

REPORT NUMBER: CAL-07-13

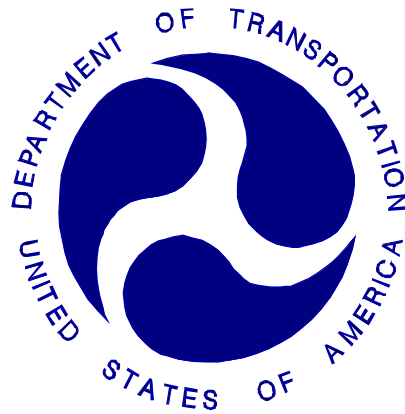
**NEW CAR ASSESSMENT PROGRAM (NCAP)**  
FRONTAL BARRIER IMPACT TEST

GRACO SNUGRIDE REAR FACING  
EVENFLO EMBRACE REAR FACING

NHTSA NUMBER: F80201

CALSPAN TEST NUMBER: 8834-NCAP/CRS-1

CALSPAN  
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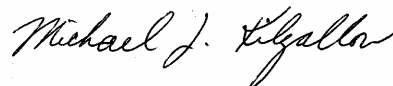
June 2, 2007

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Rulemaking  
Office of Crashworthiness Standards  
Mail Code: NVS-111  
1200 New Jersey Ave SE Room W43-410  
Washington, DC 20590

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Approval Date: 8/6/2007

**TECHNICAL REPORT STANDARD TITLE PAGE**

1. Report No. NCAP-CAL-07-13	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of Graco Snugride and Evenflo Embrace Rear Facing NHTSA No.: F80201		5. Report Date June 2, 2007	
		6. Performing Organization Code CAL	
7. Author(s) Vincent M. Paolini, Project Engineer Michael J. Kilgallon, Program Manager		8. Performing Organization Report No. 8834-NCAP/CRS-1	
9. Performing Organization Name and Address Calspan Corporation Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-06-D-00024	
12. <i>Sponsoring Agency Name and Address</i> U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NVS-111 400 Seventh, SW, Room 5311 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report, June 2007	
		14. Sponsoring Agency Code  NVS-111	
15. Supplementary Notes			
16. Abstract This CRS test was performed in conjunction with a New Car Assessment Program (NCAP) load cell barrier test. A Graco Snugride rearward facing infant restraint was secured in Position 3 (P3) with the LATCH system. An Evenflo Embrace rearward facing infant restraint was secured in Position 4 (P4) with the LATCH system. This test was conducted at the Calspan Corporation Crash Test Facility in Buffalo, New York, on June 2, 2007.			
17. Key Words New Car Assessment Program (NCAP)		18. Distribution Statement <u>Copies of this report are available from:</u> NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave SE Washington, DC 20590	
19. Security Classification of Report UNCLASSIFIED	20. Security Classification of Page UNCLASSIFIED	21. No. of Pages	22. Price

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## SECTION 1

### PURPOSE AND SUMMARY OF TEST F80201

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition. These data constitute part of the general consumer information collected by the New Car Assessment Program (NCAP).

The 55.68 kph NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

#### SUMMARY

Both child dummies were instrumented with head and chest triaxial accelerometers. In addition, redundant head z acceleration, upper six axial neck force and moment transducers were utilized.

The right rear (Position 3) child dummy (serial no. 102) and left rear (Position 4) child dummy (serial no. 103) were calibrated previous to this test. Child dummy certification information is found in section 5.

The right rear child dummy's HIC (15 ms) was 507.8, maximum chest deceleration over 3 ms was 51.5 g's. The left rear child dummy's HIC (15 ms) was 479.2 The Position 4 child dummy Chest Z accelerometer did not record properly thus the chest deceleration calculation over 3 ms could not be accurately performed for this dummy.

**SECTION 2**  
**DATA SHEET NO. 1**  
**CRASH TEST SUMMARY**

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
ATD Type/Serial No.	CRABI/102	CRABI /103
Restraint System:	Graco Snugride Rear Facing	Evenflo Embrace Rear Facing

Number of Data Channels \_\_\_\_\_ 32  
 Number of Cameras: \_\_\_\_\_ 1 \_\_\_\_\_ Real Time  
 \_\_\_\_\_ 2 \_\_\_\_\_ High Speed

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, latched and operable w/o tools	Closed, latched and operable w/o tools
Right Side Doors	Closed, latched and operable w/o tools	Closed, latched and operable w/o tools
Hatch/Other Door	-	Closed, latched and operable w/o tools

POST TEST SEAT DATA

LOCATION	SEAT MOVEMENT (mm)	SEAT BACK FAILURE
P1 (Left Front)	4 mm rearward	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

VISIBLE DUMMY CONTACT POINTS

	Position #3 CRS	Position #4 CRS
Head Contact:	The face to the P3 seatback. Back of head to CRS	The face to the P4 seatback. Back of head to CRS
Upper Torso Contact:	None	None
Lower Torso Contact:	None	None
Left Knee Contact:	Feet – P3 Seatback	Feet – P4 Seatback
Right Knee Contact:	Feet – P3 Seatback	Feet – P4 Seatback

**DATA SHEET NO. 2**

**CRS PARAMETER DATA**

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1627.0 kg (A)

AS TESTED WEIGHT OF VEHICLE (2 ATDs + 2 CRABI w/ CRS +CARGO + EQUIPMENT & INSTRUMENTATION):

Left Front	=	<u>541.0</u>	kg	Left Rear	=	<u>433.0</u>	kg
Right Front	=	<u>505.5</u>	kg	Right Rear	=	<u>415.5</u>	kg
TOTAL FRONT	=	<u>1046.5</u>	kg	TOTAL REAR	=	<u>848.5</u>	kg
TOTAL TEST WEIGHT =		<u>1895.0</u>	kg				

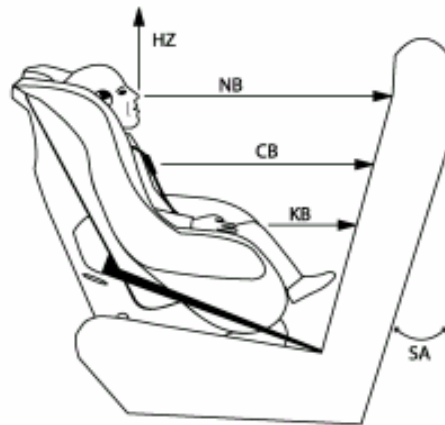
DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201

Dummy Measurements for Rear-facing CRS Passengers



X—Z View

HZ	-	Head to Roof
NB	-	Nose to Front of Back Seat
CB	-	Chest to Front of Back Seat
KB	-	Knee to Front of Back Seat
SA	-	Seat Back Angle

Measurement	Millimeters unless noted	
	P3 CRS ( 102)	P4 CRS (103)
SA	48.8°	57.7°
HZ	430	430
NB	513	480
CB	407	370
KB – LEFT	185	180
KB – RIGHT	182	175

All dimensions in mm (unless noted)

P3 – Right Rear Passenger (CRS #1)

P4 – Left Rear Passenger (CRS #2)

**DATA SHEET 4**

**CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)**

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201

**HEAD INJURY CRITERIA (HIC)**

	HIC15				HIC36			
	HIC	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	Average Acceleration t <sub>1</sub> to t <sub>2</sub>	HIC	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	Average Acceleration t <sub>1</sub> to t <sub>2</sub>
Position #3 - Right	507.8	69.2	84.2	64.8	897.7	53.6	89.6	57.4
Position #4 - Left	479.2	57.7	72.7	63.4	864.7	46.5	82.5	56.5

	CLIP SUMMARY*			
	CLIP (g's)	t <sub>1</sub> (msec)	t <sub>2</sub> (msec)	CSI
Position #3 - Right	51.5	61.0	64.0	644.7
Position #4 - Left	§	§	§	§

\* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

§ The Position 4 child dummy Chest Z accelerometer did not record properly during impact thus the chest deceleration calculation over 3 ms could not be accurately performed for this dummy.

**DATA SHEET NO. 5**

**CRS PERFORMANCE DATA**

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201

		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P3 CRS X	g	4.6	240.5	-55.6	56.0
P3 CRS Y	g	10.3	49.5	-6.5	39.3
P3 CRS Z	g	27.4	208.3	-19.6	78.0
P3 CRS Resultant	g	56.3	56.2	0.0	0.0
P4 CRS X	g	54.3	69.7	-78.9	100.0
P4 CRS Y	g	30.8	64.6	-18.8	100.0
P4 CRS Z	g	65.3	68.2	-7.8	40.7
P4 CRS Resultant	g	98.6	100.0	0.0	0.0

**DATA SHEET NO. 5**

**CRS PERFORMANCE DATA (CONTINUED)**

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201

**POSITION #3 CRS POST-TEST INSPECTION (Model No. 8465DEN3)**

<b>LOCATION</b>	<b>DAMAGE</b>	<b>REMARKS</b>
Upper Tether Strap	N/A	N/A
Upper Tether Buckle	N/A	N/A
Upper Tether Hook	N/A	N/A
Vehicle Upper Tether Anchor	N/A	N/A
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Vehicle Lower CRS Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

**POSITION #4 CRS POST-TEST INSPECTION (Model No. 3961613 L1)**

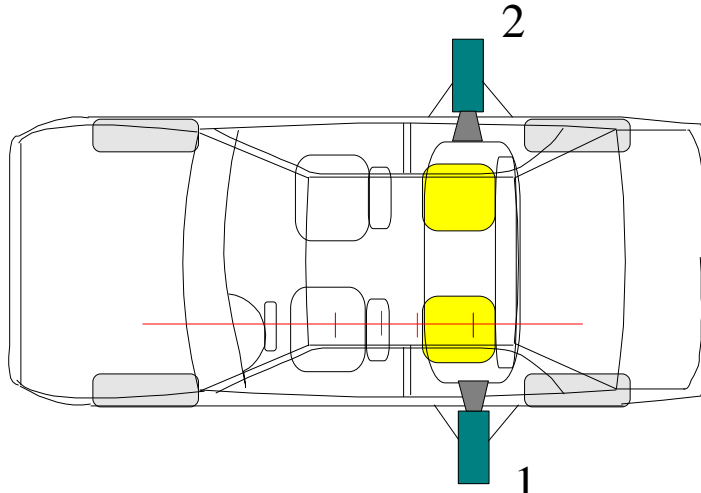
<b>LOCATION</b>	<b>DAMAGE</b>	<b>REMARKS</b>
Upper Tether Strap	N/A	N/A
Upper Tether Buckle	N/A	N/A
Upper Tether Hook	N/A	N/A
Vehicle Upper Tether Anchor	N/A	N/A
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Vehicle Lower CRS Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	Yes	Tears in forward edge of CRS base
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

**DATA SHEET NO. 6**

**CRS CAMERA DATA**

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	810	2940	1280	-8.9	28	1000
2	Right side CRS lateral view	810	2930	1280	-8.5	28	1000

\*X = film plane to monorail centerline

Y = film plane to impact location      N.T. indicates No Timing

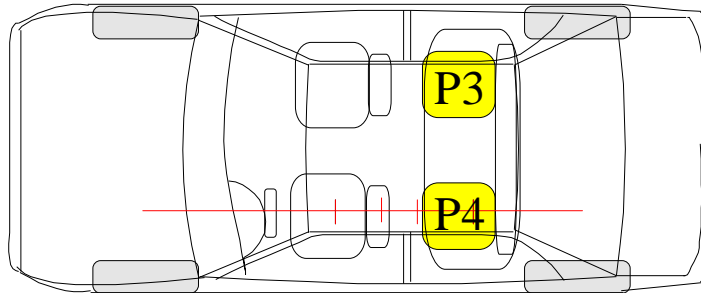
Z = film plane to ground

**DATA SHEET NO. 7**

**CRS ANCHOR DATA**

CRS: Graco Snugride and Evenflo Embrace Rear Facing

NHTSA No. F80201



Description	P3			P4		
	X*	Y*	Z*	X	Y	Z
Outboard Seatbelt floor anchor	1311	565.7	592	1313	-588.8	590.3
Inboard Seatbelt buckle anchor	1233	157.1	655.7	1227	-125.5	656
D-Ring Anchor	1102	592.8	1356	1104	-599.1	1348
Inboard LATCH anchor	1244	195.4	695	1242	-202.1	693
Outboard LATCH anchor	1241	479.5	687.9	1242	-479.4	690.4
Top Tether anchor	619.1	337	1587	633.5	-344.6	1588

\* Reference (from rear bumper centerline); all measurements accurate to within  $\pm 6$  mm.

