

REPORT NUMBER: 214MDB-CAL-10-2

**SAFETY COMPLIANCE TESTING FOR FMVSS 214
DYNAMIC SIDE IMPACT PROTECTION
MOVING DEFORMABLE BARRIER**

**FORD MOTOR COMPANY
2010 FORD FLEX SE
4-DOOR WAGON**

NHTSA NUMBER: CA0205

**PREPARED BY:
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Test Date: May 25, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NVS-220, WEST BUILDING 4TH FLOOR
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WASHINGTON, DC 20590**

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16. Abstract A 48/24 km/h 90° (Moving Deformable Barrier) Compliance Test was conducted on the subject 2010 Ford Flex SE 4-Door Wagon in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP- 214D-09 for the determination of FMVSS 214 Side Impact Protection compliance. The test was conducted at the Calspan Corporation Transportation Research Group in Buffalo, New York, on May 25, 2010. The impact velocity of the Moving Deformable Barrier (MDB) was 52.9 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 21.7°C. The target vehicle's maximum post test static crush was 219 mm at level 3. The test vehicle's occupant performance is as follows:																										
<table border="1"> <thead> <tr> <th></th> <th align="center">DRIVER</th> <th align="center">PASS.</th> </tr> </thead> <tbody> <tr> <td>HIC</td> <td align="center">55.5</td> <td align="center">149.9</td> </tr> <tr> <td>Max. Rib Deflection (mm)</td> <td align="center">29.0</td> <td></td> </tr> <tr> <td>Sum of Abdomen Forces (N)</td> <td align="center">478.6</td> <td></td> </tr> <tr> <td>Pubic Symphysis (N)</td> <td align="center">1142.4</td> <td></td> </tr> <tr> <td>Spine (g's)</td> <td></td> <td align="center">41.5</td> </tr> <tr> <td>Sum of Acetabular and Iliac</td> <td></td> <td align="center">3425.7</td> </tr> </tbody> </table>							DRIVER	PASS.	HIC	55.5	149.9	Max. Rib Deflection (mm)	29.0		Sum of Abdomen Forces (N)	478.6		Pubic Symphysis (N)	1142.4		Spine (g's)		41.5	Sum of Acetabular and Iliac		3425.7
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The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																										
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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This moving deformable barrier side impact test is part of the FY 2010 FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-07-D-00064. The purpose of this test was to evaluate side impact protection in a 2010 Ford Flex SE 4-Door Wagon. The side impact test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-09, dated July 2009).

SUMMARY

A model year 2010 Ford Flex SE 4-Door Wagon was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 52.9 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The side impact test was conducted by the Calspan Corporation Transportation Sciences Group in Buffalo, New York on May 25, 2010. Pre-test and post-test photographs of the test vehicle, the MDB, and test dummies are included in this report.

Test dummies were placed in both the driver and left rear designated seating positions according to instructions specified in the OVSC Test Procedure dated July 2009. The side impact event was documented by 1 real-time and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The ES2-re male dummy was instrumented with a tri-axial accelerometer pack located in the head, 3 rib displacement transducers located in the chest, 3 load cells located in the abdomen and a load cell in the pubic symphysis. The SID-IIs female dummy was instrumented with tri-axial accelerometer packs located in the head and spine. Load cells were located in the pubic symphysis and acetabulum. A summary of each dummy's configuration and performance verification test data has been included in this report along with the dummy response traces.

The occupant data is summarized below:

Driver ES-2re Male Dummy		
HIC	55.5	
UPPER RIB DEFLECTION	18.3	mm
MIDDLE RIB DEFLECTION	21.2	mm
LOWER RIB DEFLECTION	29.0	mm
ABDOMEN (FRONT)	76.9	N
ABDOMEN (MID)	111.9	N
ABDOMEN (REAR)	293.5	N
SUM OF ABDOMEN FORCES	478.6	N
PUBIC SYMPHYSIS	1142.4	N

Passenger SID-IIs Female Dummy		
HIC	149.9	
MAX. SPINE ACCELERATION	38.6	g
SPINE X	-9.9	g
SPINE Y	38.6	g
SPINE Z	-14.3	g
SPINE RESULTANT	41.5	g
ACETABULAR	3062.1	N
ILIAC	483.3	N
SUM	3425.7 N@ 49.9 ms	

SECTION 2

**DATA SHEET NO. 1
TEST VEHICLE INFORMATION AND OPTIONS**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

Vehicle Information		Options	
Make	Ford Motor Company	ESC	Yes
Model	Flex SE	All-Wheel Drive	No
Body Style	4-Door Wagon	Power Steering	Yes
VIN	2FMGK5BC5ABA91131	Tilt Steering Wheel	Yes
Body Color	Black	Driver Side Curtain Airbag	Yes
Engine Disp (liters)	3.5	Driver Side Torso Airbag	Yes
# of Cylinders	6	Driver Combo Bag	No
Engine Placement	Lateral	Driver Seat Belt Pretensioners	Yes
Transmission Type	Automatic	Driver Seat Belt Load Limiters	Yes
Transmission Speeds	6	Driver Power Seats	Yes
Overdrive	Yes	Rear Pass. Curtain Airbag	Yes
Final Drive	Front	Rear Pass. Side Torso Airbag	No
Odometer Reading	37 miles	Rear Pass. Seat Belt Pretensioners	No
		Rear Pass. Seat Belt Load Limiters	No
		Rear Pass. Power Seats	No
		Power Windows	Yes
		Air Conditioning	Yes
		AM/FM CD	Yes
		Automatic Door Locks (ADL)	Yes
		Does owner's manual provide instructions to disable ADLs?	Yes
		Anti-Lock Brakes	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2708
		GAWR Front (kg)	1311
Date of Manufacture	1/2010	GAWR Rear (kg)	1420

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	Bench	
Number Of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				526.0
Cargo Wt. (RCLW) (kg)				49.7

**DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

TIRE PRESSURES

	Units	LF	RF	RR	LR
As Delivered	kpa	240	240	240	240
As Tested	Kpa	240	240	240	240

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			Fully Loaded (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	592.0	434.0		632.5	512.0		635.5	512.5	
Right	kg	543.0	449.0		547.0	501.0		544.5	497.0	
Ratio	%	56.2	43.8		53.8	46.2		53.9	46.1	
Totals	kg	1135.0	883.0	2018.0	1179.5	1013.0	2192.5	1180.0	1009.5	2189.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2018.0
Weight of one P572U and one P572V ATD	kg	129.3
Rated Cargo/Luggage Weight (RCLW)	kg	49.7
Calculated Vehicle Target Weight (TVTW)	kg	2197

* Actual As Tested Weight (ATW) will be TVTW -4.5/-9.1 kg

Weight of Ballast (including instrumentation package and cameras): 42.2 kg

WEIGHT of BALLAST and VEHICLE COMPONENTS REMOVED TO MEET TVTW

Description of Component	Weight (kg)
Ballast (if any)	56.7

TEST VEHICLE ATTITUDES

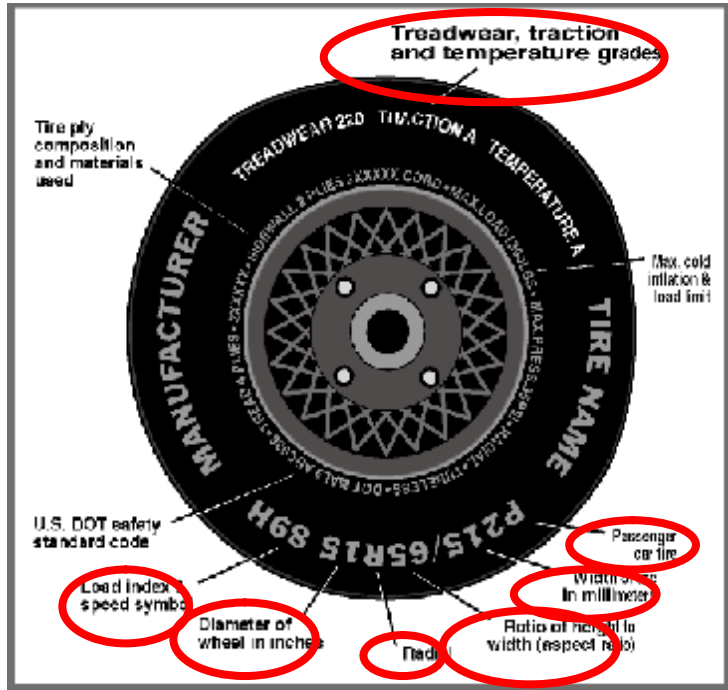
	Units	LF	RF	LR	RR
Fully Loaded	mm	786	798	807	812
As Tested	mm	783	795	815	804
DIFF Δ	mm	3	3	-8	8

TEST VEHICLE VERTICAL IMPACT LINE AND CG

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2991
Target Vertical Impact Reference Line Aft of Front Axle	mm	508
Actual Vertical Impact Reference Line Aft of Front Axle	mm	500

**DATA SHEET NO. 3
VEHICLE TIRE INFORMATION**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	240	240
Recommended Tire Size	P235/60R17	P235/60R17
Tire Size on Vehicle	P235/60R17	P235/60R17
Tire Manufacturer	Hankook	Hankook
Tire Name	Optimo H725	Optimo H725
Tire Type	Passenger	Passenger
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	60	60
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index & Speed Symbol	100T	100T
Treadwear	-	-
Traction Grade	-	-
Temperature Grade	-	-

**DATA SHEET NO. 4
SEAT AND SEAT BELT ADJUSTMENT DATA**

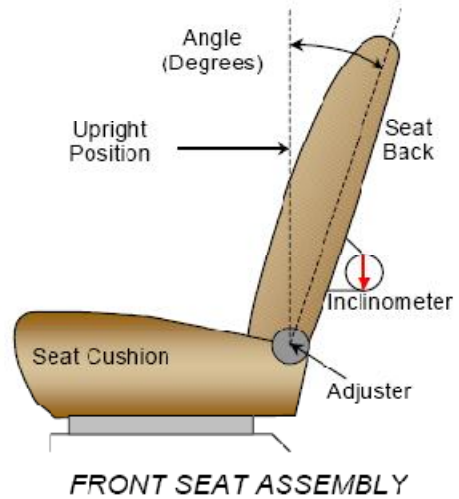
Test Vehicle: 2010 Ford Flex SE
 Test Program: FMVSS 214 Side Impact

NHTSA No. CA0205
 Test Date: May 25, 2010

NORMAL DESIGN RIDING POSITION

Driver seat:
 An inclinometer was placed on the head restraint post and the seat back was reclined 16.7 degrees from vertical.

Passenger seat:
 The seat back was set to the forward-most locked position to achieve the head level requirement for the SID-IIs final position.



SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	16.7
Passenger w/Seated Dummy	--

SEAT FORE/AFT POSITIONS

The front outboard seat was placed in the mid-travel position while maintaining the seat cushion mid-angle position. The rear outboard seat did not have a fore/aft or cushion angle adjustment.

SEAT FORE/AFT POSITION

	Driver Seat	Rear Seat
Total Fore/Aft Travel (mm)	252	N/A
Test Position (mm)	126	N/A
Test Detent (forward-most detent defined as 0)	N/A	N/A
Total Number of Detents (including 0)	N/A	N/A

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	5	3 (Mid)
Rear Seat	N/A	N/A

**DATA SHEET NO. 5
FUEL SYSTEMS AND STEERING WHEEL POSITION DATA**

Test Vehicle: 2010 Ford Flex SE

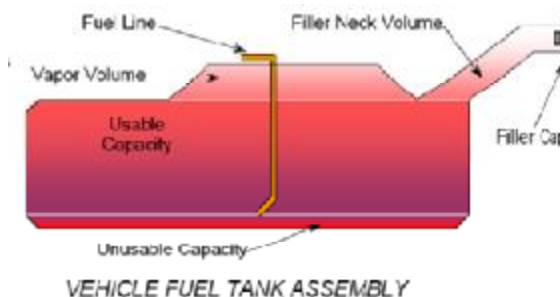
NHTSA No. CA0205

Test Program: FMVSS 214 Side Impact

Test Date: May 25, 2010

FUEL SYSTEM INFORMATION

The test vehicle is equipped with an electric fuel pump. The fuel pump operates continuously while the engine is running

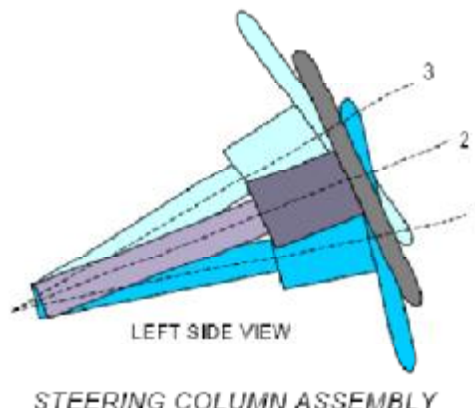


FUEL TANK CAPACITY

	Liters
Usable Capacity (Form 1)	70.4
Usable Capacity (Owner's Manual)	70.4
92%-94% of Fuel Tank Usable Capacity	64.8 – 66.2
Actual Amount of Stoddard Used	65.5

STEERING COLUMN ADJUSTMENT

A flat plate was placed on the top and bottom of steering wheel. The inclinometer was placed on the flat plate to measure the angle.

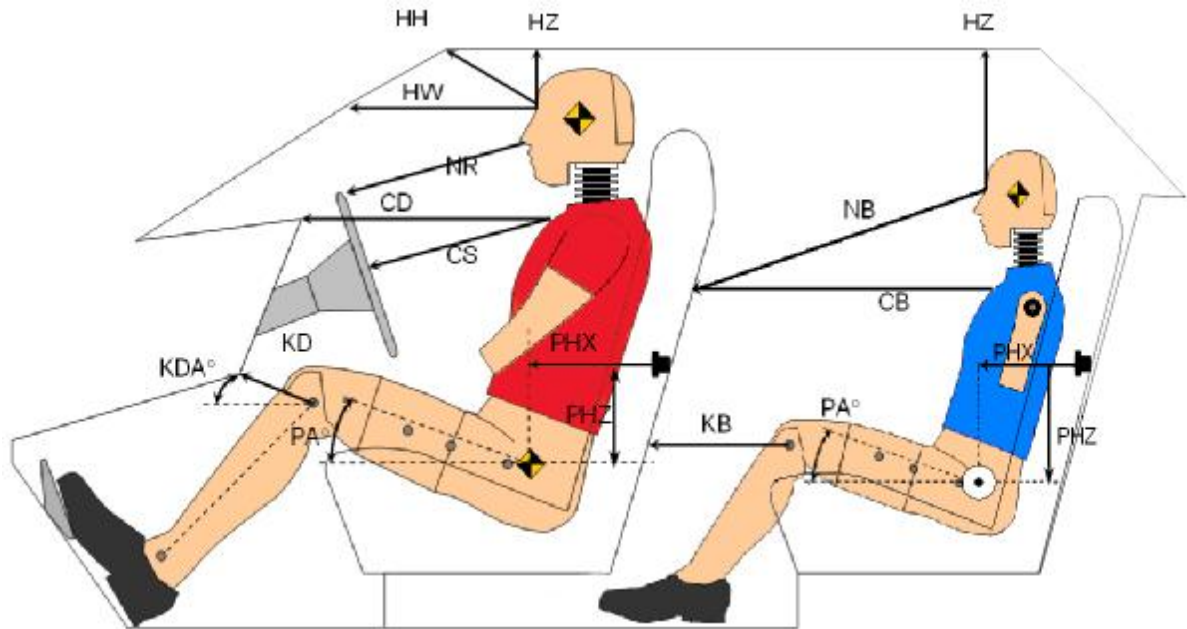


STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	23.6	
Geometric Center – Position 2	26.5	
Uppermost – Position 3	29.4	
Telescoping Steering Wheel Travel		40
Test Position	26.5	20

**DATA SHEET NO. 6
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle:	2010 Ford Flex SE	NHTSA No.	CA0205
Test Program:	FMVSS 214 Side Impact	Test Date:	May 25, 2010

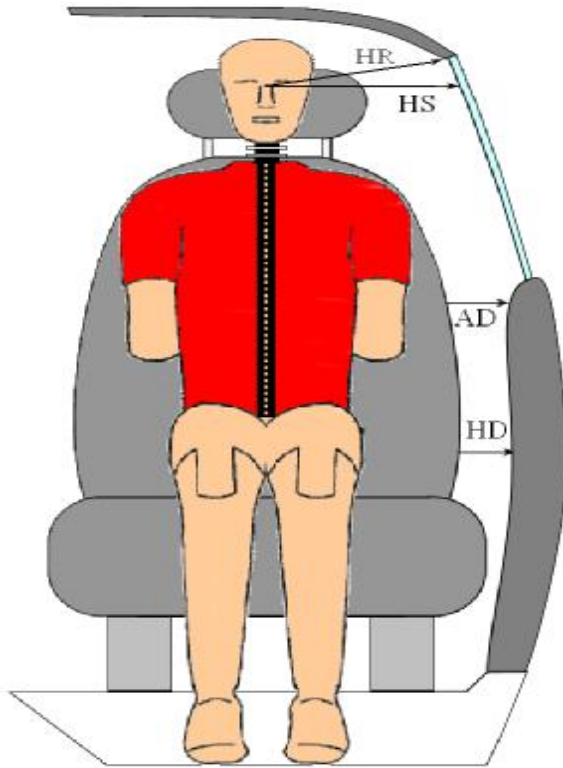


NOTE: 4-door vehicle shown. Rear dummy PHX and PHZ measurements for a 2-door vehicle would use the B-post striker as a reference point.

Frt. Occupant Code	Rear Occupant Code	Measurement Description	037 ES-2re		224 SID-IIs	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	538			
HW		Header to Windshield	769			
HZ	HZ	Head to Roof	285		335	
NR	NB	Nose to Rim/Seat Back	453		655	
CD	CB	Chest to Dash/Seat Back	608		638	
CS		Chest to Steering Wheel	345			
KDL	KBL	Left Knee to Dash/Seat Back	163	25 deg	340	8 deg
KDR	KBR	Right Knee to Dash/Seat Back	170		335	7 deg
PA	PA	Pelvic Angle		21.4		22 dg
PHX	PHX	H-Point to Striker (X-Axis)	221		294	
PHZ	PHZ	H-Point to Striker (Z-Axis)	173		170	

**DATA SHEET NO. 7
DUMMY LATERAL CLEARANCE DIMENSIONS**

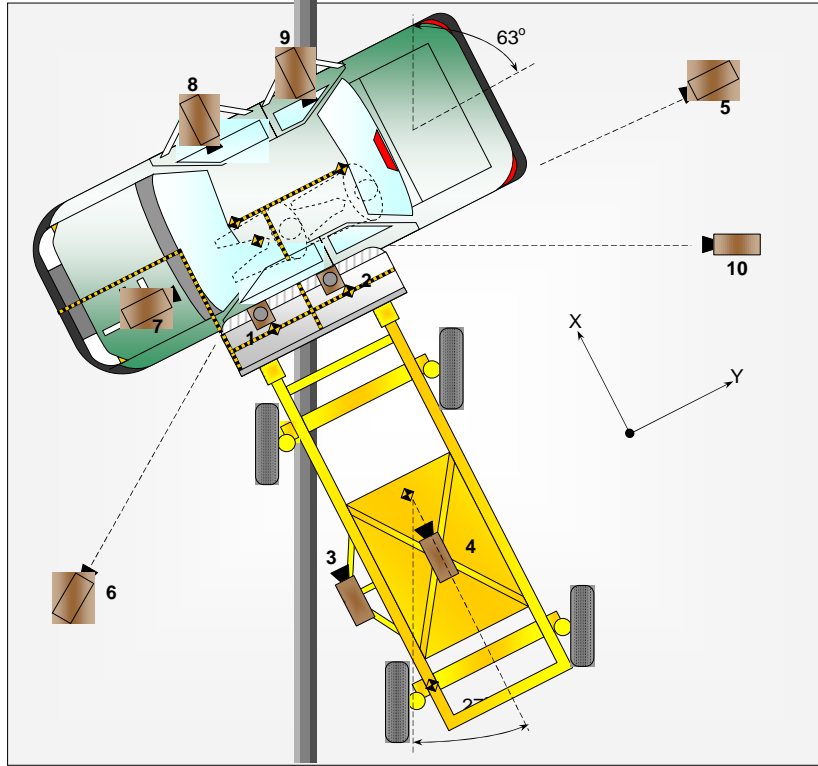
Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010



Code		Units	Front Occupant	Rear Occupant
HR	Head to Side Header	mm	300	315
HS	Head to Side Window	mm	401	390
AD	Arm to Door	mm	108	130
HD	H-point to Door	mm	183	152

**DATA SHEET NO. 8
HIGH SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

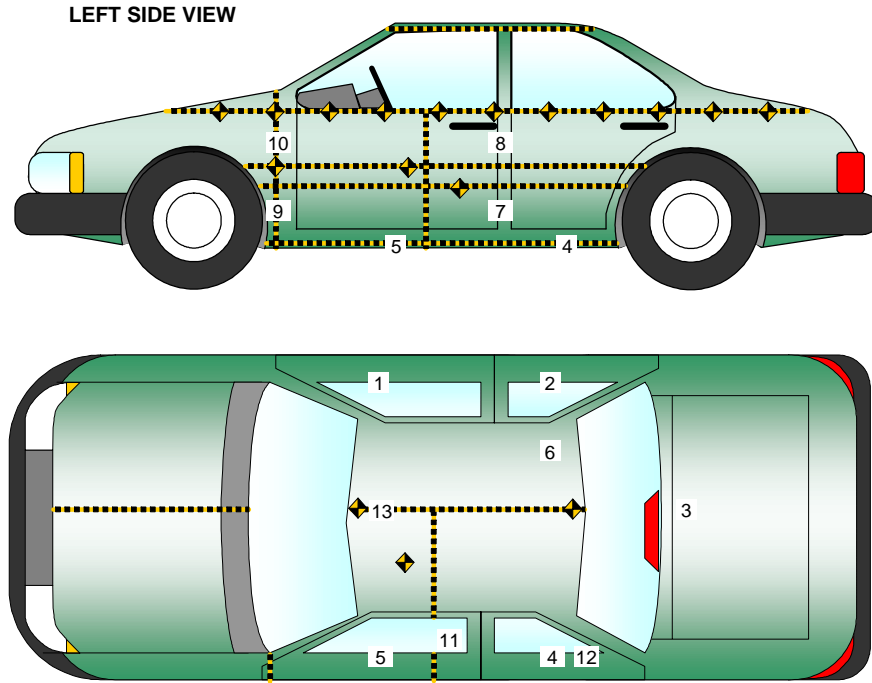


No.	Camera View	Location			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	72	812	-4880	8	1000
2	Overhead Close-up	195	855	-4880	28	1000
3	Impact Point Close-up (MDB)				13	500
4	Centerline of Impact (MDB)				7.5	500
5	Right Side View	0	11300	940	50	1000
6	Left Side View	-2500	-1870	980	28	1000
7	Front Seat Occupant - Frontal View (OB)				25	500
8	Front Seat Occupant - Side View (OB)				12.5	500
9	Rear Passenger - Side View (OB)				12.5	500
10	Real Time Coverage				-	30

Reference: Impact Point projected to Ground
 +X = To Front of MDB, +Y = To Right of MDB, +Z = Down
 *All measurements accurate to ± 6 mm.

DATA SHEET NO. 9
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle:	2010 Ford Flex SE	NHTSA No.	CA0205
Test Program:	FMVSS 214 Side Impact	Test Date:	May 25, 2010



Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3344	675	372
2	Right Sill at Rear Seat	2330	686	380
3	Rear Floorpan Above Axle	921	38	431
4	Left Sill at Rear Door	2317	-678	378
5	Left Sill at Front Door	3348	-670	371
6	Left Rear Occ. Compartment	2370	407	269
7	Left B-Post Lower	2544	-691	445
8	Left B-Post Middle	2499	-687	1059
9	Left A-Post Lower	3524	-675	667
10	Left A-Post Middle	3478	-695	1198
11	Front Seat Track	2718	-589	446
12	Rear Seat Track or Structure	1662	-684	533
13	Vehicle CG	3102	53	616

X – Test Vehicle Rear Bumper (+ forward)
Y – Test Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

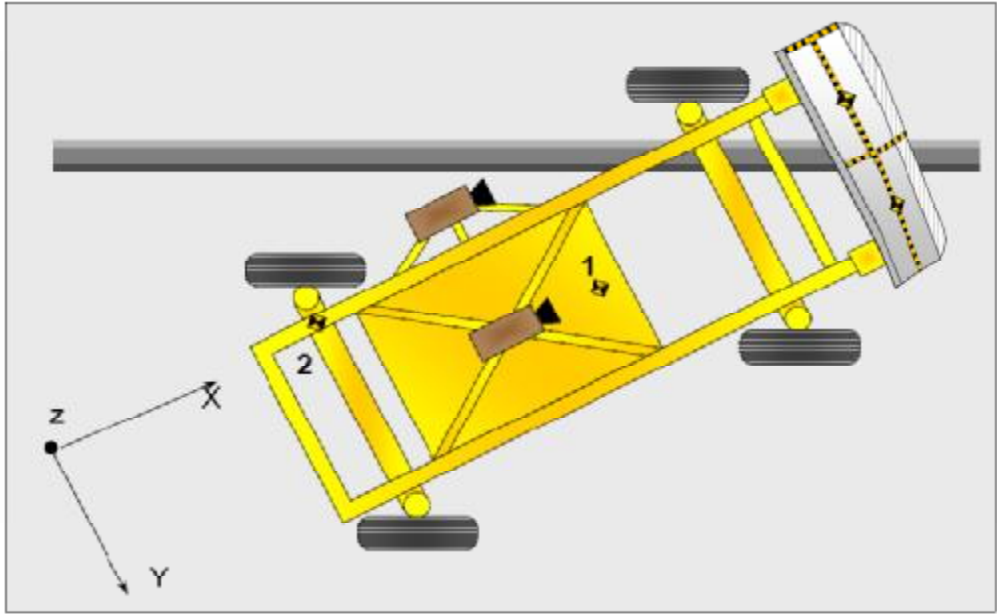
DATA SHEET NO. 10
TEST VEHICLE ACCELEROMETER DATA SUMMARY

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

Loc. No	Description	Peak Values (g's)			
		Max	Time (ms)	Min	Time (ms)
1	Right Sill at Front Seat (X)	4.8	31.6	-5.2	13.4
	Right Sill at Front Seat (Y)	21.8	7.4	-4.9	32.0
	Right Sill at Front Seat (Z)	3.4	61.9	-7.8	14.4
	Right Sill at Front Seat Resultant	22.9	7.5	0.0	-60.9
2	Right Sill at Rear Seat (X)	4.2	31.9	-6.0	13.6
	Right Sill at Rear Seat (Y)	22.3	7.0	-1.9	142.8
	Right Sill at Rear Seat (Z)	4.0	87.0	-9.6	11.6
	Right Sill at Rear Seat Resultant	22.4	7.0	0.0	-19.3
3	Rear Floor Pan Above Axle (X)	2.5	59.6	-4.5	38.9
	Rear Floor Pan Above Axle (Y)	19.5	7.4	-2.3	107.2
	Rear Floor Pan Above Axle (Z)	4.8	18.3	-6.0	12.6
	Rear Floor Pan Above Axle Resultant	19.6	7.4	0.0	-79.1
4	Left Sill at Rear Door (Y)	36.4	4.3	-16.9	17.2
5	Left Sill at Front Door (Y)	36.7	3.6	-9.1	16.8
6	Left Rear Occ. Compartment(Y)	21.6	7.0	-2.4	89.0
7	Left B-Post Lower (Y)	126.2	6.6	-359.9	81.2
8	Left B-Post Middle (Y)	171.0	11.6	-5.6	-1.0
9	Left A-Post Lower (Y)	29.1	5.3	-8.0	28.0
10	Left A-Post Middle (Y)	19.1	20.1	-15.5	31.2
11	Front Seat Track (Y)	54.5	13.2	-14.3	38.9
12	Rear Seat Track or Structure (Y)	27.8	26.3	-16.6	22.3
13	Vehicle CG (X)	6.5	29.0	-13.1	16.6
	Vehicle CG (Y)	34.4	12.3	-23.1	26.2
	Vehicle CG (Z)	28.0	31.2	-30.2	40.7
	Vehicle CG Resultant	34.6	12.0	0.0	-33.3

DATA SHEET NO. 11
MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010



No.	Accelerometer Location	Coordinates (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	1859	0	-330	X	1.1	101.0	-19.4	30.8
					Y	2.5	66.2	-8.0	50.4
					Z	12.0	58.4	-12.7	27.3
					RES	22.8	27.2	0.0	-56.7
2	MDB Rear	386	-660	-660	X	1.9	107.4	-22.4	37.0
					Y	3.3	65.6	-2.7	14.1

Reference: +X = Rearward +Y = To Right +Z = Up

**DATA SHEET NO. 12
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

MDB SPECIFICATIONS

Measurement Description	Requirement	Value
Overall Width of the Framework Carriage (mm)	1241 – 1261	1250
Overall length including honeycomb face (mm)	4140 – 3990	4120
Wheelbase of Framework Carriage	2566 – 2616	2590
Center of gravity location aft of front axle		1104
MDB Front Axle Weight		782.0
MDB Rear Axle Weight		580.5
MDB Total Weight	1356.5 – 1365.5	1362.5

SPEED AND IMPACT ANGLE DATA

	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	52.9 ± 0.8	52.9
Trap No. 2 Velocity (Redundant)	km/h	52.9 ± 0.8	52.9
MDB C/L to Target Vehicle C/L	Degrees	88.5 to 91.5	90

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Row	Description	Height	From Centerline		Maximum Crush
			Distance	Direction	
1	Center of Bumper	432	800	Left	174
2	Top of Bumper	533	700	Left	104
3	Mid-Level	686	800	Right	74
4	Top of Stack	813	800	Right	97

MDB IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	8
Vertical Offset	mm	+/- 20	-10

DATA SHEET NO. 13
DUMMY INJURY RESPONSE DATA FOR ES-2re

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

DUMMY Serial # 037				
	Positive		Negative	
	MAX	TIME (ms)	MAX	TIME (ms)
HEAD ACCELERATION (g)				
Longitudinal (X)	2.8	208.6	-11.9	61.5
Lateral (Y)	27.7	60.7	-4.7	104.7
Vertical (Z)	6.2	39.1	-5.8	93.9
Resultant (R)	30.2	60.7	0.0	-74.1
HIC36 (t1, t2)	55.5		t1 = 47.5 ms	t2 = 71.2 ms
THORAX DEFLECTION (mm)				
Upper Rib	18.3	46.0	-7.3	70.5
Middle Rib	21.2	46.7	-5.0	71.0
Lower Rib	29.0	47.3	-0.6	75.5
ABDOMINAL FORCES (N)				
Front	76.9	41.1	-48.1	12.4
Middle	111.9	41.6	-17.4	21.2
Rear	293.5	41.1	-17.5	22.6
SUM	478.6	41.2	-43.9	12.4
PELVIS FORCE (N)				
Pubic Symphysis (Y)	153.6	15.7	-1142.4	53.6

Reference:

Positive direction:

Longitudinal (x) = forward
 Lateral (y) = to right
 Vertical (z) = down

DATA SHEET NO. 14
DUMMY INJURY RESPONSE DATA FOR SID-IIs

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

DUMMY Serial No. 224				
	Positive		Negative	
	MAX	TIME (ms)	MAX	TIME (ms)
HEAD ACCELERATION (g)				
Longitudinal (X)	2.8	98.0	-12.9	74.2
Lateral (Y)	36.3	75.7	-4.1	259.3
Vertical (Z)	7.3	67.2	-4.5	42.7
Resultant (R)	38.4	74.1	0.0	-18.9
HIC36 (t1, t2)	149.9		t1 = 61.5 ms	t2 = 90.6 ms
LOWER SPINE (g)				
Longitudinal (X)	3.7	169.4	-9.9	46.8
Lateral (Y)	38.6	50.8	-5.2	168.9
Vertical (Z)	9.3	68.2	-14.3	51.8
Resultant (R)	41.5	50.9	0.0	-74.0
PELVIS FORCE (N)				
Acetabular	3062.1	49.1	-13.9	76.8
Iliac	483.3	55.7	-161.1	42.5
SUM	3425.7	49.9	-103.8	76.4

Reference:

Positive direction:

Longitudinal (x) = forward
 Lateral (y) = to right
 Vertical (z) = down

**DATA SHEET NO. 15
POST TEST OBSERVATIONS**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

TEST DUMMY INFORMATION AND CONTACT

Description	Front Occupant	Rear Occupant
Head Contact	Side of head – Side Curtain Airbag	Side of Head – Side Curtain Airbag
Upper Torso Contact	Side Torso Airbag	Upper Shoulder –Side Door
Lower Torso Contact	Side Torso Airbag	Side Door
Left Knee Contact	Side Door	Side Door
Right Knee Contact	No Contact	No Contact

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Door was Jammed shut	Door was Jammed shut
Right Side Doors	Door remained closed and latched	Door remained closed and latched
Hatch and Other Doors	Door remained closed and latched; Door opened without tools	
Seat Movement	0	0
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

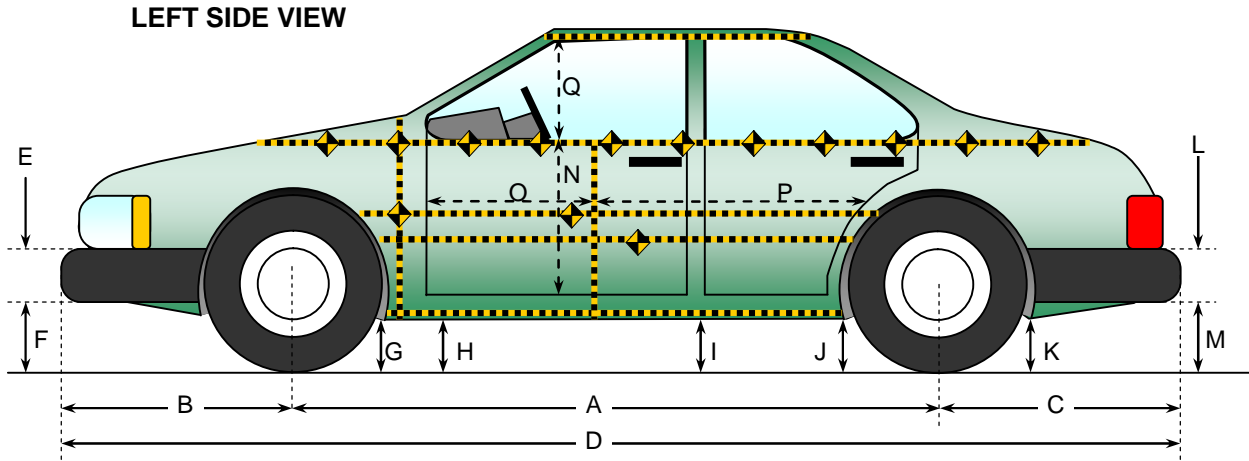
Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Window Damage	No apparent damage
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Front Occupant		Rear Occupant	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	No	NA	NA
Side Torso Airbag	Yes	Yes	No	NA
Head Airbag	No	NA	No	NA
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	Yes	No	NA

DATA SHEET NO. 16
VEHICLE PRETEST AND POST TEST MEASUREMENTS

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

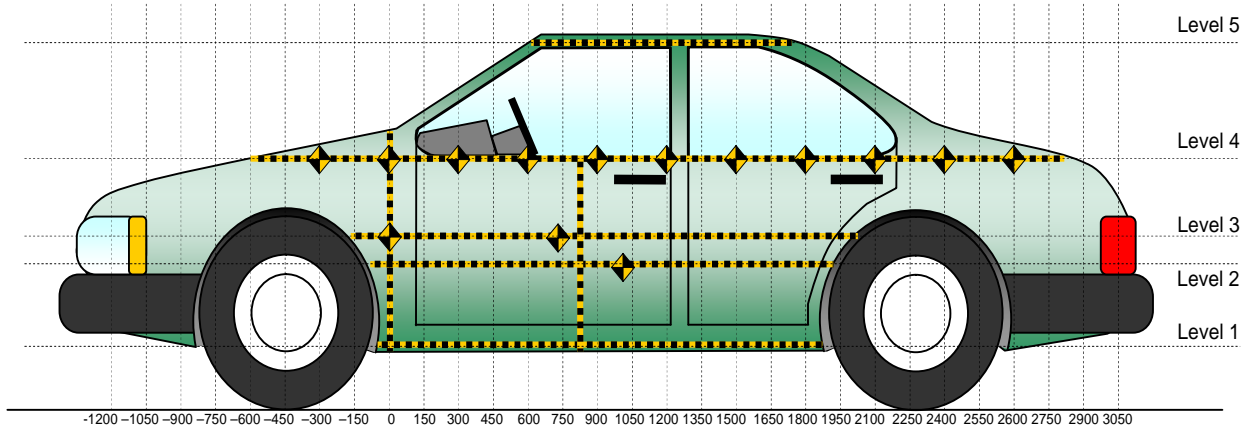


Code	Description	Pre-Test	Post-Test	Diff Δ
A	Wheelbase	2992	2994	-2
B	Front Axle to FSOV	974	976	-2
C	Rear Axle to RSOV	1157	1153	4
D	Total Length at Centerline	5123	5123	0
E	Front Bumper Thickness	135	135	0
F	Front Bumper Bottom to Ground	440	462	-22
G	Sill Height at Front Wheel Well	239	246	-7
H	Sill Height at Front Door Leading Edge	240	247	-7
I	Sill Height at B Pillar	243	255	-12
J1	Sill Height at Rear Wheel Well	255	276	-21
J2	Pinch Weld Height at Rear Wheel Well	221	229	-8
K	Sill Height Aft of Rear Wheel Well	296	306	-10
L	Rear Bumper Thickness	170	170	0
M	Rear Bumper Bottom to Ground	426	431	-5
N	Sill Height to Window Bottom Sill	847	771	76
O	Front Door Leading Edge to Impact CL	842	803	39
P	Rear Door Trailing Edge to Impact CL	1279	1261	18
Q	Front Window Opening	471	484	-13
R*	Right Side Length	5038	5042	-4
S*	Left Side Length	5037	5033	4
T*	Vehicle Width at B Post	1909	1739	170

* - not shown in schematic above

DATA SHEET NO. 17
EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010



All Measurements Shown in mm

LEFT SIDE VIEW

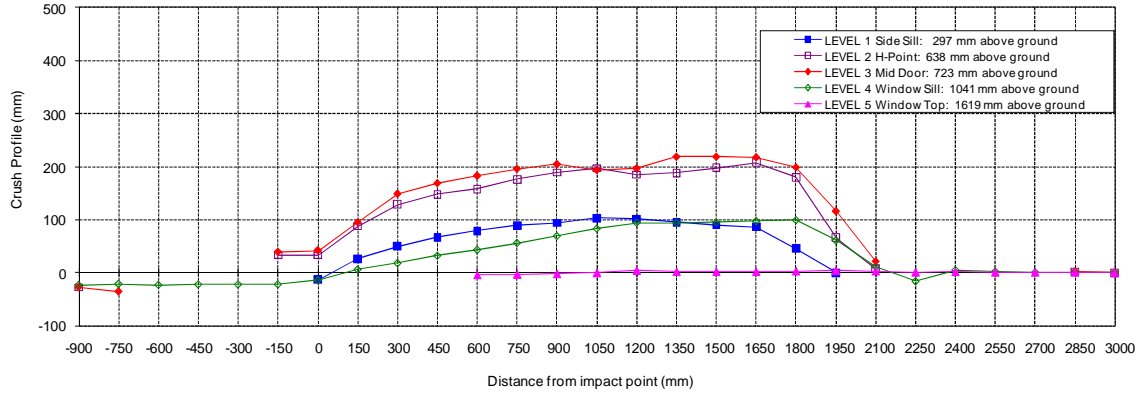
Maximum Exterior Crush Measurements

Level	Measurement Description	Maximum Exterior Static Crush	Distance from Impact	Height Above Ground
1	Sill Top	103	1200	297
2	Occupant H-Point	208	1800	638
3	Mid-Door	219	1500	723
4	Window Sill	99	1950	1041
5	Window Top	4	1350	1619

DATA SHEET NO. 18
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2010 Ford Flex SE
Test Program: FMVSS 214 Side Impact

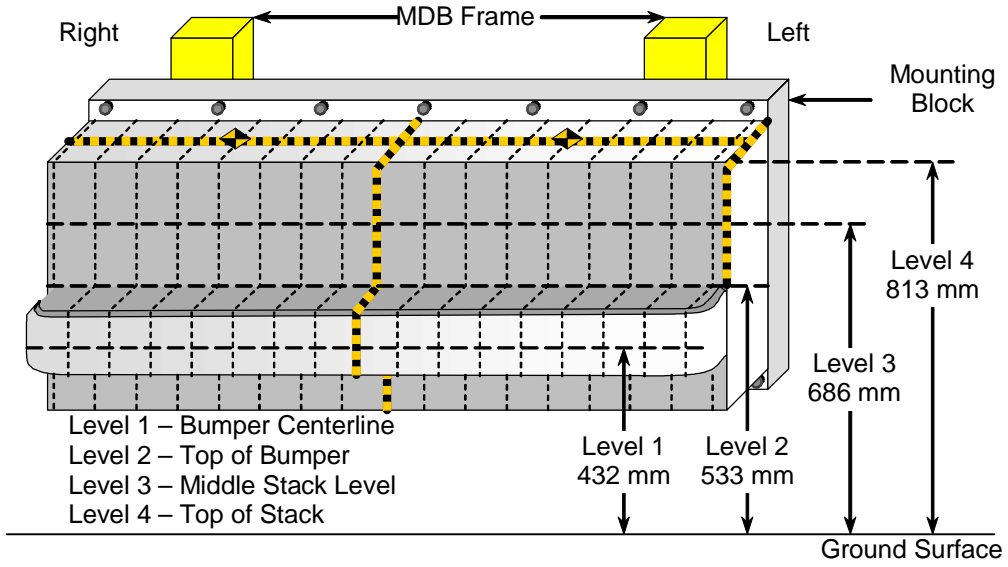
NHTSA No. CA0205
Test Date: May 25, 2010



	Pre-Test					Post-Test					Diff Δ				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	919	900	763	--	--	947	928	786	--	--	-28	-28	-23	--
-750	--	--	939	821	--	--	--	975	842	--	--	--	-36	-21	--
-600	--	--	--	845	--	--	--	--	868	--	--	--	--	-23	--
-300	--	--	--	865	--	--	--	--	887	--	--	--	--	-22	--
-150	--	--	--	879	--	--	--	--	901	--	--	--	--	-22	--
0	--	966	959	889	--	--	933	920	911	--	--	33	39	-22	--
150	941	946	946	897	--	954	913	905	911	--	-13	33	41	-14	--
300	942	951	952	908	--	916	863	857	902	--	26	88	95	6	--
450	947	952	953	912	--	897	823	804	894	--	50	129	149	18	--
600	949	953	955	916	--	882	805	786	884	--	67	148	169	32	--
750	949	953	955	919	649	870	795	772	876	653	79	158	183	43	-4
900	948	954	955	921	695	859	778	759	865	698	89	176	196	56	-3
1050	947	954	955	922	702	853	765	750	853	704	94	189	205	69	-2
1200	946	955	955	924	707	843	758	761	841	707	103	197	194	83	0
1350	944	953	955	924	712	842	768	758	830	708	102	185	197	94	4
1500	943	950	953	923	714	848	762	734	829	712	95	188	219	94	2
1650	940	948	951	922	715	850	750	732	827	713	90	198	219	95	2
1800	936	945	948	920	715	850	737	730	823	713	86	208	218	97	2
1950	933	943	946	918	714	887	763	747	819	711	46	180	199	99	3
2100	928	940	942	915	713	928	874	826	854	709	0	66	116	61	4
2250	--	954	950	912	710	--	947	929	902	707	--	7	21	10	3
2400	--	--	--	909	707	--	--	--	925	706	--	--	--	-16	1
2550	--	--	--	903	704	--	--	--	898	702	--	--	--	5	2
2700	--	--	--	897	699	--	--	--	895	698	--	--	--	2	1
2850	--	--	--	891	693	--	--	--	890	692	--	--	--	1	1
3000	--	955	946	885	685	--	954	944	884	684	--	1	2	1	1

**DATA SHEET NO. 19
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE**

Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010



Stack Level	Distance Right of Center									C/L	Distance Left of Center								
	800	700	600	500	400	300	200	100	0		100	200	300	400	500	600	700	800	
Level 1	174	163	148	141	140	141	137	137	136	134	133	133	132	132	134	146	168		
Level 2	104	97	89	86	84	82	80	78	77	76	75	74	73	72	72	77	84		
Level 3	28	10	10	12	19	34	41	38	13	9	9	10	11	14	21	37	74		
Level 4	45	9	5	2	9	27	54	39	19	12	11	15	24	29	39	56	97		

Reference: + X = Forward + Y = To Right + Z = Down

**DATA SHEET NO. 20
SUMMARY OF FMVSS 301 FUEL SYSTEM DATA**

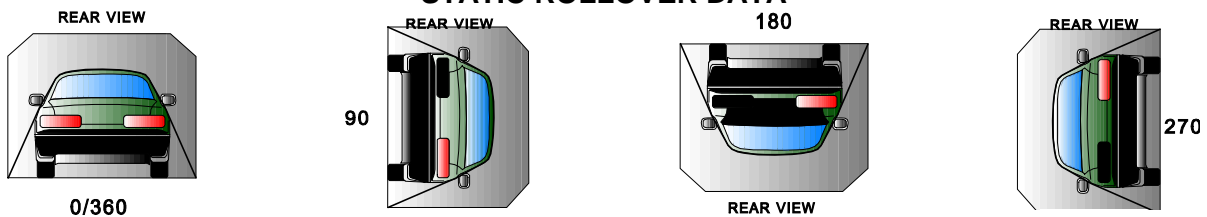
Test Vehicle: 2010 Ford Flex SE NHTSA No. CA0205
 Test Program: FMVSS 214 Side Impact Test Date: May 25, 2010

FUEL SYSTEM INTEGRITY POST IMPACT DATA

Time Interval	FMVSS 301 Maximum Allowable Spillage	Spillage (g)
Impact Until Motion Ceases	28 g	0
First Five Minutes Following Impact	142 g	0
Next 25 Minutes	28 g / 1 minute	0

Spillage Location(s)	None
----------------------	------

STATIC ROLLOVER DATA

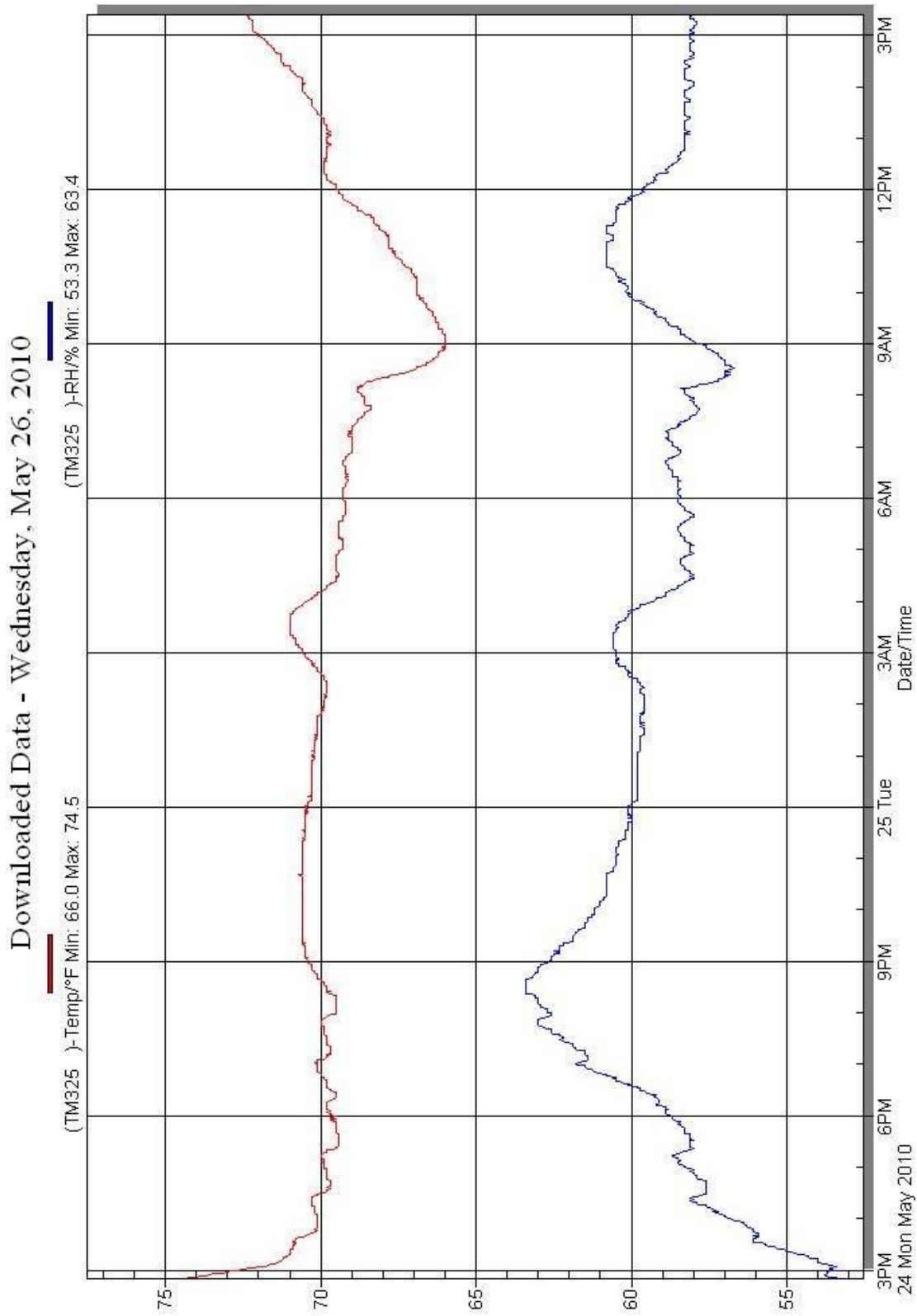


Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	8	seconds	5	minutes	6	minutes	8	seconds	7	minutes
90° - 180°	1	minutes	5	seconds	5	minutes	6	minutes	5	seconds	7	minutes
180°-270°	1	minutes	4	seconds	5	minutes	6	minutes	4	seconds	7	minutes
270°-360°	1	minutes	10	seconds	5	minutes	6	minutes	10	seconds	7	minutes

Rollover Stage	Spillage (g)			
	First 5 min. from onset of rotation	6 th min.	7 th min.	8 th min. (if required)
0° - 90°	0	0	0	0
90° - 180°	0	0	0	0
180°-270°	0	0	0	0
270°-360°	0	0	0	0
FMVSS 301 Maximum Allowable (for each 90° stage)	142	28	28	28

Rollover Stage	Spillage Location(s)
0° - 90°	None
90° - 180°	None
180°-270°	None
270°-360°	None

DATA SHEET NO. 21
TEMPERATURE AND HUMIDITY TRACE



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

FIGURE	TITLE	PAGE
A-1	Pre-Test Front View of Test Vehicle	A-3
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A-3	Pre-Test Rear View of Test Vehicle	A-5
A-4	Post-Test Rear View of Test Vehicle	A-6
A-5	Pre-Test Impacted Side View of Test Vehicle	A-7
A-6	Post-Test Impacted Side View of Test Vehicle	A-8
A-7	Pre-Test Frontal View of MDB Impactor Face	A-9
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A-30	Rollover 270 Degrees	A-32
A-31	Rollover 360 Degrees	A-33



Figure A-1 Pre-Test Front View of Test Vehicle



Figure A-2 Post-Test Front View of Test Vehicle



Figure A-3 Pre-Test Rear View of Test Vehicle



Figure A-4 Post-Test Rear View of Test Vehicle



Figure A-5 Pre-Test Impacted Side View of Test Vehicle



Figure A-6 Post-Test Impacted Side View of Test Vehicle



Figure A-7 Pre-Test Frontal View of MDB Impactor Face



Figure A-8 Post-Test Frontal View of MDB Impactor Face



Figure A-9 Pre-Test Left Side View of MDB Impactor Face



Figure A-10 Post-Test Left Side View of MDB Impactor Face



Figure A-11 Pre-Test Right Side View of MDB Impactor Face



Figure A-12 Post-Test Right Side View of MDB Impactor Face



Figure A-13 Pre-Test Top View of MDB Impactor Face



Figure A-14 Post-Test Top View of MDB Impactor Face



Figure A-15 Pre-Test Overhead View of Aligned MDB and Vehicle at Impact Location



Figure A-16 Pre-Test Occupant Compartment View Showing Both SIDS



Figure A-17 Post-Test Occupant Compartment View Showing Both SIDS



Figure A-18 Pre-Test Left Front Door Interior Trim



Figure A-19 Post-Test Left Front Door Interior Trim Showing SID Impact Locations



Figure A-20 Pre-Test Left Rear Interior Trim



Figure A-21 Post-Test Left Rear Door Interior Trim Showing SID Impact Locations



Figure A-22 Pre-Test Left Side View of Aligned MDB and Vehicle



Figure A-23 Pre-Test Right Side View of Aligned MDB and Vehicle



Figure A-24 Post-Test Close-Up View of Impact Point Target

MFD. BY FORD MOTOR CO.


DATE: 01/10
 FRONT GAWR: 1311KG/2890LB
 GVWR: 2708KG/5970LB
 REAR GAWR: 1420KG/3130LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
 VEHICLE SAFETY AND THEFT PREVENTION STANDARDS
 IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 2FMGK5BC5ABA91131 TYPE: MPV
 MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 526KG/1160LB
 OCCUPANTS = 7 TOTAL; 2 FRONT, 5 REAR

TIRE (FR): P235/60R17
 (RR): P235/60R17
 RIMS (FR): 17X7.5J
 (RR): 17X7.5J

PRESSURE (FR): 240 kPa/ 35 PSI COLD (RR): 240 kPa/ 35 PSI COLD


2FMGK5BC5ABA91131

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT:	UH	RC:	44	DSO:	
INT TR	TP/PS	R	AXLE	TR	SPR
CW		Z	3E	J	AAFF
					MS
					CBU

Figure A-25 Close-up View of Vehicle's Certification Label



Figure A-26 Close-up View of Vehicle's Tire Placard Label

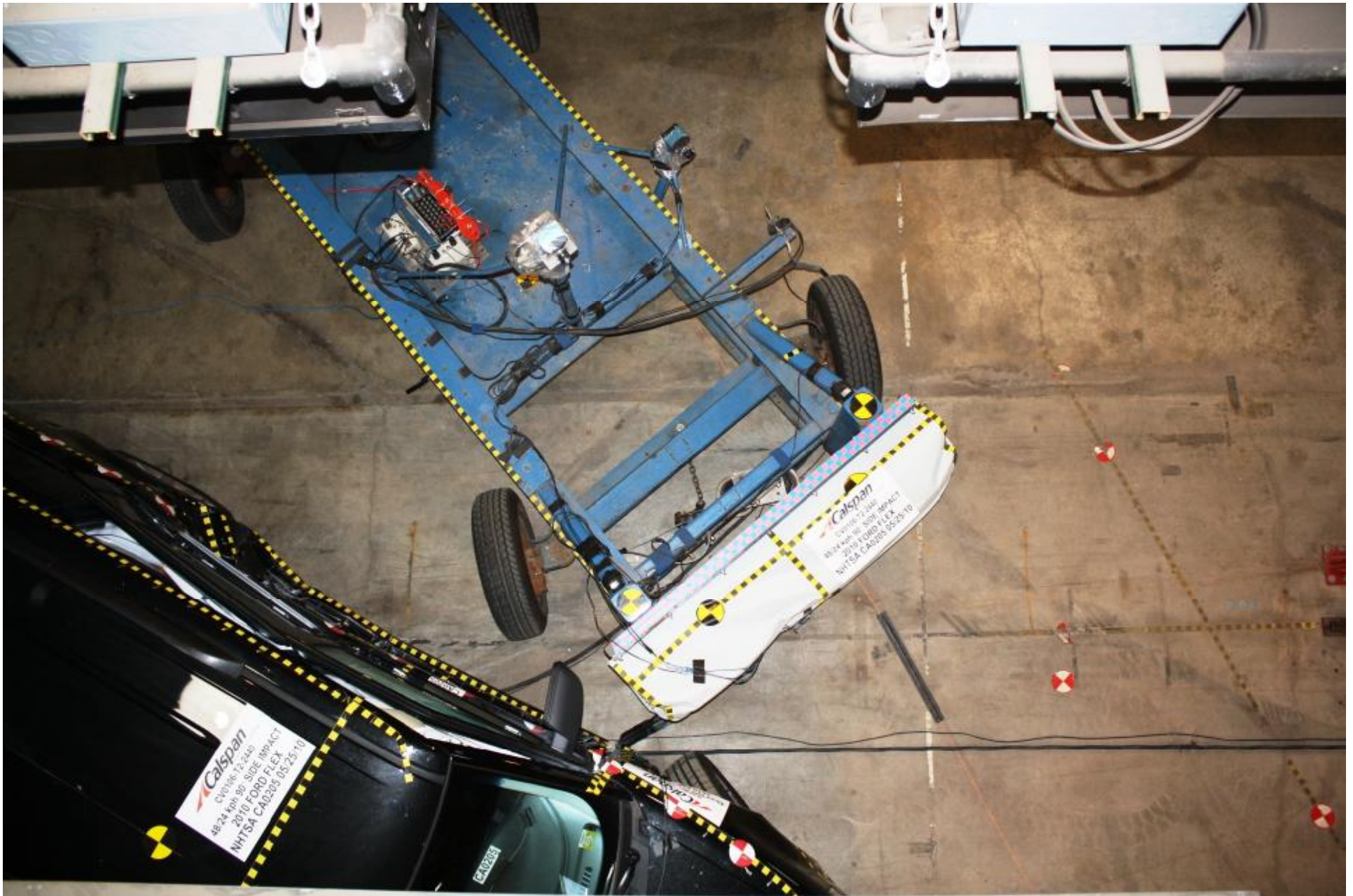


Figure A-27 Post-Test Overhead View of MDB and Target Vehicle



Figure A-28 Rollover 90 Degrees



Figure A-29 Rollover 180 Degrees



Figure A-30 Rollover 270 Degrees



Figure A-31 Rollover 360 Degrees

APPENDIX B
ES-2re DUMMY RESPONSE DATA
(SAE sign convention)

ES-2re DATA CHANNEL FILTER CLASS SUMMARY

Data Type	SAE Filter Class	Cut-off Frequency
Dummy Head Acceleration	1000	1650
Chest Deflection	180	300
Abdomen Force	600	1000
Pubic Force	600	1000

DATA CHANNEL TITLE KEY

Prefix	Suffix
V1 = Vehicle 1 (Test Vehicle)	Ax = Acceleration, X-direction
V2 = Vehicle 2 (Test Vehicle)	Ay = Acceleration, Y-direction
P1 = Left Front Seating Position (Driver)	Az = Acceleration, Z-direction
P4 = Left Second Row Seating Position (Passenger)	Fx = Force, X-direction
A1-A18 = Accelerometer Location Number	Fy = Force, Y-direction
	Fz = Force, Z-direction
	Dx = Deflection, X-direction
	Dy = Deflection, Y-direction
	Dz = Deflection, Z-direction

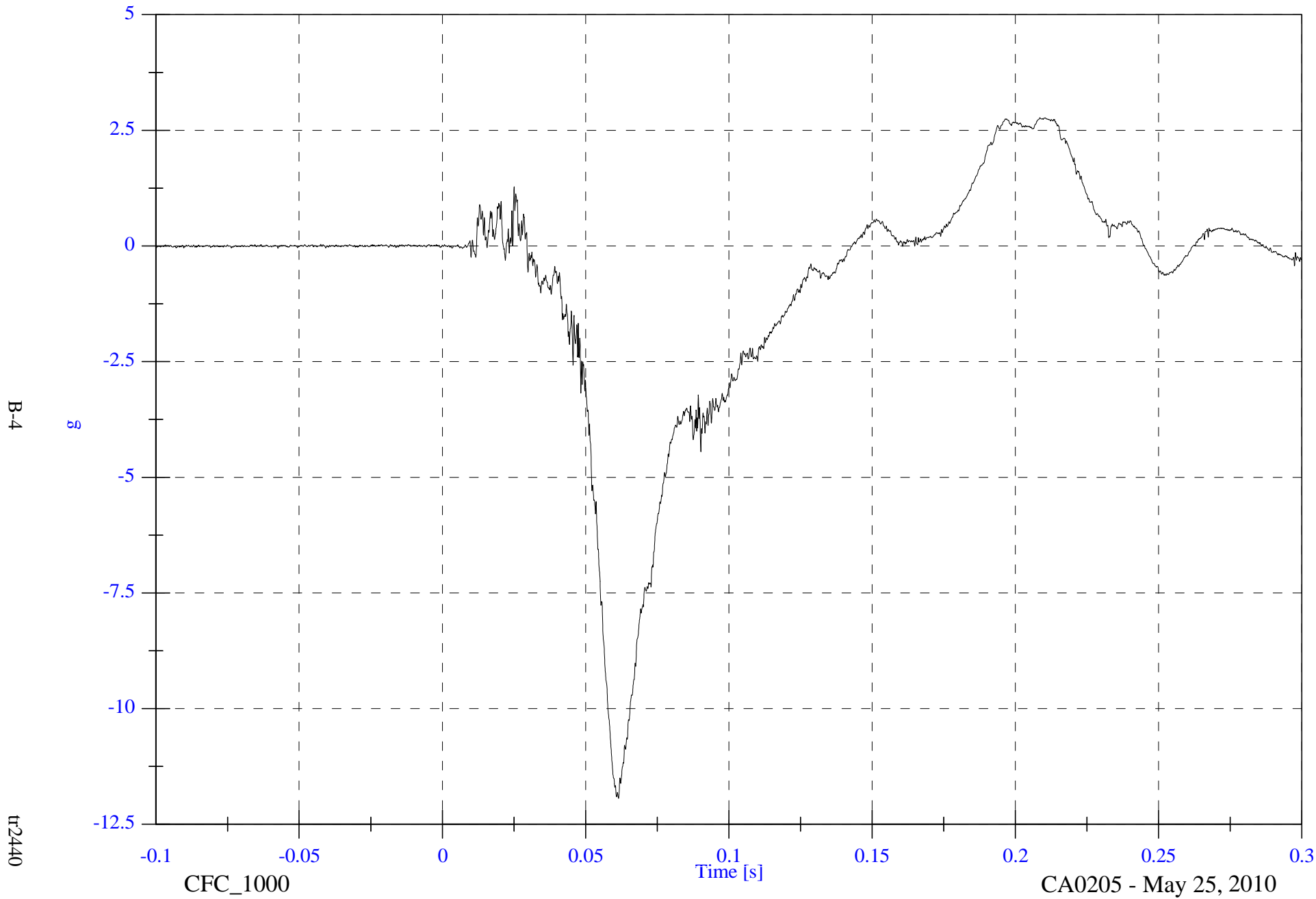
TABLE OF DATA PLOTS for ES-2re

PLOT	PLOT NAME [UNITS, CHANNEL FILTER CLASS]	PAGE
1	ES-2re Head Ax [g, CFC_1000]	B-4
2	ES-2re Head Ay [g, CFC_1000]	B-5
3	ES-2re Head Az [g, CFC_1000]	B-6
4	ES-2re Head Resultant [g, CFC_1000]	B-7
5	ES-2re Head Ax Velocity vs. Time	B-8
6	ES-2re Head Ay Velocity vs. Time	B-9
7	ES-2re Head Az Velocity vs. Time	B-10
8	ES-2re Upper Thorax Rib Deflection Rate vs. Time	B-11
9	ES-2re Upper Thorax Rib Deflection (Y) vs. Time	B-12
10	ES-2re Middle Thorax Rib Deflection Rate vs. Time	B-13
11	ES-2re Middle Thorax Rib Deflection (Y) vs. Time	B-14
12	ES-2re Lower Thorax Rib Deflection Rate vs. Time	B-15
13	ES-2re Lower Thorax Rib Deflection (Y) vs. Time	B-16
14	ES-2re Front Abdomen Force (Y) vs. Time	B-17
15	ES-2re Middle Abdomen Force (Y) vs. Time	B-18
16	ES-2re Rear Abdomen Force (Y) vs. Time	B-19
17	ES-2re Sum of the Abdominal Forces vs. Time	B-20
18	ES-2re Pubic Symphysis Force (Y)vs. Time	B-21

FMVSS 214 MDB 2010 Ford Flex

V2P1 Head x

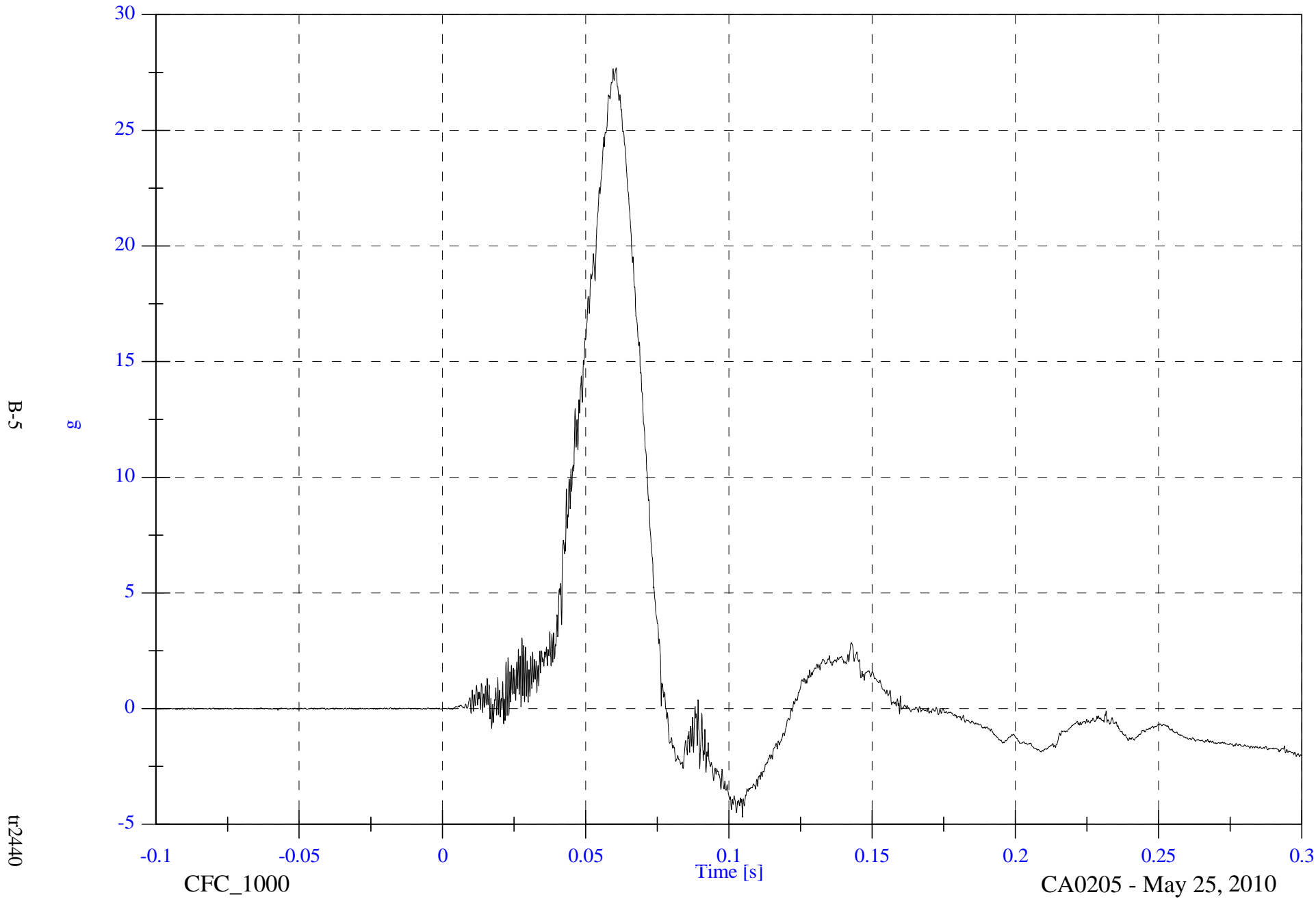
Max: 2.8 [g] at 0.209 [s]
Min: -11.9 [g] at 0.062 [s]



FMVSS 214 MDB 2010 Ford Flex

V2P1 Head y

Max: 27.7 [g] at 0.061 [s]
Min: -4.7 [g] at 0.105 [s]

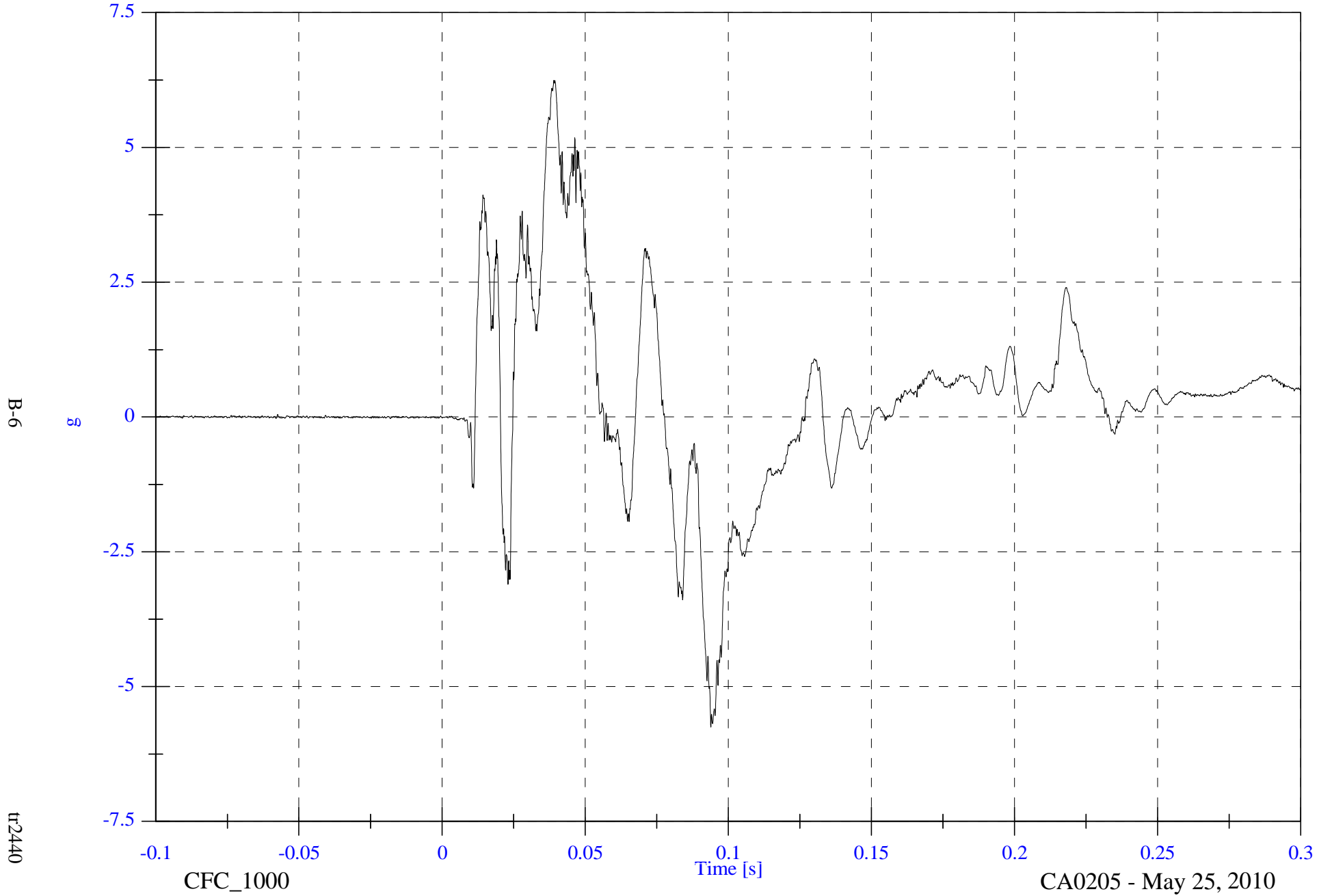


FMVSS 214 MDB 2010 Ford Flex

V2P1 Head z

Max: 6.2 [g] at 0.039 [s]

Min: -5.8 [g] at 0.094 [s]



B-6

tr2440

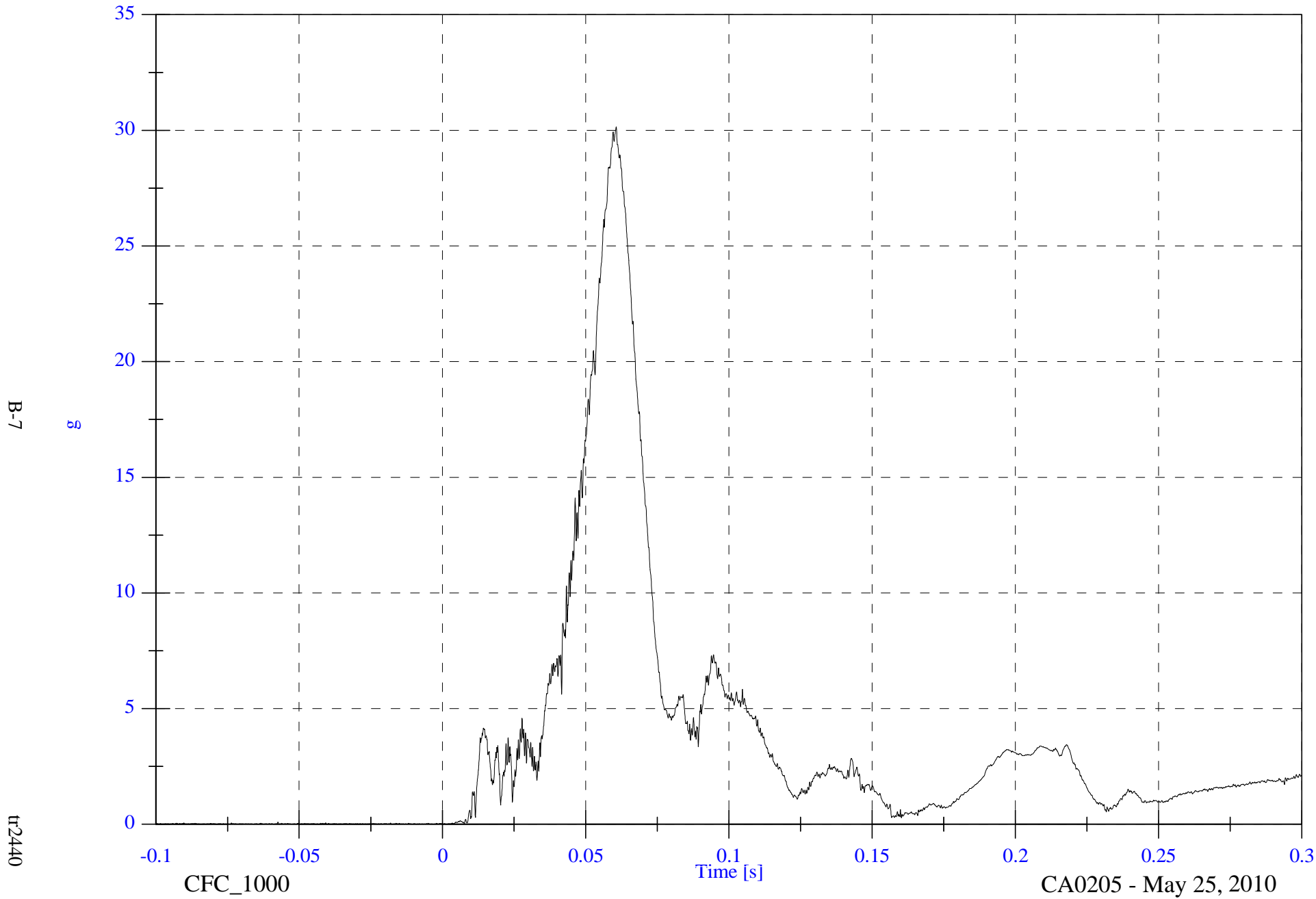
CFC_1000

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Head Resultant

Max: 30.2 [g] at 0.061 [s]
Min: 0.0 [g] at -0.074 [s]



B-7

tr2440

CFC_1000

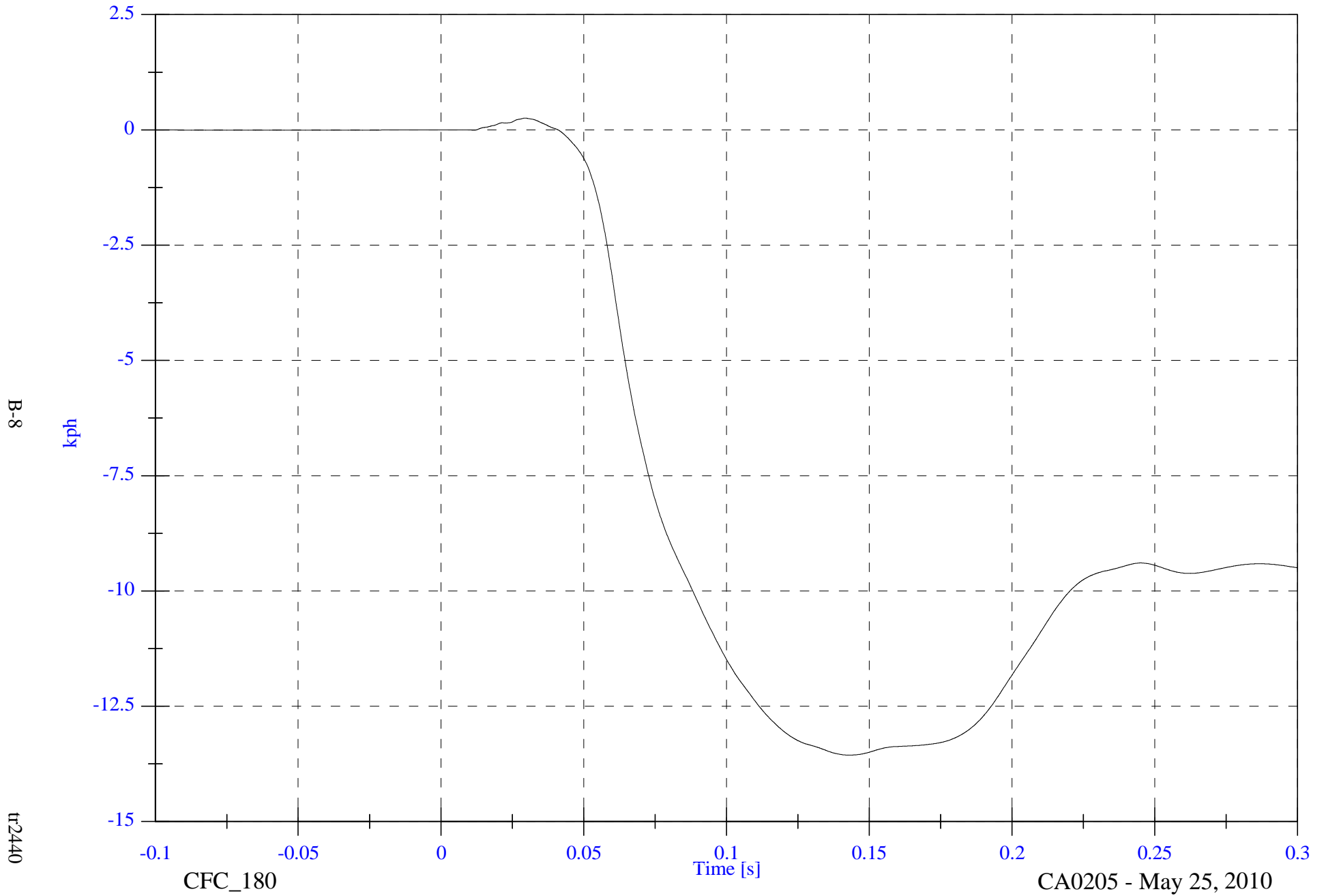
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Head x Velocity

Max: 0.3 [kph] at 0.029 [s]

Min: -13.6 [kph] at 0.143 [s]



B-8

tr2440

CFC_180

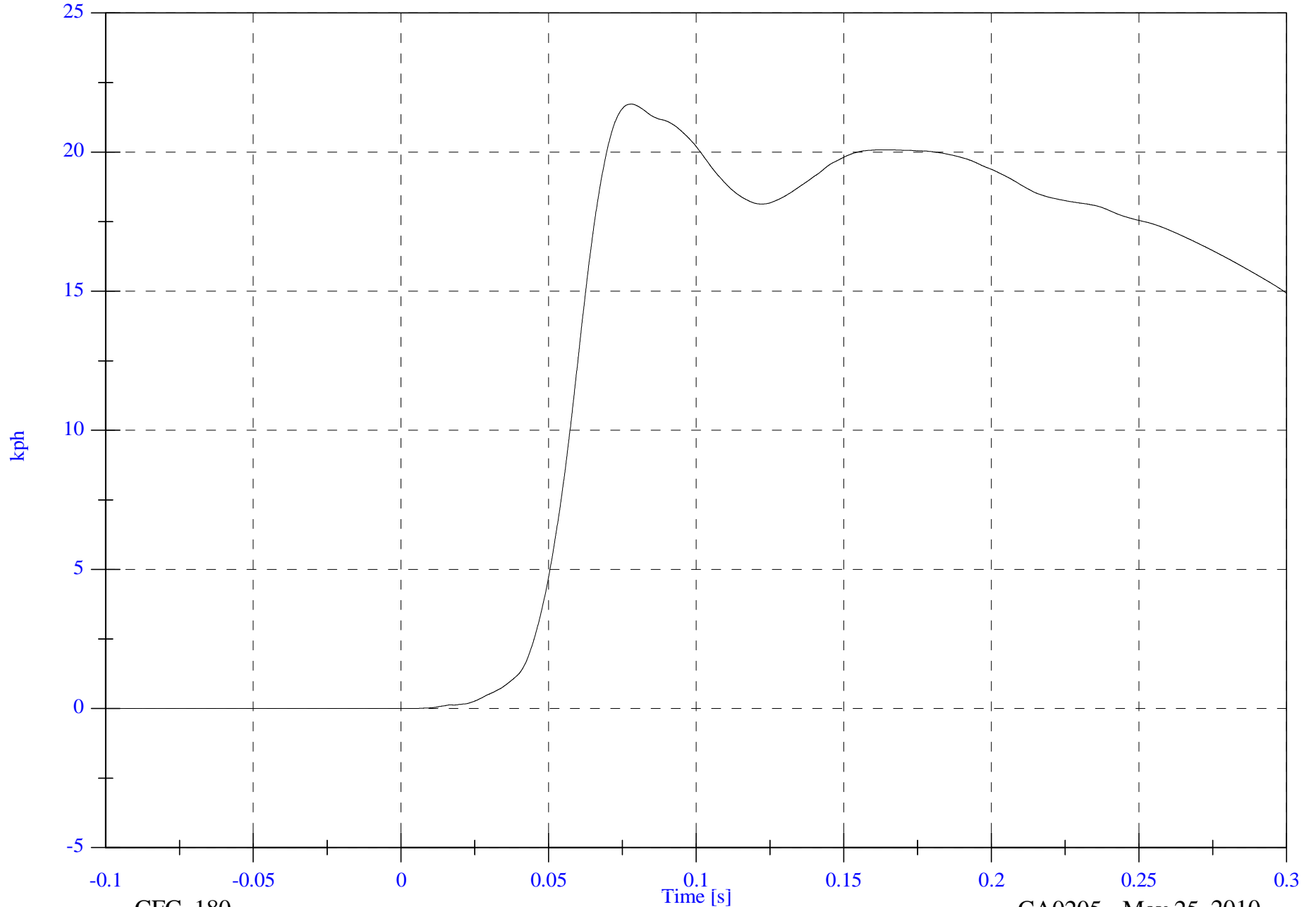
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 21.7 [kph] at 0.078 [s]

Min: -0.0 [kph] at -0.073 [s]

V2P1 Head y Velocity



B-9

kph

tr2440

CFC_180

Time [s]

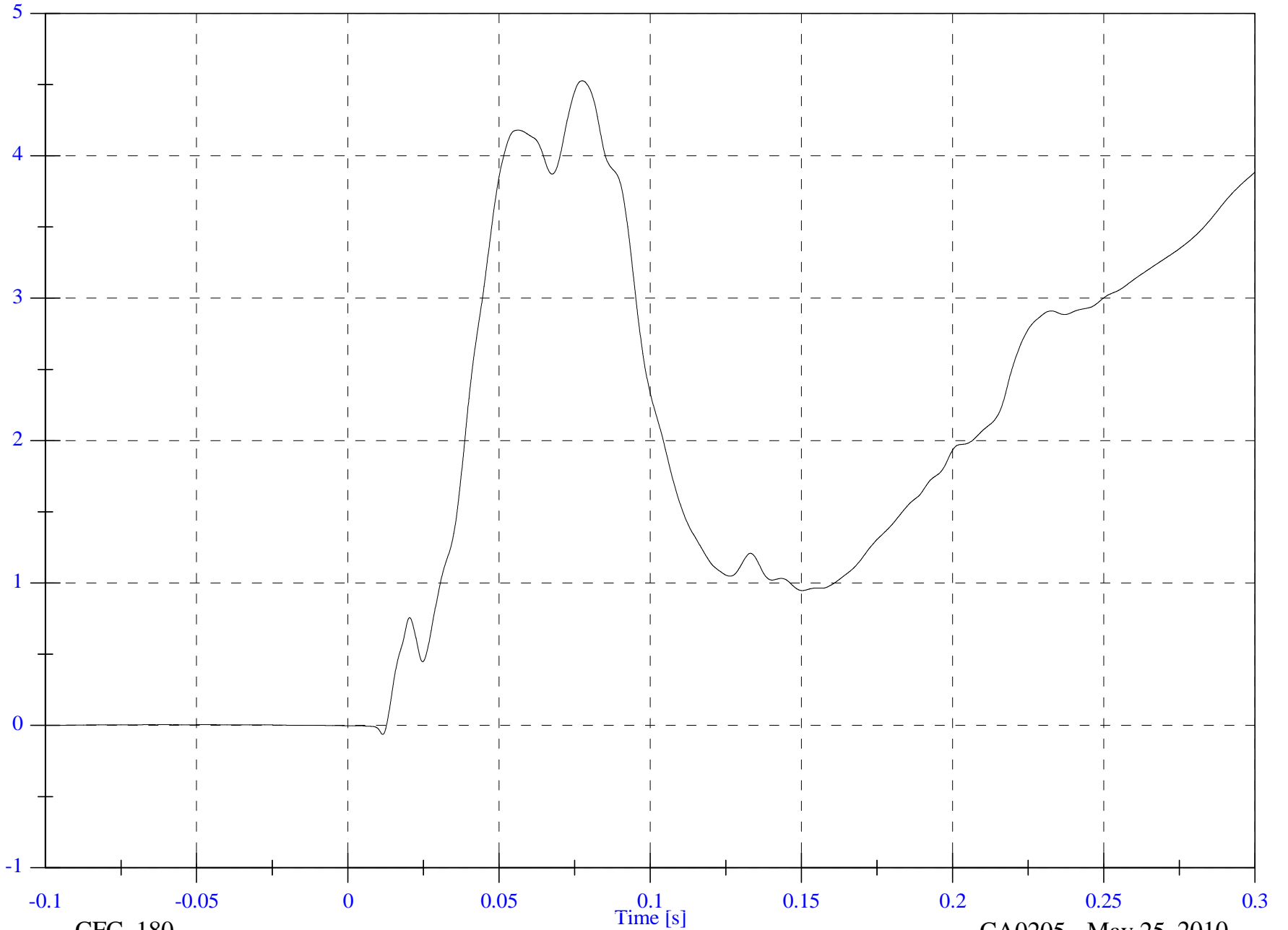
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 4.5 [kph] at 0.078 [s]

Min: -0.1 [kph] at 0.012 [s]

V2P1 Head z Velocity



B-10

kph

tr2440

CFC_180

Time [s]

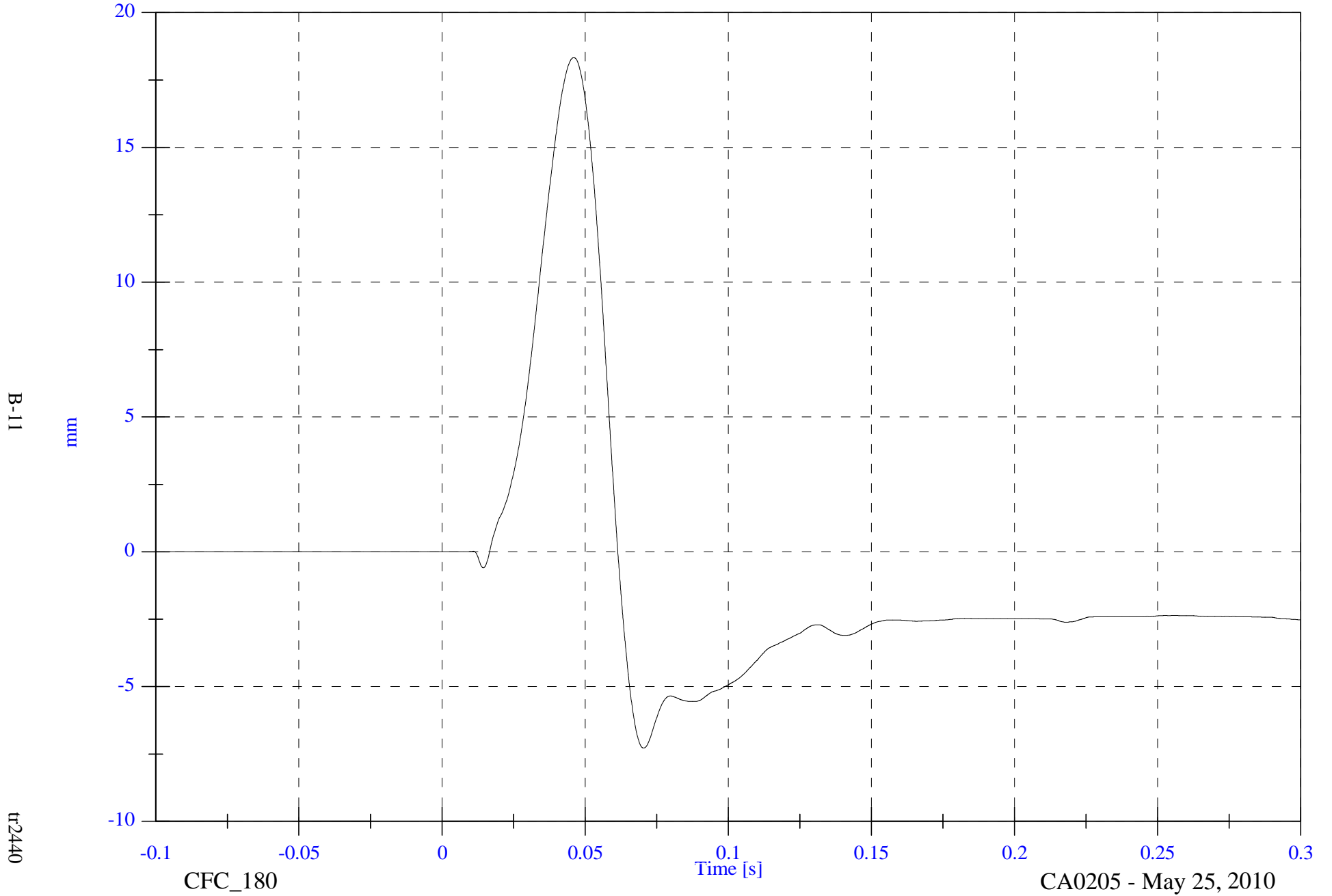
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Upper Thorax Rib Dy

Max: 18.3 [mm] at 0.046 [s]

Min: -7.3 [mm] at 0.070 [s]



B-11

tr2440

CFC_180

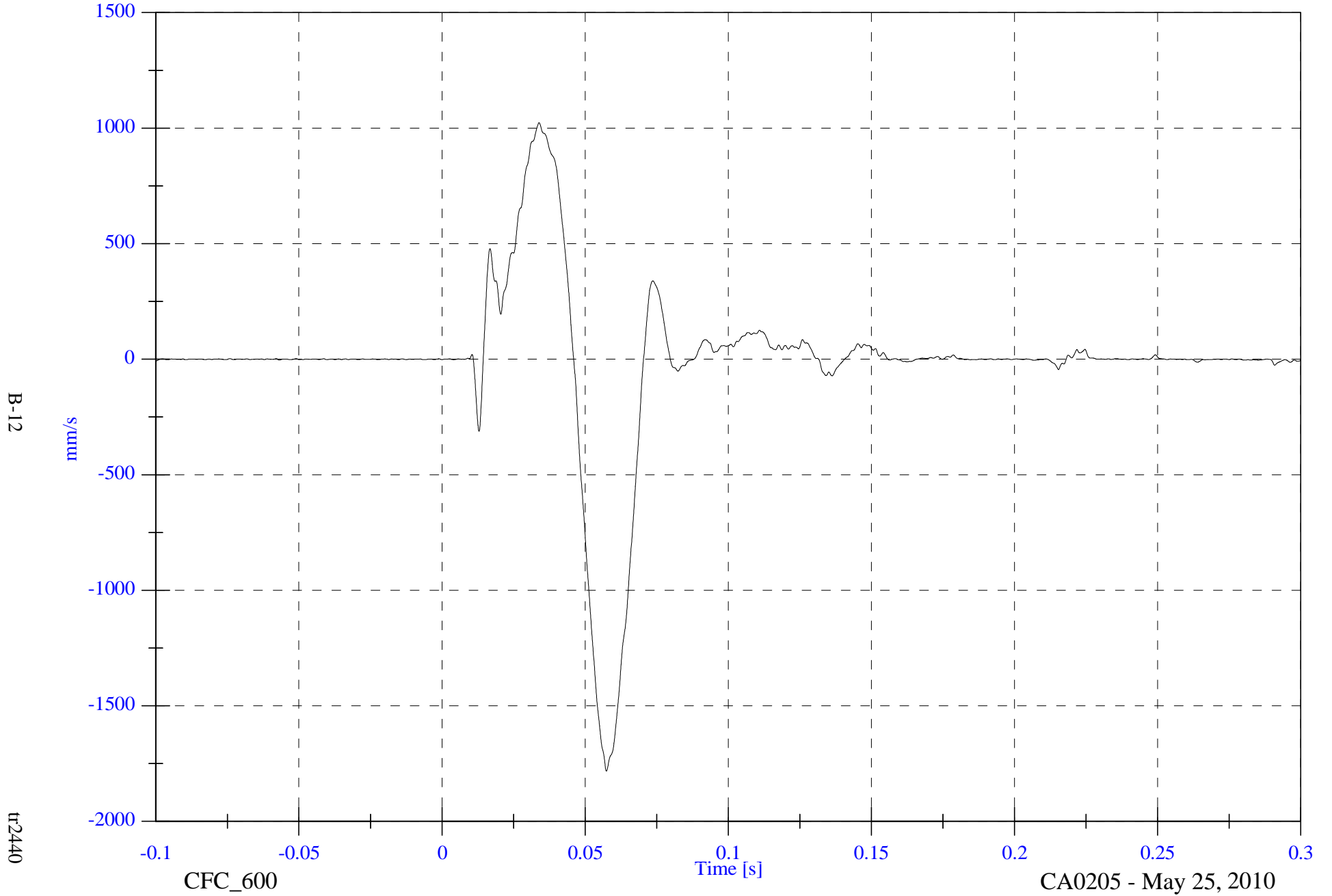
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Upper Thorax Rib Dy Rate

Max: 1023.9 [mm/s] at 0.034 [s]

Min: -1782.3 [mm/s] at 0.057 [s]



B-12

tr2440

CFC_600

Time [s]

