

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

DAIMLERCHRYSLER CORPORATION
2002 JEEP LIBERTY
SUV

NHTSA NUMBER: R20404

GDAIS TEST NUMBER: 8757-V301-02

October 26, 2004

GENERAL DYNAMICS
ADVANCED INFORMATION ENGINEERING SERVICES
P.O. BOX 400
BUFFALO, NEW YORK 14225



FINAL REPORT

PREPARED FOR:

U.S. Department of Transportation
Volpe National Transportation Systems Center
Office of Safety and Security
55 Broadway
Cambridge, MA 02142

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Prepared By:

Lawrence Q. Valvo, Project Engineer

Approved By:

David J. Travale, Program Manager
Transportation Sciences Center

Approval Date:

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16. Abstract The purpose of this test is to evaluate the seat and occupant performance in moderate-to-high speed rear impacts. This test was performed following the OVSC Laboratory Test Procedure No. TP-301-03, dated February 28, and was modified as follows: - 2 fully instrumented Hybrid III ATDs were positioned in the left front seat (P1) and right rear seat (P3) in place of ballast ATDs. - 2 door mounted high speed cameras were installed. - 4 seatback frame and 1 front sill MHDs were installed. - 4 vehicle accelerometers were installed. - VRTC seatback translation device was installed. The ATDs were positioned following TP208-12 with the following exceptions: - Seatbacks for positions that contained a 50th percentile male were set to 25 degrees $\pm$ 1 degree as measured with the SAE J826 manikin. - Seats that contained a 5th percentile female were placed in a fore-aft position that allowed for the best high speed camera occupant view. If the 5th percentile female was located in the P1 occupant position, the arms were positioned following TP208-12 S16.3.3.3 (against the seat cushion instead of on the steering wheel). - Moveable head restraints for seats that contained a 5th percentile female were set full forward and closest to, but not less than, 750 mm as measured from the SAE J826 manikin hip pivot point to the top of the head restraint along the torso line.					
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SECTION 1

PURPOSE OF TEST

This 30 mph rear impact dynamic seat test was performed on a 2002 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 2035.0 kg 2002 Jeep Liberty SUV was impacted from the rear by an 1797 kg moving barrier at a velocity of 47.15 kph (29.3 mph). The test was performed by Advanced Information Engineering Services on October 26, 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:

- Instrumented 50th percentile male Part 572E Hybrid III ATDs were positioned in the left front driver seat (P1) and the right rear passenger seat (P3) in place of ballast ATDs.
- 2 high speed cameras were installed on the vehicle front doors.
- 4 front seatback frame MHDs and 1 front sill MHDs were 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.

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 3-14 and 3-15 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	22.3	29.0	110.4	0.14	0.20	0.03	0.00	20.4	-43.3	18.2	-3.7	-209.6	-695.1
P3	9.4	8.5	95.9	0.16	0.19	0.07	0.01	18.0	-36.9	29.3	-3.7	-1173.1	-1394.6

The P1 seatback frame was deformed rearward and the adjustment mechanism remained operable. The seat back reclined statically 13.6 degrees from its pre-test position. The P3 seatback frame was deformed rearward and the adjustment mechanism remained operable. The seat back reclined statically 1.4 degrees from its pre-test position.

Electronic data anomalies are summarized below.

Channel Number	Sensor Type	Sensor Location	Sensor Attachment (name)	Axis	Problem
33	AC	P3	HDCG (Head CG)	ZL	Wire failed in adapter plug
34	AV	P3	HDCG (Head CG)	YL	Possible wire strain failure at sensor, data invalid after 295 ms

SECTION 3

TEST DATA

DATA SHEET 1

TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2002 Jeep Liberty SUV

NHTSA No.: R20404 ; Color: Silver

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

- Power Windows; - Power Door Locks; X Tilt Wheel

Date Received: 9/29/2004 ; Odometer Reading 51470 km

Selling Dealer: West Herr Chrysler-Jeep

& Address: 3599 Southwestern Blvd., Orchard Park, NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: DaimlerChrysler Corporation

Date of Manufacture: 1-02

VIN: 1J4GL48142W243220

GVWR: 2359 kg; GAWR-FRONT: 1248 kg; GAWR-REAR: 1339 kg

DATA FROM VEHICLE'S TIRE LABEL:

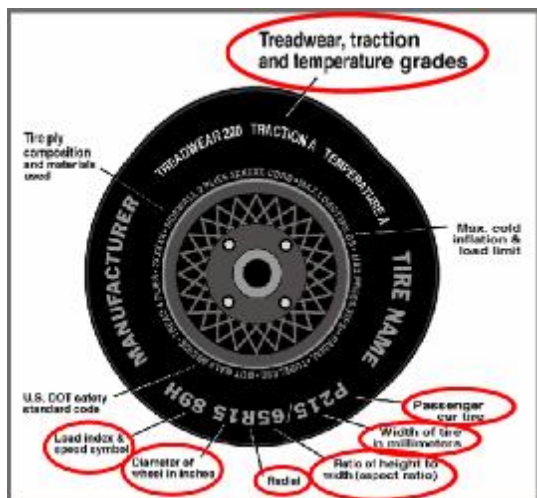
Location of Placard on Vehicle: Driver Door

Recommended Tire Size: P215/75R16

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

Type of Spare Tire: P215/75R16 mounted on rear gate

DATA FROM TIRE SIDEWALL:



Size of Tires on Test Vehicle: P215/75R16

Manufacturer and Model: Goodyear Wrangler ST

Maximum Cold Tire Pressure: 300 kPa

Load Index and Speed Symbol: 101S

Treadwear Grade: 340

Traction Grade: A

Temperature Grade: B

*Tire pressure used for test.

DATA SHEET 2

VEHICLE DATA

VEHICLE CAPACITY DATA:

Type of Front Seats:	-	Bench;	X	Bucket;	-	Split Bench
Number of Occupants:	2	Front;	3	Rear;	5	Total
Vehicle Capacity Weight (VCW) =			630			kg
No. of Occupants x 68.04 kg =			340.2			kg
Rated Cargo/Luggage Weight (RCLW) =			289.8			kg *

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

Right Front =	457.5	kg	Right Rear =	408.5	kg
Left Front =	470.0	kg.	Left Rear =	423.0	kg
TOTAL FRONT =	927.5	kg	TOTAL REAR =	831.5	kg
TOTAL DELIVERED WEIGHT =	1759	kg			
% of Total Front of Vehicle Weight =	52.7%		of Total Rear Weight =	47.3%	

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	1759.0	kg
Rated Cargo/Luggage Weight (RCLW)	=	289.8	kg
Weight of 2 p.572 Dummies, 74.4 kg	=	148.8	kg
TARGET TEST WEIGHT	=	2197.6	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 127.2 KG OF CARGO WEIGHT:

Right Front =	515.5	kg	Right Rear =	482.5	kg
Left Front =	534.0	kg	Left Rear =	503.0	kg
TOTAL FRONT =	1049.5	kg	TOTAL REAR =	985.5	kg
TOTAL TEST WEIGHT =	2035	kg			
% of Total Front of Vehicle Weight =	51.6%		of Total Rear Weight =	48.4%	

* Weight of Ballast Secured in Vehicle = 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	837	LF	841	RR	853	LR	852
AS TESTED:	RF	810	LF	811	RR	830	LR	828
Vehicle's Wheel Base:		2640						mm

Location of Vehicle's C.G.: 1278 millimeters rearward of front wheel center.

* Maximum of 136.1 kg used for target weight calculation.

† The test weight of FMVSS301 Compliance Vehicle C30302, 2003 Jeep Liberty, was used as target weight (2035.5 kg).

DATA SHEET 2 (continued)

VEHICLE DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°
Test Date: October 26, 2004 Time: 12:56 Temperature: 21.1 °C
Vehicle NHTSA No.: R20404 VIN: 1J4GL48142W243220
Required Impact Velocity Range: 46.51 to 48.12 kph

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

Trap No. 1 = 47.15 kph; Trap No. 2 = 47.15 kph
Average Impact Speed = 47.15 kph

VEHICLE STATIC CRUSH:

Vehicle Length:

Pre-Test	Left =	<u>4187</u>	; C/L =	<u>4440</u>	Right =	<u>4187</u>
Post-Test	Left =	<u>4092</u>	; C/L =	<u>4170</u>	Right =	<u>4085</u>
Crush	Left =	<u>95</u>	; C/L =	<u>270</u>	Right =	<u>102</u>
AVERAGE	=	<u>156</u>	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

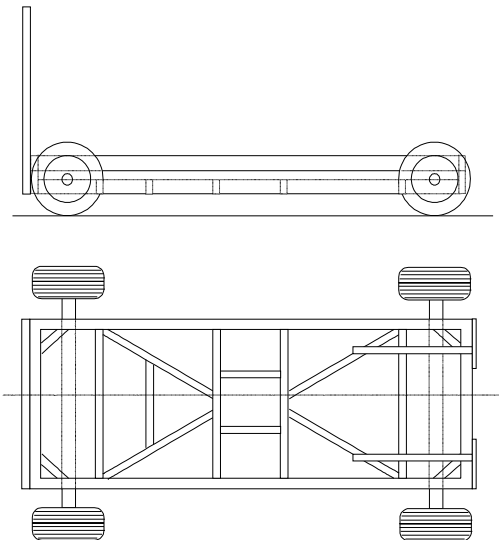
Model: AT Radial Rover

Size: P205/75R15

Recommended Max Pressure: 240 kPa:

MOVING BARRIER ABORT SYSTEM:

Type: Trailing cable



DATA SHEET 4

SEAT DATA

P1 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>
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>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)

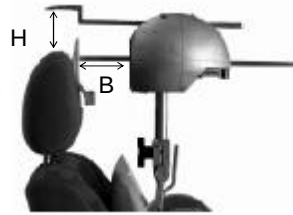
SEAT DATA

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	DETAILS	
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:	51	60	25.0	793
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:	51	60	25.0	793
Head restraint positioning details:	None			

P3 DATA:

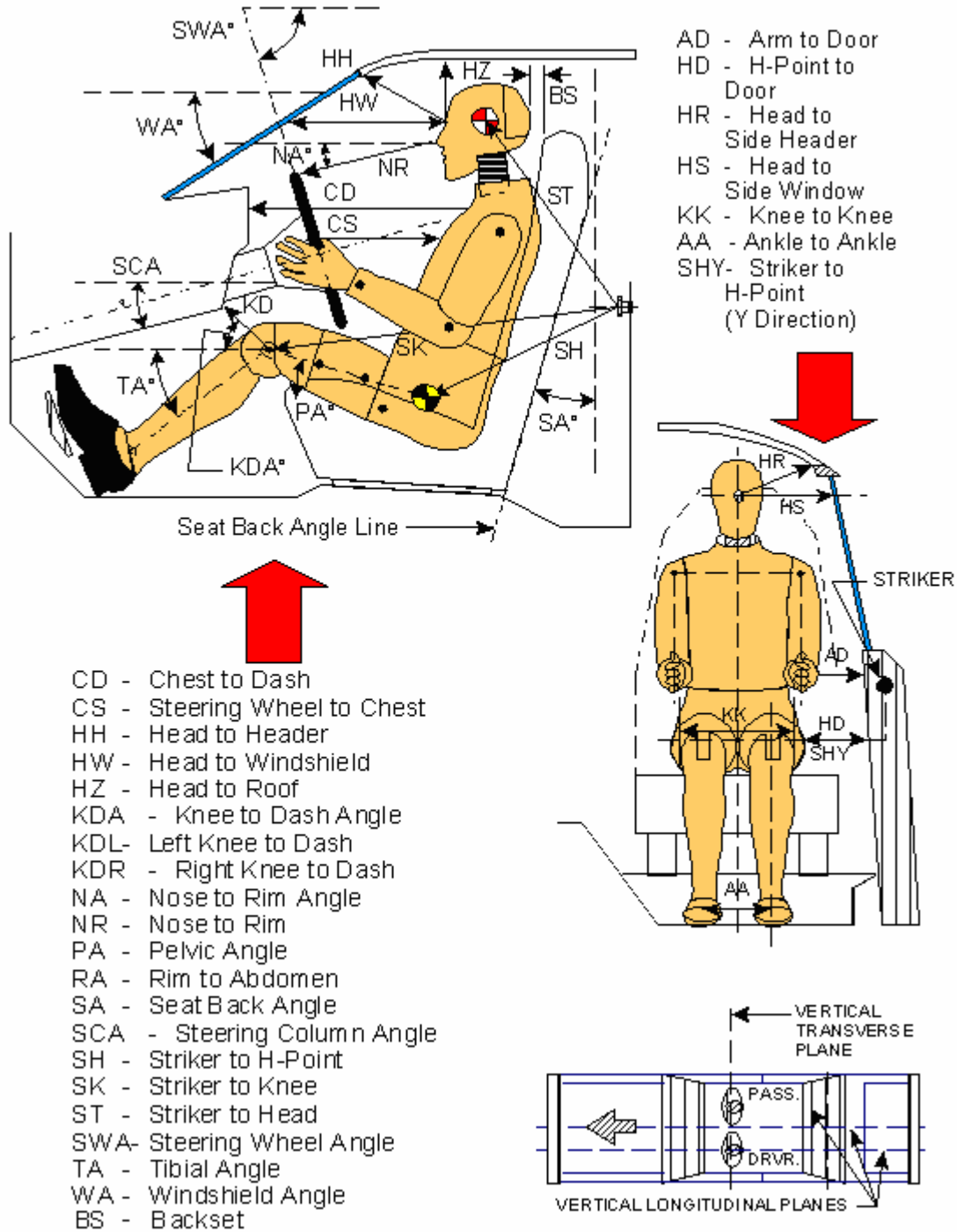
ICBC MEASUREMENTS

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:	86	40	24.6	841
Full Down / Fixed:	76	99	24.6	776
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:	86	40	24.6	841
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	43.2 deg.			N/A		
SWA ^o	66.3 deg.			N/A		
SCA ^o	23.7 deg.			N/A		
SA ^o	25.0 deg. (H-point machine back pan)			24.6 deg. (H-point machine back pan)		
HZ	215			302		
HH	428			1288		
HW	550			1446		
HR	184			241		
NR	414	Angle	17 deg.	N/A		
CD	515			1416		
CS	290			N/A		
RA	185			N/A		
KDL	136	Angle (KDA)	5 deg.	1005		
KDR	134			1005	Angle (KDA)	3 deg.
PA ^o	24.8 deg.			25.0 deg.		
TA ^o	61.2 deg.			61.5 deg.		
KK	365			312		
AA	251			160		
ST	604	Angle	5 deg.	402	Angle	12 deg.
SK	589	Angle	86 deg.	625	Angle	104 deg.
SH	214	Angle	104 deg.	338	Angle	136 deg.
SHY	200			210		
HS	332			350		
HD	192			149		
AD	84			88		
BS*	64			110		

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

DATA SHEET 7

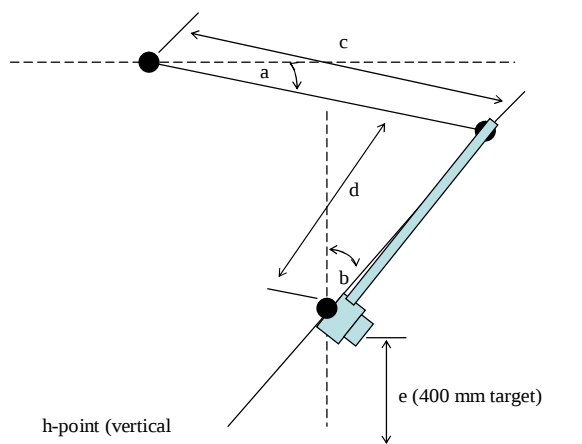
VEHICLE AND SEAT INSTRUMENTATION MEASUREMENTS

VEHICLE INSTRUMENTATION					
LOCATION	TRANSDUCER TYPE	DIRECTION OF MEASURE	PRE-TEST DIMENSIONS (mm) *		
			X	Y	Z
Left Rear Seat Cross Member	Accelerometer	X	1905	-680	-465
Left Rear Seat Cross Member Redundant	Accelerometer	X	1905	-680	-465
Right Rear Seat Cross Member Redundant	Accelerometer	X	1905	680	-465
Right Rear Seat Cross Member	Accelerometer	X	1905	680	-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 (continued)

VEHICLE AND SEAT INSTRUMENTATION MEASUREMENTS



DIMENSION	P1 LEFT	P1 RIGHT	P3 LEFT	P3 RIGHT
a (deg from horiz.)	39.5	39.5	30.5	29.7
b (deg from vertical)	24.2	24.5	26	25.7
c (mm)	282	291	376	373
d (mm)	376	372	365	373
e (mm, target=400)	340	337	366	373

SEATBACK ANGLE	P1		P3	
	PRE (deg)	POST (deg)	PRE (deg)	POST (deg)
Left MDH Bracket	21.4	32.7	24.7	21.8
Right MHD Bracket	21.7	36.1	24.4	23.8
Front Sill	-0.5	-1.2	-0.6	-1.0

POST TEST DETAILS

Seatback Deformation: The P1 seatback frame immediately above the adjustment mechanism deformed rearward. The P1 seat back reclined 13.6 degrees statically from its pre-test position. The P3 seatback frame deformed (reclined) rearward 1.4 degrees statically from its pre-test position.

Seat/Floor Attachment Point Deformation: None

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

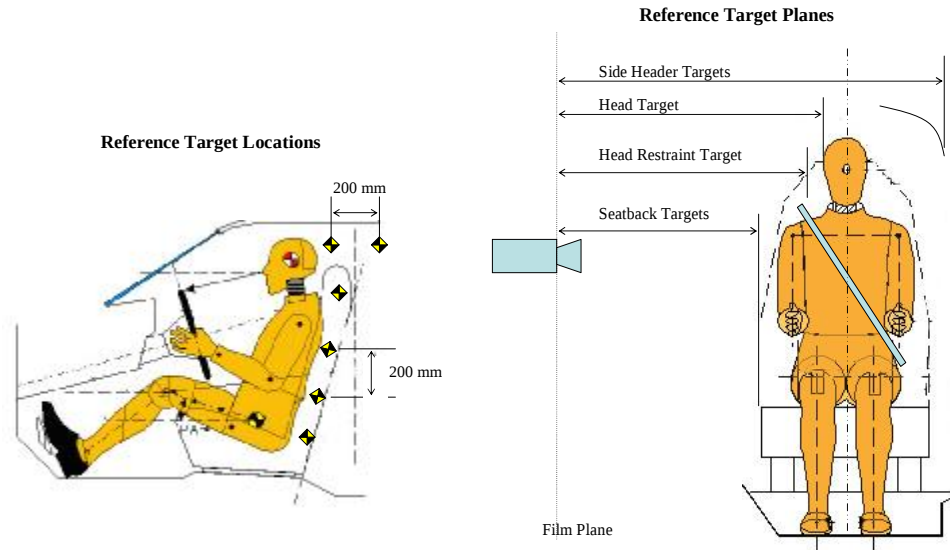
Comments: None

DATA SHEET 8

REFERENCE TARGET MEASUREMENTS

NHTSA No. : R20404

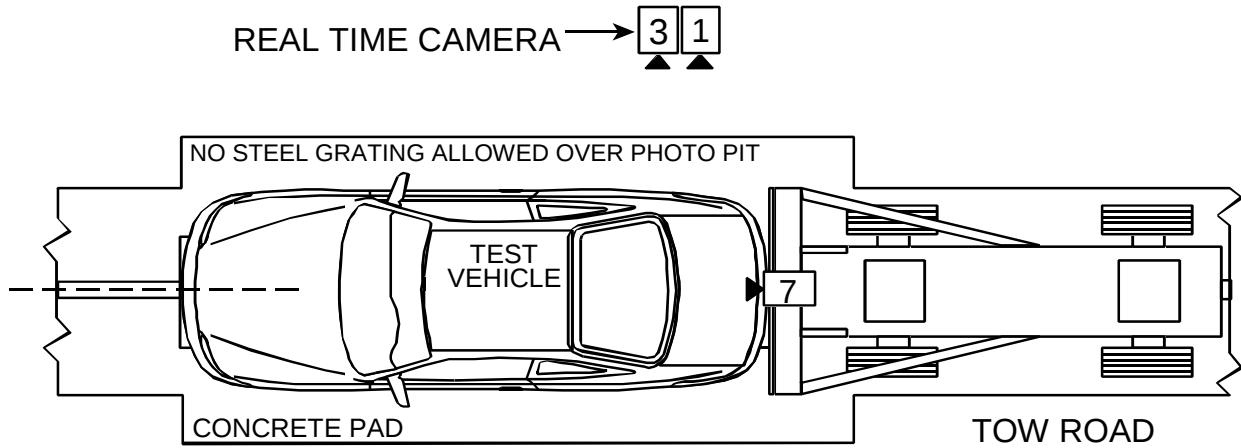
Vehicle : 2002 Jeep Liberty SUV



Film Plane to Reference Plane Distance		
Plane	Front Occupant View (mm)	Rear Occupant View (mm)
Seatback	1091	
Head Restraint	1251	1235
Head Target	1281	1275
Side Header	1488	1460

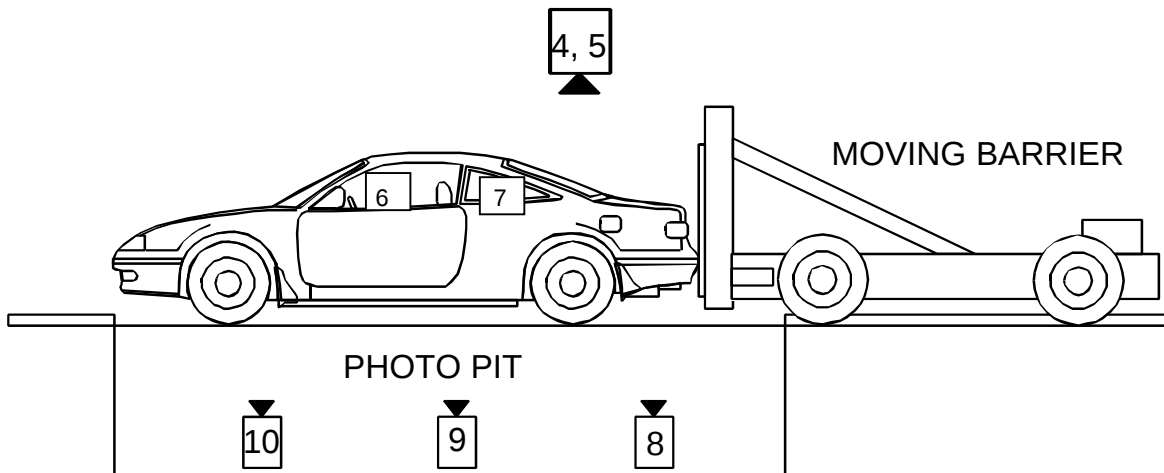
DATA SHEET 9

HIGH SPEED CAMERA LOCATIONS



2

TOP VIEW



LEFT SIDE VIEW

DATA SHEET 9 (continued)

HIGH SPEED CAMERA LOCATIONS

NHTSA No. : R20404

Vehicle : 2002 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	10566	2160	1160	-1	13	1005
3	Right Side View	6121	1860	1115	-2	25	1010
4	Onboard Driver	935	2410	1245	-12	8	1000
5	Onboard Passenger	965	1520	1245	-11	8	1005
6	Overhead Overall View	0	620	4880	90	8	1005
7	Overhead Close View	0	360	4880	90	12.5	1000
8	Left Side Video	9703	2770	1165	-3	28	1000
9	Right Side Video	7468	2770	1195	-4	28-70	1000
10	Driver/Interior Video	4039	3440	1630	-5	50	1000
11	Driver and Passenger Right Side Close Video	5258	920	1545	-3	28-70	1000

- * X = film plant 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.

DATA SHEET 10

FUEL SYSTEM PERFORMANCE

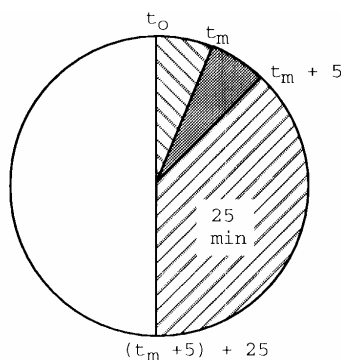
TEST VEHICLE NHTSA NO.: R20404 TEST DATE: October 26, 2004
 Vehicle Mfgr./Make/Model: 2002 Jeep Liberty SUV

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 70.0 liters
 Usable Capacity Figure Furnished by COTR = 70.0 liters
 Test Volume Range (91 to 94% of Usable Capacity) = 63.7 to 65.8 liters
 ACTUAL TEST VOLUME= 64.35 liters (with entire fuel system filled)
 Test Fluid Type: Stoddard Solution Test Fluid Color: Orange
 Test Fluid Specific Gravity: 0.764 Test Fluid Kinematic Viscosity: 0.96 centistokes
 Type of Vehicle Fuel Pump: Electric
 Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF: When the ignition is switched on without starting the engine, the fuel pump operates briefly then shuts off.
 Details of Fuel System: Fuel filler is located on the left rear quarter panel aft of the rear axle; Fuel tank is located on the vehicle underbody rear of the rear axle; Fuel lines are routed along the left side of the vehicle underbody.

TEST VEHICLE IMPACT TYPE: Rear Moving Barrier (42.31 kph target velocity)

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For five minute period after vehicle motion ceases
3. For next 25 minutes

ACTUAL	MAX ALLOWED
0	28 g
0	28 g.
0	28 g/min.

SOLVENT SPILLAGE DETAILS:

None

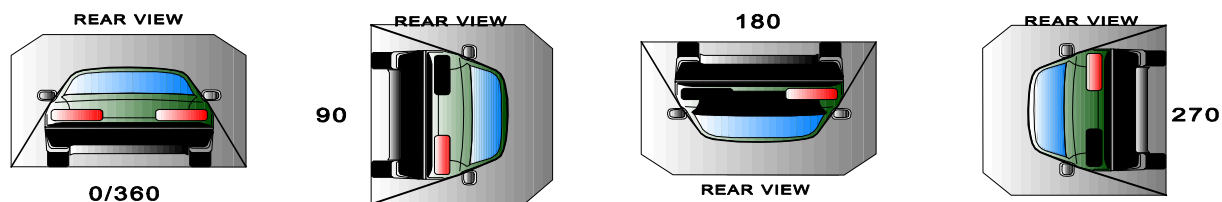
DATA SHEET 10 (continued)

FUEL SYSTEM PERFORMANCE

STATIC ROLLOVER DATA SHEET

Vehicle: 2002 Jeep Liberty SUV

NHTSA No.: R20404



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	4	seconds	5	minutes	6	minutes	4	seconds	7	minutes
90° - 180°	1	minutes	9	seconds	5	minutes	6	minutes	9	seconds	7	minutes
180°-270°	1	minutes	8	seconds	5	minutes	6	minutes	8	seconds	7	minutes
270°-360°	1	minutes	5	seconds	5	minutes	6	minutes	5	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	-
90° - 180°	0	0	0	-
180°-270°	0	0	0	-
270°-360°	0	0	0	-

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

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

Appendix A
PHOTOGRAPHS

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Figure A-1 DRIVER ICBC BACKSET VIEW



Figure A-2 PASSENGER ICBC BACKSET VIEW



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

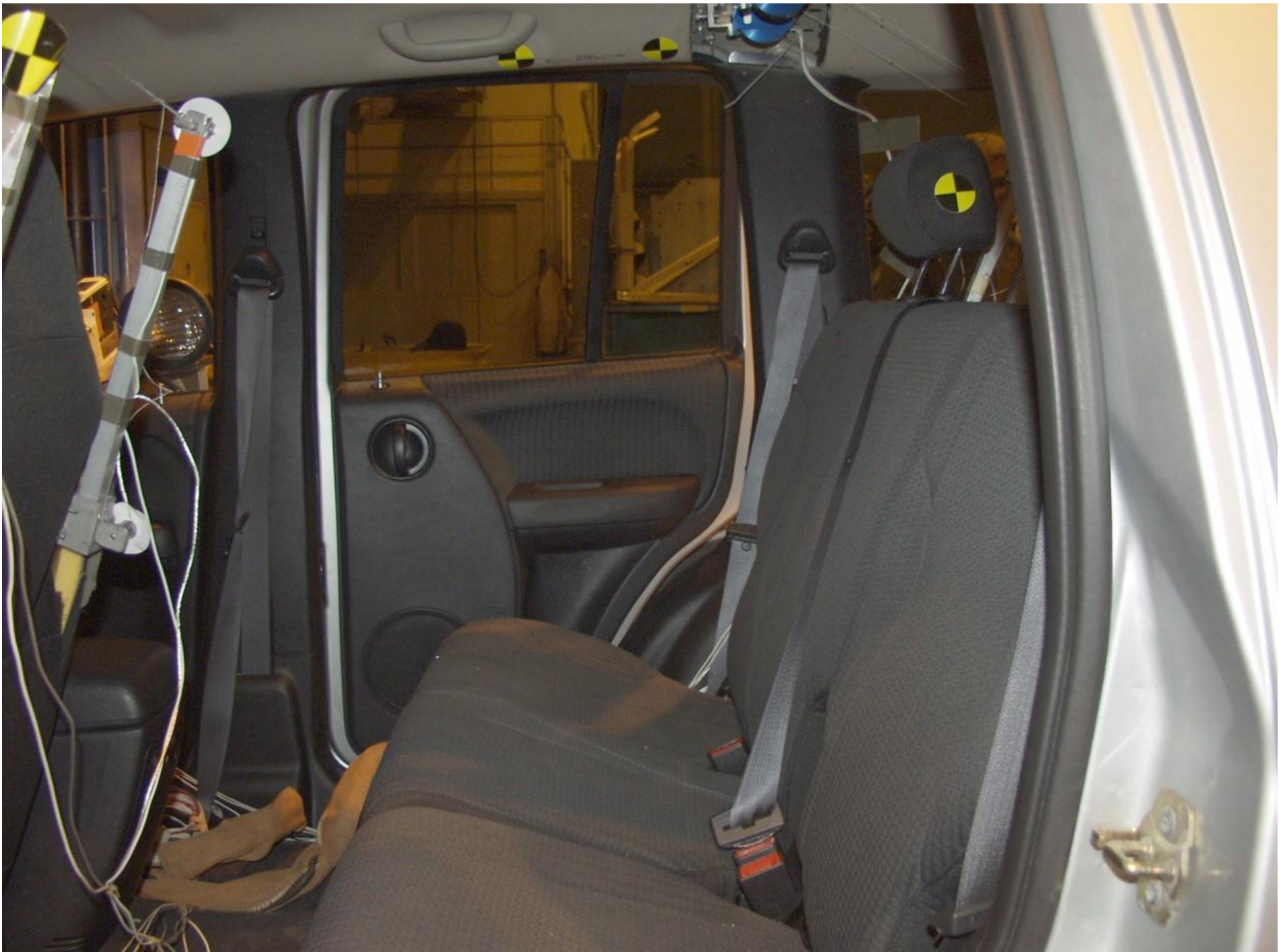




Figure A-9 PRE-TEST PASSENGER SEAT CLOSE-UP VIEW



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



A-13

8757-V301-02

Figure A-11 PRE-TEST PASSENGER SEAT PERPENDICULAR VIEW



Figure A-12 POST-TEST PASSENGER SEAT PERPENDICULAR VIEW



Figure A-13 PRE-TEST DRIVER LEFT SIDE VIEW



Figure A-14 POST-TEST DRIVER LEFT SIDE VIEW



Figure A-16 POST-TEST DRIVER RIGHT SIDE VIEW



Figure A-17 PRE-TEST DRIVER ISOMETRICAL VIEW



Figure A-18 POST-TEST DRIVER ISOMETRICAL VIEW



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



Figure A-23 PRE-TEST PASSENGER ISOMETRICAL VIEW



Figure A-24 POST-TEST PASSENGER ISOMETRICAL VIEW



Figure A-25 PRE-TEST FRONT VIEW



Figure A-26 POST-TEST FRONT VIEW



Figure A-27 PRE-TEST LEFT SIDE VIEW



Figure A-28 POST-TEST LEFT SIDE VIEW



Figure A-29 PRE-TEST RIGHT SIDE VIEW



Figure A-30 POST-TEST RIGHT SIDE VIEW



Figure A-31 PRE-TEST REAR VIEW



Figure A-32 POST-TEST REAR VIEW



Figure A-33 PRE-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-34 POST-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-35 PRE-TEST RIGHT REAR THREE-QUARTER VIEW



Figure A-36 POST-TEST RIGHT REAR THREE-QUARTER VIEW



A-39

8757-V301-02

Figure A-37 PRE-TEST FRONT UNDERBODY VIEW



Figure A-38 POST-TEST FRONT UNDERBODY VIEW



Figure A-39 PRE-TEST REAR UNDERBODY VIEW



Figure A-40 POST-TEST REAR UNDERBODY VIEW

MFD BY DAIMLERCHRYSLER
CORPORATION

DATE OF MFR
1-02

GVWR
2359 KG(05200 LB)

GAWR FRONT
1248 KG(2750 LB) WITH TIRES
P215/75SR16

RIMS AT
16X7

COLD
227 KPA(33 PSI)

GAWR REAR
1339 KG(2950 LB) WITH TIRES
P215/75SR16

RIMS AT
16X7

COLD
227 KPA(33 PSI)

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

VIN: 1J4GL48142W243220

TYPE:

MPV

SINGLE X DUAL



MDH:

012409 384AA PNT:PS2

VEHICLE MADE IN U.S.A. TRM:M5DU 4648503

Figure A-41 CERTIFICATION PLACARD

MFD BY DAIMLERCHRYSLER
CORPORATION

DATE OF MFR
1-02

GVWR
2359 KG(05200 LB)

GAWR FRONT
1248 KG(2750 LB) WITH TIRES
P215/75SR16

RIMS AT
16X7

COLD
227 KPA(33 PSI)

GAWR REAR
1339 KG(2950 LB) WITH TIRES
P215/75SR16

RIMS AT
16X7

COLD
227 KPA(33 PSI)

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

VIN: 1J4GL48142W243220

TYPE:

MPV

SINGLE X DUAL



MDH:

012409 384AA PNT:PS2

VEHICLE MADE IN U.S.A. TRM:M5DU 4648503

Figure A-42 TIRE PLACARD



Figure A-43 ROLLOVER 90°



Figure A-44 ROLLOVER 180°



Figure A-45 ROLLOVER 270°



Figure A-46 ROLLOVER 360°

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

TEST NO. R20404

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: October 26, 2004
TEST#: C42222-1002-2163
TITLE: VOLPE 301 Test 2 - 2002 Jeep Liberty R20404

P1 Head

P1 HIC(15 ms): 71.2

t1: 117.7 msec

t2: 132.7 msec

Duration: 15.0 msec

Average Acceleration: 29.5 g

P1 HIC(36 ms): 110.4

t1: 105.6 msec

t2: 141.6 msec

Duration: 36.0 msec

Average Acceleration: 24.8 g

P1 Upper Neck

P1 UP NECK Fx: Max: 379.4 N 125.9 msec

Min: -240.6 N 317.1 msec

P1 UP NECK Fz: Max: 974.5 N 114.0 msec

Min: -15.1 N 374.4 msec

P1 UP NECK Mocy (50th Male)

Max: 14.0 N-m 336.8 msec

Min: -18.0 N-m 148.4 msec

P1 UP NECK Nij (50th Male)

Ntf: 0.14 Nij 120.9 msec CVt: 6806; CVf: 310

Fz: 955.4 N

Fx: 300.5 N

Mocy: 1.3 N-m

Nte: 0.20 Nij 112.7 msec CVt: 6806; CVe: 135

Fz: 928.8 N

Fx: 145.5 N

Mocy: -8.2 N-m

Ncf: 0.03 Nij 362.5 msec CVc: 6160; CVf: 310

Fz: -1.6 N

Fx: -132.9 N

Mocy: 10.4 N-m

Nce: 0.00 Nij -0.0 msec CVc: 6160; CVe: 135

Fz: -1.6 N

Fx: 0.2 N

Mocy: -0.0 N-m

P1 Chest

P1 CLIP(3 ms): 18.2 g

t1: 76.6 msec

t2: 79.6 msec

Duration: 3.0 msec

P1 CSI: 43.4

P1 CHEST DISP: Max: 0.1 mm 49.5 msec

Min: -3.7 mm 311.6 msec

P1 Femur

P1 LEFT FEMUR: Max: 3067.0 N 74.0 msec

Min: -209.6 N 64.5 msec

P1 RIGHT FEMUR: Max: 1374.1 N 84.0 msec

Min: -695.1 N 73.3 msec

FACILITY: VERF DATE: October 26, 2004
TEST#: C42222-1002-2163
TITLE: VOLPE 301 Test 2 - 2002 Jeep Liberty R20404

P3 Head

P3 HIC(15 ms): 74.4
t1: 85.8 msec
t2: 100.8 msec
Duration: 15.0 msec
Average Acceleration: 30.1 g

P3 HIC(36 ms): 95.9
t1: 80.2 msec
t2: 105.1 msec
Duration: 24.9 msec
Average Acceleration: 27.2 g

P3 Upper Neck

P3 UP NECK Fx: Max: 381.1 N 95.9 msec
Min: -275.1 N 218.5 msec

P3 UP NECK Fz: Max: 761.1 N 88.2 msec
Min: -167.1 N 48.5 msec

P3 UP NECK Mocy (50th Male)
Max: 20.5 N-m 228.3 msec
Min: -22.8 N-m 115.4 msec

P3 UP NECK Nij (50th Male)

Ntf: 0.16 Nij 93.2 msec CVt: 6806; CVf: 310
Fz: 710.9 N
Fx: 357.1 N
Mocy: 16.3 N-m

Nte: 0.19 Nij 115.4 msec CVt: 6806; CVe: 135
Fz: 165.4 N
Fx: -112.7 N
Mocy: -22.8 N-m

Ncf: 0.07 Nij 232.5 msec CVc: 6160; CVf: 310
Fz: -57.6 N
Fx: -262.0 N
Mocy: 20.3 N-m

Nce: 0.01 Nij 452.4 msec CVc: 6160; CVe: 135
Fz: -18.6 N
Fx: 19.9 N
Mocy: -1.2 N-m

P3 Chest

P3 CLIP(3 ms): 29.3 g
t1: 52.6 msec
t2: 55.6 msec
Duration: 3.0 msec
P3 CSI: 74.7

P3 CHEST DISP: Max: 0.0 mm 140.0 msec
Min: -3.7 mm 283.3 msec

P3 Femur

P3 LEFT FEMUR: Max: 280.5 N 158.2 msec
Min: -1173.1 N 56.8 msec

P3 RIGHT FEMUR: Max: 253.8 N 147.8 msec
Min: -1394.6 N 57.4 msec

Maximum and Minimum Data

NAME	Unit	Max	msec	Min	msec	Comment
V2P1 Head x	g	29.1	126.7	-6.5	318.1	
V2P1 Head y	g	2.0	102.5	-4.4	141.2	
V2P1 Head z	g	16.6	114.3	-0.1	-87.6	
V2P1 Head Resultant	g	31.2	126.8	-	-	
V2P1 Head AVy	deg/s	1401.3	109.0	-931.9	220.2	
V2P1 Head Comp AVy	deg/s	1489.9	109.2	-935.5	222.1	f2=0.283 Hz; f4=0.001 Hz
V2P1 Head Comp ADy	deg	68.0	128.1	-37.8	335.6	f2=0.283 Hz; f4=0.001 Hz
V2P1 Upper Neck Fx	N	379.4	125.9	-240.6	317.1	
V2P1 Upper Neck Fy	N	66.7	112.7	-93.2	140.2	
V2P1 Upper Neck Fz	N	974.5	114.0	-15.1	374.4	
V2P1 Upper Neck F Resultant	N	1005.3	120.2	-	-	
V2P1 Upper Neck Mx	N-m	4.3	89.9	-4.0	152.0	
V2P1 Upper Neck My	N-m	13.8	127.5	-18.8	148.4	
V2P1 Upper Neck Mz	N-m	4.8	236.2	-9.8	154.0	
V2P1 Upper Neck M Resultant	N-m	21.3	148.7	-	-	
V2P1 Lower Neck Fx	N	847.9	121.2	-191.5	295.5	
V2P1 Lower Neck Fy	N	66.9	58.4	-108.7	124.4	
V2P1 Lower Neck Fz	N	774.3	110.1	-86.2	499.9	
V2P1 Lower Neck F Resultant	N	1107.3	113.7	-	-	
V2P1 Lower Neck Mx	N-m	12.1	103.2	-18.3	143.4	
V2P1 Lower Neck My	N-m	48.3	328.2	-172.7	120.2	
V2P1 Lower Neck Mz	N-m	17.1	328.7	-76.8	120.4	
V2P1 Lower Neck M Resultant	N-m	189.1	120.3	-	-	
V2P1 Lower Neck x	g	21.0	56.0	-4.5	307.9	
V2P1 Chest x	g	18.6	78.2	-4.0	306.8	
V2P1 Chest y	g	2.1	55.5	-1.8	94.5	
V2P1 Chest z	g	7.3	70.7	-1.9	113.1	
V2P1 Chest Resultant	g	19.4	56.3	-	-	
V2P1 Chest Displacement	mm	0.1	49.5	-3.7	311.6	
V2P1 Chest AVy	deg/s	599.7	90.9	-354.4	178.2	
V2P1 Chest Comp AVy	deg/s	618.8	91.5	-332.1	249.0	f2=0.298 Hz; f4=0.001 Hz
V2P1 Chest Comp ADy	deg	26.4	143.1	-17.4	338.3	f2=0.298 Hz; f4=0.001 Hz
V2P1 Pelvic x	g	33.1	70.9	-4.6	147.9	
V2P1 Pelvic y	g	3.7	80.7	-3.8	89.6	
V2P1 Pelvic z	g	12.8	69.8	-2.7	112.0	
V2P1 Pelvic Resultant	g	34.9	71.0	-	-	
V2P1 Left Femur	N	3067.0	74.0	-209.6	64.5	
V2P1 Right Femur	N	1374.1	84.0	-695.1	73.3	
V2P1 Head to Chest	deg	20.4	335.1	-43.3	125.7	
V2 Driver Lap Belt	N	224.8	170.9	-37.9	69.8	
V2 Driver Belt Spoolout	mm	0.0	-36.8	-103.0	136.5	

Maximum and Minimum Data (Continued)

NAME	Unit	Max	msec	Min	msec	Comment
V2P3 Head x	g	33.5	96.2	-7.1	213.8	
V2P3 Head y	g	5.6	119.1	-6.2	71.4	
V2P3 Head z	g	4.5	350.6	-23.0	289.1	Transducer failed
V2P3 Head Resultant	g	33.7	96.2	-	-	Head Az transducer failed
V2P3 Head AVy	deg/s	1525.7	67.9	-965.0	127.2	Questionable after 295 ms
V2P3 Head Comp AVy	deg/s	1566.4	68.1	-917.7	127.6	f2=0.287 Hz; f4=0.001 Hz
V2P3 Head Comp ADy	deg	44.5	89.6	-69.0	499.9	f2=0.287 Hz; f4=0.001 Hz
V2P3 Upper Neck Fx	N	381.1	95.9	-275.1	218.5	
V2P3 Upper Neck Fy	N	73.9	117.9	-187.6	71.4	
V2P3 Upper Neck Fz	N	761.1	88.2	-167.1	48.5	
V2P3 Upper Neck F Resultant	N	811.7	91.6	-	-	
V2P3 Upper Neck Mx	N-m	3.8	69.0	-12.0	95.9	
V2P3 Upper Neck My	N-m	25.5	95.9	-24.8	116.0	
V2P3 Upper Neck Mz	N-m	15.9	133.5	-10.1	79.5	
V2P3 Upper Neck M Resultant	N-m	28.2	95.9	-	-	
V2P3 Lower Neck Fx	N	908.1	93.2	-271.8	200.8	
V2P3 Lower Neck Fy	N	177.5	96.2	-229.2	64.6	
V2P3 Lower Neck Fz	N	479.7	63.2	-378.0	49.8	
V2P3 Lower Neck F Resultant	N	941.9	93.2	-	-	
V2P3 Lower Neck Mx	N-m	22.9	119.8	-40.7	70.3	
V2P3 Lower Neck My	N-m	74.7	227.0	-127.7	93.2	
V2P3 Lower Neck Mz	N-m	14.8	97.2	-13.9	60.0	
V2P3 Lower Neck M Resultant	N-m	128.3	93.2	-	-	
V2P3 Lower Neck x	g	31.7	53.0	-4.2	265.0	
V2P3 Chest x	g	29.8	54.0	-3.7	261.7	
V2P3 Chest y	g	5.8	87.4	-3.9	63.6	
V2P3 Chest z	g	8.7	55.6	-3.0	70.7	
V2P3 Chest Resultant	g	31.0	54.2	-	-	
V2P3 Chest Displacement	mm	0.0	140.0	-3.7	283.3	
V2P3 Chest AVy	deg/s	314.0	75.7	-208.4	175.1	
V2P3 Chest Comp AVy	deg/s	321.5	76.0	-209.5	177.3	f2=0.308 Hz; f4=0.001 Hz
V2P3 Chest Comp ADy	deg	9.8	109.4	-8.5	274.6	f2=0.308 Hz; f4=0.001 Hz
V2P3 Pelvic x	g	36.6	58.9	-3.7	155.5	
V2P3 Pelvic y	g	3.4	78.4	-5.4	55.6	
V2P3 Pelvic z	g	17.0	58.0	-5.1	186.2	
V2P3 Pelvic Resultant	g	40.2	58.5	-	-	
V2P3 Left Femur	N	280.5	158.2	-1173.1	56.8	
V2P3 Right Femur	N	253.8	147.8	-1394.6	57.4	
V2P3 Head to Chest	deg	71.3	499.9	-36.9	87.0	Questionable after 295 ms
V2 RFP Lap Belt	N	1407.5	152.1	-37.4	46.1	

Maximum and Minimum Data (Continued)

NAME	Unit	Max	msec	Min	msec	Comment
V2 Left X Member x	g	31.6	26.4	-1.9	113.7	
V2 Left X Member RED x	g	31.7	26.4	-1.8	117.2	
V2 Right X Member x	g	39.4	26.4	-5.7	32.8	
V2 Right X Member RED x	g	37.9	26.4	-4.2	32.7	
V2 Left Front Sill AVy	deg/s	64.5	26.1	-166.7	71.5	
V2 Left Front Sill Comp AVy	deg/s	64.7	26.1	-169.0	71.5	f2=0.283 Hz; f4=0.001 Hz
V2 Left Front Sill Comp ADy	deg	0.3	34.7	-2.1	248.7	f2=0.283 Hz; f4=0.001 Hz
V2P1 Left Seat AVy	deg/s	632.9	60.8	-213.3	157.9	
V2P1 Left Seat Comp AVy	deg/s	651.5	60.8	-185.5	159.6	f2=0.374 Hz; f4=0.001 Hz
V2P1 Left Seat Comp ADy	deg	20.7	104.6	0.0	11.0	f2=0.374 Hz; f4=0.001 Hz
V2P1 Right Seat AVy	deg/s	549.1	62.7	-309.2	164.3	
V2P1 Right Seat Comp AVy	deg/s	568.9	62.7	-277.3	164.4	f2=0.337 Hz; f4=0.001 Hz
V2P1 Right Seat Comp ADy	deg	27.3	119.2	0.0	9.4	f2=0.337 Hz; f4=0.001 Hz
V2P1 Left Link ADy	deg	31.5	90.8	-2.3	48.0	
V2P1 Right Link ADy	deg	36.3	102.6	-8.4	47.1	
V2P1 Left Span Bar D	mm	370.2	109.9	0.0	-17.3	
V2P1 Right Span Bar D	mm	418.2	118.3	0.0	-59.2	
V2P3 Left Seat AVy	deg/s	983.6	69.3	-1052.0	74.1	
V2P3 Left Seat Comp AVy	deg/s	988.8	69.4	-1046.3	74.1	f2=0.3 Hz; f4=0.001 Hz
V2P3 Left Seat Comp ADy	deg	7.8	101.9	-3.5	60.1	f2=0.3 Hz; f4=0.001 Hz
V2P3 Right Seat AVy	deg/s	369.4	31.5	-403.7	43.6	
V2P3 Right Seat Comp AVy	deg/s	372.4	31.6	-400.9	43.6	f2=0.396 Hz; f4=0.001 Hz
V2P3 Right Seat Comp ADy	deg	6.9	99.4	-0.4	52.5	f2=0.396 Hz; f4=0.001 Hz
V2P3 Left Link ADy	deg	36.7	81.7	-22.8	121.2	
V2P3 Right Link ADy	deg	20.2	100.2	-8.8	48.1	
V2P3 Left Span Bar Displacement	mm	197.5	101.5	0.0	-66.7	
V2P3 Right Span Bar Displacement	mm	132.2	99.7	0.0	-87.9	
P1 Left Change in Seat Back Angle	deg	22.3	104.8	0.0	12.0	
P1 Left Change in String Angle	deg	10.6	90.8	-5.9	48.6	
P1 Left Seat X Displacement	mm	225.6	110.0	-3.4	31.6	
P1 Right Change in Seat Back Angle	deg	29.0	118.8	0.0	12.0	
P1 Right Change in String Angle	deg	9.3	69.3	-12.1	47.3	
P1 Right Seat X Displacement	mm	227.9	102.8	-21.1	47.1	

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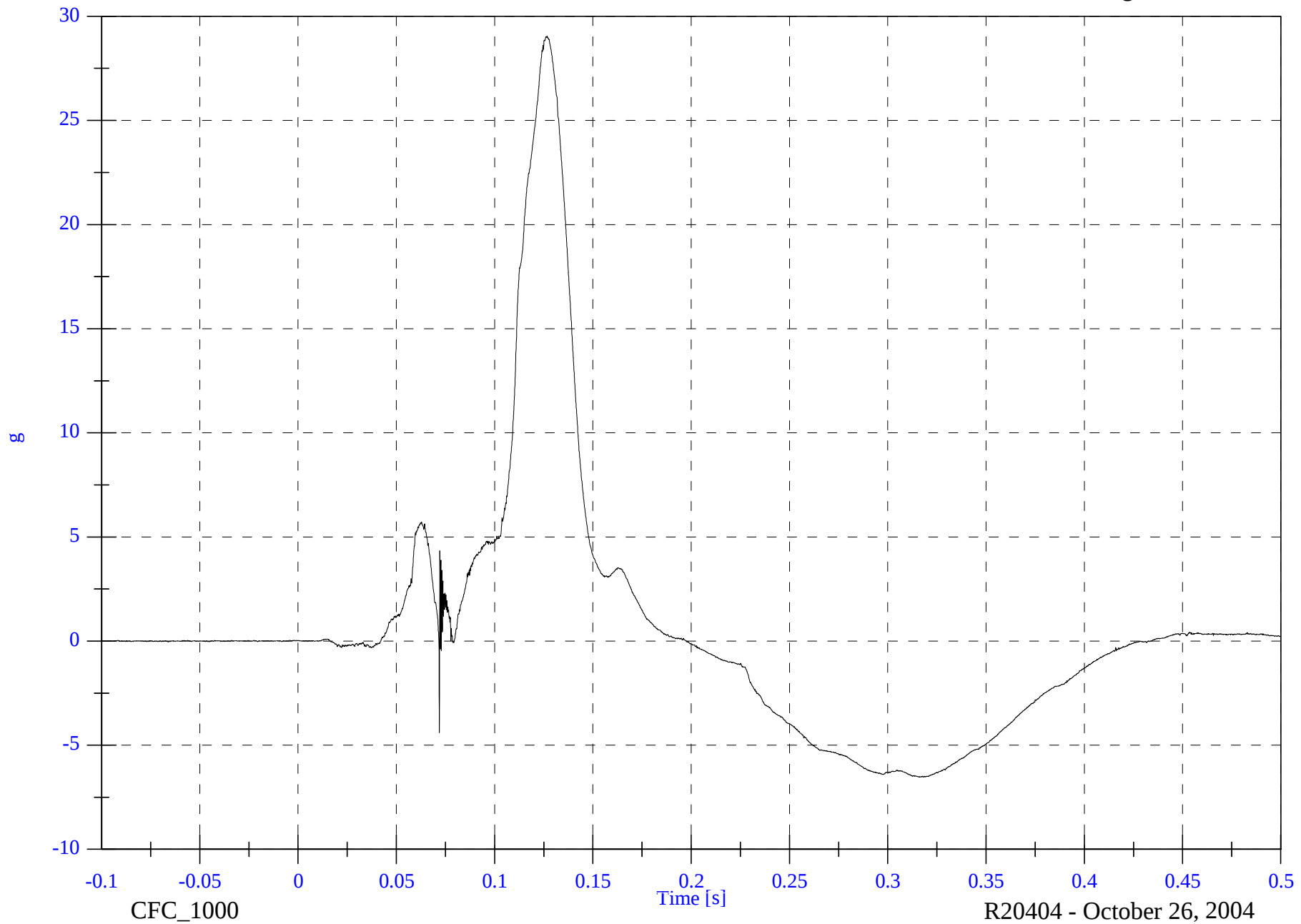
V2P1 Head x

Max: 29.1 [g] at 0.127 [s]

Min: -6.5 [g] at 0.318 [s]

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8757-V301-02

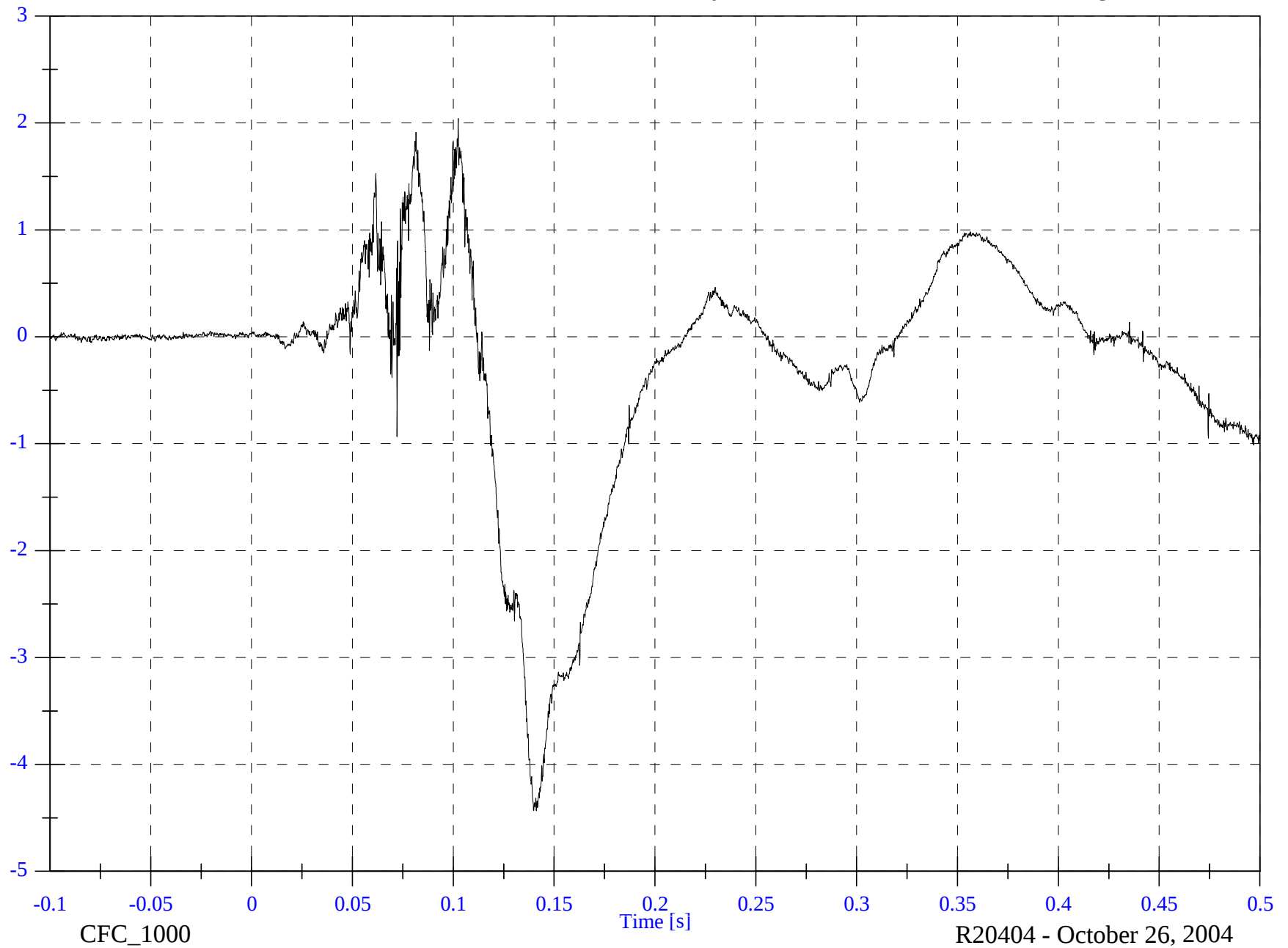


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V2P1 Head y

Max: 2.0 [g] at 0.102 [s]

Min: -4.4 [g] at 0.141 [s]



B-12

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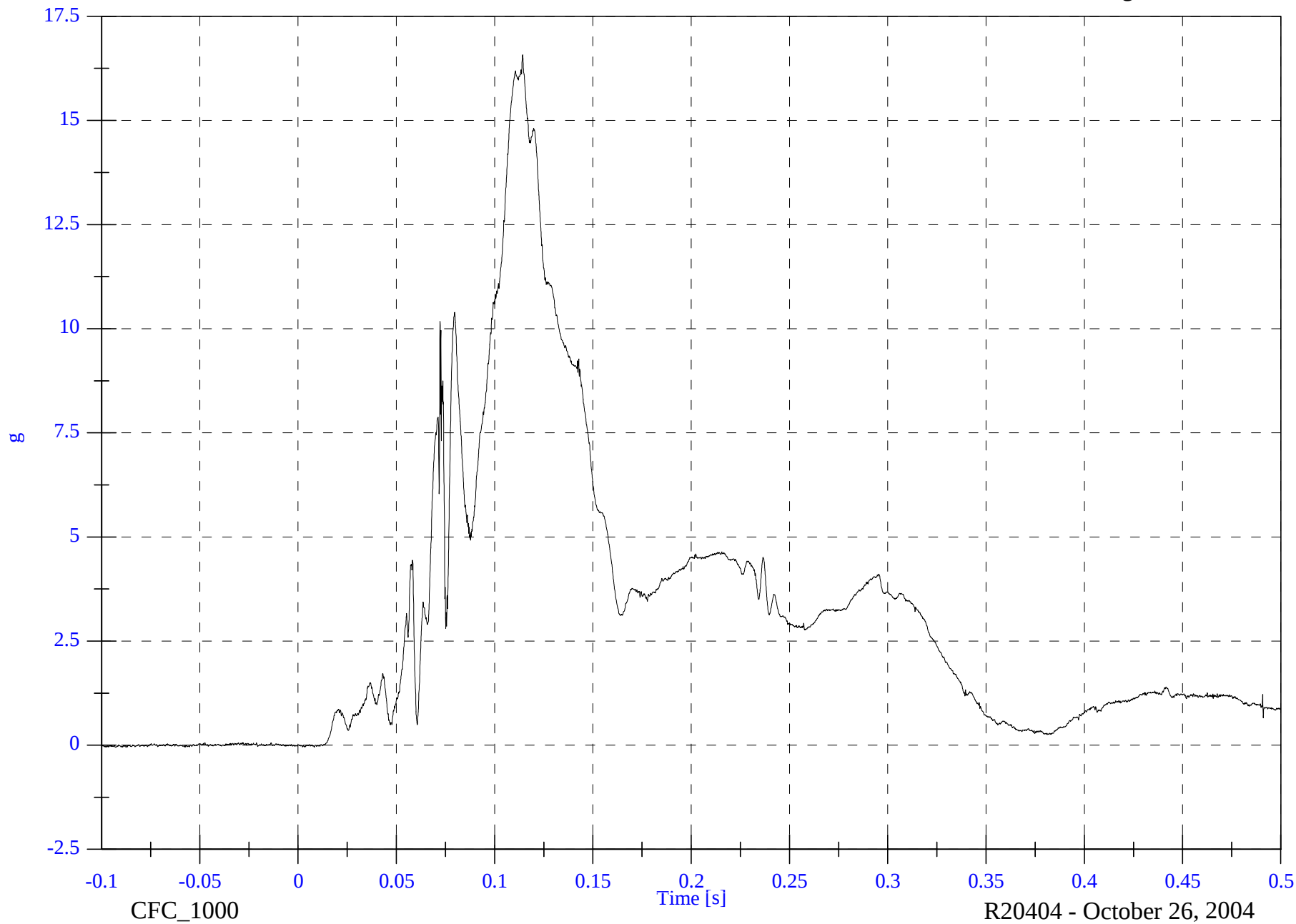
V2P1 Head z

Max: 16.6 [g] at 0.114 [s]

Min: -0.1 [g] at -0.088 [s]

B-13

8757-V301-02

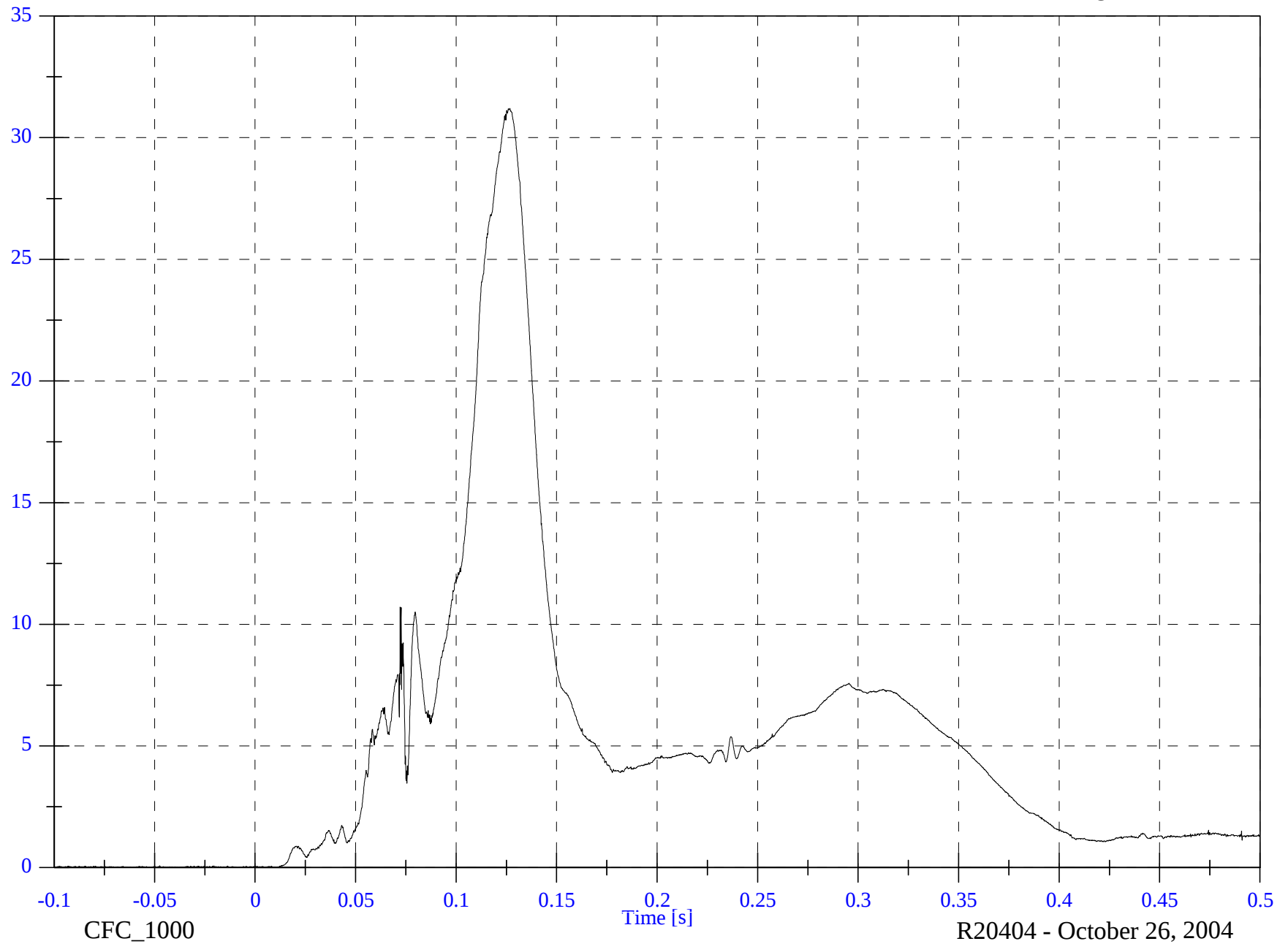


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V2P1 Head Resultant

Max: 31.2 [g] at 0.127 [s]

Min: 0.0 [g] at -0.038 [s]



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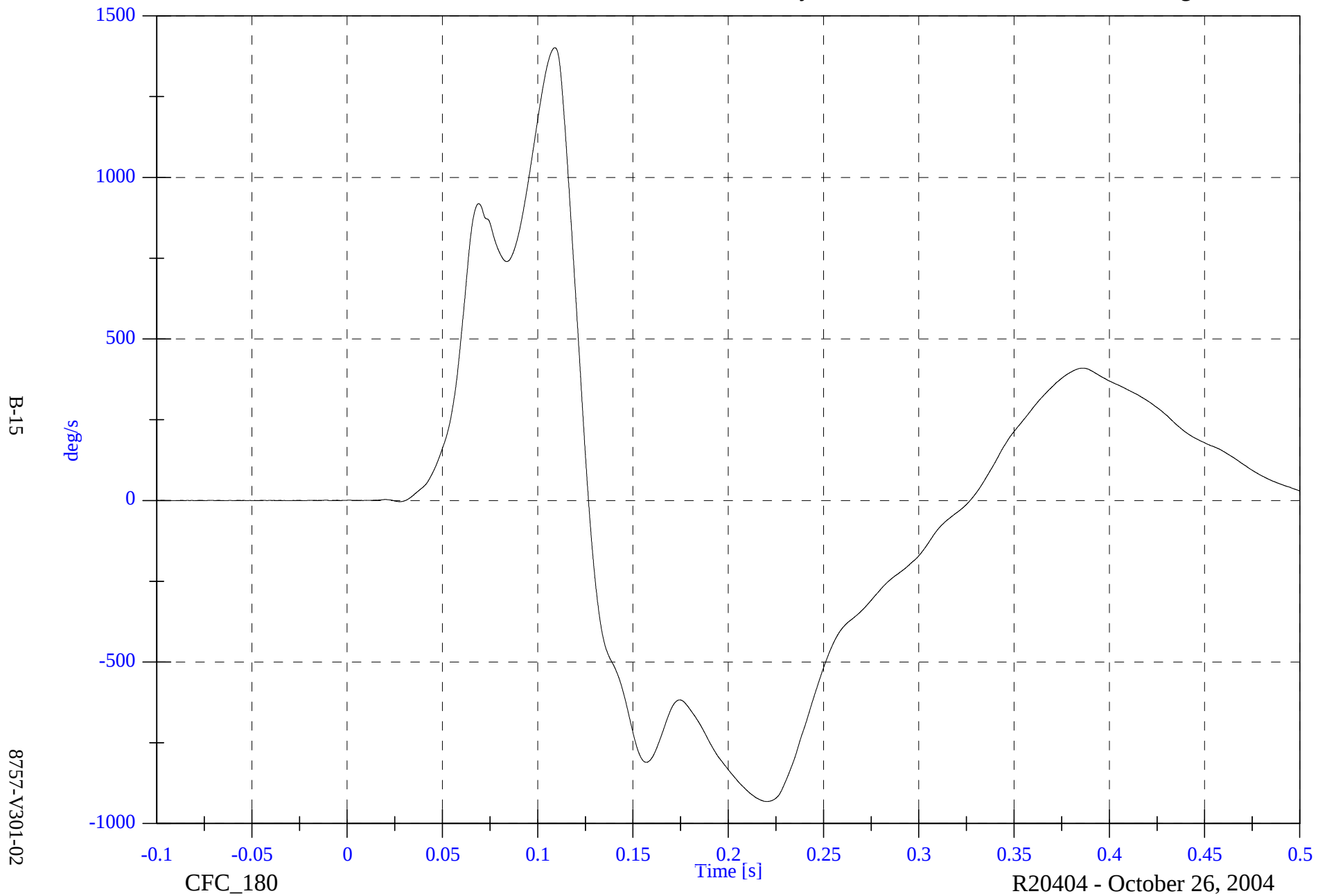
8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Head AVy