X = + Forward  
 Y = + To Right  
 Z = + Up

**SECTION 3**

**PHOTOGRAPHS**

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Figure 3-1: CLOSE-UP VIEW OF POSITION 3CRS BASE LABEL

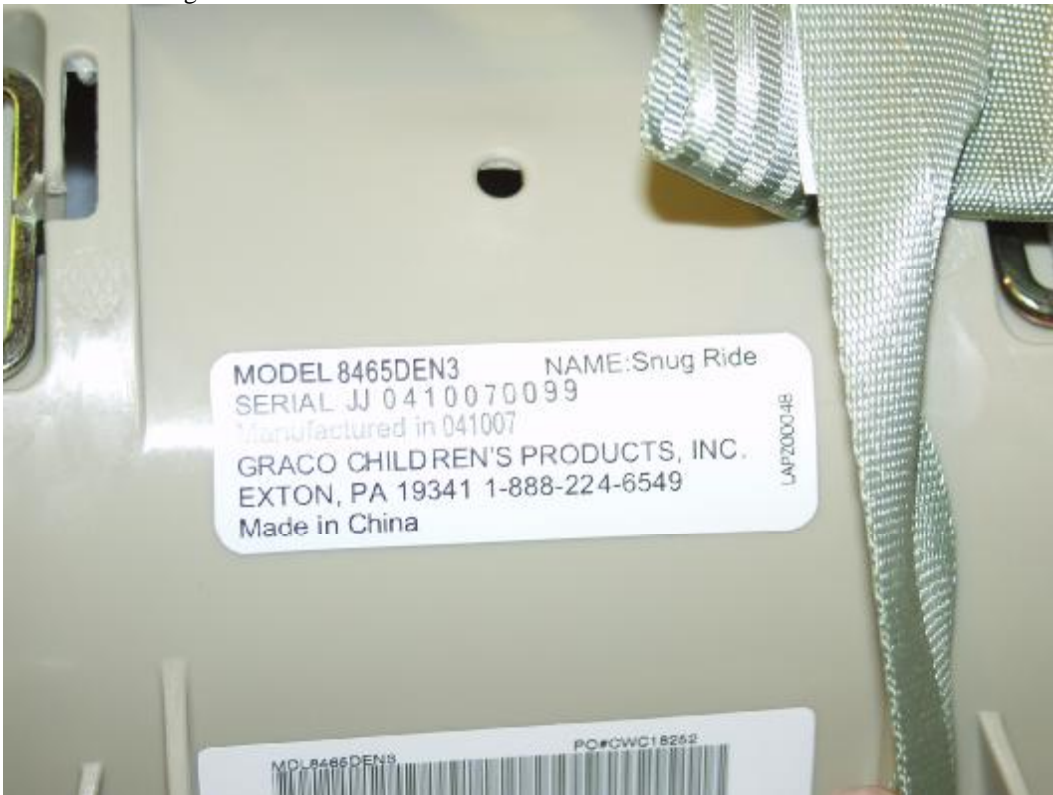


Figure 3-2: CLOSE-UP VIEW OF POSITION 3CRS CARRIER LABEL



Figure 3-3: PRE-TEST FRONTAL VIEW OF POSITION 3CRS



Figure 3-4: POST-TEST FRONTAL VIEW OF POSITION 3CRS



Figure 3-5: PRE-TEST REAR VIEW OF POSITION 3CRS



Figure 3-6: POST-TEST REAR VIEW OF POSITION 3CRS



Figure 3-7: PRE-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-8: PRE-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-9: PRE-TEST RIGHT SIDE VIEW OF POSITION 3CRS



Figure 3-10: POST-TEST RIGHT SIDE VIEW OF POSITION 3CRS

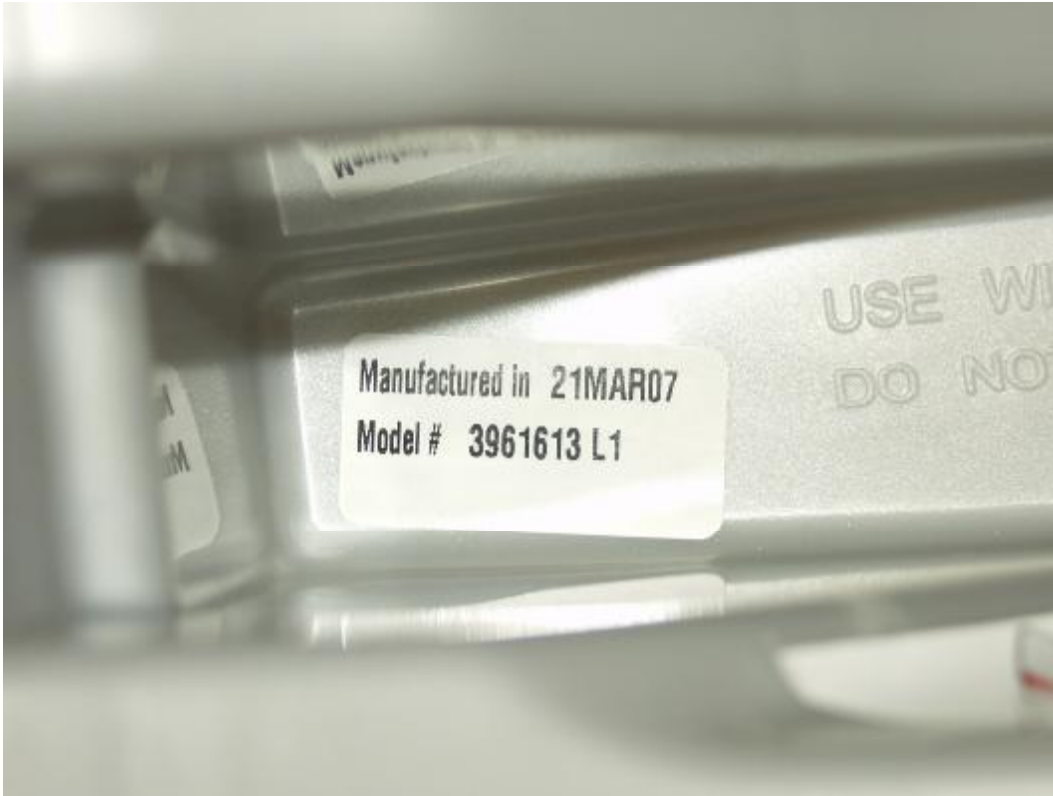


Figure 3-11: CLOSE-UP VIEW OF POSITION 4CRS BASE LABEL

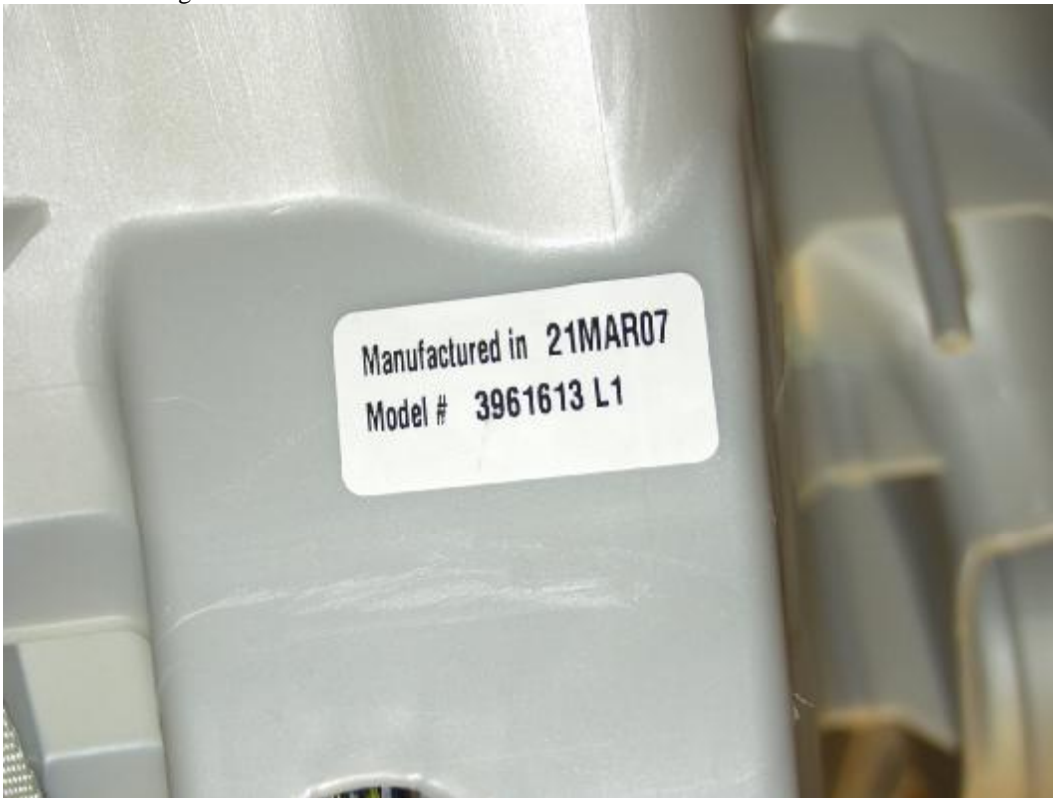


Figure 3-12: CLOSE-UP VIEW OF POSITION 4CRS CARRIER LABEL



Figure 3-13: PRE-TEST FRONTAL VIEW OF POSITION 4CRS



Figure 3-14: POST-TEST FRONTAL VIEW OF POSITION 4CRS



Figure 3-15: PRE-TEST REAR VIEW OF POSITION 4CRS



Figure 3-16: POST-TEST REAR VIEW OF POSITION 4CRS



Figure 3-17: PRE-TEST LEFT SIDE VIEW OF POSITION 4CRS



Figure 3-18: POST-TEST LEFT SIDE VIEW OF POSITION 4CRS



Figure 3-19: PRE-TEST RIGHT SIDE VIEW OF POSITION 4CRS



Figure 3-20: POST-TEST RIGHT SIDE VIEW OF POSITION 4CRS



Figure 3-21: PRE-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-22: POST-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-23: PRE-TEST POSITION 3 RIGHT SIDE VIEW



Figure 3-24: POST-TEST POSITION 3 RIGHT SIDE VIEW



Figure 3-25: PRE-TEST POSITION 3 REAR VIEW



Figure 3-26: POST-TEST POSITION 3 REAR VIEW



Figure 3-27: PRE-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-28: POST-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-29: PRE-TEST POSITION 4 RIGHT SIDE VIEW