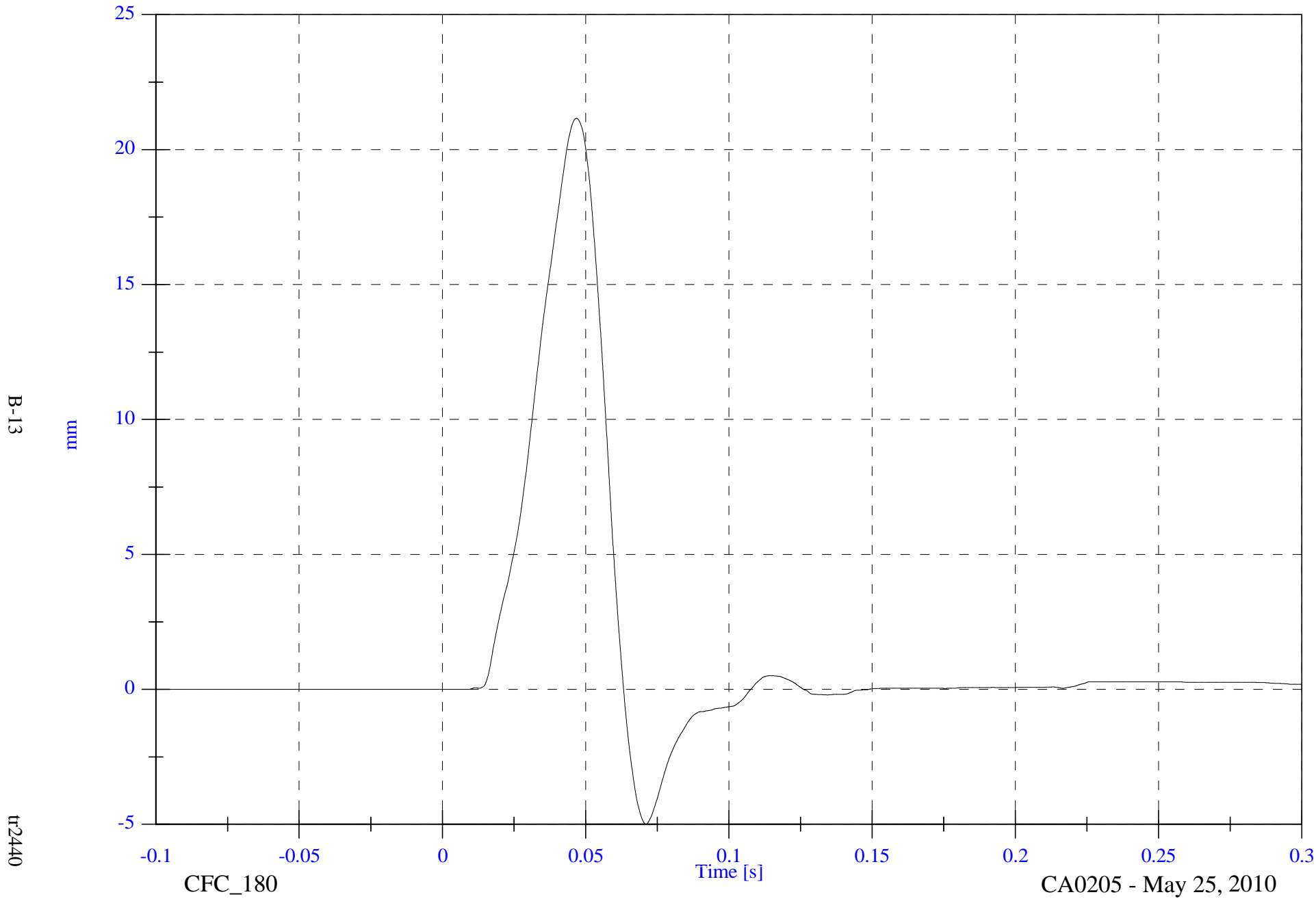
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Middle Thorax Rib Dy

Max: 21.2 [mm] at 0.047 [s]

Min: -5.0 [mm] at 0.071 [s]



B-13

mm

tr2440

CFC_180

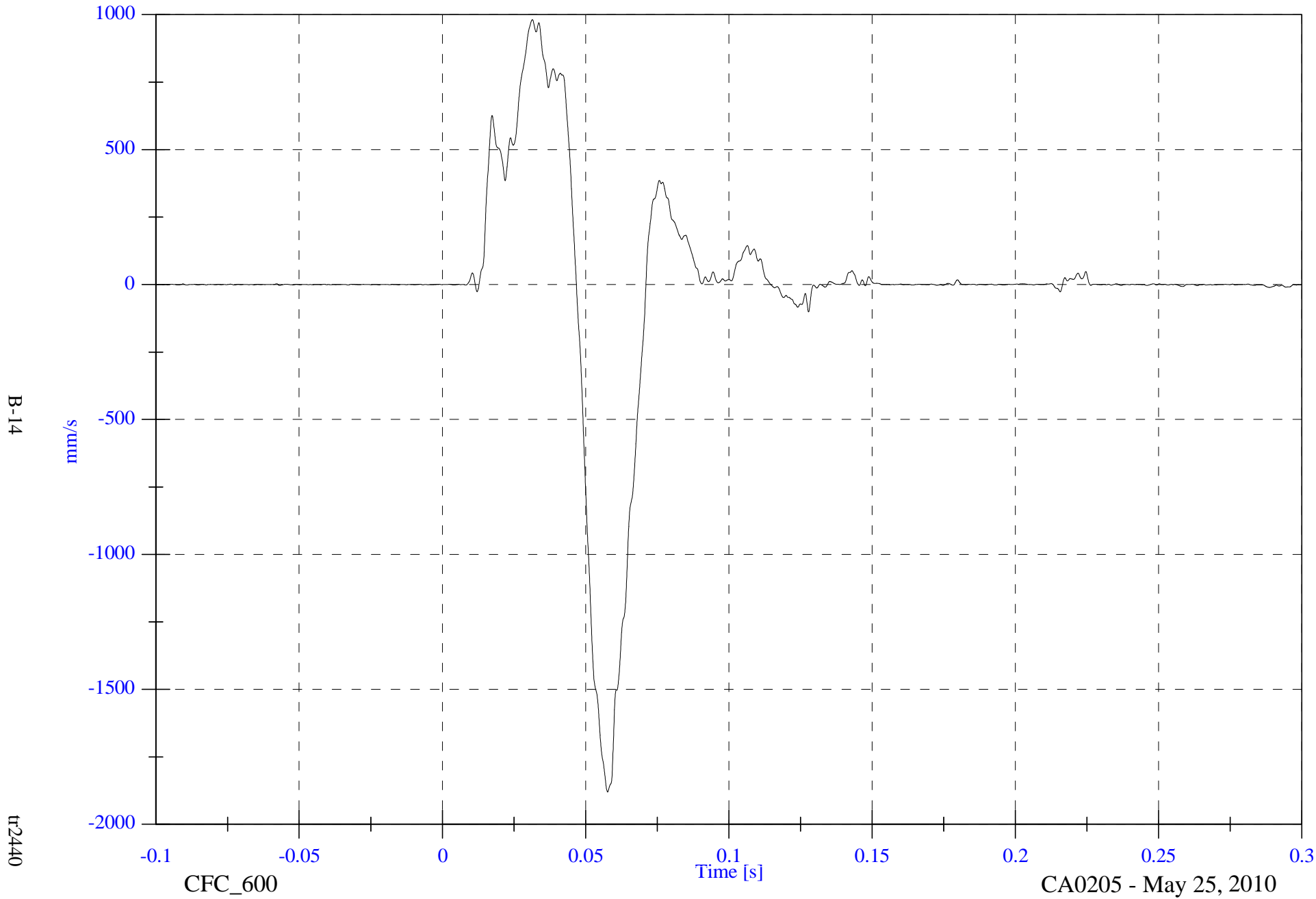
Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 982.0 [mm/s] at 0.031 [s]
Min: -1880.8 [mm/s] at 0.058 [s]

V2P1 Middle Thorax Rib Dy Rate



B-14

tr2440

CFC_600

Time [s]

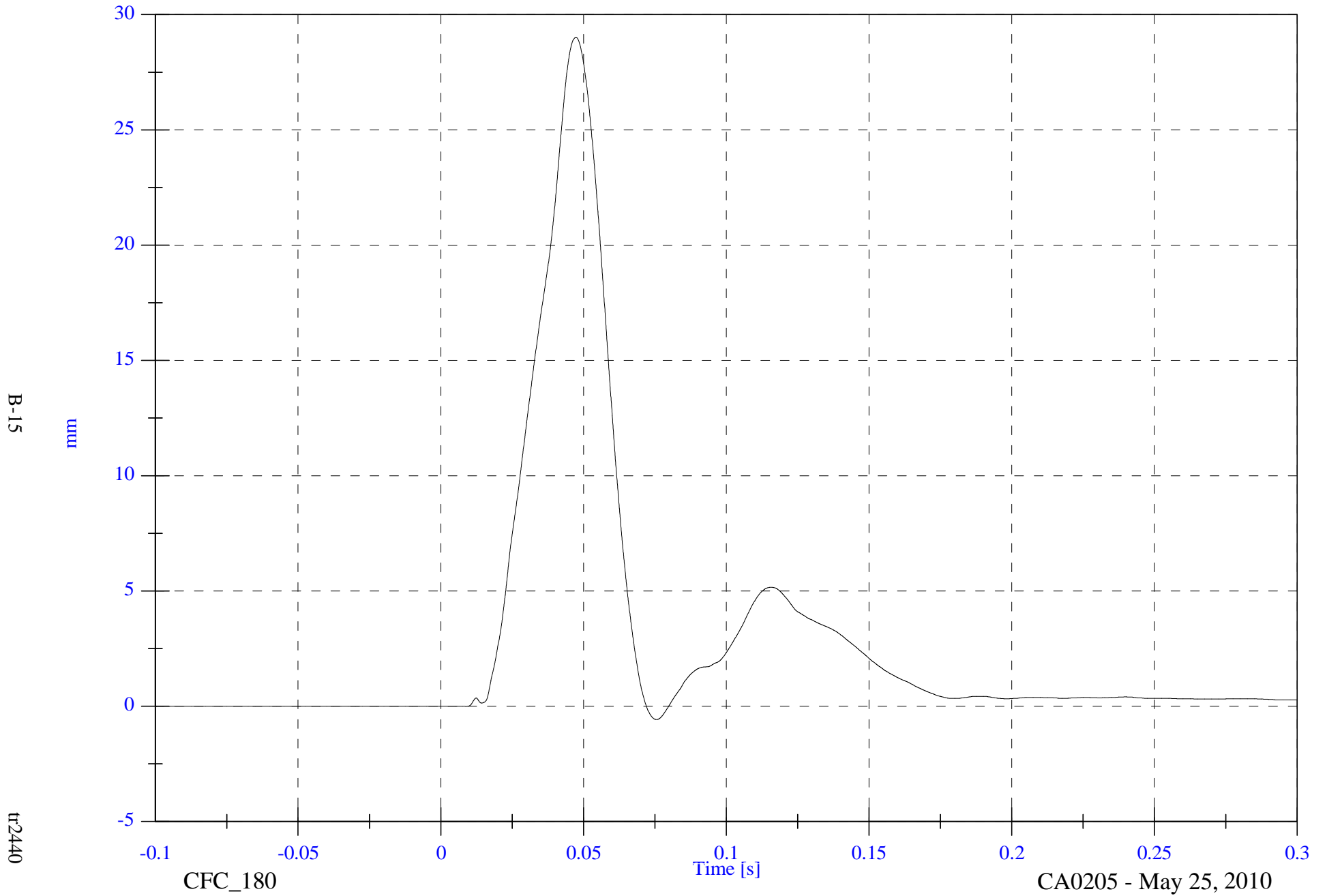
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Lower Thorax Rib Dy

Max: 29.0 [mm] at 0.047 [s]

Min: -0.6 [mm] at 0.076 [s]



B-15

mm

tr2440

CFC_180

Time [s]

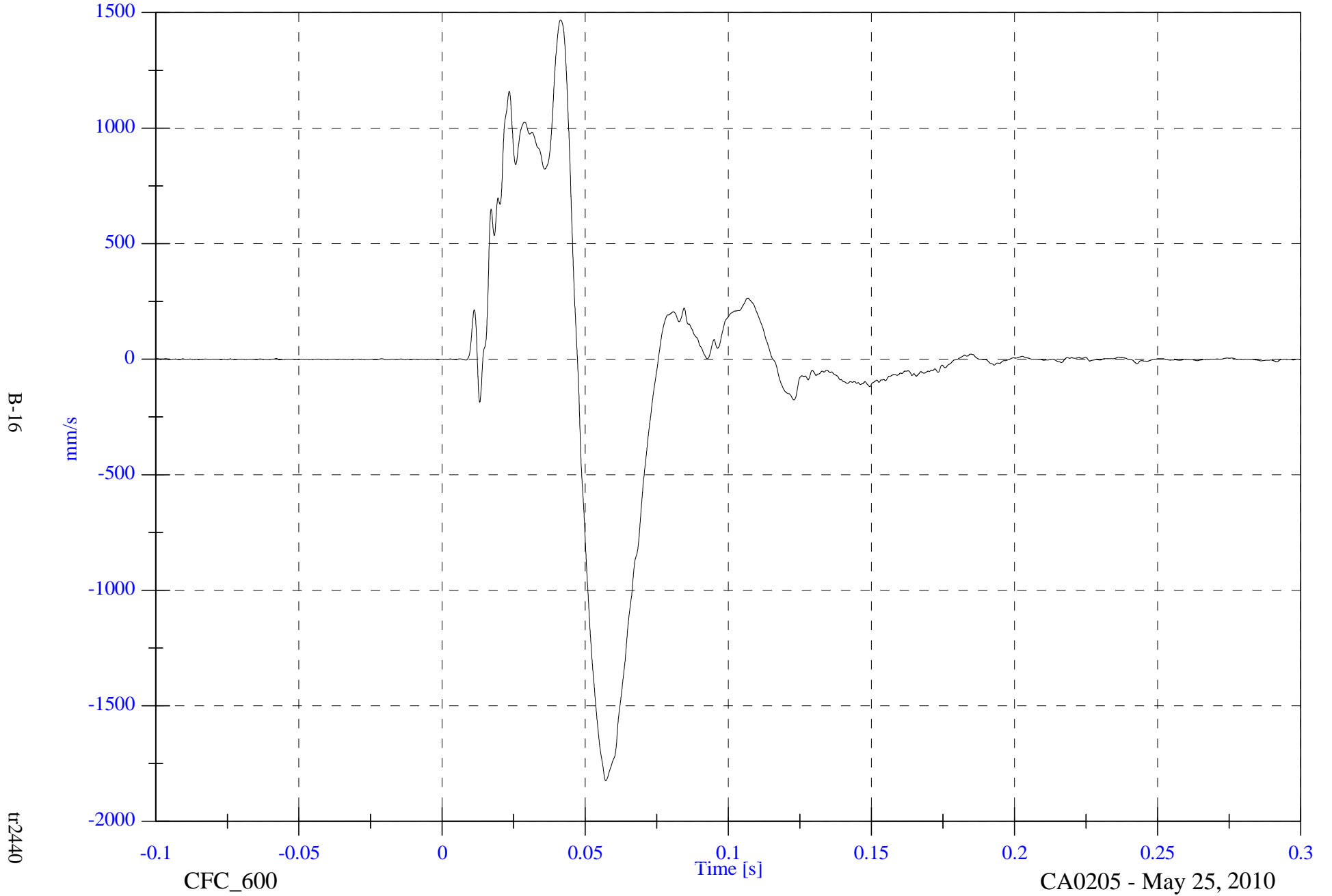
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Lower Thorax Rib Dy Rate

Max: 1468.4 [mm/s] at 0.041 [s]

Min: -1824.4 [mm/s] at 0.057 [s]



B-16

tr2440

CFC_600

Time [s]

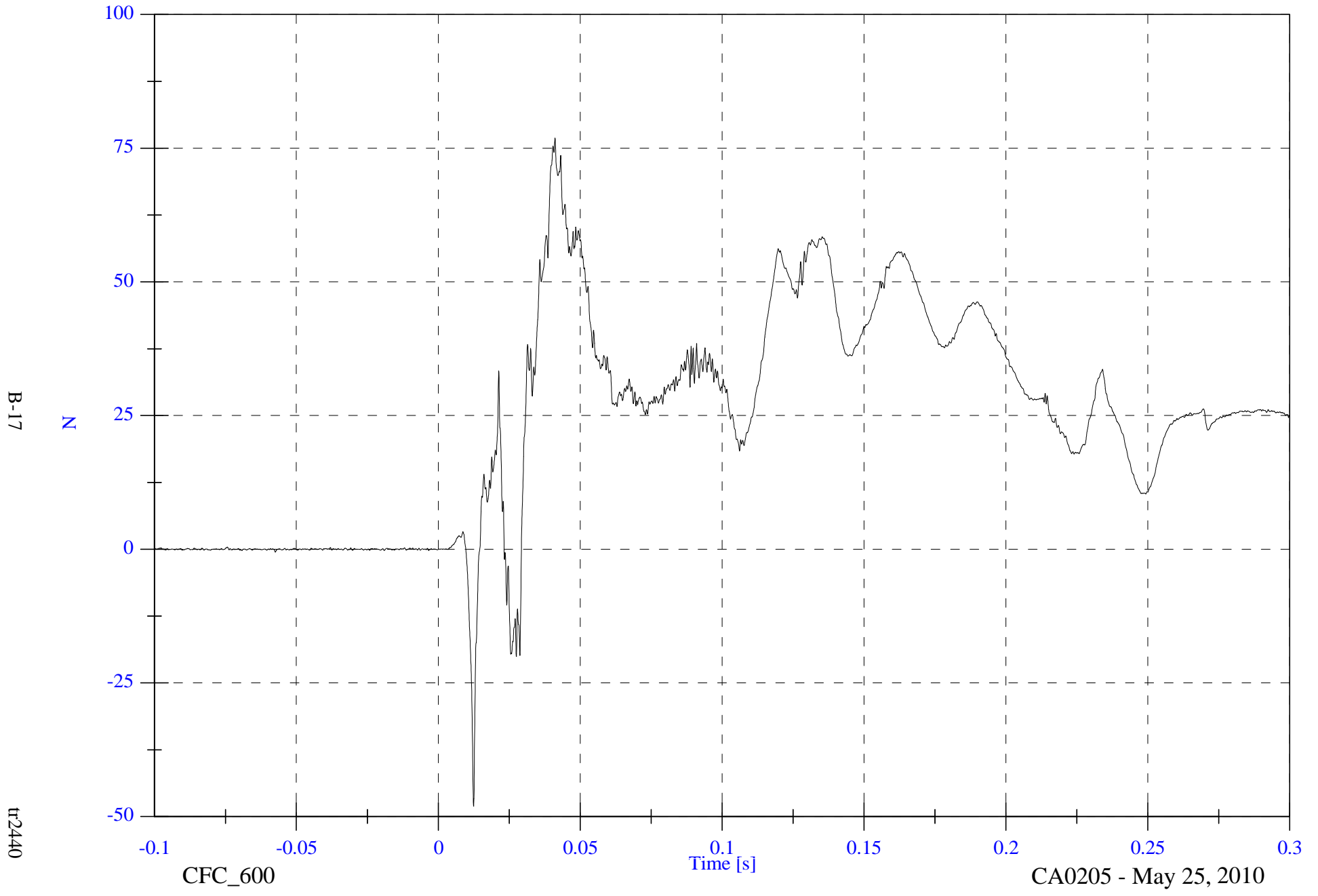
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Front Abdominal Fy

Max: 76.9 [N] at 0.041 [s]

Min: -48.1 [N] at 0.012 [s]



B-17

N

tr2440

CFC_600

Time [s]

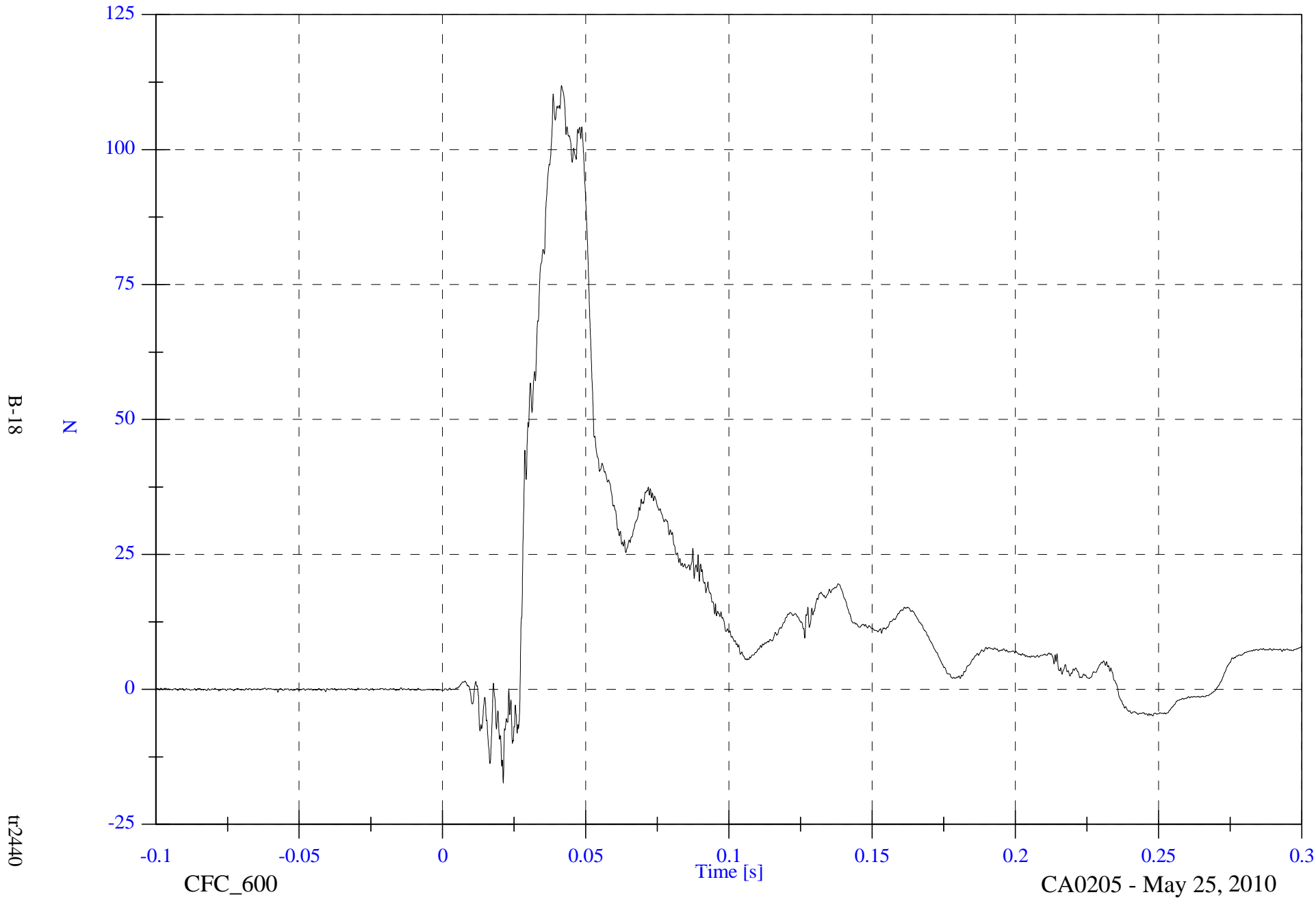
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Middle Abdominal Fy

Max: 111.9 [N] at 0.042 [s]

Min: -17.4 [N] at 0.021 [s]



B-18

N

tr2440

CFC_600

Time [s]

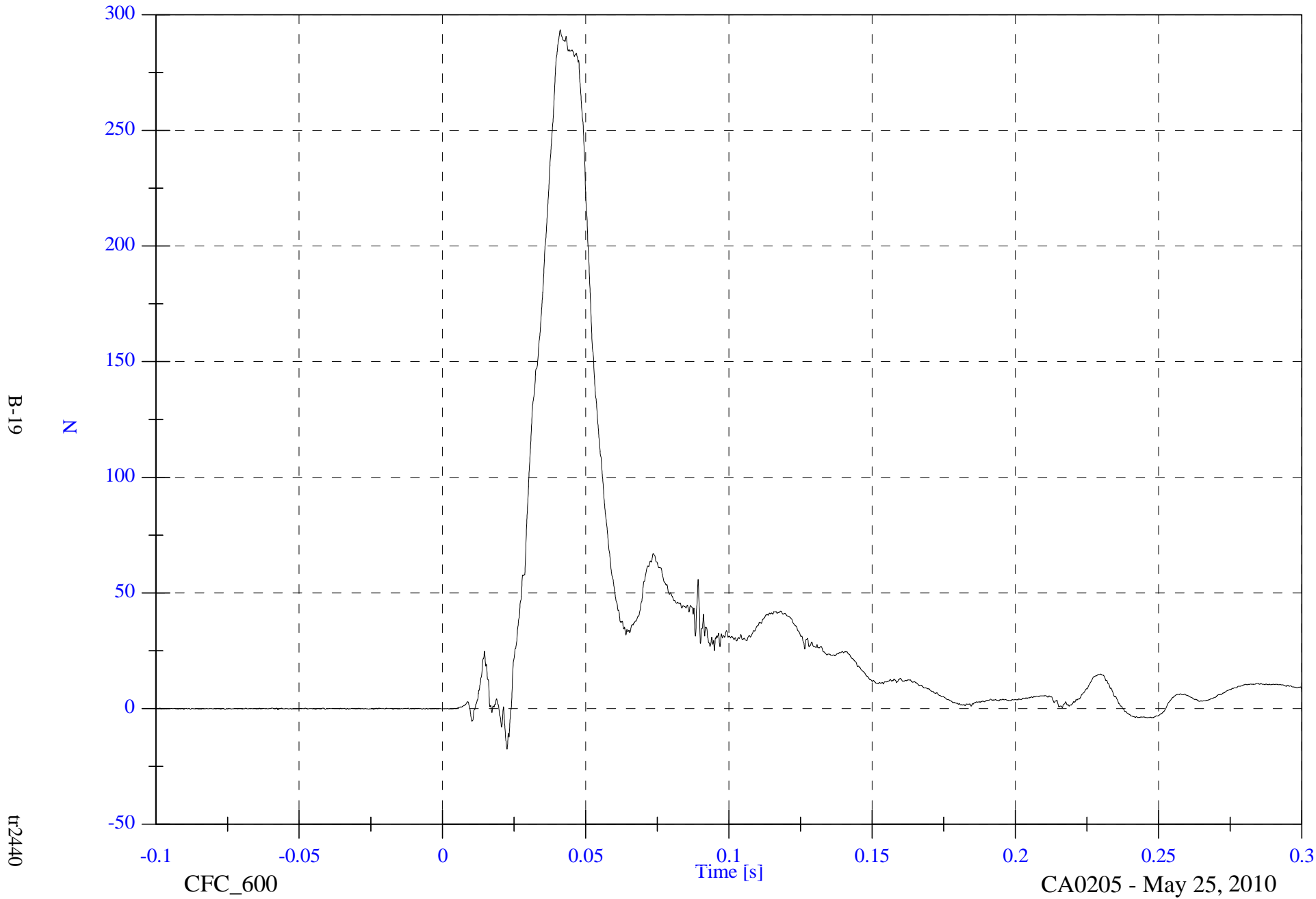
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 293.5 [N] at 0.041 [s]

V2P1 Rear Abdominal Fy

Min: -17.5 [N] at 0.023 [s]



B-19

N

tr2440

CFC_600

Time [s]

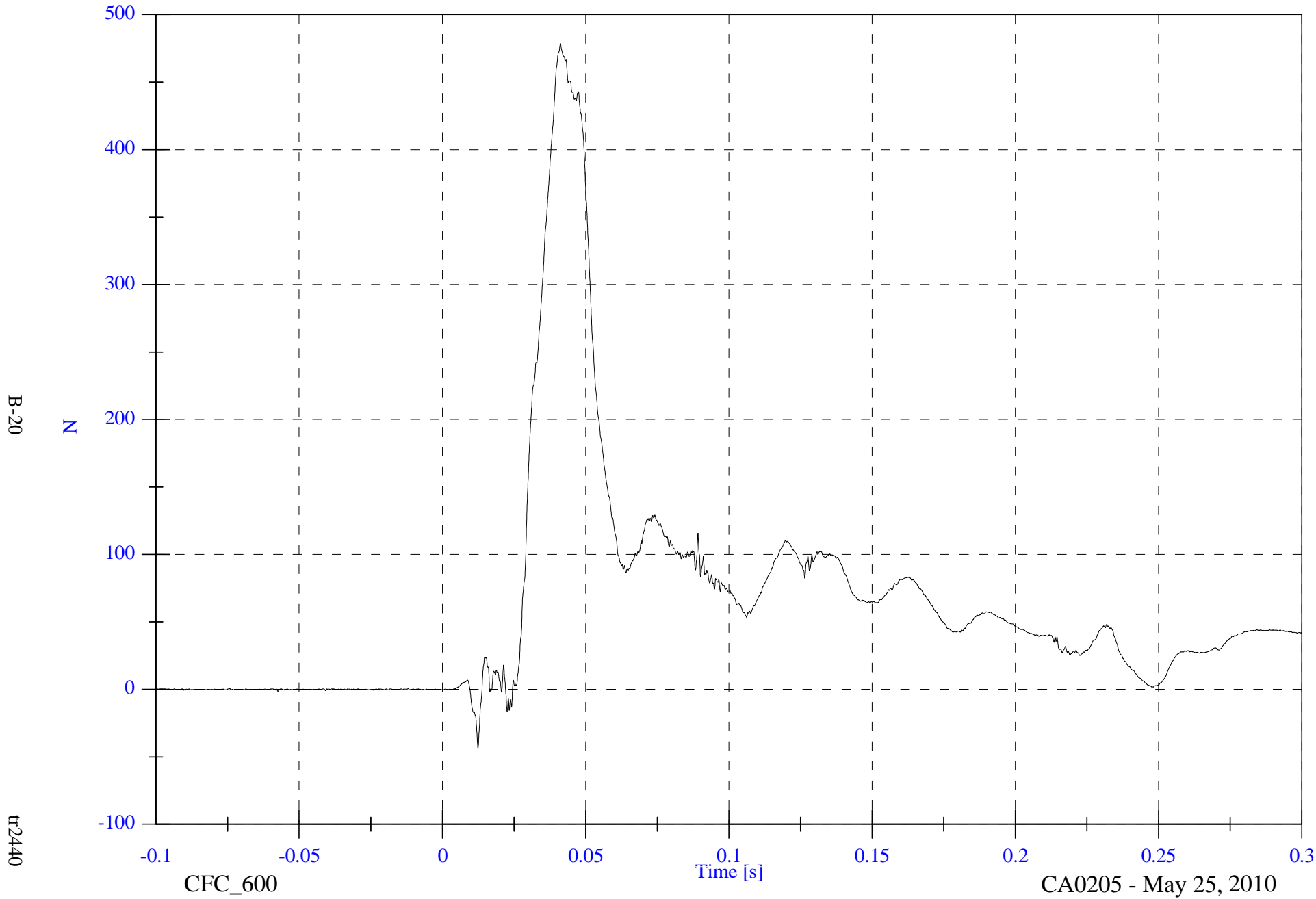
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 478.6 [N] at 0.041 [s]

V2P1 Abdominal Summation Fy

Min: -43.9 [N] at 0.012 [s]



B-20

N

tr2440

CFC_600

Time [s]

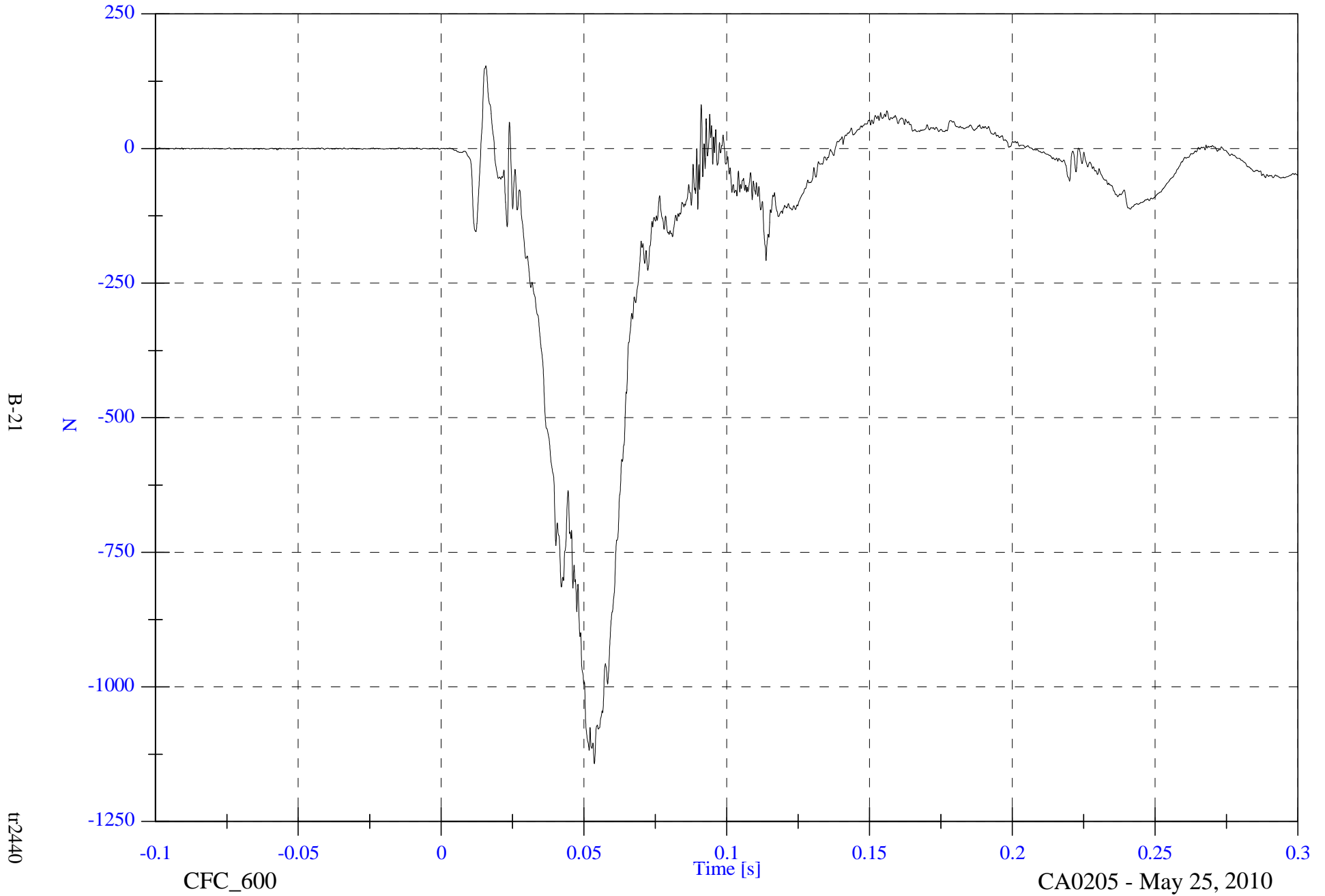
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P1 Pubic Symphysis Fy

Max: 153.6 [N] at 0.016 [s]

Min: -1142.4 [N] at 0.054 [s]



B-21

N

tr2440

CFC_600

Time [s]

CA0205 - May 25, 2010

APPENDIX C
SID-IIs DUMMY RESPONSE DATA
(SAE sign convention)

SID-IIs DATA CHANNEL FILTER CLASS SUMMARY

Data Type	SAE Filter Class	Cut-off Frequency
Dummy Head Acceleration	1000	1650
Lower Spine T12 Acceleration	180	300
Acetabulum Force	600	1000
Iliac Force	600	1000

DATA CHANNEL TITLE KEY

Prefix	Suffix
V1 = Vehicle 1 (Test Vehicle)	Ax = Acceleration, X-direction
V2 = Vehicle 2 (Test Vehicle)	Ay = Acceleration, Y-direction
P1 = Left Front Seating Position (Driver)	Az = Acceleration, Z-direction
P4 = Left Second Row Seating Position (Passenger)	Fx = Force, X-direction
A1-A18 = Accelerometer Location Number	Fy = Force, Y-direction
	Fz = Force, Z-direction
	Dx = Deflection, X-direction
	Dy = Deflection, Y-direction
	Dz = Deflection, Z-direction

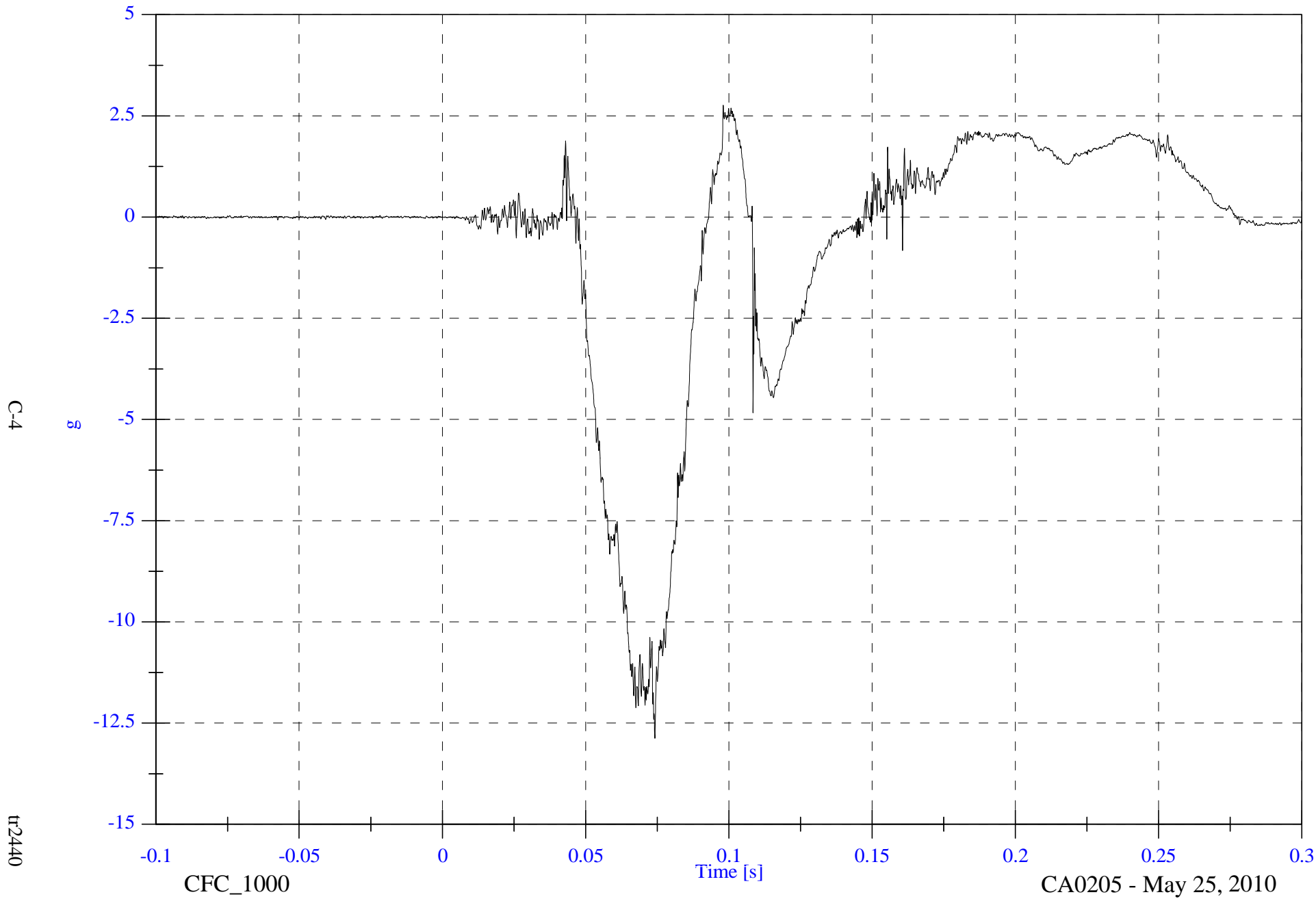
TABLE OF DATA PLOTS for SID-IIs

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	SID-IIs Head Ax [g, CFC_1000]	C-4
2	SID-IIs Head Ay [g, CFC_1000]	C-5
3	SID-IIs Head Az [g, CFC_1000]	C-6
4	SID-IIs Head Resultant [g, CFC_1000]	C-7
5	SID-IIs Head Ax Velocity vs. Time	C-8
6	SID-IIs Head Ay Velocity vs. Time	C-9
7	SID-IIs Head Az Velocity vs. Time	C-10
8	SID-IIs Lower Spine X Acceleration vs. Time	C-11
9	SID-IIs Lower Spine Y Acceleration vs. Time	C-12
10	SID-IIs Lower Spine Z Acceleration vs. Time	C-13
11	SID-IIs Lower Spine Resultant Acceleration vs. Time	C-14
12	SID-IIs Lower Spine X Velocity vs. Time	C-15
13	SID-IIs Lower Spine Y Velocity vs. Time	C-16
14	SID-IIs Lower Spine Z Velocity vs. Time	C-17
15	SID-IIs Acetabulum Force vs. Time	C-18
16	SID-IIs Iliac Force (Y) vs. Time	C-19
17	SID-IIs Sum of Iliac and Acetabulum Force vs. Time	C-20

FMVSS 214 MDB 2010 Ford Flex

Max: 2.8 [g] at 0.098 [s]
Min: -12.9 [g] at 0.074 [s]

V2P4 Head x



C-4

tr2440

CFC_1000

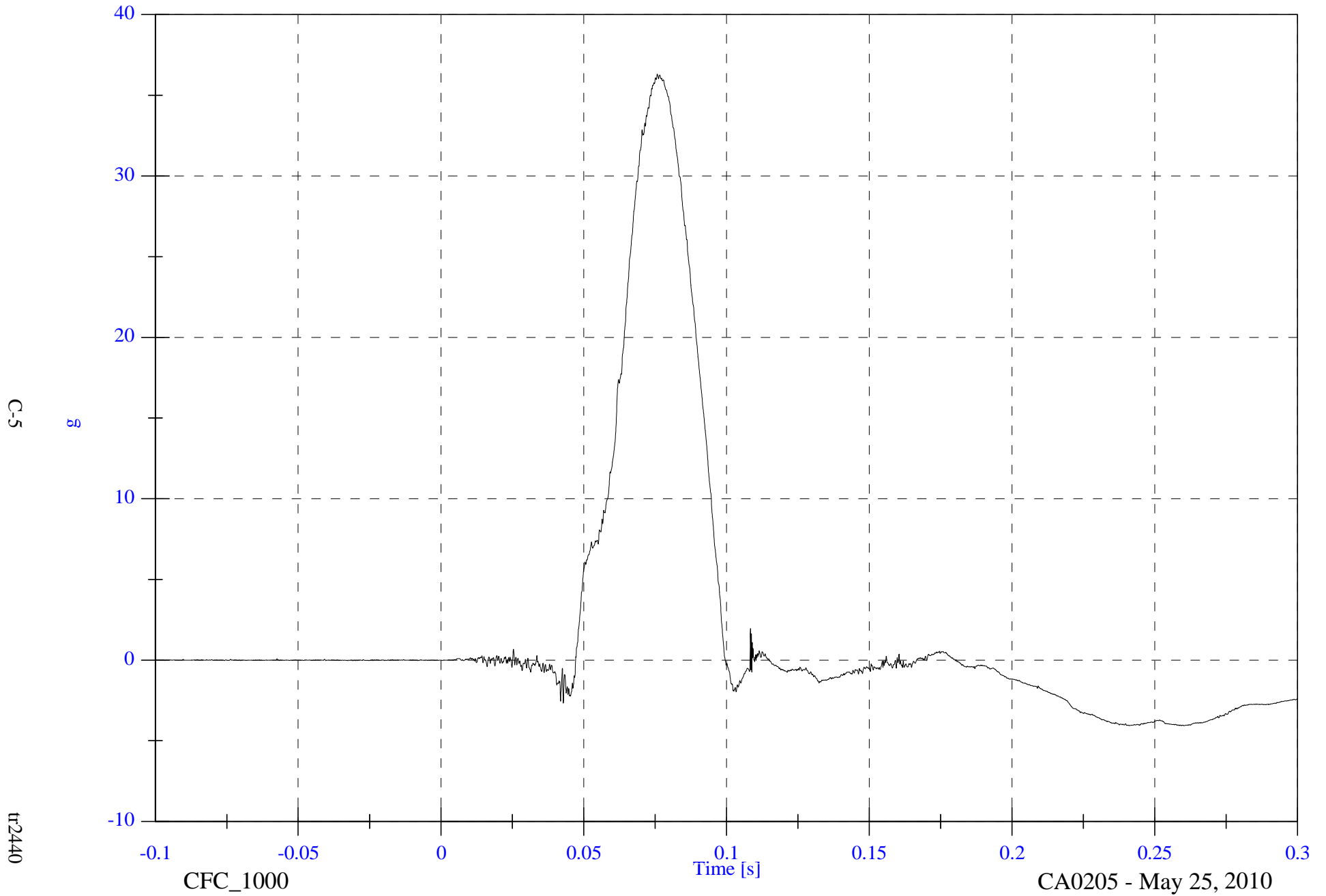
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P4 Head y

Max: 36.3 [g] at 0.076 [s]

Min: -4.1 [g] at 0.259 [s]



C-5

g

tr2440

CFC_1000

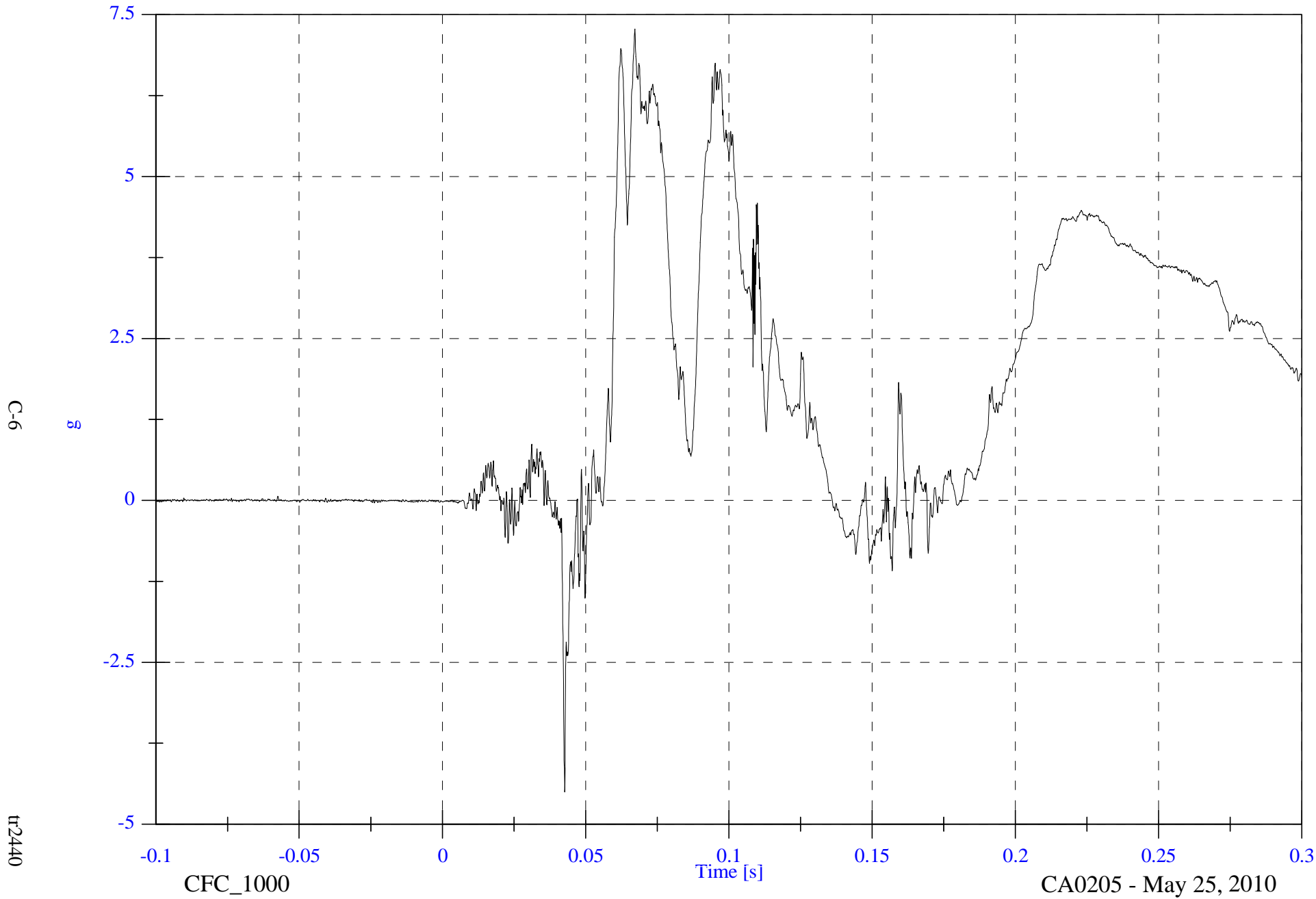
Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 7.3 [g] at 0.067 [s]
Min: -4.5 [g] at 0.043 [s]

V2P4 Head z



C-6

g

tr2440

CFC_1000

Time [s]

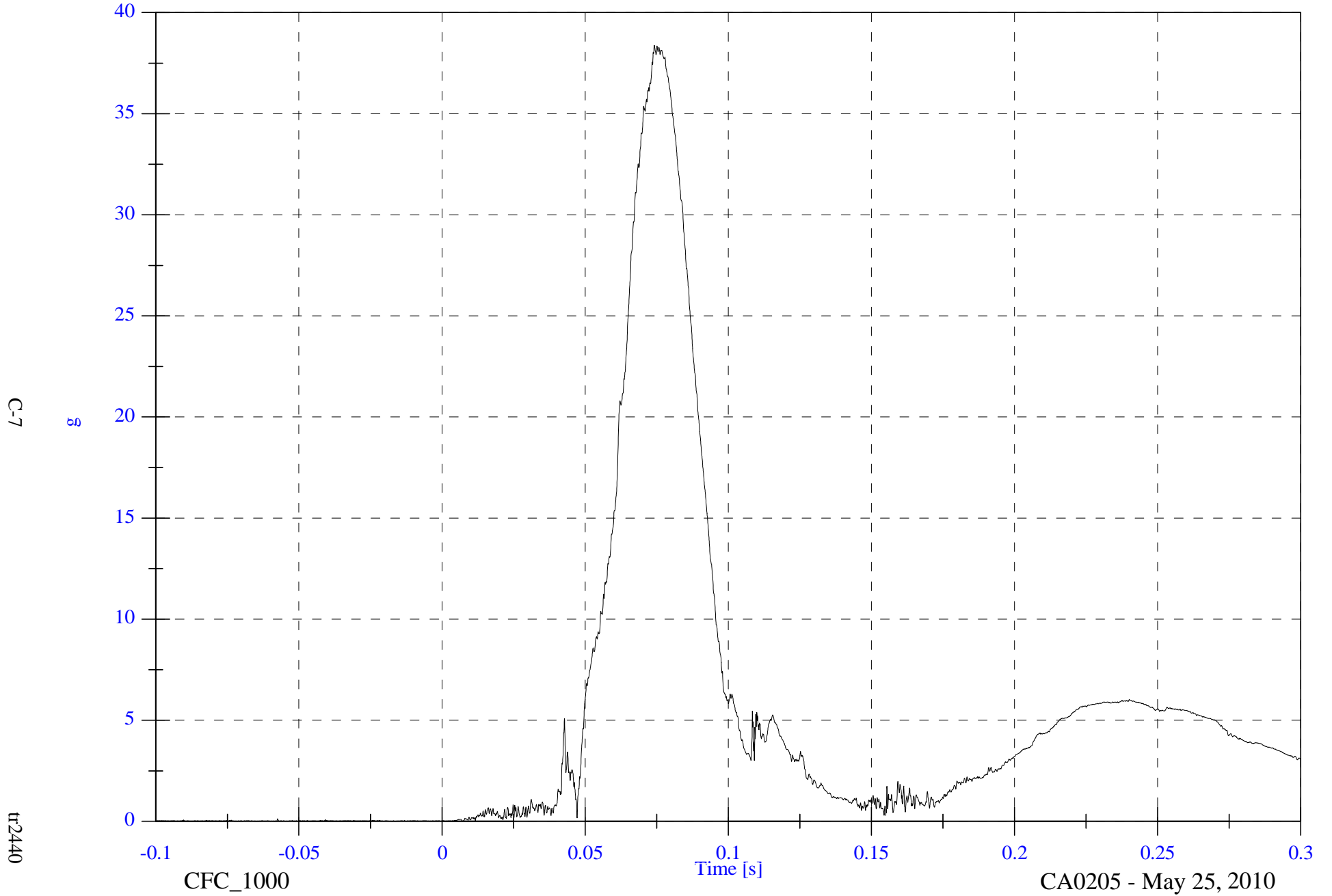
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 38.4 [g] at 0.074 [s]

V2P4 Head Resultant

Min: 0.0 [g] at -0.019 [s]



C-7

tr2440

CFC_1000

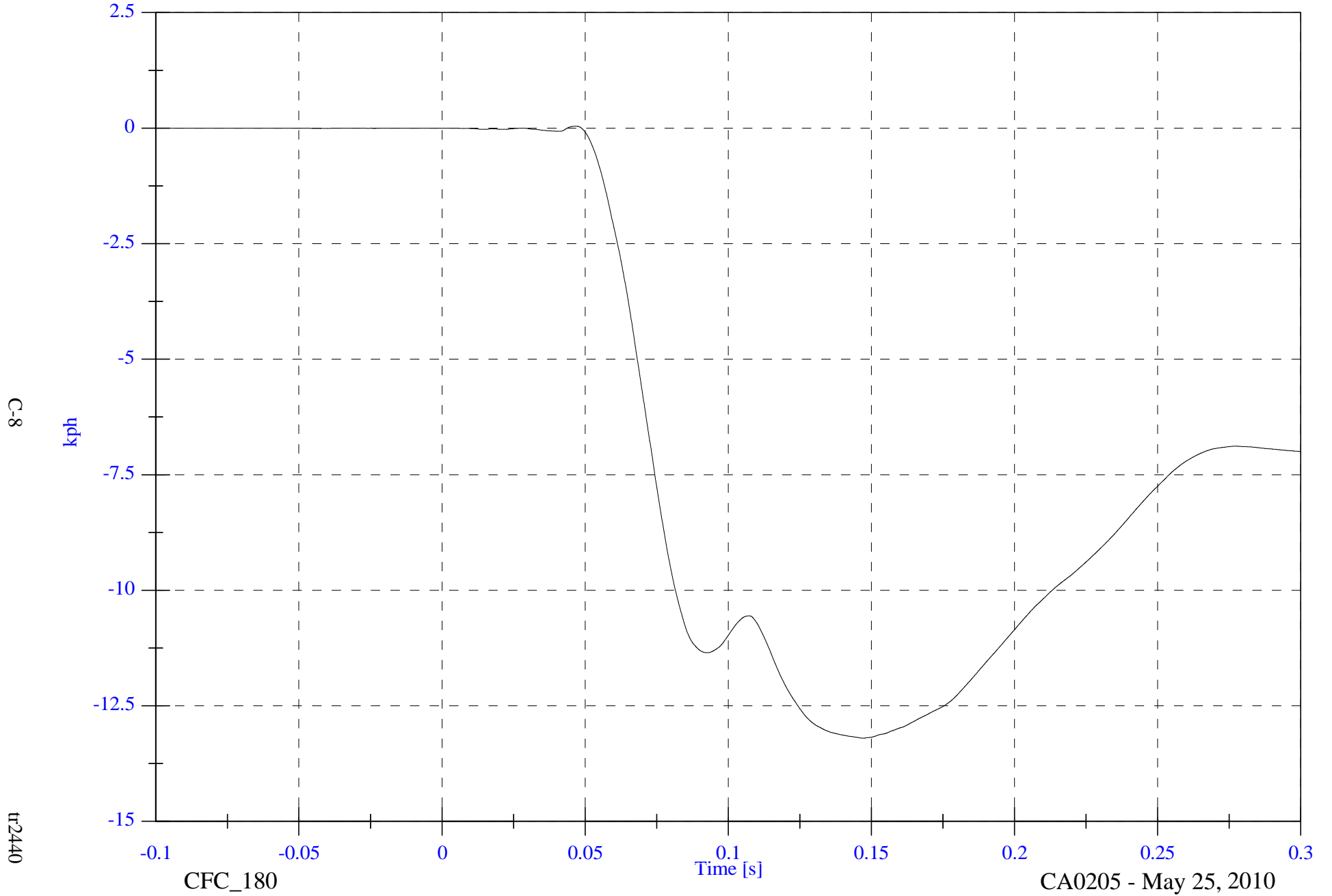
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P4 Head x Velocity

Max: 0.0 [kph] at 0.047 [s]

Min: -13.2 [kph] at 0.147 [s]



C-8

tr2440

CFC_180

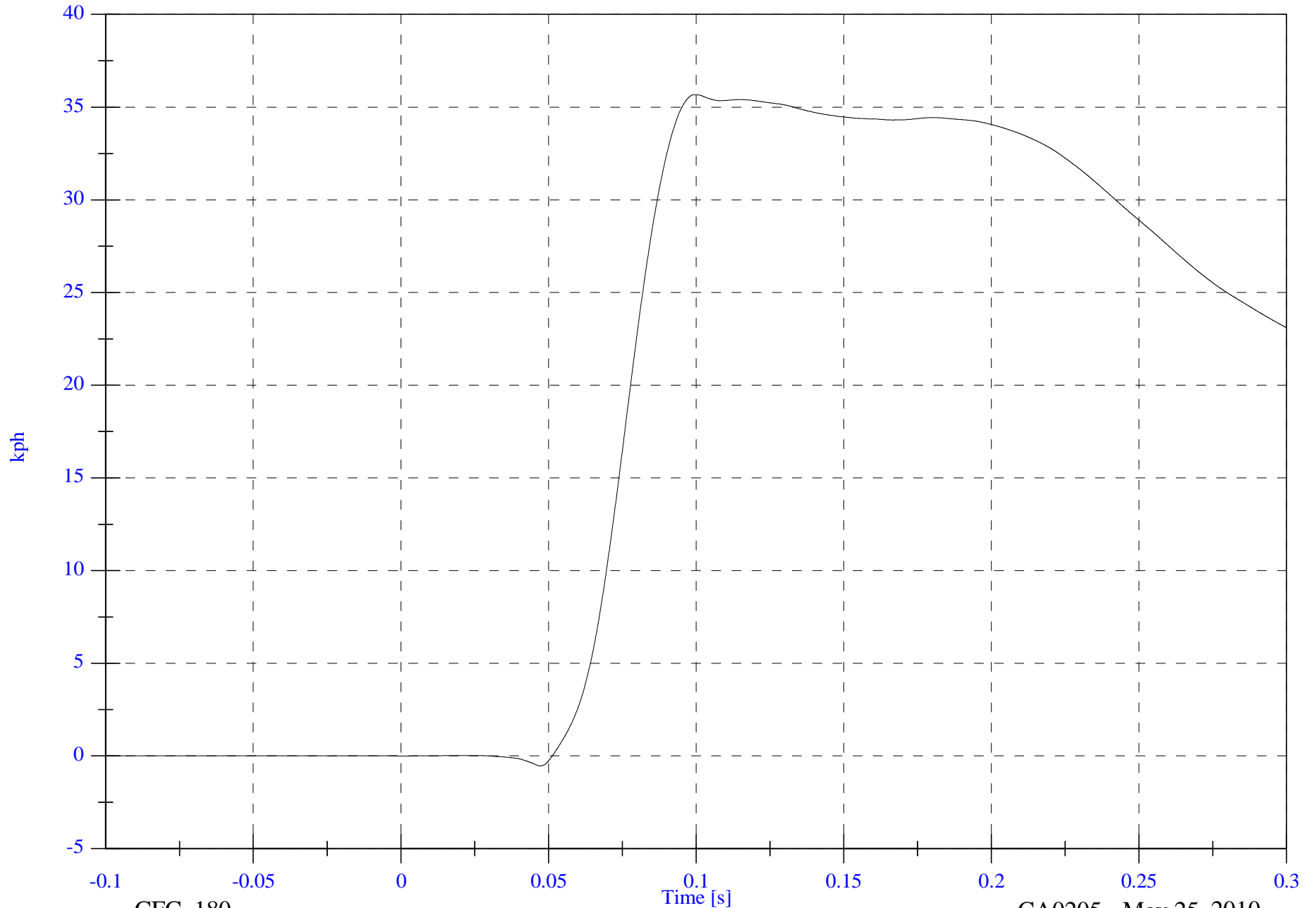
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 35.7 [kph] at 0.100 [s]

Min: -0.5 [kph] at 0.047 [s]

V2P4 Head y Velocity



C-9

tr2440

CFC_180

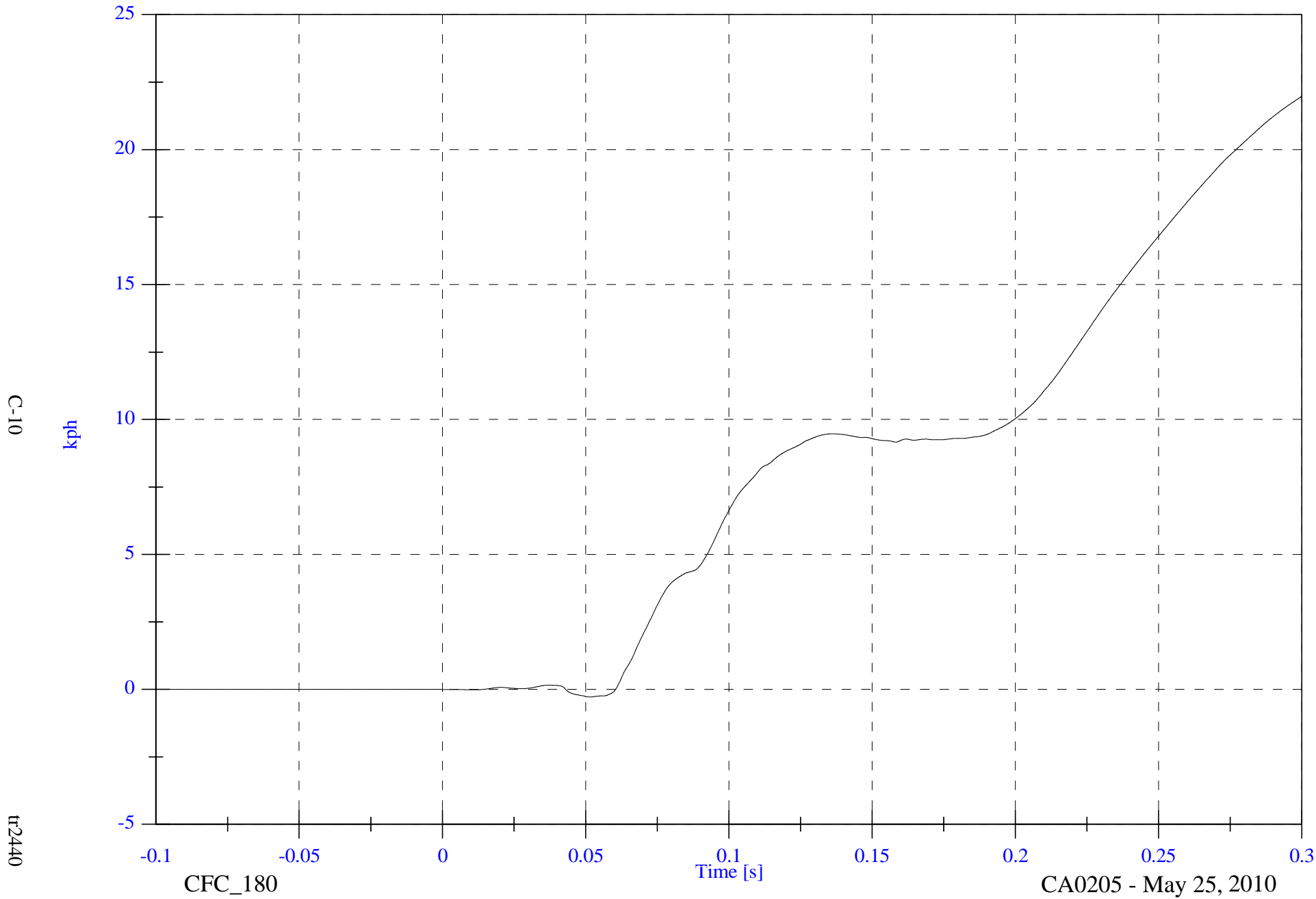
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 22.0 [kph] at 0.300 [s]

V2P4 Head z Velocity

Min: -0.3 [kph] at 0.052 [s]



C-10

kph

tr2440

CFC_180

Time [s]

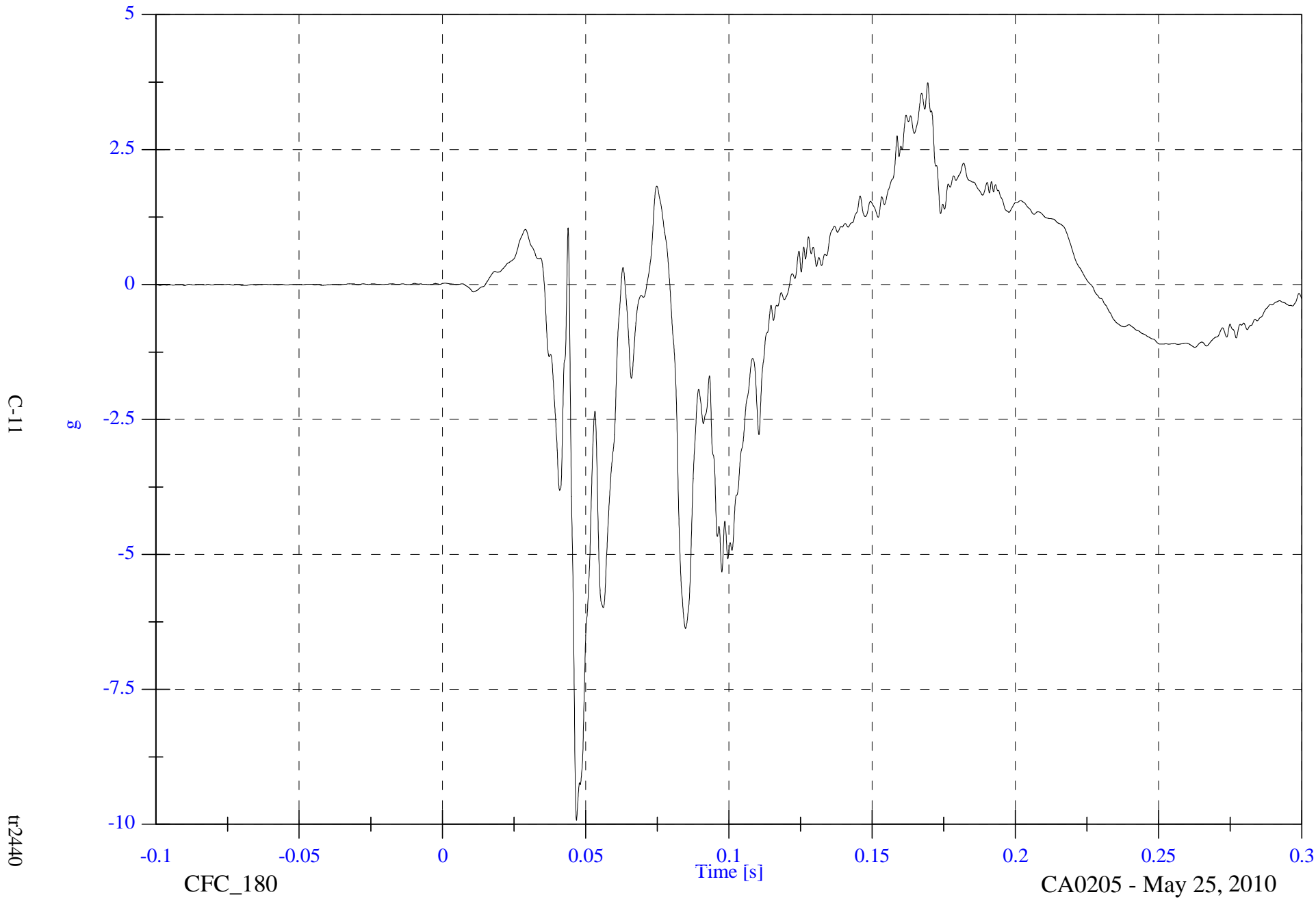
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P4 Lower Spine x

Max: 3.7 [g] at 0.169 [s]

Min: -9.9 [g] at 0.047 [s]



C-11

tr2440

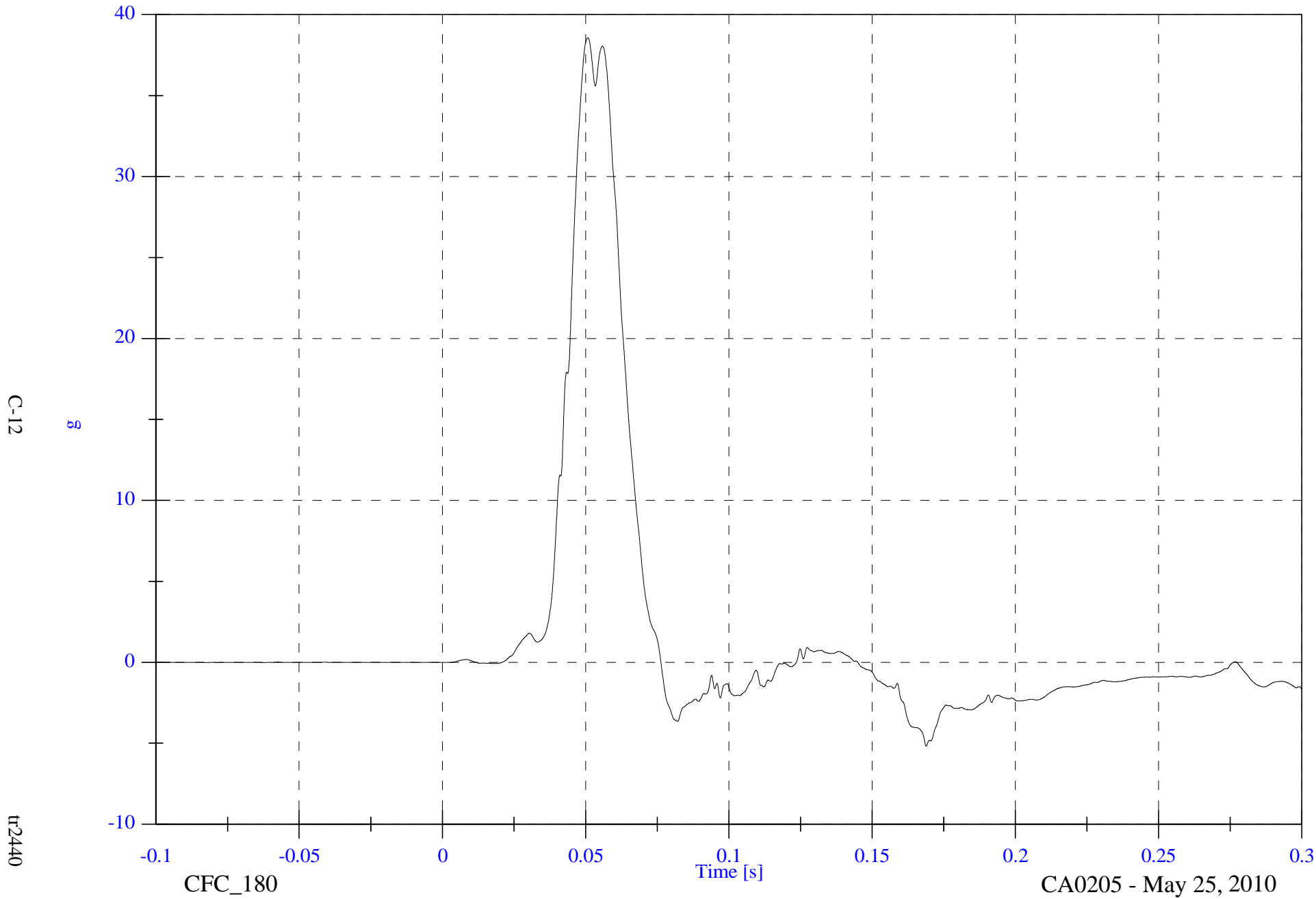
CFC_180

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 38.6 [g] at 0.051 [s]
Min: -5.2 [g] at 0.169 [s]

V2P4 Lower Spine y



C-12

g

tr2440

CFC_180

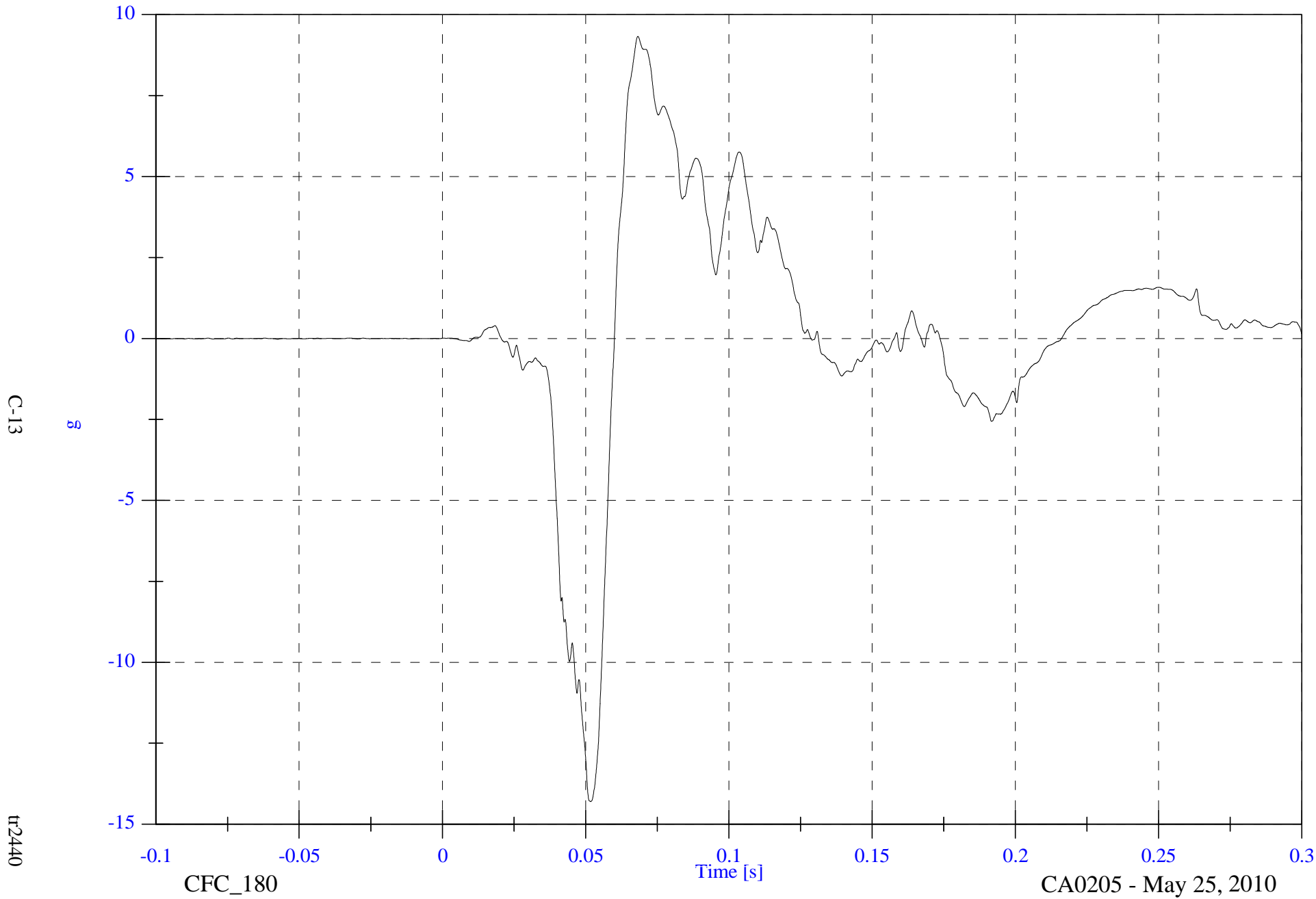
Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P4 Lower Spine z

Max: 9.3 [g] at 0.068 [s]
Min: -14.3 [g] at 0.052 [s]



C-13

g

tr2440

CFC_180

Time [s]

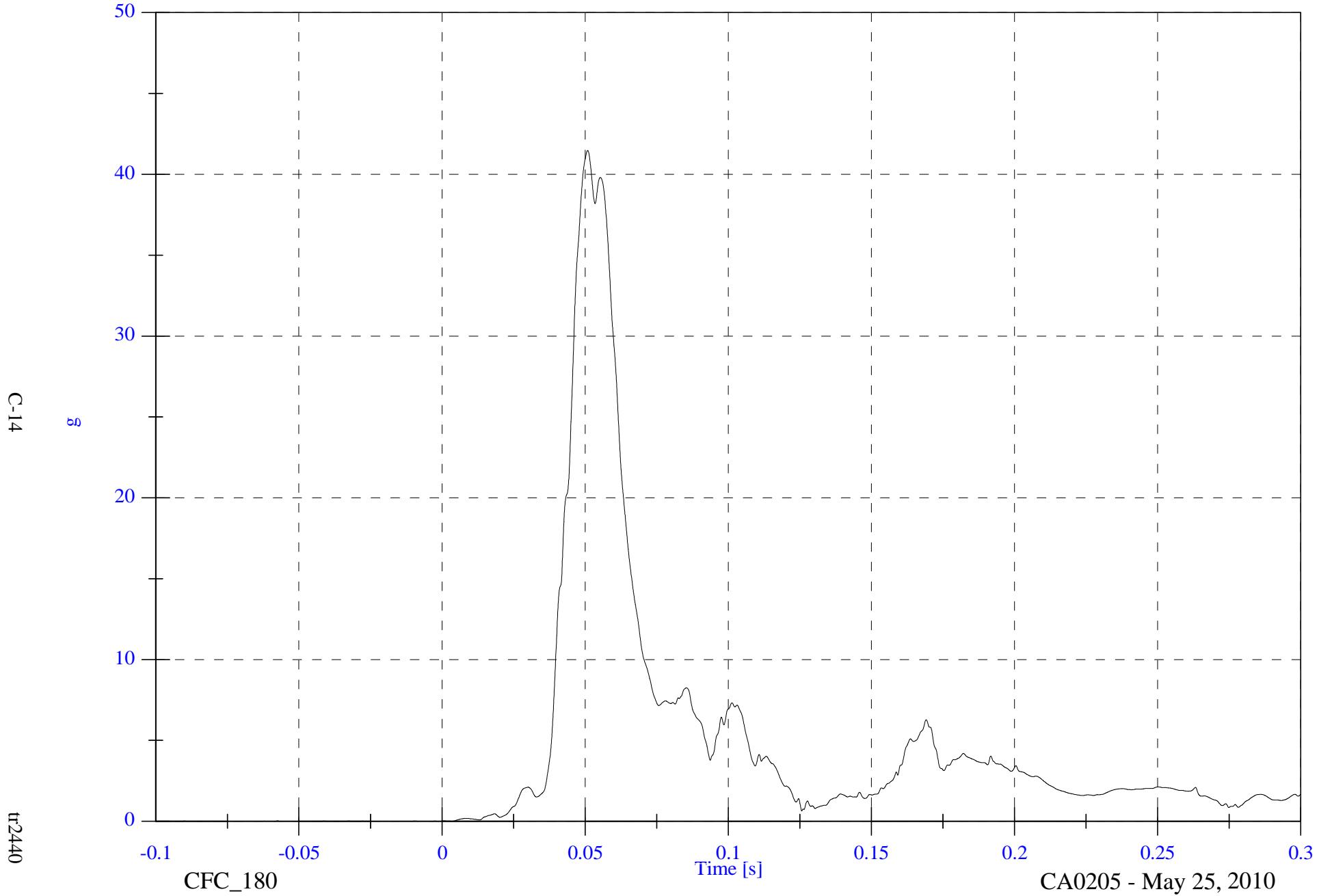
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P4 Lower Spine Resultant

Max: 41.5 [g] at 0.051 [s]

Min: 0.0 [g] at -0.074 [s]



C-14

tr2440

CFC_180

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

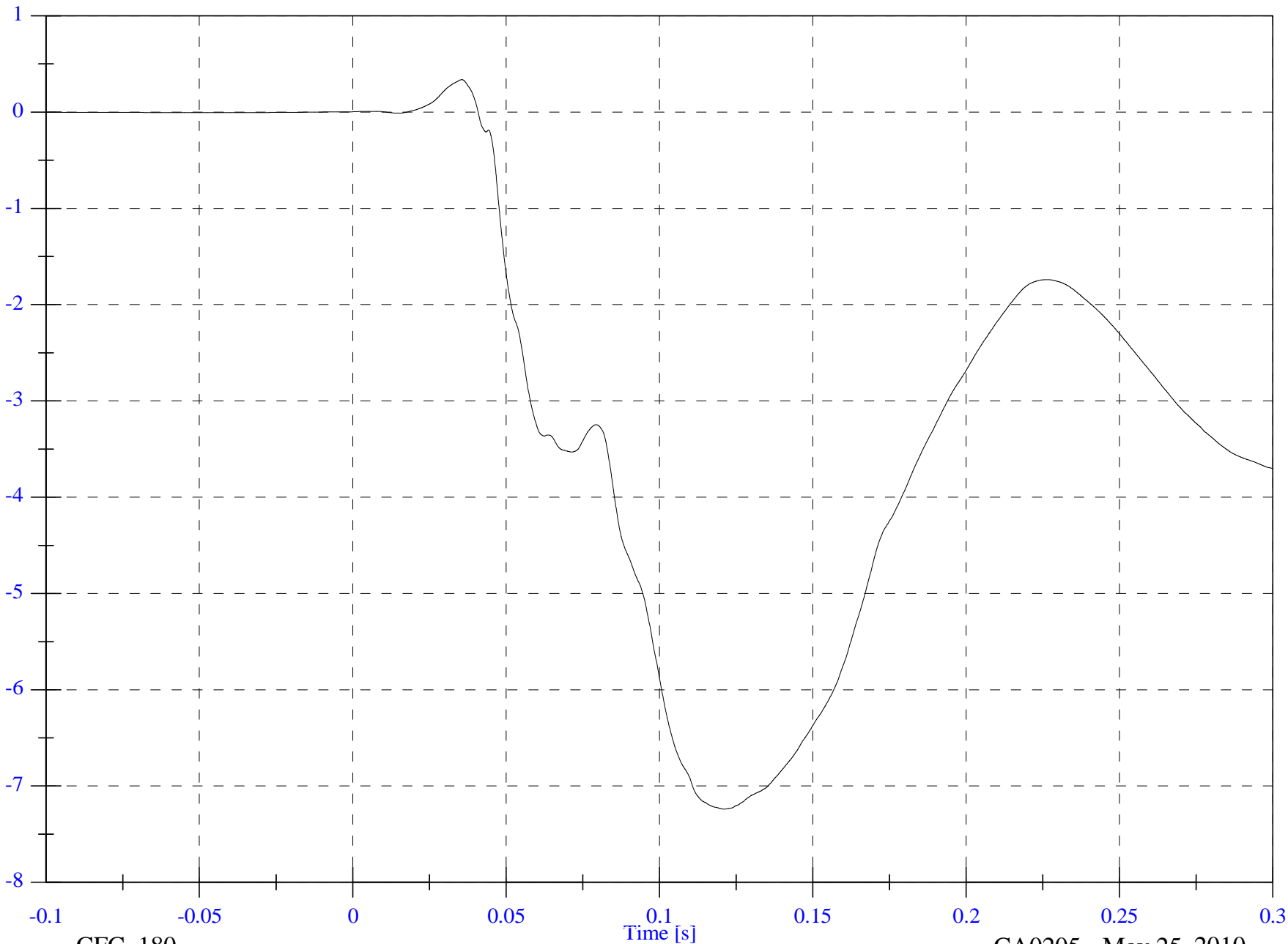
V2P4 Lower Spine x Velocity

Max: 0.3 [kph] at 0.036 [s]

Min: -7.2 [kph] at 0.121 [s]

C-15

kph



CFC_180

CA0205 - May 25, 2010

tr2440

FMVSS 214 MDB 2010 Ford Flex

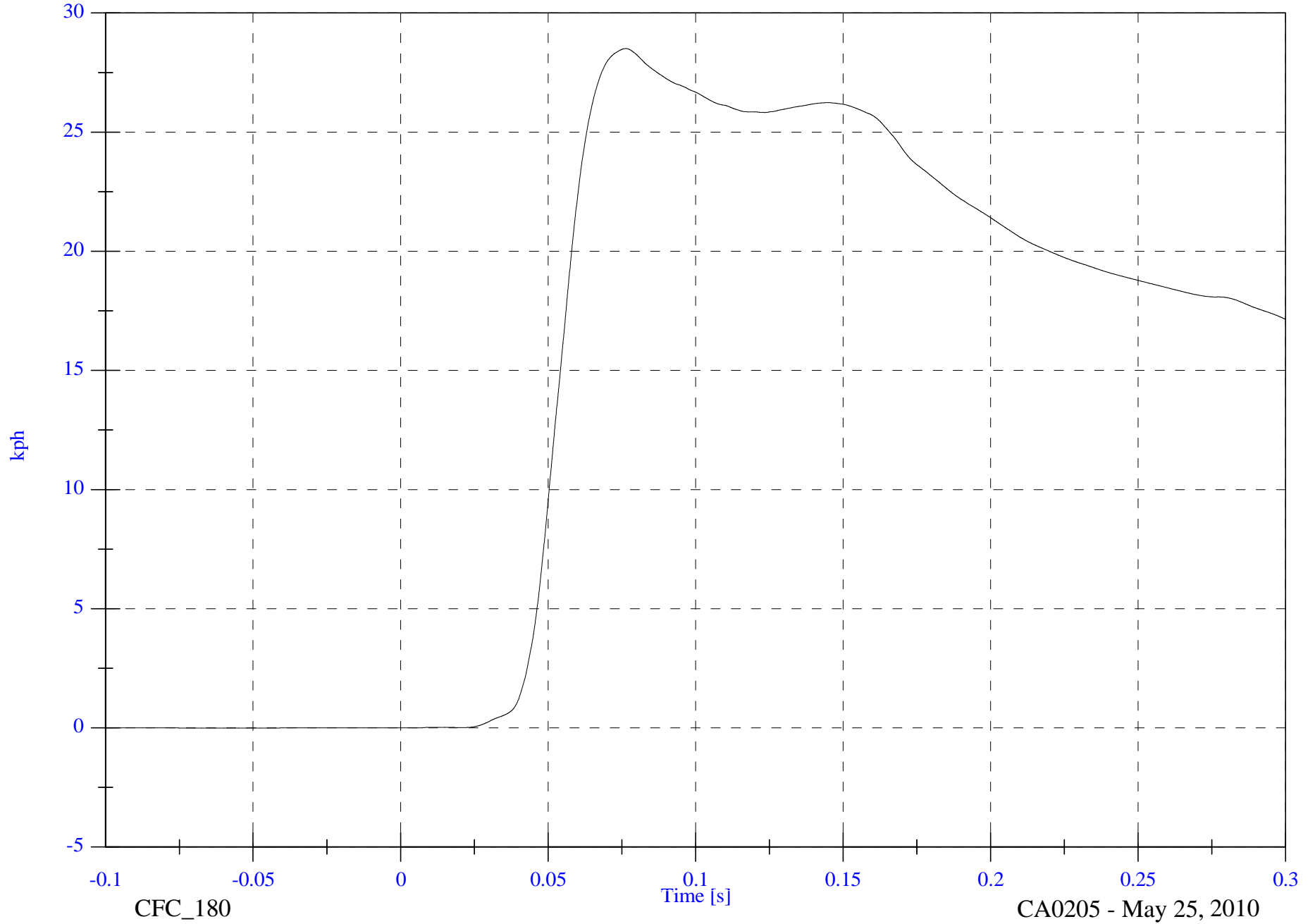
V2P4 Lower Spine y Velocity

Max: 28.5 [kph] at 0.076 [s]

Min: -0.0 [kph] at -0.059 [s]

C-16

tr2440

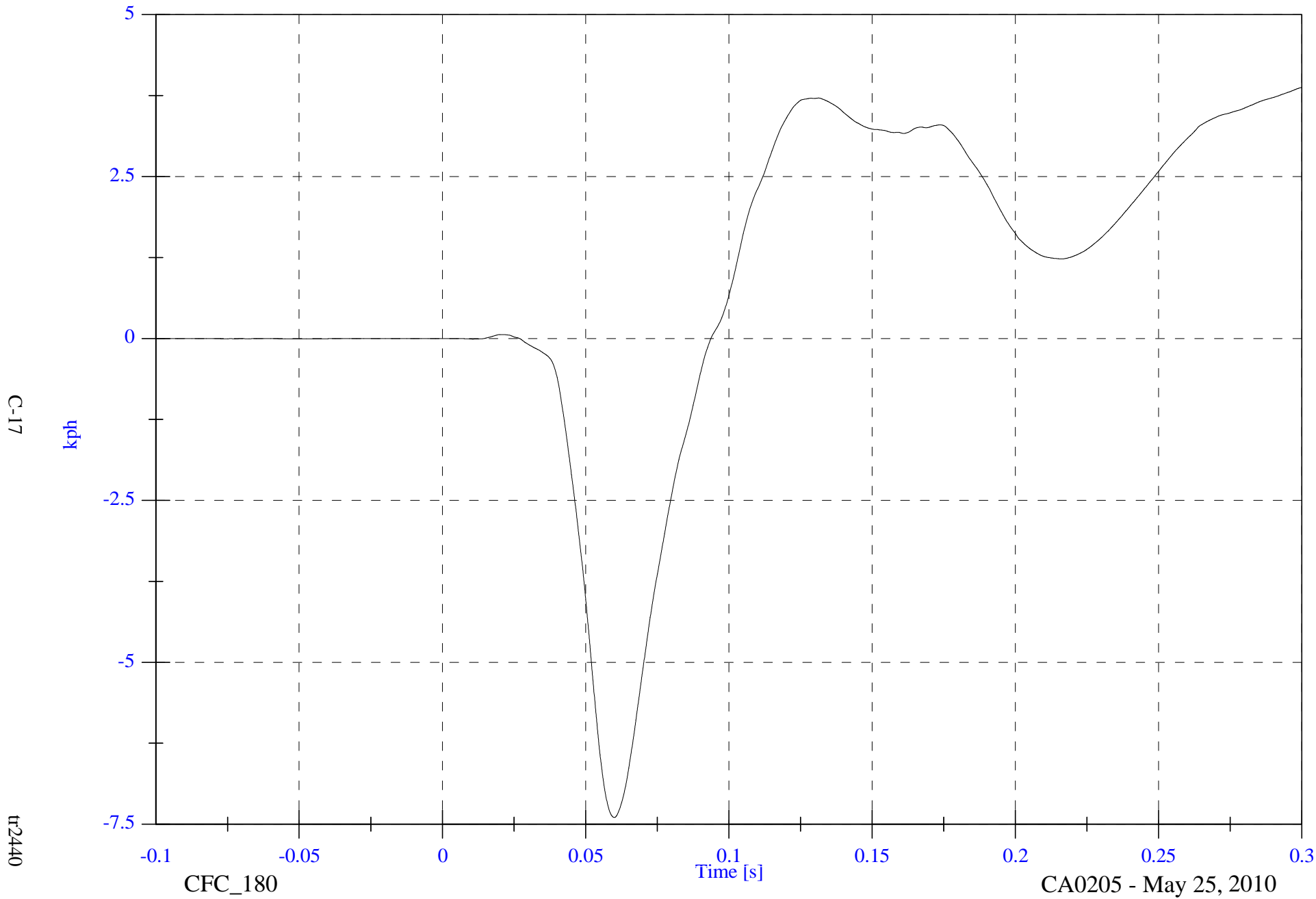


FMVSS 214 MDB 2010 Ford Flex

V2P4 Lower Spine z Velocity

Max: 3.9 [kph] at 0.300 [s]

Min: -7.4 [kph] at 0.060 [s]



C-17

tr2440

CFC_180

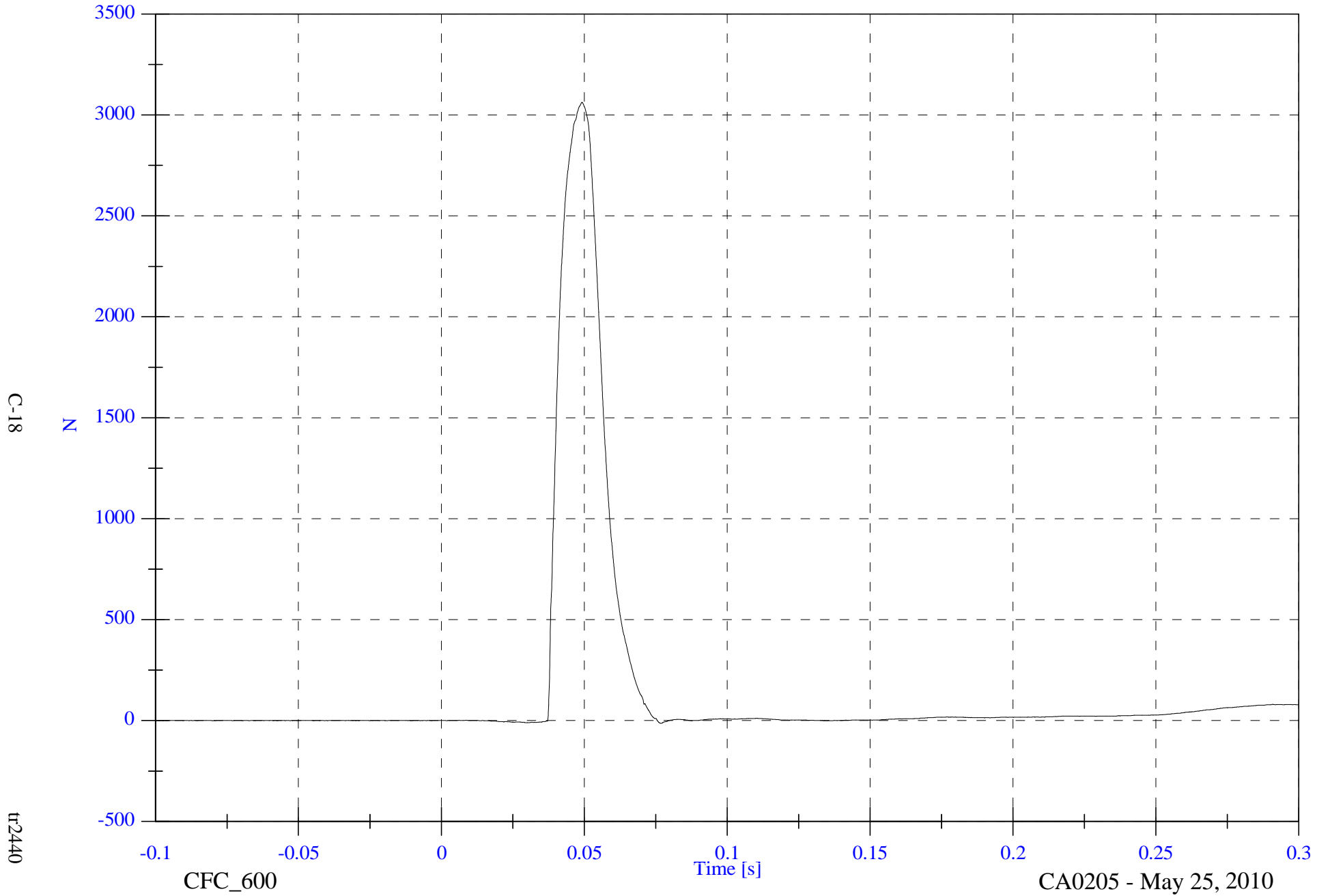
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2P4 Left Acetabulum Fy

Max: 3062.1 [N] at 0.049 [s]

Min: -13.9 [N] at 0.077 [s]



C-18

tr2440

CFC_600

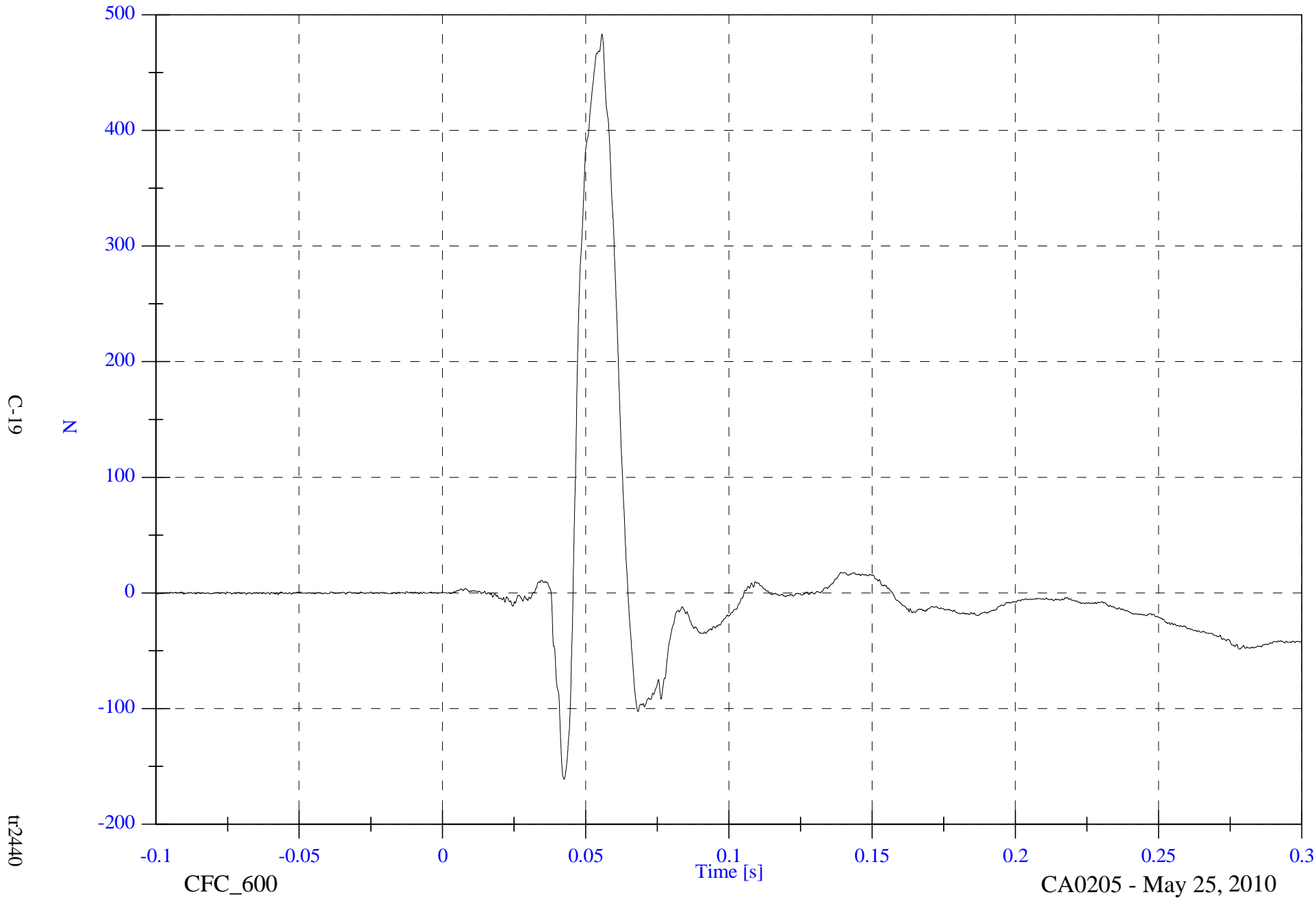
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 483.3 [N] at 0.056 [s]

