

REPORT NUMBER: 301-CAL-03-02

**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**

SAAB AUTOMOBILE AB  
2003 SAAB 9-3  
4-DOOR SEDAN

NHTSA NUMBER: C30510

VERIDIAN TEST NUMBER: 8655-F301-11R

July 25, 2003

VERIDIAN ENGINEERING  
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FINAL REPORT

PREPARED FOR:

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National Highway Traffic Safety Administration  
Applied Research  
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15. Supplementary Notes			
16. Abstract <p>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:</p> <ul style="list-style-type: none"> <li>- 2 fully instrumented Hybrid III ATDs were positioned in the front seats (P1 and P2) in place of ballast ATDs.</li> <li>- 2 door mounted high speed cameras were installed.</li> <li>- 4 seatback frame and 2 front sill MHDs were installed.</li> <li>- 4 vehicle accelerometers were installed.</li> <li>- VRTC seatback translation was installed.</li> </ul> <p>The ATDs were positioned following TP208-12 with the following exceptions:</p> <ul style="list-style-type: none"> <li>- Seatbacks for positions that contained a 50<sup>th</sup> percentile male were set to 25 degrees ± 1 degree as measured with the SAE J826 manikin.</li> <li>- Seats that contained a 5<sup>th</sup> percentile female were placed in a fore-aft position that allowed for the best high speed camera occupant view. If the 5<sup>th</sup> 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).</li> <li>- Moveable head restraints for seats that contained a 5<sup>th</sup> 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.</li> </ul>			
17. Key Words Seatback Rotation and Displacement Test FMVSS 301R Rear Impact Test		18. Distribution Statement Copies of this report are available from NHTSA Technical Reference Division Room 5108 (NPO-230), 400 Seventh , S.W., Washington, D.C. 20590 Telephone No. (202) 366-4946	
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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 Saab 9-3 4-Door Sedan. 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 1732.5 kg 2003 Saab 9-3 4-Door Sedan was impacted from the rear by an 1797 kg moving barrier at a velocity of 47.3 kph (29.4 mph). The test was performed by Veridian Engineering on July 25, 2003.

The test vehicle 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 Applied Research, the test was modified as follows:

- An instrumented 50<sup>th</sup> percentile male Part 572E Hybrid III ATD was positioned in the driver seat (P1) in place of a ballast ATD.
- An instrumented 5<sup>th</sup> percentile female Part 572O Hybrid III ATD was positioned in the right front passenger seat (P2) in place of a ballast ATD.
- 2 high speed cameras were installed on the vehicle front doors.
- 4 front seatback frame MHDs and 2 front sill MHDs were 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 3-13 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 data is summarized below.

	HIC (36ms)	Nij				Head-to-Torso Rotation (deg)		Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
		Ntf	Nte	Ncf	Nce	Flexion	Extension				
<b>P1</b>	111.0	0.20	0.08	0.06	0.02	16.90	-8.00	*	2.8	988.4	1195.0
<b>P2</b>	54.2	0.08	0.13	0.12	0.16	35.40	-10.70	21.1	10.6	485.9	576.4

\* Chest Y data is not accurate

The P1 seatback frame was deformed rearward and the adjustment mechanism remained operable. The seat back reclined statically 16 degrees from its pre-test position. The P2 seatback frame was deformed rearward and the adjustment mechanism remained operable. The seat back reclined statically 1 degree from its pre-test position.



SECTION 3  
TEST DATA

DATA SHEET 1

TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Saab 9-3 4-Door Sedan  
NHTSA No.: C30510 ; Color: Gray  
Engine Data: 4 Cylinders; - CID; 2.0 Liters; - cc  
Placement: - Longitudinal or In-Line; X Transverse or Lateral  
Transmission Data: 4 Speeds; - Manual; X Automatic; X Overdrive  
Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - 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: April 11, 2003 ; Odometer Reading 217 km  
Selling Dealer: The Dorschel Saab Country  
& Address: 3317 West Henrietta Road Rochester, NY 14623

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Saab Automobile AB  
Date of Manufacture: Feb 03  
VIN: YS3FB49S431033297  
GVWR: 1950 kg; GAWR-FRONT: 1125 kg; GAWR-REAR: 1012 kg

DATA FROM VEHICLE'S TIRE LABEL:

Location of Placard on Vehicle: Driver Door  
Recommended Tire Size: P215/55R16 93 H  
\* Recommended Cold Tire Pressure: FRONT: 240 kPa; REAR: 220 kPa

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P215/55R16 93 H Manufacturer: Pirelli  
Tire Pressure with Maximum Capacity Vehicle Load: FRONT: 300 kPa; REAR: 300 kPa  
Type of Spare Tire: T125/85R16 99M

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) = 421 kg  
No. of Occupants x 68.04 kg = 340.2 kg  
Rated Cargo/Luggage Weight (RCLW) = 80.8 kg

\*Tire pressure used for test

DATA SHEET 2

VEHICLE DATA

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

Right Front	=	<u>453.5</u>	kg	Right Rear	=	<u>281.5</u>	kg
Left Front	=	<u>468.5</u>	kg.	Left Rear	=	<u>308.5</u>	kg
TOTAL FRONT	=	<u>922</u>	kg	TOTAL REAR	=	<u>590</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1512</u>	kg				
% of Total Front of Vehicle Weight	=	<u>61.0%</u>		of Total Rear Weight	=	<u>39.0%</u>	

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>1512</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>80.8</u>	kg
Weight of 2 p.572 Dummies, 74.4 kg	=	<u>148.8</u>	kg
TARGET TEST WEIGHT	=	<u>1741.6</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 71.7 KG OF CARGO WEIGHT:

Right Front	=	<u>522.0</u>	kg	Right Rear	=	<u>321.5</u>	kg
Left Front	=	<u>546.0</u>	kg	Left Rear	=	<u>343.0</u>	kg
TOTAL FRONT	=	<u>1068</u>	kg	TOTAL REAR	=	<u>664.5</u>	kg
TOTAL TEST WEIGHT	=	<u>1732.5</u>	kg				
% of Total Front of Vehicle Weight	=	<u>61.6%</u>		of Total Rear Weight	=	<u>38.4%</u>	

\* Weight of Ballast Secured in Vehicle Trunk Area = 0 kg

Type of Ballast: None

Method of Securing Ballast: Not Applicable

Vehicle Components Removed for Weight Reduction: Vehicle battery

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>694</u>	LF	<u>686</u>	RR	<u>687</u>	LR	<u>683</u>
AS TESTED:	RF	<u>670</u>	LF	<u>660</u>	RR	<u>678</u>	LR	<u>674</u>
Vehicle's Wheel Base:		<u>2675</u>	mm					
Location of Vehicle's C.G.:		<u>1026</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 25, 2003 Time: 13:17 Temperature: 25.5 °C  
Vehicle NHTSA No.: C30510 VIN: YS3FB49S431033297  
Required Impact Velocity Range: 46.51 to 48.12 kph

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

Trap No. 1 = 47.3 kph; Trap No. 2 = 47.3 kph  
Average Impact Speed = 47.3 kph

VEHICLE STATIC CRUSH:

Vehicle Length:

Pre-Test Left = 4520 ; C/L = 4630 Right = 4520  
Post-Test Left = 4285 ; C/L = 4390 Right = 4285  
Crush Left = 235 ; C/L = 240 Right = 235  
AVERAGE = 237 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:

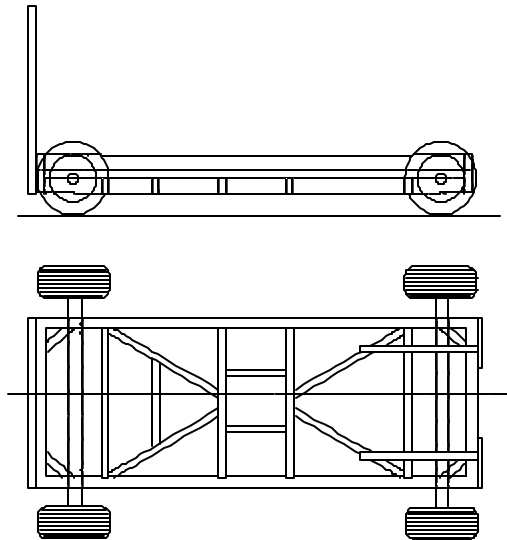
Barrier Face Height: 1524 mm  
Barrier Face Width: 1981 mm  
Barrier Face Ground Clearance: 127 mm  
Tread Width: 1511 mm  
Wheel Base: 3048 mm  
Location of C.G.: X: 1344 mm rearward of front wheel center.  
Y: 0 mm from longitudinal-vertical plane of symmetry.  
Z: 414 mm above ground.

MOVING BARRIER TIRES:

Manufacturer: Classic  
Model: Poly IV  
Size: 215/75D15  
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>-</u>	<u>X</u>		
Vertical Adjustment:	<u>X</u>	<u>-</u>	80 mm total travel	
Vertical Locks:	<u>X</u>	<u>-</u>	8 locks	
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>X</u>	<u>-</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>X</u>	<u>-</u>		
LUMBAR ADJUSTMENT	YES	NO		DETAILS
Fixed:	<u>-</u>	<u>X</u>		
Adjustable:	<u>X</u>	<u>-</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>X</u>	<u>-</u>	Travel: <u>240</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>-</u>	<u>X</u>		
Power:	<u>X</u>	<u>-</u>	70 mm Vertical Travel	
Manual-Detents	<u>-</u>	<u>X</u>		
Manual-Infinite	<u>-</u>	<u>X</u>		
SEAT TEST POSITION				
Seat Cushion Fore-aft:	<u>Mid-position (120 mm)</u>			
Seat Cushion Vertical:	<u>Mid-Height at angle (120 mm from reference)</u>			
Seat Back:	<u>25 degree torso angle as set with the H-point machine</u>			
Head Restraint:	<u>Full up</u>			

DATA SHEET 4 (continued)

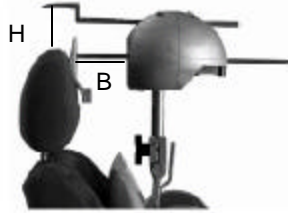
SEAT DATA

P2 DATA:

HEAD RESTRAINT	YES	NO		DETAILS
Fixed:	<u>-</u>	<u>X</u>		
Vertical Adjustment:	<u>X</u>	<u>-</u>	80 mm total travel	
Vertical Locks:	<u>X</u>	<u>-</u>	8 locks	
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>-</u>	<u>X</u>		
Lever (infinite)	<u>-</u>	<u>X</u>		
Lever (ratchet)	<u>-</u>	<u>X</u>		
Rotary Knob:	<u>X</u>	<u>-</u>		
Pivot locks on Both Sides:	<u>X</u>	<u>-</u>		
LUMBAR ADJUSTMENT	YES	NO		DETAILS
Fixed:	<u>-</u>	<u>X</u>		
Adjustable:	<u>-</u>	<u>X</u>		
BOLSTER ADJUSTMENT	YES	NO		DETAILS
Fixed:	<u>-</u>	<u>X</u>		
Adjustable:	<u>-</u>	<u>X</u>		
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>20</u>	Travel: <u>200</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>One detent rear of mid-position</u>			
Seat Cushion Vertical:	<u>Not Applicable</u>			
Seat Back:	<u>22 degree torso angle as set with the Part 572O ATD and measured with the H-point machine</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)
Full Up / Fixed:	26	-6	25	839
Full Down / Fixed:	21	86	25	751

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:	26	-6	25	839

Head restraint positioning details: \_\_\_\_\_ None \_\_\_\_\_

P2 DATA:

ICBC MEASUREMENTS

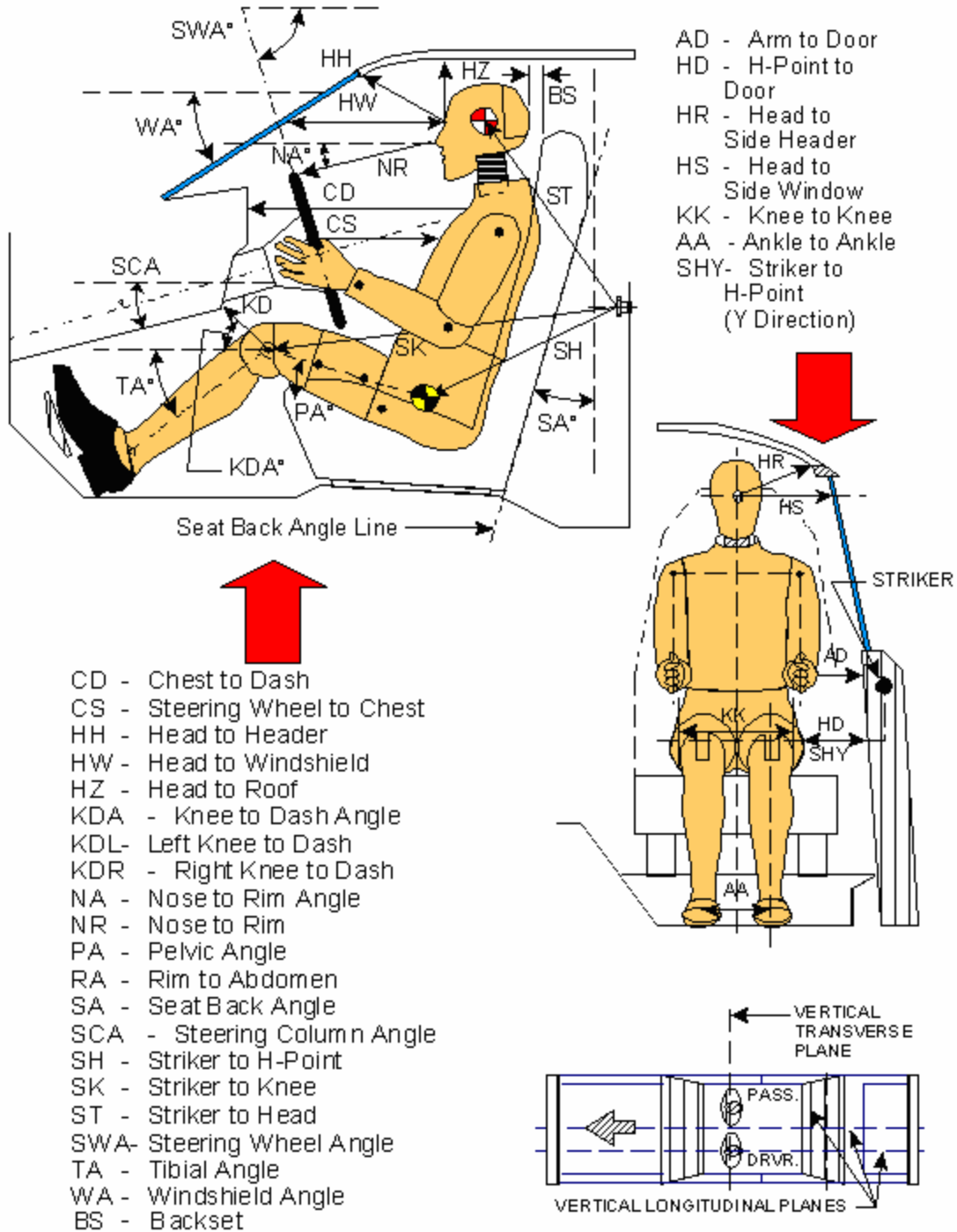
HEAD RESTRAINT POSITION (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line From Pivot (mm)
Full Up / Fixed:	28	0	25	829
Full Down / Fixed:	22	80	25	753

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)
Closest to but not < 750 mm / Fixed:	20	80	22	750

Head restraint positioning details: \_\_\_\_\_ Head restraint was placed full-down \_\_\_\_\_

DUMMY MEASUREMENTS

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



DATA SHEET 6 (continued)

DUMMY MEASUREMENTS

	DRIVER (Serial #206)			PASS. (Serial #505)		
WA <sup>o</sup>	29.0 deg.			N/A		
SWA <sup>o</sup>	66.4 deg.			N/A		
SCA <sup>o</sup>	23.6 deg.			N/A		
SA <sup>o</sup>	16.3 deg.			14.9 deg.		
HZ	189			314		
HH	418			452		
HW	680			788		
HR	208			262		
NR	434	Angle	-7 deg.	N/A		
CD	572			536		
CS	338			N/A		
RA	246			N/A		
KDL	196	Angle (KDA)	35 deg.	218		
KDR	200			228	Angle (KDA)	28 deg.
PA <sup>o</sup>	23.8 deg.			19.8 deg.		
TA <sup>o</sup>	29.6 deg.			40.7 deg.		
KK	307			222		
AA	300			233		
ST	500	Angle	92 deg.	432	Angle	3 deg.
SK	555	Angle	98 deg.	497	Angle	101 deg.
SH	240	Angle	138 deg.	210	Angle	126 deg.
SHY	244			300		
HS	305			335		
HD	160			214		
AD	104			158		
BS	28			22		

Dimensions in millimeters

DATA SHEET 7

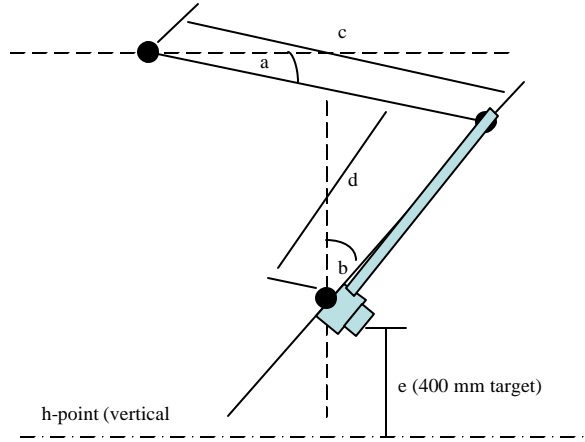
VEHICLE AND SEAT INSTRUMENTATION MEASUREMENTS

VEHICLE INSTRUMENTATION					
LOCATION	TRANSDUCER TYPE	DIRECTION OF MEASURE	PRE-TEST DIMENSIONS (mm) *		
			X	Y	Z
Left Rear Seat Cross Member	Accelerometer	X	1961	-620	-335
Left Rear Seat Cross Member Redundant	Accelerometer	X	1961	-620	-335
Right Rear Seat Cross Member Redundant	Accelerometer	X	1958	-627	-335
Right Rear Seat Cross Member	Accelerometer	X	1958	-627	-335
Left Front Sill	MHD ARS-06	About Y	2877	-708	-341
Right Front Sill	MHD ARS-01	About Y	2880	711	-341

\* 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



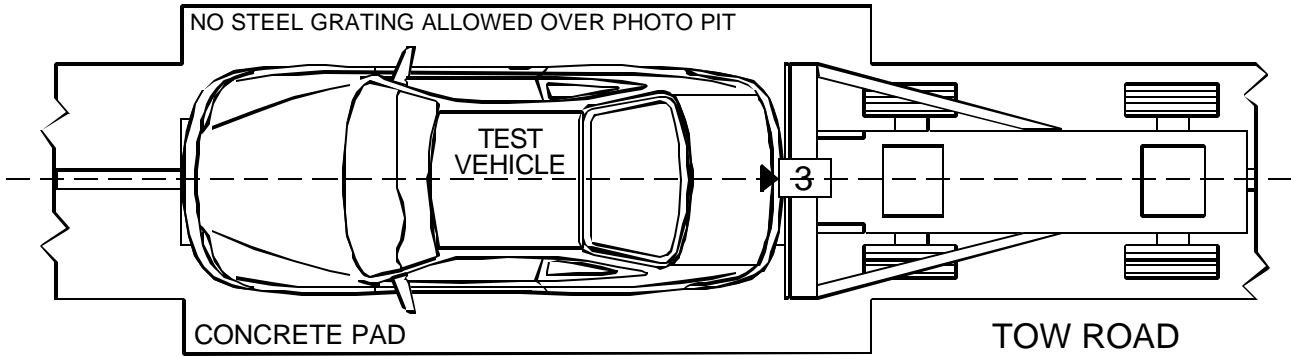
DIMENSION	P1 LEFT	P1 RIGHT	P2 LEFT	P2 RIGHT
a (deg from horiz.)	8	9	5	7
b (deg from vertical)	23	24	23	18
c (mm)	690	669	664	639
d (mm)	368	370	370	375
e (mm, target=400)	260	265	275	280

SEATBACK ANGLE	P1		P2	
	PRE (deg)	POST (deg)	PRE (deg)	POST (deg)
Left MDH Bracket	24	40	25	25
Right MHD Bracket	24	42	20	20
Front Sill	0	-2	0	-1

<b>POST TEST DETAILS</b>
Seatback Deformation: None
Seat/Floor Attachment Point Deformation: None
Recliner Mechanism Deformation: None
Comments: Both the driver and right front passenger seats were operable after the event.

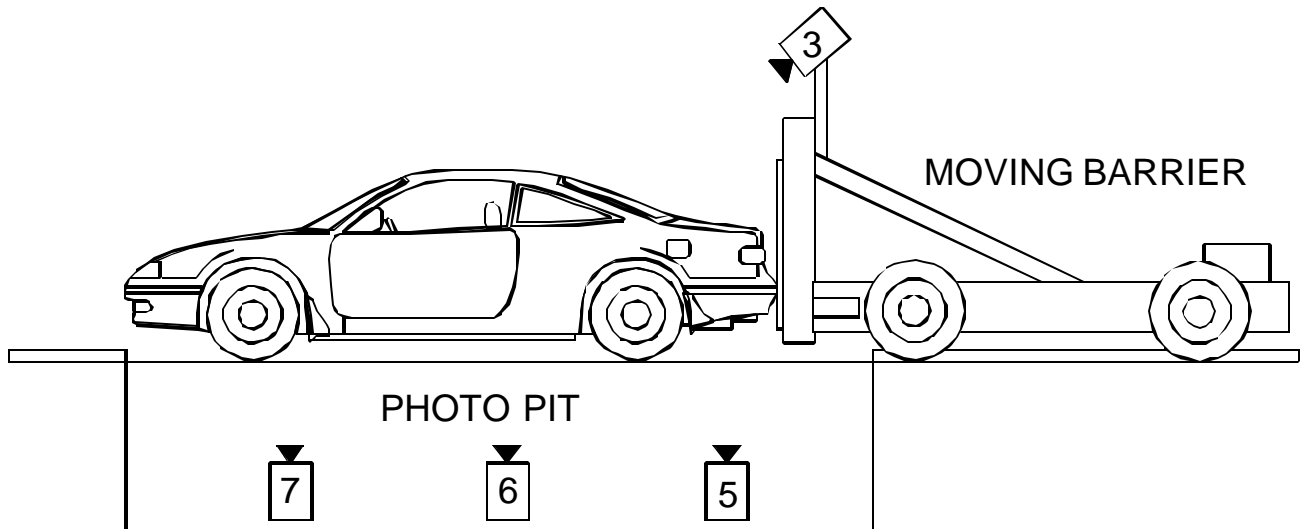
CAMERA POSITIONS FOR REAR IMPACTS

REAL TIME CAMERA → [2] [4]



1

TOP VIEW



LEFT SIDE VIEW

DATA SHEET 8

**CAMERA POSITIONS FOR REAR IMPACTS**

NHTSA No. : C30510

Vehicle : 2003 Saab 9-3 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	17323	1958	1138	0	35	1000
3	Left Side View	16459	1222	1300	0	35	1000
4	Vehicle Front Underbody View	0	2600	-1956	90	13	1000
5	Vehicle Mid-Section Underbody View	0	1825	-1956	90	13	1030
6	Vehicle Rear Underbody View	0	755	-1956	90	13	1005
7	Moving Barrier View	0	0	2515	-105	7.5	1000
8	Overhead Overall View	-508	0	9804	-90	13	1005
9†	Onboard Driver View	-	-	-	-	8	1000
10†	Onboard Passenger View	-	-	-	-	8	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.

Appendix A  
PHOTOGRAPHS

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PHOTOGRAPH IS NOT AVAILABLE

Figure A-1 DRIVER SEAT ICBC VIEW

PHOTOGRAPH IS NOT AVAILABLE

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8655-F301-11R

Figure A-2 PASSENGER SEAT ICBC VIEW



Figure A-3 PRE-TEST DRIVER BACKSET VIEW



Figure A-4 PRE-TEST PASSENGER BACKSET VIEW



Figure A-5 PRE-TEST DRIVER SEAT VIEW



Figure A-6 POST-TEST DRIVER SEAT VIEW



Figure A-7 PRE-TEST PASSENGER SEAT VIEW



Figure A-8 POST-TEST PASSENGER SEAT VIEW



Figure A-9 PRE-TEST DRIVER SIDE VIEW



Figure A-10 POST-TEST DRIVER SIDE VIEW

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8655-F301-11R



Figure A-11 PRE-TEST PASSENGER SIDE VIEW



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8655-F301-11R

Figure A-12 POST-TEST PASSENGER SIDE VIEW



Figure A-13 PRE-TEST DRIVER ISOMETRICAL VIEW



Figure A-14 POST-TEST DRIVER ISOMETRICAL VIEW



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8655-F301-11R

Figure A-15 PRE-TEST PASSENGER ISOMETRICAL VIEW



Figure A-16 POST-TEST PASSENGER ISOMETRICAL VIEW

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

## DATA CHANNEL FILTER CLASS SUMMARY

<b>DATA TYPE</b>	<b>SAE FILTER CLASS (Hz)</b>
Dummy Head Accelerations	1000
Dummy Head Angular Accelerations	1000
Dummy Neck Forces	1000
Dummy Neck Moments	600
Dummy Neck Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	60
Dummy Chest Angular Accelerations	1000
Dummy Femur Forces	600
Dummy Belt Displacements	180
Dummy Belt Loads	60
Seat Angular Accelerations	1000
Vehicle Angular Accelerations	1000
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle Displacement Integrations	180
VRTC Seat Device Components	1000

All reported data is in the SAE coordinate system.

FACILITY: VERF

DATE: July 25, 2003

TEST#: 42057-1002-2077

TITLE: 2003 FMVSS 301 Test 2 2003 Saab 9-3 C30510

Version 5.00

=====

P1 HIC(36 ms): 111.0

t1: 98.7 msec

t2: 134.7 msec

Duration: 36.0 msec

Average Acceleration: 24.9 g

Input channels: V2P1 Head x (2) CFC\_1000

V2P1 Head y (3) CFC\_1000

V2P1 Head z (4) CFC\_1000

P1 UP NECK Fx: Max: 238.4 N 121.7 msec

Min: -190.1 N 308.8 msec

Input channel: V2P1 Upper Neck Fx (6) CFC\_1000

P1 UP NECK Fz: Max: 948.2 N 110.0 msec

Min: -176.8 N 147.0 msec

Input channel: V2P1 Upper Neck Fz (8) CFC\_1000

P1 UP NECK Mocy (50th Male)

Max: 35.7 N-m 124.1 msec

Min: -8.5 N-m 184.1 msec

Input channels: V2P1 Upper Neck Fx (6) CFC\_600

V2P1 Upper Neck My (10) CFC\_600

Docy: 0.01778

P1 UP NECK Nij (50th Male)

Ntf: 0.20 Nij 116.4 msec CVt: 6806; CVf: 310

Nte: 0.08 Nij 184.0 msec CVt: 6806; CVE: 135

Ncf: 0.06 Nij 147.0 msec CVc: 6160; CVf: 310

Nce: 0.02 Nij 59.6 msec CVc: 6160; CVE: 135

Input channels: V2P1 Upper Neck Fz (8) CFC\_600

V2P1 Upper Neck Mocy [N-m, CFC\_600] (79)

P1 CLIP(3 ms): 65.2 g

t1: 198.1 msec

t2: 201.1 msec

Duration: 3.0 msec

P1 CSI: 1087.2

Input channels: V2P1 Chest x (19) CFC\_180

V2P1 Chest y (20) CFC\_180

V2P1 Chest z (21) CFC\_180

P1 CHEST DISP: Max: 1.6 mm 90.4 msec

Min: -2.8 mm 315.0 msec

Input channel: V2P1 Chest Displacement (22) CFC\_600

P1 LEFT FEMUR: Max: 162.6 N 113.8 msec

Min: -988.4 N 135.9 msec

Input channel: V2P1 Left Femur (27) CFC\_600

P1 RIGHT FEMUR: Max: 60.8 N 439.9 msec

Min: -1195.0 N 120.6 msec

Input channel: V2P1 Right Femur (28) CFC\_600

```

=====
P2 HIC(36 ms): 54.2
  t1: 78.2 msec
  t2: 114.2 msec
  Duration: 36.0 msec
  Average Acceleration: 18.7 g
  Input channels: V2P2 Head Ax (30) CFC_1000
                  V2P2 Head Ay (31) CFC_1000
                  V2P2 Head Az (32) CFC_1000

P2 UP NECK Fx:  Max:    40.0 N  45.2 msec
                Min:   -289.5 N  78.7 msec
  Input channel: V2P2 Upper Neck Fx (34) CFC_1000

P2 UP NECK Fz:  Max:    181.6 N 178.6 msec
                Min:   -455.0 N  81.6 msec
  Input channel: V2P2 Upper Neck Fz (36) CFC_1000

P2 UP NECK Mocy (5th Female)
                Max:    16.3 N-m 260.6 msec
                Min:    -9.0 N-m  98.0 msec
  Input channels: V2P2 Upper Neck Fx (34) CFC_600
                  V2P2 Upper Neck My (38) CFC_600
  Docy: 0.01778

P2 UP NECK Nij (5th Female)
  Ntf: 0.08 Nij 280.6 msec  CVt: 4287; CVf: 155
  Nte: 0.13 Nij 186.3 msec  CVt: 4287; CVE: 67
  Ncf: 0.12 Nij 247.5 msec  CVc: 3880; CVf: 155
  Nce: 0.16 Nij 95.4 msec   CVc: 3880; CVE: 67
  Input channels: V2P2 Upper Neck Fz (36) CFC_600
                  V2P2 Upper Neck Mocy [N-m, CFC_600] (85)

P2 CLIP(3 ms): 21.1 g
  t1: 76.4 msec

  t2: 79.4 msec
  Duration: 3.0 msec

P2 CSI: 77.0
  Input channels: V2P2 Chest Ax (47) CFC_180
                  V2P2 Chest Ay (48) CFC_180
                  V2P2 Chest Az (49) CFC_180

P2 CHEST DISP:  Max:    1.6 mm  97.2 msec
                Min:   -10.6 mm 191.9 msec
  Input channel: V2P2 Chest Displacement (50) CFC_600

P2 LEFT FEMUR:  Max:    216.7 N 185.0 msec
                Min:   -485.9 N  60.1 msec
  Input channel: V2P2 Left Femur (55) CFC_600

P2 RIGHT FEMUR: Max:    203.4 N 173.4 msec
                Min:   -576.4 N  62.1 msec
  Input channel: V2P2 Right Femur (56) CFC_600
=====

```

NAME	Unit	Max	msec	Min	msec	Comment
V2P1 Head x	g	32.7	121.5	-4.9	318.3	
V2P1 Head y	g	3.6	136.5	-2.2	83.5	
V2P1 Head z	g	11.1	103.2	-3.8	143.3	
V2P1 Head Resultant	g	32.7	121.5	0.0	-46.9	
V2P1 Head y Displacement	deg	36.6	116.1	-34.7	333.6	f2=0.287 Hz; f4=0.001 Hz
V2P1 Upper Neck Fx	N	238.4	121.7	-190.1	308.8	
V2P1 Upper Neck Fy	N	51.6	168.9	-45.1	118.6	
V2P1 Upper Neck Fz	N	948.2	110.0	-176.8	147	
V2P1 Upper Neck F Resultant	N	949.3	110.0	0.2	-51.2	
V2P1 Upper Neck Mx	N-m	2.9	153.5	-2.1	110	
V2P1 Upper Neck My	N-m	39.7	123.9	-9.1	184	
V2P1 Upper Neck Mz	N-m	7.2	145.9	-3.1	90.6	
V2P1 Upper Neck M Resultant	N-m	40.0	124	0.0	-93.1	
V2P1 Lower Neck Fx	N	495.4	121.8	-164.7	71.7	
V2P1 Lower Neck Fy	N	81.9	139.3	-37.3	225.4	
V2P1 Lower Neck Fz	N	930.6	110.0	-175.5	482.9	
V2P1 Lower Neck F Resultant	N	998.3	110.2	0.2	-11.4	
V2P1 Lower Neck Mx	N-m	16.6	140.8	-6.8	225.5	
V2P1 Lower Neck My	N-m	36.2	144.3	-83.5	115.4	
V2P1 Lower Neck Mz	N-m	13.7	140.7	-10.9	85.9	
V2P1 Lower Neck M Resultant	N-m	83.6	115.4	0.0	-67.8	
V2P1 Lower Neck x	g	18.9	88.7	-3.2	314	
V2P1 Chest x	g	16.6	86.6	-2.4	313.7	
V2P1 Chest y	g	35.6	41.1	-68.0	199.3	Data is not accurate
V2P1 Chest z	g	6.8	73.1	-2.9	480.3	
V2P1 Chest Resultant	g	68.0	199.3	0.0	-90.4	Data is not accurate
V2P1 Chest Displacement	mm	1.6	90.4	-2.8	315	
V2P1 Chest y Displacement	deg	33.9	132.5	-17.8	334.4	f2=0.296 Hz; f4=0.001 Hz
V2P1 Pelvic x	g	24.0	67.7	-8.1	134.3	
V2P1 Pelvic y	g	1.3	54.8	-2.1	89.2	
V2P1 Pelvic z	g	8.5	69.8	-3.5	117.3	
V2P1 Pelvic Resultant	g	25.4	67.8	0.0	-34.3	
V2P1 Left Femur	N	162.6	113.8	-988.4	135.9	
V2P1 Right Femur	N	60.8	439.9	-1195	120.6	
V2P1 Head to Chest	deg	16.9	332.7	-8.0	208.4	
V2P1 Lap Belt	N	231.1	317.5	-53.3	77.2	
V2P2 Head Ax	g	27.5	51.7	-7.4	257.7	
V2P2 Head Ay	g	2.6	79.2	-5.8	108.3	
V2P2 Head Az	g	5.4	180.5	-5.7	84	
V2P2 Head A Resultant	g	27.5	51.7	0.0	-90.3	
V2P2 Head y Displacement	deg	21.4	418.4	-38.1	260.2	f2=0.292 Hz; f4=0.001 Hz
V2P2 Upper Neck Fx	N	40.0	45.2	-289.5	78.7	
V2P2 Upper Neck Fy	N	56.7	252	-69.4	106.1	
V2P2 Upper Neck Fz	N	181.6	178.6	-455	81.6	
V2P2 Upper Neck F Resultant	N	538.6	81.6	0.1	-76.9	
V2P2 Upper Neck Mx	N-m	6.9	100.0	-2.7	199.9	
V2P2 Upper Neck My	N-m	13.0	260.7	-13.4	97.7	

NAME	Unit	Max	msec	Min	msec	Comment
V2P2 Upper Neck Mz	N-m	2.1	164.9	-3.2	109.1	
V2P2 Upper Neck M Resultant	N-m	15.1	97.9	0.0	-13.9	
V2P2 Lower Neck Fx	N	143.1	47.7	-207.4	71.7	
V2P2 Lower Neck Fy	N	51.0	241.2	-135.2	102.1	
V2P2 Lower Neck Fz	N	308.5	178.2	-518.6	81.8	
V2P2 Lower Neck F Resultant	N	530.8	81.8	0.1	-41.2	
V2P2 Lower Neck Mx	N-m	12.2	257.7	-11.8	104.8	
V2P2 Lower Neck My	N-m	56.6	251.7	-17	360.3	
V2P2 Lower Neck Mz	N-m	4.0	263.6	-12.1	98.7	
V2P2 Lower Neck M Resultant	N-m	57.9	252.1	0.0	-62.2	
V2P2 Lower Neck x	g	24.8	82.8	-8.9	184	
V2P2 Chest Ax	g	21.0	83.2	-7.9	180.8	
V2P2 Chest Ay	g	1.4	171.3	-2.9	84.3	
V2P2 Chest Az	g	8.6	72	-3.2	226.3	
V2P2 Chest A Resultant	g	22.2	77.8	0.0	-13.8	
V2P2 Chest Displacement	mm	1.6	97.2	-10.6	191.9	
V2P2 Chest y Displacement	deg	17.8	464.7	-3.1	248.6	f2=0.298 Hz; f4=0.001 Hz
V2P2 Pelvic Ax	g	0.0	-100.0	0.0	100.0	Did Not Record
V2P2 Pelvic Ay	g	2.7	91.3	-3.1	71.5	
V2P2 Pelvic Az	g	25.1	465.4	-764.9	465.9	Did not record
V2P2 Pelvic A Resultant	g	764.9	465.9	0.0	-60.5	Meaningless Data
V2P2 Left Femur	N	216.7	185.0	-485.9	60.1	
V2P2 Right Femur	N	203.4	173.4	-576.4	62.1	
V2P2 Head to Chest	deg	35.4	262.8	-10.7	378.9	
V2P2 Lap Belt	N	1853.1	164.3	-16.6	468.1	
V2 Left Front Sill Rotation Comp A Vy	deg/s	41.9	18.9	-44.1	45.4	f2=0.308 Hz; f4=0.001 Hz
V2 Left Front Sill Rotation ADy	deg	0.1	23.7	-2.6	276.0	f2=0.308 Hz; f4=0.001 Hz
V2 P1 Left Seat Rotation Comp A Vy	deg/s	680.8	94.5	-352.4	155.2	f2=0.283 Hz; f4=0.001 Hz
V2 P1 Left Seat Rotation Comp ADy	deg	29.5	124.1	-0.3	21.3	f2=0.283 Hz; f4=0.001 Hz
V2 P1 Right Seat Rotation Comp ADy	deg/s	711.0	105.1	-293.3	158.8	f2=0.283 Hz; f4=0.001 Hz
V2 P1 Right Seat Rotation Comp ADy	deg	30.0	118.3	-0.7	55.2	f2=0.283 Hz; f4=0.001 Hz
V2 P2 Left Seat Rotation Comp A Vy	deg/s	385.9	65.4	-348.1	119.9	f2=0.294 Hz; f4=0.001 Hz
V2 P2 Left Seat Rotation Comp ADy	deg	13.5	96.9	-5.0	177.1	f2=0.294 Hz; f4=0.001 Hz
V2 P2 Right Seat Rotation Comp A Vy	deg/s	355.5	81.4	-384.3	119.9	f2=0.3 Hz; f4=0.001 Hz
V2 P2 Right Seat Rotation Comp ADy	deg	14.6	99.4	-4.2	179.1	f2=0.3 Hz; f4=0.001 Hz
V2 Left X Member x	g	16.9	6.8	-2.0	96.9	
V2 Left X Member RED x	g	16.8	6.8	-2.1	96.5	
V2 Right X Member x	g	19.4	8.0	-1.7	21.4	
V2 Right X Member RED x	g	19.1	7.9	-1.5	21.2	
V2 P1 Left Link Rotation y	deg	28.6	113.8	-3.8	51.1	
V2 P1 Right Link Rotation y	deg	12.2	225.3	-6.4	143.2	
V2 P1 Left Span Bar Displacement	mm	345	122.2	-0.1	-18.1	
V2 P1 Right Span Bar Displacement	mm	324.2	119.9	-0.1	-18.1	
V2 P2 Left Link Rotation y	deg	13.1	101.2	-6.2	169.9	
V2 P2 Right Link Rotation y	deg	18.9	106.2	-14.3	143.7	
V2 P2 Left Span Bar Displacement	mm	31.5	67.2	-367.6	66.6	Data is Not Accurate
V2 P2 Right Span Bar Displacement	mm	187.8	95.6	-0.1	-18.1	
P1 Left change in string angle	deg	9.2	250.2	-19.2	121.6	

<b>NAME</b>	<b>Unit</b>	<b>Max</b>	<b>msec</b>	<b>Min</b>	<b>msec</b>	<b>Comment</b>
P1 Left Seat Displacement	mm	338.1	126.9	47.3	-18.1	
P1 Right change in string angle	deg	4.6	226.2	-34.8	114.2	
P1 Right Seat Displacement	mm	307.3	120.7	45.4	-18.1	
P2 Left change in string angle	deg	6.9	177.7	-10.4	109.7	
P2 Left Seat Displacement	mm	114.0	67.2	-248.3	66.6	Data is not accurate
P2 Right change in string angle	deg	7.2	134.9	-17.0	114.4	
P2 Right Seat Displacement	mm	199.3	94.9	37.6	-18.1	

**Table of Data Plots**

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**Table of Data Plots (Continued)**

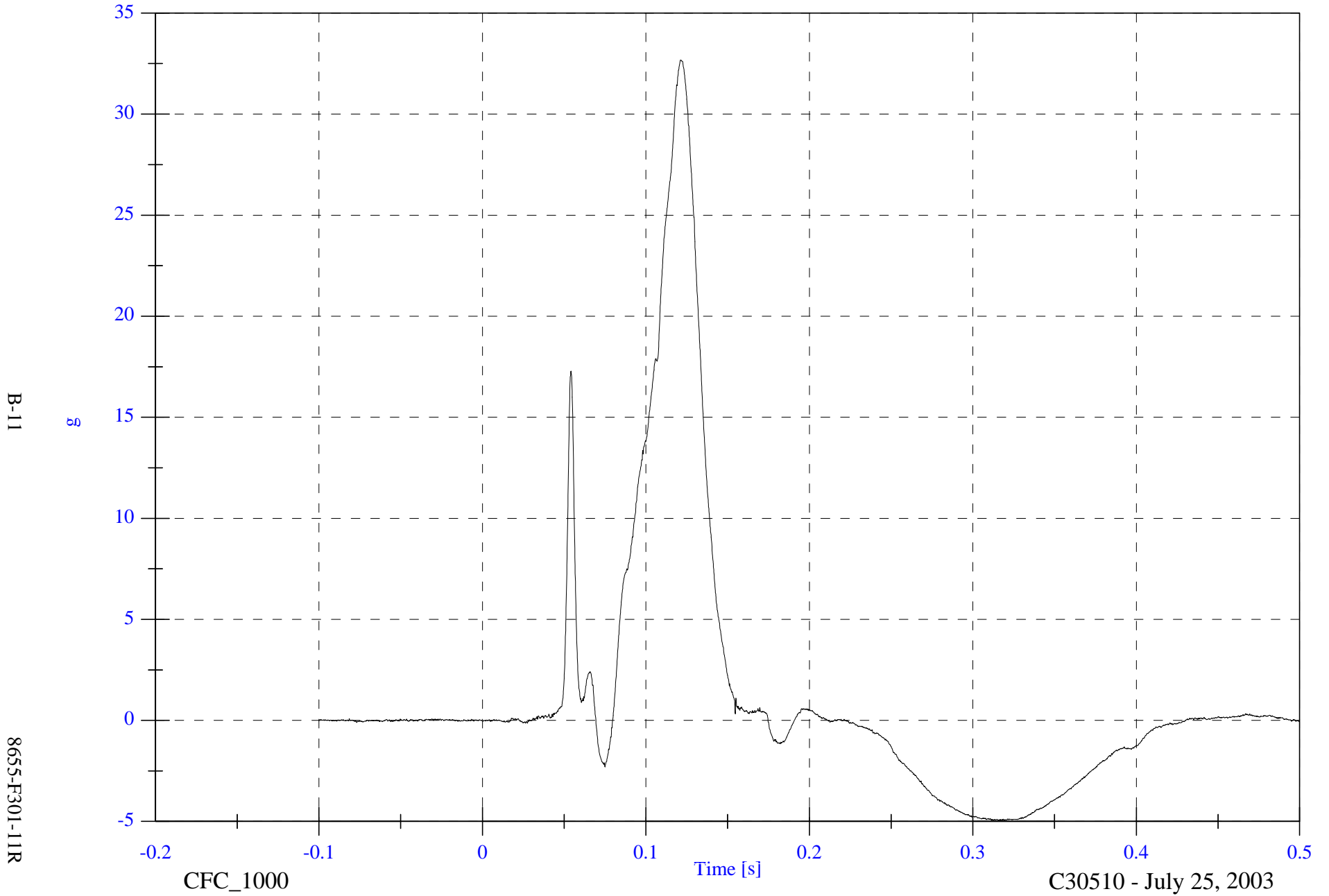
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2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Head x

Max: 32.7 [g] at 0.121 [s]

Min: -4.9 [g] at 0.318 [s]



B-11

8655-F301-11R

CFC\_1000

Time [s]

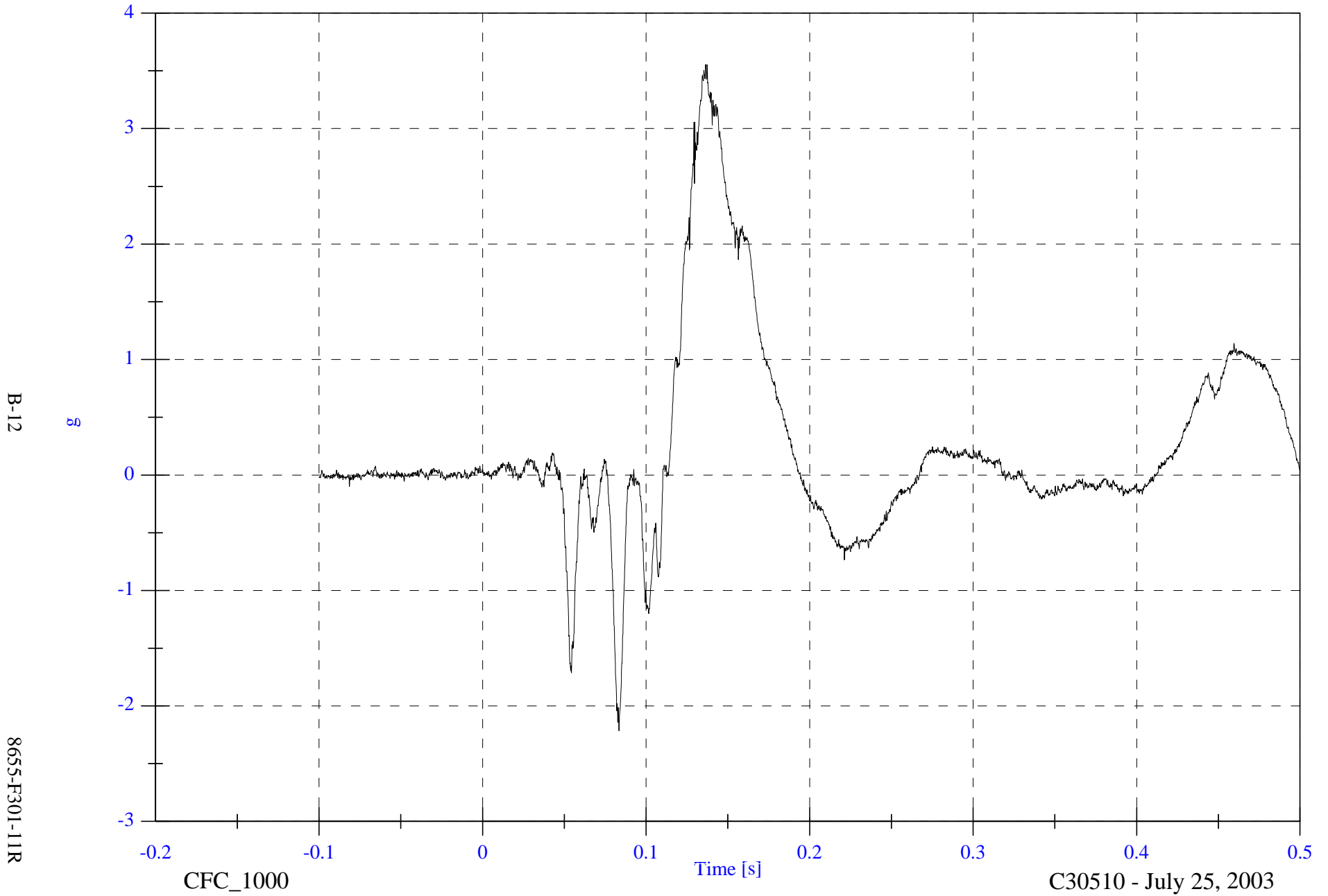
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 3.6 [g] at 0.137 [s]

Min: -2.2 [g] at 0.083 [s]

V2P1 Head y

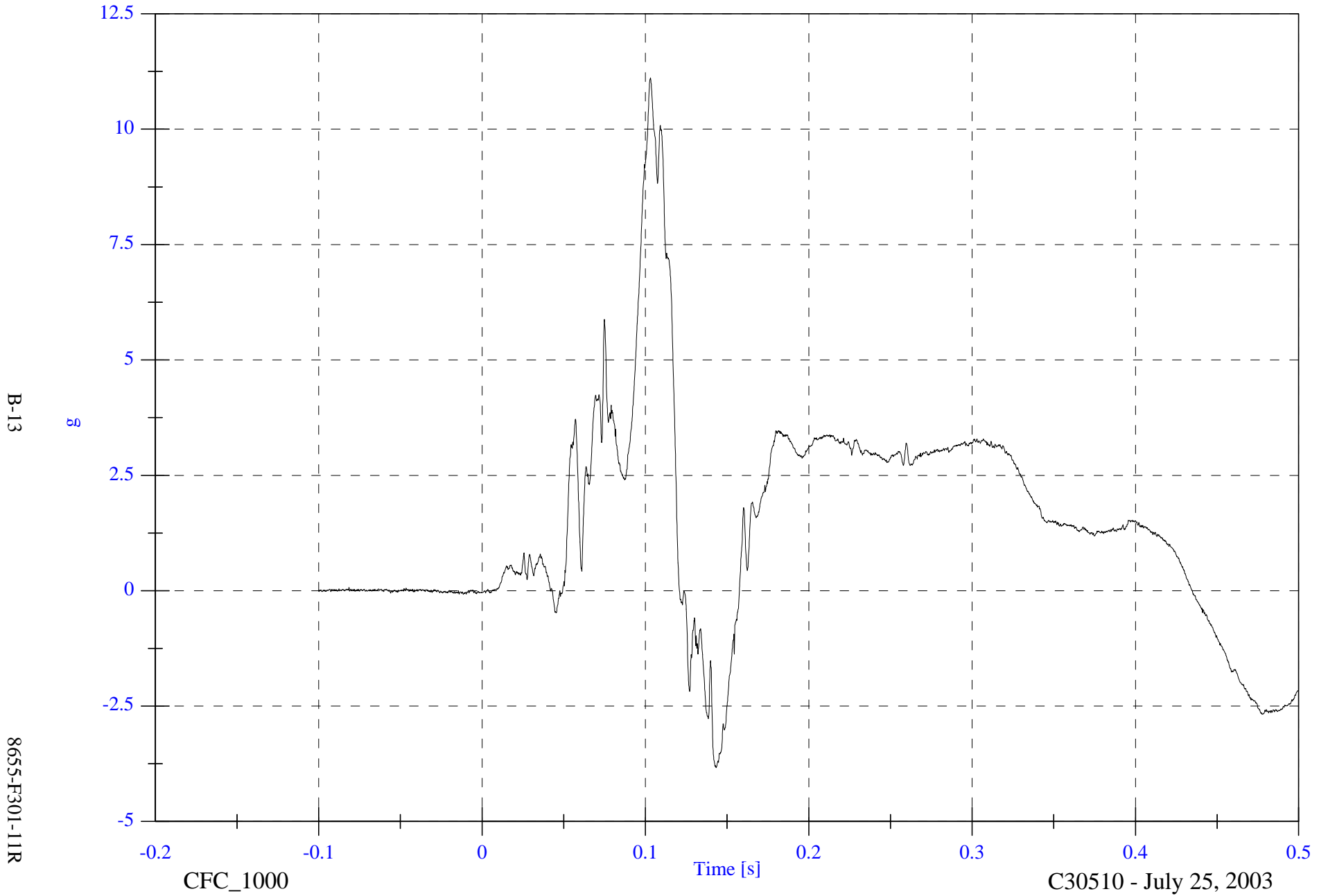


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Head z

Max: 11.1 [g] at 0.103 [s]

Min: -3.8 [g] at 0.143 [s]

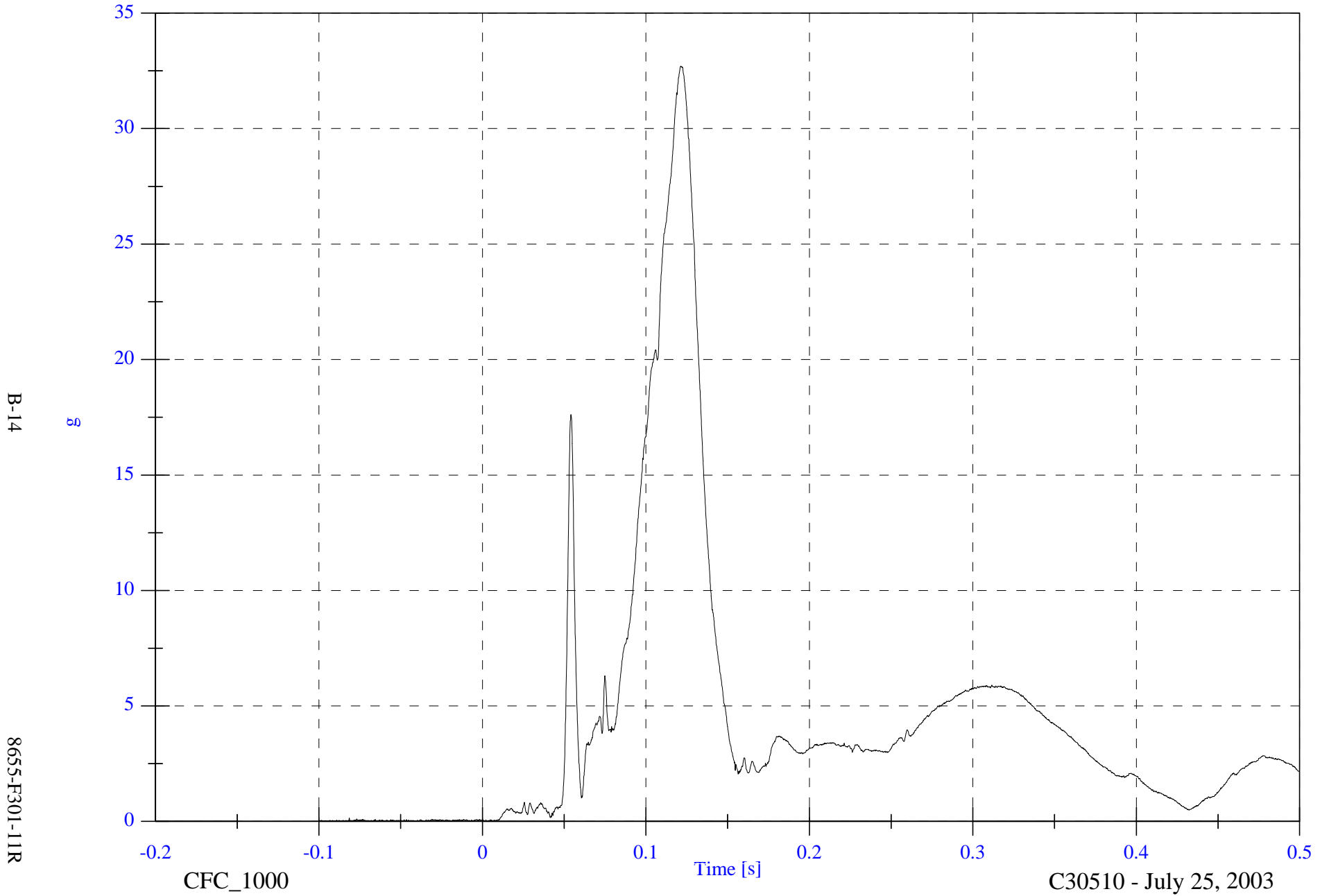


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 32.7 [g] at 0.121 [s]

Min: 0.0 [g] at -0.047 [s]

V2P1 Head Resultant

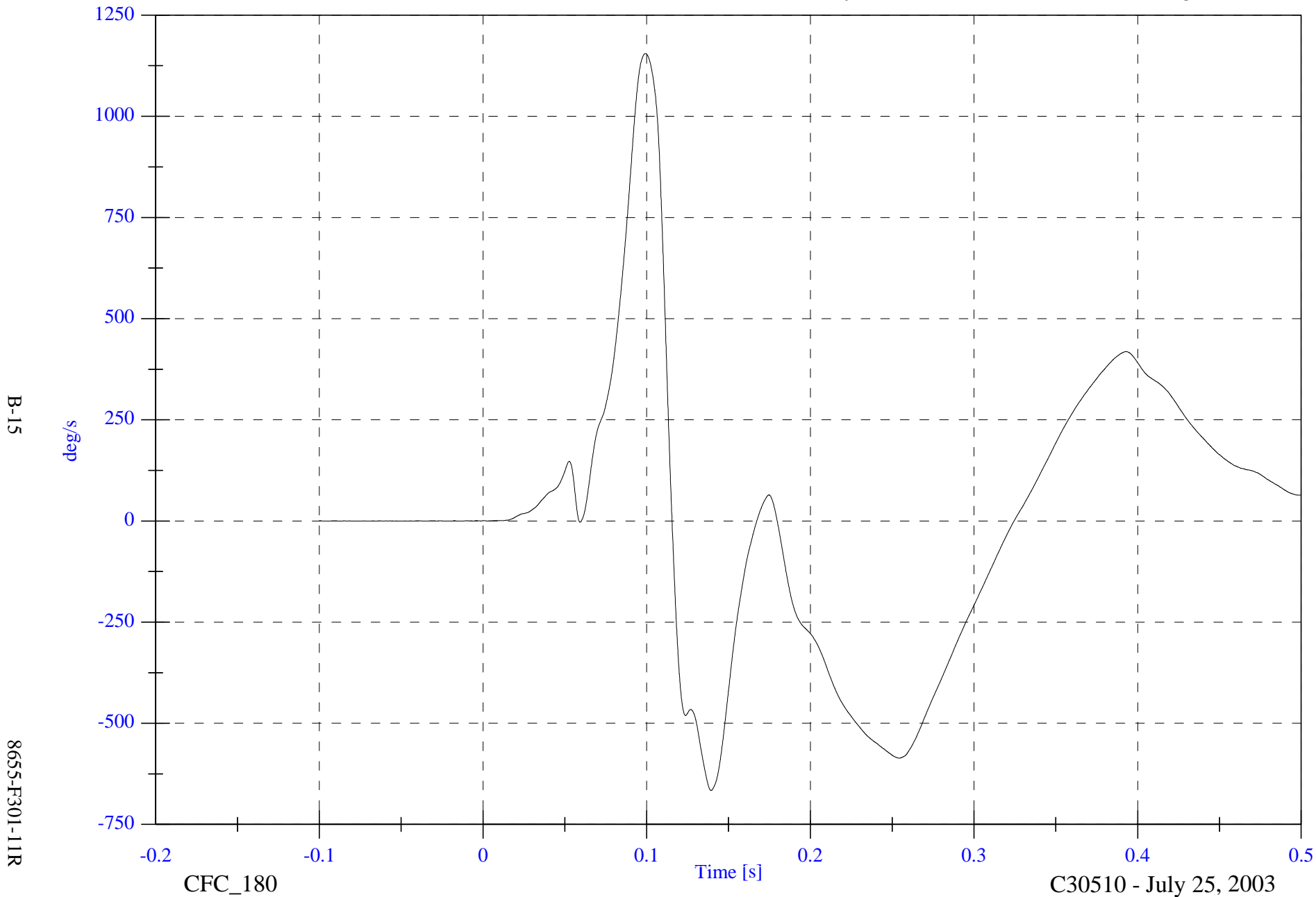


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 1155.1 [deg/s] at 0.099 [s]

Min: -666.3 [deg/s] at 0.139 [s]

### V2P1 Head Rotation AVy



B-15

8655-F301-11R

CFC\_180

Time [s]

