	Min	Time
572.7	12.7	0.4	1.5

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door Hatchback  
 Test Program: TWG 3.3.3.3

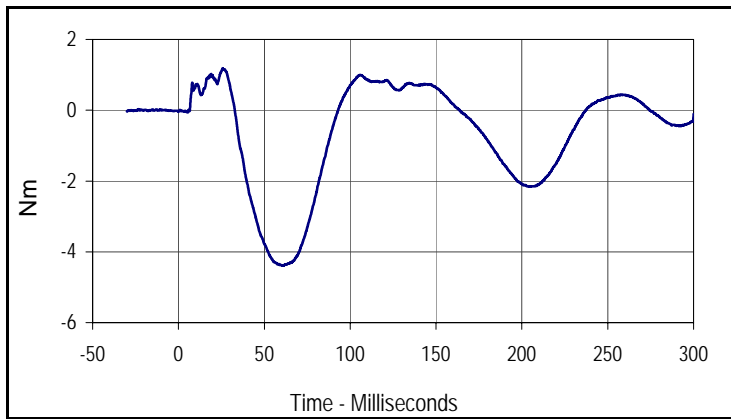
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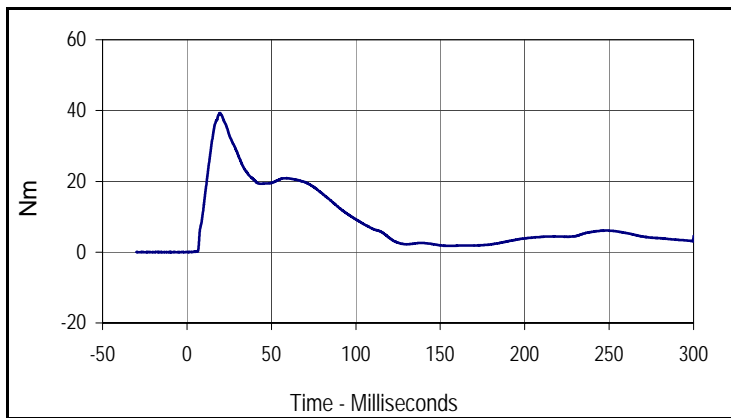
Curve Description			
3 Yr. Old Lower Neck Moment X			
Plot No.	Type	SAE Class	Units
017	FIL	600	Nm
Max	Time	Min	Time
0.6	139.2	-31.4	19.3



Curve Description			
3 Yr. Old Lower Neck Moment Y			
Plot No.	Type	SAE Class	Units
018	FIL	600	Nm
Max	Time	Min	Time
24.0	21.3	-1.5	300.0



Curve Description			
3 Yr. Old Lower Neck Moment Z			
Plot No.	Type	SAE Class	Units
019	FIL	600	Nm
Max	Time	Min	Time
1.2	25.8	-4.4	60.6



Curve Description			
3 Yr. Old Lower Neck Moment Resultant			
Plot No.	Type	SAE Class	Units
020	RES	600	Nm
Max	Time	Min	Time
39.3	19.5	0.0	1.2

**APPENDIX C**  
**INSTRUMENTATION DATA CHANNEL ASSIGNMENTS**

**TWG 3.3.3.3**  
**Instrumentation Data Channel Assignments**  
**A.T.D. Serial Number 044**  
**5/21/14**  
**2014 Audi Q5 2.0T Quattro 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	213	Load cell, six axis neck	R. A. Denton	3303	N
11	LOWER NECK FORCE	Y	213	Load cell, six axis neck	R. A. Denton	3303	N
12	LOWER NECK FORCE	Z	213	Load cell, six axis neck	R. A. Denton	3303	N
13	LOWER NECK MOMENT	X	213	Load cell, six axis neck	R. A. Denton	3303	Nm
14	LOWER NECK MOMENT	Y	213	Load cell, six axis neck	R. A. Denton	3303	Nm
15	LOWER NECK MOMENT	Z	213	Load cell, six axis neck	R. A. Denton	3303	Nm