Figure 3-30: POST-TEST POSITION 4 RIGHT SIDE VIEW

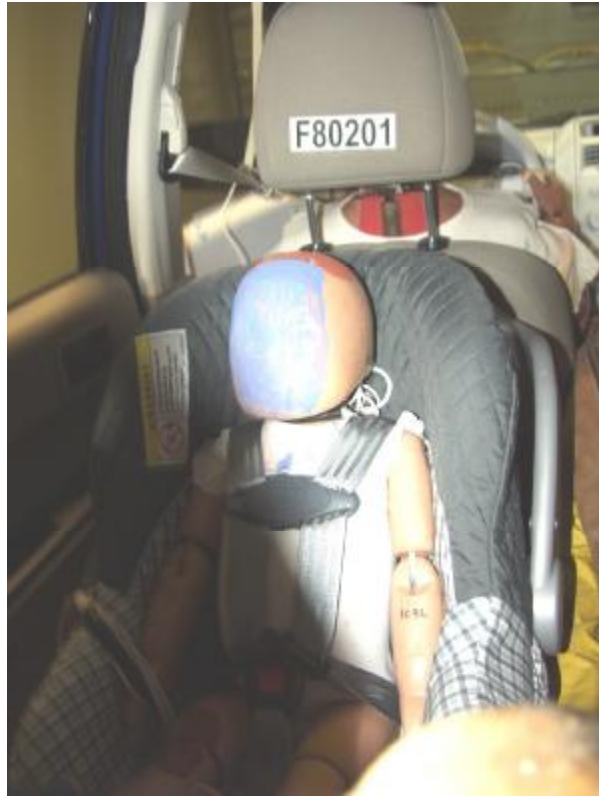


Figure 3-31: PRE-TEST POSITION 4 REAR VIEW



Figure 3-32: POST-TEST POSITION 4 REAR VIEW

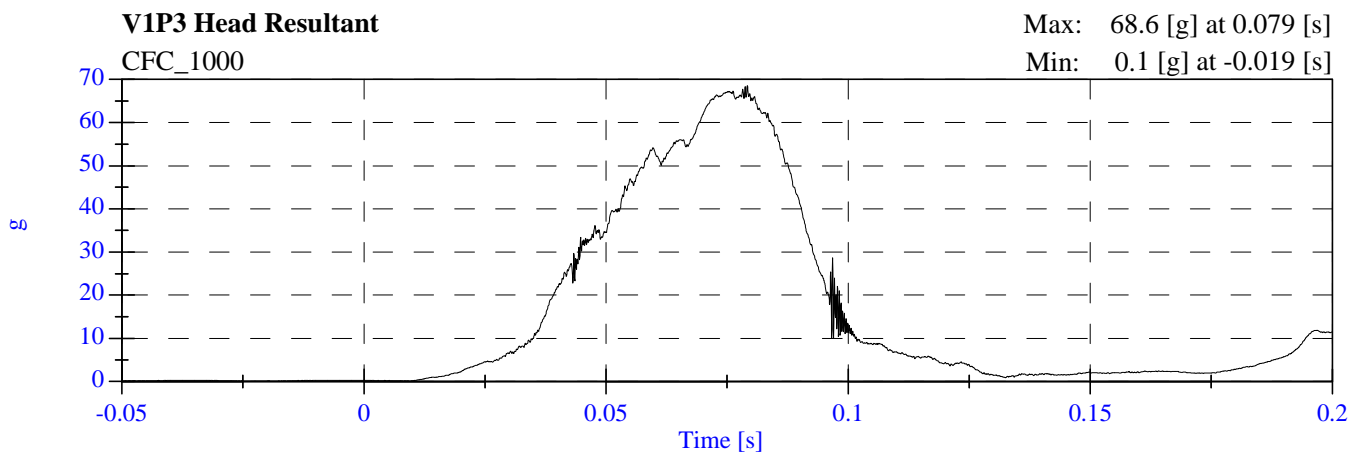
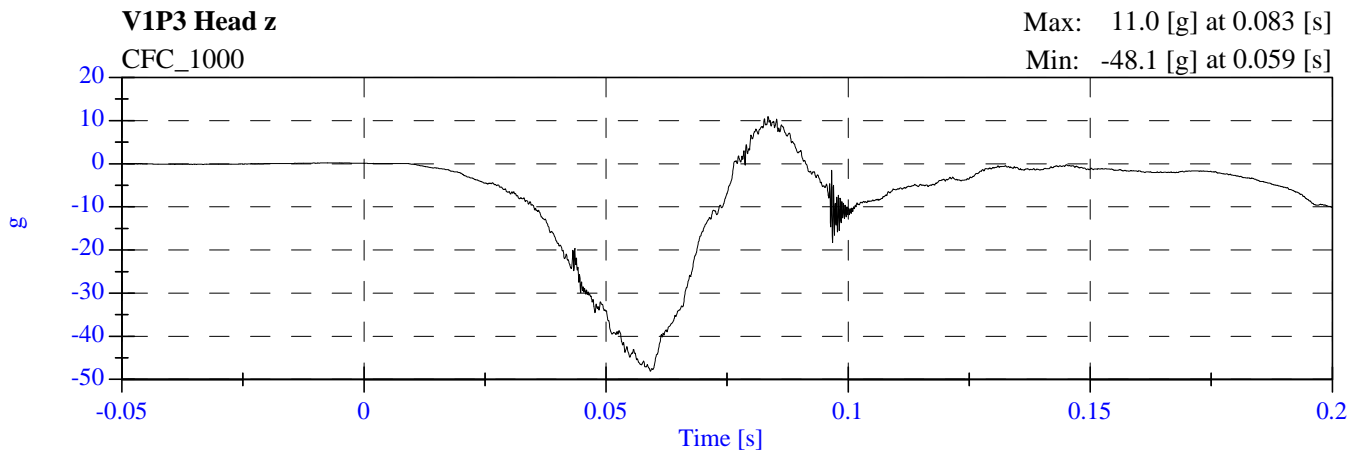
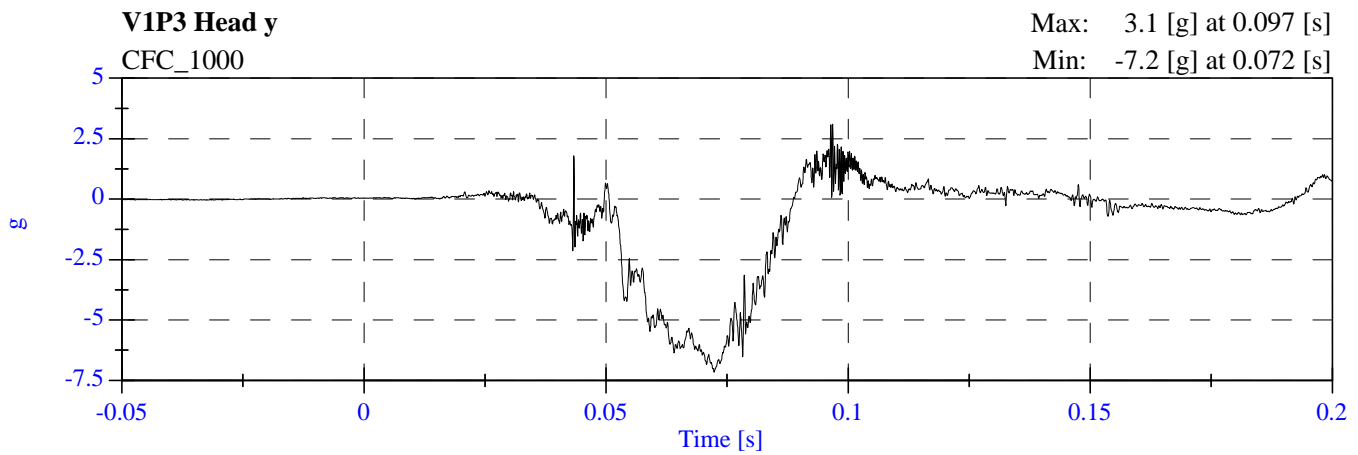
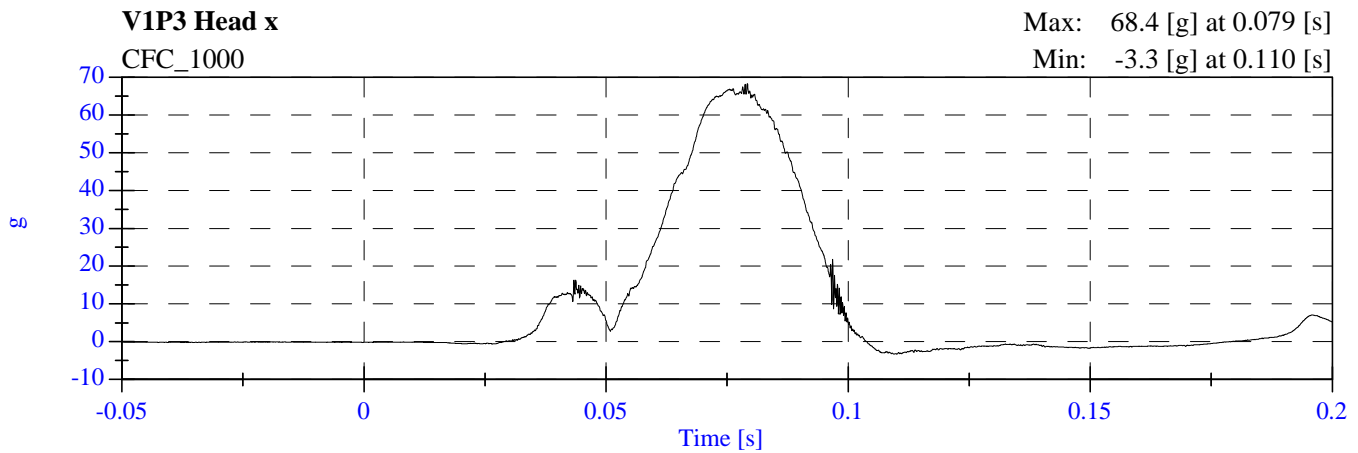
**SECTION 4**

**CHILD DUMMY RESPONSE AND CRS DATA TRACES**

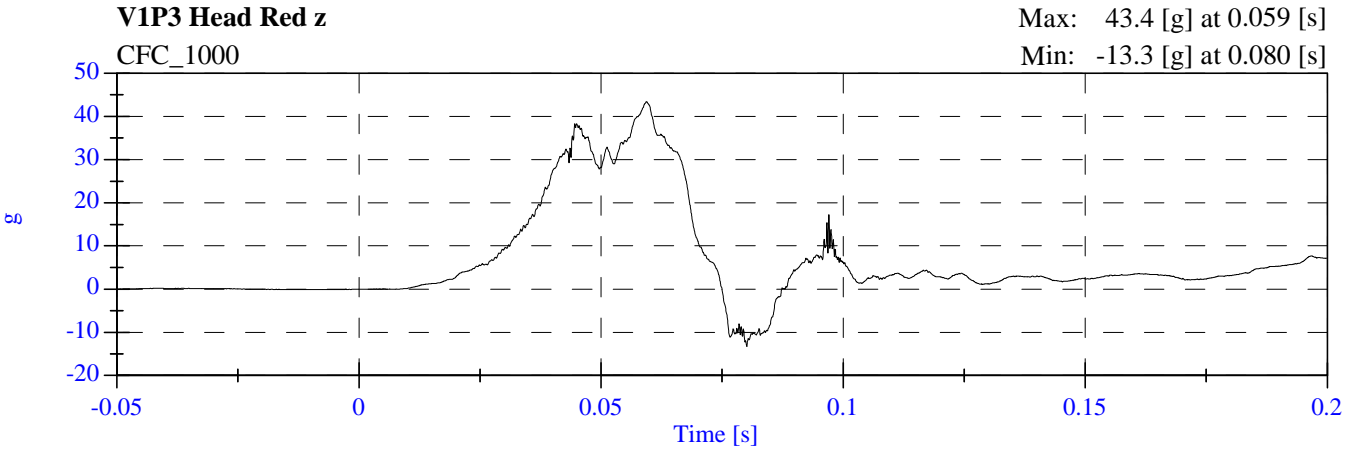
## TABLE OF DATA PLOTS

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5	P3 Head Red z [g, CFC_1000]	4-4
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25	P4 Child Seat z [g, CFC_60]	4-10
26	P4 Child Seat Resultant [g, CFC_60]	4-10

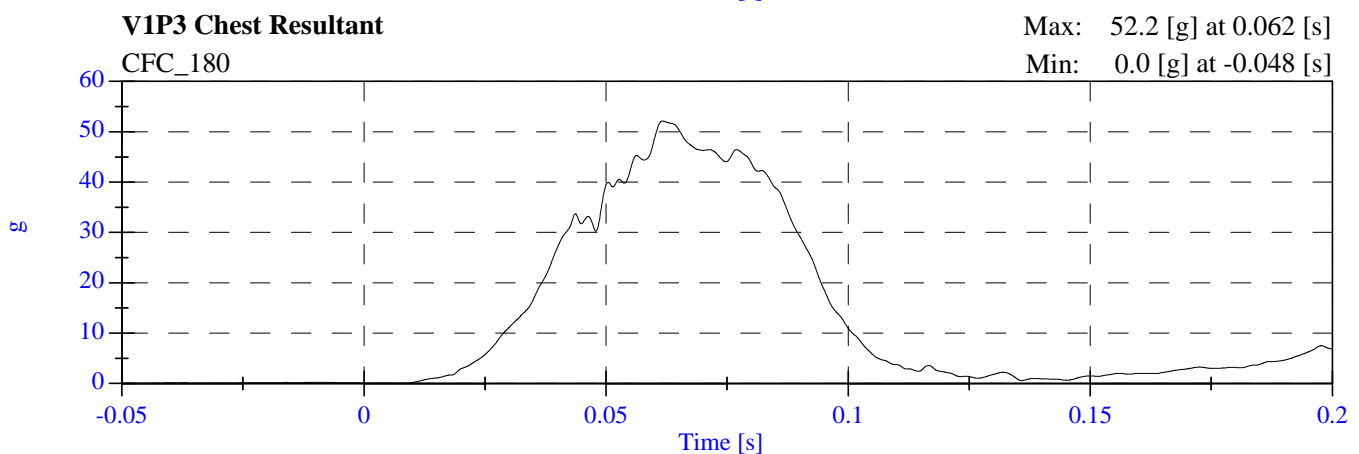
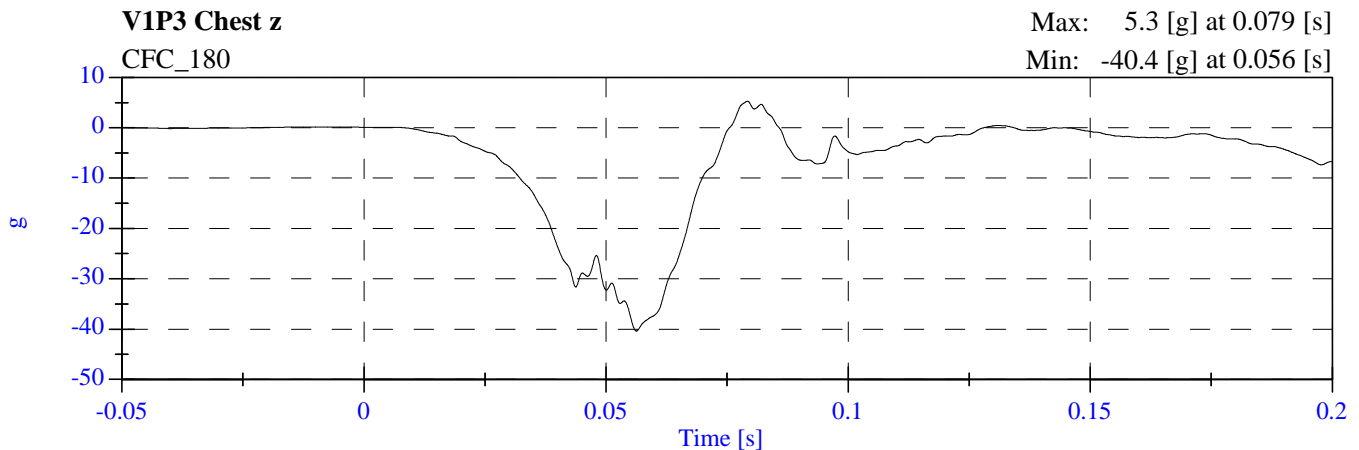
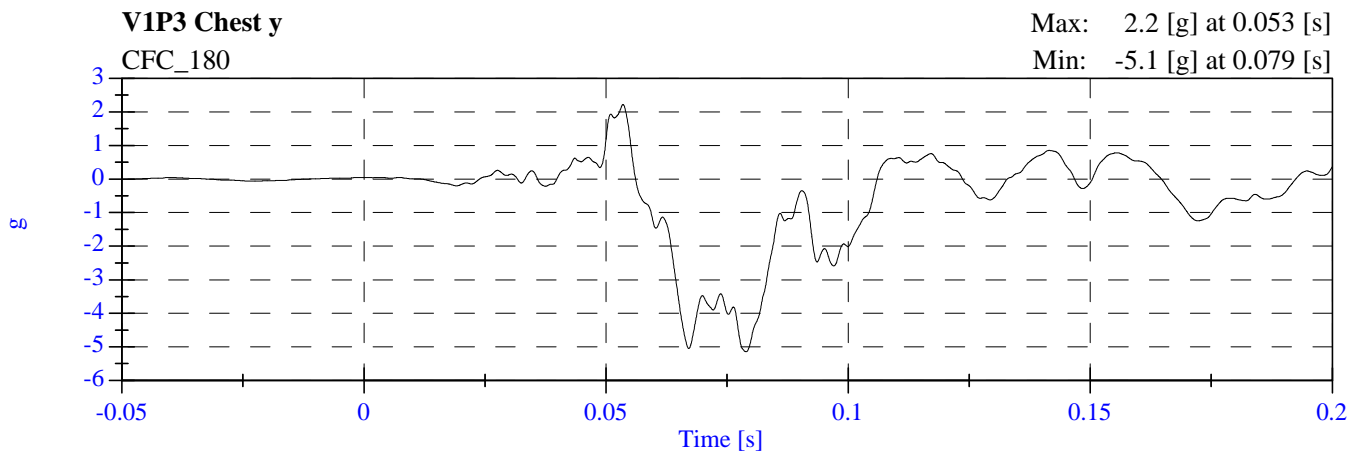
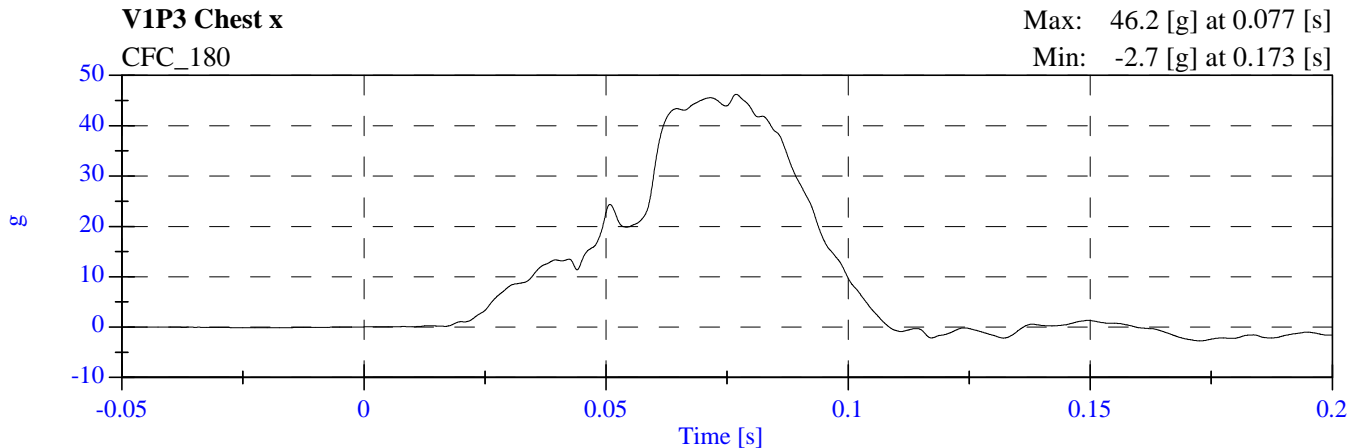
# 2007 NCAP Opt Test 1 2008 Ford Escape F80201 - June 28, 2007