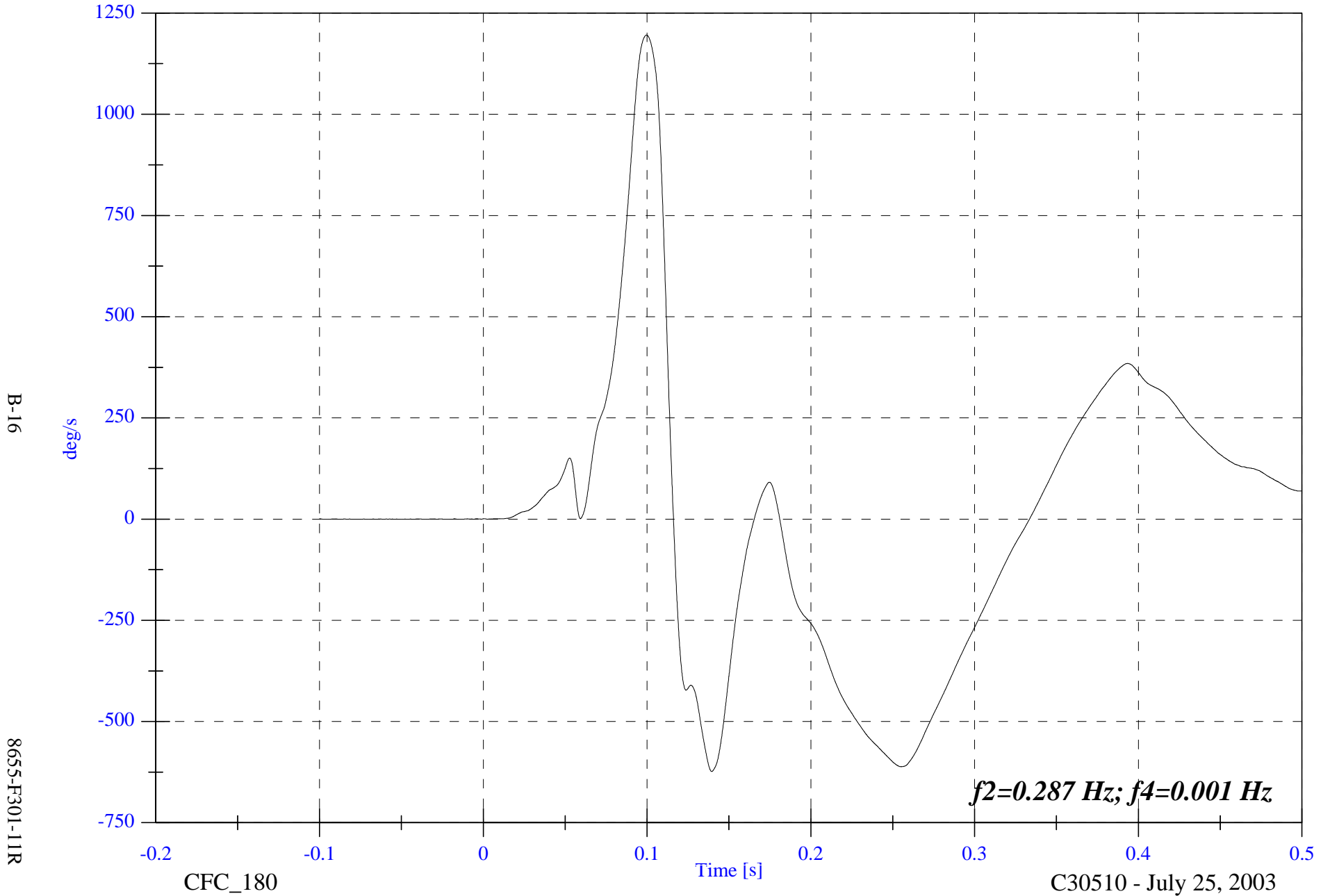
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Head Comp Rotation AVy

Max: 1195.6 [deg/s] at 0.100 [s]

Min: -623.5 [deg/s] at 0.139 [s]



B-16

8655-F301-11R

CFC\_180

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

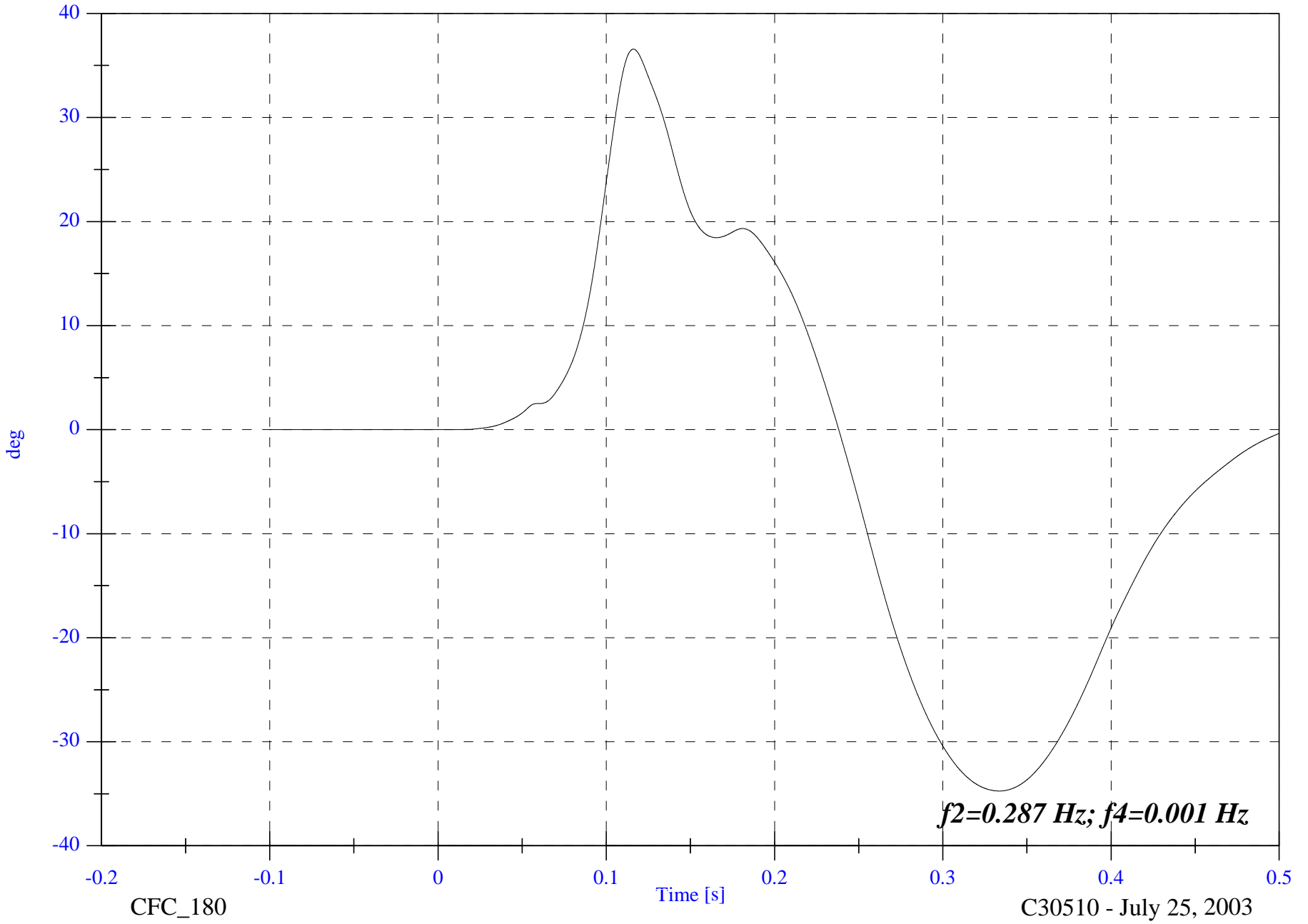
V2P1 Head Comp Rotation ADy

Max: 36.6 [deg] at 0.116 [s]

Min: -34.7 [deg] at 0.334 [s]

B-17

8655-F301-11R



CFC\_180

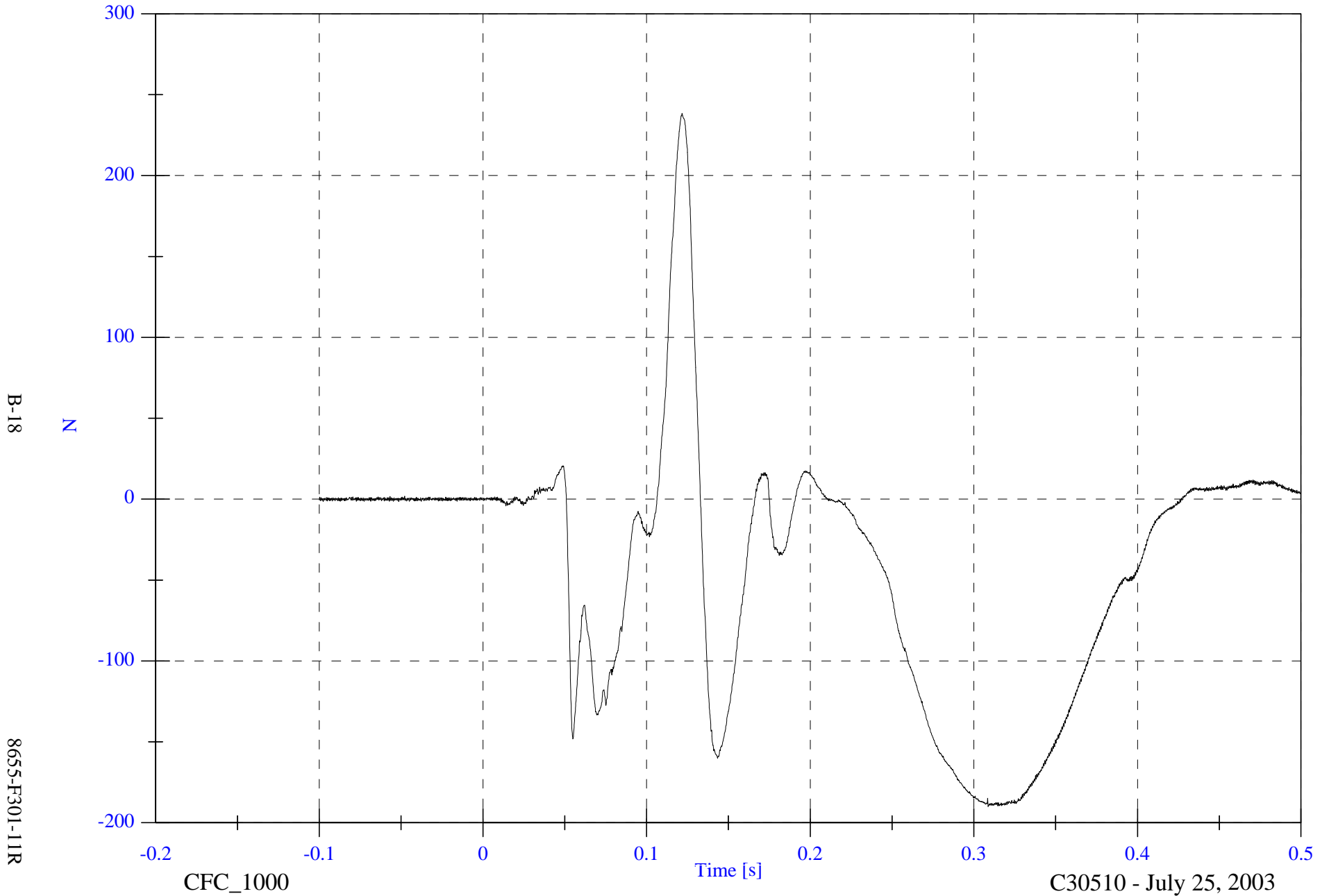
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 238.4 [N] at 0.122 [s]

Min: -190.1 [N] at 0.309 [s]

V2P1 Upper Neck Fx

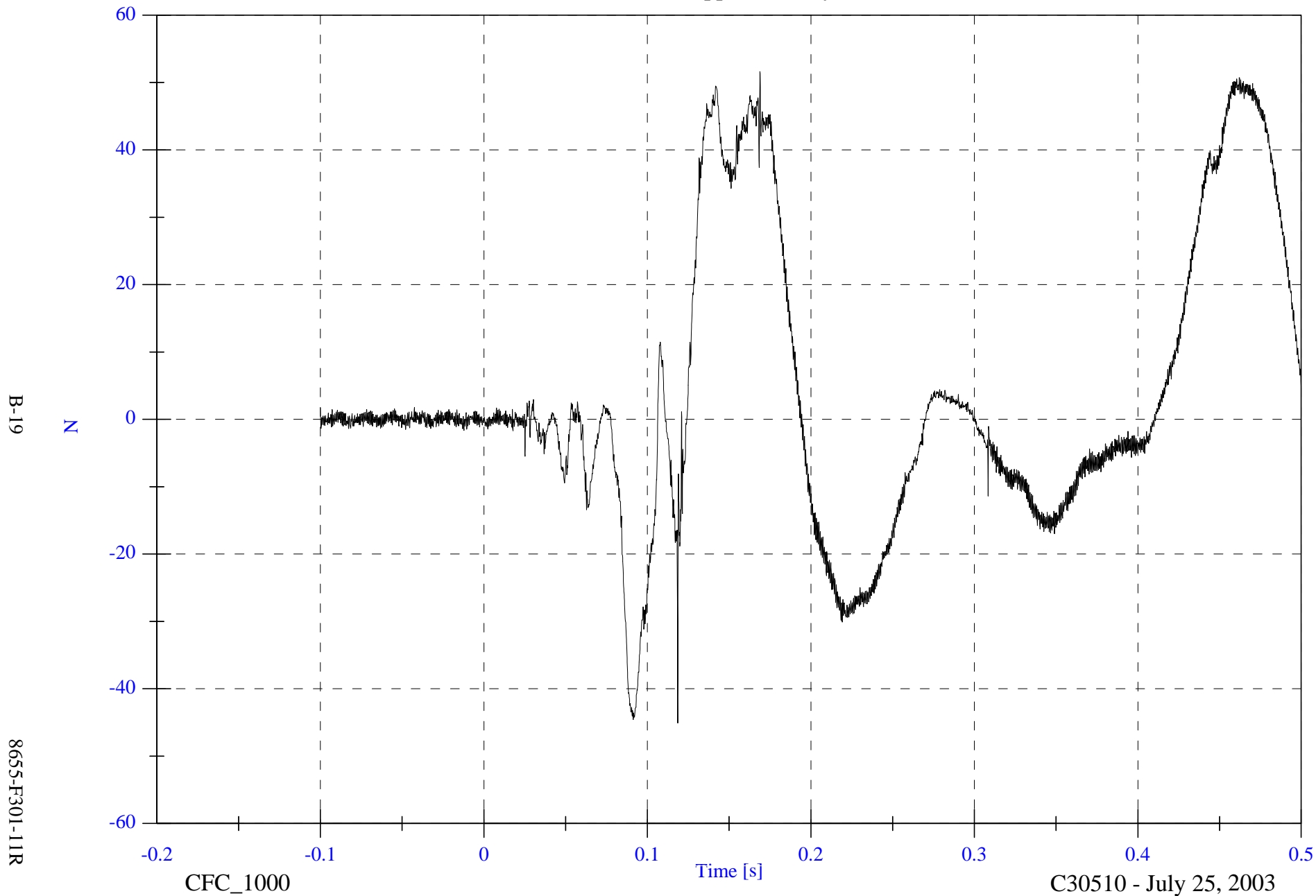


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Upper Neck Fy

Max: 51.6 [N] at 0.169 [s]

Min: -45.1 [N] at 0.119 [s]

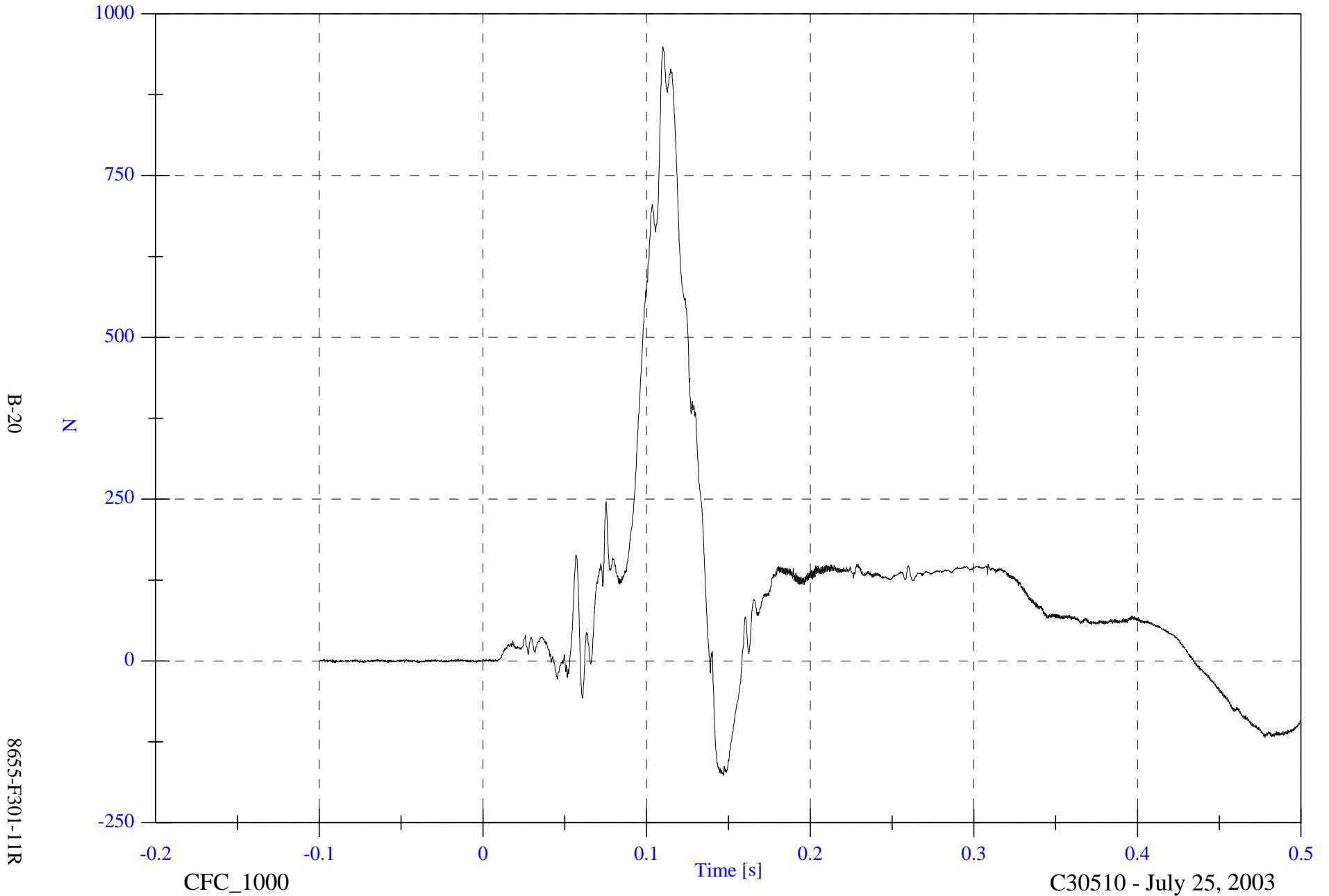


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 948.2 [N] at 0.110 [s]

Min: -176.8 [N] at 0.147 [s]

V2P1 Upper Neck Fz

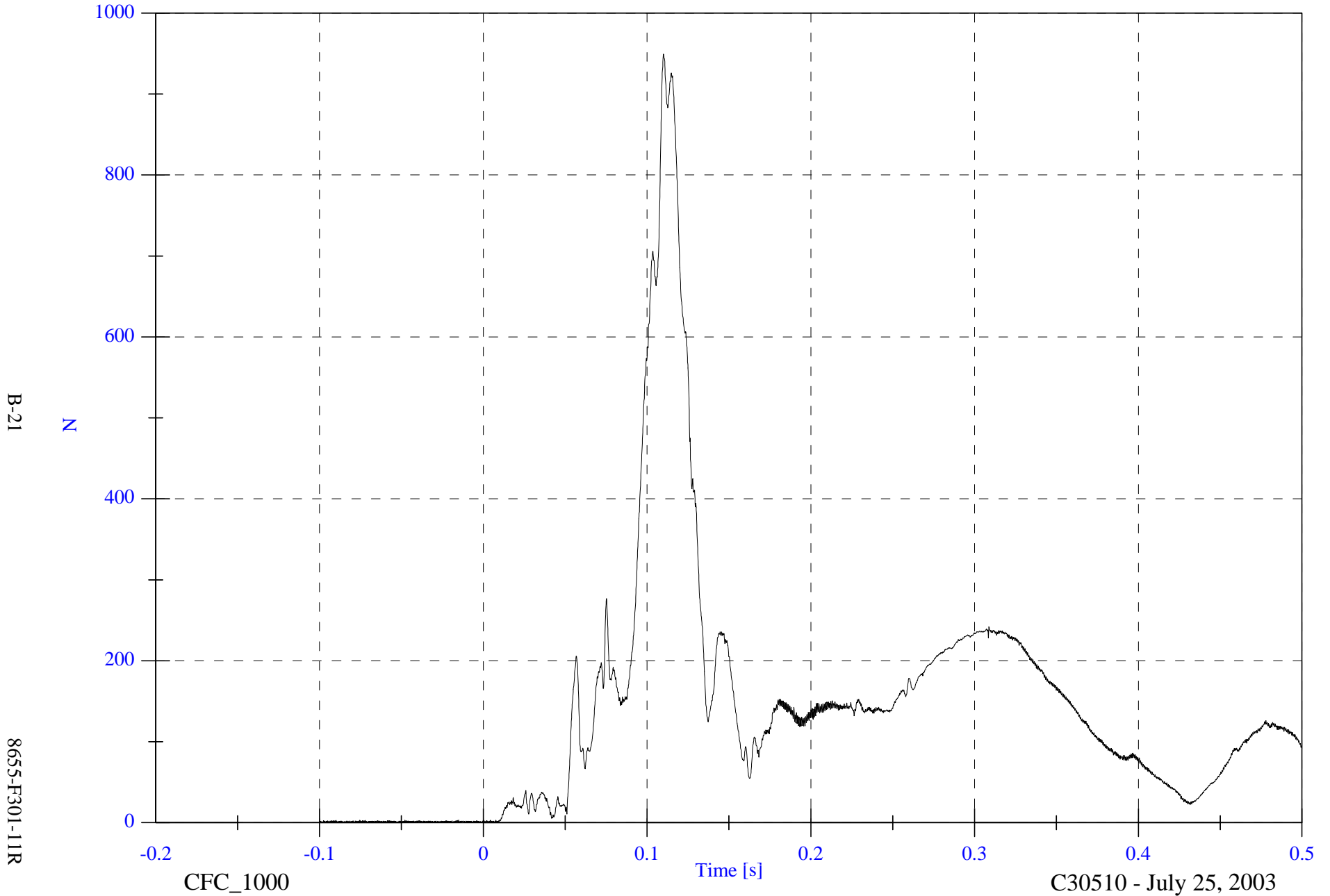


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 949.3 [N] at 0.110 [s]

V2P1 Upper Neck F Resultant

Min: 0.2 [N] at -0.051 [s]

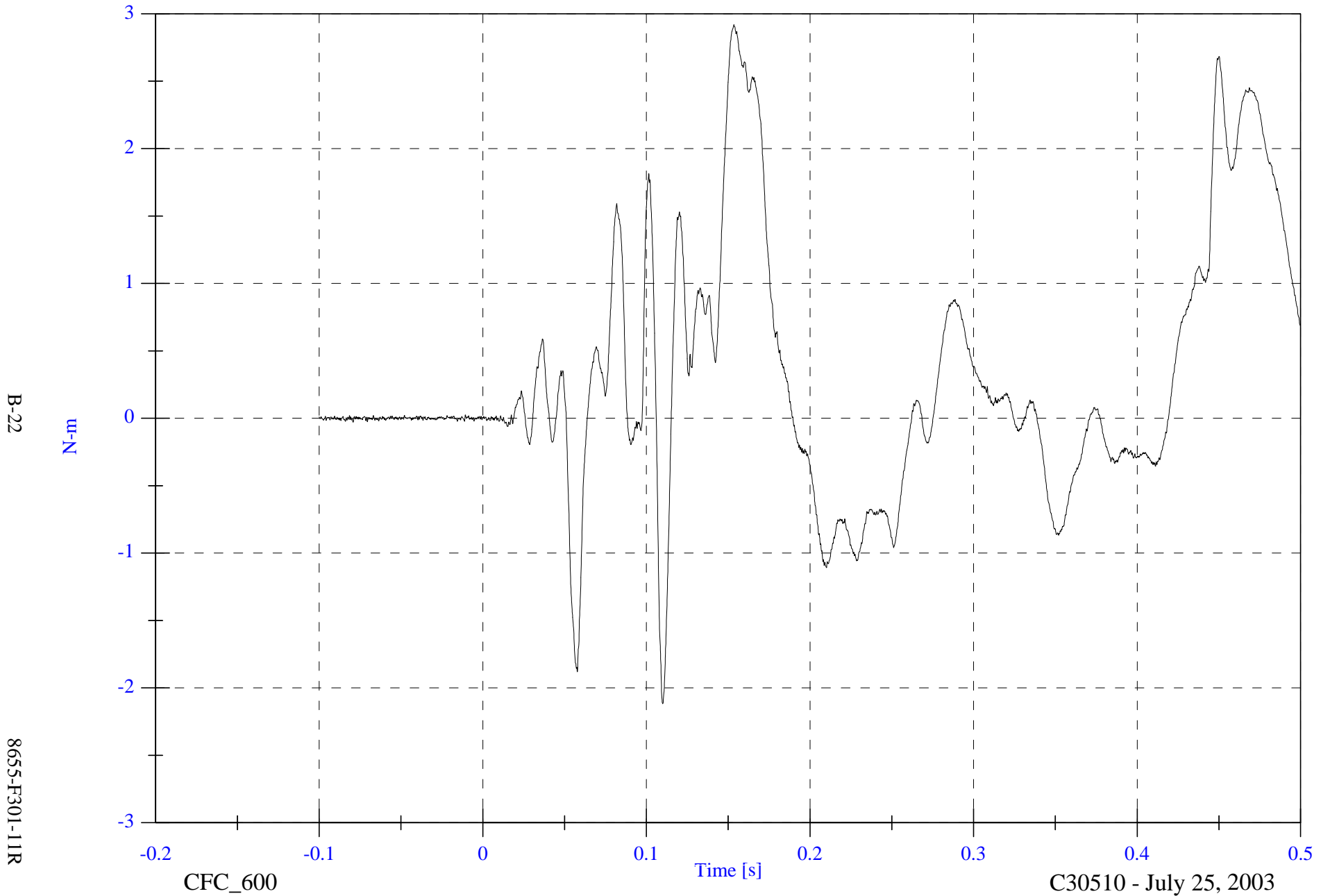


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 2.9 [N-m] at 0.153 [s]

Min: -2.1 [N-m] at 0.110 [s]

V2P1 Upper Neck Mx



B-22

8655-F301-11R

CFC\_600

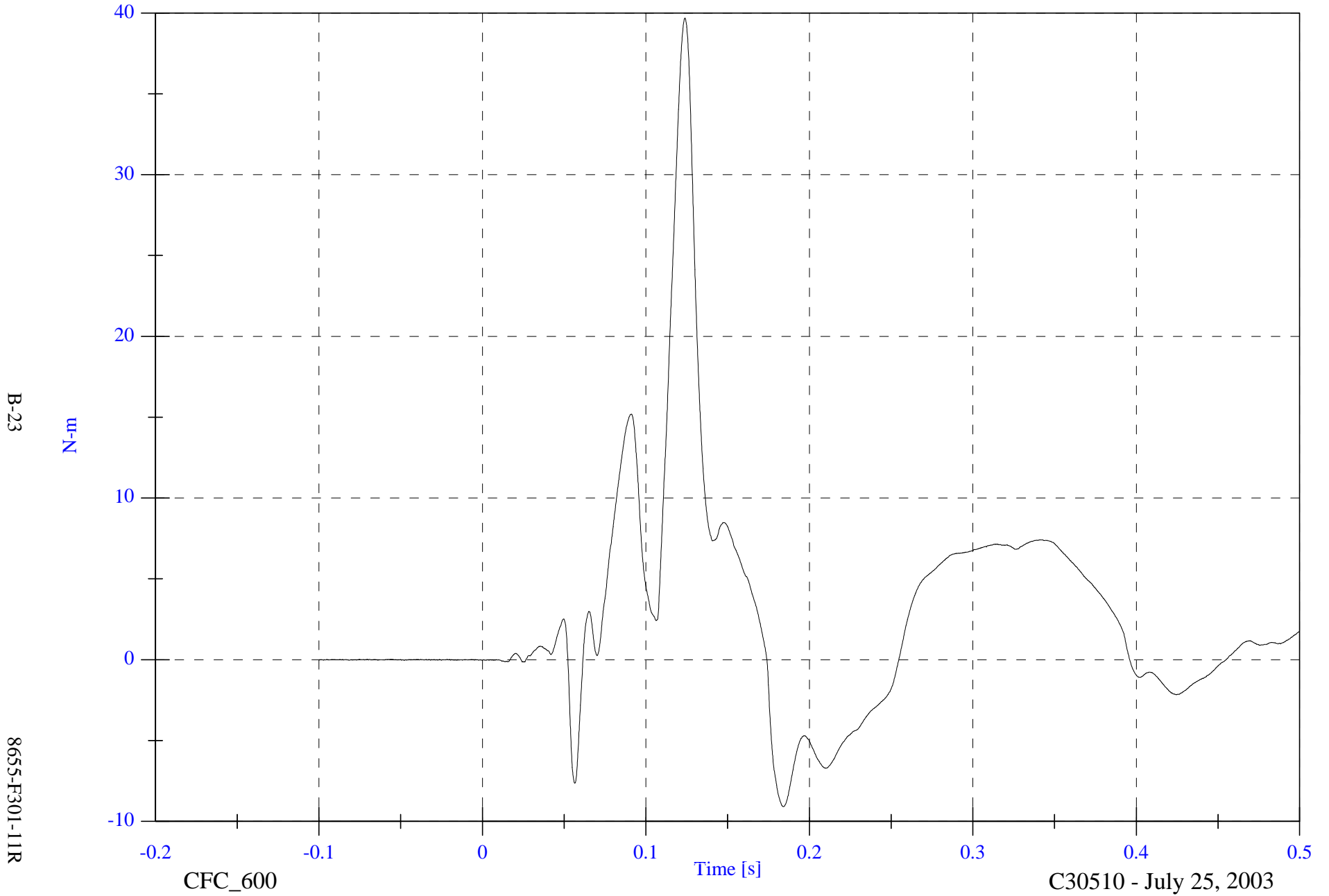
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 39.7 [N-m] at 0.124 [s]

Min: -9.1 [N-m] at 0.184 [s]

V2P1 Upper Neck My

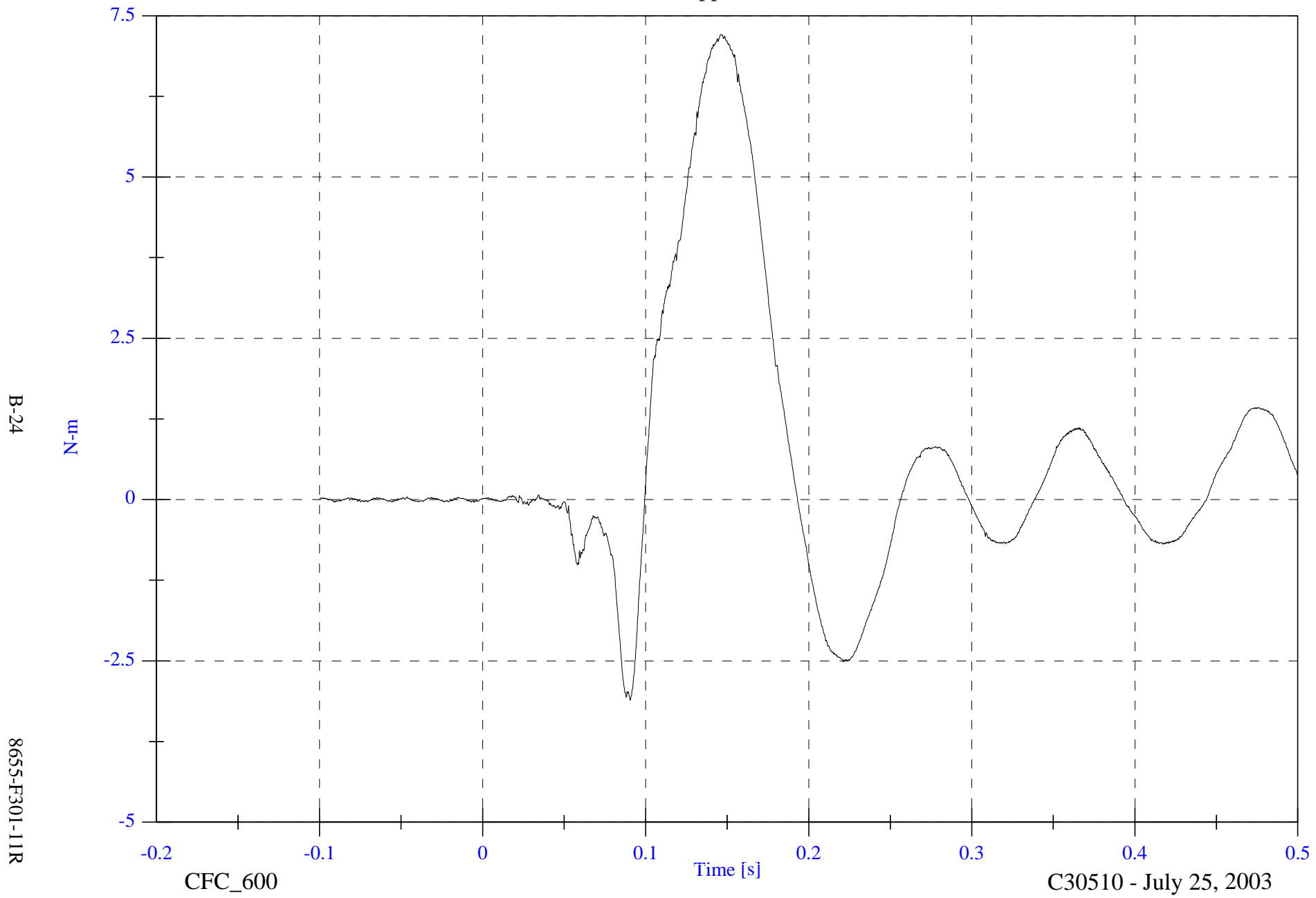


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 7.2 [N-m] at 0.146 [s]

Min: -3.1 [N-m] at 0.091 [s]

V2P1 Upper Neck Mz



B-24

8655-F301-11R

CFC\_600

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

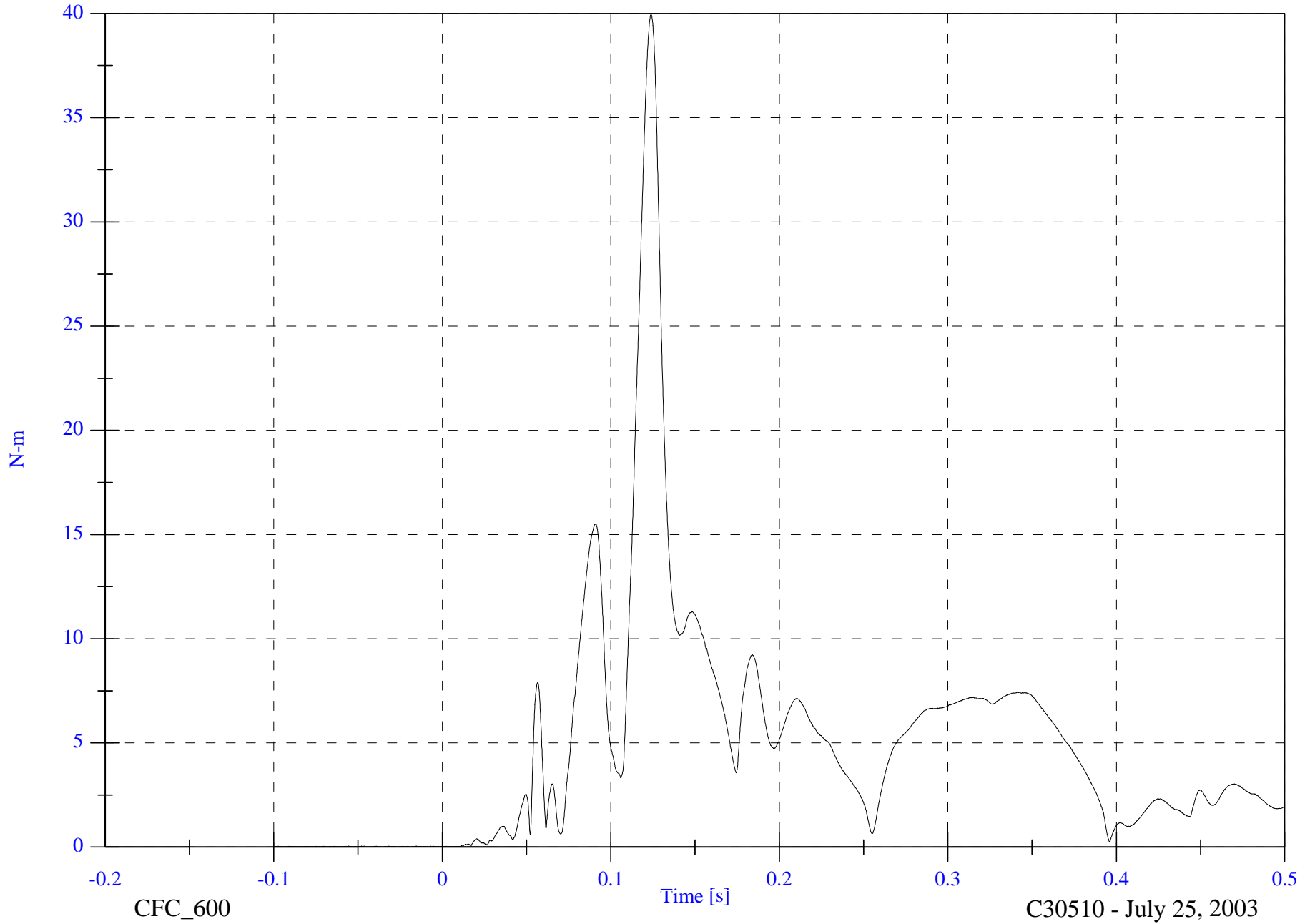
V2P1 Upper Neck M Resultant

Max: 40.0 [N-m] at 0.124 [s]

Min: 0.0 [N-m] at -0.093 [s]

B-25

8655-F301-11R



CFC\_600

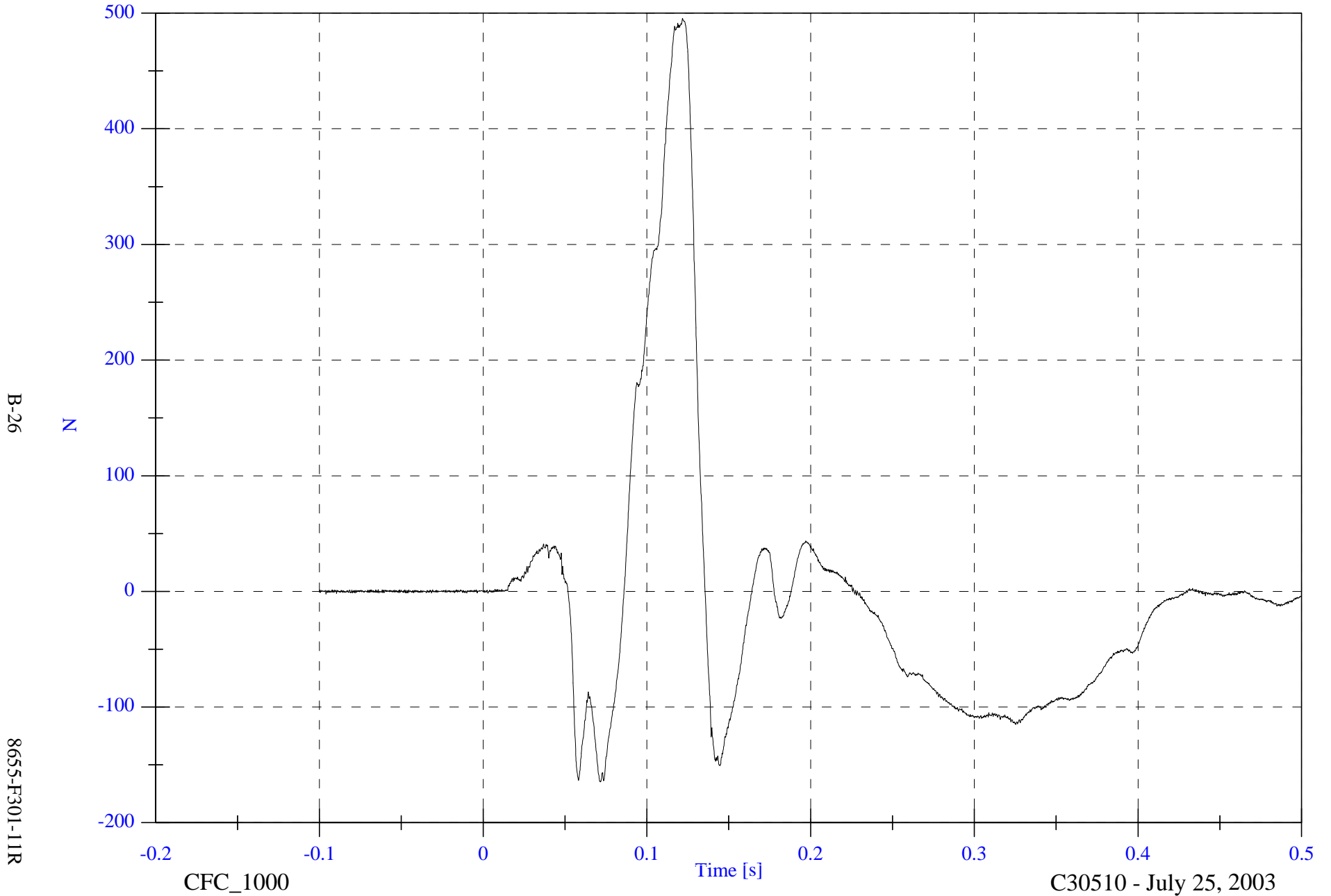
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 495.4 [N] at 0.122 [s]

Min: -164.7 [N] at 0.072 [s]

V2P1 Lower Neck Fx

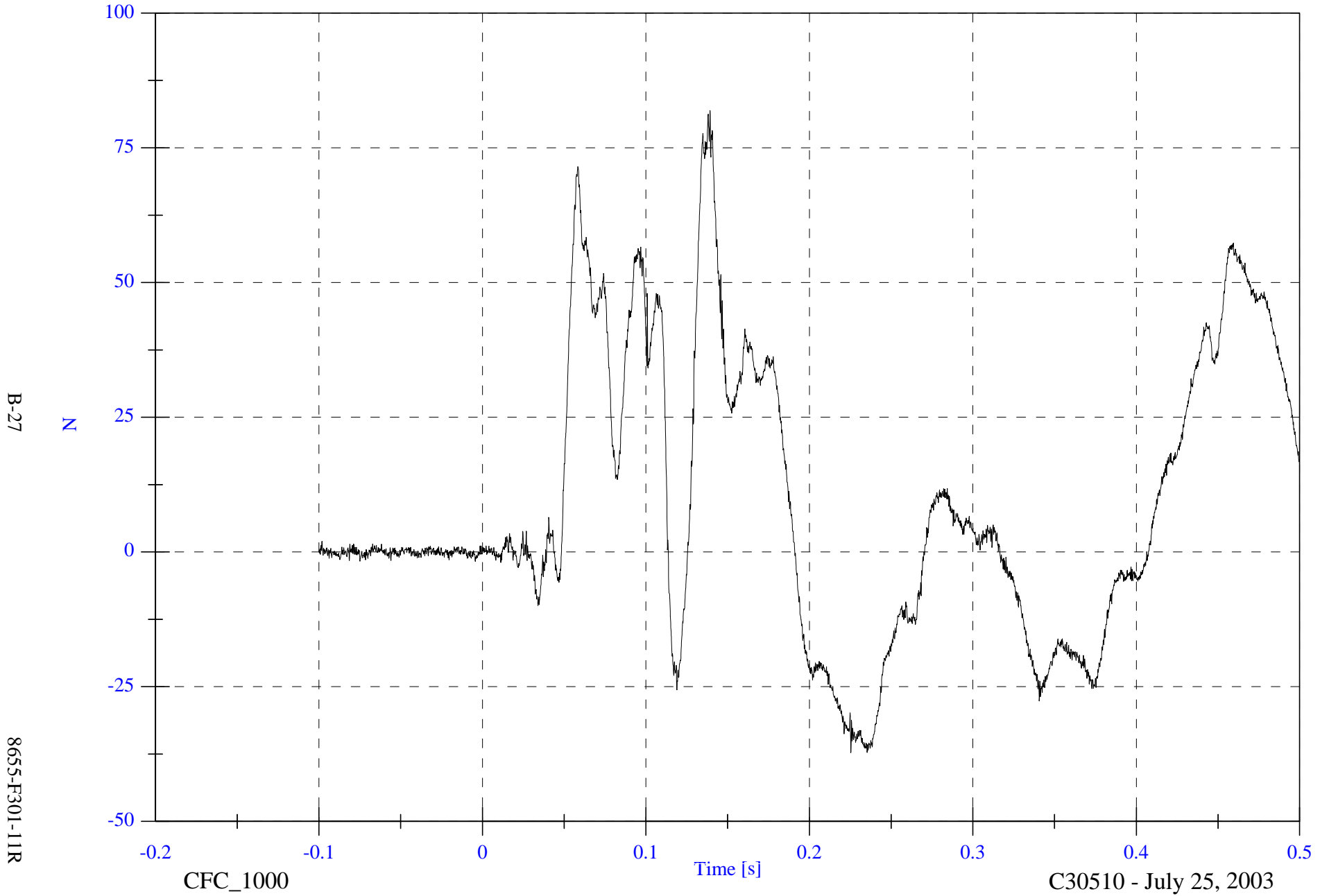


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 81.9 [N] at 0.139 [s]

Min: -37.3 [N] at 0.225 [s]

V2P1 Lower Neck Fy



B-27

8655-F301-11R

CFC\_1000

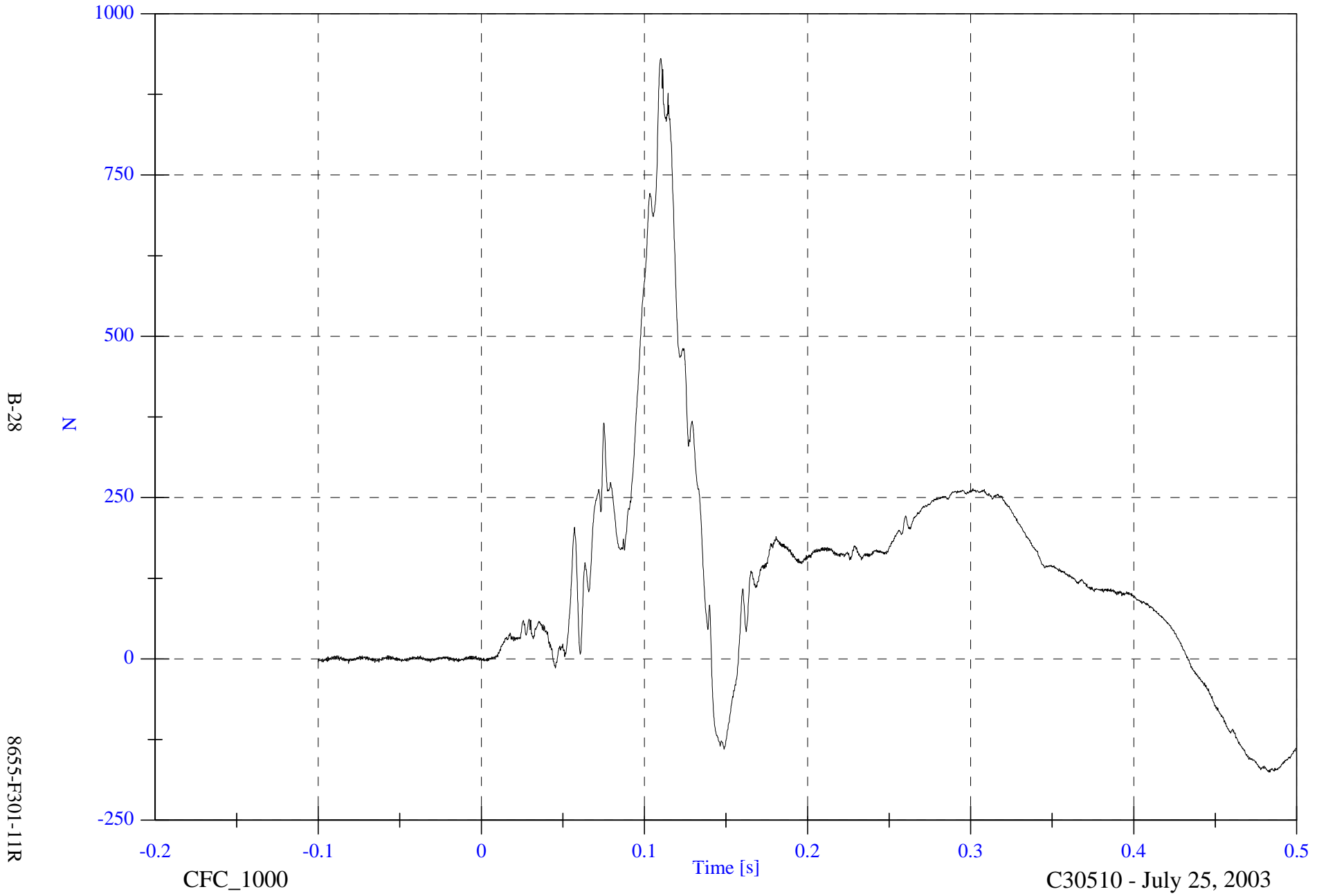
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 930.6 [N] at 0.110 [s]

Min: -175.5 [N] at 0.483 [s]

V2P1 Lower Neck Fz



B-28

8655-F301-11R

CFC\_1000

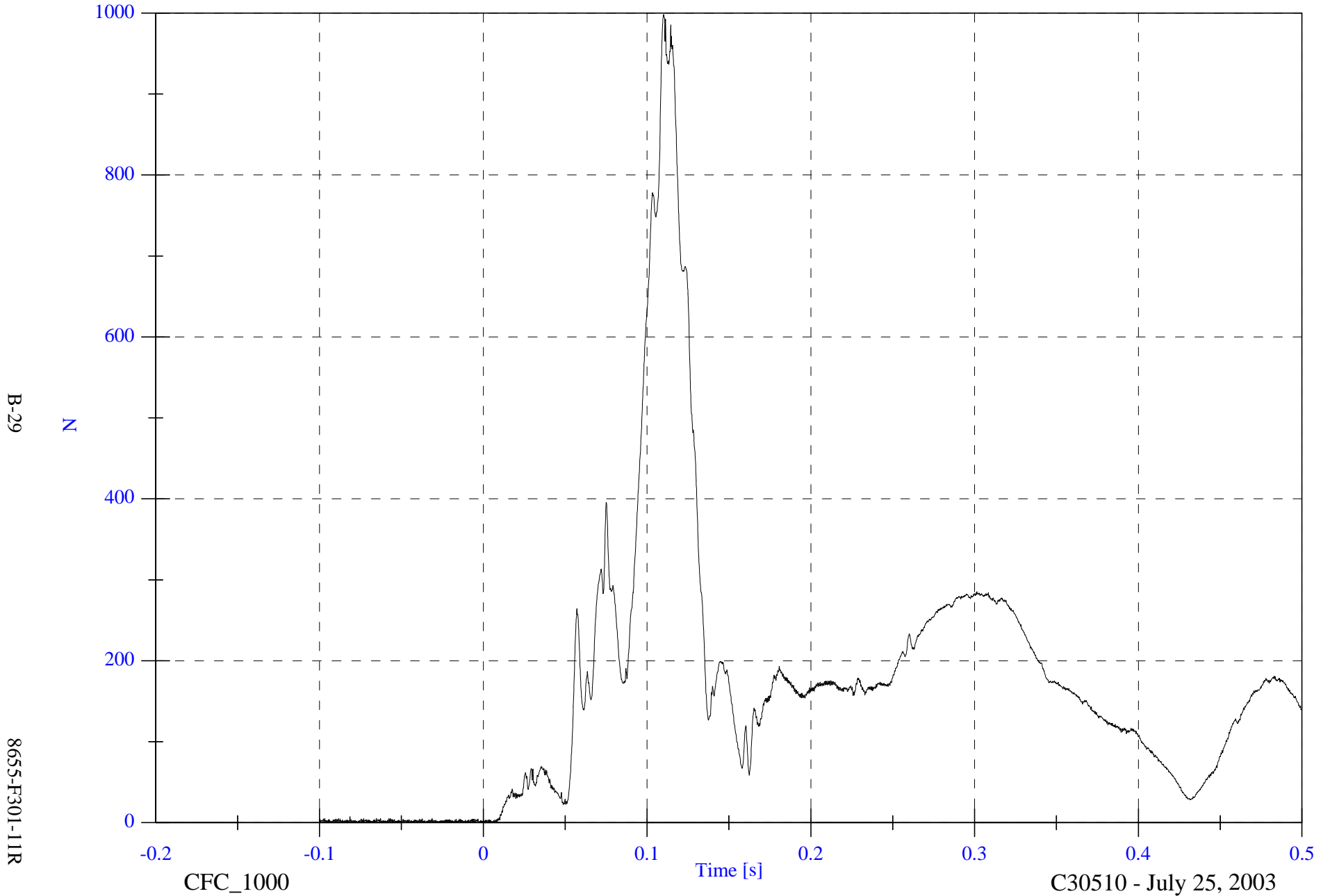
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Lower Neck F Resultant

Max: 998.3 [N] at 0.110 [s]

Min: 0.2 [N] at -0.011 [s]



B-29

8655-F301-11R

CFC\_1000

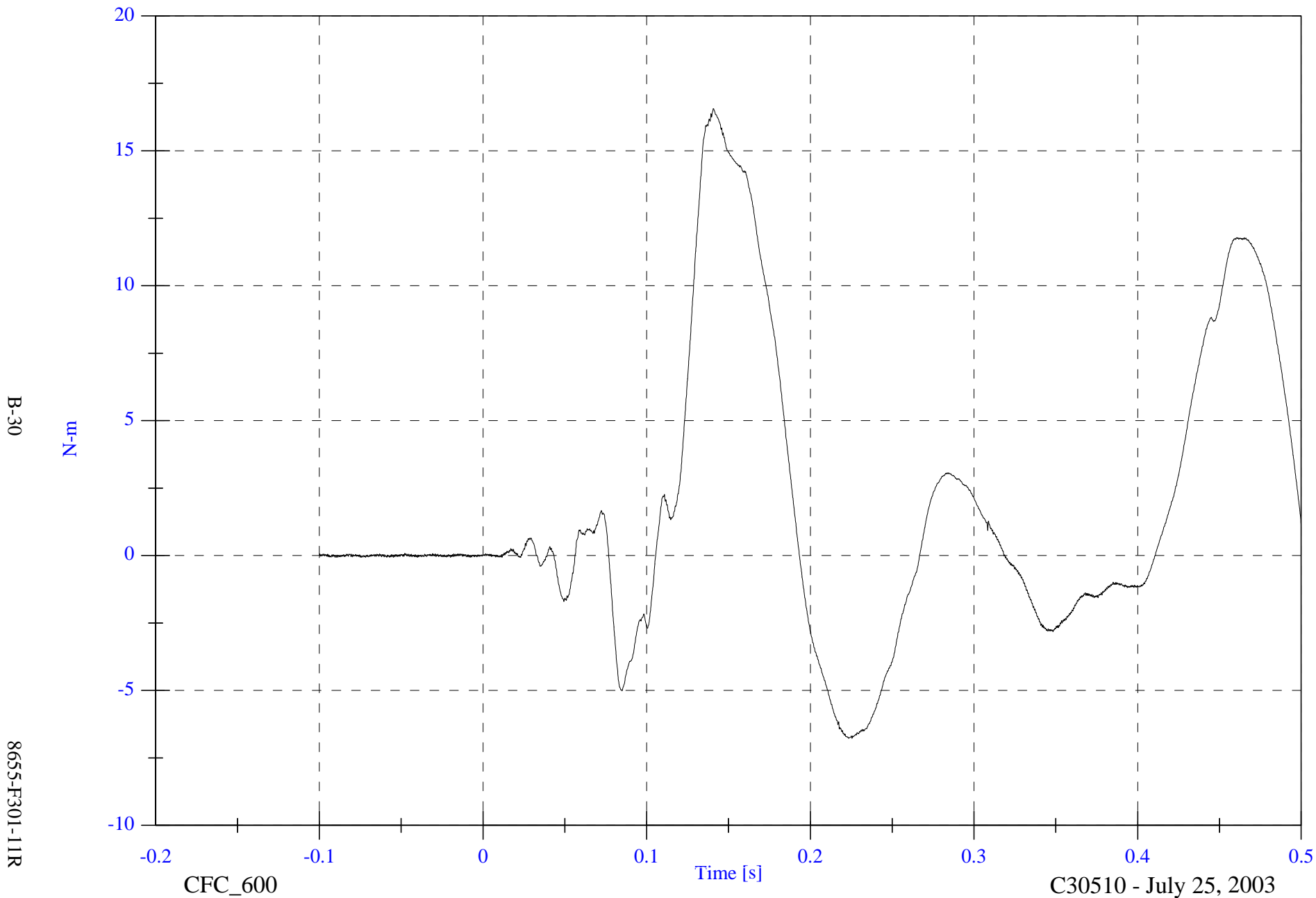
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 16.6 [N-m] at 0.141 [s]

Min: -6.8 [N-m] at 0.225 [s]

V2P1 Lower Neck Mx



B-30

N-m

8655-F301-11R

CFC\_600

Time [s]

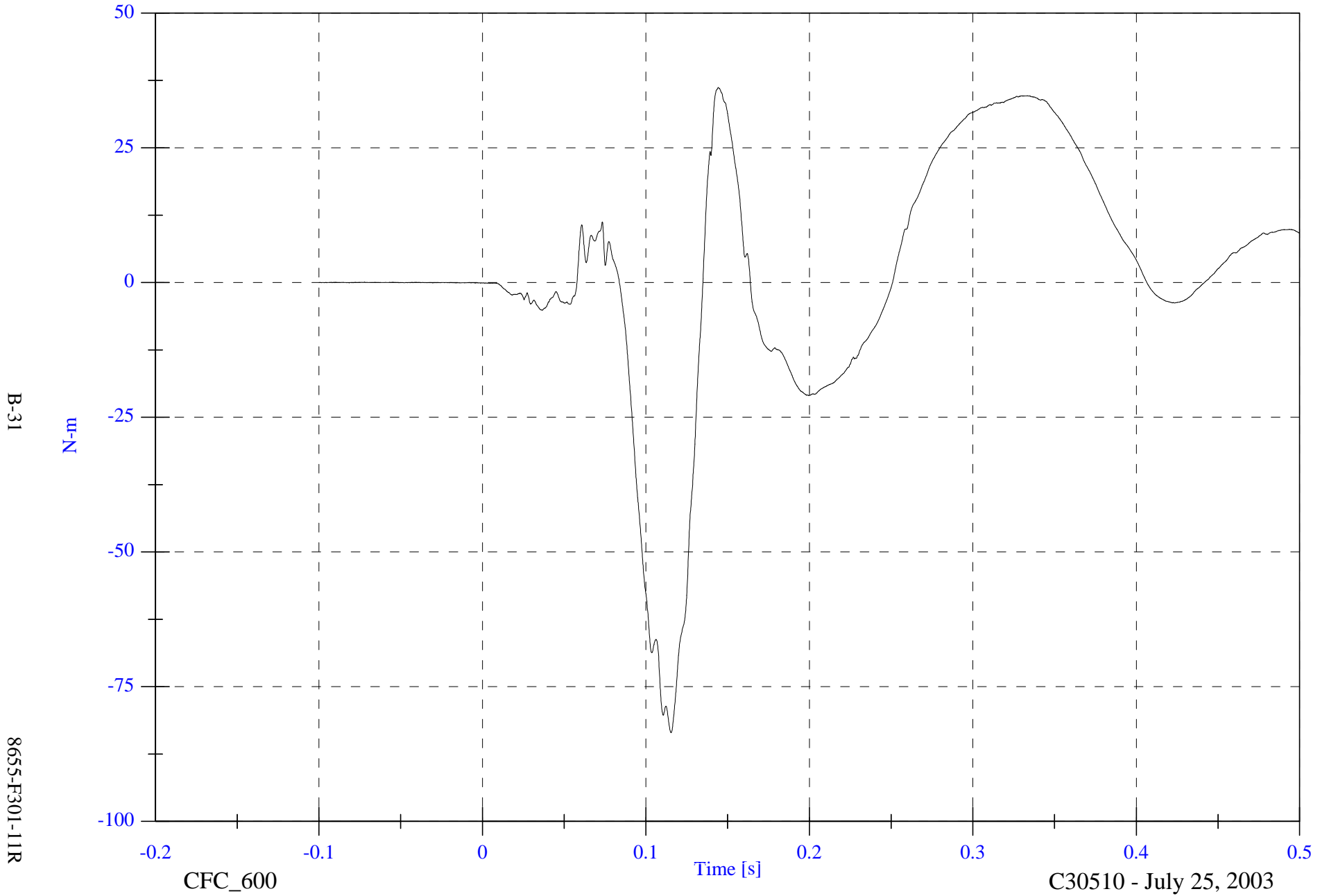
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Lower Neck My

Max: 36.2 [N-m] at 0.144 [s]

Min: -83.5 [N-m] at 0.115 [s]



B-31

8655-F301-11R

CFC\_600

Time [s]