Max: 1401.3 [deg/s] at 0.109 [s]

Min: -931.9 [deg/s] at 0.220 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

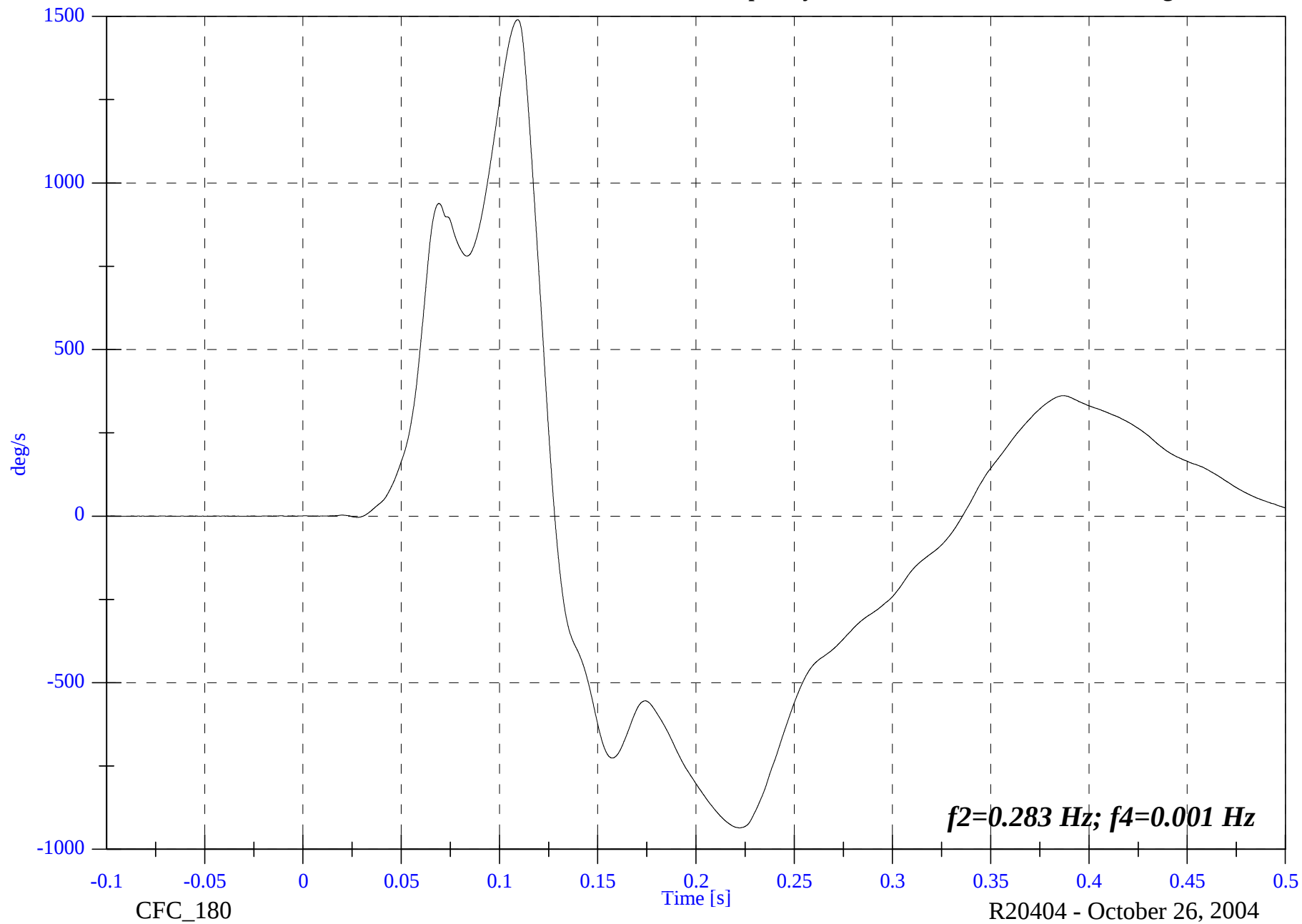
V2P1 Head Comp AVy

Max: 1489.9 [deg/s] at 0.109 [s]

Min: -935.5 [deg/s] at 0.222 [s]

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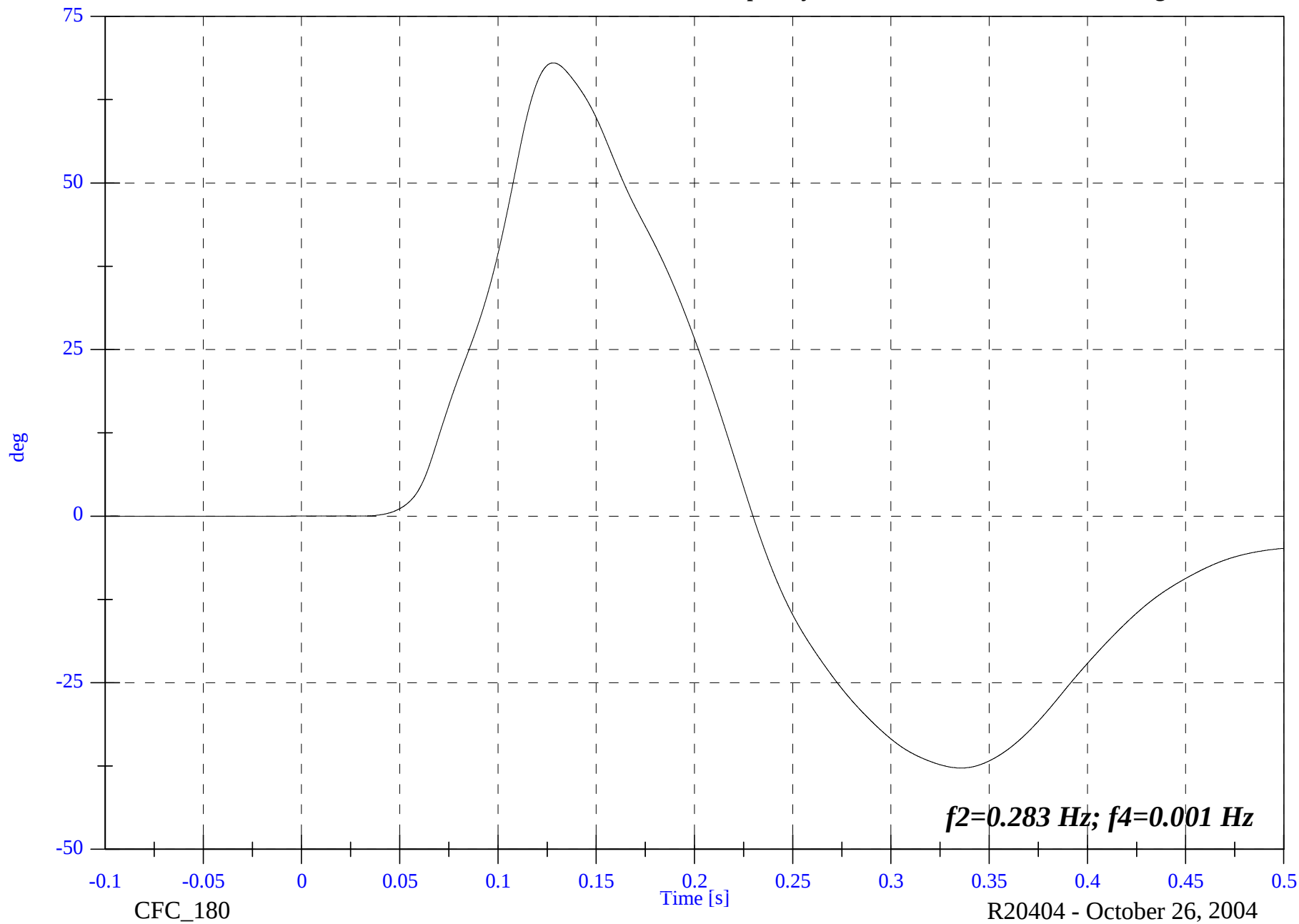
V2P1 Head Comp ADy

Max: 68.0 [deg] at 0.128 [s]

Min: -37.8 [deg] at 0.336 [s]

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8757-V301-02



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V2P1 Upper Neck Fx

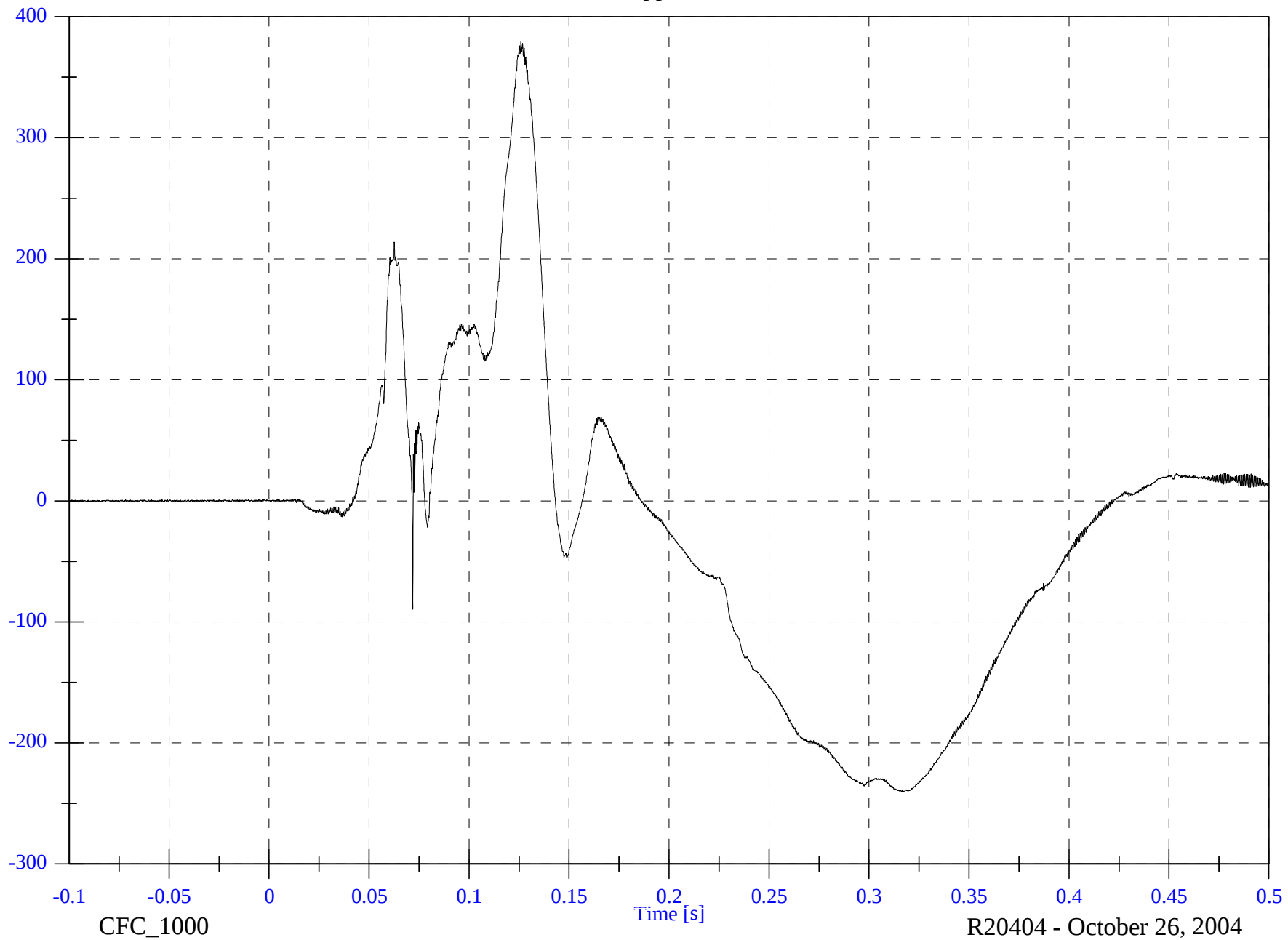
Max: 379.4 [N] at 0.126 [s]

Min: -240.6 [N] at 0.317 [s]

B-18

N

8757-V301-02

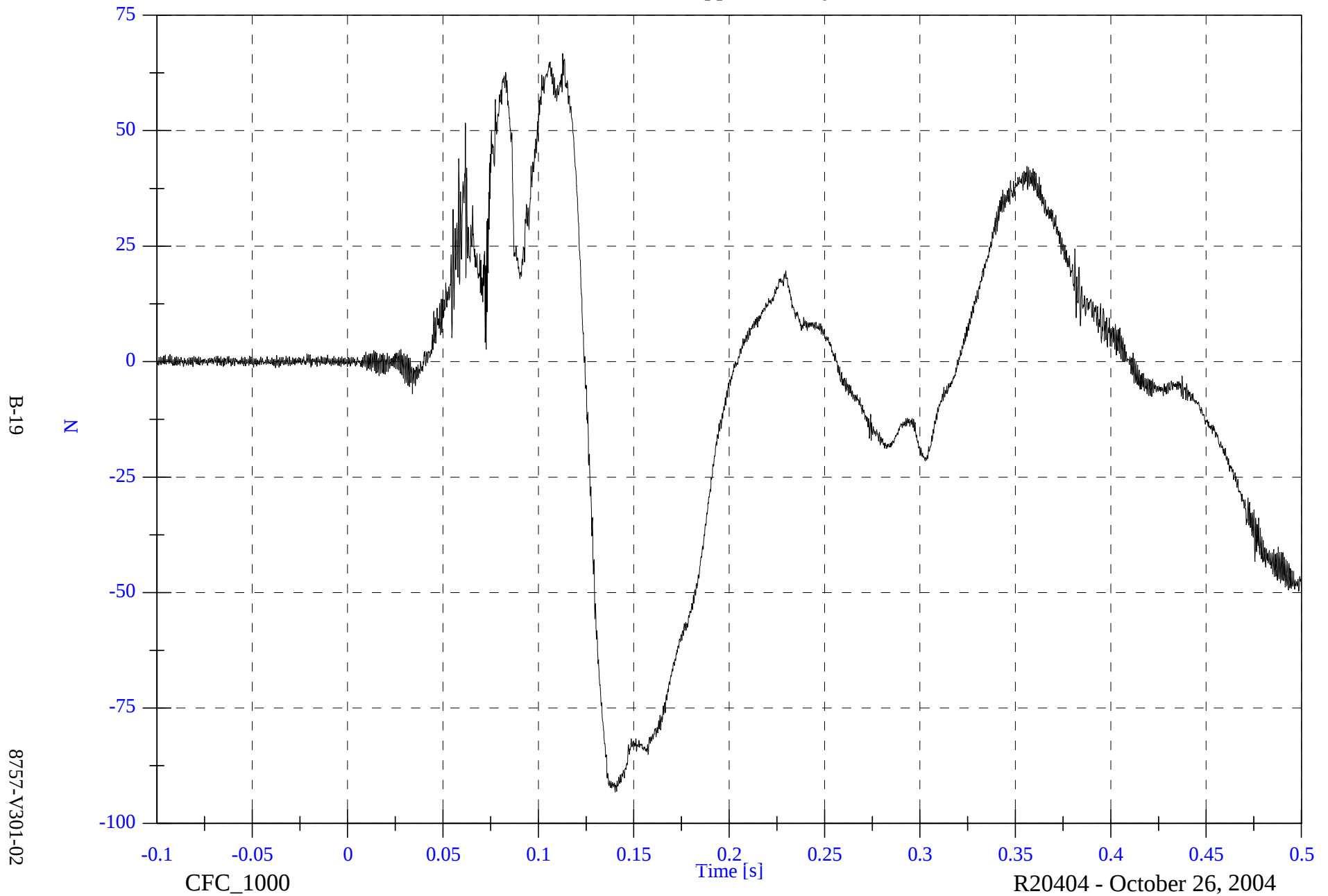


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Upper Neck Fy

Max: 66.7 [N] at 0.113 [s]

Min: -93.2 [N] at 0.140 [s]

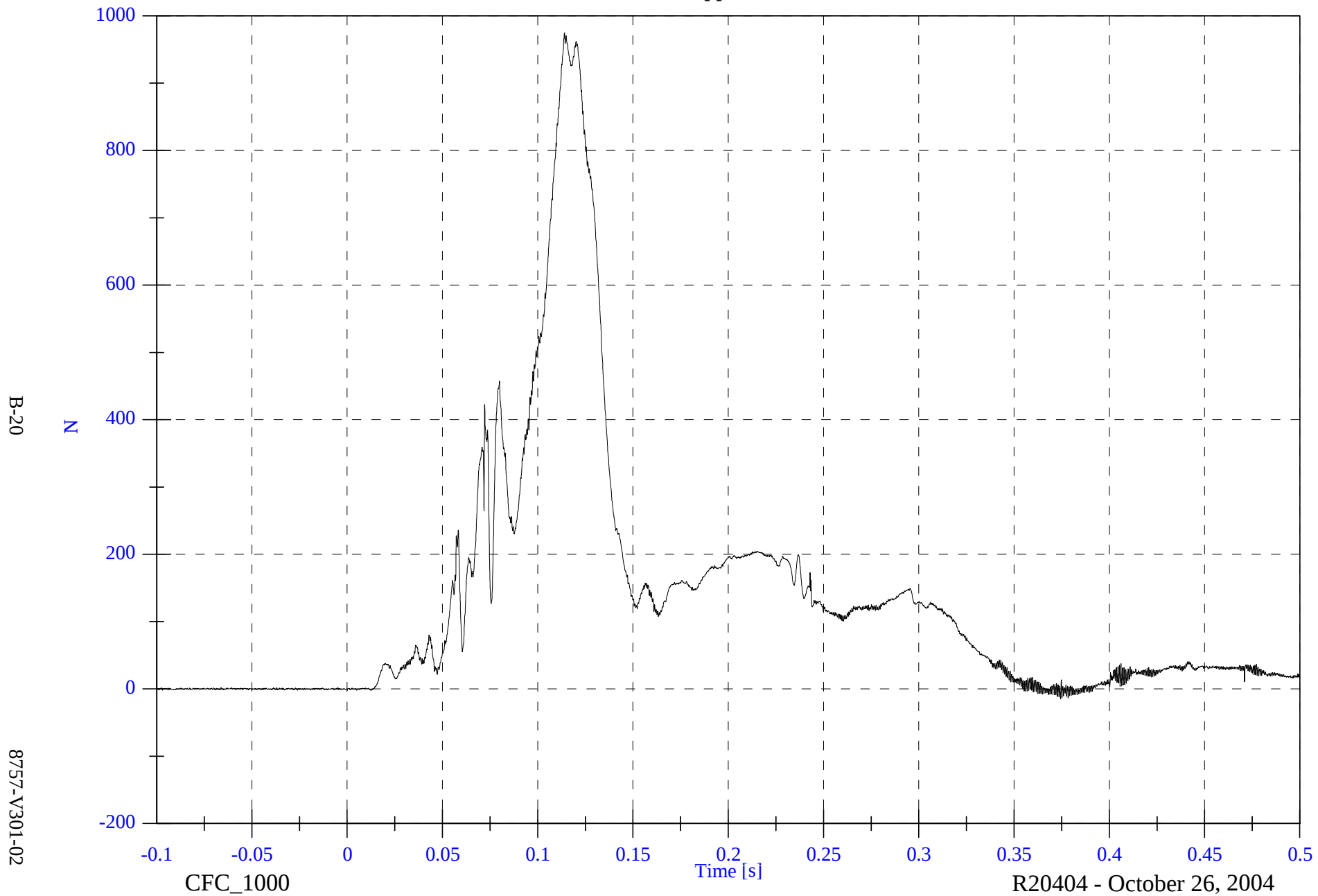


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Upper Neck Fz

Max: 974.5 [N] at 0.114 [s]

Min: -15.1 [N] at 0.374 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

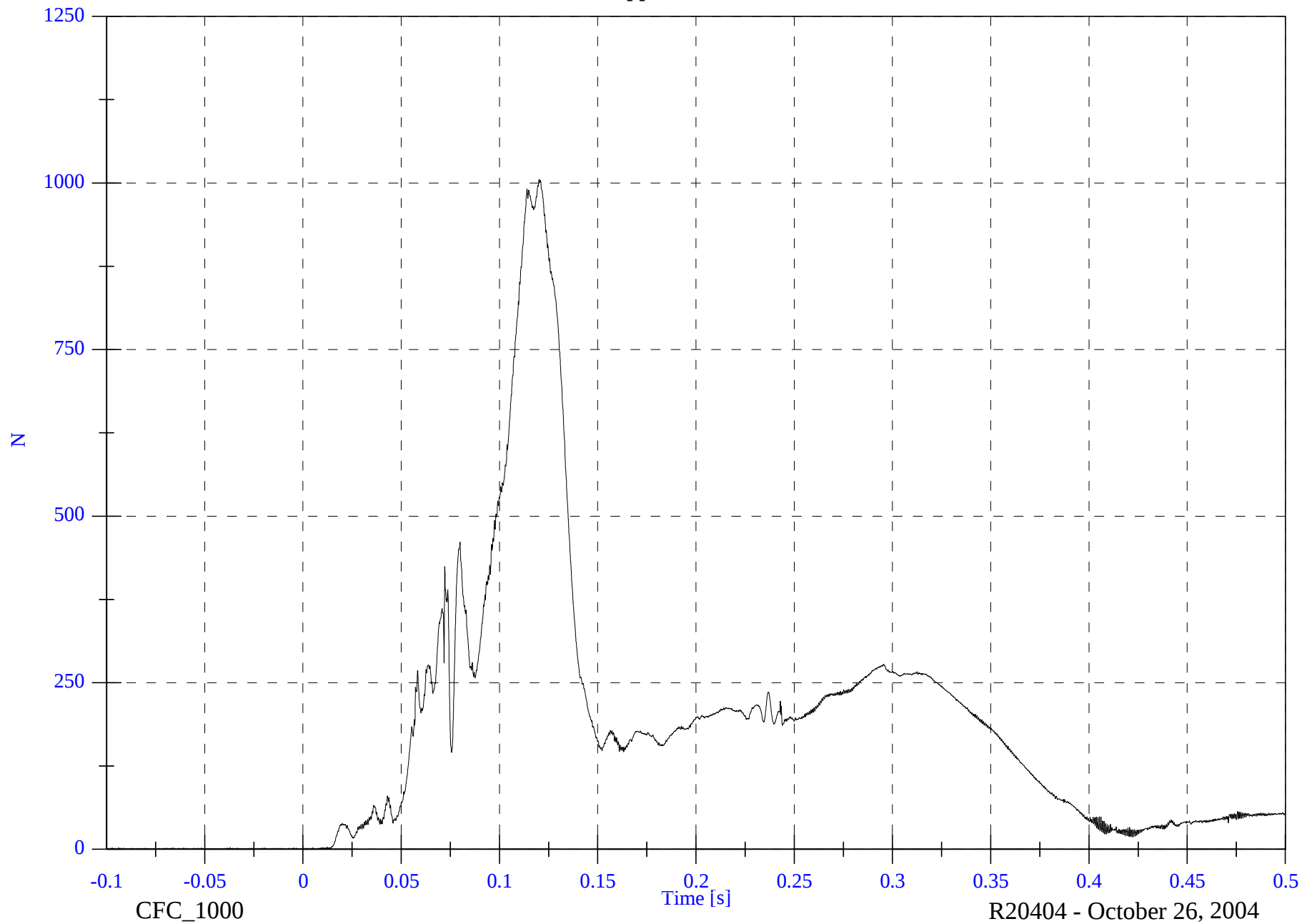
V2P1 Upper Neck F Resultant

Max: 1005.3 [N] at 0.120 [s]

Min: 0.0 [N] at -0.086 [s]

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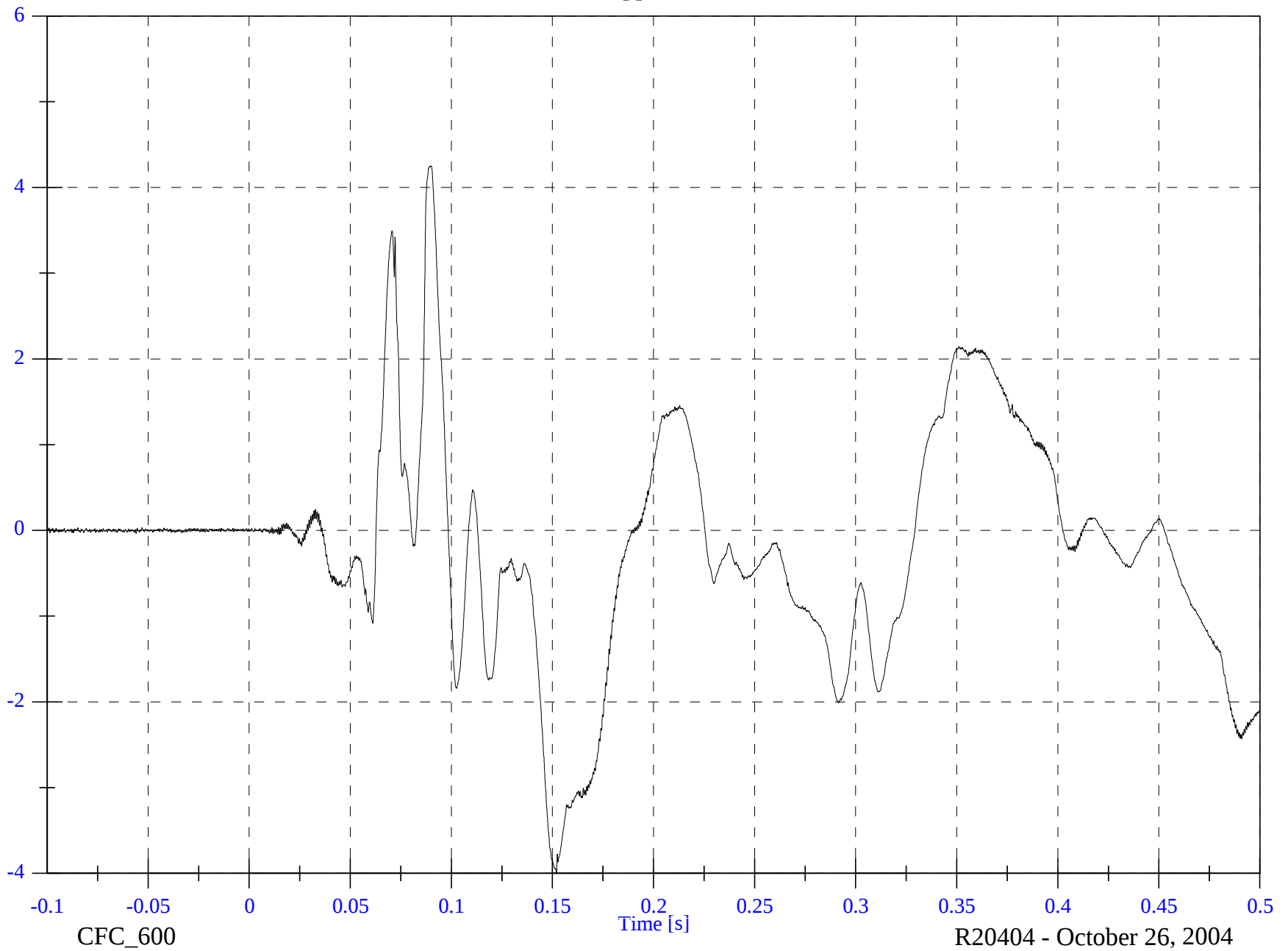


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Upper Neck Mx

Max: 4.3 [N-m] at 0.090 [s]

Min: -4.0 [N-m] at 0.152 [s]



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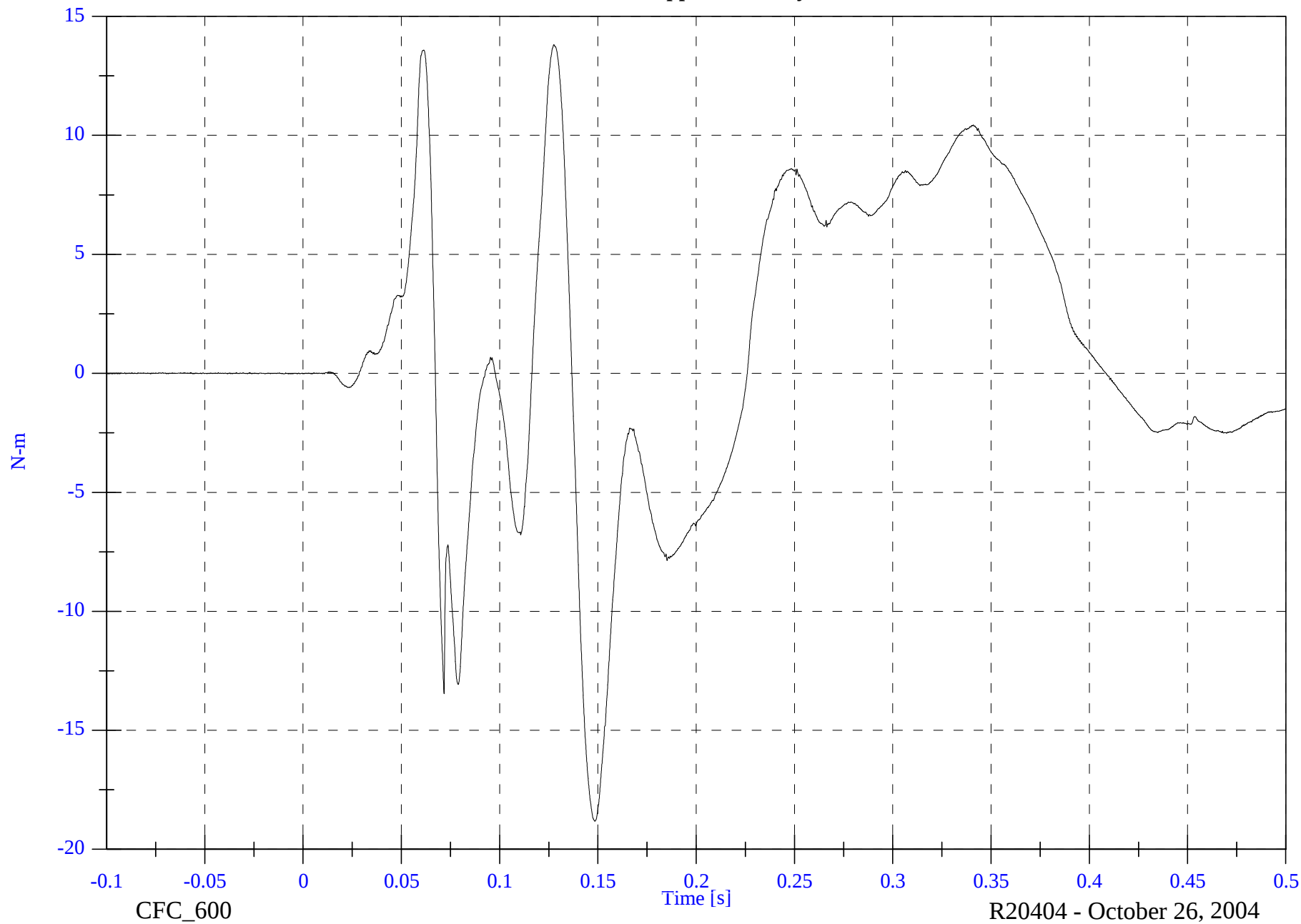
8757-V301-02

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V2P1 Upper Neck My

Max: 13.8 [N-m] at 0.128 [s]

Min: -18.8 [N-m] at 0.148 [s]



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8757-V301-02

CFC_600

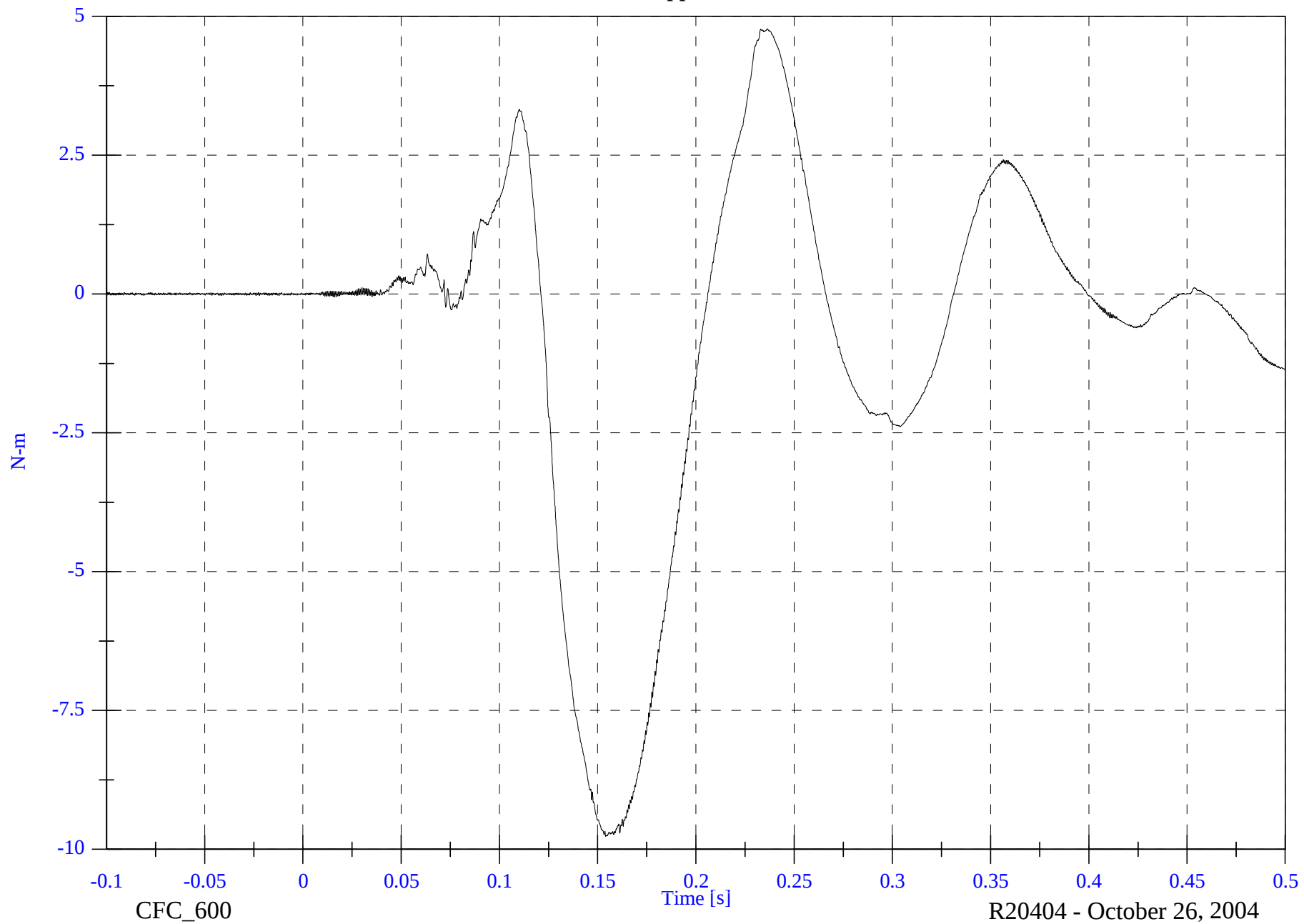
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Upper Neck Mz

Max: 4.8 [N-m] at 0.236 [s]

Min: -9.8 [N-m] at 0.154 [s]



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8757-V301-02

CFC_600

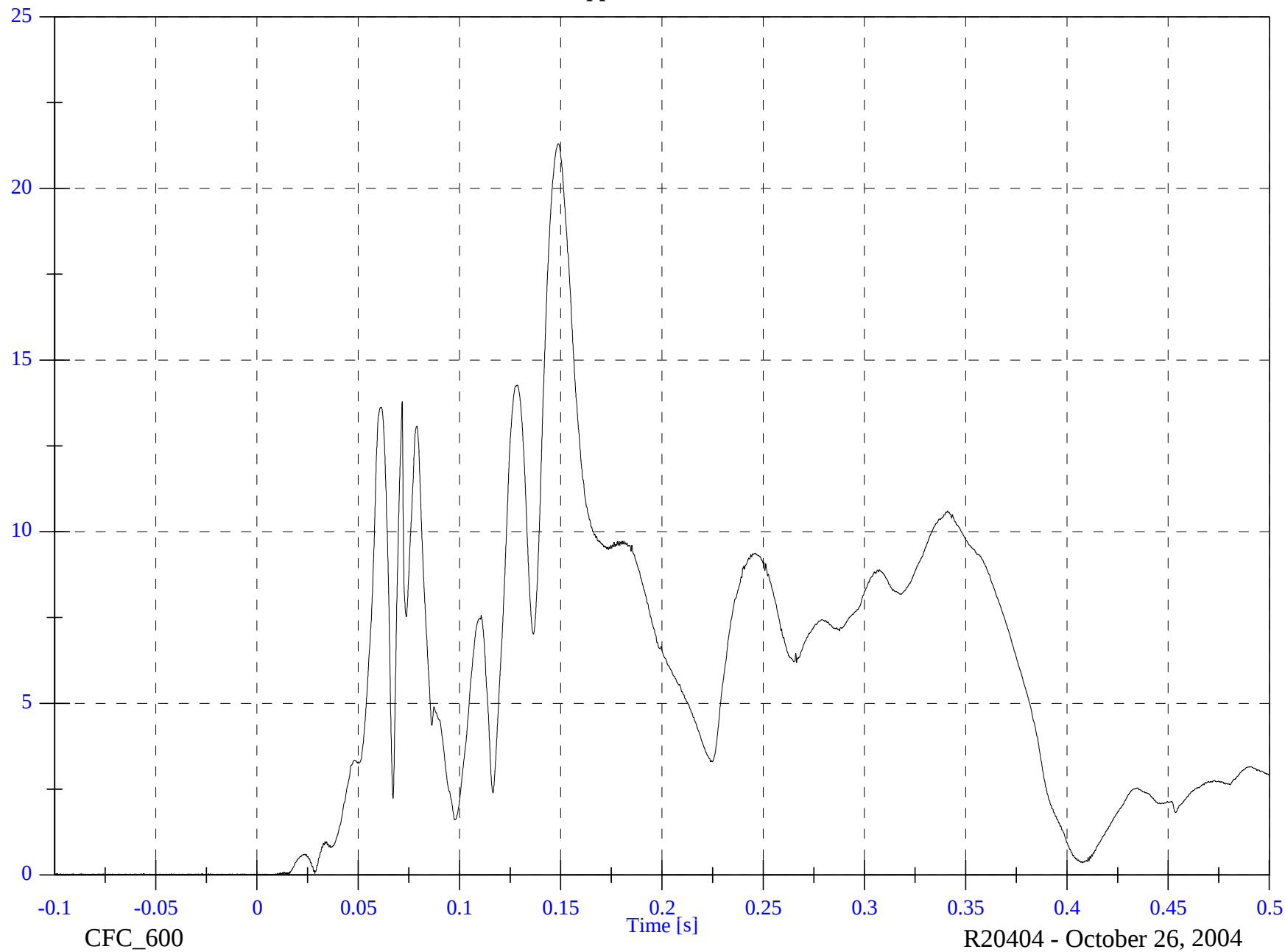
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Upper Neck M Resultant

Max: 21.3 [N-m] at 0.149 [s]

Min: 0.0 [N-m] at -0.020 [s]



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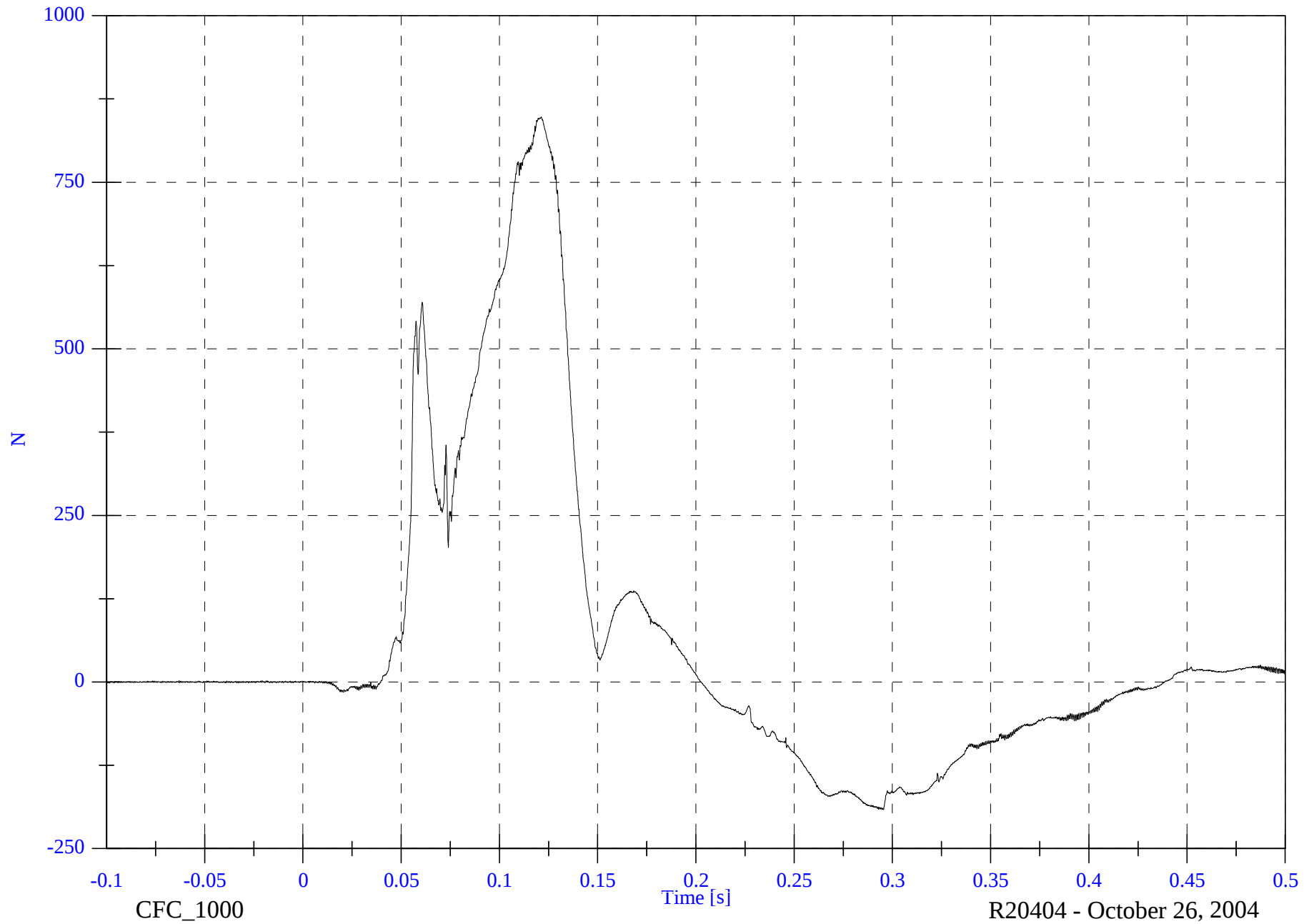
8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck Fx

Max: 847.9 [N] at 0.121 [s]

Min: -191.5 [N] at 0.295 [s]



B-26

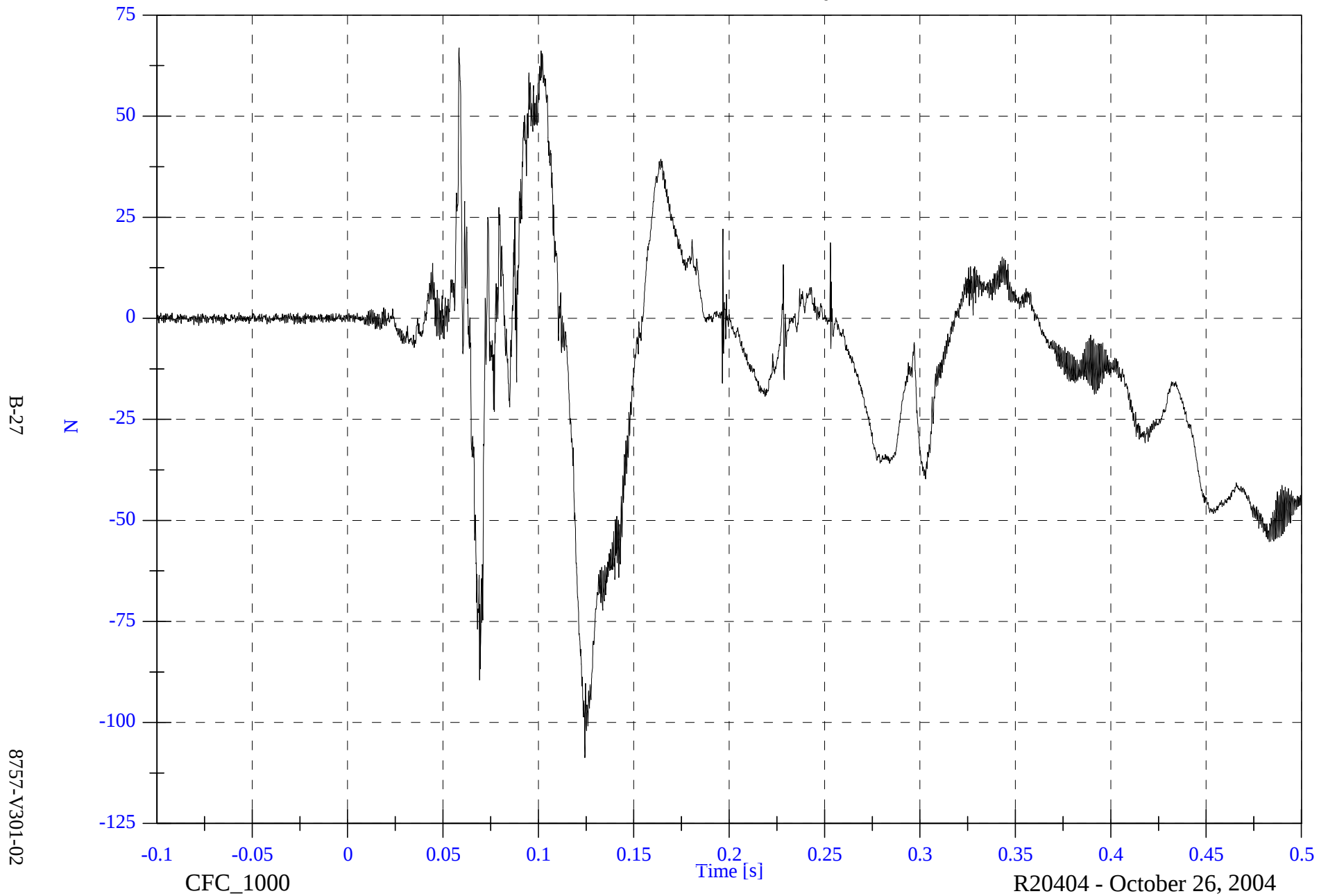
8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck Fy

Max: 66.9 [N] at 0.058 [s]

Min: -108.7 [N] at 0.124 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck Fz

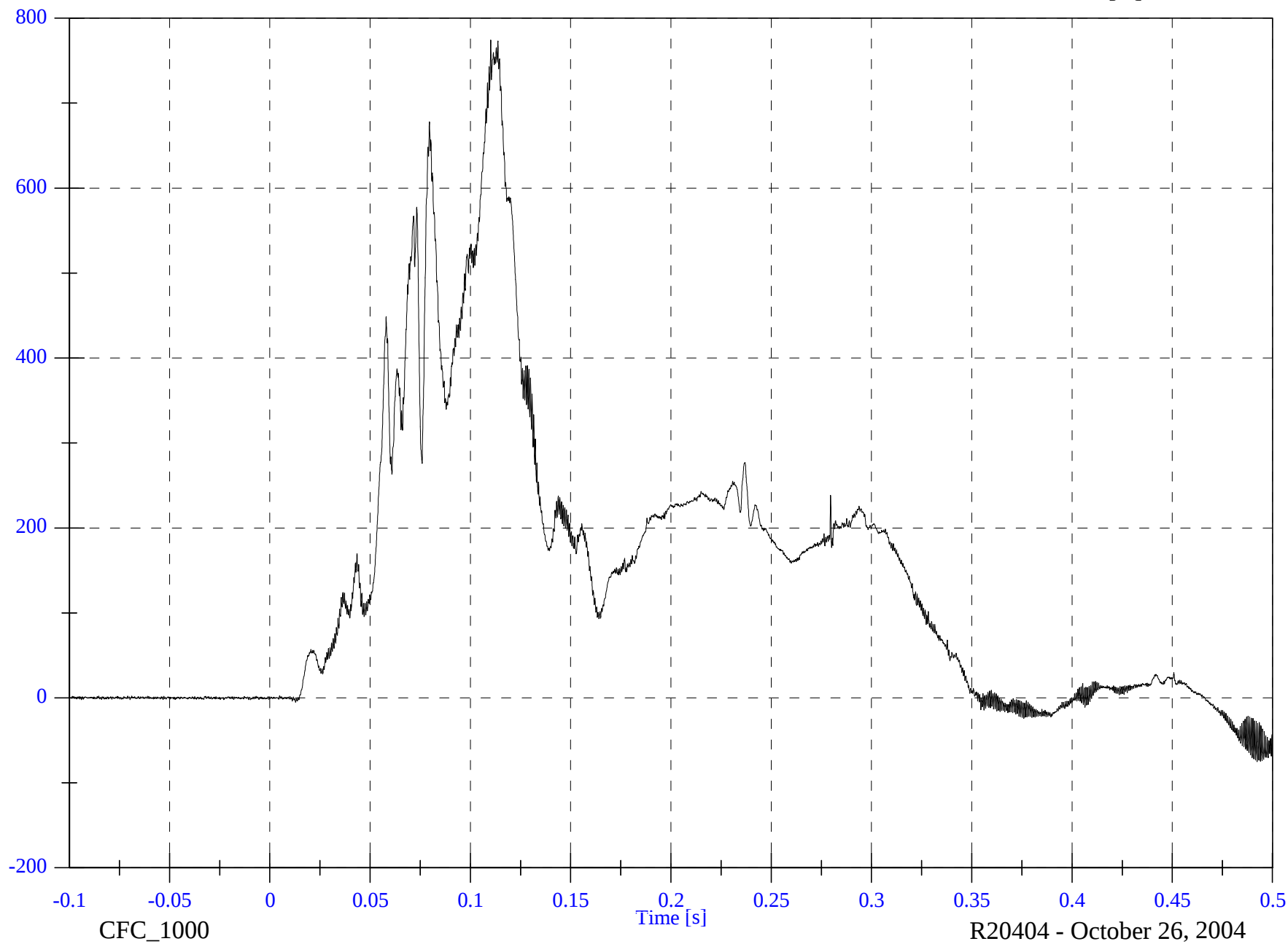
Max: 774.3 [N] at 0.110 [s]

Min: -86.2 [N] at 0.500 [s]

B-28

N

8757-V301-02

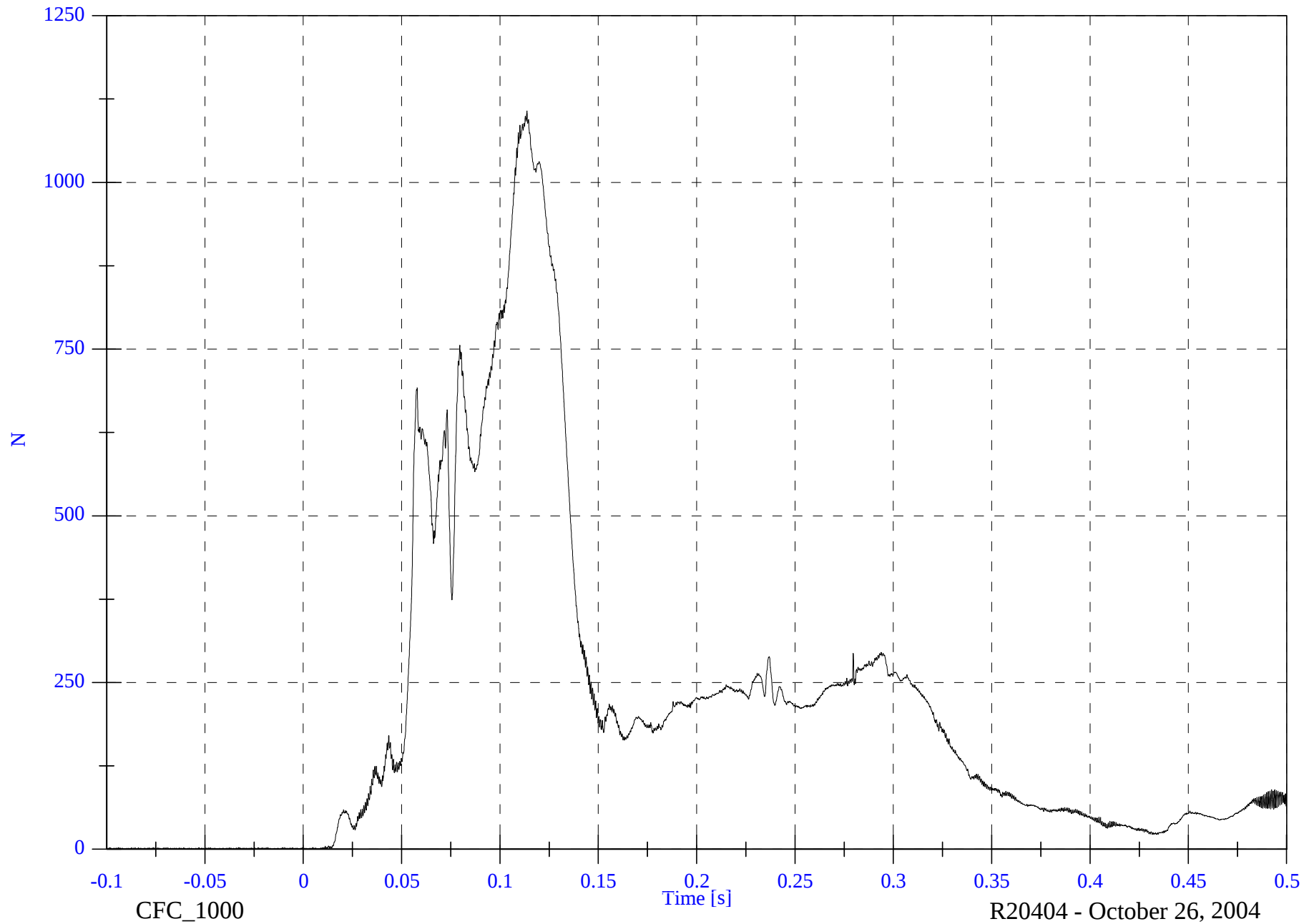


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck F Resultant

Max: 1107.3 [N] at 0.114 [s]

Min: 0.0 [N] at -0.089 [s]



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VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck Mx

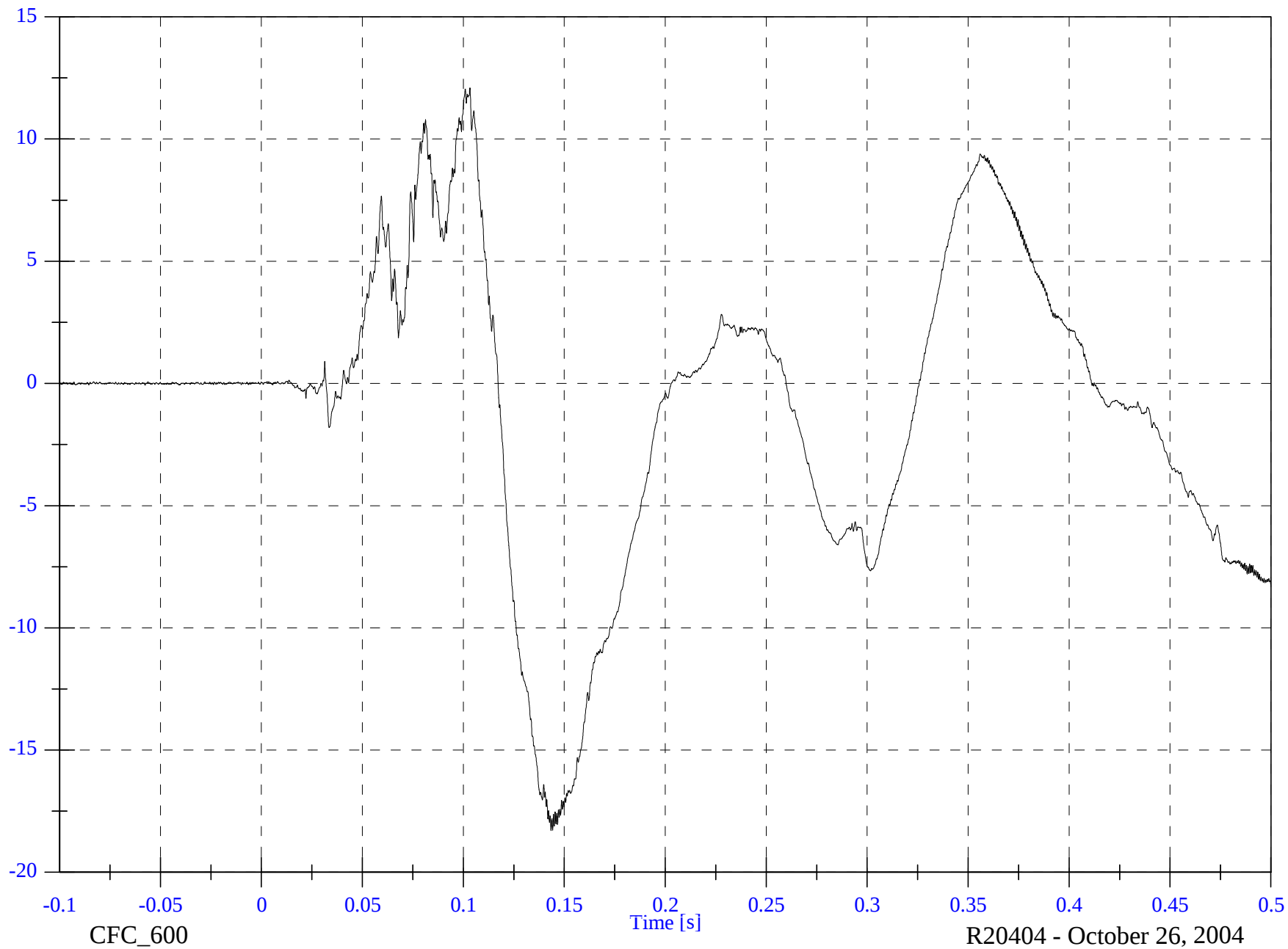
Max: 12.1 [N-m] at 0.103 [s]

Min: -18.3 [N-m] at 0.143 [s]

B-30

N-m

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

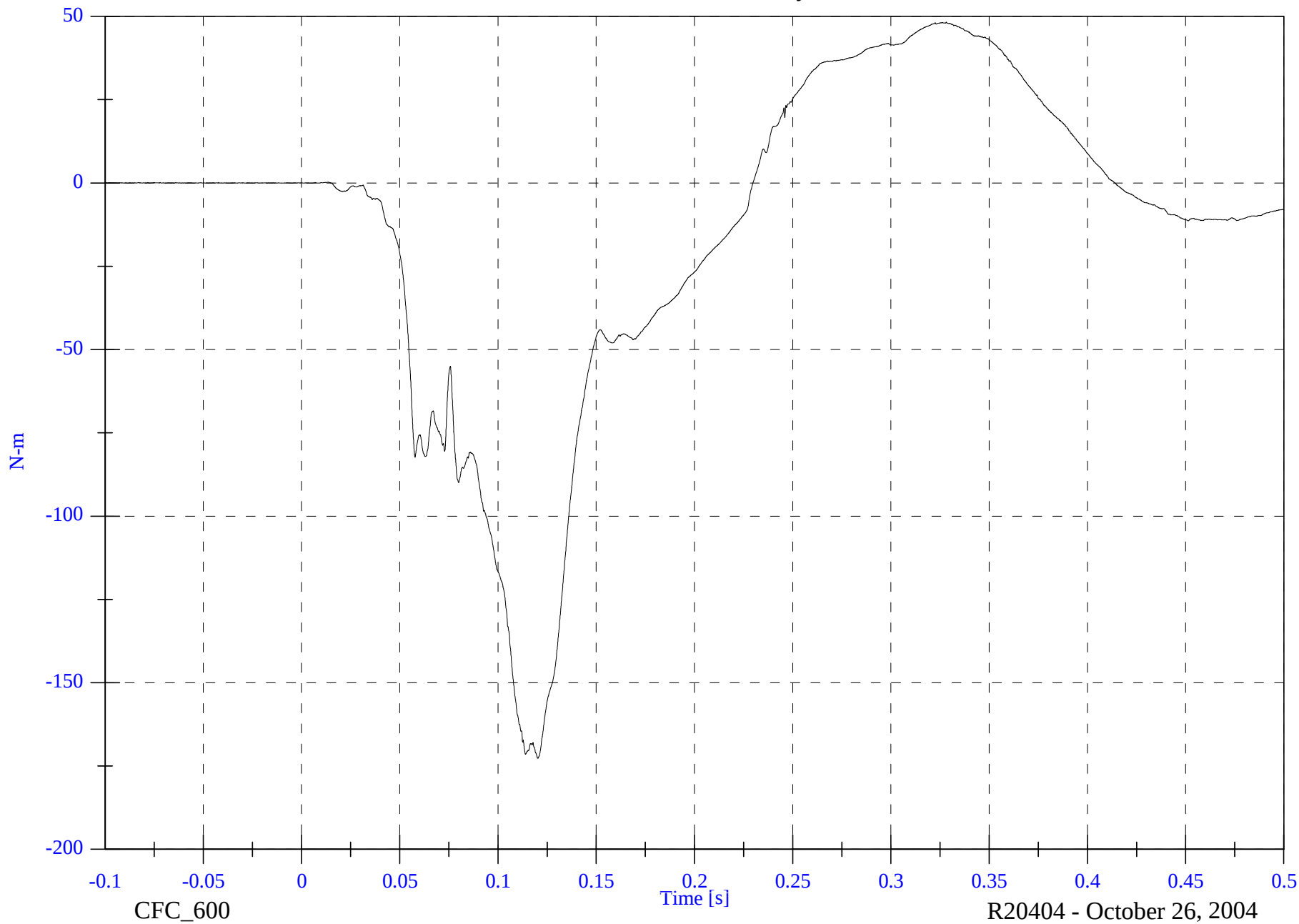
V2P1 Lower Neck My

Max: 48.3 [N-m] at 0.328 [s]

Min: -172.7 [N-m] at 0.120 [s]

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8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck Mz

Max: 17.1 [N-m] at 0.329 [s]

Min: -76.8 [N-m] at 0.120 [s]

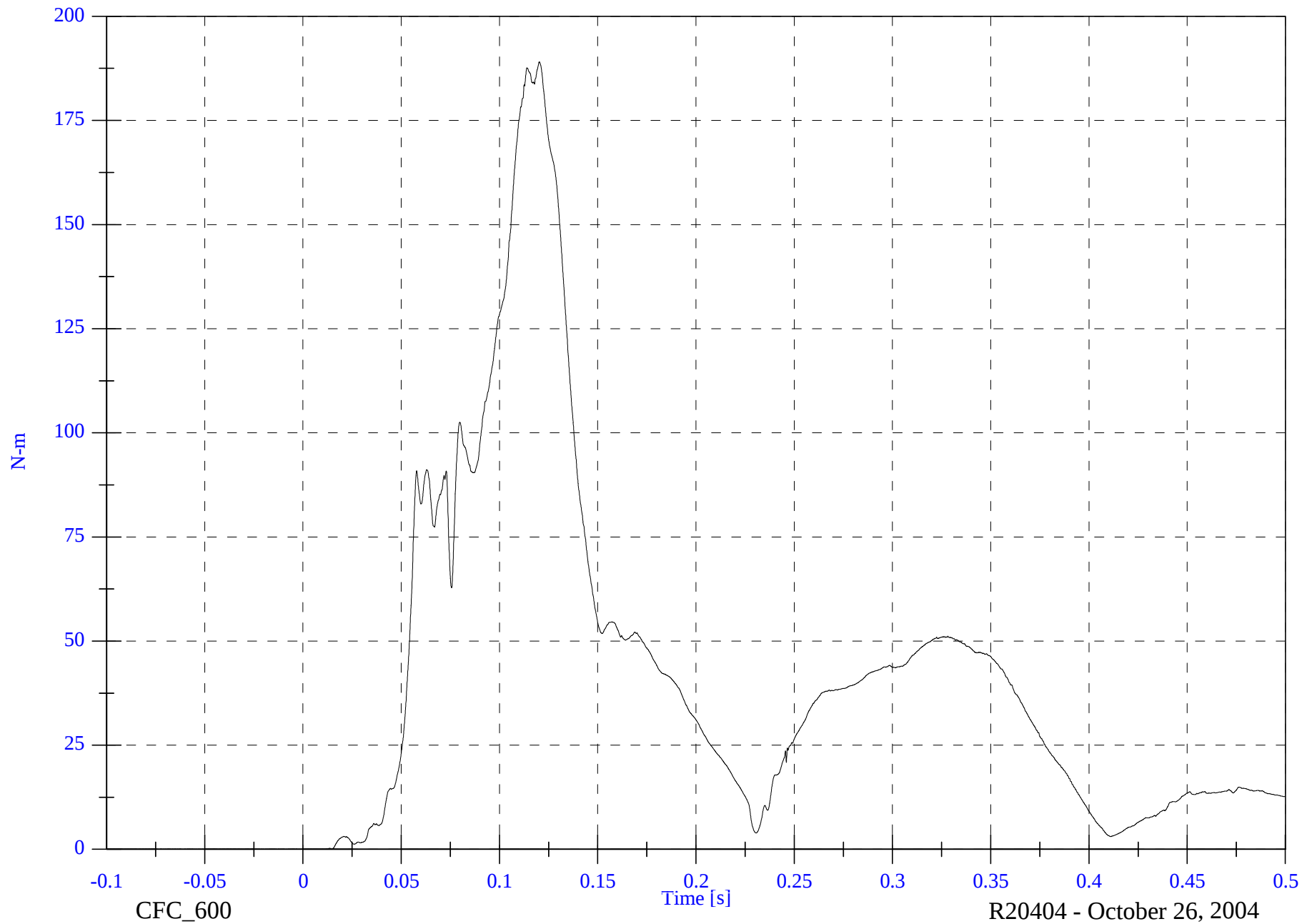


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Lower Neck M Resultant

Max: 189.1 [N-m] at 0.120 [s]

Min: 0.0 [N-m] at -0.059 [s]



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8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

