

**REPORT NUMBER: 214MDB-CAL-10-1**

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

**CHRYSLER GROUP LLC  
2010 DODGE JOURNEY SE  
5-DOOR HATCHBACK**

**NHTSA NUMBER: CA0300**

**PREPARED BY:  
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P.O. BOX 400  
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**Test Date: May 11, 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 4<sup>TH</sup> FLOOR  
1200 NEW JERSEY AVENUE, SE  
WASHINGTON, DC 20590**

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**Technical Report Documentation Page**

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16. Abstract		14. Sponsoring Agency Code NVS-220																						
<p>A 48/24 km/h 90° (Moving Deformable Barrier) Compliance Test was conducted on the subject 2010 Dodge Journey SE 5-Door Hatchback 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 11, 2010.</p> <p>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 150 mm at level 3. The test vehicle's occupant performance is as follows:</p>																								
<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">52.5</td> <td align="center">112.7</td> </tr> <tr> <td>Max. Rib Deflection (mm)</td> <td align="center">15.8</td> <td></td> </tr> <tr> <td>Sum of Abdomen Forces (N)</td> <td align="center">876.0</td> <td></td> </tr> <tr> <td>Pubic Symphysis (N)</td> <td align="center">812.3</td> <td></td> </tr> <tr> <td>Spine (g's)</td> <td></td> <td align="center">41.8</td> </tr> <tr> <td>Sum of Acetabular and Iliac</td> <td></td> <td align="center">3794.4</td> </tr> </tbody> </table>					DRIVER	PASS.	HIC	52.5	112.7	Max. Rib Deflection (mm)	15.8		Sum of Abdomen Forces (N)	876.0		Pubic Symphysis (N)	812.3		Spine (g's)		41.8	Sum of Acetabular and Iliac		3794.4
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<p>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.</p>																								
17. Key Words Compliance Testing Side Impact Protection MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: NHTSA Technical Information Services National Highway Traffic Safety Admin. 1200 New Jersey Avenue, SE Washington, DC 20590																						
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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 Dodge Journey SE 5-Door Hatchback. 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 Dodge Journey SE 5-Door Hatchback 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 11, 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:

<b>Driver ES-2re Male Dummy</b>		
HIC	52.5	
UPPER RIB DEFLECTION	13.3	mm
MIDDLE RIB DEFLECTION	13.4	mm
LOWER RIB DEFLECTION	15.8	mm
ABDOMEN (FRONT)	240.0	N
ABDOMEN (MID)	364.8	N
ABDOMEN (REAR)	358.3	N
SUM OF ABDOMEN FORCES	876.0	N
PUBIC SYMPHYSIS	812.3	N

<b>Passenger SID-IIs Female Dummy</b>		
HIC	112.7	
MAX. SPINE ACCELERATION	39.2	g
SPINE X	-12.7	g
SPINE Y	39.2	g
SPINE Z	10.7	g
SPINE RESULTANT	41.8	g
ACETABULAR	3275.6	N
ILIAC	688.7	N
SUM	3794.4 N @ 48.3 ms	

## SECTION 2

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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

Vehicle Information		Options	
Make	Chrysler Group LLC	ESC	Yes
Model	Journey SE	All-Wheel Drive	No
Body Style	5-Door Hatchback	Power Steering	Yes
VIN	3D4PG4FB9AT119859	Tilt Steering Wheel	Yes
Body Color	Silver	Driver Side Curtain Airbag	Yes
Engine Disp (liters)	2.4	Driver Side Torso Airbag	Yes
# of Cylinders	4	Driver Combo Bag	No
Engine Placement	Lateral	Driver Seat Belt Pretensioners	Yes
Transmission Type	Automatic	Driver Seat Belt Load Limiters	Yes
Transmission Speeds	4	Driver Power Seats	Yes
Overdrive	Yes	Rear Pass. Curtain Airbag	Yes
Final Drive	Front	Rear Pass. Side Torso Airbag	No
Odometer Reading	94 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?	No
		Anti-Lock Brakes	Yes

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Chrysler Group LLC	GVWR (kg)	2271
		GAWR Front (kg)	1248
Date of Manufacture	9/09	GAWR Rear (kg)	1316

**VEHICLE CAPACITY DATA**

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				408.0
Cargo Wt. (RCLW) (kg)				67.8



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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

**TIRE PRESSURES**

	Units	LF	RF	RR	LR
As Delivered	kpa	220	220	220	220
As Tested	Kpa	220	220	220	220

**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	510.0	373.0		546.0	464.0		547.5	455.0	
Right	kg	465.0	367.0		476.0	422.0		475.0	428.0	
Ratio	%	56.9	43.1		53.6	46.4		53.7	46.3	
Totals	kg	975.0	740.0	1715.0	1022.0	886.0	1908.0	1022.5	883.0	1905.5

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1715.0
Weight of one P572U and one P572V ATD	kg	129.3
Rated Cargo/Luggage Weight (RCLW)	kg	67.8
Calculated Vehicle Target Weight (TVTW)	kg	1912.1

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

Weight of Ballast (including instrumentation package and cameras): 61.2 kg

**WEIGHT of BALLAST and VEHICLE COMPONENTS REMOVED TO MEET TVTW**

Description of Component	Weight (kg)
Ballast (if any)	45.4

**TEST VEHICLE ATTITUDES**

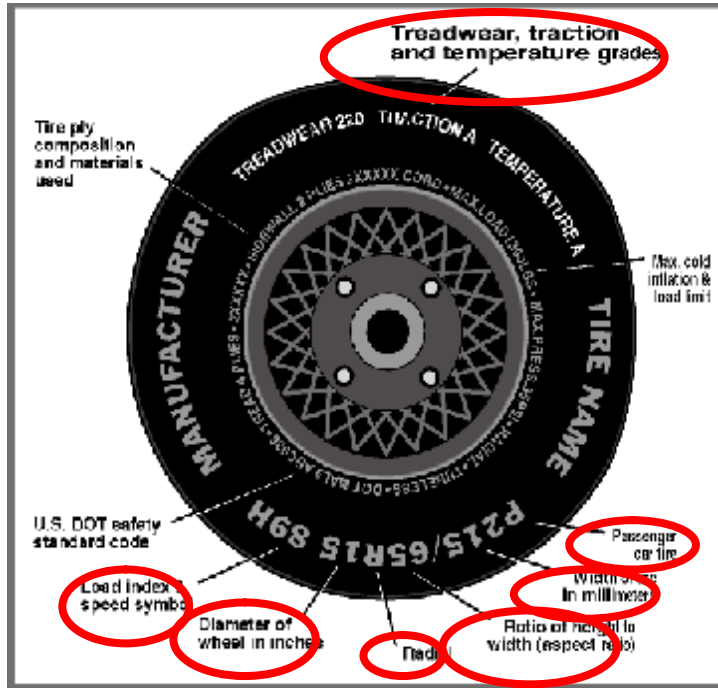
	Units	LF	RF	LR	RR
Fully Loaded	mm	795	803	790	798
As Tested	mm	798	805	791	802
DIFF Δ	mm	-3	-2	-1	-4

**TEST VEHICLE VERTICAL IMPACT LINE AND CG**

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2896
Target Vertical Impact Reference Line Aft of Front Axle	mm	508
Actual Vertical Impact Reference Line Aft of Front Axle	mm	519

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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010



**DATA FROM TIRE PLACARD**

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P225/70R16	P225/70R16
Tire Size on Vehicle	P225/70R16	P225/70R16
Tire Manufacturer	Hankook	Hankook
Tire Name	DynaPro HP	DynaPro HP
Tire Type	Passenger	Passenger
Tire Width (mm)	225	225
Ratio of Height to Width (aspect ratio)	70	70
Radial	Yes	Yes
Wheel Diameter	16	16
Load Index & Speed Symbol	101T	101T
Treadwear	-	-
Traction Grade	-	-
Temperature Grade	-	-

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

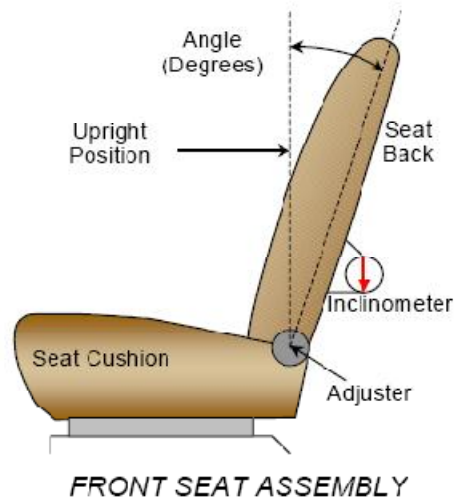
Test Vehicle: 2010 Dodge Journey SE  
 Test Program: FMVSS 214 Side Impact

NHTSA No. CA0300  
 Test Date: May 11, 2010

**NORMAL DESIGN RIDING POSITION**

**Driver seat:**  
 An inclinometer was placed on the head restraint post and the seat was positioned 16 degrees rearward of the forward-most locked position with the ATD not in seat.

**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.



<b>SEAT BACK ANGLES</b>	
	Degrees
Driver w/ Seated Dummy	19.7
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 was placed in the most rearward fore/aft position. The rear seat did not have a cushion angle adjustment.

<b>SEAT FORE/AFT POSITION</b>		
	Driver Seat	Rear Seat
Total Fore/Aft Travel (mm)	260	120
Test Position (mm)	130	120
Test Detent (forward-most detent defined as 0)	-	12
Total Number of Detents (including 0)	-	12

<b>SEAT BELT UPPER ANCHORAGES</b>		
	Total # of Positions	Placed in Position #
Driver Seat	5	3 (Mid)
Rear Seat	NA	NA

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

Test Vehicle: 2010 Dodge Journey SE

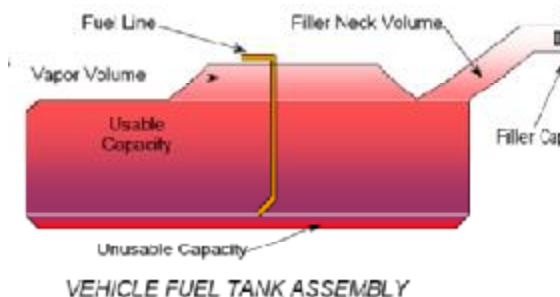
NHTSA No. CA0300

Test Program: FMVSS 214 Side Impact

Test Date: May 11, 2010

**FUEL SYSTEM INFORMATION**

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

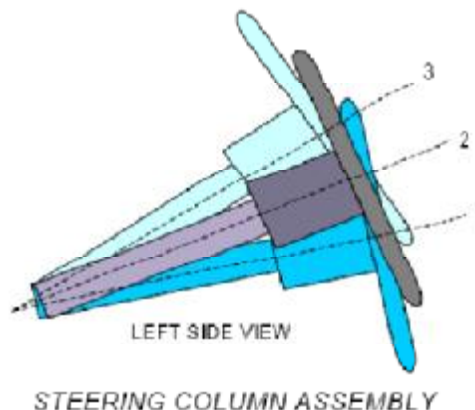


**FUEL TANK CAPACITY**

	Liters
Usable Capacity (Form 1)	77.6 (FWD)
Usable Capacity (Owner's Manual)	77.6 (FWD)
92%-94% of Fuel Tank Usable Capacity	72.3
Actual Amount of Stoddard Used	72.3

**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.

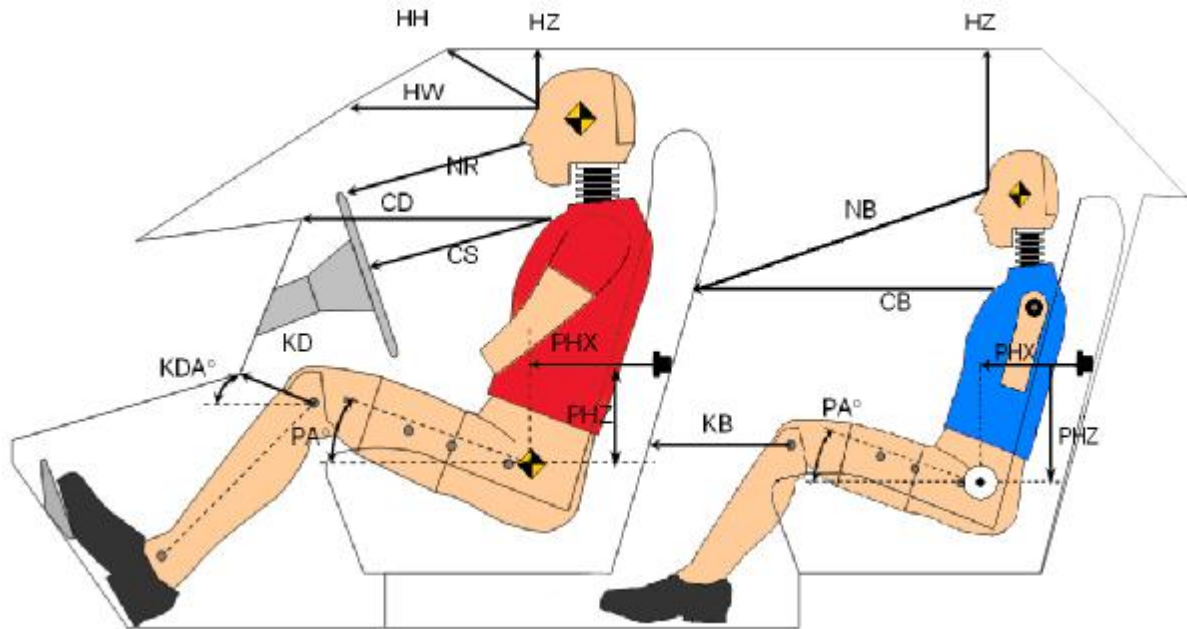


**STEERING COLUMN POSITIONING**

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	20.4	
Geometric Center - Position 2	23.4	
Uppermost - Position 3	26.4	
Telescoping Steering Wheel Travel		46
Test Position	23.4	23

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

Test Vehicle:	2010 Dodge Journey SE	NHTSA No.	CA0300
Test Program:	FMVSS 214 Side Impact	Test Date:	May 11, 2010

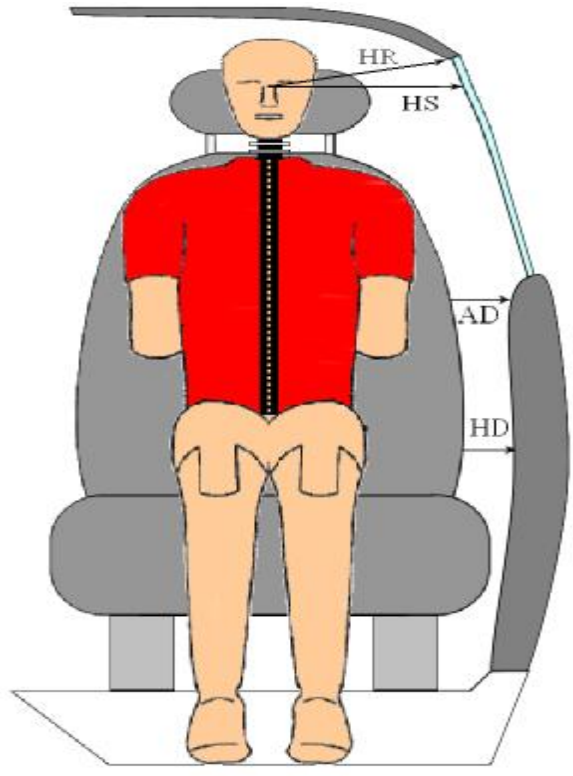


NOTE: 4-door vehicle shown. Rear dummy PHX and PHZ measurements for a 2-door vehicle would use the B-post striker as a reference point.

Frt. Occupant Code	Rear Occupant Code	Measurement Description	037 ES-2re		224 SID-IIs	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	465			
HW		Header to Windshield	755			
HZ	HZ	Head to Roof	221		315	
NR	NB	Nose to Rim/Seat Back	437		502	
CD	CB	Chest to Dash/Seat Back	603		503	
CS		Chest to Steering Wheel	310			
KDL	KBL	Left Knee to Dash/Seat Back	165	27.5	275	18.5
KDR	KBR	Right Knee to Dash/Seat Back	145	26.0	250	17.2
PA	PA	Pelvic Angle		20.2		18.0
PHX	PHX	H-Point to Striker (X-Axis)	198		306	
PHZ	PHZ	H-Point to Striker (Z-Axis)	133		199	

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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

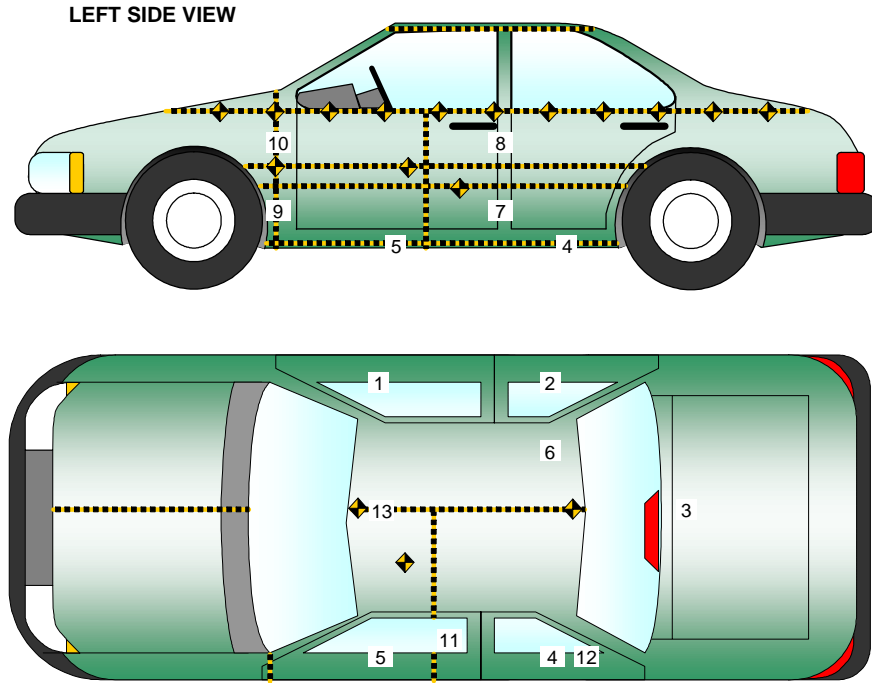


Code		Units	Front Occupant	Rear Occupant
HR	Head to Side Header	mm	223	255
HS	Head to Side Window	mm	362	353
AD	Arm to Door	mm	101	142
HD	H-point to Door	mm	142	147



**DATA SHEET NO. 9**  
**TEST VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010



Loc. No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3068	634	388
2	Right Sill at Rear Seat	2101	644	383
3	Rear Floorpan Above Axle	1234	-23	790
4	Left Sill at Rear Door	2092	-663	393
5	Left Sill at Front Door	3048	-663	376
6	Left Rear Occ. Compartment	2159	307	198
7	Left B-Post Lower	2338	-703	488
8	Left B-Post Middle	2277	-691	1076
9	Left A-Post Lower	3344	-619	484
10	Left A-Post Middle	3358	-697	1132
11	Front Seat Track	2431	-562	433
12	Rear Seat Track or Structure	1452	-678	657
13	Vehicle CG	2908	-82	488

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 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

Loc. No	Description	Peak Values (g's)			
		Max	Time (ms)	Min	Time (ms)
1	Right Sill at Front Seat (X)	3.0	55.9	-5.0	17.6
	Right Sill at Front Seat (Y)	30.6	8.7	-3.5	121.9
	Right Sill at Front Seat (Z)	3.7	60.9	-8.7	9.5
	Right Sill at Front Seat Resultant	31.7	8.7	0.0	-36.4
2	Right Sill at Rear Seat (X)	3.0	53.6	-5.0	18.0
	Right Sill at Rear Seat (Y)	20.5	8.4	-3.4	86.5
	Right Sill at Rear Seat (Z)	4.5	83.1	-8.3	11.6
	Right Sill at Rear Seat Resultant	21.1	8.7	0.0	-39.2
3	Rear Floor Pan Above Axle (X)	2.6	51.0	-4.2	10.2
	Rear Floor Pan Above Axle (Y)	25.2	8.4	-2.5	83.4
	Rear Floor Pan Above Axle (Z)	7.5	29.4	-8.8	54.2
	Rear Floor Pan Above Axle Resultant	25.4	8.4	0.0	-12.7
4	Left Sill at Rear Door (Y)	32.1	3.4	-36.4	12.9
5	Left Sill at Front Door (Y)	97.9	4.9	-36.5	11.3
6	Left Rear Occ. Compartment(Y)	30.3	10.5	-3.9	86.2
7	Left B-Post Lower (Y)	174.5	5.7	-122.5	17.6
8	Left B-Post Middle (Y)	163.2	9.9	-6.8	12.9
9	Left A-Post Lower( Y)	91.6	5.1	-45.2	9.9
10	Left A-Post Middle (Y)	31.3	27.5	-29.2	31.0
11	Front Seat Track (Y)	40.1	5.1	-58.2	20.0
12	Rear Seat Track or Structure (Y)	26.5	11.5	-2.4	85.0
13	Vehicle CG (X)	3.3	71.4	-11.3	29.5
	Vehicle CG (Y)	33.8	10.2	-8.0	76.1
	Vehicle CG (Z)	13.7	18.8	-6.4	46.2
	Vehicle CG Resultant	33.9	10.2	0.0	-33.0



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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 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 (mm)	2566 – 2616	2590
Center of gravity location aft of front axle (mm)		1104
MDB Front Axle Weight (kg)		782.0
MDB Rear Axle Weight (kg)		580.5
MDB Total Weight (kg)	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	89.2

**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE**

Row	Description	Height	From Centerline		Maximum Crush
			Distance	Direction	
1	Center of Bumper	432	700	Right	173
2	Top of Bumper	533	800	Right	95
3	Mid-Level	686	100	Right	74
4	Top of Stack	813	100	Right	90

**MDB IMPACT POINT DATA**

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-11
Vertical Offset	mm	+/- 20	-5

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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

<b>DUMMY Serial # 037</b>				
	<b>Positive</b>		<b>Negative</b>	
	<b>MAX</b>	<b>TIME (ms)</b>	<b>MAX</b>	<b>TIME (ms)</b>
<b>HEAD ACCELERATION (g)</b>				
Longitudinal (X)	2.2	155.4	-10.2	63.9
Lateral (Y)	25.2	64.6	-2.6	299.1
Vertical (Z)	6.0	74.4	-7.5	92.7
Resultant (R)	27.4	64.6	0.0	-36.6
HIC36 (t1, t2)	52.5		t1 = 51.7 ms	t2 = 76.0 ms
<b>THORAX DEFLECTION (mm)</b>				
Upper Rib	13.3	41.9	-4.9	86.8
Middle Rib	13.4	41.2	-3.8	78.1
Lower Rib	15.8	40.0	-1.8	74.8
<b>ABDOMINAL FORCES (N)</b>				
Front	240.0	54.3	-18.5	20.6
Middle	364.8	52.8	-26.0	43.8
Rear	358.3	49.1	-21.7	44.3
SUM	876.0	50.7	-56.4	42.4
<b>PELVIS FORCE (N)</b>				
Pubic Symphysis (Y)	101.8	79.9	-812.3	50.5

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 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

DUMMY Serial No. 224				
	Positive		Negative	
	MAX	TIME (ms)	MAX	TIME (ms)
<b>HEAD ACCELERATION (g)</b>				
Longitudinal (X)	4.5	291.6	-17.6	67.2
Lateral (Y)	29.5	62.7	-5.5	290.2
Vertical (Z)	5.4	283.7	-6.1	64.1
Resultant (R)	34.5	67.1	0.0	-17.7
HIC36 (t1, t2)	112.7		t1 = 48.1 ms	t2 = 81.0 ms
<b>LOWER SPINE (g)</b>				
Longitudinal (X)	4.4	31.7	-12.7	52.8
Lateral (Y)	39.2	52.5	-2.6	153.2
Vertical (Z)	10.7	64.0	-9.1	50.8
Resultant (R)	41.8	52.5	0.0	-23.8
<b>PELVIS FORCE (N)</b>				
Acetabular	3275.6	46.8		
Iliac	688.7	51.9		
Pelvic Summation	3794.4	48.3		

Reference:

Positive direction:

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

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

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

**TEST DUMMY INFORMATION AND CONTACT**

Description	Front Occupant	Rear Occupant
Head Contact	Side of head – Side Curtain Airbag Top of Head – Side Header	Side of Head – Side Curtain Airbag
Upper Torso Contact	Side Torso Airbag	Upper Shoulder – Side Curtain Airbag and 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**

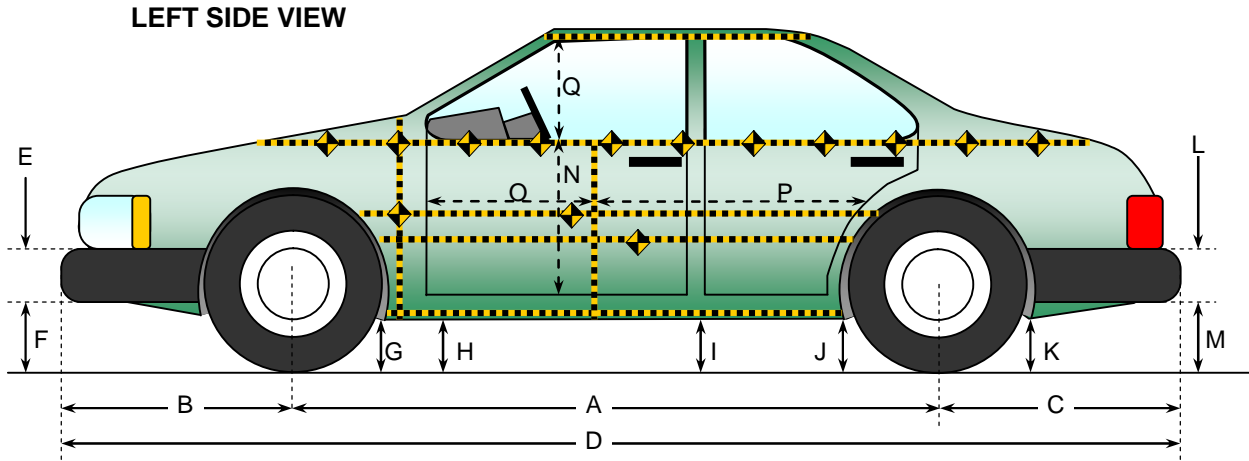
Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Window Damage	No apparent damage
Other Notable Effects	None

**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 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010

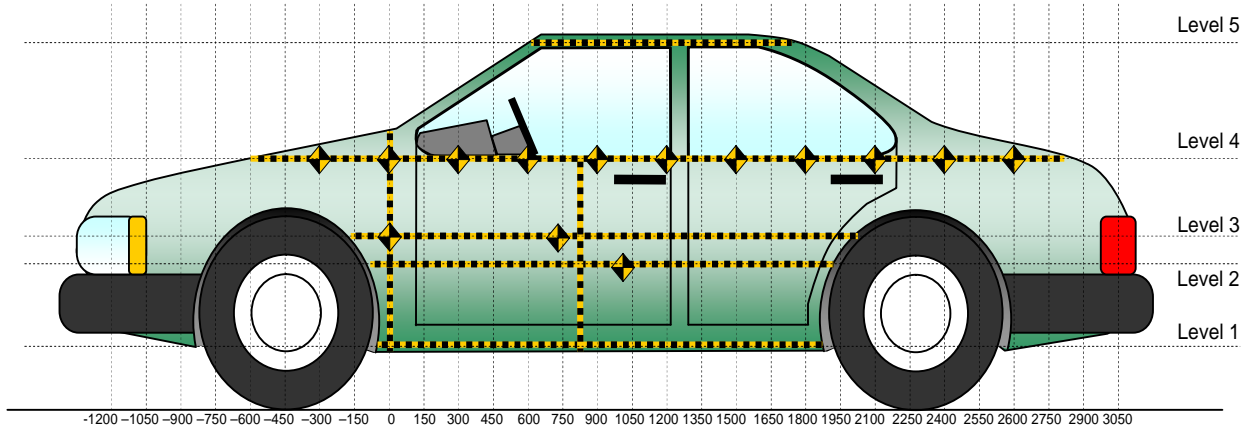


Code	Description	Pre-Test	Post-Test	Diff Δ
A	Wheelbase	2896	2909	-13
B	Front Axle to FSOV	989	989	0
C	Rear Axle to RSOV	1008	996	12
D	Total Length at Centerline	4893	4894	-1
E	Front Bumper Thickness	110	110	0
F	Front Bumper Bottom to Ground	472	473	-1
G	Sill Height at Front Wheel Well	211	213	-2
H	Sill Height at Front Door Leading Edge	235	235	0
I	Sill Height at B Pillar	246	240	6
J1	Sill Height at Rear Wheel Well	238	249	-11
J2	Pinch Weld Height at Rear Wheel Well	249	238	11
K	Sill Height Aft of Rear Wheel Well	251	249	2
L	Rear Bumper Thickness	145	145	0
M	Rear Bumper Bottom to Ground	490	482	8
N	Sill Height to Window Bottom Sill	777	751	26
O	Front Door Leading Edge to Impact CL	834	769	65
P	Rear Door Trailing Edge to Impact CL	1330	1210	120
Q	Front Window Opening	457	456	1
R*	Right Side Length	4740	4743	-3
S*	Left Side Length	4748	4750	-2
T*	Vehicle Width at B Post	1816	1724	92

\* - not shown in schematic above

**DATA SHEET NO. 17  
EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2010 Dodge Journey SE NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact Test Date: May 11, 2010



All Measurements Shown in mm

**LEFT SIDE VIEW**

**Maximum Exterior Crush Measurements**

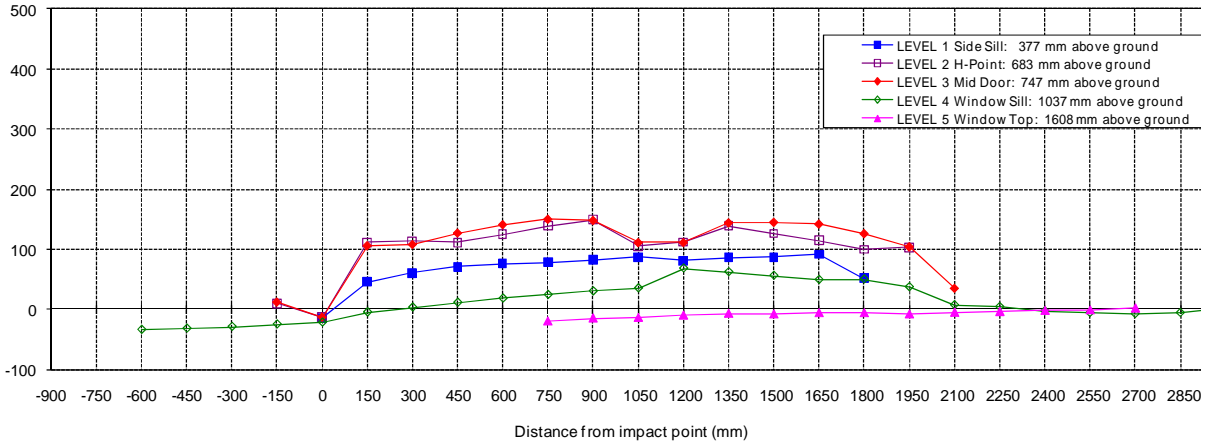
Level	Measurement Description	Maximum Exterior Static Crush	Distance from Impact	Height Above Ground
1	Sill Top	92	1800	377
2	Occupant H-Point	149	1050	683
3	Mid-Door	150	900	747
4	Window Sill	68	1350	1037
5	Window Top	2	2850	1608



**DATA SHEET NO. 18**  
**VEHICLE EXTERIOR CRUSH PROFILES**

Test Vehicle: 2010 Dodge Journey SE  
Test Program: FMVSS 214 Side Impact

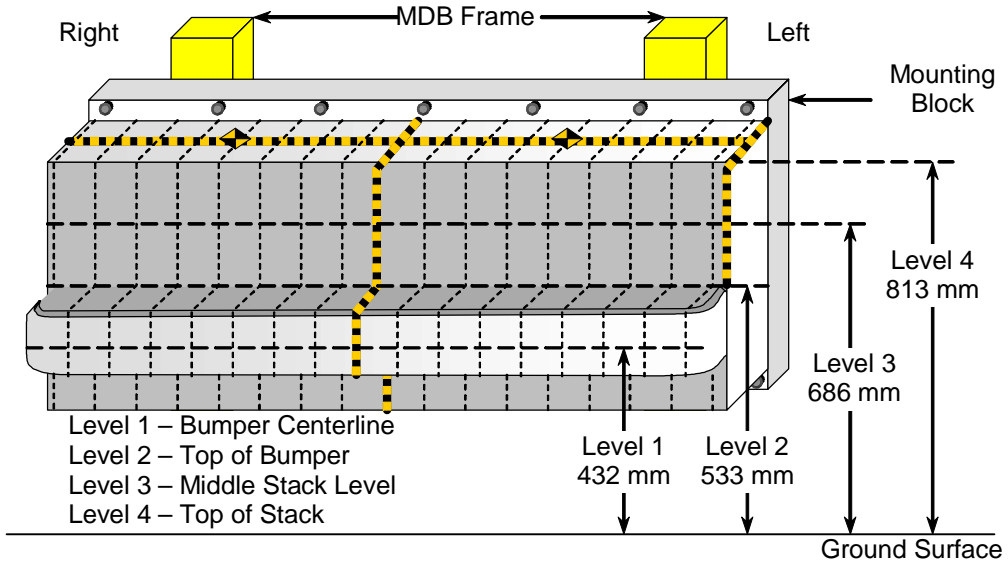
NHTSA No. CA0300  
Test Date: May 11, 2010



	Pre-Test					Post-Test					Diff Δ				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-750	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-600	--	--	--	795	--	--	--	--	829	--	--	--	--	-34	--
-300	--	--	--	824	--	--	--	--	856	--	--	--	--	-32	--
-150	--	--	--	845	--	--	--	--	874	--	--	--	--	-29	--
0	--	938	932	859	--	--	928	920	884	--	--	10	12	-25	--
150	900	914	914	869	--	914	927	930	891	--	-14	-13	-16	-22	--
300	891	917	920	876	--	845	806	814	881	--	46	111	106	-5	--
450	893	918	922	884	--	832	804	814	881	--	61	114	108	3	--
600	894	919	923	894	--	823	808	796	883	--	71	111	127	11	--
750	895	919	923	900	--	819	794	782	882	--	76	125	141	18	--
900	895	919	923	904	648	817	780	773	880	668	78	139	150	24	-20
1050	895	918	922	907	655	813	769	774	877	670	82	149	148	30	-15
1200	895	916	921	907	657	808	811	810	872	671	87	105	111	35	-14
1350	893	913	918	906	659	812	801	807	838	669	81	112	111	68	-10
1500	891	910	915	904	659	805	771	771	842	666	86	139	144	62	-7
1650	887	906	911	902	656	800	780	766	846	664	87	126	145	56	-8
1800	884	901	907	898	653	792	786	765	849	659	92	115	142	49	-6
1950	880	896	902	895	649	828	796	776	845	655	52	100	126	50	-6
2100	--	915	896	922	644	--	812	792	885	652	--	103	104	37	-8
2250	--	--	942	895	637	--	--	907	888	642	--	--	35	7	-5
2400	--	--	--	878	630	--	--	--	874	634	--	--	--	4	-4
2550	--	--	--	872	619	--	--	--	875	621	--	--	--	-3	-2
2700	--	--	--	866	604	--	--	--	872	605	--	--	--	-6	-1
2850	--	--	--	858	582	--	--	--	866	580	--	--	--	-8	2
3000	--	--	--	850	--	--	--	--	856	--	--	--	--	-6	--

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

Test Vehicle: 2010 Dodge Journey SE                      NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact                      Test Date: May 11, 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
Level 1	168	173	158	156	155	153	152	151	150	148	146	145	144	143	142	141	141
Level 2	95	92	88	87	85	75	67	71	68	69	71	73	72	71	70	69	68
Level 3	65	47	34	26	29	42	66	74	43	21	14	11	15	23	33	39	48
Level 4	46	33	24	20	29	51	88	90	61	31	26	27	31	37	43	53	67

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

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

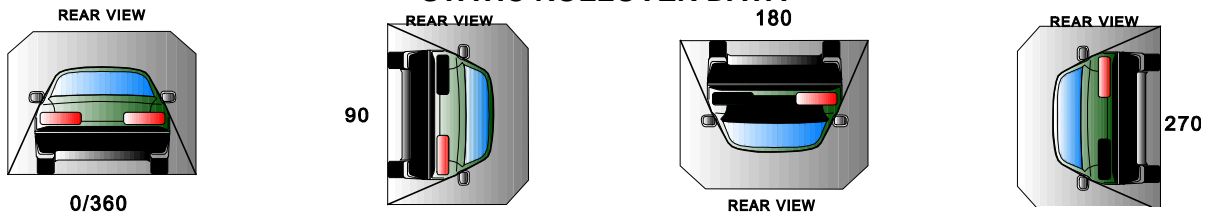
Test Vehicle: 2010 Dodge Journey SE      NHTSA No. CA0300  
 Test Program: FMVSS 214 Side Impact      Test Date: May 11, 2010

**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**

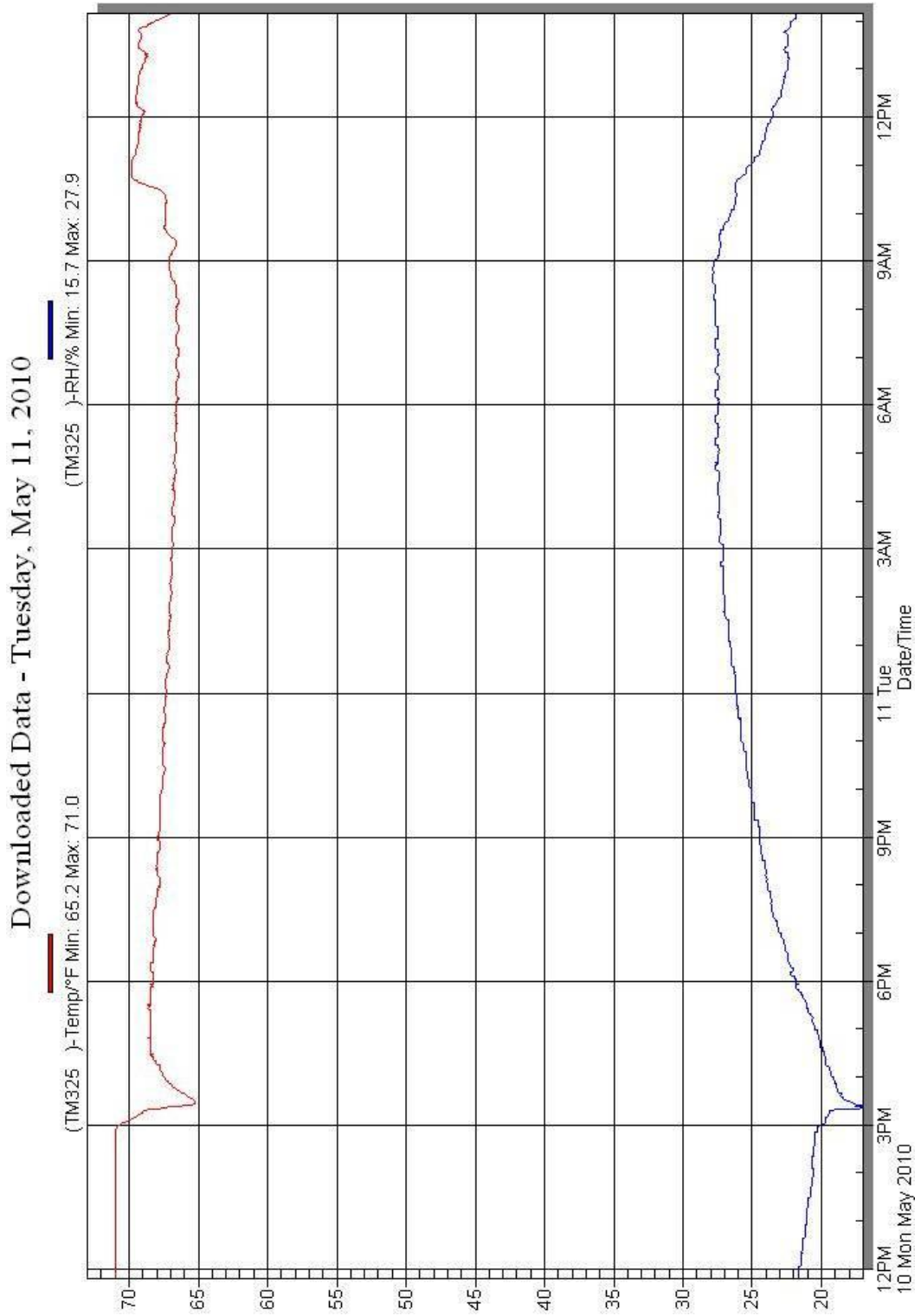


Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
	1	minutes	12	seconds	5	minutes	6	minutes	12	seconds	7	minutes
0° - 90°	1	minutes	12	seconds	5	minutes	6	minutes	12	seconds	7	minutes
90° - 180°	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
180°-270°	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
270°-360°	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes

Rollover Stage	Spillage (g)			
	First 5 min. from onset of rotation	6 <sup>th</sup> min.	7 <sup>th</sup> min.	8 <sup>th</sup> 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**

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A-7	Pre-Test Frontal View of MDB Impactor Face	A-9
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A-9	Pre-Test Left Side View of MDB Impactor Face	A-11
A-10	Post-Test Left Side View of MDB Impactor Face	A-12
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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



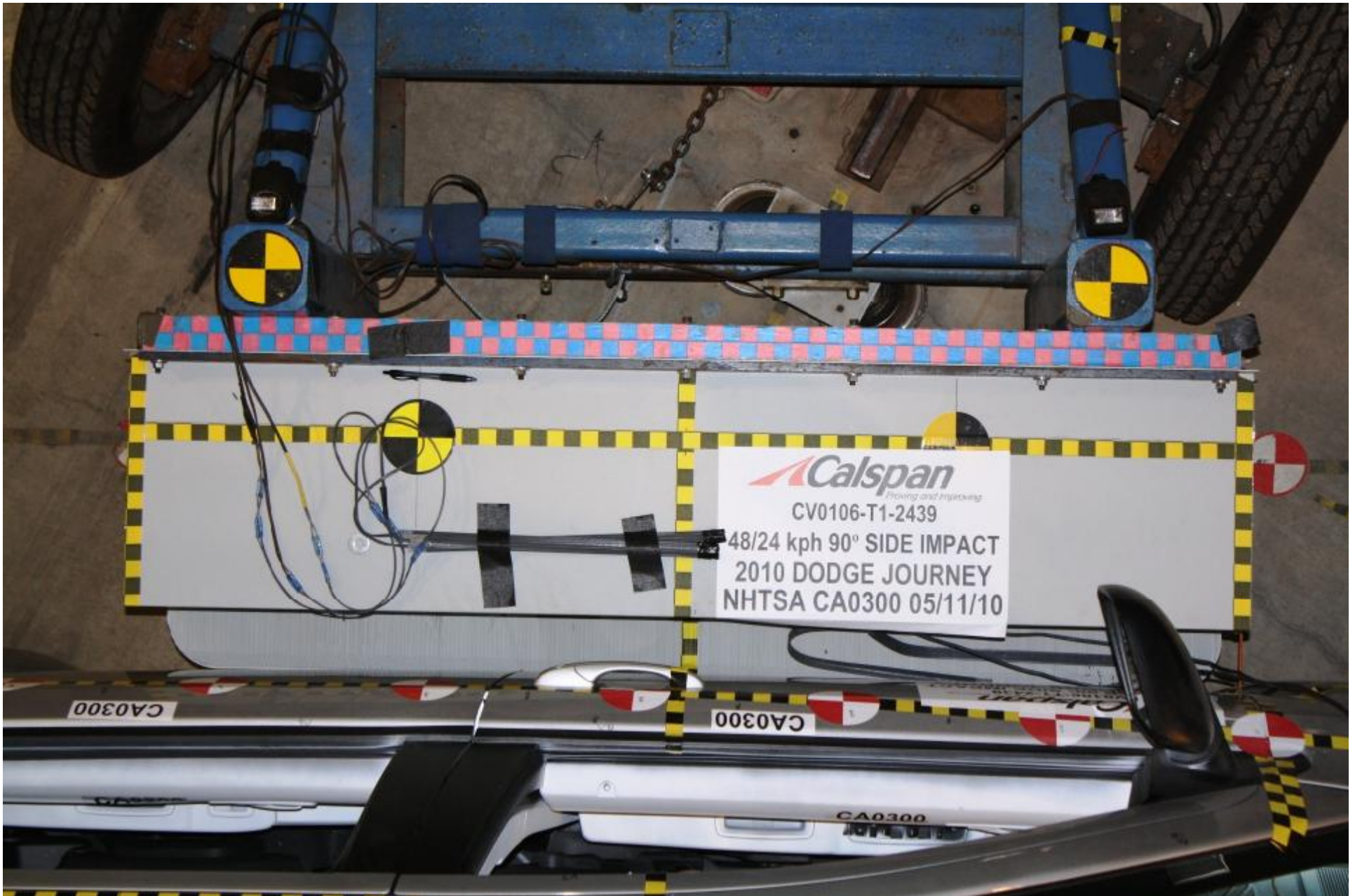


Figure A-13 Pre-Test Top View of MDB Impactor Face



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



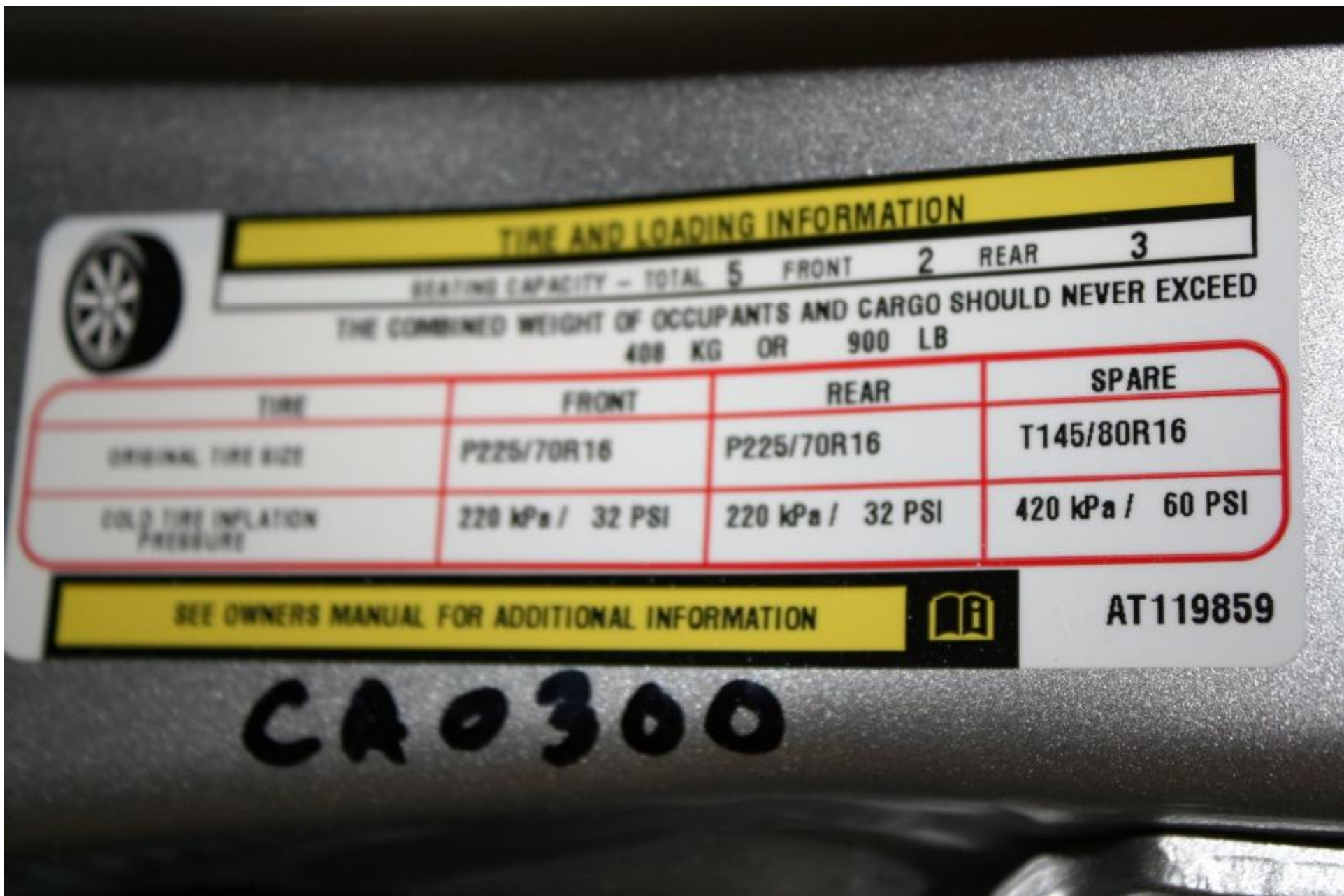


Figure A-24 Post-Test Close-Up View of Impact Point Target



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





**TIRE AND LOADING INFORMATION**

SEATING CAPACITY - TOTAL 5 FRONT 2 REAR 3

THE COMBINED WEIGHT OF OCCUPANTS AND CARGO SHOULD NEVER EXCEED  
400 KG OR 900 LB

TIRE	FRONT	REAR	SPARE
ORIGINAL TIRE SIZE	P225/70R16	P225/70R16	T145/80R16
COLD TIRE INFLATION PRESSURE	220 kPa / 32 PSI	220 kPa / 32 PSI	420 kPa / 60 PSI

SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION



AT119859

CA0300

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



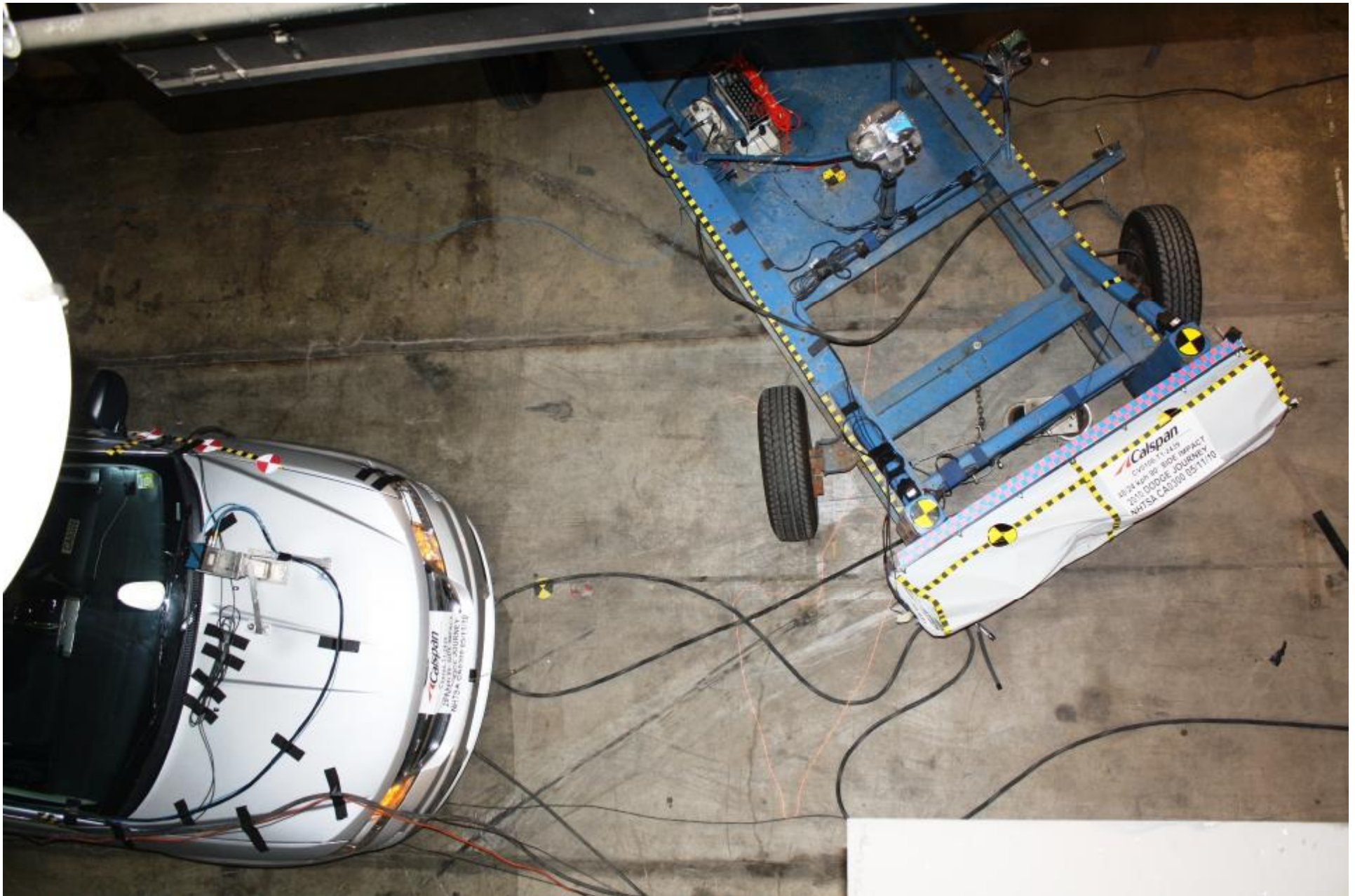


Figure A-27 Post-Test Overhead View of MDB and Target Vehicle



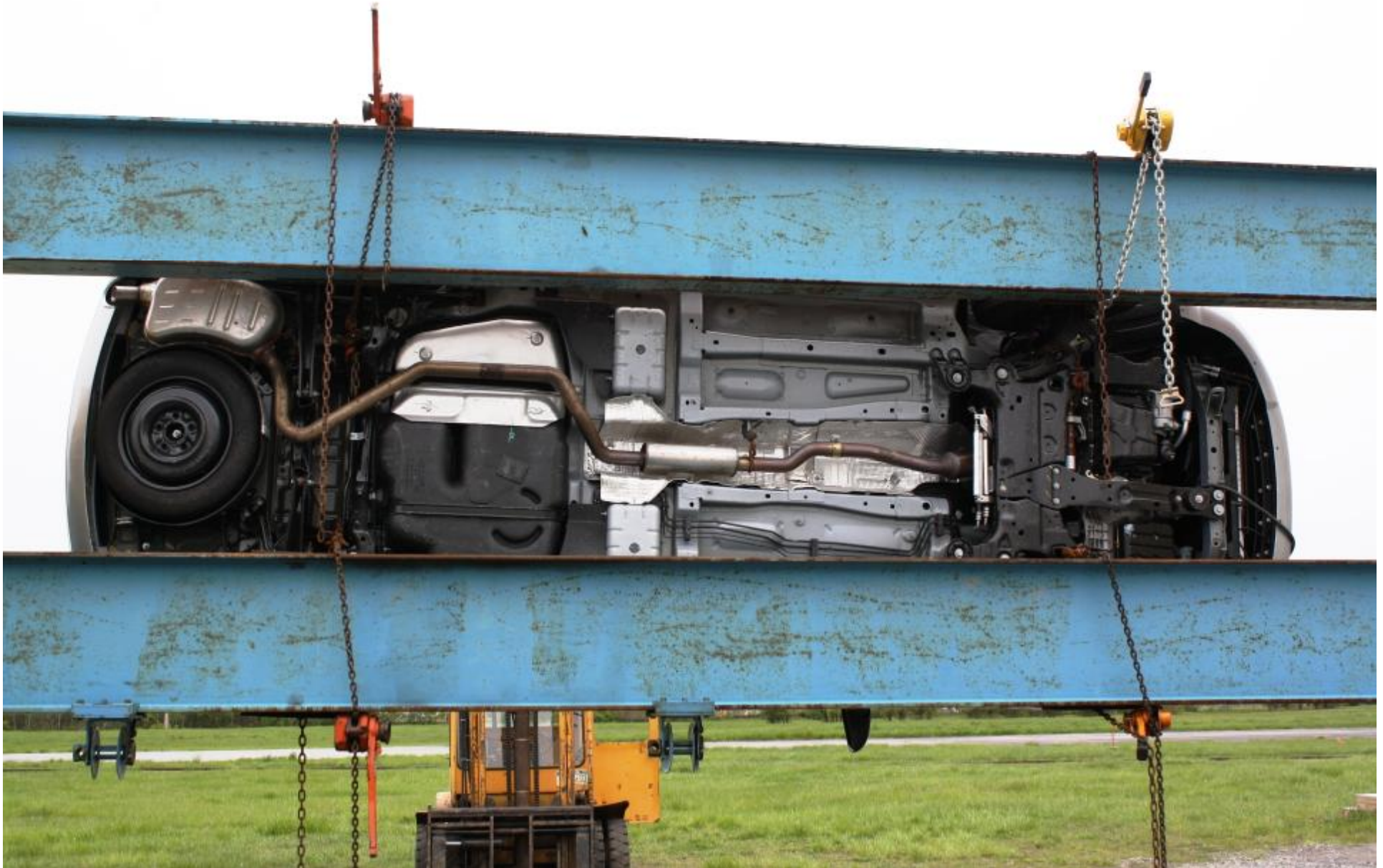


Figure A-28 Rollover 90 Degrees



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**

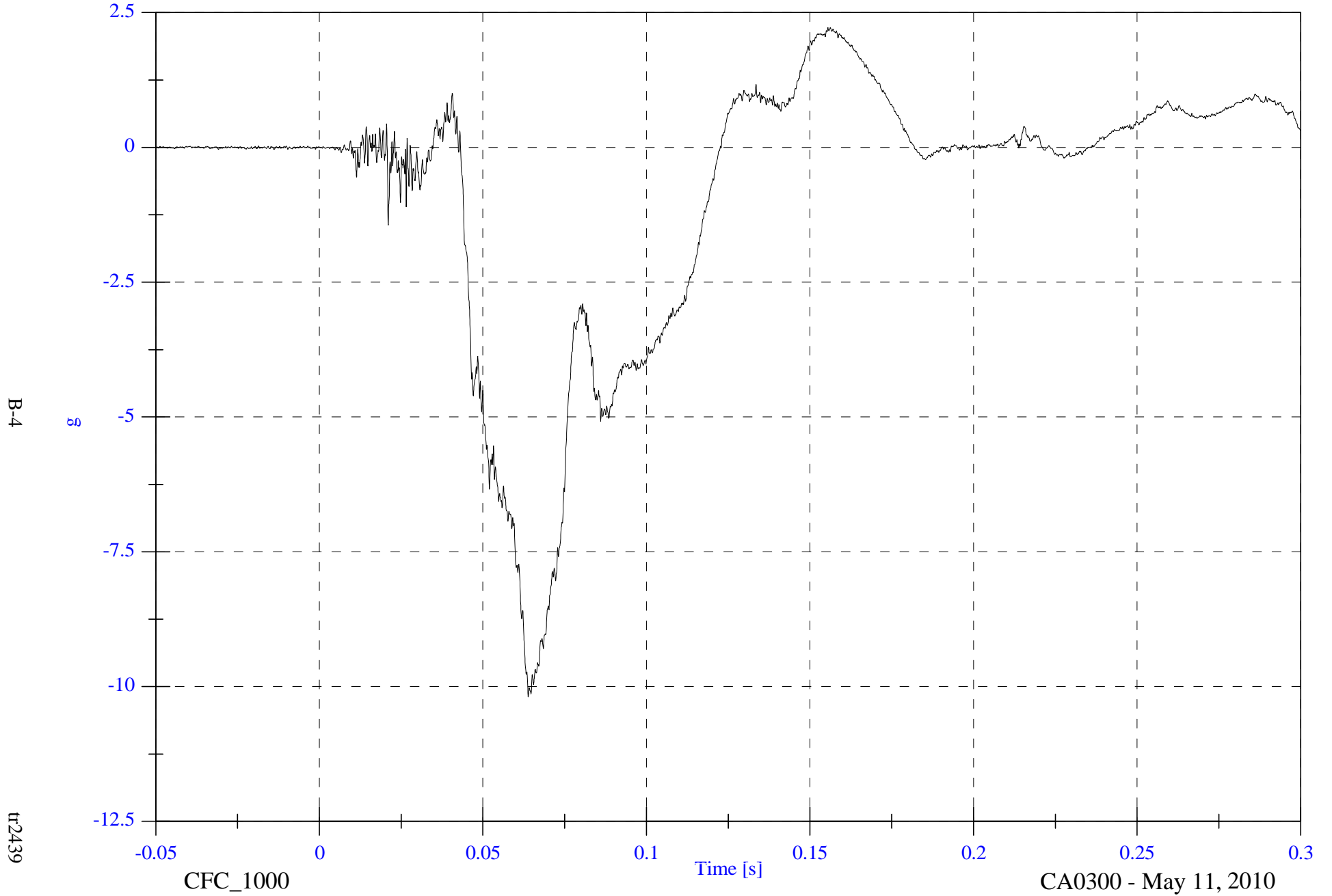
PLOT	PLOT NAME [UNITS, CHANNEL FILTER CLASS]	PAGE
1	ES-2re Head Ax [g, CFC_1000]	B-4
2	ES-2re Head Ay [g, CFC_1000]	B-5
3	ES-2re Head Az [g, CFC_1000]	B-6
4	ES-2re Head Resultant [g, CFC_1000]	B-7
5	ES-2re Head Ax Velocity vs. Time	B-8
6	ES-2re Head Ay Velocity vs. Time	B-9
7	ES-2re Head Az Velocity vs. Time	B-10
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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 Dodge Journey CA0300

Max: 2.2 [g] at 0.155 [s]

V2P1 Head x

Min: -10.2 [g] at 0.064 [s]



B-4

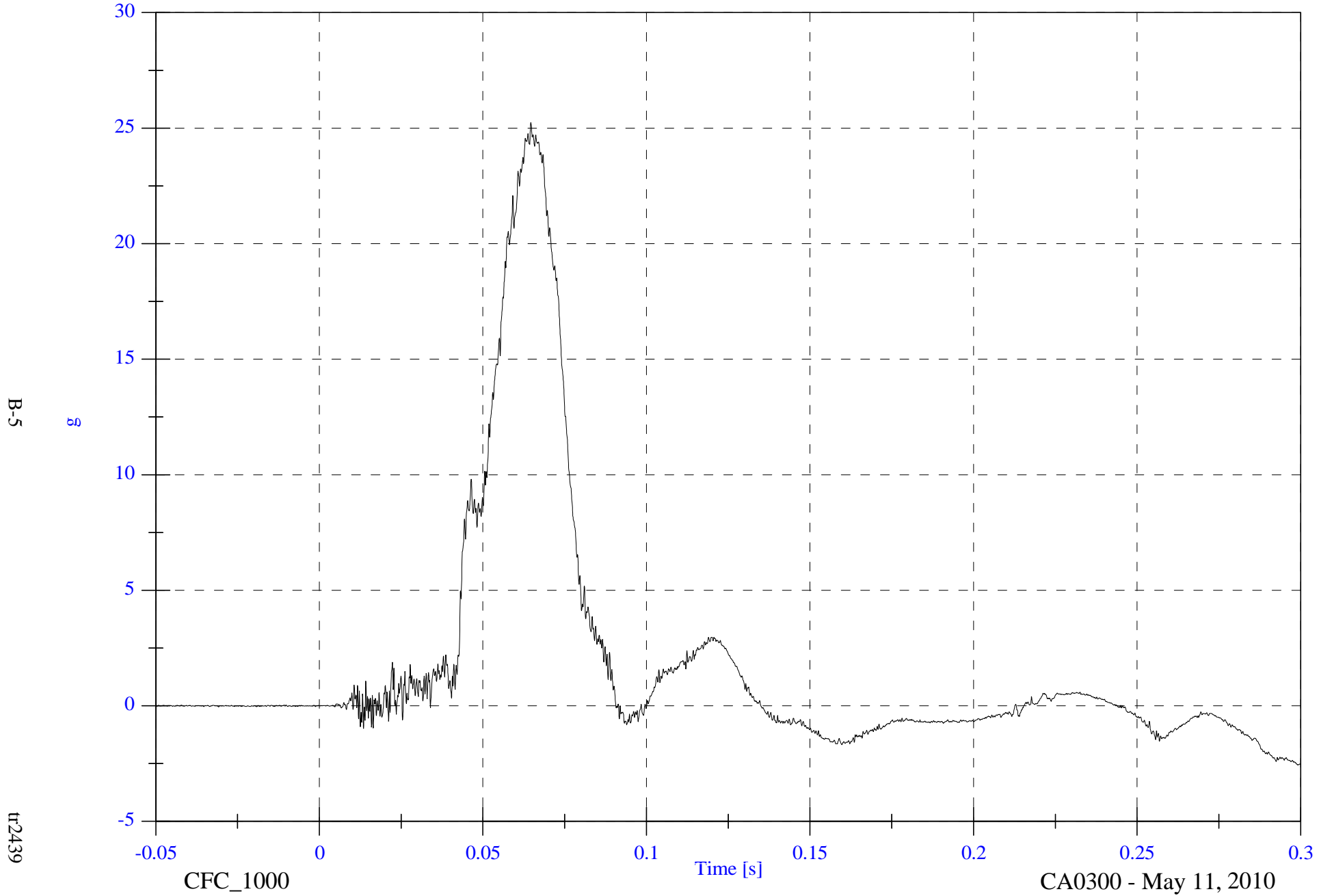
tt2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 25.2 [g] at 0.065 [s]

V2P1 Head y

Min: -2.6 [g] at 0.299 [s]



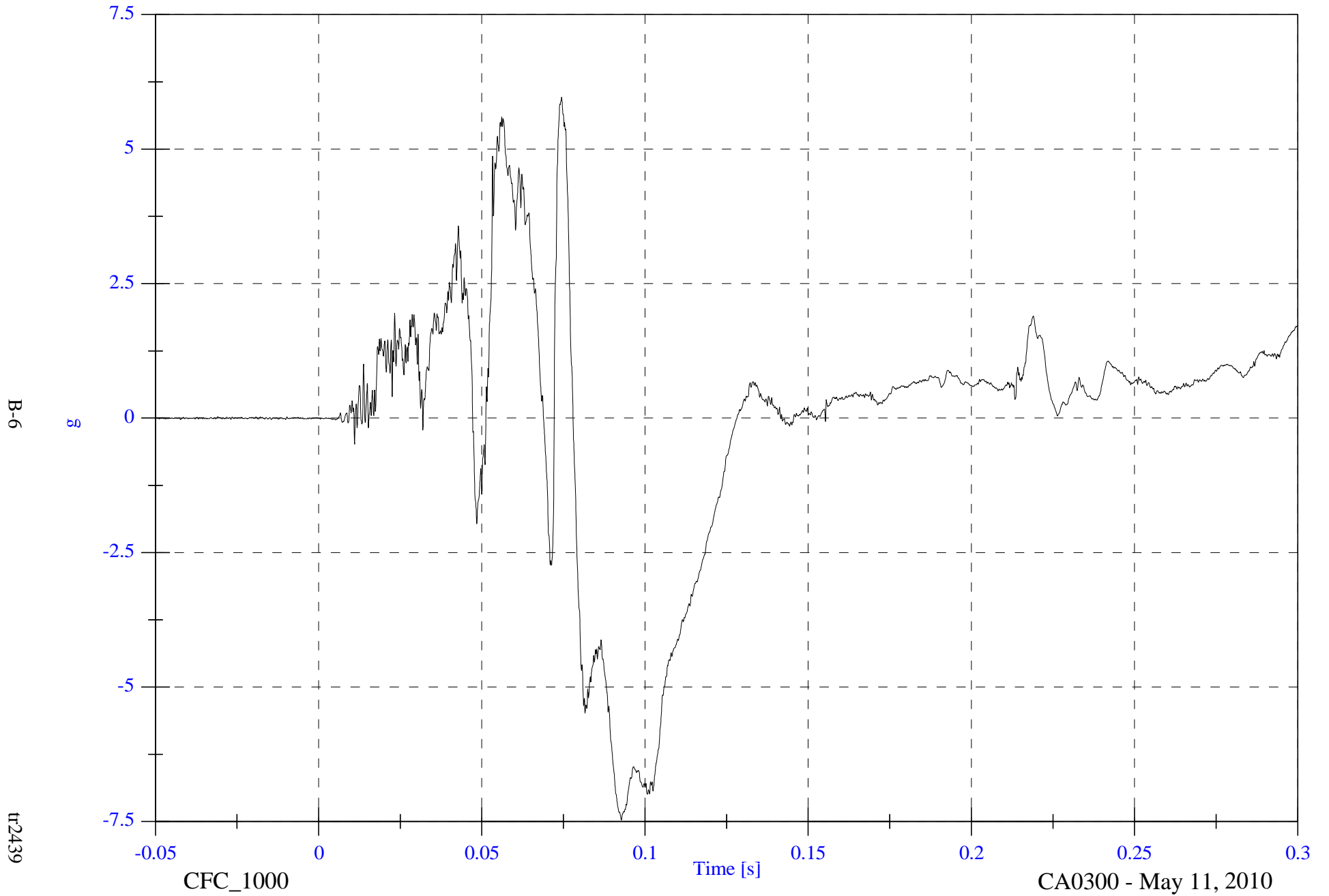


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Head z

Max: 6.0 [g] at 0.074 [s]

Min: -7.5 [g] at 0.093 [s]



B-6

tr2439

CFC\_1000

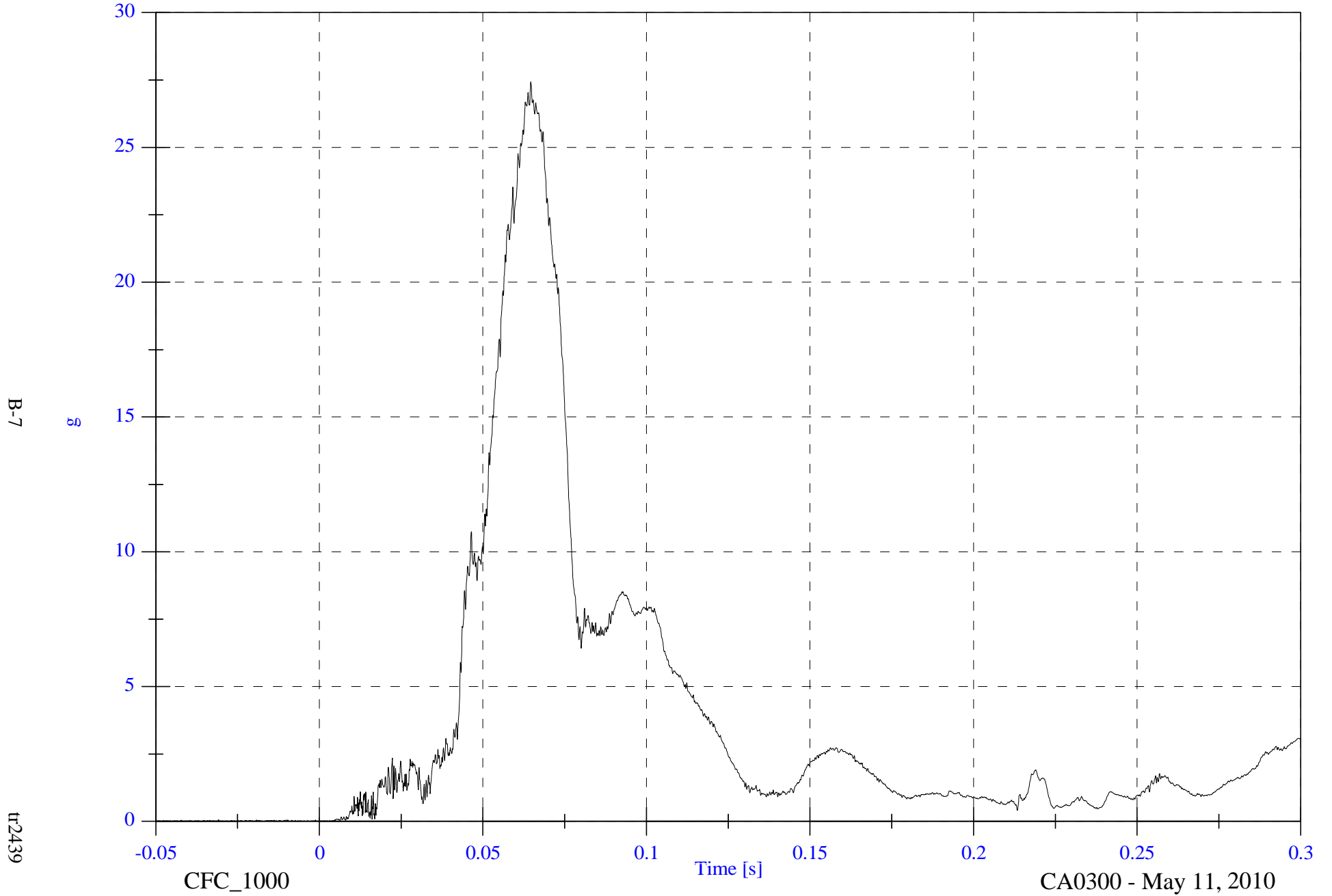
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Head Resultant

Max: 27.4 [g] at 0.065 [s]

Min: 0.0 [g] at -0.037 [s]



B-7

tr2439

CFC\_1000

CA0300 - May 11, 2010

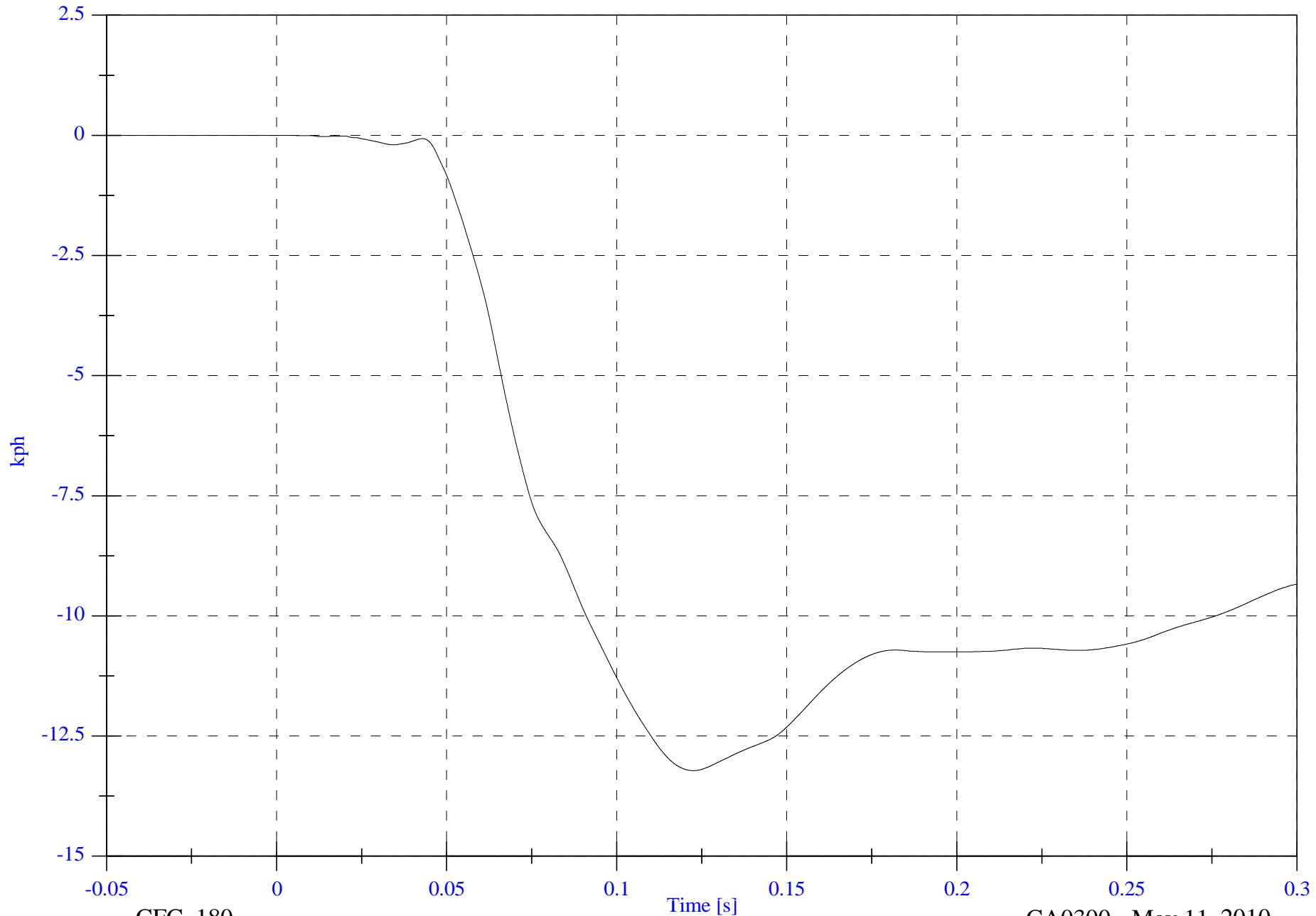
FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 0.0 [kph] at -0.034 [s]

V2P1 Head x Velocity

Min: -13.2 [kph] at 0.123 [s]

B-8



tr2439

CFC\_180

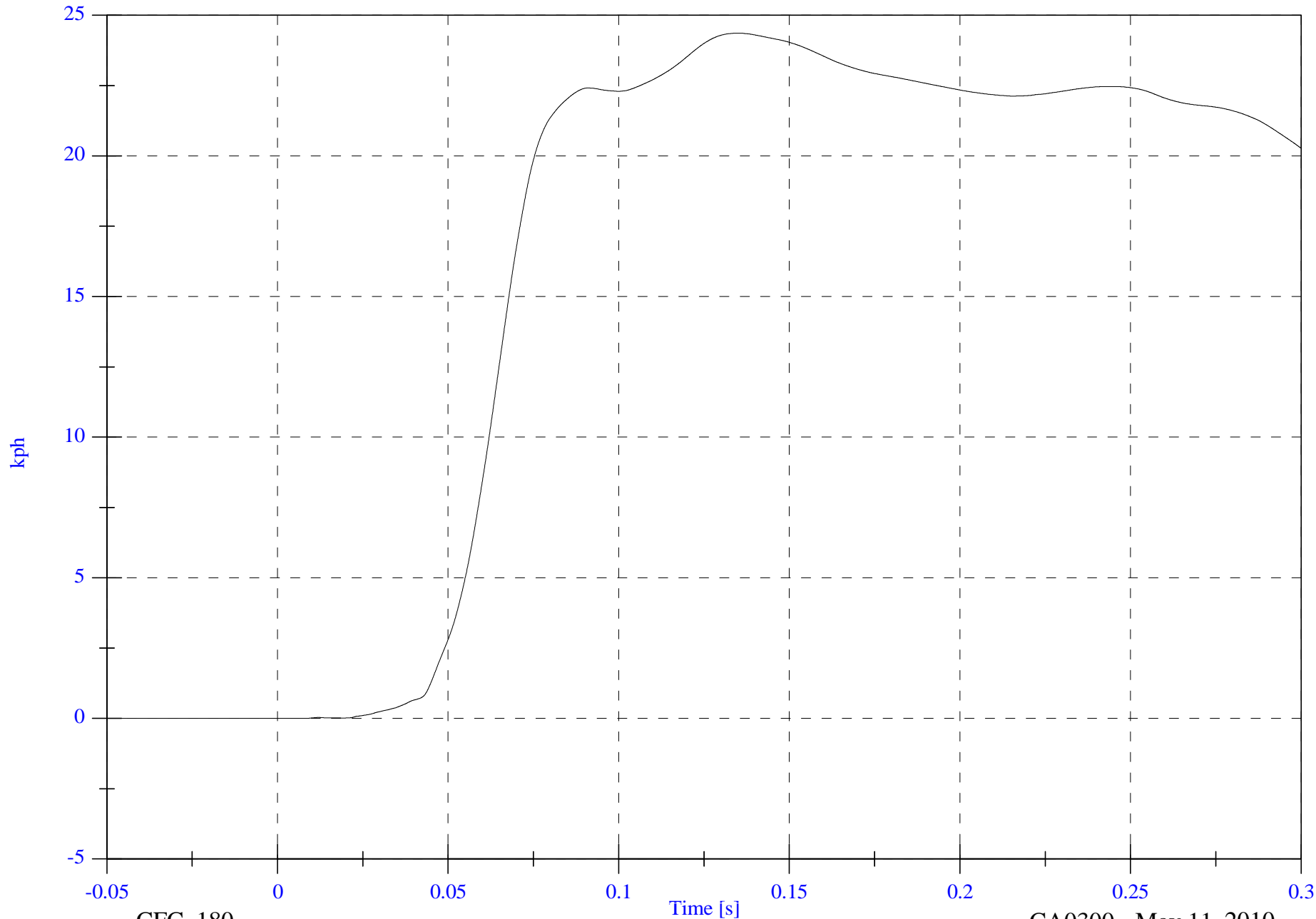
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 24.4 [kph] at 0.135 [s]

V2P1 Head y Velocity

Min: -0.0 [kph] at -0.017 [s]



B-9

kph

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010



FMVSS 214 MDB 2010 Dodge Journey CA0300

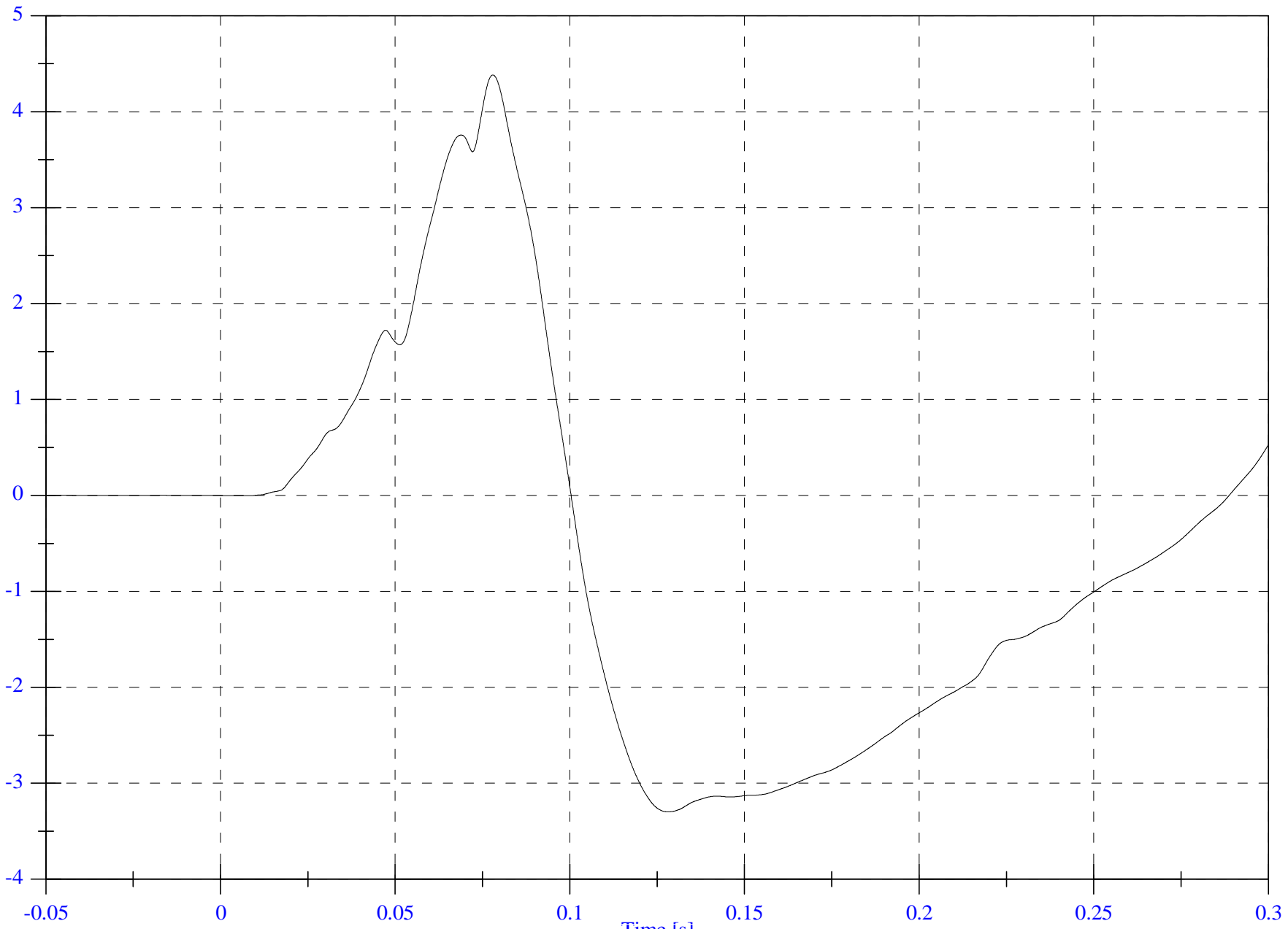
V2P1 Head z Velocity

Max: 4.4 [kph] at 0.078 [s]

Min: -3.3 [kph] at 0.128 [s]

B-10

kph



CFC\_180

Time [s]

CA0300 - May 11, 2010

tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

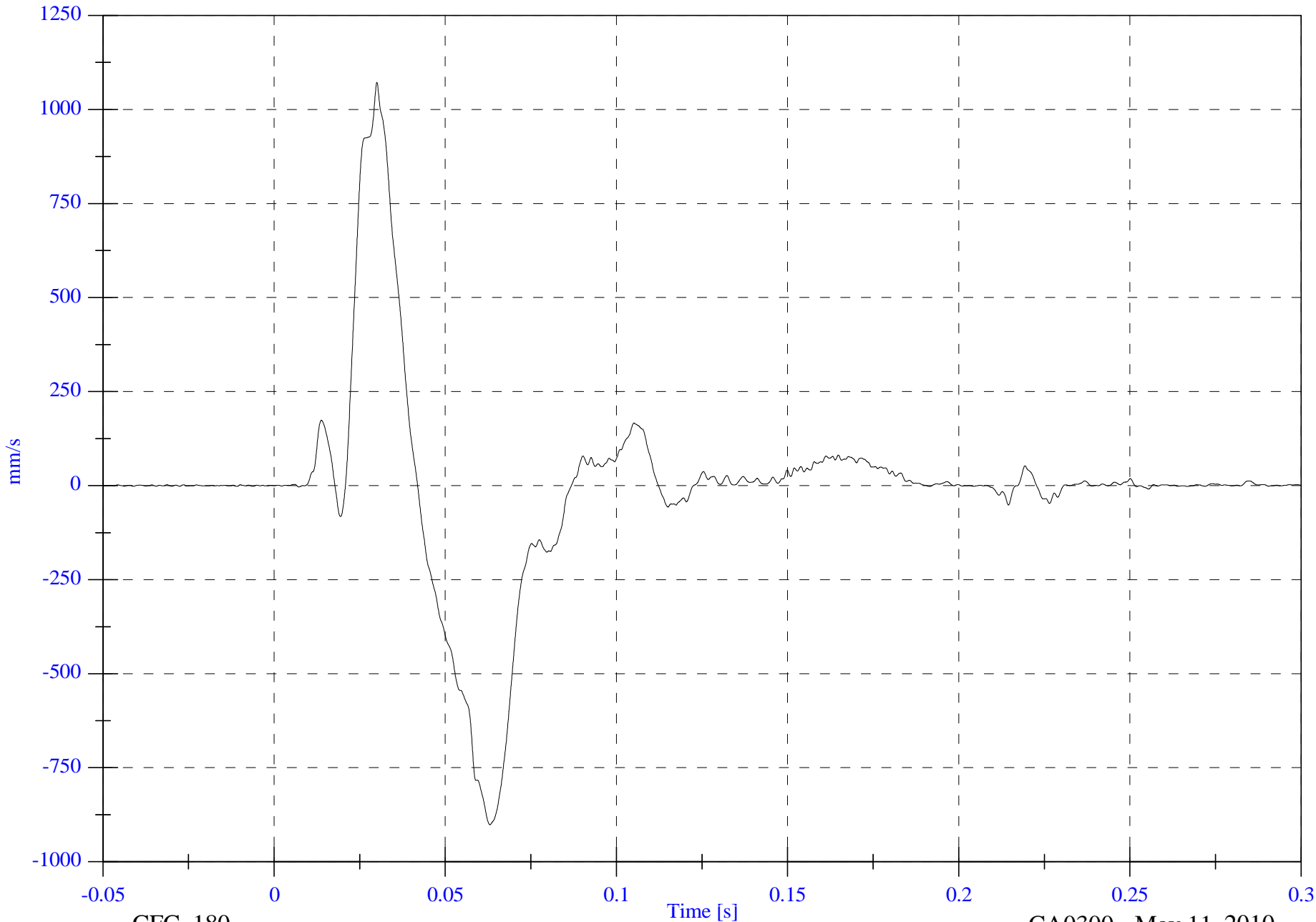
V2P1 Upper Thorax Rib Dy Rate

Max: 1072.1 [mm/s] at 0.030 [s]

Min: -901.5 [mm/s] at 0.063 [s]

B-11

tr2439



CFC\_180

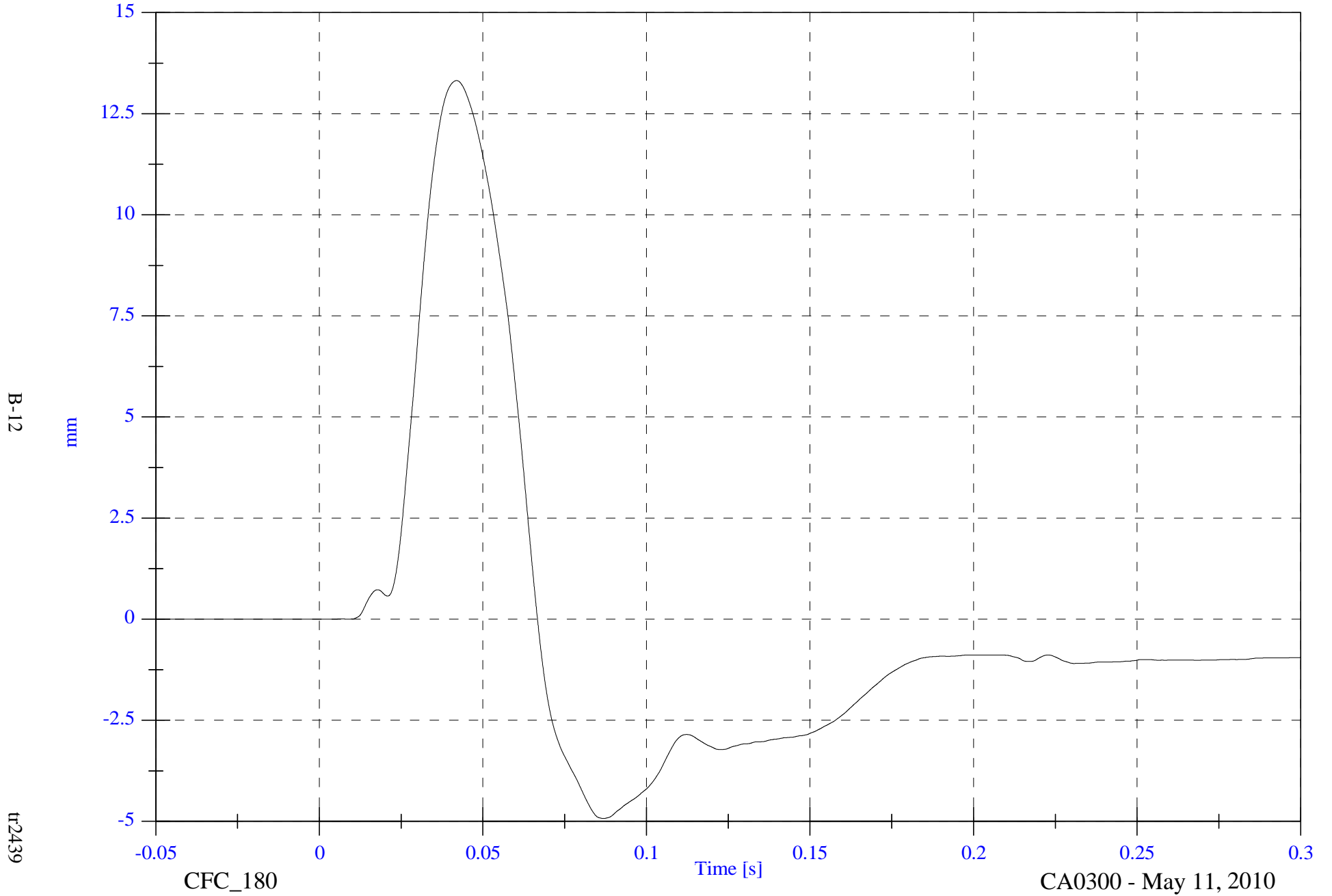
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Upper Thorax Rib Dy

Max: 13.3 [mm] at 0.042 [s]

Min: -4.9 [mm] at 0.087 [s]



B-12

tr2439

CFC\_180

Time [s]

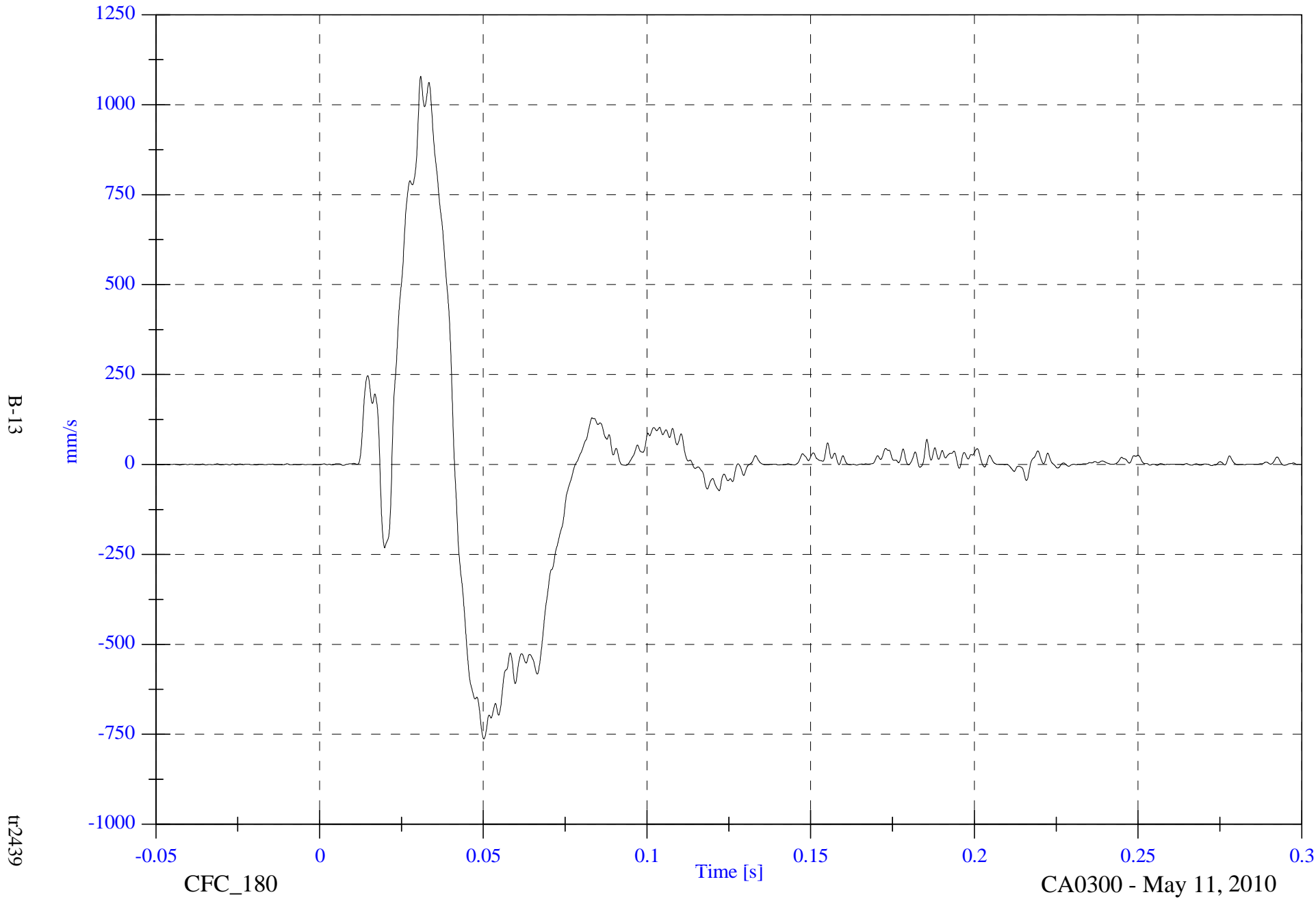
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Middle Thorax Rib Dy Rate

Max: 1079.0 [mm/s] at 0.031 [s]

Min: -762.8 [mm/s] at 0.050 [s]



