

REPORT NUMBER: 8708-SLEDNCAP-01

**CHILD RESTRAINT SYSTEM IN
DYNAMIC SLED TEST
COSCO SUMMIT, FORWARD-FACING UPRIGHT, UPRIGHT**

TEST NUMBER: 07-3-01

**PREPARED BY:
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July 30, 2003

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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WASHINGTON, D.C. 20590**

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Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Dynamic Sled Test Program

Date of Acceptance

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16. Abstract This report contains the results of tests performed in accordance with FMVSS 213 Final Rule Published June 24 th , 2003 for FMVSS 213 Child Restraint Systems, on the Cosco Summit child restraint.			
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SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This dynamic sled testing is part of the FY' 03 New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract Number DTNH22-01-D-32005. The purpose of this test is to obtain child seat research data for frontal dynamic testing.

1.2 TEST PROCEDURE

This frontal dynamic sled test was conducted in accordance with the child restraint test procedure provided by the FMVSS No. 213 Final Rule published June 24th, 2003. Any reference to FMVSS No. 213 in this document refers to the Final Rule published June 24th, 2003, for FMVSS No. 213 Child Restraint Systems.

The test was conducted at Veridian Engineering on July 30th, 2003 at a speed of 45.3 kph (28.1 mph). The FMVSS No. 213 sled pulse was used as a crash pulse. The requirements specified in the FMVSS No. 213 were also followed.

The bench seat contained one anthropomorphic test device (ATD). One (1) Hybrid III 3 year old size ATD, Serial Number 044, was instrumented with head, chest, and pelvic tri-axial accelerometers, and upper and lower neck load cells. The child ATD was positioned according to the child seat manufacturer's instructions. The data was digitally sampled at 20,000 samples per second and processed per Section IP11 of the Laboratory Test Procedure.

SECTION 2

CHILD RESTRAINT INFORMATION

Test No.: NCAP 07-3-01

Test Date: July 30th, 2003

Child Restraint Type (forward-facing, rearward facing, booster)	FORWARD FACING
LATCH or NON-LATCH	LATCH
Harness Type	5 POINT
Child Restraint Manufacturer	COSCO
Child Restraint Model	SUMMIT
Model Number	22-260-HOU
Date of Manufacture	9/13/2002
Child Restraint Age Limits	OVER 1 YEAR OLD
Child Restraint Weight Limits (kg)	10-45 KGS
Weight of Child Restraint (kg)	7.3 KGS

SECTION 3

POST-TEST OBSERVATIONS

Test No.: NCAP 07-3-01

Test Date: July 30th, 2003

Child Seat	COSCO SUMMIT
Belt Fraying	NONE
Stress Marks	NONE
Cracks	NONE
Buckle Stress	NONE
Latch Hooks	NONE
Max. Head Excursion (mm)	561.3
Max. Knee Excursion (mm)	701.0
Velocity	45.3 KPH
Acceleration (G's)	22.7

SECTION 4

HYBRID III 3 YEAR OLD ATD INJURY CRITERIA AND SENSOR DATA

Test No.: NCAP 07-3-01

Test Date: July 30th, 2003

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Head CG	X	G's	42.2	184.7	-52.1	74.7
Head CG	Y	G's	3.8	183.3	-3.4	57.7
Head CG	Z	G's	34.3	65.2	-0.1	5.1
Head CG Resultant	N/A	G's	55.8	74.7		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Chest CG	X	G's	11.0	209.5	-34.9	71.3
Chest CG	Y	G's	2.2	205.0	-4.3	85.6
Chest CG	Z	G's	11.1	190.3	-31.1	68.3
Chest CG Resultant	N/A	G's	46.1	67.8		

SEAT BELT SENSOR PEAK VALUES

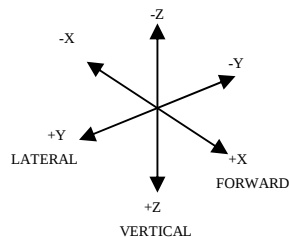
Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Tether Belt	N/A	Newtons	NA	NA		

HEAD INJURY CRITERIA (HIC)

Location	P6 (Center) Rear Passenger			
	HIC	Avg. G's	T ¹	T ²
Head CG Primary (36 msec)	415.1	42.1	57.2	93.2
Head CG Primary (15 msec)	254.8	49.2	68.1	83.1

CHEST CLIP (3 MSEC)

Location	P6 (Center) Rear Passenger		
	Clip	T ¹	T ²
Chest CG Primary	45.3	66.6	69.6



HYBRID III 3 YEAR OLD ATD INJURY CRITERIA AND SENSOR DATA...(continued)

Test No.: NCAP 07-3-01

Test Date: July 30th, 2003

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Pelvis	X	G's	14.2	89.8	-47.1	68.0
Pelvis	Y	G's	3.3	112.5	-8.2	66.2
Pelvis	Z	G's	11.5	190.2	-43.4	67.8

UPPER NECK PEAK FORCES AND MOMENTS

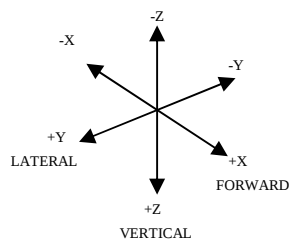
Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Neck Force	X	Newtons	37.1	229.3	-1279.8	74.7
Neck Force	Y	Newtons	33.6	84.2	-79.1	56.4
Neck Force	Z	Newtons	1869.0	75.3	-38.7	209.3
Neck Moment	X	Nm	1.6	233.4	-4.1	77.2
Neck Moment	Y	Nm	6.6	143.9	-22.5	74.6
Neck Moment	Z	Nm	2.7	108.8	-1.7	200.3

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Neck Force	X	Newtons	205.3	185.7	-1392.5	75.9
Neck Force	Y	Newtons	76.6	97.6	-63.9	54.3
Neck Force	Z	Newtons	586.7	186.0	-107.1	74.3
Neck Moment	X	Nm	3.7	229.7	-13.4	70.7
Neck Moment	Y	Nm	165.0	74.6	-13.9	185.4
Neck Moment	Z	Nm	1.9	193.9	-5.7	80.6

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	P6 (Center) Rear Passenger			
			Max	Time	Min	Time
Chest CG	X	mm	0.1	17.0	-20.5	107.3



SECTION 5

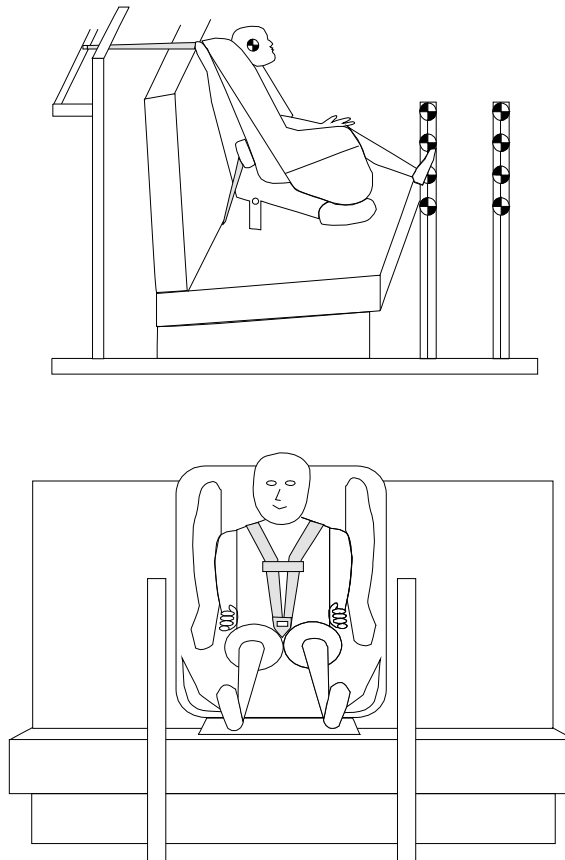
SLED TEST SET-UP

Test No.: NCAP 07-3-01

Test Date: July 30th, 2003

An FMVSS 213 test bench was fixtured on the sled in order to simulate a frontal impact. One child seat was placed on the bench and fastened in a manner suggested in the owner's manual of the child seat. Stadia poles were set up to measure dummy head and knee excursions.

Pre-test Infant and Car Seat Positions

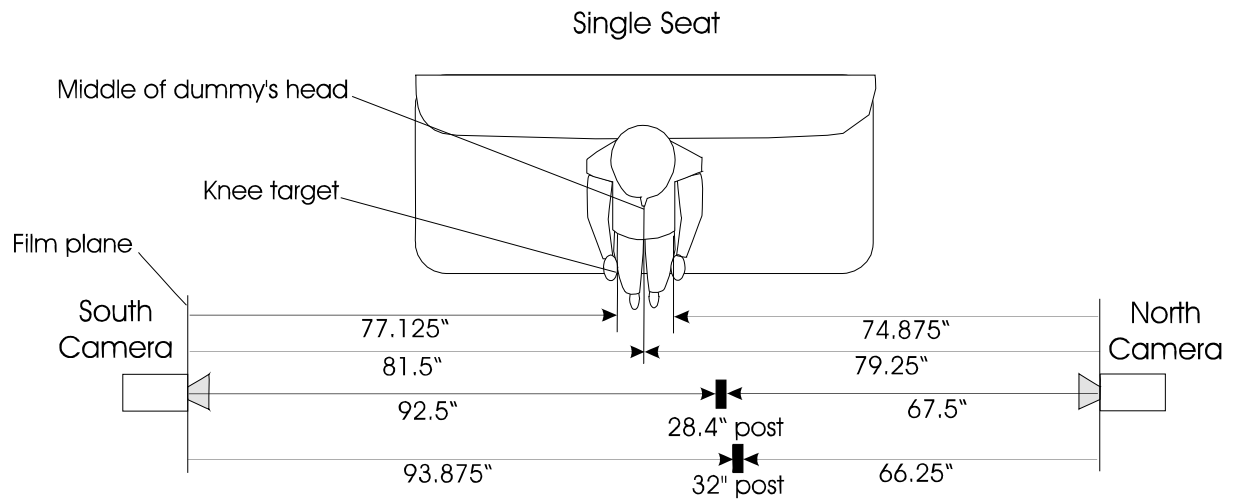


SECTION 6
CAMERA LOCATION

Test No.: NCAP 07-3-01

Test Date: July 30th, 2003

There were two cameras mounted onto the sled carriage for views of the left and right side of the child seat.



SECTION 7
PHOTOGRAPHS

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Pre Test Right Side View



Post Test Right Side View



Pre Test Right Front View



Post Test Right Front View



Pre Test Left Front View



Post Test Left Front View



Pre Test Left Side View



Post Test Left Side View

SECTION 8

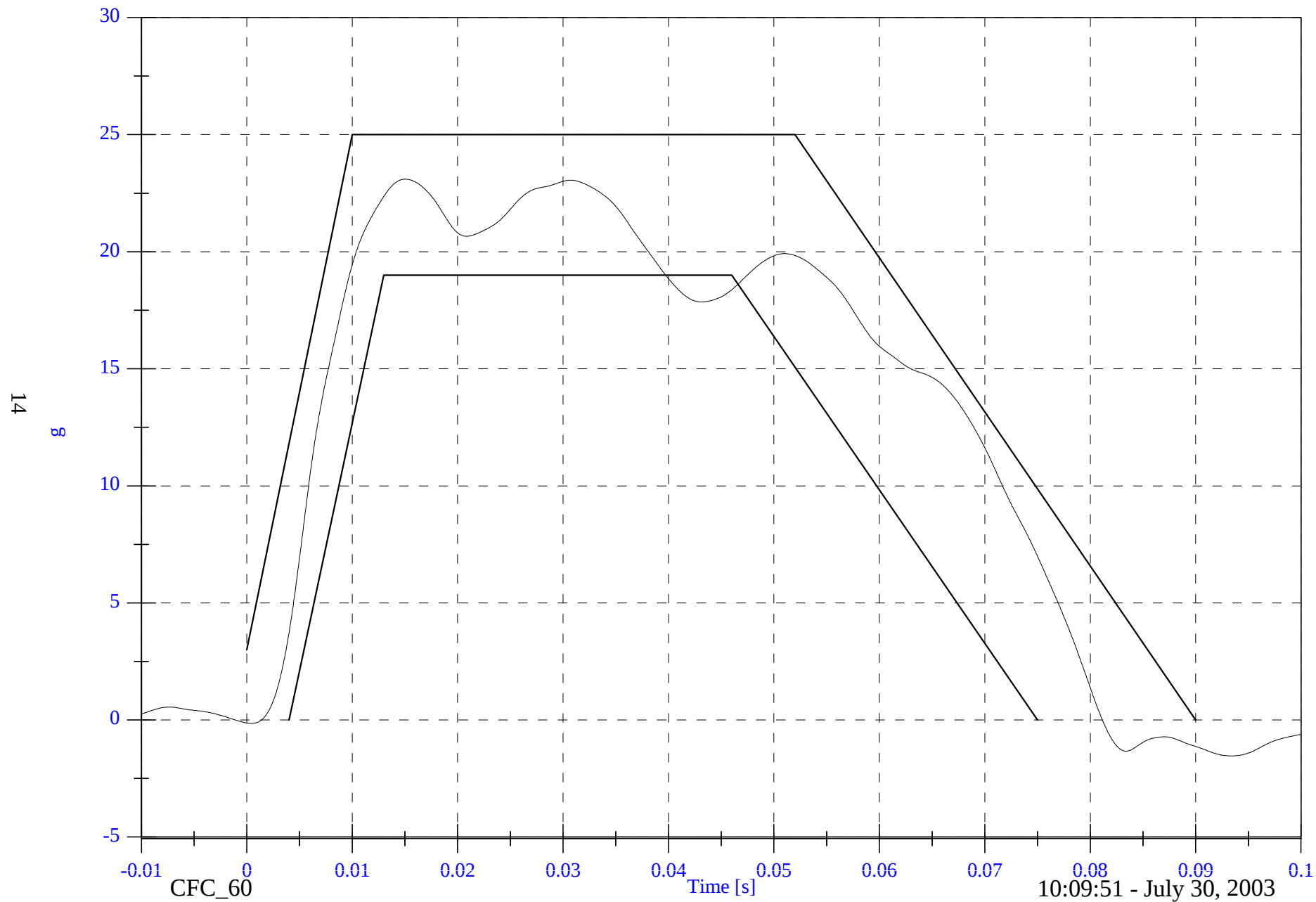
Data Plots

Sled Test NCAP SLED 07-3-01

Sled Pulse Corridor

Max: 23.1 [g] at 0.015 [s]

Min: -1.8 [g] at 1.209 [s]



