FINAL REPORT NUMBER 202a-MGA-09-002

SAFETY COMPLIANCE TESTING FOR FMVSS 202a
"Head Restraints"

TOYOTA MOTOR MANUFACTURING
2009 Toyota Venza
NHTSA No. C95108

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: July 21 - 31, 2009
Report Date: September 9, 2009

FINAL REPORT

Prepared For:

U.S DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (Rm W45-304)
1200 New Jersey Avenue, SE
Washington, DC 20590

Prepared By: Chris Collins
Chris Collins, Project Engineer

Helen A. Kaleto
Helen A. Kaleto, Laboratory Manager

P. Michael Miller II
Approved By: P. Michael Miller II, Vice President

Approval Date: 9/18/2009

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Edward E. Chan
Digitally signed by Edward E. Chan
DN: cn=Edward E. Chan, email=ed.chan@nhtsa.dot.gov, o=National Highway Traffic Safety Administration, ou=Office of Vehicle Safety Compliance, c=US
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15. Supplementary Notes			
16. Abstract A compliance test was conducted on the subject 2009 Toyota Venza, NHTSA No. C95108, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-202aS-00S-00 for the determination of FMVSS 202a compliance. The test was conducted at MGA Research Corporation in Troy, Michigan on July 21 - 31, 2009. Test failures identified were as follows: NONE The data recorded indicates that the 2009 Toyota Venza tested appears to meet the requirements of FMVSS 202a.			
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1.0 PURPOSE AND PROCEDURE

Purpose: The purpose of testing was to determine whether head restraints equipped in vehicles supplied by the National Highway Traffic Safety Administration meet the requirements of Federal Motor Vehicle Safety Standard Number 202a, entitled "Head Restraints".

Test Procedures: The "MGA Research Corporation Testing Procedures for FMVSS 202a, submitted to and approved by the National Highway Transportation Safety Administration, contains the specific procedures used to conduct the testing.

This procedure shall not be interpreted to conflict with any portion of NHTSA TP-202aS-00, FMVSS 202a nor any amendment thereof within the applicable contract.

2.0 DATA SUMMARY

Summary data is provided below. Data for the configuration and the location of seating position tested provided in Section 5.0. Photographs are found in Section 6.0 and test plots are found in Section 7.0. The data recorded indicates that the 2009 Toyota Venza tested appears to meet the requirements of FMVSS 202a.

Table 1. Summary Data

MGA Test #	Test Type	Seat Description
ES9552	Dimensional Measurements	Front LH 8-Way Power (Cloth)
ES9553	Dimensional Measurements	Front RH 2-Way Manual (Cloth)
ES9554	Dimensional Measurements	2nd Row LH 40% (Cloth)
ES9555	Dimensional Measurements	2nd Row RH 60% (Cloth)
DS9211	Energy Absorption	Front RH 2-Way Manual (Cloth)
DS9212	Energy Absorption	2nd Row RH 60% (Cloth)
ES9588	Height Retention	Front RH 2-Way Manual (Cloth)
ES9595	Height Retention	2nd Row RH 60% (Cloth)
ES9589	Backset Retention, Displacement and Strength	Front LH 8-Way Power (Cloth)
ES9596	Backset Retention, Displacement and Strength	2nd Row LH 40% (Cloth)

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2009 Toyota Venza
VEH. NHTSA NO.	C95108
VIN	4T3ZK11A89U007432
COLOR	Blue
VEH. BUILD DATE	02/09
TEST DATE	July 21 - 31, 2009
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Chris Collins , Helen Kaleto, Dave Maier

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Toyota Motor Manufacturing

Date of Manufacture: 02/09 VIN: 4T3ZK11A89U007432

GVWR: 5,095 lbs GAWR FRONT: 3,090 lbs

GAWR REAR: 2,800 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 32 psi REAR: 32 psi

Recommended Tire Size: P245/50R20

Recommended Cold Tire Pressure:

FRONT: 32 psi REAR: 32 psi

Recommended Tire Size: P245/50R20

Size of Spare Tire: T165/90D18

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench ____; Bucket _X__; Split Bench___

Number of Occupants: Front _2_ ; Middle__0__; Rear _3_ TOTAL _5_.

4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

MGA Research Corporation 446 Executive Drive Troy, Michigan 48083	
Test Equipment Used for Testing	**Calibration Due Date**
MGA Hydraulic Test Frame (202a)	N/A
Hydraulic Pump	N/A
MGA Data Acquisition System (202a)	12/31/2009
Inclinometer (Digital) - MGA00575	11/5/2009
Accelerometer - P47818, P47963	9/2/2009
LVDT's - H1, H3, T1, T3	9/9/2009
Load Cells - 500 lbs - 143138, 143538, 145489	9/4/2009

5.0 DATA

Table 3. S5.2.1-5.2.4 Dimensional Measurement

MGA Test #	Average H-Point (Reference Point)		S4.2.1 – Average Height (mm) (Req't>800 R/S at 1 adj. / No adjustments below 750)				S4.2.3-Average Backset (mm) Req't<55				S4.2.2-Width (mm) Req't>170	S4.2.4- Gaps Did Cylinder Pass Through? (Yes/No) Req't = No
	X (mm)	Z (mm)	H1	H2	H3	H4	H1	H2	H3	H4		
ES9552	-174	76	837	816	798	778	2	2	3	5	212	No
ES9553	-167	71	844	823	804	785	28	27	27	29	210	No
ES9554	-5	132	814	794	775	759	--	--	--	--	192	No
ES9555	-14	145	810	790	771	752	--	--	--	--	193	No

Table 4. S5.2.5 Energy Absorption

MGA Test #	Impact Angle (θ_h)	Impact Velocity (kph)	Accel 1 (g's)		Accel 2 (g's)		Post-Test Comments
			Peak	3msec Clip Req't<80	Peak	3msec Clip Req't<80	
DS9211	0.0	24.0	25.4	20.9	26.1	20.5	• No visible damage.
DS9212	0.0	24.1	35.8	33.9	35.9	33.9	• No visible damage.

Table 5. S5.2.6 Height Retention

MGA Test #	Initial Displacement at 50 N (mm) Req't < 25	Max. Load (N) Req't=500 N (Hold 5 Sec.)	Height Retention (mm) Req't < 13	Post-Test Comments
ES9588	12.1	504	6.9	• The H/R successfully completed the load profile.
ES9595	7.2	504	3.6	• The H/R successfully completed the load profile.

Table 6. S5.2.7 Backset Retention, Displacement and Strength

MGA Test #	H/R Type	H/R Test Position	Displaced Torso Angle (deg)	Initial Headform Disp. at 37 Nm (mm) Req't<25	Headform Disp. at 373 Nm (mm) Req't<102	Backset Retention (mm) Req't<13	Max Load Applied through Headform (N) Req't>890	Headform Loading Axis Distance (mm)
ES9589	2-Way	H2 (816)	28.6	15.1	-27.3	7.9	901	743
ES9596			27.8	11	22.1	4.8	901	706

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SUMMARY OF RESULTS

VEH. MOD YR/MAKE/MODEL/BODY STYLE: 2009 Toyota Venza

VEH. NHTSA NO.: C95108 ; VIN: 4T3ZK11A89U007432

VEH. BUILD DATE: 02/09 ; TEST DATE: 7/22/2009

TEST LABORATORY: MGA Research

OBSERVERS: Chris Collins, David Maier, Helen Kaleto

A. VISUAL INSPECTION OF TEST VEHICLE

Upon receipt for completeness, function, and discrepancies or damage which might influence the testing.

RESULTS:

B.	**DIMENSIONAL REQUIREMENTS**	**PASS**	**FAIL**	
	Driver's Side	X		
	Passenger's Side	X		
	Rear Designated Seating Positions	X		
C.	**OWNER'S MANUAL**	**PASS**	**FAIL**	
D.	**REMOVABILITY**	**PASS**	**FAIL**	**X N/A**
	Driver's Side	X		
	Passenger's Side	X		
	Rear Designated Seating Positions	X		
E.	**NON-USE POSITION**	**PASS**	**FAIL**	**X N/A**
	Rear Designated Seating Positions	NA	NA	
F.	**ENERGY ABSORPTION TEST**	**PASS**	**FAIL**	
	Driver's Side	NA	NA	
	Passenger's Side	X		

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	Rear Designated Seating Positions	X	
G.	**HEIGHT RETENTION TEST**	**PASS**	**FAIL**
	Driver's Side	NA	NA
	Passenger's Side	X	
	Rear Designated Seating Positions	X	
H.	**BACKSET RETENTION TEST**	**PASS**	**FAIL**
	Driver's Side	X	
	Passenger's Side	NA	NA
	Rear Designated Seating Positions	X	

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 2a

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108 TEST DATE: 7/21/2009

Seat Location: Driver 8 Way Power (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 20.7

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 837 mm _X_ **PASS** ___ **FAIL**

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 778 mm _X_ **PASS** ___ **FAIL**

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 772 mm

Width, W (mm): 212 mm _X_ **PASS** ___ **FAIL**

Width must be greater than of equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.

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Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 20.7°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): 5 mm __X__ **PASS** ___ **FAIL**

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

Gap Size: The 25mm cylinder did not pass through the gap. __X__**PASS** ___**FAIL**

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/21/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 2b

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108 TEST DATE: 7/22/2009

Seat Location: Passenger 2 Way Manual (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 20.7

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 844 mm _X_ **PASS** ___ **FAIL**

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 785 mm _X_ **PASS** ___ **FAIL**

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 779 mm

Width, W (mm): 210 mm _X_ **PASS** ___ **FAIL**

Width must be greater than of equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.

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Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 20.7°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): 29 mm _X_ **PASS** ___ **FAIL**

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

Gap Size: The 25mm cylinder did not pass through the gap. _X_ **PASS** ___ **FAIL**

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 2c

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108 TEST DATE: 7/22/2009

Seat Location: 2nd Row LH 40% (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 25.7°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 814 mm _X_ **PASS** ___ **FAIL**

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 759 mm _X_ **PASS** ___ **FAIL**

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 779 mm

Width, W (mm): 192 mm _X_ **PASS** ___ **FAIL**

Width must be greater than of equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.

53

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 25.7°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): NA ___ **PASS** ___ **FAIL** _X_ **NA**

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

Gap Size: The 25mm cylinder did not pass through the gap. _X_ **PASS** ___ **FAIL**

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 2d

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108 TEST DATE: 7/22/2009

Seat Location: 2nd Row RH 60% (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 26.0°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 810 mm _X_ **PASS** ___ **FAIL**

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 752 mm _X_ **PASS** ___ **FAIL**

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 779 mm

Width, W (mm): 193 mm _X_ **PASS** ___ **FAIL**

Width must be greater than of equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.

55

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 26.0°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): NA ___ **PASS** ___ **FAIL** _X_ **NA**

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

Gap Size: The 25mm cylinder did not pass through the gap. _X_ **PASS** ___ **FAIL**

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 3

OWNER'S MANUAL

VEH. NHTSA NO.: C95108 TEST DATE: 7/22/2009

Emphasize that all occupants should place their head restraint in a proper position prior to operating the vehicle in order to prevent the risk of serious injury.

__X__**PASS** ____**FAIL**

Description of the head restraint system and identification of which seats are equipped.

__X__**PASS** ____**FAIL**

If the head restraint is removable, instructions on how to properly remove and reinstall using a deliberate action distinct from any act necessary for adjustment.

__X__**PASS** ____**FAIL**

Warning that all head restraints must be reinstalled properly to protect occupants.

__X__**PASS** ____**FAIL**

Describe the adjustment of the head restraints and/or seat back to achieve proper head restraint position relative the head. The description must include the following:

1) a presentation and explanation of the main components of the vehicle's head restraints

2) the basic requirements for proper head restraint operation, including an explanation of the actions that may affect the proper functioning of the head restraints.

3) the basic requirements for proper positioning of a head restraint in relation to an occupant's head position, including information regarding the proper positioning of the center of gravity of an occupant's head in relation to the head restraint.

__X__**PASS** ____**FAIL**

Include copies of relevant pages from the owner's manual in the final report.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 4

REMOVABILITY

VEH. NHTSA NO.: C95108 TEST DATE: 7/22/2009

Are the head restraints removable? __X__**YES** ____**NO**

If removable, does removal REQUIRE an action distinct from actions to adjust the head restraint? __X__**YES (PASS)** ____**NO (FAIL)**

Description of action(s) for head restraint adjustment:

Vertical Adjustment (front and rear outboard seats)
1. Up- Pull the head restraint up
2. Down- Push the head restraint down while pressing the lock release button.

Vertical Adjustment (rear center seat)
1. Down
2. Up

Push the head restraint up or down while pressing the lock release button.

Description of distinct action for removal:

Pull the head restraint up while pressing the lock release button.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 6a

ENERGY ABSORPTION TEST

VEH. NHTSA NO.: C95108 TEST DATE: 7/30/2009

Seat Location: Passenger 2 Way Manual (Cloth) Type of head restraint: 2 way adjustable

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 20.7°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Accelerometer identification: P47818, P47963 Accelerometer type/brand: Endevco 2000G

Last calibration date: 3/2/2009

Head form vertical angle (-2° - +2°): 0°

Distance between head form and target location (> or = 25 mm): 300mm

Impact velocity (23.6 kph ± 0.5 kph): 24.04 kph

Impact location: 635 mm above the h point and within 70 mm of the vertical centerline

Maximum deceleration (< or = 785 m/s² (80 g)): 20.9 g __X__ **PASS** ___ **FAIL**

REMARKS:

RECORDED BY: Chris Collins DATE: 7/30/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 6b

ENERGY ABSORPTION TEST

VEH. NHTSA NO.: C95108 TEST DATE: 7/31/2009

Seat Location: 2nd Row RH 60% (Cloth) Type of head restraint: 2 way adjustable

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 26.0°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Accelerometer identification: P47818, P47963 Accelerometer type/brand: Endevco 2000G

Last calibration date: 3/2/2009

Head form vertical angle (-2° - +2°): 0°

Distance between head form and target location (> or = 25 mm): 300mm

Impact velocity (23.6 kph ± 0.5 kph): 24.04 kph

Impact location: 635 mm above the h point and within 70 mm of the vertical centerline

Maximum deceleration (< or = 785 m/s² (80 g)): 33.9 g __X__ **PASS** ___ **FAIL**

REMARKS:

RECORDED BY: Chris Collins DATE: 7/31/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 7a

HEIGHT RETENTION TEST (ADJUSTABLE HEAD RESTRAINTS ONLY)

VEH. NHTSA NO.: C95108 TEST DATE: 7/30/2009

Seat Location: Passenger 2 Way Manual (Cloth)

Pre-test measurements

SAE J826 Manikin torso angle: 20.7° Top of Head Restraint Height (mm): 844 mm

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Description of height retention lock: Spring loaded button catch.

Test measurements

Initial load (50 N ± 1 N): 50 N Initial Displacement, D1 (mm): **12.1 mm**

Initial Displacement (D1) < 25 mm _X_**PASS** ___**FAIL**

Maximum load (495 N ± 5 N): **504 N** Maximum Displacement, D2 (mm): 55 mm

Return load (50 N ± 1 N): 50 N Return Displacement, D3 (mm): 19 mm

Total displacement (D3-D1) < 13 mm: **6.9 mm** _X_**PASS** ___**FAIL**

REMARKS: HR test position was full up.

RECORDED BY: Chris Collins DATE: 7/31/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 7b

HEIGHT RETENTION TEST (ADJUSTABLE HEAD RESTRAINTS ONLY)

VEH. NHTSA NO.: C95108 TEST DATE: 7/30/2009

Seat Location: 2nd Row RH 60% (Cloth)

Pre-test measurements

SAE J826 Manikin torso angle: 26.0° Top of Head Restraint Height (mm): 810 mm

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Description of height retention lock: Spring loaded button catch.

Test measurements

Initial load (50 N ± 1 N): 50 N Initial Displacement, D1 (mm): **7.2 mm**

Initial Displacement (D1) < 25 mm _X_ **PASS** ___ **FAIL**

Maximum load (495 N ± 5 N): **504 N** Maximum Displacement, D2 (mm): 55 mm

Return load (50 N ± 1 N): 50 N Return Displacement, D3 (mm): 19 mm

Total displacement (D3-D1) < 13 mm: **3.6 mm** _X_ **PASS** ___ **FAIL**

REMARKS: HR test position was full up.

RECORDED BY: Chris Collins DATE: 7/31/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 8a

BACKSET RETENTION TEST

VEH. NHTSA NO.: C95108 TEST DATE: 7/30/2009

Seat Location: Driver 8 Way Power (Cloth) Type of head restraint: 2 way adjustable

Pre-test measurements

SAE J826 Manikin torso angle: 20.7° Top of Head Restraint Height (mm): 837 mm

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Displacement torso reference line

Test device back pan angle: 21°

Distance from the H-point to the initial location of the load (0.290 ± 0.013 m):

Initial load (N): 1,286 N Initial moment (373 ± 7.5 Nm): 373 Nm

Backset retention and strength

Distance from the H-point to the head form tangency point (m):

Initial load (N): 49.8 N Initial moment (37 ± 0.7 Nm): 37 Nm

Initial head form displacement, D1 (< or = 25 mm): **15.1 mm** _X_ **PASS** ___**FAIL**

Load range to generate a 373 ± 7.5 Nm rearward moment (N): 502 N

Actual load applied (N): 502 N Resultant moment (Nm): 373 Nm

Maximum Head form displacement, D2 (< or = 102 mm):**-27.3** _X_ **PASS** ___**FAIL**

Final head form displacement, D3 (mm): 23 mm
measured at (37 ± 0.7 Nm)

Total displacement (D3-D1) < 13 mm : **7.9 mm** _X_ **PASS** ___**FAIL**

Maximum applied load (> or equal to 885 N): **901 N** _X_ **PASS** ___**FAIL**

REMARKS: HR test position was 1 notch below full up.

