

REPORT NUMBER: 301-CAL-04-06

**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
MODERATE-TO-HIGH SPEED REAR IMPACT TEST**

**PERFORMED IN CONJUNCTION WITH
SAFETY COMPLIANCE TESTING FOR FMVSS 301R
FUEL SYSTEM INTEGRITY**

DAIMLERCHRYSLER CORPORATION
2003 JEEP LIBERTY
SUV

NHTSA NUMBER: C30302

GDAIS TEST NUMBER: 8655-F301-23R

July 7, 2004

GENERAL DYNAMICS
ADVANCED INFORMATION ENGINEERING SERVICES
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BUFFALO, NEW YORK 14225



FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Vehicle Safety Research
Crashworthiness Research Division
400 Seventh Street, S. W.
Room No. 6226
Washington, DC 20590

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16. Abstract This test was performed in conjunction with Compliance Testing for FMVSS 301R, Fuel System Integrity. The purpose of this test is to evaluate the seat and occupant performance in moderate-to-high speed rear impacts. The base FMVSS 301R test was modified as follows: <ul style="list-style-type: none"> - 2 fully instrumented Hybrid III ATDs were positioned in the front seats (P1 and P3) in place of ballast ATDs. - 2 door mounted high speed cameras were installed. - 4 seatback frame and 2 front sill MHDs were installed. - 4 vehicle accelerometers were installed. - VRTC seatback translation was installed. <p>The ATDs were positioned following TP208-12 with the following exceptions: <ul style="list-style-type: none"> - Seatbacks for positions that contained a 50th percentile male were set to 25 degrees ± 1 degree as measured with the SAE J826 manikin. </p>			
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SECTION 1

PURPOSE OF TEST

This moderate-to-high speed rear impact test was performed in conjunction with a Federal Motor Vehicle Safety Standard (FMVSS) 301R 30 mph rear moving barrier impact test of a 2003 Jeep Liberty SUV. The purpose of this test is to evaluate the seat and occupant performance in moderate-to-high speed rear impacts.

SECTION 2

SUMMARY OF TEST

A 2035.5 kg 2003 Jeep Liberty SUV was impacted from the rear by a 1797 kg moving barrier at a velocity of 46.83 kph (29.1 mph). The test was performed by Advanced Information Engineering Services on July 7, 2004.

The test vehicle was prepared for the Federal Motor Vehicle Safety Standard (FMVSS) 301R Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) following the OVSC Laboratory Test Procedure No. TP-301-03, dated February 28, 2003. For the purpose of acquiring information for Office of Vehicle Safety Research, the test was modified as follows:

- An instrumented 50th percentile male Part 572E Hybrid III ATD was positioned in the driver seat (P1) in place of a ballast ATD.
- An instrumented 50th percentile male Part 572E Hybrid III ATD was positioned in the right rear passenger seat (P3) in place of the right front passenger seat (P2) ballast ATD.
- The right front passenger seat (P2) was removed to improve film coverage and to help offset instrumentation weight.
- 2 high speed cameras were installed on the vehicle front doors (P2 and P4 doors).
- 2 seatback frame MHDs were installed on each occupied seat to measure rotation about the Y axis.
- 1 front sill MHD was installed to measure rotation about the Y-axis.
- 4 vehicle accelerometers were installed to measure acceleration along the X-axis.
- The VRTC seatback translation was installed on the inside of the roof to measure rearward displacement of the P1 and P3 seatbacks.

The crash event was recorded by ten high-speed cameras and one real-time camera. Camera locations and other pertinent camera information are found on pages 3-13 and 3-14 of this report. Pre- and post-test photographs of the ATDs can be found in Appendix A. Electronic data plots are presented in Appendix B.

The occupant and seat data is summarized below.

	Seatback Rotation		HIC (36ms)	Nij				Head -to- Torso Rotation		Clip (g)	Chest Disp. (mm)	Femur	
	Left (deg)	Right (deg)		Ntf	Nte	Ncf	Nce	Flexion (deg)	Extension (deg)			Left (N)	Right (N)
P1 ATD	20.5	21.2	106.5	0.16	0.26	0.00	0.00	20.3	-47.9	16.9	-2.2	-180.3	-768.9
P3 ATD	11.4	1.8	132.3	0.17	0.23	0.05	0.01	35.2	-16.8	28.9	-4.7	-1293.2	-1160.6

The P1 seatback frame immediately above the adjustment mechanism deformed rearward and the left front seat track (fore/aft adjuster) slid rearward 66 mm during the impact. The adjustment mechanism remained operable following the test. The P1 seat back reclined 10.0 degrees statically from its pre-test position. The P3 seatback frame deformed rearward 1.7 degrees statically from its pre-test position.

SECTION 3
TEST DATA

DATA SHEET 1

TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Jeep Liberty SUV
NHTSA No.: C30302 ; Color: Red
Engine Data: 4 Cylinders; - CID; 2.4 Liters; - cc
Placement: X Longitudinal or In-Line; - Transverse or Lateral
Transmission Data: 5 Speeds; X Manual; - Automatic; - Overdrive
Final Drive: - Rear Wheel Drive; - Front Wheel Drive; X Four Wheel Drive
Major Options: X A/C; X Power Steering; X Power Brakes
X Power Windows; X Power Door Locks; X Tilt Wheel
Date Received: 1/19/2004 ; Odometer Reading 102 km
Selling Dealer: Ricart Chrysler, Plymouth, Jeep, Eagle
& Address: 465 South Hamilton Road, Columbus OH 43213

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: DaimlerChrysler Corporation
Date of Manufacture: 9-02
VIN: 1J4GL48183W539150
GVWR: 2359 kg; GAWR-FRONT: kg; GAWR-REAR: kg

DATA FROM VEHICLE'S TIRE LABEL:

Location of Placard on Vehicle: Driver Door
Recommended Tire Size: P215/75R16

* Recommended Cold Tire Pressure: FRONT: 227 kPa; REAR: 227 kPa

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P215/75R16 101S Manufacturer: Goodyear Wrangler
Tire Pressure with Maximum Capacity Vehicle Load: FRONT: 300 kPa; REAR: 300 kPa
Type of Spare Tire: P215/75R16 mounted on rear gate

VEHICLE CAPACITY DATA:

Type of Front Seats: X Bench; - Bucket; - Split Bench
Number of Occupants: 2 Front; 3 Rear; 5 Total
Vehicle Capacity Weight (VCW) = 601.5 kg
No. of Occupants x 68.04 kg = 340.2 kg
Rated Cargo/Luggage Weight (RCLW) = 261.3 kg **

*Tire pressure used for test

** Maximum of 136.1 kg used for target weight calculation.

DATA SHEET 2

VEHICLE DATA

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front	=	<u>444.5</u>	kg	Right Rear	=	<u>409.5</u>	kg
Left Front	=	<u>470.0</u>	kg.	Left Rear	=	<u>433.5</u>	kg
TOTAL FRONT	=	<u>914.5</u>	kg	TOTAL REAR	=	<u>843</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1757.5</u>	kg				
% of Total Front of Vehicle Weight	=	<u>52.0%</u>		of Total Rear Weight	=	<u>48.0%</u>	

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>1757.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>136.1</u>	kg
Weight of 2 p.572 Dummies, 74.4 kg	=	<u>148.8</u>	kg
TARGET TEST WEIGHT	=	<u>2042.4</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 129.2 KG OF CARGO WEIGHT:

Right Front	=	<u>520.0</u>	kg	Right Rear	=	<u>480.0</u>	kg
Left Front	=	<u>532.5</u>	kg	Left Rear	=	<u>503.0</u>	kg
TOTAL FRONT	=	<u>1052.5</u>	kg	TOTAL REAR	=	<u>983</u>	kg
TOTAL TEST WEIGHT	=	<u>2035.5</u>	kg				
% of Total Front of Vehicle Weight	=	<u>51.7%</u>		of Total Rear Weight	=	<u>48.3%</u>	

* Weight of Ballast Secured in Vehicle Trunk Area = 73 kg

Type of Ballast: Lead shot

Method of Securing Ballast: Left rear seat anchors, engine compartment firewall

Vehicle Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>834</u>	LF	<u>826</u>	RR	<u>844</u>	LR	<u>831</u>
AS TESTED:	RF	<u>803</u>	LF	<u>796</u>	RR	<u>816</u>	LR	<u>810</u>
Vehicle's Wheel Base:		<u>2640</u>	mm					
Location of Vehicle's C.G.:		<u>1275</u>	millimeters rearward of front wheel center.					

DATA SHEET 2 (continued)

VEHICLE DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°
Test Date: July 7, 2004 Time: 10:30 Temperature: 21.1 °C
Vehicle NHTSA No.: C30302 VIN: 1J4GL48183W539150
Required Impact Velocity Range: 46.51 to 48.12 kph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 46.83 kph; Trap No. 2 = 46.83 kph
Average Impact Speed = 46.83 kph

VEHICLE STATIC CRUSH:

Vehicle Length:

Pre-Test Left = 4188 ; C/L = 4444 Right = 4188
Post-Test Left = 4090 ; C/L = 4165 Right = 4095
Crush Left = 98 ; C/L = 279 Right = 93
AVERAGE = 157 millimeters

DATA SHEET 3

MOVING BARRIER DATA

WEIGHT OF MOVING BARRIER:

Right Front	=	<u>504.9</u>	kg	Right Rear	=	<u>393.7</u>	kg.
Left Front	=	<u>499.9</u>	kg	Left Rear	=	<u>398.3</u>	kg
TOTAL FRONT	=	<u>1004.8</u>	kg	TOTAL REAR	=	<u>792.0</u>	kg
TOTAL BARRIER WEIGHT	=	<u>1796.8</u>	kg				

MOVING BARRIER DIMENSIONS:

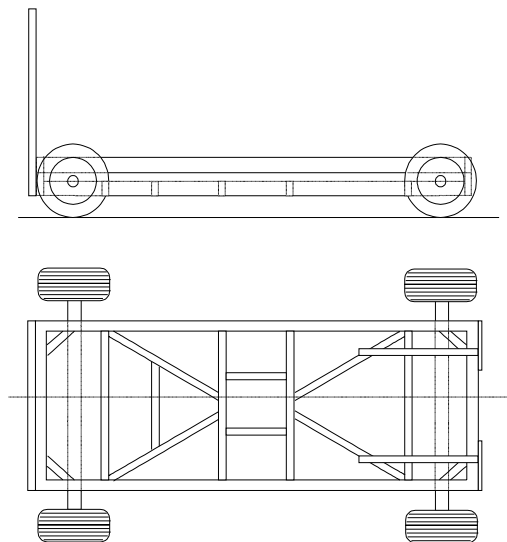
Barrier Face Height: 1524 mm
Barrier Face Width: 1981 mm
Barrier Face Ground Clearance: 127 mm
Tread Width: 1511 mm
Wheel Base: 3048 mm
Location of C.G.: X: 1344 mm rearward of front wheel center.
Y: 0 mm from longitudinal-vertical plane of symmetry.
Z: 414 mm above ground.

MOVING BARRIER TIRES:

Manufacturer: Dunlop
Model: AT Radial Rover
Size: P205/75R15
Recommended Max Pressure: 240 kPa:

MOVING BARRIER ABORT SYSTEM:

Type: Trailing cable



DATA SHEET 4

SEAT DATA

PI DATA:

HEAD RESTRAINT	YES	NO		DETAILS
Fixed:	<u> X </u>	<u> </u>		
Vertical Adjustment:	<u> </u>	<u> X </u>		
Vertical Locks:	<u> </u>	<u> X </u>		
Fore-Aft Adjustment:	<u> </u>	<u> X </u>		
Fore-Aft Locks:	<u> </u>	<u> X </u>		
SEATBACK RECLINE TYPE	YES	NO		DETAILS
Fixed:	<u> - </u>	<u> X </u>		
Power:	<u> - </u>	<u> X </u>		
Lever (with detents):	<u> X </u>	<u> - </u>		
Lever (infinite)	<u> - </u>	<u> X </u>		
Lever (ratchet)	<u> - </u>	<u> X </u>		
Rotary Knob:	<u> - </u>	<u> X </u>		
Pivot locks on Both Sides:	<u> X </u>	<u> - </u>		
LUMBAR ADJUSTMENT	YES	NO		DETAILS
Fixed:	<u> X </u>	<u> - </u>		
Adjustable:	<u> - </u>	<u> X </u>	Placed in retracted position for ICBC measurements and test.	
BOLSTER ADJUSTMENT	YES	NO		DETAILS
Fixed:	<u> X </u>	<u> - </u>		
Adjustable:	<u> - </u>	<u> X </u>	Placed in full open for ICBC measurements and test.	
SEAT CUSHION TYPE	YES	NO		DETAILS
Cushion moves vertically independently of seat back:	<u> - </u>	<u> X </u>		
SEAT CUSHION FORE-AFT	YES	NO		DETAILS
Fixed:	<u> - </u>	<u> X </u>		
Power:	<u> - </u>	<u> X </u>	Travel: <u> - </u> mm	
Manual-Detents:	<u> X </u>	<u> - </u>	First Detent: <u> 0 </u> Last Detent: <u> 18 </u> Travel: <u> 215 </u> mm	
Manual-Infinite:	<u> - </u>	<u> X </u>	Travel: <u> - </u> mm	
SEAT CUSHION VERTICAL	YES	NO		DETAILS
Fixed:	<u> </u>	<u> </u>		
Power:	<u> </u>	<u> </u>		
Manual-Detents	<u> </u>	<u> </u>		
Manual-Infinite	<u> </u>	<u> </u>		
SEAT TEST POSITION				
Seat Cushion Fore-aft:	<u>Mid-position (detent 9) OR 107.5 mm forward of rearward-most position</u>			
Seat Cushion Vertical:	<u>Fixed</u>			
Seat Back:	<u>25 degree torso angle as set with the H-point machine.</u>			
Head Restraint:	<u>Fixed</u>			

DATA SHEET 4 (continued)

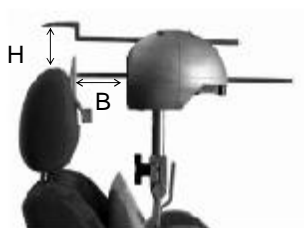
SEAT DATA

P3 DATA:

HEAD RESTRAINT	YES	NO	DETAILS
Fixed:	<u>-</u>	<u>X</u>	
Vertical Adjustment:	<u>X</u>	<u>-</u>	
Vertical Locks:	<u>X</u>	<u>-</u>	Prevents head restraint from sliding downward. Button must be pushed to move restraint downward.
Fore-Aft Adjustment:	<u>-</u>	<u>X</u>	
Fore-Aft Locks:	<u>-</u>	<u>X</u>	
SEATBACK RECLINE TYPE	YES	NO	
Fixed:	<u>X</u>	<u>-</u>	
Power:	<u>-</u>	<u>X</u>	
Lever (with detents):	<u>-</u>	<u>X</u>	
Lever (infinite)	<u>-</u>	<u>X</u>	
Lever (ratchet)	<u>-</u>	<u>X</u>	
Rotary Knob:	<u>-</u>	<u>X</u>	
Pivot locks on Both Sides:	<u>-</u>	<u>X</u>	Forward folding seatback latches in a single upright position for occupant use. Latch is located at the upper outboard side of the seatback.
LUMBAR ADJUSTMENT	YES	NO	DETAILS
Fixed:	<u>X</u>	<u>-</u>	
Adjustable:	<u>-</u>	<u>X</u>	Placed in retracted position for ICBC measurements and test.
BOLSTER ADJUSTMENT	YES	NO	DETAILS
Fixed:	<u>X</u>	<u>-</u>	
Adjustable:	<u>-</u>	<u>X</u>	Placed in full open for ICBC measurements and test.
SEAT CUSHION TYPE	YES	NO	DETAILS
Cushion moves vertically independently of seat back:	<u>-</u>	<u>X</u>	
SEAT CUSHION FORE-AFT	YES	NO	DETAILS
Fixed:	<u>X</u>	<u>-</u>	
Power:	<u>-</u>	<u>X</u>	Travel: <u>-</u> mm
Manual-Detents:	<u>-</u>	<u>X</u>	First Detent: <u>-</u> Last Detent: <u>-</u> Travel: <u>-</u> mm
Manual-Infinite:	<u>-</u>	<u>X</u>	Travel: <u>-</u> mm
SEAT CUSHION VERTICAL	YES	NO	DETAILS
Fixed:	<u>X</u>	<u>-</u>	
Power:	<u>-</u>	<u>X</u>	
Manual-Detents	<u>-</u>	<u>X</u>	
Manual-Infinite	<u>-</u>	<u>X</u>	
SEAT TEST POSITION			
Seat Cushion Fore-aft:	<u>Fixed</u>		
Seat Cushion Vertical:	<u>Fixed</u>		
Seat Back:	<u>Fixed</u>		
Head Restraint:	<u>Full up</u>		

DATA SHEET 5

ICBC MEASUREMENTS



P1 DATA:

ICBC MEASUREMENTS

HEAD RESTRAINT POSITION (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line From Pivot (mm)
Fixed / Fixed:	49	63	25.0	789
HEAD RESTRAINT POSITION – CONFIGURED FOR TEST (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line From Pivot (mm)
Fixed / Fixed:	49	63	25.0	789
Head restraint positioning details:	None			

P3 DATA:

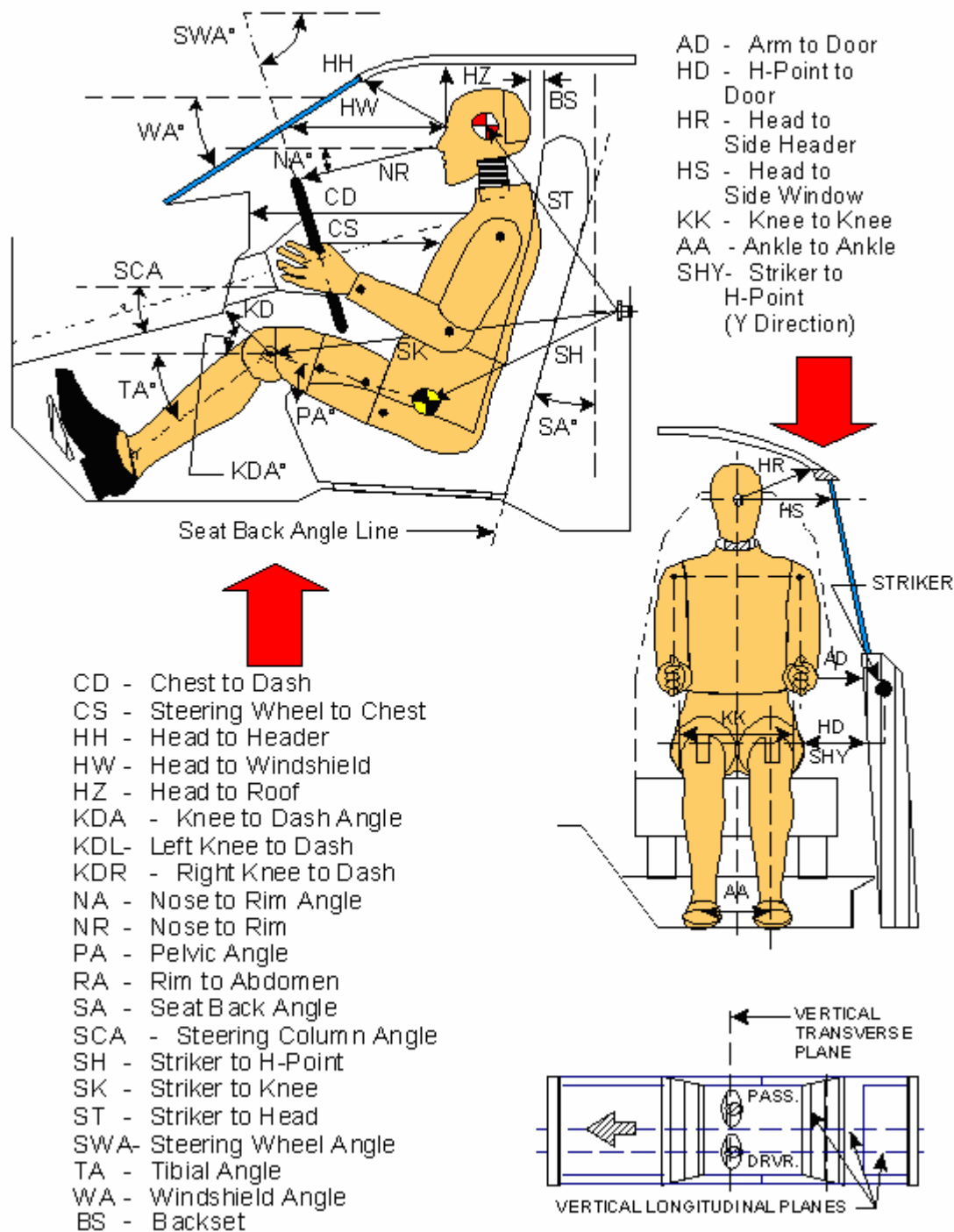
ICBC MEASUREMENTS

HEAD RESTRAINT POSITION (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line From Pivot (mm)
Full Up / Fixed:	88	44	24.1	835
Full Down / Fixed:	81	103	24.1	772
HEAD RESTRAINT POSITION – CONFIGURED FOR TEST (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line From Pivot (mm)
Full Up / Fixed:	88	44	24.1	835
Head restraint positioning details:	Head restraint was positioned full up.			

DATA SHEET 6

DUMMY MEASUREMENTS

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



DATA SHEET 6 (continued)

DUMMY MEASUREMENTS

	DRIVER (Serial #202)			PASS. (Serial #206)		
WA ^o	43.9 deg.			N/A		
SWA ^o	66.0 deg.			N/A		
SCA ^o	24.0 deg.			N/A		
SA ^o	25.0 deg. (H-point machine back pan)			24.1 deg. (H-point machine back pan)		
HZ	218			294		
HH	431			1304		
HW	558			1458		
HR	188			245		
NR	420	Angle	17 deg.	N/A		
CD	519			1432		
CS	298			N/A		
RA	184			N/A		
KDL	136	Angle (KDA)	5 deg.	1014		
KDR	133			1014	Angle (KDA)	3 deg.
PA ^o	24.8 deg.			24.2 deg.		
TA ^o	61.5 deg.			62.0 deg.		
KK	372			306		
AA	248			180		
ST	596	Angle	5 deg.	384	Angle	10 deg.
SK	594	Angle	83 deg.	606	Angle	102 deg.
SH	207	Angle	102 deg.	330	Angle	133 deg.
SHY	198			222		
HS	340			358		
HD	194			160		
AD	85			93		
BS*	68			101		

*Note: Measured with ATD in final seating position
Dimensions in millimeters

DATA SHEET 7

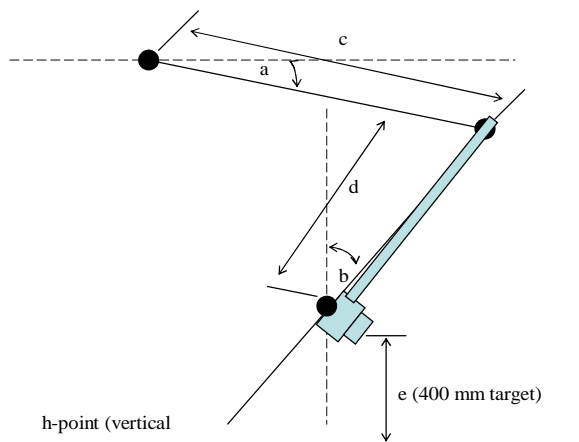
VEHICLE AND SEAT INSTRUMENTATION MEASUREMENTS

VEHICLE INSTRUMENTATION					
LOCATION	TRANSDUCER TYPE	DIRECTION OF MEASURE	PRE-TEST DIMENSIONS (mm) *		
			X	Y	Z
Left Rear Seat Cross Member	Accelerometer	X	1905	-681	-465
Left Rear Seat Cross Member Redundant	Accelerometer	X	1905	-681	-465
Right Rear Seat Cross Member Redundant	Accelerometer	X	1905	681	-465
Right Rear Seat Cross Member	Accelerometer	X	1905	681	-465
Left Front Sill	MHD ARS-06	About Y	2665	656	-465
Right Front Sill	MHD ARS-06	About Y	-	-	-

* X: From rear bumper, positive forward; Y: From long. centerline, positive right; Z: From ground, positive down.

DATA SHEET 7

VEHICLE AND SEAT INSTRUMENTATION MEASUREMENTS



DIMENSION	P1 LEFT	P1 RIGHT	P3 LEFT	P3 RIGHT
a (deg from horiz.)	26.7	29.5	19.8	20.0
b (deg from vertical)	23.6	23.6	21.5	23.3
c (mm)	330	328	373	381
d (mm)	375	373	369	370
e (mm, target=400)	321	316	380	386

SEATBACK ANGLE	P1		P3	
	PRE (deg)	POST (deg)	PRE (deg)	POST (deg)
Left MDH Bracket	20.8	31.1	20.2	21.6
Right MHD Bracket	20.8	31.1	22.0	24.6
Front Sill	-0.8	-0.5	-0.8	-0.5

POST TEST DETAILS

Seatback Deformation: The P1 seatback frame immediately above the adjustment mechanism deformed rearward. The P1 seat back reclined 10.0 degrees statically from its pre-test position. The P3 seatback frame deformed (reclined) rearward 1.7 degrees statically from its pre-test position.

Seat/Floor Attachment Point Deformation: No deformation of the seat/floor attachment points. The P1 left front seat track (fore/aft adjuster) slid rearward 66 mm during the impact.

Recliner Mechanism Deformation: None. The adjustment mechanism remained operable following the test.

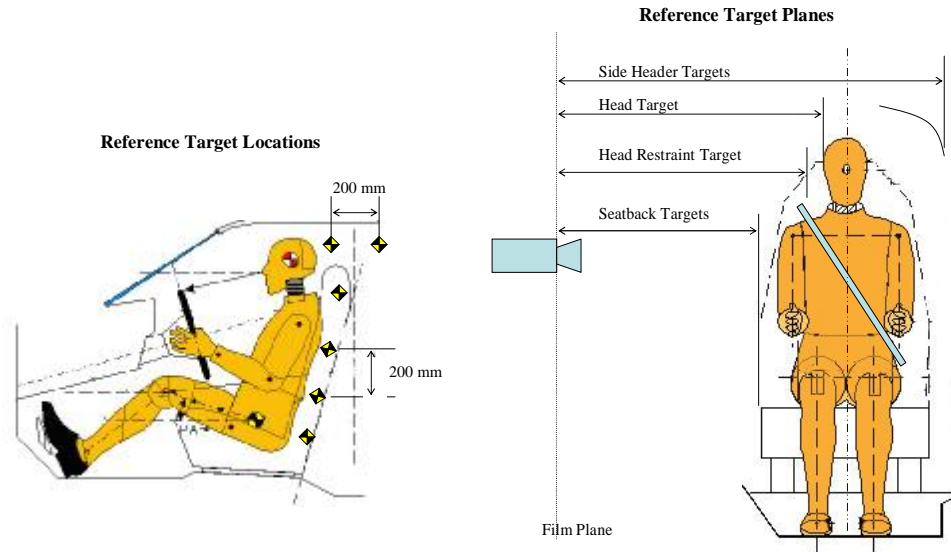
Comments: None

DATA SHEET 8

REFERENCE TARGET MEASUREMENTS

NHTSA No. : C30302

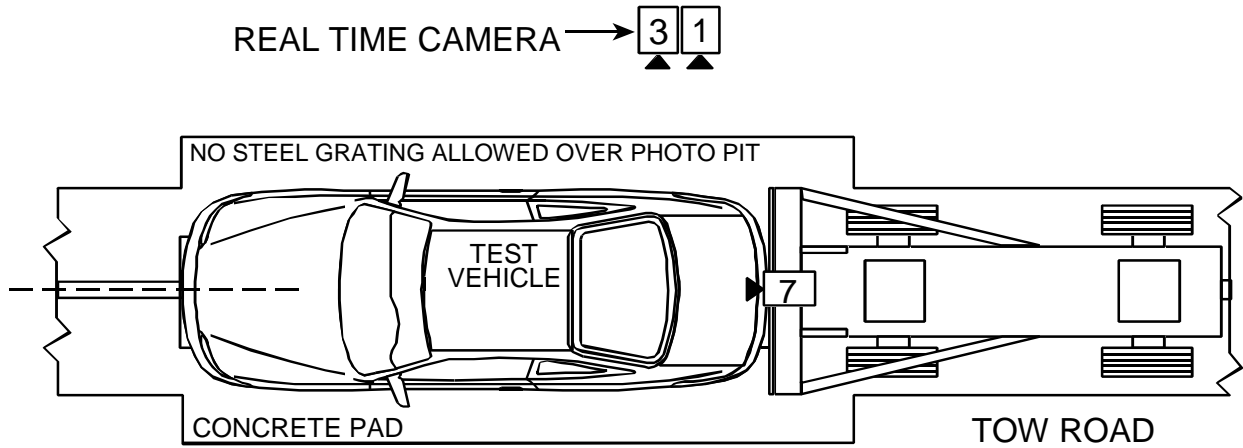
Vehicle : 2003 Jeep Liberty SUV



Film Plane to Reference Plane Distance		
Plane	Front Occupant View (mm)	Rear Occupant View (mm)
Seatback	1060	-
Head Restraint	1220	1182
Head Target	1250	1220
Side Header	1457	1404

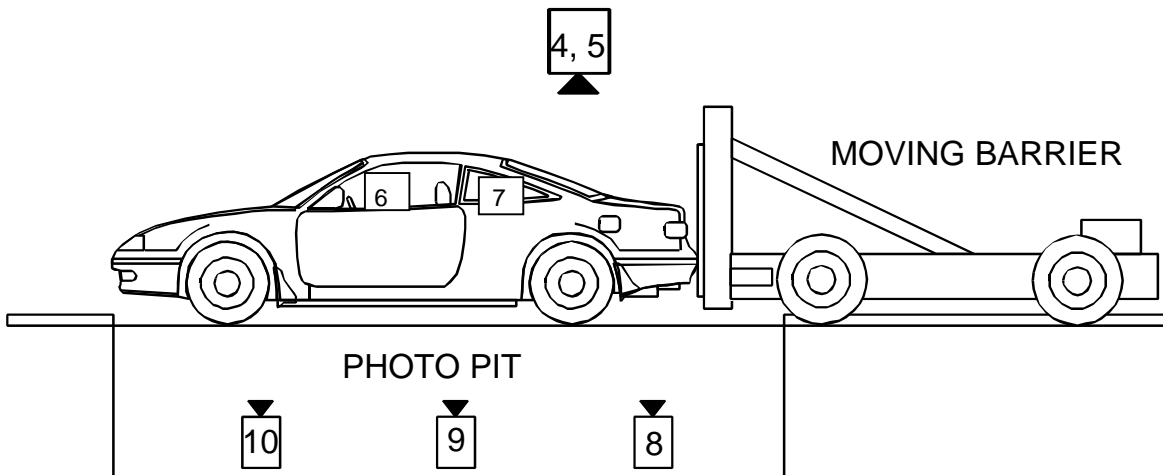
DATA SHEET 9

HIGH SPEED CAMERA LOCATIONS



2

TOP VIEW



LEFT SIDE VIEW

DATA SHEET 9 (continued)

HIGH SPEED CAMERA LOCATIONS

NHTSA No. : C30302

Vehicle : 2003 Jeep Liberty SUV

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Left Side View	17665	3450	1110	0.0	35	View not available†
3	Right Side View	-17840	405	1108	1.0	35	1000
4	Overhead Overall View	0	508	9804	-90	13	1000
5	Overhead Close View	0	508	9804	-105	25	Timing not available
6†	Onboard Driver View	-964	2355	1208	-10.0	8	1010
7†	Onboard Passenger View	1015	1590	1205	-10.0	8	1000
8	Vehicle Rear Underbody View	0	1080	-1956	90	13	1030
9	Vehicle Mid-Section Underbody View	0	2390	-1956	90	13	1000
10	Vehicle Front Underbody View	0	3790	-1956	90	13	1005

- * X = film plane to monorail centerline (+ to left of rail)
- Y = film plane to impact location (+ ahead of impact location)
- Z = film plane to ground (+ above ground)
- ** = referenced to horizontal plane

† Research cameras – X distance is measured to the reference target plane.

Appendix A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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A-24	POST-TEST PASSENGER ISOMETRICAL VIEW	A-26



Figure A-1 DRIVER ICBC BACKSET VIEW

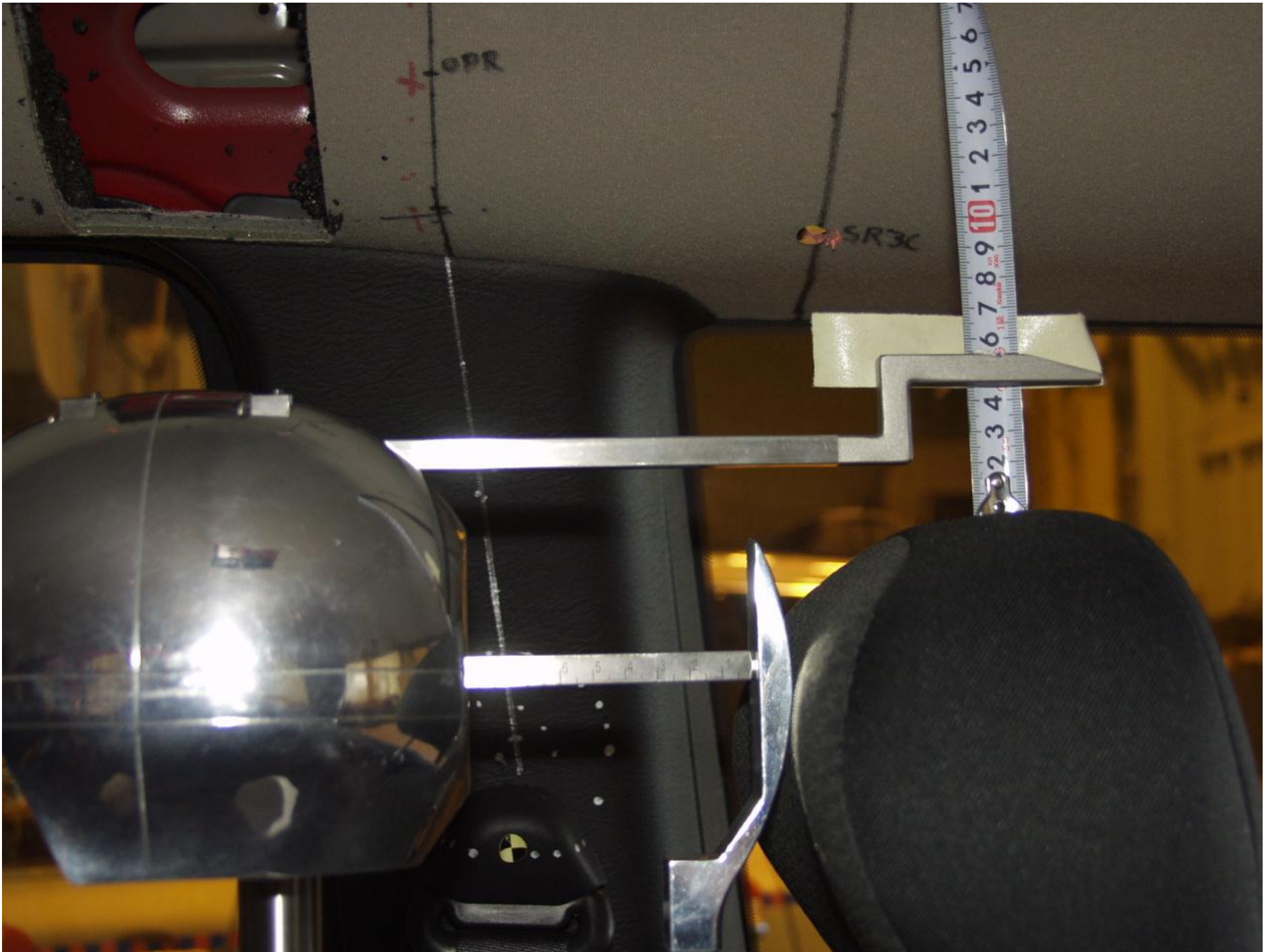
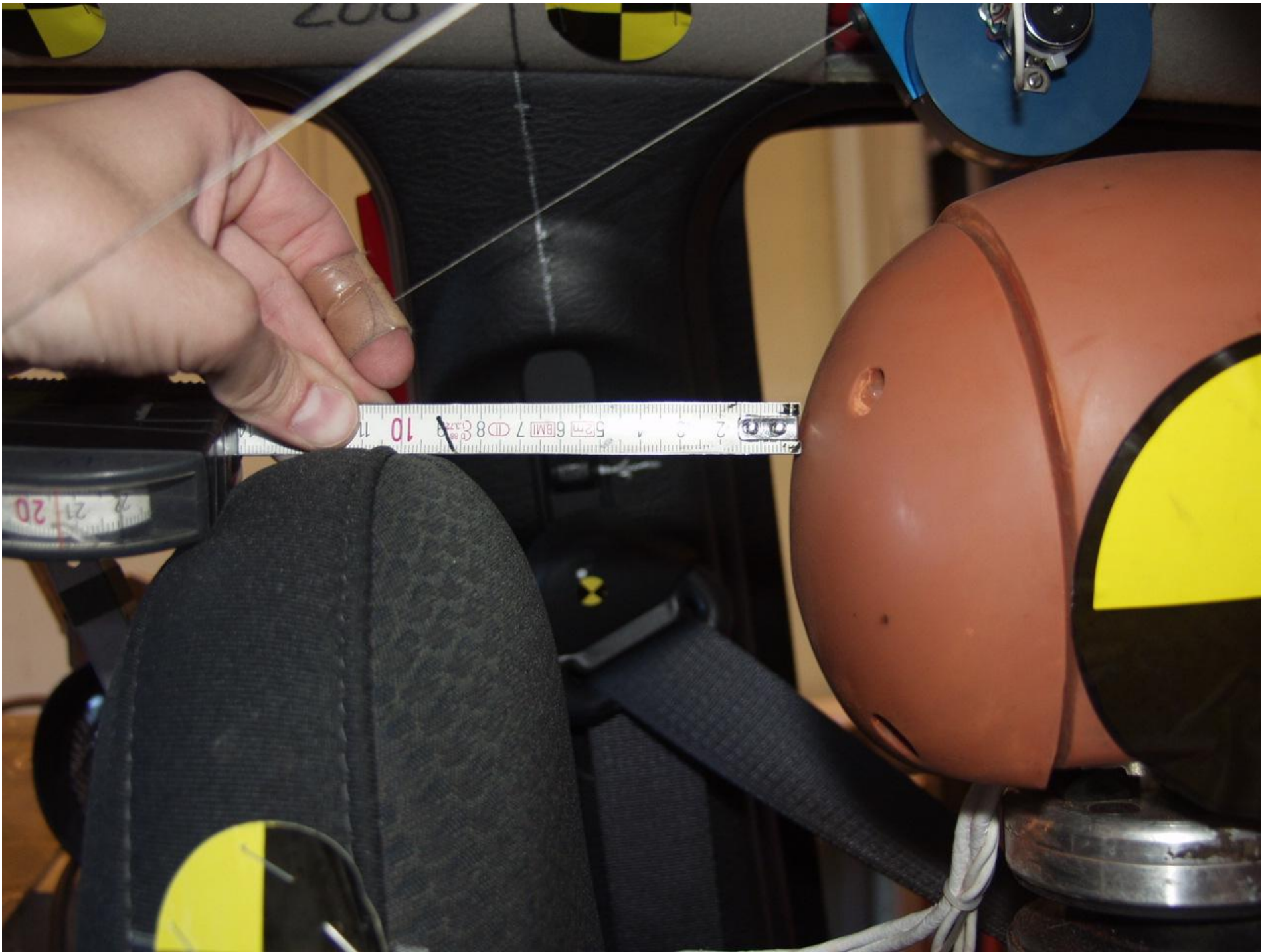


Figure A-2 PASSENGER ICBC BACKSET VIEW



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8655-F301-23R

Figure A-3 PRE-TEST DRIVER BACKSET VIEW



Figure A-4 PRE-TEST PASSENGER BACKSET VIEW



Figure A-5 PRE-TEST DRIVER SEAT CLOSE-UP VIEW



Figure A-6 POST-TEST DRIVER SEAT CLOSE-UP VIEW



Figure A-7 PRE-TEST DRIVER SEAT PERPENDICULAR VIEW

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8655-F301-23R



Figure A-8 POST-TEST DRIVER SEAT PERPENDICULAR VIEW

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8655-F301-23R



Figure A-9 PRE-TEST PASSENGER SEAT CLOSE-UP VIEW

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8655-F301-23R



Figure A-10 POST-TEST PASSENGER SEAT CLOSE-UP VIEW



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8655-F301-23R

Figure A-11 PRE-TEST PASSENGER SEAT PERPENDICULAR VIEW

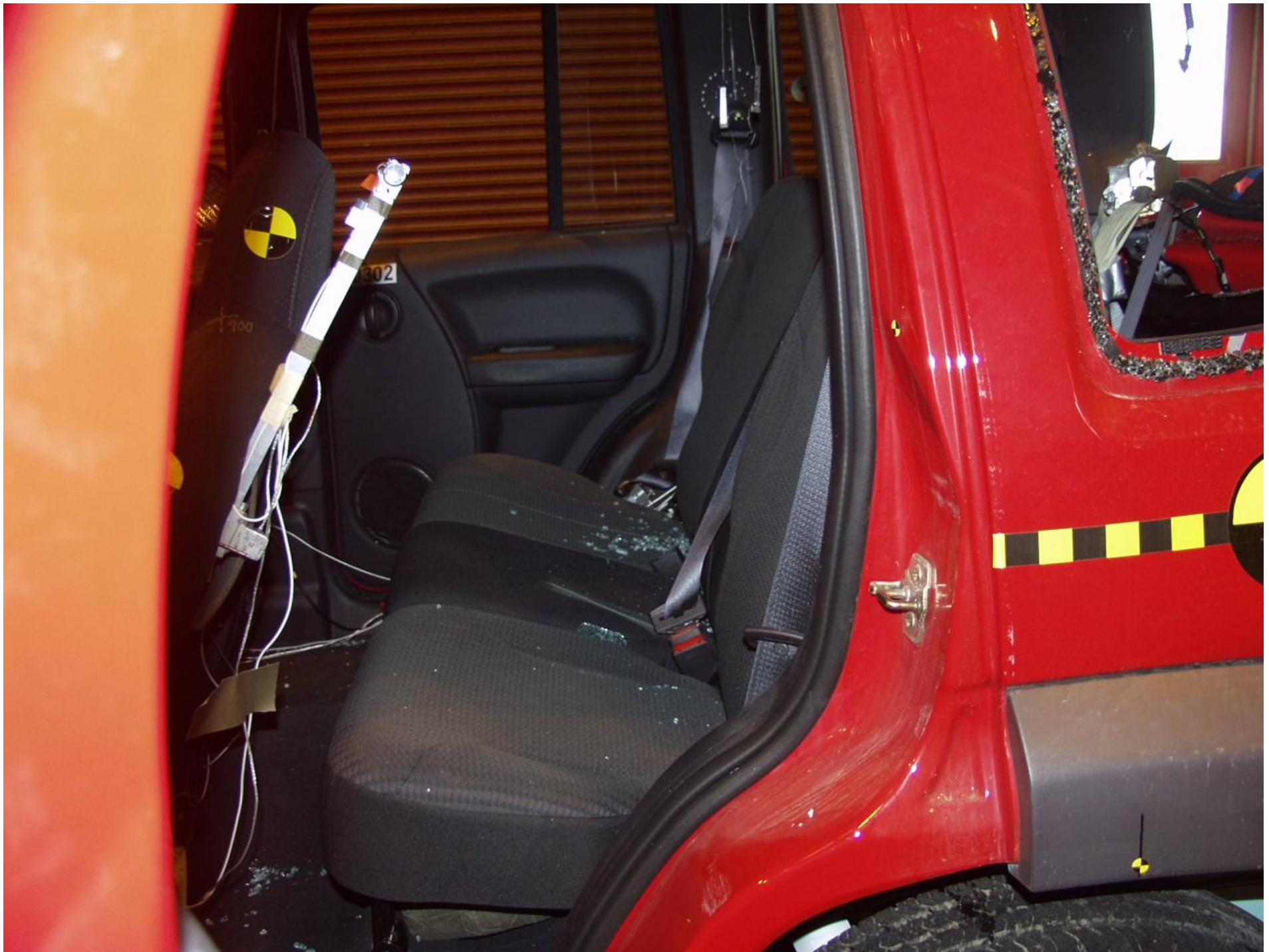


Figure A-12 POST-TEST PASSENGER SEAT PERPENDICULAR VIEW



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8655-F301-23R

Figure A-13 PRE-TEST DRIVER LEFT SIDE VIEW



Figure A-14 POST-TEST DRIVER LEFT SIDE VIEW



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8655-F301-23R

Figure A-15 PRE-TEST DRIVER RIGHT SIDE VIEW



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Figure A-16 POST-TEST DRIVER RIGHT SIDE VIEW



Figure A-17 PRE-TEST DRIVER ISOMETRICAL VIEW



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8655-F301-23R

Figure A-18 POST-TEST DRIVER ISOMETRICAL VIEW



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8655-F301-23R

Figure A-19 PRE-TEST PASSENGER LEFT SIDE VIEW



Figure A-20 POST-TEST PASSENGER LEFT SIDE VIEW



Figure A-21 PRE-TEST PASSENGER RIGHT SIDE VIEW



Figure A-22 POST-TEST PASSENGER RIGHT SIDE VIEW



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Figure A-23 PRE-TEST PASSENGER ISOMETRICAL VIEW



Figure A-24 POST-TEST PASSENGER ISOMETRICAL VIEW

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. C30302

DRIVER DUMMY (Pos. 1)	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Head Angular Velocity	1000
Neck Forces	1000
Neck Moments	600
Chest Accelerations	180
Chest Angular Velocity	600
Chest Rotations	1000
Pelvic Accelerations	1000
Belt Forces	60
Belt Spoolout	180
Vehicle Accelerations	60
Vehicle Angular Velocity	1000

Note: Angular position is measured in degrees of rotation from the initial (design) position.

FACILITY: VERF DATE: July 07, 2004
TEST#: 42057-1009-2145
TITLE: 2003 '301' Test 9 2004 Jeep Liberty C30302
Version 5.00

P1 Head

P1 HIC(15 ms): 72.9
t1: 115.7 msec
t2: 130.7 msec
Duration: 15.0 msec
Average Acceleration: 29.8 g

P1 HIC(36 ms): 106.6
t1: 103.1 msec
t2: 139.1 msec
Duration: 36.0 msec
Average Acceleration: 24.5 g

P1 Upper Neck

P1 UP NECK Fx: Max: 386.5 N 126.6 msec
Min: -204.4 N 361.7 msec

P1 UP NECK Fz: Max: 1135.5 N 115.5 msec
Min: -14.2 N -22.2 msec

P1 UP NECK Mocy (50th Male)
Max: 16.5 N-m 373.4 msec
Min: -18.1 N-m 146.7 msec

P1 UP NECK Nij (50th Male)

Ntf: 0.16 Nij 123.0 msec CVt: 6806; CVf: 310
Fz: 990.3 N
Fx: 319.6 N
Mocy: 3.1 N-m

Nte: 0.26 Nij 115.1 msec CVt: 6806; CVe: 135
Fz: 1122.7 N
Fx: 117.5 N
Mocy: -12.3 N-m

Ncf: 0.00 Nij -28.9 msec CVc: 6160; CVf: 310
Fz: -1.6 N
Fx: 0.1 N
Mocy: 0.0 N-m

Nce: 0.00 Nij-100.0 msec CVc: 6160; CVe: 135
Fz: -9.6 N
Fx: 1.1 N
Mocy: -0.1 N-m

P1 Chest

P1 CLIP(3 ms): 16.9 g
t1: 79.7 msec
t2: 82.7 msec
Duration: 3.0 msec
P1 CSI: 38.5

P1 CHEST DISP: Max: 0.3 mm 463.7 msec
Min: -2.2 mm 98.1 msec

P1 Femur

P1 LEFT FEMUR: Max: 2490.5 N 72.3 msec
Min: -180.3 N 64.3 msec

P1 RIGHT FEMUR: Max: 1025.0 N 82.0 msec
Min: -768.9 N 73.1 msec

Maximum and Minimum Data

NAME	Unit	Max	msec	Min	msec	Comment
V2P1 Head x	g	28.9	125.7	-5.4	365.5	
V2P1 Head y	g	3.0	154.0	-2.0	122.3	
V2P1 Head z	g	17.4	115.1	-0.1	-76.3	
V2P1 Head Resultant	g	31.2	124.1	0.0	-87.0	
V2P1 Head AVy	deg/s	1503.7	108.6	-1021.4	214.3	
V2P1 Head Comp AVy	deg/s	1588.7	108.9	-1030.6	216.9	f2=0.283 Hz; f4=0.001 Hz
V2P1 Head Comp ADy	deg	64.6	124.2	-48.4	379.6	f2=0.283 Hz; f4=0.001 Hz
V2P1 Upper Neck Fx	N	386.5	126.6	-204.4	361.7	
V2P1 Upper Neck Fy	N	153.0	143.8	-48.8	389.1	
V2P1 Upper Neck Fz	N	1135.5	115.5	-14.2	-22.2	
V2P1 Upper Neck F Resultant	N	1143.6	115.5	0.1	-47.2	
V2P1 Upper Neck Mx	N-m	10.4	123.5	-3.7	380.1	
V2P1 Upper Neck My	N-m	16.0	127.7	-18.2	146.7	
V2P1 Upper Neck Mz	N-m	4.3	166.1	-3.5	102.8	
V2P1 Upper Neck M Resultant	N-m	18.8	146.8	0.0	-5.8	
V2P1 Lower Neck Fx	N	993.1	124.0	-123.4	356.3	
V2P1 Lower Neck Fy	N	245.8	131.3	-93.0	81.1	
V2P1 Lower Neck Fz	N	840.2	115.0	-50.8	390.8	
V2P1 Lower Neck F Resultant	N	1244.8	115.3	0.2	-93.3	
V2P1 Lower Neck Mx	N-m	35.9	132.8	-10.9	253.9	
V2P1 Lower Neck My	N-m	48.0	378.8	-186.0	115.7	
V2P1 Lower Neck Mz	N-m	17.2	378.4	-80.4	107.6	
V2P1 Lower Neck M Resultant	N-m	201.9	115.7	0.0	-15.4	
V2P1 Lower Neck x	g	18.1	56.1	-4.3	316.1	
V2P1 Chest x	g	17.1	80.6	-3.8	316.5	
V2P1 Chest y	g	4.5	83.6	-2.1	73.7	
V2P1 Chest z	g	7.8	70.3	-1.7	84.6	
V2P1 Chest Resultant	g	17.5	80.6	0.0	-42.5	
V2P1 Chest Displacement	mm	0.3	463.7	-2.2	98.1	
V2P1 Chest AVy	deg/s	405.7	89.3	-289.5	161.5	
V2P1 Chest Comp AVy	deg/s	420.0	89.6	-294.7	266.5	f2=0.298 Hz; f4=0.001 Hz
V2P1 Chest Comp ADy	deg	17.7	135.6	-28.1	380.3	f2=0.298 Hz; f4=0.001 Hz
V2P1 Pelvic x	g	32.1	70.3	-1.8	141.4	
V2P1 Pelvic y	g	4.3	113.7	-2.9	70.5	
V2P1 Pelvic z	g	12.2	69.5	-1.3	300.0	
V2P1 Pelvic Resultant	g	33.0	70.3	0.0	-12.7	
V2P1 Left Femur	N	2490.5	72.3	-180.3	64.3	
V2P1 Right Femur	N	1025.0	82.0	-768.9	73.1	
V2P1 Head to Chest	deg	20.3	379.6	-47.9	122.8	
V2P1 Lap Belt	N	211.4	332.7	-25.0	88.6	
V2P1 Belt Spoolout	mm	0.0	12.9	-83.3	147.8	

Maximum and Minimum Data (Continued)

NAME	Unit	Max	msec	Min	msec	Comment
V2P3 Head x	g	36.5	95.6	-5.4	212.7	
V2P3 Head y	g	5.2	119.9	-4.6	68.8	
V2P3 Head z	g	18.3	87.8	-3.2	45.2	
V2P3 Head Resultant	g	37.9	94.9	0.0	-32.9	
V2P3 Head AVy	deg/s	1352.5	81.0	-897.9	129.0	Questionable Data
V2P3 Head Comp AVy	deg/s	1365.2	81.0	-896.7	129.6	f2=0.287 Hz; f4=0.001 Hz
V2P3 Head Comp ADy	deg	13.3	109.5	-44.6	229.9	f2=0.287 Hz; f4=0.001 Hz
V2P3 Upper Neck Fx	N	472.7	94.9	-226.3	208.8	
V2P3 Upper Neck Fy	N	69.2	138.6	-163.7	73.7	
V2P3 Upper Neck Fz	N	961.5	87.8	-133.8	45.0	
V2P3 Upper Neck F Resultant	N	986.7	87.9	0.0	-6.6	
V2P3 Upper Neck Mx	N-m	3.3	54.4	-17.0	96.0	
V2P3 Upper Neck My	N-m	33.9	95.6	-28.7	115.3	
V2P3 Upper Neck Mz	N-m	14.8	132.6	-9.0	80.4	
V2P3 Upper Neck M Resultant	N-m	37.9	95.6	0.0	-38.9	
V2P3 Lower Neck Fx	N	1006.1	91.8	-264.2	212.1	
V2P3 Lower Neck Fy	N	254.0	96.1	-287.0	63.4	
V2P3 Lower Neck Fz	N	526.8	62.3	-287.4	97.2	
V2P3 Lower Neck F Resultant	N	1027.1	91.7	0.1	-36.1	
V2P3 Lower Neck Mx	N-m	19.8	122.5	-35.8	70.2	
V2P3 Lower Neck My	N-m	52.2	215.5	-135.4	88.3	
V2P3 Lower Neck Mz	N-m	16.9	96.2	-17.4	63.6	
V2P3 Lower Neck M Resultant	N-m	136.3	88.3	0.0	-46.4	
V2P3 Lower Neck x	g	31.9	51.8	-2.8	209.8	
V2P3 Chest x	g	29.6	52.5	-2.5	191.2	
V2P3 Chest y	g	6.4	89.1	-4.8	56.5	
V2P3 Chest z	g	8.0	58.6	-3.6	70.4	
V2P3 Chest Resultant	g	30.7	52.5	0.0	-31.6	
V2P3 Chest Compression	mm	0.2	106.3	-4.7	206.6	
V2P3 Chest AVy	deg/s	296.2	77.2	-247.0	186.8	
V2P3 Chest Comp AVy	deg/s	305.8	77.3	-253.1	187.4	f2=0.308 Hz; f4=0.001 Hz
V2P3 Chest Comp ADy	deg	9.9	109.2	-13.2	279.8	f2=0.308 Hz; f4=0.001 Hz
V2P3 Pelvic x	g	32.9	59.2	-4.2	170.8	
V2P3 Pelvic y	g	3.0	79.1	-4.2	57.8	
V2P3 Pelvic z	g	15.5	55.5	-1.5	273.4	
V2P3 Pelvic Resultant	g	35.8	58.4	0.0	-10.9	
V2P3 Left Femur	N	272.7	159.8	-1293.2	61.7	
V2P3 Right Femur	N	283.8	162.1	-1160.6	57.6	
V2P3 Head to Chest	deg	35.2	214.6	-16.8	371.6	
V2P3 Lap Belt	N	1288.8	168.1	-7.8	44.5	

Maximum and Minimum Data (Continued)

NAME	Unit	Max	msec	Min	msec	Comment
V2 Left X Member x	g	35.4	26.0	-4.1	123.6	
V2 Left X Member RED x	g	35.6	25.9	-2.5	124.5	
V2 Right X Member x	g	41.9	26.0	-7.2	31.8	
V2 Right X Member RED x	g	40.5	26.1	-9.2	32.0	
V2 Left Front Sill AVy	deg/s	68.4	80.1	-188.6	70.8	
V2 Left Front Sill Comp AVy	deg/s	66.1	80.1	-190.1	70.8	f2=0.283 Hz; f4=0.001 Hz
V2 Left Front Sill Comp ADy	deg	0.2	36.5	-1.7	174.7	f2=0.283 Hz; f4=0.001 Hz
V2P1 Left Seat AVy	deg/s	637.5	60.8	-277.3	159.6	
V2P1 Left Seat Comp AVy	deg/s	655.1	60.8	-254.0	159.6	f2=0.374 Hz; f4=0.001 Hz
V2P1 Left Seat Comp ADy	deg	18.9	123.1	0.0	9.2	f2=0.374 Hz; f4=0.001 Hz
V2P1 Right Seat AVy	deg/s	549.6	60.8	-211.4	116.4	
V2P1 Right Seat Comp AVy	deg/s	563.6	60.9	-179.9	116.4	f2=0.296 Hz; f4=0.001 Hz
V2P1 Right Seat Comp ADy	deg	19.6	101.8	0.0	7.1	f2=0.296 Hz; f4=0.001 Hz
V2P1 Left Link ADy	deg	24.7	123.4	-9.4	49.3	
V2P1 Right Link ADy	deg	16.1	106.9	-5.1	34.1	
V2P1 Left Span Bar D	mm	379.7	122.6	0.0	-76.7	
V2P1 Right Span Bar D	mm	322.7	110.6	-0.1	-76.7	
V2P3 Left Seat AVy	deg/s	1046.1	67.1	-756.8	48.6	
V2P3 Left Seat Comp AVy	deg/s	1051.0	67.1	-755.6	48.7	f2=0.3 Hz; f4=0.001 Hz
V2P3 Left Seat Comp ADy	deg	9.9	103.5	-3.6	58.2	f2=0.3 Hz; f4=0.001 Hz
V2P3 Right Seat AVy	deg/s	396.2	110.4	-381.7	77.8	
V2P3 Right Seat Comp AVy	deg/s	383.8	110.4	-394.5	77.8	f2=0.396 Hz; f4=0.001 Hz
V2P3 Right Seat Comp ADy	deg	0.1	161.9	-7.4	103.5	f2=0.396 Hz; f4=0.001 Hz
V2P3 Left Link ADy	deg	12.8	128.0	-51.2	115.0	
V2P3 Right Link ADy	deg	23.2	109.7	-13.2	156.0	
V2P3 Left Span Bar D	mm	189.9	106.0	0.0	-76.7	
V2P3 Right Span Bar D	mm	126.2	84.7	0.0	-76.7	
P1 Left Change in Seat Back Angle WR	deg	20.5	123.0	0.0	11.3	
P1 Left Change in String Angle	deg	5.6	203.0	-12.7	49.3	
P1 Left Seat X Displacement	mm	249.4	123.4	-6.6	31.6	
P1 Right Change in Seat Back Angle W	deg	21.2	99.8	0.0	9.1	
P1 Right Change in String Angle	deg	2.8	37.2	-10.3	100.1	
P1 Right Seat X Displacement	mm	133.5	107.0	-12.0	33.7	
P3 Left Change in Seat Back Angle WR	deg	11.4	103.4	-3.8	58.1	
P3 Left Change in String Angle	deg	10.5	128.0	-57.3	114.5	
P3 Left Seat X Displacement	mm	106.1	92.6	-273.5	114.3	
P3 Right Change in Seat Back Angle W	deg	1.8	161.9	-5.9	103.6	
P3 Right Change in String Angle	deg	27.8	109.2	-14.7	156.1	
P3 Right Seat X Displacement	mm	184.7	103.6	-26.8	156.3	

Table of Data Plots

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3	V2P1 Head z [g, CFC_1000]	B-13
4	V2P1 Head Resultant [g, CFC_1000]	B-14
5	V2P1 Head AVy	B-15
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7	V2P1 Head Comp ADy	B-17
8	V2P1 Upper Neck Fx [N, CFC_1000]	B-18
9	V2P1 Upper Neck Fy [N, CFC_1000]	B-19
10	V2P1 Upper Neck Fz [N, CFC_1000]	B-20
11	V2P1 Upper Neck F Resultant [N, CFC_1000]	B-21
12	V2P1 Upper Neck Mx [N-m, CFC_600]	B-22
13	V2P1 Upper Neck My [N-m, CFC_600]	B-23
14	V2P1 Upper Neck Mz [N-m, CFC_600]	B-24
15	V2P1 Upper Neck M Resultant [N-m, CFC_600]	B-25
16	V2P1 Lower Neck Fx [N, CFC_1000]	B-26
17	V2P1 Lower Neck Fy [N, CFC_1000]	B-27
18	V2P1 Lower Neck Fz [N, CFC_1000]	B-28
19	V2P1 Lower Neck F Resultant [N, CFC_1000]	B-29
20	V2P1 Lower Neck Mx [N-m, CFC_600]	B-30
21	V2P1 Lower Neck My [N-m, CFC_600]	B-31
22	V2P1 Lower Neck Mz [N-m, CFC_600]	B-32
23	V2P1 Lower Neck M Resultant [N-m, CFC_600]	B-33
24	V2P1 Lower Neck x [g, CFC_1000]	B-34
25	V2P1 Chest x [g, CFC_180]	B-35
26	V2P1 Chest y [g, CFC_180]	B-36
27	V2P1 Chest z [g, CFC_180]	B-37
28	V2P1 Chest Resultant [g, CFC_180]	B-38
29	V2P1 Chest Displacement [mm, CFC_600]	B-39
30	V2P1 Chest AVy	B-40
31	V2P1 Chest Comp AVy	B-41
32	V2P1 Chest Comp ADy	B-42
33	V2P1 Pelvic x [g, CFC_1000]	B-43
34	V2P1 Pelvic y [g, CFC_1000]	B-44
35	V2P1 Pelvic z [g, CFC_1000]	B-45
36	V2P1 Pelvic Resultant [g, CFC_1000]	B-46
37	V2P1 Left Femur [N, CFC_600]	B-47
38	V2P1 Right Femur [N, CFC_600]	B-48
39	V2P1 Head to Chest	B-49
40	V2P1 Lap Belt [N, CFC_60]	B-50
41	V2P1 Belt Spoolout [mm, CFC_180]	B-51
42	V2P3 Head x [g, CFC_1000]	B-52
43	V2P3 Head y [g, CFC_1000]	B-53
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45	V2P3 Head Resultant [g, CFC_1000]	B-55
46	V2P3 Head AVy	B-56
47	V2P3 Head Comp AVy	B-57
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Table of Data Plots (continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
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52	V2P3 Upper Neck F Resultant [N, CFC_1000]	B-62
53	V2P3 Upper Neck Mx [N-m, CFC_600]	B-63
54	V2P3 Upper Neck My [N-m, CFC_600]	B-64
55	V2P3 Upper Neck Mz [N-m, CFC_600]	B-65
56	V2P3 Upper Neck M Resultant [N-m, CFC_600]	B-66
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FMVSS301 Test 9 - 2004 Jeep Liberty

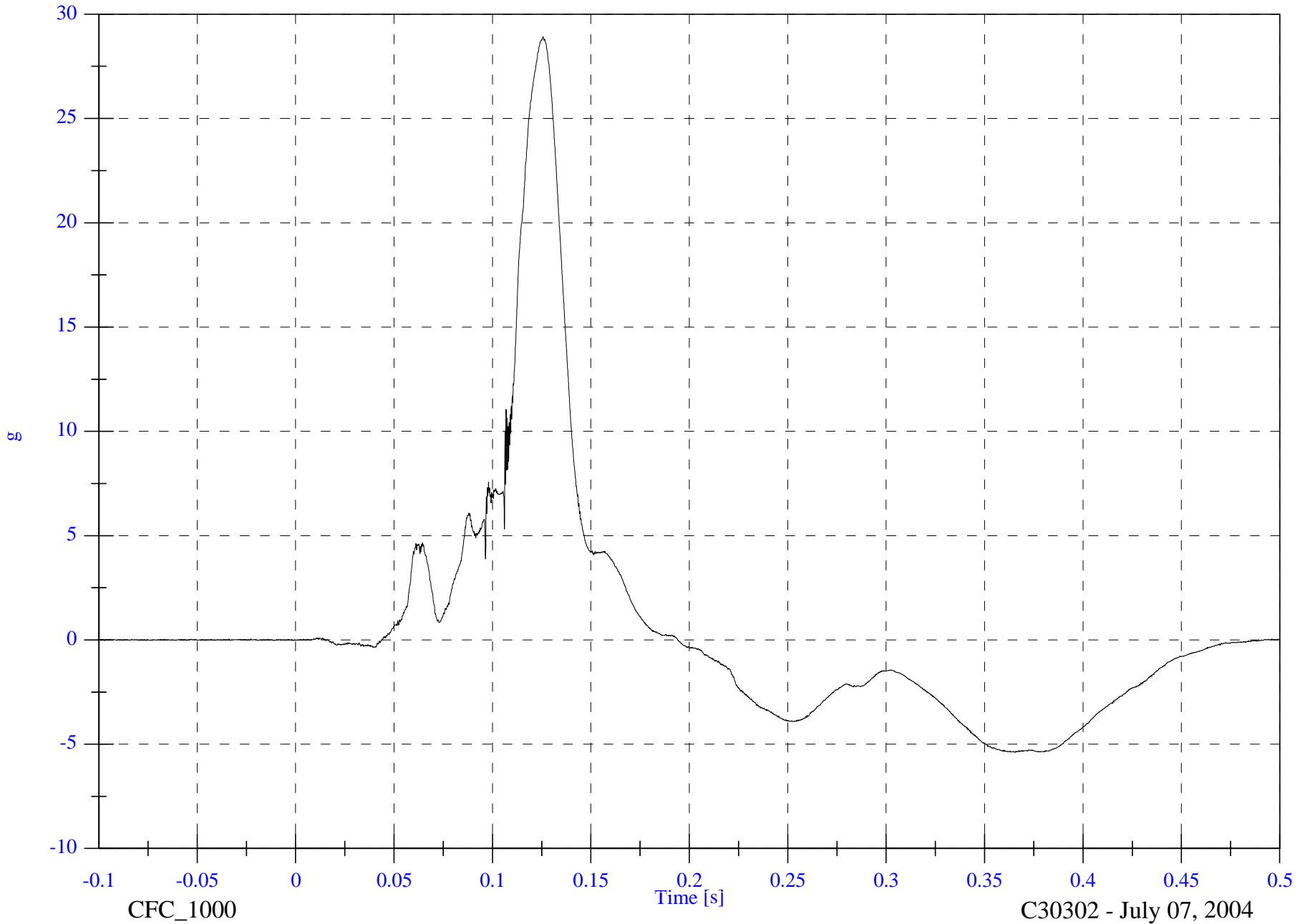
V2P1 Head x

Max: 28.9 [g] at 0.126 [s]

Min: -5.4 [g] at 0.366 [s]

B-11

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

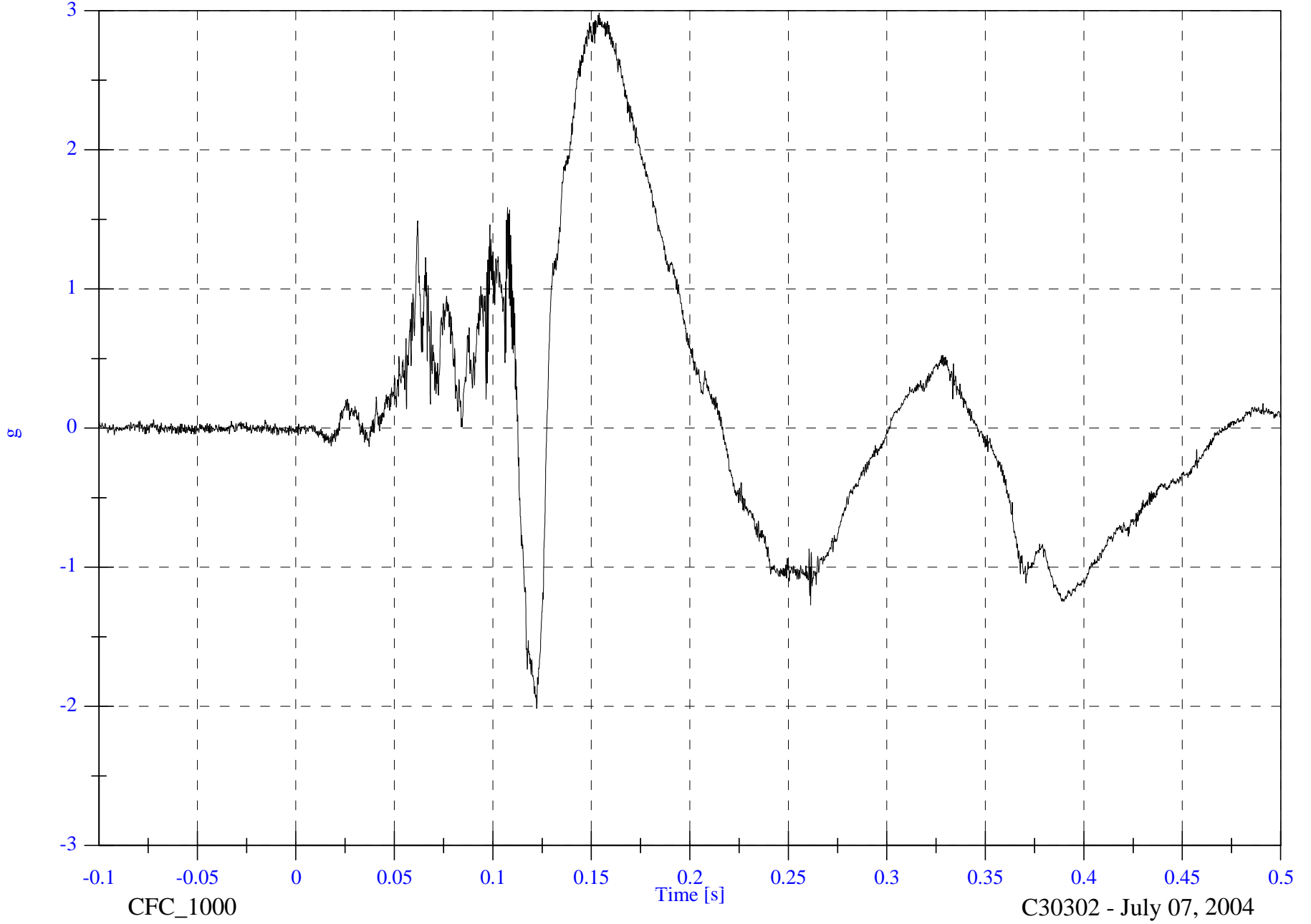
V2P1 Head y

Max: 3.0 [g] at 0.154 [s]