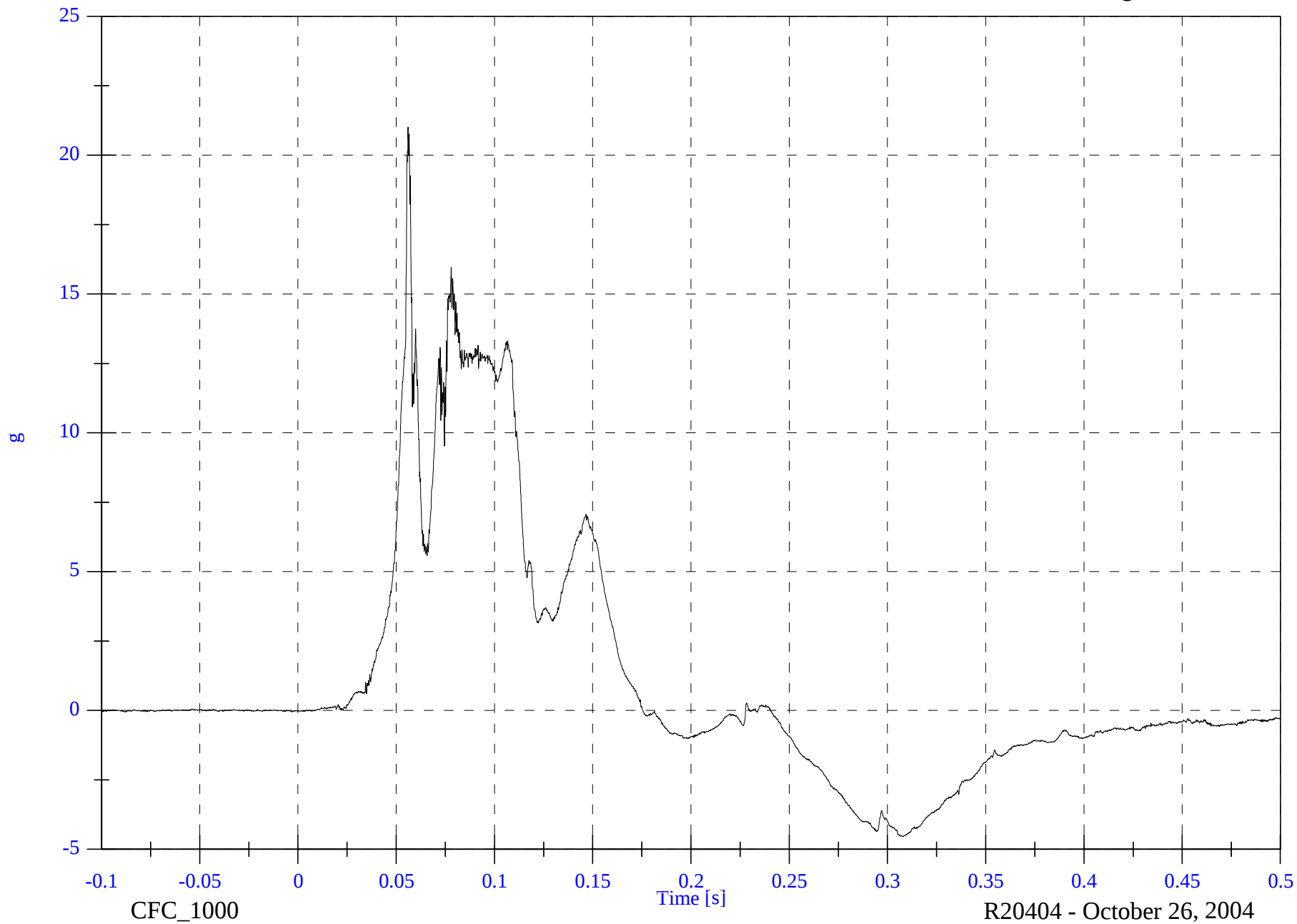
V2P1 Lower Neck x

Max: 21.0 [g] at 0.056 [s]

Min: -4.5 [g] at 0.308 [s]

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8757-V301-02

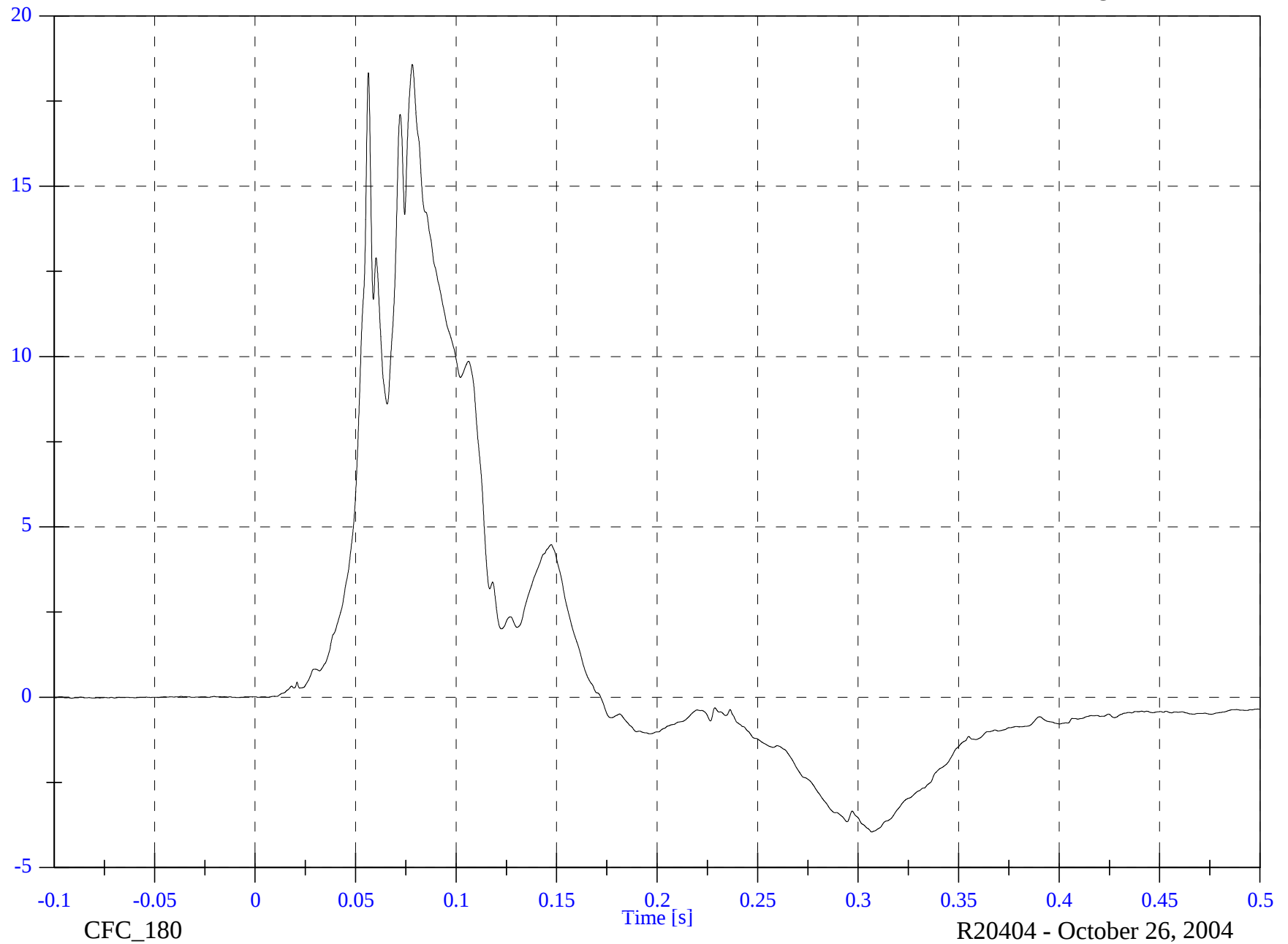


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Chest x

Max: 18.6 [g] at 0.078 [s]

Min: -4.0 [g] at 0.307 [s]



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8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

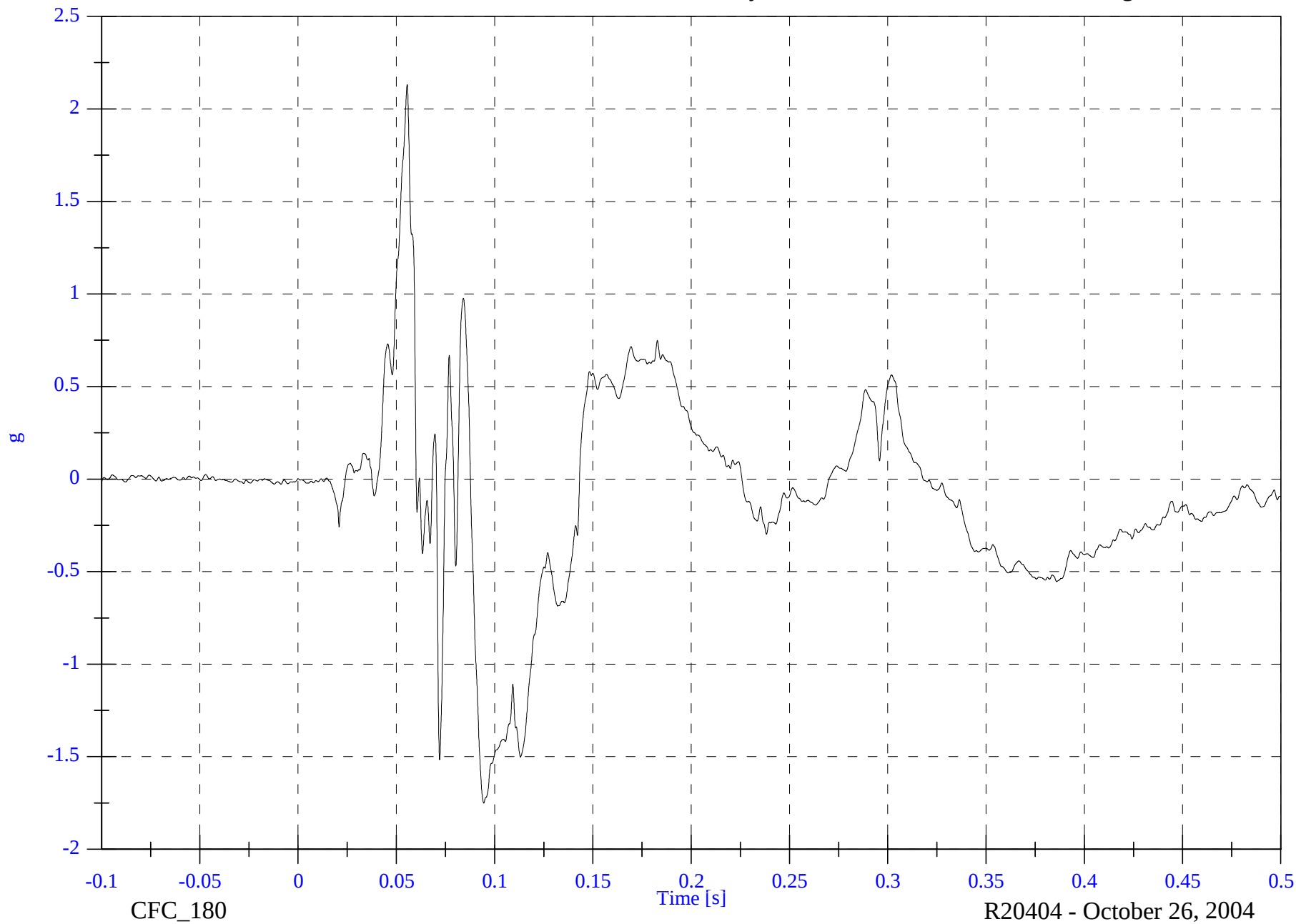
V2P1 Chest y

Max: 2.1 [g] at 0.055 [s]

Min: -1.8 [g] at 0.094 [s]

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8757-V301-02

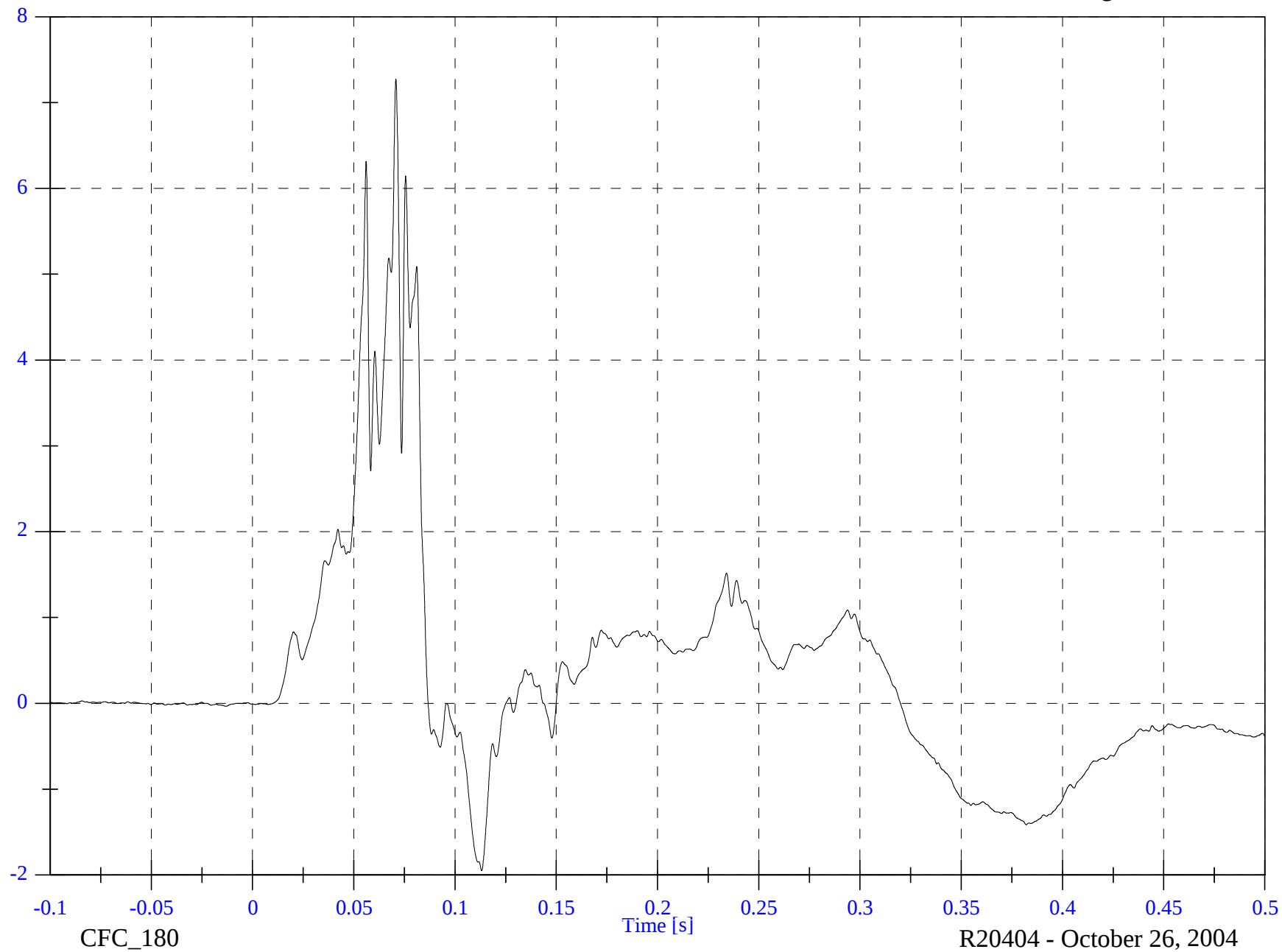


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Chest z

Max: 7.3 [g] at 0.071 [s]

Min: -1.9 [g] at 0.113 [s]



B-37

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

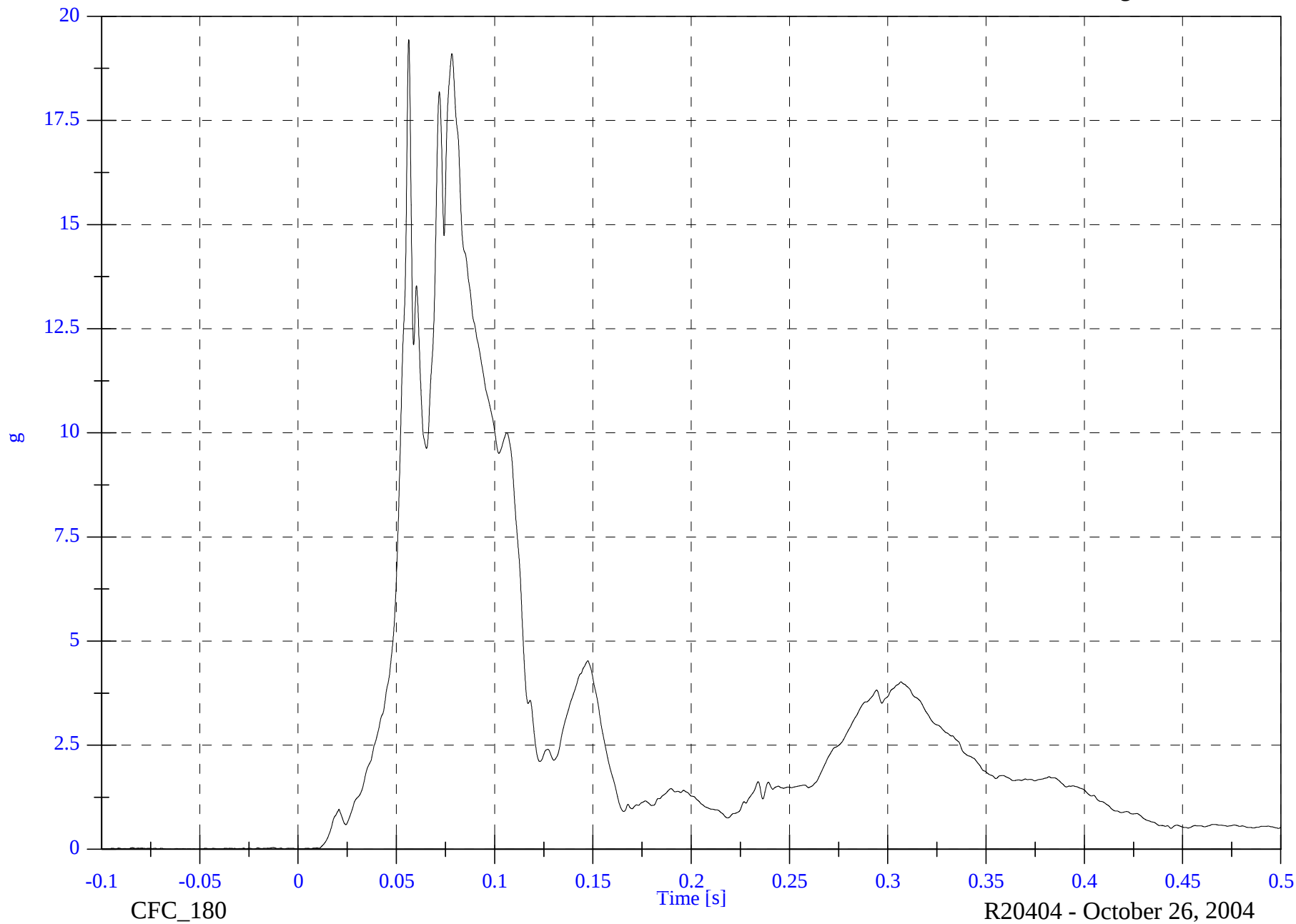
V2P1 Chest Resultant

Max: 19.4 [g] at 0.056 [s]

Min: 0.0 [g] at -0.067 [s]

B-38

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

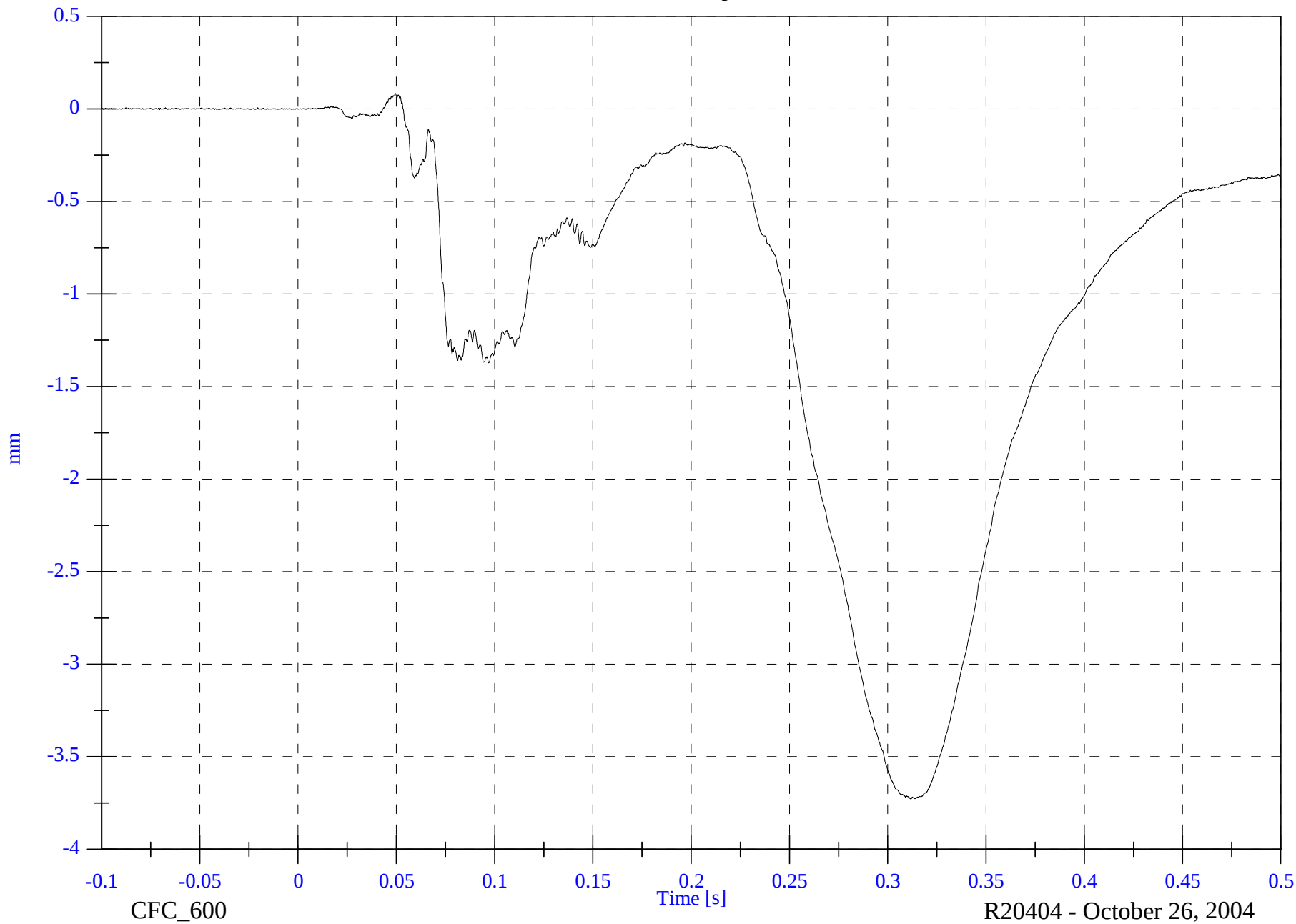
V2P1 Chest Displacement

Max: 0.1 [mm] at 0.050 [s]

Min: -3.7 [mm] at 0.312 [s]

B-39

8757-V301-02

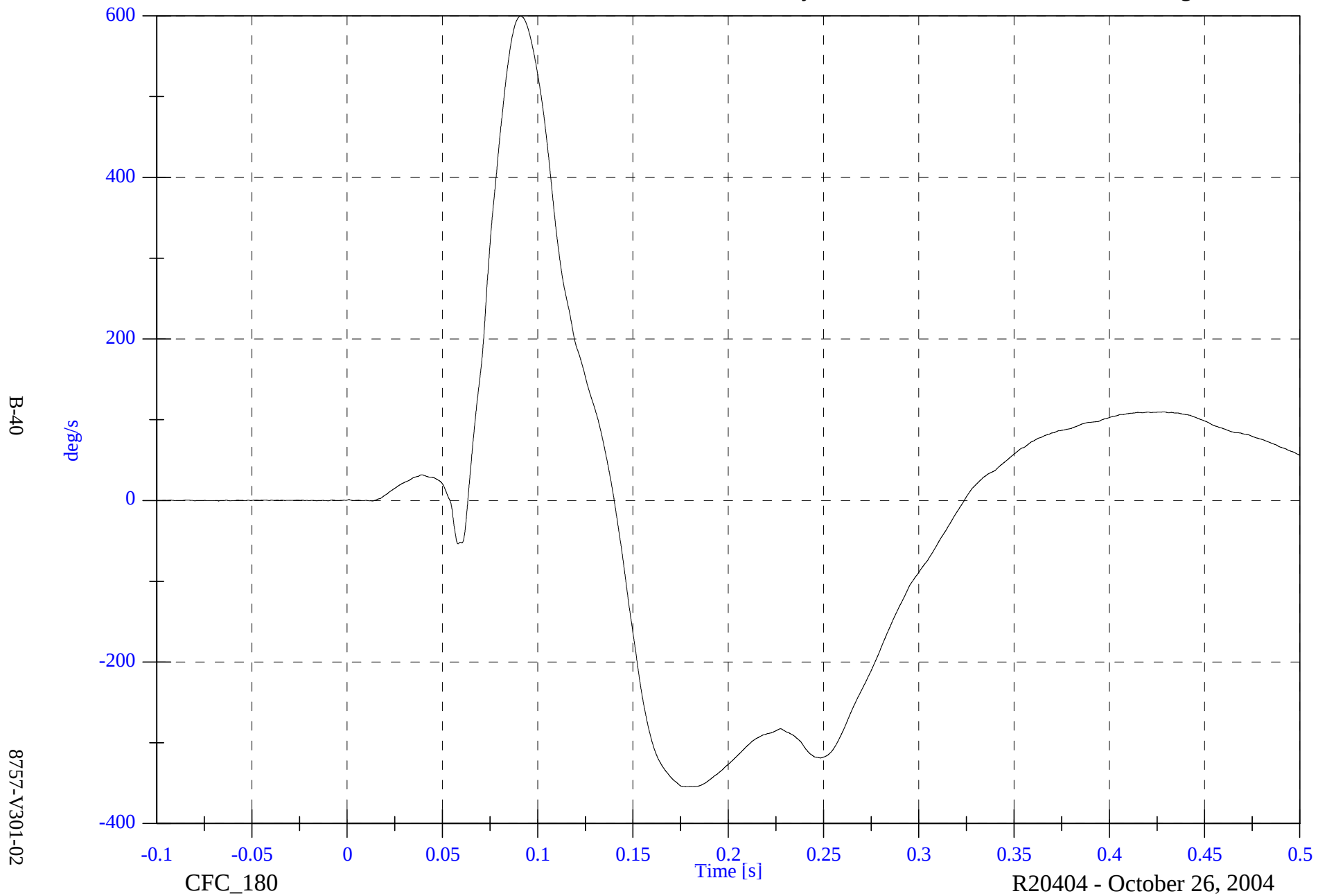


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Chest AVy

Max: 599.7 [deg/s] at 0.091 [s]

Min: -354.4 [deg/s] at 0.178 [s]

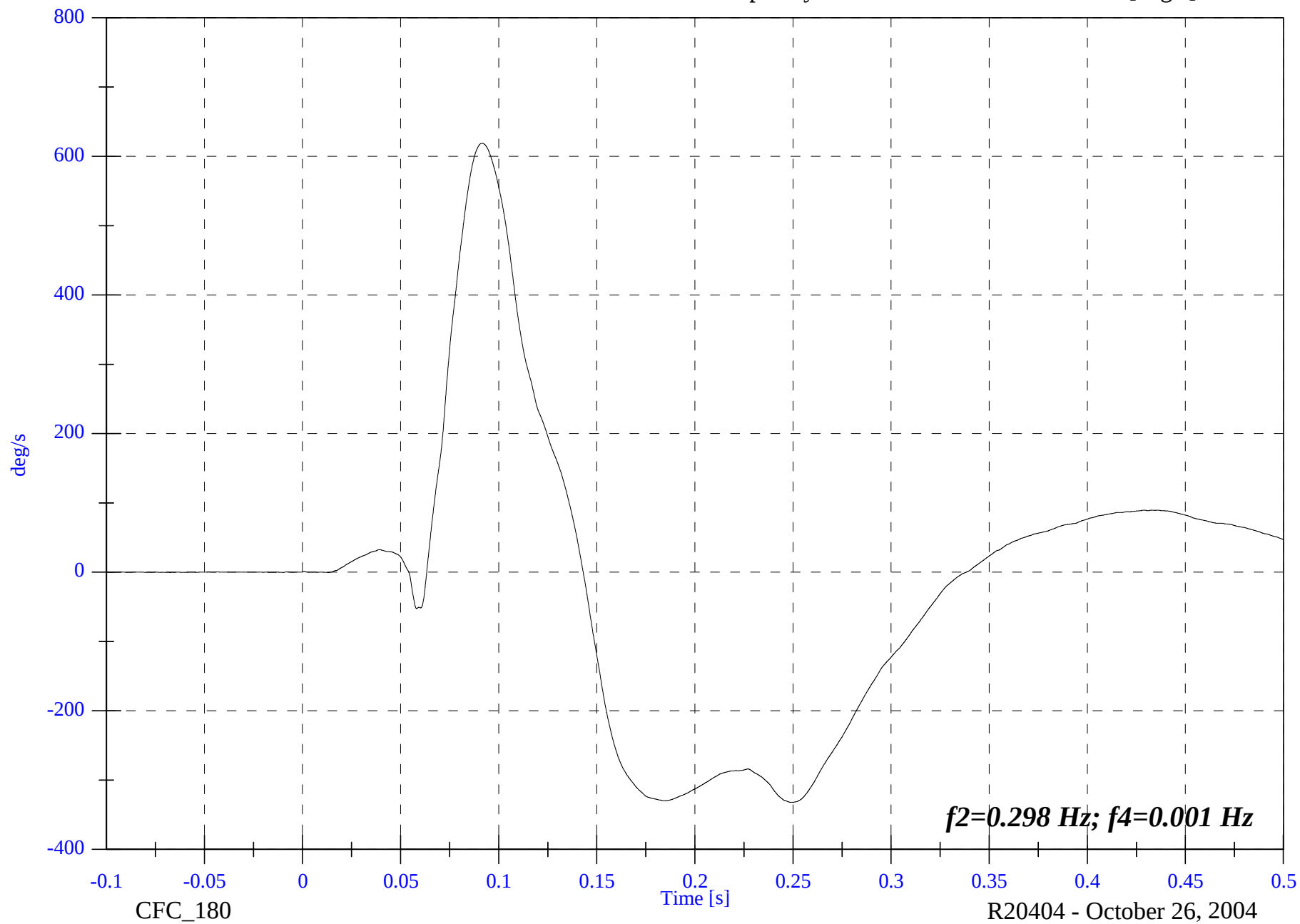


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Chest Comp AVy

Max: 618.8 [deg/s] at 0.092 [s]

Min: -332.1 [deg/s] at 0.249 [s]



B-41

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

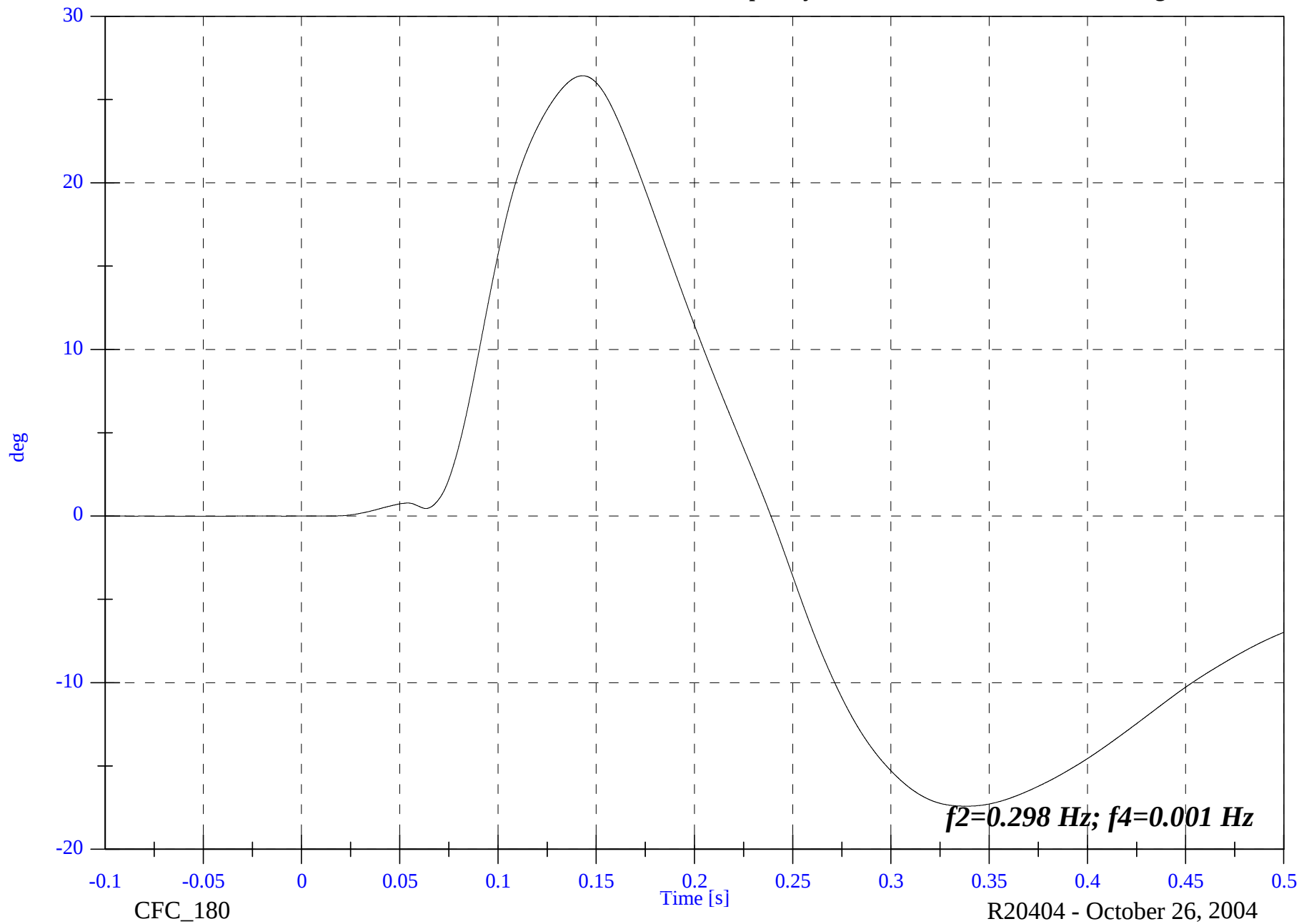
V2P1 Chest Comp ADy

Max: 26.4 [deg] at 0.143 [s]

Min: -17.4 [deg] at 0.338 [s]

B-42

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

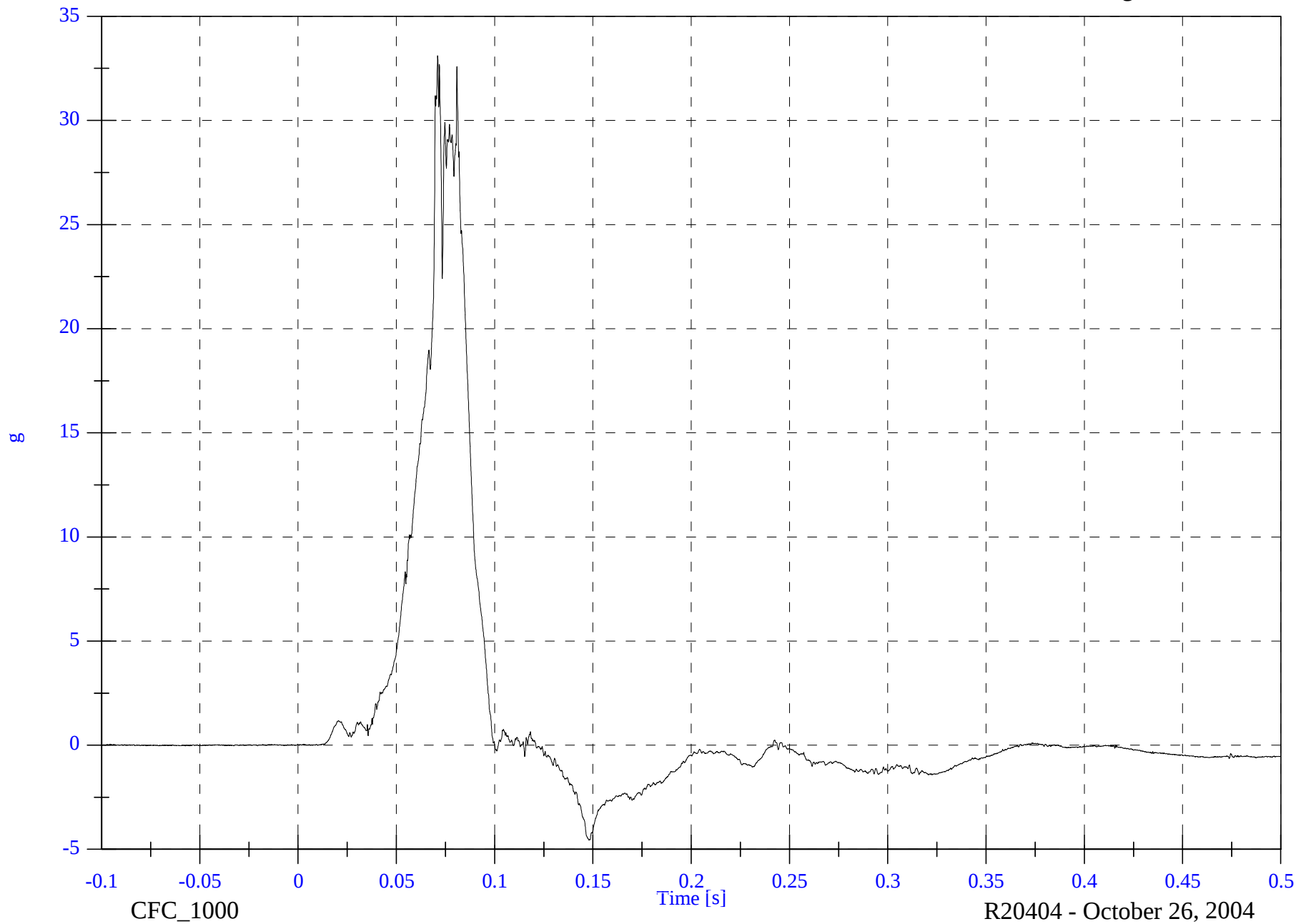
V2P1 Pelvic x

Max: 33.1 [g] at 0.071 [s]

Min: -4.6 [g] at 0.148 [s]

B-43

8757-V301-02

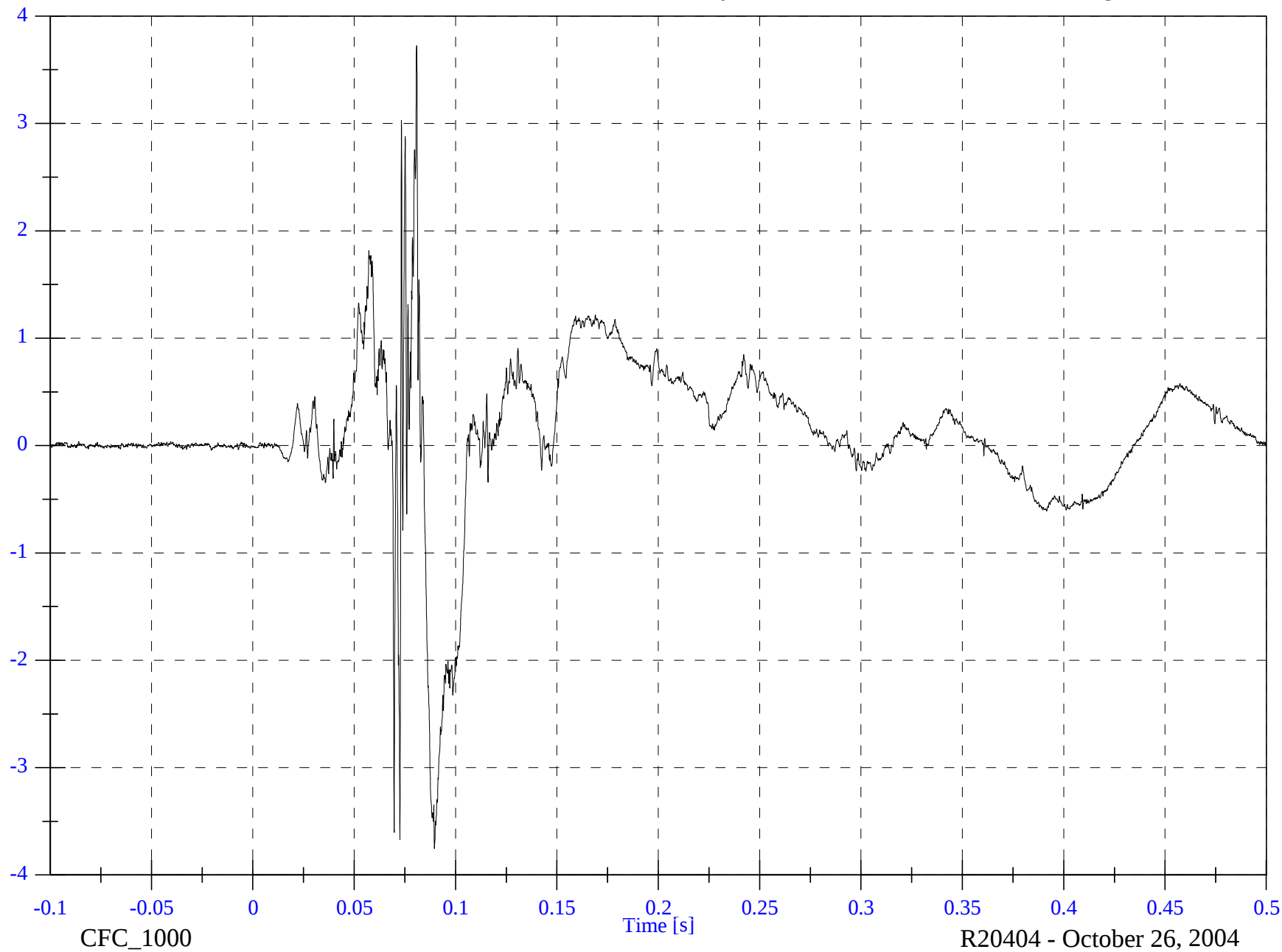


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Pelvic y

Max: 3.7 [g] at 0.081 [s]

Min: -3.8 [g] at 0.090 [s]



B-44

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

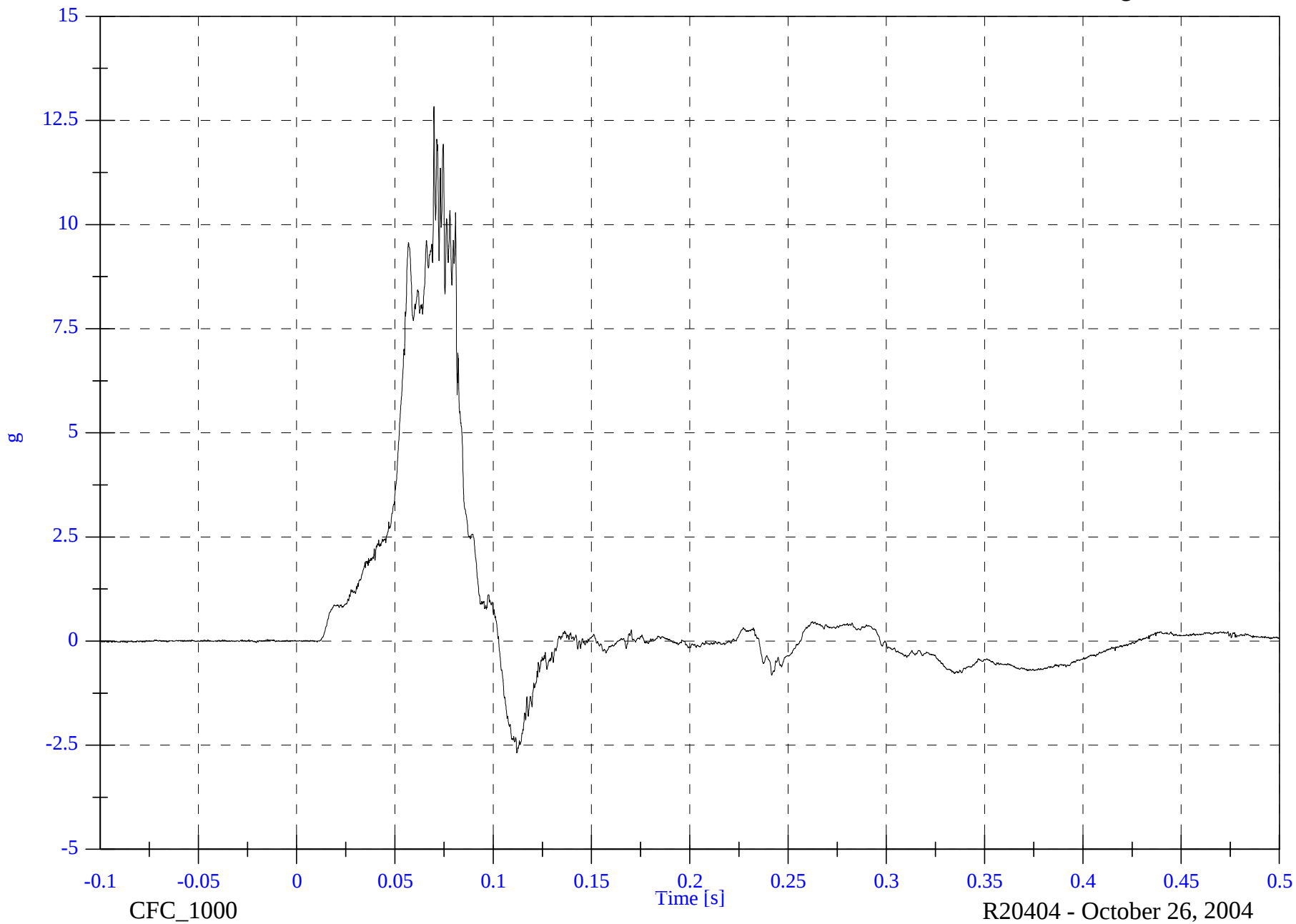
V2P1 Pelvic z

Max: 12.8 [g] at 0.070 [s]

Min: -2.7 [g] at 0.112 [s]

B-45

8757-V301-02

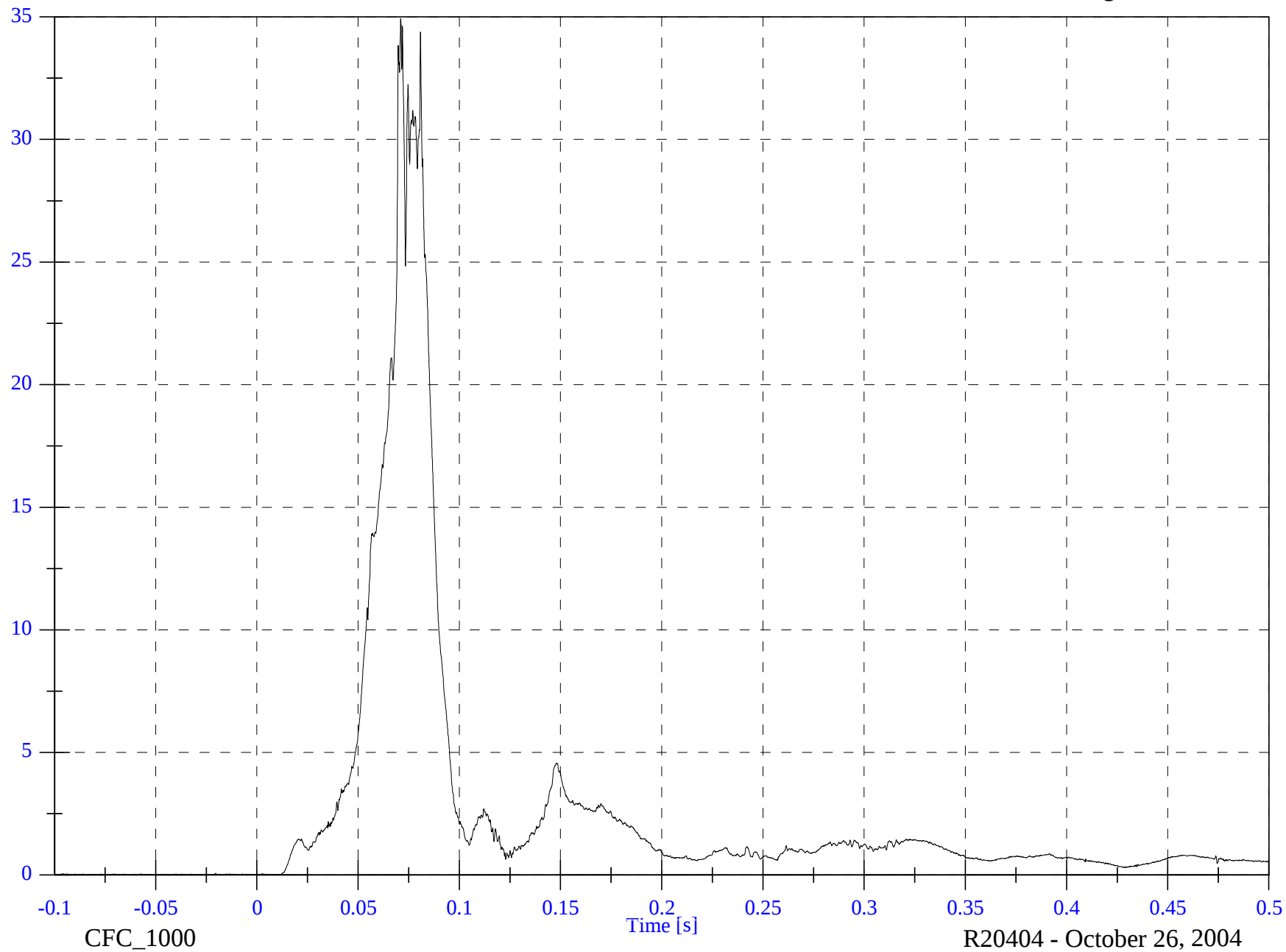


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Pelvic Resultant

Max: 34.9 [g] at 0.071 [s]

Min: 0.0 [g] at -0.052 [s]



B-46

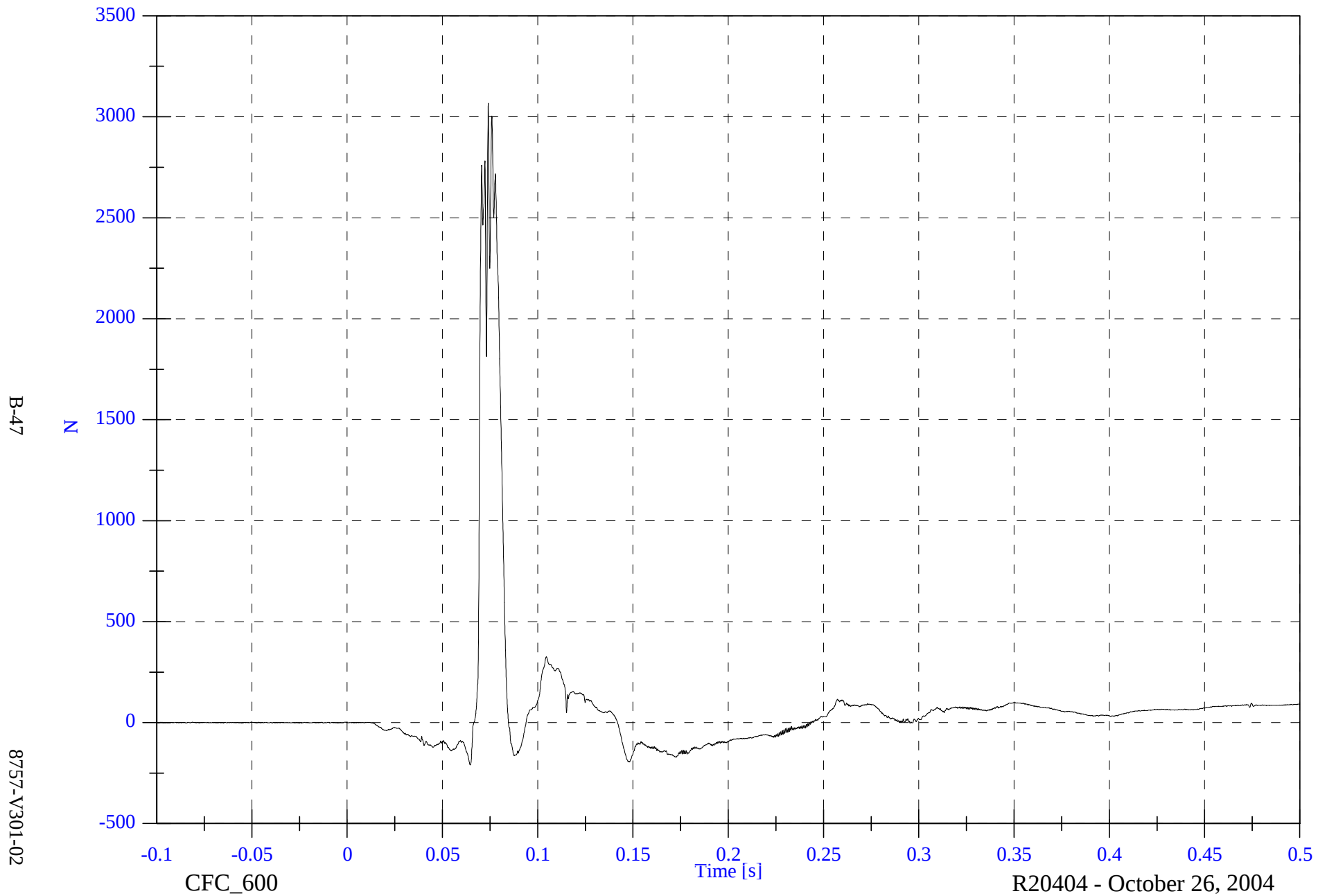
8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Left Femur

Max: 3067.0 [N] at 0.074 [s]

Min: -209.6 [N] at 0.065 [s]

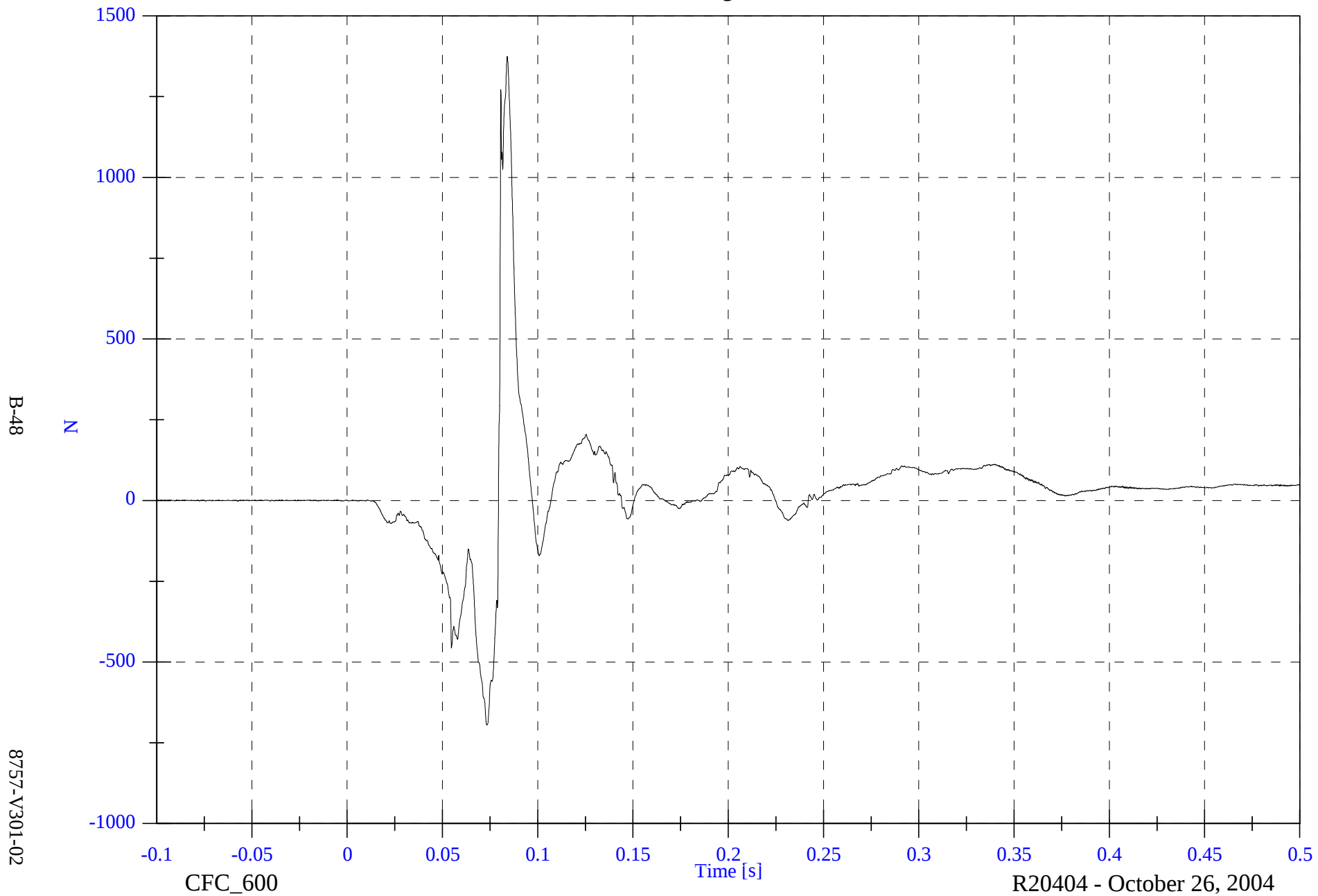


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Right Femur

Max: 1374.1 [N] at 0.084 [s]

Min: -695.1 [N] at 0.073 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

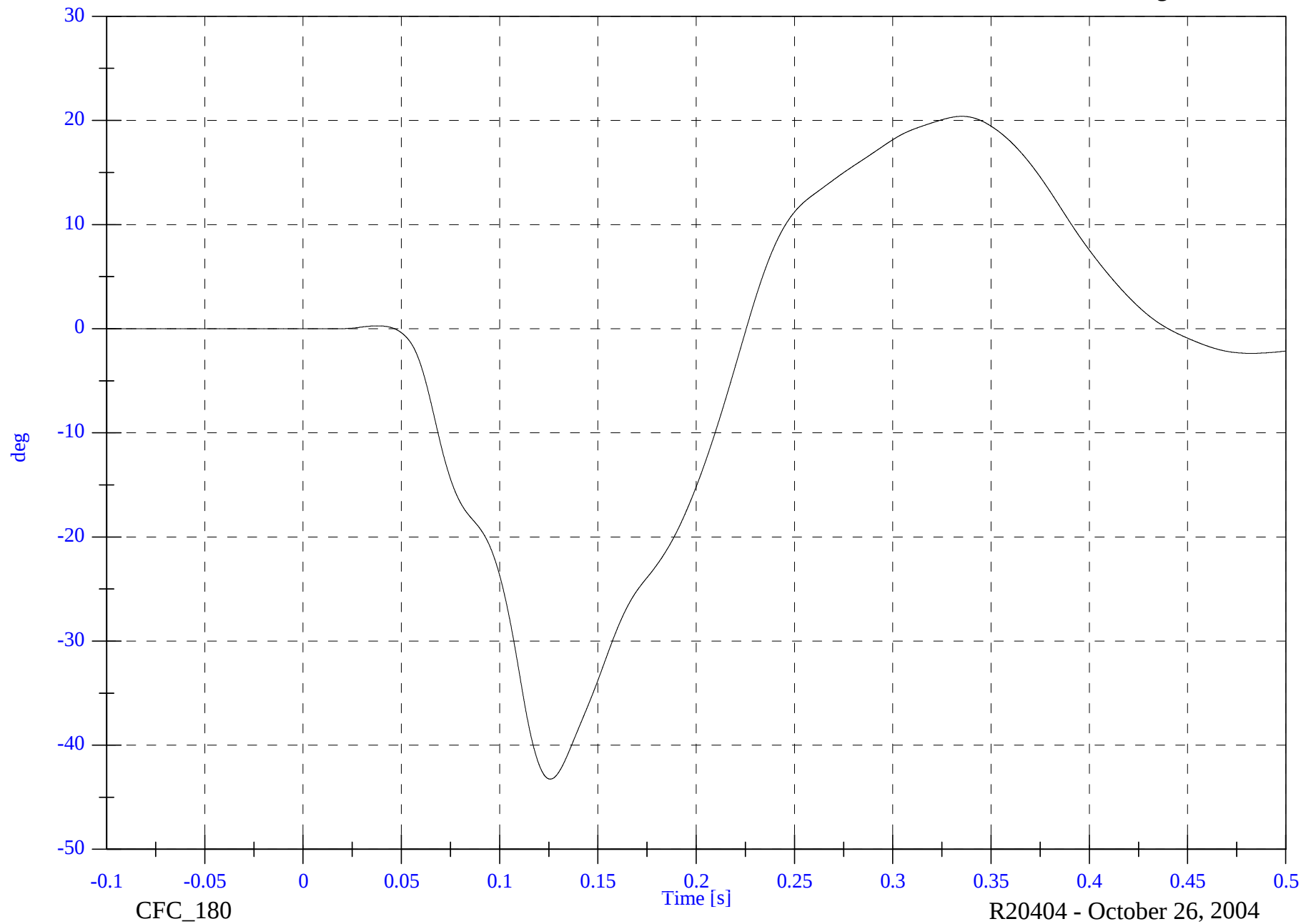
V2P1 Head to Chest

Max: 20.4 [deg] at 0.335 [s]

Min: -43.3 [deg] at 0.126 [s]

B-49

8757-V301-02

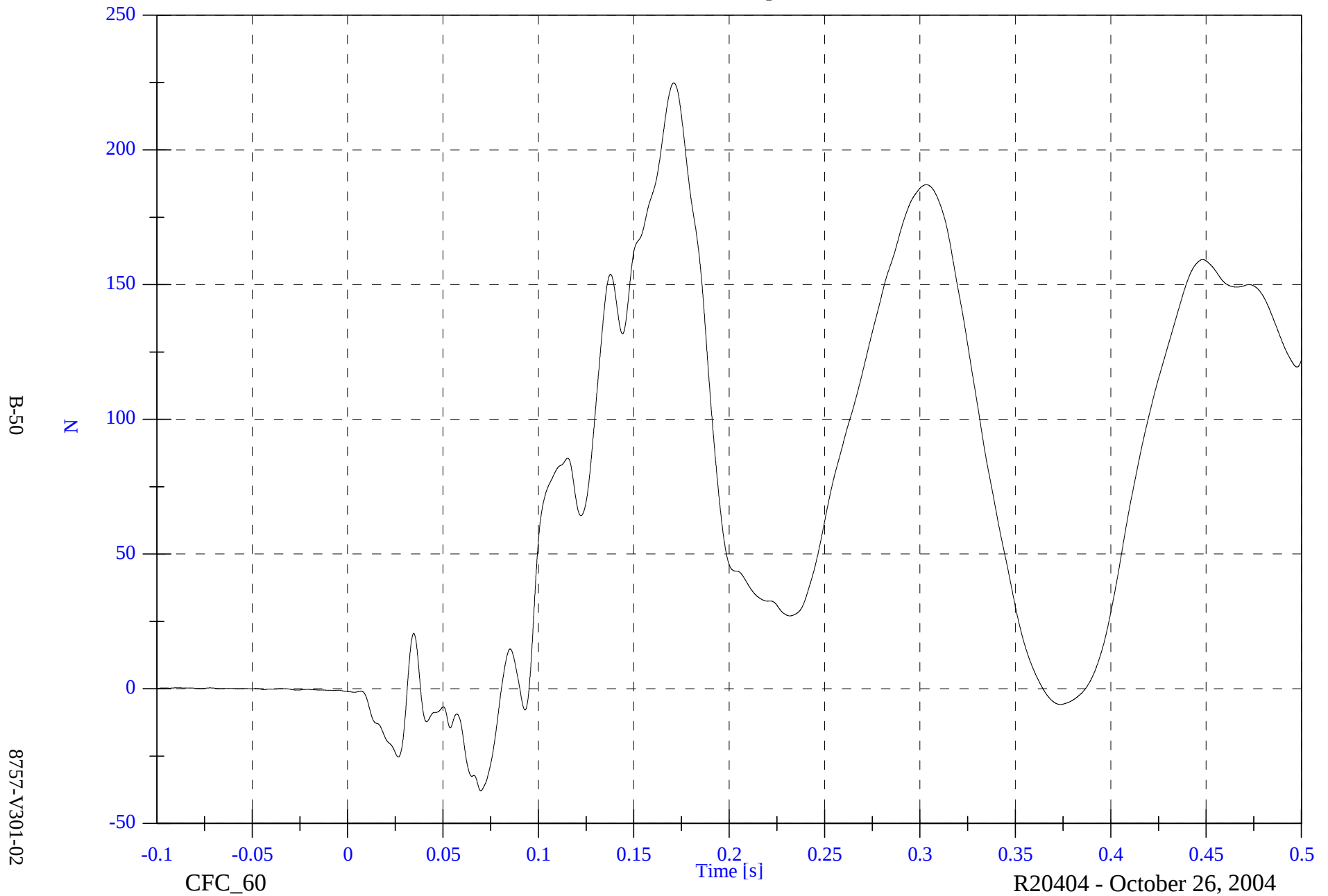


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2 Driver Lap Belt

Max: 224.8 [N] at 0.171 [s]