**APPENDIX D**  
**PRE-TEST AND POST-TEST HYBRID III CONFIGURATION AND PERFORMANCE**  
**VERIFICATION DATA**

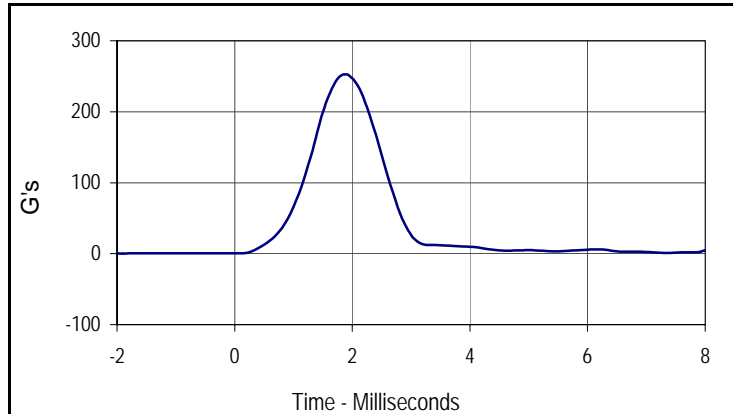
**APPENDIX D**  
**PRE-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

Test Program: Hybrid III 3 Yr Old Head Drop Test  
 ATD Serial No.: 044

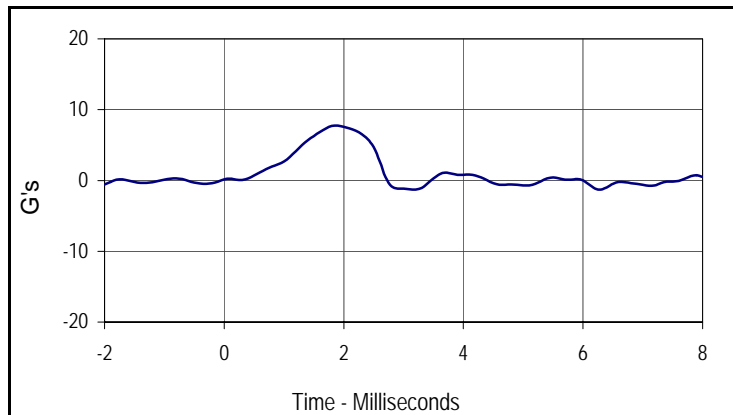
Test Date: 5/19/14  
 Test I.D.: 044HD005



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Peak Resultant Acceleration	G's	250.0 to 280.0	252.6	Pass
Peak Lateral Acceleration	G's	≤15.0	7.8	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
252.6	1.9	0.3	-1.9



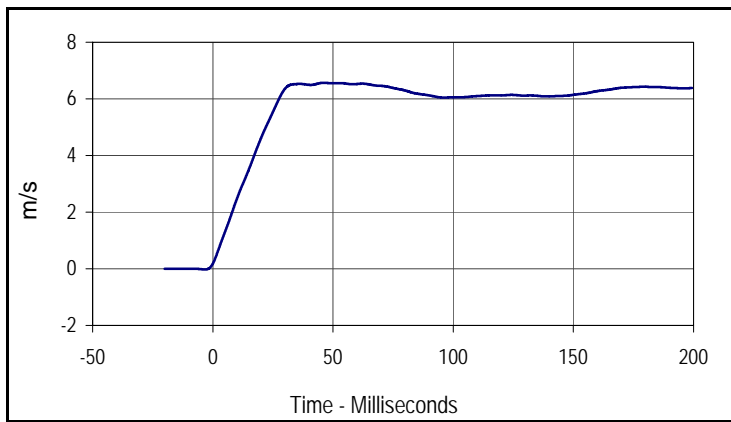
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.8	1.9	-1.3	3.2

Test Program: Hybrid III 3 Yr Old Neck Flexion Test  
 ATD Serial No.: 044

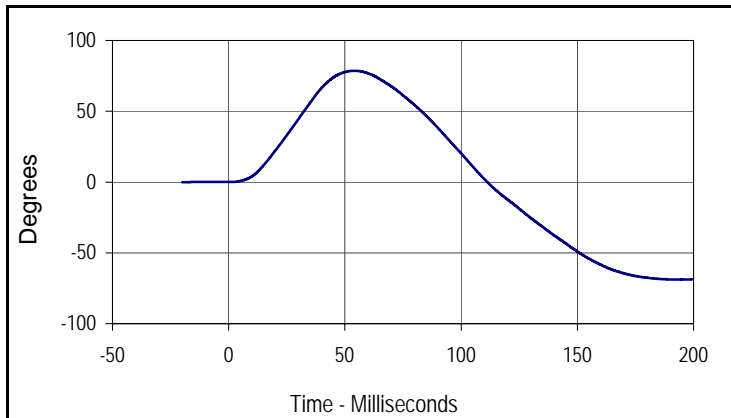
Test Date: 5/19/14  
 Test I.D.: 044NF005