RECORDED BY: Chris Collins DATE: 9/14/2009

APPROVED BY: Helen Kaleto

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DATA SHEET 8b
BACKSET RETENTION TEST

VEH. NHTSA NO.: C95108 TEST DATE: 7/31/2009

Seat Location: 2nd Row LH 40% (Cloth) Type of head restraint: 2 way adjustable

Pre-test measurements

SAE J826 Manikin torso angle: 25.7° Top of Head Restraint Height (mm): 814 mm

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Displacement torso reference line

Test device back pan angle: 25°

Distance from the H-point to the initial location of the load (0.290 ± 0.013m):

Initial load (N): 1,286 N Initial moment (373 ± 7.5 Nm): 373 Nm

Backset retention and strength

Distance from the H-point to the head form tangency point (m):

Initial load (N): 52.4 N Initial moment (37 ± 0.7 Nm): 37 Nm

Initial head form displacement, D1 (< or = 25 mm): **11.0 mm** _X_ **PASS** ___**FAIL**

Load range to generate a 373 ± 7.5 Nm rearward moment (N): 502 N

Actual load applied (N): 528 N Resultant moment (Nm): 373 Nm

Maximum Head form displacement, D2 (< or = 102 mm):**22.1** _X_ **PASS** ___**FAIL**

Final head form displacement, D3 (mm): 15.8 mm
measured at (37 ± 0.7 Nm)

Total displacement (D3-D1) < 13 mm : **4.8 mm** _X_**PASS** ___**FAIL**

Maximum applied load (> or equal to 885 N): **901 N** _X_**PASS**___**FAIL**

REMARKS: HR test position was 1 notch below full up.

RECORDED BY: Chris Collins DATE: 9/14/2009

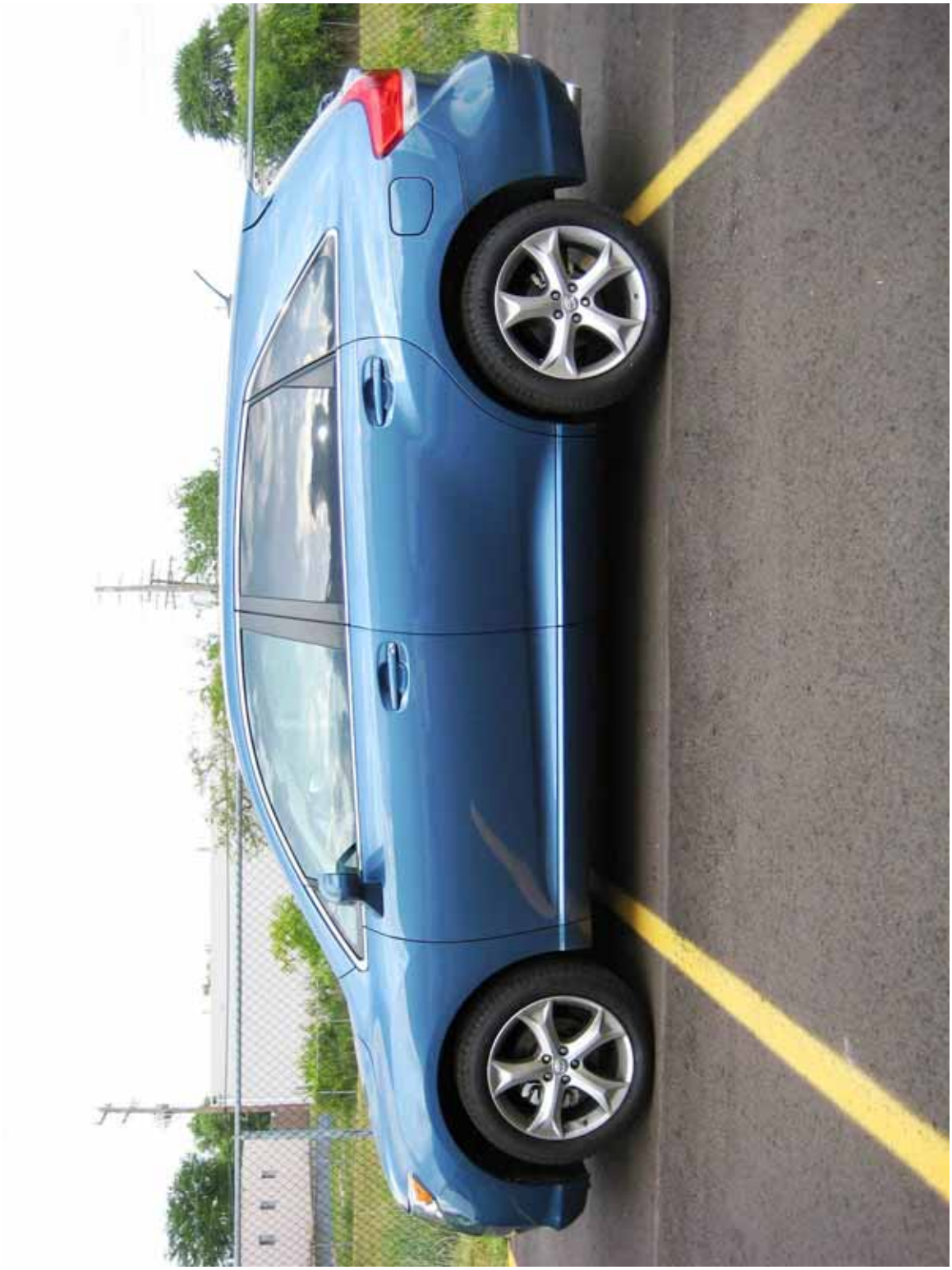
APPROVED BY: Helen Kaleto

PHOTOGRAPHS

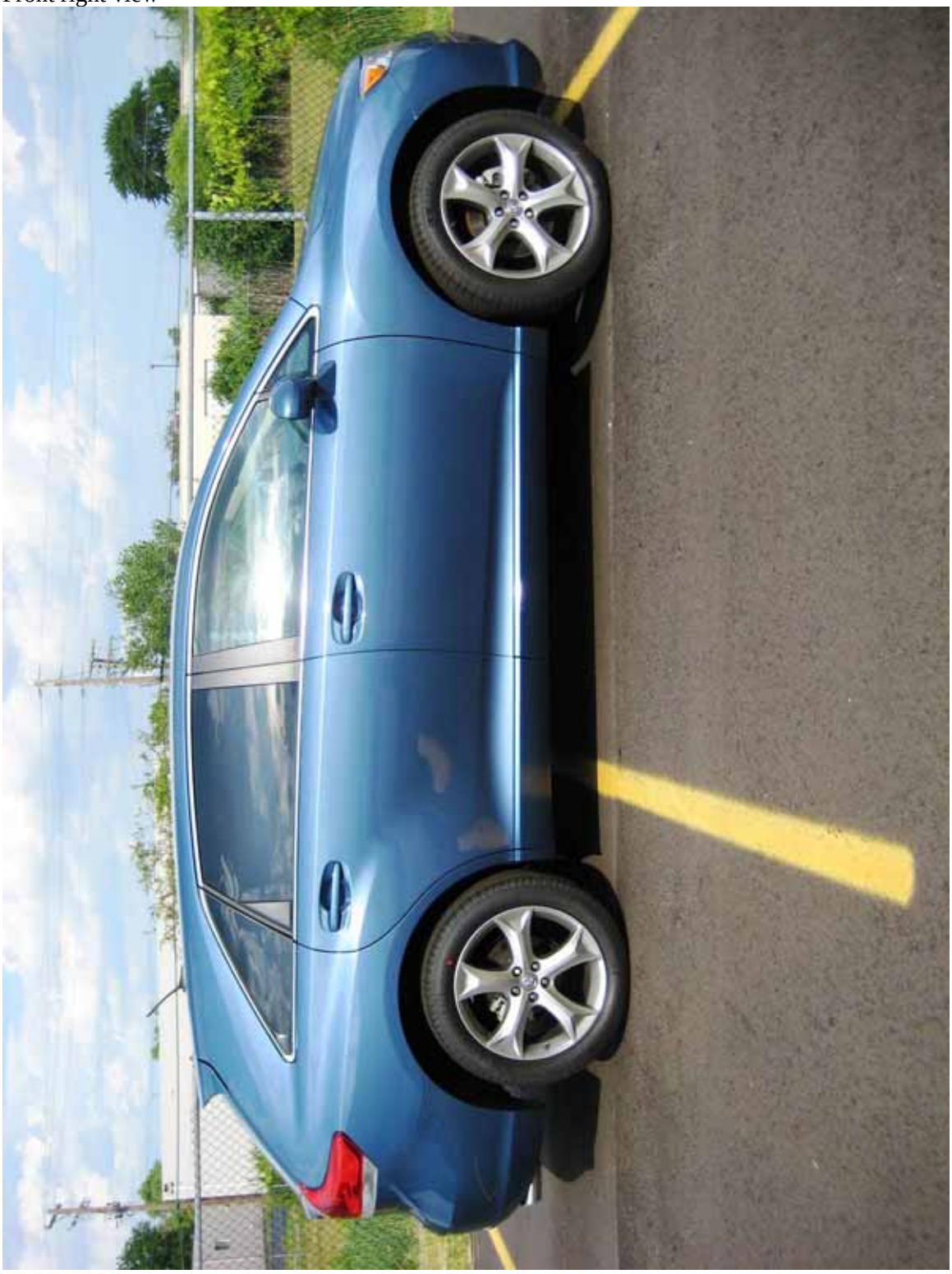
6.1 Front view

6.2 Rear view

6.3 Front left view



6.4 Front right view



6.5 Test vehicle's certification label

6.5.1 Certification label photo #1

6.5.2 Tire information label photo #1

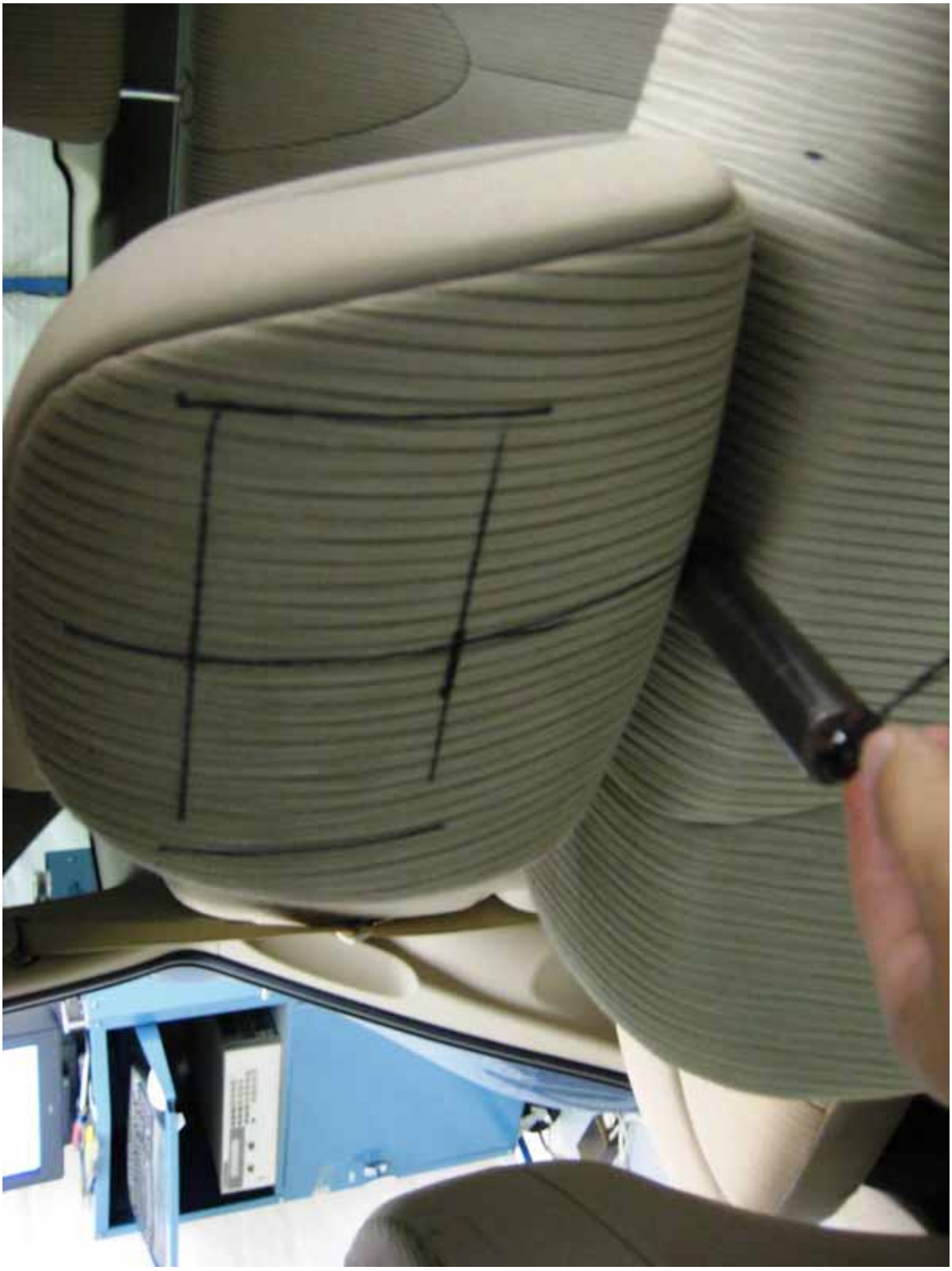
6.6 S5.2.1-5.2.4 Dimensional Measurements