FACILITY: HYGE SLED
 TEST#: 07-3-01
 TITLE: Sled Test NCAP 07-3-01

DATE: July 30, 2003

CHN	NAME	Unit	Max	msec	Min	msec	Filt	Comment
26	Sled Acceleration	g	22.7	14.2	-1.9	92.6	CFC_60	
27	Sled Acceleration Velocity	kph	45.3	80.0	-0.0	1.6	CFC_180	
28	Sled Acceleration Displacement	mm	2546.5	250.0	-0.0	-9.3	CFC_180	
29	P6 Head x	g	42.2	184.7	-52.1	74.7	CFC_1000	
30	P6 Head y	g	3.8	183.3	-3.4	57.7	CFC_1000	
31	P6 Head z	g	34.3	65.2	-0.1	5.1	CFC_1000	
32	P6 Head Resultant	g	55.8	74.7	0.0	-5.7	CFC_1000	
33	P6 Upper Neck Fx	N	37.1	229.3	-1279.8	74.7	CFC_1000	
34	P6 Upper Neck Fy	N	33.6	84.2	-79.1	56.4	CFC_1000	
35	P6 Upper Neck Fz	N	1869.0	75.3	-38.7	209.3	CFC_1000	
36	P6 Upper Neck F Resultant	N	2264.0	75.1	0.2	-2.1	CFC_1000	
37	P6 Upper Neck Mx	N-m	1.6	233.4	-4.1	77.2	CFC_600	
38	P6 Upper Neck My	N-m	6.6	143.9	-22.5	74.6	CFC_600	
39	P6 Upper Neck Mz	N-m	2.7	108.8	-1.7	200.3	CFC_600	
40	P6 Upper Neck M Resultant	N-m	23.0	74.6	0.0	-7.6	CFC_600	
41	P6 Lower Neck Fx	N	205.3	185.7	-1392.5	75.9	CFC_1000	
42	P6 Lower Neck Fy	N	76.6	97.6	-63.9	54.3	CFC_1000	
43	P6 Lower Neck Fz	N	586.7	186.0	-107.1	74.3	CFC_1000	
44	P6 Lower Neck F Resultant	N	1395.0	75.4	0.1	-5.1	CFC_1000	
45	P6 Lower Neck Mx	N-m	3.7	229.7	-13.4	70.7	CFC_600	
46	P6 Lower Neck My	N-m	165.0	74.6	-13.9	185.4	CFC_600	
47	P6 Lower Neck Mz	N-m	1.9	193.9	-5.7	80.6	CFC_600	
48	P6 Lower Neck M Resultant	N-m	165.4	74.6	0.0	-4.4	CFC_600	
49	P6 Chest x	g	11.0	209.5	-34.9	71.3	CFC_180	
50	P6 Chest y	g	2.2	205.0	-4.3	85.6	CFC_180	
51	P6 Chest z	g	11.1	190.3	-31.1	68.3	CFC_180	
52	P6 Chest Resultant	g	46.1	67.8	0.0	-2.8	CFC_180	
53	P6 Pelvic x	g	14.2	89.8	-47.1	68.0	CFC_1000	
54	P6 Pelvic y	g	3.3	112.5	-8.2	66.2	CFC_1000	
55	P6 Pelvic z	g	11.5	190.2	-43.4	67.8	CFC_1000	
56	P6 Pelvic Resultant	g	64.4	67.9	0.0	-4.7	CFC_1000	

FACILITY: HYG SLED
TEST#: 07-3-01
TITLE: Sled Test NCAP 07-3-01

DATE: July 30, 2003

CHN NAME	Unit	Max	msec	Min	msec	Filt	Comment
57 P6 Head Red z	g	44.1	69.0	-15.1	51.7	CFC_1000	
58 P6 Chest Compression	mm	0.1	17.0	-20.5	107.3	CFC_600	
59 P6 Upper Neck Mocy	N-m	6.6	143.9	-22.5	74.6	CFC_600	

FACILITY: HYGE SLED

DATE: July 30, 2003

TEST#: 07-3-01

TITLE: Sled Test NCAP 07-3-01

Version 5.00

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P6 HIC(36 ms): 415.1

t1: 57.2 msec

t2: 93.2 msec

Duration: 36.0 msec

Average Acceleration: 42.1 g

Input channels: P6 Head x (2) CFC_1000

P6 Head y (3) CFC_1000

P6 Head z (4) CFC_1000

P6 UP NECK Fx: Max: 37.1 N 229.3 msec

Min: -1279.8 N 74.7 msec

Input channel: P6 Upper Neck Fx (6) CFC_1000

P6 UP NECK Fz: Max: 1869.0 N 75.3 msec

Min: -38.7 N 209.3 msec

Input channel: P6 Upper Neck Fz (8) CFC_1000

P6 UP NECK Mocy (3Y0 Child OOP)

Max: 6.6 N-m 143.9 msec

Min: -22.5 N-m 74.6 msec

Input channels: P6 Upper Neck Fx (6) CFC_600

P6 Upper Neck My (10) CFC_600

Docy: 0

P6 UP NECK Nij (3Y0 Child OOP)

Ntf: 0.17 Nij 150.1 msec CVt: 2120 CVf: 68

Nte: 1.72 Nij 75.4 msec CVt: 2120 CVe: 27

Ncf: 0.00 Nij -6.2 msec CVc: 2120 CVf: 68

Nce: 0.18 Nij 206.1 msec CVc: 2120 CVe: 27

Input channels: P6 Upper Neck Fz (8) CFC_600

P6 Upper Neck Mocy [N-m, CFC_600] (55)

FACILITY: HYGE SLED
TEST#: 07-3-01
TITLE: Sled Test NCAP 07-3-01
Version 5.00

DATE: July 30, 2003

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P6 CLIP(3 ms): 45.3 g

t1: 66.6 msec

t2: 69.6 msec

Duration: 3.0 msec

P6 CSI: 342.9

Input channels: P6 Chest x (18) CFC_180

P6 Chest y (19) CFC_180

P6 Chest z (20) CFC_180

P6 CHEST DISP: Max: 0.1 mm 17.0 msec

Min: -20.5 mm 107.3 msec

Input channel: P6 Chest Compression (21) CFC_600

=====

P6 HIC(15 ms): 254.8

t1: 68.1 msec

t2: 83.1 msec

Duration: 15.0 msec

Average Acceleration: 49.2 g

Input channels: P6 Head x (2) CFC_1000

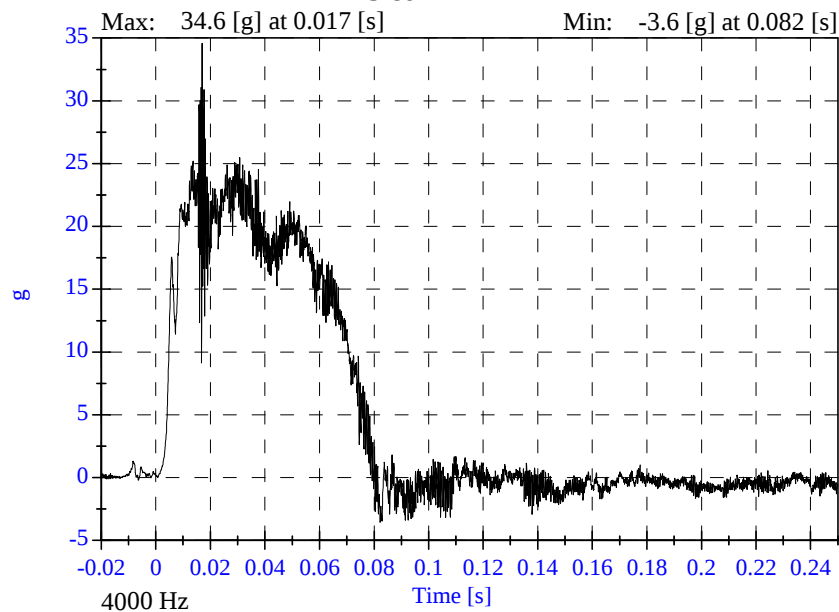
P6 Head y (3) CFC_1000

P6 Head z (4) CFC_1000

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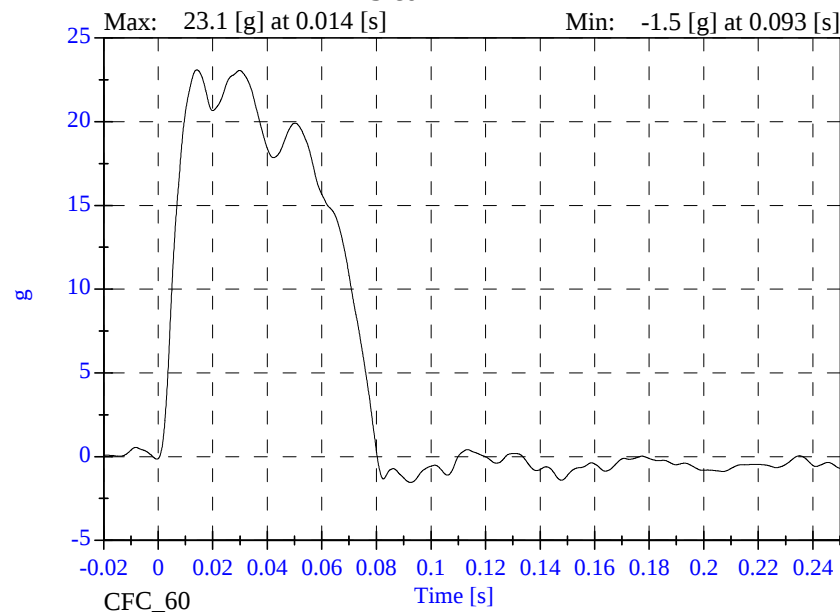
Sled Test NACP SLED 07-3-01

Sled Acceleration

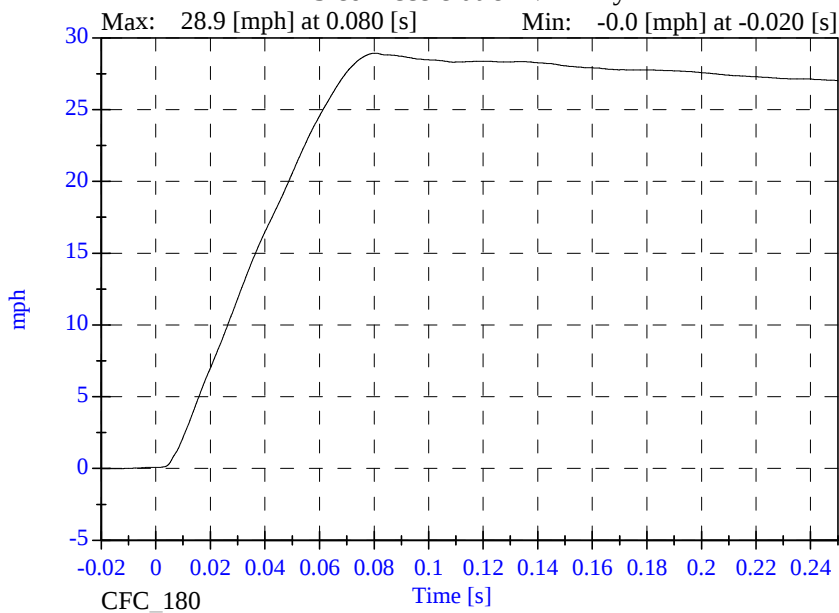


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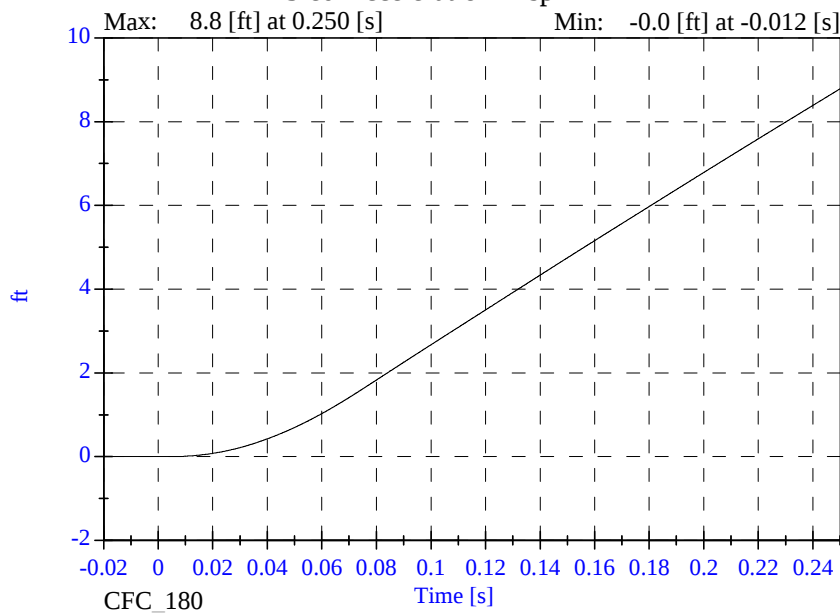
Sled Acceleration



Sled Acceleration Velocity

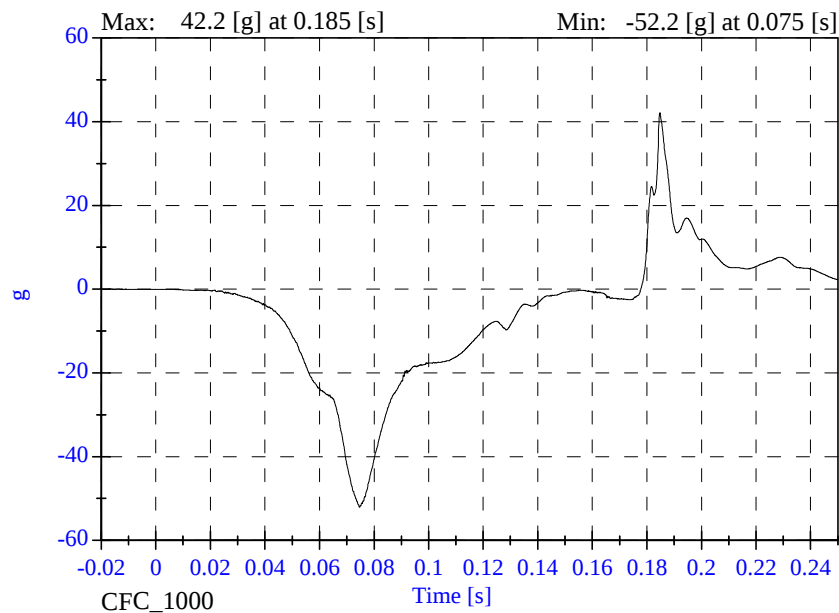


Sled Acceleration Displacement



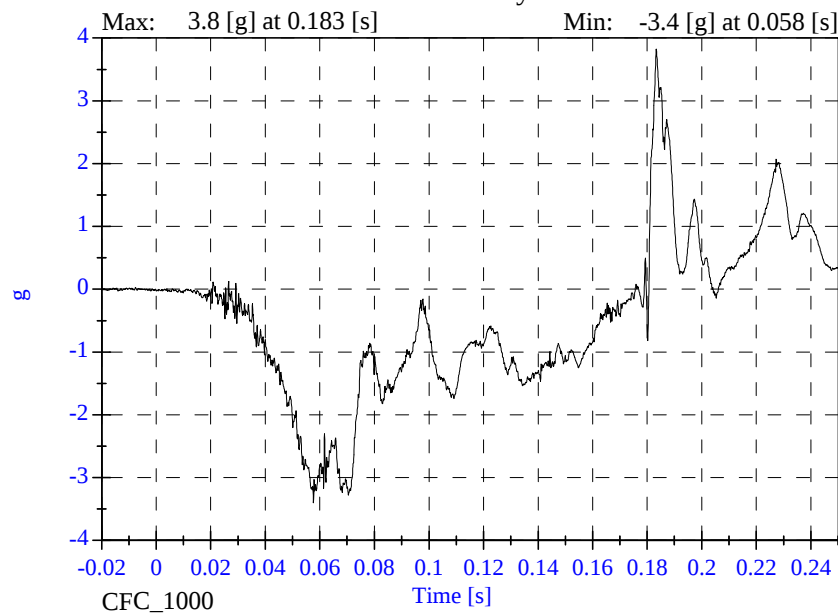
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P6 Head x