B-13

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

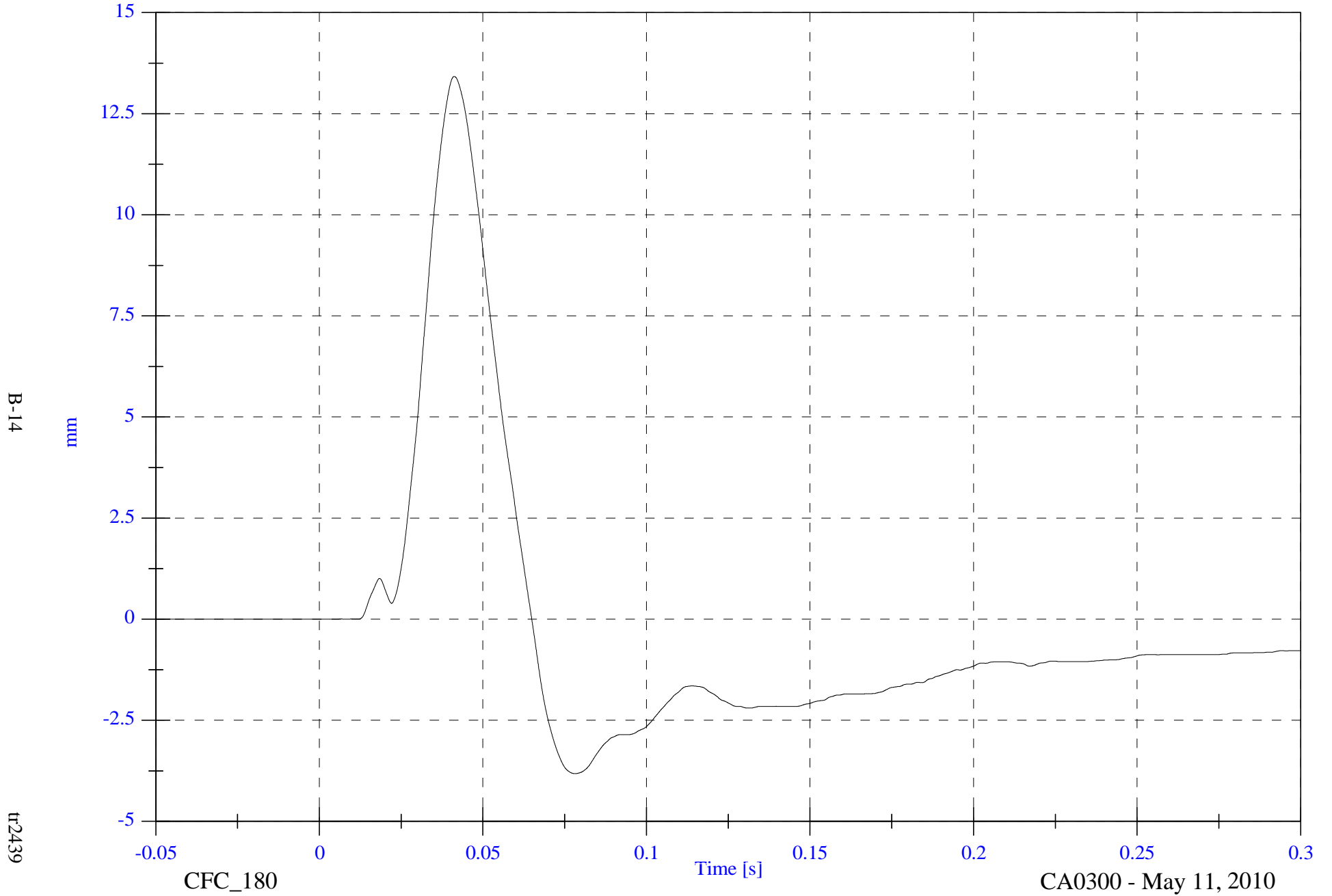


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Middle Thorax Rib Dy

Max: 13.4 [mm] at 0.041 [s]

Min: -3.8 [mm] at 0.078 [s]



B-14

tr2439

CFC\_180

Time [s]

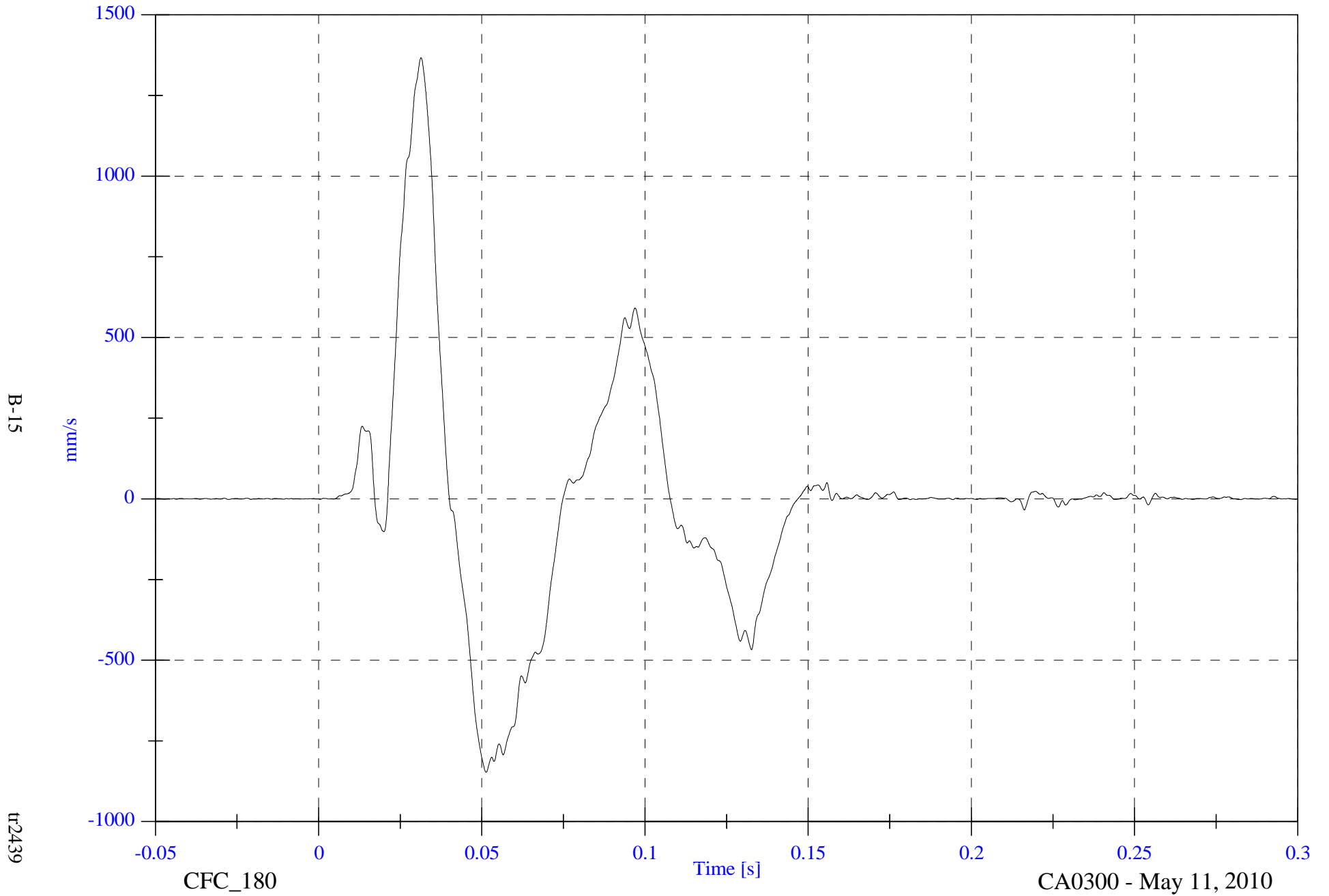
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Lower Thorax Rib Dy Rate

Max: 1366.9 [mm/s] at 0.031 [s]

Min: -847.3 [mm/s] at 0.051 [s]



B-15

tr2439

CFC\_180

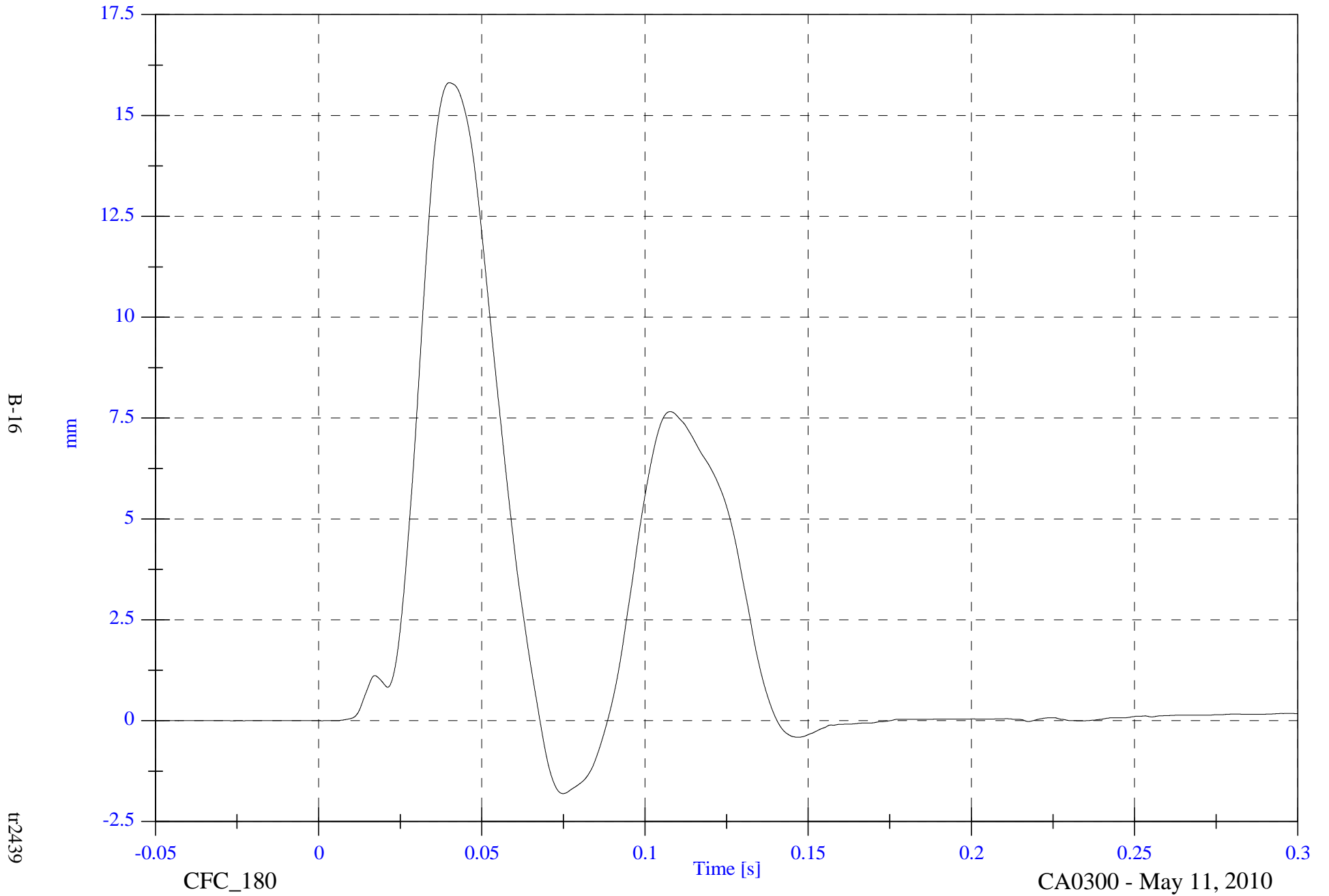
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Lower Thorax Rib Dy

Max: 15.8 [mm] at 0.040 [s]

Min: -1.8 [mm] at 0.075 [s]



B-16

tr2439

CFC\_180

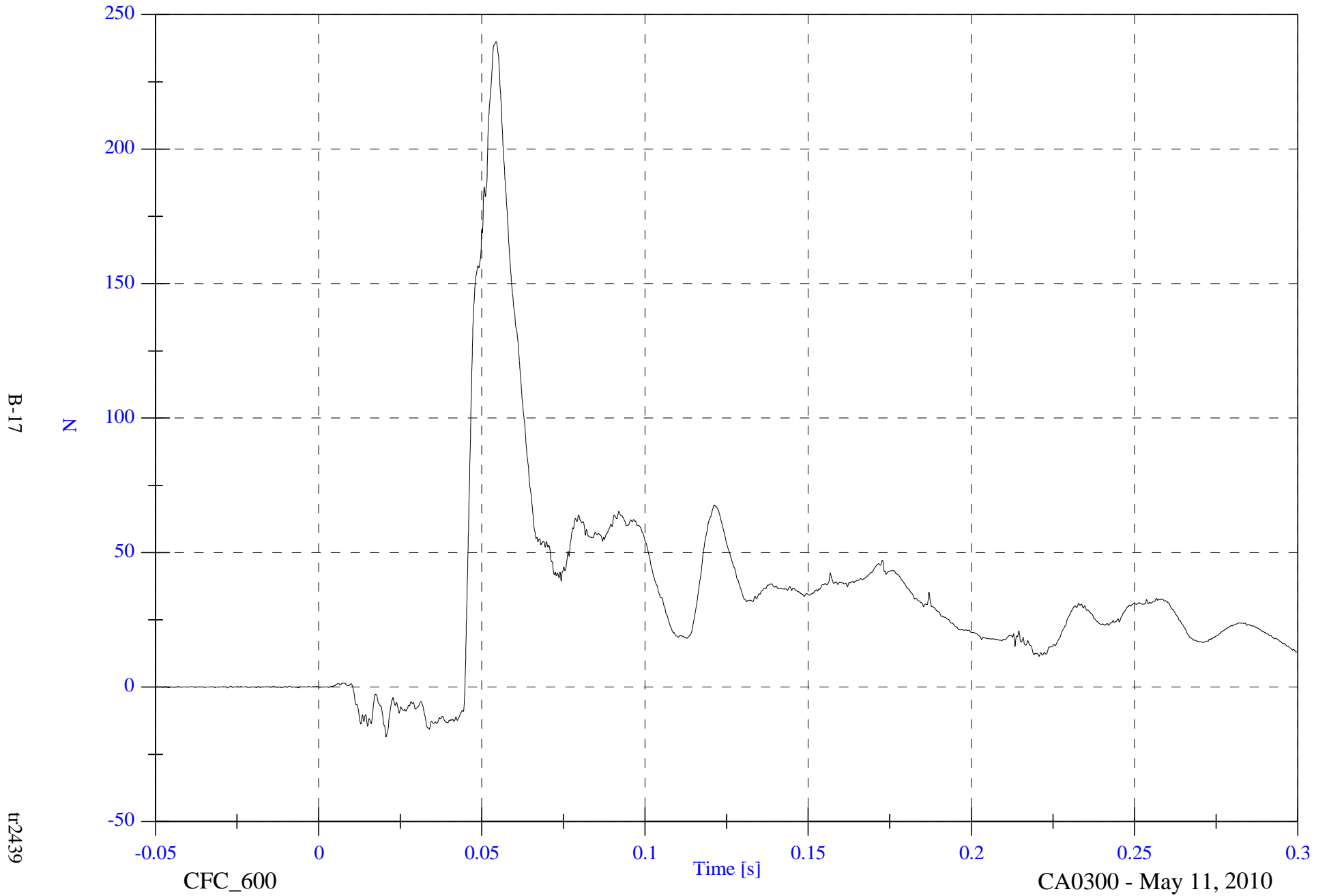
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 240.0 [N] at 0.054 [s]

V2P1 Front Abdominal Fy

Min: -18.5 [N] at 0.021 [s]



B-17

tr2439

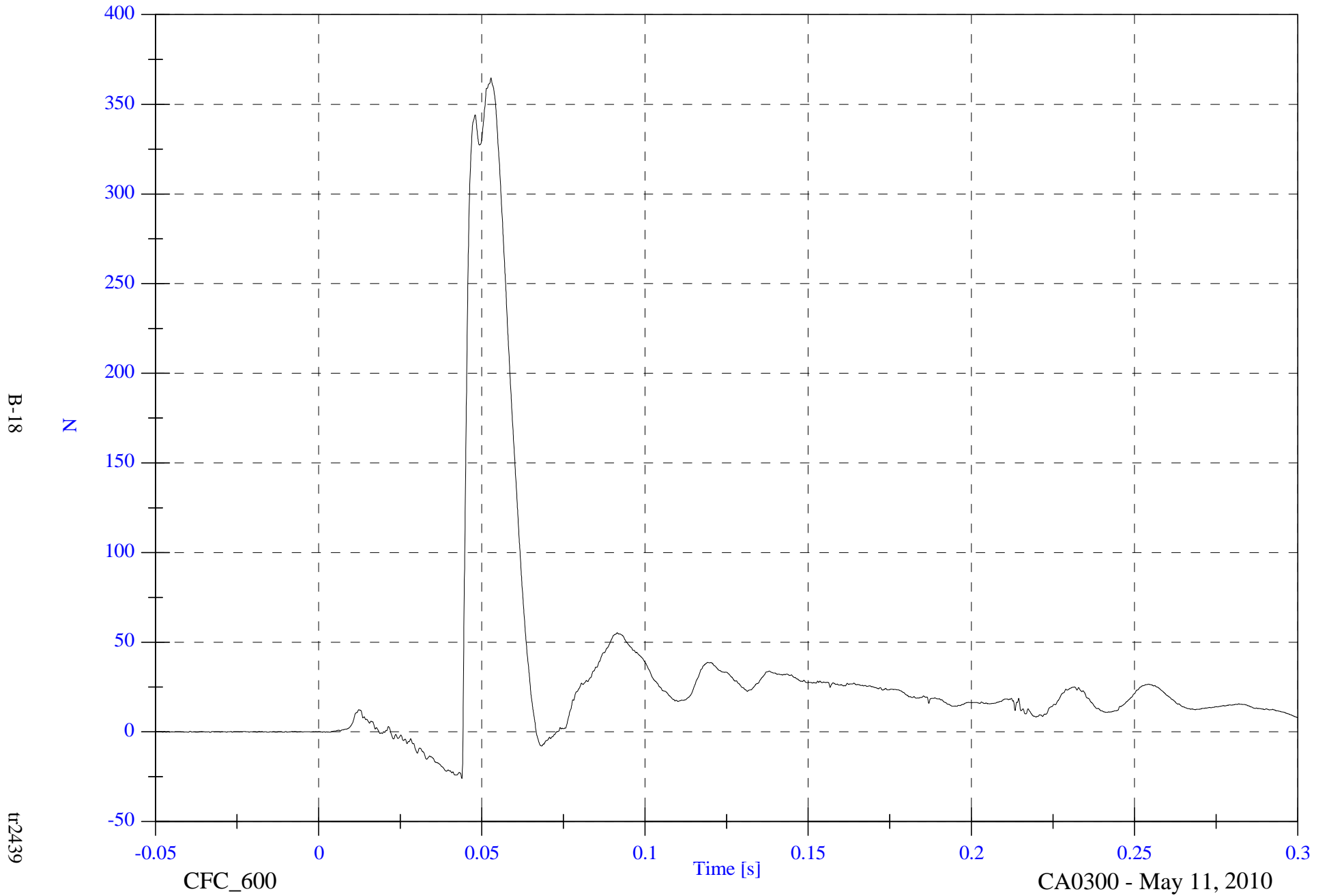


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P1 Middle Abdominal Fy

Max: 364.8 [N] at 0.053 [s]

Min: -26.0 [N] at 0.044 [s]



B-18

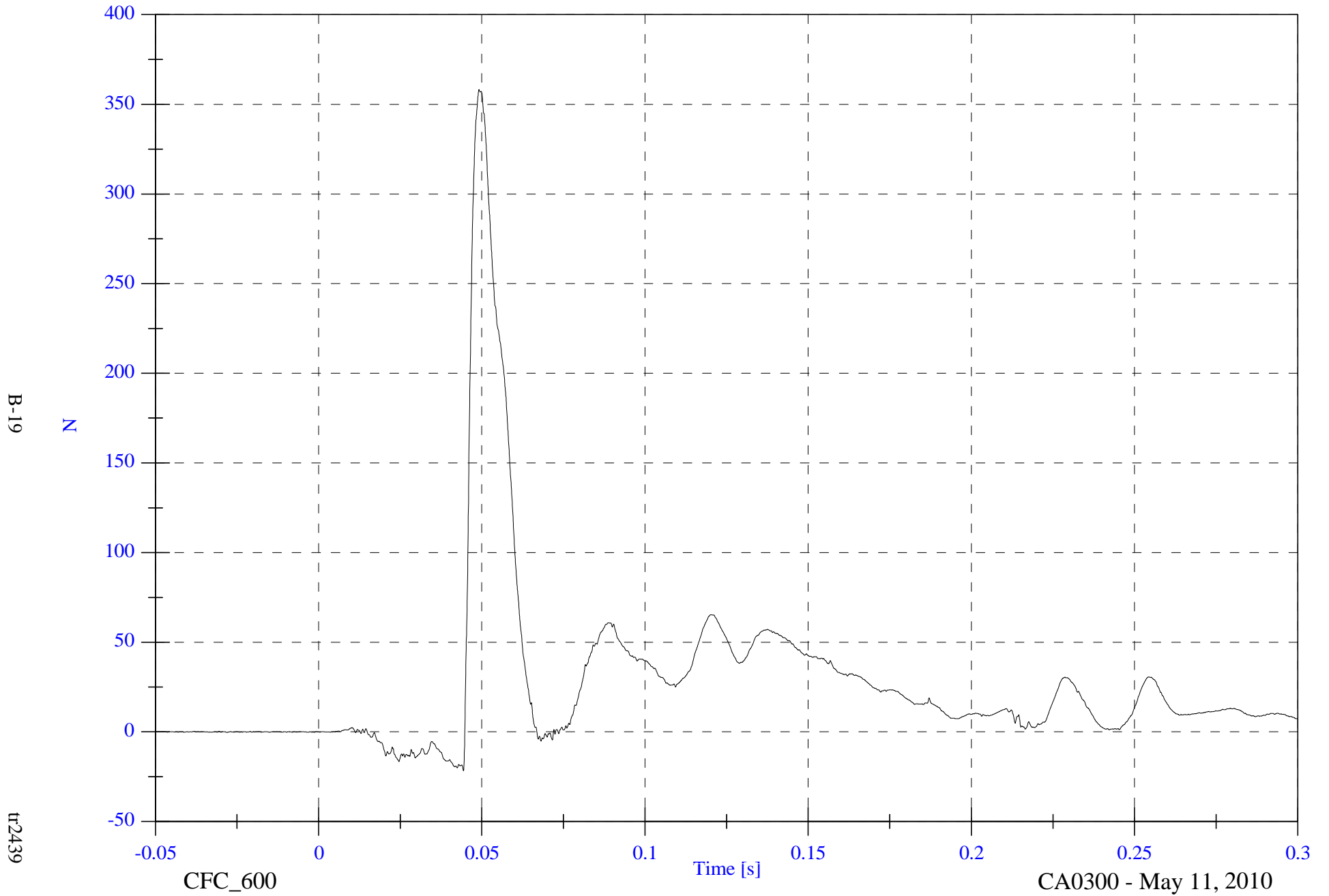
tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 358.3 [N] at 0.049 [s]

V2P1 Rear Abdominal Fy

Min: -21.7 [N] at 0.044 [s]

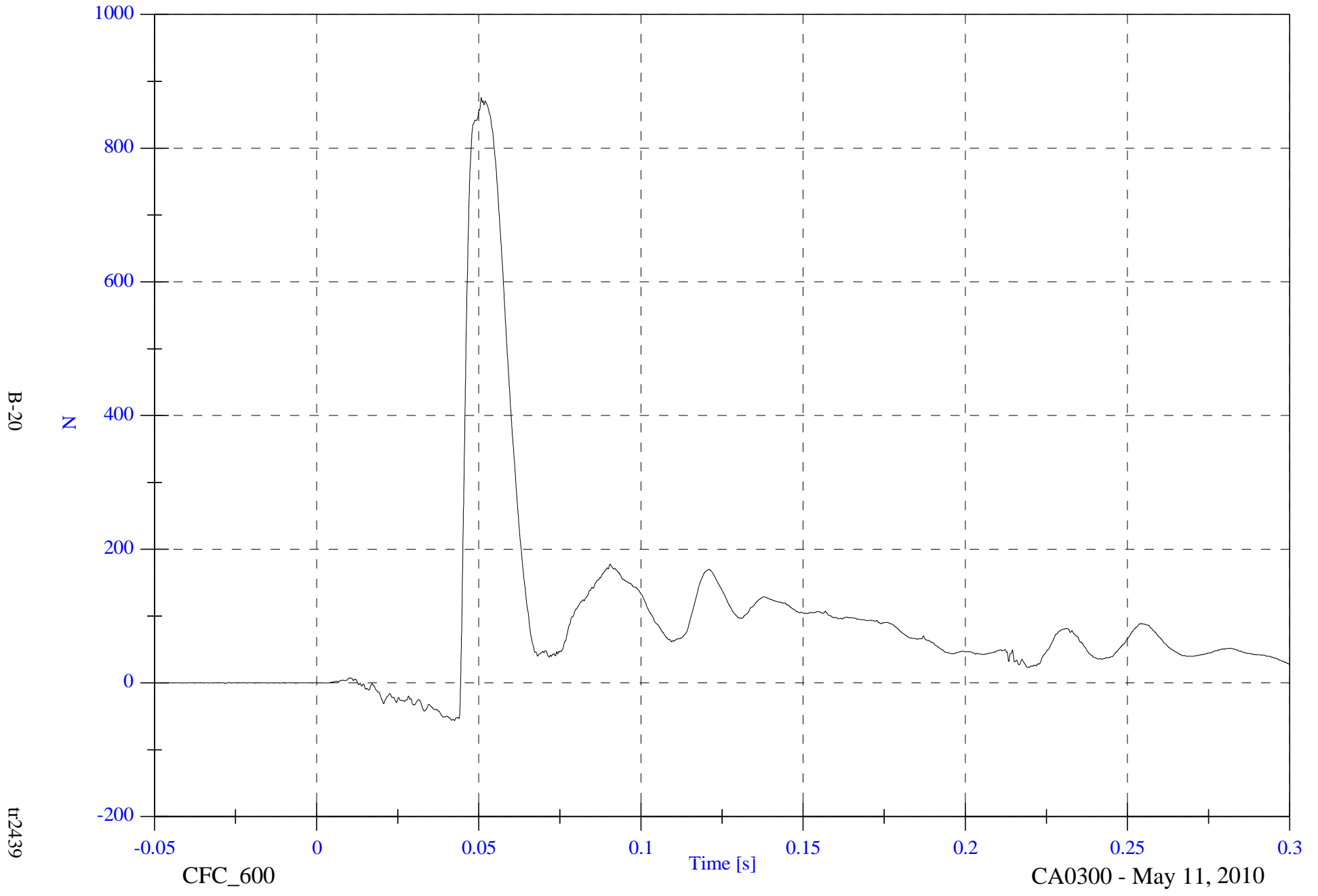


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 876.0 [N] at 0.051 [s]

V2P1 Abdominal Summation Fy

Min: -56.4 [N] at 0.042 [s]



B-20

tr2439

CFC\_600

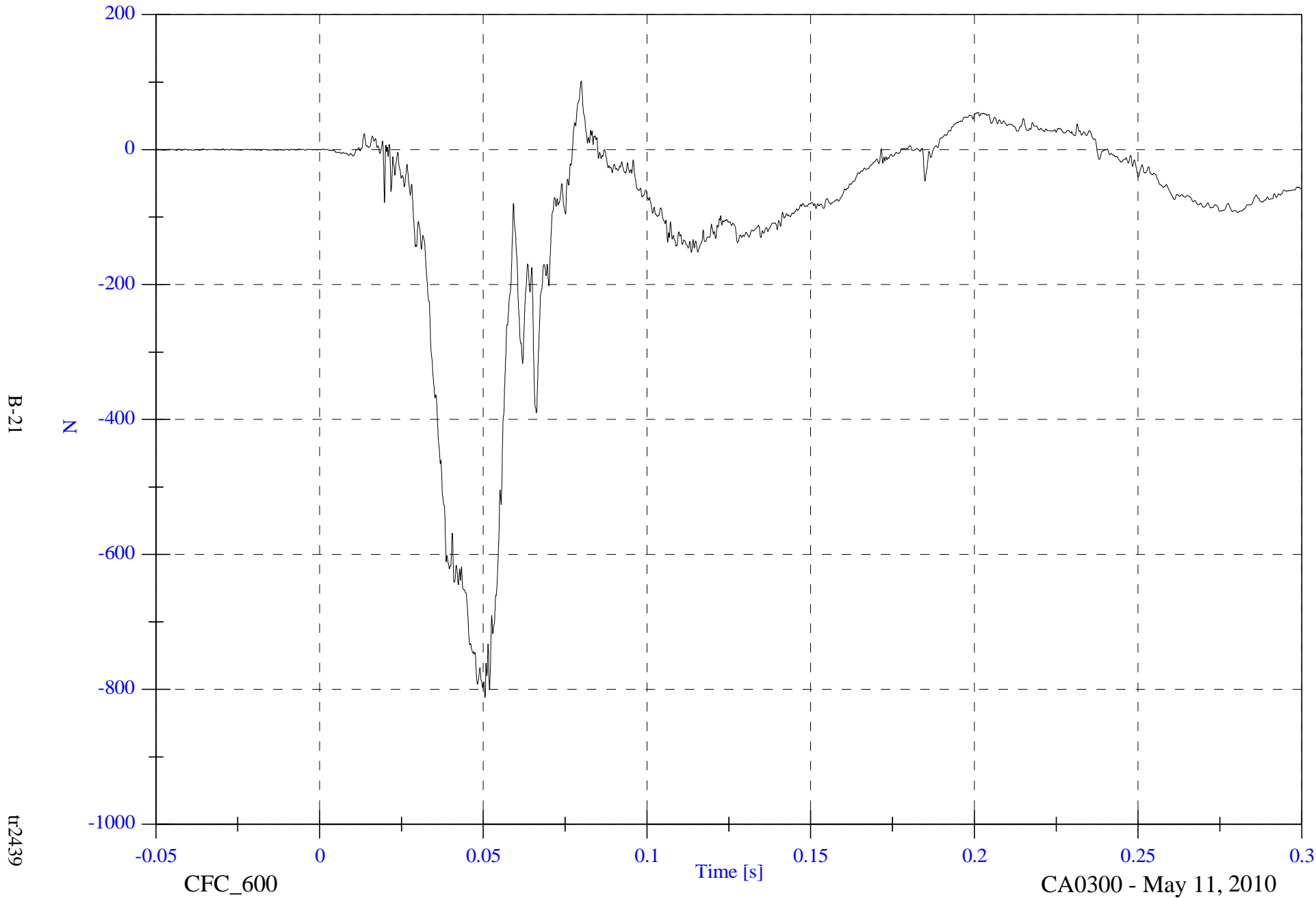
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 101.8 [N] at 0.080 [s]

V2P1 Pubic Symphysis Fy

Min: -812.3 [N] at 0.051 [s]



B-21

N

tr2439

CFC\_600

Time [s]

CA0300 - May 11, 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**

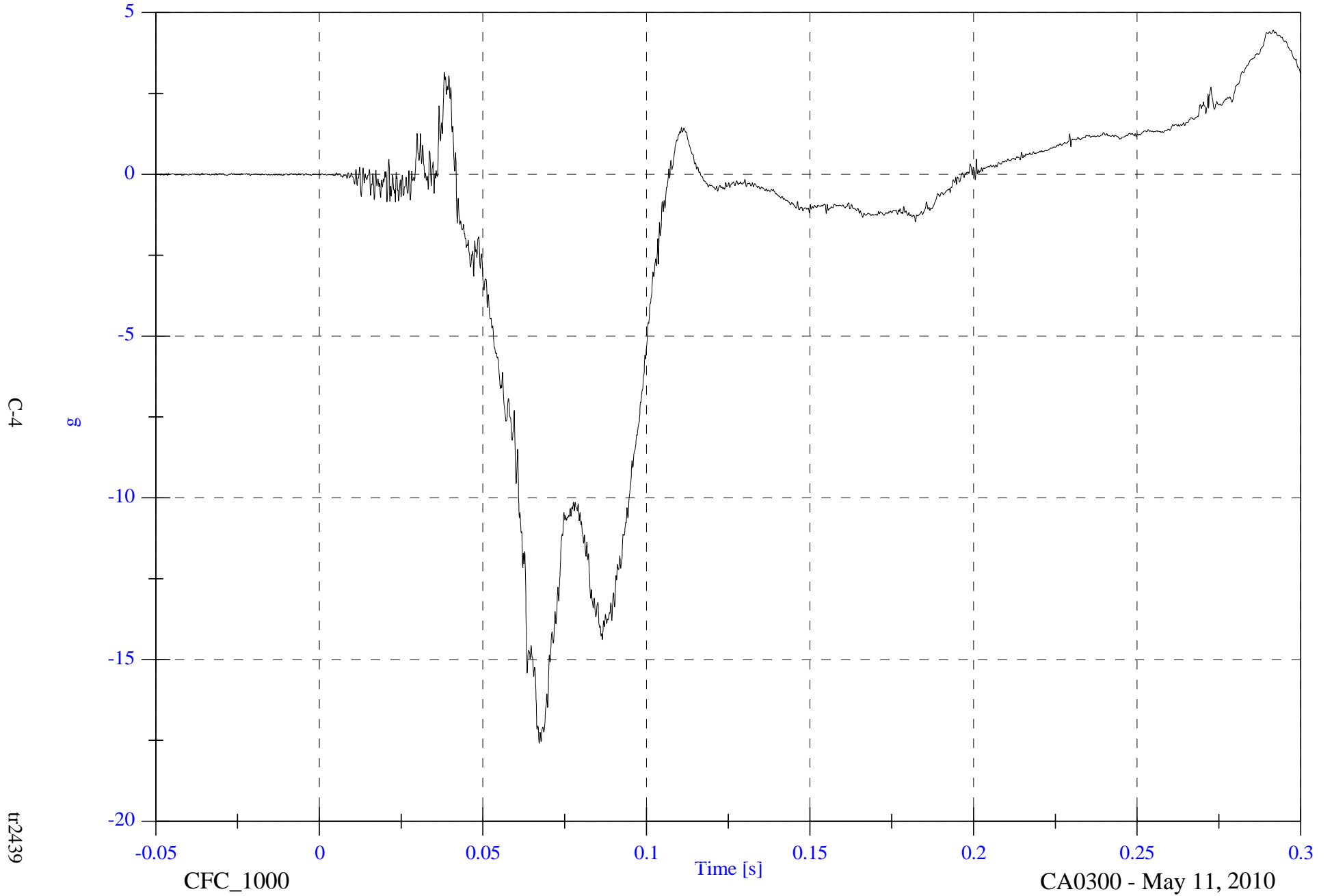
PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	SID-IIs Head Ax [g, CFC_1000]	C-4
2	SID-IIs Head Ay [g, CFC_1000]	C-5
3	SID-IIs Head Az [g, CFC_1000]	C-6
4	SID-IIs Head Resultant [g, CFC_1000]	C-7
5	SID-IIs Head Ax Velocity vs. Time	C-8
6	SID-IIs Head Ay Velocity vs. Time	C-9
7	SID-IIs Head Az Velocity 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 Illiac Force (Y) vs. Time	C-19
17	SID-IIs Sum of Illiac and Acetabulum Force vs. Time	C-20

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Head x

Max: 4.5 [g] at 0.292 [s]

Min: -17.6 [g] at 0.067 [s]



C-4

g

tr2439

CFC\_1000

Time [s]

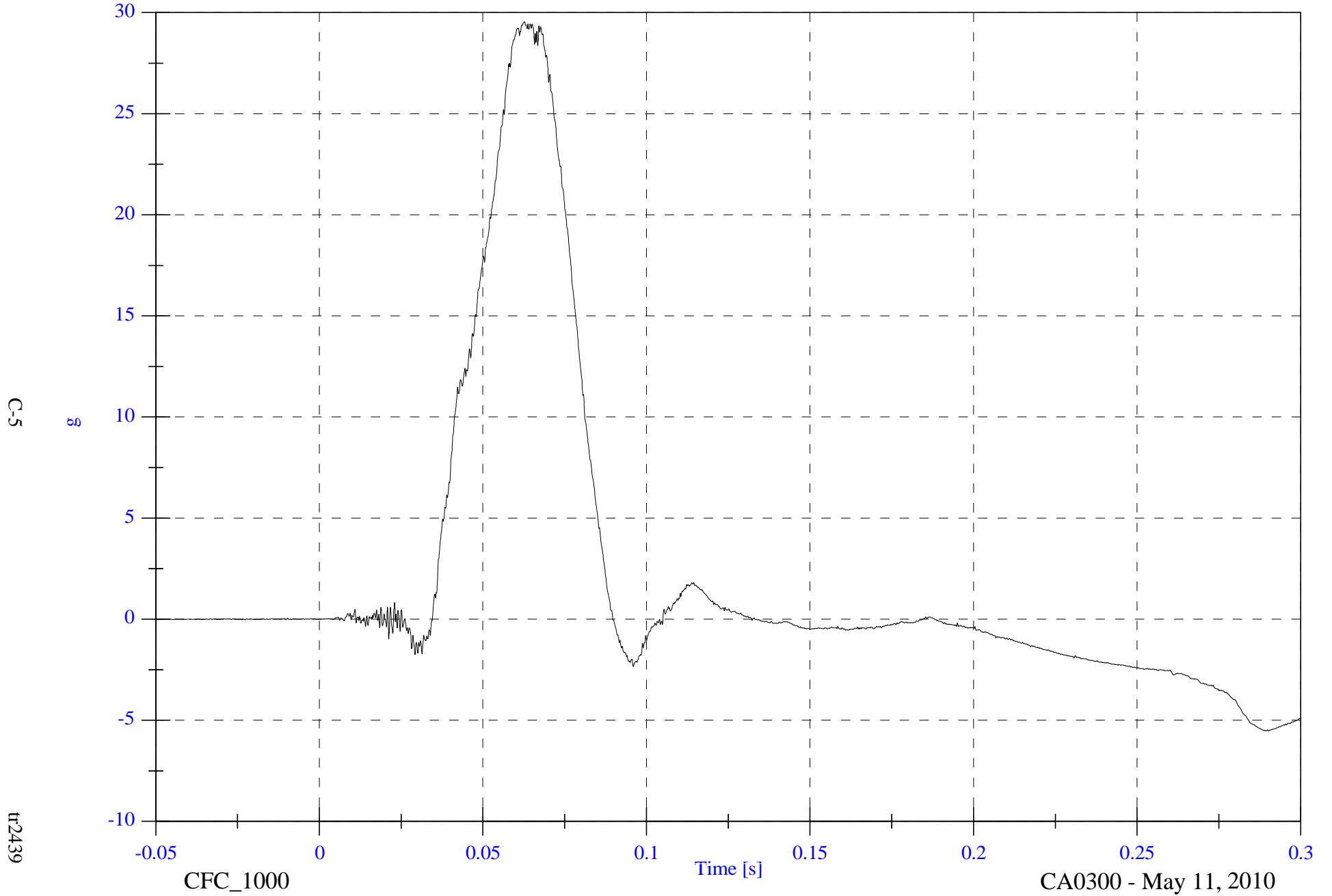
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Head y

Max: 29.5 [g] at 0.063 [s]

Min: -5.5 [g] at 0.290 [s]



C-5

g

tt2439

CFC\_1000

Time [s]

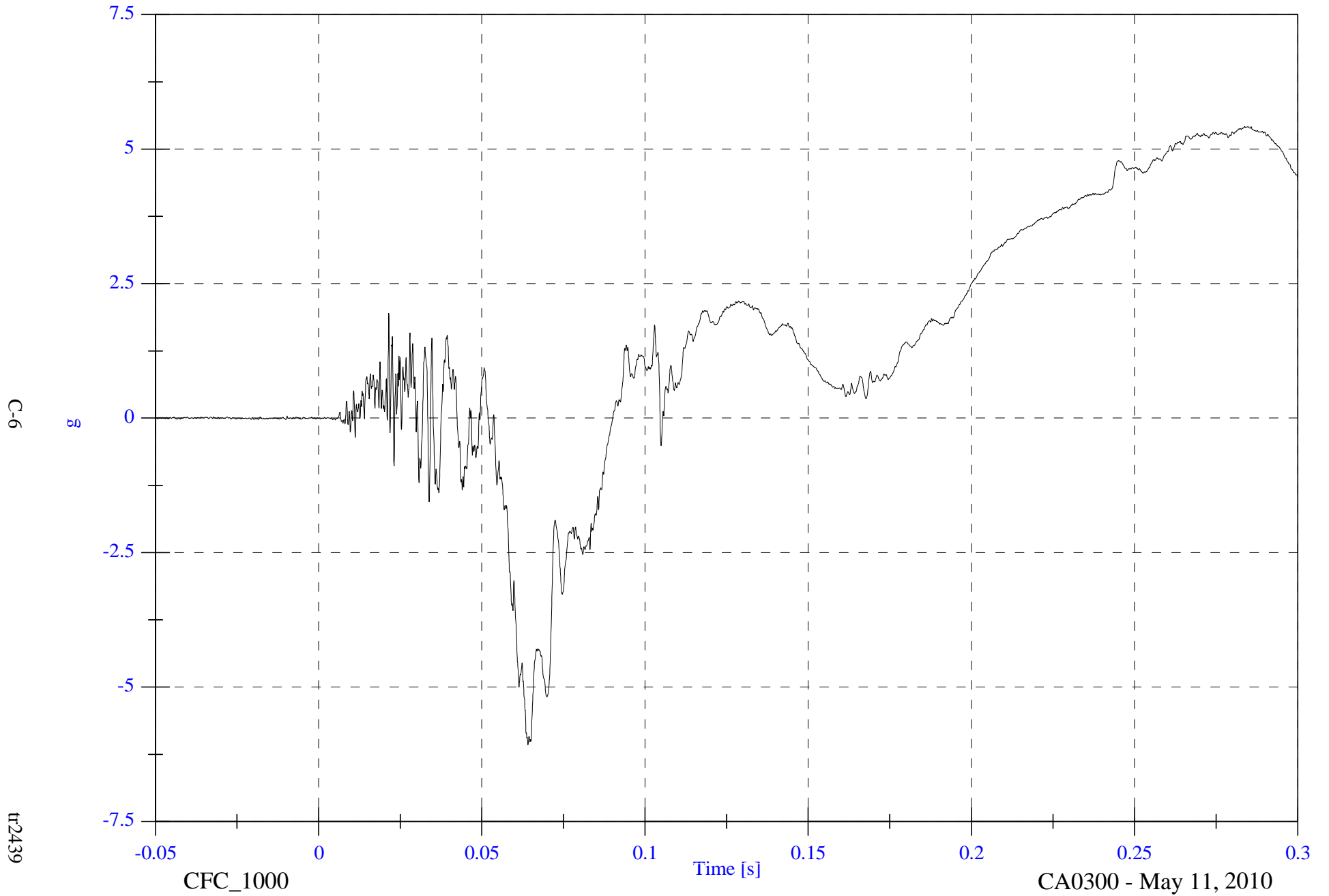
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Head z

Max: 5.4 [g] at 0.284 [s]

Min: -6.1 [g] at 0.064 [s]



C-6

tt2439

CFC\_1000

CA0300 - May 11, 2010

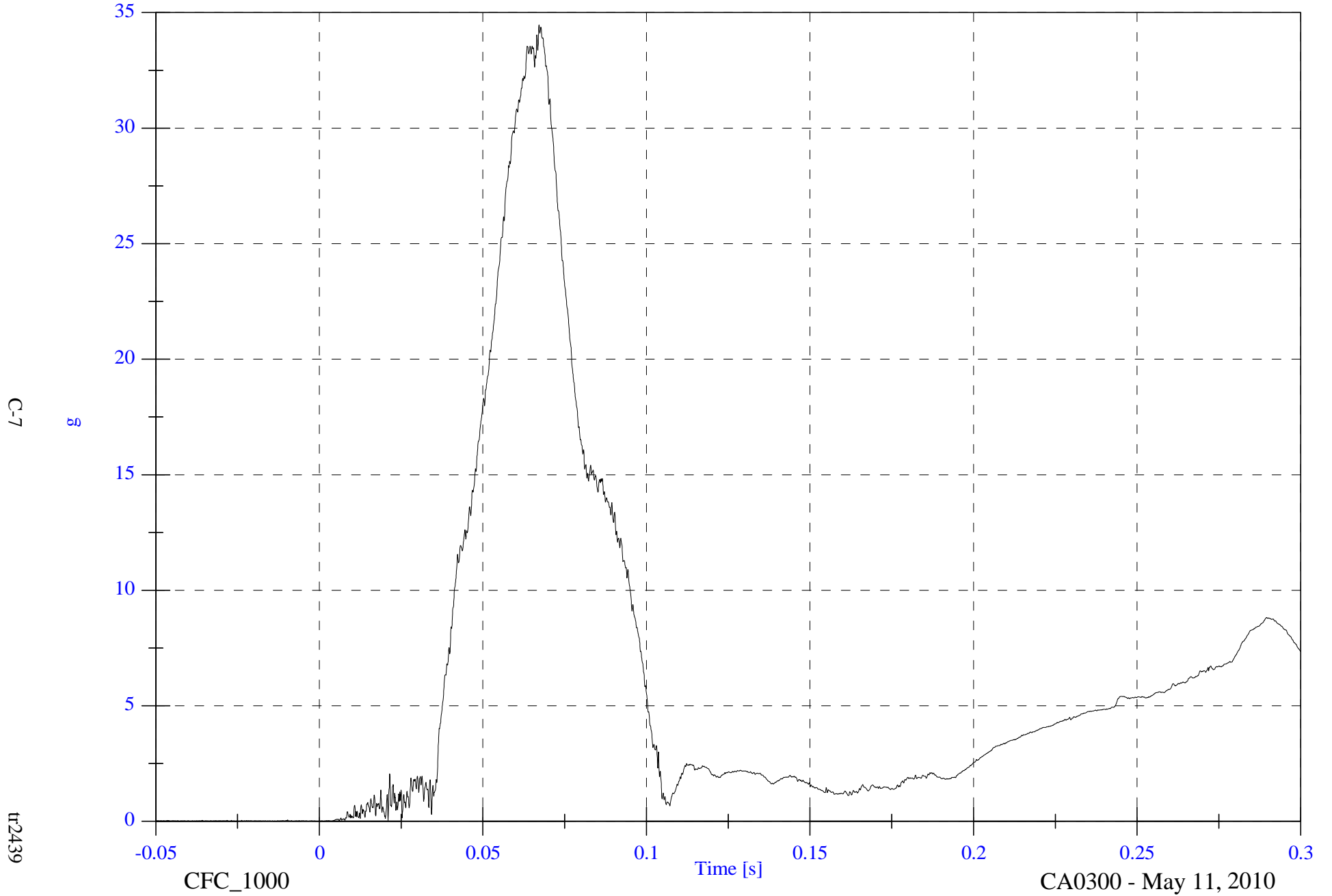


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Head Resultant

Max: 34.5 [g] at 0.067 [s]

Min: 0.0 [g] at -0.018 [s]



C-7

IT2439

CFC\_1000

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

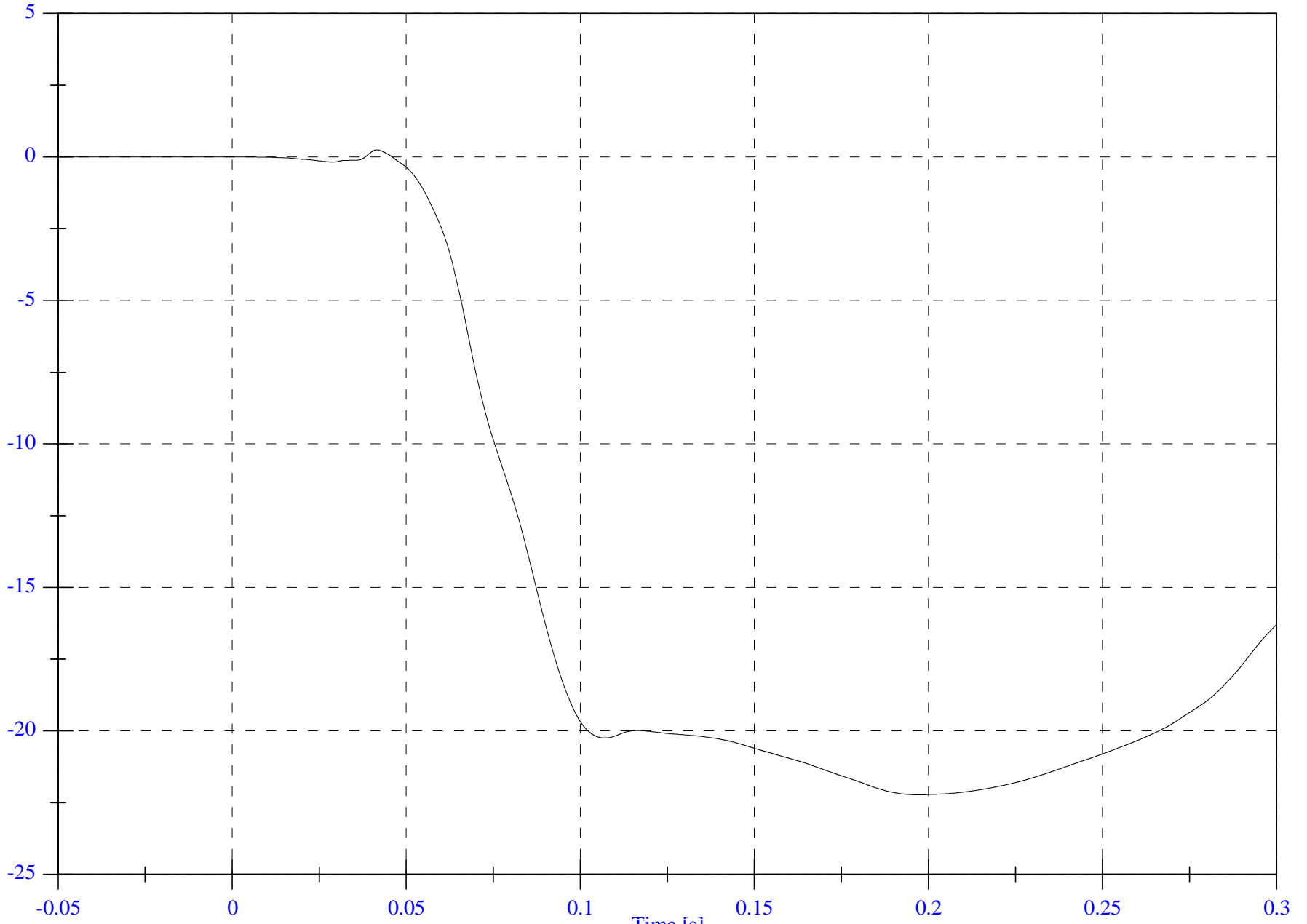
V2P4 Head x Velocity

Max: 0.2 [kph] at 0.042 [s]

Min: -22.2 [kph] at 0.197 [s]

C-8

kph



CFC\_180

Time [s]

CA0300 - May 11, 2010

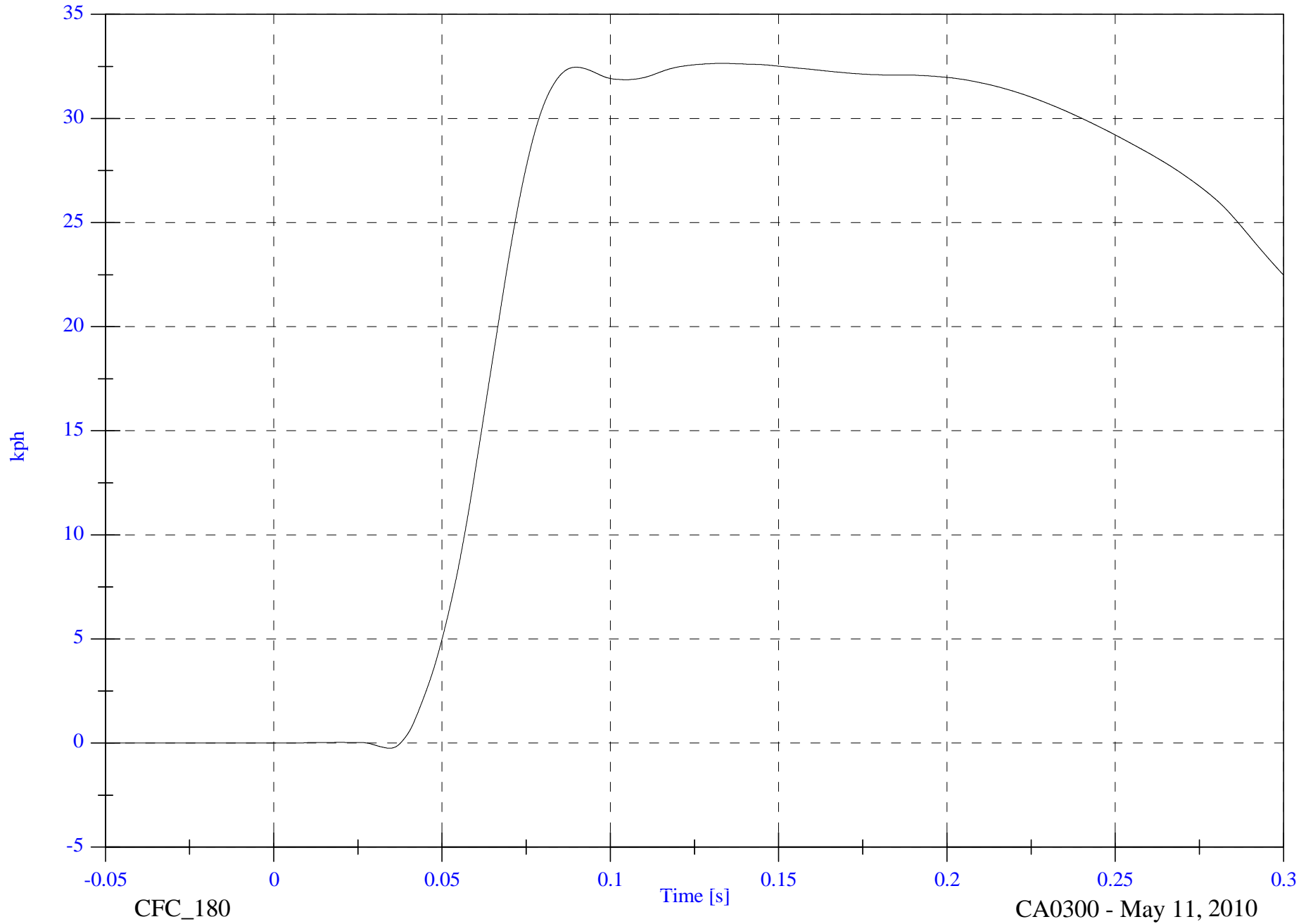
tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Head y Velocity

Max: 32.6 [kph] at 0.133 [s]

Min: -0.2 [kph] at 0.034 [s]



C-9

kph

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

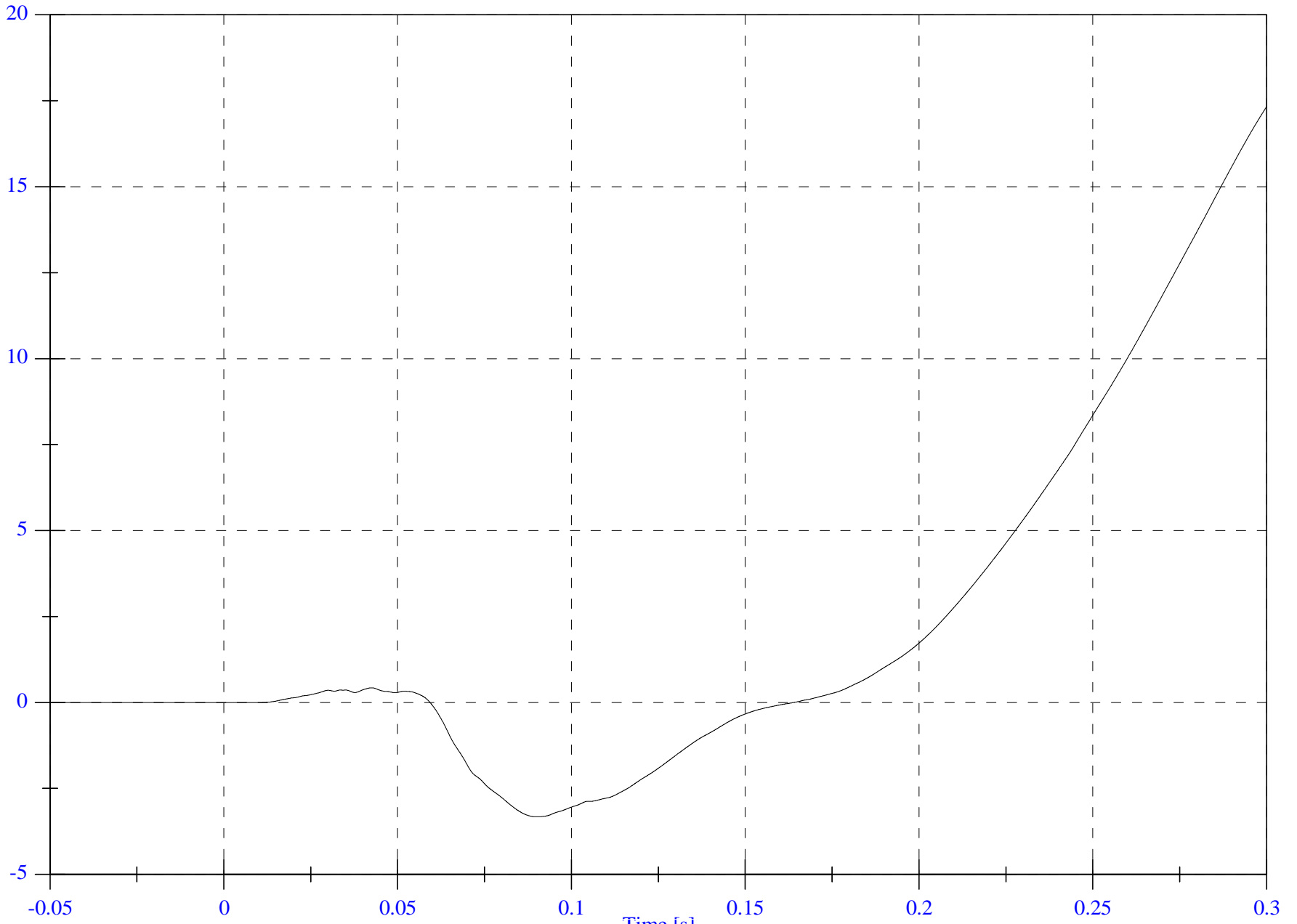
V2P4 Head z Velocity

Max: 17.3 [kph] at 0.300 [s]

Min: -3.3 [kph] at 0.090 [s]

C-110

kph



tr2439

CFC\_180

Time [s]

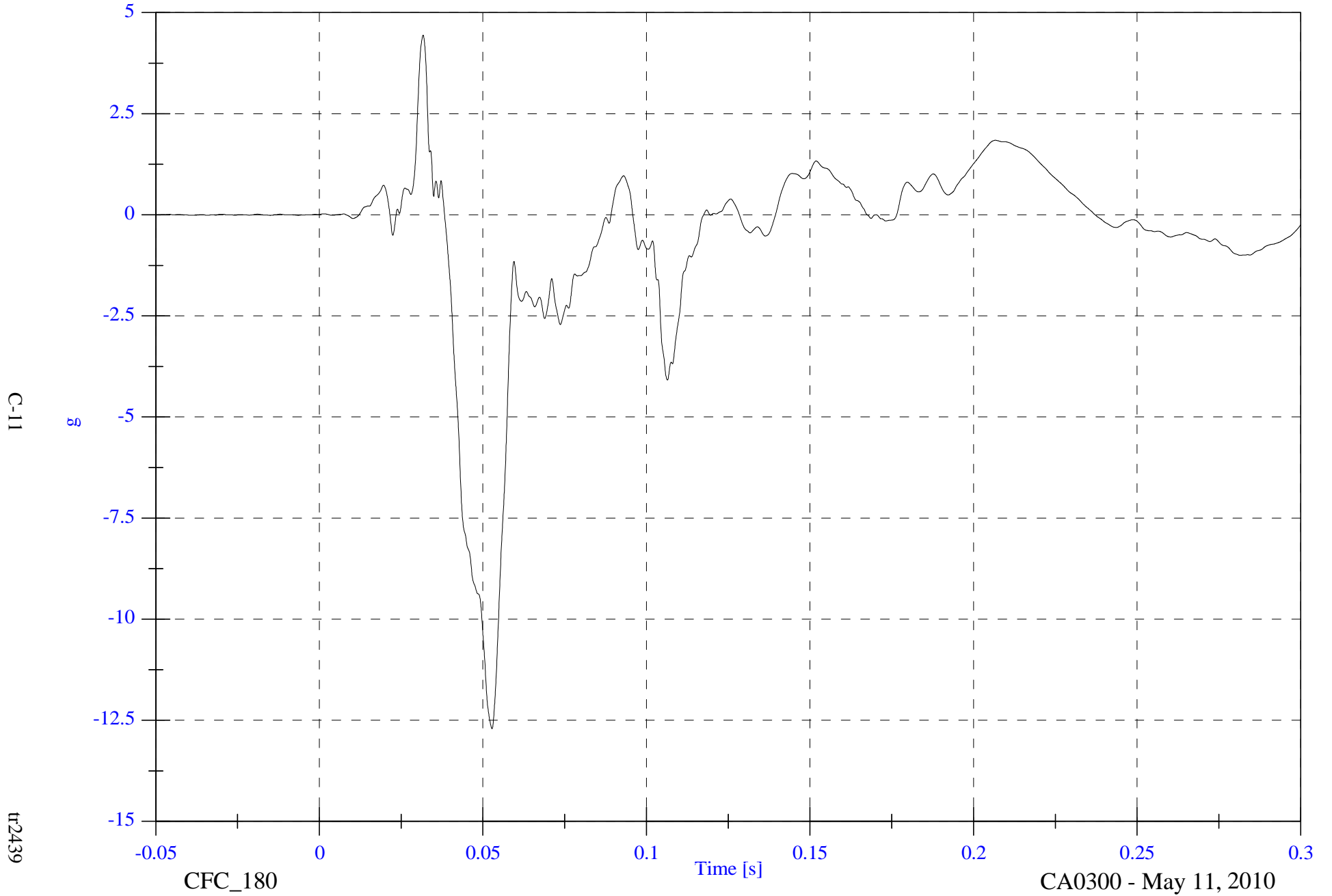
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Lower Spine x

Max: 4.4 [g] at 0.032 [s]

Min: -12.7 [g] at 0.053 [s]



C-11

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

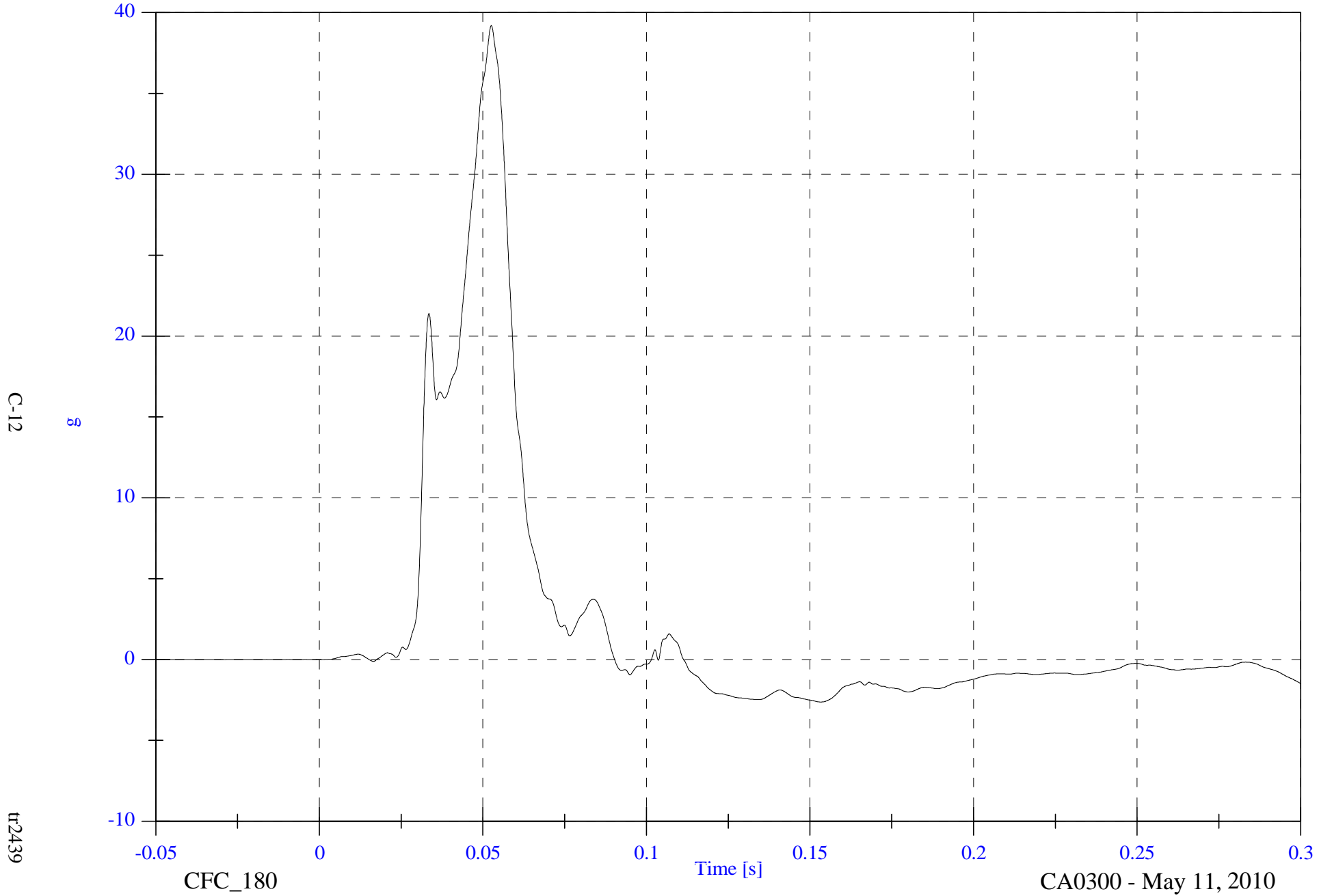


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 39.2 [g] at 0.053 [s]

V2P4 Lower Spine y

Min: -2.6 [g] at 0.153 [s]



C-12

g

tr2439

CFC\_180

Time [s]

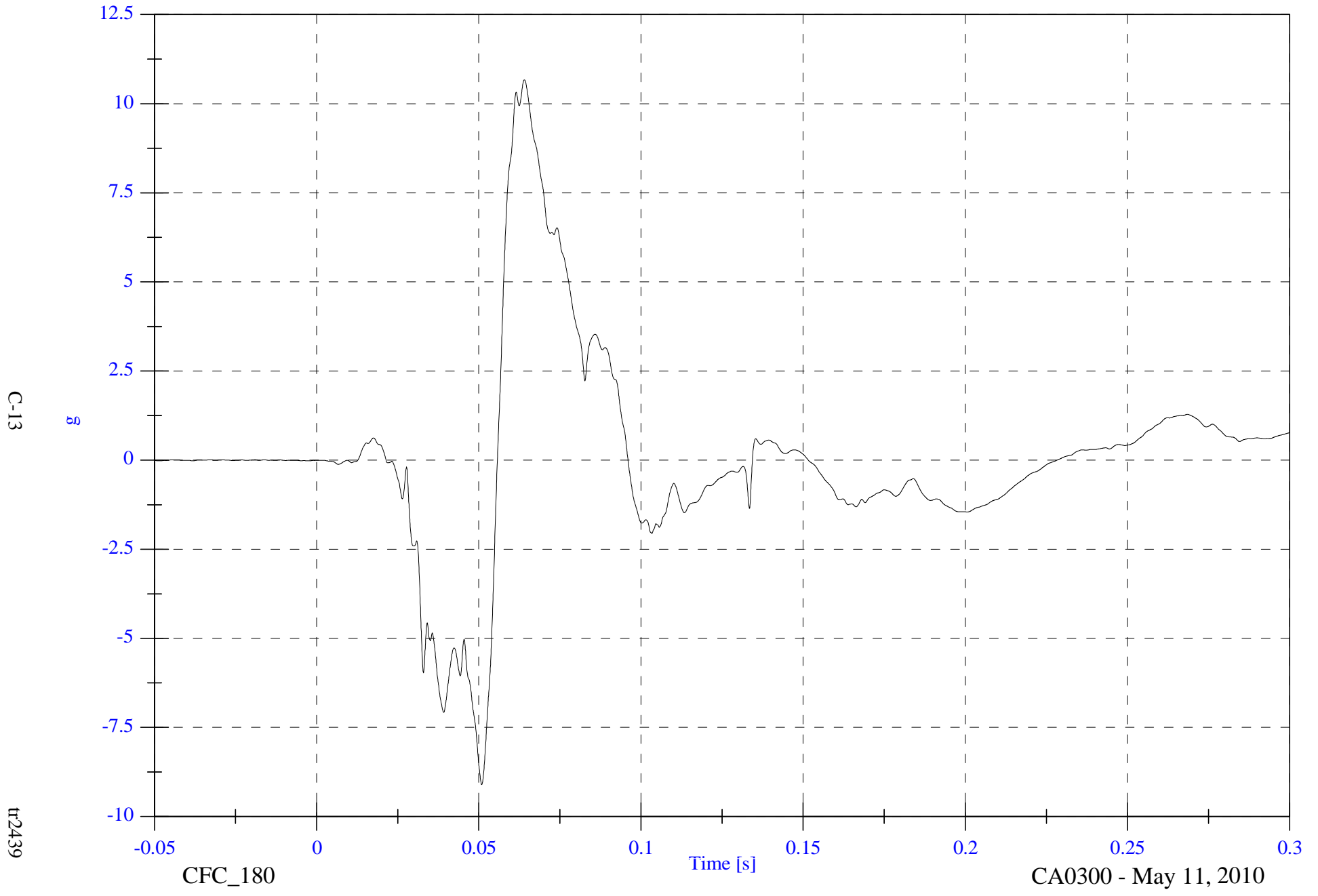
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 10.7 [g] at 0.064 [s]

V2P4 Lower Spine z

Min: -9.1 [g] at 0.051 [s]



C-13

tr2439

CFC\_180

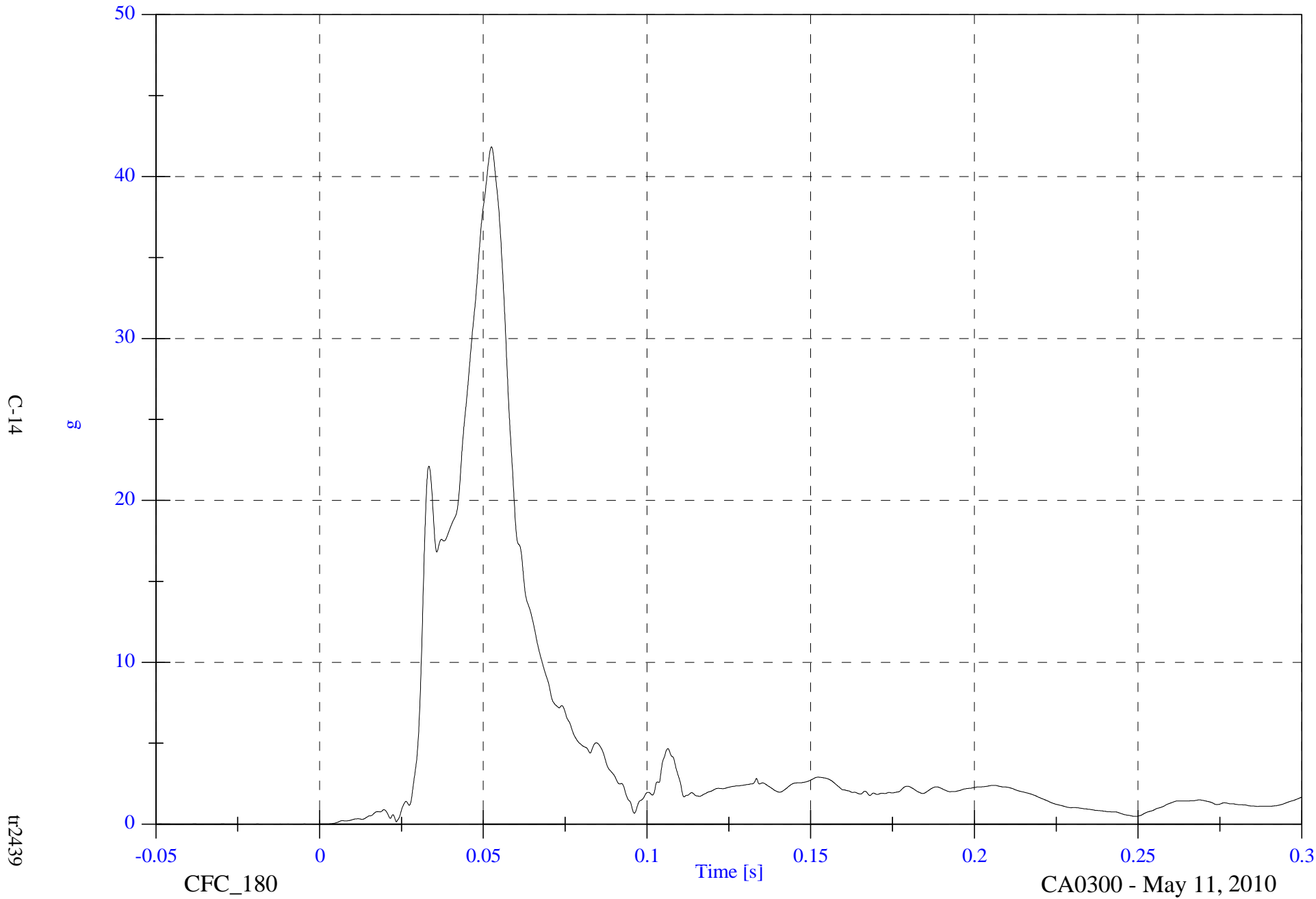
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Lower Spine Resultant

Max: 41.8 [g] at 0.052 [s]

Min: 0.0 [g] at -0.024 [s]



C-14

tr2439

CFC\_180

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

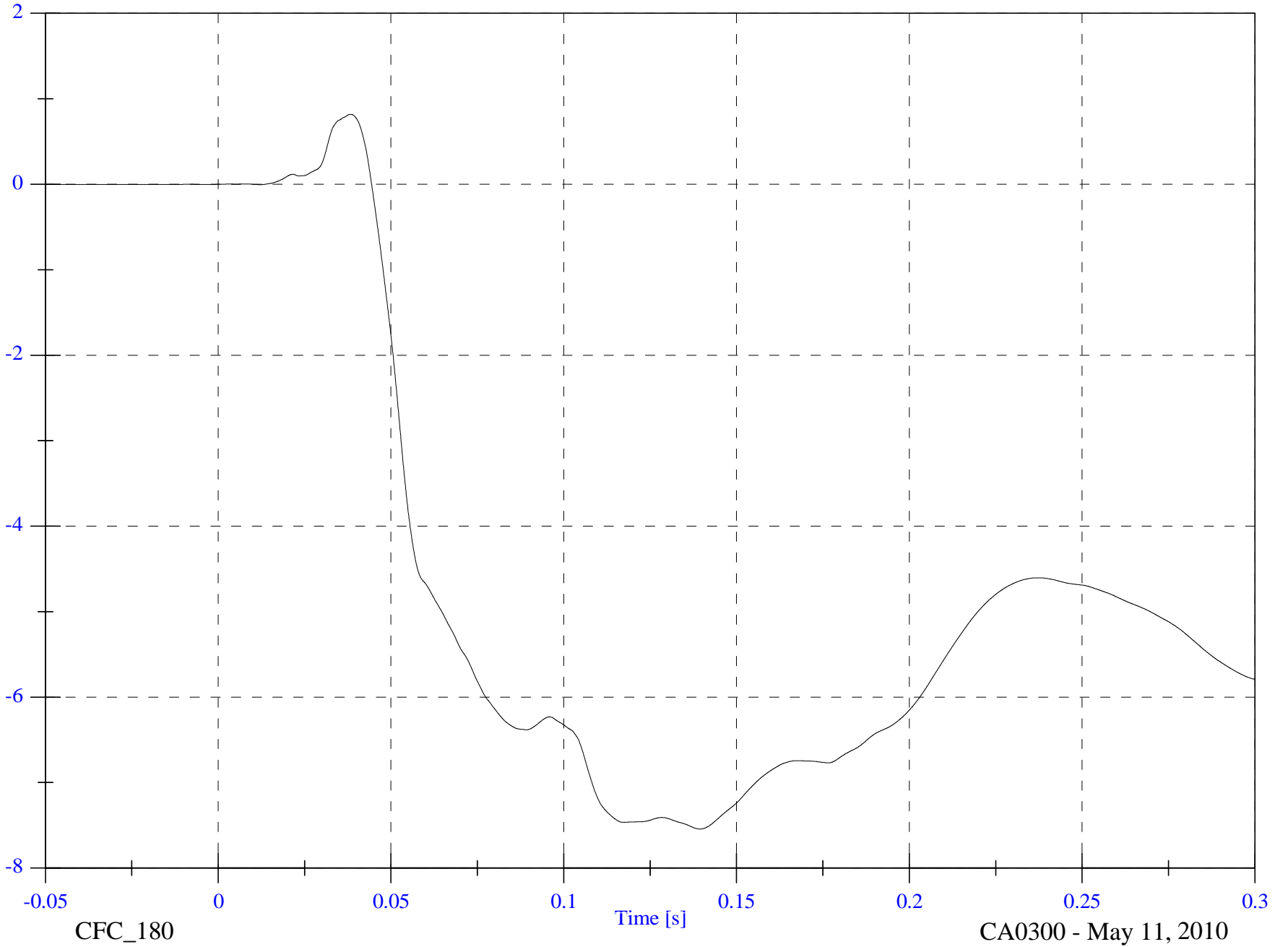
V2P4 Lower Spine x Velocity

Max: 0.8 [kph] at 0.038 [s]

Min: -7.5 [kph] at 0.139 [s]

C-15

kph



tr2439

CFC\_180

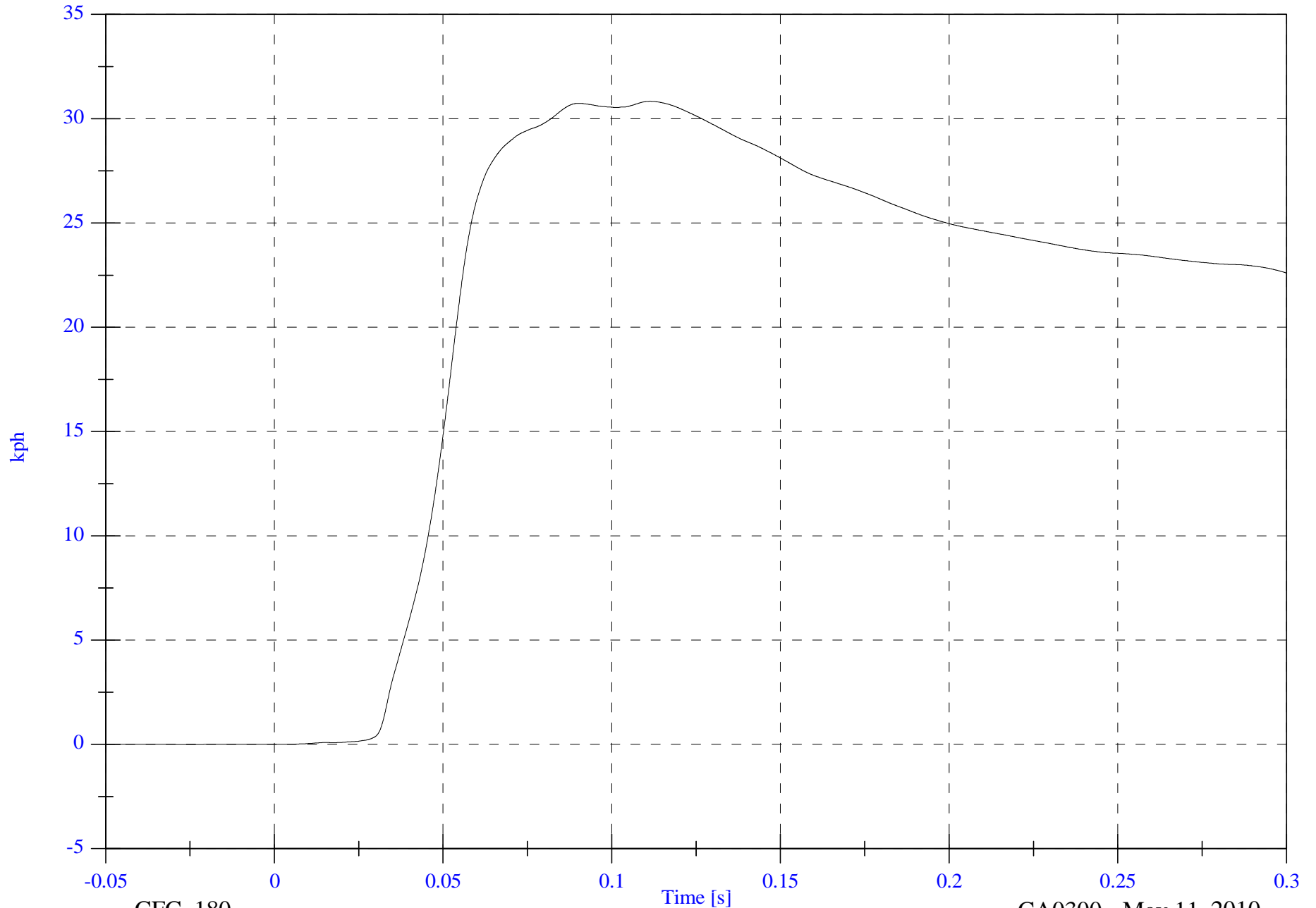
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Lower Spine y Velocity

Max: 30.8 [kph] at 0.111 [s]

Min: -0.0 [kph] at -0.027 [s]



C-16

tr2439

CFC\_180

CA0300 - May 11, 2010

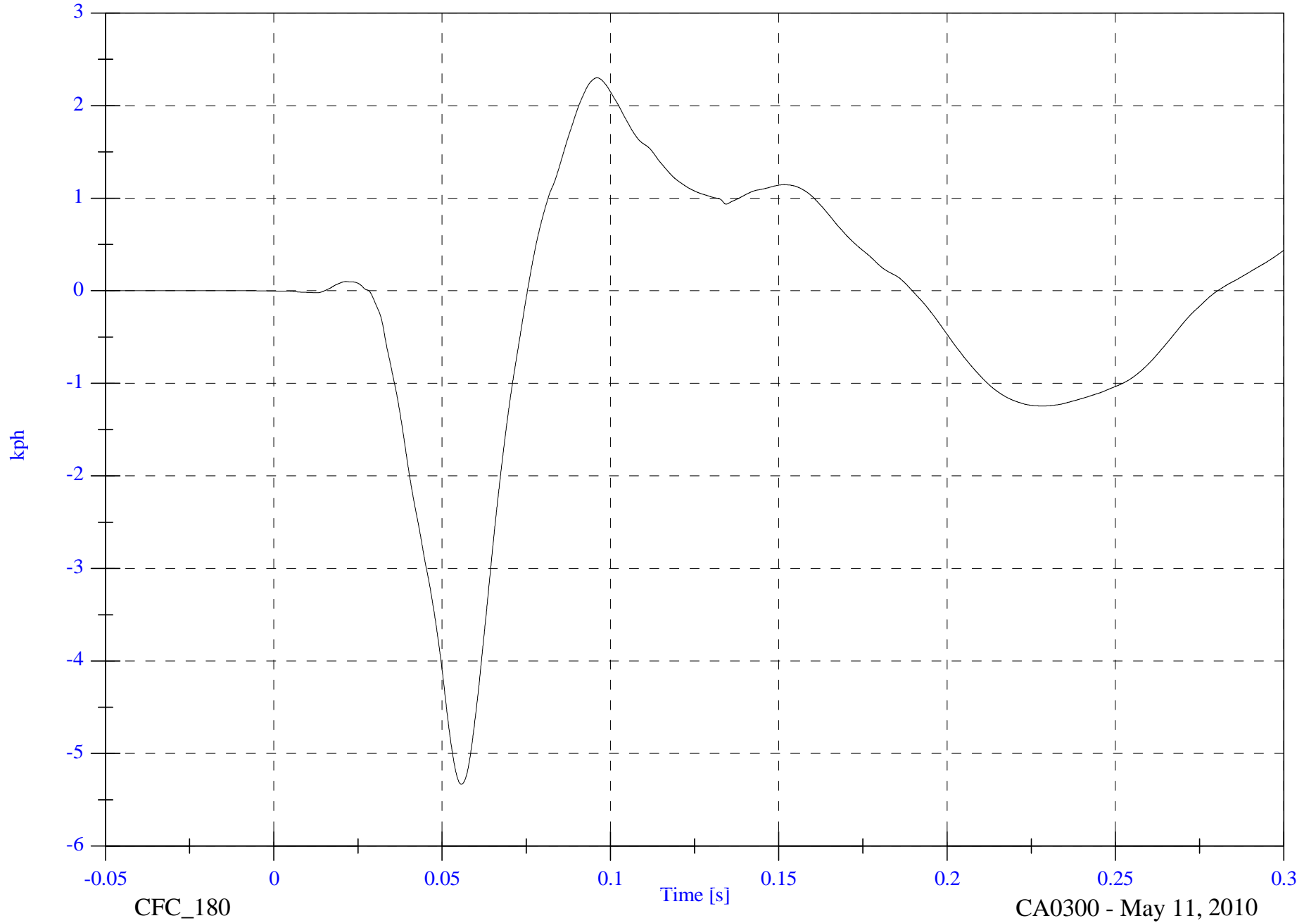


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Lower Spine z Velocity

Max: 2.3 [kph] at 0.096 [s]

Min: -5.3 [kph] at 0.056 [s]



C-17

tr2439

CFC\_180

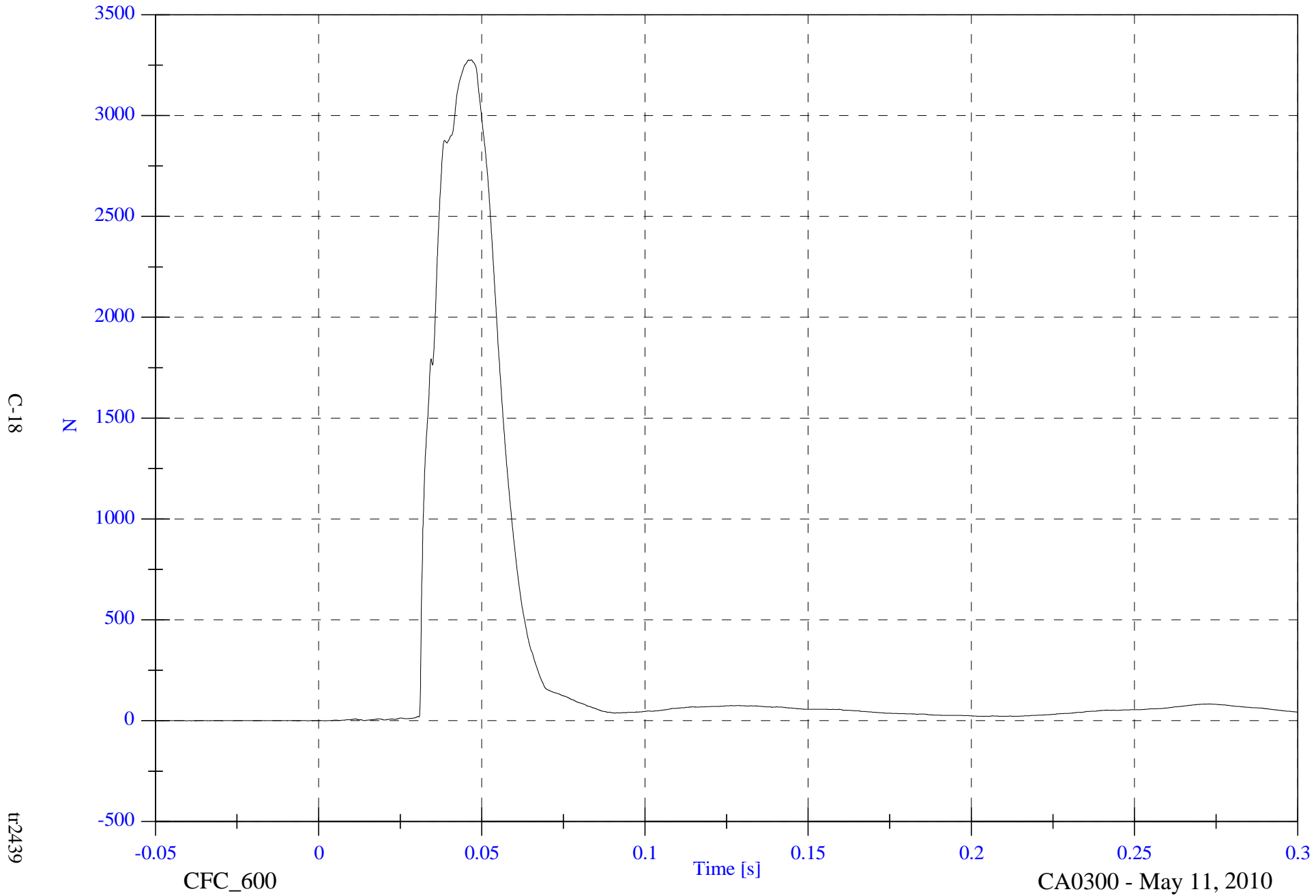
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Left Acetabulum Fy

Max: 3275.6 [N] at 0.047 [s]

Min: -0.5 [N] at -0.006 [s]



C-18

tr2439

CFC\_600

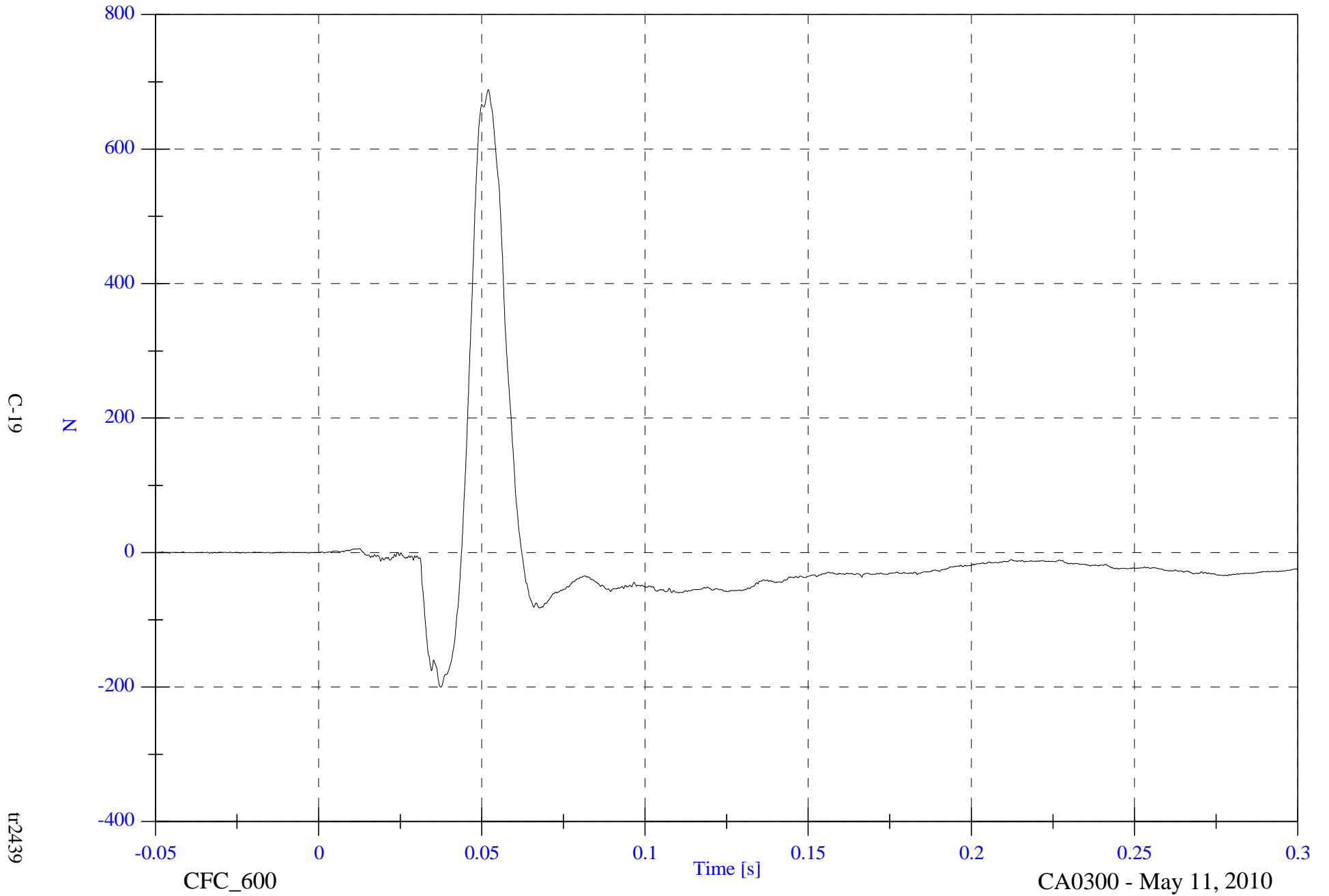
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Left Illiac Wing Fy

Max: 688.7 [N] at 0.052 [s]

Min: -200.3 [N] at 0.037 [s]



C-19

tr2439

CFC\_600

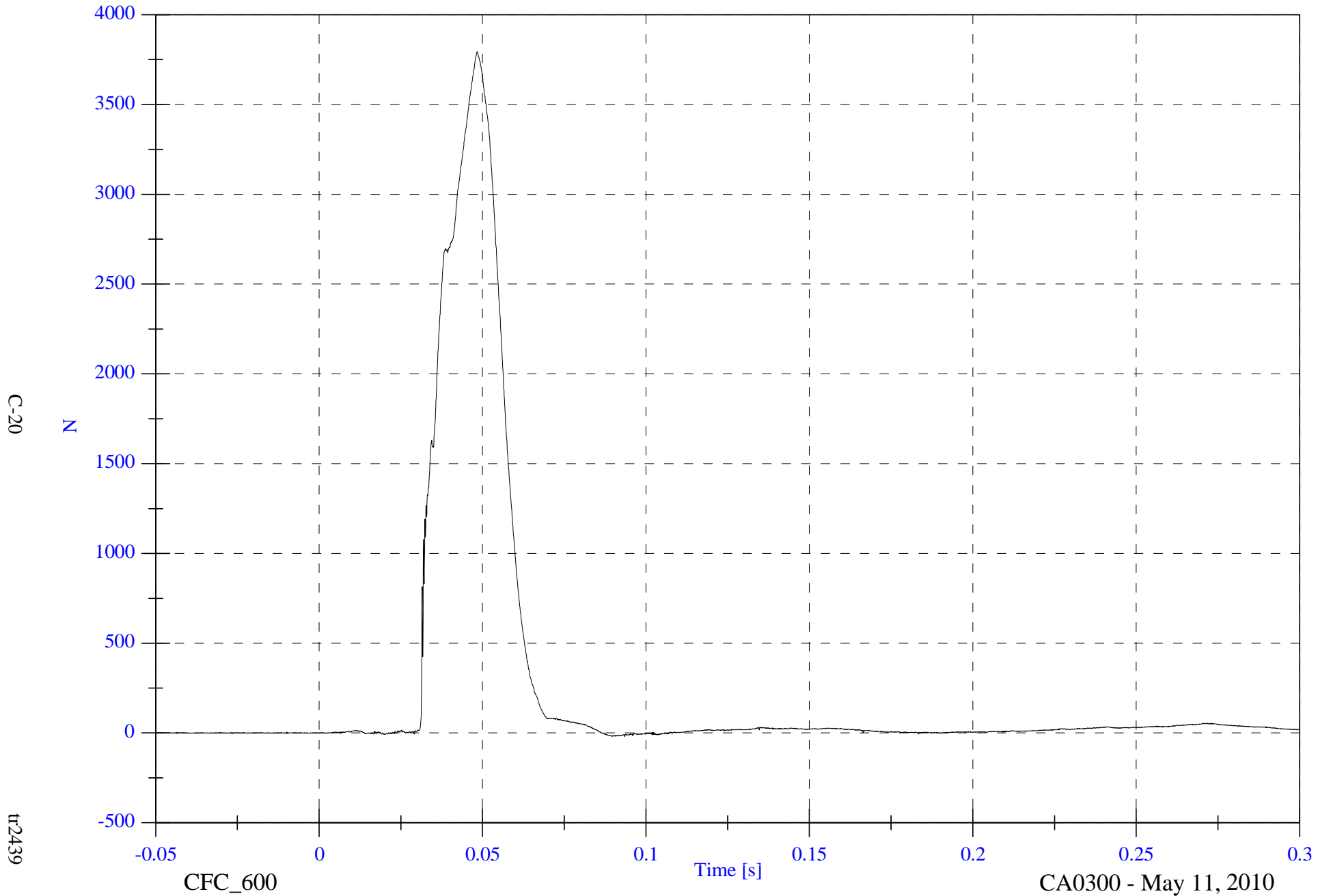
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2P4 Pelvic Summation

Max: 3794.4 [N] at 0.048 [s]

Min: -20.5 [N] at 0.093 [s]



C-20

N

tr2439

CFC\_600

Time [s]