6.6.1 Driver Test Photo #1

6.6.2 Driver Test Photo #2

6.6.3 Driver Test Photo #3

6.6.4 Driver Test Photo #4



6.6.5 Passenger Test Photo #1

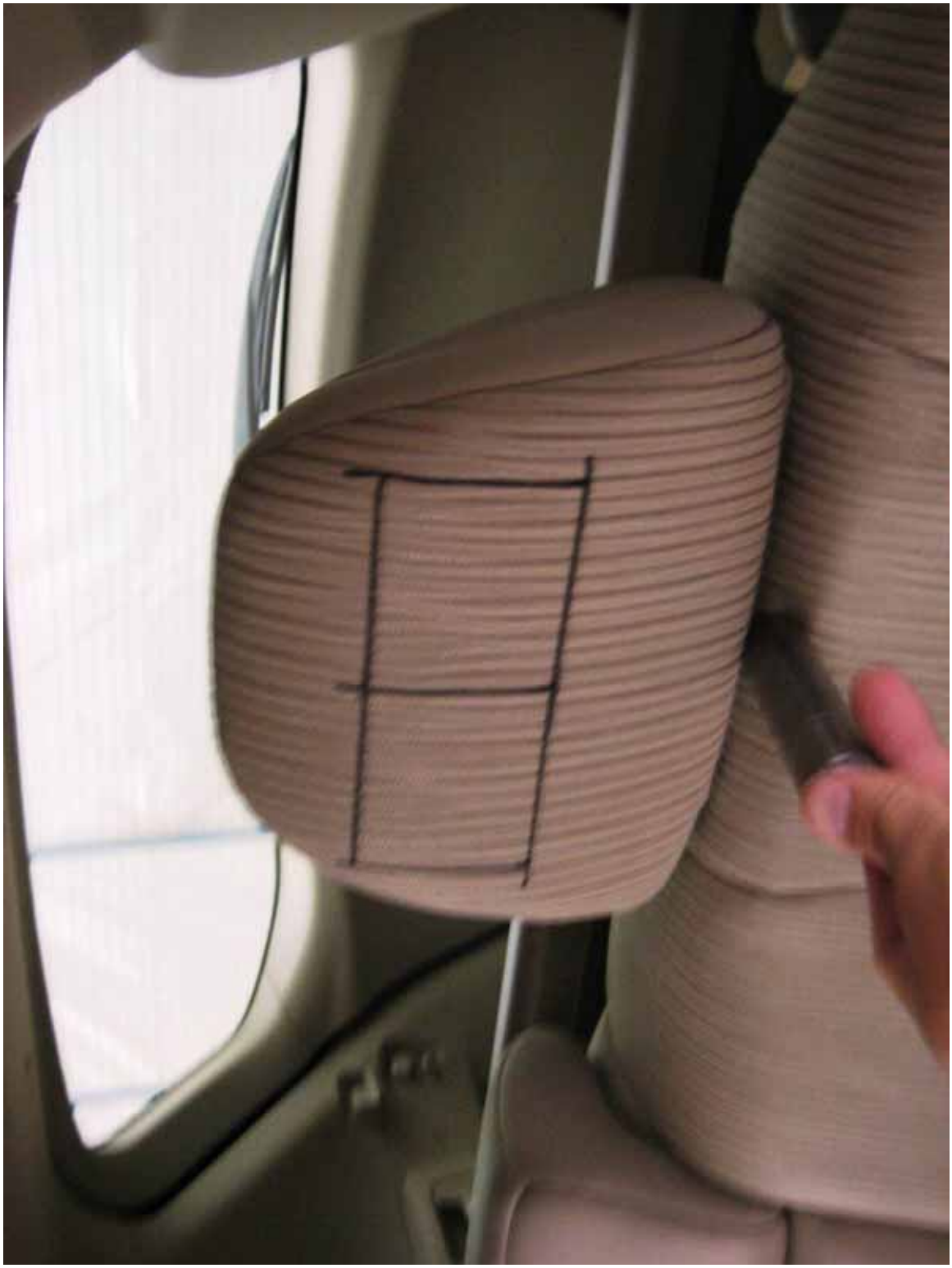
6.6.6 Passenger Test Photo #2

6.6.7 Passenger Test Photo #3

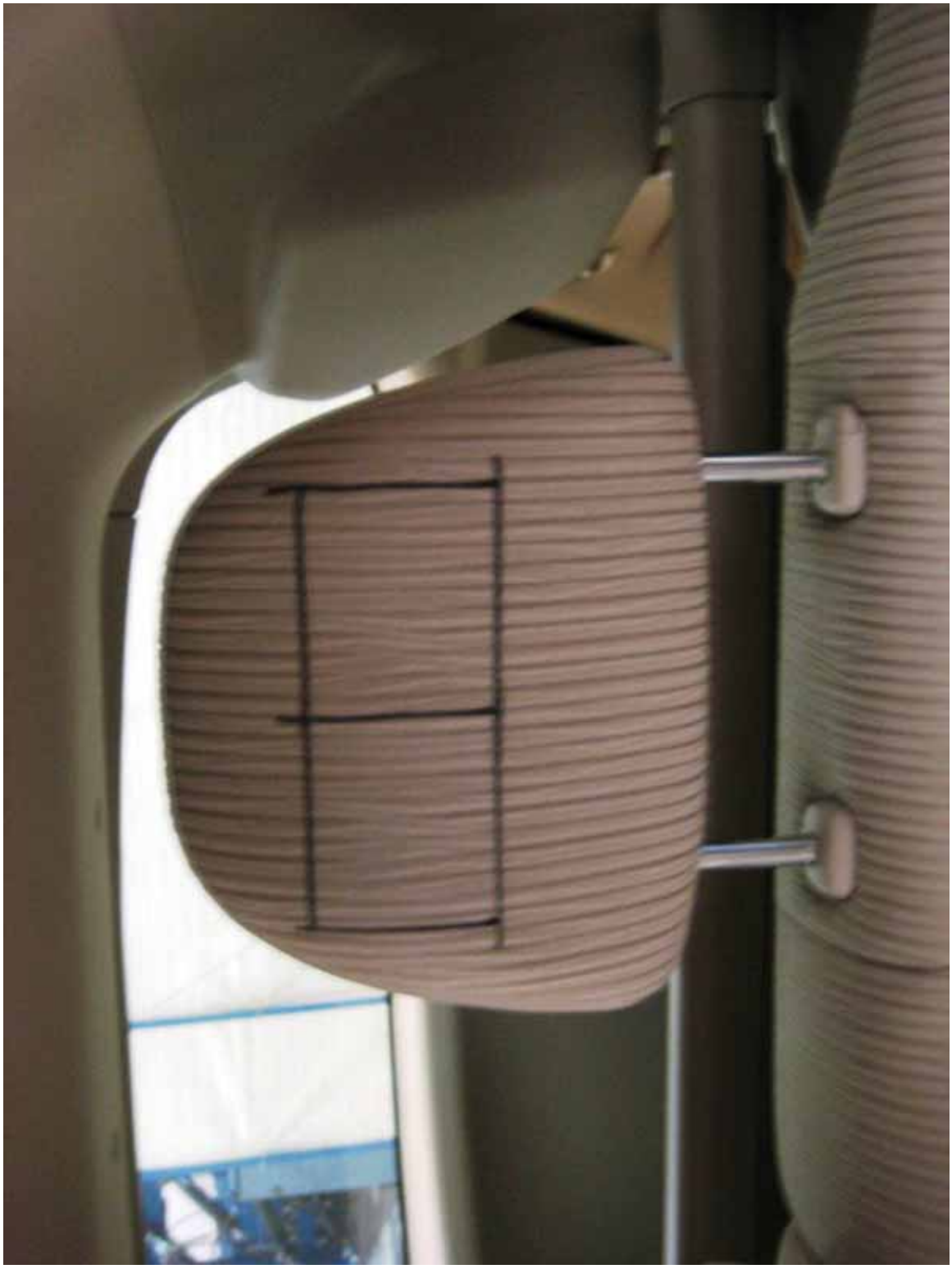
6.6.8 2nd Row LH Test Photo #1

6.6.9 2nd Row LH Test Photo #1

6.6.10 2nd Row LH Test Photo #3



6.6.11 2nd Row RH Test Photo #1



6.6.12 2nd Row RH Test Photo #2

6.6.13 2nd Row RH Test Photo #3

6.7 S5.2.5 Energy Absorption

6.7.1 Passenger Pre-Test Photo #1

6.7.2 Passenger Pre-Test Photo #2

6.7.3 Passenger Post-Test Photo #1

6.7.4 Passenger Post-Test Photo #2

6.7.5 2nd Row RH Pre-Test Photo #1

6.7.6 2nd Row RH Pre-Test Photo #2

6.7.7 2nd Row RH Post-Test Photo #1

6.7.8 2nd Row RH Post-Test Photo #2

6.7.9 2nd Row RH Post-Test Photo #3

6.8 S5.2.6 Height Retention

6.8.1 Passenger Test Photo #1

6.8.2 Passenger Test Photo #2

6.8.3 Passenger Test Photo #3

6.8.4 Passenger Test Photo #4

6.8.5 Passenger Test Photo #5

6.8.6 Passenger Test Photo #6

6.8.7 Passenger Test Photo #7

6.8.8 Passenger Test Photo #8

6.8.9 2nd Row RH Test Photo #1

6.8.10 2nd Row RH Test Photo #2

6.8.11 2nd Row RH Test Photo #3

6.8.12 2nd Row RH Test Photo #4

6.8.13 2nd Row RH Test Photo #5

6.8.14 2nd Row RH Test Photo #6

6.8.15 2nd Row RH Test Photo #7