Min: -161.1 [N] at 0.043 [s]

V2P4 Left Illiac Wing Fy



C-19

N

tr2440

CFC_600

Time [s]

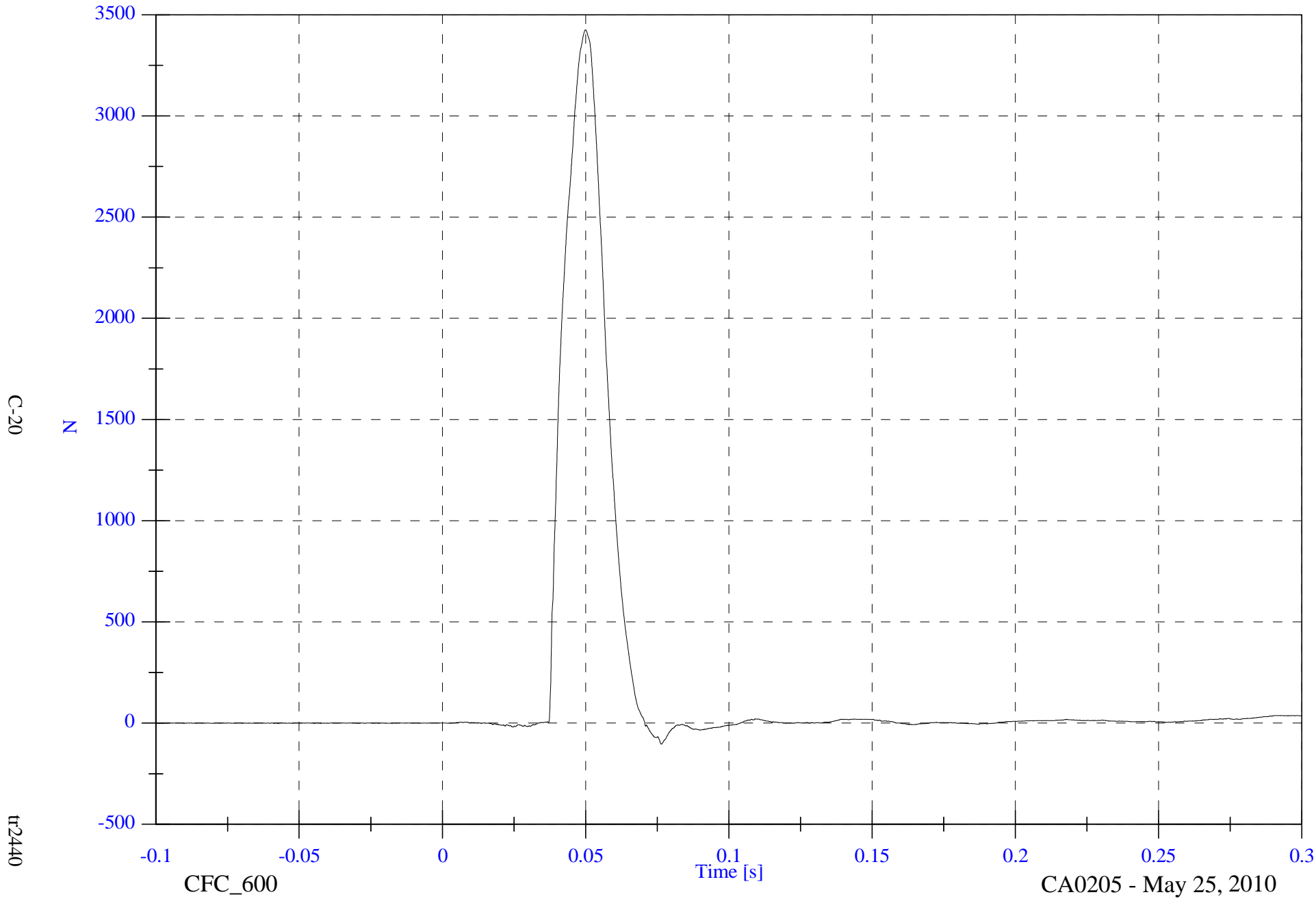
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 3425.7 [N] at 0.050 [s]

V2P4 Pelvis Summation

Min: -103.8 [N] at 0.076 [s]



APPENDIX D
VEHICLE AND MDB ACCELEROMETER RESPONSE DATA
(SAE sign convention)

DATA CHANNEL TITLE KEY

Prefix	Suffix
V1 = Vehicle 1 (Test Vehicle)	Ax = Acceleration, X-direction
V2 = Vehicle 2 (Test Vehicle)	Ay = Acceleration, Y-direction
A1-A13 = Accelerometer Location Number	Az = Acceleration, Z-direction

TABLE OF DATA PLOTS for VEHICLE

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	Right Sill at Front Seat (X) Acceleration vs. Time	D-4
2	Right Sill at Front Seat (X) Velocity vs. Time	D-5
3	Right Sill at Front Seat (Y) Acceleration vs. Time	D-6
4	Right Sill at Front Seat (Y) Velocity vs. Time	D-7
5	Right Sill at Front Seat (Z) Acceleration vs. Time	D-8
6	Right Sill at Front Seat (Z) Velocity vs. Time	D-9
7	Right Sill at Front Seat Resultant Acceleration vs. Time	D-10
8	Right Sill at Rear Seat (X) Acceleration vs. Time	D-11
9	Right Sill at Rear Seat (X) Velocity vs. Time	D-12
10	Right Sill at Rear Seat (Y) Acceleration vs. Time	D-13
11	Right Sill at Rear Seat (Y) Velocity vs. Time	D-14
12	Right Sill at Rear Seat (Z) Acceleration vs. Time	D-15
13	Right Sill at Rear Seat (Z) Velocity vs. Time	D-16
14	Right Sill at Rear Seat Resultant Acceleration vs. Time	D-17
15	Rear Floorpan Above Axle (X) Acceleration vs. Time	D-18
16	Rear Floorpan Above Axle (X) Velocity vs. Time	D-19
17	Rear Floorpan Above Axle (Y) Acceleration vs. Time	D-20
18	Rear Floorpan Above Axle (Y) Velocity vs. Time	D-21
19	Rear Floorpan Above Axle (Z) Acceleration vs. Time	D-22
20	Rear Floorpan Above Axle (Z) Velocity vs. Time	D-23
21	Rear Floorpan Above Axle Resultant Acceleration vs. Time	D-24
22	Left Sill at Rear Door (Y) Acceleration vs. Time	D-25
23	Left Sill at Rear Door (Y) Velocity vs. Time	D-26
24	Left Sill at Front Door (Y) Acceleration vs. Time	D-27
25	Left Sill at Front Door (Y) Velocity vs. Time	D-28
26	Left Rear Occupant Compartment (Y) Acceleration vs. Time	D-29
27	Left Rear Occupant Compartment (Y) Velocity vs. Time	D-30
28	Left Lower B-Pillar (Y) Acceleration vs. Time	D-31
29	Left Lower B-Pillar (Y) Velocity vs. Time	D-32
30	Left Mid B-Pillar (Y) Acceleration vs. Time	D-33
31	Left Mid B-Pillar (Y) Velocity vs. Time	D-34

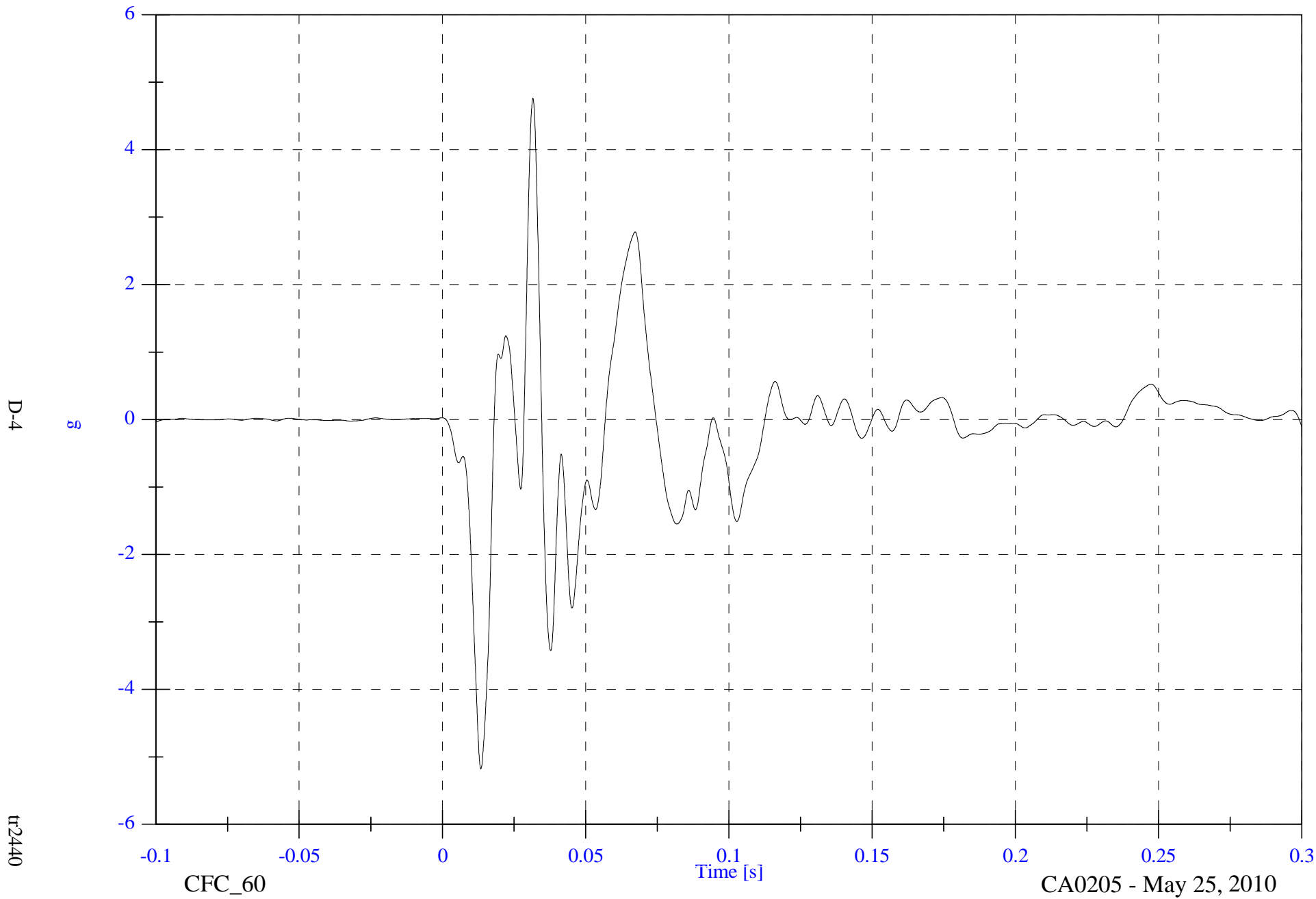
TABLE OF DATA PLOTS for VEHICLE (cont'd)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
32	Left Lower A-Pillar (Y) Acceleration vs. Time	D-35
33	Left Lower A-Pillar (Y) Velocity vs. Time	D-36
34	Left Middle A-Pillar (Y) Acceleration vs. Time	D-37
35	Left Middle A-Pillar (Y) Velocity vs. Time	D-38
36	Driver Seat Track (Y) Acceleration vs. Time	D-39
37	Driver Seat Track (Y) Velocity vs. Time	D-40
38	Rear Seat Track (Y) Acceleration vs. Time	D-41
39	Rear Seat Track (Y) Velocity vs. Time	D-42
40	Vehicle Center of Gravity (X) Acceleration vs. Time	D-43
41	Vehicle Center of Gravity (X) Velocity vs. Time	D-44
42	Vehicle Center of Gravity (Y) Acceleration vs. Time	D-45
43	Vehicle Center of Gravity (Y) Velocity vs. Time	D-46
44	Vehicle Center of Gravity (Z) Acceleration vs. Time	D-47
45	Vehicle Center of Gravity (Z) Velocity vs. Time	D-48
46	Vehicle Center of Gravity Resultant Acceleration vs. Time	D-49
47	MDB Center of Gravity (X) Acceleration vs. Time	D-50
48	MDB Center of Gravity (X) Velocity vs. Time	D-51
49	MDB Center of Gravity (Y) Acceleration vs. Time	D-52
50	MDB Center of Gravity (Y) Velocity vs. Time	D-53
51	MDB Center of Gravity (Z) Acceleration vs. Time	D-54
52	MDB Center of Gravity (Z) Velocity vs. Time	D-55
53	MDB Center of Gravity Resultant Acceleration vs. Time	D-56
54	MDB Rear (X) Acceleration vs. Time	D-57
55	MDB Rear (X) Velocity vs. Time	D-58
56	MDB Rear (Y) Acceleration vs. Time	D-59
57	MDB Rear (Y) Velocity vs. Time	D-60

FMVSS 214 MDB 2010 Ford Flex

V2 A1 Right Front Sill X

Max: 4.8 [g] at 0.032 [s]
Min: -5.2 [g] at 0.013 [s]



D-4

g

tr2440

CFC_60

Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A1 Right Front Sill X Velocity

Max: 0.0 [kph] at 0.004 [s]

Min: -1.8 [kph] at 0.112 [s]



D-5

tr2440

CFC_180

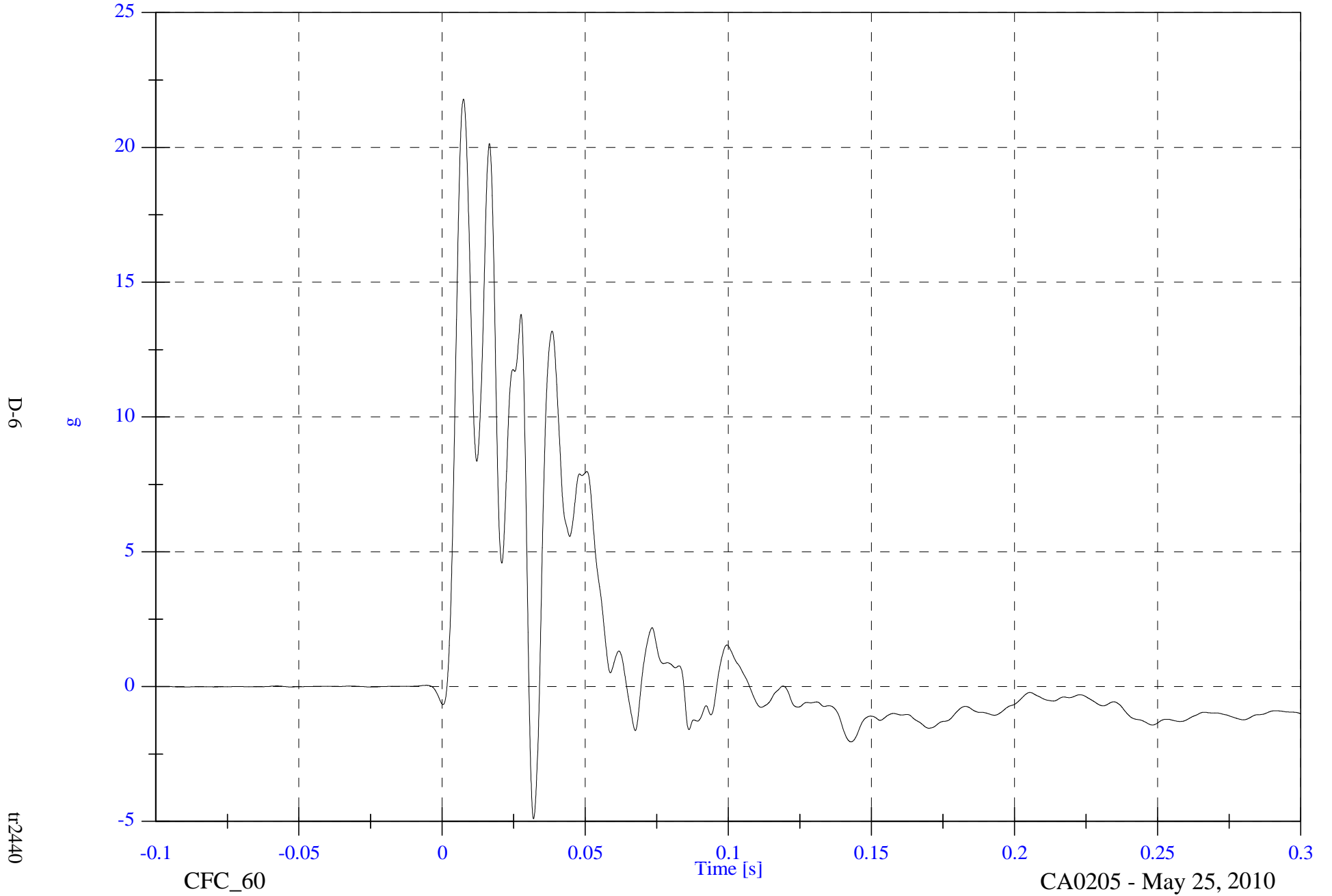
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A1 Right Front Sill Y

Max: 21.8 [g] at 0.007 [s]

Min: -4.9 [g] at 0.032 [s]



D-6

tr2440

CFC_60

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

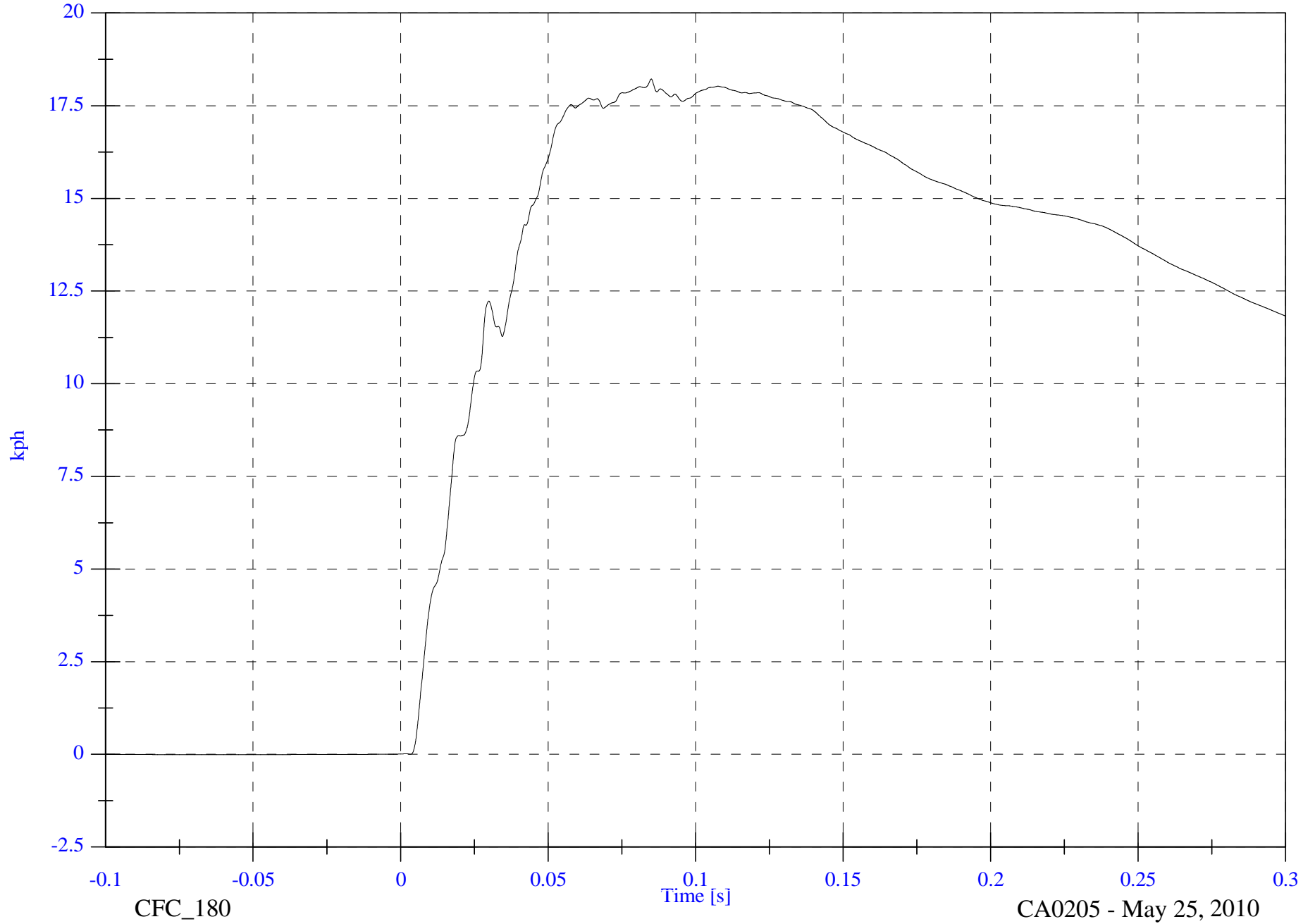
V2 A1 Right Front Sill Y Velocity

Max: 18.2 [kph] at 0.085 [s]

Min: -0.0 [kph] at -0.060 [s]

D-7

tr2440

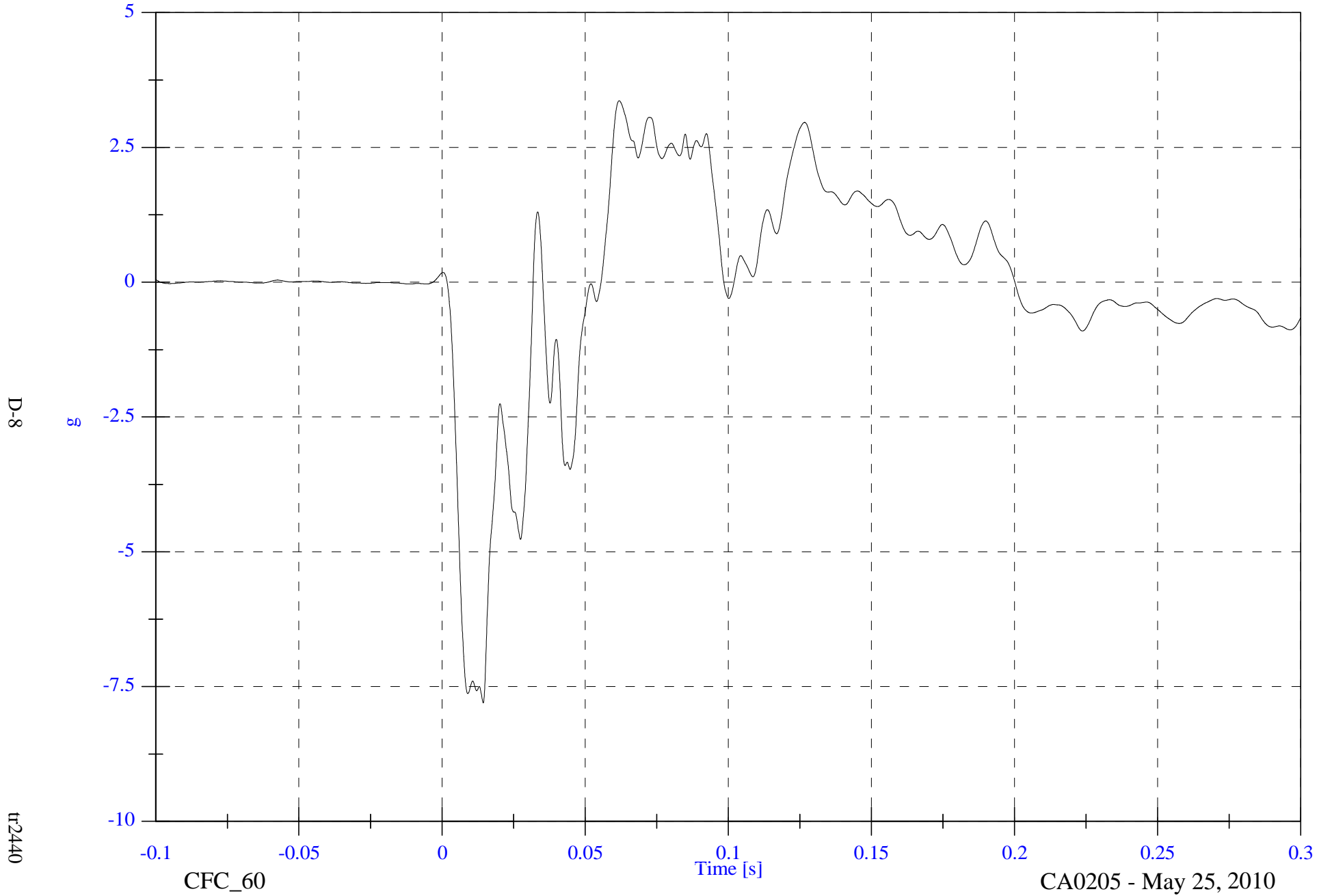


FMVSS 214 MDB 2010 Ford Flex

V2 A1 Right Front Sill Z

Max: 3.4 [g] at 0.062 [s]

Min: -7.8 [g] at 0.014 [s]



D-8

tr2440

CFC_60

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A1 Right Front Sill Z Velocity

Max: 1.8 [kph] at 0.200 [s]

Min: -5.8 [kph] at 0.055 [s]

D-9

kph



CFC_180

CA0205 - May 25, 2010

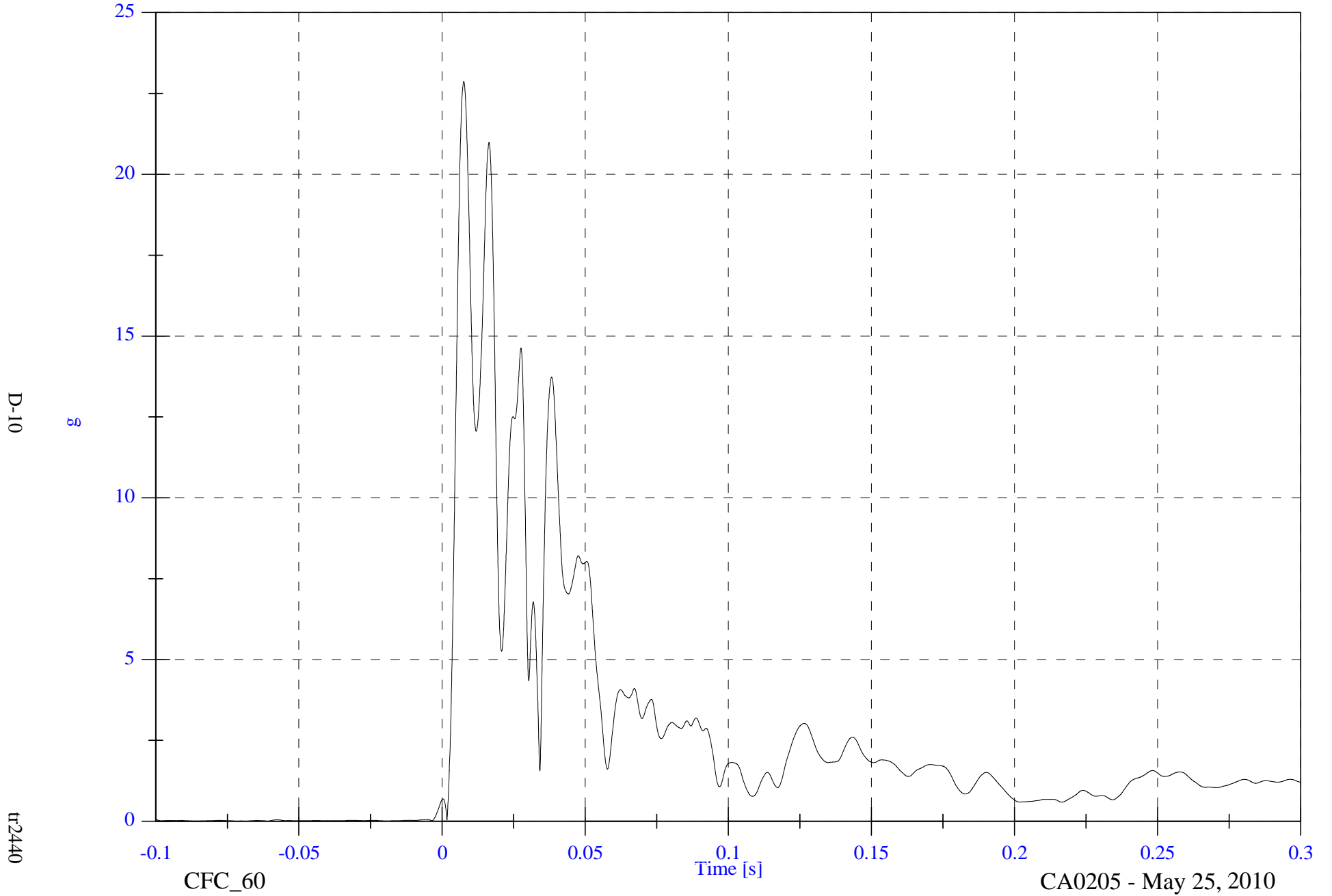
tr2440

FMVSS 214 MDB 2010 Ford Flex

V2 A1 Right Front Sill Resultant

Max: 22.9 [g] at 0.008 [s]

Min: 0.0 [g] at -0.061 [s]



D-10

tr2440

CFC_60

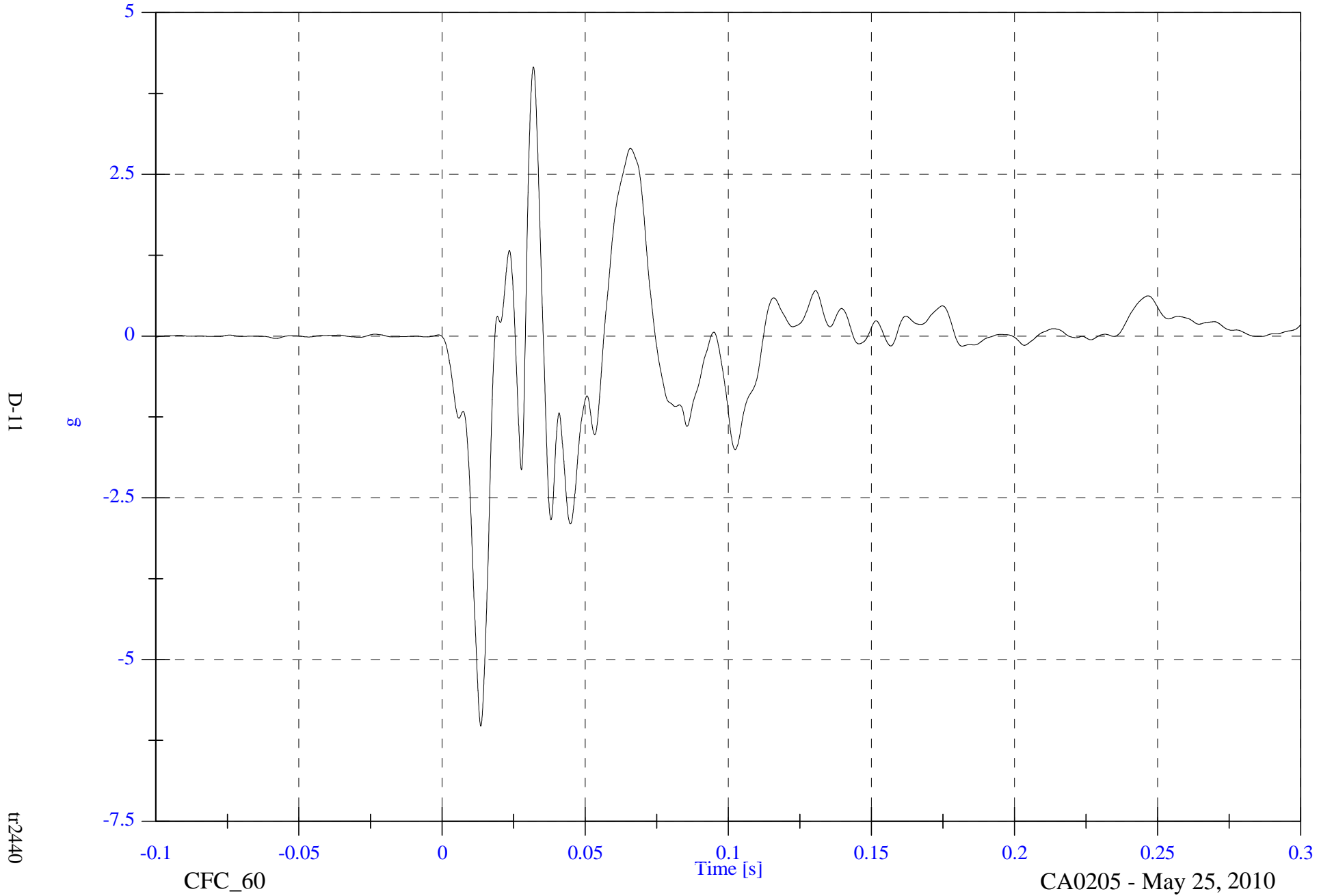
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A2 Right Rear Sill X

Max: 4.2 [g] at 0.032 [s]

Min: -6.0 [g] at 0.014 [s]



D-11

tr2440

CFC_60

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A2 Right Rear Sill X Velocity

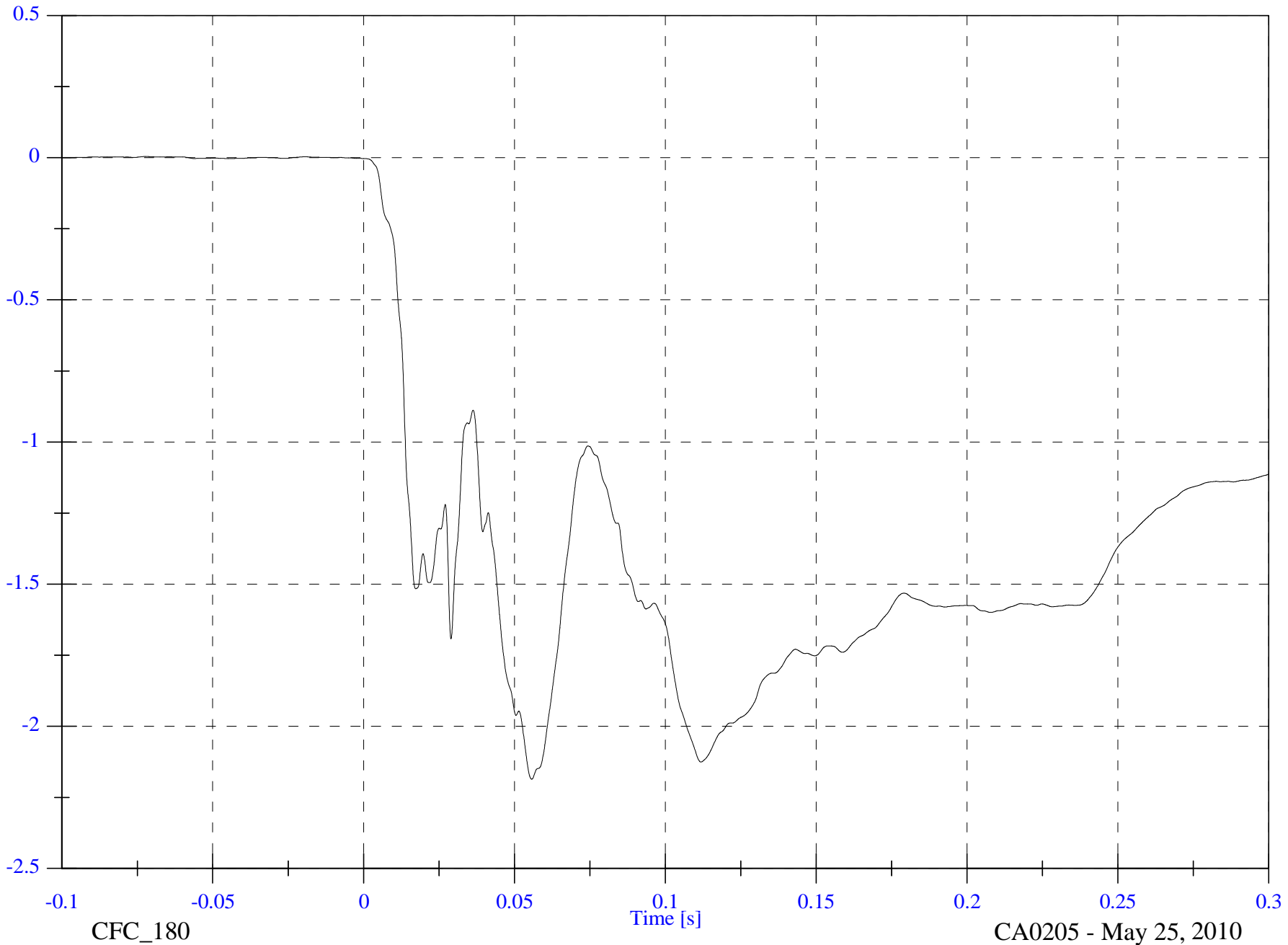
Max: 0.0 [kph] at -0.072 [s]

Min: -2.2 [kph] at 0.056 [s]

D-12

kph

tr2440



CFC_180

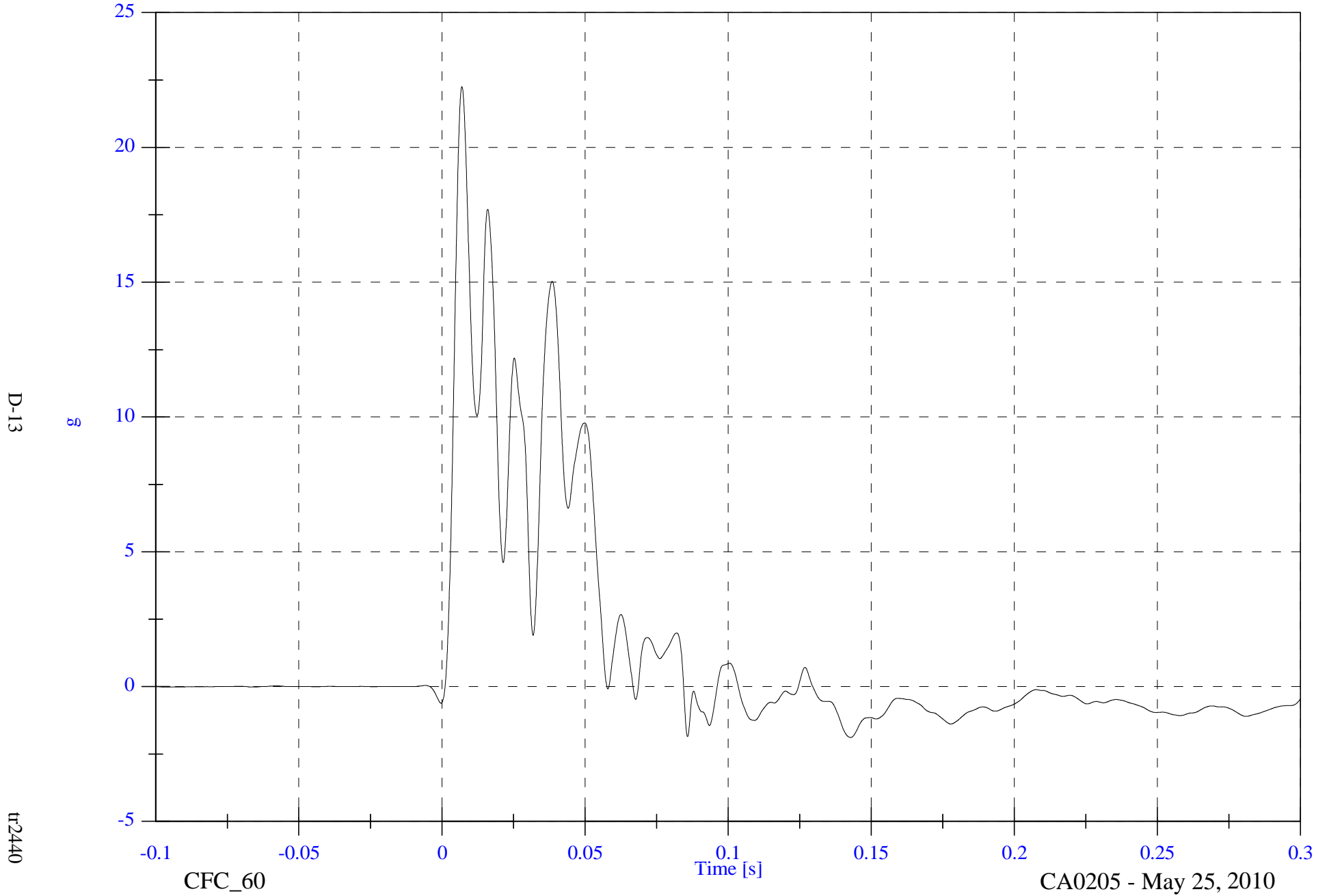
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A2 Right Rear Sill Y

Max: 22.3 [g] at 0.007 [s]

Min: -1.9 [g] at 0.143 [s]



D-13

tr2440

CFC_60

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

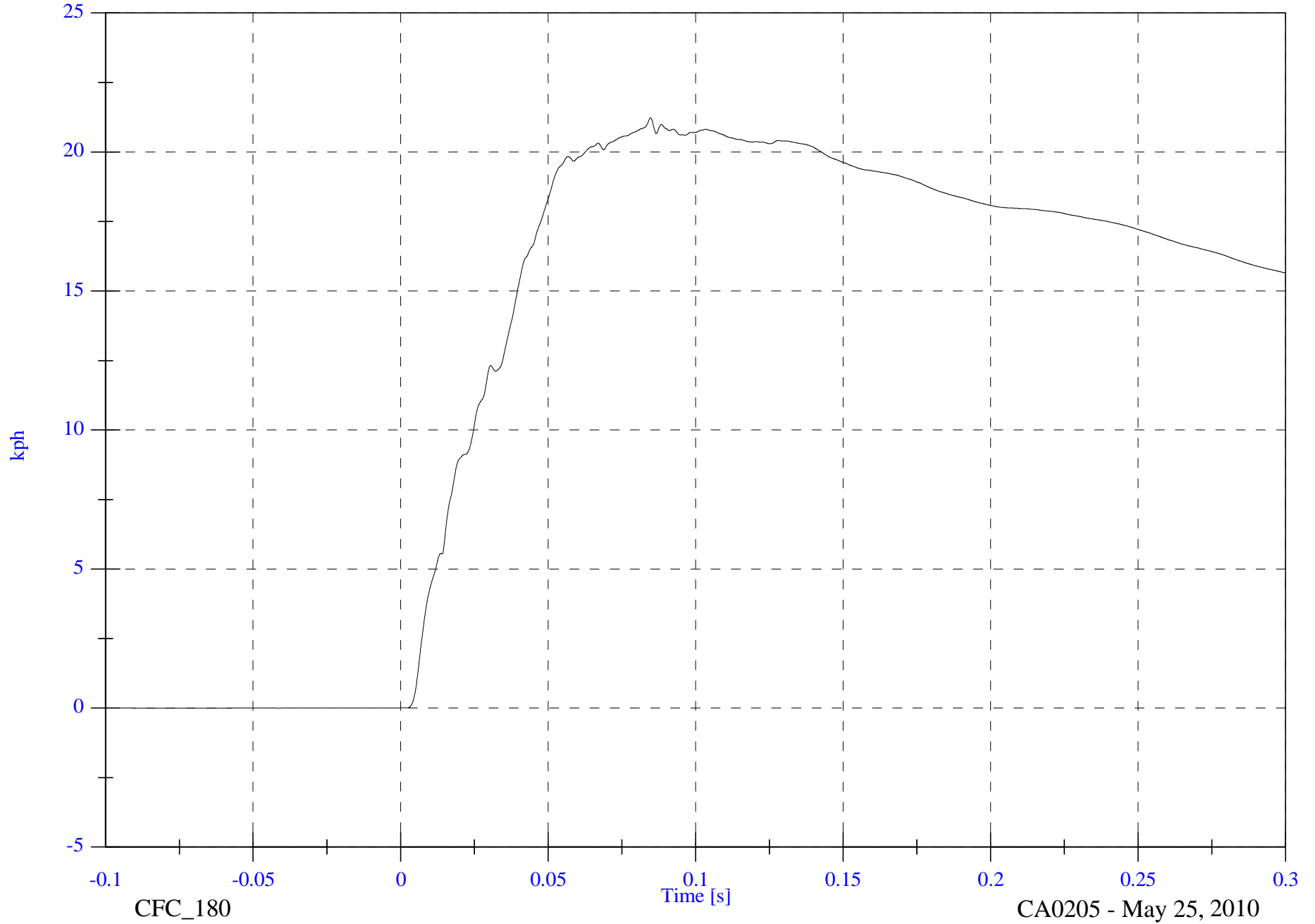
V2 A2 Right Rear Sill Y Velocity

Max: 21.2 [kph] at 0.085 [s]

Min: -0.0 [kph] at -0.064 [s]

D-14

tr2440



CFC_180

Time [s]

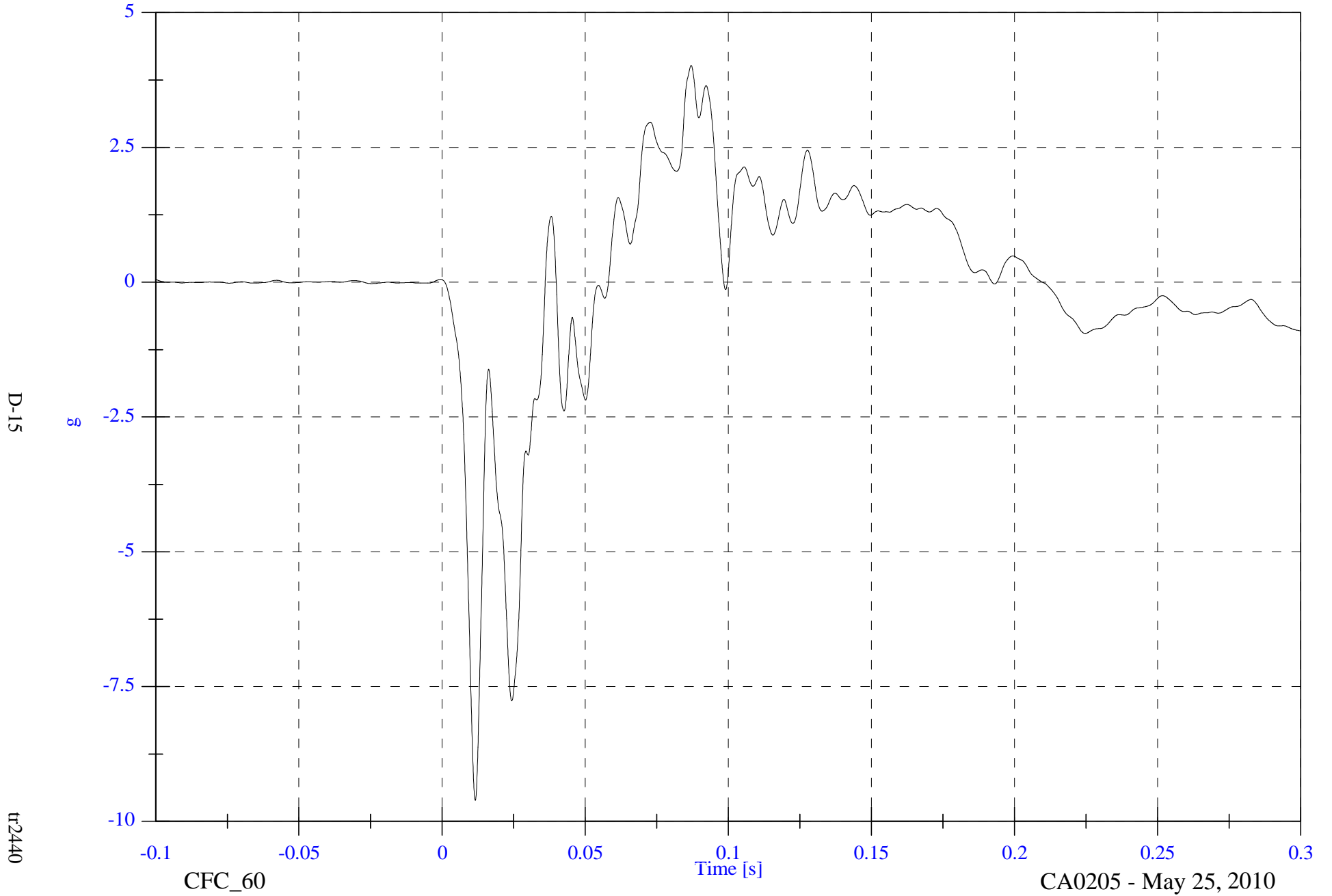
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A2 Right Rear Sill Z

Max: 4.0 [g] at 0.087 [s]

Min: -9.6 [g] at 0.012 [s]



D-15

tr2440

CFC_60

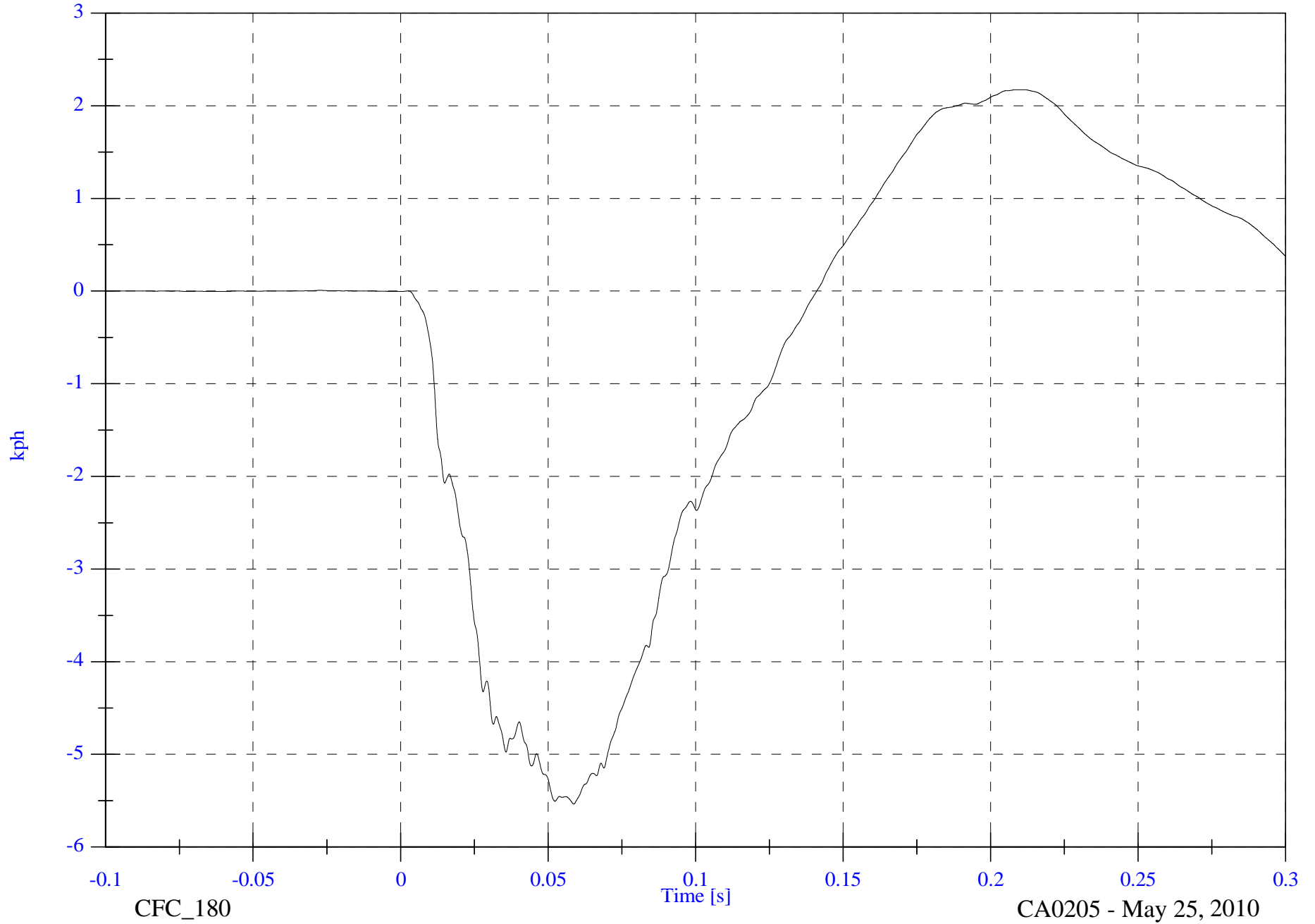
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A2 Right Rear Sill Z Velocity

Max: 2.2 [kph] at 0.209 [s]

Min: -5.5 [kph] at 0.059 [s]



D-16

tr2440

CFC_180

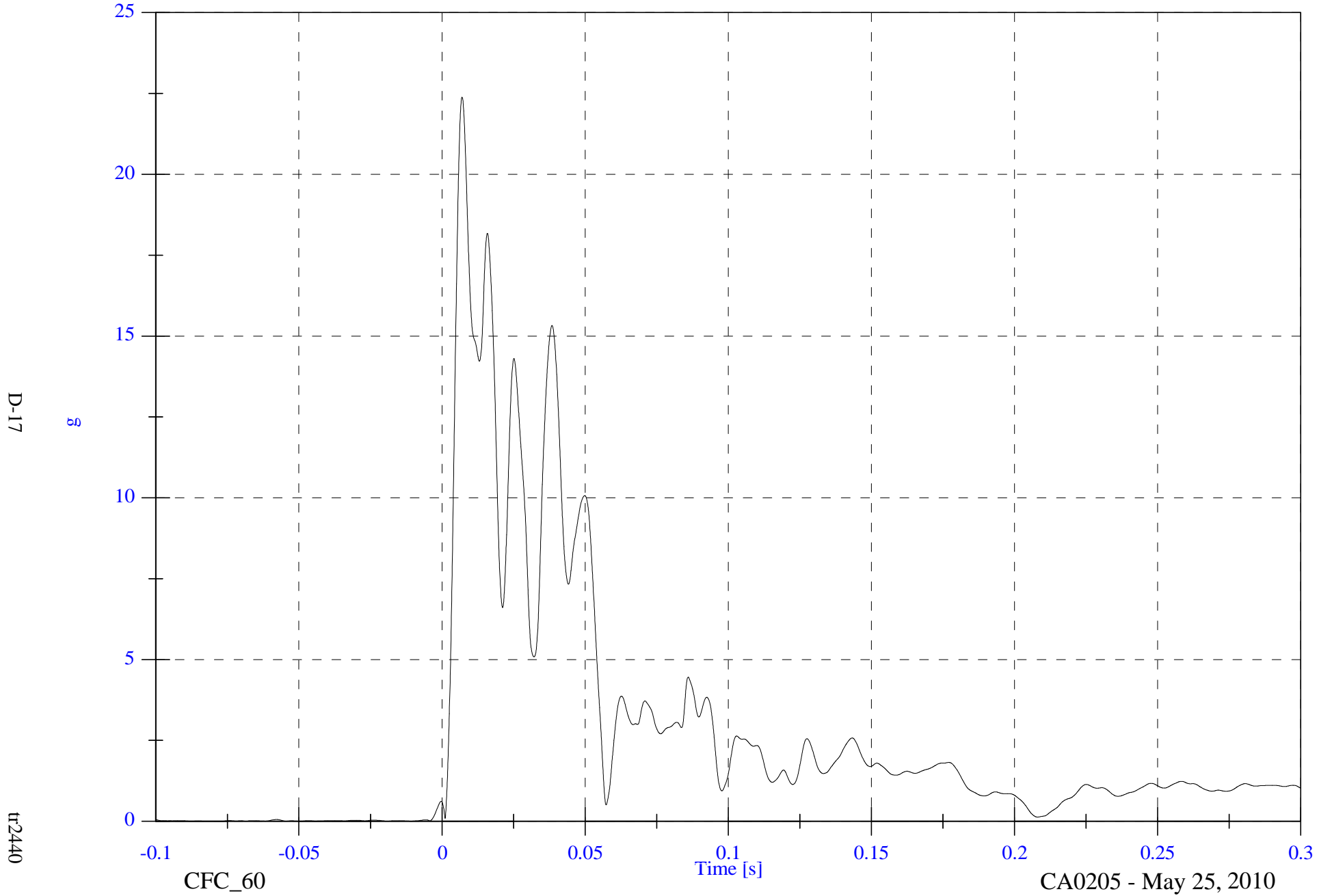
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A2 Right Rear Sill Resultant

Max: 22.4 [g] at 0.007 [s]

Min: 0.0 [g] at -0.019 [s]



D-17

tr2440

CFC_60

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

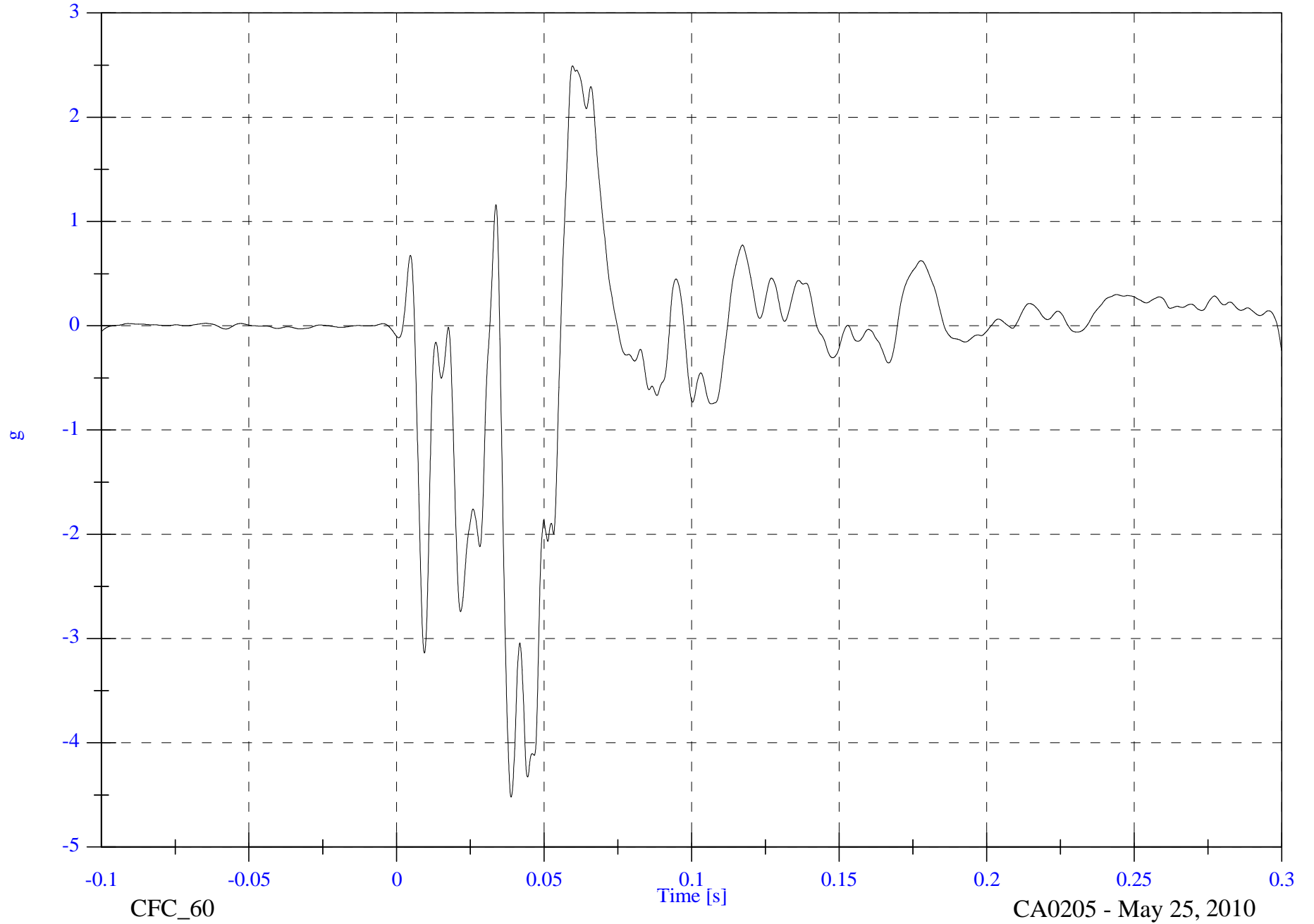
V2 A3 Rear Floorpan X

Max: 2.5 [g] at 0.060 [s]

Min: -4.5 [g] at 0.039 [s]

D-18

tr2440



FMVSS 214 MDB 2010 Ford Flex

V2 A3 Rear Floorpan X Velocity

Max: 0.1 [kph] at 0.006 [s]

Min: -3.3 [kph] at 0.055 [s]

D-19

kph

tr2440



CFC_180

Time [s]

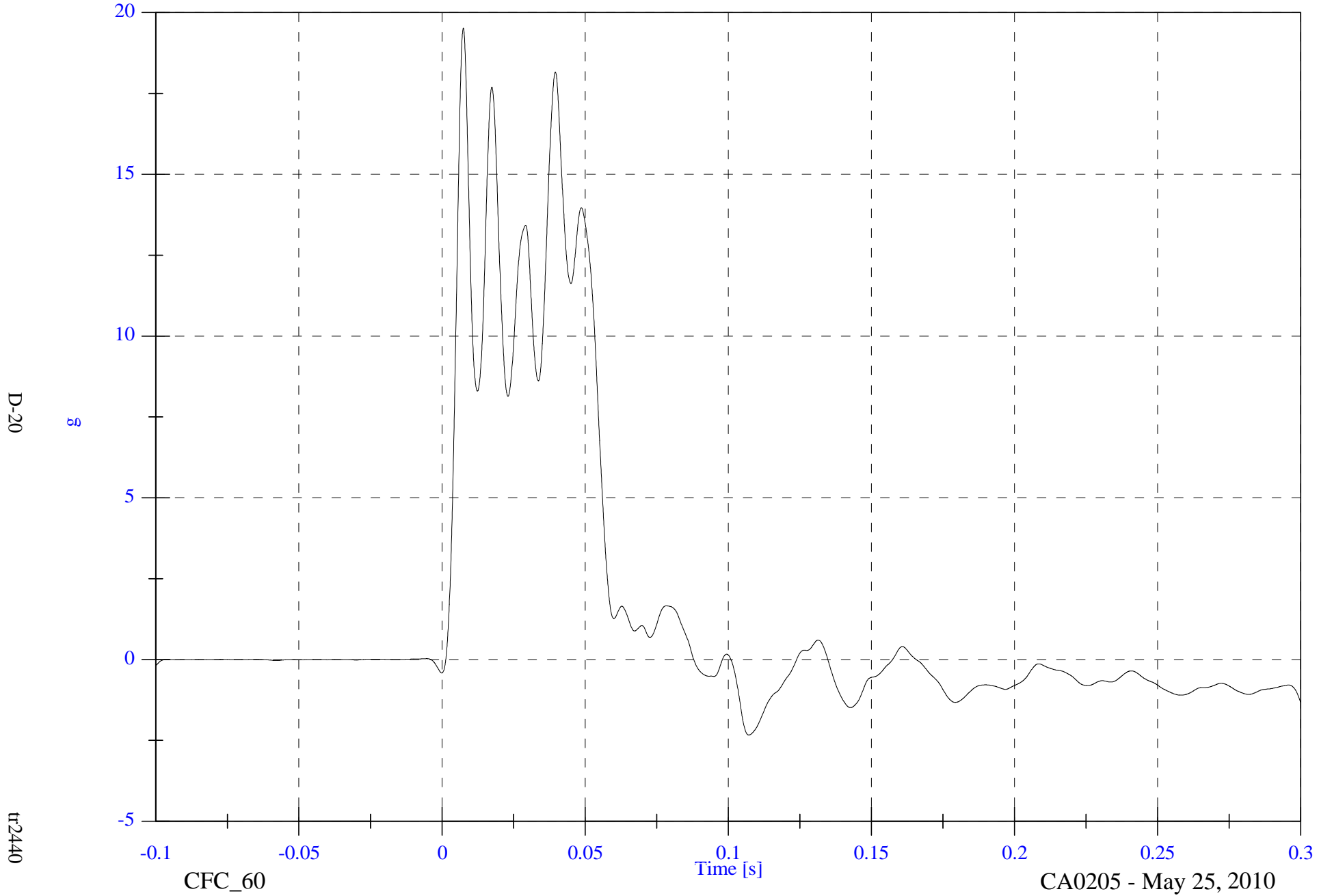
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A3 Rear Floorpan Y

Max: 19.5 [g] at 0.007 [s]

Min: -2.3 [g] at 0.107 [s]



D-20

tr2440

CFC_60

Time [s]

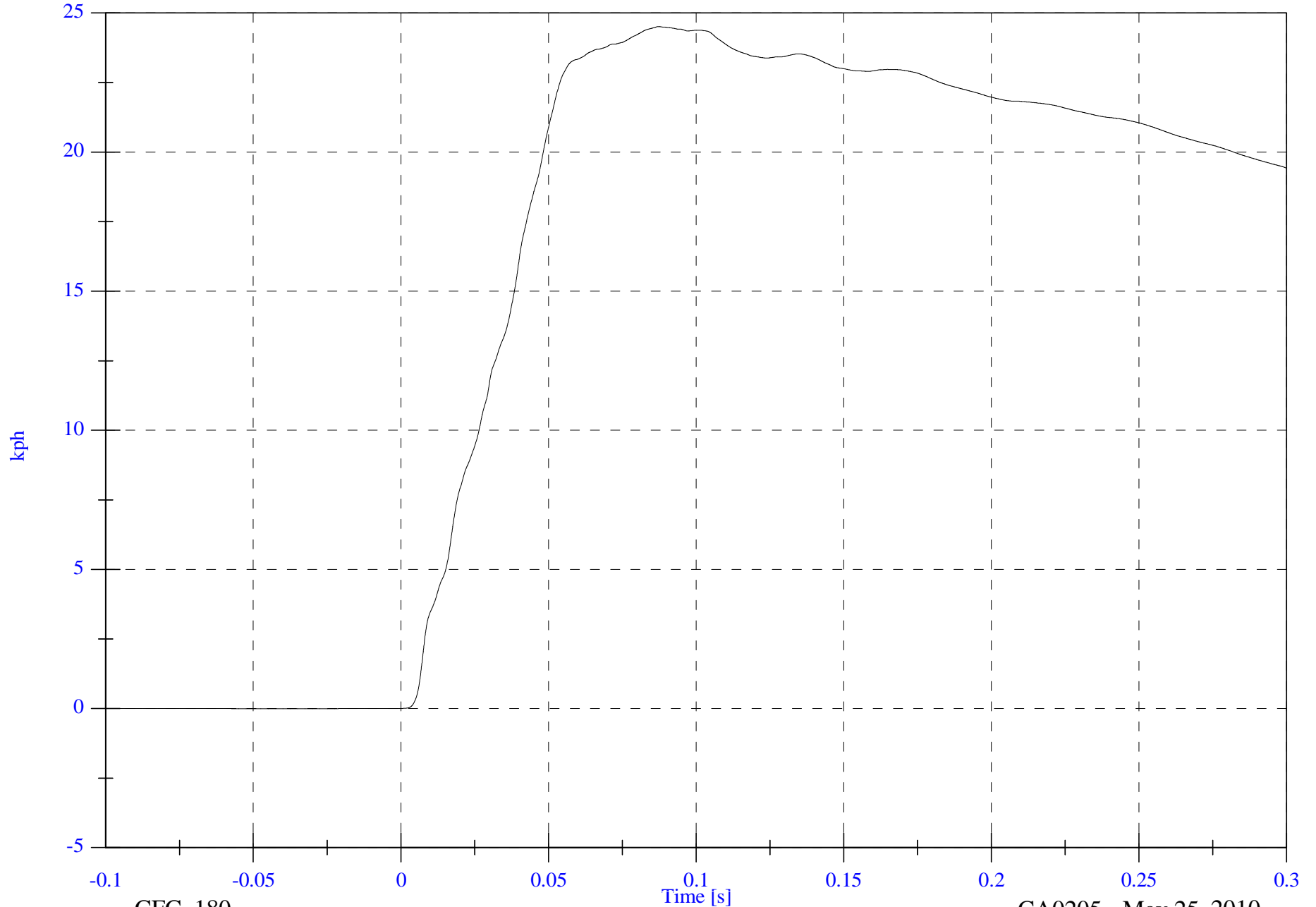
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 24.5 [kph] at 0.087 [s]

V2 A3 Rear Floorpan Y Velocity

Min: -0.0 [kph] at -0.028 [s]



D-21

tr2440

CFC_180

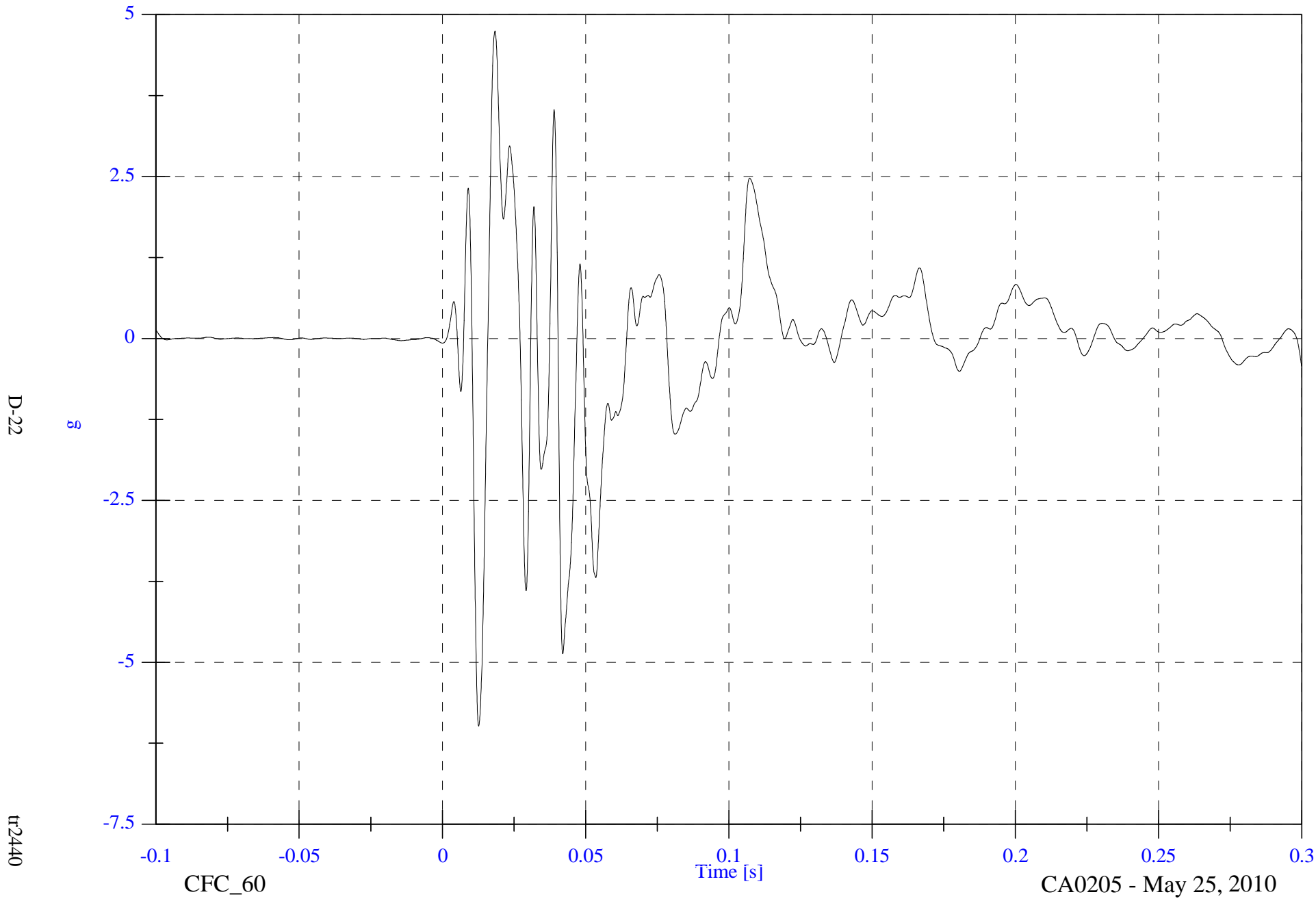
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A3 Rear Floorpan Z

Max: 4.8 [g] at 0.018 [s]

Min: -6.0 [g] at 0.013 [s]



D-22

tr2440

CFC_60

Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A3 Rear Floorpan Z Velocity

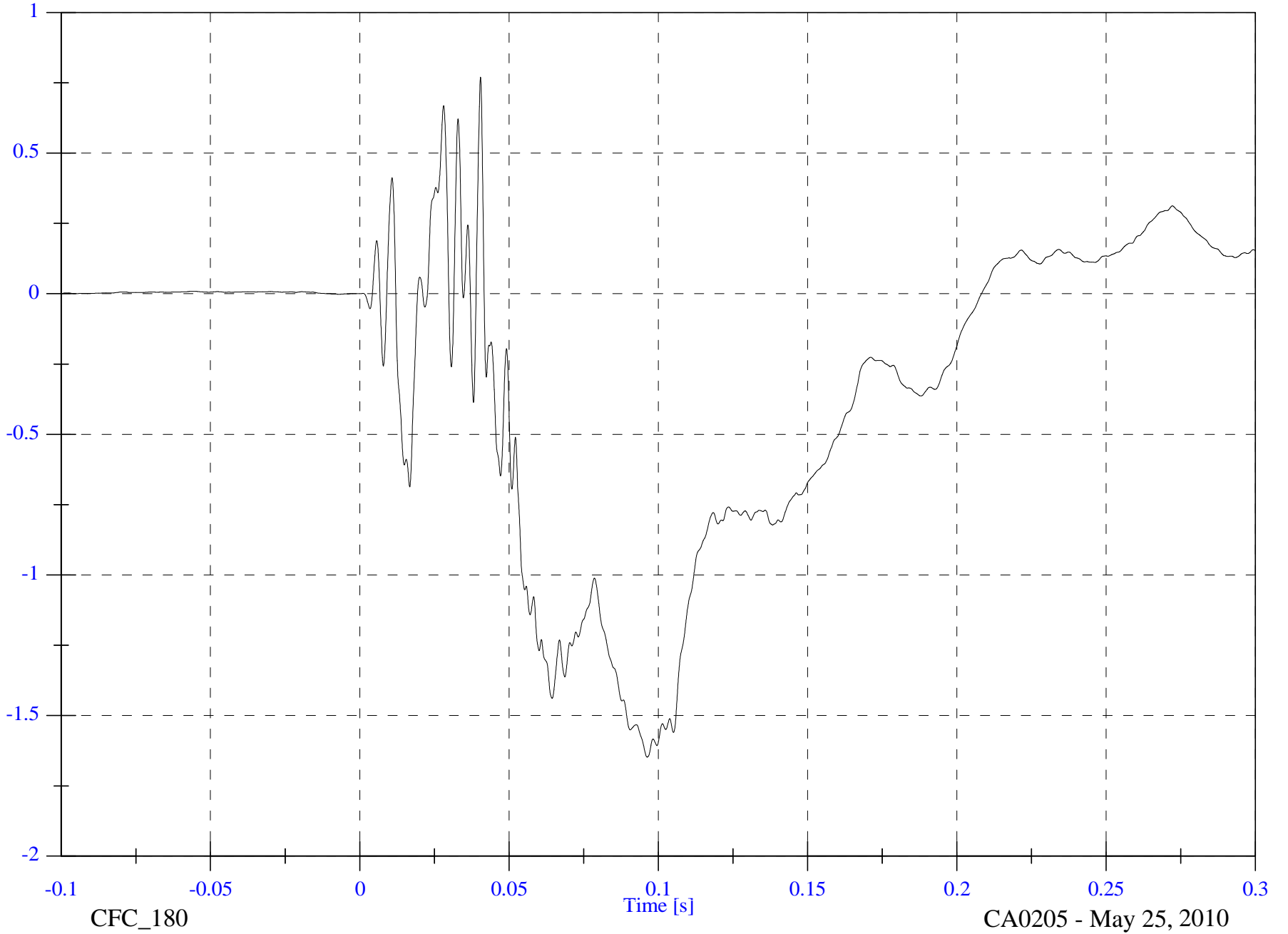
Max: 0.8 [kph] at 0.040 [s]

Min: -1.6 [kph] at 0.096 [s]

D-23

kph

tr2440

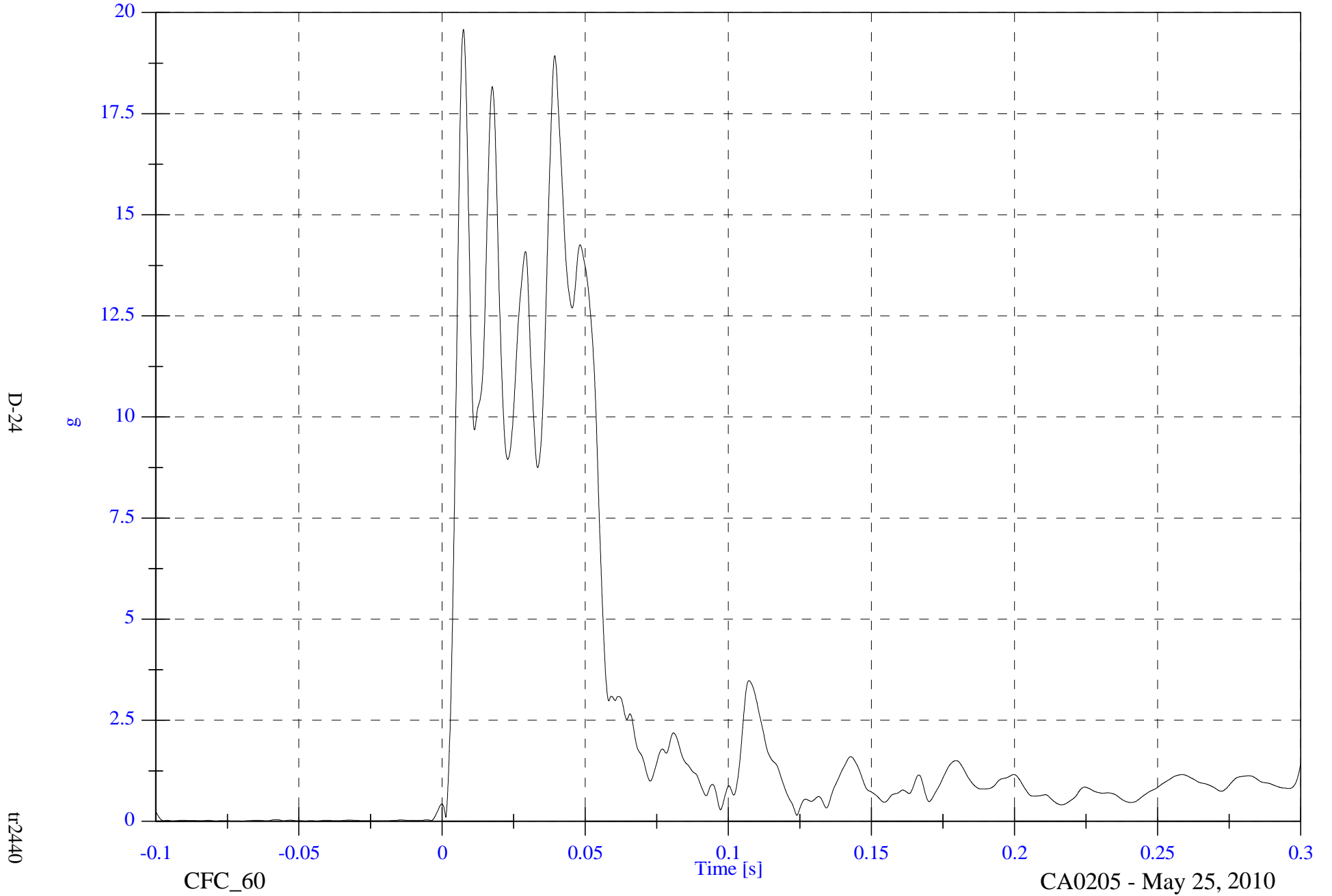


FMVSS 214 MDB 2010 Ford Flex

V2 A3 Rear Floorpan Resultant

Max: 19.6 [g] at 0.007 [s]

Min: 0.0 [g] at -0.079 [s]



D-24

tr2440

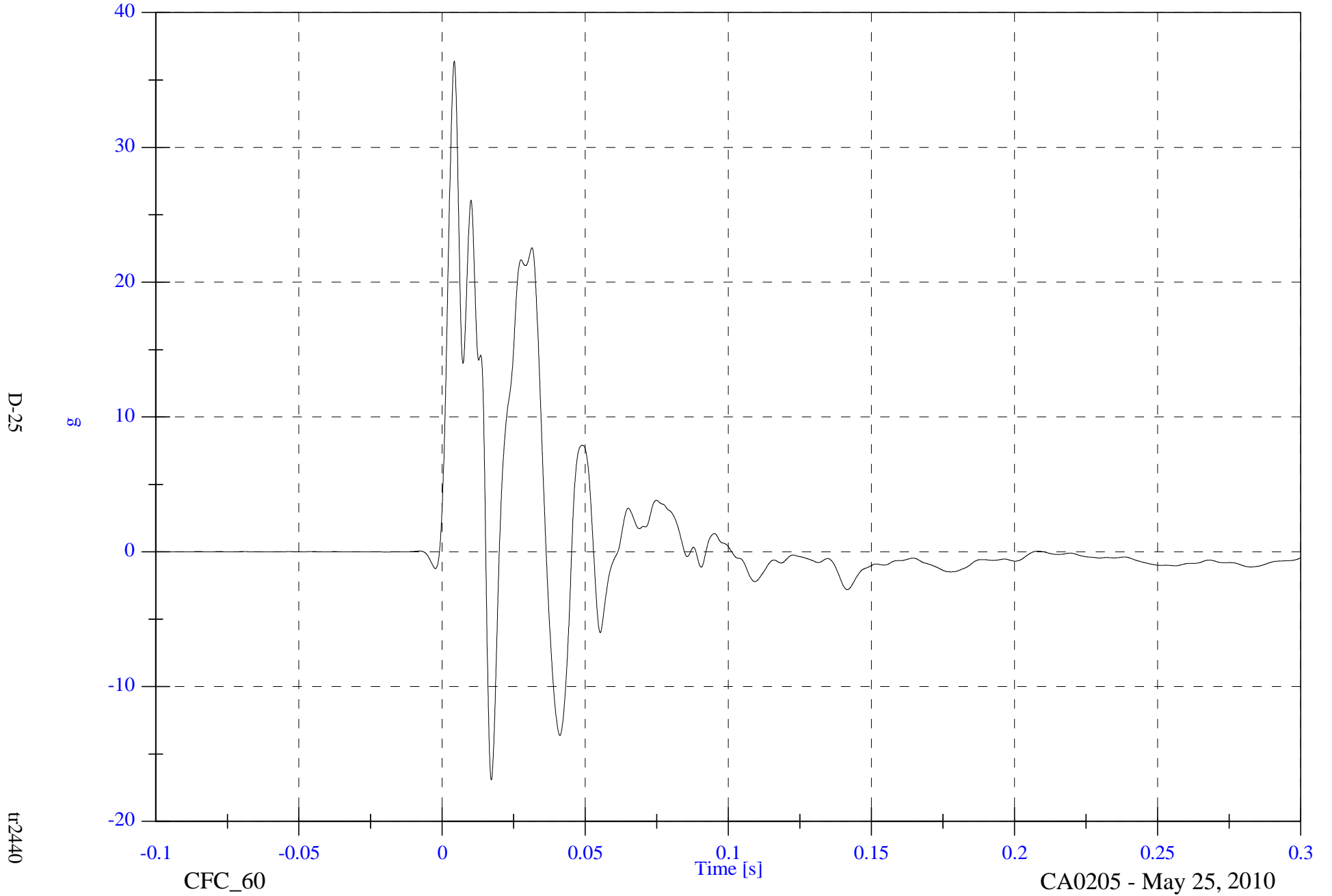
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A4 Left Rear Sill Y

Max: 36.4 [g] at 0.004 [s]

Min: -16.9 [g] at 0.017 [s]



FMVSS 214 MDB 2010 Ford Flex

V2 A4 Left Rear Sill Y Velocity

Max: 17.6 [kph] at 0.101 [s]

Min: -0.0 [kph] at 0.001 [s]



D-26

tr2440

CFC_180

Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

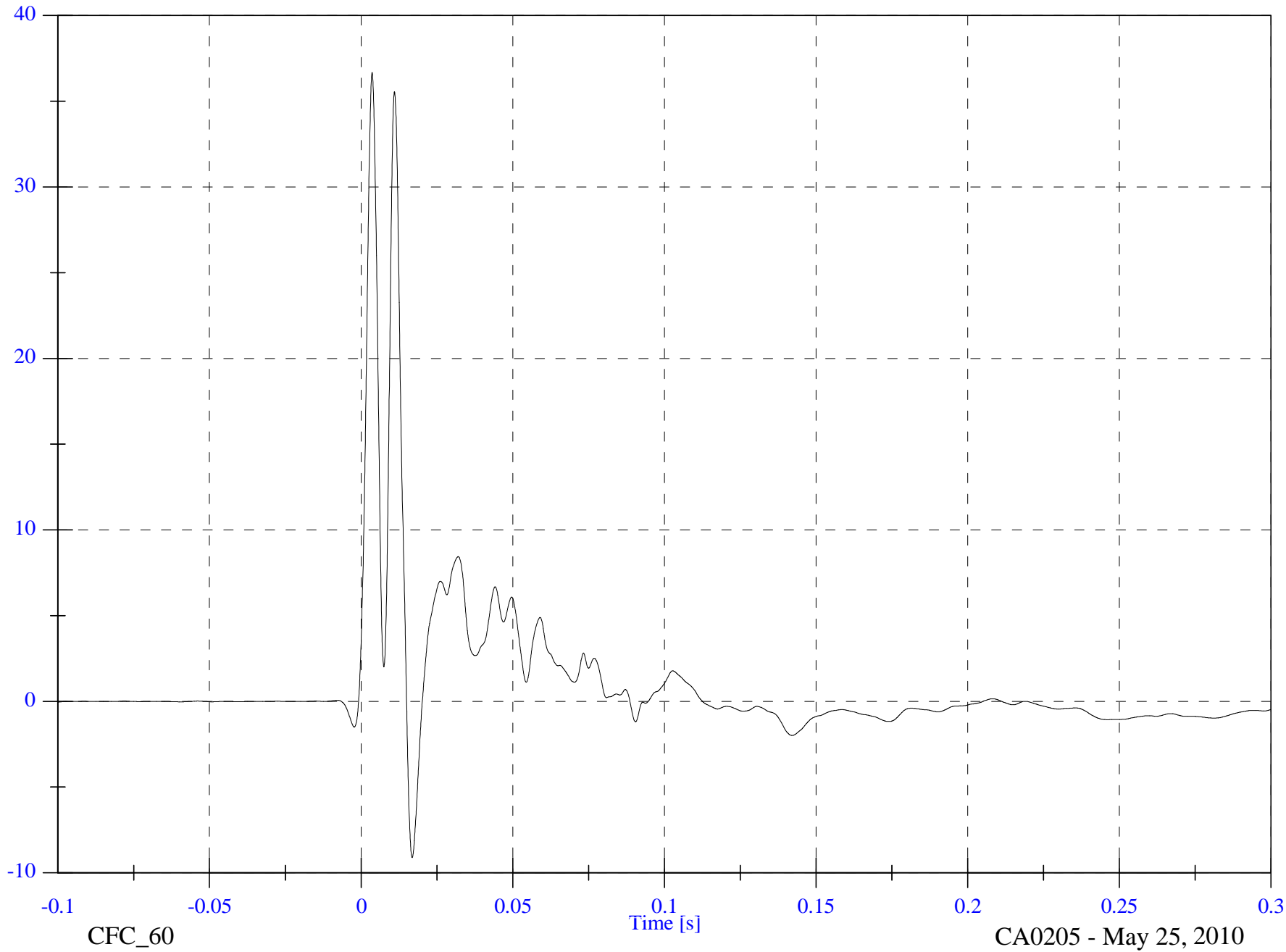
V2 A5 Left Front Sill Y

Max: 36.7 [g] at 0.004 [s]

Min: -9.1 [g] at 0.017 [s]

D-27

g



tr2440

CFC_60

Time [s]

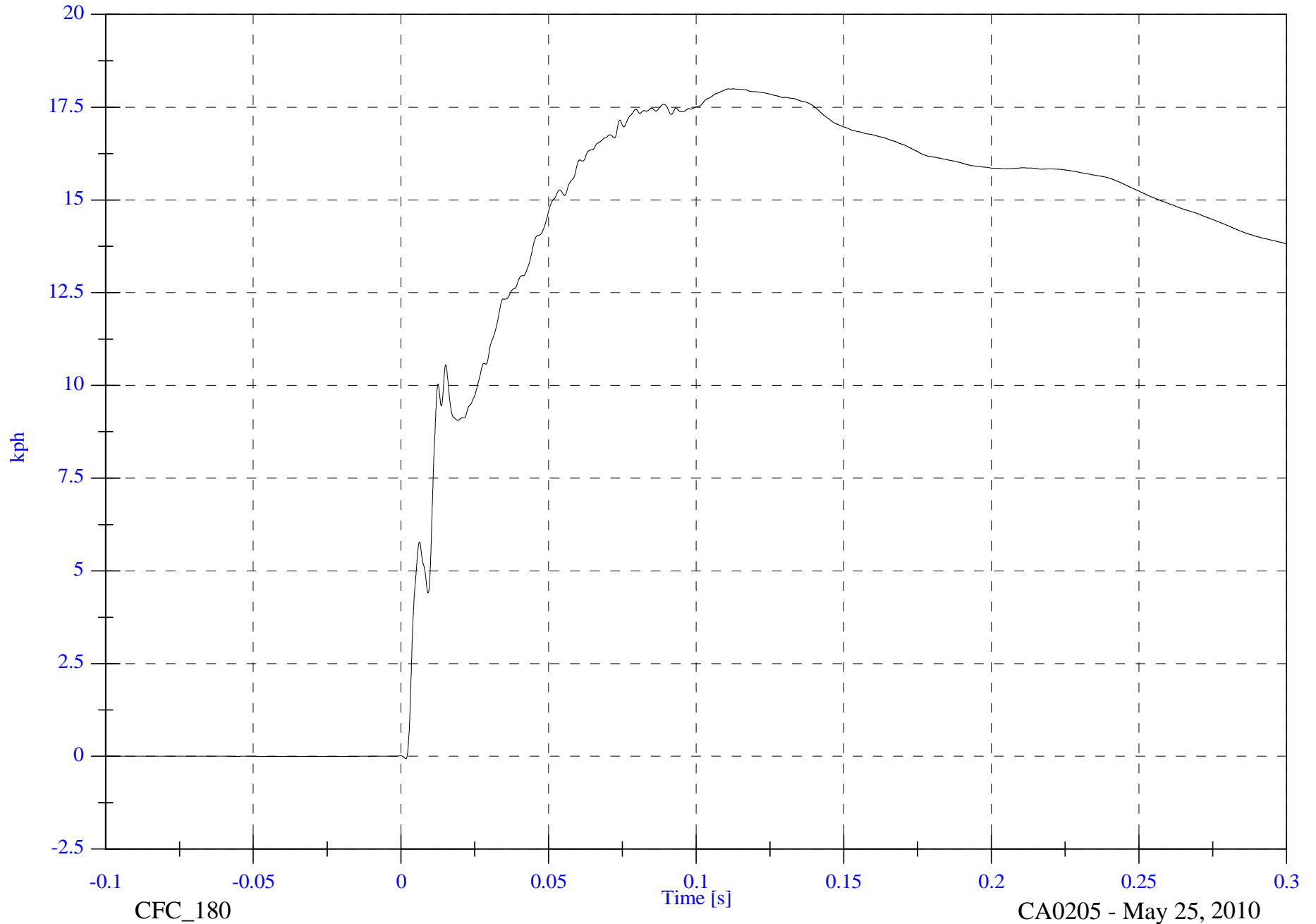
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 18.0 [kph] at 0.113 [s]

V2 A5 Left Front Sill Y Velocity

Min: -0.1 [kph] at 0.002 [s]



D-28

tr2440

CFC_180

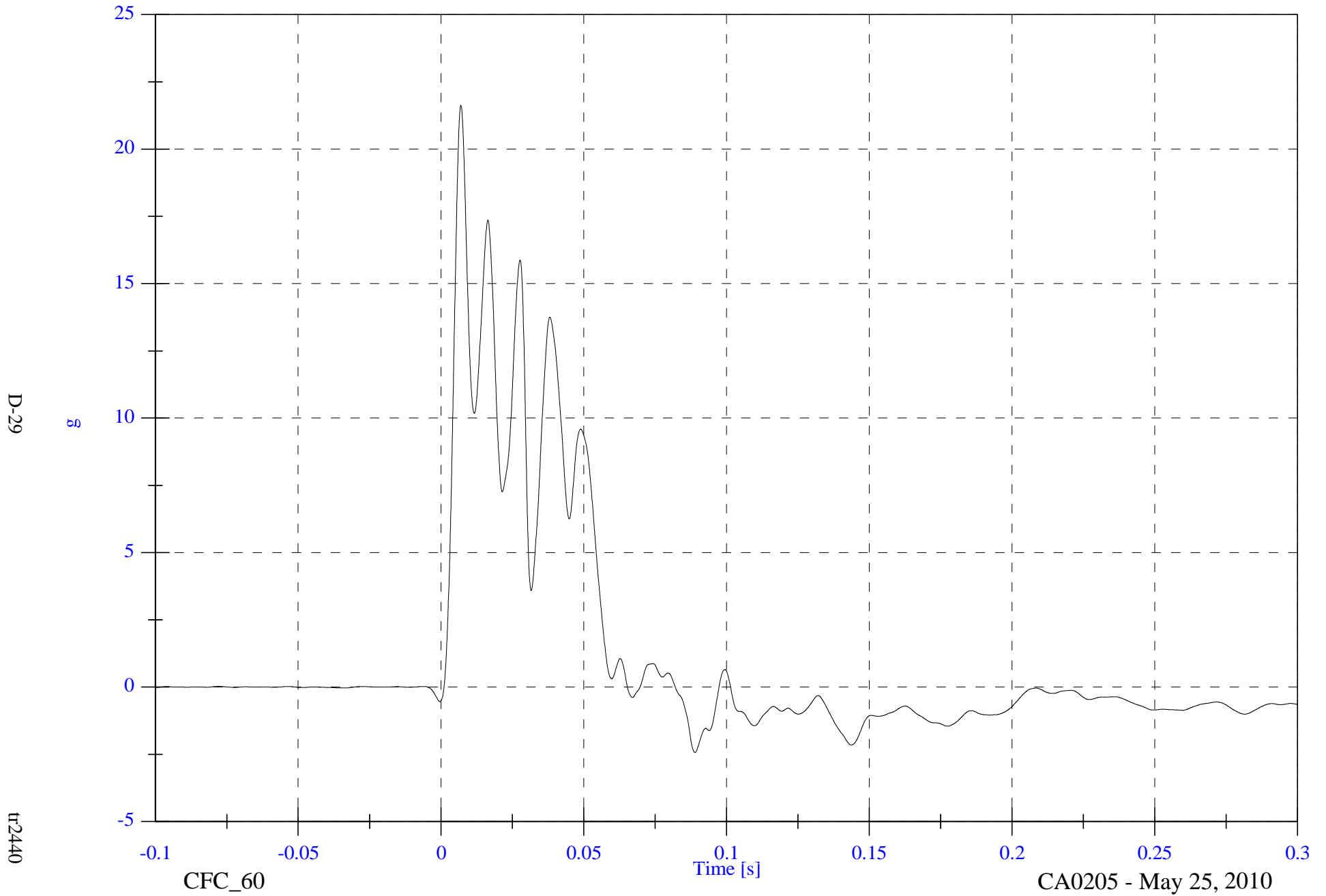
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A6 Right Rear Compartment Y