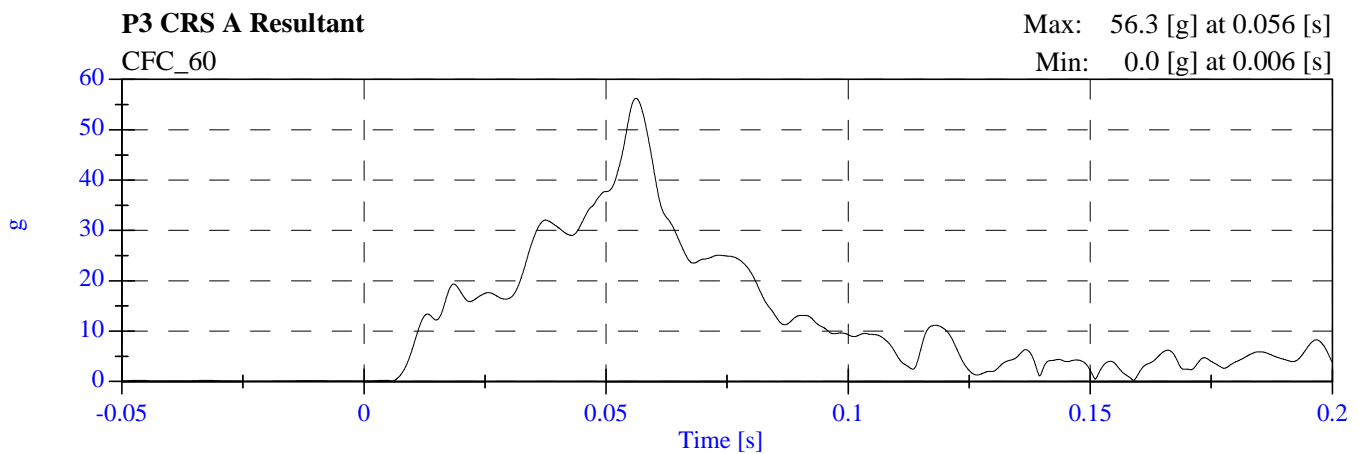
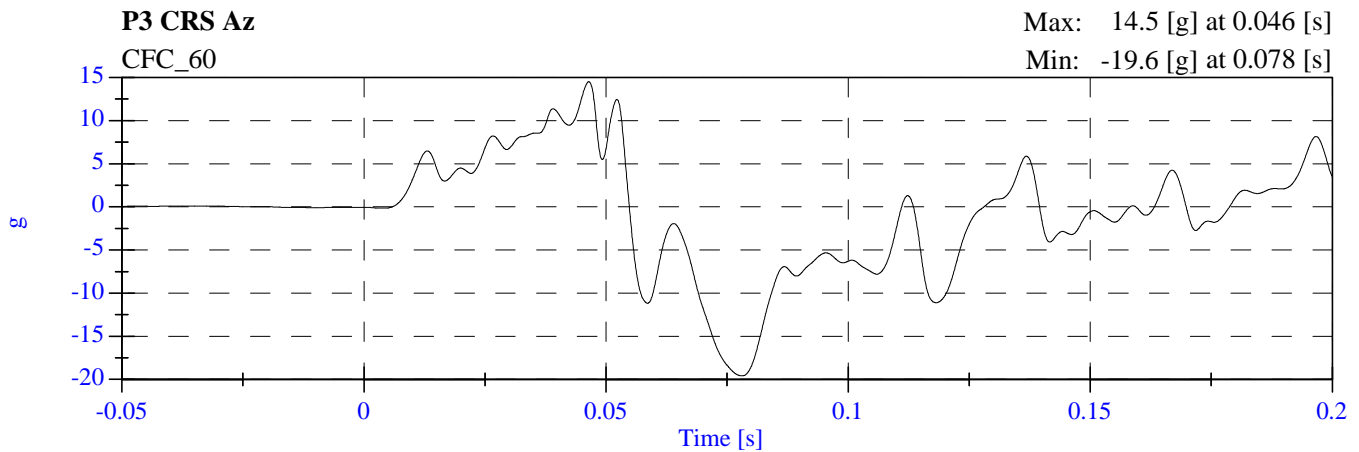
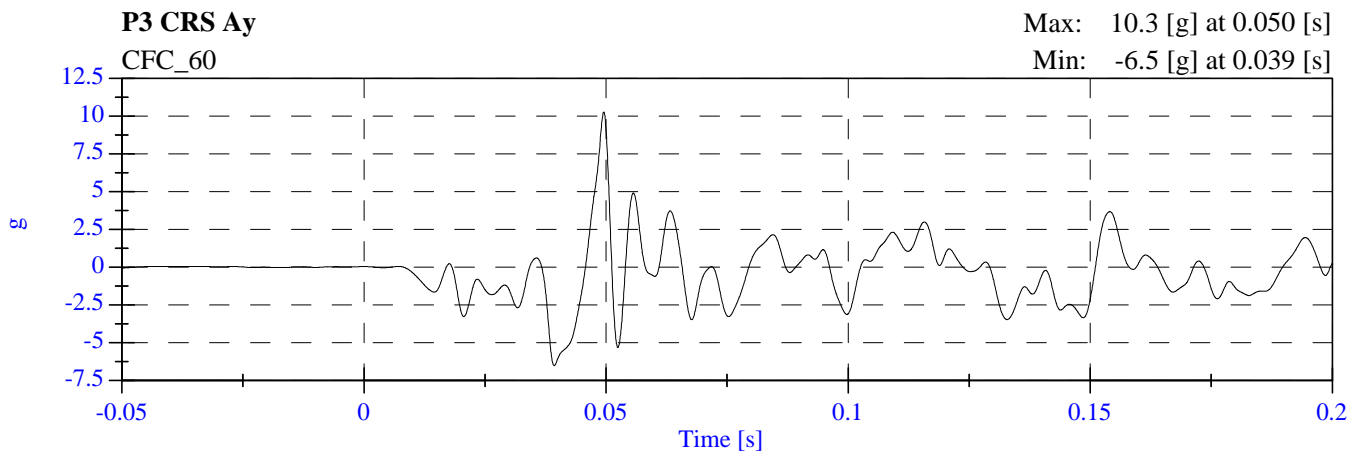
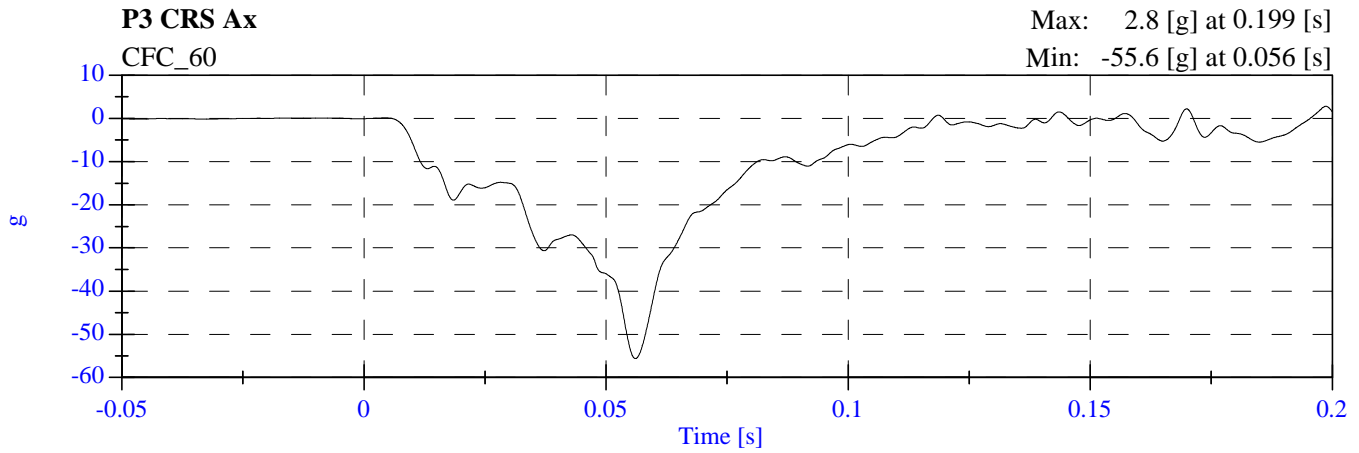
**2007 NCAP Opt Test 1 2008 Ford Escape  
F80201 - June 28, 2007**