CA0300 - May 11, 2010

**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)**

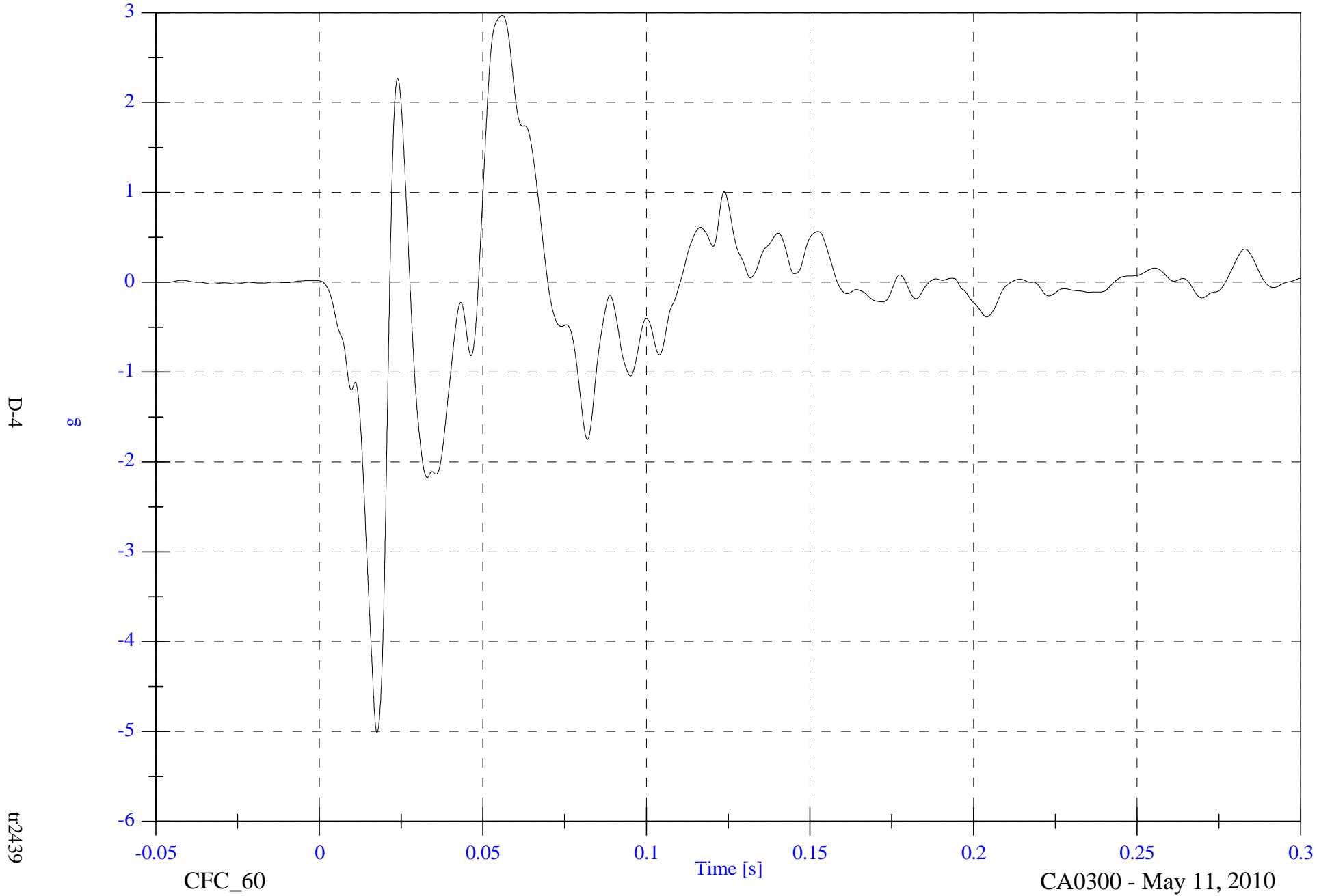
PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
32	Left Lower A-Pillar (Y) Acceleration vs. Time	D-35
33	Left Lower A-Pillar (Y) Velocity vs. Time	D-36
34	Left Middle A-Pillar (Y) Acceleration vs. Time	D-37
35	Left Middle A-Pillar (Y) Velocity vs. Time	D-38
36	Driver Seat Track (Y) Acceleration vs. 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 Dodge Journey CA0300

V2 A1 Right Front Sill X

Max: 3.0 [g] at 0.056 [s]

Min: -5.0 [g] at 0.018 [s]



D-4

g

tr2439

CFC\_60

Time [s]

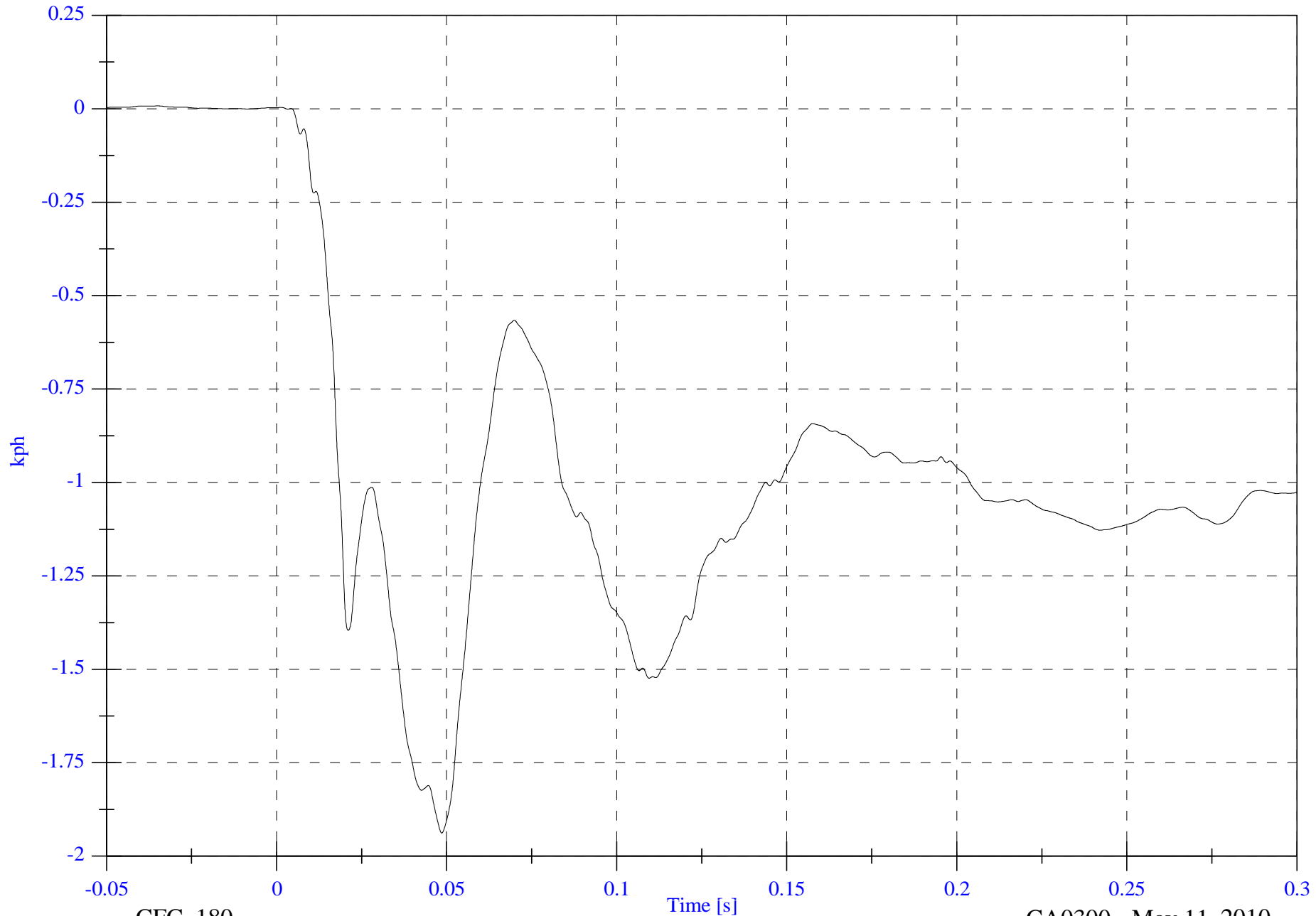
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A1 Right Front Sill X Velocity

Max: 0.0 [kph] at -0.035 [s]

Min: -1.9 [kph] at 0.049 [s]



D-5

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A1 Right Front Sill Y

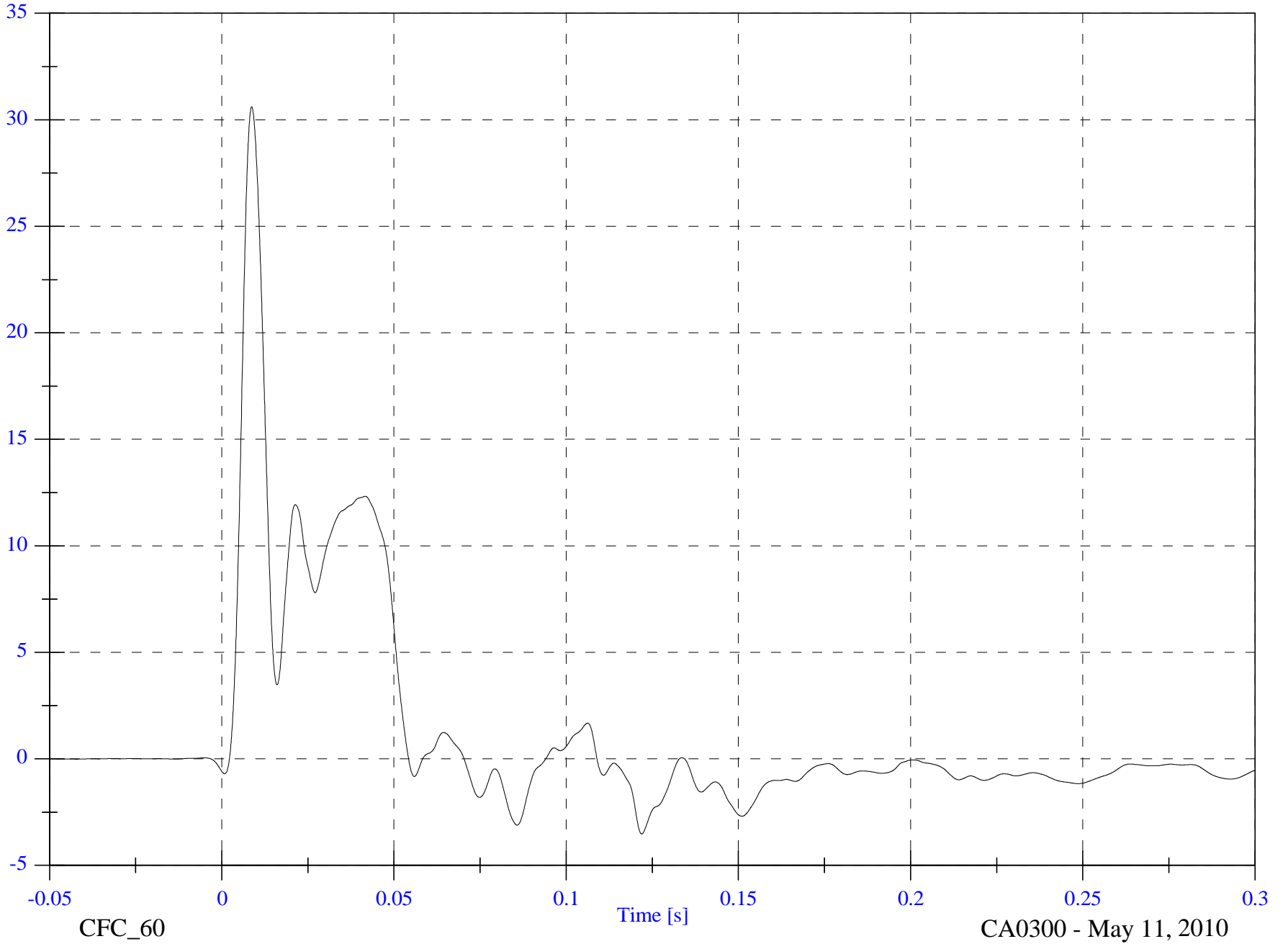
Max: 30.6 [g] at 0.009 [s]

Min: -3.5 [g] at 0.122 [s]

D-6

g

tt2439

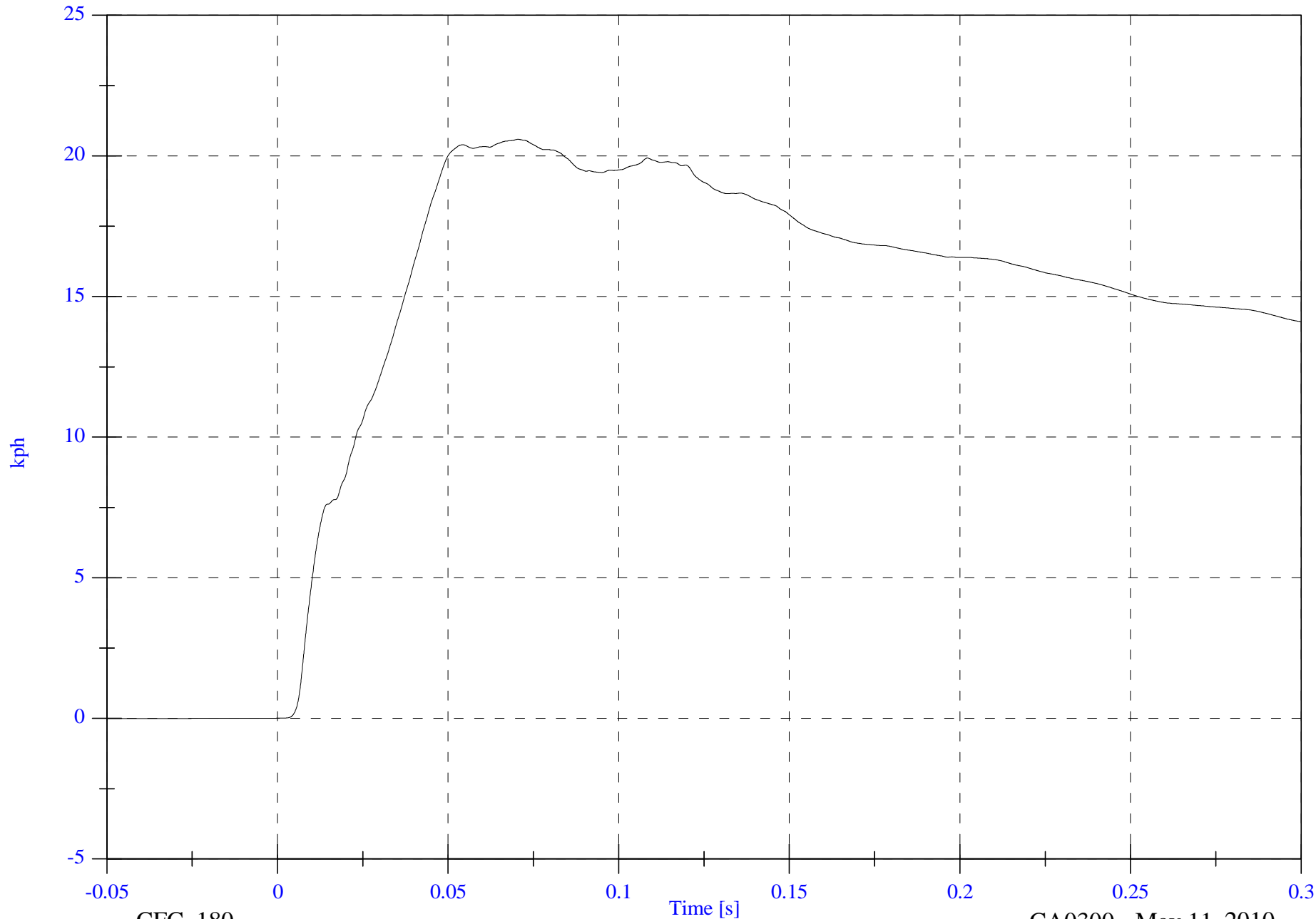


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 20.6 [kph] at 0.070 [s]

V2 A1 Right Front Sill Y Velocity

Min: -0.0 [kph] at -0.034 [s]



D-7

kph

tr2439

CFC\_180

Time [s]

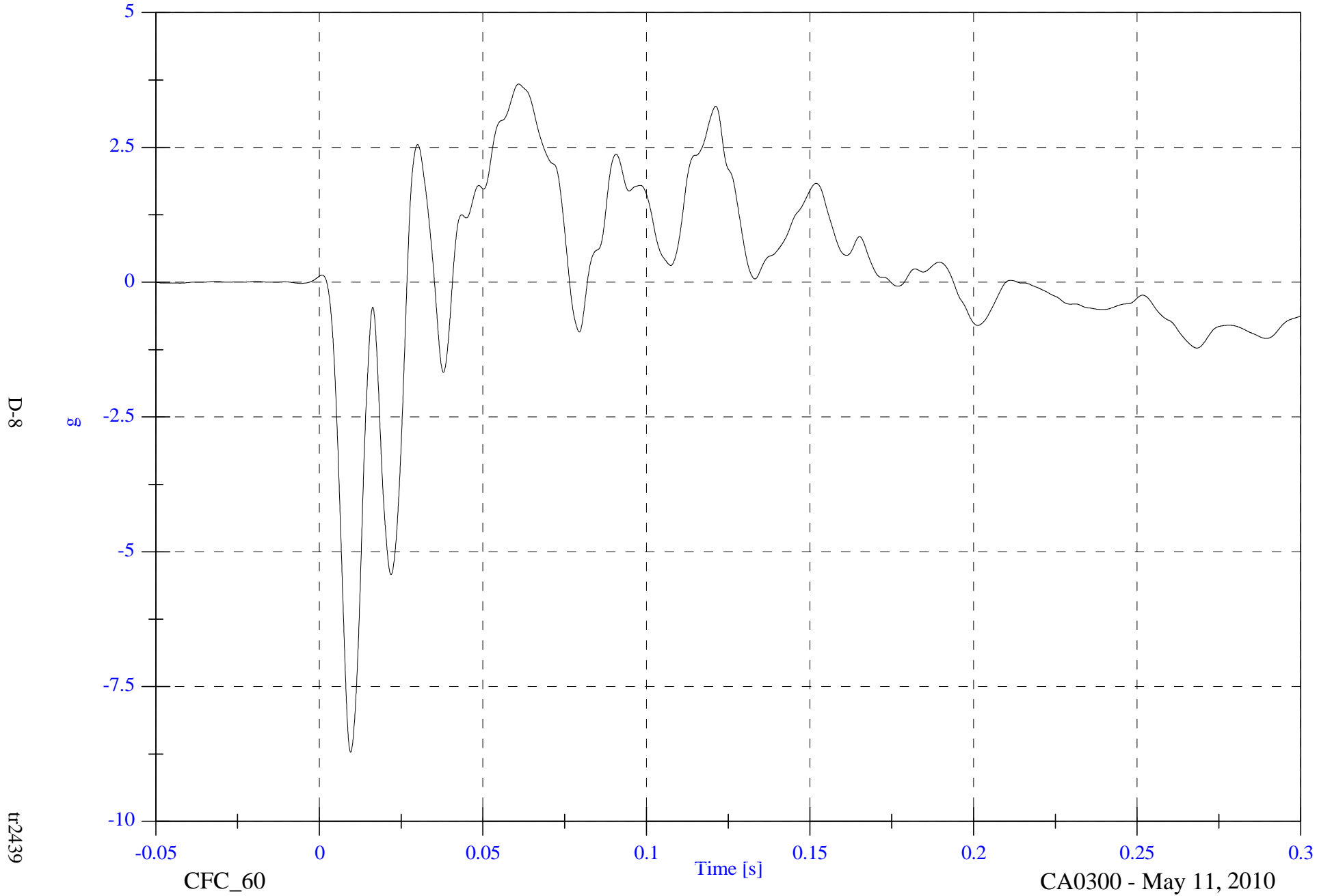
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A1 Right Front Sill Z

Max: 3.7 [g] at 0.061 [s]

Min: -8.7 [g] at 0.010 [s]



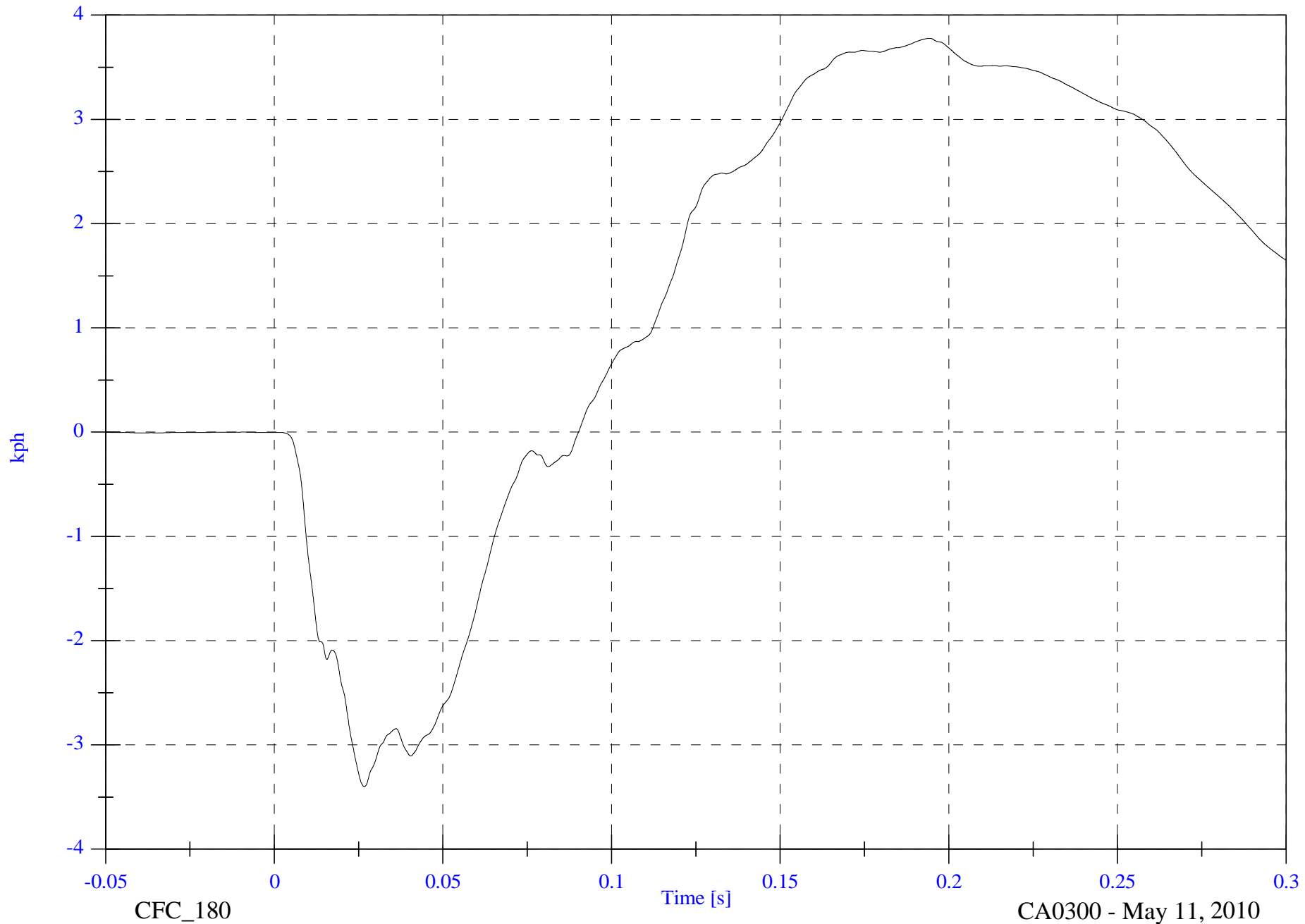


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A1 Right Front Sill Z Velocity

Max: 3.8 [kph] at 0.194 [s]

Min: -3.4 [kph] at 0.027 [s]



D-9

tr2439

CFC\_180

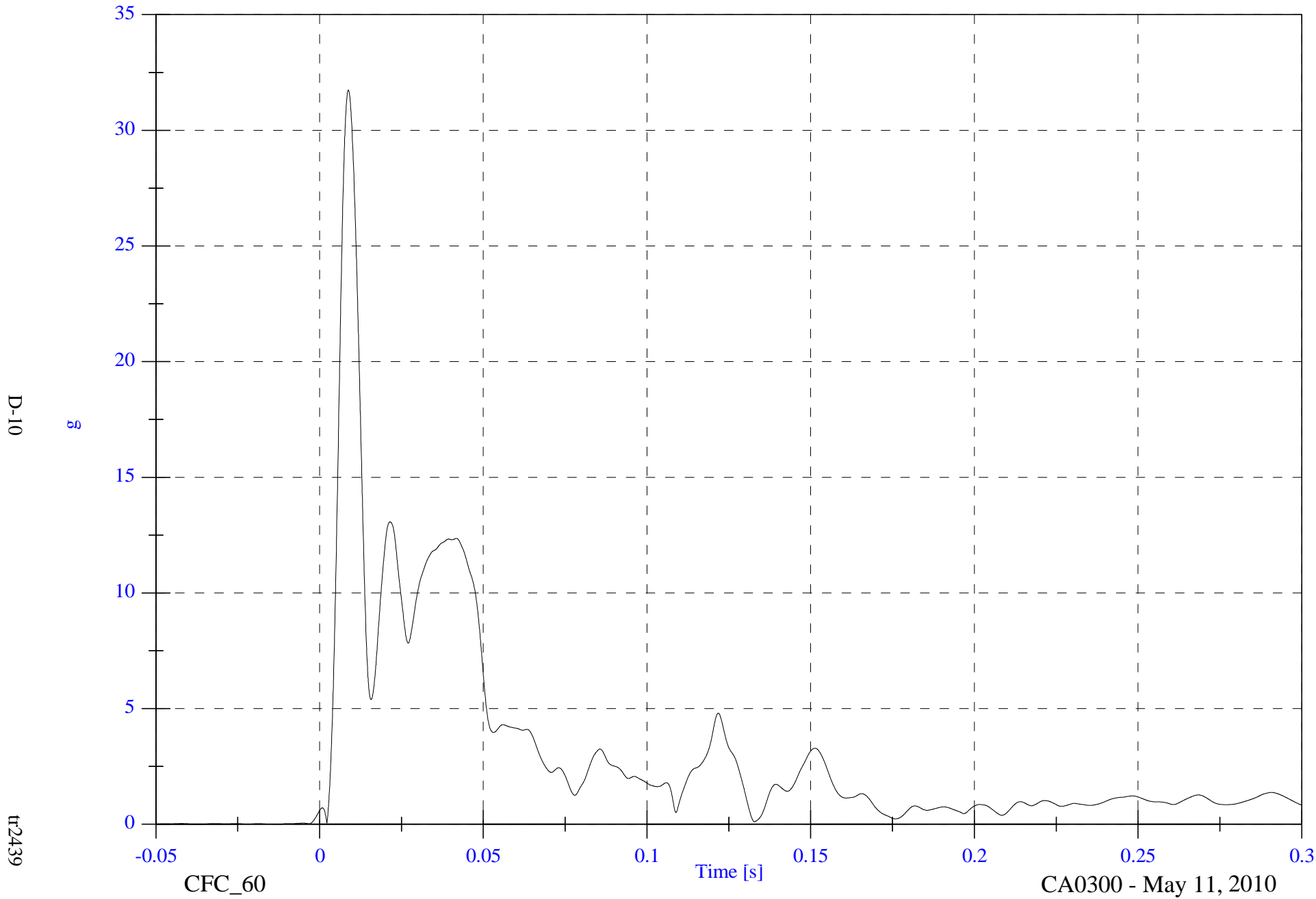
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A1 Right Front Sill Resultant

Max: 31.7 [g] at 0.009 [s]

Min: 0.0 [g] at -0.036 [s]



D-10

tr2439

CFC\_60

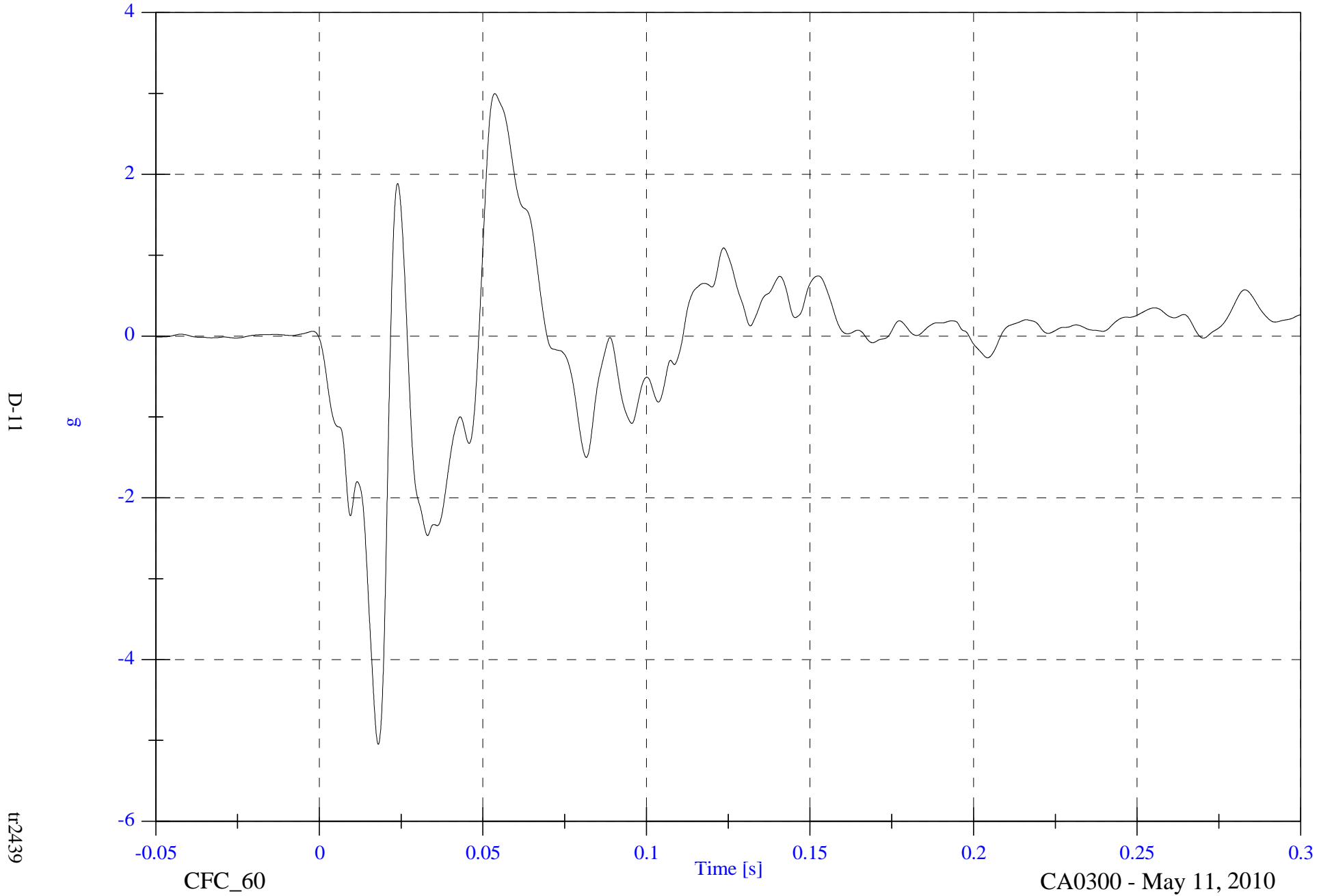
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A2 Right Rear Sill X

Max: 3.0 [g] at 0.054 [s]

Min: -5.0 [g] at 0.018 [s]



D-11

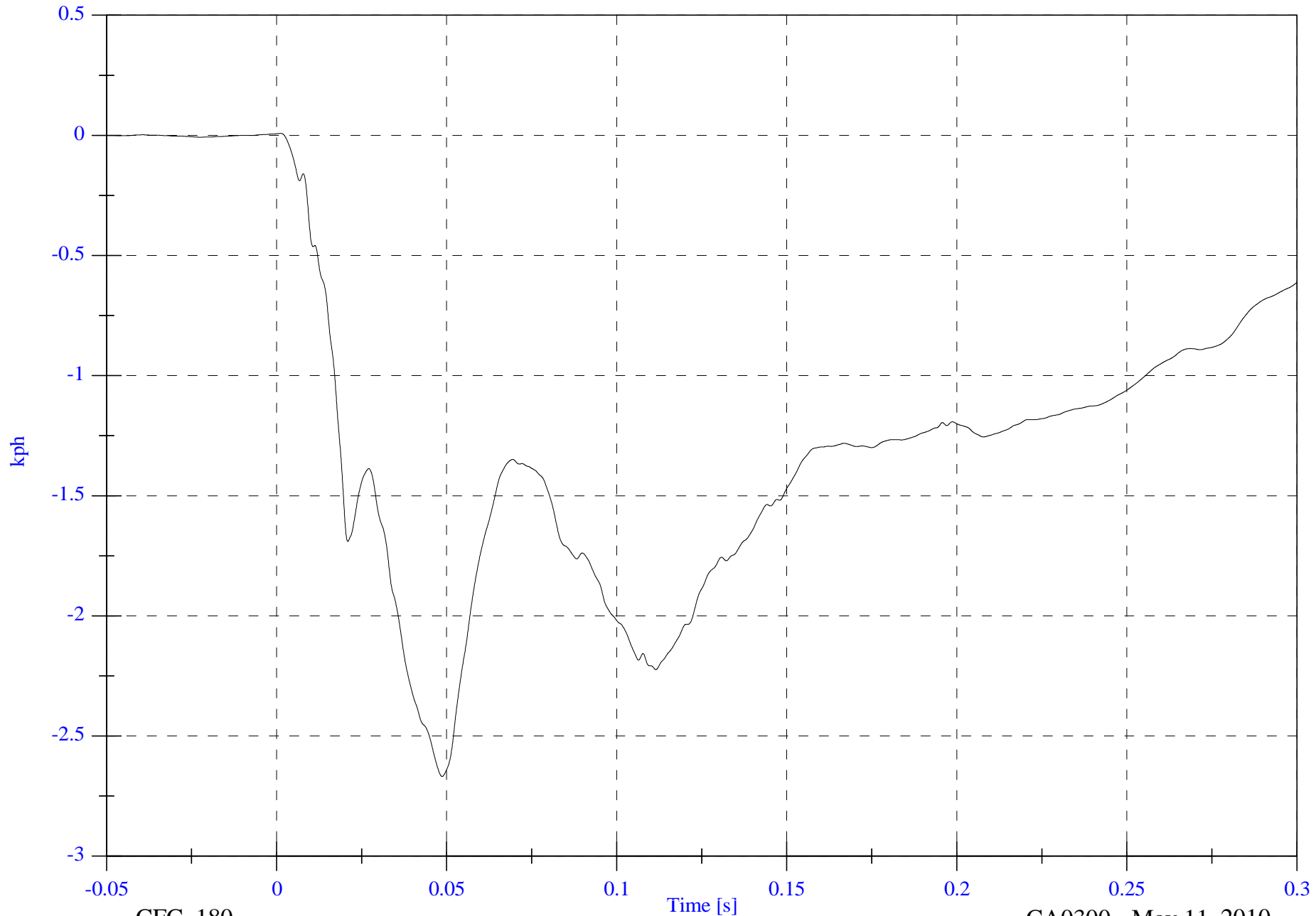
tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A2 Right Rear Sill X Velocity

Max: 0.0 [kph] at 0.001 [s]

Min: -2.7 [kph] at 0.049 [s]



D-12

tr2439

CFC\_180

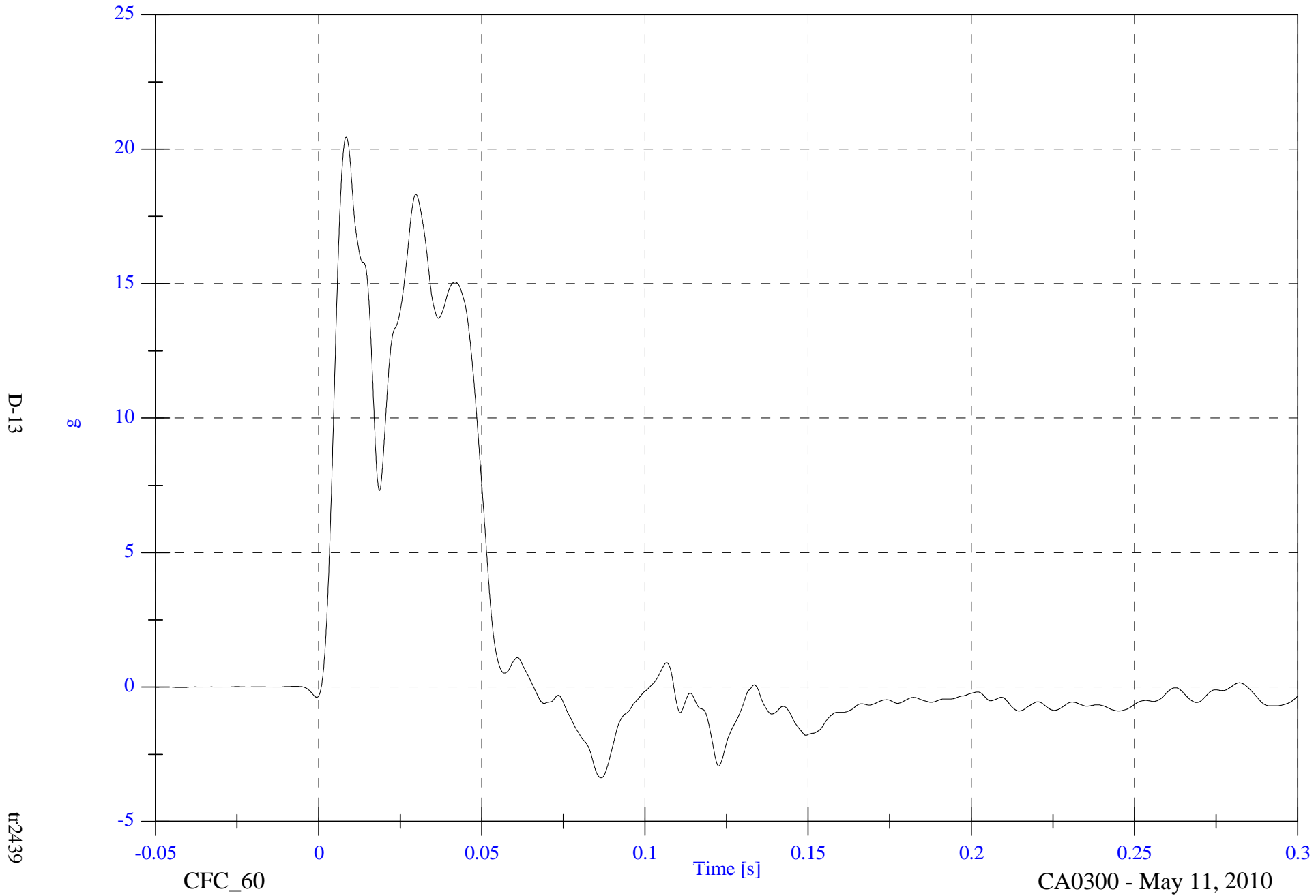
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A2 Right Rear Sill Y

Max: 20.5 [g] at 0.008 [s]

Min: -3.4 [g] at 0.087 [s]



D-13

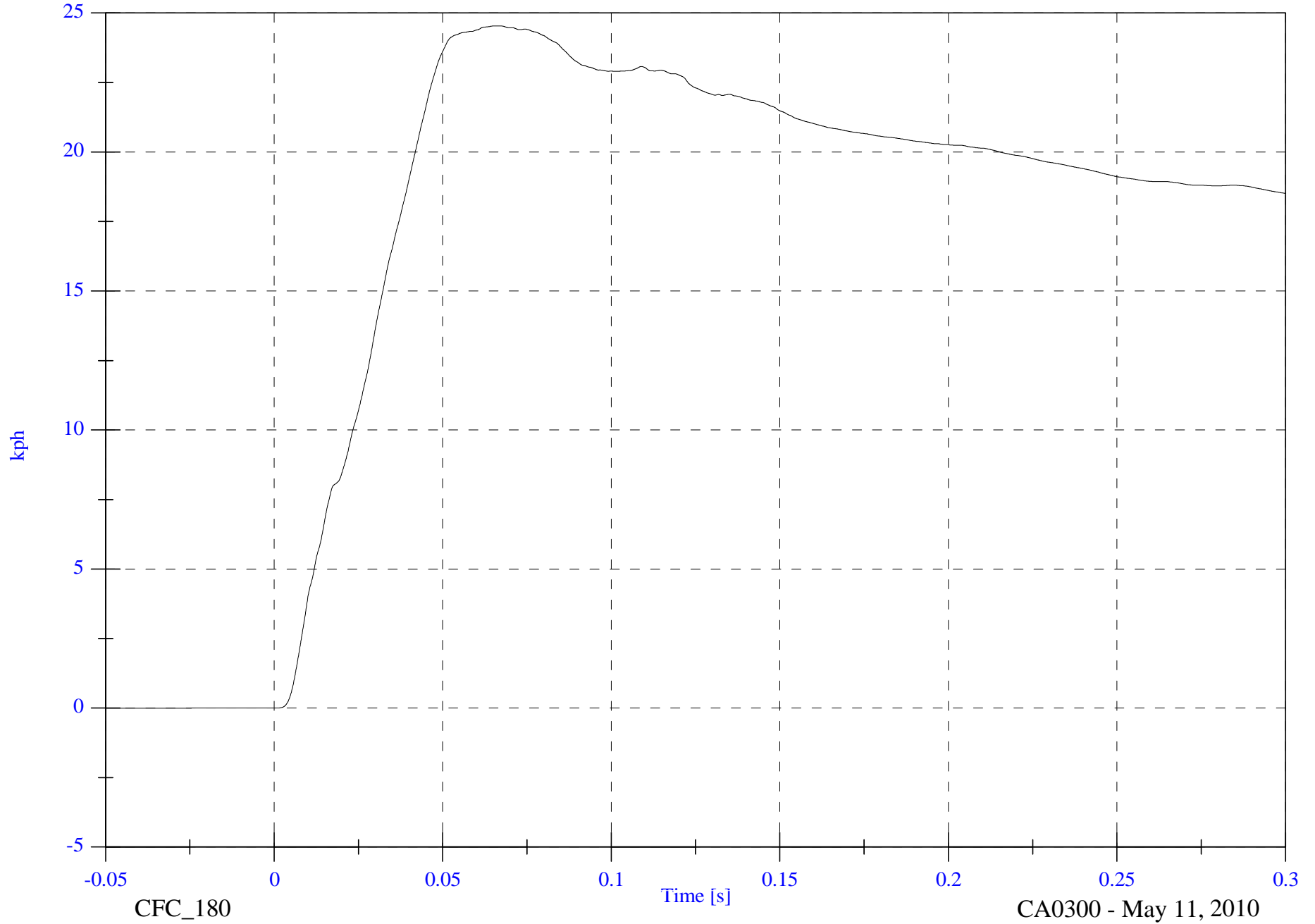
tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A2 Right Rear Sill Y Velocity

Max: 24.5 [kph] at 0.067 [s]

Min: -0.0 [kph] at -0.040 [s]



D-14

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

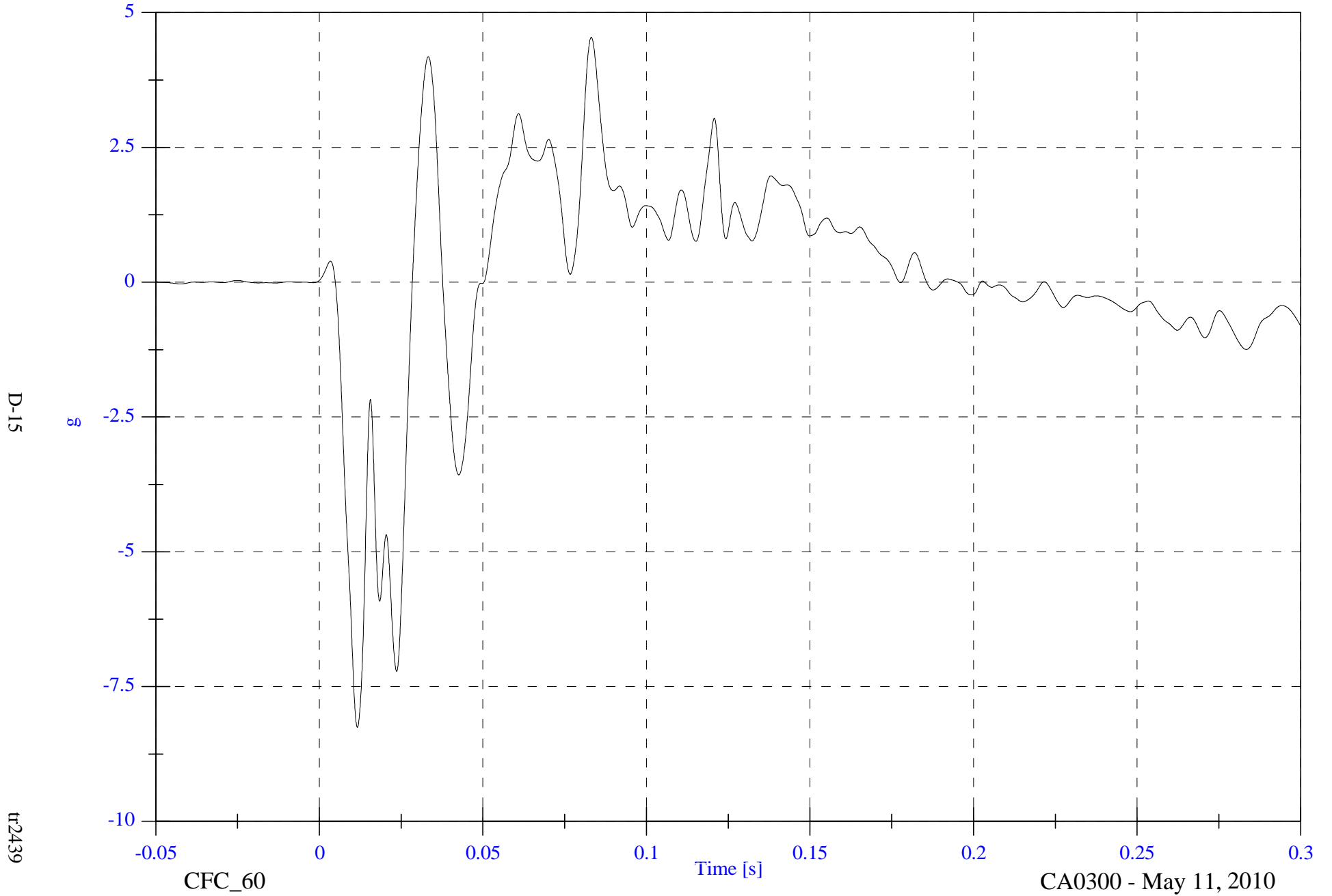


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A2 Right Rear Sill Z

Max: 4.5 [g] at 0.083 [s]

Min: -8.3 [g] at 0.012 [s]



D-15

tr2439

CFC\_60

Time [s]

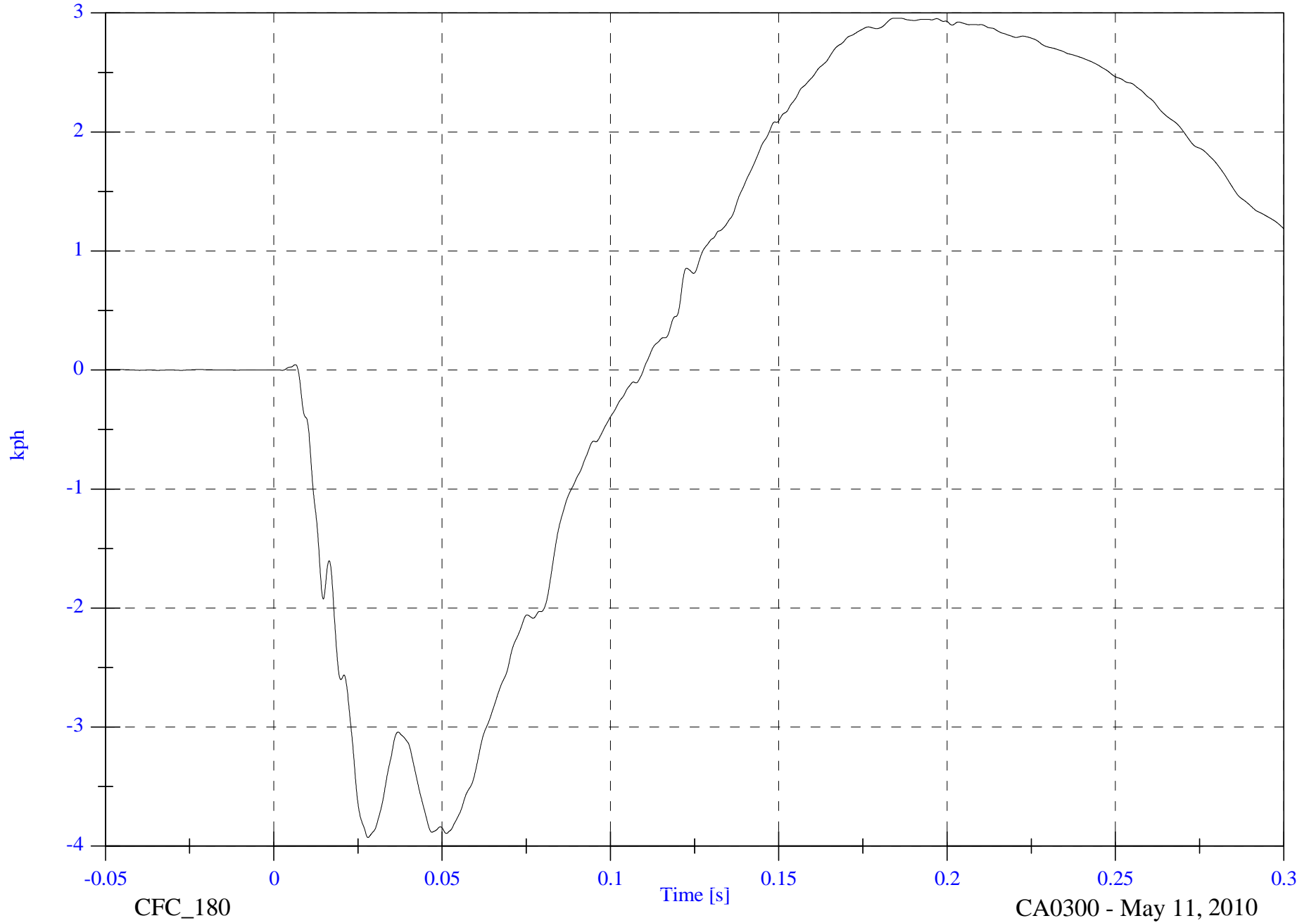
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A2 Right Rear Sill Z Velocity

Max: 3.0 [kph] at 0.186 [s]

Min: -3.9 [kph] at 0.028 [s]



D-16

tr2439

CFC\_180

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

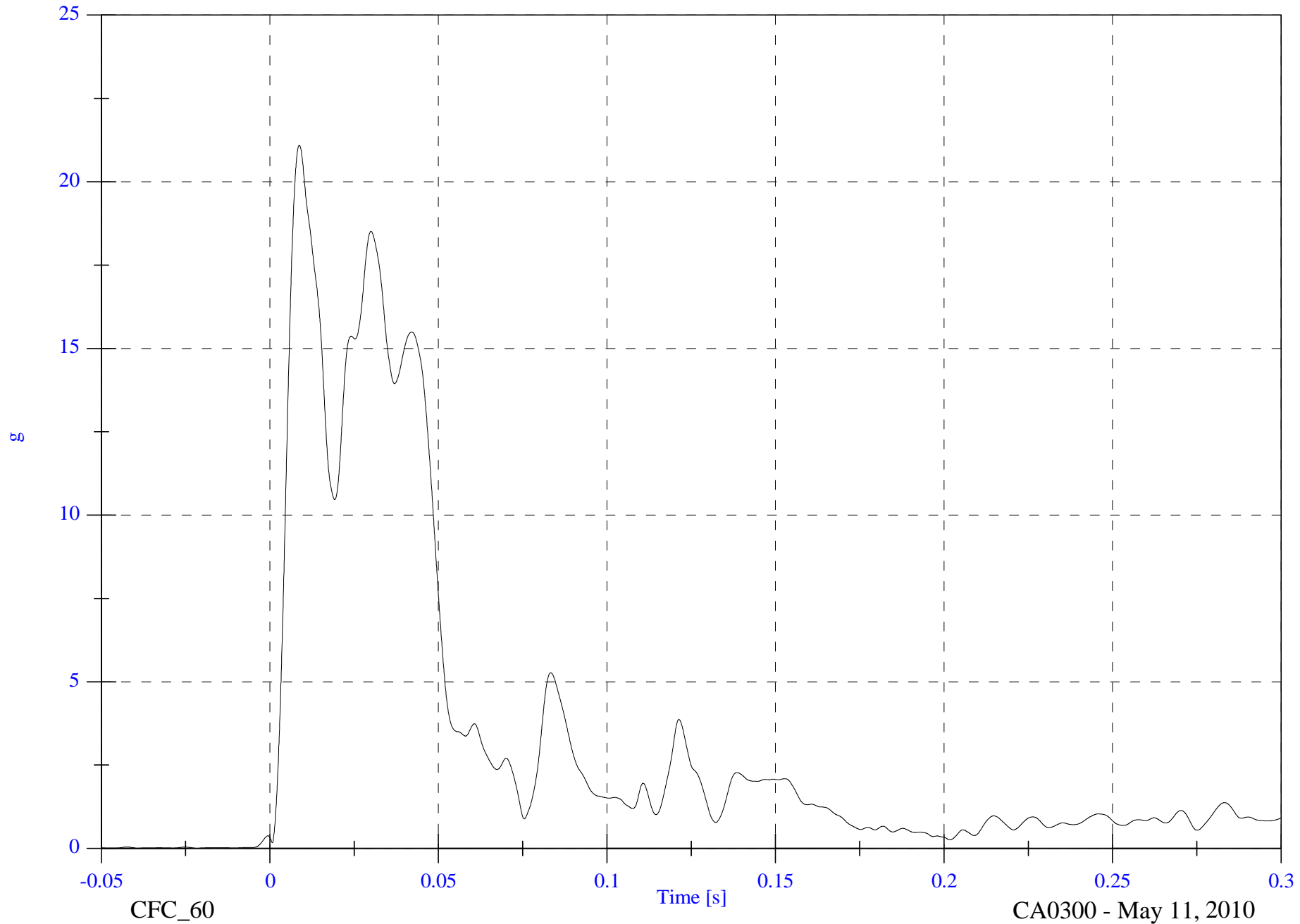
V2 A2 Right Rear Sill Resultant

Max: 21.1 [g] at 0.009 [s]

Min: 0.0 [g] at -0.039 [s]

D-17

tr2439



FMVSS 214 MDB 2010 Dodge Journey CA0300

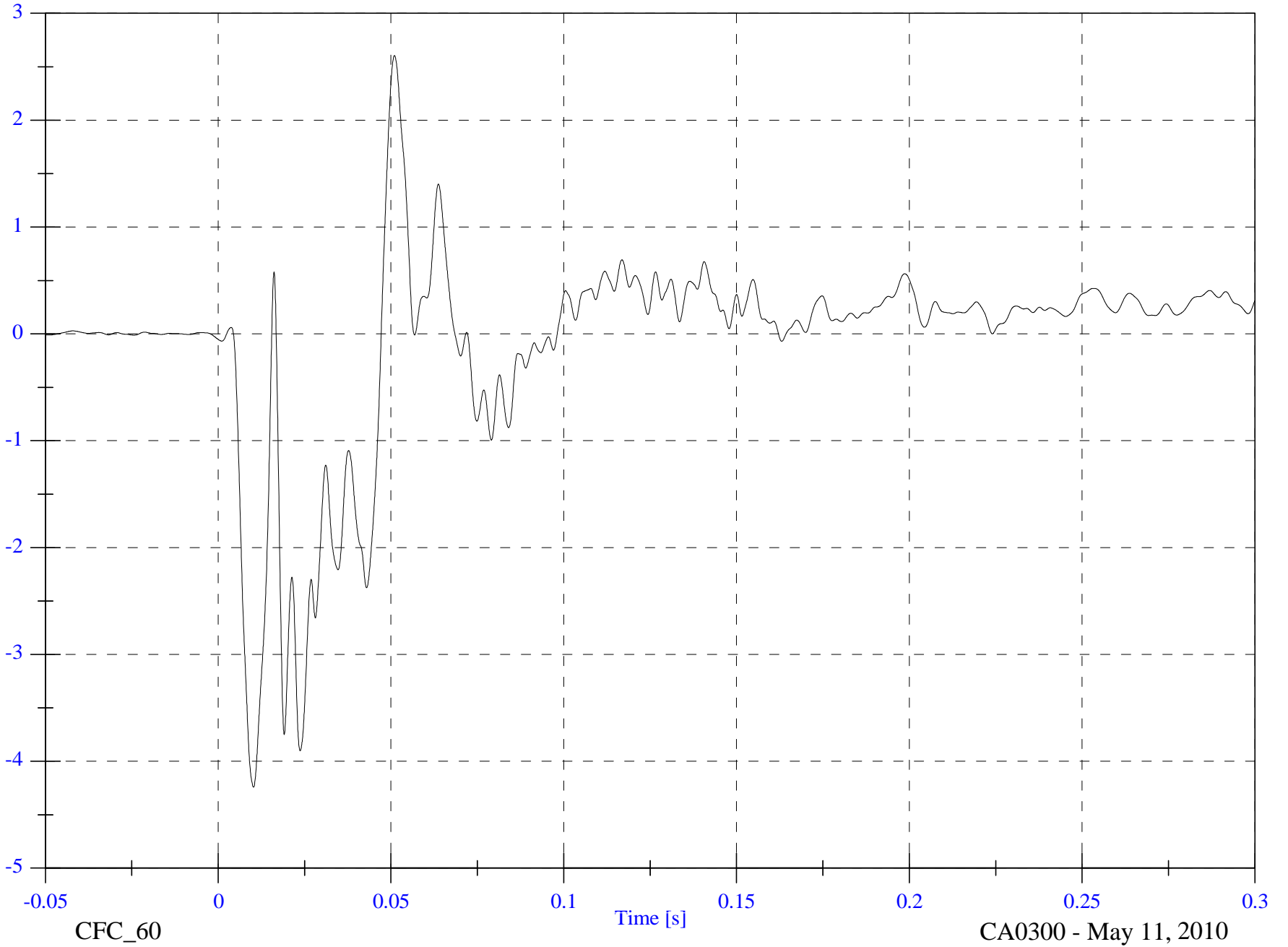
V2 A3 Rear Floorpan X

Max: 2.6 [g] at 0.051 [s]

Min: -4.2 [g] at 0.010 [s]

D-18

g



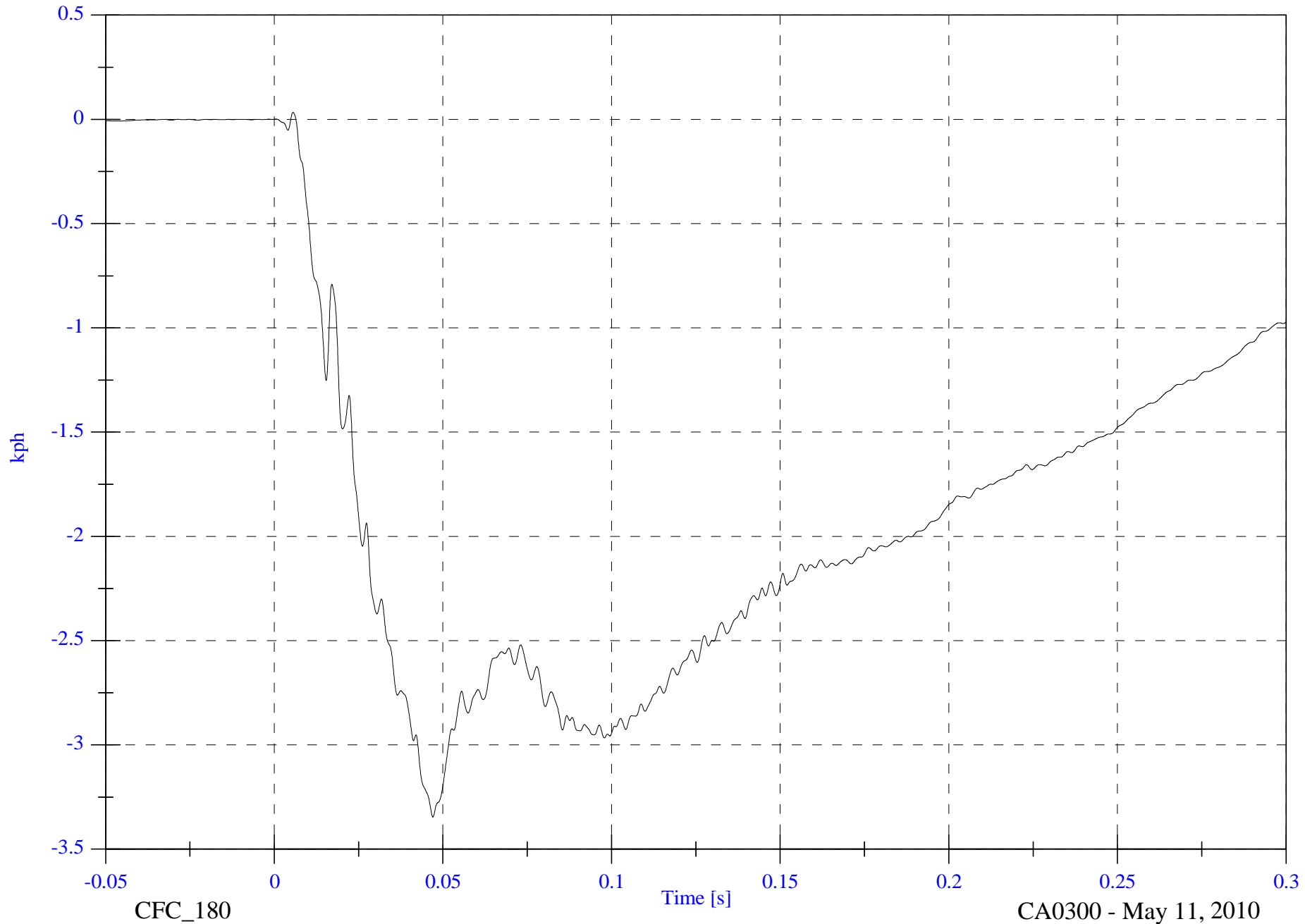
tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A3 Rear Floorpan X Velocity

Max: 0.0 [kph] at 0.006 [s]

Min: -3.3 [kph] at 0.047 [s]



D-19

tr2439

CFC\_180

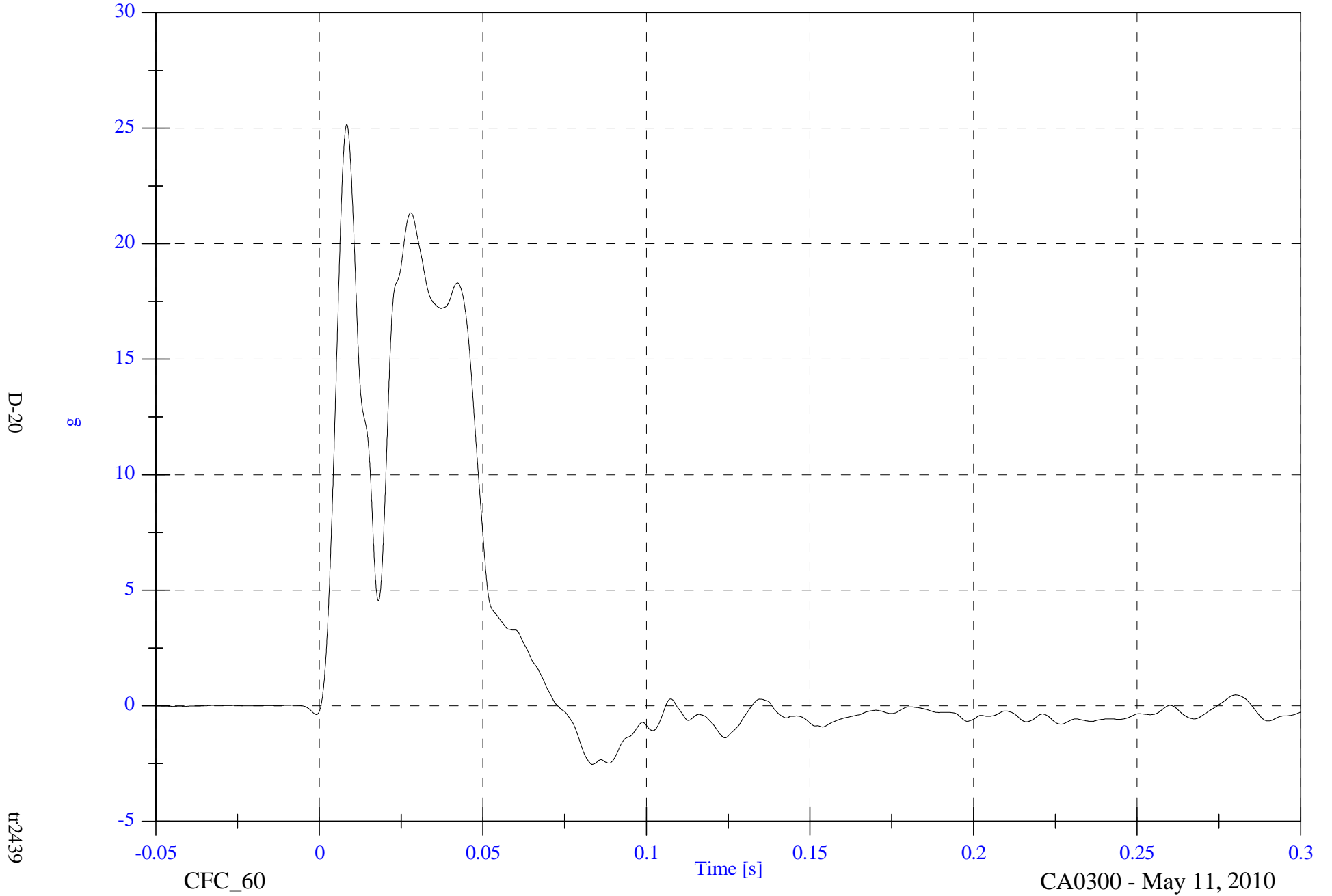
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A3 Rear Floorpan Y

Max: 25.2 [g] at 0.008 [s]

Min: -2.5 [g] at 0.083 [s]



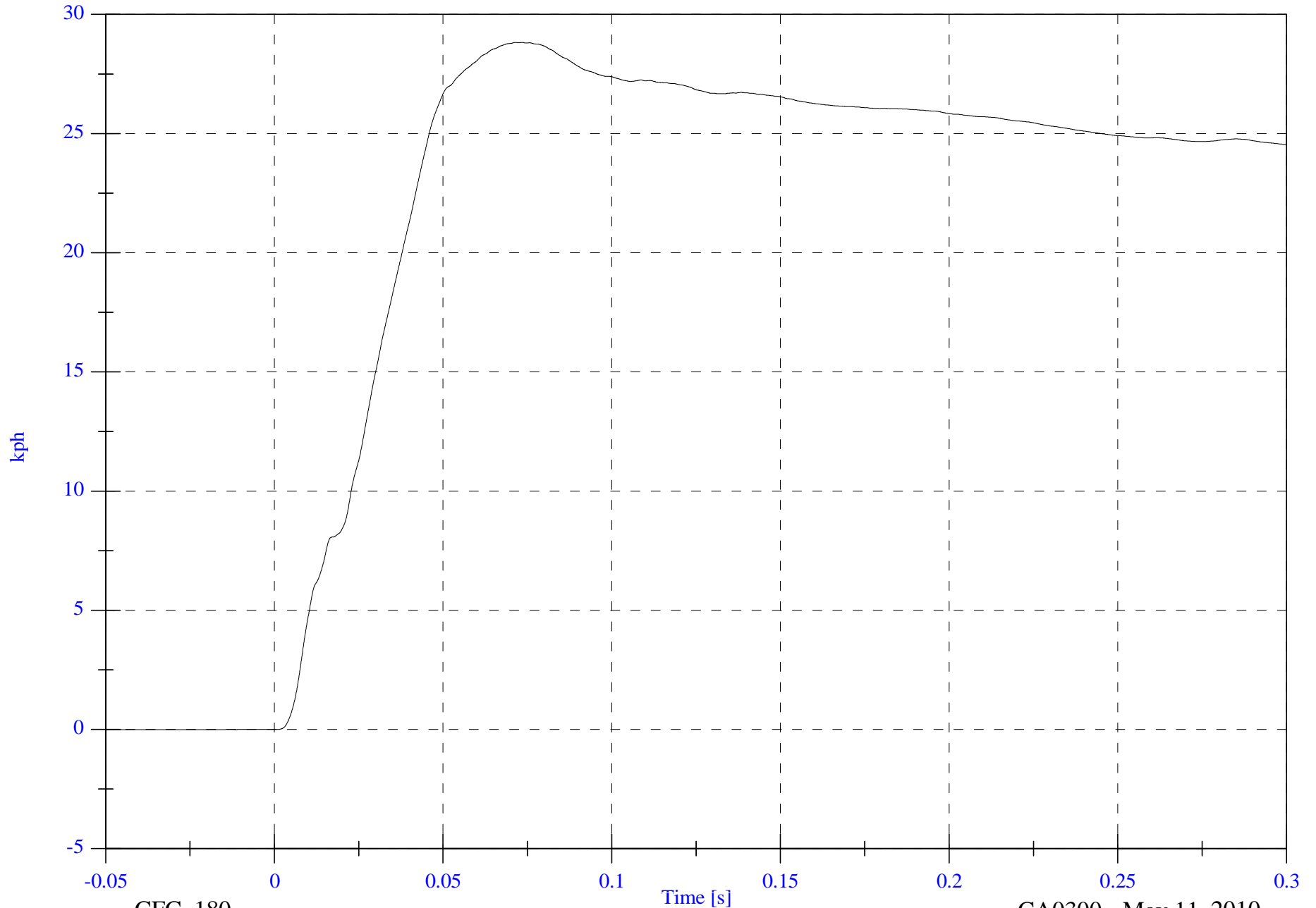


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 28.8 [kph] at 0.071 [s]

V2 A3 Rear Floorpan Y Velocity

Min: -0.0 [kph] at -0.035 [s]



D-21

tr2439

CFC\_180

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

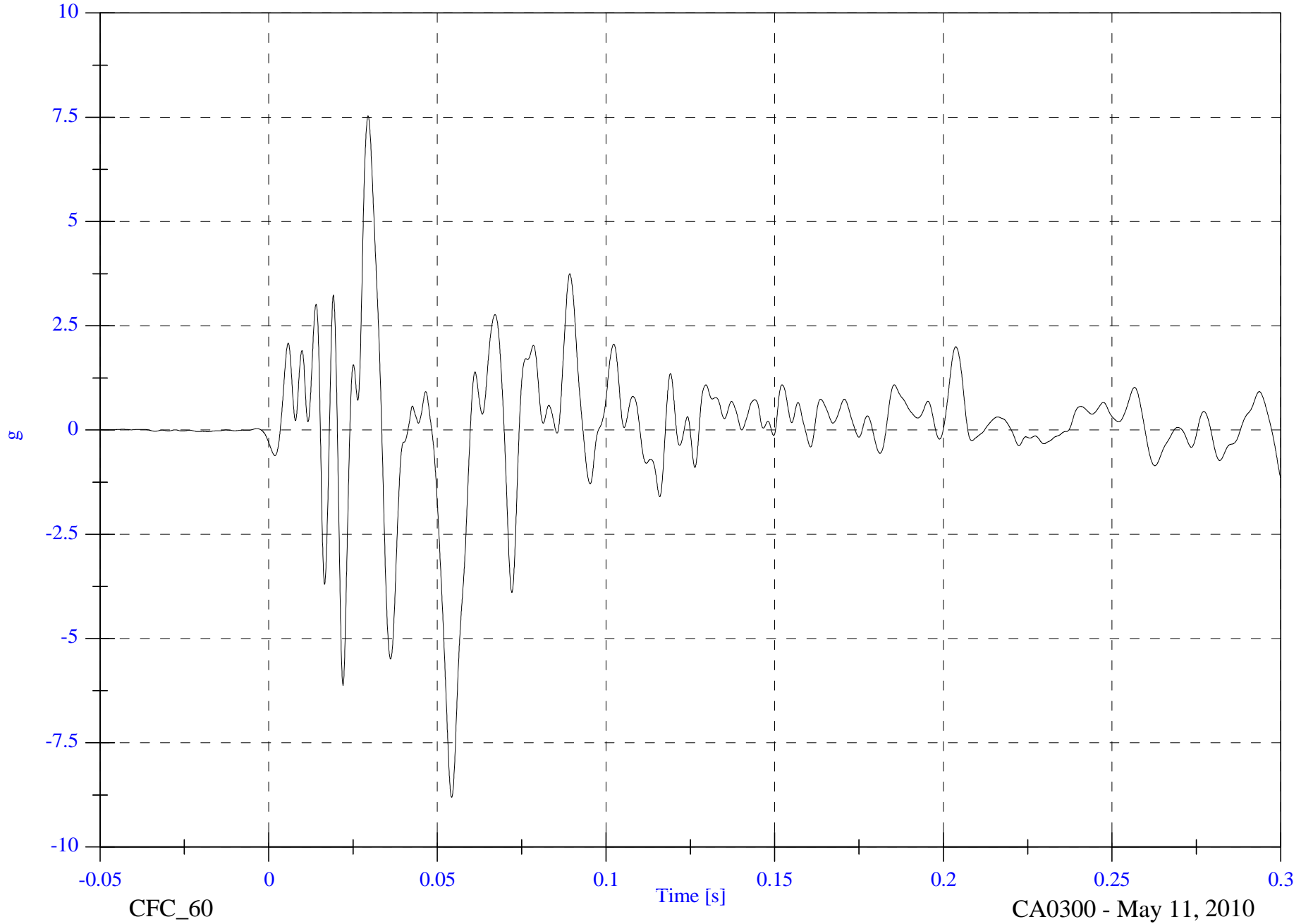
V2 A3 Rear Floorpan Z

Max: 7.5 [g] at 0.029 [s]

Min: -8.8 [g] at 0.054 [s]

D-22

tr2439



FMVSS 214 MDB 2010 Dodge Journey CA0300

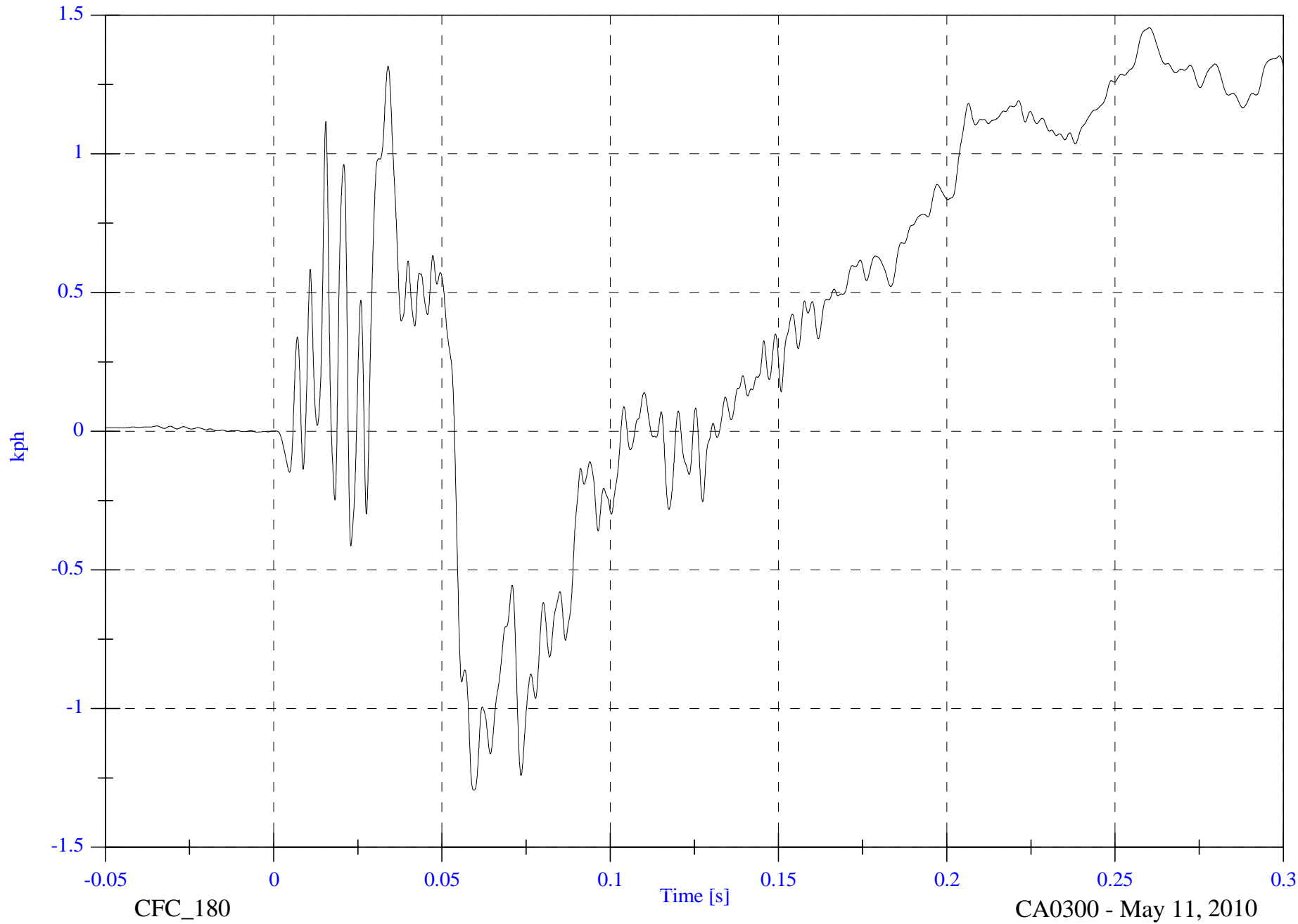
V2 A3 Rear Floorpan Z Velocity

Max: 1.5 [kph] at 0.260 [s]

Min: -1.3 [kph] at 0.059 [s]

D-23

tr2439



CFC\_180

Time [s]

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

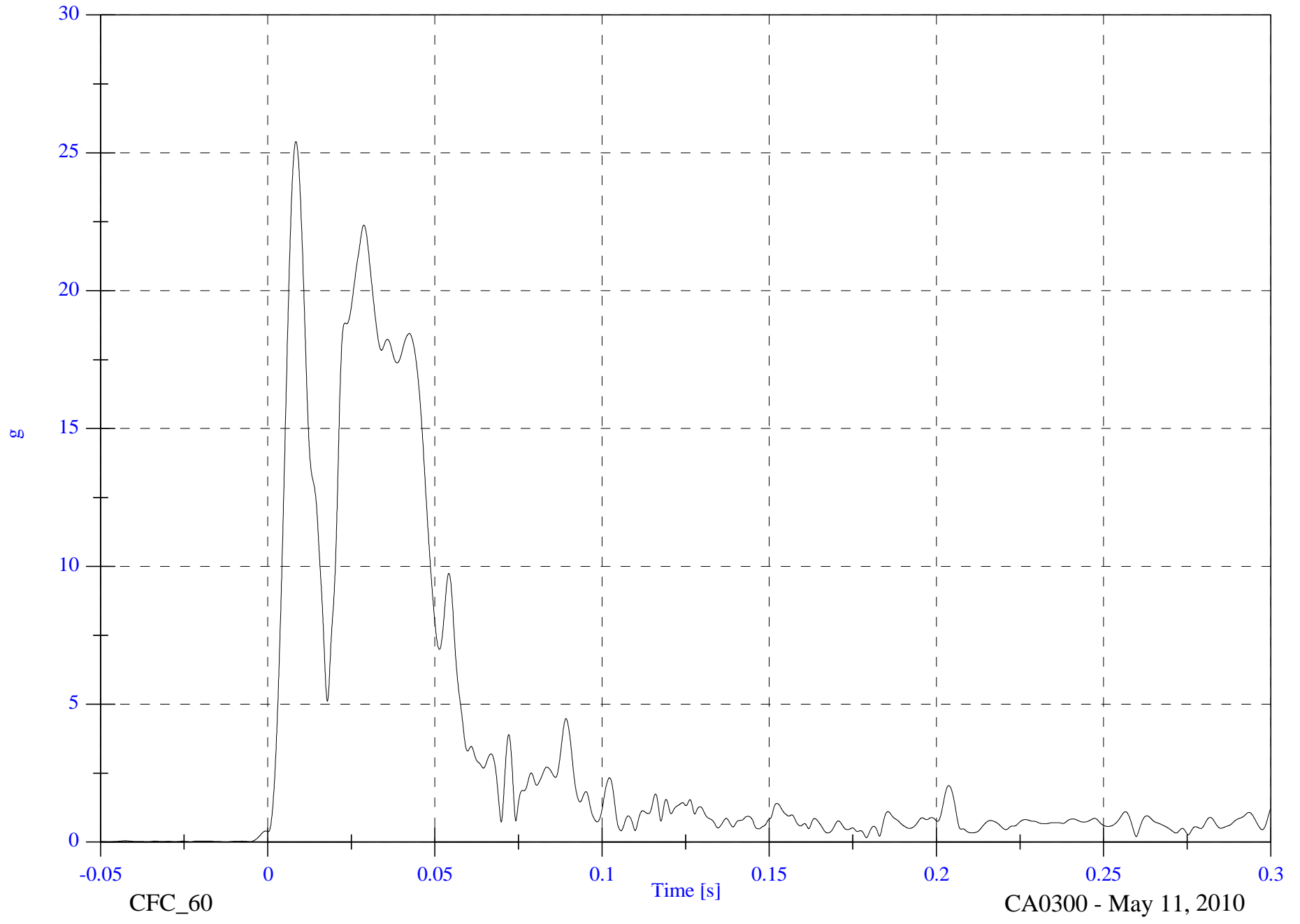
V2 A3 Rear Floorpan Resultant

Max: 25.4 [g] at 0.008 [s]

Min: 0.0 [g] at -0.013 [s]

D-24

tr2439



FMVSS 214 MDB 2010 Dodge Journey CA0300

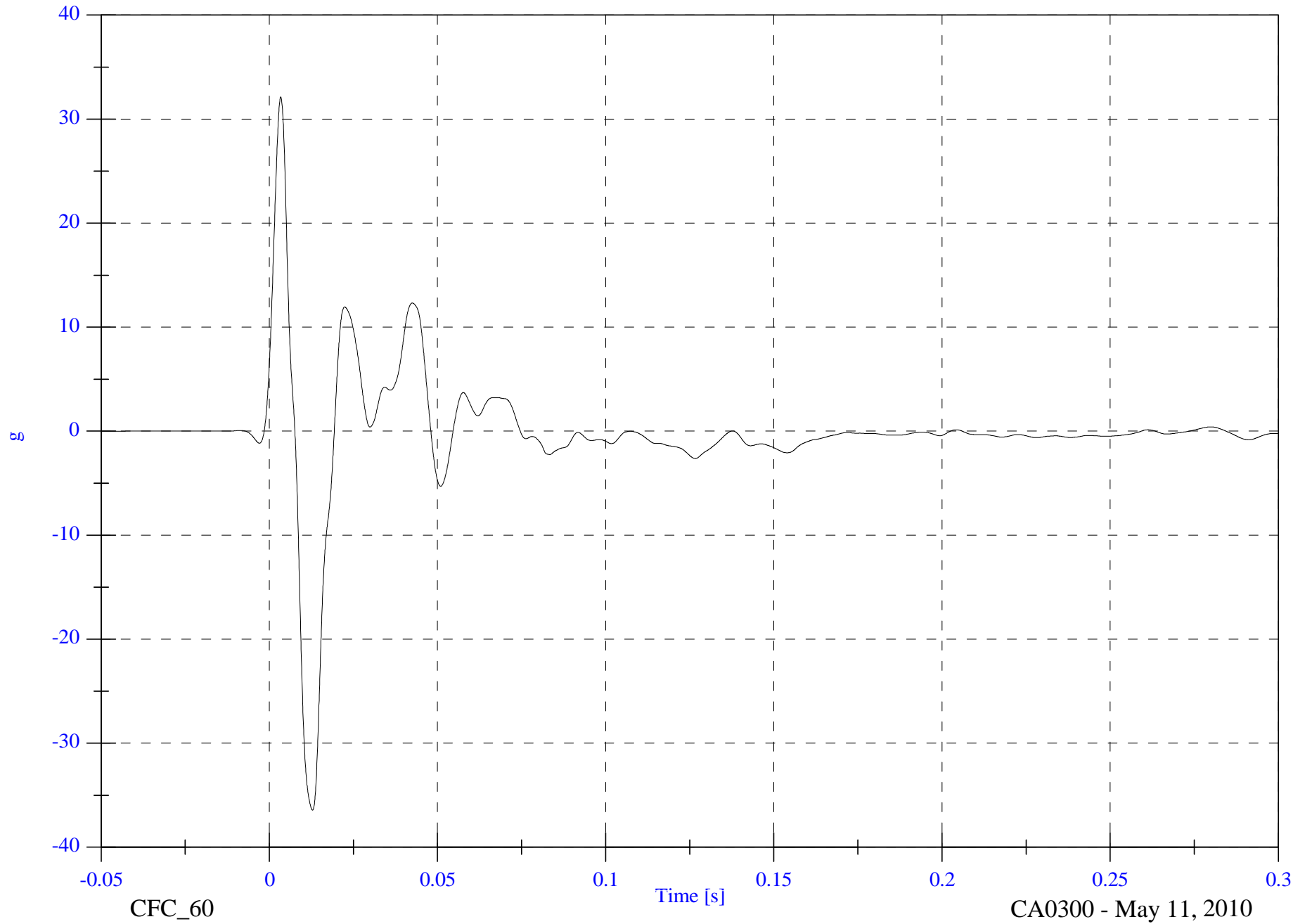
V2 A4 Left Rear Sill Y

Max: 32.1 [g] at 0.003 [s]

Min: -36.4 [g] at 0.013 [s]

D-25

tr2439

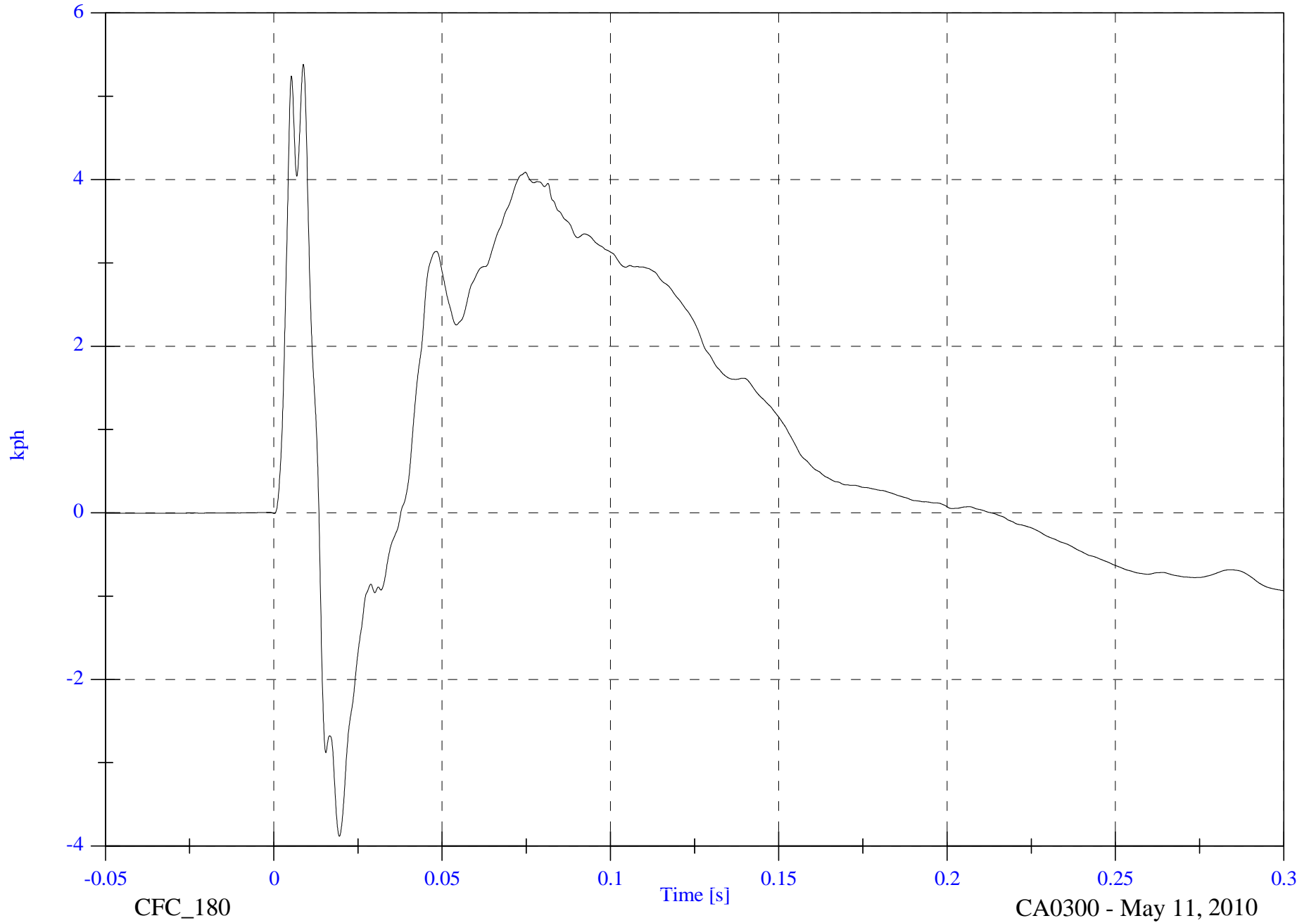


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A4 Left Rear Sill Y Velocity

Max: 5.4 [kph] at 0.009 [s]

Min: -3.9 [kph] at 0.019 [s]



D-26

tr2439

CFC\_180

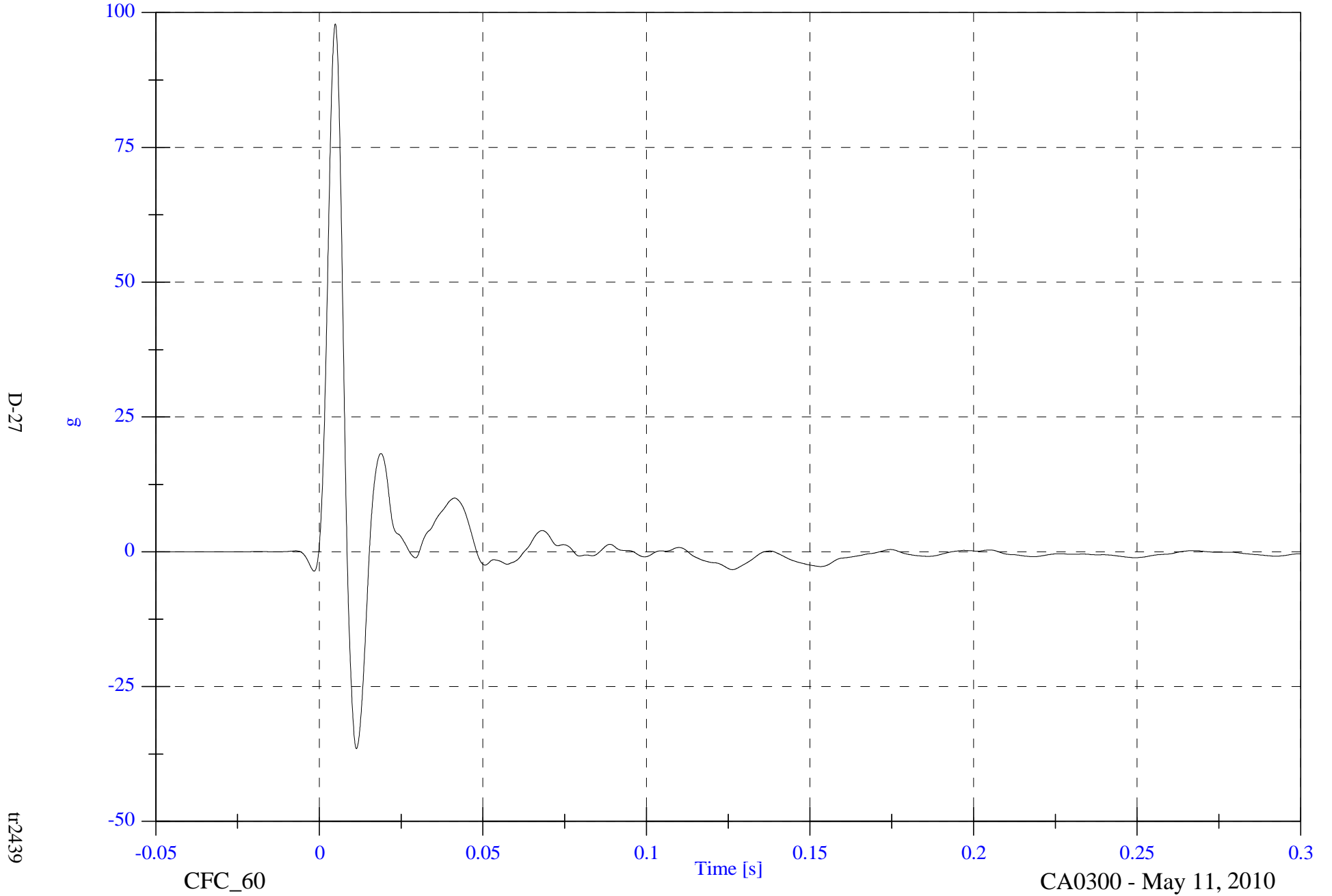
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A5 Left Front Sill Y

Max: 97.9 [g] at 0.005 [s]

Min: -36.5 [g] at 0.011 [s]



D-27

tr2439

CFC\_60

Time [s]

CA0300 - May 11, 2010

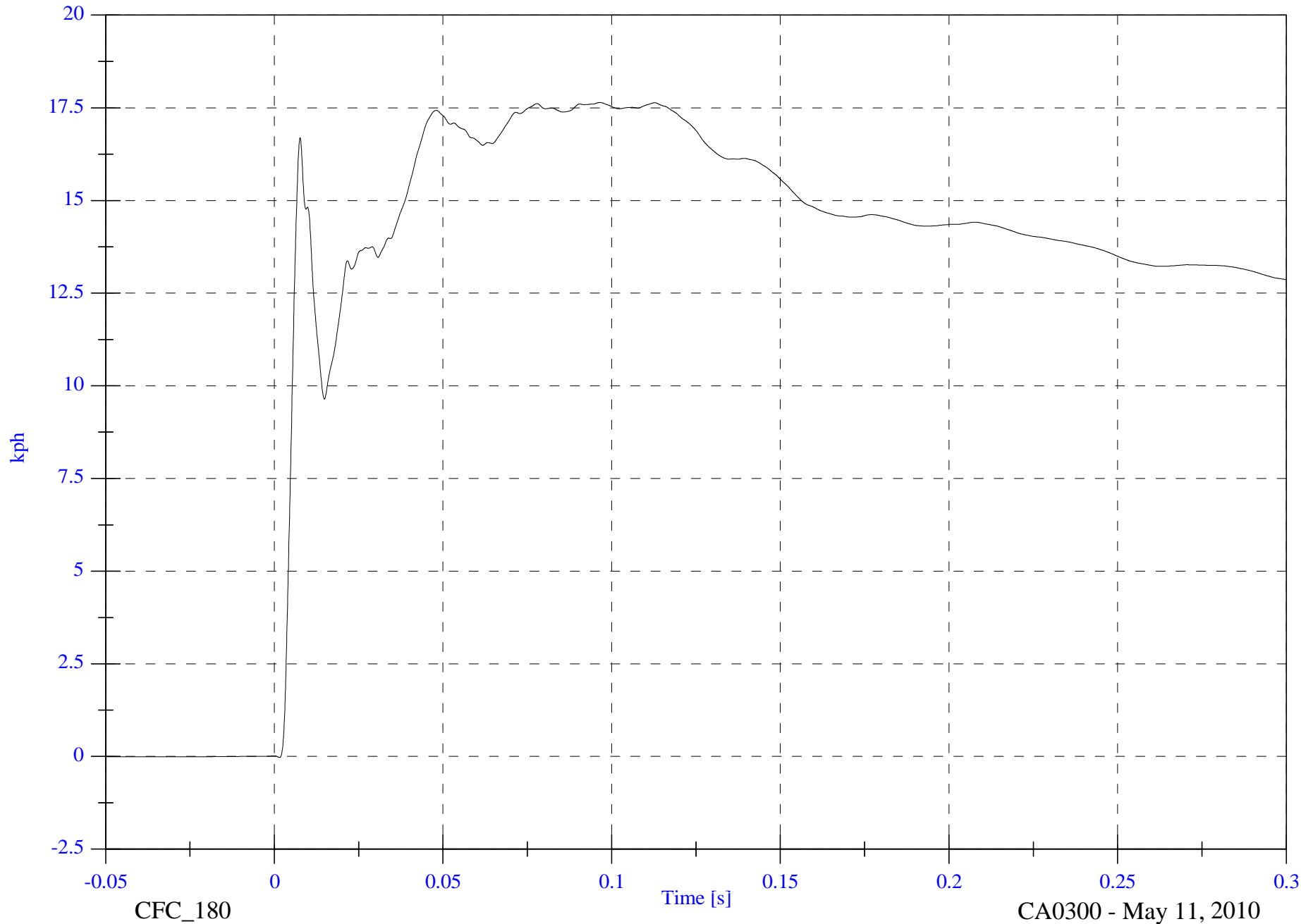


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 17.6 [kph] at 0.096 [s]