Min: -37.9 [N] at 0.070 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

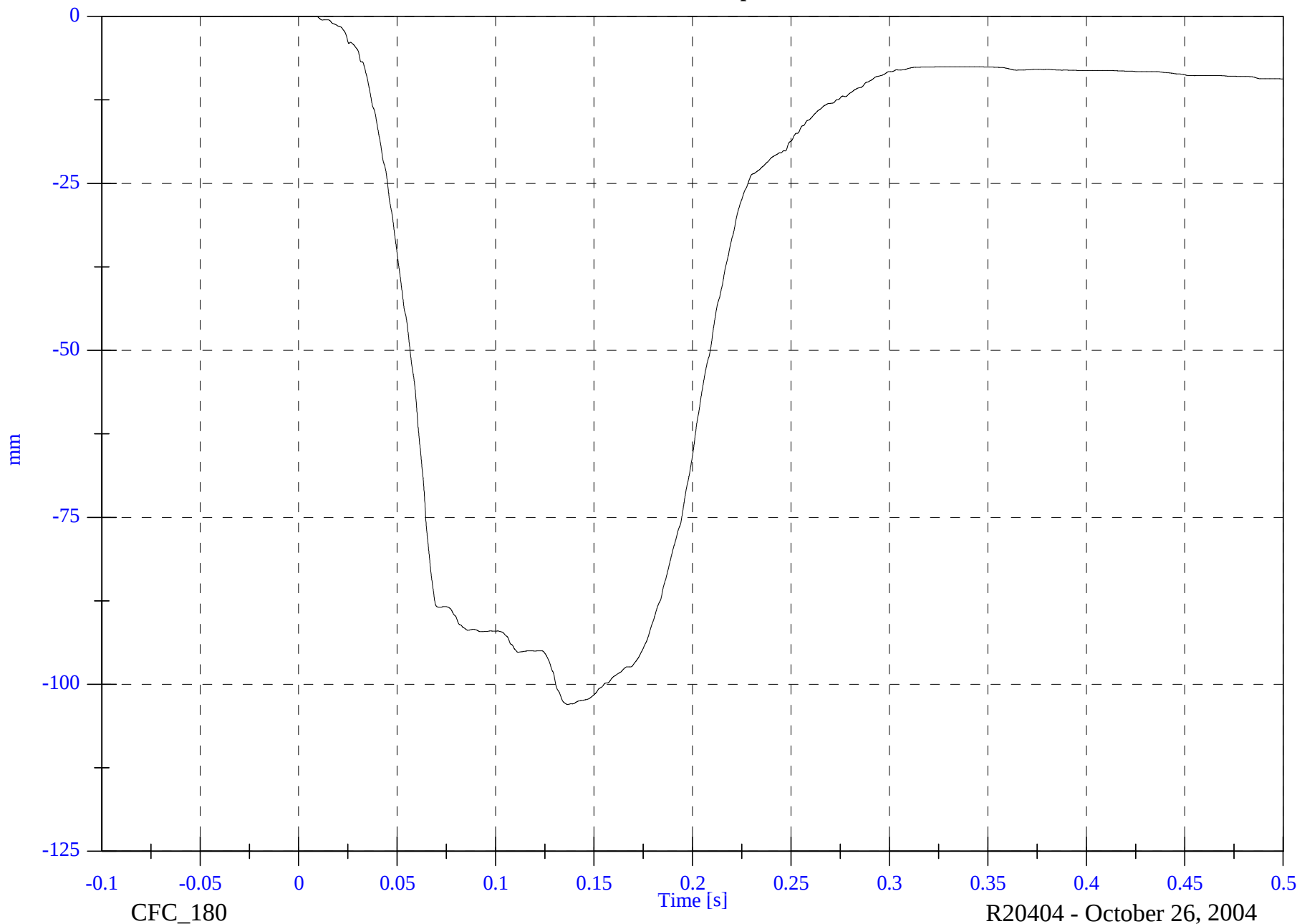
V2 Driver Belt Spoolout

Max: 0.0 [mm] at -0.037 [s]

Min: -103.0 [mm] at 0.137 [s]

B-51

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

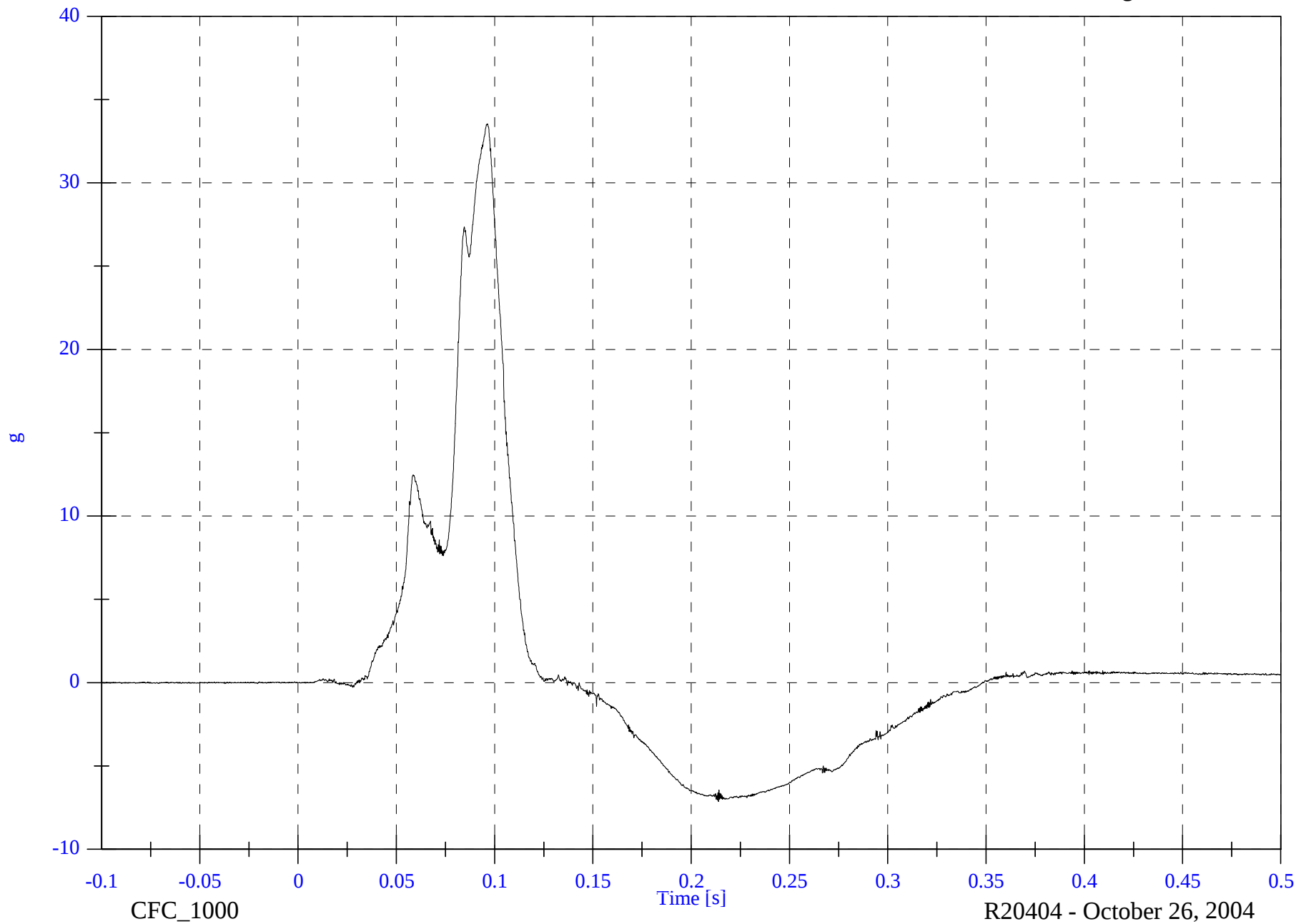
V2P3 Head x

Max: 33.5 [g] at 0.096 [s]

Min: -7.1 [g] at 0.214 [s]

B-52

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

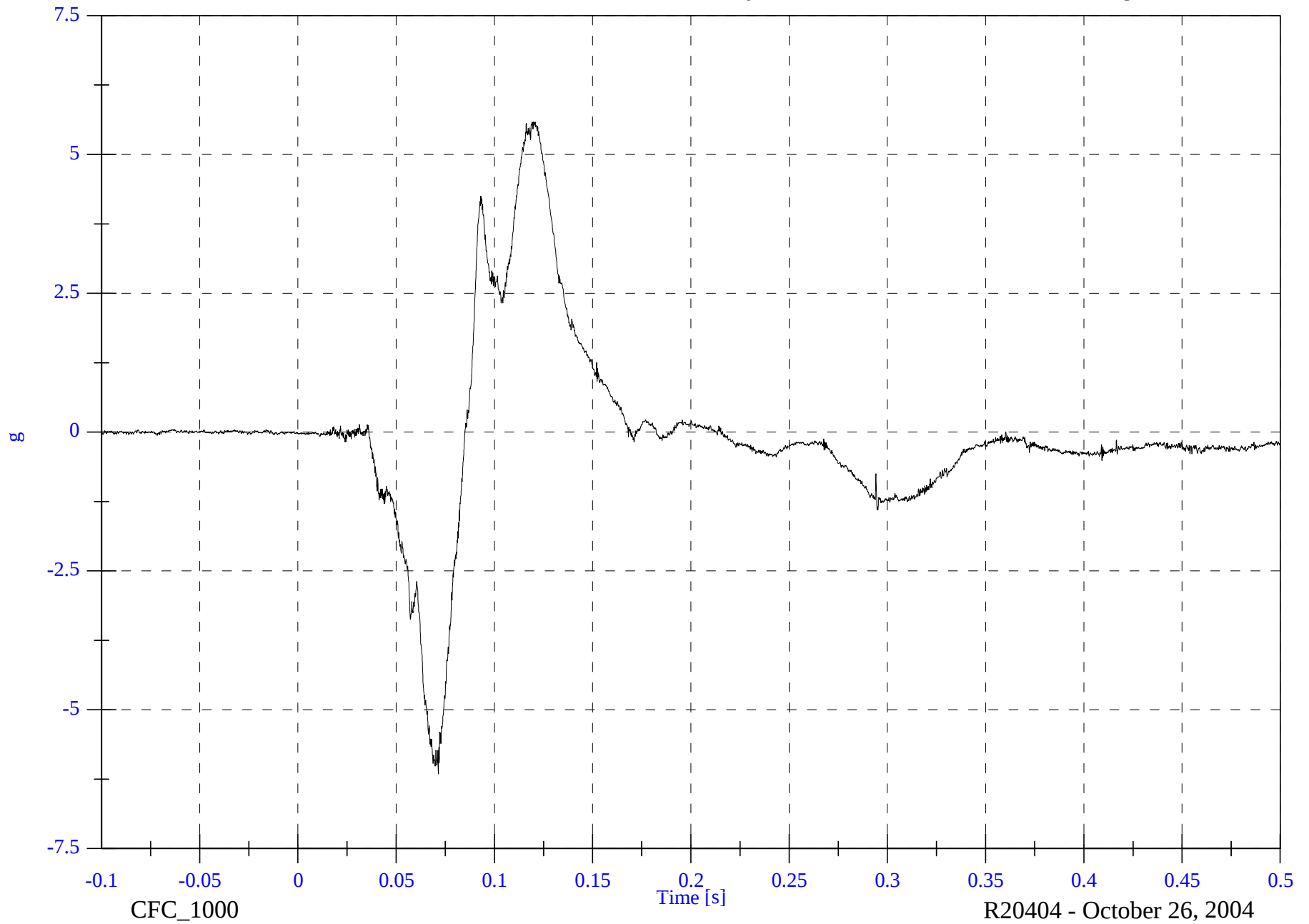
V2P3 Head y

Max: 5.6 [g] at 0.119 [s]

Min: -6.2 [g] at 0.071 [s]

B-53

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

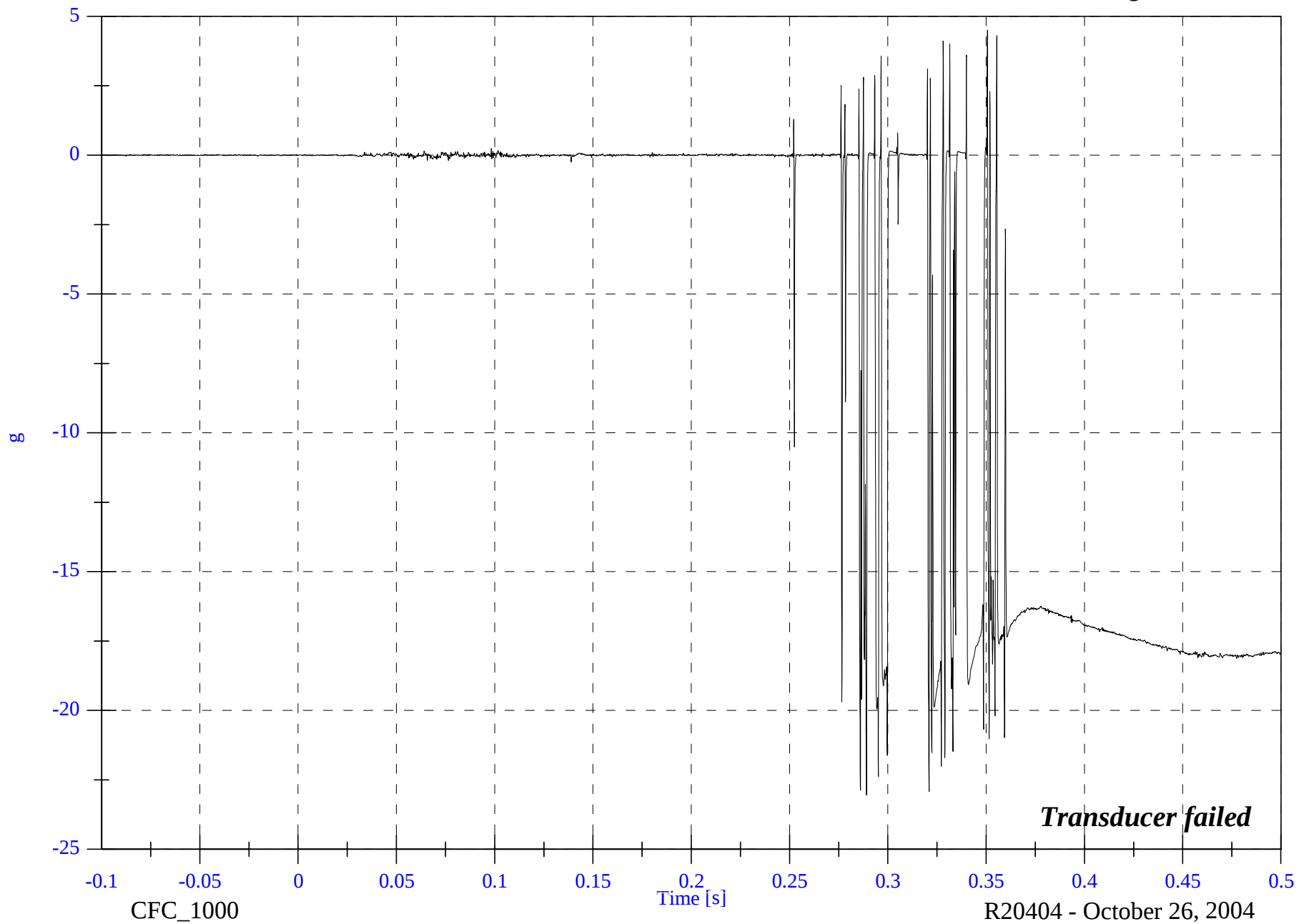
V2P3 Head z

Max: 4.5 [g] at 0.351 [s]

Min: -23.0 [g] at 0.289 [s]

B-54

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

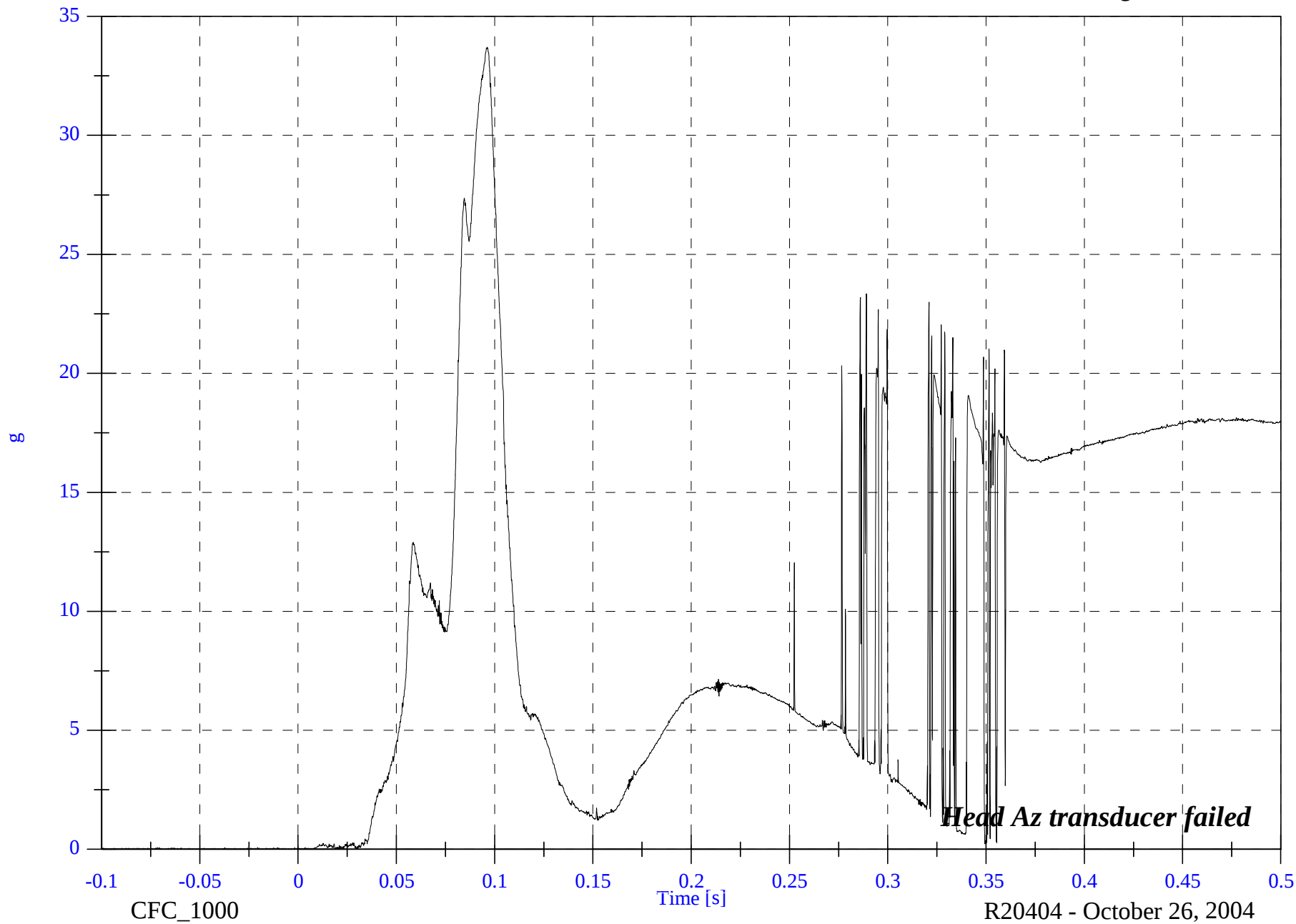
V2P3 Head Resultant

Max: 33.7 [g] at 0.096 [s]

Min: 0.0 [g] at -0.084 [s]

B-55

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

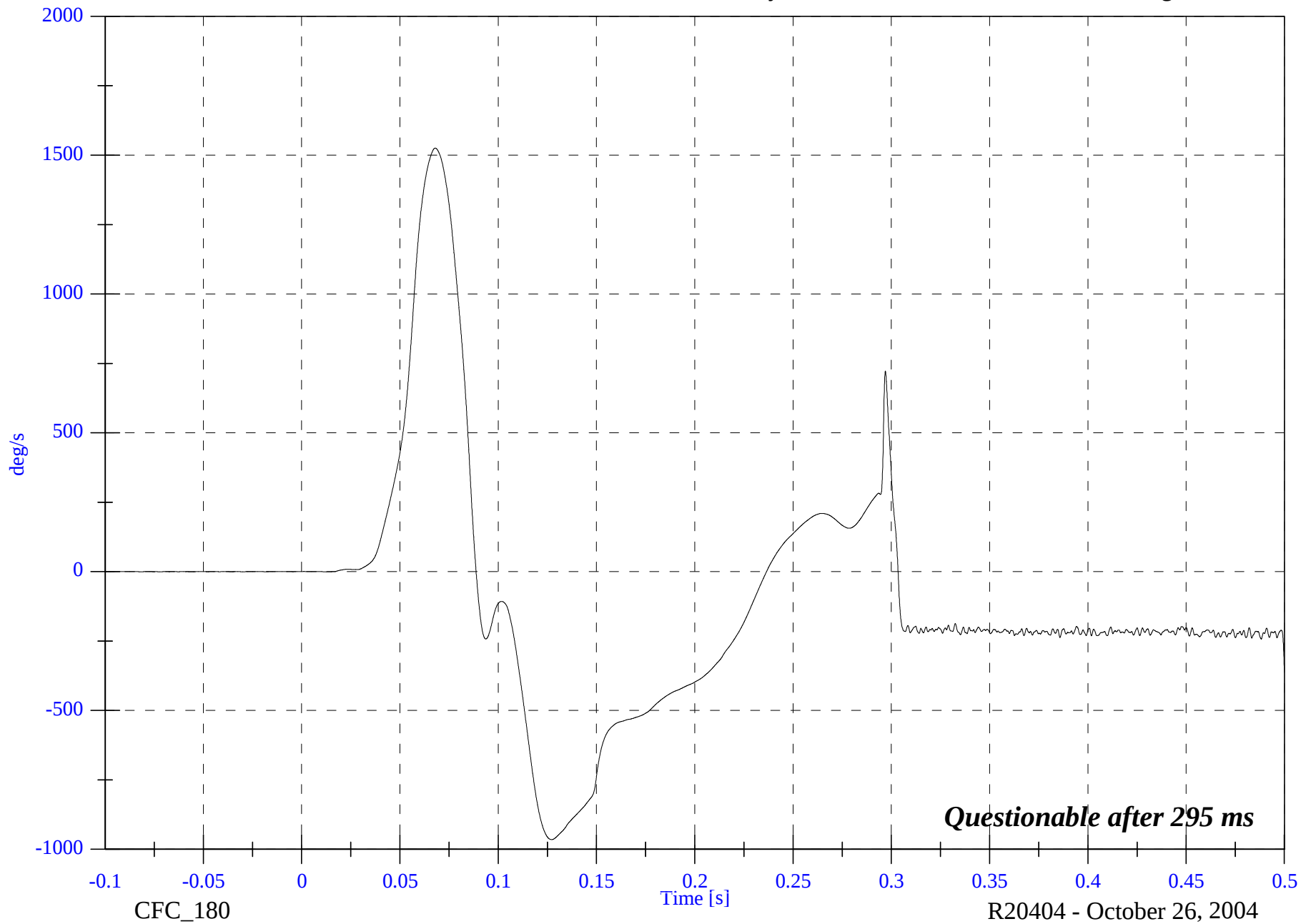
V2P3 Head AVy

Max: 1525.7 [deg/s] at 0.068 [s]

Min: -965.0 [deg/s] at 0.127 [s]

B-56

8757-V301-02

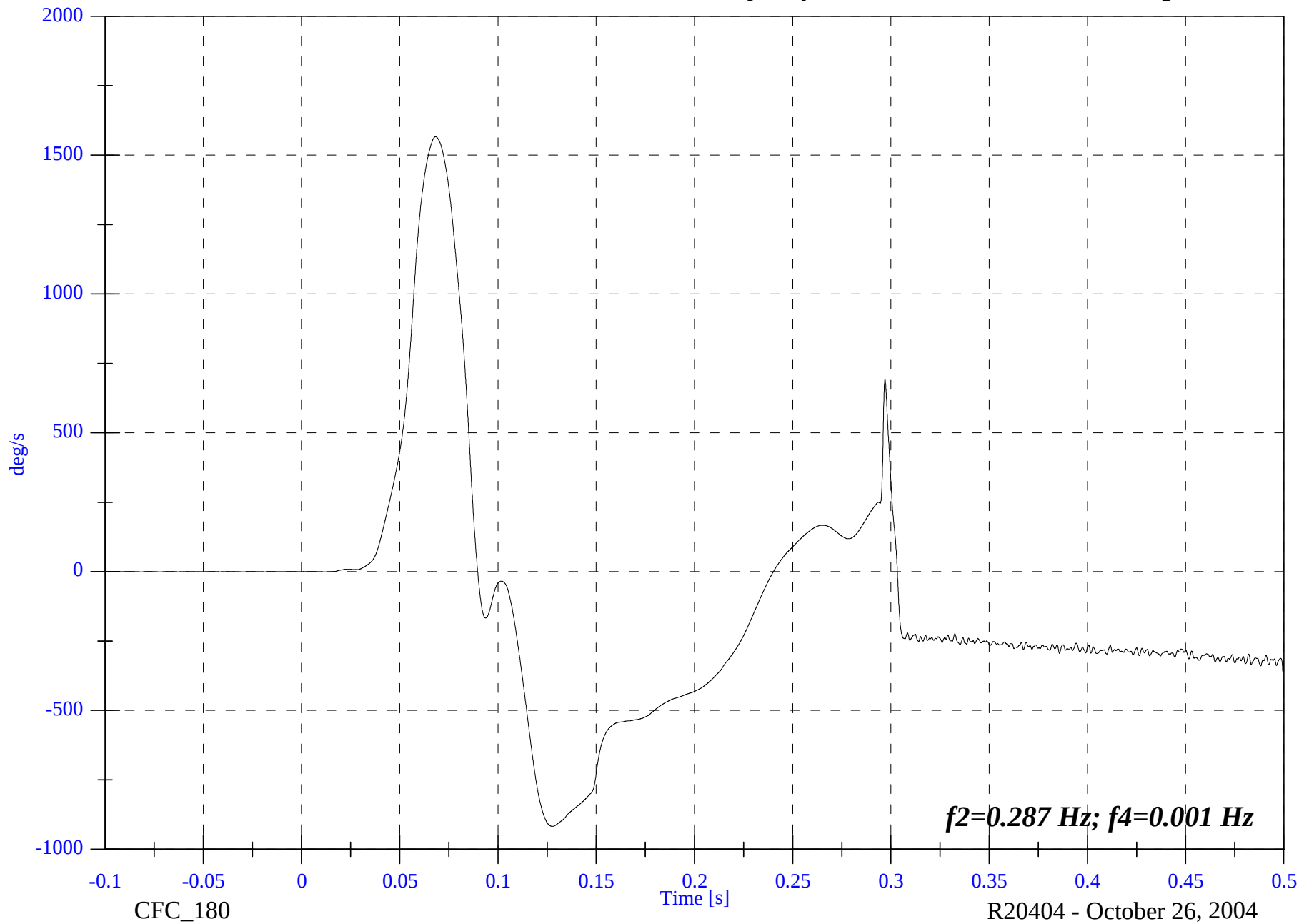


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Head Comp AVy

Max: 1566.4 [deg/s] at 0.068 [s]

Min: -917.7 [deg/s] at 0.128 [s]



B-57

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

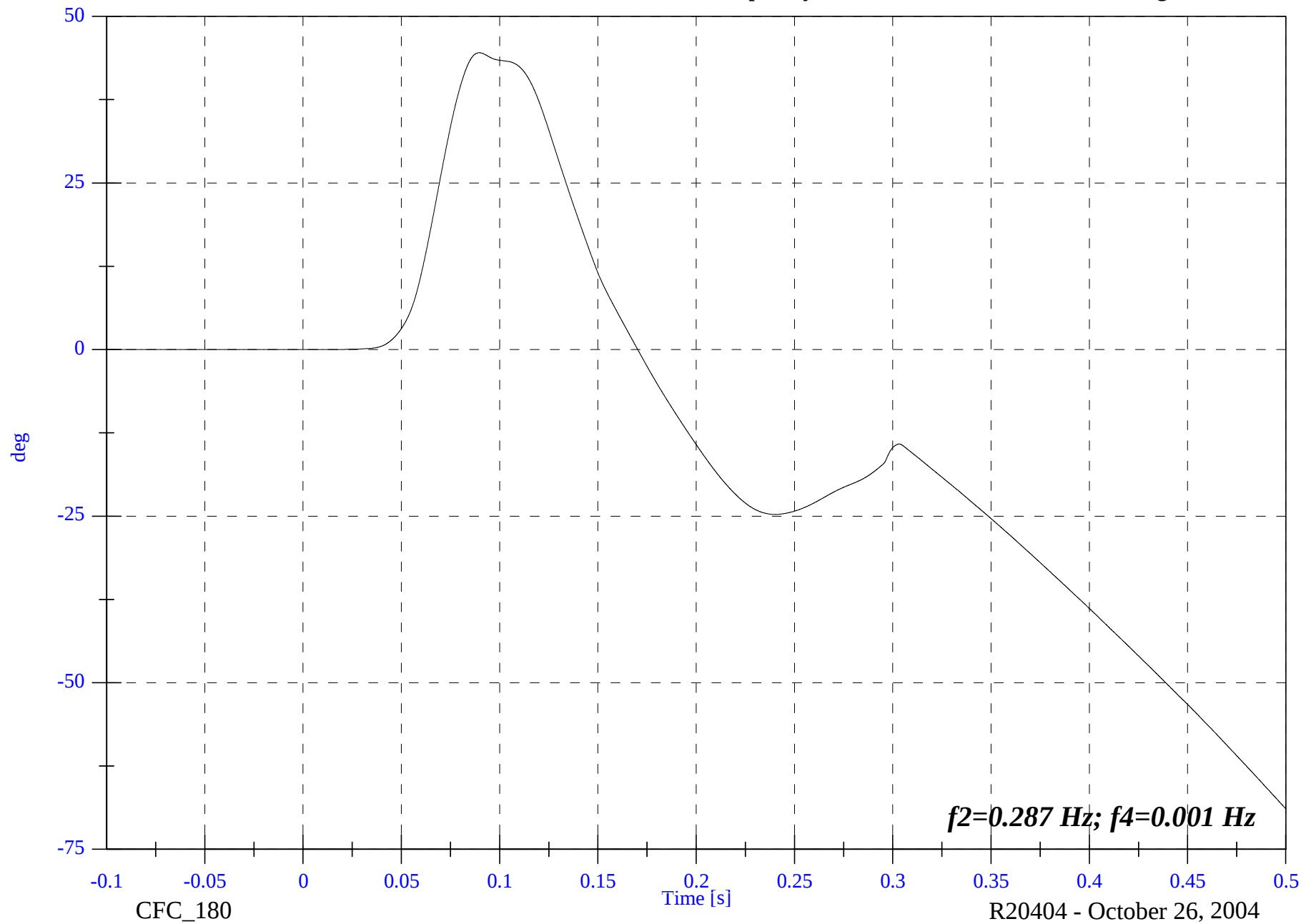
V2P3 Head Comp ADy

Max: 44.5 [deg] at 0.090 [s]

Min: -69.0 [deg] at 0.500 [s]

B-58

8757-V301-02

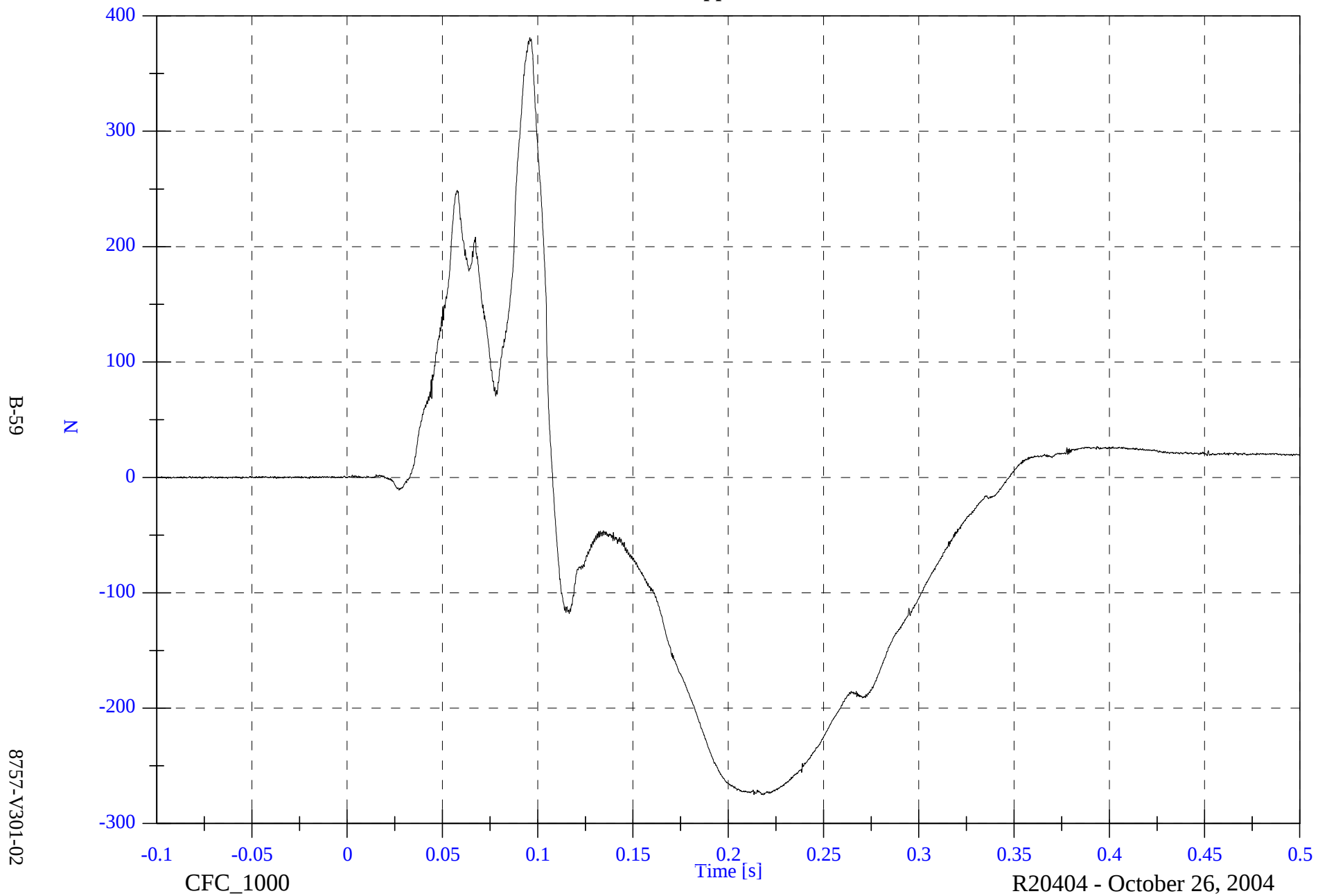


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Upper Neck Fx

Max: 381.1 [N] at 0.096 [s]

Min: -275.1 [N] at 0.218 [s]

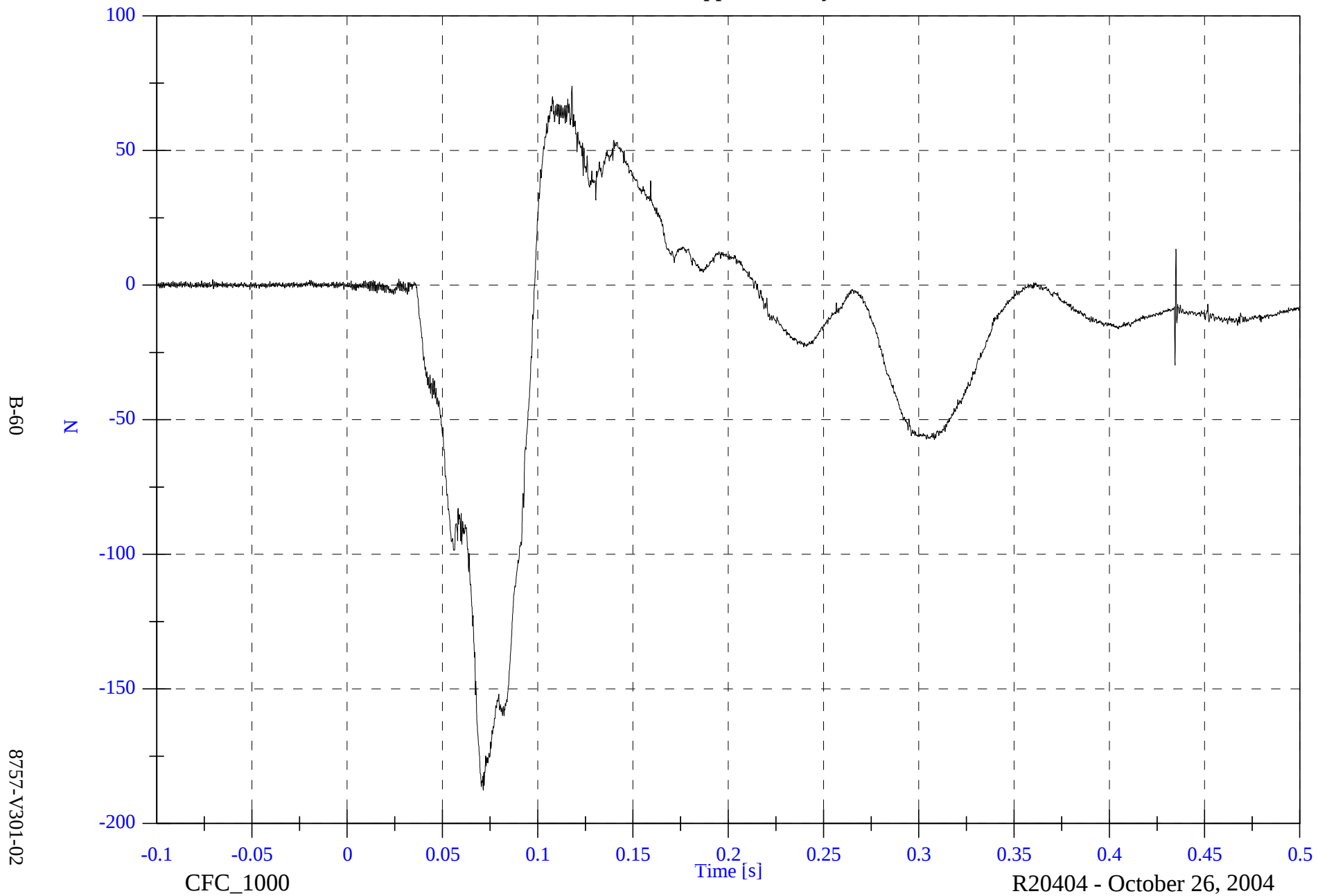


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Upper Neck Fy

Max: 73.9 [N] at 0.118 [s]

Min: -187.6 [N] at 0.071 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

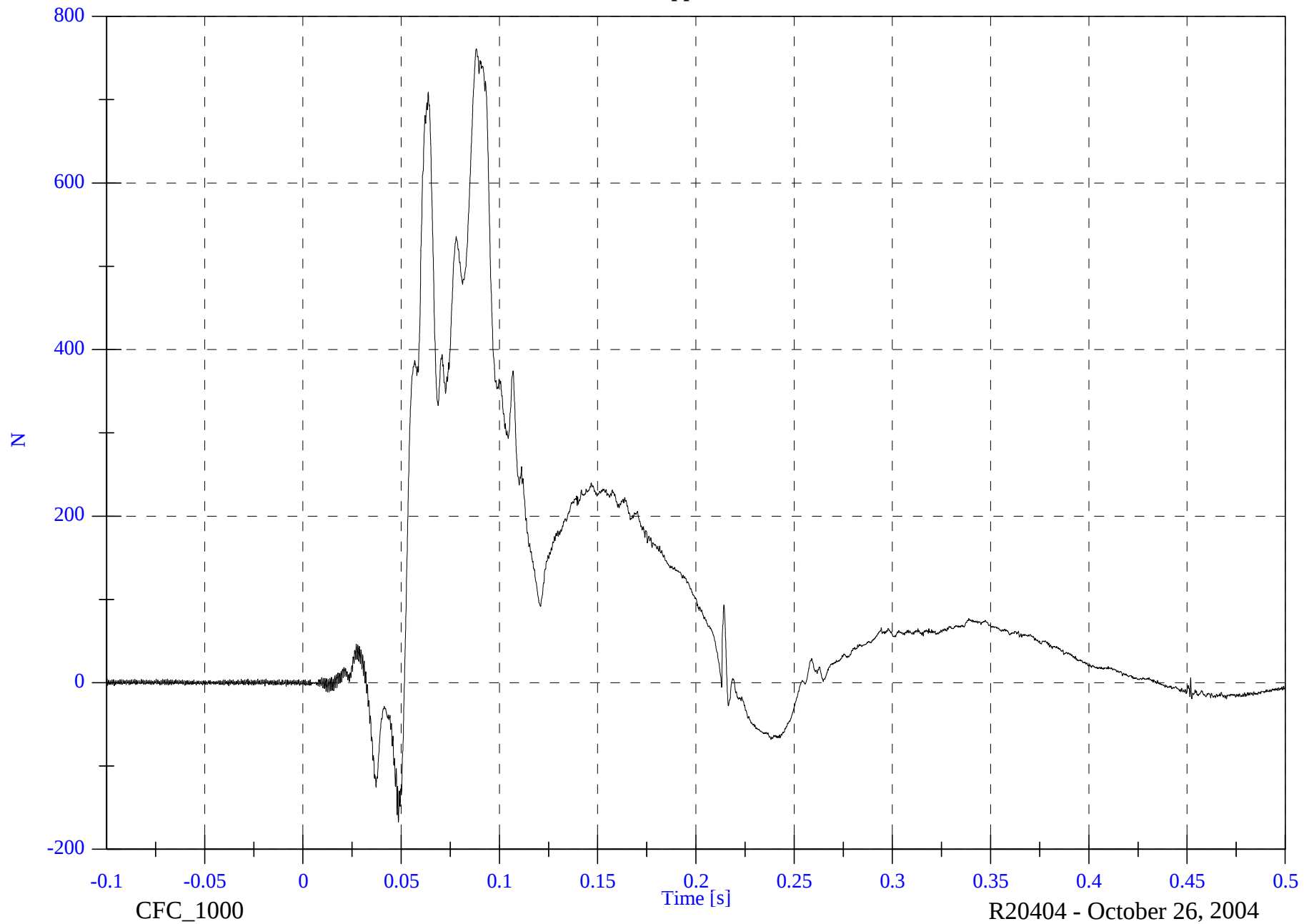
V2P3 Upper Neck Fz

Max: 761.1 [N] at 0.088 [s]

Min: -167.1 [N] at 0.049 [s]

B-61

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

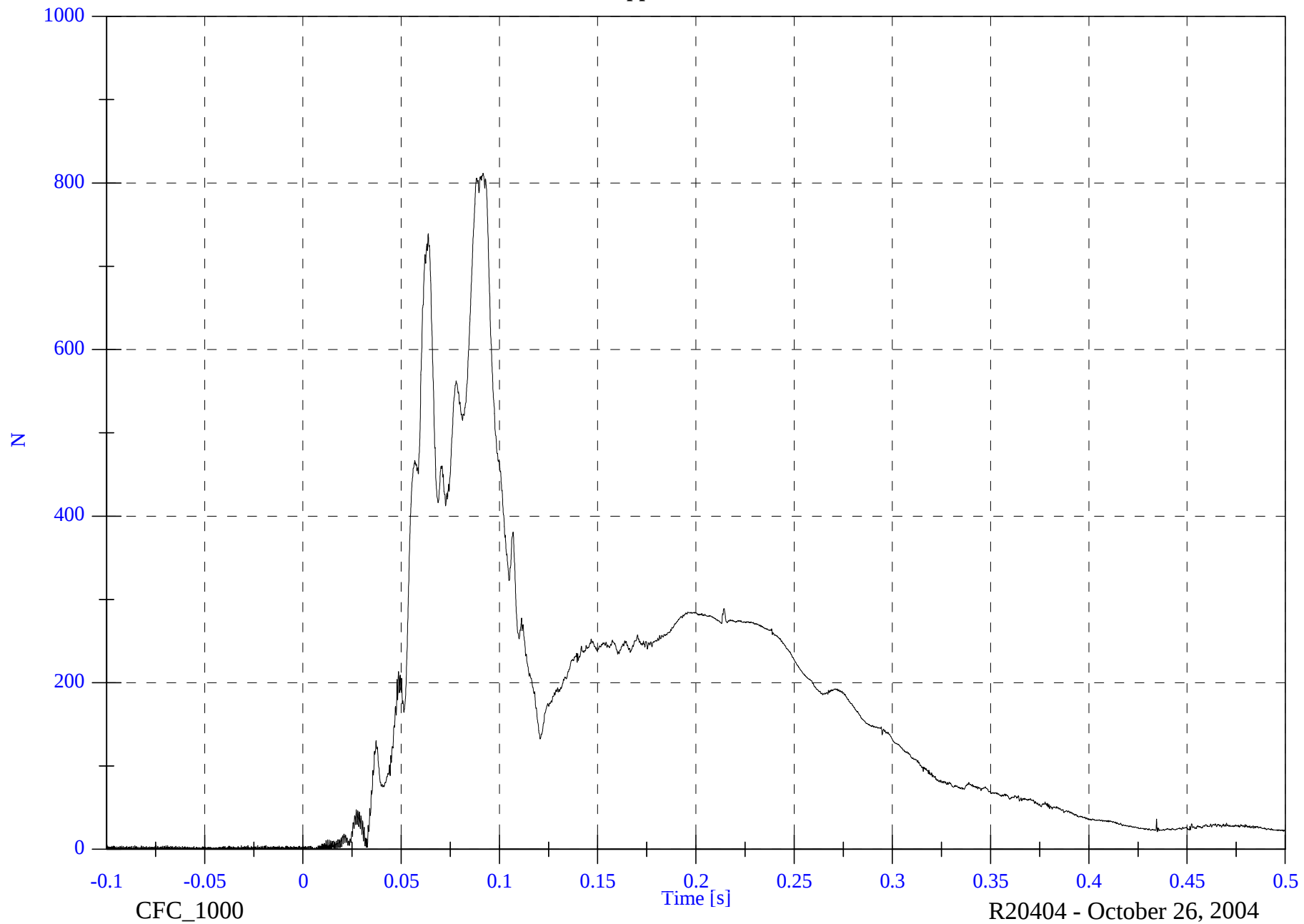
V2P3 Upper Neck F Resultant

Max: 811.7 [N] at 0.092 [s]

Min: 0.1 [N] at -0.053 [s]

B-62

8757-V301-02

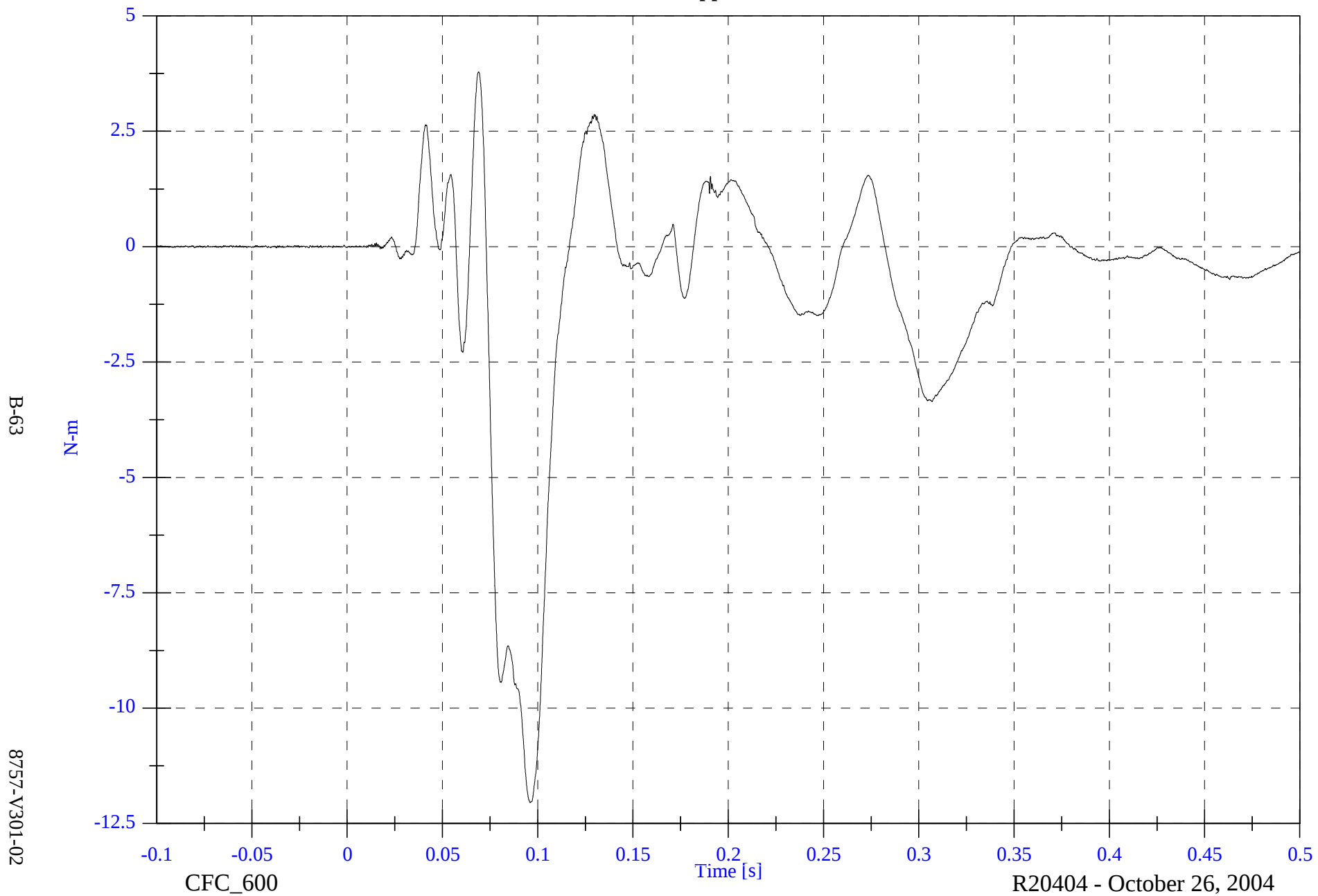


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Upper Neck Mx

Max: 3.8 [N-m] at 0.069 [s]

Min: -12.0 [N-m] at 0.096 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

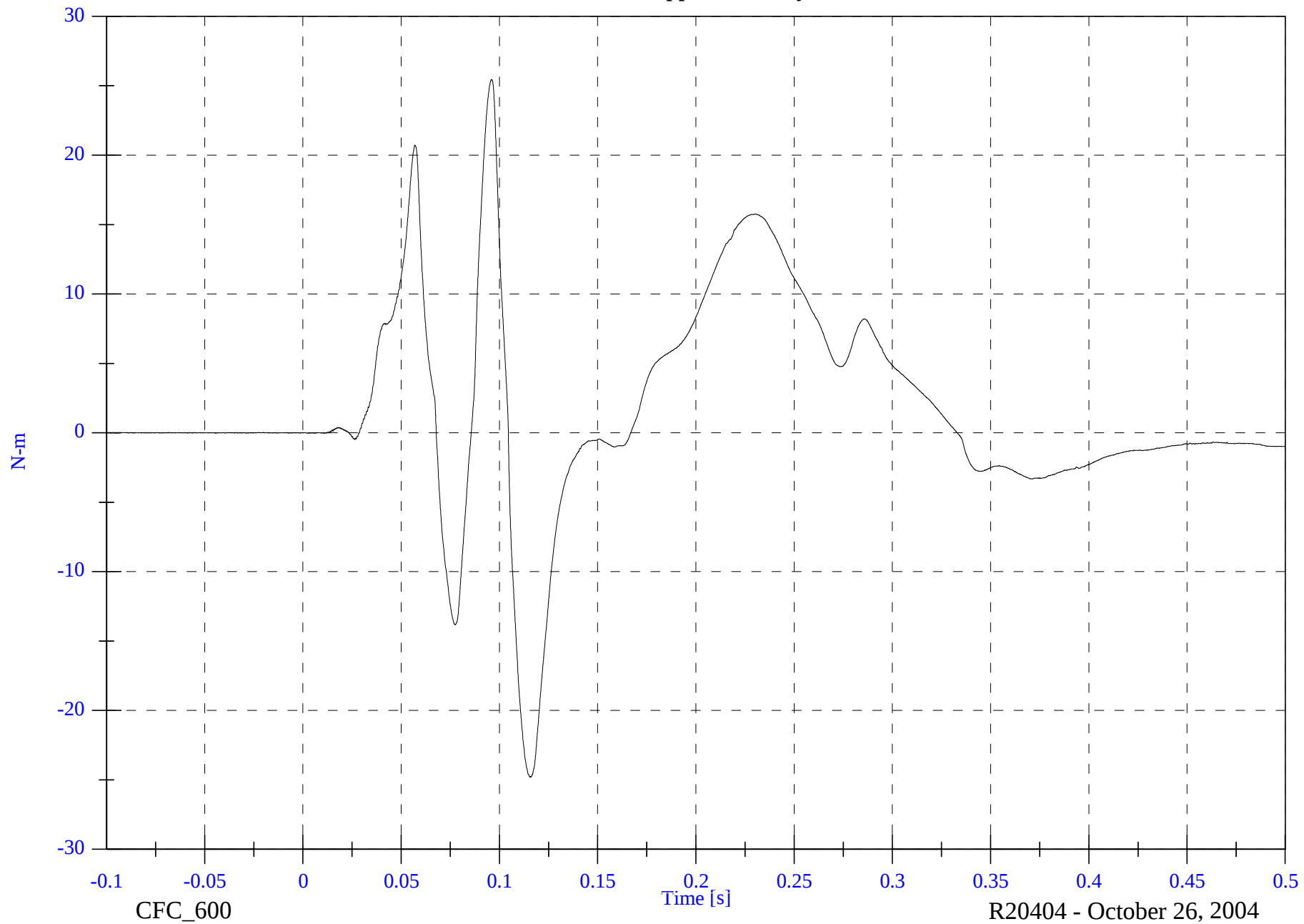
V2P3 Upper Neck My

Max: 25.5 [N-m] at 0.096 [s]

Min: -24.8 [N-m] at 0.116 [s]

B-64

8757-V301-02

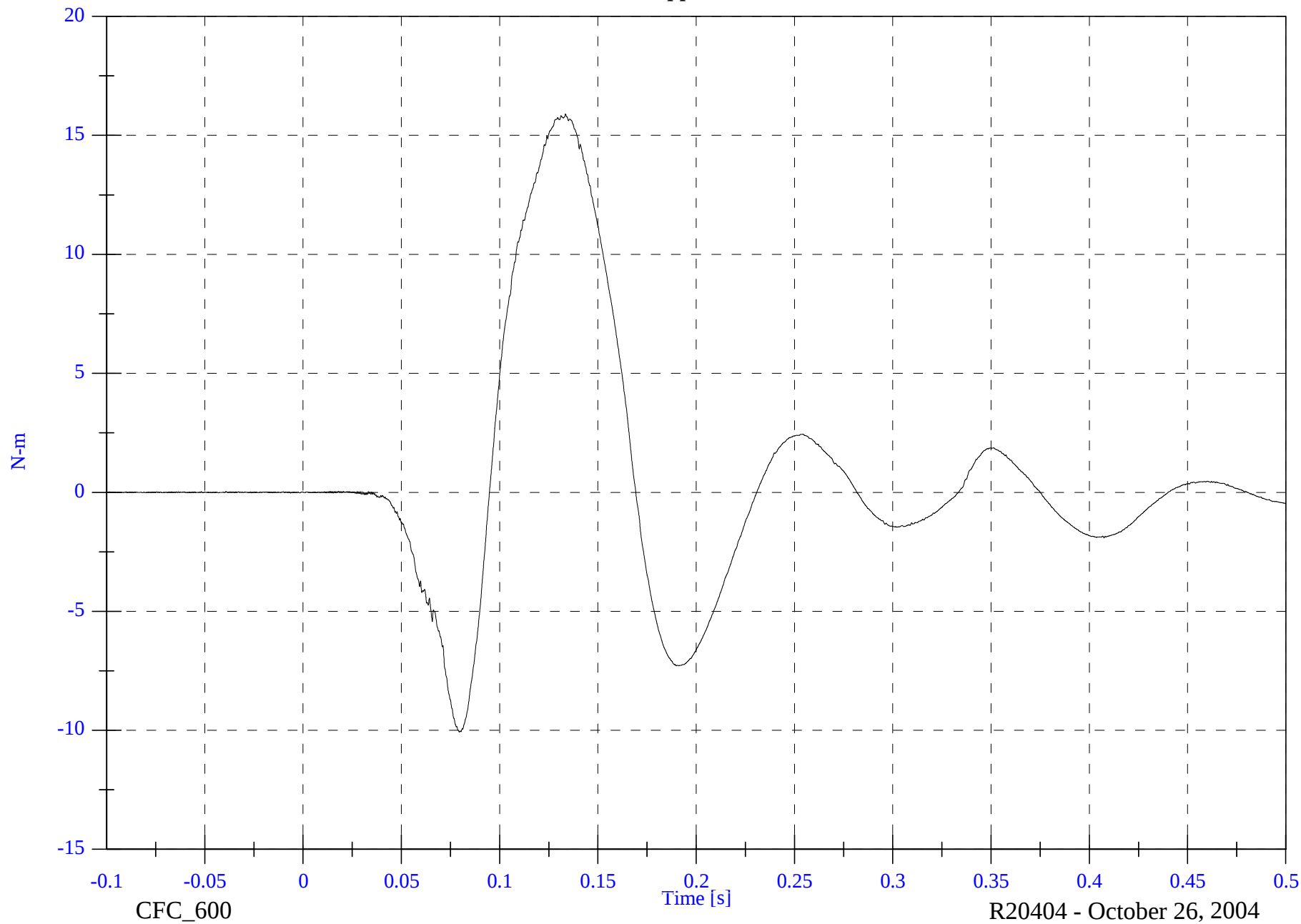


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Upper Neck Mz

Max: 15.9 [N-m] at 0.134 [s]

Min: -10.1 [N-m] at 0.079 [s]



B-65

8757-V301-02

CFC_600

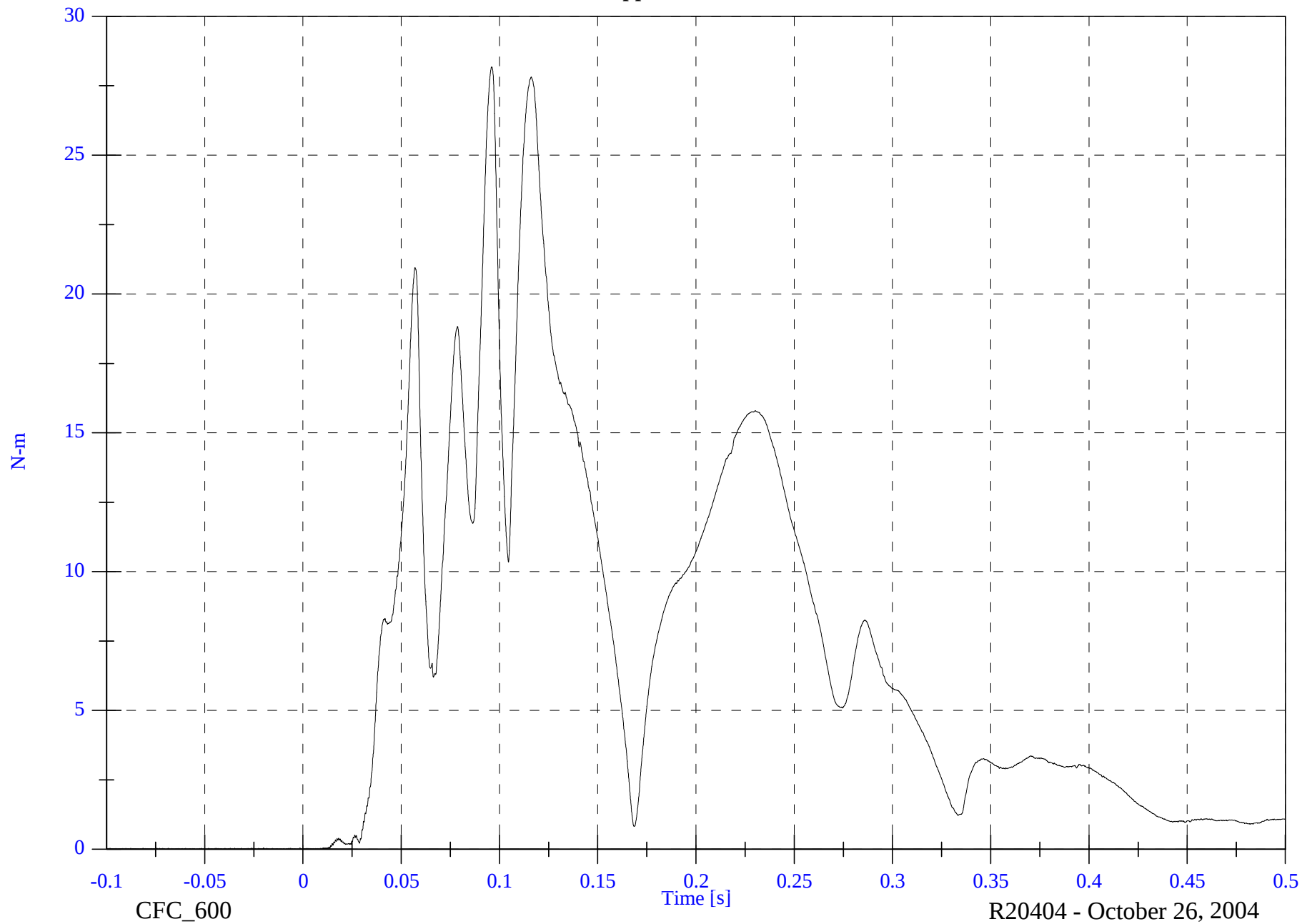
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Upper Neck M Resultant

Max: 28.2 [N-m] at 0.096 [s]

Min: 0.0 [N-m] at -0.058 [s]



B-66

8757-V301-02

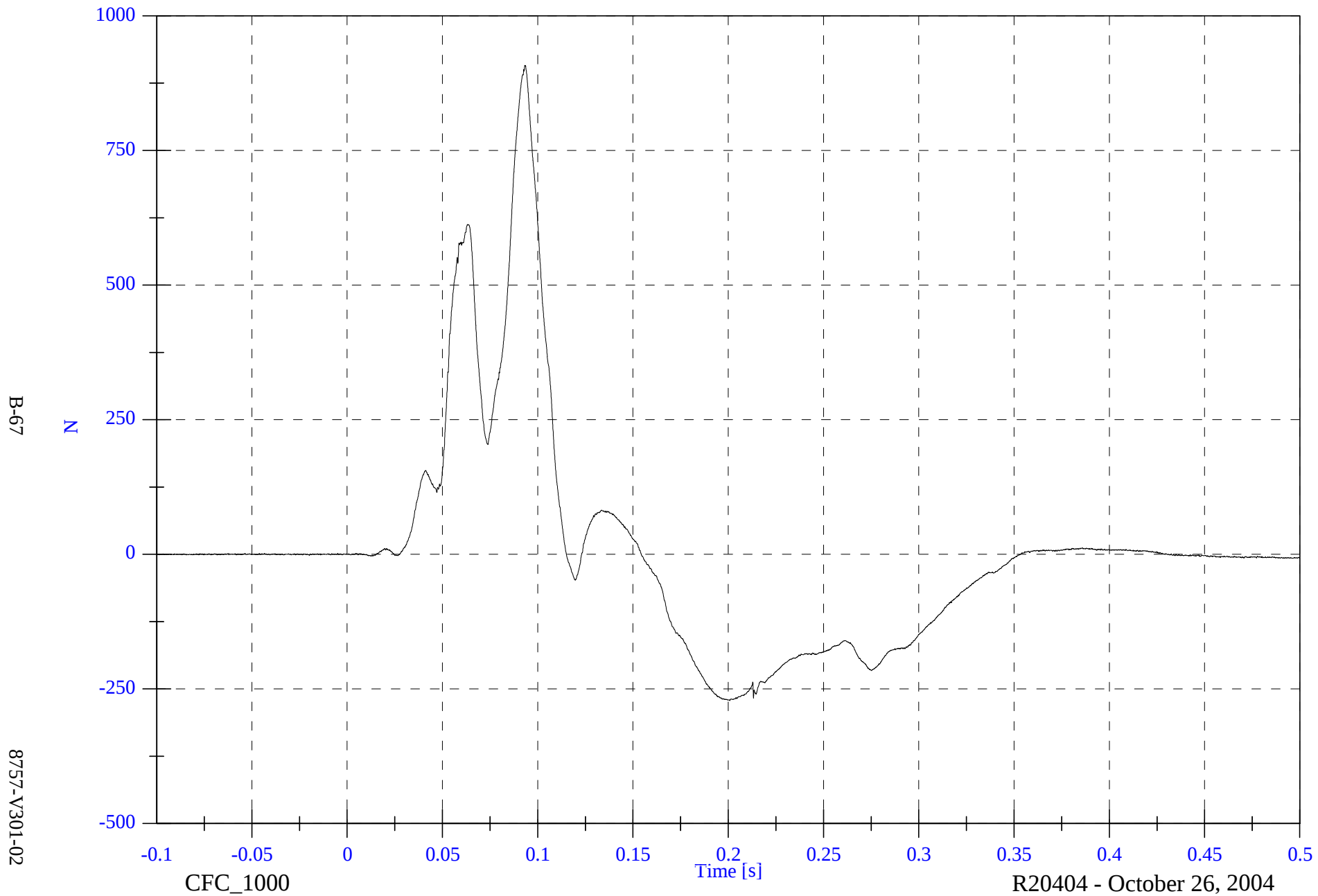
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck Fx

Max: 908.1 [N] at 0.093 [s]

Min: -271.8 [N] at 0.201 [s]

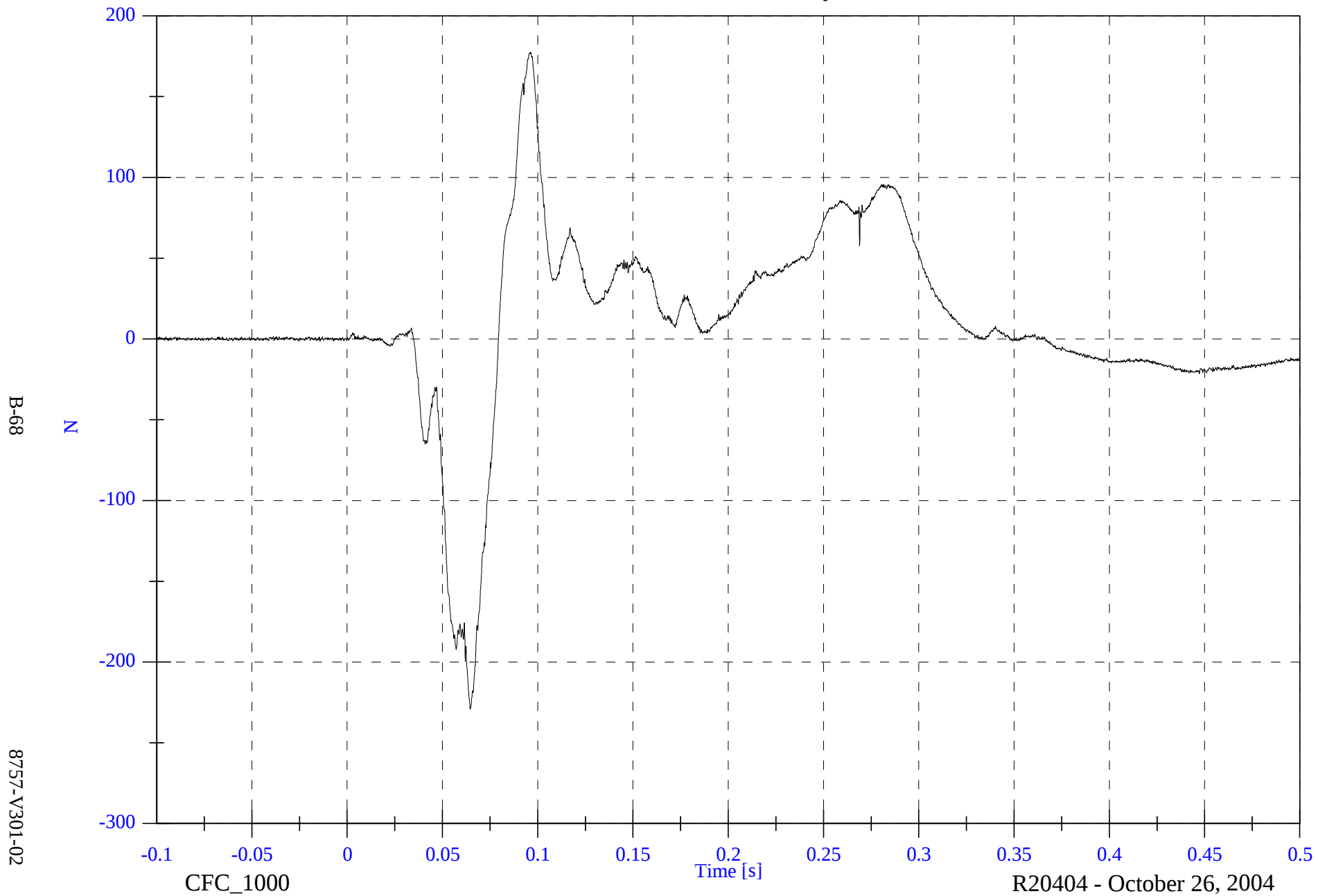


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck Fy

Max: 177.5 [N] at 0.096 [s]