Min: -2.0 [g] at 0.122 [s]

B-12

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

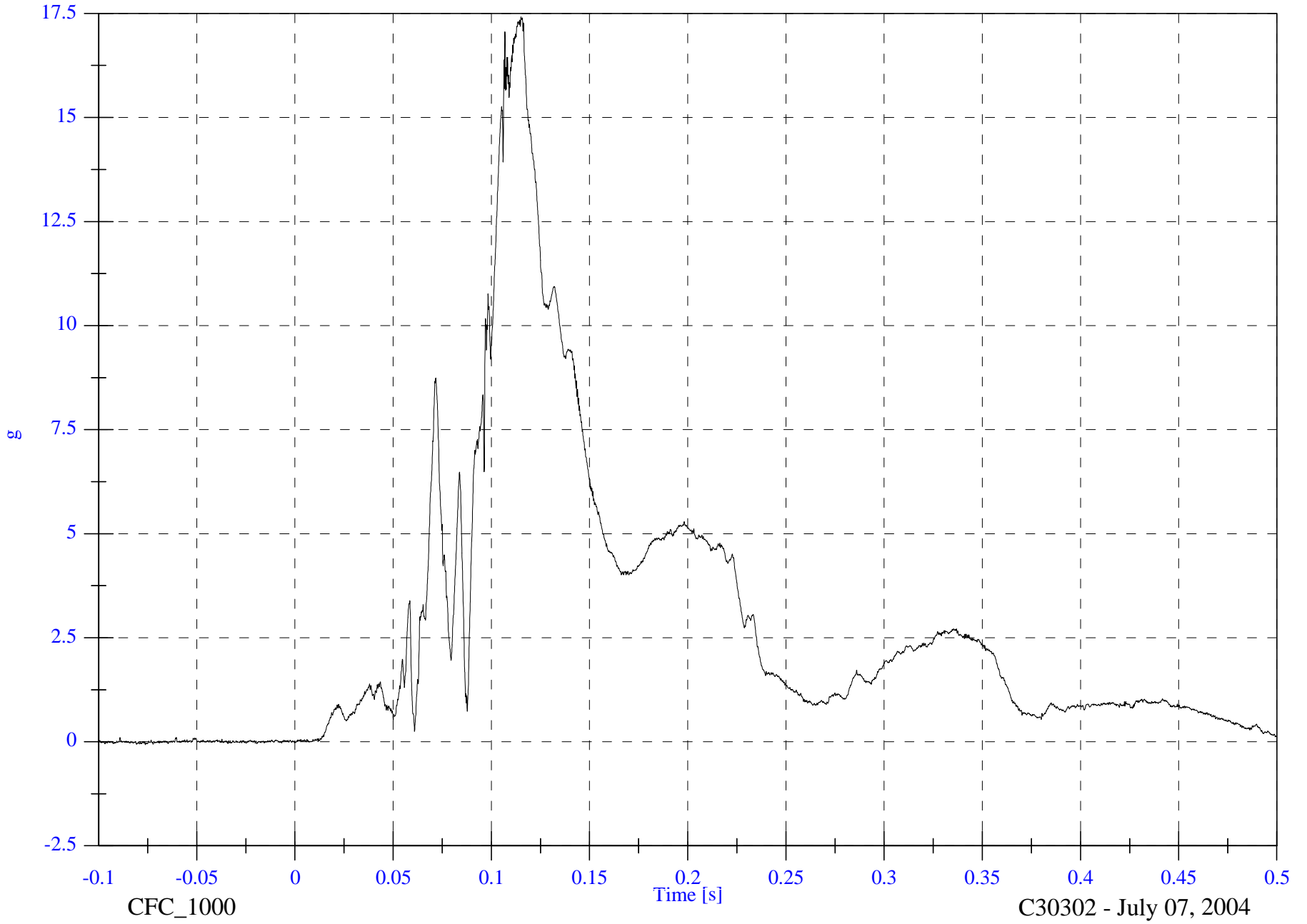
V2P1 Head z

Max: 17.4 [g] at 0.115 [s]

Min: -0.1 [g] at -0.076 [s]

B-13

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

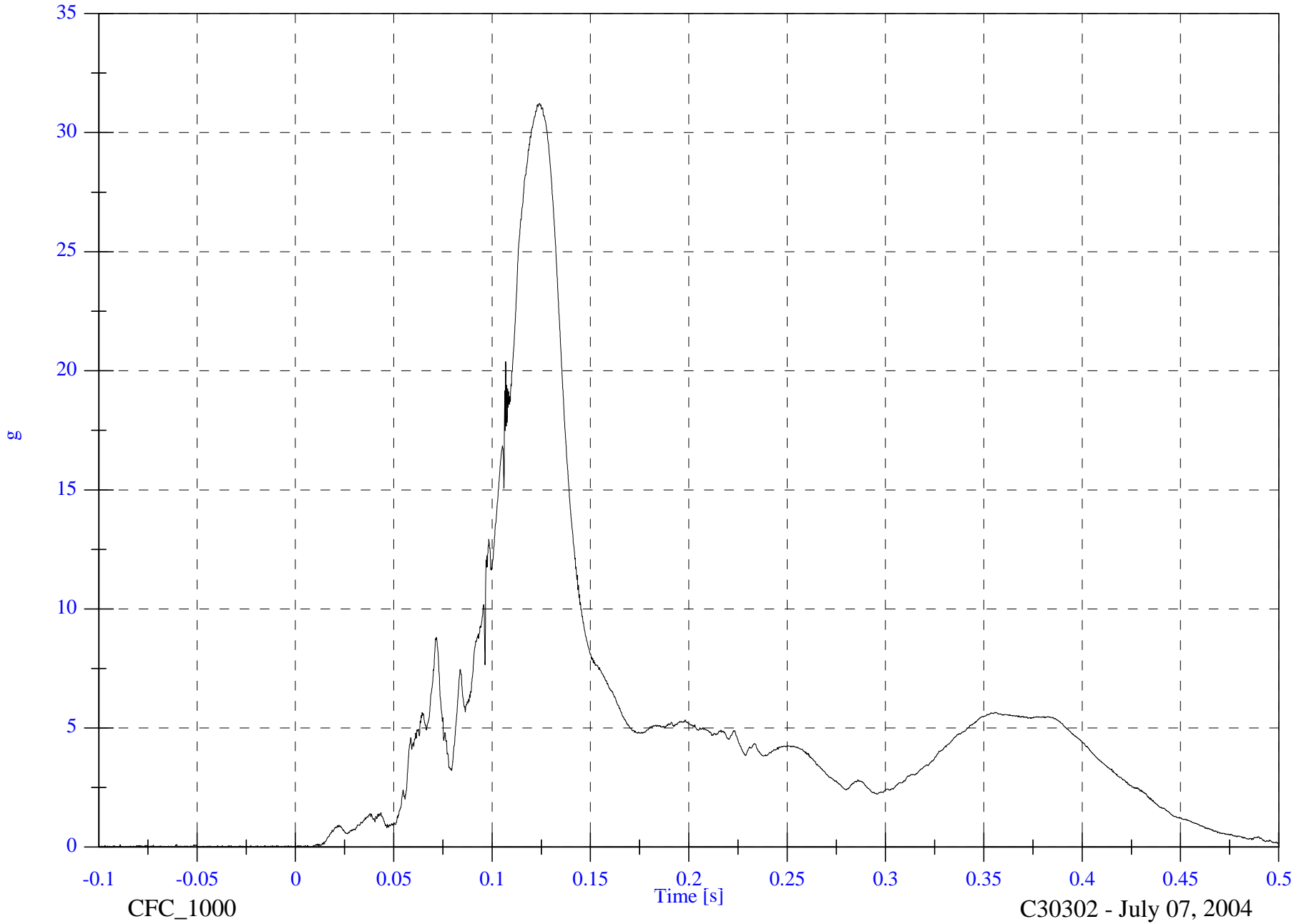
V2P1 Head Resultant

Max: 31.2 [g] at 0.124 [s]

Min: 0.0 [g] at -0.087 [s]

B-14

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

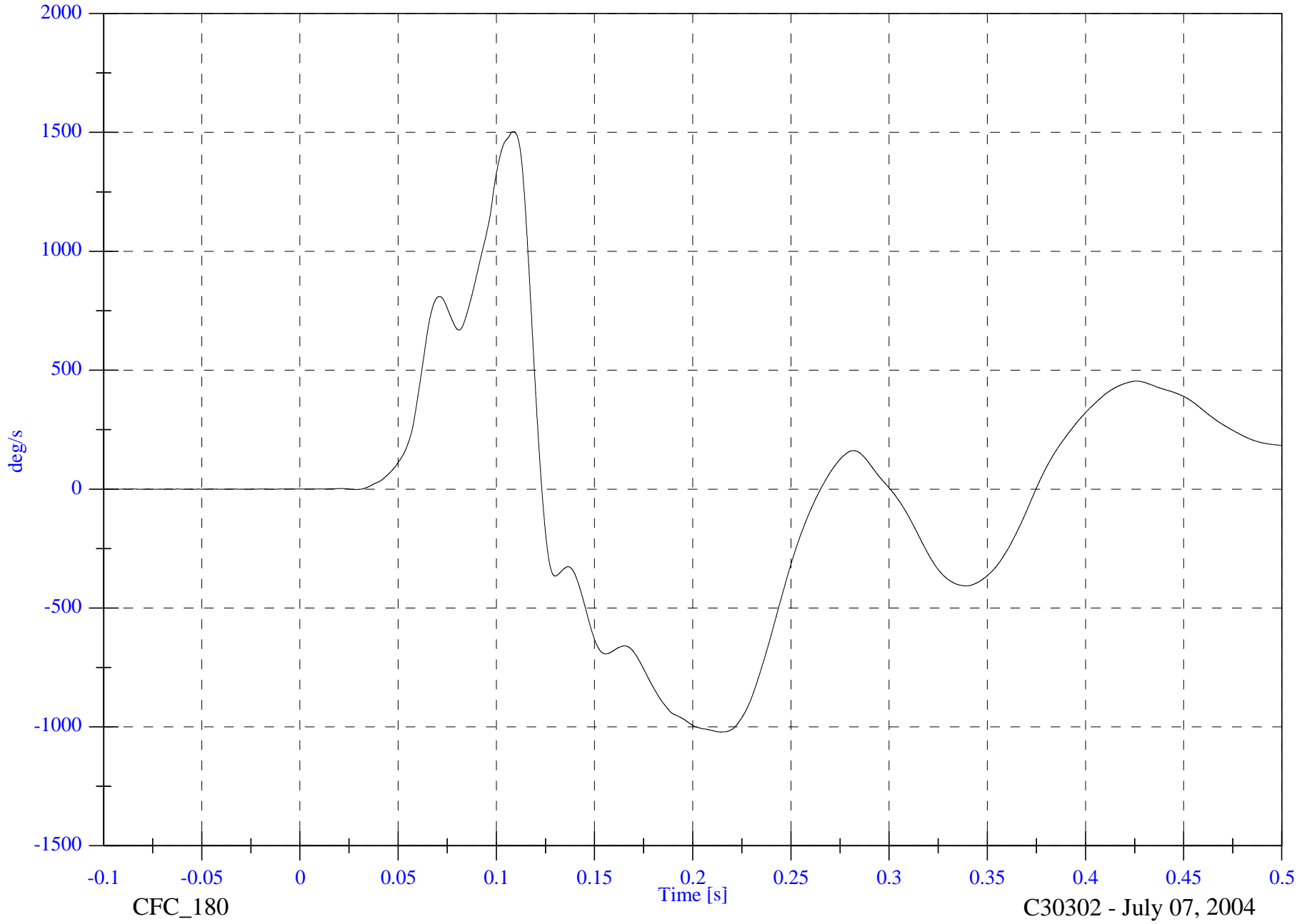
V2P1 Head AVy

Max: 1503.7 [deg/s] at 0.109 [s]

Min: -1021.4 [deg/s] at 0.214 [s]

B-15

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

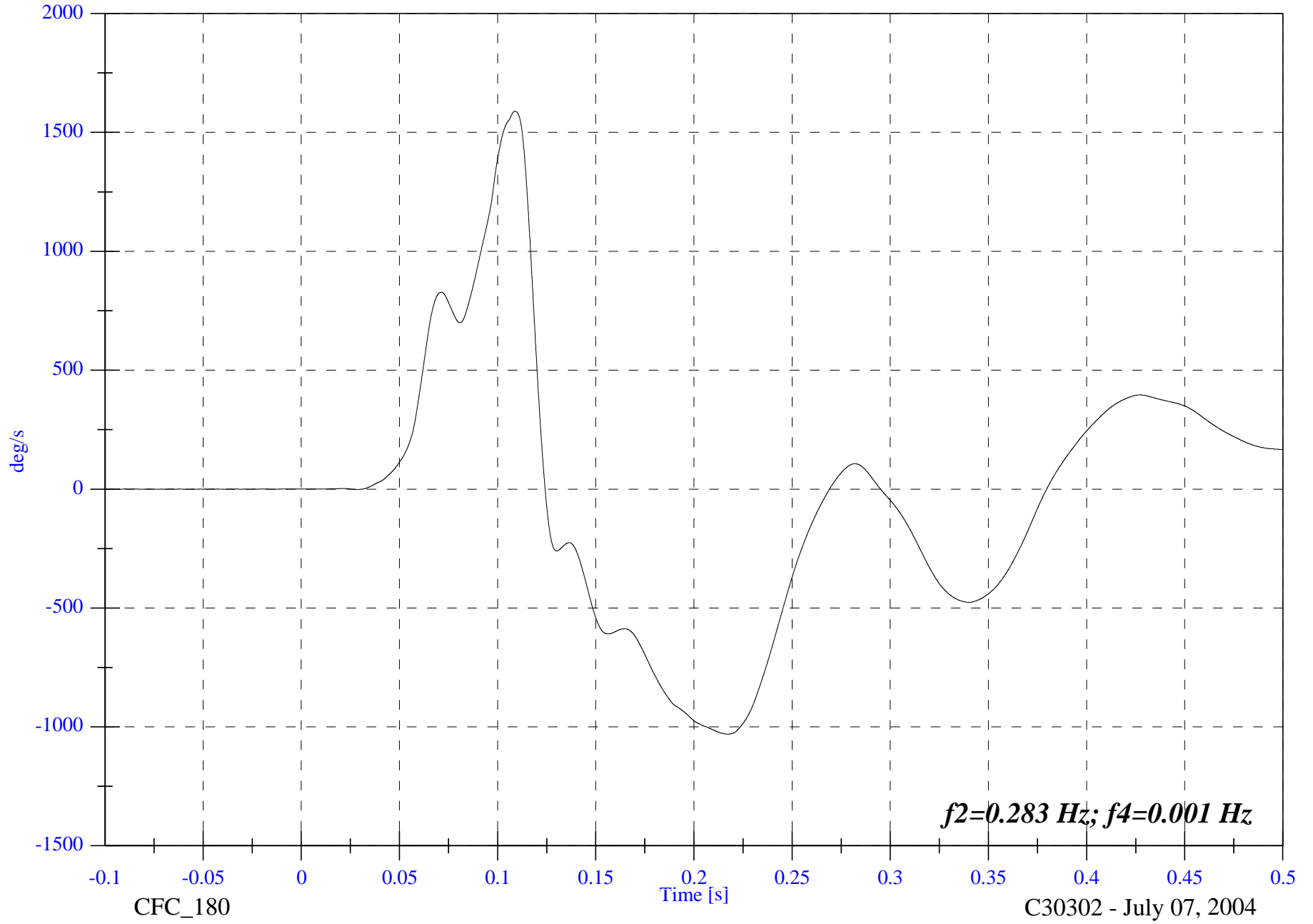
V2P1 Head Comp AVy

Max: 1588.7 [deg/s] at 0.109 [s]

Min: -1030.6 [deg/s] at 0.217 [s]

B-16

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

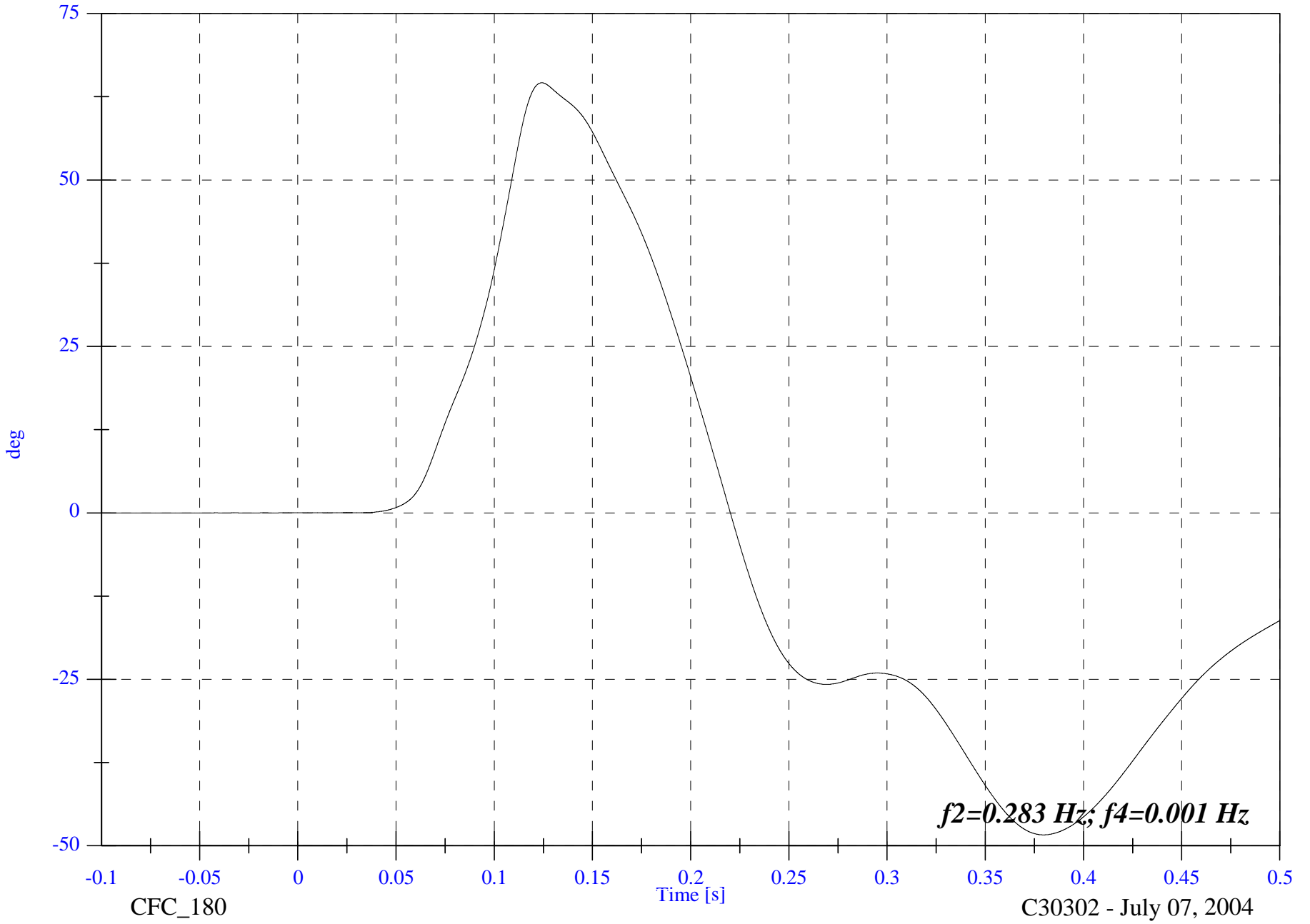
V2P1 Head Comp ADy

Max: 64.6 [deg] at 0.124 [s]

Min: -48.4 [deg] at 0.380 [s]

B-17

8655-F301-23R



CFC_180

Time [s]

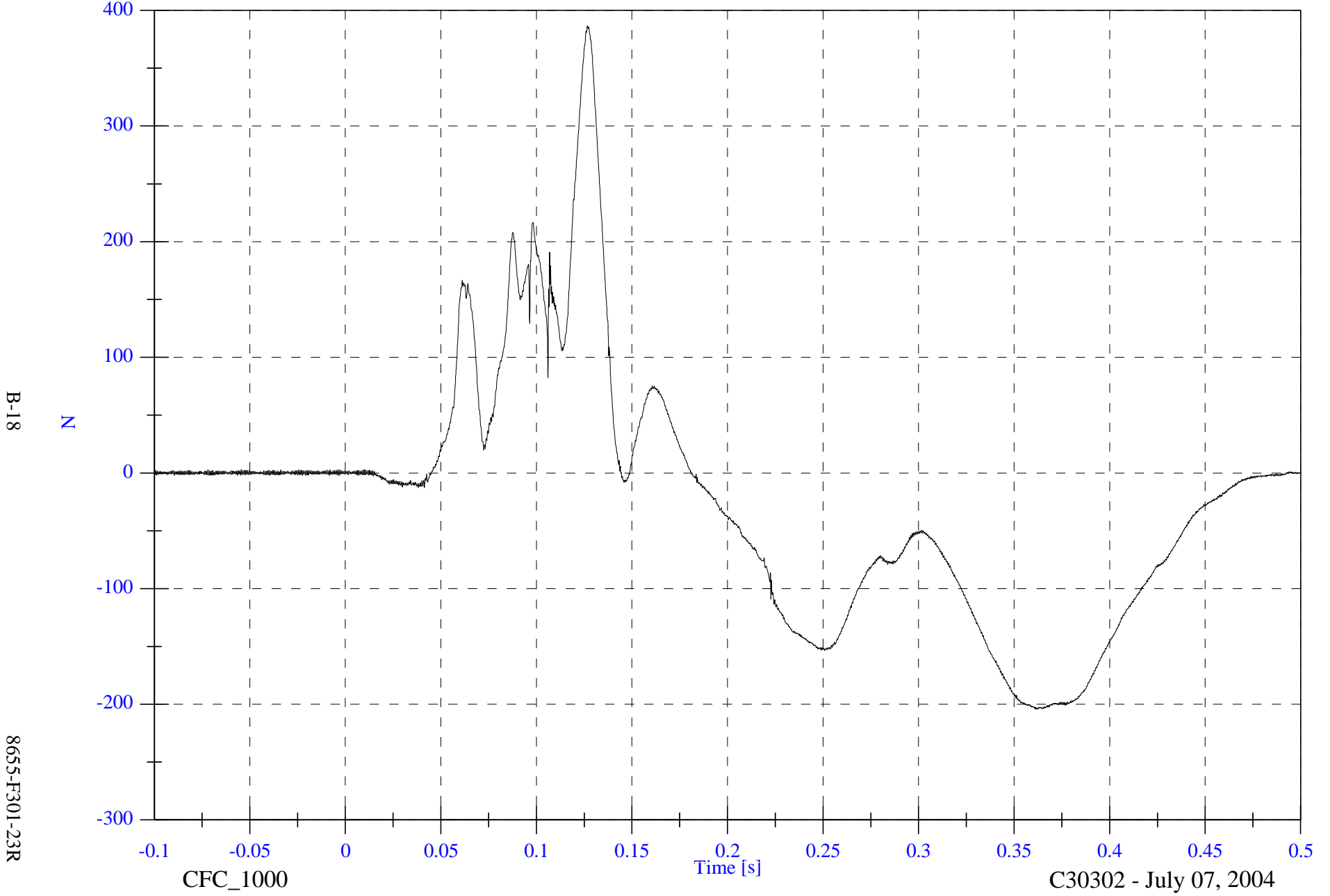
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Upper Neck Fx

Max: 386.5 [N] at 0.127 [s]

Min: -204.4 [N] at 0.362 [s]



B-18

8655-F301-23R

CFC_1000

Time [s]

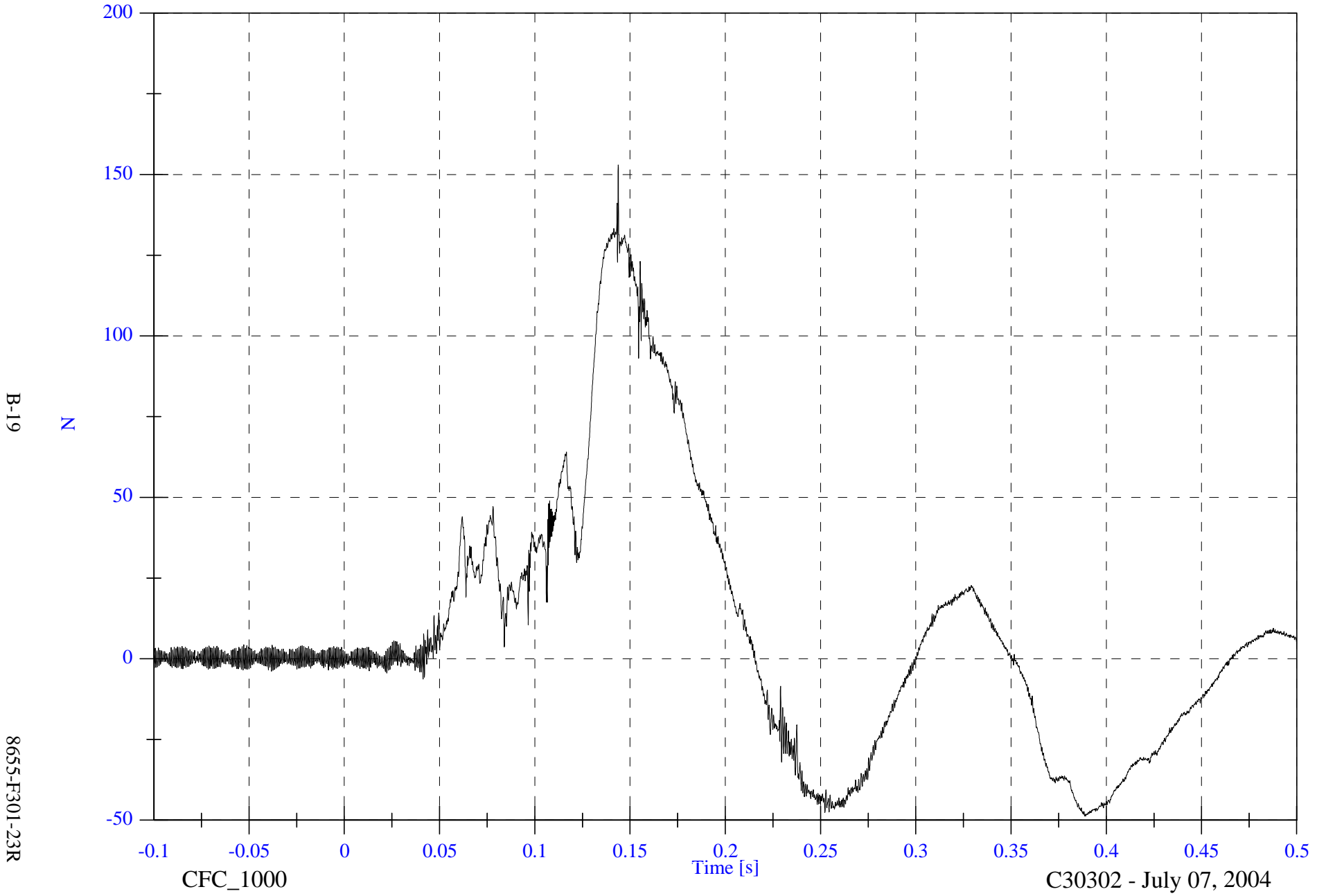
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Upper Neck Fy

Max: 153.0 [N] at 0.144 [s]

Min: -48.8 [N] at 0.389 [s]

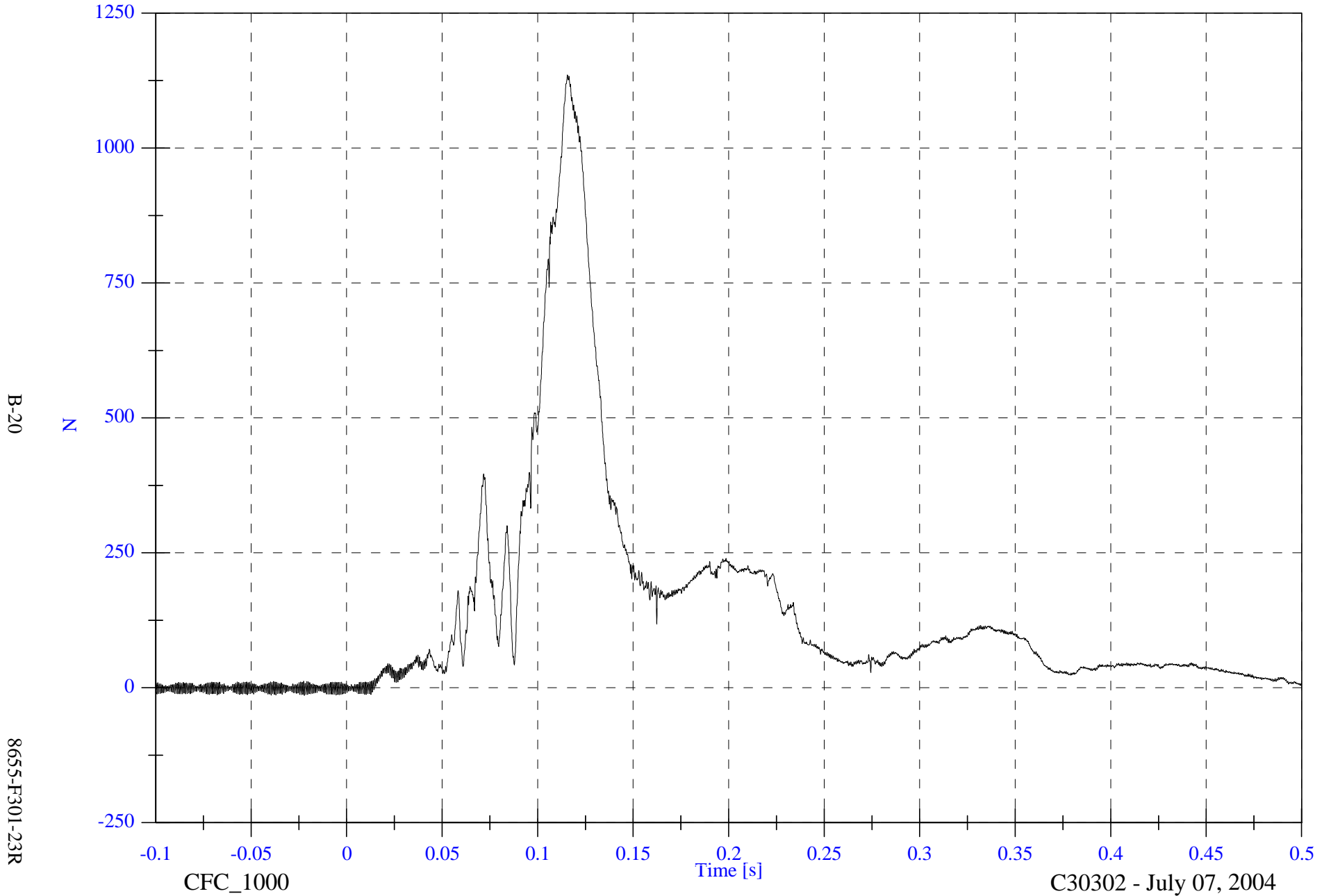


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Upper Neck Fz

Max: 1135.5 [N] at 0.116 [s]

Min: -14.2 [N] at -0.022 [s]



FMVSS301 Test 9 - 2004 Jeep Liberty

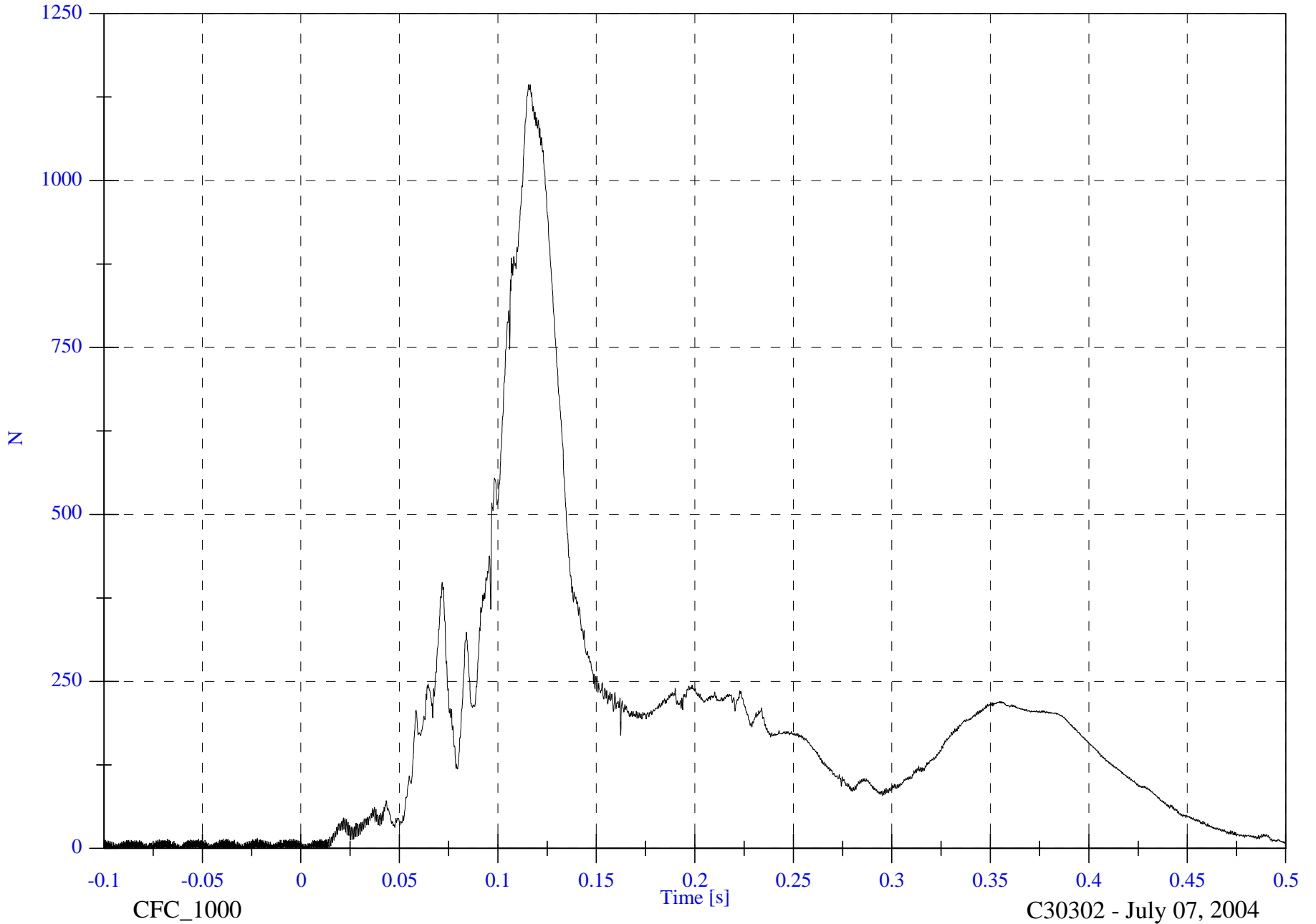
V2P1 Upper Neck F Resultant

Max: 1143.6 [N] at 0.116 [s]

Min: 0.1 [N] at -0.047 [s]

B-21

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

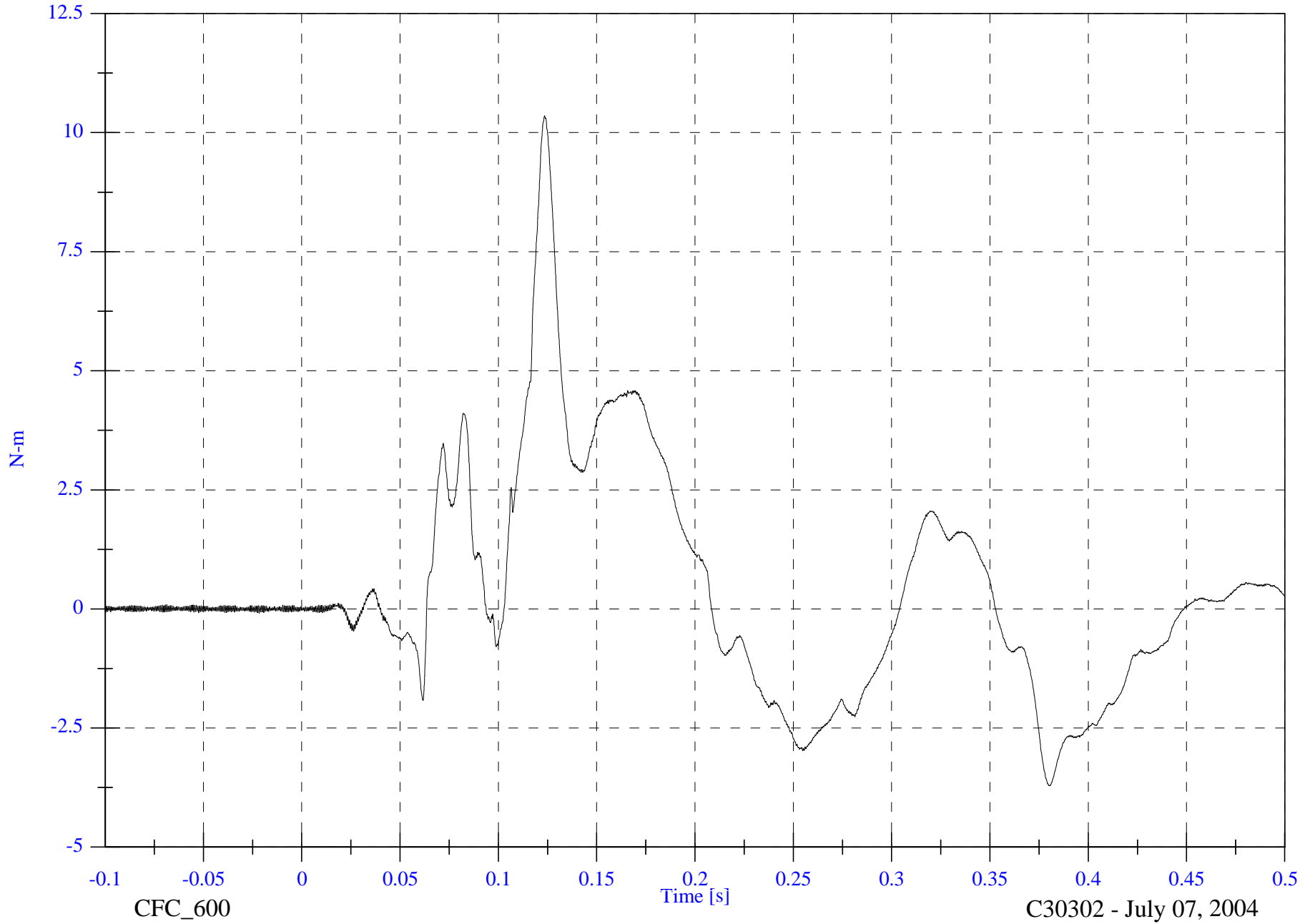
V2P1 Upper Neck Mx

Max: 10.4 [N-m] at 0.123 [s]

Min: -3.7 [N-m] at 0.380 [s]

B-22

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

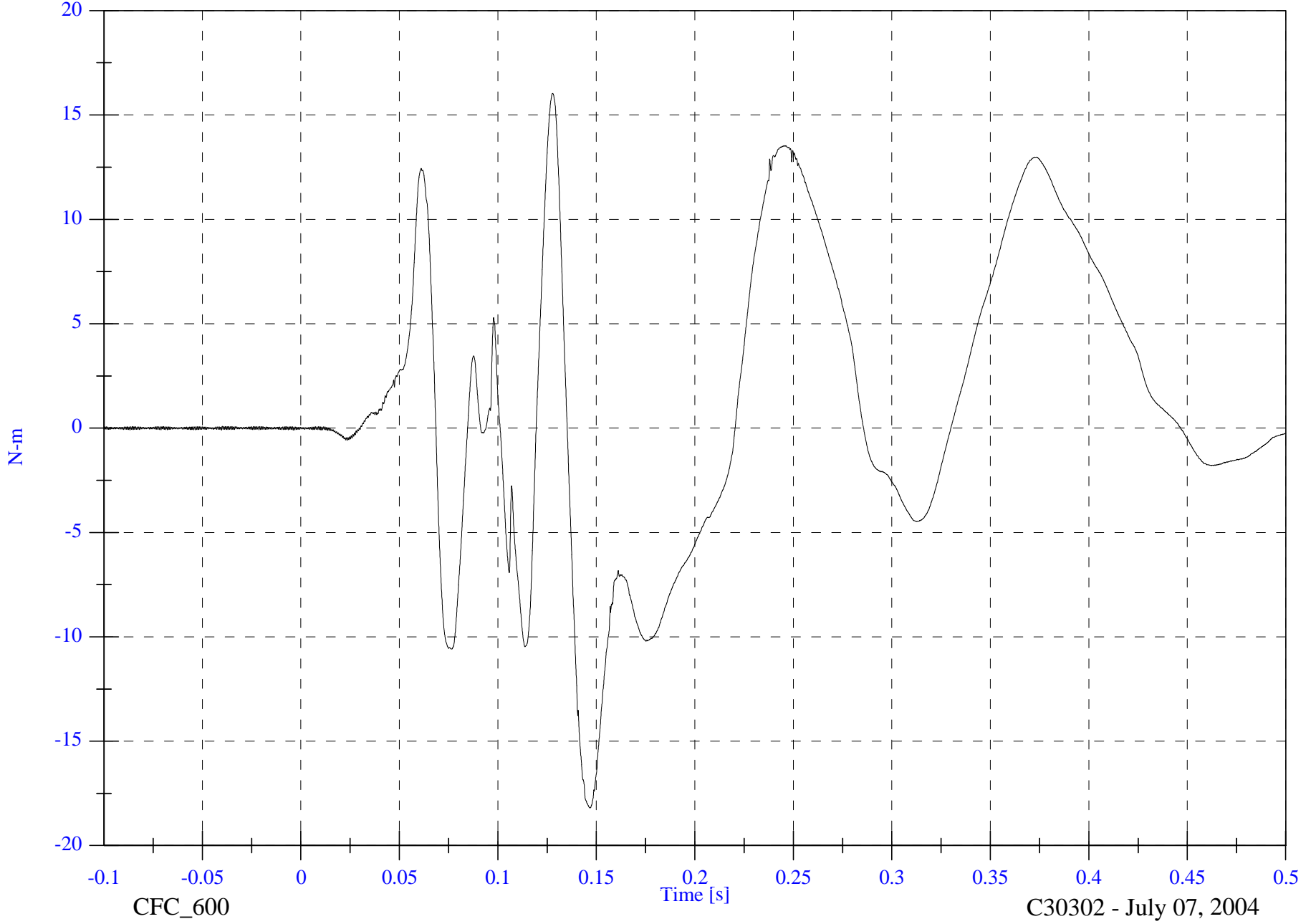
V2P1 Upper Neck My

Max: 16.0 [N-m] at 0.128 [s]

Min: -18.2 [N-m] at 0.147 [s]

B-23

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

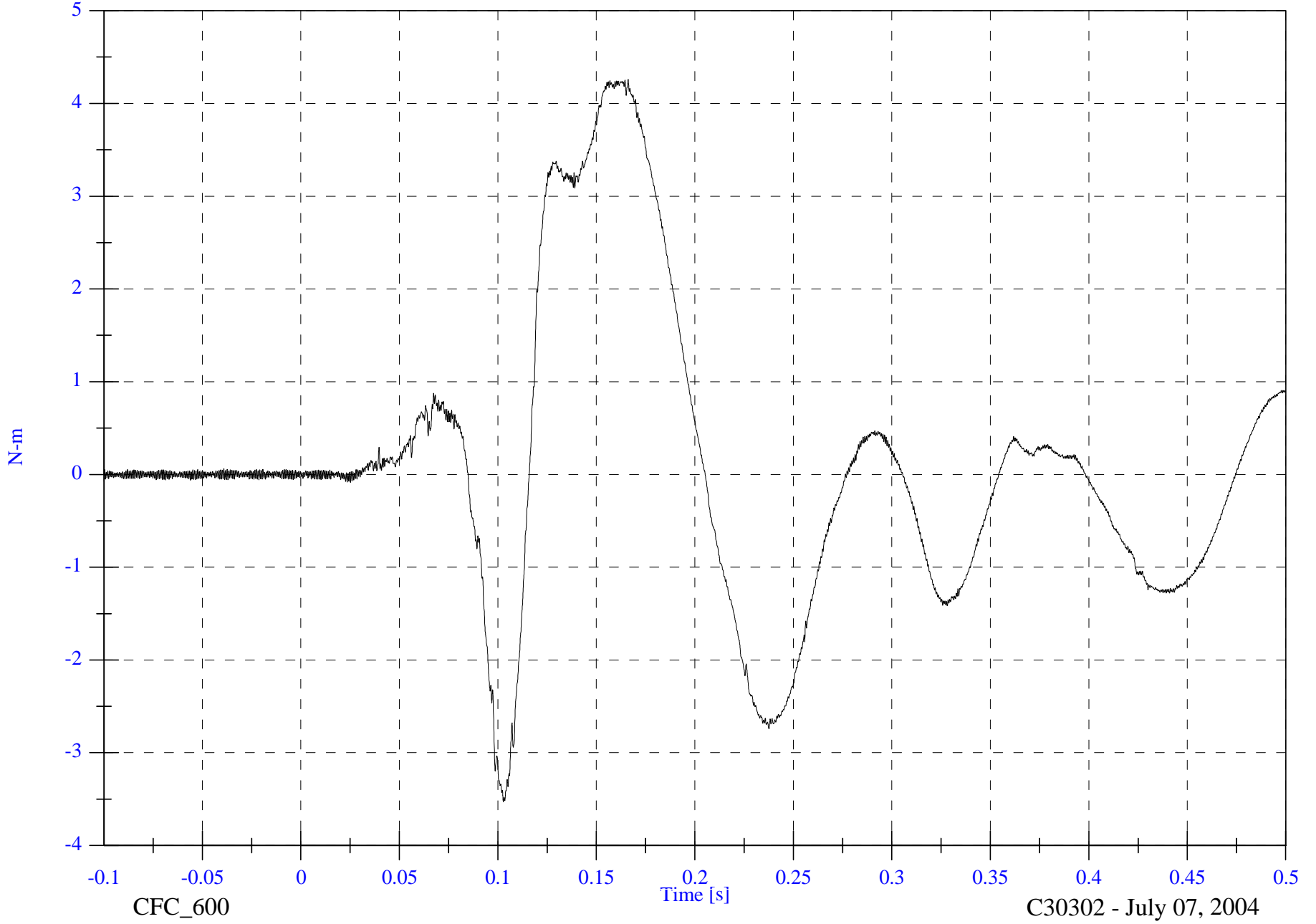
V2P1 Upper Neck Mz

Max: 4.3 [N-m] at 0.166 [s]

Min: -3.5 [N-m] at 0.103 [s]

B-24

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

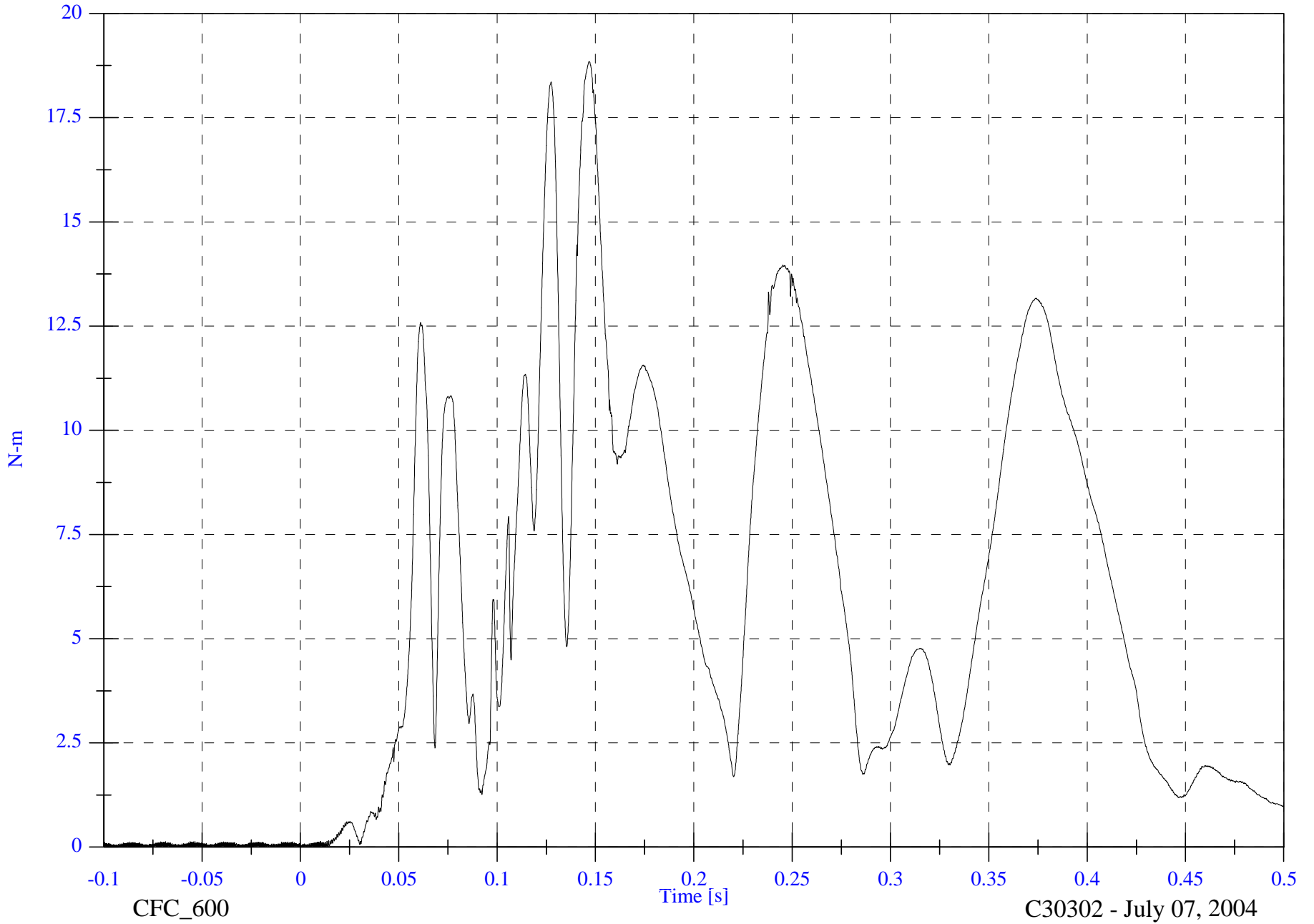
V2P1 Upper Neck M Resultant

Max: 18.8 [N-m] at 0.147 [s]

Min: 0.0 [N-m] at -0.006 [s]

B-25

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

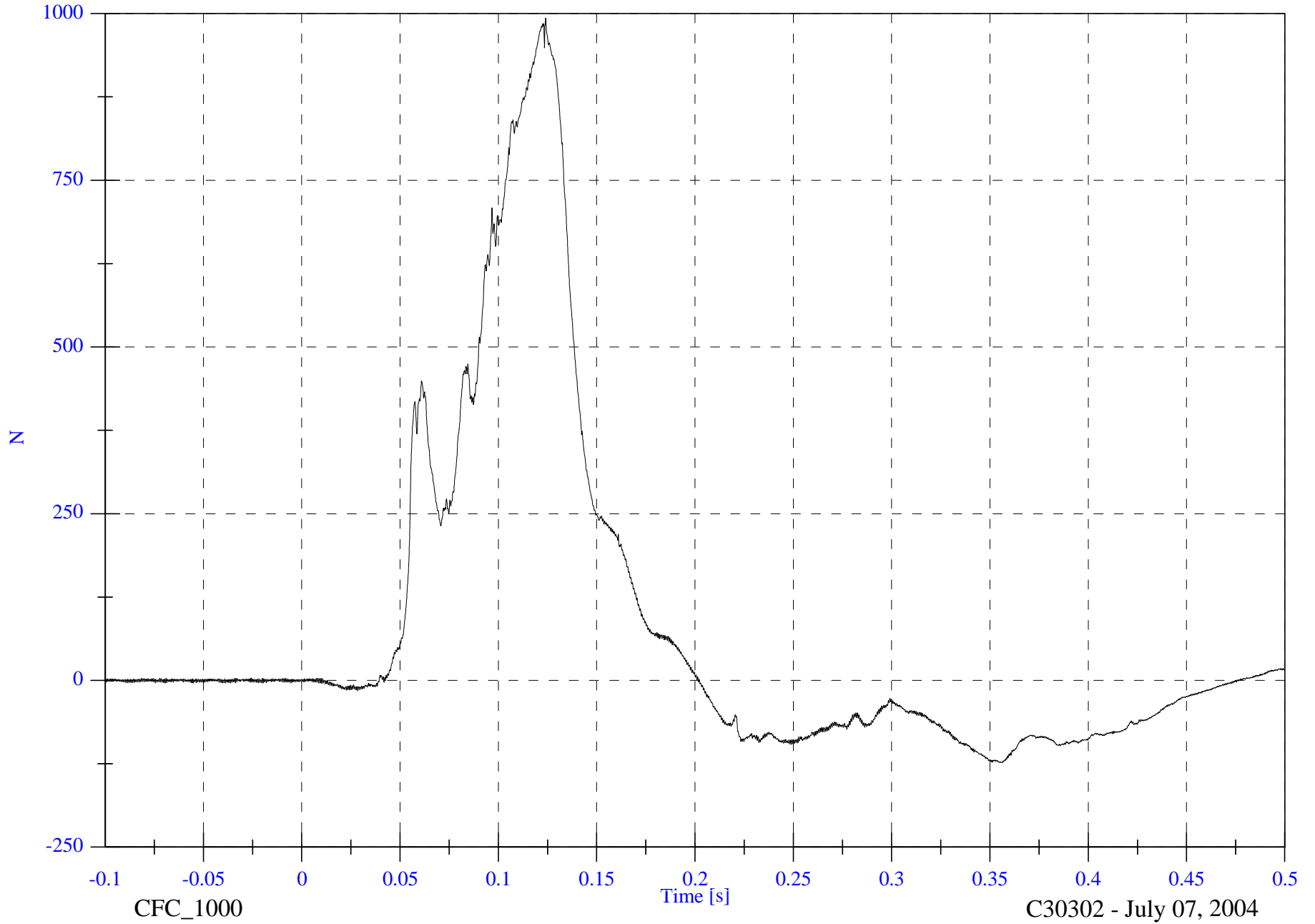
V2P1 Lower Neck Fx

Max: 993.1 [N] at 0.124 [s]

Min: -123.4 [N] at 0.356 [s]

B-26

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

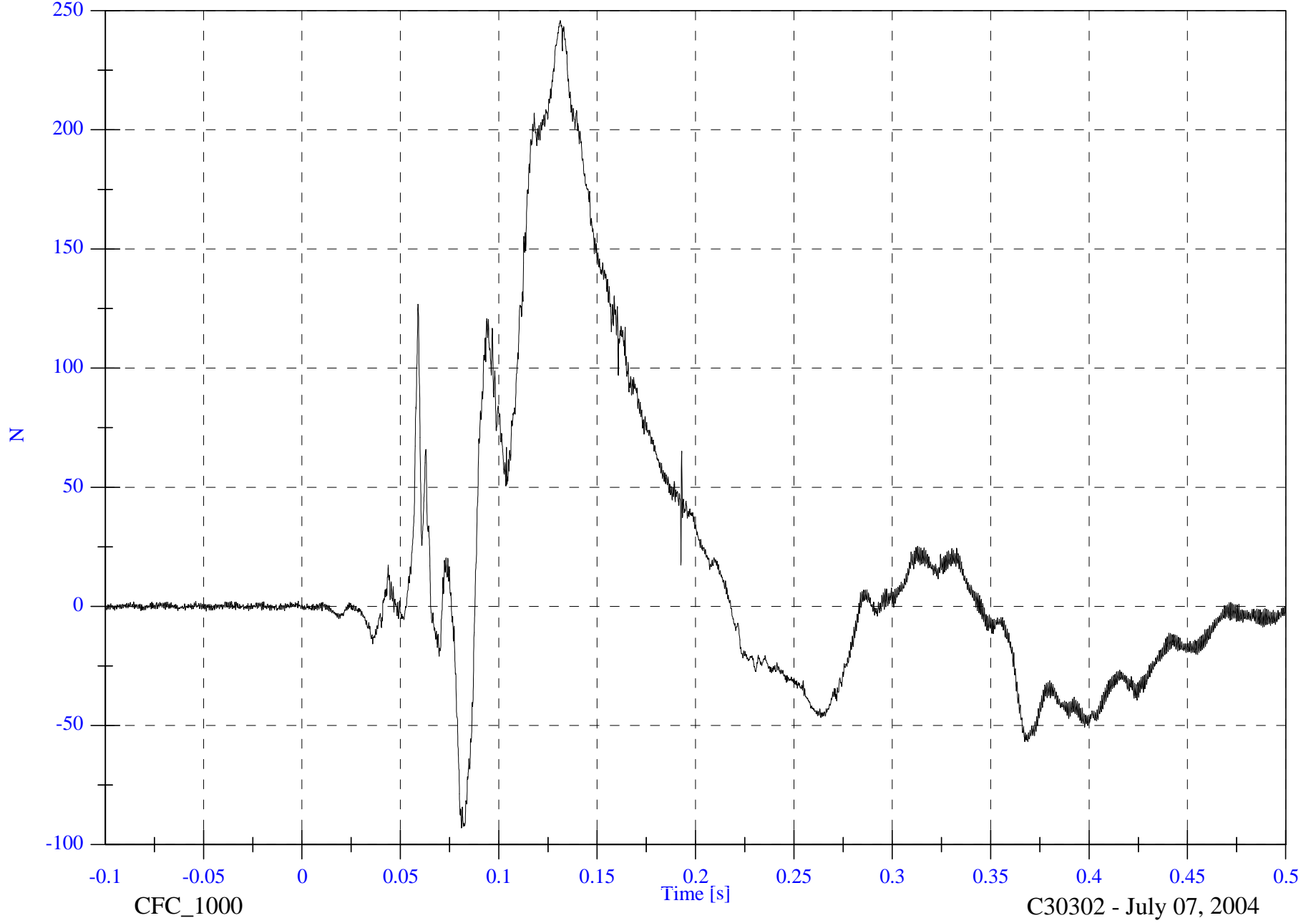
V2P1 Lower Neck Fy

Max: 245.8 [N] at 0.131 [s]

Min: -93.0 [N] at 0.081 [s]

B-27

8655-F301-23R



CFC_1000

Time [s]

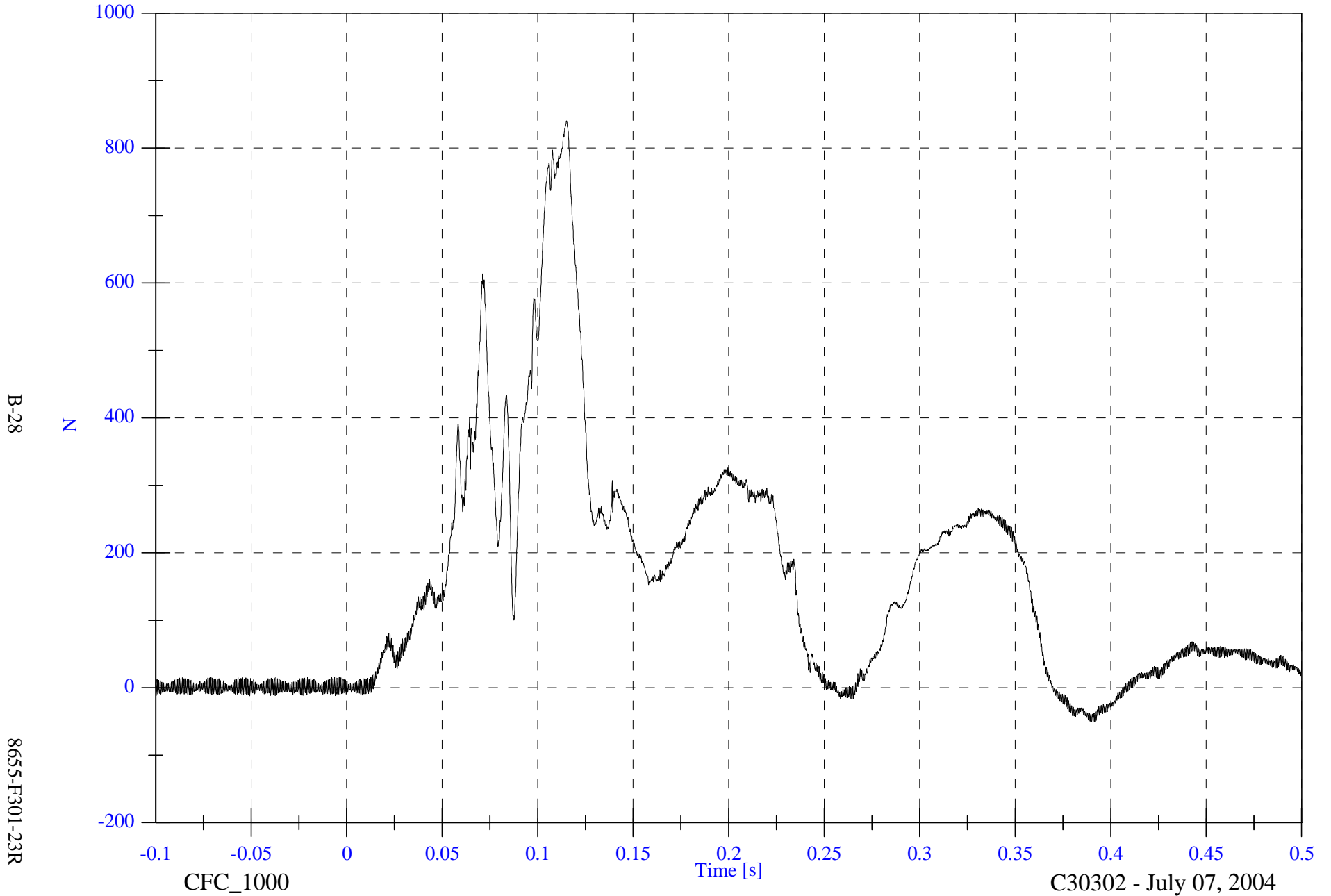
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Lower Neck Fz

Max: 840.2 [N] at 0.115 [s]

Min: -50.8 [N] at 0.391 [s]



B-28

8655-F301-23R

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

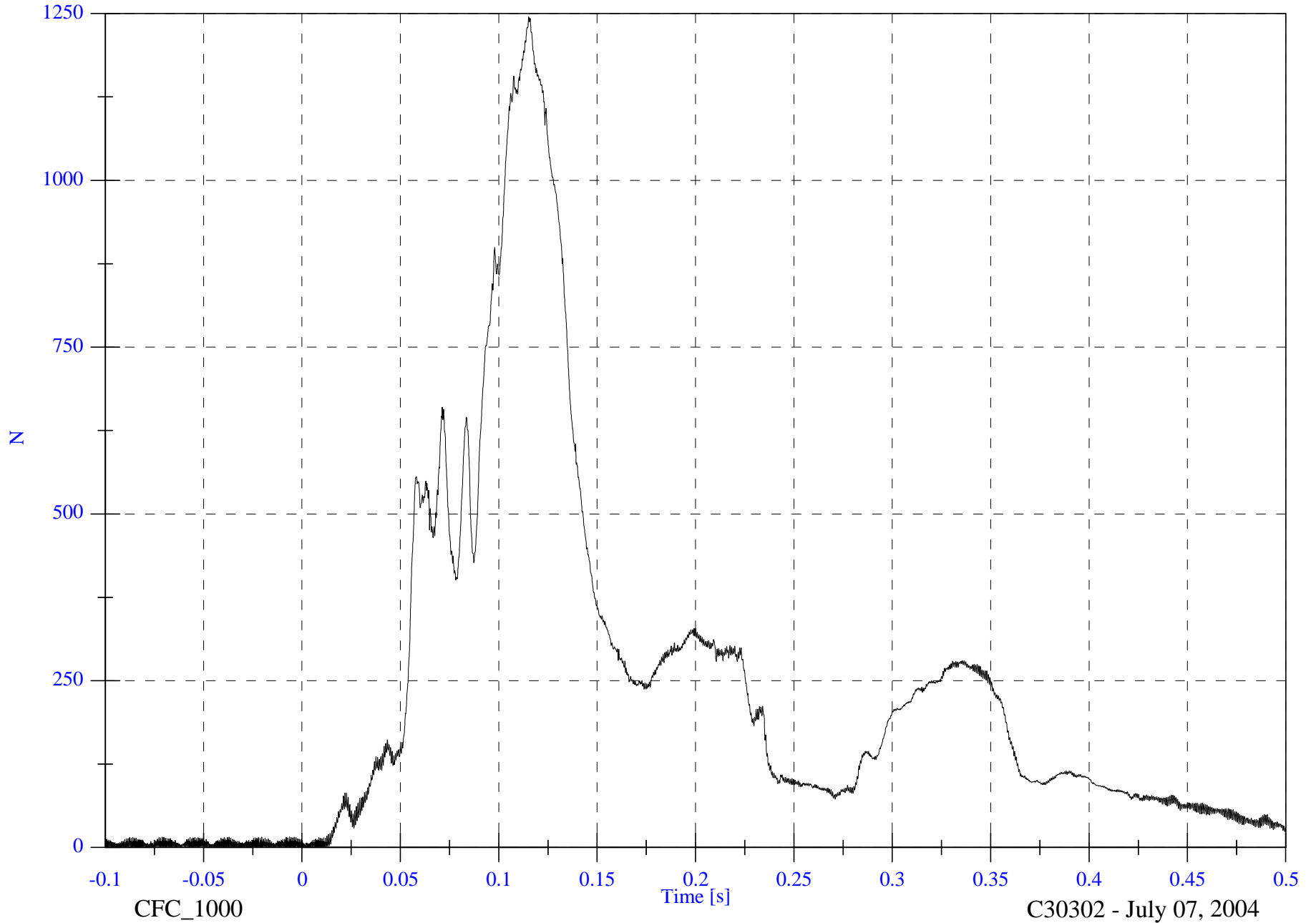
V2P1 Lower Neck F Resultant

Max: 1244.8 [N] at 0.115 [s]

Min: 0.2 [N] at -0.093 [s]

B-29

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

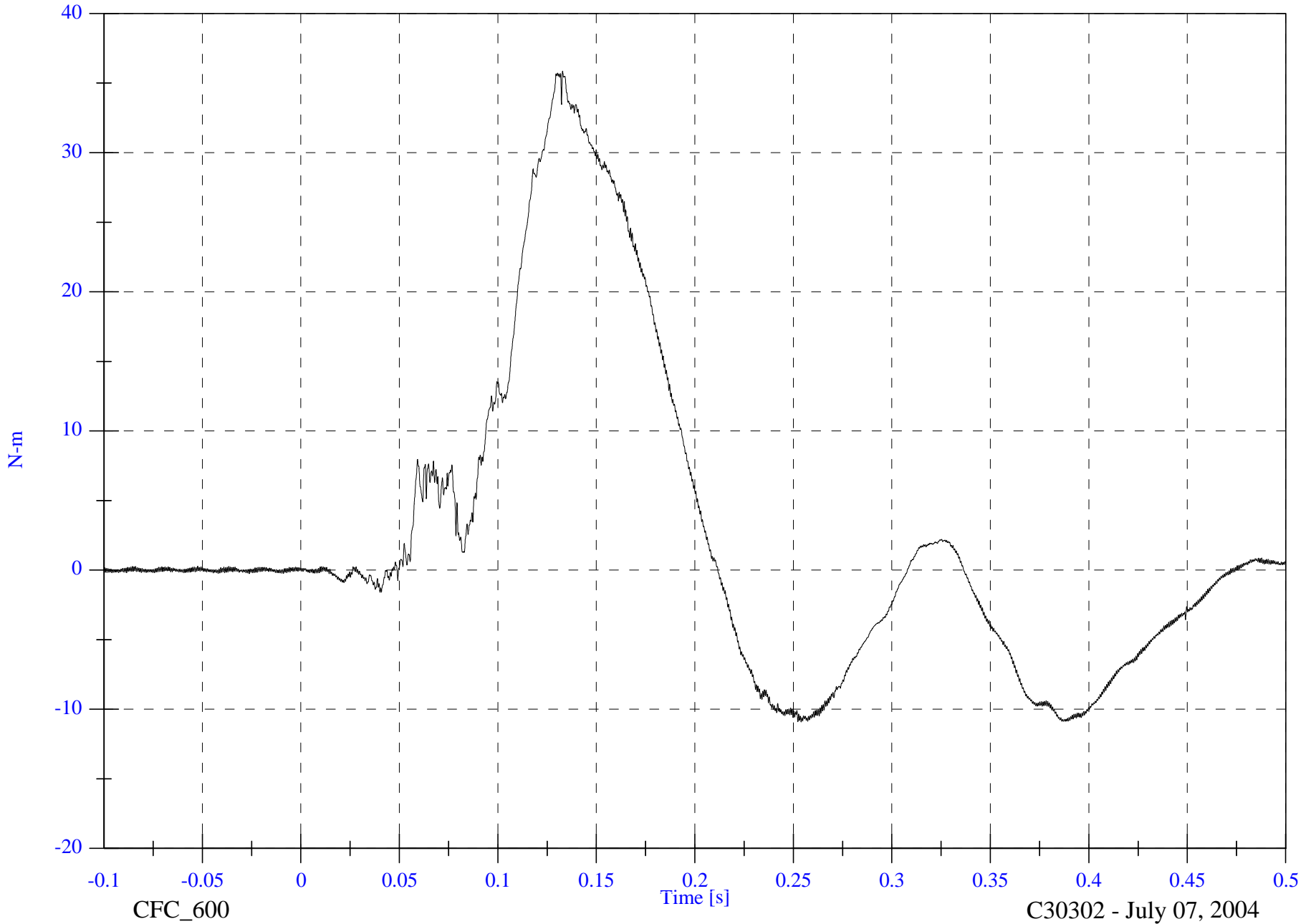
V2P1 Lower Neck Mx

Max: 35.9 [N-m] at 0.133 [s]