V2 A5 Left Front Sill Y Velocity

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



D-28

tr2439

CFC\_180

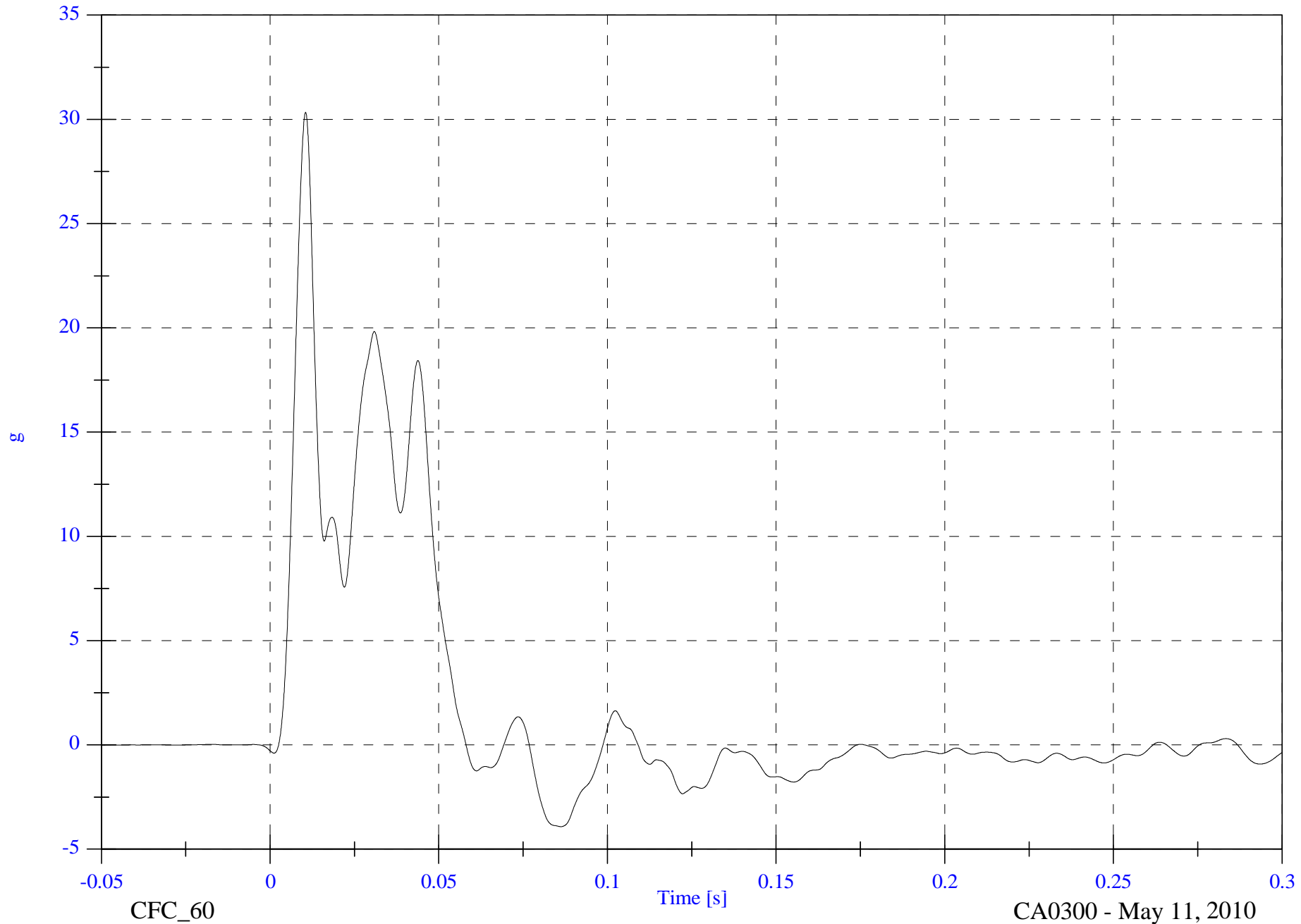
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A6 Right Rear Compartment Y

Max: 30.3 [g] at 0.010 [s]

Min: -3.9 [g] at 0.086 [s]



D-29

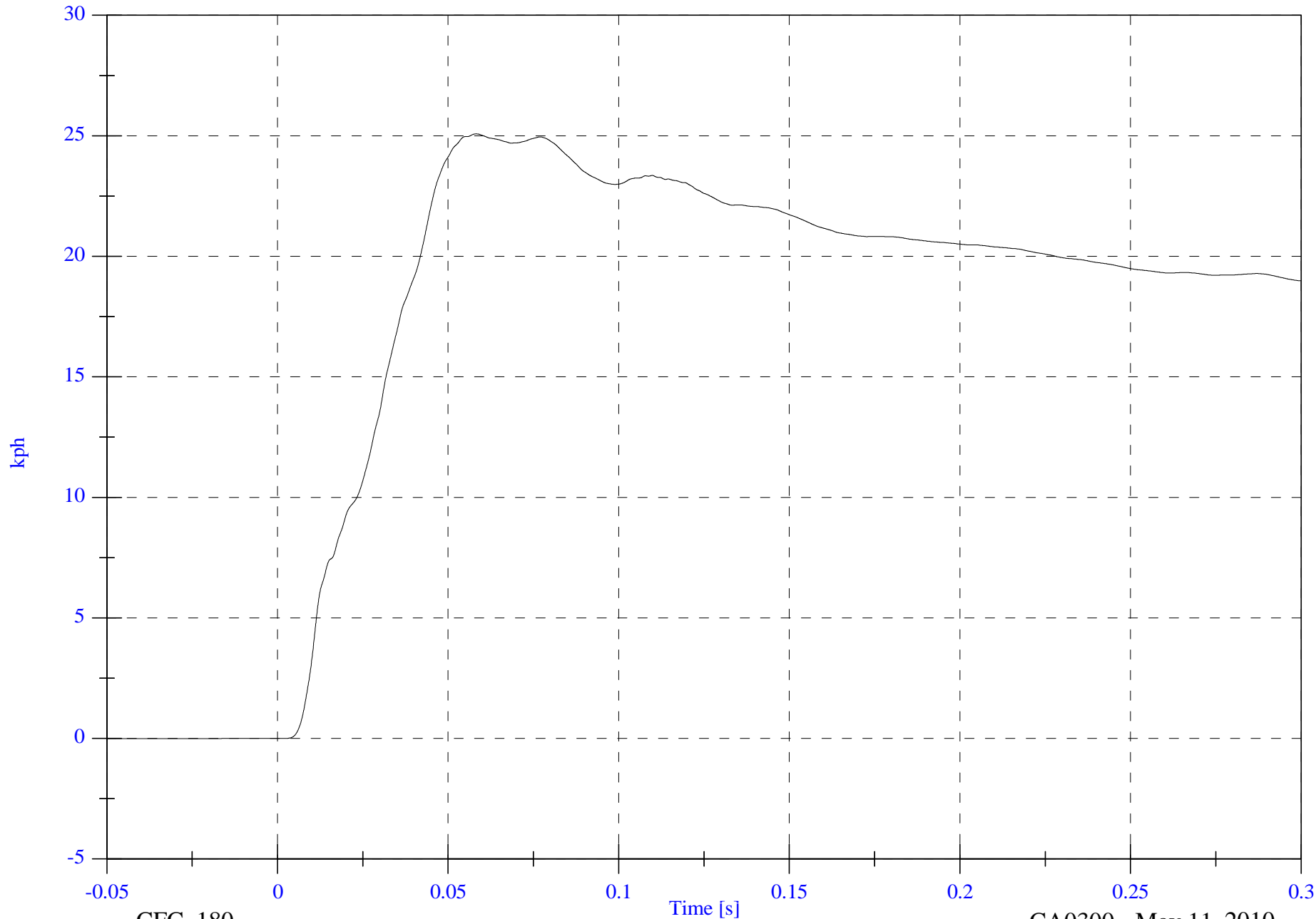
tr2439

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A6 Right Rear Compartment Y Velocity

Max: 25.1 [kph] at 0.058 [s]

Min: -0.0 [kph] at -0.025 [s]



D-30

tr2439

CFC\_180

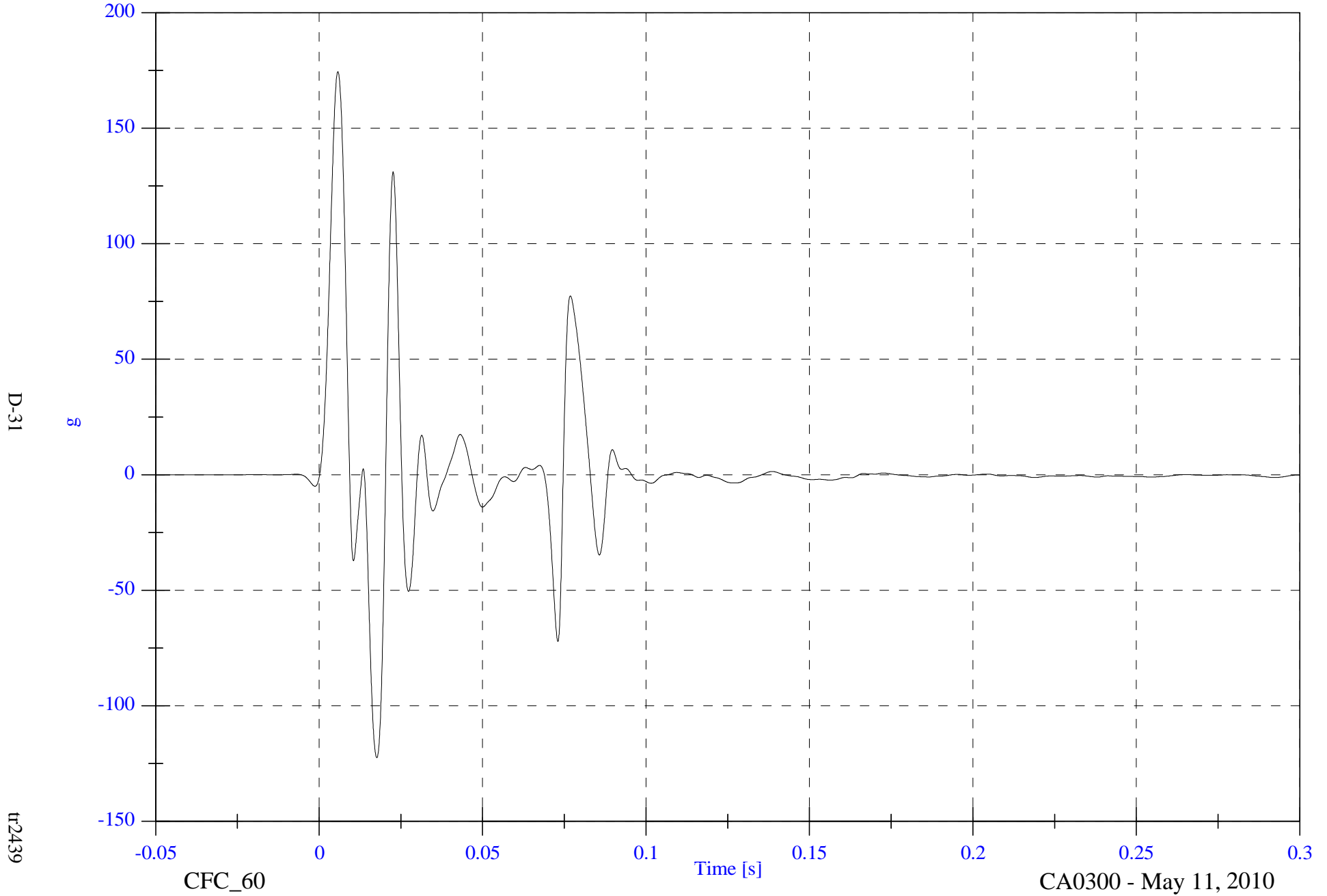
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A7 Left Lower B Post Y

Max: 174.5 [g] at 0.006 [s]

Min: -122.5 [g] at 0.018 [s]



D-31

tr2439

CFC\_60

Time [s]

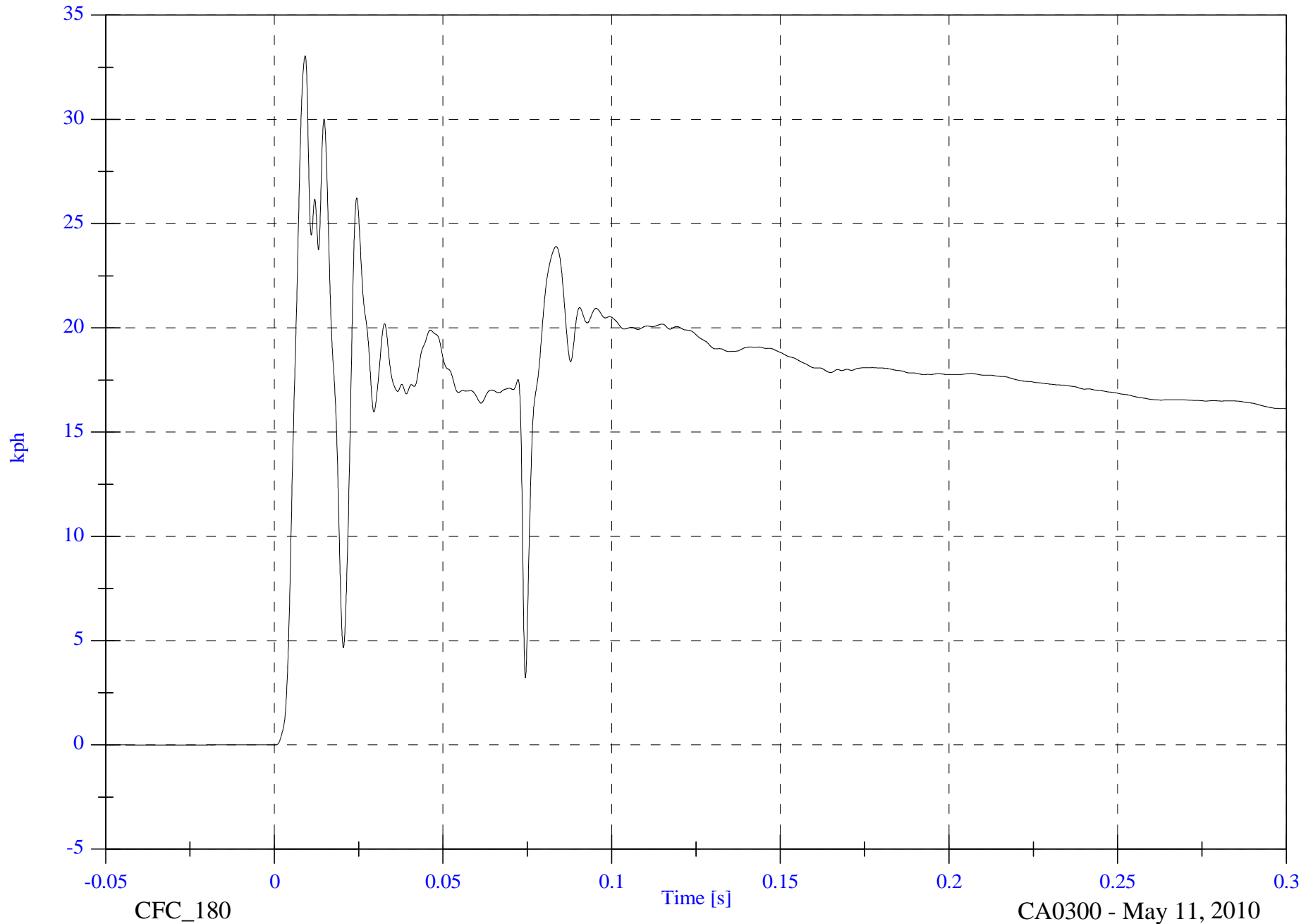
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 33.0 [kph] at 0.009 [s]

V2 A7 Left Lower B Post Y Velocity

Min: -0.0 [kph] at -0.034 [s]



D-32

tr2439

CFC\_180

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

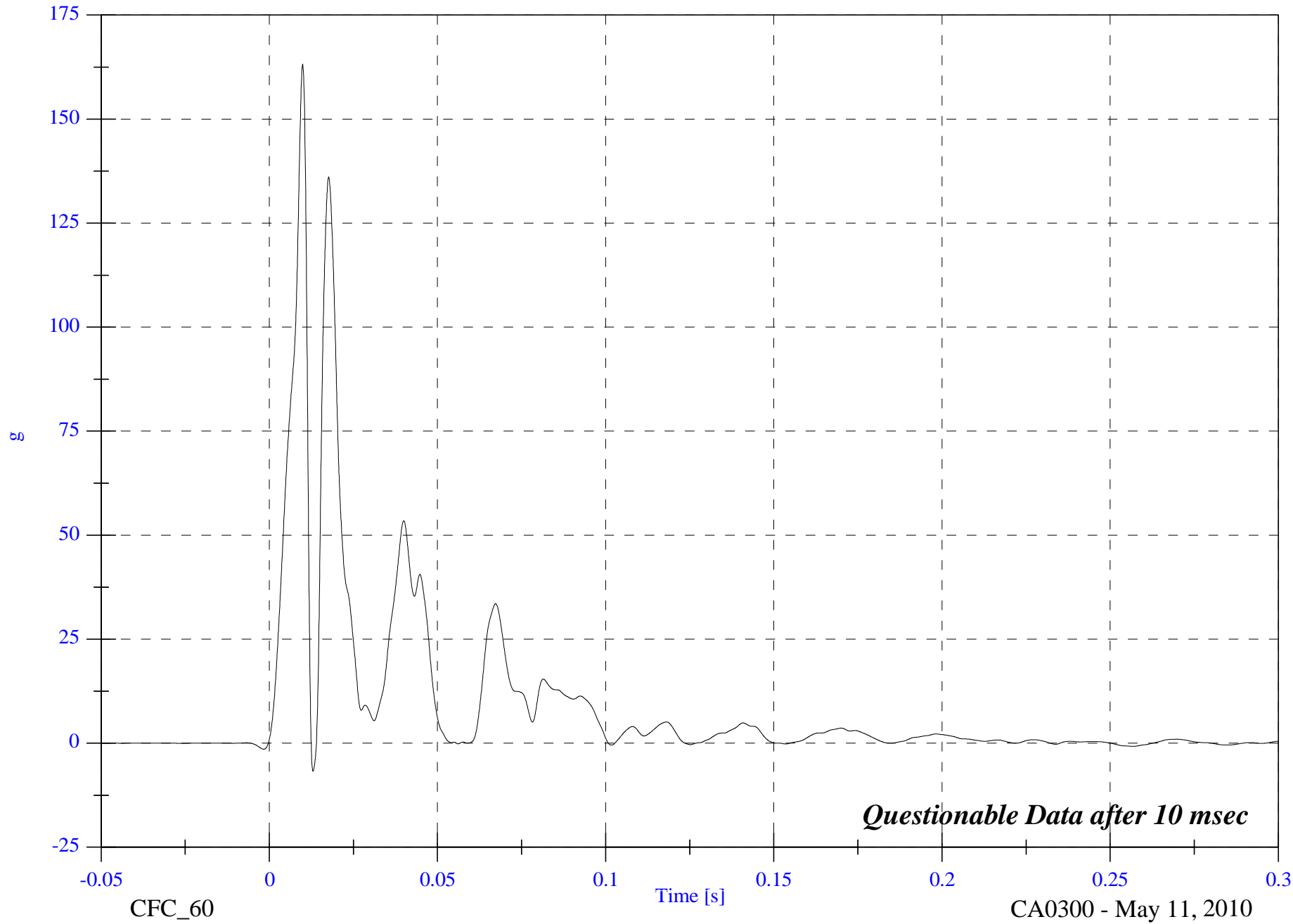
V2 A8 Left Middle B Post Y

Max: 163.2 [g] at 0.010 [s]

Min: -6.8 [g] at 0.013 [s]

D-33

IT2439

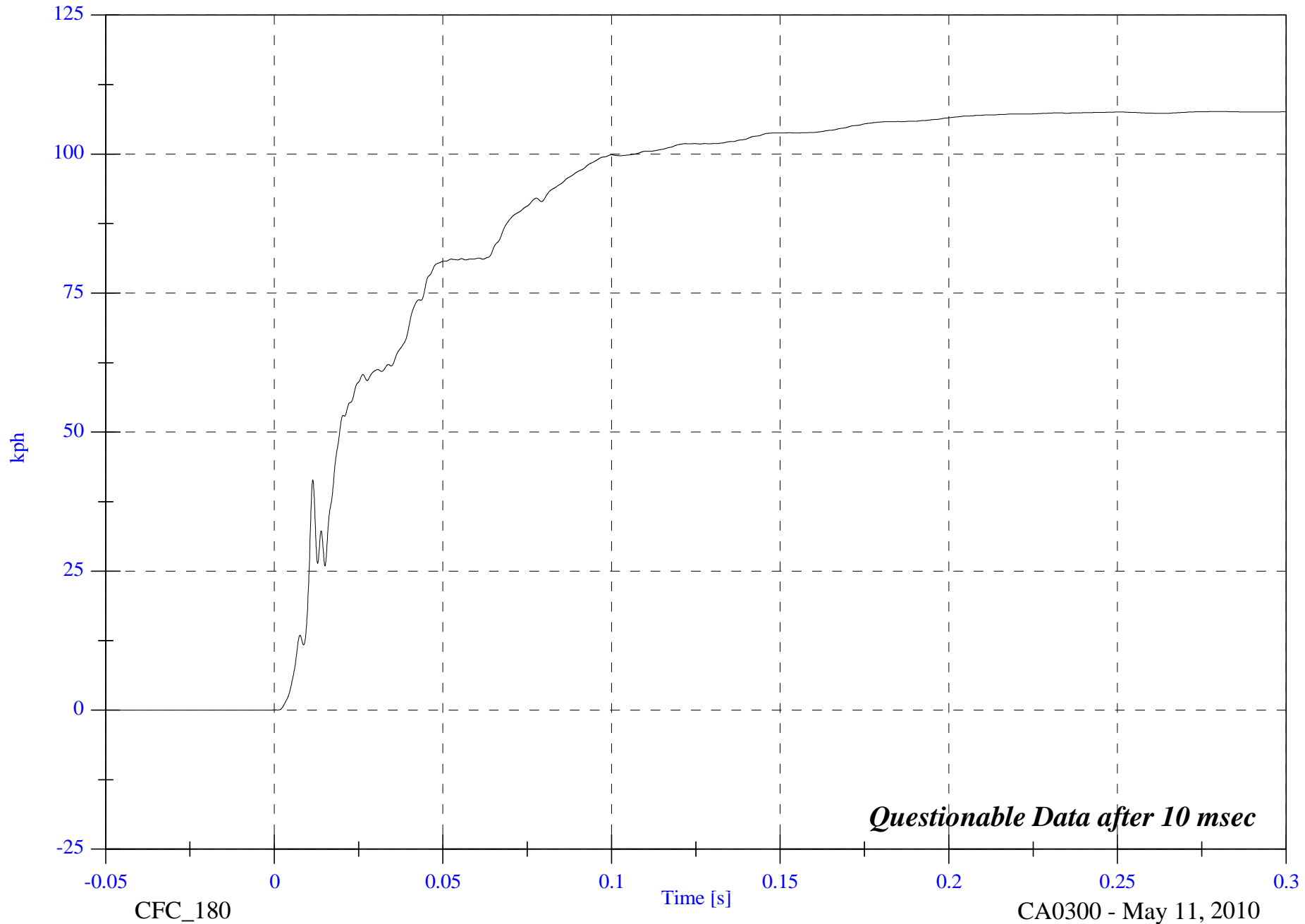


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 107.7 [kph] at 0.280 [s]

V2 A8 Left Middle B Post Y Velocity

Min: -0.0 [kph] at -0.025 [s]



D-34

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

*Questionable Data after 10 msec*

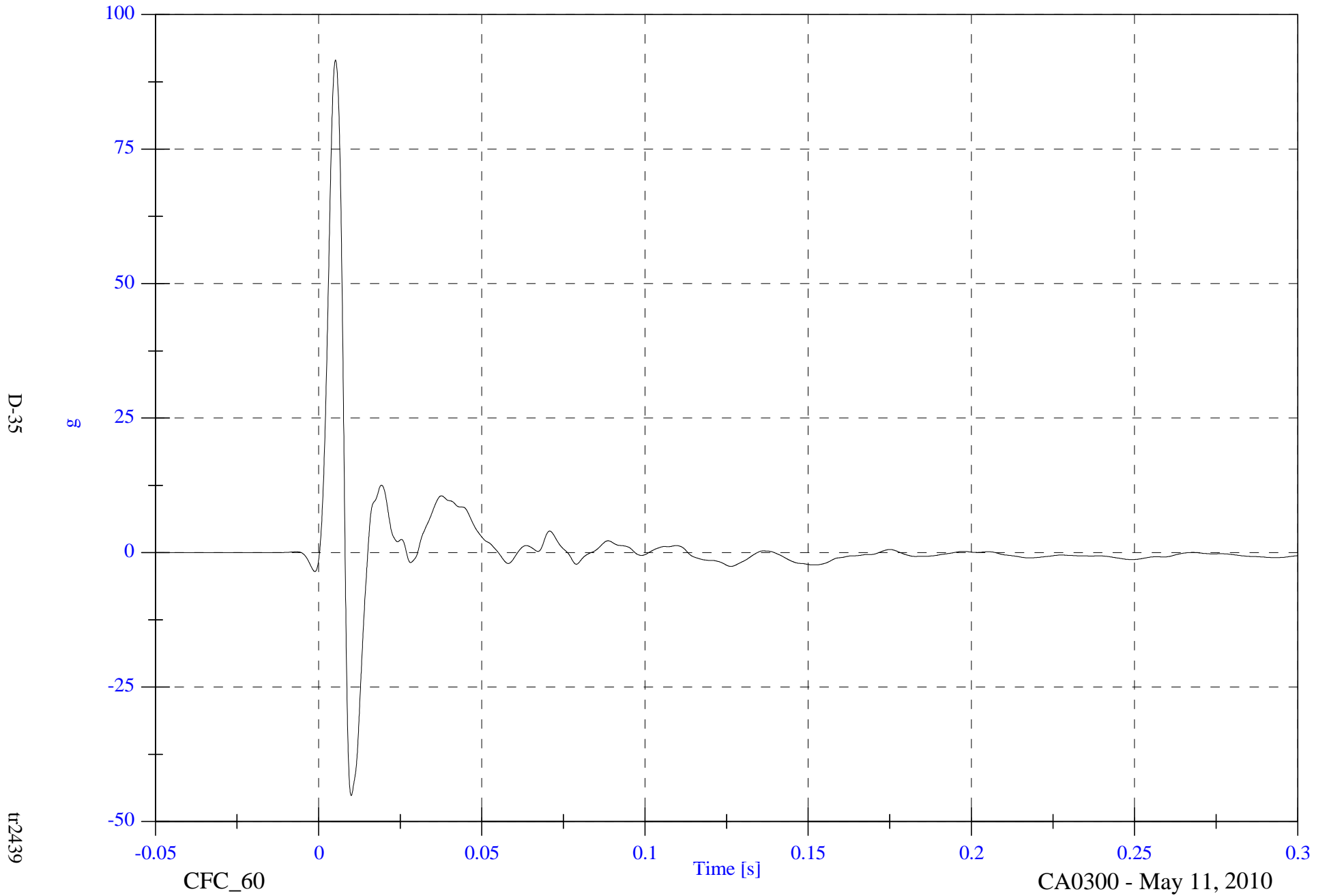


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A9 Left Lower A Post Y

Max: 91.6 [g] at 0.005 [s]

Min: -45.2 [g] at 0.010 [s]

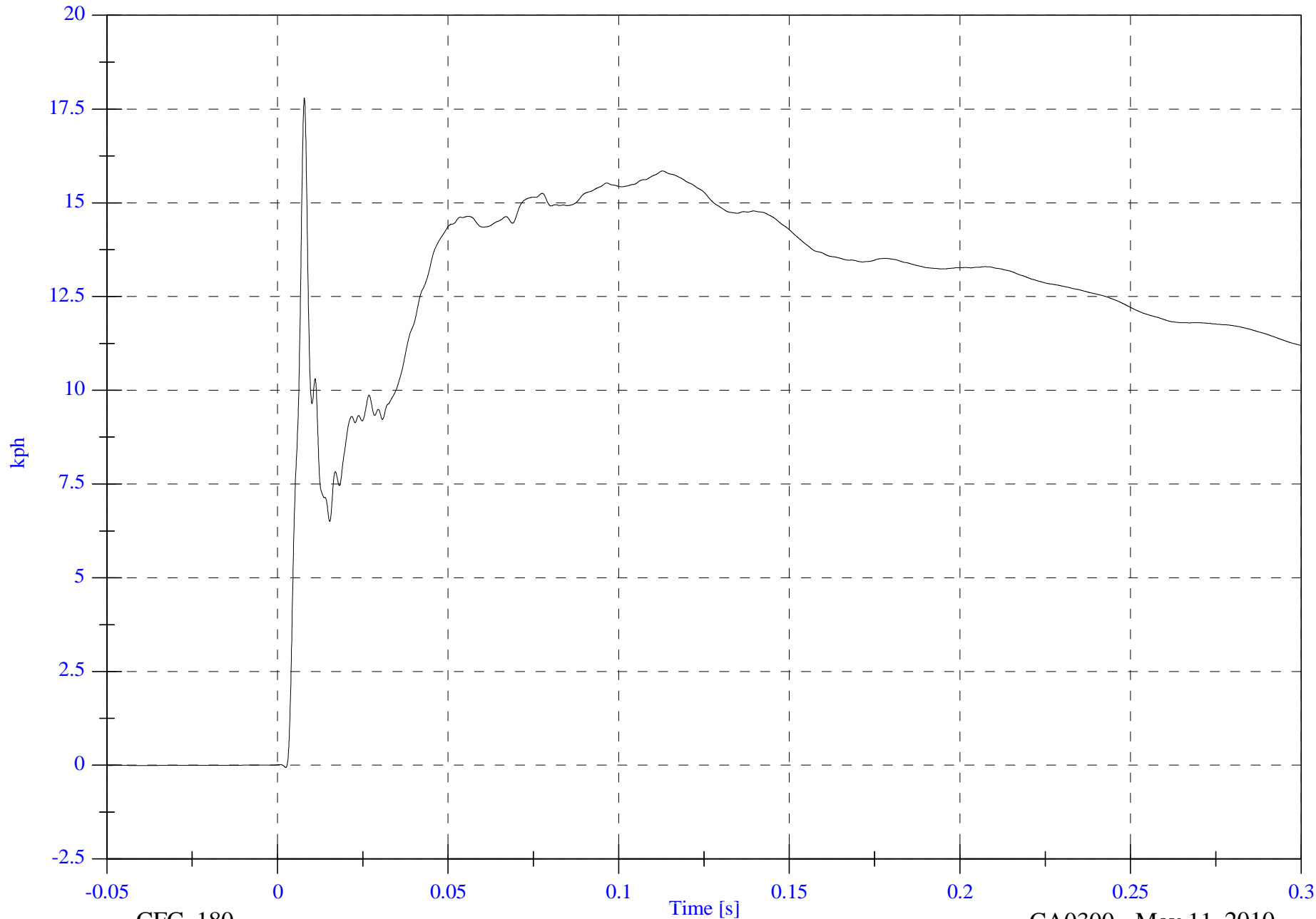


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 17.8 [kph] at 0.008 [s]

V2 A9 Left Lower A Post Y Velocity

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



D-36

tr2439

CFC\_180

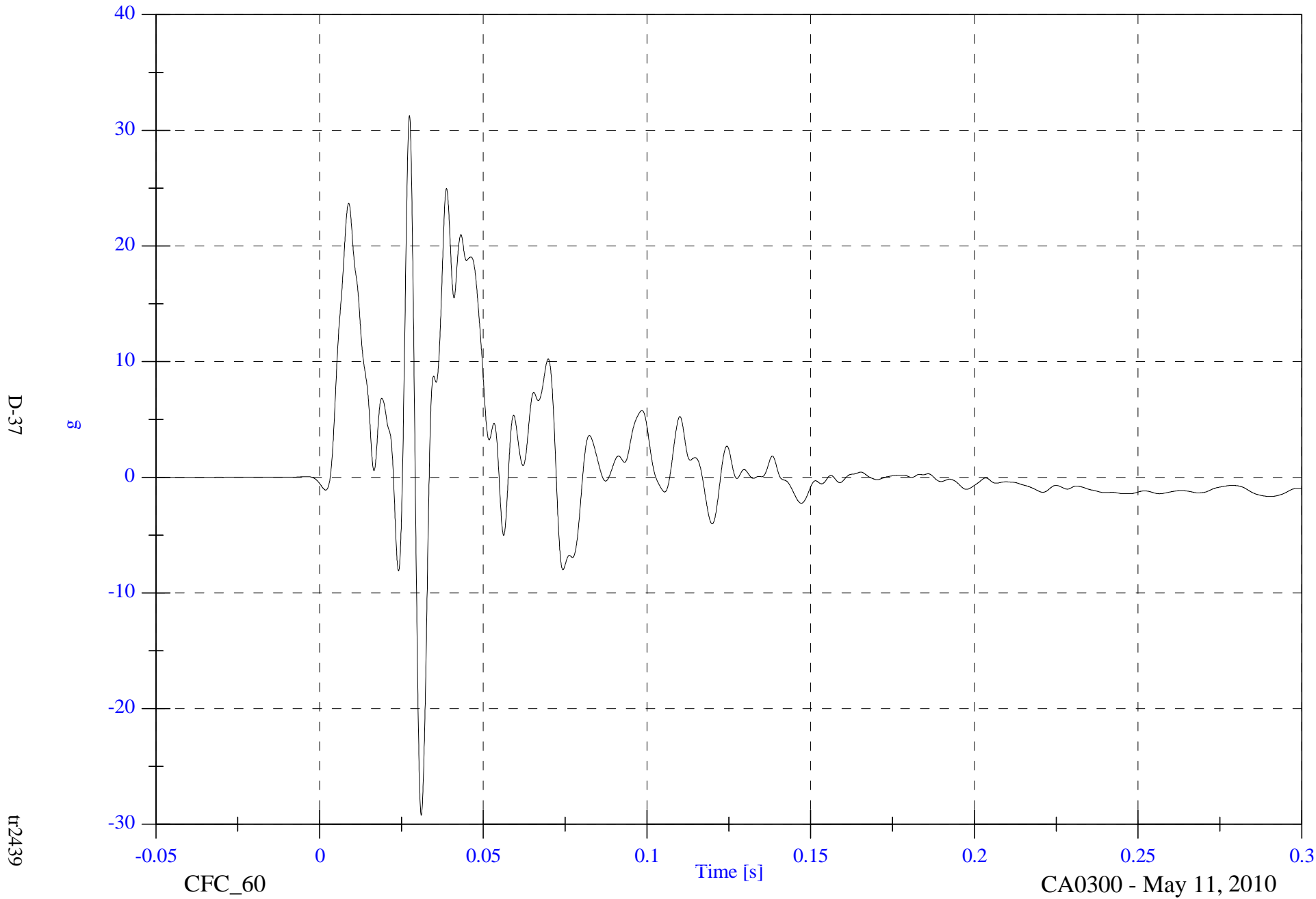
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A10 Left Mid A Post Y

Max: 31.3 [g] at 0.027 [s]

Min: -29.2 [g] at 0.031 [s]



D-37

g

tr2439

CFC\_60

Time [s]

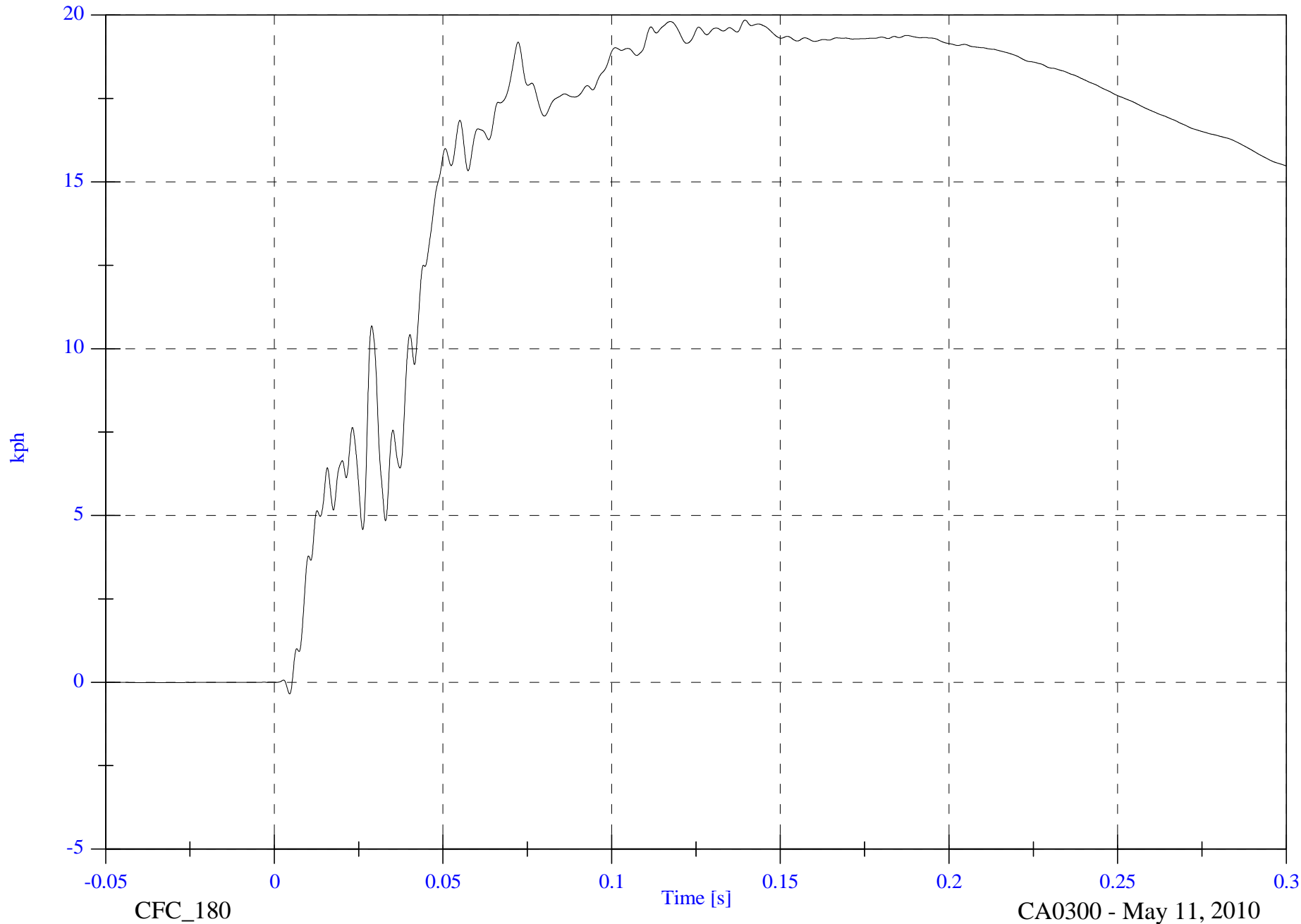
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 19.9 [kph] at 0.140 [s]

V2 A10 Left Mid A Post Y Velocity

Min: -0.3 [kph] at 0.004 [s]



D-38

tr2439

CFC\_180

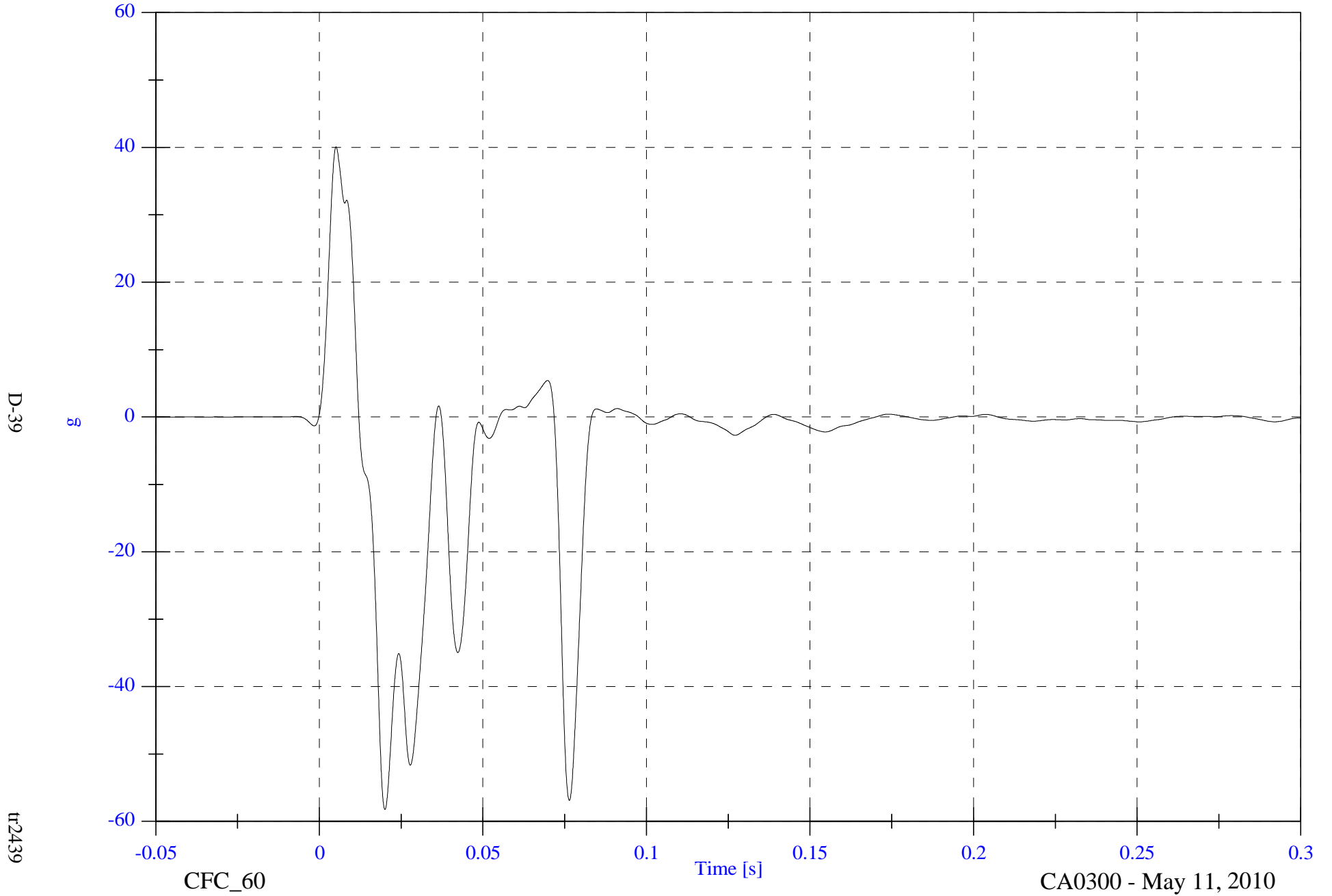
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A11 Front Seat Track Y

Max: 40.1 [g] at 0.005 [s]

Min: -58.2 [g] at 0.020 [s]

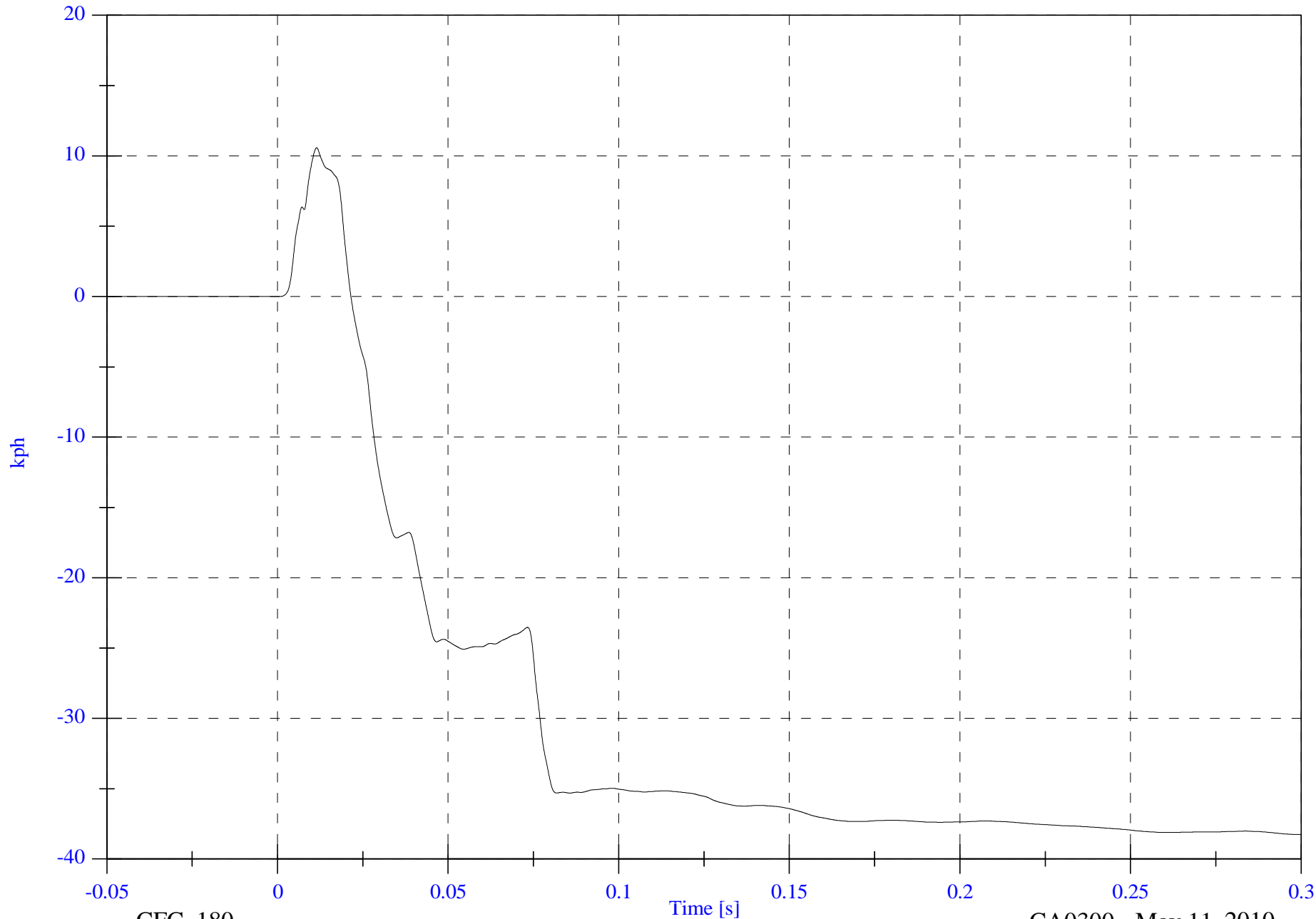


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A11 Front Seat Track Y Velocity

Max: 10.6 [kph] at 0.011 [s]

Min: -38.3 [kph] at 0.300 [s]



D-40

tr2439

CFC\_180

Time [s]

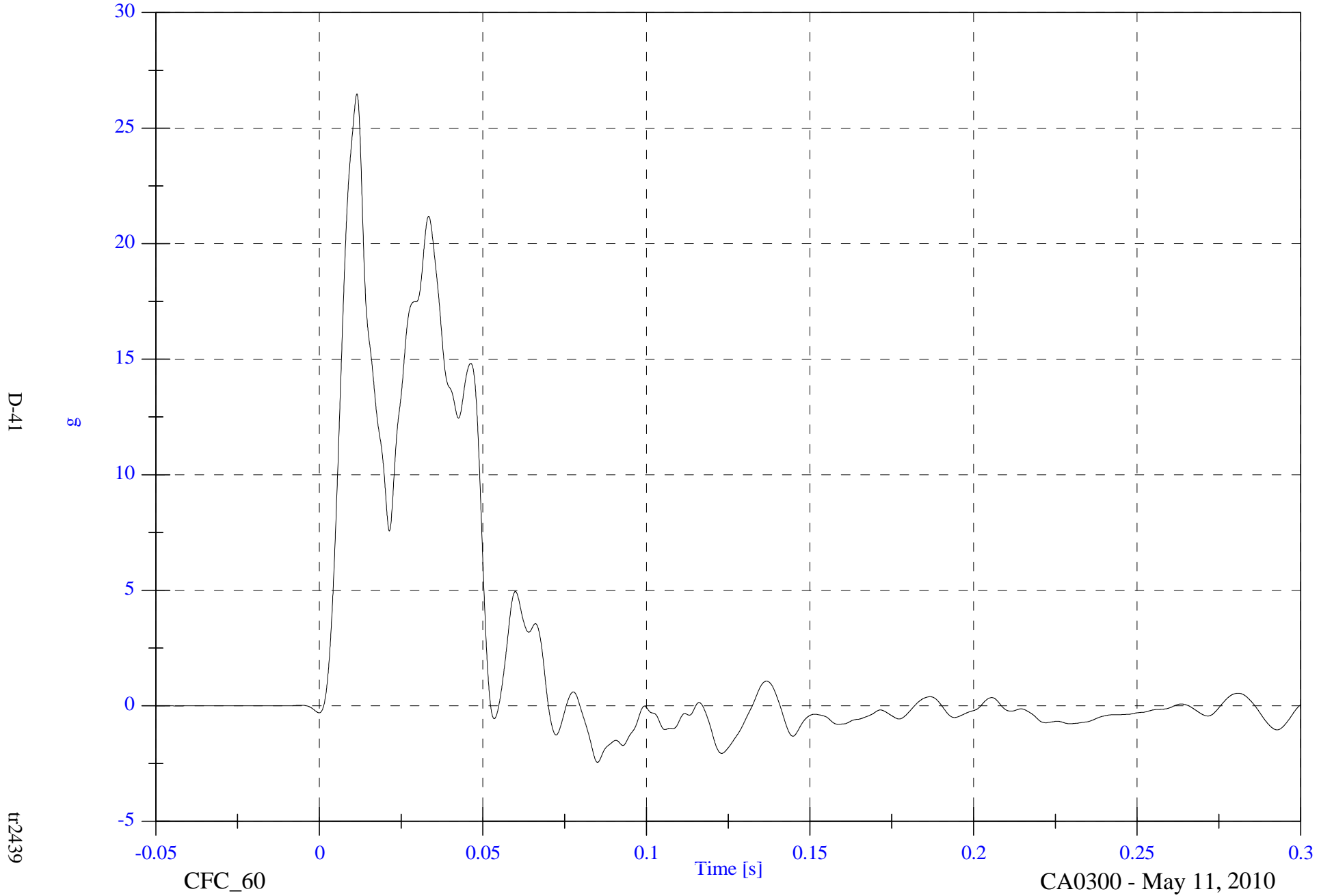
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A12 Rear Seat Track Y

Max: 26.5 [g] at 0.011 [s]

Min: -2.4 [g] at 0.085 [s]



D-41

tr2439

CFC\_60

CA0300 - May 11, 2010

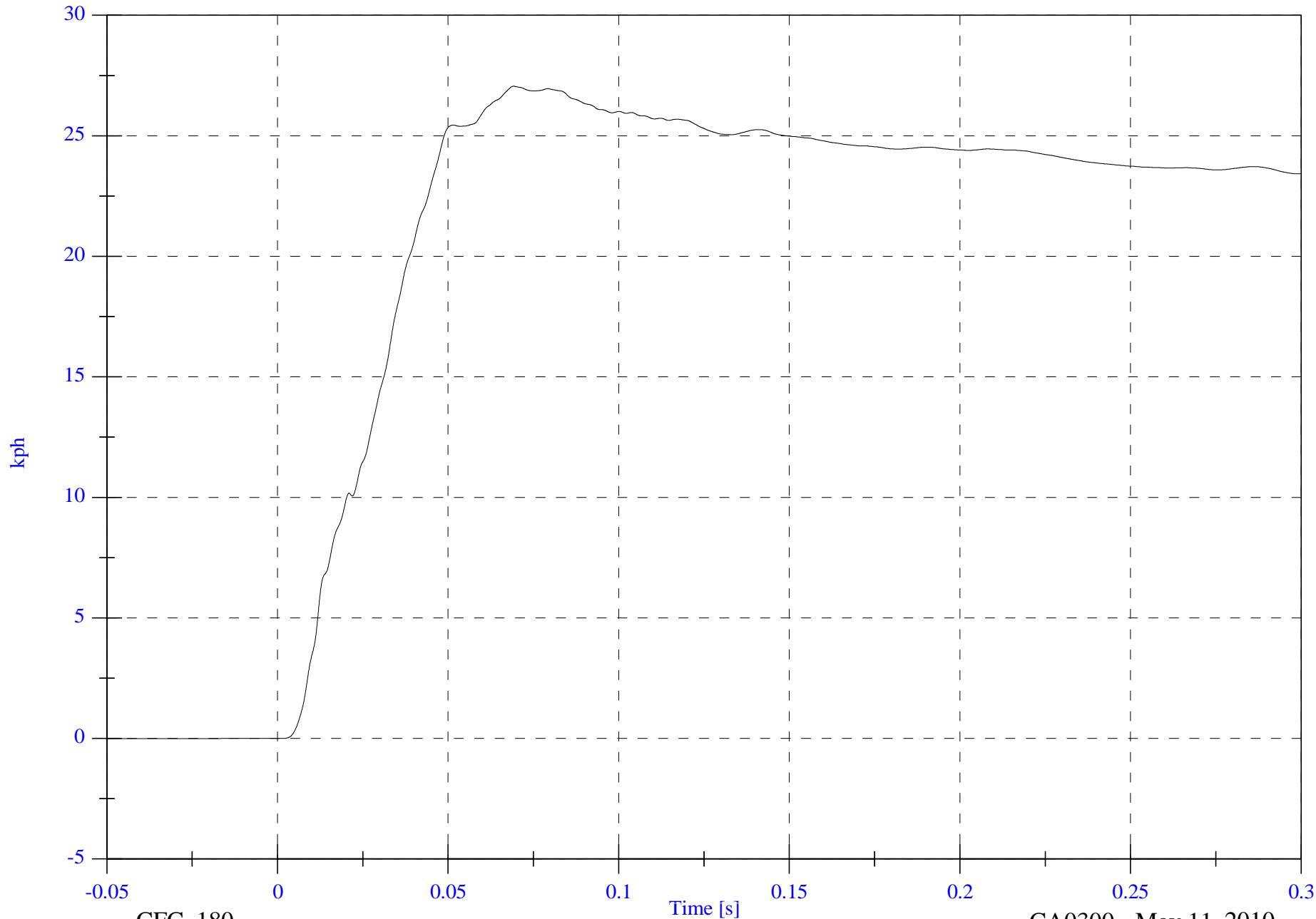


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A12 Rear Seat Track Y Velocity

Max: 27.1 [kph] at 0.069 [s]

Min: -0.0 [kph] at -0.042 [s]



D-42

tr2439

CFC\_180

Time [s]

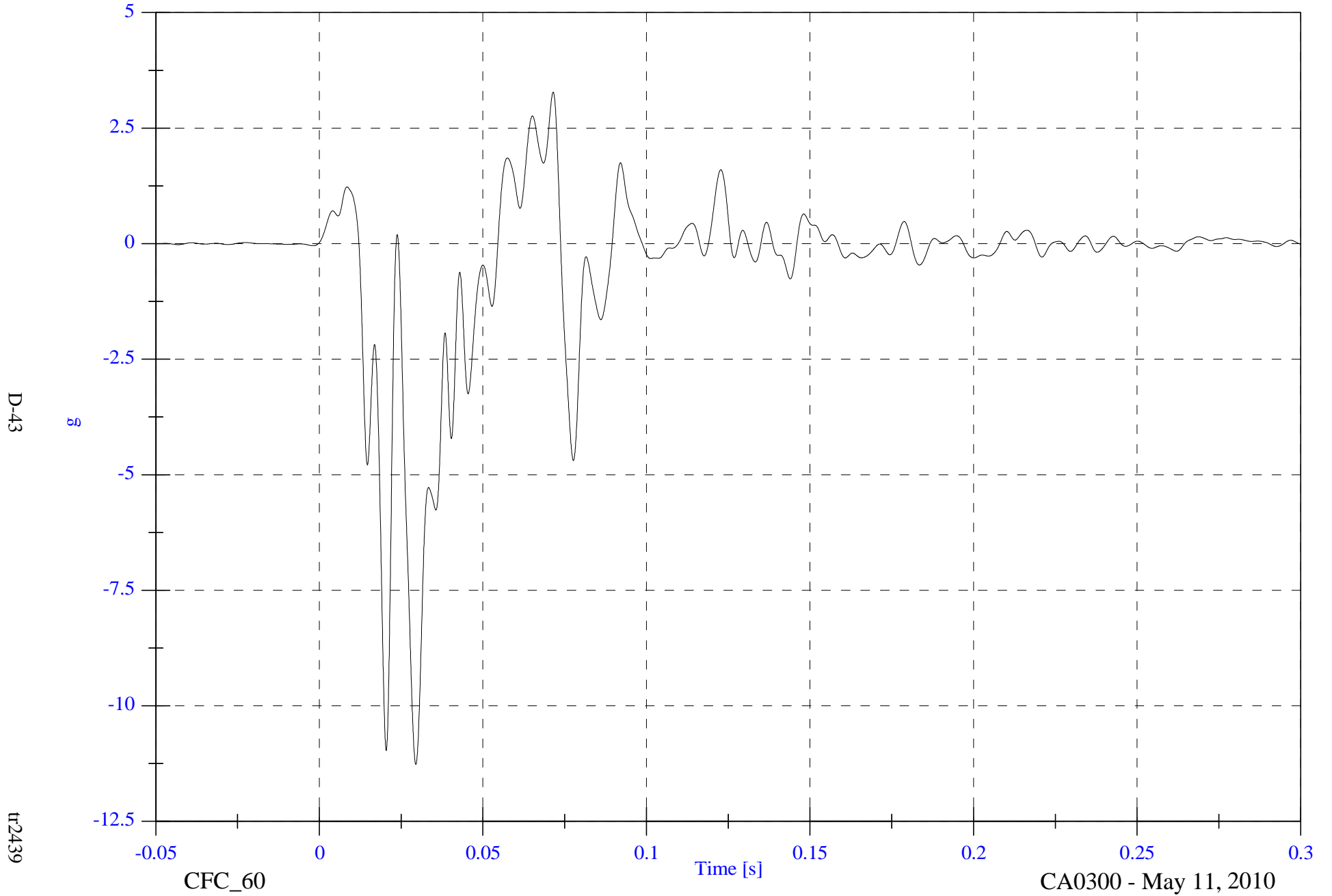
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A13 Target CG X

Max: 3.3 [g] at 0.071 [s]

Min: -11.3 [g] at 0.029 [s]



D-43

tr2439

CFC\_60

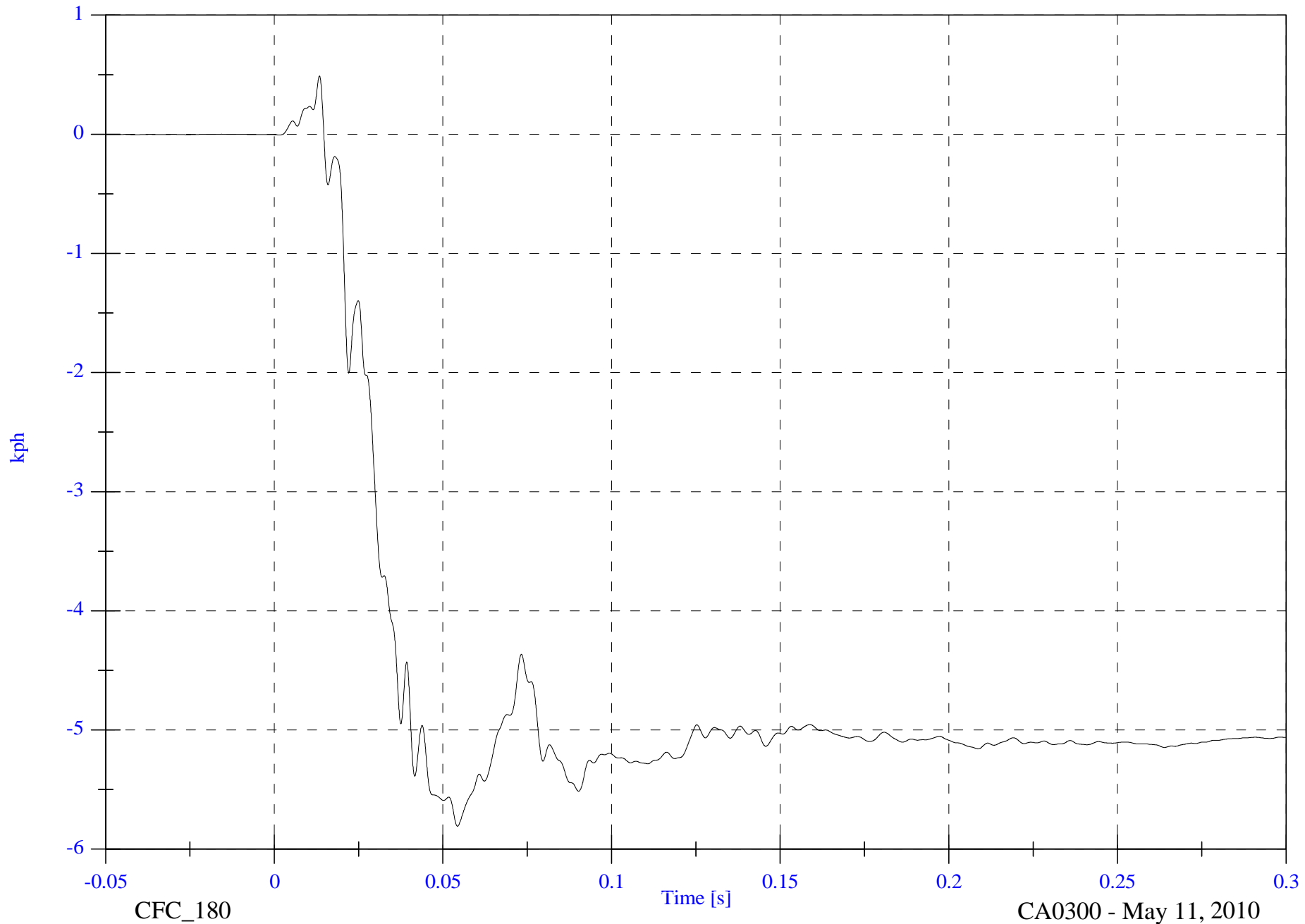
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A13 Target CG X Velocity

Max: 0.5 [kph] at 0.013 [s]

Min: -5.8 [kph] at 0.054 [s]



D-44

tr2439

CFC\_180

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

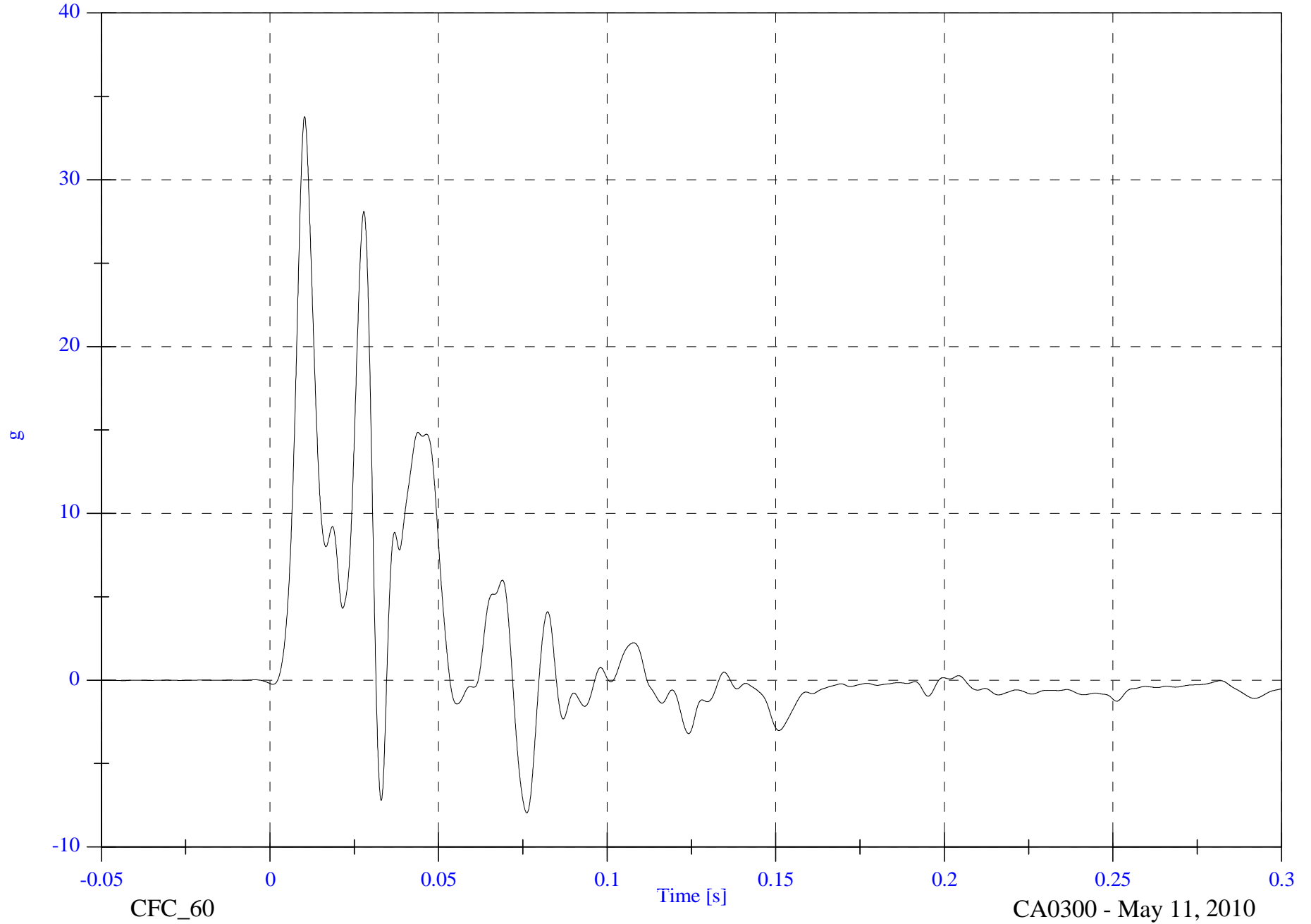
V2 A13 Target CG Y

Max: 33.8 [g] at 0.010 [s]

Min: -8.0 [g] at 0.076 [s]

D-45

tr2439

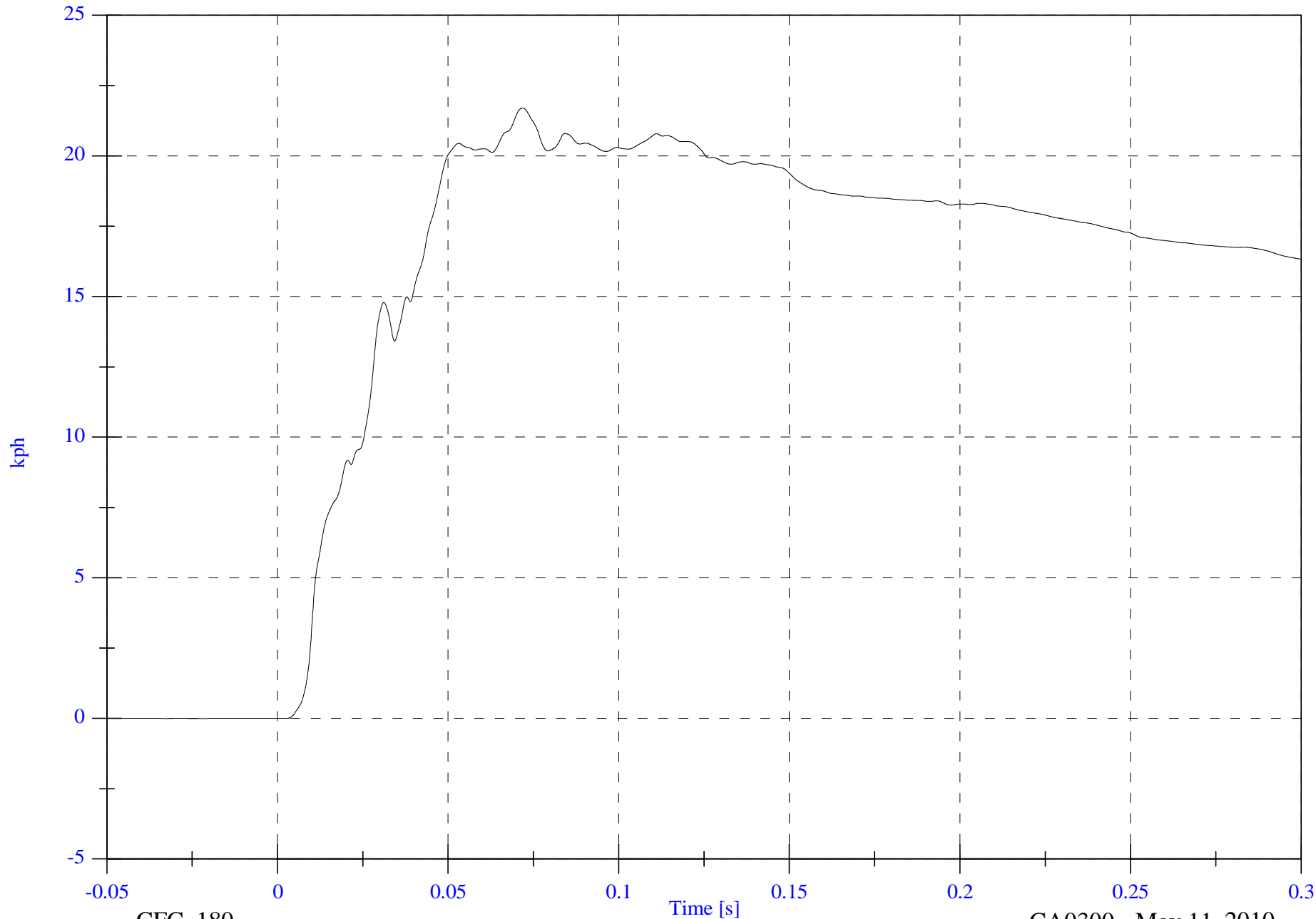


FMVSS 214 MDB 2010 Dodge Journey CA0300

V2 A13 Target CG Y Velocity

Max: 21.7 [kph] at 0.072 [s]

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



D-46

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

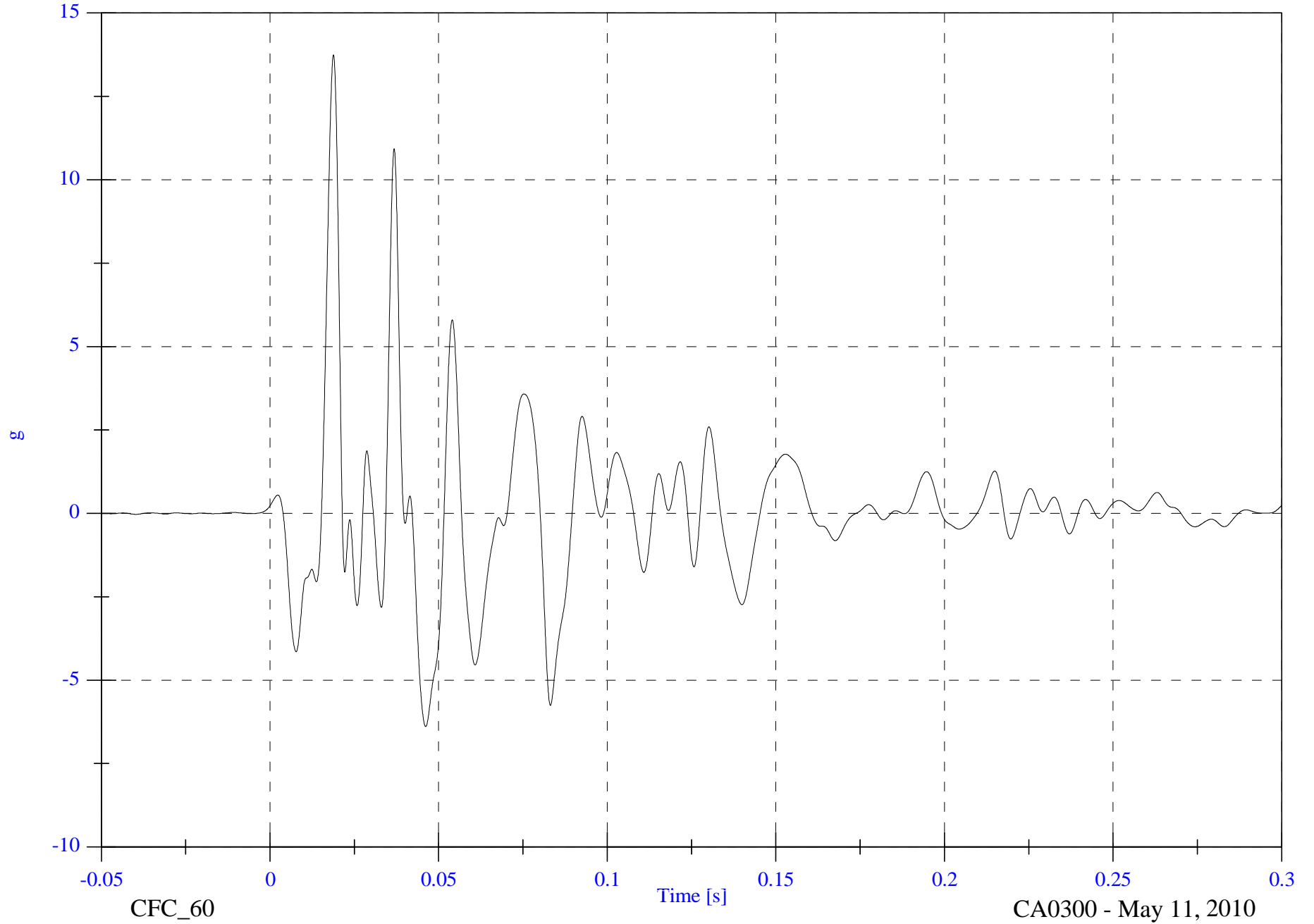
V2 A13 Target CG Z

Max: 13.7 [g] at 0.019 [s]

Min: -6.4 [g] at 0.046 [s]

D-47

tt2439



FMVSS 214 MDB 2010 Dodge Journey CA0300

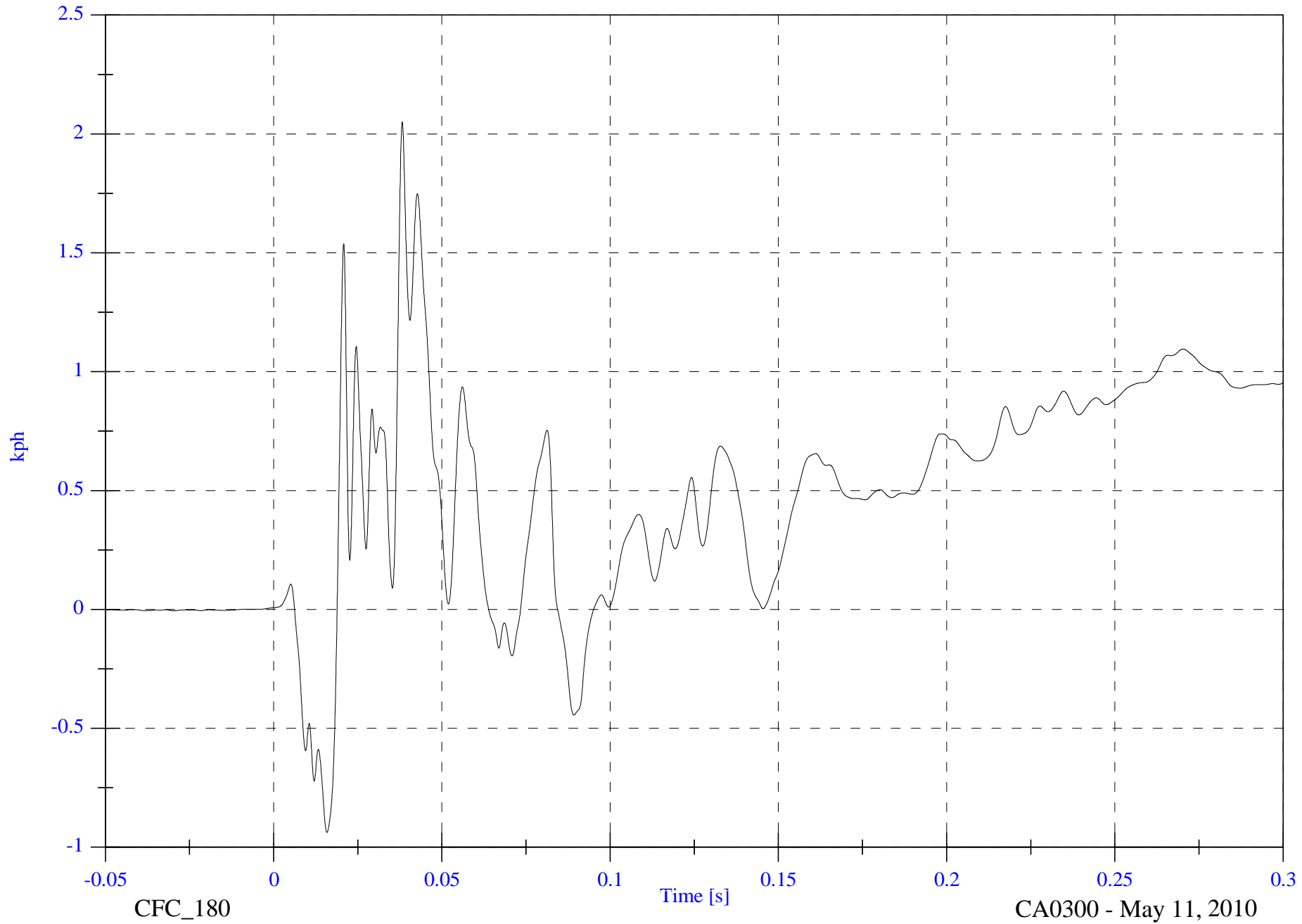
V2 A13 Target CG Z Velocity

Max: 2.1 [kph] at 0.038 [s]

Min: -0.9 [kph] at 0.016 [s]

D-48

tr2439



CFC\_180

Time [s]

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

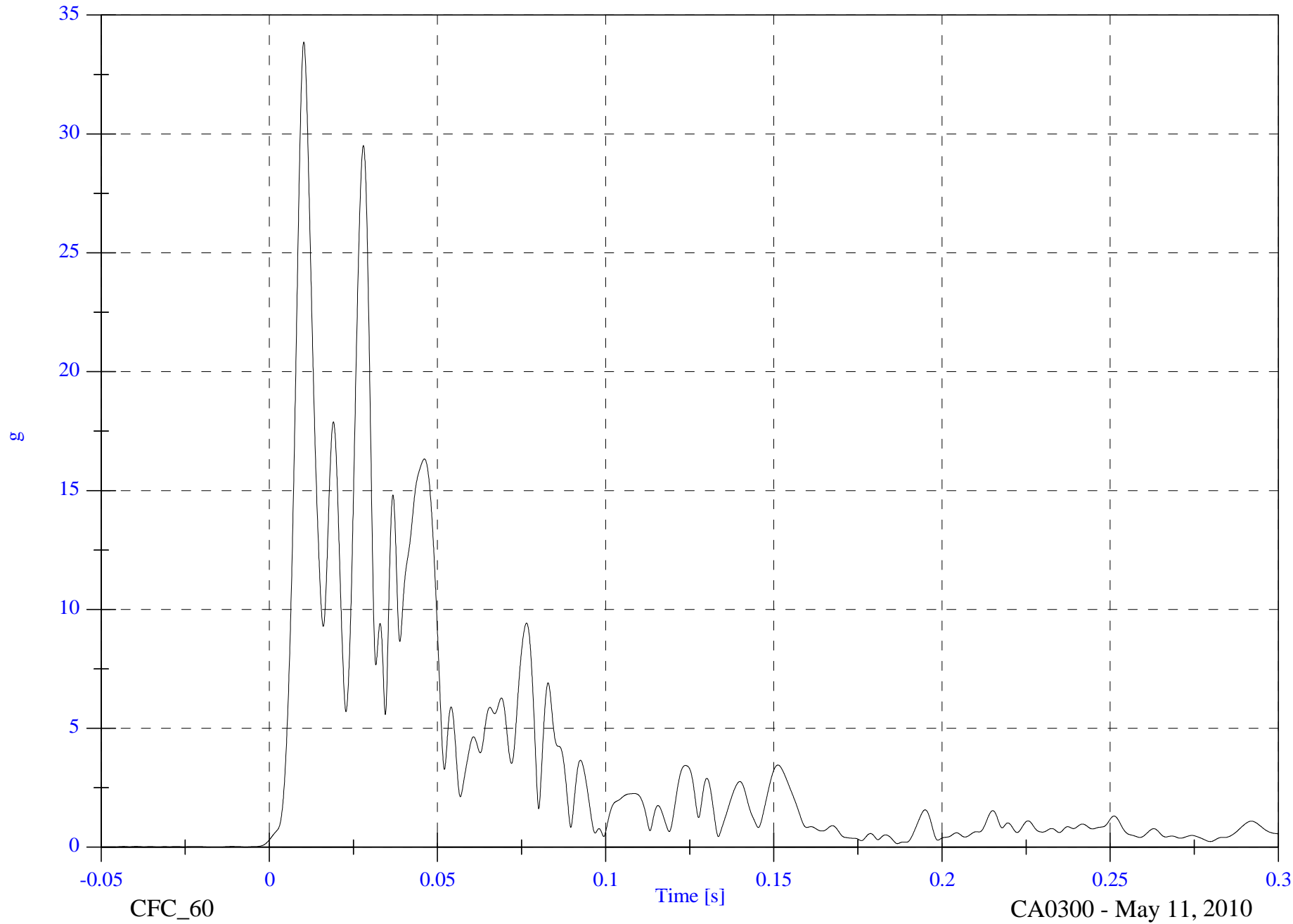
V2 A13 Target CG Resultant

Max: 33.9 [g] at 0.010 [s]

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

D-49

tr2439



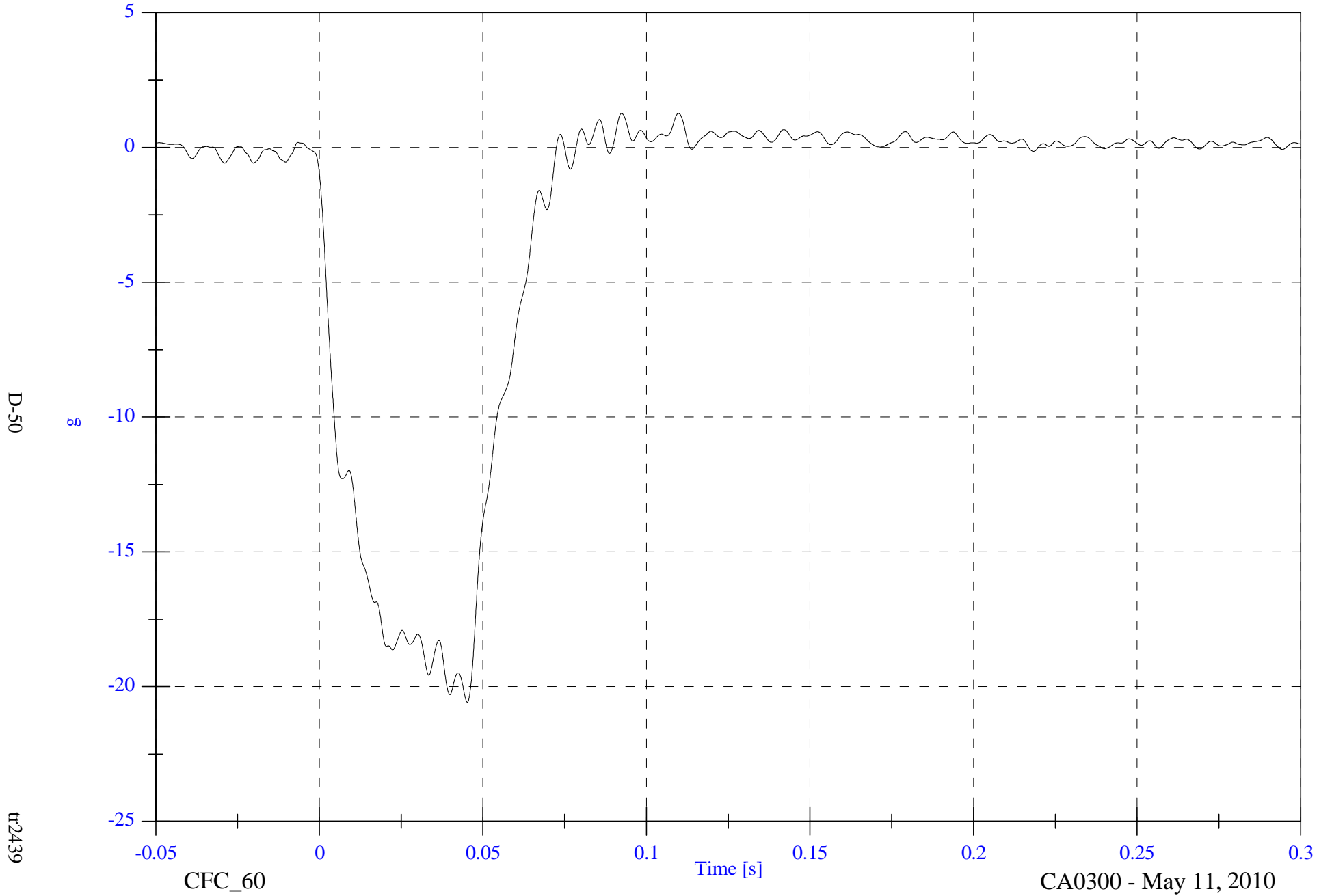


FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier CG X

Max: 1.3 [g] at 0.110 [s]

Min: -20.6 [g] at 0.045 [s]

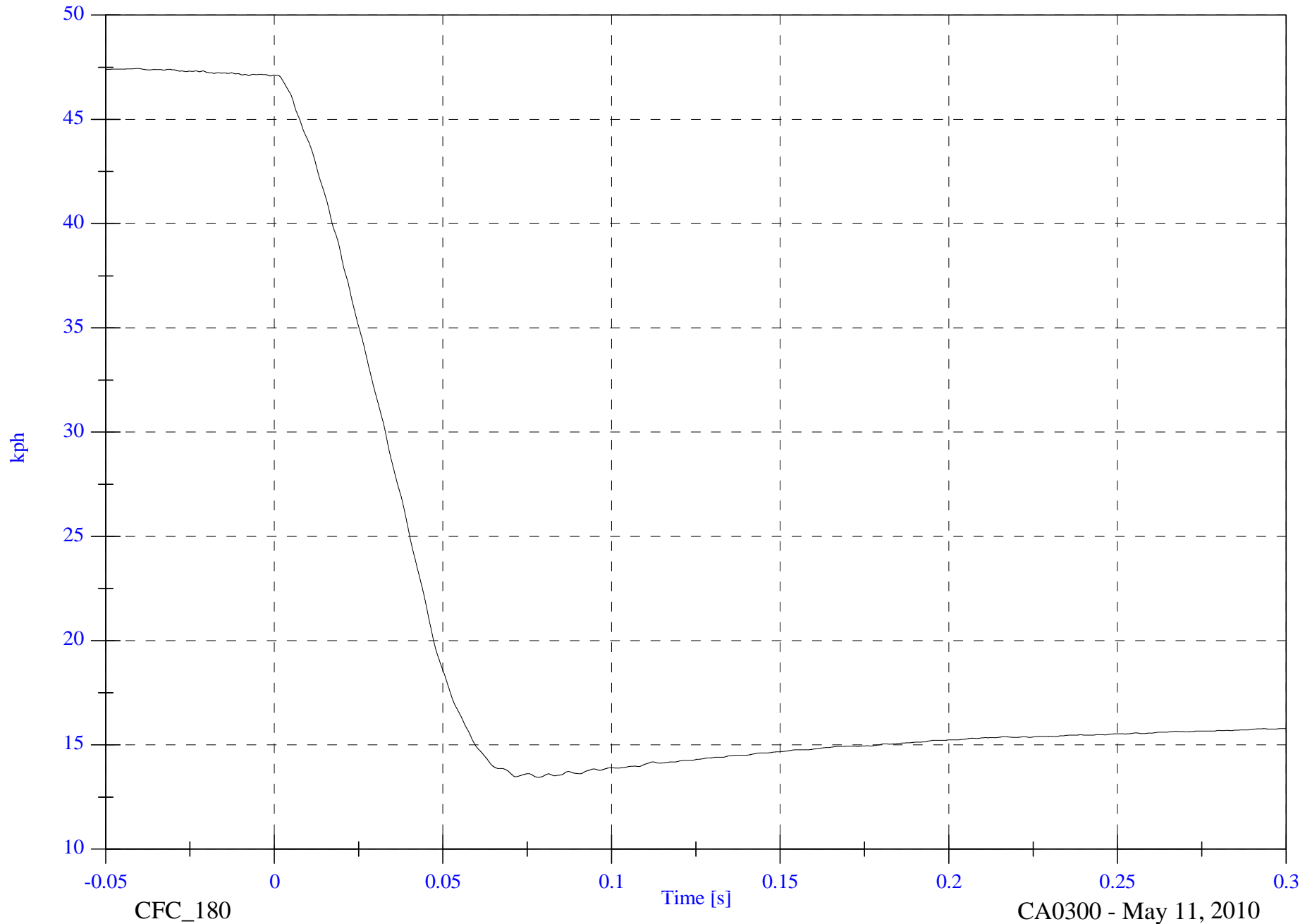


FMVSS 214 MDB 2010 Dodge Journey CA0300

Max: 47.4 [kph] at -0.040 [s]

V1 Moving Barrier CG X Velocity

Min: 13.4 [kph] at 0.078 [s]



D-51

tr2439

CFC\_180

Time [s]

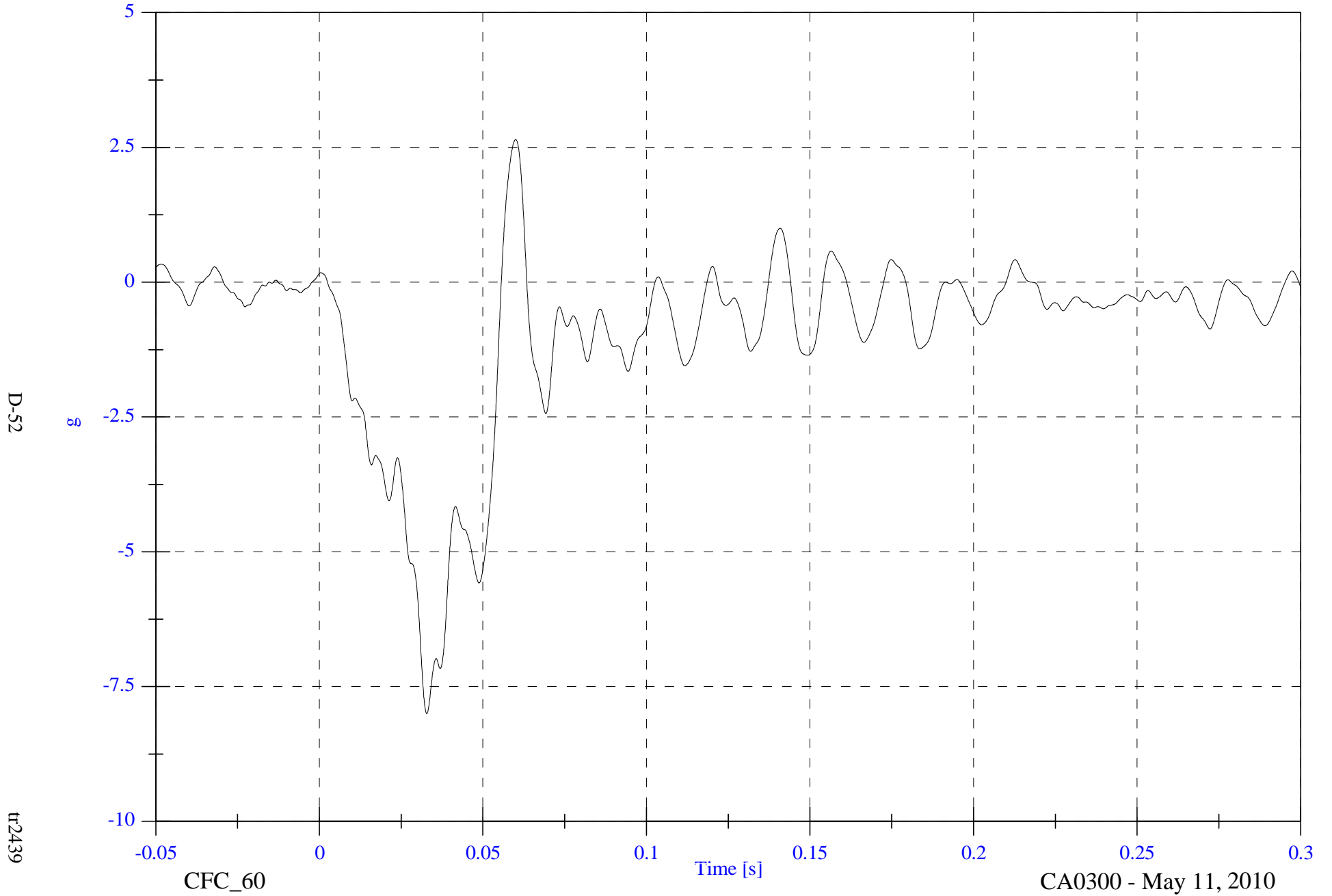
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier CG Y

Max: 2.6 [g] at 0.060 [s]

Min: -8.0 [g] at 0.033 [s]



FMVSS 214 MDB 2010 Dodge Journey CA0300

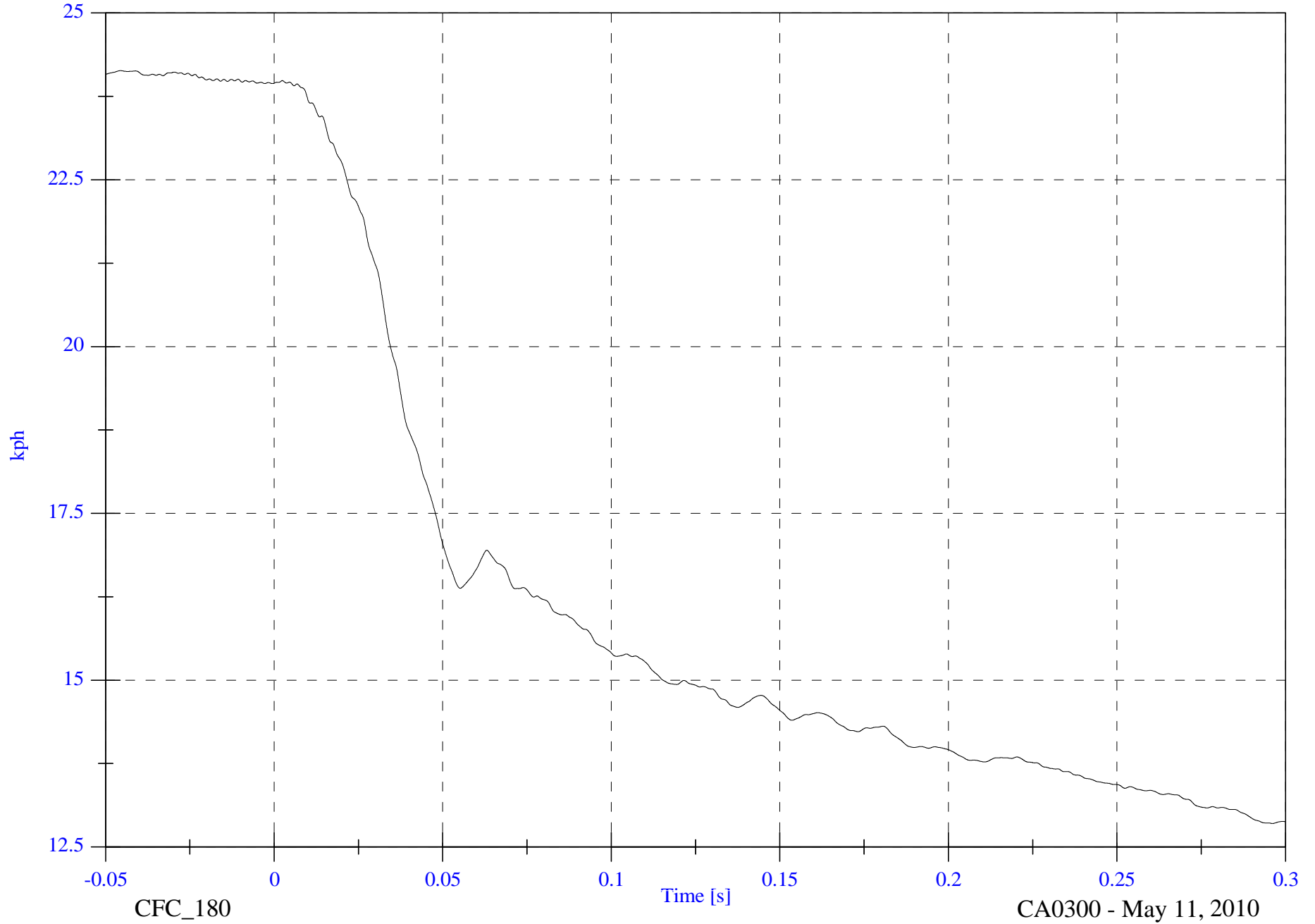
Max: 24.1 [kph] at -0.046 [s]

V1 Moving Barrier CG Y Velocity

Min: 12.9 [kph] at 0.296 [s]