Min: -229.2 [N] at 0.065 [s]

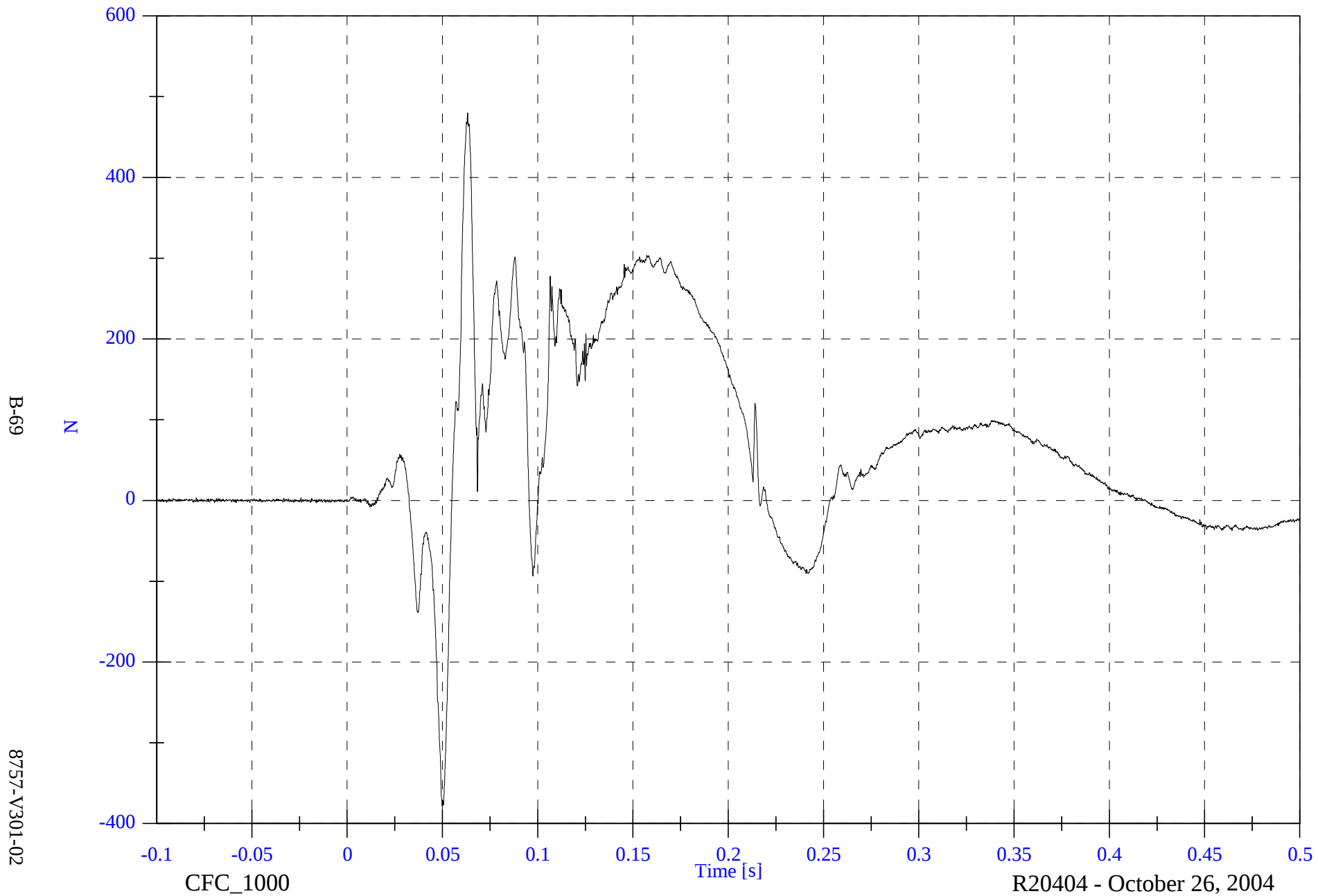


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck Fz

Max: 479.7 [N] at 0.063 [s]

Min: -378.0 [N] at 0.050 [s]

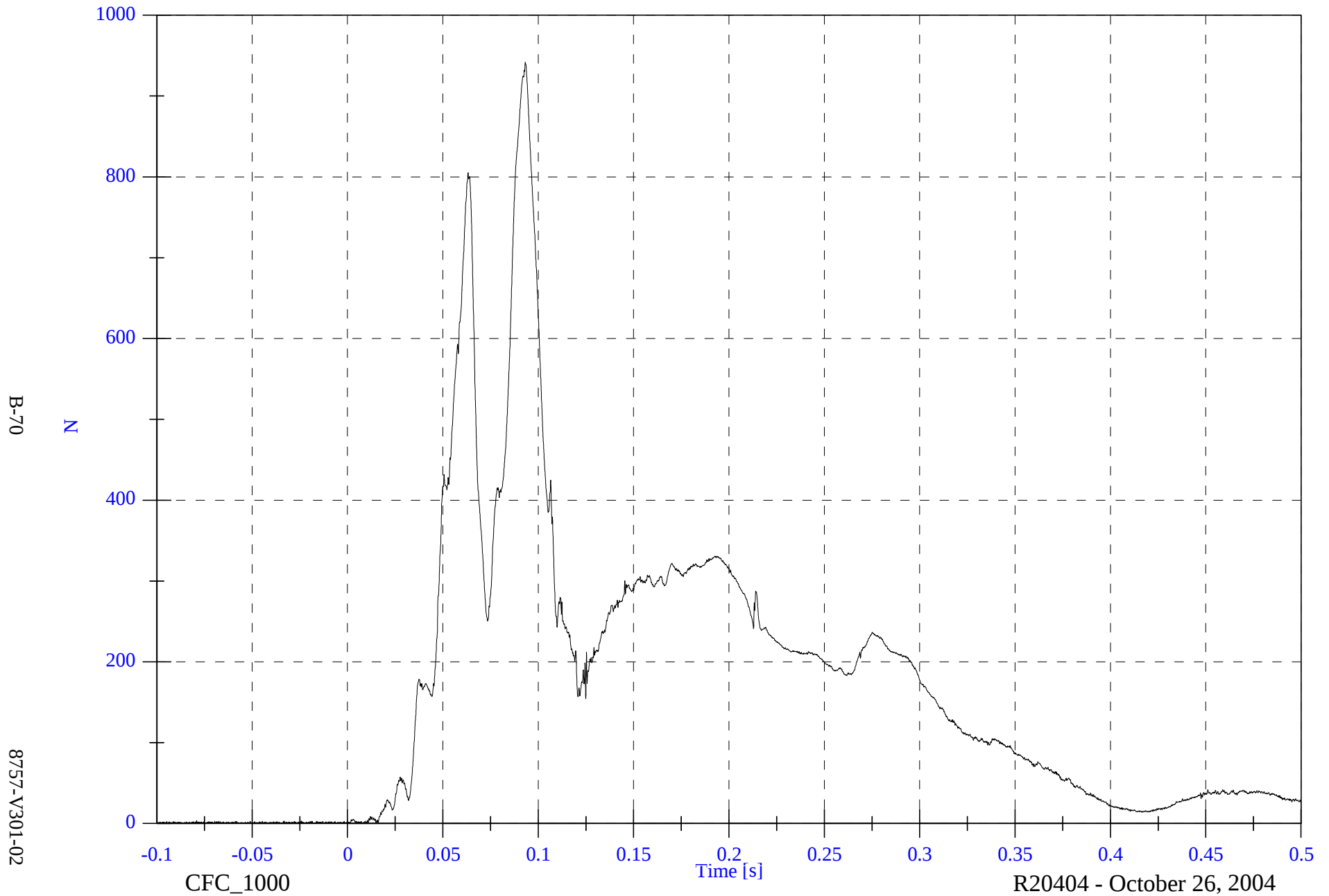


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck F Resultant

Max: 941.9 [N] at 0.093 [s]

Min: 0.1 [N] at -0.034 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

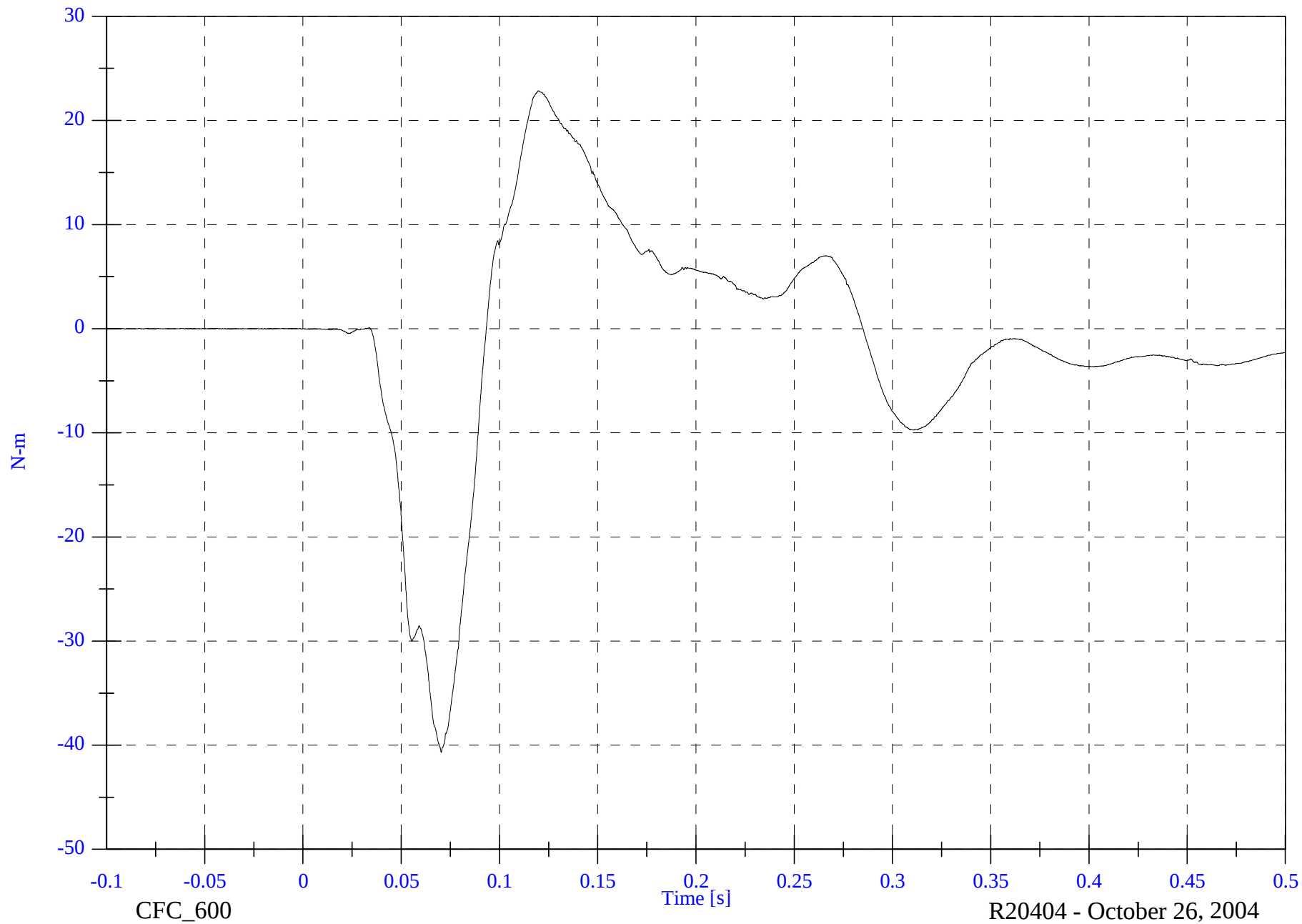
V2P3 Lower Neck Mx

Max: 22.9 [N-m] at 0.120 [s]

Min: -40.7 [N-m] at 0.070 [s]

B-71

8757-V301-02

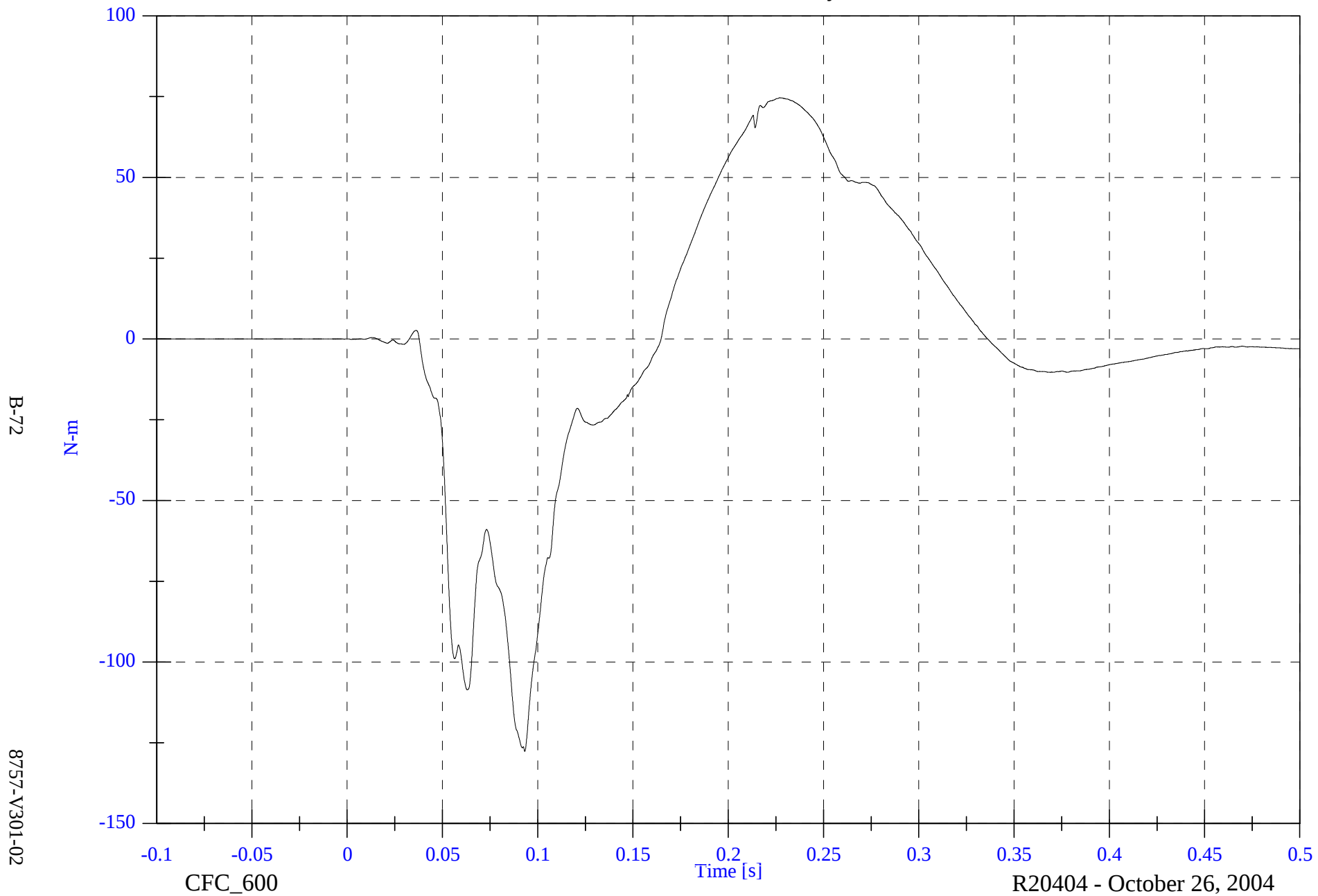


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck My

Max: 74.7 [N-m] at 0.227 [s]

Min: -127.7 [N-m] at 0.093 [s]

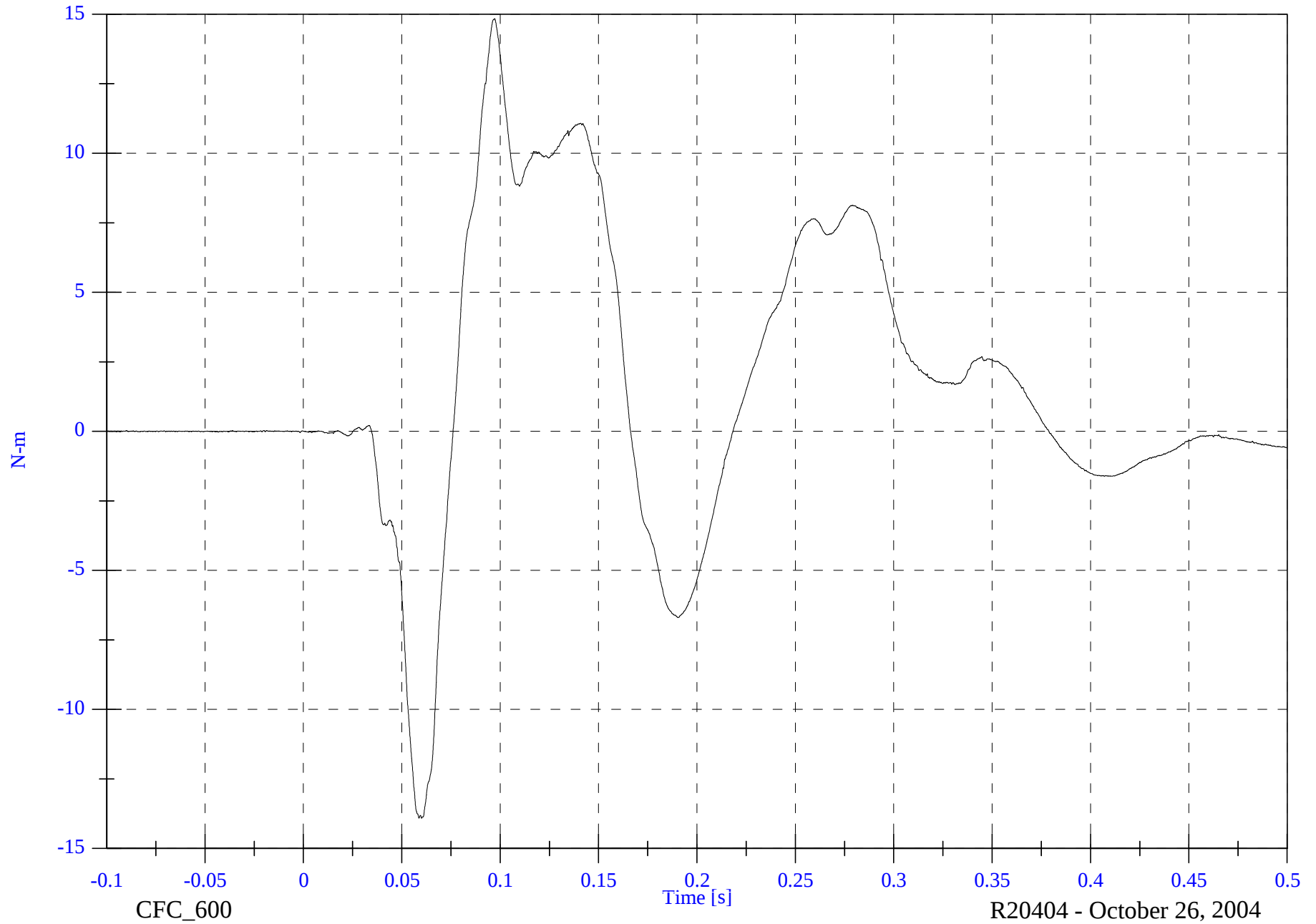


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck Mz

Max: 14.8 [N-m] at 0.097 [s]

Min: -13.9 [N-m] at 0.060 [s]



B-73

8757-V301-02

CFC_600

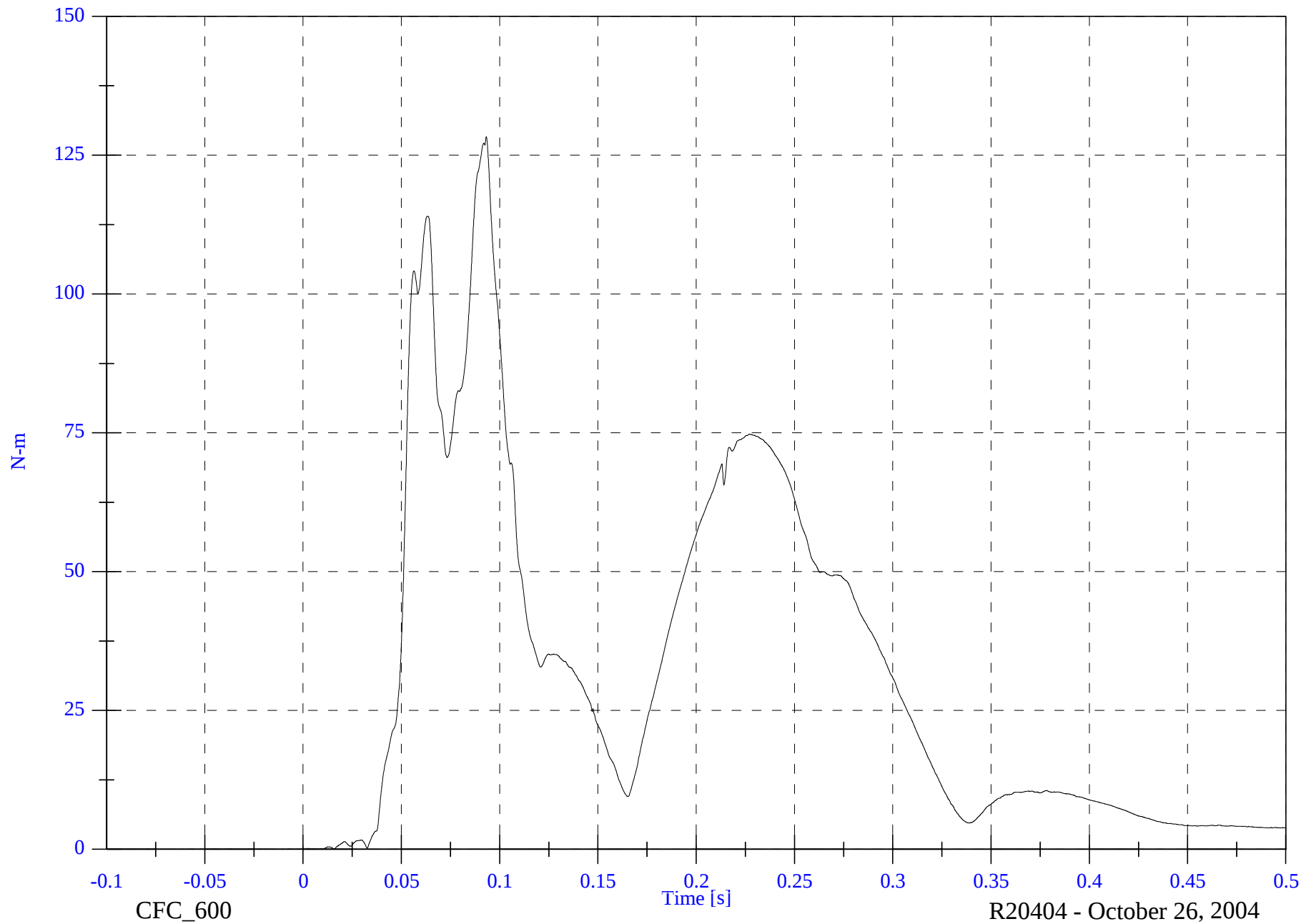
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Lower Neck M Resultant

Max: 128.3 [N-m] at 0.093 [s]

Min: 0.0 [N-m] at -0.005 [s]



B-74

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

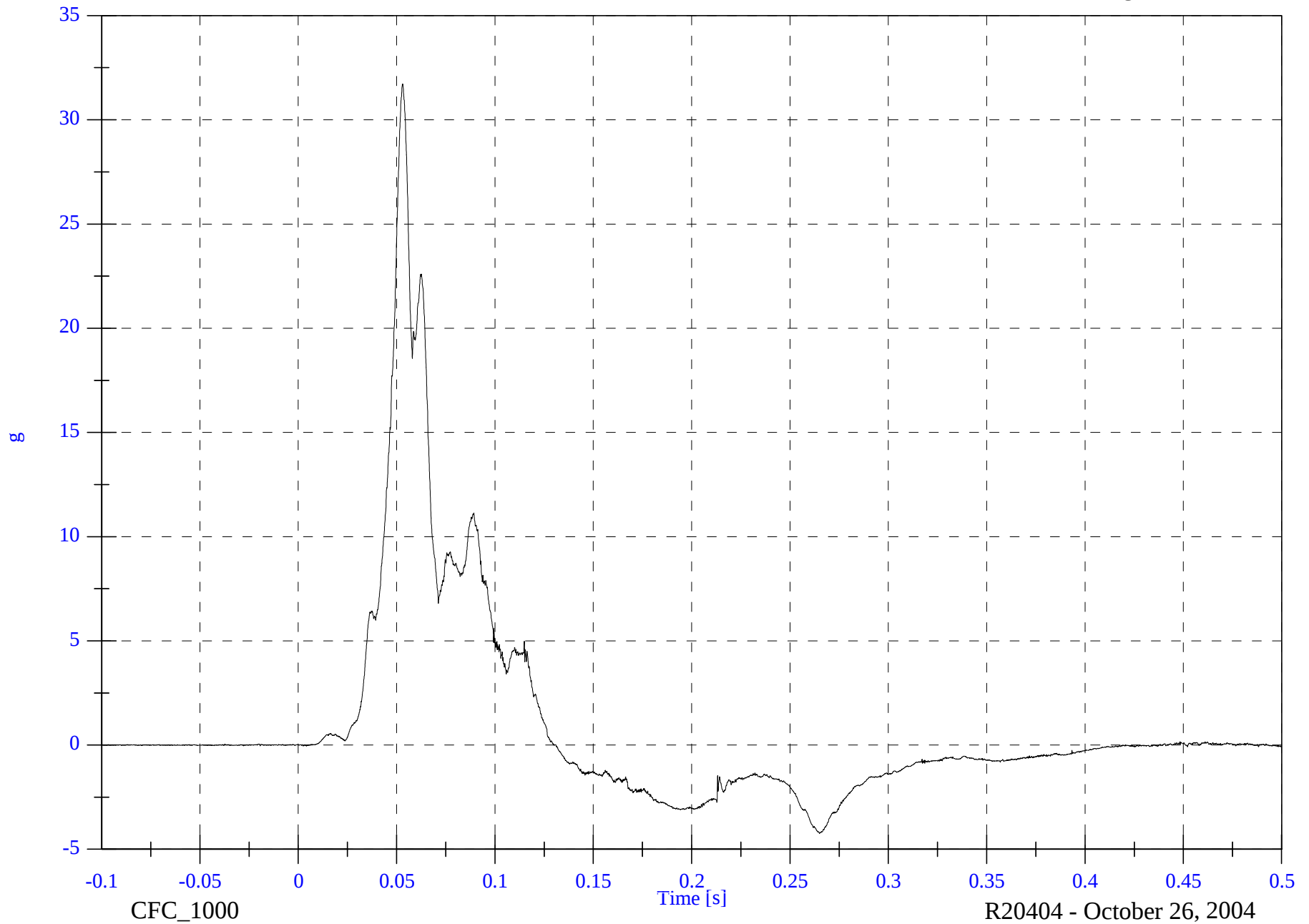
V2P3 Lower Neck x

Max: 31.7 [g] at 0.053 [s]

Min: -4.2 [g] at 0.265 [s]

B-75

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

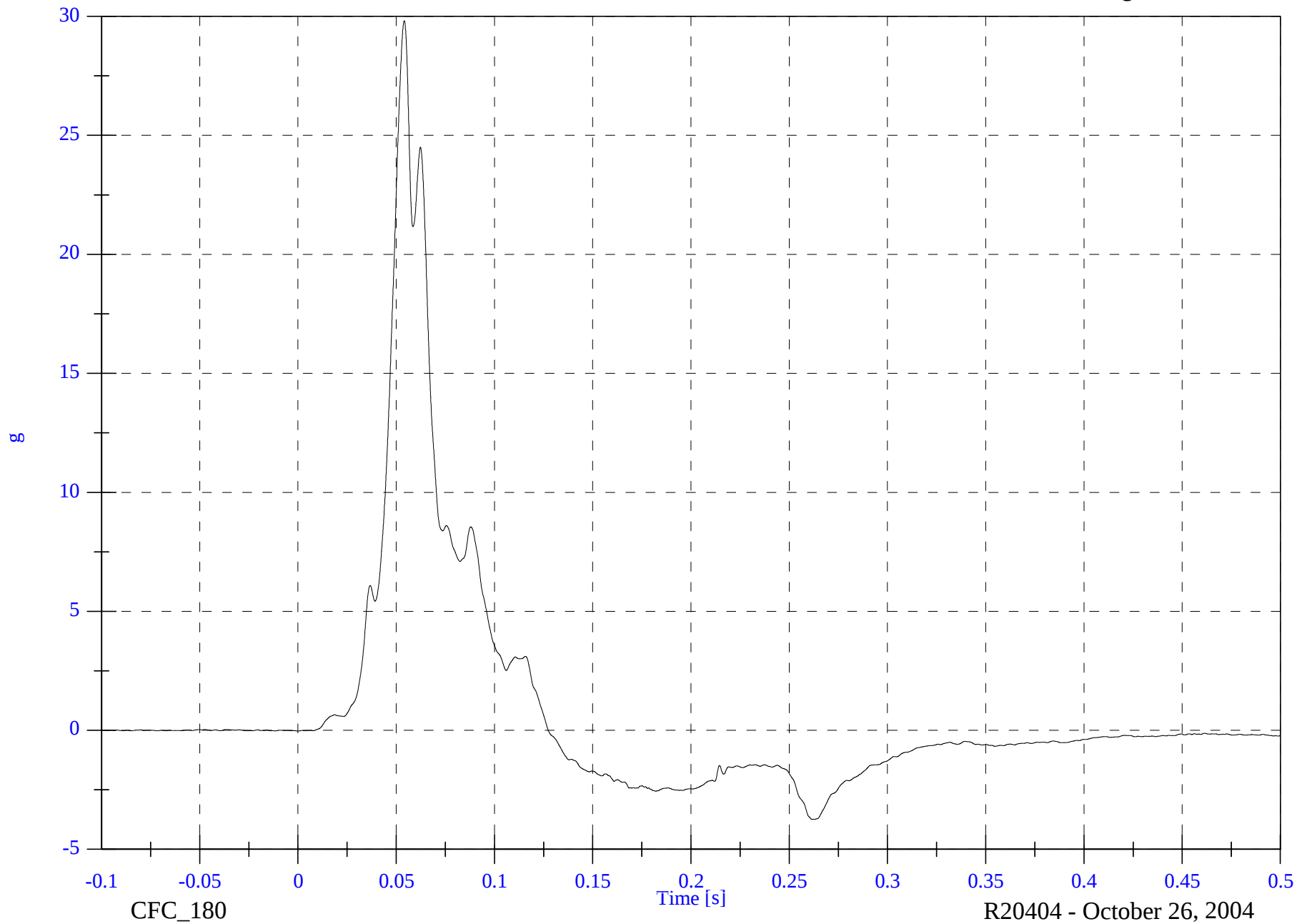
V2P3 Chest x

Max: 29.8 [g] at 0.054 [s]

Min: -3.7 [g] at 0.262 [s]

B-76

8757-V301-02

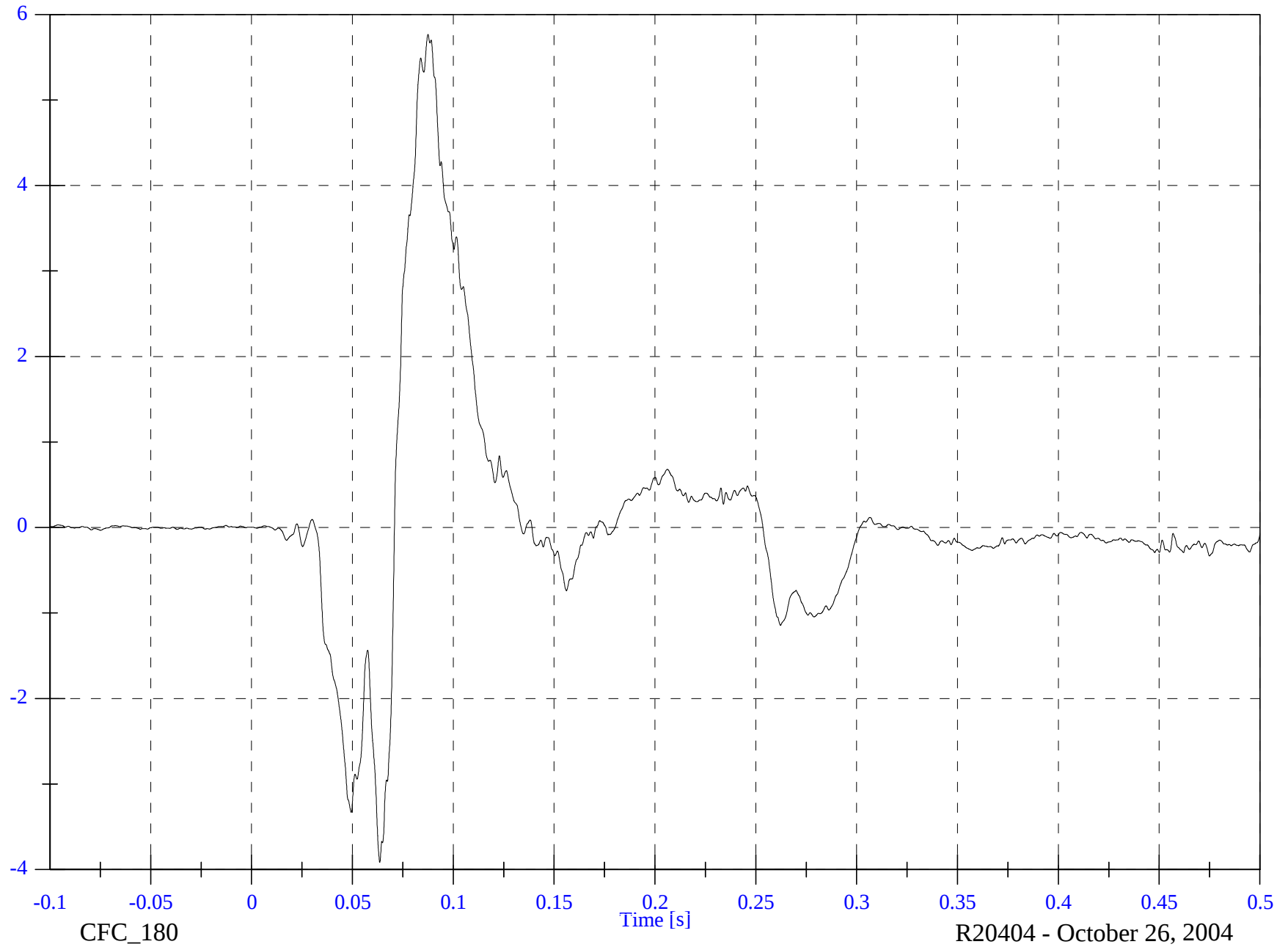


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Chest y

Max: 5.8 [g] at 0.087 [s]

Min: -3.9 [g] at 0.064 [s]



B-77

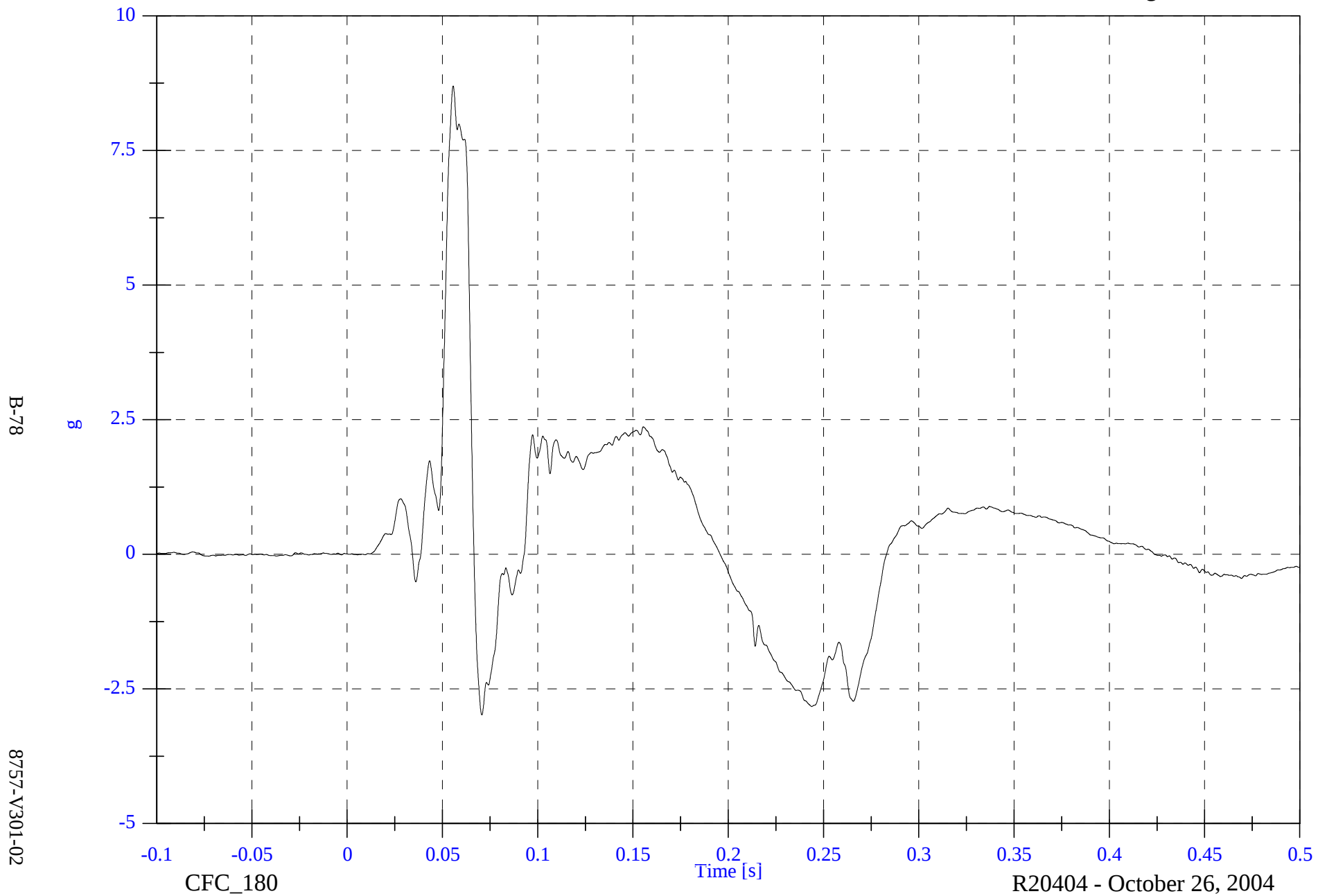
8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Chest z

Max: 8.7 [g] at 0.056 [s]

Min: -3.0 [g] at 0.071 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

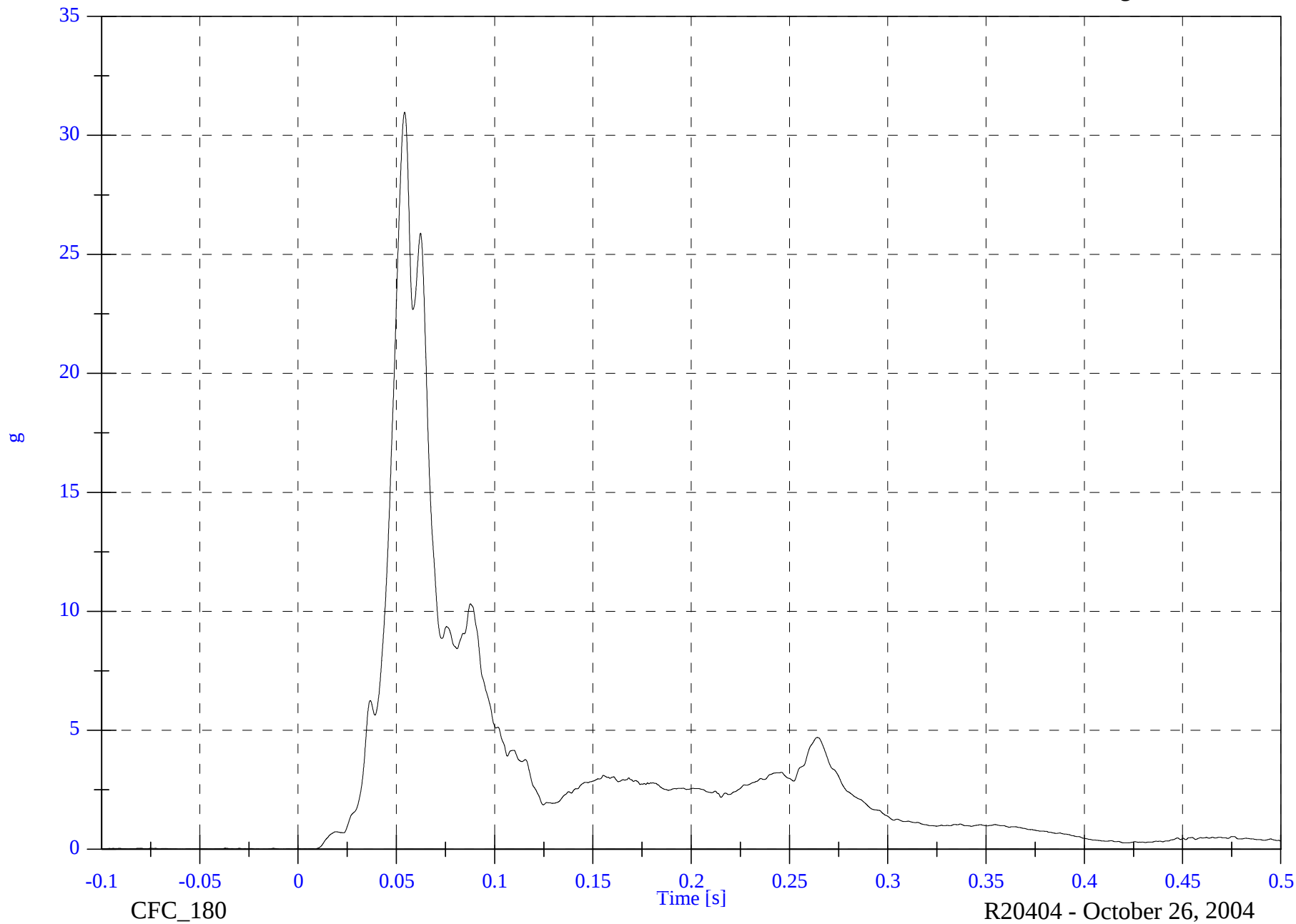
V2P3 Chest Resultant

Max: 31.0 [g] at 0.054 [s]

Min: 0.0 [g] at -0.058 [s]

B-79

8757-V301-02

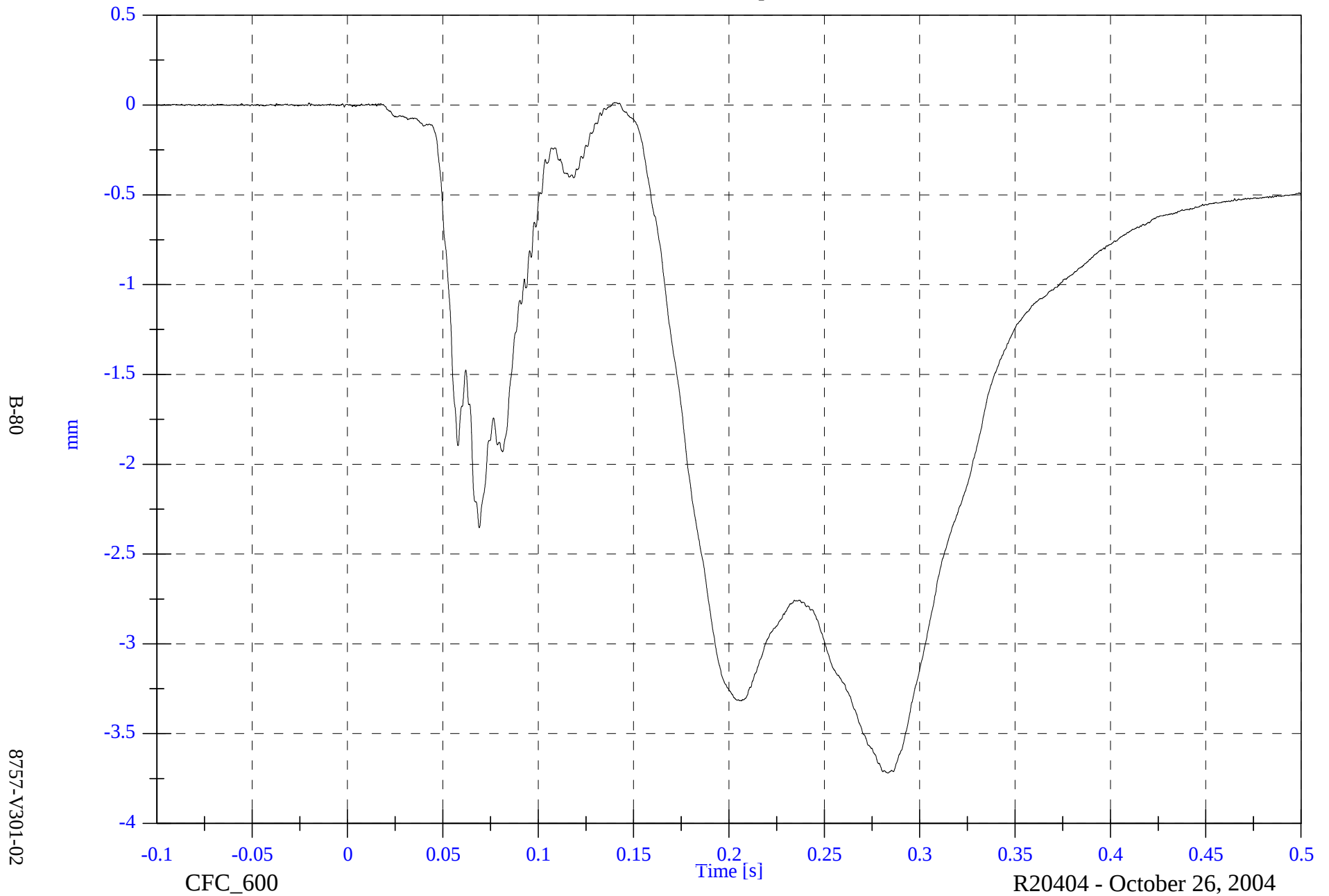


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Chest Displacement

Max: 0.0 [mm] at 0.140 [s]

Min: -3.7 [mm] at 0.283 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

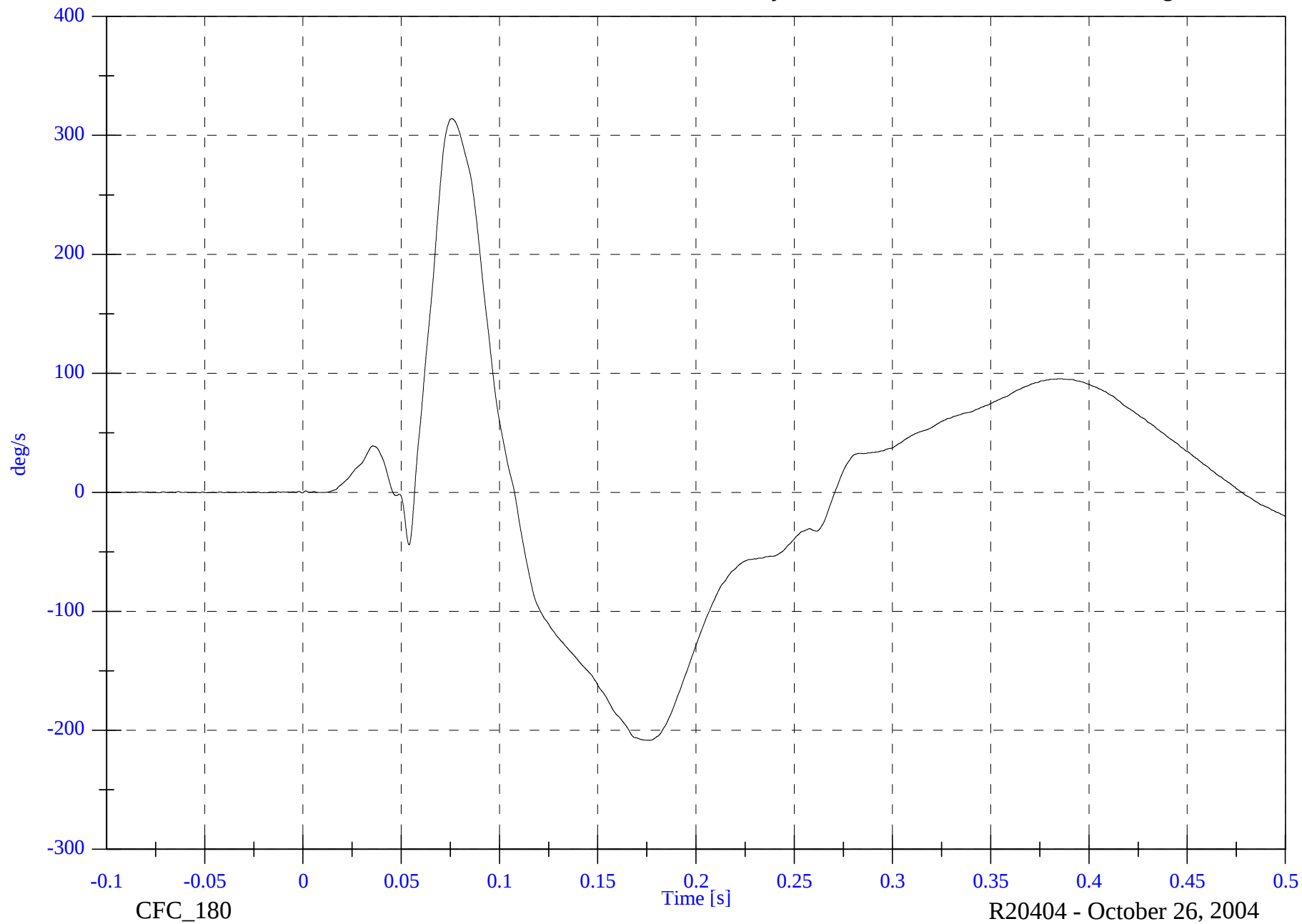
V2P3 Chest AVy

Max: 314.0 [deg/s] at 0.076 [s]

Min: -208.4 [deg/s] at 0.175 [s]

B-81

8757-V301-02

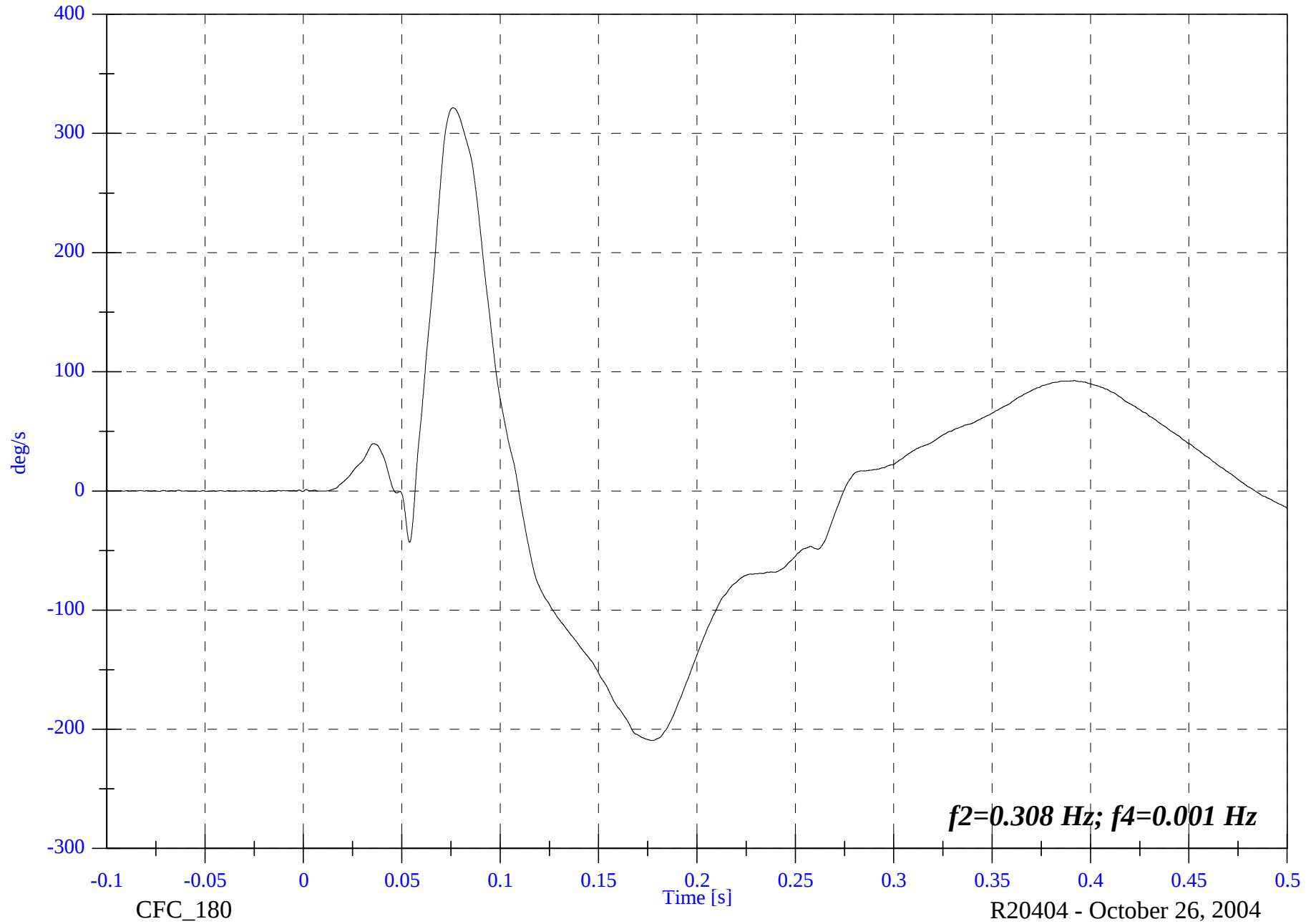


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Chest Comp AVy

Max: 321.5 [deg/s] at 0.076 [s]

Min: -209.5 [deg/s] at 0.177 [s]



B-82

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

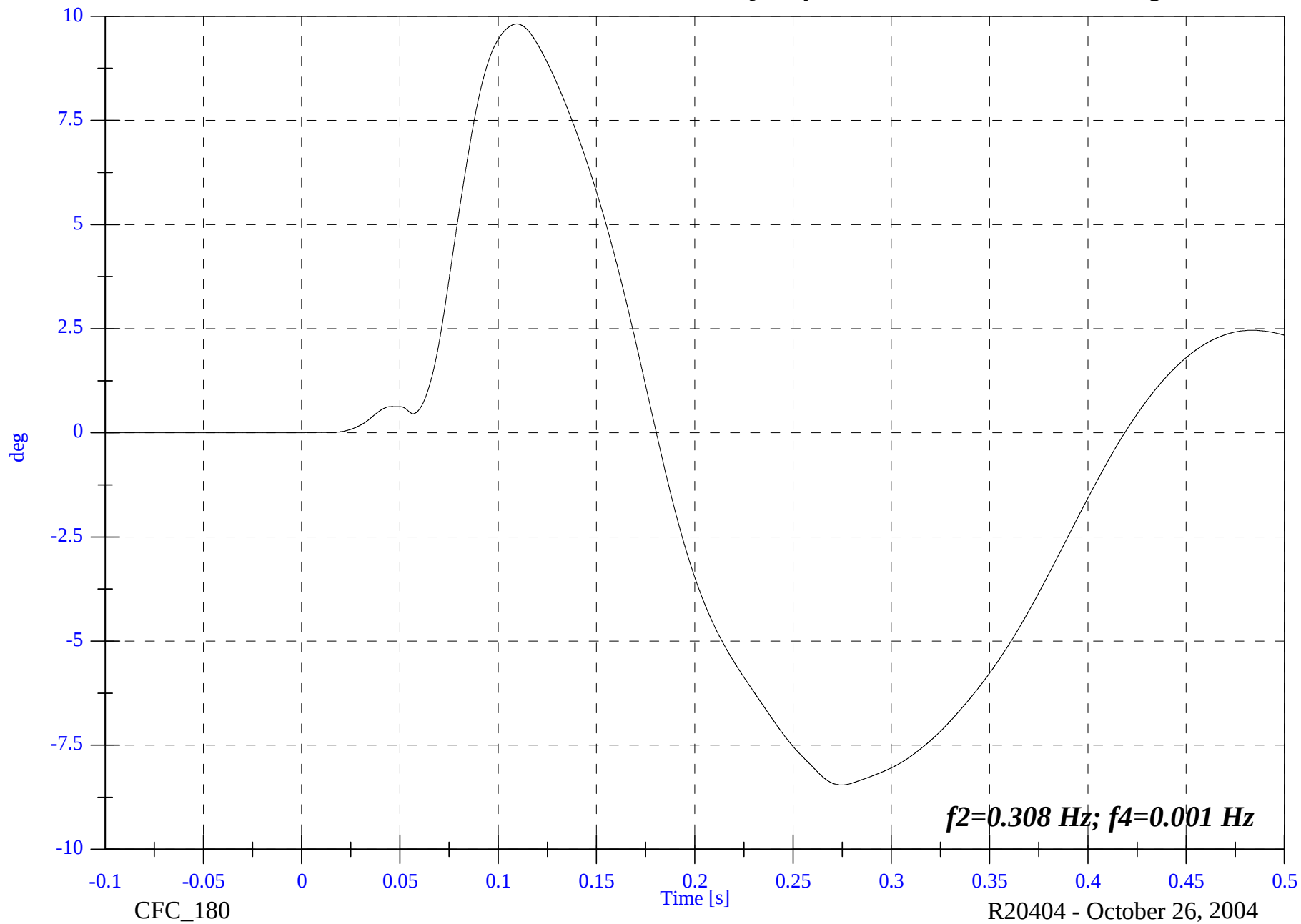
V2P3 Chest Comp ADy

Max: 9.8 [deg] at 0.109 [s]

Min: -8.5 [deg] at 0.275 [s]

B-83

8757-V301-02

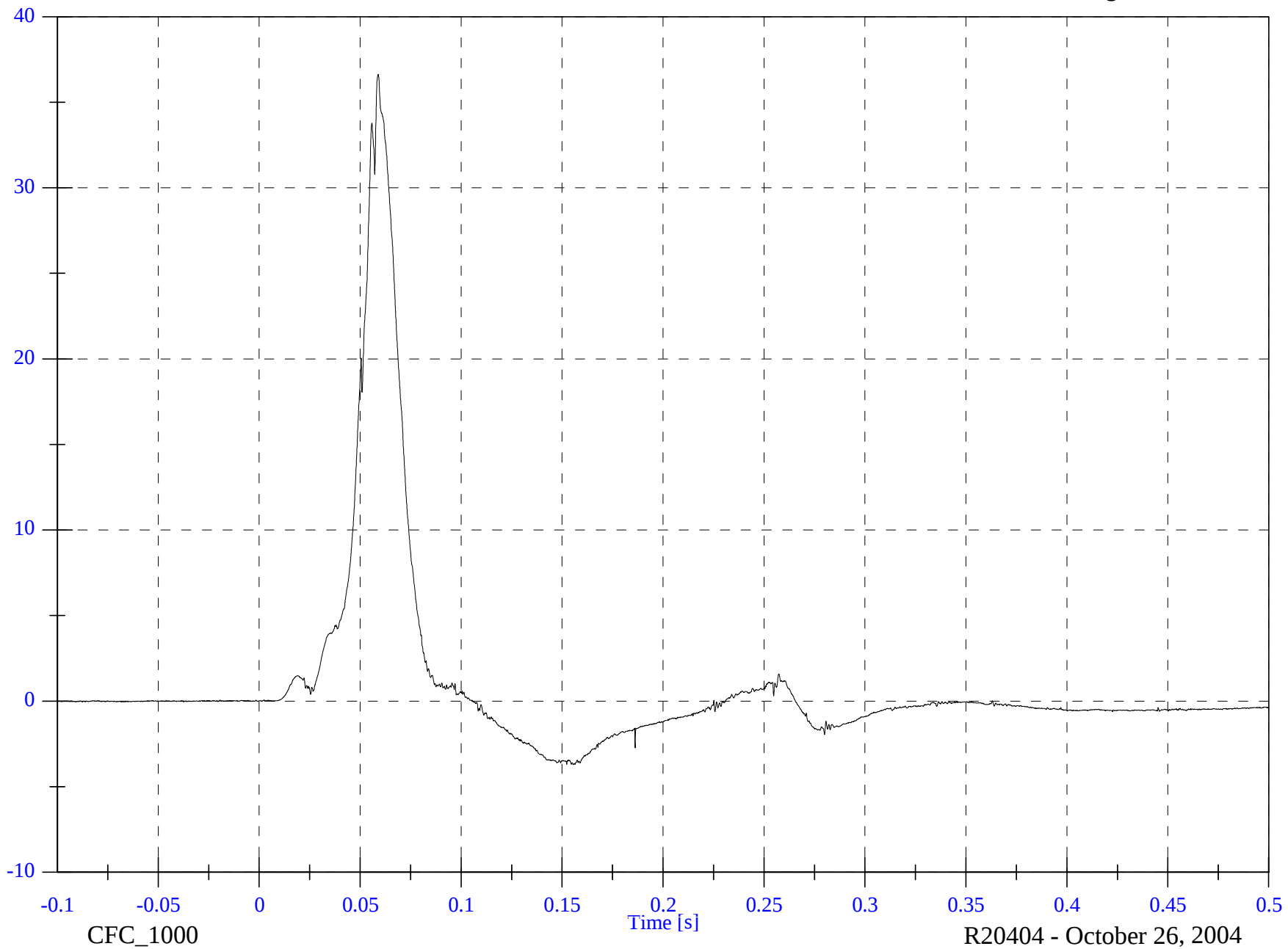


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Pelvic x

Max: 36.6 [g] at 0.059 [s]

Min: -3.7 [g] at 0.156 [s]



B-84

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Pelvic y

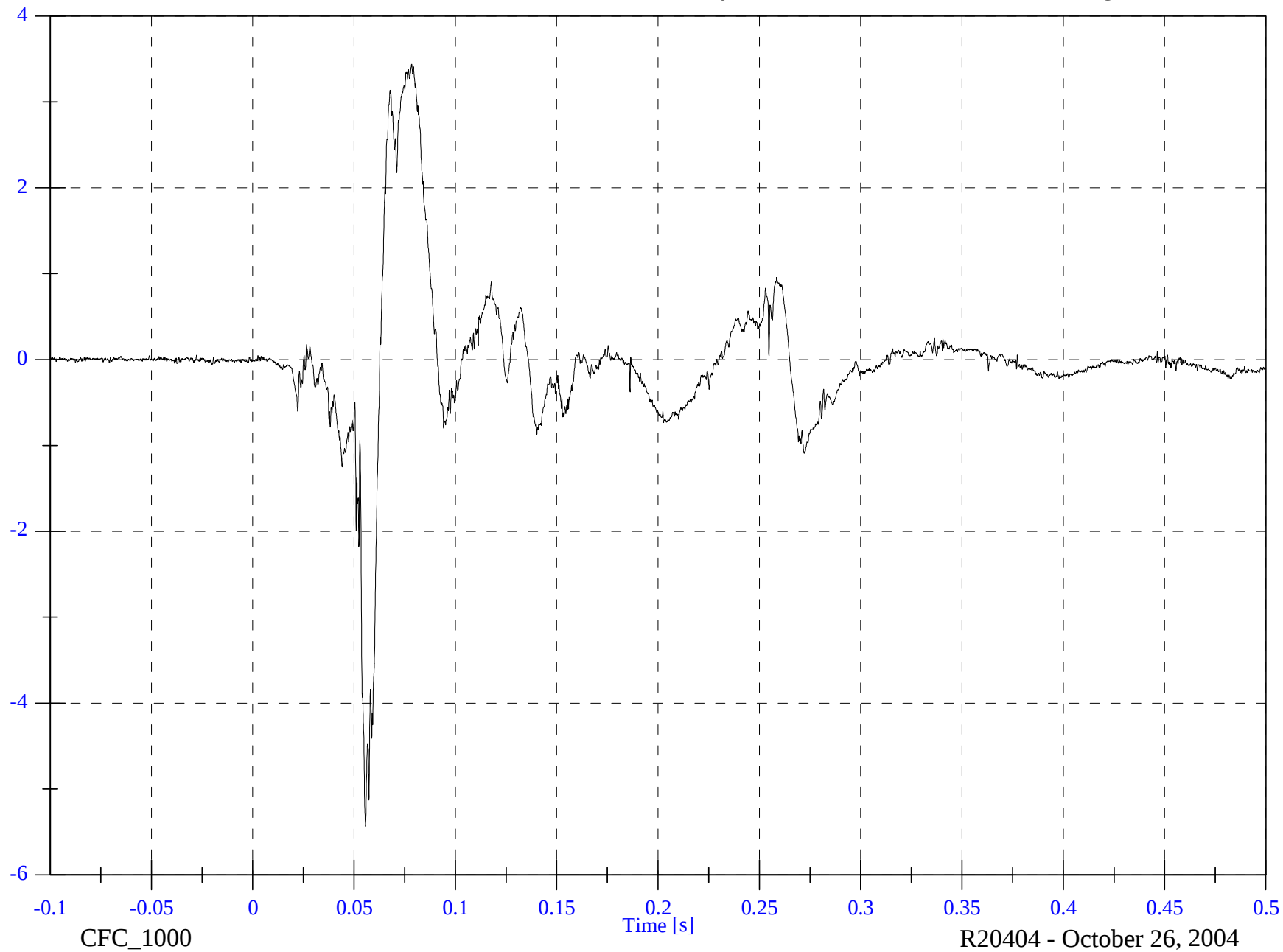
Max: 3.4 [g] at 0.078 [s]

Min: -5.4 [g] at 0.056 [s]