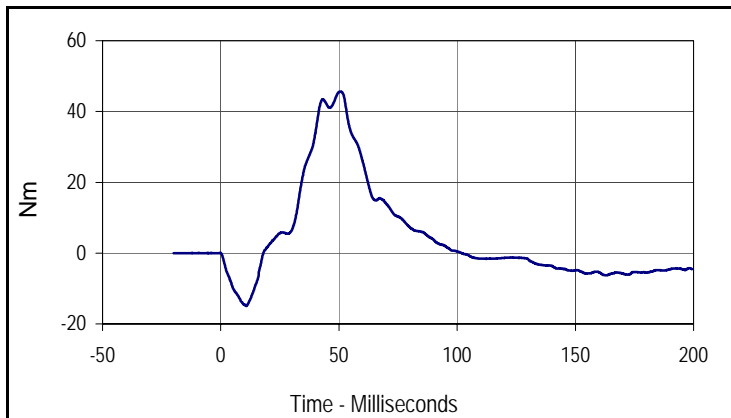
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass	
Laboratory Relative Humidity	%	10 to 70	22	Pass	
Pendulum Velocity	m/s	5.40 to 5.60	5.55	Pass	
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.3	Pass
	15 Msec.	m/s	3.0 to 4.0	3.4	Pass
	20 Msec.	m/s	4.0 to 5.1	4.5	Pass
"D" Plane Rotation	Max	Degrees	70.0 to 82.0	78.6	Pass
Peak Moment in Rotation	Max	Nm	42.0 to 53.0	45.6	Pass
Positive Moment Decay, Time To 10 Nm	Msec.		60.0 to 80.0	76.7	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.6	46.1	0.0	-3.3



Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
78.6	54.1	-68.9	194.0



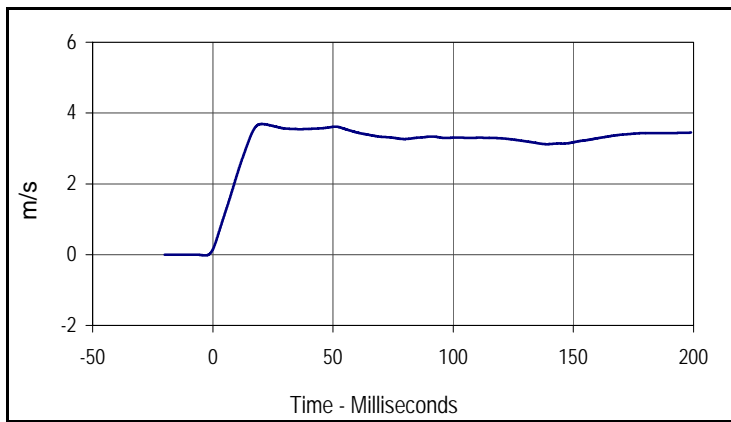
Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
45.6	50.4	-15.0	10.8