D-53

tr2439

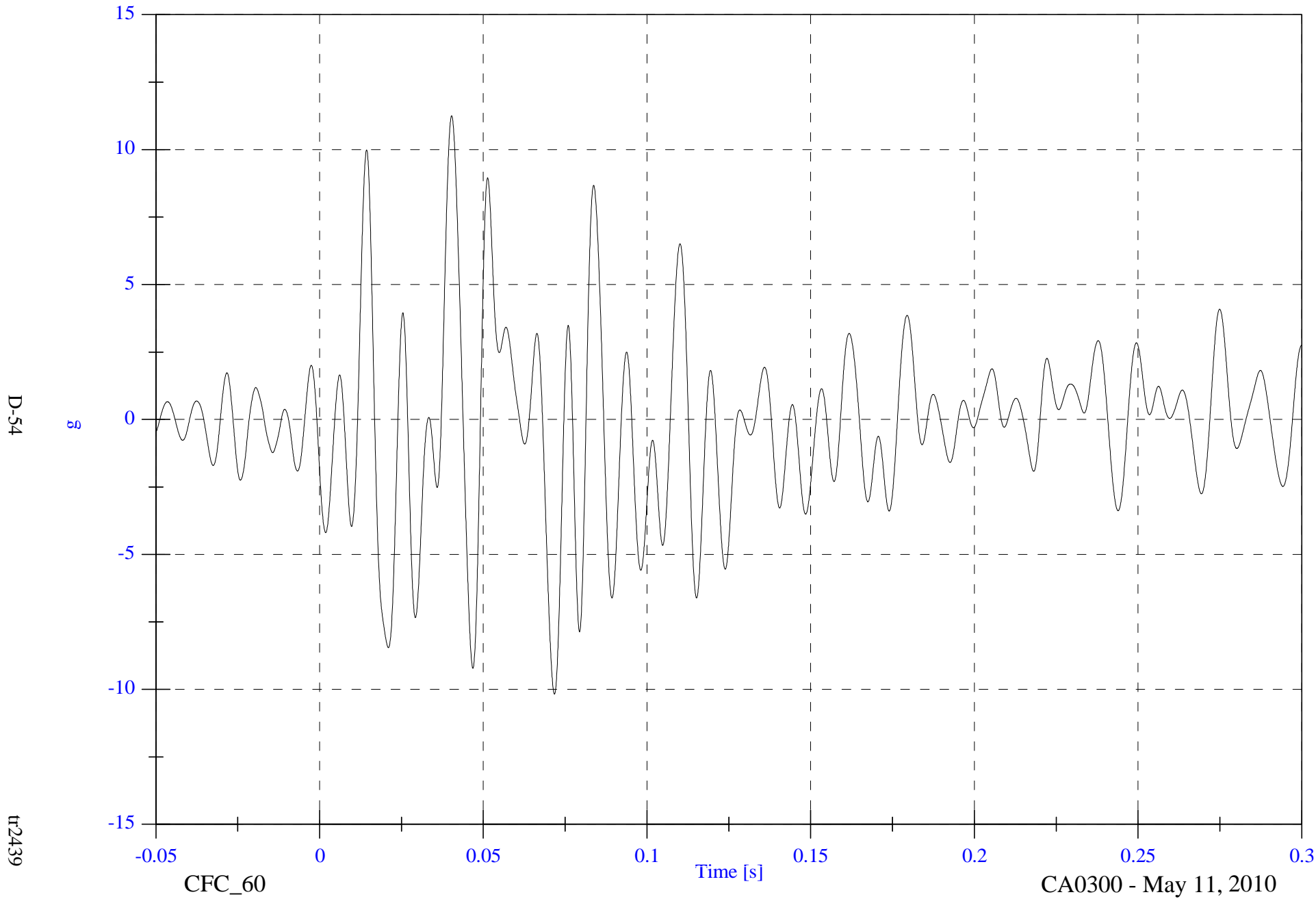


FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier CG Z

Max: 11.3 [g] at 0.040 [s]

Min: -10.2 [g] at 0.072 [s]



D-54

tr2439

CFC\_60

Time [s]

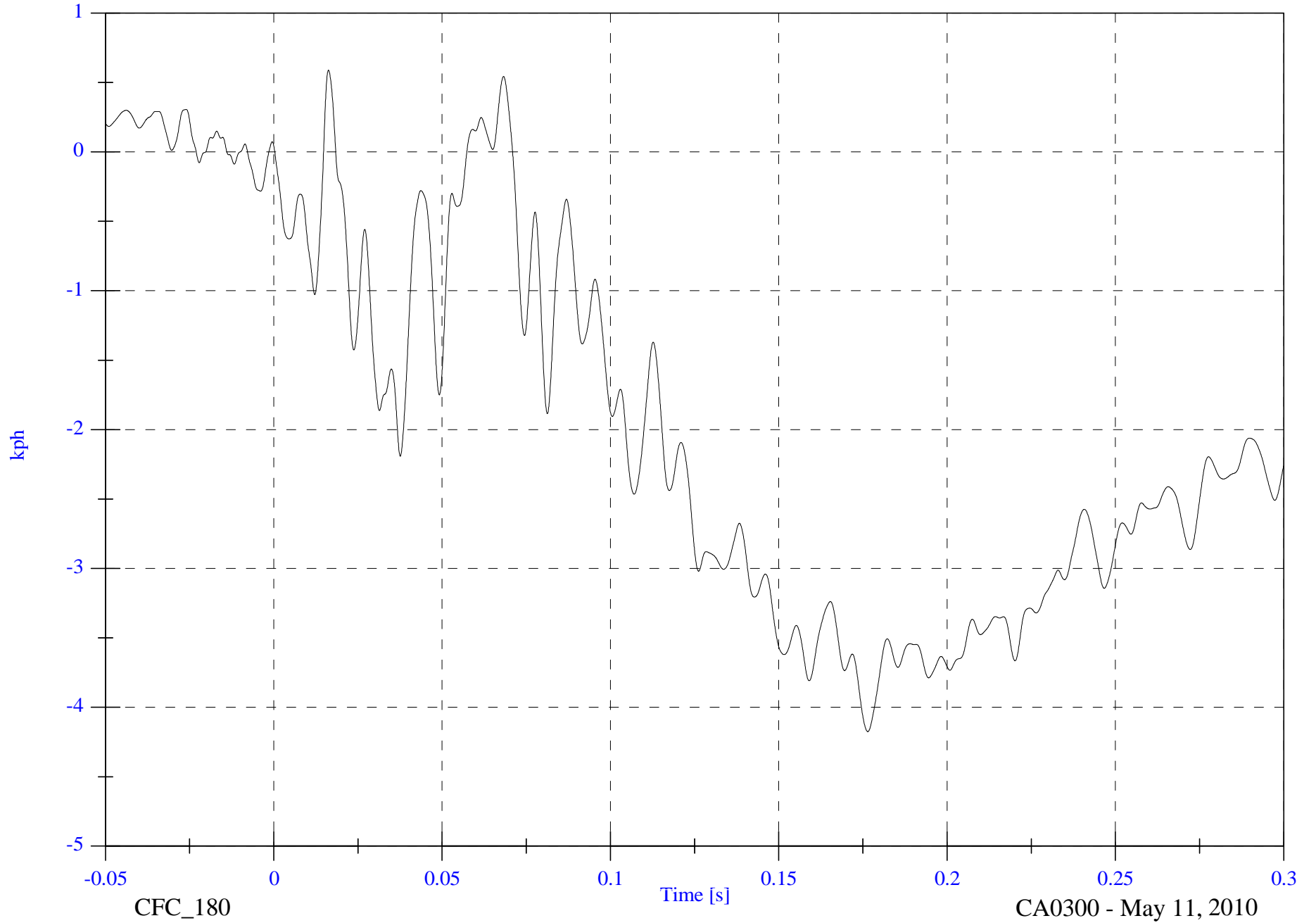
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier CG Z Velocity

Max: 0.6 [kph] at 0.016 [s]

Min: -4.2 [kph] at 0.176 [s]



D-55

kph

tr2439

CFC\_180

Time [s]

CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

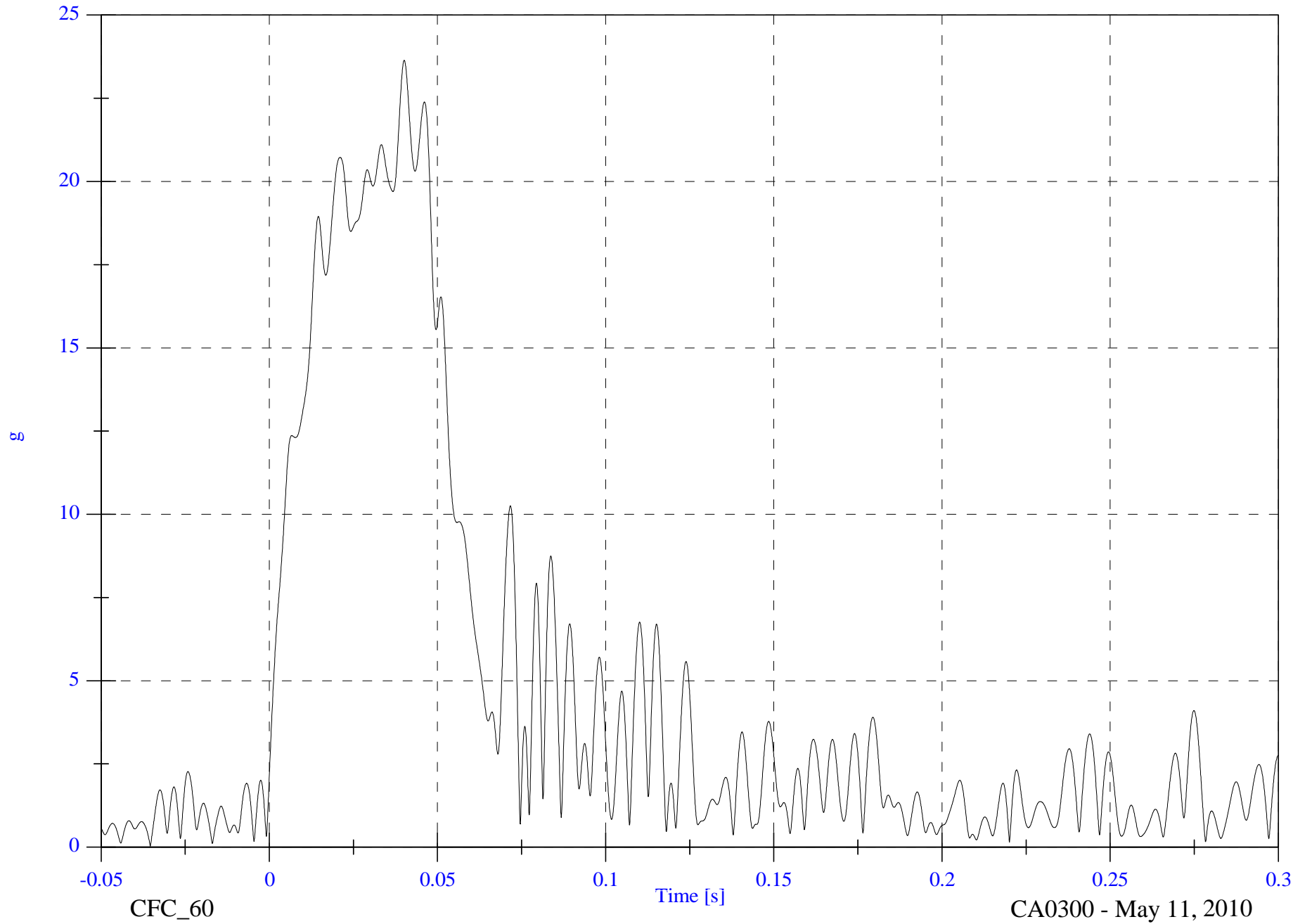
V1 Moving Barrier CG Resultant

Max: 23.6 [g] at 0.040 [s]

Min: 0.0 [g] at -0.035 [s]

D-56

tr2439



CFC\_60

Time [s]

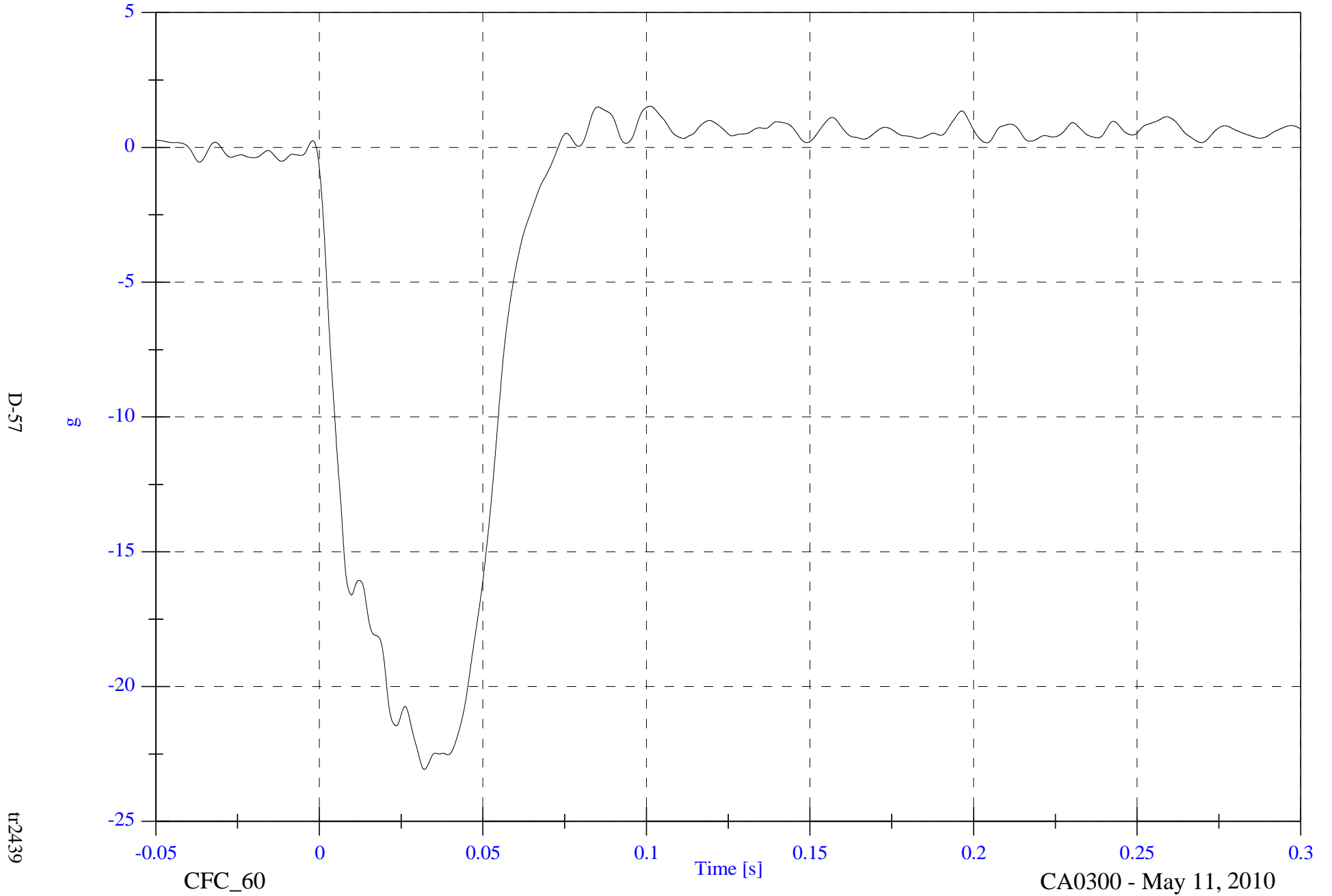
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier Left Rail X

Max: 1.5 [g] at 0.101 [s]

Min: -23.1 [g] at 0.032 [s]



D-57

tr2439

CFC\_60

Time [s]

CA0300 - May 11, 2010

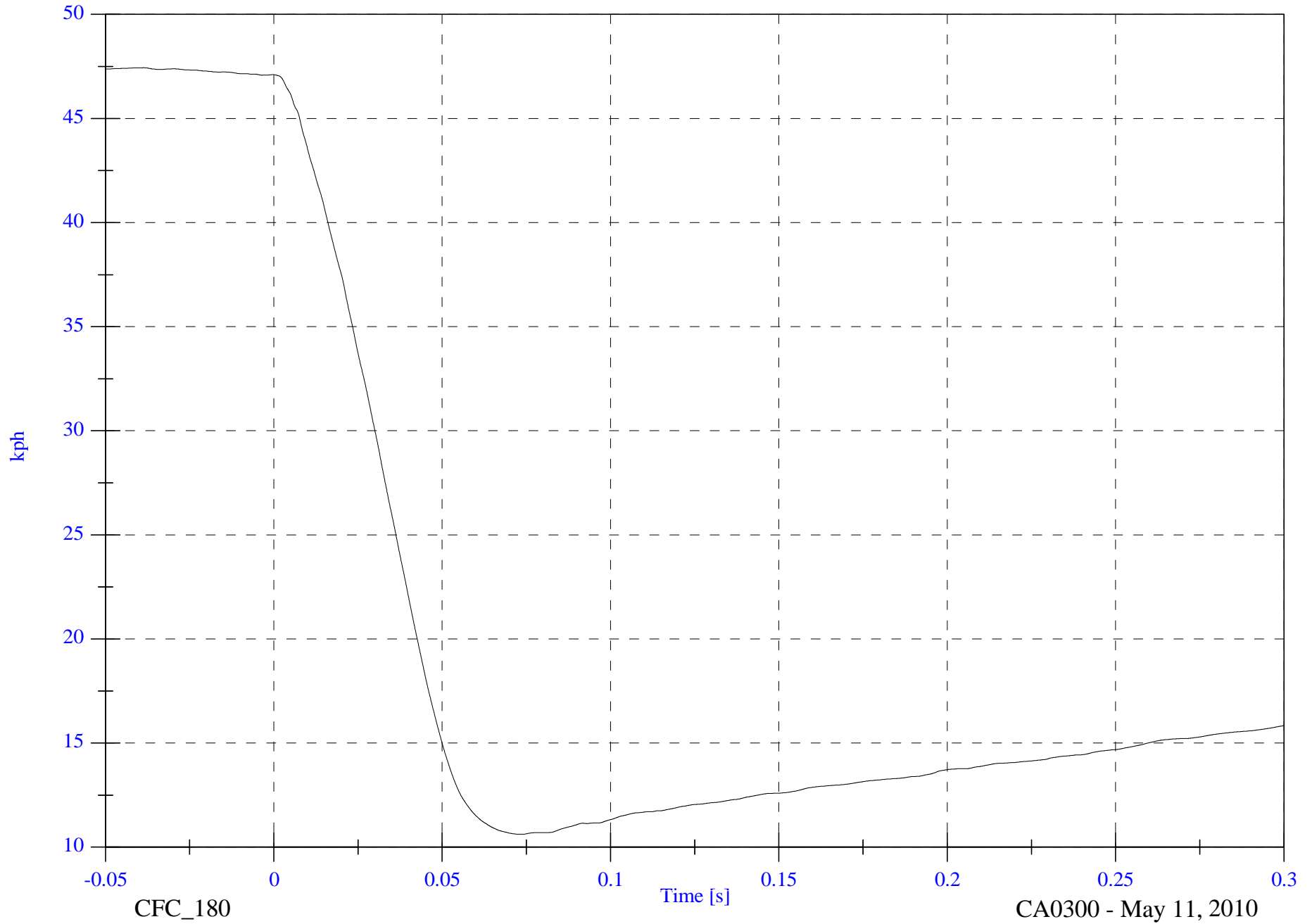


FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier Left Rail X Velocity

Max: 47.4 [kph] at -0.039 [s]

Min: 10.6 [kph] at 0.074 [s]



D-58

tr2439

CFC\_180

Time [s]

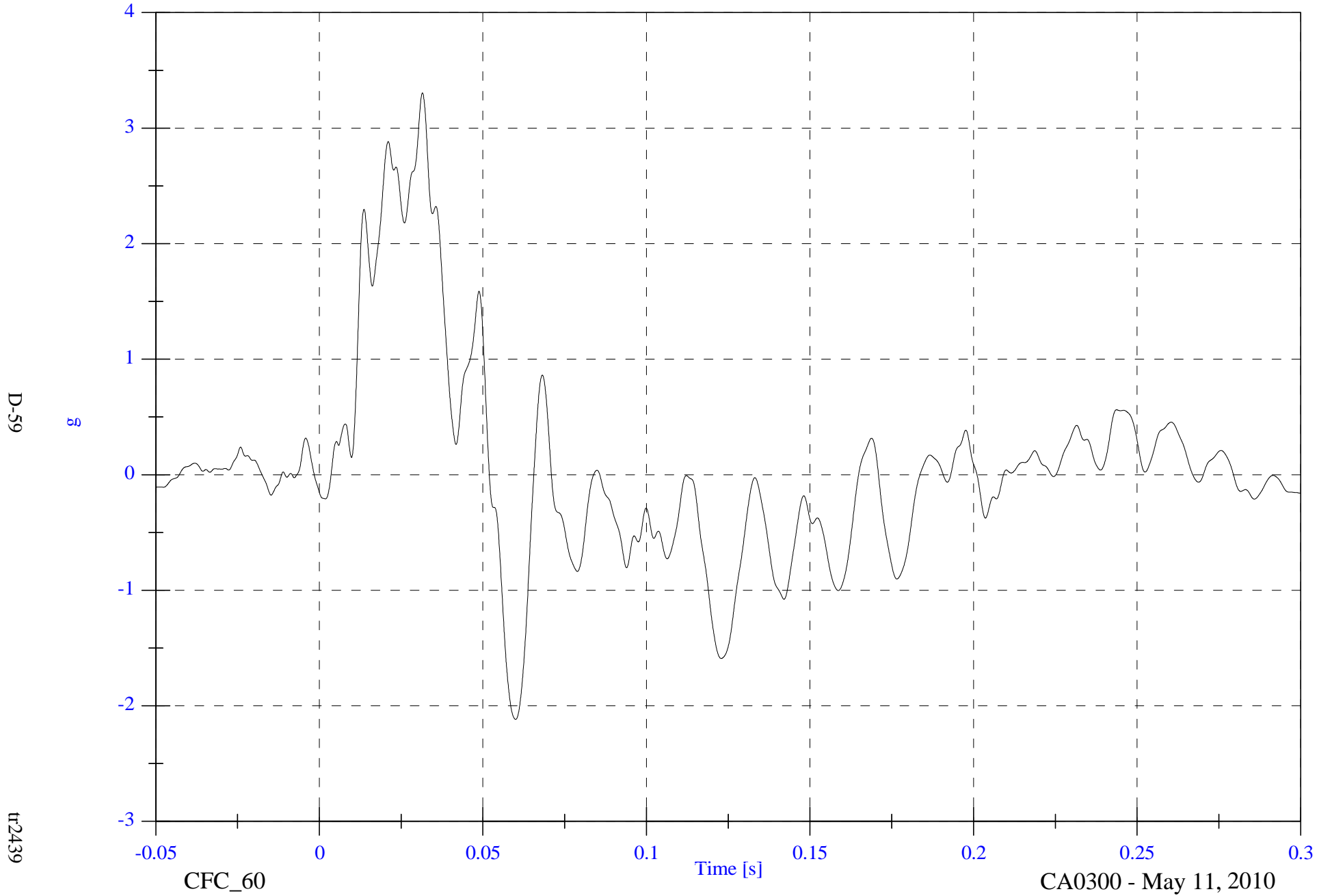
CA0300 - May 11, 2010

FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier Left Rail Y

Max: 3.3 [g] at 0.031 [s]

Min: -2.1 [g] at 0.060 [s]

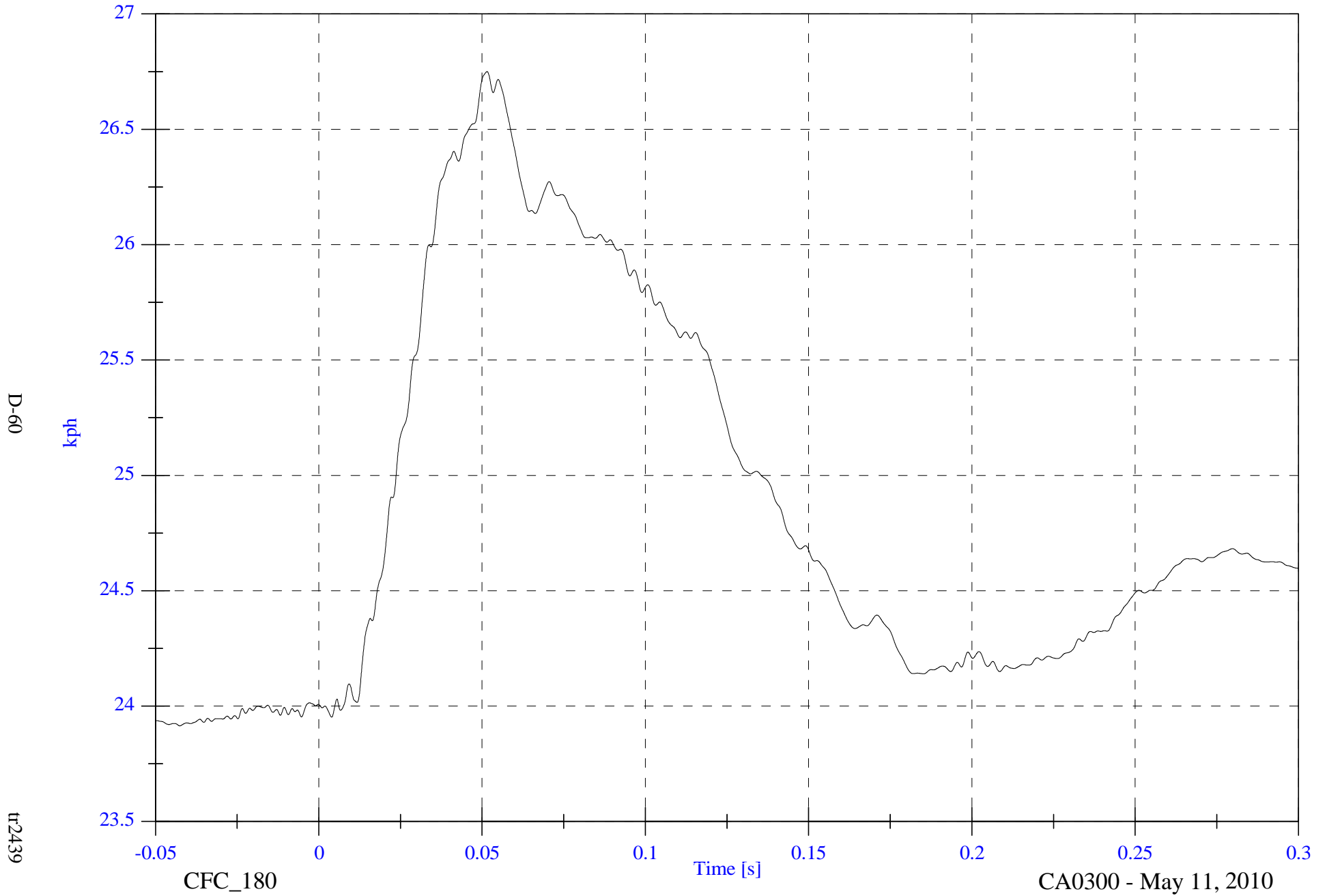


FMVSS 214 MDB 2010 Dodge Journey CA0300

V1 Moving Barrier Left Rail Y Velocity

Max: 26.8 [kph] at 0.051 [s]

Min: 23.9 [kph] at -0.043 [s]



D-60

tr2439

CFC\_180

CA0300 - May 11, 2010

**APPENDIX E**

**ES-2re PERFORMANCE CALIBRATION TEST DATA**

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**ES-2re NO.: 037**

**CONFIGURED FOR LEFT SIDE IMPACT**



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## VERIFICATION REPORT

Test Name:	<b>Head Drop</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Head Drop Test</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>11:35:05 AM</b>

Component Part Number	Component Serial Number
<b>455-1007</b>	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>35</b> %RH P
Resultant Acceleration	125 -- 155	<b>134</b> g P
Oscillation	0.0 -- 15.0	<b>11.1</b> % P
Fore-Aft Acceleration	-15.00 -- 15.00	<b>-6.70</b> g P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_  
Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Head Drop Test**      Test Time: **11:35:05 AM**      Test Date: **4/22/2010**



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## Calspan - Transportation Research Group

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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	J45479	1/25/2010
Endevco	7264-2000	P32453	1/25/2010
Endevco	7264-2000	P22639	1/25/2010

Test ID: **Head Drop Test**

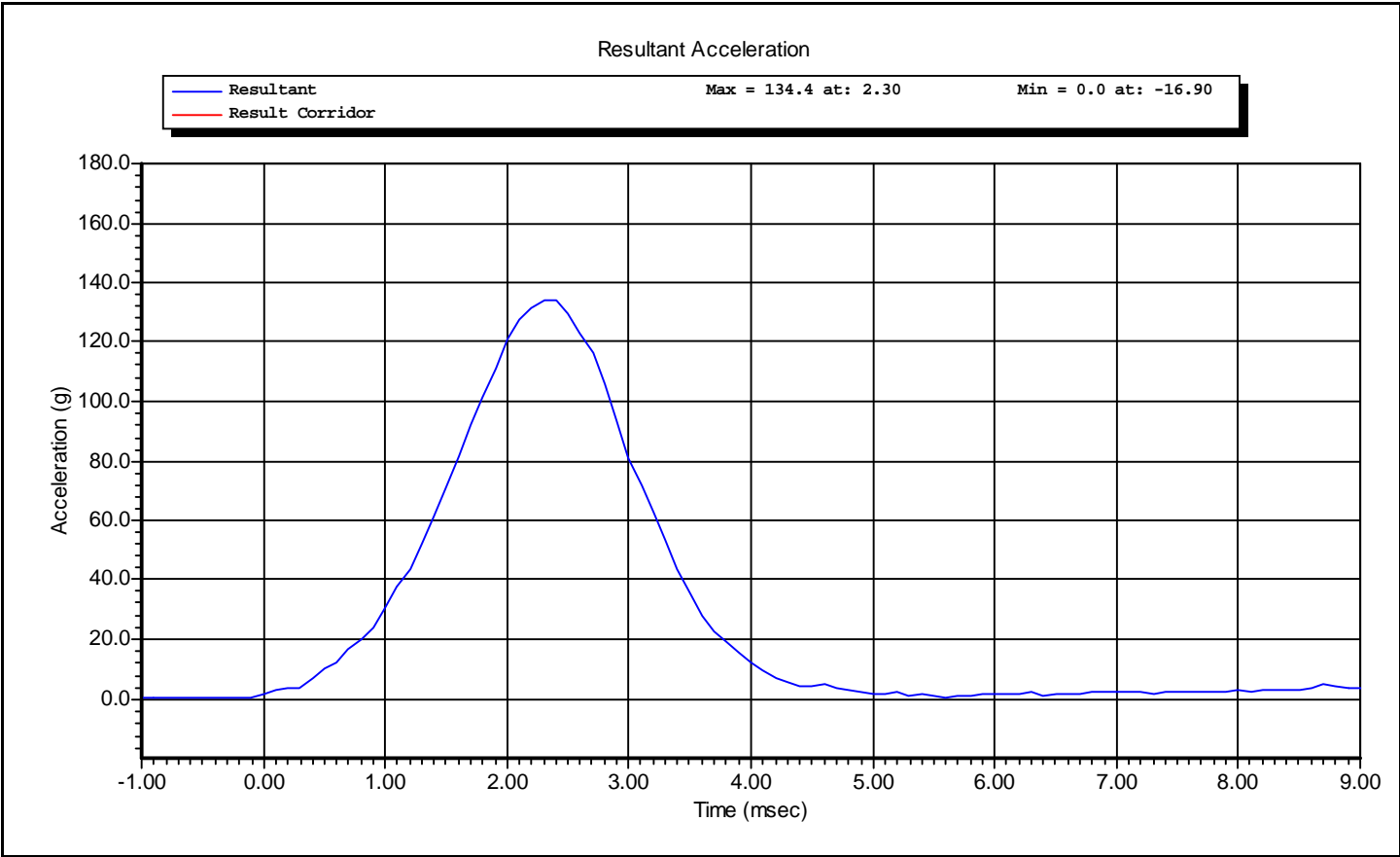
Test Time: **11:35:05 AM**

Test Date: **4/22/2010**

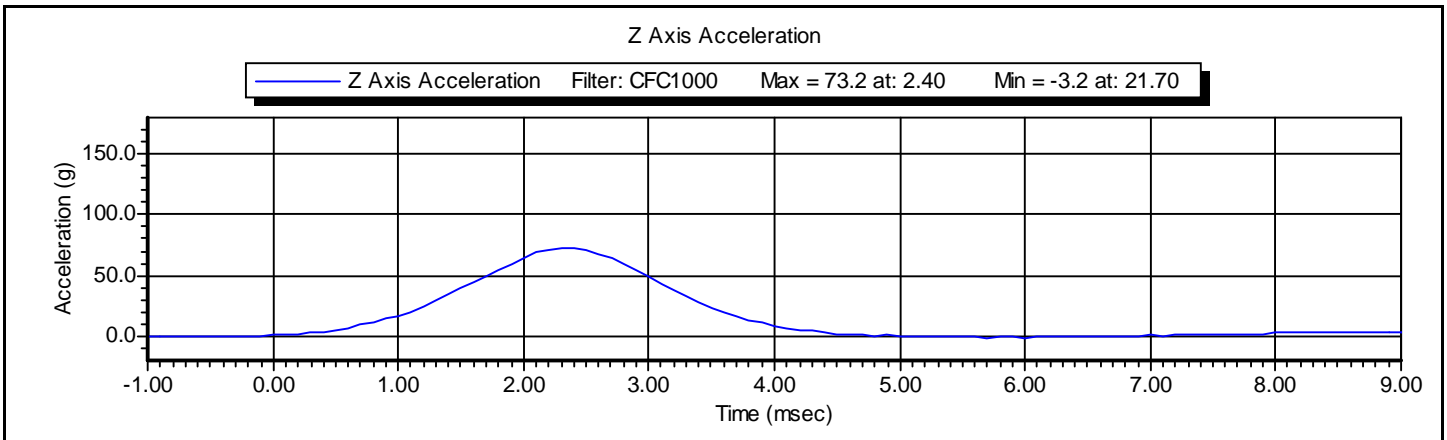
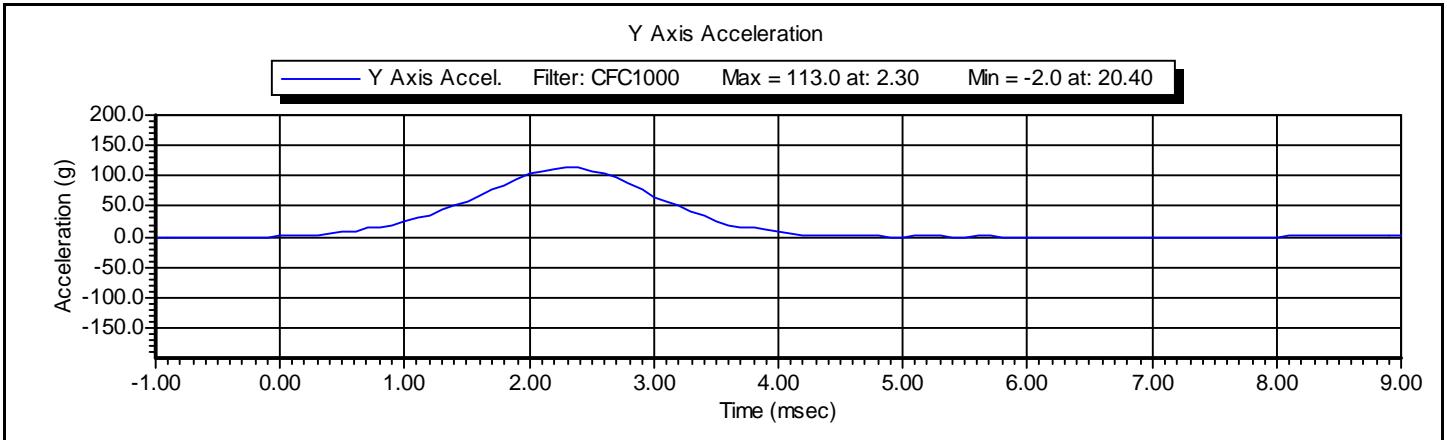
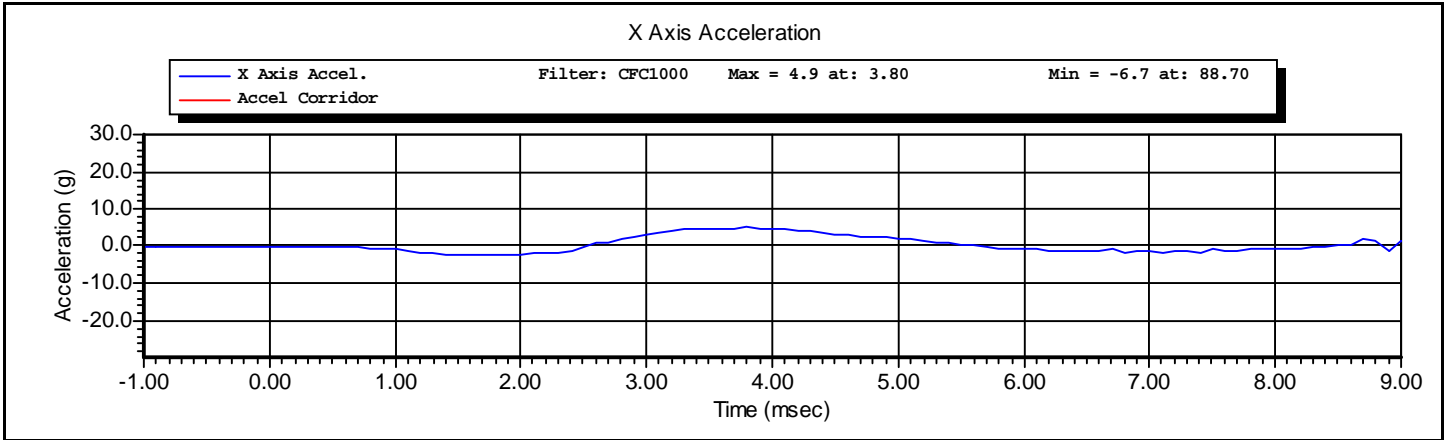


Test Name:	<b>Head Drop</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Head Drop Test</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>11:35:05 AM</b>

Component Part Number	Component Serial Number
<b>455-1007</b>	









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## VERIFICATION REPORT

Test Name:	<b>Neck Flexion</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Neck Flexion</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>1:38:18 PM</b>

Component Part Number	Component Serial Number
<b>455-2002</b>	<b>19-020118A</b>

Comments:  
4x7 PC, 47 degrees.

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.7</b> deg C P
Humidity	10 -- 70	<b>37</b> %RH P
Velocity	3.30 -- 3.50	<b>3.38</b> m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	<b>53.3</b> degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	<b>60.3</b> ms P
Decay to Zero Degrees	53.0 -- 88.0	<b>60.2</b> 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: **1:38:18 PM**

Test Date: **4/22/2010**



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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	10/23/2009
DentonATD	7000428	095	10/23/2009
DentonATD	7000428	093	10/23/2009

Test ID: **Neck Flexion**

Test Time: **1:38:18 PM**

Test Date: **4/22/2010**



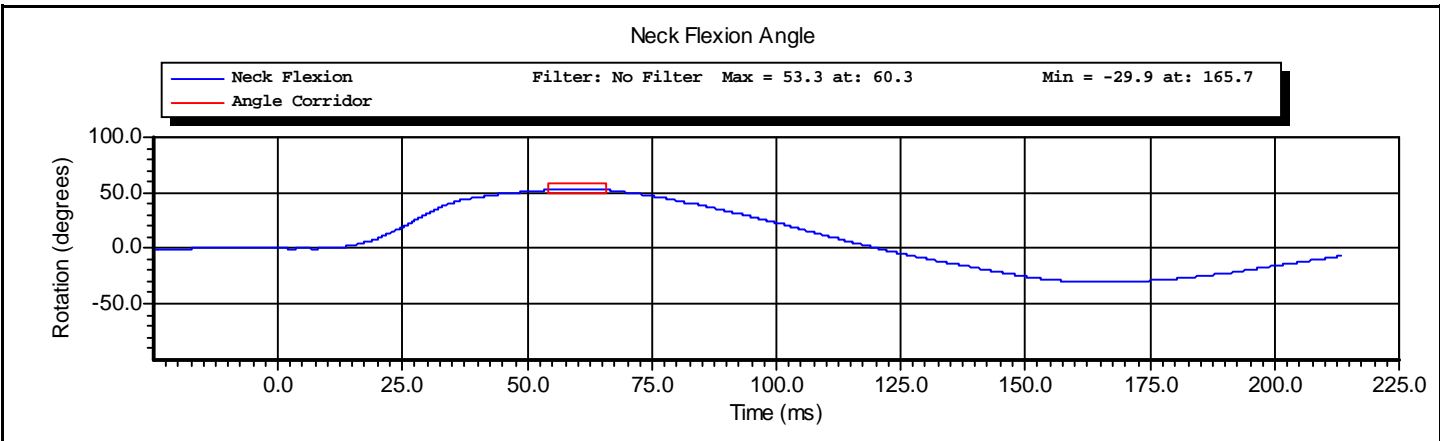
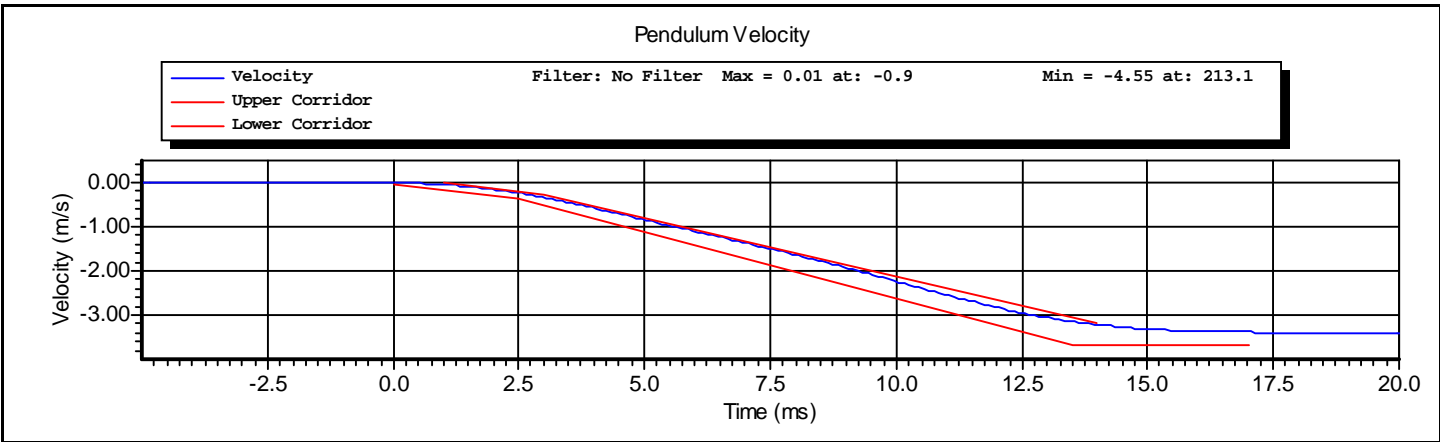
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Test Name:	<b>Neck Flexion</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Neck Flexion</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>1:38:18 PM</b>

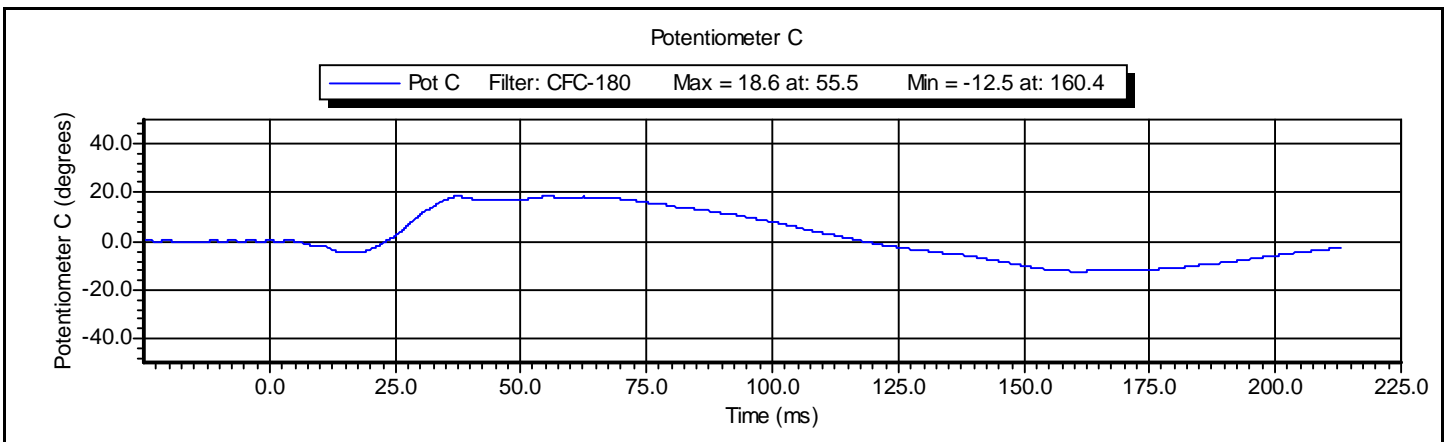
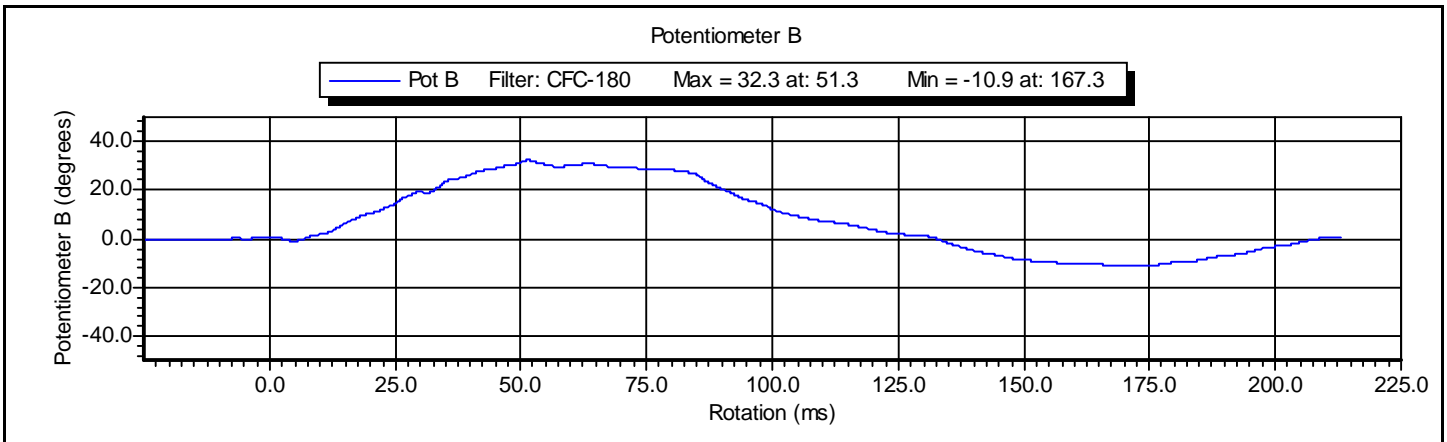
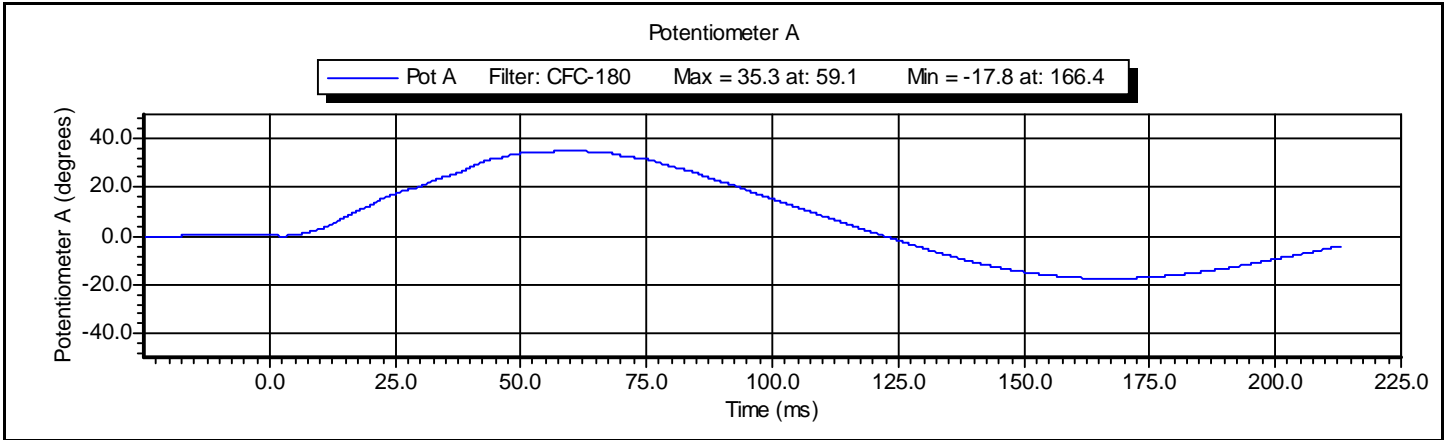
Component Part Number	Component Serial Number
<b>455-2002</b>	<b>19-020118A</b>



Test ID: **Neck Flexion**

Test Time: **1:38:18 PM**

Test Date: **4/22/2010**





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## VERIFICATION REPORT

Test Name:	<b>Shoulder Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Shoulder Impact</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:15:52 AM</b>

Component Part Number	Component Serial Number
<b>960715-313</b>	

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>34.0</b> %RH P
Velocity	4.20 -- 4.40	<b>4.28</b> m/s P
Pendulum Acceleration	-10.50 -- -7.50	<b>-7.90</b> g P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_  
Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Shoulder Impact**      Test Time: **9:15:52 AM**      Test Date: **4/22/2010**



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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 Impact**

Test Time: **9:15:52 AM**

Test Date: **4/22/2010**



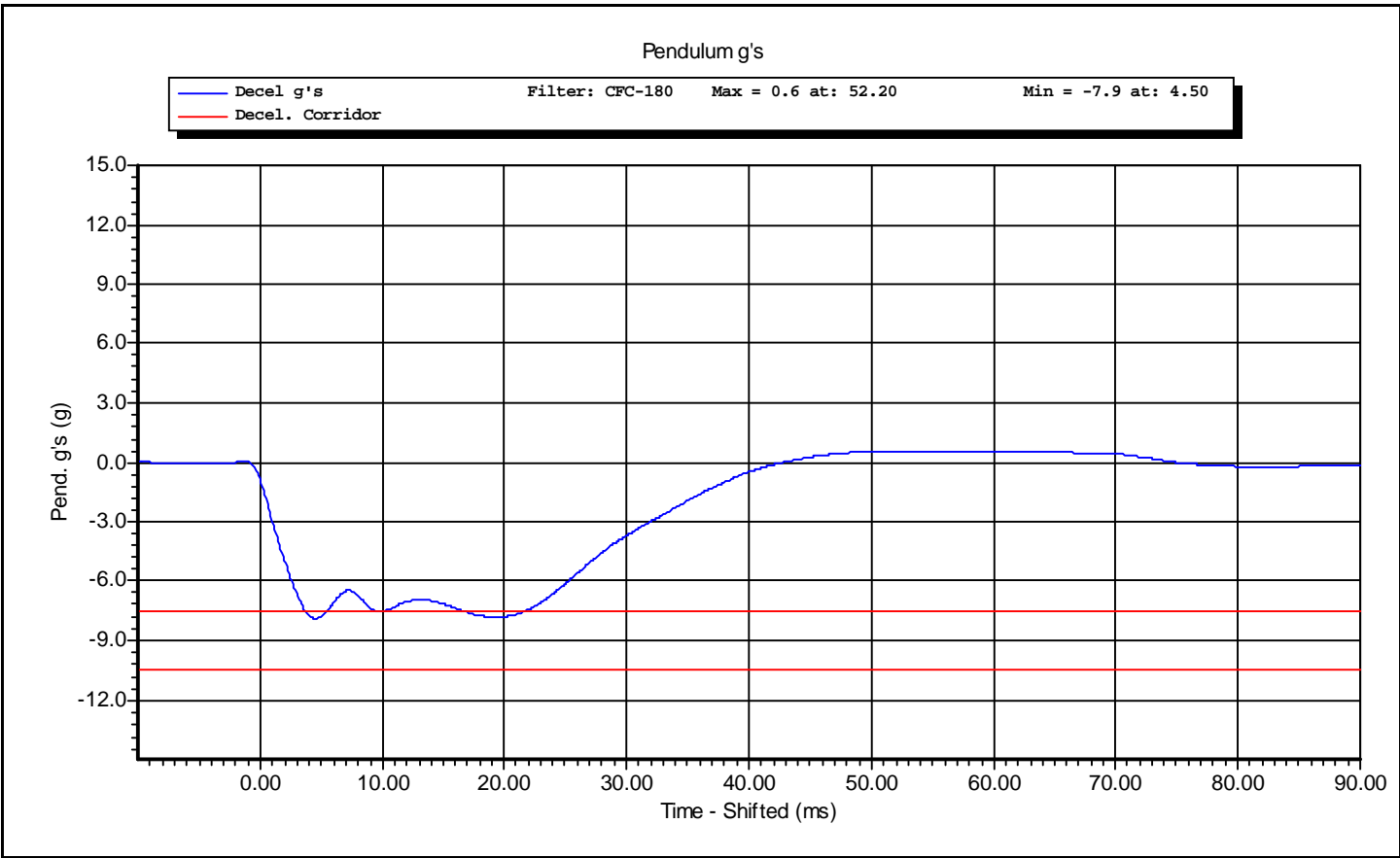
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Test Name:	<b>Shoulder Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Shoulder Impact</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:15:52 AM</b>

Component Part Number	Component Serial Number
<b>960715-313</b>	



Test ID: **Shoulder Impact**

Test Time: **9:15:52 AM**

Test Date: **4/22/2010**





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## VERIFICATION REPORT

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Upper Rib 4 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:35:50 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>34.0</b> %RH P
Velocity	3.90 -- 4.10	<b>3.99</b> m/s P
Rib Displacement	-51.00 -- -46.00	<b>-49.41</b> mm P
Drop Height	807.0 -- 823.0	<b>815.0</b> 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: **9:35:50 AM**

Test Date: **4/22/2010**



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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: **9:35:50 AM**

Test Date: **4/22/2010**



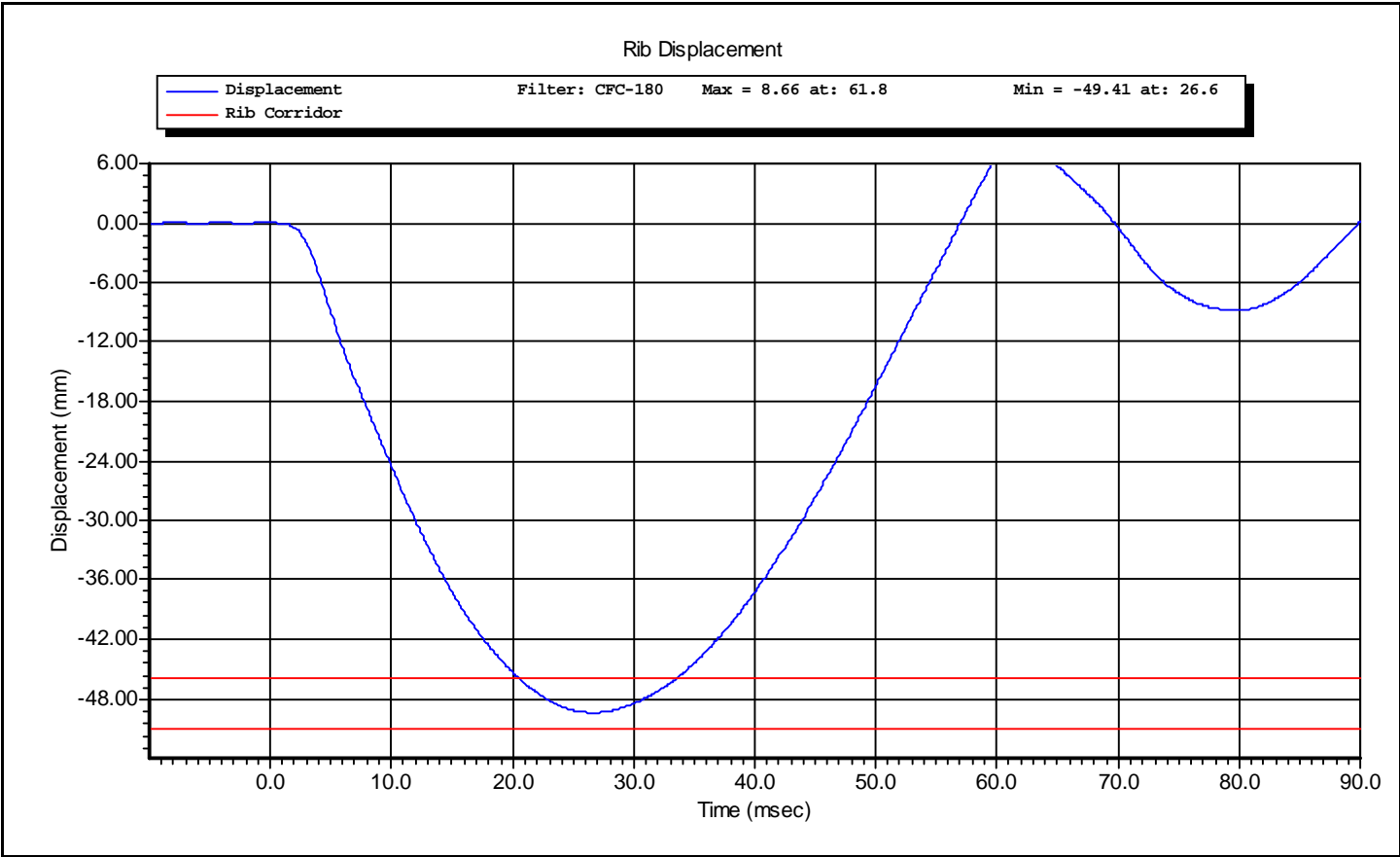
www.calspan.com

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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Upper Rib 4 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:35:50 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>



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

Test Time: **9:35:50 AM**

Test Date: **4/22/2010**



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## VERIFICATION REPORT

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Upper Rib 3 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:42:14 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>35.0</b> %RH P
Velocity	2.90 -- 3.10	<b>2.97</b> m/s P
Rib Displacement	-40.00 -- -36.00	<b>-37.99</b> mm P
Drop Height	454 -- 464	<b>459</b> 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: **9:42:14 AM**

Test Date: **4/22/2010**



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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: **9:42:14 AM**

Test Date: **4/22/2010**



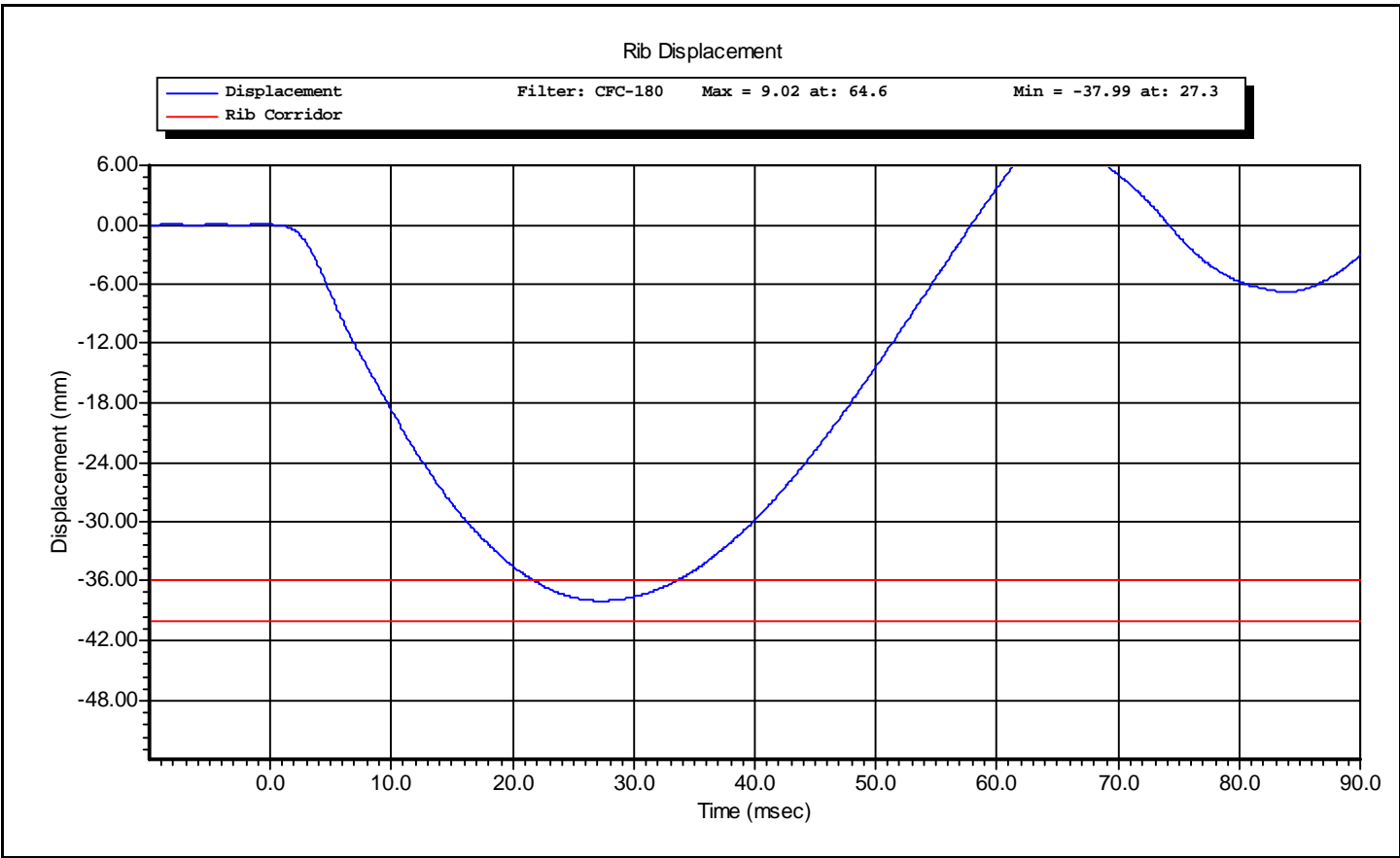
www.calspan.com

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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Upper Rib 3 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:42:14 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>



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

Test Time: **9:42:14 AM**

Test Date: **4/22/2010**



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## VERIFICATION REPORT

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Middle Rib 4 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:52:04 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>35.0</b> %RH P
Velocity	3.90 -- 4.10	<b>3.99</b> m/s P
Rib Displacement	-51.00 -- -46.00	<b>-47.96</b> mm P
Drop Height	807.0 -- 823.0	<b>815.0</b> 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: **9:52:04 AM**

Test Date: **4/22/2010**



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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: **9:52:04 AM**

Test Date: **4/22/2010**





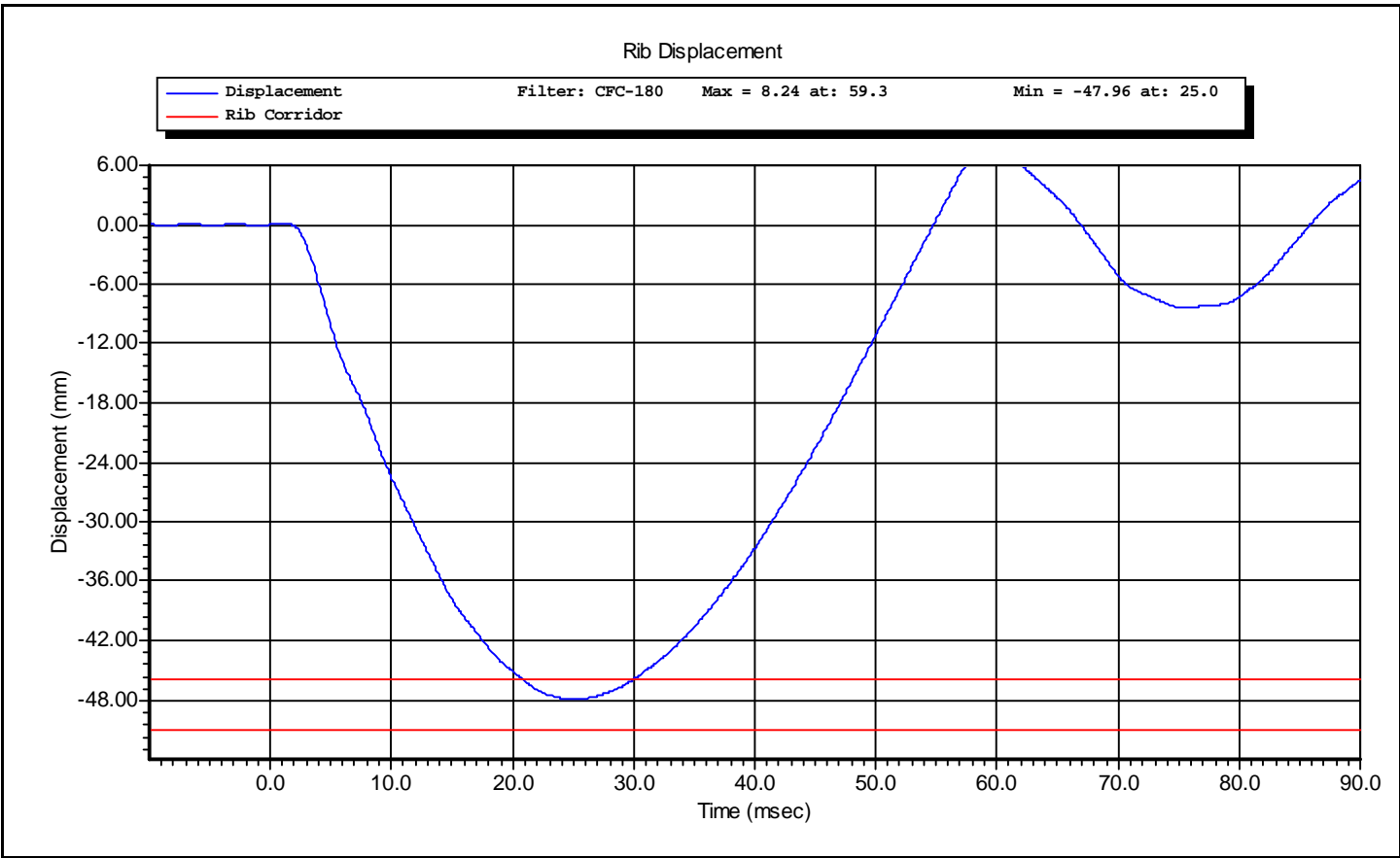
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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Middle Rib 4 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>9:52:04 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>



Test ID: **Middle Rib 4 m/s**    Test Time: **9:52:04 AM**

Test Date: **4/22/2010**



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## VERIFICATION REPORT

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Middle Rib 3 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:00:09 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>35.0</b> %RH P
Velocity	2.90 -- 3.10	<b>3.00</b> m/s P
Rib Displacement	-40.00 -- -36.00	<b>-37.49</b> mm P
Drop Height	454 -- 464	<b>459</b> 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: **10:00:09 AM**

Test Date: **4/22/2010**



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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: **10:00:09 AM**

Test Date: **4/22/2010**



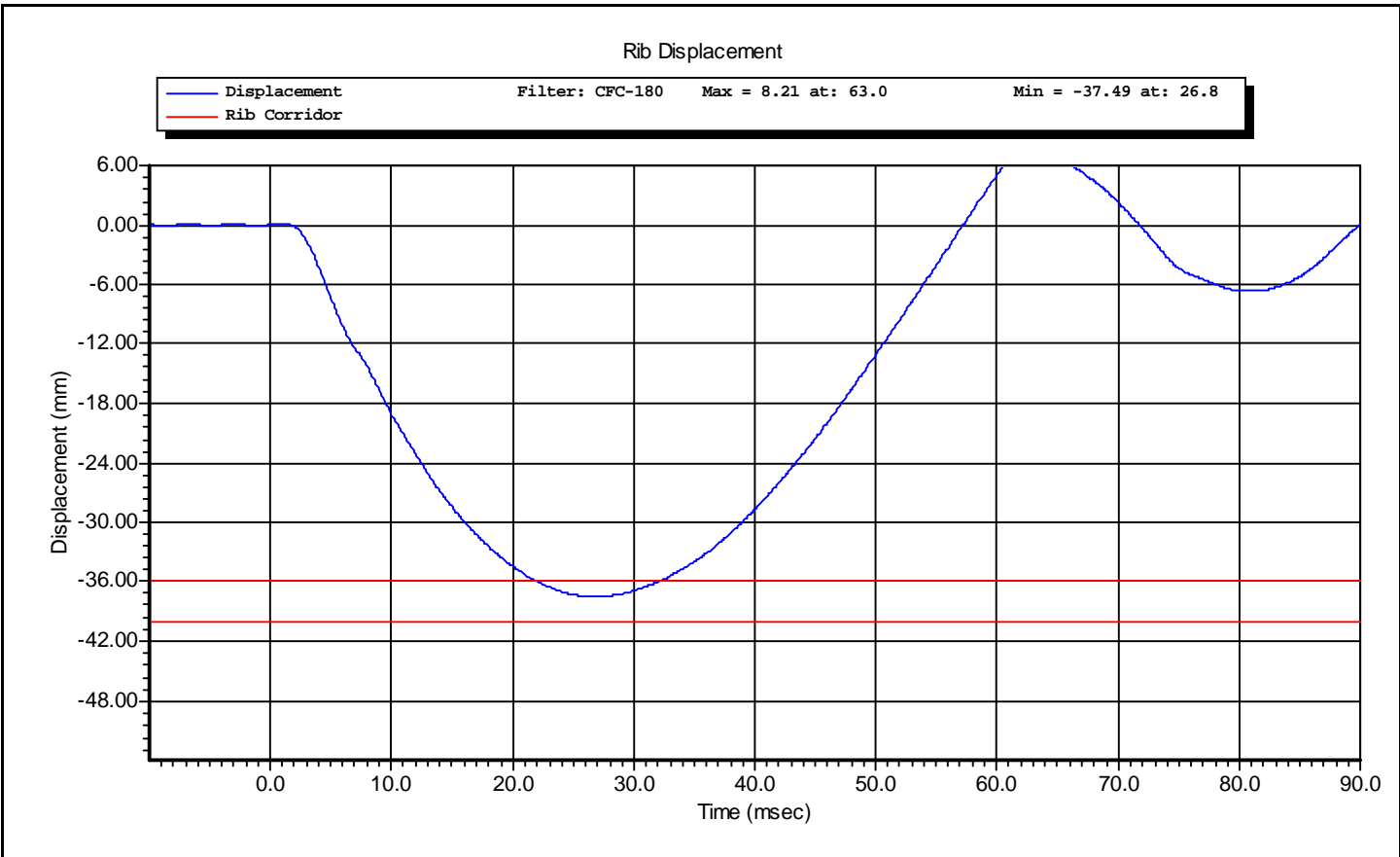
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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Middle Rib 3 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:00:09 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>



Test ID: **Middle Rib 3 m/s**    Test Time: **10:00:09 AM**

Test Date: **4/22/2010**



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

## VERIFICATION REPORT

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lower Rib 4 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:06:02 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>35.0</b> %RH P
Velocity	3.90 -- 4.10	<b>3.98</b> m/s P
Rib Displacement	-51.00 -- -46.00	<b>-46.74</b> mm P
Drop Height	807.0 -- 823.0	<b>815.0</b> mm P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

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

Test Time: **10:06:02 AM**

Test Date: **4/22/2010**



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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: **Lower Rib 4 m/s**

Test Time: **10:06:02 AM**

Test Date: **4/22/2010**



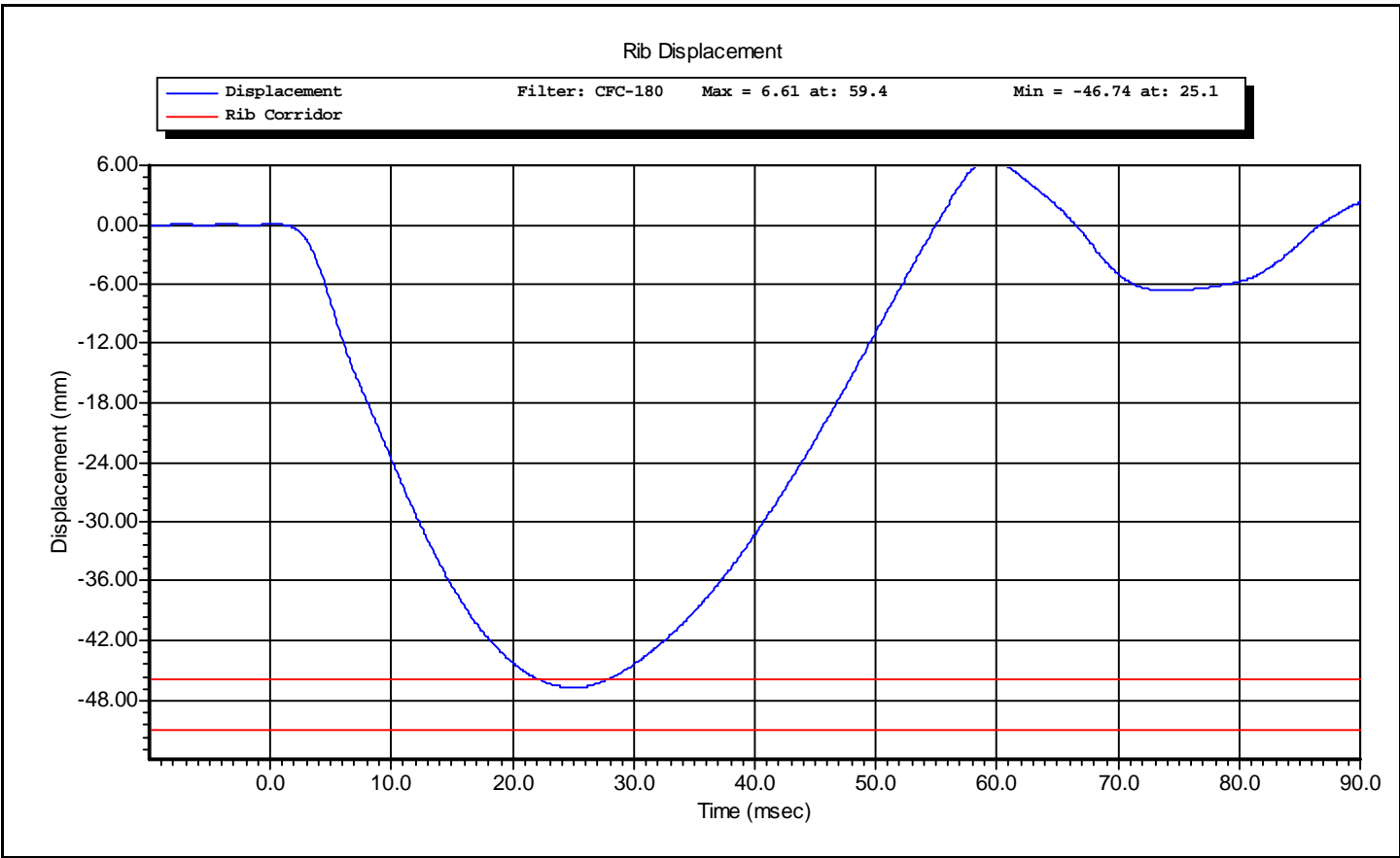
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lower Rib 4 m/s</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:06:02 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>



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

Test Time: **10:06:02 AM**

Test Date: **4/22/2010**



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## VERIFICATION REPORT

Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lower Rib</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:21:15 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>35.0</b> %RH P
Velocity	2.90 -- 3.10	<b>2.97</b> m/s P
Rib Displacement	-40.00 -- -36.00	<b>-37.88</b> mm P
Drop Height	454 -- 464	<b>459</b> mm P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Lower Rib**

Test Time: **10:21:15 AM**

Test Date: **4/22/2010**





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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: **Lower Rib**

Test Time: **10:21:15 AM**

Test Date: **4/22/2010**



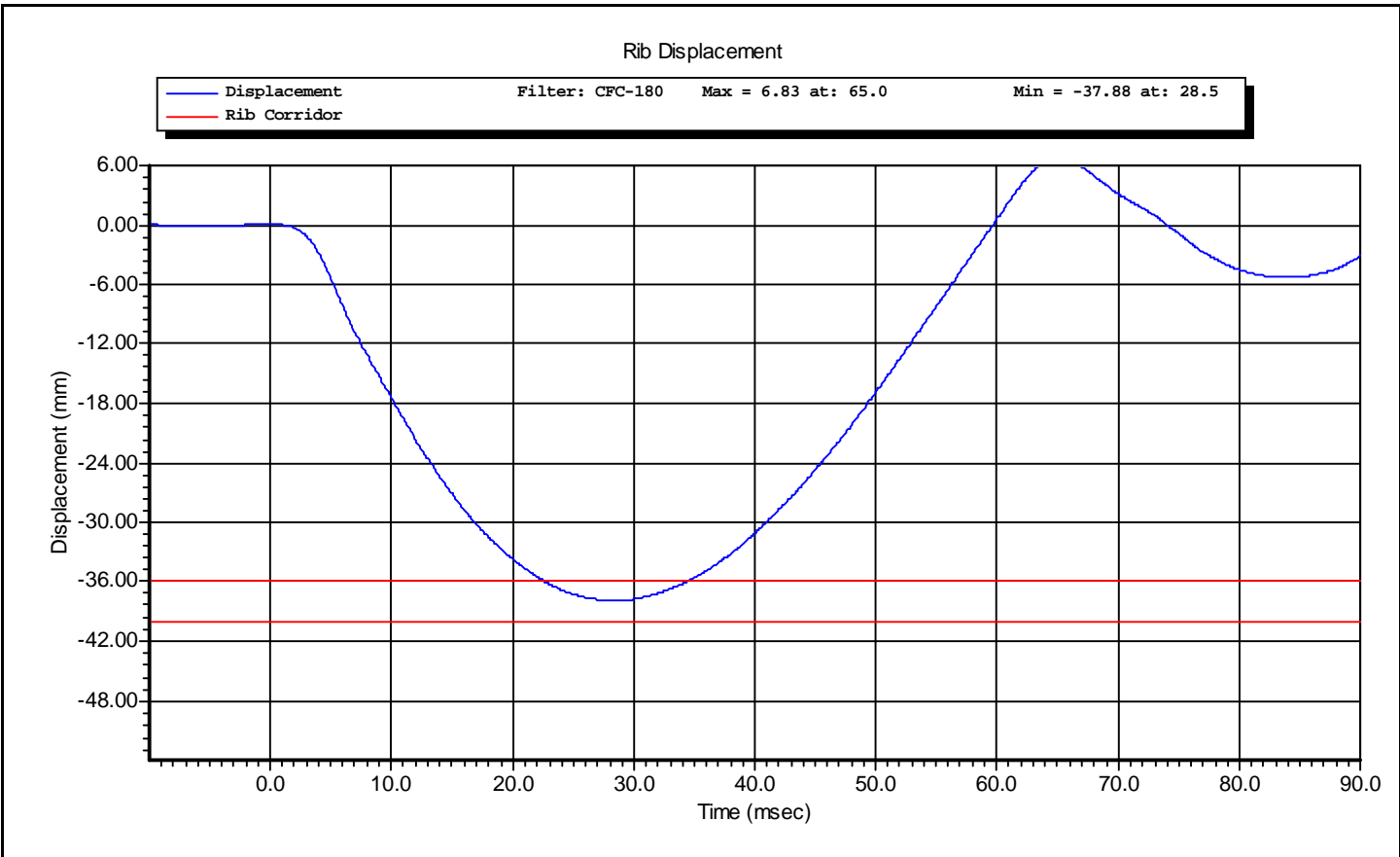
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lower Rib</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:21:15 AM</b>

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>



Test ID: **Lower Rib**

Test Time: **10:21:15 AM**

Test Date: **4/22/2010**



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## VERIFICATION REPORT

Test Name:	<b>Thorax Impact</b>	Revision:	<b>8/15/2008</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Thorax Impact</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>11:00:41 AM</b>

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

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10.0 -- 70.0	<b>35.0</b> %RH P
Velocity	5.40 -- 5.60	<b>5.49</b> m/s P
Upper Rib Displacement	34.0 -- 41.0	<b>37.9</b> mm P
Middle Rib Displacement	37.0 -- 45.0	<b>40.8</b> mm P
Lower Rib Displacement	37.0 -- 44.0	<b>41.9</b> mm P
Impactor Force	5100 -- 6200	<b>5544</b> N P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Thorax Impact**

Test Time: **11:00:41 AM**

Test Date: **4/22/2010**



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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: **11:00:41 AM**

Test Date: **4/22/2010**



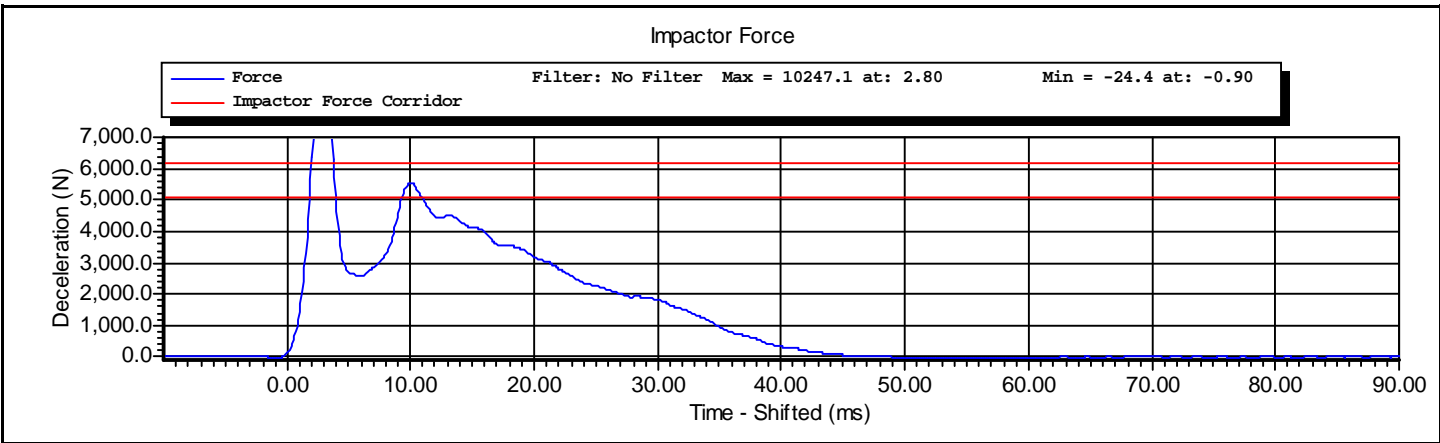
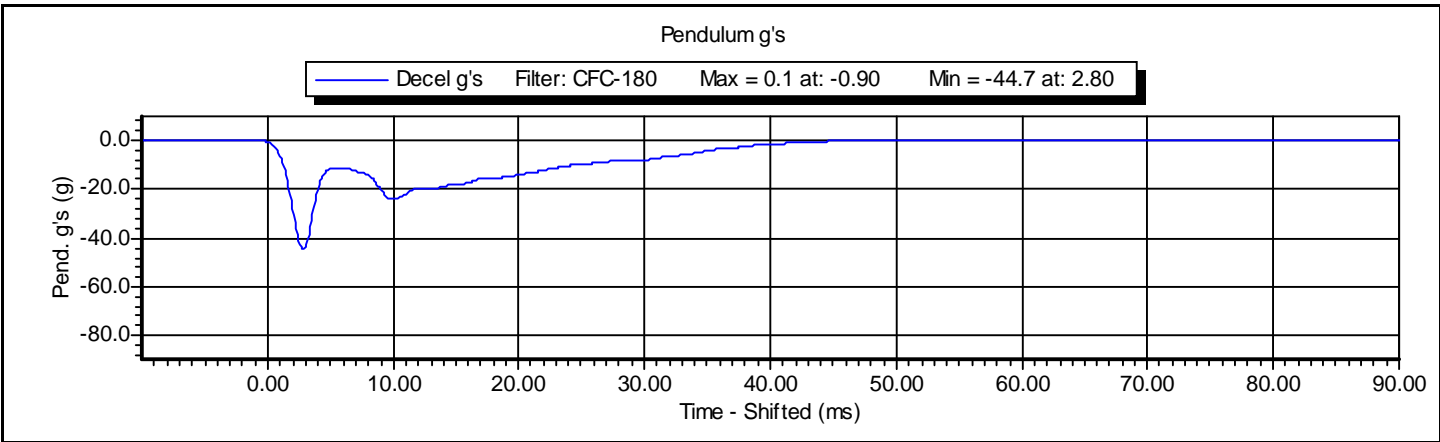
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Test Name:	<b>Thorax Impact</b>	Revision:	<b>8/15/2008</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Thorax Impact</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>11:00:41 AM</b>

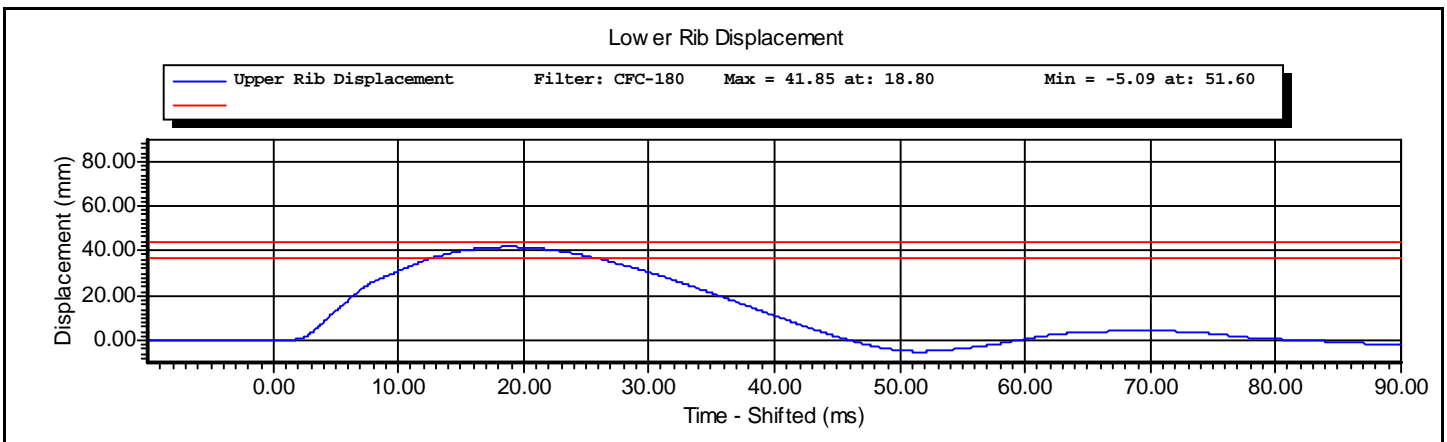
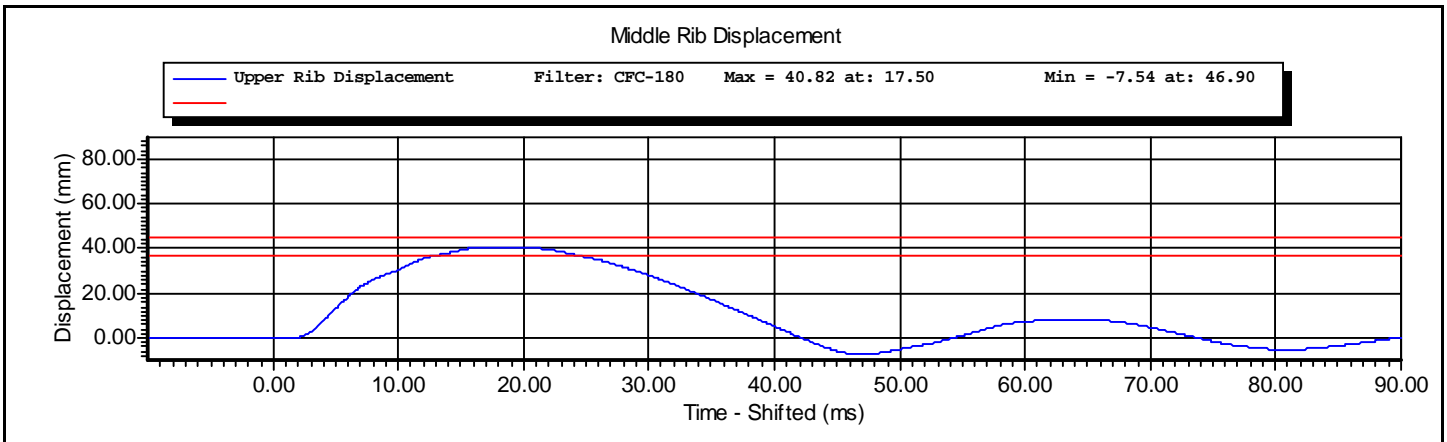
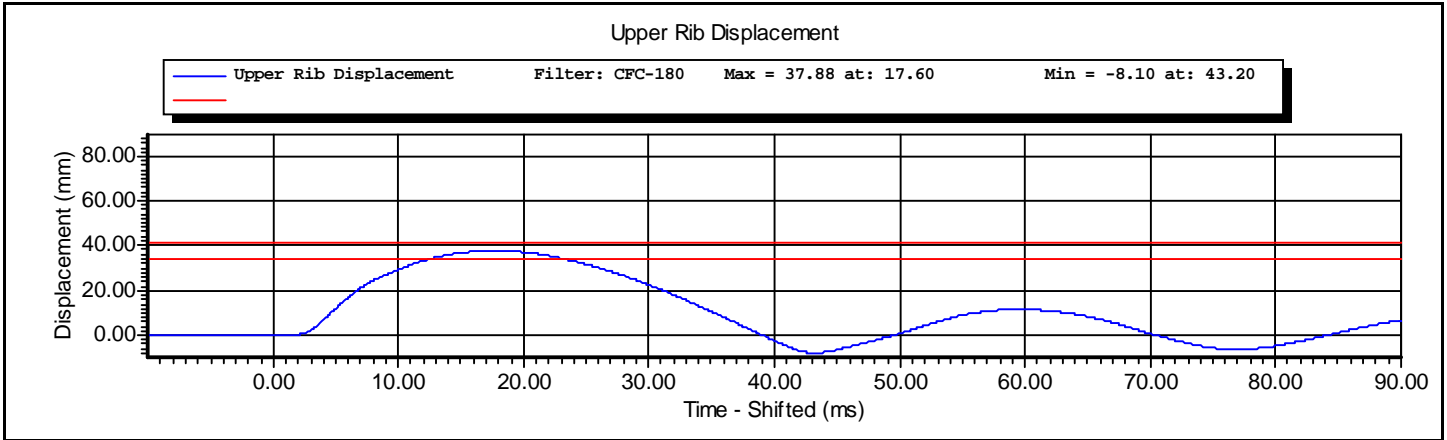
Component Part Number	Component Serial Number
<b>Upper Rib - 175-4002</b>	<b>1954-0124A</b>



Test ID: **Thorax Impact**

Test Time: **11:00:41 AM**

Test Date: **4/22/2010**





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## VERIFICATION REPORT

Test Name:	<b>Abdominal Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Abdominal Impact</b>	Test Date:	<b>4/23/2010</b>
Test Number:	<b>2</b>	Test Time:	<b>8:30:31 AM</b>

Component Part Number	Component Serial Number
<b>FTSS-0004</b>	<b>07/118</b>

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>36</b> %RH P
Velocity	3.90 -- 4.10	<b>3.95</b> m/s P
Peak Abdominal Force	-2.70 -- -2.20	<b>-2.48</b> kN P
Time At Peak Abdominal Force	10.0 -- 12.3	<b>10.6</b> ms P
Maximum Pendulum Force	-4.80 -- -4.00	<b>-4.28</b> kN P
Time at Peak Pendulum Force	10.6 -- 13.0	<b>10.8</b> ms P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Abdominal Impact** Test Time: **8:30:31 AM**

Test Date: **4/23/2010**



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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: **8:30:31 AM**

Test Date: **4/23/2010**





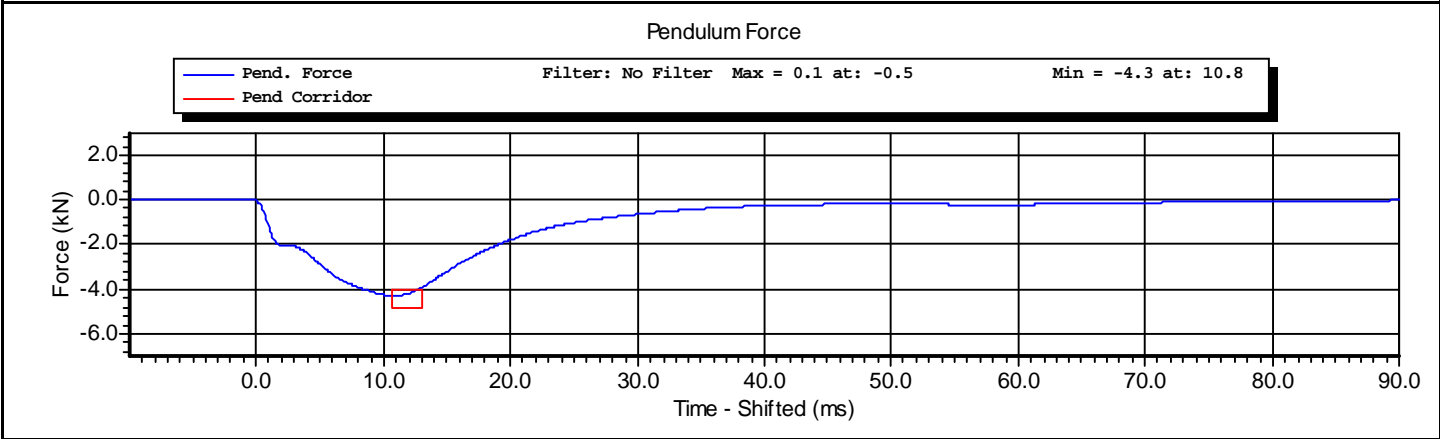
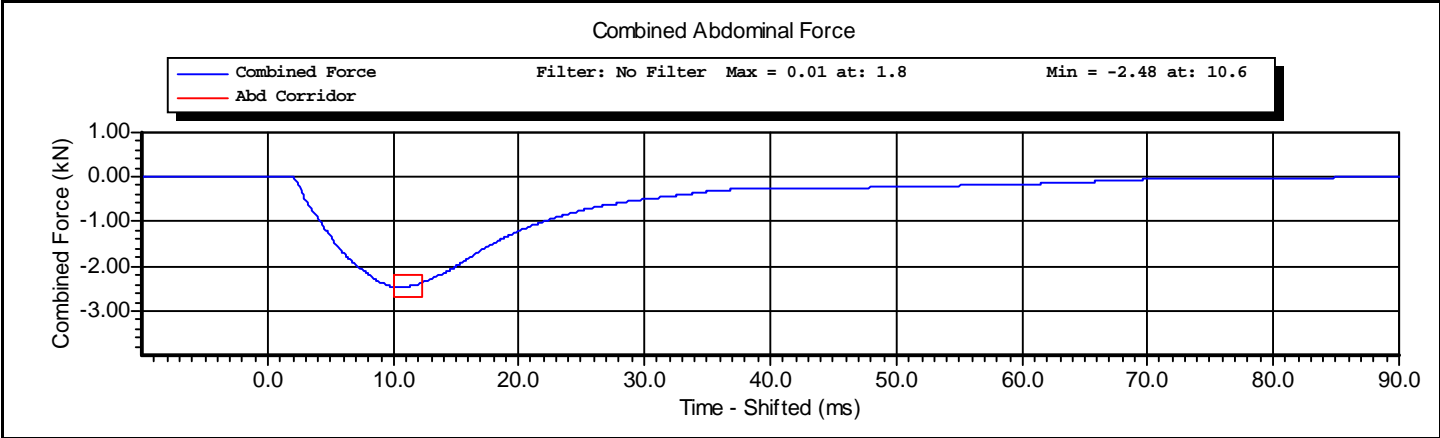
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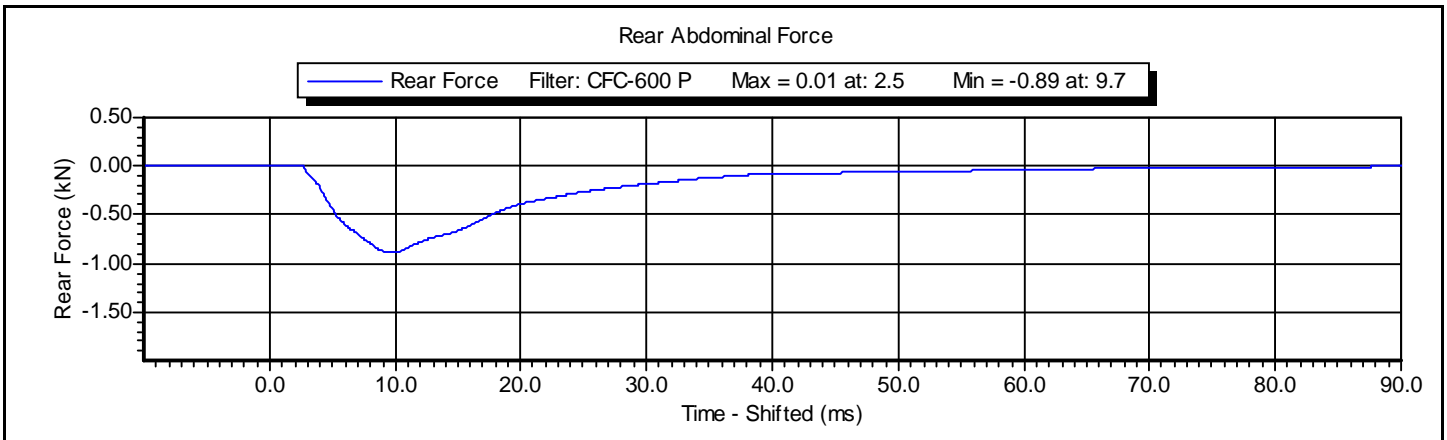
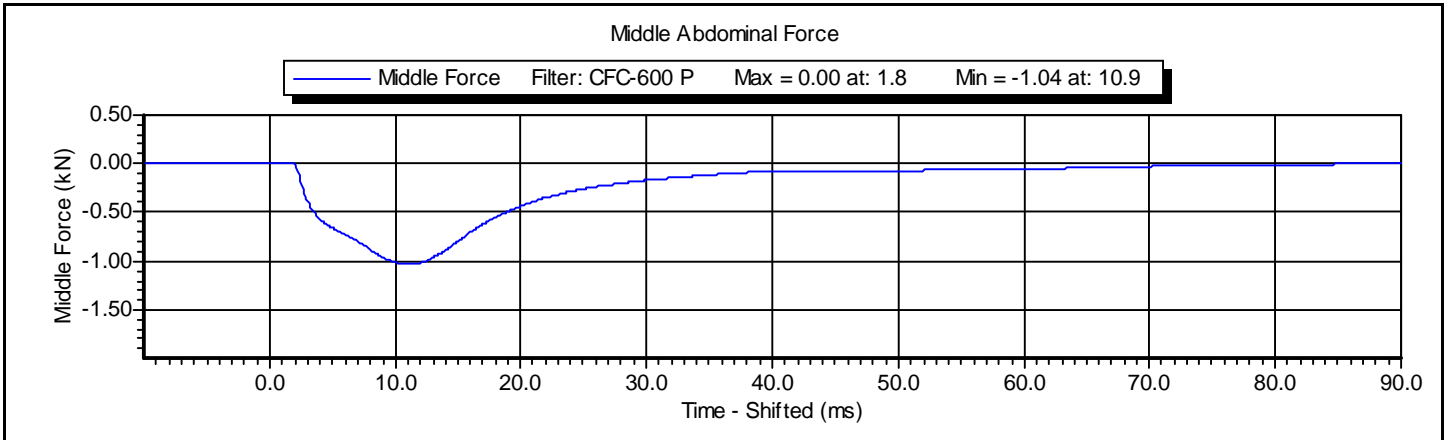
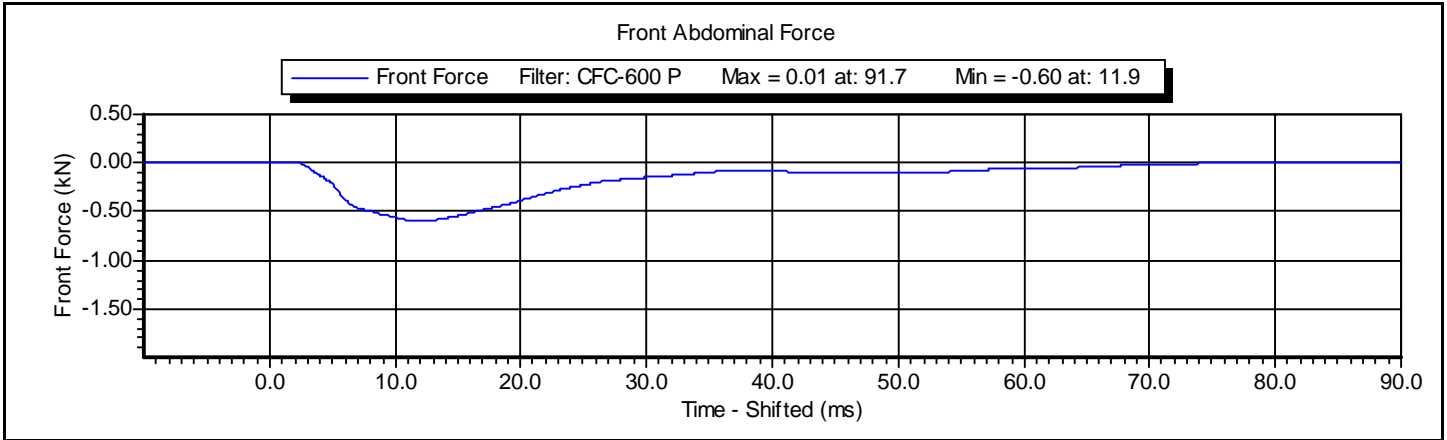
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Test Name:	<b>Abdominal Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Abdominal Impact</b>	Test Date:	<b>4/23/2010</b>
Test Number:	<b>2</b>	Test Time:	<b>8:30:31 AM</b>

Component Part Number	Component Serial Number
<b>FTSS-0004</b>	<b>07/118</b>







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## VERIFICATION REPORT

Test Name:	<b>Lumbar Spine</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lumbar Spine</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>2:26:35 PM</b>

Component Part Number	Component Serial Number
<b>175-5501</b>	<b>15-0376</b>

Comments:  
7x9 PC, 92.6 deg.