B-85

8757-V301-02

g



VOLPE 301 Test 2 - 2002 Jeep Liberty

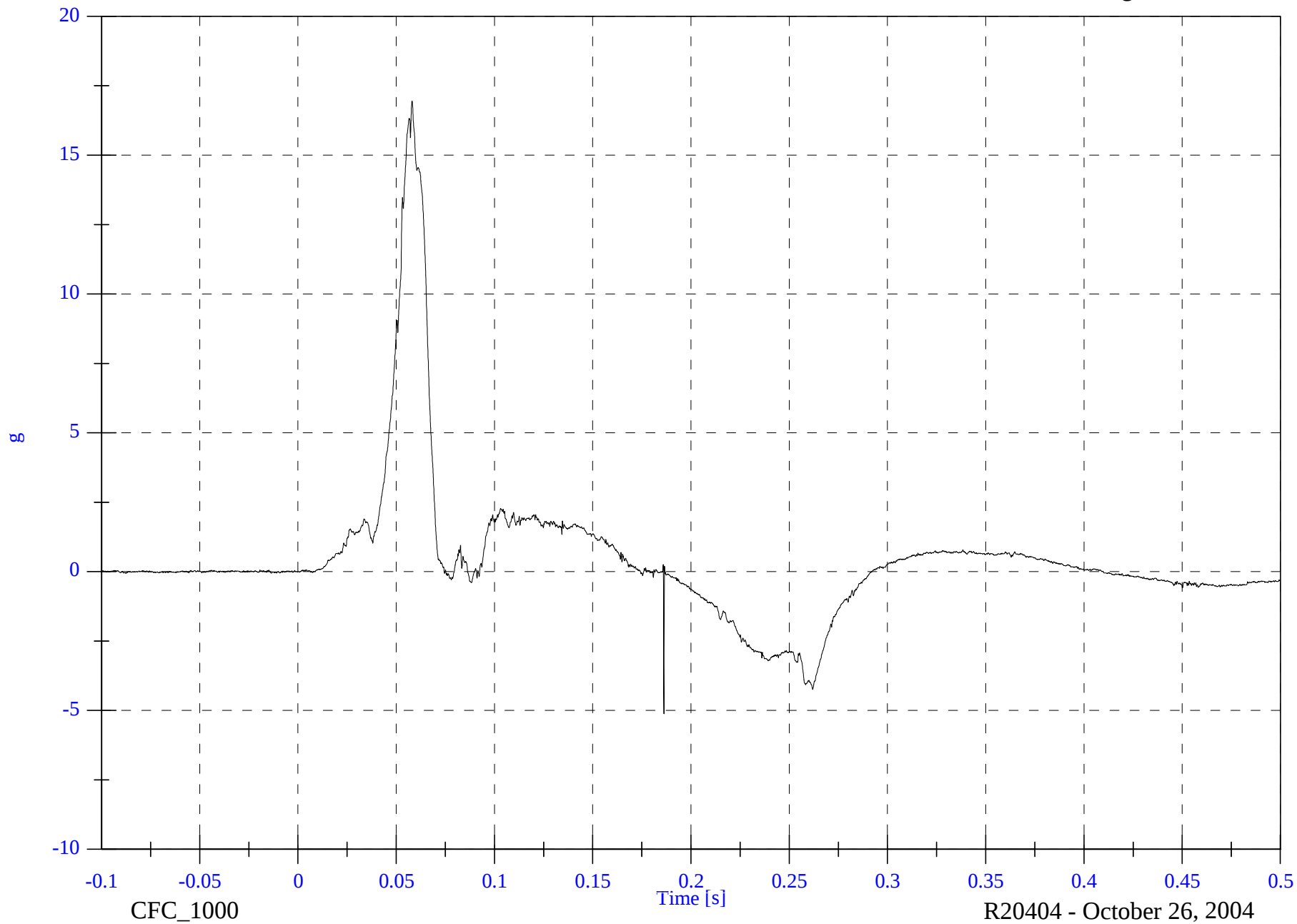
V2P3 Pelvic z

Max: 17.0 [g] at 0.058 [s]

Min: -5.1 [g] at 0.186 [s]

B-86

8757-V301-02

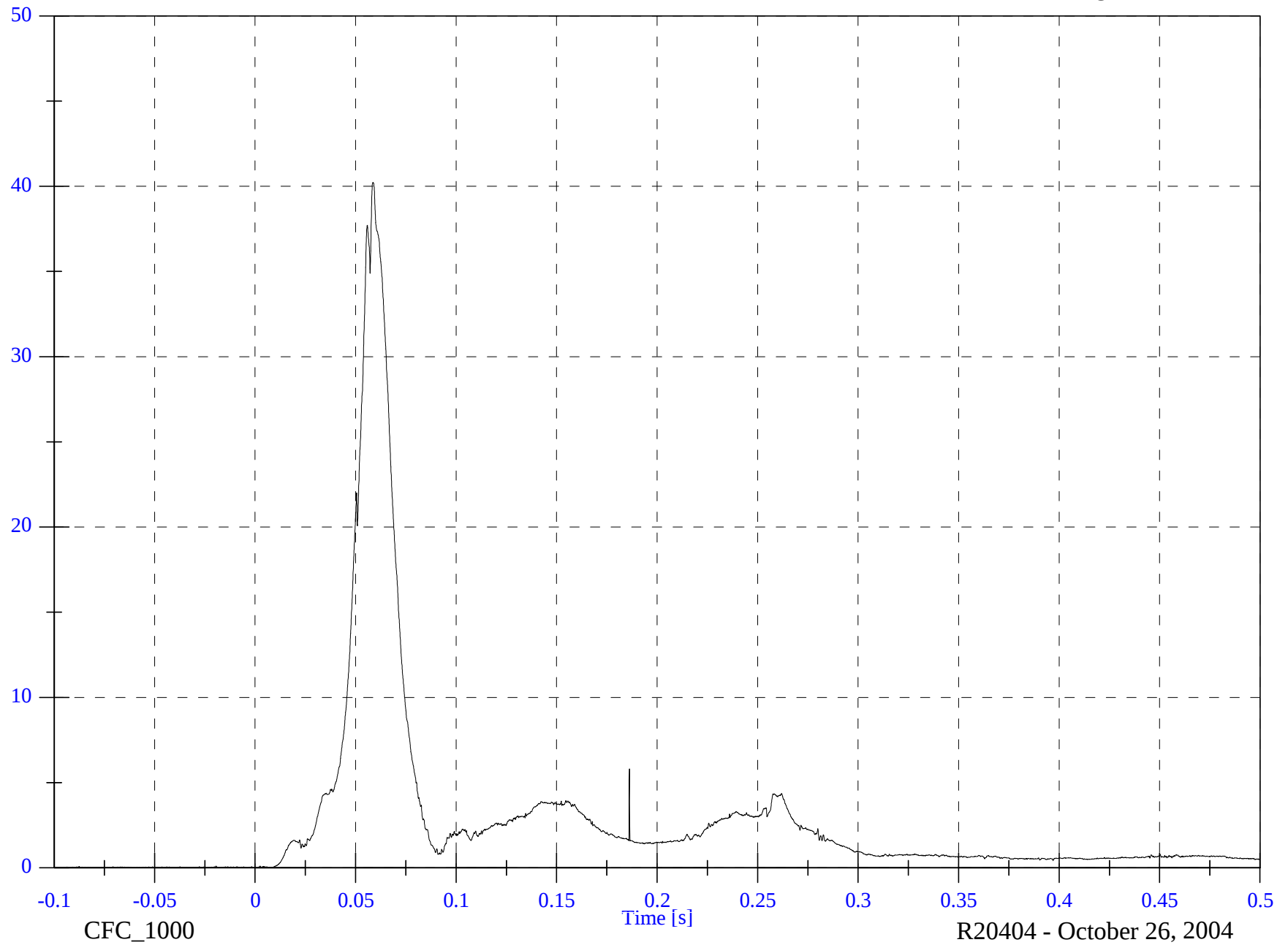


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Pelvic Resultant

Max: 40.2 [g] at 0.059 [s]

Min: 0.0 [g] at -0.058 [s]



B-87

8757-V301-02

CFC_1000

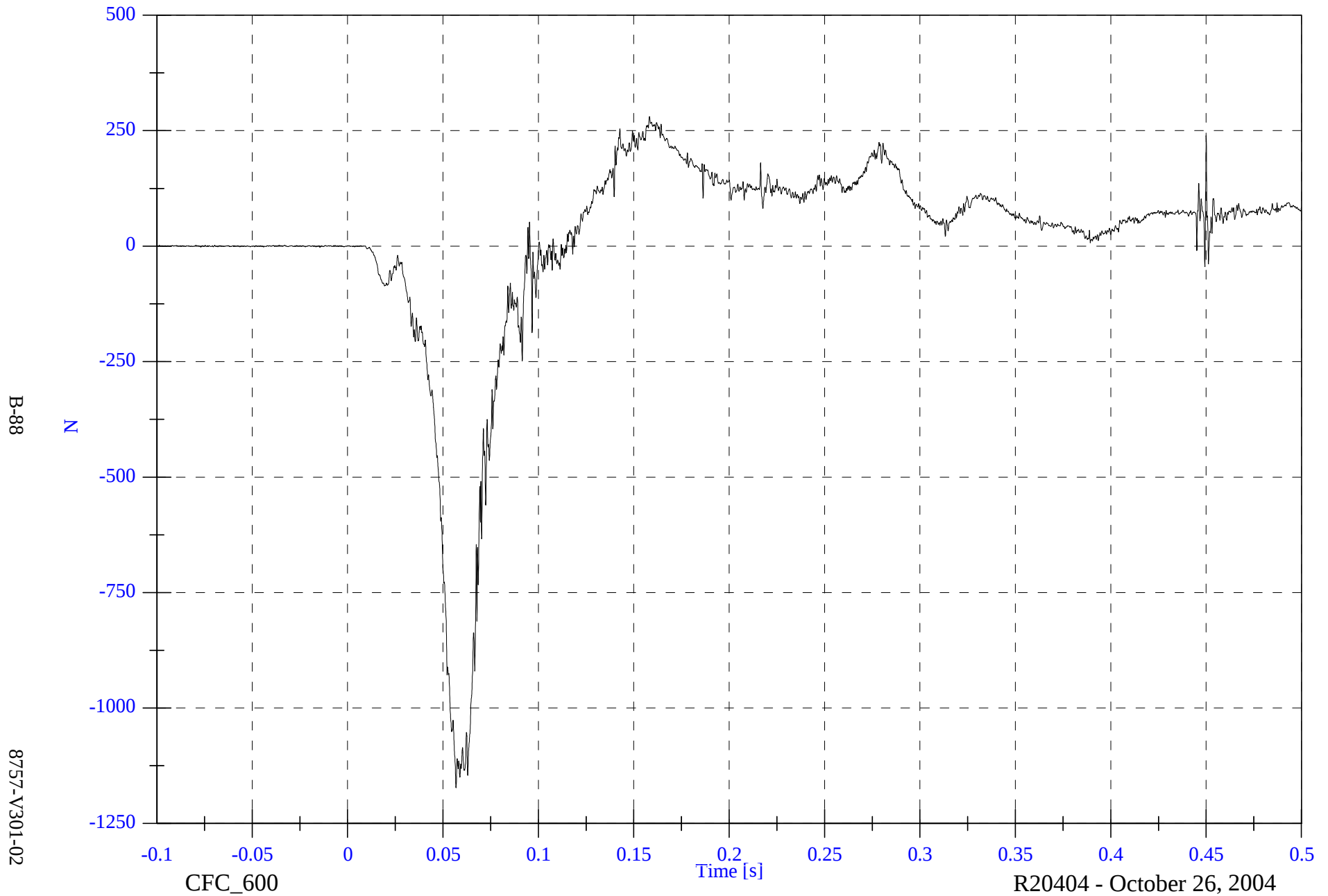
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Left Femur

Max: 280.5 [N] at 0.158 [s]

Min: -1173.1 [N] at 0.057 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

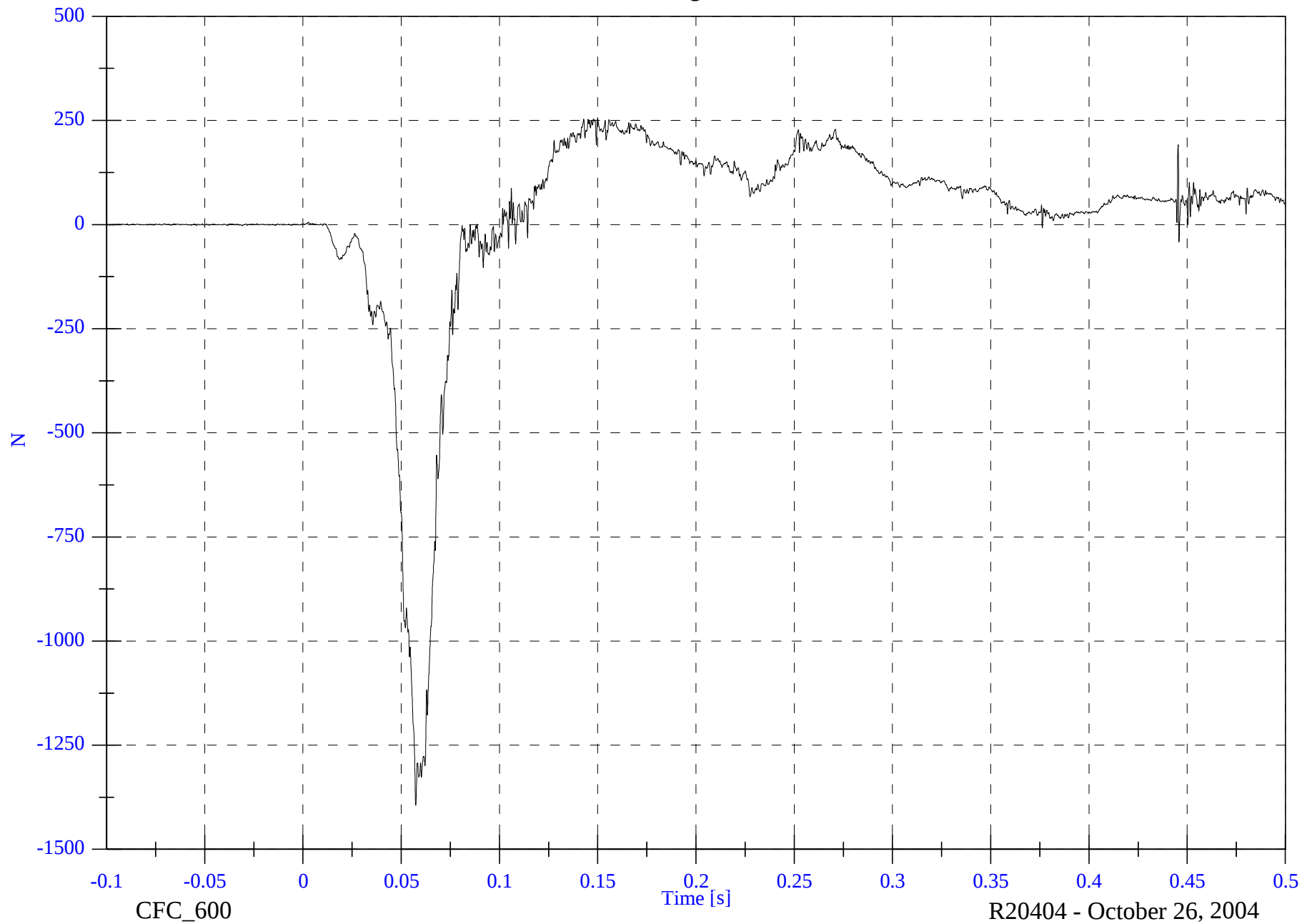
V2P3 Right Femur

Max: 253.8 [N] at 0.148 [s]

Min: -1394.6 [N] at 0.057 [s]

B-89

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Head to Chest

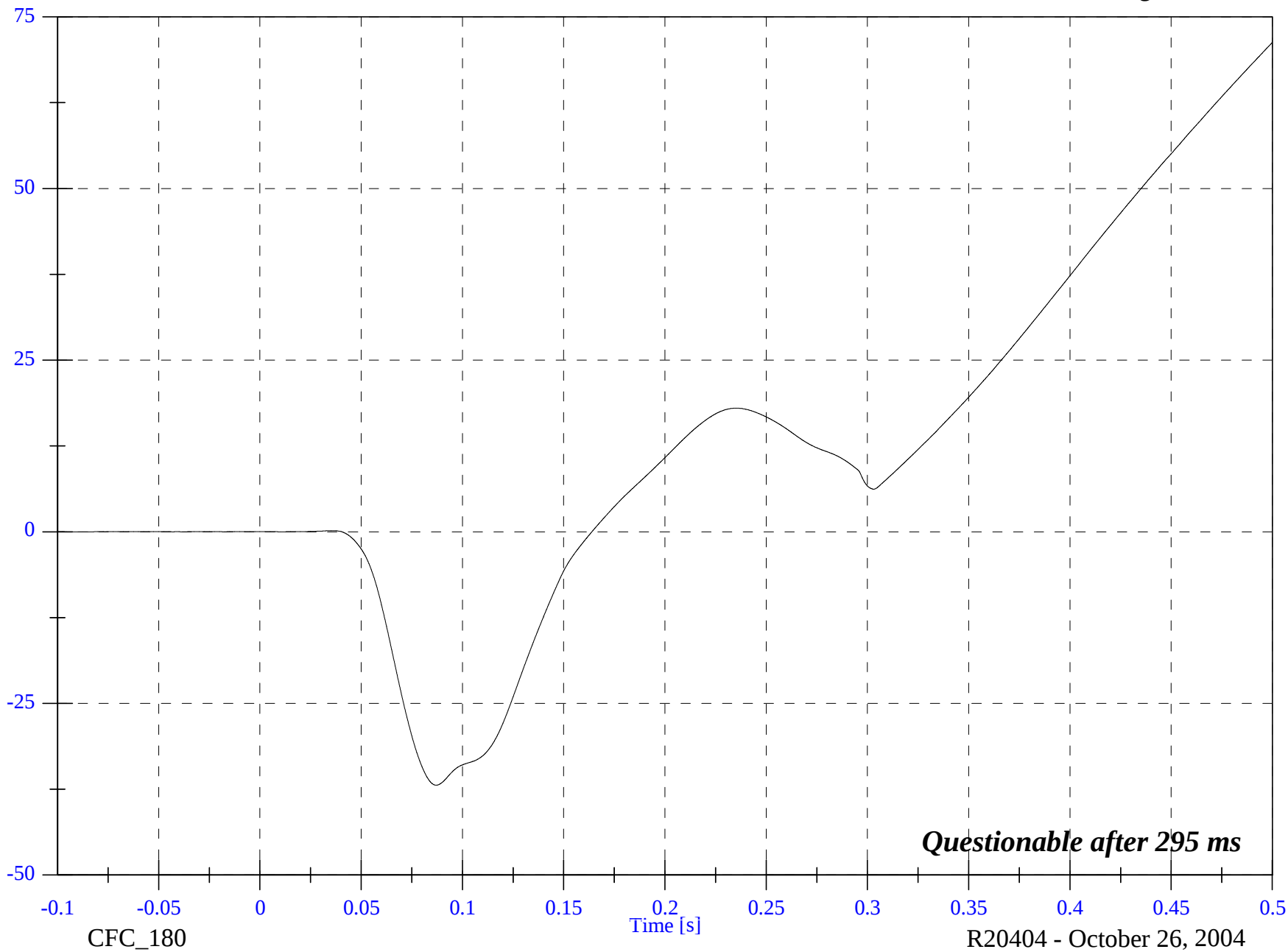
Max: 71.3 [deg] at 0.500 [s]

Min: -36.9 [deg] at 0.087 [s]

B-90

deg

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

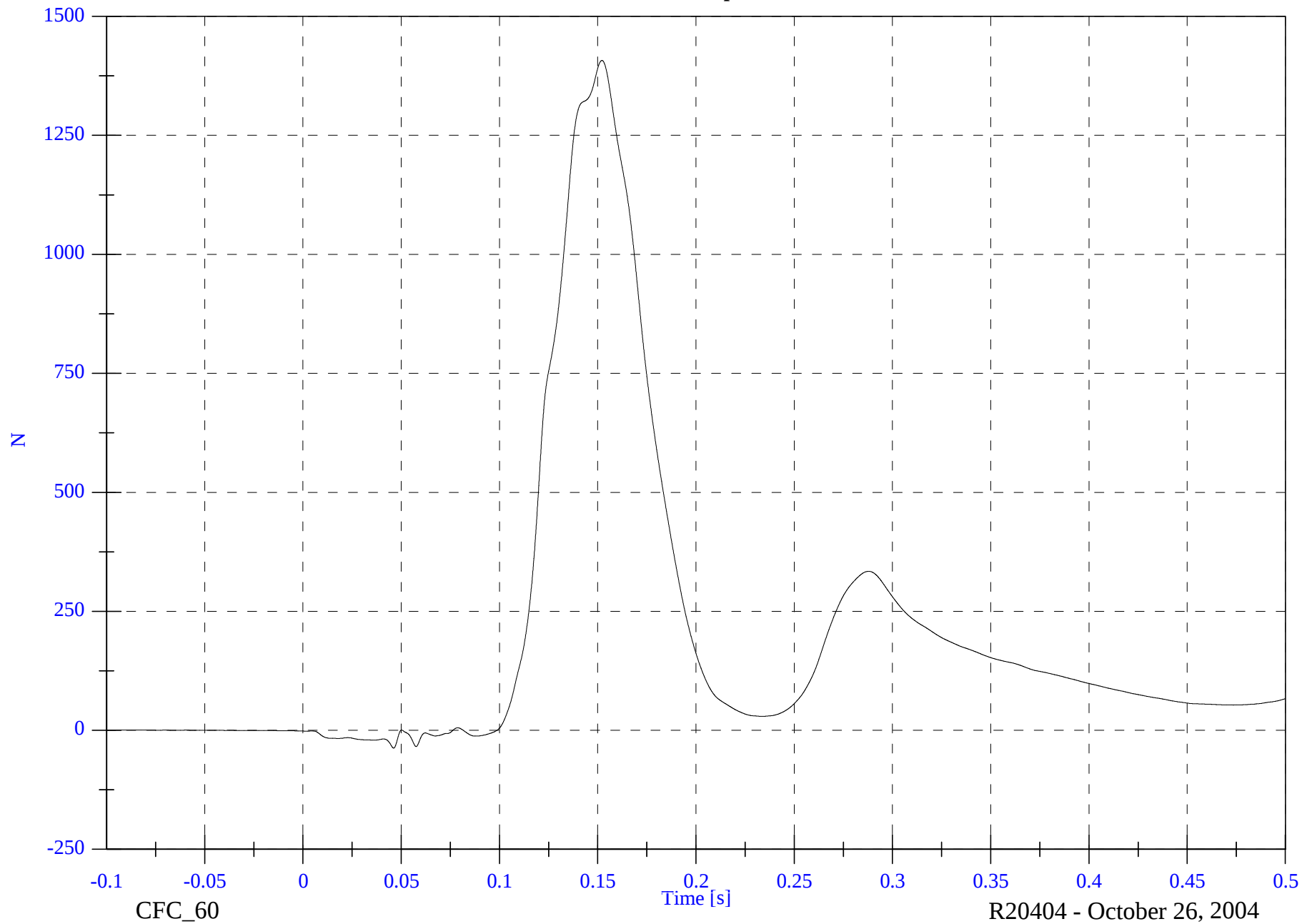
V2 RFP Lap Belt

Max: 1407.5 [N] at 0.152 [s]

Min: -37.4 [N] at 0.046 [s]

B-91

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

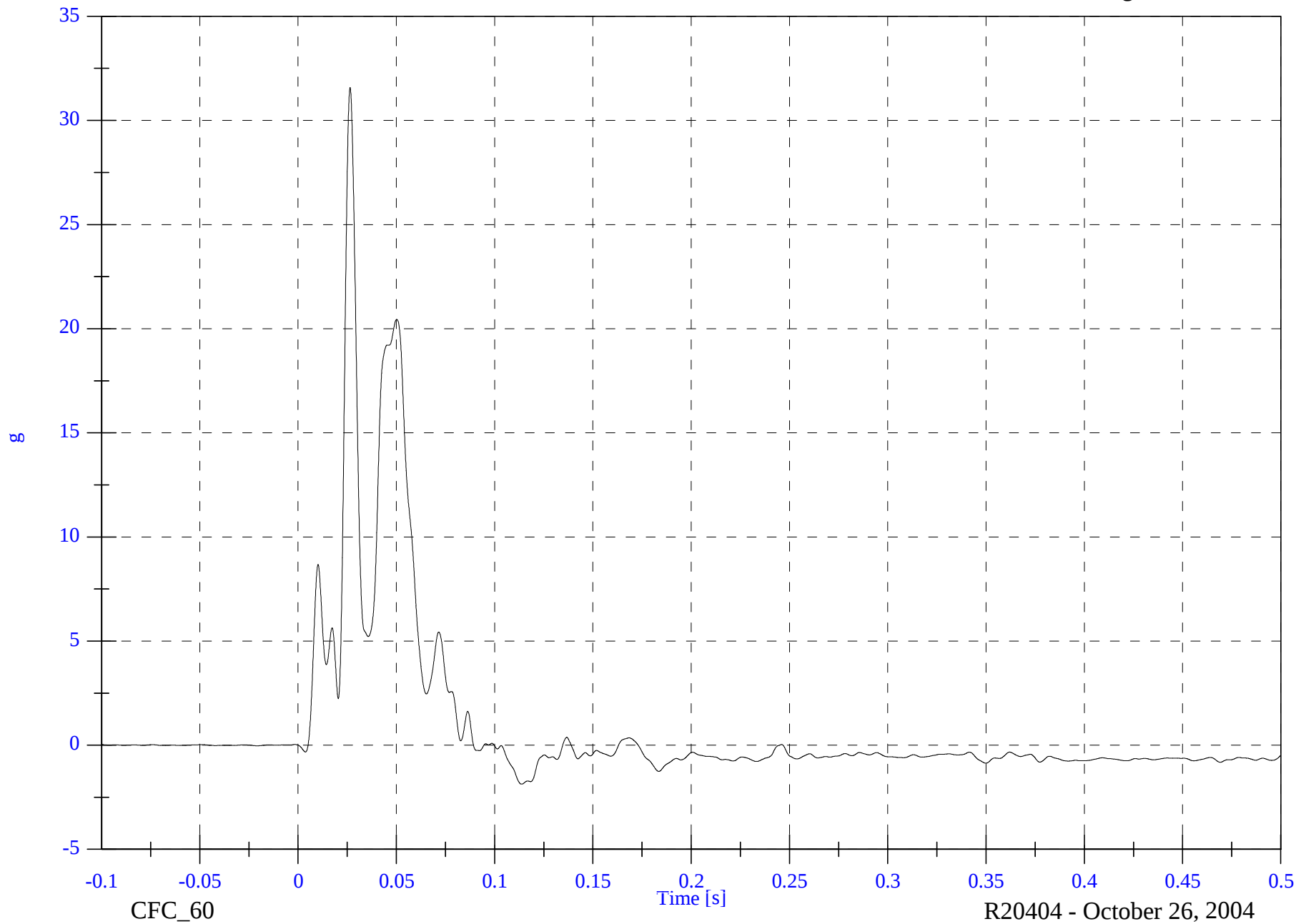
V2 Left X Member x

Max: 31.6 [g] at 0.026 [s]

Min: -1.9 [g] at 0.114 [s]

B-92

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

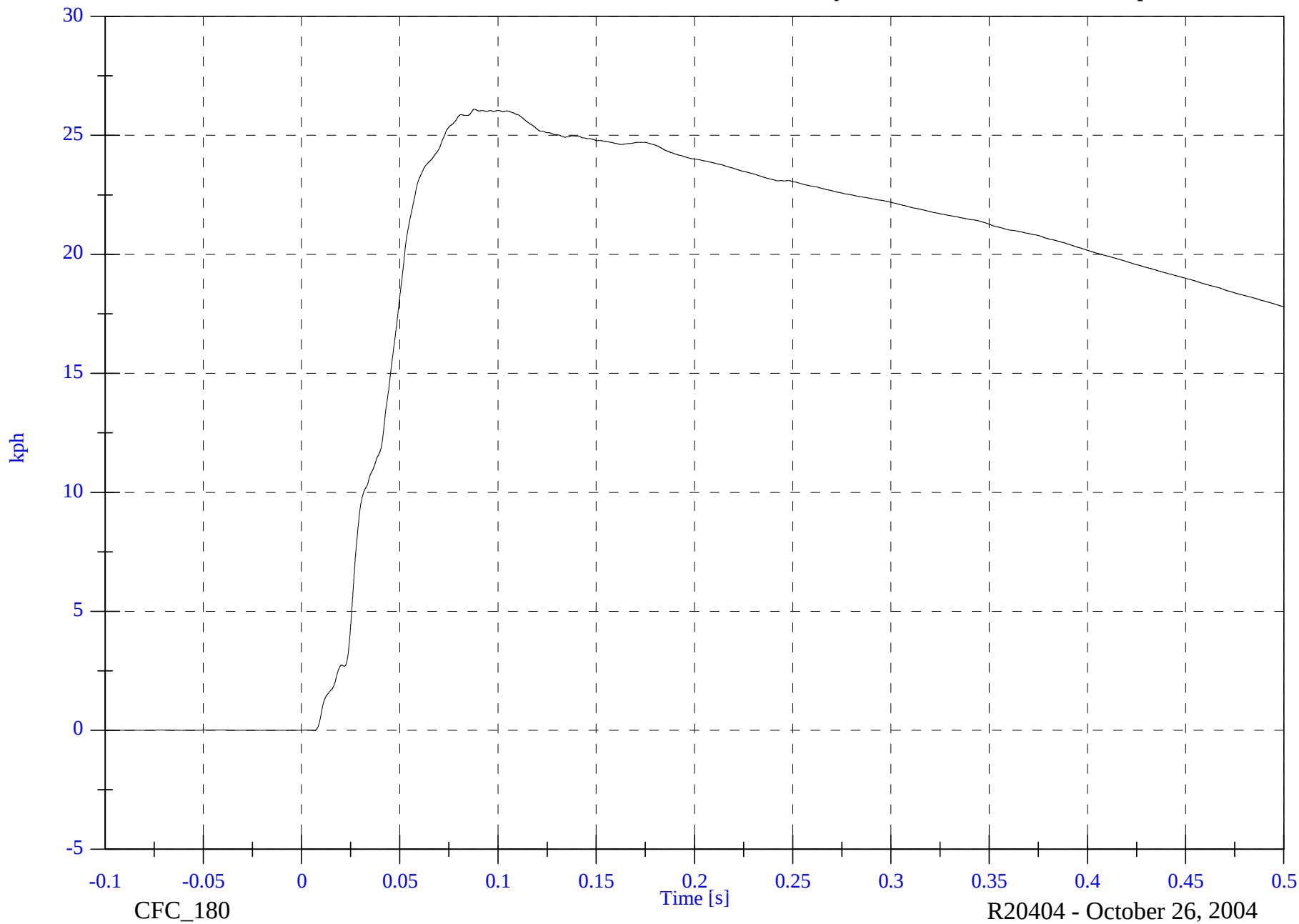
V2 Left X Member x Velocity

Max: 26.1 [kph] at 0.088 [s]

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

B-93

8757-V301-02

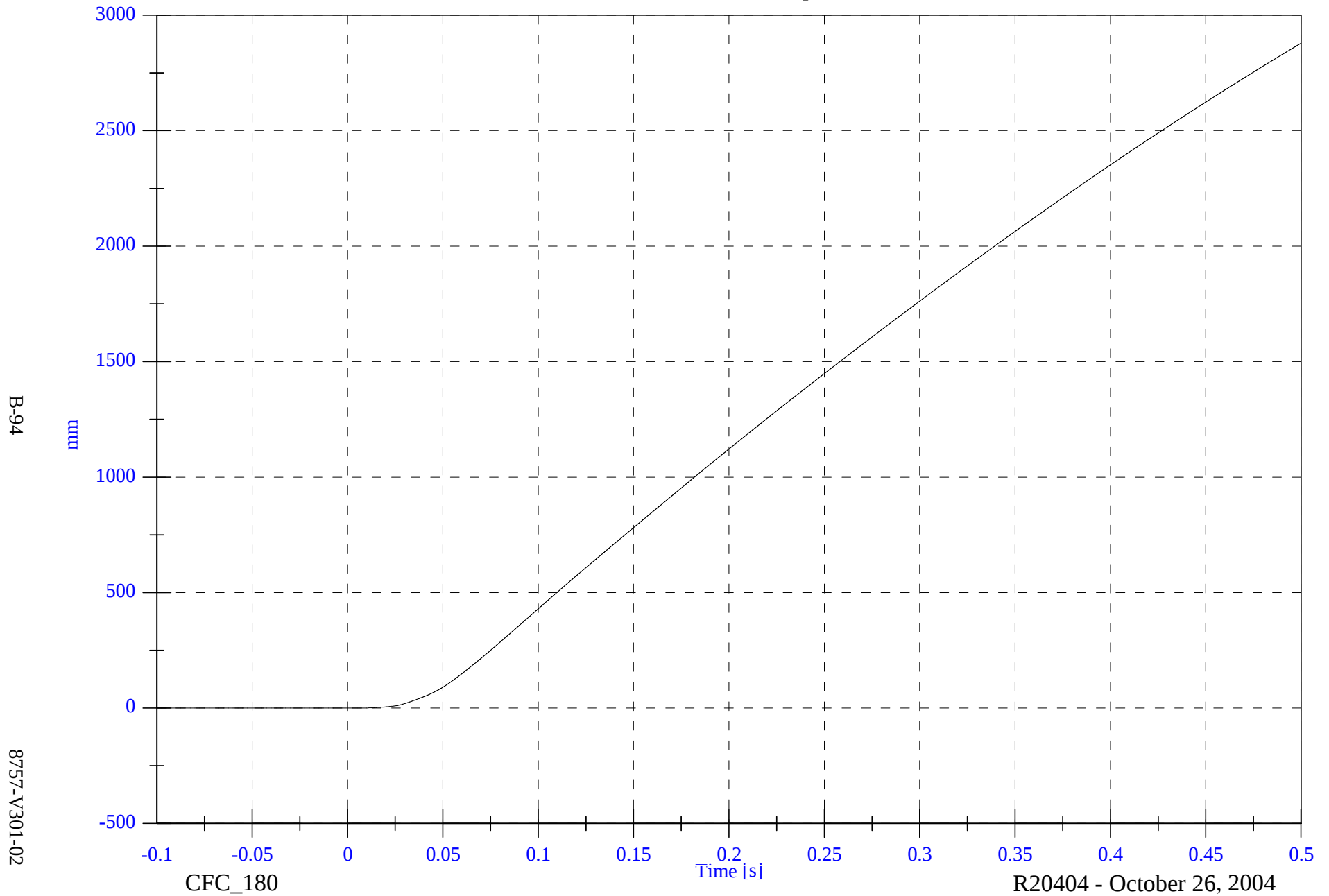


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2 Left X Member x Displacement

Max: 2878.7 [mm] at 0.500 [s]

Min: -0.1 [mm] at -0.100 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

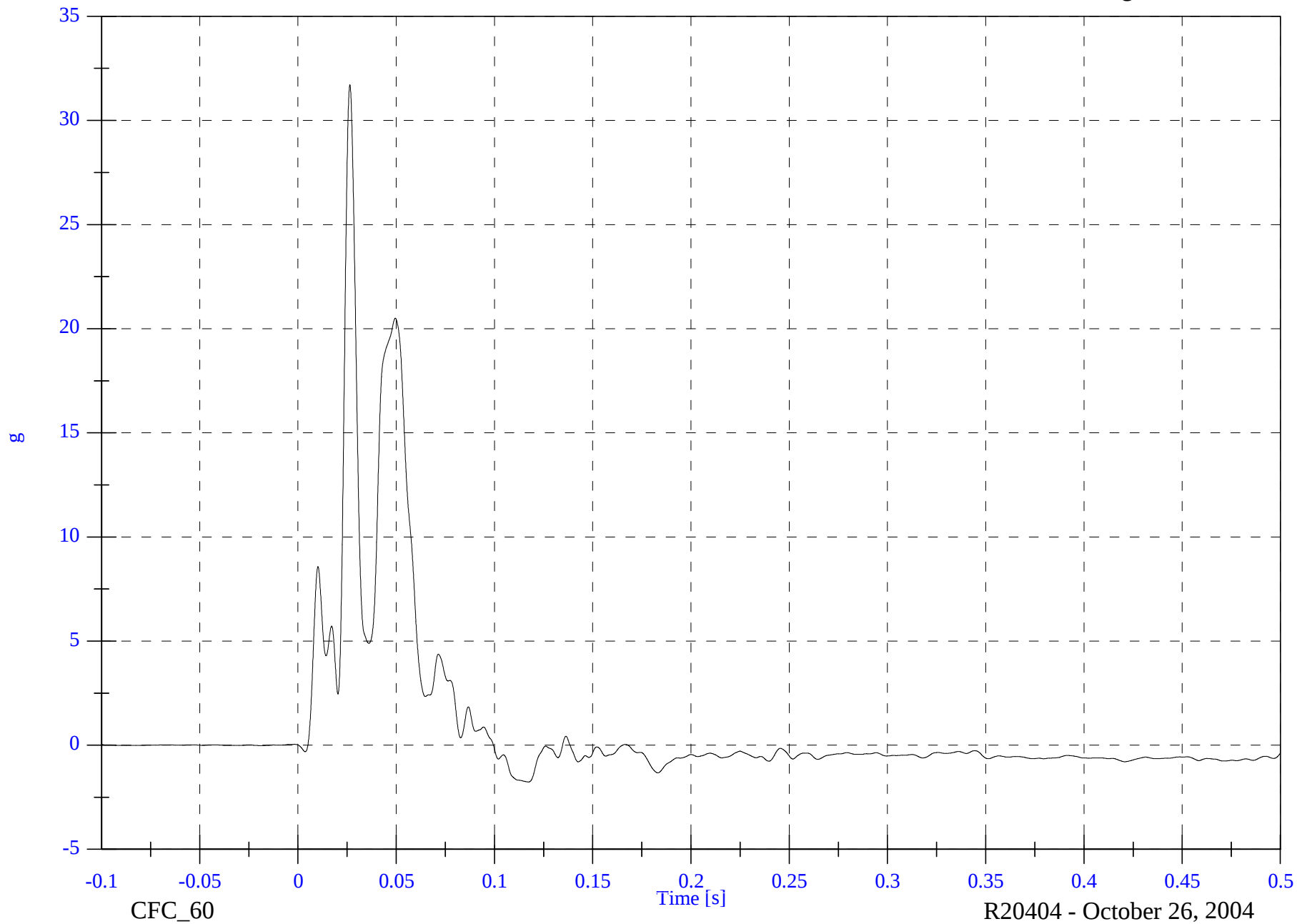
V2 Left X Member RED x

Max: 31.7 [g] at 0.026 [s]

Min: -1.8 [g] at 0.117 [s]

B-95

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

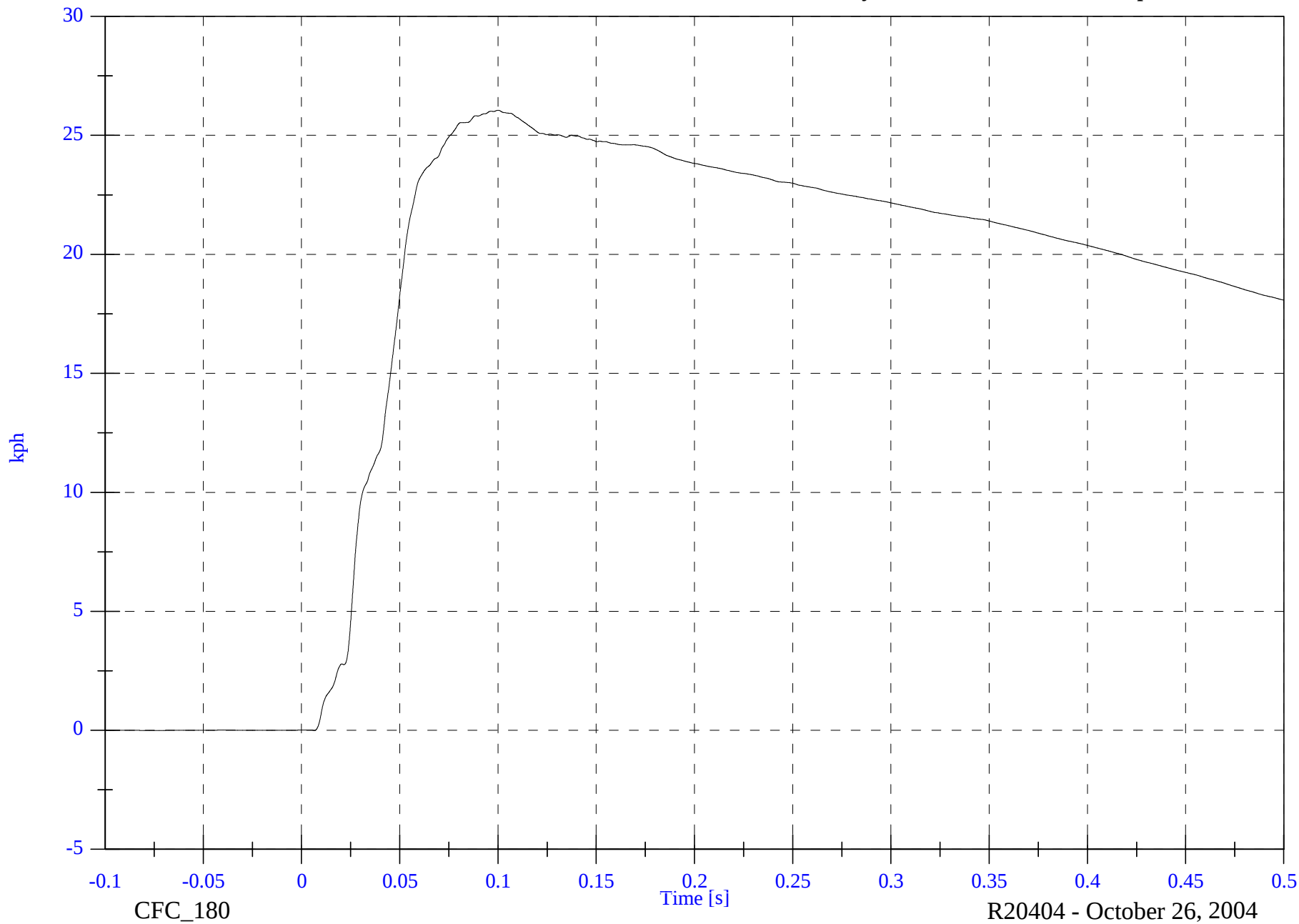
V2 Left X Member RED x Velocity

Max: 26.1 [kph] at 0.100 [s]

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

B-96

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

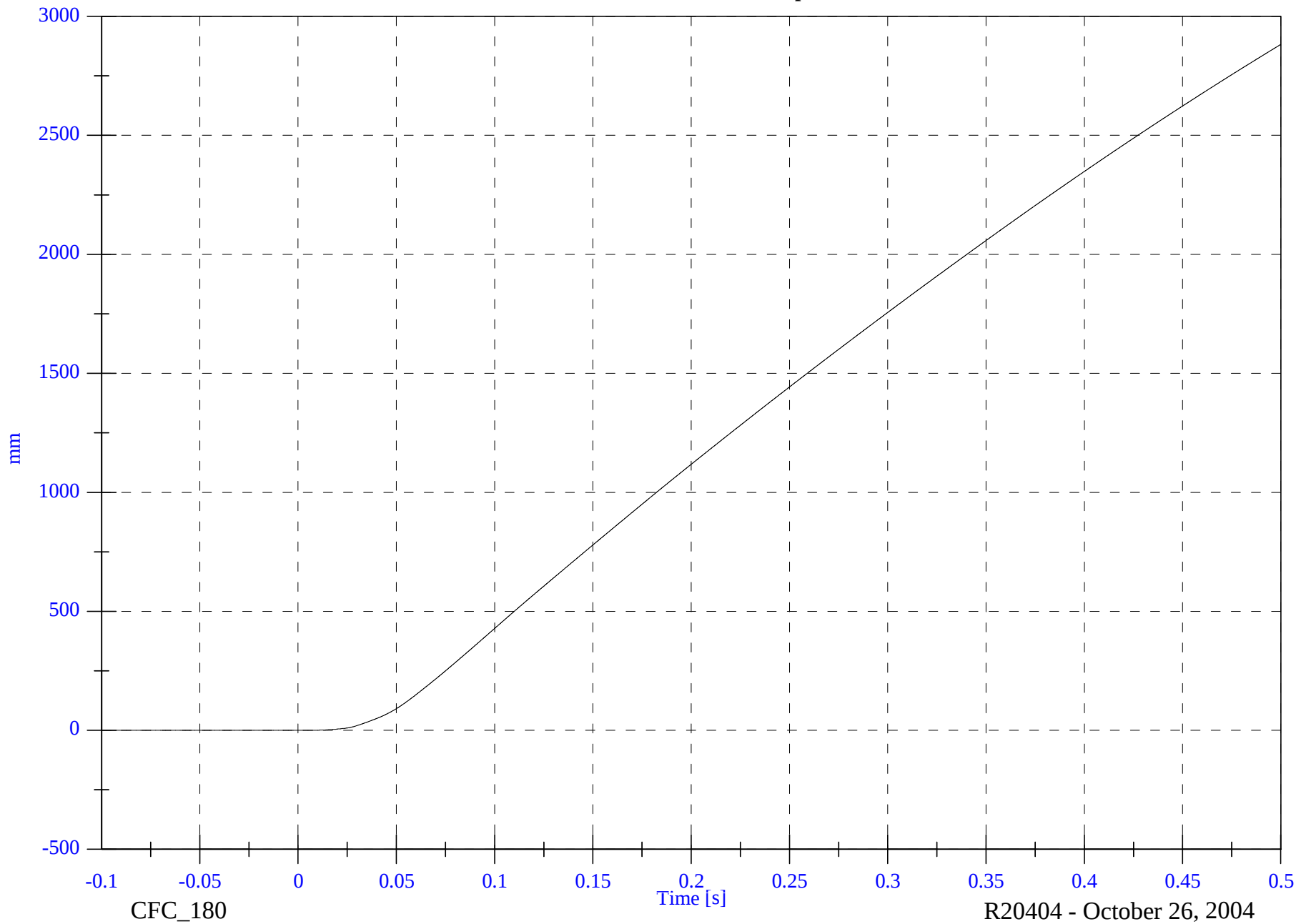
V2 Left X Member RED x Displacement

Max: 2881.9 [mm] at 0.500 [s]

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

B-97

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

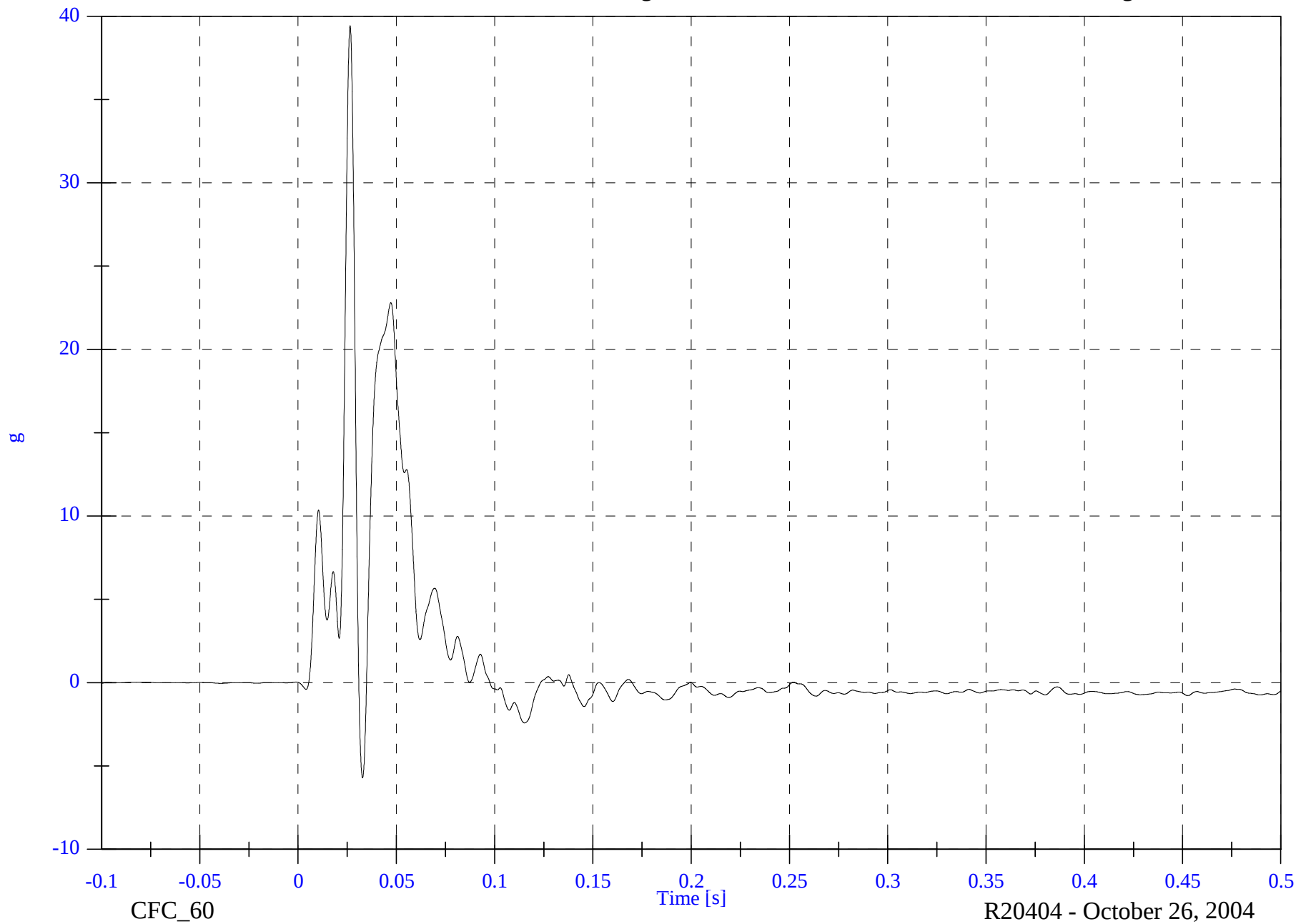
V2 Right X Member x

Max: 39.4 [g] at 0.026 [s]

Min: -5.7 [g] at 0.033 [s]

B-98

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

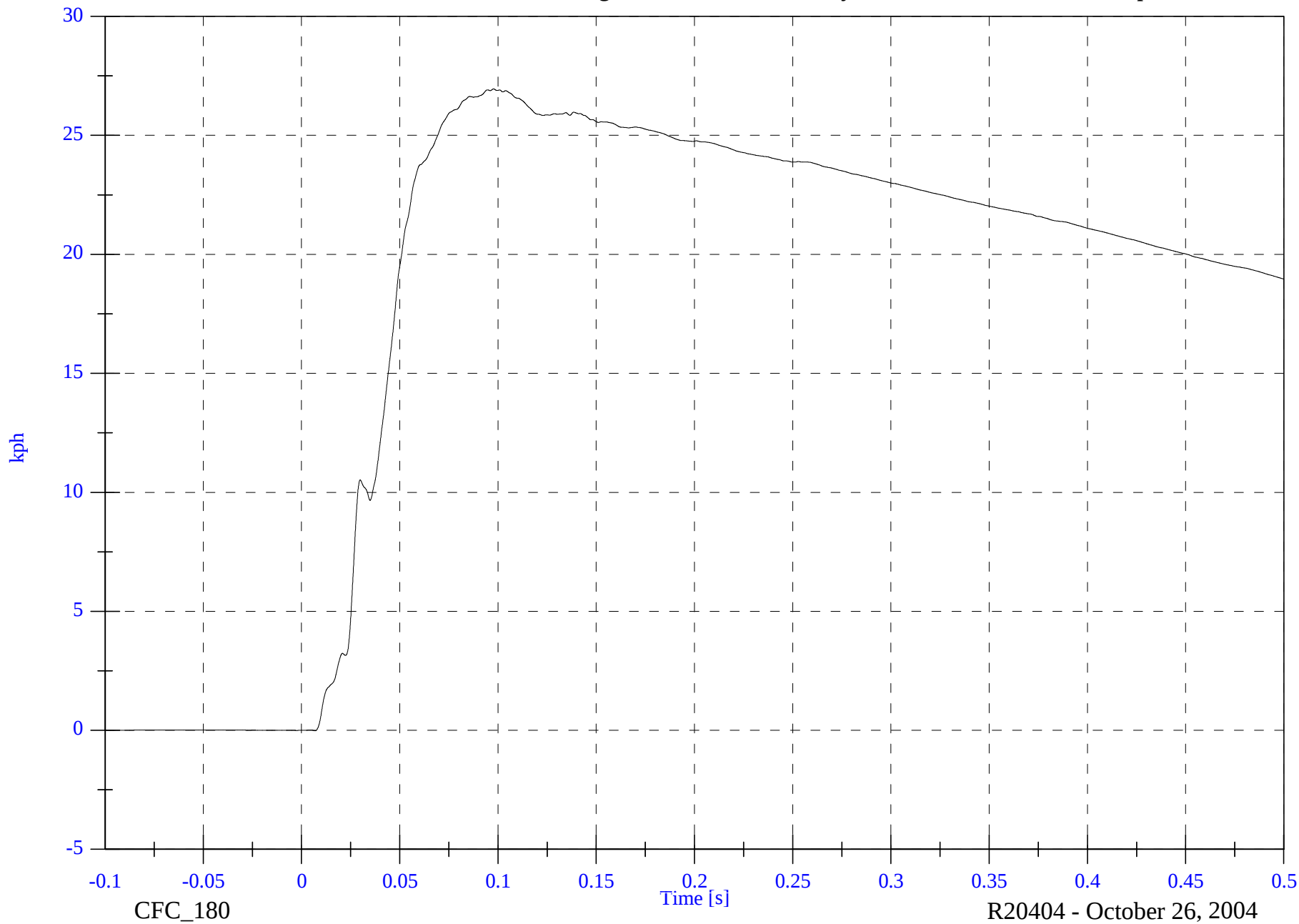
V2 Right X Member x Velocity

Max: 26.9 [kph] at 0.098 [s]

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

B-99

8757-V301-02

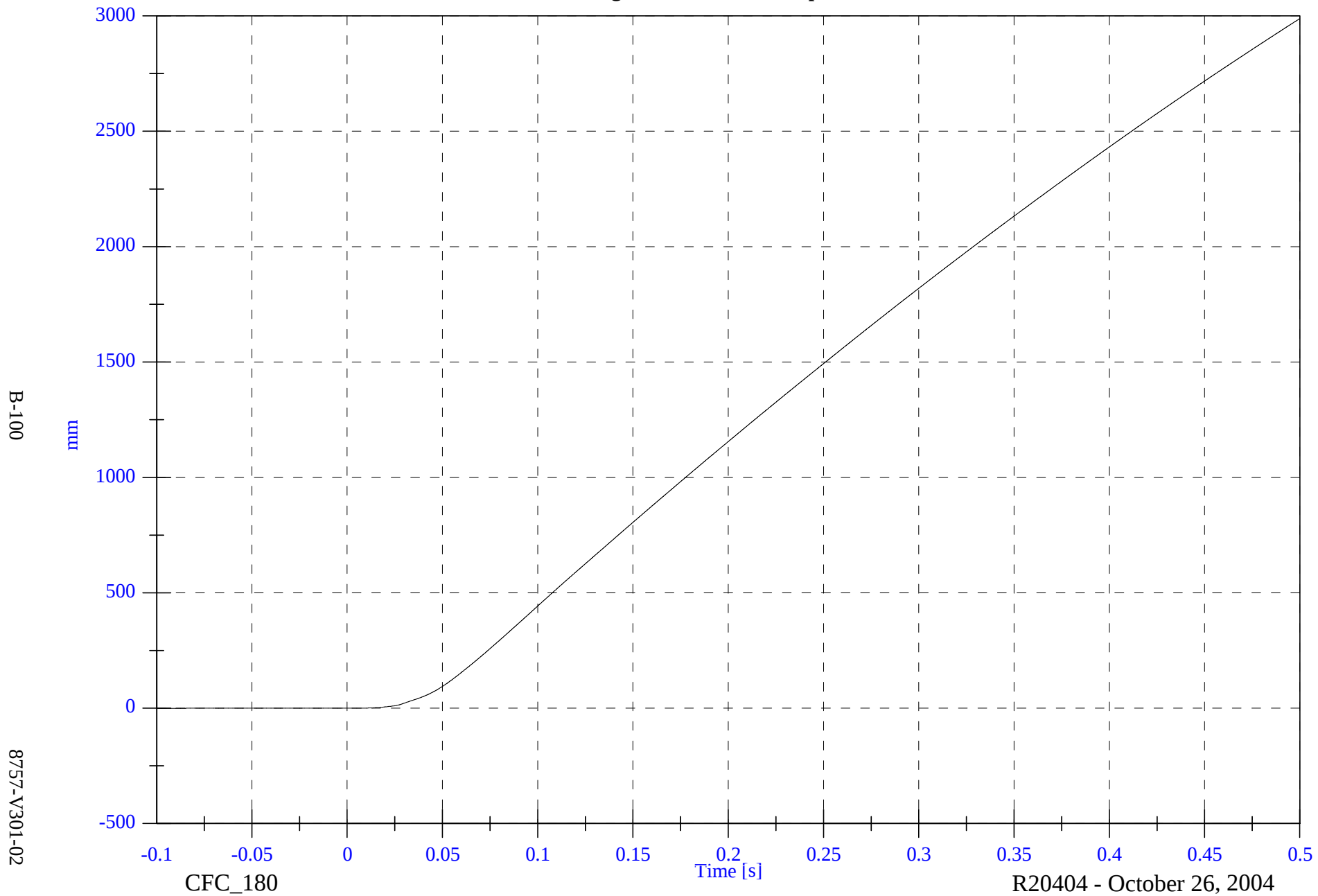


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2 Right X Member x Displacement

Max: 2987.9 [mm] at 0.500 [s]

Min: -0.2 [mm] at -0.099 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

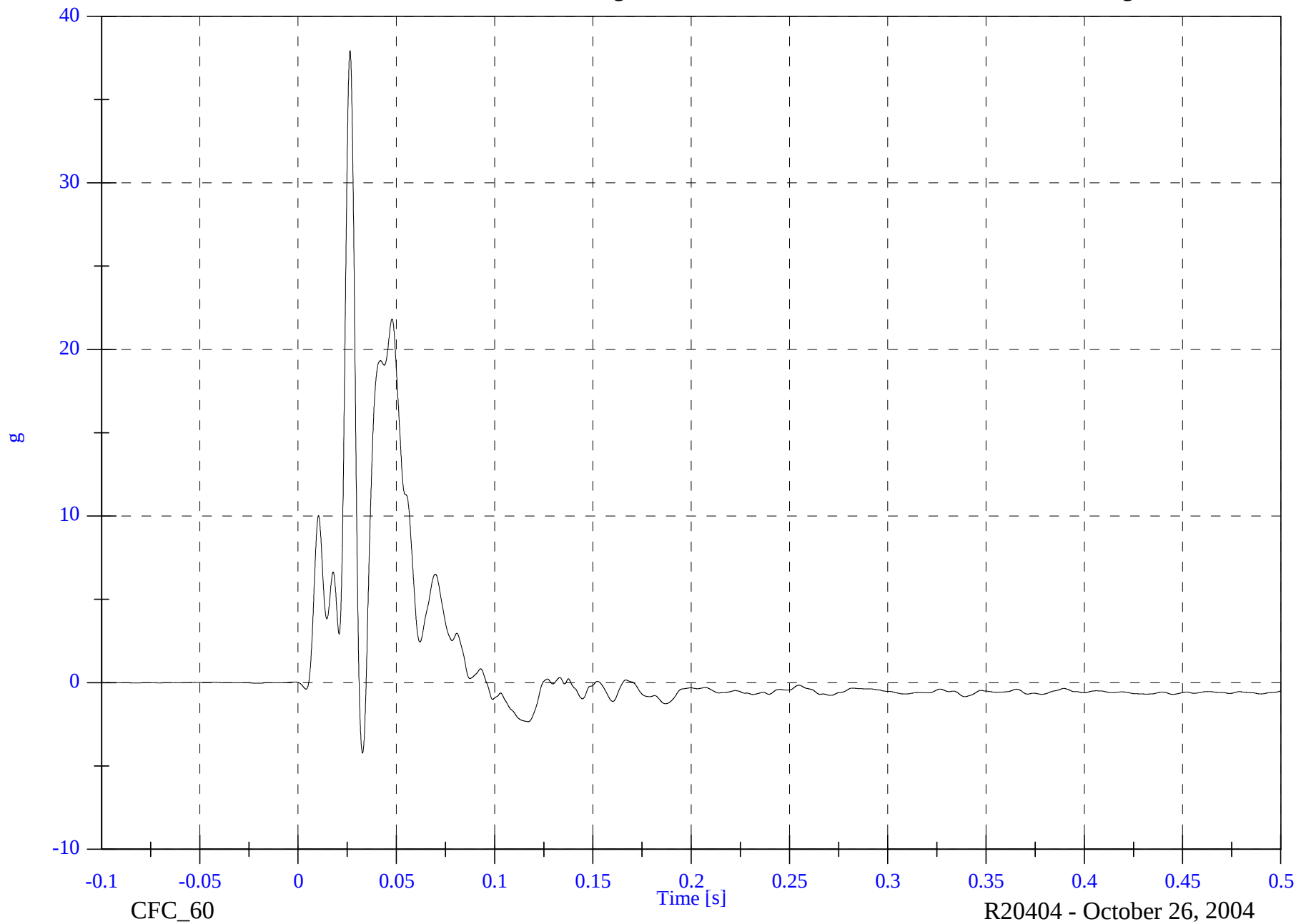
V2 Right X Member RED x

Max: 37.9 [g] at 0.026 [s]

Min: -4.2 [g] at 0.033 [s]

B-101

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

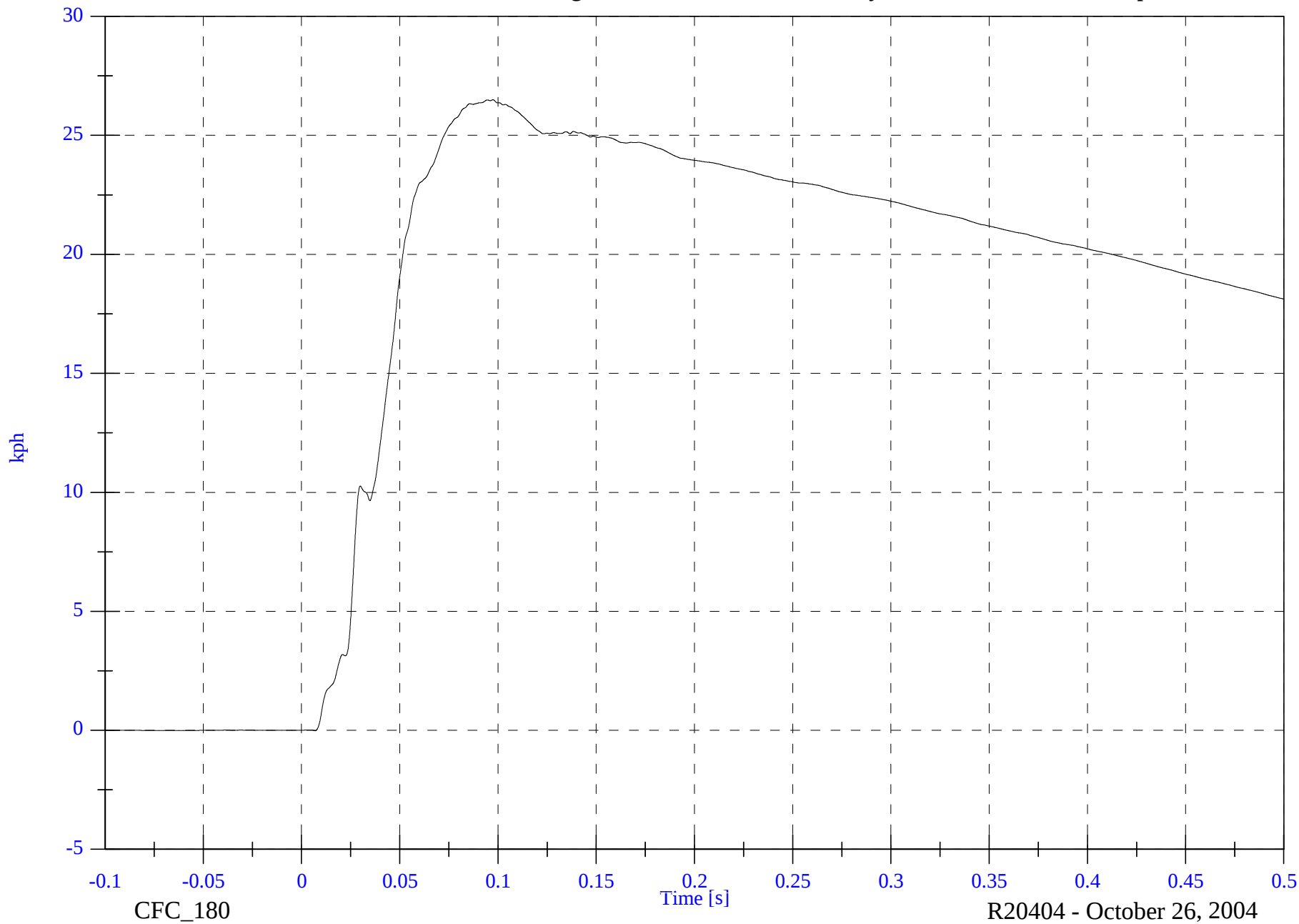
V2 Right X Member RED x Velocity

Max: 26.5 [kph] at 0.097 [s]

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

B-102

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

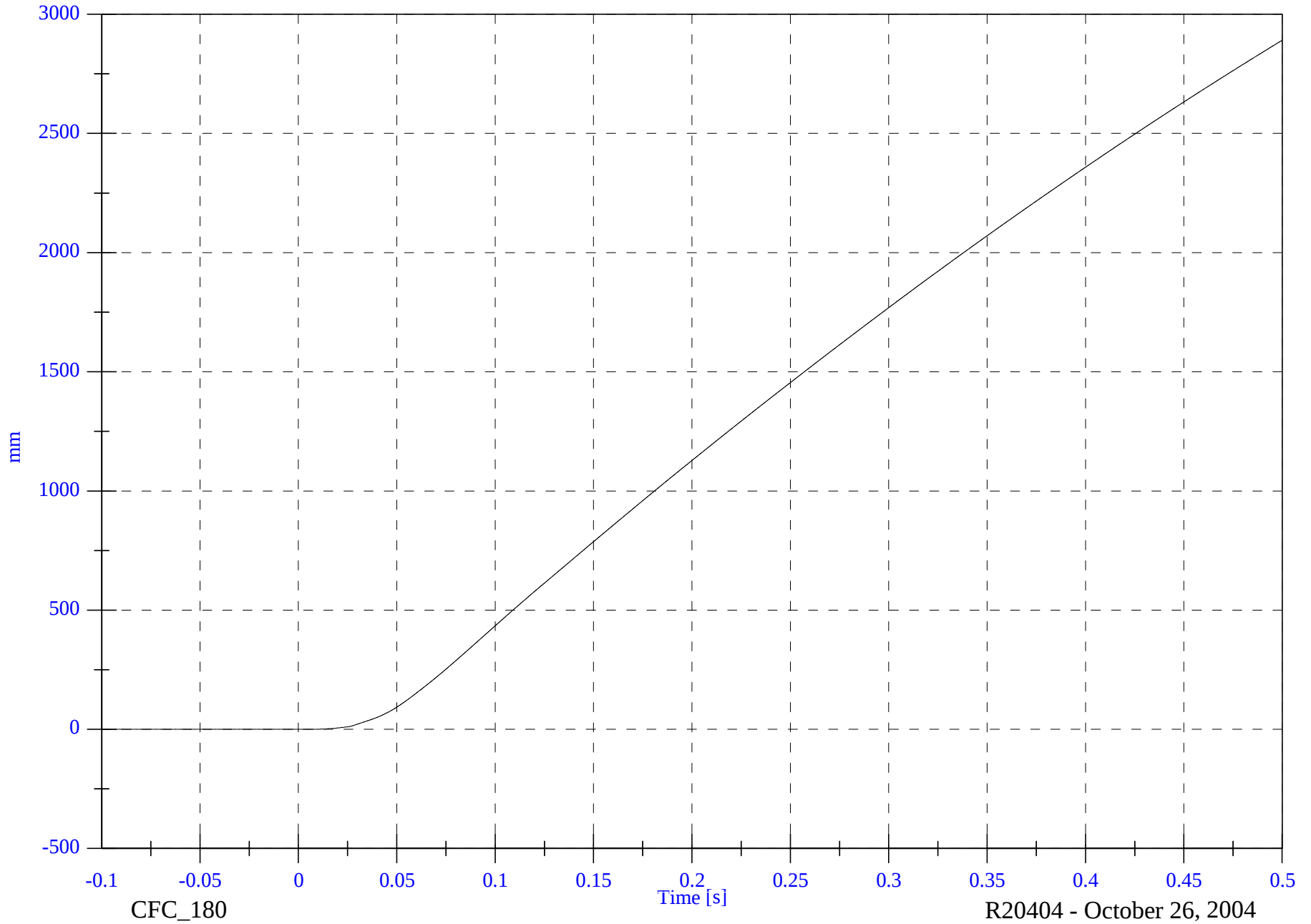
V2 Right X Member RED x Displacement

Max: 2890.6 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.048 [s]