Max: 21.6 [g] at 0.007 [s]

Min: -2.4 [g] at 0.089 [s]



D-29

tr2440

CFC_60

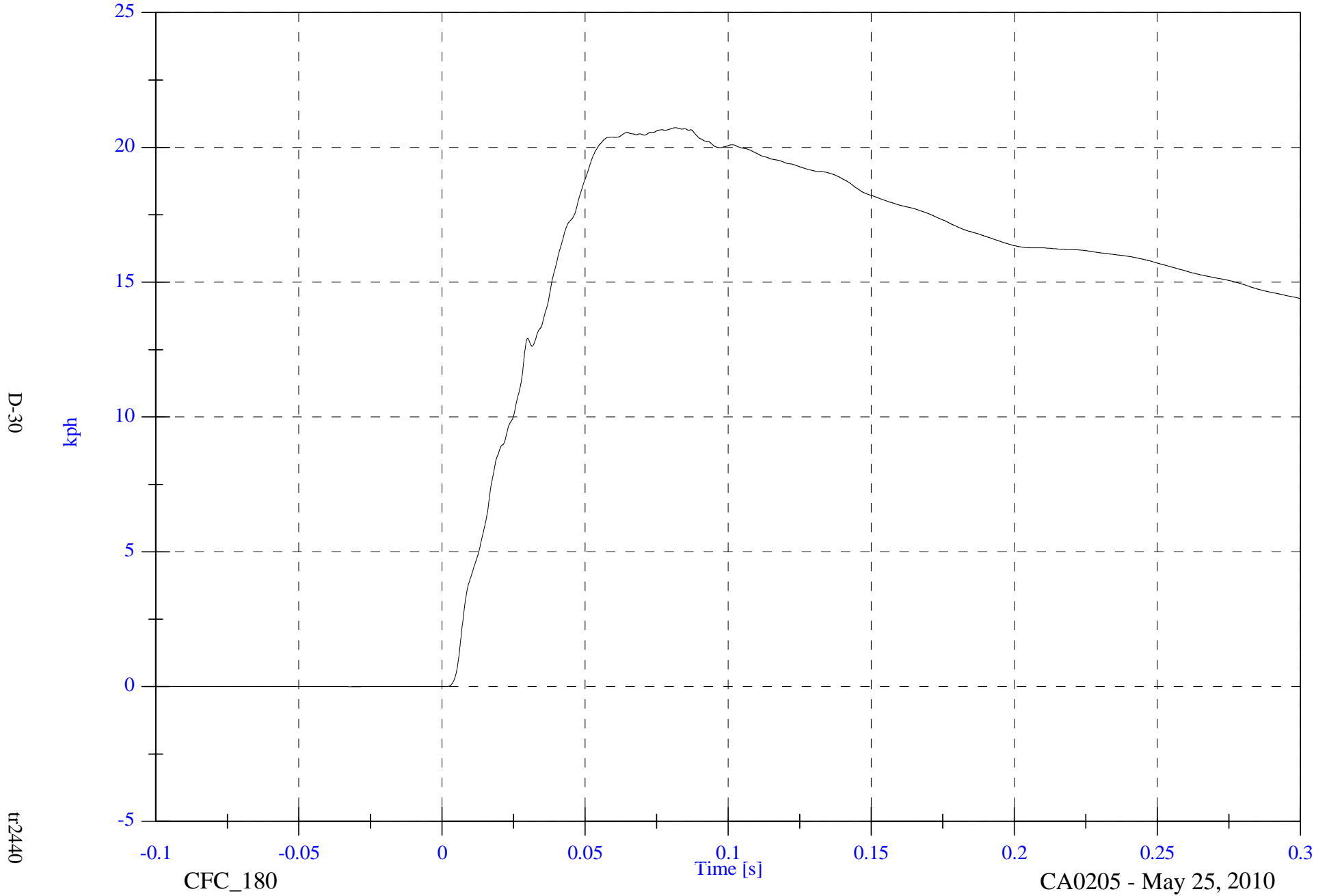
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 20.7 [kph] at 0.082 [s]

V2 A6 Right Rear Compartment Y Velocity

Min: -0.0 [kph] at -0.030 [s]



D-30

kph

tr2440

CFC_180

Time [s]

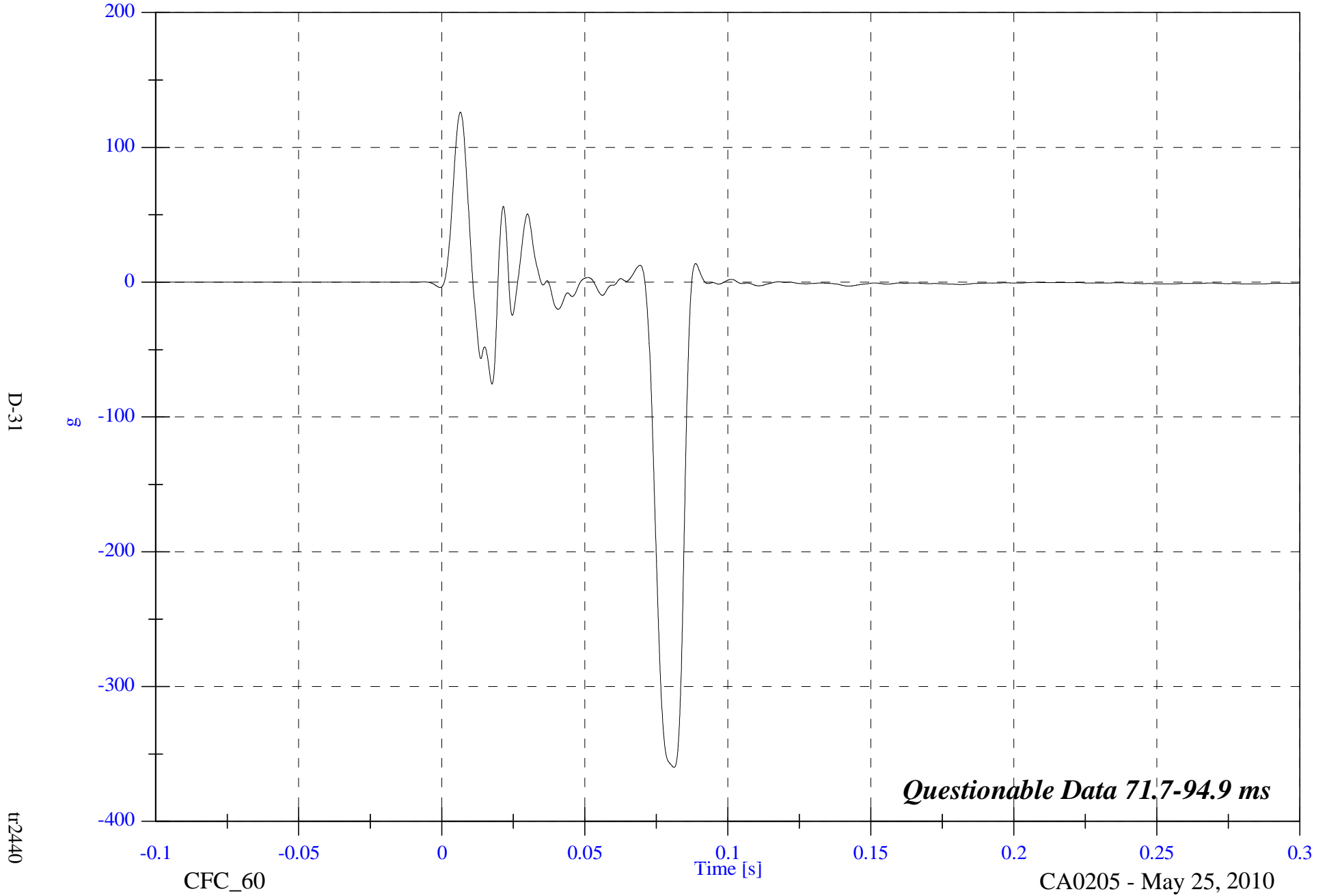
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A7 Left Lower B Post Y

Max: 126.2 [g] at 0.007 [s]

Min: -359.9 [g] at 0.081 [s]



D-31

tr2440

Questionable Data 71.7-94.9 ms

CFC_60

Time [s]

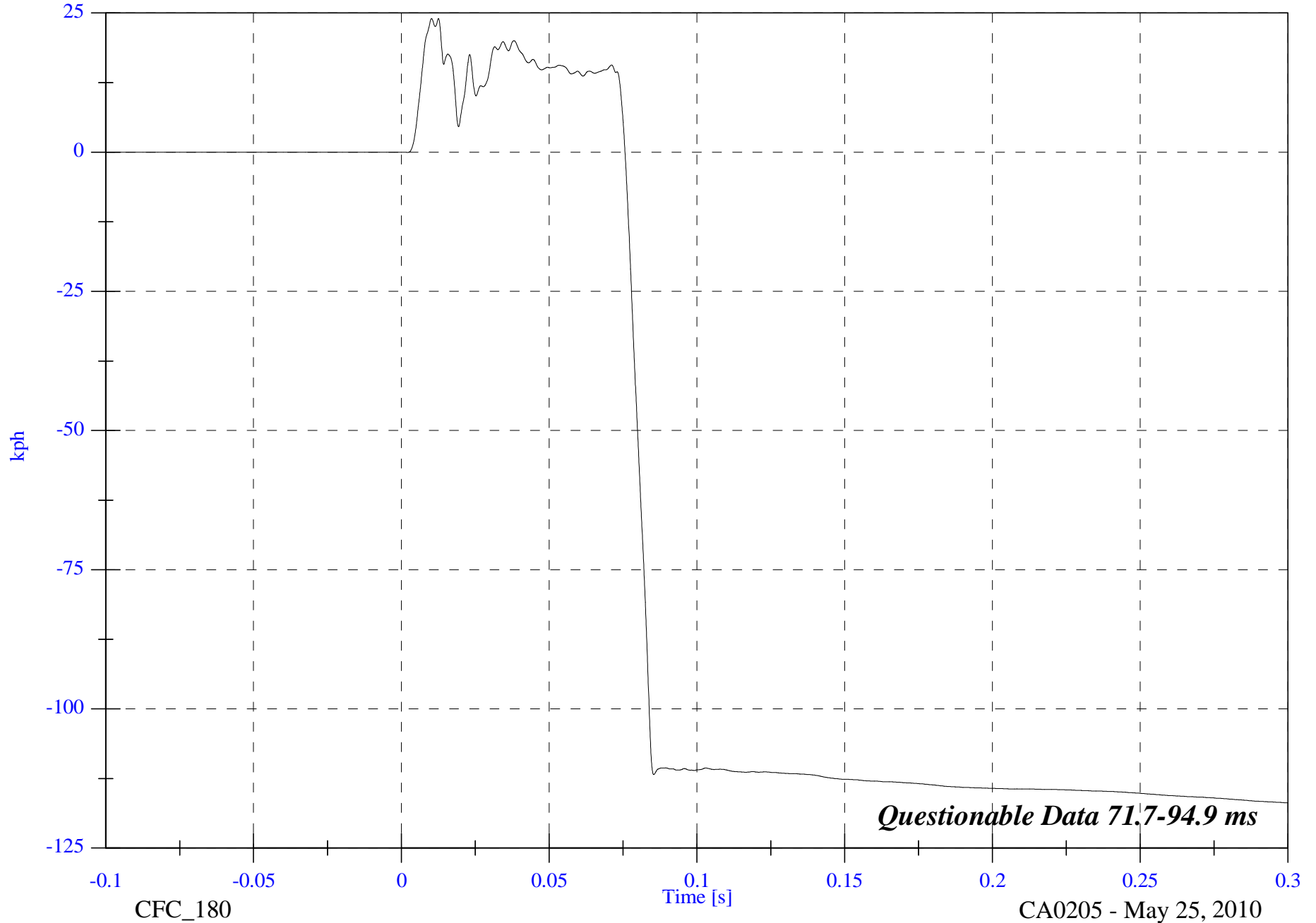
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 24.0 [kph] at 0.013 [s]

V2 A7 Left Lower B Post Y Velocity

Min: -116.9 [kph] at 0.300 [s]



D-32

kph

tr2440

CFC_180

Time [s]

CA0205 - May 25, 2010

Questionable Data 71.7-94.9 ms

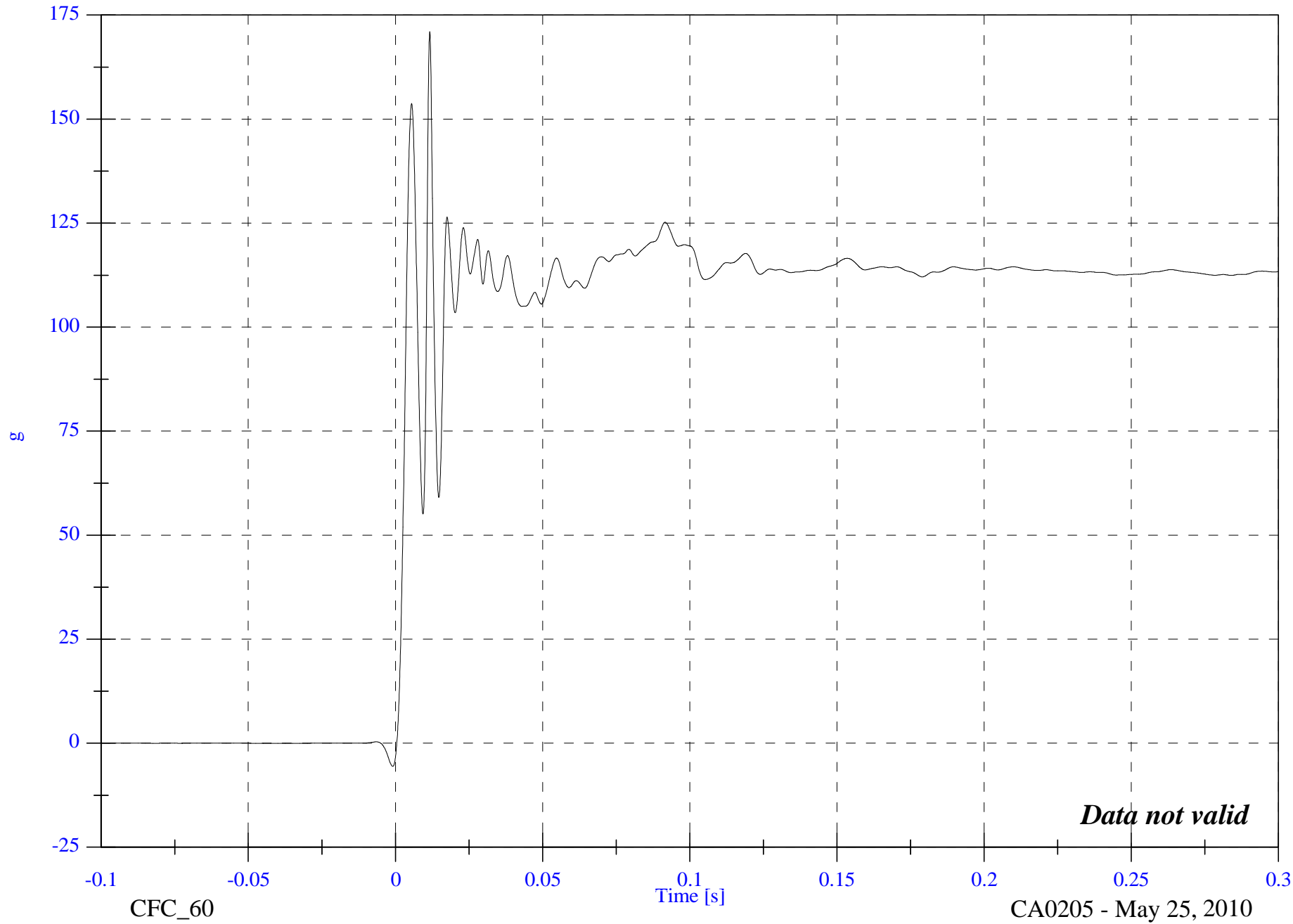
FMVSS 214 MDB 2010 Ford Flex

V2 A8 Left Middle B Post Y

Max: 171.0 [g] at 0.012 [s]
Min: -5.6 [g] at -0.001 [s]

D-33

tr2440



Data not valid

CA0205 - May 25, 2010

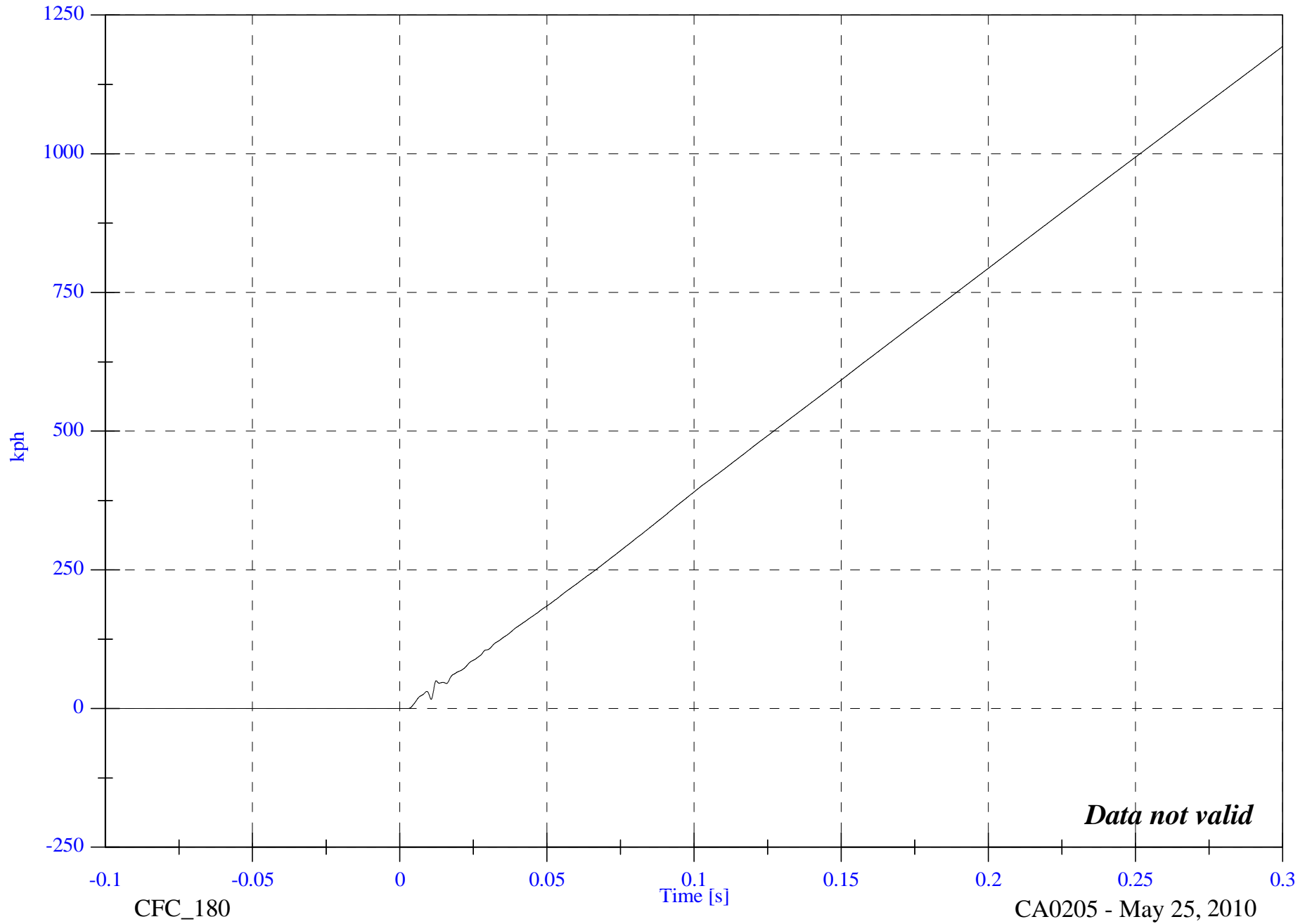
FMVSS 214 MDB 2010 Ford Flex

Max: 1193.4 [kph] at 0.300 [s]

V2 A8 Left Middle B Post Y Velocity

Min: -0.0 [kph] at 0.002 [s]

D-34



tr2440

CFC_180

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

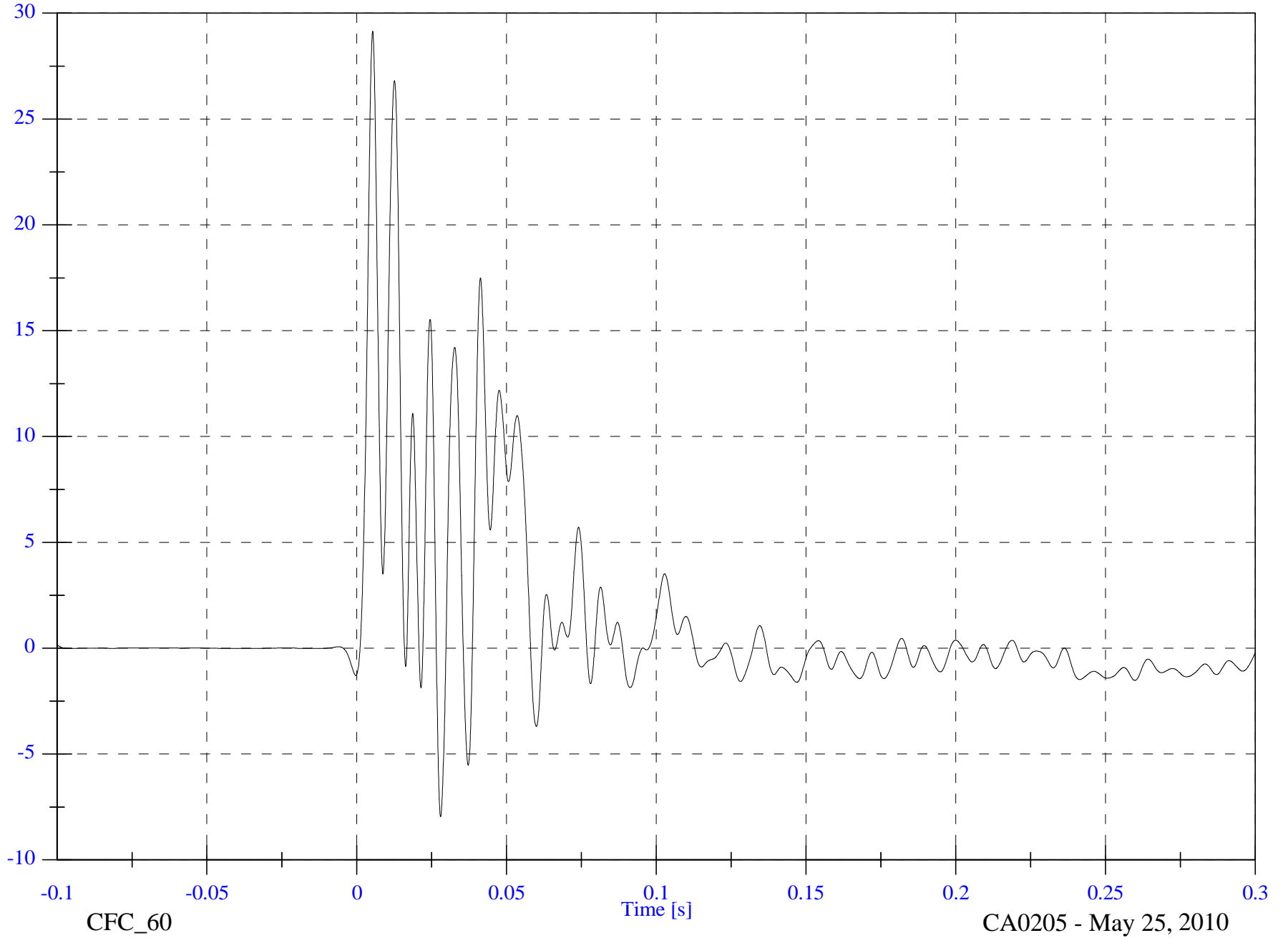
V2 A9 Left Lower A Post Y

Max: 29.1 [g] at 0.005 [s]

Min: -8.0 [g] at 0.028 [s]

D-35

g



tr2440

FMVSS 214 MDB 2010 Ford Flex

Max: 19.0 [kph] at 0.113 [s]

V2 A9 Left Lower A Post Y Velocity

Min: -0.2 [kph] at 0.004 [s]



D-36

tr2440

CFC_180

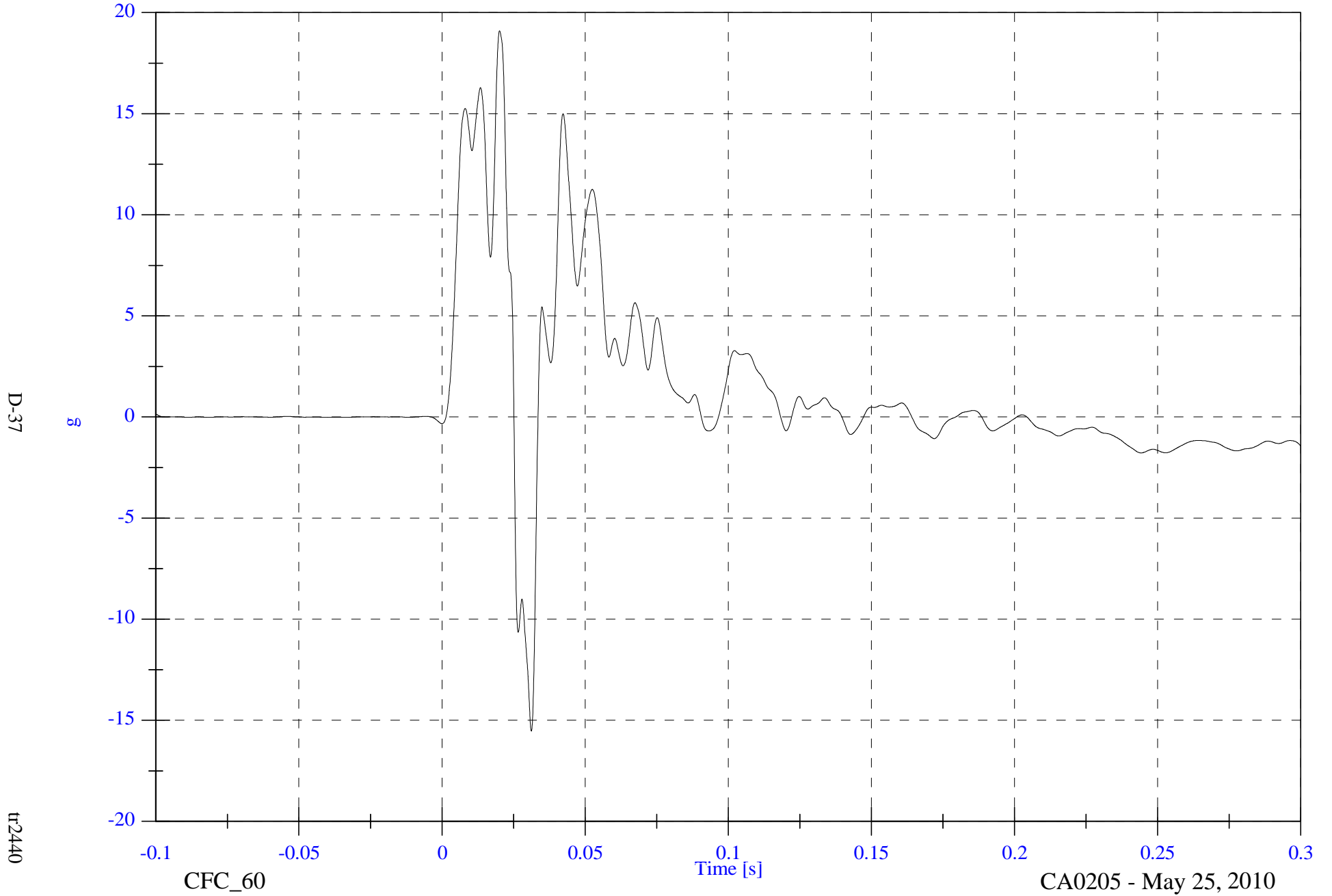
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A10 Left Mid A Post Y

Max: 19.1 [g] at 0.020 [s]

Min: -15.5 [g] at 0.031 [s]



D-37

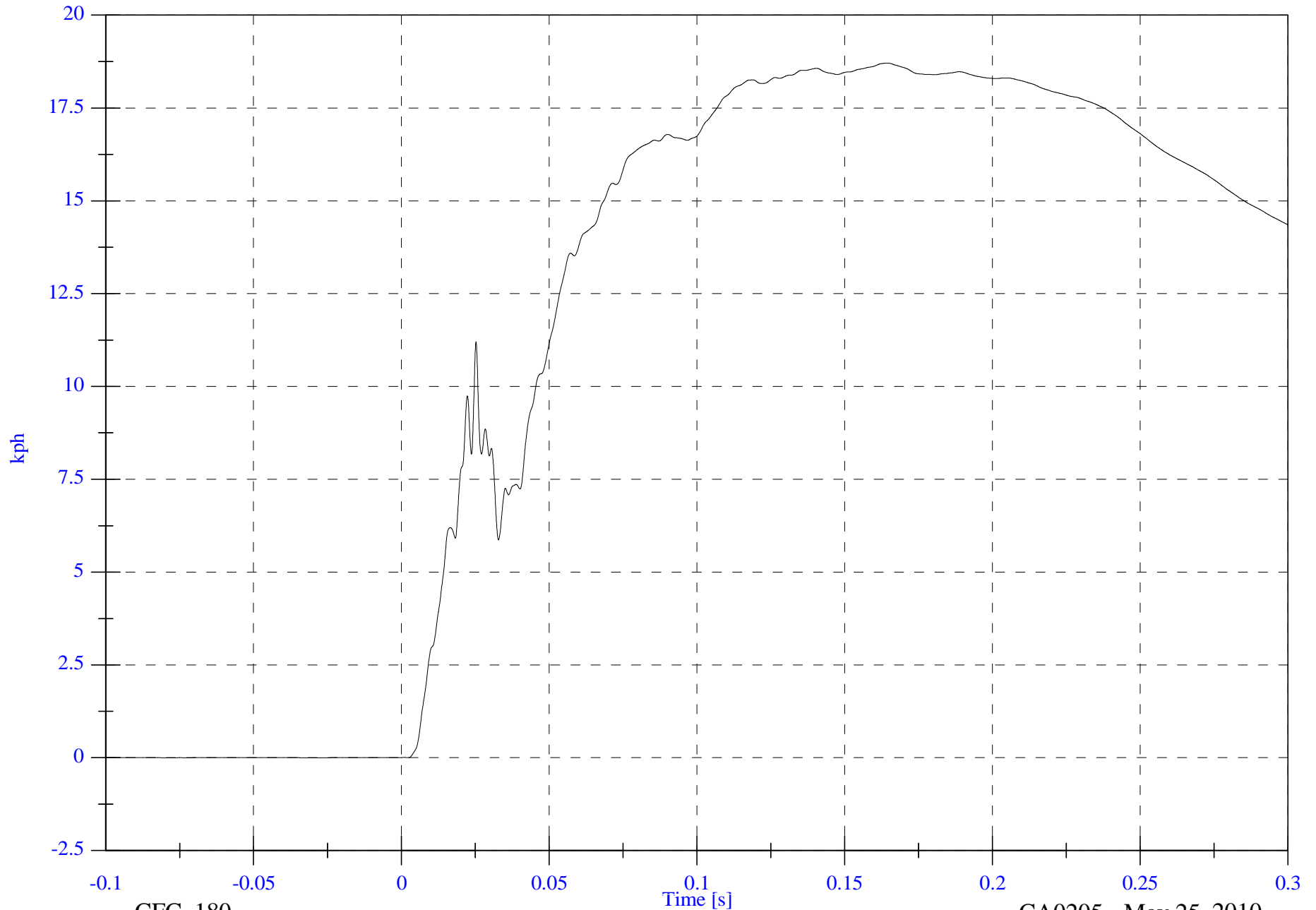
tr2440

FMVSS 214 MDB 2010 Ford Flex

V2 A10 Left Mid A Post Y Velocity

Max: 18.7 [kph] at 0.165 [s]

Min: -0.0 [kph] at -0.030 [s]



D-38

tr2440

CFC_180

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A11 Front Seat Track Y

Max: 54.5 [g] at 0.013 [s]

Min: -14.3 [g] at 0.039 [s]

D-39

tr2440



FMVSS 214 MDB 2010 Ford Flex

Max: 19.8 [kph] at 0.037 [s]

V2 A11 Front Seat Track Y Velocity

Min: -0.0 [kph] at -0.065 [s]

D-40

kph

tr2440



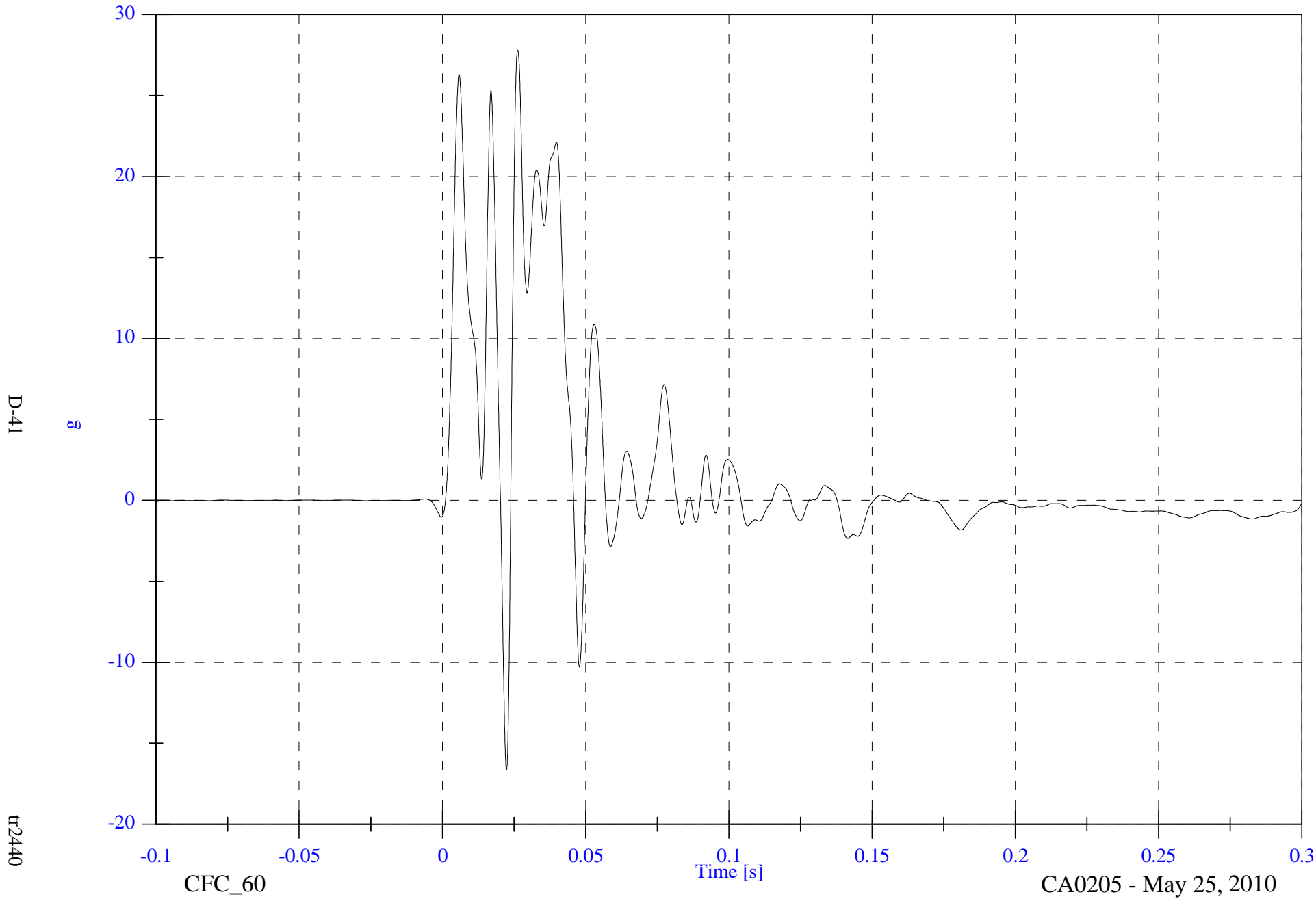
CFC_180

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A12 Rear Seat Track Y

Max: 27.8 [g] at 0.026 [s]
Min: -16.6 [g] at 0.022 [s]

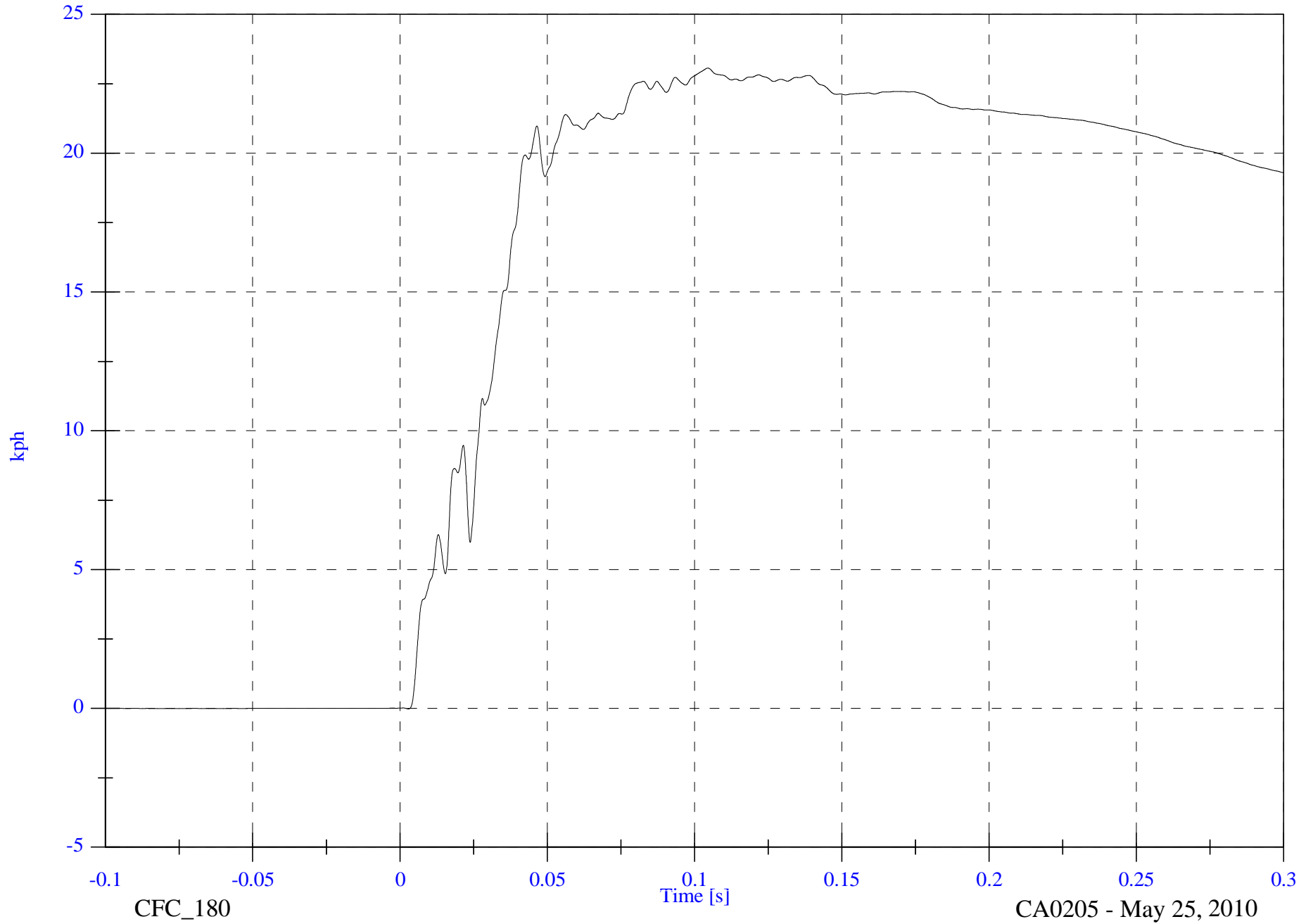


FMVSS 214 MDB 2010 Ford Flex

V2 A12 Rear Seat Track Y Velocity

Max: 23.1 [kph] at 0.105 [s]

Min: -0.0 [kph] at 0.003 [s]



D-42

tr2440

CFC_180

Time [s]

CA0205 - May 25, 2010

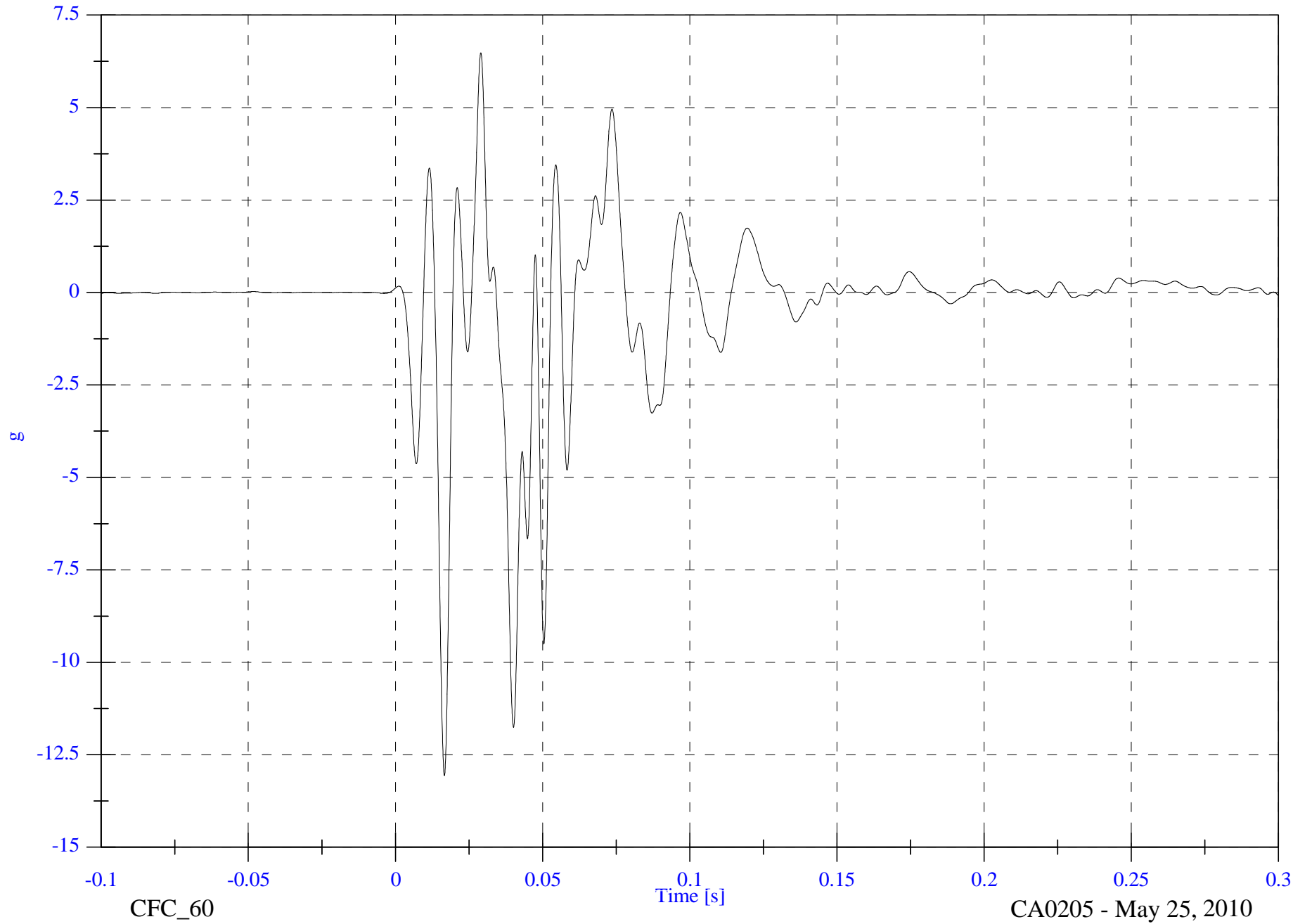
FMVSS 214 MDB 2010 Ford Flex

V2 A13 Target CG X

Max: 6.5 [g] at 0.029 [s]
Min: -13.1 [g] at 0.017 [s]

D-43

tr2440



FMVSS 214 MDB 2010 Ford Flex

V2 A13 Target CG X Velocity

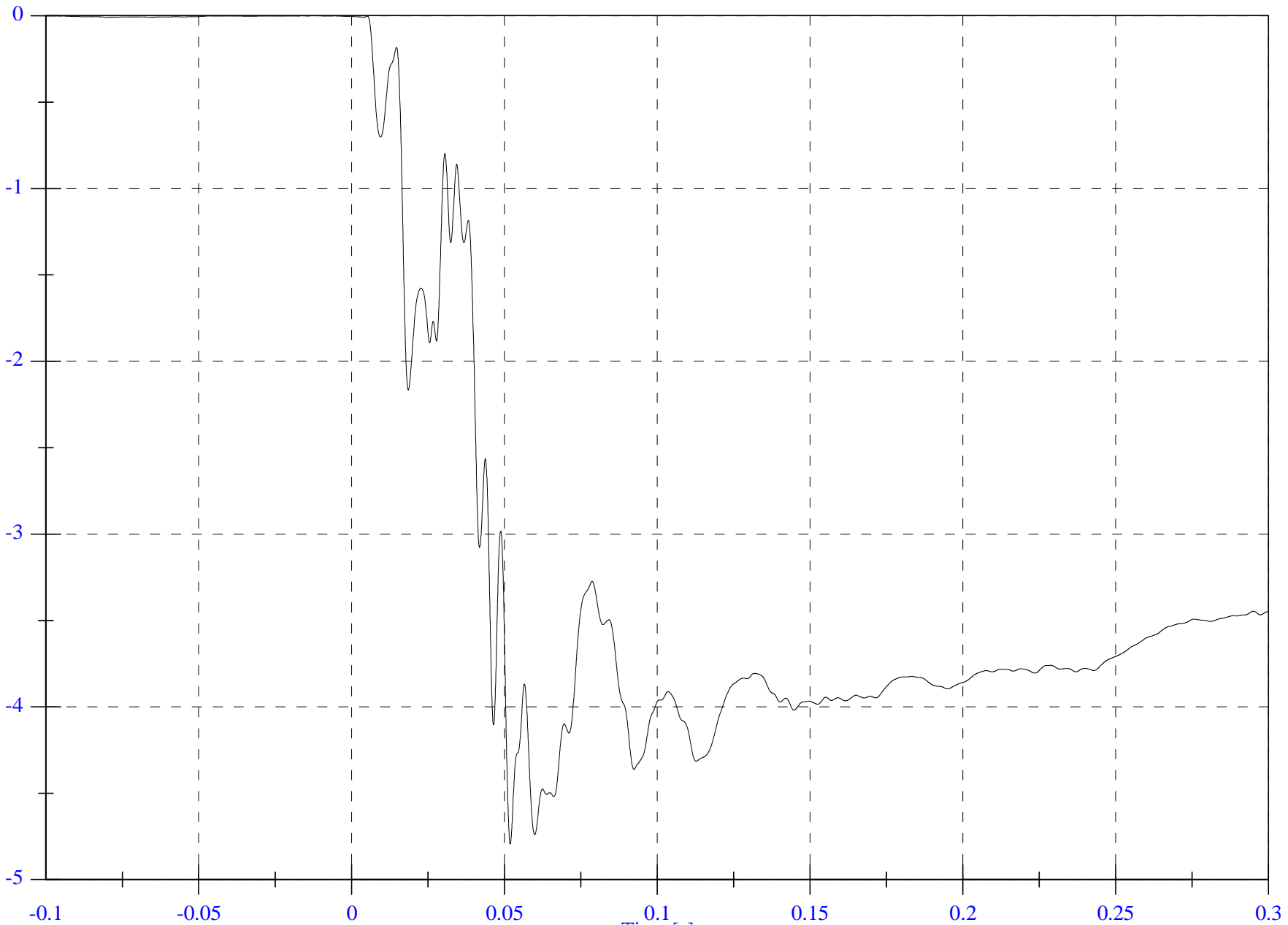
Max: 0.0 [kph] at -0.098 [s]

Min: -4.8 [kph] at 0.052 [s]

D-44

tr2440

kph



CFC_180

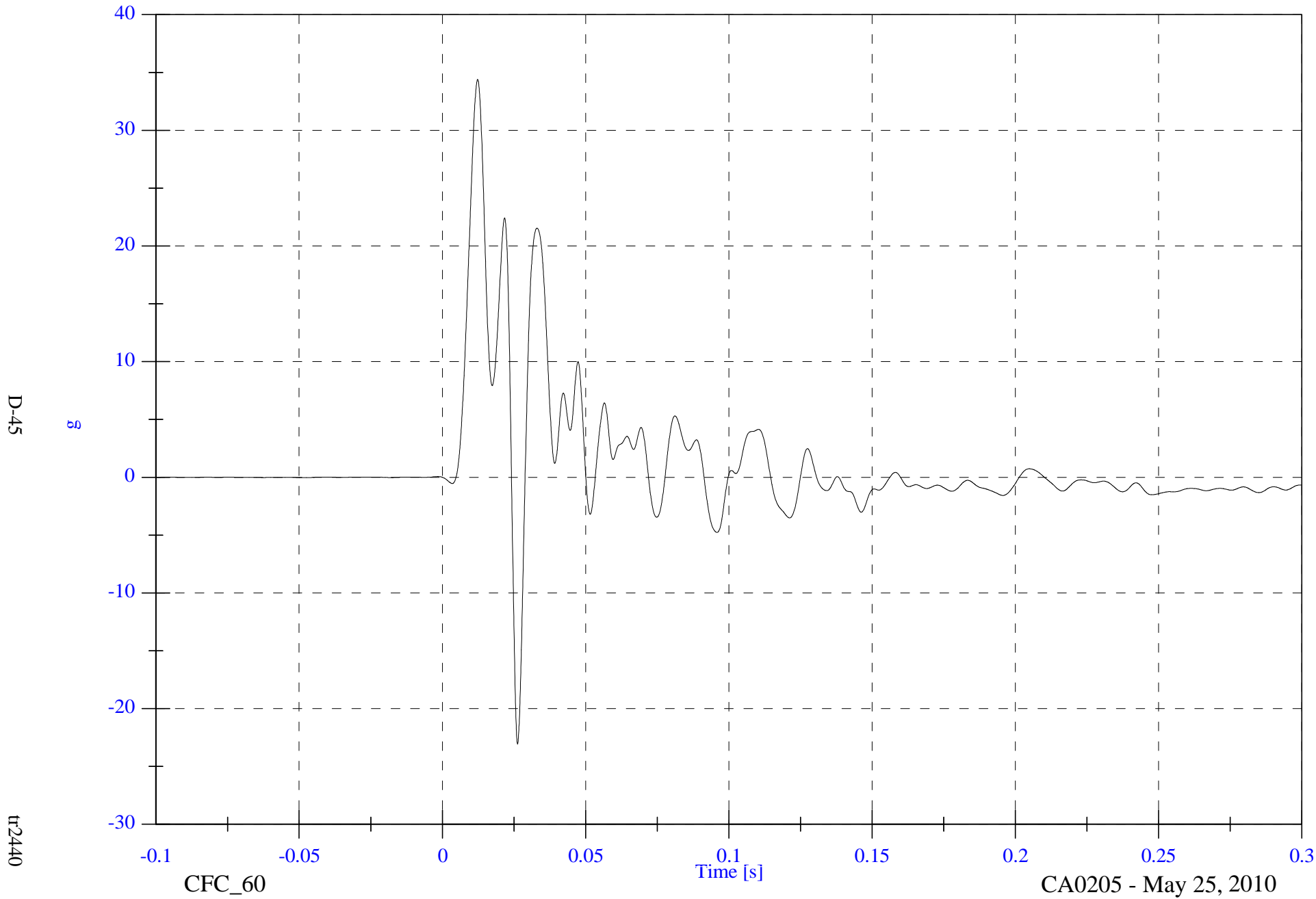
Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A13 Target CG Y

Max: 34.4 [g] at 0.012 [s]
Min: -23.1 [g] at 0.026 [s]



D-45

tr2440

CFC_60

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A13 Target CG Y Velocity

Max: 19.5 [kph] at 0.114 [s]

Min: -0.0 [kph] at -0.045 [s]



D-46

tr2440

CFC_180

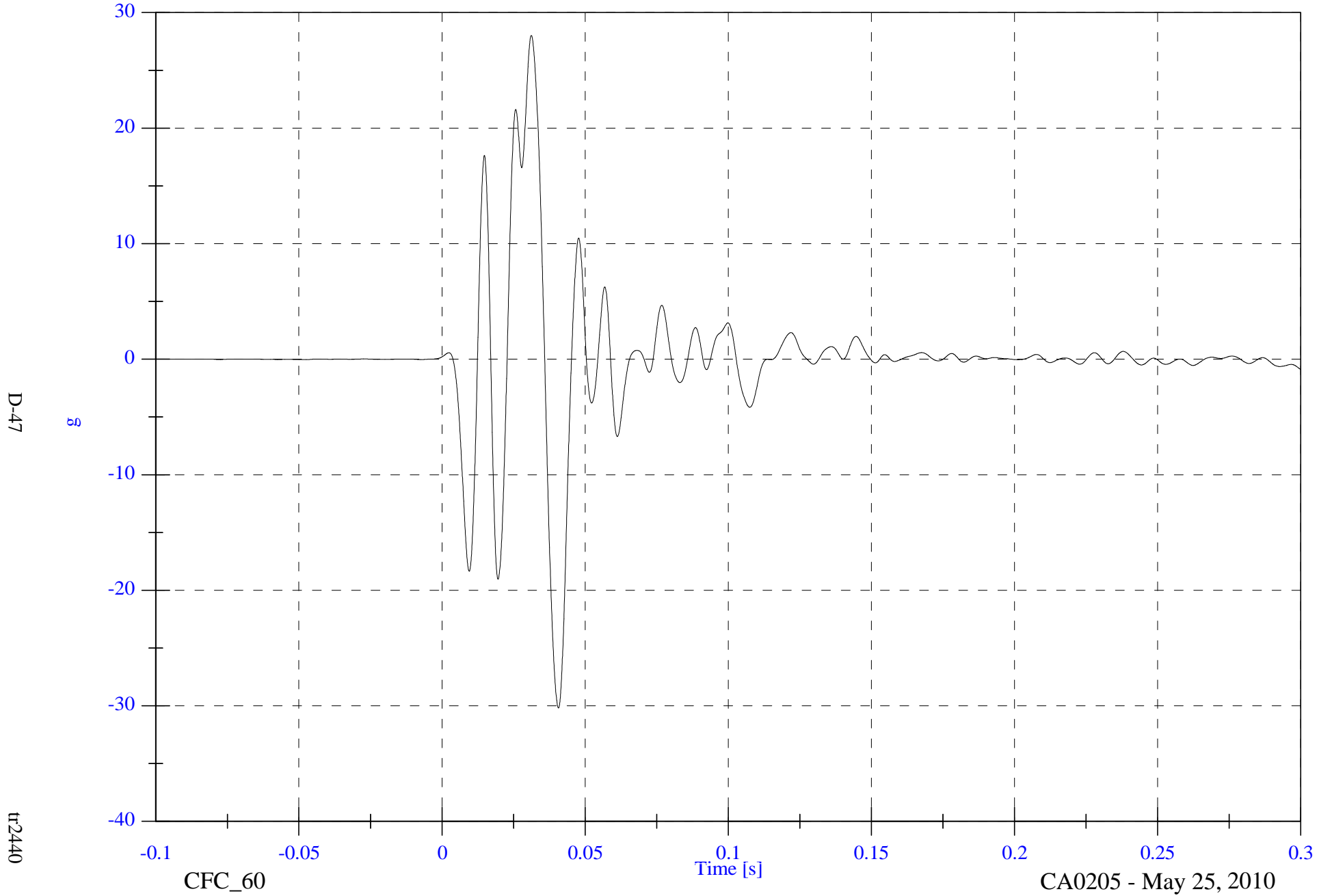
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V2 A13 Target CG Z

Max: 28.0 [g] at 0.031 [s]

Min: -30.2 [g] at 0.041 [s]



FMVSS 214 MDB 2010 Ford Flex

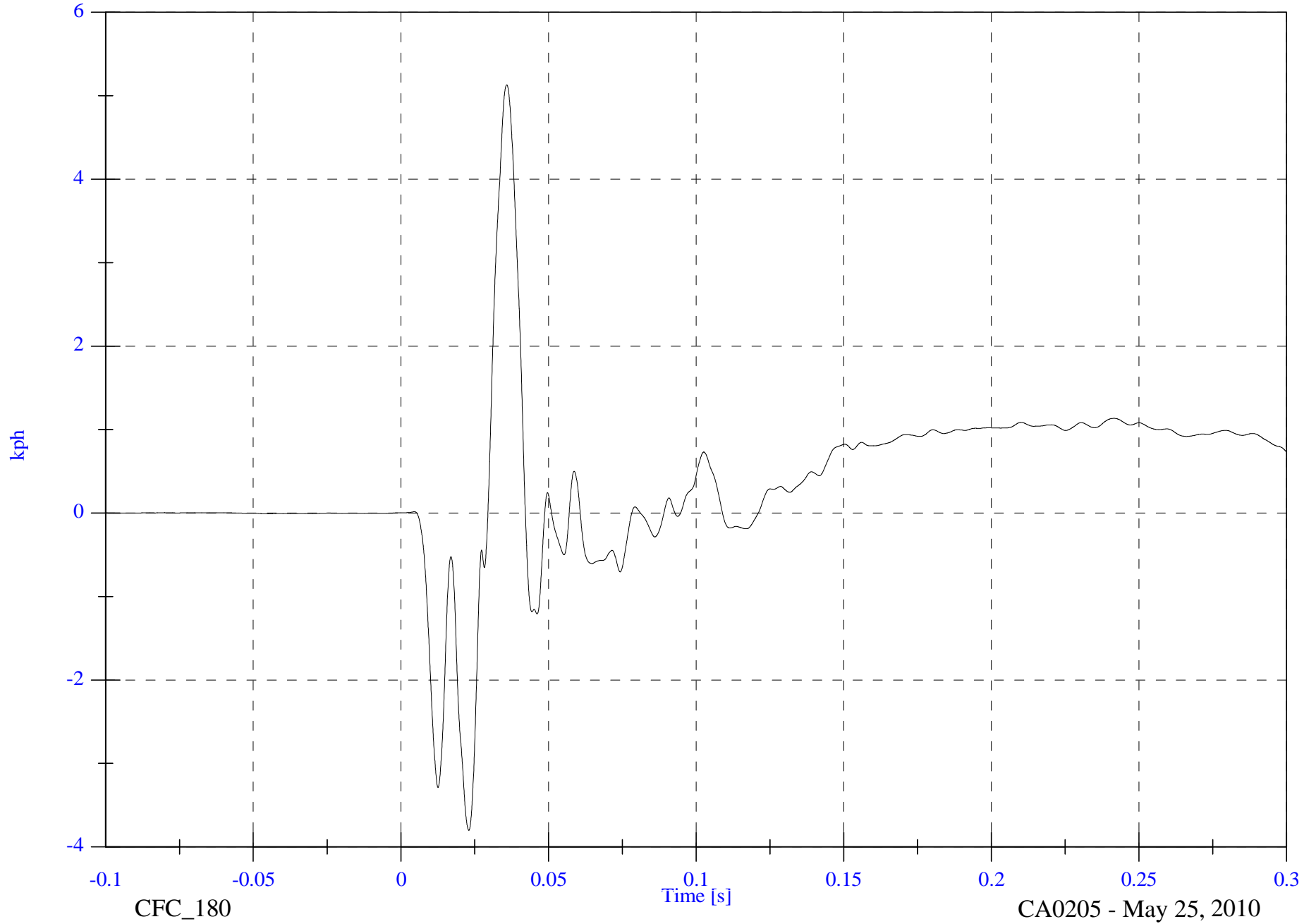
V2 A13 Target CG Z Velocity

Max: 5.1 [kph] at 0.036 [s]

Min: -3.8 [kph] at 0.023 [s]

D-48

tr2440

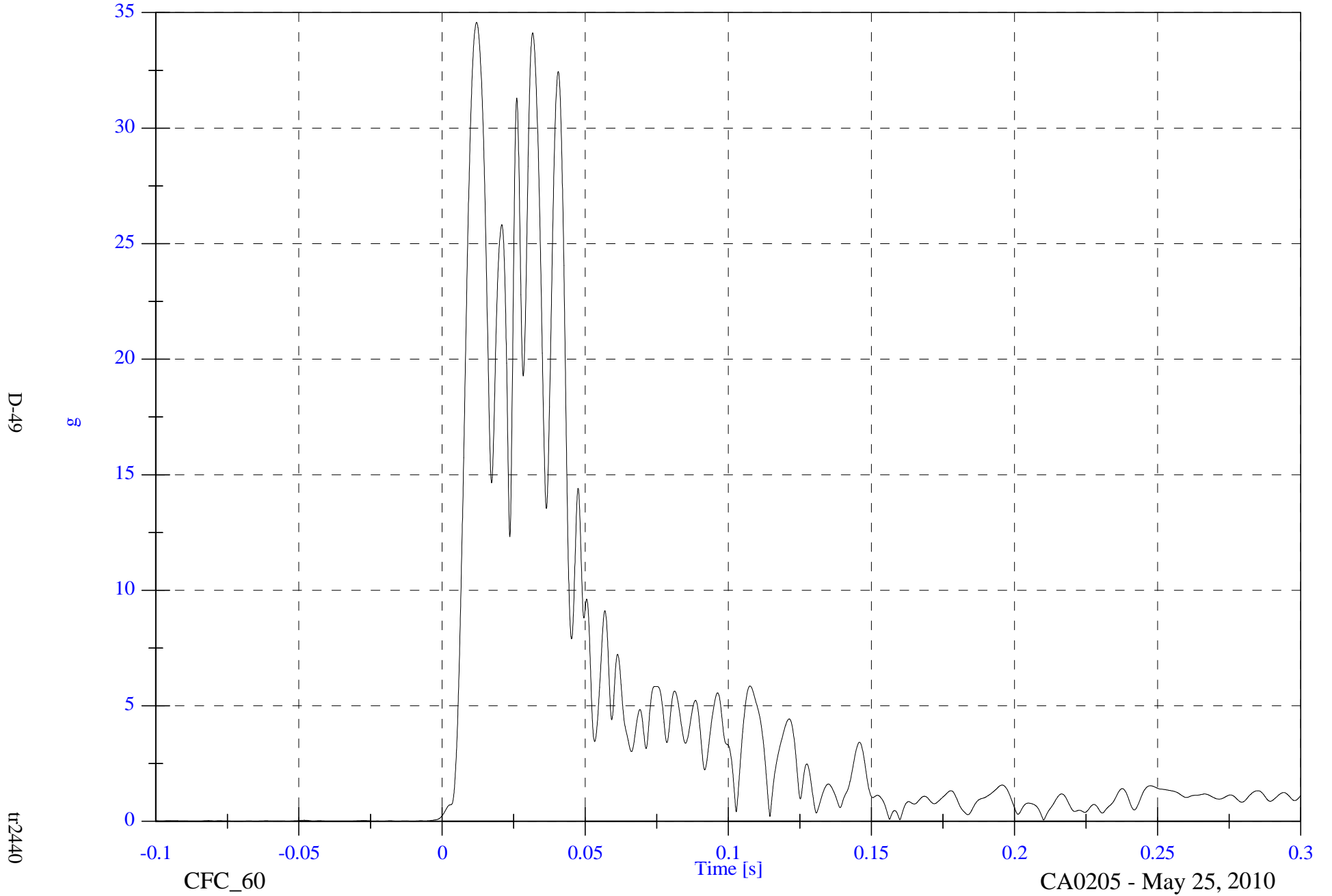


FMVSS 214 MDB 2010 Ford Flex

V2 A13 Target CG Resultant

Max: 34.6 [g] at 0.012 [s]

Min: 0.0 [g] at -0.033 [s]

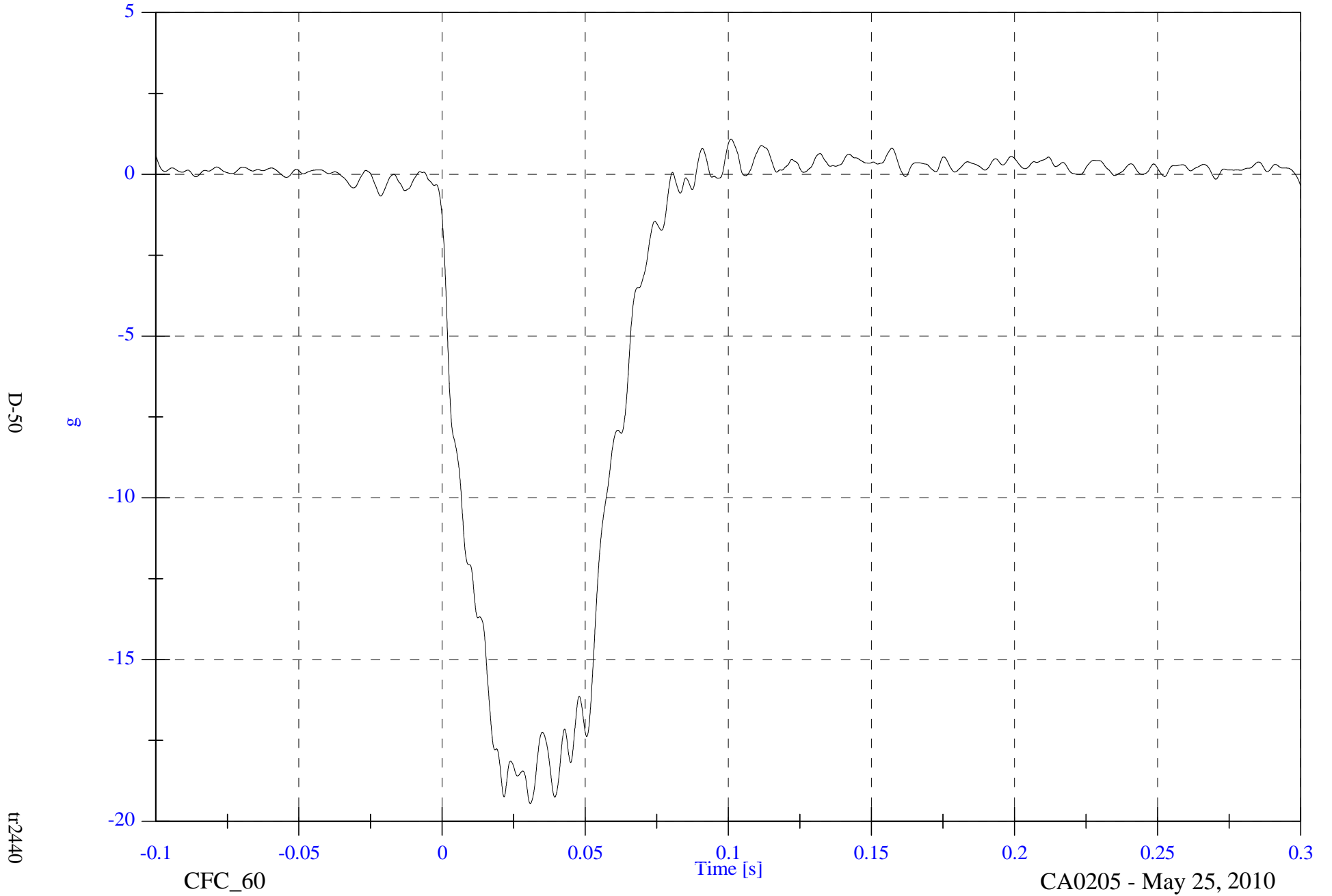


FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier CG X

Max: 1.1 [g] at 0.101 [s]

Min: -19.4 [g] at 0.031 [s]



D-50

tr2440

CFC_60

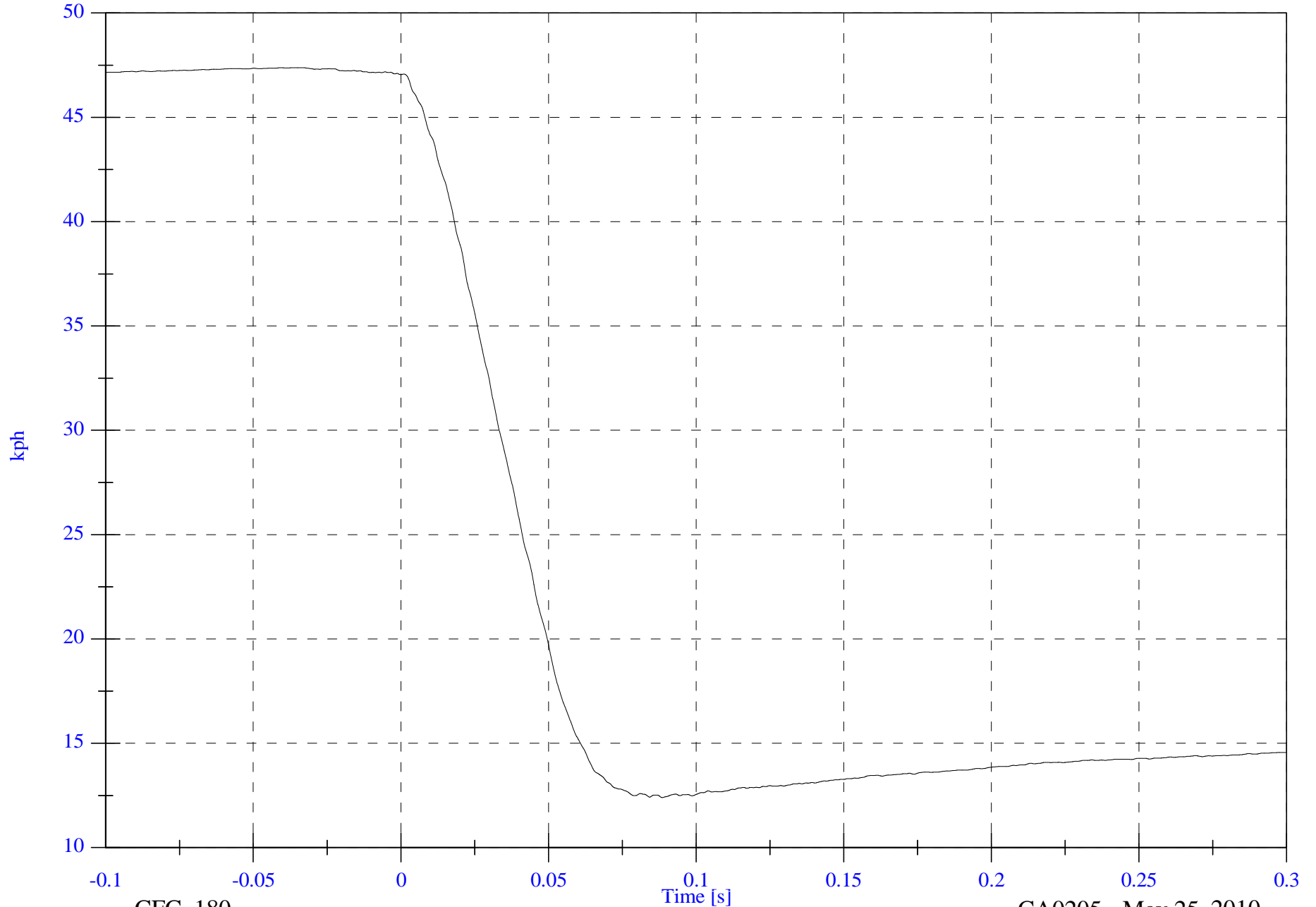
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 47.4 [kph] at -0.036 [s]

V1 Moving Barrier CG X Velocity

Min: 12.4 [kph] at 0.089 [s]



D-51

tr2440

CFC_180

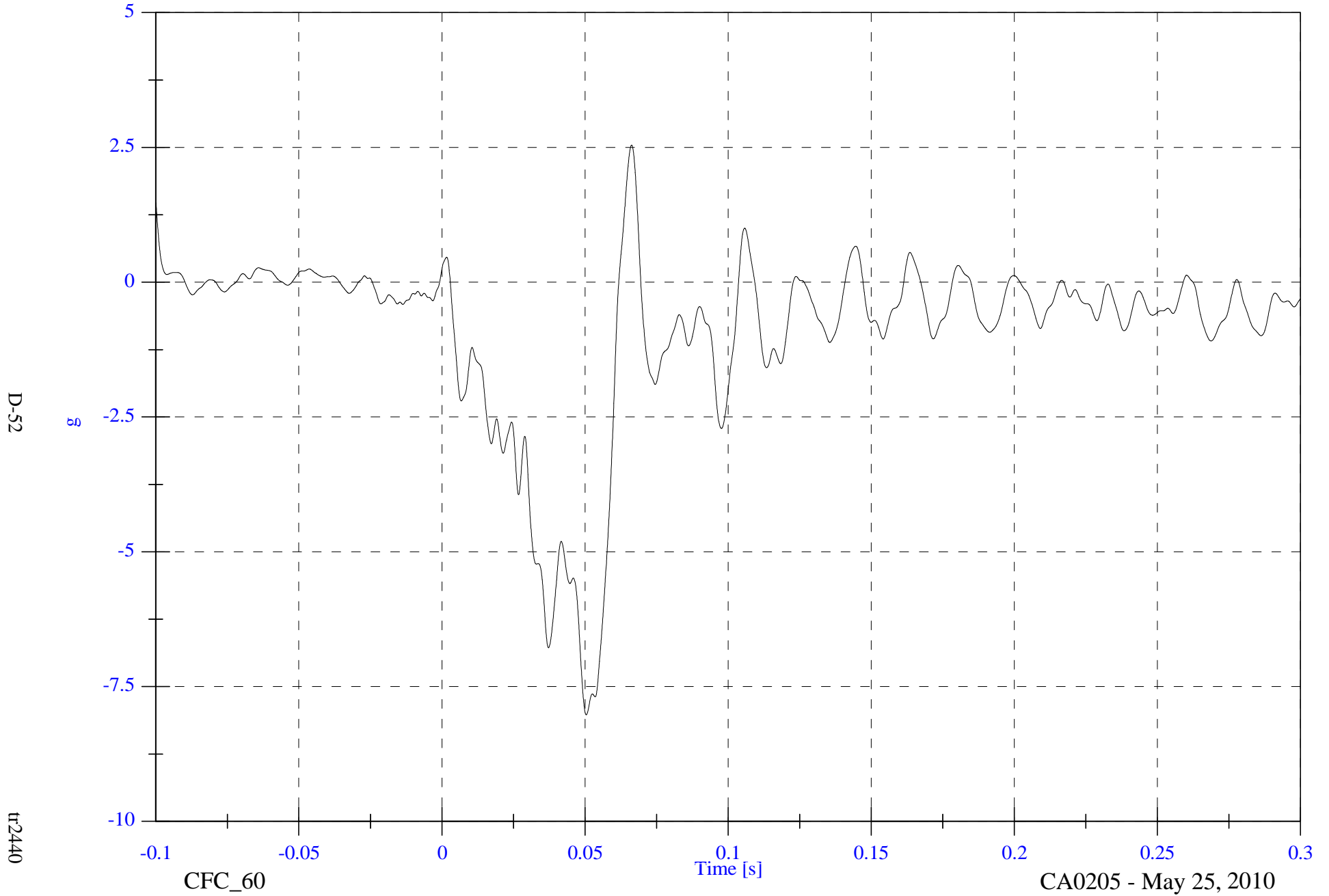
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier CG Y

Max: 2.5 [g] at 0.066 [s]

Min: -8.0 [g] at 0.050 [s]



D-52

tr2440

CFC_60

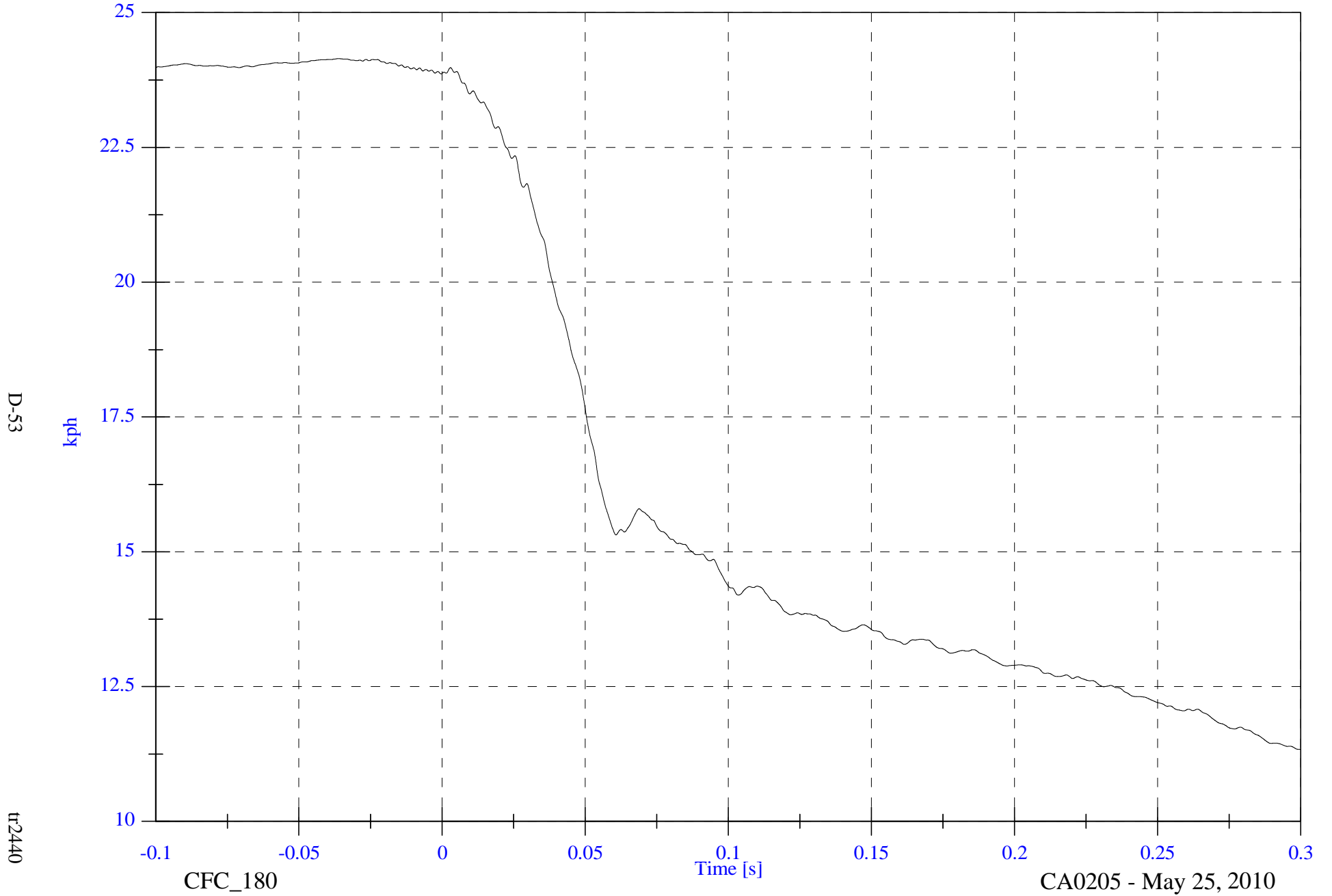
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 24.1 [kph] at -0.036 [s]

V1 Moving Barrier CG Y Velocity

Min: 11.3 [kph] at 0.300 [s]



D-53

tr2440

CFC_180

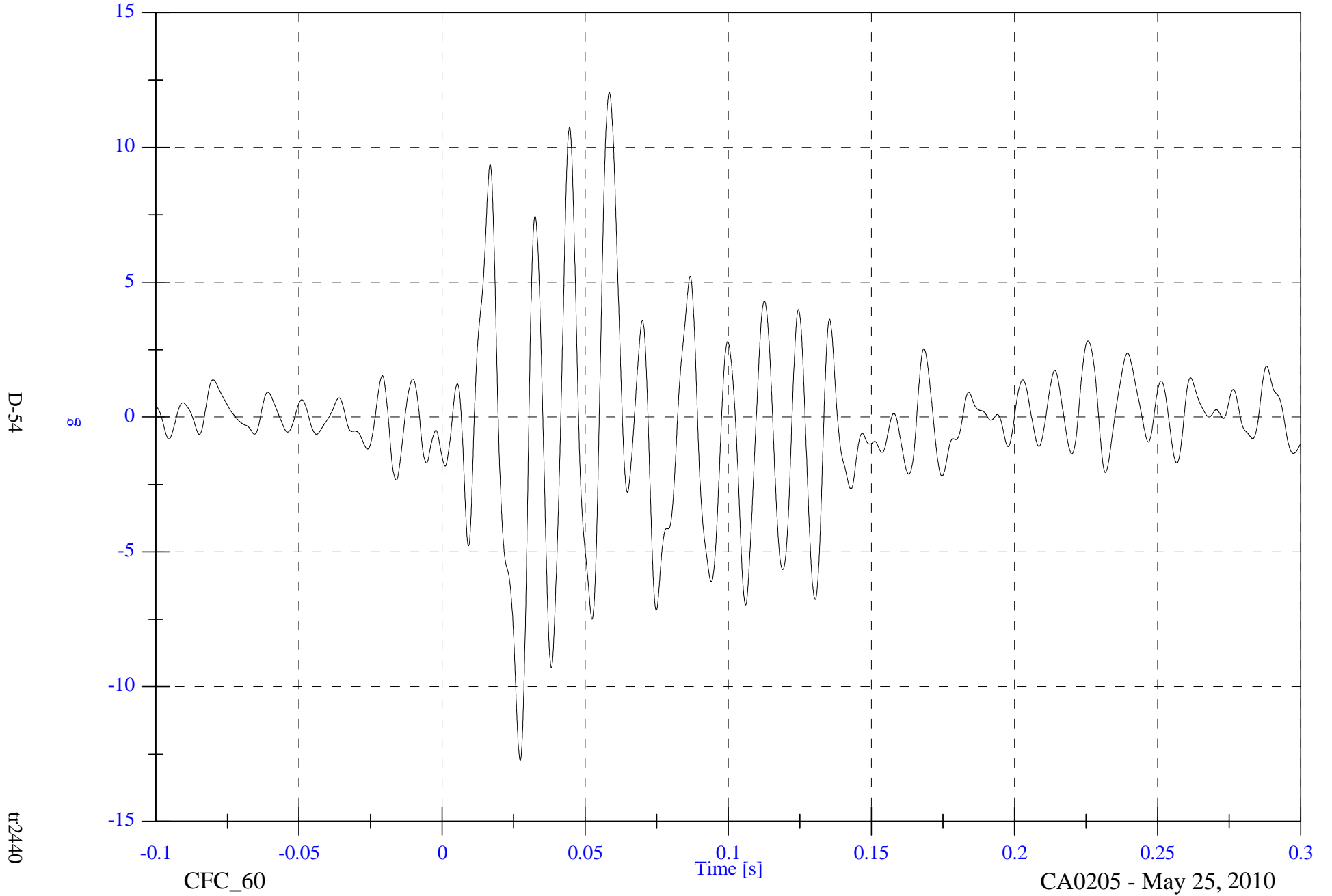
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier CG Z

Max: 12.0 [g] at 0.058 [s]

Min: -12.7 [g] at 0.027 [s]



D-54

g

tr2440

CFC_60

Time [s]

CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier CG Z Velocity

Max: 1.0 [kph] at 0.019 [s]

Min: -4.4 [kph] at 0.182 [s]

D-55

tr2440

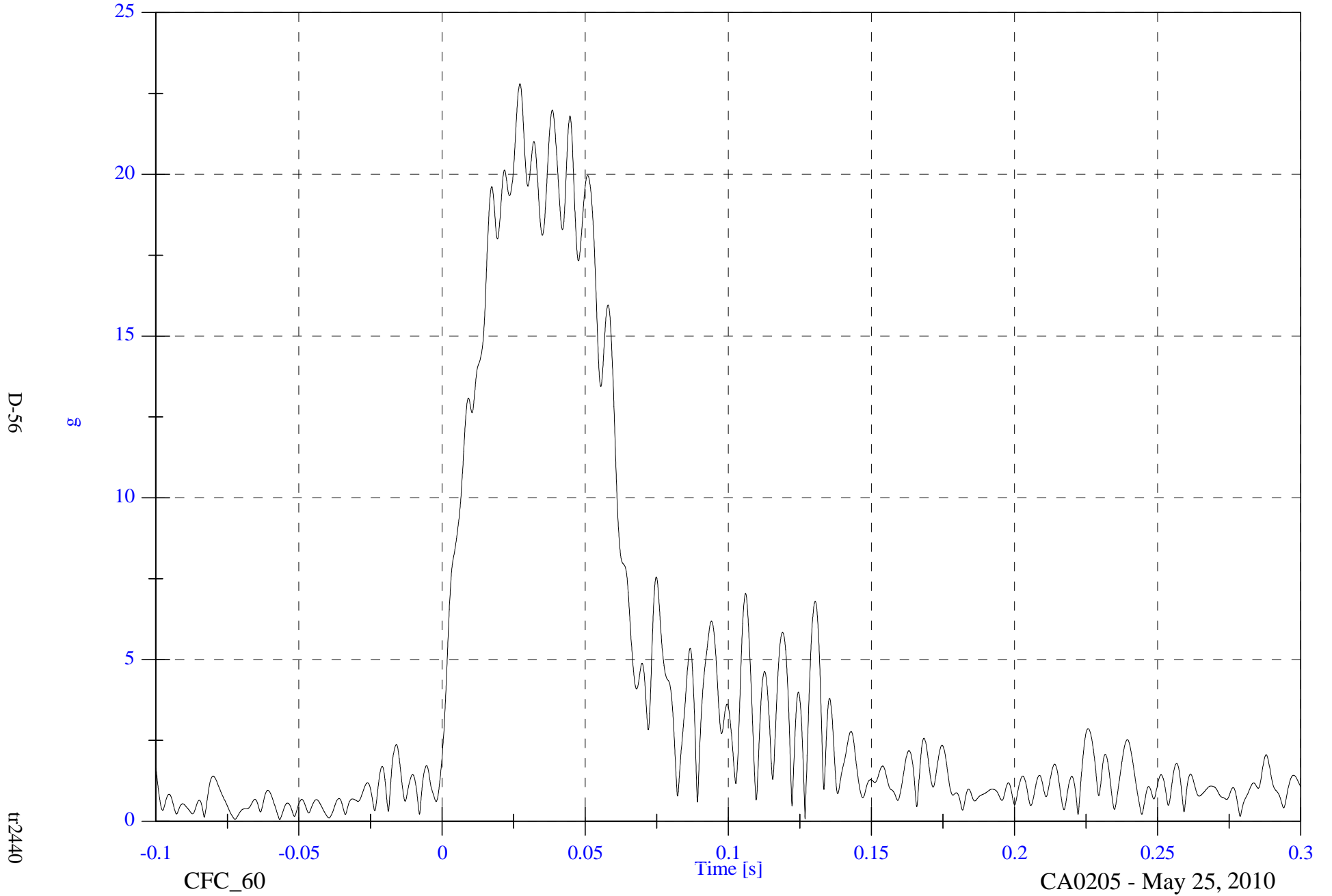


FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier CG Resultant

Max: 22.8 [g] at 0.027 [s]

Min: 0.0 [g] at -0.057 [s]

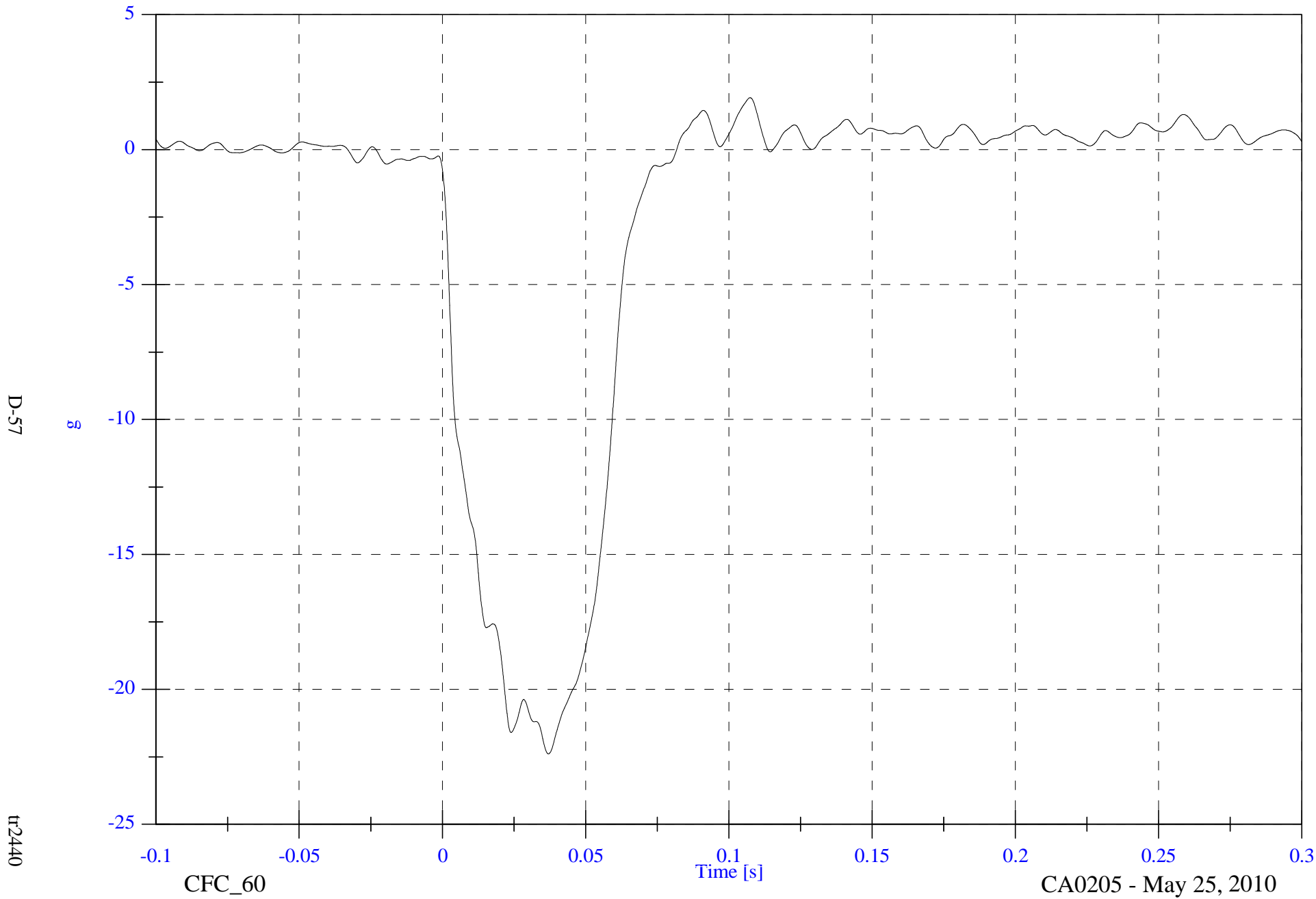


FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier Left Rail X

Max: 1.9 [g] at 0.107 [s]

Min: -22.4 [g] at 0.037 [s]



D-57

tr2440

CFC_60

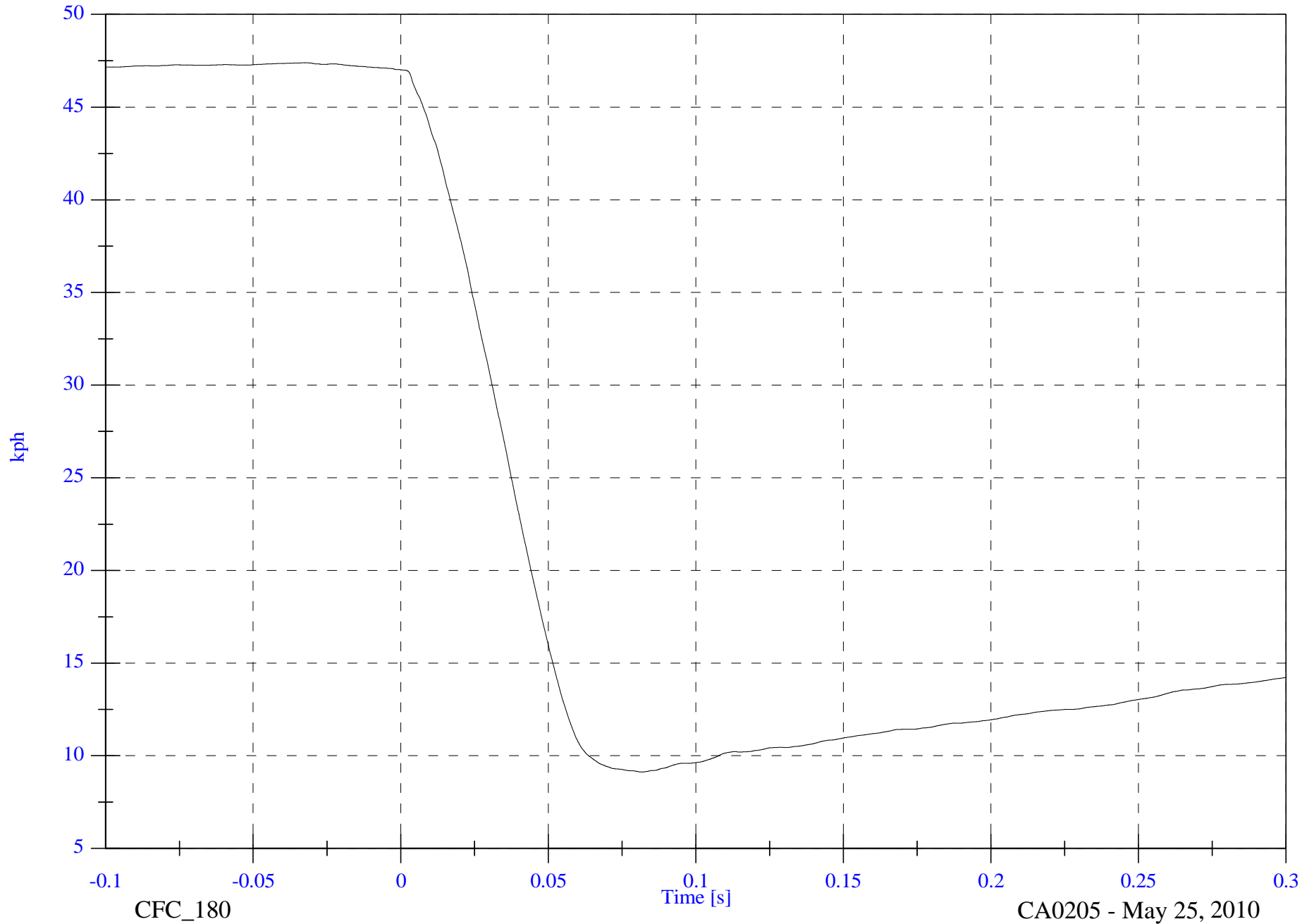
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

Max: 47.4 [kph] at -0.032 [s]

V1 Moving Barrier Left Rail X Velocity

Min: 9.1 [kph] at 0.082 [s]