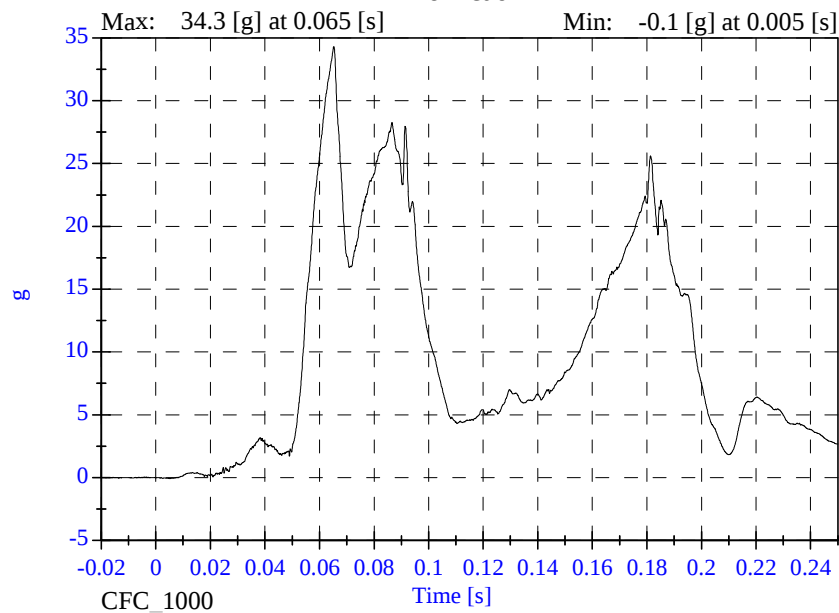


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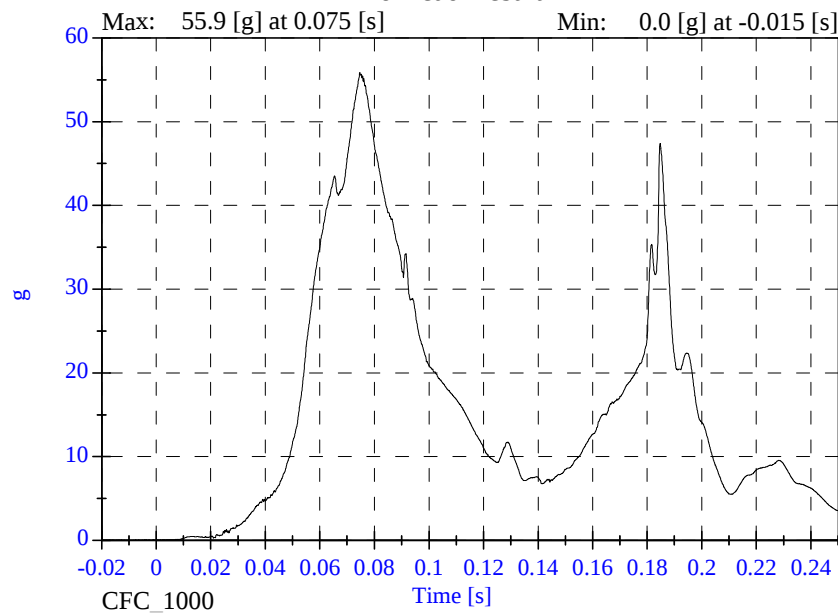
P6 Head y



P6 Head z

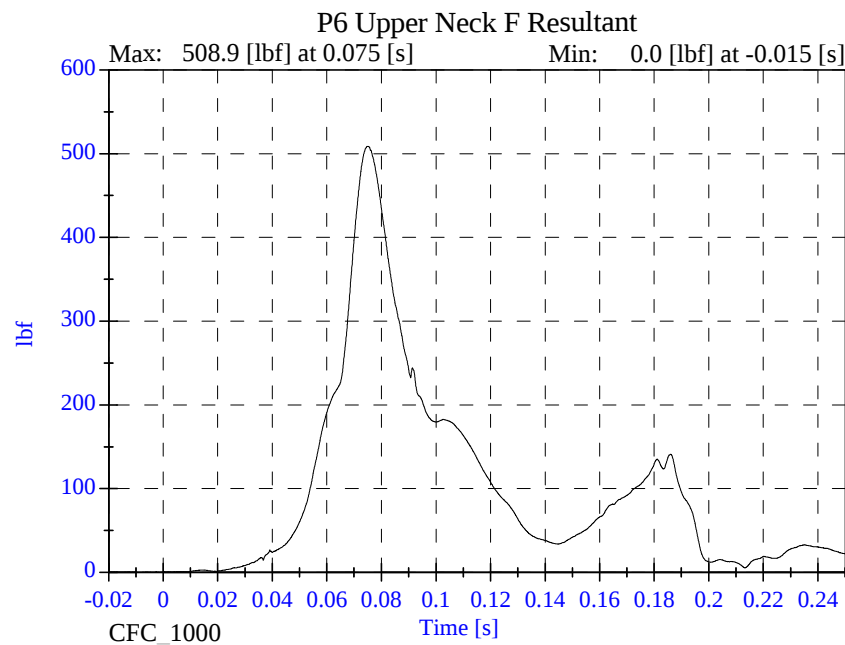
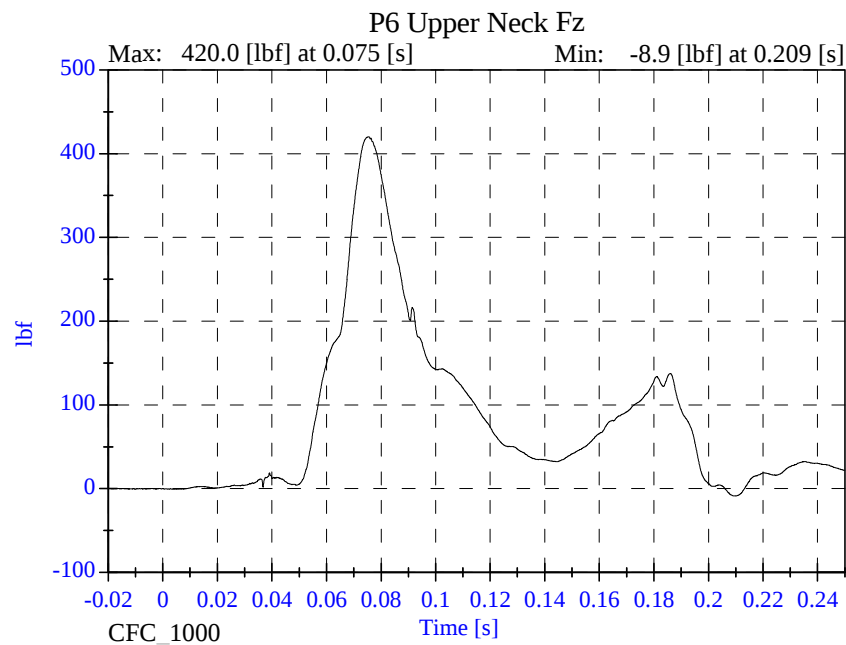
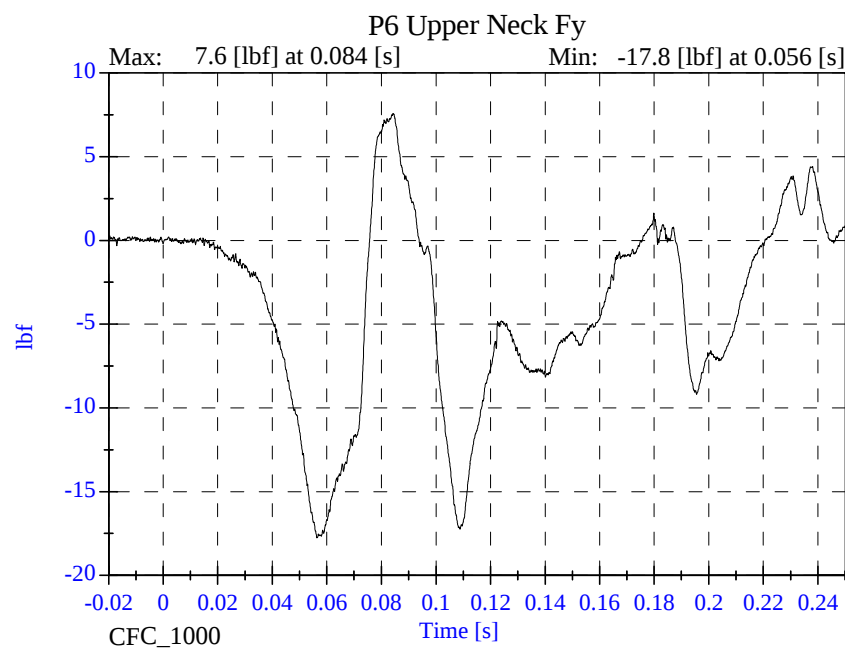
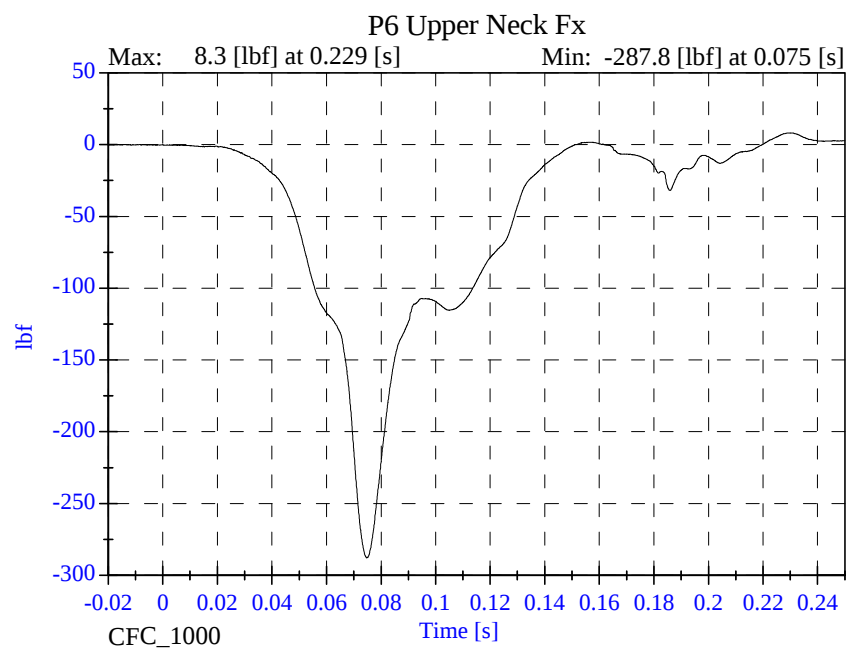


P6 Head Resultant



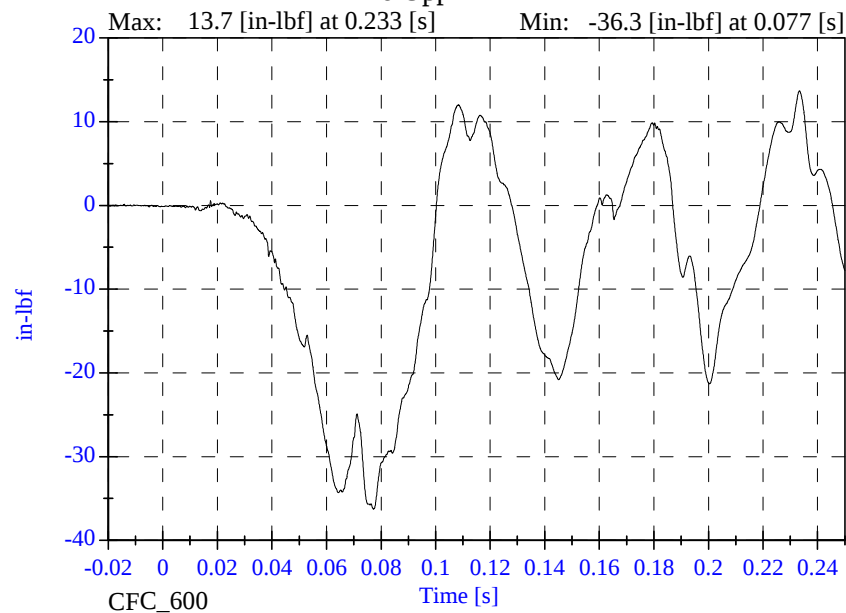
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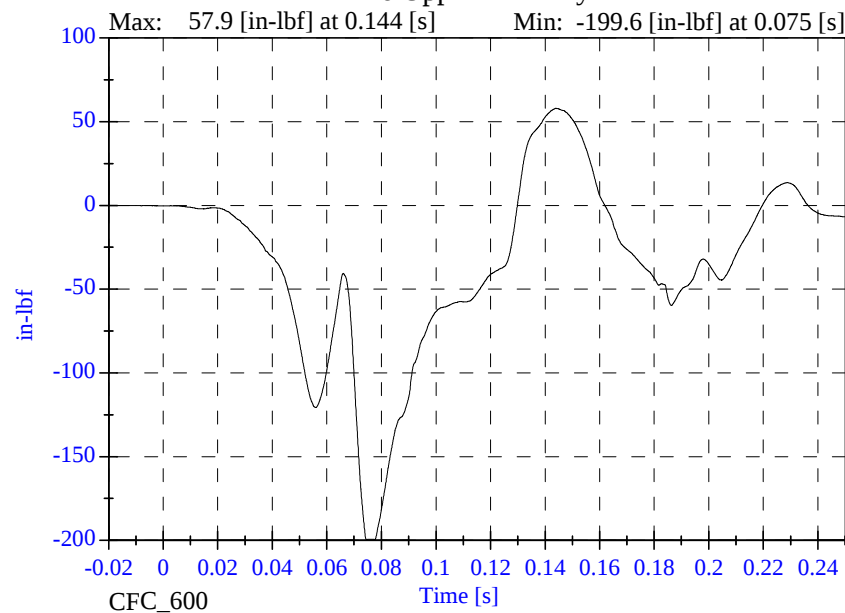
Sled Test NACP SLED 07-3-01