6.8.16 2nd Row RH Test Photo #8

6.9 S5.2.7 Backset Retention, Displacement and Strength

6.9.1 Driver Test Photo #1

6.9.2 Driver Test Photo #2

6.9.3 Driver Test Photo #3

6.9.4 Driver Test Photo #4

6.9.5 Driver Test Photo #5

6.9.6 Driver Test Photo #6

6.9.7 Driver Test Photo #7

6.9.8 Driver Test Photo #8

6.9.9 Driver Test Photo #9

6.9.10 Driver Test Photo #10

6.9.11 2nd Row LH Test Photo #1

6.9.12 2nd Row LH Test Photo #2

6.9.13 2nd Row LH Test Photo #3

6.9.14 2nd Row LH Test Photo #4

6.9.15 2nd Row LH Test Photo #5

6.9.16 2nd Row LH Test Photo #6

6.9.17 2nd Row LH Test Photo #7

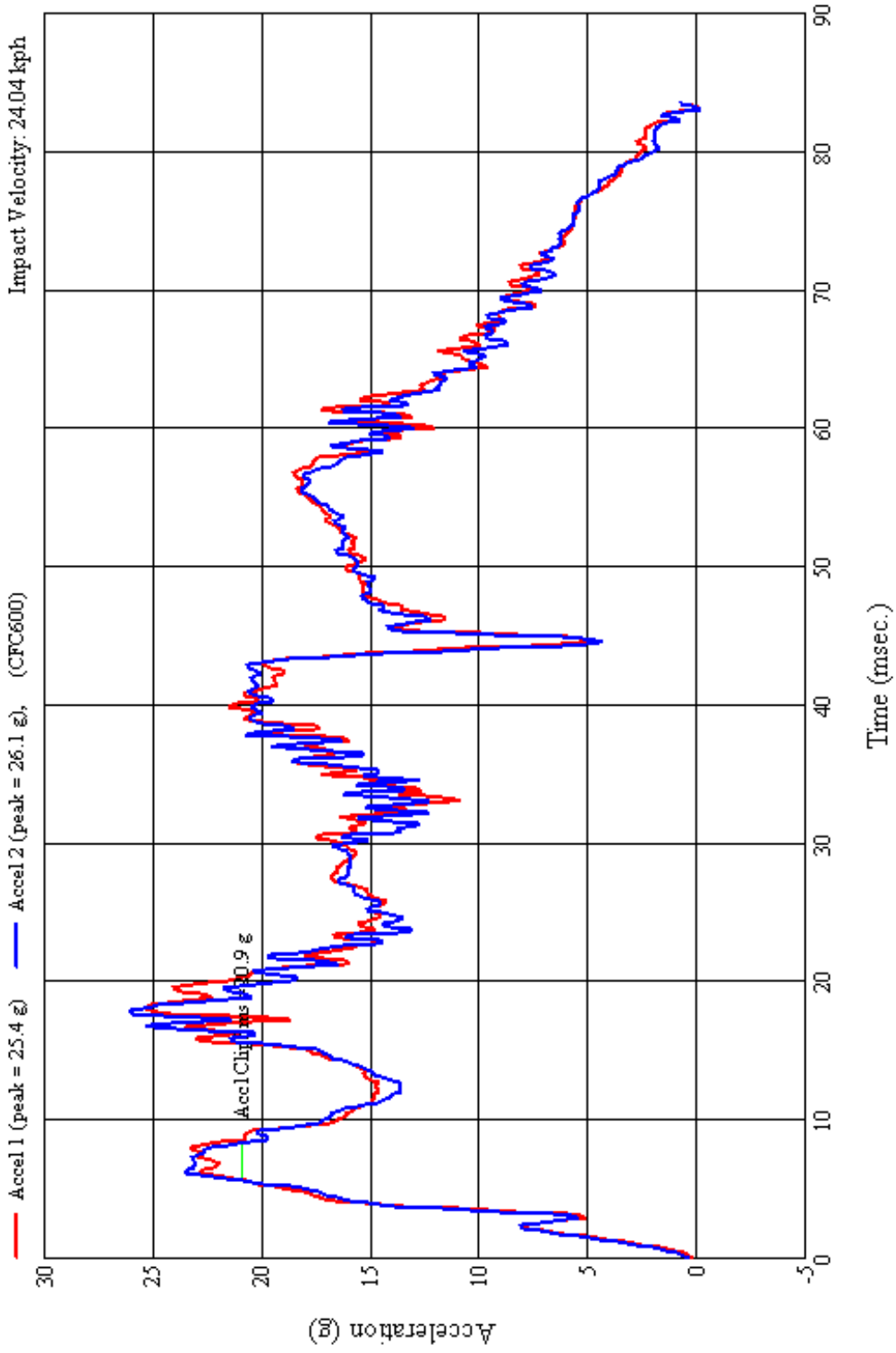
6.9.18 2nd Row LH Test Photo #8

6.9.19 2nd Row LH Test Photo #9

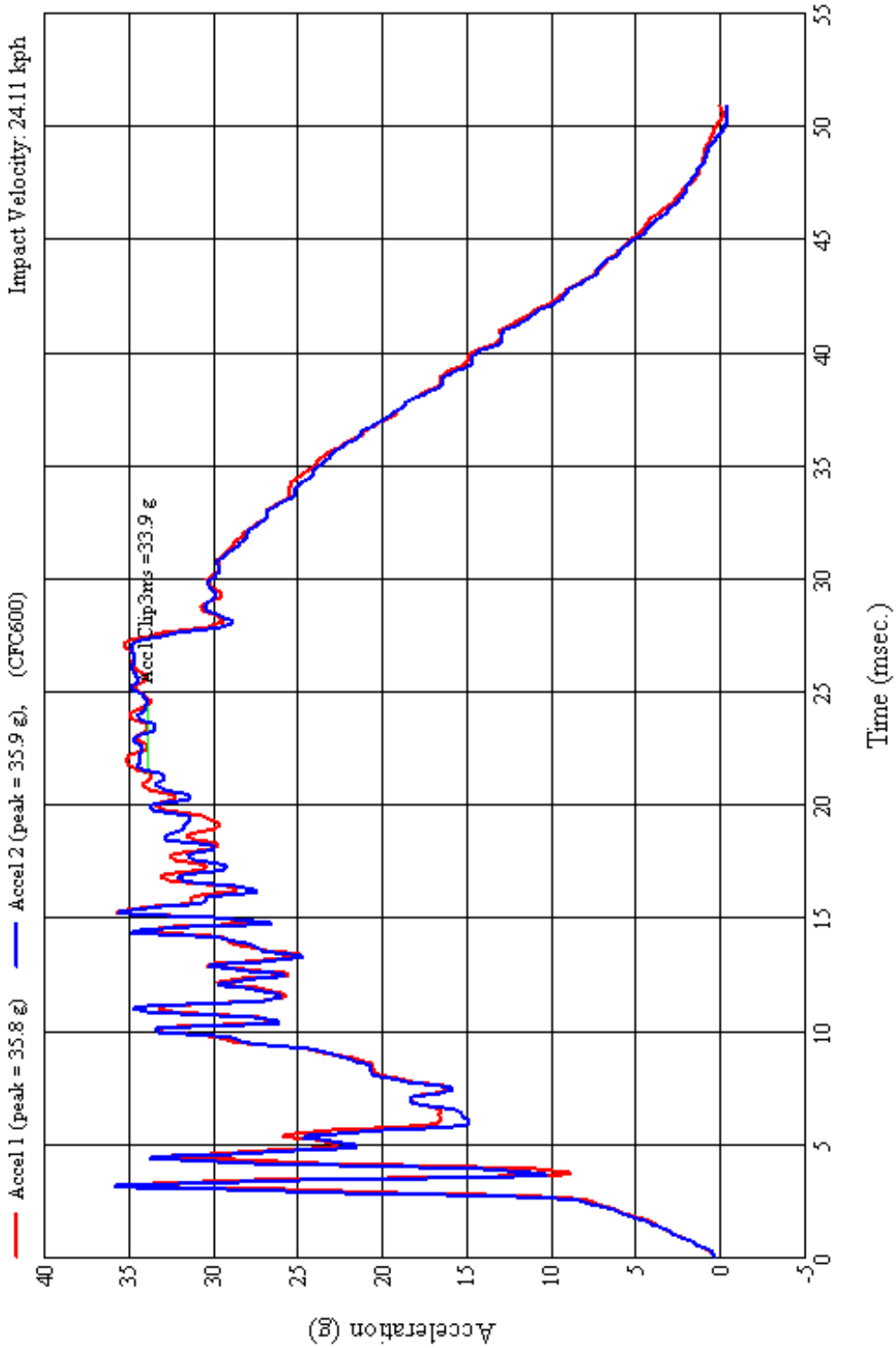
6.9.20 2nd Row LH Test Photo #10

7.0 PLOTS

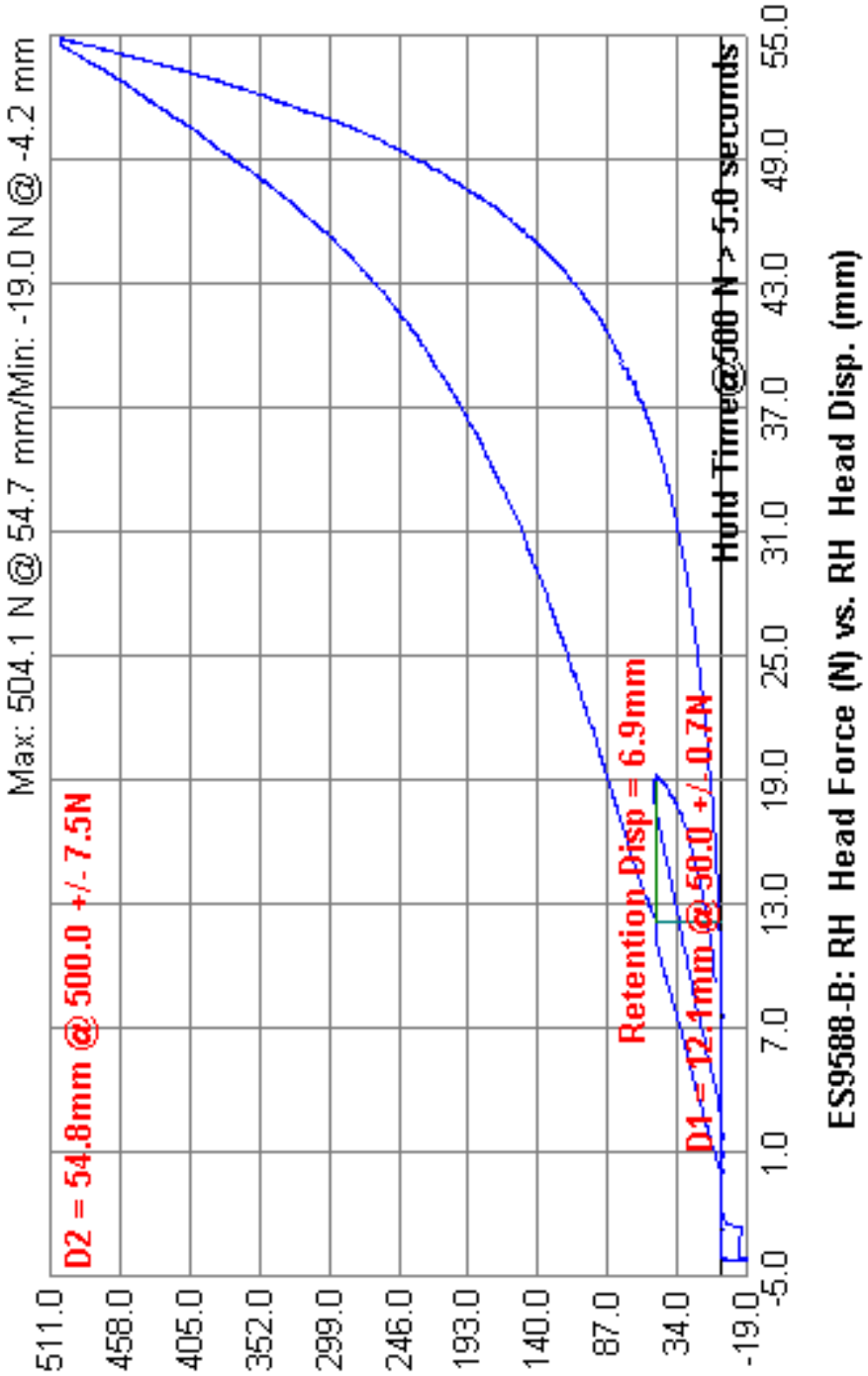
7.1.1 S5.2.5 Energy Absorption

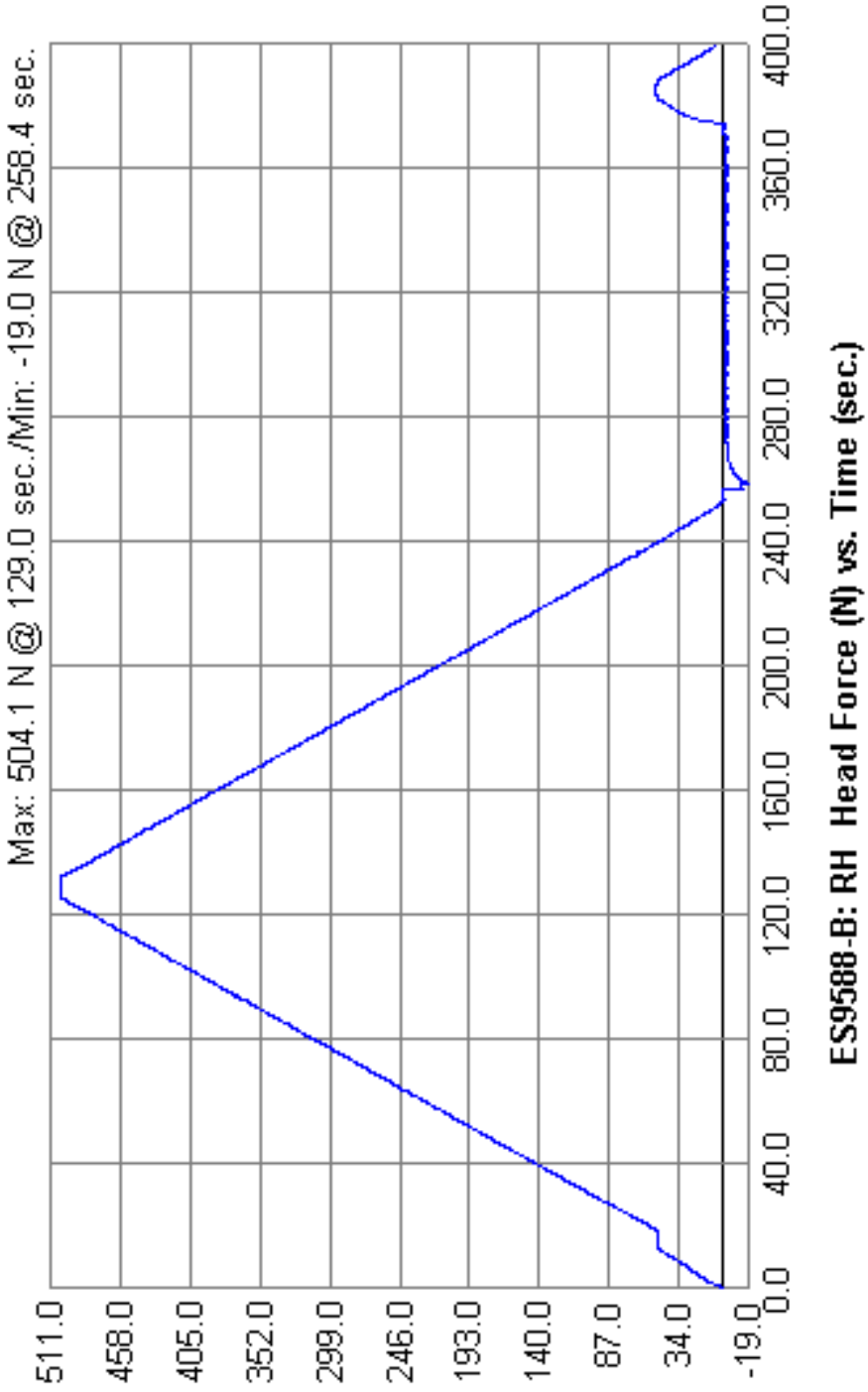


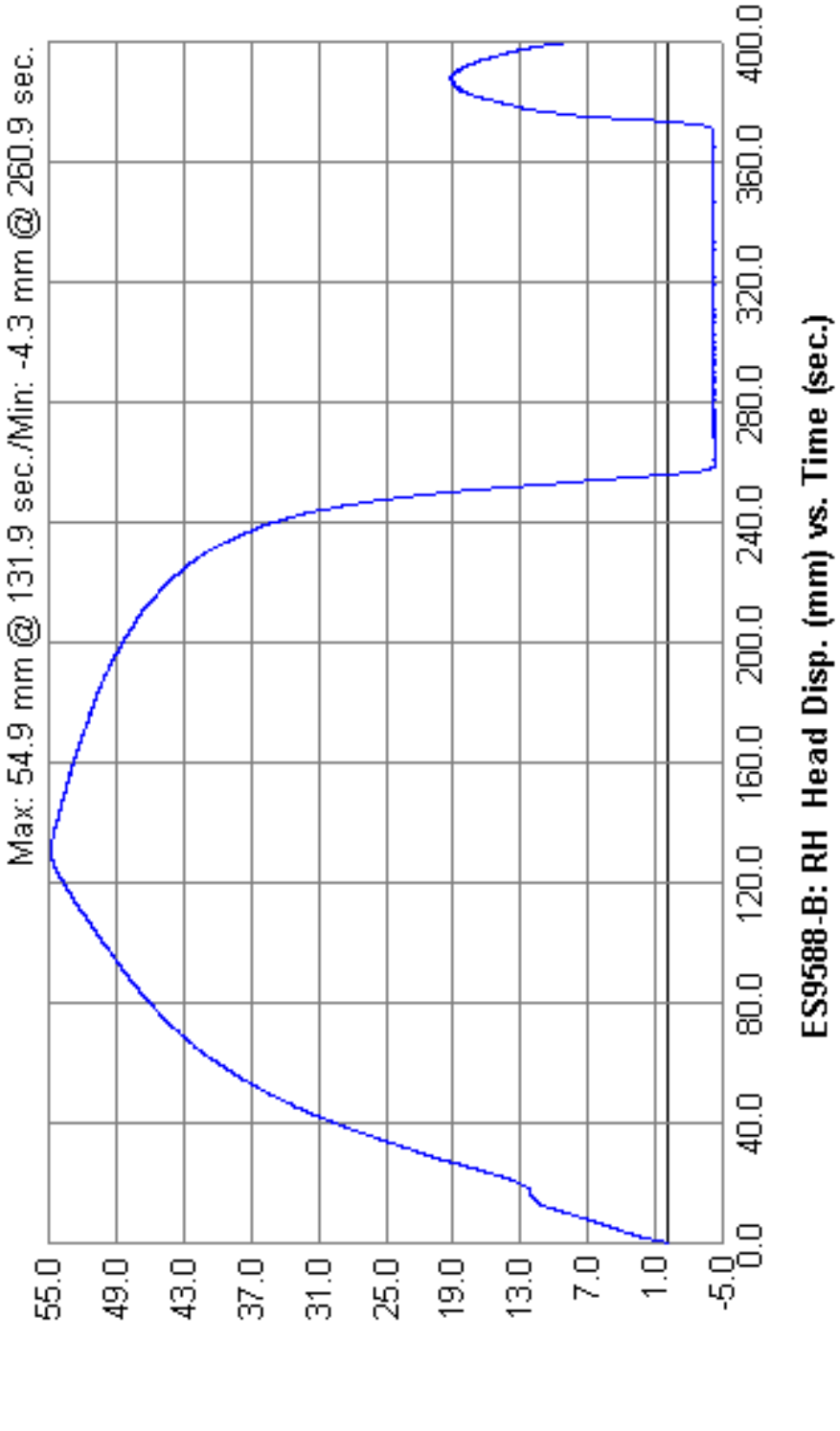
7.1.2 S5.2.5 Energy Absorption



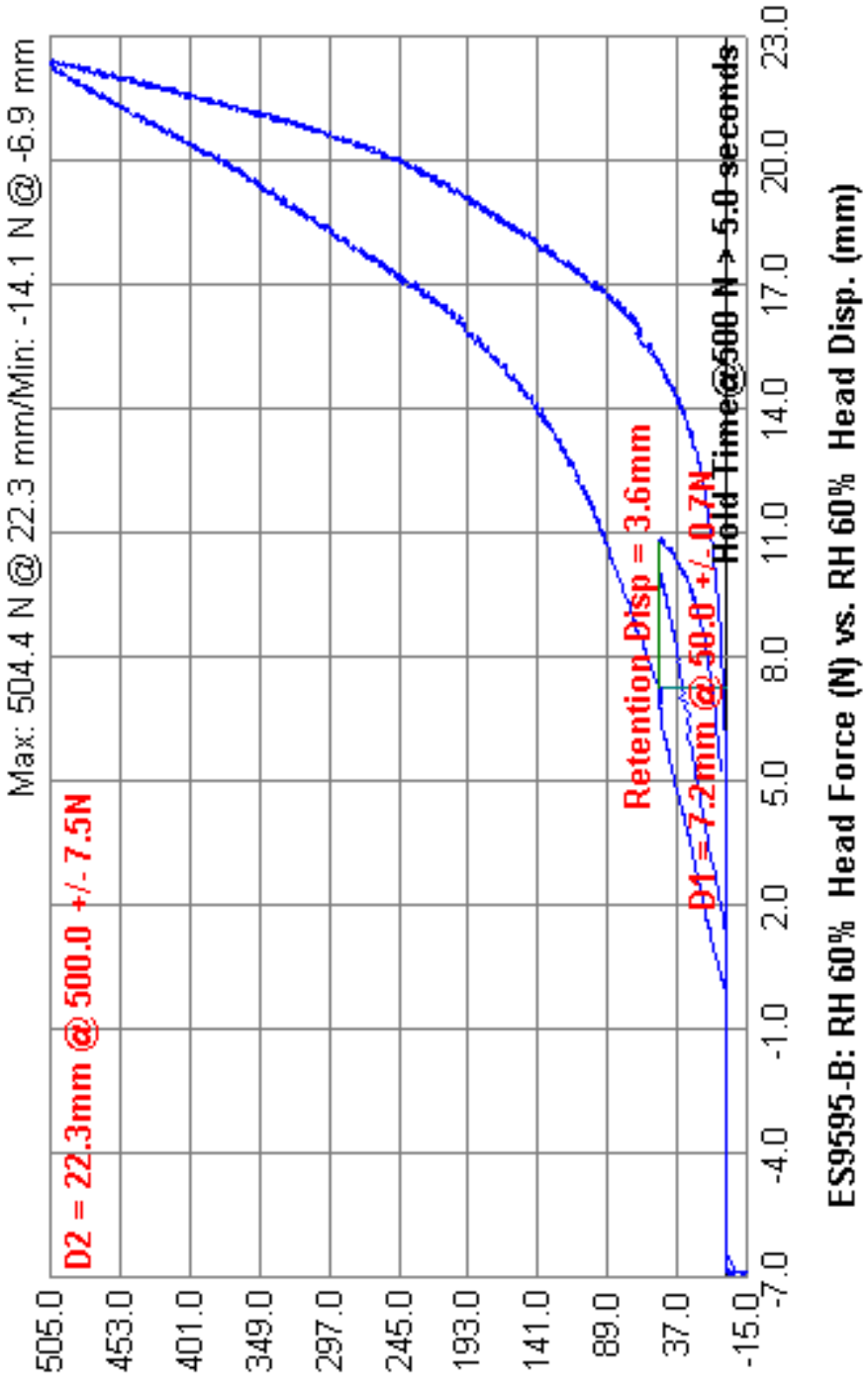
7.2.1 S5.2.6 Height Retention

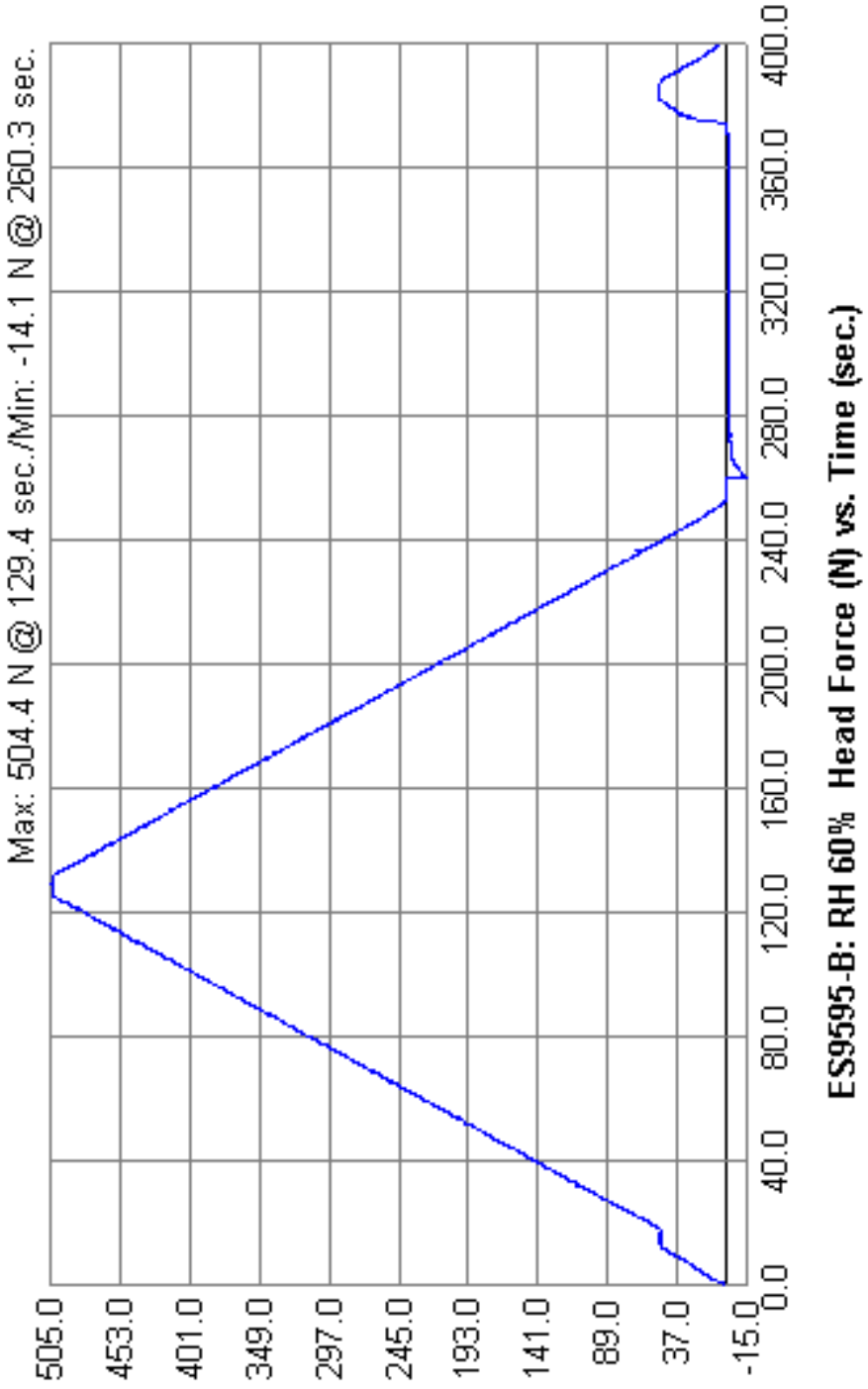


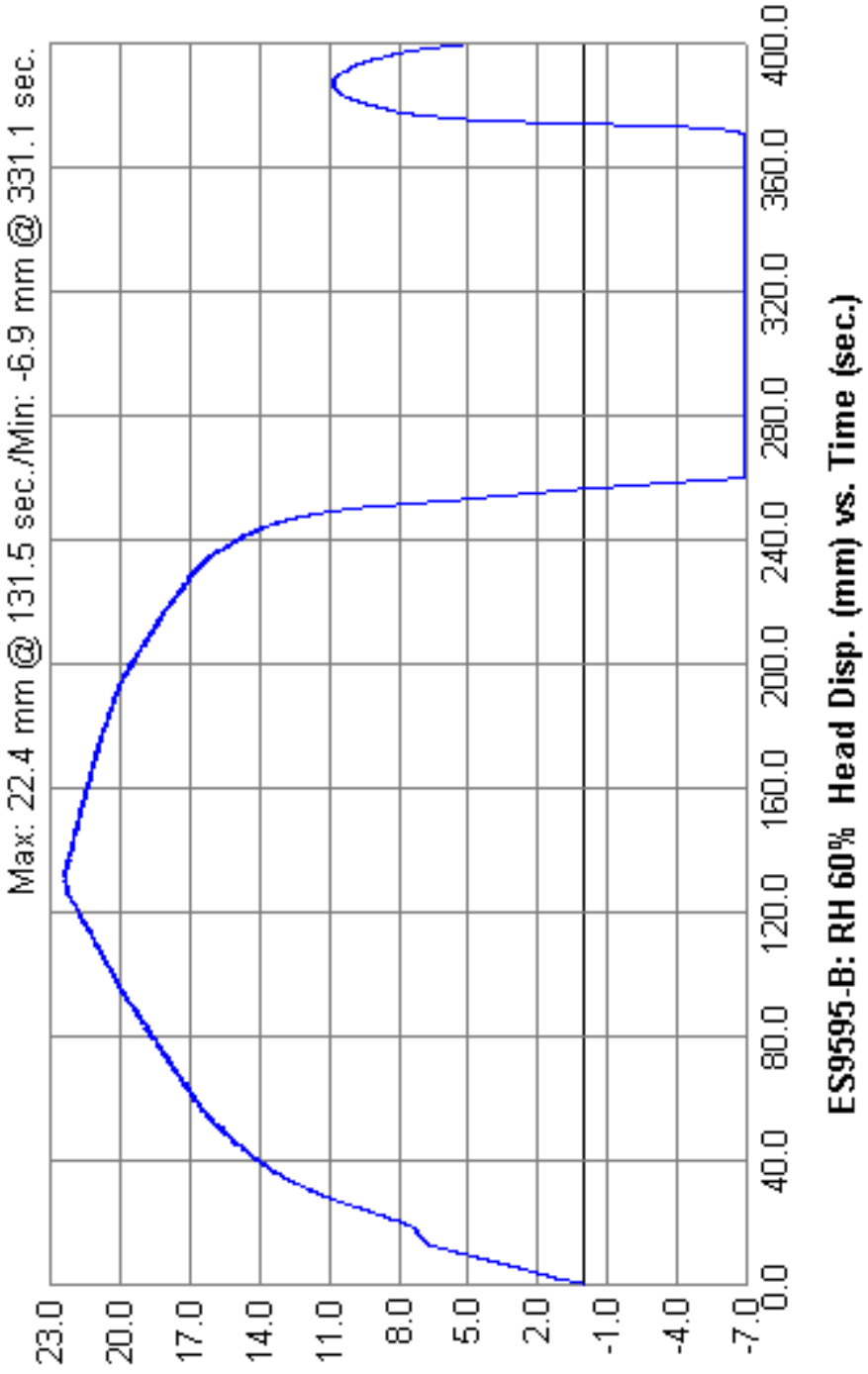

Max: 504.1 N @ 129.0 sec./Min: -19.0 N @ 258.4 sec.
511.0
458.0
405.0
352.0
299.0
246.0
193.0
140.0
87.0
34.0
-19.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
280.0
320.0
360.0
400.0
ES9588-B: RH Head Force (N) vs. Time (sec.)