D-58

tr2440

CFC_180

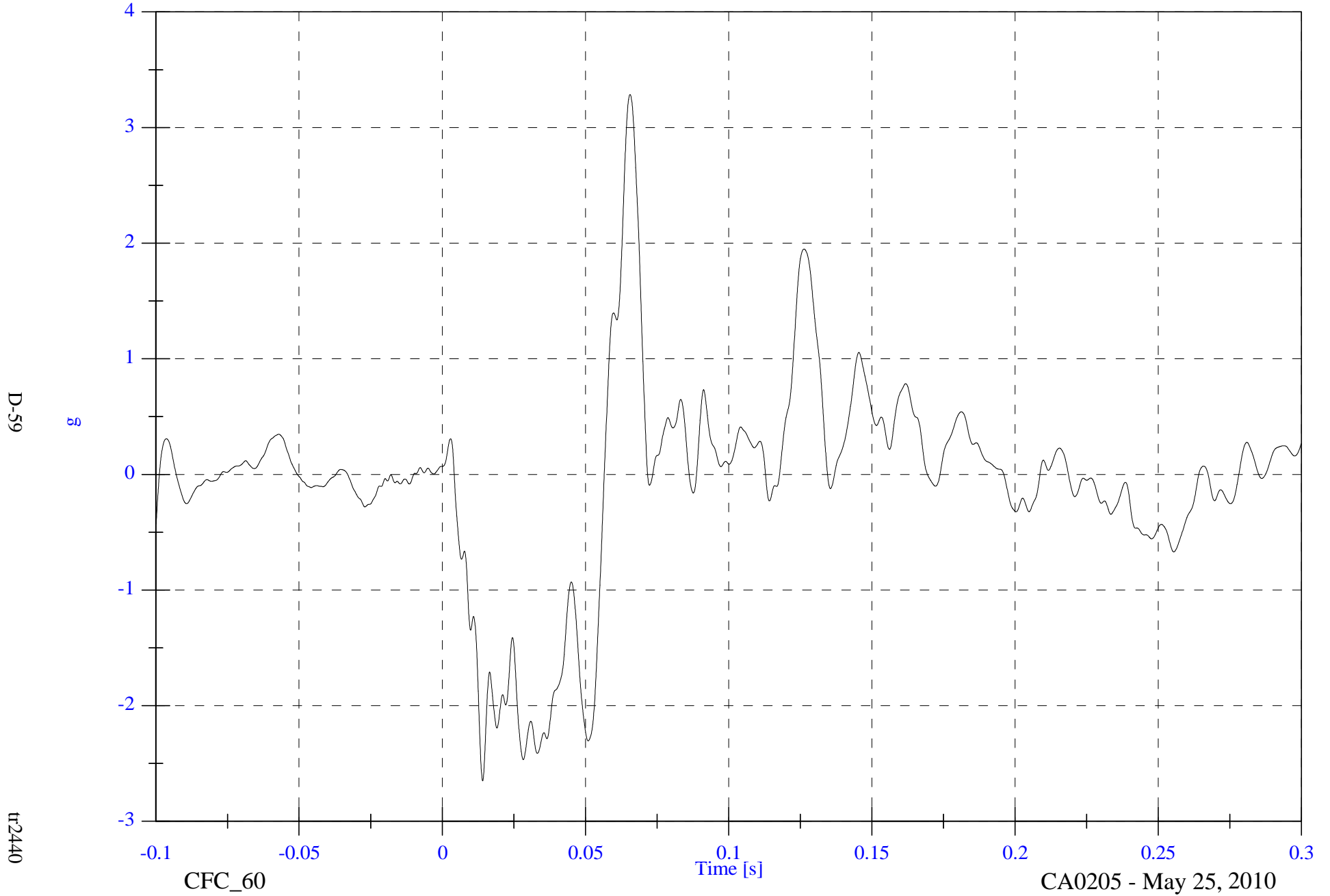
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier Left Rail Y

Max: 3.3 [g] at 0.066 [s]

Min: -2.7 [g] at 0.014 [s]



D-59

tr2440

CFC_60

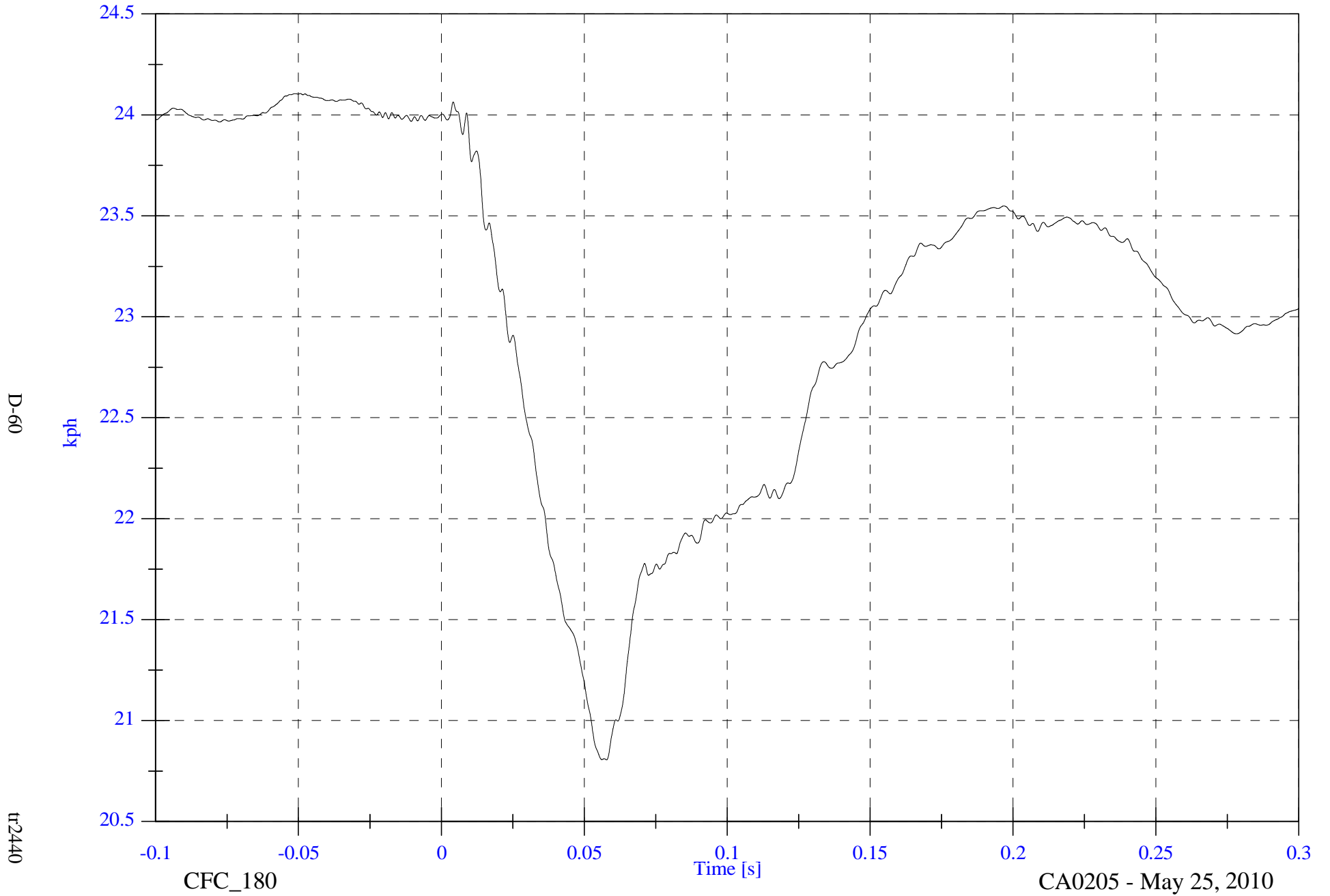
CA0205 - May 25, 2010

FMVSS 214 MDB 2010 Ford Flex

V1 Moving Barrier Left Rail Y Velocity

Max: 24.1 [kph] at -0.049 [s]

Min: 20.8 [kph] at 0.058 [s]



D-60

tr2440

CFC_180

CA0205 - May 25, 2010

APPENDIX E

ES-2re PERFORMANCE CALIBRATION TEST DATA

CALIBRATION TEST RESULTS

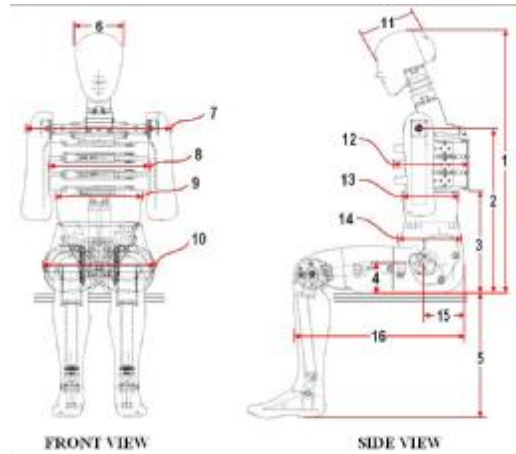
PRE-TEST

ES-2re NO.: 037

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

S/N D037



Dim. No.	Description	Specification (mm)	Result	Pass/Fail
1	Sitting Height	900-918	913	Pass
2	Seat to Shoulder Joint	558-572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	352	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	441	Pass
6	Head Width	152-158	155	Pass
7	Shoulder/Arm Width	461-479	473	Pass
8	Thorax Width	322-332	327	Pass
9	Abdomen Width	273-287	282	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	199	Pass
12	Thorax Depth	262-272	266	Pass
13	Abdomen Depth	194-204	198	Pass
14	Pelvis Depth	235-245	242	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	157	Pass
16	Back of Buttocks to Front Knee	597-615	605	Pass

Technician : A. Rudniski

Date: 05/07/2010



www.calspan.com

Calspan - Transportation Research Group

4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Head Drop	Test Date:	5/13/2010
Test Number:	1	Test Time:	3:08:46 PM

Component Part Number	Component Serial Number
455-1007	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	41 %RH P
Resultant Acceleration	125 -- 155	150 g P
Oscillation	0.0 -- 15.0	3.1 % P
Fore-Aft Acceleration	-15.00 -- 15.00	6.58 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **3:08:46 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	AC-P18639	1/25/2010
Endevco	7264-2000	AC-P23128	1/25/2010
Endevco	7264-2000	AC-P16591	1/25/2010

Test ID: **Head Drop**

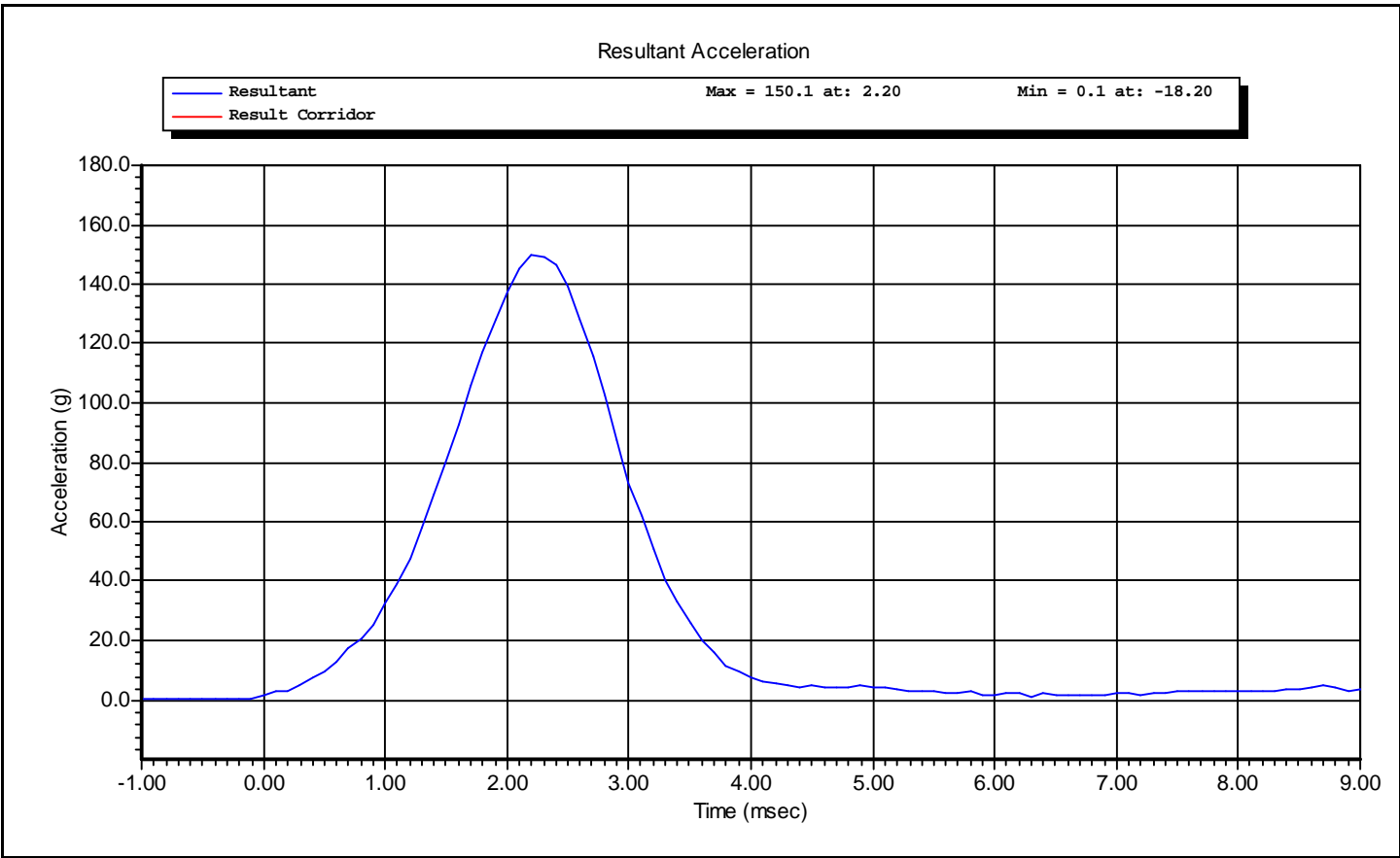
Test Time: **3:08:46 PM**

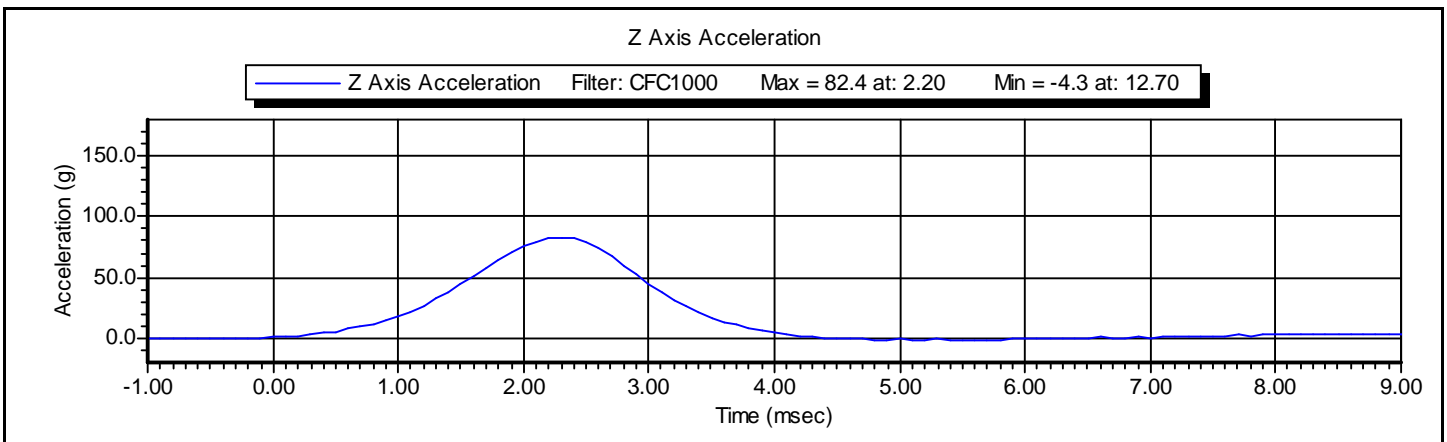
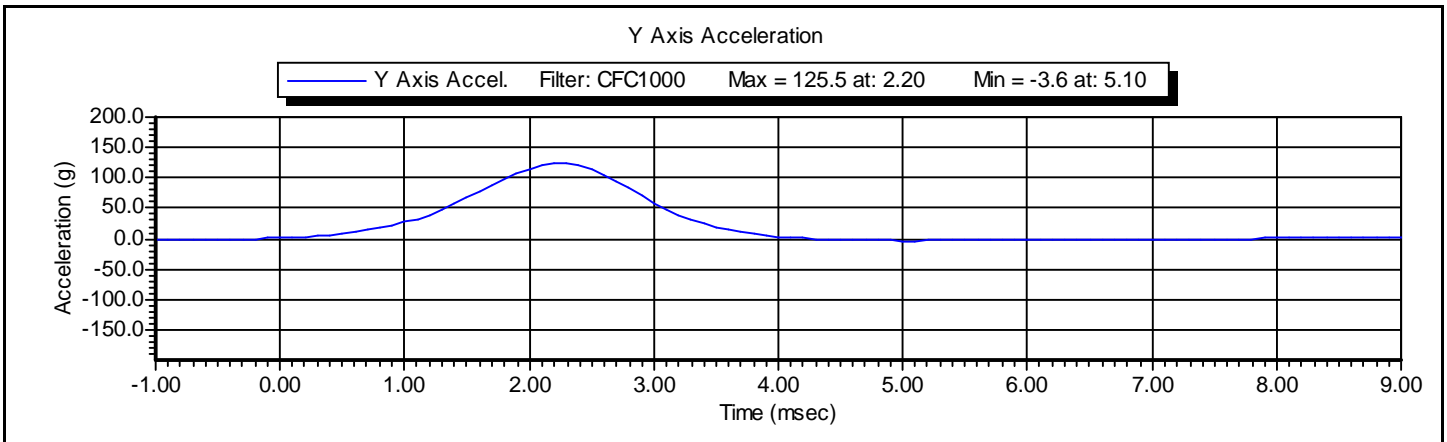
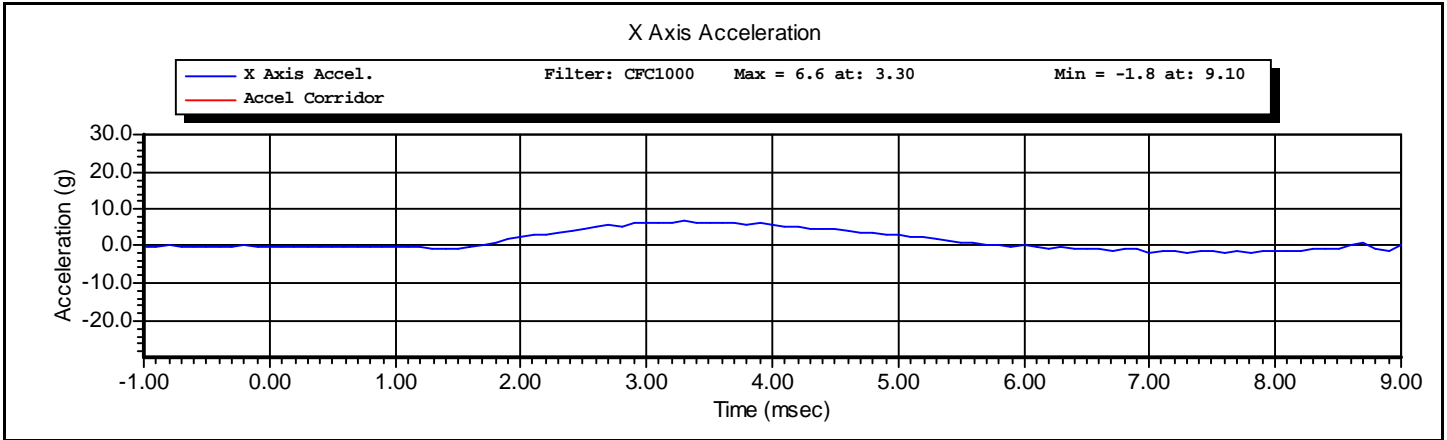
Test Date: **5/13/2010**



Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Head Drop	Test Date:	5/13/2010
Test Number:	1	Test Time:	3:08:46 PM

Component Part Number	Component Serial Number
455-1007	







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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Neck Flexion	Test Date:	5/14/2010
Test Number:	2	Test Time:	11:21:10 AM

Component Part Number	Component Serial Number
455-2002	19-020118A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	3.30 -- 3.50	3.41 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	53.5 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	60.3 ms P
Decay to Zero Degrees	53.0 -- 88.0	60.3 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **11:21:10 AM**

Test Date: **5/14/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	AF5B3	2/24/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **11:21:10 AM**

Test Date: **5/14/2010**



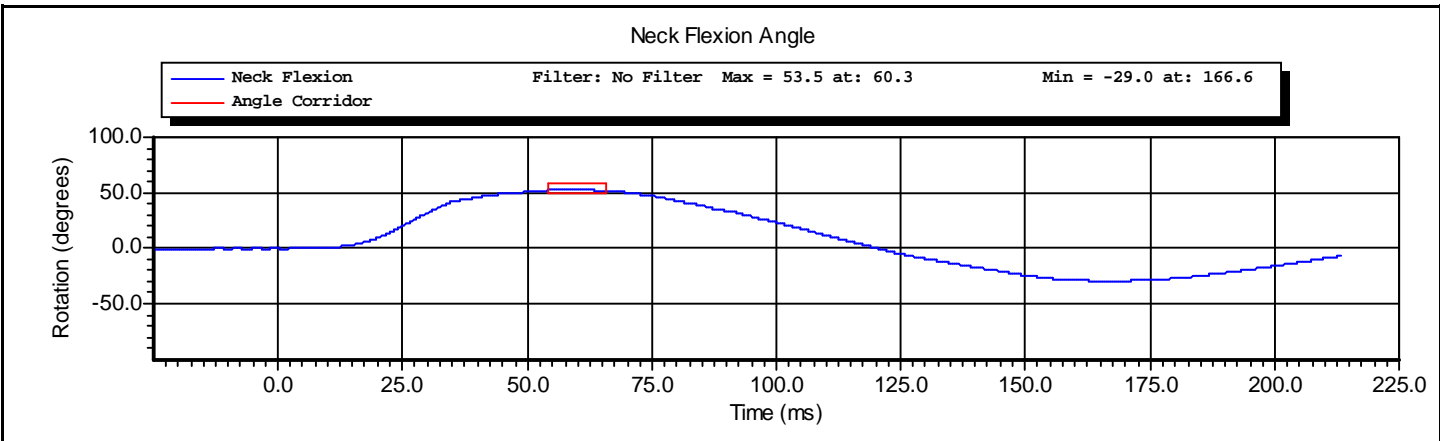
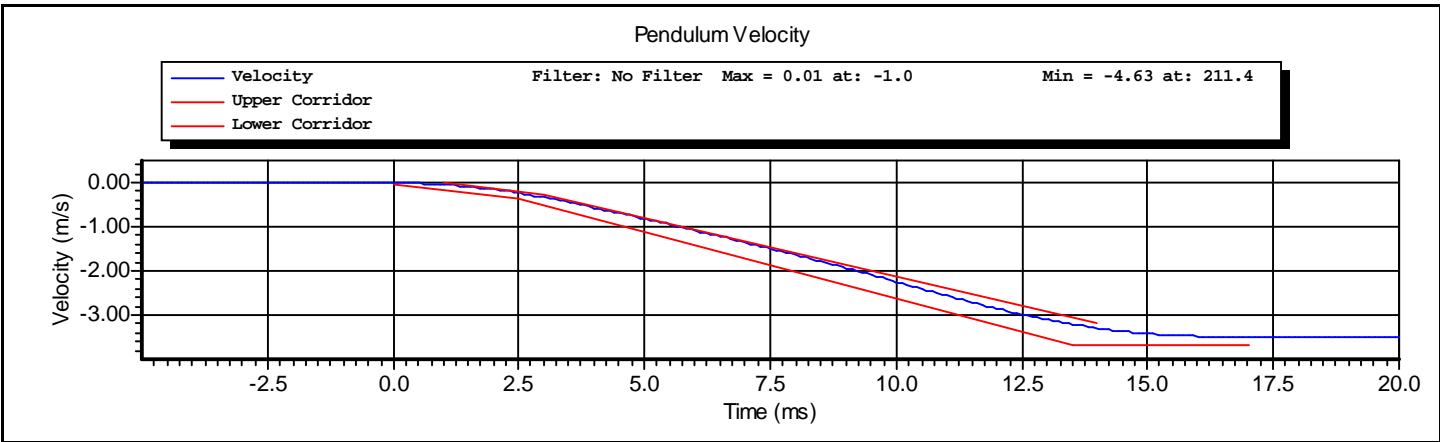
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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Neck Flexion	Test Date:	5/14/2010
Test Number:	2	Test Time:	11:21:10 AM

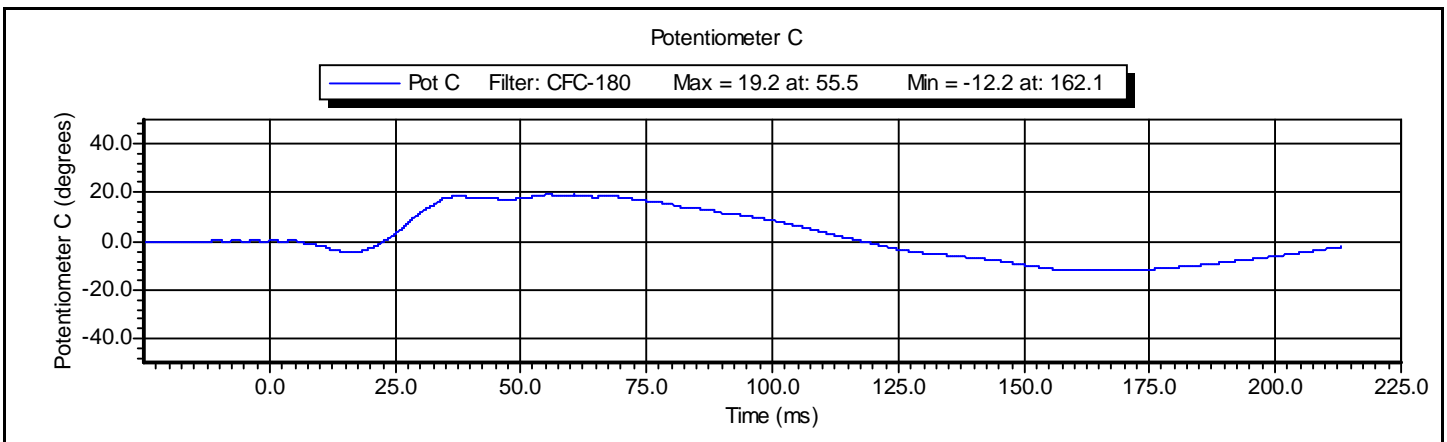
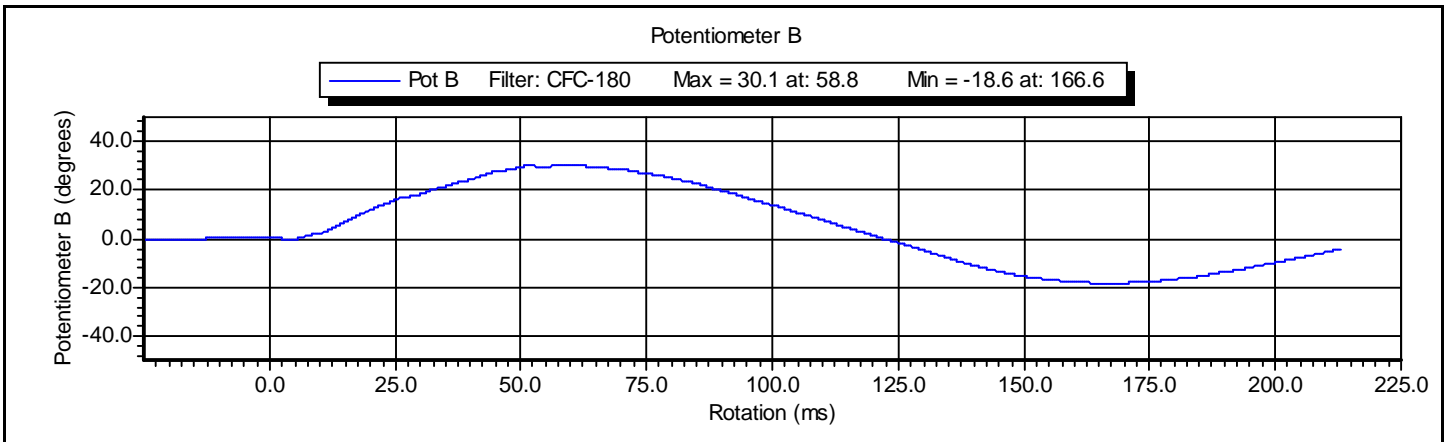
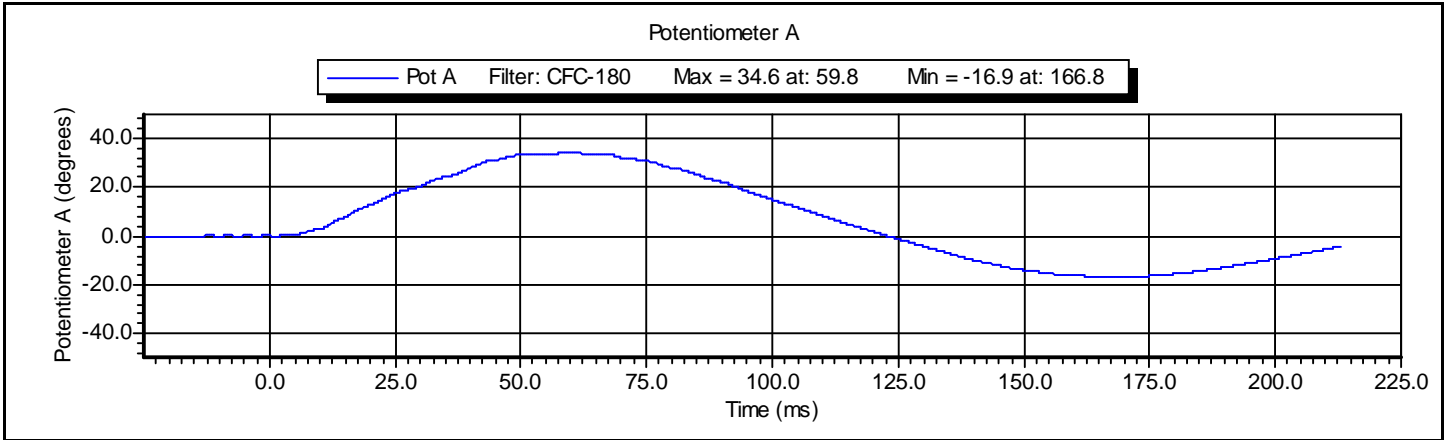
Component Part Number	Component Serial Number
455-2002	19-020118A



Test ID: **Neck Flexion**

Test Time: **11:21:10 AM**

Test Date: **5/14/2010**





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Shoulder	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:36:48 AM

Component Part Number	Component Serial Number
960715-313	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	4.20 -- 4.40	4.30 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.16 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **11:36:48 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010

Test ID: **Shoulder**

Test Time: **11:36:48 AM**

Test Date: **5/13/2010**



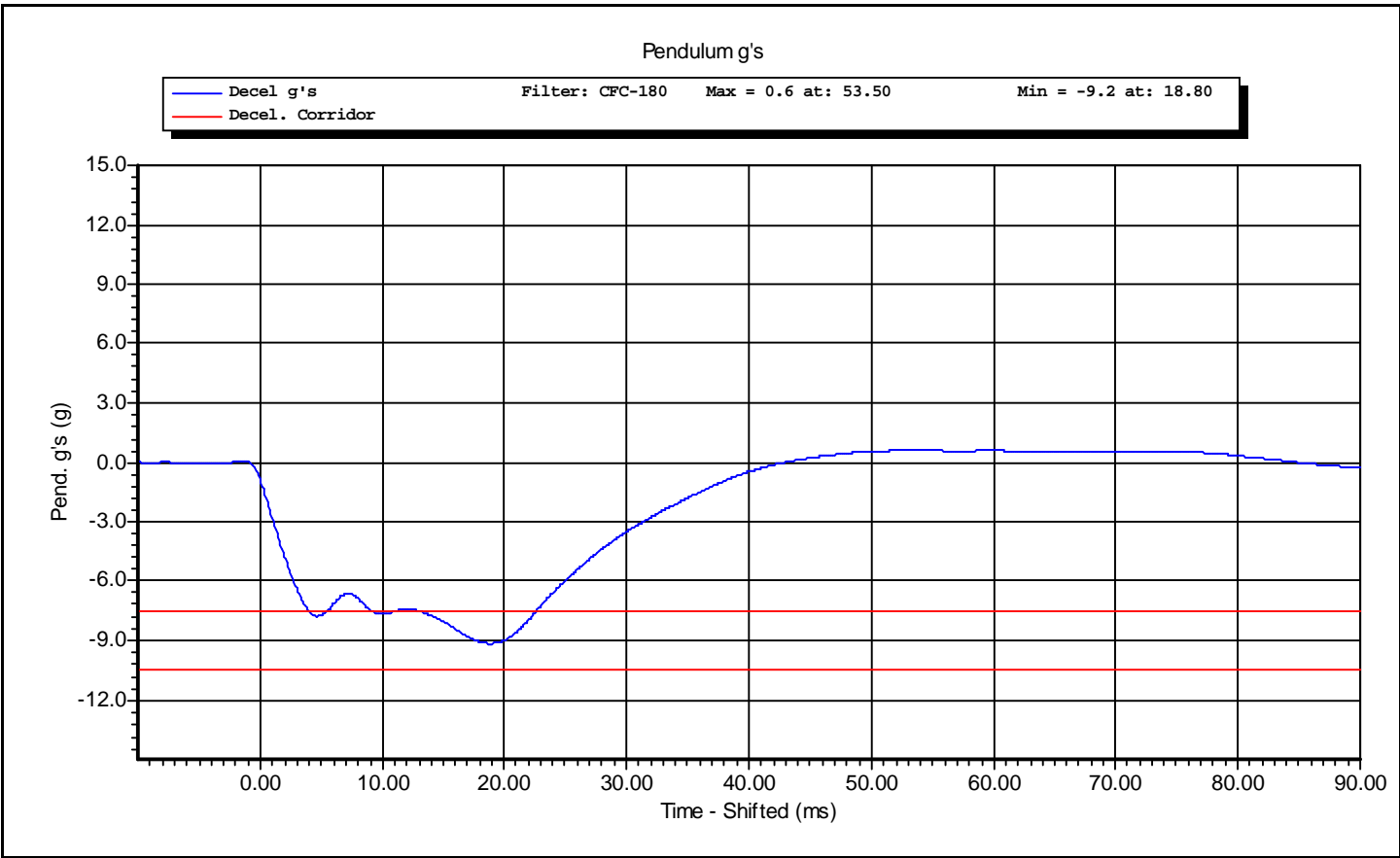
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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Shoulder	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:36:48 AM

Component Part Number	Component Serial Number
960715-313	



Test ID: **Shoulder**

Test Time: **11:36:48 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Upper Rib 4 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:48:46 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	42.0 %RH P
Velocity	3.90 -- 4.10	4.00 m/s P
Rib Displacement	-51.00 -- -46.00	-49.56 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Upper Rib 4 m/s**

Test Time: **11:48:46 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-01	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Upper Rib 4 m/s**

Test Time: **11:48:46 AM**

Test Date: **5/13/2010**



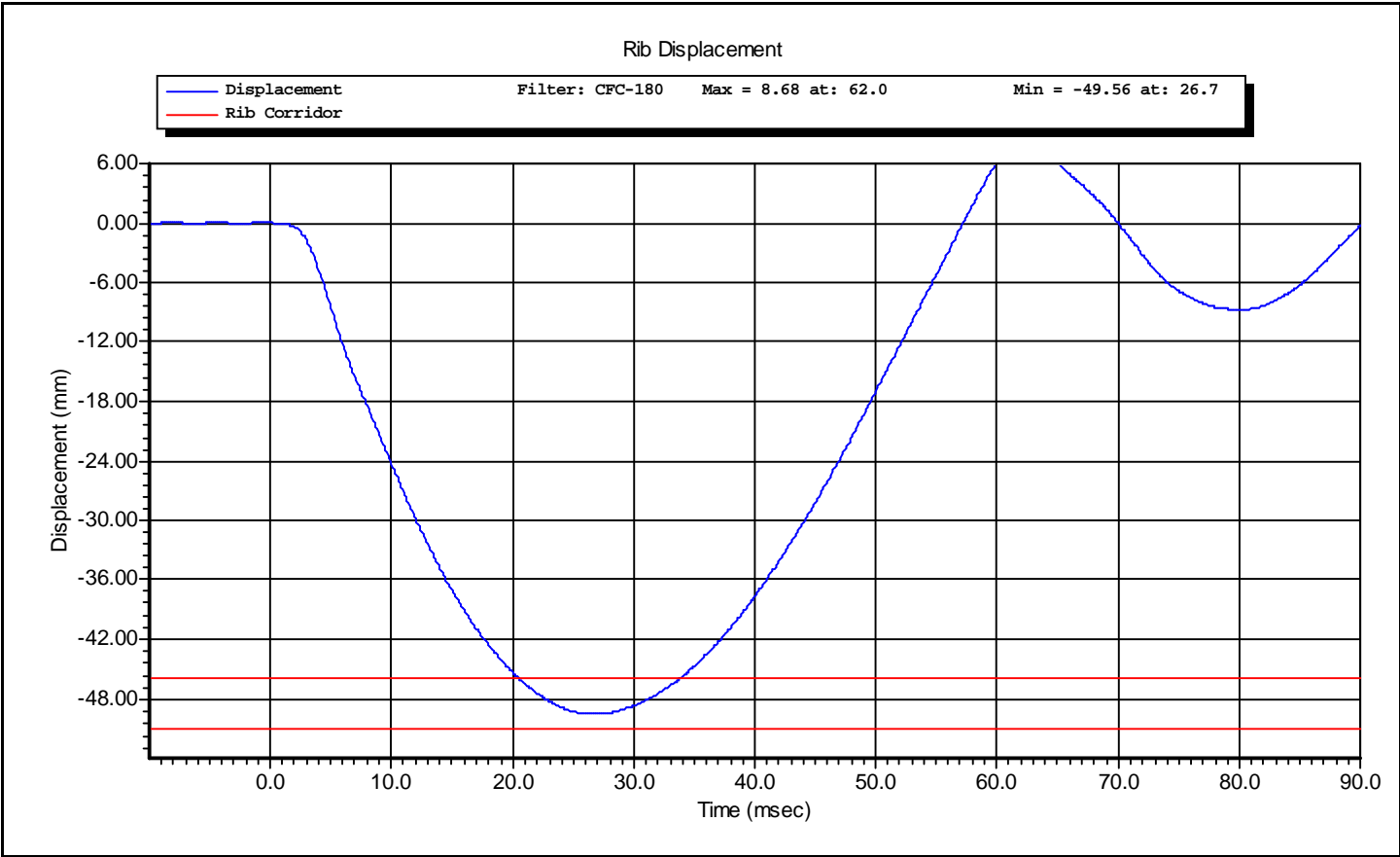
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Upper Rib 4 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:48:46 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A



Test ID: **Upper Rib 4 m/s**

Test Time: **11:48:46 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Upper Rib 3 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:57:58 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.87 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Upper Rib 3 m/s**

Test Time: **11:57:58 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-01	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Upper Rib 3 m/s**

Test Time: **11:57:58 AM**

Test Date: **5/13/2010**



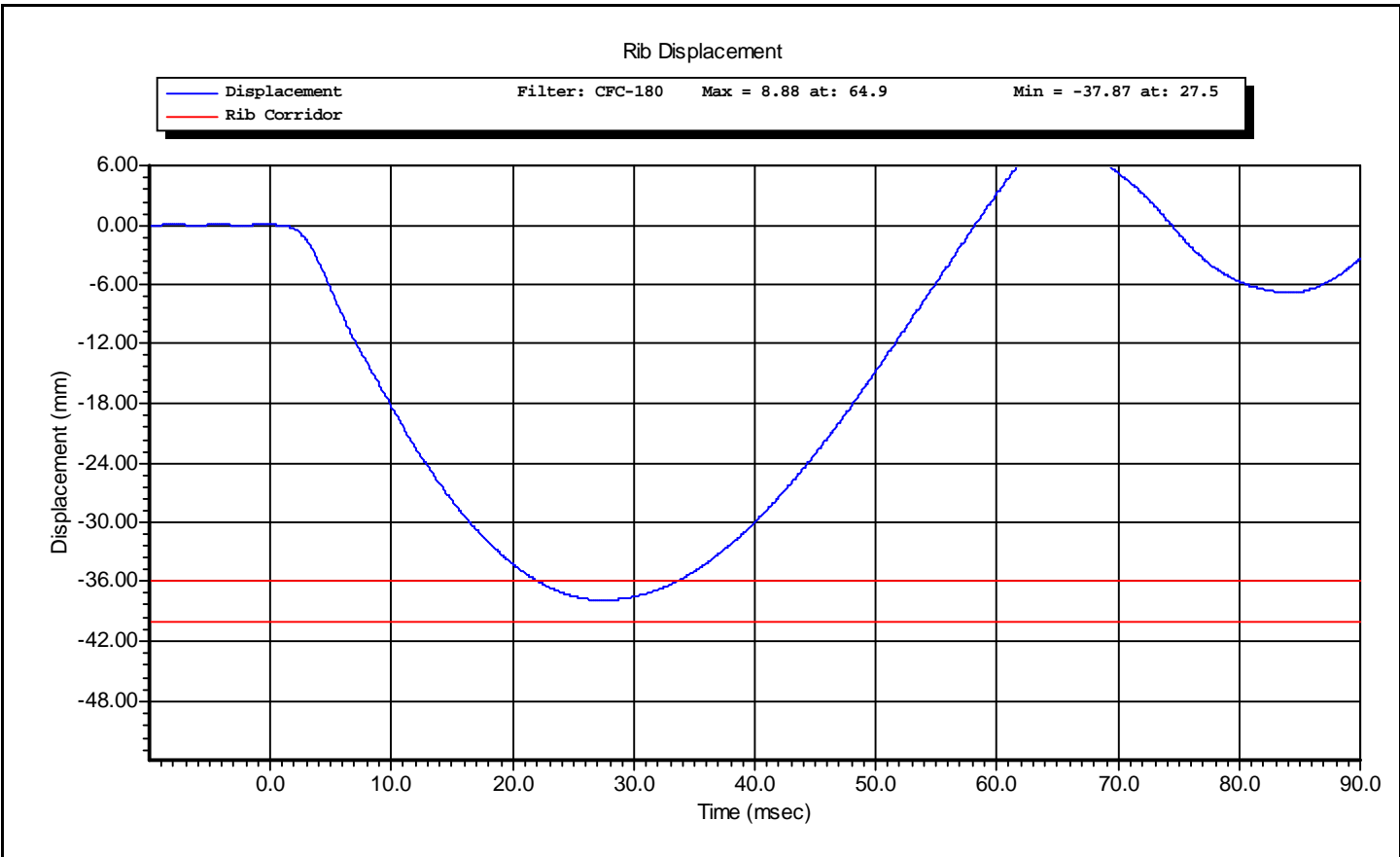
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Upper Rib 3 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:57:58 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A



Test ID: **Upper Rib 3 m/s**

Test Time: **11:57:58 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Middle Rib 4 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:15:44 PM

Component Part Number	Component Serial Number
455-3100	1954-0125A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-48.04 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Middle Rib 4 m/s**

Test Time: **1:15:44 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0807	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Middle Rib 4 m/s**

Test Time: **1:15:44 PM**

Test Date: **5/13/2010**



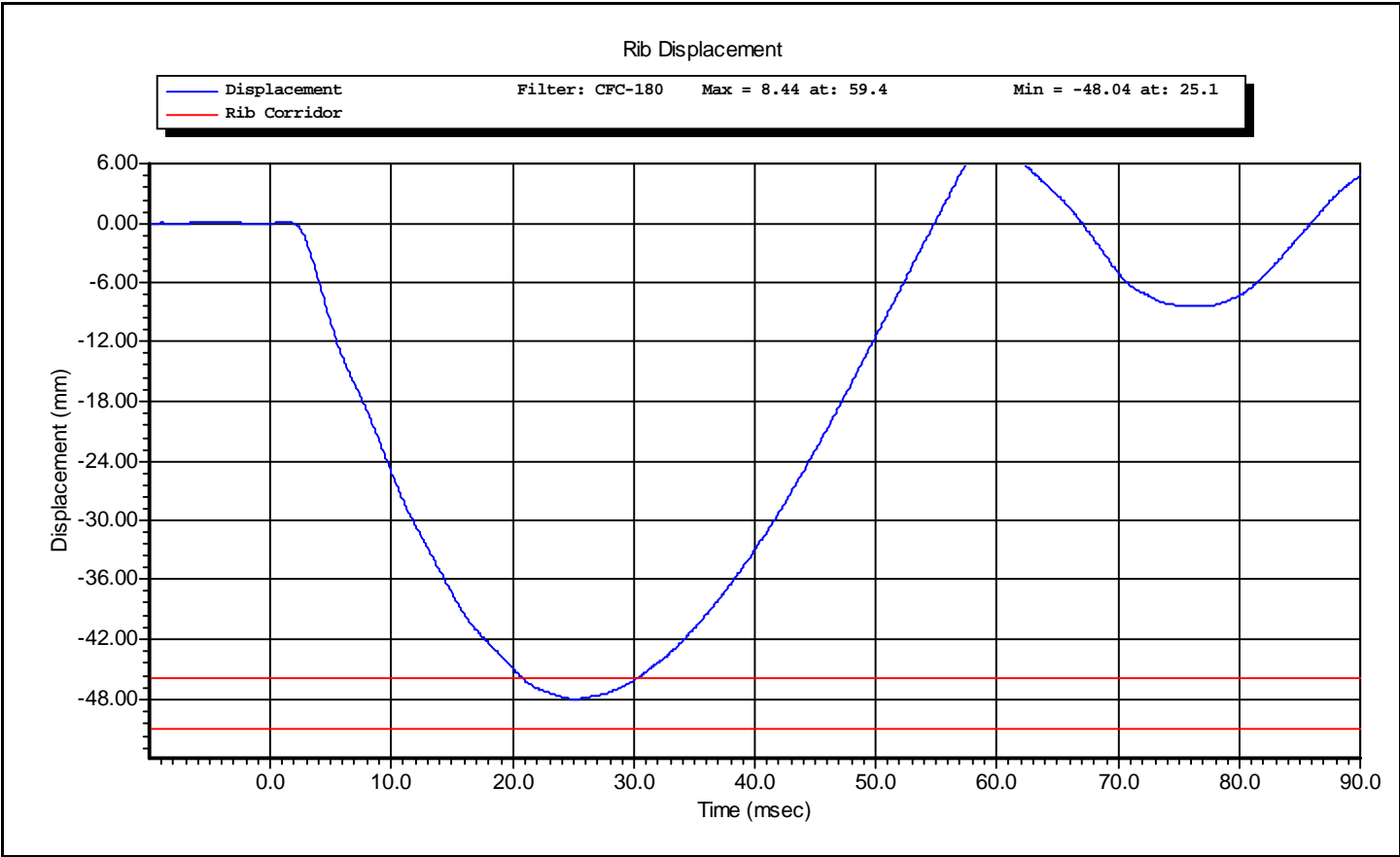
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Middle Rib 4 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:15:44 PM

Component Part Number	Component Serial Number
455-3100	1954-0125A



Test ID: **Middle Rib 4 m/s**

Test Time: **1:15:44 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Middle Rib 3 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:22:35 PM

Component Part Number	Component Serial Number
455-3100	1954-0125A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.68 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Middle Rib 3 m/s**

Test Time: **1:22:35 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0807	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Middle Rib 3 m/s**

Test Time: **1:22:35 PM**

Test Date: **5/13/2010**



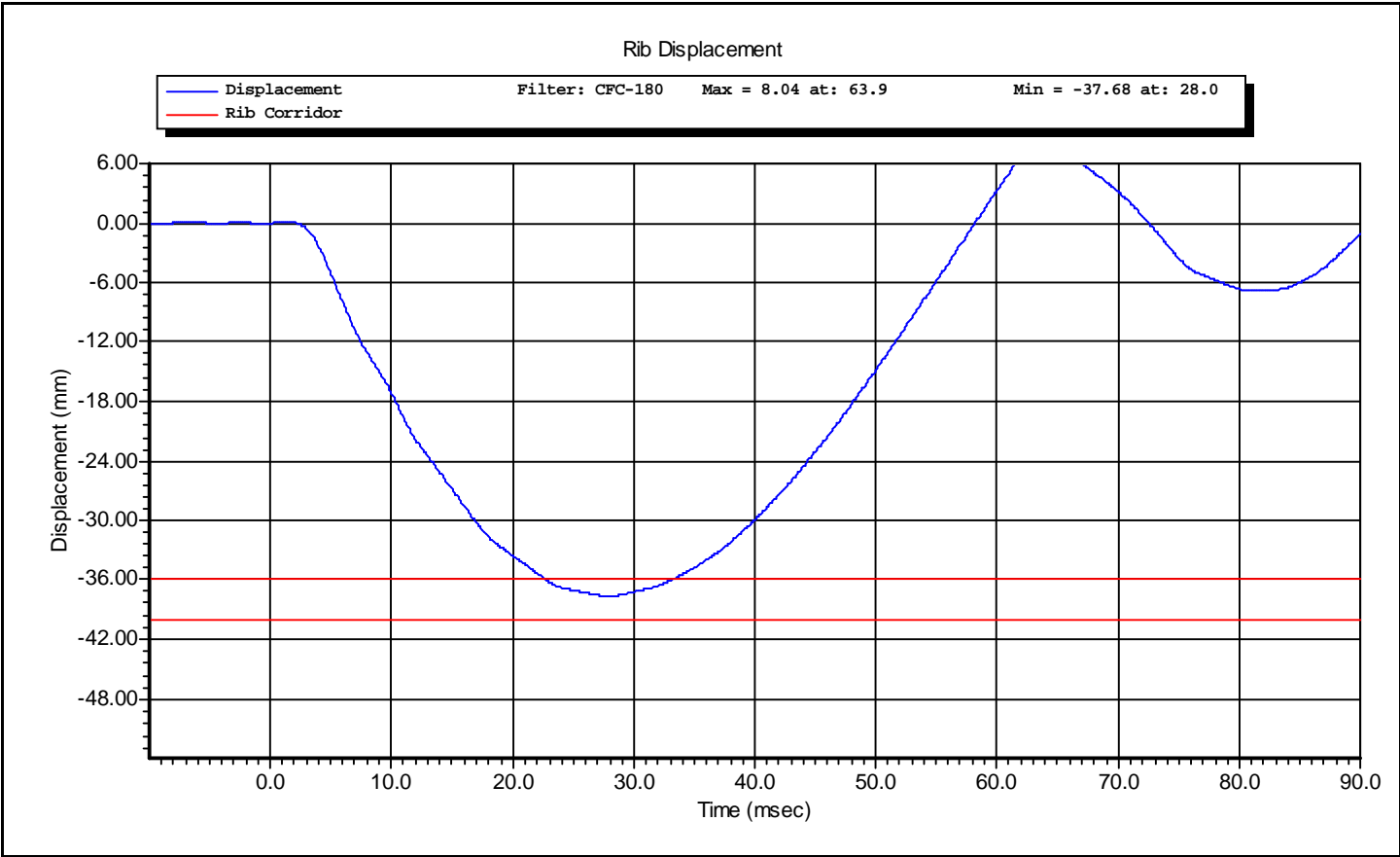
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Middle Rib 3 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:22:35 PM

Component Part Number	Component Serial Number
455-3100	1954-0125A



Test ID: **Middle Rib 3 m/s**

Test Time: **1:22:35 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Lower 4 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:35:04 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	41.0 %RH P
Velocity	3.90 -- 4.10	3.95 m/s P
Rib Displacement	-51.00 -- -46.00	-48.23 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Lower 4 m/s**

Test Time: **1:35:04 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-3	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Lower 4 m/s**

Test Time: **1:35:04 PM**

Test Date: **5/13/2010**



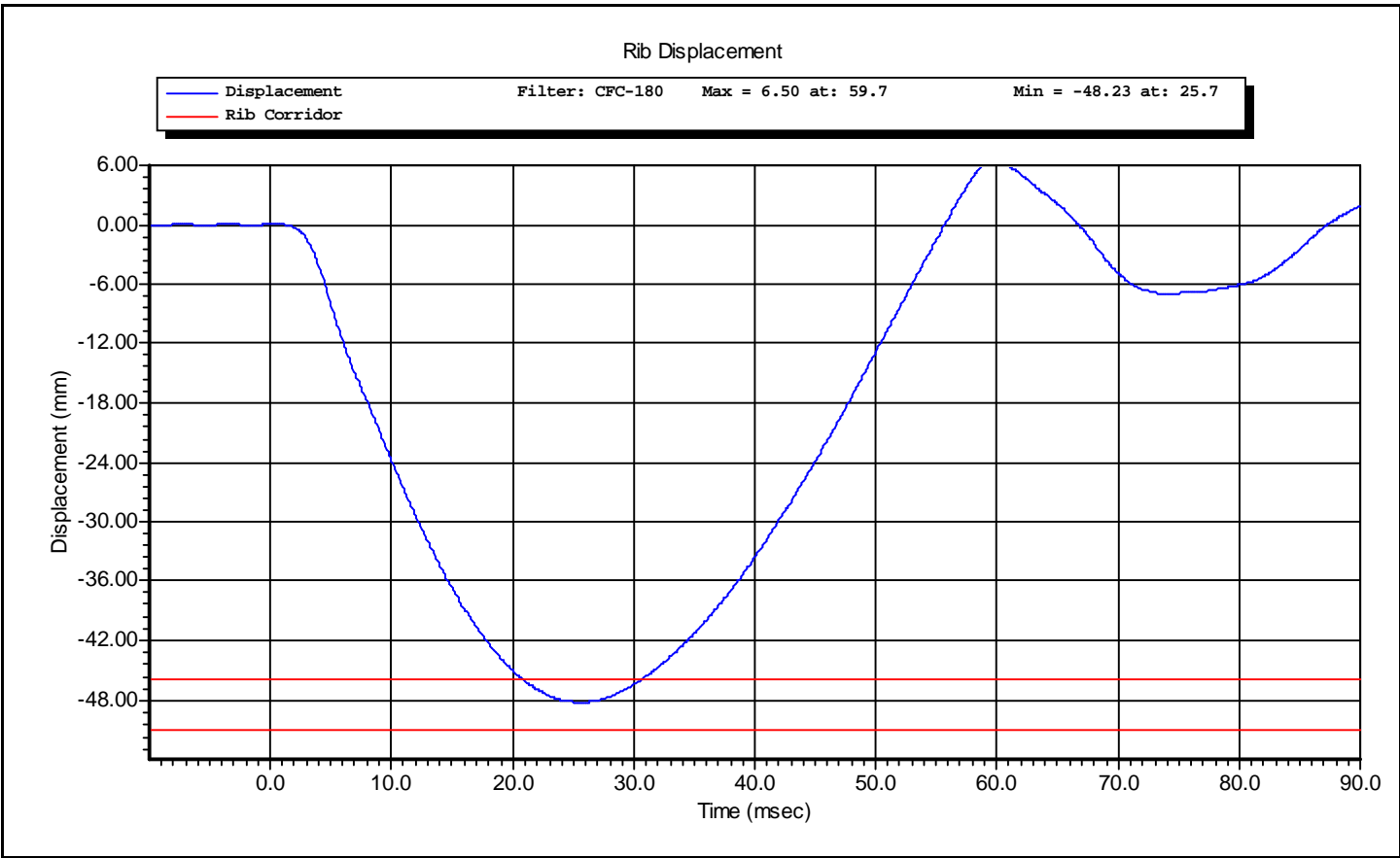
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Lower 4 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:35:04 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A



Test ID: **Rib Lower 4 m/s**

Test Time: **1:35:04 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Lower Rib 3 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:45:08 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	41.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-38.43 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Lower Rib 3 m/s**

Test Time: **1:45:08 PM**

Test Date: **5/13/2010**



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REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-3	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Lower Rib 3 m/s**

Test Time: **1:45:08 PM**

Test Date: **5/13/2010**



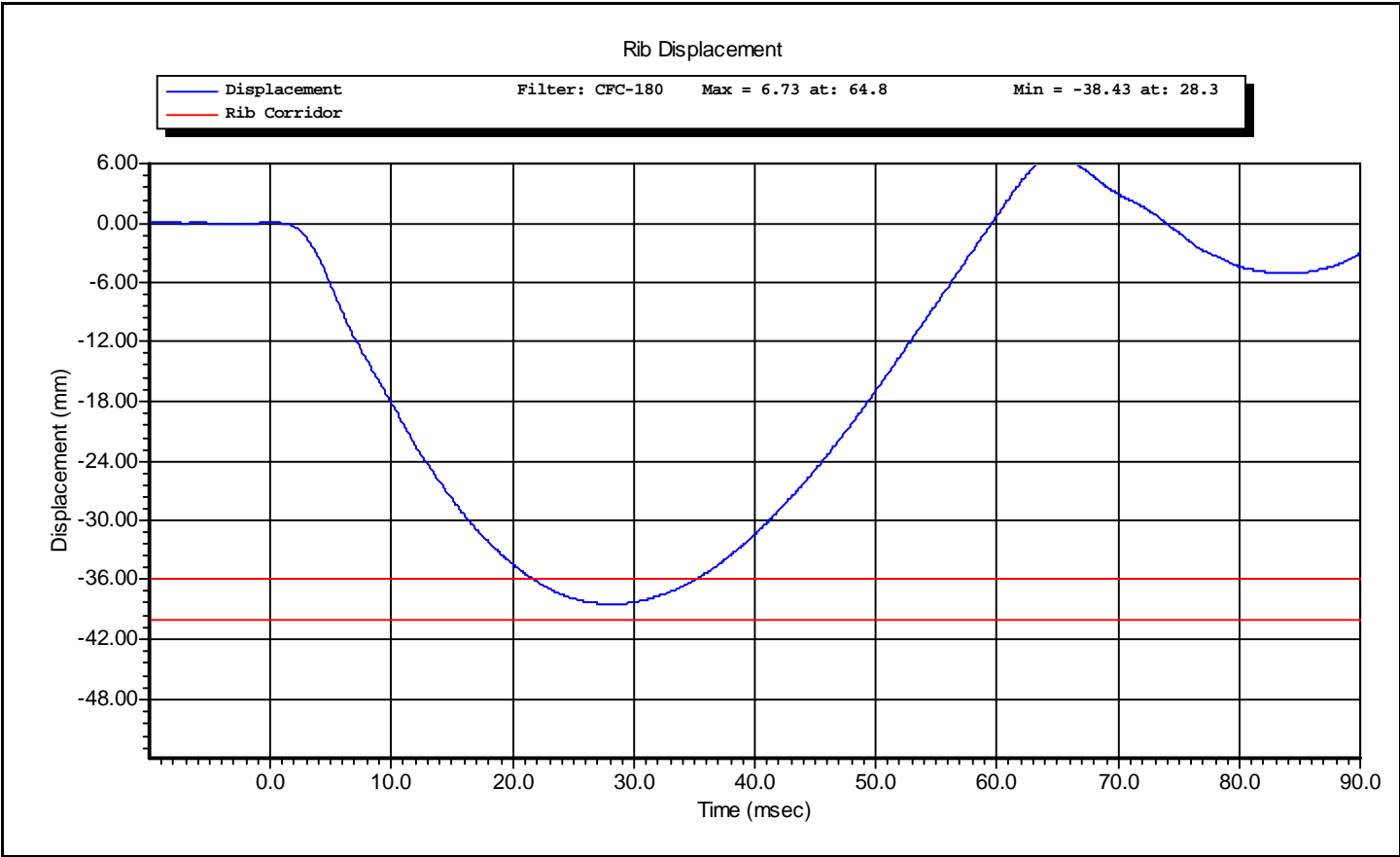
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Lower Rib 3 m/s	Test Date:	5/13/2010
Test Number:	1	Test Time:	1:45:08 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A



Test ID: **Lower Rib 3 m/s**

Test Time: **1:45:08 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Thorax Impact	Test Date:	5/13/2010
Test Number:	1	Test Time:	2:15:12 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	1954-0124A
Middle Rib - 175-4002	1954-0125A
Lower Rib - 175-4002	1954-0126A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	41.0 %RH P
Velocity	5.40 -- 5.60	5.48 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.0 mm P
Middle Rib Displacement	37.0 -- 45.0	41.2 mm P
Lower Rib Displacement	37.0 -- 44.0	42.2 mm P
Impactor Force	5100 -- 6200	5739 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Impact**

Test Time: **2:15:12 PM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16761	1/22/2010
Honeywell	MLT-38000	DS-0552-01	1/11/2010
Honeywell	MLT-38000	DS-0807	1/11/2010
Honeywell	MLT-38000	DS-0552-3	1/11/2010

Test ID: **Thorax Impact**

Test Time: **2:15:12 PM**

Test Date: **5/13/2010**



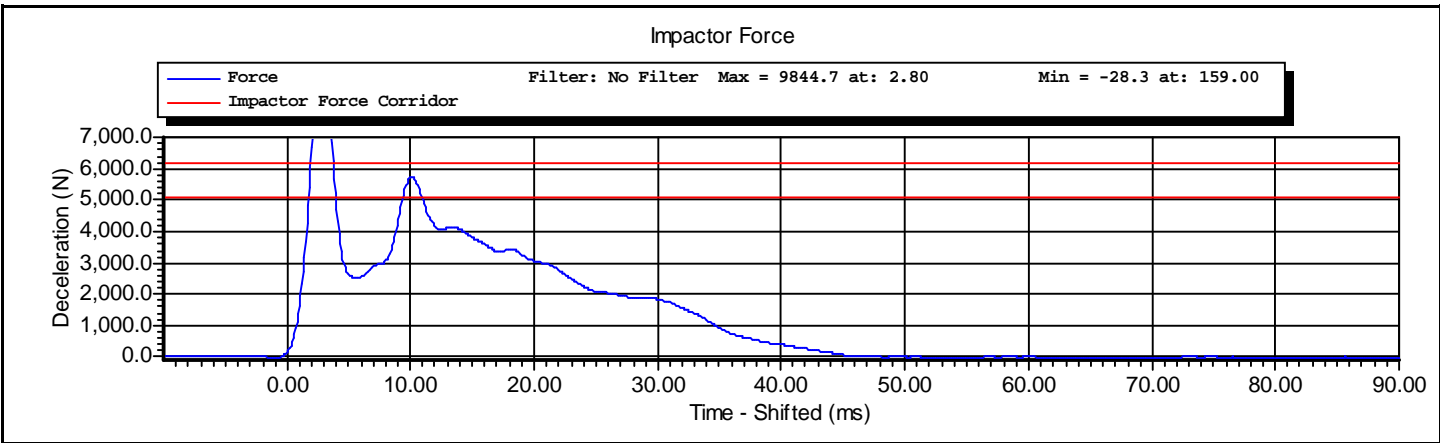
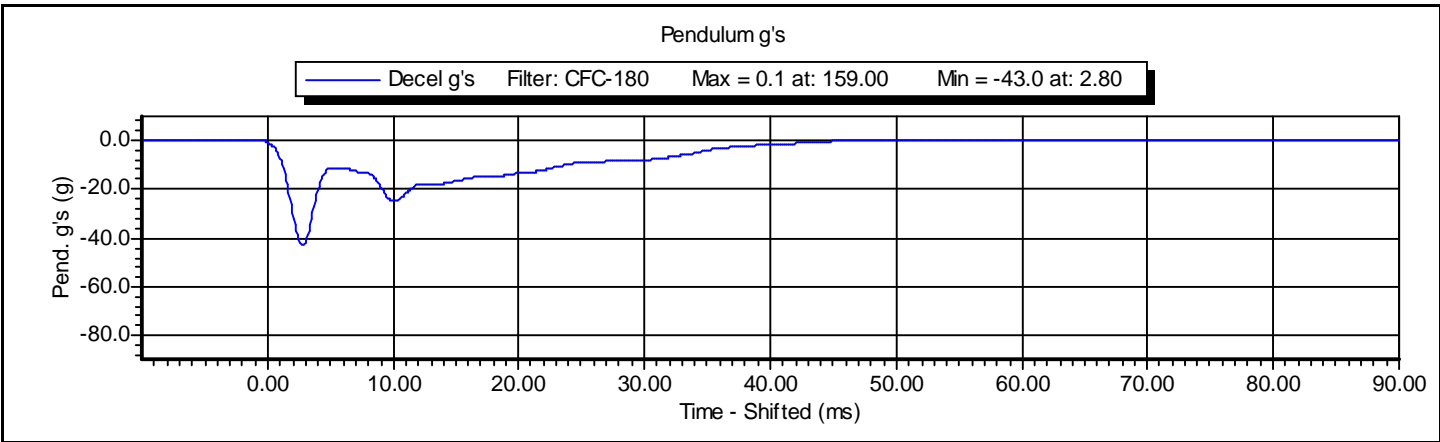
www.calspan.com

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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Thorax Impact	Test Date:	5/13/2010
Test Number:	1	Test Time:	2:15:12 PM

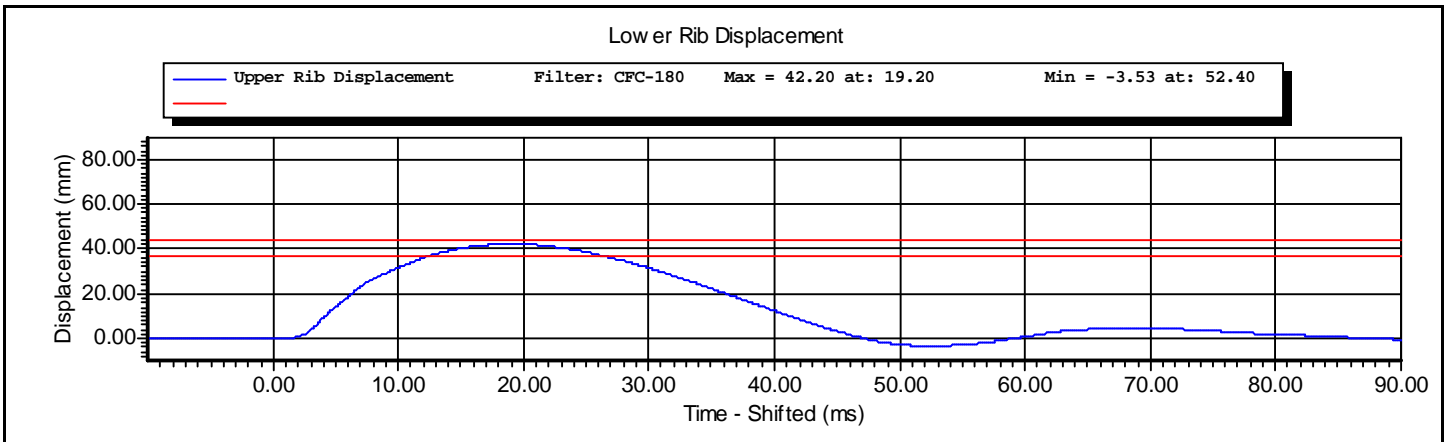
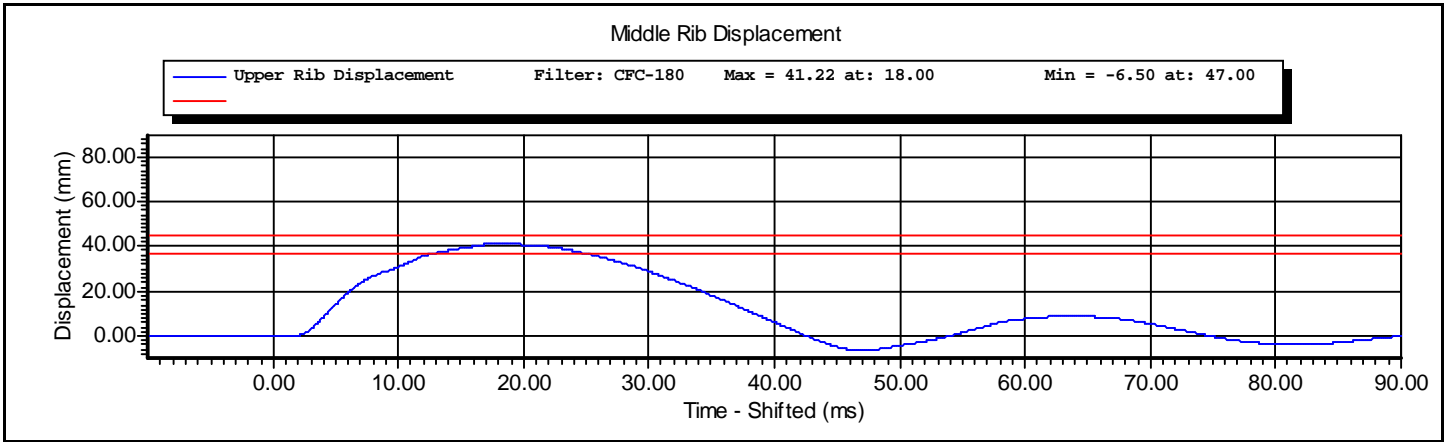
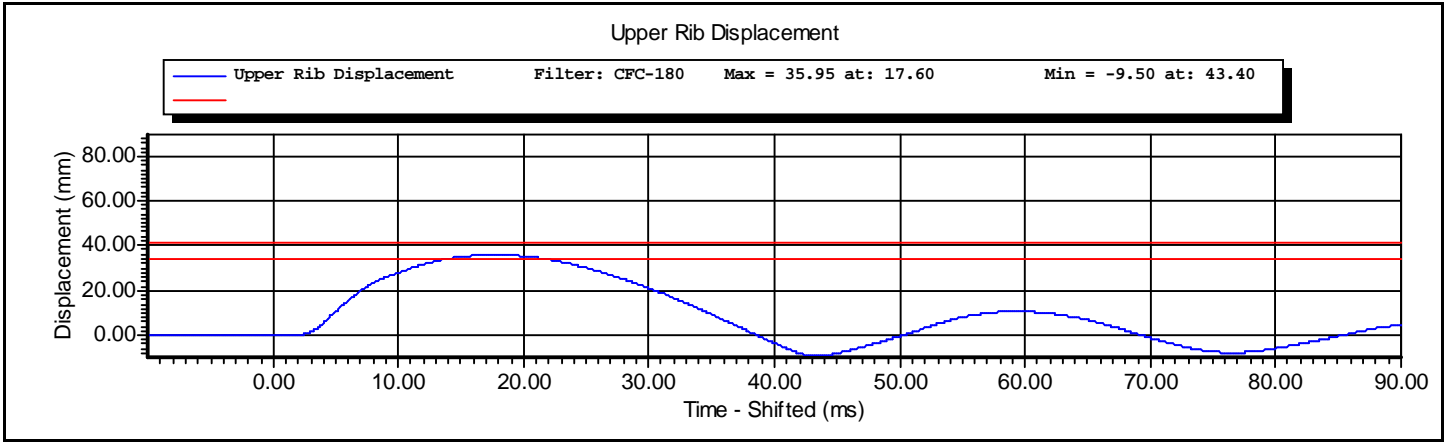
Component Part Number	Component Serial Number
Upper Rib - 175-4002	1954-0124A



Test ID: **Thorax Impact**

Test Time: **2:15:12 PM**

Test Date: **5/13/2010**





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Abdominal Impact	Test Date:	5/13/2010
Test Number:	2	Test Time:	11:03:14 AM

Component Part Number	Component Serial Number
FTSS-0004	07/118

Comments:
 FTSS Abdomen
 Model - FTSS-0004
 Serial - 07/118

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	38 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.48 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.4 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.36 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	10.7 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Abdominal Impact** Test Time: **11:03:14 AM** Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Denton	2631	LC-1507Fy	1/7/2010
Denton	2631	LC-1508Fy	1/7/2010
Denton	2631	LC-1509Fy	1/7/2010

Test ID: **Abdominal Impact** Test Time: **11:03:14 AM**

Test Date: **5/13/2010**



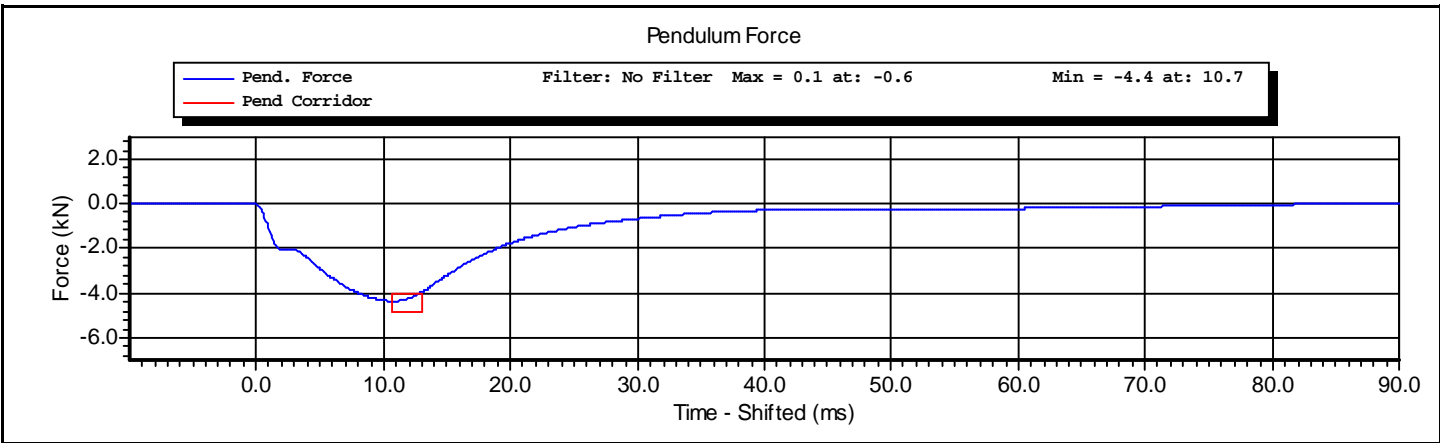
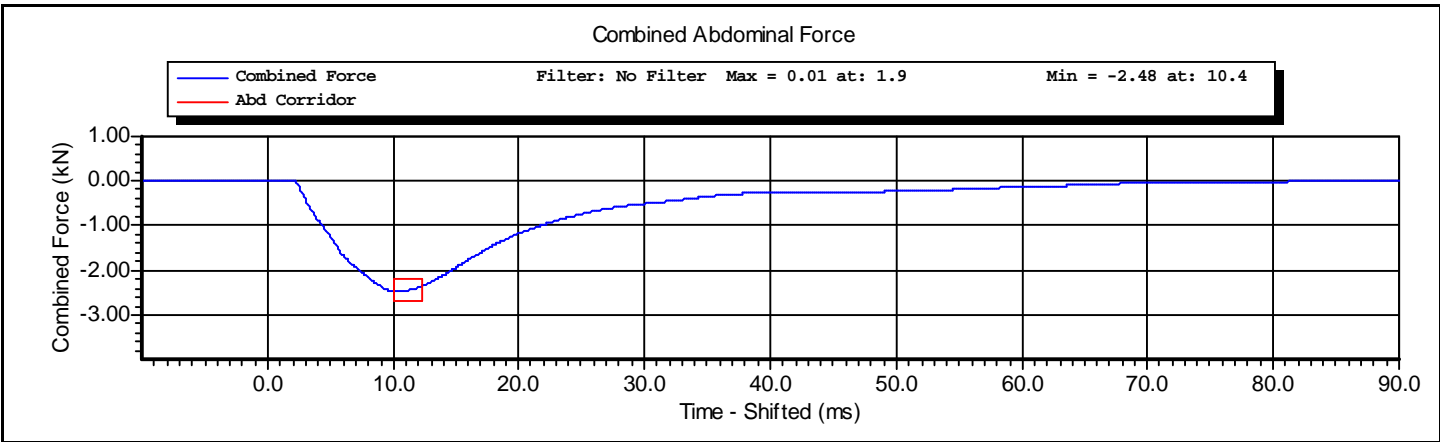
www.calspan.com

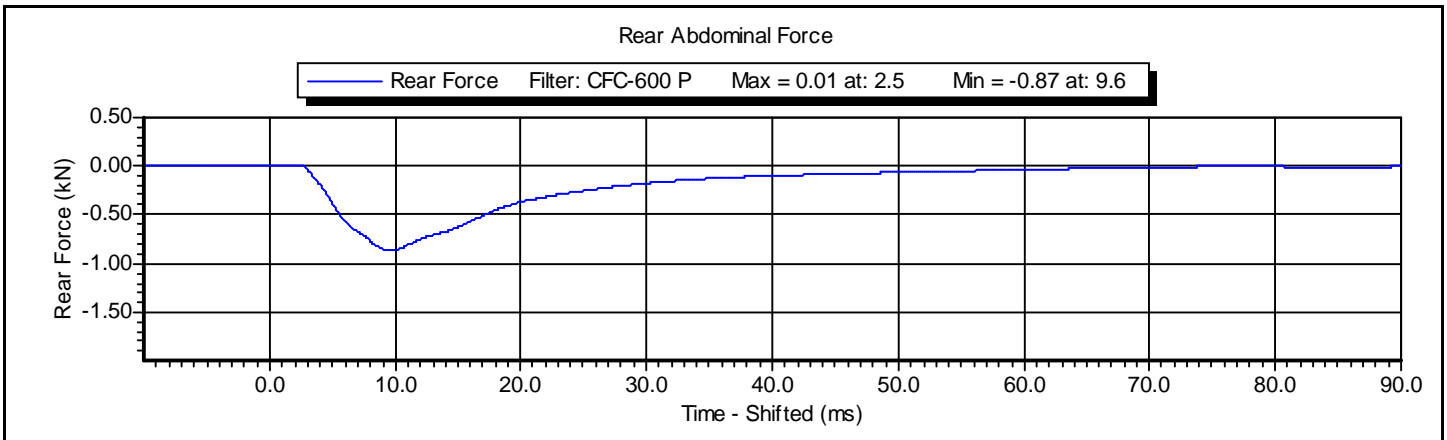
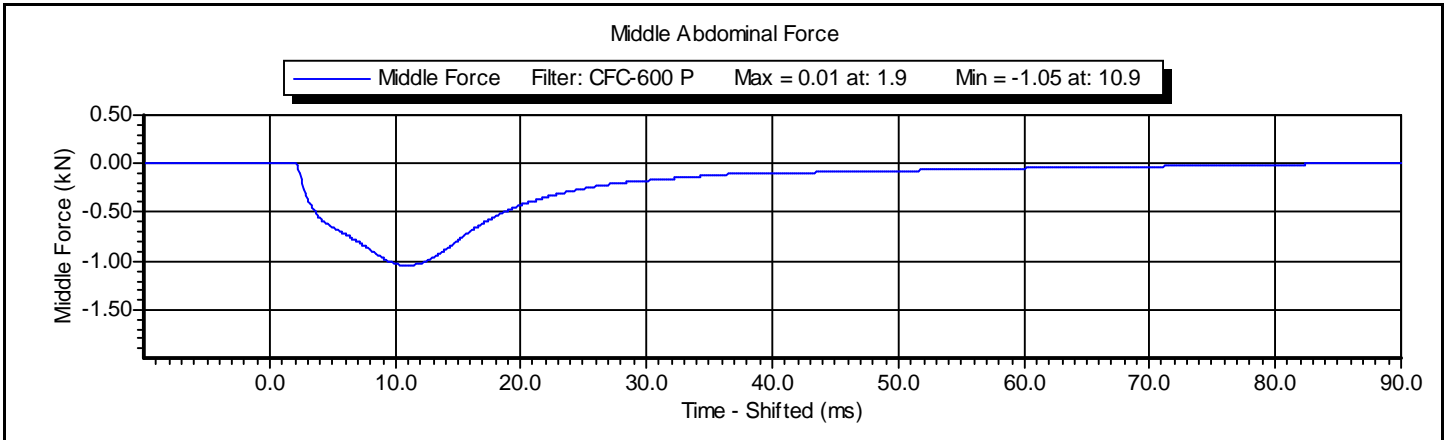
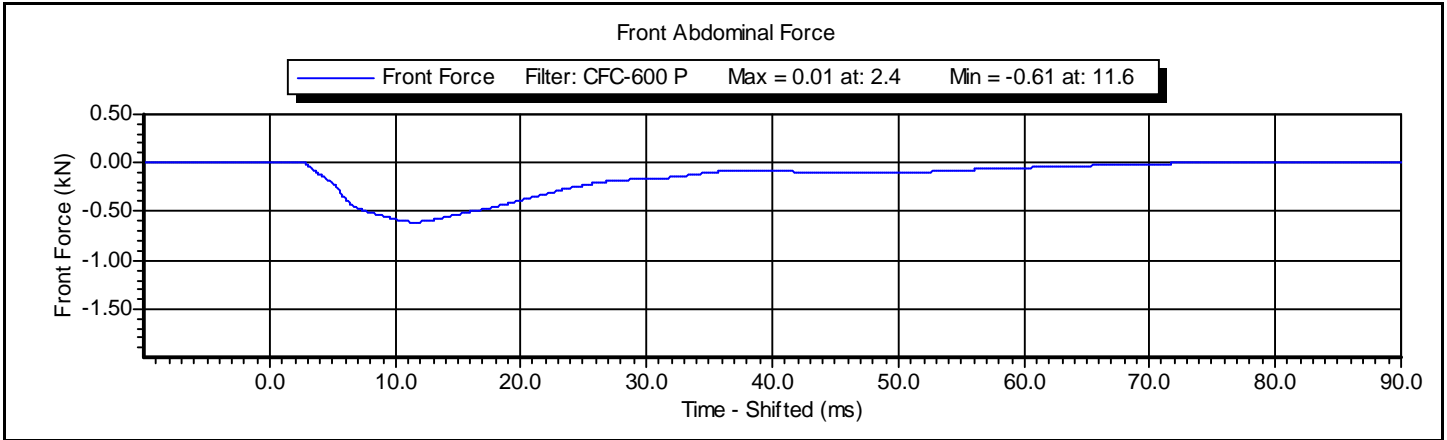
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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Abdominal Impact	Test Date:	5/13/2010
Test Number:	2	Test Time:	11:03:14 AM

Component Part Number	Component Serial Number
FTSS-0004	07/118







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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Lumbar Spine	Test Date:	5/14/2010
Test Number:	2	Test Time:	3:57:44 PM

Component Part Number	Component Serial Number
175-5501	15-0376

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	5.95 -- 6.15	6.13 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	47.7 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	41.0 ms P
Decay to Zero Degrees	37.0 -- 57.0	38.9 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Lumbar Spine**

Test Time: **3:57:44 PM**

Test Date: **5/14/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	AF5B3	2/24/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Lumbar Spine**

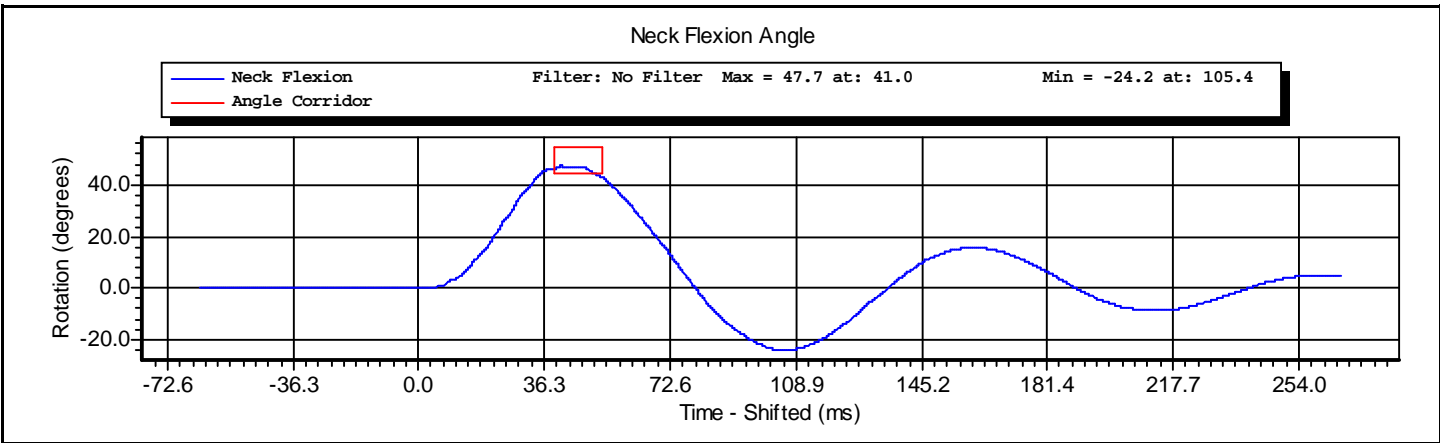
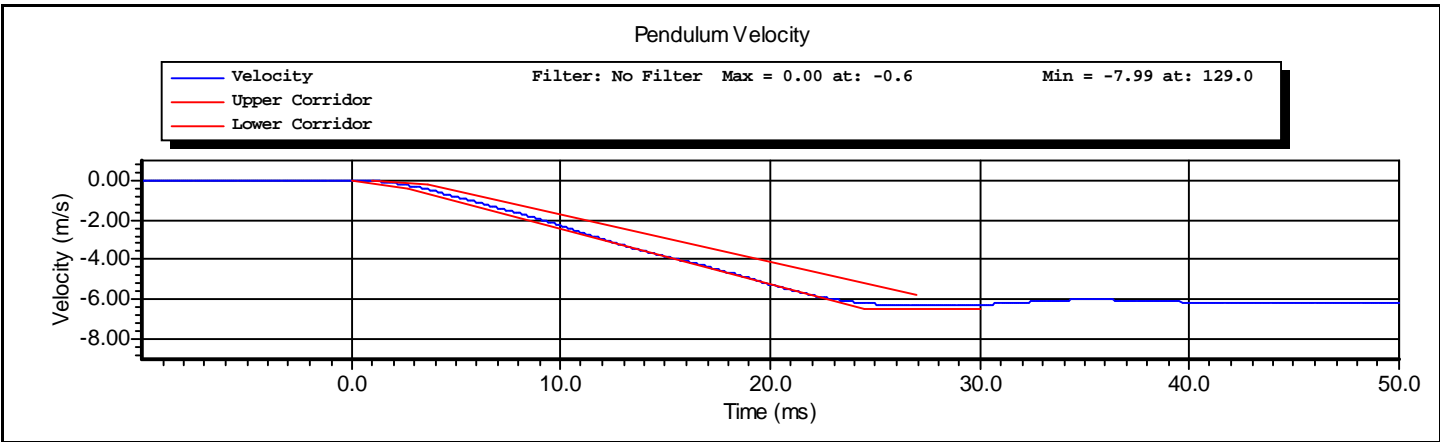
Test Time: **3:57:44 PM**

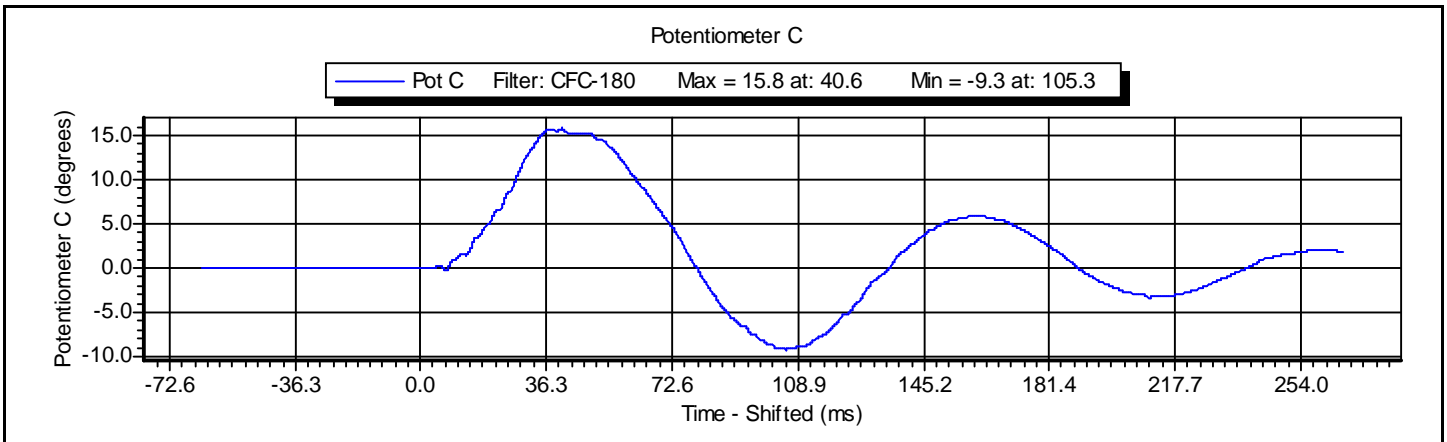
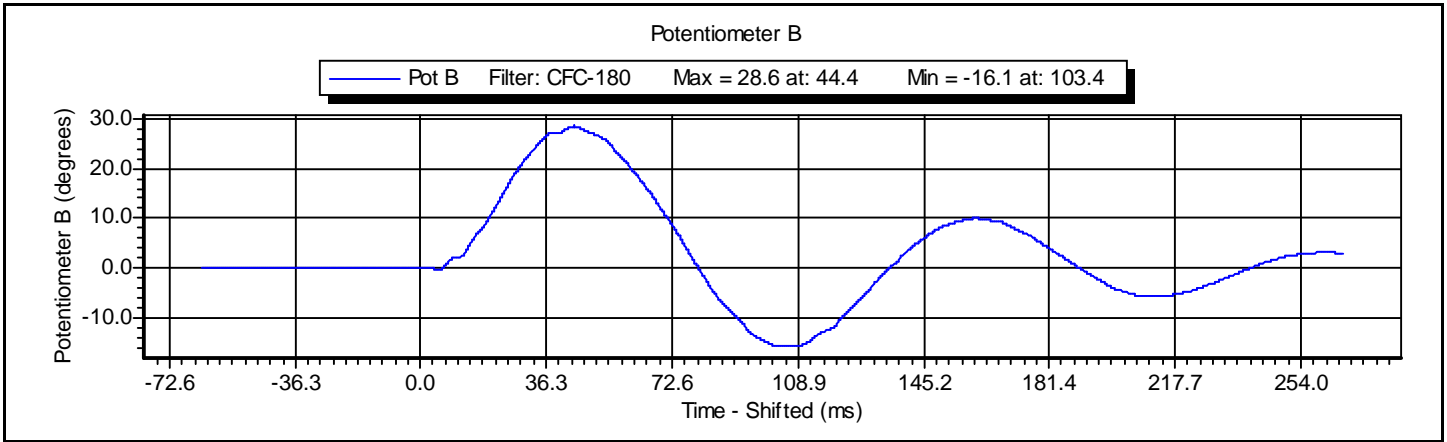
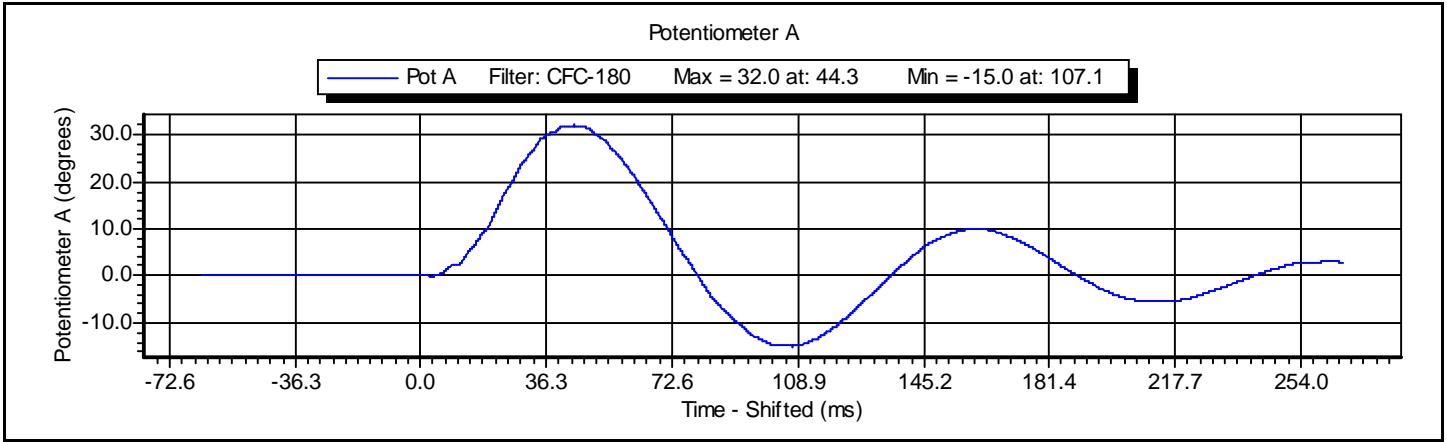
Test Date: **5/14/2010**



Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Lumbar Spine	Test Date:	5/14/2010
Test Number:	2	Test Time:	3:57:44 PM

Component Part Number	Component Serial Number
175-5501	15-0376







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VERIFICATION REPORT

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Pelvis	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:22:46 AM

Component Part Number	Component Serial Number
455-4003	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	40 %RH P
Velocity	4.20 -- 4.40	4.26 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-5.22 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	14.20 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.56 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	14.50 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis**

Test Time: **11:22:46 AM**

Test Date: **5/13/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Denton	3096	LC-458Fy	1/7/2010

Test ID: **Pelvis**

Test Time: **11:22:46 AM**

Test Date: **5/13/2010**



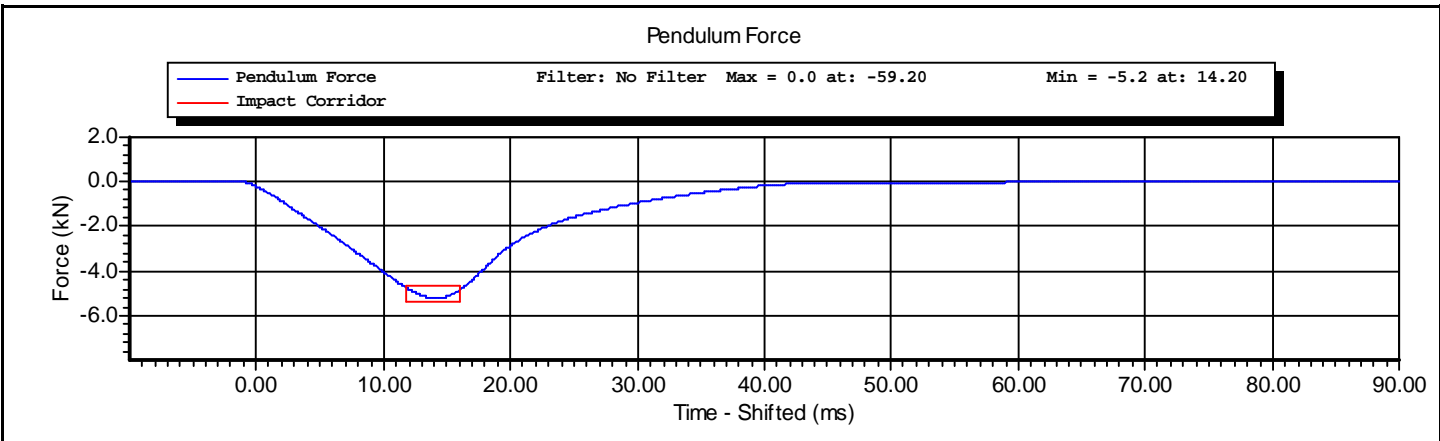
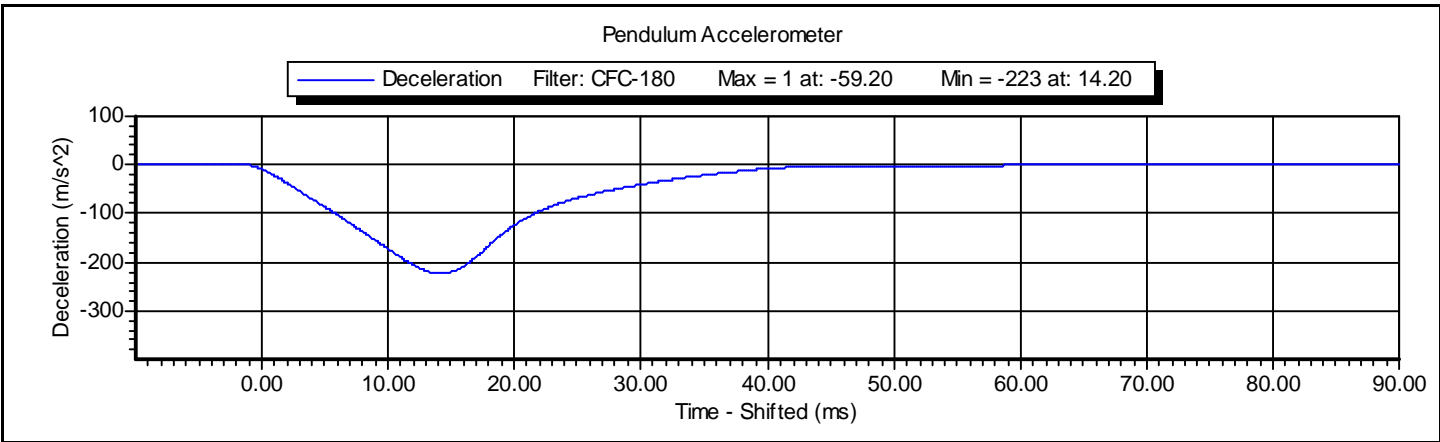
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Pelvis	Test Date:	5/13/2010
Test Number:	1	Test Time:	11:22:46 AM