Min: -10.9 [N-m] at 0.254 [s]

B-30

8655-F301-23R



N-m

Time [s]

CFC_600

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

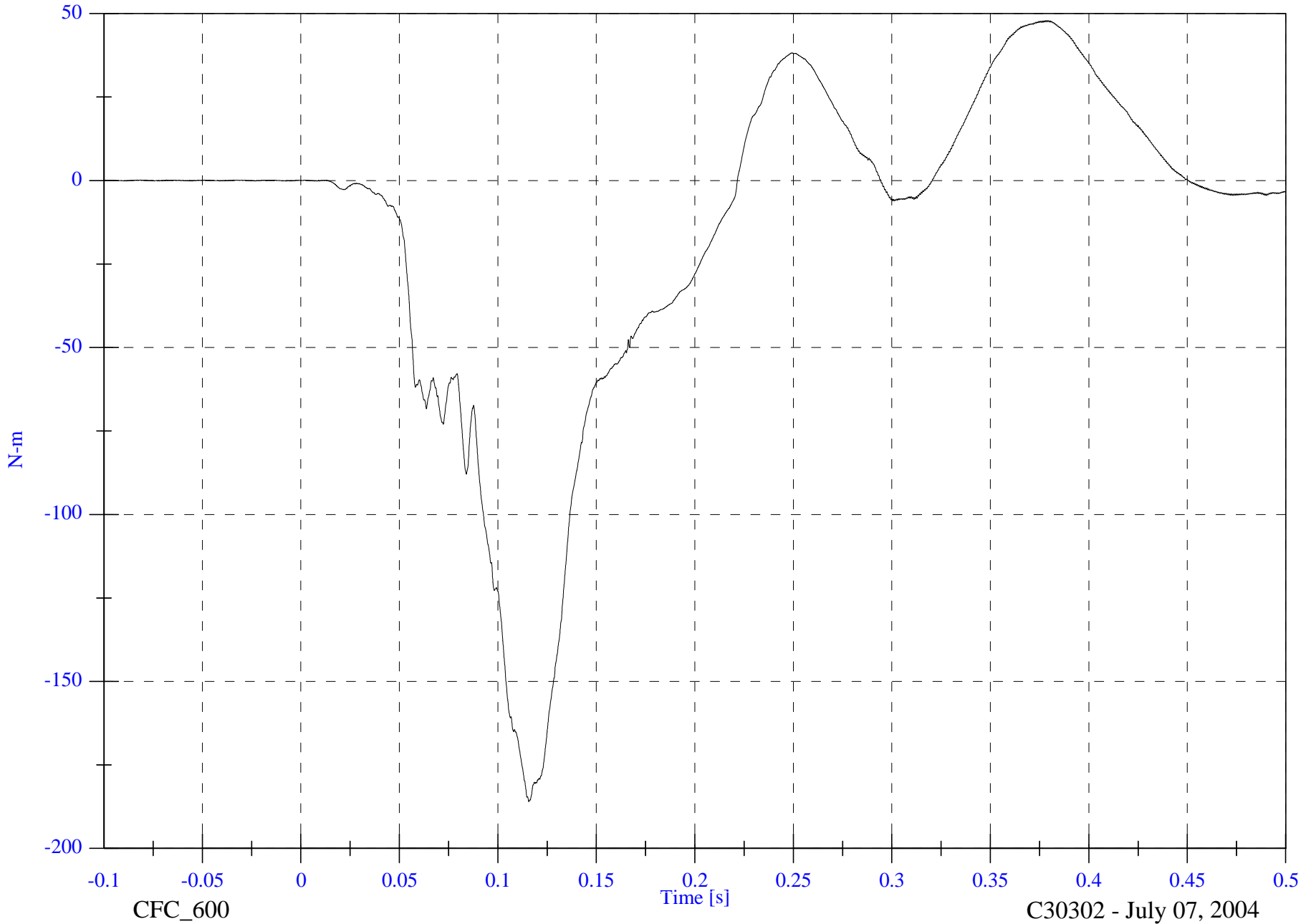
V2P1 Lower Neck My

Max: 48.0 [N-m] at 0.379 [s]

Min: -186.0 [N-m] at 0.116 [s]

B-31

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

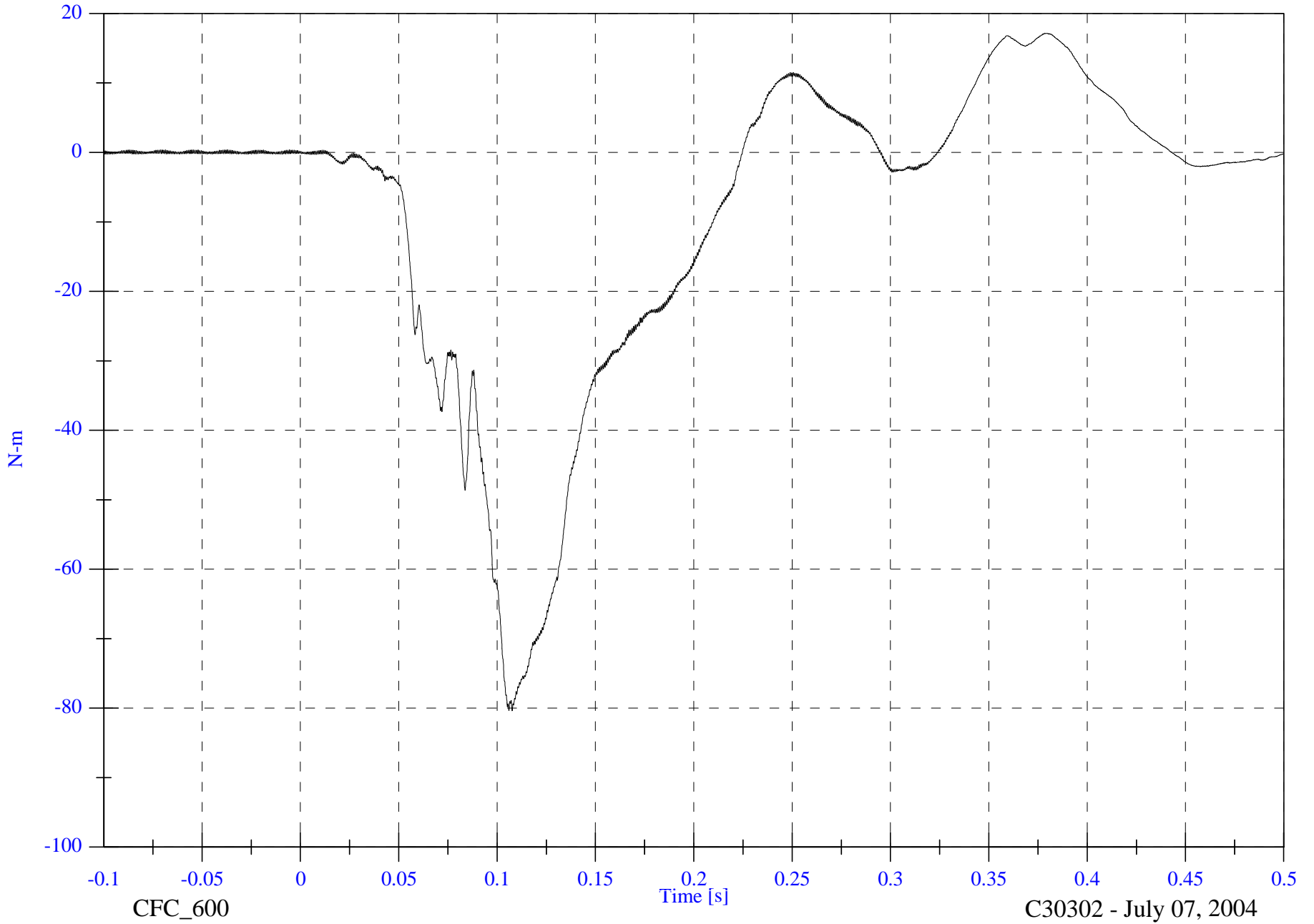
V2P1 Lower Neck Mz

Max: 17.2 [N-m] at 0.378 [s]

Min: -80.4 [N-m] at 0.108 [s]

B-32

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

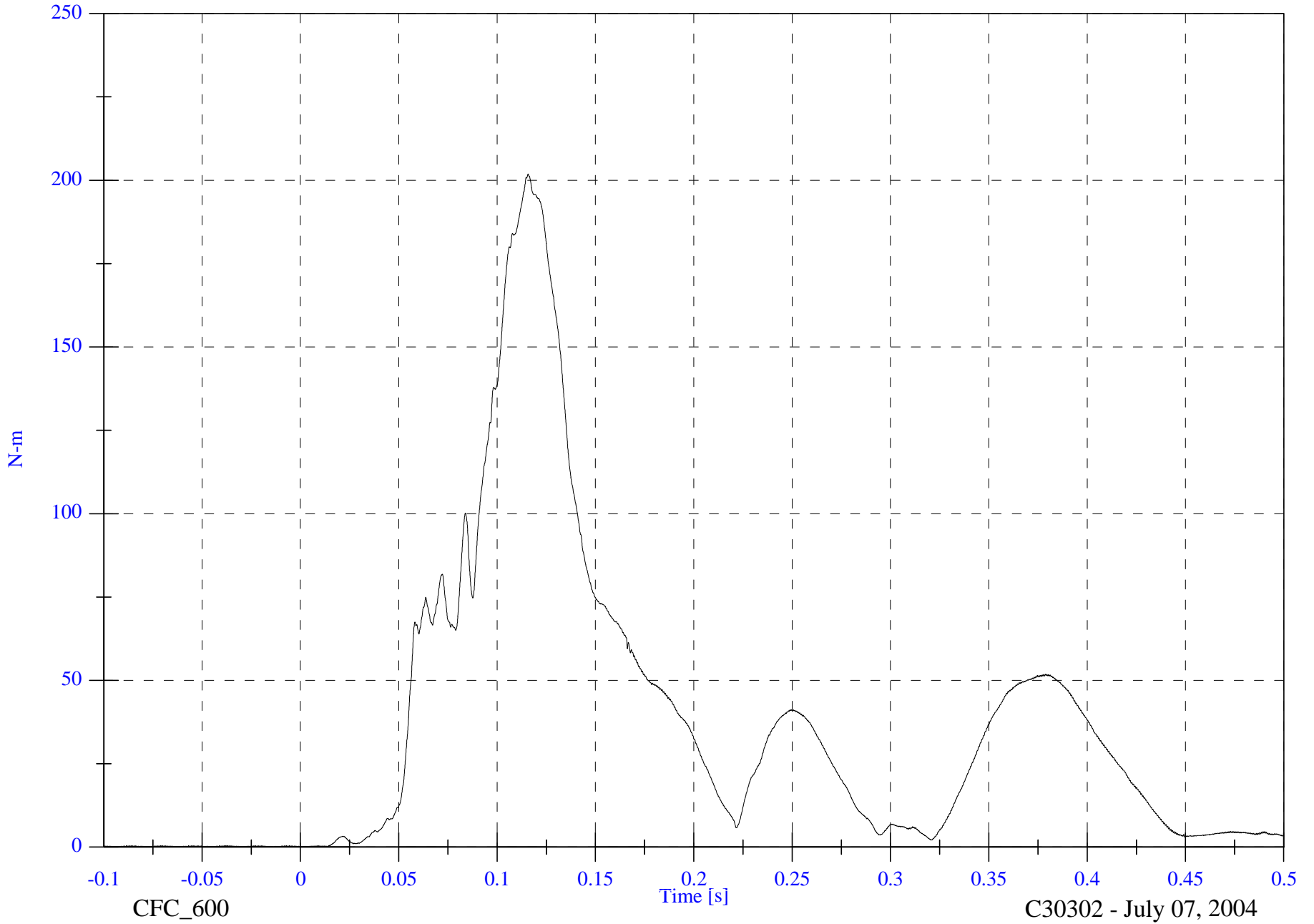
V2P1 Lower Neck M Resultant

Max: 201.9 [N-m] at 0.116 [s]

Min: 0.0 [N-m] at -0.015 [s]

B-33

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

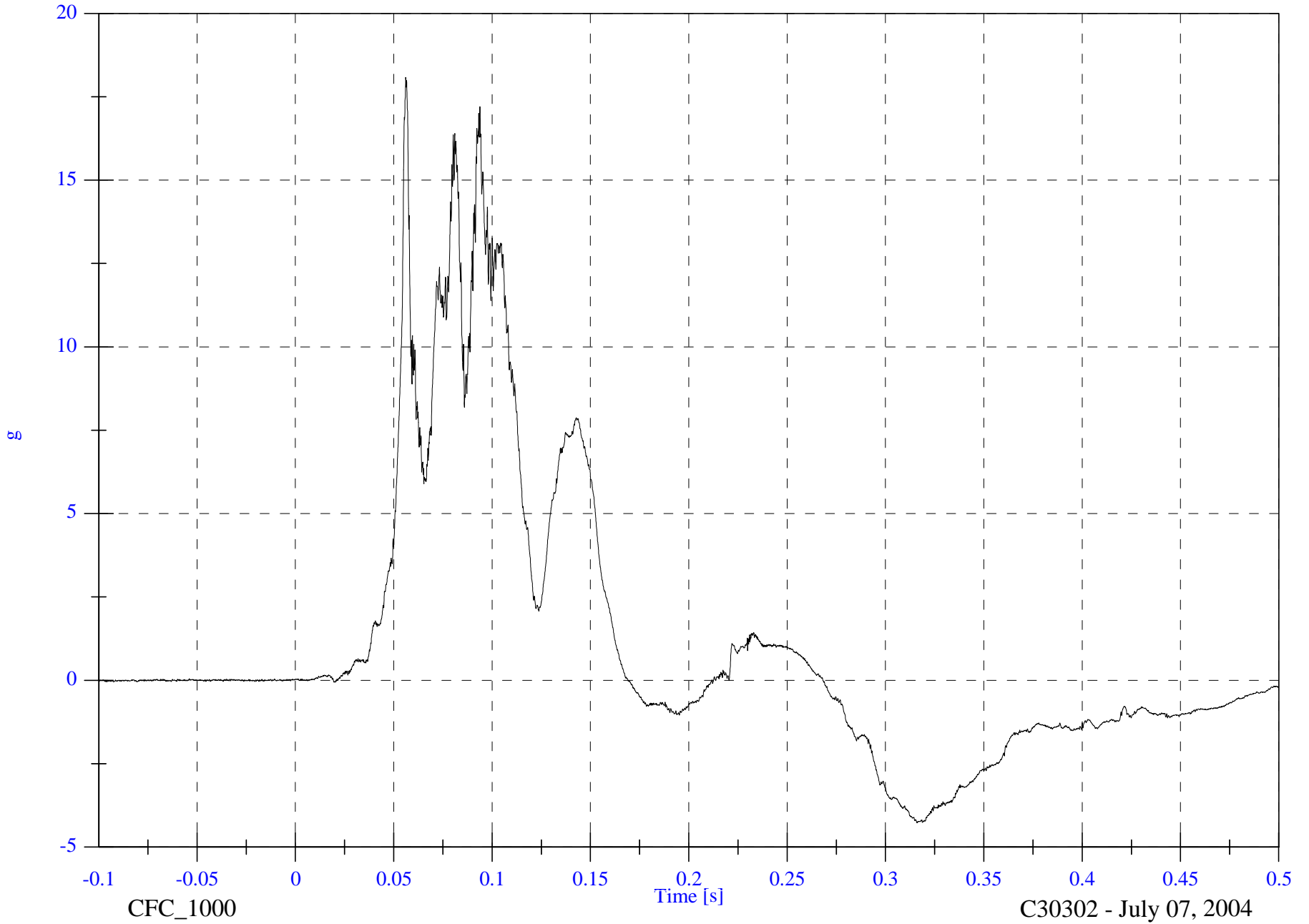
V2P1 Lower Neck x

Max: 18.1 [g] at 0.056 [s]

Min: -4.3 [g] at 0.316 [s]

B-34

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

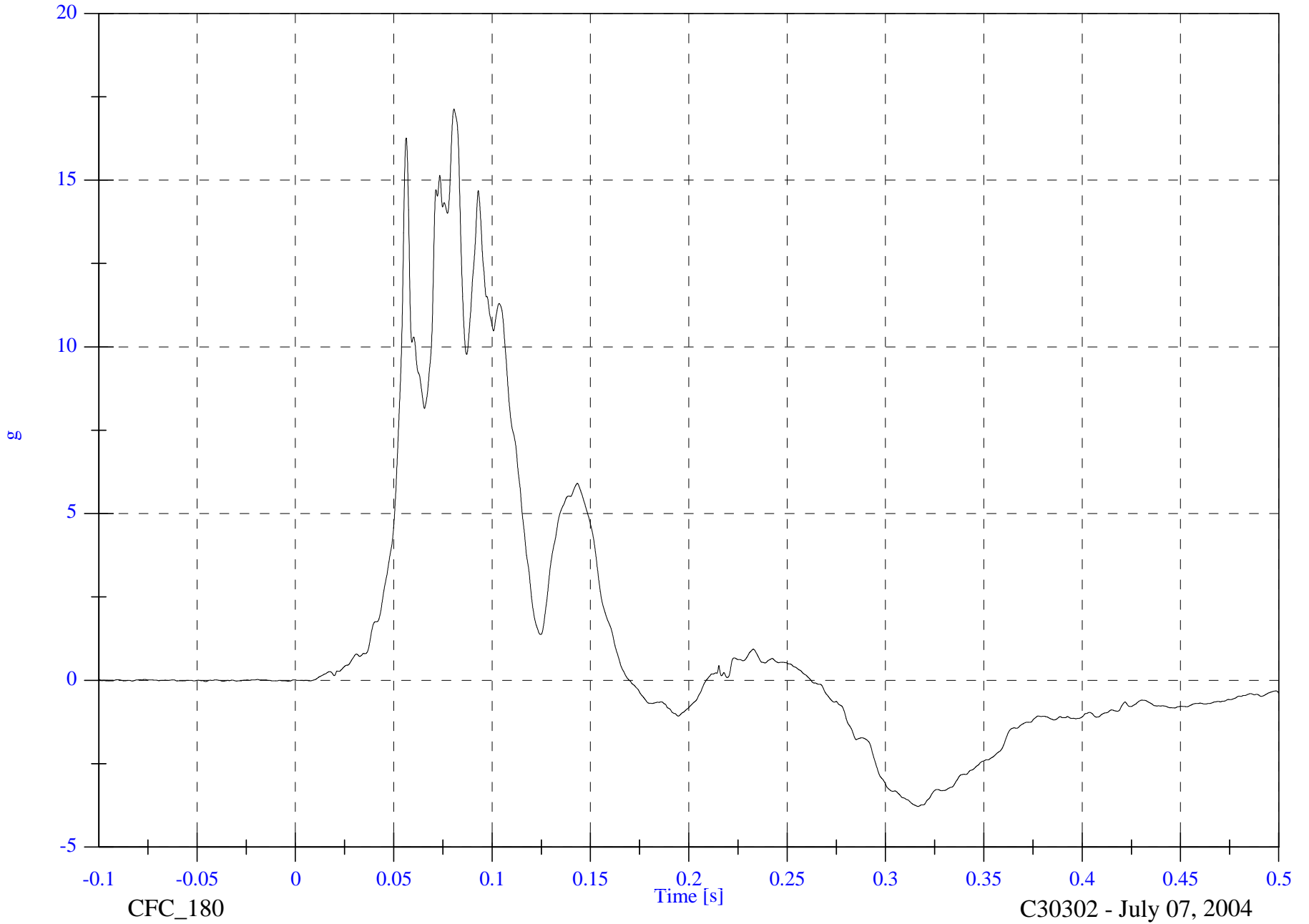
V2P1 Chest x

Max: 17.1 [g] at 0.081 [s]

Min: -3.8 [g] at 0.317 [s]

B-35

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

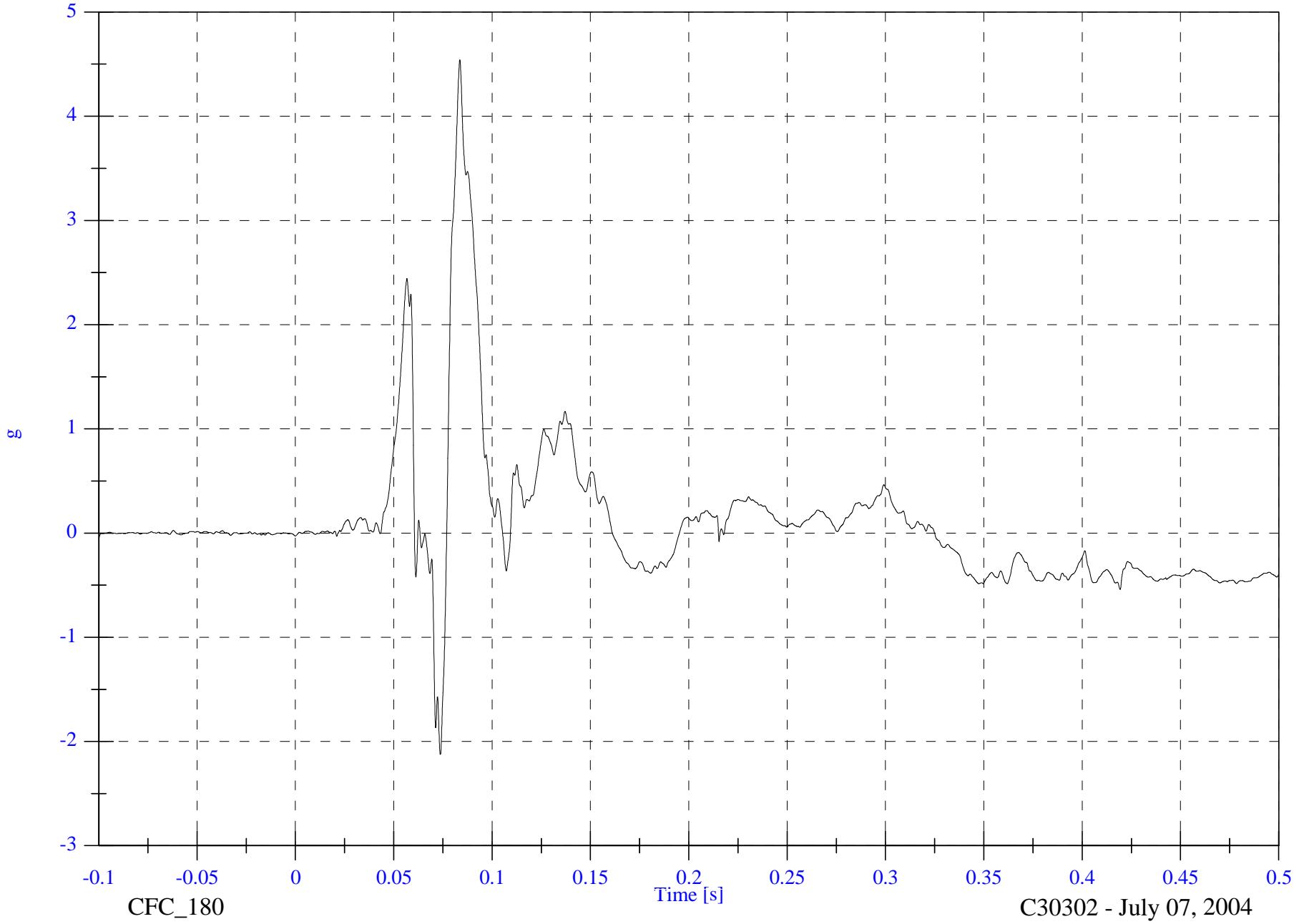
V2P1 Chest y

Max: 4.5 [g] at 0.084 [s]

Min: -2.1 [g] at 0.074 [s]

B-36

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

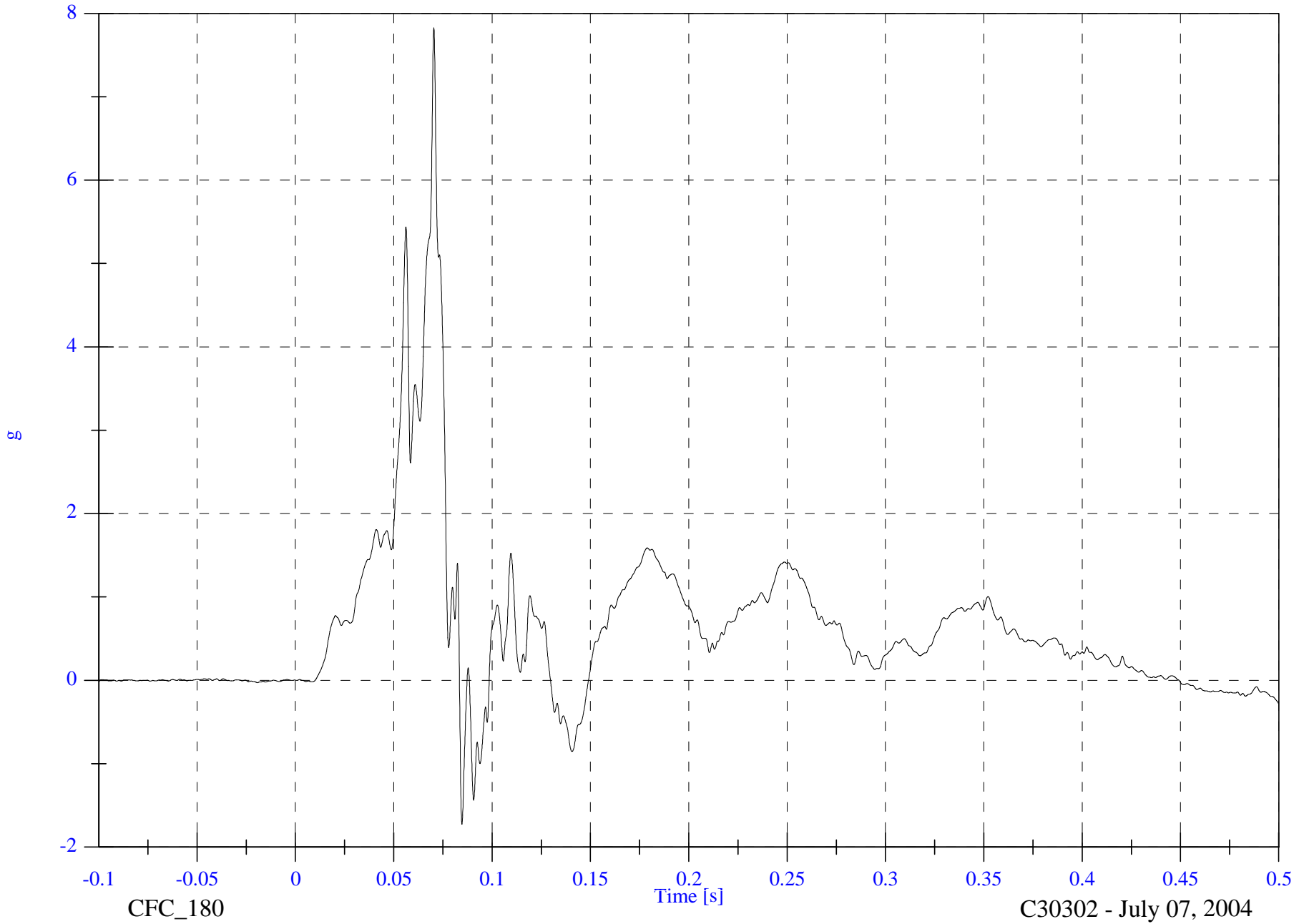
V2P1 Chest z

Max: 7.8 [g] at 0.070 [s]

Min: -1.7 [g] at 0.085 [s]

B-37

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

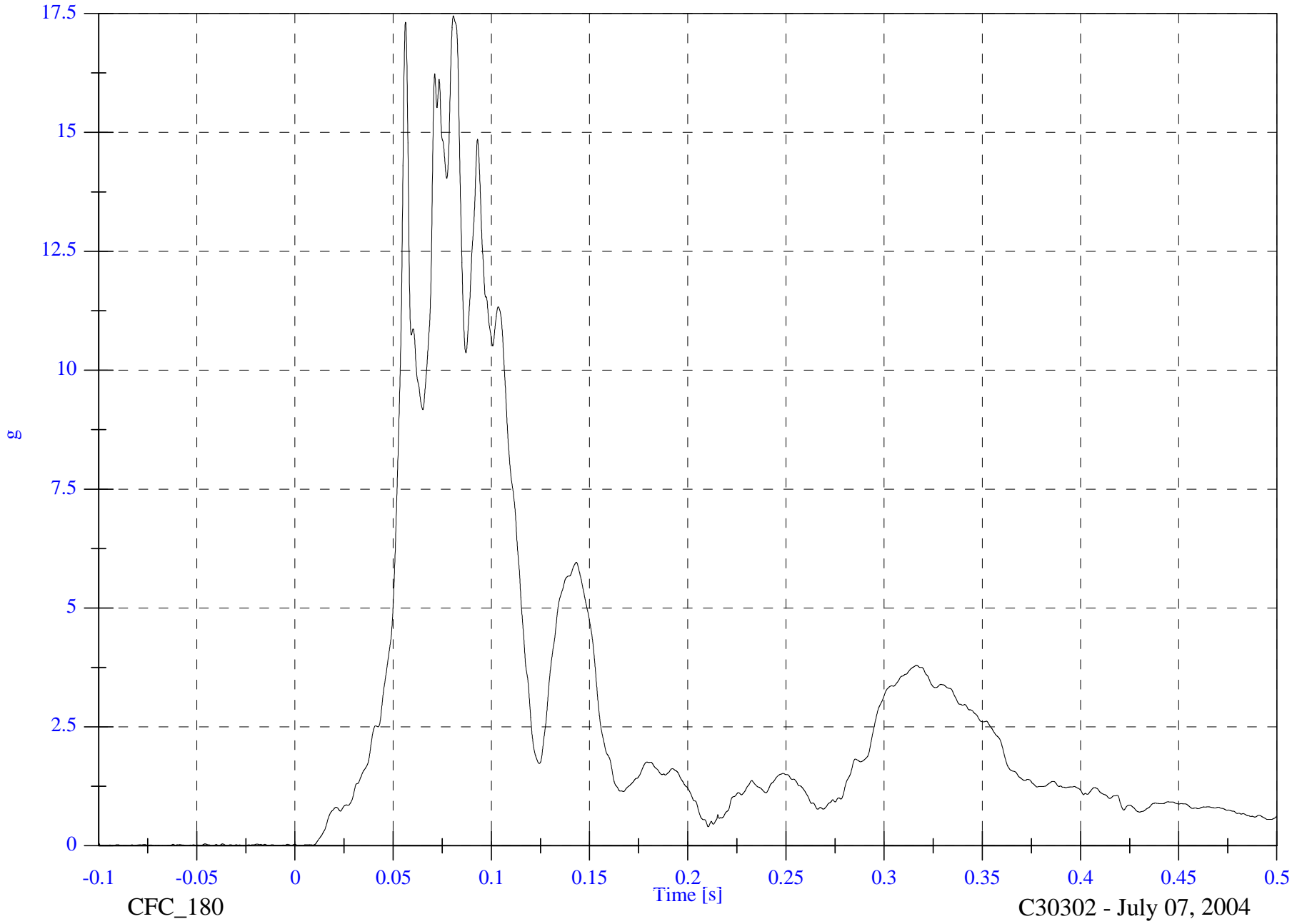
V2P1 Chest Resultant

Max: 17.5 [g] at 0.081 [s]

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

B-38

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

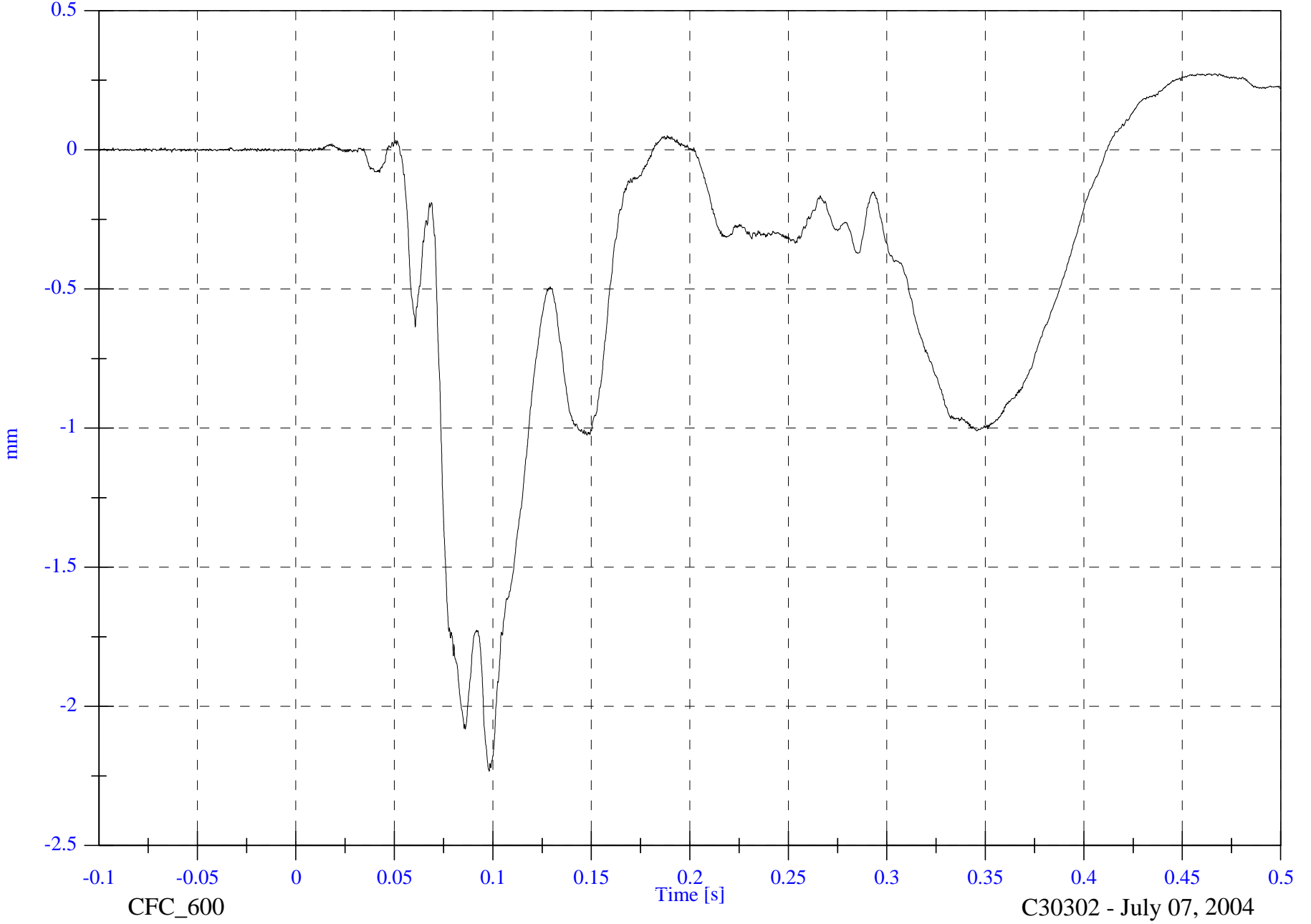
V2P1 Chest Displacement

Max: 0.3 [mm] at 0.464 [s]

Min: -2.2 [mm] at 0.098 [s]

B-39

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

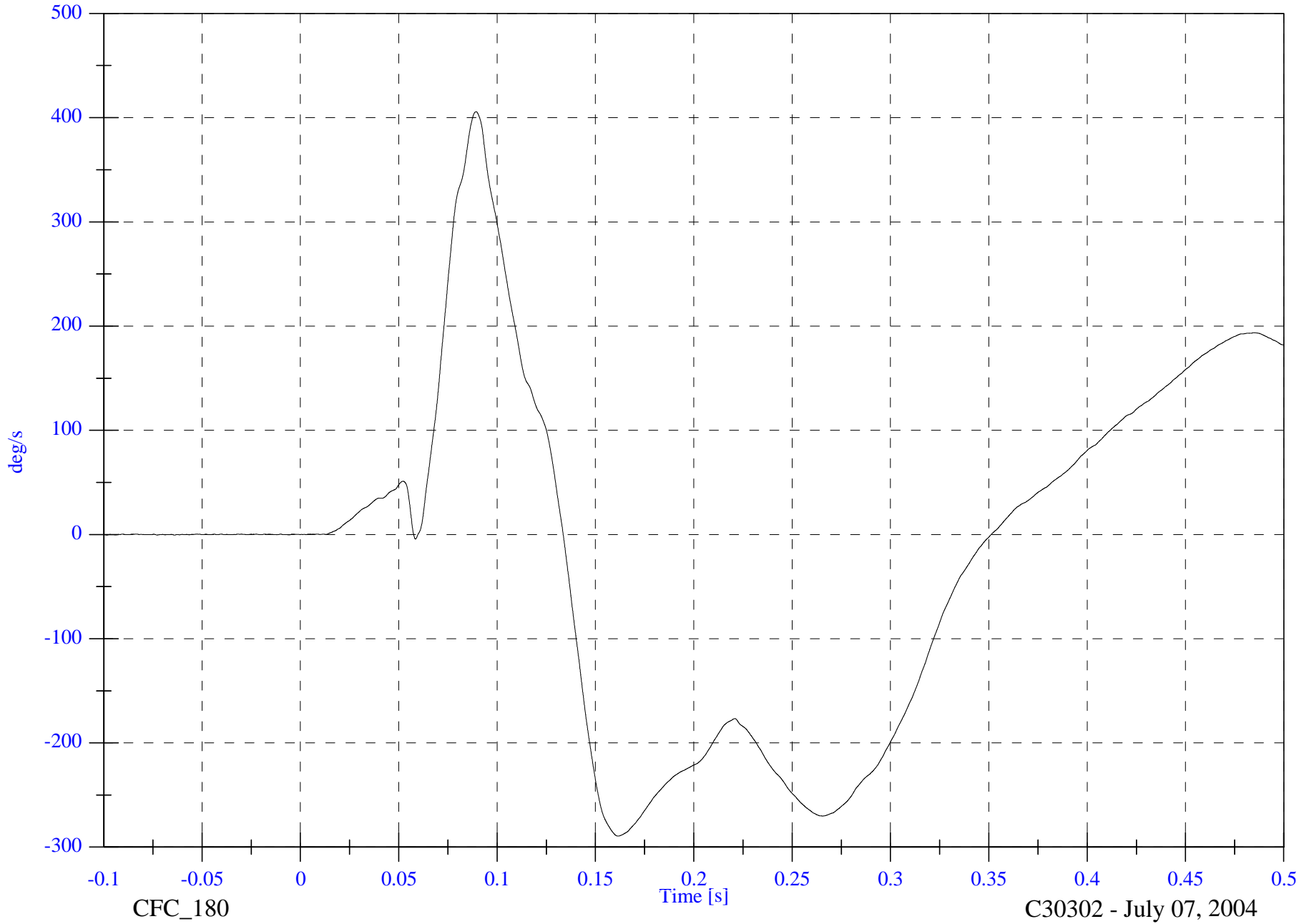
V2P1 Chest AVy

Max: 405.7 [deg/s] at 0.089 [s]

Min: -289.5 [deg/s] at 0.162 [s]

B-40

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

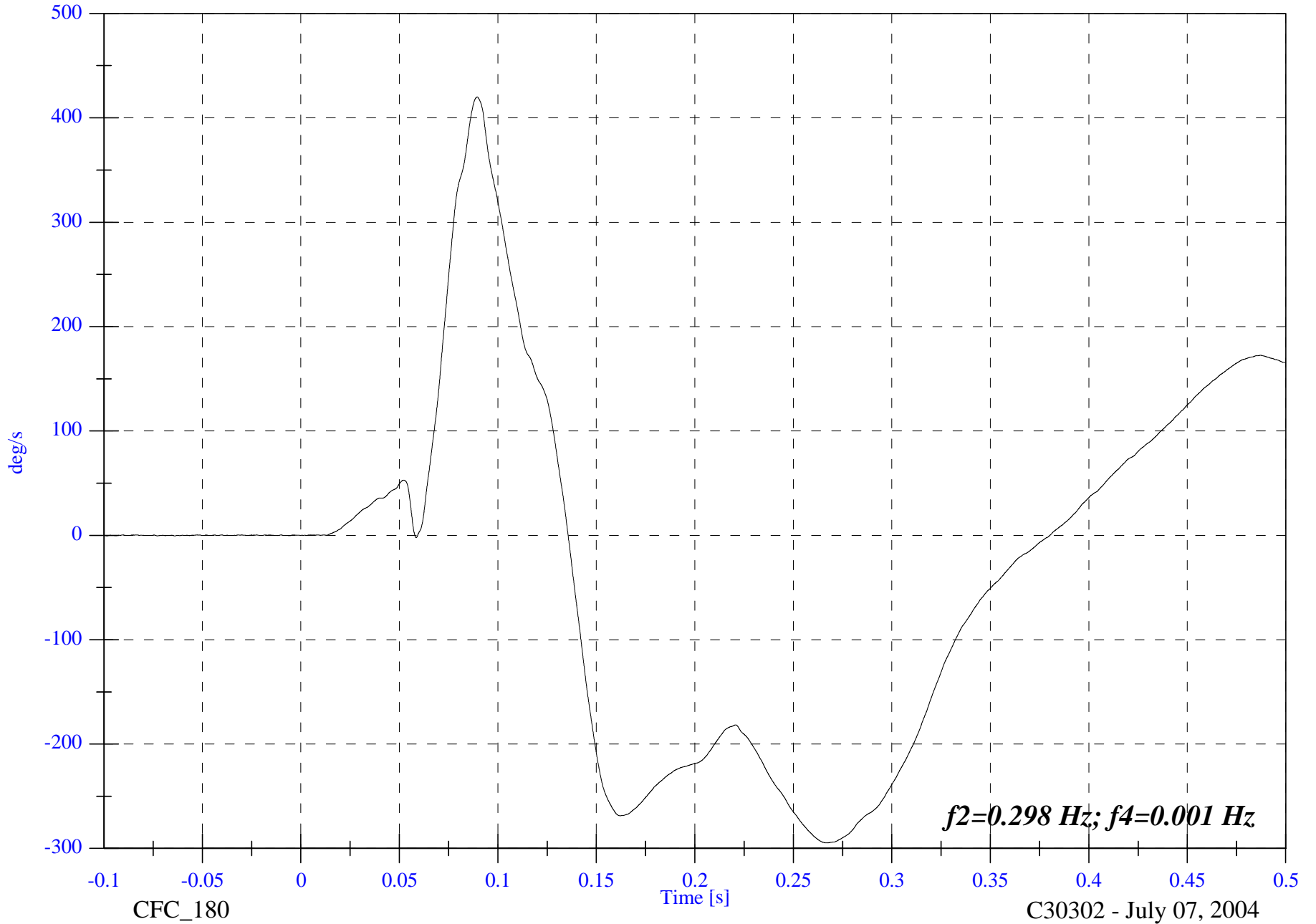
V2P1 Chest Comp AVy

Max: 420.0 [deg/s] at 0.090 [s]

Min: -294.7 [deg/s] at 0.267 [s]

B-41

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

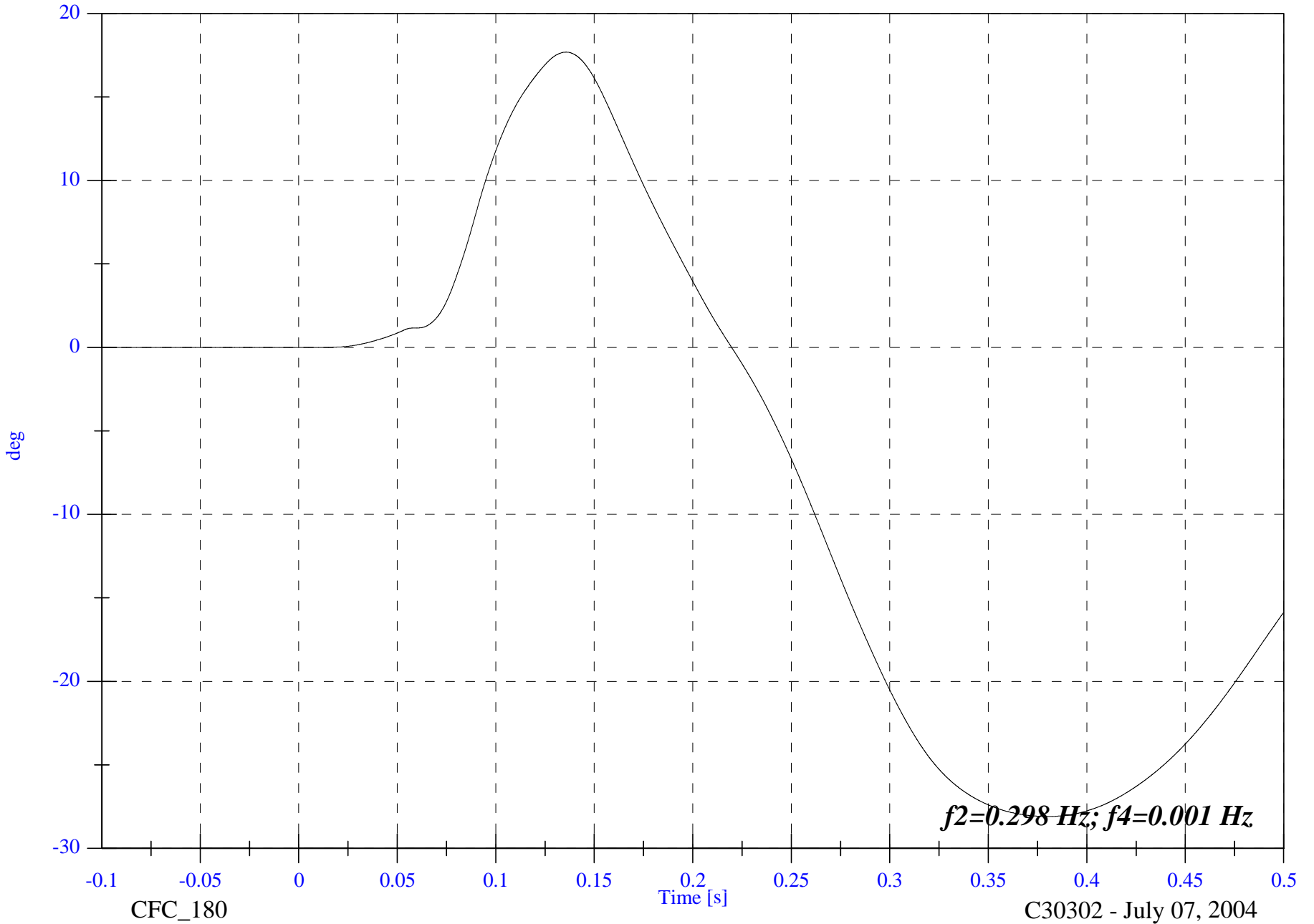
V2P1 Chest Comp ADy

Max: 17.7 [deg] at 0.136 [s]

Min: -28.1 [deg] at 0.380 [s]

B-42

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

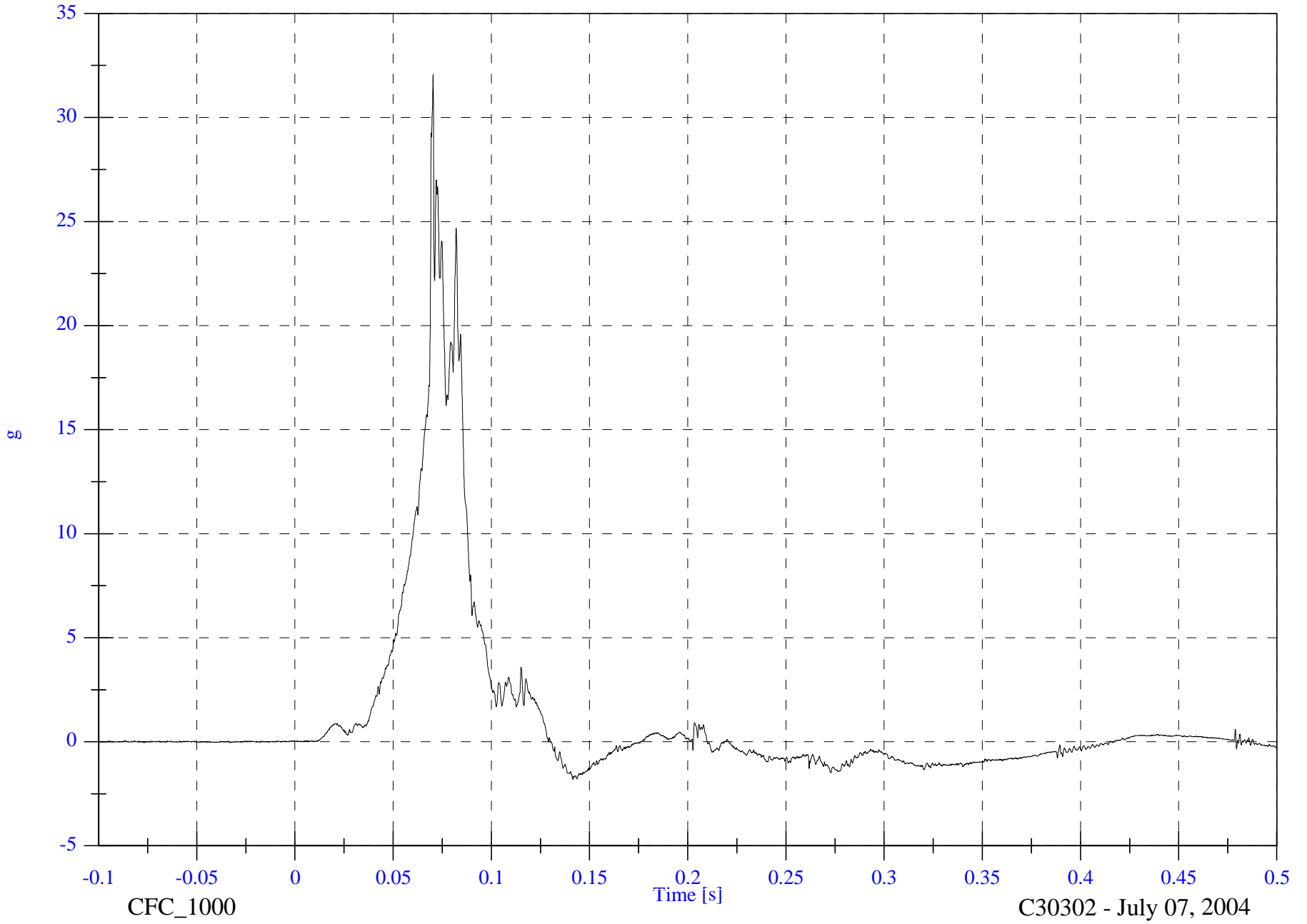
V2P1 Pelvic x

Max: 32.1 [g] at 0.070 [s]

Min: -1.8 [g] at 0.141 [s]

B-43

8655-F301-23R



CFC_1000

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

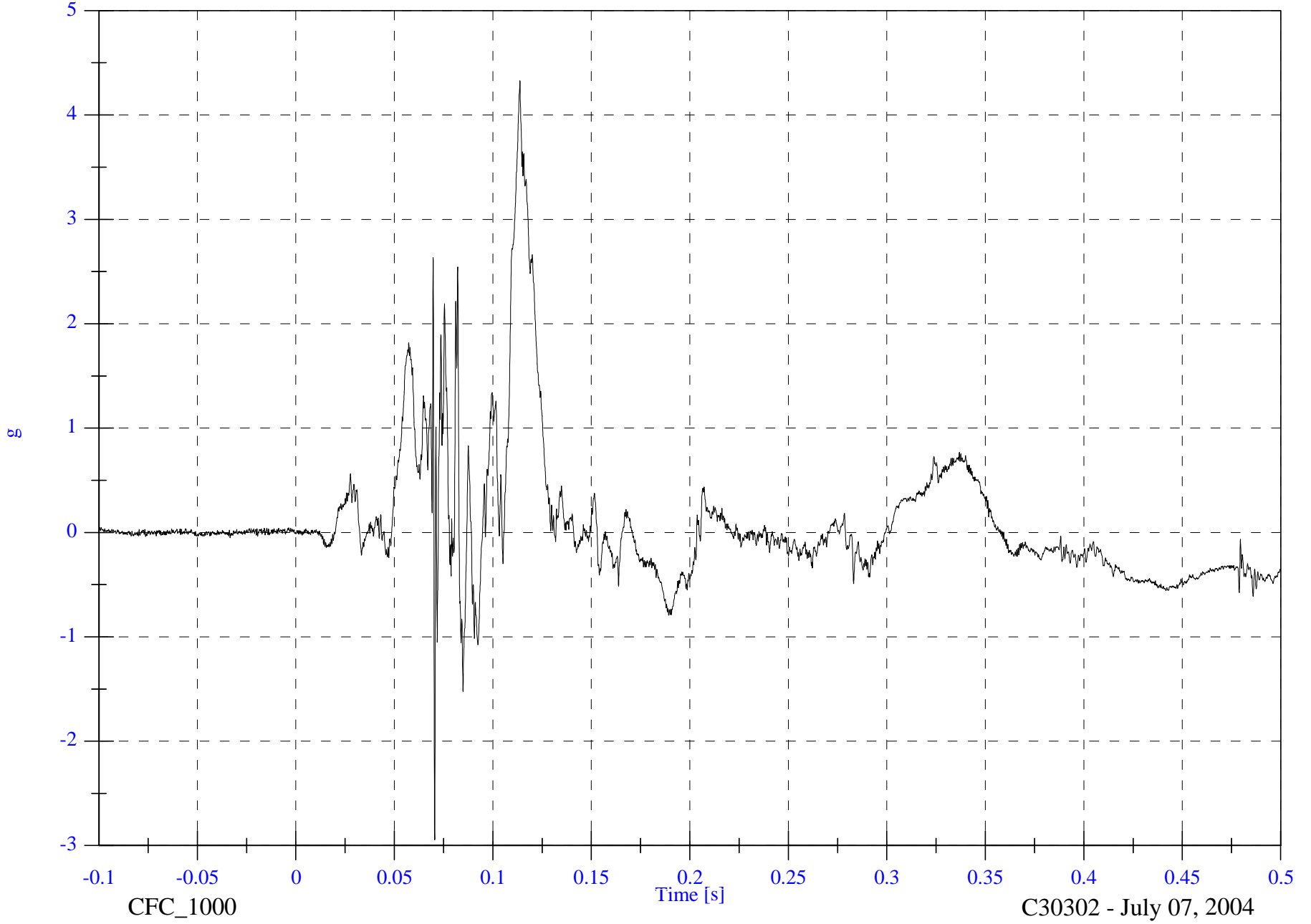
V2P1 Pelvic y

Max: 4.3 [g] at 0.114 [s]

Min: -2.9 [g] at 0.070 [s]

B-44

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

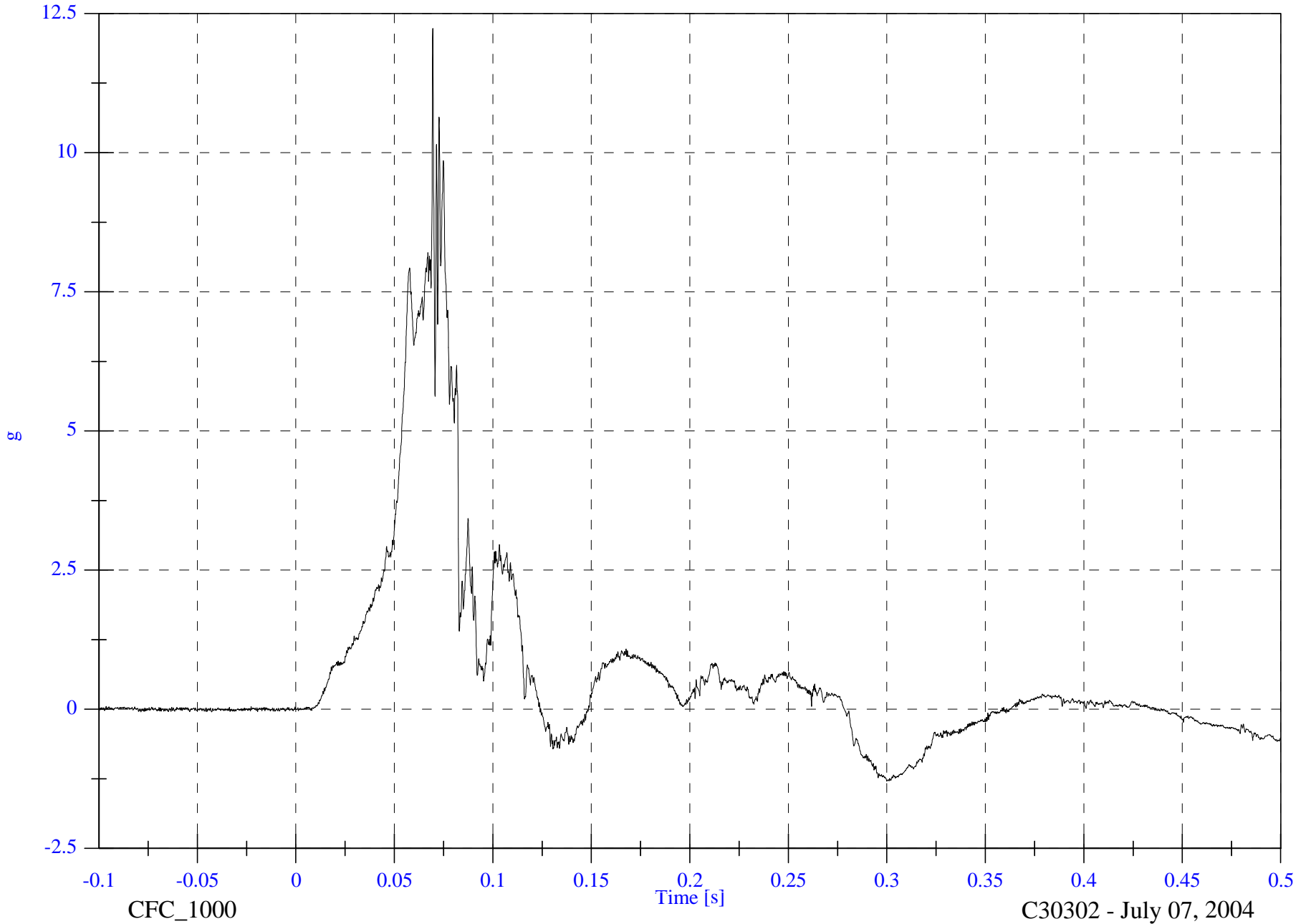
V2P1 Pelvic z

Max: 12.2 [g] at 0.069 [s]

Min: -1.3 [g] at 0.300 [s]

B-45

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

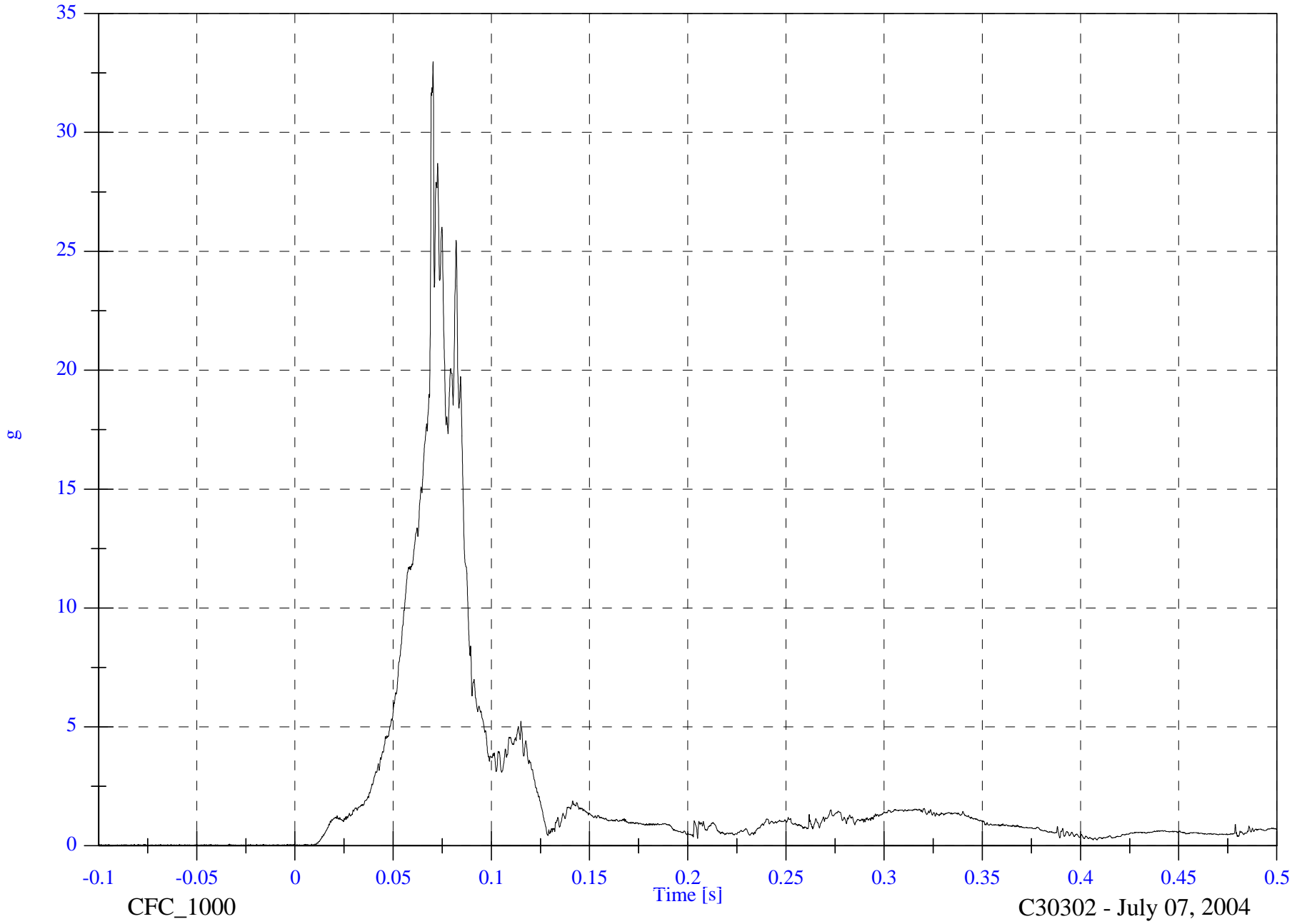
V2P1 Pelvic Resultant

Max: 33.0 [g] at 0.070 [s]

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

B-46

8655-F301-23R

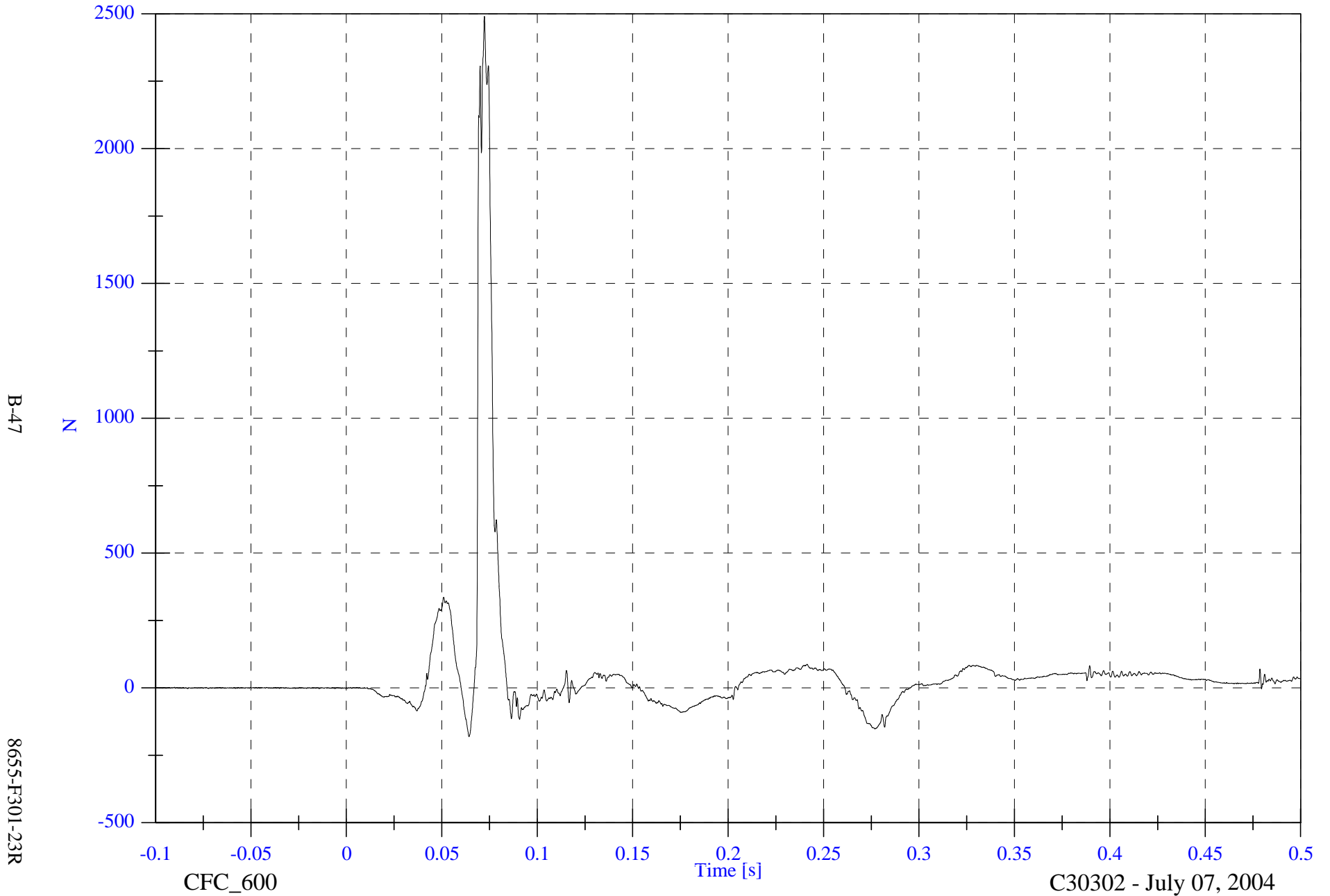


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Left Femur

Max: 2490.5 [N] at 0.072 [s]

Min: -180.3 [N] at 0.064 [s]

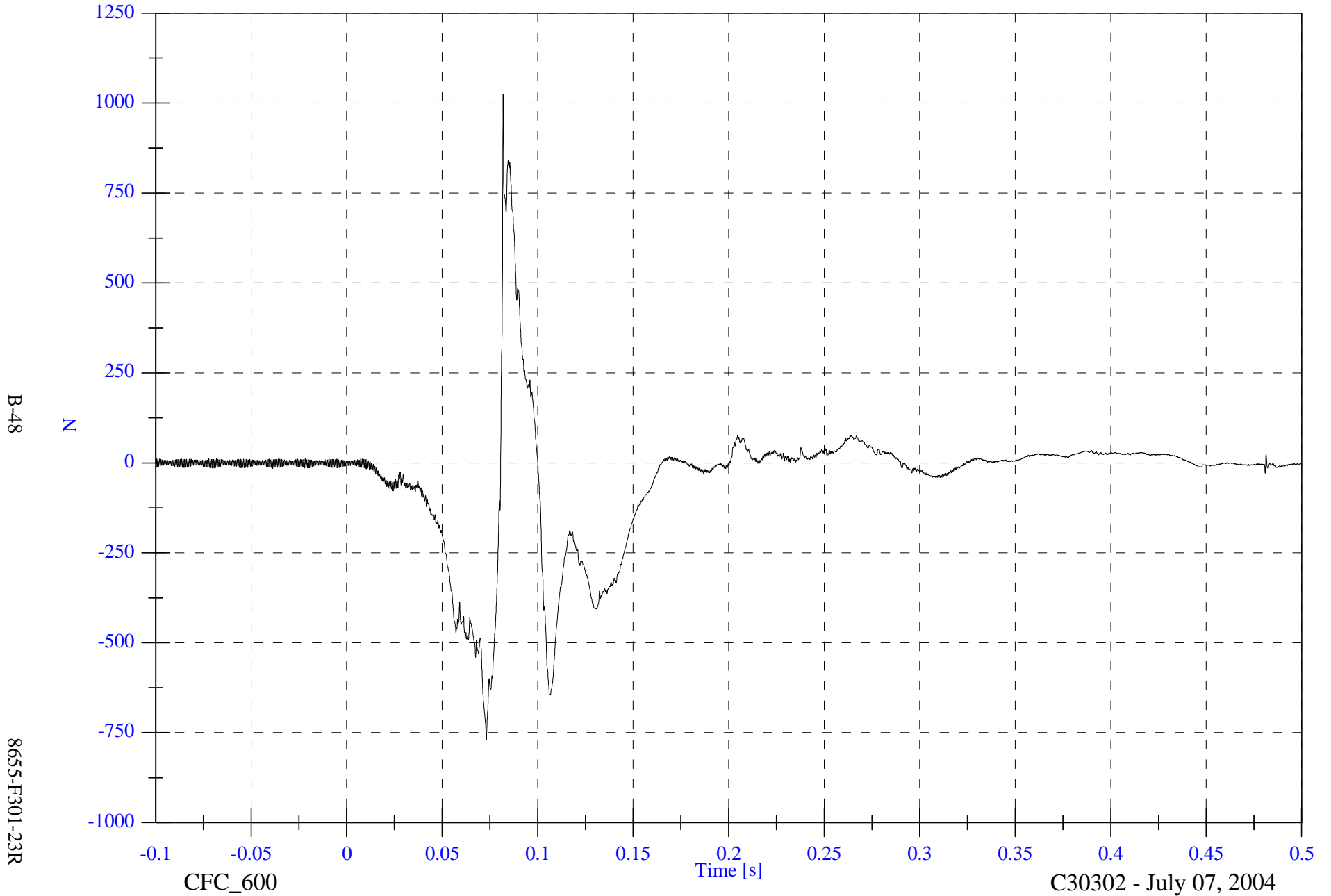


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Right Femur

Max: 1025.0 [N] at 0.082 [s]

Min: -768.9 [N] at 0.073 [s]