Max: 54.9 mm @ 131.9 sec./Min: -4.3 mm @ 260.9 sec.
ES9588-B: RH Head Disp. (mm) vs. Time (sec.)
55.0
49.0
43.0
37.0
31.0
25.0
19.0
13.0
7.0
1.0
-5.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
280.0
320.0
360.0
400.0

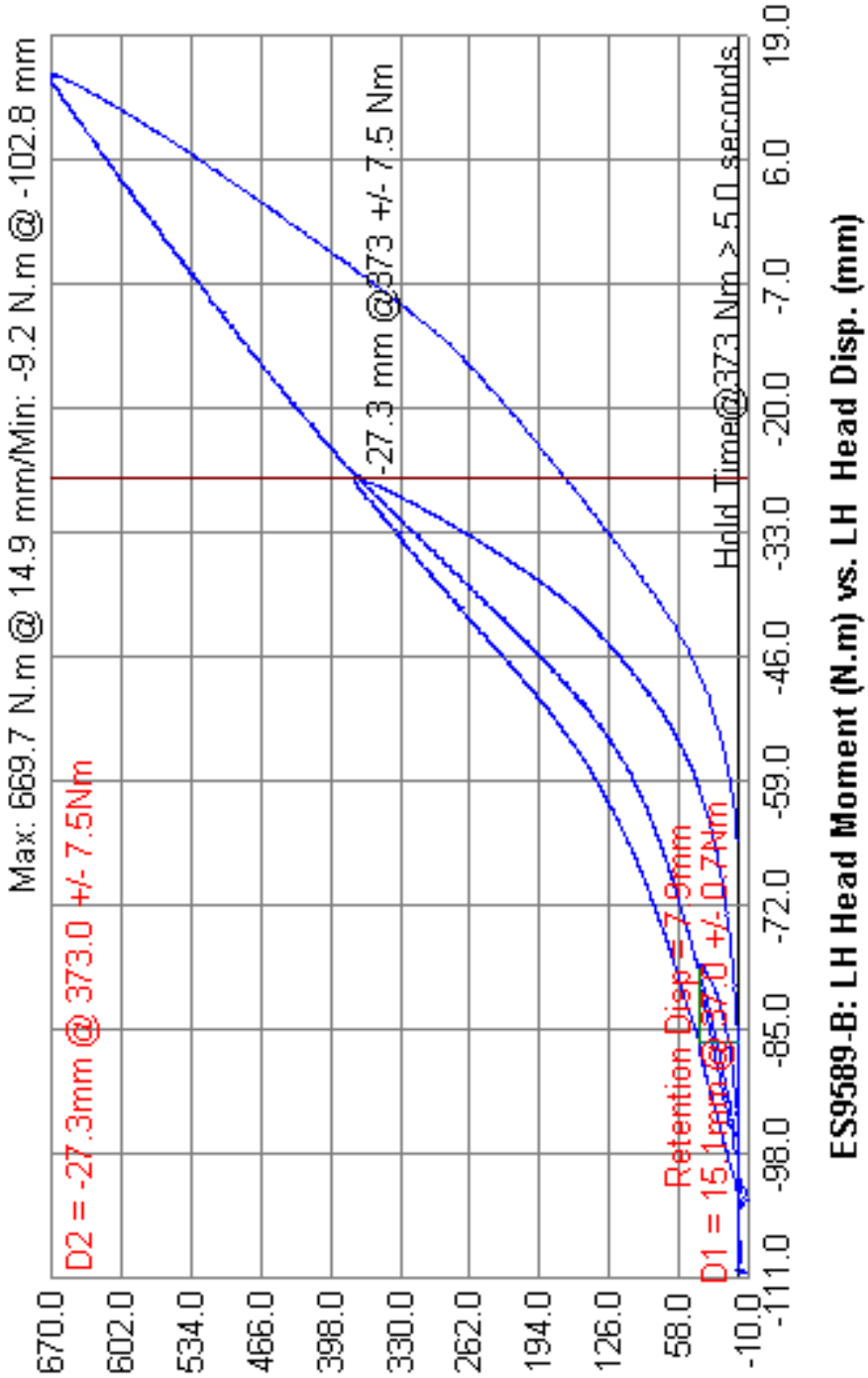
7.2.2 S5.2.6 Height Retention

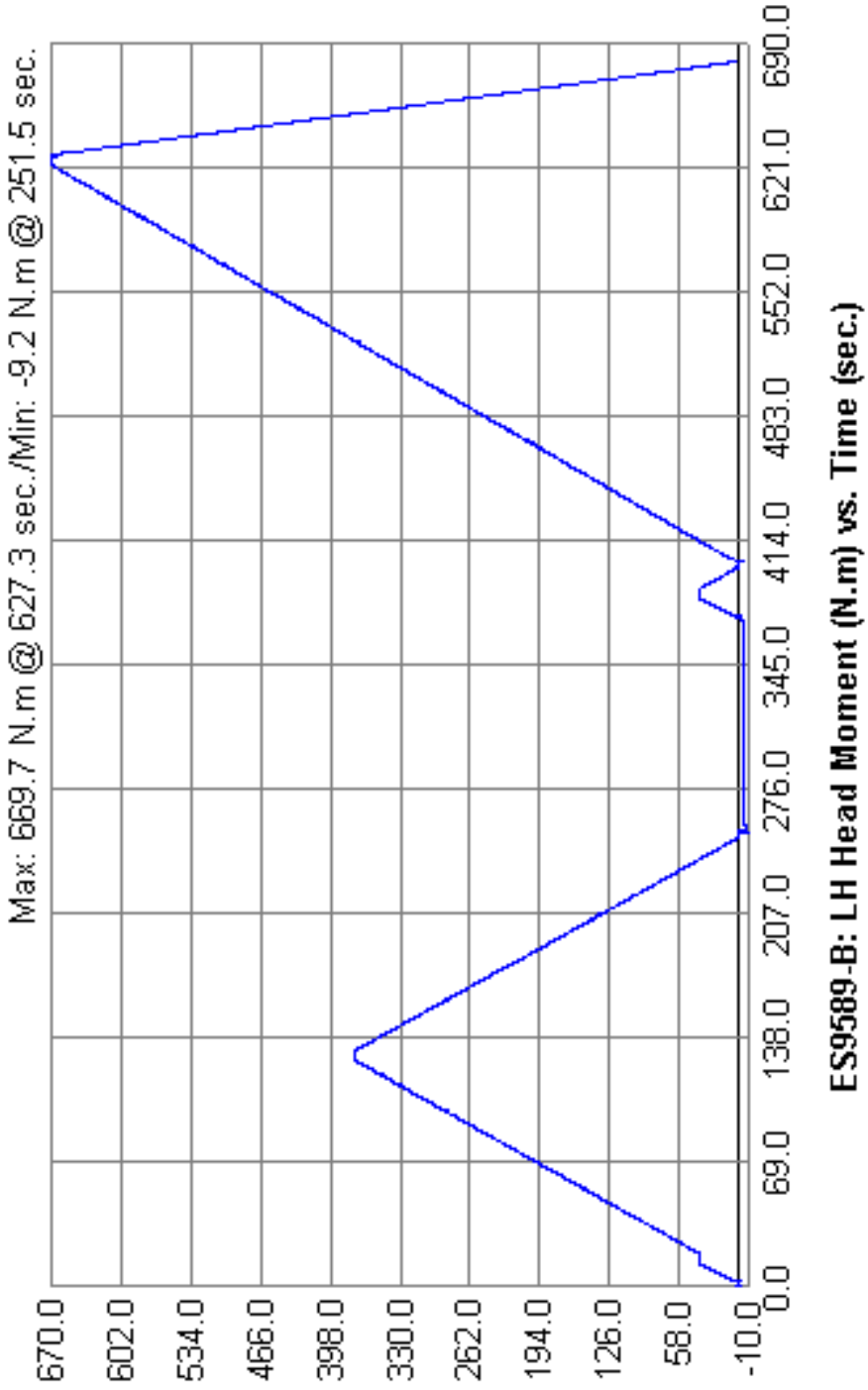


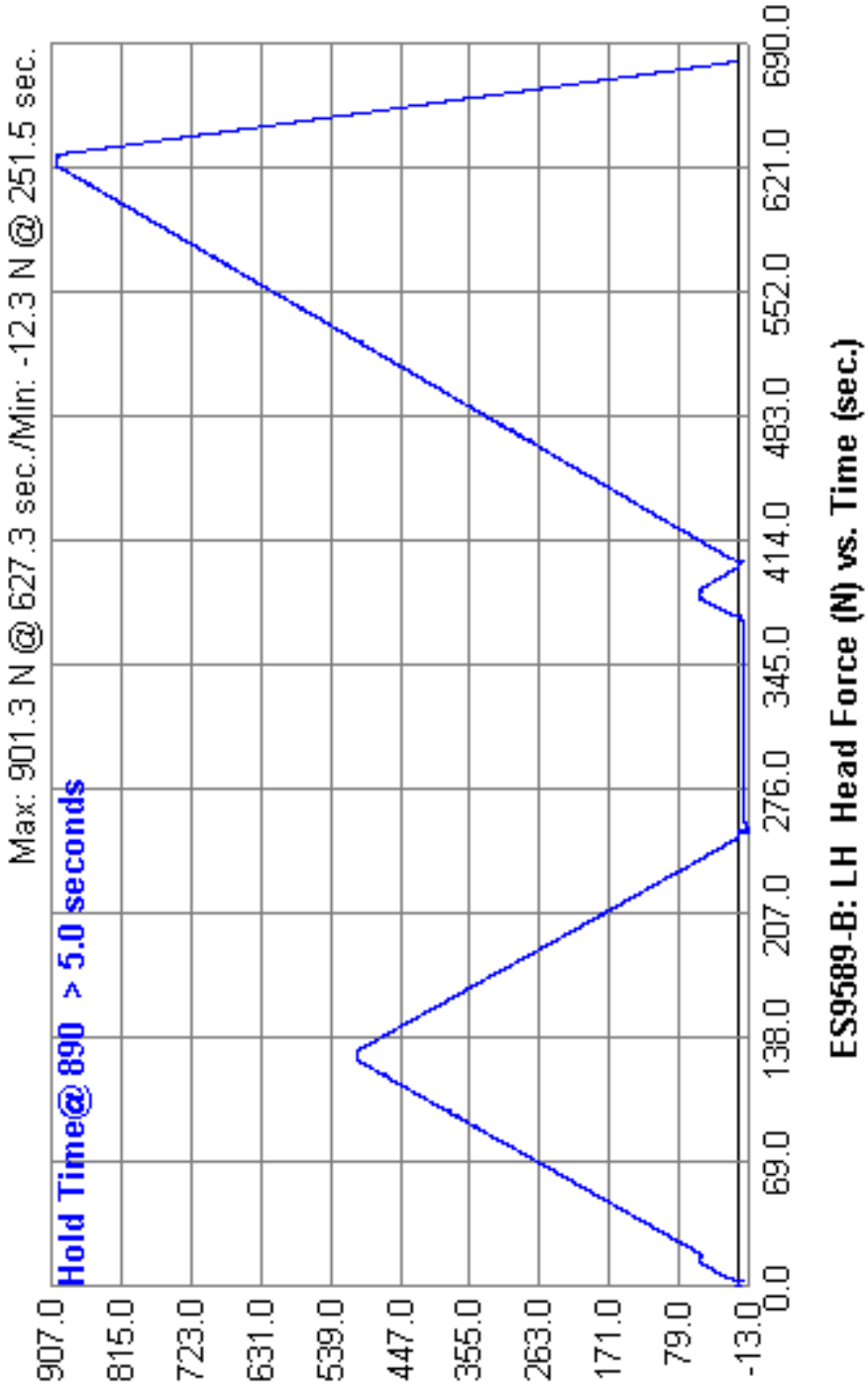

Max: 504.4 N @ 129.4 sec./Min: -14.1 N @ 260.3 sec.
505.0
453.0
401.0
349.0
297.0
245.0
193.0
141.0
89.0
37.0
-15.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
280.0
320.0
360.0
400.0
ES9595-B: RH 60% Head Force (N) vs. Time (sec.)

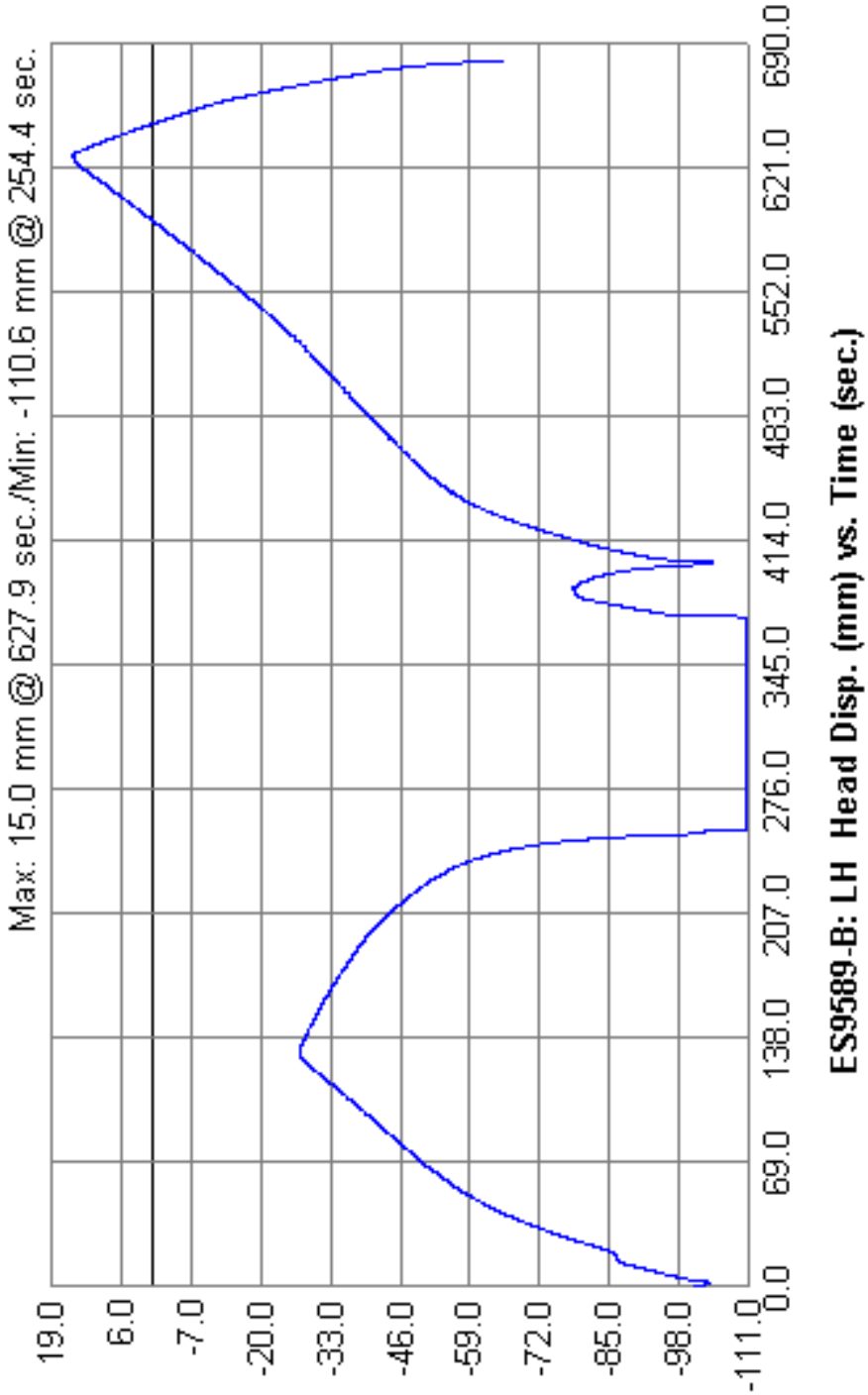

Max: 22.4 mm @ 131.5 sec./Min: -6.9 mm @ 331.1 sec.
ES9595-B: RH 60% Head Disp. (mm) vs. Time (sec.)
23.0
20.0
17.0
14.0
11.0
8.0
5.0
2.0
-1.0
-4.0
-7.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
280.0
320.0
360.0
400.0

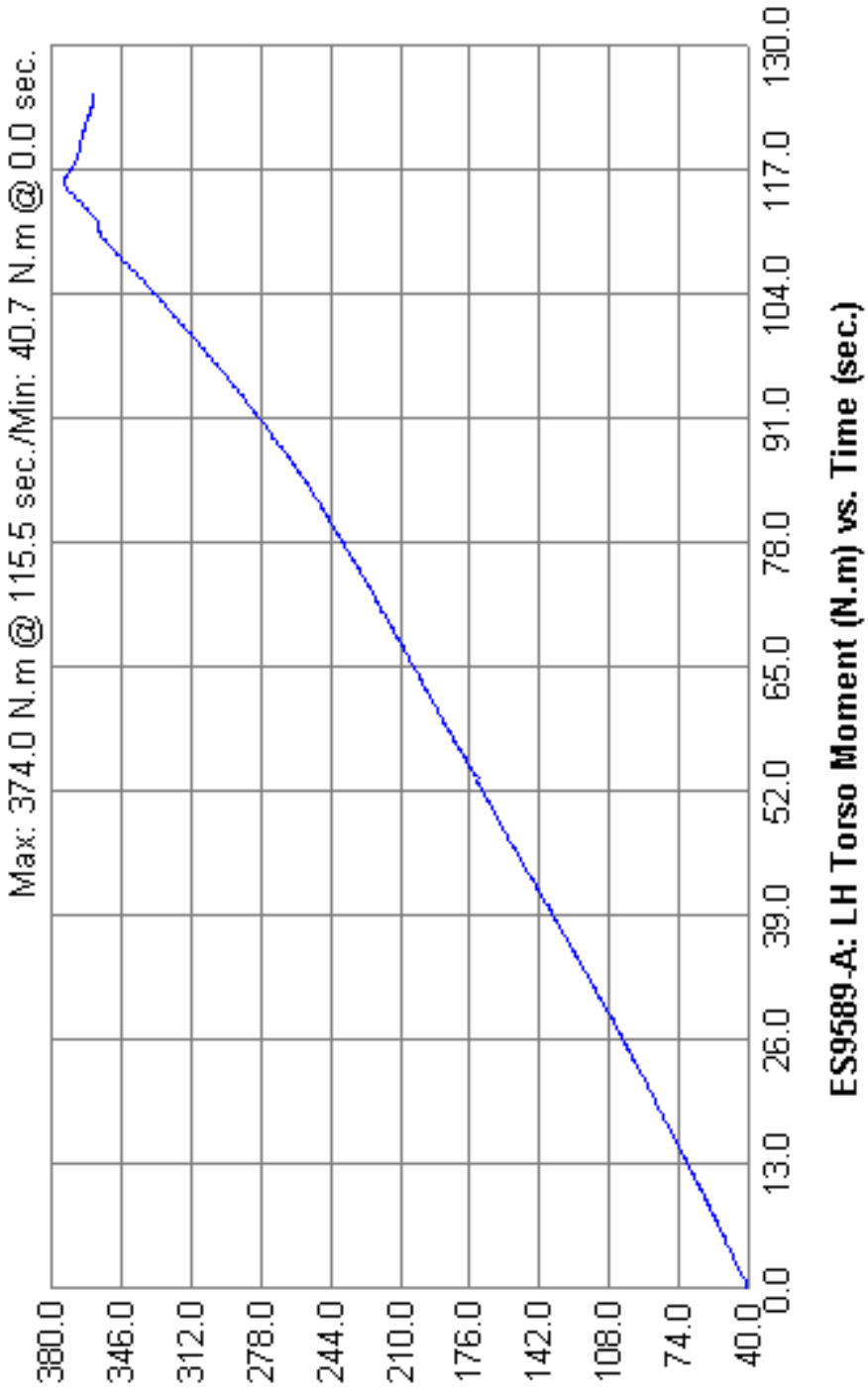
7.3.1 S5.2.7 Backset Retention, Displacement and Strength