P6 Upper Neck Mx

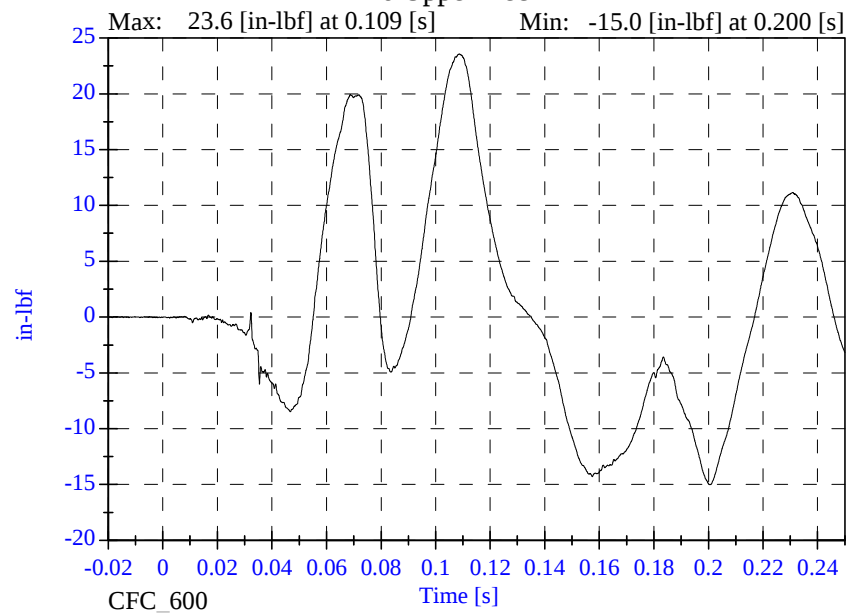


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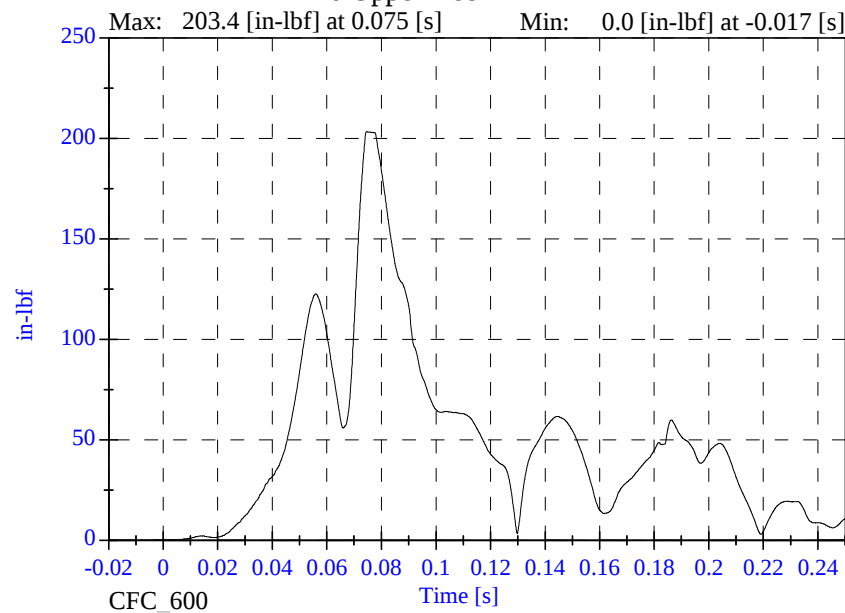
P6 Upper Neck My



P6 Upper Neck Mz

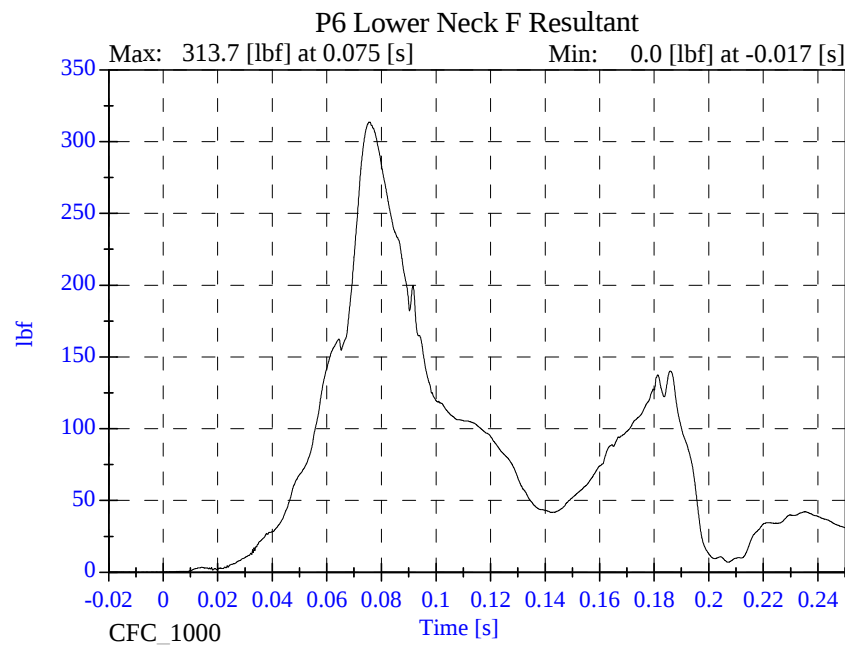
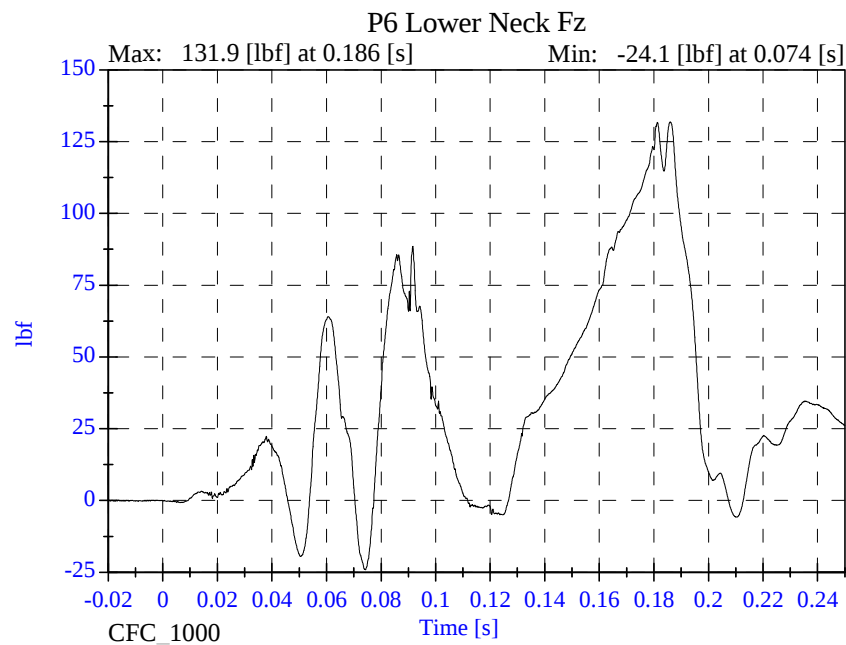
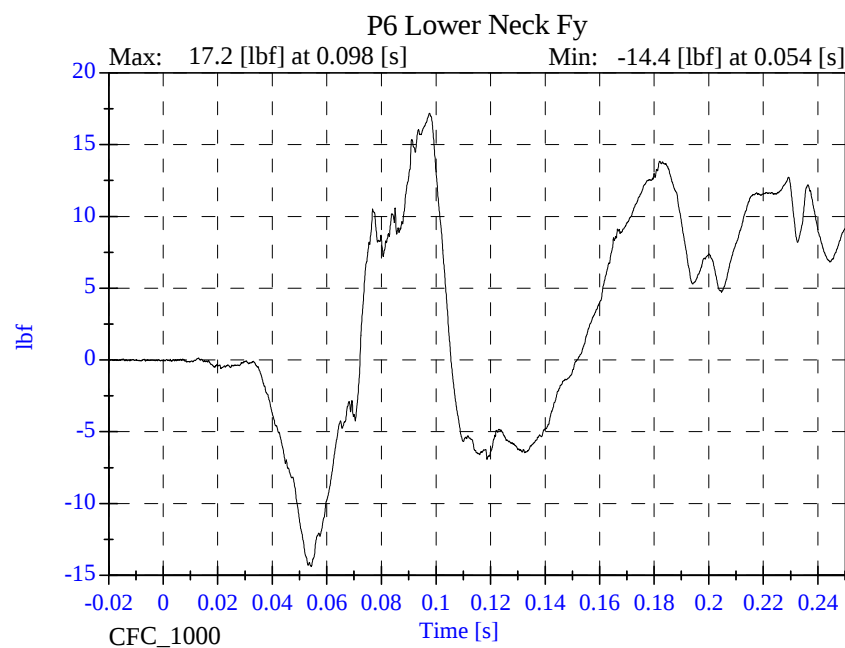
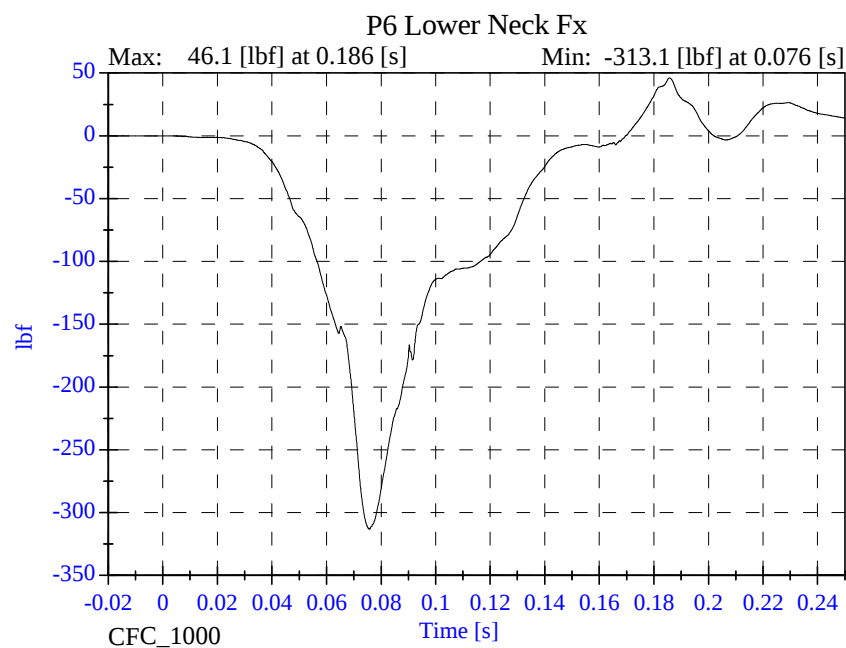


P6 Upper Neck M Resultant



Sled Test NACP SLED 07-3-01

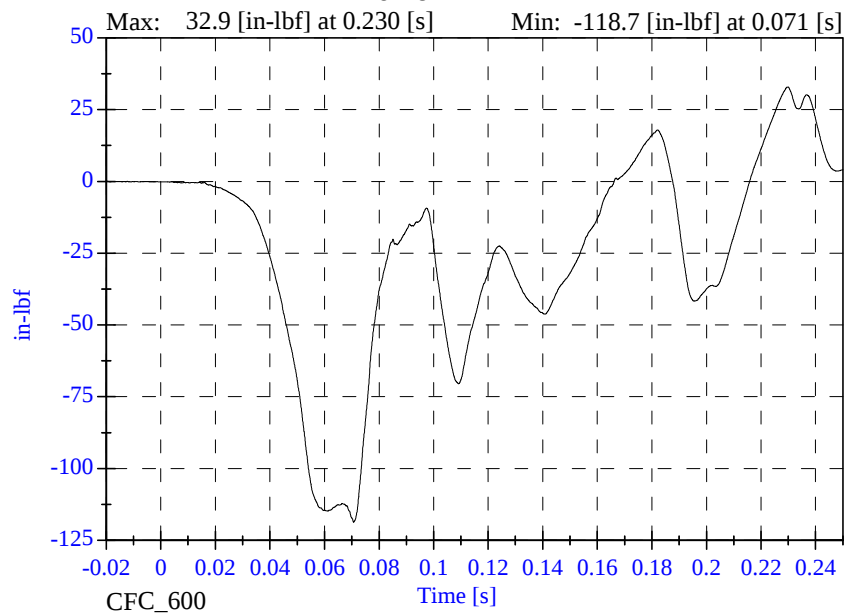
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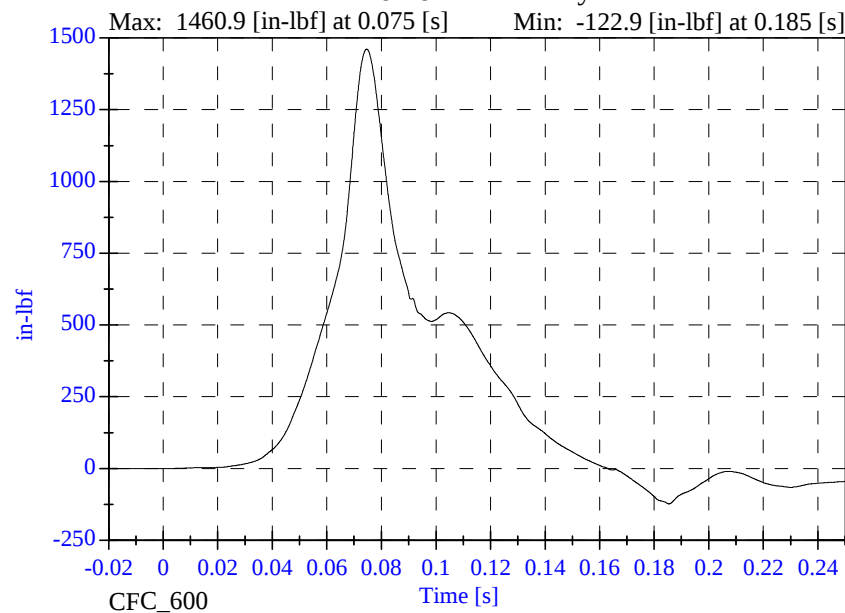
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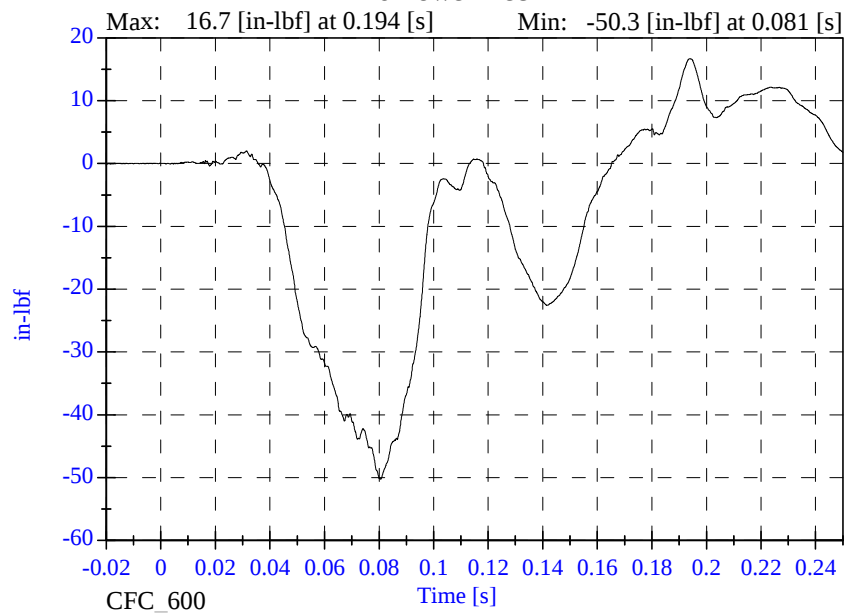
P6 Lower Neck Mx