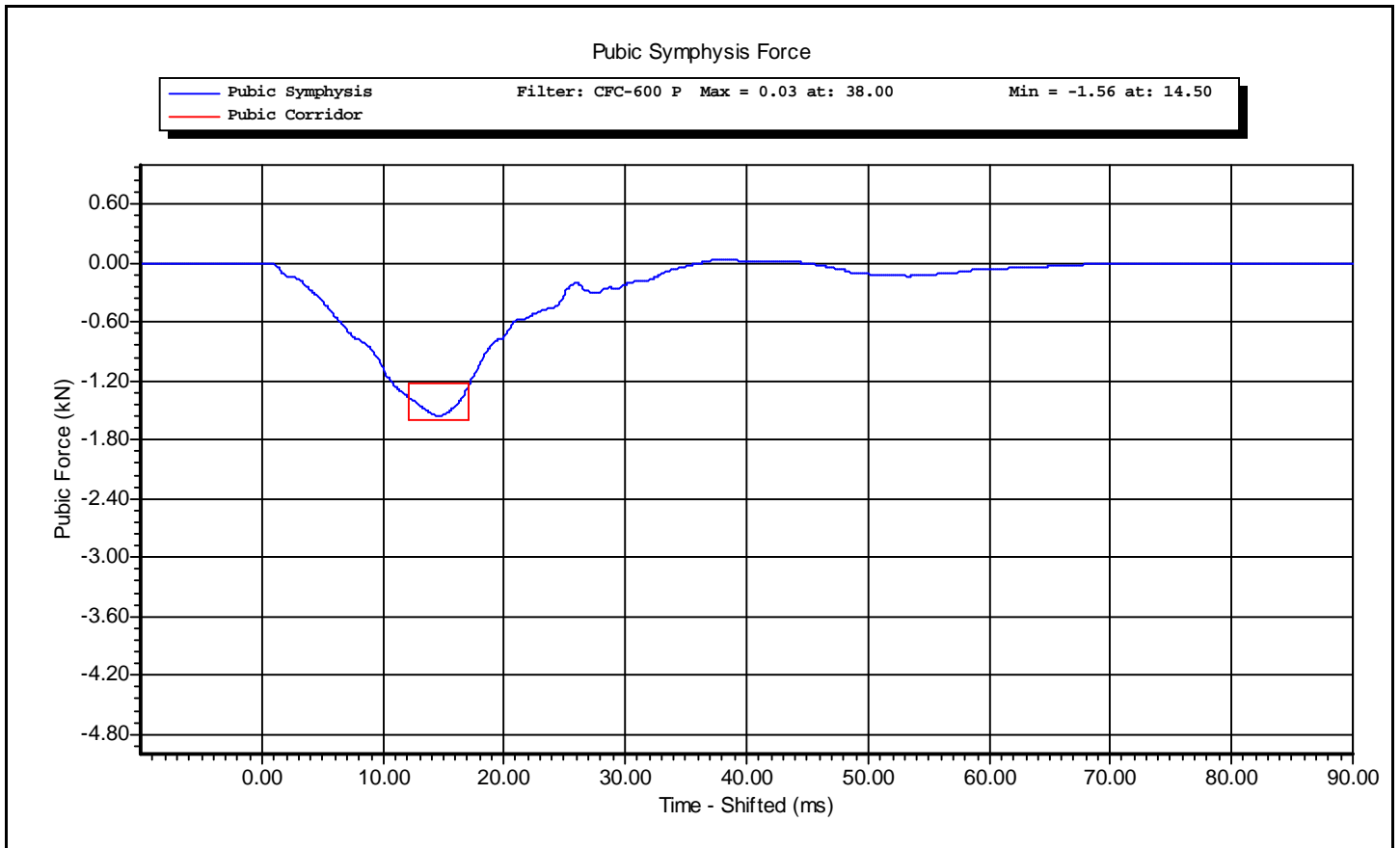
Component Part Number	Component Serial Number
455-4003	



Test ID: **Pelvis**

Test Time: **11:22:46 AM**

Test Date: **5/13/2010**



CALIBRATION TEST RESULTS

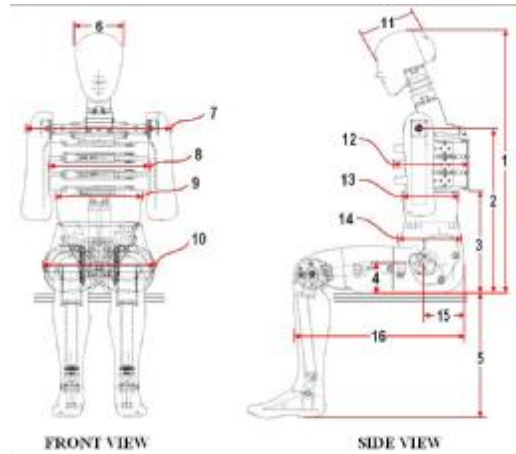
POST-TEST

ES2-re NO.: 037

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

S/N D037



Dim. No.	Description	Specification (mm)	Result	Pass/Fail
1	Sitting Height	900-918	912	Pass
2	Seat to Shoulder Joint	558-572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	352	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	441	Pass
6	Head Width	152-158	155	Pass
7	Shoulder/Arm Width	461-479	473	Pass
8	Thorax Width	322-332	326	Pass
9	Abdomen Width	273-287	283	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	199	Pass
12	Thorax Depth	262-272	266	Pass
13	Abdomen Depth	194-204	198	Pass
14	Pelvis Depth	235-245	242	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	157	Pass
16	Back of Buttocks to Front Knee	597-615	605	Pass

Technician: A. Rudniski

Date: 06/2/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Head Drop	Test Date:	6/3/2010
Test Number:	1	Test Time:	11:05:48 AM

Component Part Number	Component Serial Number
455-1007	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	65 %RH P
Resultant Acceleration	125 -- 155	144 g P
Oscillation	0.0 -- 15.0	4.2 % P
Fore-Aft Acceleration	-15.00 -- 15.00	5.92 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **11:05:48 AM**

Test Date: **6/3/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	AC-P18639	1/25/2010
Endevco	7264-2000	AC-P23128	1/25/2010
Endevco	7264-2000	AC-P16591	1/25/2010

Test ID: **Head Drop**

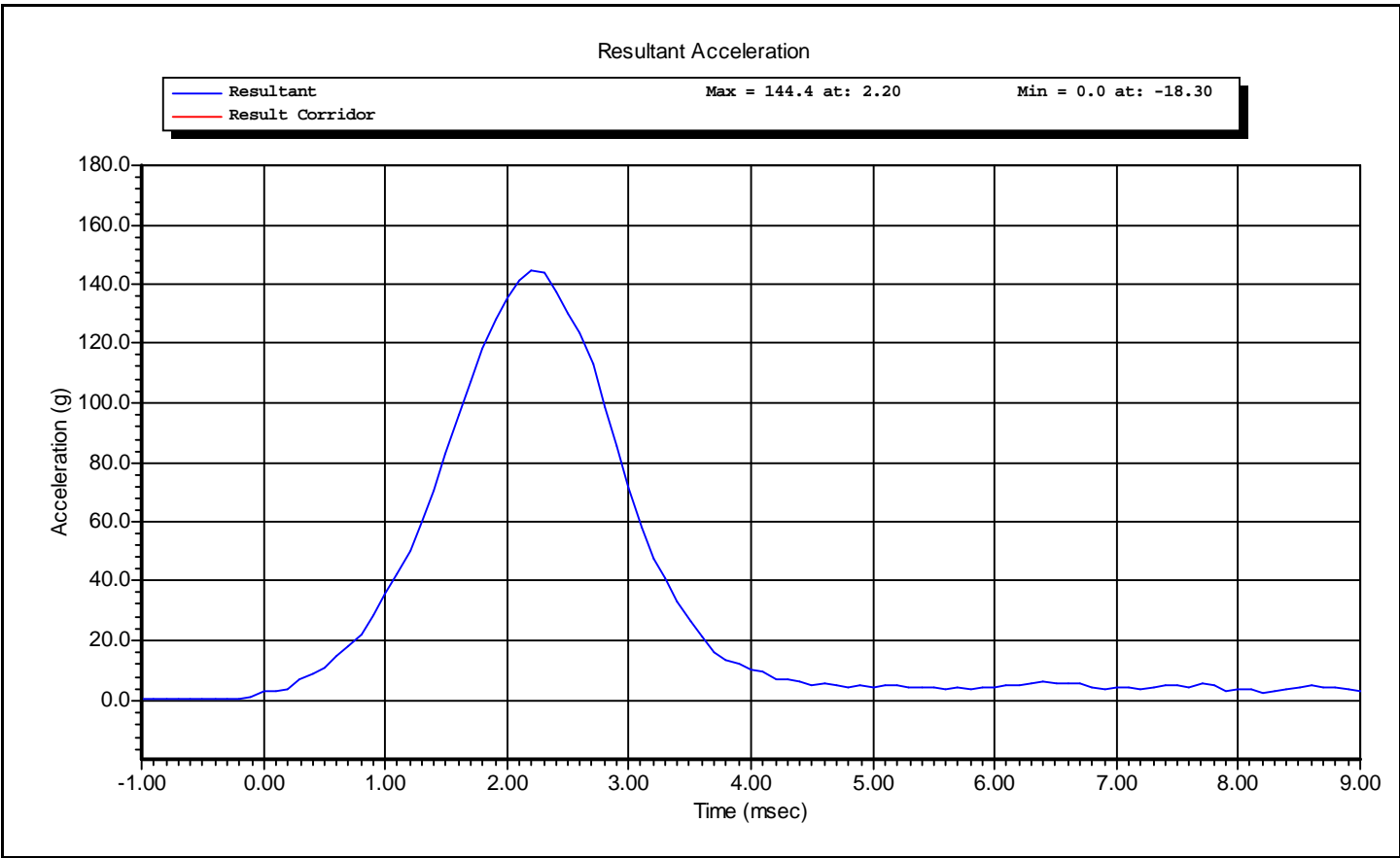
Test Time: **11:05:48 AM**

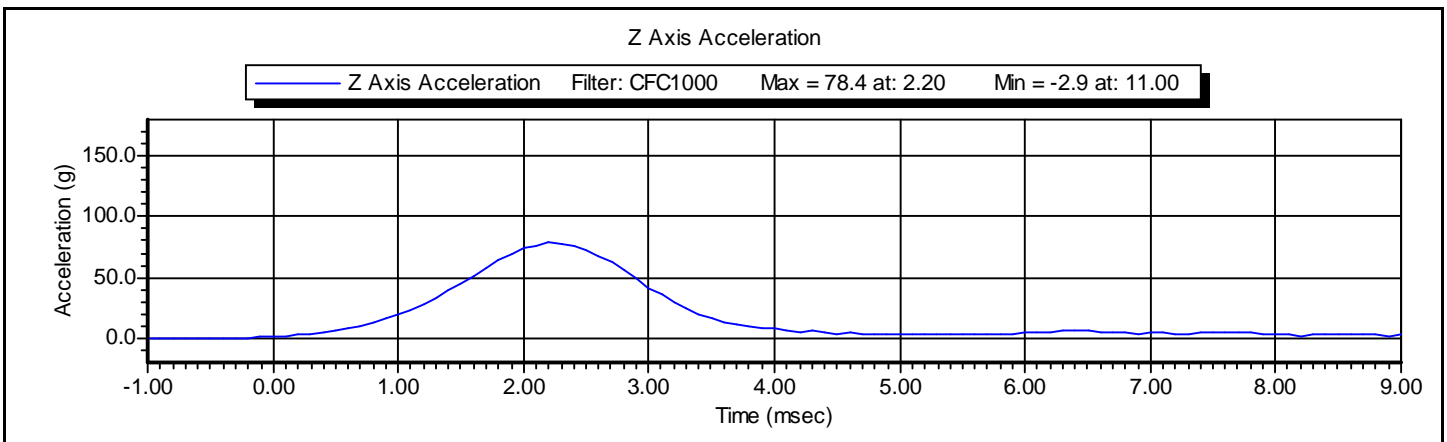
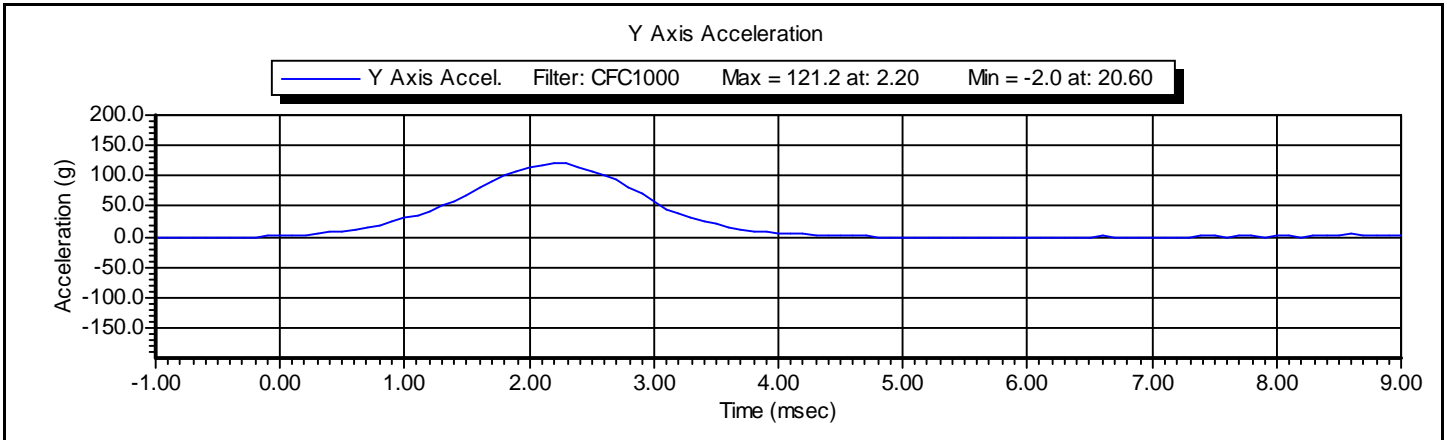
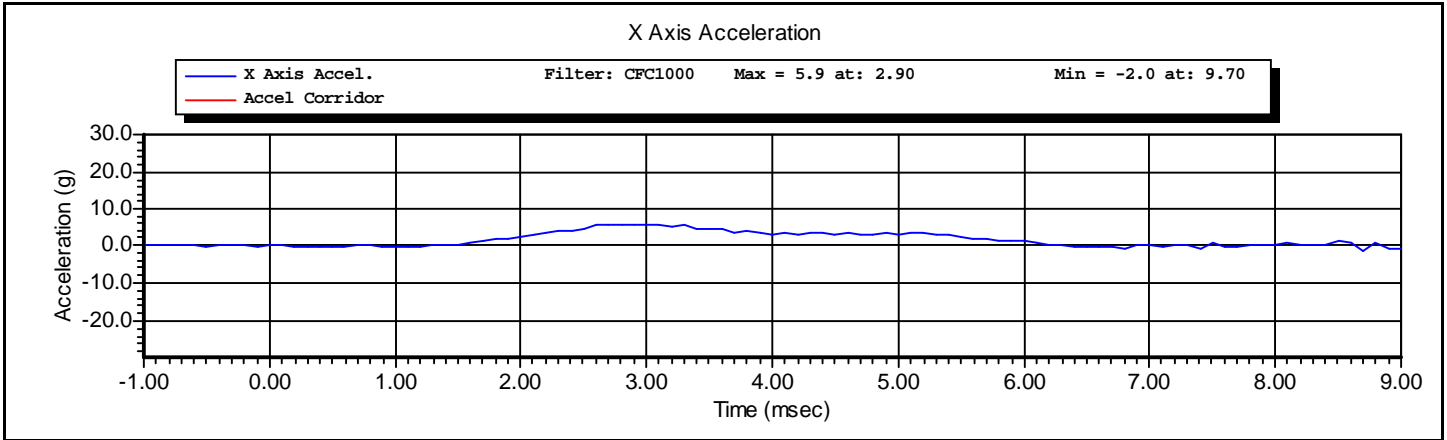
Test Date: **6/3/2010**



Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Head Drop	Test Date:	6/3/2010
Test Number:	1	Test Time:	11:05:48 AM

Component Part Number	Component Serial Number
455-1007	







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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Neck Flexion	Test Date:	6/2/2010
Test Number:	1	Test Time:	3:27:59 PM

Component Part Number	Component Serial Number
455-2002	19-020118A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	51 %RH P
Velocity	3.30 -- 3.50	3.43 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	53.5 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	60.9 ms P
Decay to Zero Degrees	53.0 -- 88.0	59.5 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion** Test Time: **3:27:59 PM** Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	AF5B3	2/24/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **3:27:59 PM**

Test Date: **6/2/2010**



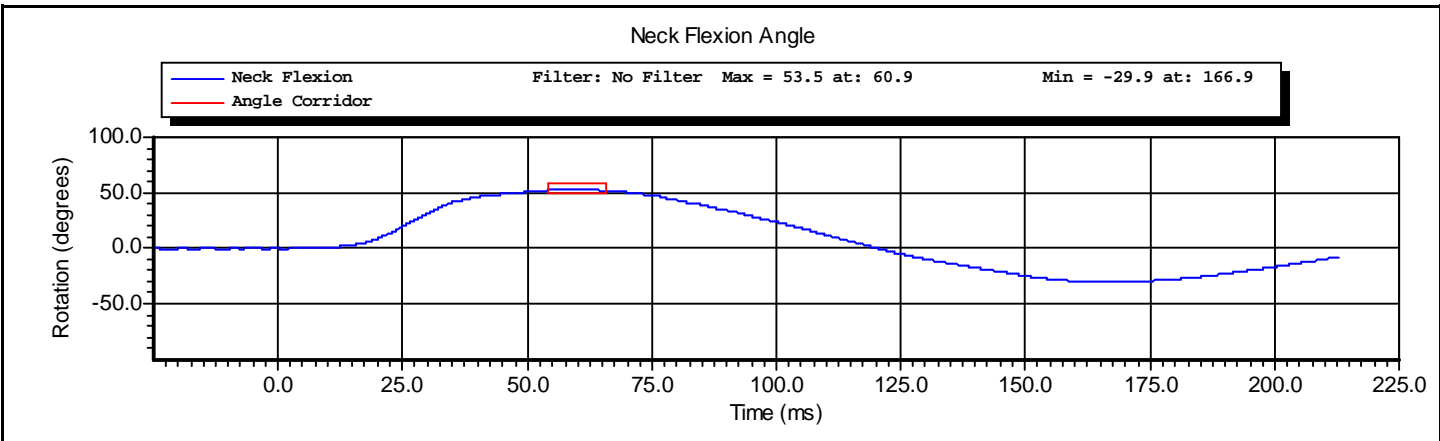
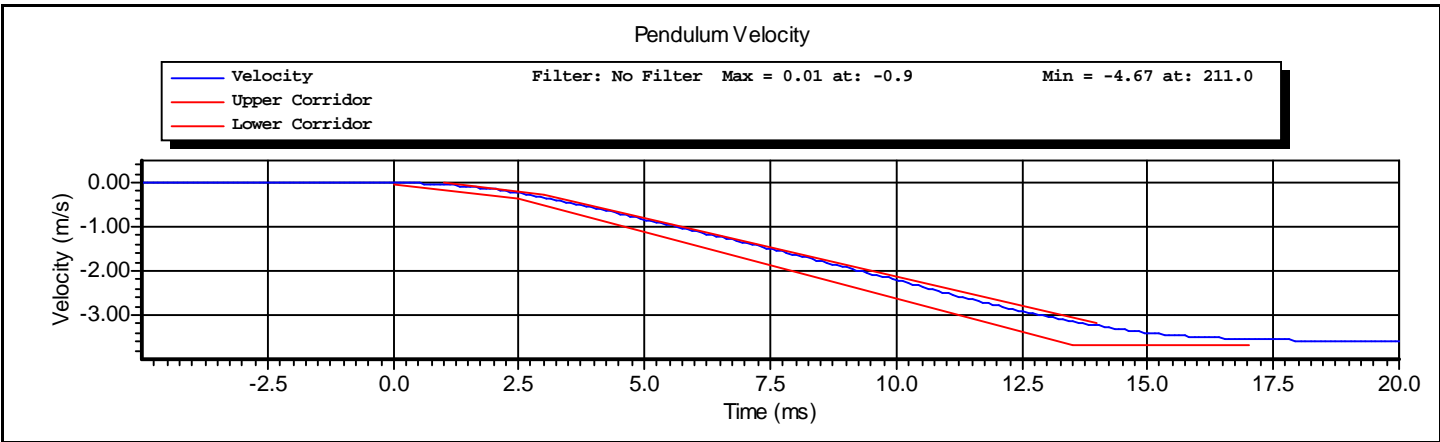
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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Neck Flexion	Test Date:	6/2/2010
Test Number:	1	Test Time:	3:27:59 PM

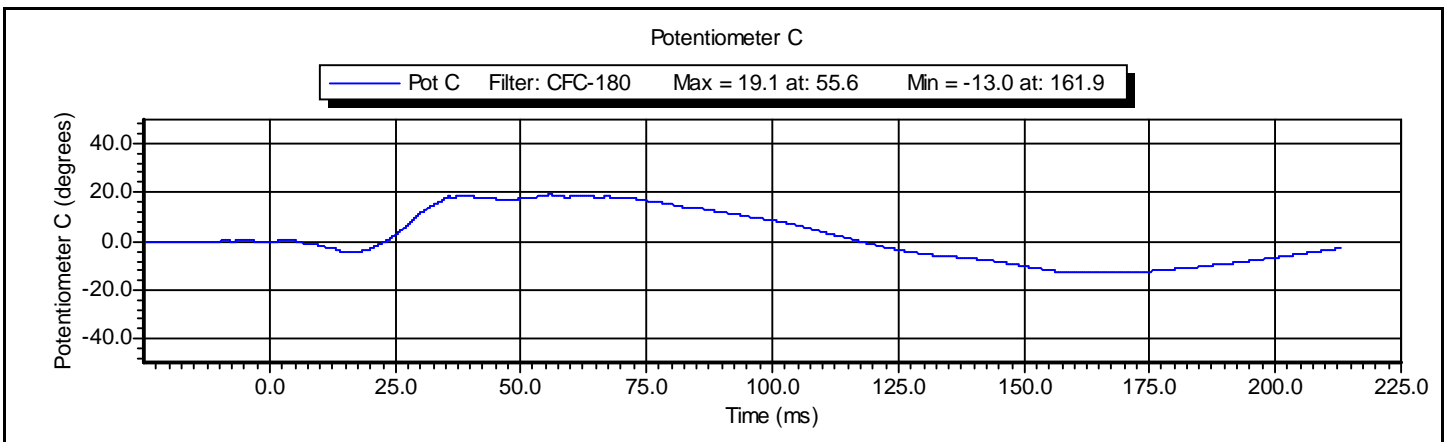
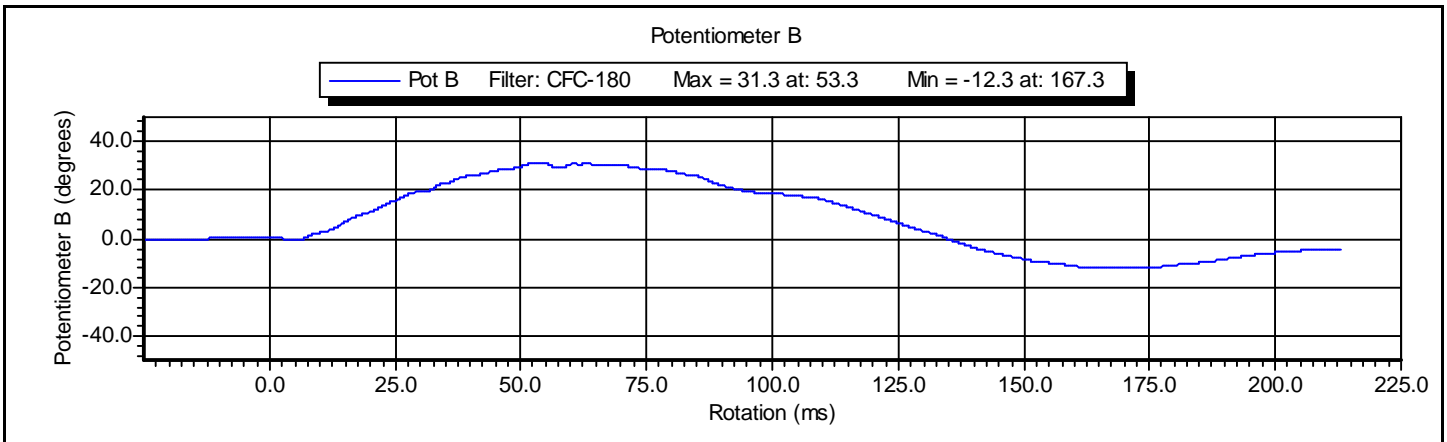
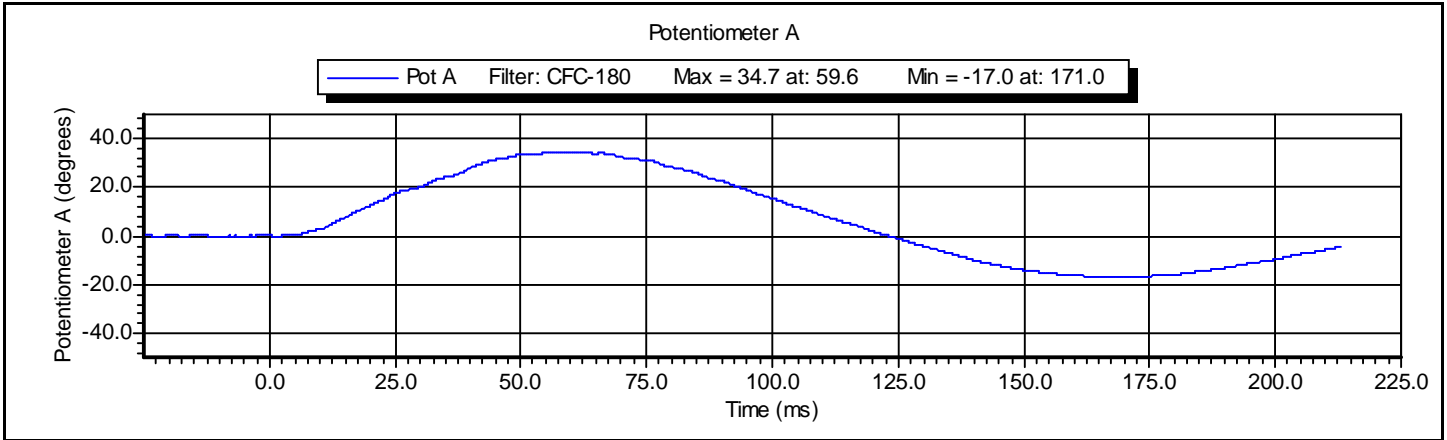
Component Part Number	Component Serial Number
455-2002	19-020118A



Test ID: **Neck Flexion**

Test Time: **3:27:59 PM**

Test Date: **6/2/2010**





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Shoulder	Test Date:	6/2/2010
Test Number:	1	Test Time:	9:51:49 AM

Component Part Number	Component Serial Number
960715-313	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.12 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **9:51:49 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010

Test ID: **Shoulder**

Test Time: **9:51:49 AM**

Test Date: **6/2/2010**



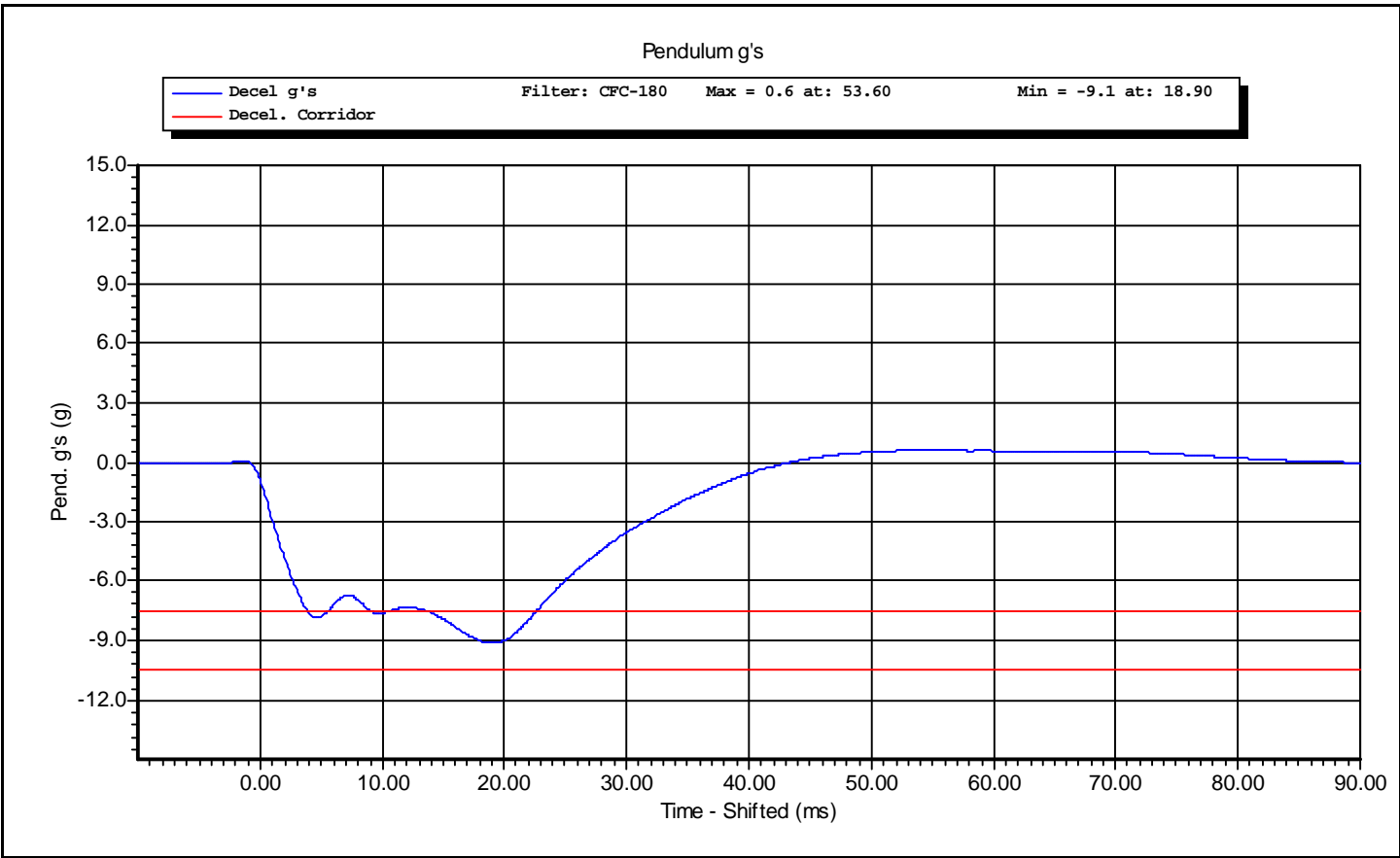
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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Shoulder	Test Date:	6/2/2010
Test Number:	1	Test Time:	9:51:49 AM

Component Part Number	Component Serial Number
960715-313	



Test ID: **Shoulder**

Test Time: **9:51:49 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Lower 4 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	12:51:13 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	52.0 %RH P
Velocity	3.90 -- 4.10	4.00 m/s P
Rib Displacement	-51.00 -- -46.00	-47.87 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Lower 4 m/s**

Test Time: **12:51:13 PM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-3	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Lower 4 m/s**

Test Time: **12:51:13 PM**

Test Date: **6/2/2010**



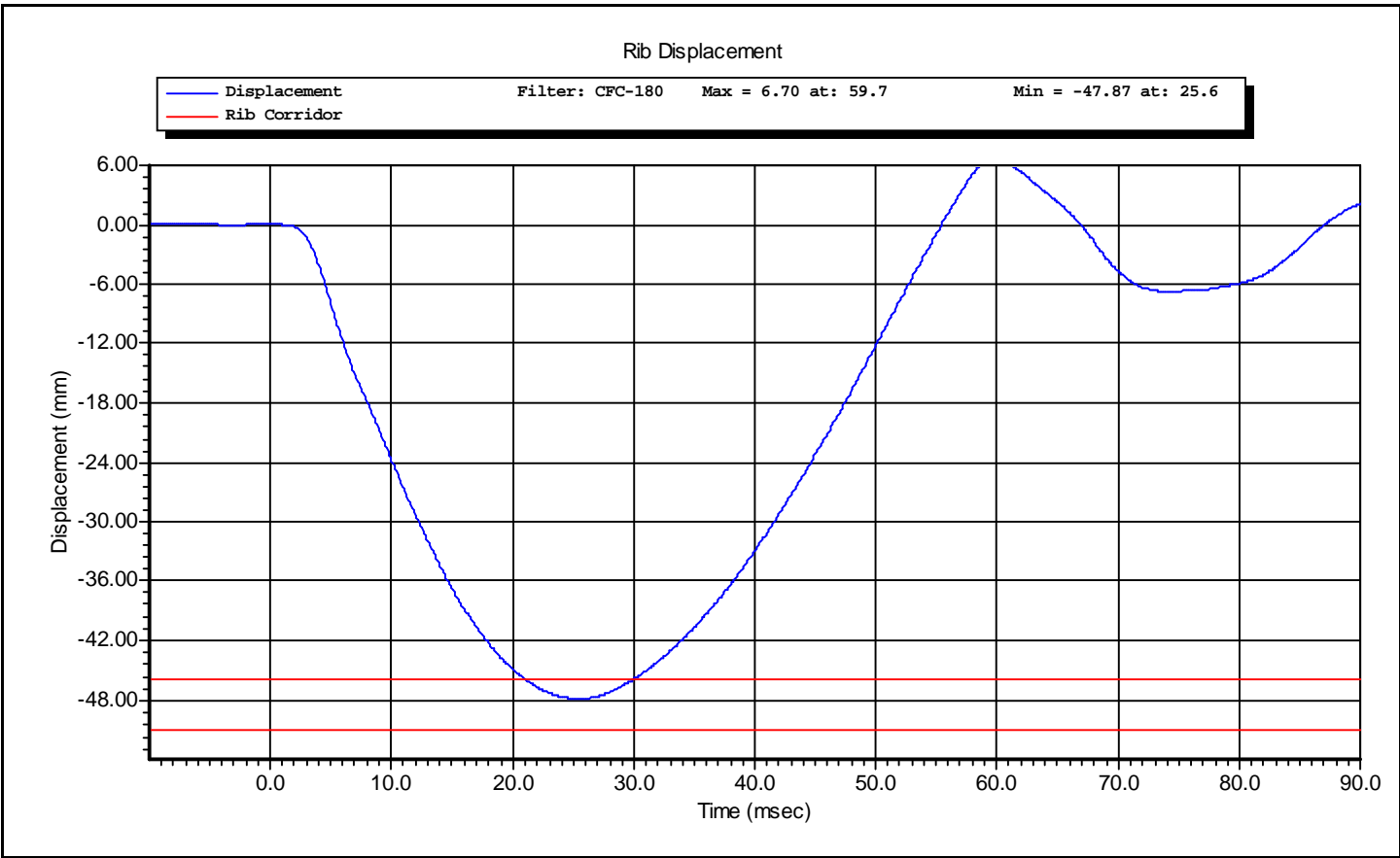
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Lower 4 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	12:51:13 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A



Test ID: **Rib Lower 4 m/s**

Test Time: **12:51:13 PM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Lower 3 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	1:00:40 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	52.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-38.23 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Lower 3 m/s**

Test Time: **1:00:40 PM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-3	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Lower 3 m/s**

Test Time: **1:00:40 PM**

Test Date: **6/2/2010**



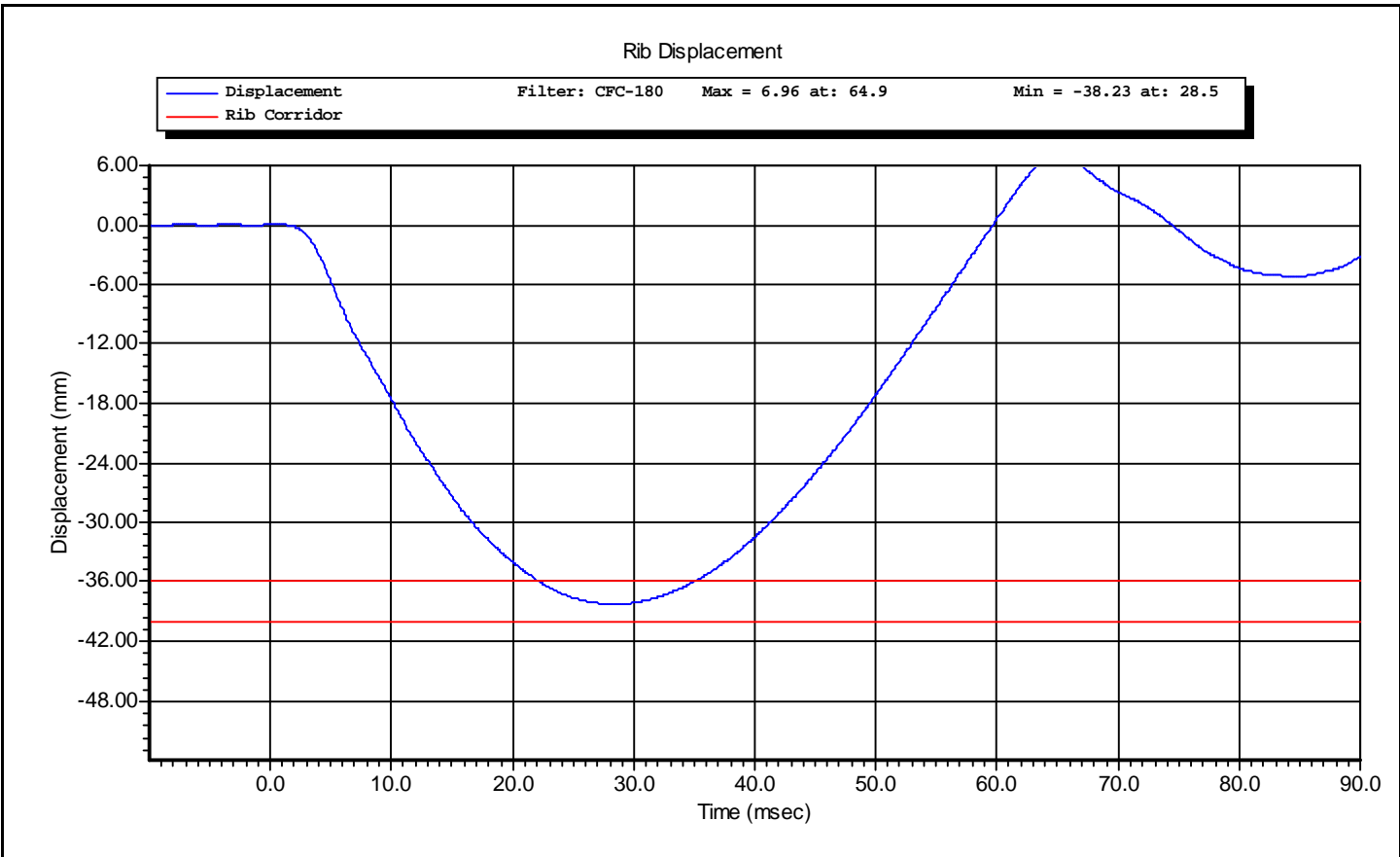
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Lower 3 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	1:00:40 PM

Component Part Number	Component Serial Number
455-3100	1954-0126A



Test ID: **Rib Lower 3 m/s**

Test Time: **1:00:40 PM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Middle 4 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	10:48:56 AM

Component Part Number	Component Serial Number
455-3100	1954-0125A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-48.16 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Middle 4 m/s**

Test Time: **10:48:56 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0807	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Middle 4 m/s**

Test Time: **10:48:56 AM**

Test Date: **6/2/2010**



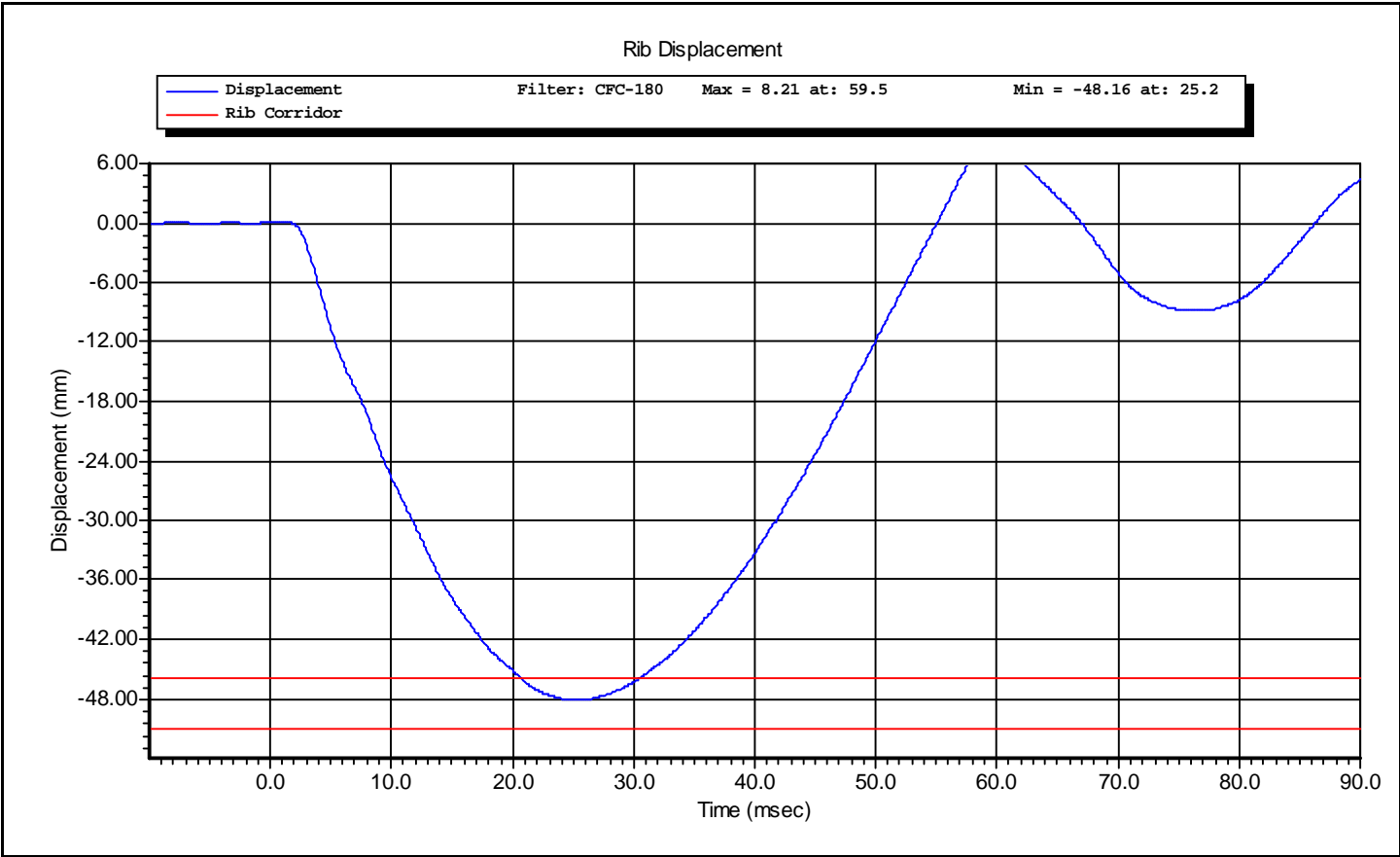
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Middle 4 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	10:48:56 AM

Component Part Number	Component Serial Number
455-3100	1954-0125A



Test ID: **Rib Middle 4 m/s** Test Time: **10:48:56 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Middle 3 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	11:03:32 AM

Component Part Number	Component Serial Number
455-3100	1954-0125A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	2.90 -- 3.10	2.99 m/s P
Rib Displacement	-40.00 -- -36.00	-37.64 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Middle 3 m/s**

Test Time: **11:03:32 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0807	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Middle 3 m/s**

Test Time: **11:03:32 AM**

Test Date: **6/2/2010**



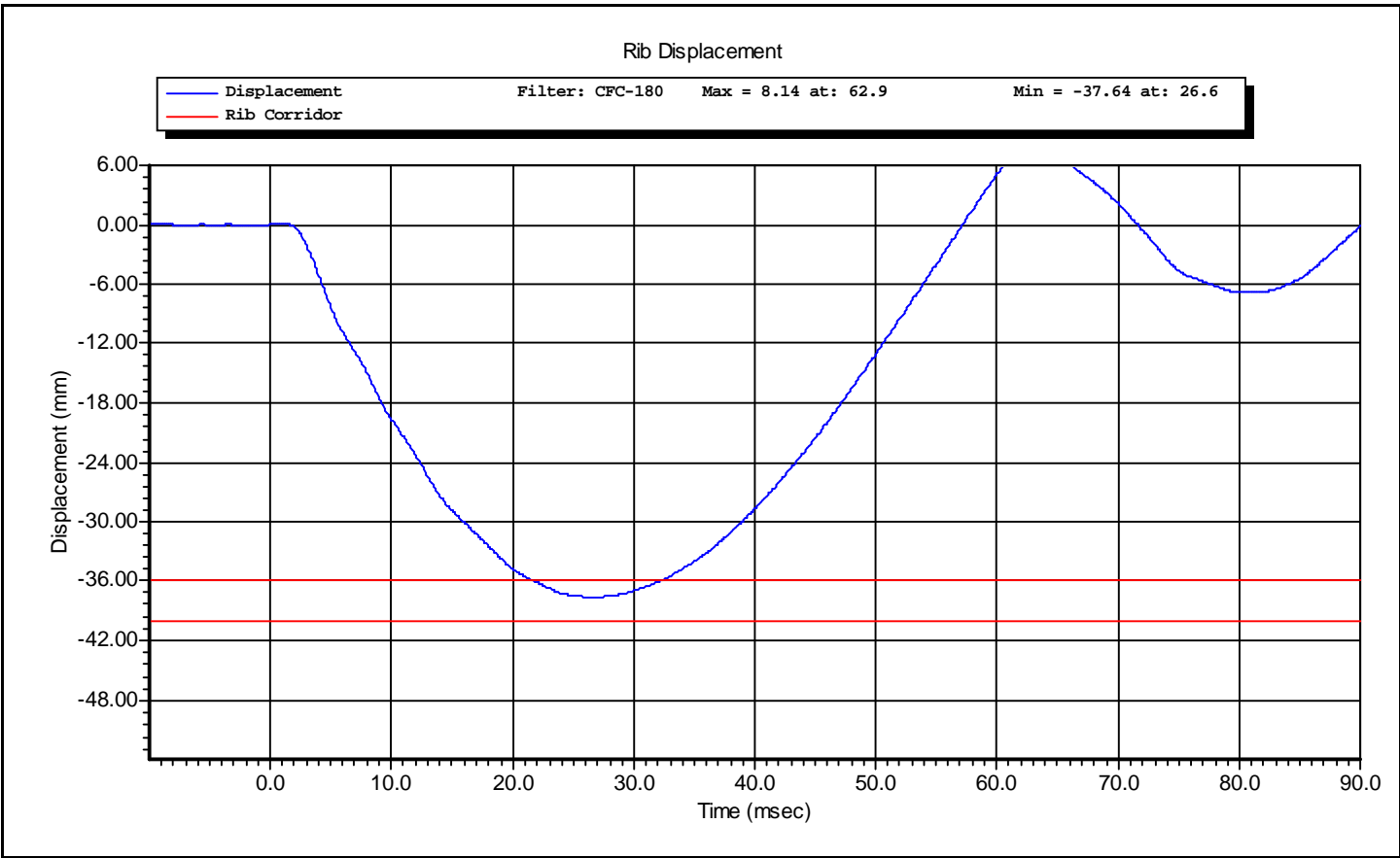
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Middle 3 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	11:03:32 AM

Component Part Number	Component Serial Number
455-3100	1954-0125A





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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Upper 4 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	10:16:09 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-49.51 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Upper 4 m/s**

Test Time: **10:16:09 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-01	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Upper 4 m/s**

Test Time: **10:16:09 AM**

Test Date: **6/2/2010**



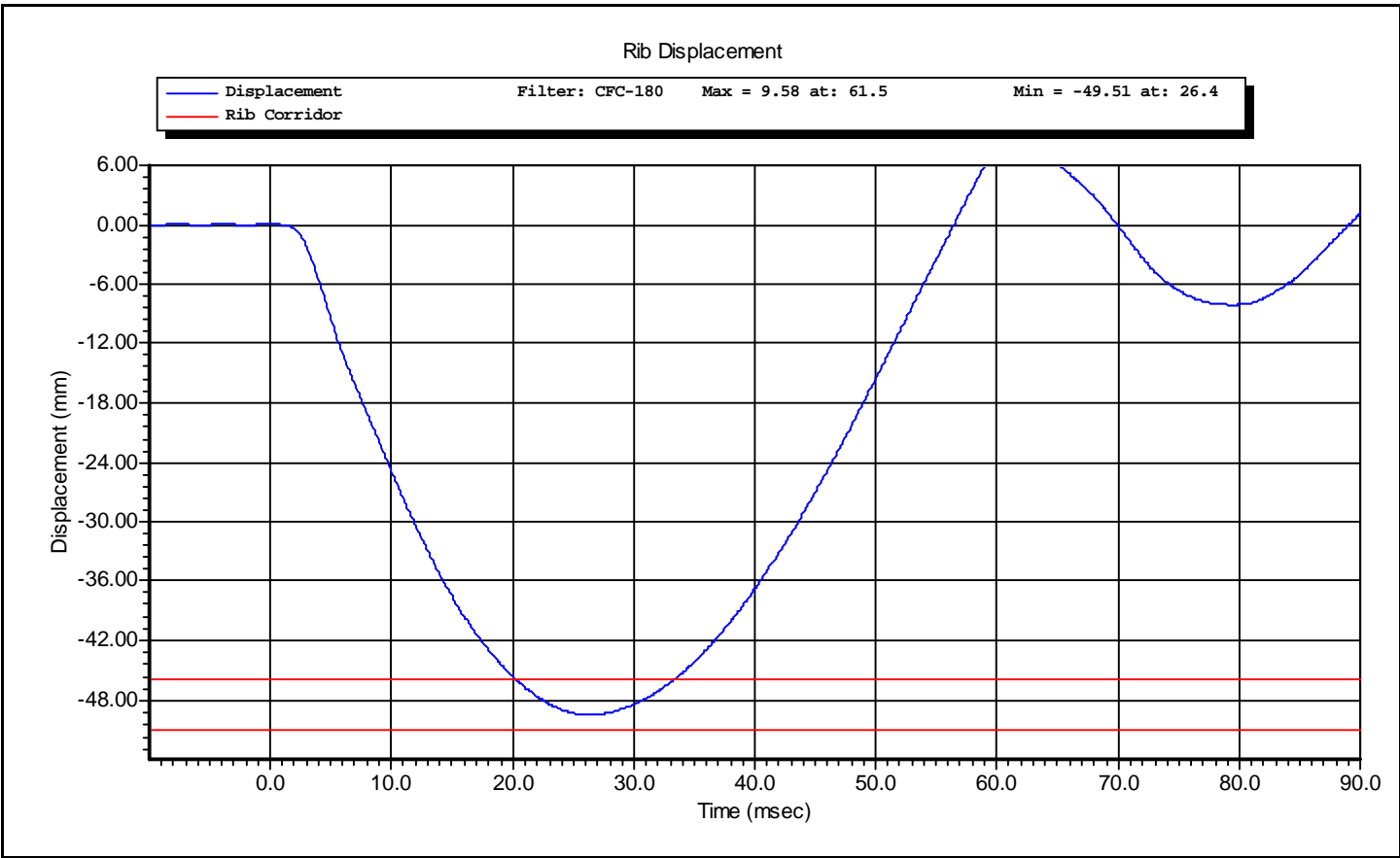
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Upper 4 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	10:16:09 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A



Test ID: **Rib Upper 4 m/s**

Test Time: **10:16:09 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Upper 3 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	10:41:37 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-38.06 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Upper 3 m/s**

Test Time: **10:41:37 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-0552-01	1/11/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P23137	1/22/2010

Test ID: **Rib Upper 3 m/s**

Test Time: **10:41:37 AM**

Test Date: **6/2/2010**



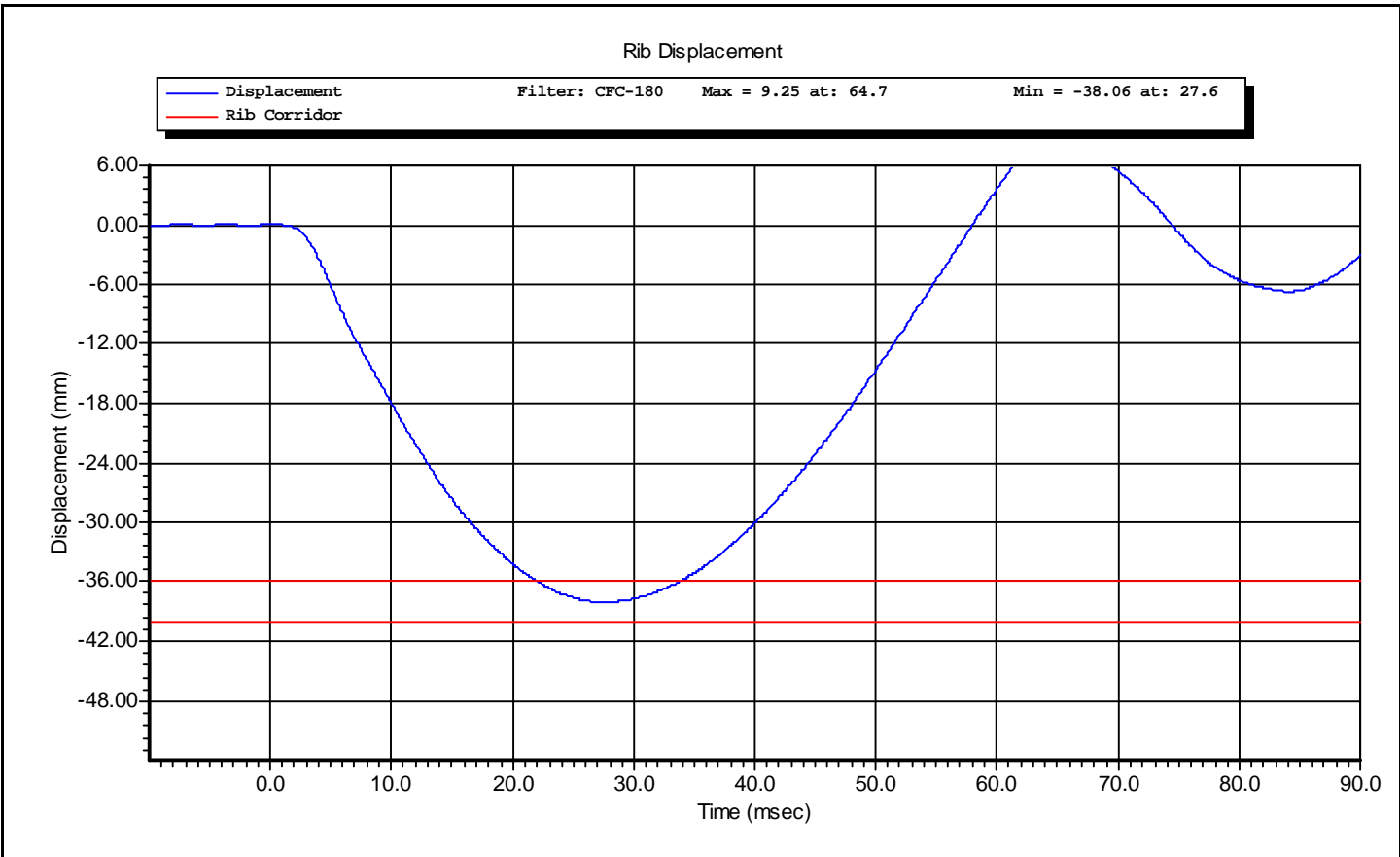
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Rib Upper 3 m/s	Test Date:	6/2/2010
Test Number:	1	Test Time:	10:41:37 AM

Component Part Number	Component Serial Number
455-3100	1954-0124A



Test ID: **Rib Upper 3 m/s**

Test Time: **10:41:37 AM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Thorax Impact	Test Date:	6/2/2010
Test Number:	1	Test Time:	1:22:14 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	1954-0124A
Middle Rib - 175-4002	1954-0125A
Lower Rib - 175-4002	1954-0126A

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	52.0 %RH P
Velocity	5.40 -- 5.60	5.50 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.0 mm P
Middle Rib Displacement	37.0 -- 45.0	40.5 mm P
Lower Rib Displacement	37.0 -- 44.0	41.7 mm P
Impactor Force	5100 -- 6200	6100 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Impact**

Test Time: **1:22:14 PM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Honeywell	MLT-38000	DS-0552-01	1/11/2010
Honeywell	MLT-38000	DS-0807	1/11/2010
Honeywell	MLT-38000	DS-0552-3	1/11/2010

Test ID: **Thorax Impact**

Test Time: **1:22:14 PM**

Test Date: **6/2/2010**



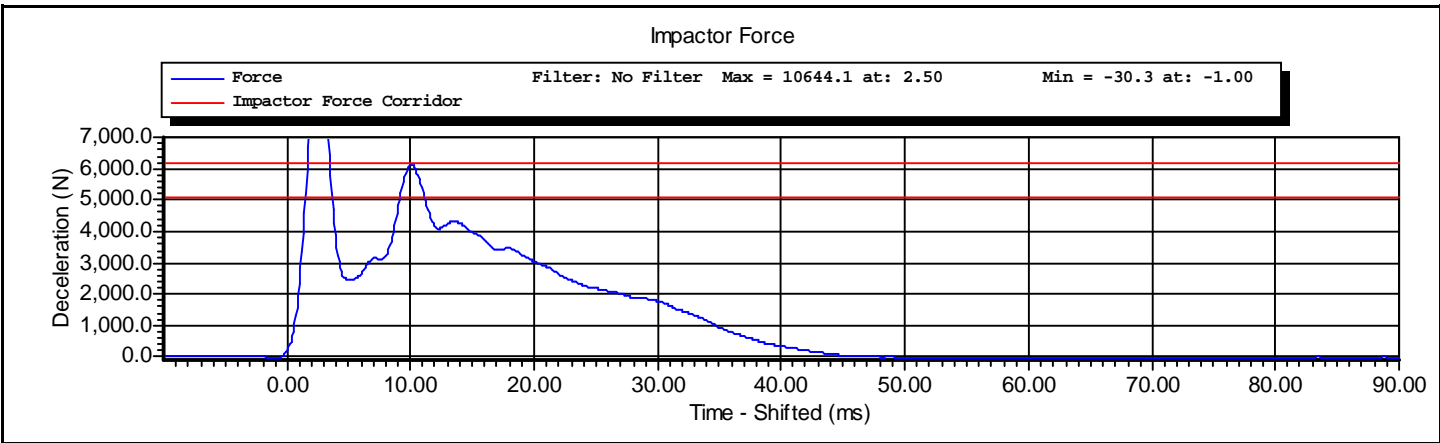
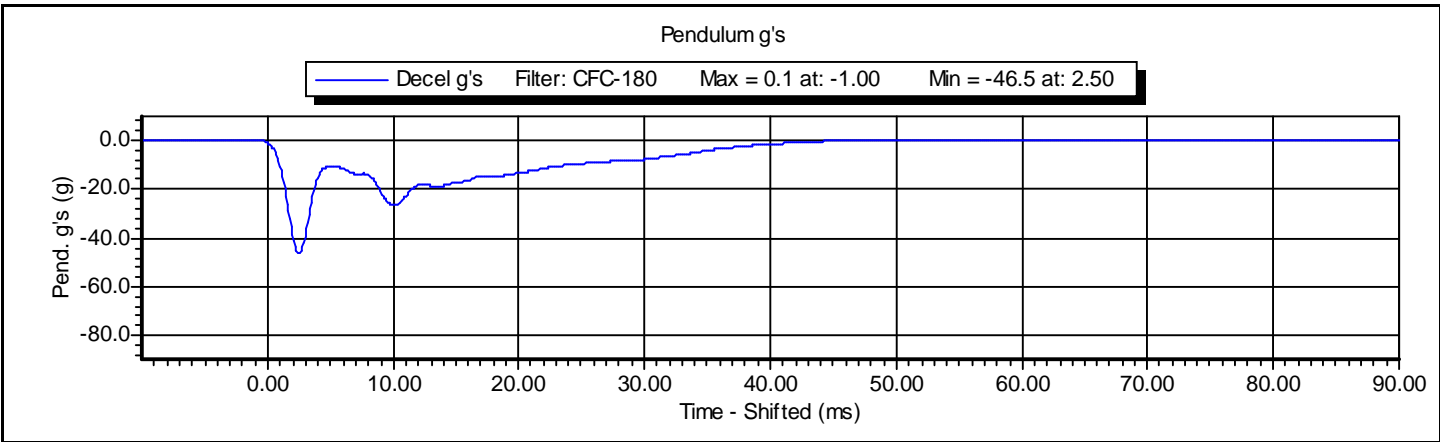
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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Thorax Impact	Test Date:	6/2/2010
Test Number:	1	Test Time:	1:22:14 PM

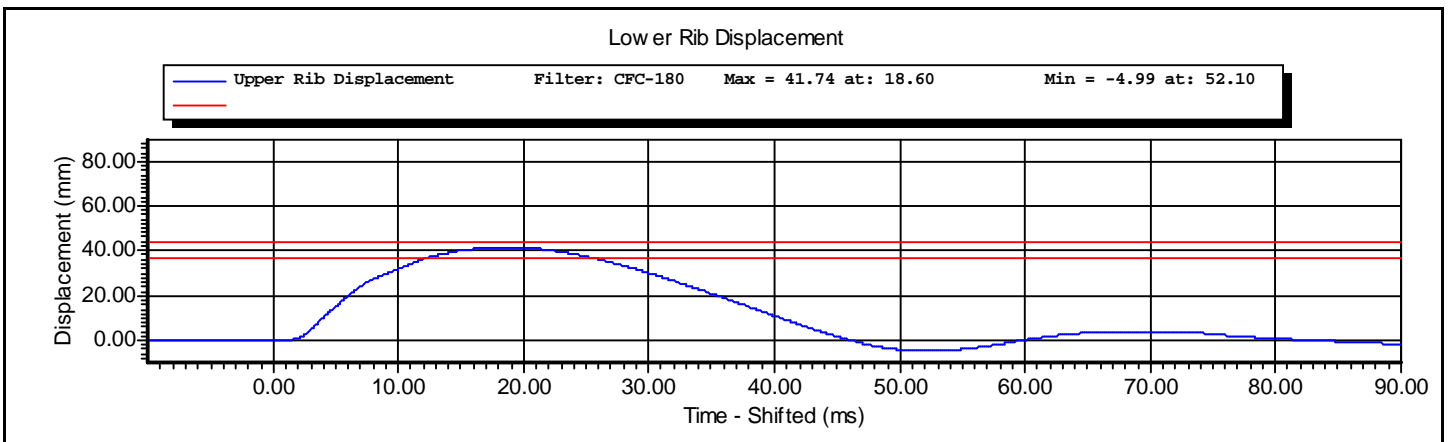
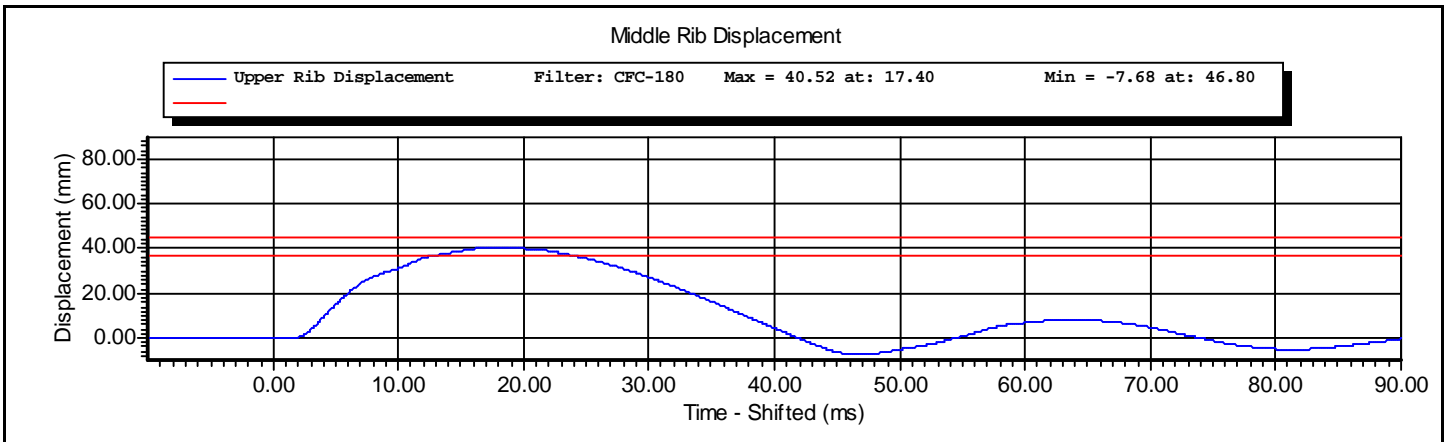
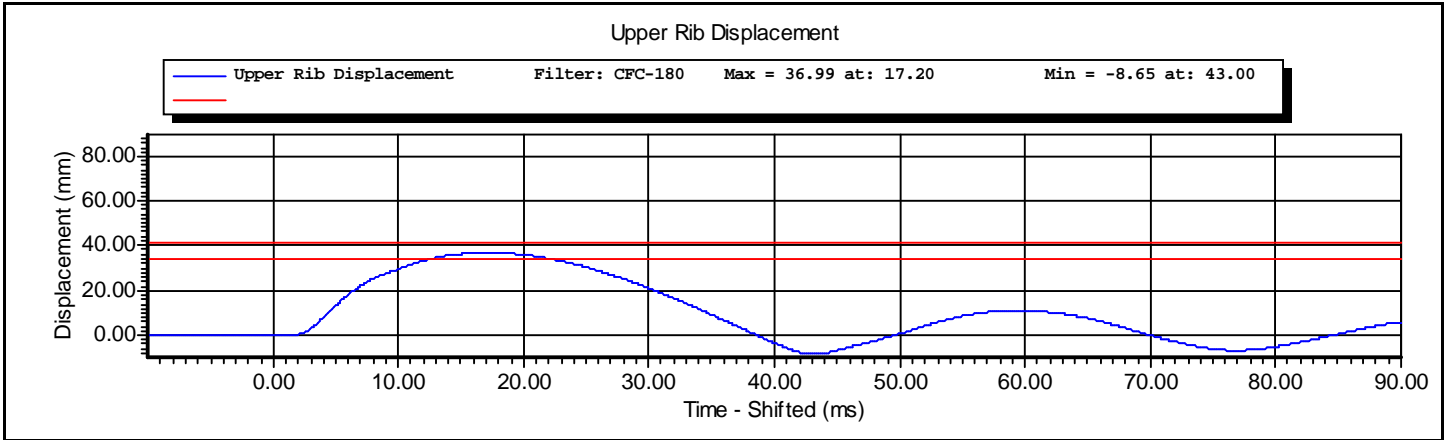
Component Part Number	Component Serial Number
Upper Rib - 175-4002	1954-0124A



Test ID: **Thorax Impact**

Test Time: **1:22:14 PM**

Test Date: **6/2/2010**





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Abdominal Impact	Test Date:	6/1/2010
Test Number:	1	Test Time:	3:51:04 PM

Component Part Number	Component Serial Number
FTSS-0004	07/118

Comments:
 FTSS Abdomen
 Model - FTSS-0004
 Serial - 07/118

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	53 %RH P
Velocity	3.90 -- 4.10	4.02 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.39 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	11.5 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.21 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.3 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Abdominal Impact** Test Time: **3:51:04 PM**

Test Date: **6/1/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Denton	2631	LC-1507Fy	1/7/2010
Denton	2631	LC-1508Fy	1/7/2010
Denton	2631	LC-1509Fy	1/7/2010

Test ID: **Abdominal Impact** Test Time: **3:51:04 PM**

Test Date: **6/1/2010**



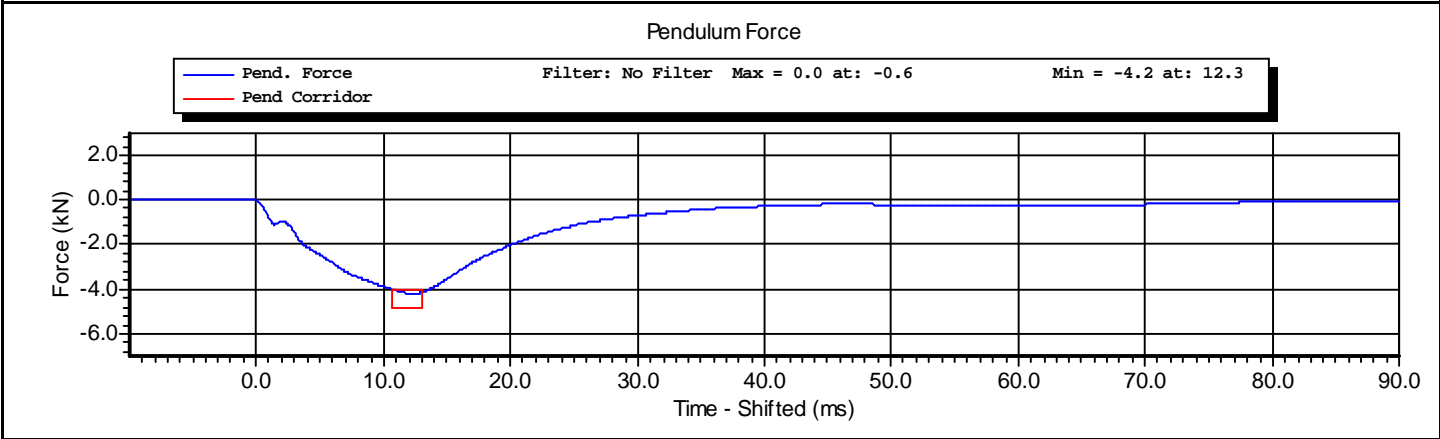
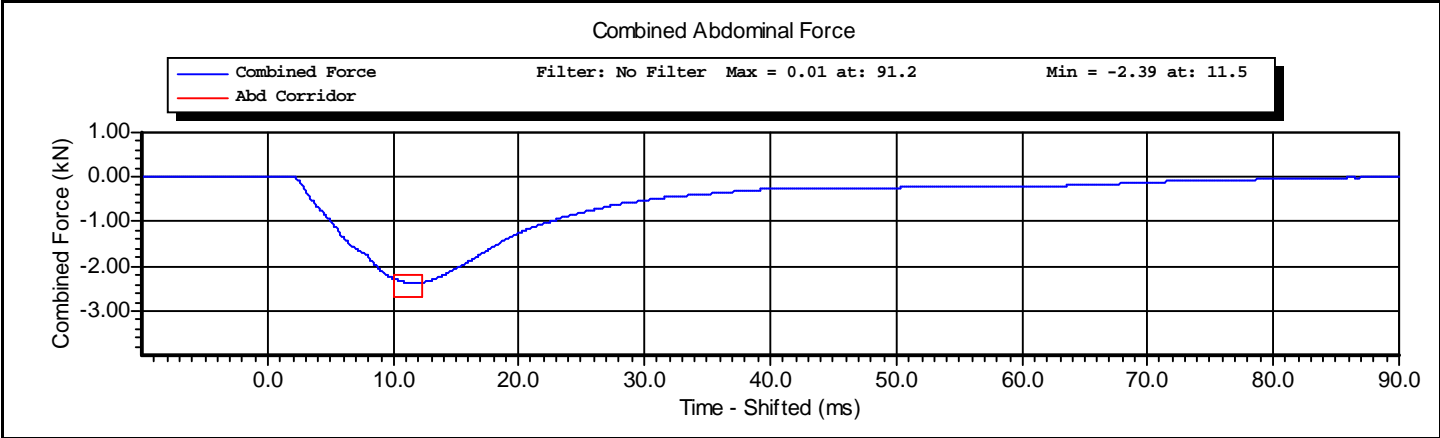
www.calspan.com

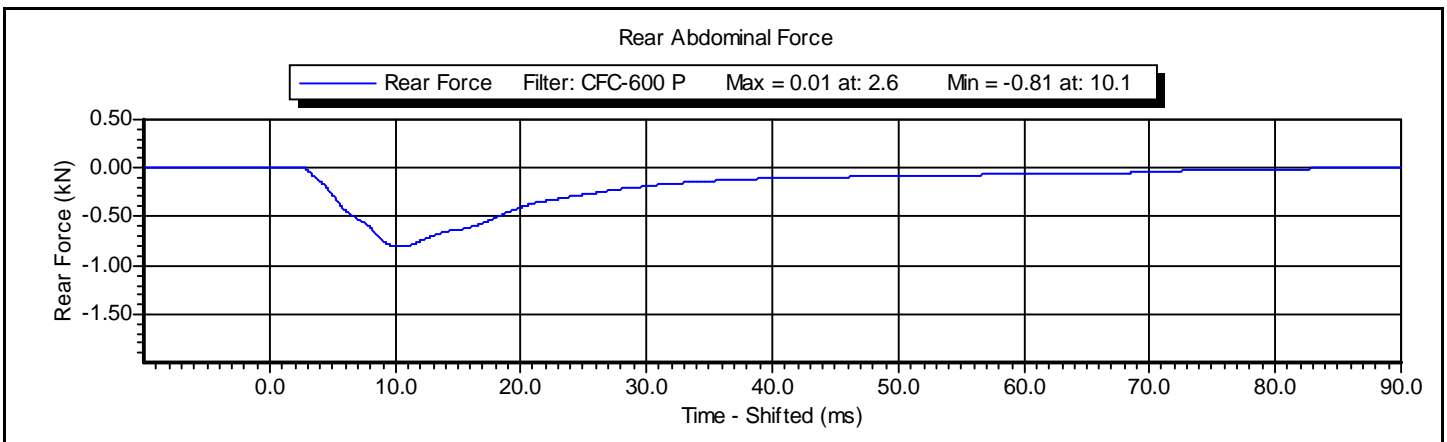
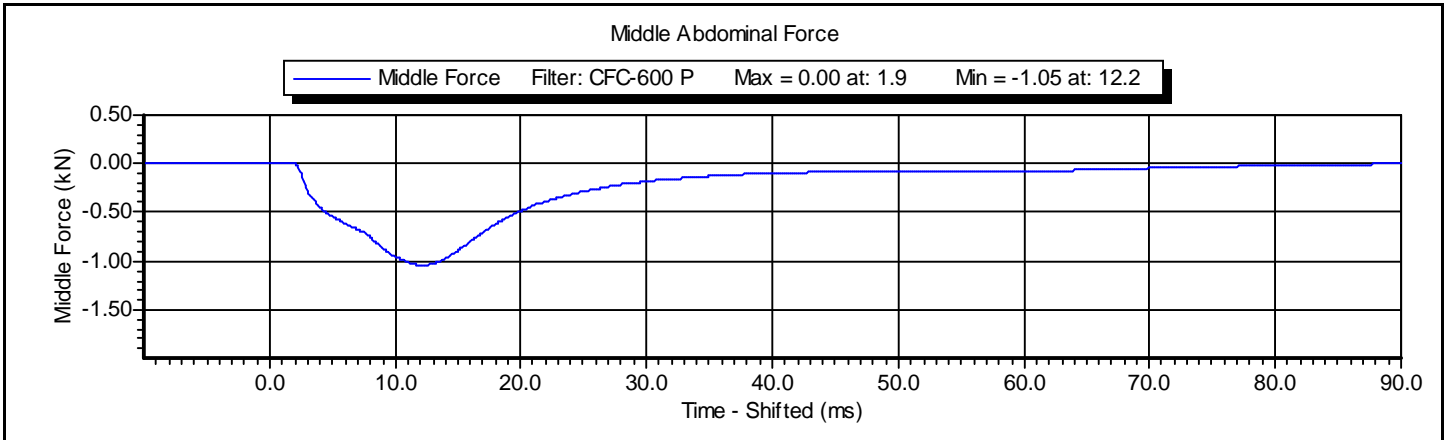
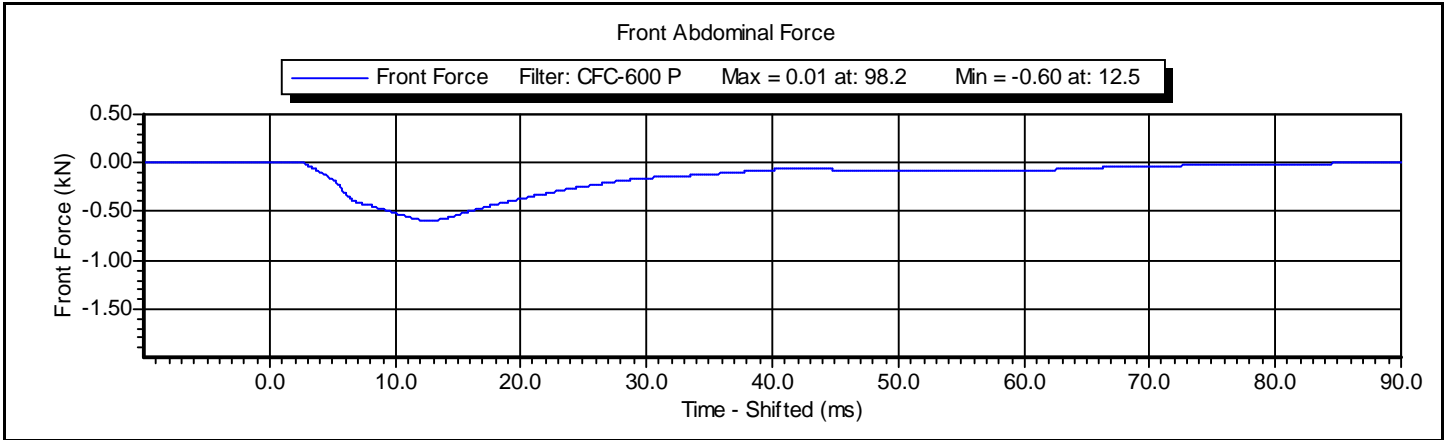
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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Abdominal Impact	Test Date:	6/1/2010
Test Number:	1	Test Time:	3:51:04 PM

Component Part Number	Component Serial Number
FTSS-0004	07/118







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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Lumbar Spine	Test Date:	6/2/2010
Test Number:	1	Test Time:	4:21:28 PM

Component Part Number	Component Serial Number
175-5501	15-0376

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	51 %RH P
Velocity	5.95 -- 6.15	6.12 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	45.7 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	42.1 ms P
Decay to Zero Degrees	37.0 -- 57.0	37.5 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Lumbar Spine**

Test Time: **4:21:28 PM**

Test Date: **6/2/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Lumbar Spine**

Test Time: **4:21:28 PM**

Test Date: **6/2/2010**



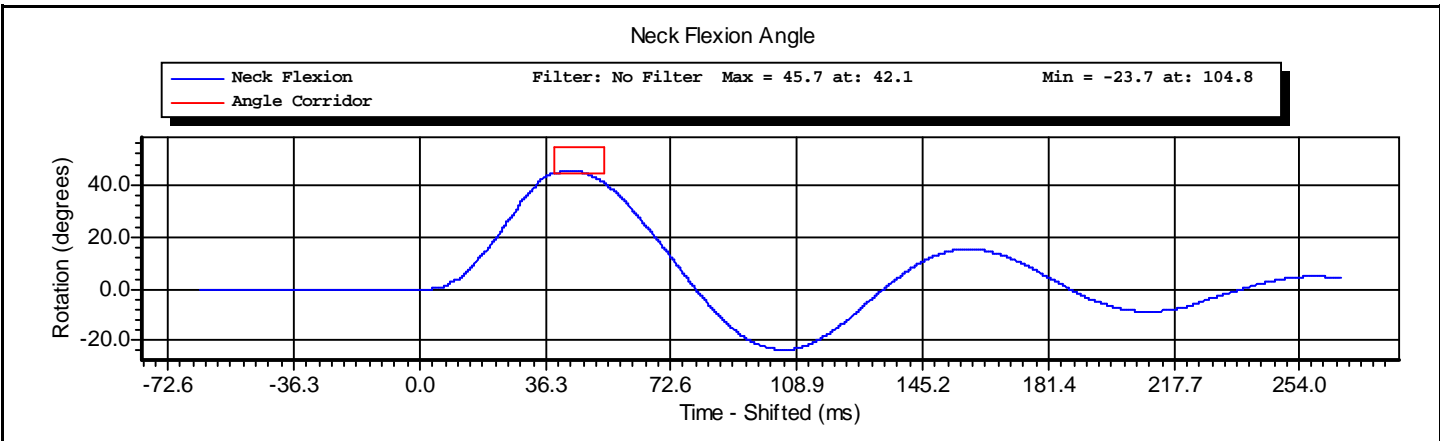
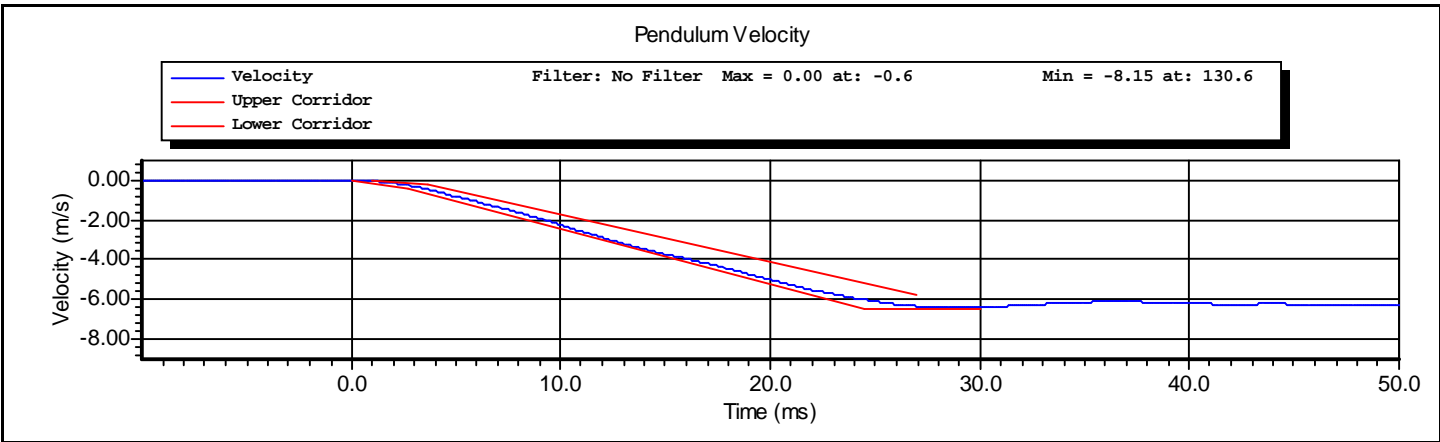
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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Lumbar Spine	Test Date:	6/2/2010
Test Number:	1	Test Time:	4:21:28 PM

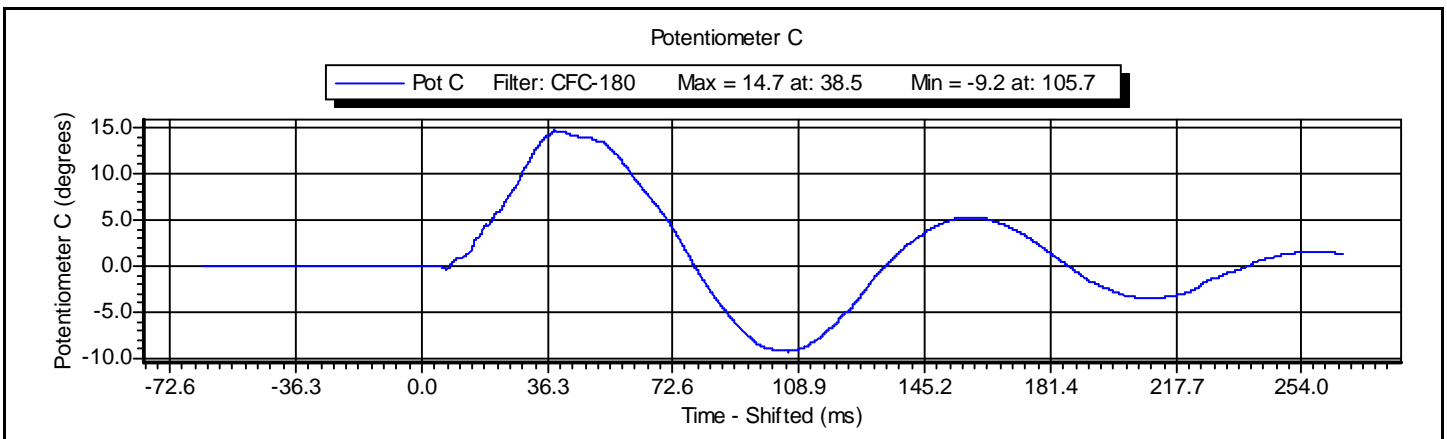
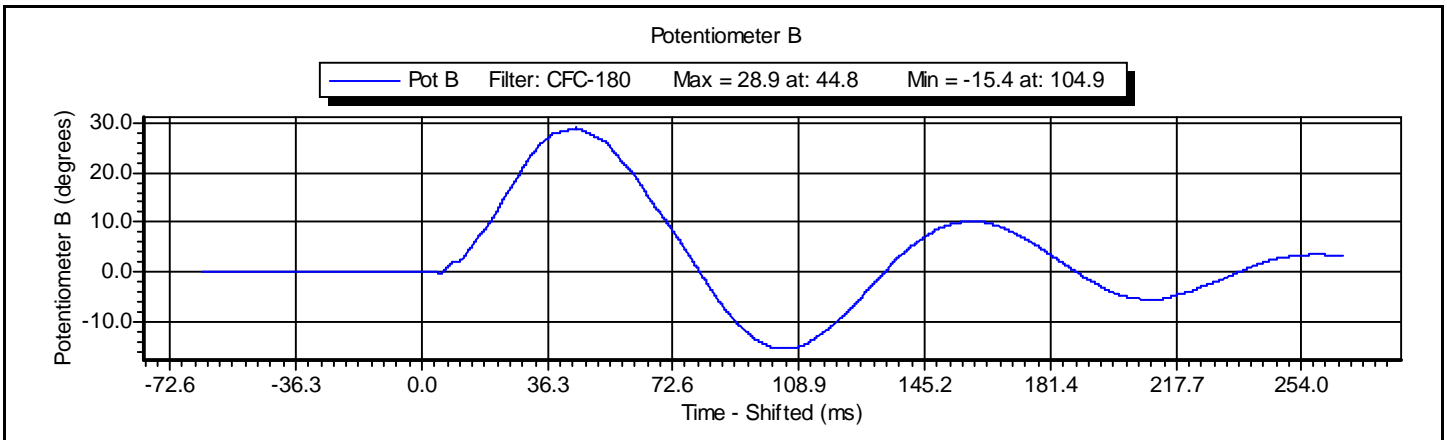
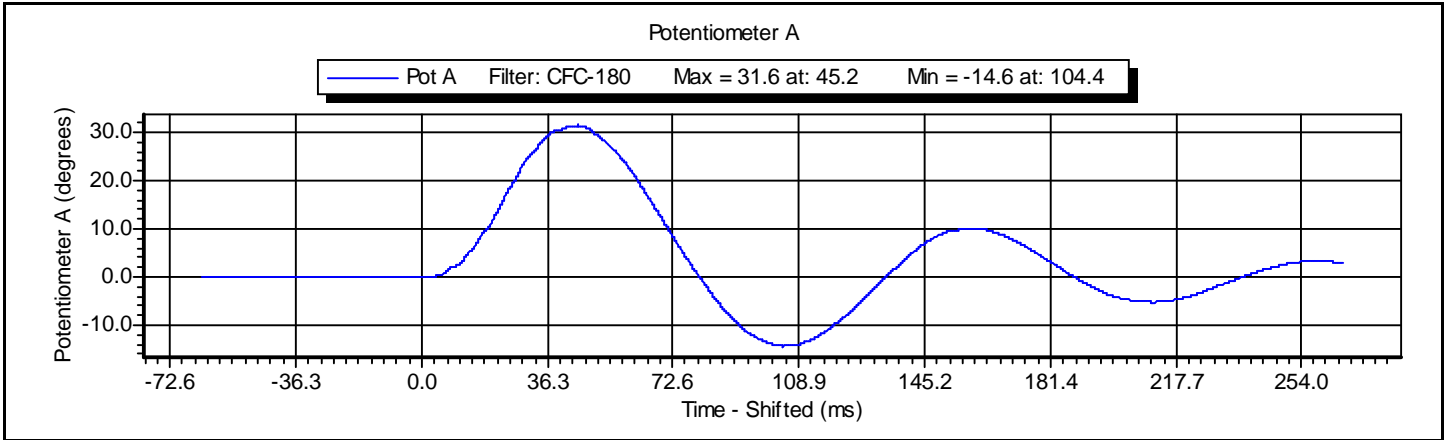
Component Part Number	Component Serial Number
175-5501	15-0376



Test ID: **Lumbar Spine**

Test Time: **4:21:28 PM**

Test Date: **6/2/2010**





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VERIFICATION REPORT

Test Name:	Pelvis Impact New	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Pelvis	Test Date:	6/3/2010
Test Number:	2	Test Time:	4:00:28 PM

Component Part Number	Component Serial Number
455-4003	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	56 %RH P
Velocity	4.20 -- 4.40	4.23 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-5.13 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	15.99 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.53 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	15.59 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis**

Test Time: **4:00:28 PM**

Test Date: **6/3/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Denton	3096	LC-458Fy	1/7/2010

Test ID: **Pelvis**

Test Time: **4:00:28 PM**

Test Date: **6/3/2010**



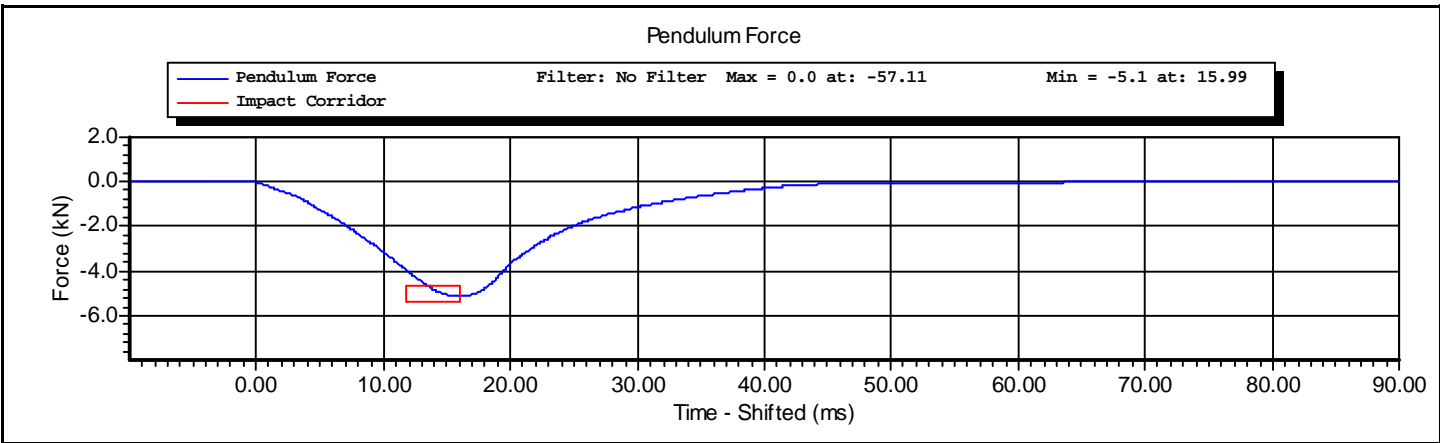
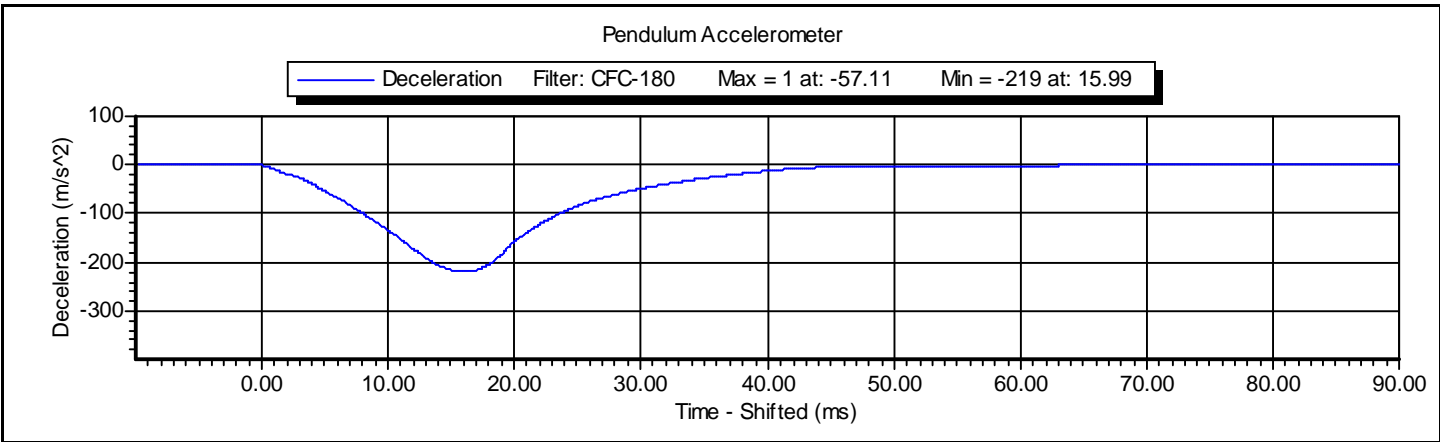
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Test Name:	Pelvis Impact New	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	D037		
Test ID:	Pelvis	Test Date:	6/3/2010
Test Number:	2	Test Time:	4:00:28 PM

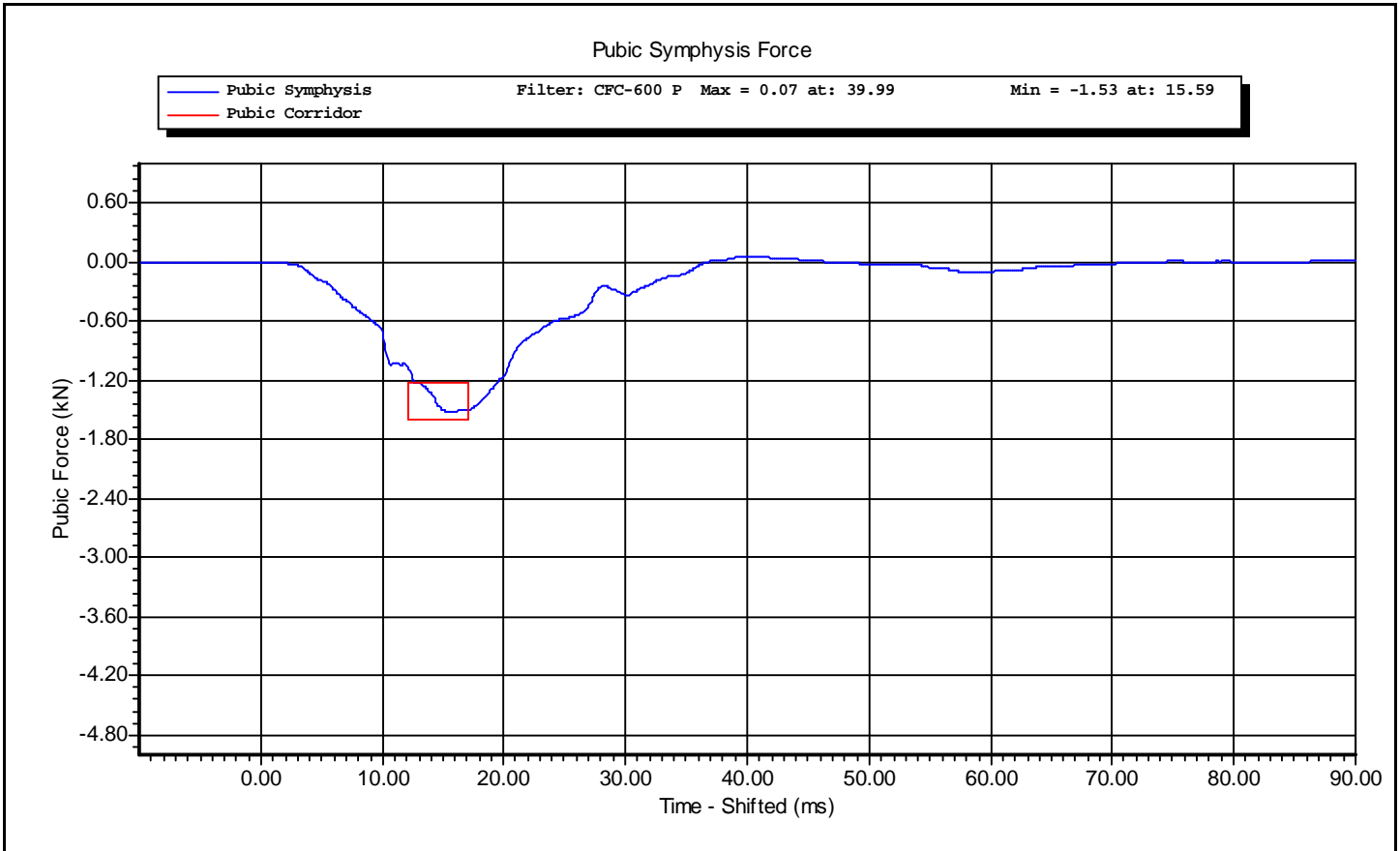
Component Part Number	Component Serial Number
455-4003	



Test ID: **Pelvis**

Test Time: **4:00:28 PM**

Test Date: **6/3/2010**



APPENDIX F
SID-IIs PERFORMANCE CALIBRATION TEST DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs NO.: 224

CONFIGURED FOR LEFT SIDE IMPACT



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SID-IIsD External Measurements