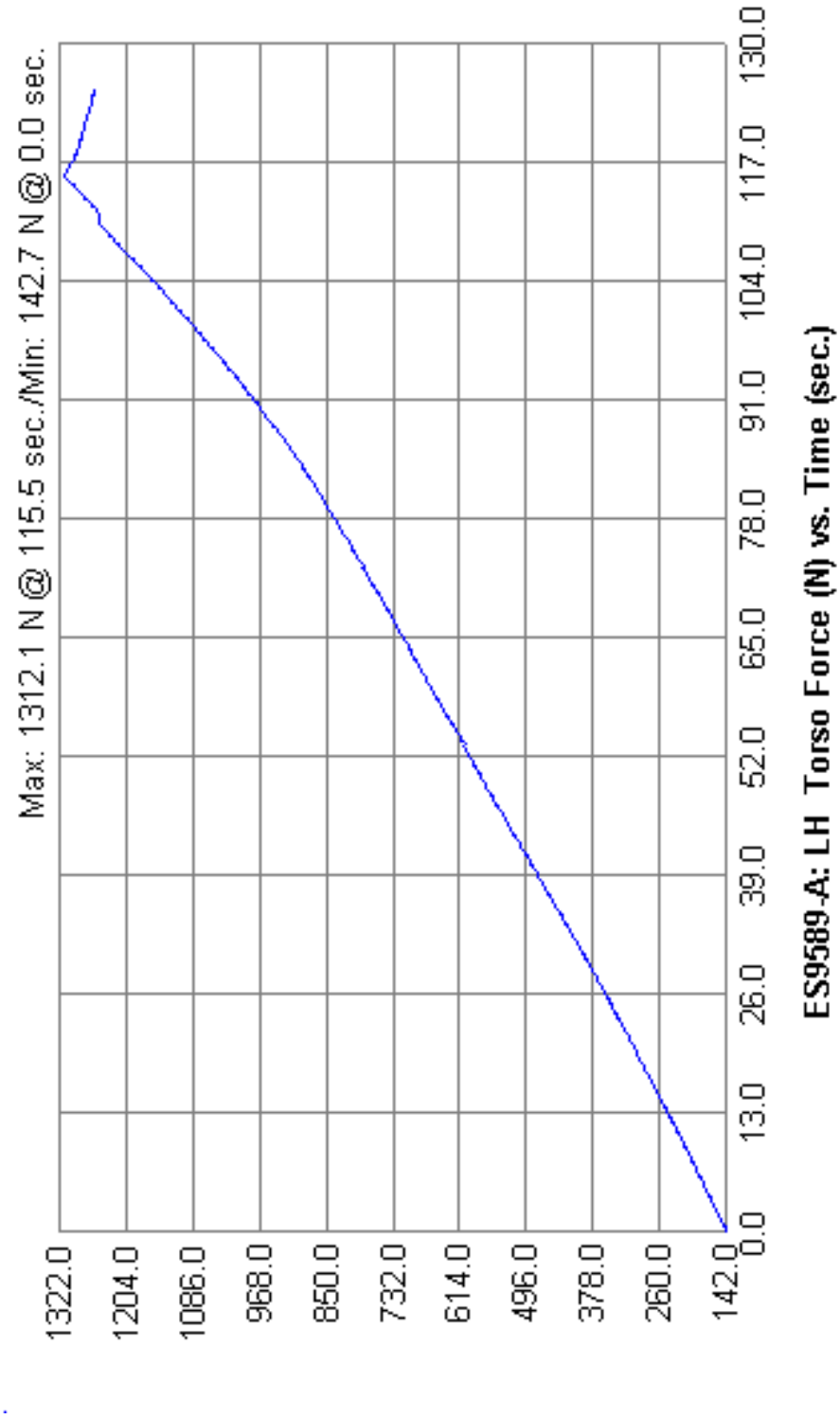


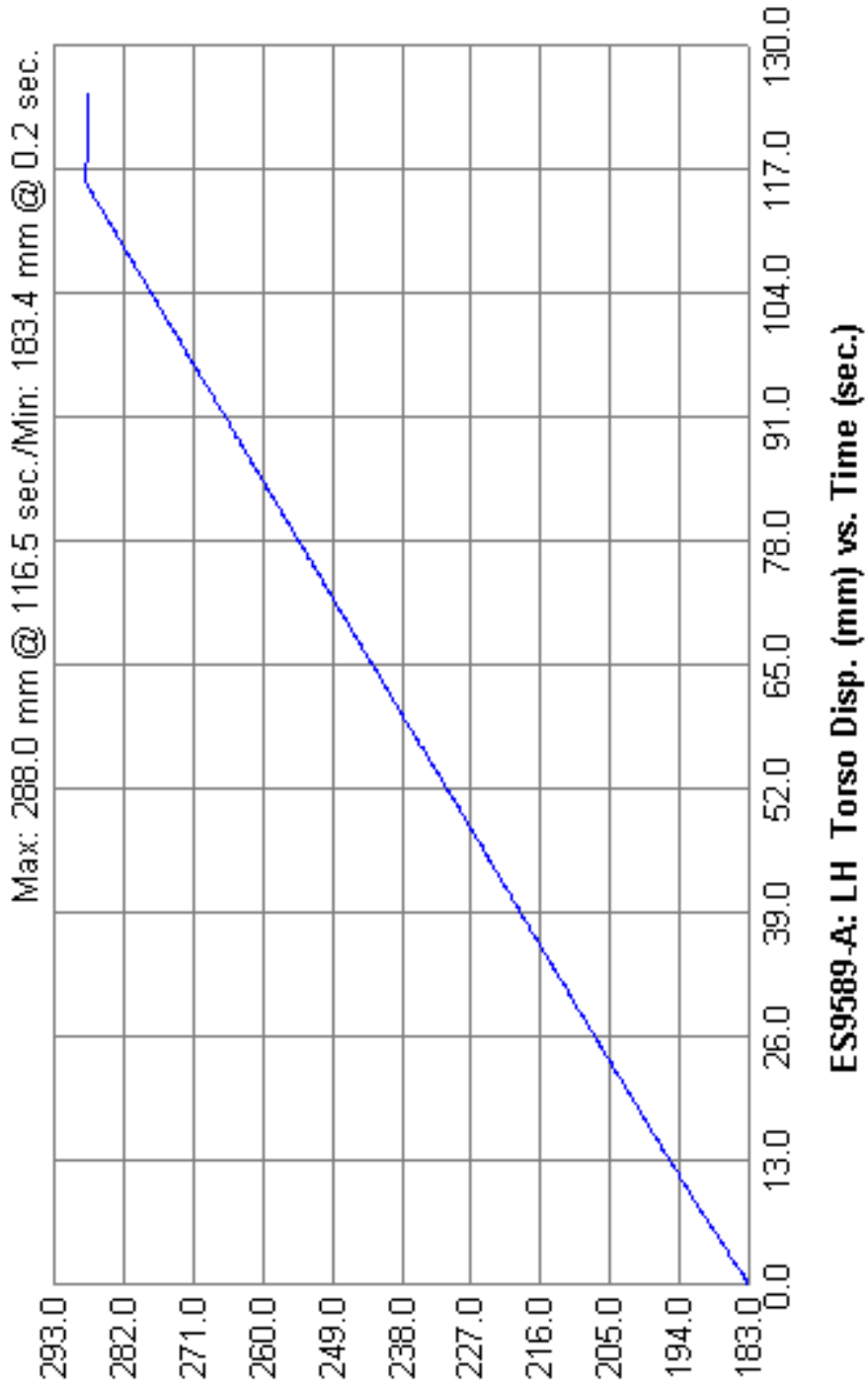

Max: 669.7 N.m @ 627.3 sec./Min: -9.2 N.m @ 251.5 sec.
670.0
602.0
534.0
466.0
398.0
330.0
262.0
194.0
126.0
58.0
-10.0
0.0
69.0
138.0
207.0
276.0
345.0
414.0
483.0
552.0
621.0
690.0
ES9589-B: LH Head Moment (N.m) vs. Time (sec.)


Max: 901.3 N @ 627.3 sec./Min: -12.3 N @ 251.5 sec.
Hold Time@ 890 > 5.0 seconds
907.0
815.0
723.0
631.0
539.0
447.0
355.0
263.0
171.0
79.0
-13.0
0.0
69.0
138.0
207.0
276.0
345.0
414.0
483.0
552.0
621.0
690.0
ES9589-B: LH Head Force (N) vs. Time (sec.)

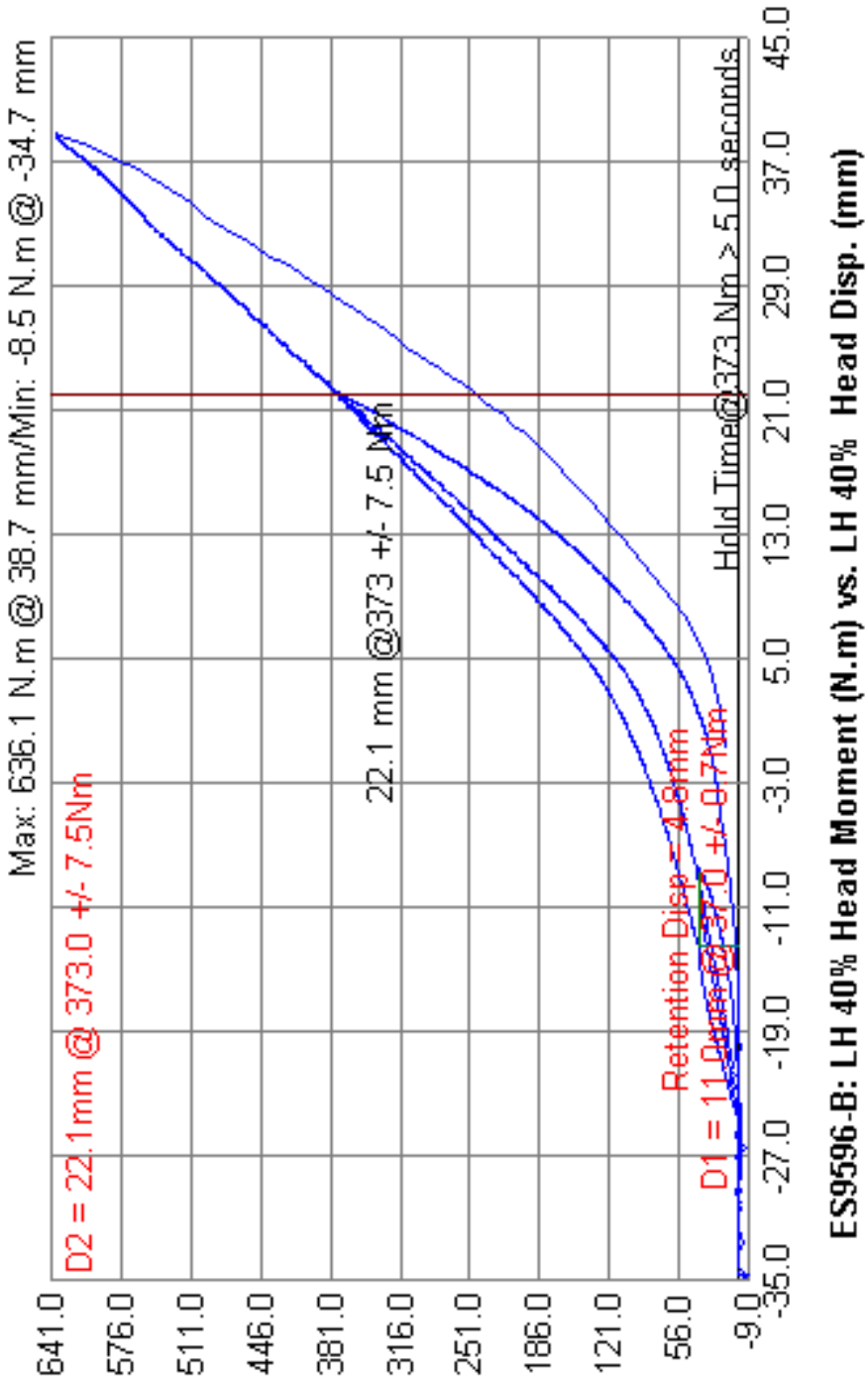

Max: 15.0 mm @ 627.9 sec./Min: -110.6 mm @ 254.4 sec.
19.0
6.0
-7.0
-20.0
-33.0
-46.0
-59.0
-72.0
-85.0
-98.0
-111.0
0.0
69.0
138.0
207.0
276.0
345.0
414.0
483.0
552.0
621.0
690.0
ES9589-B: LH Head Disp. (mm) vs. Time (sec.)

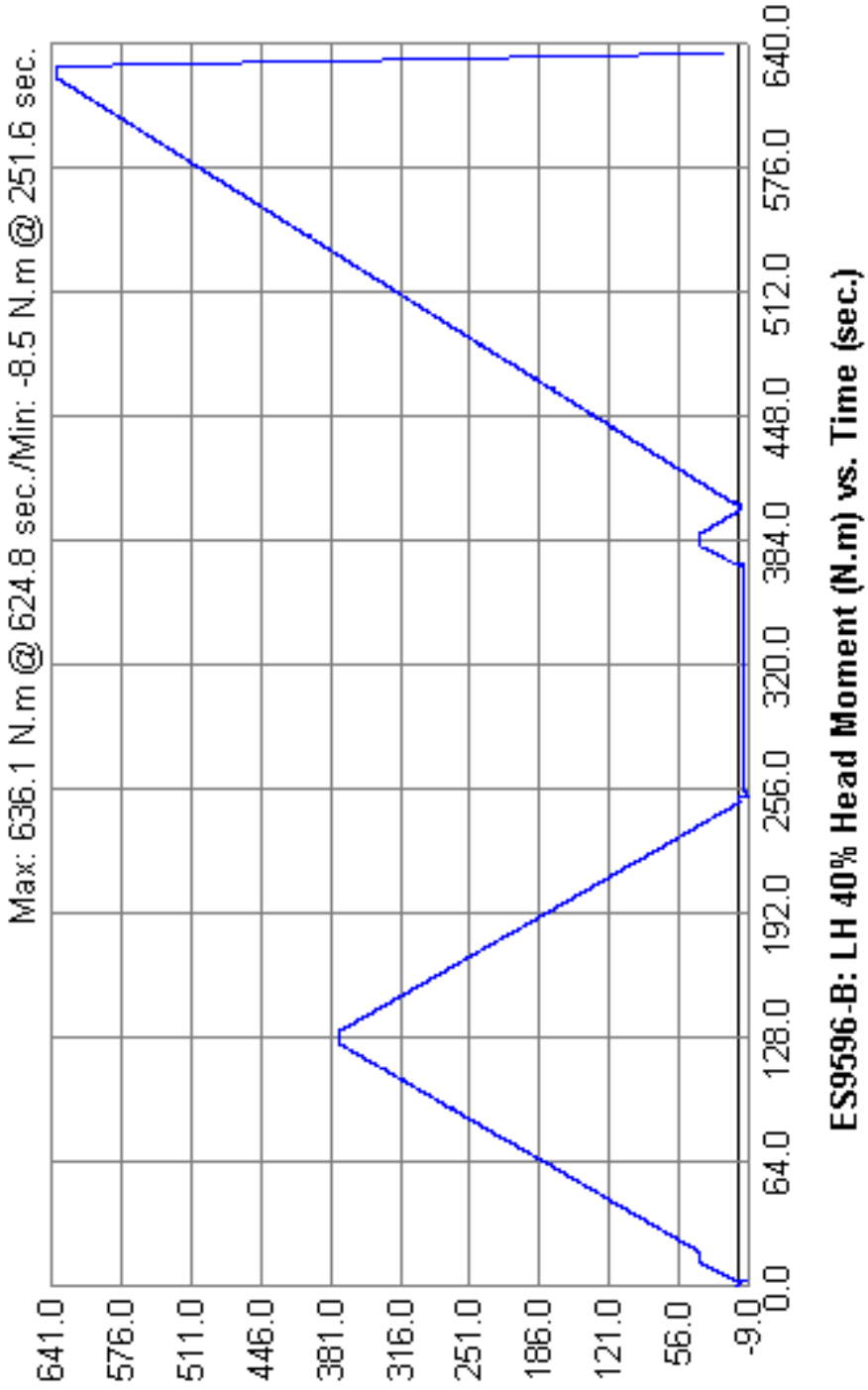

Max: 374.0 N.m @ 115.5 sec./Min: 40.7 N.m @ 0.0 sec.
380.0
346.0
312.0
278.0
244.0
210.0
176.0
142.0
108.0
74.0
40.0
0.0
13.0
26.0
39.0
52.0
65.0
78.0
91.0
104.0
117.0
130.0
ES9589-A: LH Torso Moment (N.m) vs. Time (sec.)