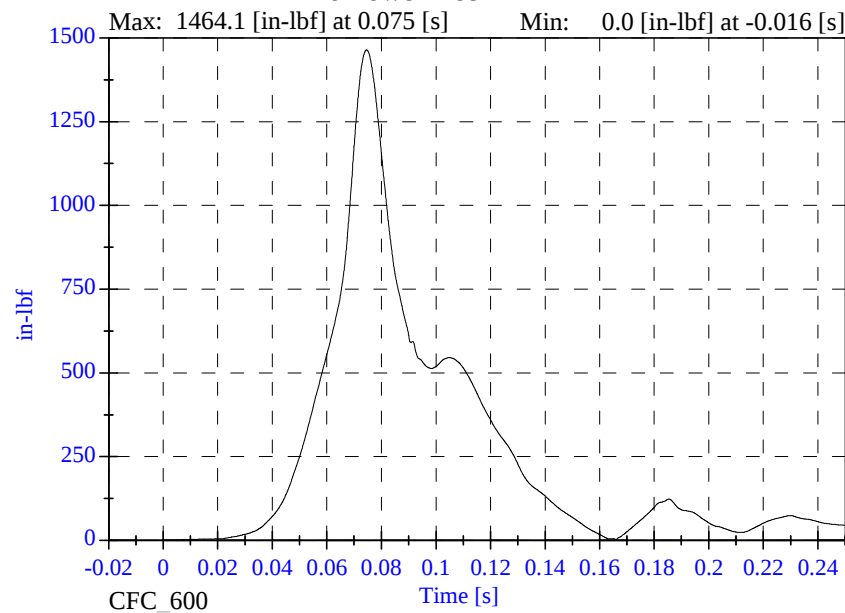
P6 Lower Neck My



P6 Lower Neck Mz

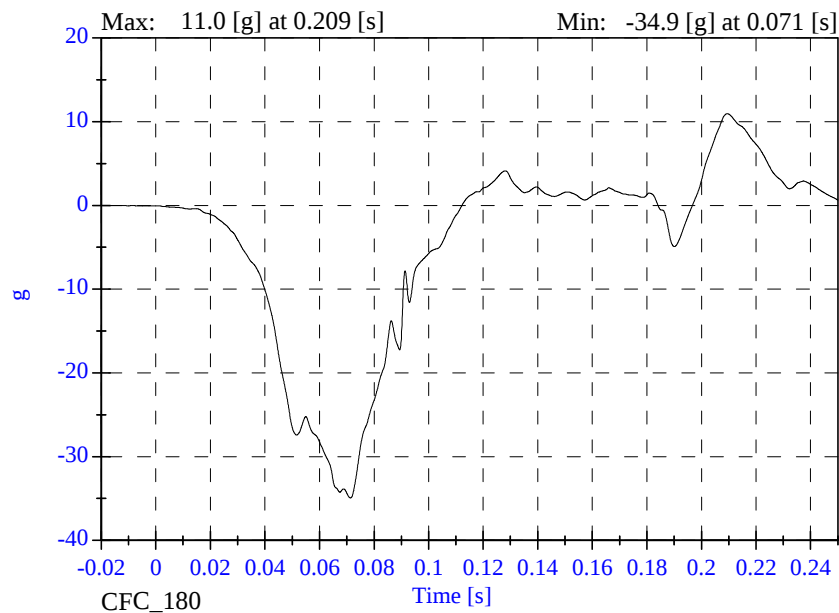


P6 Lower Neck M Resultant



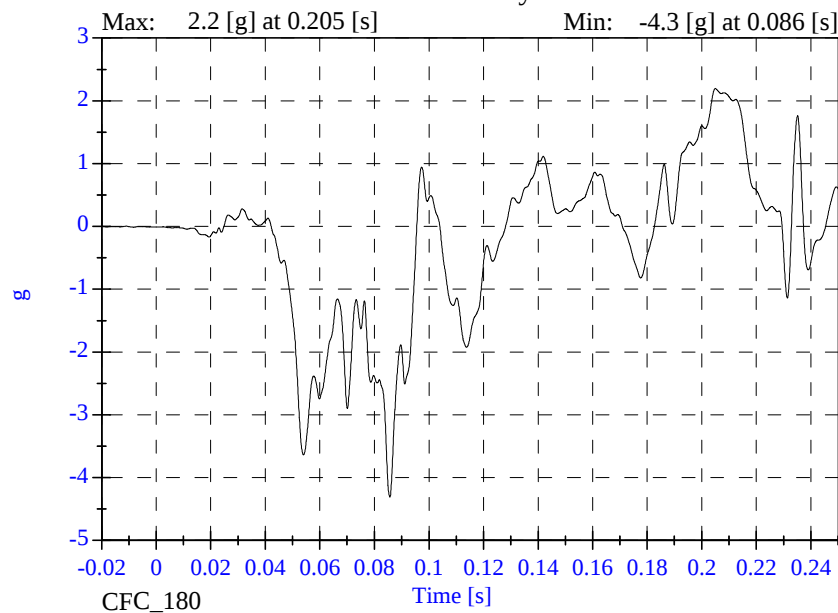
Sled Test NACP SLED 07-3-01

P6 Chest x

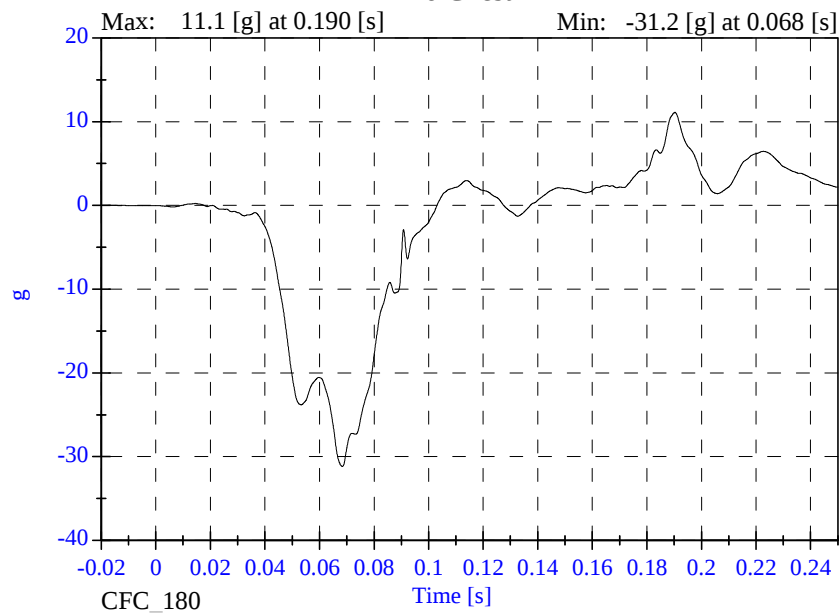


- July 30, 2003

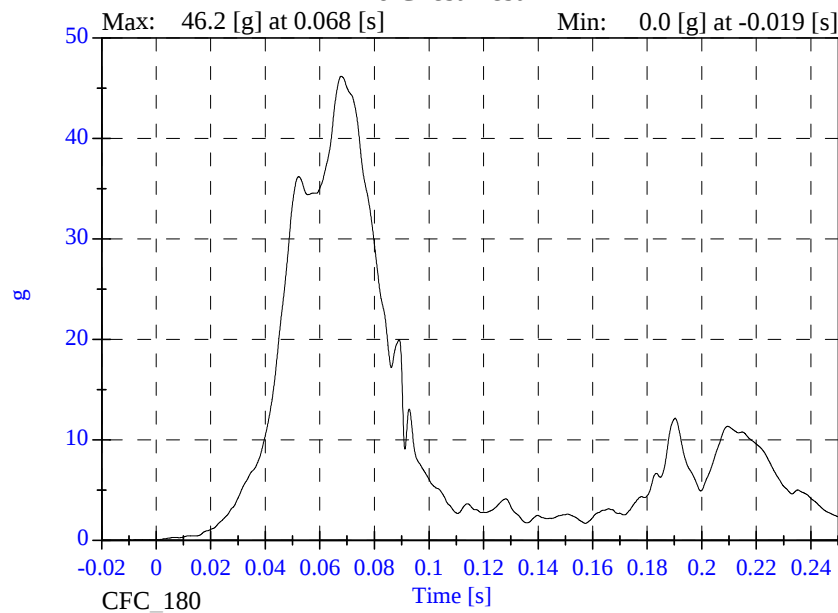
P6 Chest y



P6 Chest z

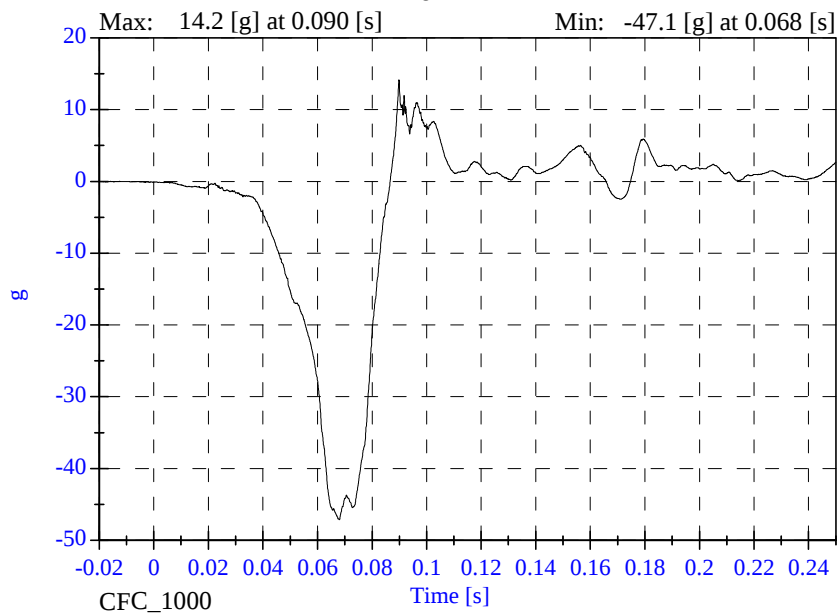


P6 Chest Resultant



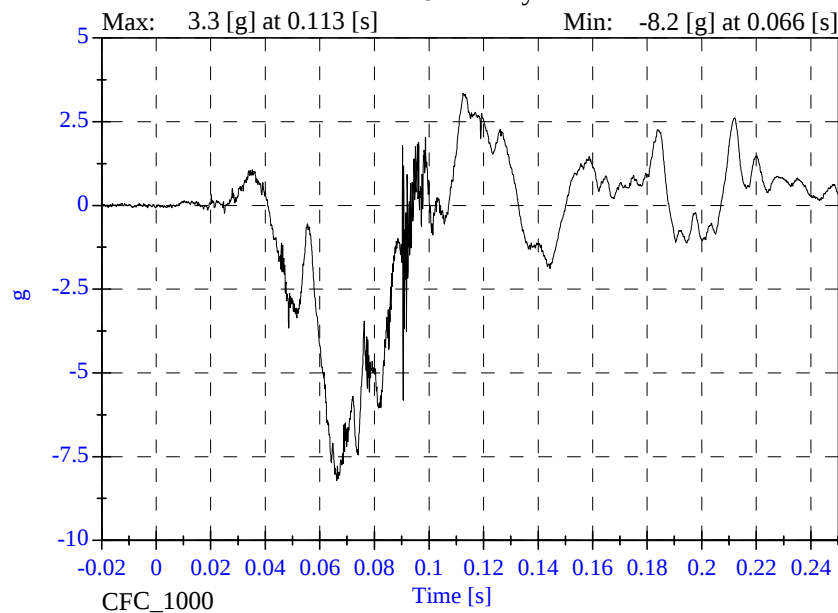
Sled Test NACP SLED 07-3-01

P6 Pelvic x

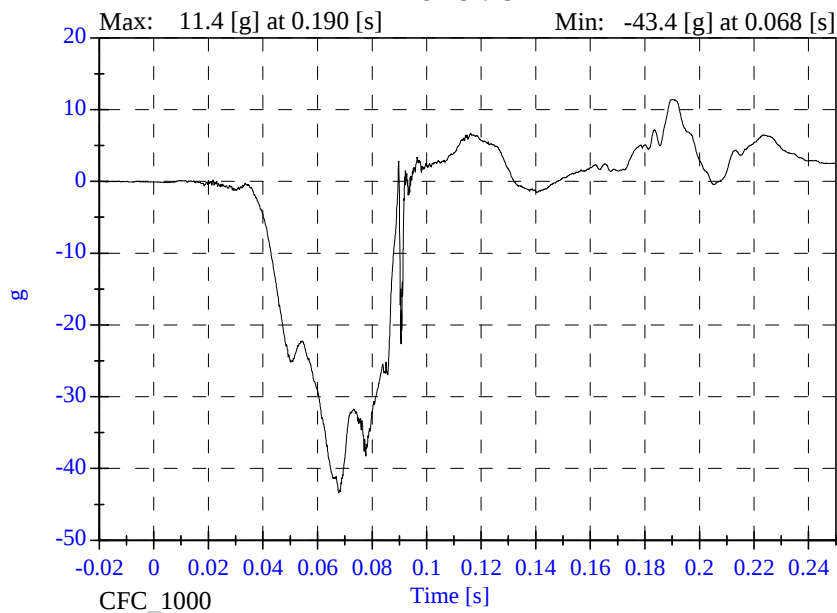


- July 30, 2003