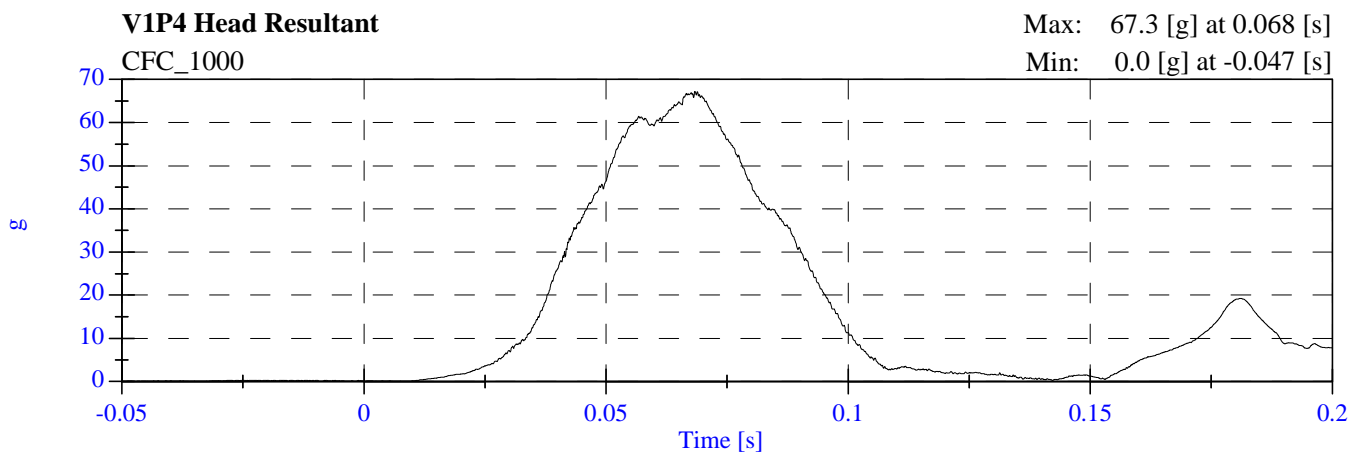
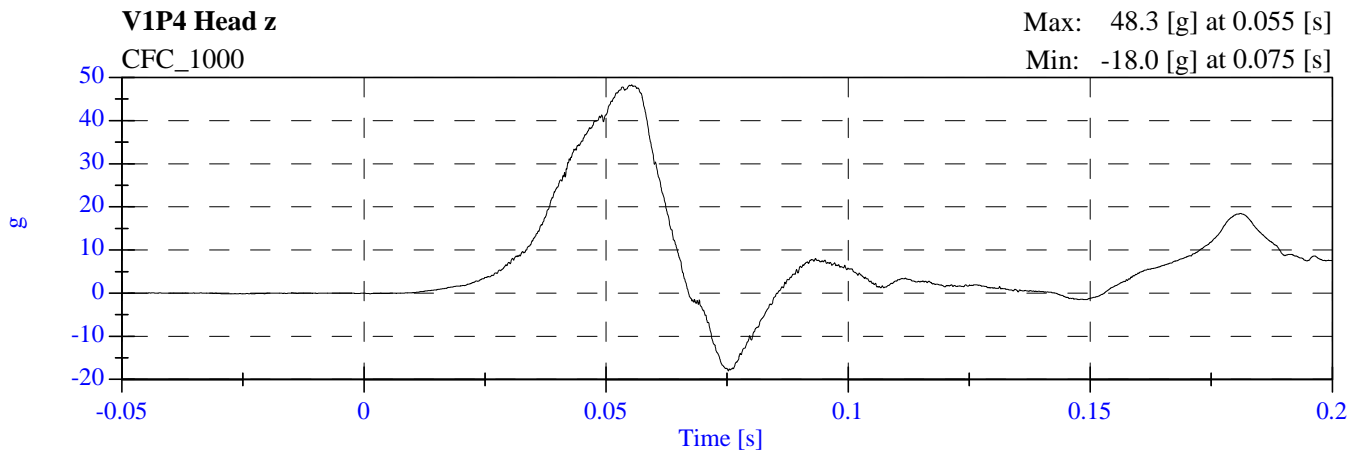
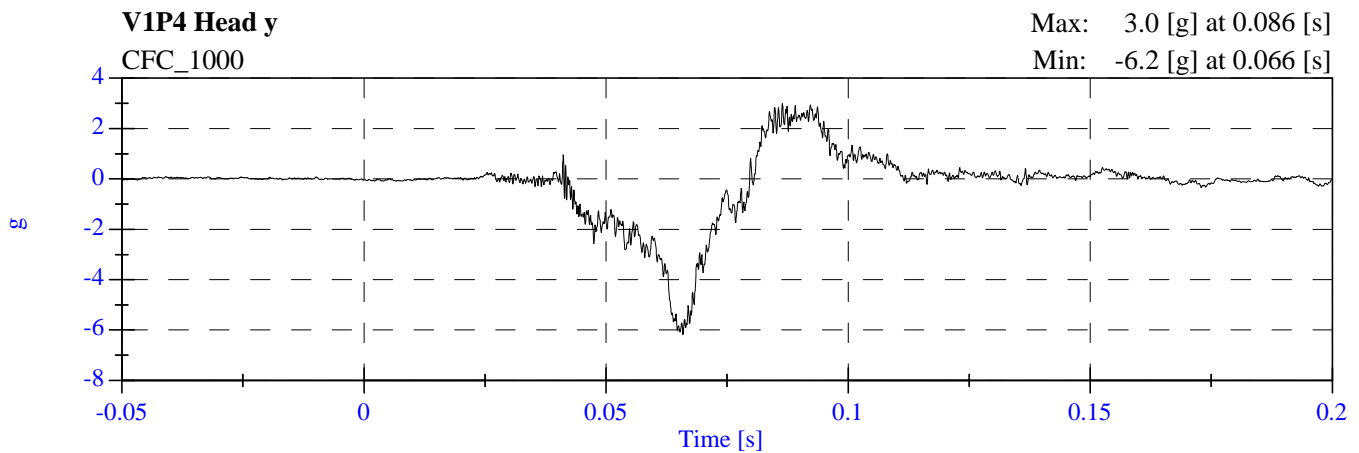
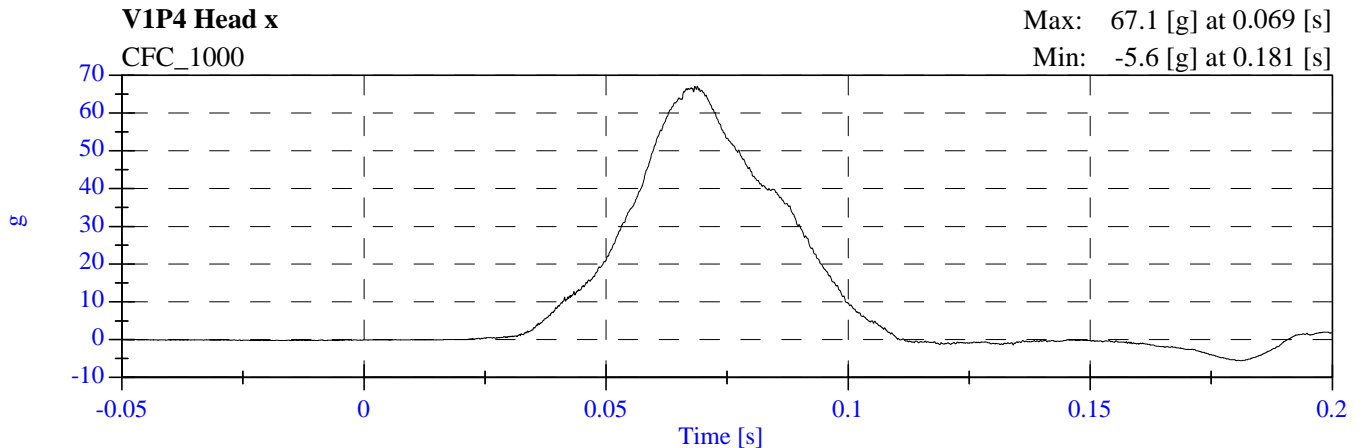
# 2007 NCAP Opt Test 1 2008 Ford Escape F80201 - June 28, 2007



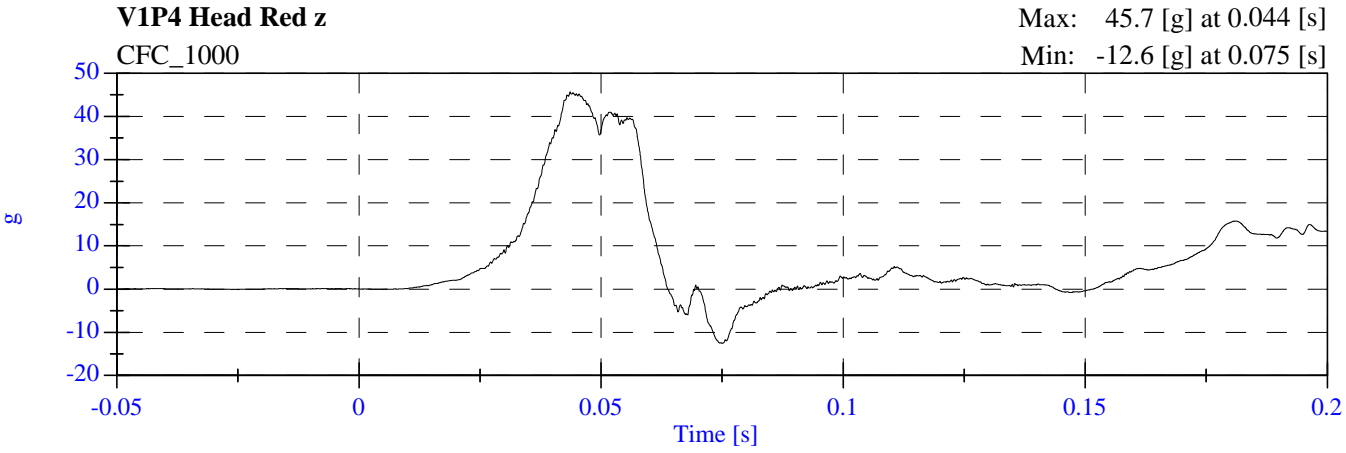
# 2007 NCAP Opt Test 1 2008 Ford Escape F80201 - June 28, 2007



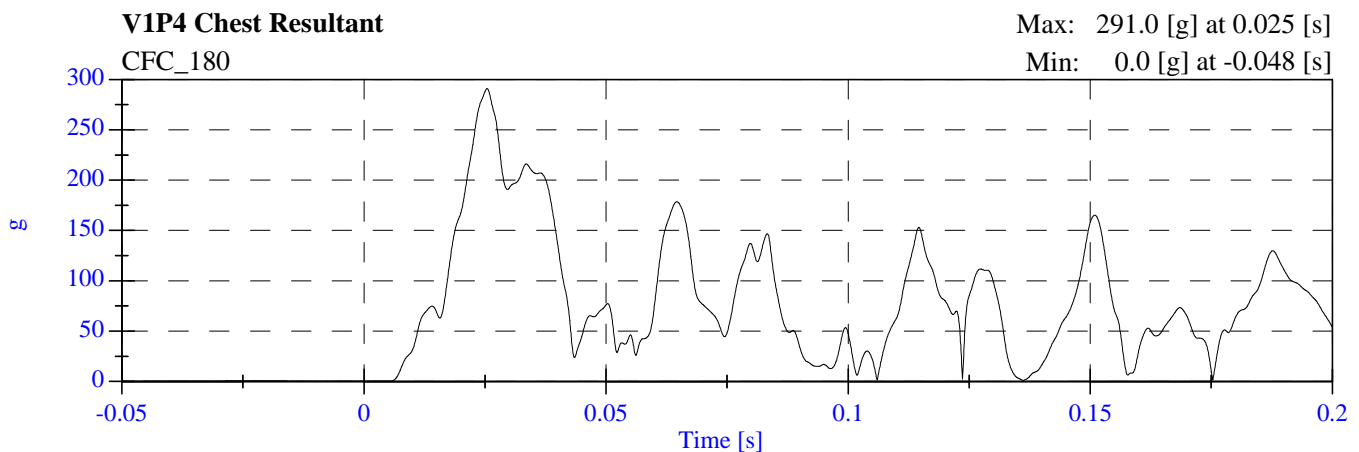
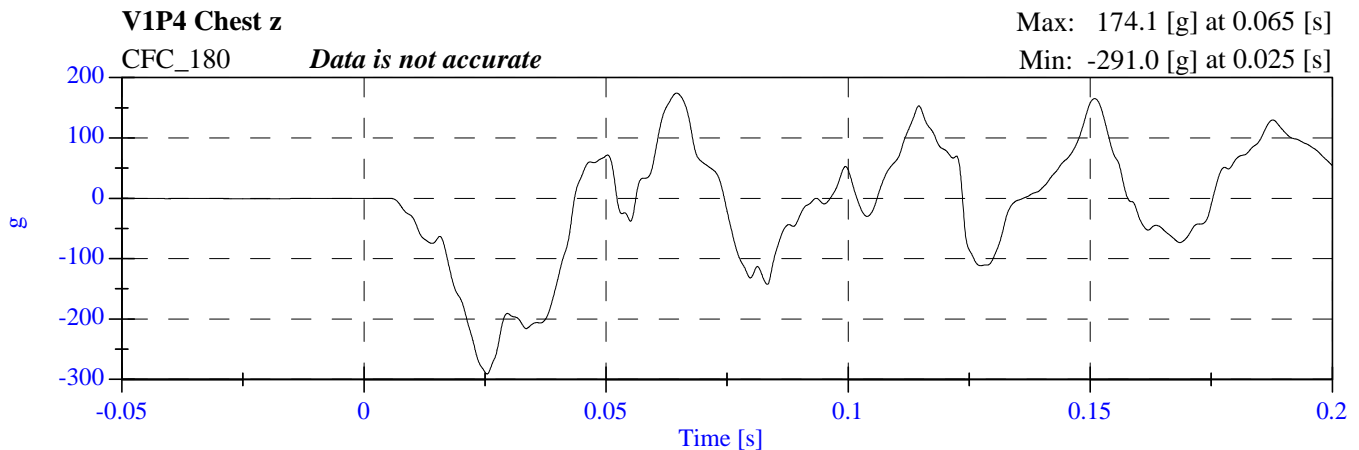
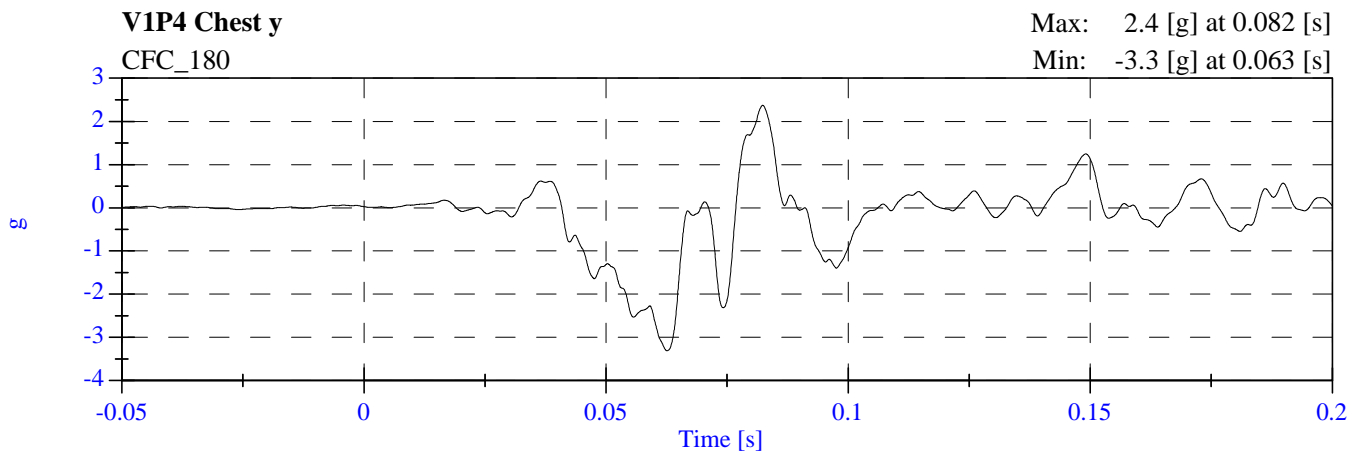
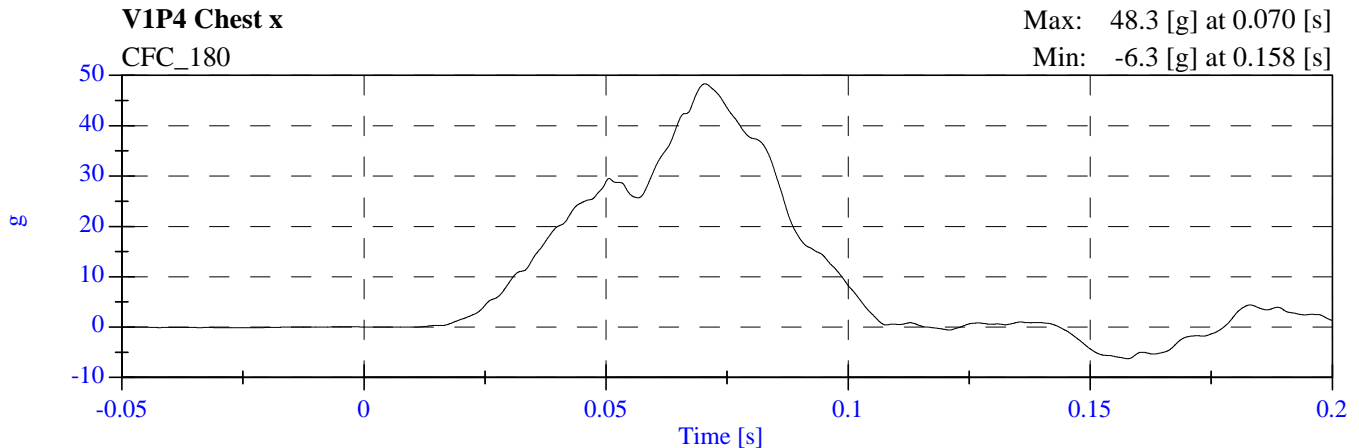
# 2007 NCAP Opt Test 1 2008 Ford Escape F80201 - June 28, 2007