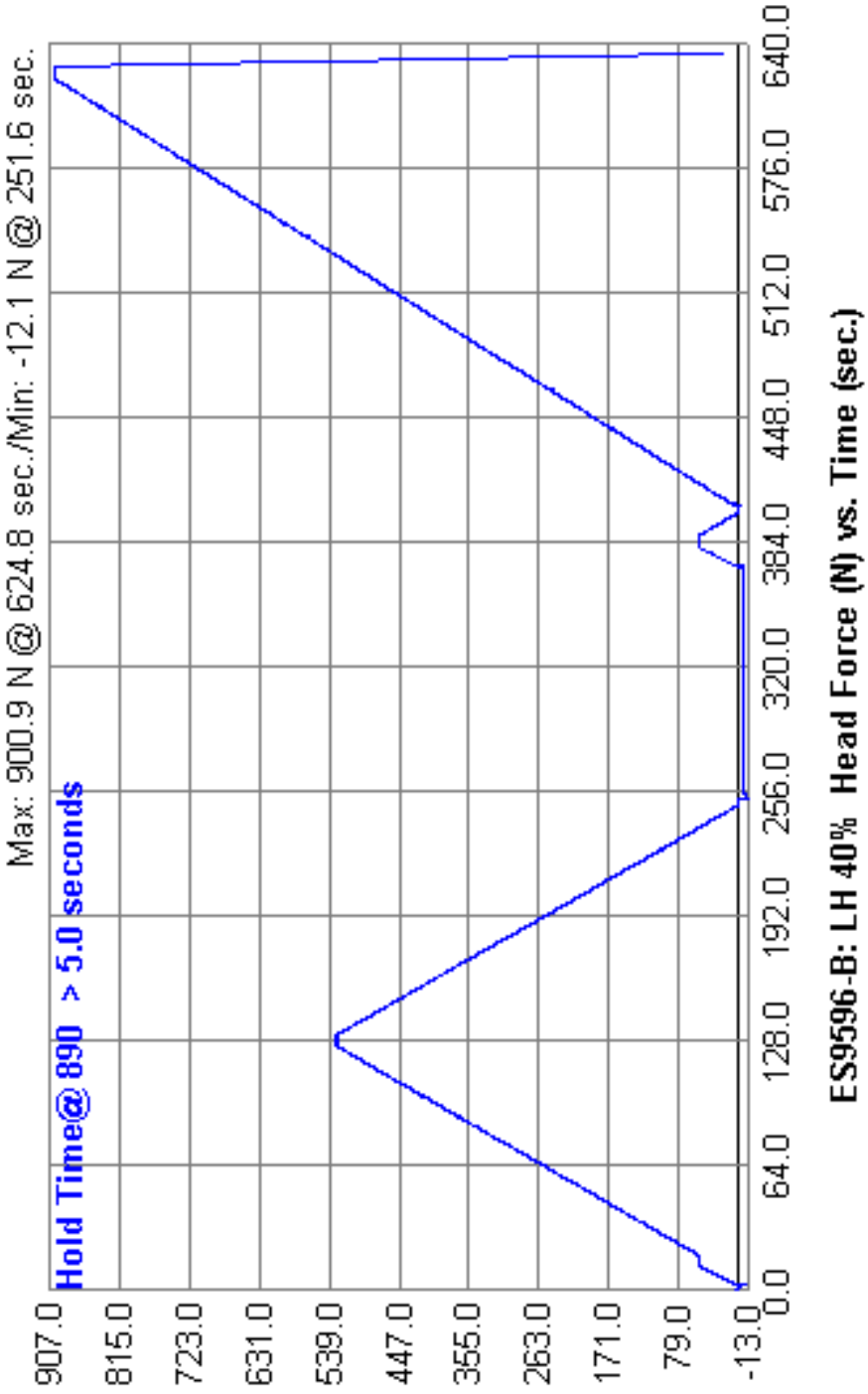

Max: 1312.1 N @ 115.5 sec./Min: 142.7 N @ 0.0 sec.
ES9589-A: LH Torso Force (N) vs. Time (sec.)
1322.0
1204.0
1086.0
968.0
850.0
732.0
614.0
496.0
378.0
260.0
142.0
0.0
13.0
26.0
39.0
52.0
65.0
78.0
91.0
104.0
117.0
130.0

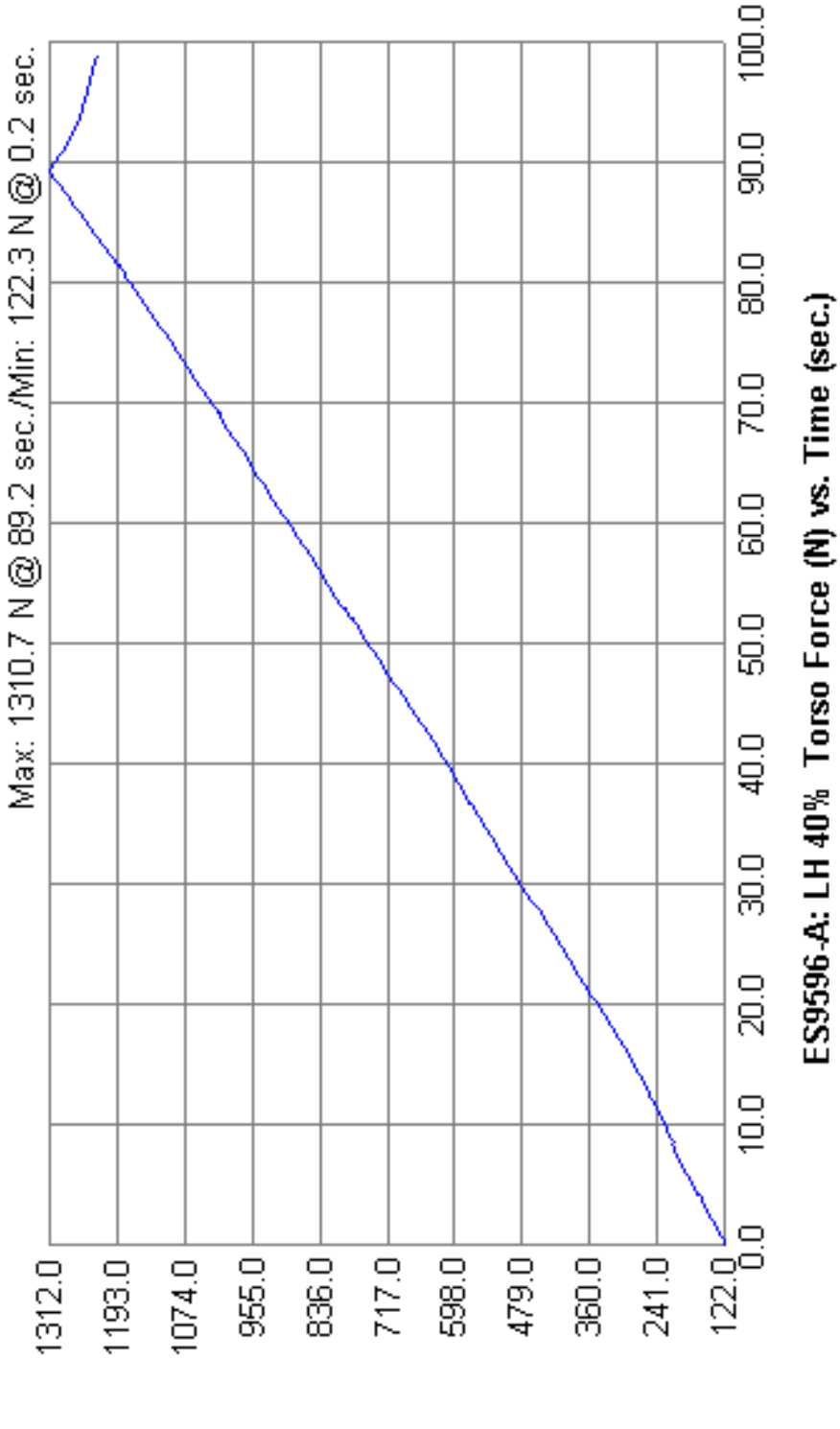

Max: 288.0 mm @ 116.5 sec./Min: 183.4 mm @ 0.2 sec.
ES9589-A: LH Torso Disp. (mm) vs. Time (sec.)
293.0
282.0
271.0
260.0
249.0
238.0
227.0
216.0
205.0
194.0
183.0
0.0
13.0
26.0
39.0
52.0
65.0
78.0
91.0
104.0
117.0
130.0

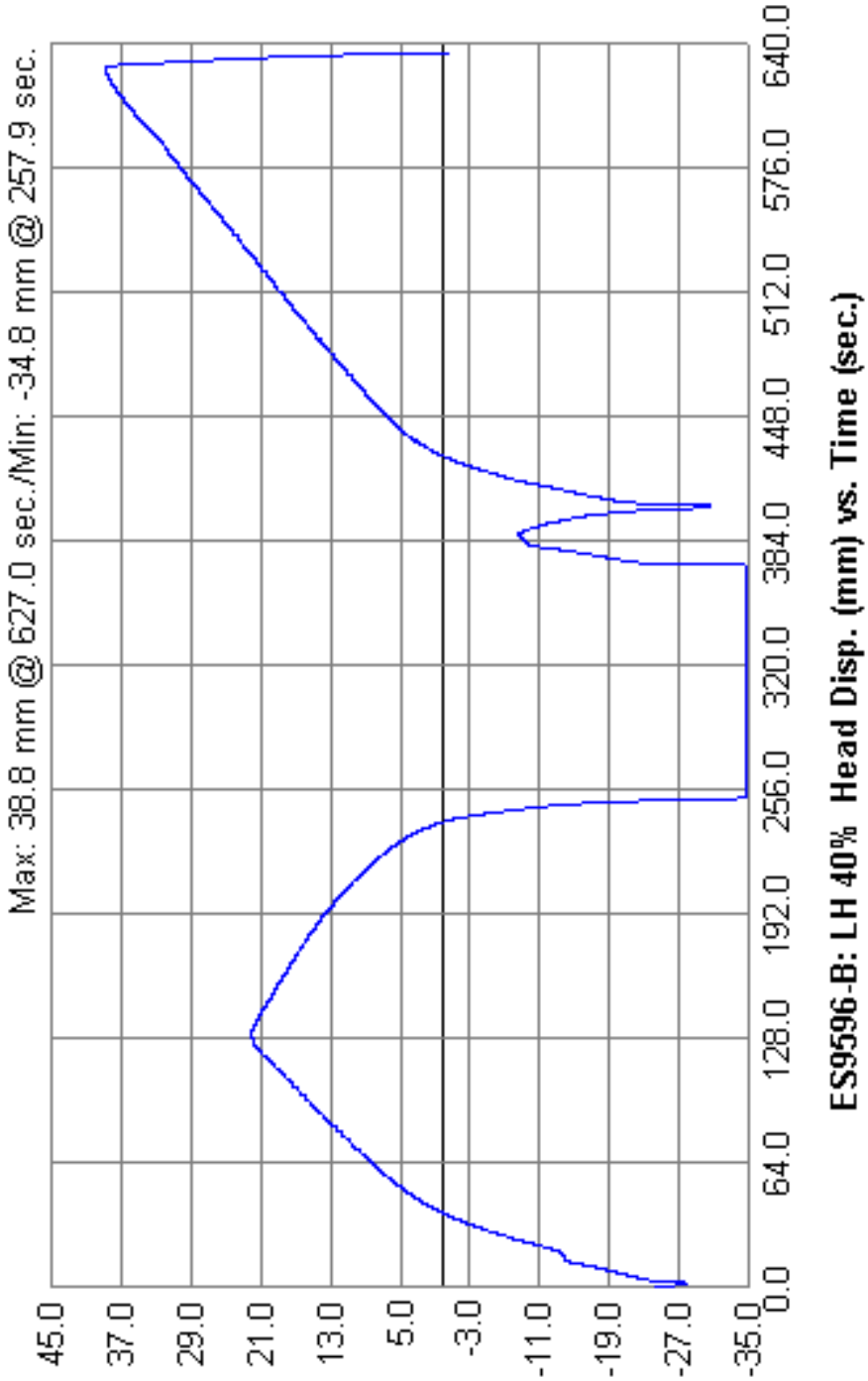
7.3.2 S5.2.7 Backset Retention, Displacement and Strength

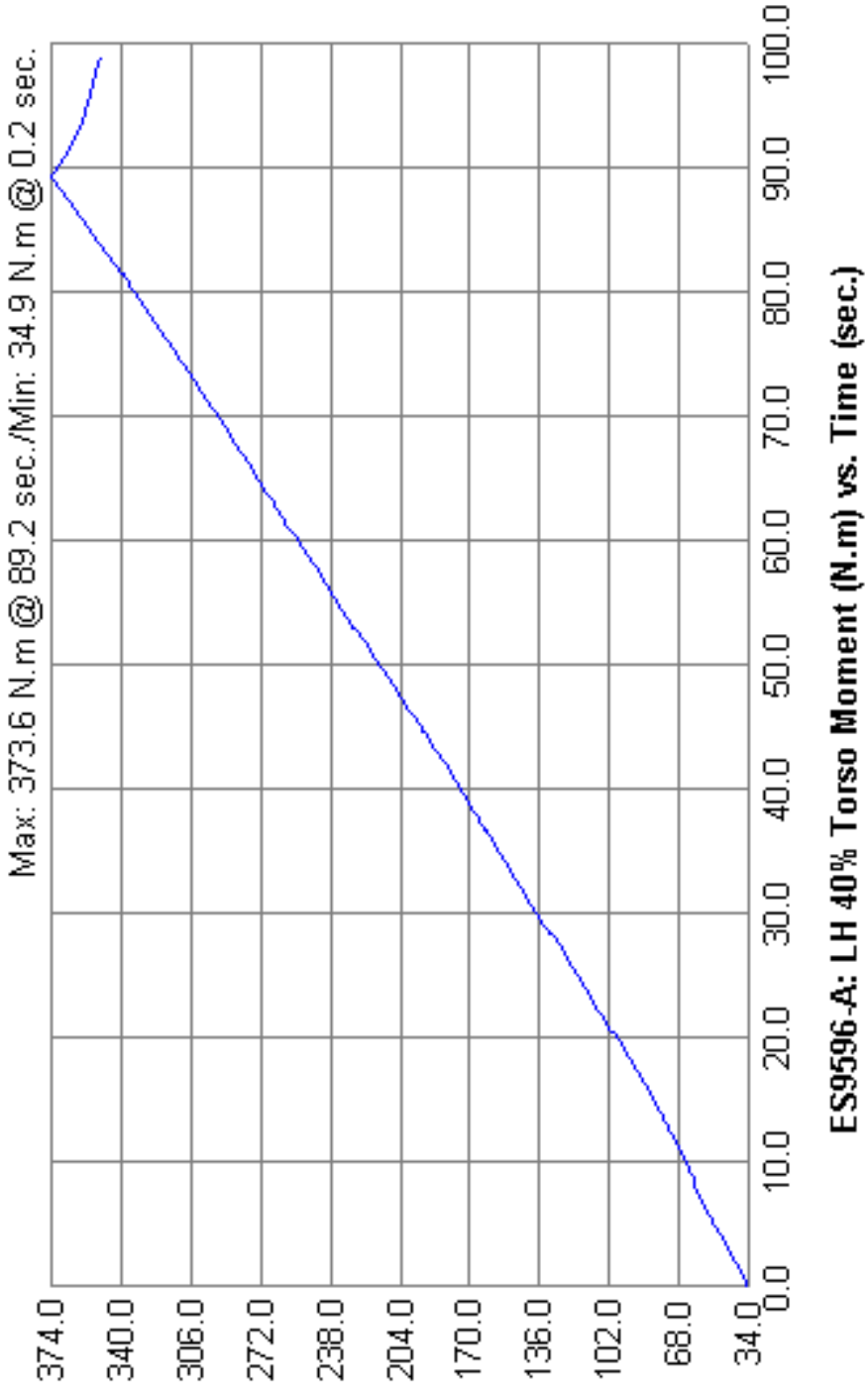


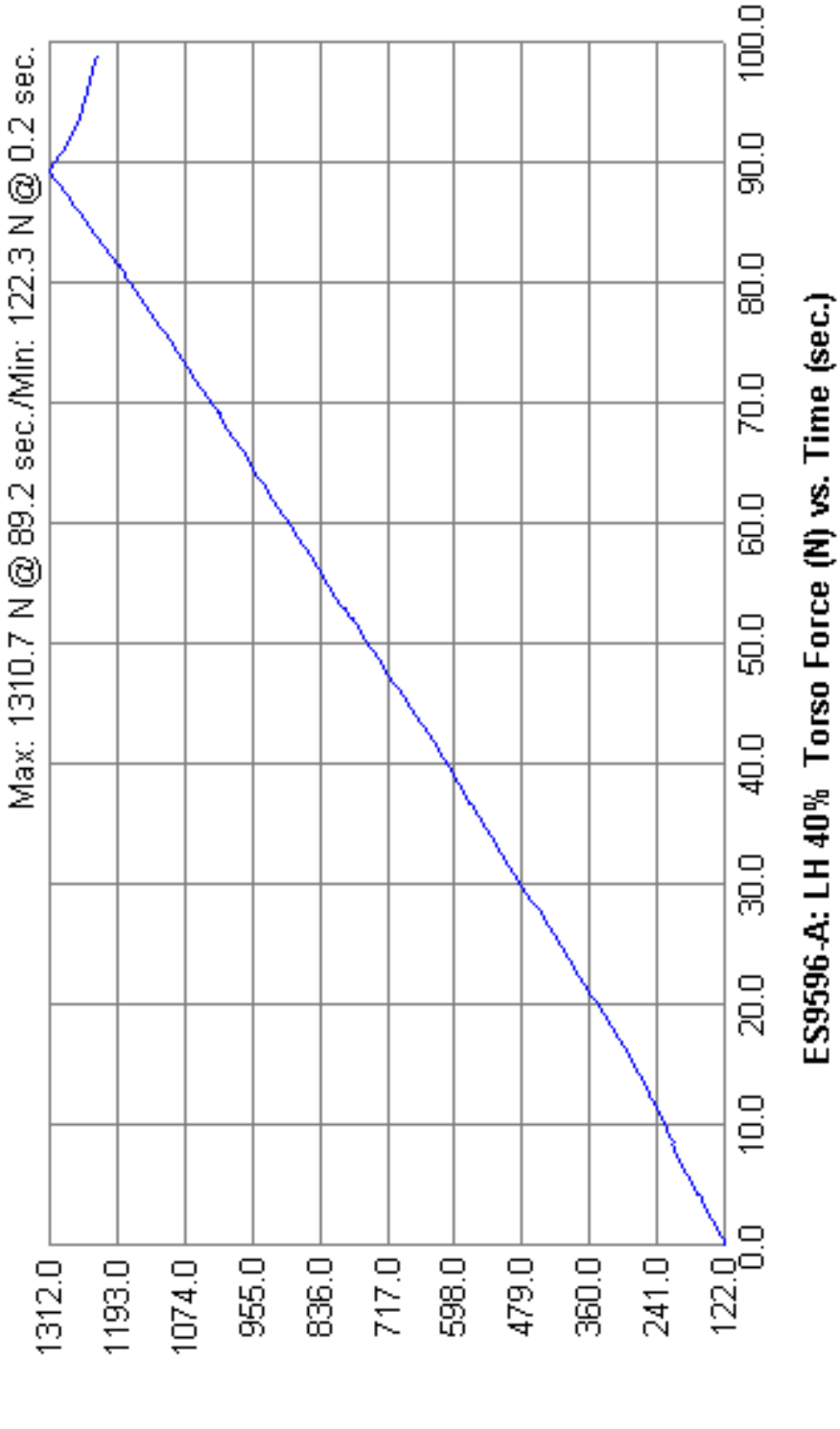

Max: 636.1 N.m @ 624.8 sec./Min: -8.5 N.m @ 251.6 sec.
641.0
576.0
511.0
446.0
381.0
316.0
251.0
186.0
121.0
56.0
-9.0
0.0
64.0
128.0
192.0
256.0
320.0
384.0
448.0
512.0
576.0
640.0
ES9596-B: LH 40% Head Moment (N.m) vs. Time (sec.)