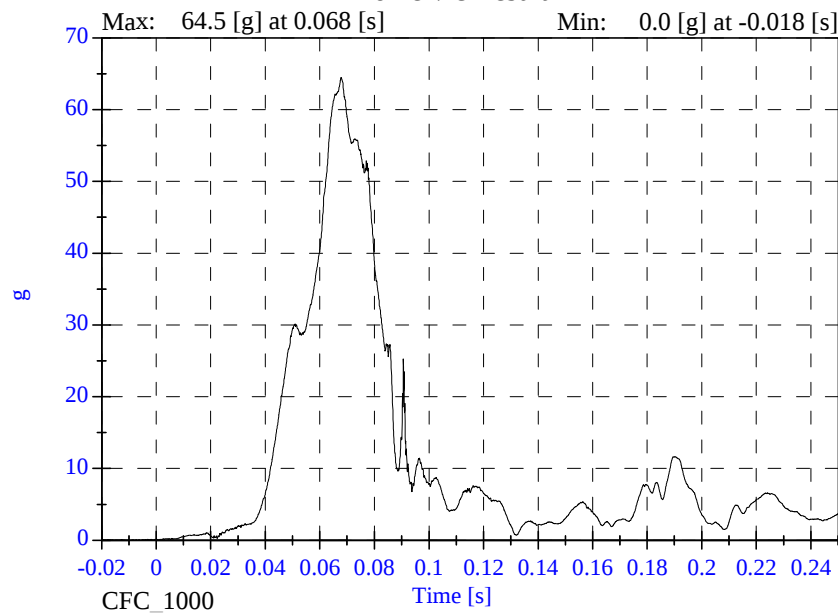
P6 Pelvic y



P6 Pelvic z

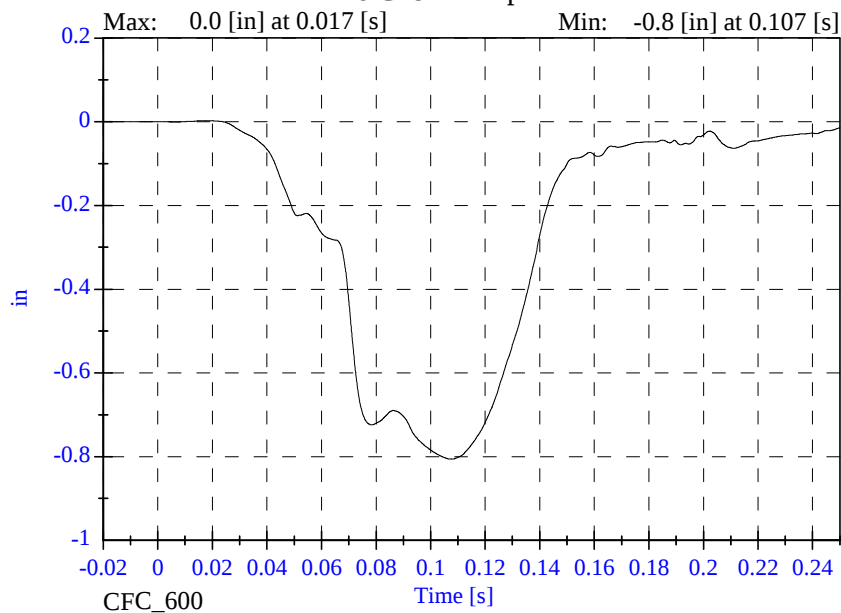


P6 Pelvic Resultant



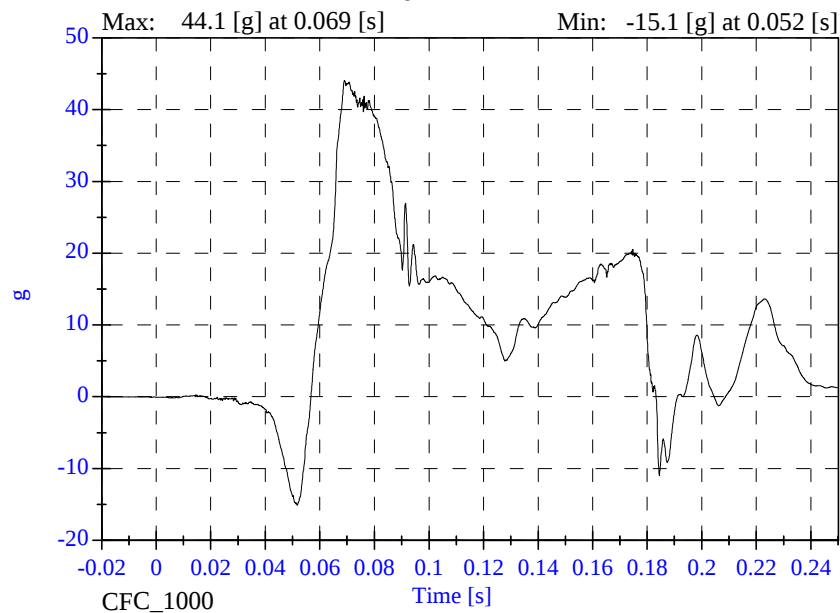
Sled Test NACP SLED 07-3-01

P6 Chest Compression

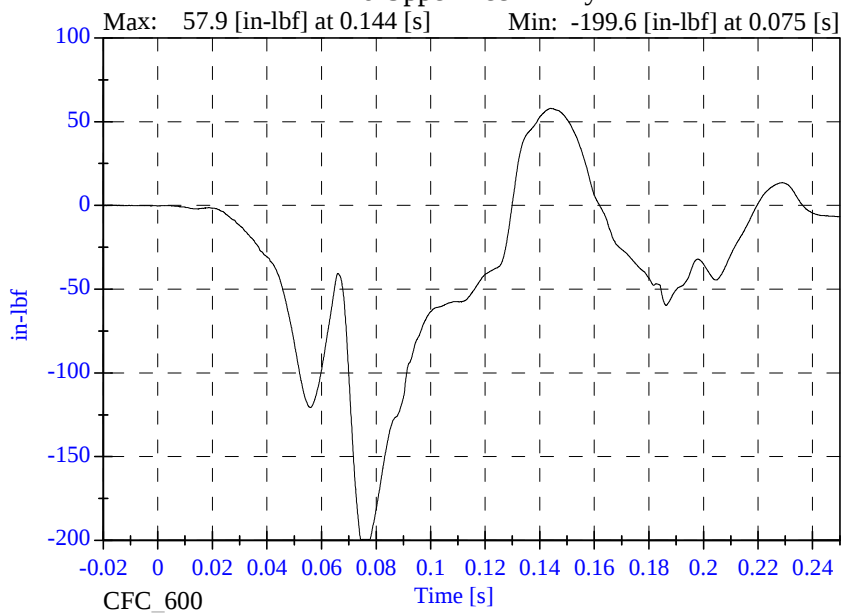


- July 30, 2003

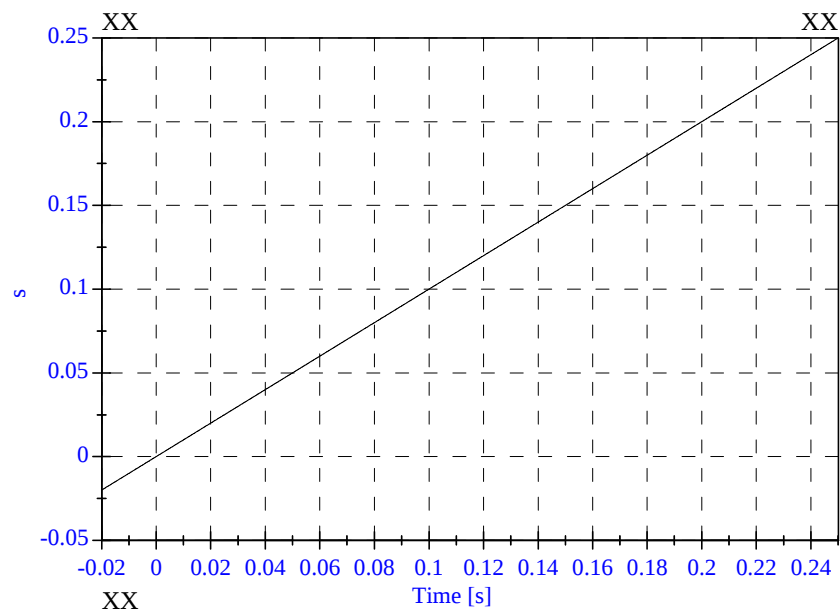
P6 Head Red z



P6 Upper Neck Mocyc



BLANK

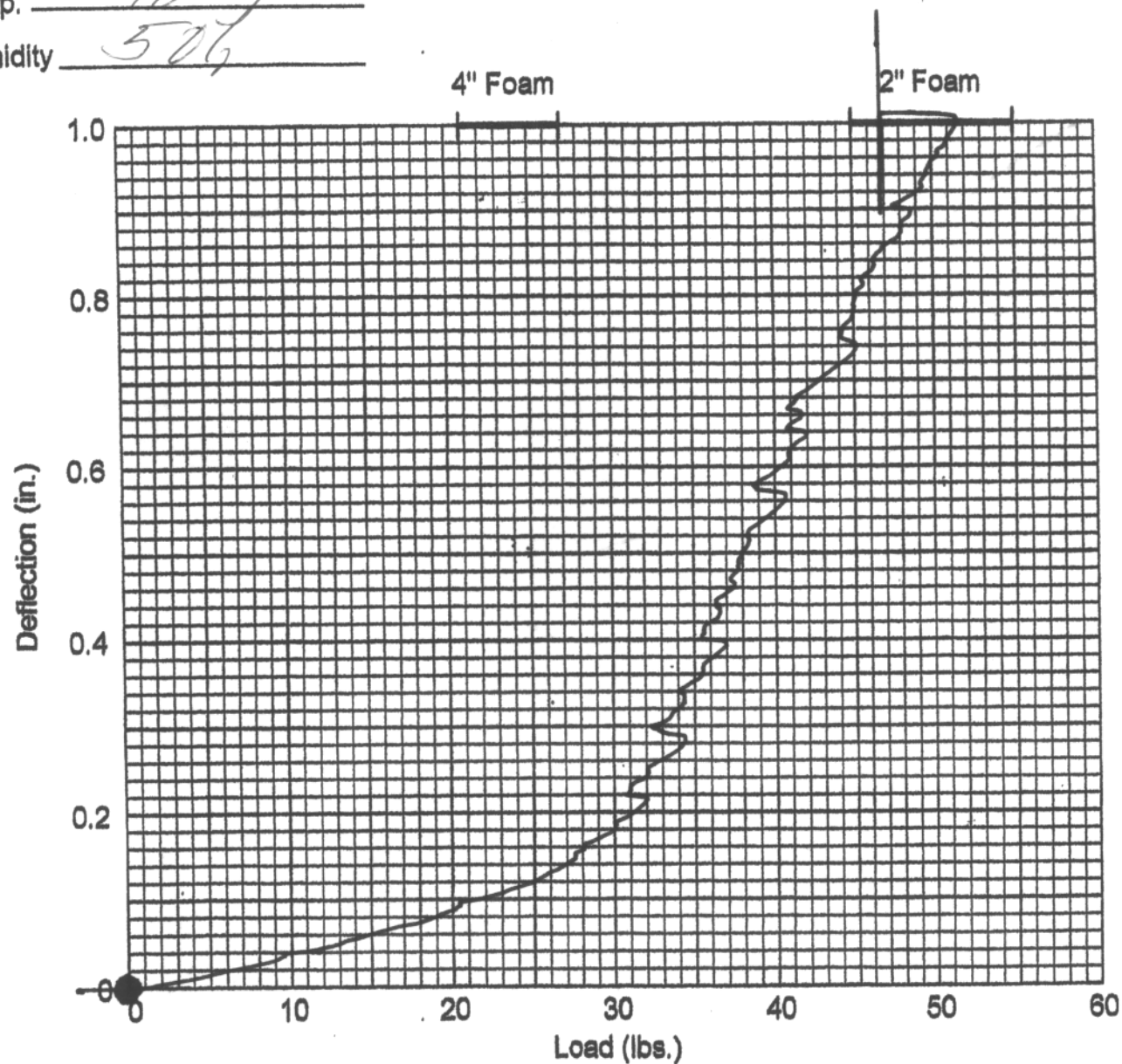


SECTION 9

Compression – Deflection Resistance Test

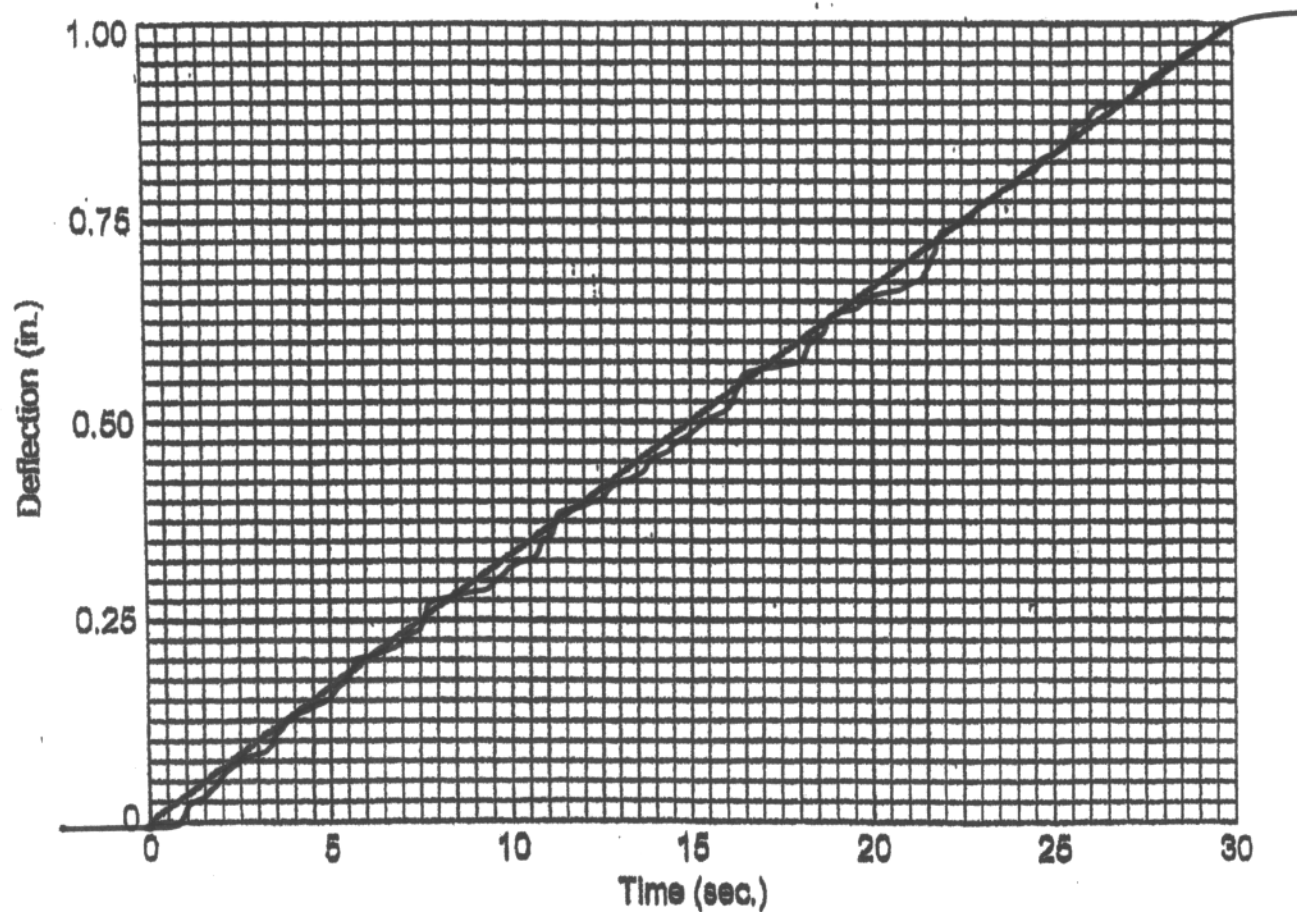
Date 7/30/03
Performed By SD
Temp. 70°
Humidity 50%