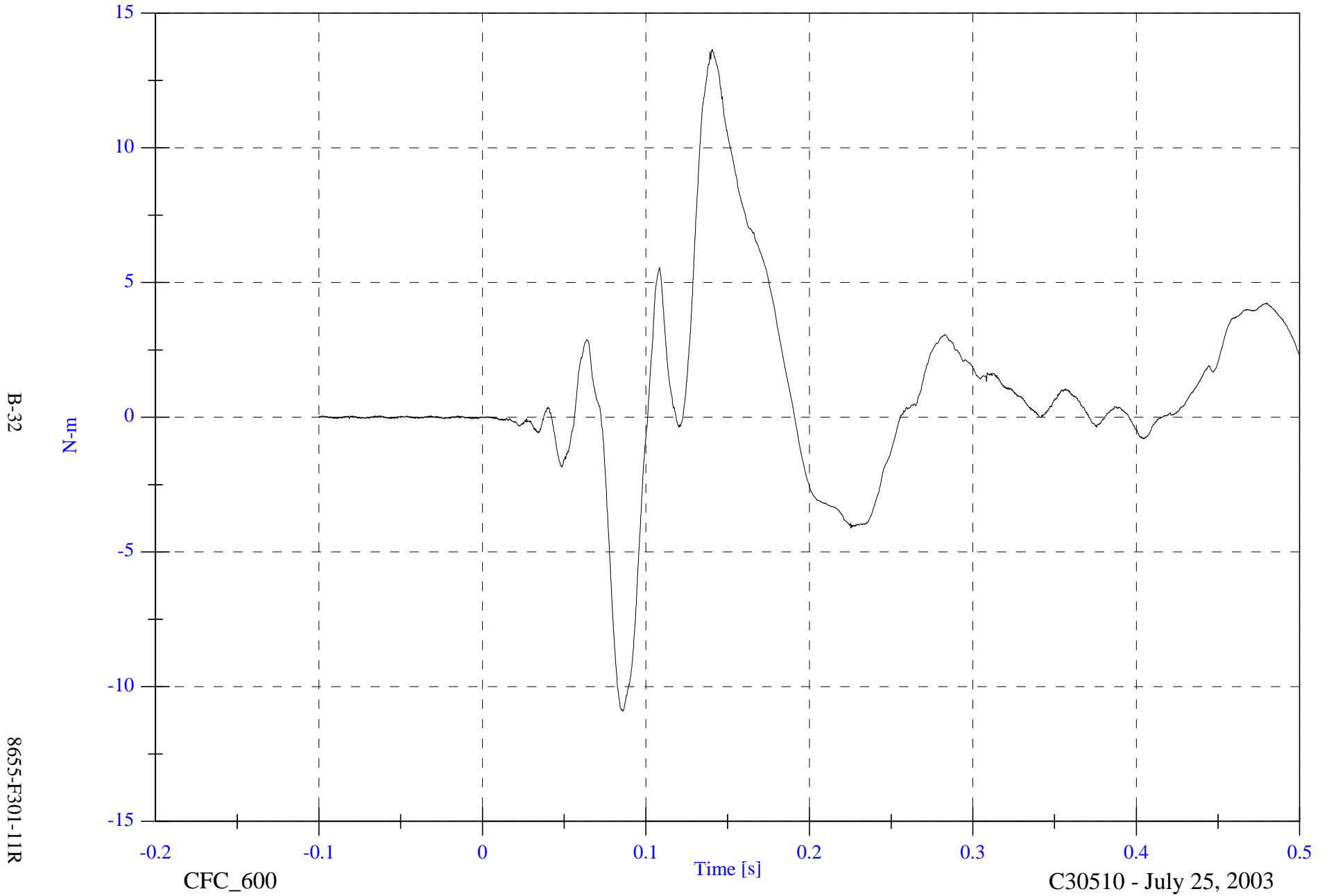
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 13.7 [N-m] at 0.141 [s]

Min: -10.9 [N-m] at 0.086 [s]

V2P1 Lower Neck Mz



B-32

8655-F301-11R

CFC\_600

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

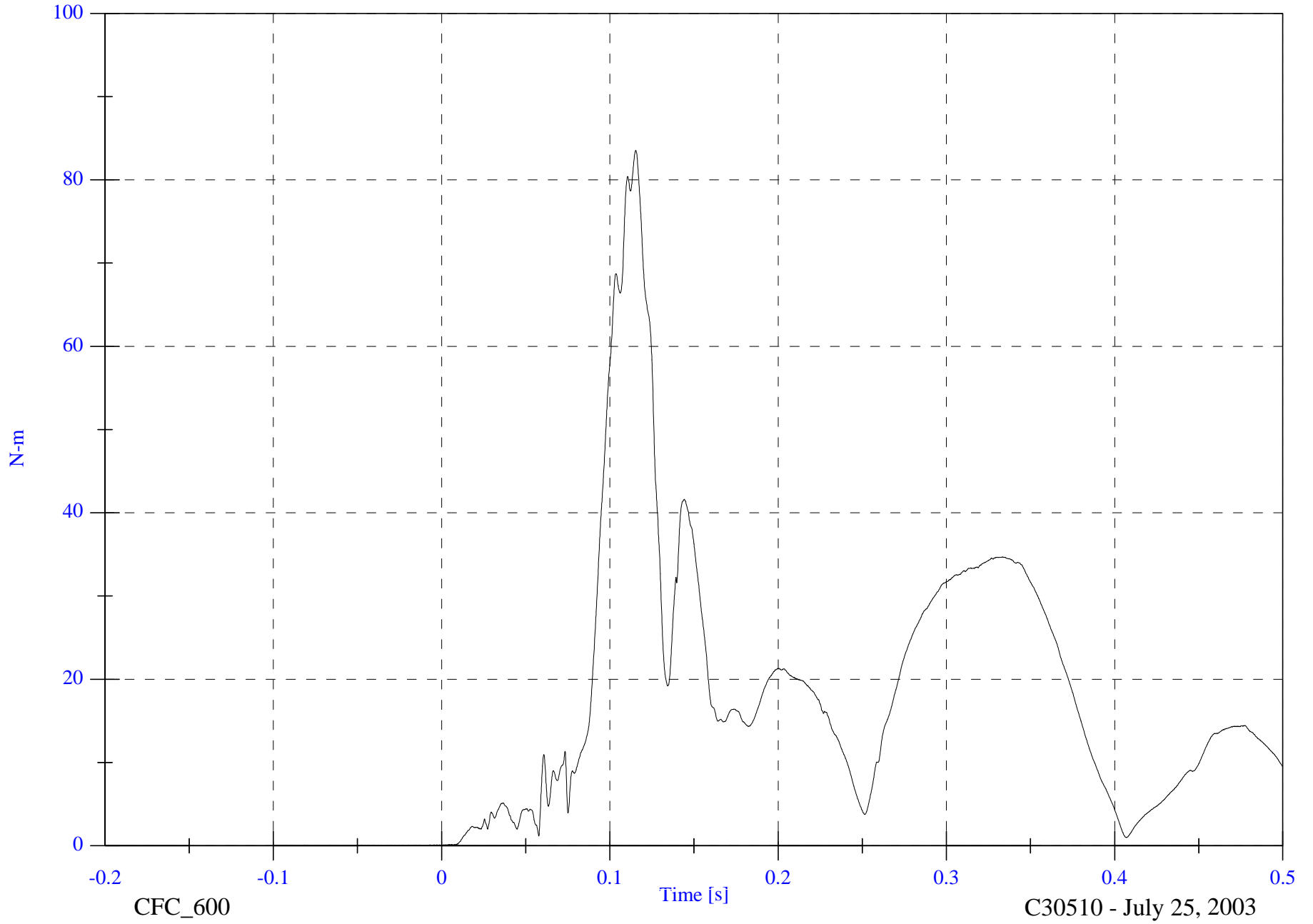
V2P1 Lower Neck M Resultant

Max: 83.6 [N-m] at 0.115 [s]

Min: 0.0 [N-m] at -0.068 [s]

B-33

8655-F301-11R



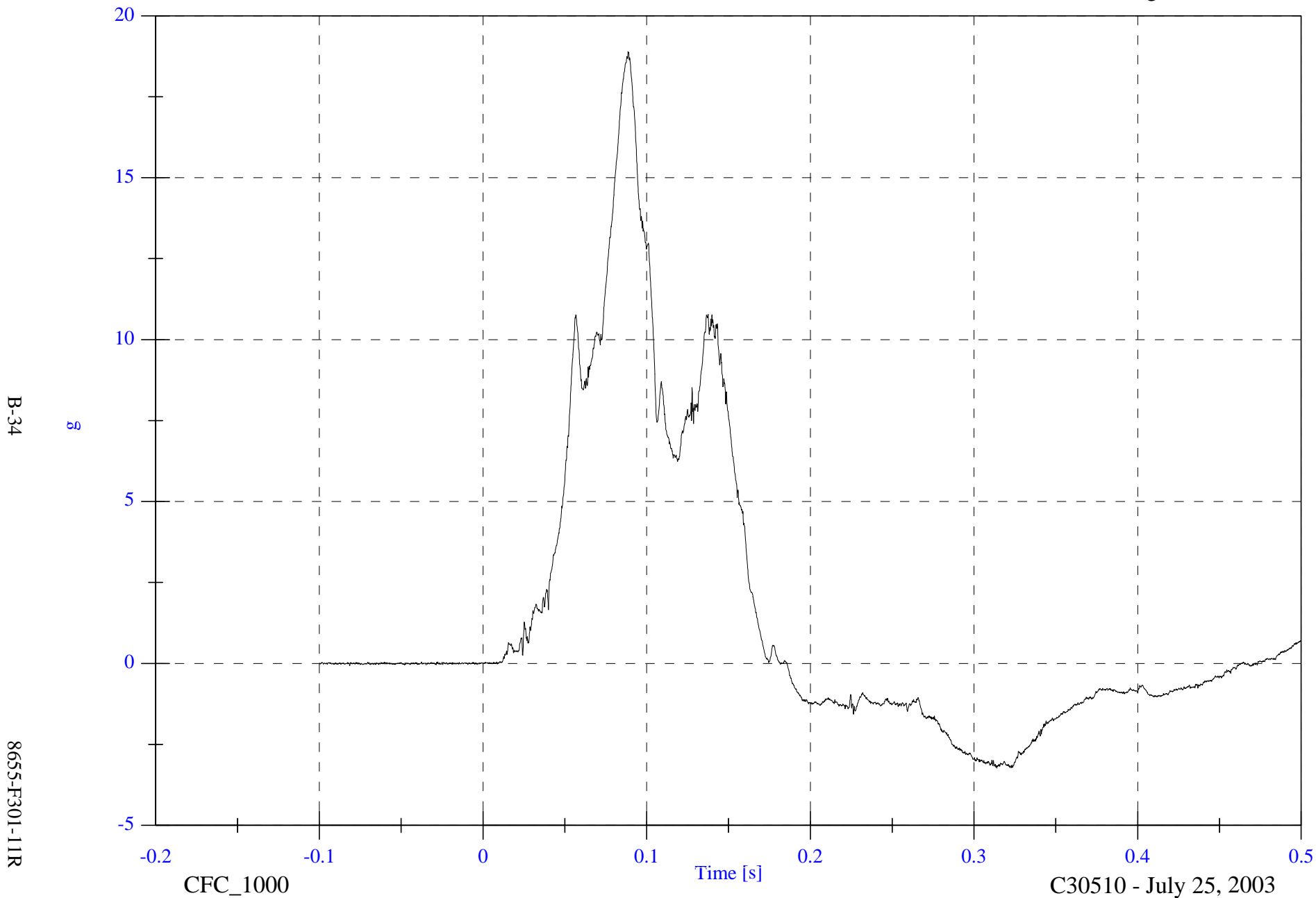
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 18.9 [g] at 0.089 [s]

Min: -3.2 [g] at 0.314 [s]

V2P1 Lower Neck x

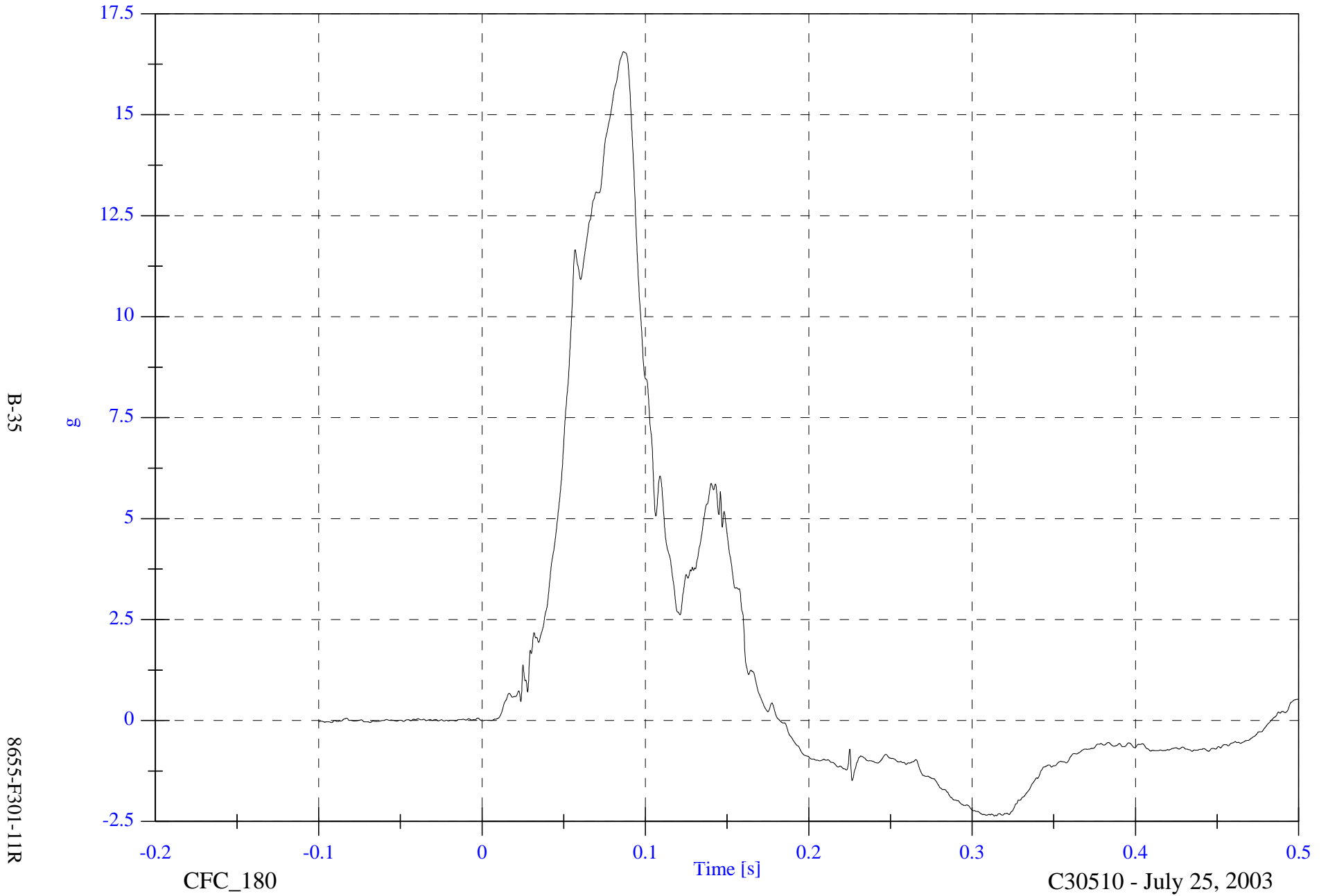


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Chest x

Max: 16.6 [g] at 0.087 [s]

Min: -2.4 [g] at 0.314 [s]



B-35

8655-F301-11R

CFC\_180

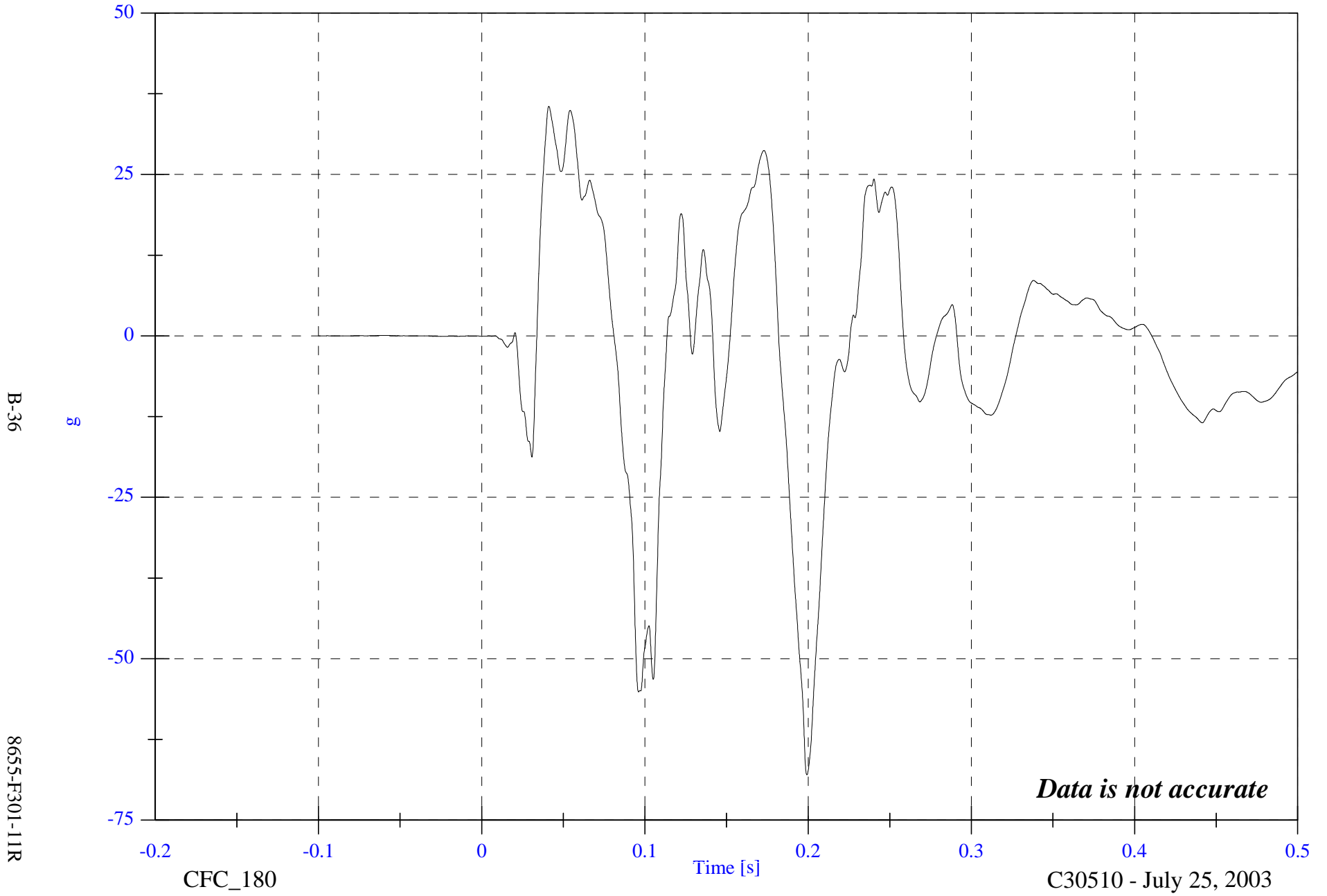
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Chest y

Max: 35.6 [g] at 0.041 [s]

Min: -68.0 [g] at 0.199 [s]



B-36

8655-F301-11R

CFC\_180

Time [s]

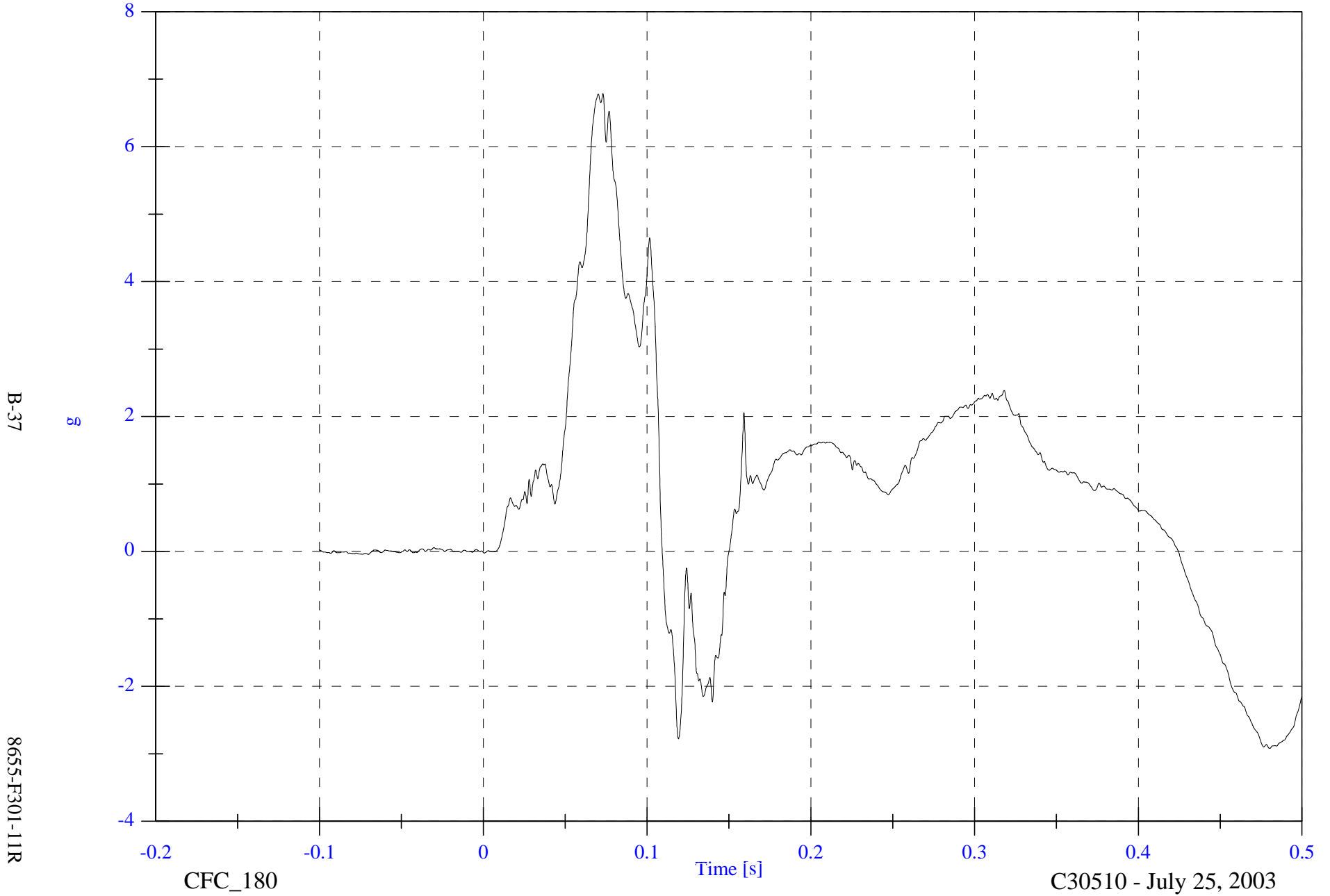
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Chest z

Max: 6.8 [g] at 0.073 [s]

Min: -2.9 [g] at 0.480 [s]



B-37

8655-F301-11R

CFC\_180

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

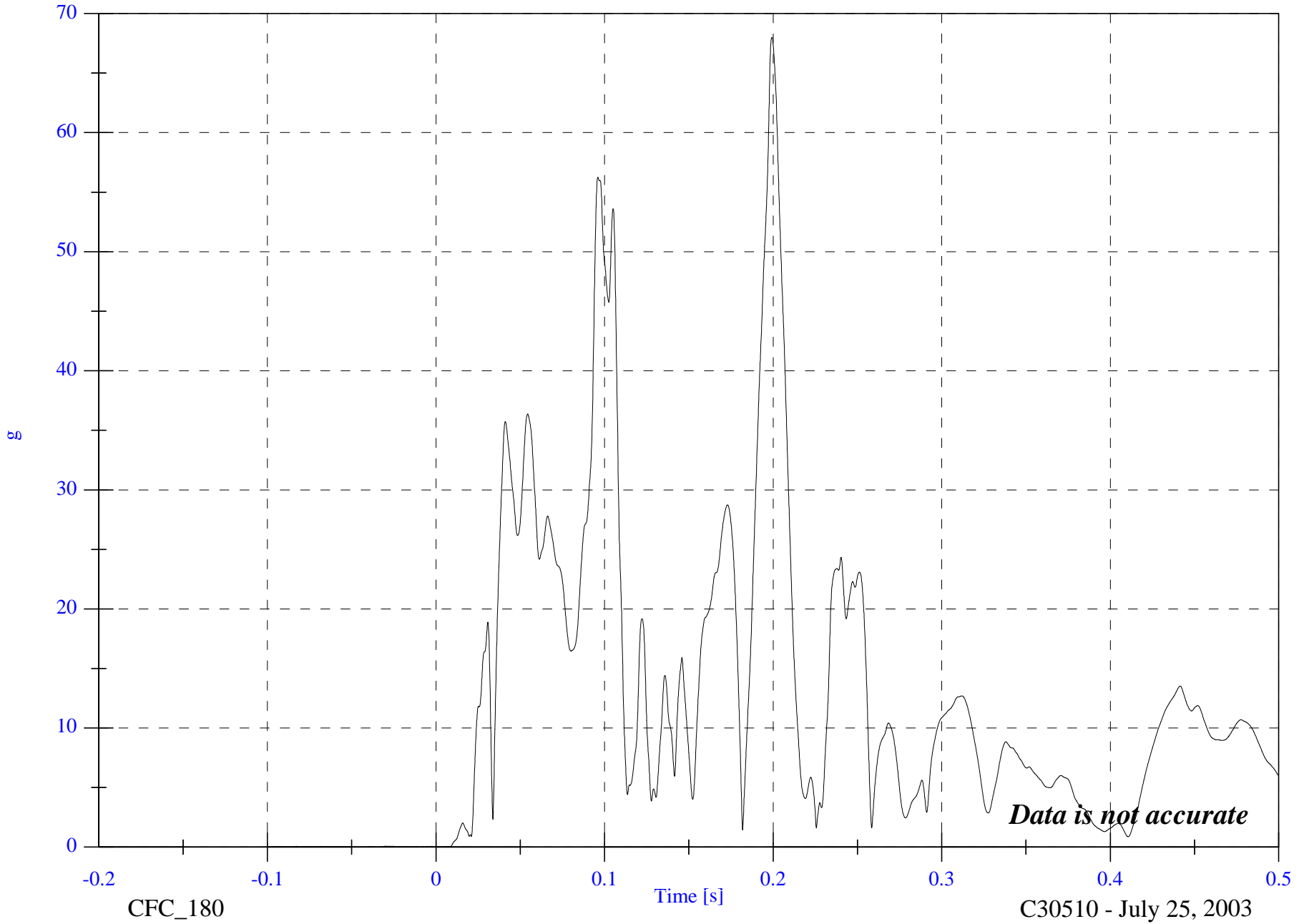
V2P1 Chest Resultant

Max: 68.0 [g] at 0.199 [s]

Min: 0.0 [g] at -0.090 [s]

B-38

8655-F301-11R



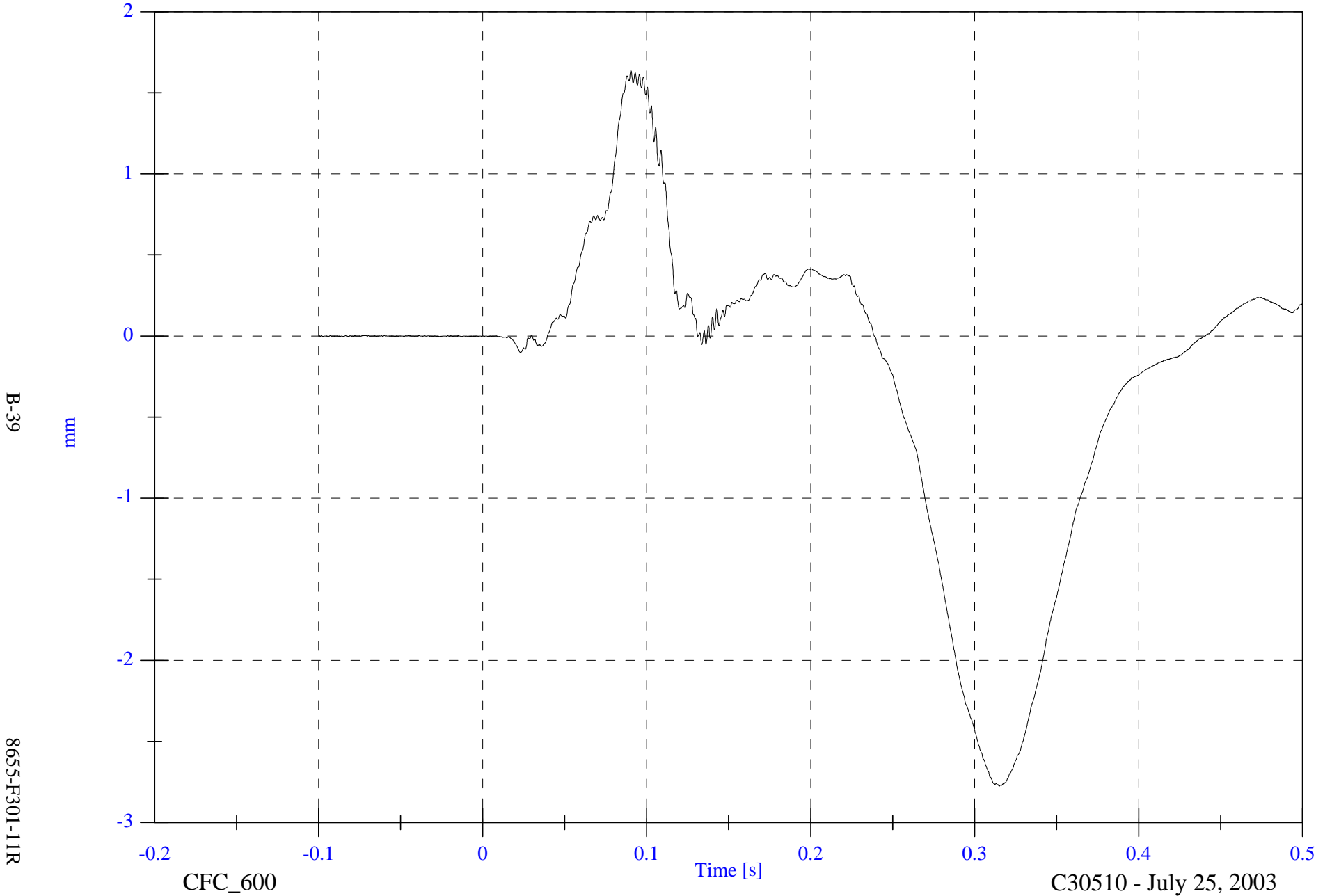
*Data is not accurate*

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 1.6 [mm] at 0.090 [s]

Min: -2.8 [mm] at 0.315 [s]

### V2P1 Chest Displacement



B-39

mm

8655-F301-11R

CFC\_600

Time [s]

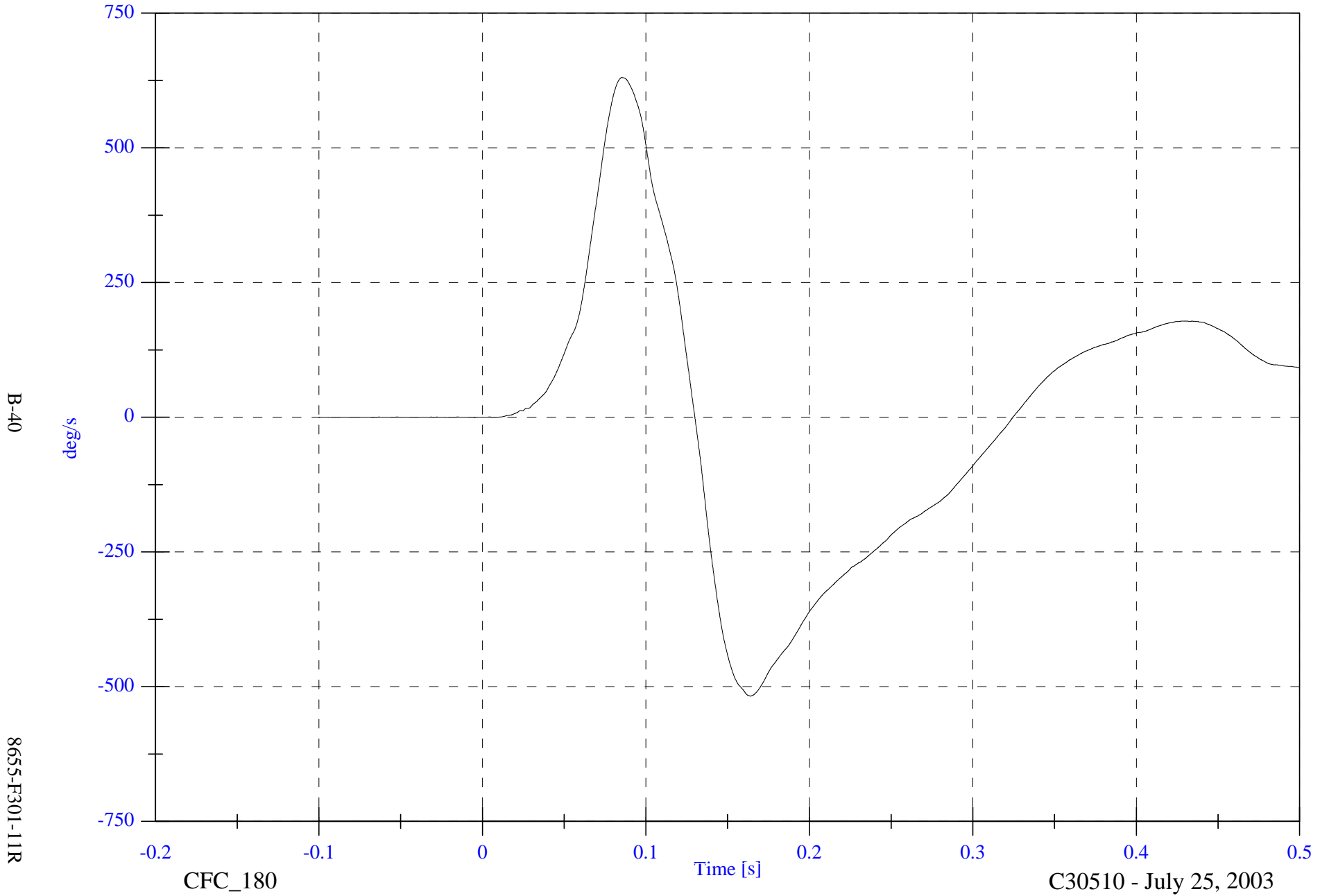
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Chest Rotation AVy

Max: 630.5 [deg/s] at 0.085 [s]

Min: -517.4 [deg/s] at 0.164 [s]



B-40

8655-F301-11R

CFC\_180

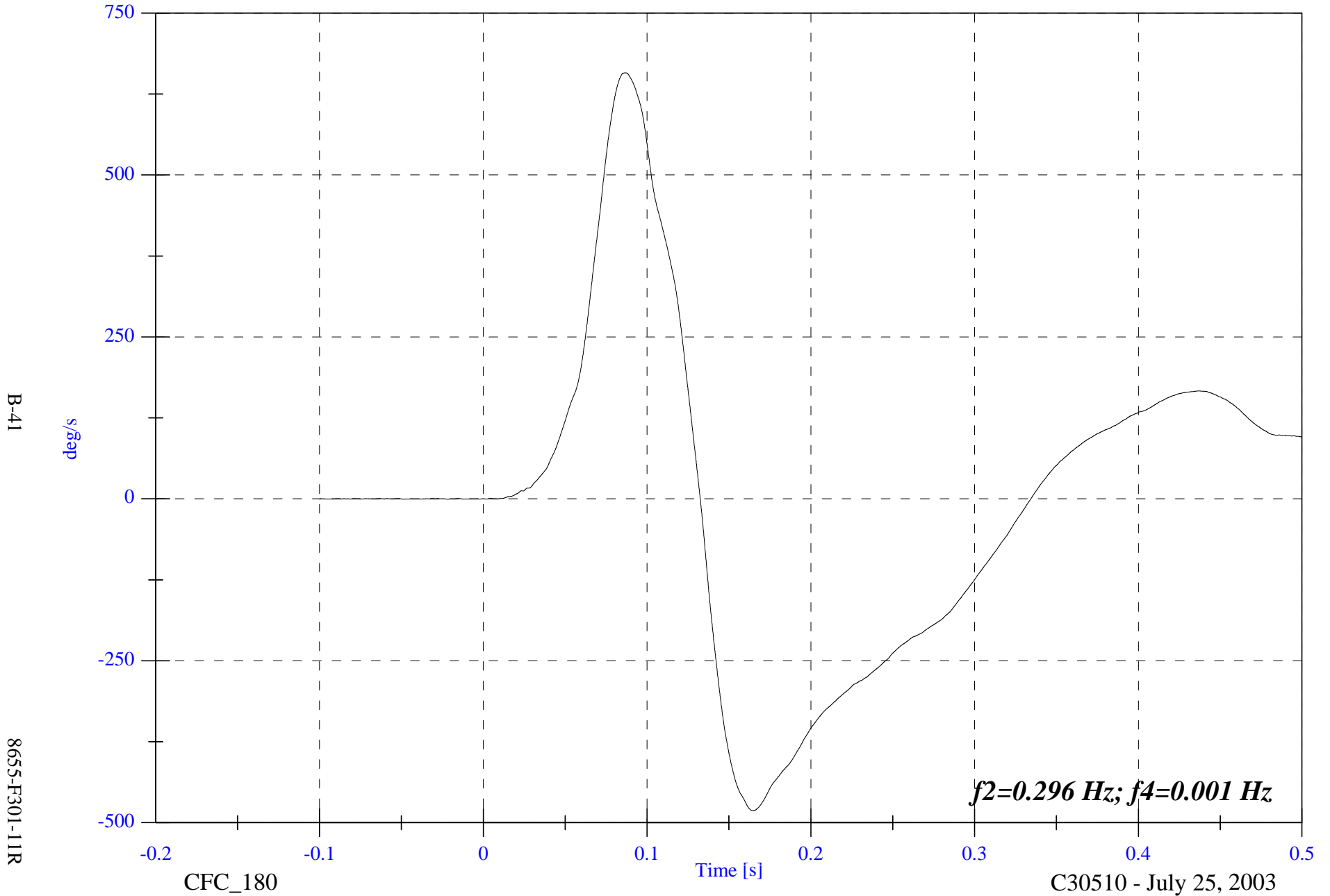
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Chest Comp Rotation AVy

Max: 657.7 [deg/s] at 0.087 [s]

Min: -481.5 [deg/s] at 0.165 [s]



2003 FMVSS 301 Test 2 2003 Saab 9-3

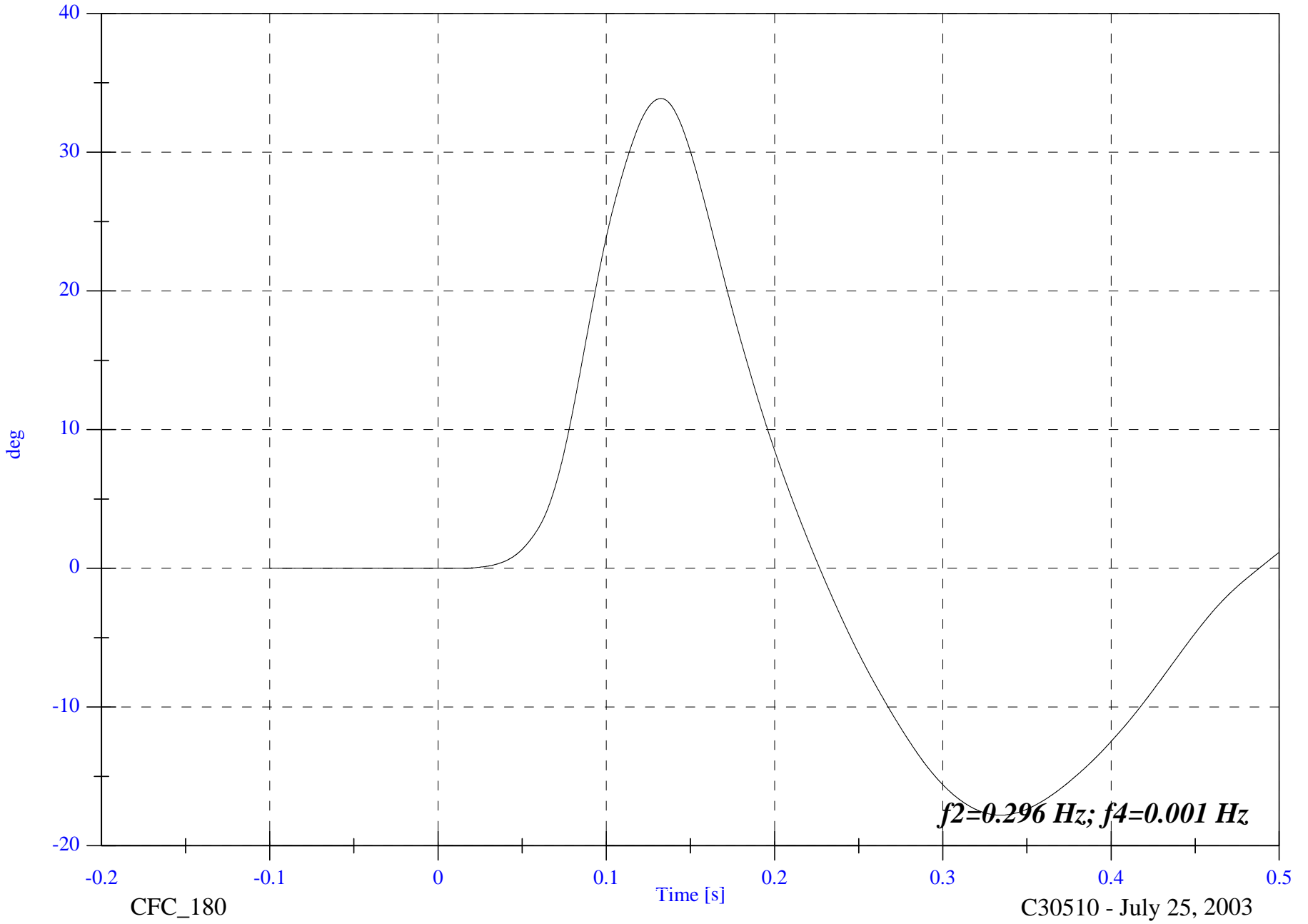
V2P1 Chest Comp Rotation ADy

Max: 33.9 [deg] at 0.133 [s]

Min: -17.8 [deg] at 0.334 [s]

B-42

8655-F301-11R

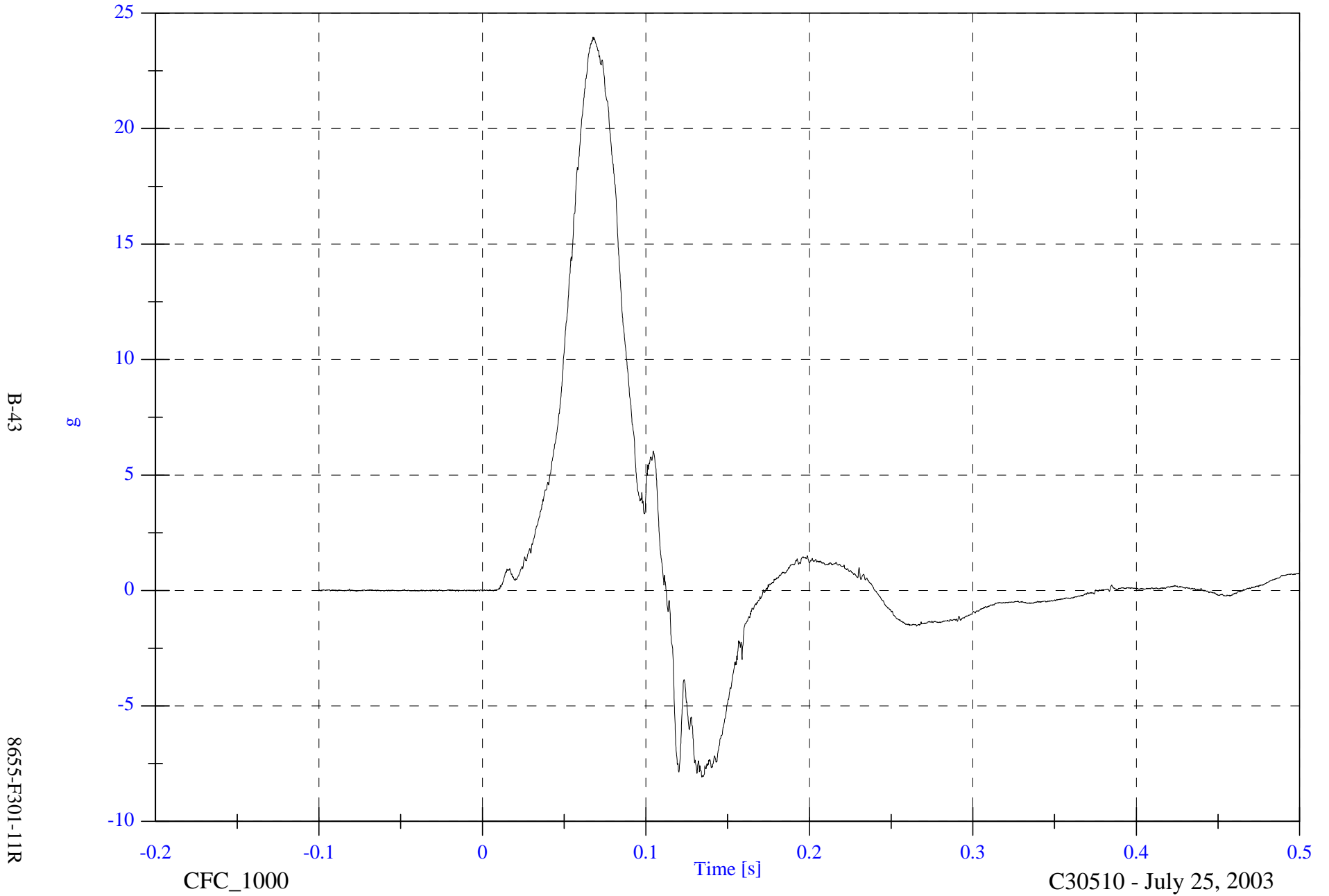


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Pelvic x

Max: 24.0 [g] at 0.068 [s]

Min: -8.1 [g] at 0.134 [s]



B-43

8655-F301-11R

CFC\_1000

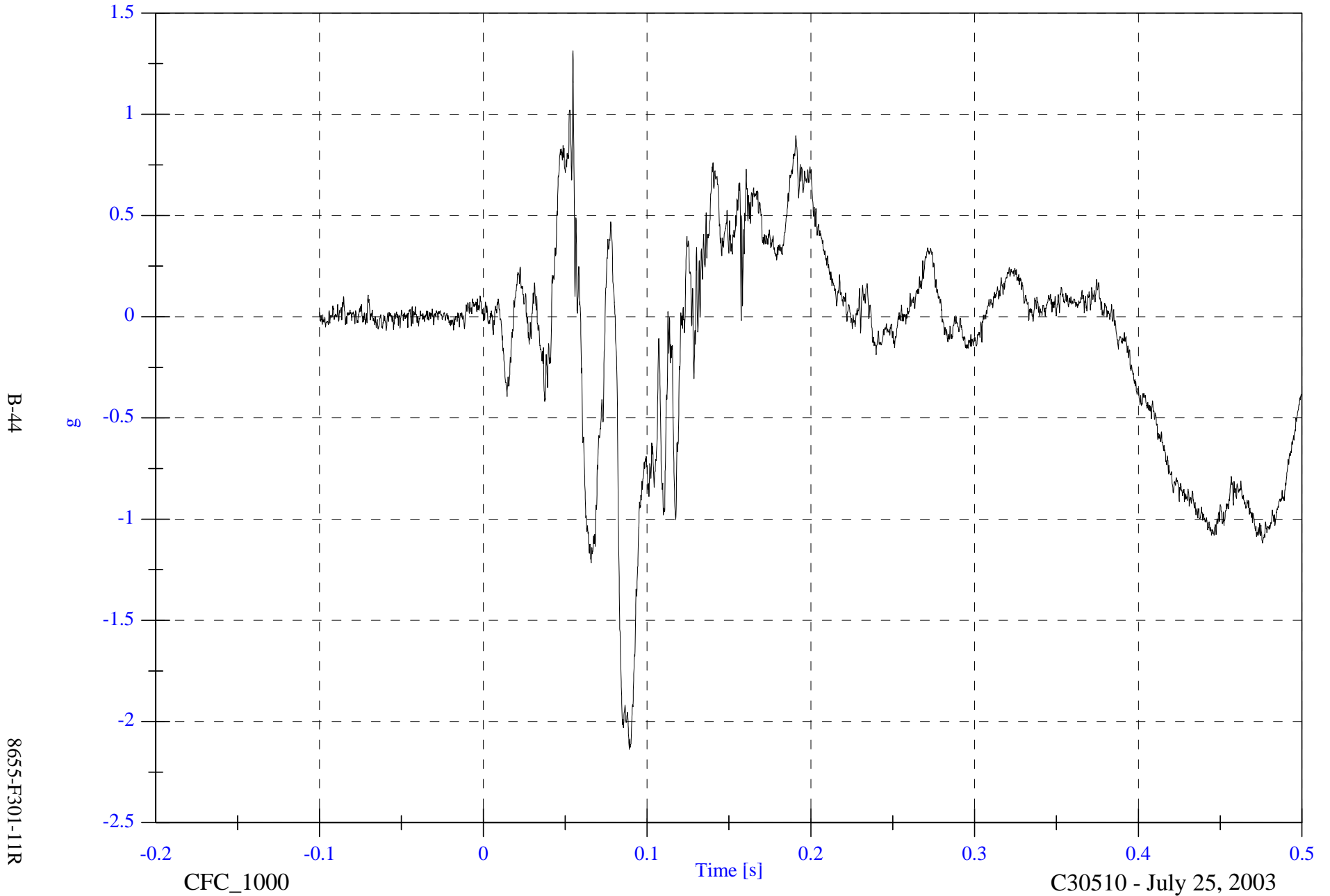
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Pelvic y

Max: 1.3 [g] at 0.055 [s]

Min: -2.1 [g] at 0.089 [s]

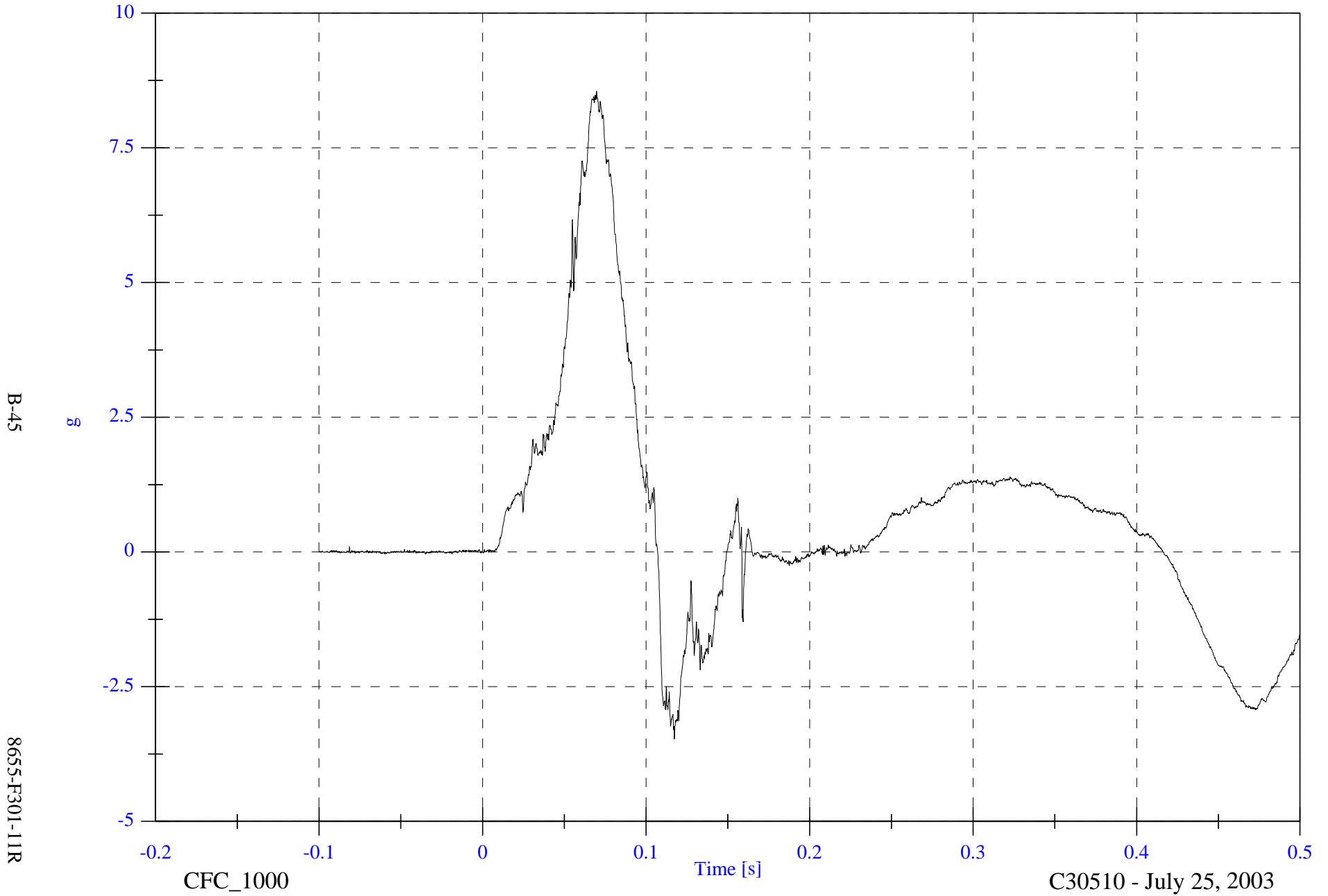


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Pelvic z

Max: 8.5 [g] at 0.070 [s]

Min: -3.5 [g] at 0.117 [s]



B-45

8655-F301-11R

CFC\_1000

Time [s]

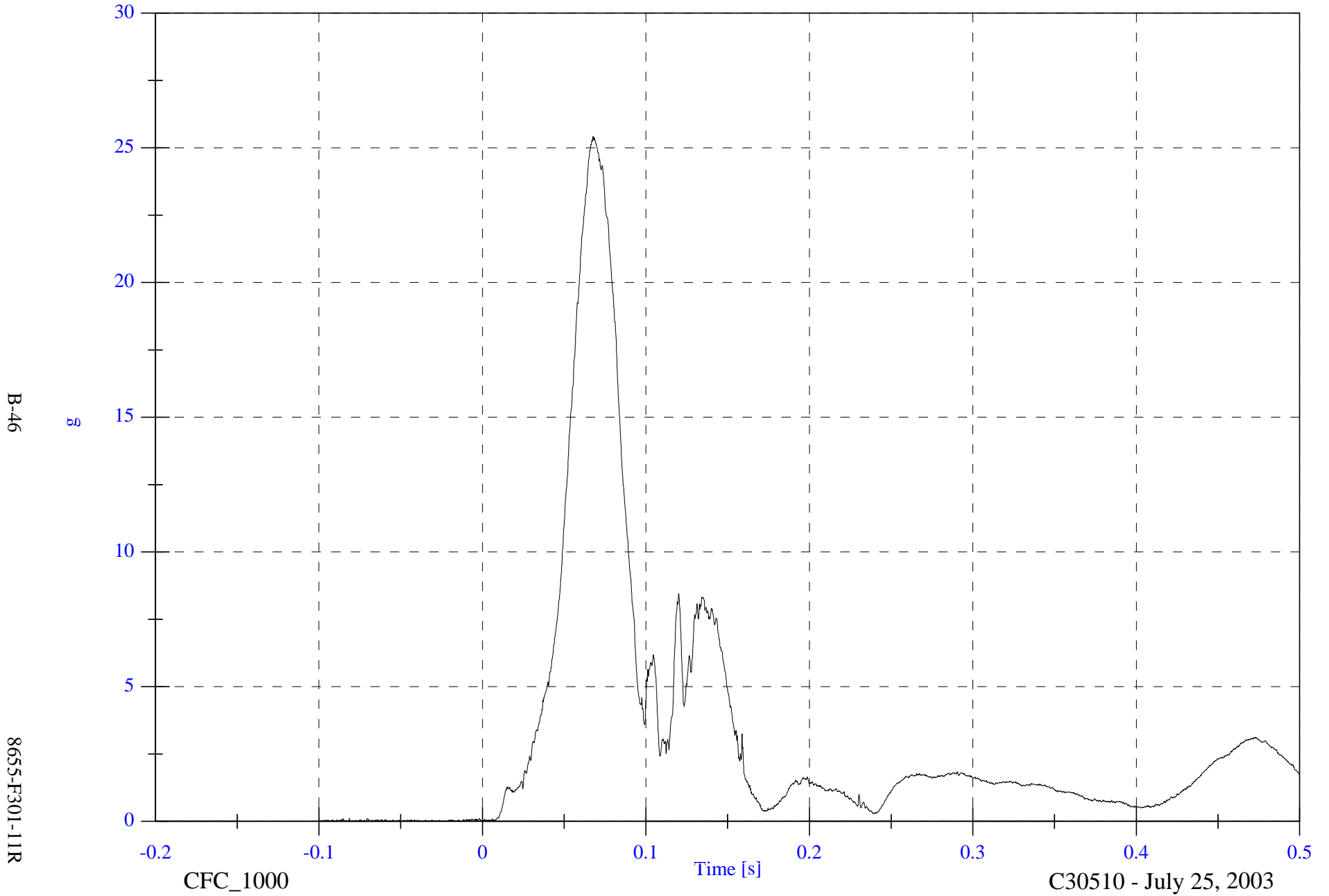
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Pelvic Resultant

Max: 25.4 [g] at 0.068 [s]

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



B-46

8655-F301-11R

CFC\_1000

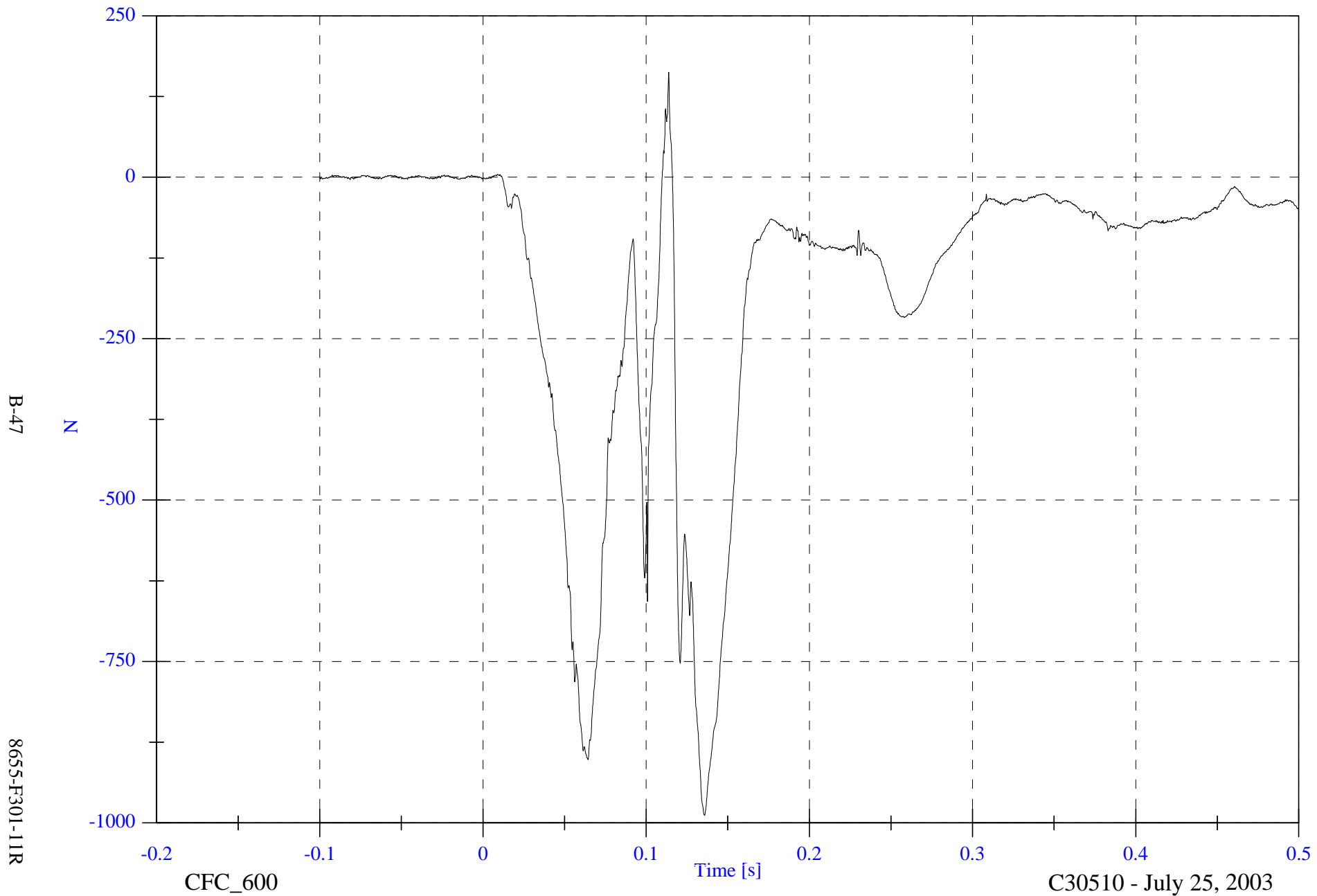
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 162.6 [N] at 0.114 [s]