Test Program: Hybrid III 3 Yr Old Neck Extension Test  
 ATD Serial No.: 044

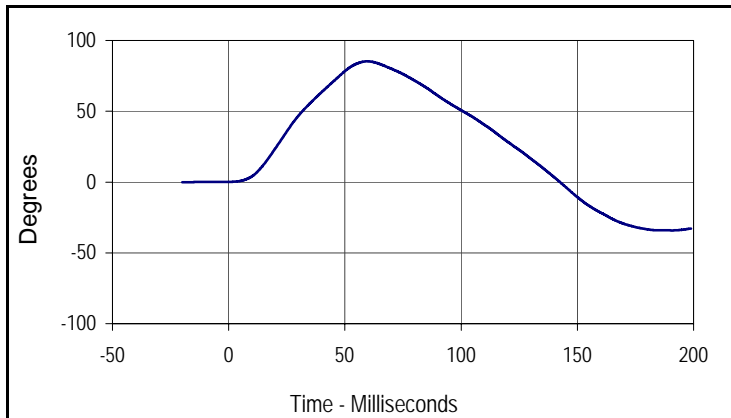
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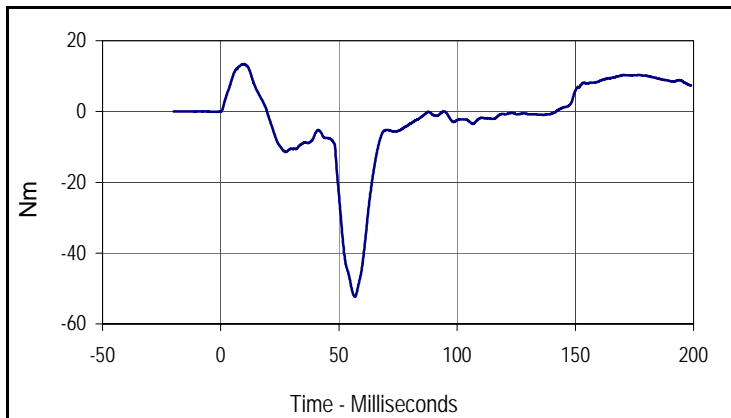
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.0	Pass	
Laboratory Relative Humidity	%	10 to 70	23	Pass	
Pendulum Velocity	m/s	3.55 to 3.75	3.68	Pass	
Pendulum Deceleration	6 Msec.	m/s	1.0 to 1.4	1.4	Pass
	10 Msec.	m/s	1.9 to 2.5	2.2	Pass
	14 Msec.	m/s	2.8 to 3.5	3.0	Pass
"D" Plane Rotation	Max	Degrees	83.0 to 93.0	85.3	Pass
Peak Moment in Rotation	Max	Nm	-43.7 to -53.3	-44.3	Pass
Positive Moment Decay, Time To -10 Nm	Msec.		60.0 to 80.0	66.6	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
3.7	20.3	0.0	-3.2



Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
85.3	59.6	-34.1	190.8



Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
13.4	9.5	-52.4	56.7

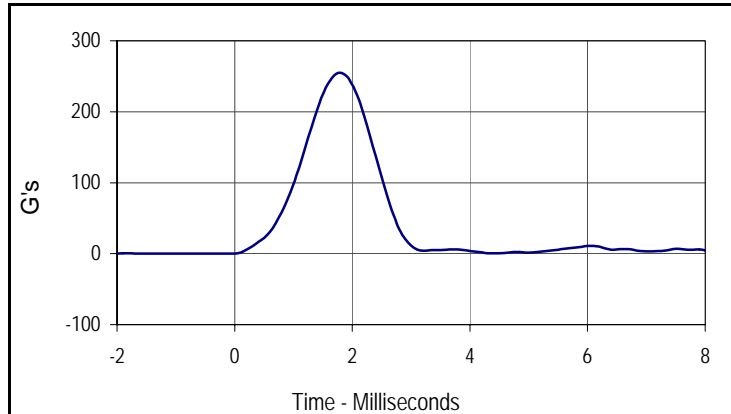
**APPENDIX D**  
**POST-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

Test Program: Hybrid III 3 Yr Old Head Drop Test  
 ATD Serial No.: 044

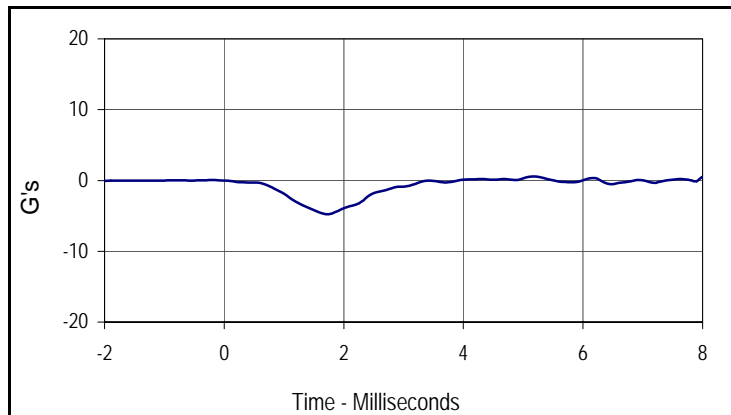
Test Date: 5/23/14  
 Test I.D.: 044HD006