B-103

8757-V301-02

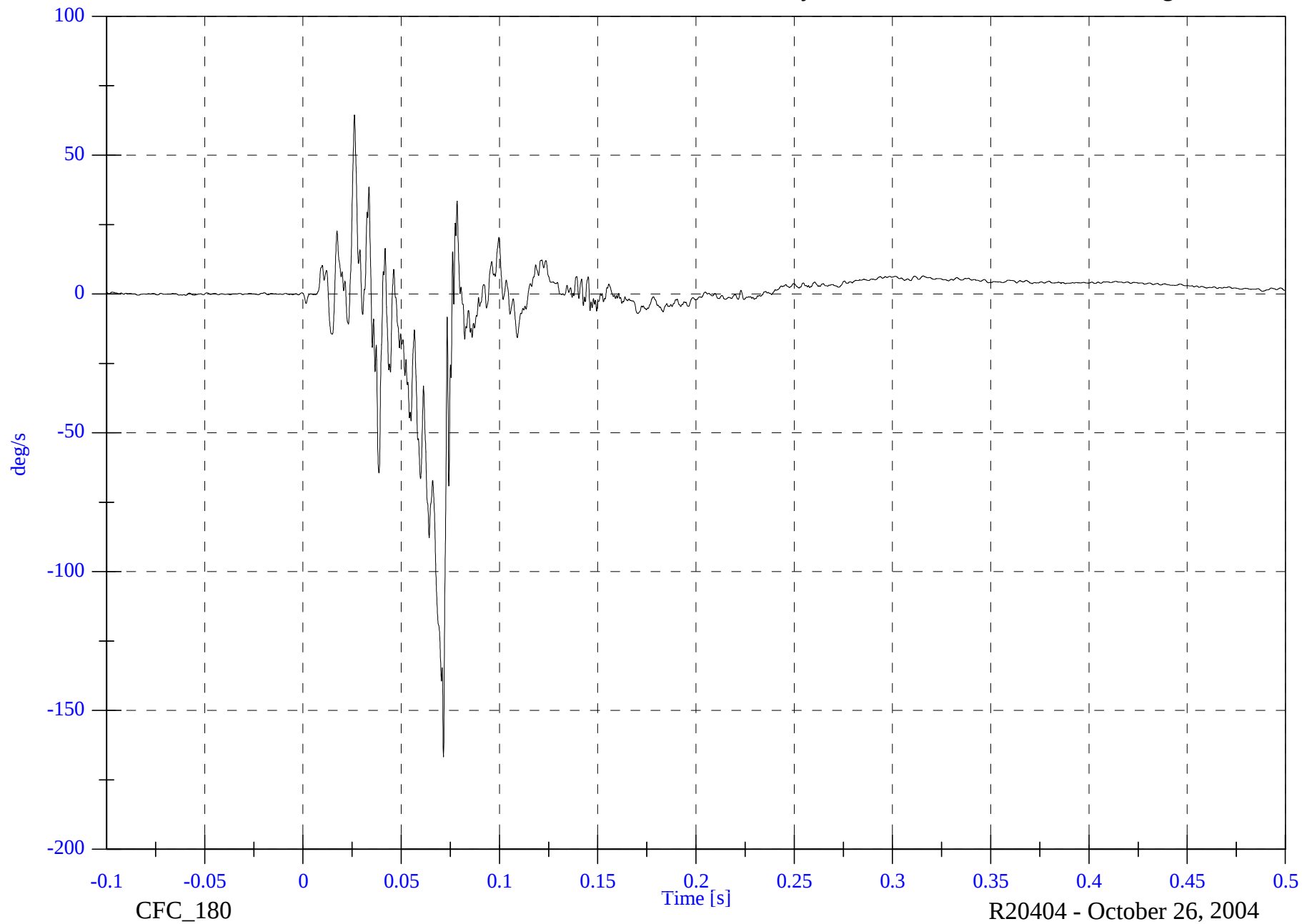


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2 Left Front Sill AVy

Max: 64.5 [deg/s] at 0.026 [s]

Min: -166.7 [deg/s] at 0.071 [s]

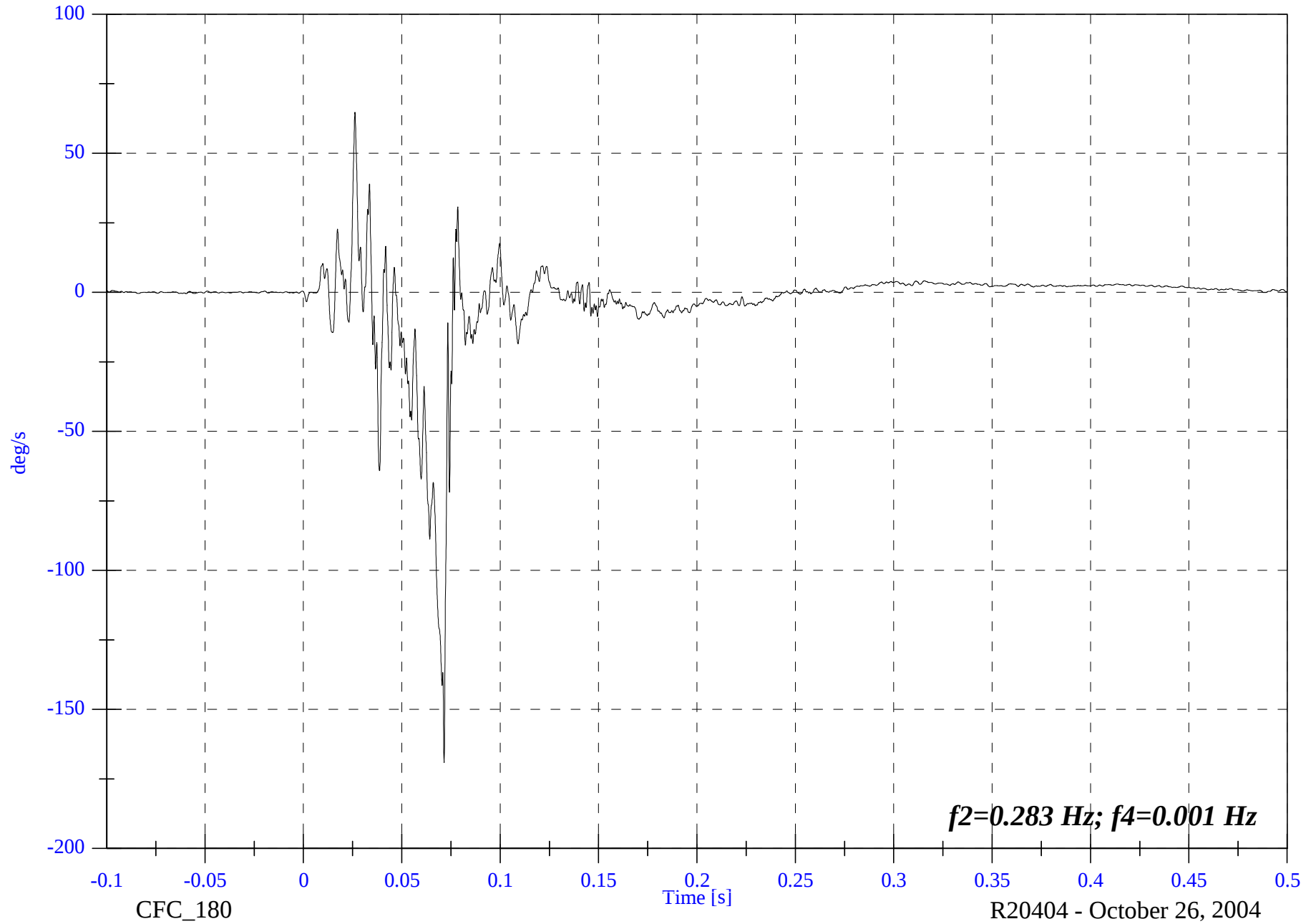


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2 Left Front Sill Comp AVy

Max: 64.7 [deg/s] at 0.026 [s]

Min: -169.0 [deg/s] at 0.071 [s]



B-105

8757-V301-02

CFC_180

R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

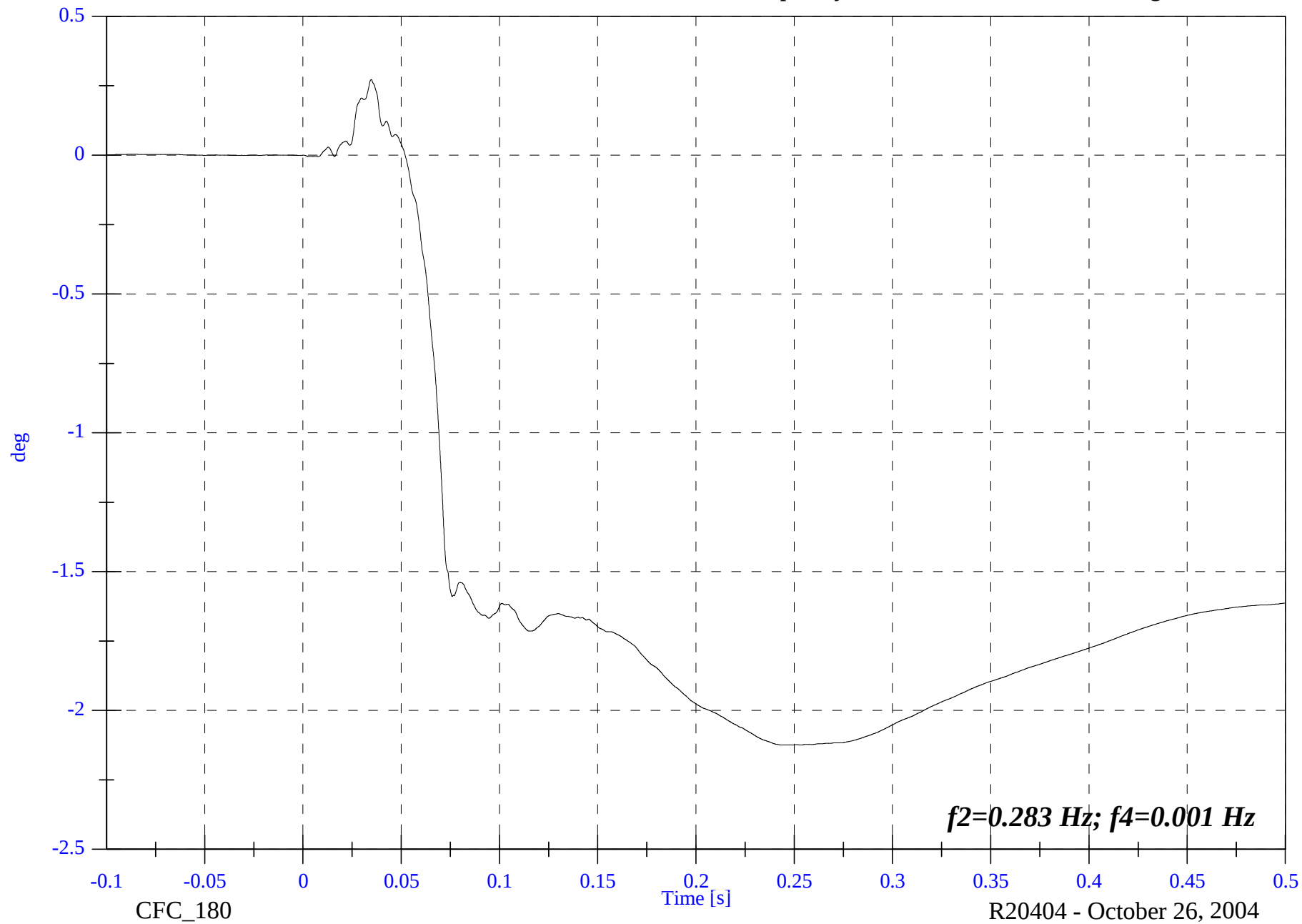
V2 Left Front Sill Comp ADy

Max: 0.3 [deg] at 0.035 [s]

Min: -2.1 [deg] at 0.249 [s]

B-106

8757-V301-02

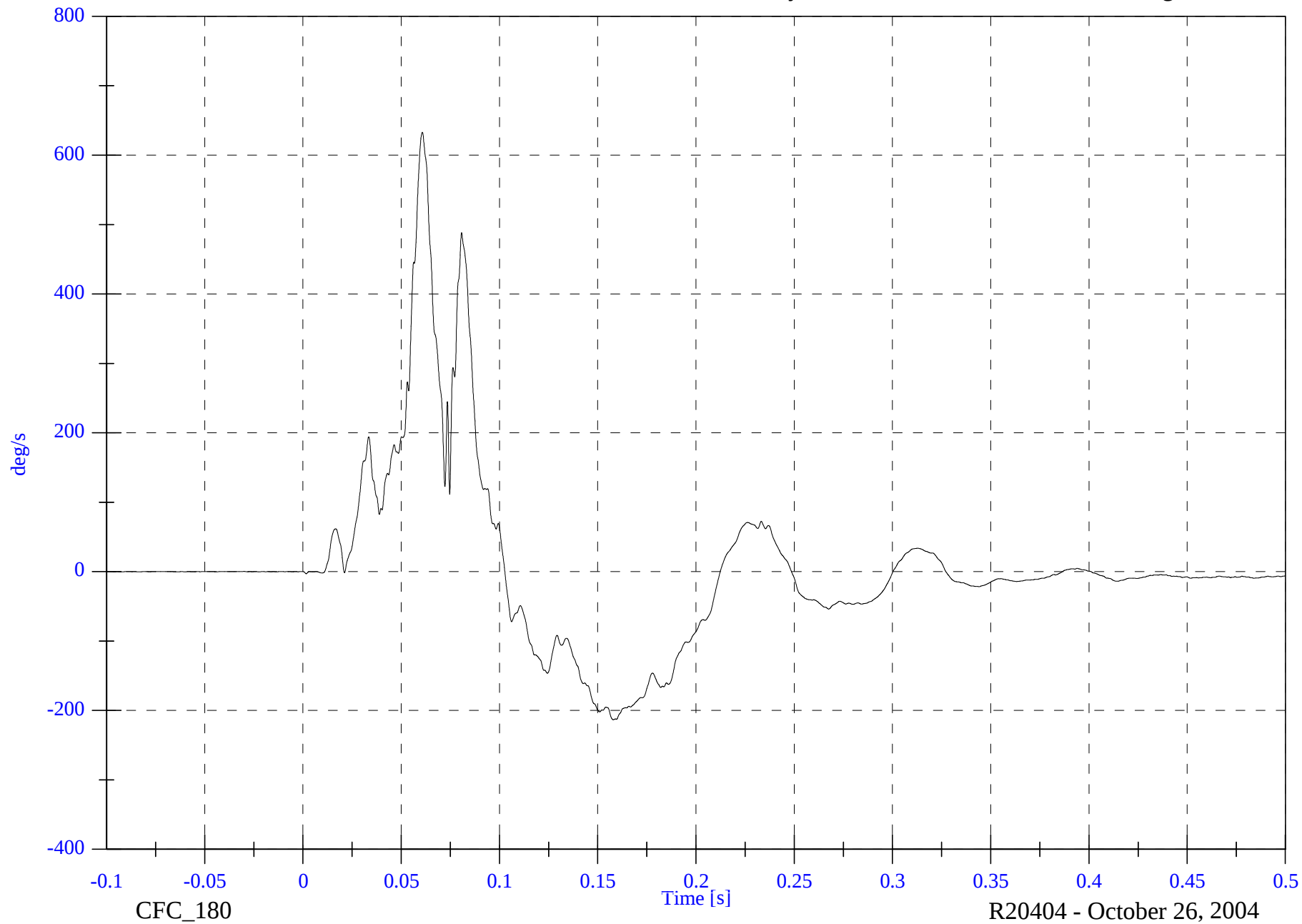


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Left Seat AVy

Max: 632.9 [deg/s] at 0.061 [s]

Min: -213.3 [deg/s] at 0.158 [s]



B-107

8757-V301-02

CFC_180

R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

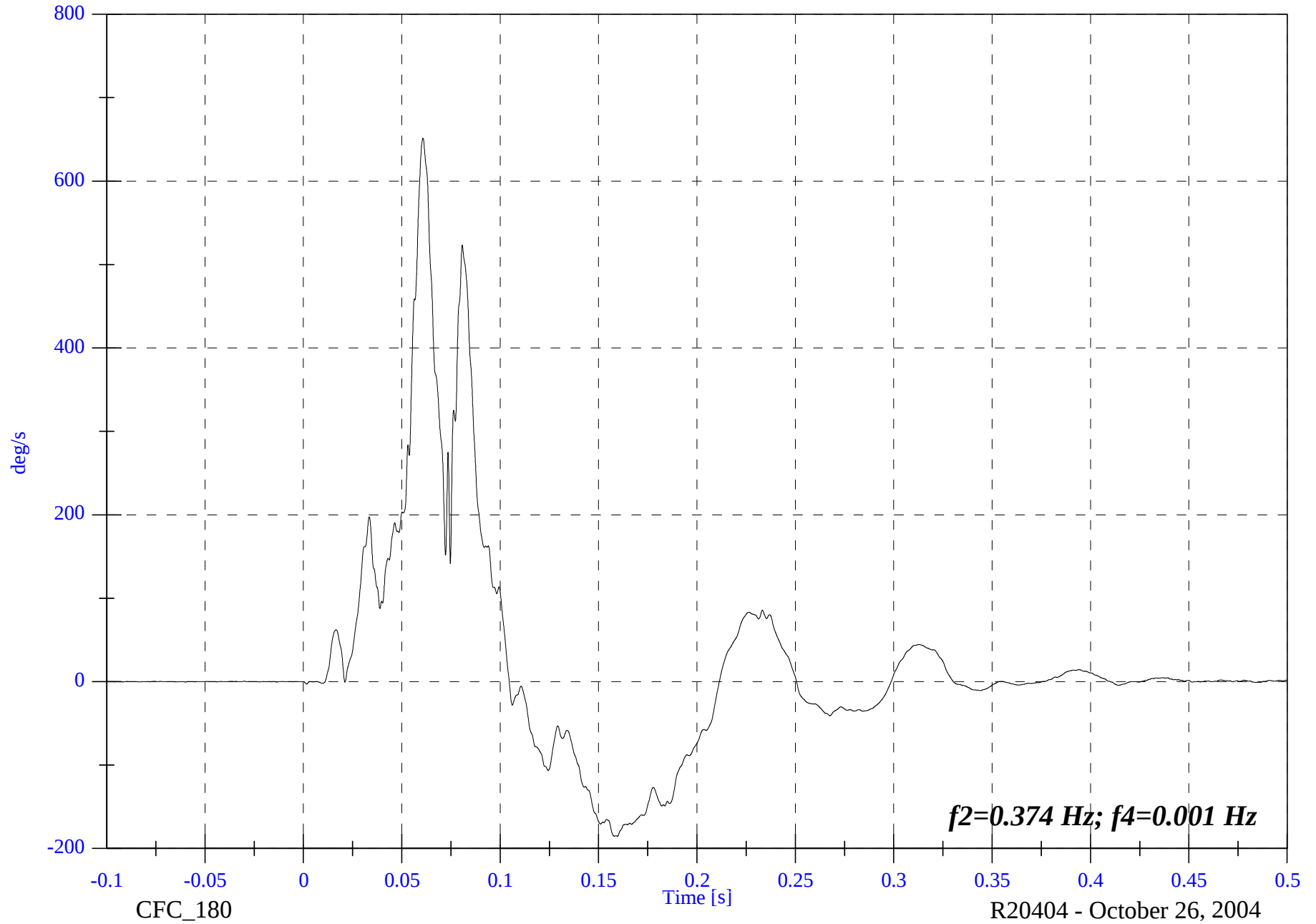
V2P1 Left Seat Comp AVy

Max: 651.5 [deg/s] at 0.061 [s]

Min: -185.5 [deg/s] at 0.160 [s]

B-108

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

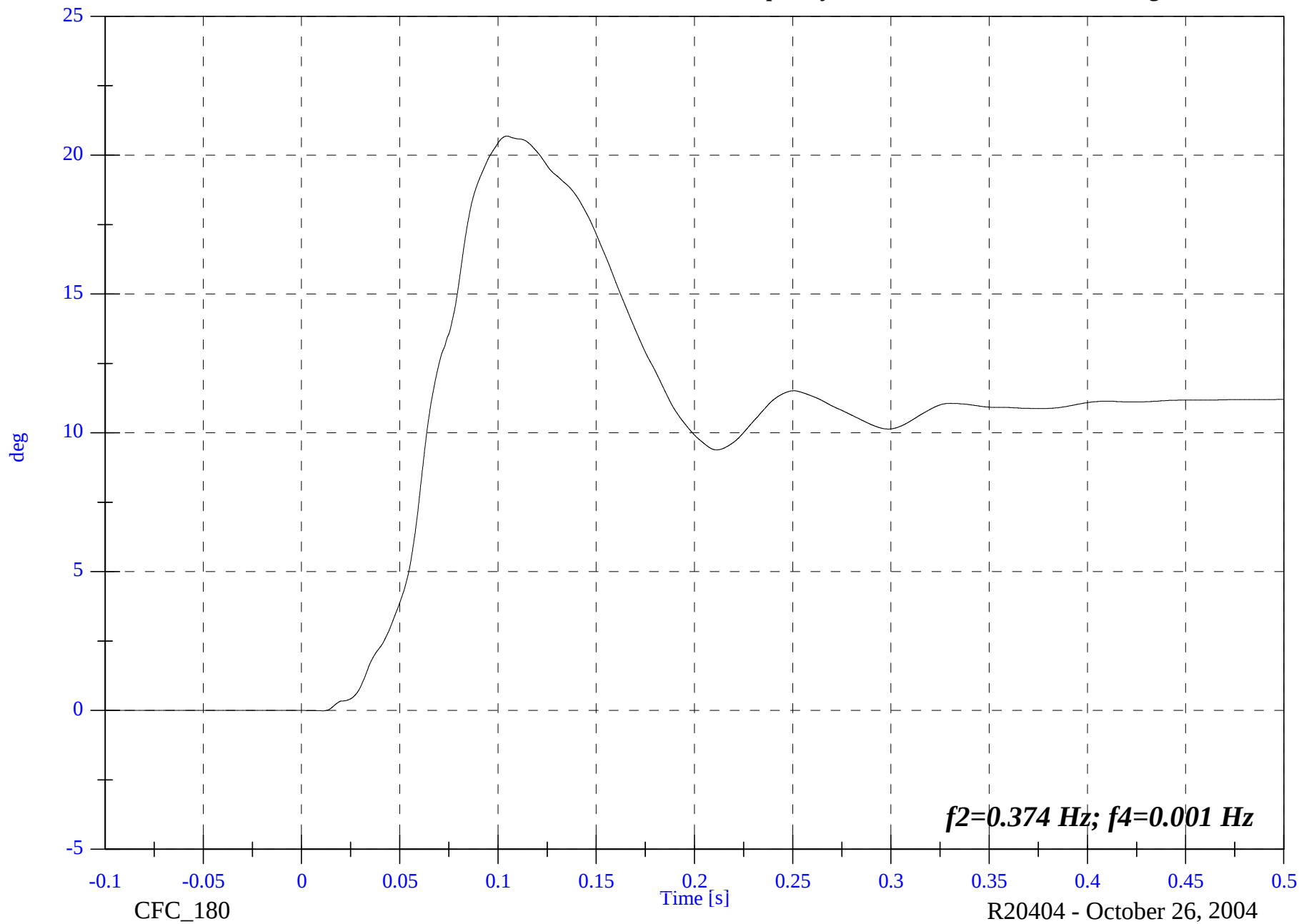
V2P1 Left Seat Comp ADy

Max: 20.7 [deg] at 0.105 [s]

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

B-109

8757-V301-02

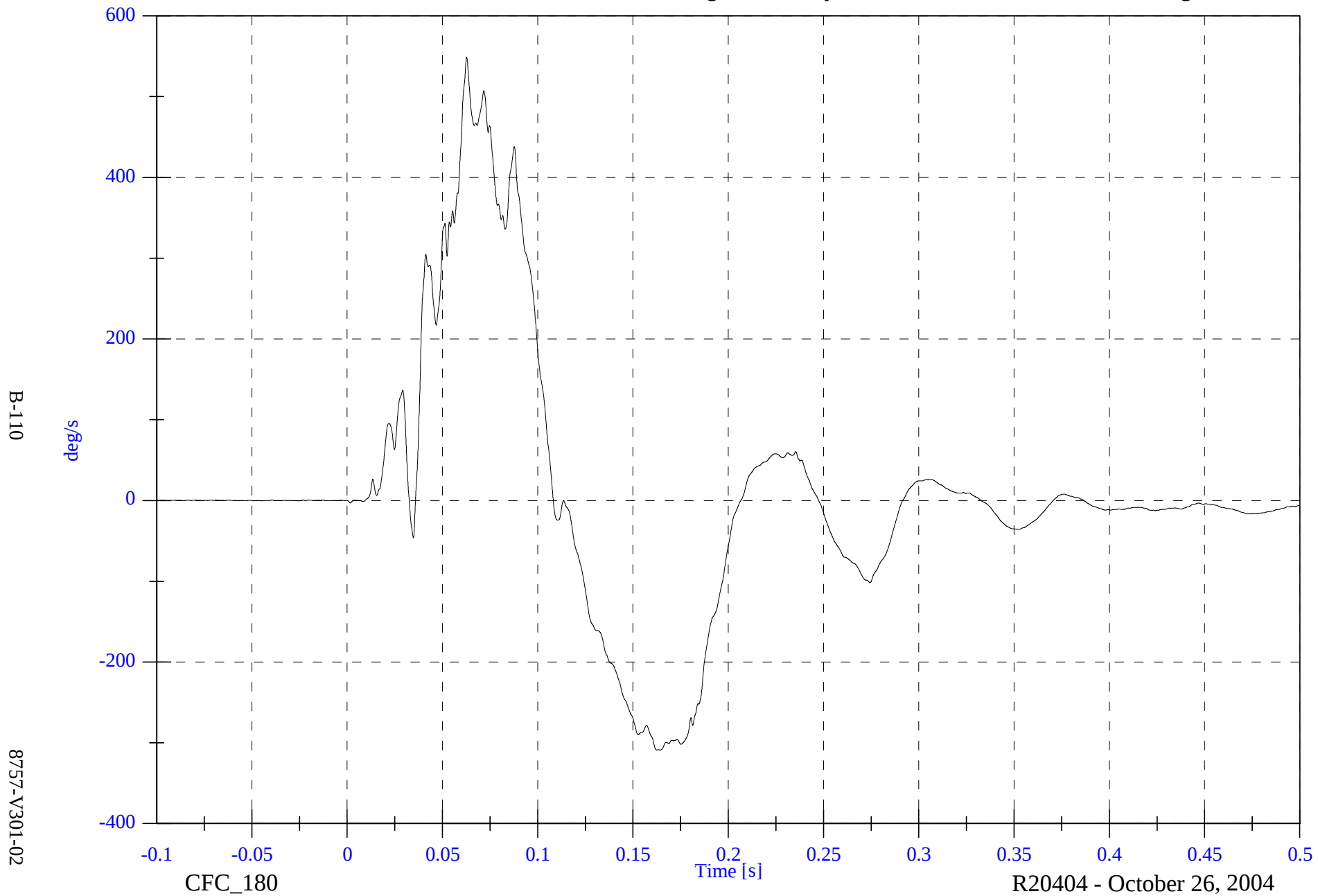


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Right Seat AVy

Max: 549.1 [deg/s] at 0.063 [s]

Min: -309.2 [deg/s] at 0.164 [s]

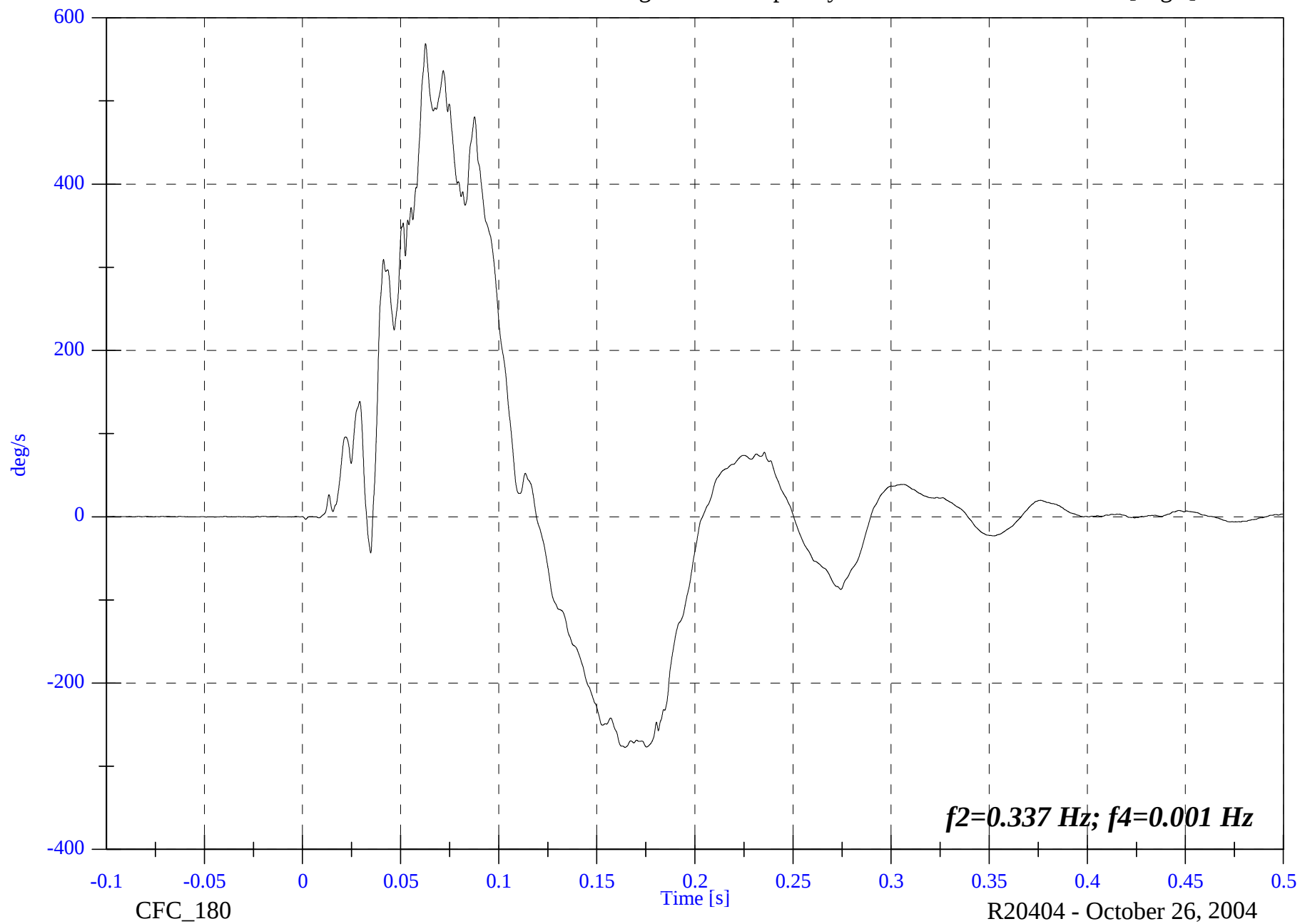


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P1 Right Seat Comp AVy

Max: 568.9 [deg/s] at 0.063 [s]

Min: -277.3 [deg/s] at 0.164 [s]



B-111

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

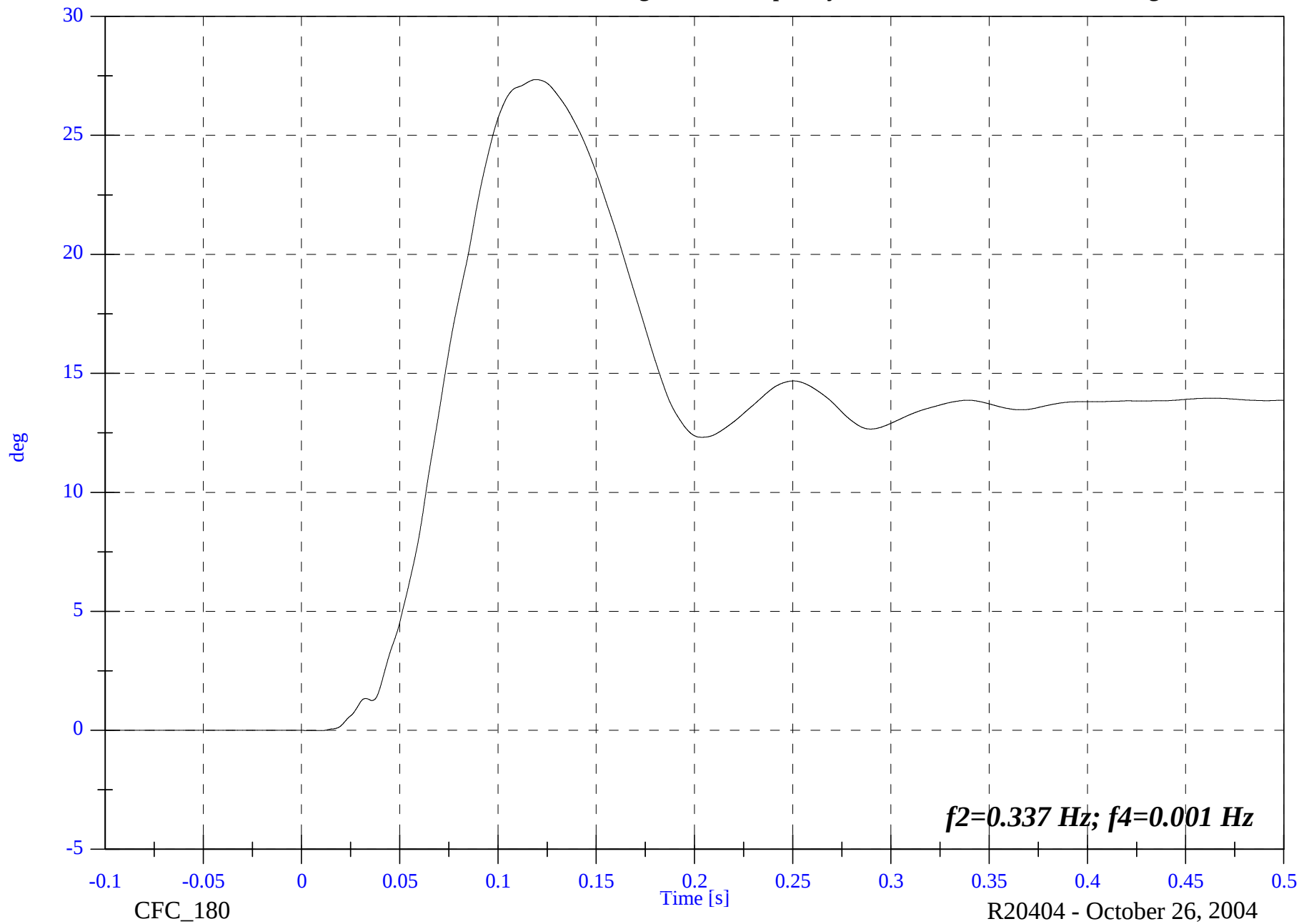
V2P1 Right Seat Comp ADy

Max: 27.3 [deg] at 0.119 [s]

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

B-112

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

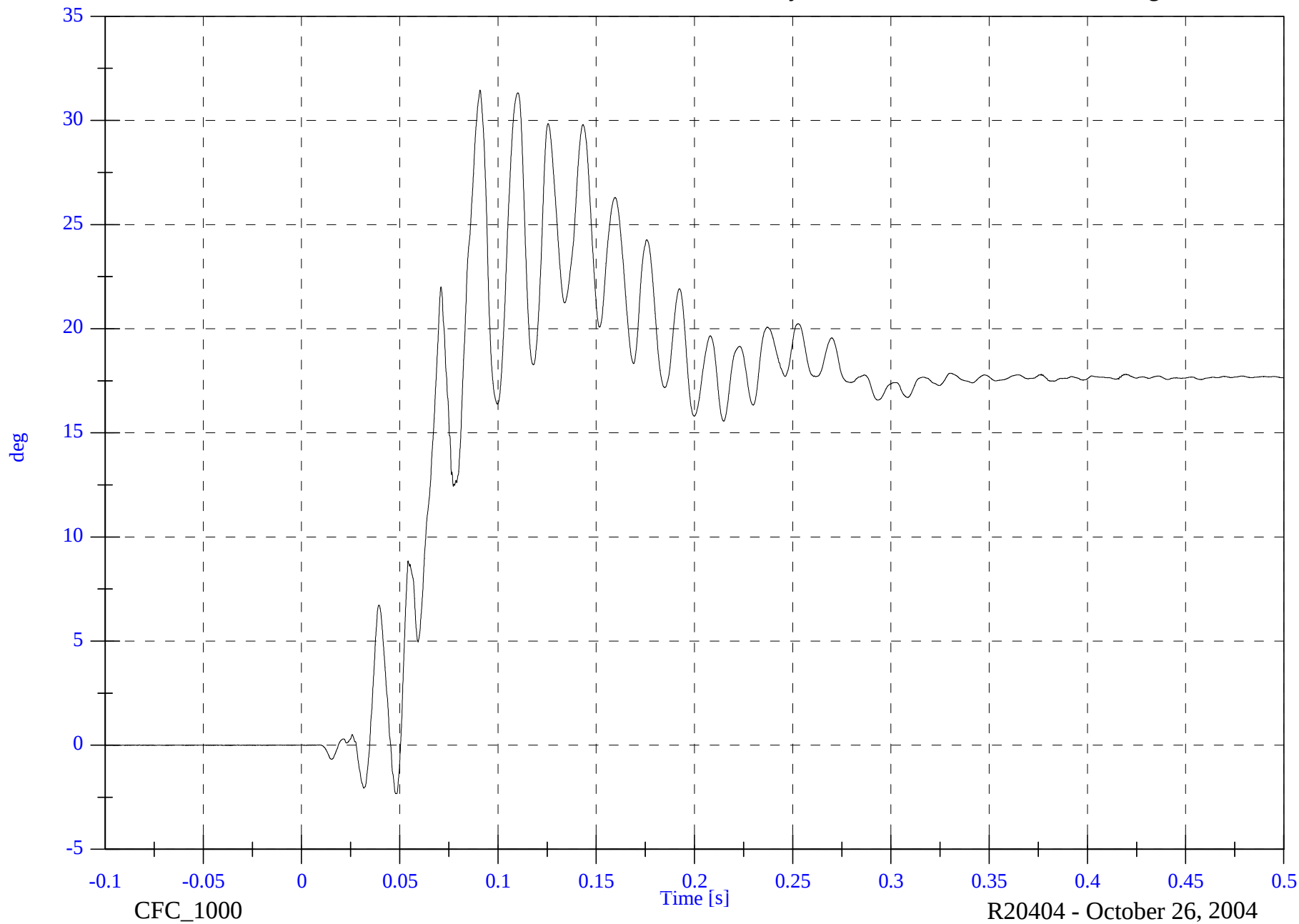
V2P1 Left Link ADy

Max: 31.5 [deg] at 0.091 [s]

Min: -2.3 [deg] at 0.048 [s]

B-113

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

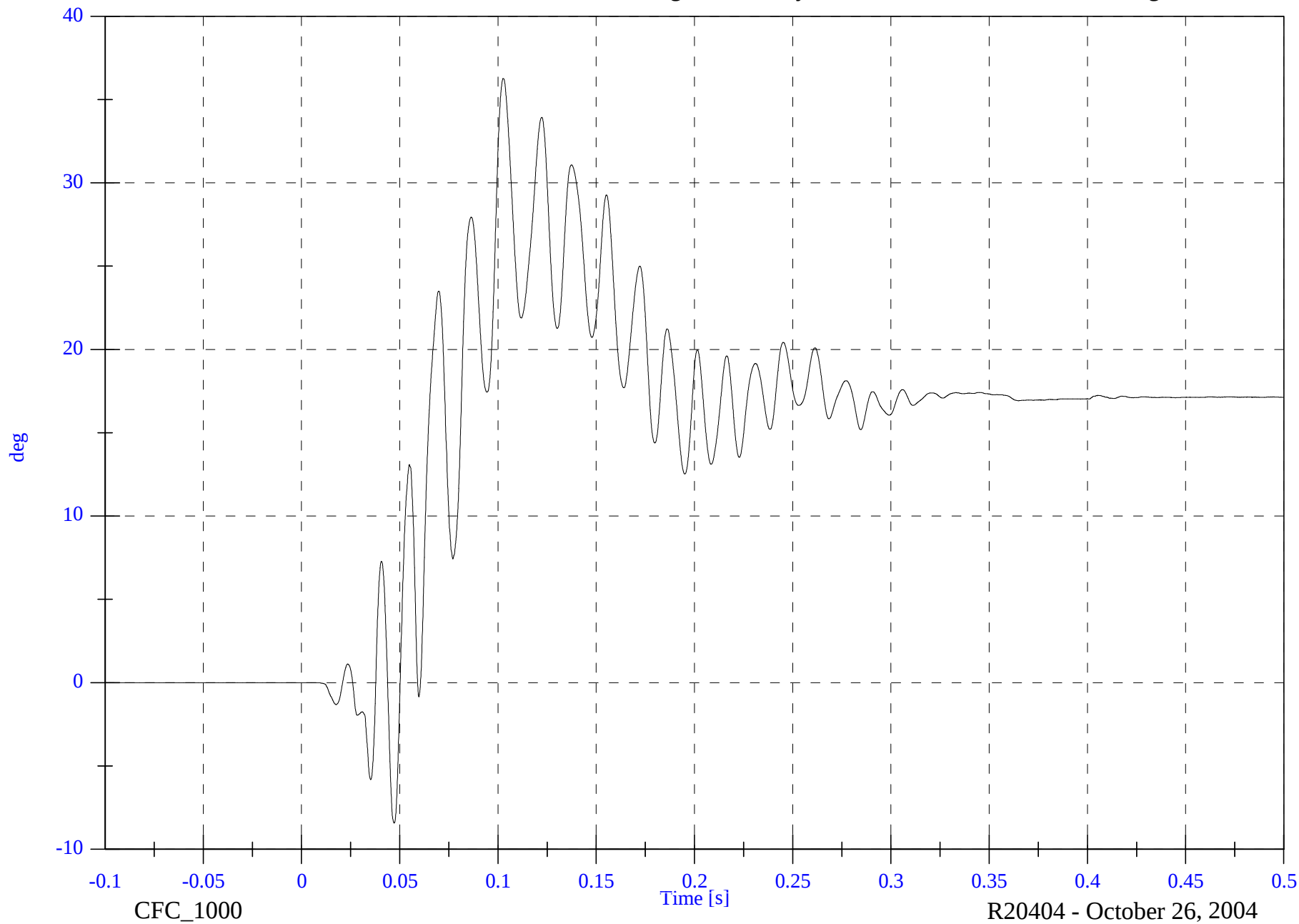
V2P1 Right Link ADy

Max: 36.3 [deg] at 0.103 [s]

Min: -8.4 [deg] at 0.047 [s]

B-114

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

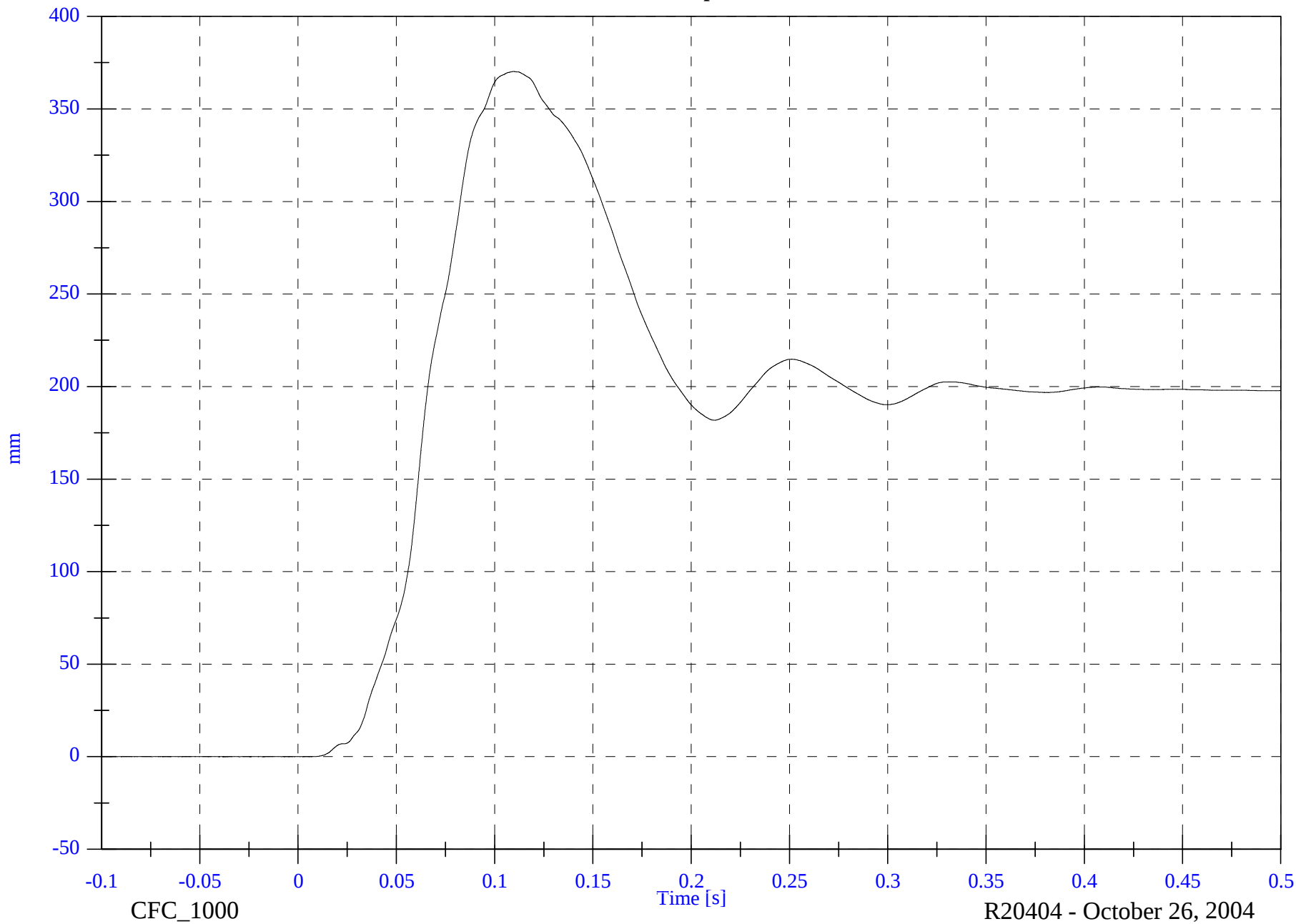
V2P1 Left Span Bar D

Max: 370.2 [mm] at 0.110 [s]

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

B-115

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

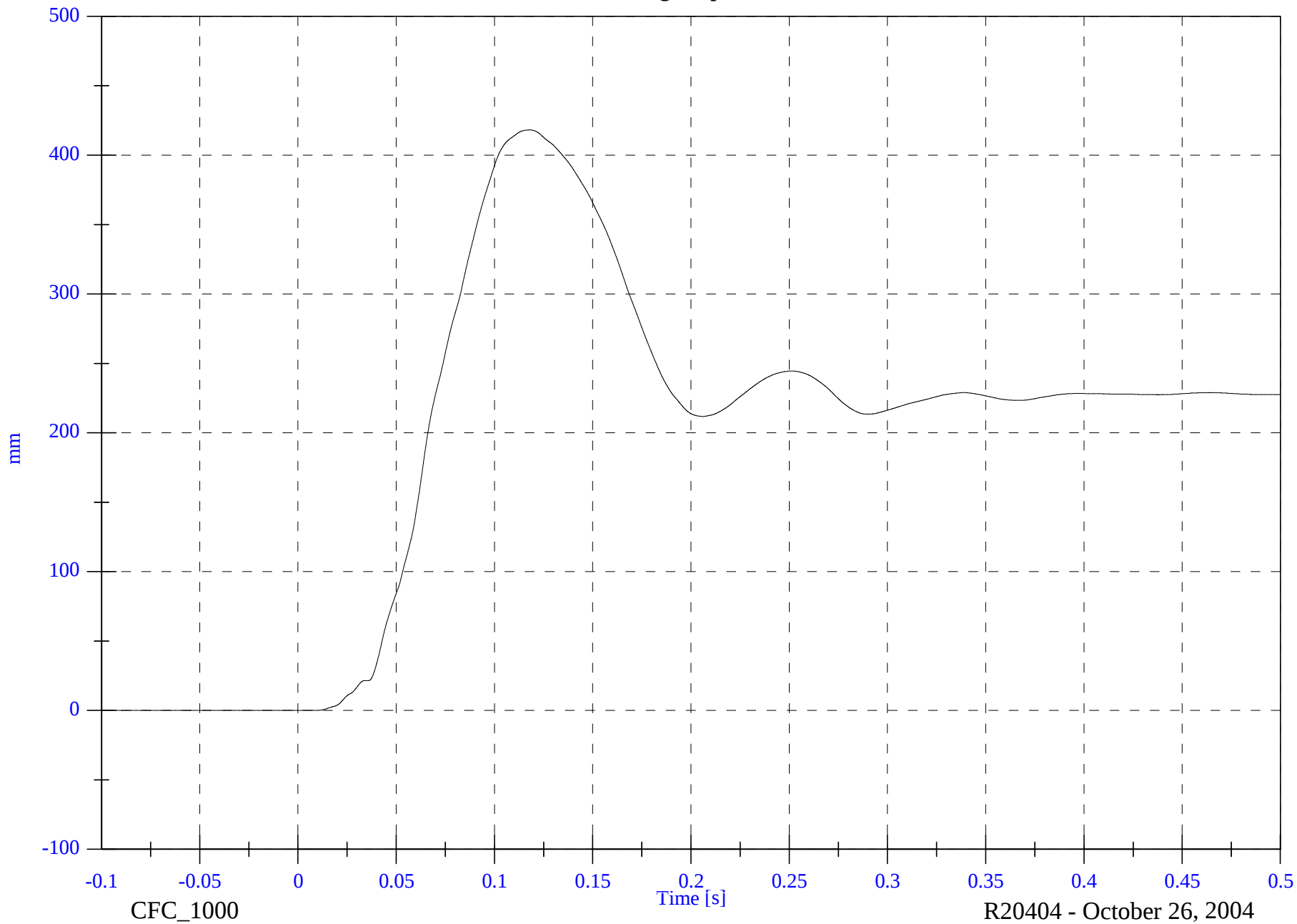
V2P1 Right Span Bar D

Max: 418.2 [mm] at 0.118 [s]

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

B-116

8757-V301-02

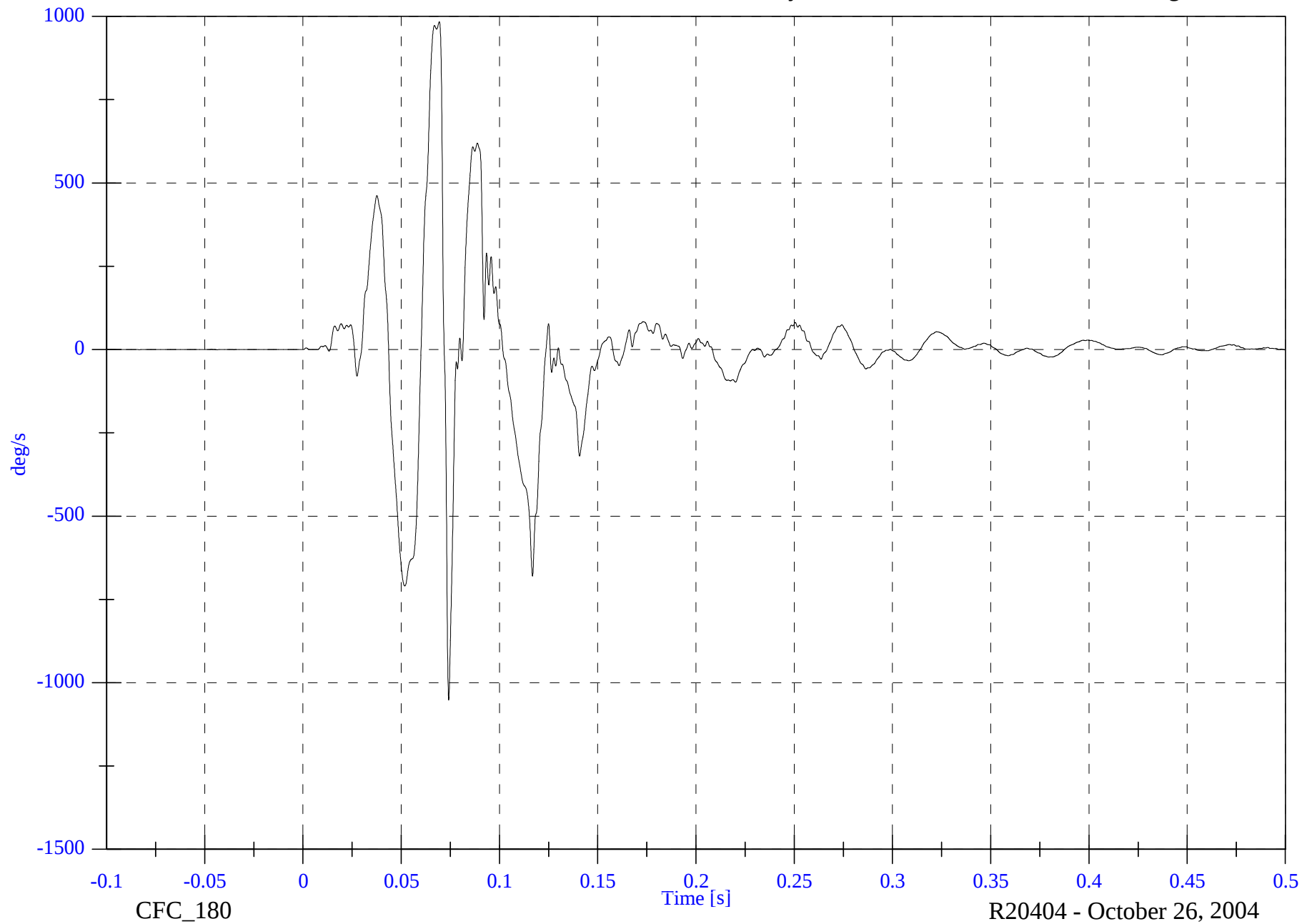


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Left Seat AVy

Max: 983.6 [deg/s] at 0.069 [s]

Min: -1052.0 [deg/s] at 0.074 [s]



B-117

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

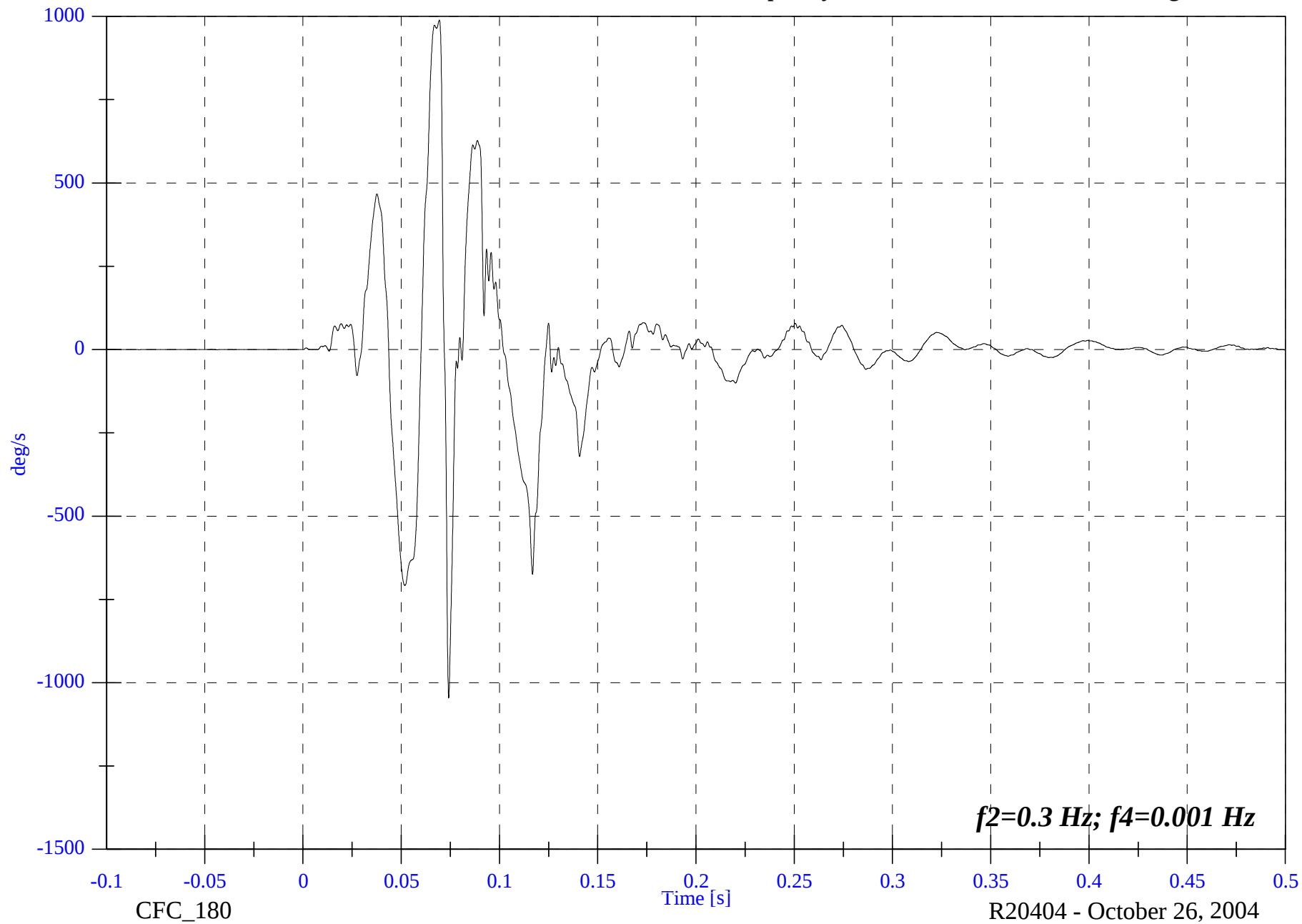
V2P3 Left Seat Comp AVy

Max: 988.8 [deg/s] at 0.069 [s]

Min: -1046.3 [deg/s] at 0.074 [s]

B-118

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

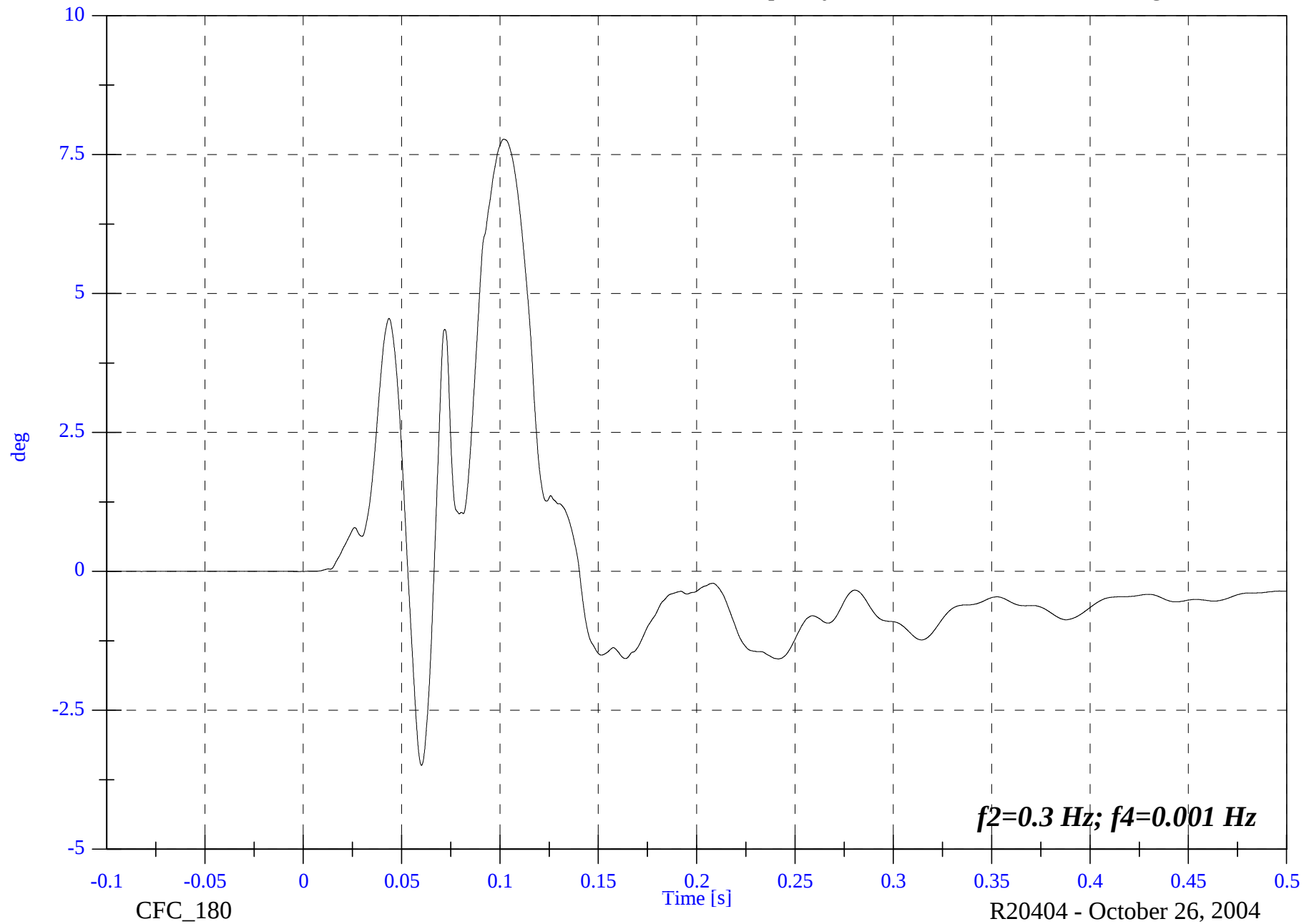
V2P3 Left Seat Comp ADy

Max: 7.8 [deg] at 0.102 [s]

Min: -3.5 [deg] at 0.060 [s]

B-119

8757-V301-02

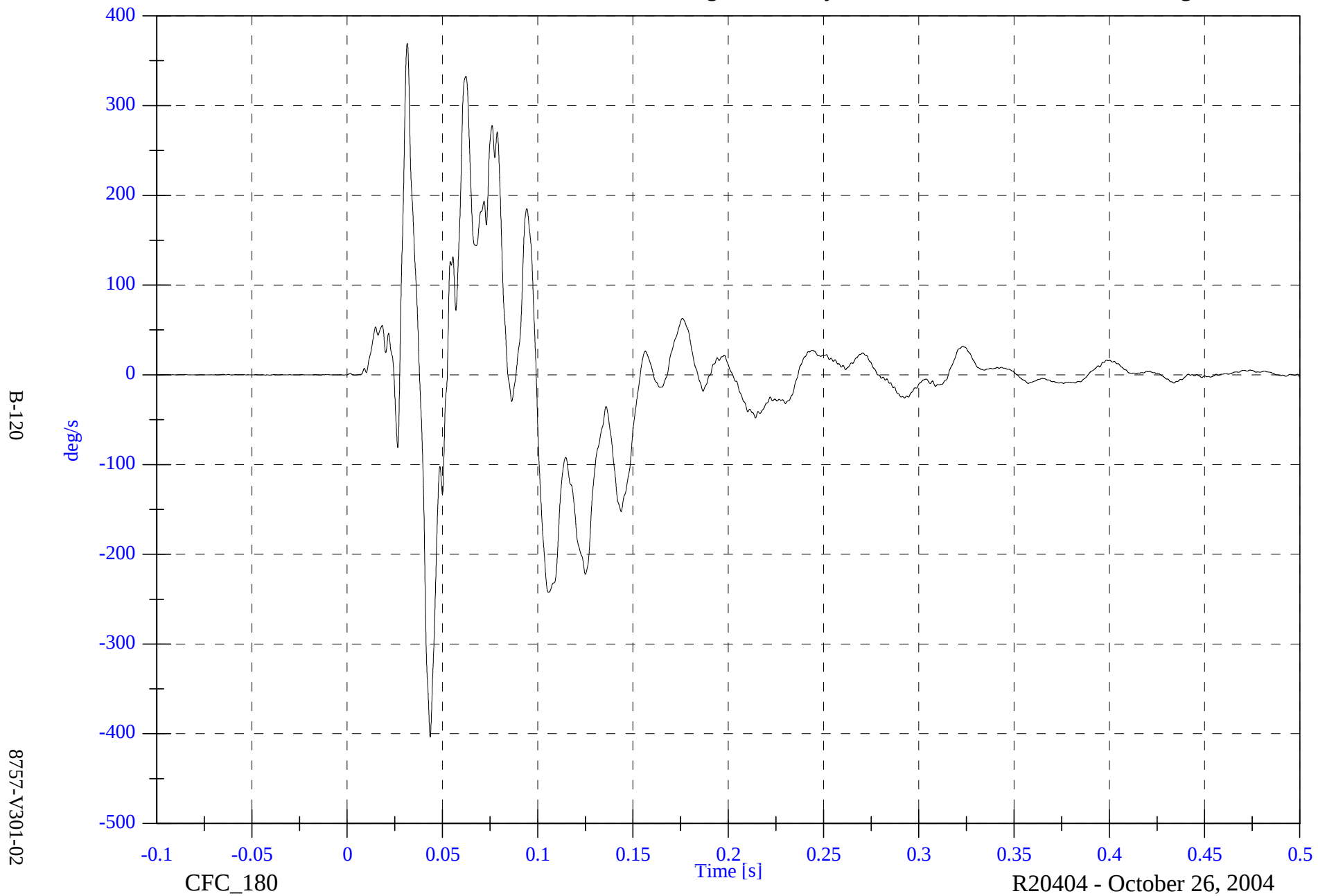


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Right Seat AVy

Max: 369.4 [deg/s] at 0.031 [s]