Min: -988.4 [N] at 0.136 [s]

V2P1 Left Femur



B-47

N

8655-F301-11R

CFC\_600

Time [s]

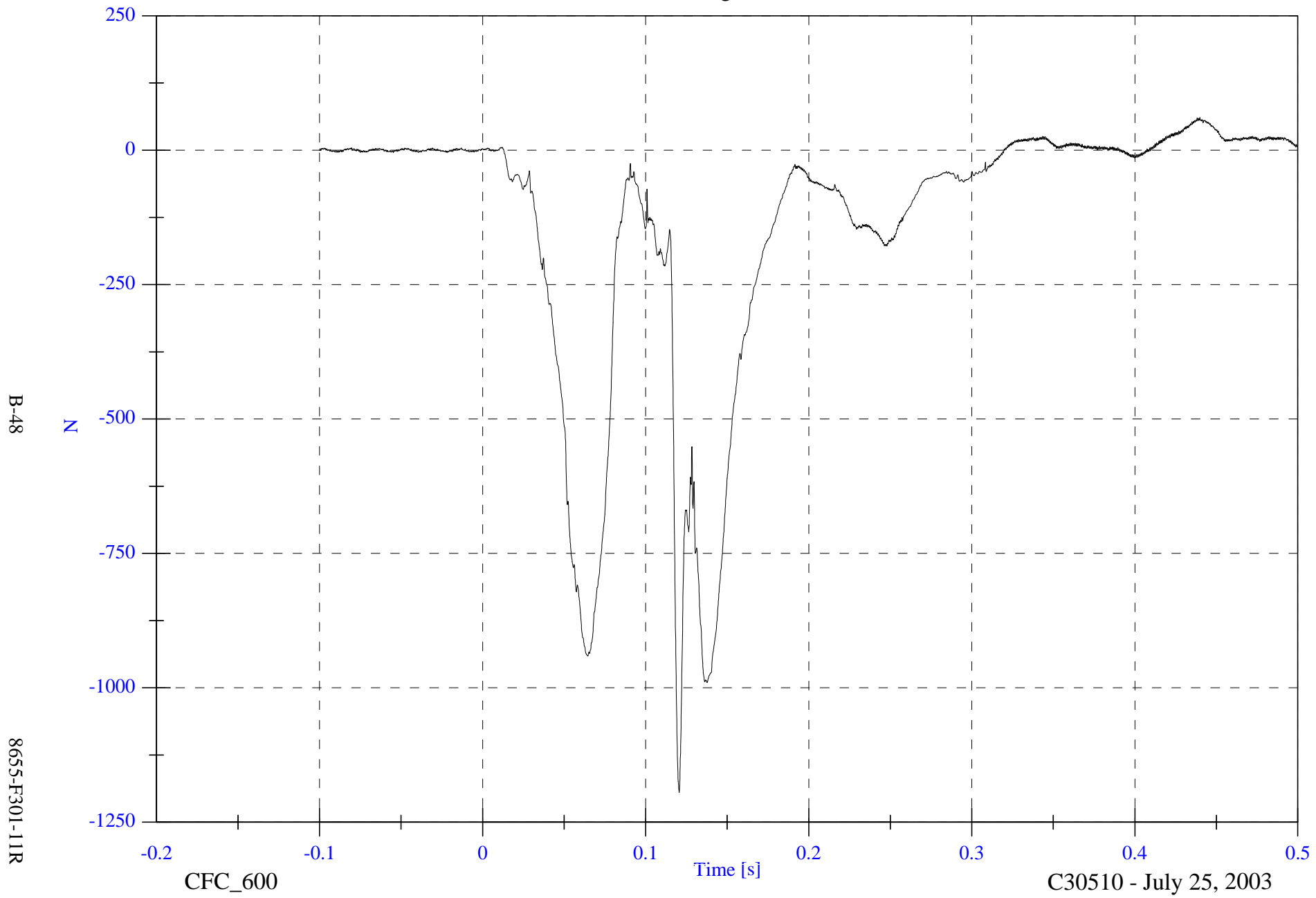
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Right Femur

Max: 60.8 [N] at 0.440 [s]

Min: -1195.0 [N] at 0.121 [s]



B-48

8655-F301-11R

CFC\_600

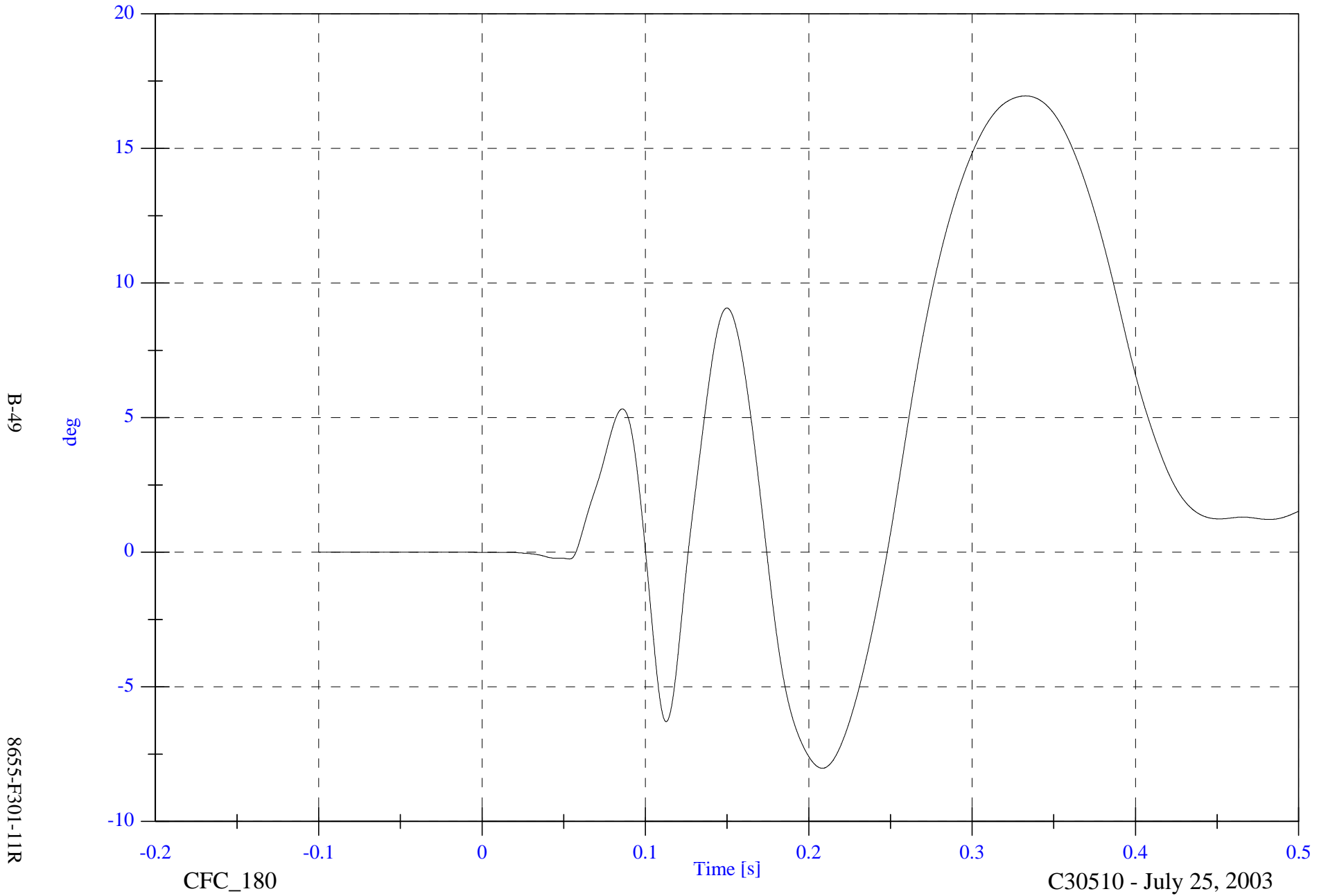
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Head to Chest

Max: 16.9 [deg] at 0.333 [s]

Min: -8.0 [deg] at 0.208 [s]



B-49

8655-F301-11R

CFC\_180

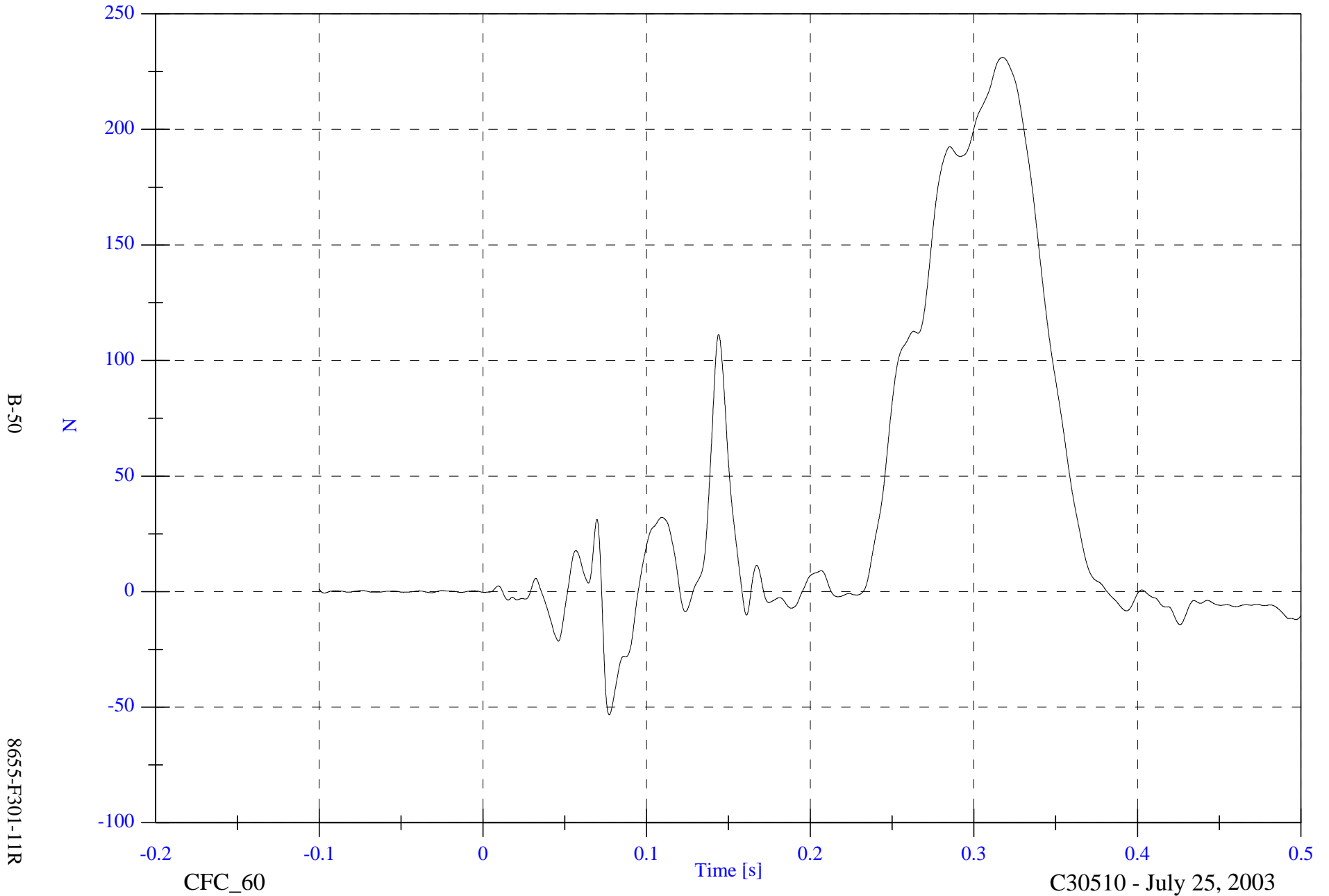
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P1 Lap Belt

Max: 231.1 [N] at 0.317 [s]

Min: -53.3 [N] at 0.077 [s]



B-50

N

8655-F301-11R

CFC\_60

Time [s]

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

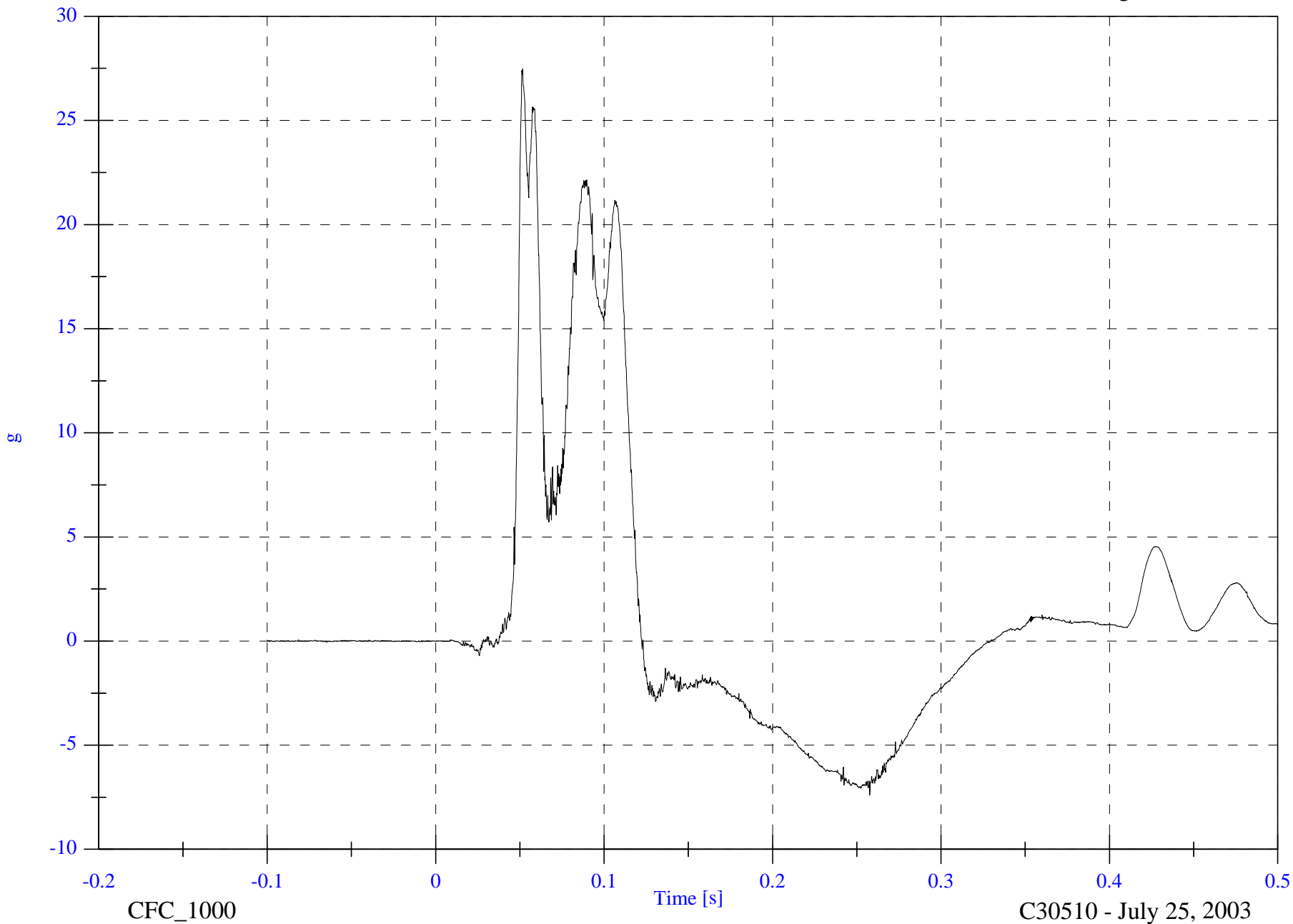
V2P2 Head Ax

Max: 27.5 [g] at 0.052 [s]

Min: -7.4 [g] at 0.258 [s]

B-51

8655-F301-11R



CFC\_1000

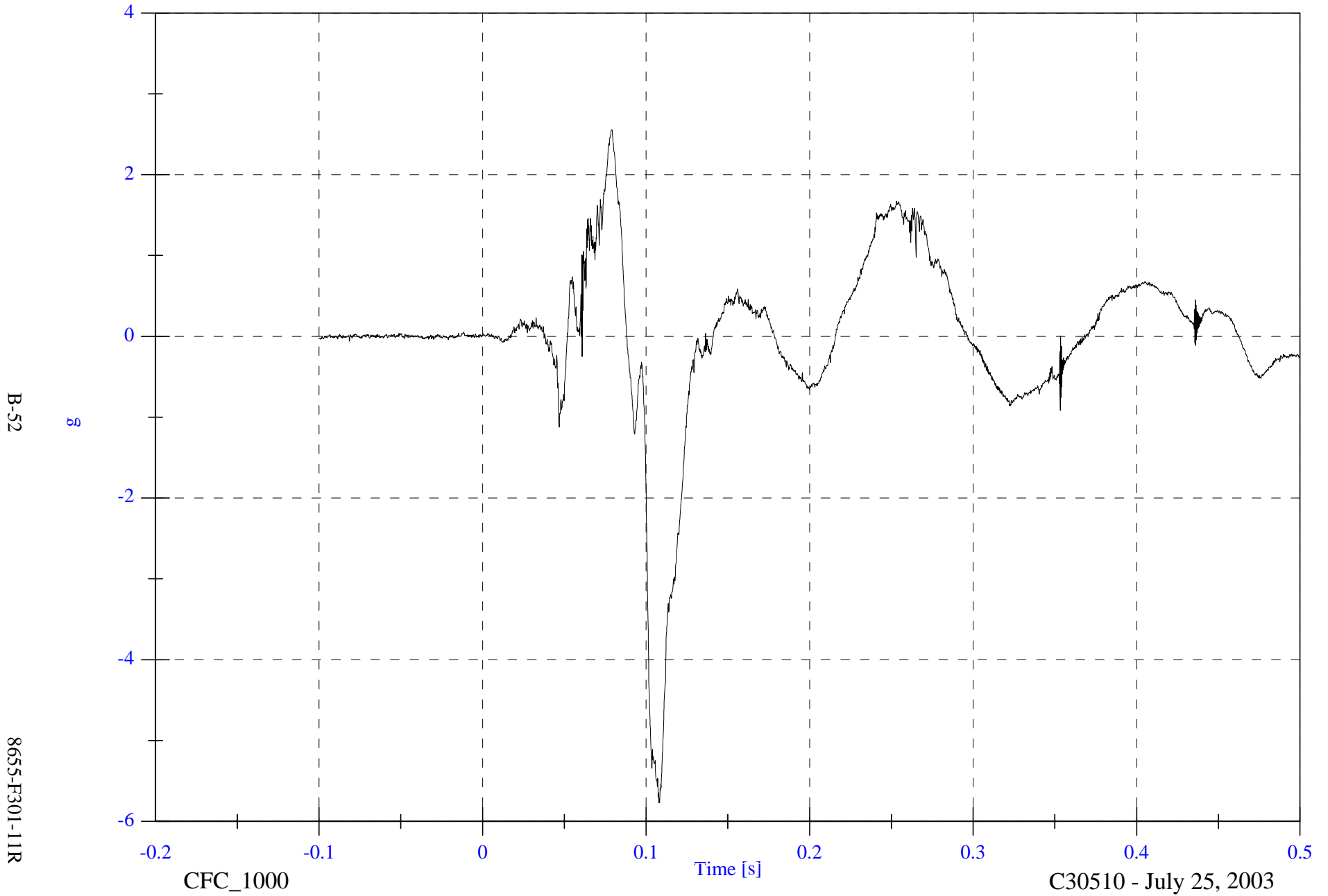
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Head Ay

Max: 2.6 [g] at 0.079 [s]

Min: -5.8 [g] at 0.108 [s]

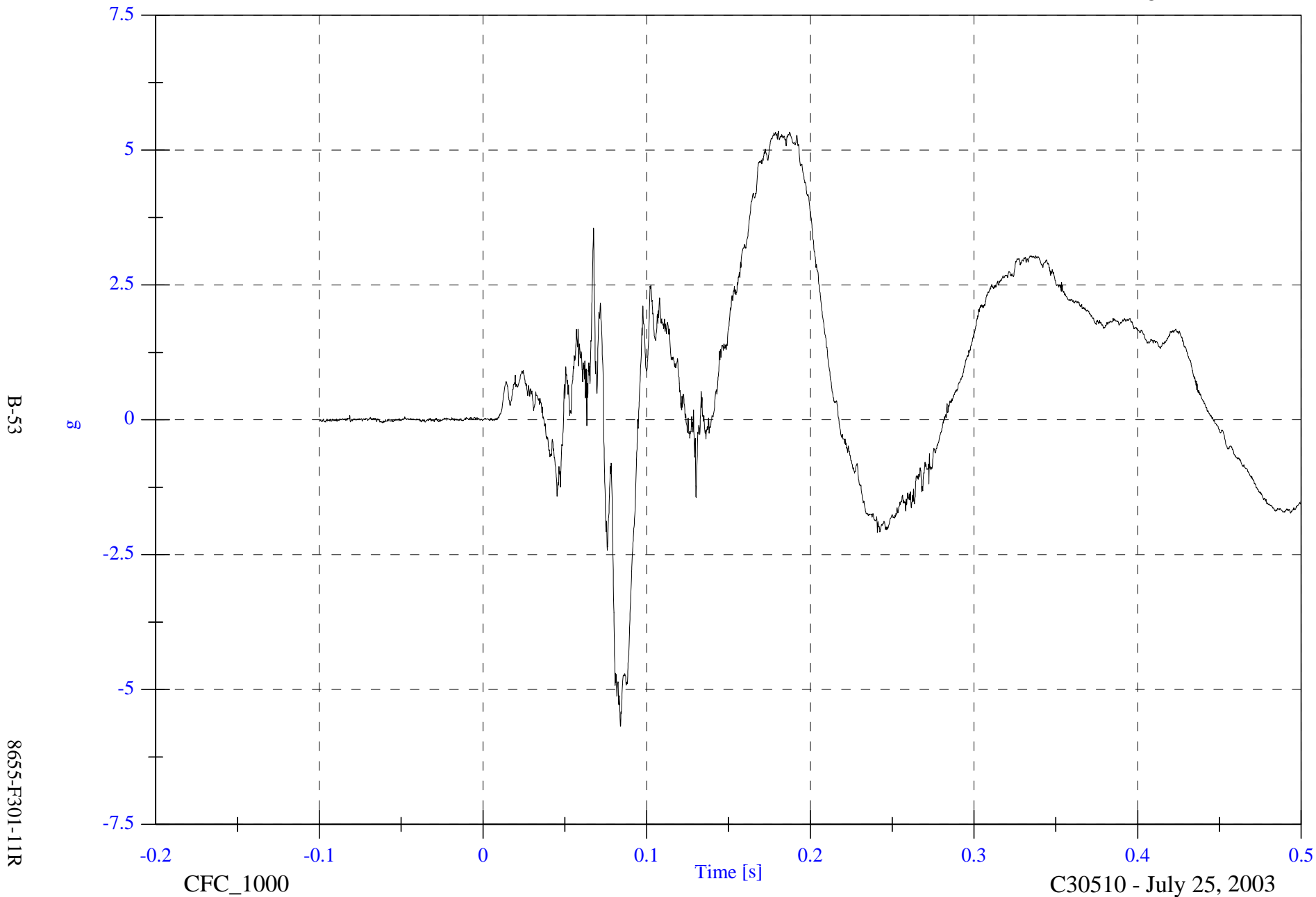


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Head Az

Max: 5.4 [g] at 0.180 [s]

Min: -5.7 [g] at 0.084 [s]



B-53

8655-F301-11R

CFC\_1000

Time [s]

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

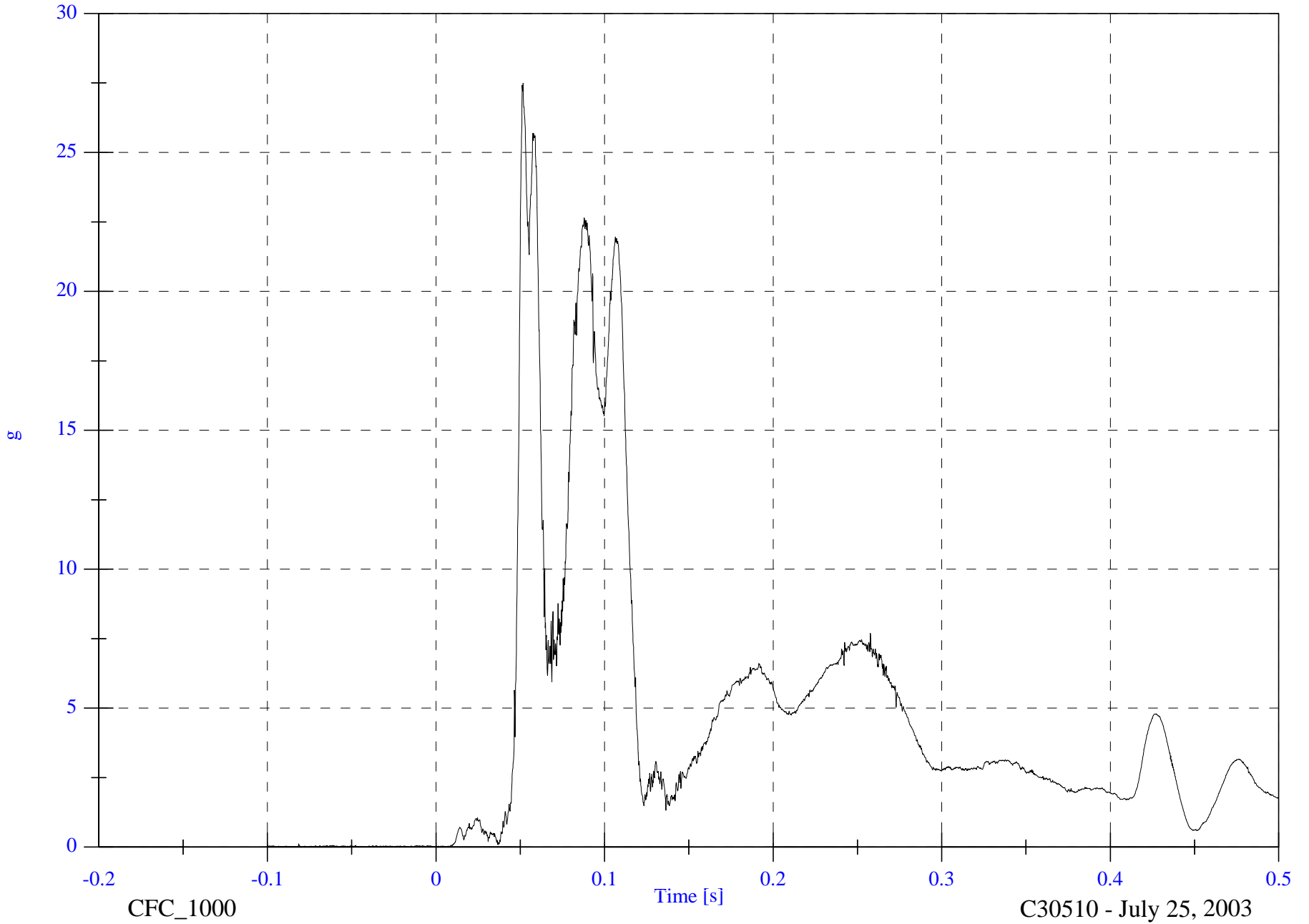
V2P2 Head A Resultant

Max: 27.5 [g] at 0.052 [s]

Min: 0.0 [g] at -0.090 [s]

B-54

8655-F301-11R

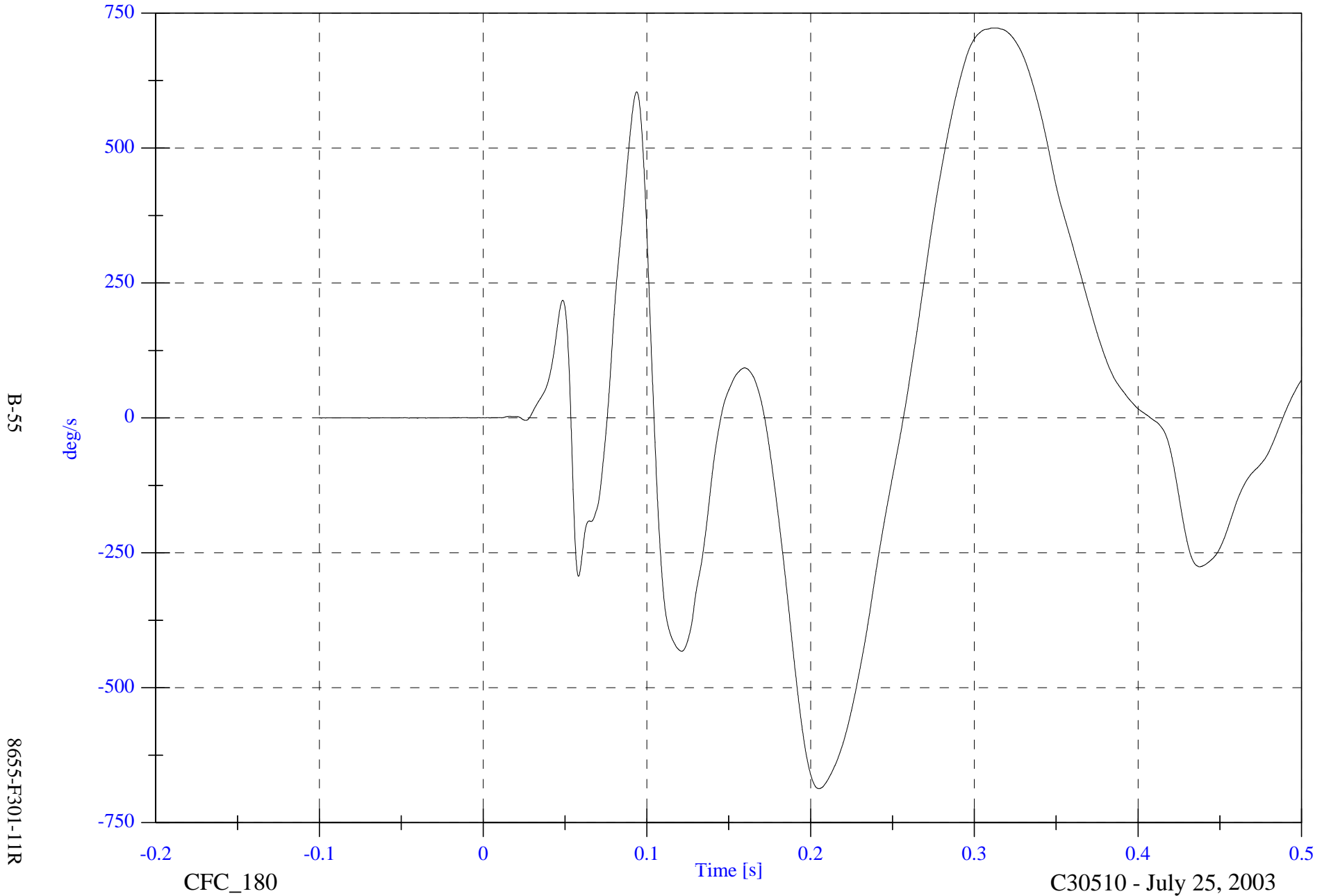


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Head Rotation AVy

Max: 722.5 [deg/s] at 0.313 [s]

Min: -686.9 [deg/s] at 0.205 [s]



B-55

8655-F301-11R

CFC\_180

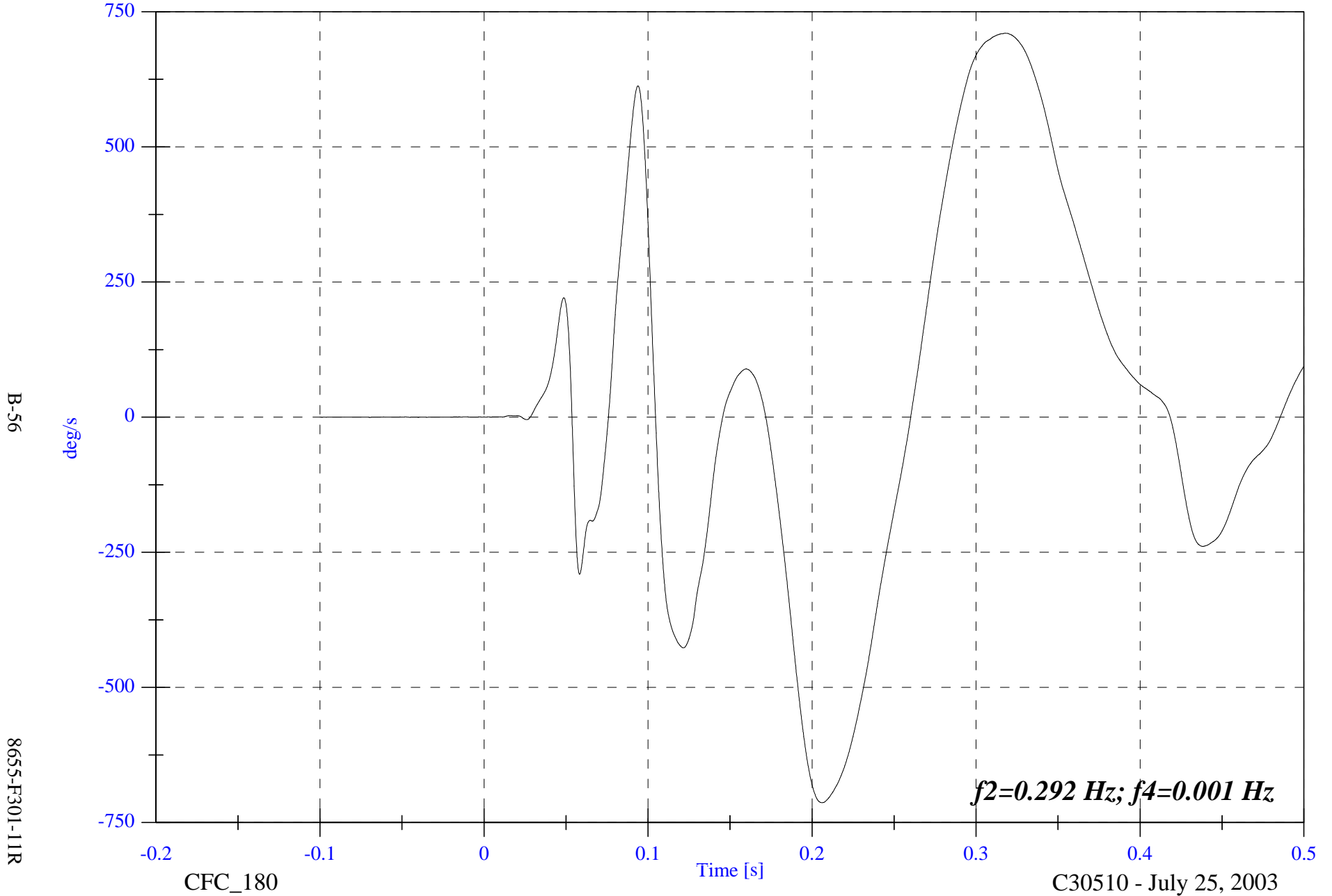
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Head Comp Rotation AVy

Max: 710.2 [deg/s] at 0.318 [s]

Min: -713.3 [deg/s] at 0.206 [s]

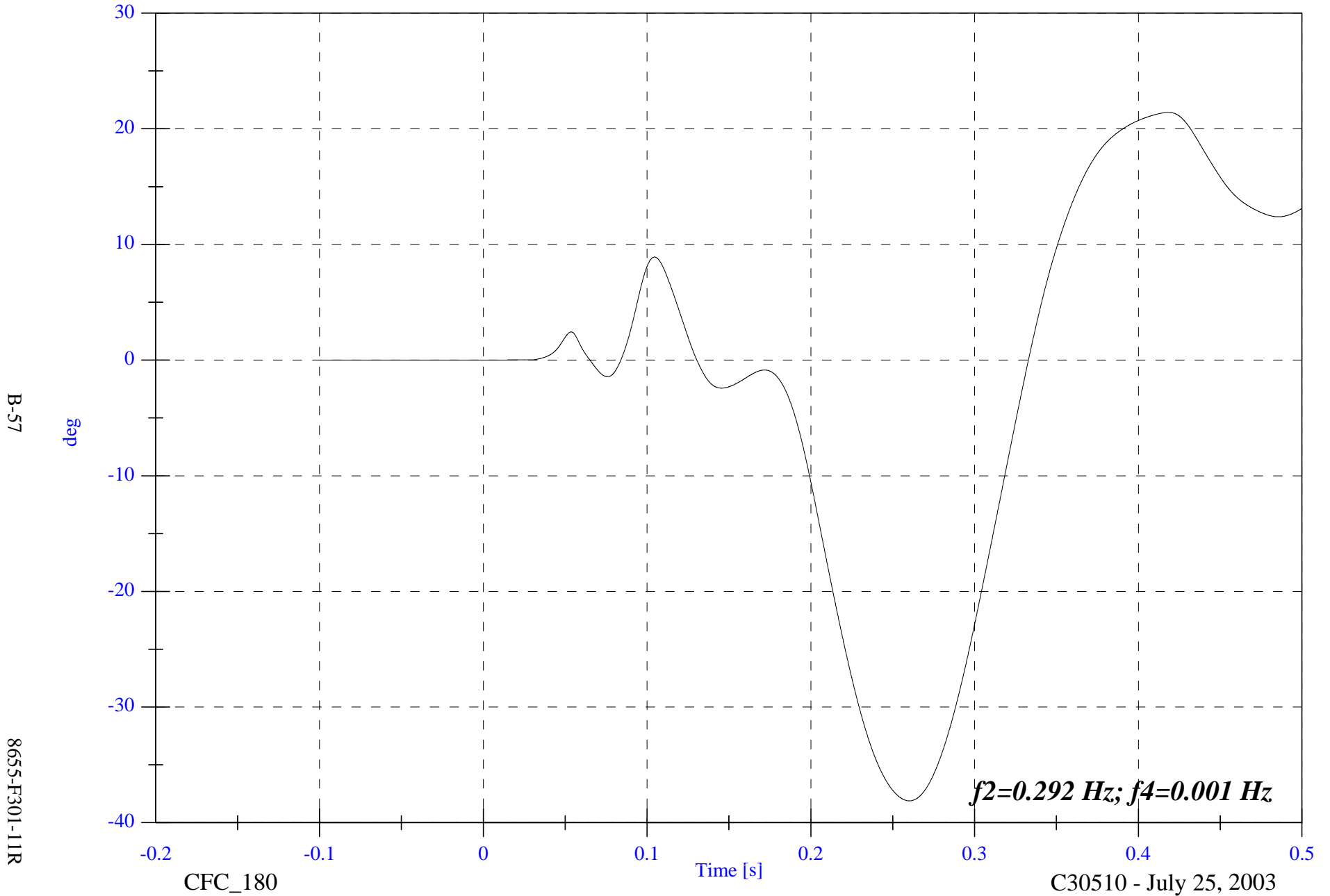


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Head Comp Rotation ADy

Max: 21.4 [deg] at 0.418 [s]

Min: -38.1 [deg] at 0.260 [s]



B-57

8655-F301-11R

CFC\_180

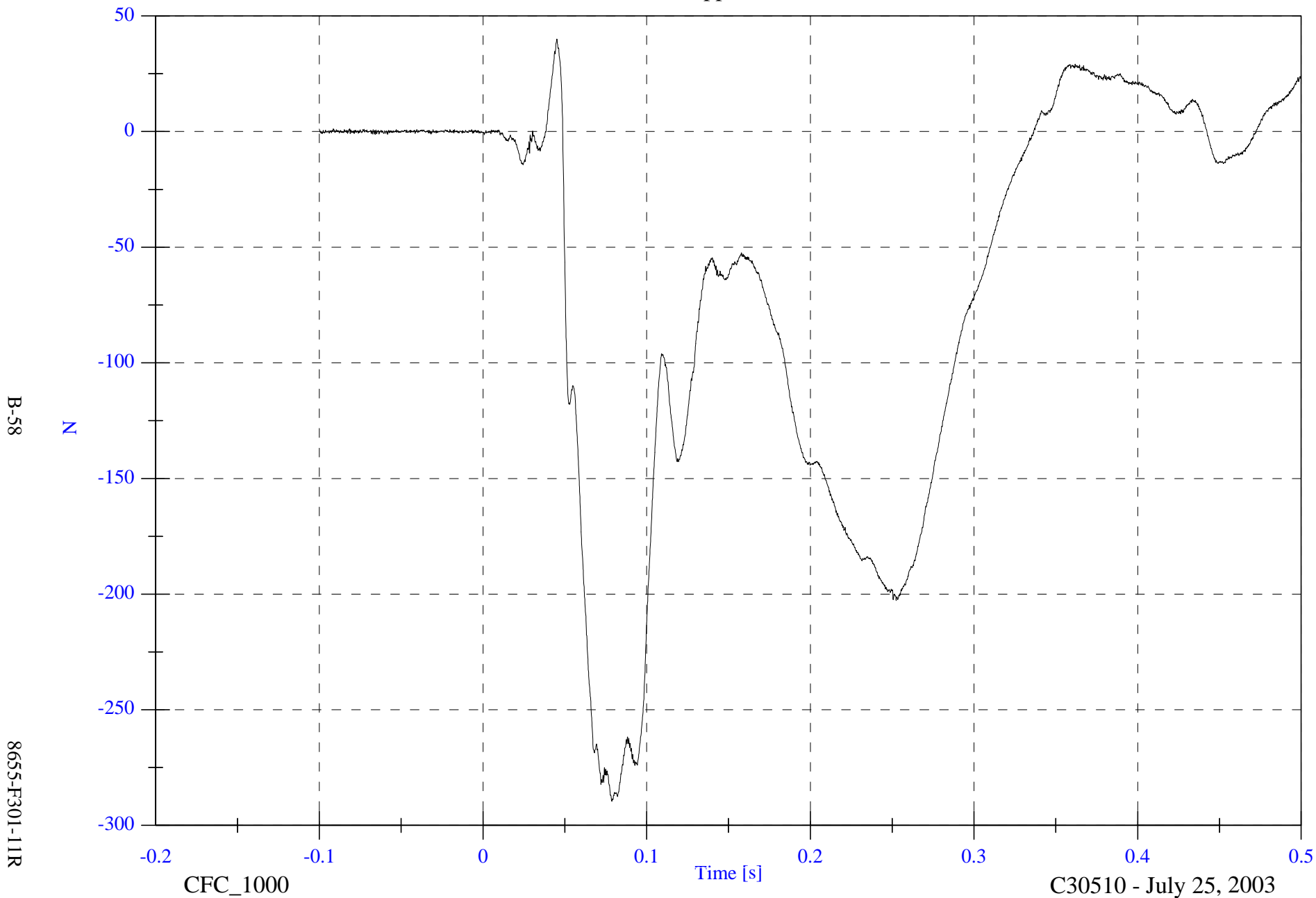
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Upper Neck Fx

Max: 40.0 [N] at 0.045 [s]

Min: -289.5 [N] at 0.079 [s]



B-58

N

8655-F301-11R

CFC\_1000

Time [s]

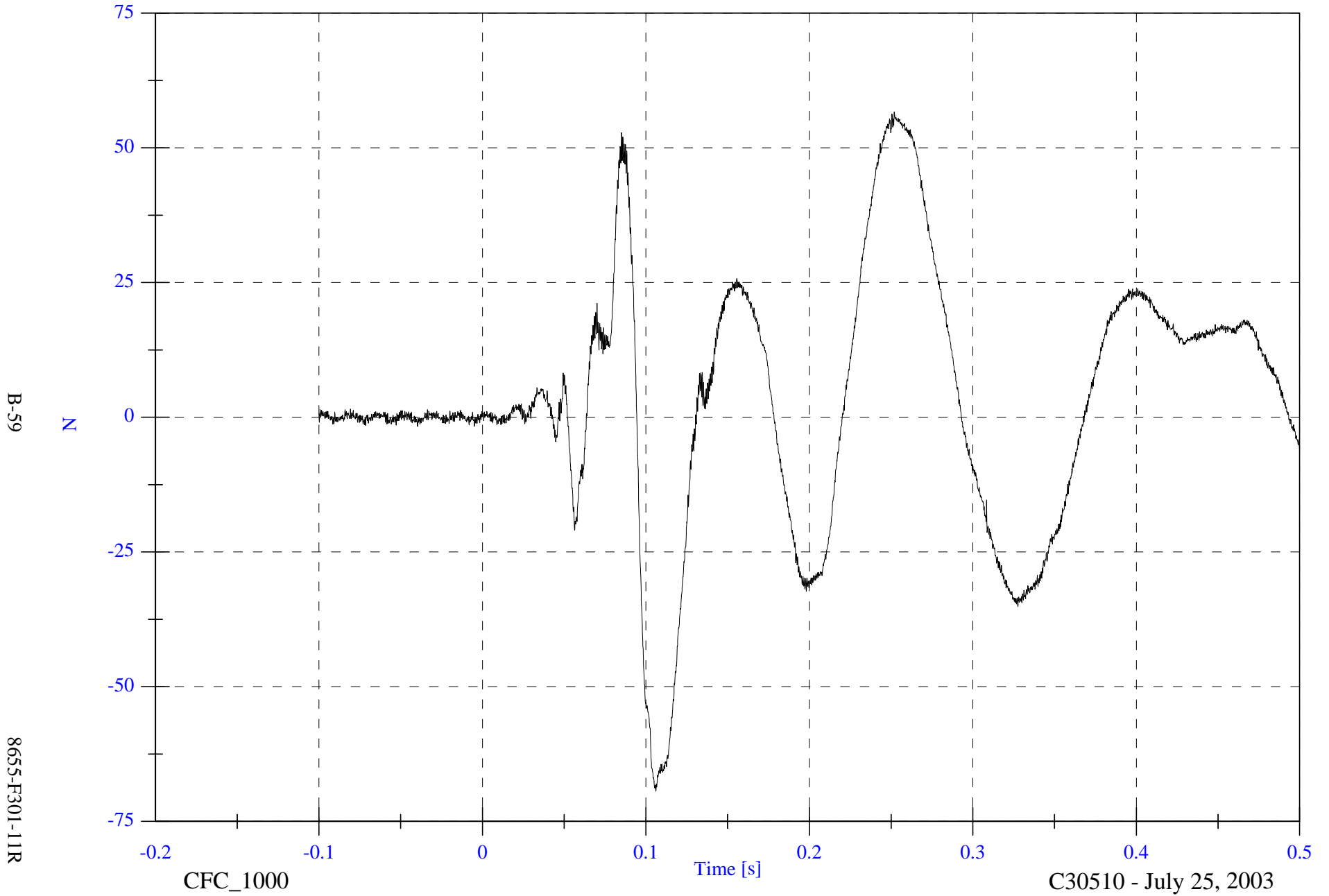
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Upper Neck Fy

Max: 56.7 [N] at 0.252 [s]

Min: -69.4 [N] at 0.106 [s]



B-59

8655-F301-11R

CFC\_1000

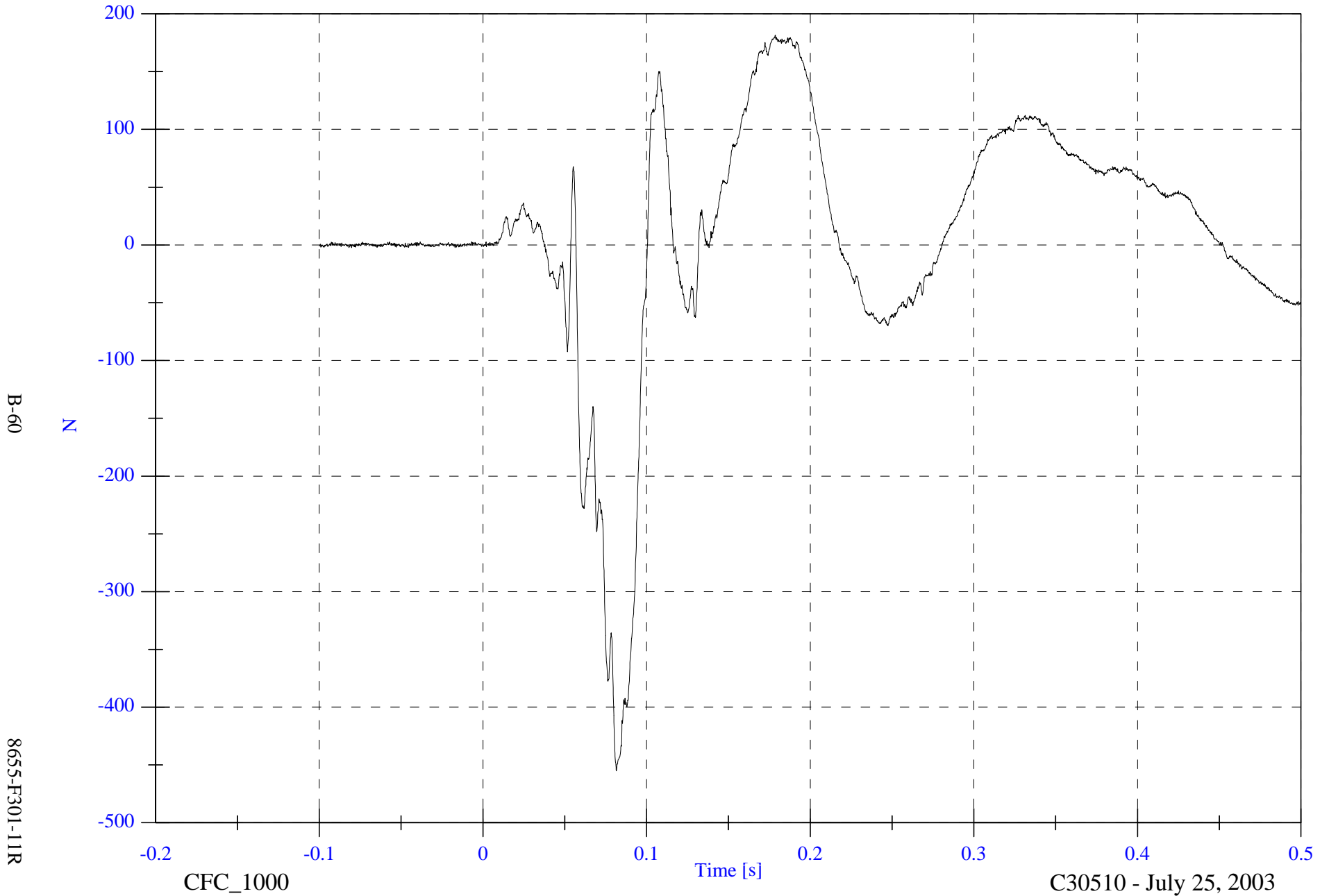
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 181.6 [N] at 0.179 [s]

Min: -455.0 [N] at 0.082 [s]

V2P2 Upper Neck Fz

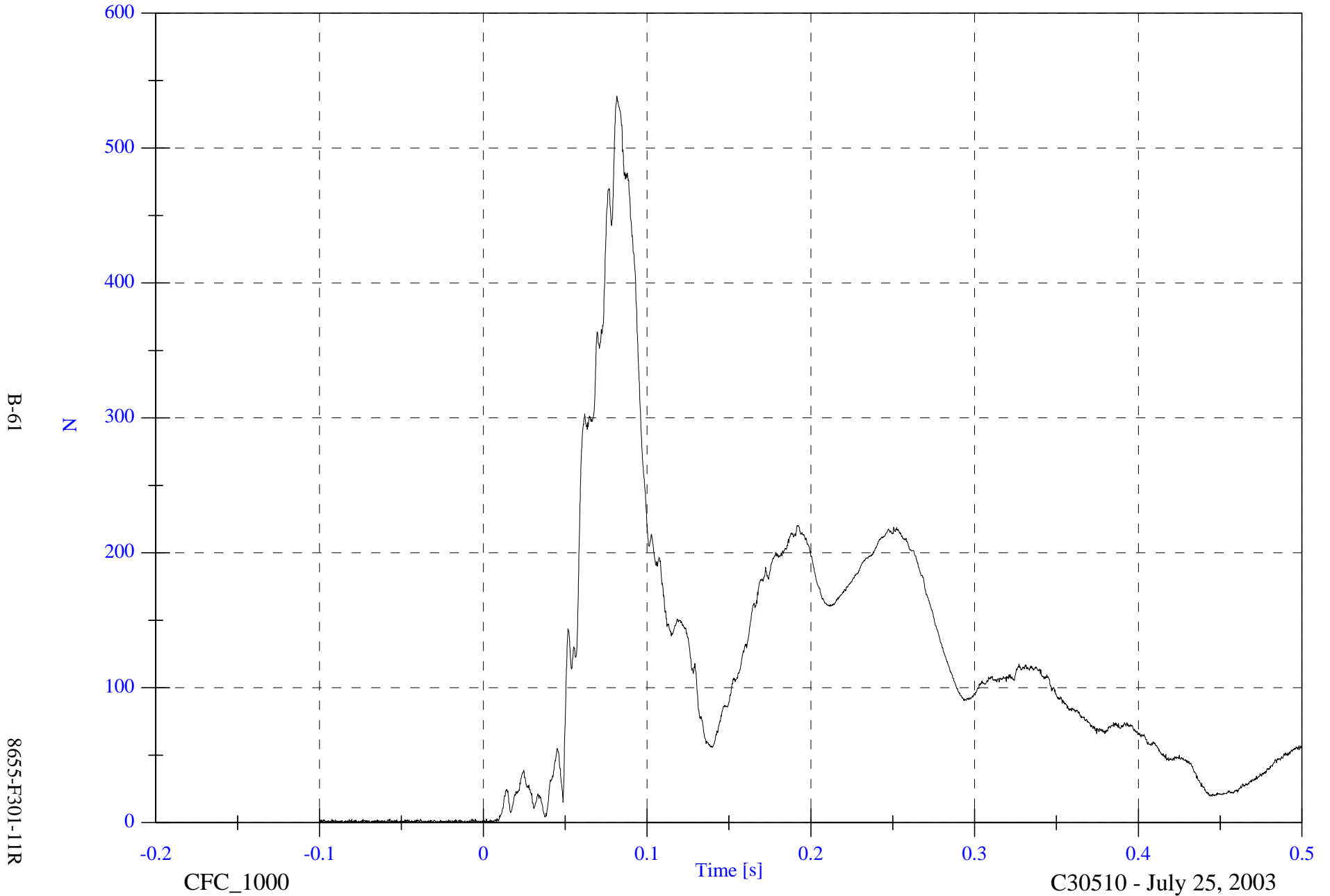


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Upper Neck F Resultant

Max: 538.6 [N] at 0.082 [s]

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



B-61

8655-F301-11R

CFC\_1000

Time [s]

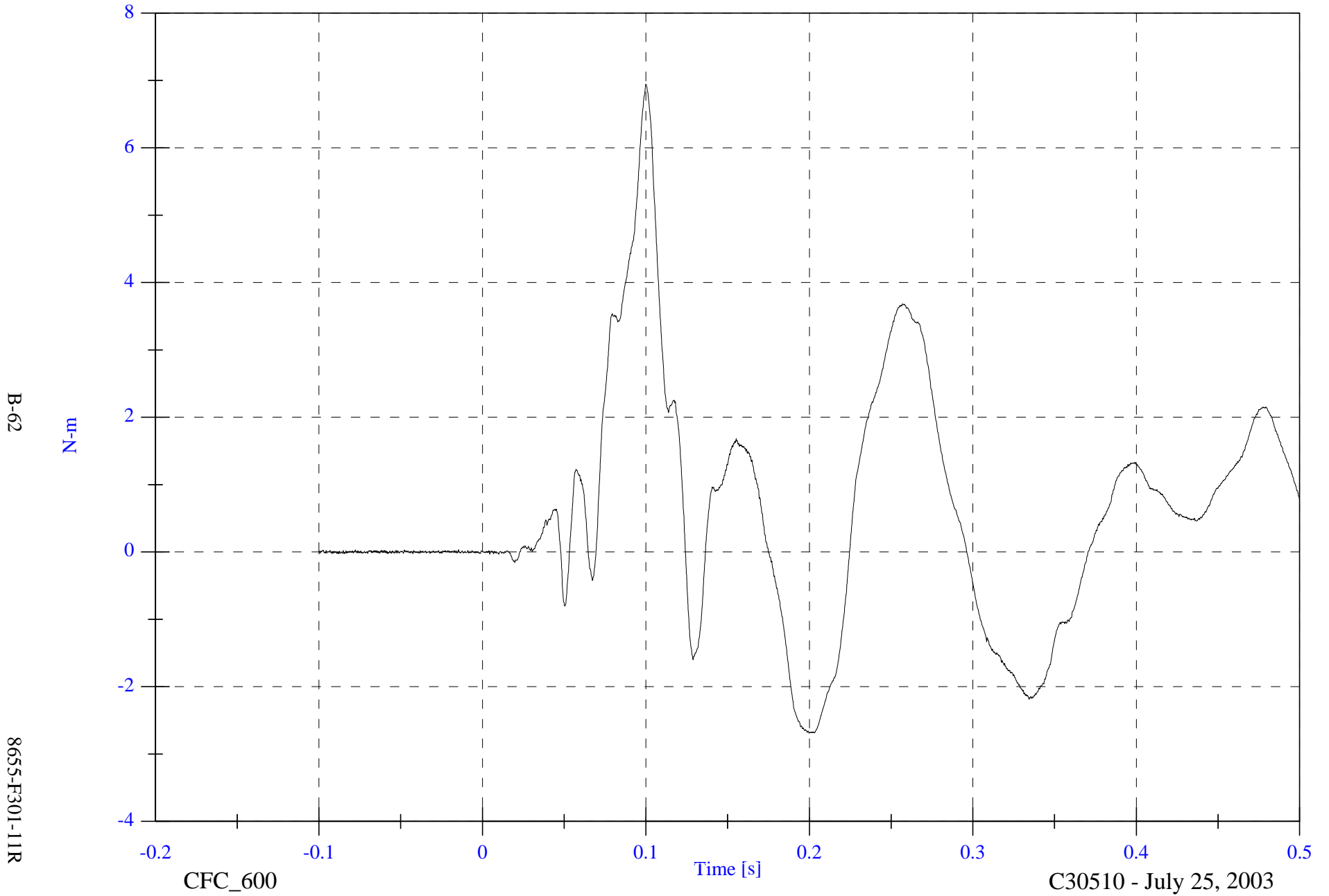
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 6.9 [N-m] at 0.100 [s]

Min: -2.7 [N-m] at 0.200 [s]

V2P2 Upper Neck Mx



B-62

8655-F301-11R

CFC\_600

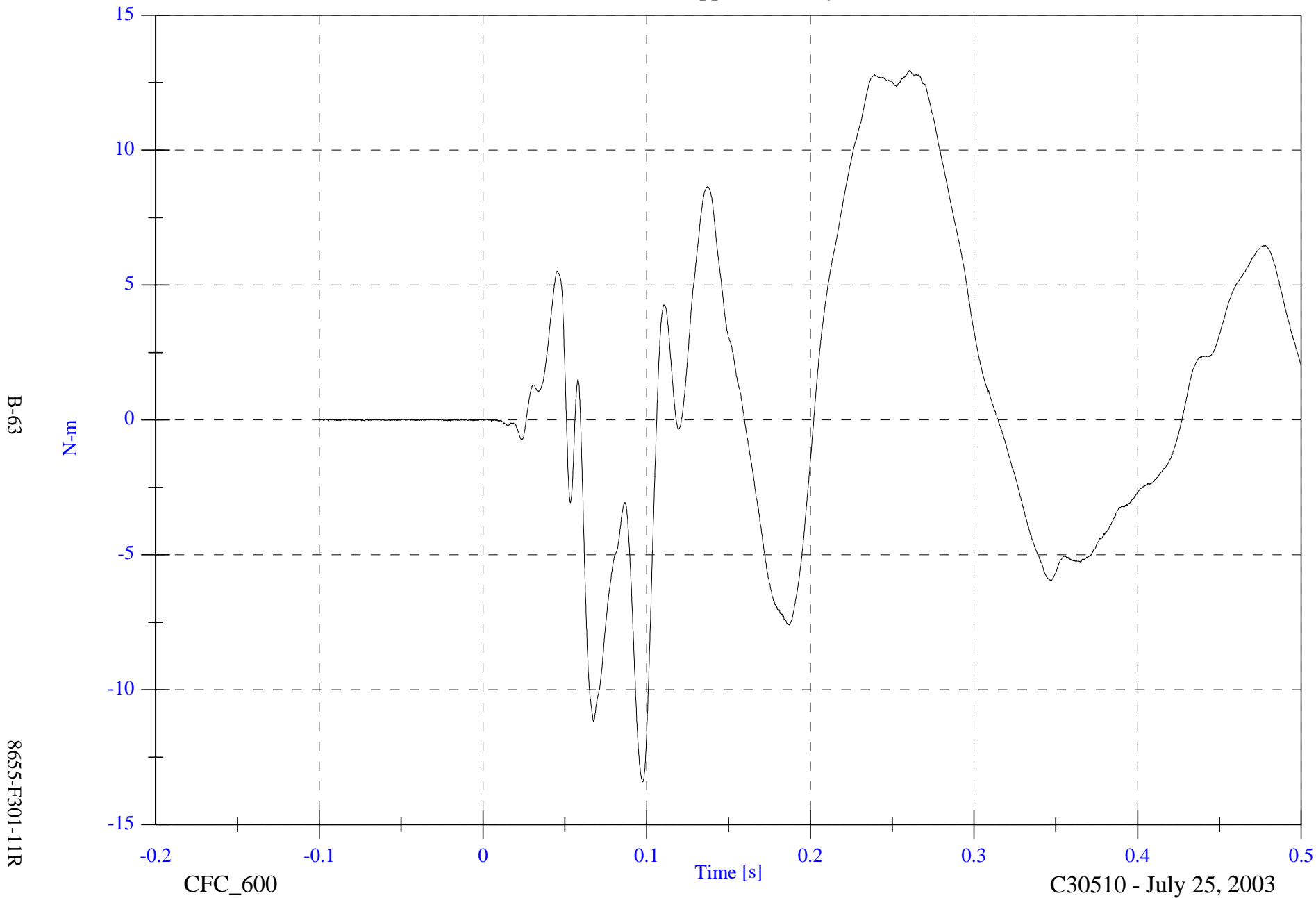
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Upper Neck My