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Peak Resultant Acceleration	G's	250.0 to 280.0	255.1	Pass
Peak Lateral Acceleration	G's	≤15.0	4.7	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
255.1	1.8	0.1	-1.1



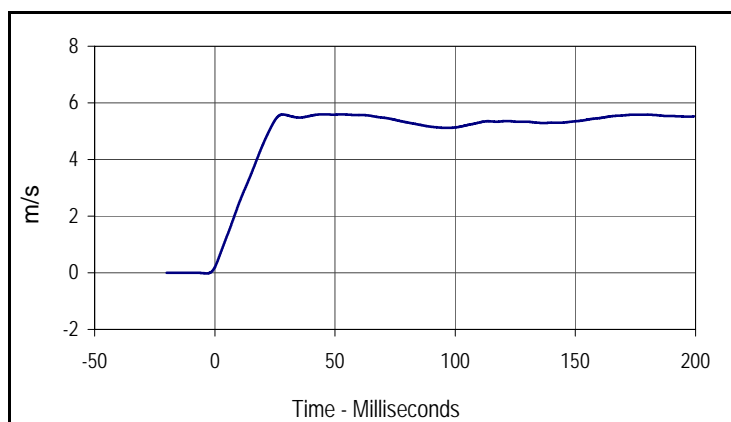
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.6	5.2	-4.7	1.7

Test Program: Hybrid III 3 Yr Old Neck Flexion Test  
 ATD Serial No.: 044

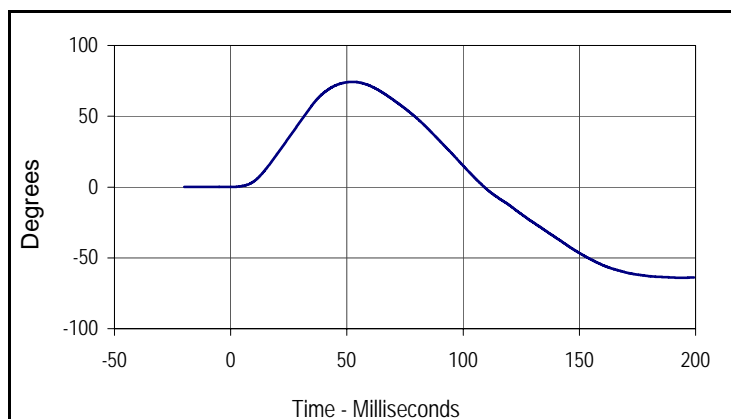
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 Test I.D.: 044NF006



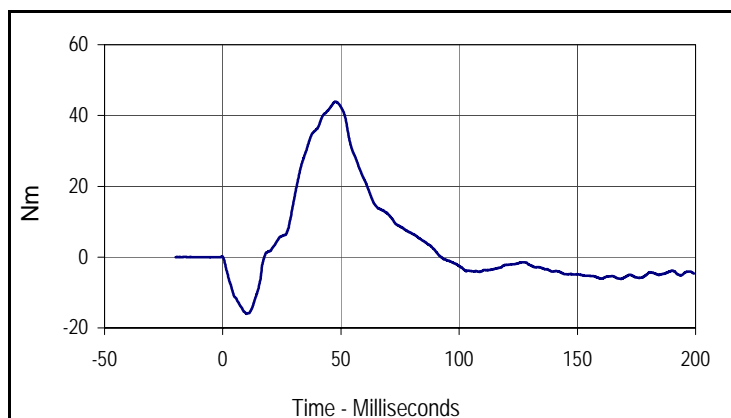
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass	
Laboratory Relative Humidity	%	10 to 70	22	Pass	
Pendulum Velocity	m/s	5.40 to 5.60	5.49	Pass	
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.3	Pass
	15 Msec.	m/s	3.0 to 4.0	3.3	Pass
	20 Msec.	m/s	4.0 to 5.1	4.4	Pass
"D" Plane Rotation	Max	Degrees	70.0 to 82.0	74.3	Pass
Peak Moment in Rotation	Max	Nm	42.0 to 53.0	43.9	Pass
Positive Moment Decay, Time To 10 Nm	Msec.		60.0 to 80.0	73.2	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.6	45.0	0.0	-3.4



Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
74.3	52.3	-64.0	194.2



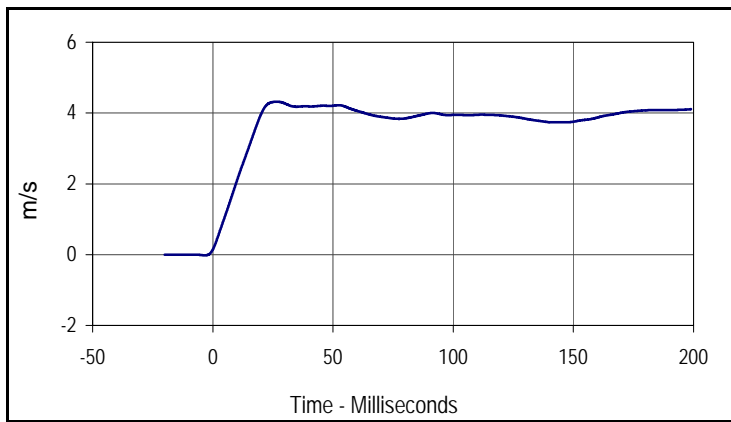
Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
43.9	47.7	-16.1	10.1

Test Program: Hybrid III 3 Yr Old Neck Extension Test  
 ATD Serial No.: 044

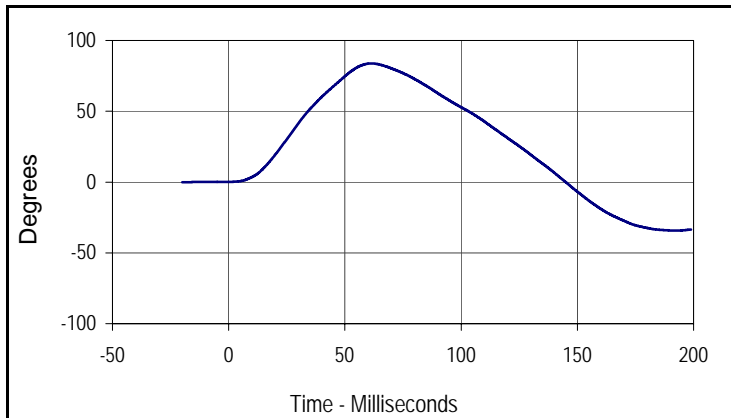
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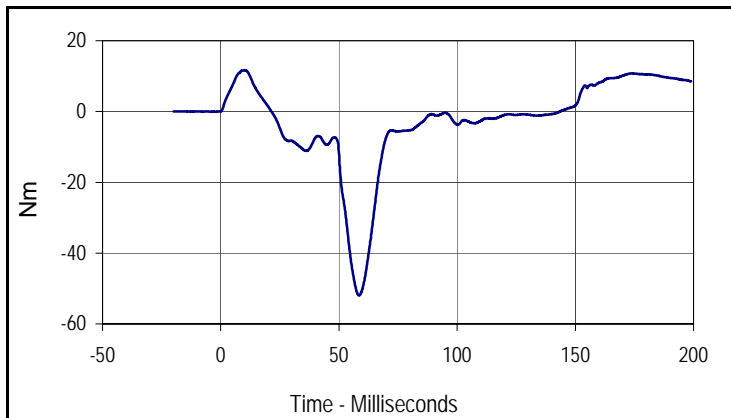
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	°C	20.6 to 22.2	21.5	Pass	
Laboratory Relative Humidity	%	10 to 70	23	Pass	
Pendulum Velocity	m/s	3.55 to 3.75	3.68	Pass	
Pendulum Deceleration	6 Msec.	m/s	1.0 to 1.4	1.3	Pass
	10 Msec.	m/s	1.9 to 2.5	2.1	Pass
	14 Msec.	m/s	2.8 to 3.5	2.9	Pass
"D" Plane Rotation	Max	Degrees	83.0 to 93.0	83.8	Pass
Peak Moment in Rotation	Max	Nm	-43.7 to -53.3	-45.2	Pass
Positive Moment Decay, Time To -10 Nm	Msec.		60.0 to 80.0	68.9	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	26.6	0.0	-3.3



Curve Description			
D Plane Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
83.8	61.3	-34.3	192.3



Curve Description			
Neck Moment Y			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
11.7	10.0	-51.9	58.5