B-48

8655-F301-23R

CFC_600

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

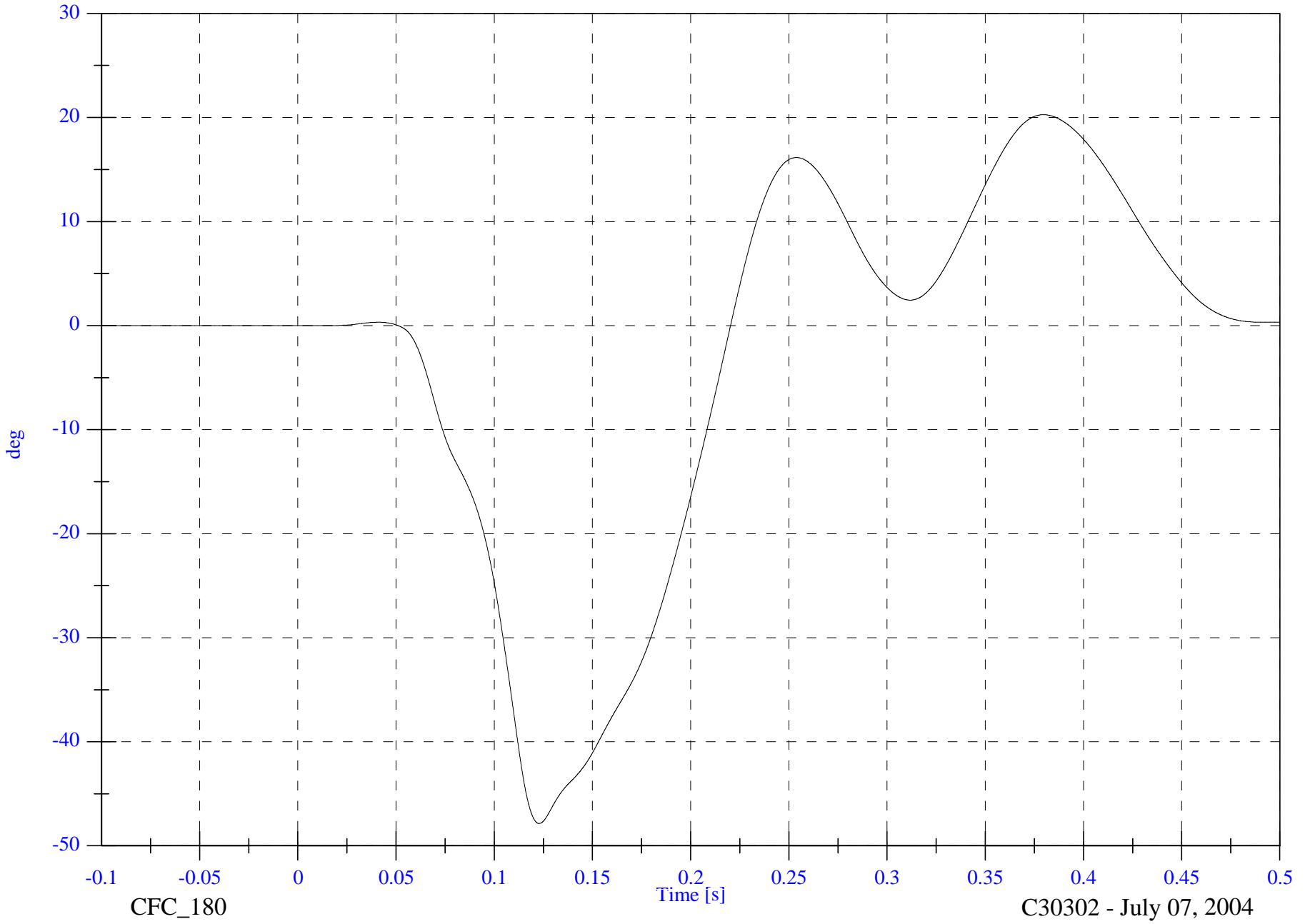
V2P1 Head to Chest

Max: 20.3 [deg] at 0.380 [s]

Min: -47.9 [deg] at 0.123 [s]

B-49

8655-F301-23R



CFC_180

Time [s]

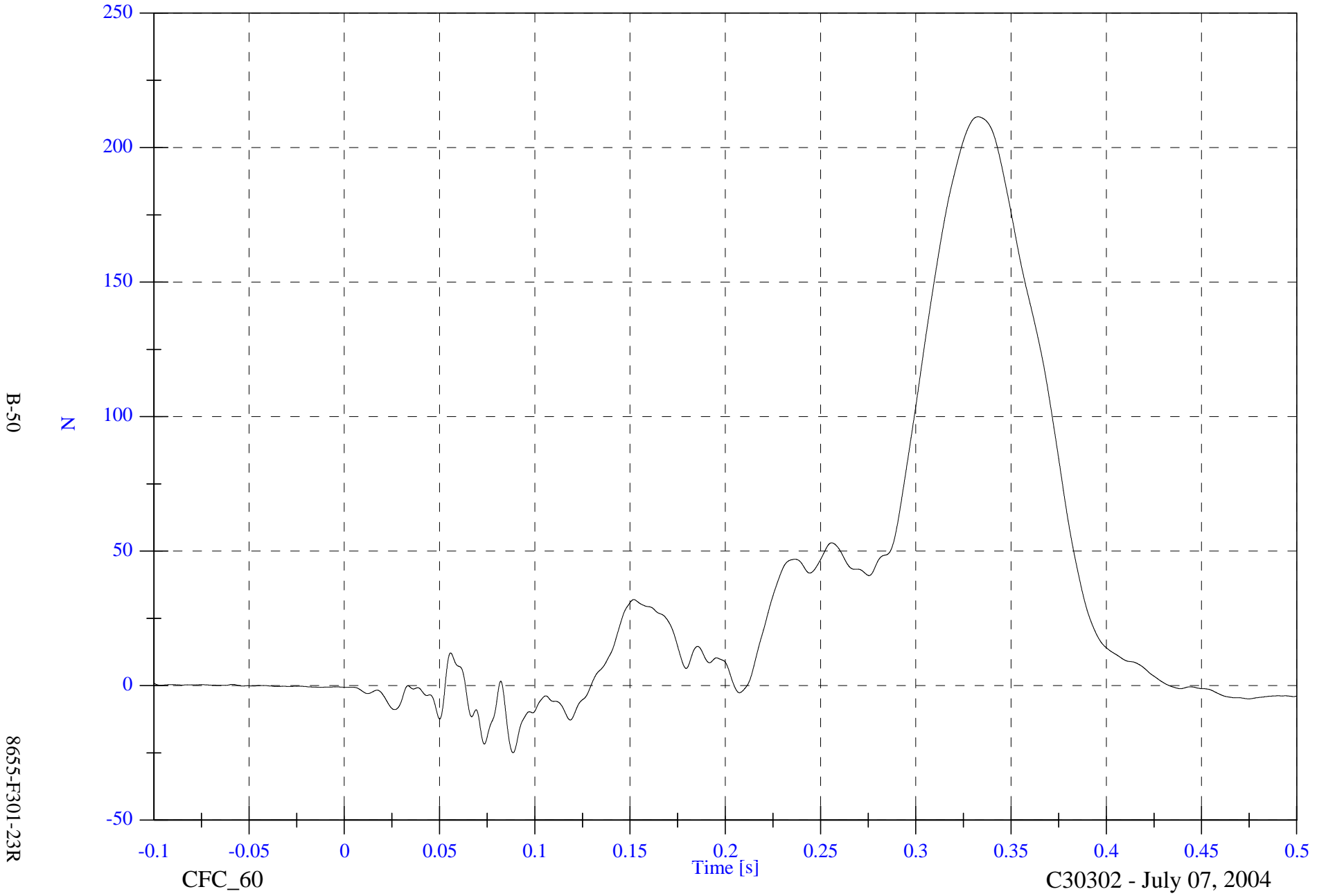
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Lap Belt

Max: 211.4 [N] at 0.333 [s]

Min: -25.0 [N] at 0.089 [s]



B-50

8655-F301-23R

CFC_60

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

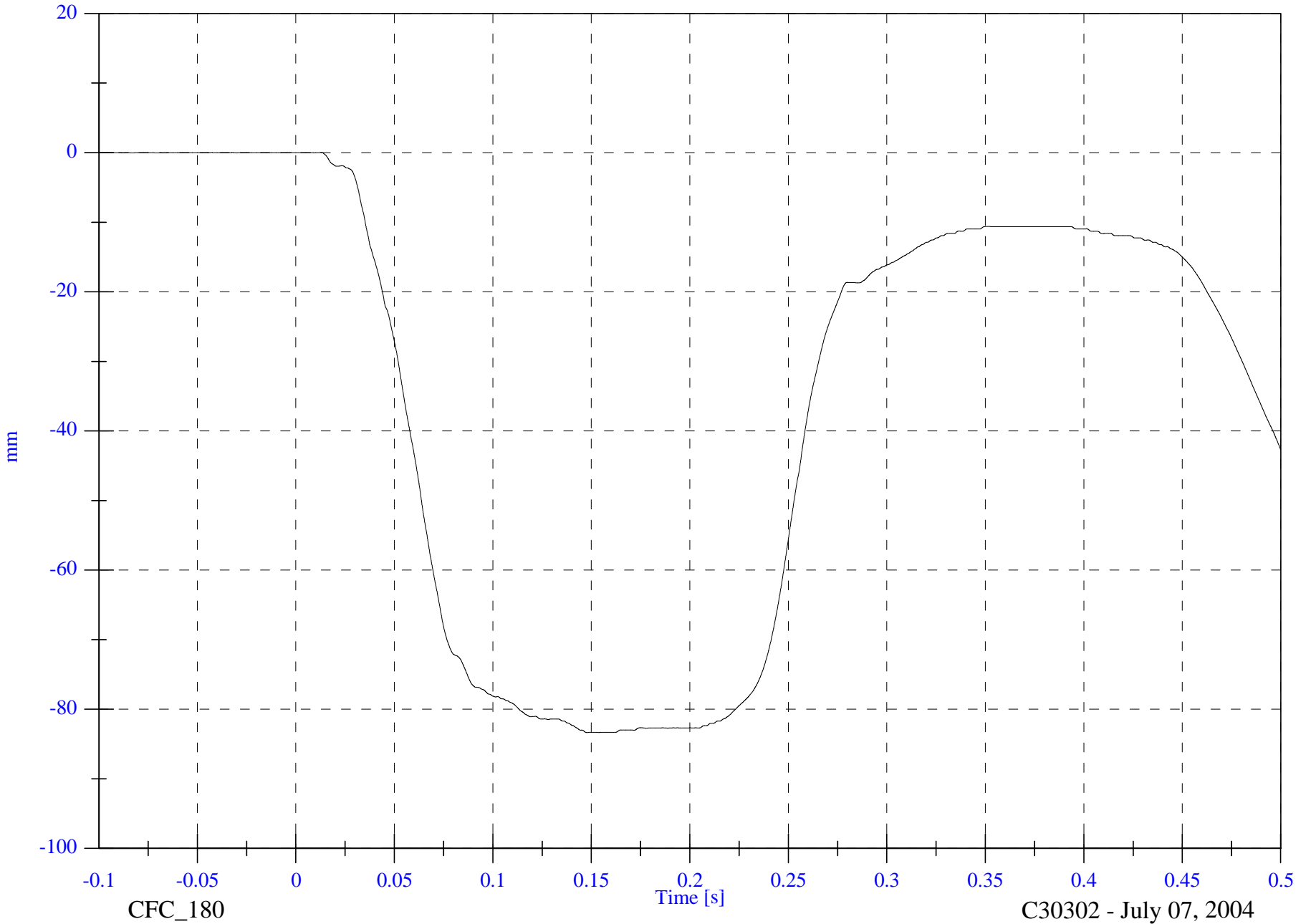
V2P1 Belt Spoolout

Max: 0.0 [mm] at 0.013 [s]

Min: -83.3 [mm] at 0.148 [s]

B-51

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Head x

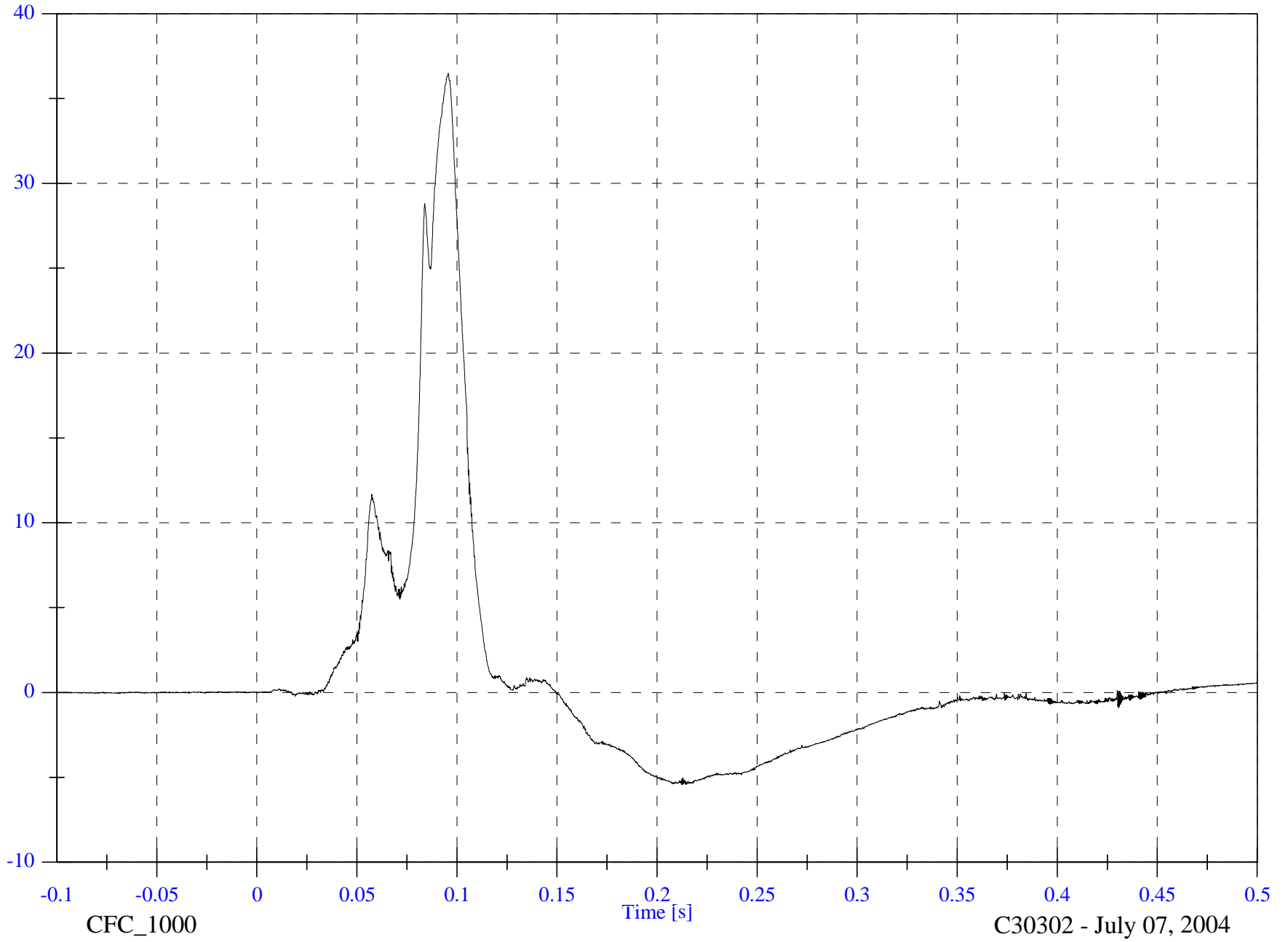
Max: 36.5 [g] at 0.096 [s]

Min: -5.4 [g] at 0.213 [s]

B-52

8655-F301-23R

g



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

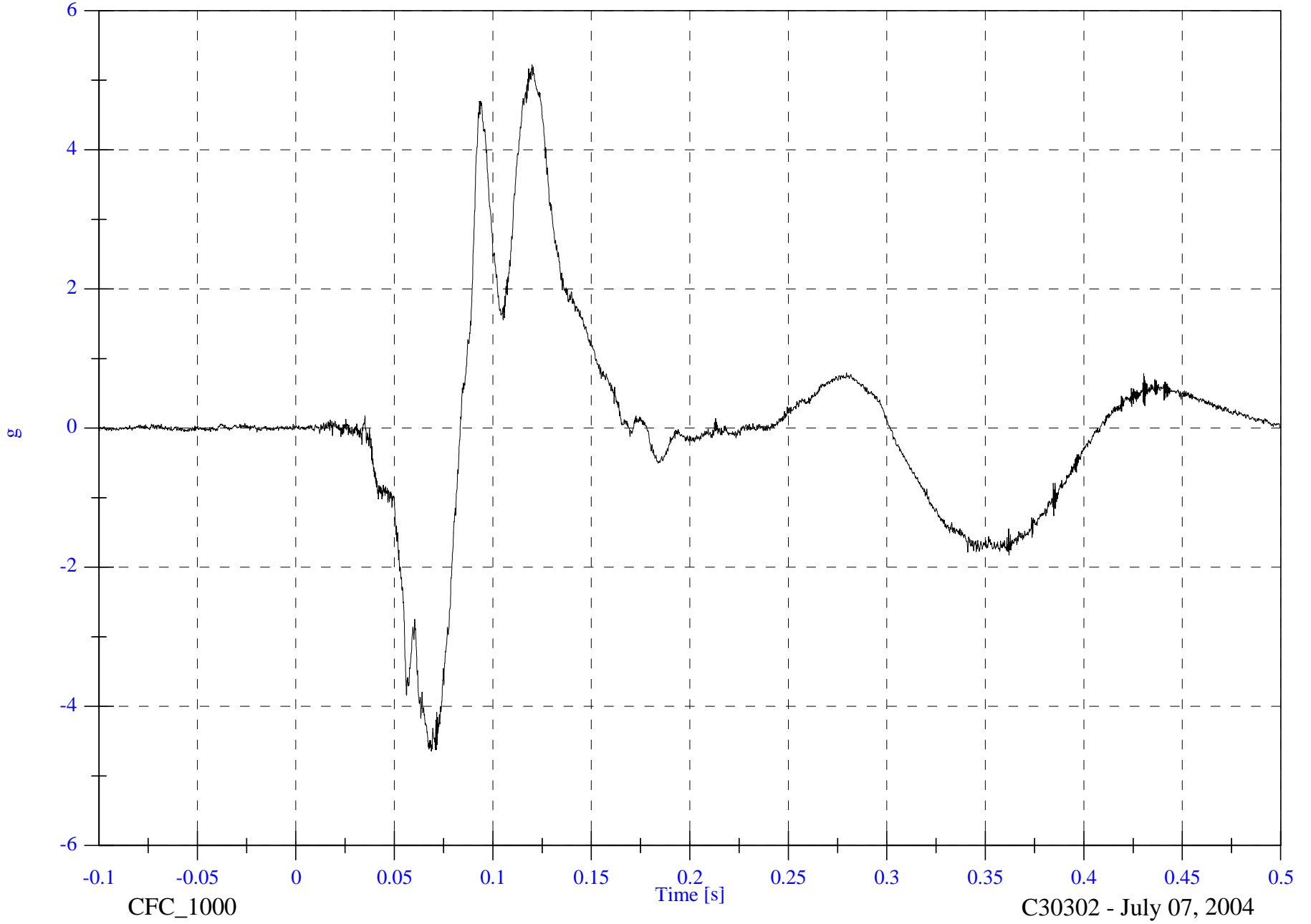
V2P3 Head y

Max: 5.2 [g] at 0.120 [s]

Min: -4.6 [g] at 0.069 [s]

B-53

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

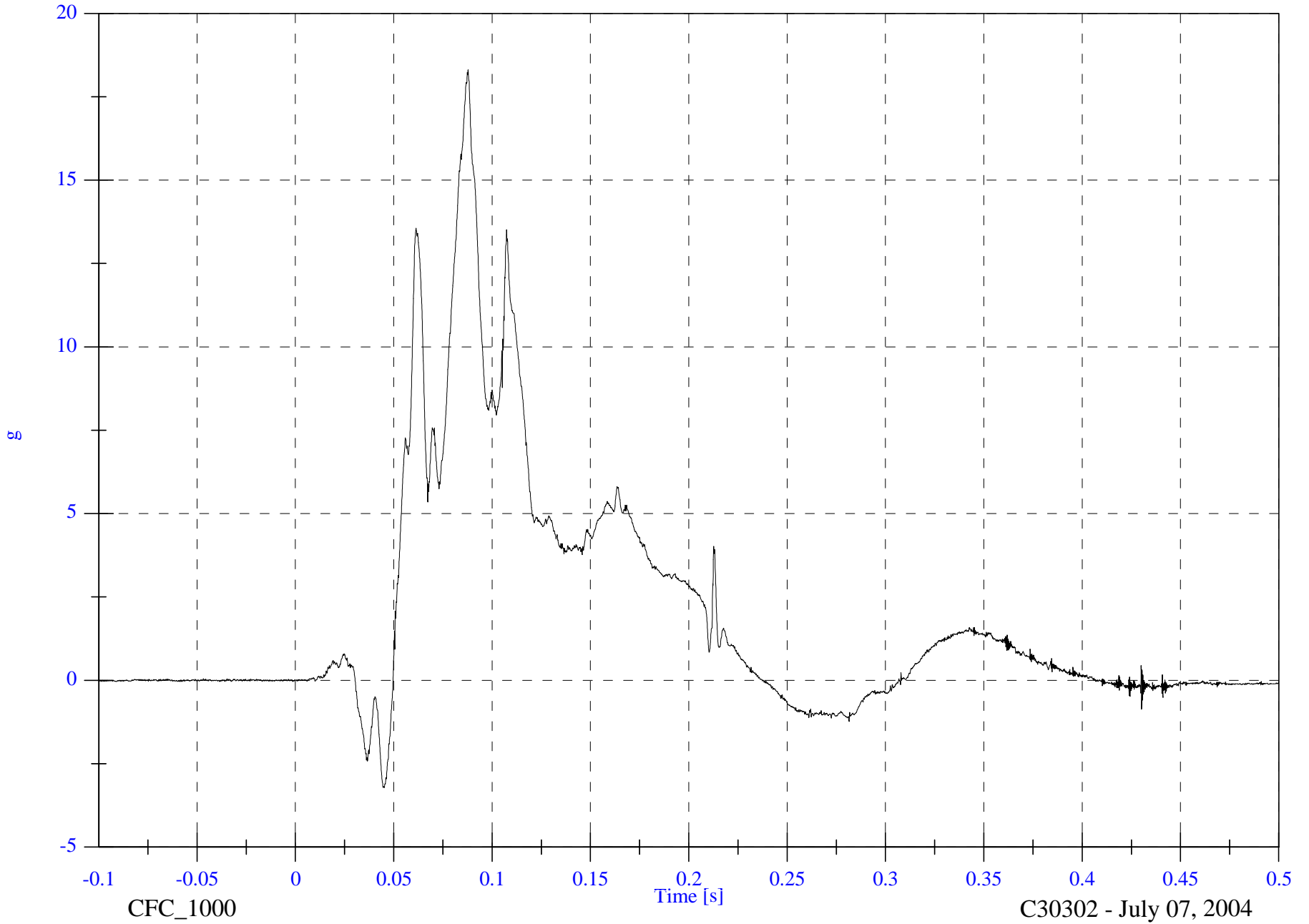
V2P3 Head z

Max: 18.3 [g] at 0.088 [s]

Min: -3.2 [g] at 0.045 [s]

B-54

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

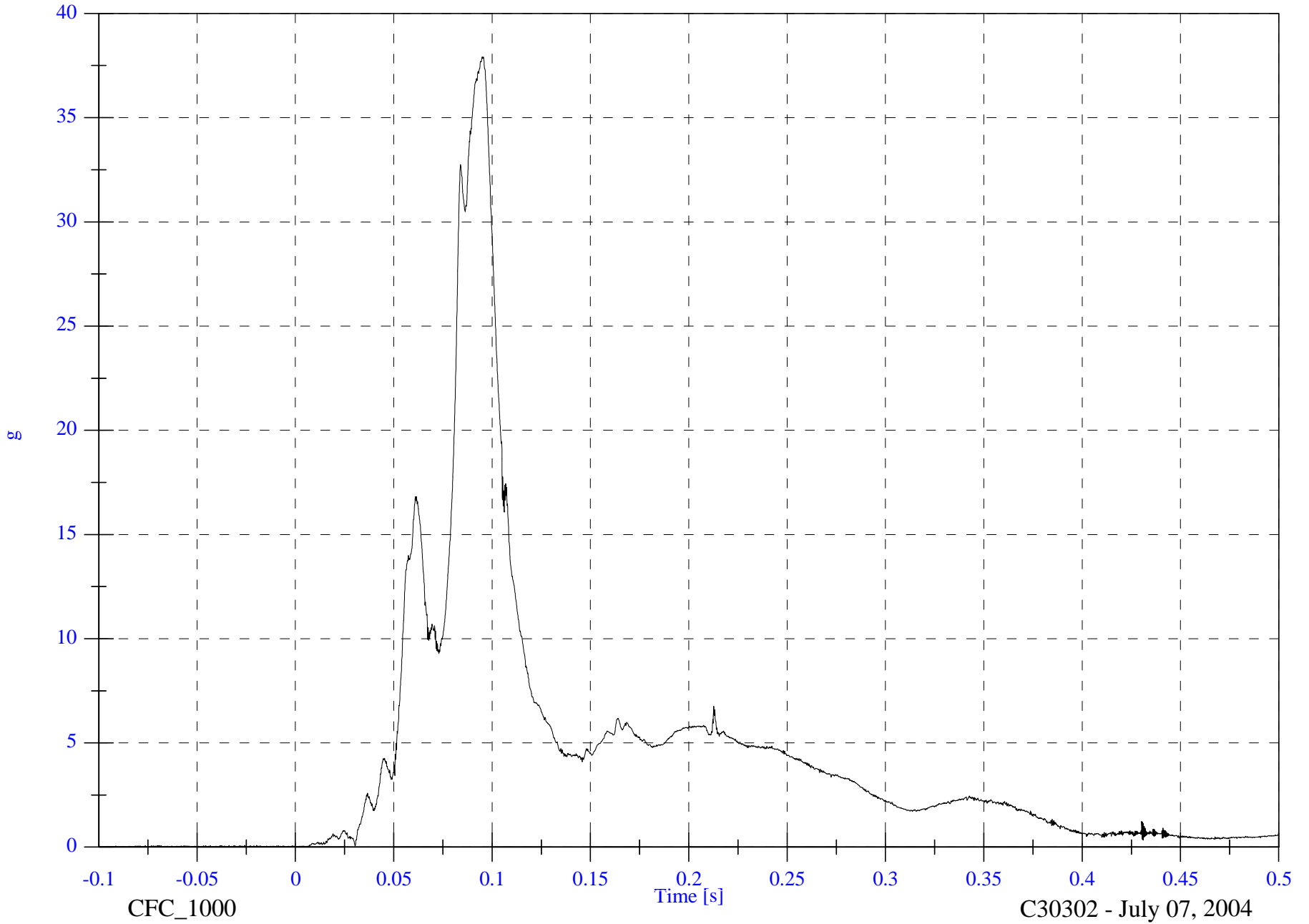
V2P3 Head Resultant

Max: 37.9 [g] at 0.095 [s]

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

B-55

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

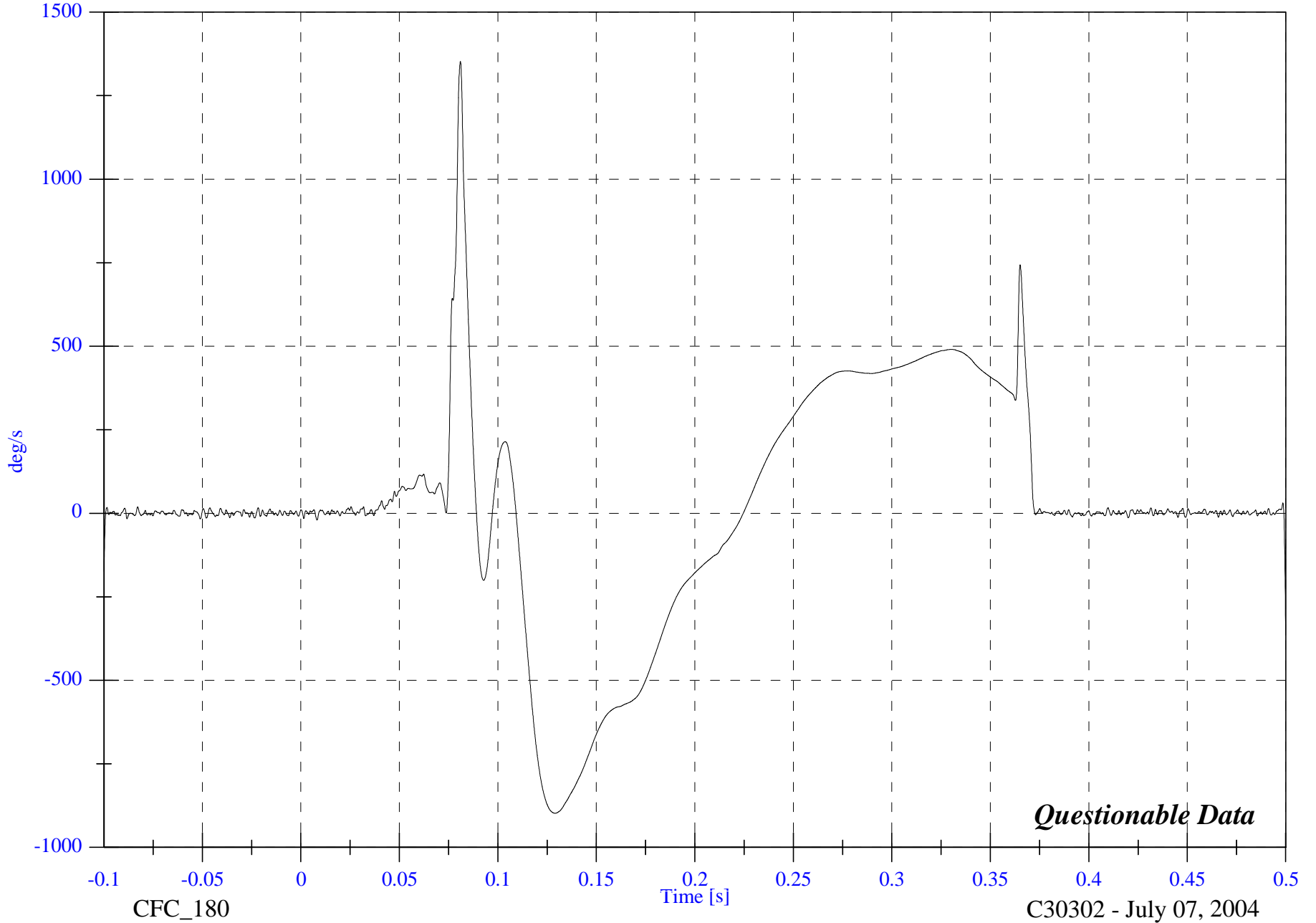
V2P3 Head AVy

Max: 1352.5 [deg/s] at 0.081 [s]

Min: -897.9 [deg/s] at 0.129 [s]

B-56

8655-F301-23R



Questionable Data

FMVSS301 Test 9 - 2004 Jeep Liberty

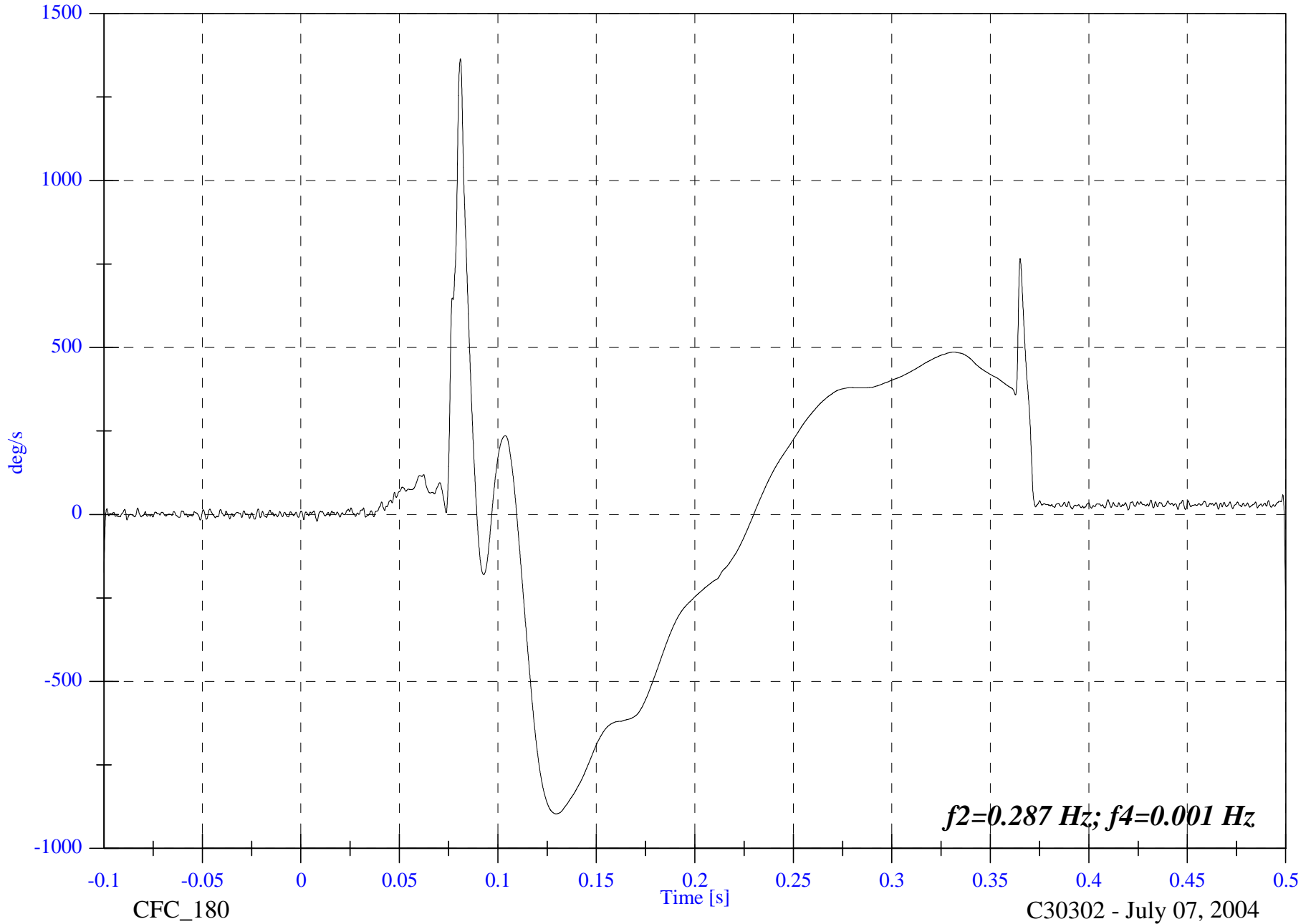
V2P3 Head Comp AVy

Max: 1365.2 [deg/s] at 0.081 [s]

Min: -896.7 [deg/s] at 0.130 [s]

B-57

8655-F301-23R



$f_2=0.287$ Hz; $f_4=0.001$ Hz

CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

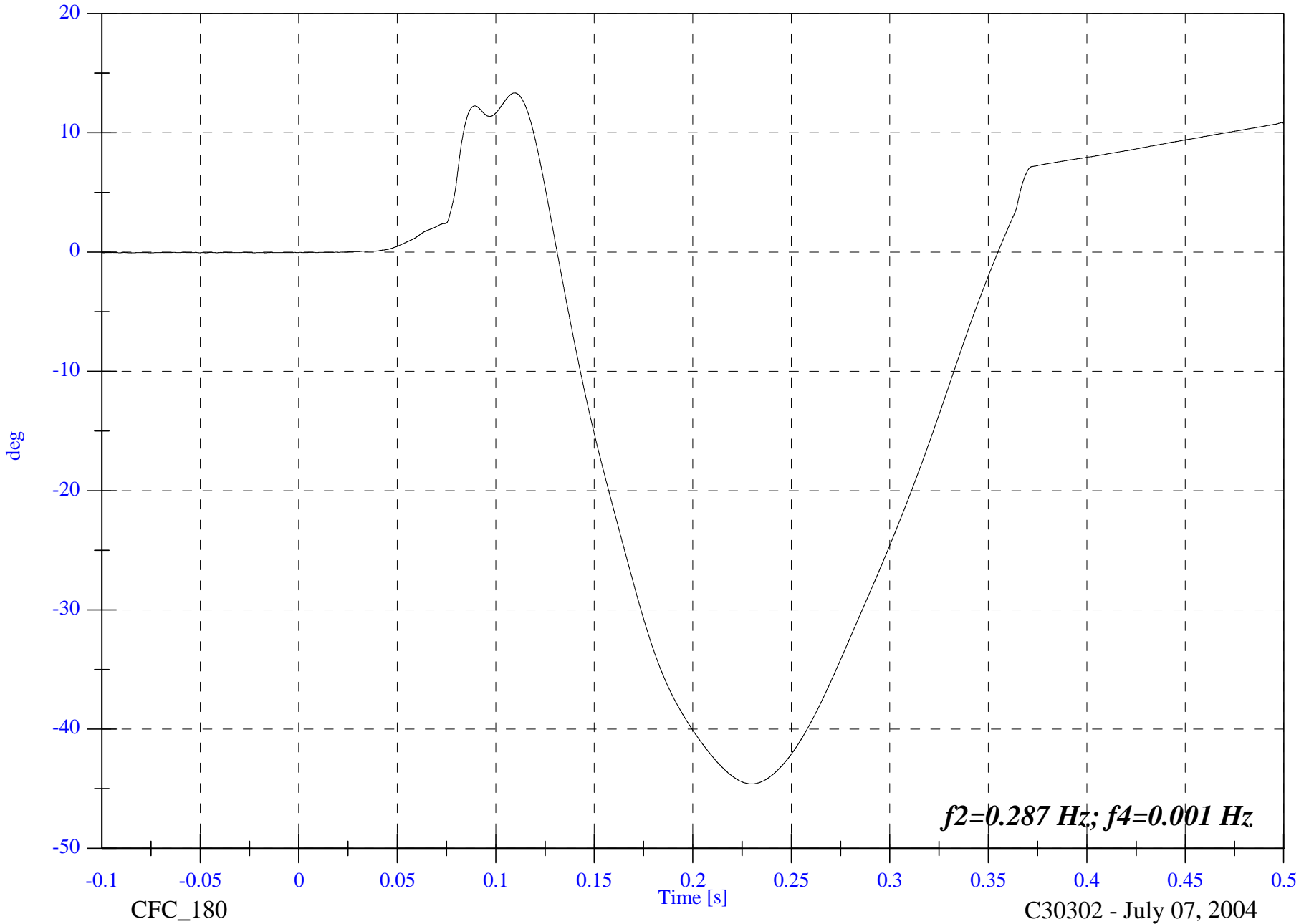
V2P3 Head Comp ADy

Max: 13.3 [deg] at 0.110 [s]

Min: -44.6 [deg] at 0.230 [s]

B-58

8655-F301-23R

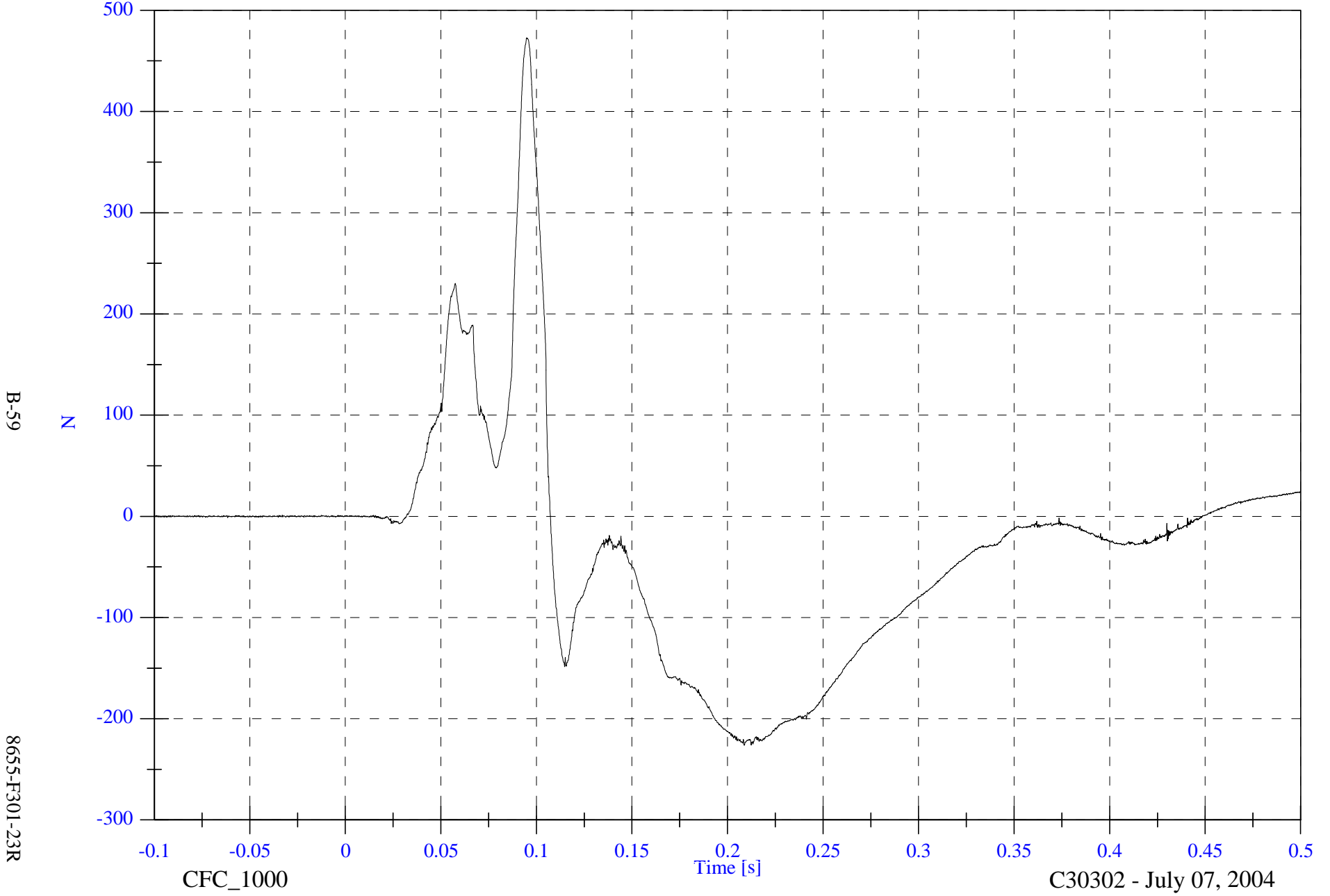


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Upper Neck Fx

Max: 472.7 [N] at 0.095 [s]

Min: -226.3 [N] at 0.209 [s]



B-59

8655-F301-23R

CFC_1000

Time [s]

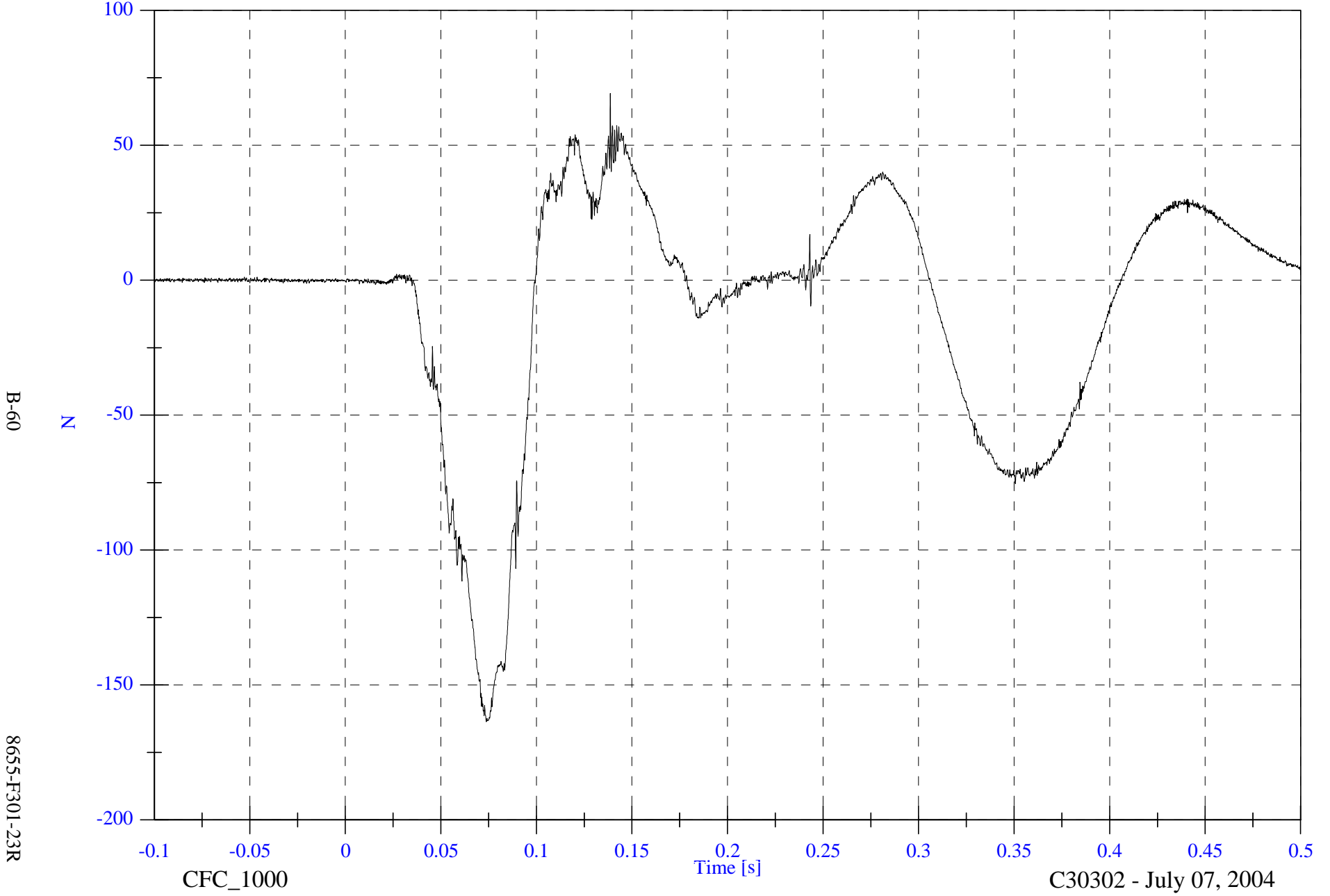
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Upper Neck Fy

Max: 69.2 [N] at 0.139 [s]

Min: -163.7 [N] at 0.074 [s]



B-60

N

8655-F301-23R

CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

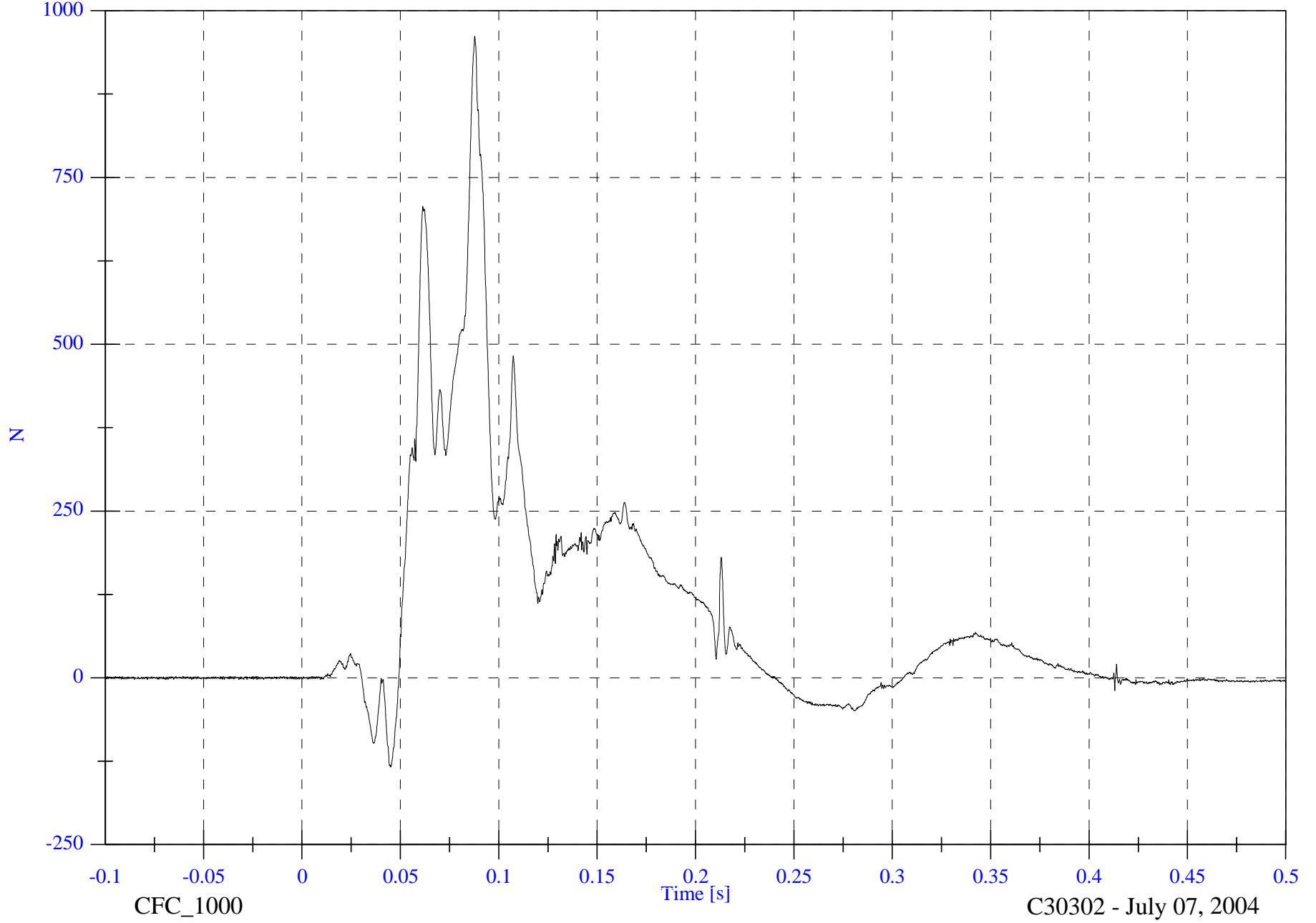
V2P3 Upper Neck Fz

Max: 961.5 [N] at 0.088 [s]

Min: -133.8 [N] at 0.045 [s]

B-61

8655-F301-23R



CFC_1000

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

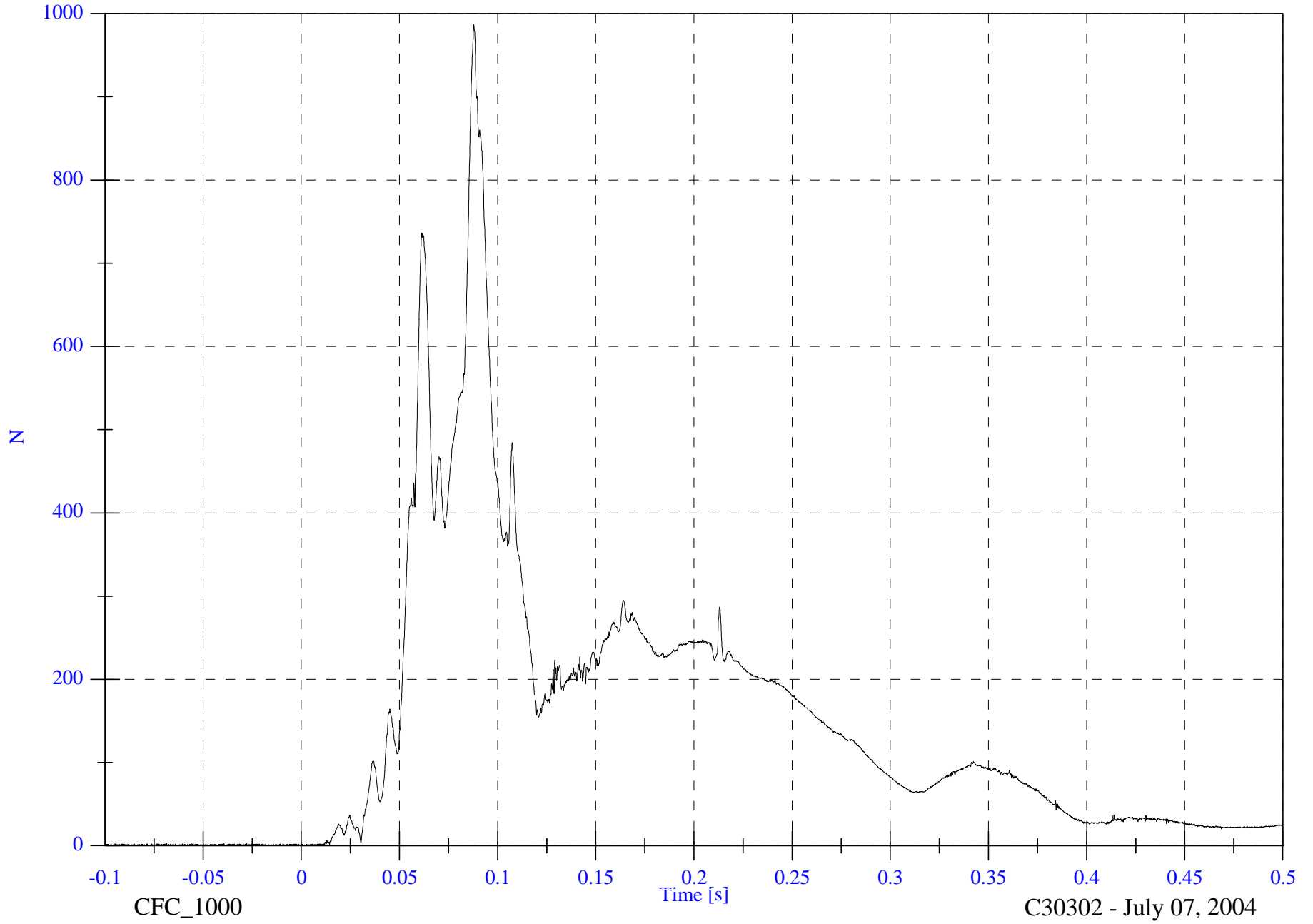
V2P3 Upper Neck F Resultant

Max: 986.7 [N] at 0.088 [s]

Min: 0.0 [N] at -0.007 [s]

B-62

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

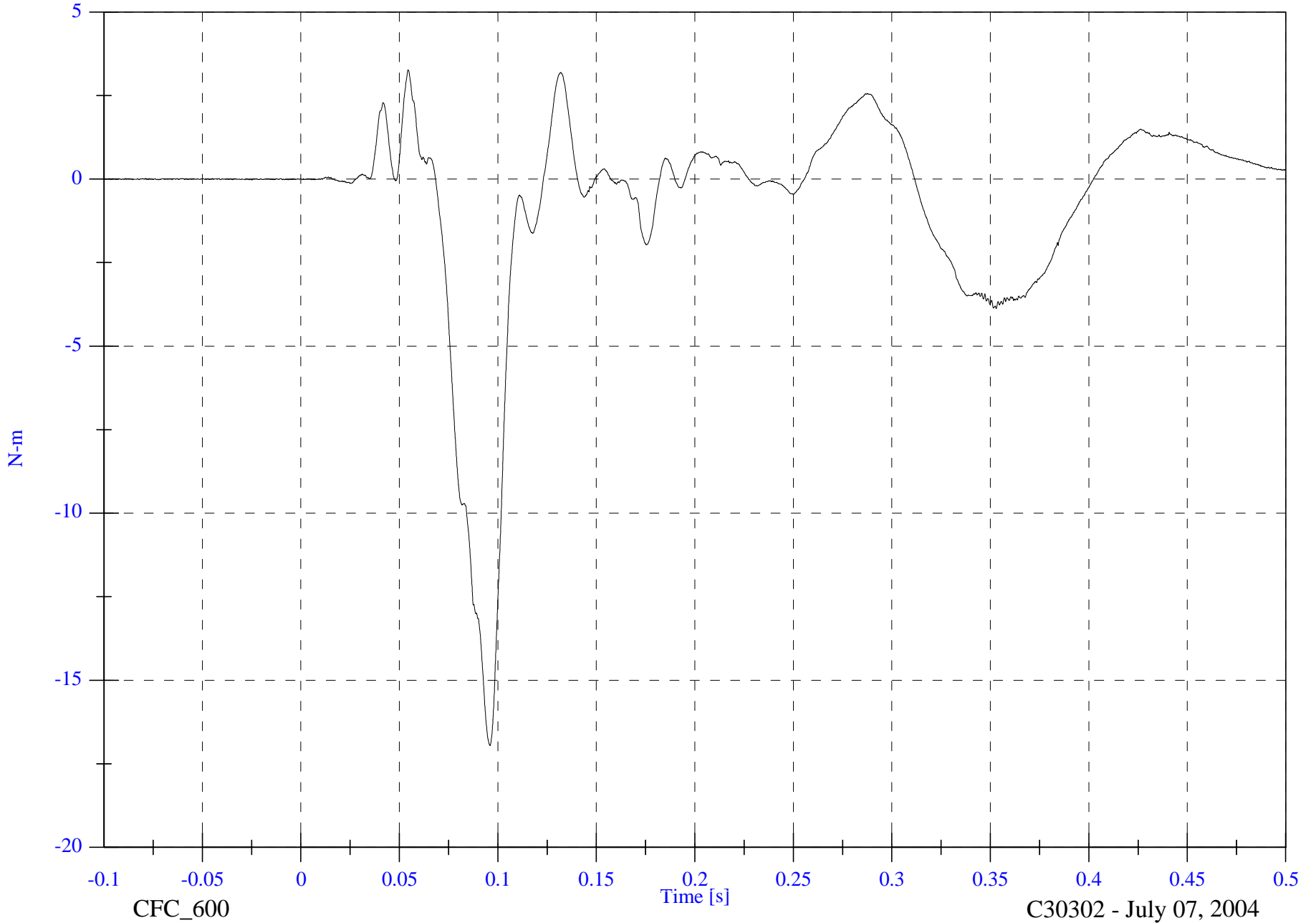
V2P3 Upper Neck Mx

Max: 3.3 [N-m] at 0.054 [s]

Min: -17.0 [N-m] at 0.096 [s]

B-63

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

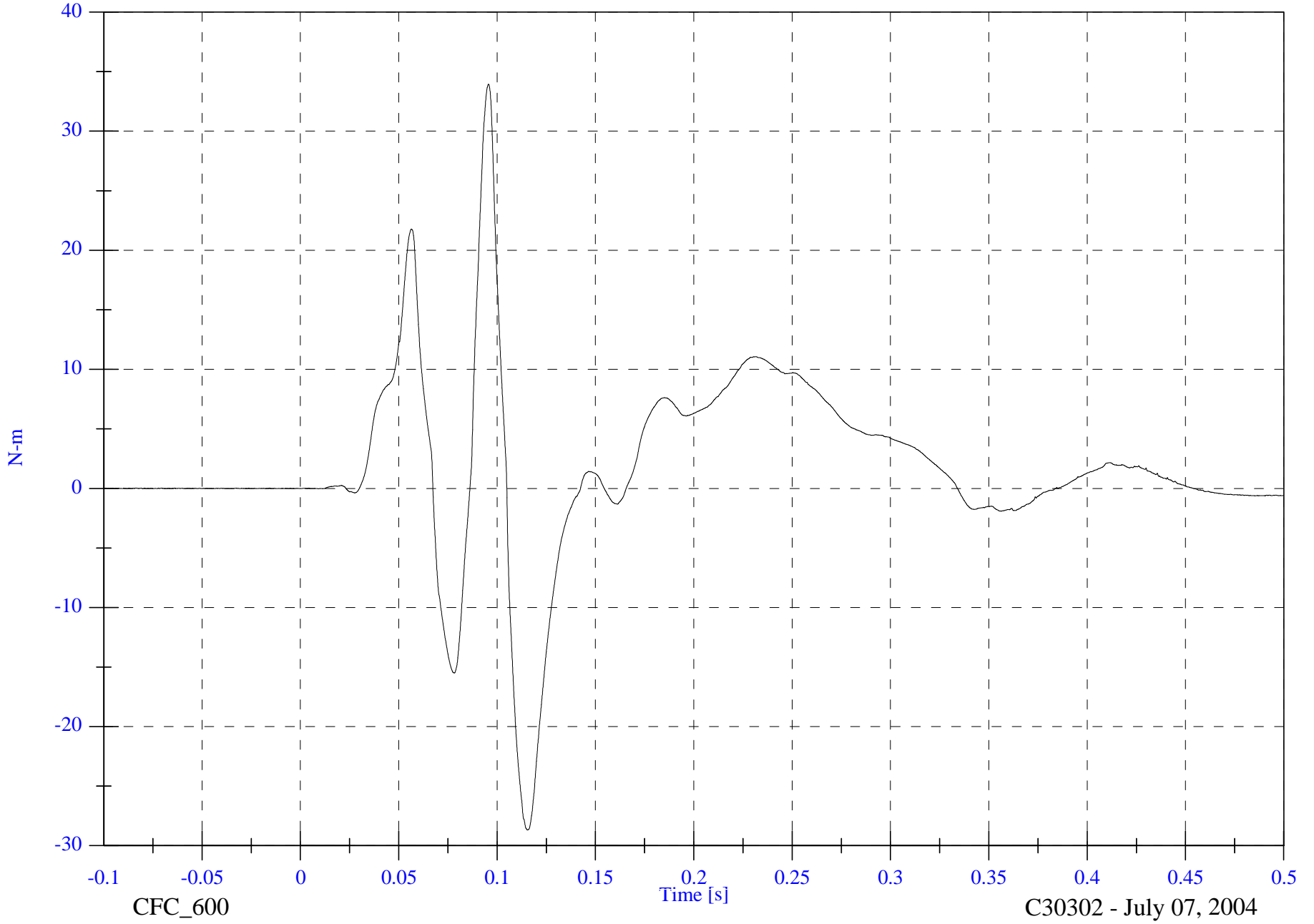
V2P3 Upper Neck My

Max: 33.9 [N-m] at 0.096 [s]

Min: -28.7 [N-m] at 0.115 [s]

B-64

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

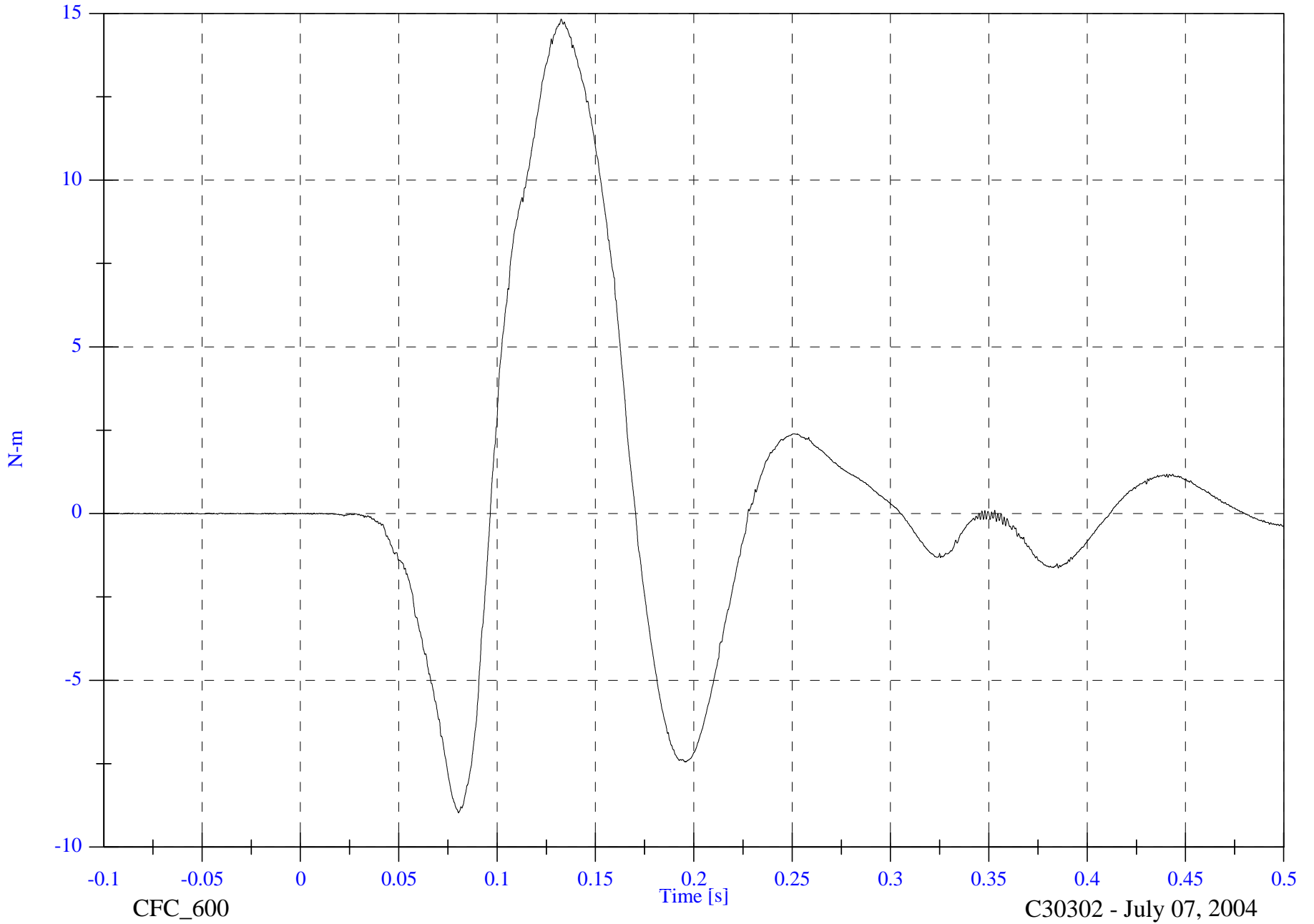
V2P3 Upper Neck Mz

Max: 14.8 [N-m] at 0.133 [s]

Min: -9.0 [N-m] at 0.080 [s]

B-65

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

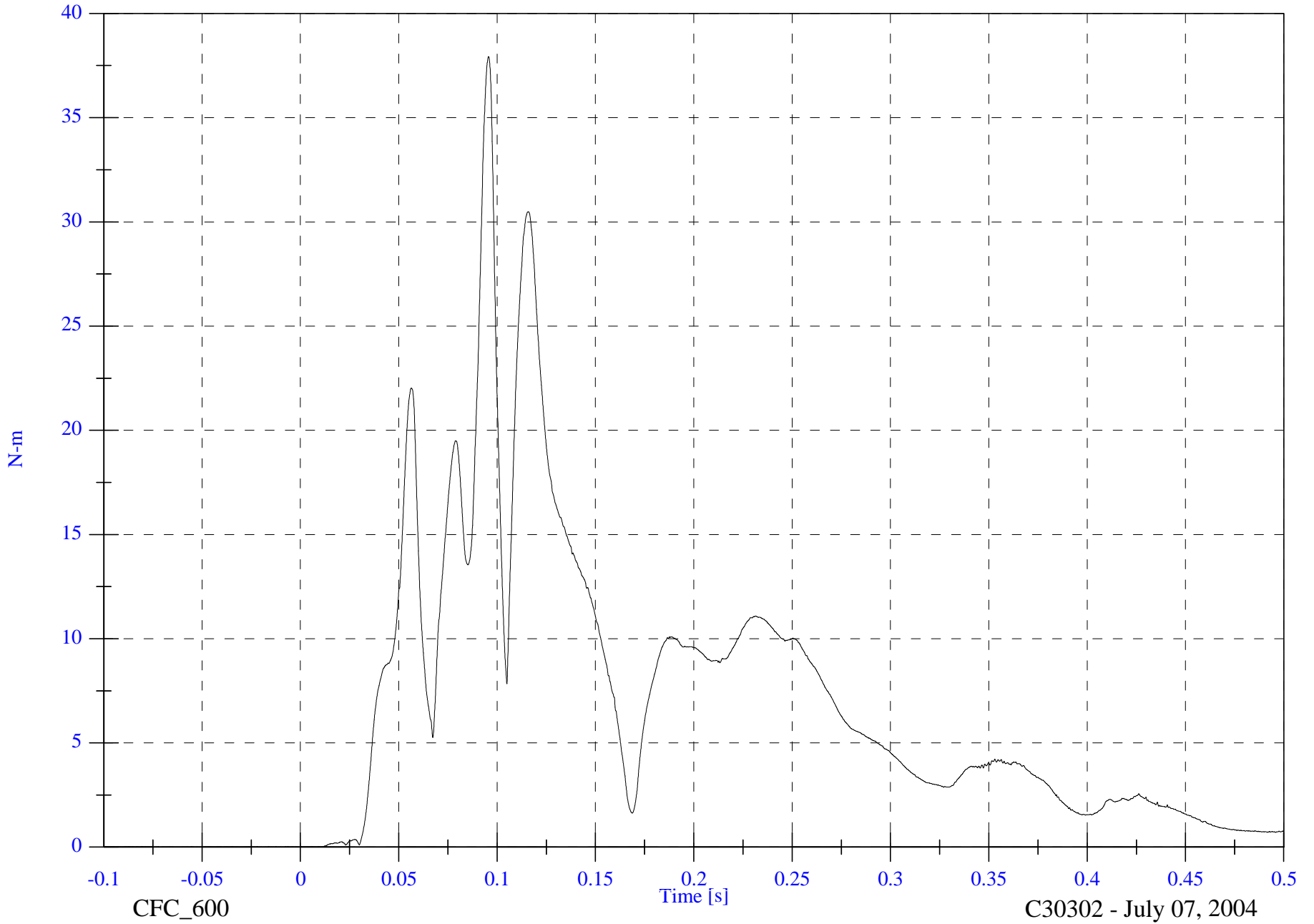
V2P3 Upper Neck M Resultant

Max: 37.9 [N-m] at 0.096 [s]