Foam No. 2" x 20" 2" x 24" IS



Compression - Deflection Resistance Test
Child Seat Foam

Date 7/30/03
Temp 70°
Humidity 50%
Foam No. 2" X 20" 2" X 24" IS



Compression - Deflection Resistance Test Child Seat Foam

SEAT FOAM USAGE LOG

Foam I.D. Number 2" X 20" 2" X 24" IS

Date	Peak Load	Pass/Fail
7/30/03	47 LBS	

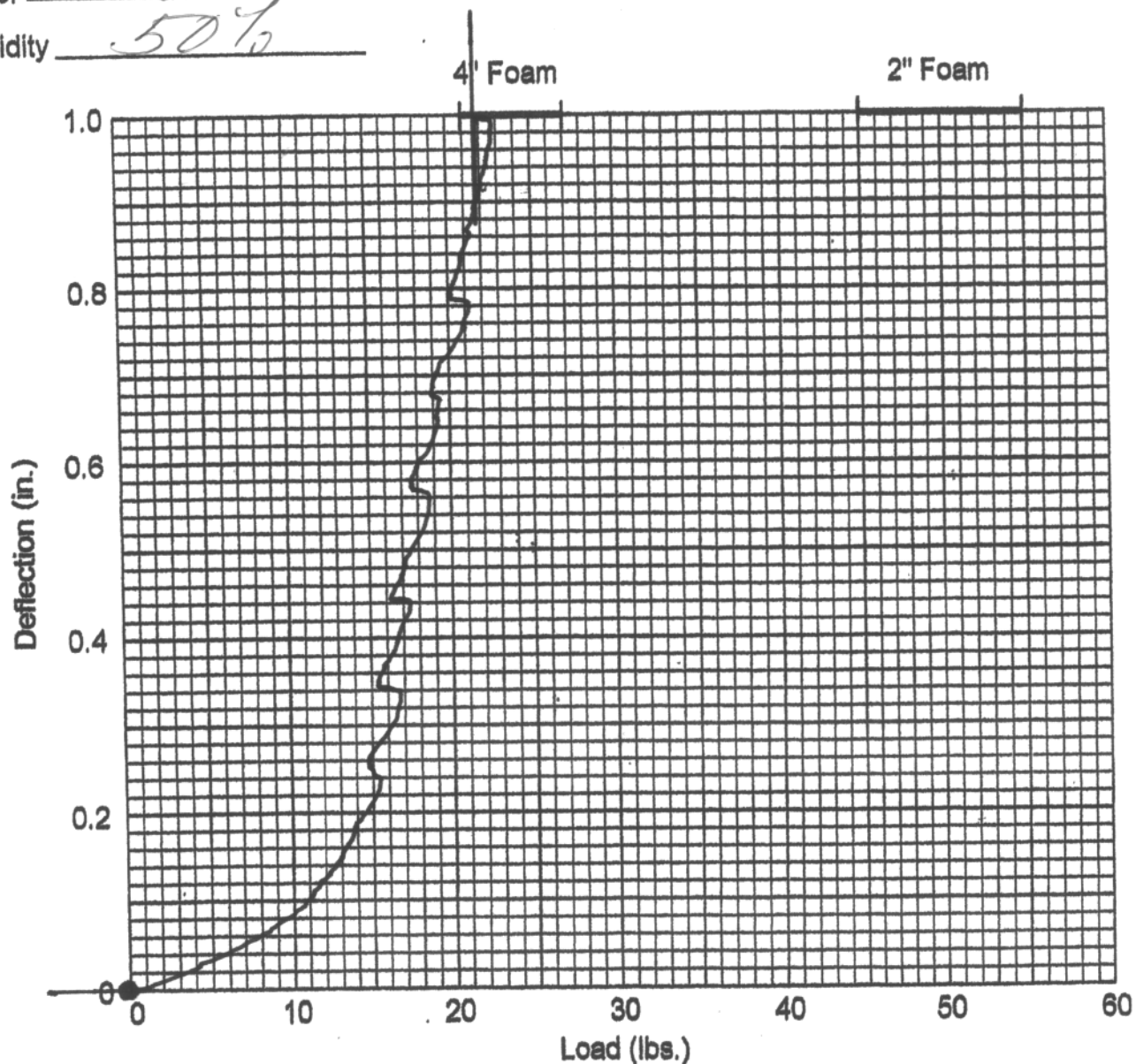
Date 7/30/03

Performed By [Signature]

Temp. 70°

Humidity 50%

Foam No. 4" X 20" I 5



Compression - Deflection Resistance Test
Child Seat Foam

Date

7/30/03

Temp

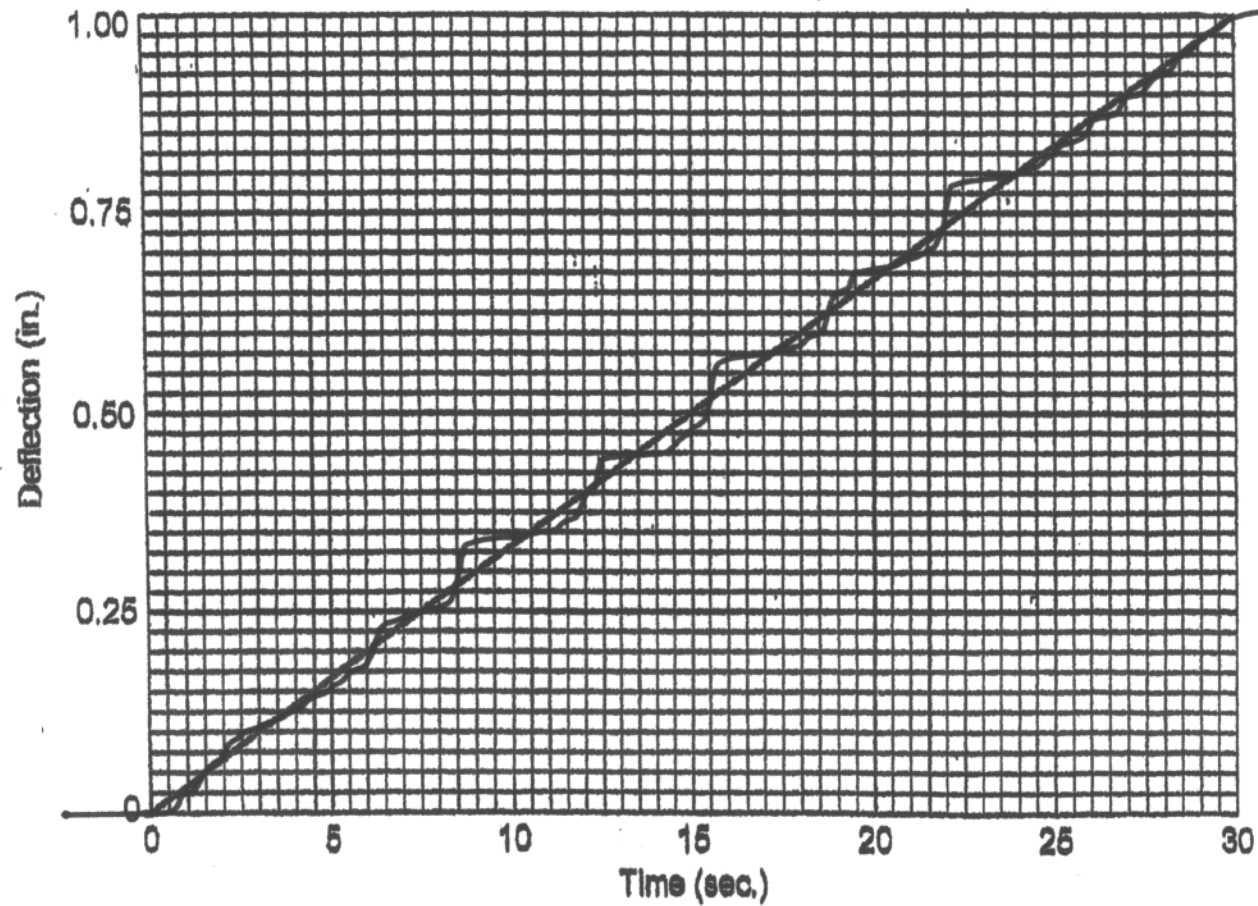
70°

Humidity

50%

Foam No.

4" X 20" IS



Compression - Deflection Resistance Test Child Seat Foam

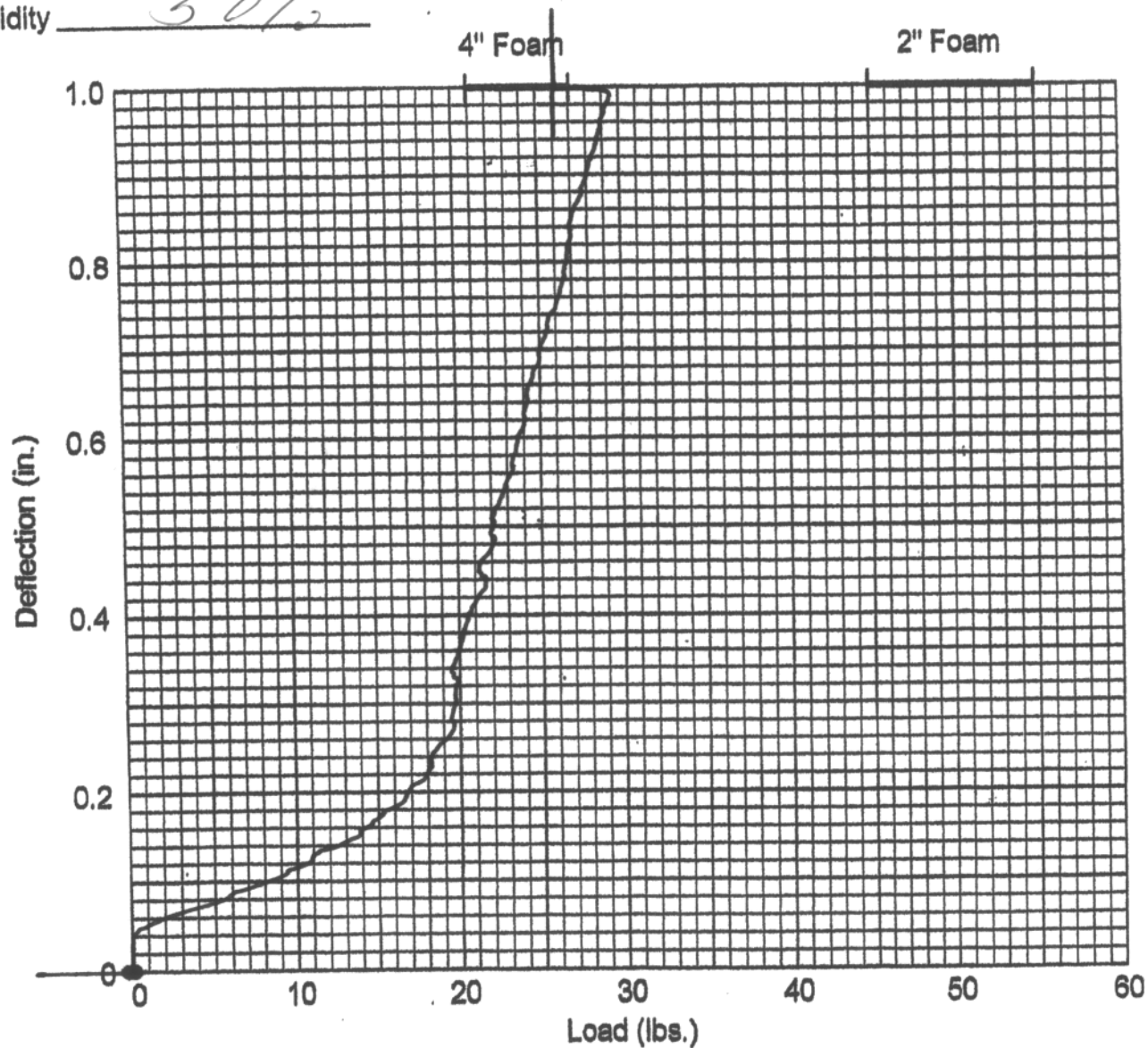
SEAT FOAM USAGE LOG

Foam I.D. Number 4" X 20" IS

Date	Peak Load	Pass/Fail
7/30/03	22 LBS	

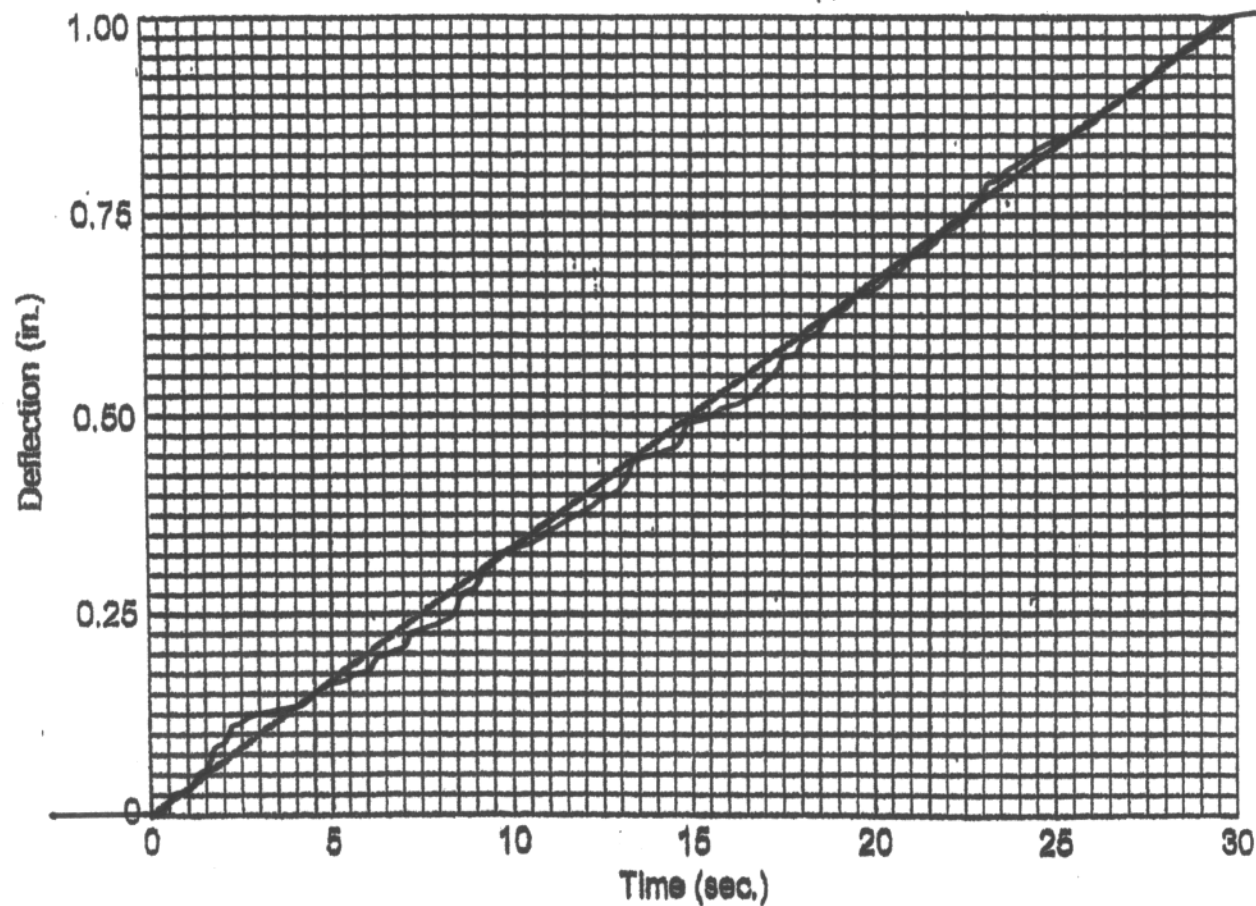
Date 7/30/93
Performed By SP
Temp. 70°
Humidity 50%