S/N 224

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	80	Yes
D	H-Point from Seat Back	141.0 - 151.0	143	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	104	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	144	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	182	Yes
J	Head Circumference	541.0 - 551.0	546	Yes
K	Buttock to Knee Length	514.0 - 540.0	523	Yes
L	Popliteal Height	343.0 - 369.0	349	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	398	Yes
N	Buttock Popliteal Length	416.0 - 442.0	423	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	221	Yes
P	Foot Length (left)	216.0 - 232.0	221	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to Seat back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	80	Yes
W	Foot Width (left)	78.0 - 94.0	80	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	865	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician : A. Rudniski

Date: 05/17/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Head Drop	Test Date:	5/19/2010
Test Number:	1	Test Time:	3:59:26 PM

Component Part Number	Component Serial Number
Head Skin - FTSS 880105-106	1105

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	38 %RH P
Resultant Acceleration	115.0 -- 137.0	131.0 g P
Oscillation	0.0 -- 15.0	2.7 % P
Fore-Aft Acceleration	-15.0 -- 15.0	4.2 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **3:59:26 PM**

Test Date: **5/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P23142	2/12/2010
Endevco	7264-2000	P16593	2/12/2010
Endevco	7264-2000	P32219	2/12/2010

Test ID: **Head Drop**

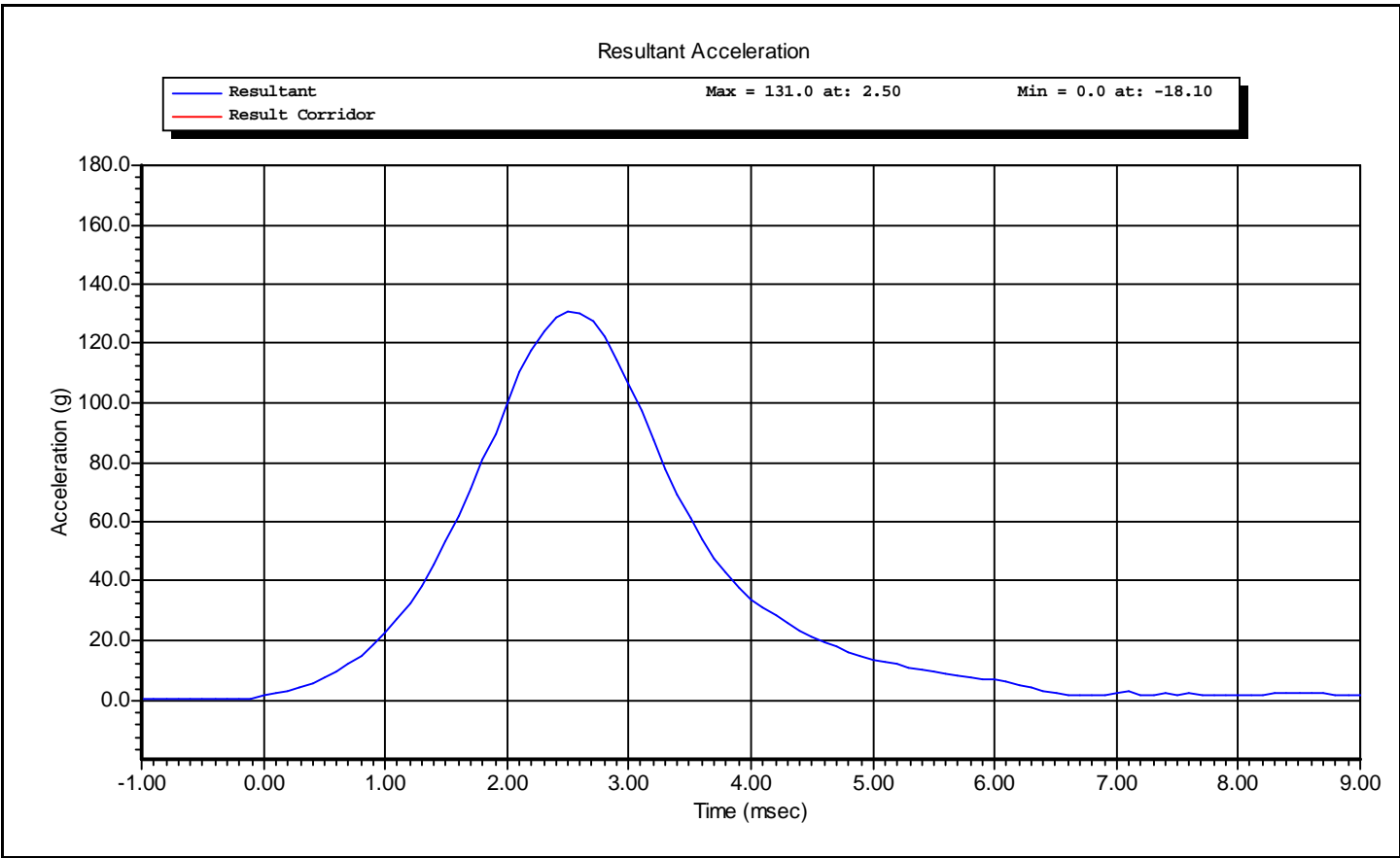
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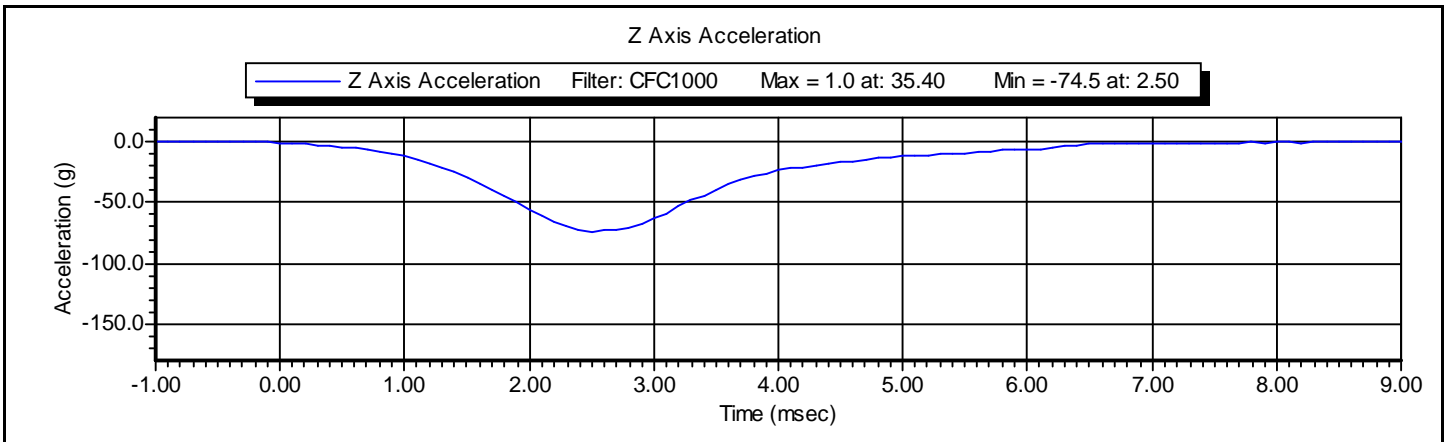
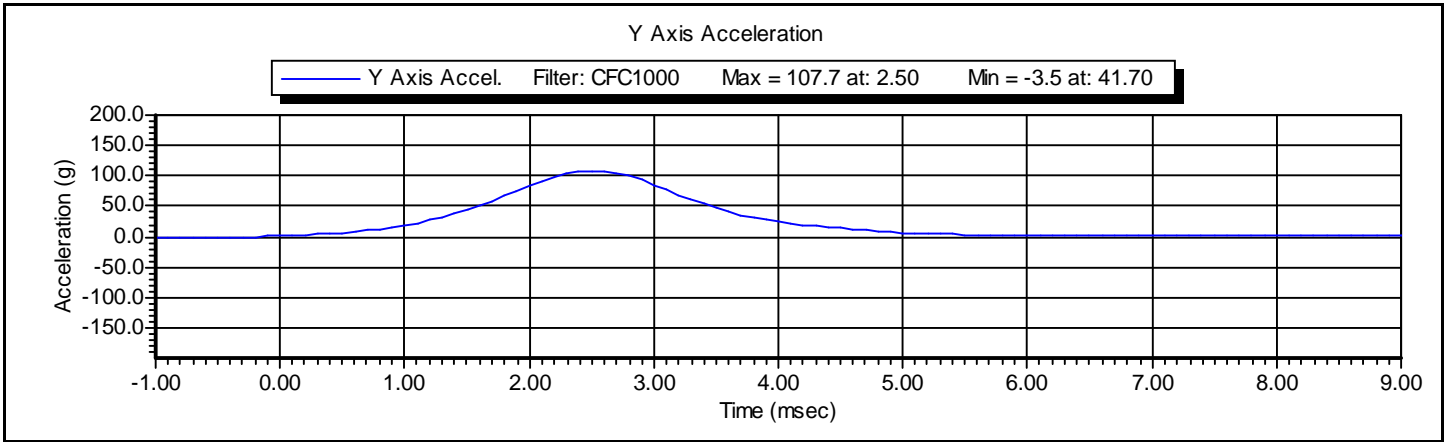
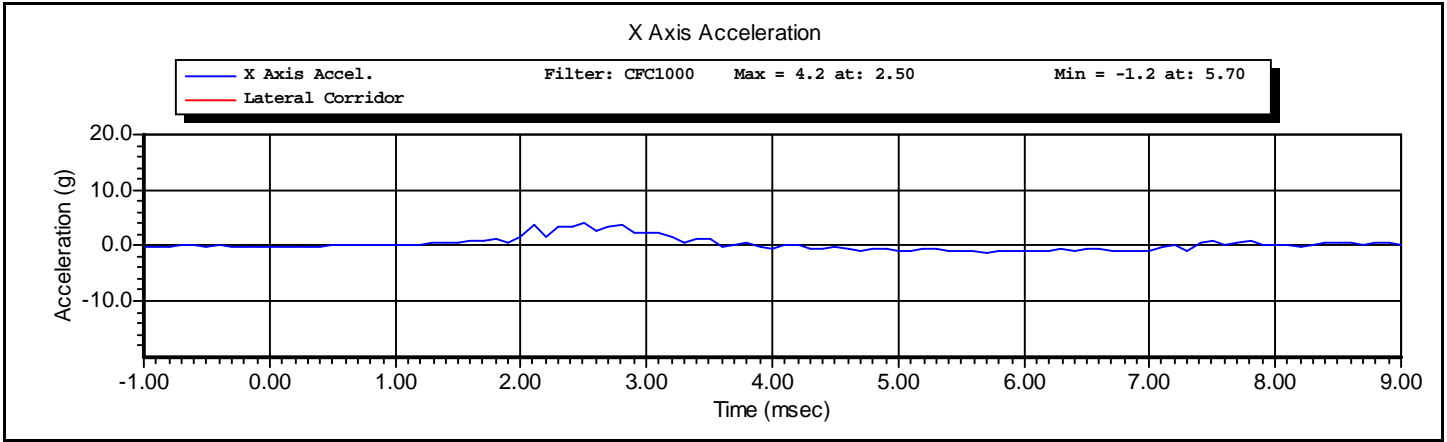
Test Date: **5/19/2010**



Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Head Drop	Test Date:	5/19/2010
Test Number:	1	Test Time:	3:59:26 PM

Component Part Number	Component Serial Number
Head Skin - FTSS 880105-106	1105







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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Left Side	Test Date:	5/21/2010
Test Number:	1	Test Time:	10:26:49 AM

Component Part Number	Component Serial Number
FTSS Neck - 180-2001	AB8236

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	5.51 -- 5.63	5.58 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.64 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.85 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.10 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.79 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.81 m/s P
Max D Plane Rotation	71.0 -- 81.0	75.0 degrees P
Time at Max Rotation	50.0 -- 70.0	60.9 ms P
Moment about OC	-44.0 -- -36.0	-42.3 Nm P
Moment Decay to Zero	102.0 -- 126.0	122.2 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Side**

Test Time: **10:26:49 AM**

Test Date: **5/21/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
Denton	1716A	LC-576 Fy	1/12/2010
Denton	1716A	LC-576 Mx	1/12/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Left Side**

Test Time: **10:26:49 AM**

Test Date: **5/21/2010**



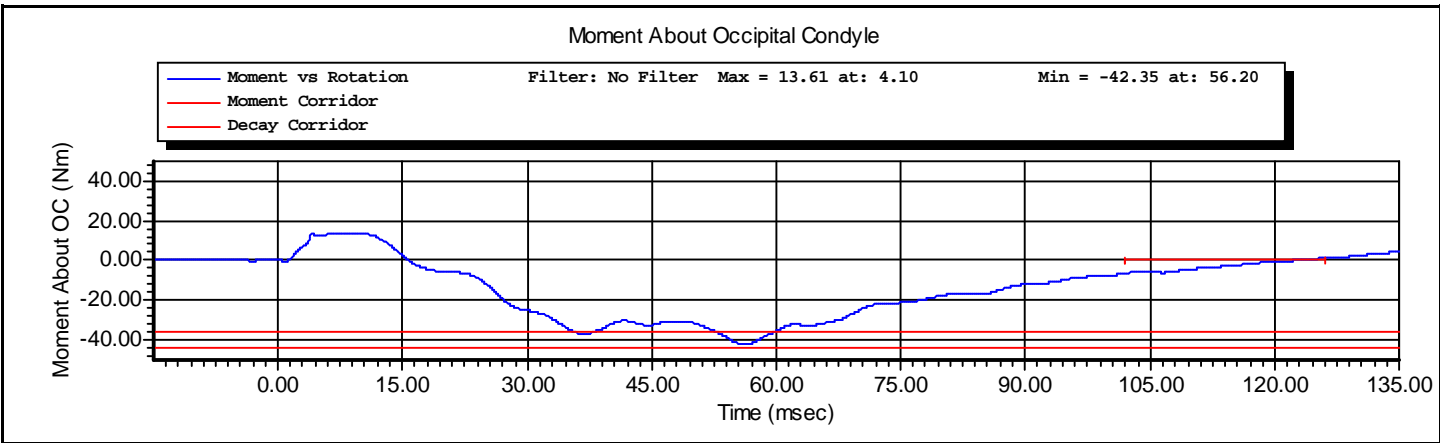
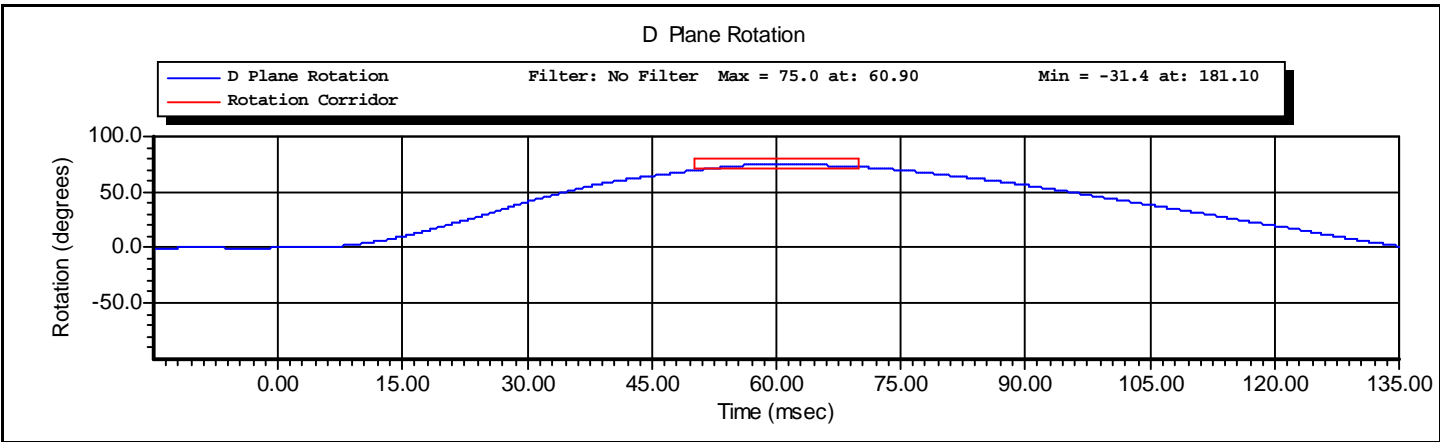
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Left Side	Test Date:	5/21/2010
Test Number:	1	Test Time:	10:26:49 AM

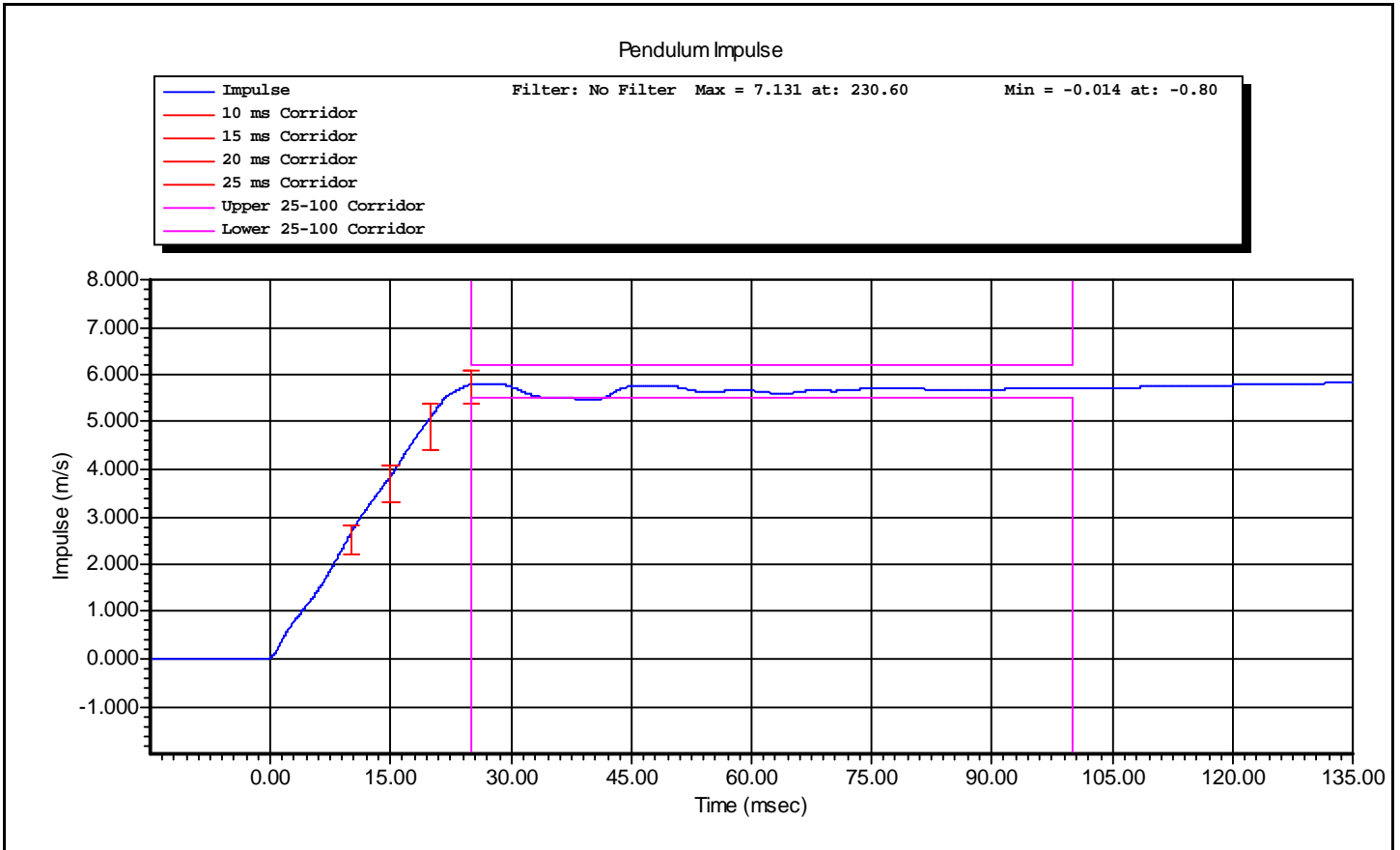
Component Part Number	Component Serial Number
FTSS Neck - 180-2001	AB8236



Test ID: **Left Side**

Test Time: **10:26:49 AM**

Test Date: **5/21/2010**





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Shoulder	Test Date:	5/18/2010
Test Number:	1	Test Time:	4:00:23 PM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	4.20 -- 4.40	4.36 m/s P
Probe Acceleration	13.0 -- 18.0	16.4 g P
Shoulder Deflection	28.0 -- 37.0	34.3 mm P
T1 Acceleration	17.0 -- 22.0	19.7 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **4:00:23 PM**

Test Date: **5/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-125	4/26/2010
Endevco	7264-2000	P16862	3/29/2010

Test ID: **Shoulder**

Test Time: **4:00:23 PM**

Test Date: **5/18/2010**



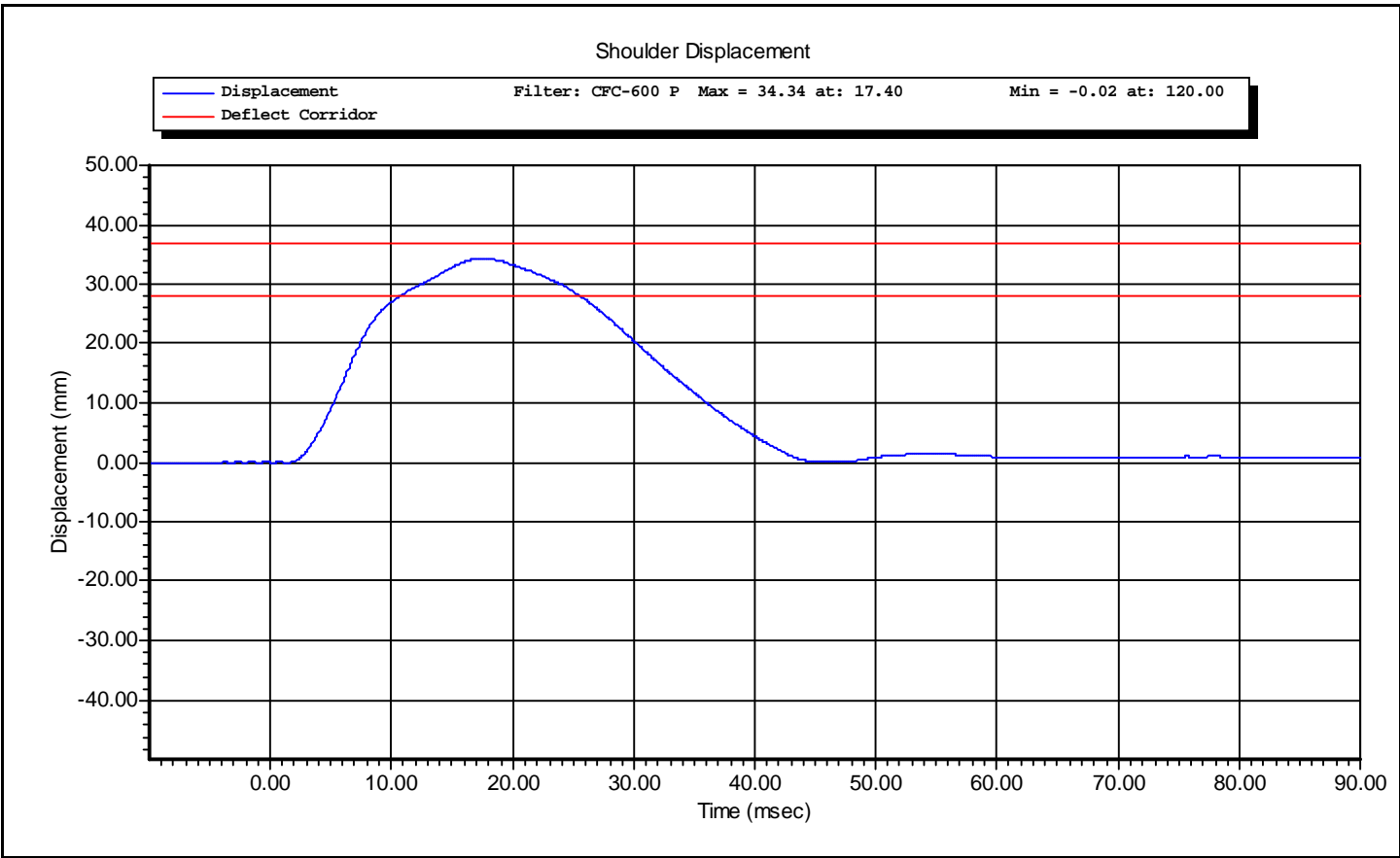
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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Shoulder	Test Date:	5/18/2010
Test Number:	1	Test Time:	4:00:23 PM

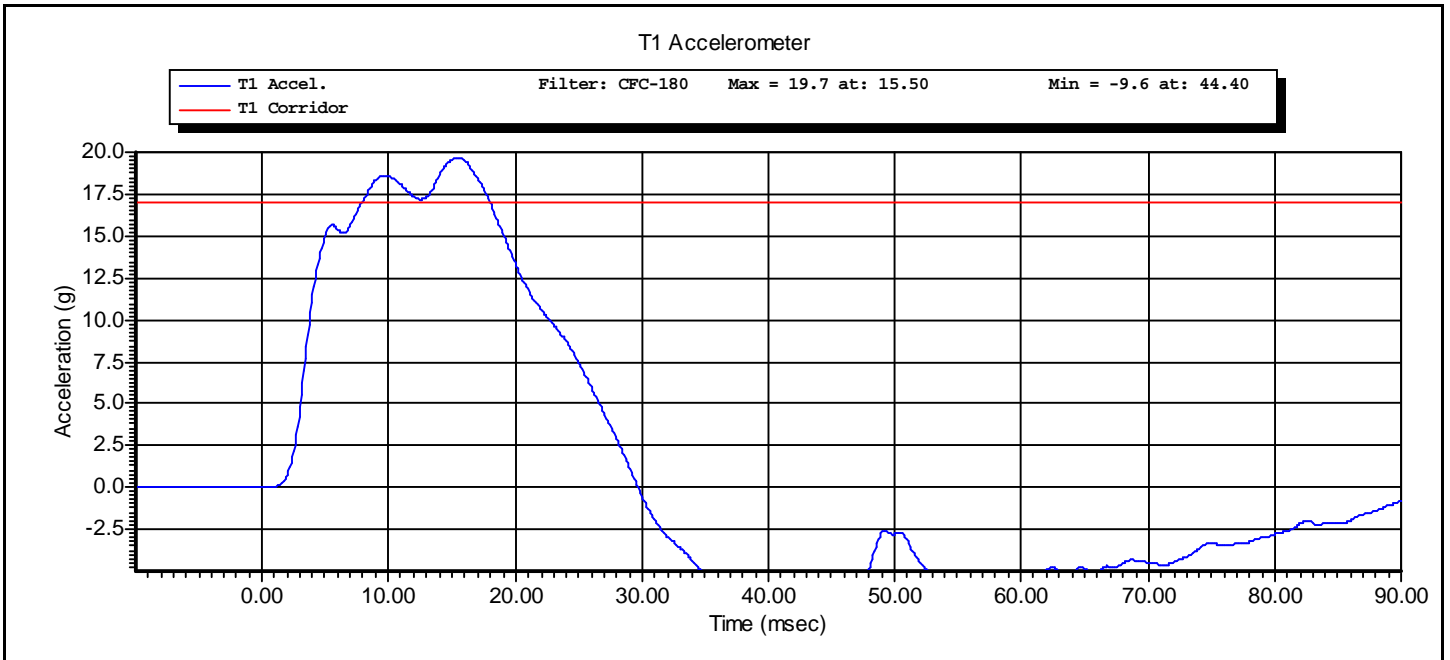
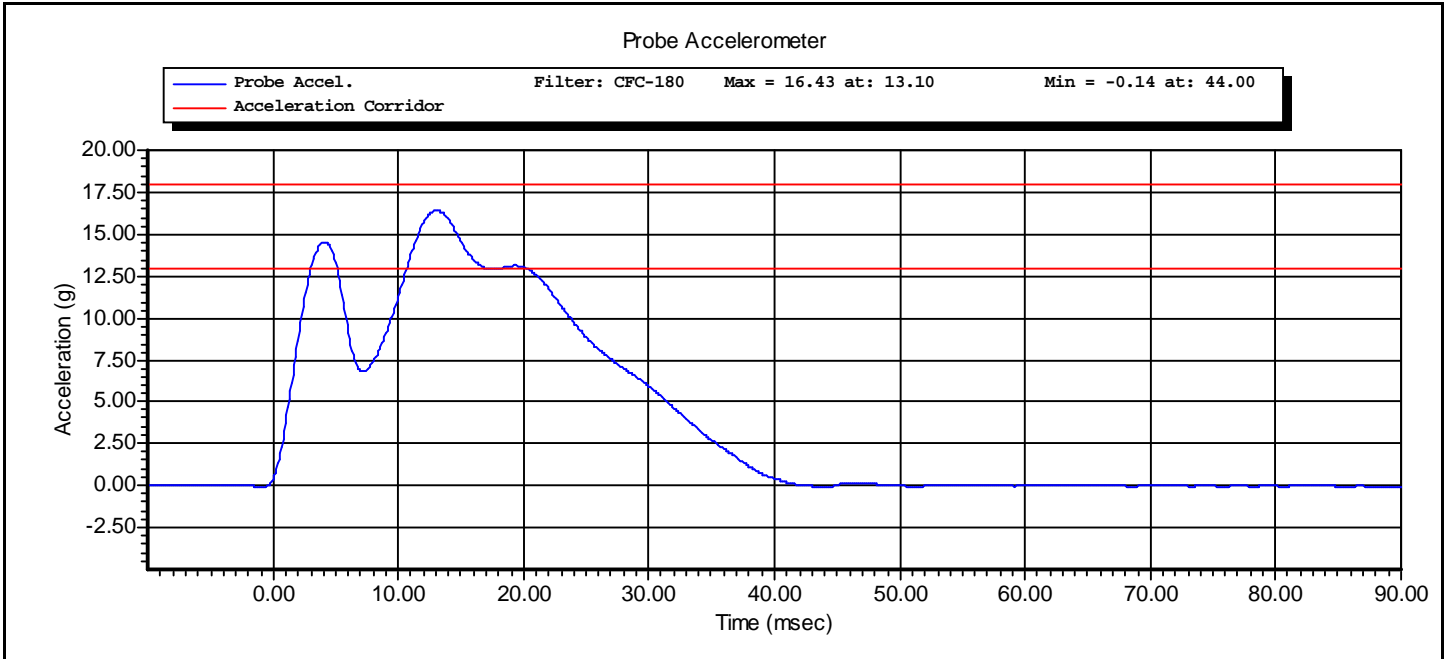
Component Part Number	Component Serial Number
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Test ID: **Shoulder**

Test Time: **4:00:23 PM**

Test Date: **5/18/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thorax With Arm	Test Date:	5/18/2010
Test Number:	1	Test Time:	2:44:02 PM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	42 %RH P
Velocity	6.60 -- 6.80	6.69 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	33.5 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	27.4 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	30.8 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	34.1 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	38.7 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	35.8 g P
Shoulder Deflection	31.0 -- 40.0	38.1 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax With Arm** Test Time: **2:44:02 PM**

Test Date: **5/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-145	4/26/2010
Servo	180-3885	DS-222	4/26/2010
Servo	180-3885	DS-224	4/26/2010
Endevco	7264-2000	P16862	3/29/2010
Endevco	7264-2000	P23939	4/13/2010
Servo	180-3885	DS-125	4/26/2010

Test ID: **Thorax With Arm**

Test Time: **2:44:02 PM**

Test Date: **5/18/2010**



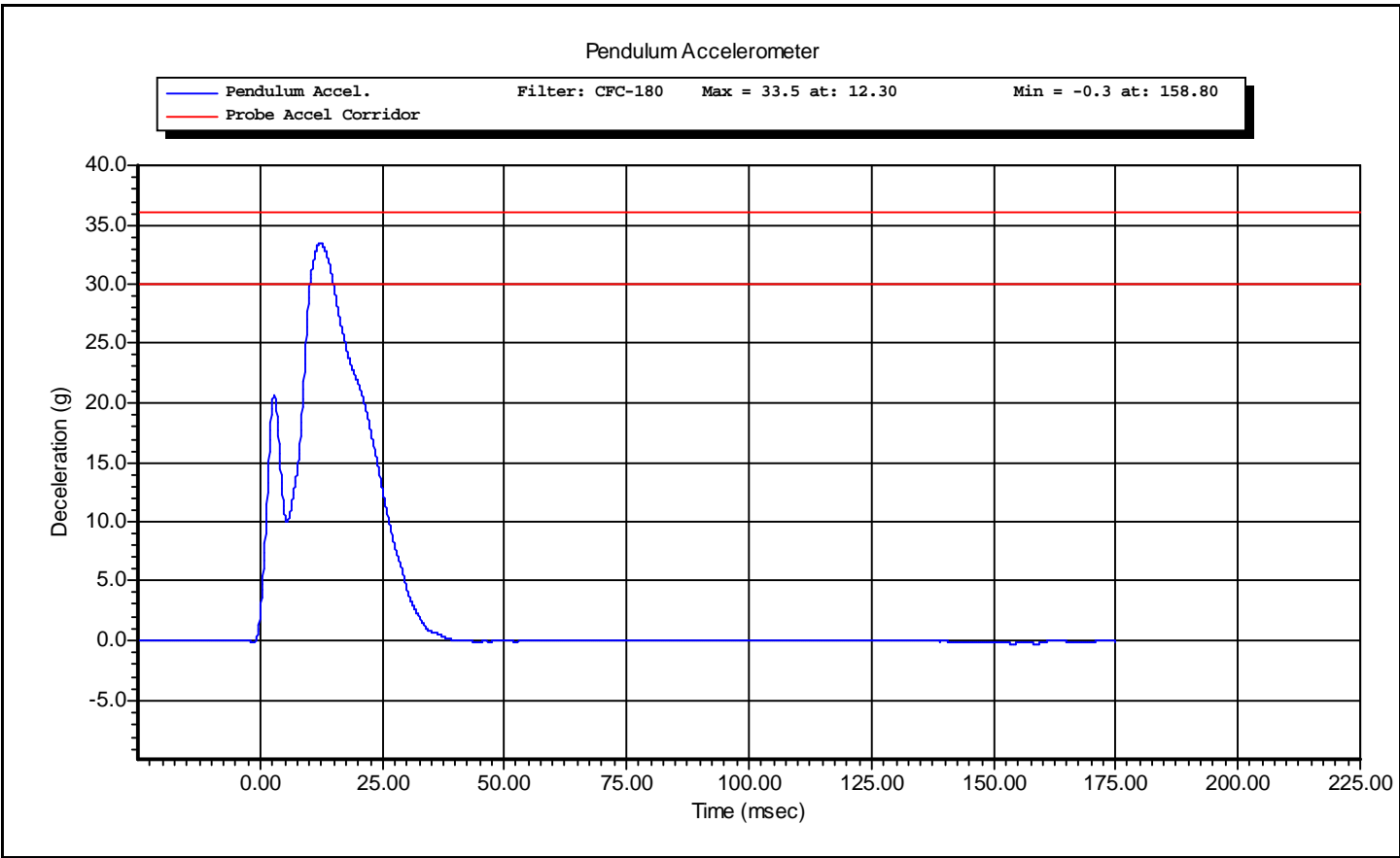
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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thorax With Arm	Test Date:	5/18/2010
Test Number:	1	Test Time:	2:44:02 PM

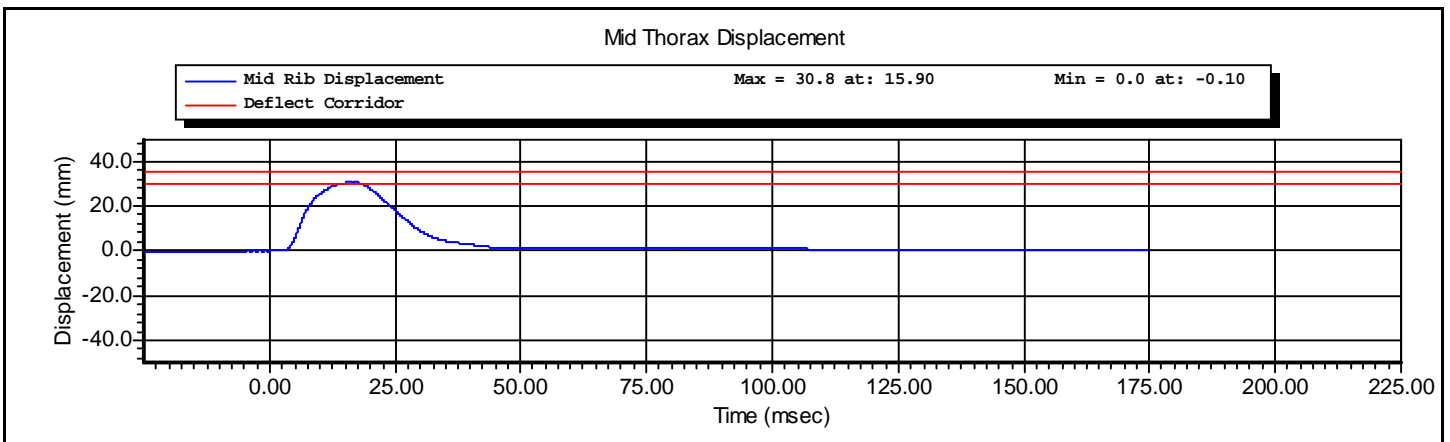
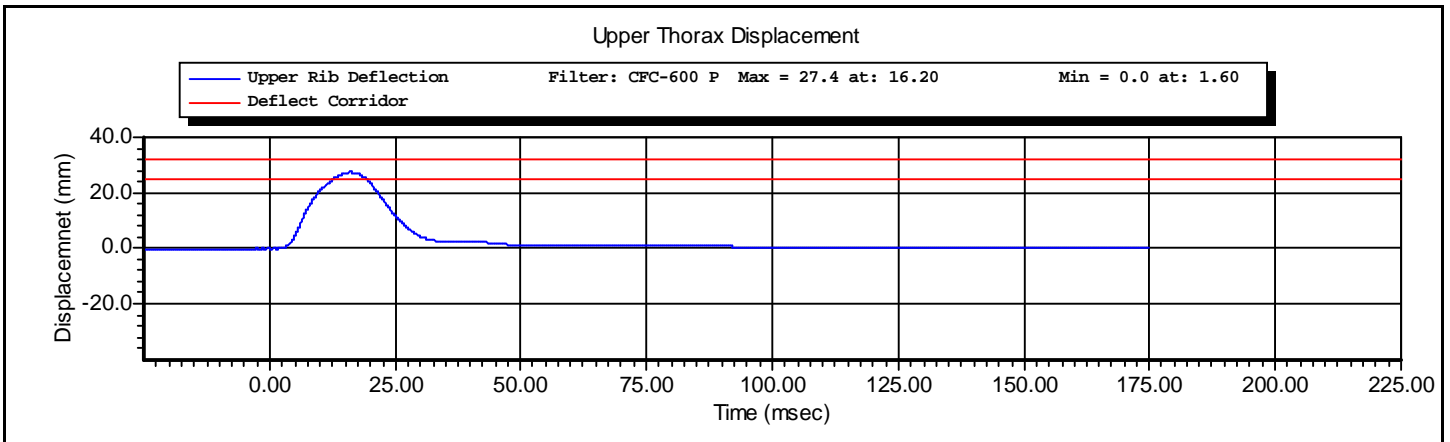
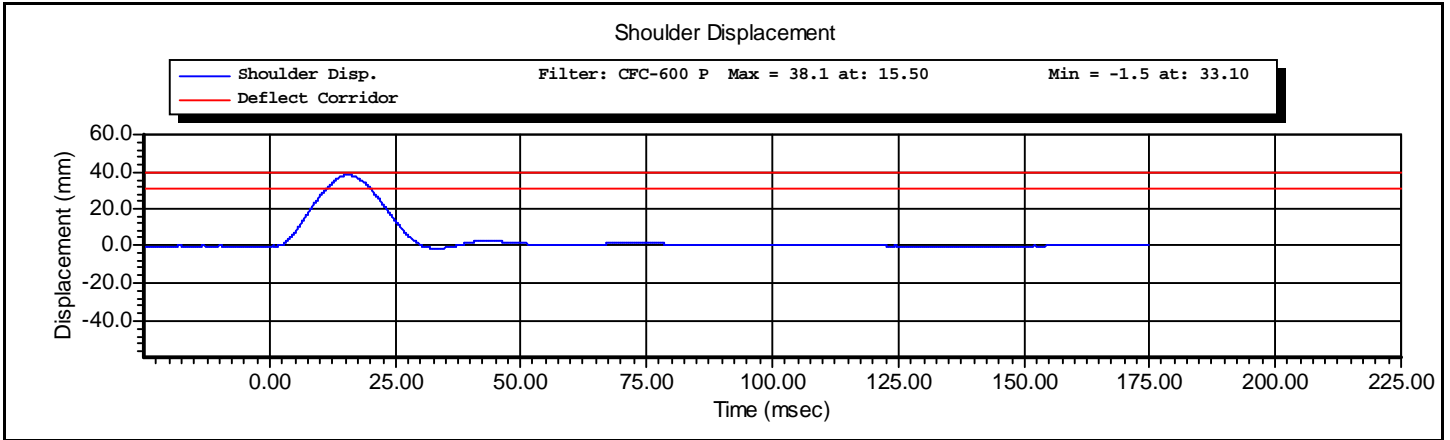
Component Part Number	Component Serial Number
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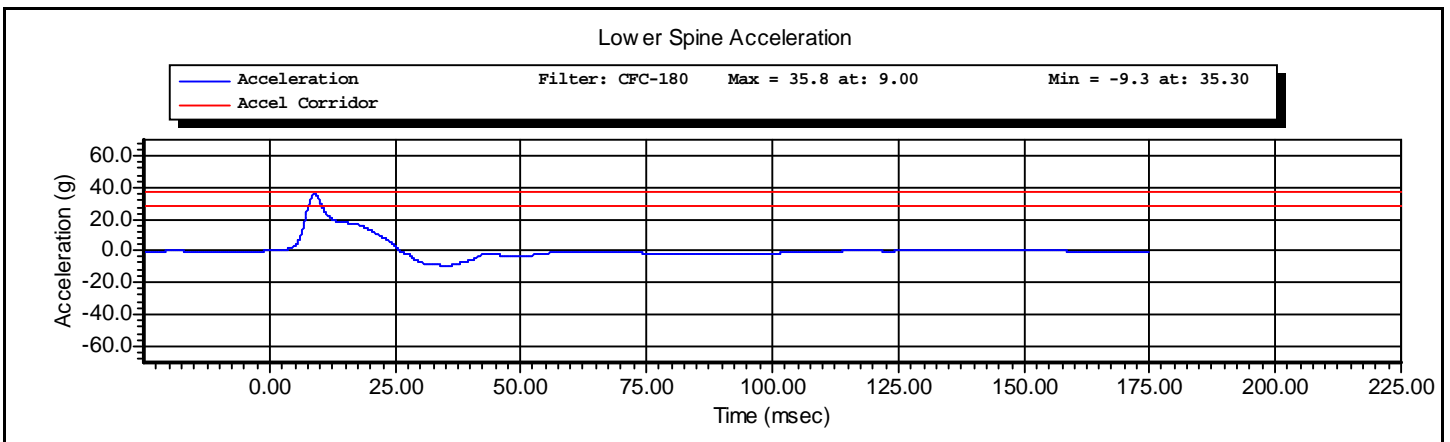
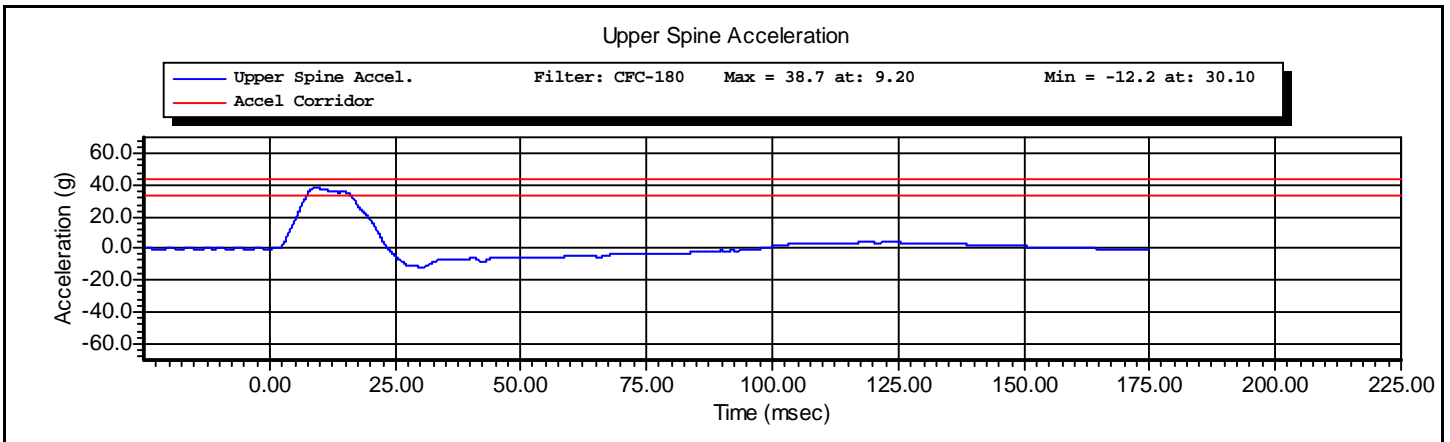
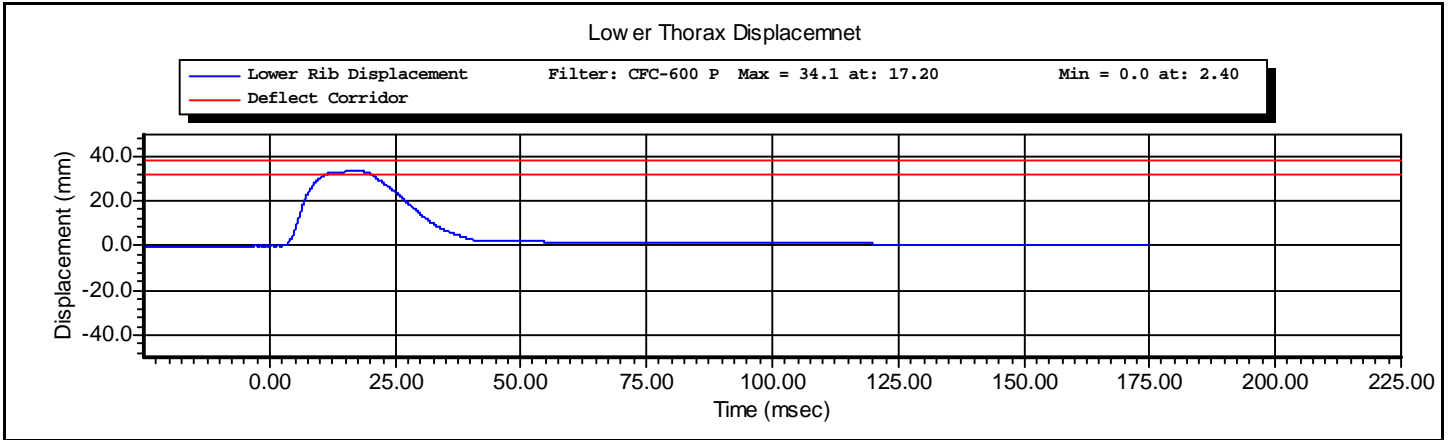


Test ID: **Thorax With Arm**

Test Time: **2:44:02 PM**

Test Date: **5/18/2010**







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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thx w/o Arm	Test Date:	5/18/2010
Test Number:	1	Test Time:	11:54:58 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Probe Acceleration	14.0 -- 18.0	16.6 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	35.8 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	40.8 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	39.4 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	16.2 g P
Lower Spine Acceleration T12	7.0 -- 11.0	10.0 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thx w/o Arm**

Test Time: **11:54:58 AM**

Test Date: **5/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-145	4/26/2010
Servo	180-3885	DS-222	4/26/2010
Servo	180-3885	DS-224	4/26/2010
Endevco	7264-2000	P16862	3/29/2010
Endevco	7264-2000	P23939	4/13/2010

Test ID: **Thx w/o Arm**

Test Time: **11:54:58 AM**

Test Date: **5/18/2010**



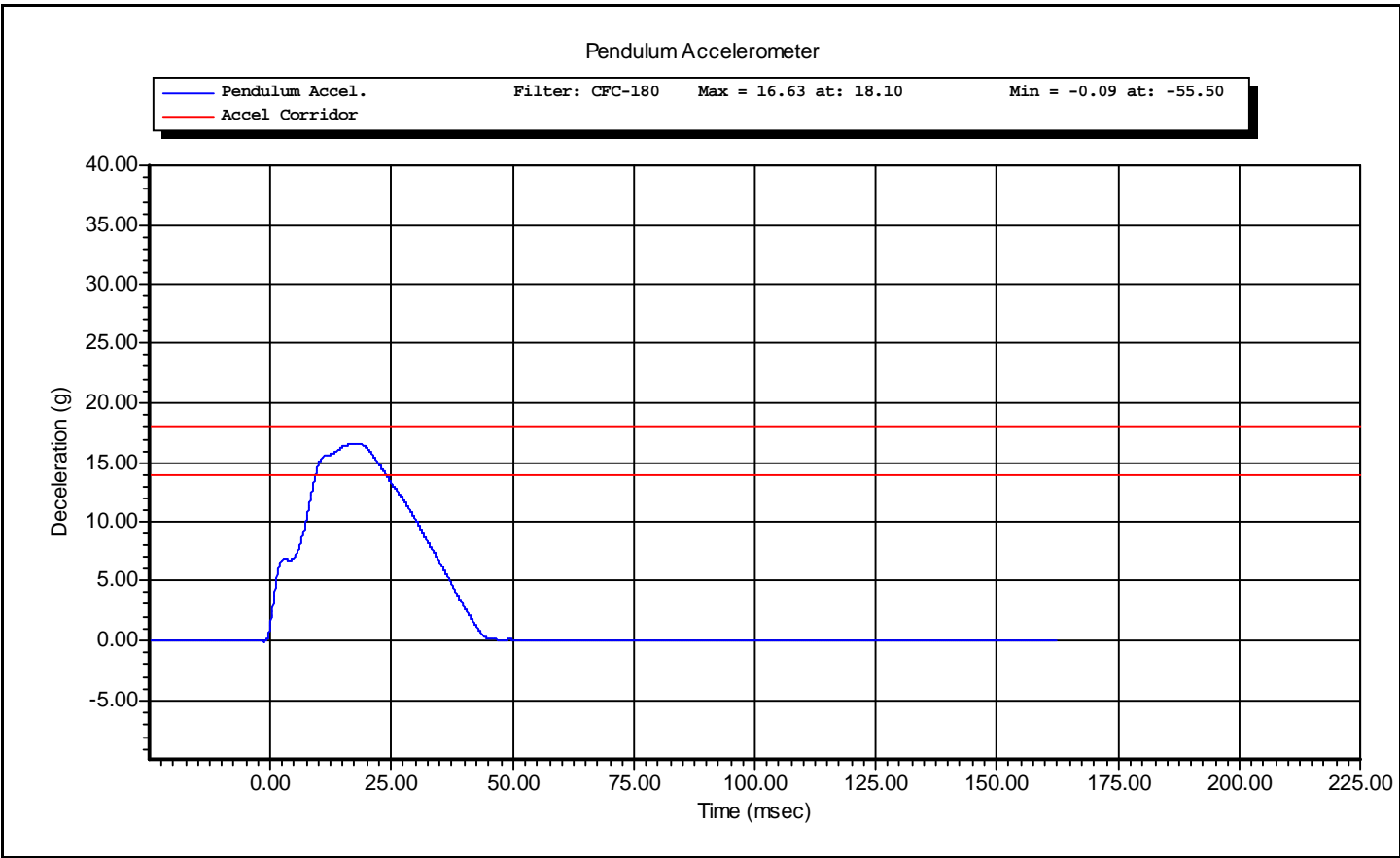
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thx w/o Arm	Test Date:	5/18/2010
Test Number:	1	Test Time:	11:54:58 AM

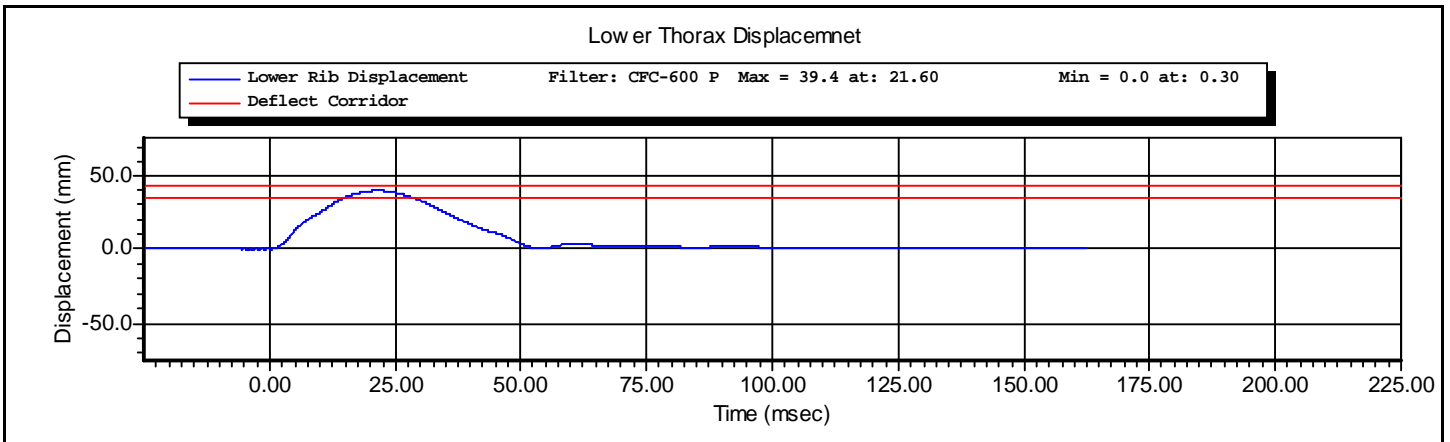
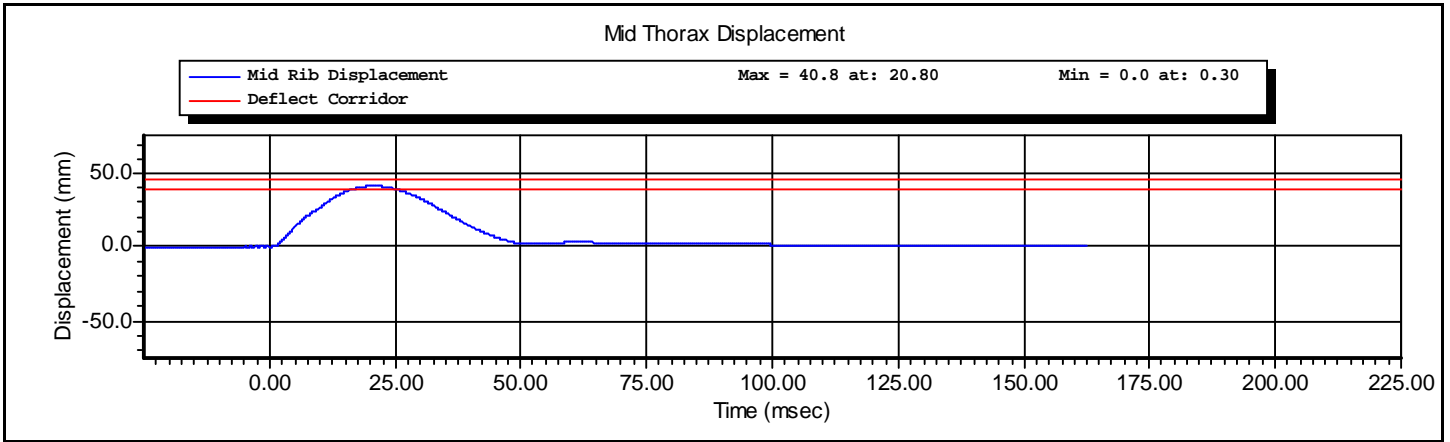
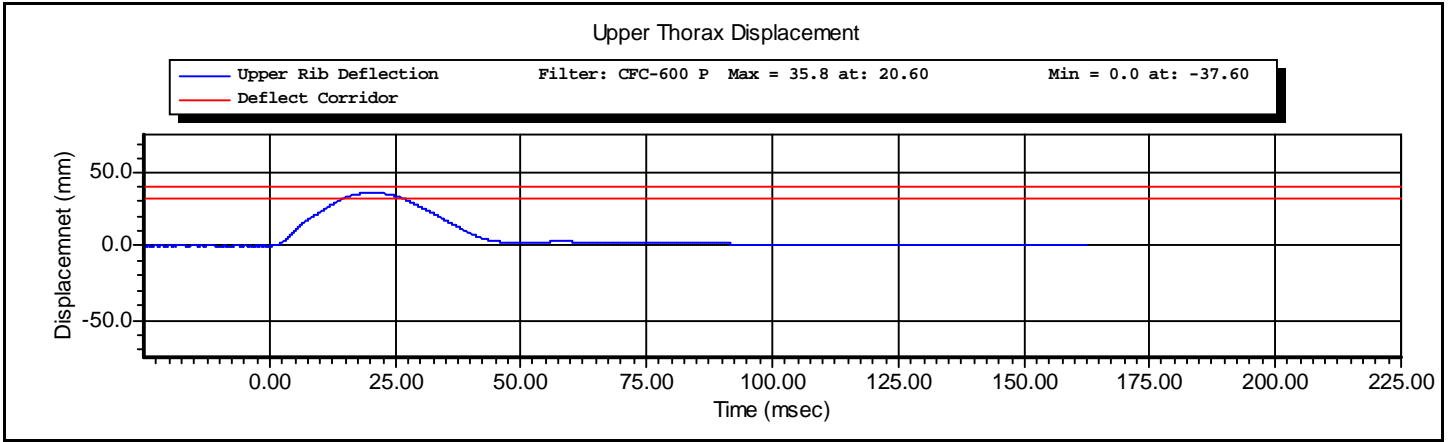
Component Part Number	Component Serial Number
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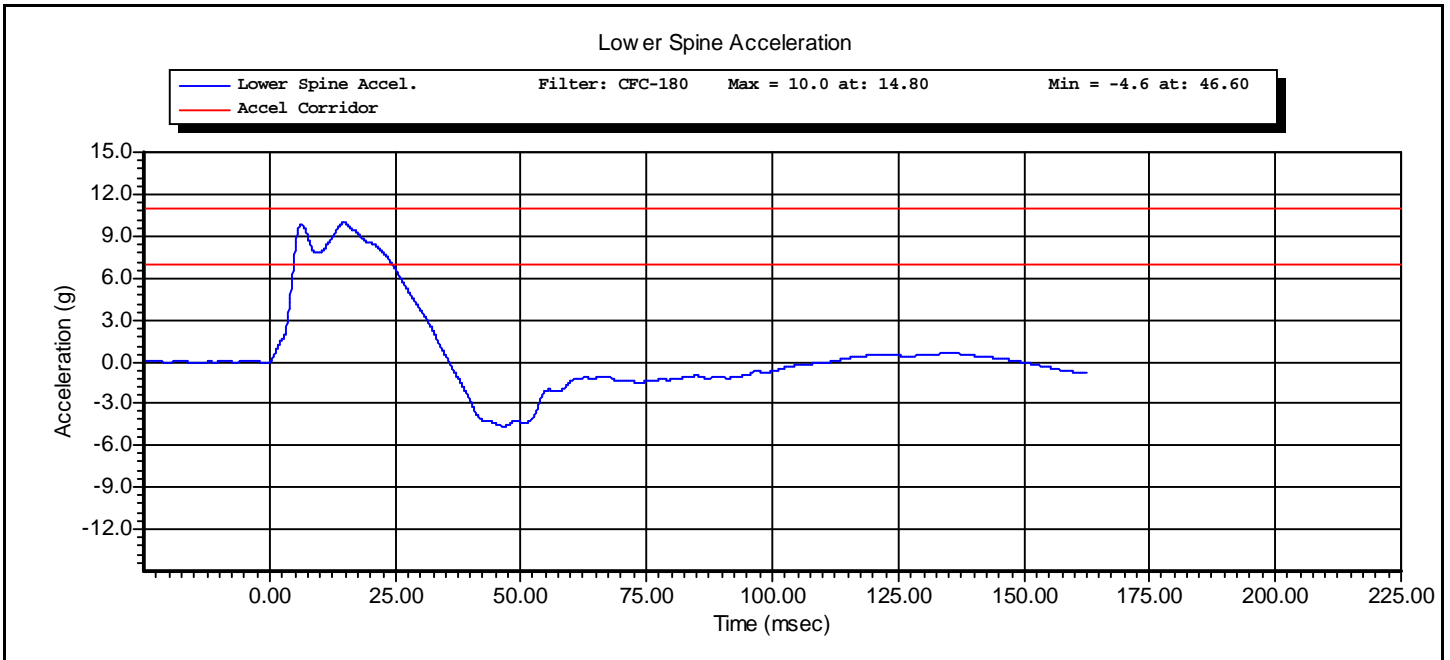
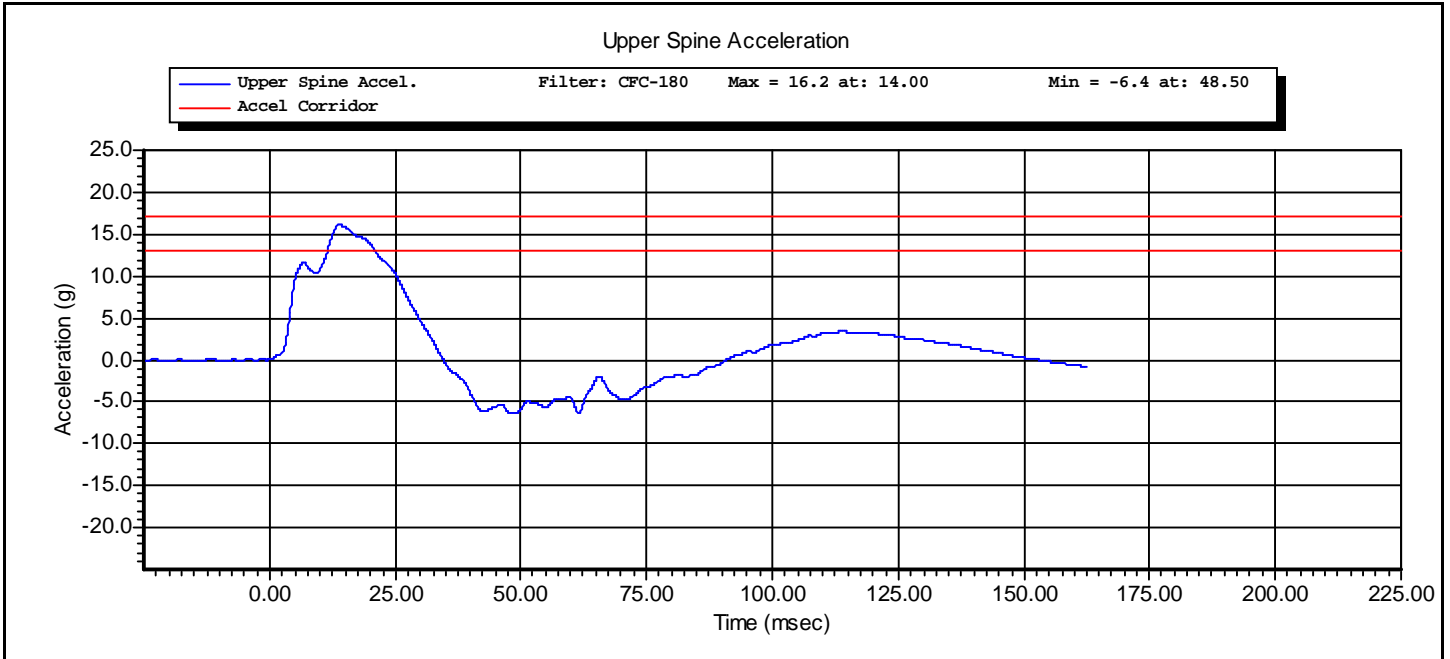


Test ID: **Thx w/o Arm**

Test Time: **11:54:58 AM**

Test Date: **5/18/2010**







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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Abdominal Impact	Test Date:	5/18/2010
Test Number:	1	Test Time:	11:34:57 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	4.20 -- 4.40	4.40 m/s P
Probe Acceleration	12.0 -- 16.0	14.8 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	36.4 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	33.1 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.3 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Abdominal Impact** Test Time: **11:34:57 AM** Test Date: **5/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-225	4/26/2010
Servo	180-3885	DS-230	4/26/2010
Endevco	7264-2000	P23939	4/13/2010

Test ID: **Abdominal Impact** Test Time: **11:34:57 AM**

Test Date: **5/18/2010**



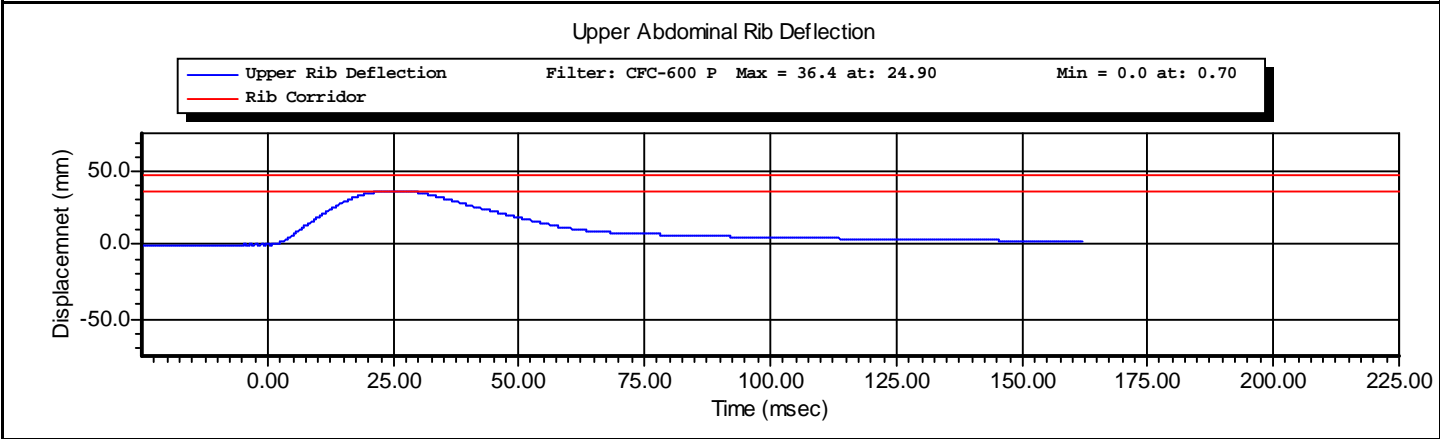
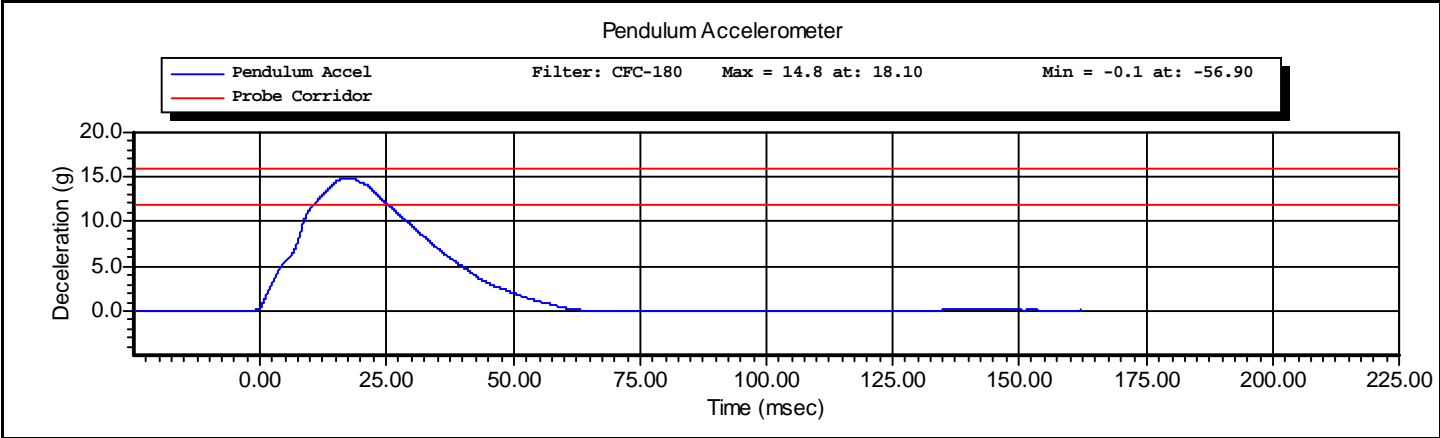
www.calspan.com

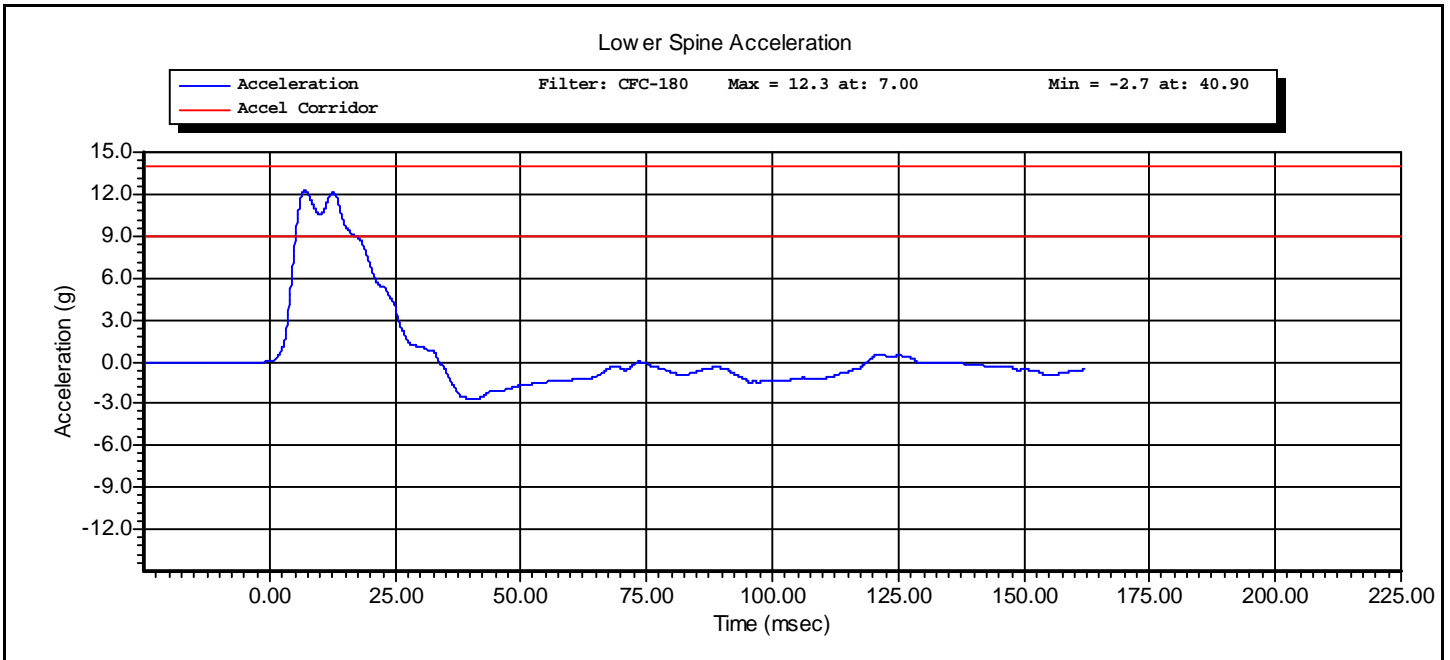
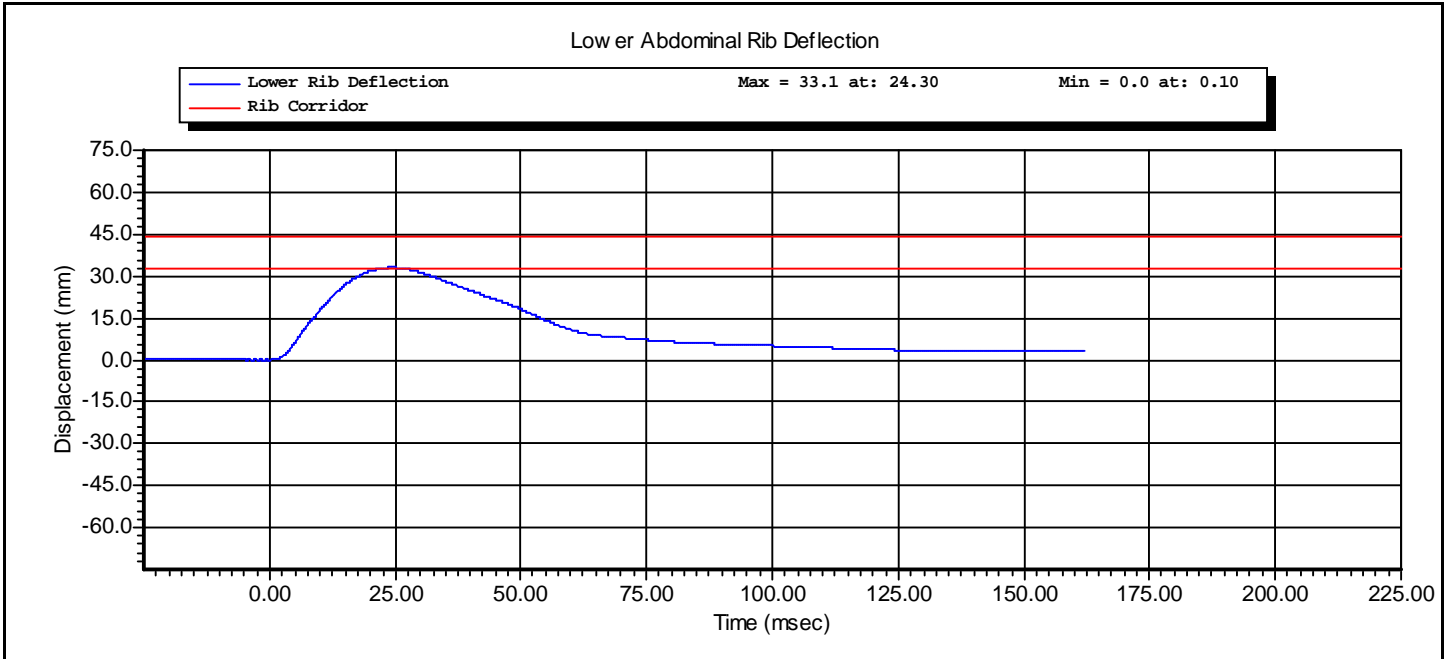
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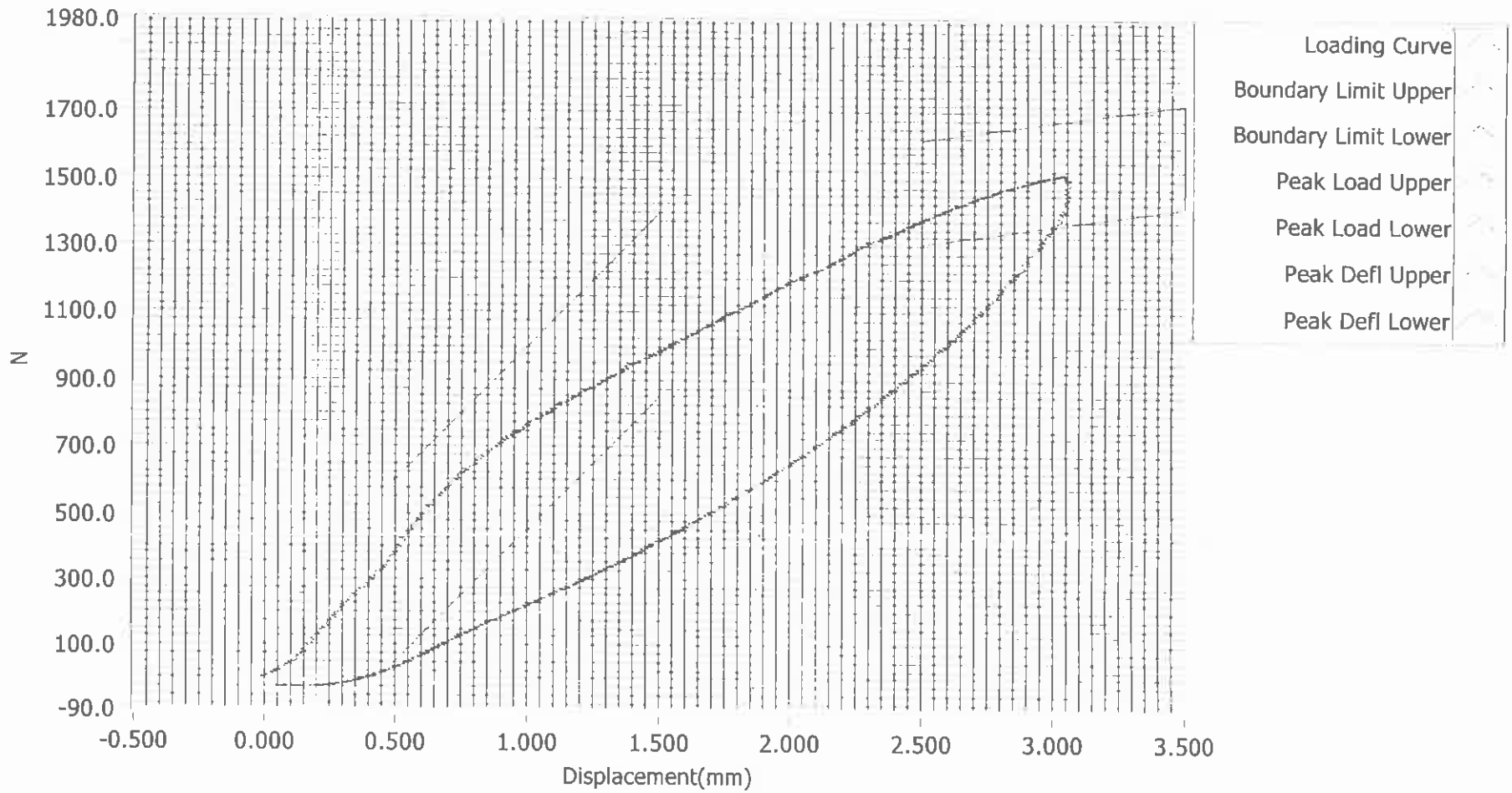
Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Abdominal Impact	Test Date:	5/18/2010
Test Number:	1	Test Time:	11:34:57 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------





Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
		7/17/2007	11:31 AM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	12814	SIDIIs	

Current Date : 7/17/2007

Current Time : 11:32:22



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Pelvis Acetabulum	Test Date:	5/18/2010
Test Number:	1	Test Time:	10:11:05 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Pelvis Plug Used for Certification:
 FTSS S/N 12796
 Force @ 3mm = 1509N

Pelvis Plug Used for Full Scale Test:
 FTSS S/N 12814
 Force @ 3mm = 1507N

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	6.60 -- 6.80	6.67 m/s P
Peak Probe Acceleration	38.0 -- 47.0	41.4 g P
Peak Pelvis Acceleration	34.0 -- 42.0	37.4 g P
Peak Acetabulum Force	3.60 -- 4.30	3.96 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis Acetabulum** Test Time: **10:11:05 AM**

Test Date: **5/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Endevco	7264-2000	P35793	2/24/2010
DentonATD	IF-520	LC-115 Fy	4/26/2010

Test ID: **Pelvis Acetabulum** Test Time: **10:11:05 AM**

Test Date: **5/18/2010**



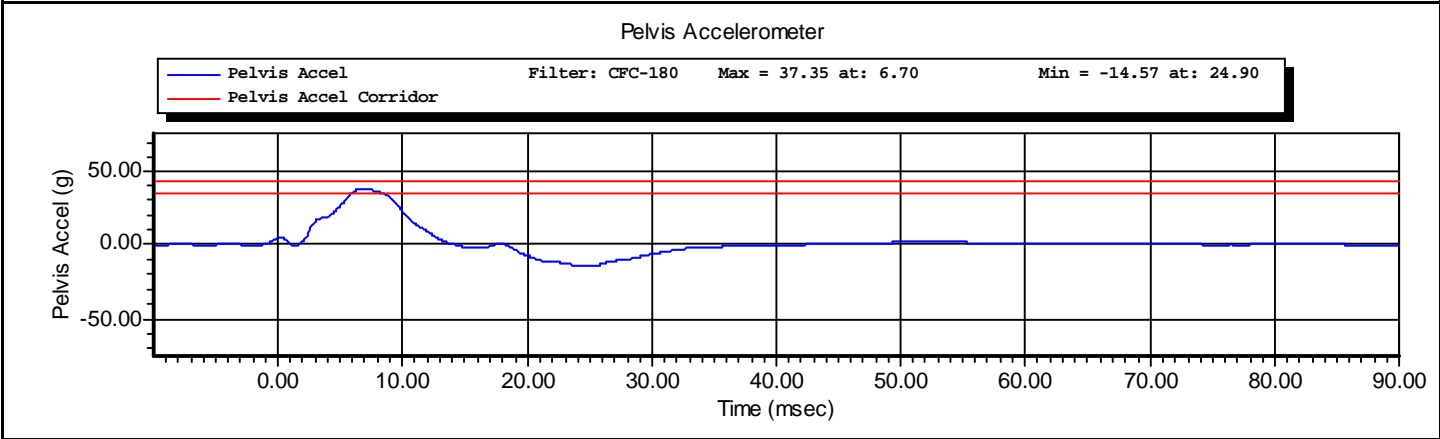
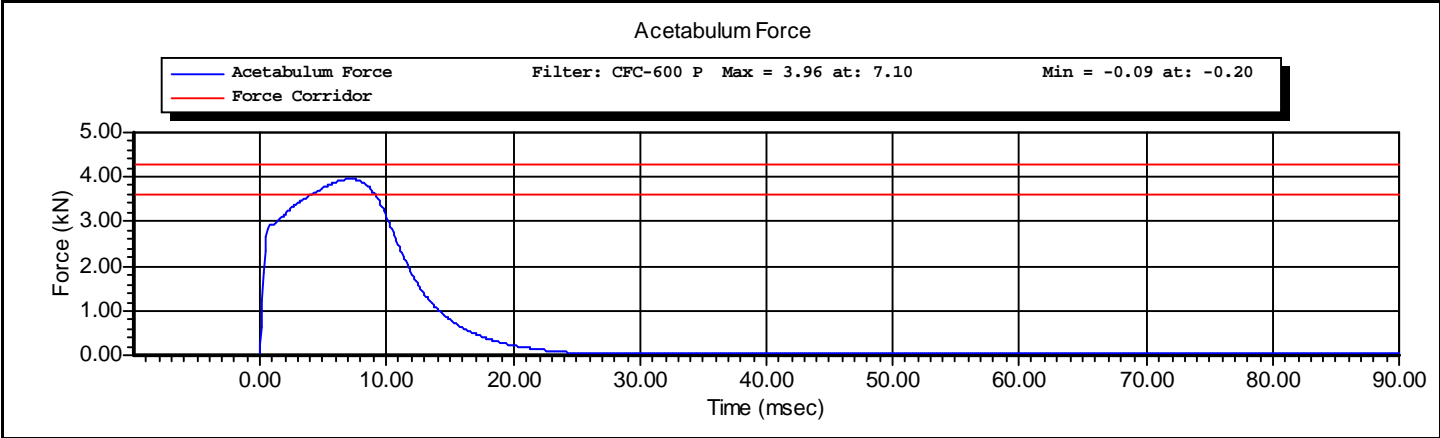
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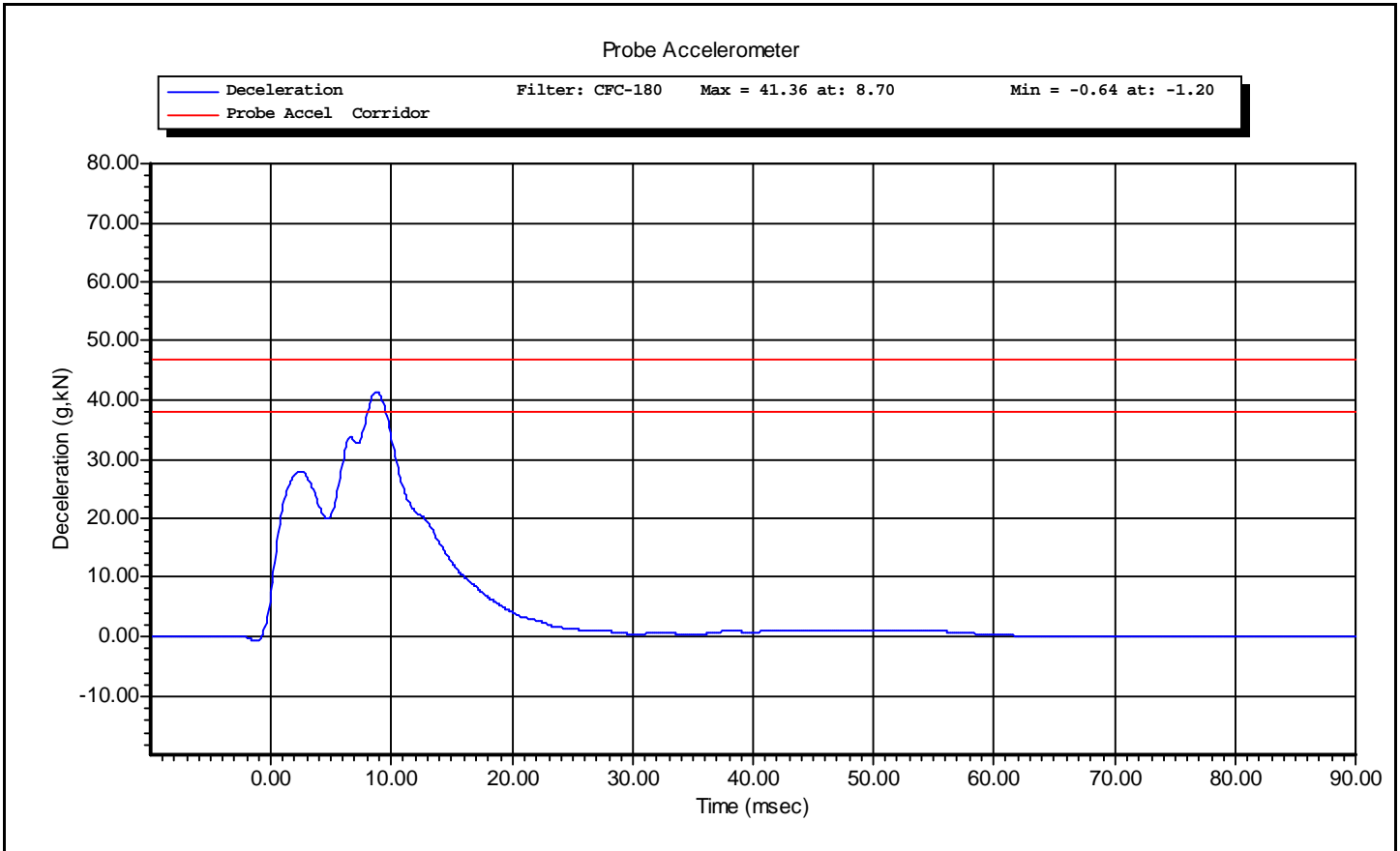
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Pelvis Acetabulum	Test Date:	5/18/2010
Test Number:	1	Test Time:	10:11:05 AM

Component Part Number	Component Serial Number
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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Illiic Pelvis	Test Date:	5/18/2010
Test Number:	1	Test Time:	9:26:46 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	4.20 -- 4.40	4.24 m/s P
Peak Probe Acceleration	36.0 -- 45.0	41.1 g P
Peak Pelvis Acceleration	28.0 -- 39.0	38.3 g P
Peak Iliac Force	4.10 -- 5.10	4.70 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Illiic Pelvis**

Test Time: **9:26:46 AM**

Test Date: **5/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Endevco	7264-2000	P35793	2/24/2010
DentonATD	3228J	LC-290 Fy	4/26/2010

Test ID: **Illiac Pelvis**

Test Time: **9:26:46 AM**

Test Date: **5/18/2010**



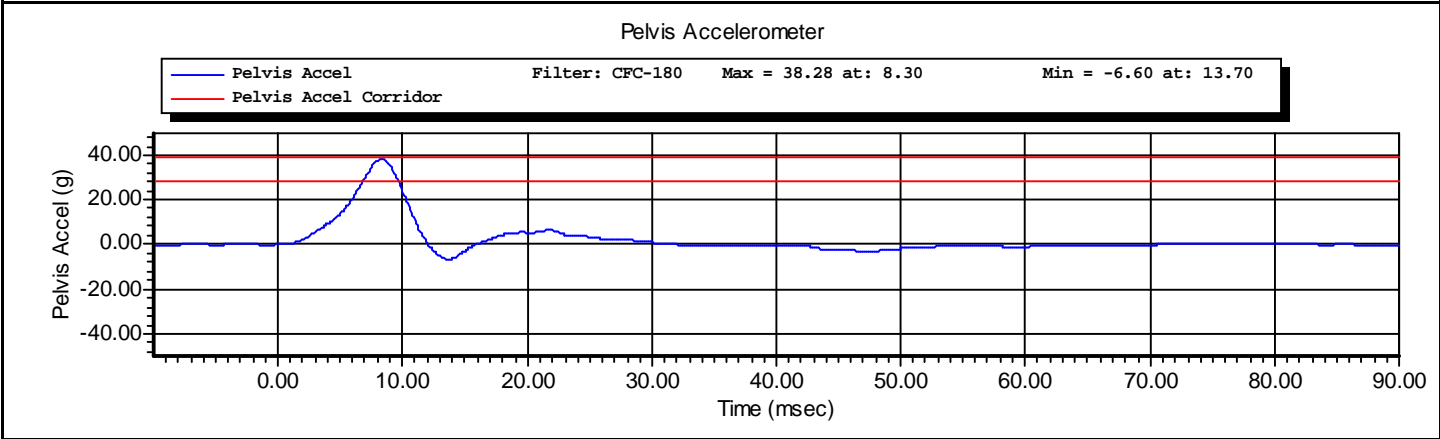
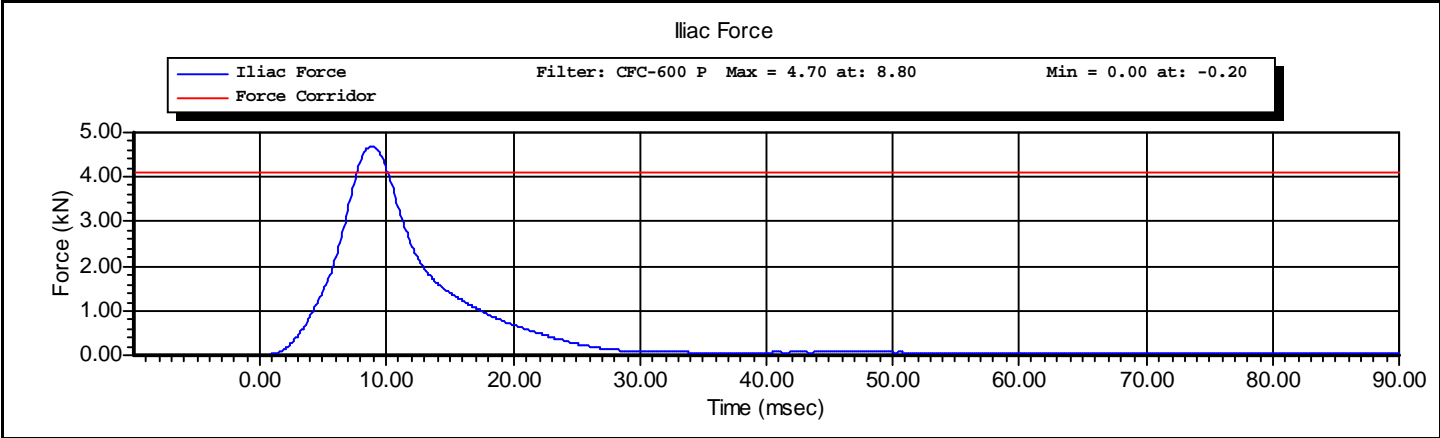
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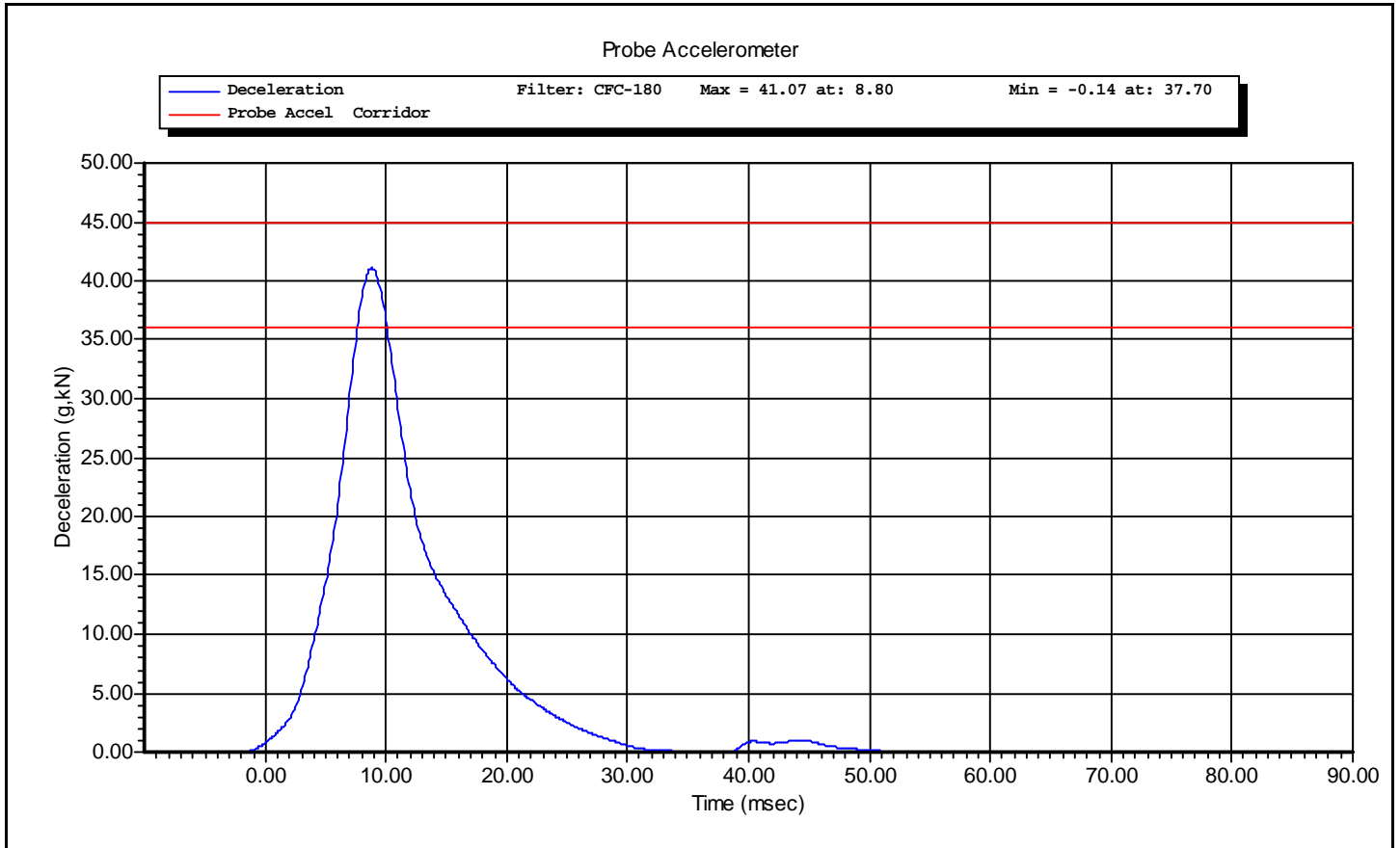
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Illiic Pelvis	Test Date:	5/18/2010
Test Number:	1	Test Time:	9:26:46 AM

Component Part Number	Component Serial Number
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CALIBRATION TEST RESULTS

POST-TEST

SID-IIs NO.: 224

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

S/N 224

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	80	Yes
D	H-Point from Seat Back	141.0 - 151.0	143	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	104	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	144	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	182	Yes
J	Head Circumference	541.0 - 551.0	546	Yes
K	Buttock to Knee Length	514.0 - 540.0	523	Yes
L	Popliteal Height	343.0 - 369.0	349	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	398	Yes
N	Buttock Popliteal Length	416.0 - 442.0	423	Yes
O	Chest Depth without Jacket	195.0 - 211.0	201	Yes
P	Foot Length (right)	216.0 - 232.0	221	Yes
P	Foot Length (left)	216.0 - 232.0	221	Yes
Q	Hip Breadth	313.0 - 323.0	318	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to Seat back	478.0 - 493.0	484	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	80	Yes
W	Foot Width (left)	78.0 - 94.0	80	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	865	Yes
Z	Waist Circumference	761.0 - 791.0	780	Yes