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.7</b> deg C P
Humidity	10 -- 70	<b>36</b> %RH P
Velocity	5.95 -- 6.15	<b>6.06</b> m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	<b>47.5</b> degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	<b>41.3</b> ms P
Decay to Zero Degrees	37.0 -- 57.0	<b>38.6</b> 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: **2:26:35 PM**

Test Date: **4/22/2010**



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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	10/23/2009
DentonATD	7000428	095	10/23/2009
DentonATD	7000428	093	10/23/2009

Test ID: **Lumbar Spine**

Test Time: **2:26:35 PM**

Test Date: **4/22/2010**



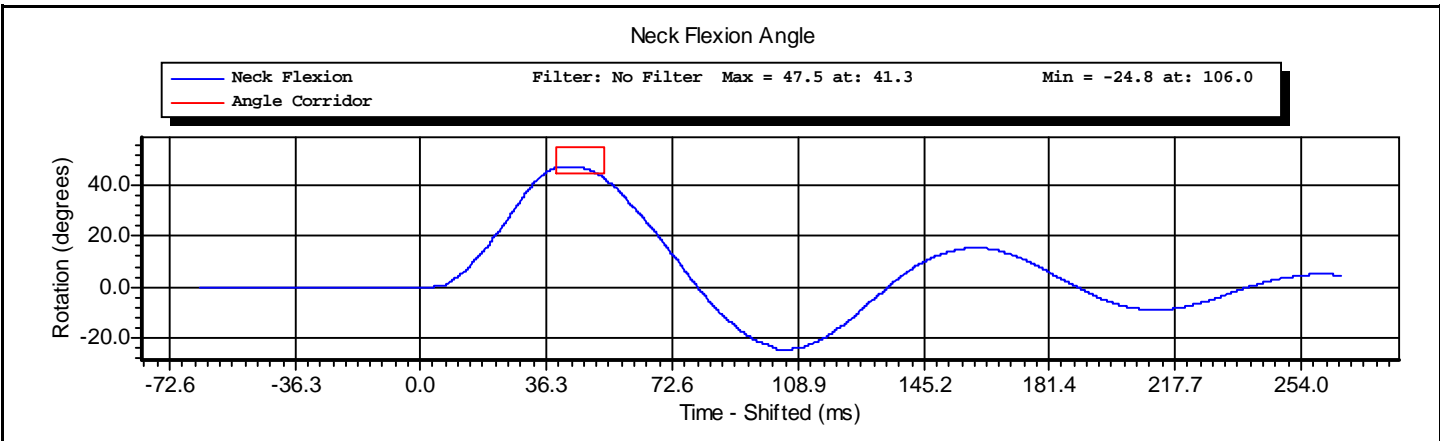
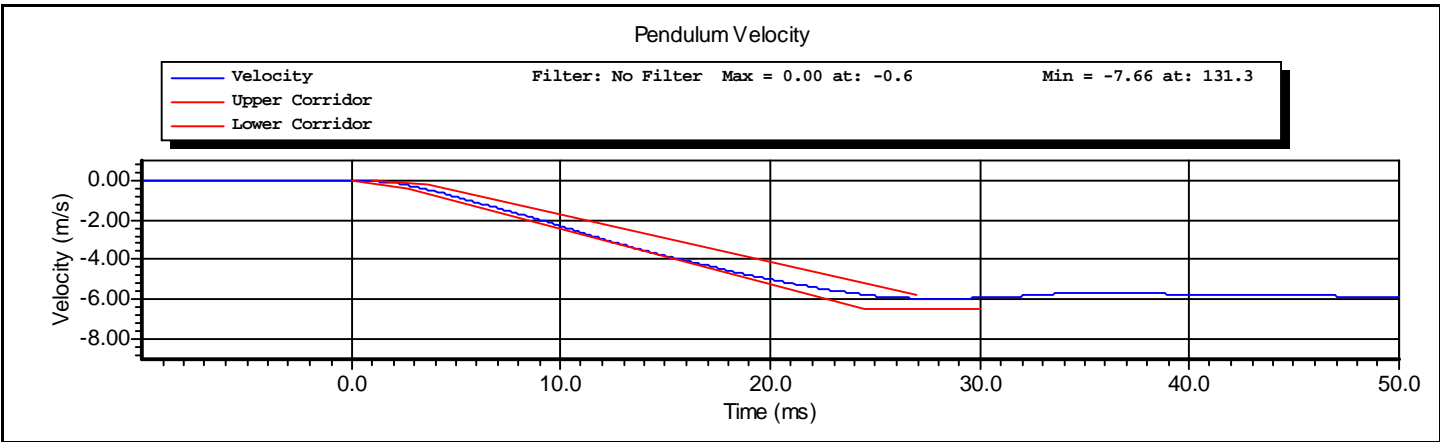
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Test Name:	<b>Lumbar Spine</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lumbar Spine</b>	Test Date:	<b>4/22/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>2:26:35 PM</b>

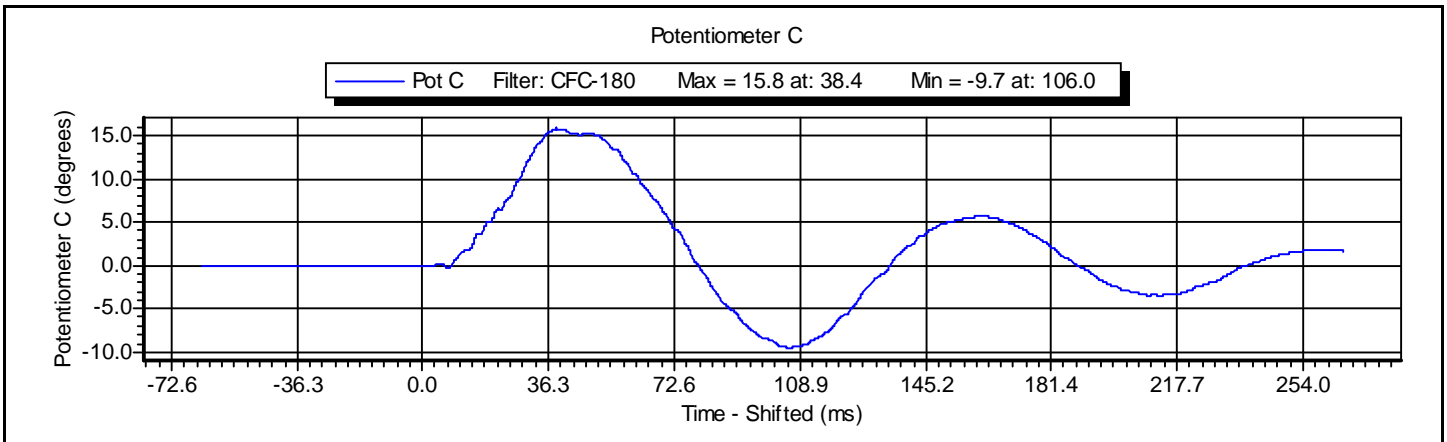
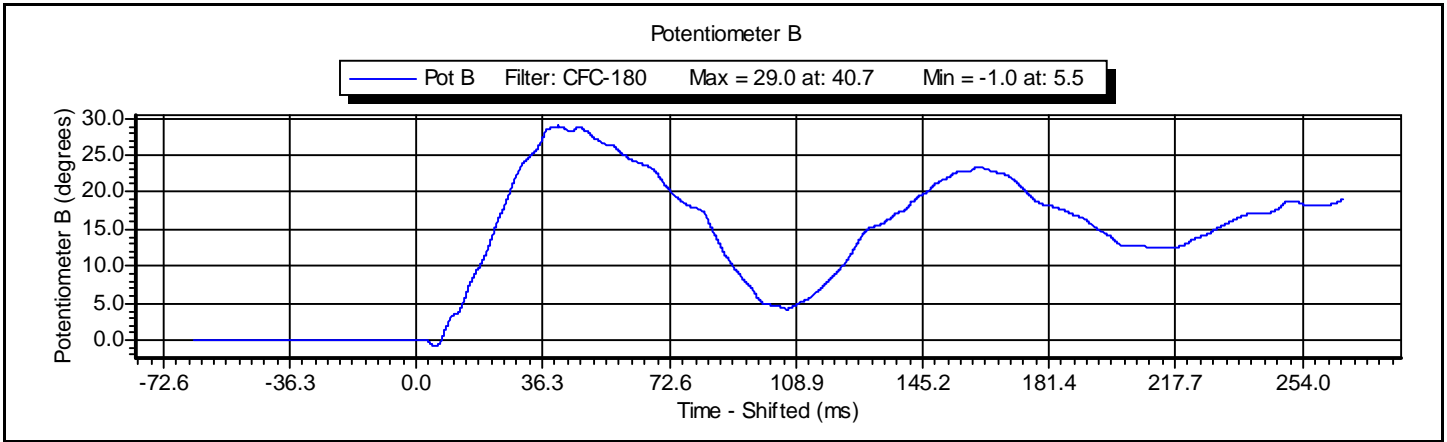
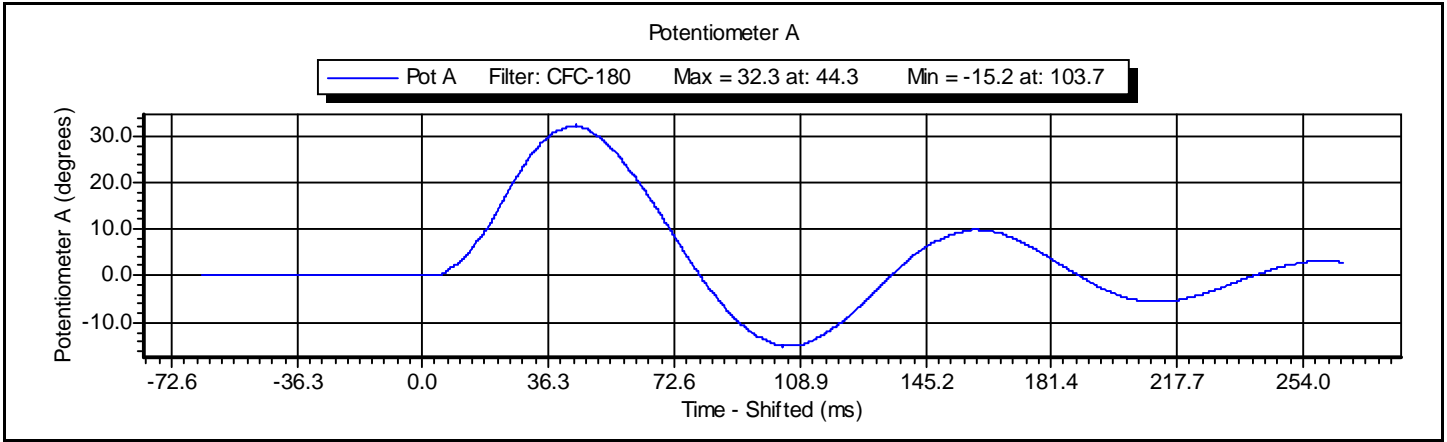
Component Part Number	Component Serial Number
<b>175-5501</b>	<b>15-0376</b>



Test ID: **Lumbar Spine**

Test Time: **2:26:35 PM**

Test Date: **4/22/2010**





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## VERIFICATION REPORT

Test Name:	<b>Pelvis Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Pelvis Impact</b>	Test Date:	<b>4/21/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>3:39:29 PM</b>

Component Part Number	Component Serial Number
<b>455-4003</b>	

Comments:  
10.0 N-m torque on bushings.

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>35</b> %RH P
Velocity	4.20 -- 4.40	<b>4.26</b> m/s P
Peak Pendulum Force	-5.40 -- -4.70	<b>-5.15</b> kN P
Time at Peak Pendulum Force	11.80 -- 16.10	<b>14.30</b> ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	<b>-1.49</b> kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	<b>14.90</b> ms P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_  
Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Pelvis Impact**

Test Time: **3:39:29 PM**

Test Date: **4/21/2010**



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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	7264-2000	P16576	4/6/2010
Denton	3096	LC-458Fy	1/7/2010

Test ID: **Pelvis Impact**

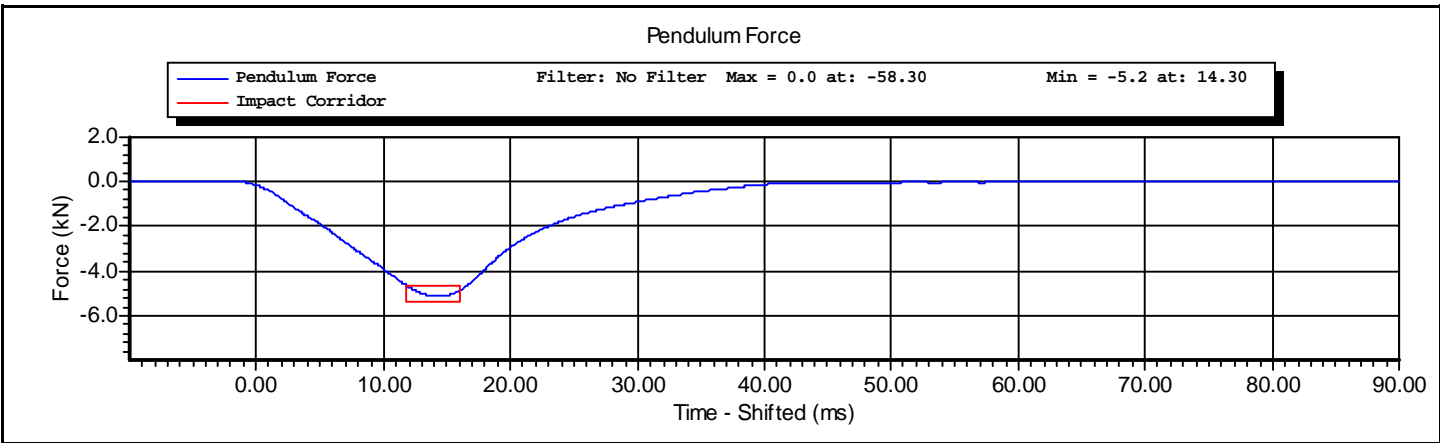
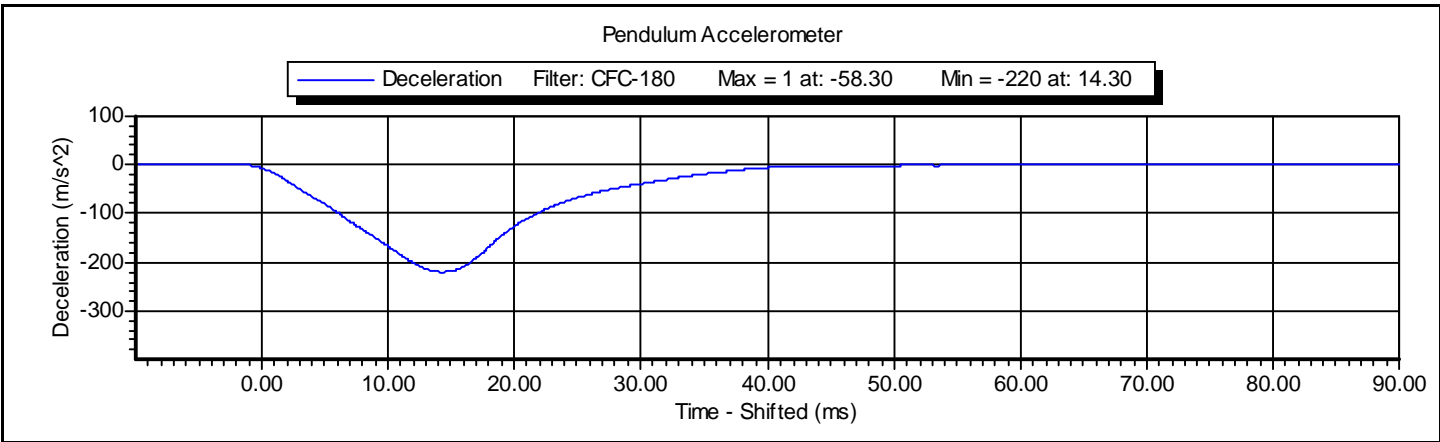
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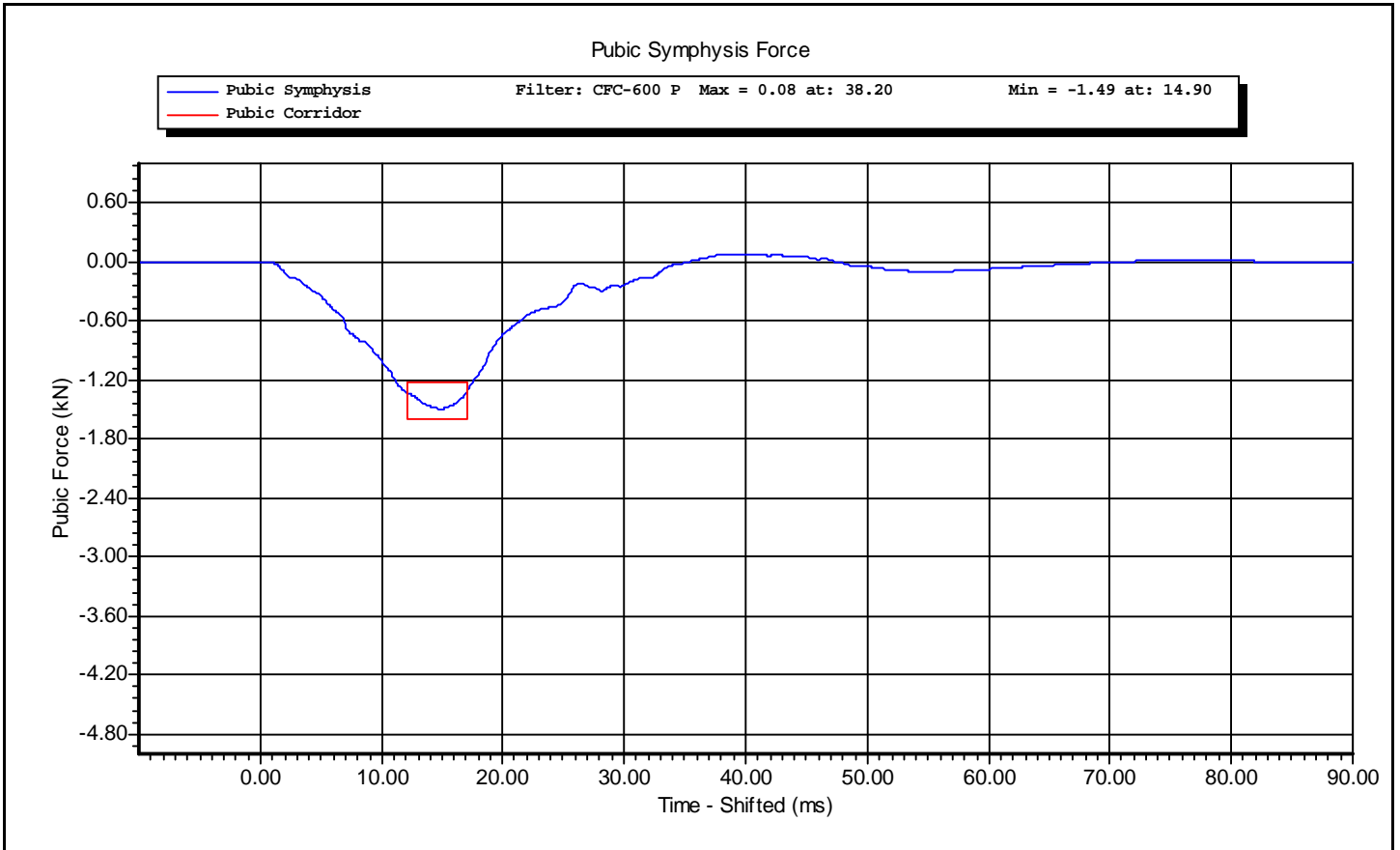
Test Date: **4/21/2010**



Test Name:	<b>Pelvis Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Pelvis Impact</b>	Test Date:	<b>4/21/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>3:39:29 PM</b>

Component Part Number	Component Serial Number
<b>455-4003</b>	





**CALIBRATION TEST RESULTS**

**POST-TEST**

**ES2-re NO.:** 037

**CONFIGURED FOR LEFT SIDE IMPACT**



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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>455-1007</b>	

Comments:

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

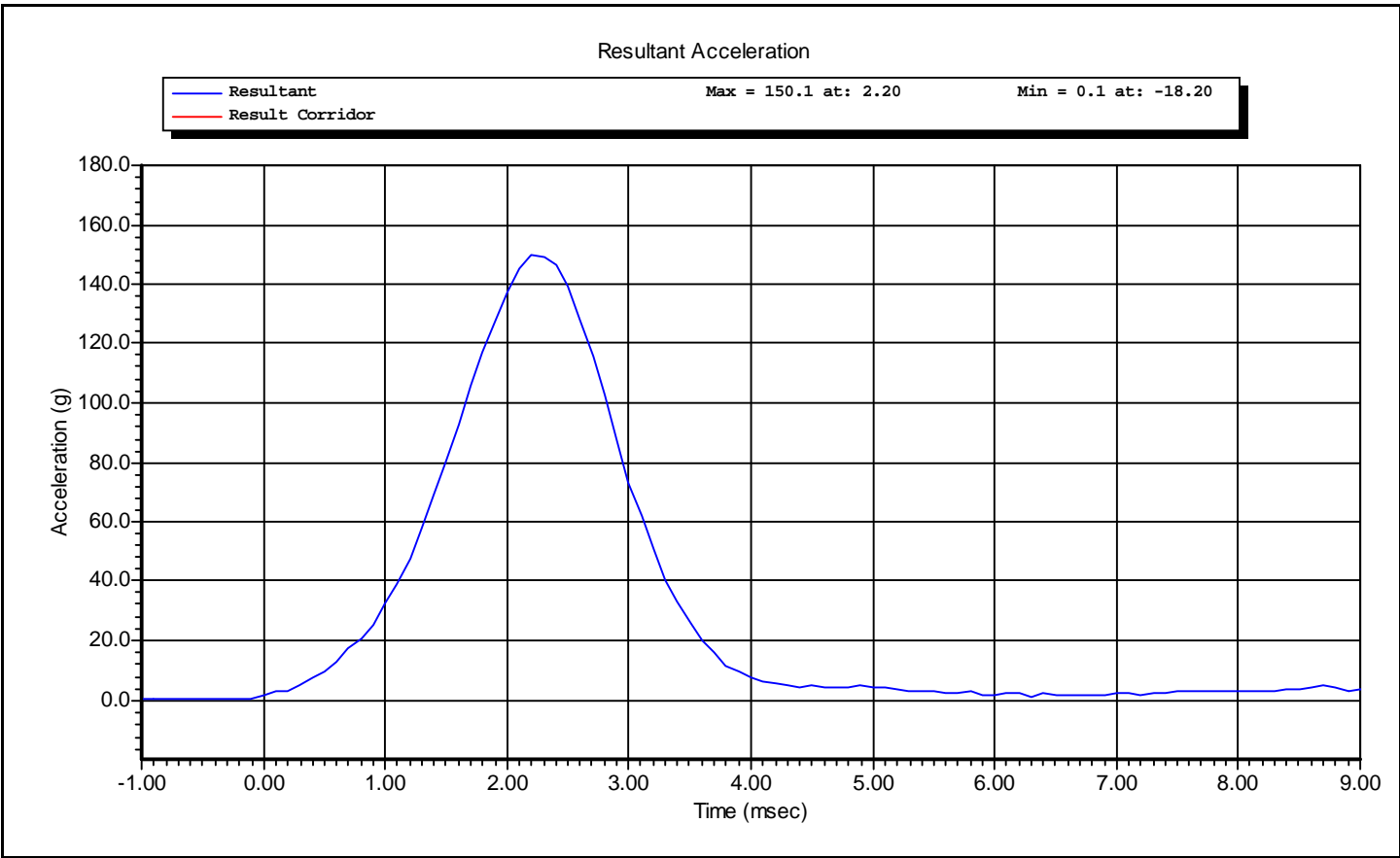
Test Time: **3:08:46 PM**

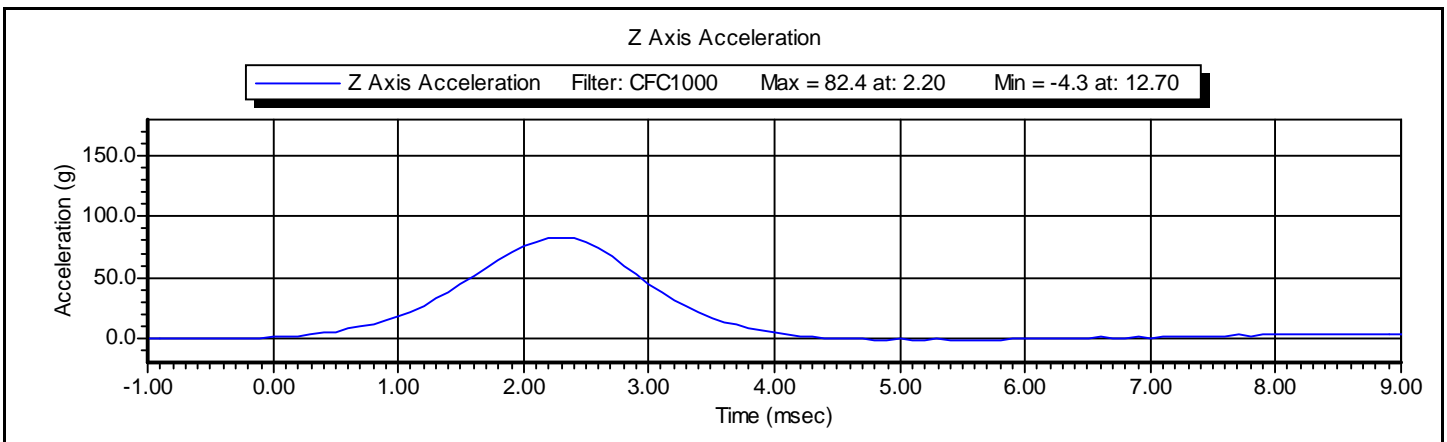
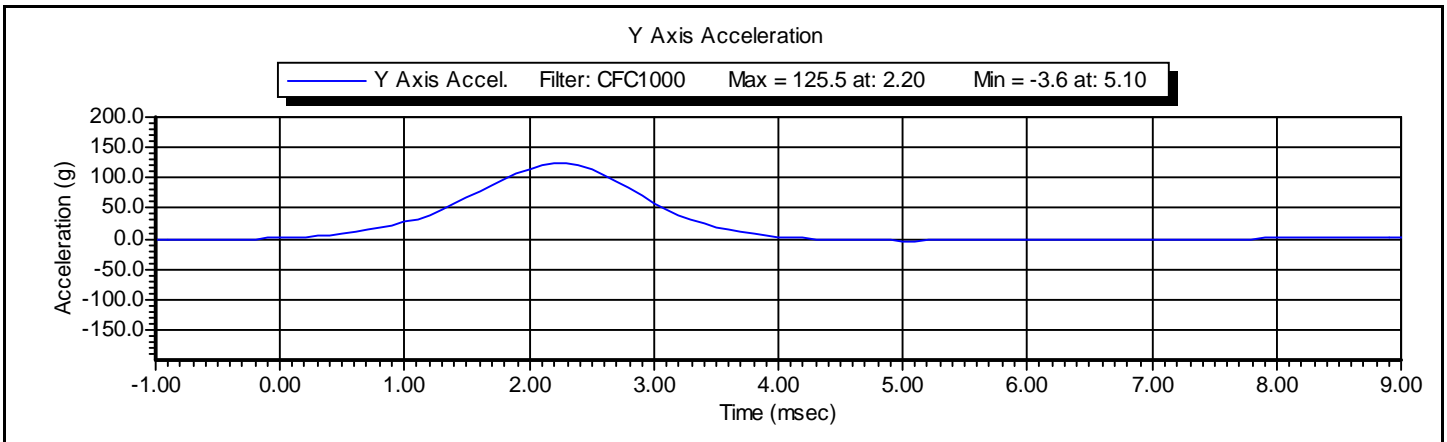
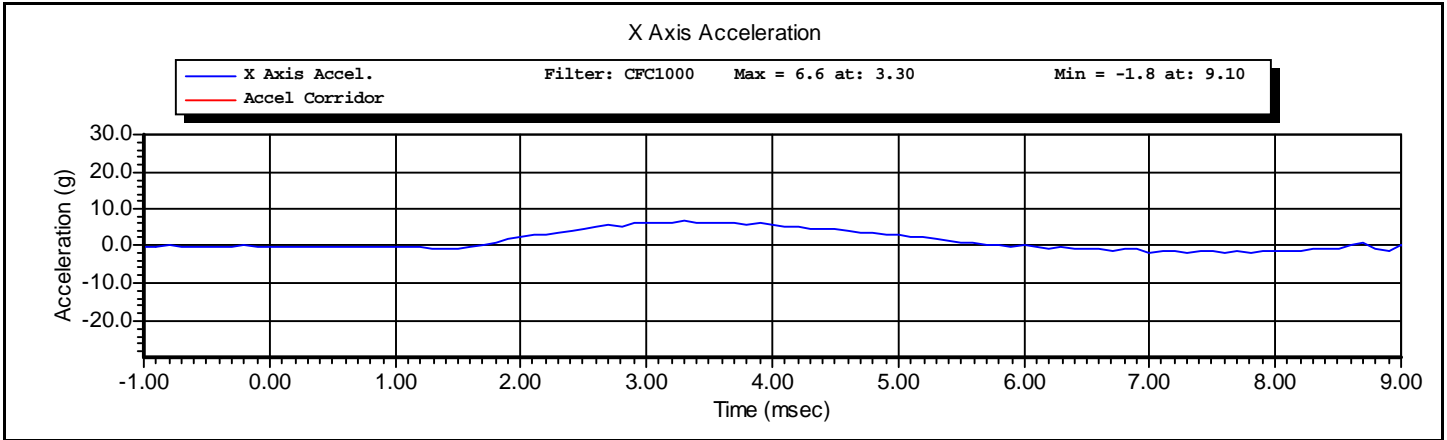
Test Date: **5/13/2010**



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

Component Part Number	Component Serial Number
<b>455-1007</b>	







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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>455-2002</b>	<b>19-020118A</b>

Comments:

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



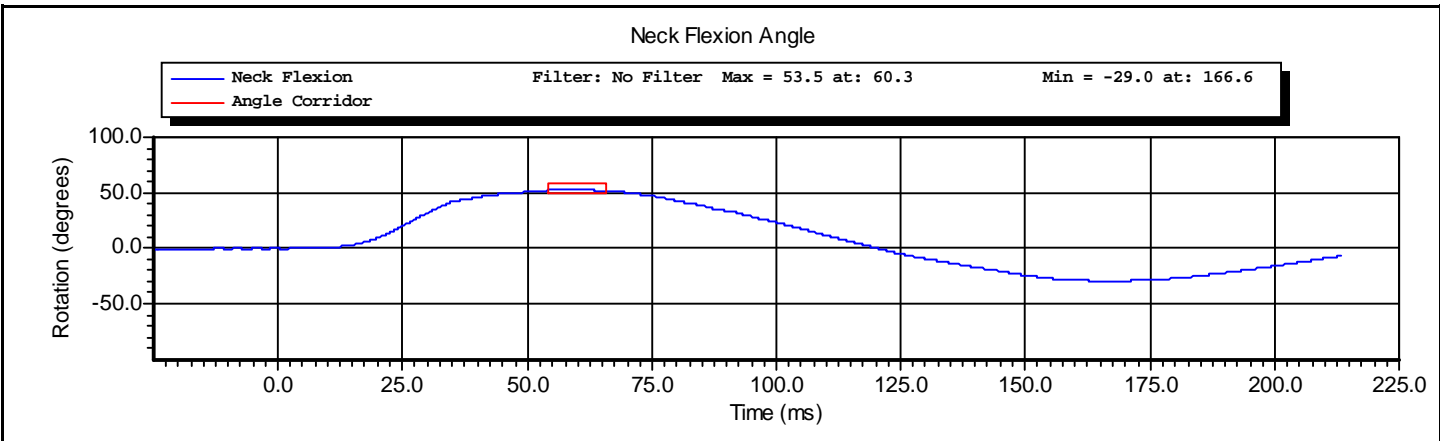
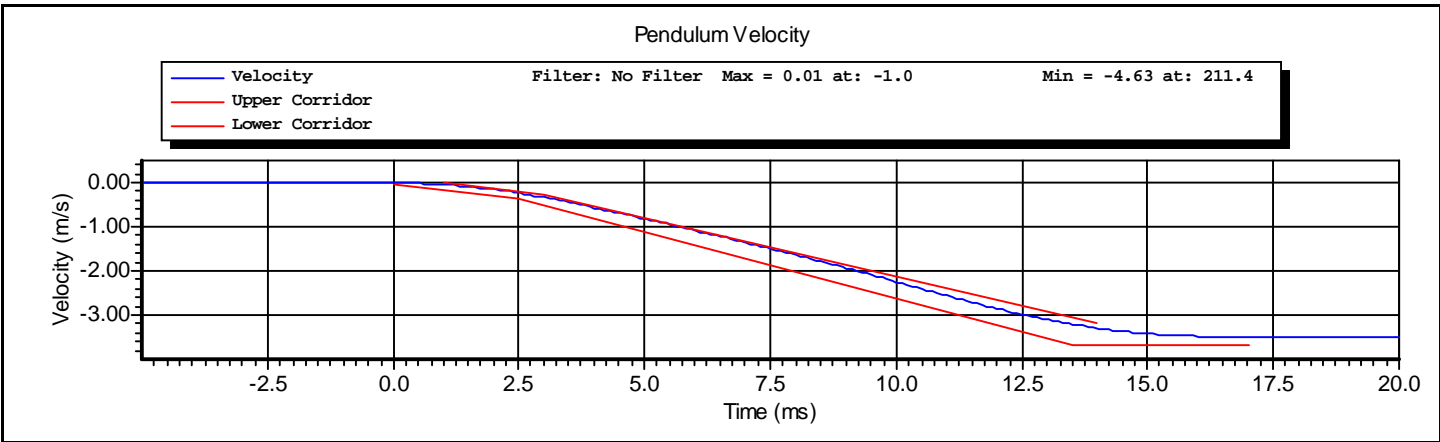
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Test Name:	<b>Neck Flexion</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Neck Flexion</b>	Test Date:	<b>5/14/2010</b>
Test Number:	<b>2</b>	Test Time: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

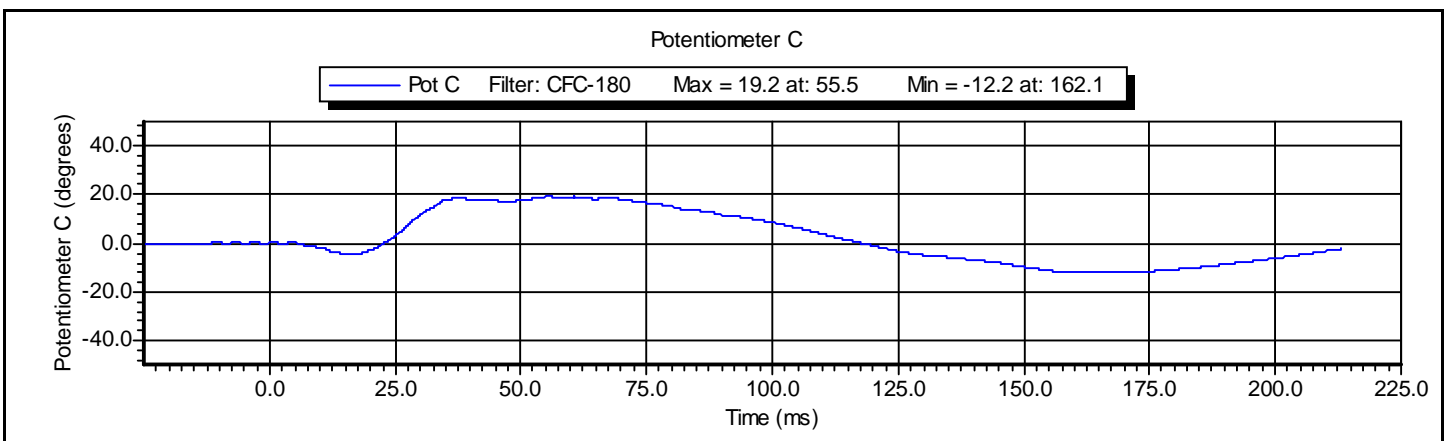
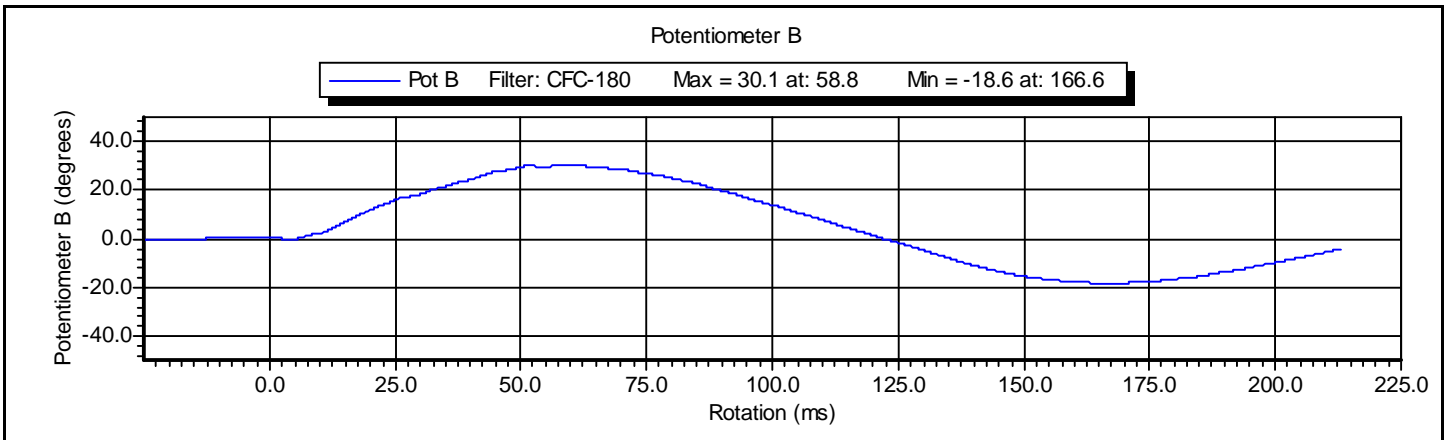
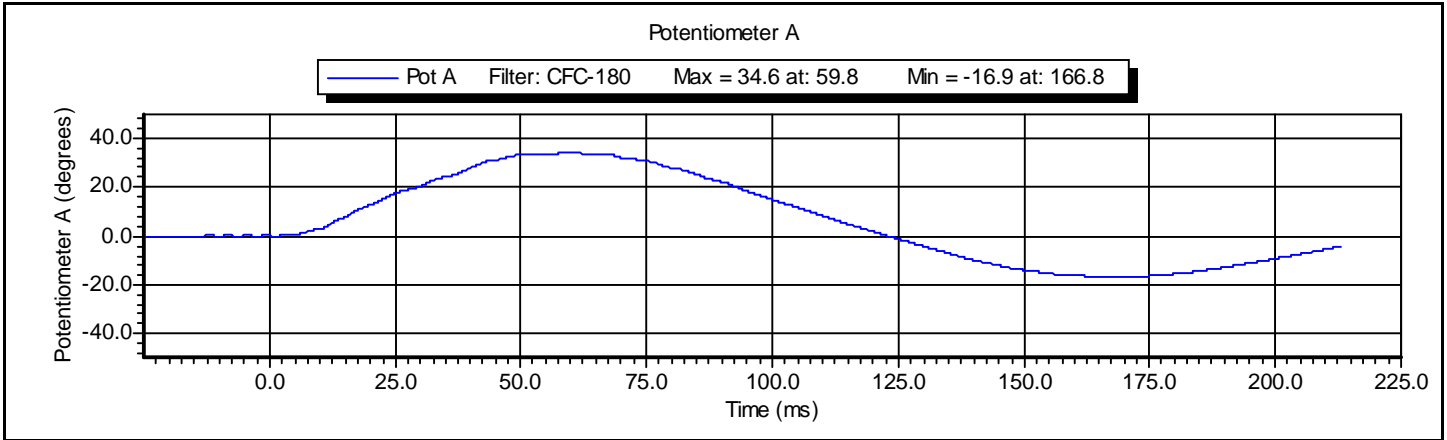
Component Part Number	Component Serial Number
<b>455-2002</b>	<b>19-020118A</b>



Test ID: **Neck Flexion**

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

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





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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>960715-313</b>	

Comments:

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

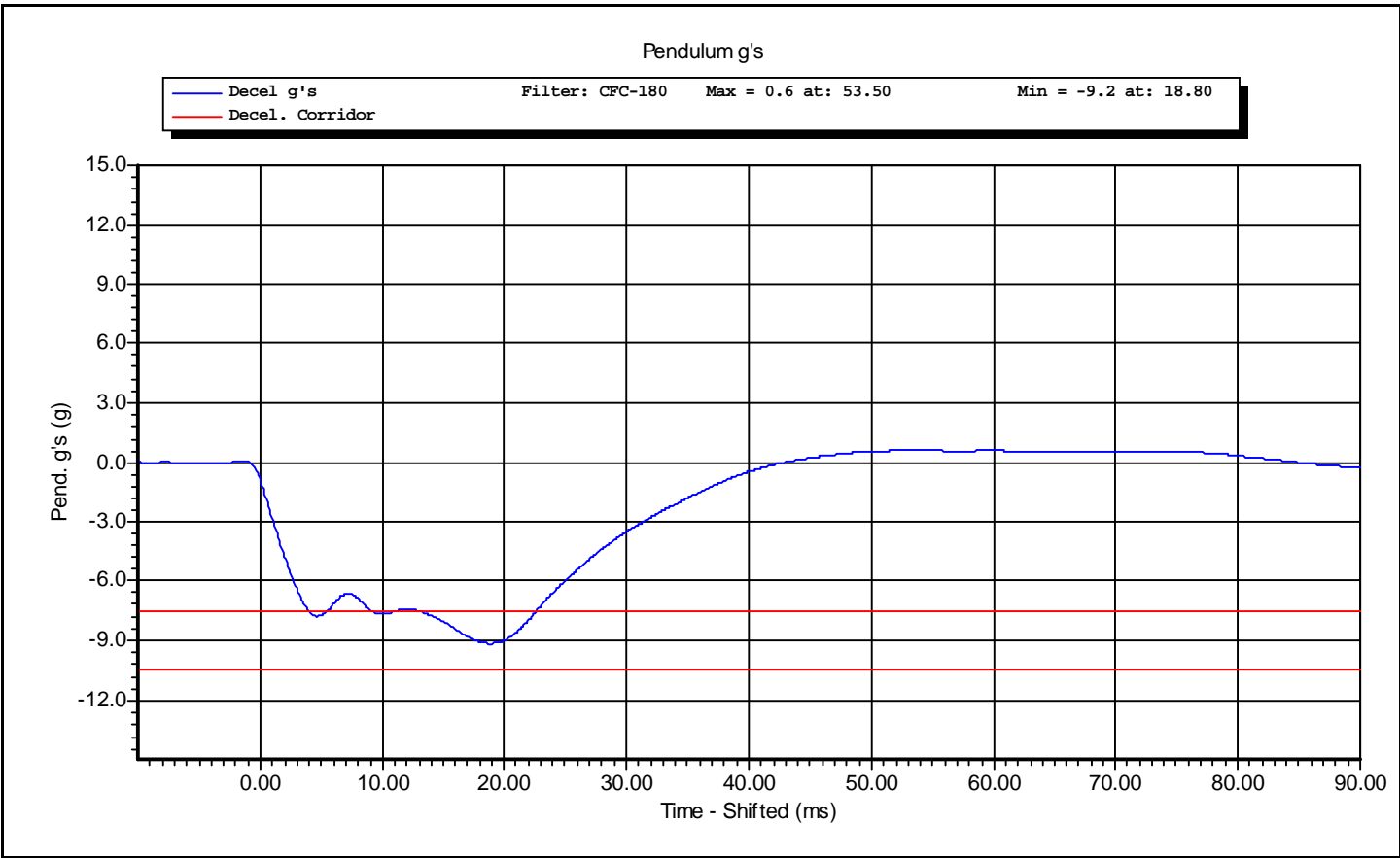
Test Time: **11:36:48 AM**

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



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

Component Part Number	Component Serial Number
<b>960715-313</b>	





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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>

Comments:

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





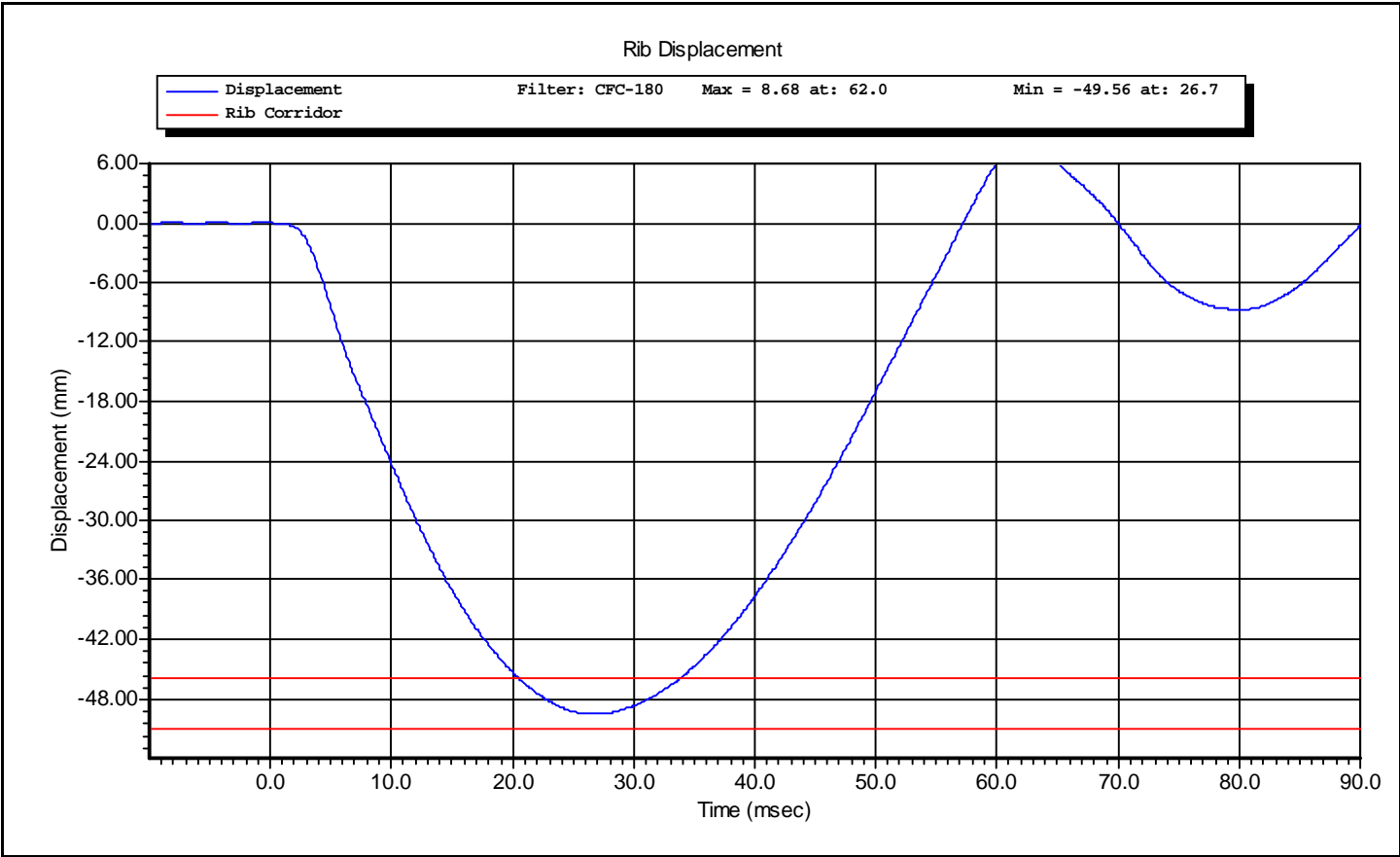
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Upper Rib 4 m/s</b>	Test Date:	<b>5/13/2010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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>



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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>

Comments:

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



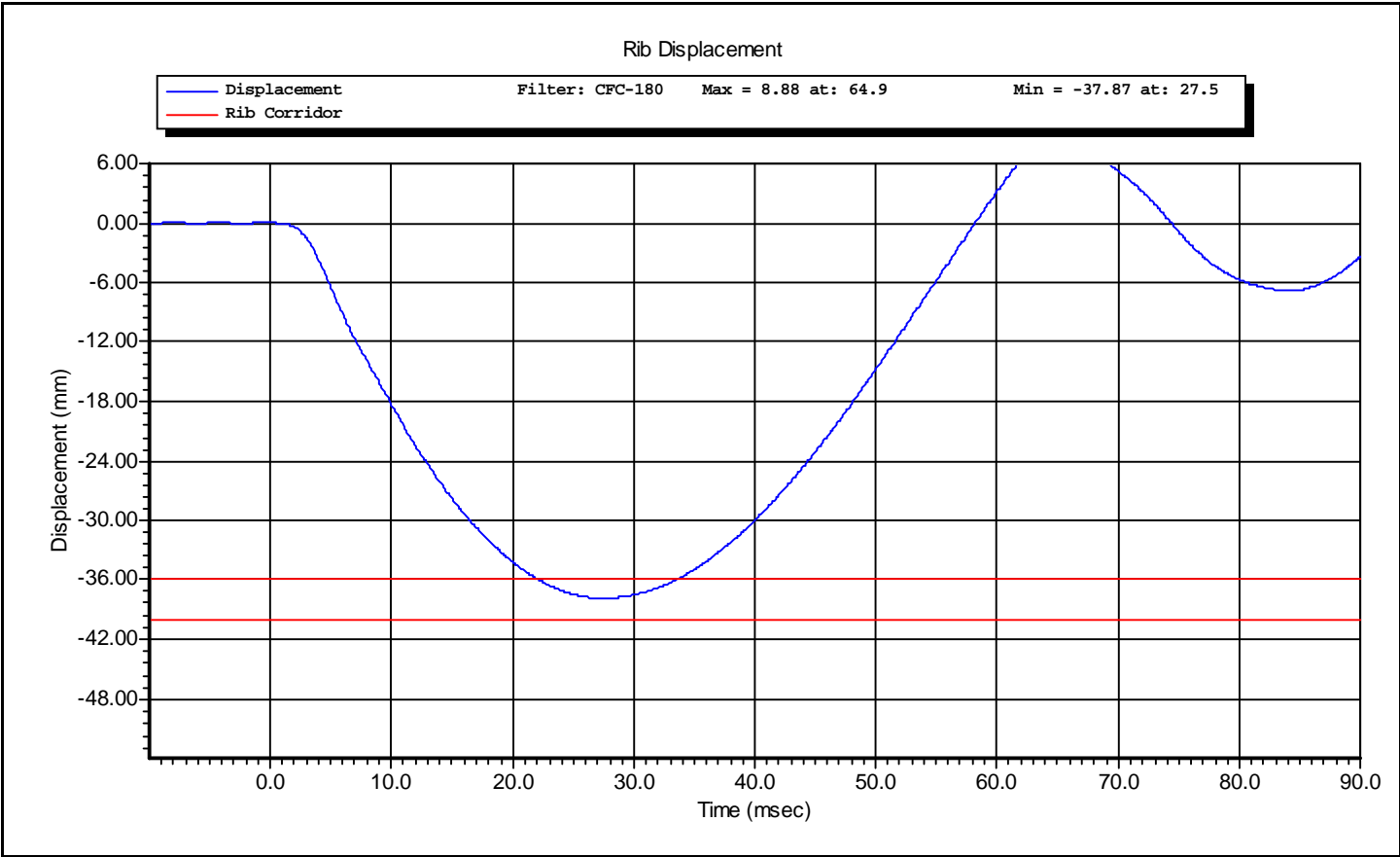
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Upper Rib 3 m/s</b>	Test Date:	<b>5/13/2010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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0124A</b>



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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>

Comments:

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



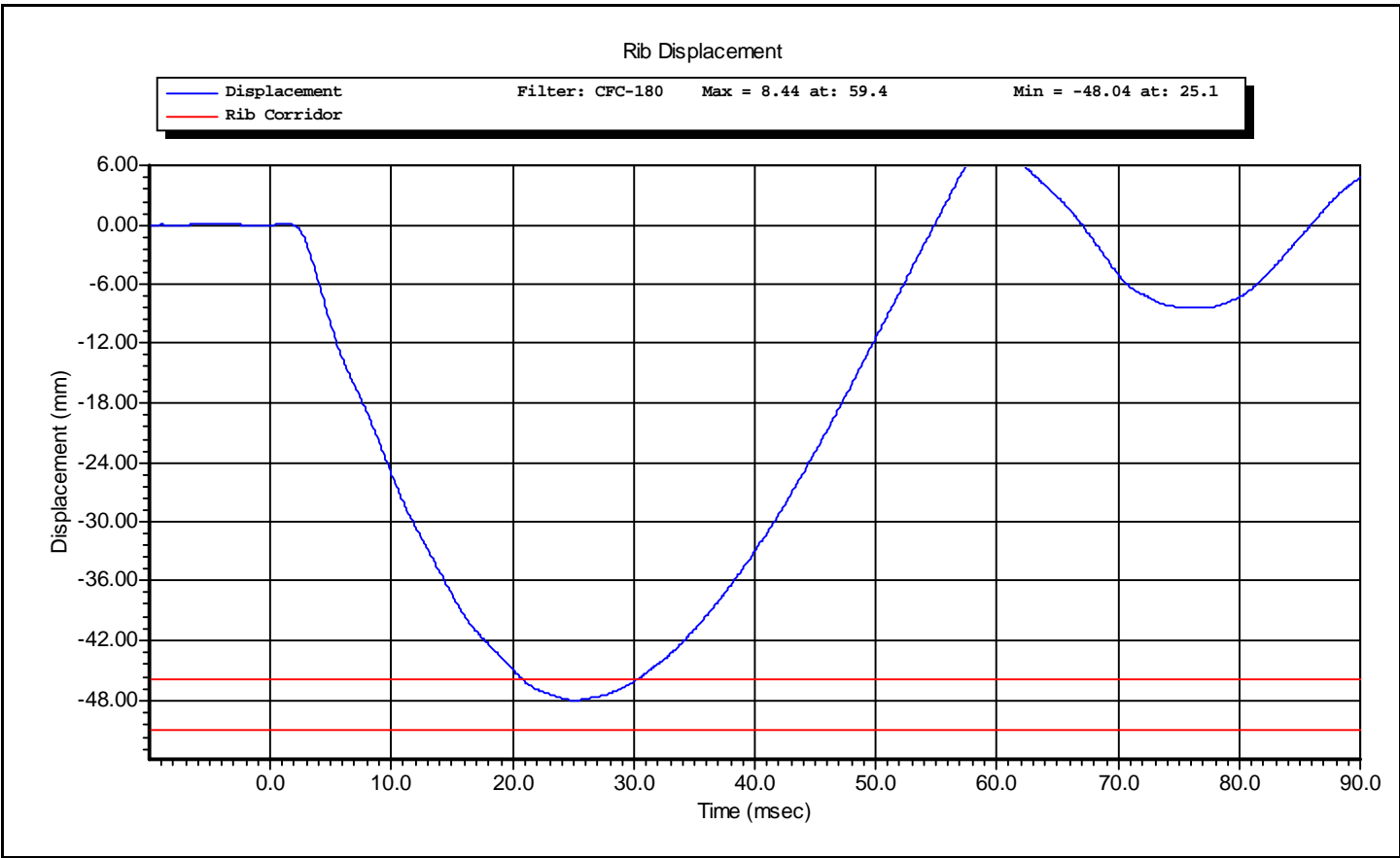
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Middle Rib 4 m/s</b>	Test Date:	<b>5/13/2010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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>



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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>

Comments:

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



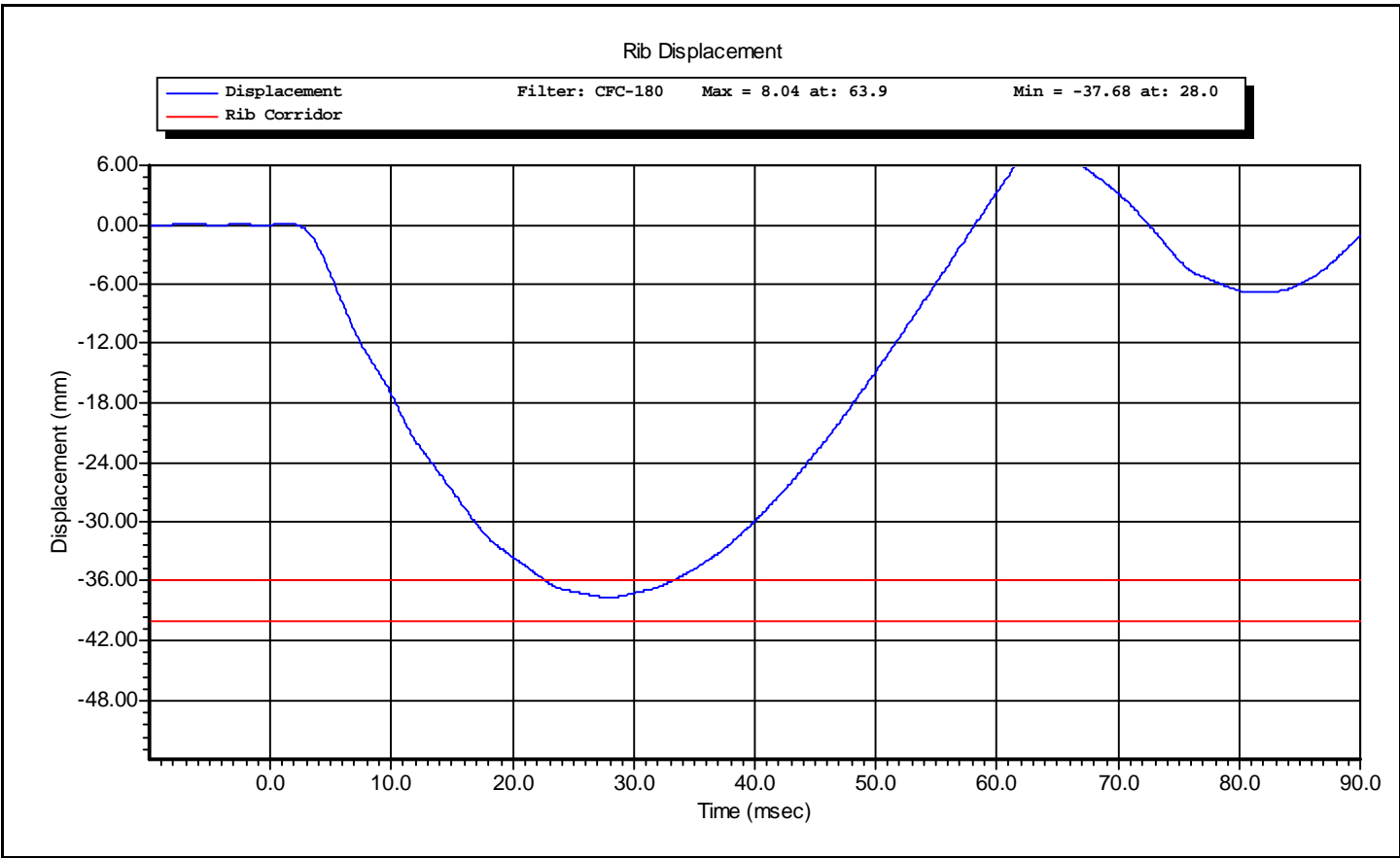
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Middle Rib 3 m/s</b>	Test Date:	<b>5/13/2010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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0125A</b>



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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>

Comments:

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



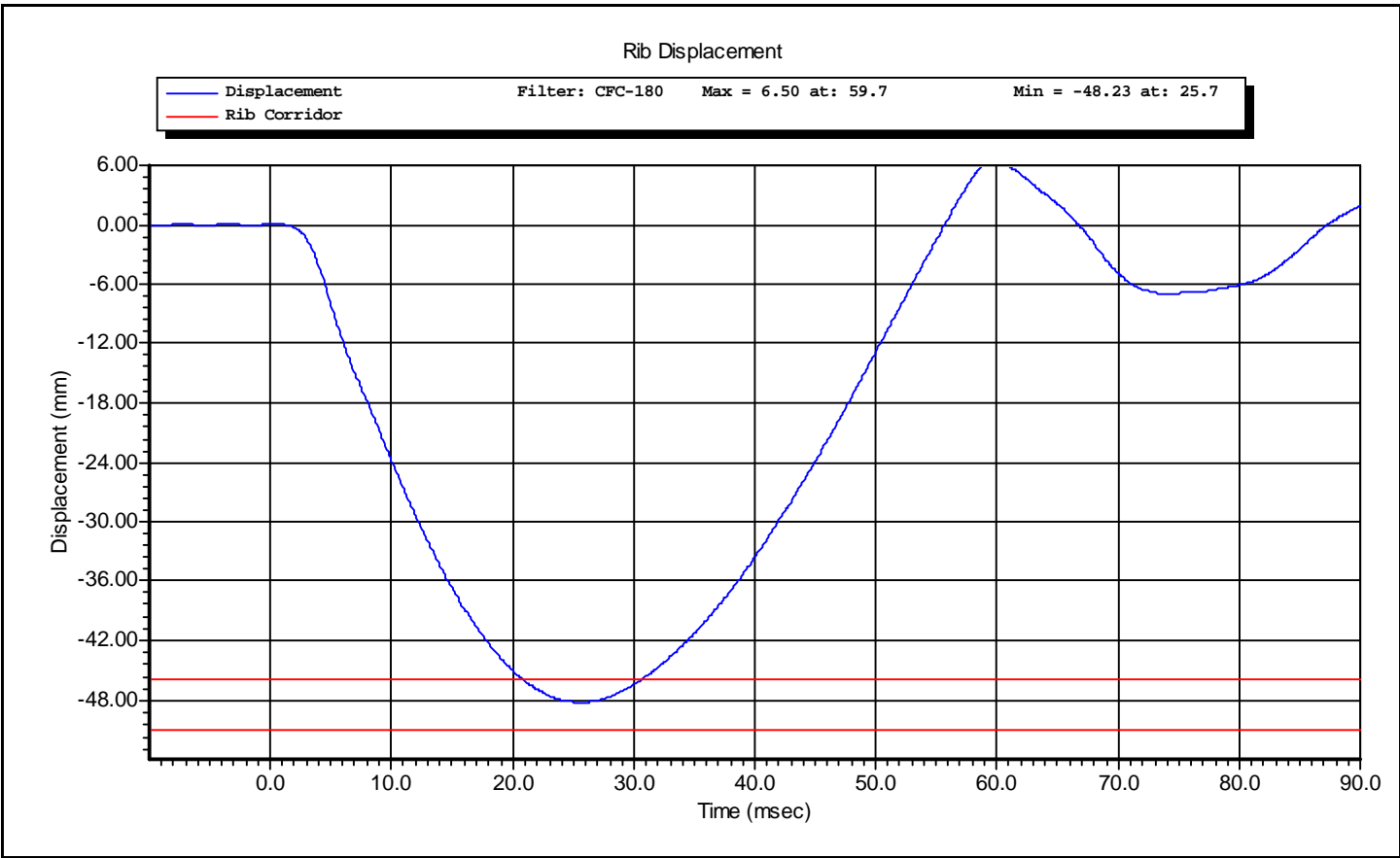
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>4.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Rib Lower 4 m/s</b>	Test Date:	<b>5/13/2010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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>



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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10.0 -- 70.0	<b>41.0</b> %RH P
Velocity	2.90 -- 3.10	<b>2.98</b> m/s P
Rib Displacement	-40.00 -- -36.00	<b>-38.43</b> mm P
Drop Height	454 -- 464	<b>459</b> 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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### 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: **Lower Rib 3 m/s**

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

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



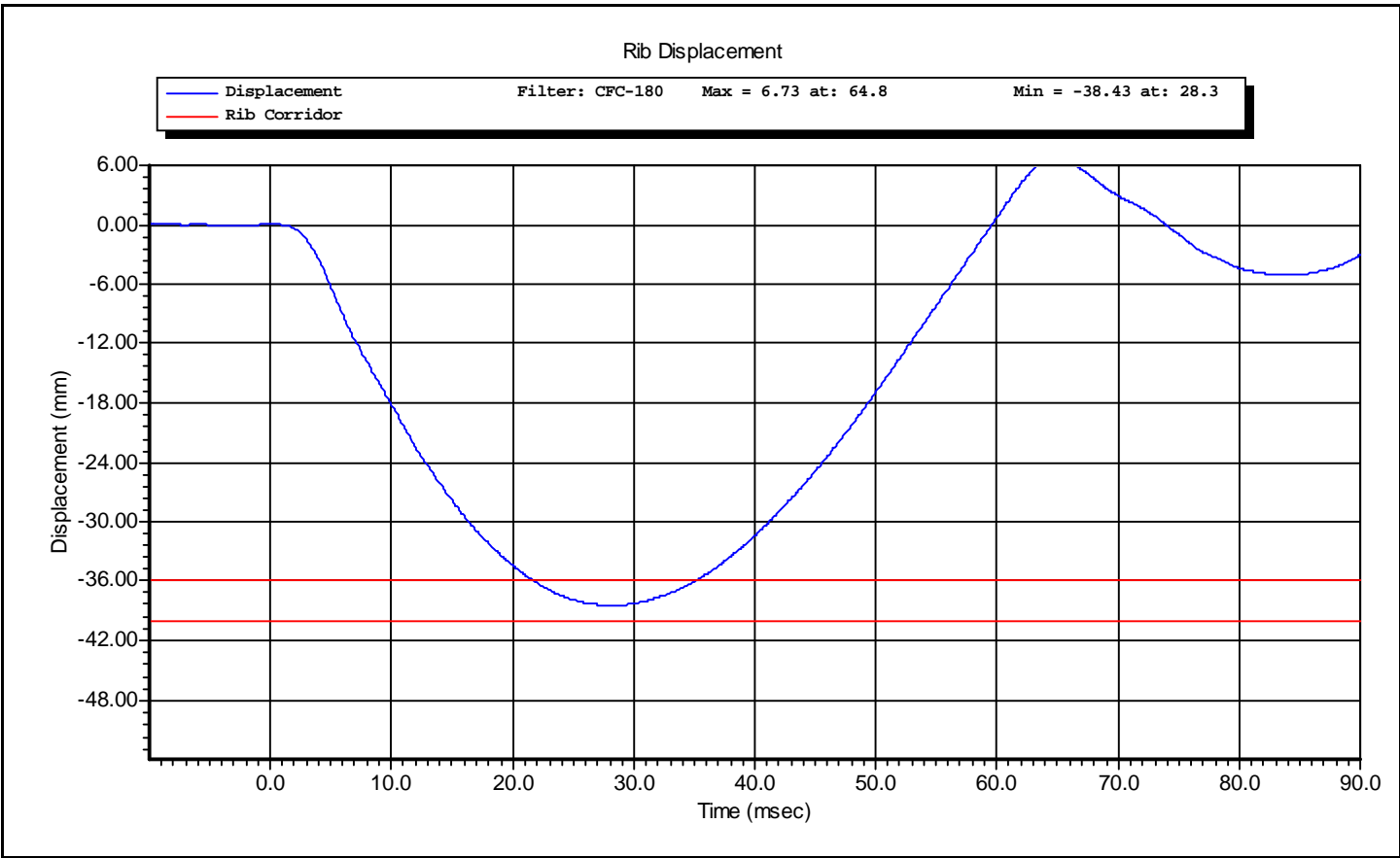
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Test Name:	<b>Full Rib Module Impact</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:	<b>3.0 Meters/Second</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>ES-2re</b>		
ATD Serial Number:	<b>D037</b>		
Test ID:	<b>Lower Rib 3 m/s</b>	Test Date:	<b>5/13/2010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

Component Part Number	Component Serial Number
<b>455-3100</b>	<b>1954-0126A</b>



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

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

Comments:

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



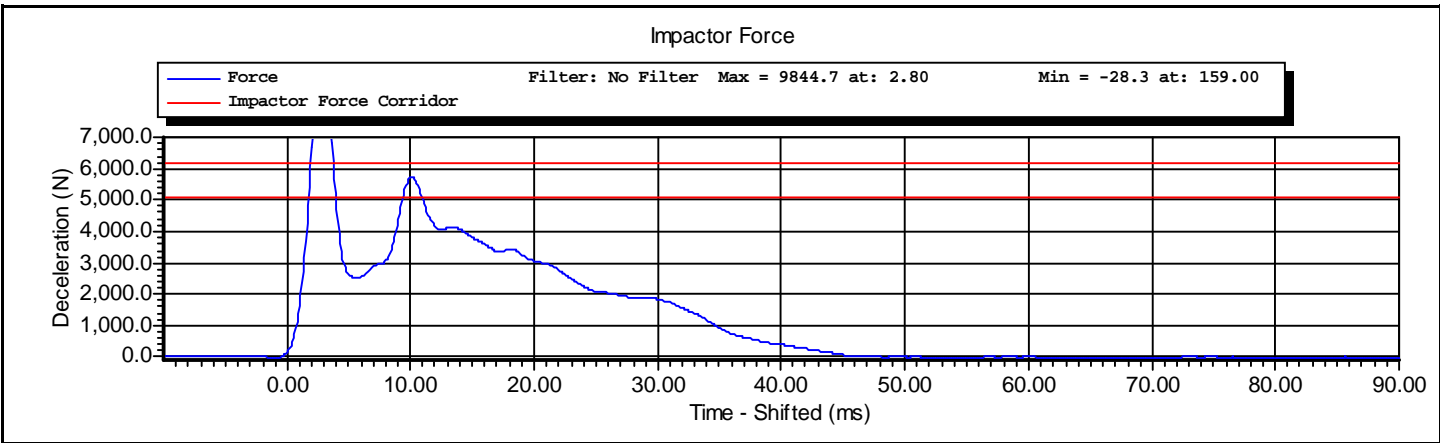
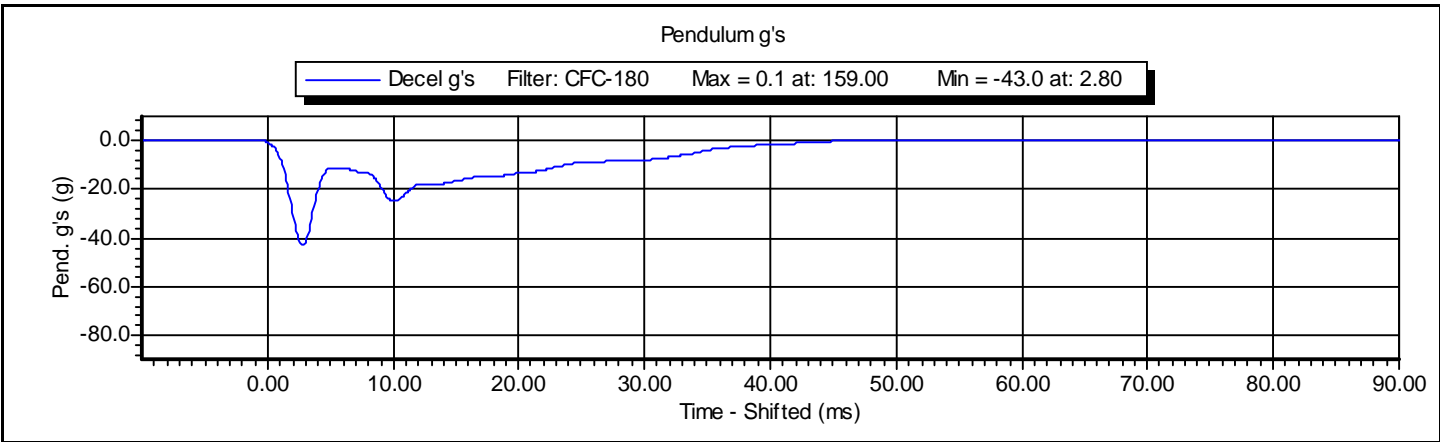
www.calspan.com

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

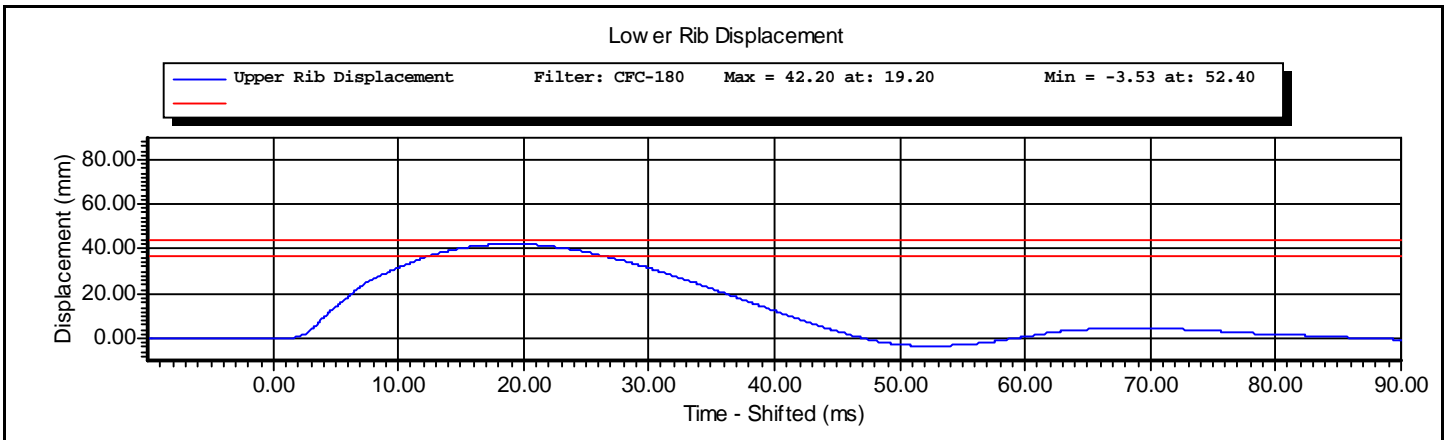
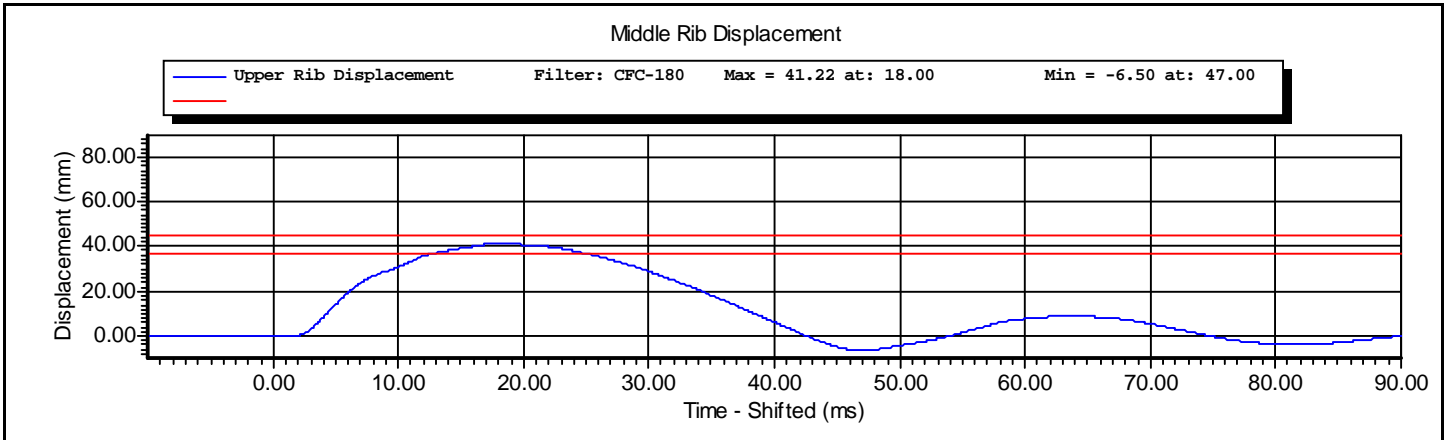
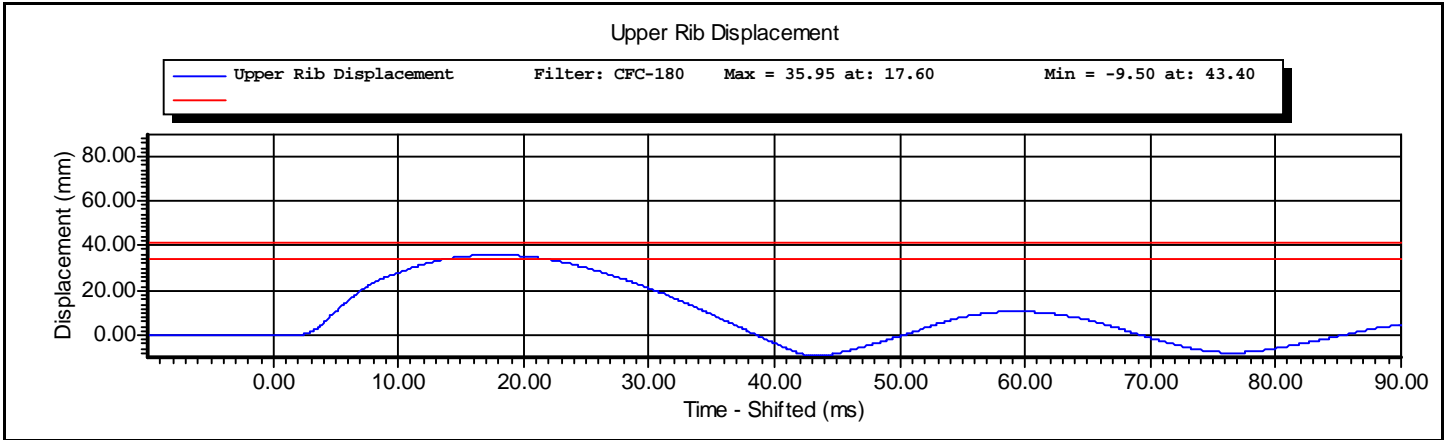
Component Part Number	Component Serial Number
<b>Upper Rib - 175-4002</b>	<b>1954-0124A</b>



Test ID: **Thorax Impact**

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

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





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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>FTSS-0004</b>	<b>07/118</b>

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

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

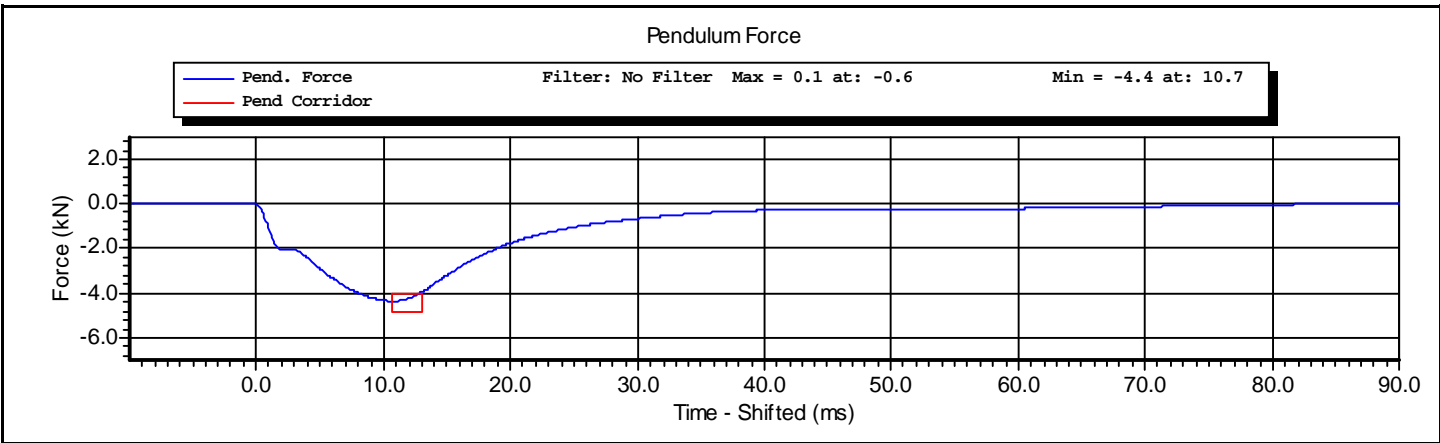
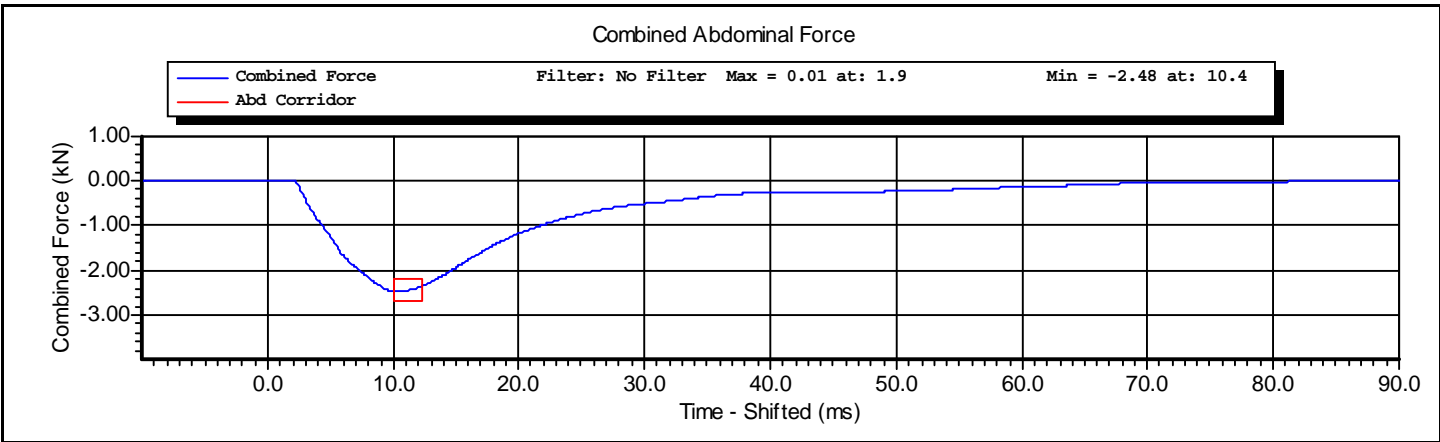
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P16576	4/6/2010
Denton	2631	LC-1507Fy	1/7/2010
Denton	2631	LC-1508Fy	1/7/2010
Denton	2631	LC-1509Fy	1/7/2010

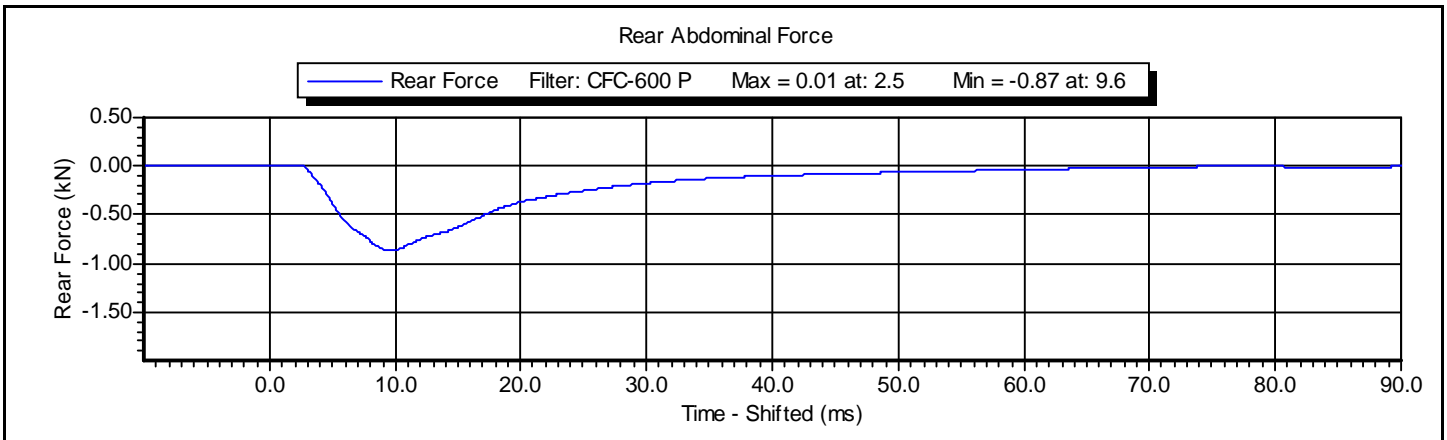
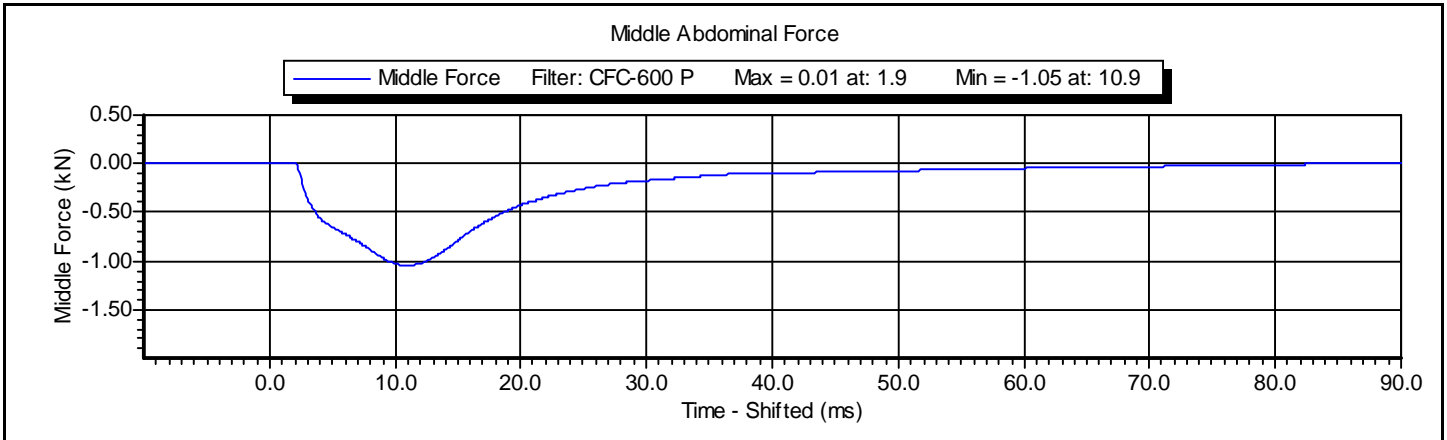
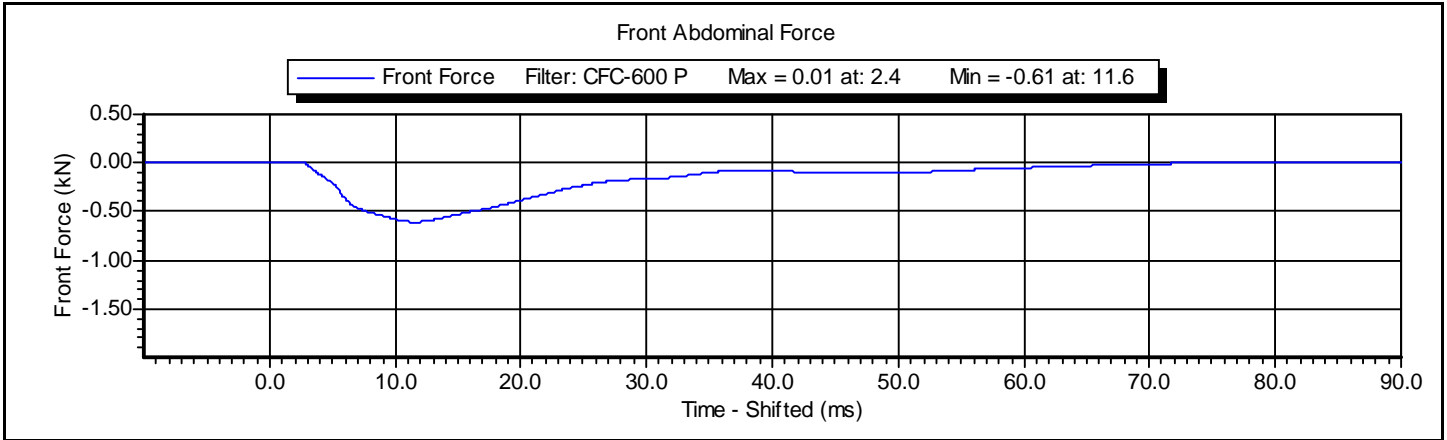
Test ID: **Abdominal Impact** Test Time: **11:03:14 AM**

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

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

Component Part Number	Component Serial Number
<b>FTSS-0004</b>	<b>07/118</b>









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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>175-5501</b>	<b>15-0376</b>

Comments:

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

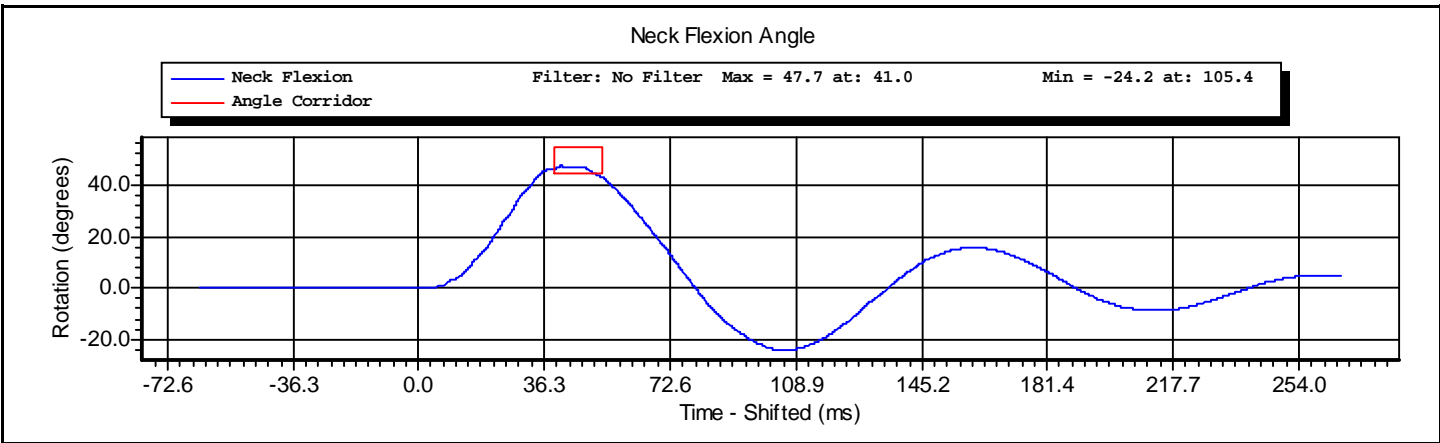
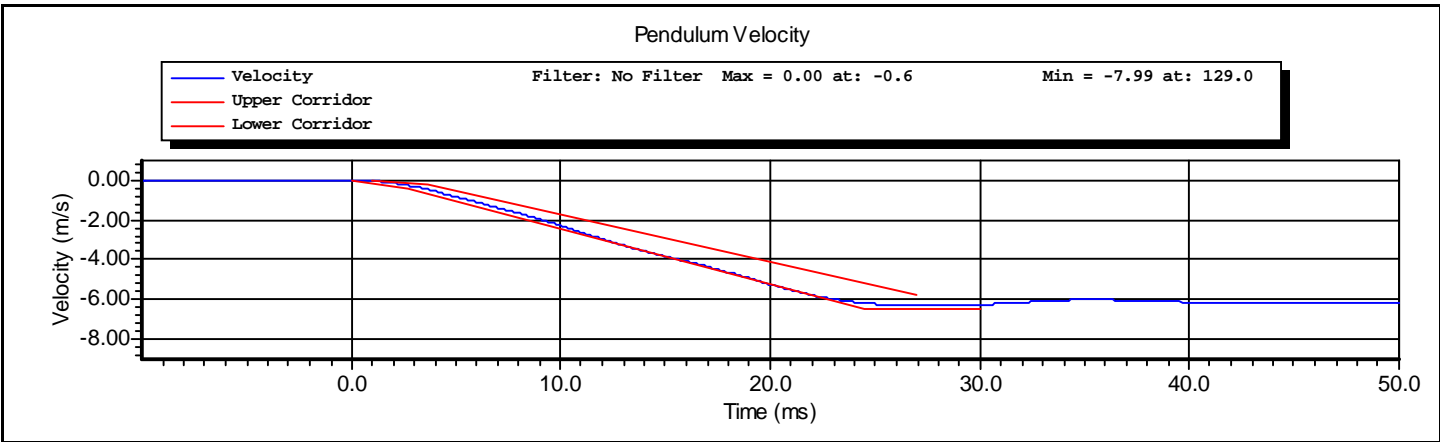
Test Time: **3:57:44 PM**