Min: 0.0 [N-m] at -0.039 [s]

B-66

8655-F301-23R



CFC_600

Time [s]

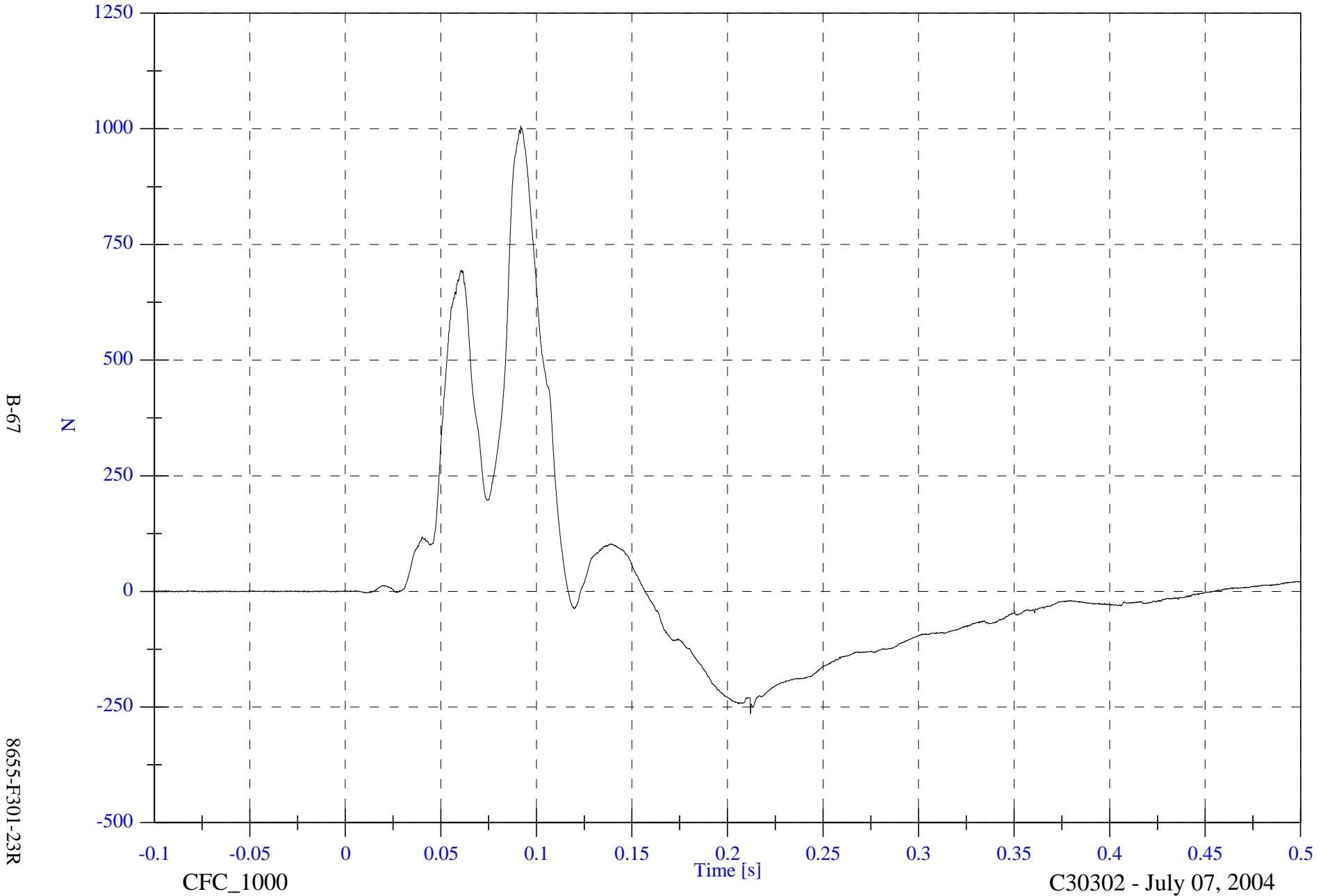
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Lower Neck Fx

Max: 1006.1 [N] at 0.092 [s]

Min: -264.2 [N] at 0.212 [s]



B-67

8655-F301-23R

CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

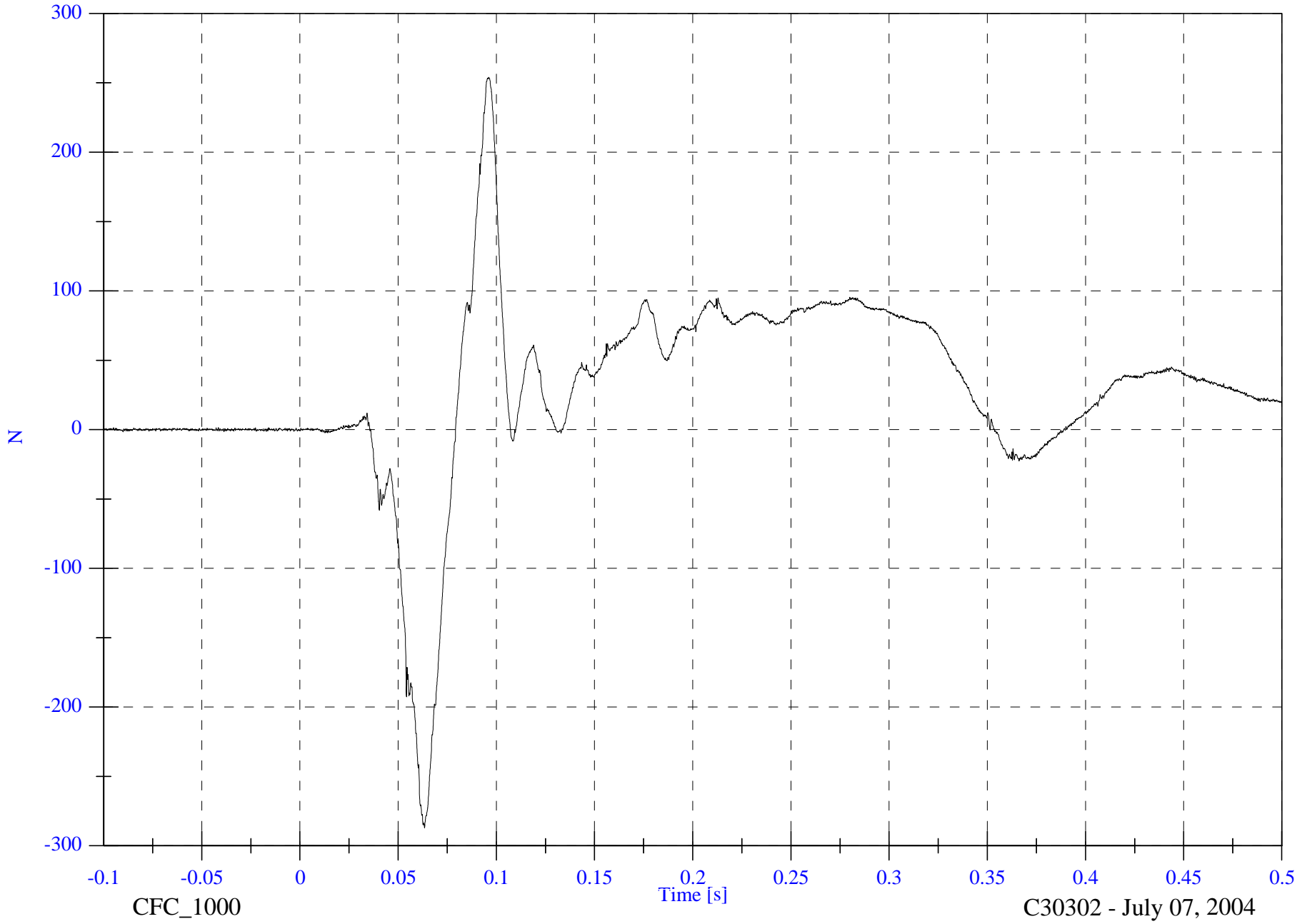
V2P3 Lower Neck Fy

Max: 254.0 [N] at 0.096 [s]

Min: -287.0 [N] at 0.063 [s]

B-68

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

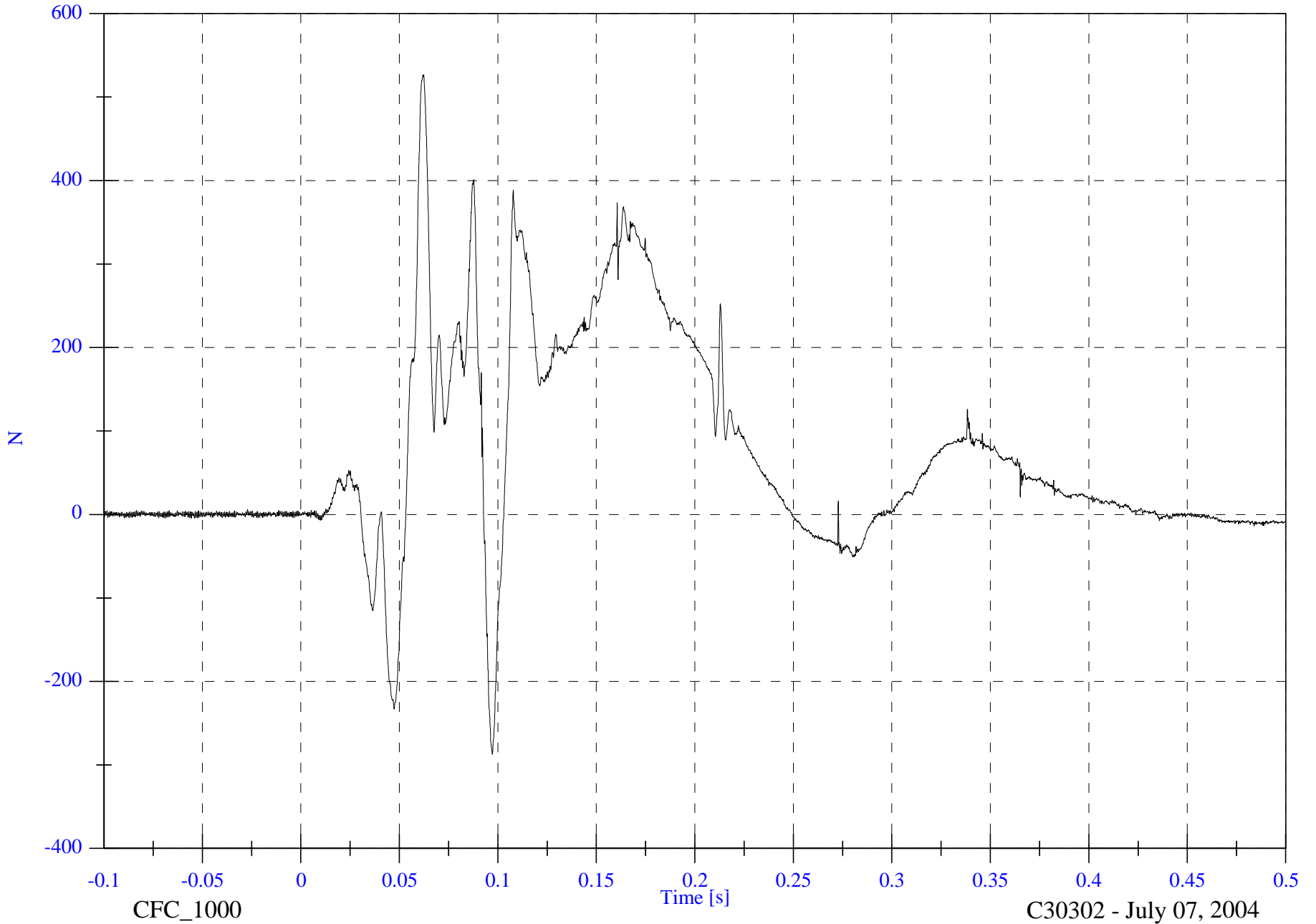
V2P3 Lower Neck Fz

Max: 526.8 [N] at 0.062 [s]

Min: -287.4 [N] at 0.097 [s]

B-69

8655-F301-23R



CFC_1000

Time [s]

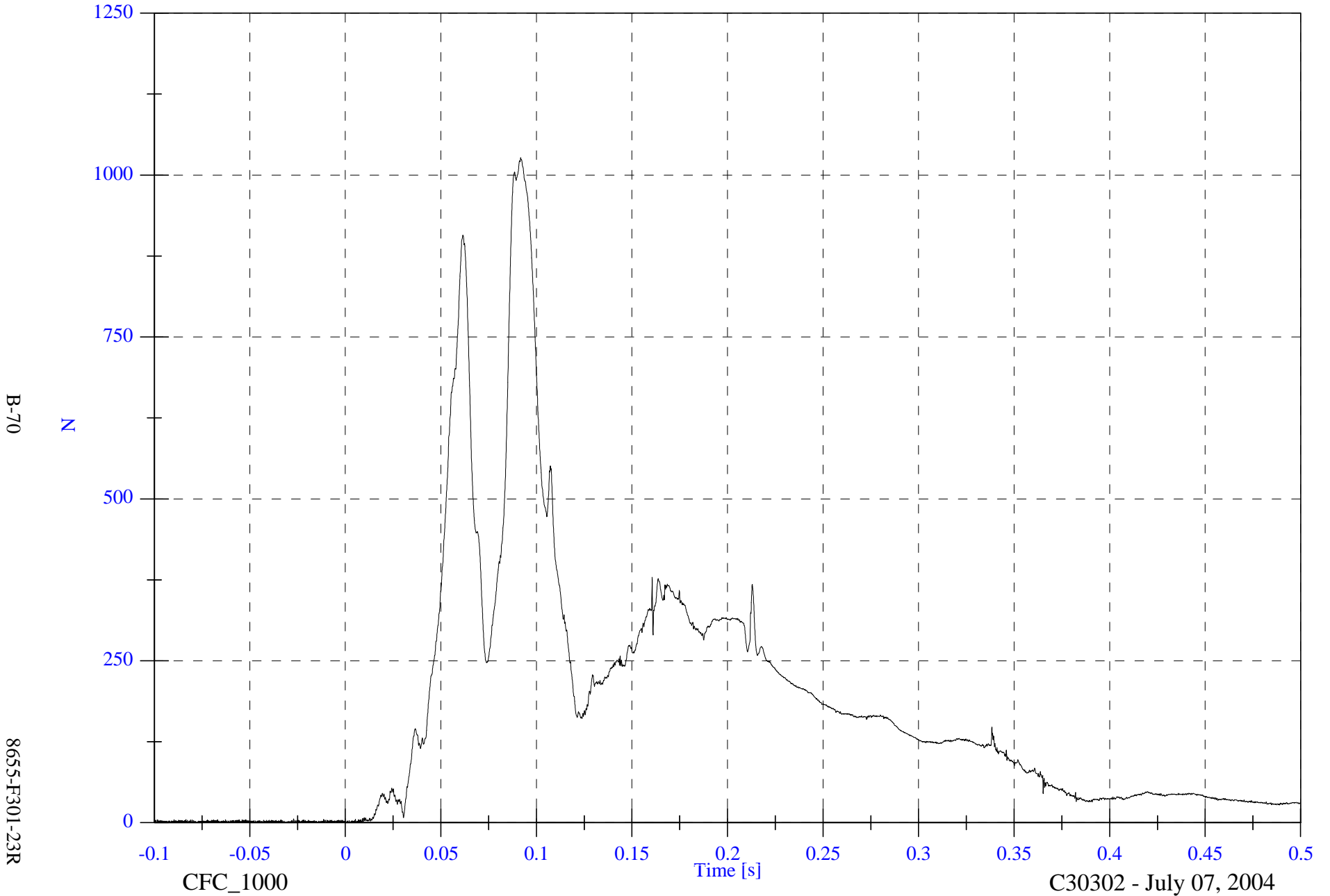
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Lower Neck F Resultant

Max: 1027.1 [N] at 0.092 [s]

Min: 0.1 [N] at -0.036 [s]



B-70

8655-F301-23R

CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

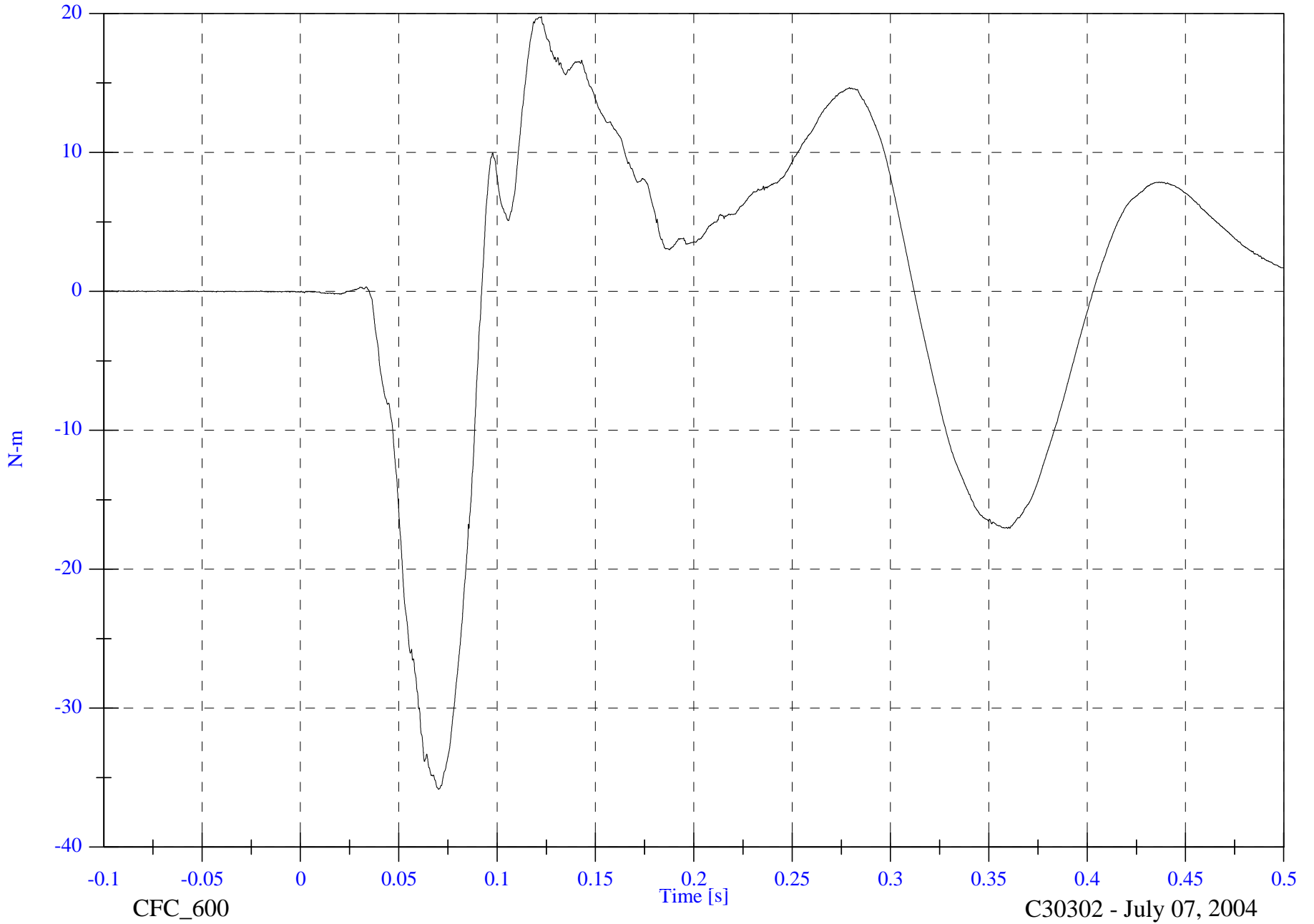
V2P3 Lower Neck Mx

Max: 19.8 [N-m] at 0.122 [s]

Min: -35.8 [N-m] at 0.070 [s]

B-71

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

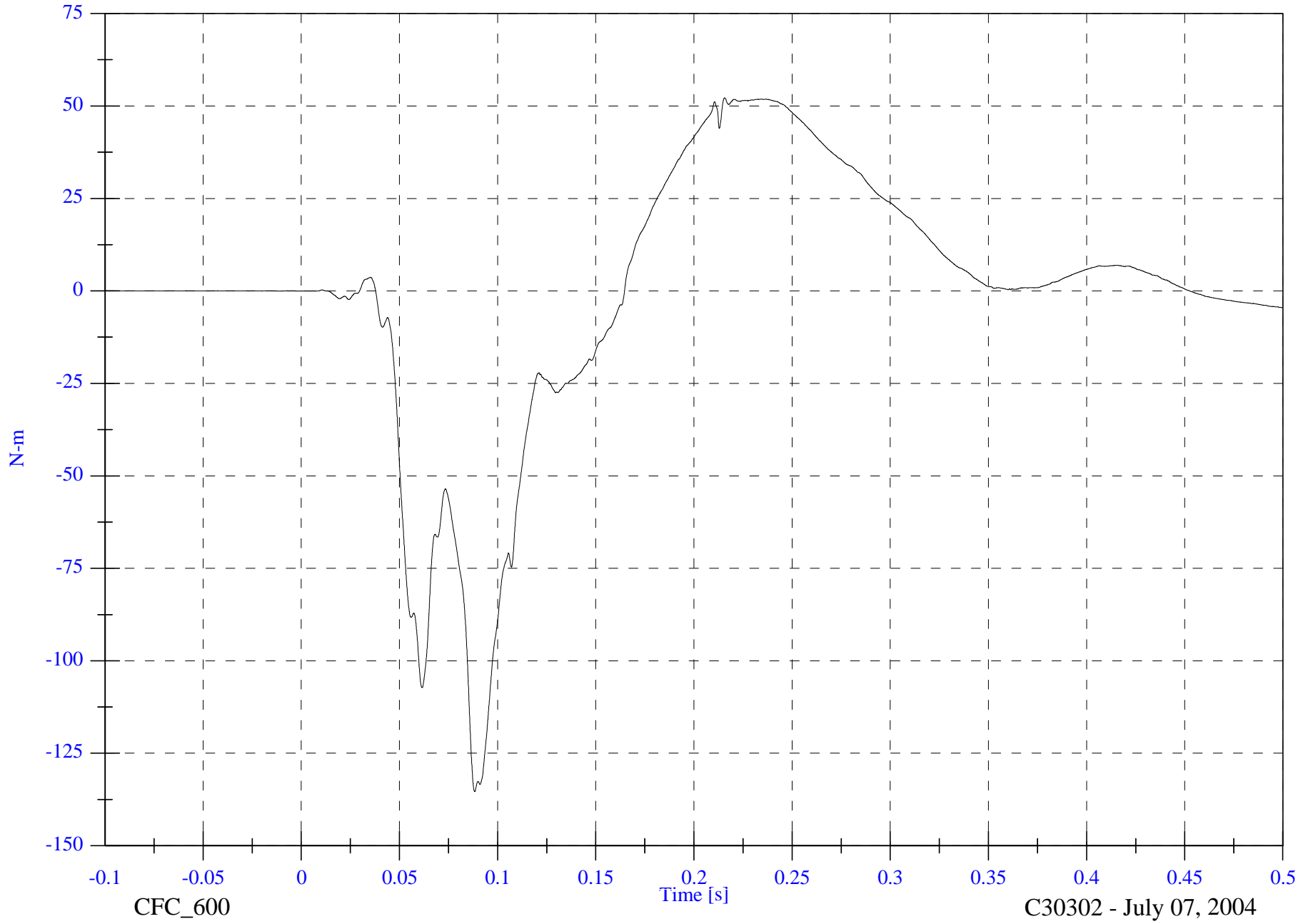
V2P3 Lower Neck My

Max: 52.2 [N-m] at 0.216 [s]

Min: -135.4 [N-m] at 0.088 [s]

B-72

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

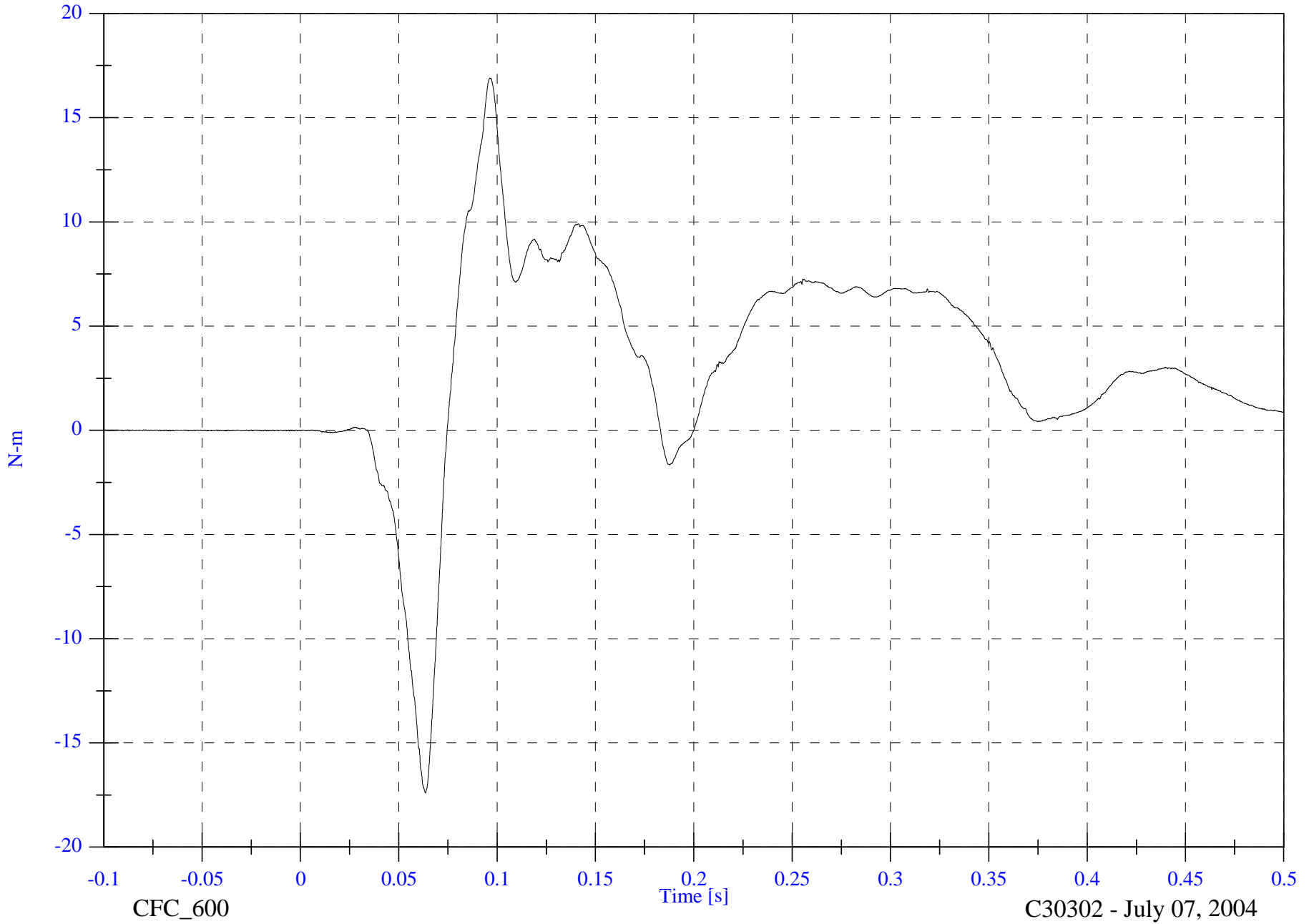
V2P3 Lower Neck Mz

Max: 16.9 [N-m] at 0.096 [s]

Min: -17.4 [N-m] at 0.064 [s]

B-73

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

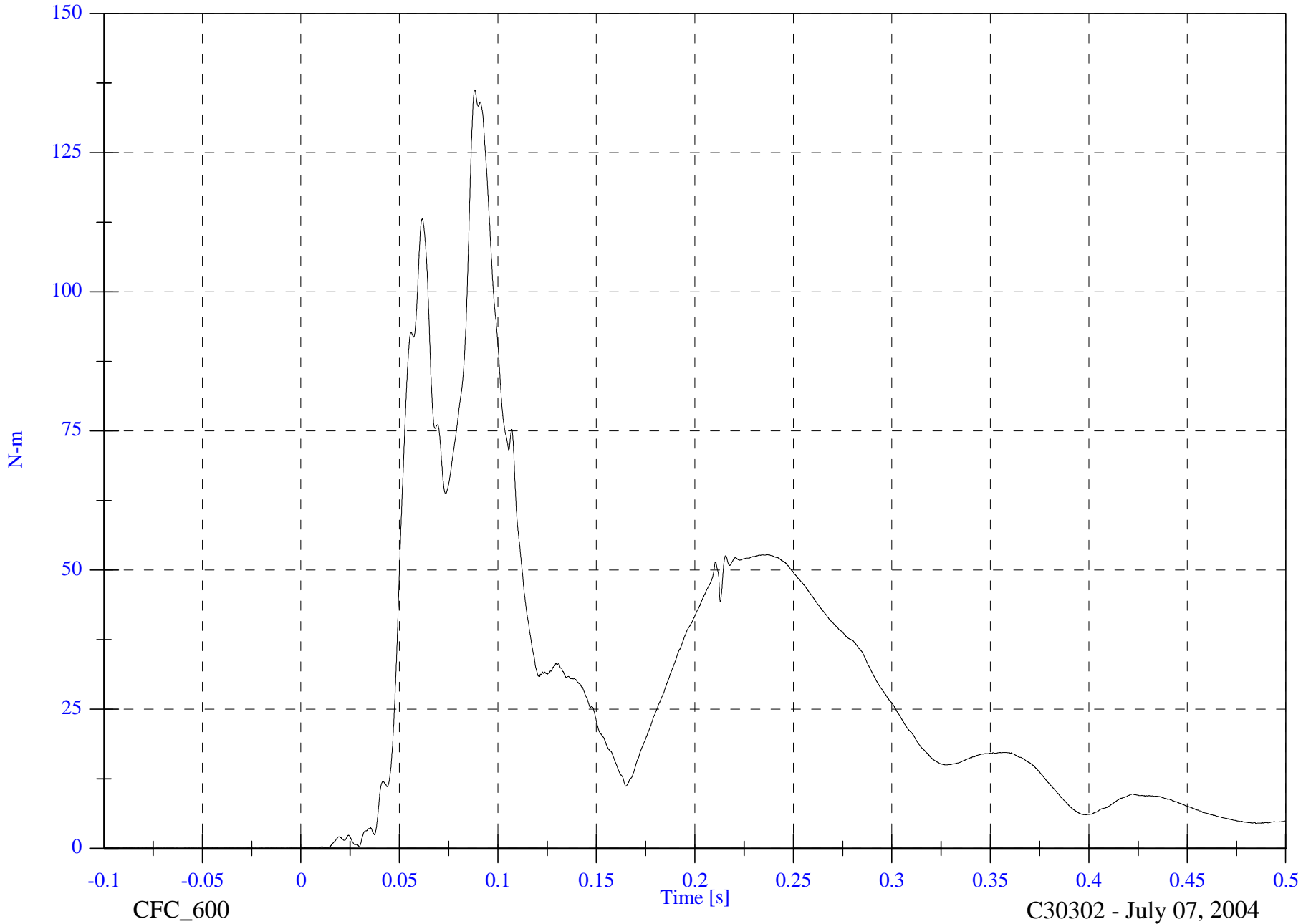
V2P3 Lower Neck M Resultant

Max: 136.3 [N-m] at 0.088 [s]

Min: 0.0 [N-m] at -0.046 [s]

B-74

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

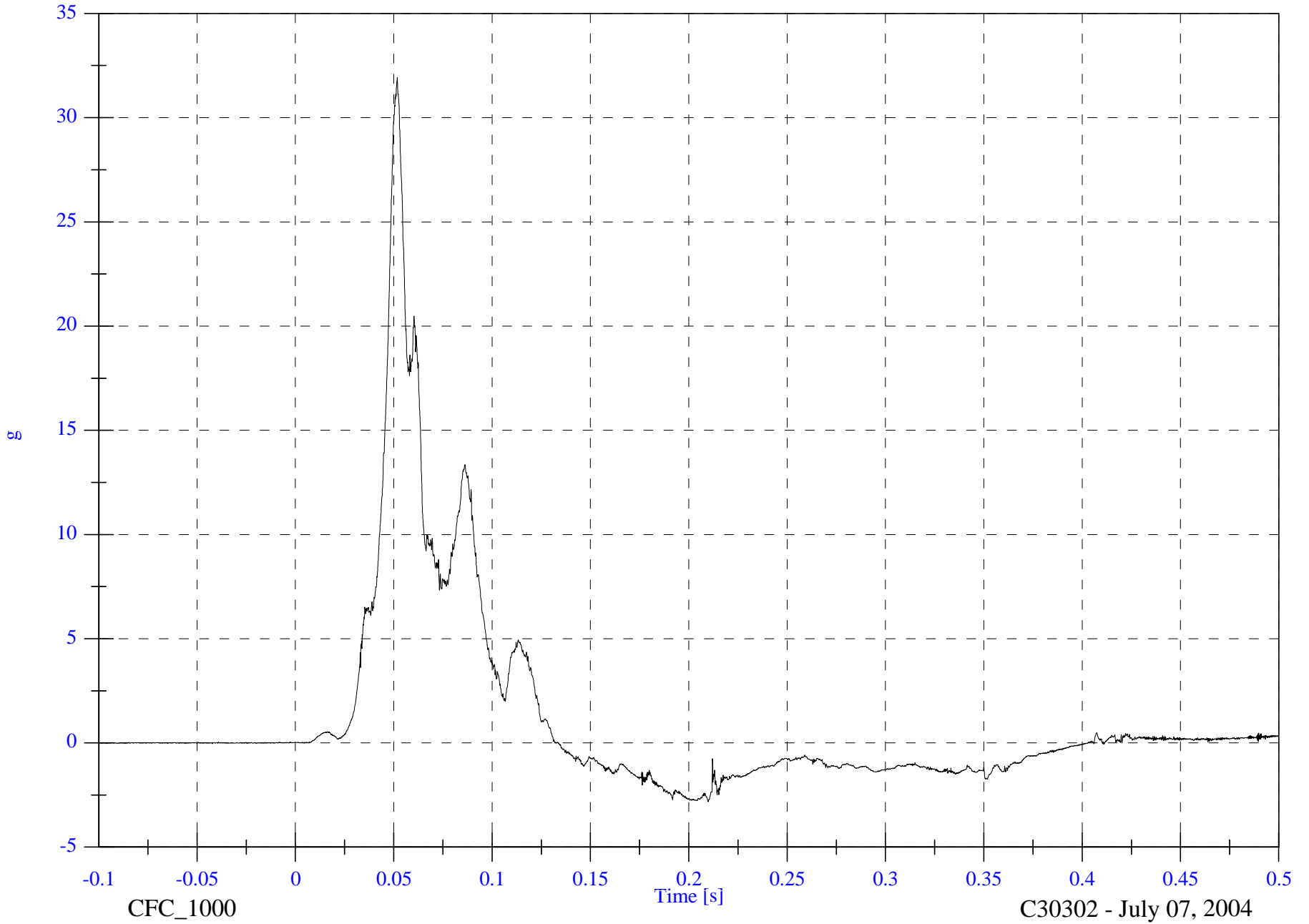
V2P3 Lower Neck x

Max: 31.9 [g] at 0.052 [s]

Min: -2.8 [g] at 0.210 [s]

B-75

8655-F301-23R



CFC_1000

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

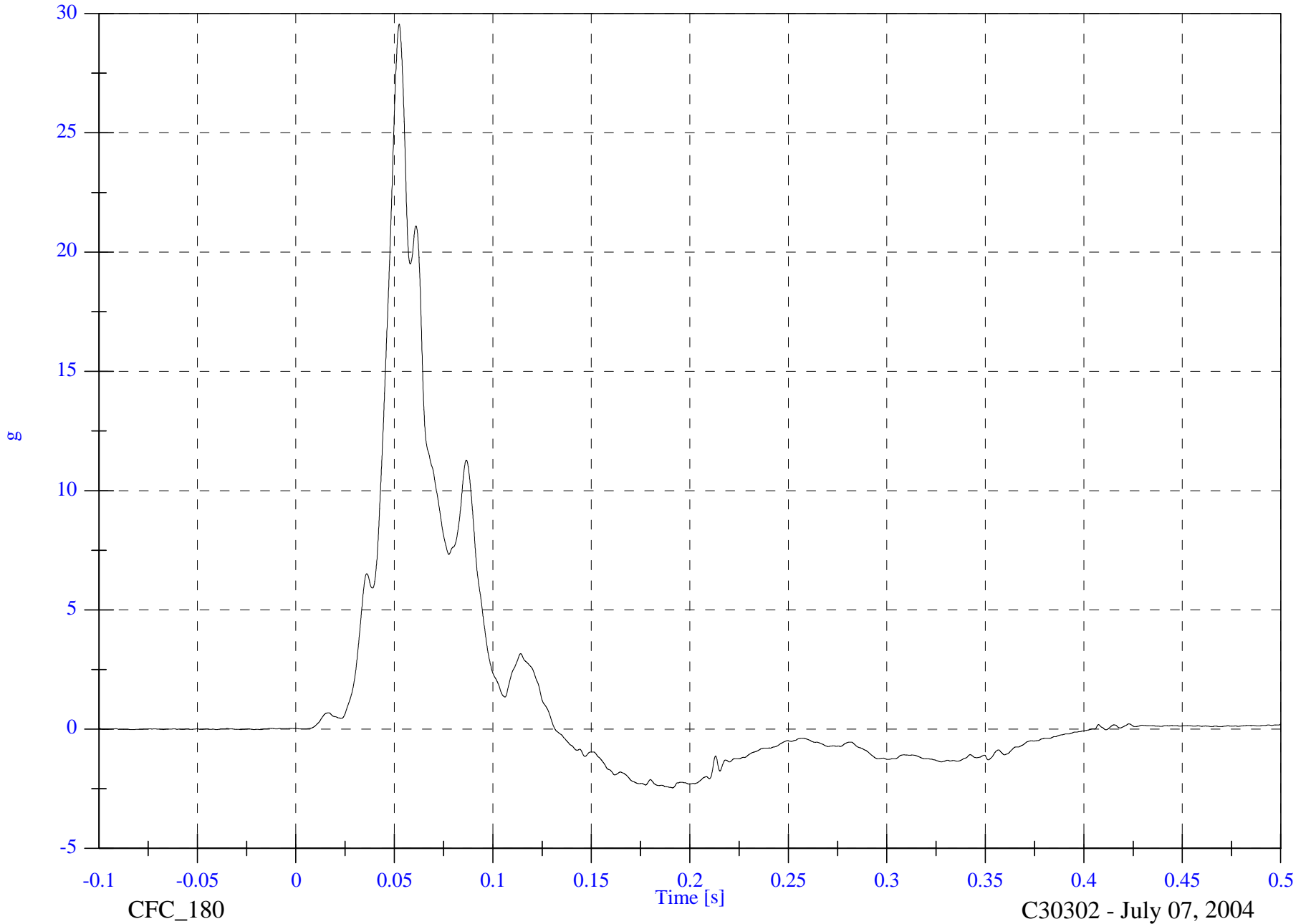
V2P3 Chest x

Max: 29.6 [g] at 0.052 [s]

Min: -2.5 [g] at 0.191 [s]

B-76

8655-F301-23R

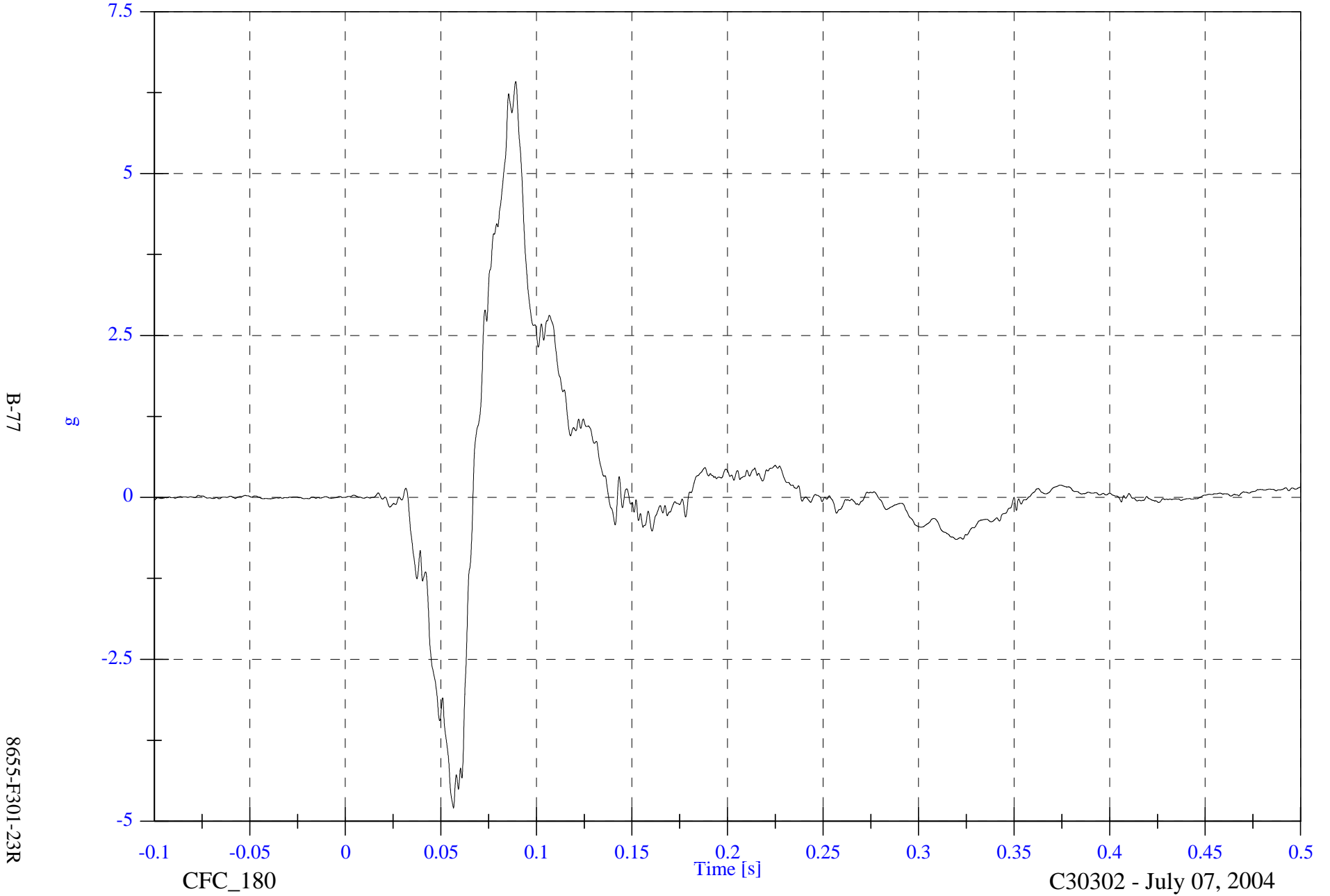


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Chest y

Max: 6.4 [g] at 0.089 [s]

Min: -4.8 [g] at 0.057 [s]

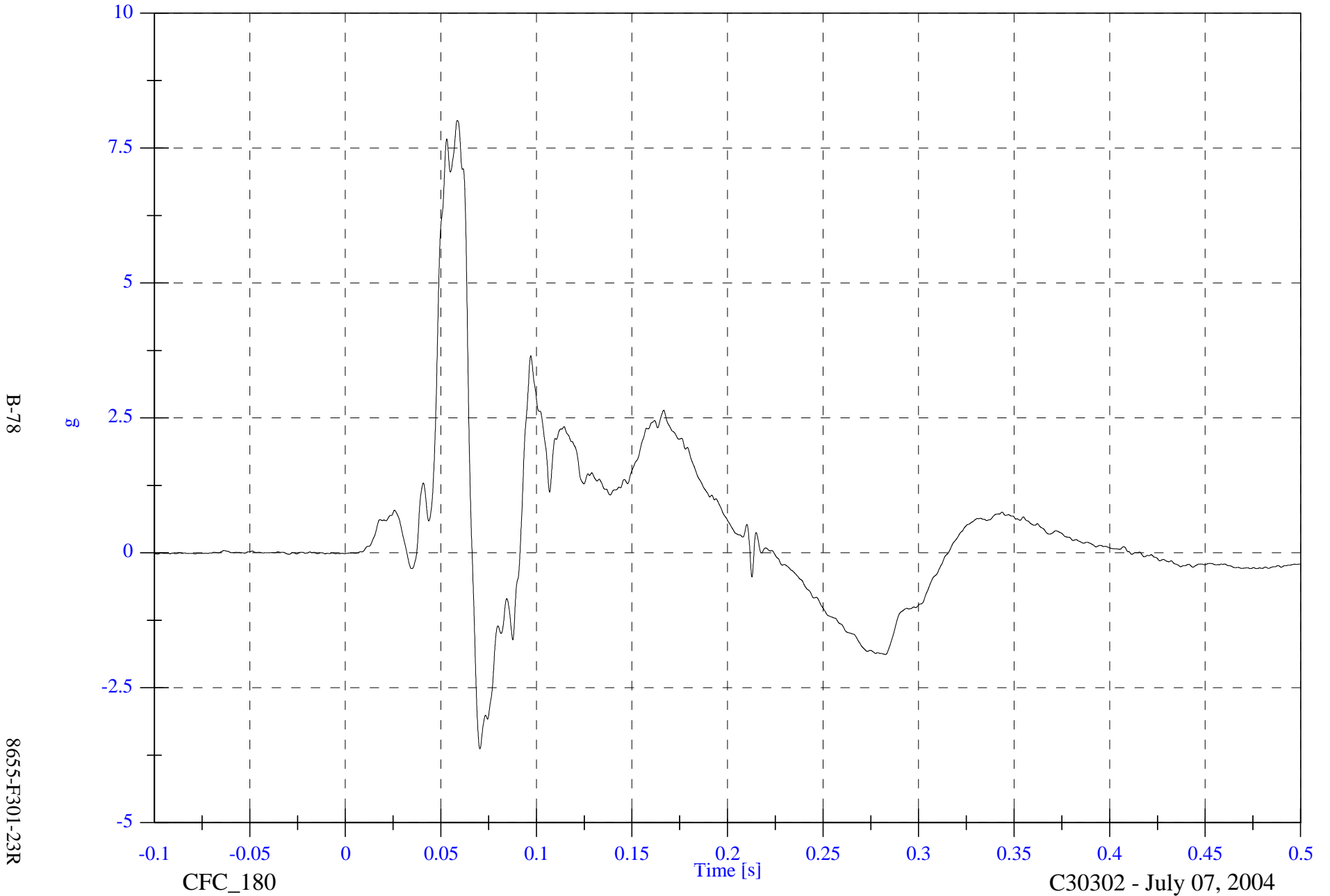


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Chest z

Max: 8.0 [g] at 0.059 [s]

Min: -3.6 [g] at 0.070 [s]



FMVSS301 Test 9 - 2004 Jeep Liberty

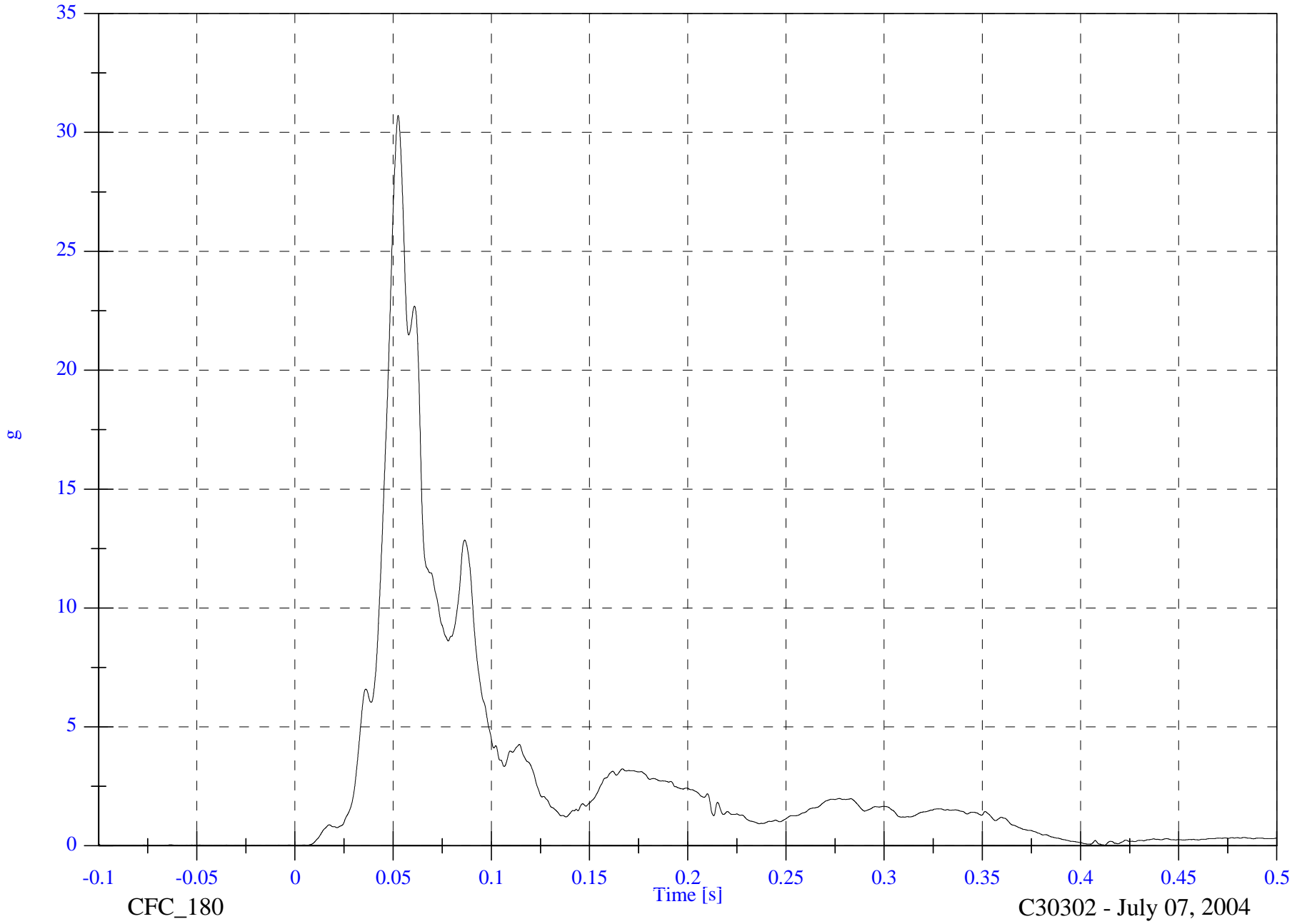
V2P3 Chest Resultant

Max: 30.7 [g] at 0.053 [s]

Min: 0.0 [g] at -0.032 [s]

B-79

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

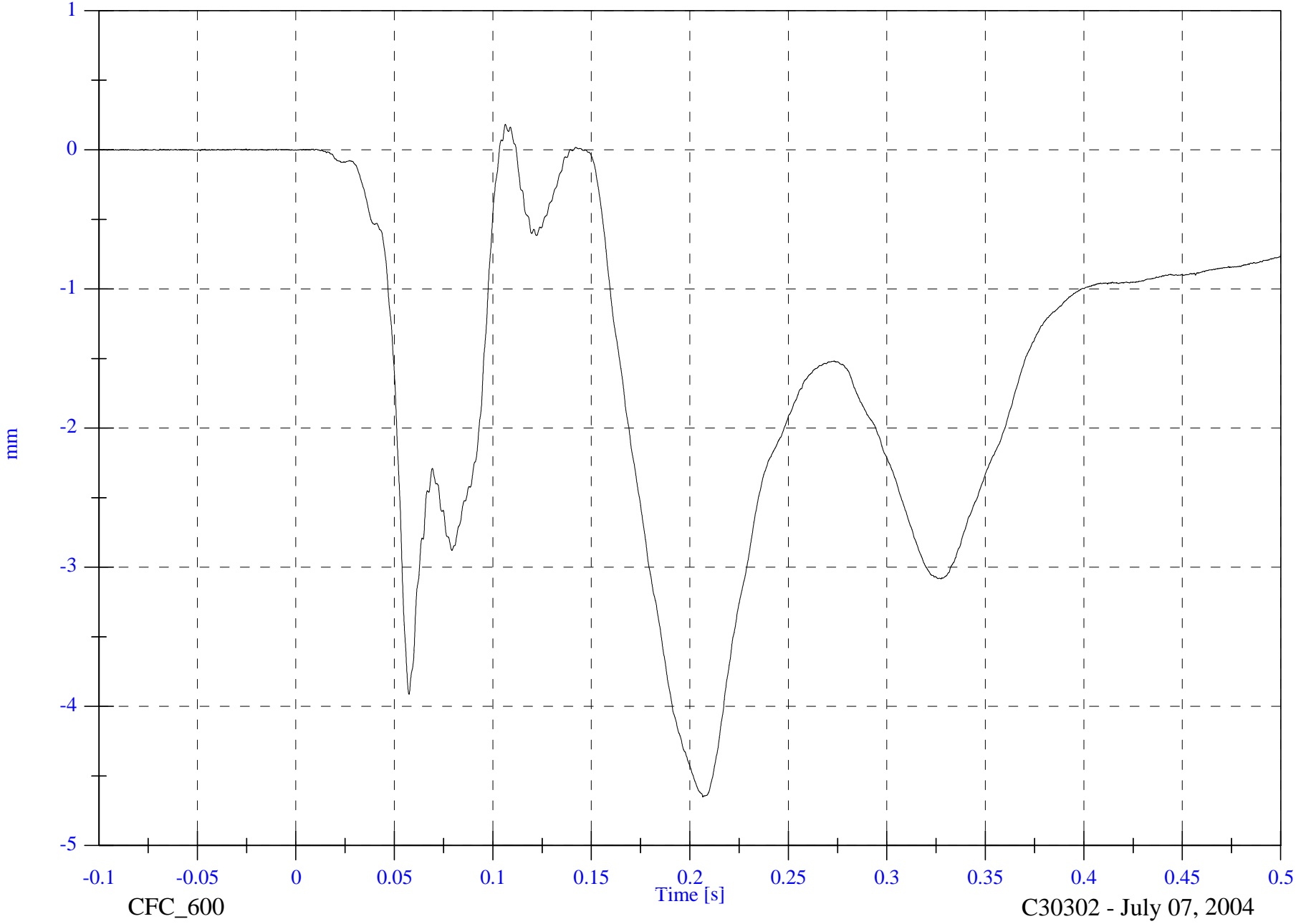
V2P3 Chest Compression

Max: 0.2 [mm] at 0.106 [s]

Min: -4.7 [mm] at 0.207 [s]

B-80

8655-F301-23R



CFC_600

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

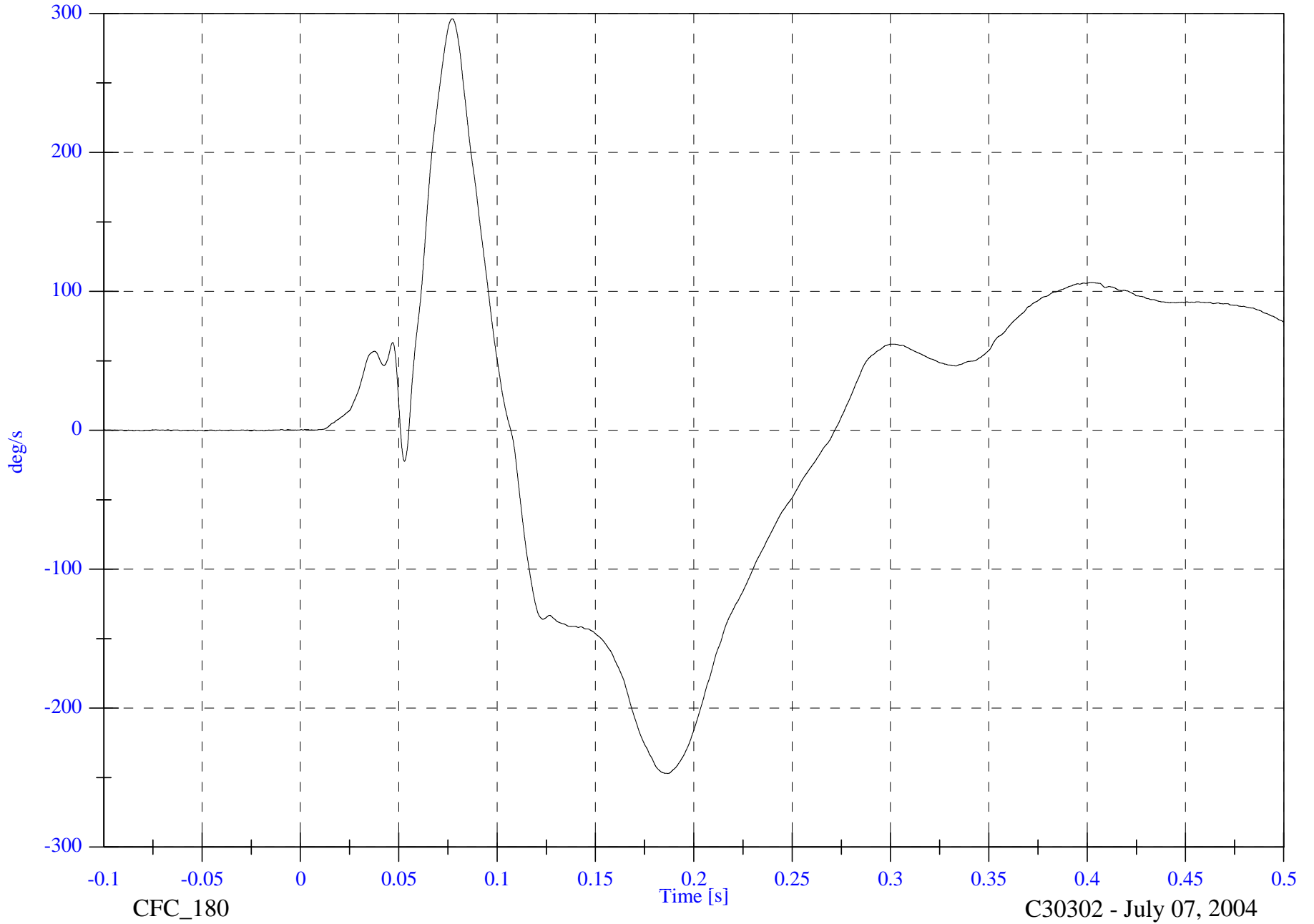
V2P3 Chest AVy

Max: 296.2 [deg/s] at 0.077 [s]

Min: -247.0 [deg/s] at 0.187 [s]

B-81

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

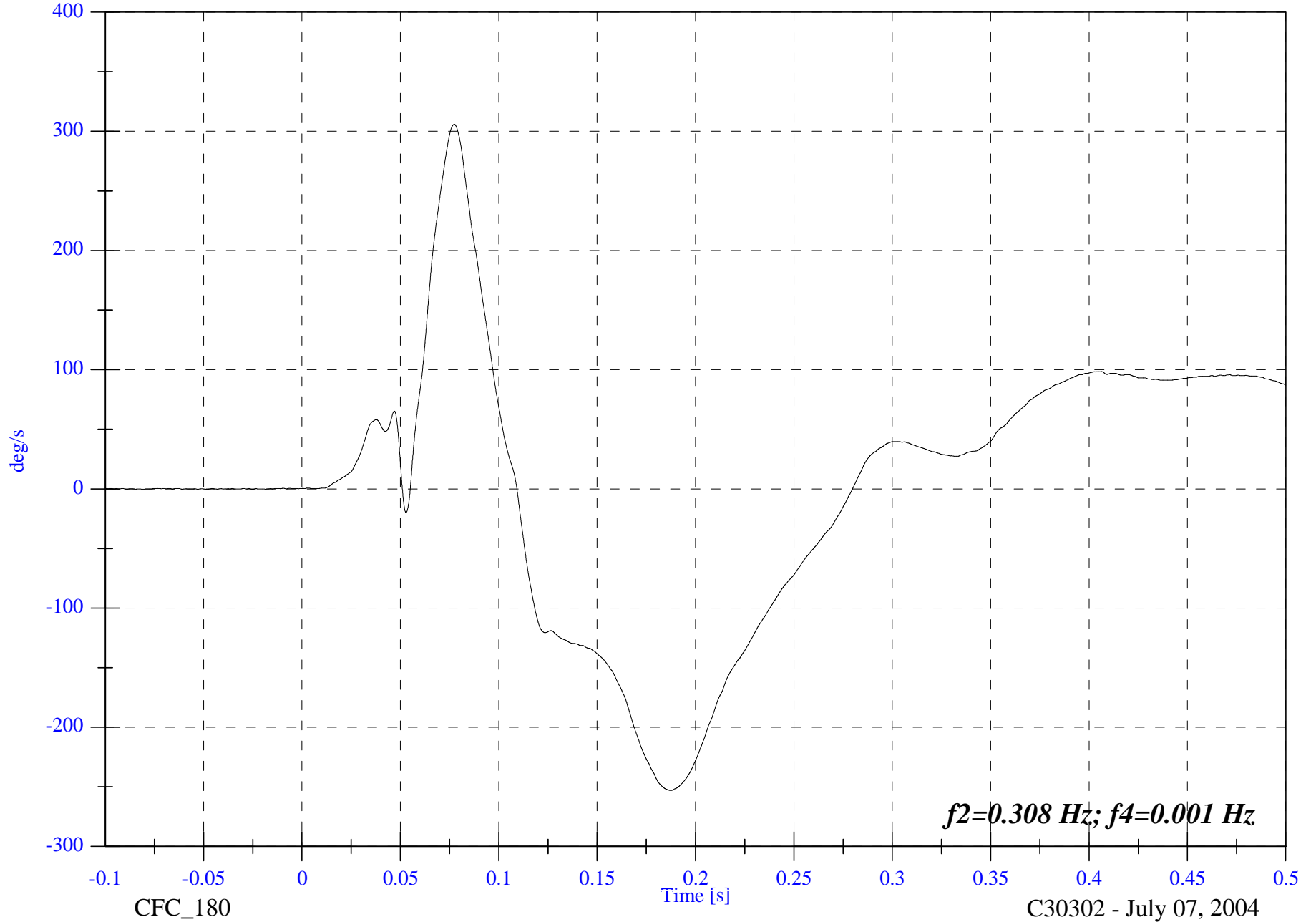
V2P3 Chest Comp AVy

Max: 305.8 [deg/s] at 0.077 [s]

Min: -253.1 [deg/s] at 0.187 [s]

B-82

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

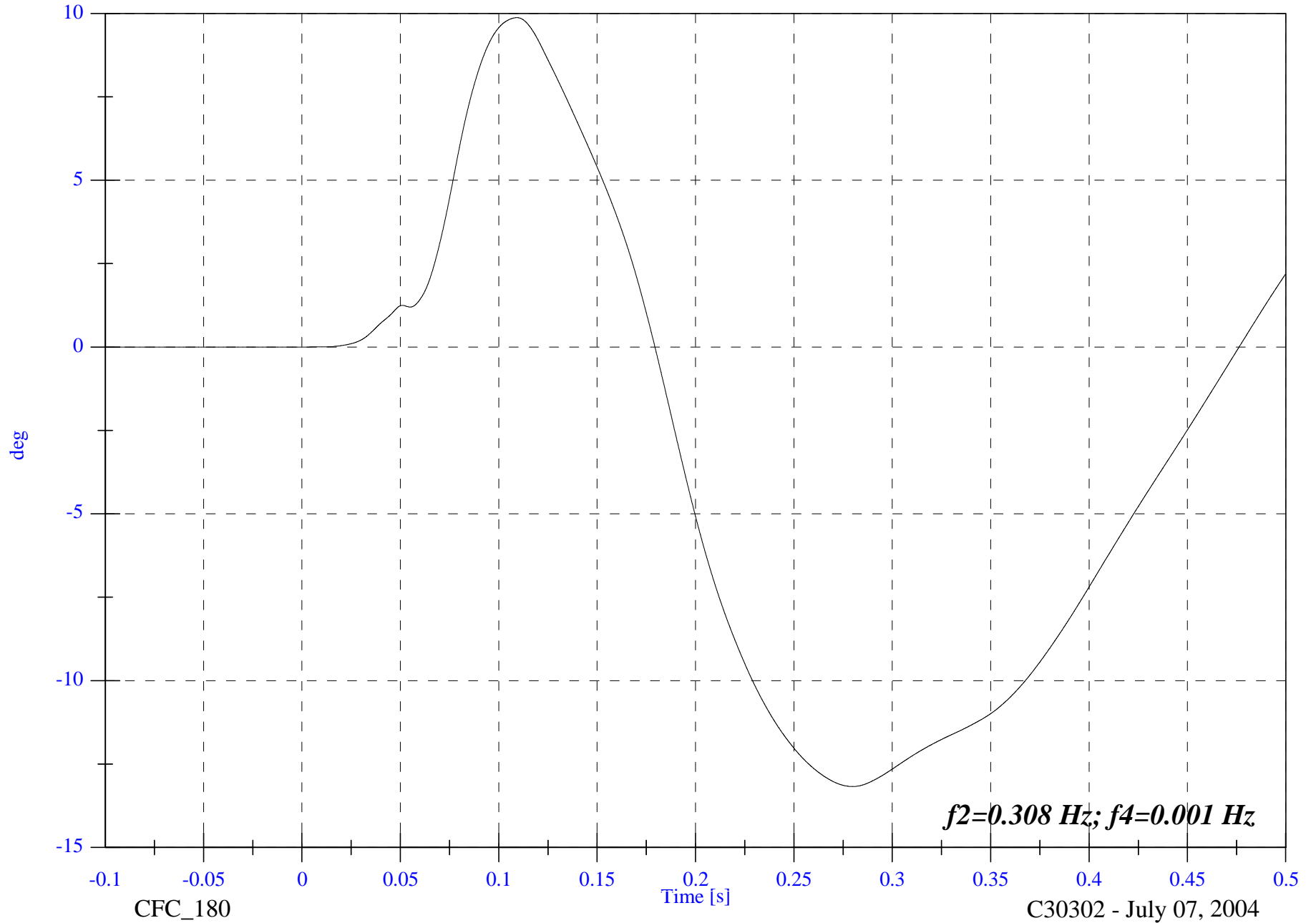
V2P3 Chest Comp ADy

Max: 9.9 [deg] at 0.109 [s]

Min: -13.2 [deg] at 0.280 [s]

B-83

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

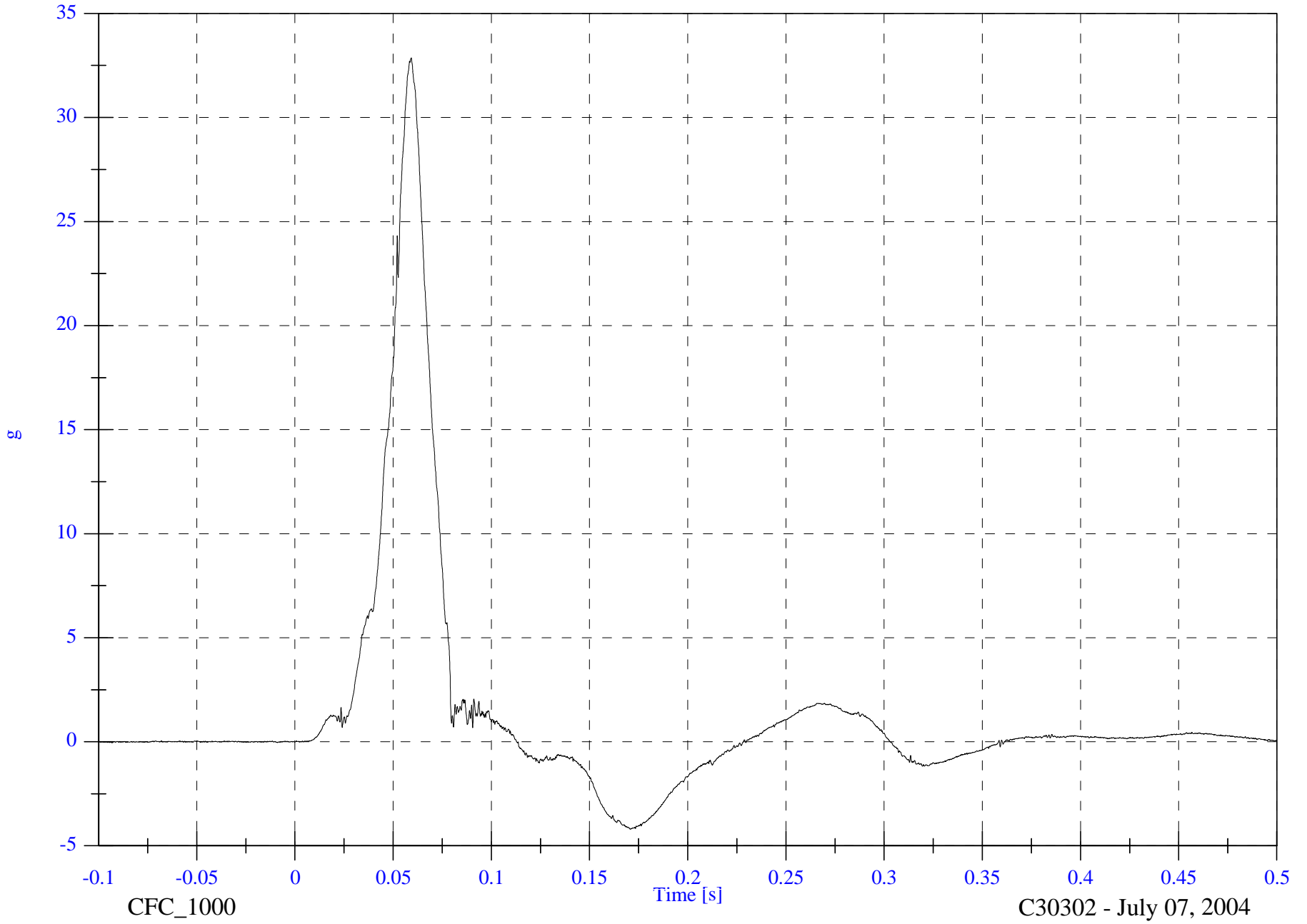
V2P3 Pelvic x

Max: 32.9 [g] at 0.059 [s]

Min: -4.2 [g] at 0.171 [s]