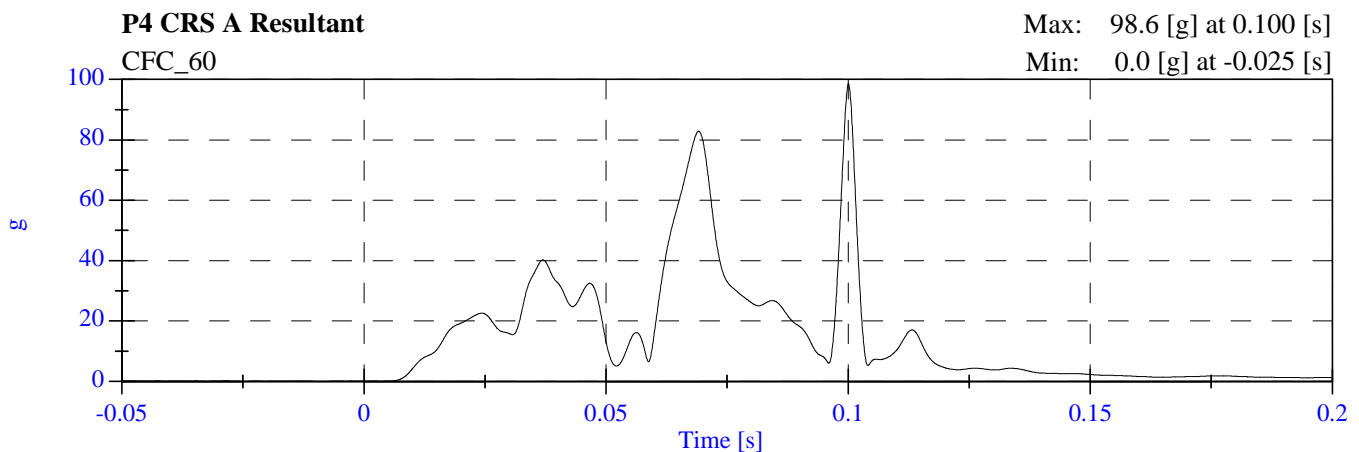
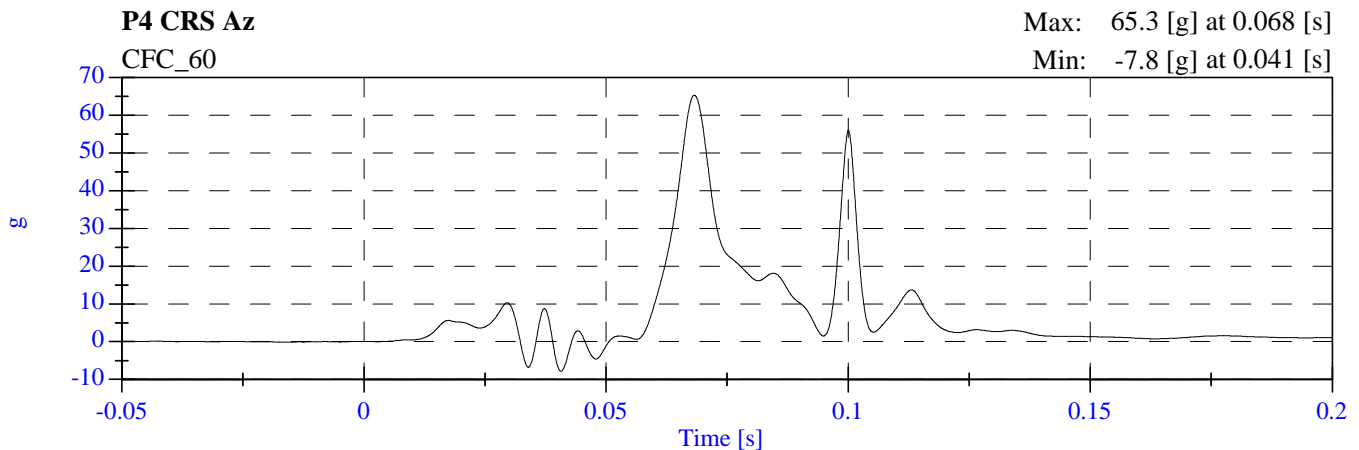
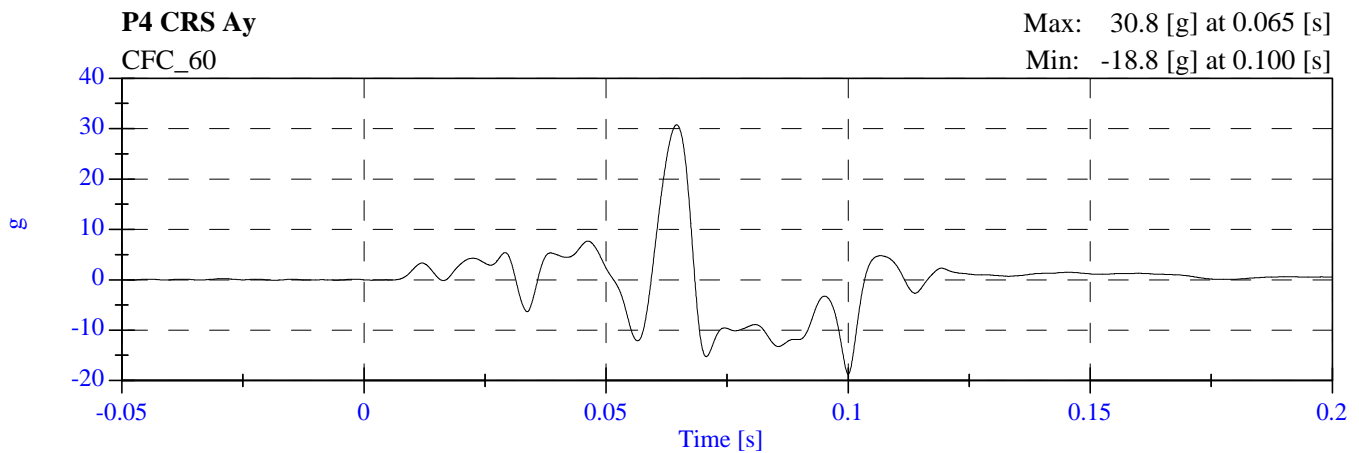
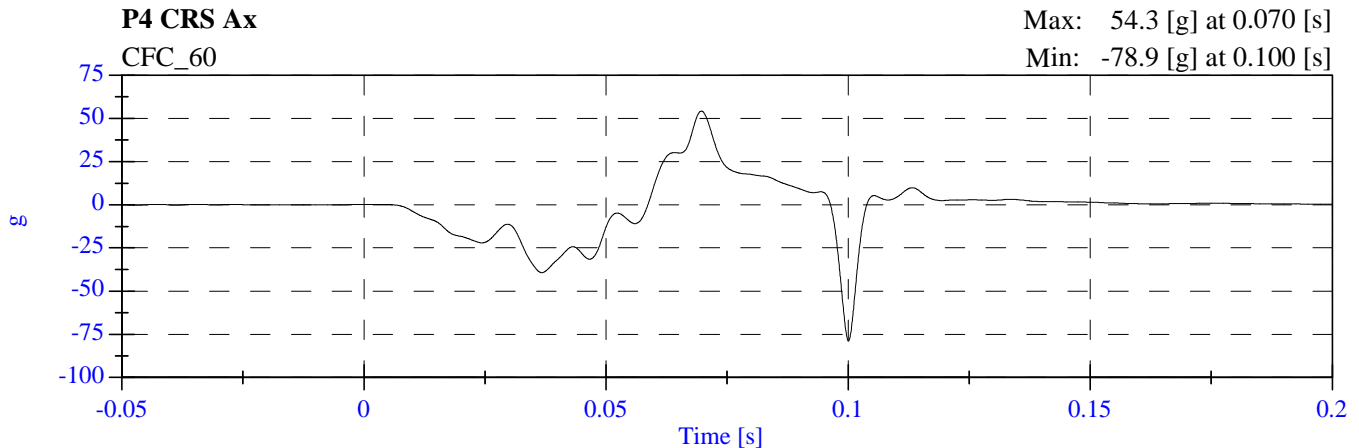
**2007 NCAP Opt Test 1 2008 Ford Escape  
F80201 - June 28, 2007**



# 2007 NCAP Opt Test 1 2008 Ford Escape F80201 - June 28, 2007



# 2007 NCAP Opt Test 1 2008 Ford Escape F80201 - June 28, 2007



**SECTION 5**

**CHILD DUMMY CALIBRATION INFORMATION**

# Head Drop Frontal

Part 572R Frontal Head Drop

Calibration Date: 01-15-07

Serial No: 102

Work File: Crabi\_102\_HD1\_01-15

## -----TEST RESULTS-----

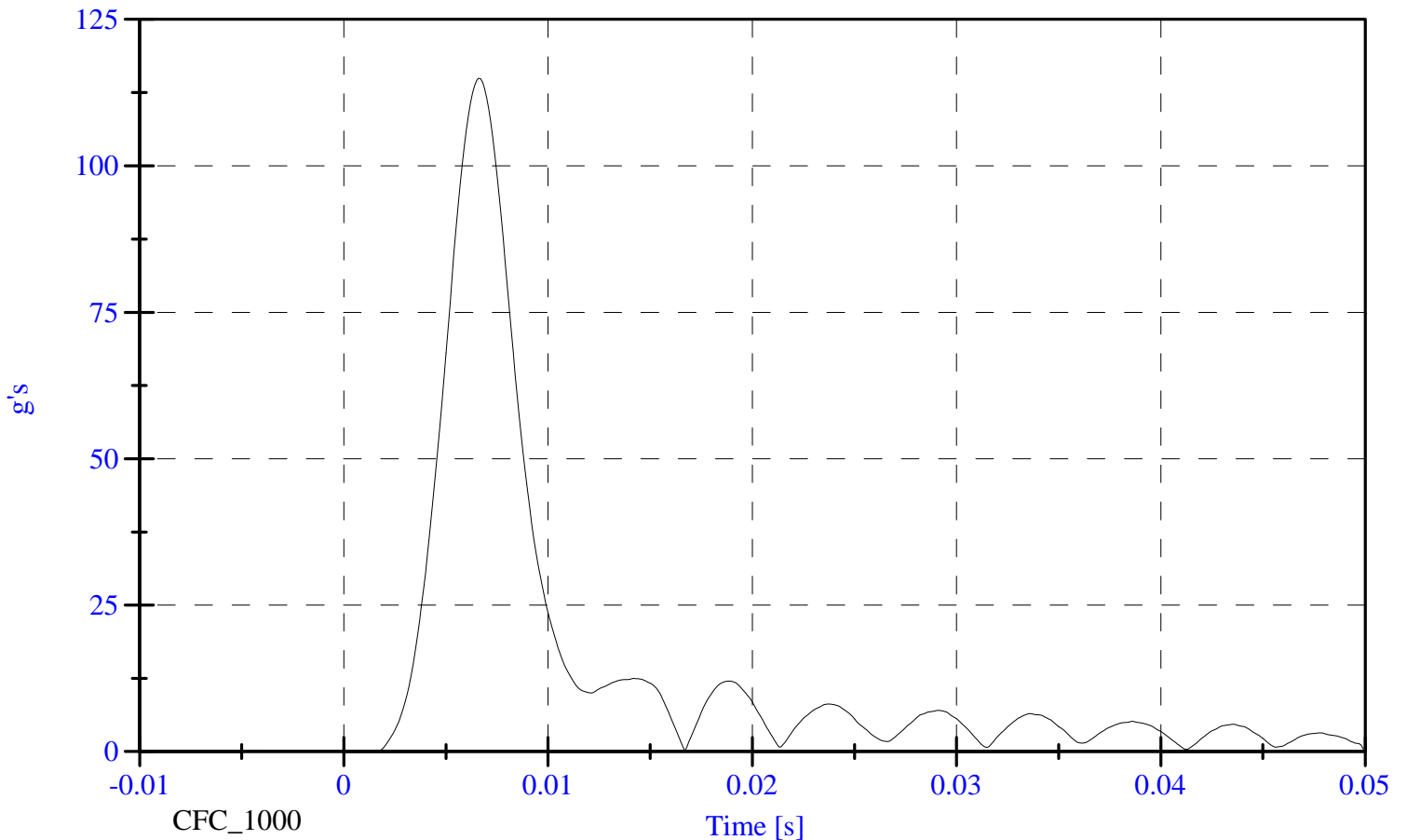
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	21.1 C	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Peak Resultant Accel.:	100-120 Gs	114.95 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	13.62 Gs	Passed
Curve PerCent NonModal:	< 17%	10.85 %	Passed

Head Drop Frontal

Head Resultant

Max: 114.9 [g's] at 0.007 [s]

Min: 0.0 [g's] at -0.010 [s]