Technician : A. Rudniski

Date: 5/26/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Head Drop	Test Date:	6/1/2010
Test Number:	1	Test Time:	1:58:24 PM

Component Part Number	Component Serial Number
FTSS 880105-106	1105

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	64 %RH P
Resultant Acceleration	115.0 -- 137.0	134.3 g P
Oscillation	0.0 -- 15.0	1.3 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-5.1 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **1:58:24 PM**

Test Date: **6/1/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P23142	2/12/2010
Endevco	7264-2000	P16593	2/12/2010
Endevco	7264-2000	P32219	2/12/2010

Test ID: **Head Drop**

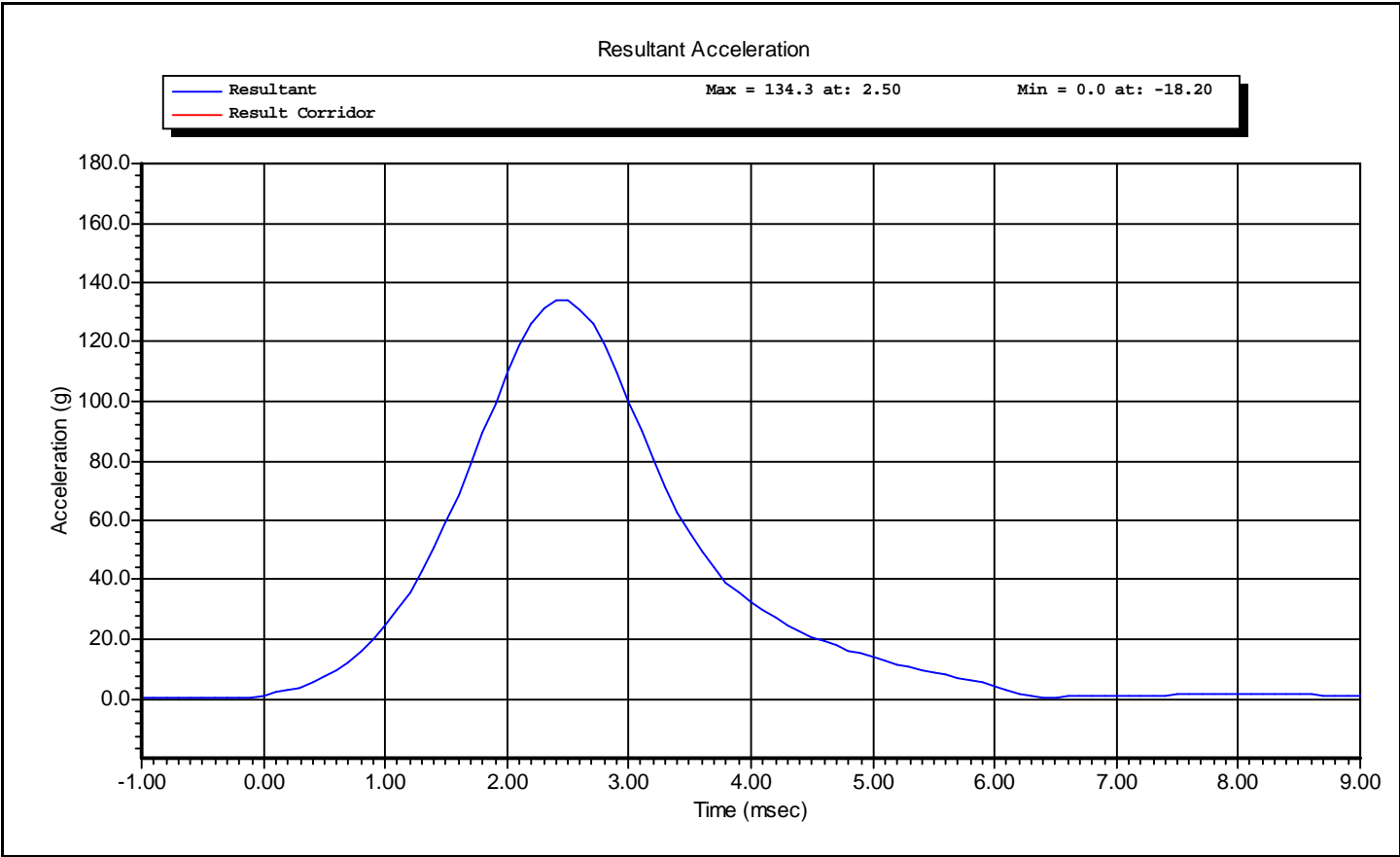
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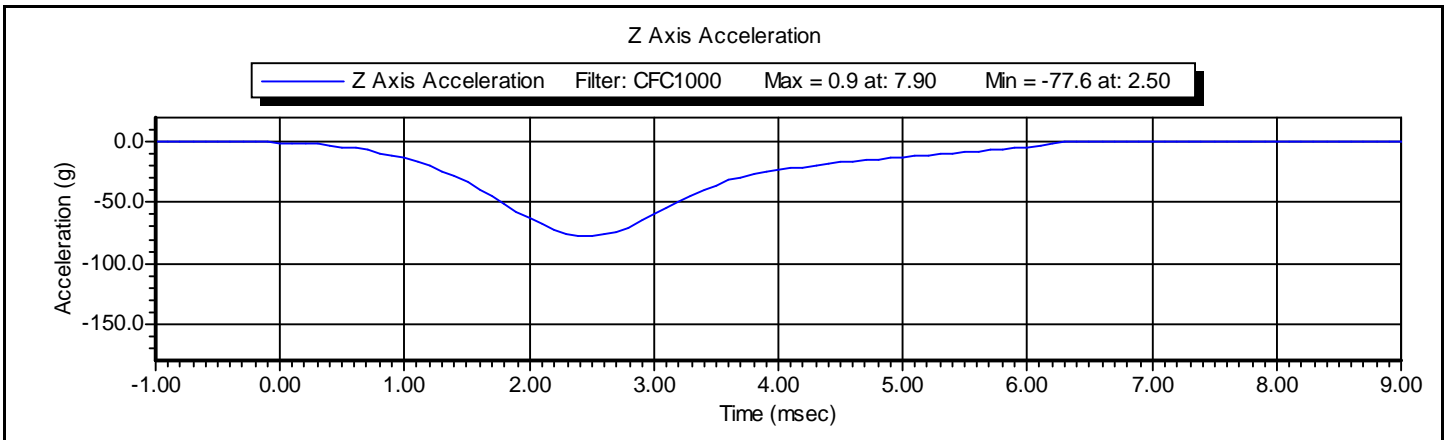
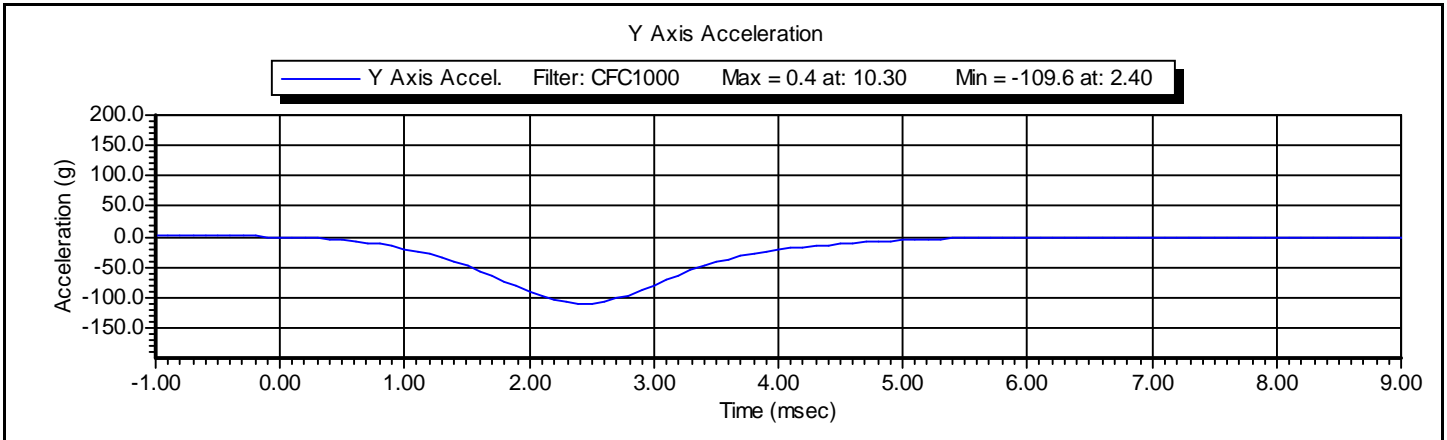
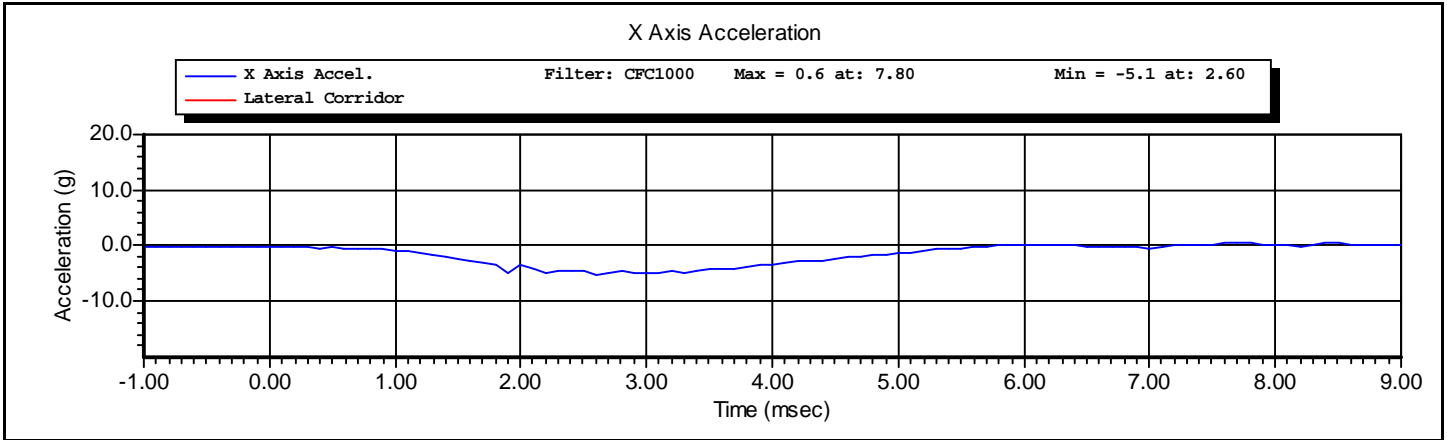
Test Date: **6/1/2010**



Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Head Drop	Test Date:	6/1/2010
Test Number:	1	Test Time:	1:58:24 PM

Component Part Number	Component Serial Number
FTSS 880105-106	1105







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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Neck Flexion	Test Date:	6/1/2010
Test Number:	1	Test Time:	1:26:20 PM

Component Part Number	Component Serial Number
Neck - 180-2001	AB8236

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	61 %RH P
Velocity	5.51 -- 5.63	5.58 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.44 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.58 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.91 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.74 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.77 m/s P
Max D Plane Rotation	71.0 -- 81.0	74.2 degrees P
Time at Max Rotation	50.0 -- 70.0	61.1 ms P
Moment about OC	-44.0 -- -36.0	-43.1 Nm P
Moment Decay to Zero	102.0 -- 126.0	120.6 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **1:26:20 PM**

Test Date: **6/1/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	AF5B3	2/24/2010
Denton	1716A	LC-576 Fy	1/12/2010
Denton	1716A	LC-576 Mx	1/12/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

Test Time: **1:26:20 PM**

Test Date: **6/1/2010**



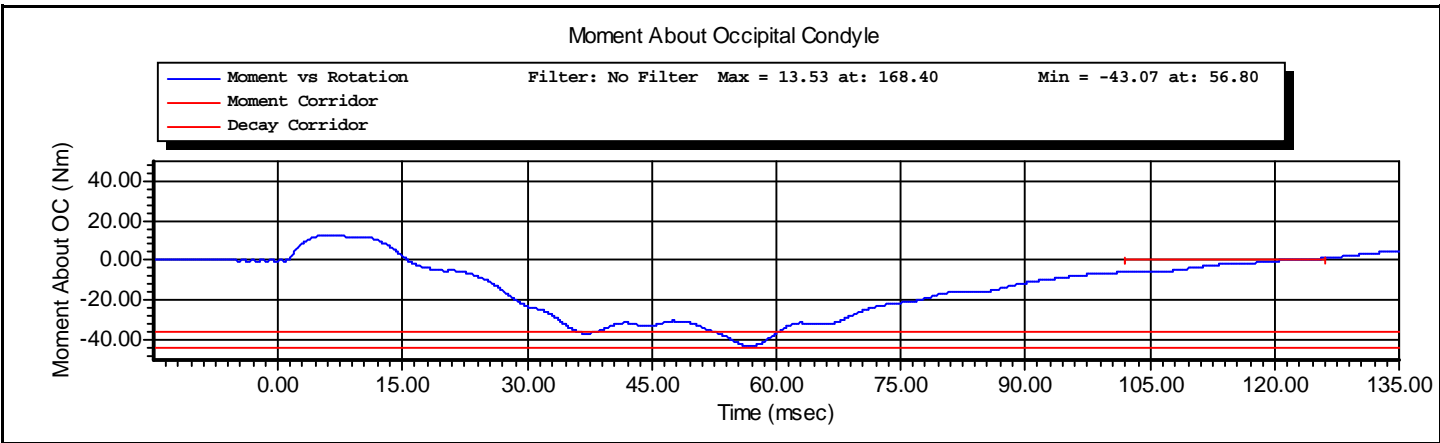
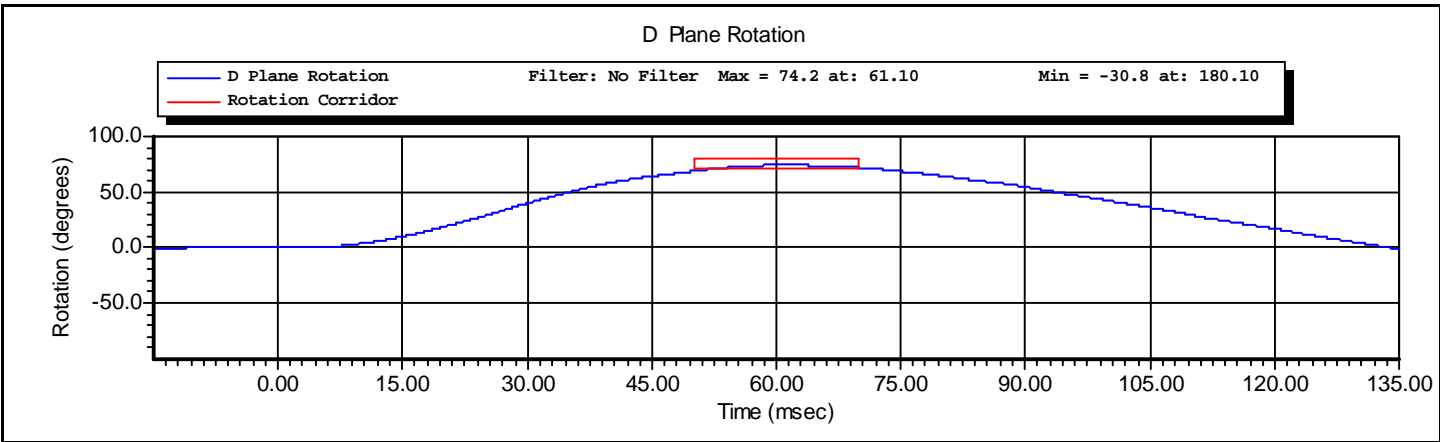
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Neck Flexion	Test Date:	6/1/2010
Test Number:	1	Test Time:	1:26:20 PM

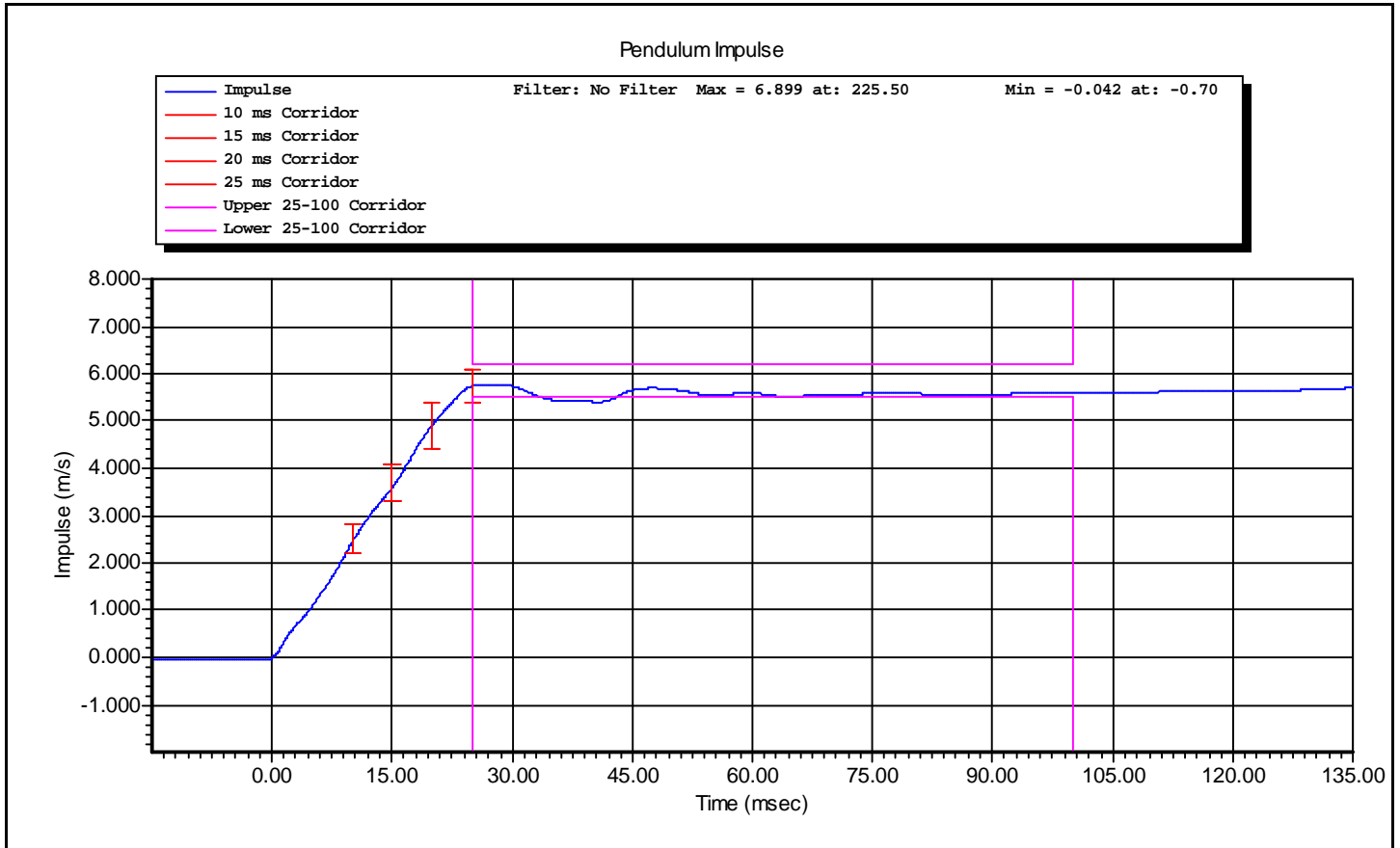
Component Part Number	Component Serial Number
Neck - 180-2001	AB8236



Test ID: **Neck Flexion**

Test Time: **1:26:20 PM**

Test Date: **6/1/2010**





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Shoulder	Test Date:	5/27/2010
Test Number:	1	Test Time:	9:41:40 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.70 deg C P
Humidity	10.0 -- 70.0	66.0 %RH P
Velocity	4.20 -- 4.40	4.34 m/s P
Probe Acceleration	13.0 -- 18.0	16.3 g P
Shoulder Deflection	28.0 -- 37.0	32.5 mm P
T1 Acceleration	17.0 -- 22.0	19.9 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
 Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **9:41:40 AM**

Test Date: **5/27/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-125	4/26/2010
Endevco	7264-2000	P16862	3/29/2010

Test ID: **Shoulder**

Test Time: **9:41:40 AM**

Test Date: **5/27/2010**



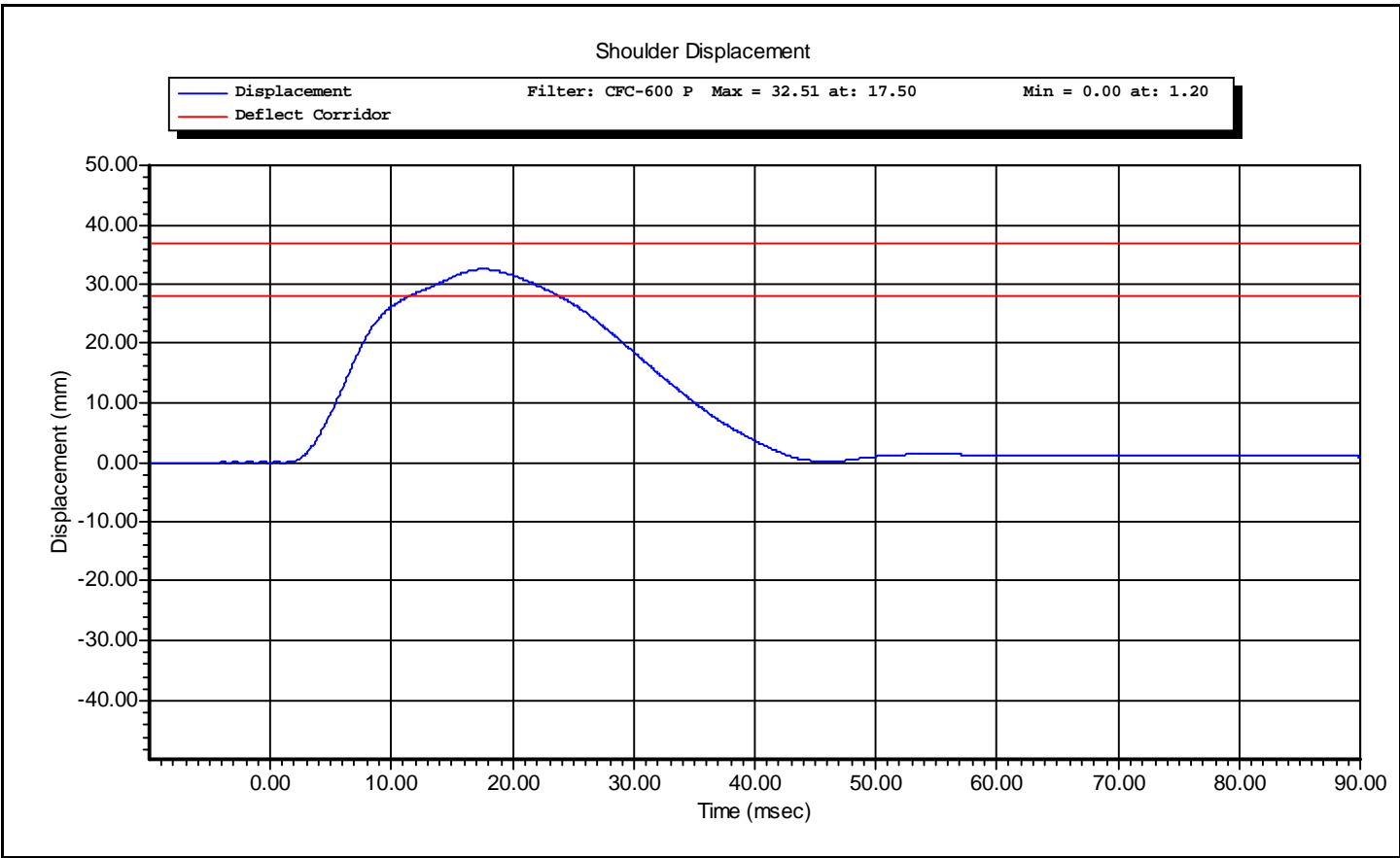
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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Shoulder	Test Date:	5/27/2010
Test Number:	1	Test Time:	9:41:40 AM

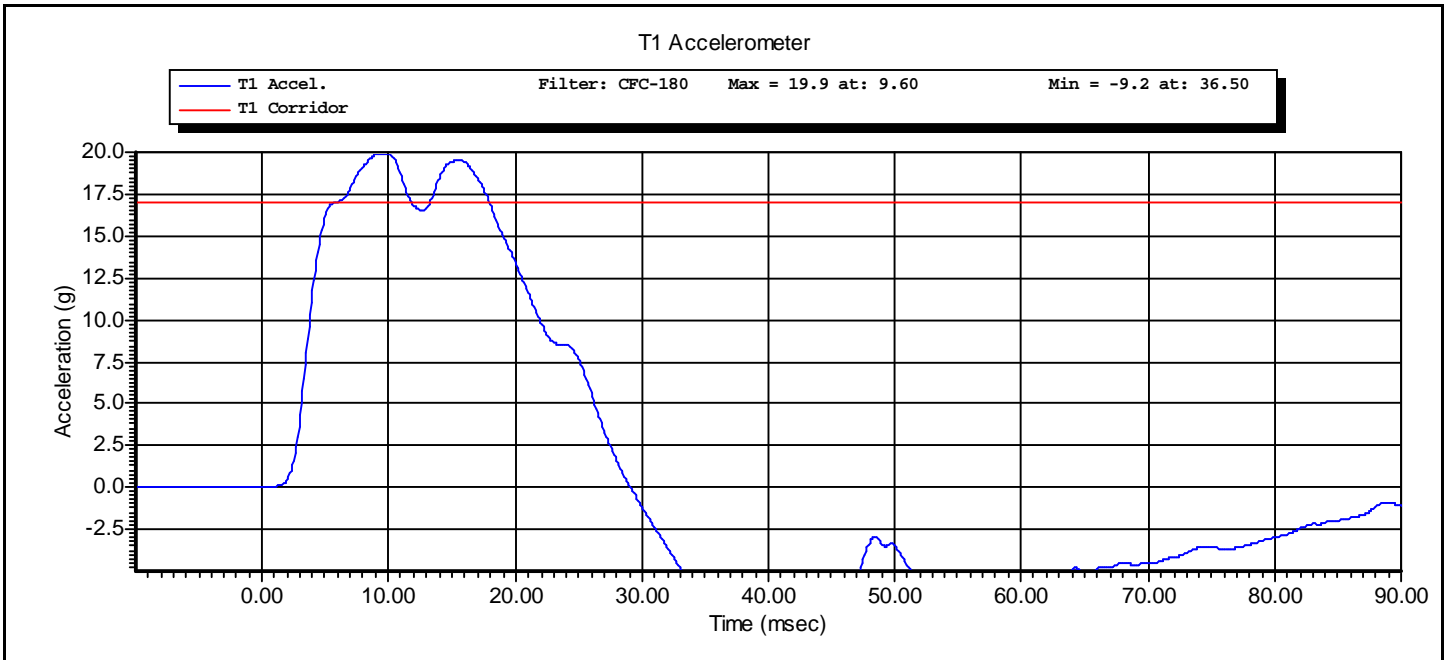
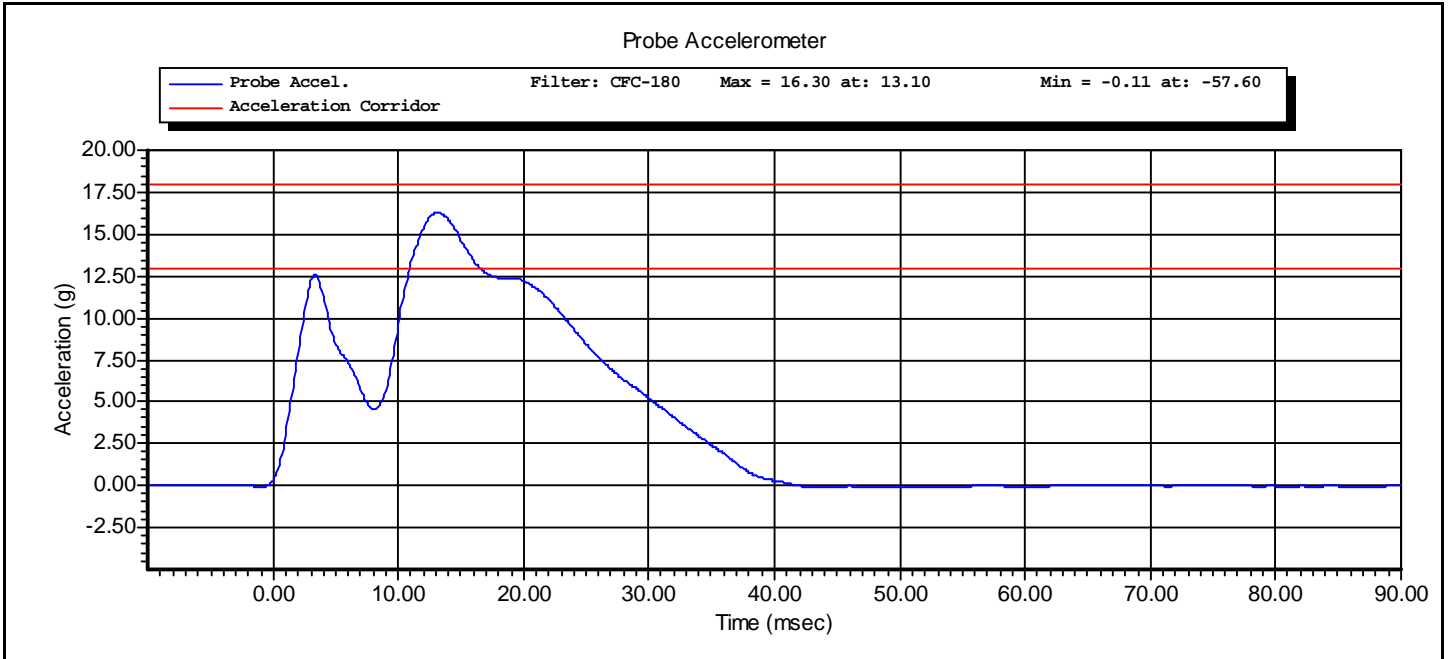
Component Part Number	Component Serial Number
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Test ID: **Shoulder**

Test Time: **9:41:40 AM**

Test Date: **5/27/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thorax With Arm	Test Date:	6/1/2010
Test Number:	1	Test Time:	10:12:47 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	66 %RH P
Velocity	6.60 -- 6.80	6.67 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	32.9 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	26.7 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	30.6 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	34.1 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	39.9 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	33.8 g P
Shoulder Deflection	31.0 -- 40.0	36.9 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax With Arm**

Test Time: **10:12:47 AM**

Test Date: **6/1/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-145	4/26/2010
Servo	180-3885	DS-222	4/26/2010
Servo	180-3885	DS-224	4/26/2010
Endevco	7264-2000	P16862	3/29/2010
Endevco	7264-2000	P23939	4/13/2010
Servo	180-3885	DS-125	4/26/2010

Test ID: **Thorax With Arm**

Test Time: **10:12:47 AM**

Test Date: **6/1/2010**



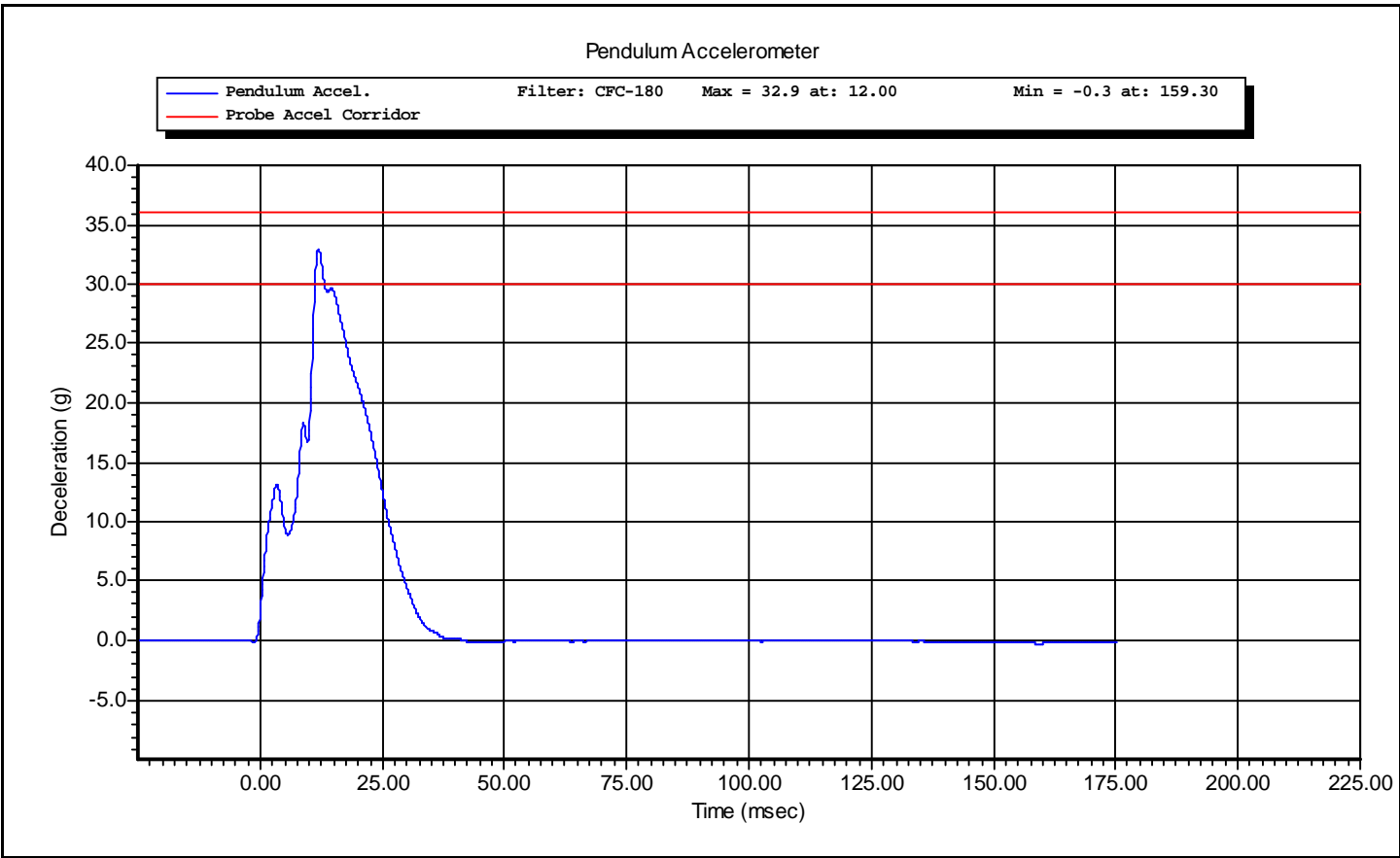
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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thorax With Arm	Test Date:	6/1/2010
Test Number:	1	Test Time:	10:12:47 AM

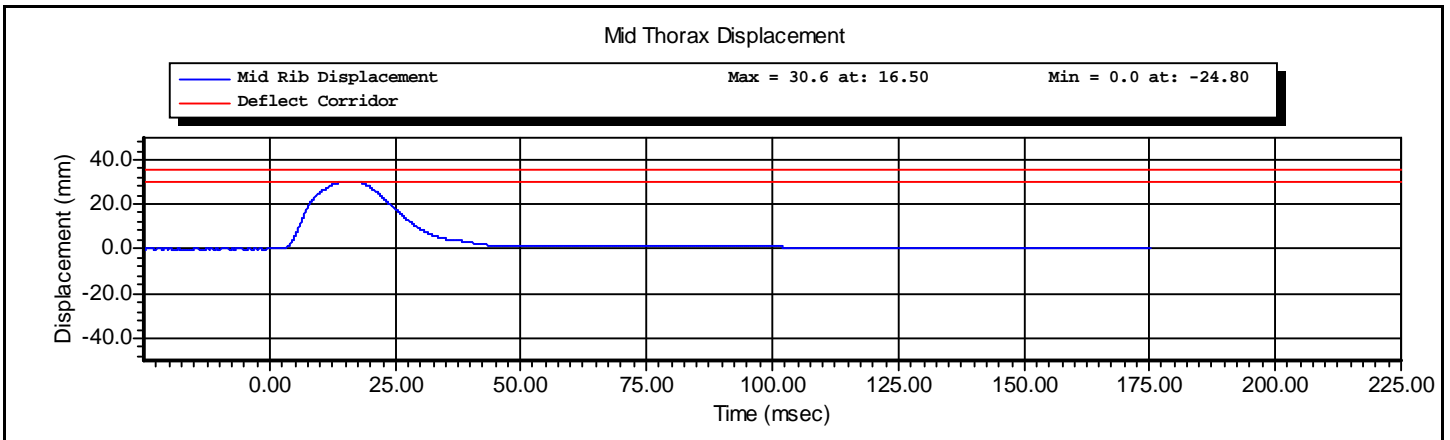
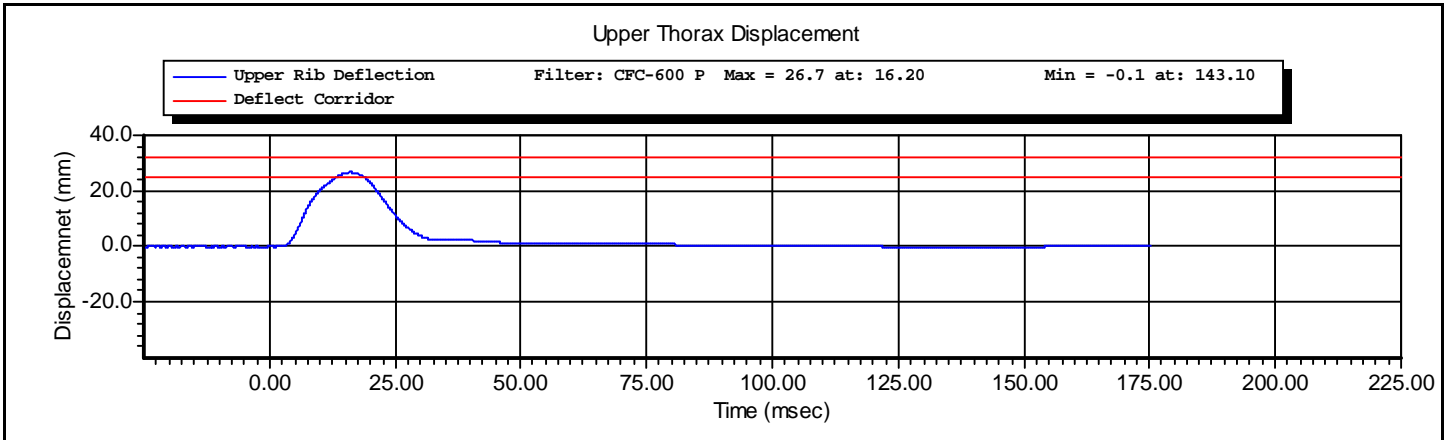
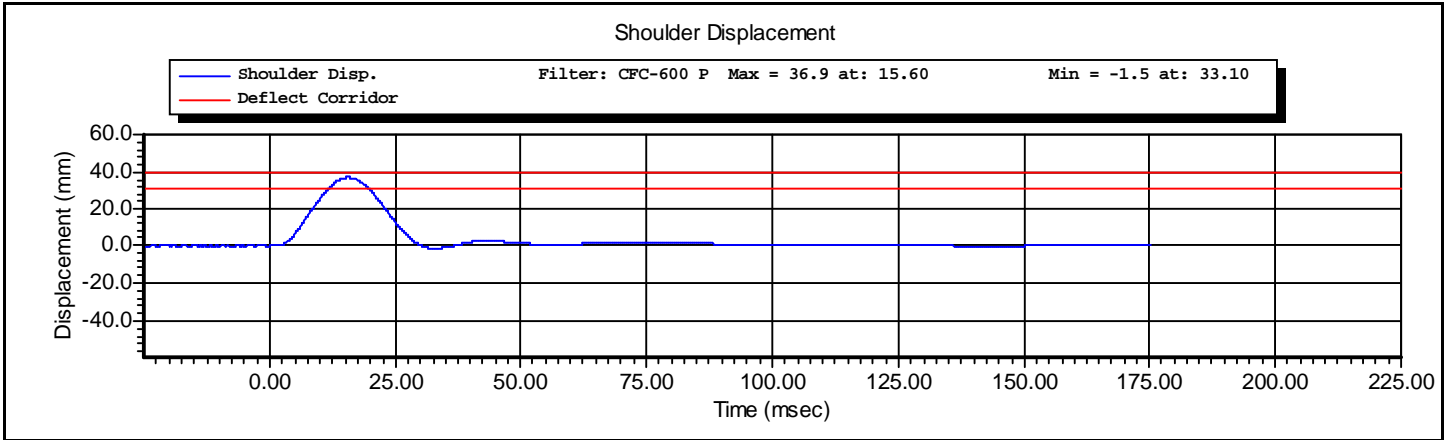
Component Part Number	Component Serial Number
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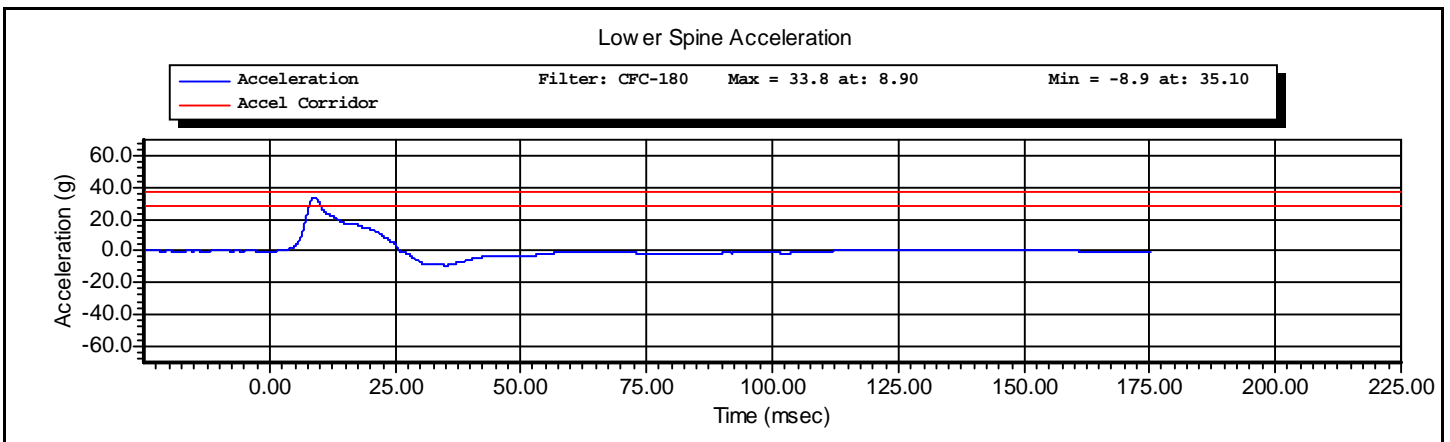
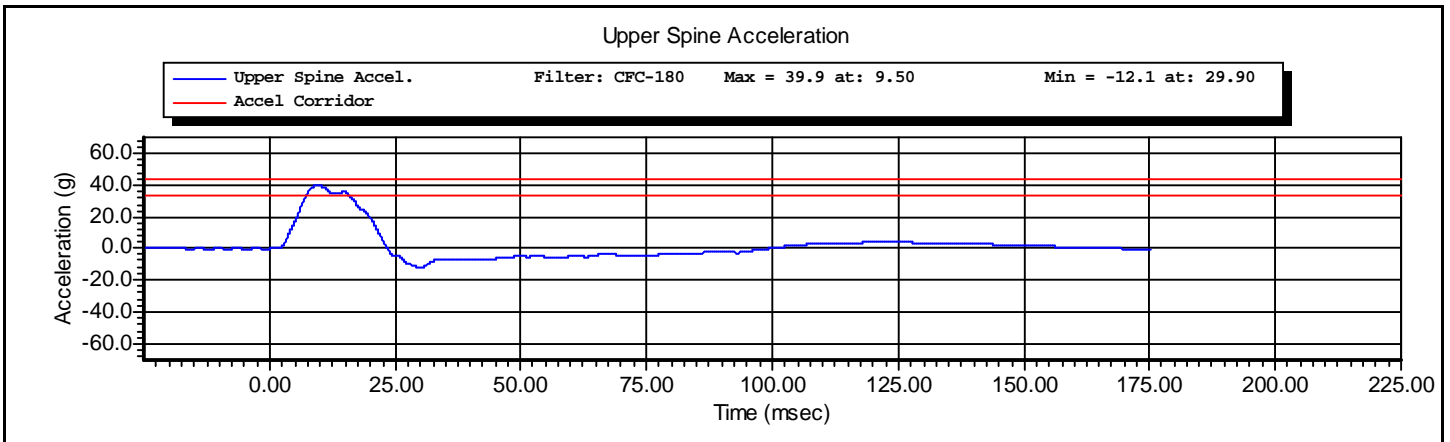
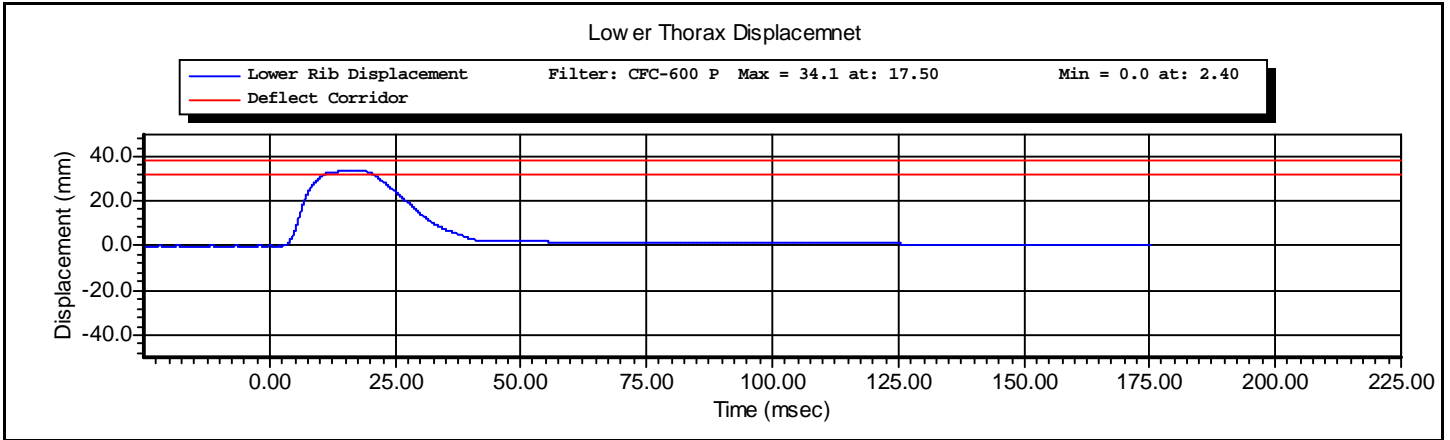


Test ID: **Thorax With Arm**

Test Time: **10:12:47 AM**

Test Date: **6/1/2010**







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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thorax Without Arm	Test Date:	6/1/2010
Test Number:	1	Test Time:	9:37:55 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	66 %RH P
Velocity	4.20 -- 4.40	4.39 m/s P
Probe Acceleration	14.0 -- 18.0	16.7 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	35.7 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	41.0 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	39.7 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	16.0 g P
Lower Spine Acceleration T12	7.0 -- 11.0	10.2 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Without Arm** Test Time: **9:37:55 AM**

Test Date: **6/1/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-145	4/26/2010
Servo	180-3885	DS-222	4/26/2010
Servo	180-3885	DS-224	4/26/2010
Endevco	7264-2000	P16862	3/29/2010
Endevco	7264-2000	P23939	4/13/2010

Test ID: **Thorax Without Arm** Test Time: **9:37:55 AM**

Test Date: **6/1/2010**



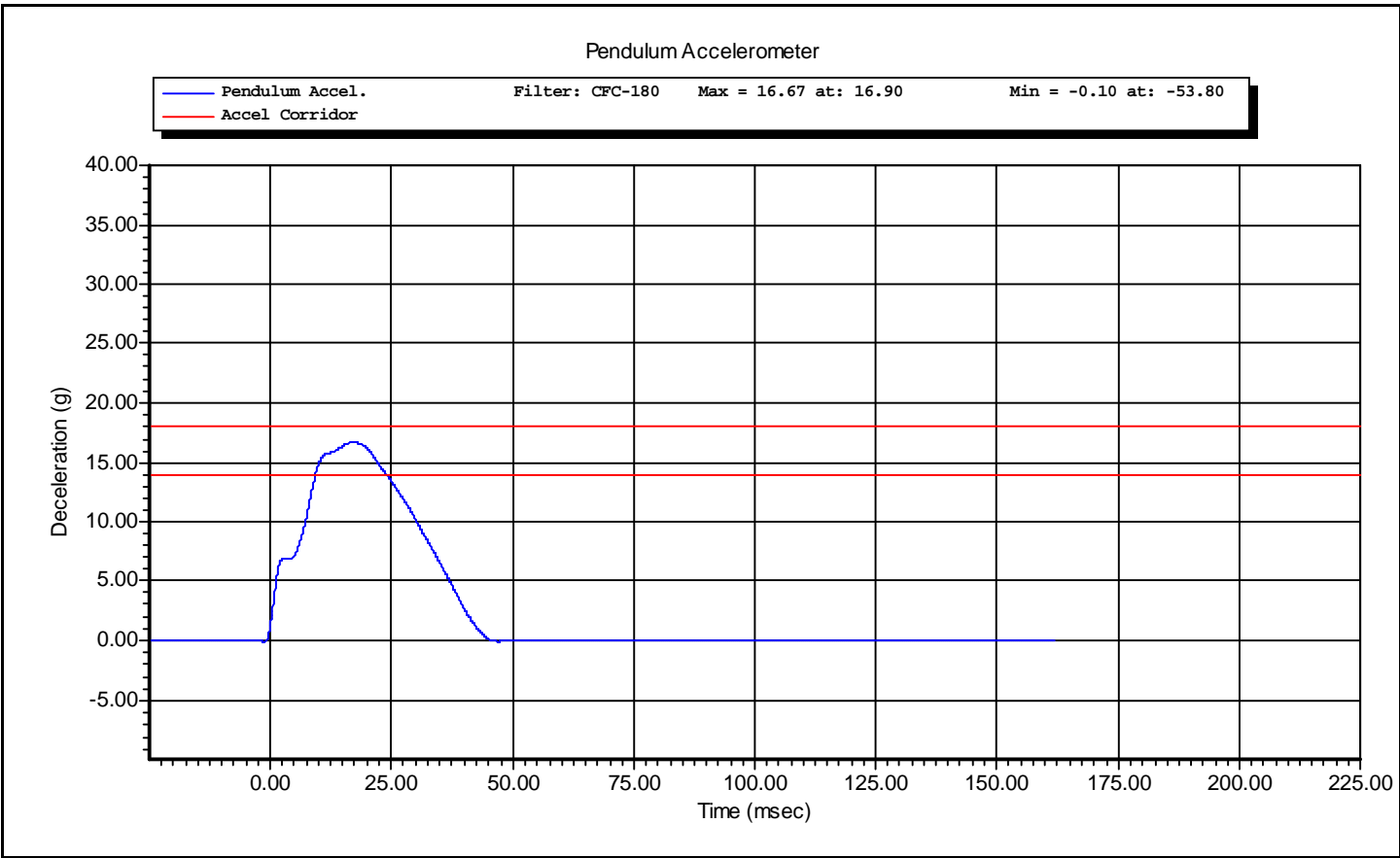
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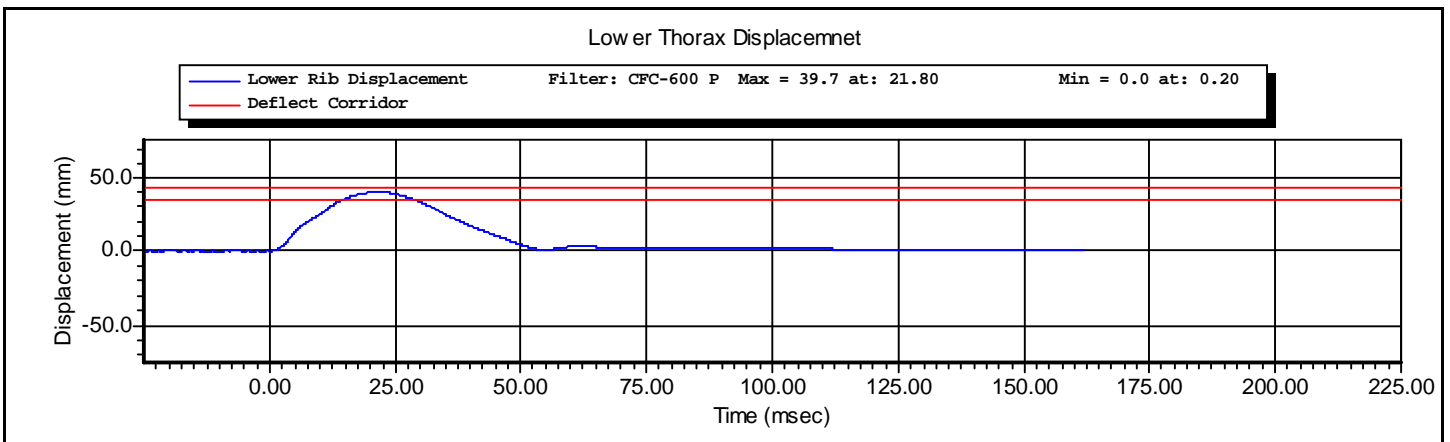
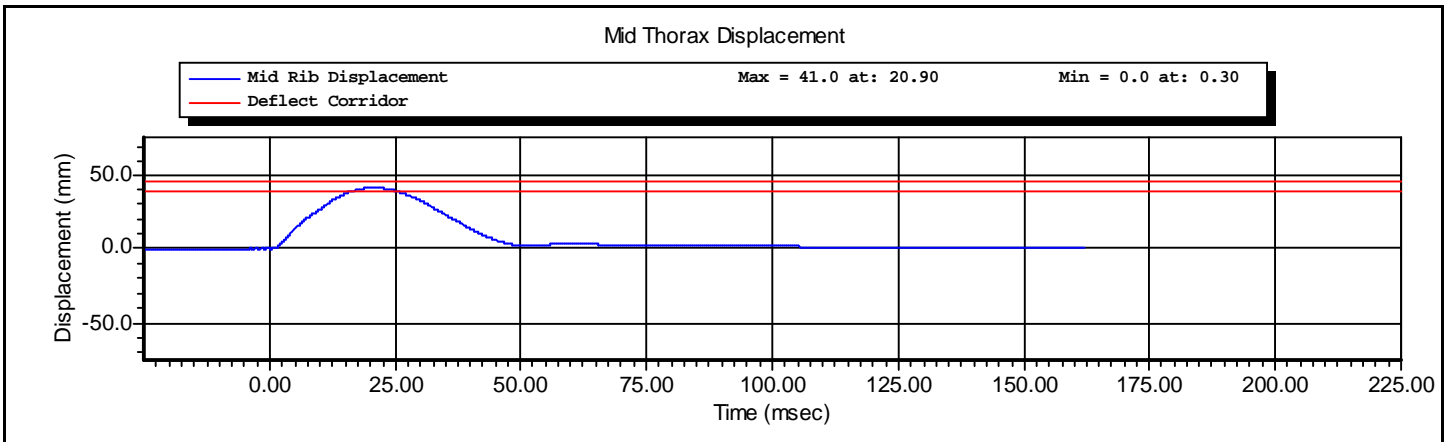
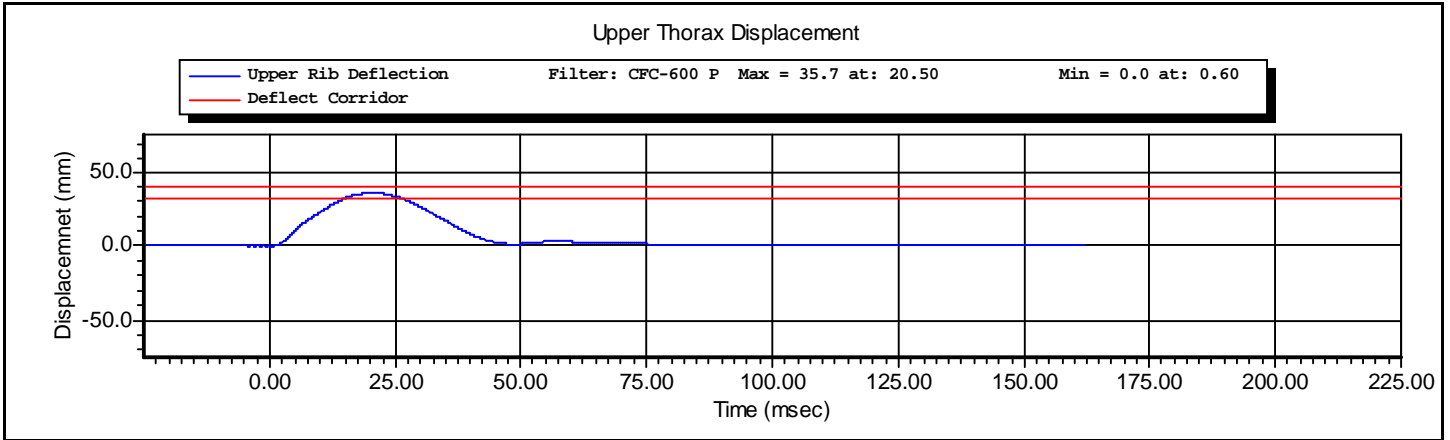
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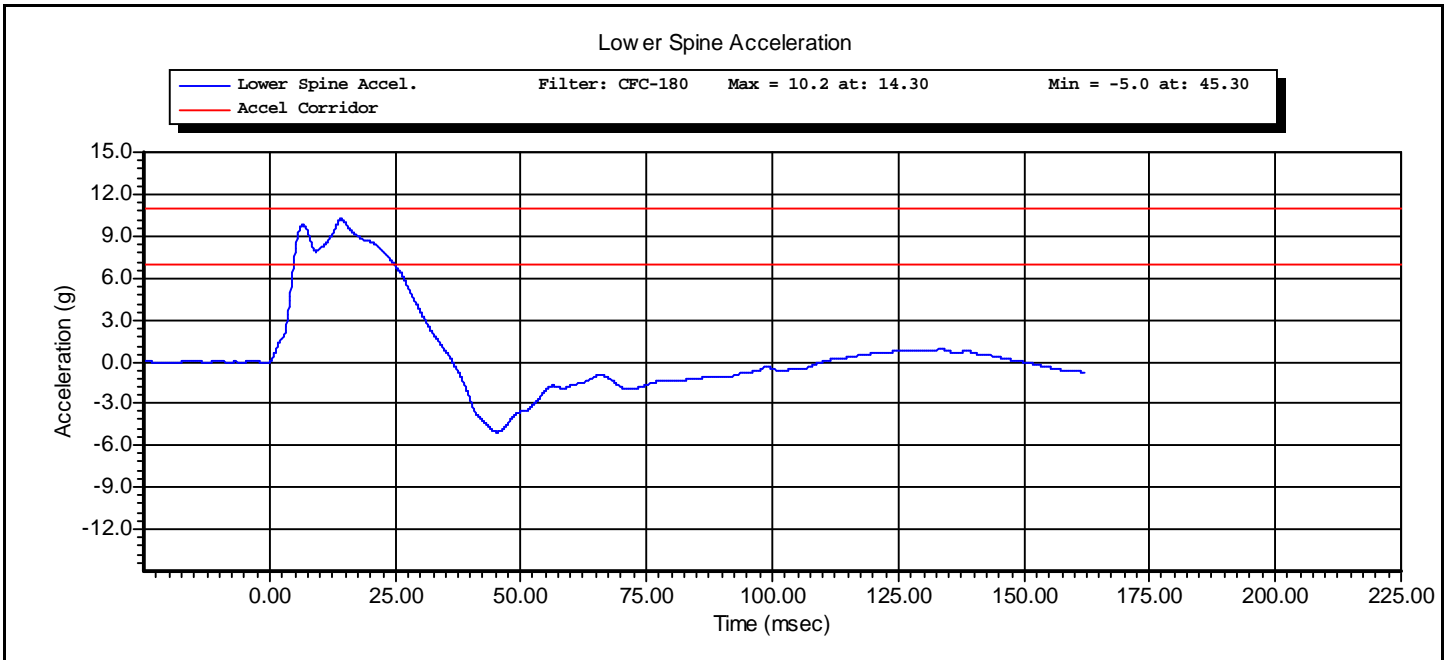
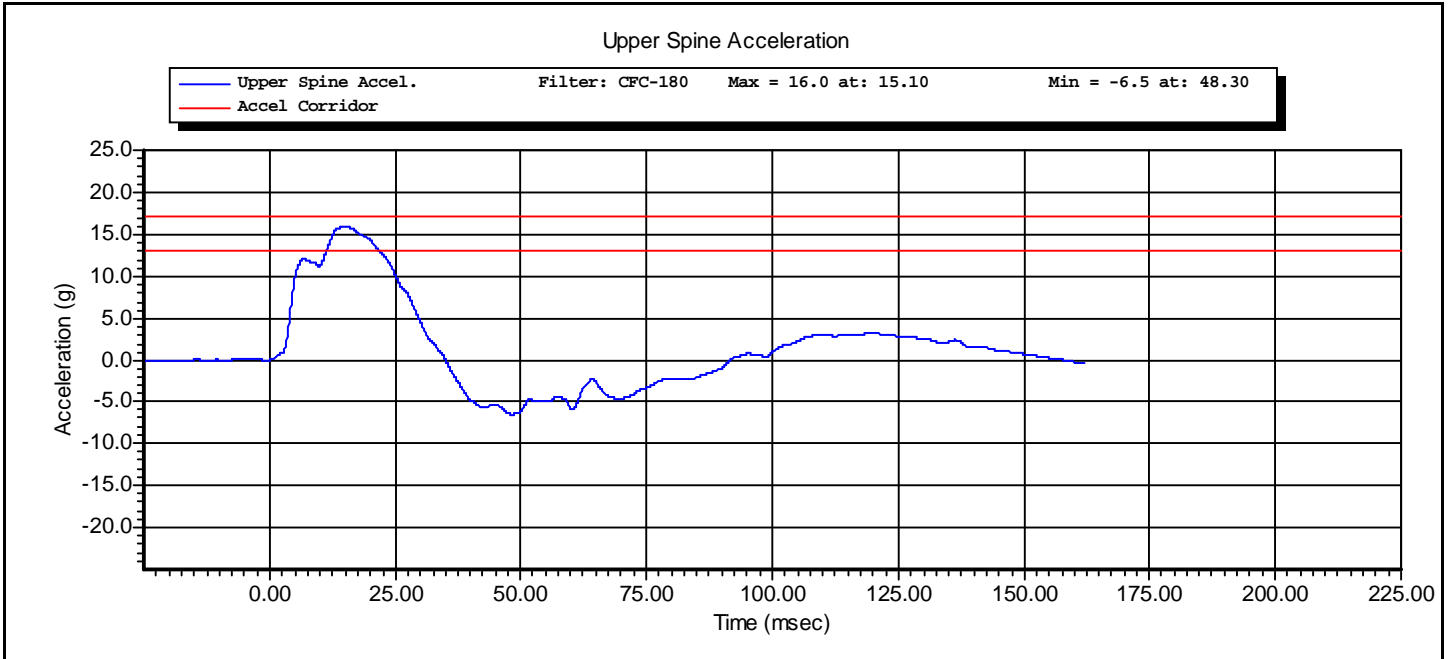
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Thorax Without Arm	Test Date:	6/1/2010
Test Number:	1	Test Time:	9:37:55 AM

Component Part Number	Component Serial Number
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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Abdominal Impact	Test Date:	6/1/2010
Test Number:	2	Test Time:	11:34:16 AM

Component Part Number	Component Serial Number
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Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	66 %RH P
Velocity	4.20 -- 4.40	4.40 m/s P
Probe Acceleration	12.0 -- 16.0	14.3 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	43.1 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	39.9 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	11.6 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Abdominal Impact** Test Time: **11:34:16 AM** Test Date: **6/1/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Servo	180-3885	DS-225	4/26/2010
Servo	180-3885	DS-230	4/26/2010
Endevco	7264-2000	P23939	4/13/2010

Test ID: **Abdominal Impact** Test Time: **11:34:16 AM**

Test Date: **6/1/2010**



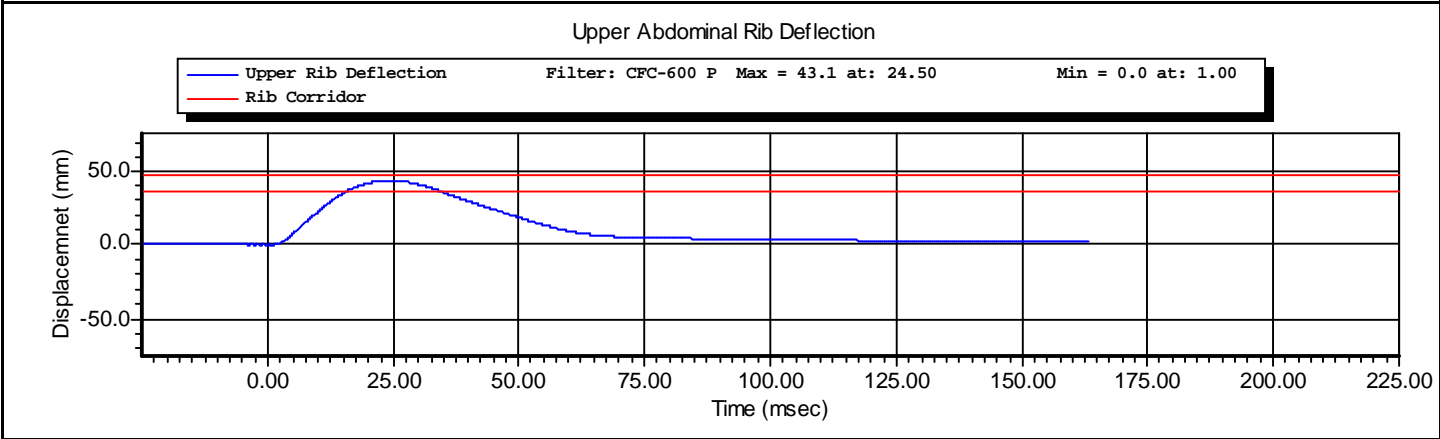
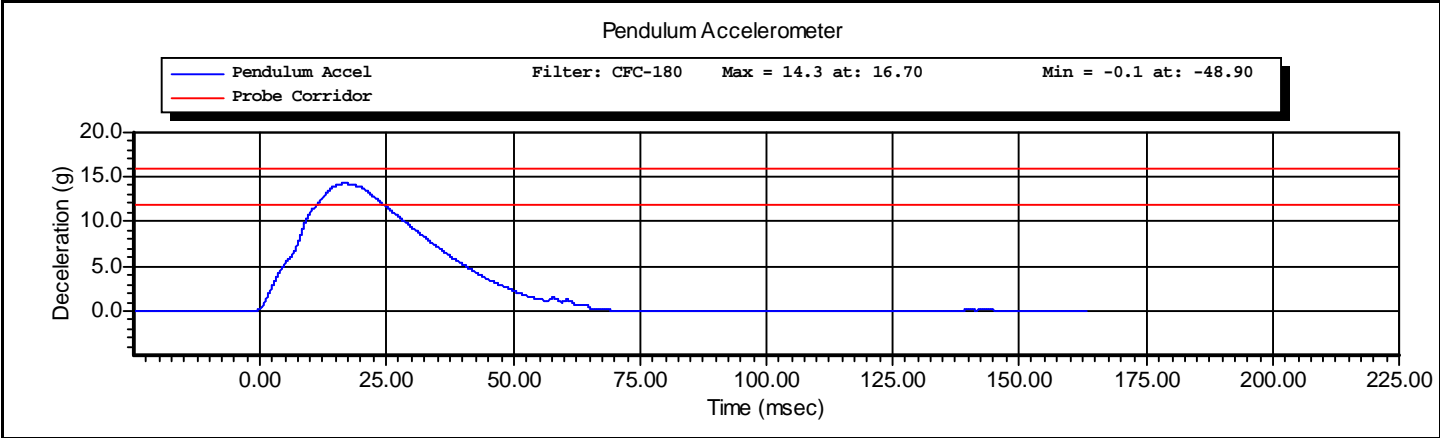
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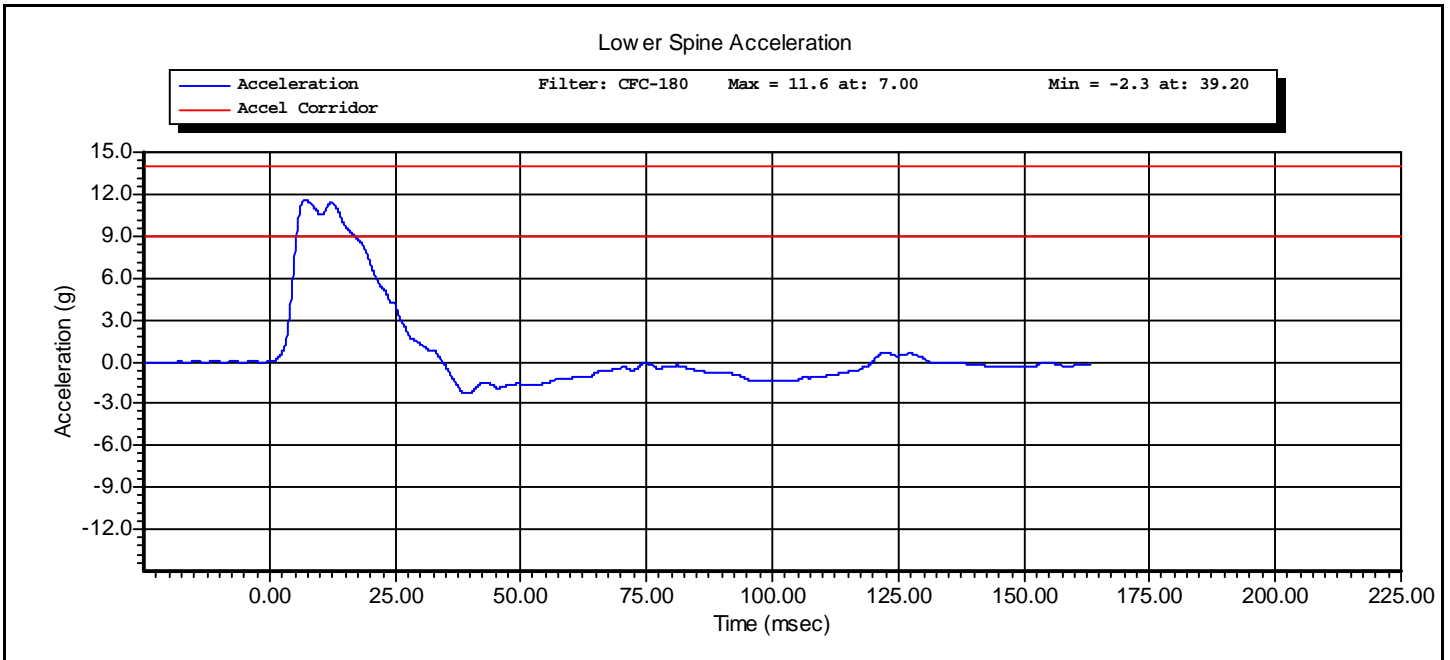
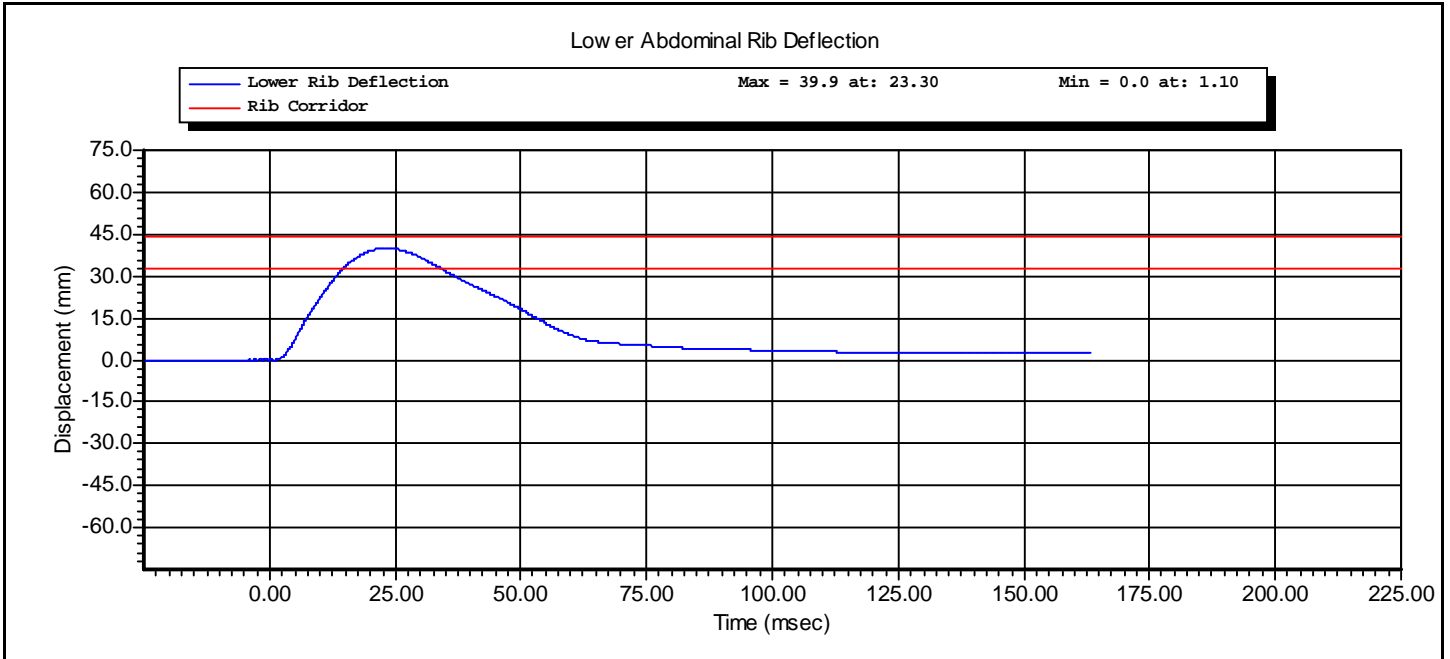
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Abdominal Impact	Test Date:	6/1/2010
Test Number:	2	Test Time:	11:34:16 AM

Component Part Number	Component Serial Number
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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Acetabulum Pelvis	Test Date:	5/27/2010
Test Number:	1	Test Time:	9:10:18 AM

Component Part Number	Component Serial Number
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Comments:

Pelvis Plug Used for Certification:
 FTSS S/N 12804
 Force @ 3mm = 1535N

Pelvis Plug Used for Full Scale Test:
 FTSS S/N 12817
 Force @ 3mm = 1527N

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	66 %RH P
Velocity	6.60 -- 6.80	6.68 m/s P
Peak Probe Acceleration	38.0 -- 47.0	41.9 g P
Peak Pelvis Acceleration	34.0 -- 42.0	36.1 g P
Peak Acetabulum Force	3.60 -- 4.30	4.03 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Acetabulum Pelvis** Test Time: **9:10:18 AM**

Test Date: **5/27/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Endevco	7264-2000	P35793	2/24/2010
DentonATD	IF-520	LC-115 Fy	4/26/2010

Test ID: **Acetabulum Pelvis** Test Time: **9:10:18 AM**

Test Date: **5/27/2010**



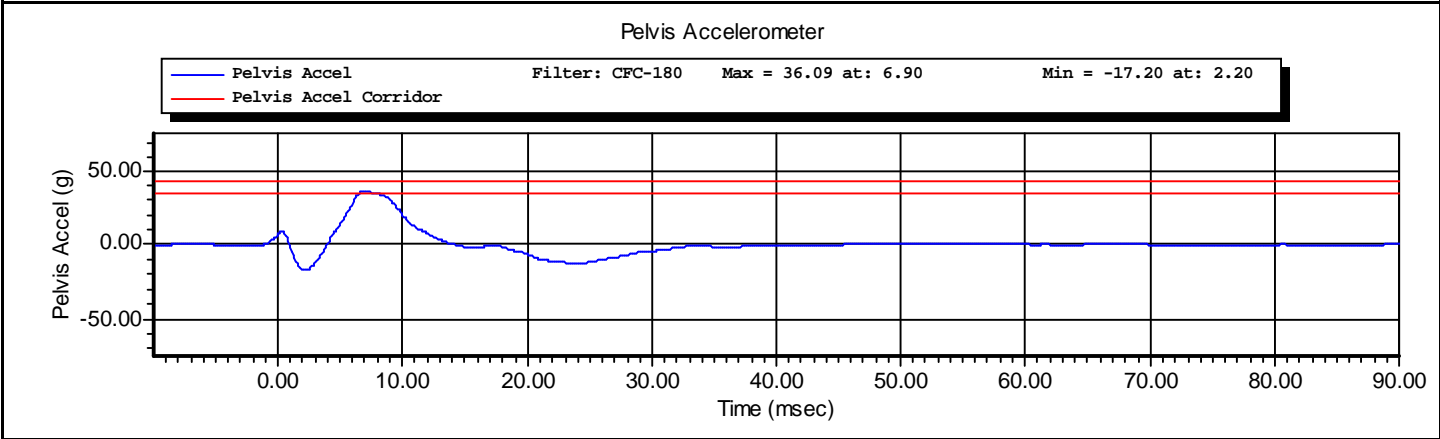
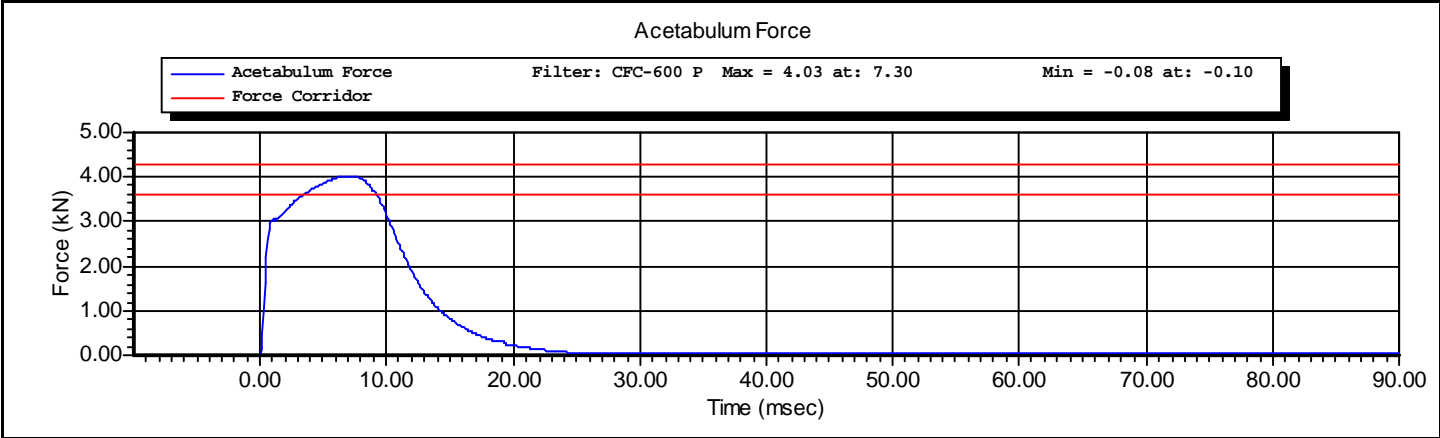
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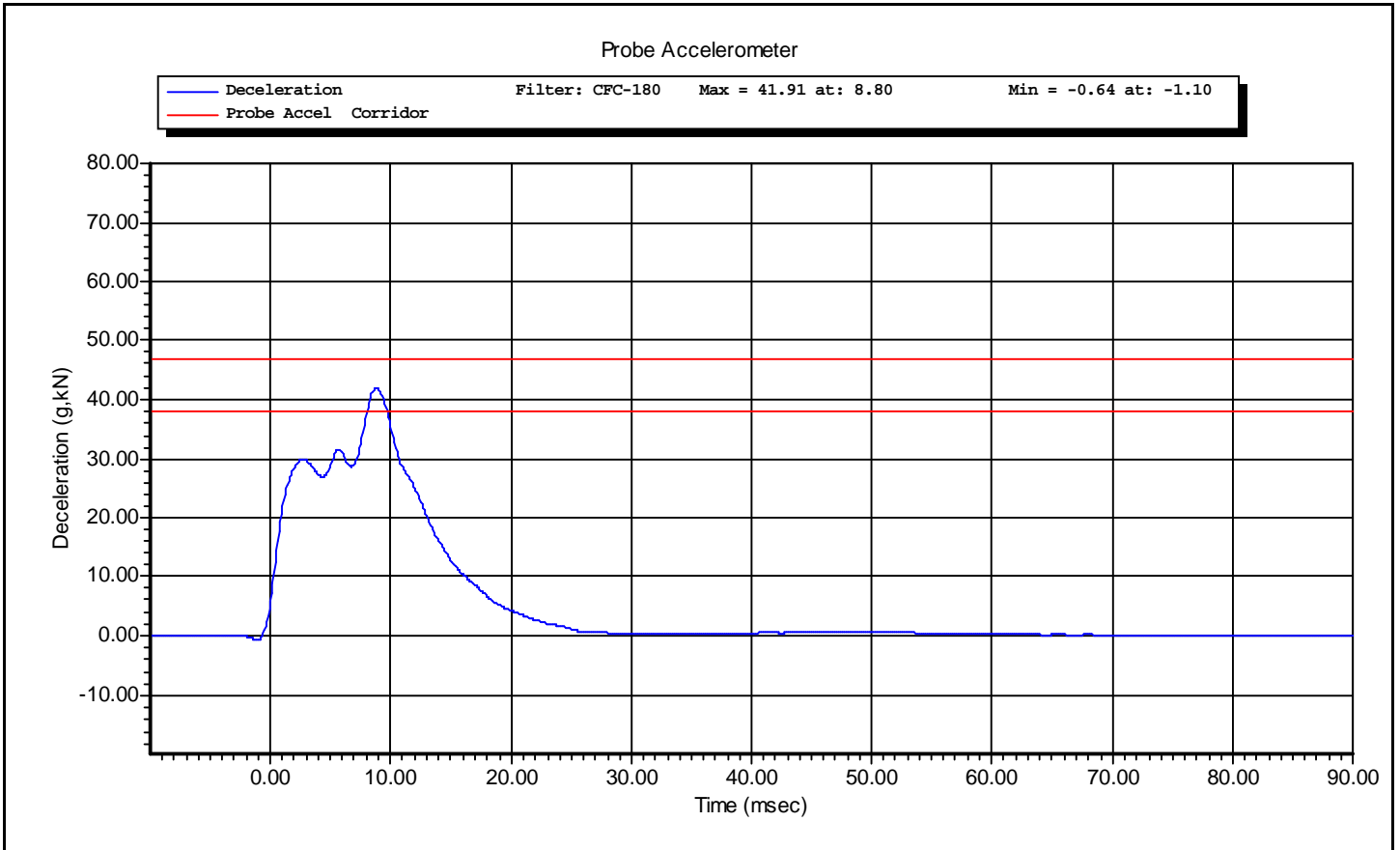
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Acetabulum Pelvis	Test Date:	5/27/2010
Test Number:	1	Test Time:	9:10:18 AM

Component Part Number	Component Serial Number
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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Illiic Pelvis	Test Date:	5/27/2010
Test Number:	1	Test Time:	8:29:59 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	66 %RH P
Velocity	4.20 -- 4.40	4.22 m/s P
Peak Probe Acceleration	36.0 -- 45.0	40.4 g P
Peak Pelvis Acceleration	28.0 -- 39.0	37.4 g P
Peak Iliac Force	4.10 -- 5.10	4.55 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D Travale** Signature: _____

Test ID: **Illiic Pelvis**

Test Time: **8:29:59 AM**

Test Date: **5/27/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Endevco	7264-2000	P35793	2/24/2010
DentonATD	3228J	LC-290 Fy	4/26/2010

Test ID: **Illiac Pelvis**

Test Time: **8:29:59 AM**

Test Date: **5/27/2010**



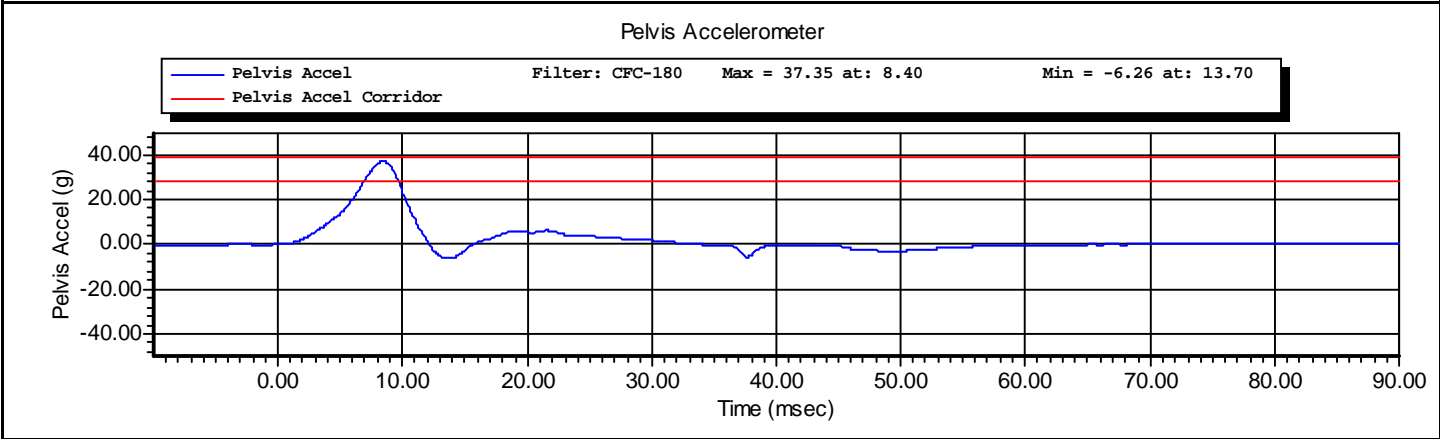
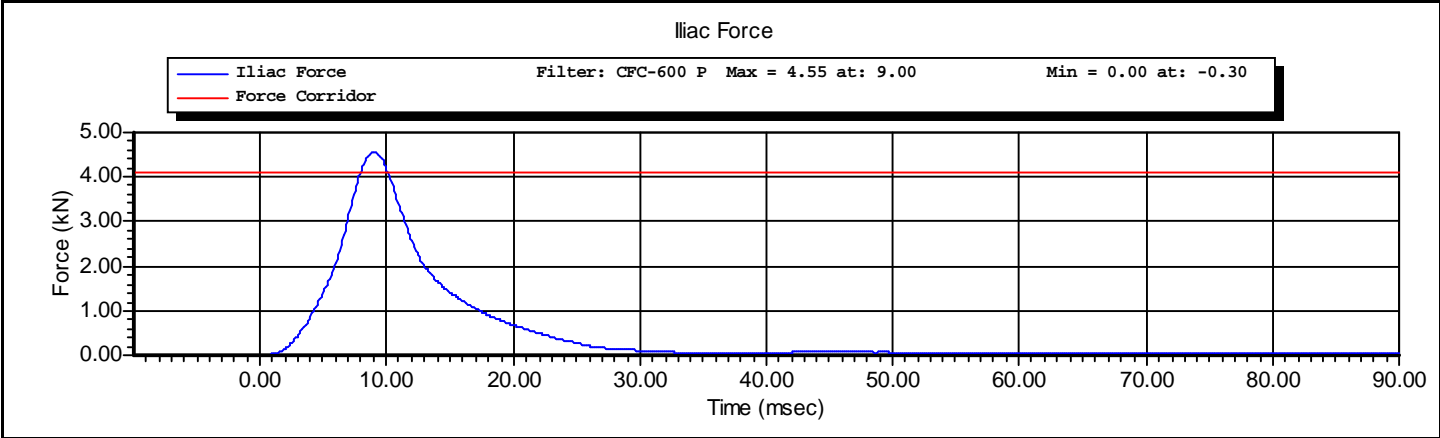
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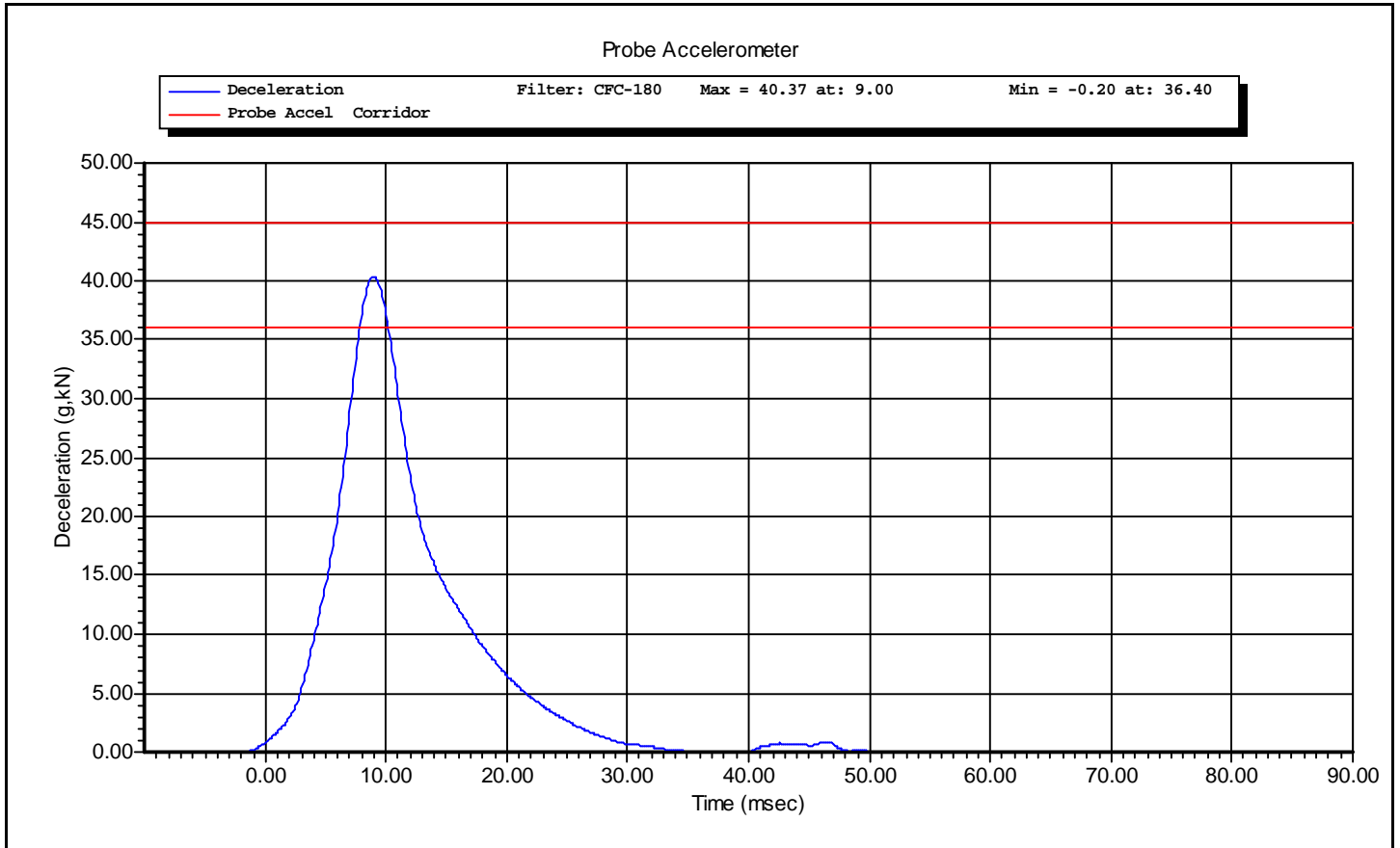
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 224		
Test ID:	Illiic Pelvis	Test Date:	5/27/2010
Test Number:	1	Test Time:	8:29:59 AM

Component Part Number	Component Serial Number
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APPENDIX G
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY INSTRUMENTATION

		FRONT ES-2re NO.: 037		
		SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Head Accelerometers	X	AC-P18639	ENDEVCO	25-Jan-10
	Y	AC-P23128	ENDEVCO	25-Jan-10
	Z	AC-P16591	ENDEVCO	25-Jan-10
Head Accelerometers	X (Redundant)	AC-J45479	ENDEVCO	22-Jan-10
	Y (Redundant)	AC-P32453	ENDEVCO	25-Jan-10
	Z (Redundant)	AC-P22639	ENDEVCO	25-Jan-10
Thorax Potentiometers	Upper Rib (Y)	DS-0552-01	Honeywell	11-Jan-10
	Middle Rib (Y)	DS-0807	Honeywell	11-Jan-10
	Lower Rib (Y)	DS-0552-3	Honeywell	11-Jan-10
Abdomen Load Cells	Forward (Y)	LC-1507Fy	DENTON	07-Jan-10
	Middle (Y)	LC-1508Fy	DENTON	07-Jan-10
	Rear (Y)	LC-1509Fy	DENTON	07-Jan-10
Pubic Symphysis Load Cell (Y)		LC-458Fy	DENTON	07-Jan-10

		REAR SID-IIs NO.: 224		
		SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Head Accelerometers	X	AC-P23142	ENDEVCO	12-Feb-10
	Y	AC-P16593	ENDEVCO	12-Feb-10
	Z	AC-P32219	ENDEVCO	12-Feb-10
Head Accelerometers	X (Redundant)	AC-P16289	ENDEVCO	12-Feb-10
	Y (Redundant)	AC-P15736	ENDEVCO	12-Feb-10
	Z (Redundant)	AC-P35786	ENDEVCO	22-Jan-10
Lower Spine Accelerometers (T12)	X	AC-P23993	ENDEVCO	13-Apr-10
	Y	AC-P23939	ENDEVCO	13-Apr-10
	Z	AC-P17283	ENDEVCO	13-Apr-10
Acetabulum Load Cell (Y)		LC-115Fy	Denton	26-Apr-10
Iliac Wing Load Cell (Y)		LC-290Fy	DENTON	26-Apr-10

REMARKS: None

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

VEHICLE INSTRUMENTATION	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT SILL at FRONT SEAT(X)	AC-P32276	ENDEVCO	25-Jan-10
RIGHT SILL at FRONT SEAT (Y)	AC-P32217	ENDEVCO	25-Jan-10
RIGHT SILL at FRONT SEAT (Z)	AC-P32225	ENDEVCO	25-Jan-10
RIGHT SILL at REAR SEAT (X)	AC-P19363	ENDEVCO	26-Jan-10
RIGHT SILL at REAR SEAT (Y)	AC-P23176	ENDEVCO	26-Jan-10
RIGHT SILL at REAR SEAT (Z)	AC-P17457	ENDEVCO	26-Jan-10
REAR FLOORPAN ABOVE AXLE (X)	AC-P26262	ENDEVCO	02-Feb-10
REAR FLOORPAN ABOVE AXLE (Y)	AC-P21373	ENDEVCO	02-Feb-10
REAR FLOORPAN ABOVE AXLE (Z)	AC-P23957	ENDEVCO	02-Feb-10
LEFT SILL at REAR DOOR (Y)	AC-P18728	ENDEVCO	04-Dec-09
LEFT SILL at FRONT DOOR (Y)	AC-P15526	ENDEVCO	22-Jan-10
RIGHT REAR OCCUPANT COMP. (Y)	AC-P23926	ENDEVCO	29-Mar-10
LOWER LEFT B- PILLAR (Y)	AC-P24145	ENDEVCO	11-Feb-10
MIDDLE LEFT B-PILLAR (Y)	AC-P35798	ENDEVCO	25-Jan-10
LOWER LEFT A-PILLAR (Y)	AC-P18528	ENDEVCO	22-Jan-10
MIDDLE LEFT A-PILLAR (Y)	AC-APF89	ENDEVCO	04-Dec-09
FRONT SEAT TRACK (Y)	AC-P26269	ENDEVCO	06-Apr-10
REAR SEAT TRACK or STRUCTURE (Y)	AC-P18743	ENDEVCO	04-Dec-09
VEHICLE CG (X)	AC-P35803	ENDEVCO	29-Mar-10
VEHICLE CG (Y)	AC-P35811	ENDEVCO	29-Mar-10
VEHICLE CG (Z)	AC-P35789	ENDEVCO	29-Mar-10
MDB INSTRUMENTATION			
MDB CG (X)	AC-C16680	ENDEVCO	09-Dec-09
MDB CG (Y)	AC-C14948	ENDEVCO	09-Dec-09
MDB CG (Z)	AC-CP30	ENDEVCO	09-Dec-09
MDB REAR (X)	AC-C15007	ENDEVCO	09-Dec-09
MDB REAR (Y)	AC-C16499	ENDEVCO	09-Dec-09

REMARKS: None