B-84

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

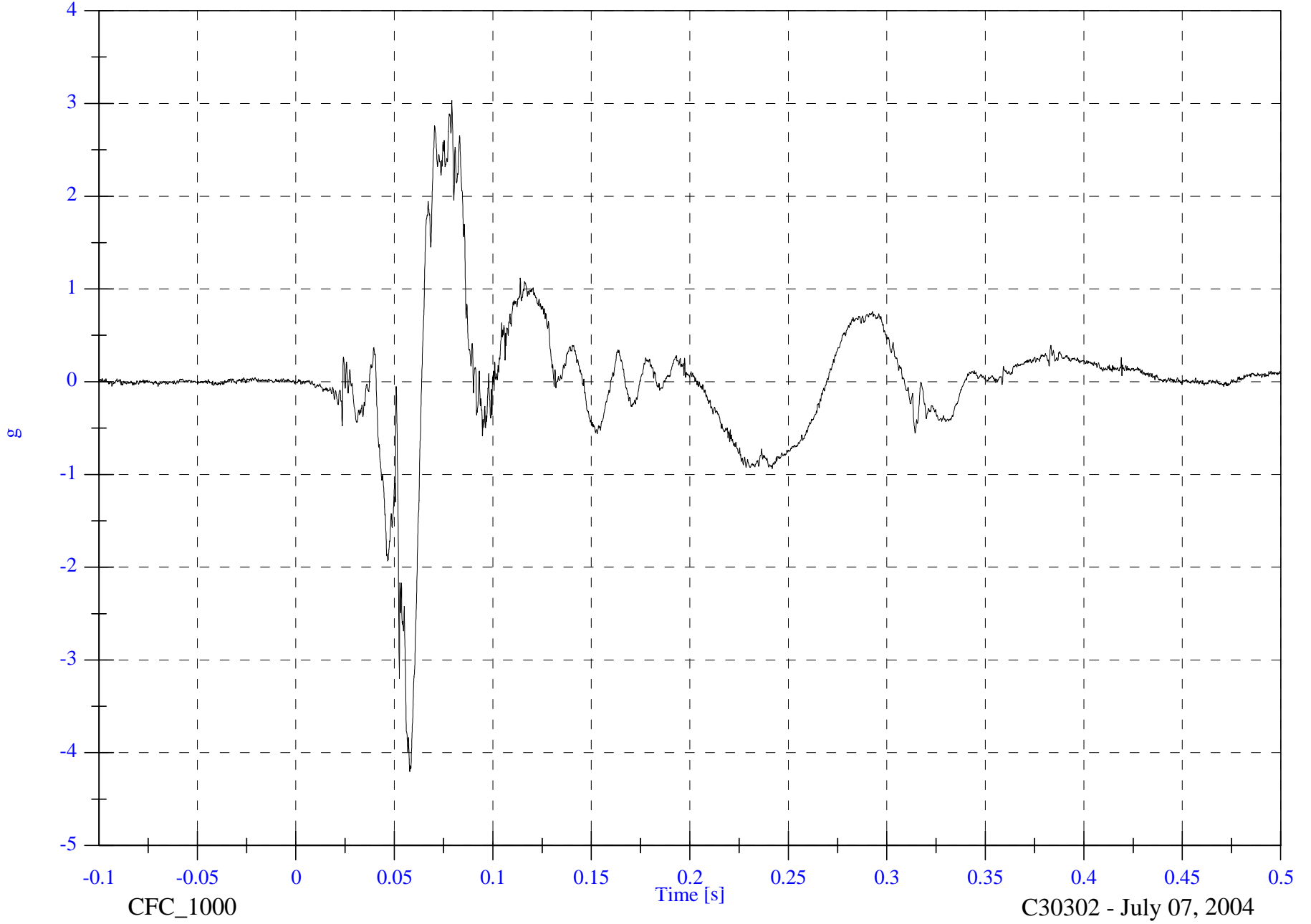
V2P3 Pelvic y

Max: 3.0 [g] at 0.079 [s]

Min: -4.2 [g] at 0.058 [s]

B-85

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

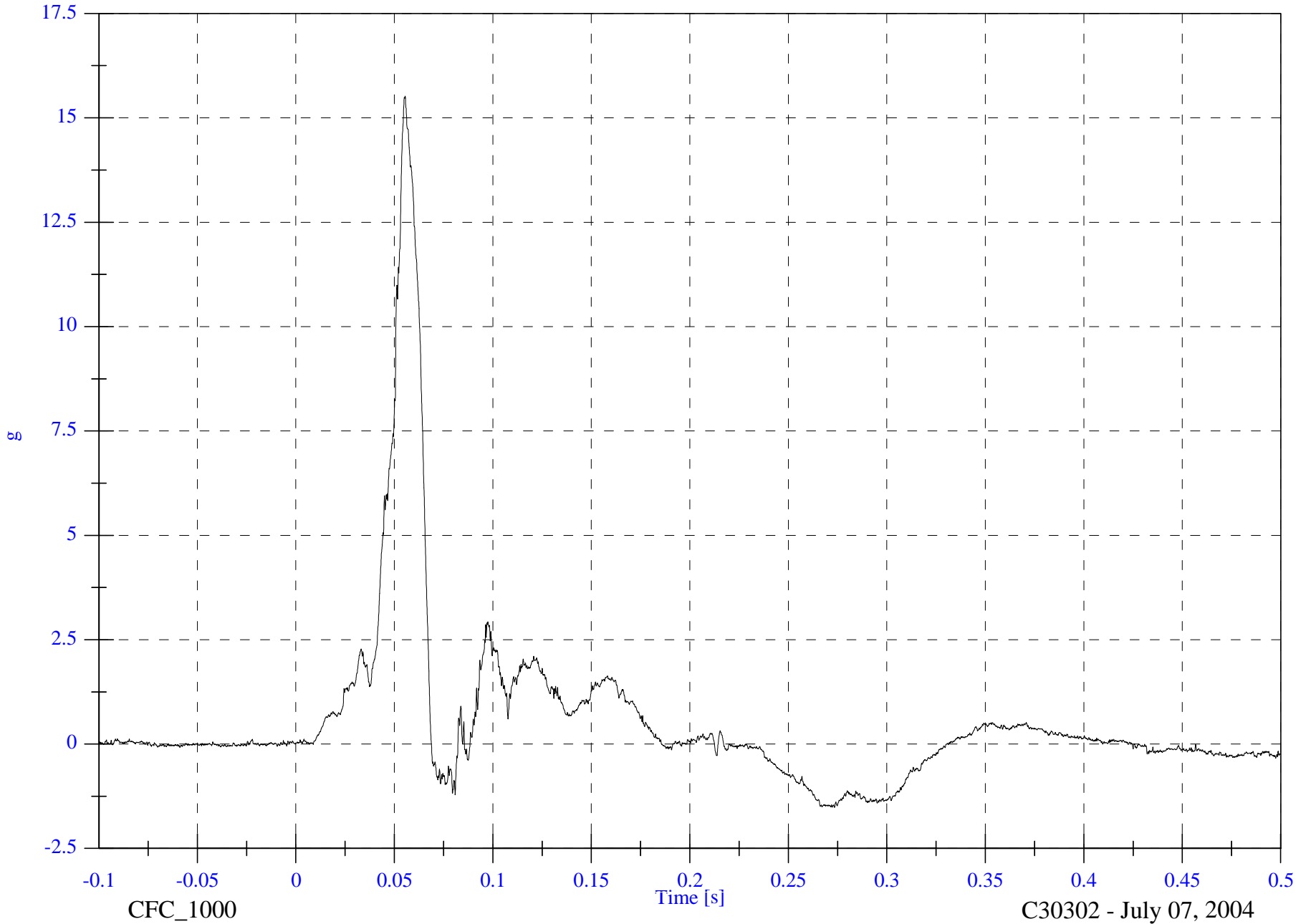
V2P3 Pelvic z

Max: 15.5 [g] at 0.055 [s]

Min: -1.5 [g] at 0.273 [s]

B-86

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

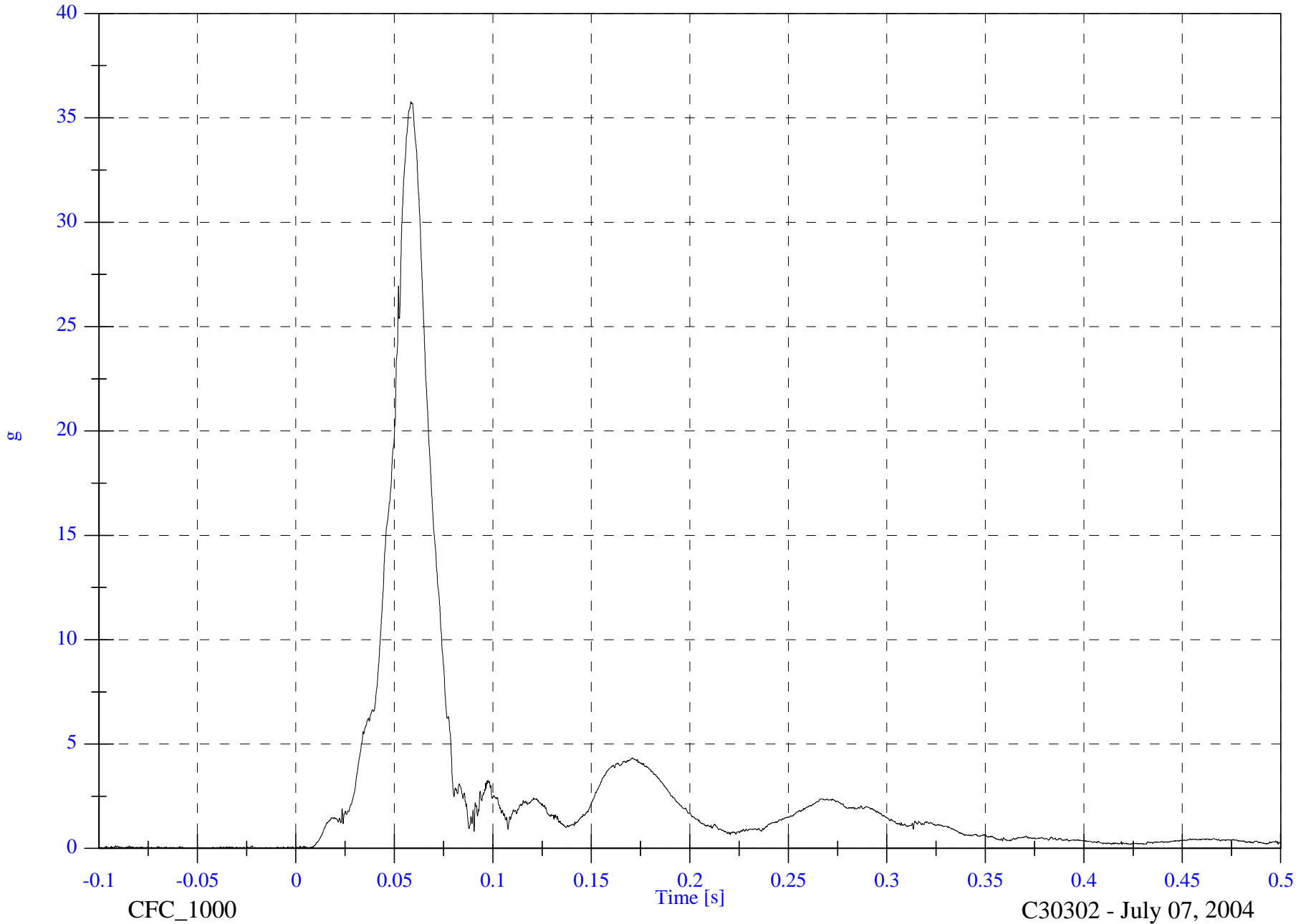
V2P3 Pelvic Resultant

Max: 35.8 [g] at 0.058 [s]

Min: 0.0 [g] at -0.011 [s]

B-87

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

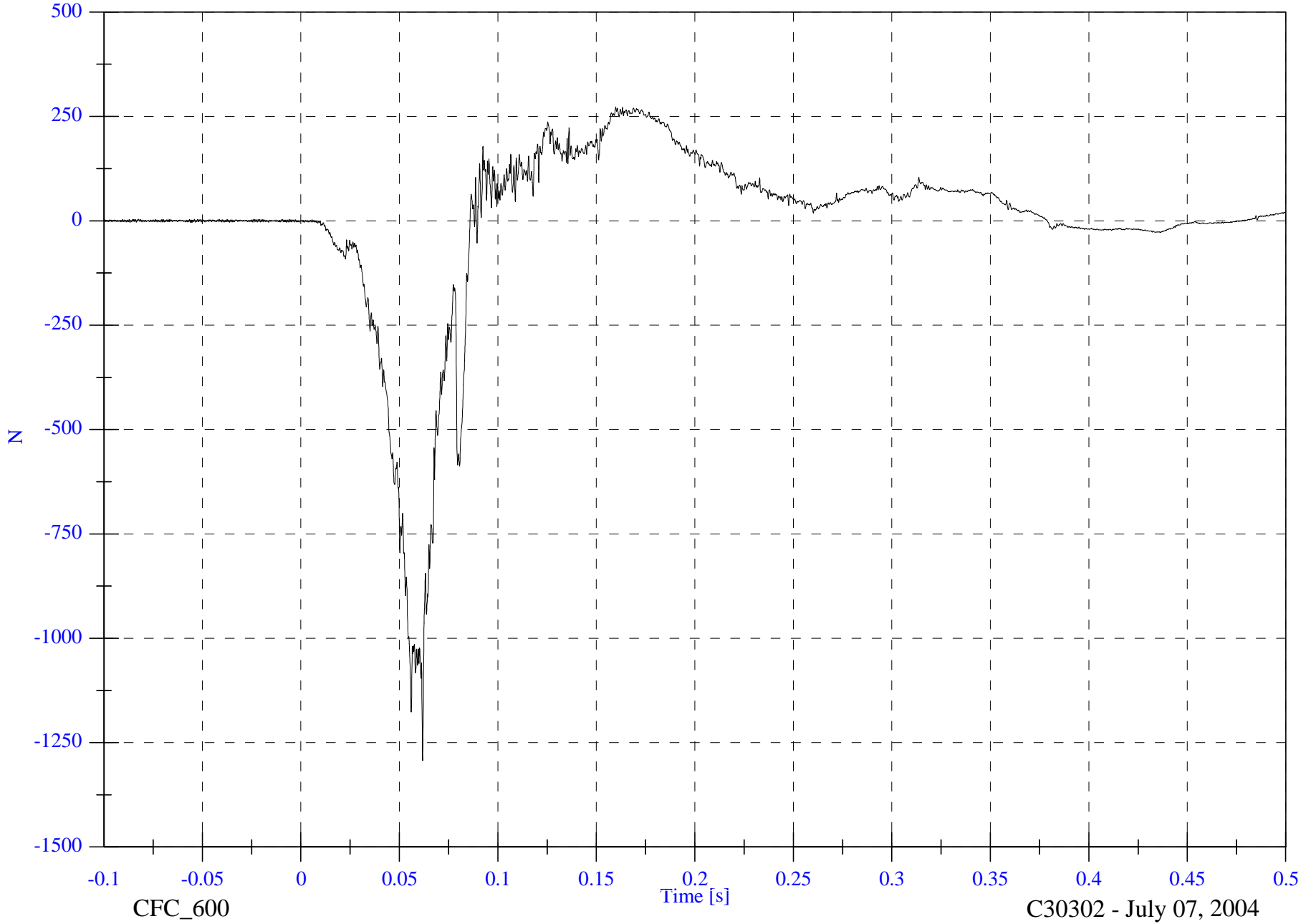
V2P3 Left Femur

Max: 272.7 [N] at 0.160 [s]

Min: -1293.2 [N] at 0.062 [s]

B-88

8655-F301-23R



CFC_600

Time [s]

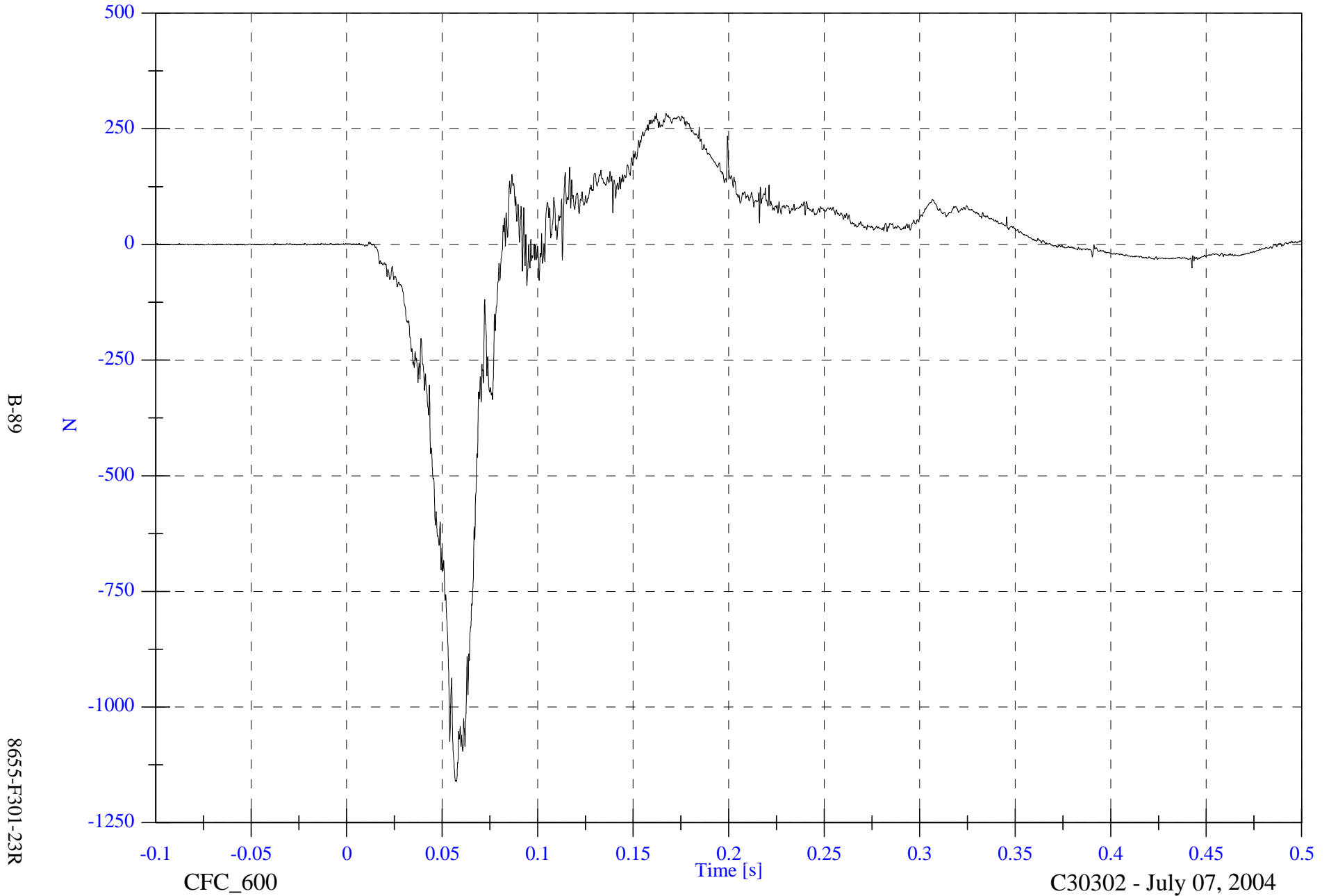
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Right Femur

Max: 283.8 [N] at 0.162 [s]

Min: -1160.6 [N] at 0.058 [s]

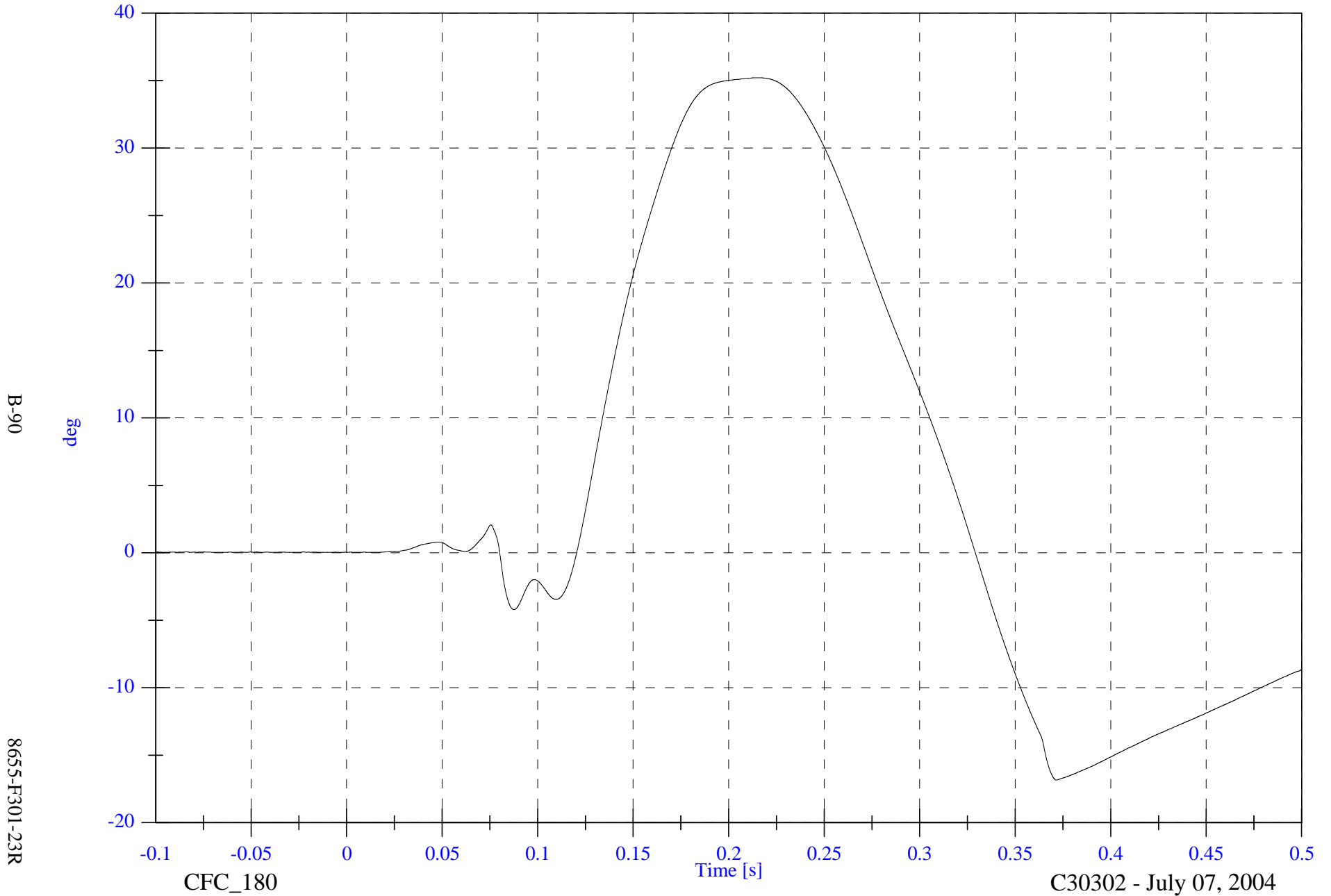


FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Head to Chest

Max: 35.2 [deg] at 0.215 [s]

Min: -16.8 [deg] at 0.372 [s]



B-90

8655-F301-23R

CFC_180

Time [s]

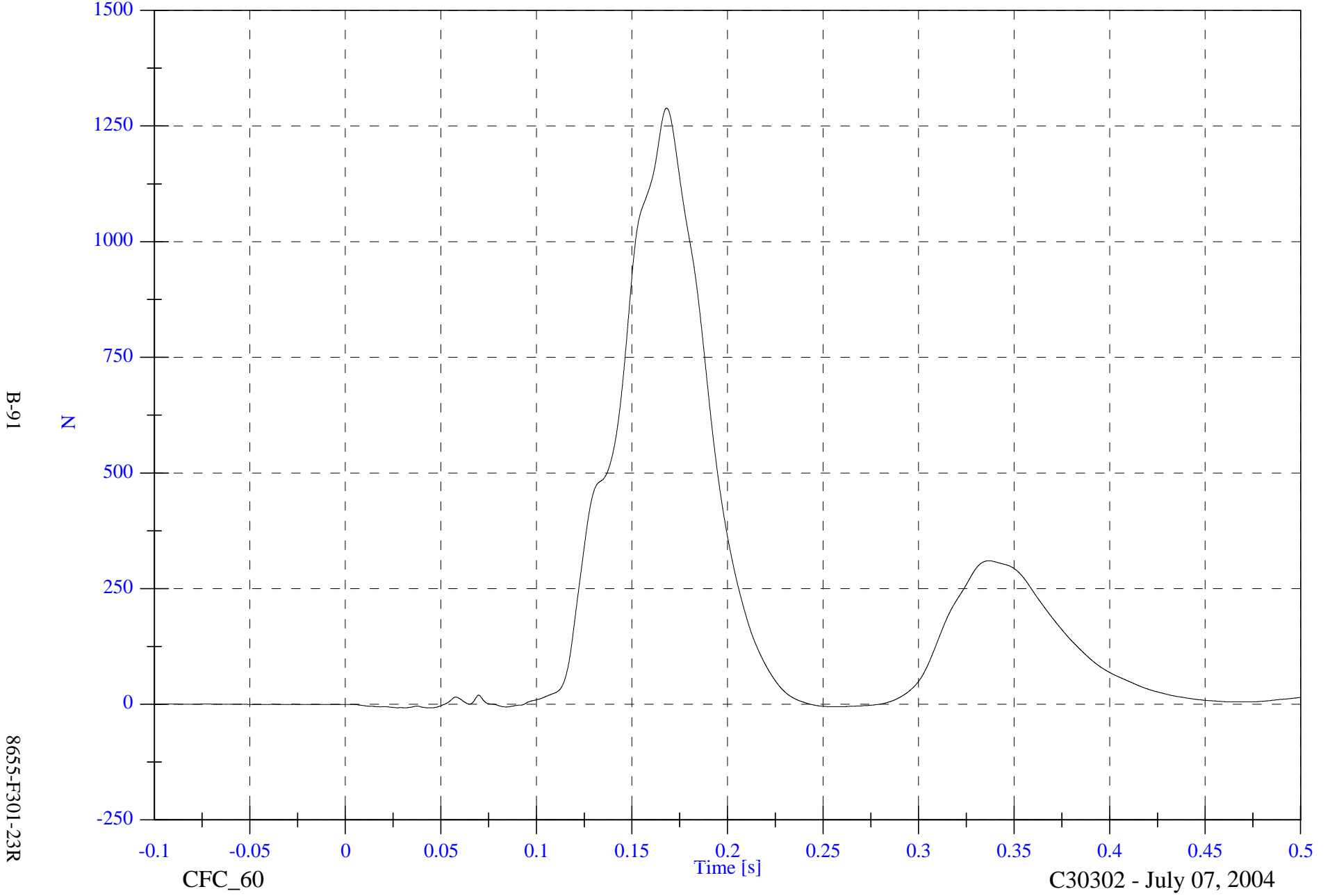
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Lap Belt

Max: 1288.8 [N] at 0.168 [s]

Min: -7.8 [N] at 0.044 [s]



B-91

8655-F301-23R

CFC_60

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

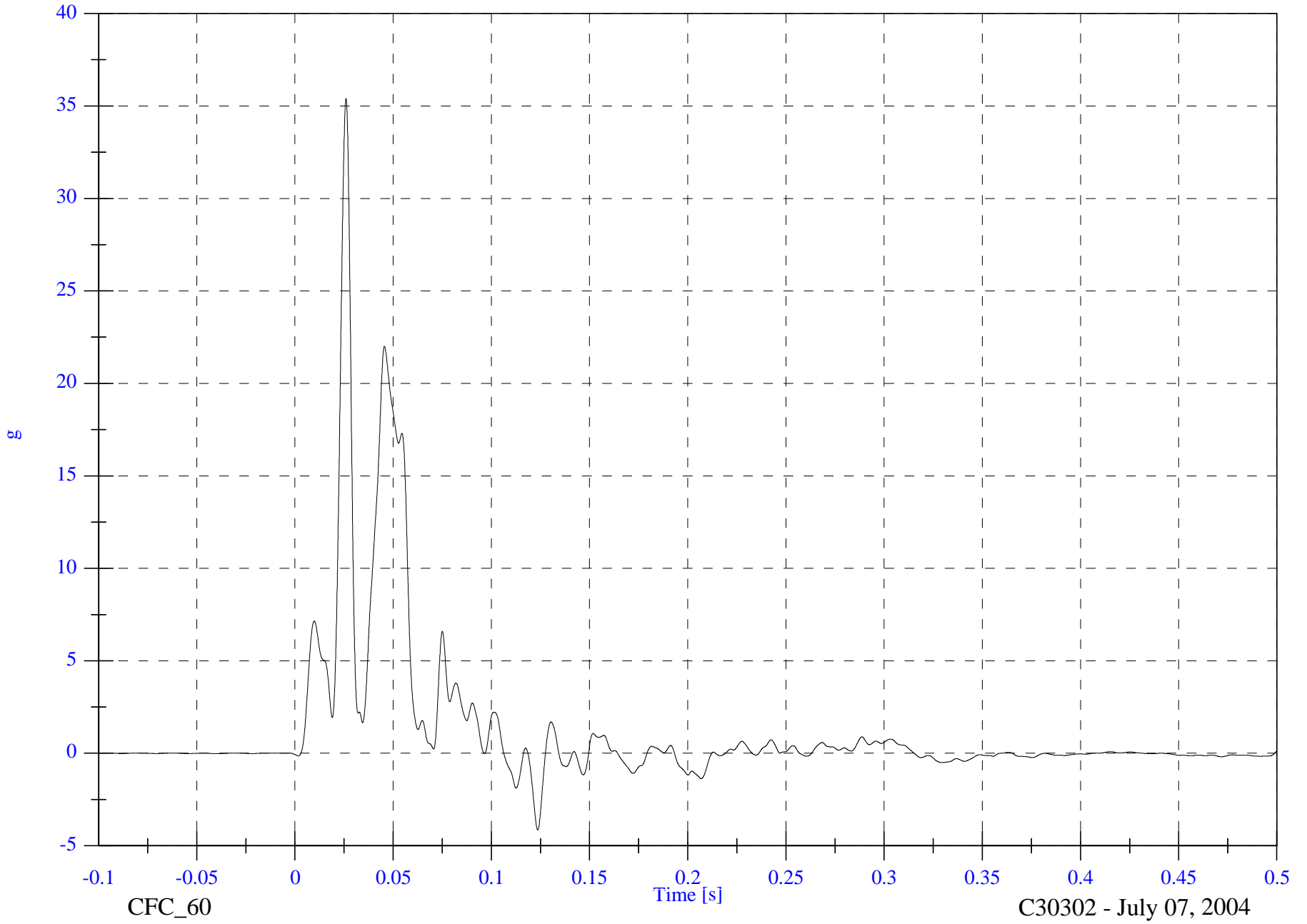
V2 Left X Member x

Max: 35.4 [g] at 0.026 [s]

Min: -4.1 [g] at 0.124 [s]

B-92

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

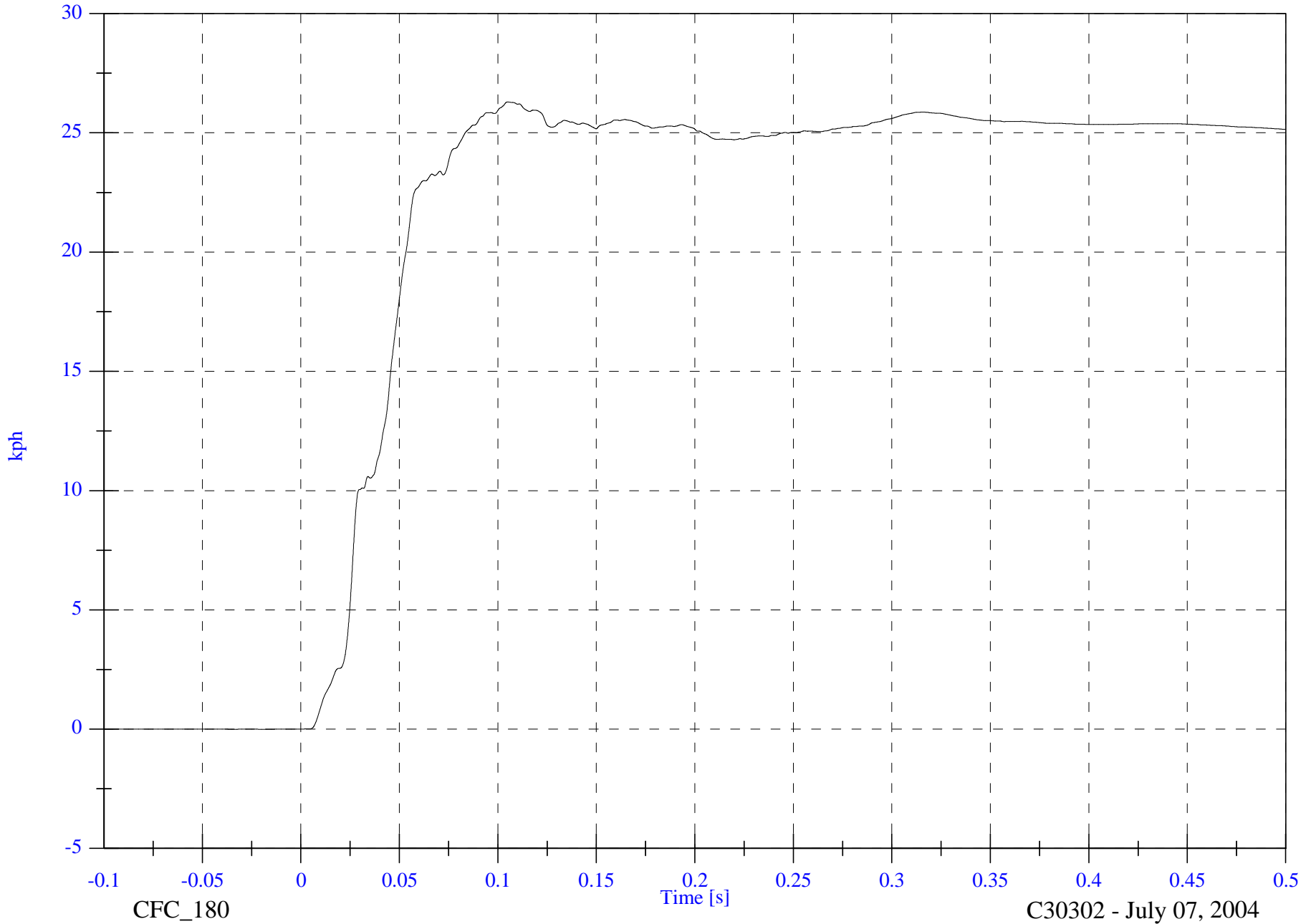
V2 Left X Member x Velocity

Max: 26.3 [kph] at 0.105 [s]

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

B-93

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

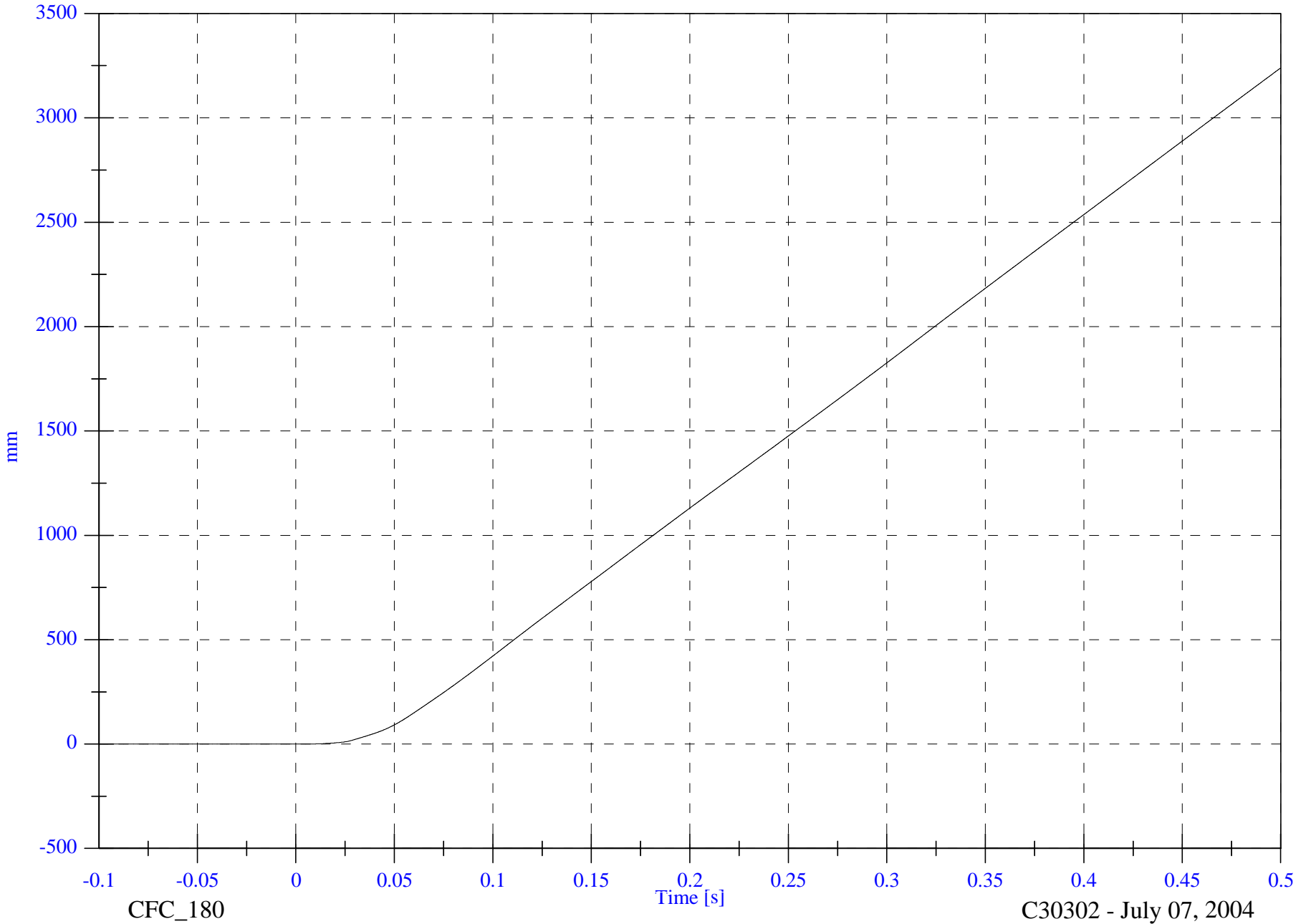
V2 Left X Member x Displacement

Max: 3239.2 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.100 [s]

B-94

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

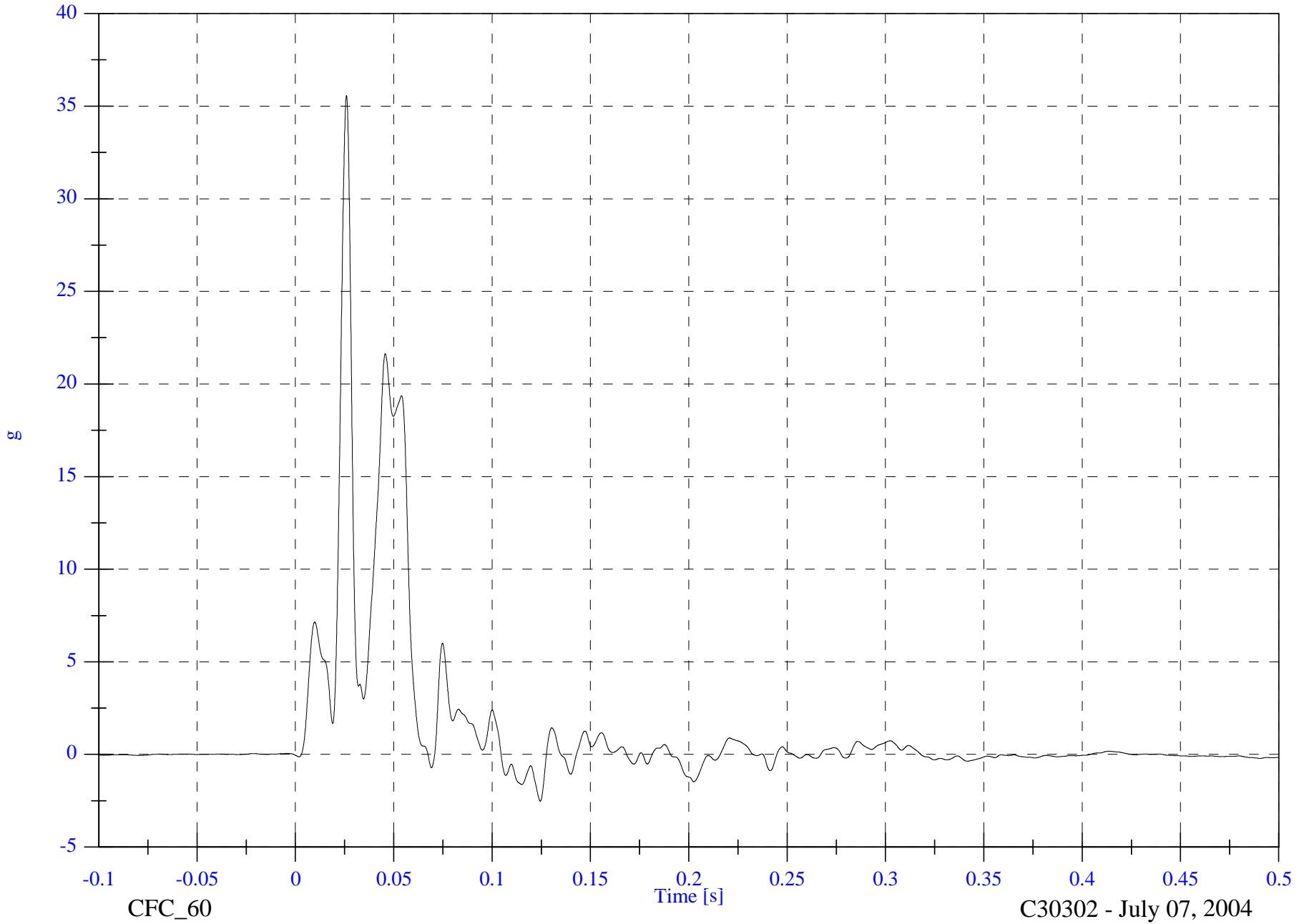
V2 Left X Member RED x

Max: 35.6 [g] at 0.026 [s]

Min: -2.5 [g] at 0.125 [s]

B-95

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

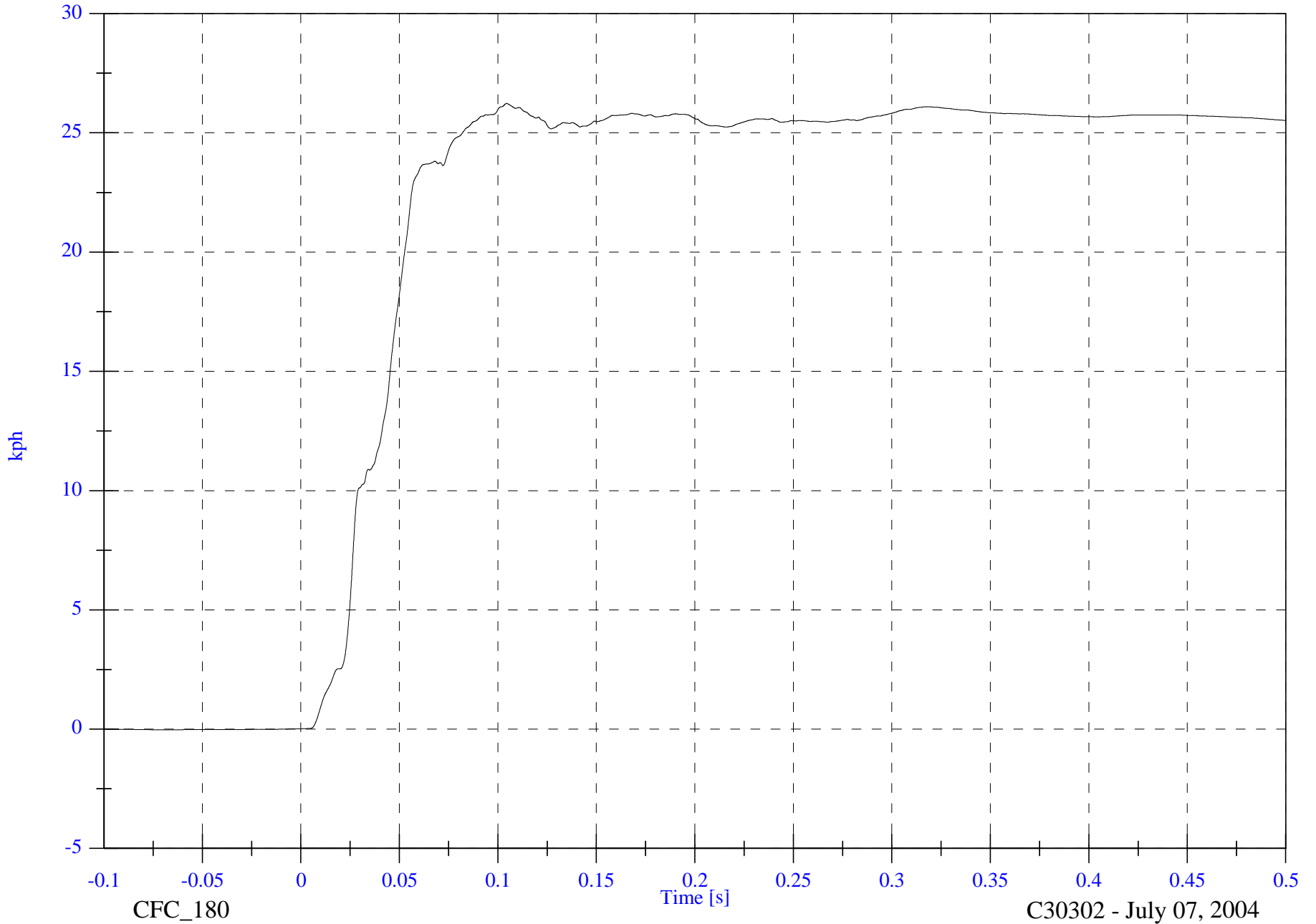
V2 Left X Member RED x Velocity

Max: 26.2 [kph] at 0.104 [s]

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

B-96

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

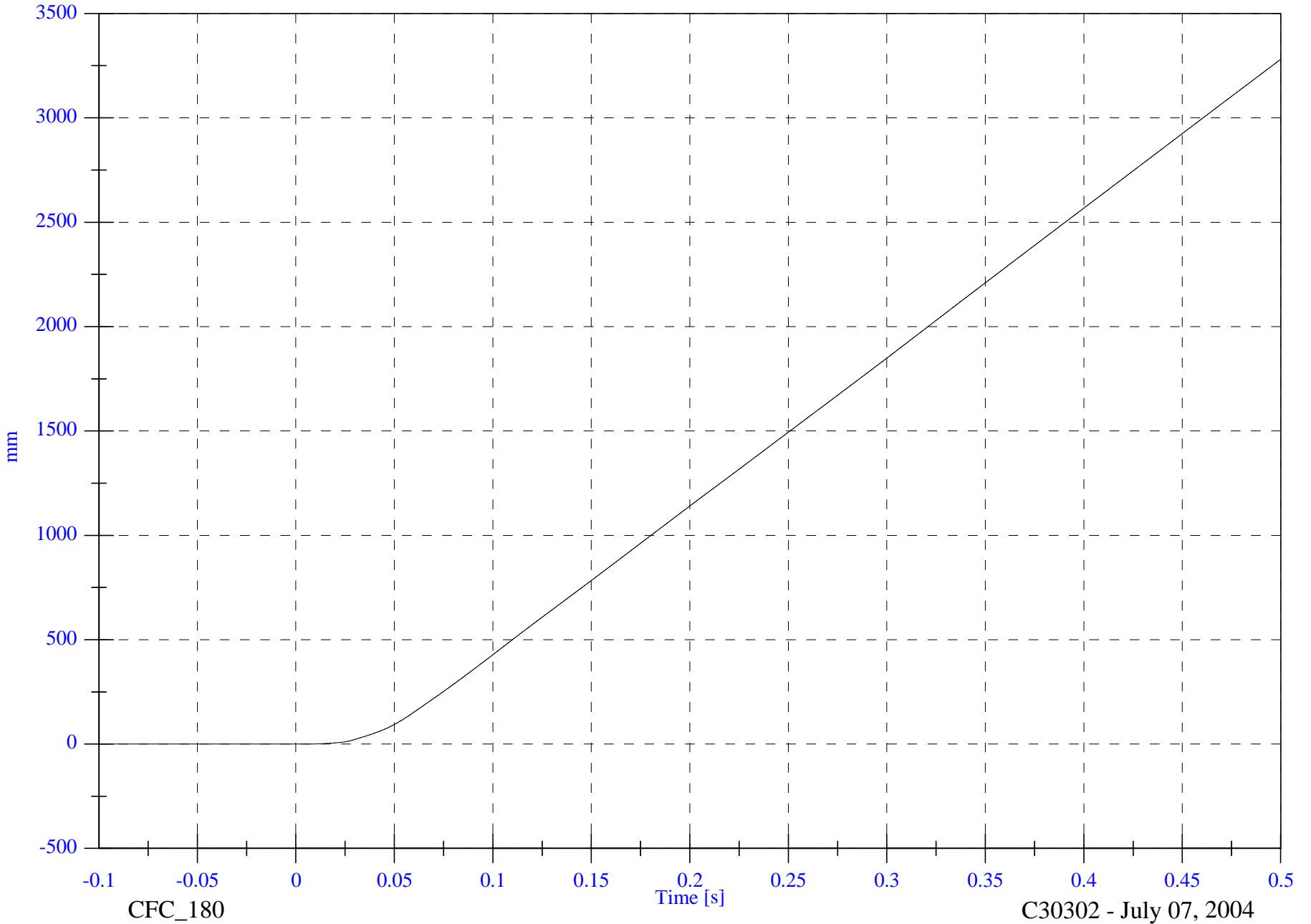
V2 Left X Member RED x Displacement

Max: 3280.4 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.010 [s]

B-97

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

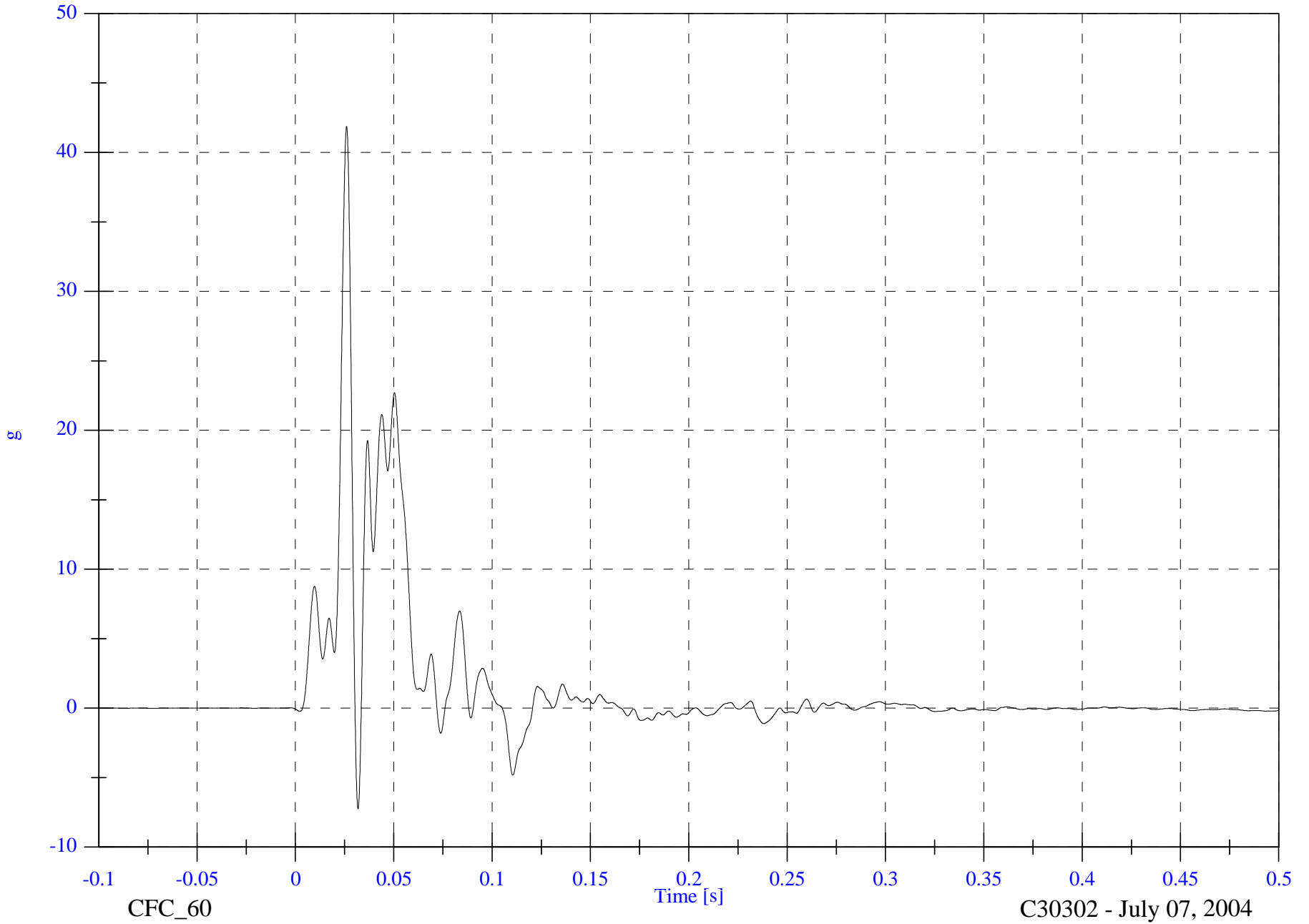
V2 Right X Member x

Max: 41.9 [g] at 0.026 [s]

Min: -7.2 [g] at 0.032 [s]

B-98

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

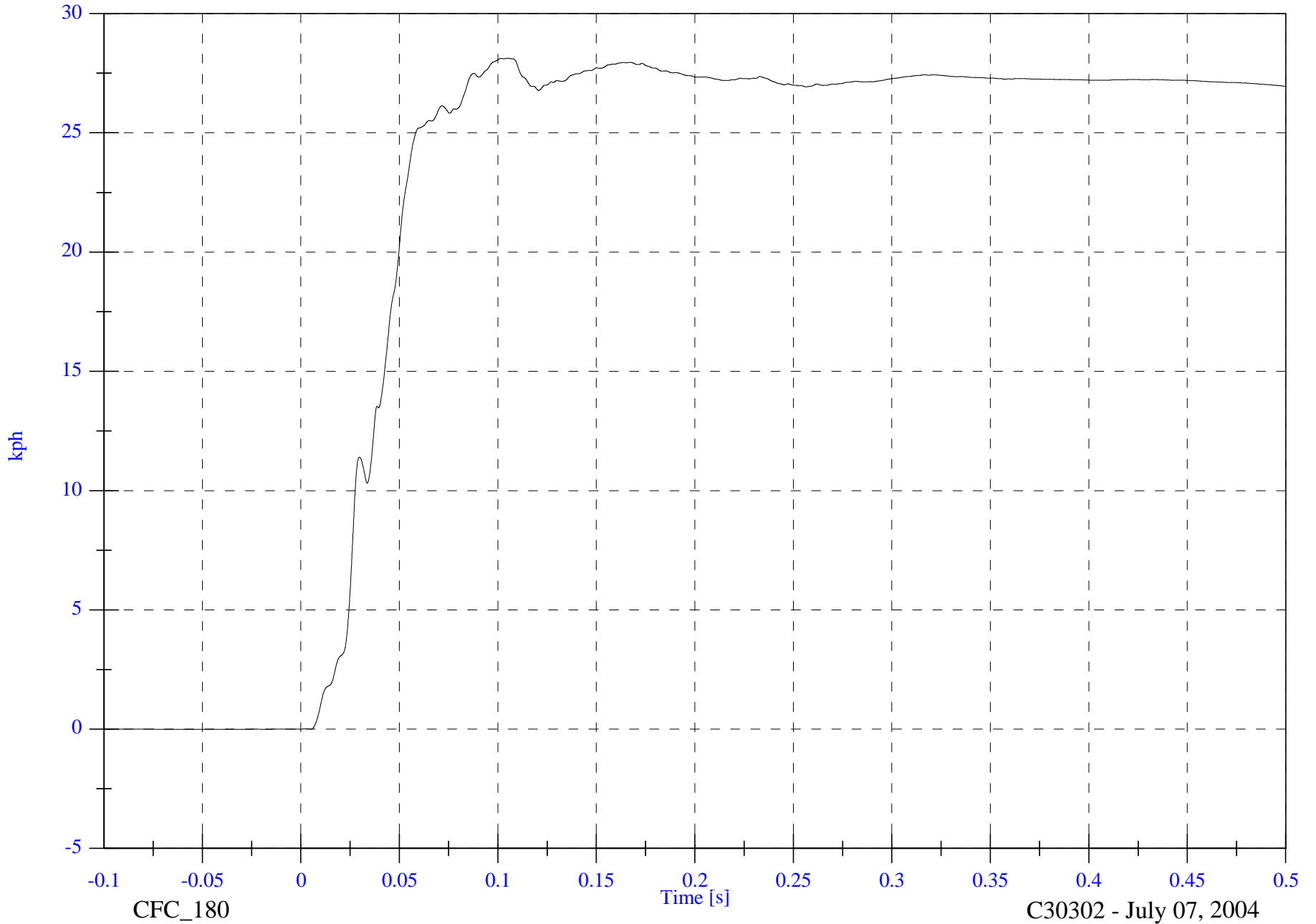
V2 Right X Member x Velocity

Max: 28.1 [kph] at 0.106 [s]

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

B-99

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

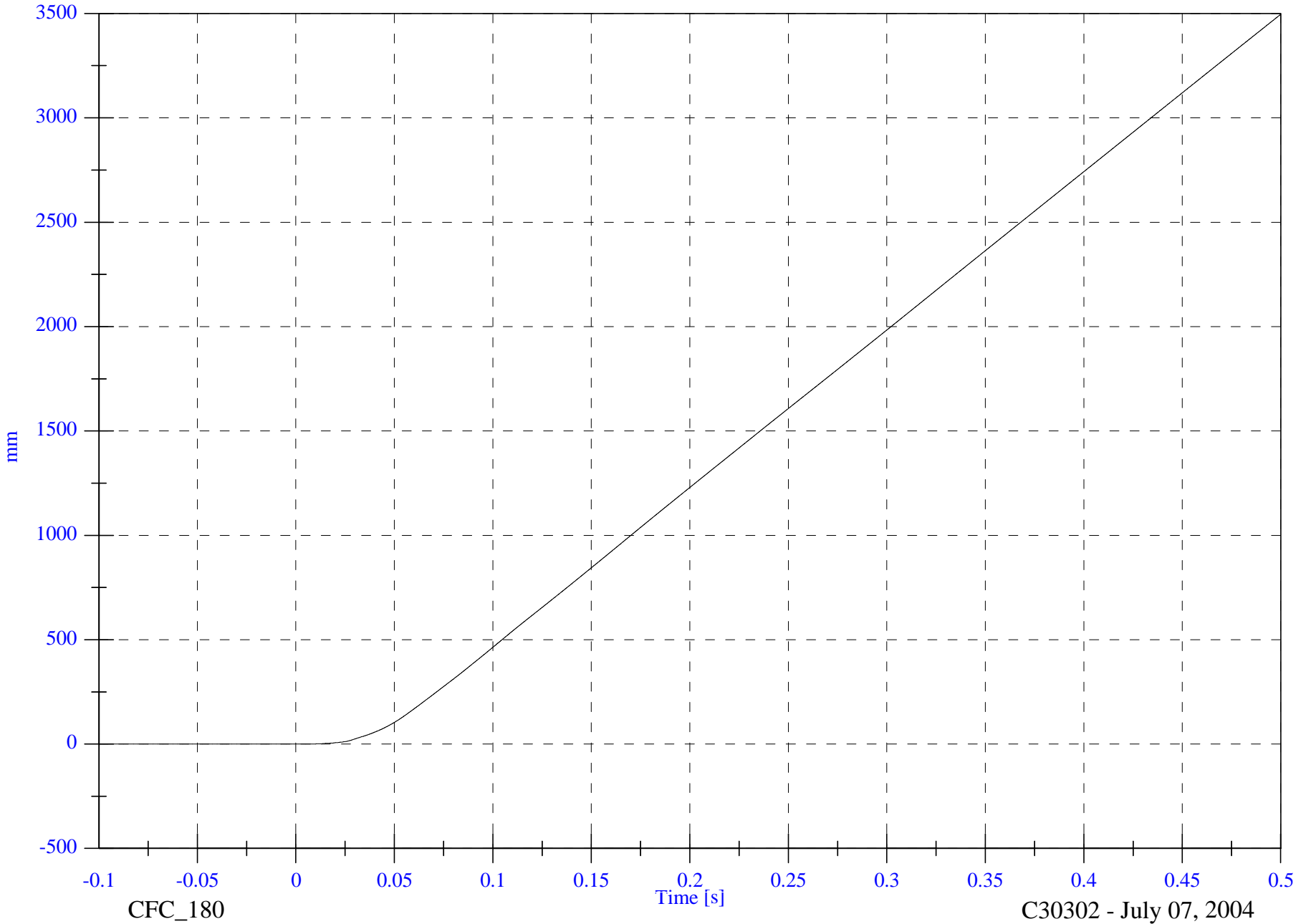
V2 Right X Member x Displacement

Max: 3495.9 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.010 [s]

B-100

8655-F301-23R



CFC_180

Time [s]

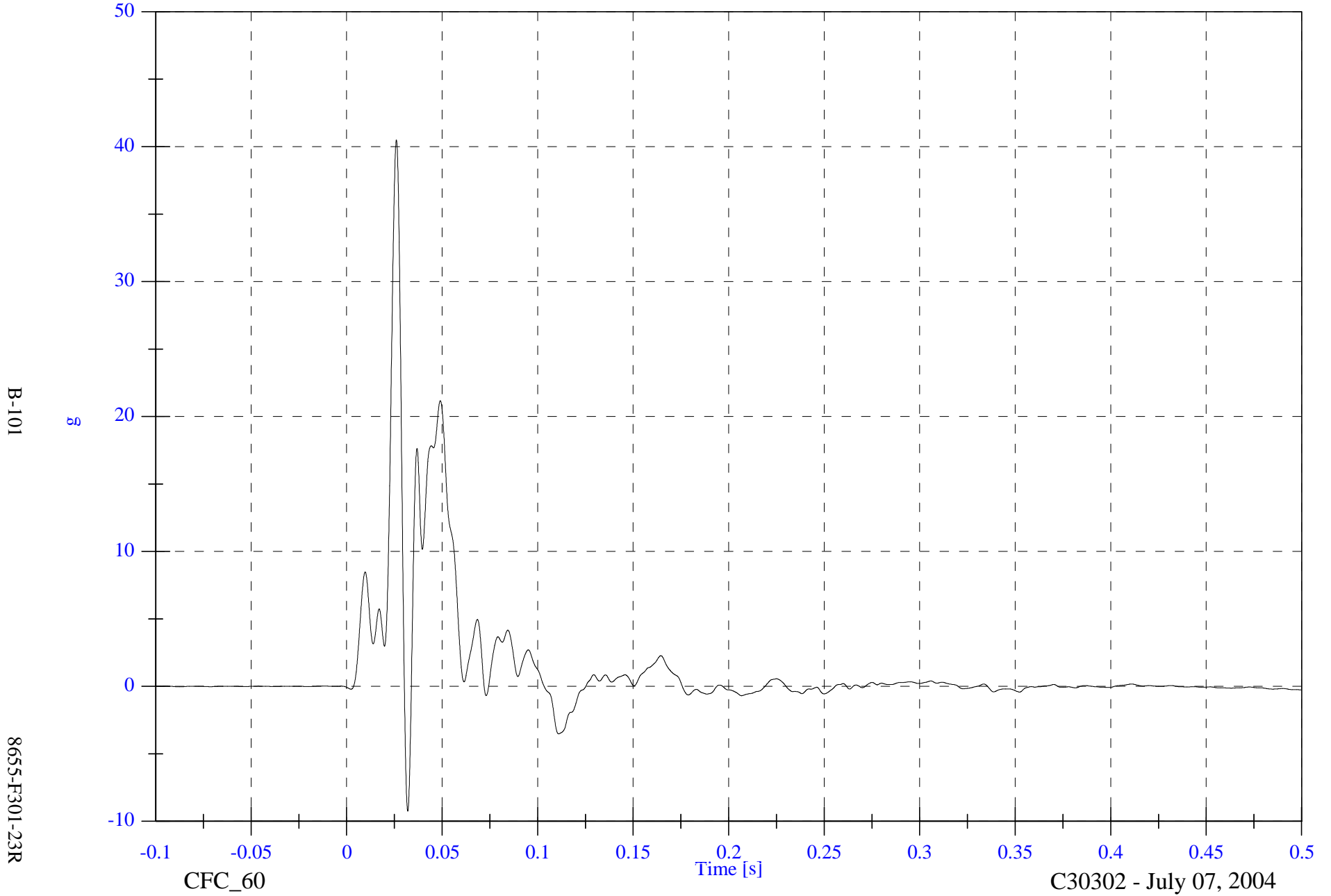
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2 Right X Member RED x

Max: 40.5 [g] at 0.026 [s]

Min: -9.2 [g] at 0.032 [s]



FMVSS301 Test 9 - 2004 Jeep Liberty

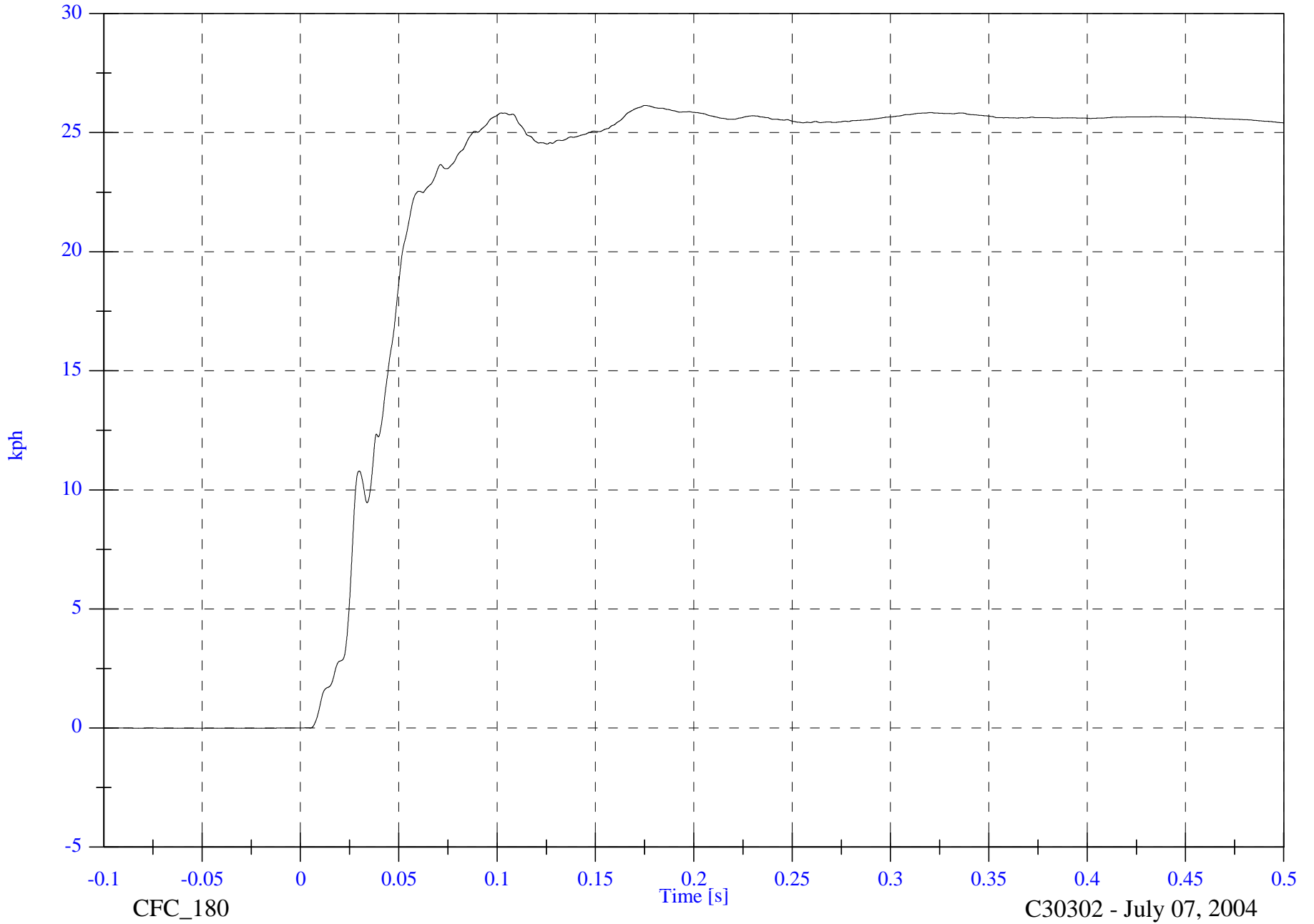
V2 Right X Member RED x Velocity

Max: 26.1 [kph] at 0.175 [s]