# Head Drop Rear

Part 572R Rear Head Drop

Calibration Date: 01-15-07

Serial No: 102

Work File: Crabi\_102\_HD\_Rear\_01-15-07

## -----TEST RESULTS-----

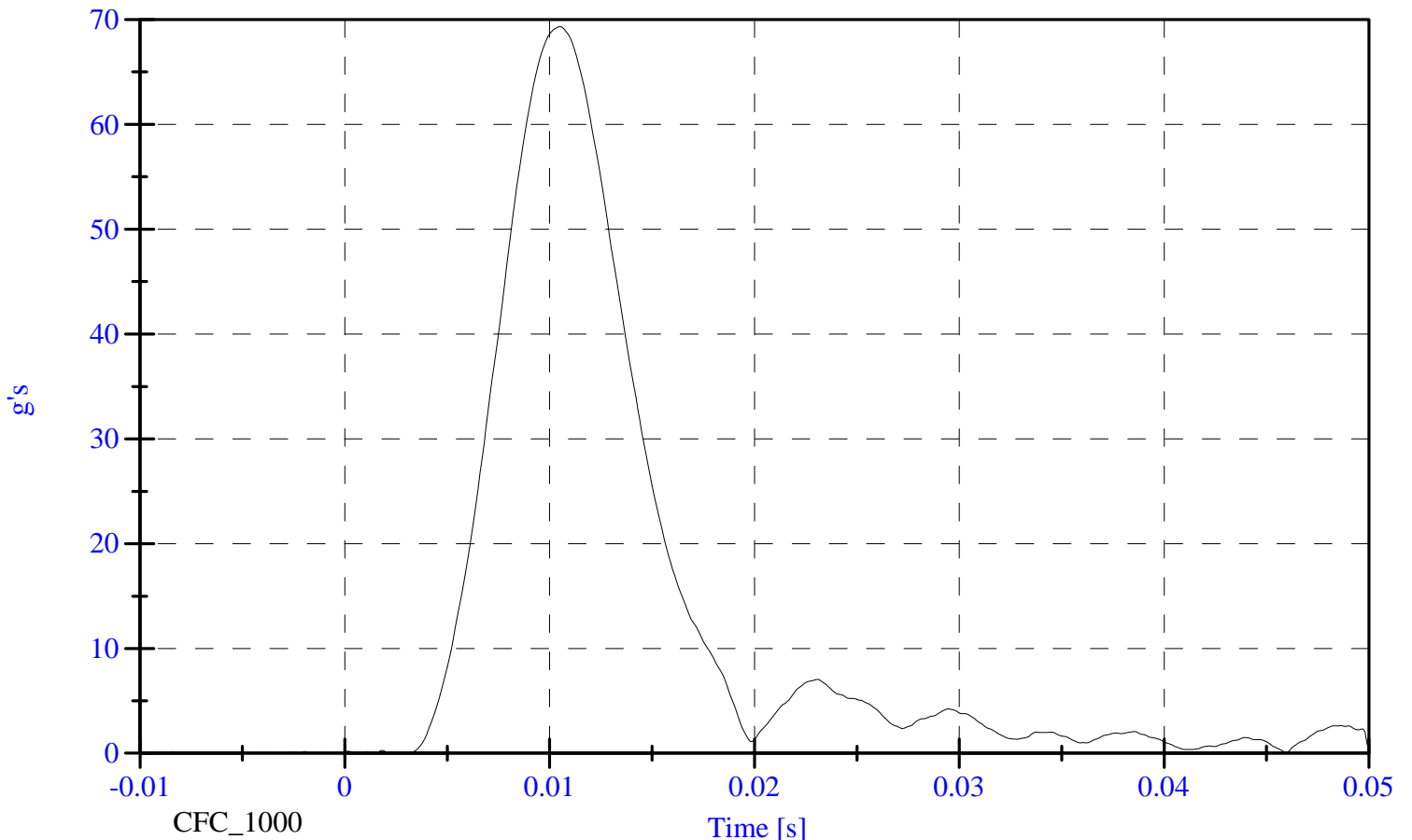
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	66.0-78.0 F	70.0 F	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Peak Resultant Accel.:	55-71 Gs	69.35 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	7.02 Gs	Passed
Curve PerCent NonModal:	< 17%	10.15 %	Passed

Head Drop Rear

Head Resultant

Max: 69.3 [g's] at 0.011 [s]

Min: 0.0 [g's] at 0.001 [s]



## Neck Flexion

Part 572R

Neck Flexion Test

Calibration Date:

01-15-07

Serial No:

102

Work File:

Crabi\_102\_NF1\_01-15-

### -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.11 C	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Test Pendulum Speed:	5.10- 5.30 m/s	5.25 m/s	Passed

### -----PENDULUM PULSE-----

Pulse at 10 ms:	1.60- 2.30 m/s	1.79 m/s	Passed
Pulse at 20 ms:	3.40- 4.20 m/s	3.77 m/s	Passed
Pulse at 25 ms:	4.30- 5.20 m/s	4.58 m/s	Passed

### -----D PLANE ROTATION-----

Maximum Rotation:	75.0-86.0 Deg	85.14 Deg	Passed
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### -----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	36.00- 45.00 N-m	42.67 N-m	Passed
Occipital Moment Decay:	60.0-80.0 ms	74.00 ms	Passed

FM-ATDLAB-572.143E-0005-R00

## Neck Extension

Part 572R

Neck Extension Test

Calibration Date:

01-15-07

Serial No:

102

Work File:

Crabi\_102\_NE\_01-15-0

### -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	69.0-72.0 F	70.00 F	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Test Pendulum Speed:	7.90- 8.50 ft/s	7.95 ft/s	Passed

### -----PENDULUM PULSE-----

Pulse at 6 ms:	2.60- 3.90 ft/s	2.80 ft/s	Passed
Pulse at 10 ms:	4.90- 6.90 ft/s	5.28 ft/s	Passed
Pulse at 14 ms:	7.20- 9.50 ft/s	8.02 ft/s	Passed

### -----D PLANE ROTATION-----

Maximum Rotation:	80.0-92.0 Deg	80.60 Deg	Passed
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### -----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	-23.00--12.00 N-m	-12.85 N-m	Passed
Occipital Moment Decay:	76.0-90.0 ms	86.10 ms	Passed

FM-ATDLAB-572.143E-0005-R00

# Thorax Impact

Part 572R Thorax Impact

Calibration Date: 01-16-07

Serial No: 102

Work File: Crabi\_102\_T2\_01-16-07

## -----TEST RESULTS-----

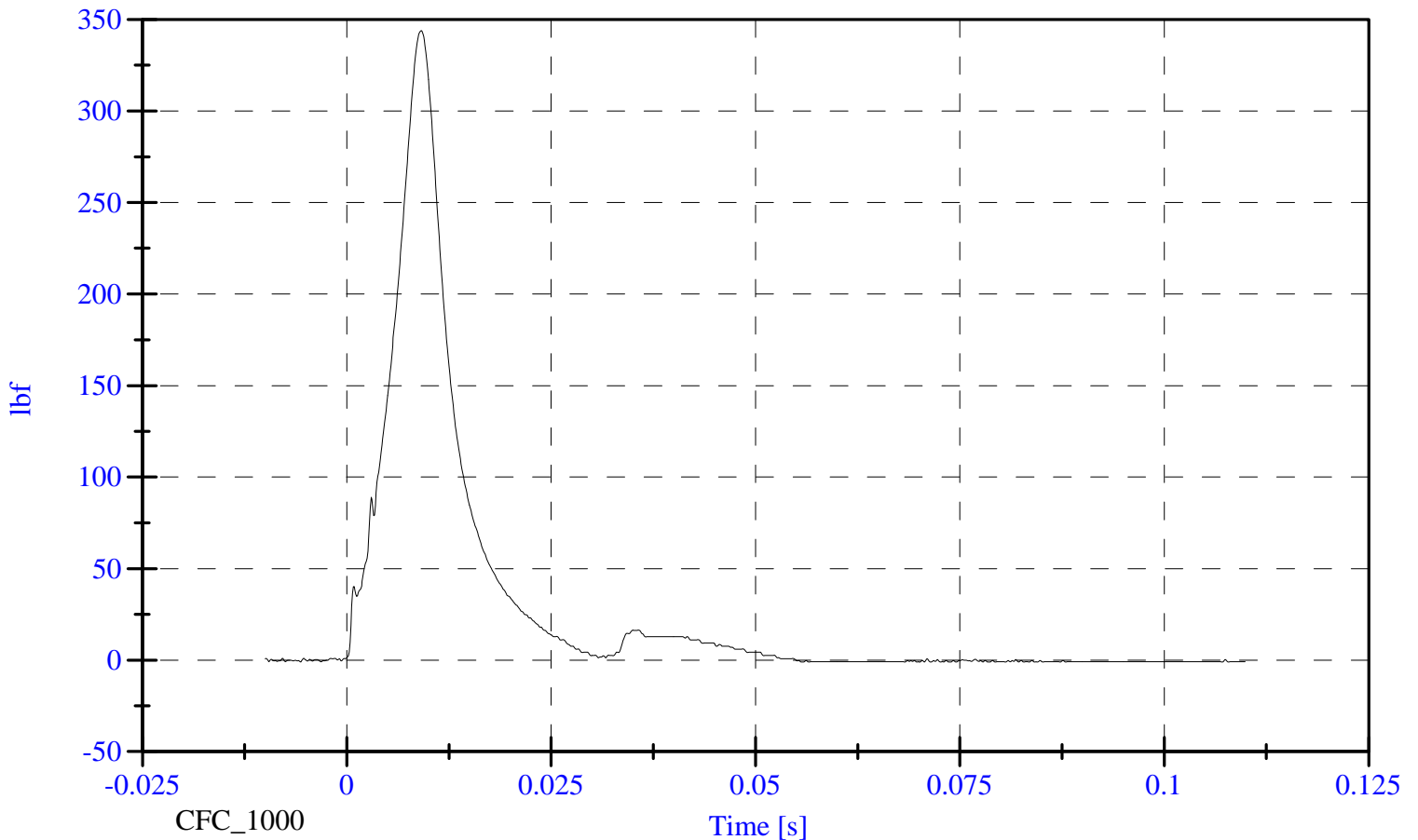
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	69.0-72.0 F	70.0 F	Passed
Lab Humidity:	10-70 %	35.00 %	Passed
Pendulum Velocity:	16.20-16.80 ft/s	16.42 ft/s	Passed
Maximum Res. Force:	340.70- 404.10 lbf	344.01 lbf	Passed

Thorax Impact

Probe Force vs. Time

Max: 344.0 [lbf] at 0.009 [s]

Min: -1.1 [lbf] at 0.082 [s]



# Head Drop Frontal

Part 572R Frontal Head Drop

Calibration Date: 01-15-07

Serial No: 103

Work File: Crabi\_103\_HD\_Front\_

## -----TEST RESULTS-----

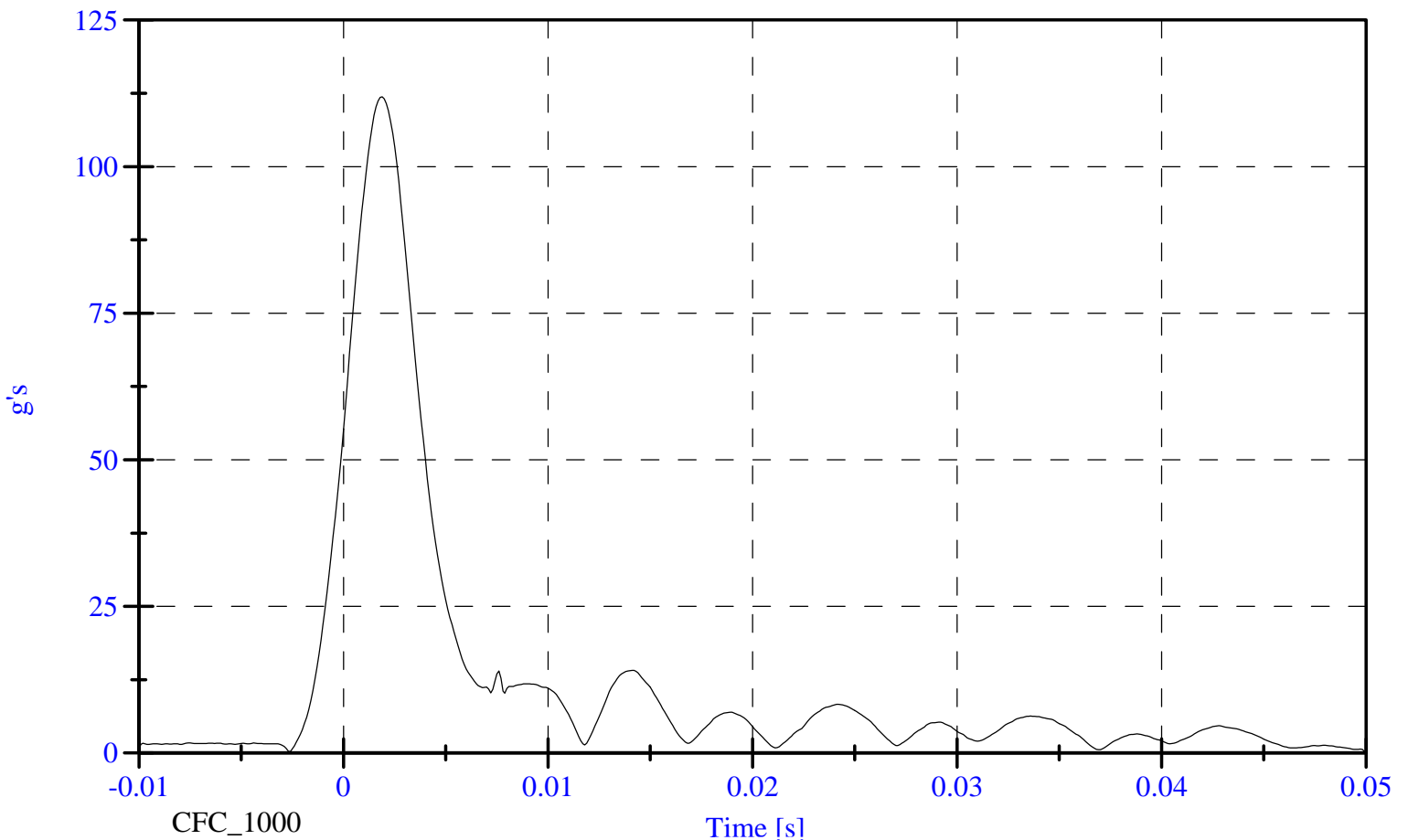
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	21.1 C	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Peak Resultant Accel.:	100-120 Gs	111.95 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	13.03 Gs	Passed
Curve PerCent NonModal:	< 17%	12.59 %	Passed