Max: 13.0 [N-m] at 0.261 [s]

Min: -13.4 [N-m] at 0.098 [s]



B-63

8655-F301-11R

CFC\_600

Time [s]

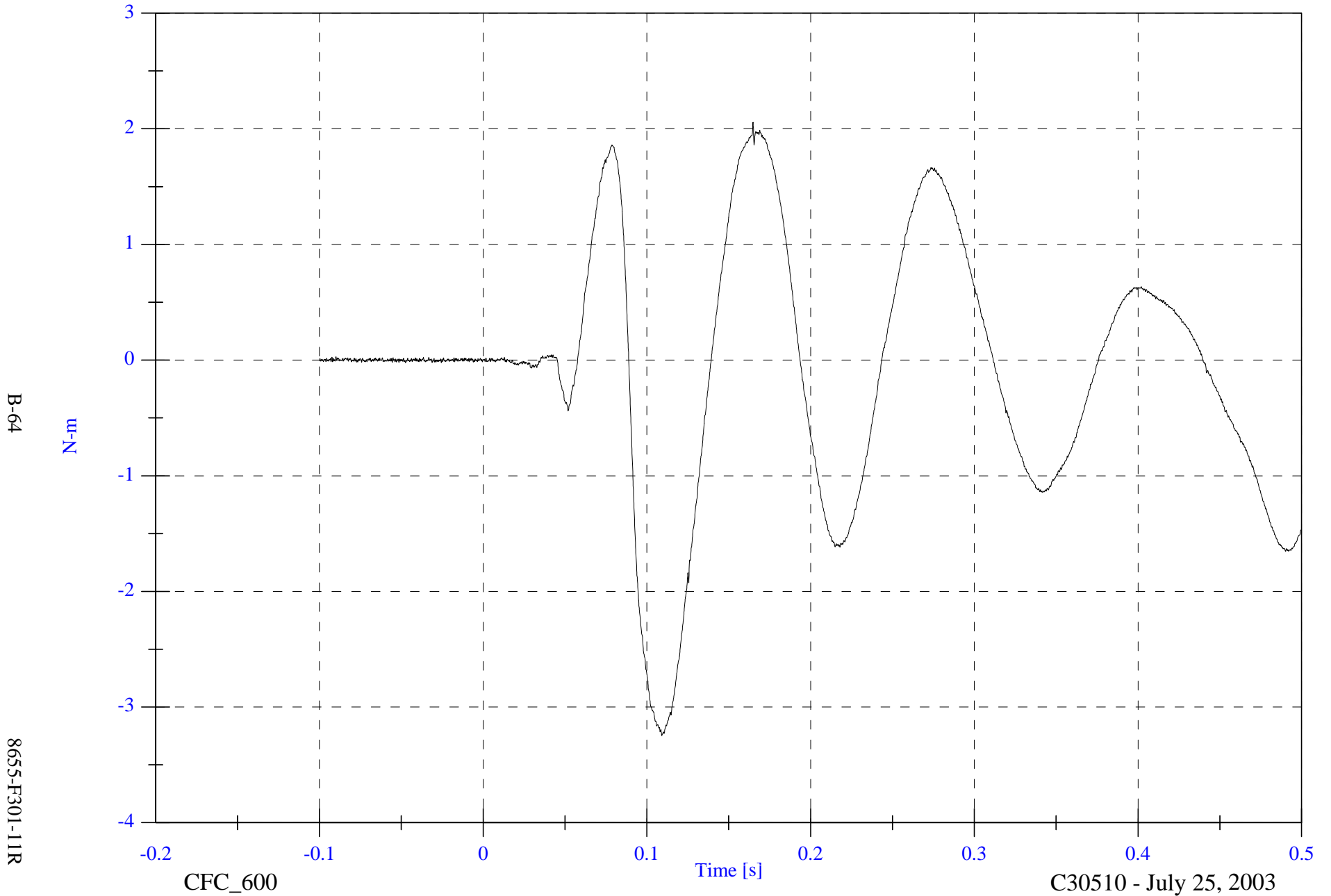
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 2.1 [N-m] at 0.165 [s]

Min: -3.2 [N-m] at 0.109 [s]

V2P2 Upper Neck Mz



B-64

8655-F301-11R

CFC\_600

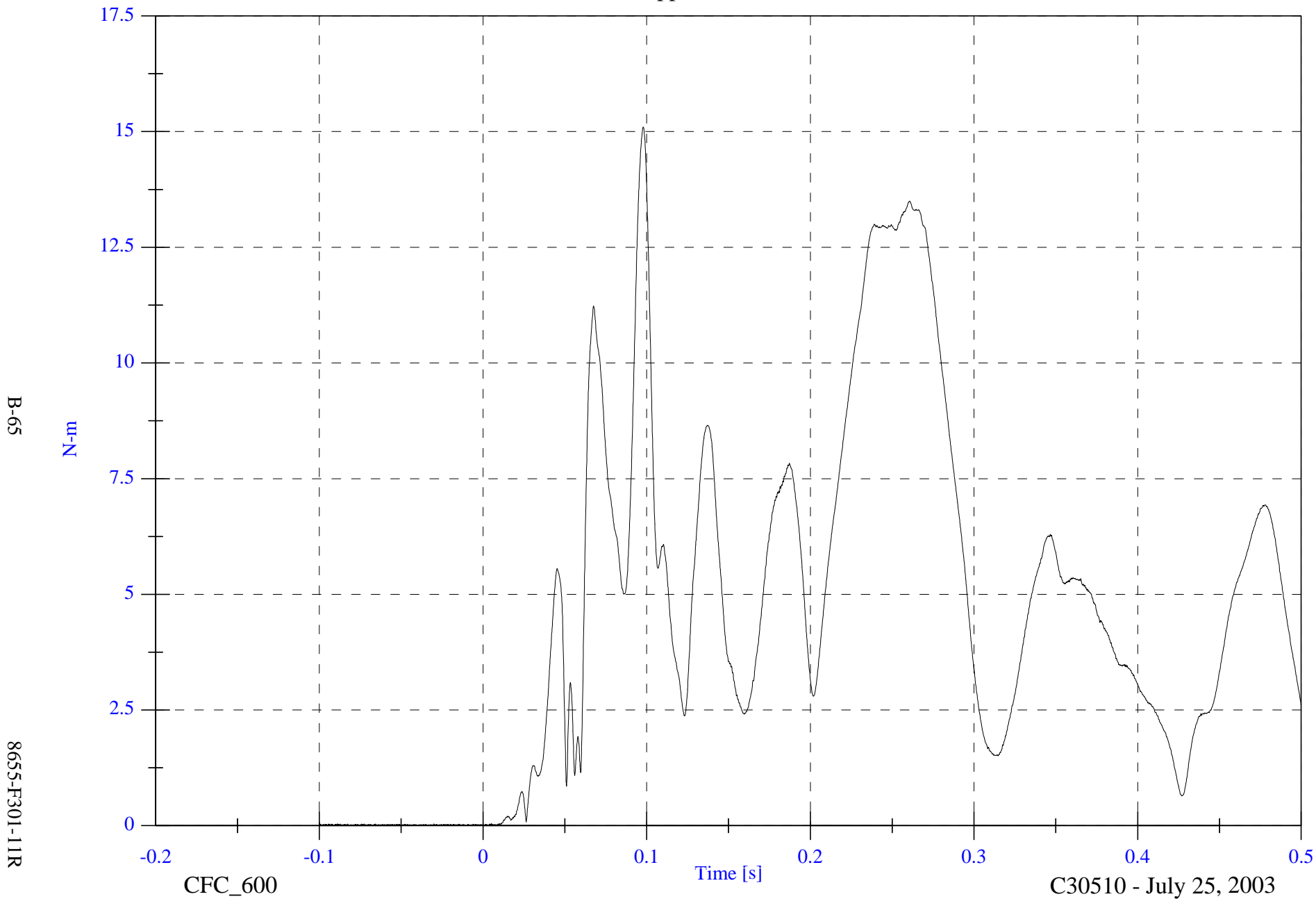
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Upper Neck M Resultant

Max: 15.1 [N-m] at 0.098 [s]

Min: 0.0 [N-m] at -0.014 [s]



B-65

8655-F301-11R

CFC\_600

Time [s]

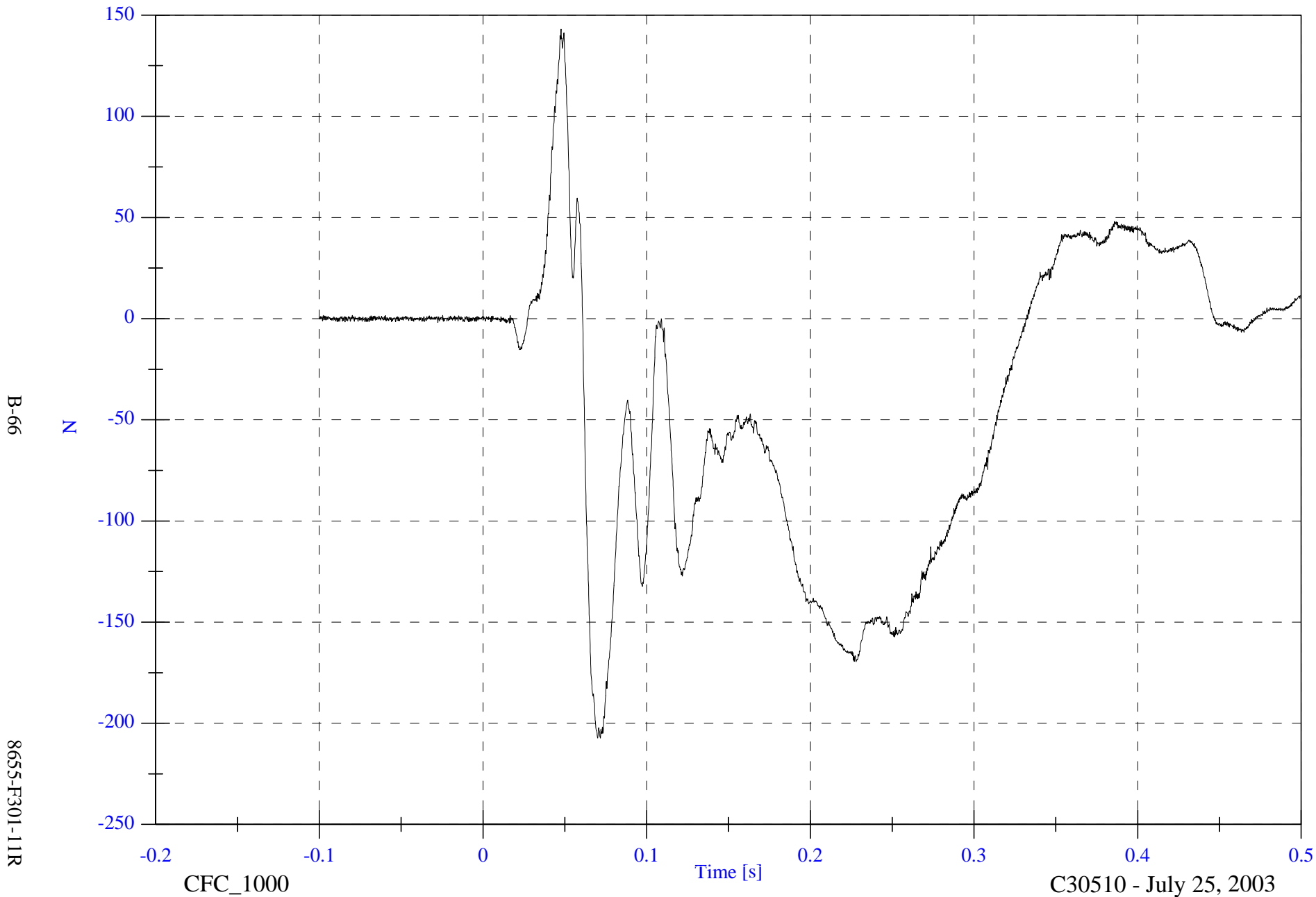
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lower Neck Fx

Max: 143.1 [N] at 0.048 [s]

Min: -207.4 [N] at 0.072 [s]



B-66

8655-F301-11R

CFC\_1000

Time [s]

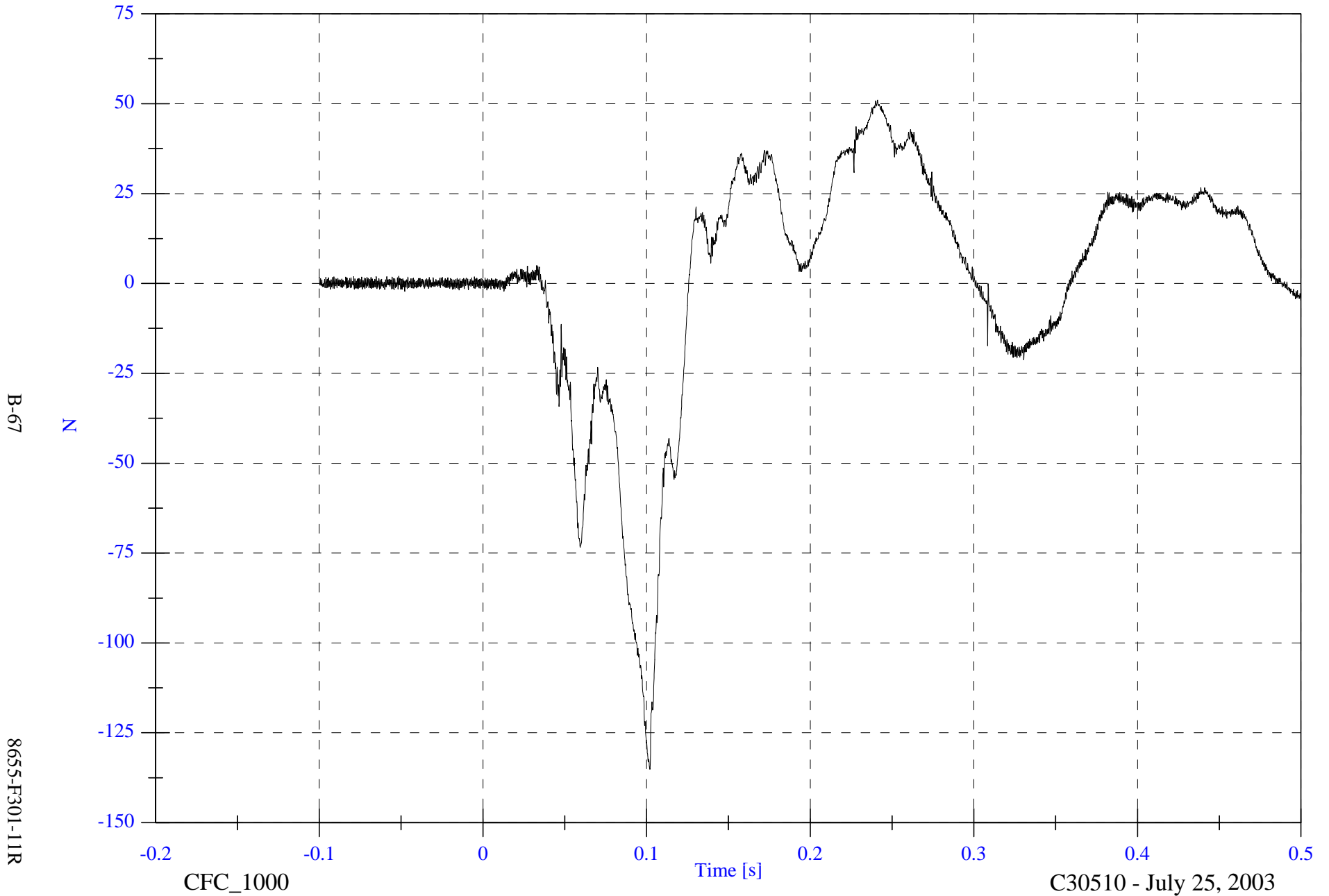
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lower Neck Fy

Max: 51.0 [N] at 0.241 [s]

Min: -135.2 [N] at 0.102 [s]



B-67

N

8655-F301-11R

CFC\_1000

Time [s]

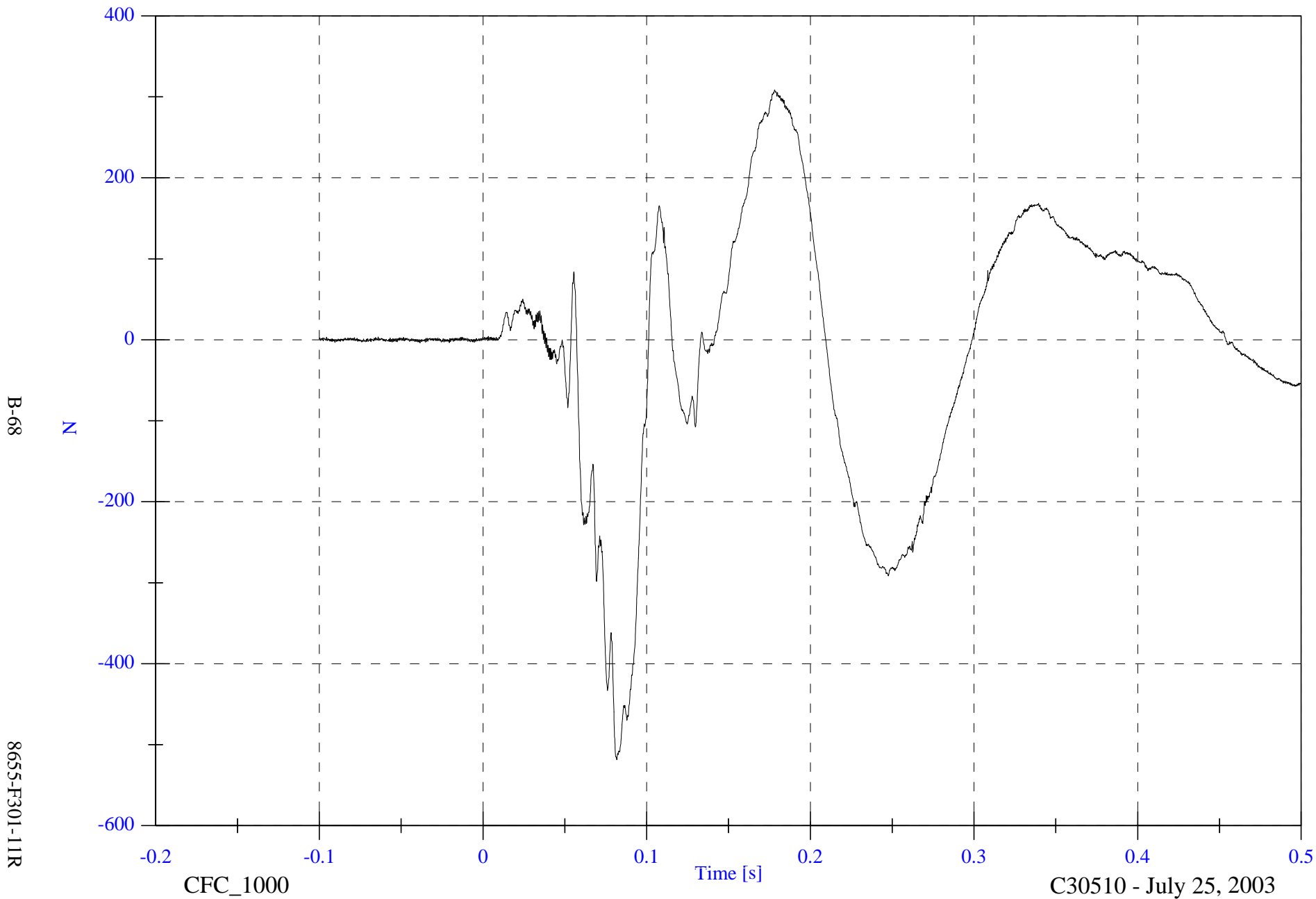
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 308.5 [N] at 0.178 [s]

Min: -518.6 [N] at 0.082 [s]

V2P2 Lower Neck Fz



B-68

N

8655-F301-11R

CFC\_1000

Time [s]

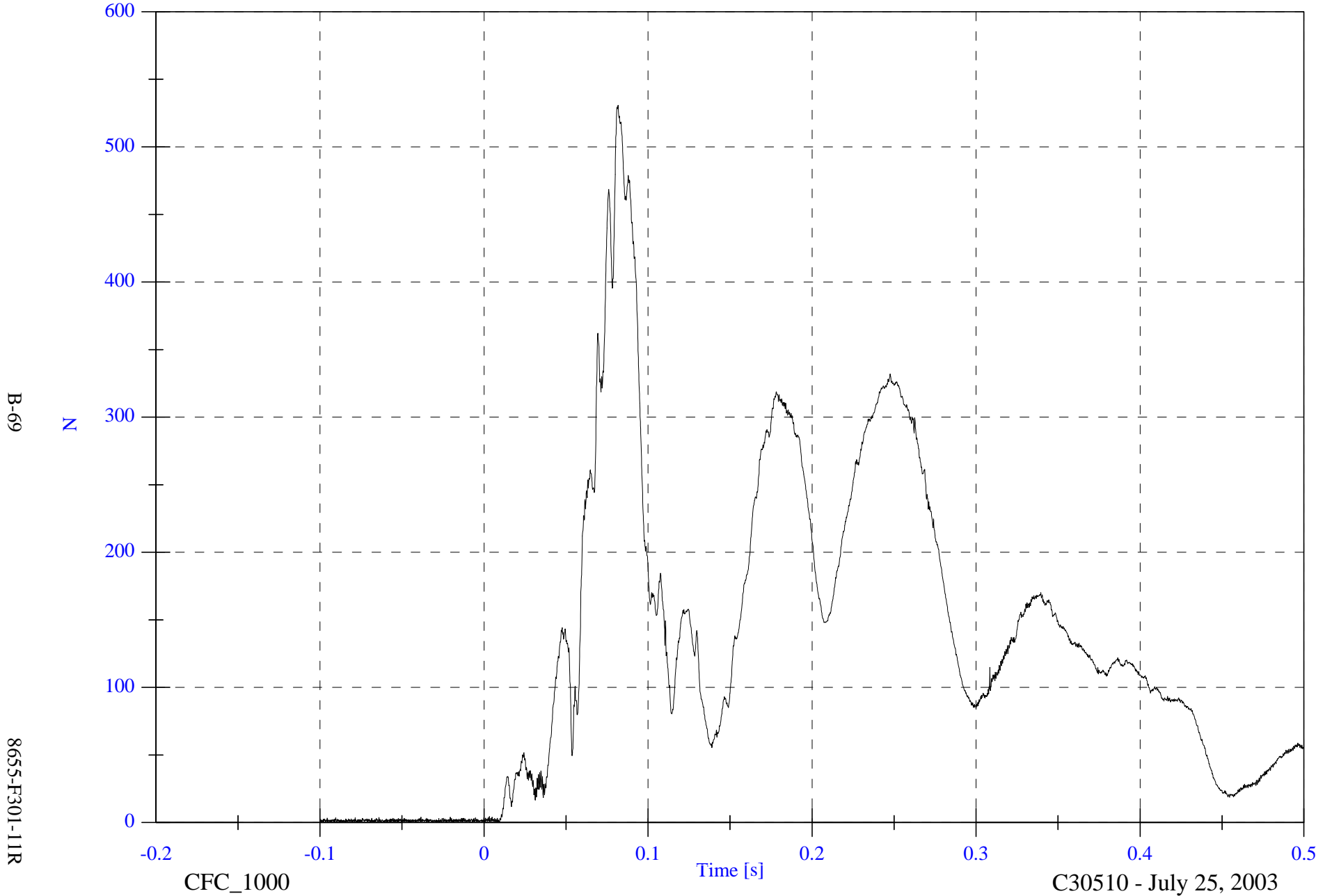
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lower Neck F Resultant

Max: 530.8 [N] at 0.082 [s]

Min: 0.1 [N] at -0.041 [s]



B-69

8655-F301-11R

CFC\_1000

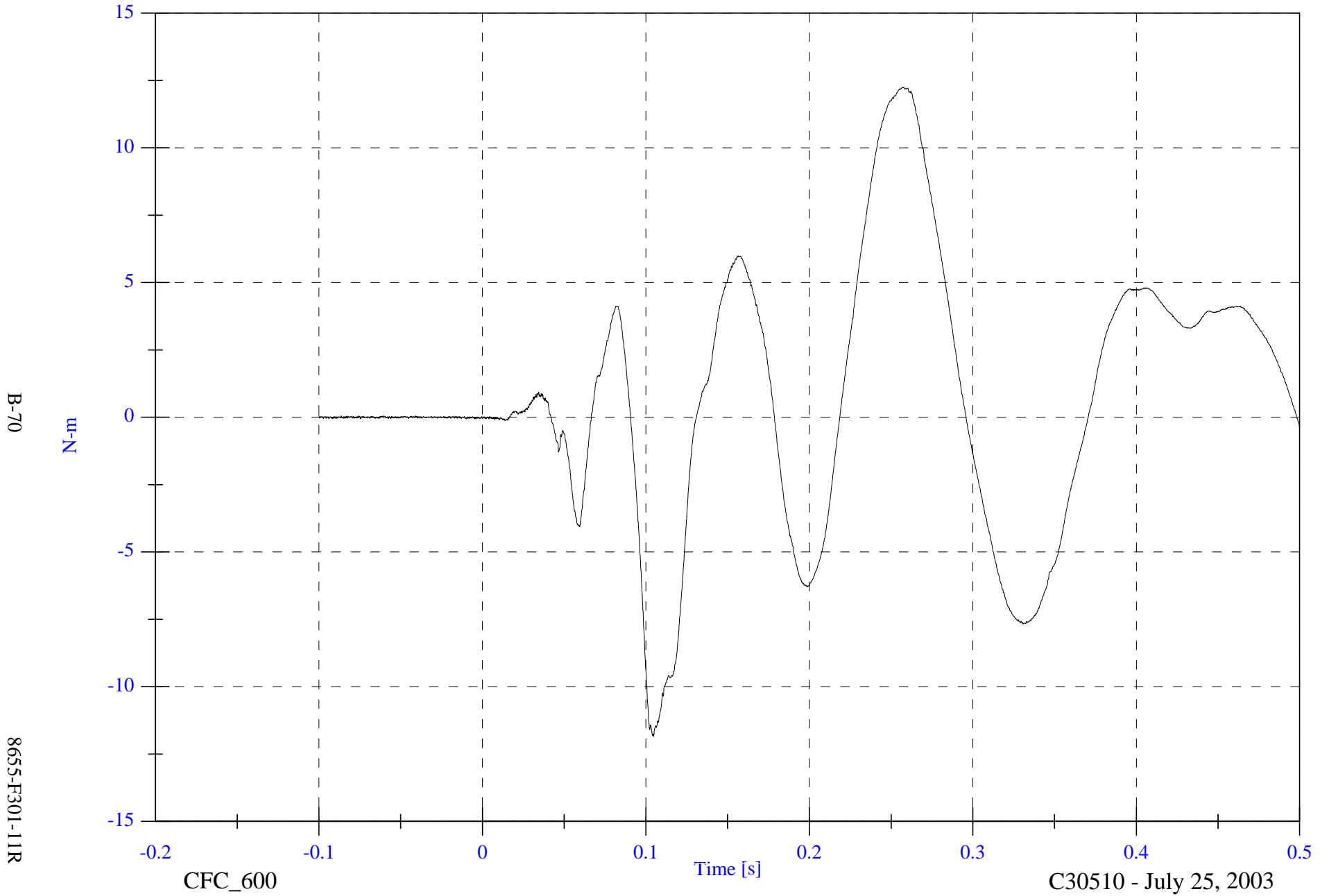
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lower Neck Mx

Max: 12.2 [N-m] at 0.258 [s]

Min: -11.8 [N-m] at 0.105 [s]



B-70

N-m

8655-F301-11R

CFC\_600

Time [s]

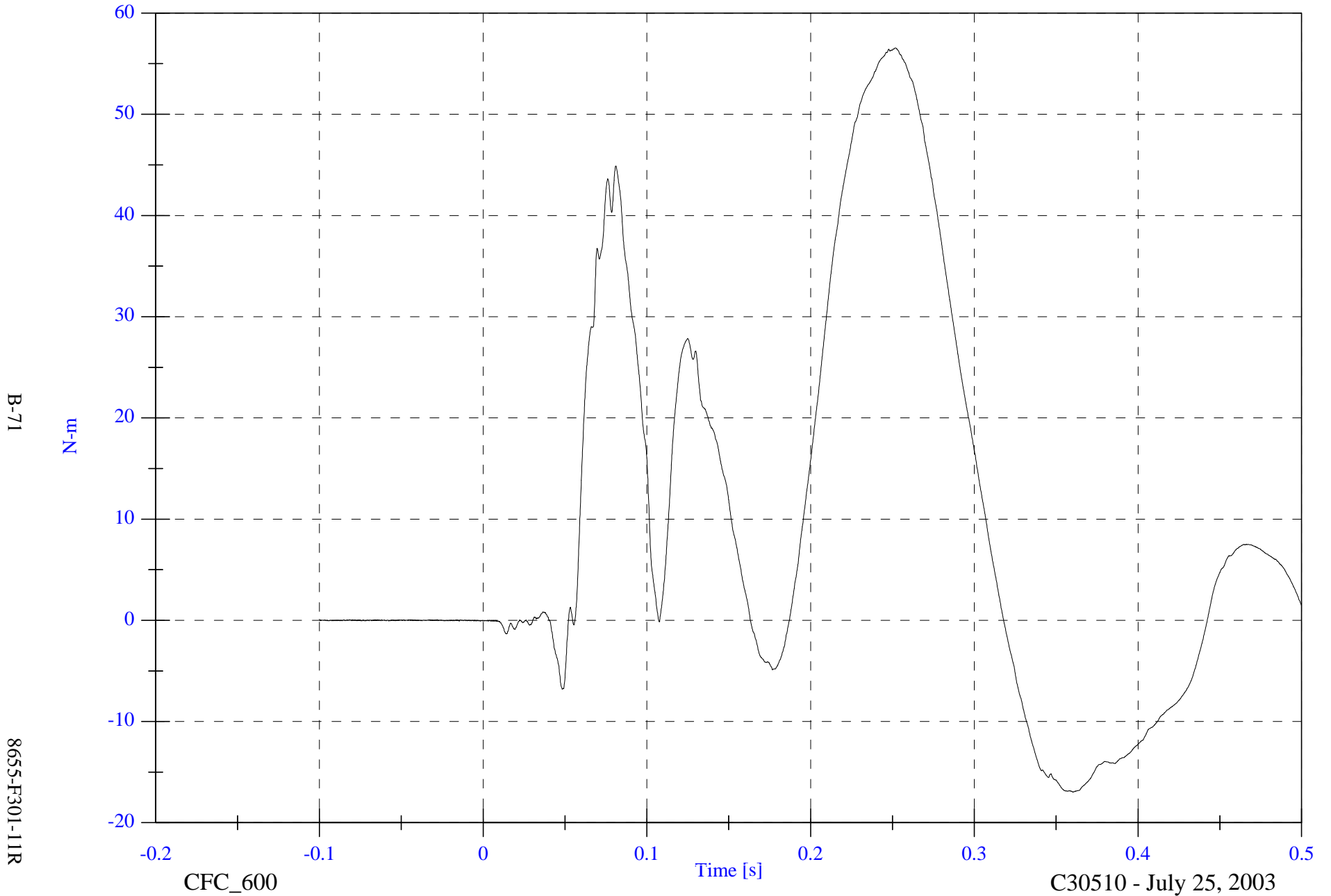
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lower Neck My

Max: 56.6 [N-m] at 0.252 [s]

Min: -17.0 [N-m] at 0.360 [s]



B-71

8655-F301-11R

CFC\_600

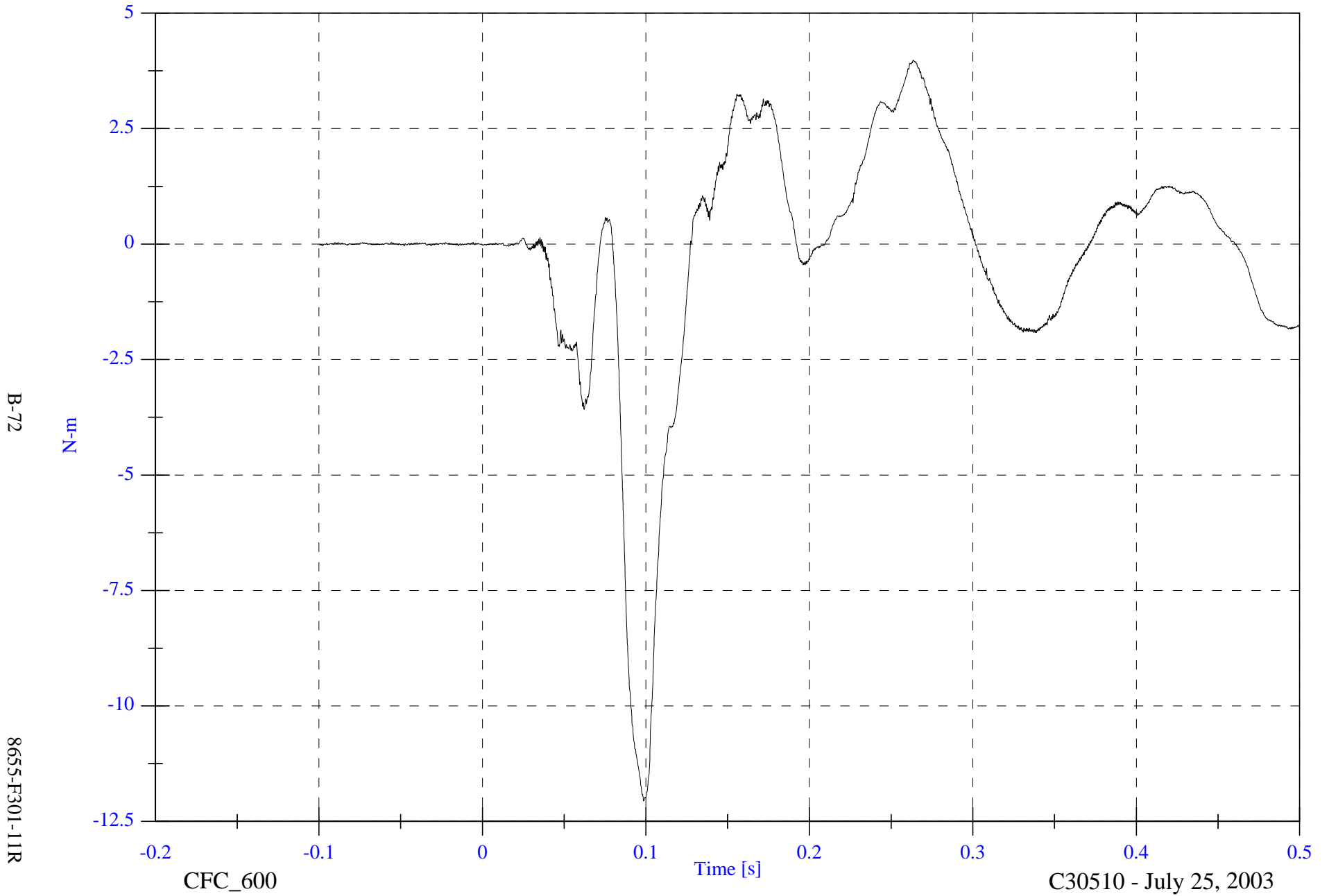
Time [s]

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lower Neck Mz

Max: 4.0 [N-m] at 0.264 [s]  
Min: -12.1 [N-m] at 0.099 [s]



B-72

8655-F301-11R

CFC\_600

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

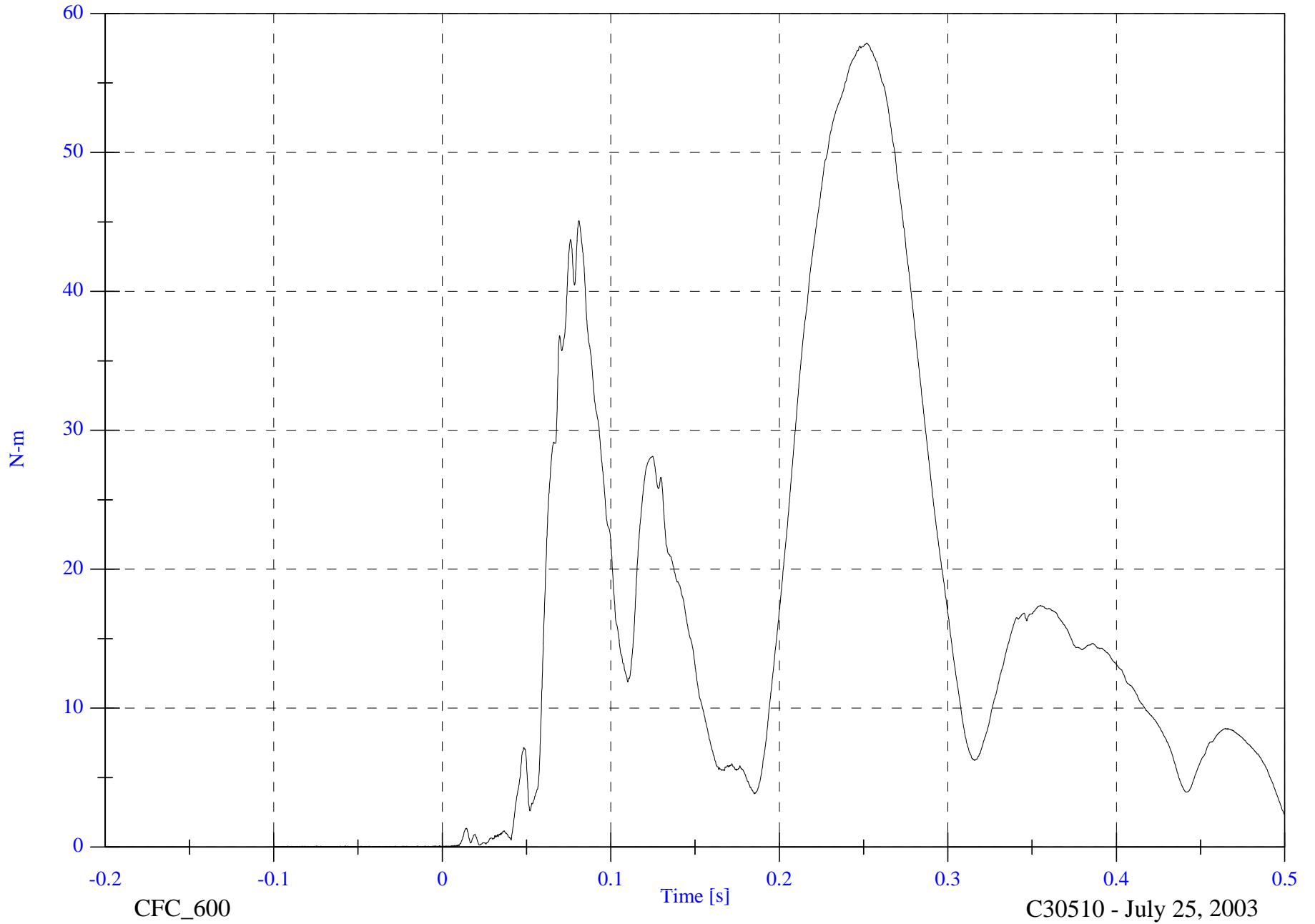
V2P2 Lower Neck M Resultant

Max: 57.9 [N-m] at 0.252 [s]

Min: 0.0 [N-m] at -0.062 [s]

B-73

8655-F301-11R

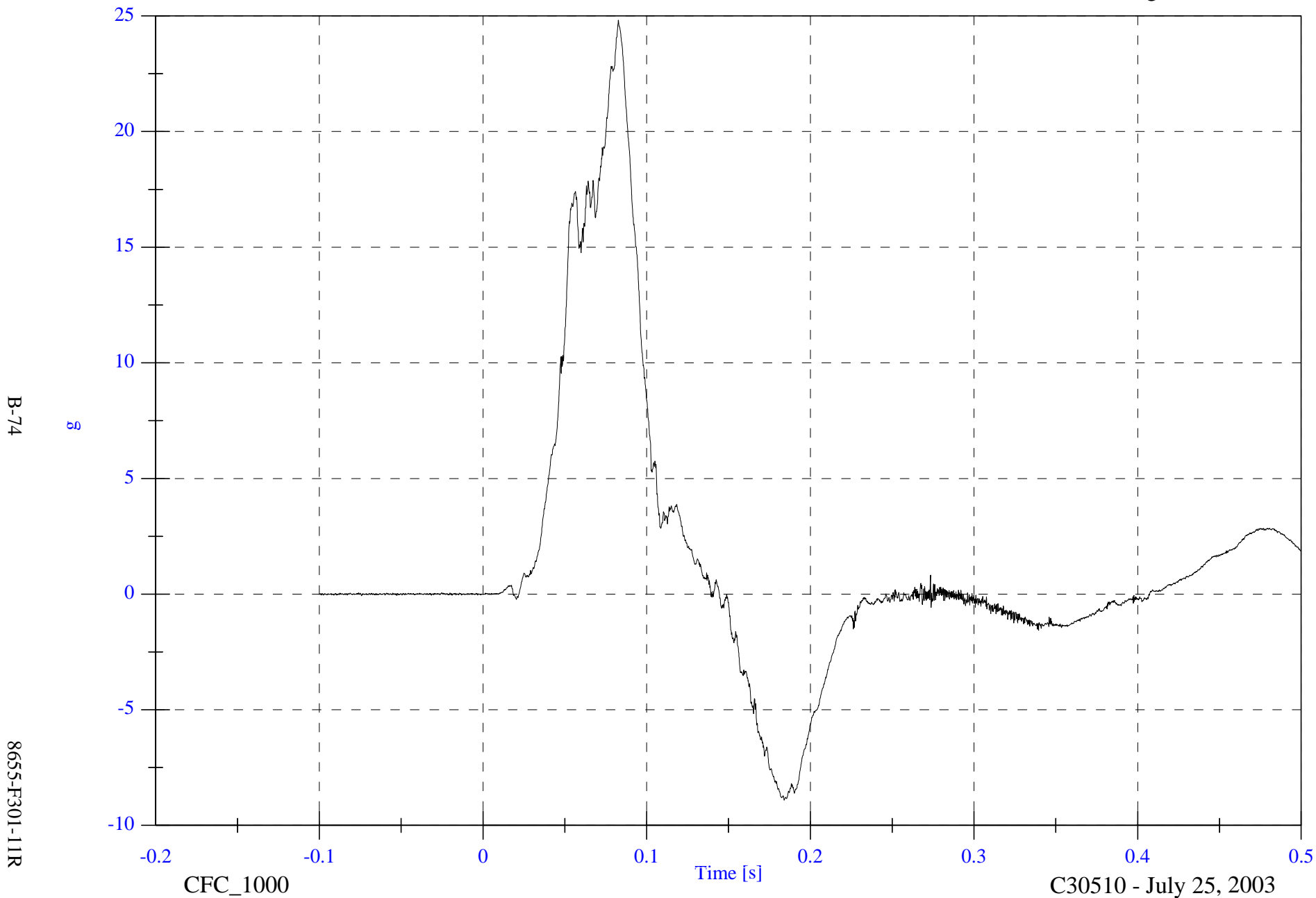


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 24.8 [g] at 0.083 [s]

Min: -8.9 [g] at 0.184 [s]

V2P2 Lower Neck x



B-74

8655-F301-11R

CFC\_1000

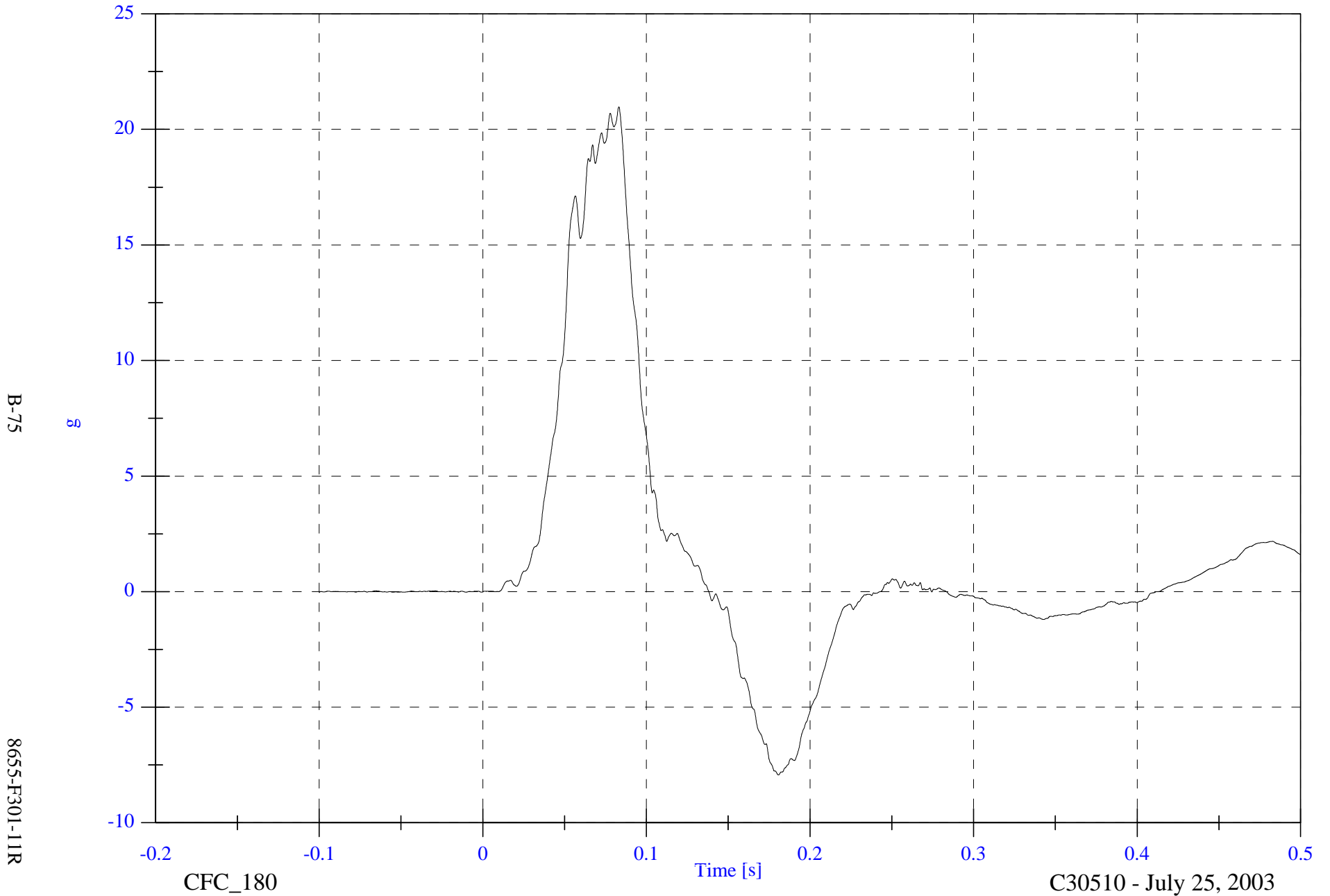
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Chest Ax

Max: 21.0 [g] at 0.083 [s]

Min: -7.9 [g] at 0.181 [s]

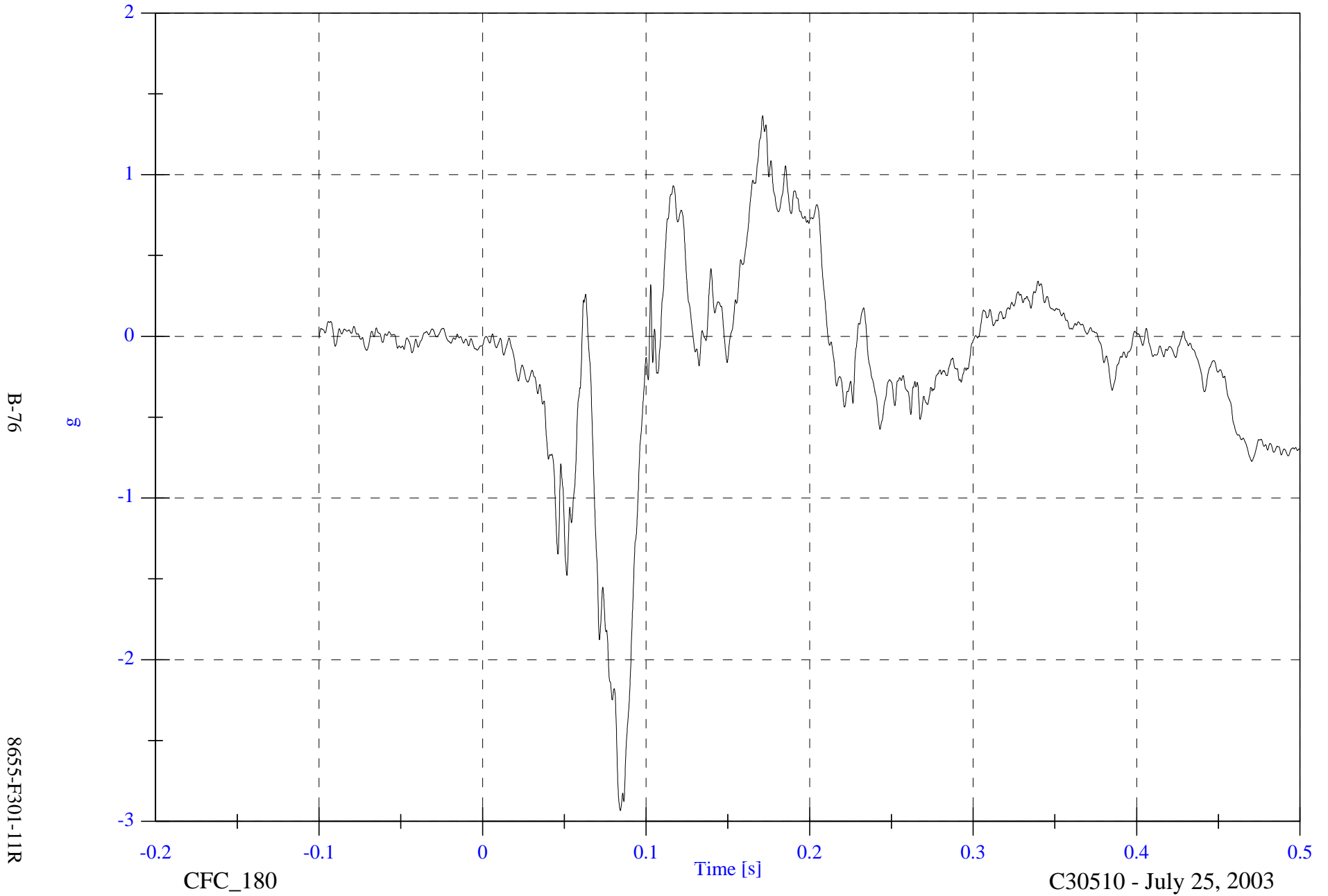


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Chest Ay

Max: 1.4 [g] at 0.171 [s]

Min: -2.9 [g] at 0.084 [s]



B-76

g

8655-F301-11R

CFC\_180

Time [s]

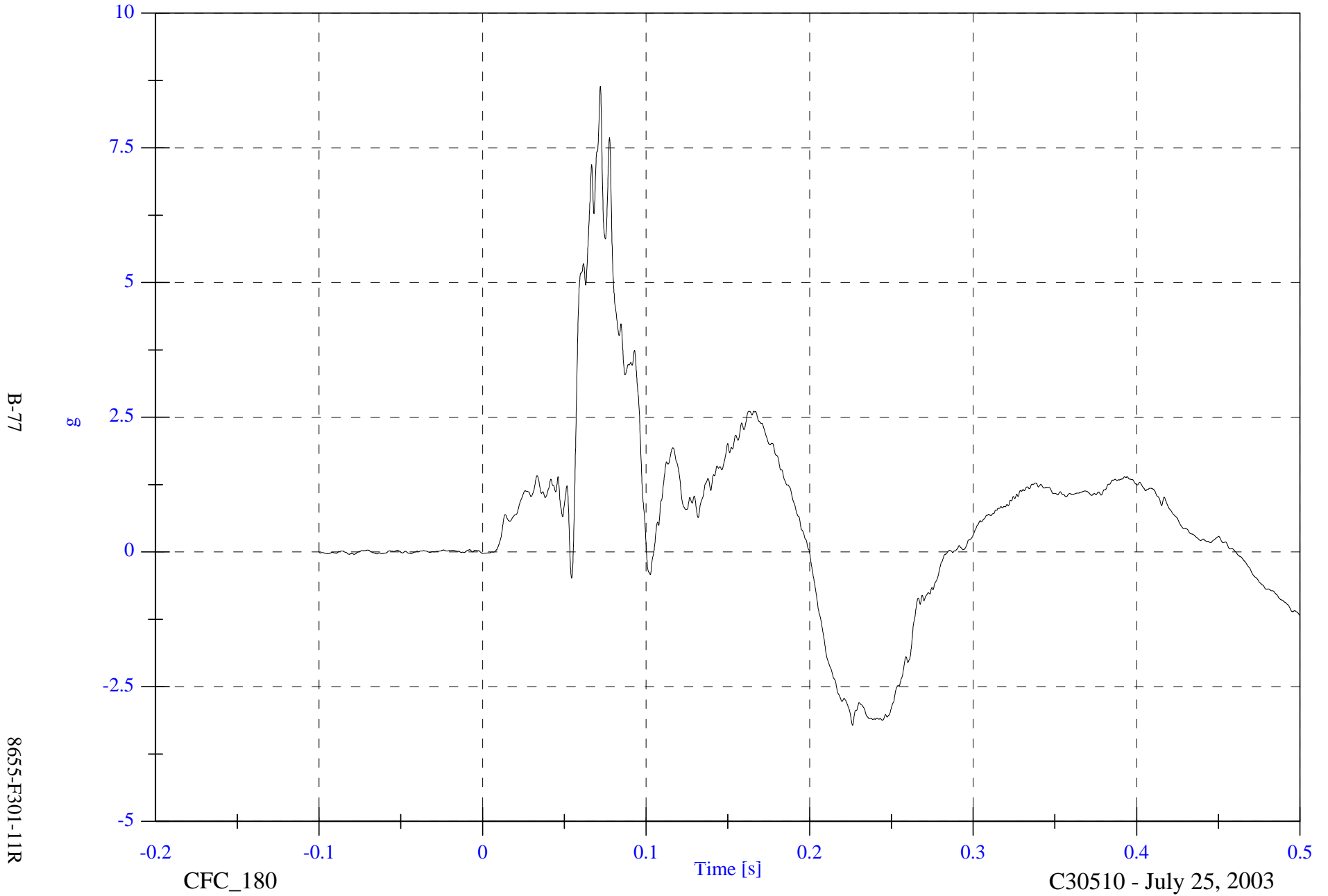
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Chest Az

Max: 8.6 [g] at 0.072 [s]

Min: -3.2 [g] at 0.226 [s]



B-77

8655-F301-11R

CFC\_180

Time [s]

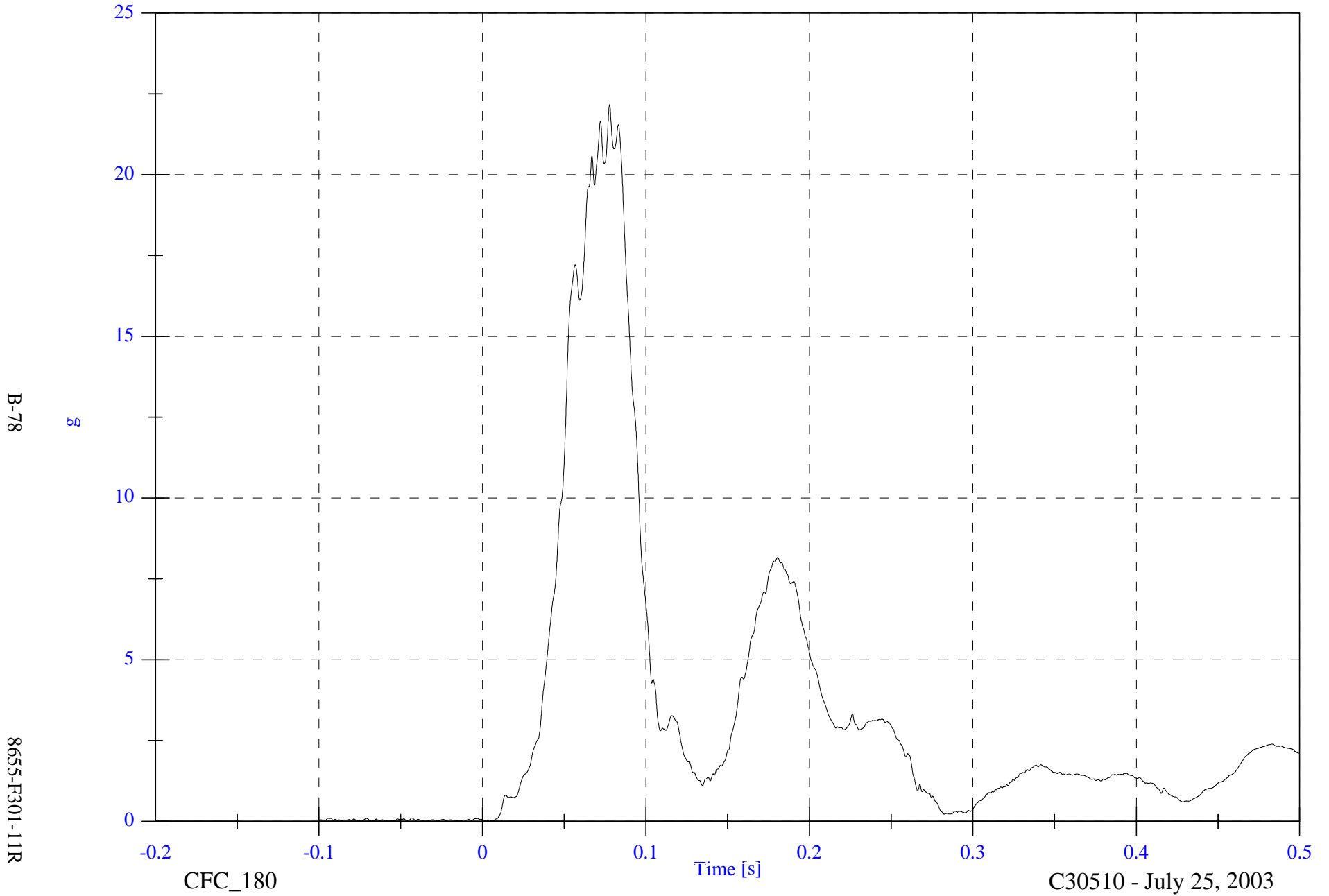
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Chest A Resultant

Max: 22.2 [g] at 0.078 [s]

Min: 0.0 [g] at -0.014 [s]