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

B-102

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

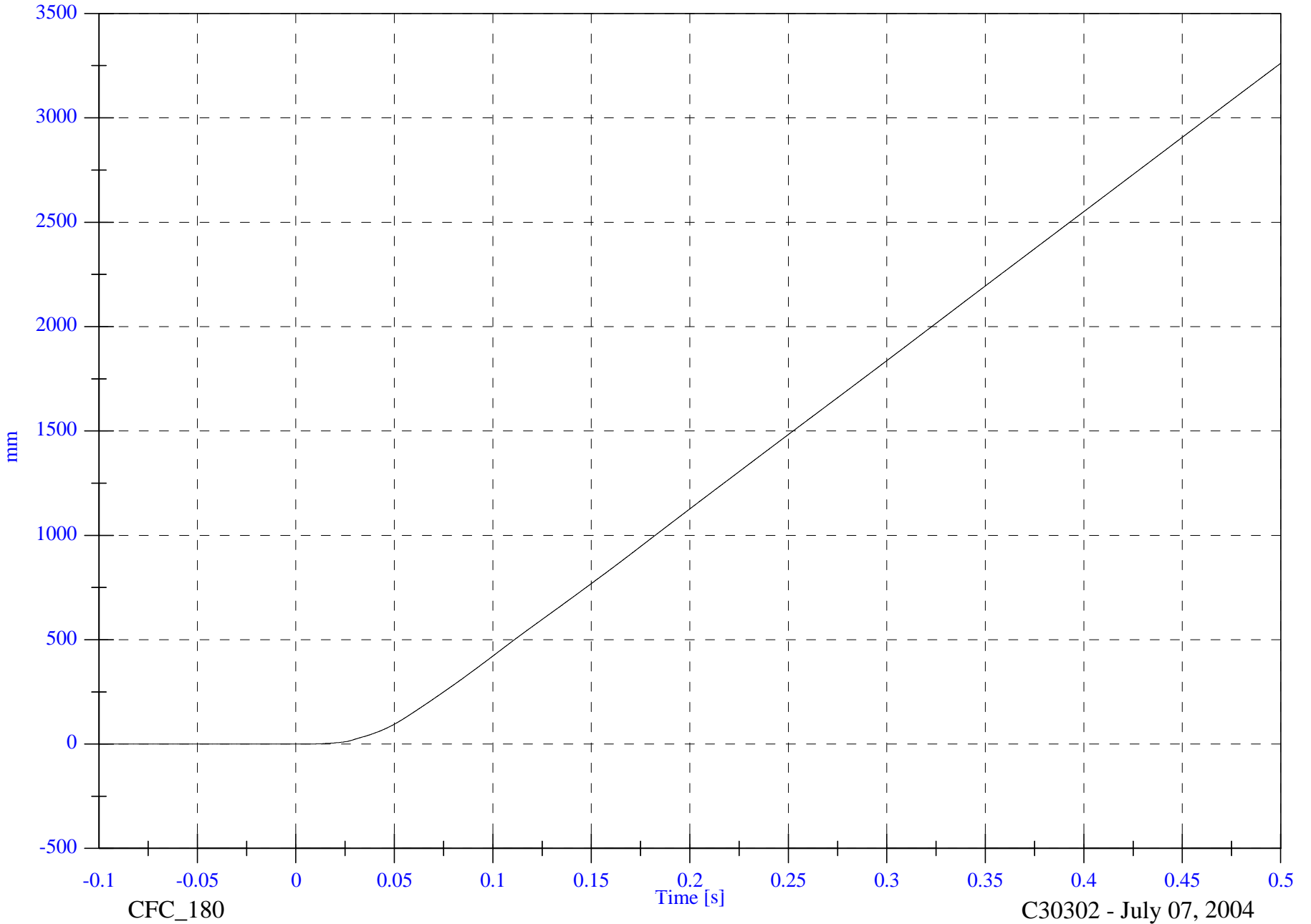
V2 Right X Member RED x Displacement

Max: 3261.3 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.010 [s]

B-103

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

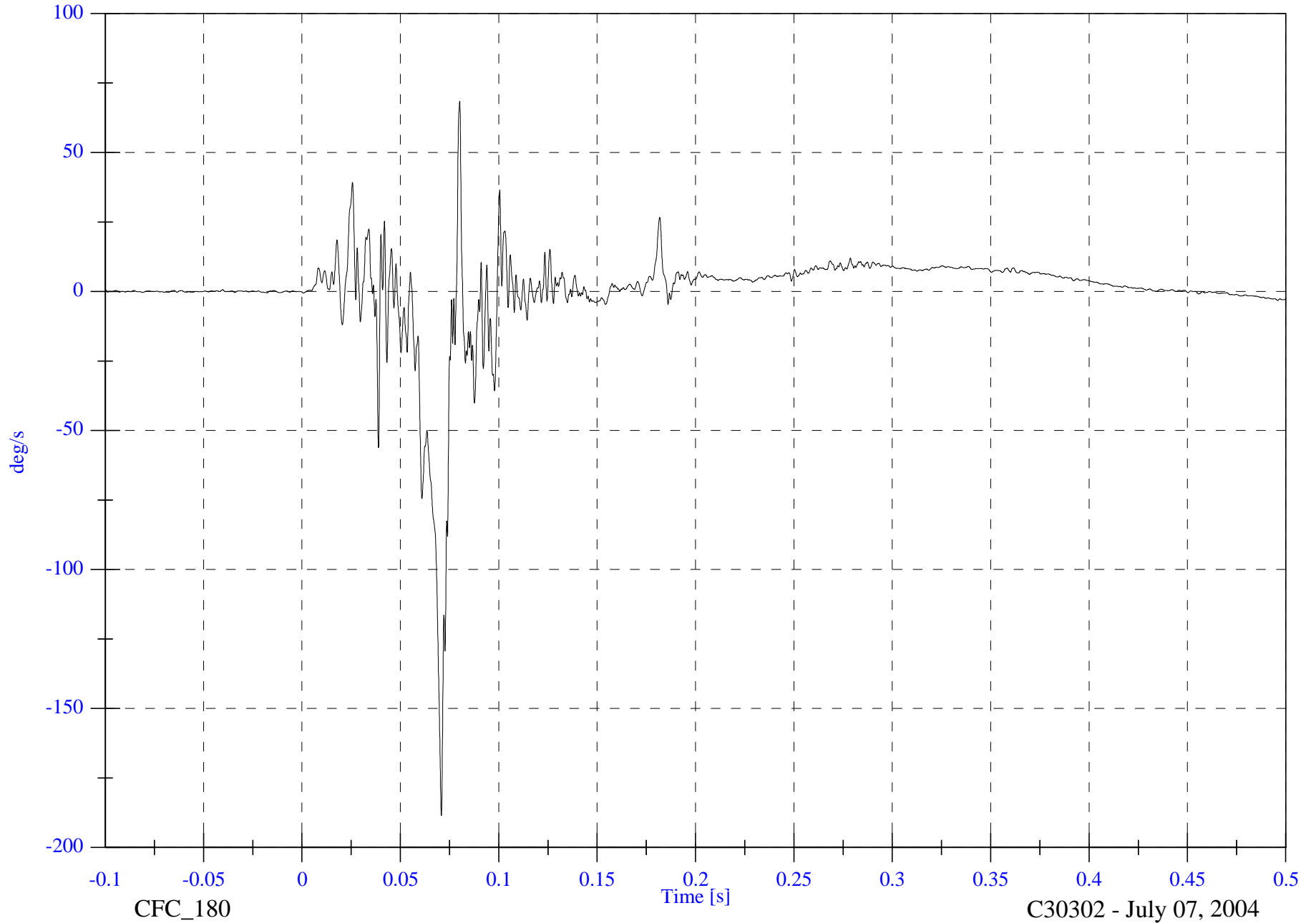
V2 Left Front Sill AVy

Max: 68.4 [deg/s] at 0.080 [s]

Min: -188.6 [deg/s] at 0.071 [s]

B-104

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

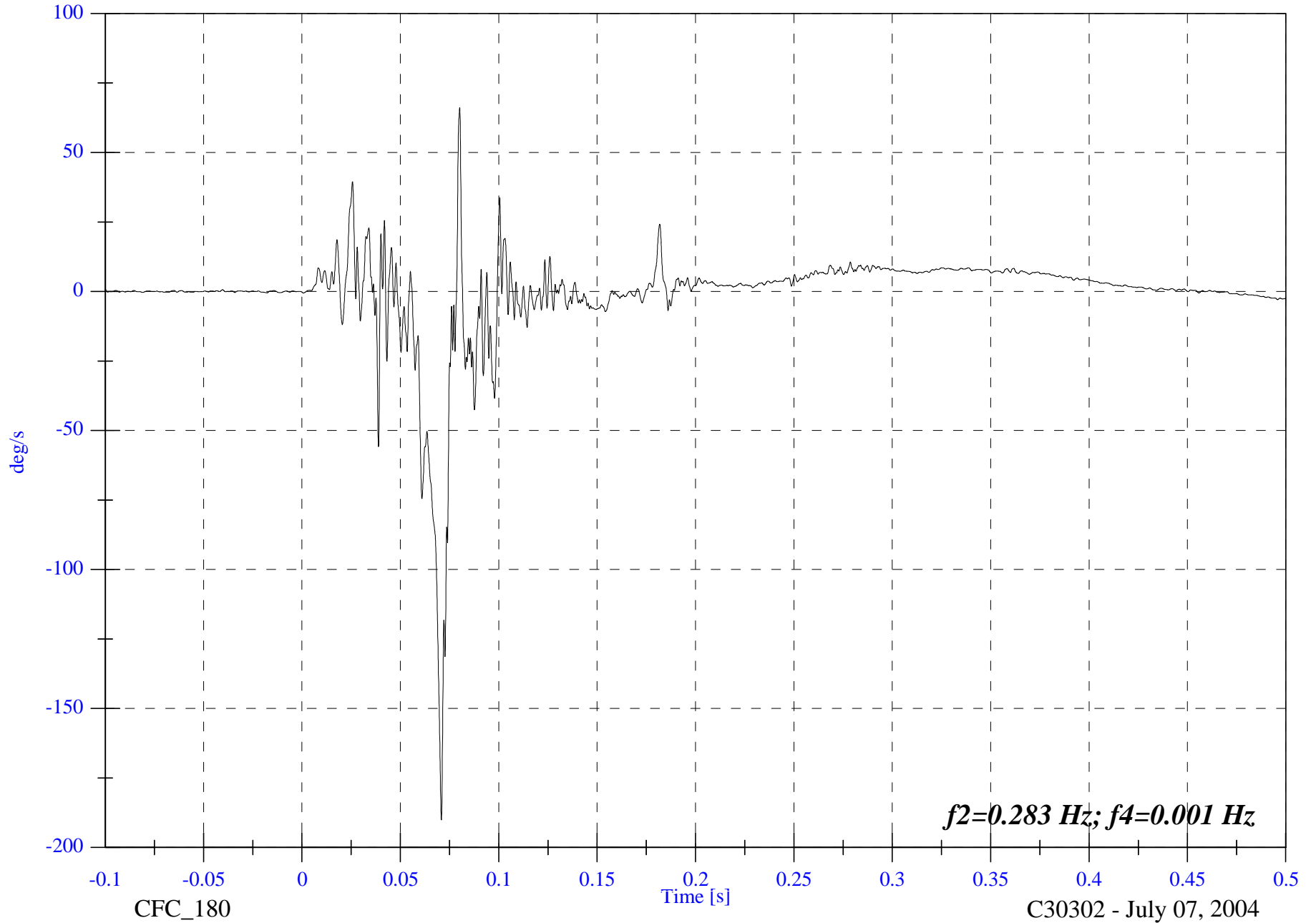
V2 Left Front Sill Comp AVy

Max: 66.1 [deg/s] at 0.080 [s]

Min: -190.1 [deg/s] at 0.071 [s]

B-105

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

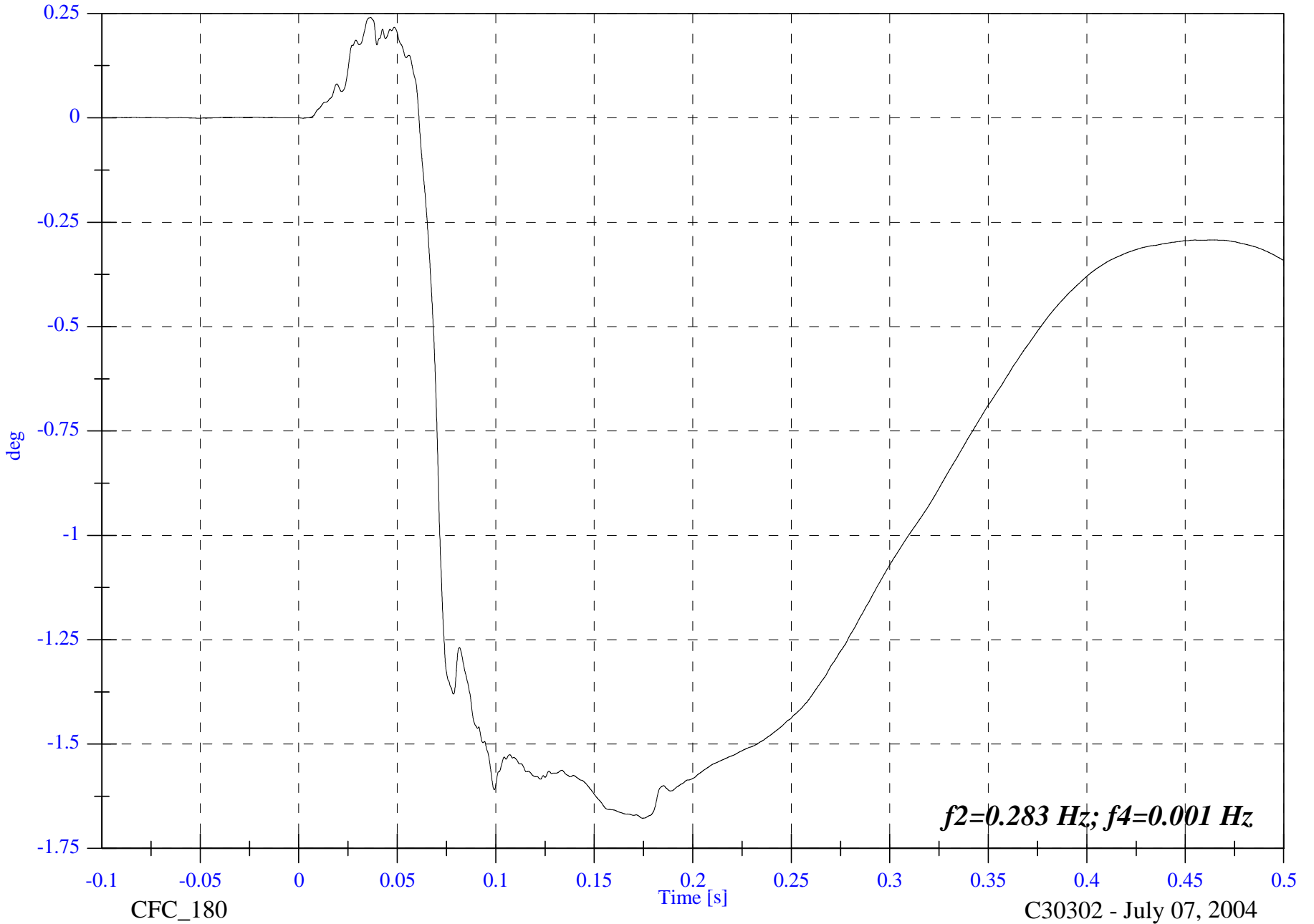
V2 Left Front Sill Comp ADy

Max: 0.2 [deg] at 0.037 [s]

Min: -1.7 [deg] at 0.175 [s]

B-106

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

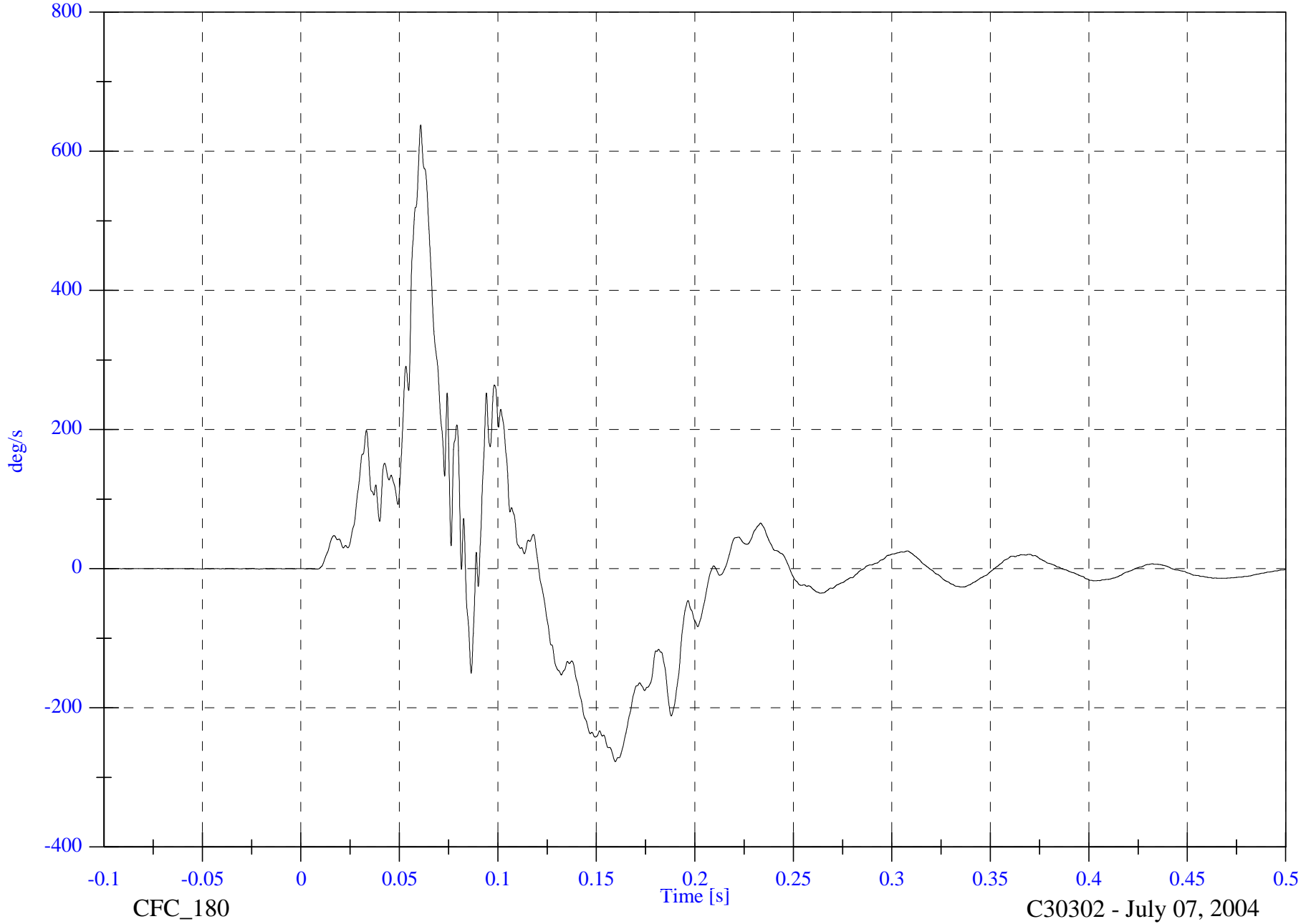
V2P1 Left Seat AVy

Max: 637.5 [deg/s] at 0.061 [s]

Min: -277.3 [deg/s] at 0.160 [s]

B-107

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

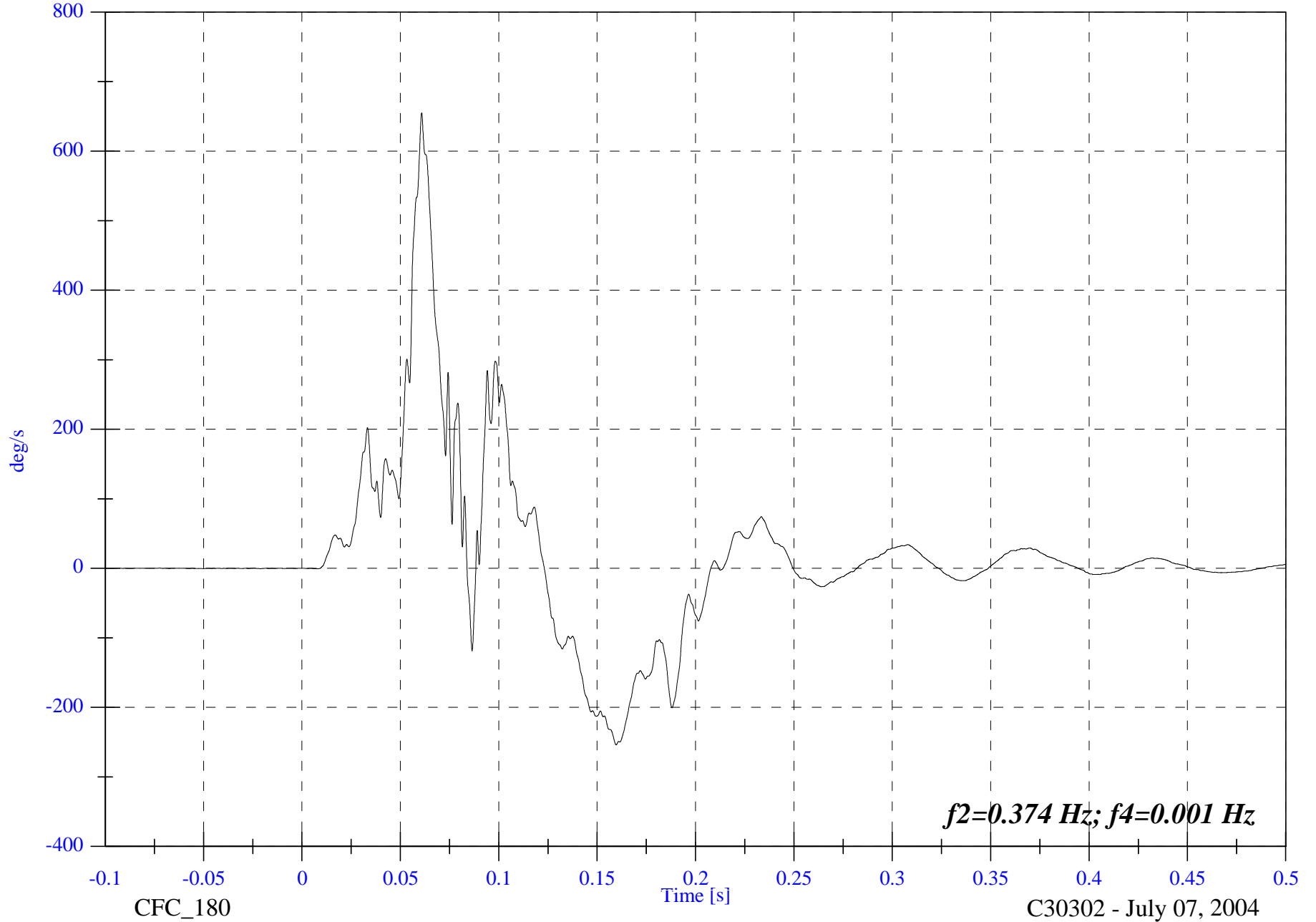
V2P1 Left Seat Comp AVy

Max: 655.1 [deg/s] at 0.061 [s]

Min: -254.0 [deg/s] at 0.160 [s]

B-108

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

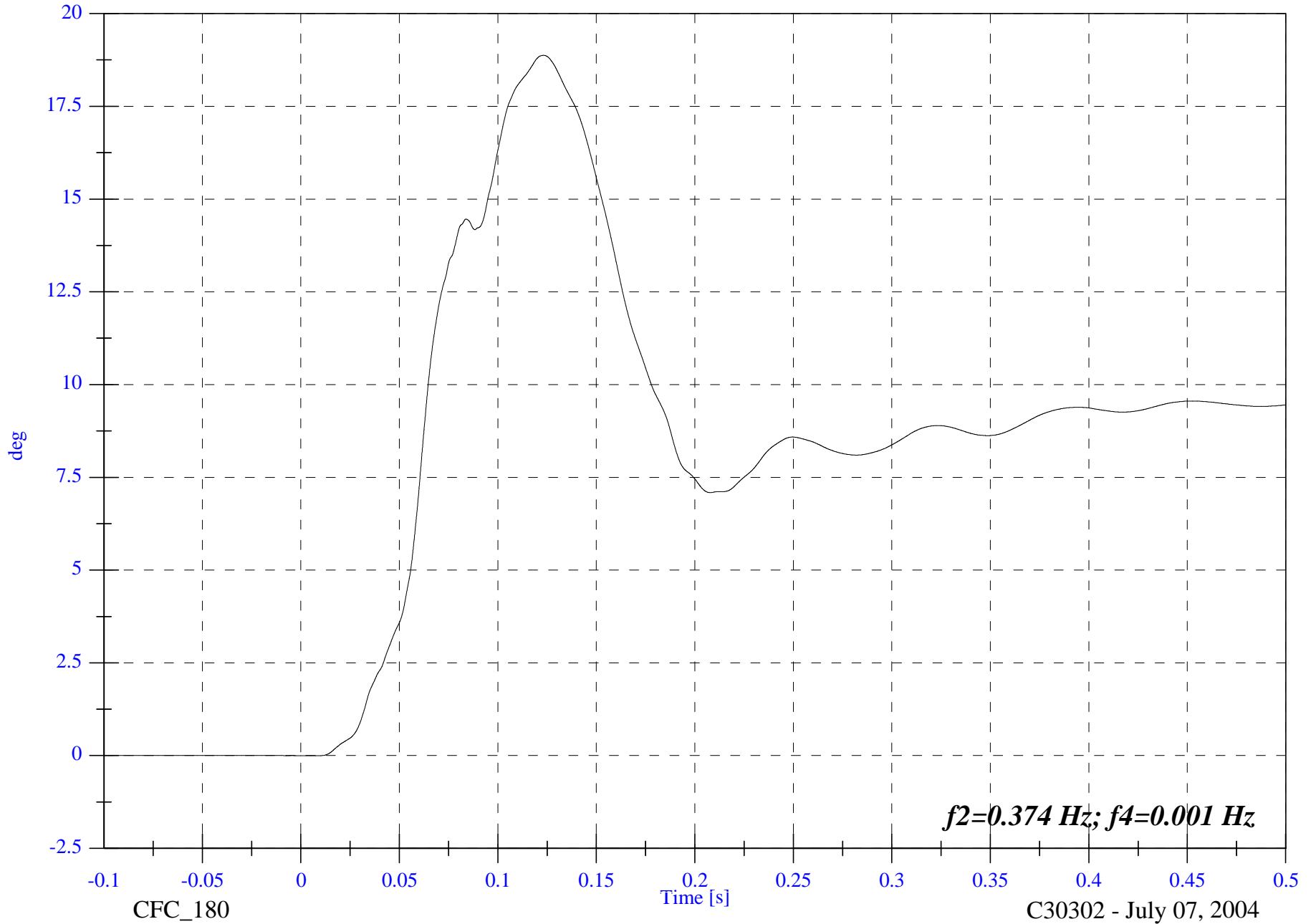
V2P1 Left Seat Comp ADy

Max: 18.9 [deg] at 0.123 [s]

Min: -0.0 [deg] at 0.009 [s]

B-109

8655-F301-23R



CFC_180

Time [s]

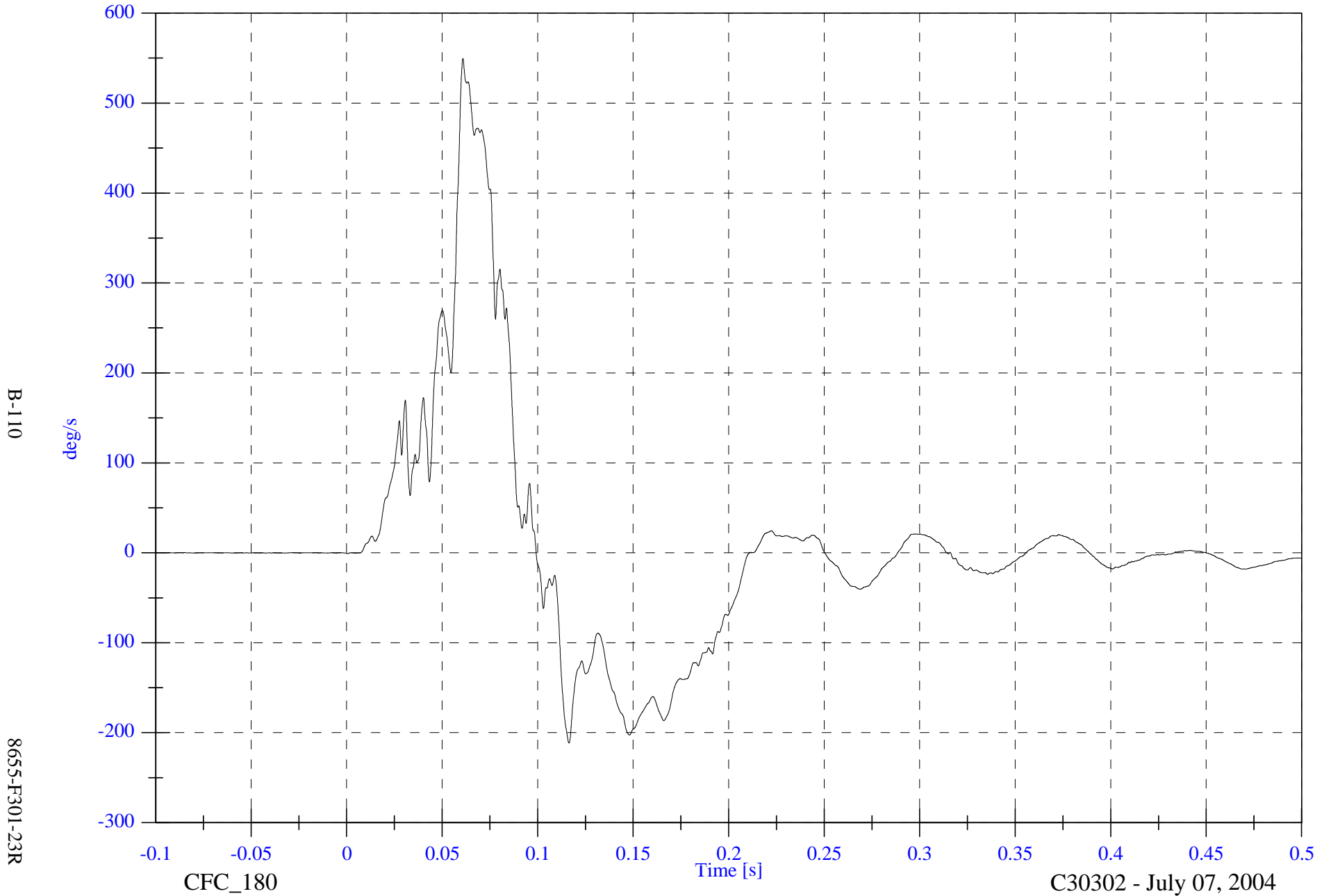
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P1 Right Seat AVy

Max: 549.6 [deg/s] at 0.061 [s]

Min: -211.4 [deg/s] at 0.116 [s]



B-110

8655-F301-23R

CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

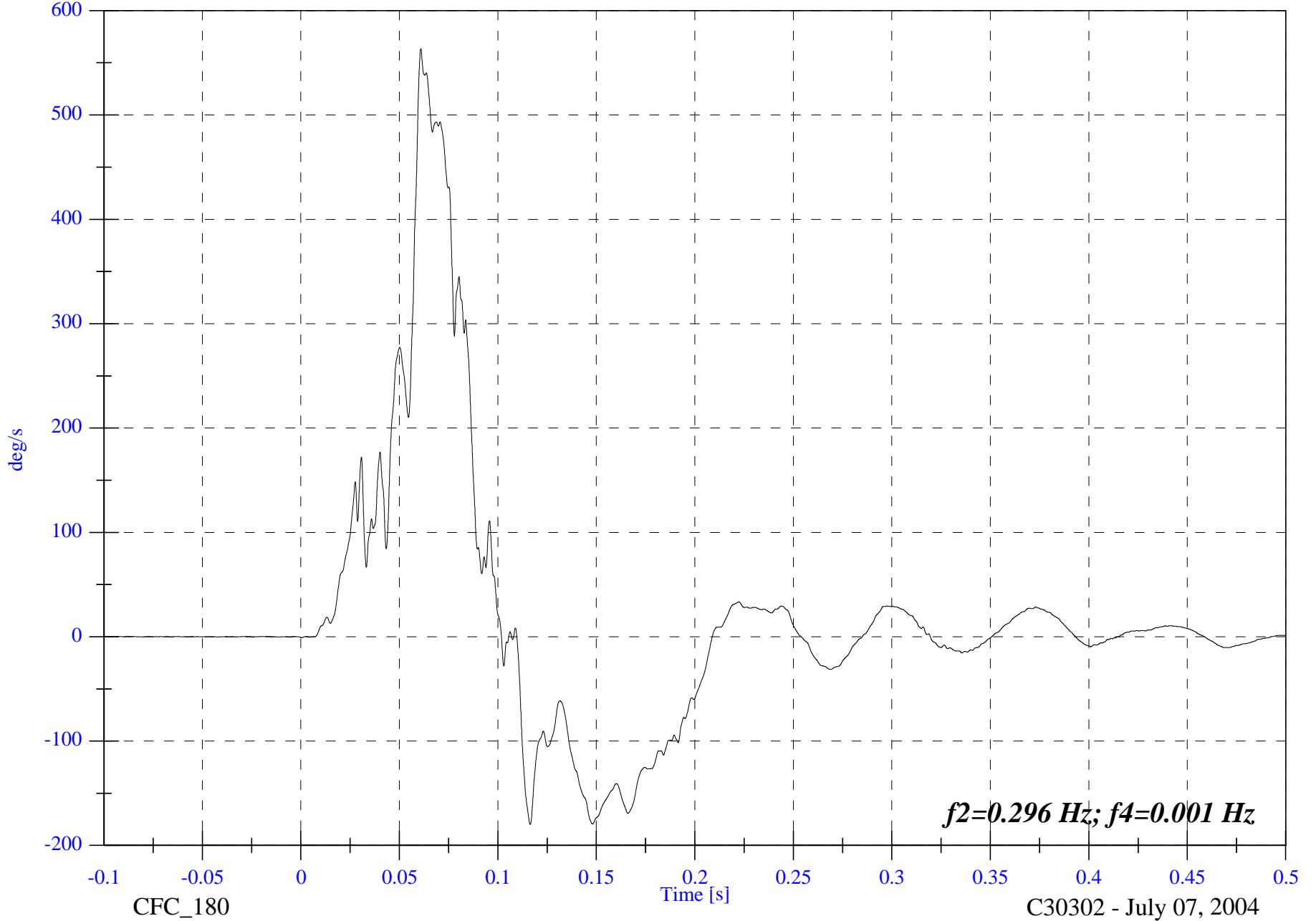
V2P1 Right Seat Comp AVy

Max: 563.6 [deg/s] at 0.061 [s]

Min: -179.9 [deg/s] at 0.116 [s]

B-111

8655-F301-23R



f2=0.296 Hz; f4=0.001 Hz

CFC_180

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

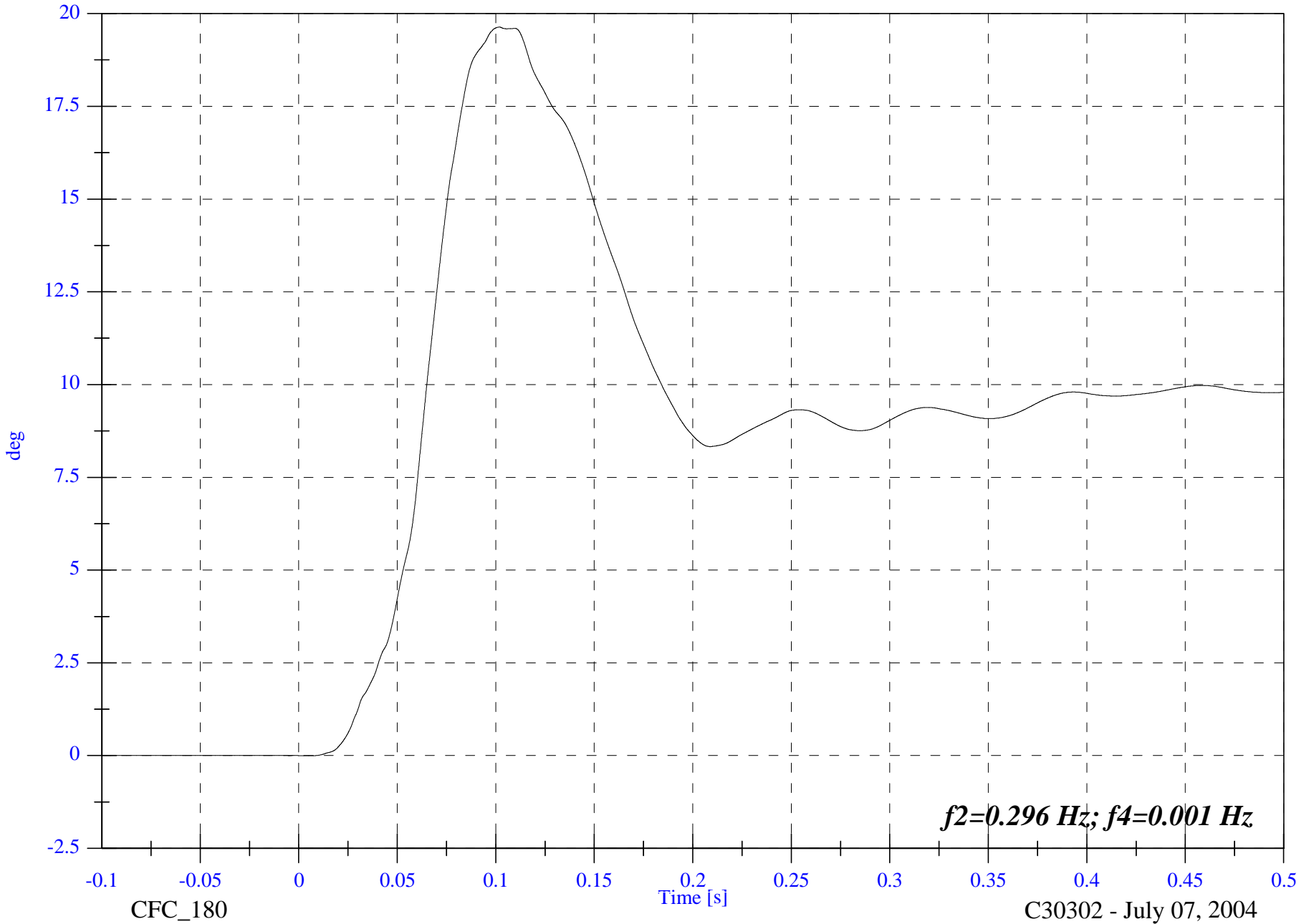
V2P1 Right Seat Comp ADy

Max: 19.6 [deg] at 0.102 [s]

Min: -0.0 [deg] at 0.007 [s]

B-112

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

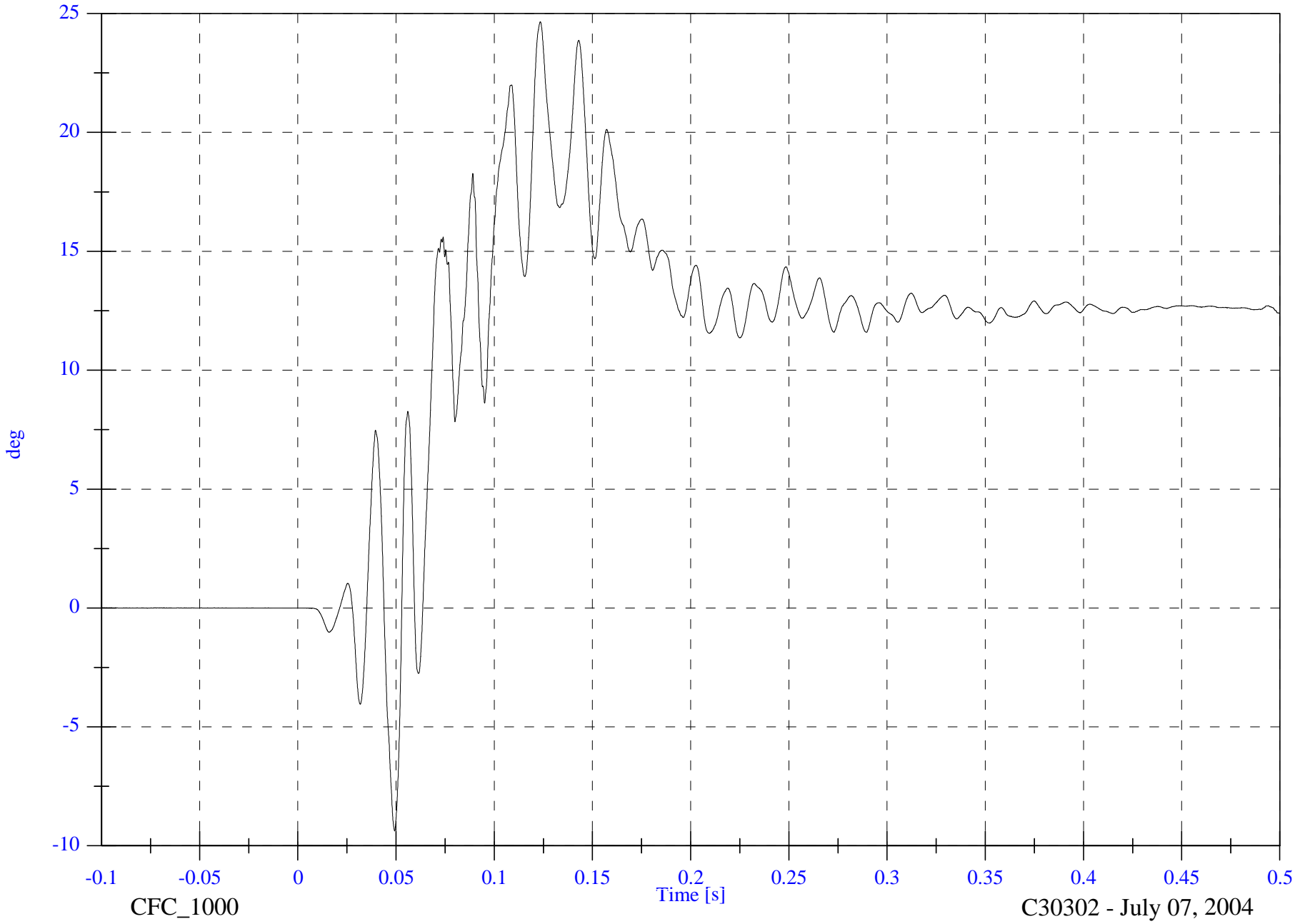
V2P1 Left Link ADy

Max: 24.7 [deg] at 0.123 [s]

Min: -9.4 [deg] at 0.049 [s]

B-113

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

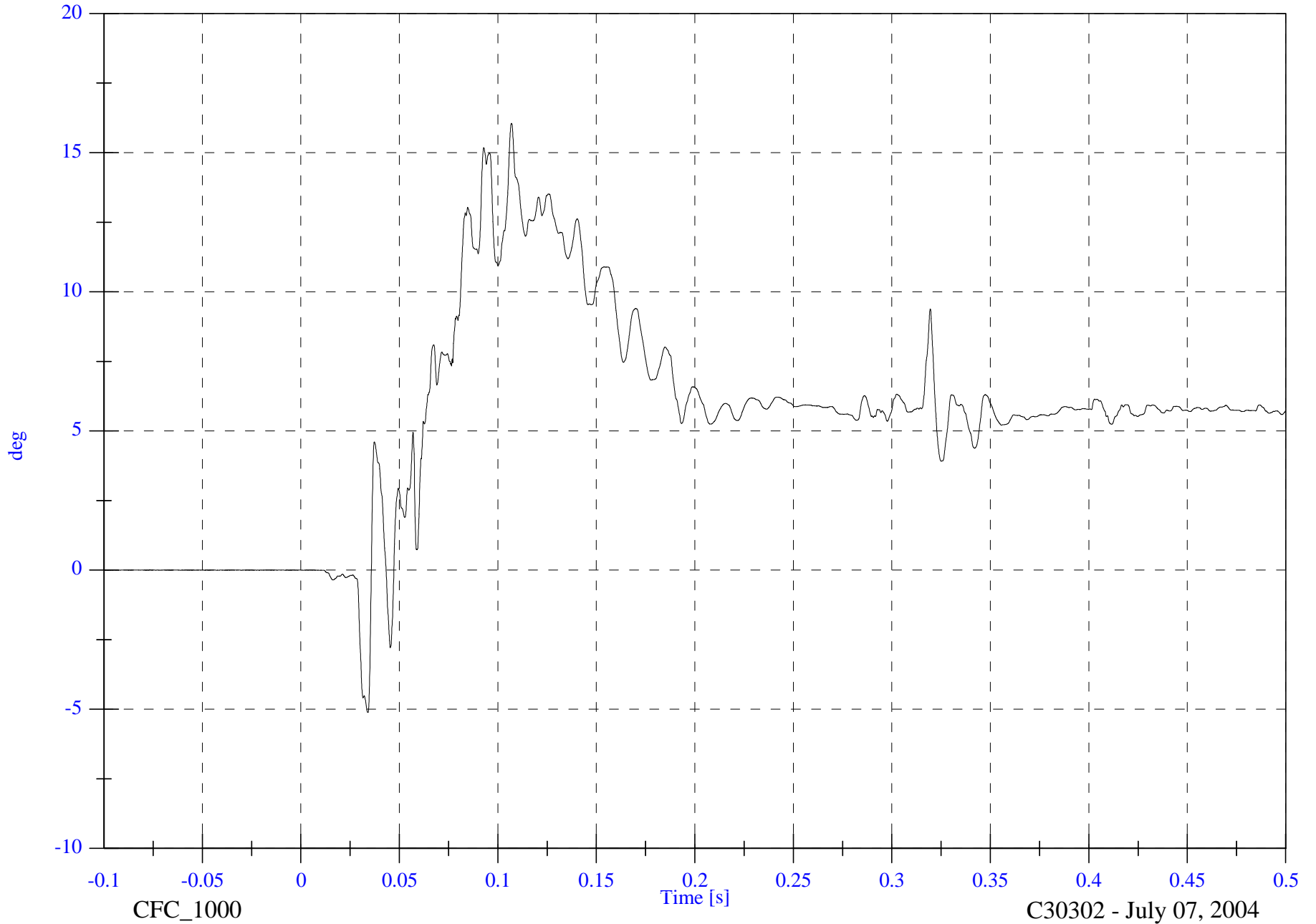
V2P1 Right Link ADy

Max: 16.1 [deg] at 0.107 [s]

Min: -5.1 [deg] at 0.034 [s]

B-114

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

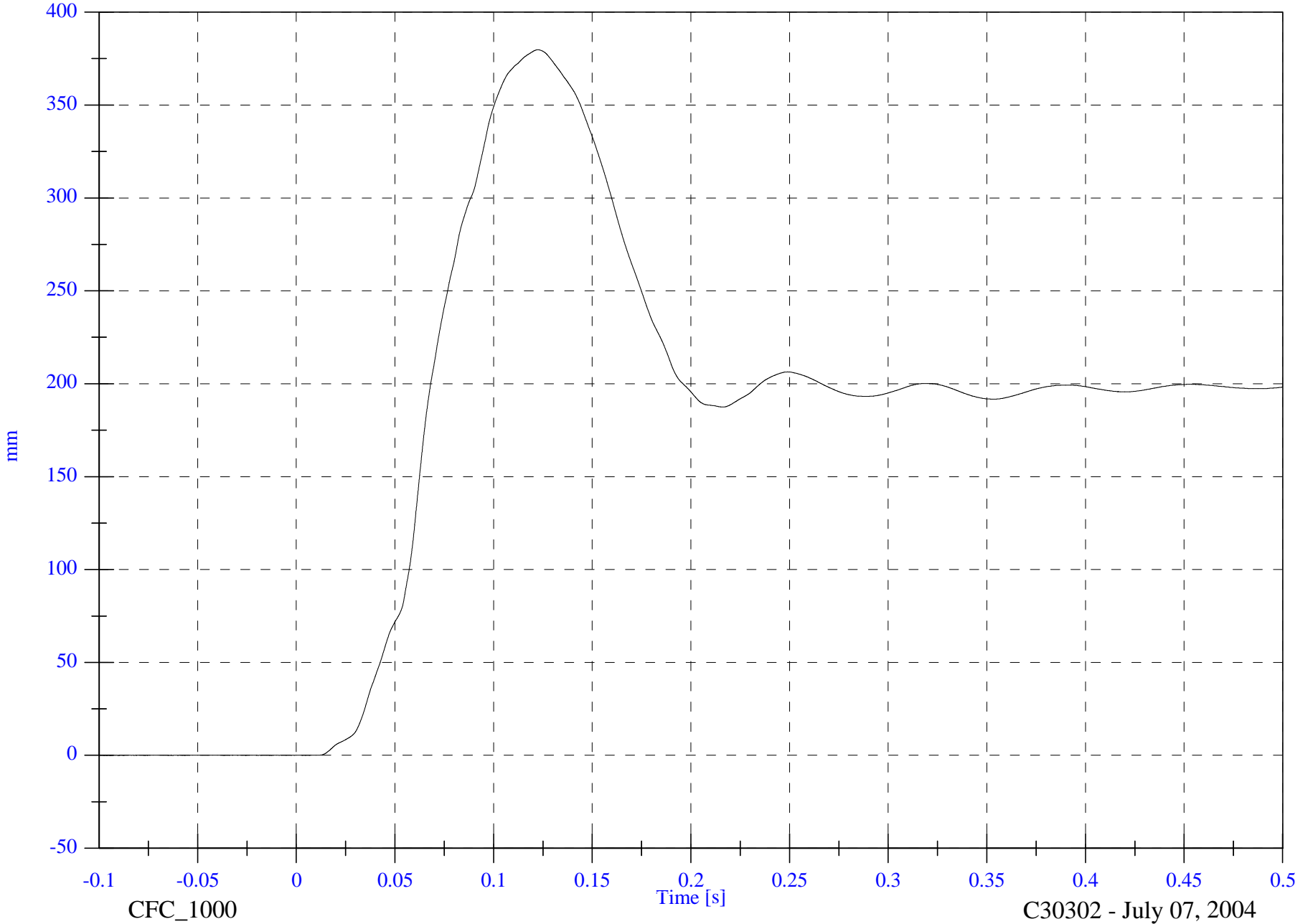
V2P1 Left Span Bar D

Max: 379.7 [mm] at 0.123 [s]

Min: -0.0 [mm] at -0.077 [s]

B-115

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

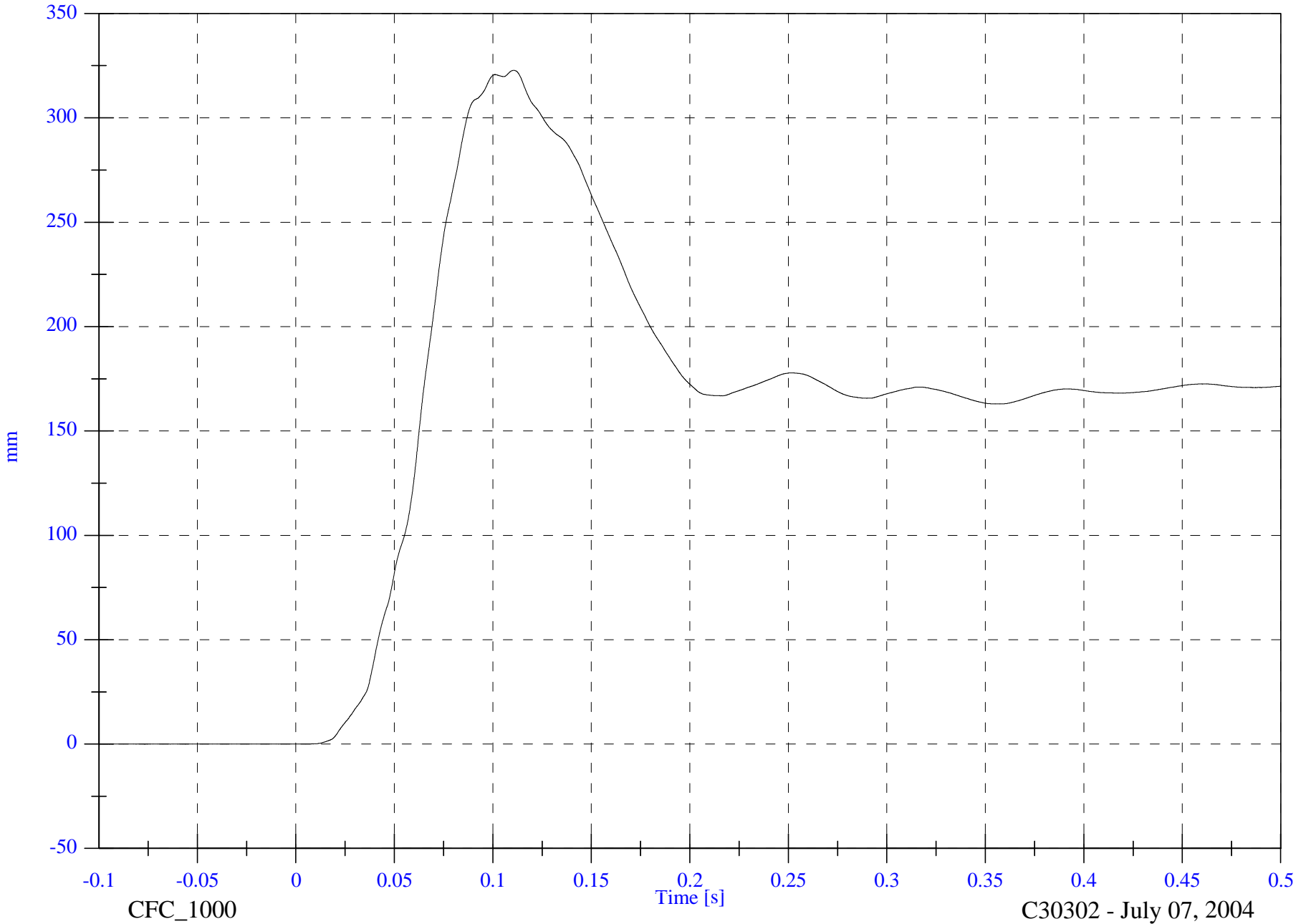
V2P1 Right Span Bar D

Max: 322.7 [mm] at 0.111 [s]

Min: -0.1 [mm] at -0.077 [s]

B-116

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

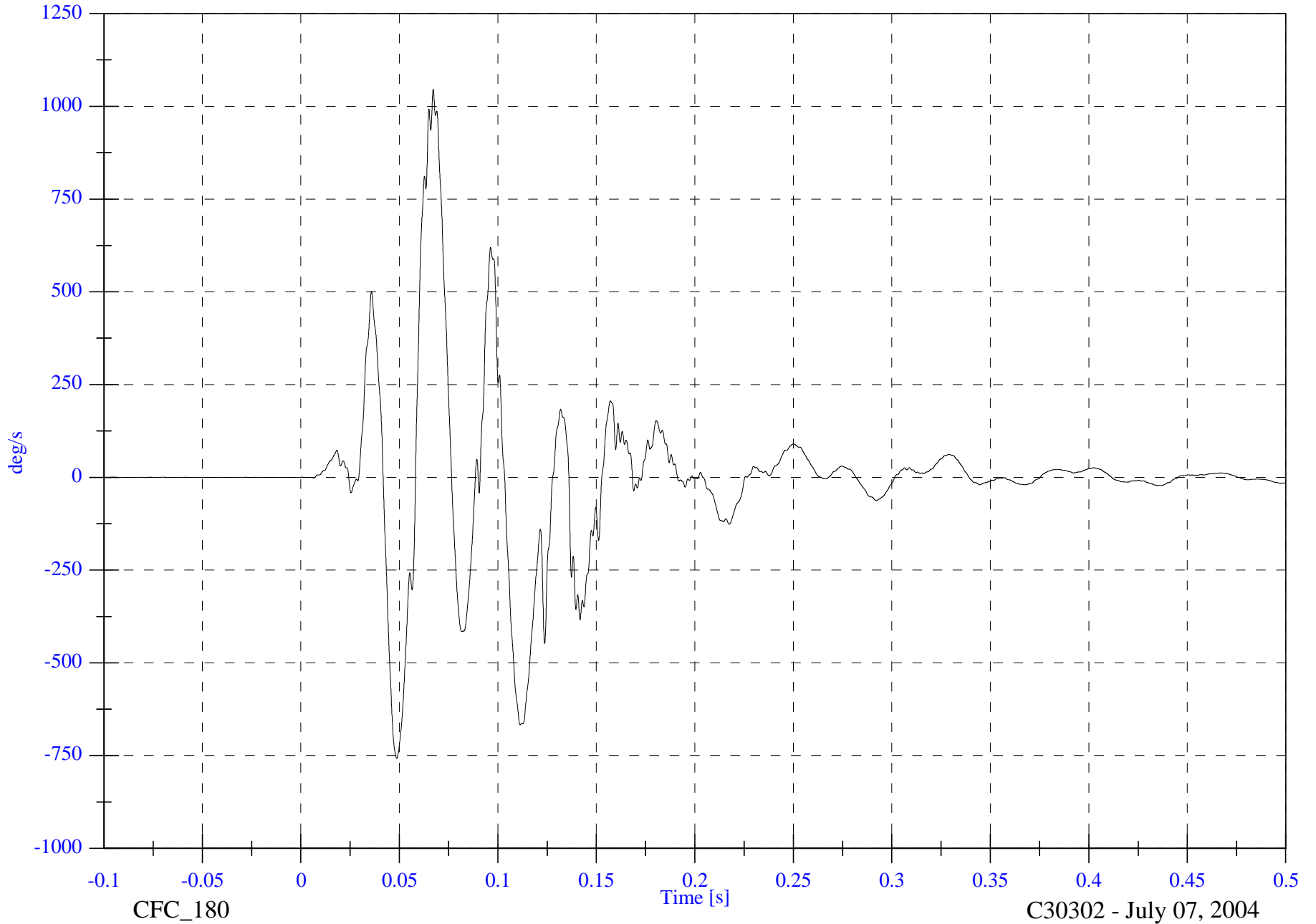
V2P3 Left Seat AVy

Max: 1046.1 [deg/s] at 0.067 [s]

Min: -756.8 [deg/s] at 0.049 [s]

B-117

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

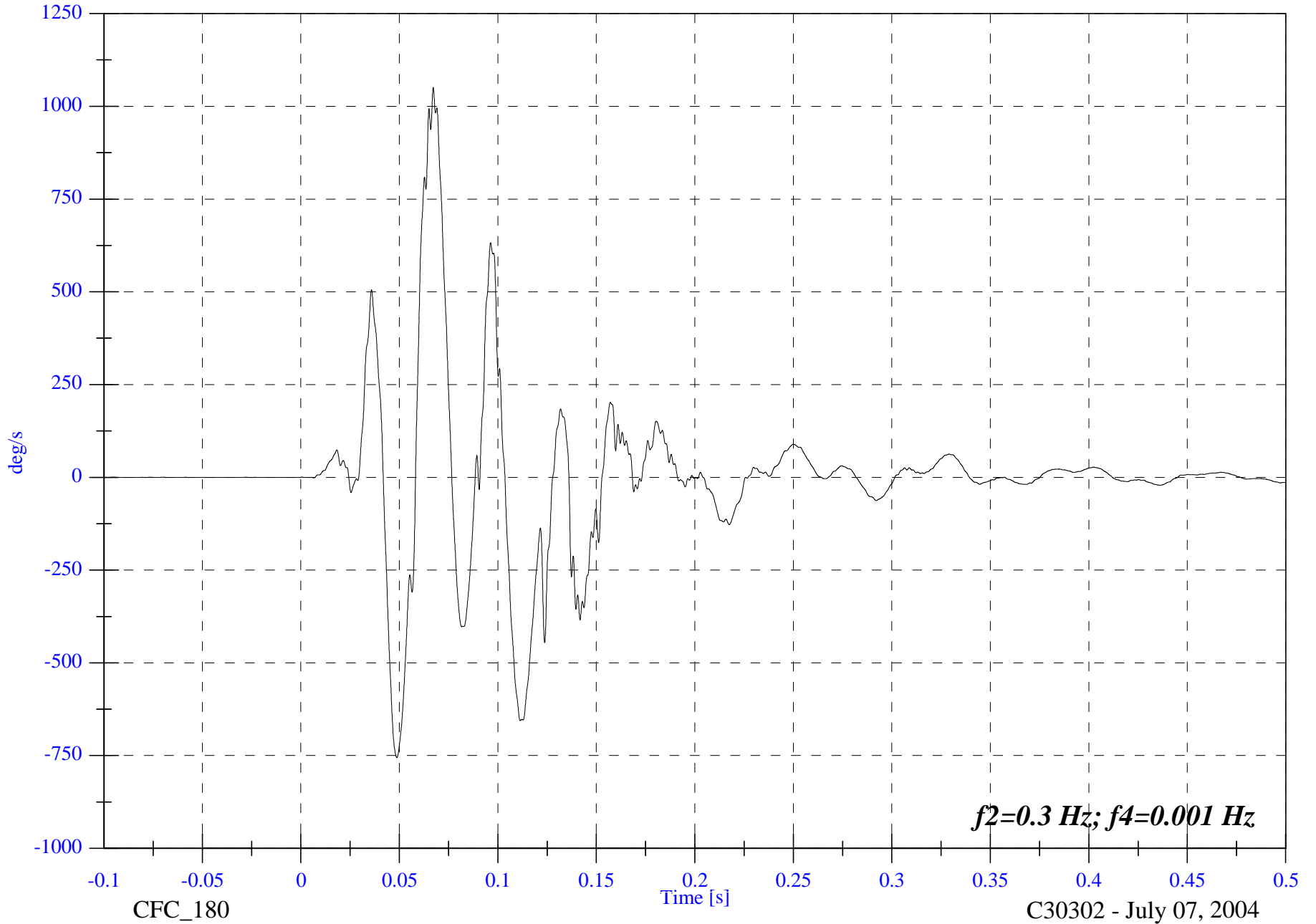
V2P3 Left Seat Comp AVy

Max: 1051.0 [deg/s] at 0.067 [s]

Min: -755.6 [deg/s] at 0.049 [s]

B-118

8655-F301-23R



$f_2=0.3 \text{ Hz}; f_4=0.001 \text{ Hz}$

CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

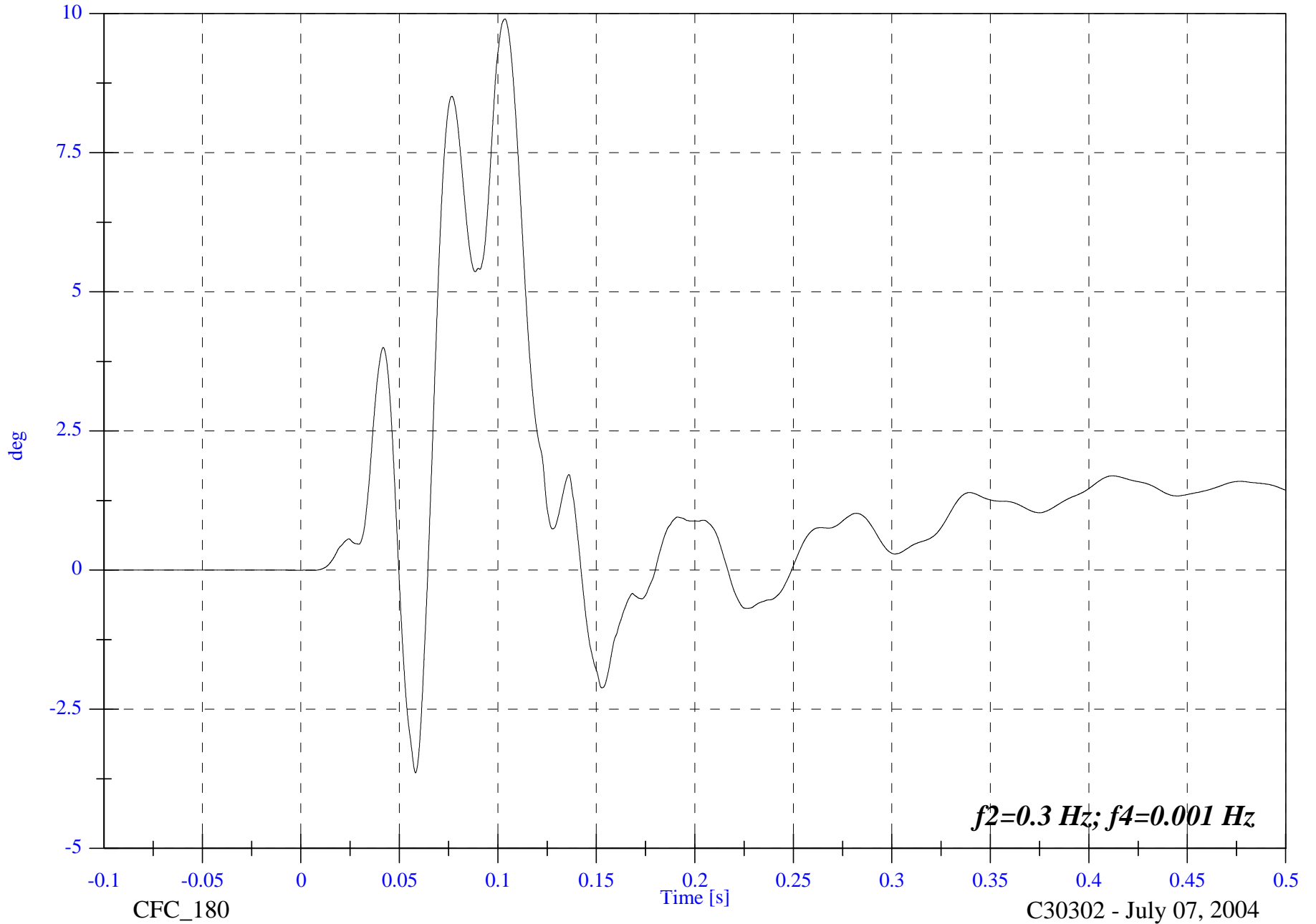
V2P3 Left Seat Comp ADy

Max: 9.9 [deg] at 0.104 [s]

Min: -3.6 [deg] at 0.058 [s]

B-119

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

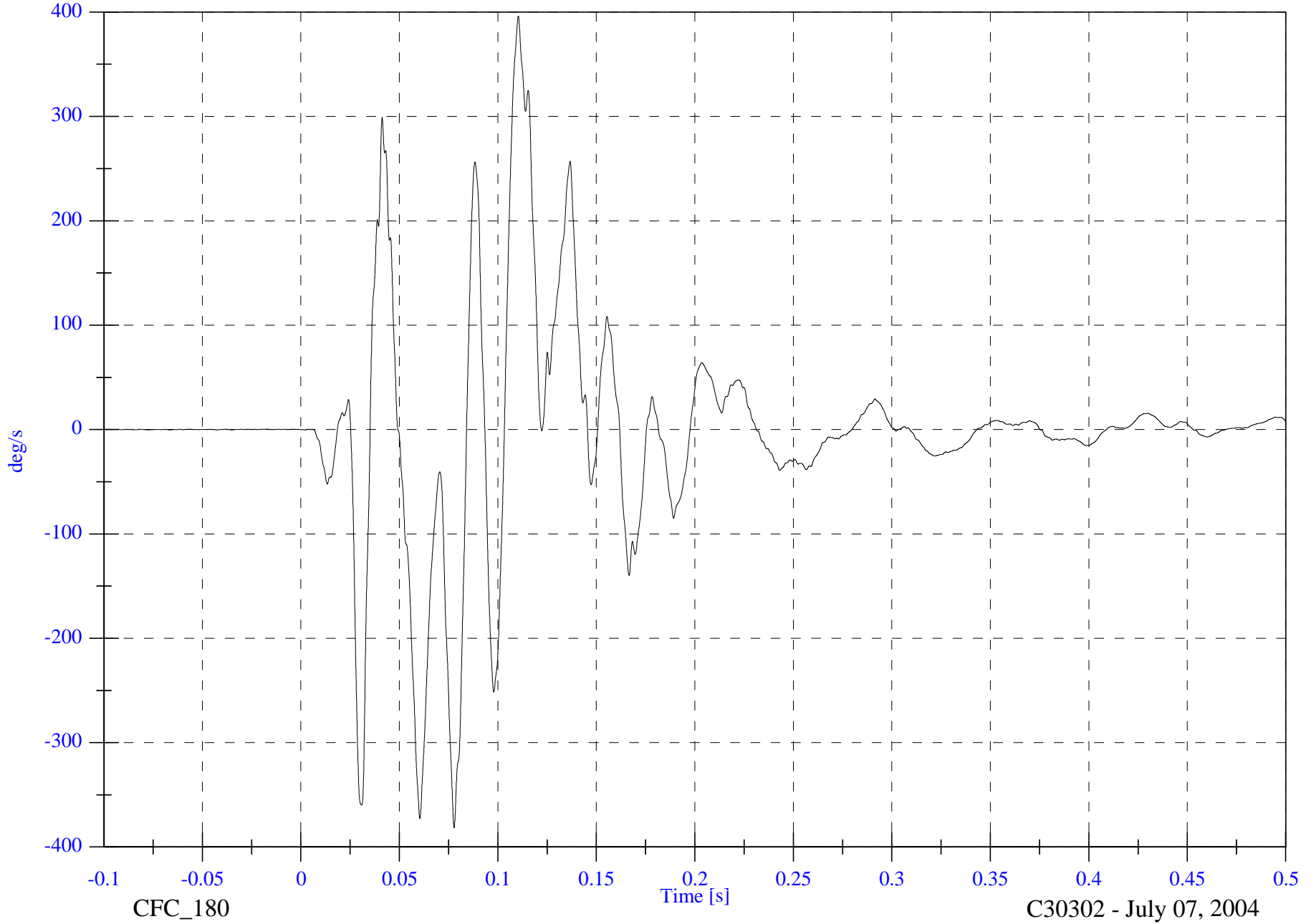
V2P3 Right Seat AVy

Max: 396.2 [deg/s] at 0.110 [s]

Min: -381.7 [deg/s] at 0.078 [s]