Min: -403.7 [deg/s] at 0.044 [s]

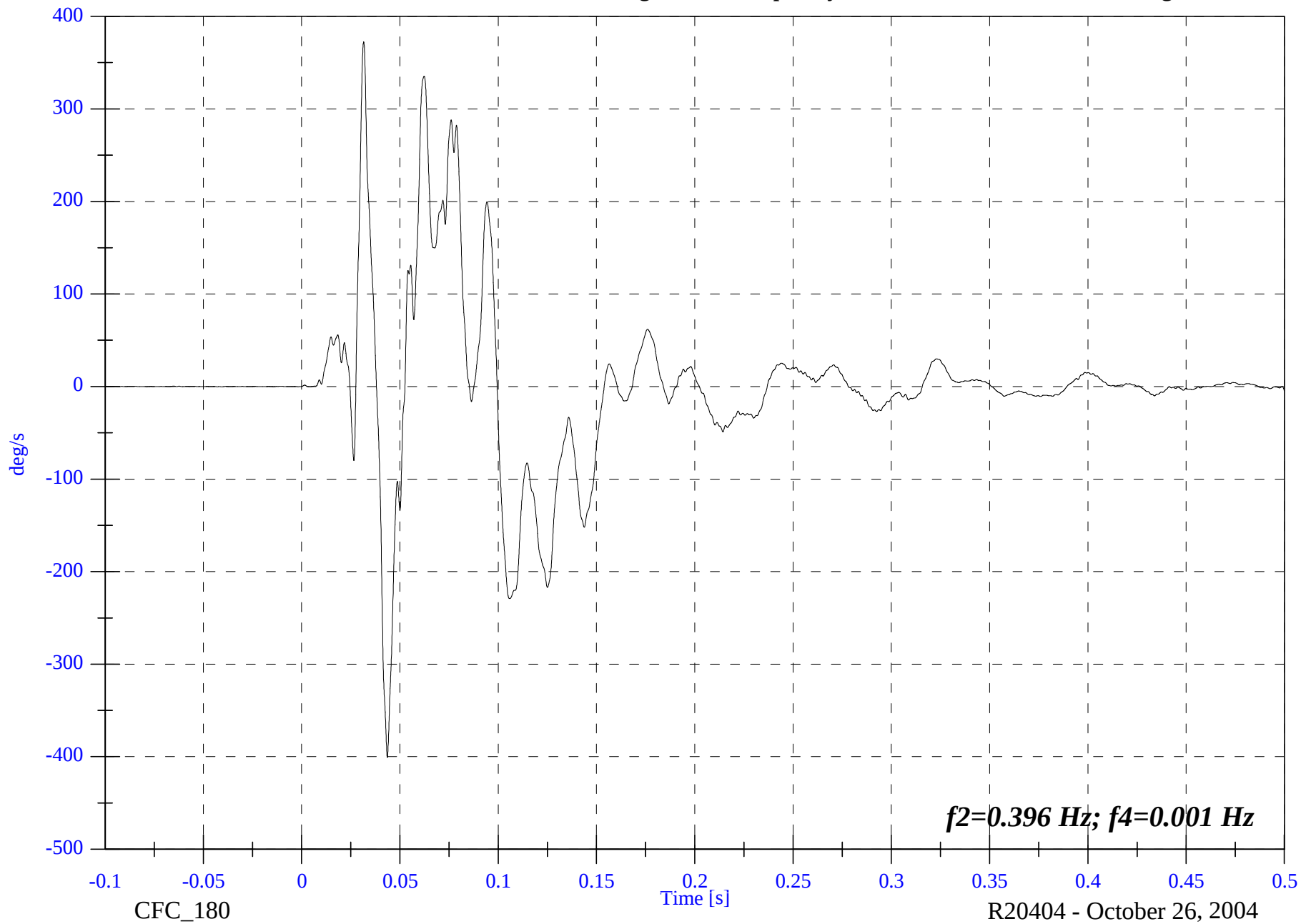


VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Right Seat Comp AVy

Max: 372.4 [deg/s] at 0.032 [s]

Min: -400.9 [deg/s] at 0.044 [s]



B-121

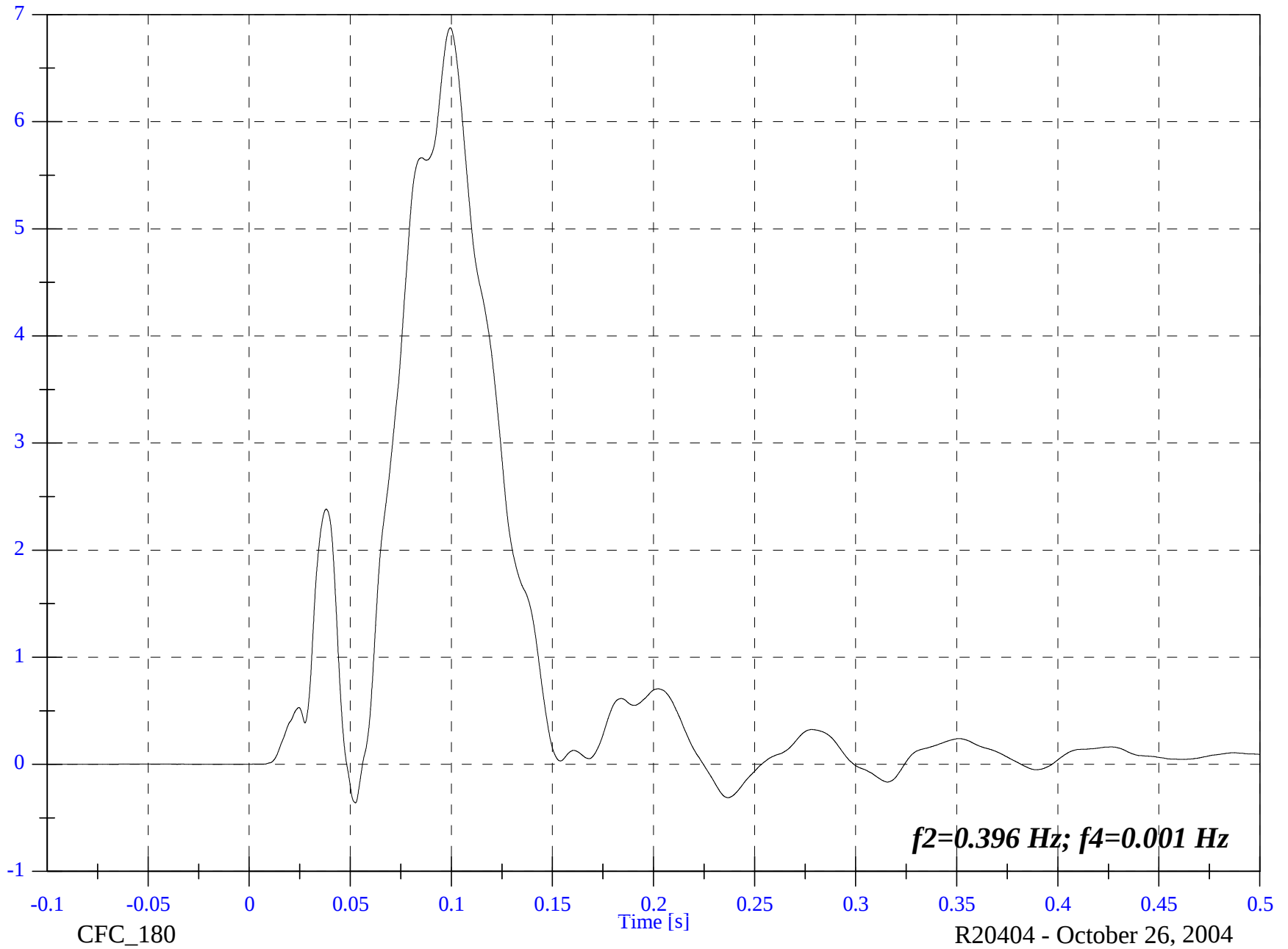
8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

V2P3 Right Seat Comp ADy

Max: 6.9 [deg] at 0.099 [s]

Min: -0.4 [deg] at 0.053 [s]



B-122

8757-V301-02

CFC_180

R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

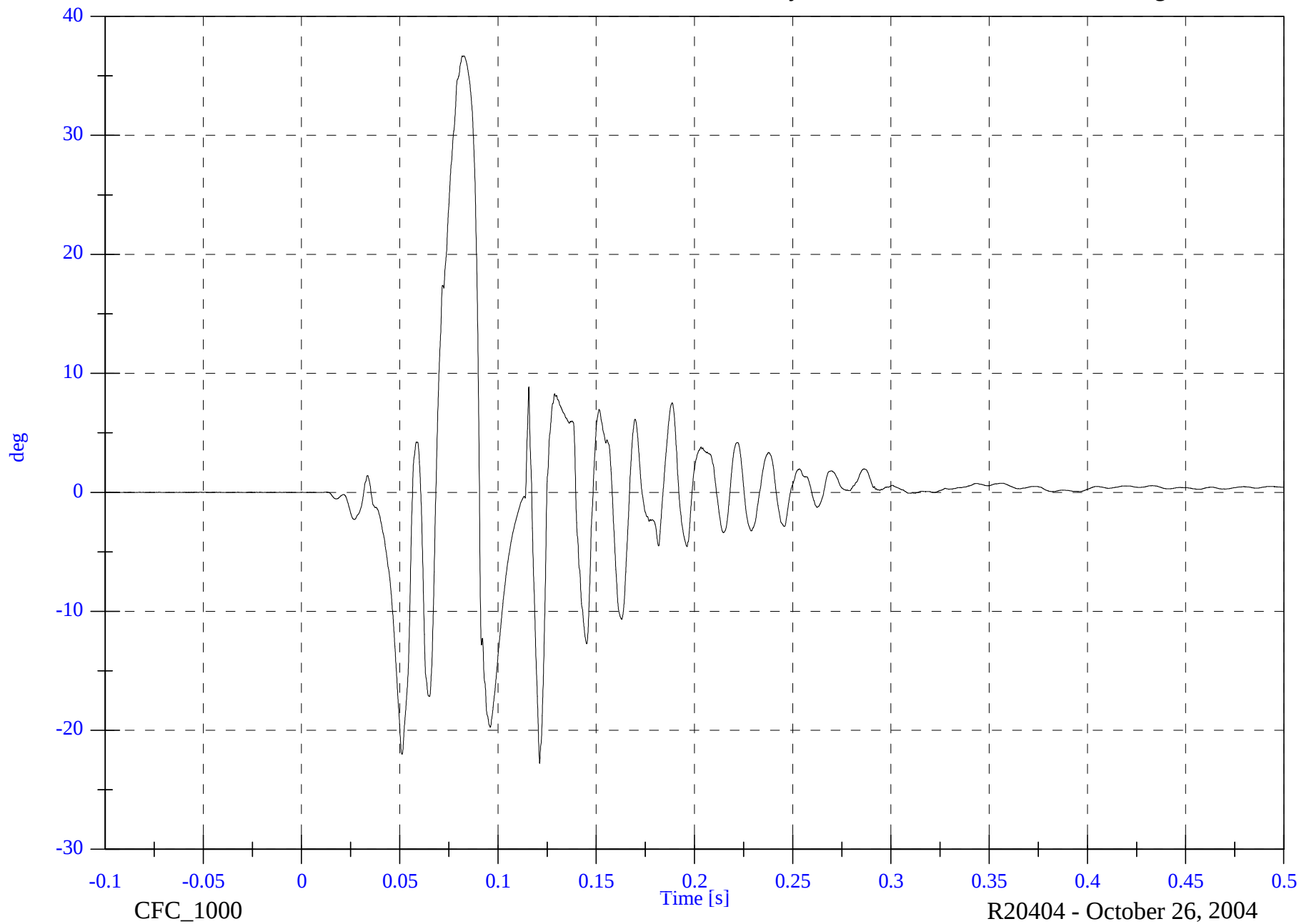
V2P3 Left Link ADy

Max: 36.7 [deg] at 0.082 [s]

Min: -22.8 [deg] at 0.121 [s]

B-123

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

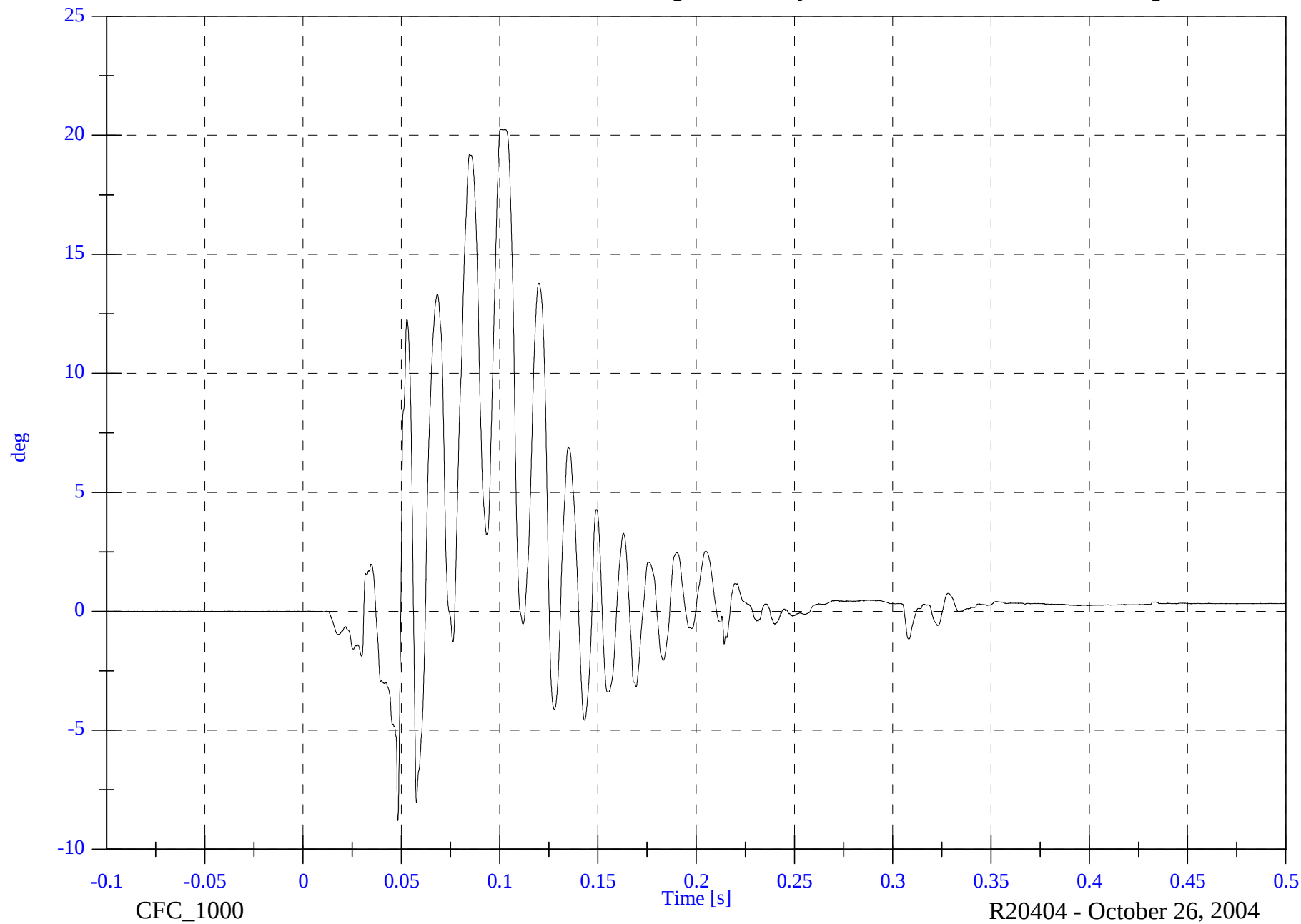
V2P3 Right Link ADy

Max: 20.2 [deg] at 0.100 [s]

Min: -8.8 [deg] at 0.048 [s]

B-124

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

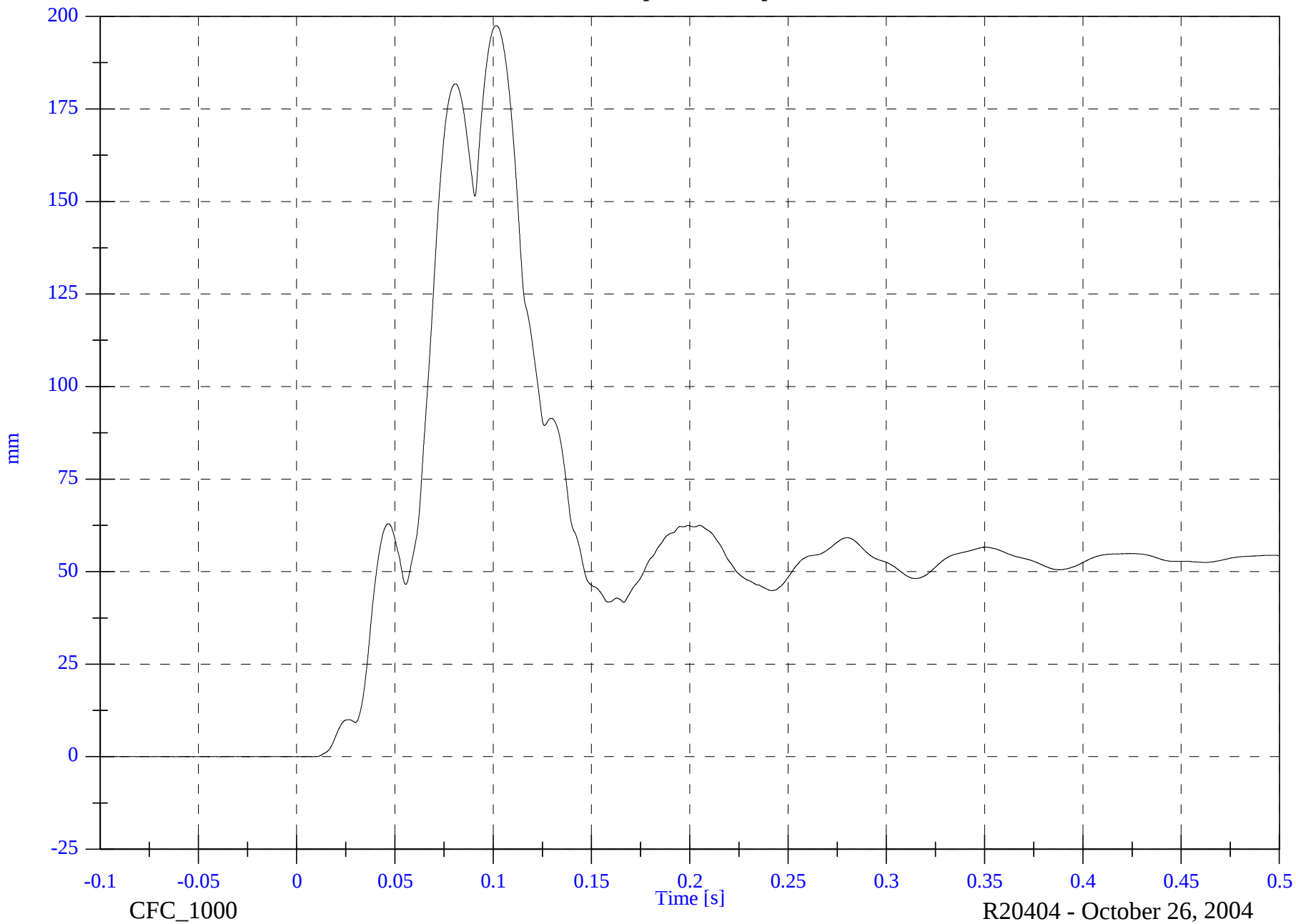
V2P3 Left Span Bar Displacement

Max: 197.5 [mm] at 0.102 [s]

Min: -0.0 [mm] at -0.067 [s]

B-125

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

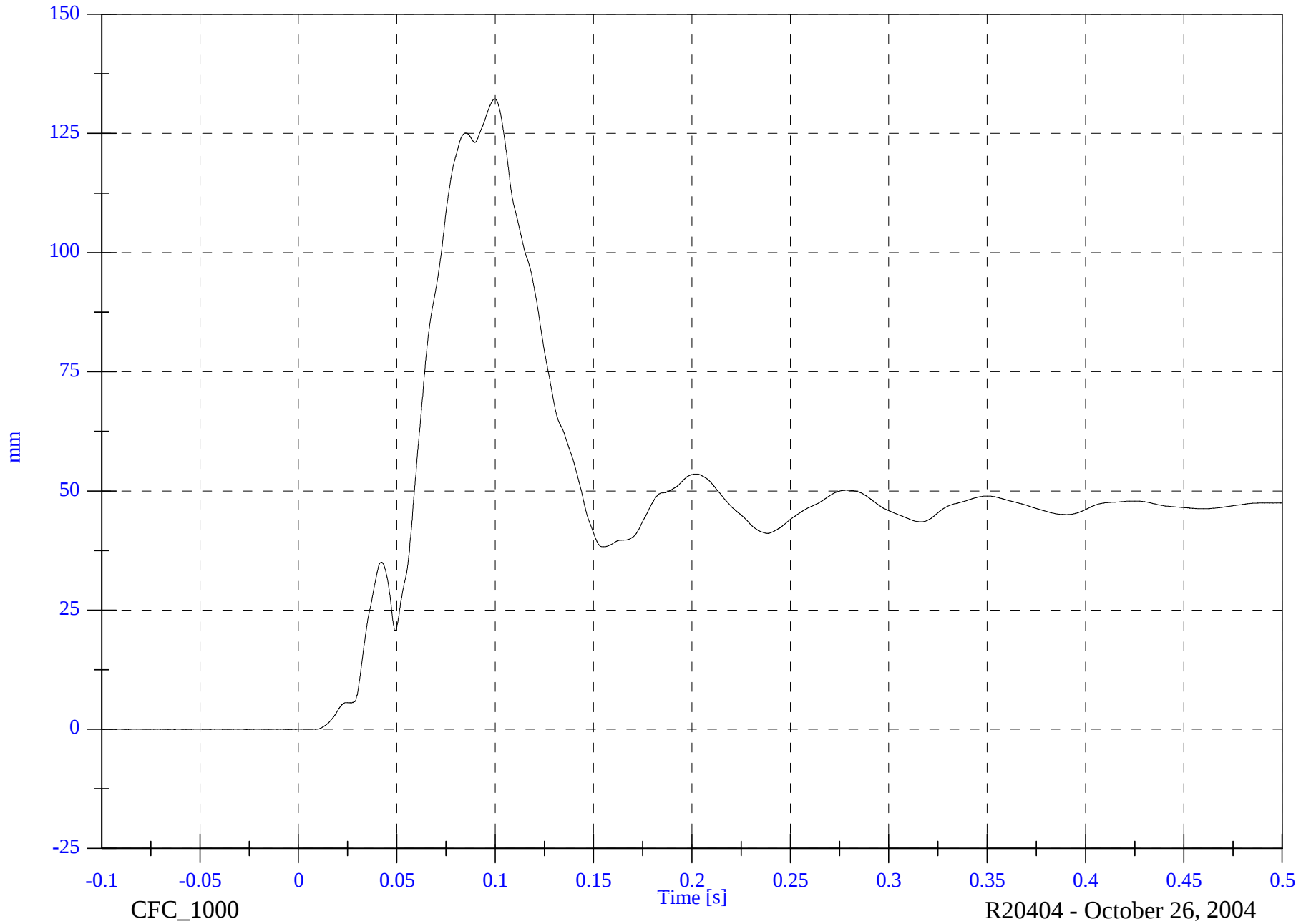
V2P3 Right Span Bar Displacement

Max: 132.2 [mm] at 0.100 [s]

Min: -0.0 [mm] at -0.088 [s]

B-126

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

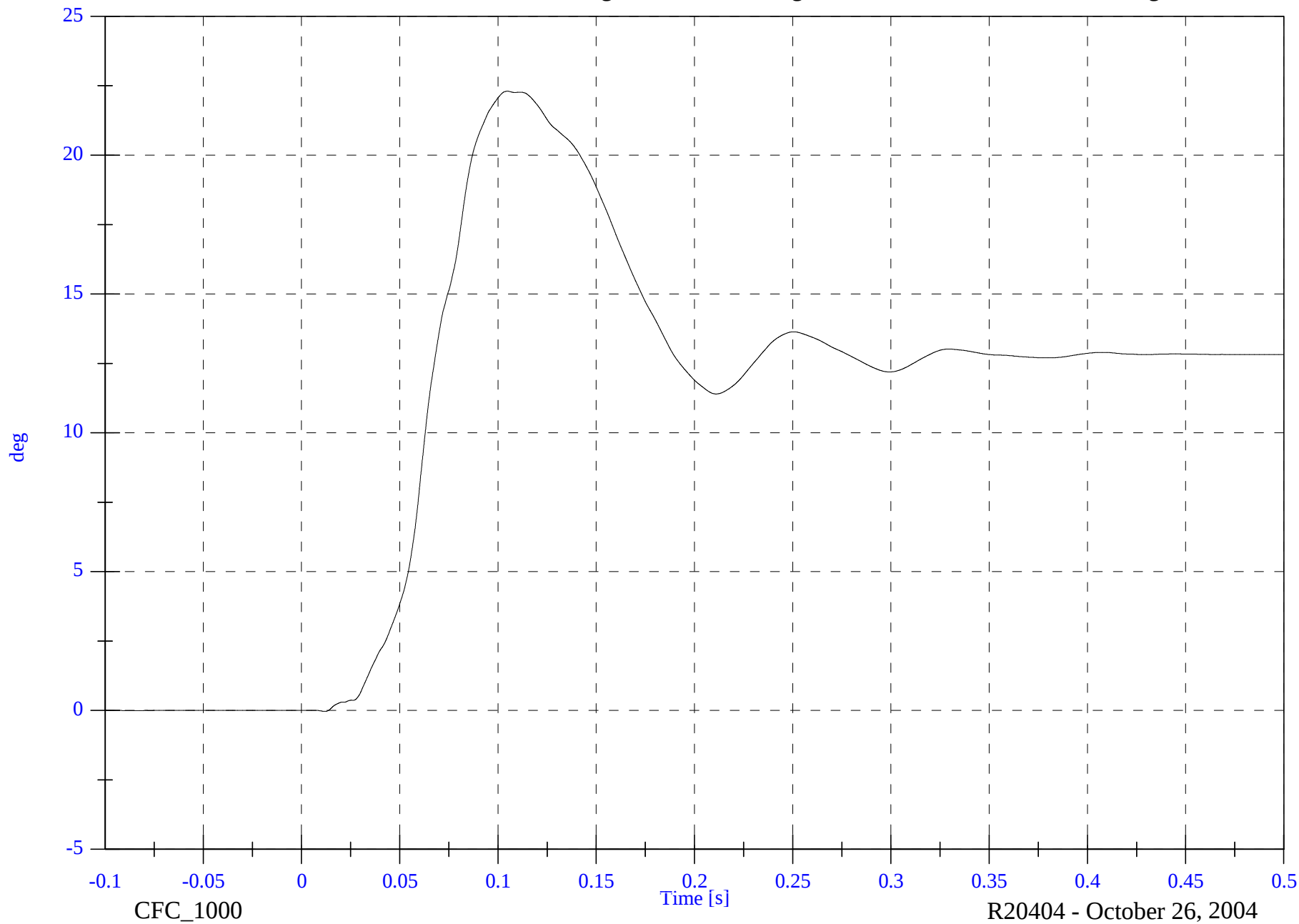
P1 Left Change in Seat Back Angle WRT Sill

Max: 22.3 [deg] at 0.105 [s]

Min: -0.0 [deg] at 0.012 [s]

B-127

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

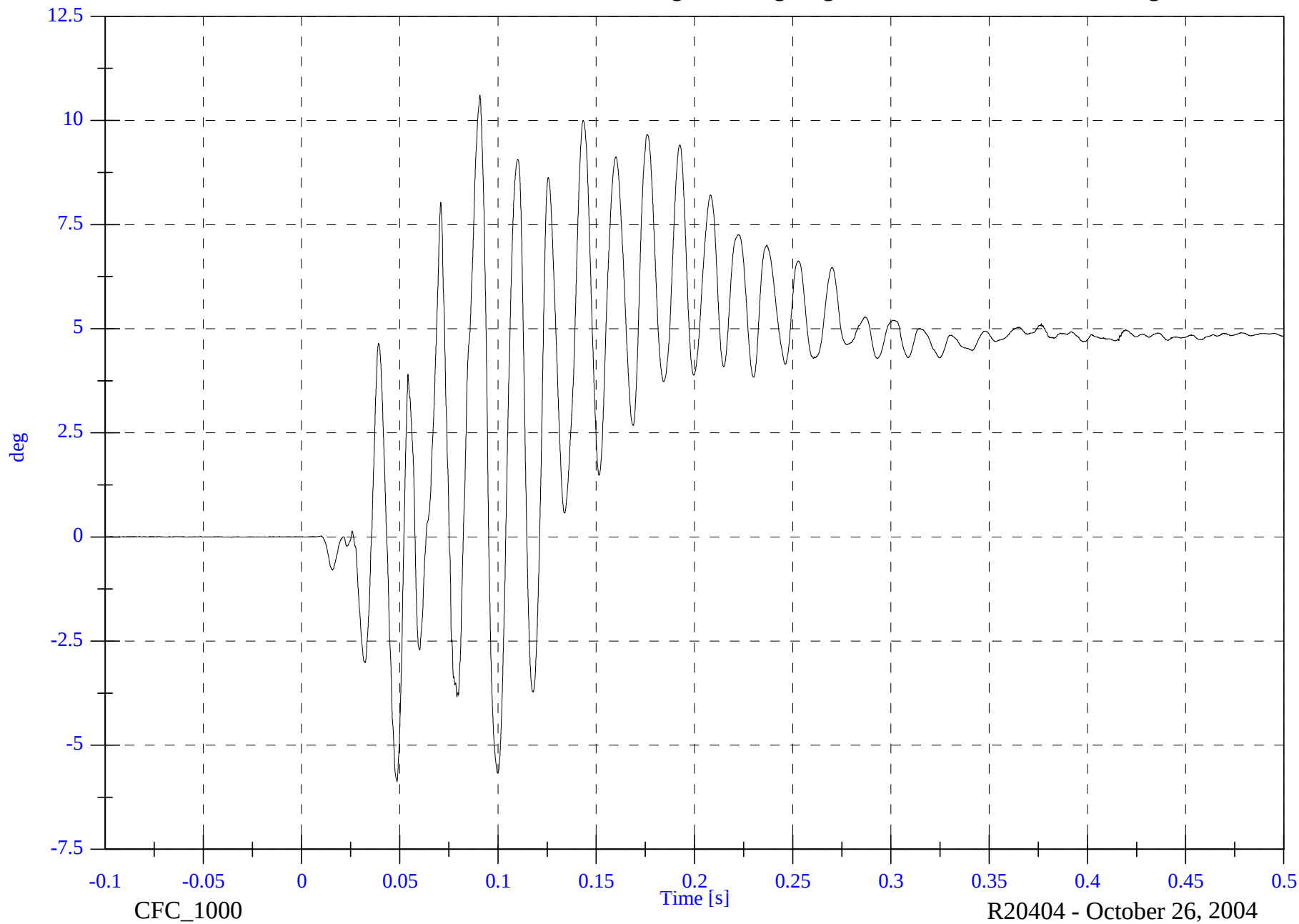
P1 Left Change in String Angle

Max: 10.6 [deg] at 0.091 [s]

Min: -5.9 [deg] at 0.049 [s]

B-128

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

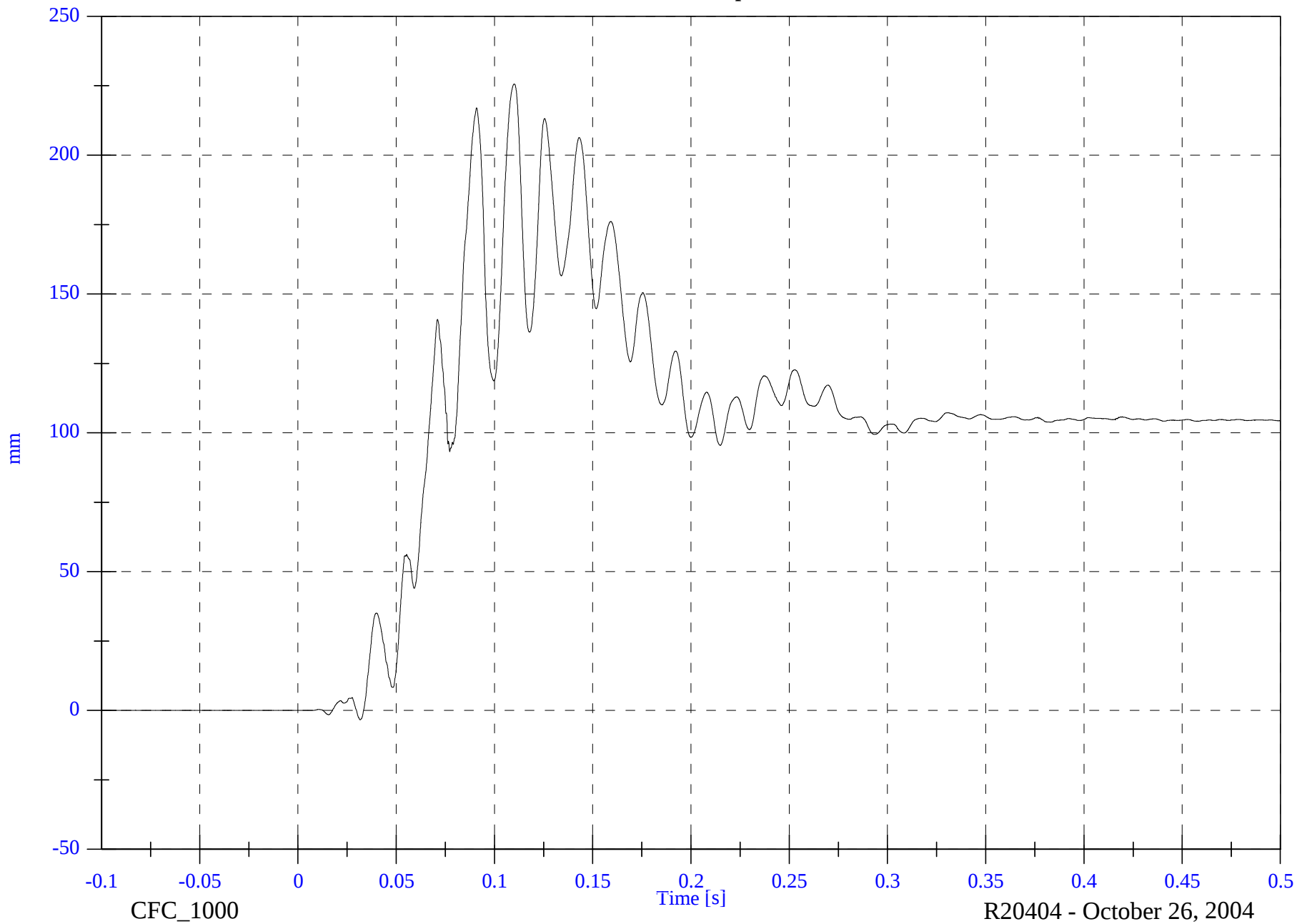
P1 Left Seat X Displacement

Max: 225.6 [mm] at 0.110 [s]

Min: -3.4 [mm] at 0.032 [s]

B-129

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

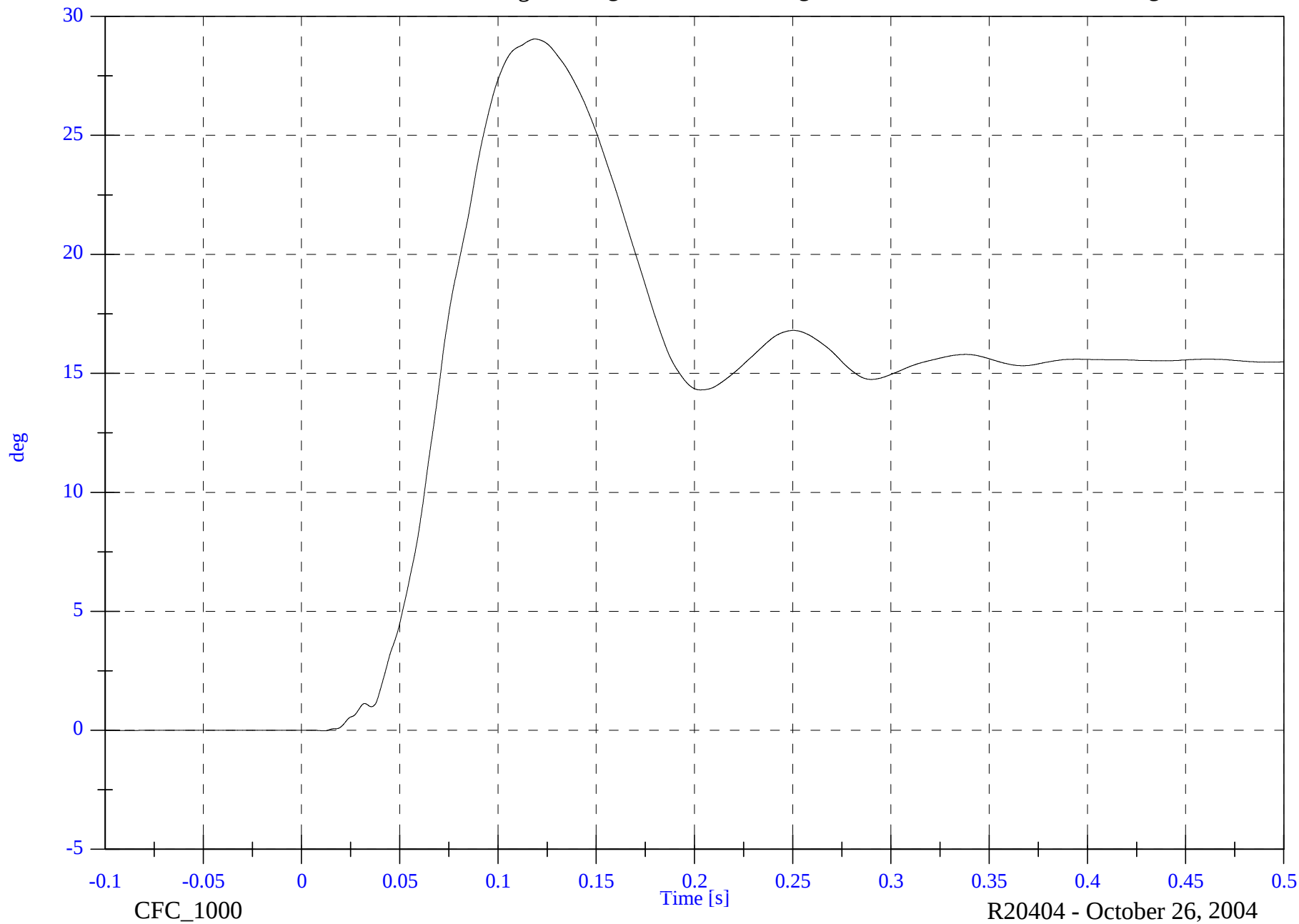
P1 Right Change in Seat Back Angle WRT Sill

Max: 29.0 [deg] at 0.119 [s]

Min: -0.0 [deg] at 0.012 [s]

B-130

8757-V301-02

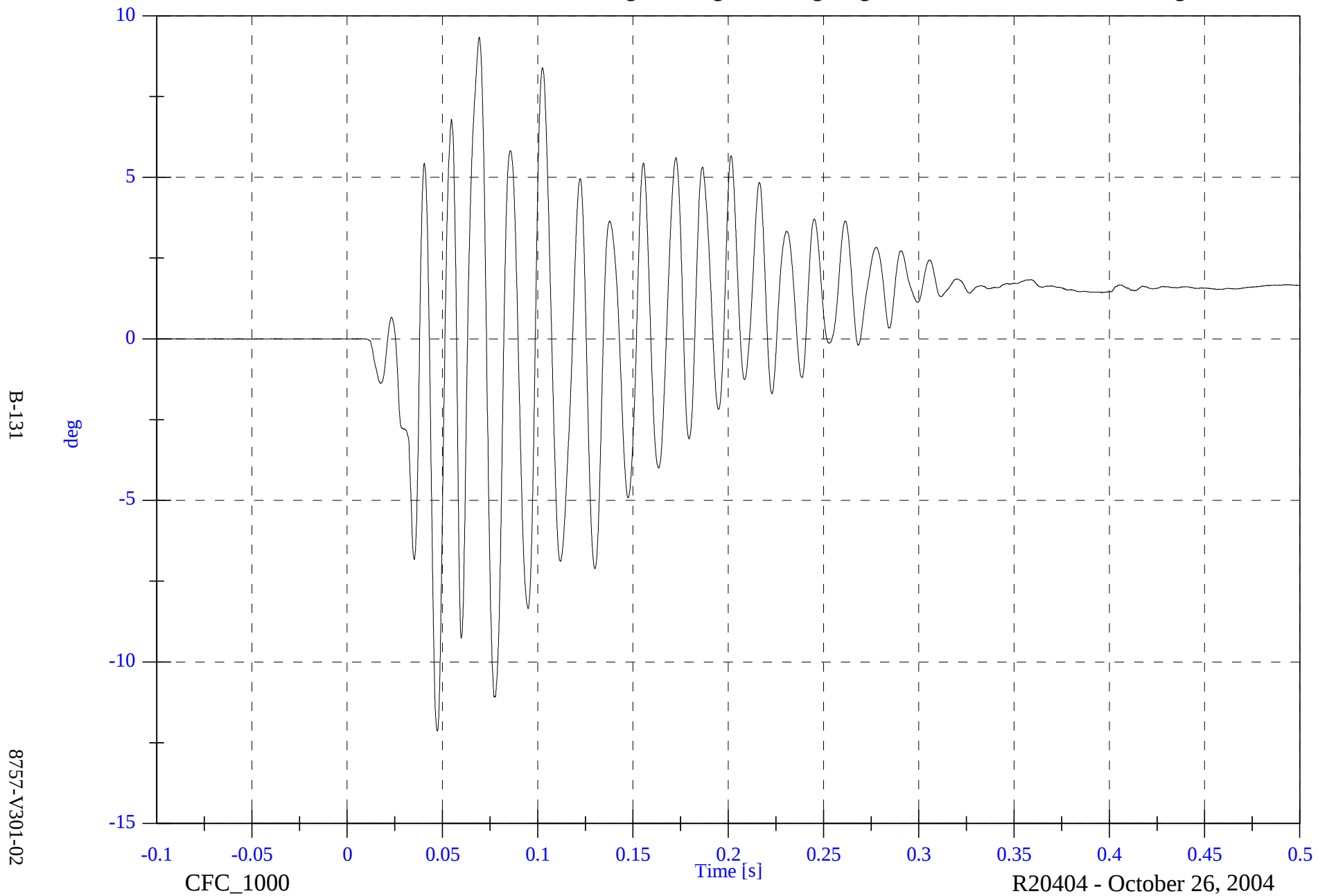


VOLPE 301 Test 2 - 2002 Jeep Liberty

P1 Right Change in String Angle

Max: 9.3 [deg] at 0.069 [s]

Min: -12.1 [deg] at 0.047 [s]

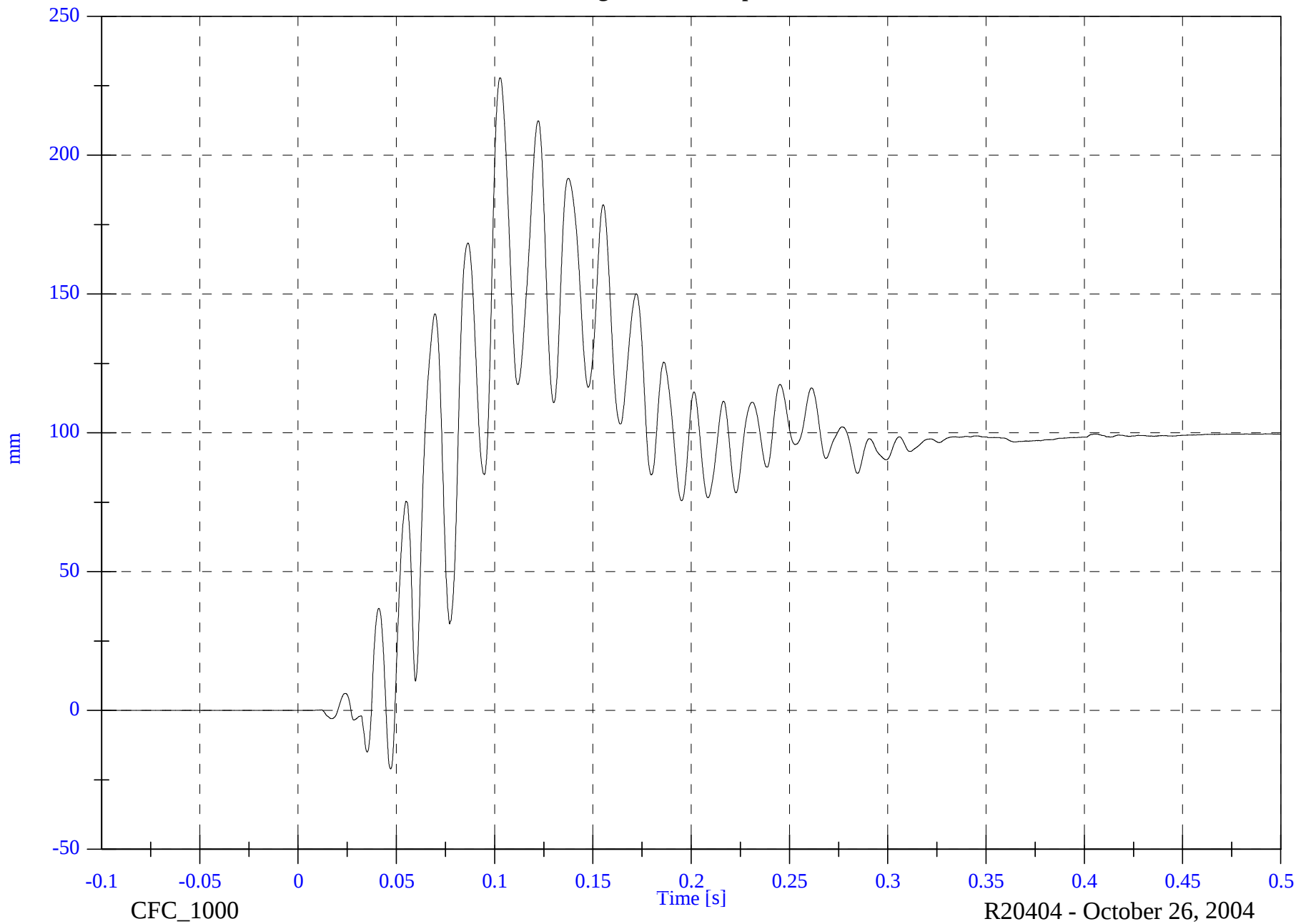


VOLPE 301 Test 2 - 2002 Jeep Liberty

P1 Right Seat X Displacement

Max: 227.9 [mm] at 0.103 [s]

Min: -21.1 [mm] at 0.047 [s]



B-132

8757-V301-02

CFC_1000

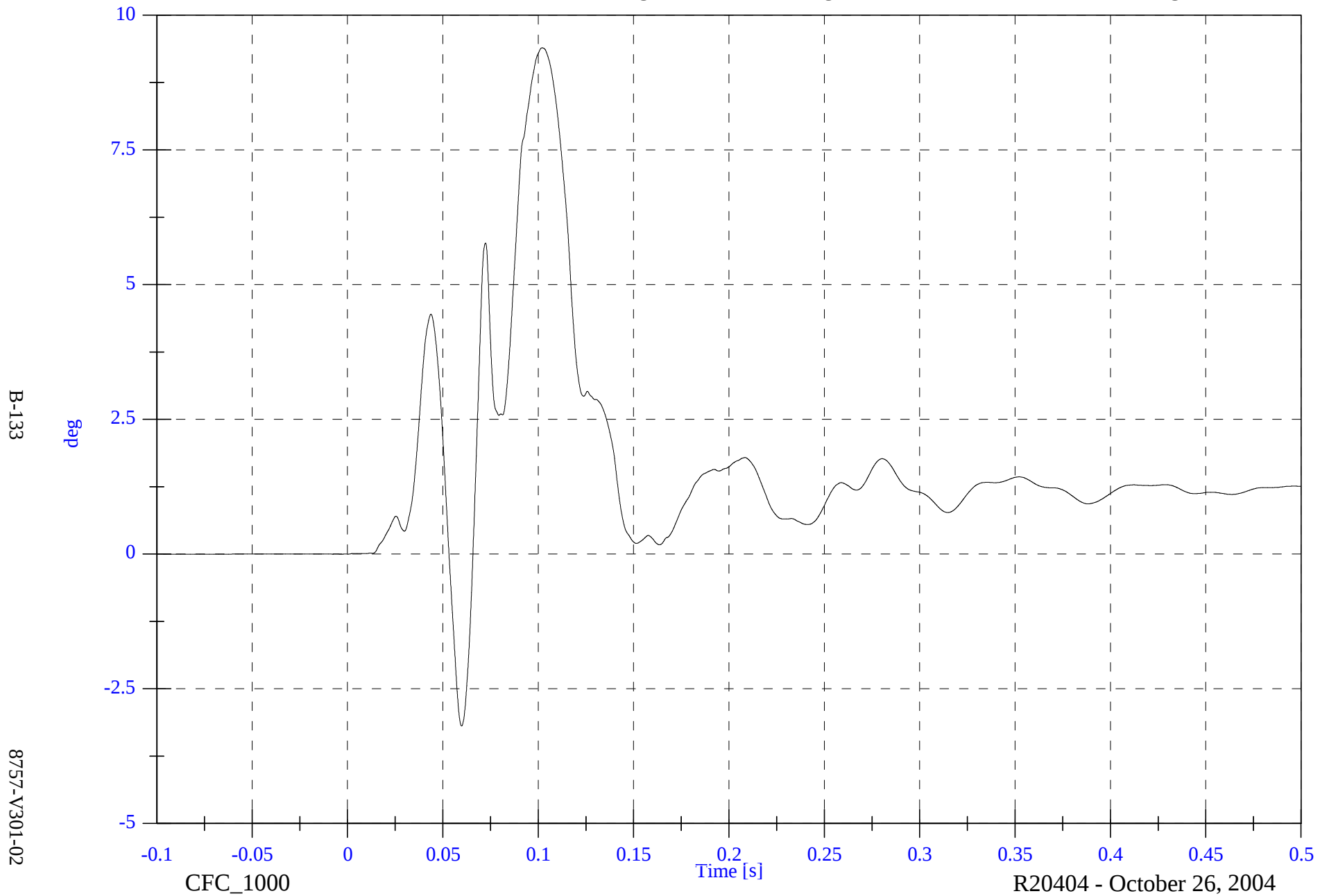
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

P3 Left Change in Seat Back Angle WRT Sill

Max: 9.4 [deg] at 0.102 [s]

Min: -3.2 [deg] at 0.060 [s]



VOLPE 301 Test 2 - 2002 Jeep Liberty

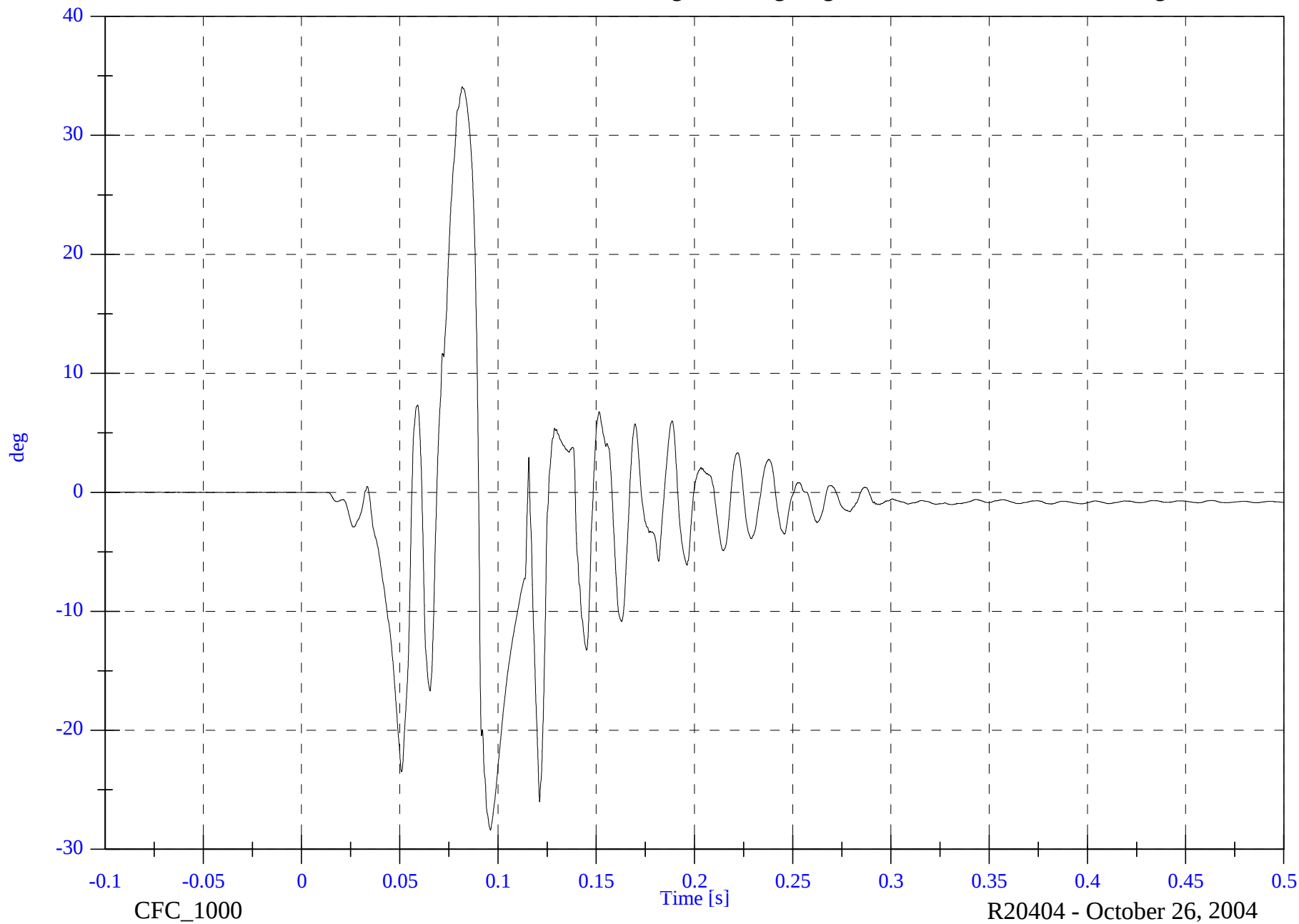
P3 Left Change in String Angle

Max: 34.1 [deg] at 0.082 [s]

Min: -28.4 [deg] at 0.096 [s]

B-134

8757-V301-02



VOLPE 301 Test 2 - 2002 Jeep Liberty

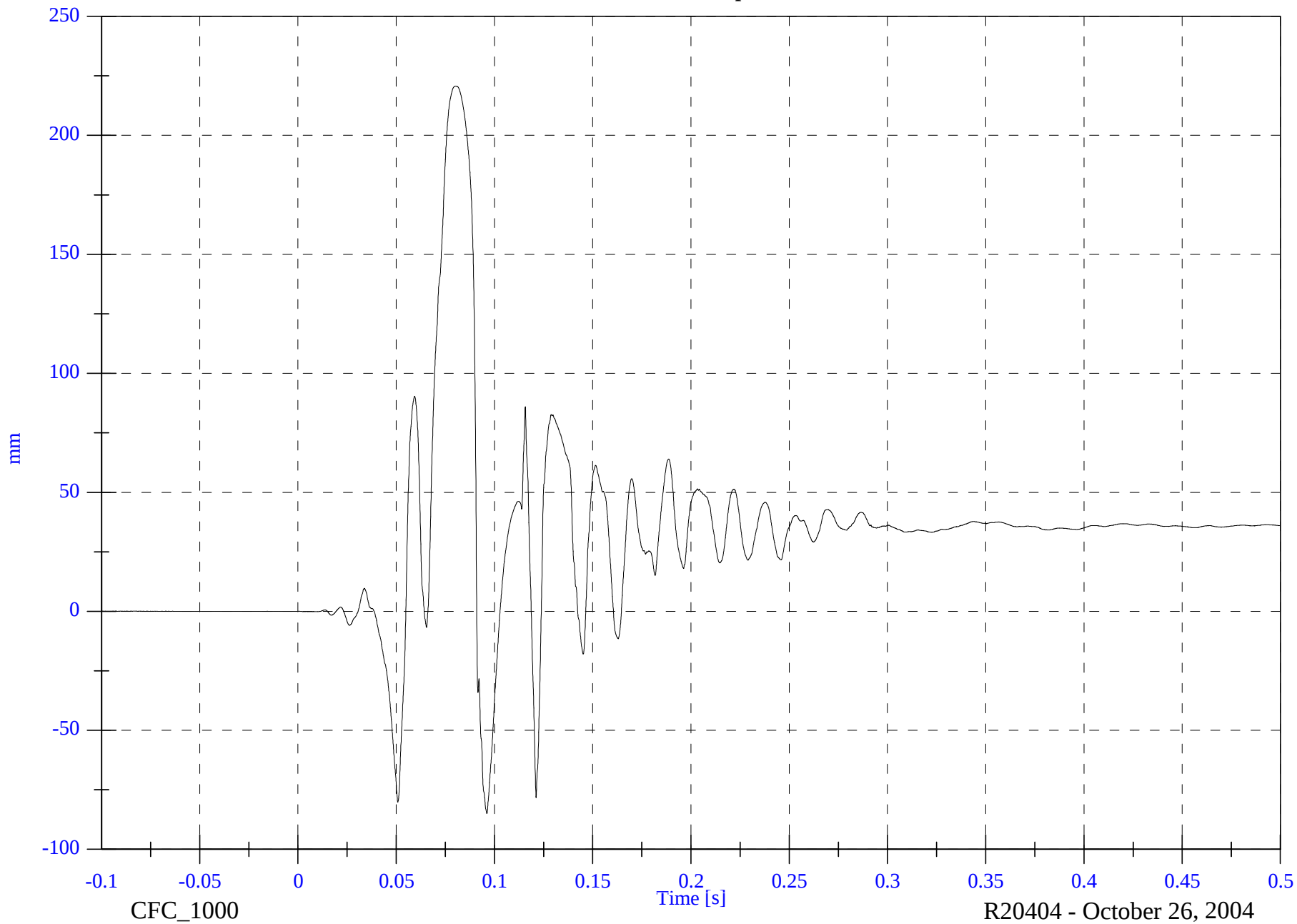
P3 Left Seat X Displacement

Max: 220.7 [mm] at 0.080 [s]

Min: -85.0 [mm] at 0.096 [s]

B-135

8757-V301-02

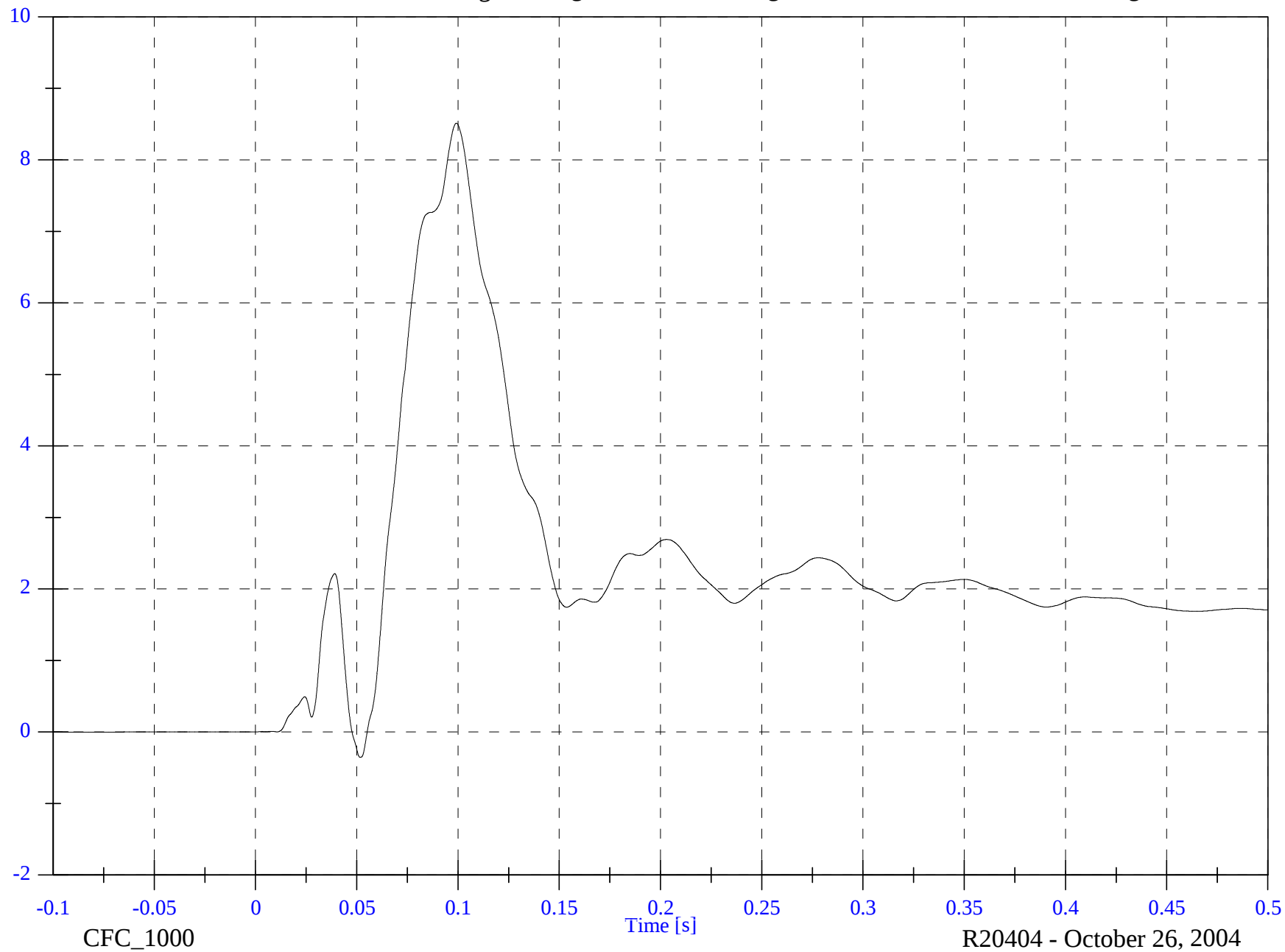


VOLPE 301 Test 2 - 2002 Jeep Liberty

P3 Right Change in Seat Back Angle WRT Sill

Max: 8.5 [deg] at 0.099 [s]

Min: -0.4 [deg] at 0.052 [s]



B-136

8757-V301-02

CFC_1000

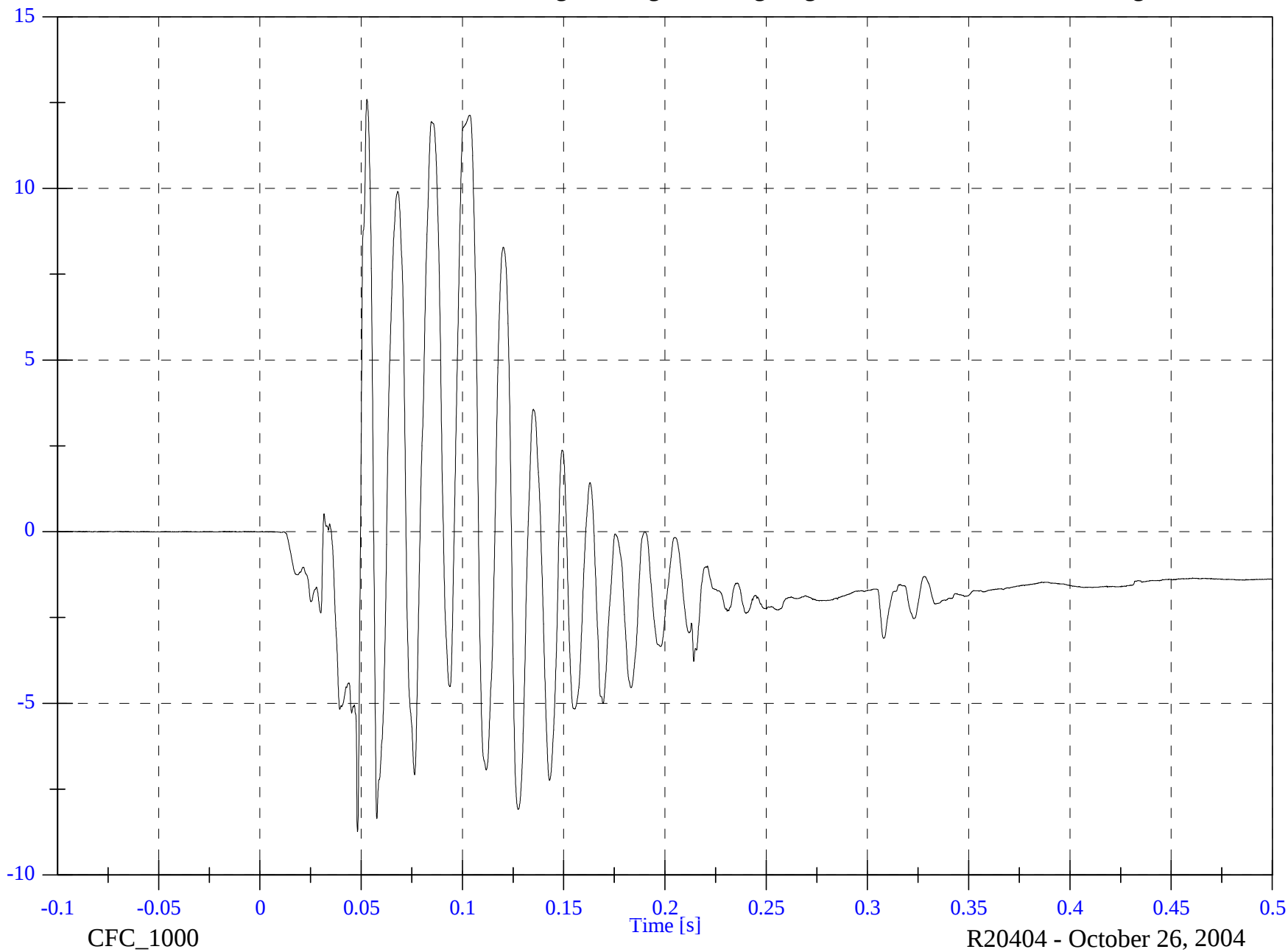
R20404 - October 26, 2004

VOLPE 301 Test 2 - 2002 Jeep Liberty

P3 Right Change in String Angle

Max: 12.6 [deg] at 0.053 [s]

Min: -8.7 [deg] at 0.048 [s]



B-137

8757-V301-02

VOLPE 301 Test 2 - 2002 Jeep Liberty

P3 Right Seat X Displacement

Max: 109.8 [mm] at 0.085 [s]

Min: -14.7 [mm] at 0.048 [s]

B-138

8757-V301-02