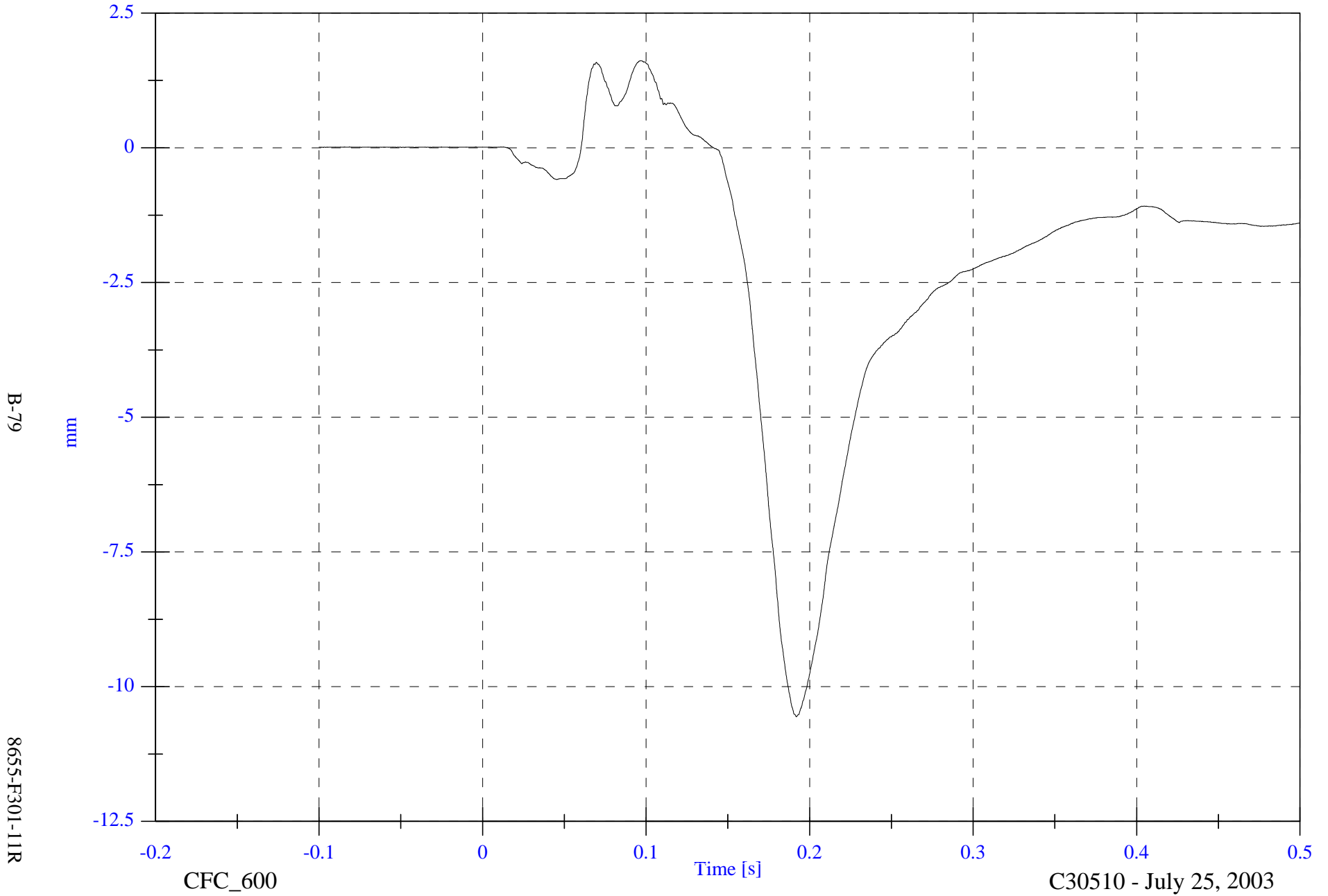


2003 FMVSS 301 Test 2 2003 Saab 9-3

### V2P2 Chest Displacement

Max: 1.6 [mm] at 0.097 [s]

Min: -10.6 [mm] at 0.192 [s]



B-79

mm

8655-F301-11R

CFC\_600

Time [s]

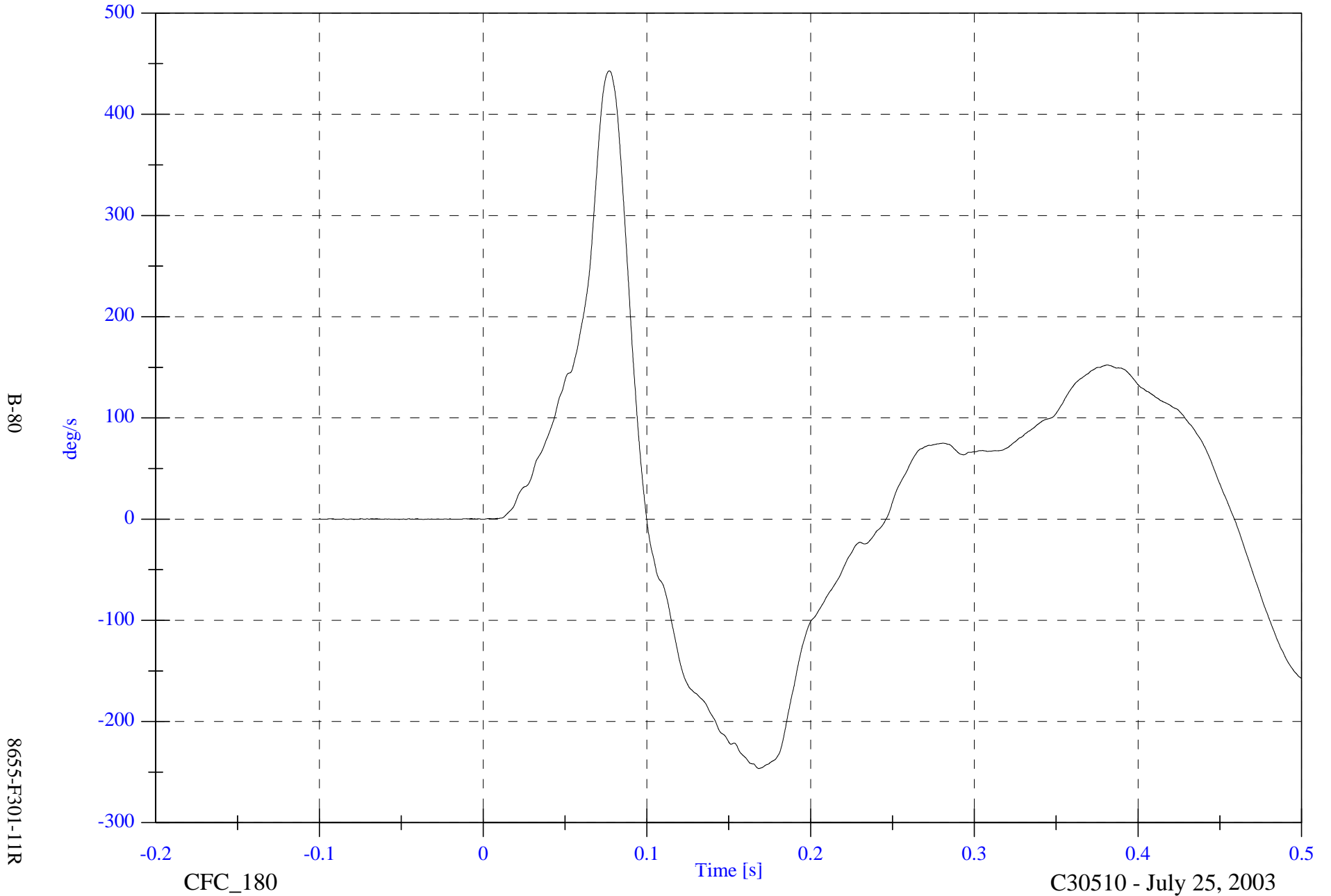
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Chest Rotation AVy

Max: 442.9 [deg/s] at 0.077 [s]

Min: -246.6 [deg/s] at 0.168 [s]



B-80

8655-F301-11R

CFC\_180

Time [s]

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

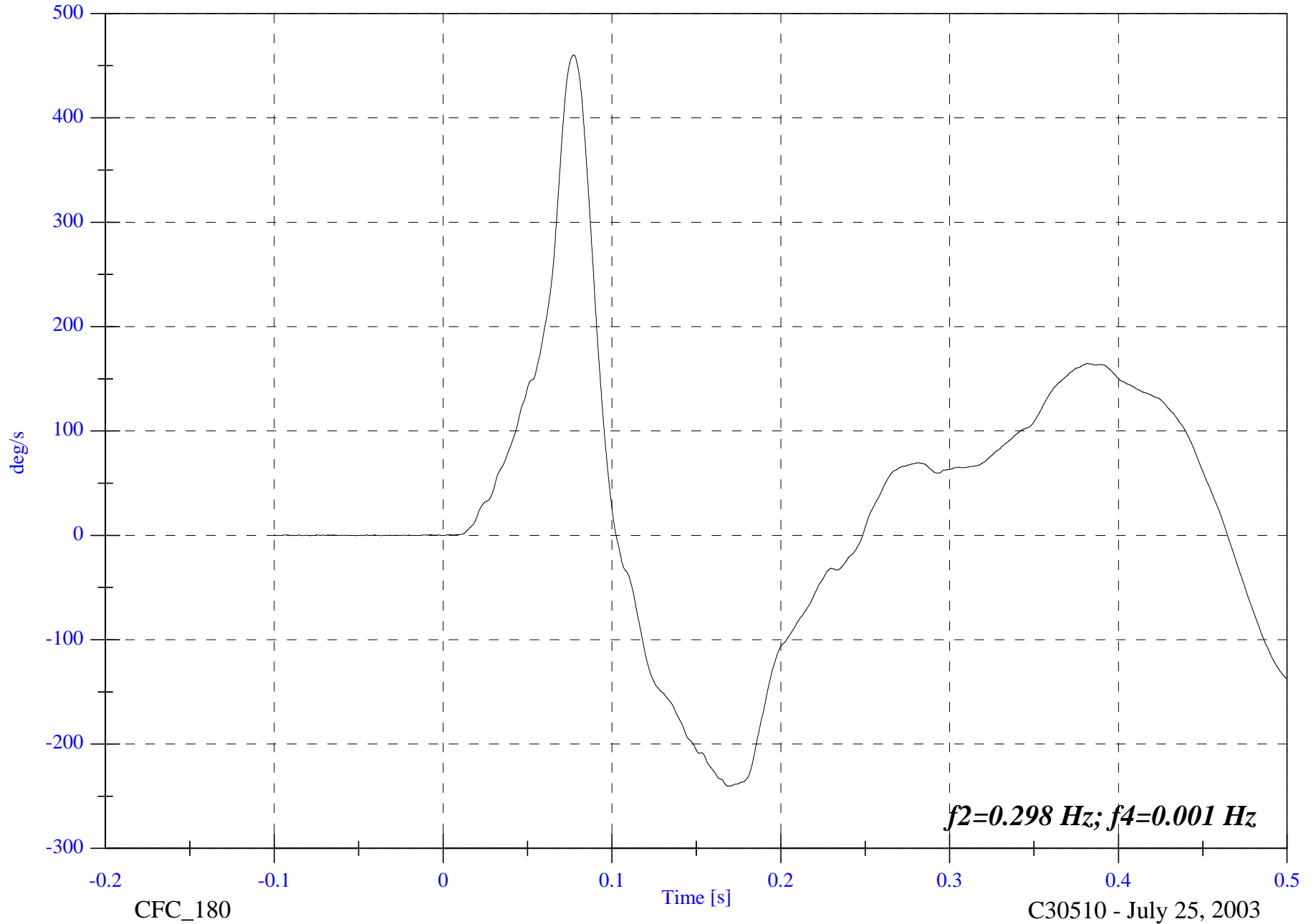
V2P2 Chest Comp Rotation AVy

Max: 460.3 [deg/s] at 0.077 [s]

Min: -240.3 [deg/s] at 0.169 [s]

B-81

8655-F301-11R



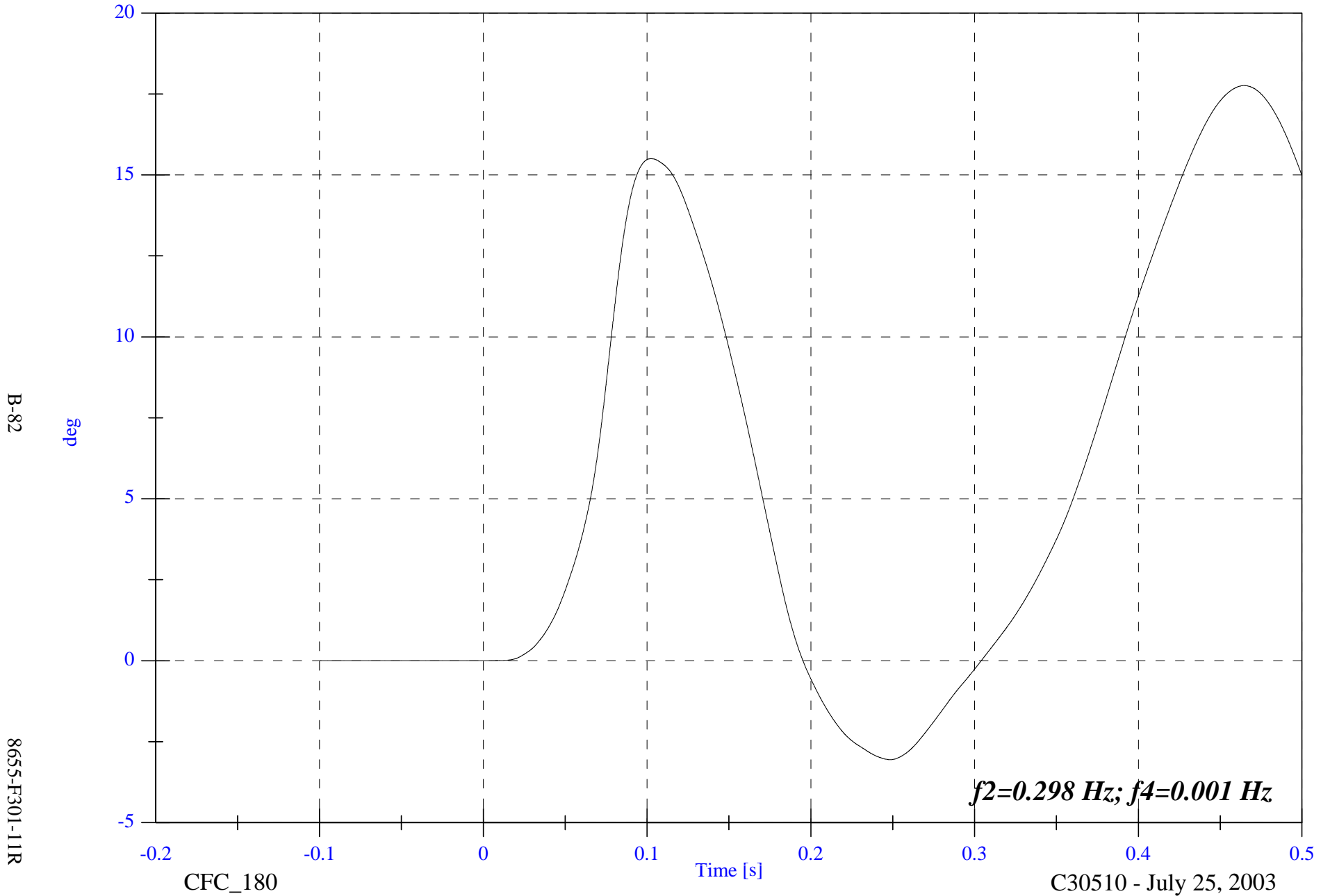
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Chest Comp Rotation ADy

Max: 17.8 [deg] at 0.465 [s]

Min: -3.1 [deg] at 0.249 [s]

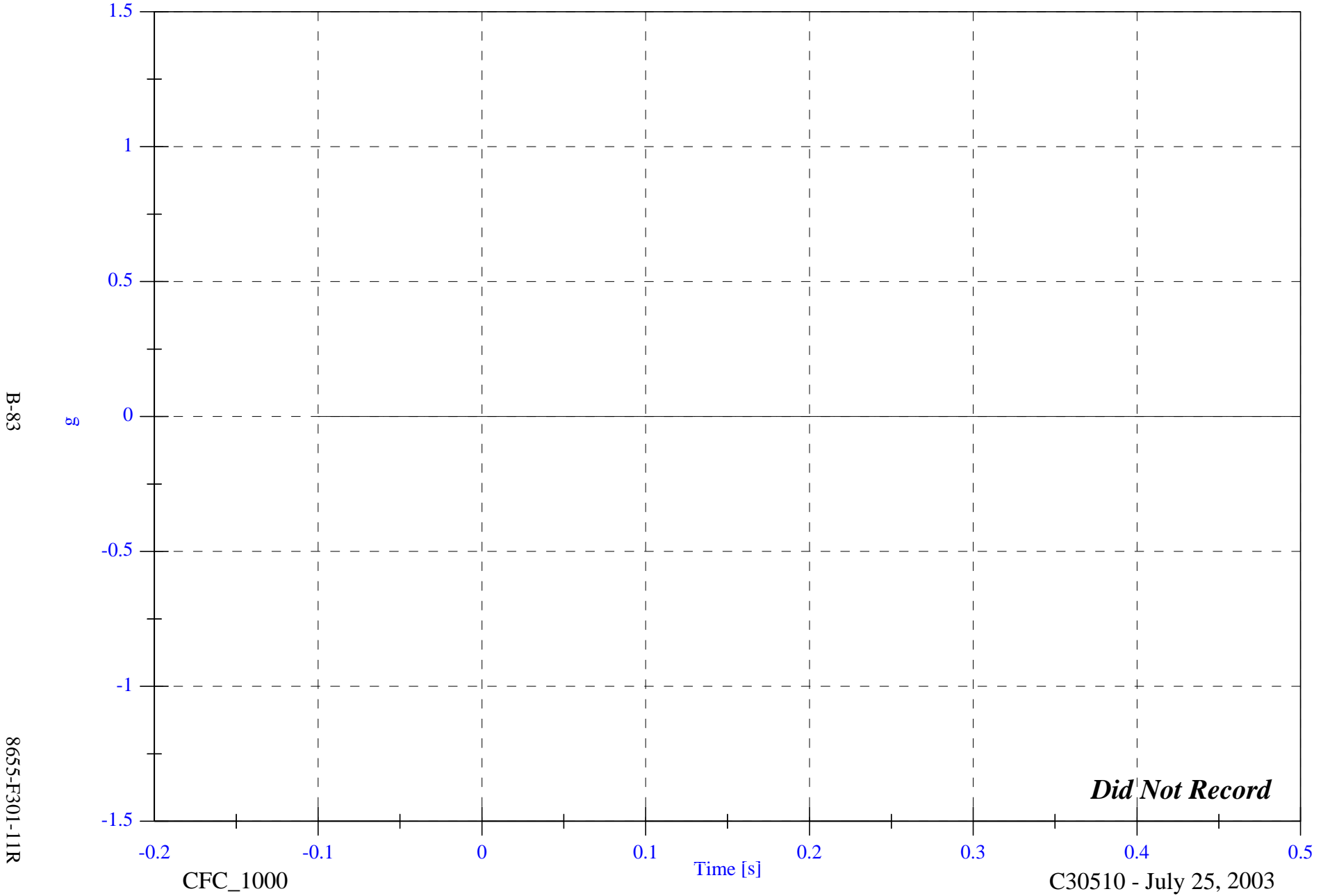


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Pelvic Ax

Max: 0.0 [g] at -0.100 [s]

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

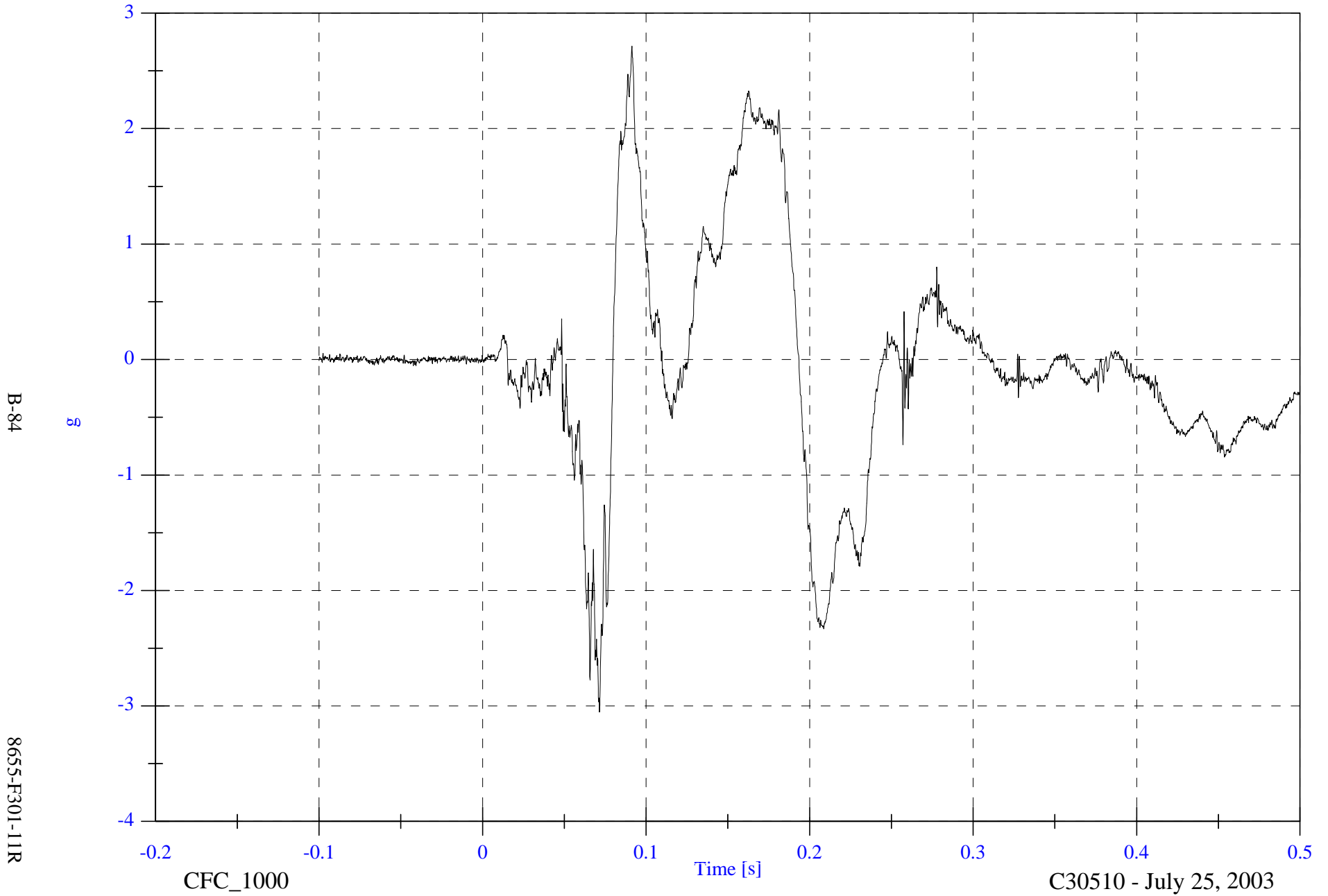


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Pelvic Ay

Max: 2.7 [g] at 0.091 [s]

Min: -3.1 [g] at 0.072 [s]



B-84

g

8655-F301-11R

CFC\_1000

Time [s]

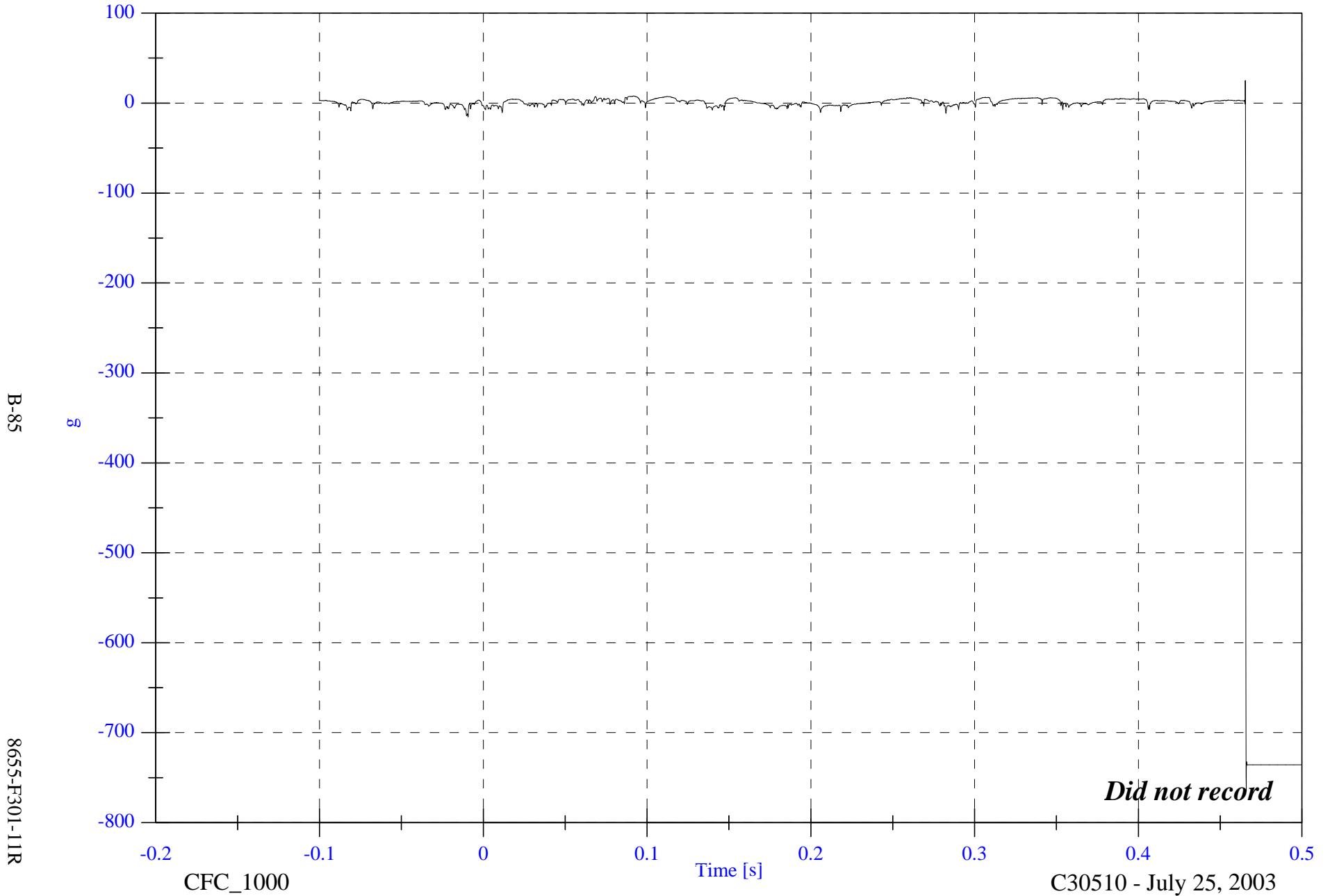
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Pelvic Az

Max: 25.1 [g] at 0.465 [s]

Min: -764.9 [g] at 0.466 [s]



B-85

8655-F301-11R

CFC\_1000

Time [s]

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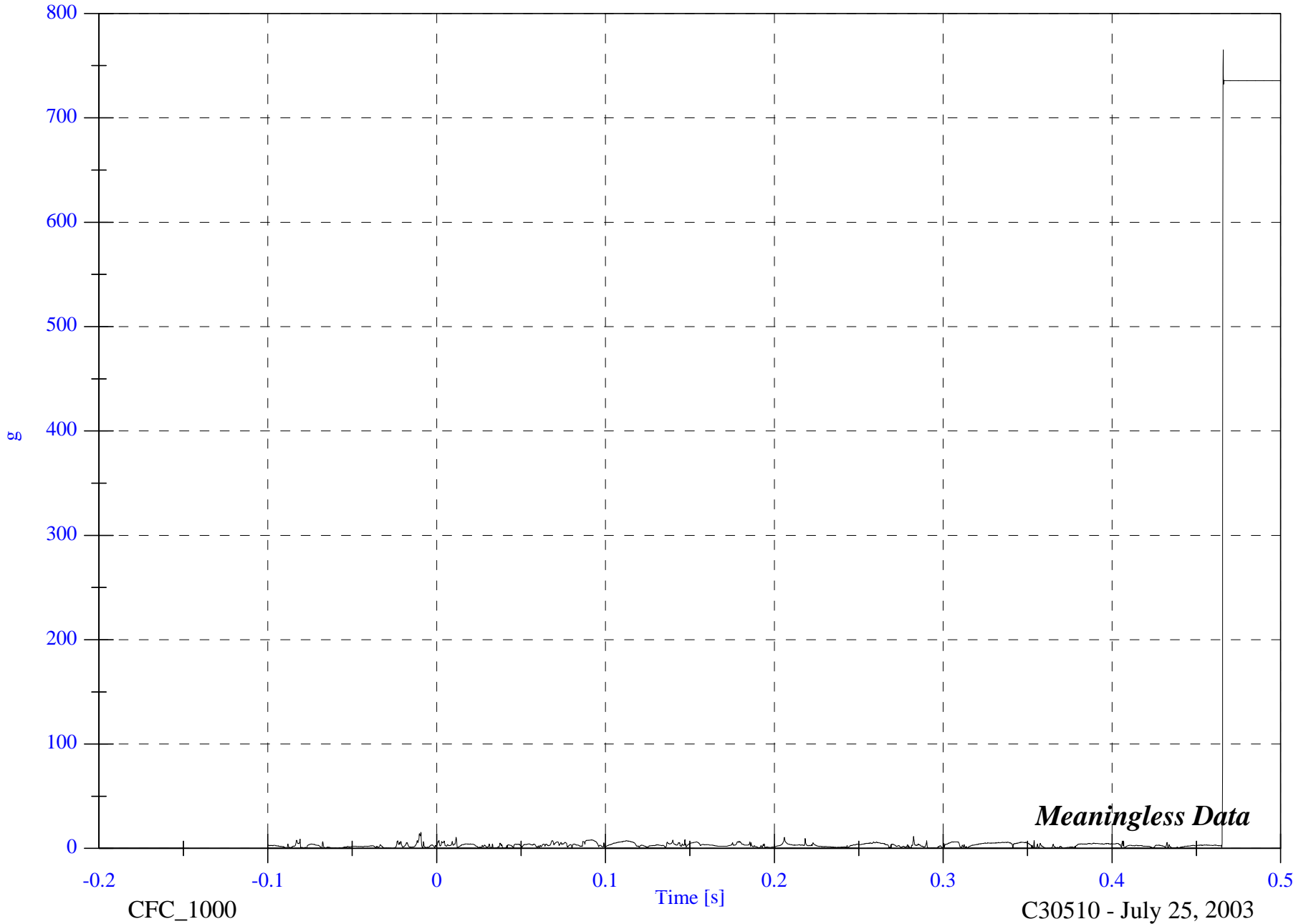
Max: 764.9 [g] at 0.466 [s]

V2P2 Pelvic A Resultant

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

B-86

8655-F301-11R



*Meaningless Data*

CFC\_1000

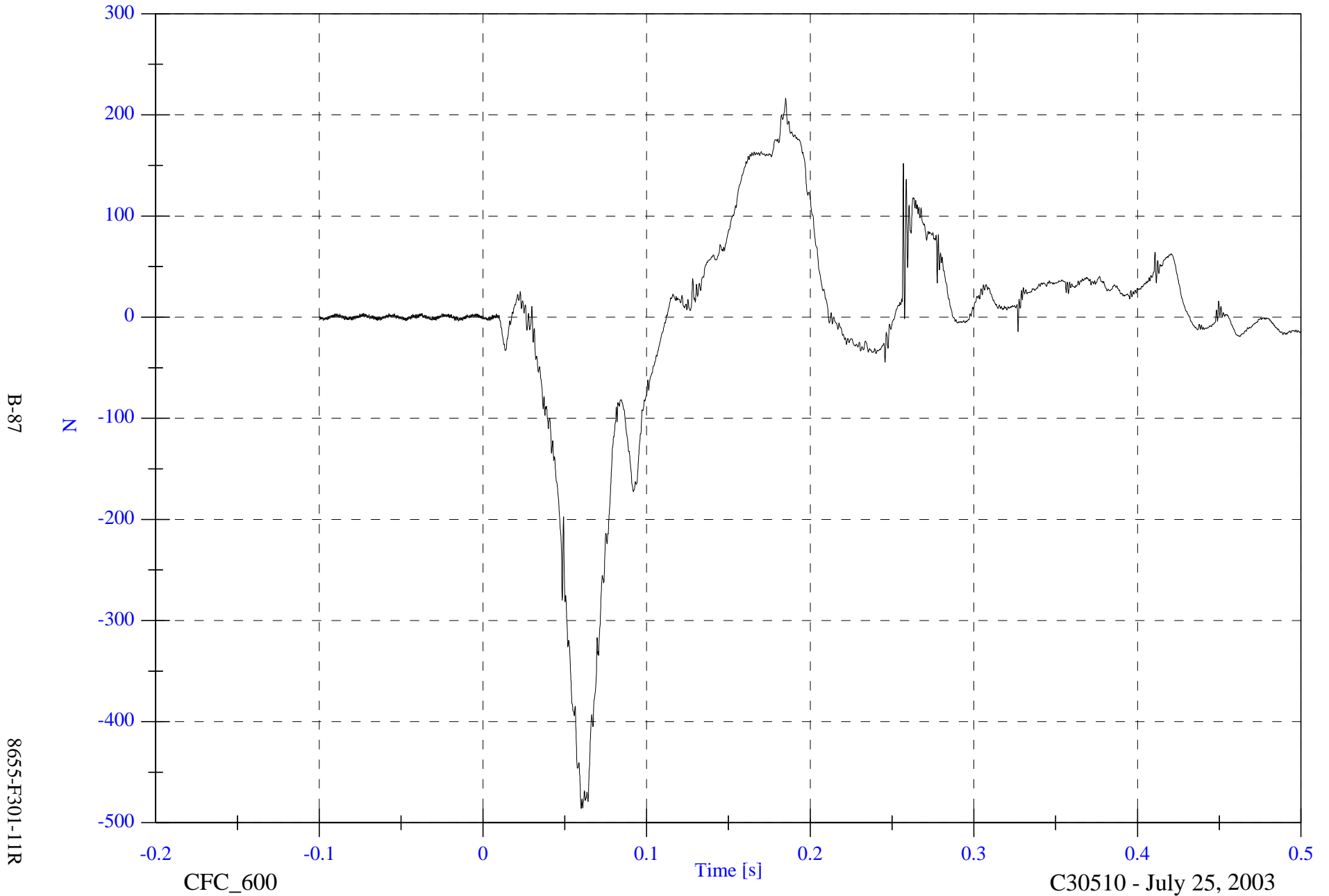
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Left Femur

Max: 216.7 [N] at 0.185 [s]

Min: -485.9 [N] at 0.060 [s]



B-87

8655-F301-11R

CFC\_600

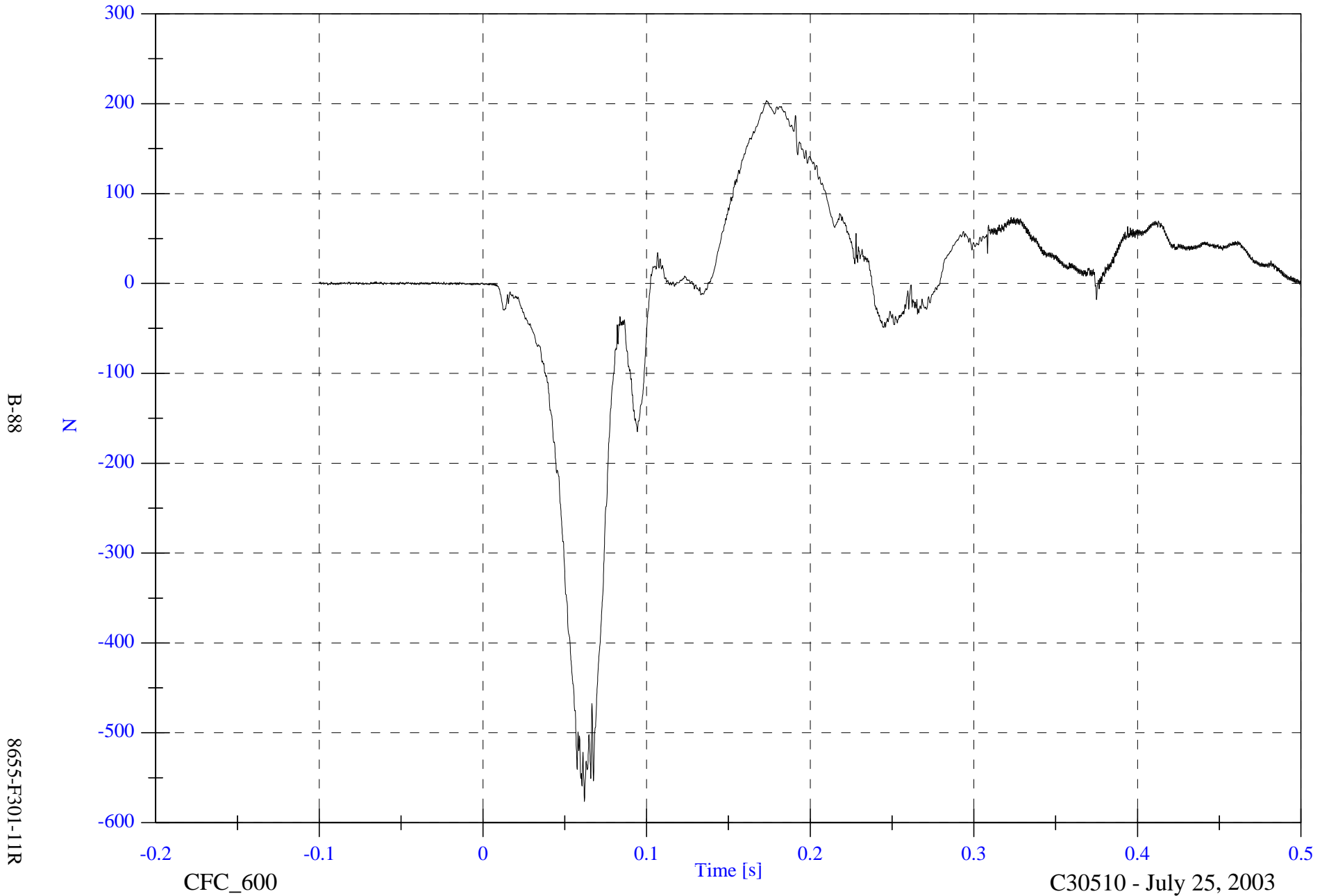
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Right Femur

Max: 203.4 [N] at 0.173 [s]

Min: -576.4 [N] at 0.062 [s]



B-88

8655-F301-11R

CFC\_600

Time [s]

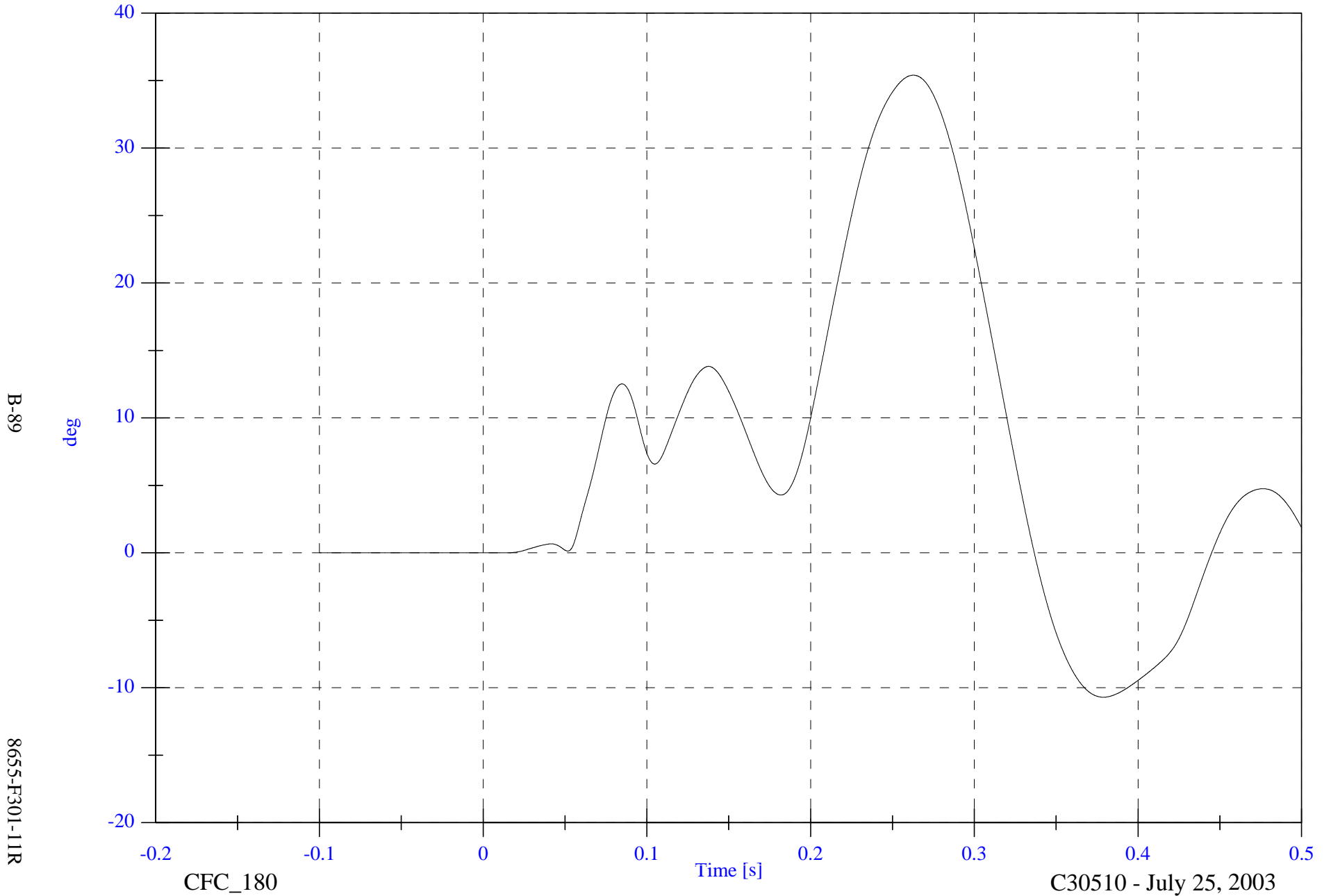
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Head to Chest

Max: 35.4 [deg] at 0.263 [s]

Min: -10.7 [deg] at 0.379 [s]



B-89

8655-F301-11R

CFC\_180

Time [s]

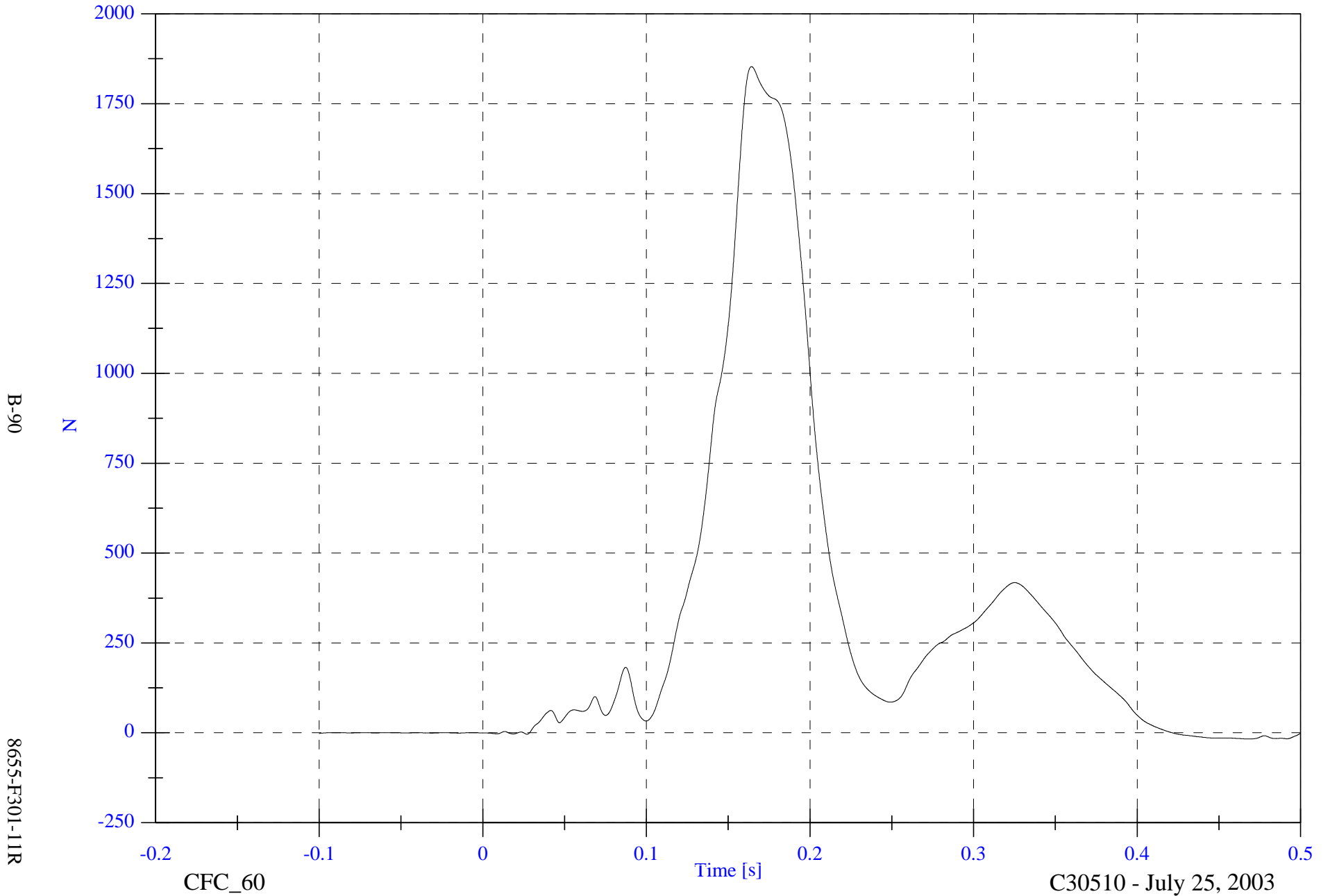
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2P2 Lap Belt

Max: 1853.1 [N] at 0.164 [s]

Min: -16.6 [N] at 0.468 [s]



2003 FMVSS 301 Test 2 2003 Saab 9-3

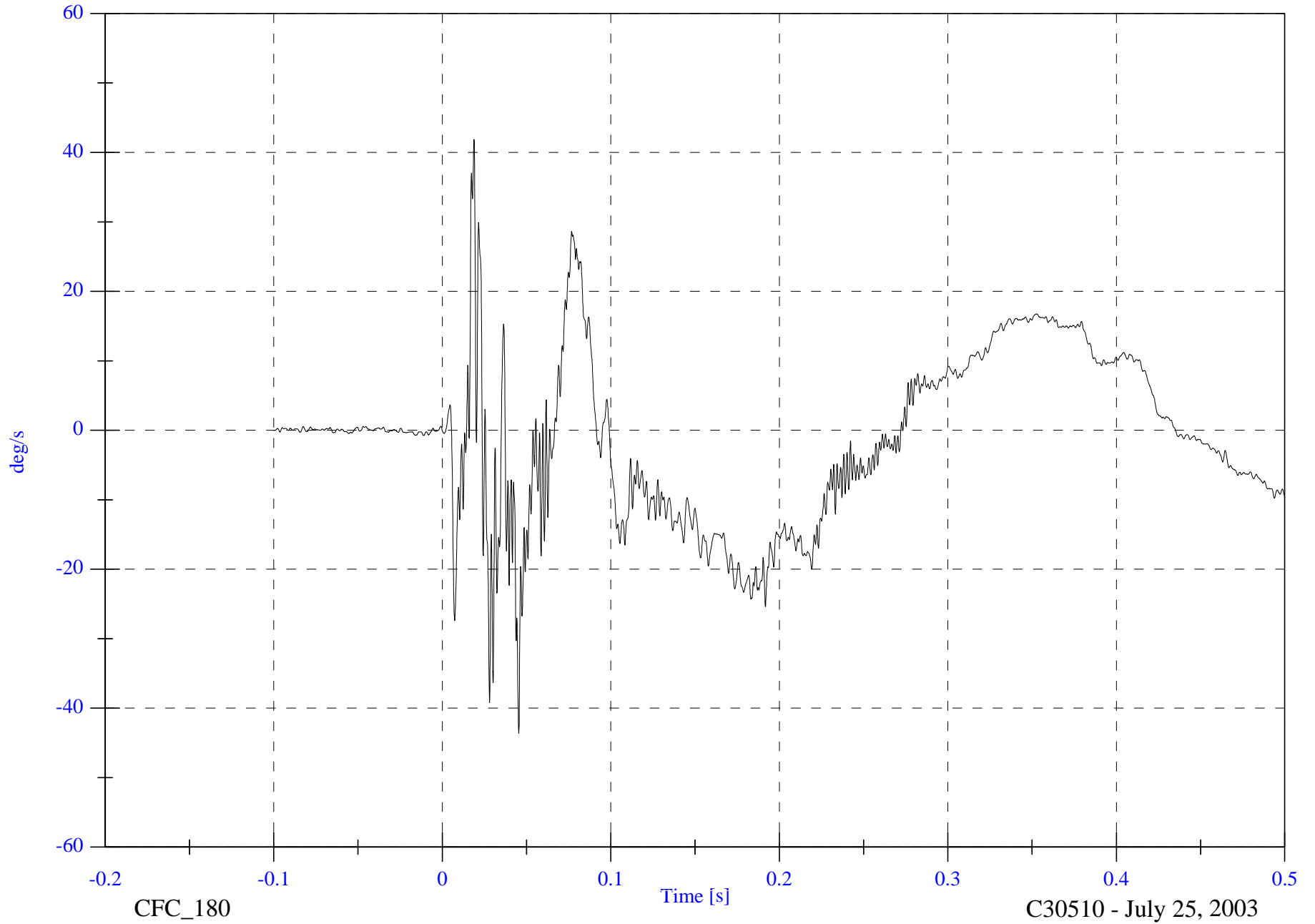
V2 Left Front Sill Rotation AVy

Max: 41.9 [deg/s] at 0.019 [s]

Min: -43.6 [deg/s] at 0.045 [s]

B-91

8655-F301-11R



CFC\_180

Time [s]

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2003 FMVSS 301 Test 2 2003 Saab 9-3

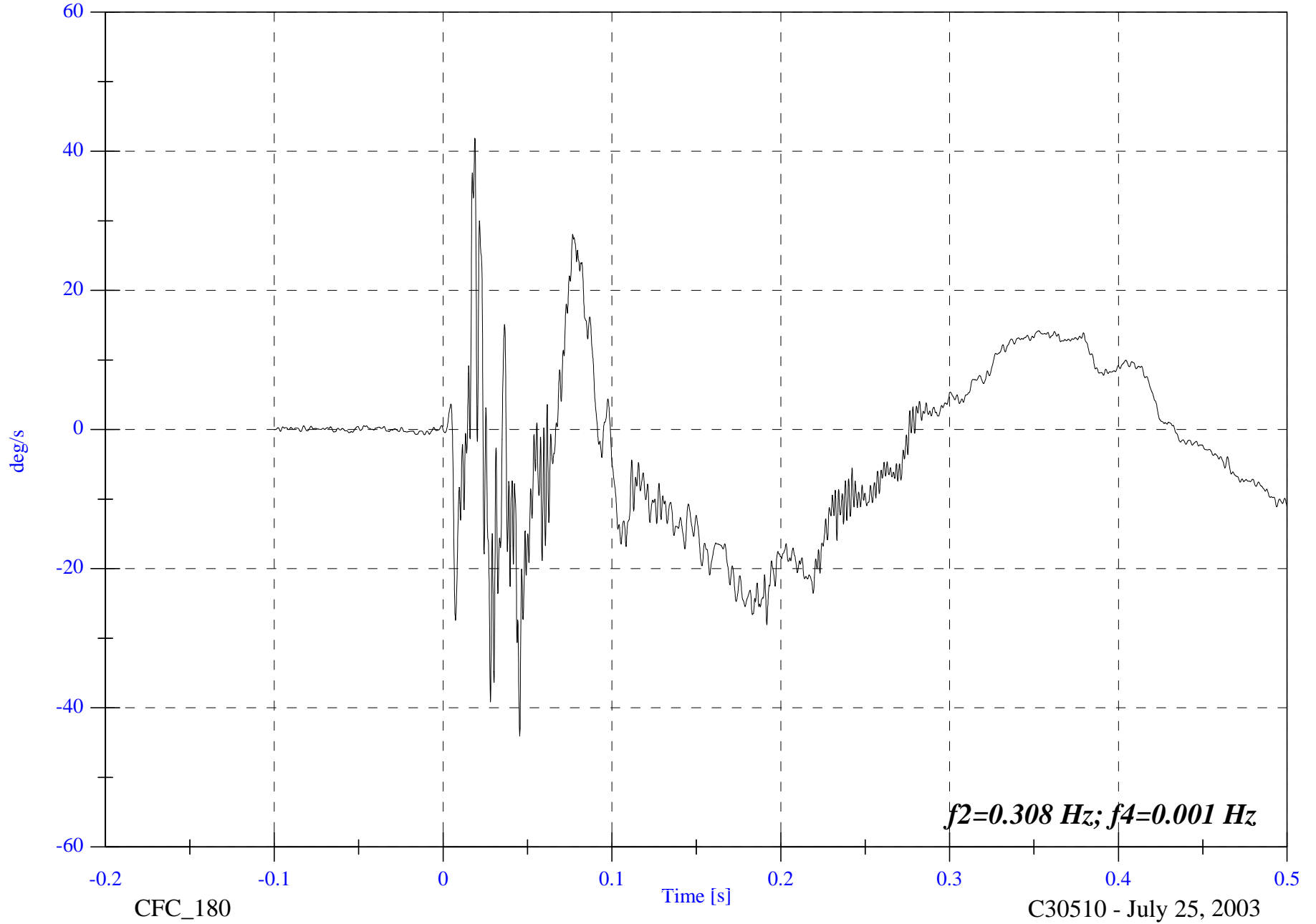
V2 Left Front Sill Rotation Comp AVy

Max: 41.9 [deg/s] at 0.019 [s]

Min: -44.1 [deg/s] at 0.045 [s]

B-92

8655-F301-11R



CFC\_180

Time [s]

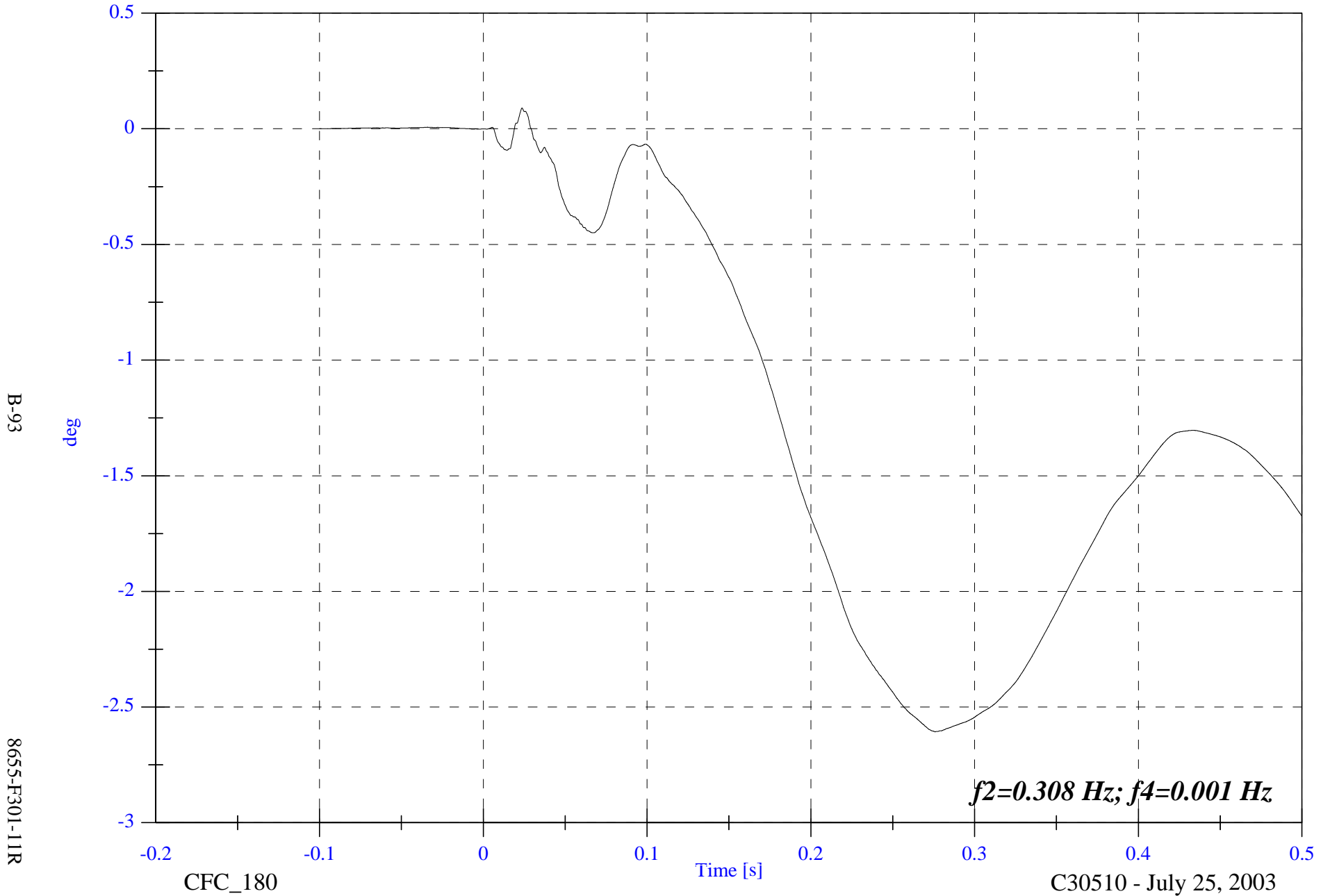
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2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 Left Front Sill Rotation Comp ADy

Max: 0.1 [deg] at 0.024 [s]

Min: -2.6 [deg] at 0.276 [s]



2003 FMVSS 301 Test 2 2003 Saab 9-3

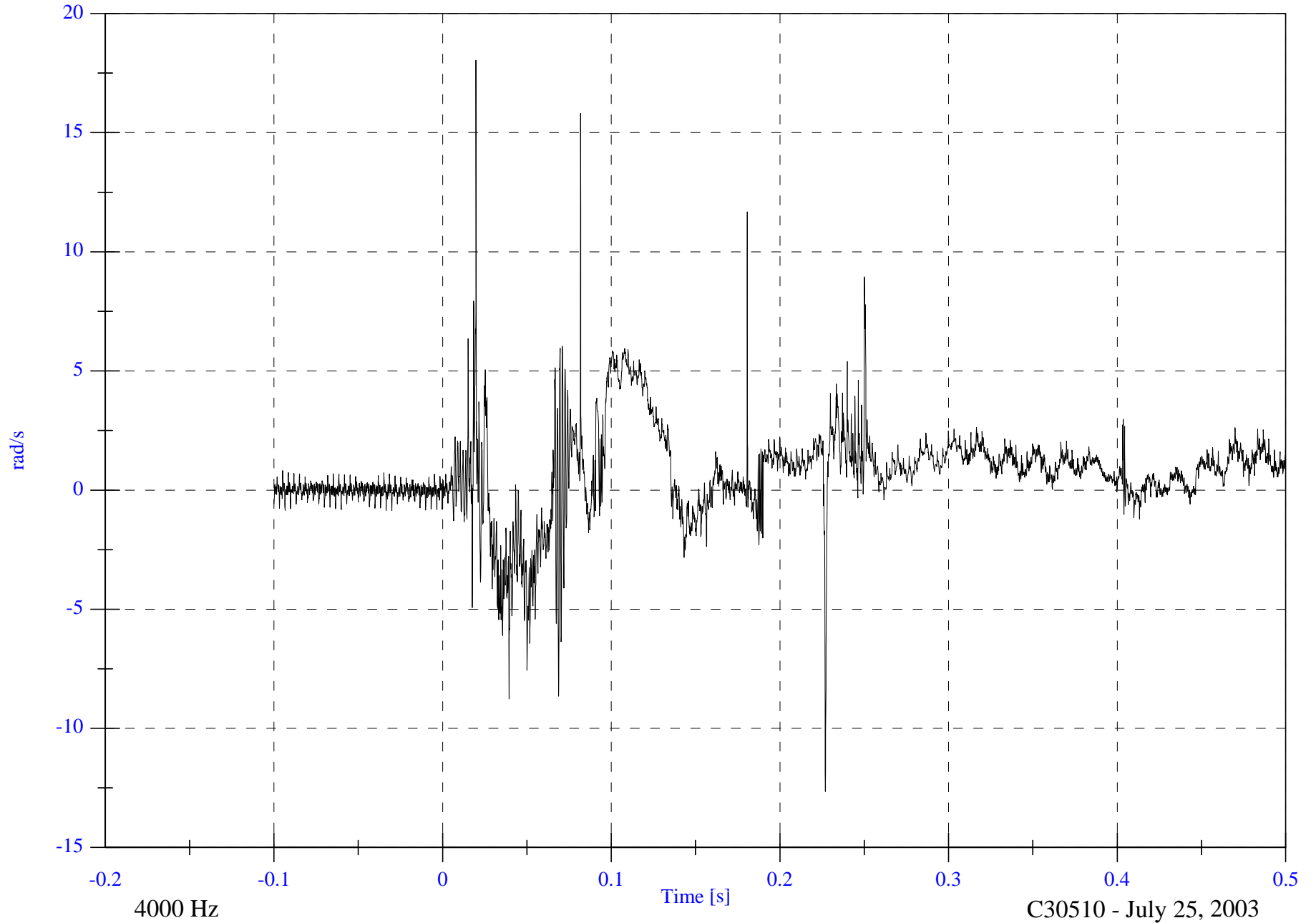
V2 Right Front Sill Rotation

Max: 18.0 [rad/s] at 0.020 [s]