B-120

8655-F301-23R



CFC_180

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

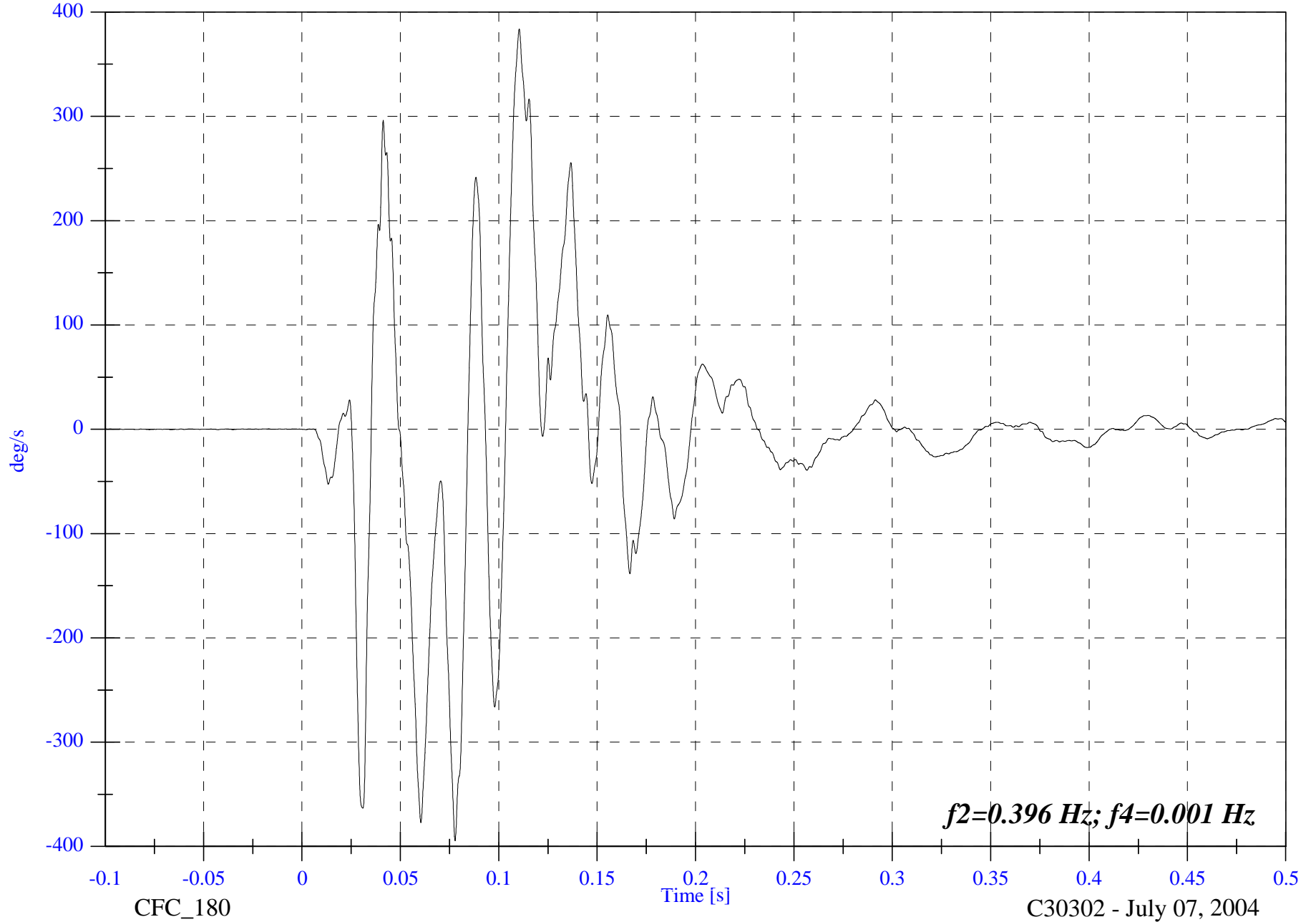
V2P3 Right Seat Comp AVy

Max: 383.8 [deg/s] at 0.110 [s]

Min: -394.5 [deg/s] at 0.078 [s]

B-121

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

V2P3 Right Seat Comp ADy

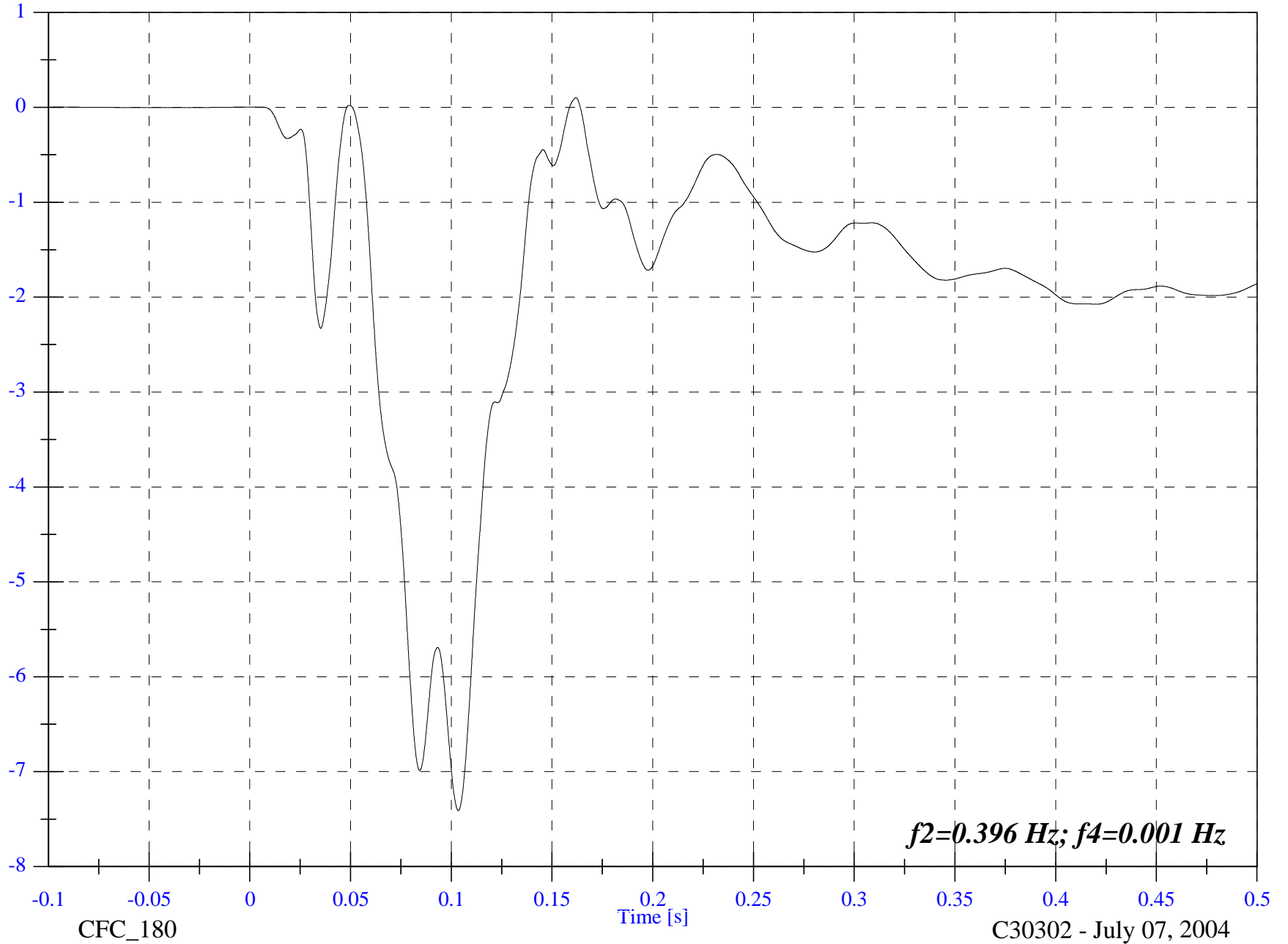
Max: 0.1 [deg] at 0.162 [s]

Min: -7.4 [deg] at 0.103 [s]

B-122

8655-F301-23R

gap



$f_2=0.396$ Hz; $f_4=0.001$ Hz

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

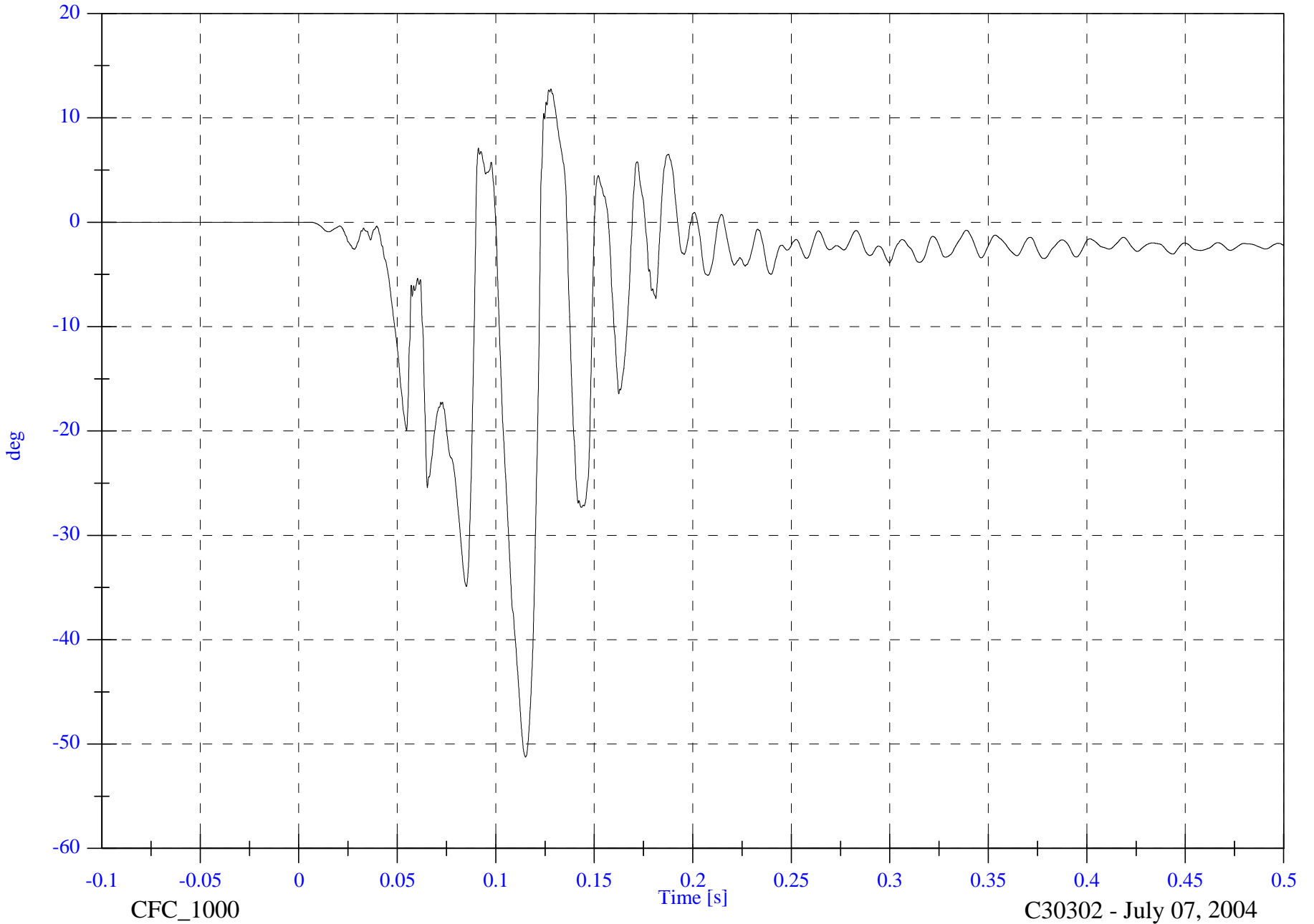
V2P3 Left Link ADy

Max: 12.8 [deg] at 0.128 [s]

Min: -51.2 [deg] at 0.115 [s]

B-123

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

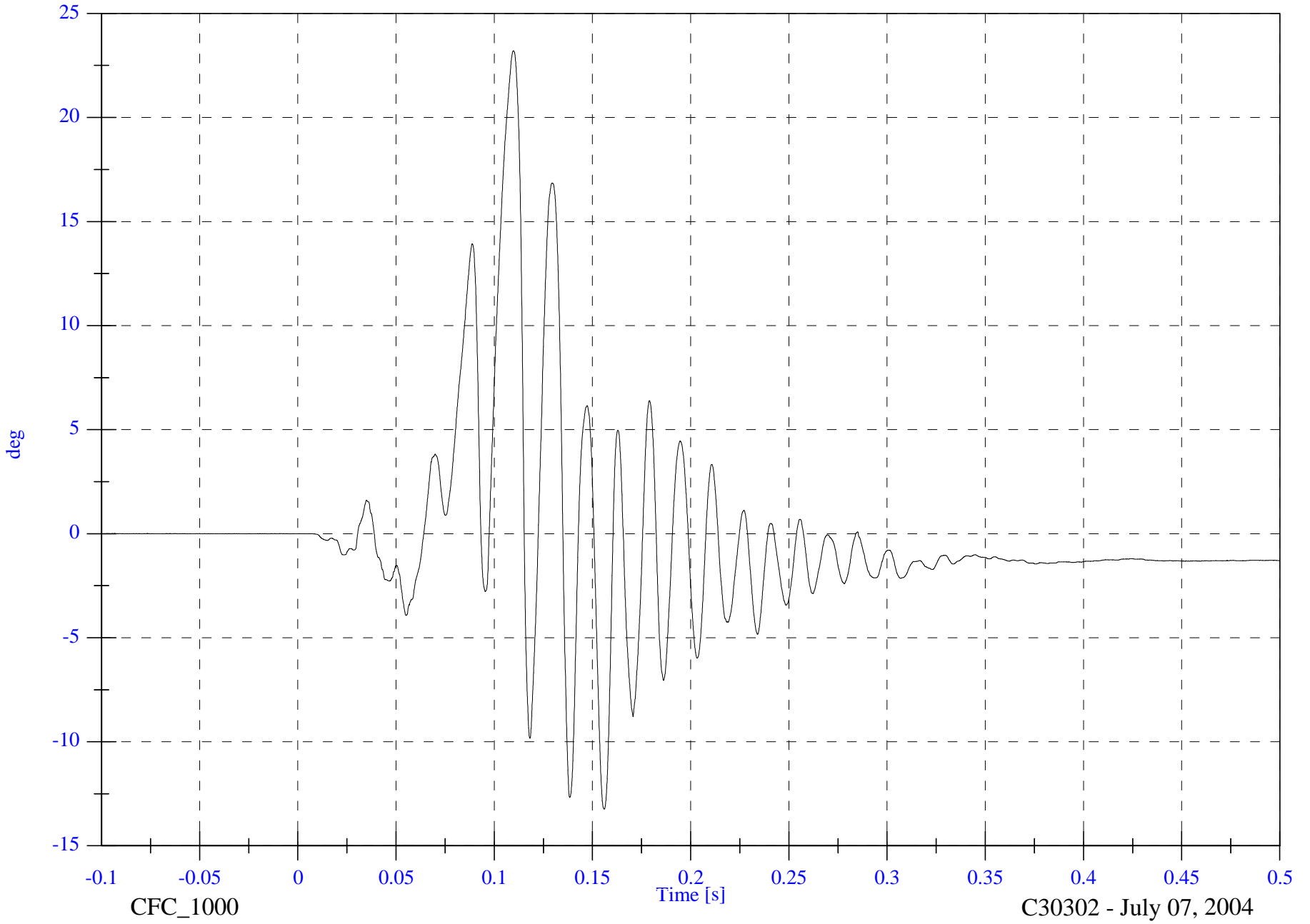
V2P3 Right Link ADy

Max: 23.2 [deg] at 0.110 [s]

Min: -13.2 [deg] at 0.156 [s]

B-124

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

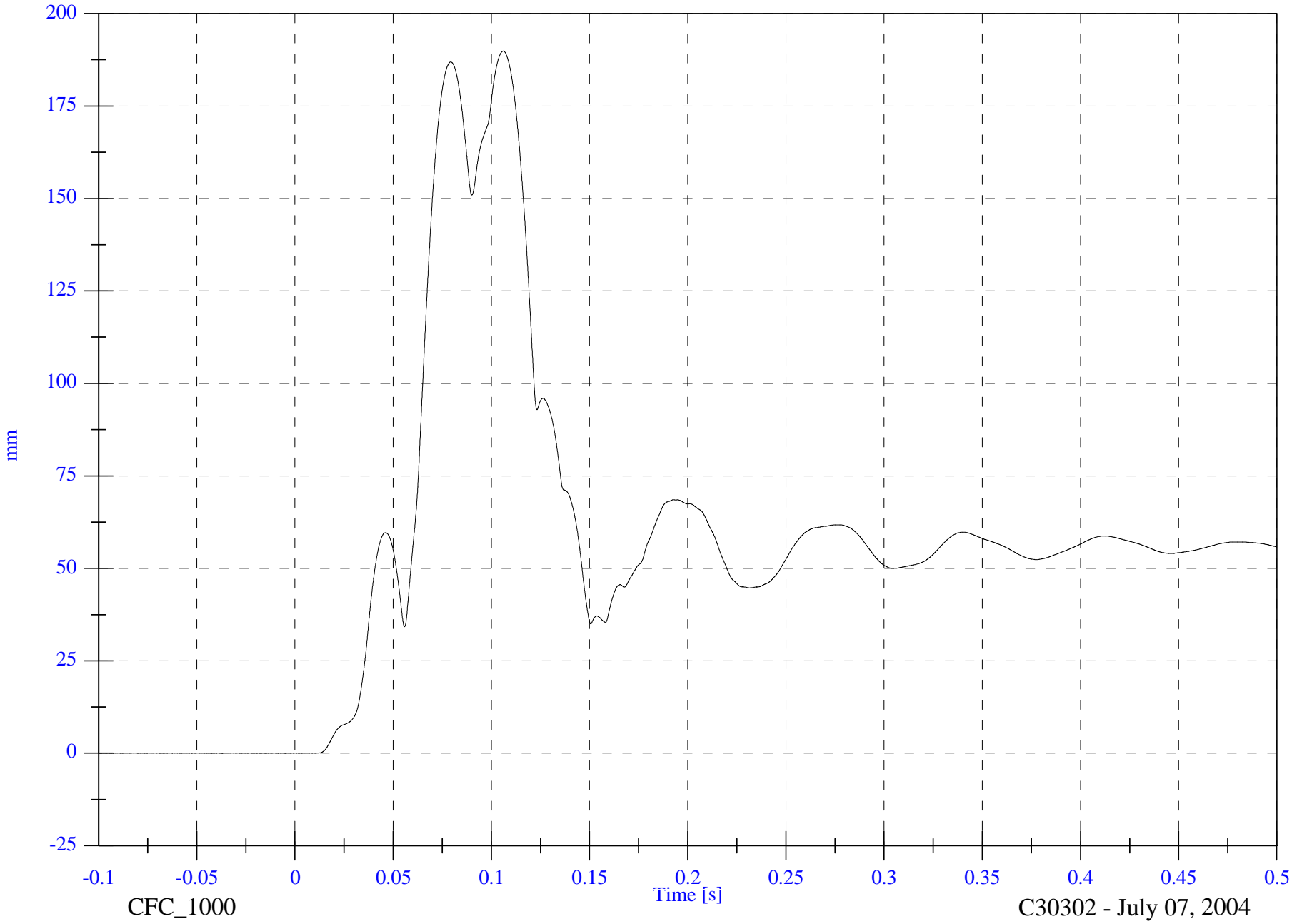
V2P3 Left Span Bar D

Max: 189.9 [mm] at 0.106 [s]

Min: -0.0 [mm] at -0.077 [s]

B-125

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

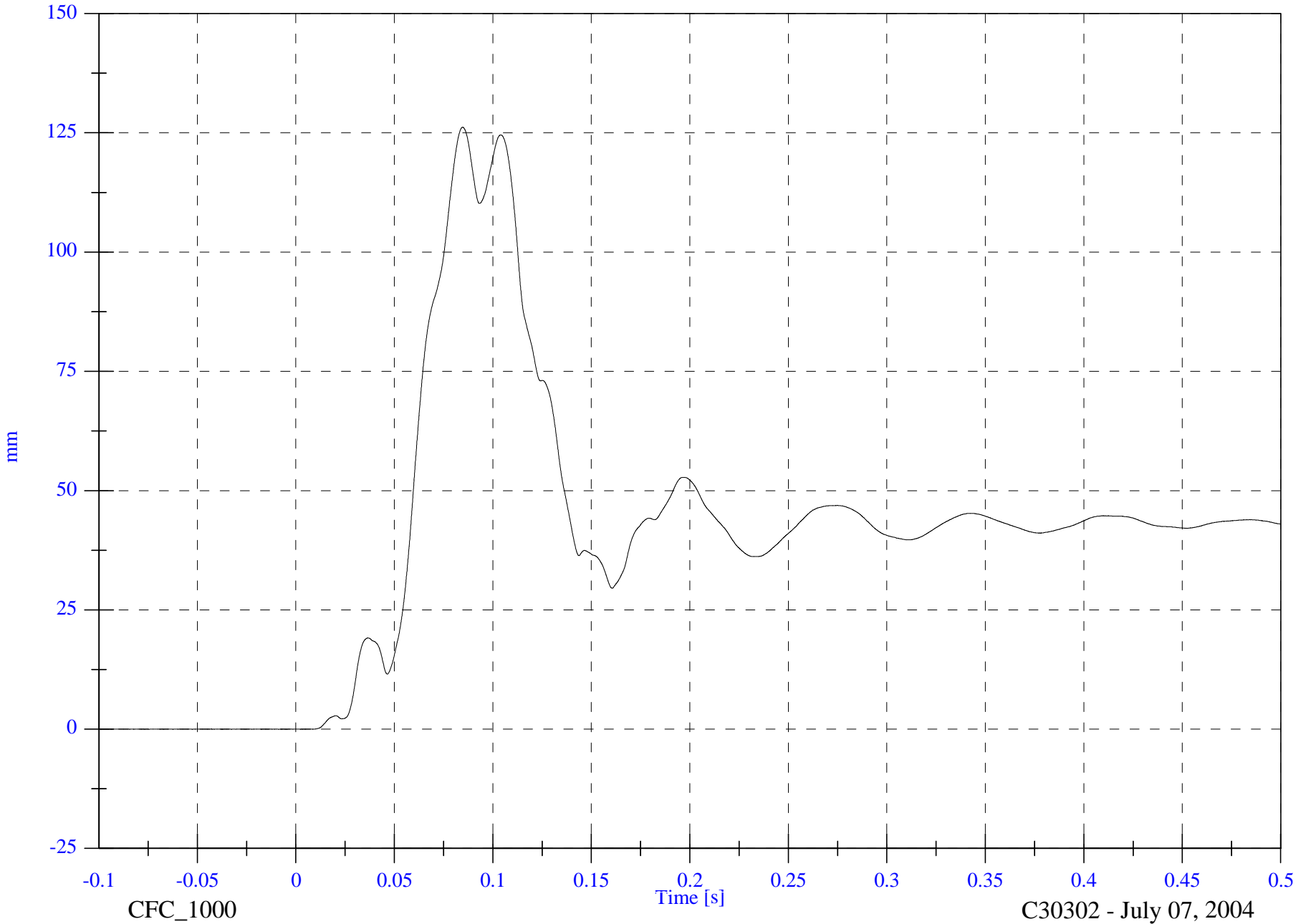
V2P3 Right Span Bar D

Max: 126.2 [mm] at 0.085 [s]

Min: -0.0 [mm] at -0.077 [s]

B-126

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

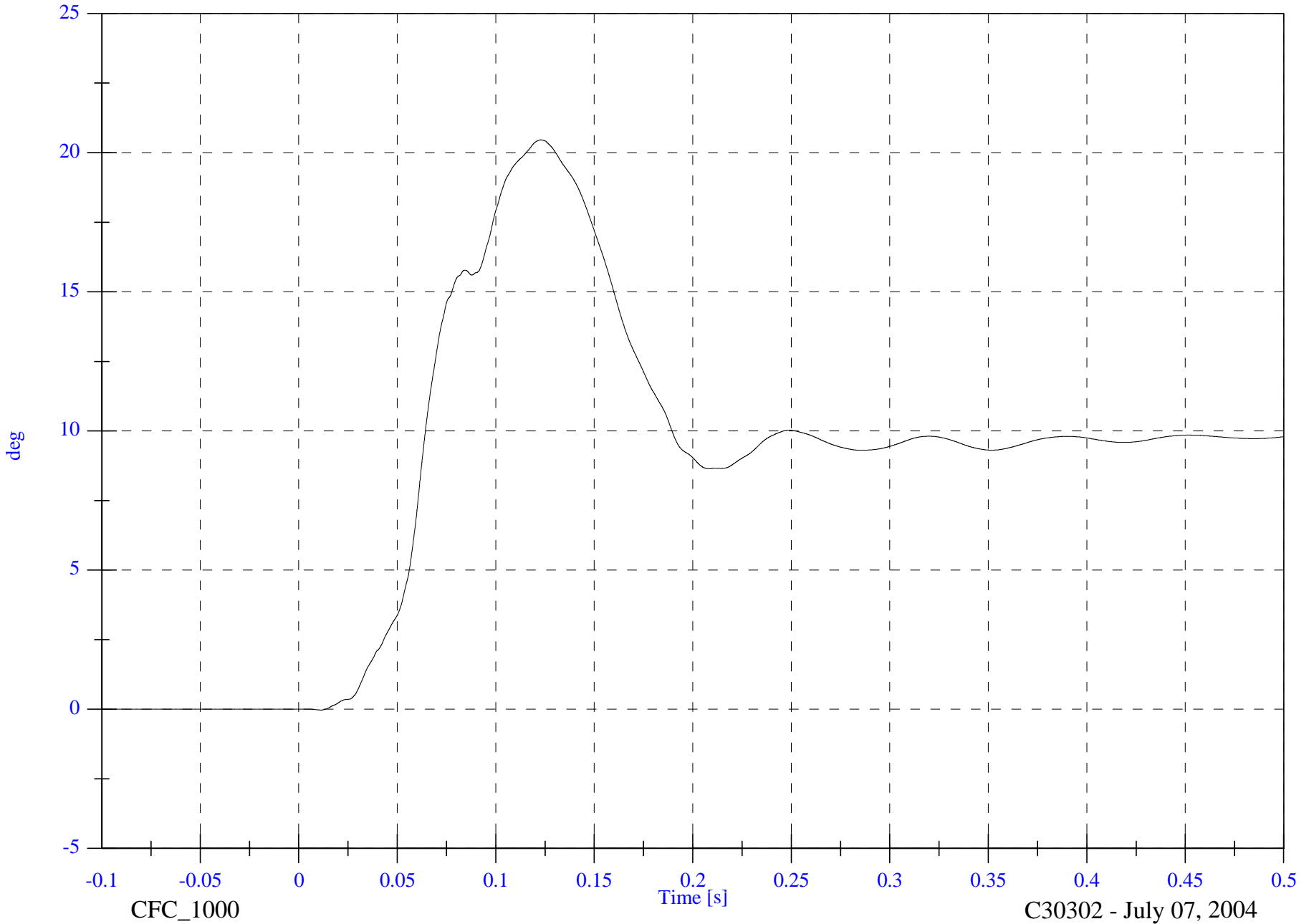
P1 Left Change in Seat Back Angle WRT Sill

Max: 20.5 [deg] at 0.123 [s]

Min: -0.0 [deg] at 0.011 [s]

B-127

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

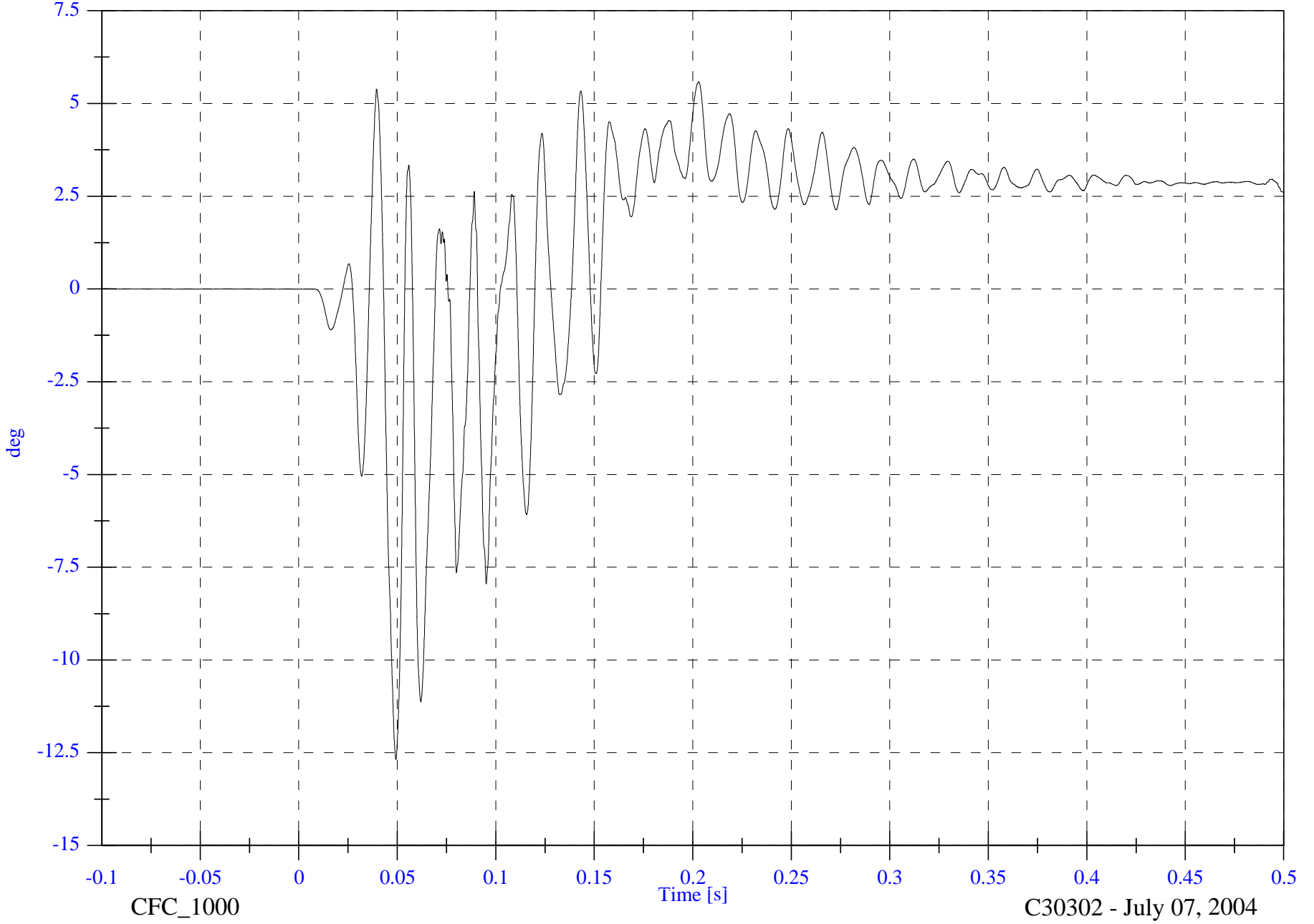
P1 Left Change in String Angle

Max: 5.6 [deg] at 0.203 [s]

Min: -12.7 [deg] at 0.049 [s]

B-128

8655-F301-23R



C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

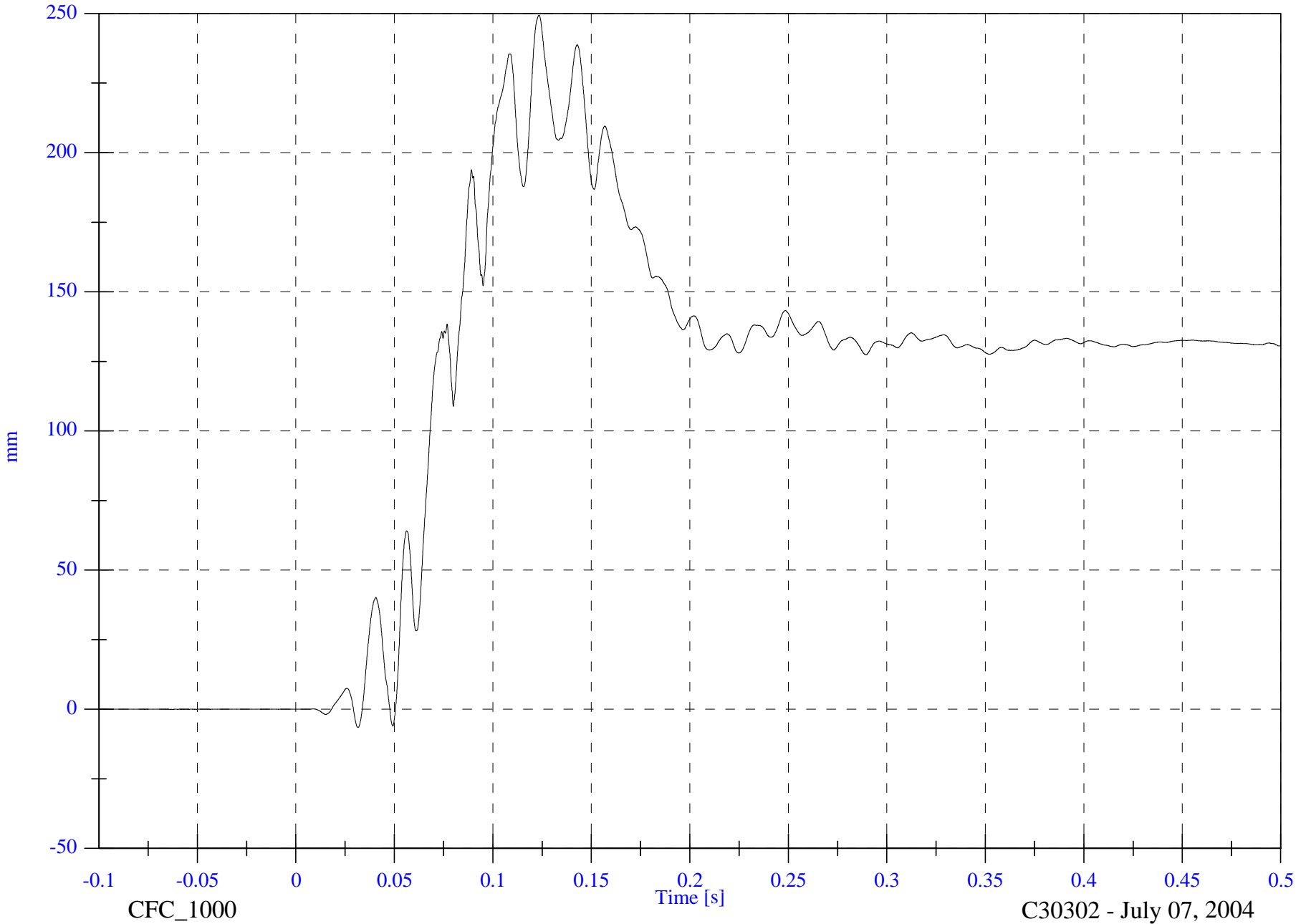
Max: 249.4 [mm] at 0.123 [s]

P1 Left Seat X Displacement

Min: -6.6 [mm] at 0.032 [s]

B-129

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

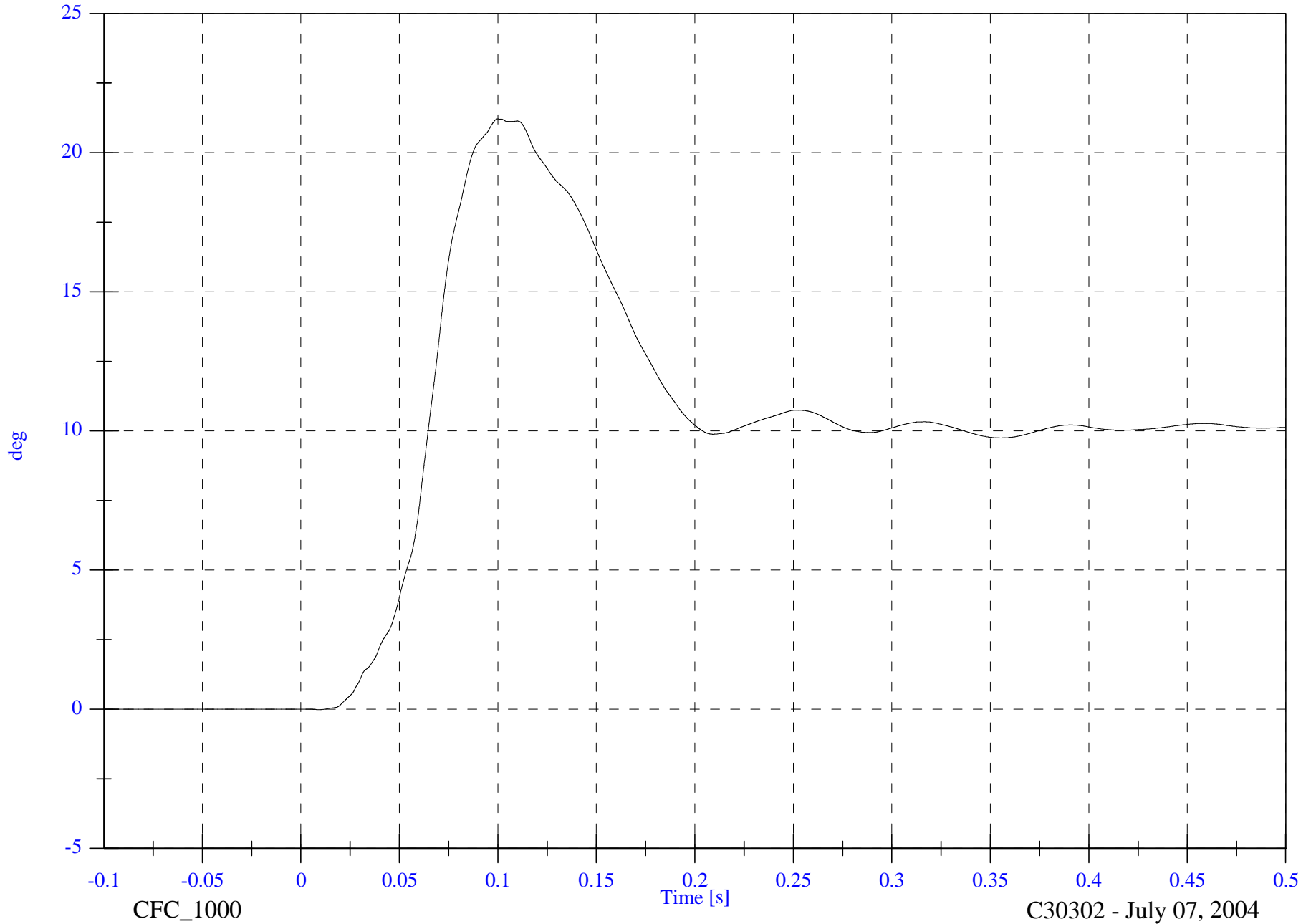
P1 Right Change in Seat Back Angle WRT Sill

Max: 21.2 [deg] at 0.100 [s]

Min: -0.0 [deg] at 0.009 [s]

B-130

8655-F301-23R



CFC_1000

Time [s]

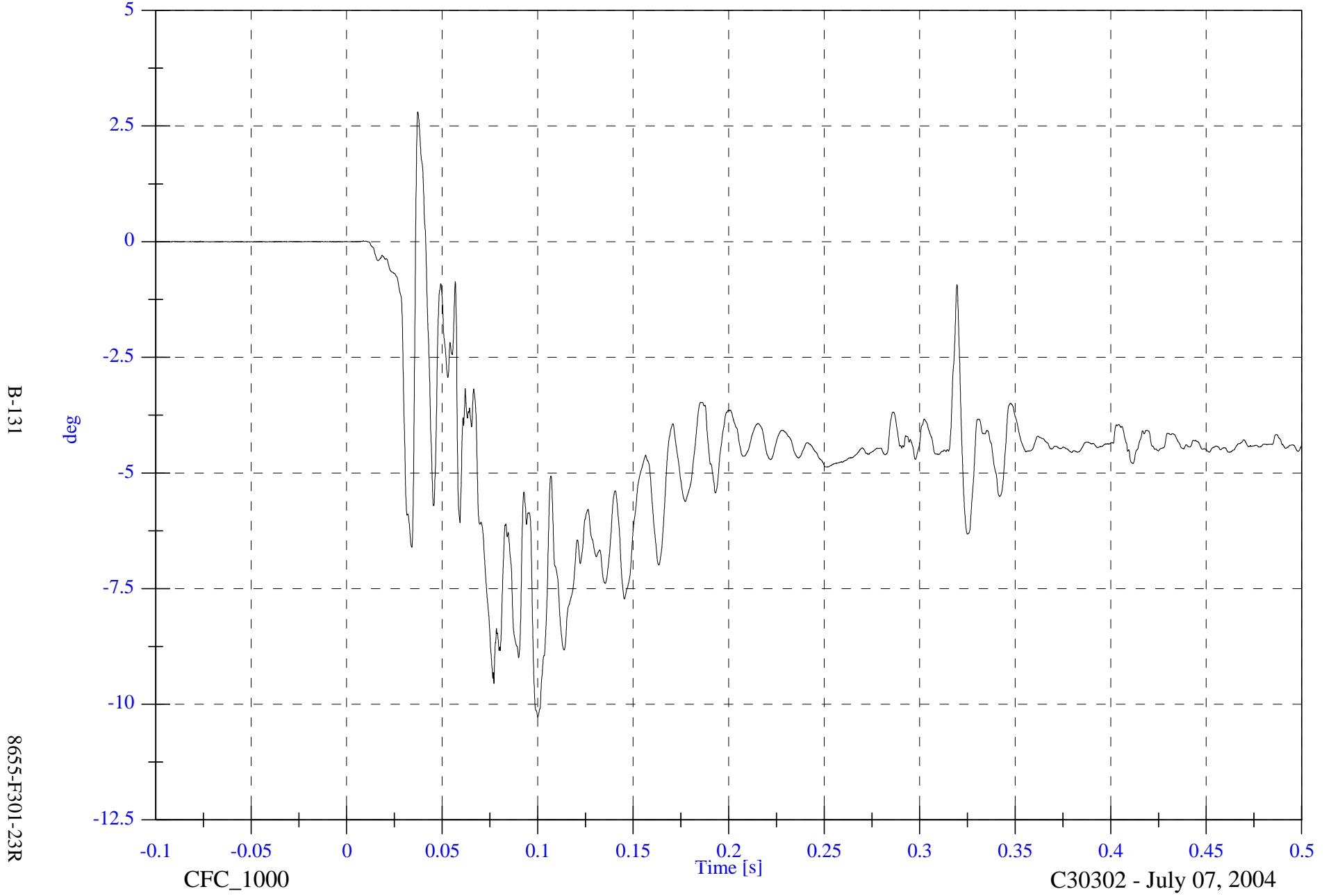
C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

P1 Right Change in String Angle

Max: 2.8 [deg] at 0.037 [s]

Min: -10.3 [deg] at 0.100 [s]



FMVSS301 Test 9 - 2004 Jeep Liberty

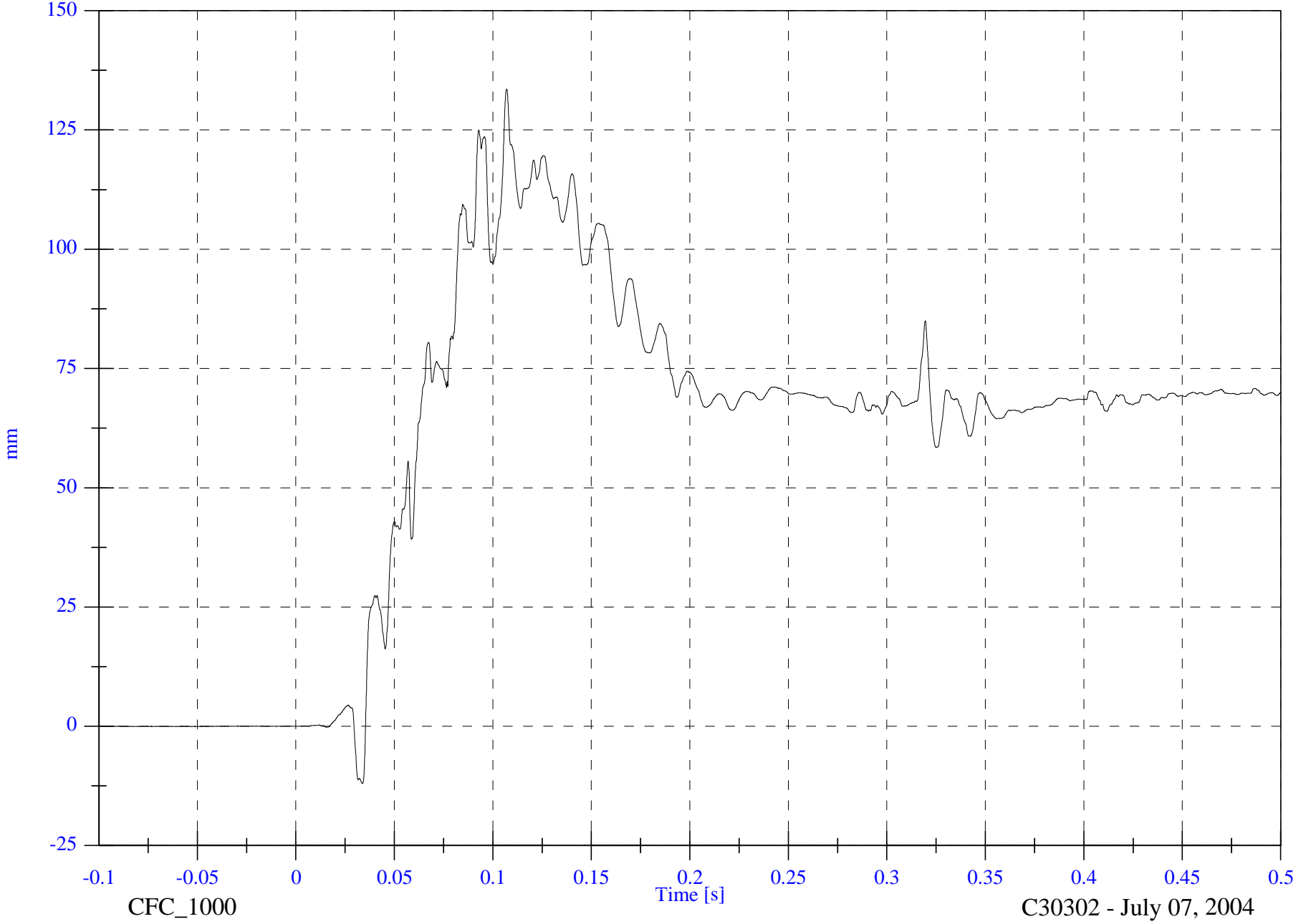
P1 Right Seat X Displacement

Max: 133.5 [mm] at 0.107 [s]

Min: -12.0 [mm] at 0.034 [s]

B-132

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

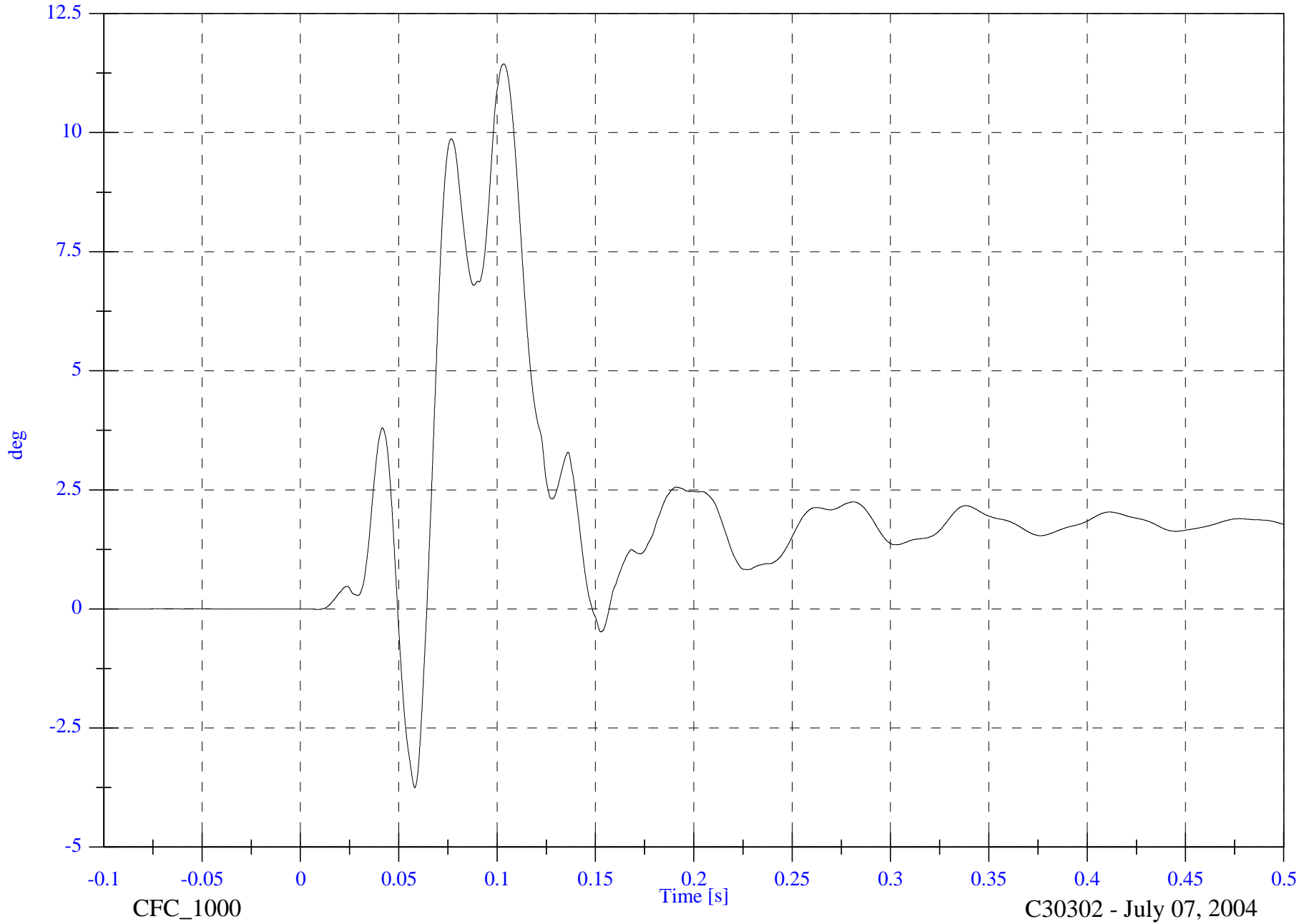
P3 Left Change in Seat Back Angle WRT Sill

Max: 11.4 [deg] at 0.103 [s]

Min: -3.8 [deg] at 0.058 [s]

B-133

8655-F301-23R



FMVSS301 Test 9 - 2004 Jeep Liberty

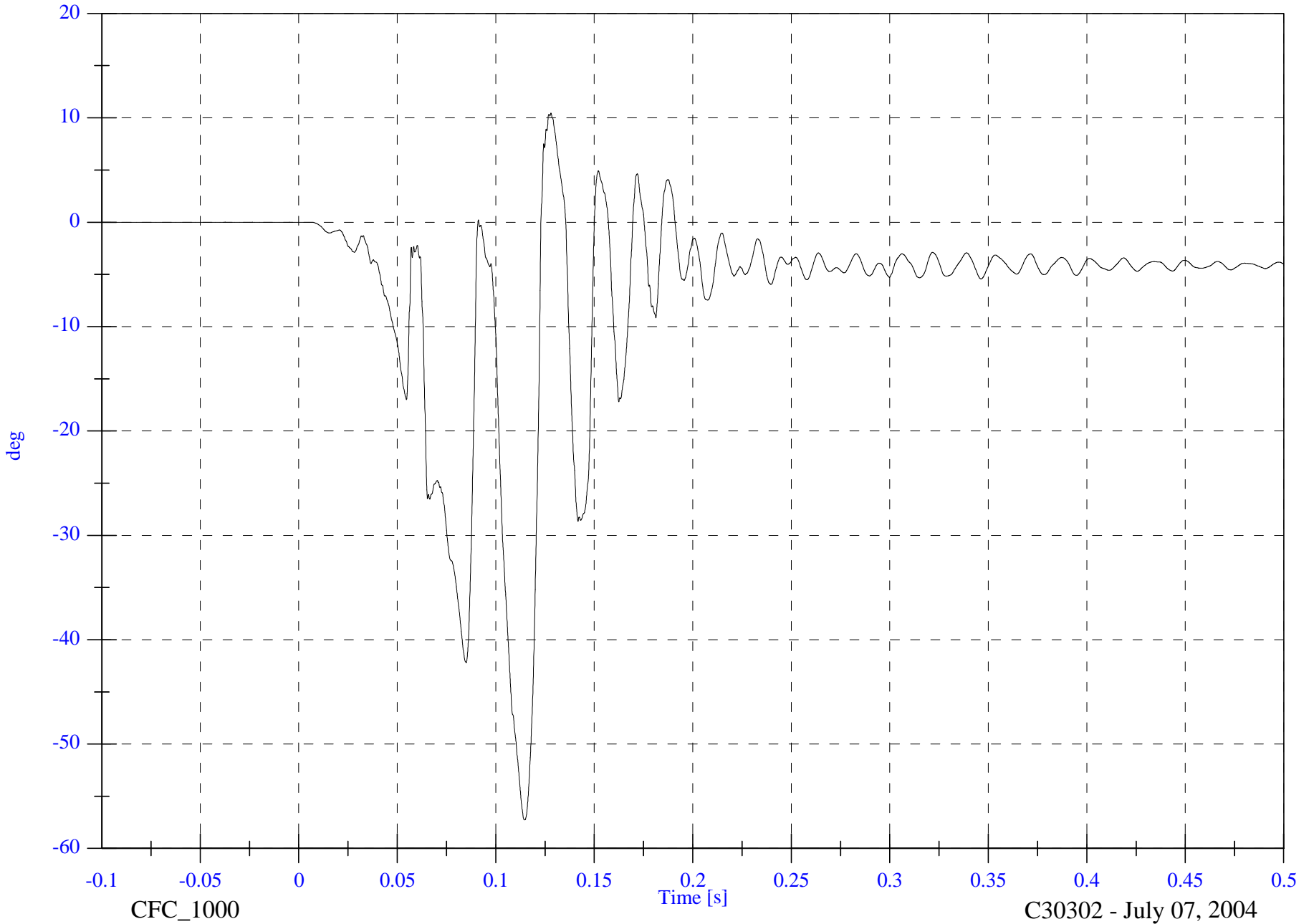
P3 Left Change in String Angle

Max: 10.5 [deg] at 0.128 [s]

Min: -57.3 [deg] at 0.114 [s]

B-134

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

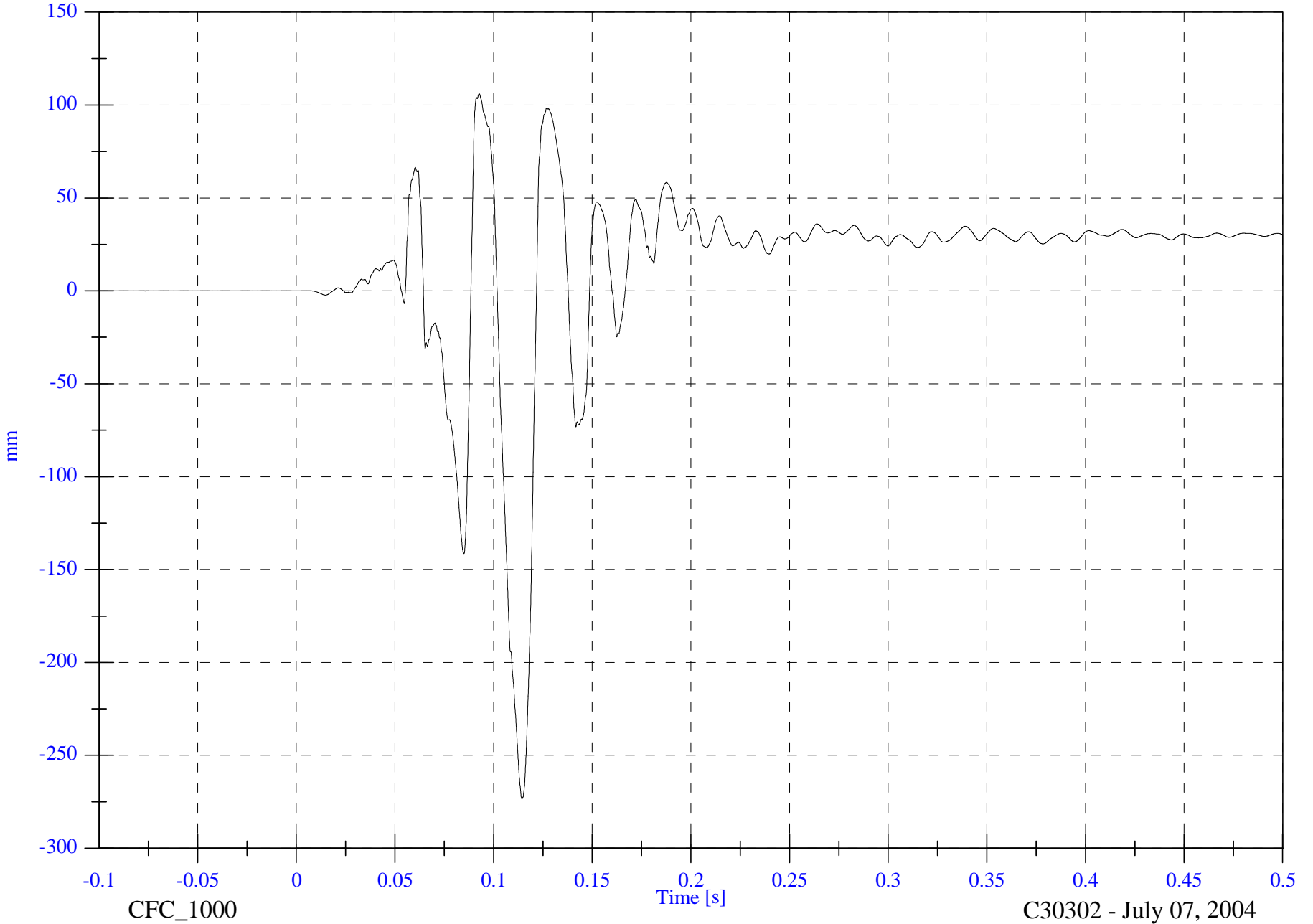
P3 Left Seat X Displacement

Max: 106.1 [mm] at 0.093 [s]

Min: -273.5 [mm] at 0.114 [s]

B-135

8655-F301-23R



mm

Time [s]

CFC_1000

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

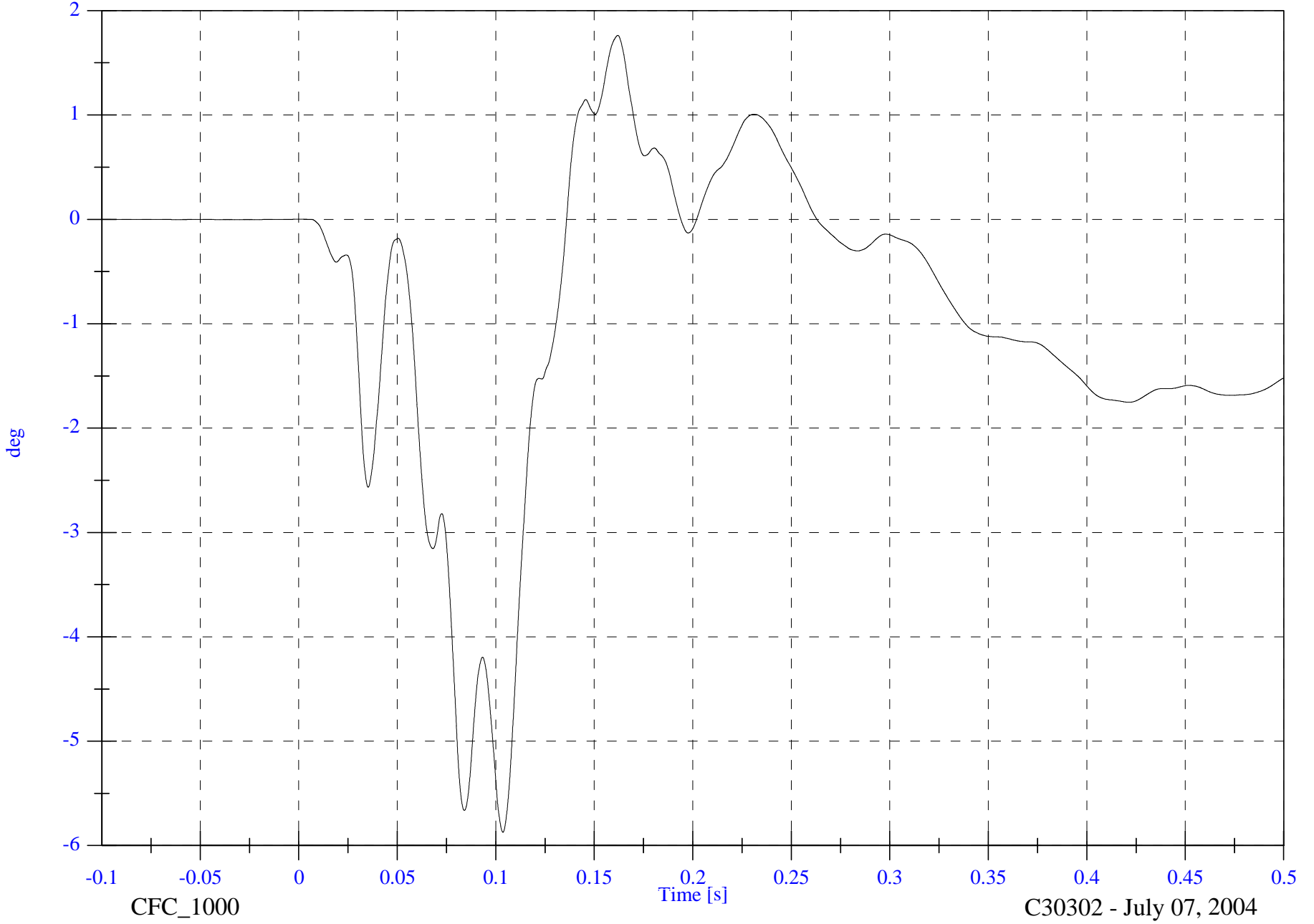
P3 Right Change in Seat Back Angle WRT Sill

Max: 1.8 [deg] at 0.162 [s]

Min: -5.9 [deg] at 0.104 [s]

B-136

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

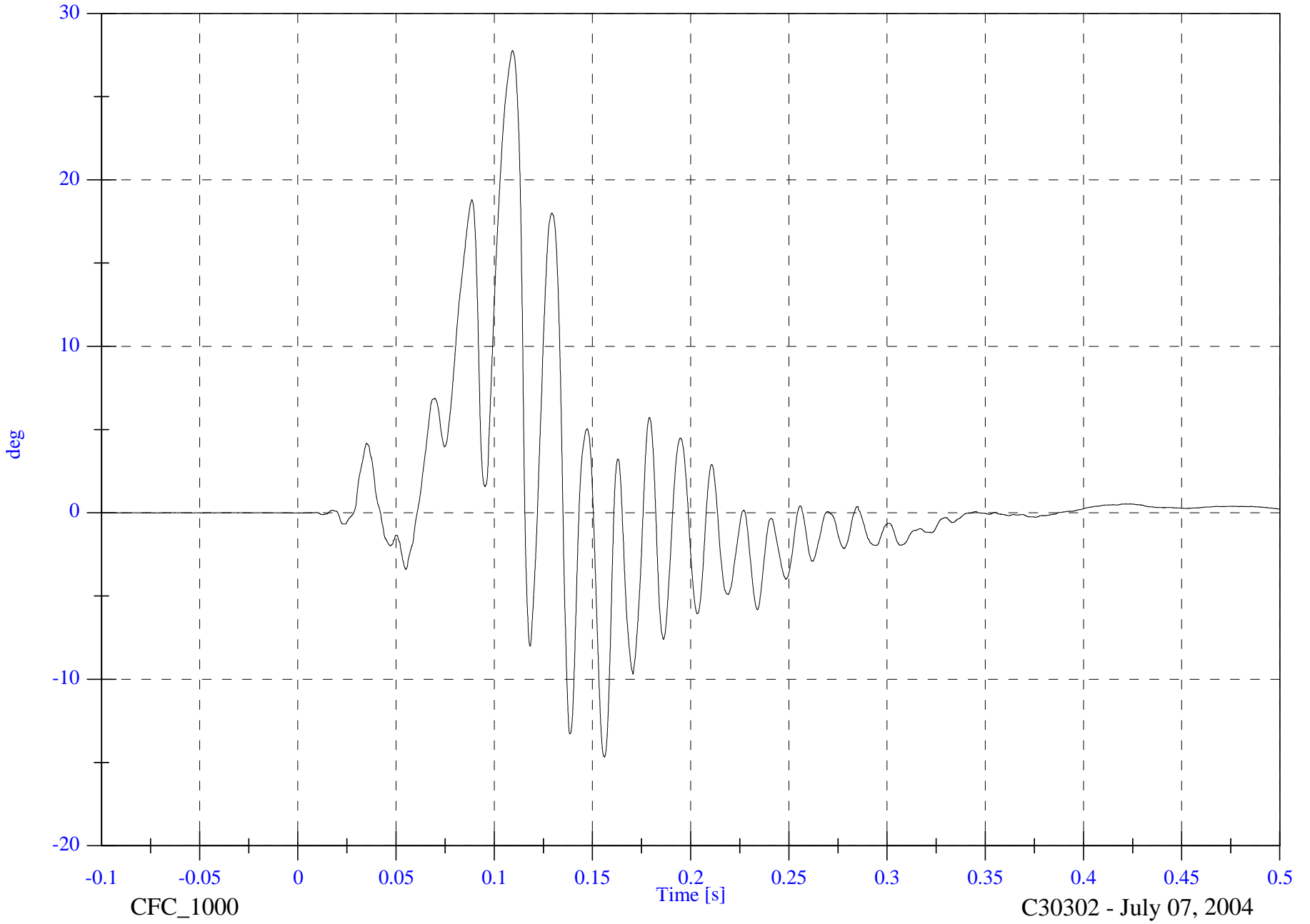
P3 Right Change in String Angle

Max: 27.8 [deg] at 0.109 [s]

Min: -14.7 [deg] at 0.156 [s]

B-137

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004

FMVSS301 Test 9 - 2004 Jeep Liberty

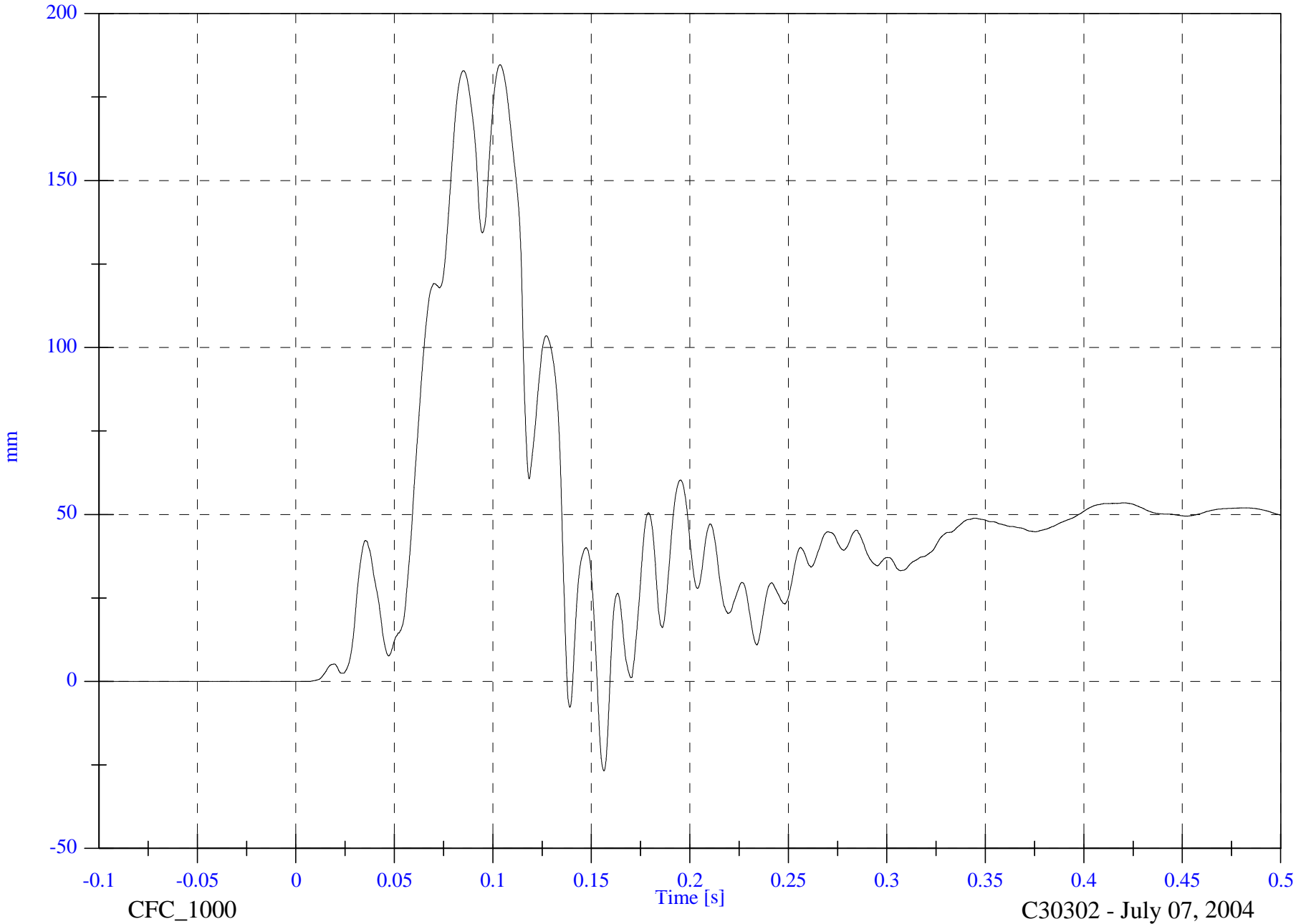
P3 Right Seat X Displacement

Max: 184.7 [mm] at 0.104 [s]

Min: -26.8 [mm] at 0.156 [s]

B-138

8655-F301-23R



CFC_1000

Time [s]

C30302 - July 07, 2004