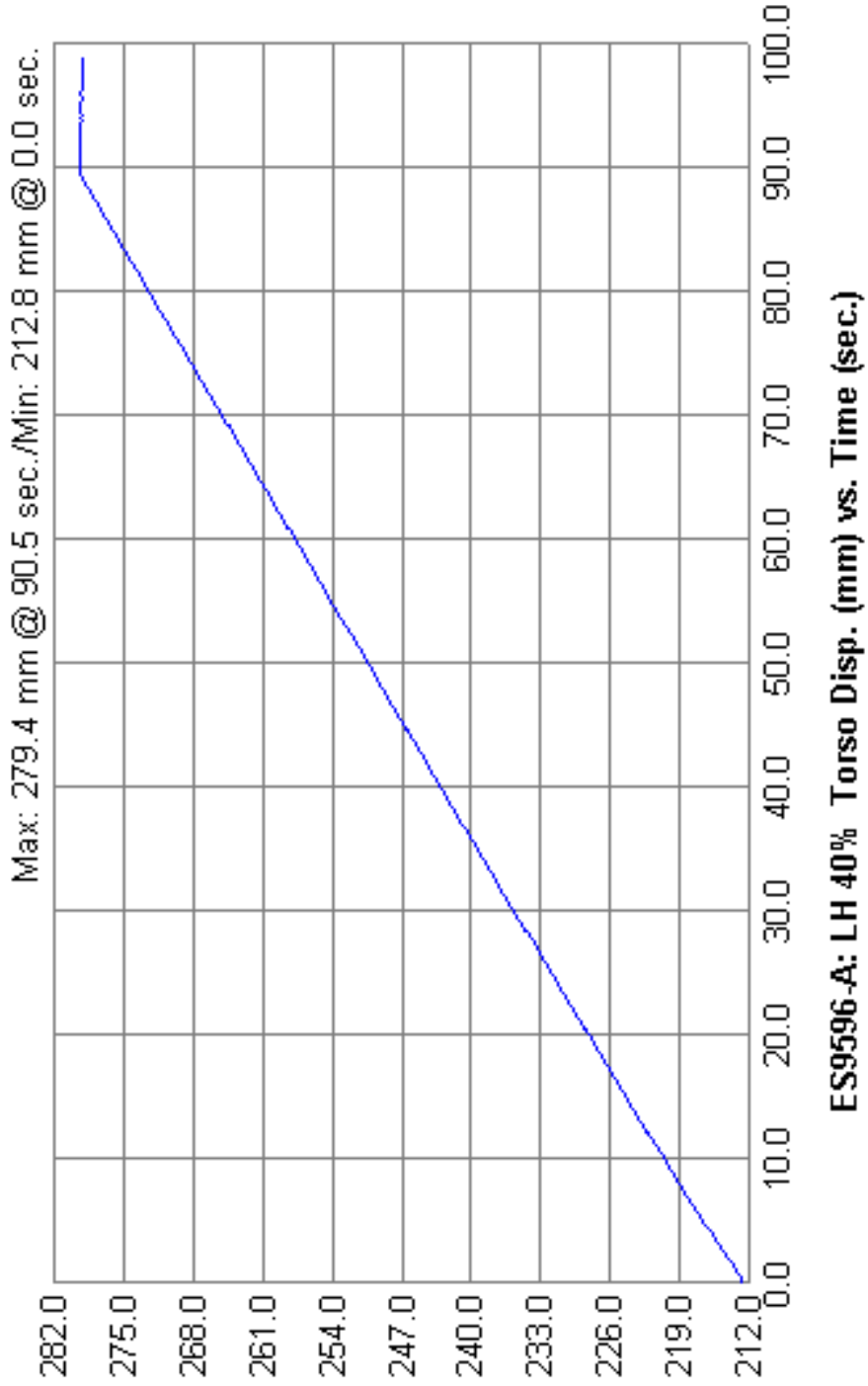

ES9596-B: LH 40% Head Force (N) vs. Time (sec.)
Max: 900.9 N @ 624.8 sec./Min: -12.1 N @ 251.6 sec.
Hold Time@ 890 > 5.0 seconds
907.0
815.0
723.0
631.0
539.0
447.0
355.0
263.0
171.0
79.0
-13.0
0.0
64.0
128.0
192.0
256.0
320.0
384.0
448.0
512.0
576.0
640.0


Max: 1310.7 N @ 89.2 sec./Min: 122.3 N @ 0.2 sec.
1312.0
1193.0
1074.0
955.0
836.0
717.0
598.0
479.0
360.0
241.0
122.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
ES9596-A: LH 40% Torso Force (N) vs. Time (sec.)


Max: 38.8 mm @ 627.0 sec./Min: -34.8 mm @ 257.9 sec.
45.0
37.0
29.0
21.0
13.0
5.0
-3.0
-11.0
-19.0
-27.0
-35.0
0.0
64.0
128.0
192.0
256.0
320.0
384.0
448.0
512.0
576.0
640.0
ES9596-B: LH 40% Head Disp. (mm) vs. Time (sec.)


Max: 373.6 N.m @ 89.2 sec./Min: 34.9 N.m @ 0.2 sec.
ES9596-A: LH 40% Torso Moment (N.m) vs. Time (sec.)
374.0
340.0
306.0
272.0
238.0
204.0
170.0
136.0
102.0
68.0
34.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0


Max: 1310.7 N @ 89.2 sec./Min: 122.3 N @ 0.2 sec.
ES9596-A: LH 40% Torso Force (N) vs. Time (sec.)
1312.0
1193.0
1074.0
955.0
836.0
717.0
598.0
479.0
360.0
241.0
122.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0


Max: 279.4 mm @ 90.5 sec./Min: 212.8 mm @ 0.0 sec.
282.0
275.0
268.0
261.0
254.0
247.0
240.0
233.0
226.0
219.0
212.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
ES9596-A: LH 40% Torso Disp. (mm) vs. Time (sec.)

8.0 REPORT OF VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-06-C-00030/0007 DATE: July 21 - 31, 2009

From: MGA Research Corporation, 446 Executive Drive, Troy, MI 48083

To: NHTSA, OVSC, NVS-220

The following vehicle has been subjected to compliance testing for FMVSS No. 202a

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD0-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

VEH. MOD YR/MAKE/MODEL/BODY: 2009 Toyota Venza

VEH. NHTSA NO.: C95108 VIN: 4T3ZK11A89U007432

COLOR: Blue

ODOMETER READINGS: ARRIVAL 589 miles Date: 5/26/2009

COMPLETION 589 miles Date: 7/31/2009

ENGINE DATA: 6 Cylinders __ Liters ____ Cubic Inches

TRANSMISSION DATA: X Automatic ____ Manual ___ No. of Speeds

FINAL DRIVE DATA: ____Rear Drive X Front Drive ____4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Chris Collins, Helen Kaleto, Dave Maier

X	Air Conditioning	X	Traction Control	X	Clock
X	Tinted Glass	N/A	All Wheel Drive	N/A	Roof Rack
X	Power Steering	X	Speed Control	X	Console
X	Power Windows	X	Rear Window Defroster	X	Driver Air Bag
X	Power Door Locks	N/A	Sun Roof or T-Top	X	Passenger Air Bag
X	Power Seat(s)	X	Tachometer	X	Front Disc Brakes
X	Power Brakes	X	Tilt Steering Wheel	X	Rear Disc Brakes
X	Antilock Brake System	X	AM/FM/Compact Disc		Other

REMARKS:

Salvage only.

Equipment that is no longer on the test vehicle as noted on previous pages:

All equipment inventoried and placed in vehicle.

Explanation for equipment removal:

Roof removed and vehicle cut to accommodate test equipment.

Test Vehicle Condition:

Salvage only. Vehicle cut in half to complete testing.

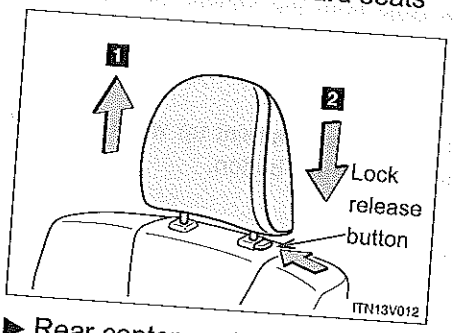
RECORDED BY: Chris Collins, David Maier DATE: September 3, 2009

APPROVED BY: Helen Kaleto

APPENDIX A
OWNERS MANUAL HEAD RESTRAINTS

1-3. Adjustable components (seats, mirrors, steering wheel)
Head restraints

▶ Front and rear outboard seats



Vertical adjustment

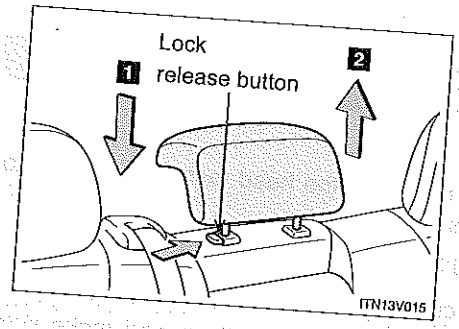
1 Up

Pull the head restraint up.

2 Down

Push the head restraints down while pressing the lock release button.

▶ Rear center seat



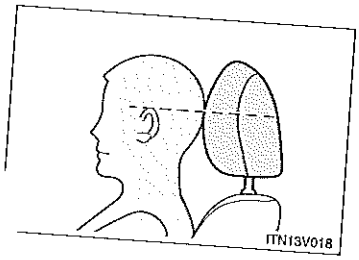
Vertical adjustment

1 Down

2 Up

Push the head restraint up or down while pressing the lock release button.

Adjusting the height of the head restraints



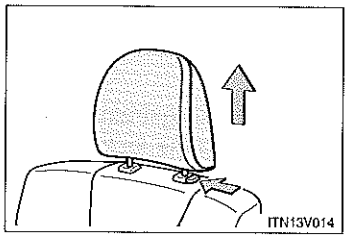
Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.

1-3. Adjustable components (seats, mirrors, steering wheel)

Adjusting the rear center seat head restraint

Always raise the head restraint one level from the stowed position when using.

Removing the head restraints



Pull the head restraint up while pressing the lock release button.

⚠ CAUTION

Head restraint precautions

Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.

APPENDIX B
MANUFACTURER'S DATA (OVSC FORM-SRP)

Attachment 1

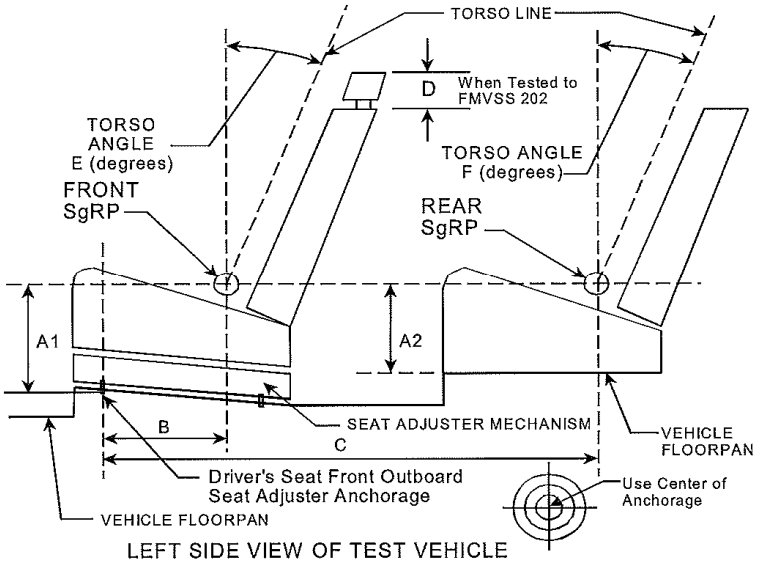
FORM – SRP
Rev. 10/10/08

SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA

FMVSS No. 201, 202*, 203, 207, 210 & 216
(All dimensions in inches)
* : We conducted this test based on FMVSS 202a Dynamic test in Front outboard designated seating position and Static test in Rear outboard designated seating position.

Model Year: 2009 / Make: TOYOTA / Model: Venza .

Body Style: 5 Door MPV / Seat Style: Fr : Separate Seat Rr : 6:4 Split Seat



LEFT SIDE VIEW OF TEST VEHICLE

DIMENSION	FRONT, A1	REAR, A2
A	11.00" (279.5 mm)	11.59" (294.3 mm)
B	15.47" (393 mm)	
C	49.56" (1258.9 mm)	
D	9.62" (244.4 mm)	
E	21 degrees	
F	25 degrees	

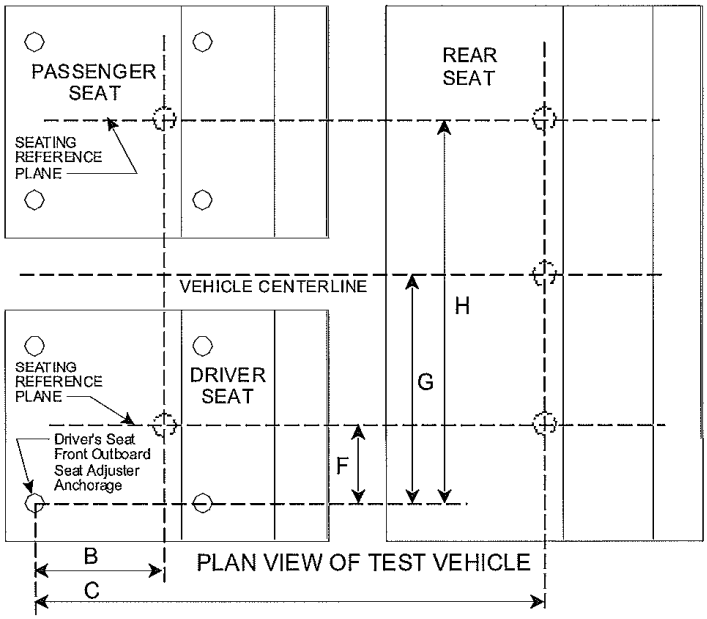
2

SEATING REFERENCE POINT (SRP) AND TORSO ANGLE DATA

FMVSS No. 201, 202*, 203, 207 & 210
(All dimensions in inches)
* : We conducted this test based on FMVSS 202a Dynamic test in Front outboard designated seating position and Static test in Rear outboard designated seating position.

Model Year: 2009 / Make: TOYOTA / Model: Venza .

Body Style: 5 Door MPV / Seat Style: Fr : Separate Seat Rr : 6:4 Split Seat



B	15.47" (393 mm)
C	59.56" (1258.9 mm)
F*	Fr: 7.96" (202.2 mm) Rr: 8.35" (212.2 mm)
G	23.12" (587.2 mm)
H*	Fr: 38.28" (972.2 mm) Rr: 37.88" (962.2 mm)

* Provide all dimensions needed to locate SRP.

FORM – SRP

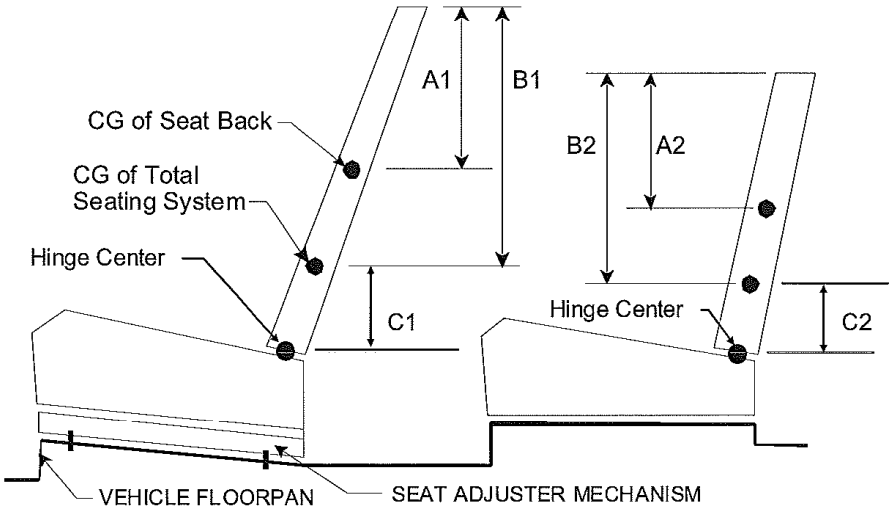
3

TEST VEHICLE SEAT INFORMATION

FMVSS No. 201, (202*) 203, 207 & 210
(All dimensions in inches)
* : We conducted this test based on FMVSS 202a Dynamic test in Front outboard designated seating position and Static test in Rear outboard designated seating position.

Model Year: 2009 / Make: TOYOTA / Model: Venza .

Body Style: 5 Door MPV / Seat Style: Fr : Separate Seat Rr : 6:4 Split Seat



A1	No data				FRONT			BACK	
B1	No data		Weight of Hinged or Folding portion of seat	No data			No data		
C1		LH	RH						
	MNL	1.77" (45mm	3.36" (60 mm)						
	PWR	3.46" (88 mm)	4.02" (102 mm)						
A2	No data		Weight of Total Seat System		LH	RH		40%	60%
				MNL	24.7kg	23.2kg	FAB	17.2kg	28.0kg
				PWR	28.7kg	28.0kg	LTHR	17.9kg	29.4kg
				PWR W/HEATER	28.9kg	28.2kg			
B2	No data		Angle of Seat Back	21 degrees			25 degrees		
C2	40%	60%							
	0.37" (9.3 mm)	1.43" (36.3 mm)							

FORM – SRP