Min: -12.6 [rad/s] at 0.227 [s]

B-94

8655-F301-11R



4000 Hz

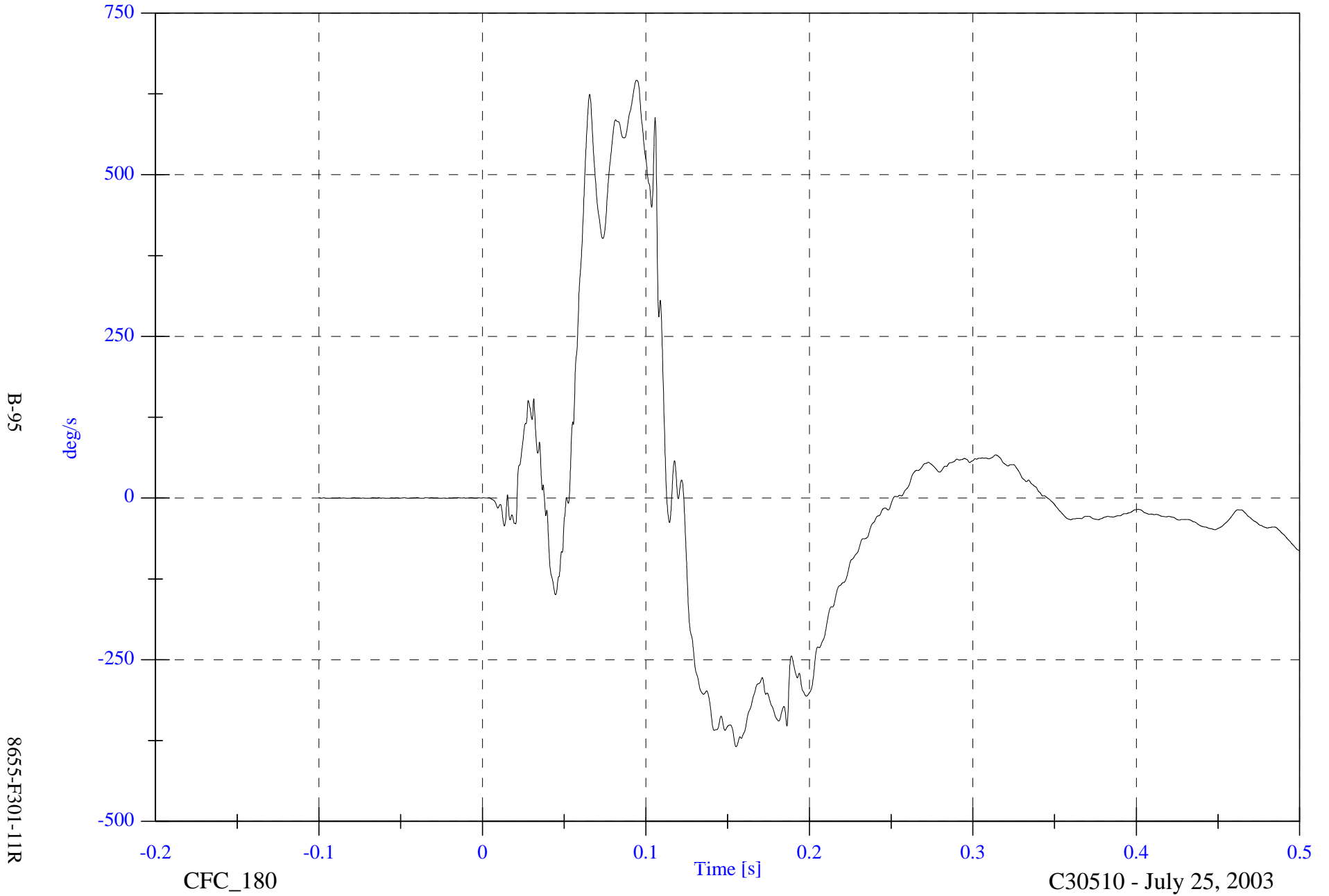
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 646.2 [deg/s] at 0.094 [s]

Min: -384.5 [deg/s] at 0.155 [s]

V2 P1 Left Seat Rotation AVy



B-95

8655-F301-11R

CFC\_180

Time [s]

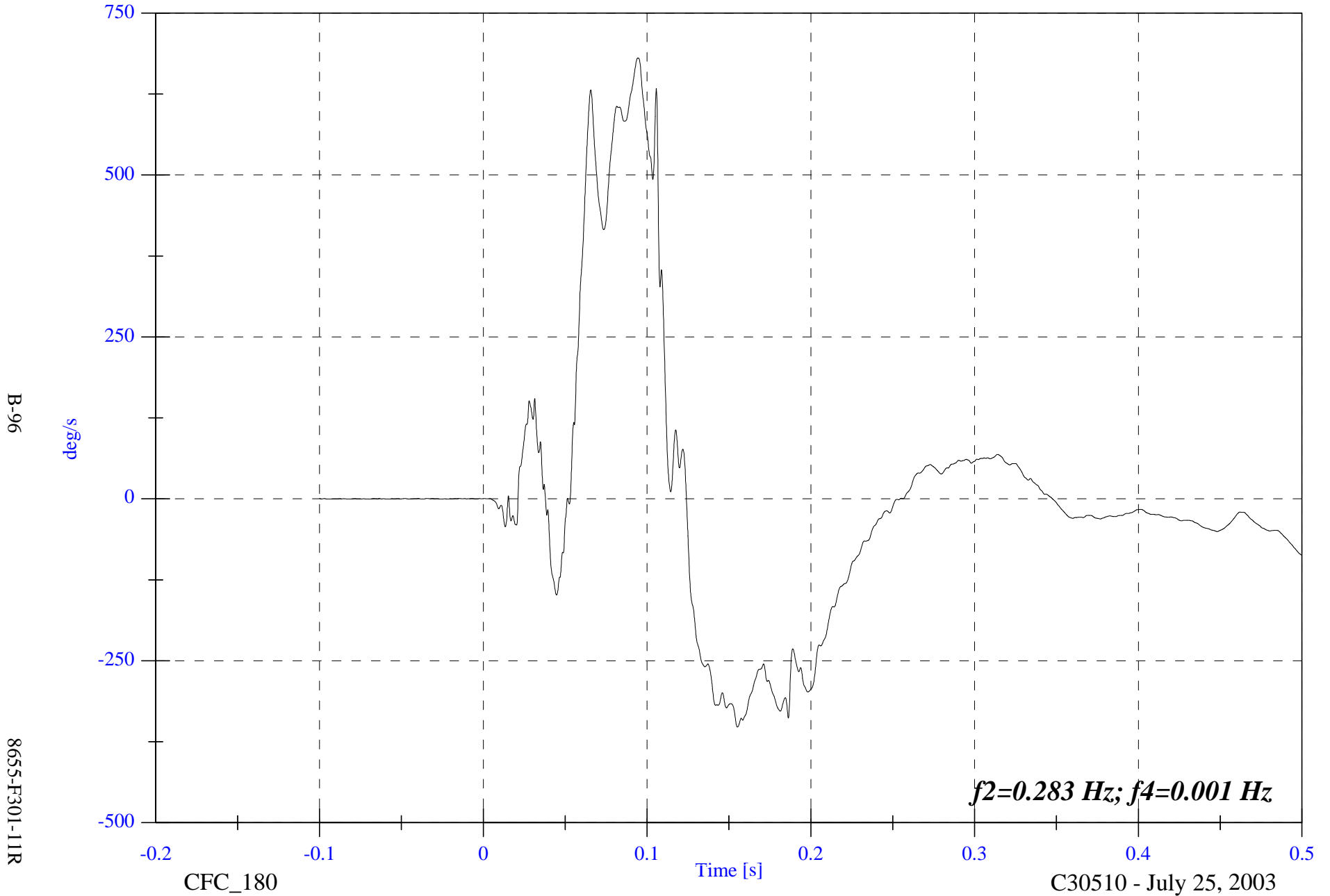
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Left Seat Rotation Comp AVy

Max: 680.8 [deg/s] at 0.095 [s]

Min: -352.4 [deg/s] at 0.155 [s]

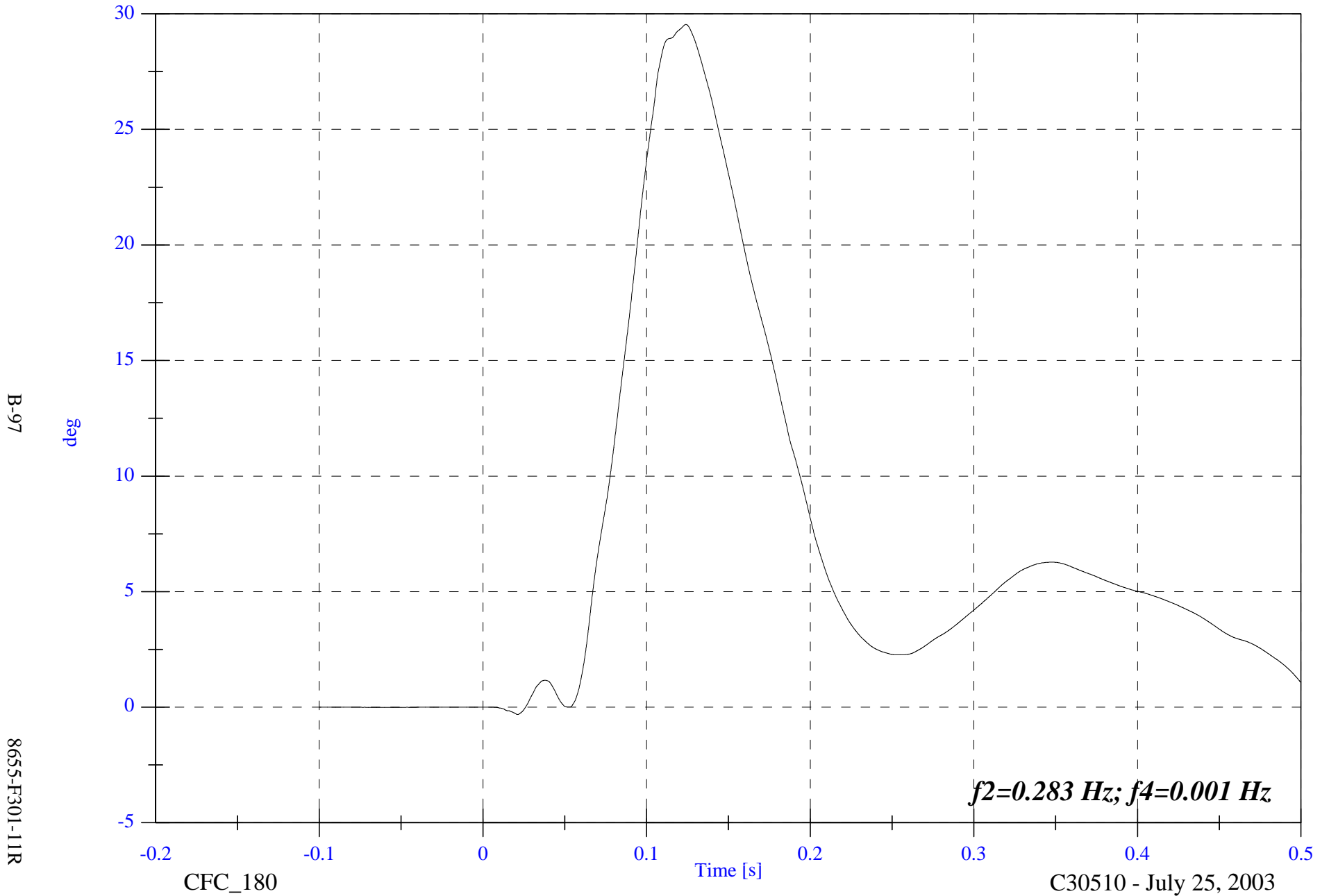


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 29.5 [deg] at 0.124 [s]

V2 P1 Left Seat Rotation Comp ADy

Min: -0.3 [deg] at 0.021 [s]



B-97

8655-F301-11R

CFC\_180

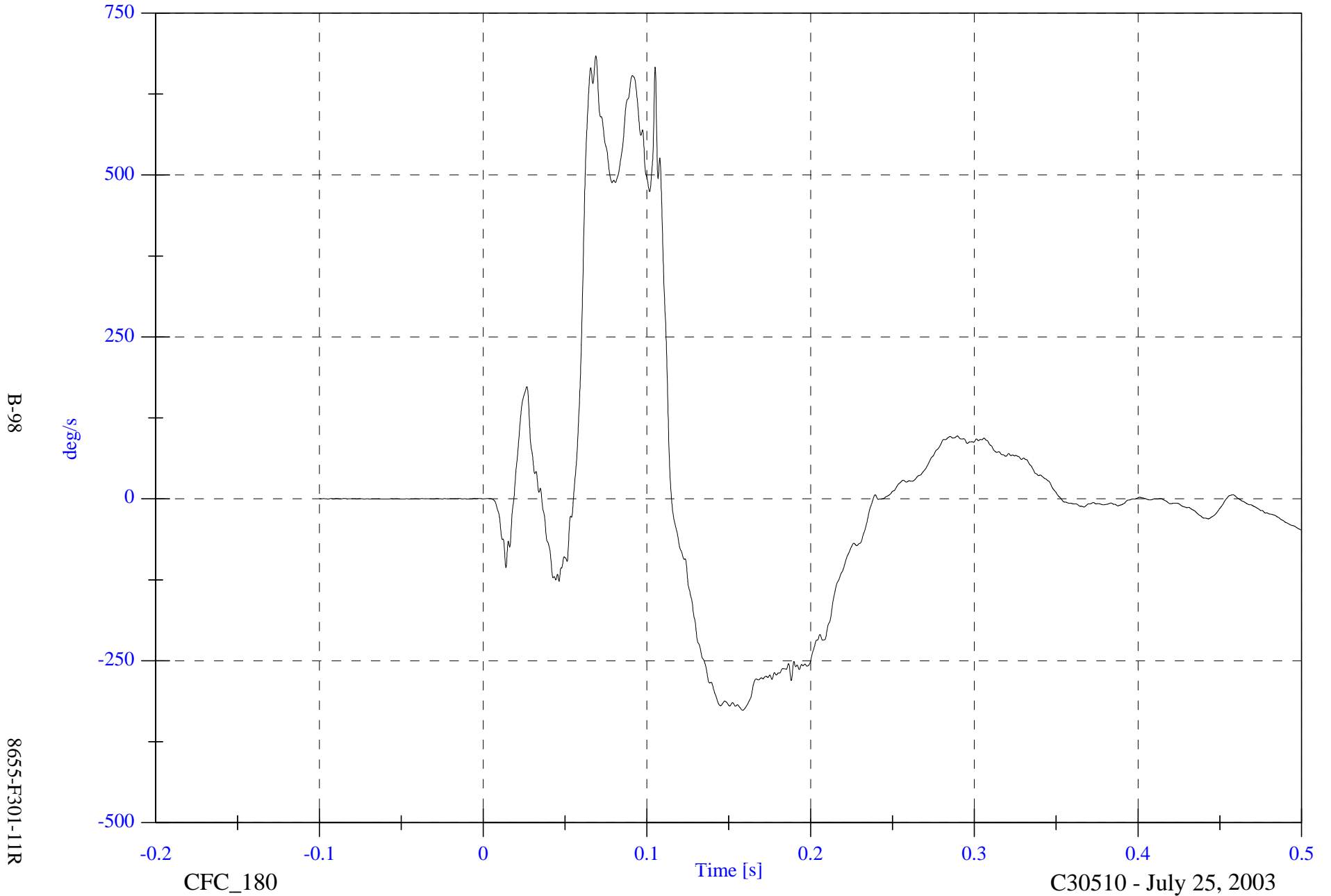
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Right Seat Rotation AVy

Max: 684.0 [deg/s] at 0.069 [s]

Min: -326.2 [deg/s] at 0.159 [s]



B-98

8655-F301-11R

CFC\_180

Time [s]

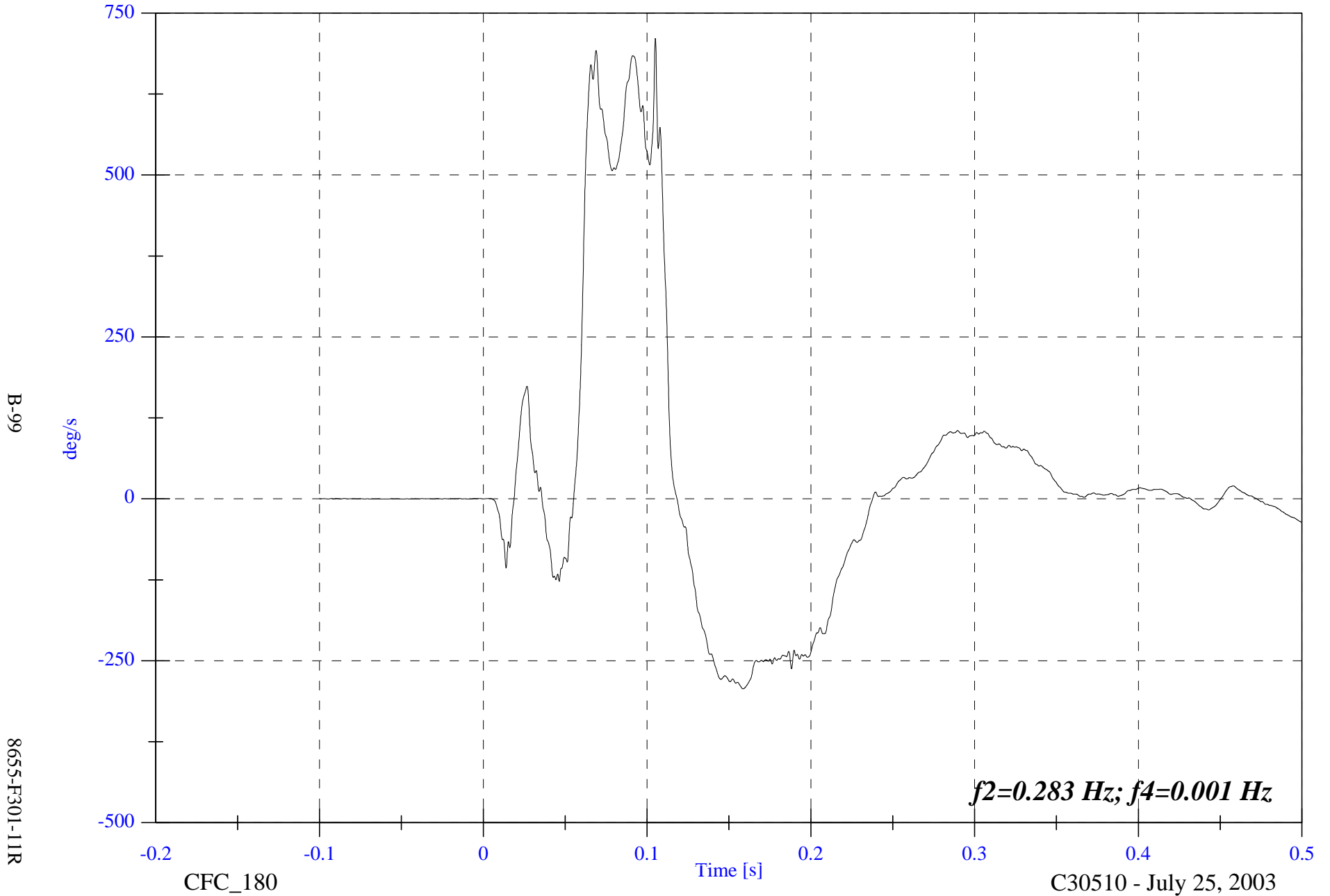
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Right Seat Rotation Comp AVy

Max: 711.0 [deg/s] at 0.105 [s]

Min: -293.3 [deg/s] at 0.159 [s]

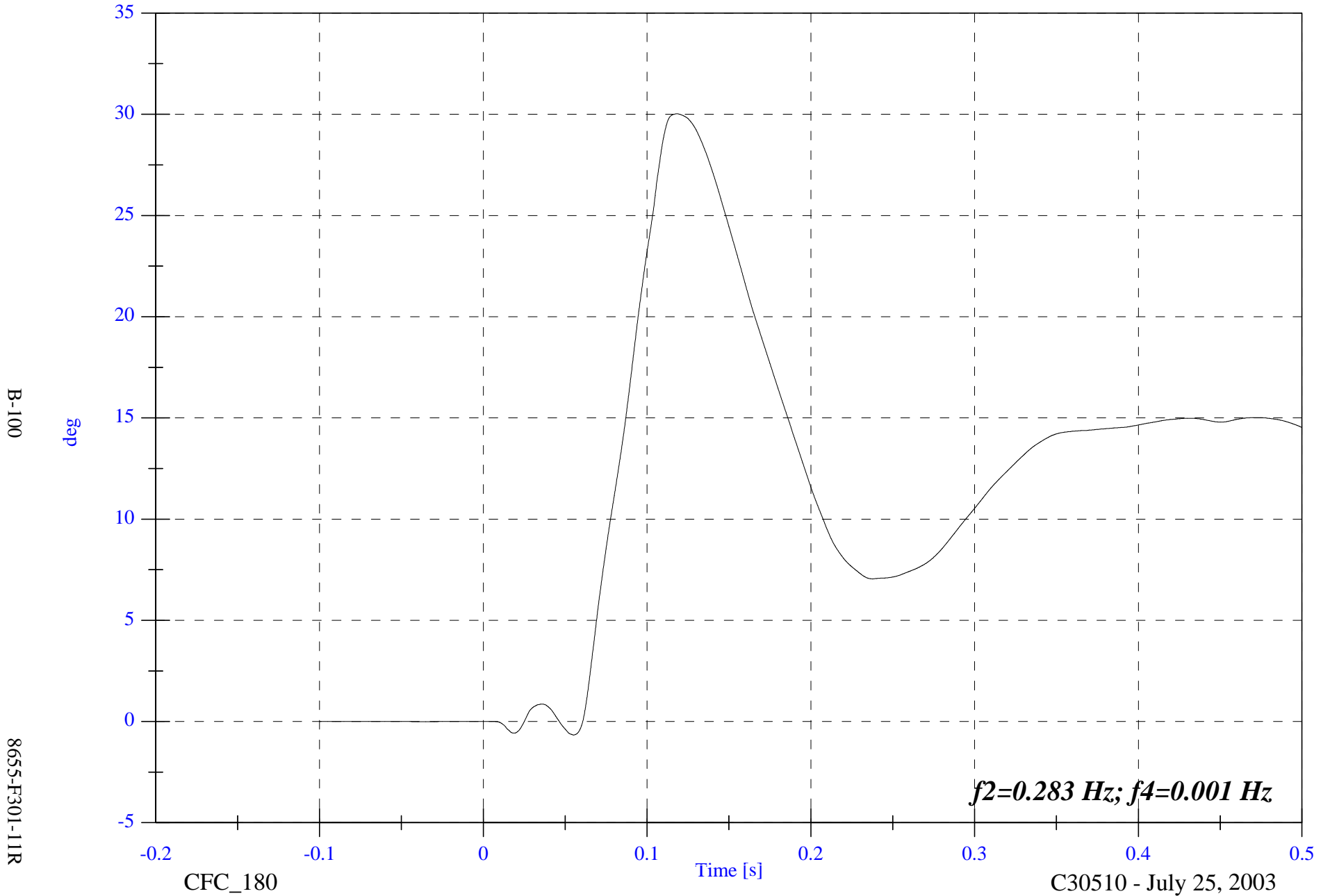


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Right Seat Rotation Comp ADy

Max: 30.0 [deg] at 0.118 [s]

Min: -0.7 [deg] at 0.055 [s]



B-100

8655-F301-11R

CFC\_180

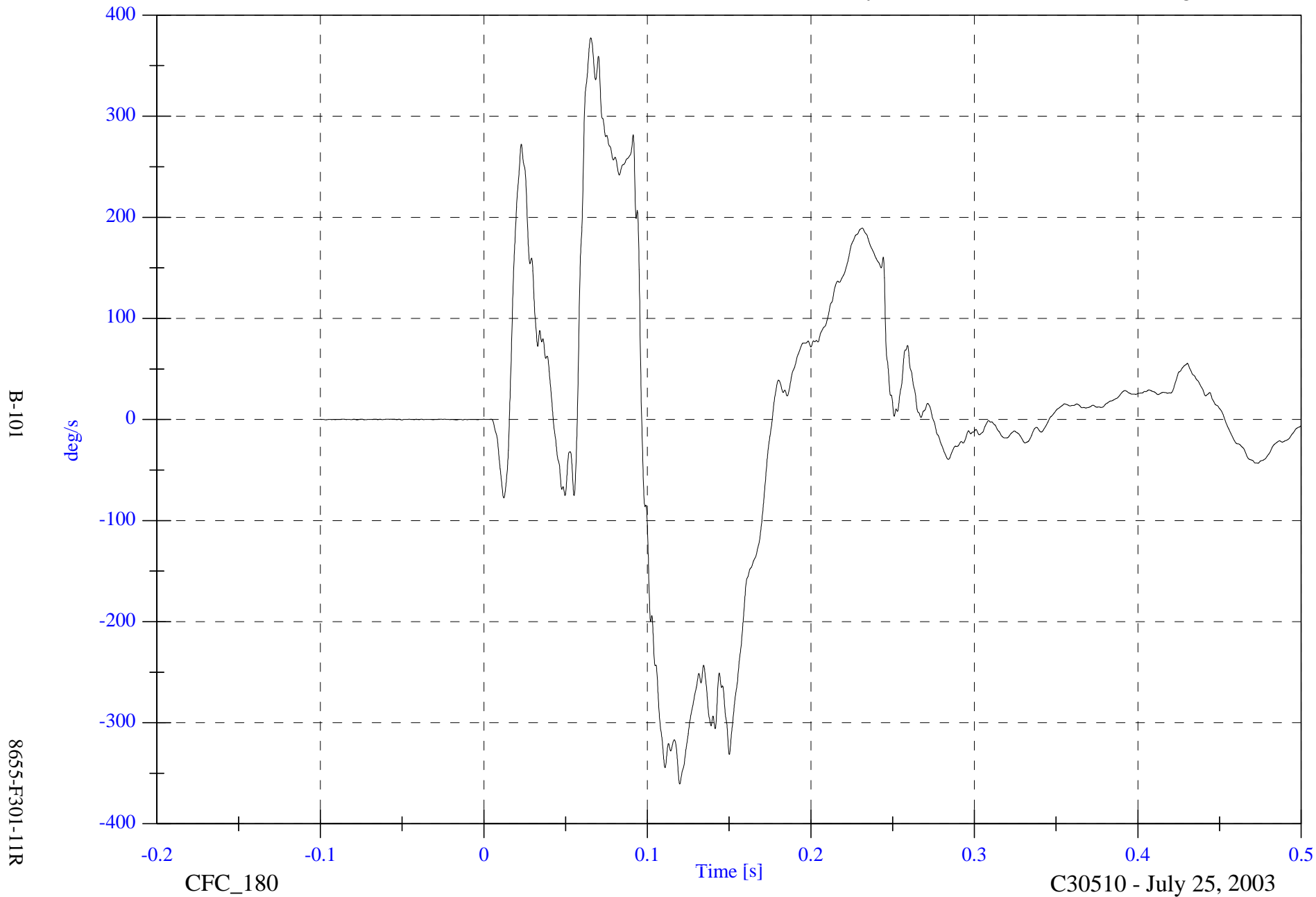
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 377.6 [deg/s] at 0.065 [s]

Min: -360.7 [deg/s] at 0.120 [s]

### V2 P2 Left Seat Rotation AVy



B-101

8655-F301-11R

CFC\_180

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

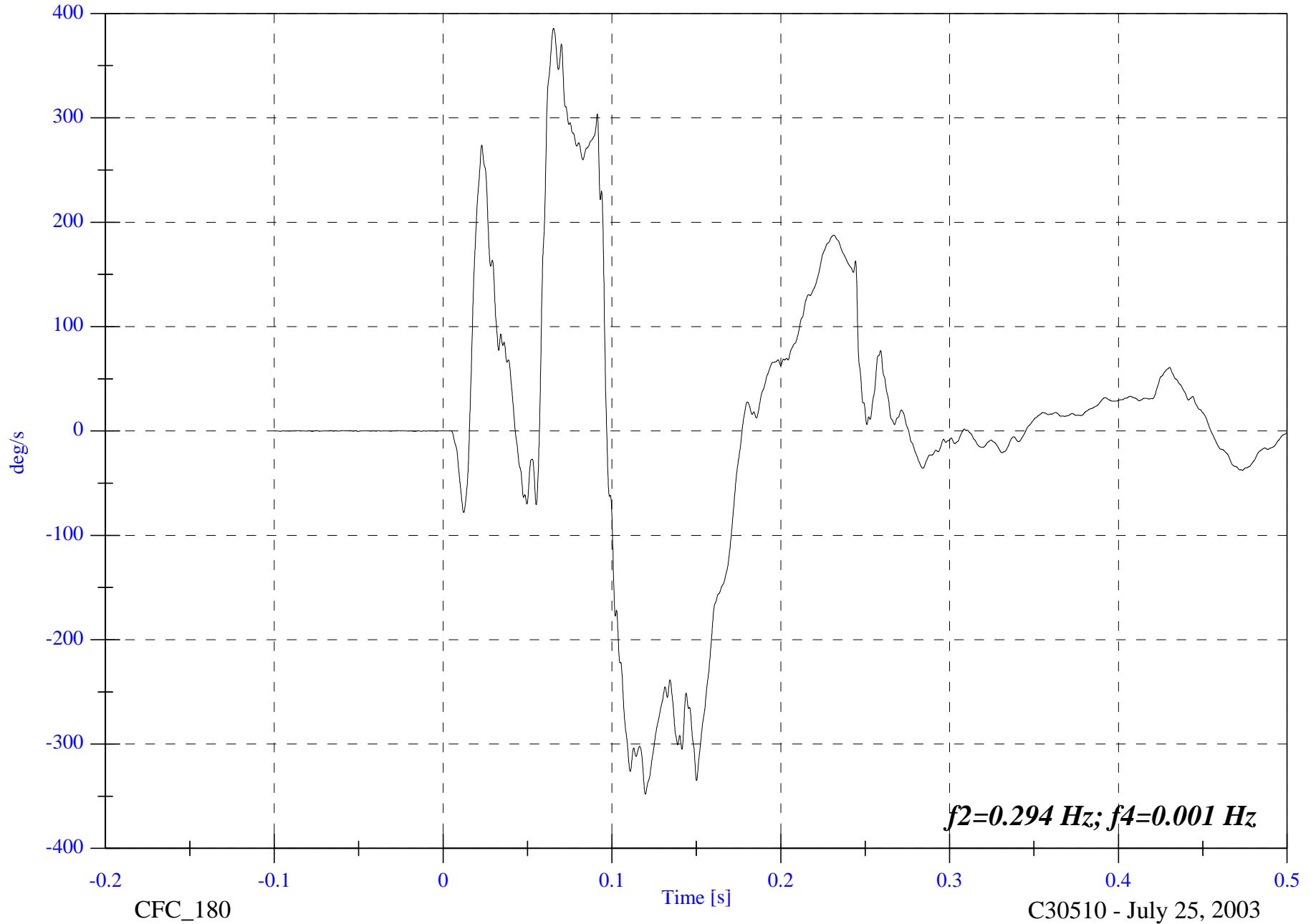
V2 P2 Left Seat Rotation Comp AVy

Max: 385.9 [deg/s] at 0.065 [s]

Min: -348.1 [deg/s] at 0.120 [s]

B-102

8655-F301-11R



2003 FMVSS 301 Test 2 2003 Saab 9-3

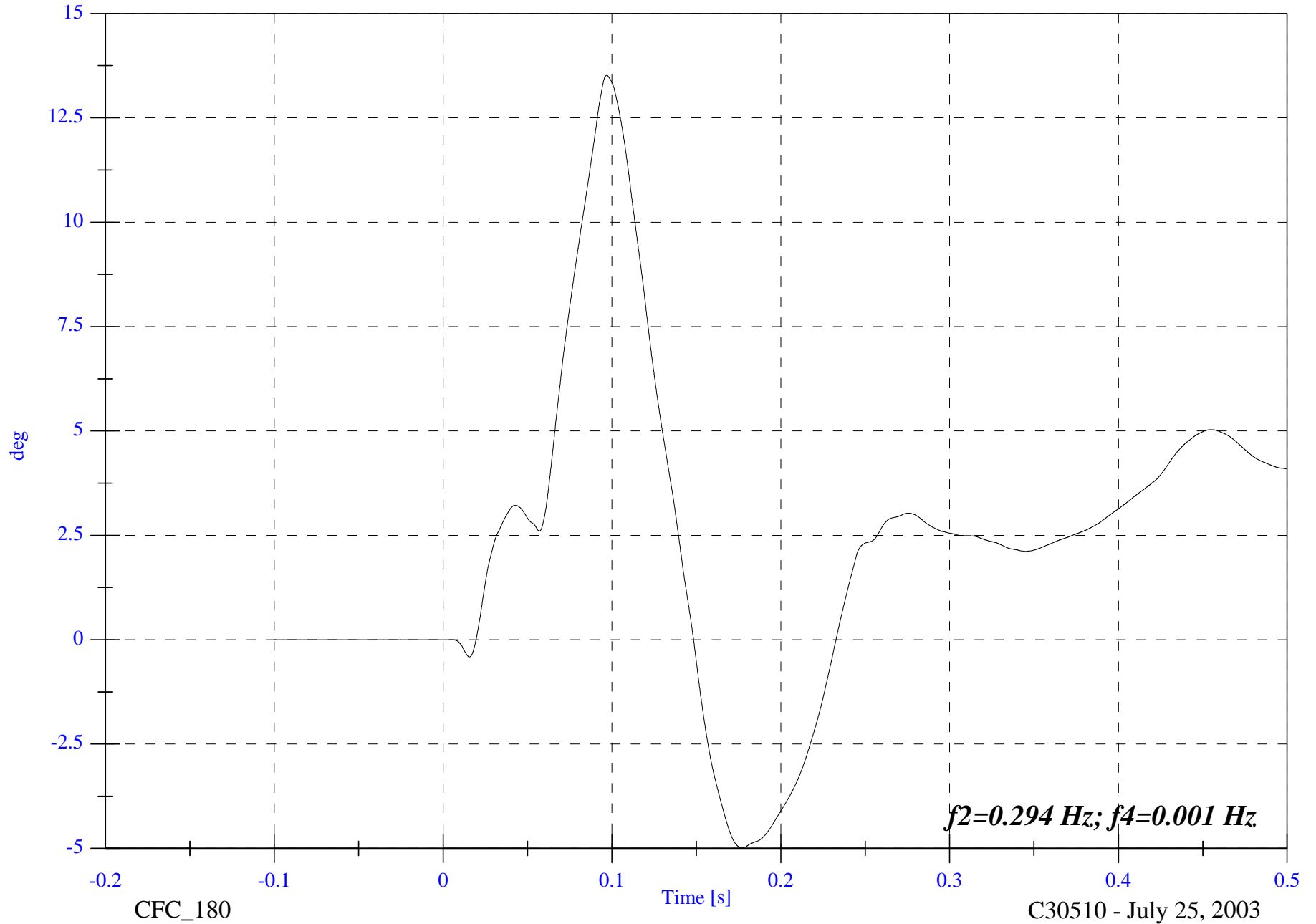
Max: 13.5 [deg] at 0.097 [s]

V2 P2 Left Seat Rotation Comp ADy

Min: -5.0 [deg] at 0.177 [s]

B-103

8655-F301-11R



CFC\_180

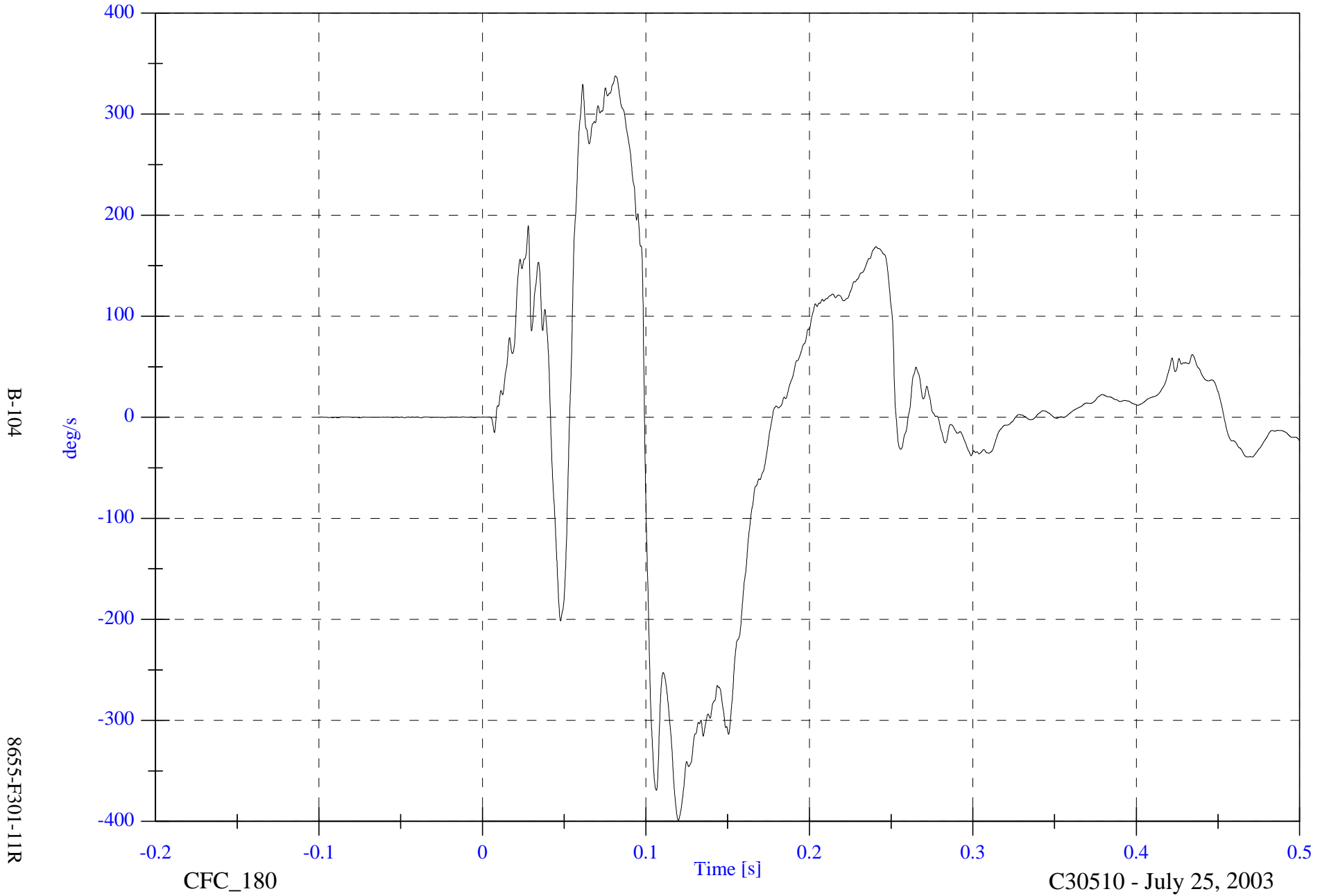
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P2 Right Seat Rotation AVy

Max: 337.8 [deg/s] at 0.081 [s]

Min: -398.8 [deg/s] at 0.120 [s]



2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P2 Right Seat Rotation Comp AVy

Max: 355.5 [deg/s] at 0.081 [s]

Min: -384.3 [deg/s] at 0.120 [s]

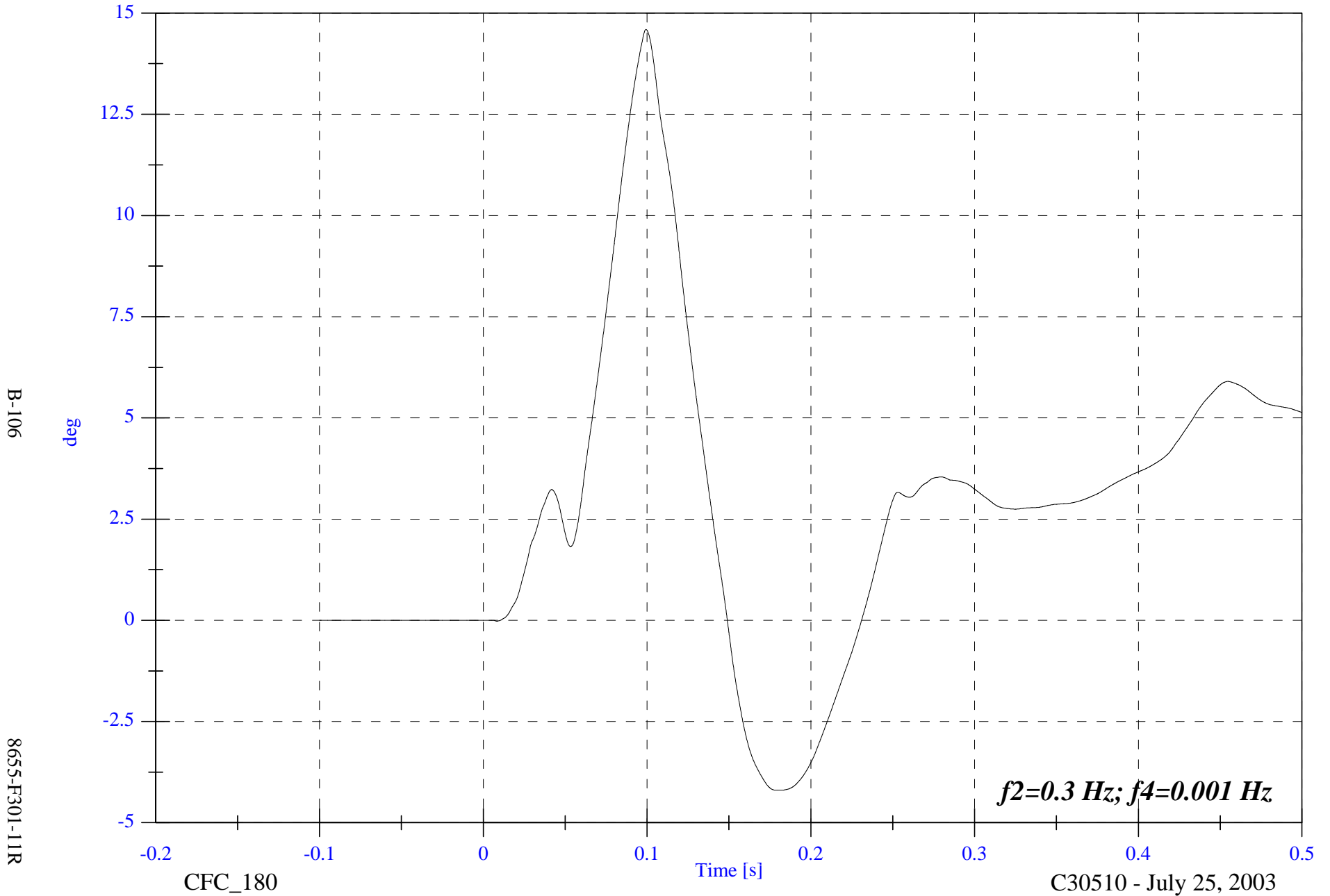


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 14.6 [deg] at 0.099 [s]

V2 P2 Right Seat Rotation Comp ADy

Min: -4.2 [deg] at 0.179 [s]

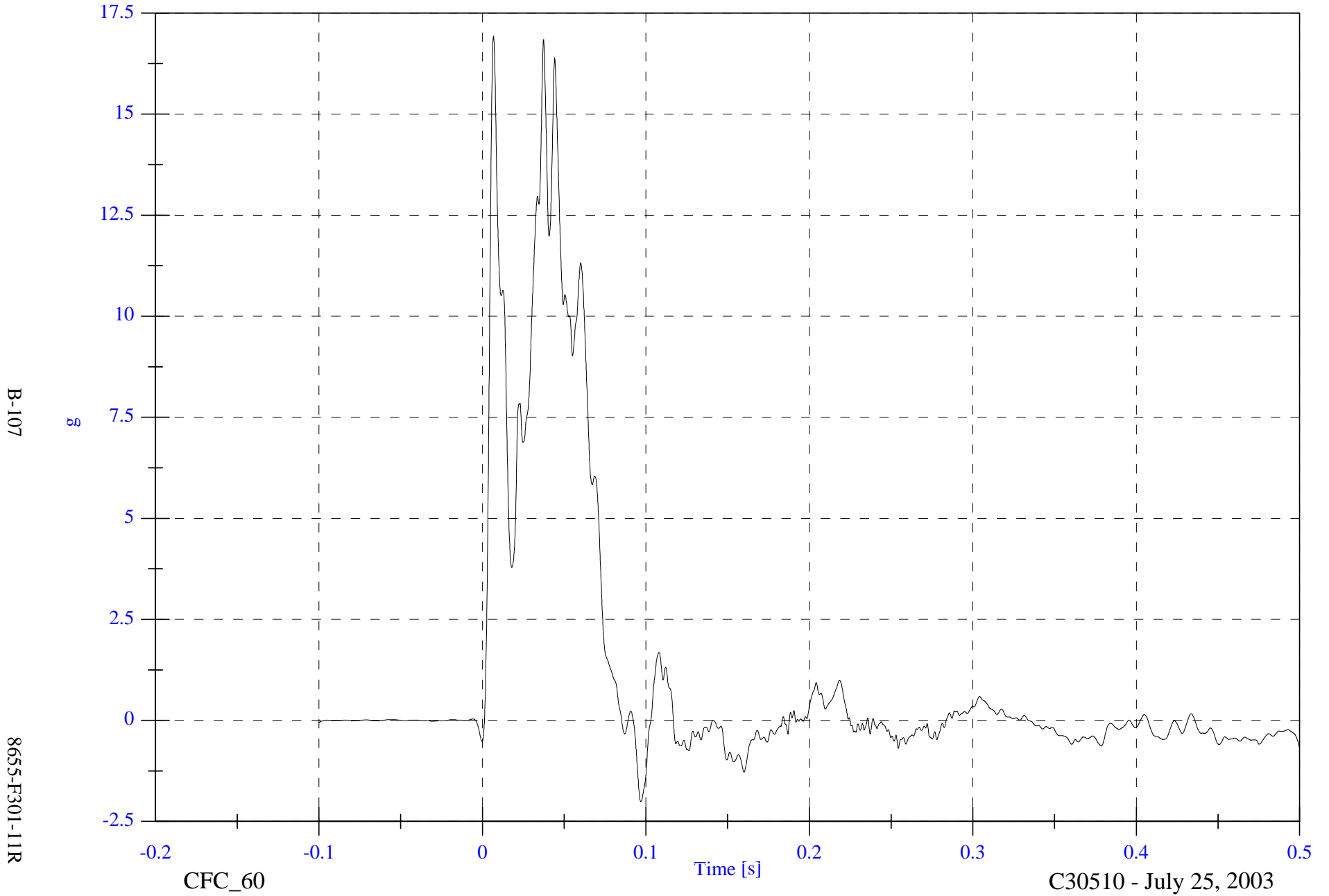


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 16.9 [g] at 0.007 [s]

Min: -2.0 [g] at 0.097 [s]

V2 Left X Member x

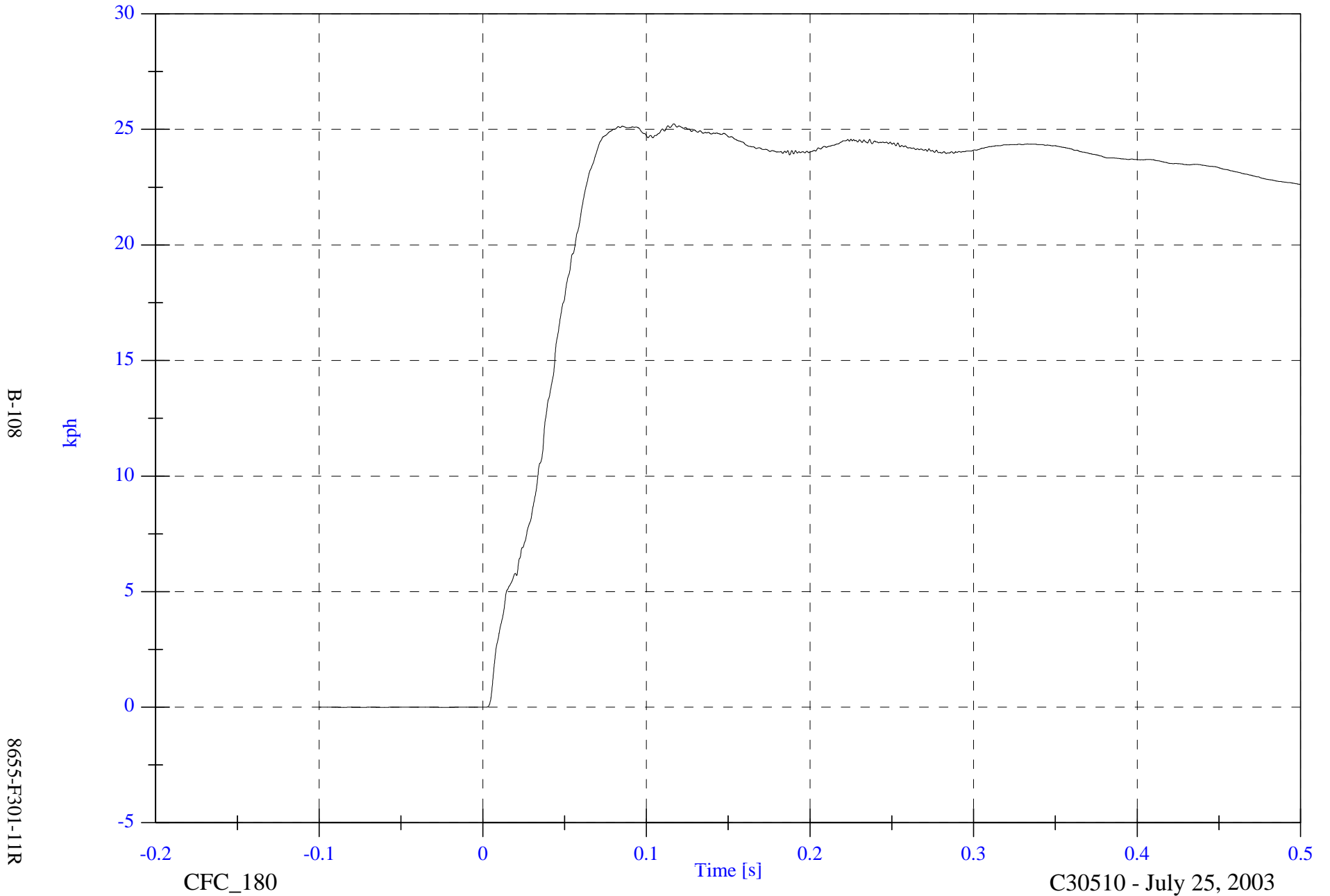


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 25.2 [kph] at 0.117 [s]

V2 Left X Member x Velocity

Min: -0.0 [kph] at -0.021 [s]



B-108

8655-F301-11R

CFC\_180

Time [s]

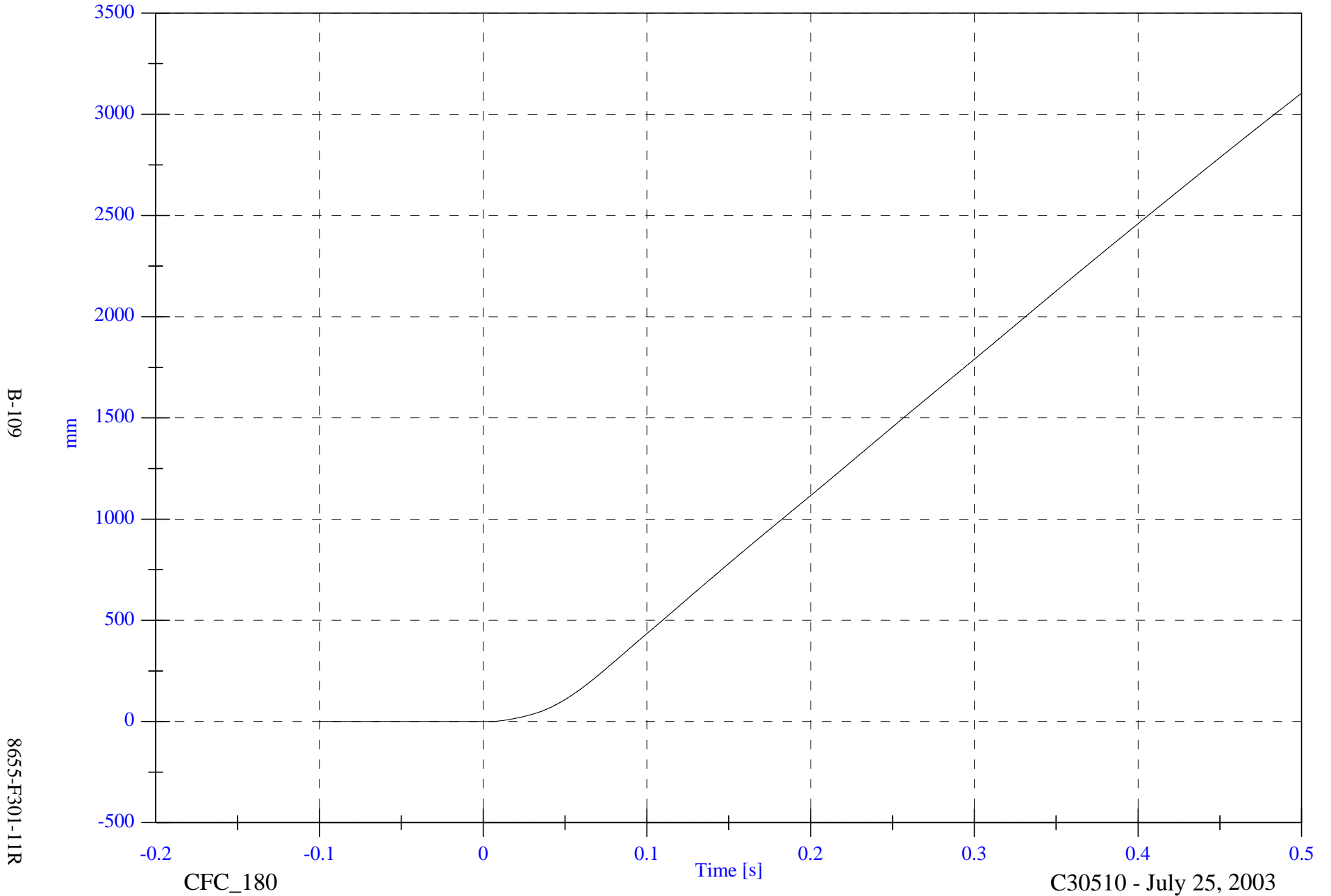
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 Left X Member x Displacement

Max: 3103.9 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.055 [s]



B-109

8655-F301-11R

CFC\_180

Time [s]

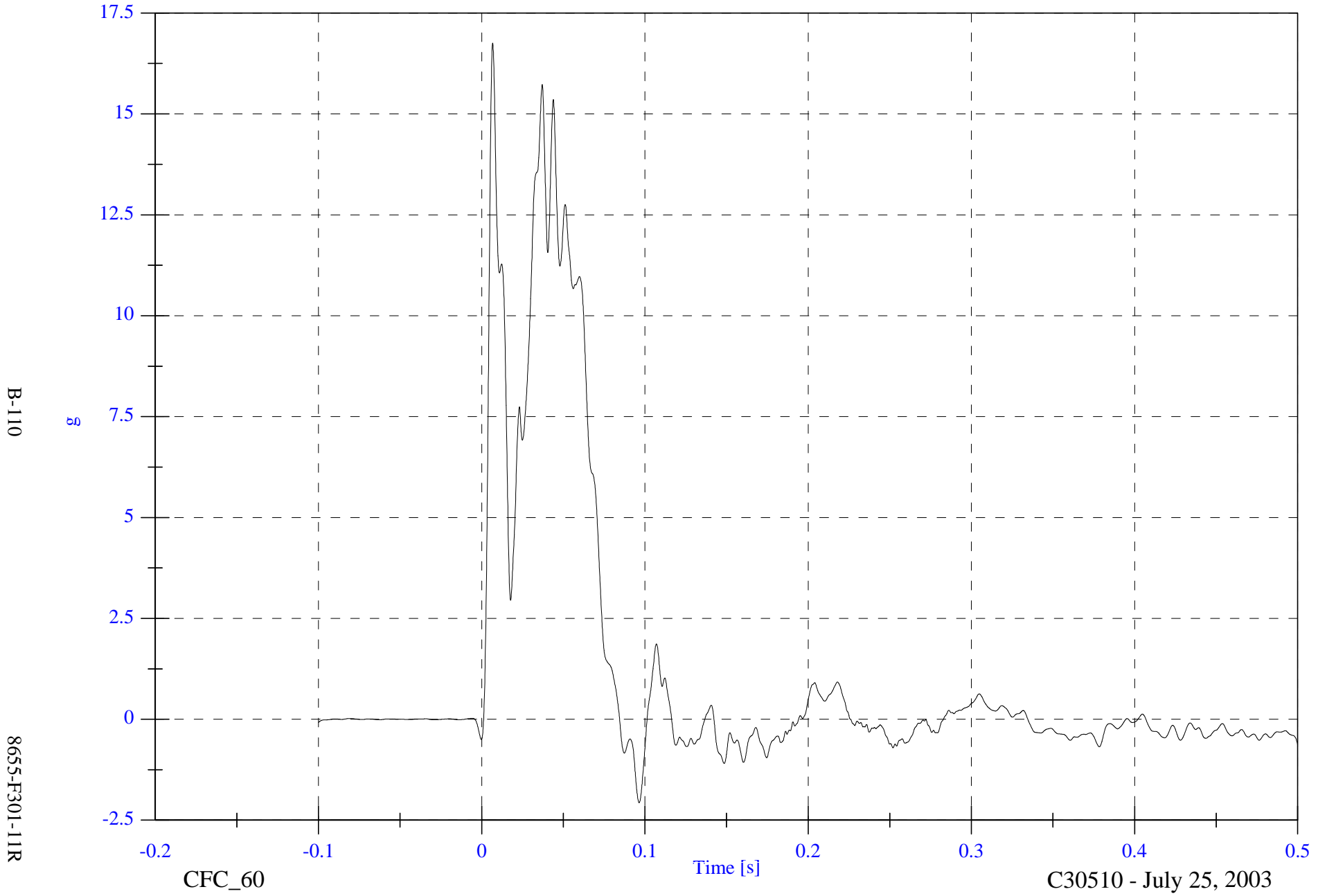
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 16.8 [g] at 0.007 [s]

Min: -2.1 [g] at 0.096 [s]

V2 Left X Member RED x



B-110

8655-F301-11R

CFC\_60

Time [s]