Foam No. 4" X 24" IS



Compression - Deflection Resistance Test
Child Seat Foam

Date 7/30/03
Temp 70°
Humidity 50%
Foam No. 4" X 24" IS



Compression - Deflection Resistance Test Child Seat Foam

SEAT FOAM USAGE LOG

Foam I.D. Number 4" x 24" IS

Date	Peak Load	Pass/Fail
7/30/03	26 LBS	

SECTION 10

Child Dummy Calibration Data Traces and Tables

HYIII 3 Year Old Head Drop Test S/N:044

Part 572P Head Drop

Calibration Date: July 22, 2003

Serial No: 044

Work File: 4001

-----TEST RESULTS-----

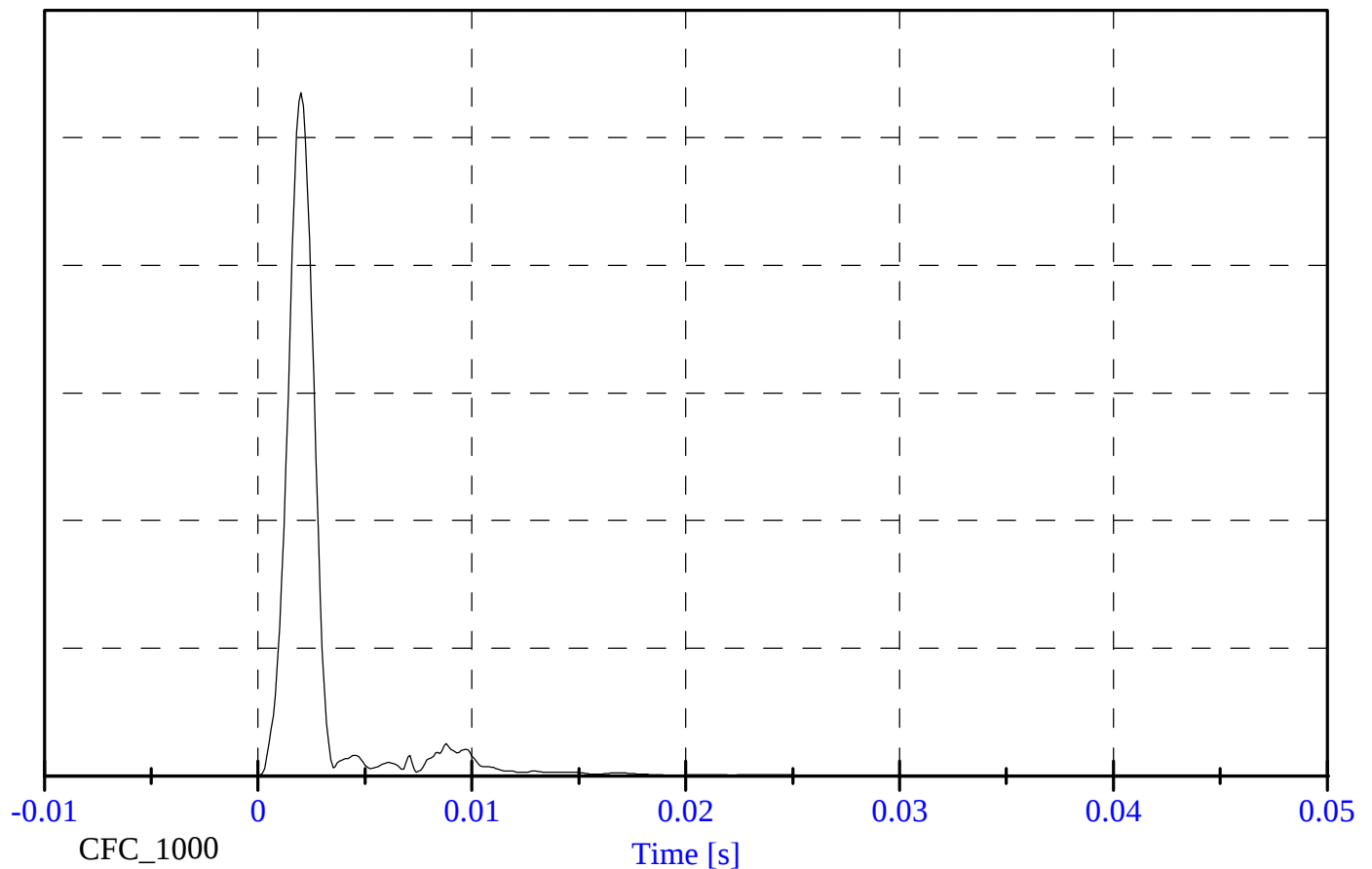
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	66.0-78.0 F	70.0 F	Passed
Lab Humidity:	10-70 %	35.00 %	Passed
Peak Resultant Accel.:	250-280 Gs	267.66 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	5.53 Gs	Passed
Curve PerCent NonModal:	< 10%	6.05 %	Passed

HYIII 3 Year Old Head Drop Test S/N:044

Head Resultant

Max: 267.7 [g] at 0.002 [s]

Min: 0.0 [g] at -0.080 [s]



Hybrid III Head Neck Extention Test S/N:044

Part 572P	Neck Extension Test	Calibration Date:	July 22, 2003
Serial No:	144	Work File:	4001

-----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 %	35.00 %	Passed
Test Pendulum Speed:	11.58-12.38 ft/s	12.30 ft/s	Passed

-----PENDULUM PULSE-----

Pulse at 6 ms:	3.30- 4.60 ft/s	3.89 ft/s	Passed
Pulse at 10 ms:	6.20- 8.20 ft/s	6.94 ft/s	Passed
Pulse at 14 ms:	9.20-11.50 ft/s	9.47 ft/s	Passed

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

Maximum Rotation:	83.0-93.0 Deg	86.18 Deg	Passed
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-----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	-53.30--43.70 N-m	-45.61 N-m	Passed
Occipital Moment Decay:	60.0-80.0 ms	71.60 ms	Passed

Hybrid III 3 Year Old Head Neck Flexion Test S/N:044

Part 572P	Neck Flexion Test	Calibration Date:	July 22, 2003
Serial No:	044	Work File:	4001

-----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:	5.40- 5.60 m/s	5.60 m/s	Passed

-----PENDULUM PULSE-----

Pulse at 10 ms:	2.00- 2.70 m/s	2.13 m/s	Passed
Pulse at 15 ms:	3.00- 4.00 m/s	3.10 m/s	Passed
Pulse at 20 ms:	4.00- 5.10 m/s	4.20 m/s	Passed

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

Maximum Rotation:	70.0-82.0 Deg	81.53 Deg	Passed
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-----MOMENT ABOUT THE OCCIPITAL CONDYLE-----

Max Occipital Moment:	42.00- 53.00 N-m	47.85 N-m	Passed
Occipital Moment Decay:	60.0-80.0 ms	74.00 ms	Passed

Hybrid III 3 Year Old Thorax Test S/N:044

Part 572P Thorax Impact

Calibration Date: July 22, 2003

Serial No: 044

Work File: 4001

-----TEST RESULTS-----

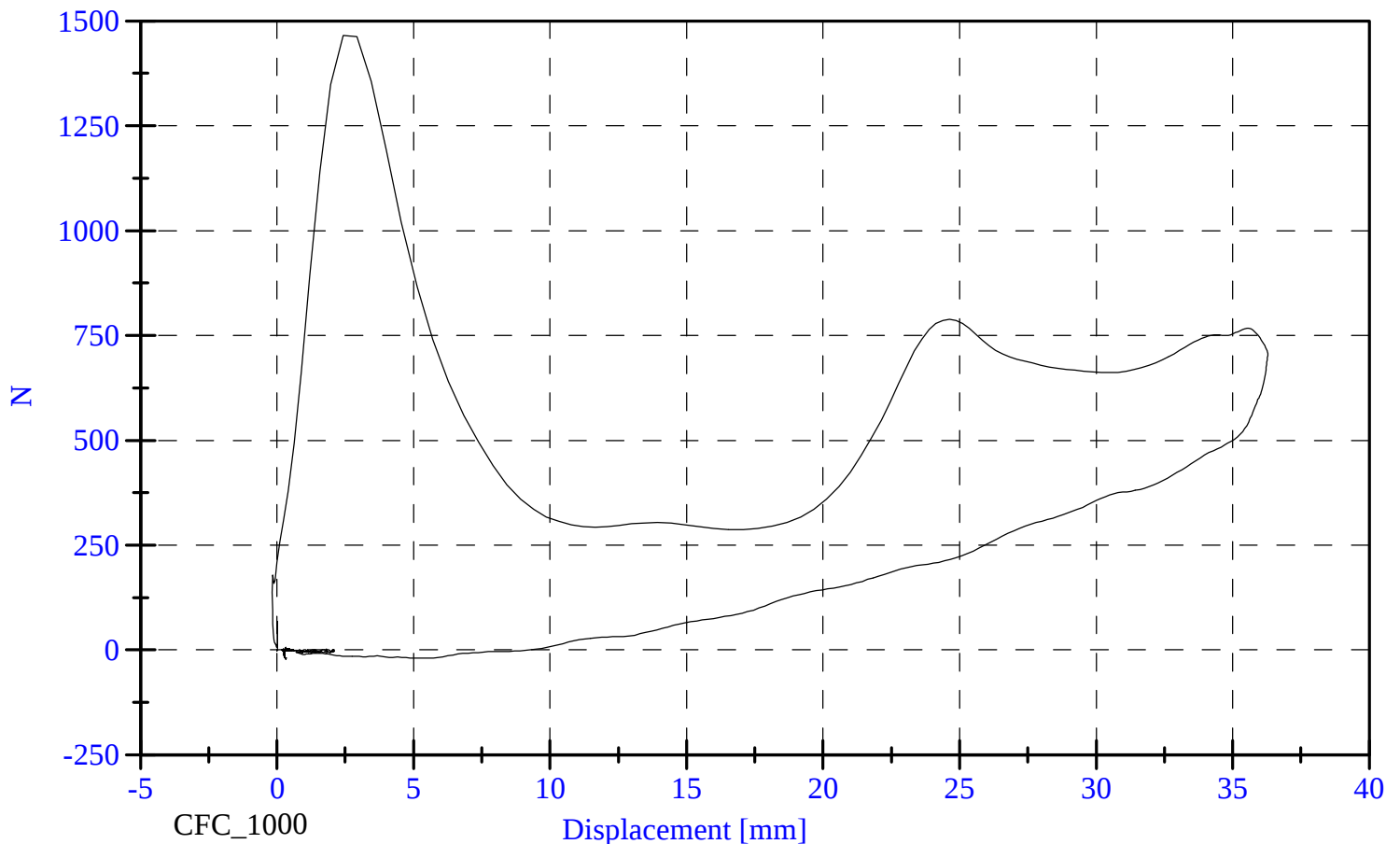
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	36.00 %	Passed
Pendulum Velocity:	5.90- 6.10 m/s	6.08 m/s	Passed
Maximum Deflection:	32.00-38.00 mm	36.28 mm	Passed
Maximum Res. Force:	680.00- 810.00 N	767.48 N	Passed
Internal Hysteresis:	65-85 %	73.20 %	Passed
Pass Sternum Force Criteria?:	860.00 N	788.71	Passed

Hybrid III 3 Year Old Thorax Test S/N:044

Probe Force vs. Displacement

Max: 1465.5 [N] at 2.421 [mm]

Min: -21.7 [N] at 0.325 [mm]



SECTION 11

Test Equipment and Instrumentation Calibration

CALIBRATION DATA FOR TEST 07-3-01

SENSOR NAME	MANUFACTURER AND SERIAL NUMBER	CALDATE
Sled Ax	MFG: ENDEVCO S/N: 24144	7/24/2003
P6 Head Ax	MFG: ENDEVCO S/N: P17912	7/17/2003
P6 Head Ay	MFG: ENDEVCO S/N: P17743	7/17/2003
P6 Head Az	MFG: ENDEVCO S/N: P15319	6/26/2003
P6 Redundant Head Az	MFG: ENDEVCO S/N: P16279	6/25/2003
P6 Chest Ax	MFG: ENDEVCO S/N: P15334	7/17/2003
P6 Chest Ay	MFG: ENDEVCO S/N: P15321	7/17/2003
P6 Chest Az	MFG: ENDEVCO S/N: P17758	7/17/2003
P6 Chest Displacement	MFG: SERVO S/N: 044	7/22/2003
P6 Pelvic Ax	MFG: ENDEVCO S/N: P16755	7/17/2003
P6 Pelvic Ay	MFG: ENDEVCO S/N: P15591	7/17/2003
P6 Pelvic Az	MFG: ENDEVCO S/N: P16155	7/17/2003
P6 Upper Neck Load Cell Fx	MFG: Denton S/N: 248-FX	7/18/2003
P6 Upper Neck Load Cell Fy	MFG: Denton S/N: 248-FY	7/18/2003
P6 Upper Neck Load Cell Fz	MFG: Denton S/N: 248-FZ	7/18/2003
P6 Upper Neck Load Cell Mx	MFG: Denton S/N: 248-MX	7/18/2003
P6 Upper Neck Load Cell My	MFG: Denton S/N: 248-MY	7/18/2003
P6 Upper Neck Load Cell Mz	MFG: Denton S/N: 248-MZ	7/18/2003
P6 Lower Neck Load Cell Fx	MFG: Denton S/N: 249Fx	7/18/2003
P6 Lower Neck Load Cell Fy	MFG: Denton S/N: 249Fy	7/18/2003
P6 Lower Neck Load Cell Fz	MFG: Denton S/N: 249Fz	7/18/2003
P6 Lower Neck Load Cell Mx	MFG: Denton S/N: 249Mx	7/18/2003
P6 Lower Neck Load Cell My	MFG: Denton S/N: 249My	7/18/2003
P6 Lower Neck Load Cell Mz	MFG: Denton S/N: 249Mz	7/18/2003

SECTION 12

Link to High Speed Movies

Test 07-3-01 North View

Test 07-3-01 South View