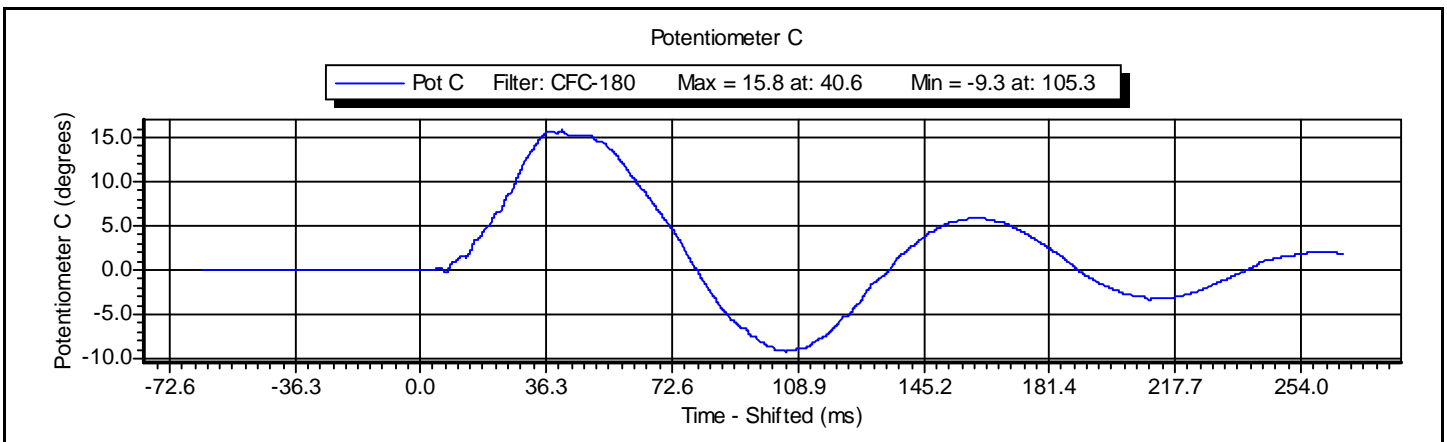
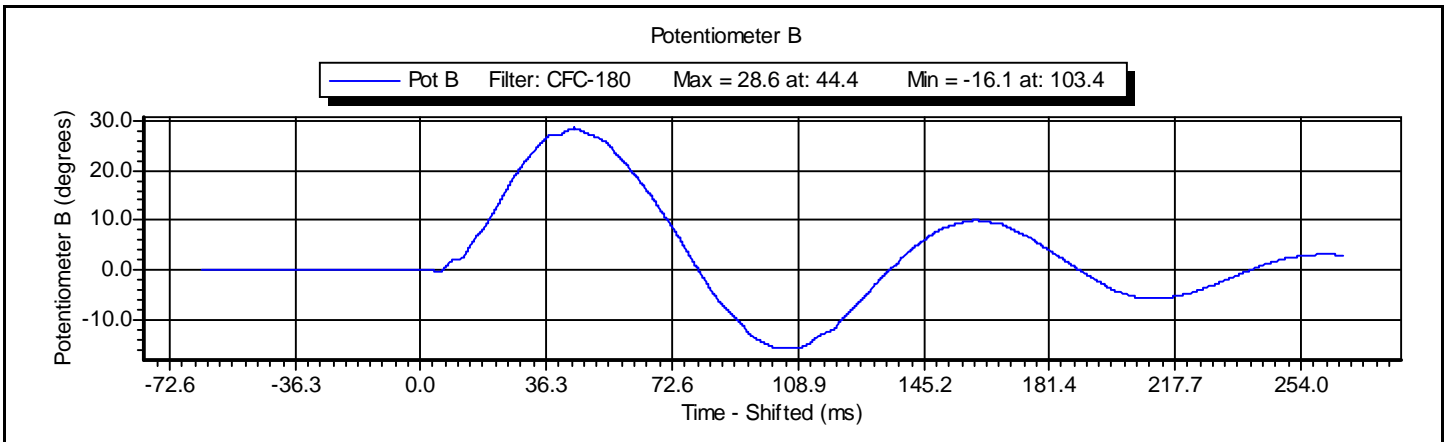
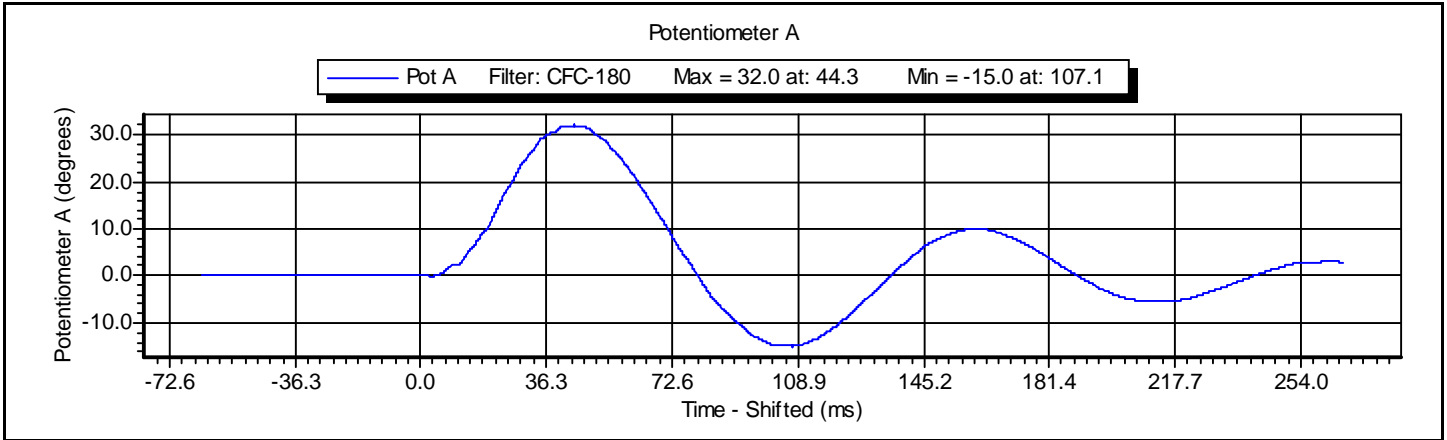
Test Date: **5/14/2010**



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

Component Part Number	Component Serial Number
<b>175-5501</b>	<b>15-0376</b>







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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>455-4003</b>	

Comments:

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



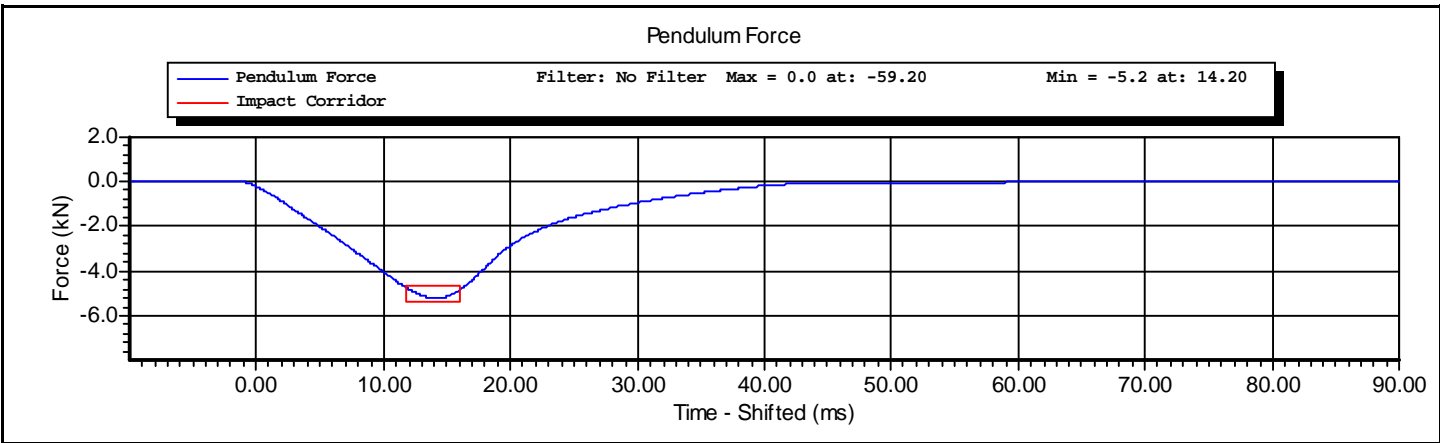
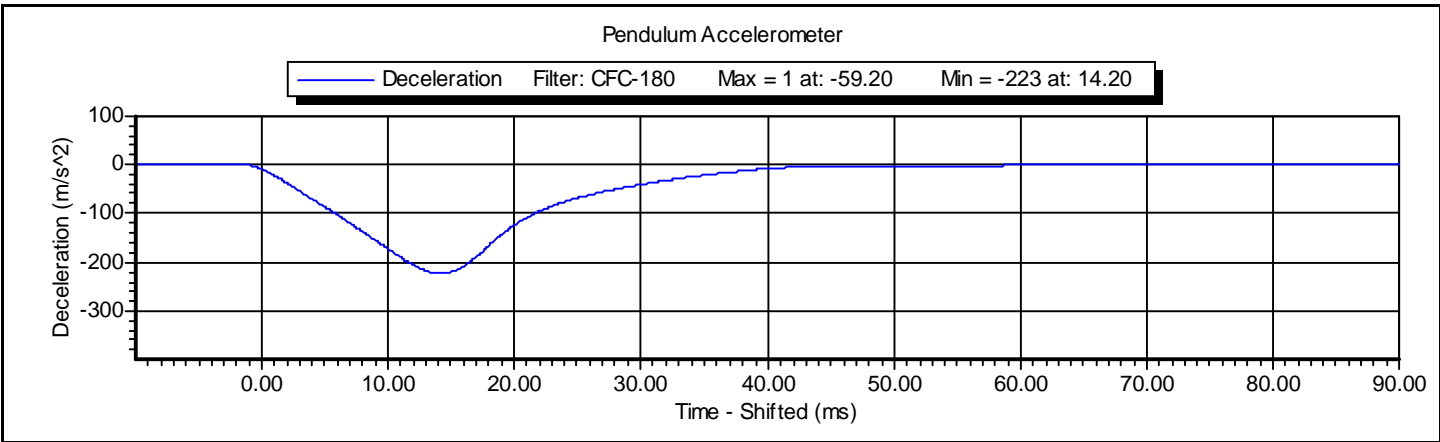
www.calspan.com

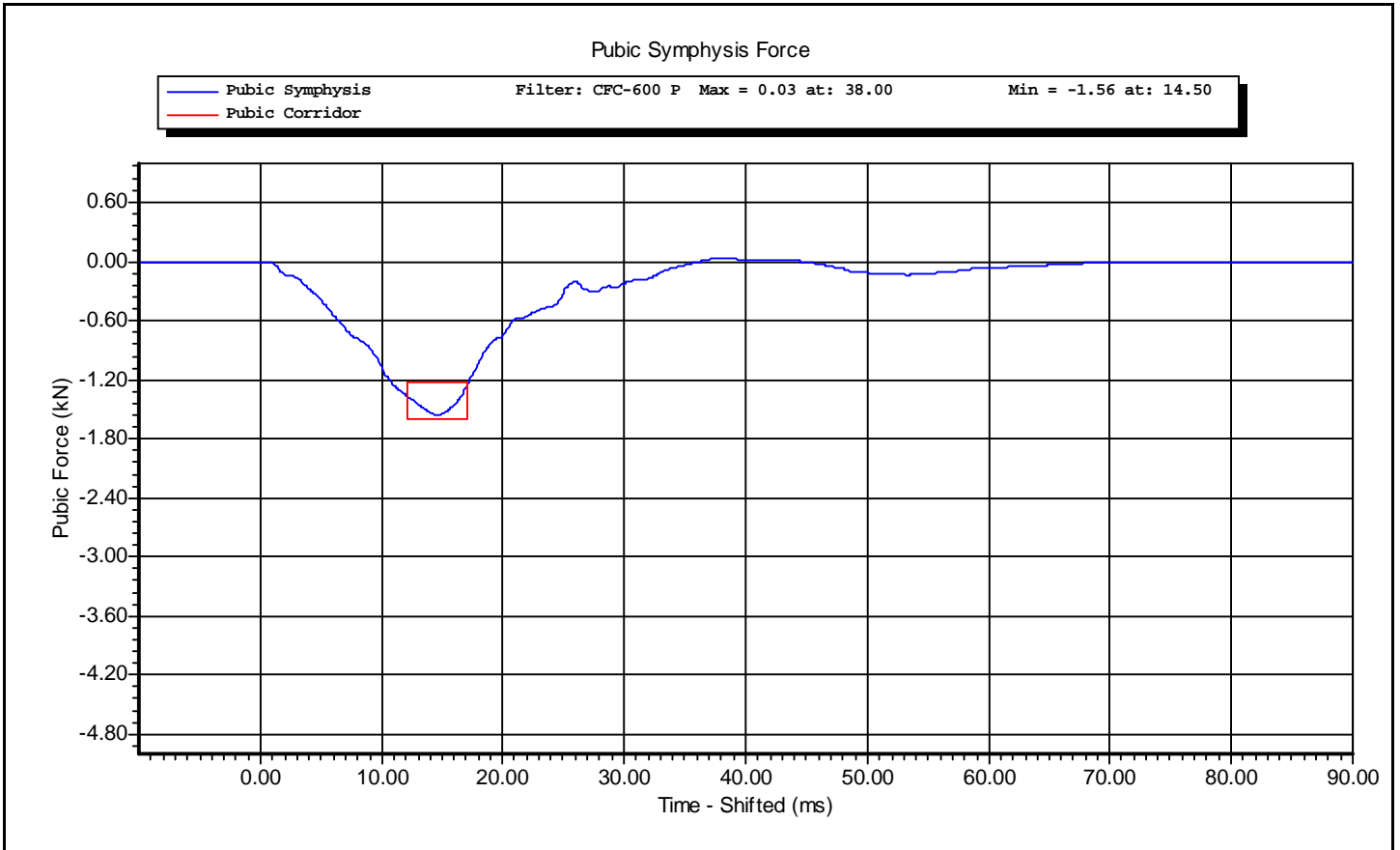
# Calspan - Transportation Research Group

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

Component Part Number	Component Serial Number
<b>455-4003</b>	







**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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## VERIFICATION REPORT

Test Name:	<b>Head Drop</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Head Drop Test</b>	Test Date:	<b>5/3/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>2:51:02 PM</b>

Component Part Number	Component Serial Number
<b>Head Skin - FTSS 880105-106</b>	<b>1105</b>

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>51</b> %RH P
Resultant Acceleration	115.0 -- 137.0	<b>128.8</b> g P
Oscillation	0.0 -- 15.0	<b>3.9</b> % P
Fore-Aft Acceleration	-15.0 -- 15.0	<b>-3.3</b> g P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Head Drop Test**

Test Time: **2:51:02 PM**

Test Date: **5/3/2010**



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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	P16593	2/12/2010
Endevco	7264-2000	P23142	2/12/2010
Endevco	7264-2000	P32219	2/12/2010

Test ID: **Head Drop Test**

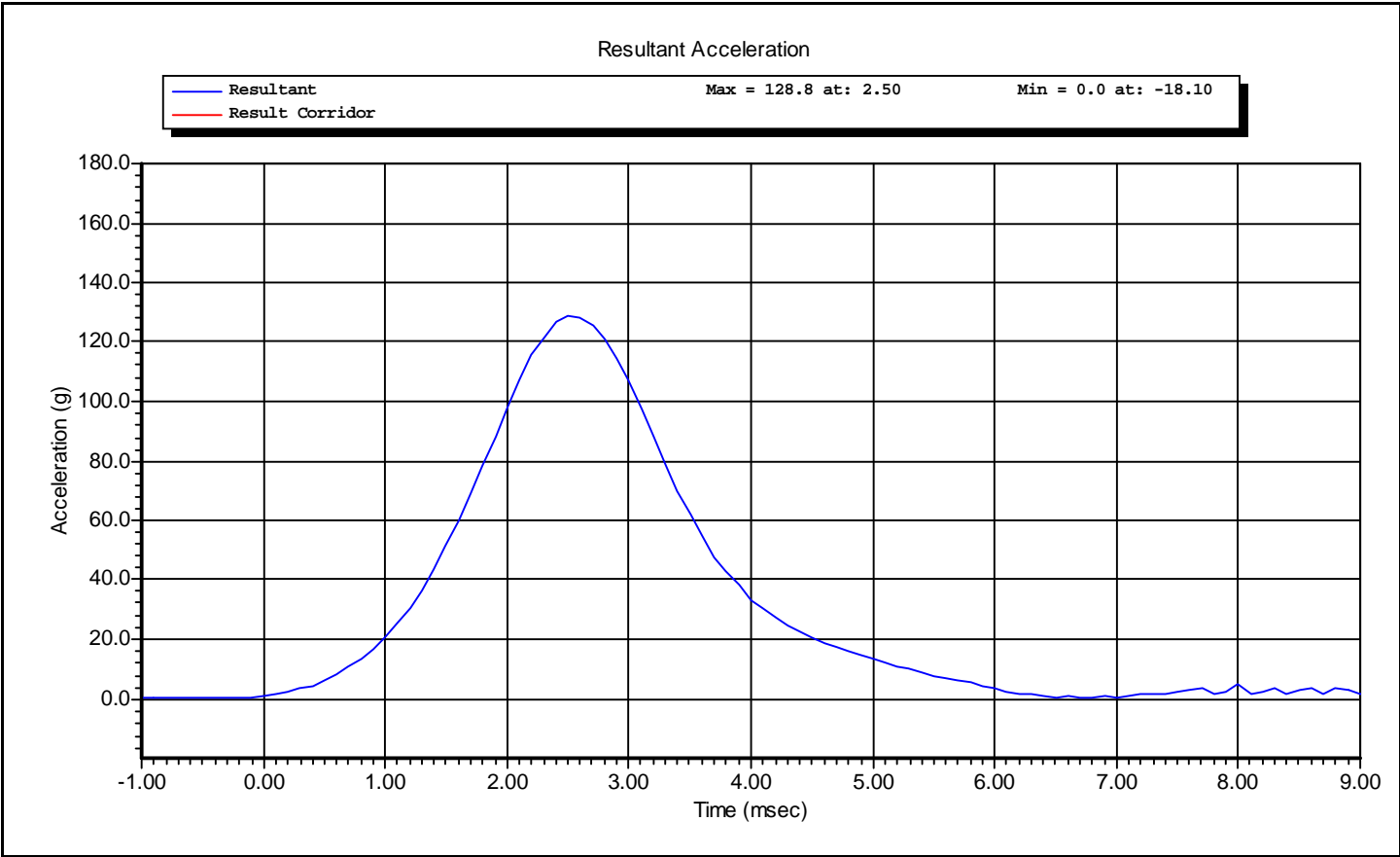
Test Time: **2:51:02 PM**

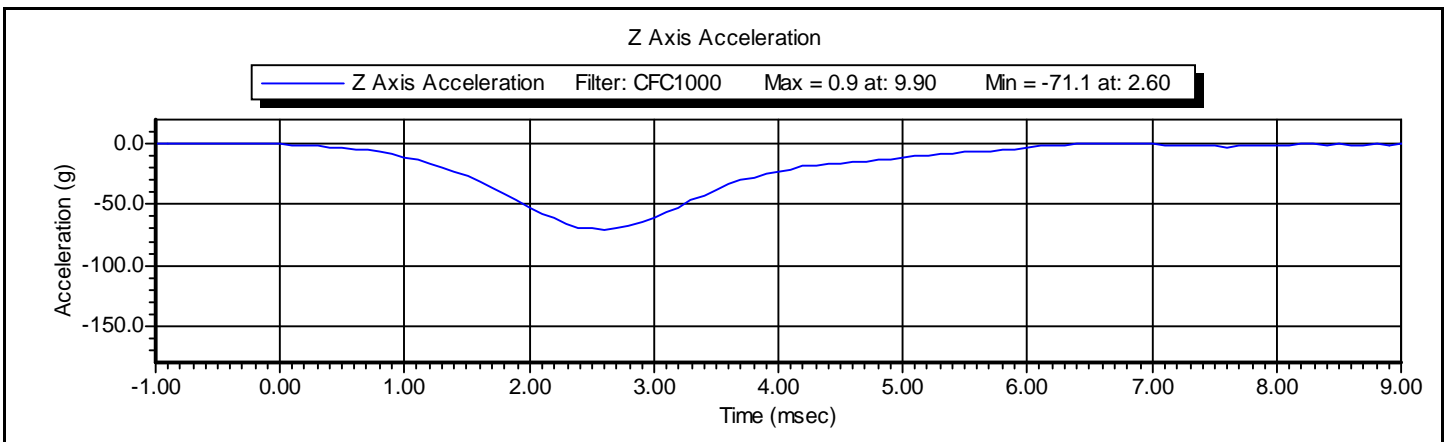
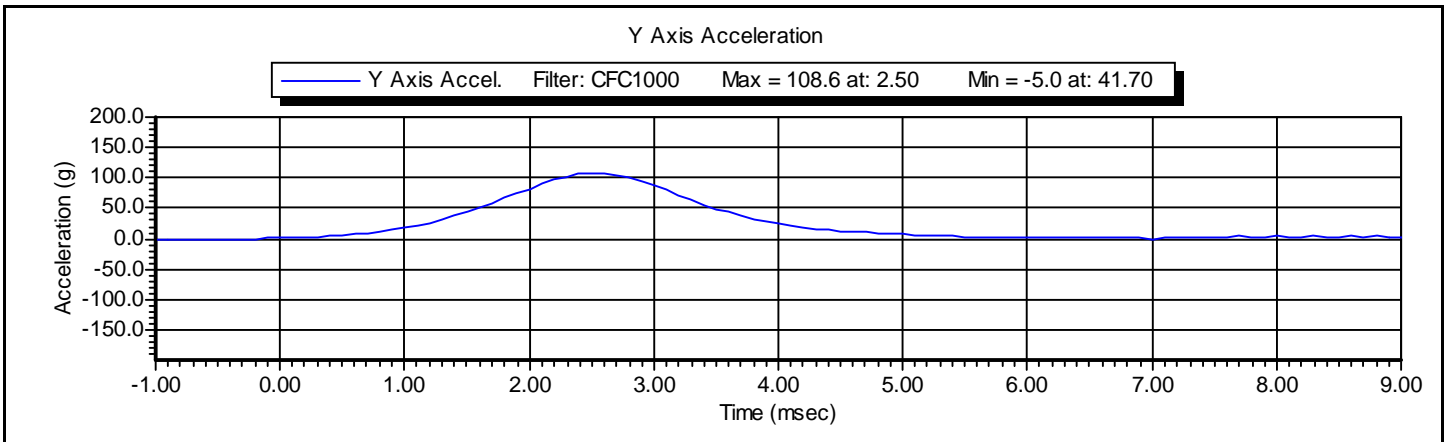
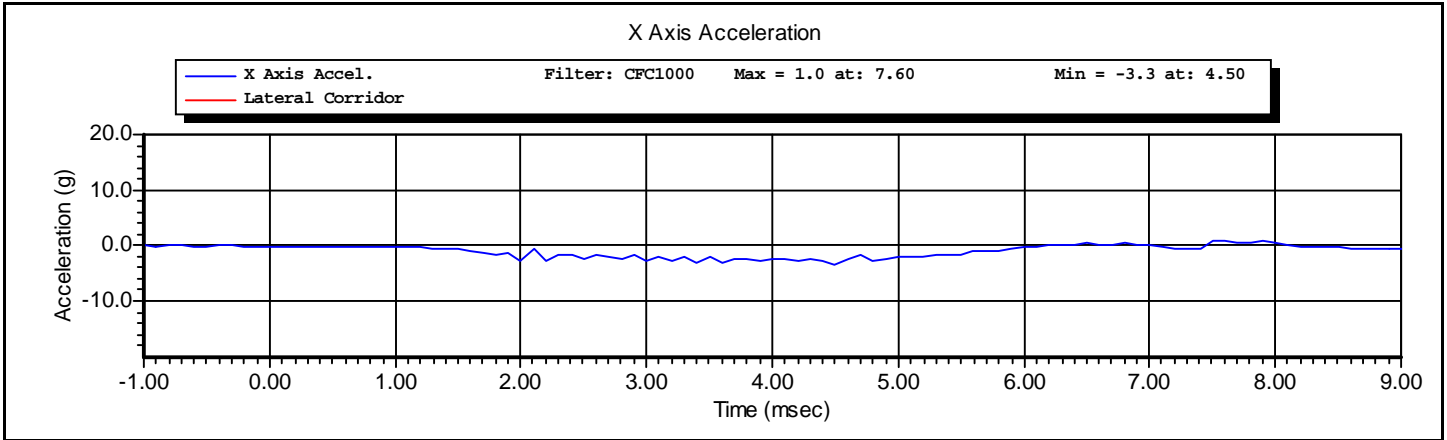
Test Date: **5/3/2010**



Test Name:	<b>Head Drop</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Head Drop Test</b>	Test Date:	<b>5/3/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>2:51:02 PM</b>

Component Part Number	Component Serial Number
<b>Head Skin - FTSS 880105-106</b>	<b>1105</b>







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## VERIFICATION REPORT

Test Name:	<b>Neck Pendulum</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Left Side</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:		Test Date:	<b>5/5/2010</b>
Test Number:	<b>3</b>	Test Time:	<b>12:09:21 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 180-2001</b>	<b>614</b>

Comments:  
Neck Torque 11 in-lbs.

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>45</b> %RH P
Velocity	5.51 -- 5.63	<b>5.56</b> m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	<b>2.43</b> m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	<b>3.53</b> m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	<b>4.64</b> m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	<b>5.53</b> m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	<b>5.64</b> m/s P
Max D Plane Rotation	71.0 -- 81.0	<b>71.3</b> degrees P
Time at Max Rotation	50.0 -- 70.0	<b>61.6</b> ms P
Moment about OC	-44.0 -- -36.0	<b>-43.0</b> Nm P
Moment Decay to Zero	102.0 -- 126.0	<b>117.6</b> ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: \_\_\_\_\_  
 Supervisor: **D. Travale** Signature: \_\_\_\_\_

Test ID:

Test Time: **12:09:21 PM**

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



**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:

Test Time: **12:09:21 PM**

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





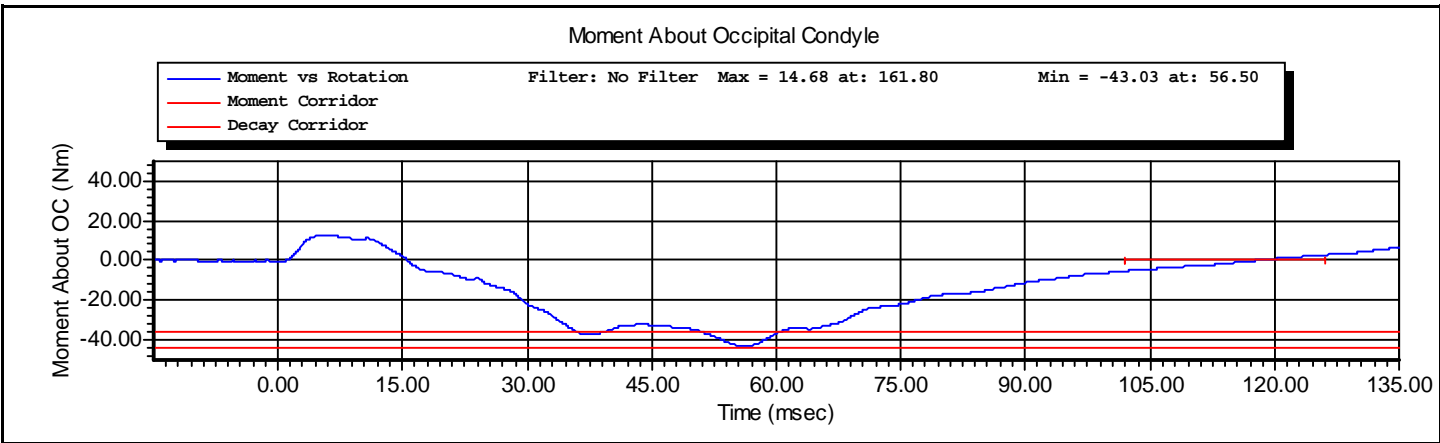
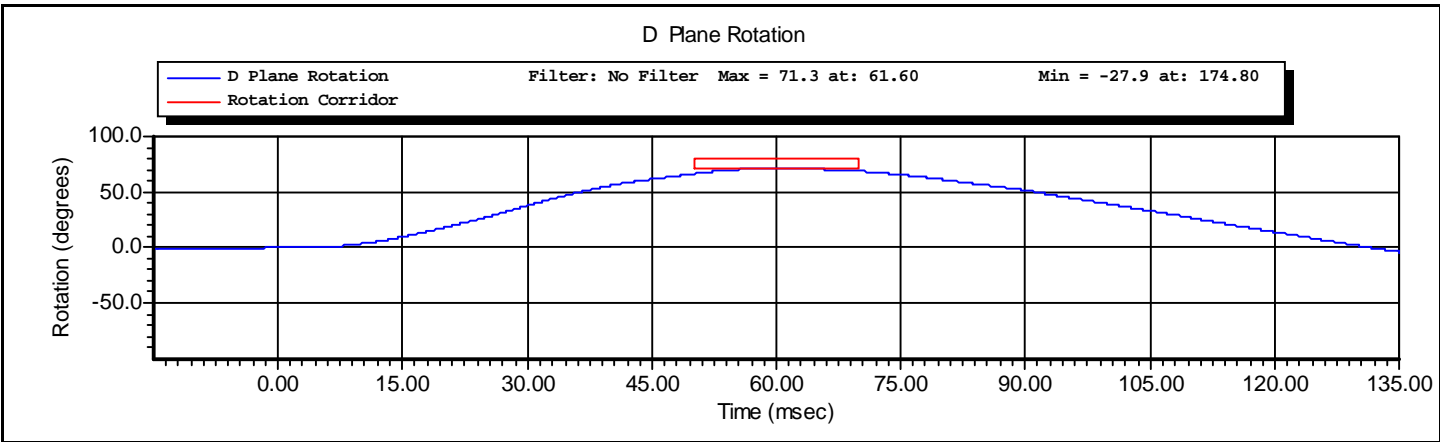
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Test Name:	<b>Neck Pendulum</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Left Side</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:		Test Date:	<b>5/5/2010</b>
Test Number:	<b>3</b>	Test Time:	<b>12:09:21 PM</b>

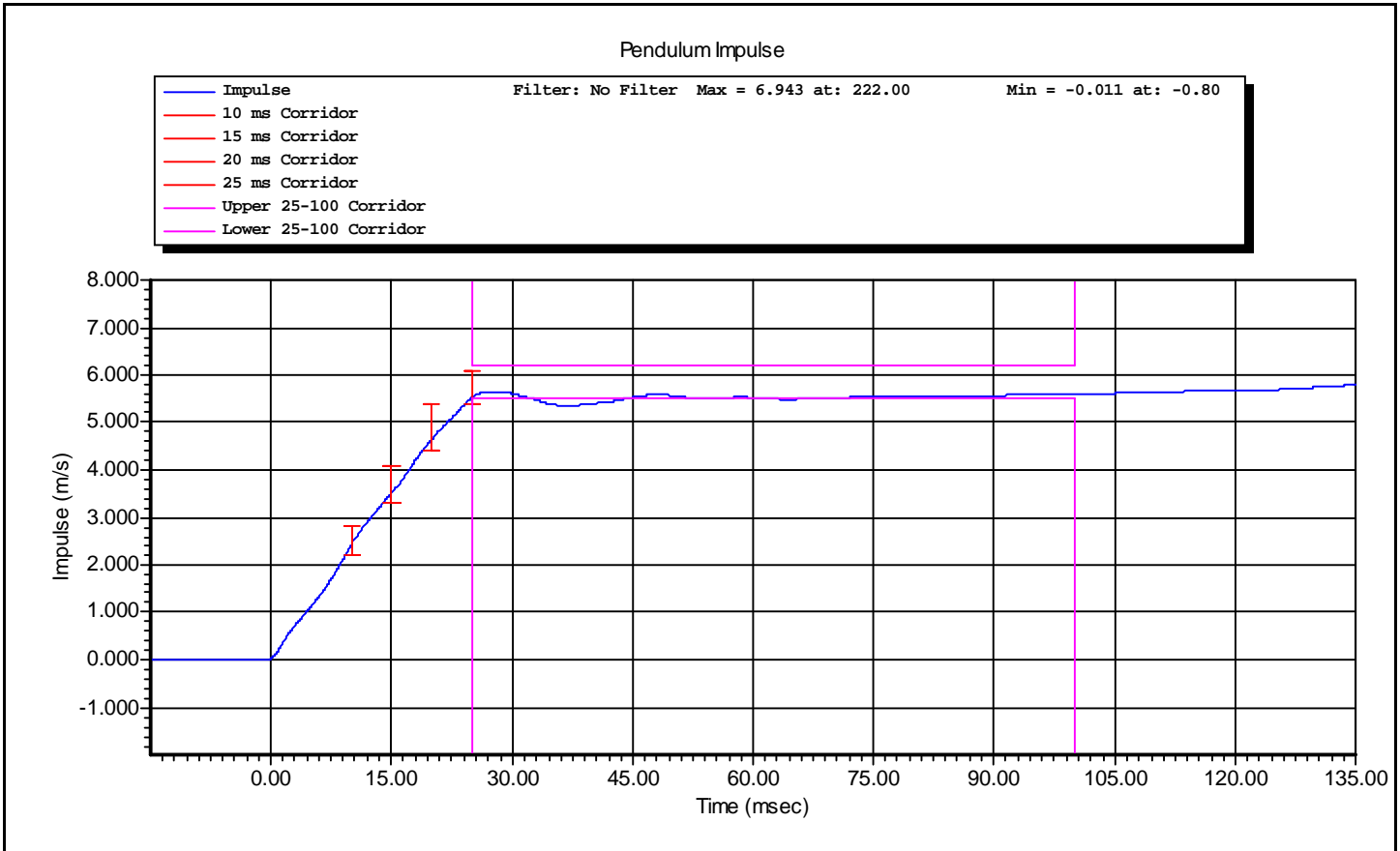
Component Part Number	Component Serial Number
<b>Neck - 180-2001</b>	<b>614</b>



Test ID:

Test Time: **12:09:21 PM**

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





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## VERIFICATION REPORT

Test Name:	<b>Shoulder Impact</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Shoulder Impact</b>	Test Date:	<b>5/5/2010</b>
Test Number:	<b>2</b>	Test Time:	<b>4:12:09 PM</b>

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

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.20</b> deg C P
Humidity	10.0 -- 70.0	<b>46.0</b> %RH P
Velocity	4.20 -- 4.40	<b>4.34</b> m/s P
Probe Acceleration	13.0 -- 18.0	<b>16.3</b> g P
Shoulder Deflection	28.0 -- 37.0	<b>34.0</b> mm P
T1 Acceleration	17.0 -- 22.0	<b>20.2</b> g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: \_\_\_\_\_

Supervisor: **D. Travale** Signature: \_\_\_\_\_

Test ID: **Shoulder Impact**

Test Time: **4:12:09 PM**

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



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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 Impact**

Test Time: **4:12:09 PM**

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



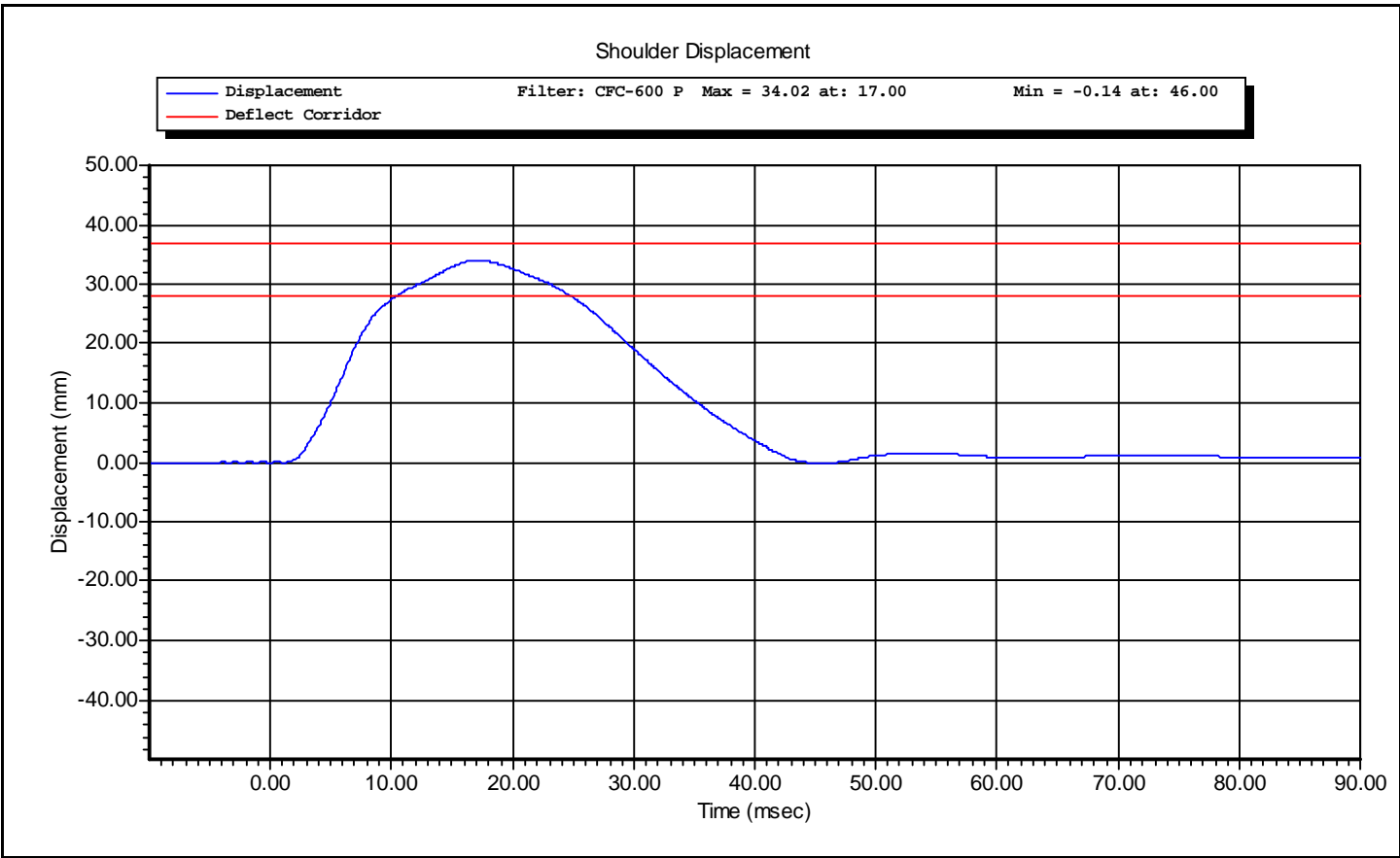
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Test Name:	<b>Shoulder Impact</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Shoulder Impact</b>	Test Date:	<b>5/5/2010</b>
Test Number:	<b>2</b>	Test Time:	<b>4:12:09 PM</b>

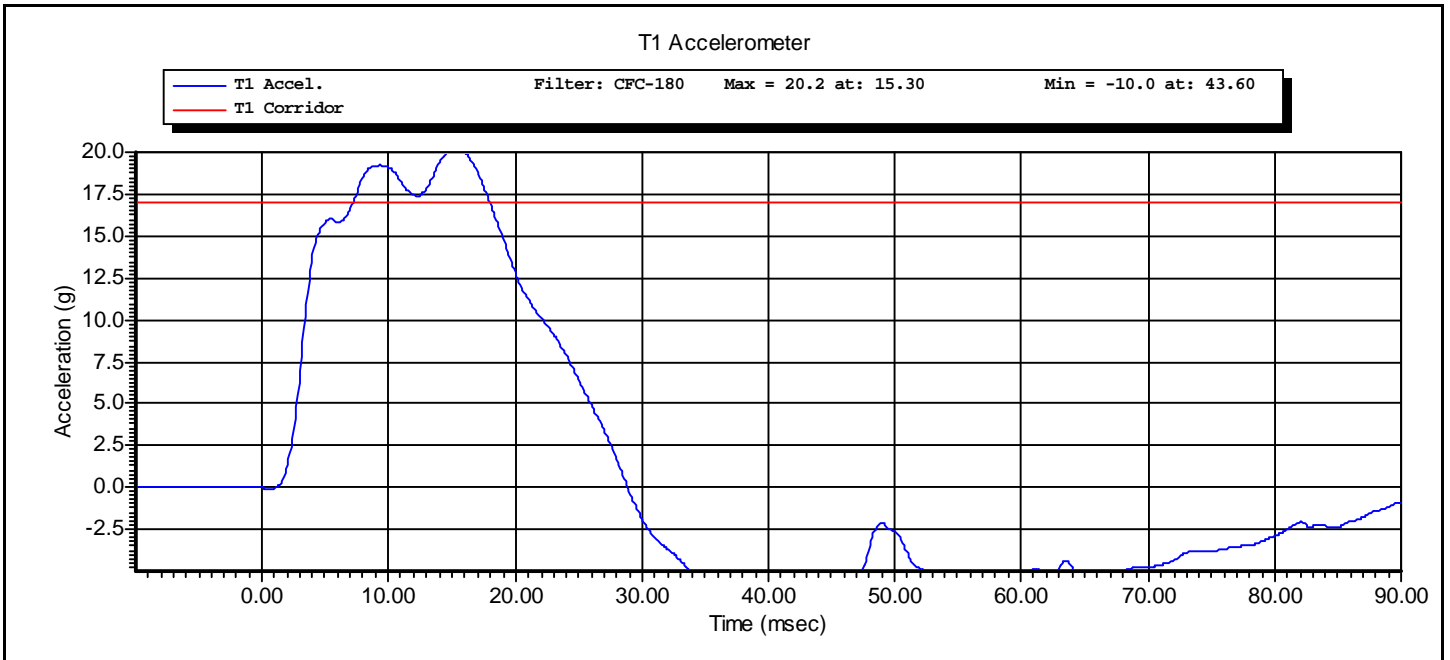
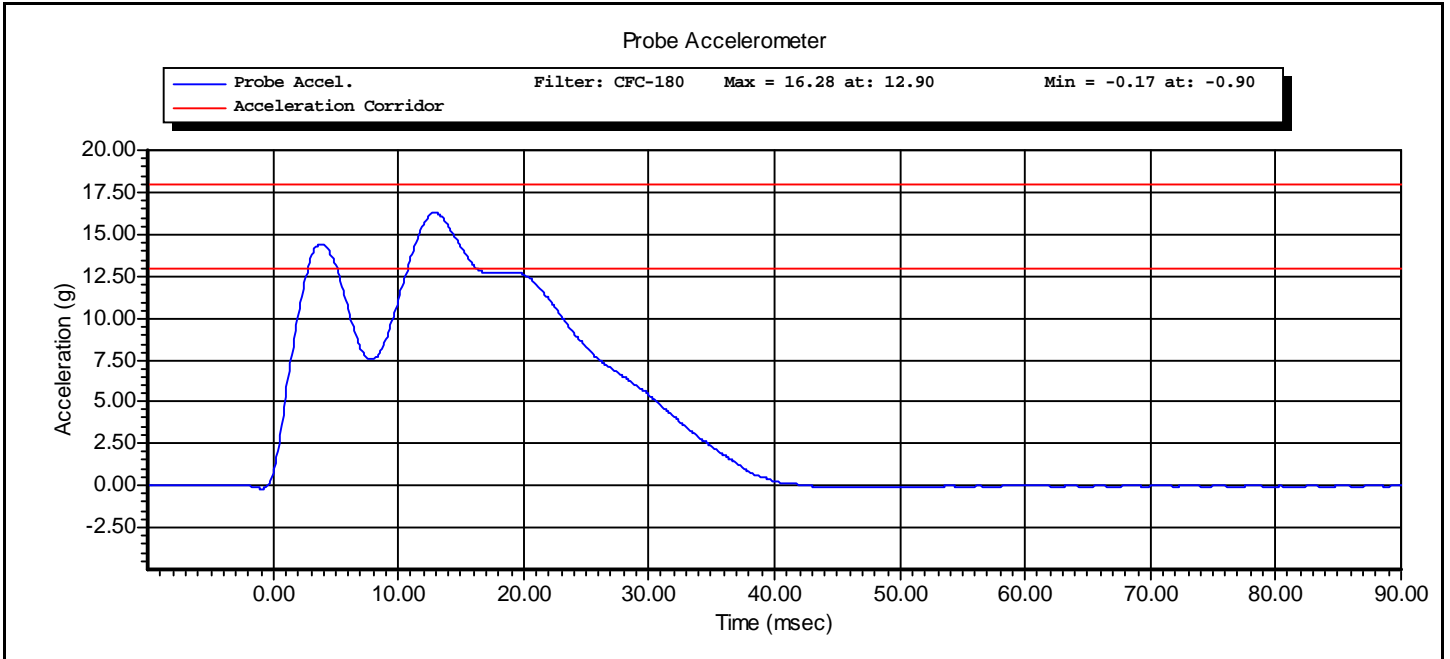
Component Part Number	Component Serial Number
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Test ID: **Shoulder Impact**

Test Time: **4:12:09 PM**

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





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## VERIFICATION REPORT

Test Name:	<b>Thorax Impact with Arm</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Shoulder With Arm</b>	Test Date:	<b>5/5/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>4:29:29 PM</b>

Component Part Number	Component Serial Number
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Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>46</b> %RH P
Velocity	6.60 -- 6.80	<b>6.67</b> m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	<b>32.7</b> g P
Upper Thorax Rib Deflection	25.0 -- 32.0	<b>27.7</b> mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	<b>30.9</b> mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	<b>33.9</b> mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	<b>38.5</b> g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	<b>34.4</b> g P
Shoulder Deflection	31.0 -- 40.0	<b>38.7</b> mm P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Shoulder With Arm** Test Time: **4:29:29 PM**

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



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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: **Shoulder With Arm** Test Time: **4:29:29 PM**

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





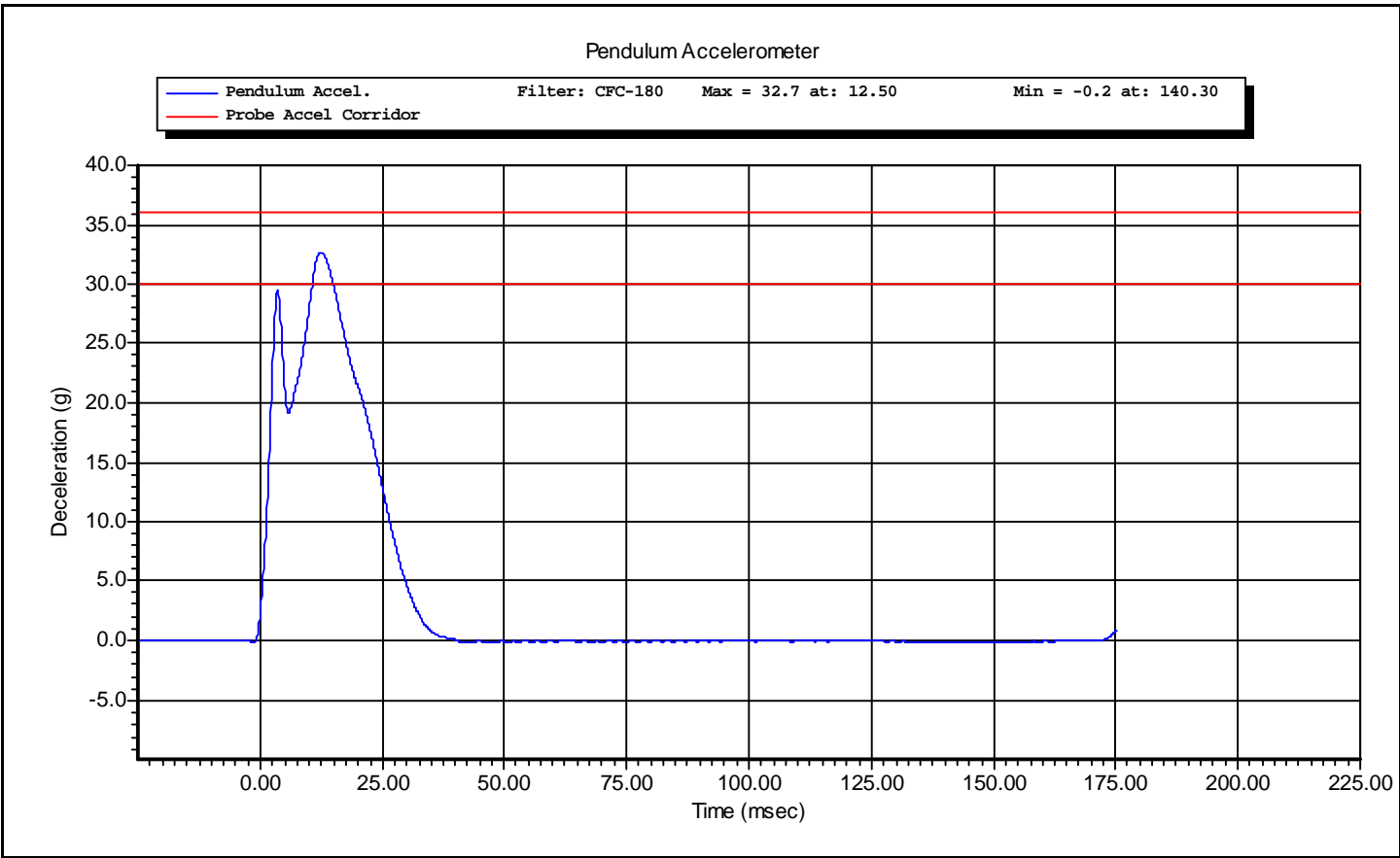
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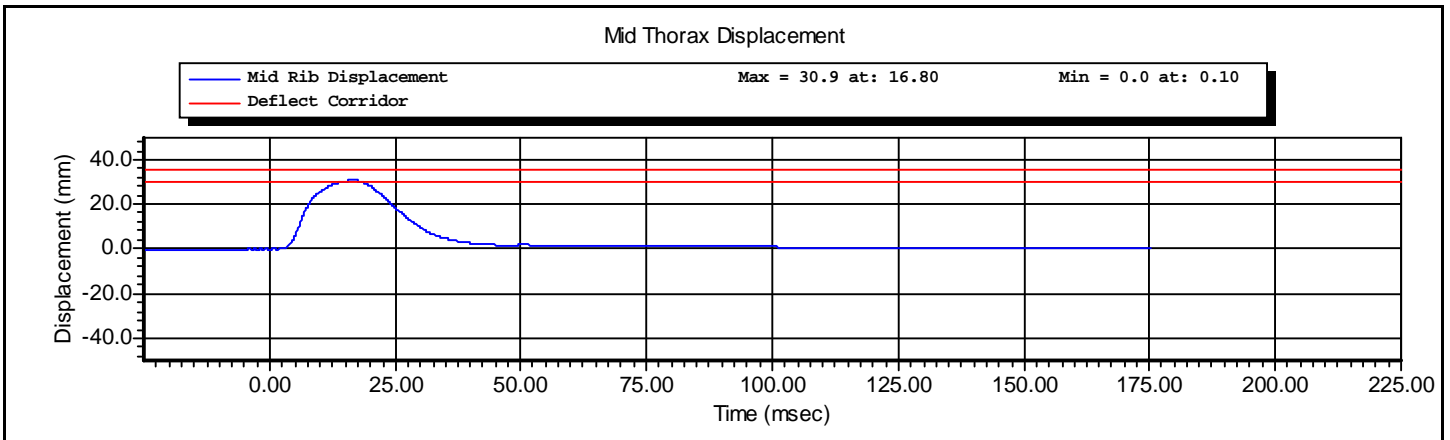
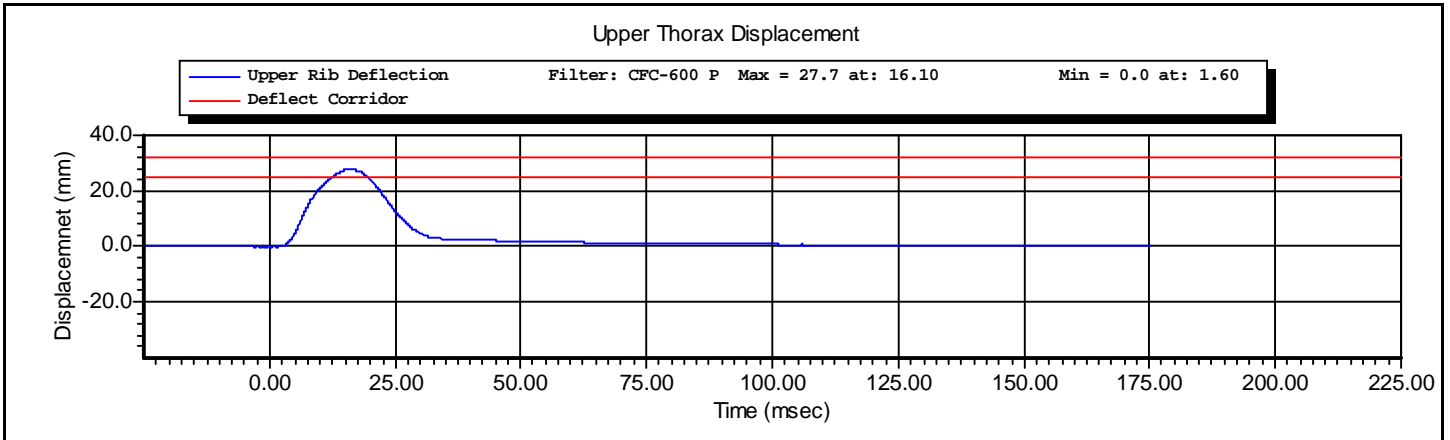
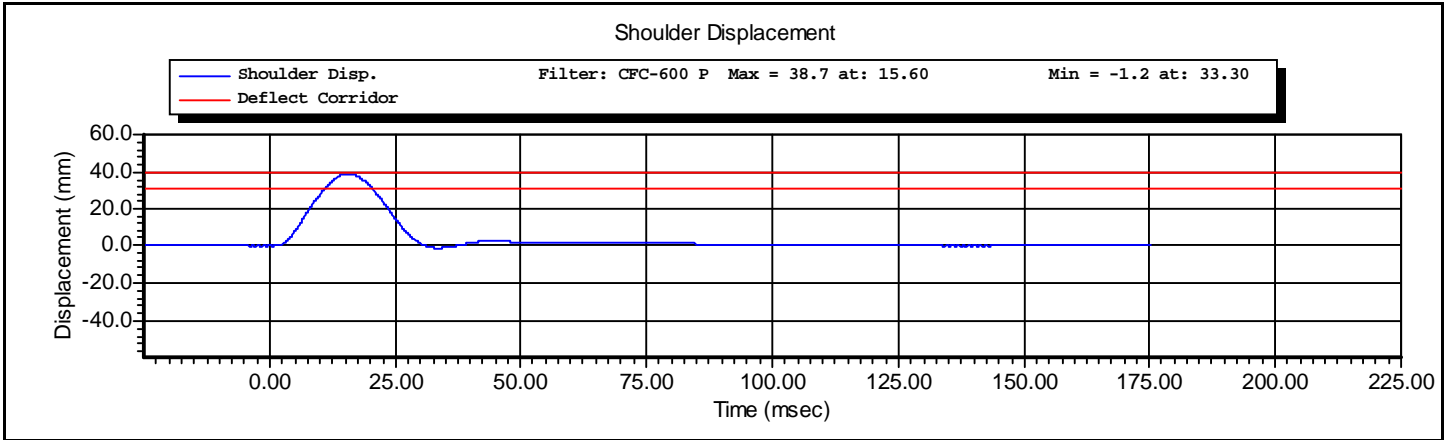
# Calspan - Transportation Research Group

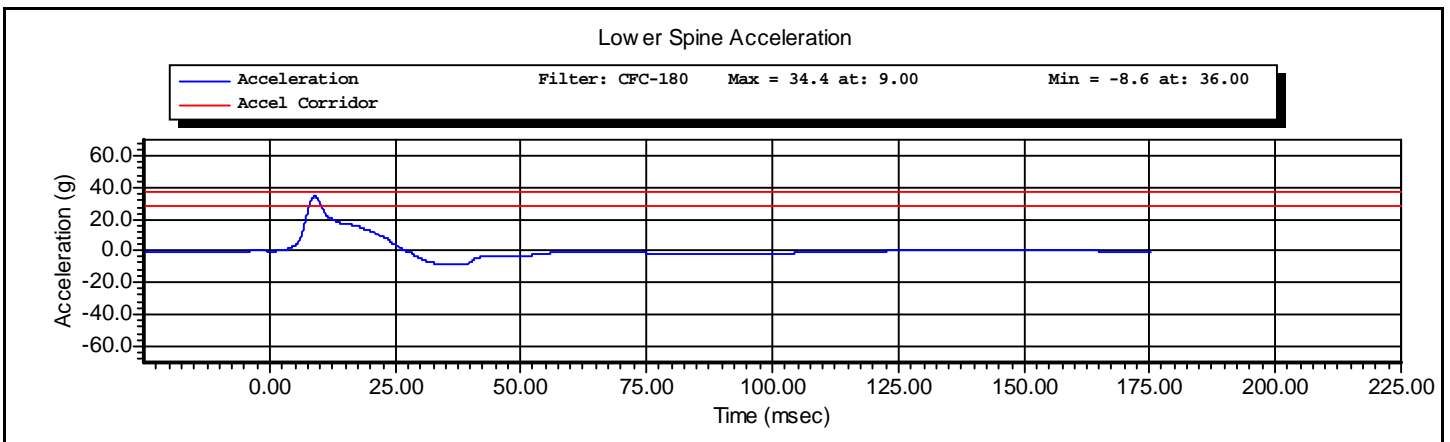
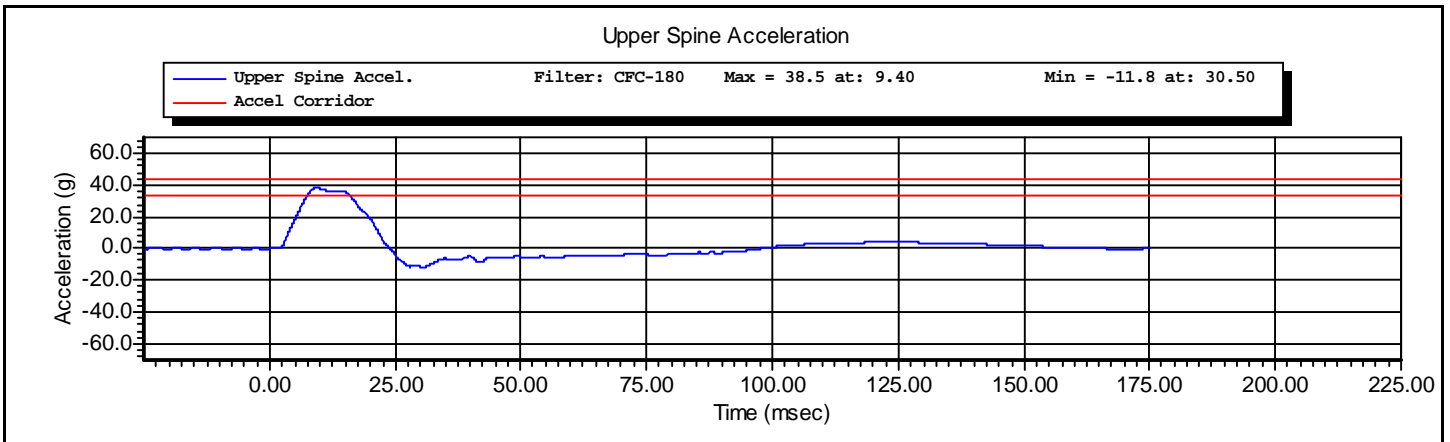
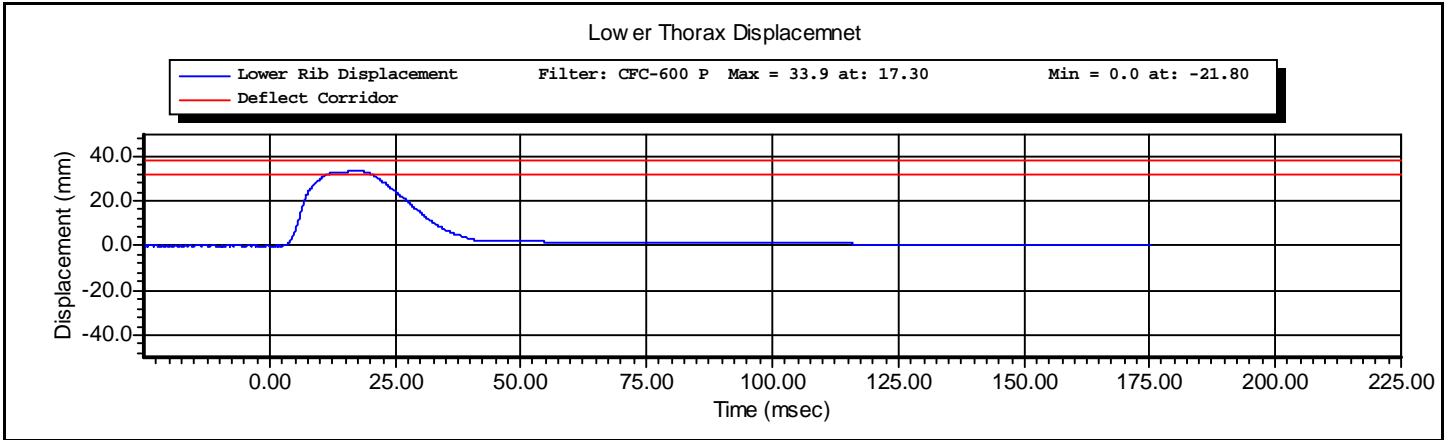
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Test Name:	<b>Thorax Impact with Arm</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Shoulder With Arm</b>	Test Date:	<b>5/5/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>4:29:29 PM</b>

Component Part Number	Component Serial Number
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## VERIFICATION REPORT

Test Name:	<b>Thorax Impact without Arm</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Thx w/o arm</b>	Test Date:	<b>4/28/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>11:51:28 AM</b>

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

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>44</b> %RH P
Velocity	4.20 -- 4.40	<b>4.30</b> m/s P
Probe Acceleration	14.0 -- 18.0	<b>16.6</b> g P
Upper Thorax Rib Deflection	32.0 -- 40.0	<b>34.6</b> mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	<b>39.0</b> mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	<b>37.3</b> mm P
Upper Spine Acceleration T1	13.0 -- 17.0	<b>16.1</b> g P
Lower Spine Acceleration T12	7.0 -- 11.0	<b>10.2</b> g P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_

Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

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

Test Time: **11:51:28 AM**

Test Date: **4/28/2010**



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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: **11:51:28 AM**

Test Date: **4/28/2010**



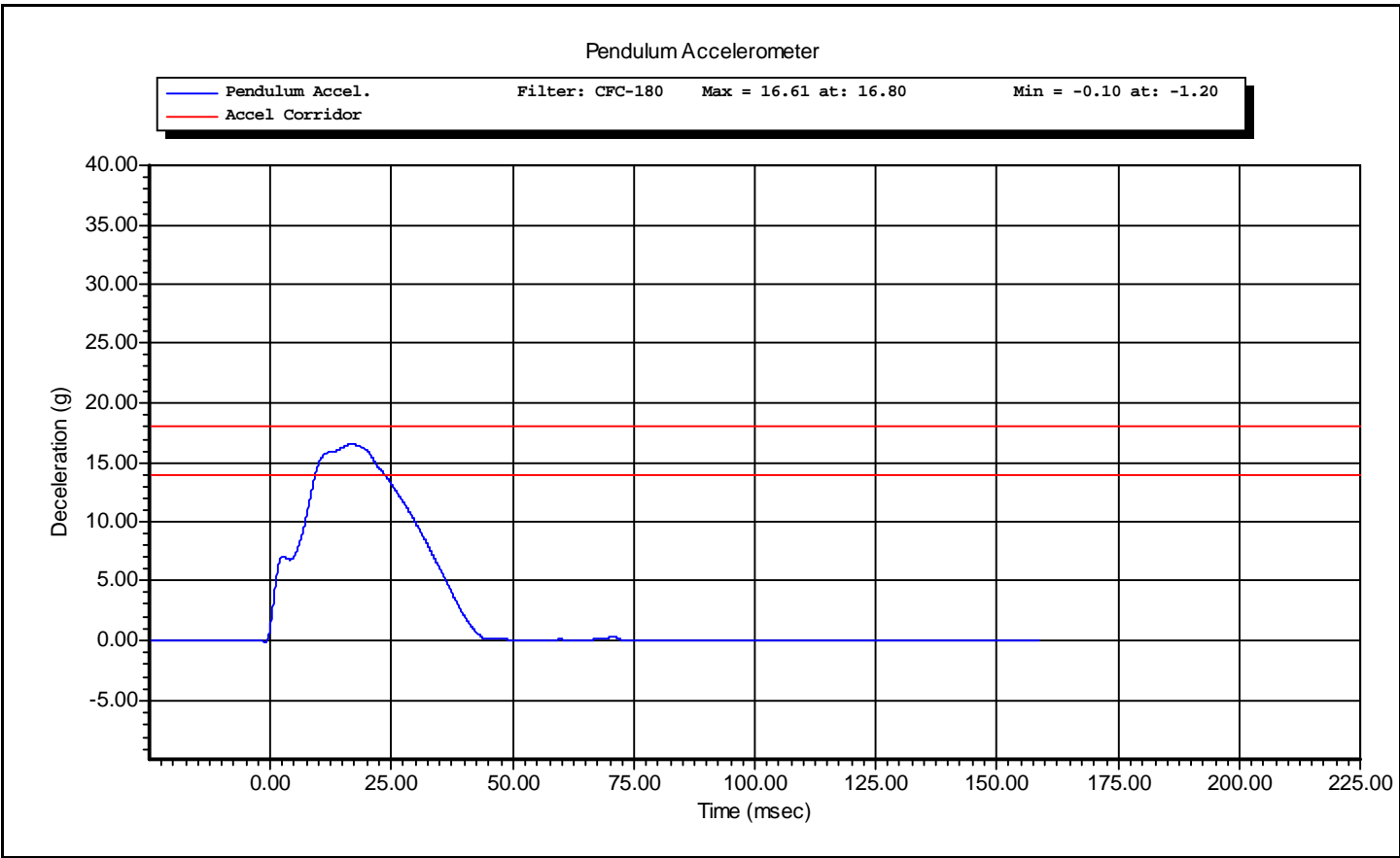
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Test Name:	<b>Thorax Impact without Arm</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Thx w/o arm</b>	Test Date:	<b>4/28/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>11:51:28 AM</b>

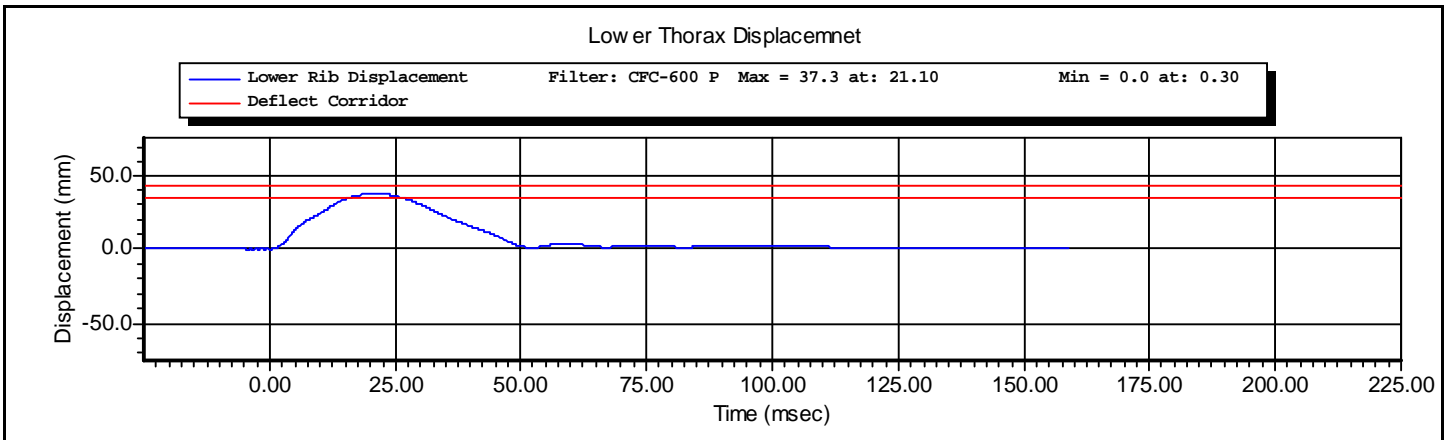
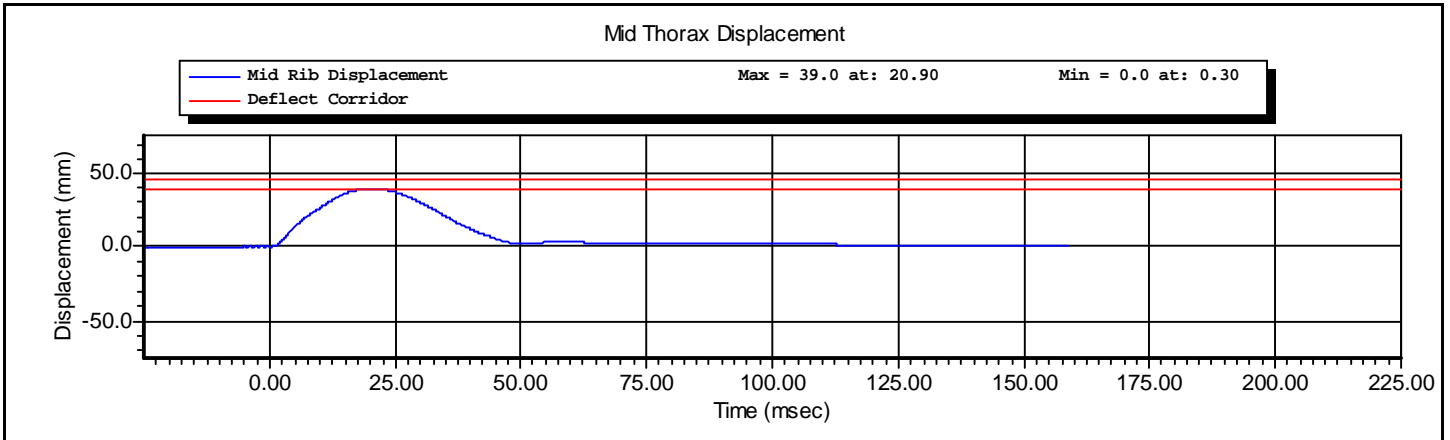
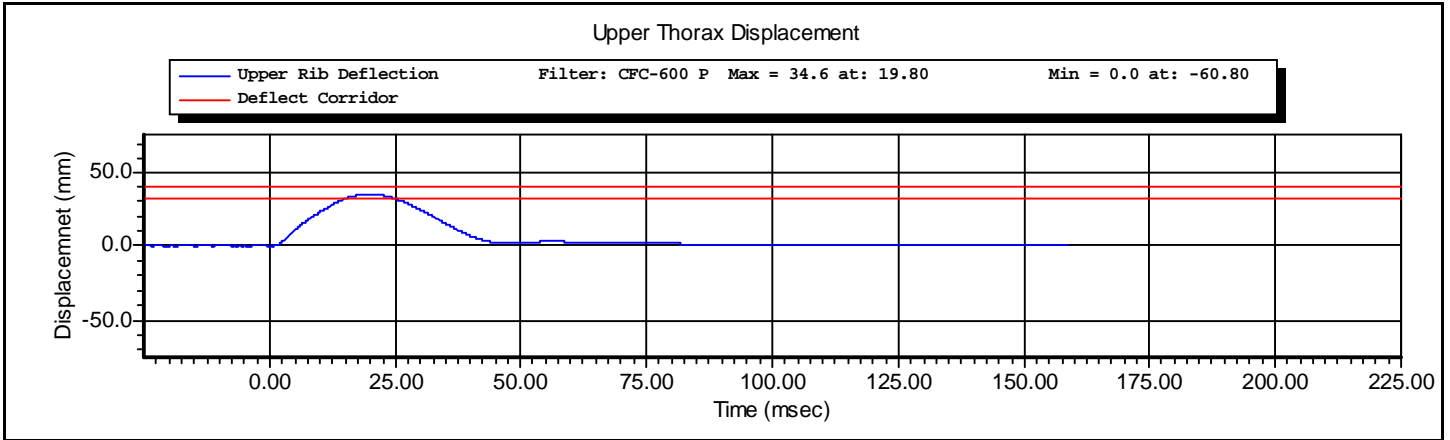
Component Part Number	Component Serial Number
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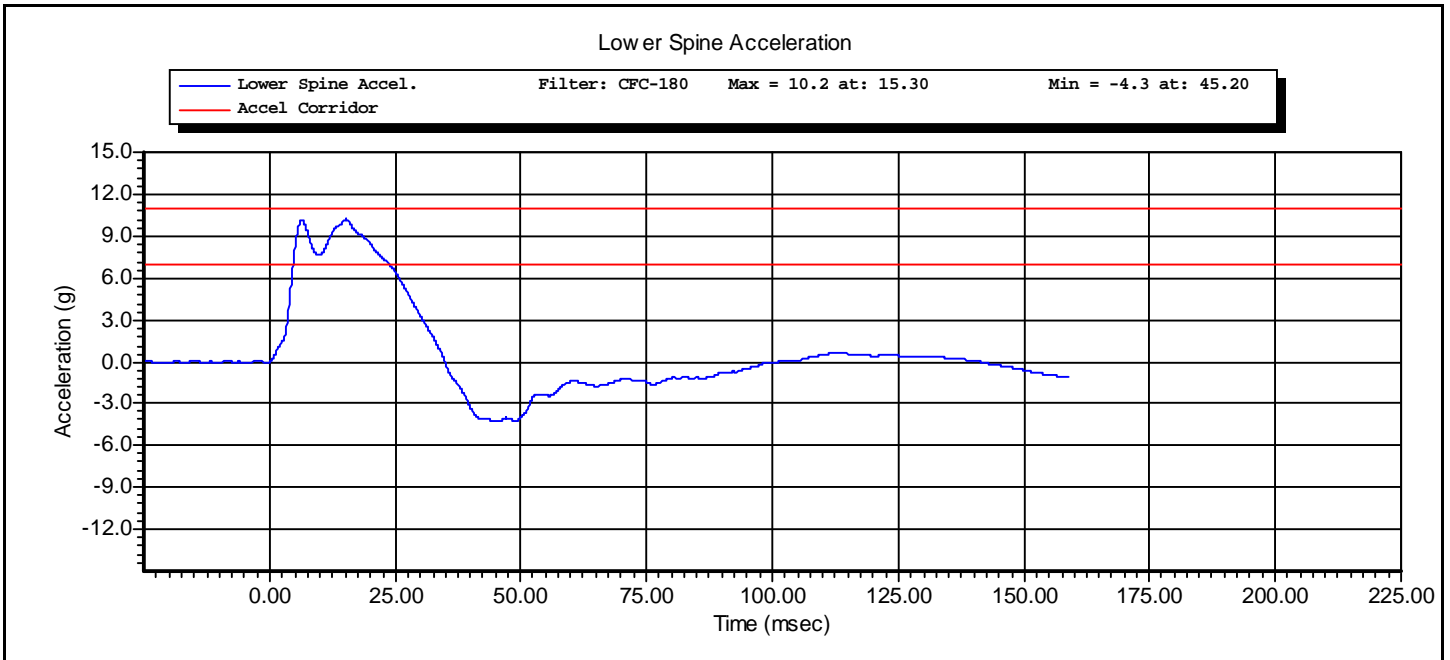
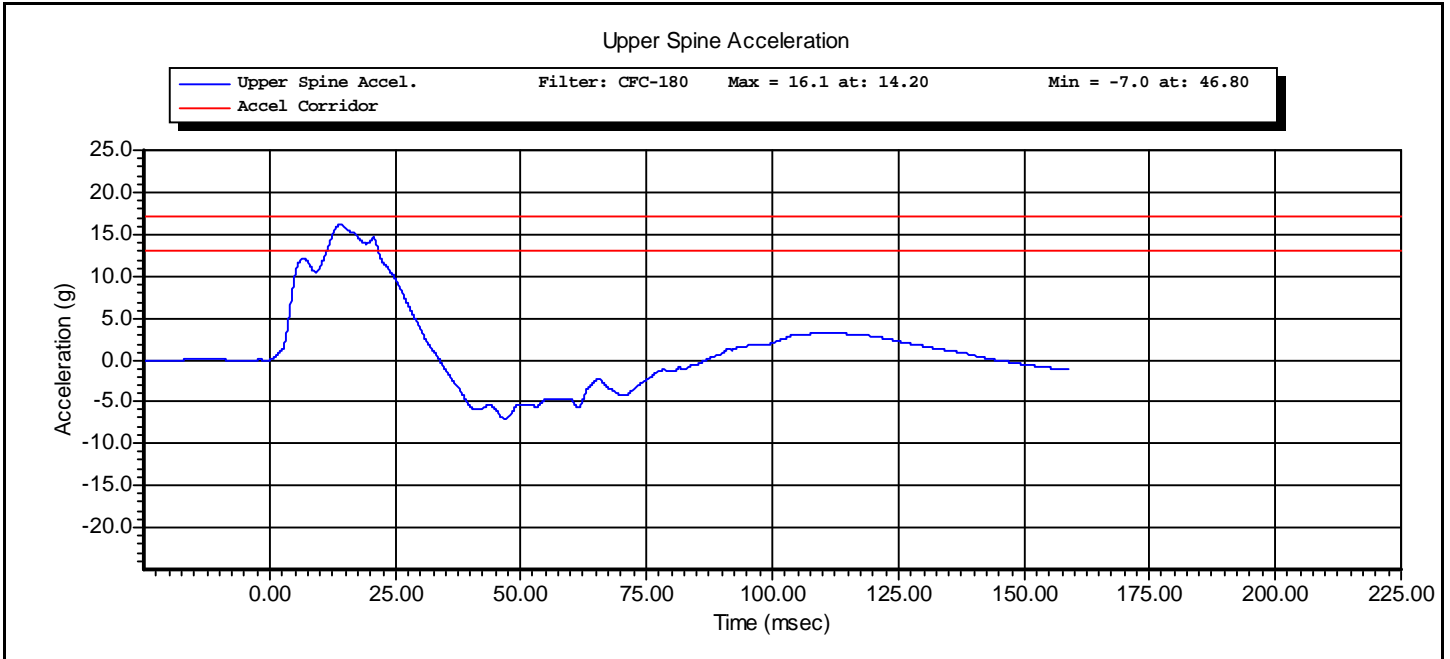


Test ID: **Thx w/o arm**

Test Time: **11:51:28 AM**

Test Date: **4/28/2010**









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## VERIFICATION REPORT

Test Name:	<b>Abdominal Impact</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Abdominal Impact</b>	Test Date:	<b>5/5/2010</b>
Test Number:	<b>4</b>	Test Time:	<b>3:11:10 PM</b>

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

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>46</b> %RH P
Velocity	4.20 -- 4.40	<b>4.39</b> m/s P
Probe Acceleration	12.0 -- 16.0	<b>14.4</b> g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	<b>36.1</b> mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	<b>34.9</b> mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	<b>12.0</b> g P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_  
 Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Abdominal Impact**      Test Time: **3:11:10 PM**      Test Date: **5/5/2010**



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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: **3:11:10 PM**

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



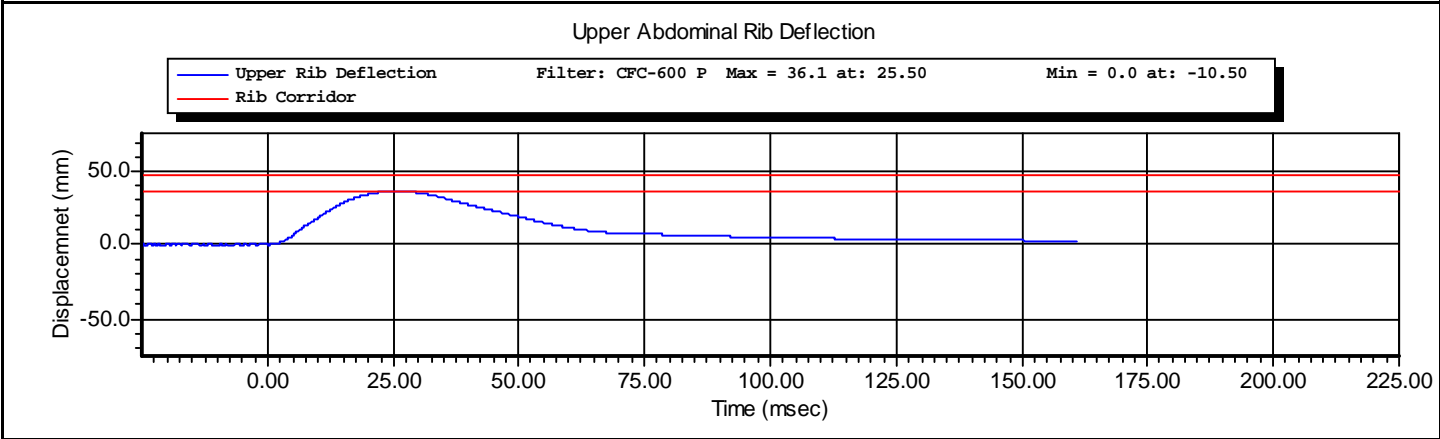
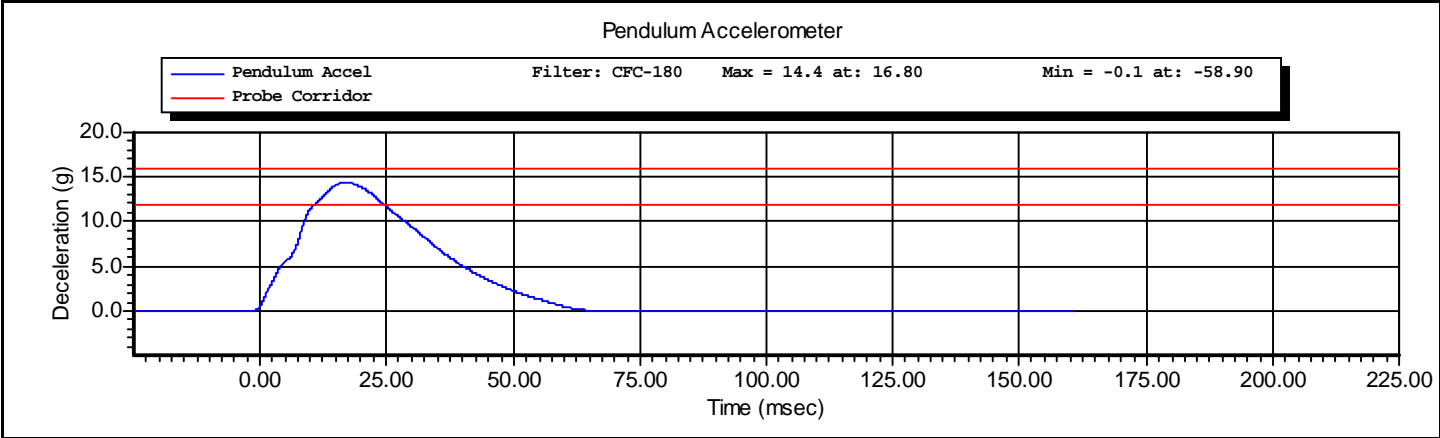
www.calspan.com

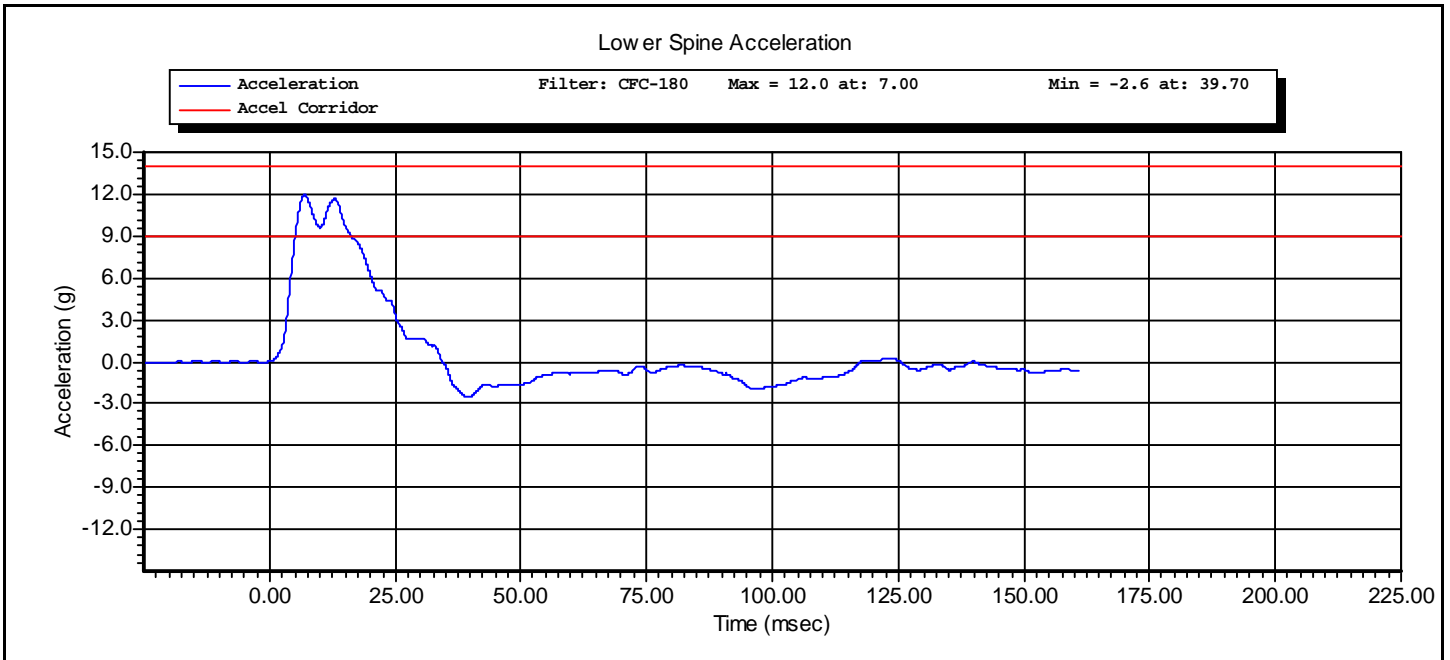
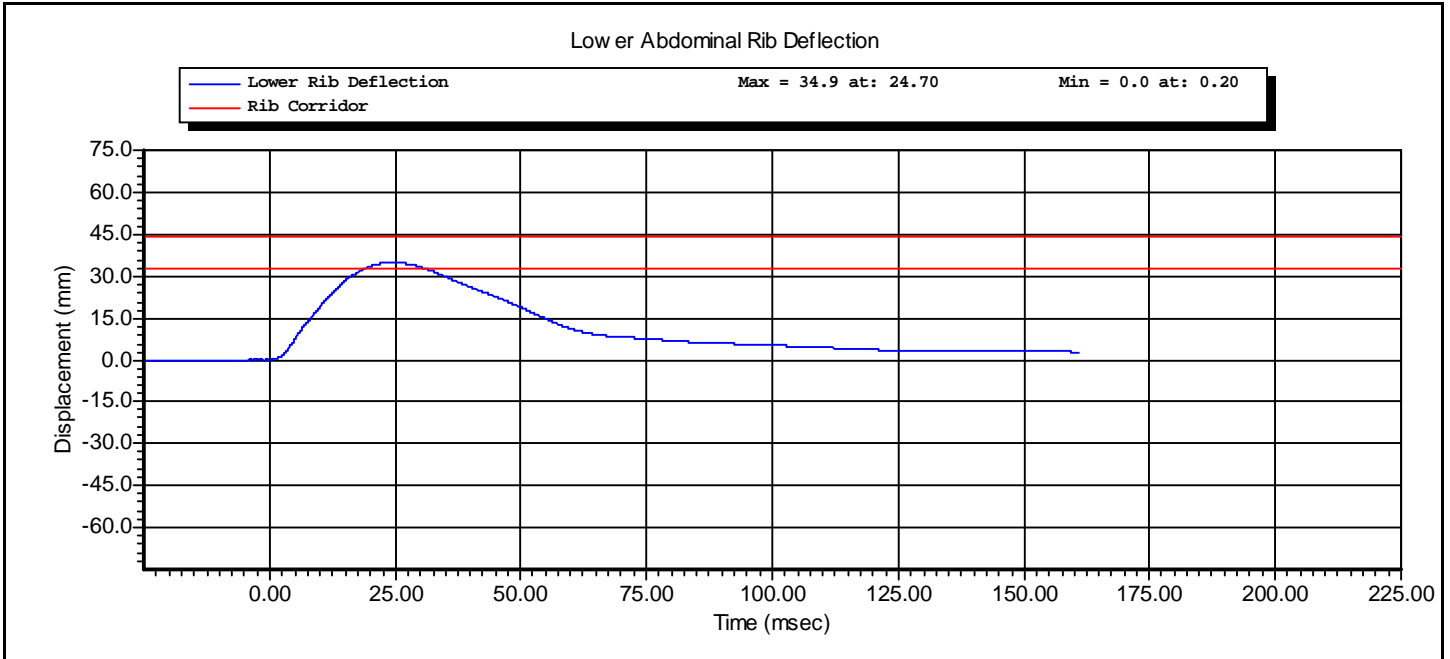
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Test Name:	<b>Abdominal Impact</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Abdominal Impact</b>	Test Date:	<b>5/5/2010</b>
Test Number:	<b>4</b>	Test Time:	<b>3:11:10 PM</b>

Component Part Number	Component Serial Number
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## VERIFICATION REPORT

Test Name:	<b>Pelvis</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Acetabulum Impact</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Acetabulum</b>	Test Date:	<b>5/6/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:48:03 AM</b>

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

Comments:  
Pelvis Plug FTSS SN 12806 Used; 1553N

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>58</b> %RH P
Velocity	6.60 -- 6.80	<b>6.68</b> m/s P
Peak Probe Acceleration	38.0 -- 47.0	<b>42.9</b> g P
Peak Pelvis Acceleration	34.0 -- 42.0	<b>36.4</b> g P
Peak Acetabulum Force	3.60 -- 4.30	<b>4.02</b> kN P

All test parameters are within specifications

Technician:     **A. Rudniski**     Signature: \_\_\_\_\_  
Supervisor:     **D. Travale**     Signature: \_\_\_\_\_

Test ID: **Acetabulum**      Test Time: **10:48:03 AM**      Test Date: **5/6/2010**



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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**

Test Time: **10:48:03 AM**

Test Date: **5/6/2010**



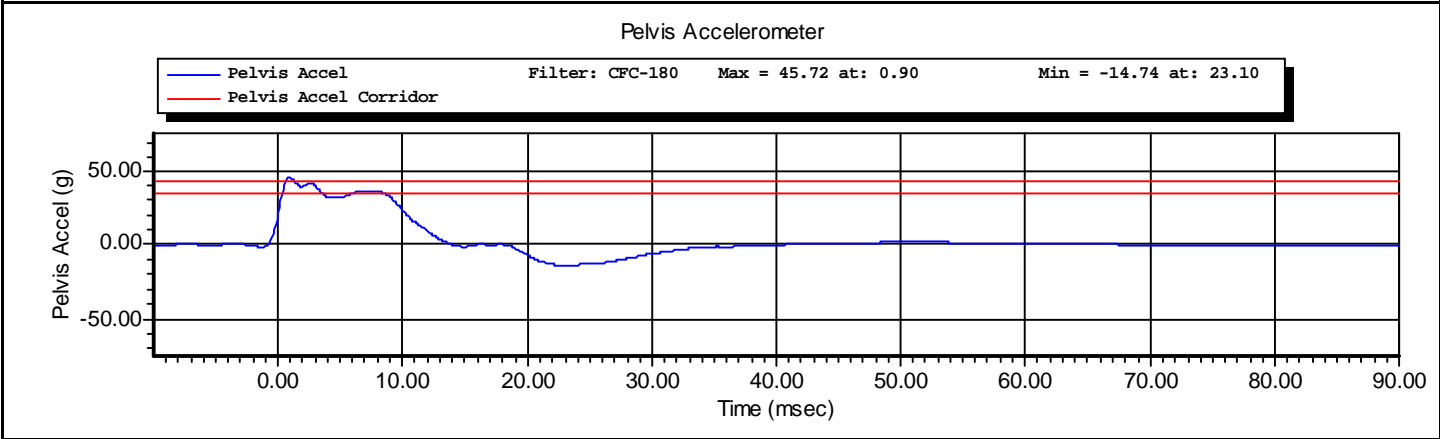
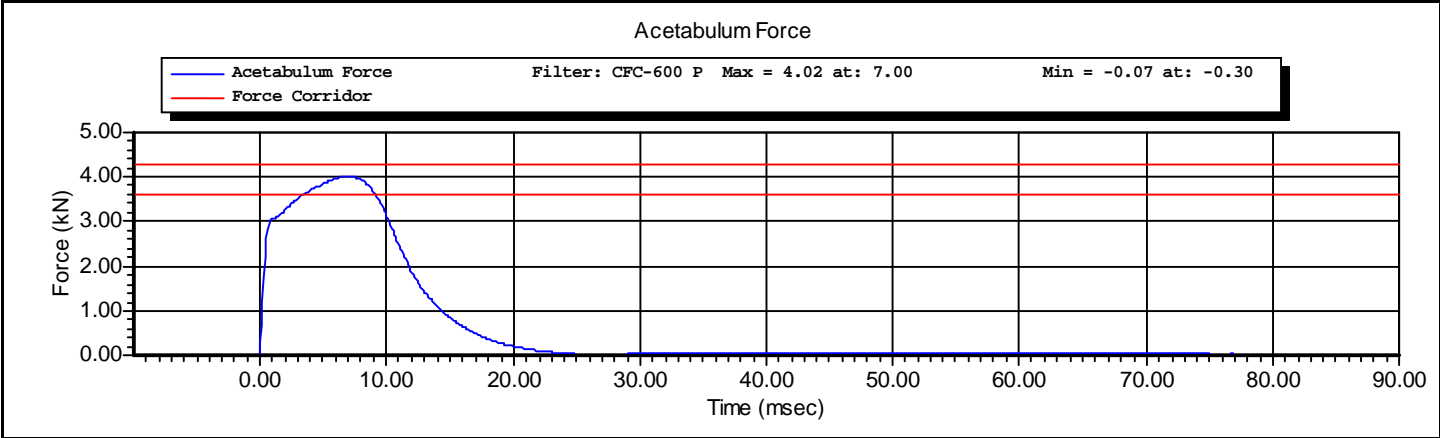
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Test Name:	<b>Pelvis</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Acetabulum Impact</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Acetabulum</b>	Test Date:	<b>5/6/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>10:48:03 AM</b>

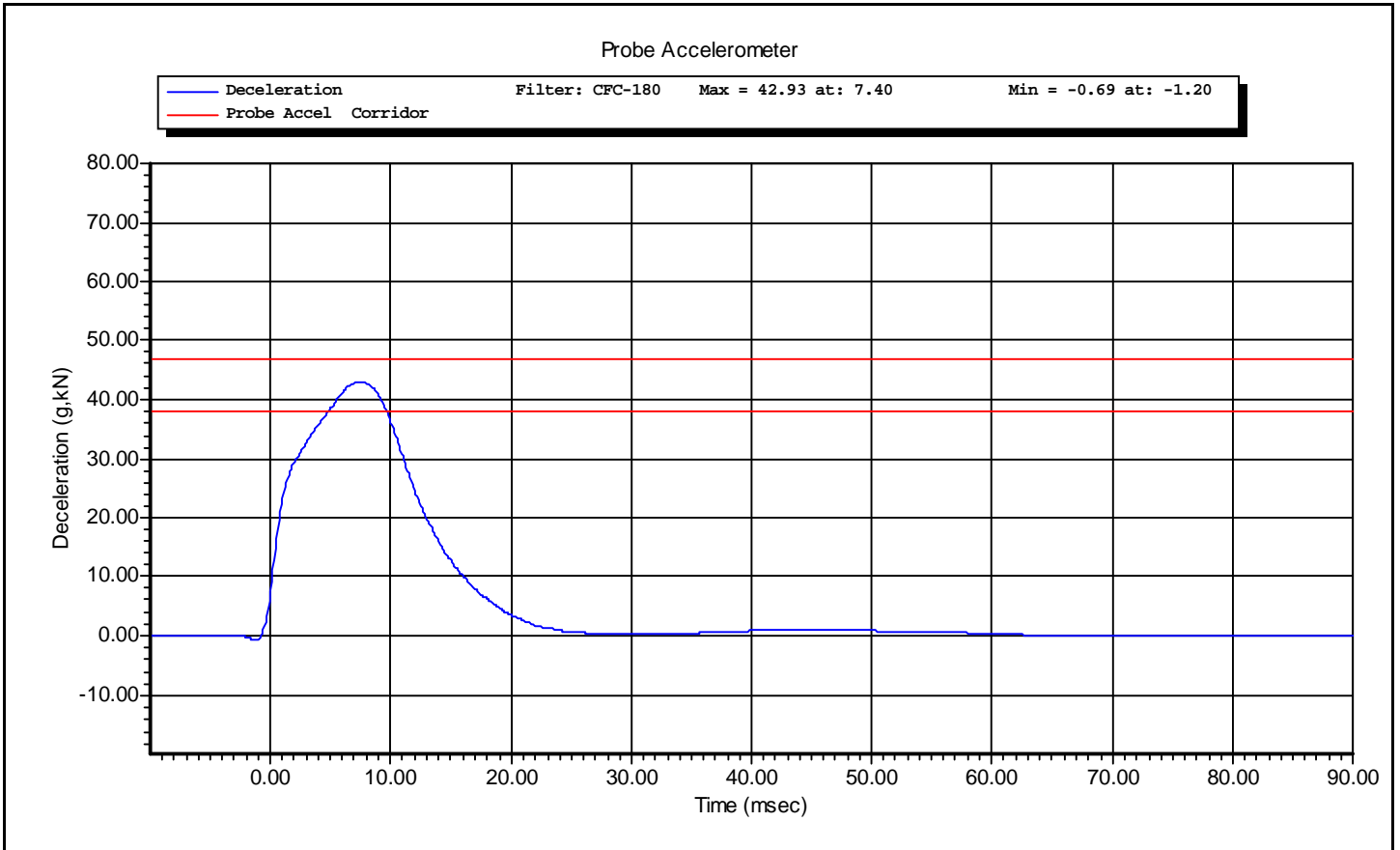
Component Part Number	Component Serial Number
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Test ID: **Acetabulum**