Head Drop Frontal

Head Resultant

Max: 112.0 [g's] at 0.002 [s]

Min: 0.2 [g's] at -0.003 [s]



# Head Drop Rear

Part 572R Rear Head Drop

Calibration Date: 01-15-07

Serial No: 103

Work File: Crabi\_103\_HD\_Rear\_01-15-07

## -----TEST RESULTS-----

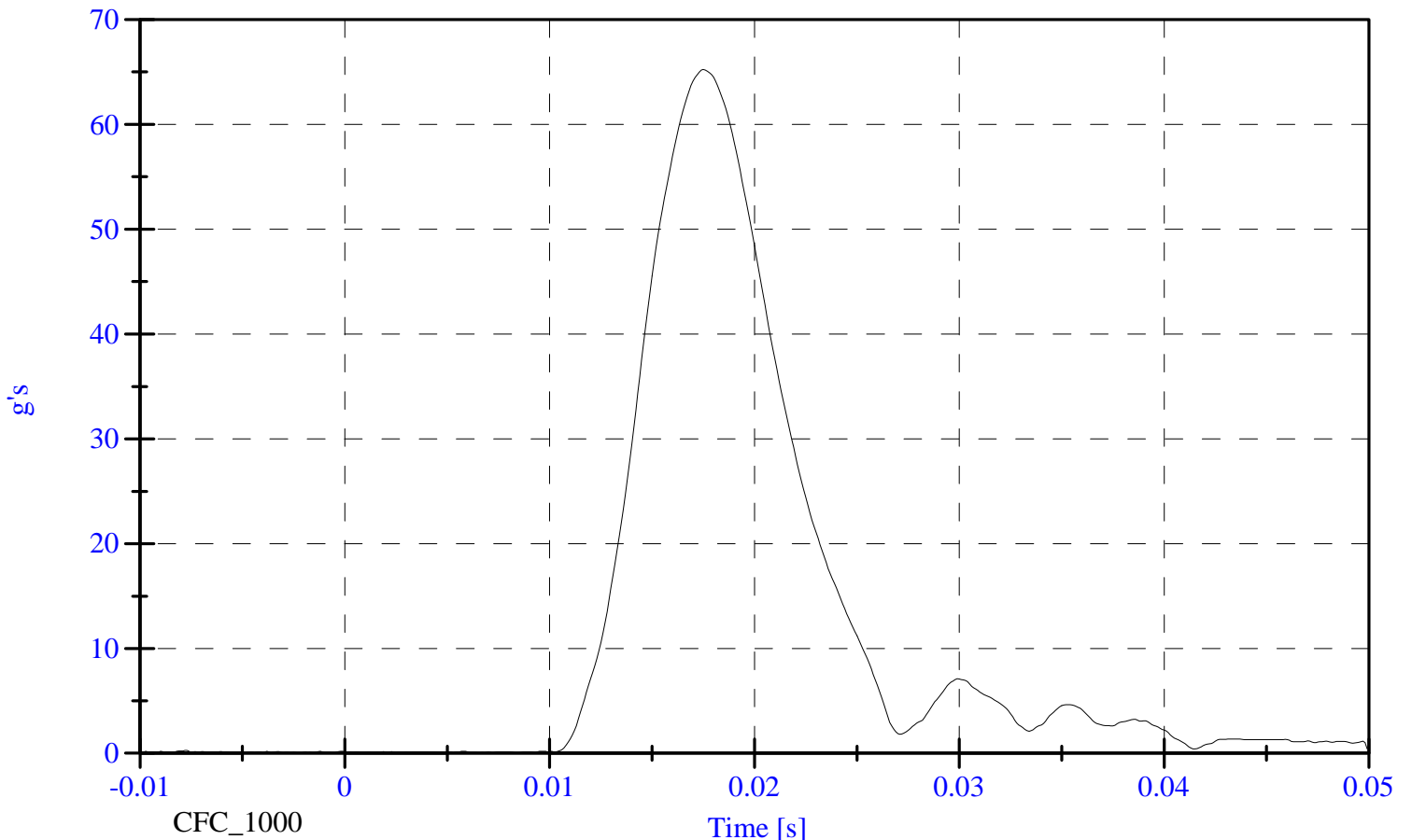
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	21.1 C	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Peak Resultant Accel.:	55-71 Gs	65.22 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	2.91 Gs	Passed
Curve PerCent NonModal:	< 17%	10.88 %	Passed

Head Drop Rear

Head Resultant

Max: 65.2 [g's] at 0.018 [s]

Min: 0.0 [g's] at -0.005 [s]



## Neck Flexion

Part 572R

Neck Flexion Test

Calibration Date:

01-15-07

Serial No:

103

Work File:

Crabi\_103\_NF\_01-15-0

### -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.11 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Test Pendulum Speed:	5.10- 5.30 m/s	5.25 m/s	Passed

### -----PENDULUM PULSE-----

Pulse at 10 ms:	1.60- 2.30 m/s	1.78 m/s	Passed
Pulse at 20 ms:	3.40- 4.20 m/s	3.75 m/s	Passed
Pulse at 25 ms:	4.30- 5.20 m/s	4.59 m/s	Passed

### -----D PLANE ROTATION-----

Maximum Rotation:	75.0-86.0 Deg	84.66 Deg	Passed
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### -----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	36.00- 45.00 N-m	39.67 N-m	Passed
Occipital Moment Decay:	60.0-80.0 ms	76.00 ms	Passed

FM-ATDLAB-572.143E-0005-R00

## Neck Extension

Part 572R

Neck Extension Test

Calibration Date:

01-15-07

Serial No:

103

Work File:

Crabi\_103\_NE1\_01-15-

### -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.11 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Test Pendulum Speed:	2.40- 2.60 m/s	2.43 m/s	Passed

### -----PENDULUM PULSE-----

Pulse at 6 ms:	0.80- 1.20 m/s	0.83 m/s	Passed
Pulse at 10 ms:	1.50- 2.10 m/s	1.62 m/s	Passed
Pulse at 14 ms:	2.20- 2.90 m/s	2.50 m/s	Passed

### -----D PLANE ROTATION-----

Maximum Rotation:	80.0-92.0 Deg	80.83 Deg	Passed
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### -----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	-23.00--12.00 N-m	-15.61 N-m	Passed
Occipital Moment Decay:	76.0-90.0 ms	83.10 ms	Passed

FM-ATDLAB-572.143E-0005-R00

# Thorax Impact

Part 572R Thorax Impact

Calibration Date: 01-16-07

Serial No: 103

Work File: Crabi\_103\_T3\_01-16-07

## -----TEST RESULTS-----

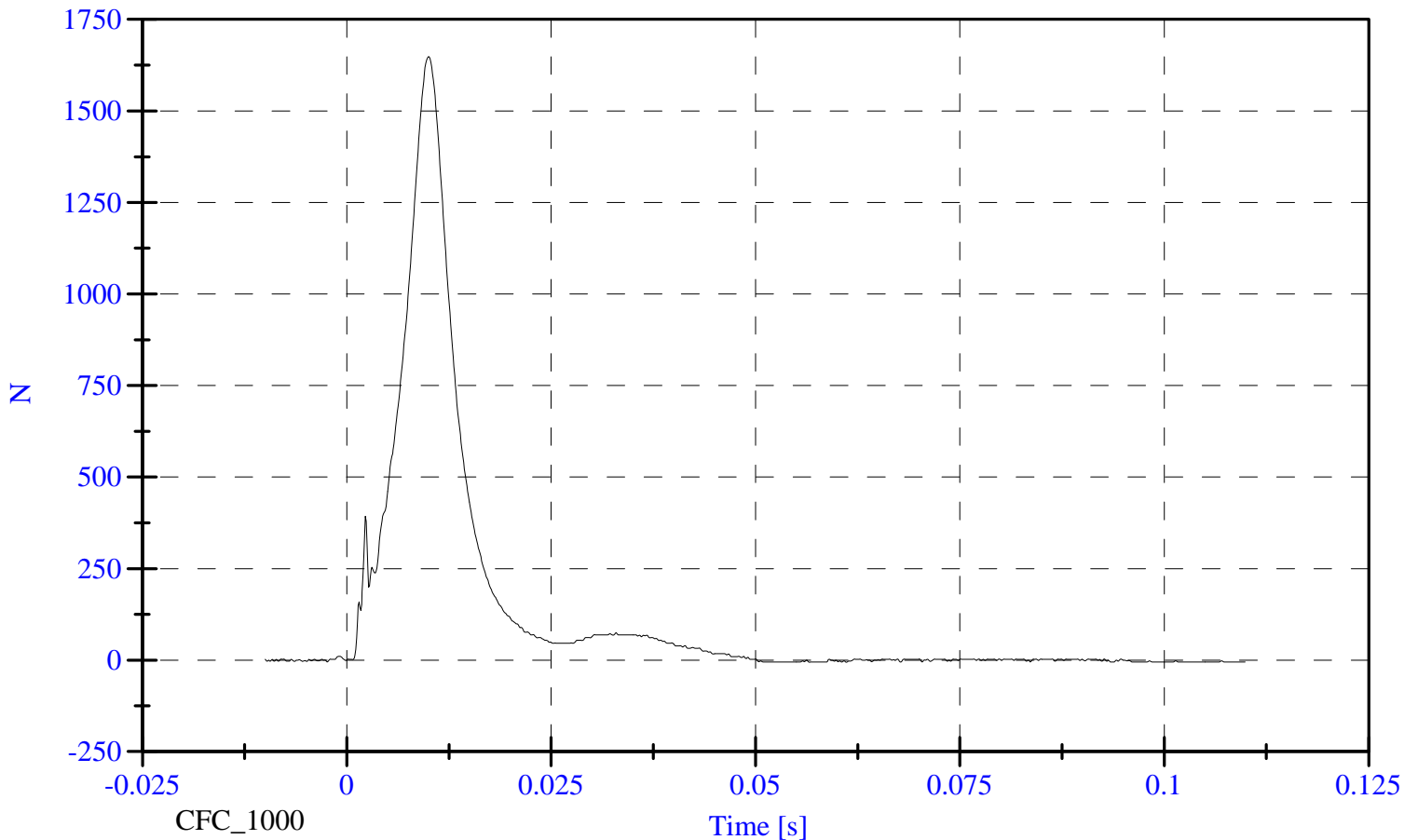
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	35.00 %	Passed
Pendulum Velocity:	4.90- 5.10 m/s	5.01 m/s	Passed
Maximum Res. Force:	1514.00-1796.00 N	1648.54 N	Passed

Thorax Impact

Probe Force vs. Time

Max: 1648.5 [N] at 0.010 [s]

Min: -5.5 [N] at 0.061 [s]



**SECTION 6**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**P572C INSTRUMENTATION**

	POSITION #3 (RIGHT) SERIAL NO.: 102		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P51288	ENDEVCO	11-Jan-07
HEAD AY	AC-P51295	ENDEVCO	09-Jan-07
HEAD AZ	AC-P51282	ENDEVCO	09-Jan-07
HEAD RAZ	AC-P51298	ENDEVCO	09-Jan-07
UPPER NECK FX	LC-231Fx	DENTON	11-Jan-07
UPPER NECK FY	LC-231Fy	DENTON	11-Jan-07
UPPER NECK FZ	LC-231Fz	DENTON	11-Jan-07
UPPER NECK MX	LC-231Mx	DENTON	11-Jan-07
UPPER NECK MY	LC-231My	DENTON	11-Jan-07
UPPER NECK MZ	LC-231Mz	DENTON	11-Jan-07
CHEST AX	AC-B02A18-N21	ENTRAN	09-Jan-07
CHEST AY	AC-99H30-Z14	ENTRAN	09-Jan-07
CHEST AZ	AC-00L13-F39	ENTRAN	29-Jan-07

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**P572C INSTRUMENTATION**

	POSITION #4 (LEFT) SERIAL NO.: 103		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-03E03E20-N04	ENTRAN	09-Jan-07
HEAD AY	AC-02A18-N01	ENTRAN	09-Jan-07
HEAD AZ	AC-B02A25-N01	ENTRAN	09-Jan-07
HEAD RAZ	AC-03D03D09-N08	ENTRAN	09-Jan-07
UPPER NECK FX	LC-211Fx	DENTON	08-Jan-07
UPPER NECK FY	LC-211Fy	DENTON	08-Jan-07
UPPER NECK FZ	LC-211Fz	DENTON	08-Jan-07
UPPER NECK MX	LC-211Mx	DENTON	08-Jan-07
UPPER NECK MY	LC-211My	DENTON	08-Jan-07
UPPER NECK MZ	LC-211Mz	DENTON	08-Jan-07
CHEST AX	AC-98H14-K15	ENTRAN	09-Jan-07
CHEST AY	AC-98H10-F02	ENTRAN	09-Jan-07
CHEST AZ	AC-P50093	ENDEVCO	09-Jan-07

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**VEHICLE AND MDB INSTRUMENTATION**

	VEHICLE AND CRS INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P3 CRS (X)	AC-P23926	ENDEVCO	15-Jan-07
P3 CRS (Y)	AC-P32218	ENDEVCO	15-Jan-07
P3 CRS (Z)	AC-P18785	ENDEVCO	15-Jan-07
P4 CRS (X)	AC-P17237	ENDEVCO	15-Jan-07
P4 CRS (Y)	AC-J32838	ENDEVCO	15-Jan-07
P4 CRS (Z)	AC-P16625	ENDEVCO	15-Jan-07

**REMARKS:** None