Test Time: **10:48:03 AM**

Test Date: **5/6/2010**







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## VERIFICATION REPORT

Test Name:	<b>Pelvis</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Iliac Impact</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Illiacc</b>	Test Date:	<b>5/7/2010</b>
Test Number:	<b>3</b>	Test Time:	<b>8:55:52 AM</b>

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

Comments:

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>49</b> %RH P
Velocity	4.20 -- 4.40	<b>4.21</b> m/s P
Peak Probe Acceleration	36.0 -- 45.0	<b>42.0</b> g P
Peak Pelvis Acceleration	28.0 -- 39.0	<b>38.6</b> g P
Peak Iliac Force	4.10 -- 5.10	<b>4.82</b> kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: \_\_\_\_\_  
 Supervisor: **D. Travale** Signature: \_\_\_\_\_

Test ID: **Illiacc**

Test Time: **8:55:52 AM**

Test Date: **5/7/2010**



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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**

Test Time: **8:55:52 AM**

Test Date: **5/7/2010**



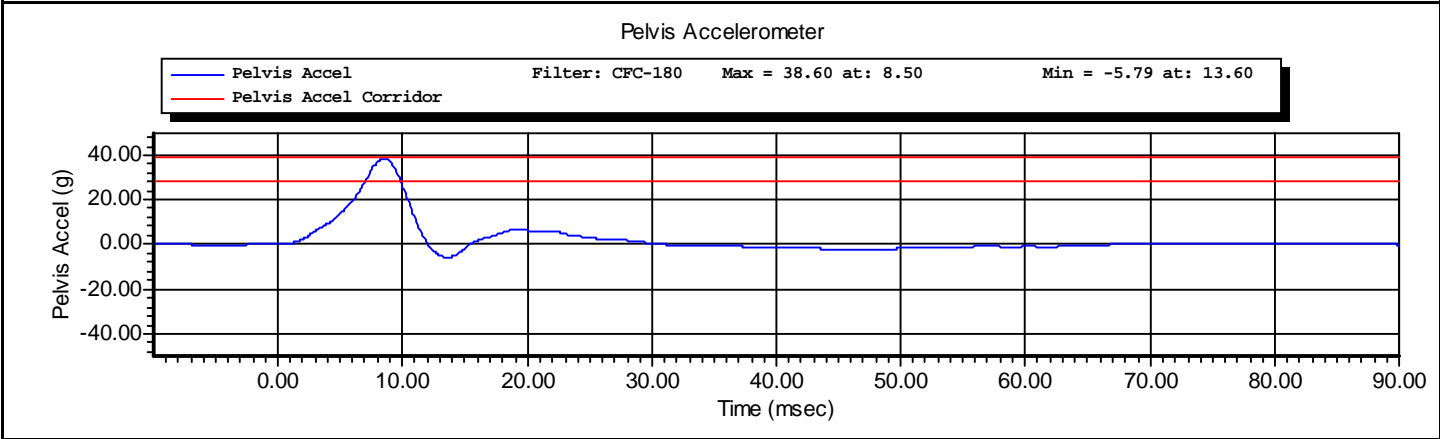
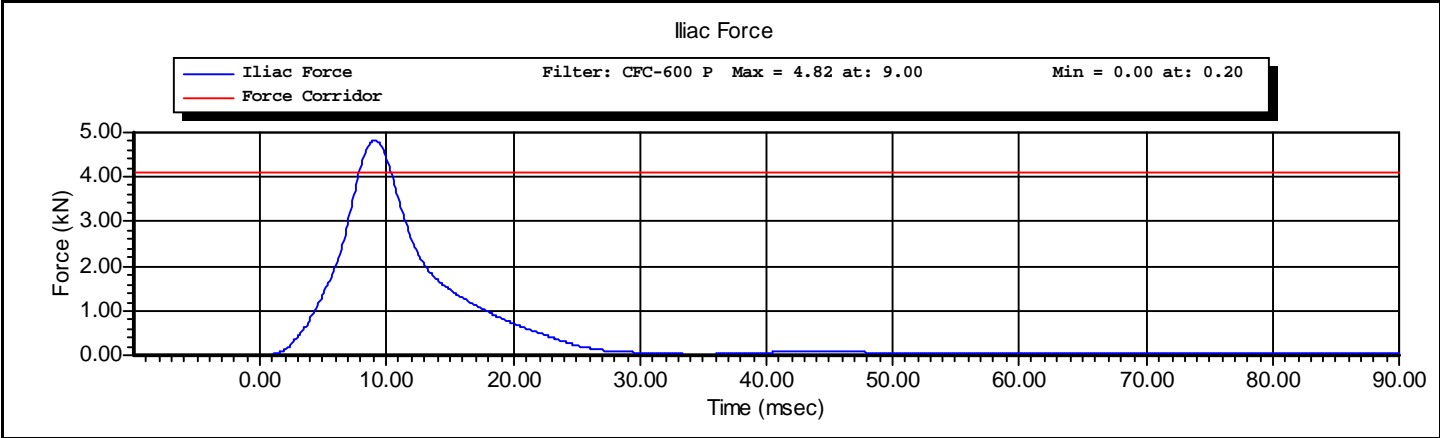
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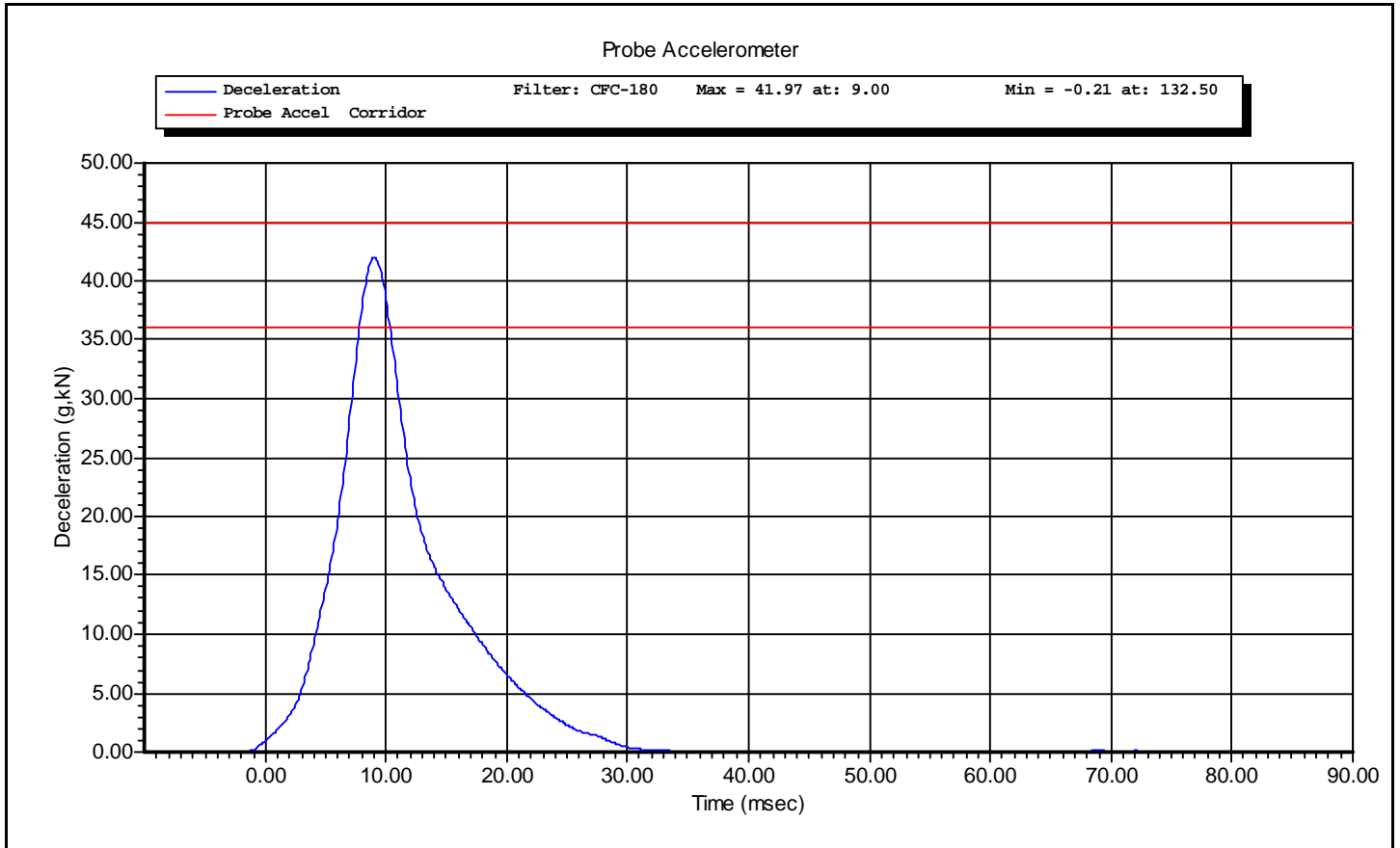
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Test Name:	<b>Pelvis</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Iliac Impact</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Illiacc</b>	Test Date:	<b>5/7/2010</b>
Test Number:	<b>3</b>	Test Time:	<b>8:55:52 AM</b>

Component Part Number	Component Serial Number
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**CALIBRATION TEST RESULTS**

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

Component Part Number	Component Serial Number
<b>Head Skin - FTSS 880105-106</b>	<b>1105</b>

Comments:

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

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

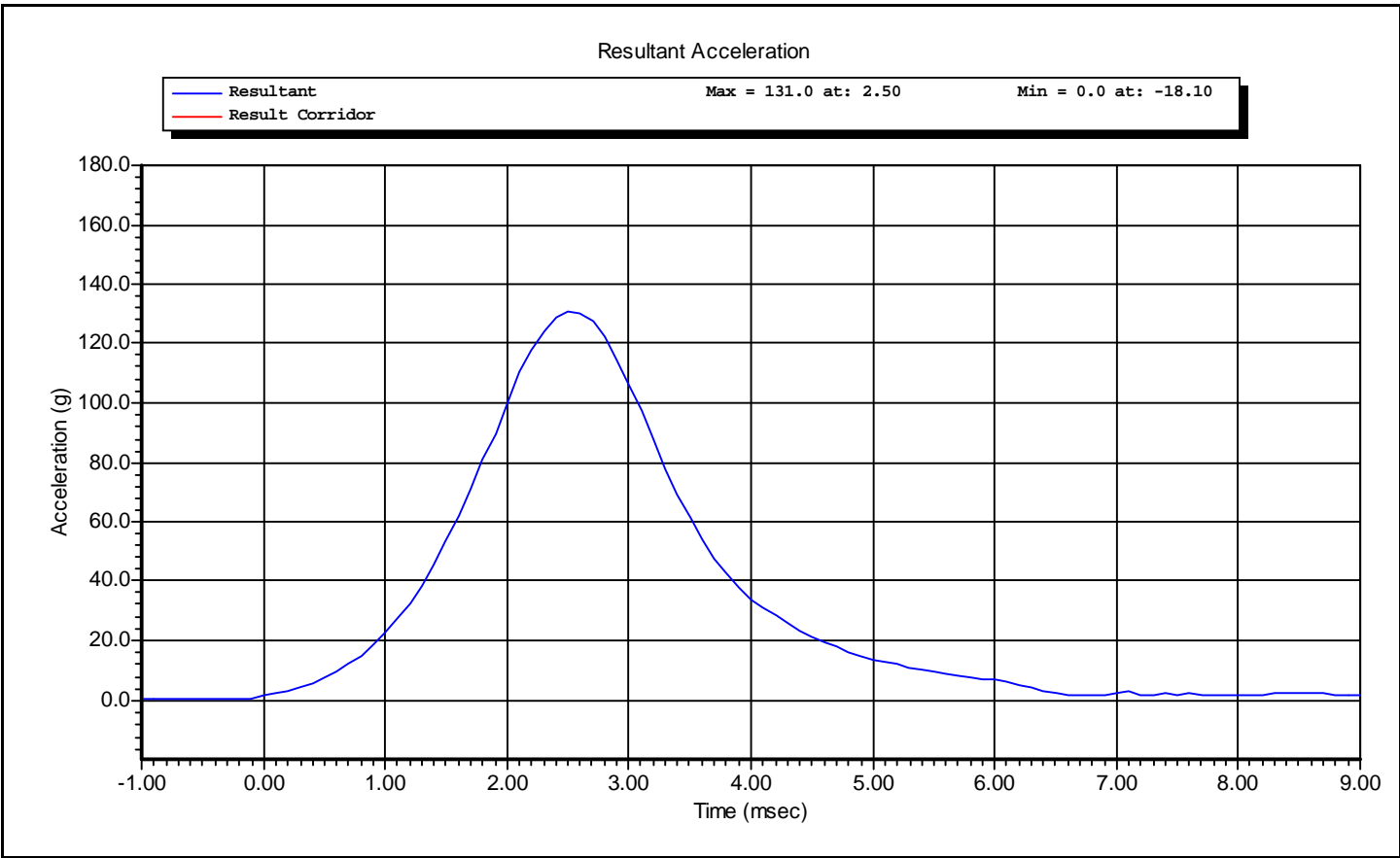
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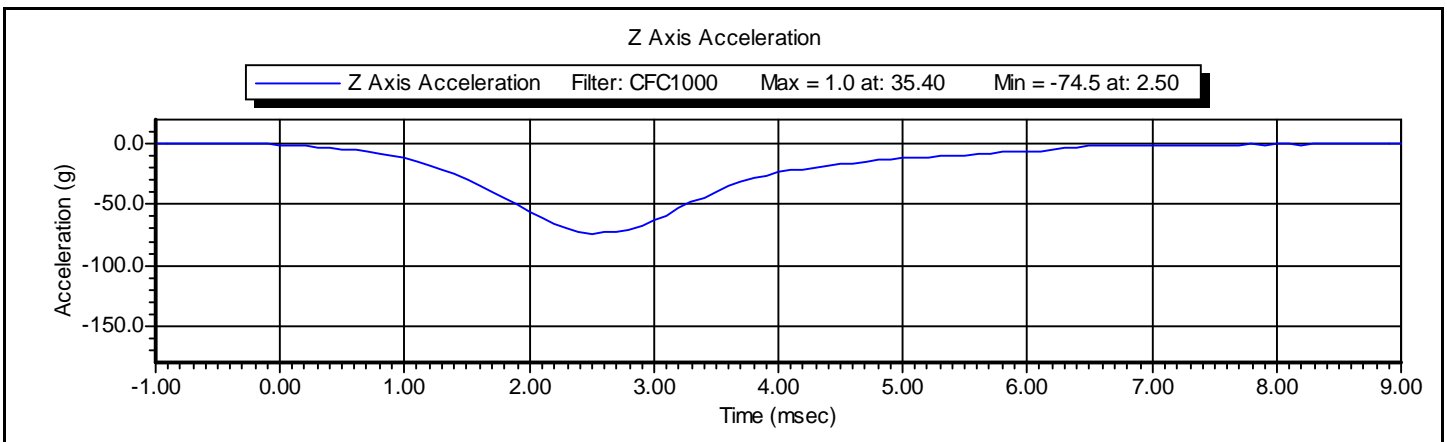
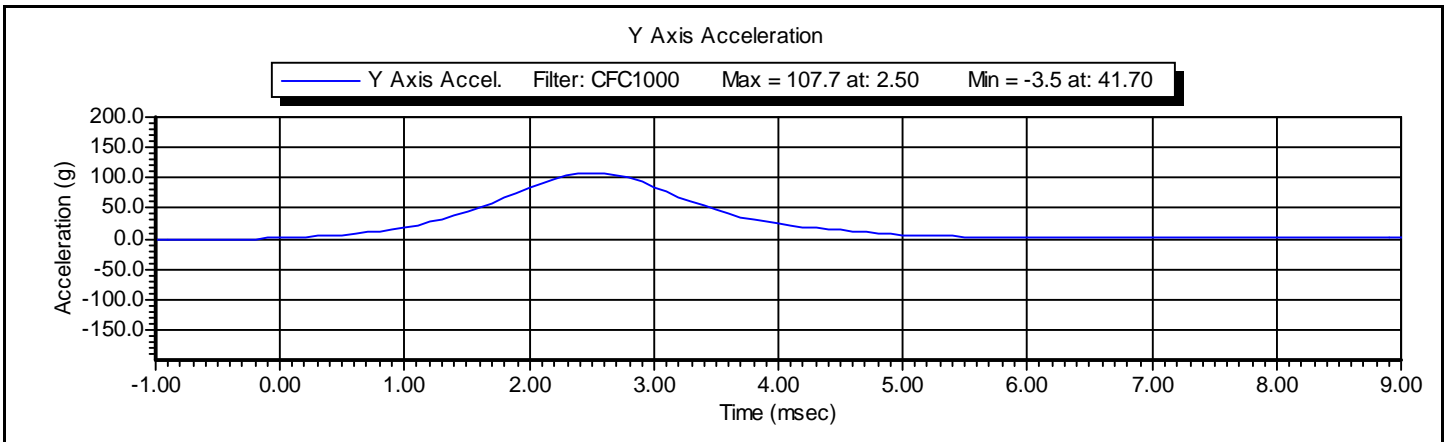
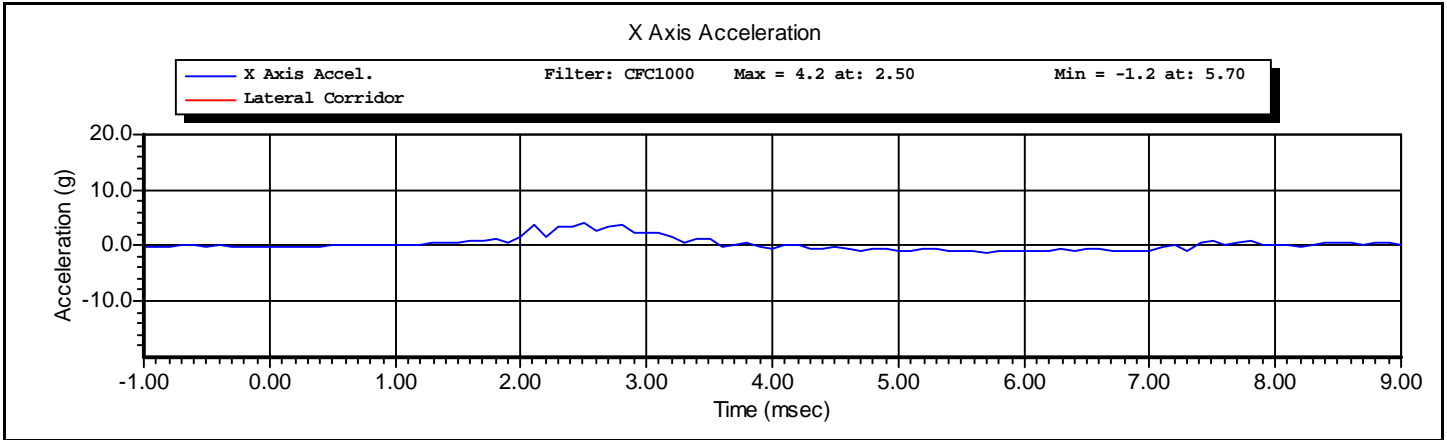




Test Name:	<b>Head Drop</b>	Revision:	<b>12/14/2006</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Head Drop</b>	Test Date:	<b>5/19/2010</b>
Test Number:	<b>1</b>	Test Time:	<b>3:59:26 PM</b>

Component Part Number	Component Serial Number
<b>Head Skin - FTSS 880105-106</b>	<b>1105</b>







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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
<b>FTSS Neck - 180-2001</b>	<b>AB8236</b>

Comments:

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



**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**



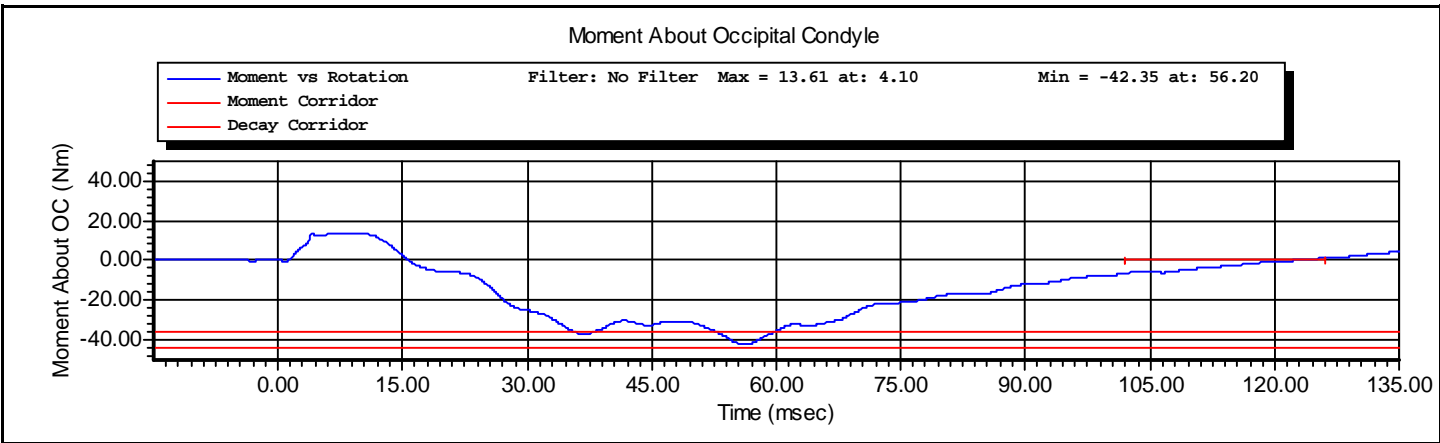
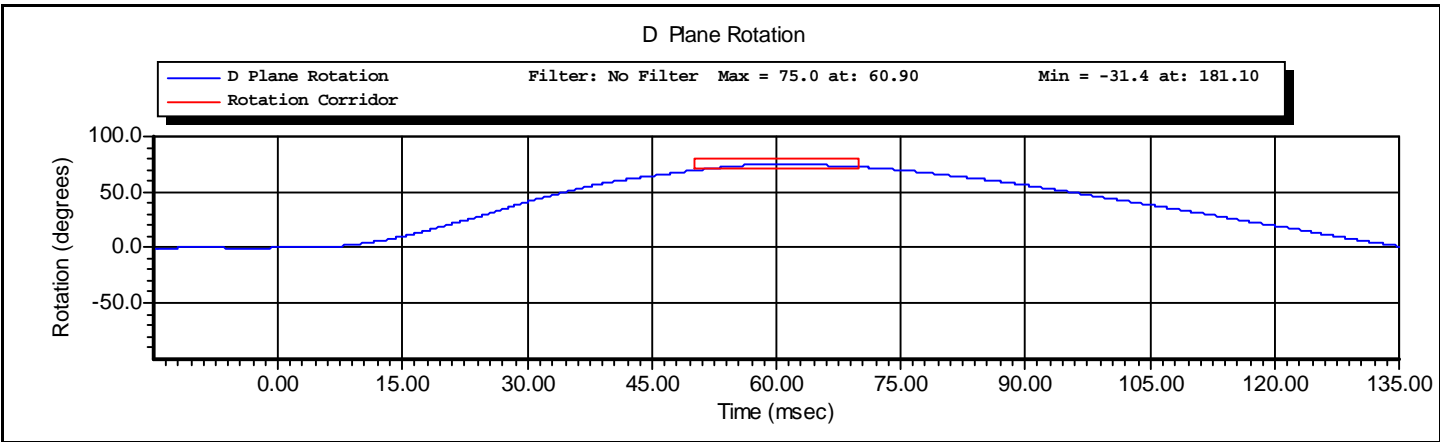
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Test Name:	<b>Neck Pendulum</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Left Side</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Left Side</b>	Test Date:	<b>5/21/2010</b>
Test Number:	<b>1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

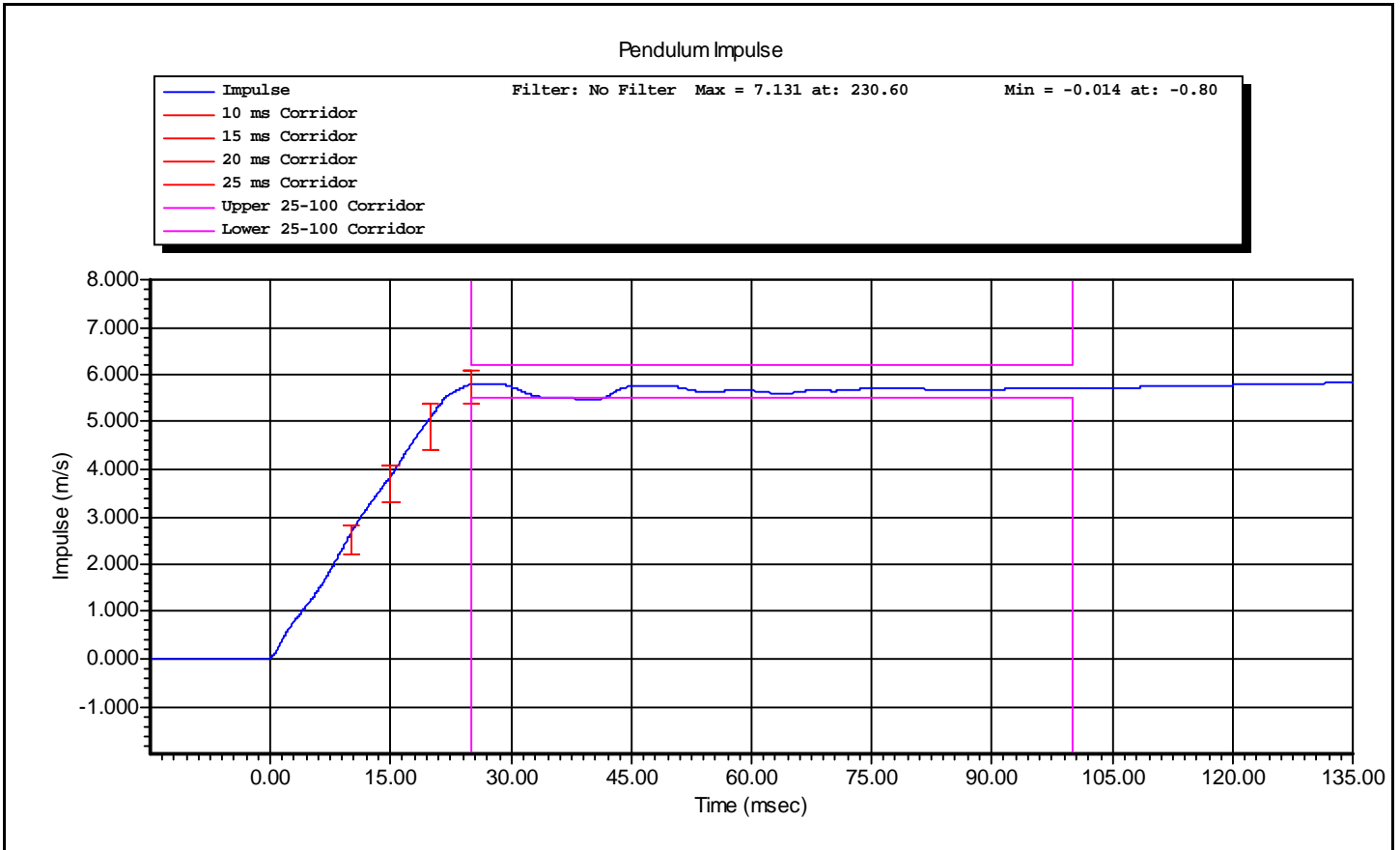
Component Part Number	Component Serial Number
<b>FTSS Neck - 180-2001</b>	<b>AB8236</b>



Test ID: **Left Side**

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

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





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## VERIFICATION REPORT

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

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

Comments:

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





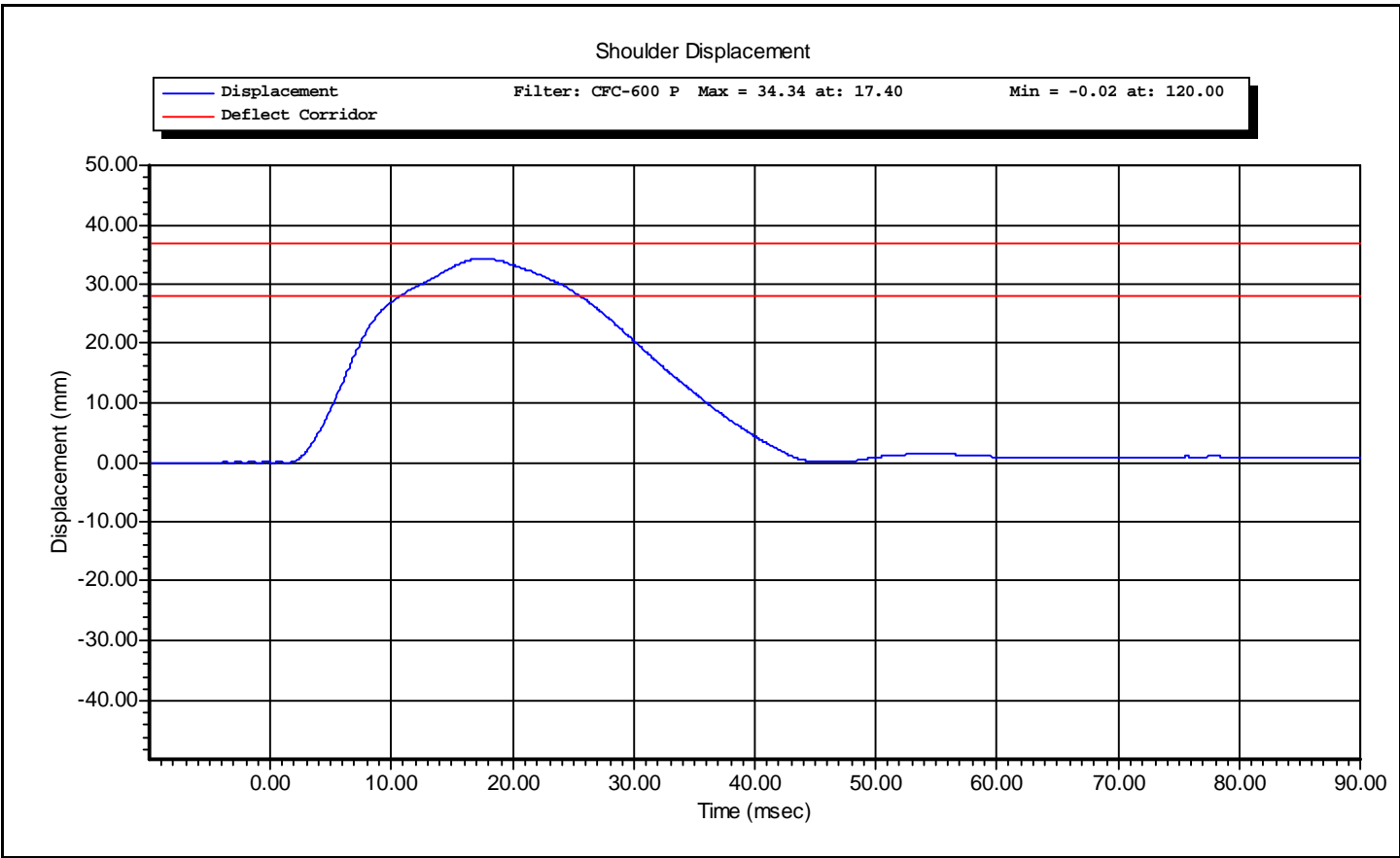
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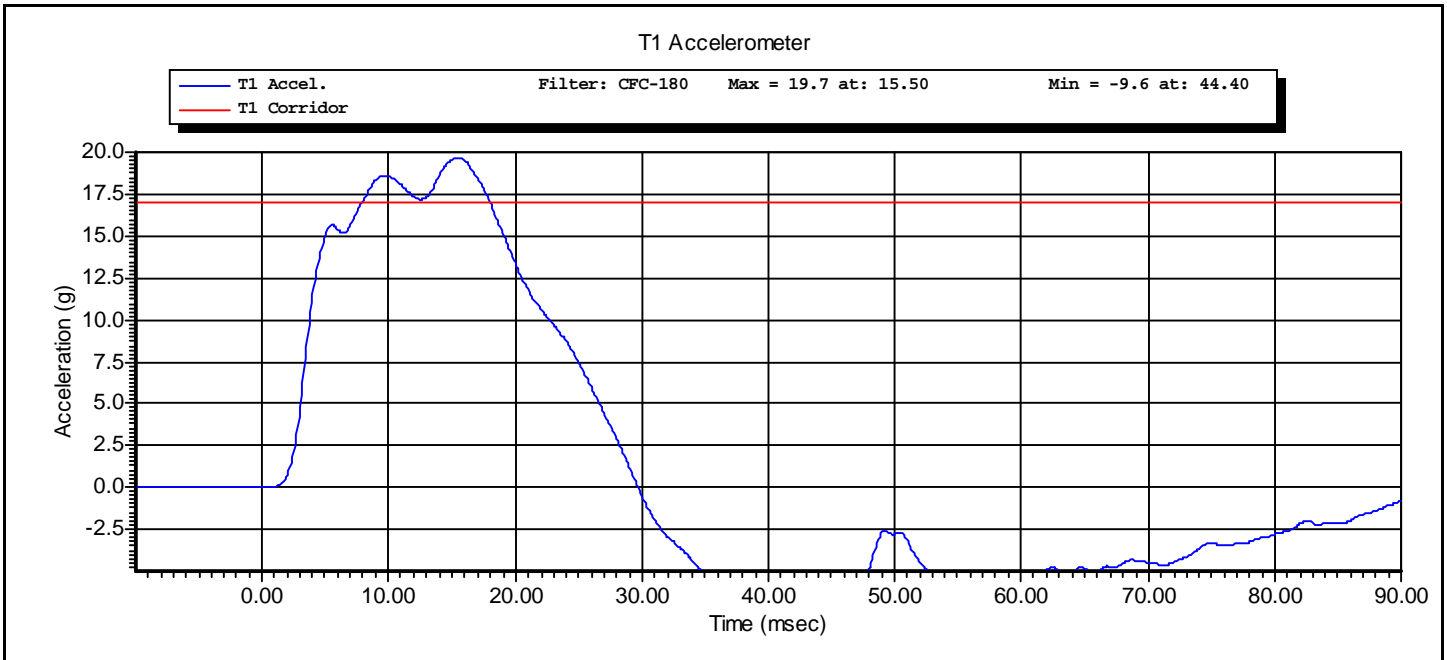
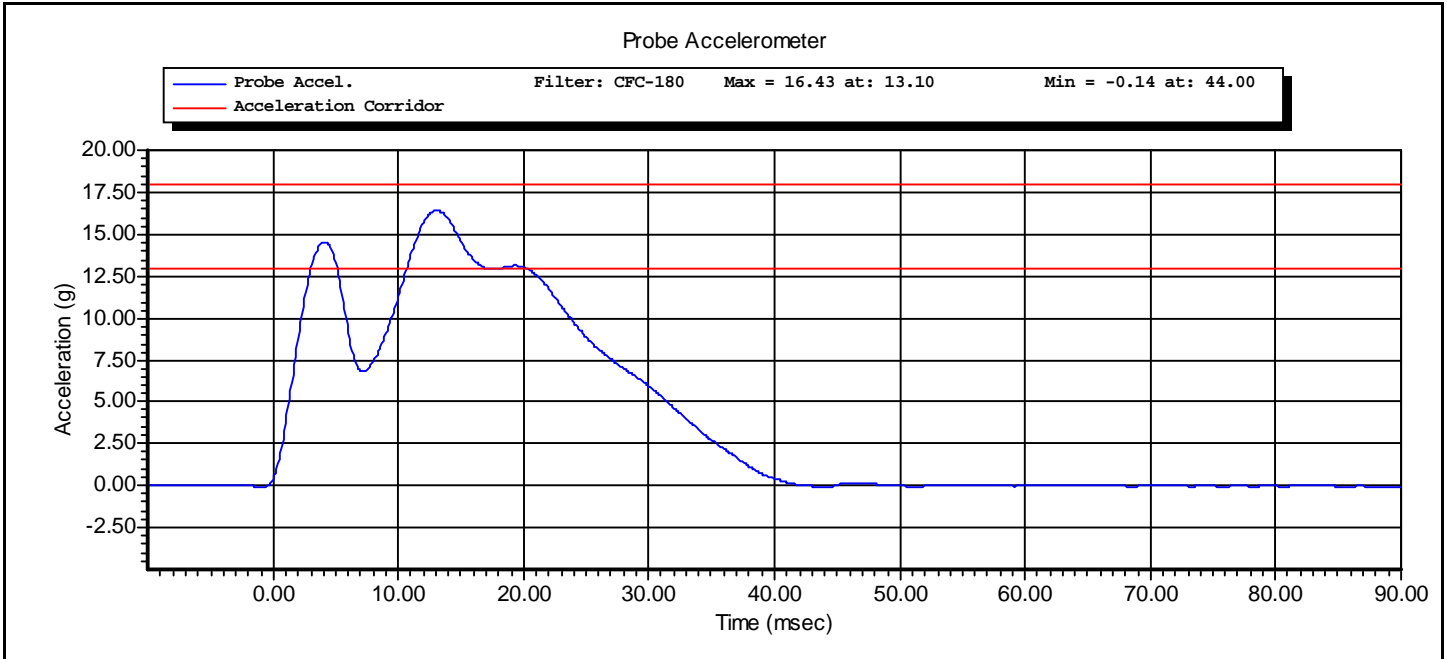
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Test Name:	<b>Shoulder Impact</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Shoulder</b>	Test Date:	<b>5/18/2010</b>
Test Number:	<b>1</b>	Test Time: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

Component Part Number	Component Serial Number
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## VERIFICATION REPORT

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

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

Comments:

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



**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**



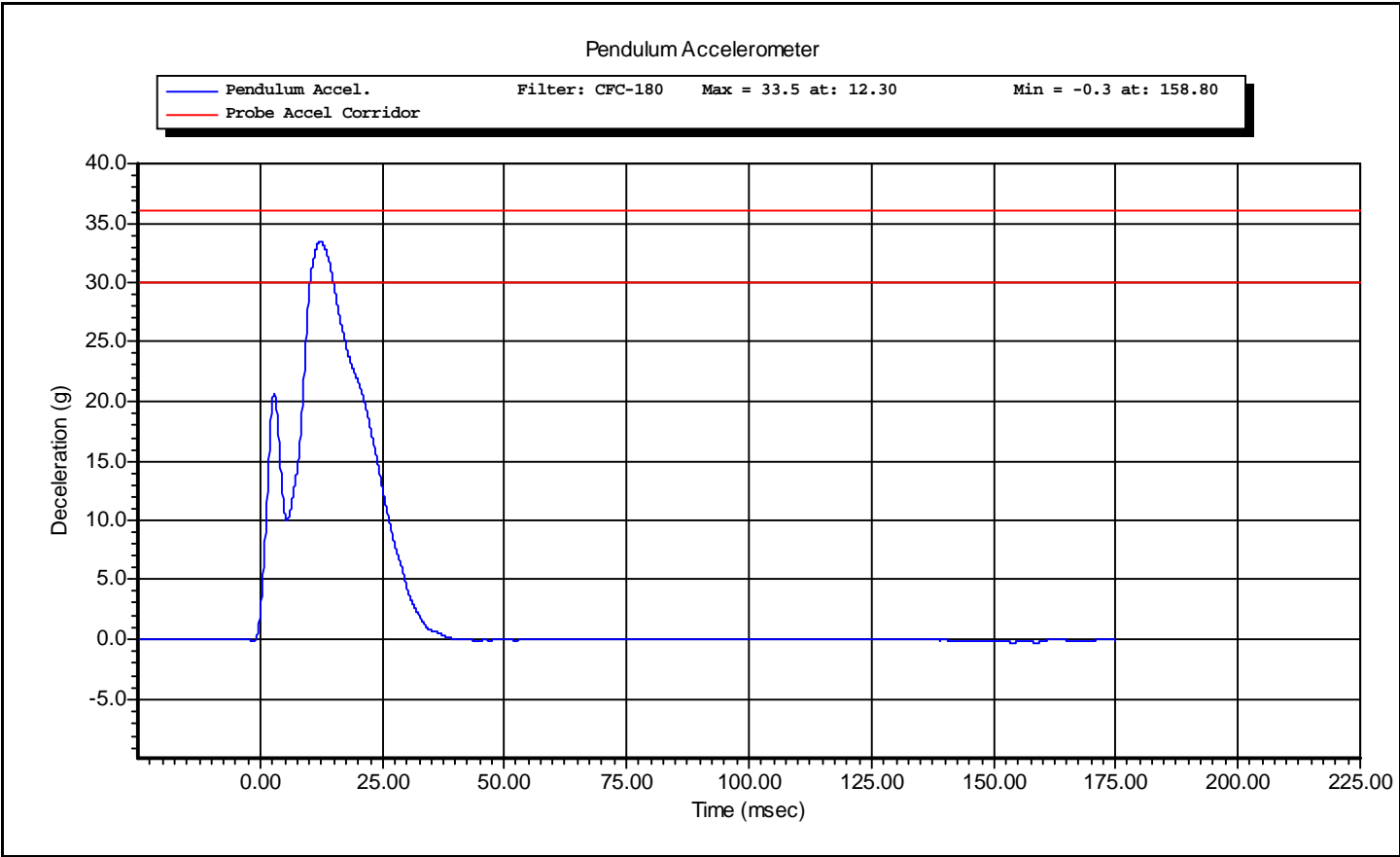
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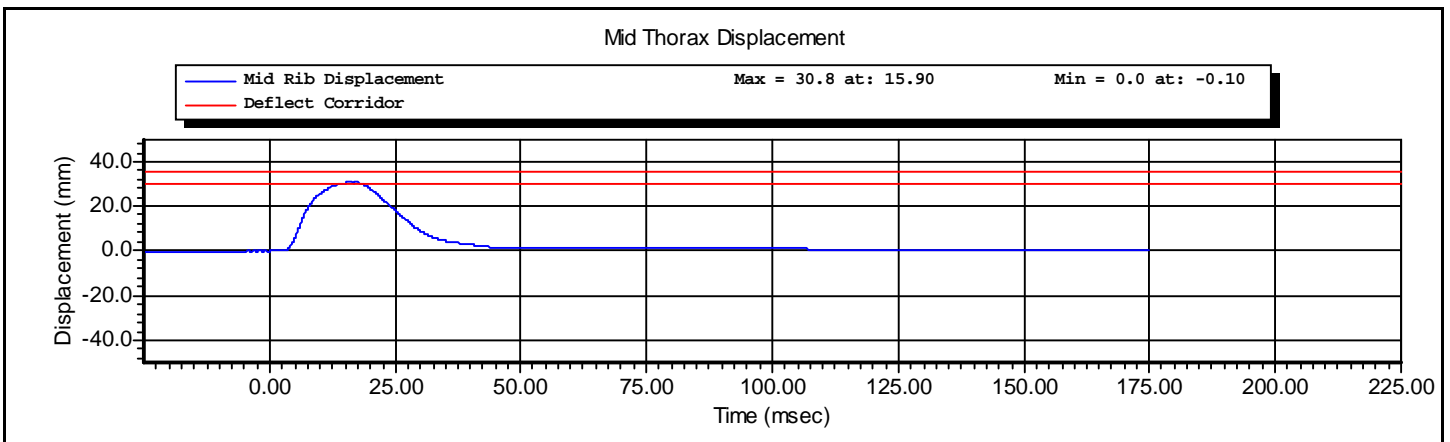
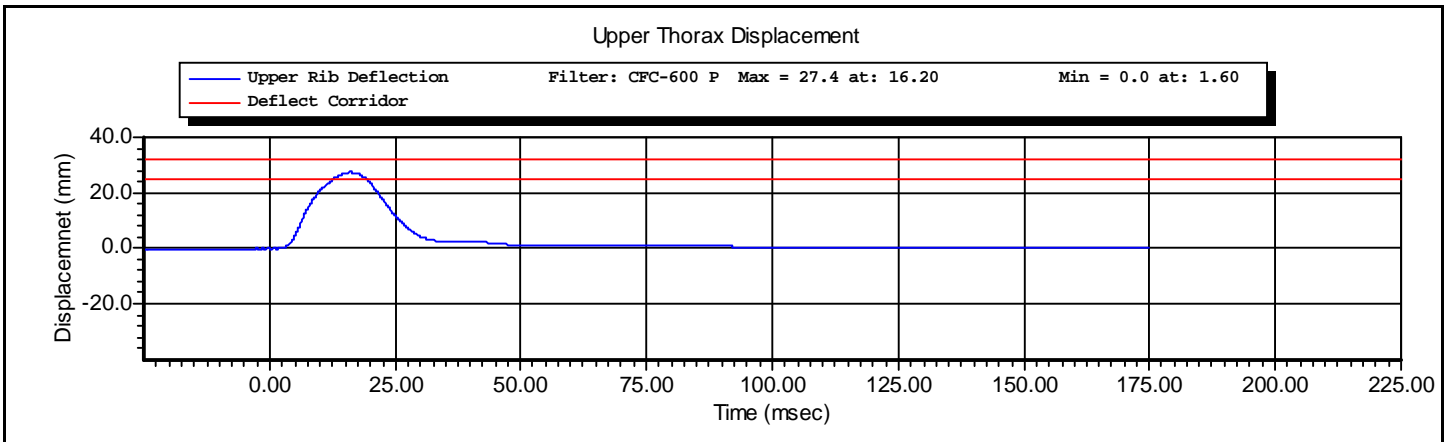
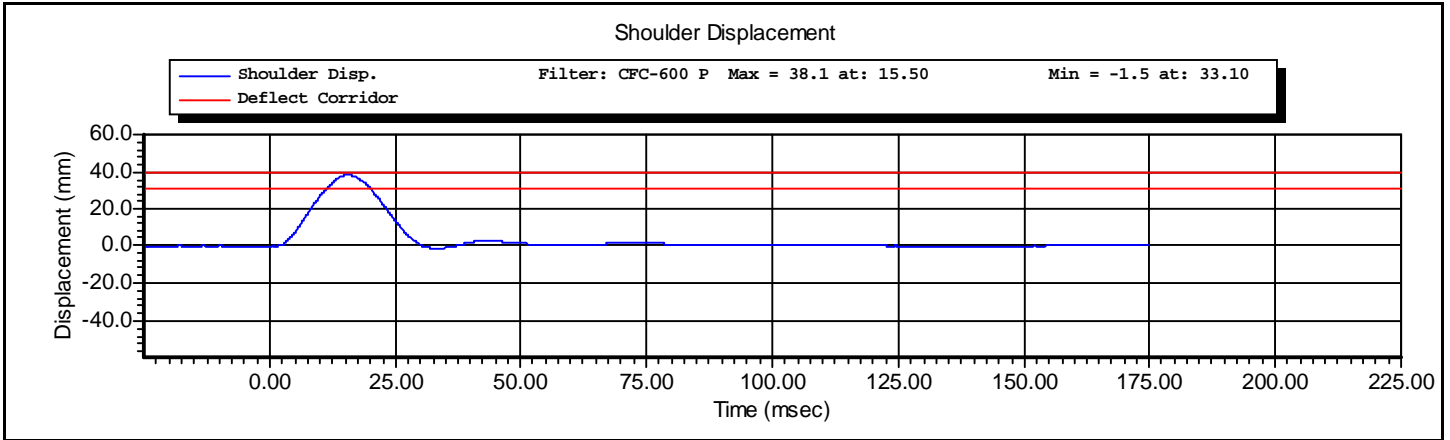
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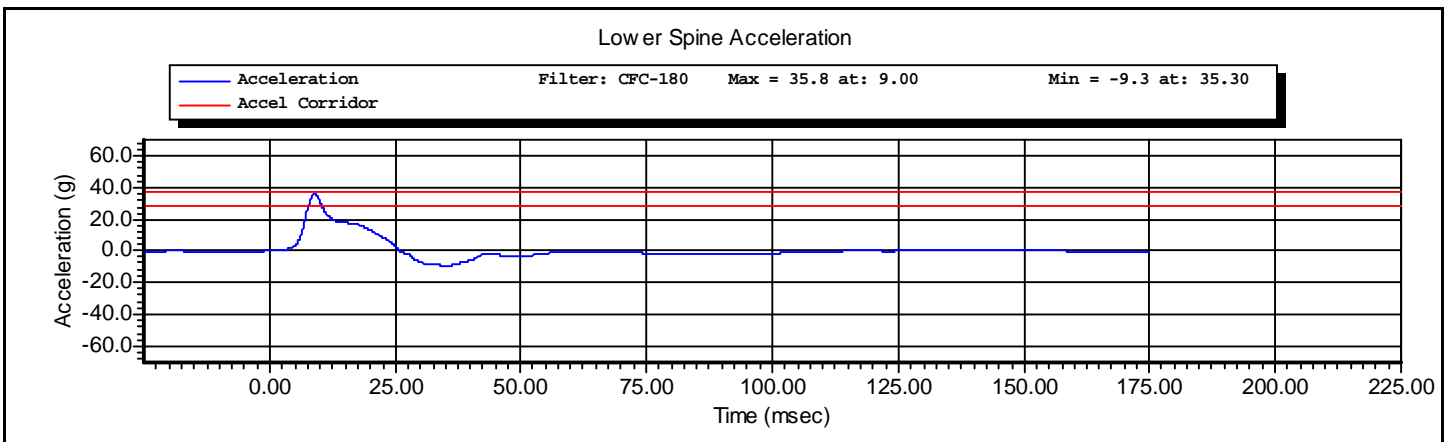
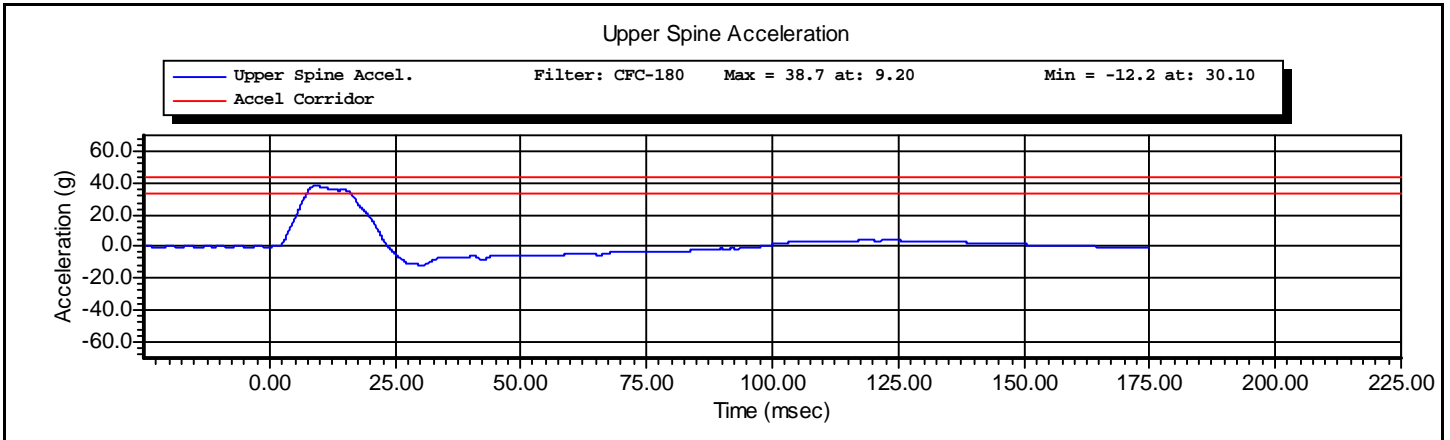
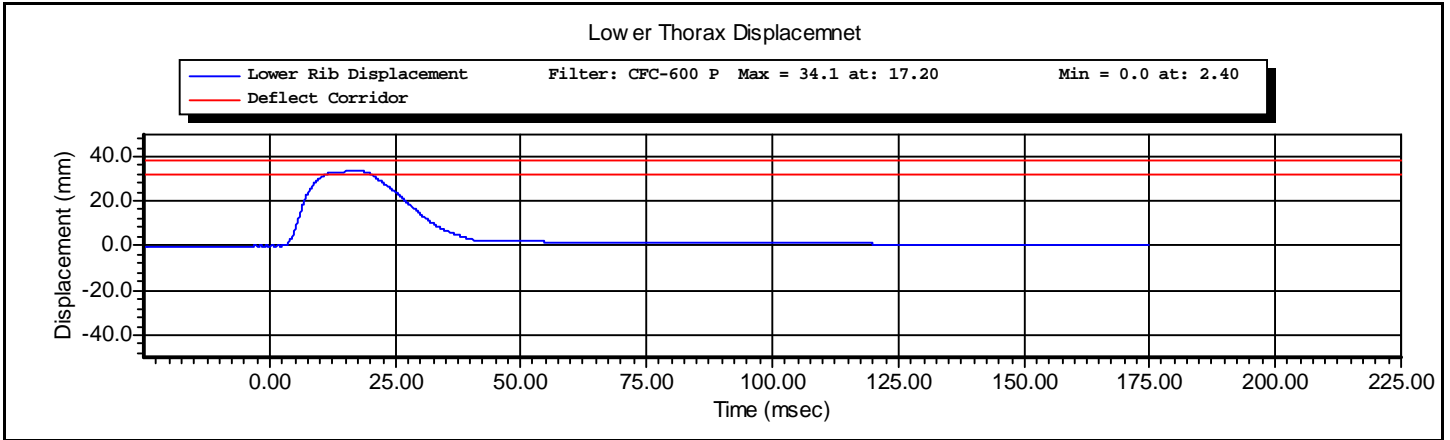
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Test Name:	<b>Thorax Impact with Arm</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Thorax With Arm</b>	Test Date:	<b>5/18/2010</b>
Test Number:	<b>1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

Component Part Number	Component Serial Number
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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
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Comments:

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



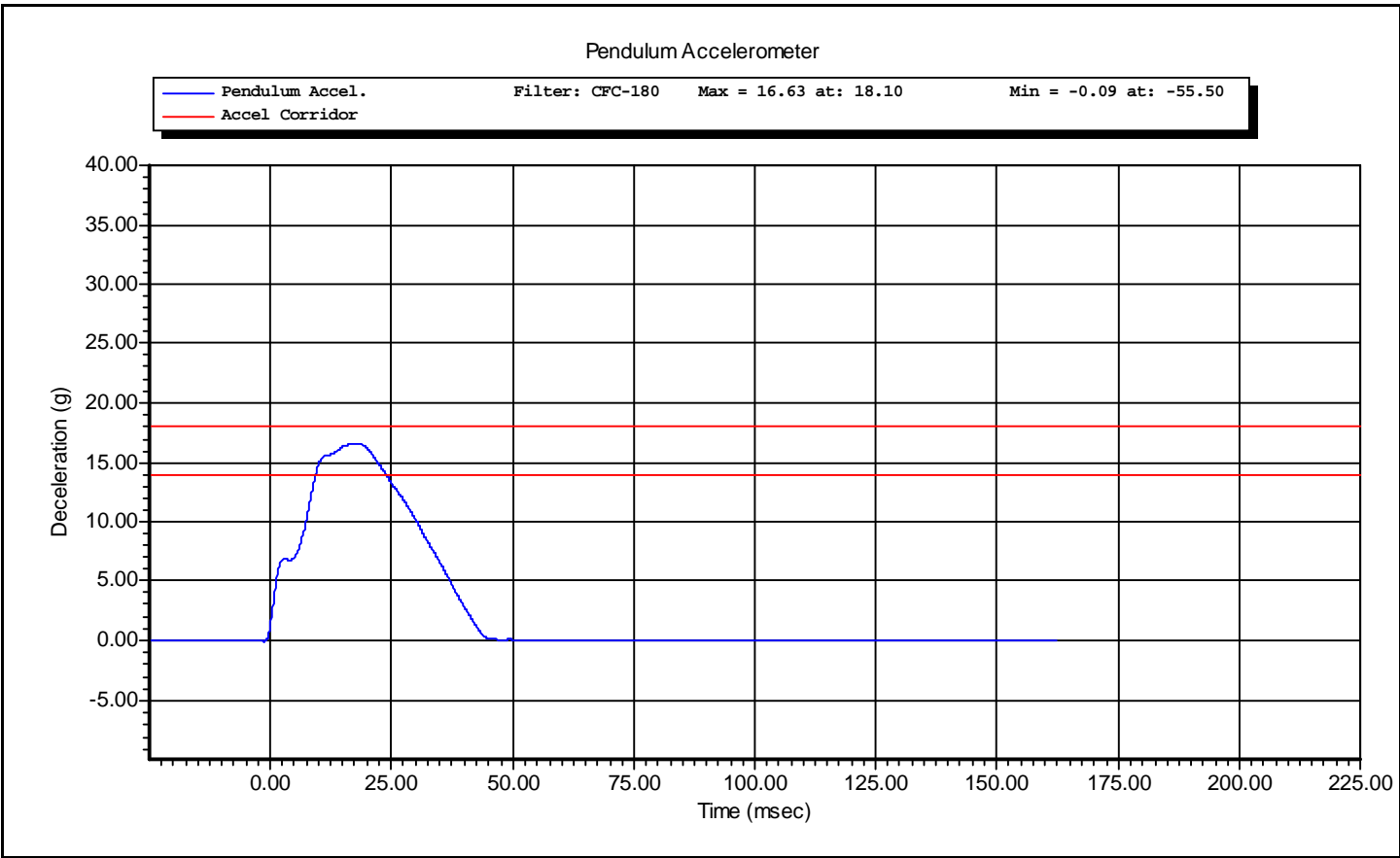
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Test Name:	<b>Thorax Impact without Arm</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Thx w/o Arm</b>	Test Date:	<b>5/18/2010</b>
Test Number:	<b>1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

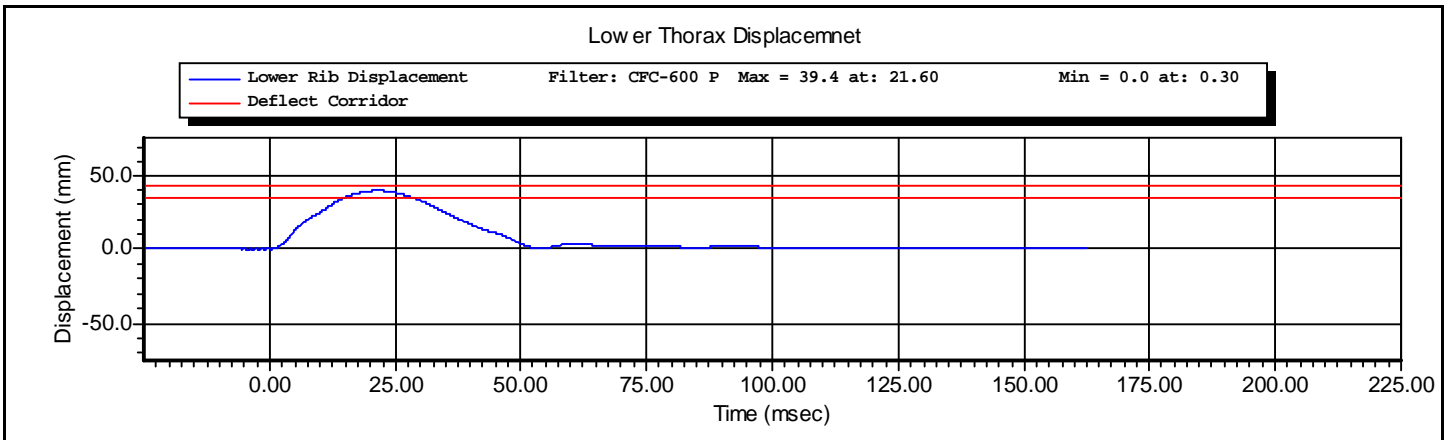
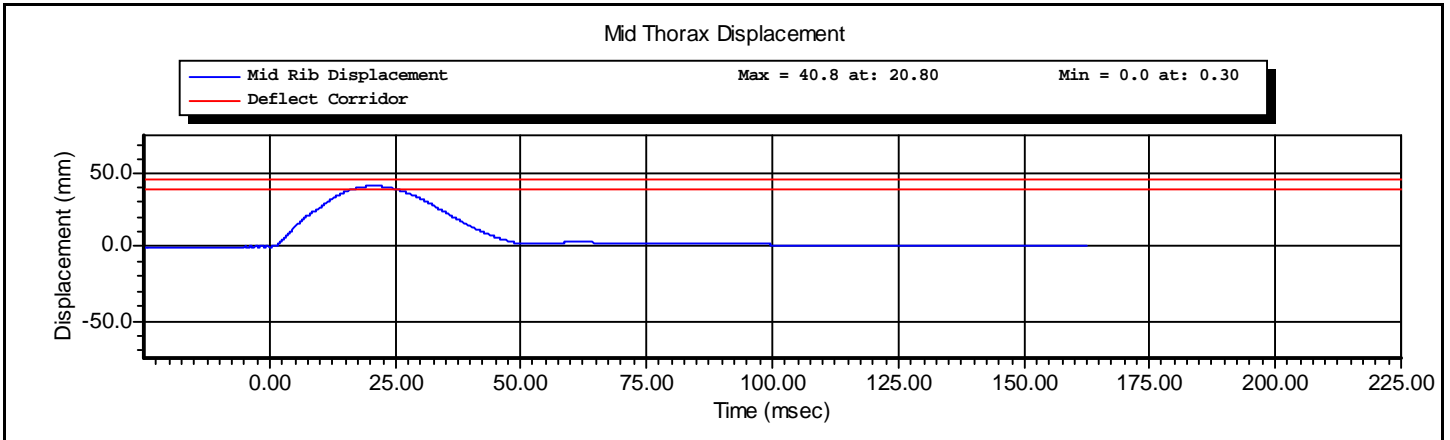
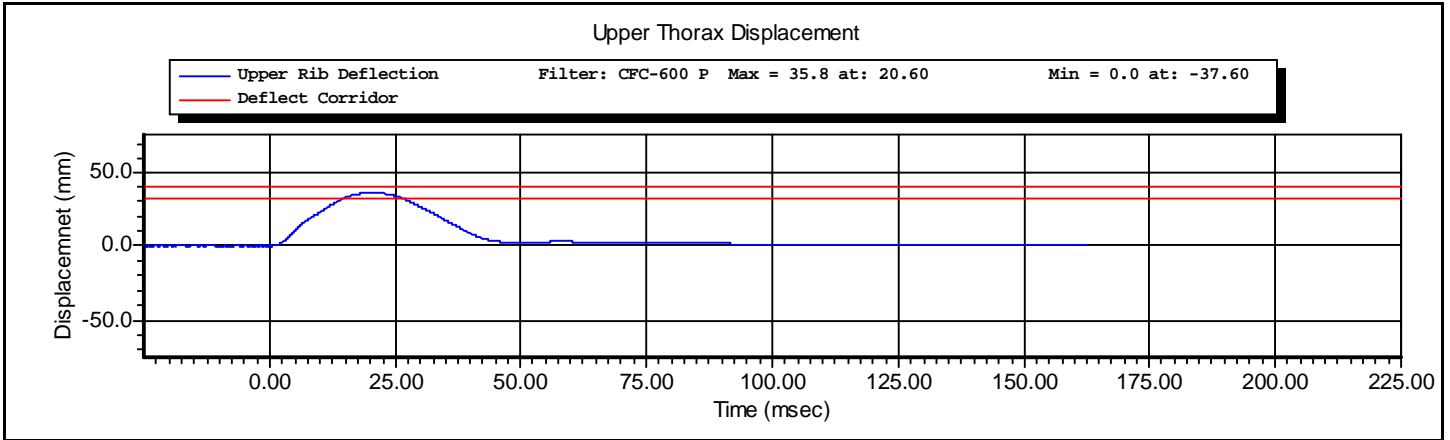
Component Part Number	Component Serial Number
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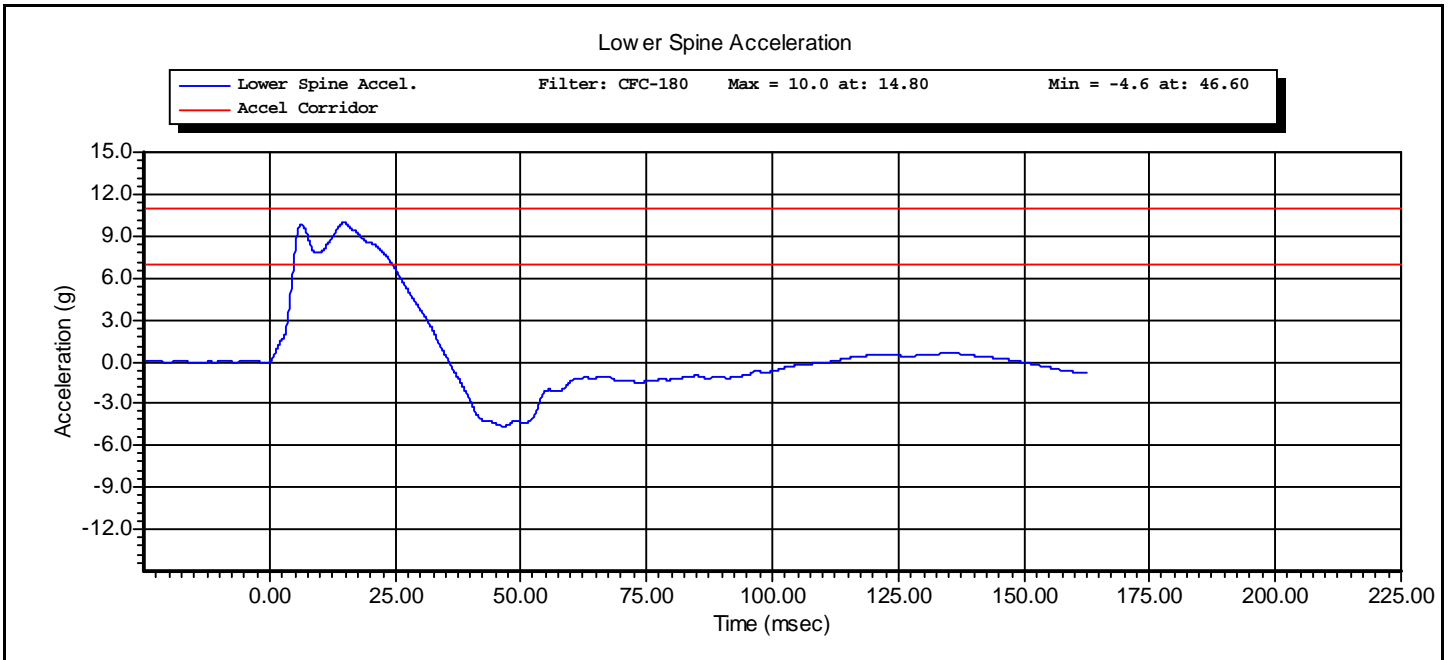
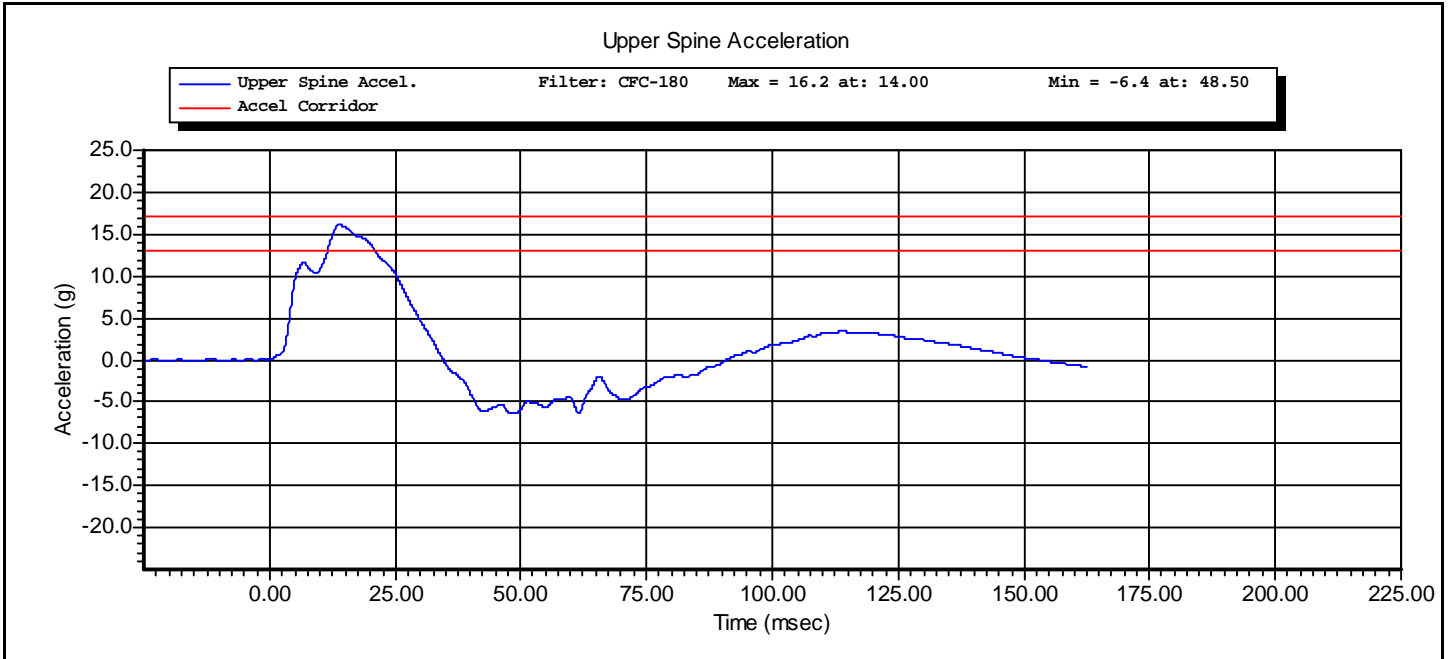


Test ID: **Thx w/o Arm**

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

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







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## VERIFICATION REPORT

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

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

Comments:

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



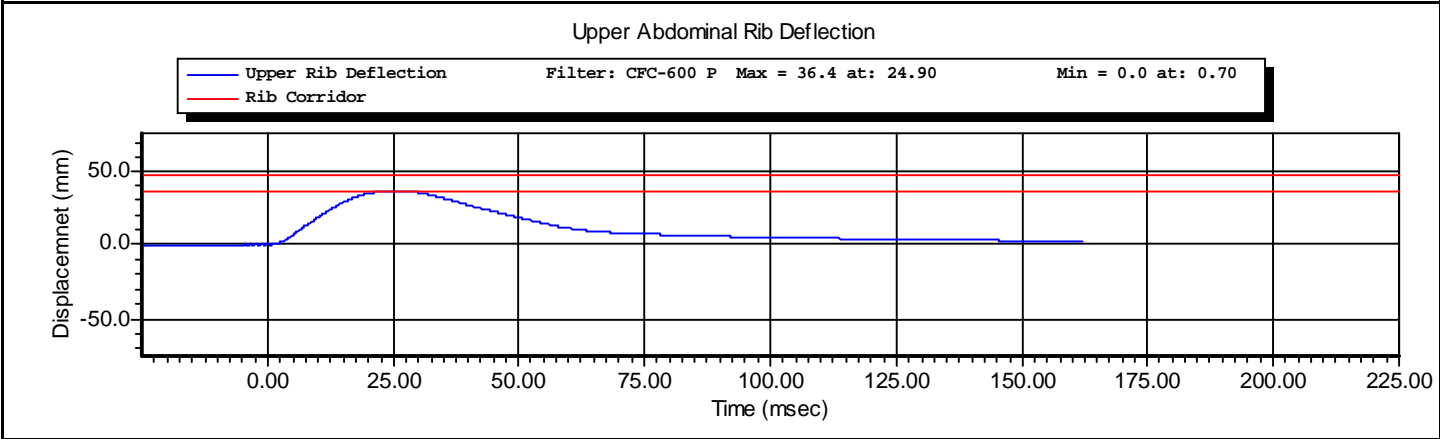
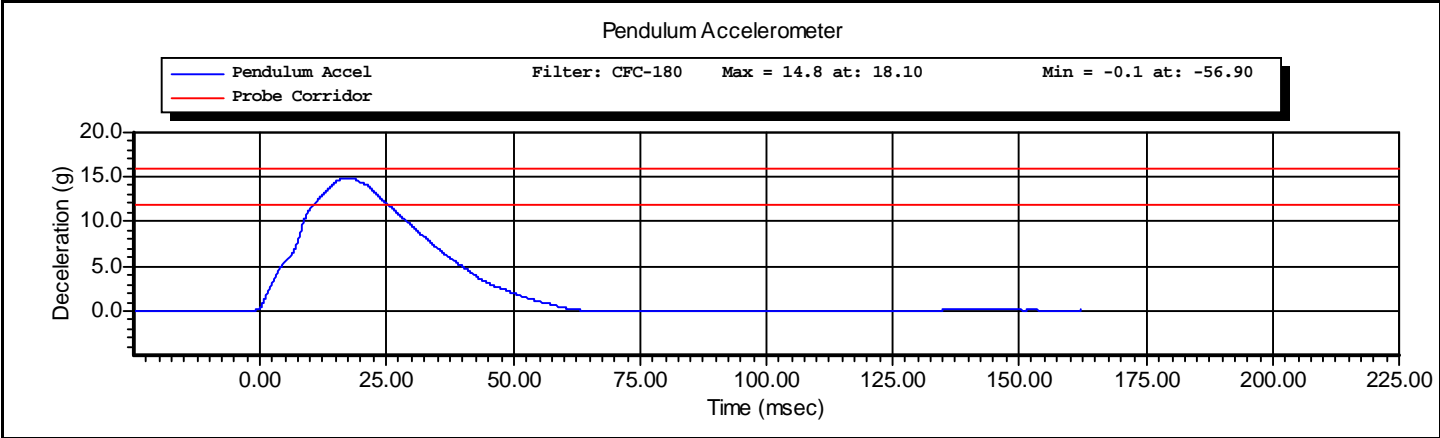
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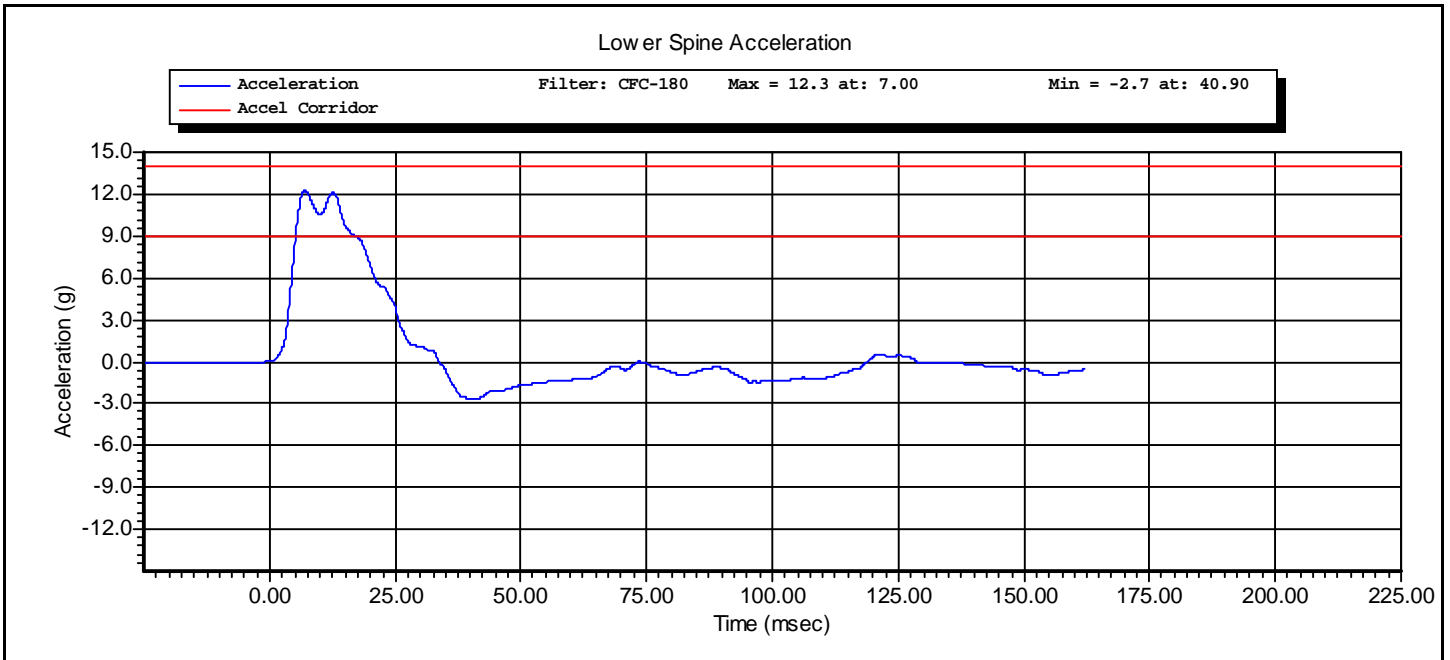
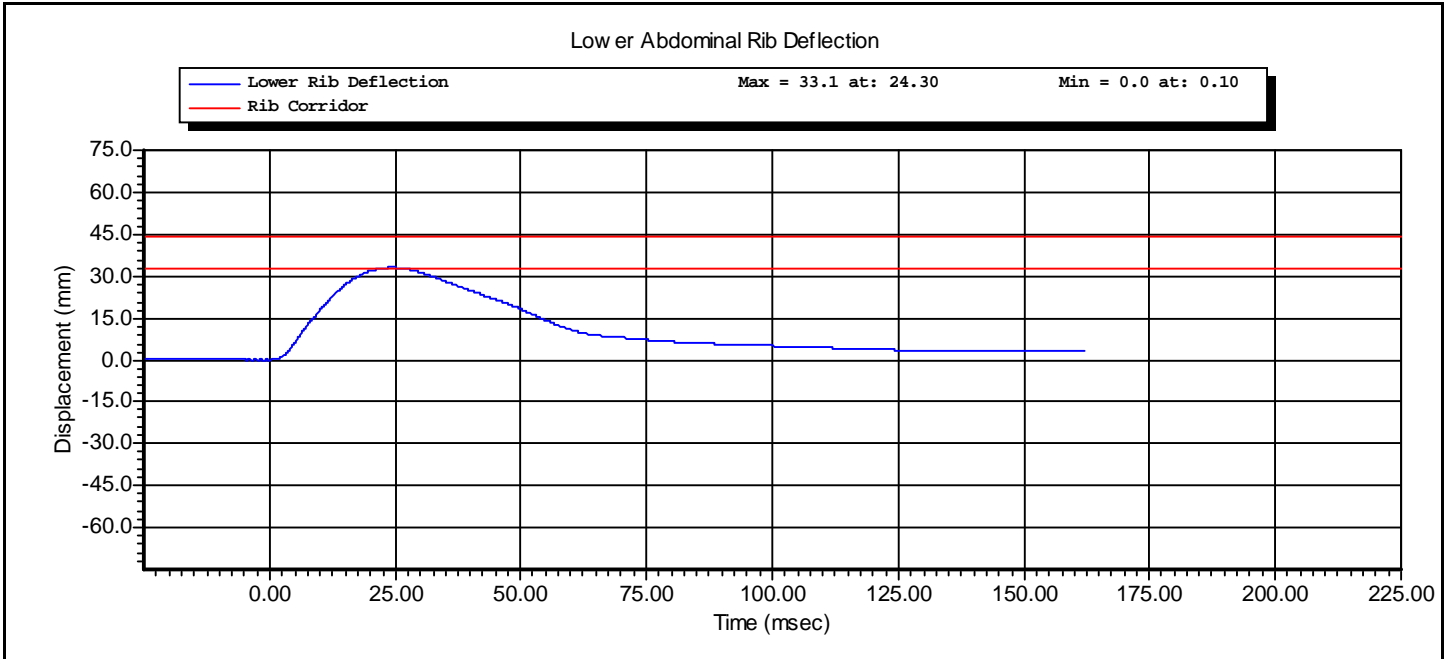
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Test Name:	<b>Abdominal Impact</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Abdominal Impact</b>	Test Date:	<b>5/18/2010</b>
Test Number:	<b>1</b>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

Component Part Number	Component Serial Number
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## VERIFICATION REPORT

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

Component Part Number	Component Serial Number
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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	<b>22.2</b> deg C P
Humidity	10 -- 70	<b>45</b> %RH P
Velocity	6.60 -- 6.80	<b>6.67</b> m/s P
Peak Probe Acceleration	38.0 -- 47.0	<b>41.4</b> g P
Peak Pelvis Acceleration	34.0 -- 42.0	<b>37.4</b> g P
Peak Acetabulum Force	3.60 -- 4.30	<b>3.96</b> 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**



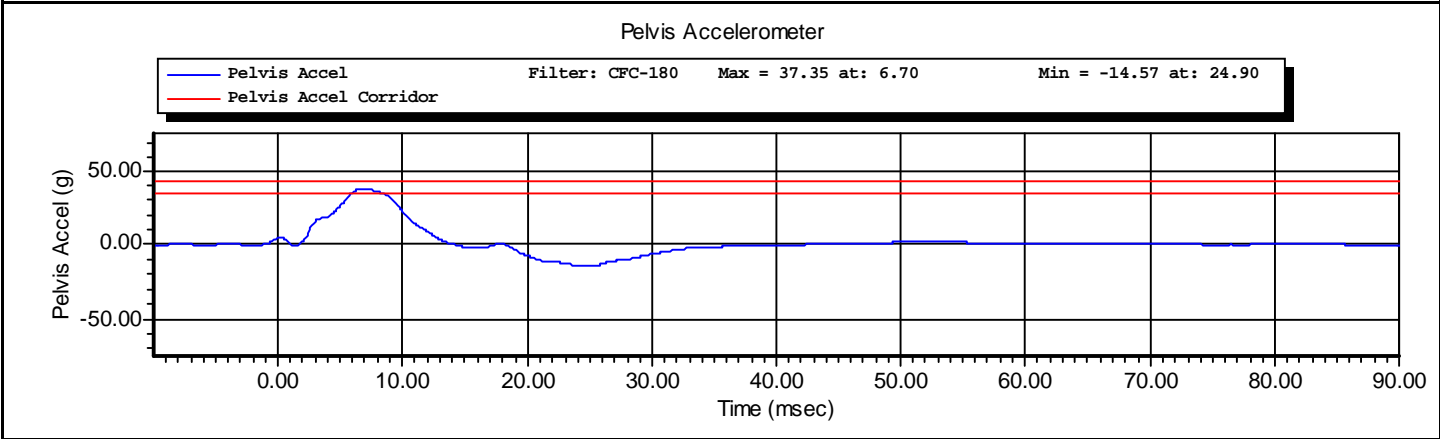
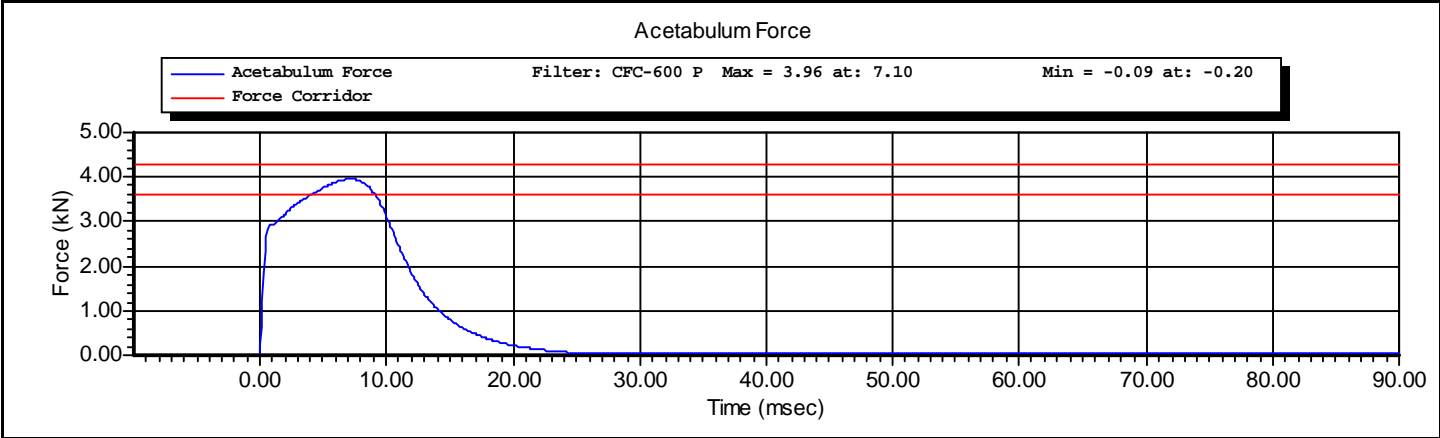
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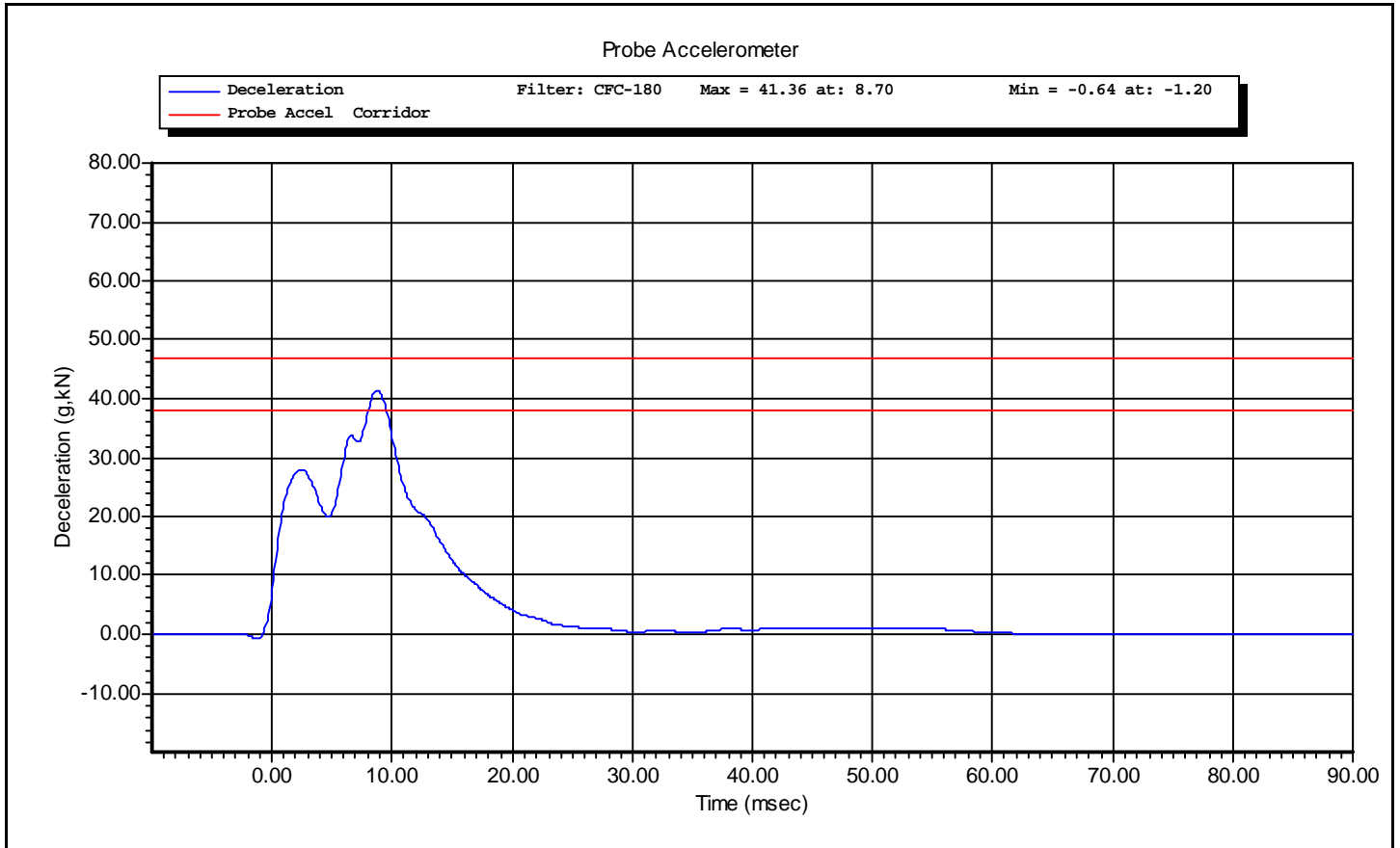
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Test Name:	<b>Pelvis</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Acetabulum Impact</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Pelvis Acetabulum</b>	Test Date:	<b>5/18/2010</b>
Test Number: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

Component Part Number	Component Serial Number
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## VERIFICATION REPORT

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

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

Comments:

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



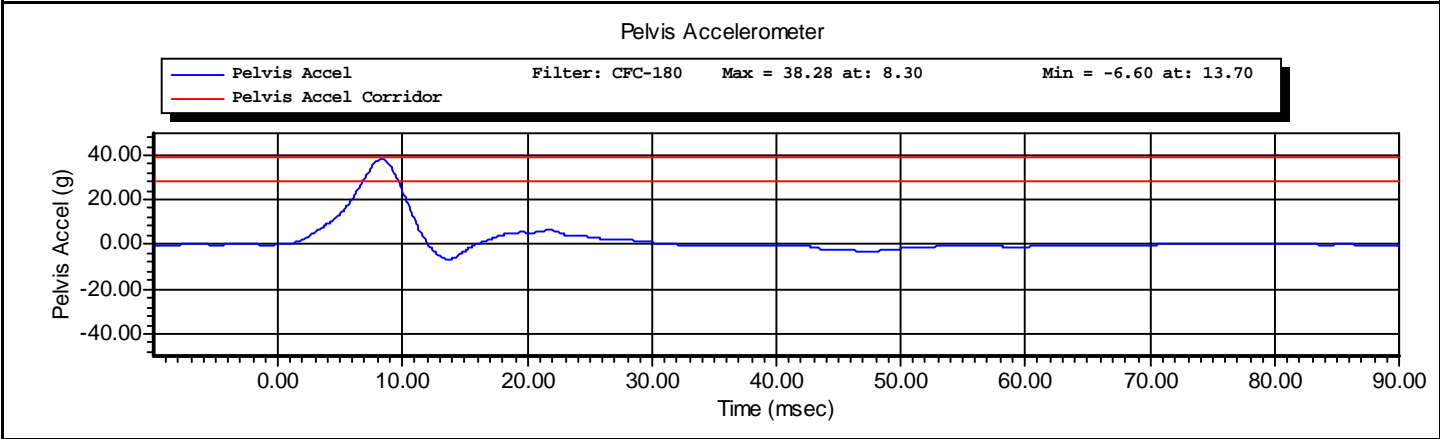
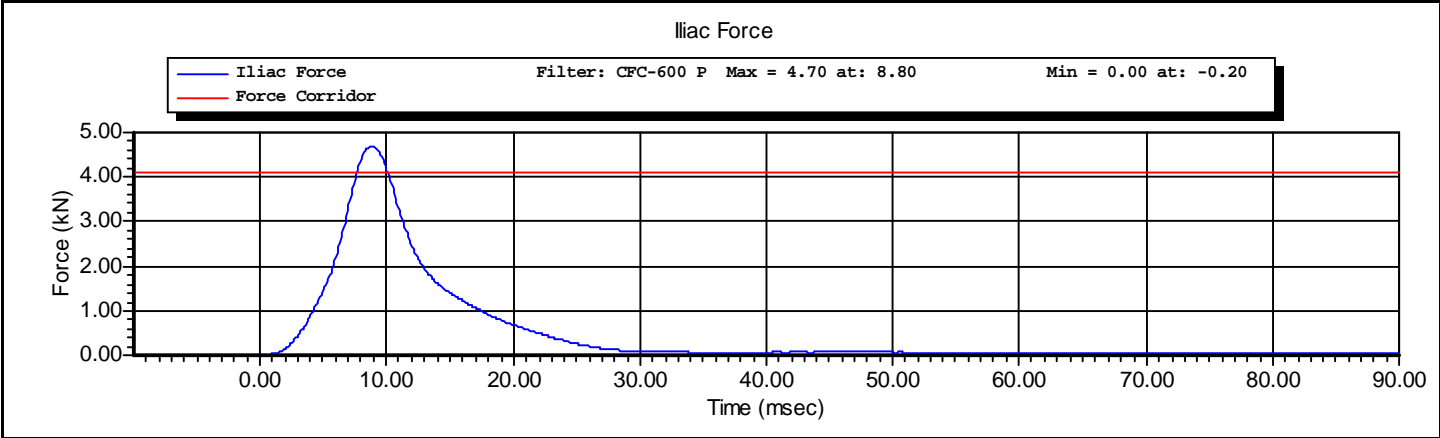
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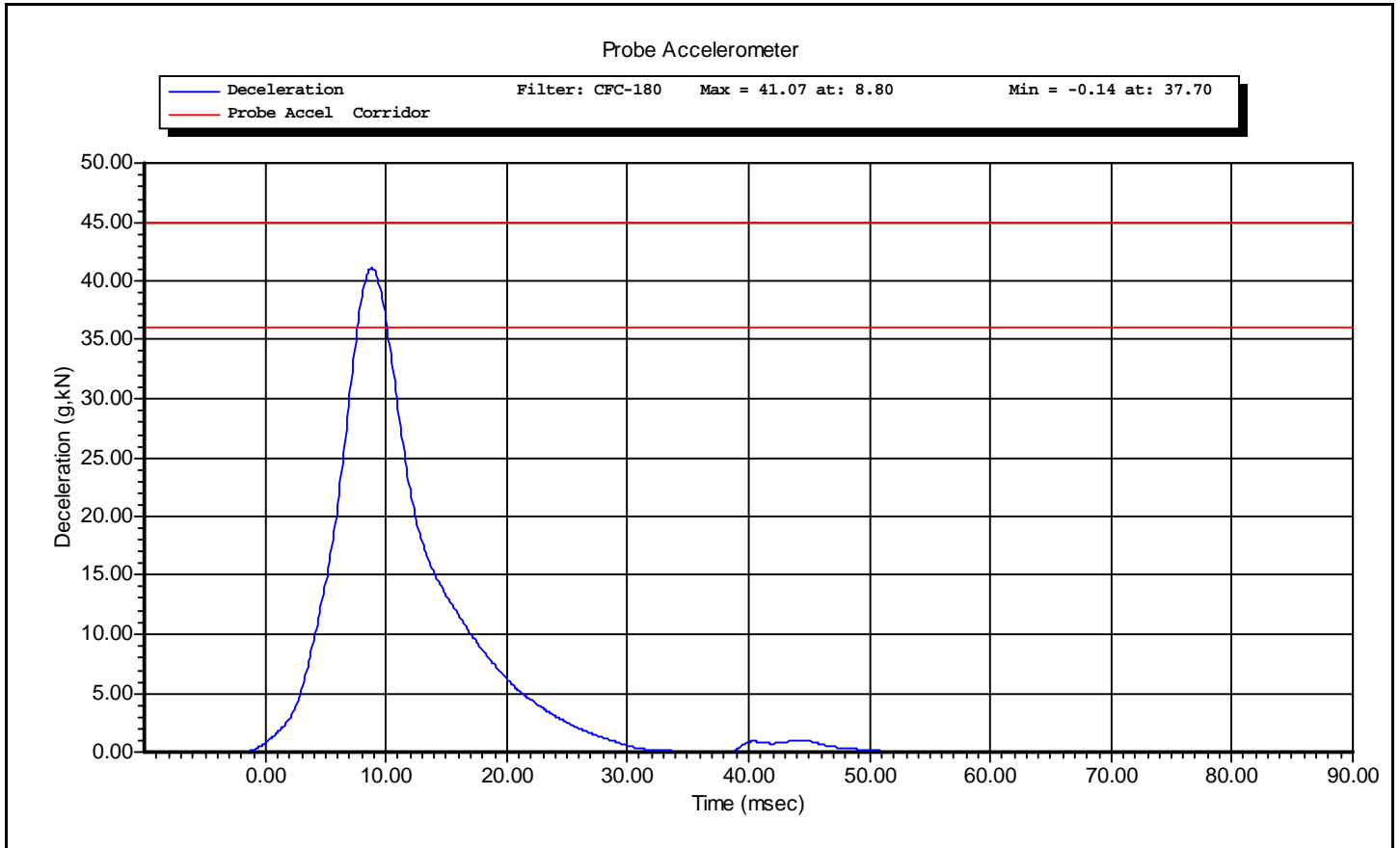
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Test Name:	<b>Pelvis</b>	Revision:	<b>8/24/2009</b>
Sub Test Name:	<b>Iliac Impact</b>	Spec Type:	<b>NHTSA</b>
ATD Type:	<b>SID-IIs</b>		
ATD Serial Number:	<b>SID 224</b>		
Test ID:	<b>Illiic Pelvis</b>	Test Date:	<b>5/18/2010</b>
Test Number:	<b>1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

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-P35803	ENDEVCO	29-Mar-10
REAR FLOORPAN ABOVE AXLE (Y)	AC-P35811	ENDEVCO	29-Mar-10
REAR FLOORPAN ABOVE AXLE (Z)	AC-P35789	ENDEVCO	29-Mar-10
LEFT SILL at REAR DOOR (Y)	AC-P18743	ENDEVCO	04-Dec-09
LEFT SILL at FRONT DOOR (Y)	AC-P24145	ENDEVCO	11-Feb-10
RIGHT REAR OCCUPANT COMP. (Y)	AC-P23926	ENDEVCO	29-Mar-10
LOWER LEFT B- PILLAR (Y)	AC-P26269	ENDEVCO	06-Apr-10
MIDDLE LEFT B-PILLAR (Y)	AC-P35798	ENDEVCO	25-Jan-10
LOWER LEFT A-PILLAR (Y)	AC-P23788	ENDEVCO	22-Jan-10
MIDDLE LEFT A-PILLAR (Y)	AC-APF89	ENDEVCO	04-Dec-09
FRONT SEAT TRACK (Y)	AC-P23960	ENDEVCO	20-Dec-09
REAR SEAT TRACK or STRUCTURE (Y)	AC-P18728	ENDEVCO	04-Dec-09
VEHICLE CG (X)	AC-P26262	ENDEVCO	02-Feb-10
VEHICLE CG (Y)	AC-P21373	ENDEVCO	02-Feb-10
VEHICLE CG (Z)	AC-P23957	ENDEVCO	02-Feb-10
<b>MDB INSTRUMENTATION</b>			
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