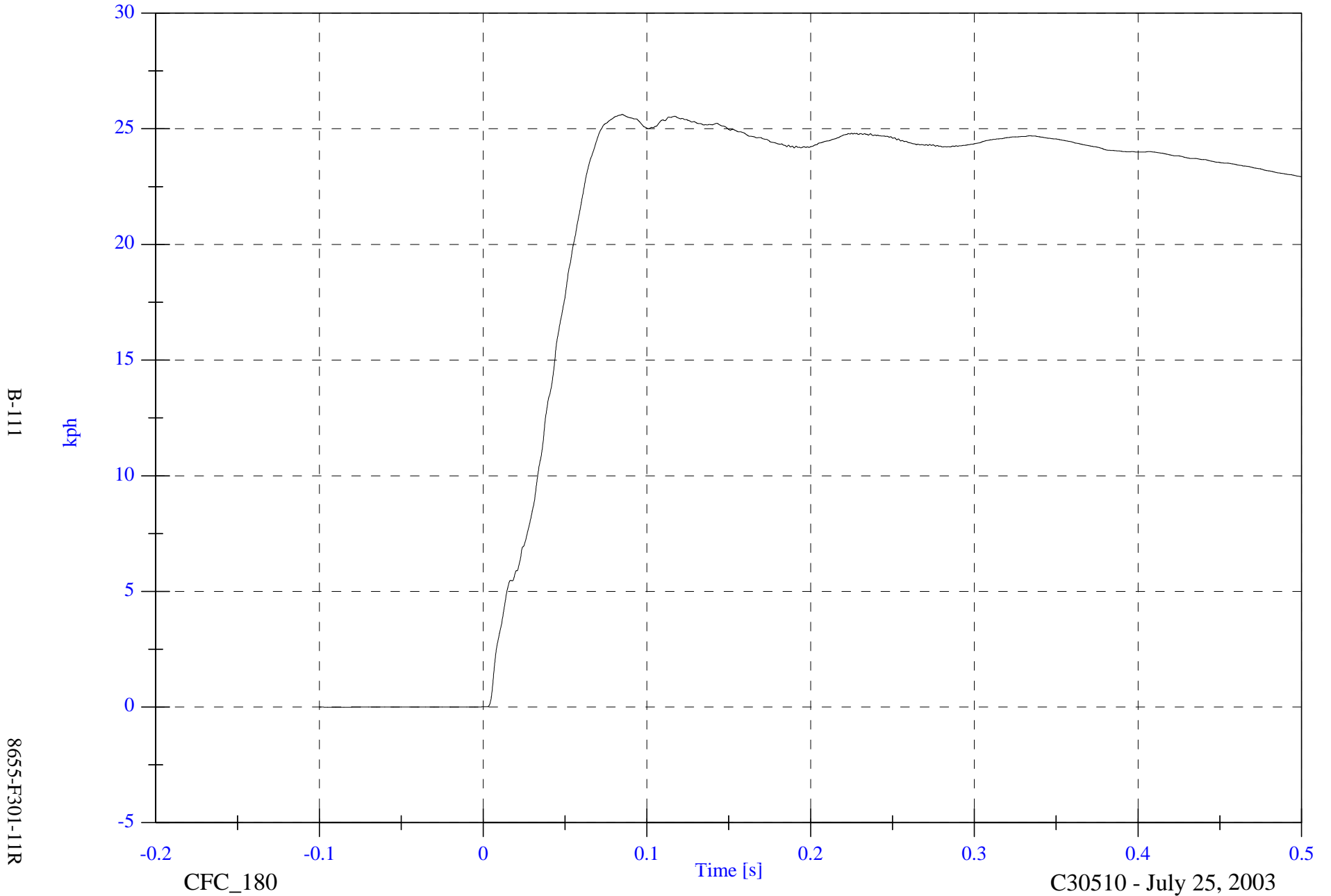
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 25.6 [kph] at 0.085 [s]

V2 Left X Member RED x Velocity

Min: -0.0 [kph] at -0.092 [s]



B-111

8655-F301-11R

CFC\_180

Time [s]

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2003 FMVSS 301 Test 2 2003 Saab 9-3

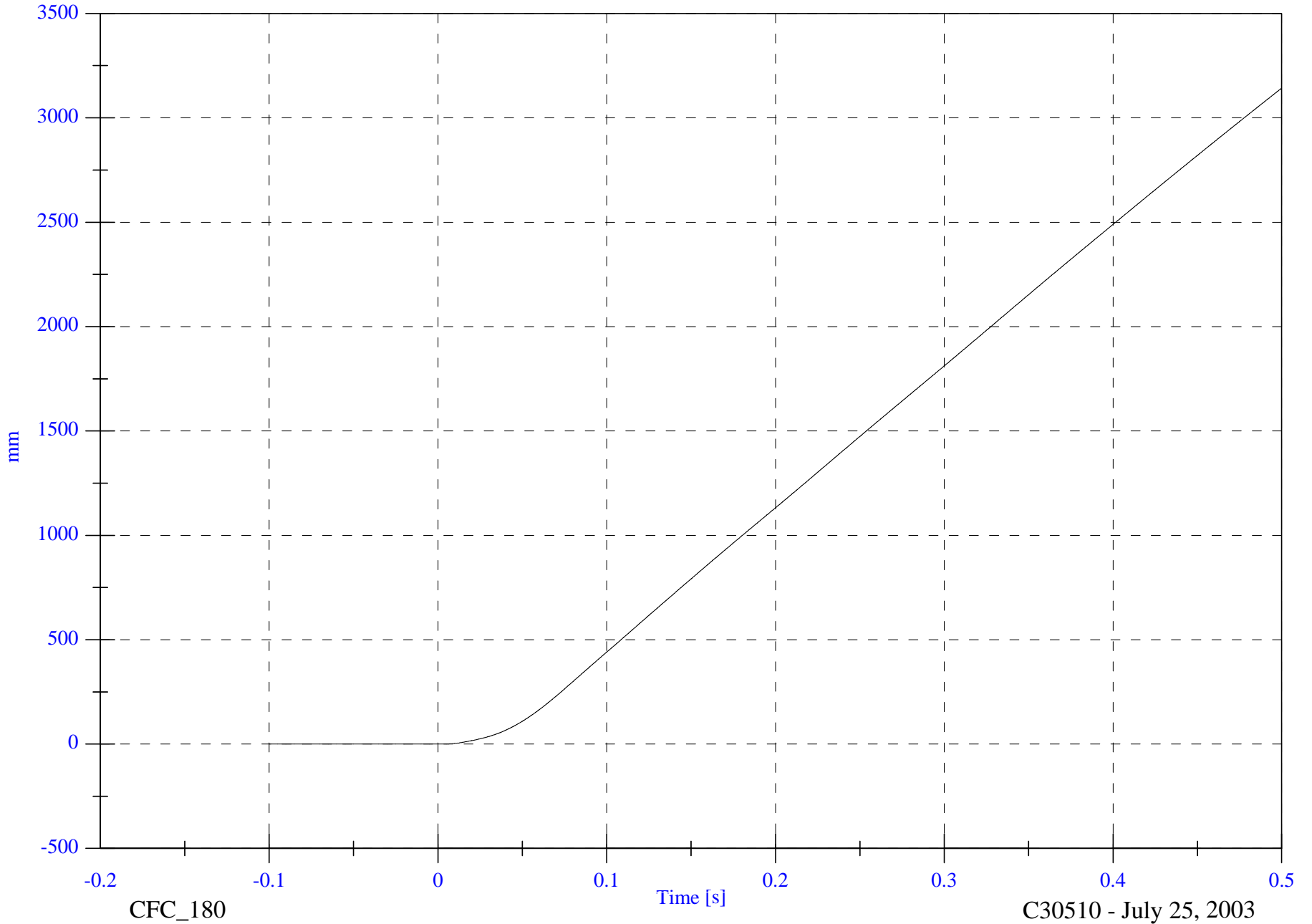
V2 Left X Member RED x Displacement

Max: 3142.3 [mm] at 0.500 [s]

Min: -0.0 [mm] at -0.055 [s]

B-112

8655-F301-11R



CFC\_180

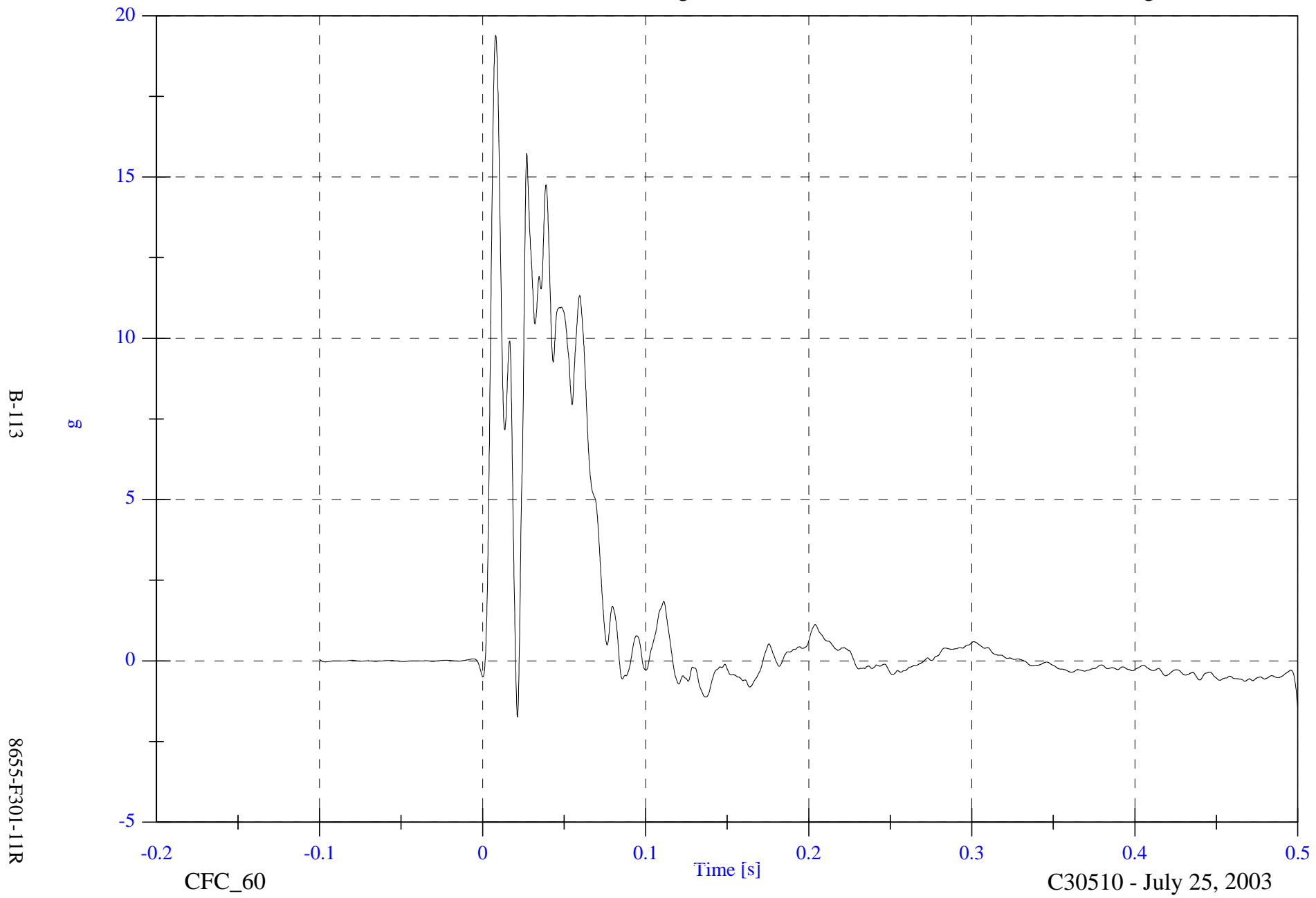
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 Right X Member x

Max: 19.4 [g] at 0.008 [s]

Min: -1.7 [g] at 0.021 [s]



2003 FMVSS 301 Test 2 2003 Saab 9-3

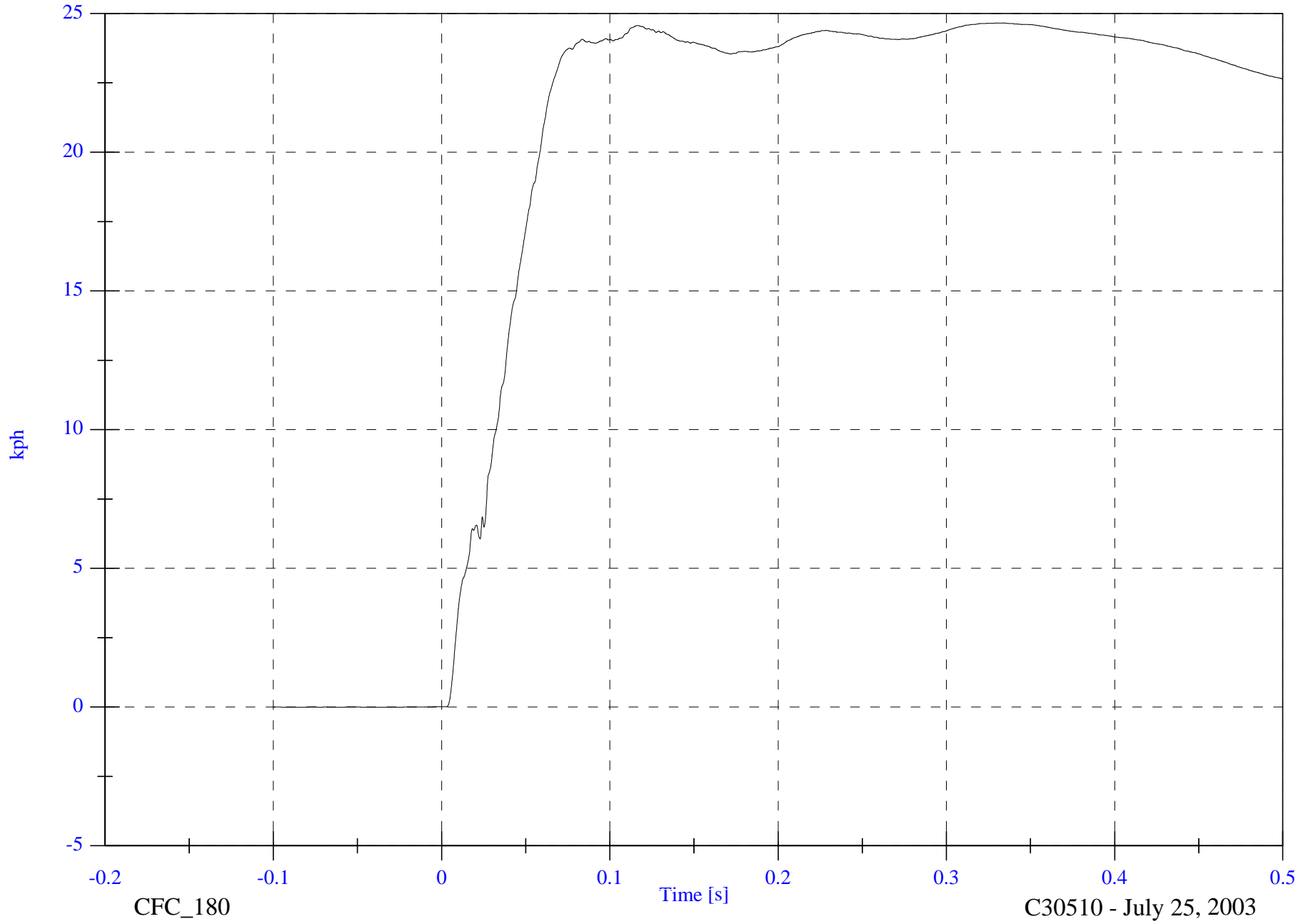
Max: 24.7 [kph] at 0.334 [s]

V2 Right X Member x Velocity

Min: -0.0 [kph] at -0.083 [s]

B-114

8655-F301-11R



CFC\_180

Time [s]

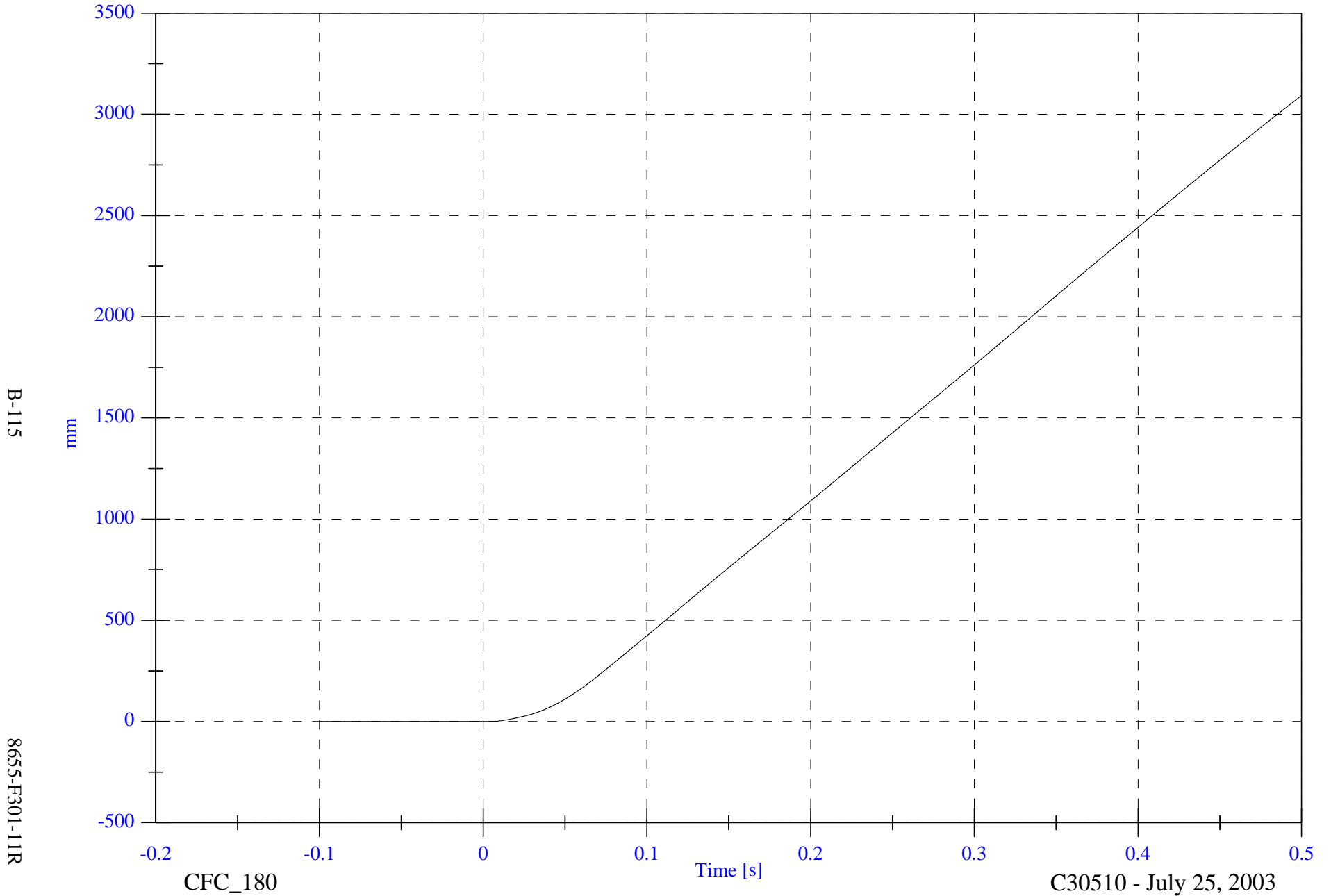
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 Right X Member x Displacement

Max: 3092.8 [mm] at 0.500 [s]

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



B-115

8655-F301-11R

CFC\_180

Time [s]

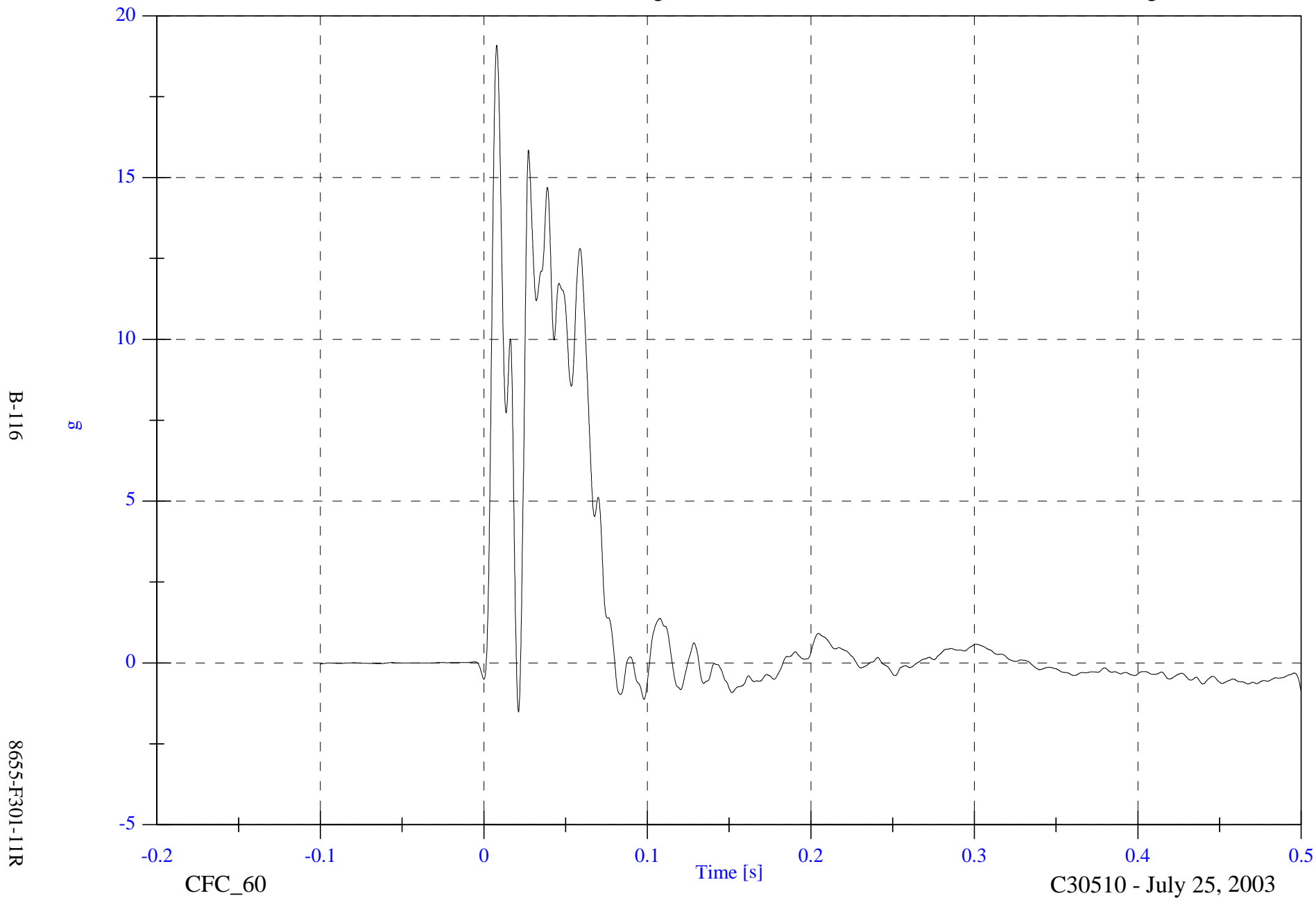
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 Right X Member RED x

Max: 19.1 [g] at 0.008 [s]

Min: -1.5 [g] at 0.021 [s]



B-116

8655-F301-11R

CFC\_60

Time [s]

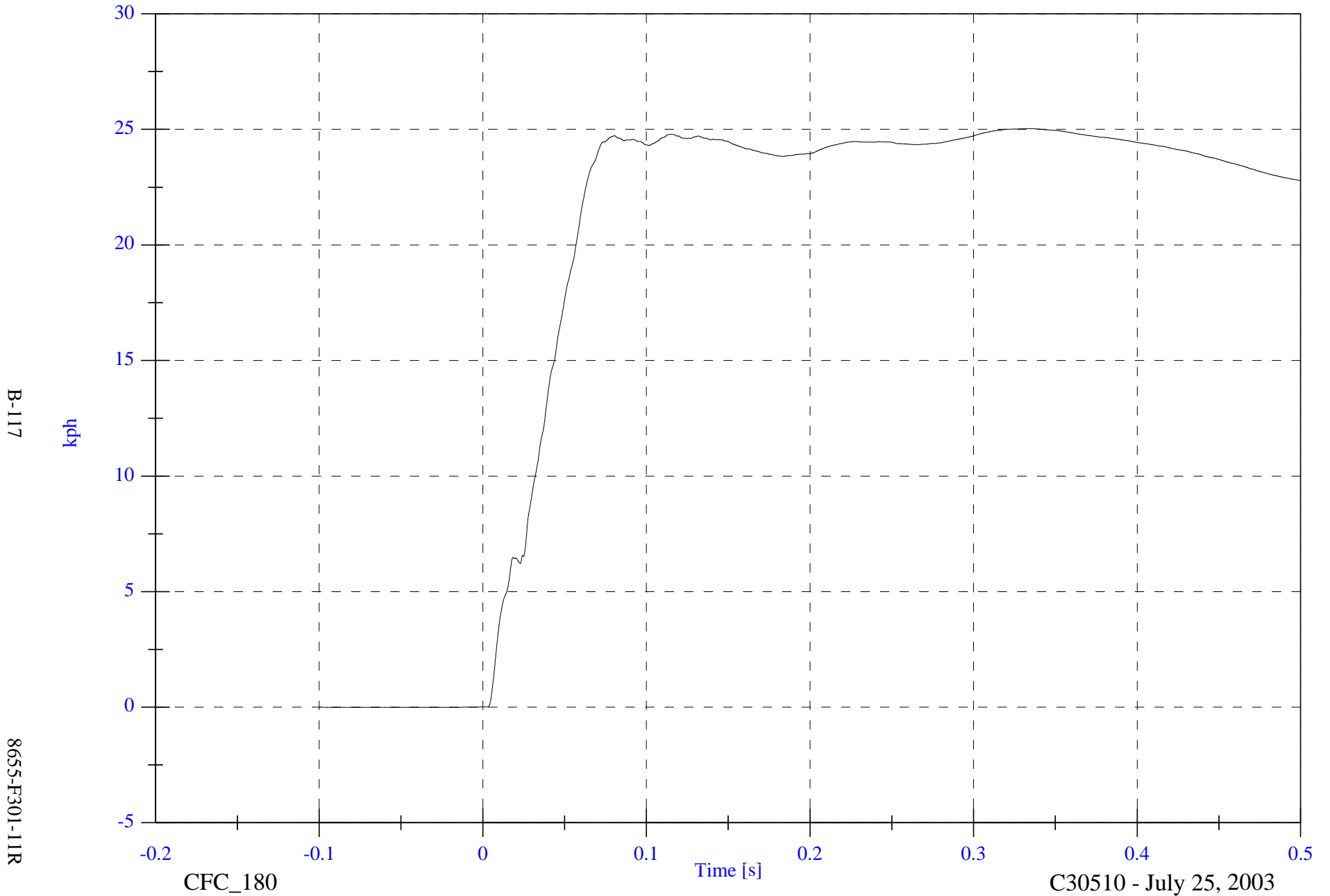
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 25.0 [kph] at 0.334 [s]

V2 Right X Member RED x Velocity

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



B-117

8655-F301-11R

CFC\_180

Time [s]

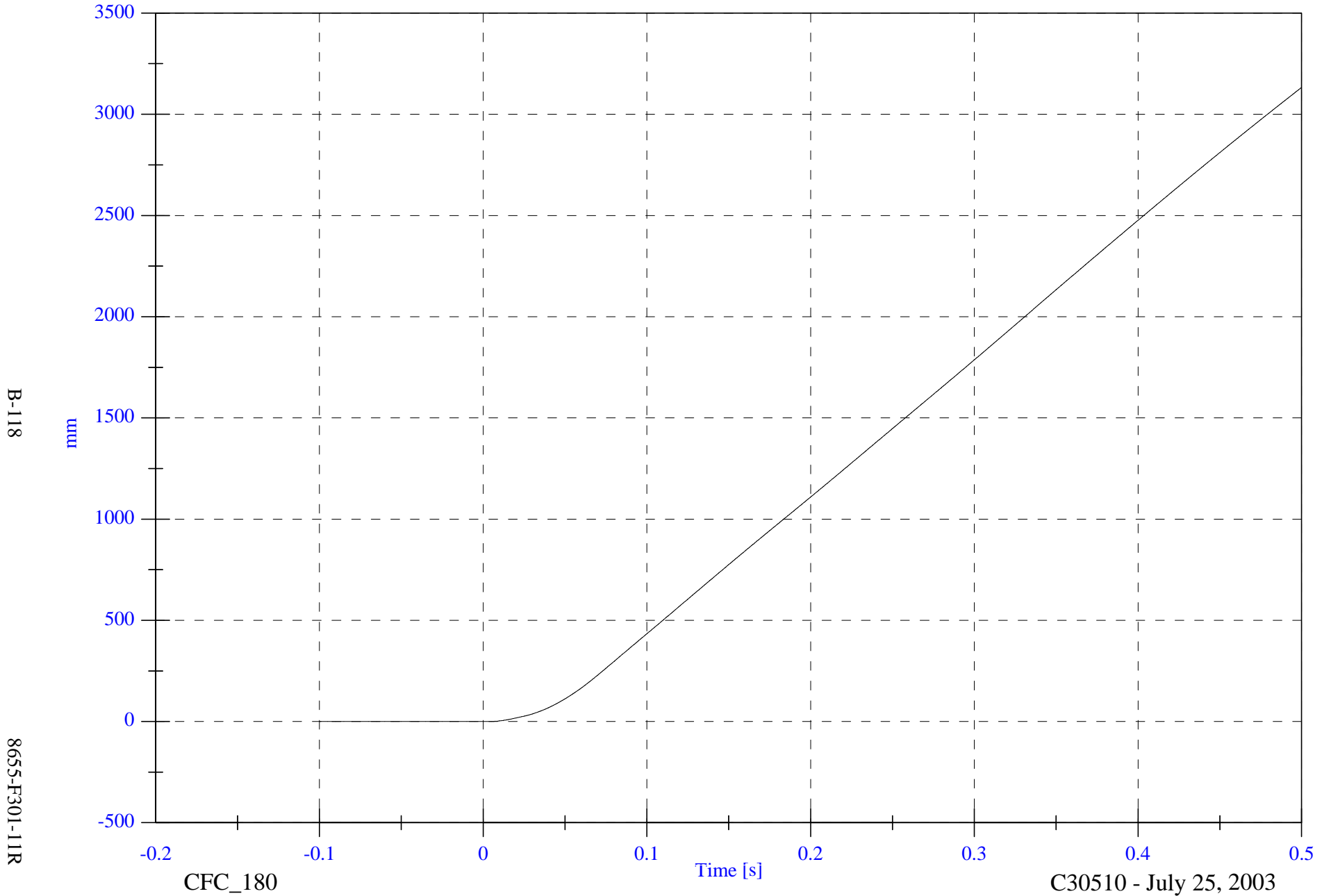
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 Right X Member RED x Displacement

Max: 3132.5 [mm] at 0.500 [s]

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



B-118

8655-F301-11R

CFC\_180

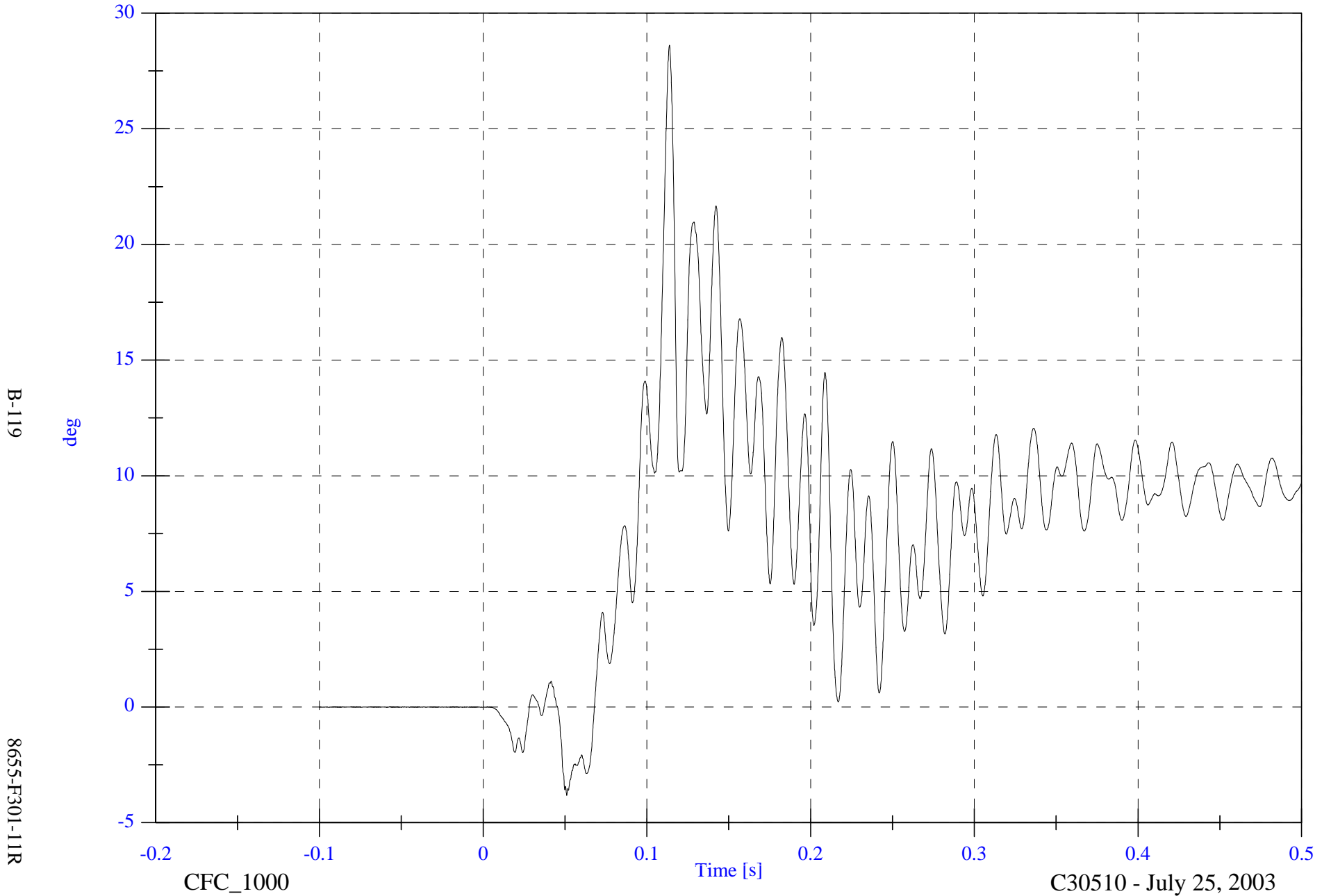
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Left Link Rotation y

Max: 28.6 [deg] at 0.114 [s]

Min: -3.8 [deg] at 0.051 [s]



B-119

8655-F301-11R

CFC\_1000

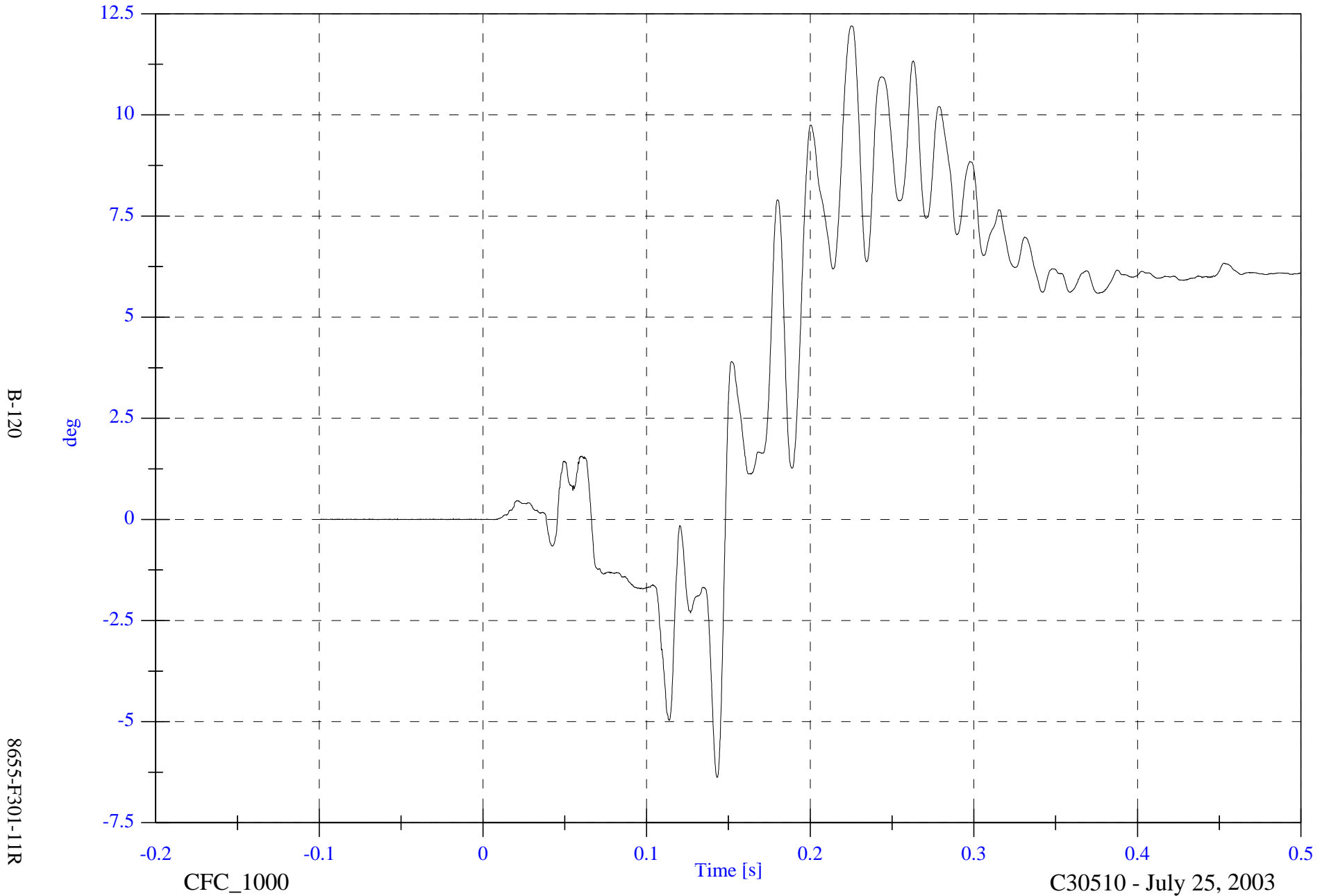
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 12.2 [deg] at 0.225 [s]

V2 P1 Right Link Rotation y

Min: -6.4 [deg] at 0.143 [s]



B-120

8655-F301-11R

CFC\_1000

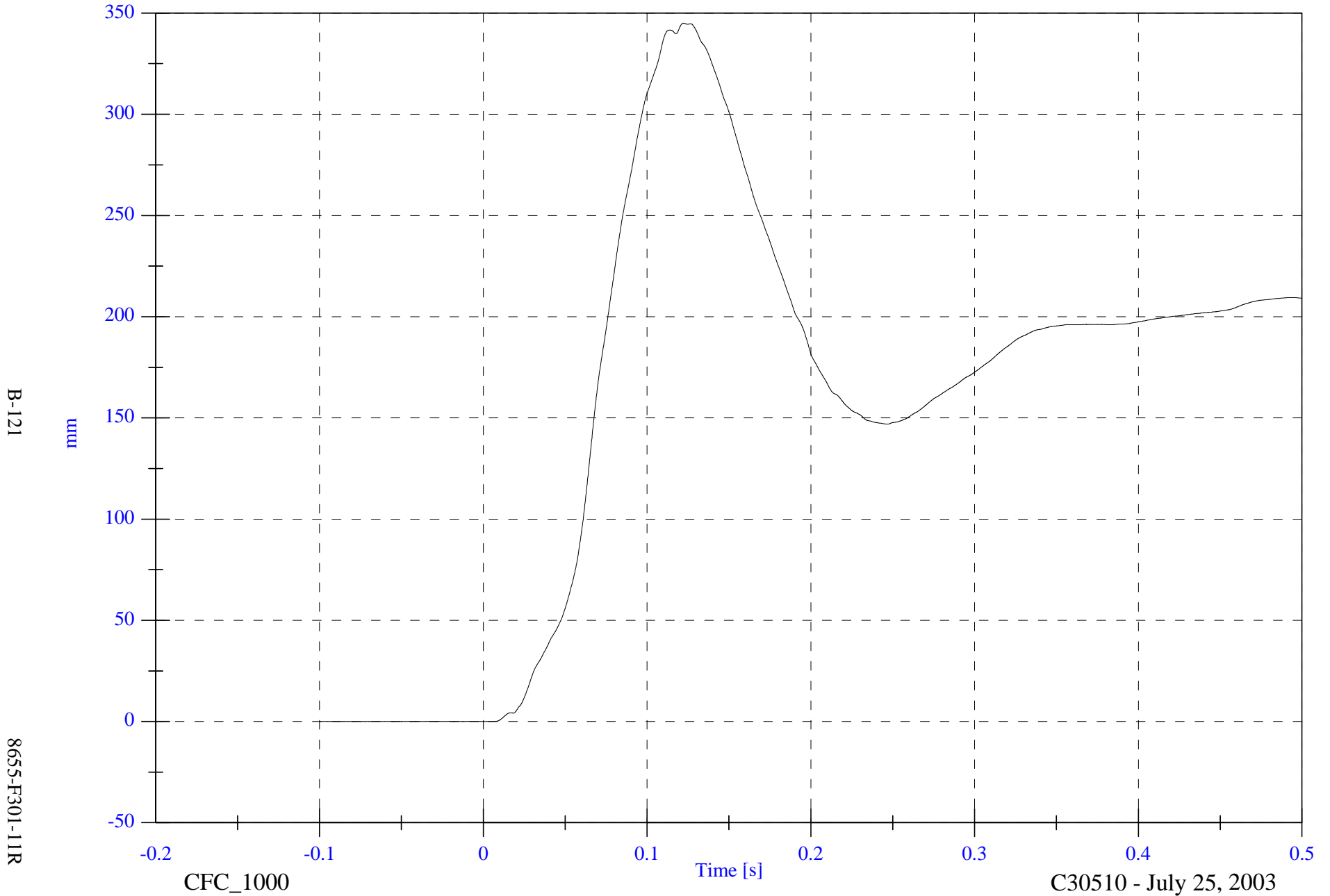
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Left Span Bar Displacement

Max: 345.0 [mm] at 0.122 [s]

Min: -0.1 [mm] at -0.018 [s]



B-121

8655-F301-11R

CFC\_1000

Time [s]

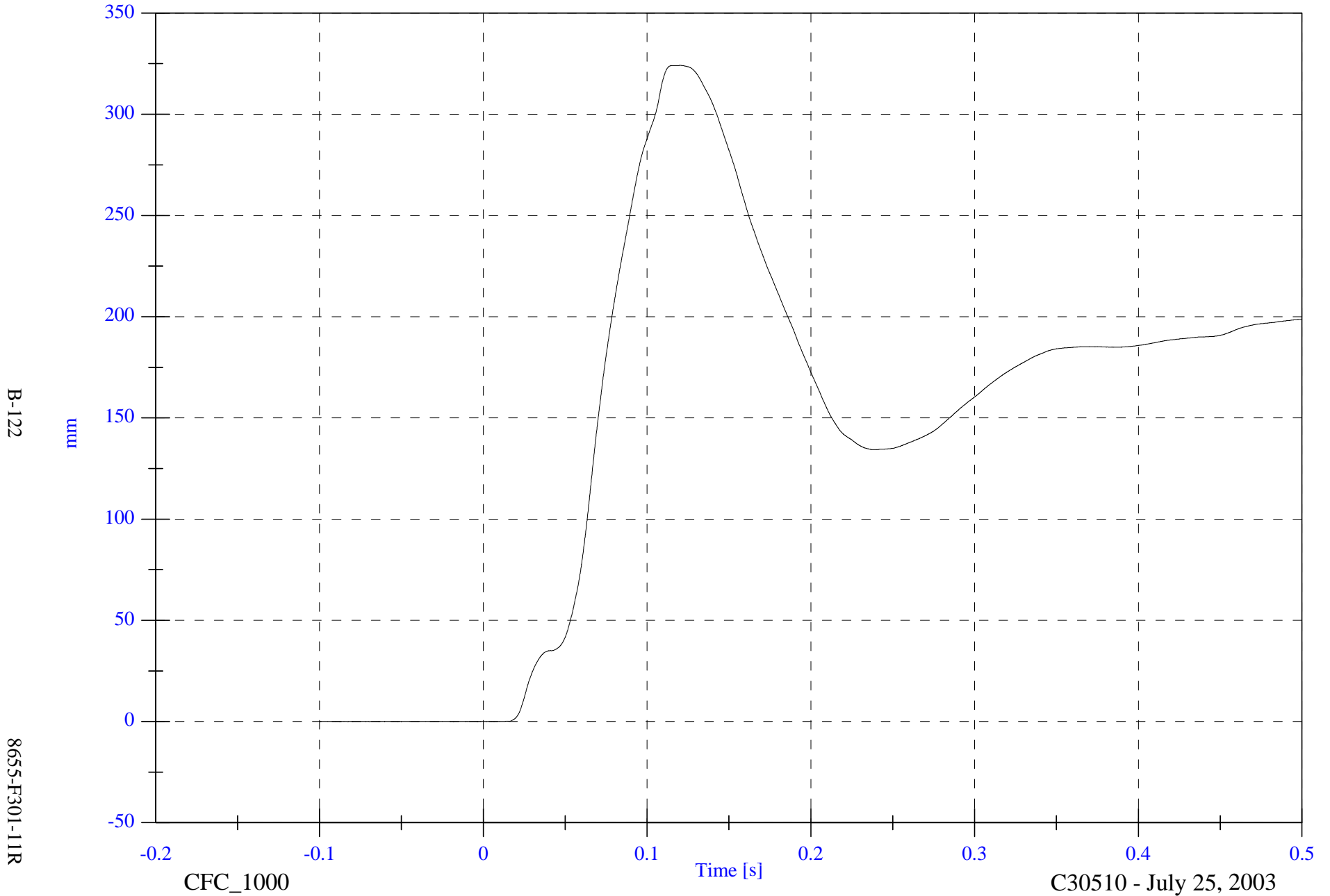
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P1 Right Span Bar Displacement

Max: 324.2 [mm] at 0.120 [s]

Min: -0.1 [mm] at -0.018 [s]



B-122

8655-F301-11R

CFC\_1000

Time [s]

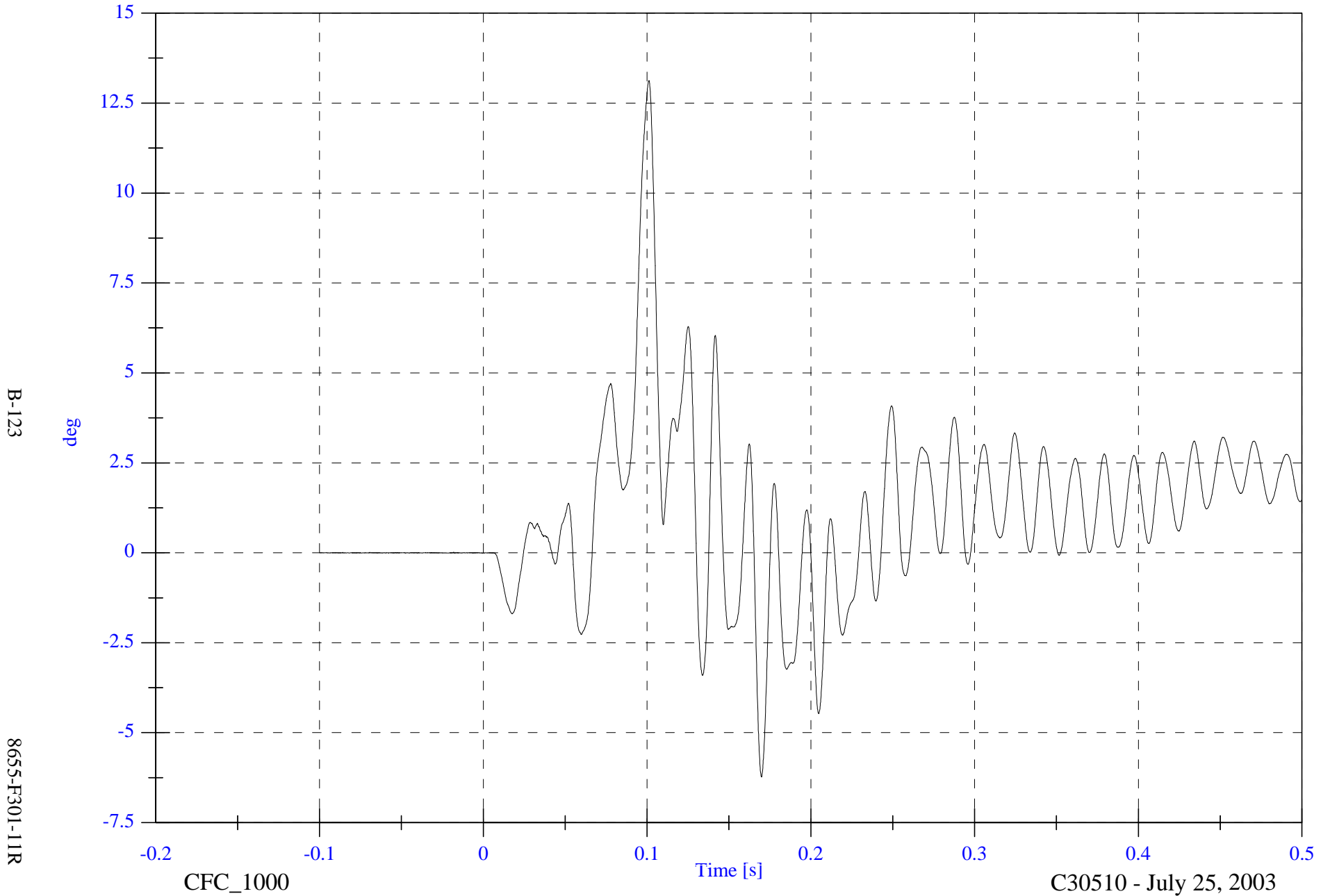
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P2 Left Link Rotation y

Max: 13.1 [deg] at 0.101 [s]

Min: -6.2 [deg] at 0.170 [s]



B-123

8655-F301-11R

CFC\_1000

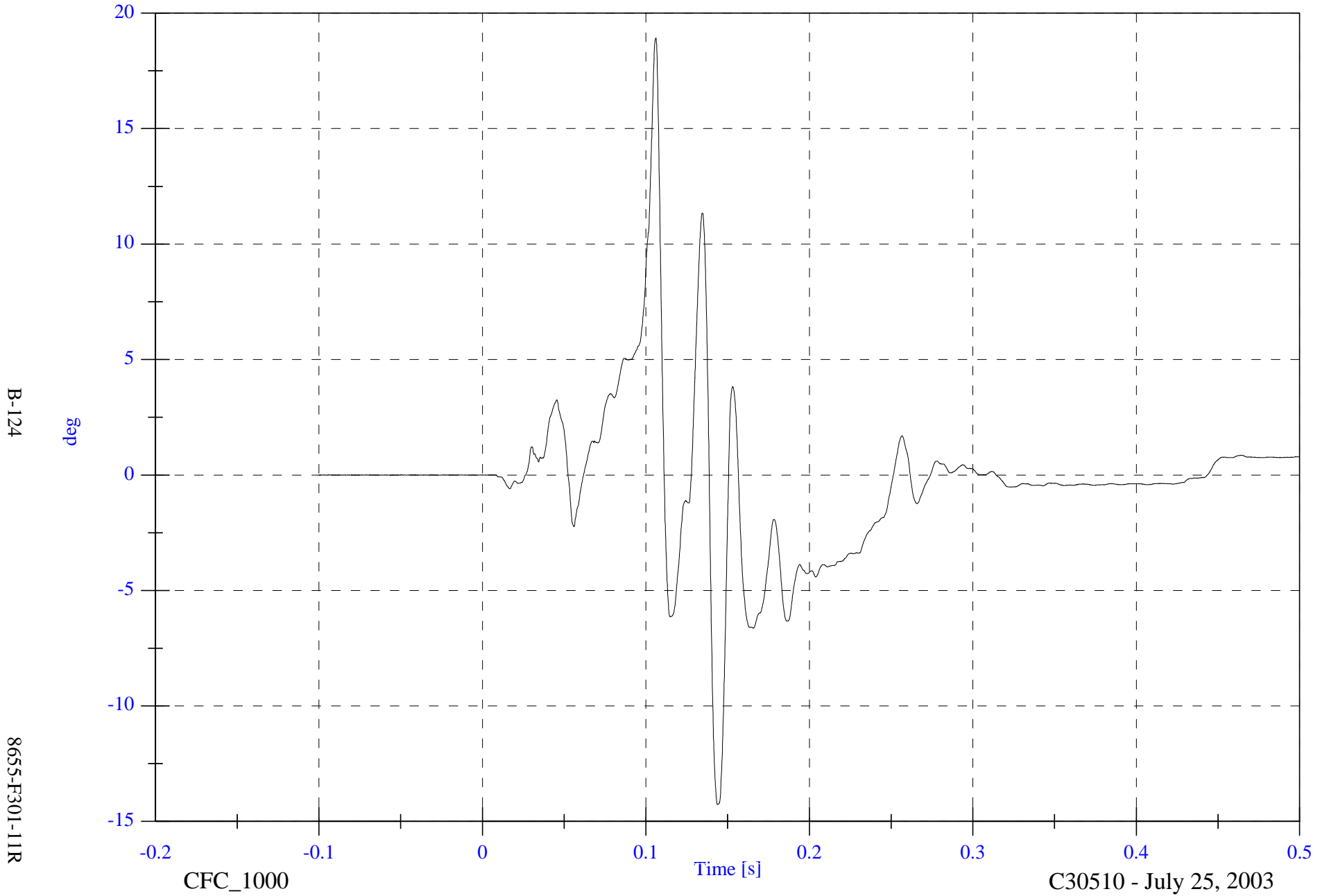
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P2 Right Link Rotation y

Max: 18.9 [deg] at 0.106 [s]

Min: -14.3 [deg] at 0.144 [s]

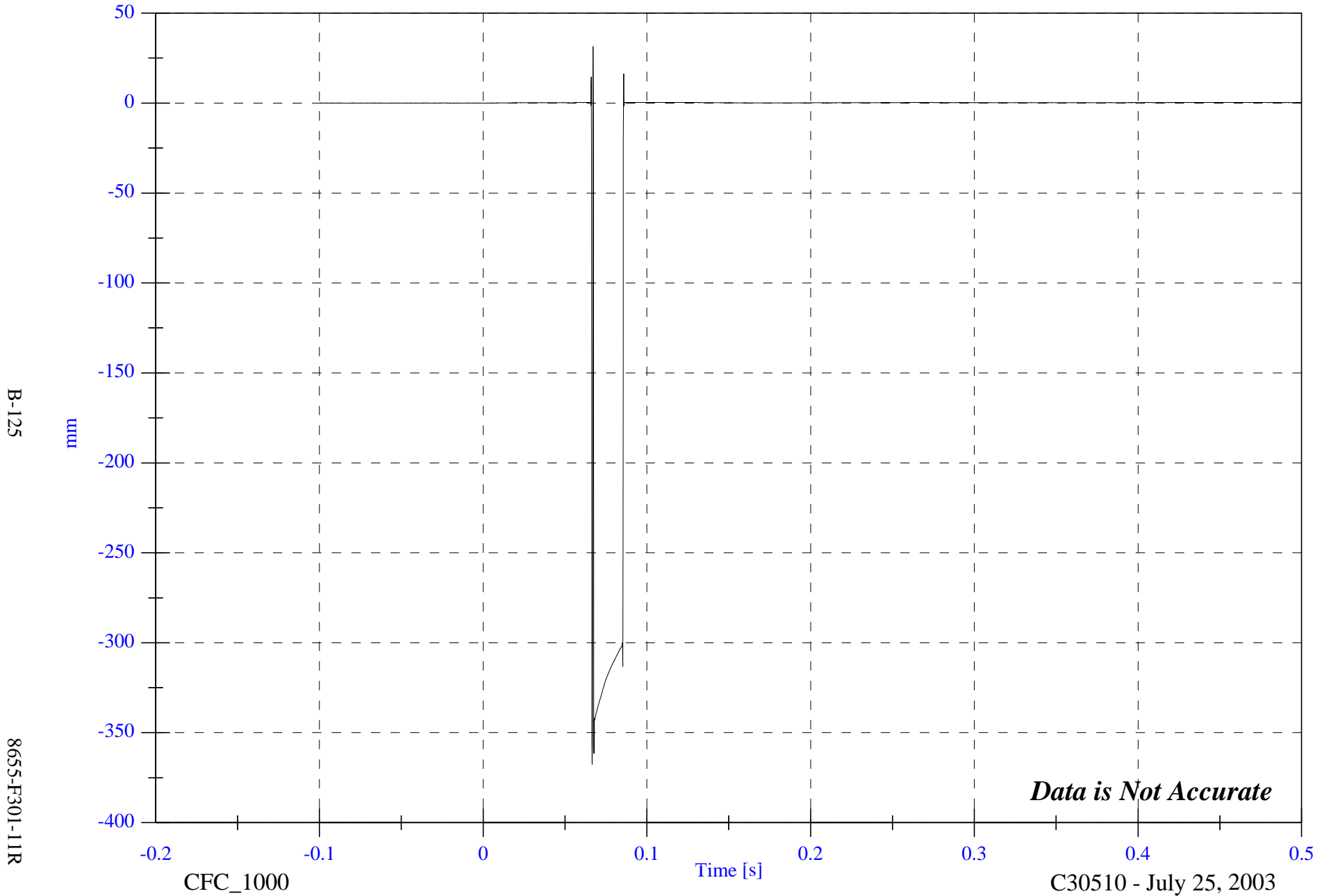


2003 FMVSS 301 Test 2 2003 Saab 9-3

V2 P2 Left Span Bar Displacement

Max: 31.5 [mm] at 0.067 [s]

Min: -367.6 [mm] at 0.067 [s]



B-125

8655-F301-11R

CFC\_1000

Time [s]

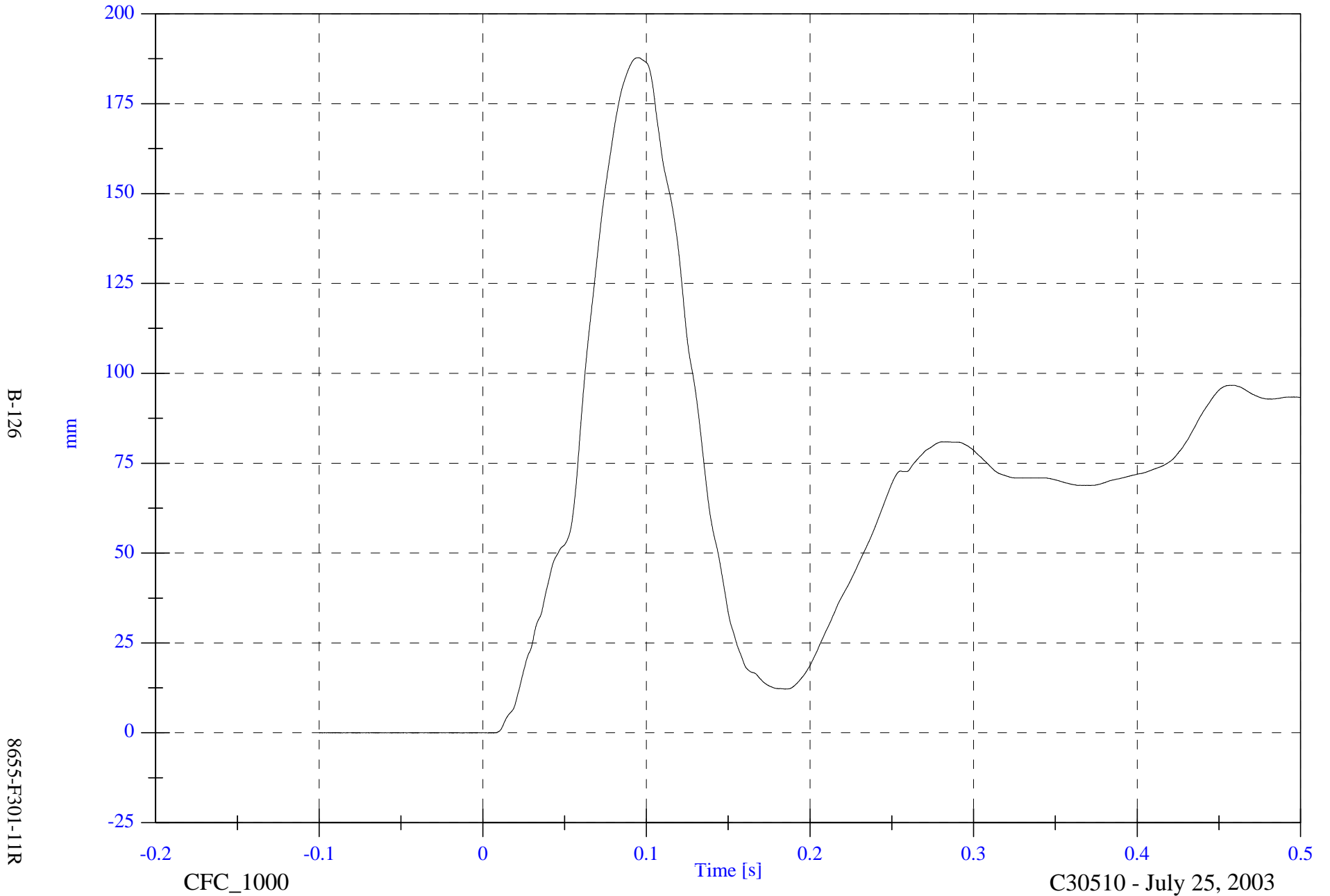
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 187.8 [mm] at 0.096 [s]

V2 P2 Right Span Bar Displacement

Min: -0.1 [mm] at -0.018 [s]

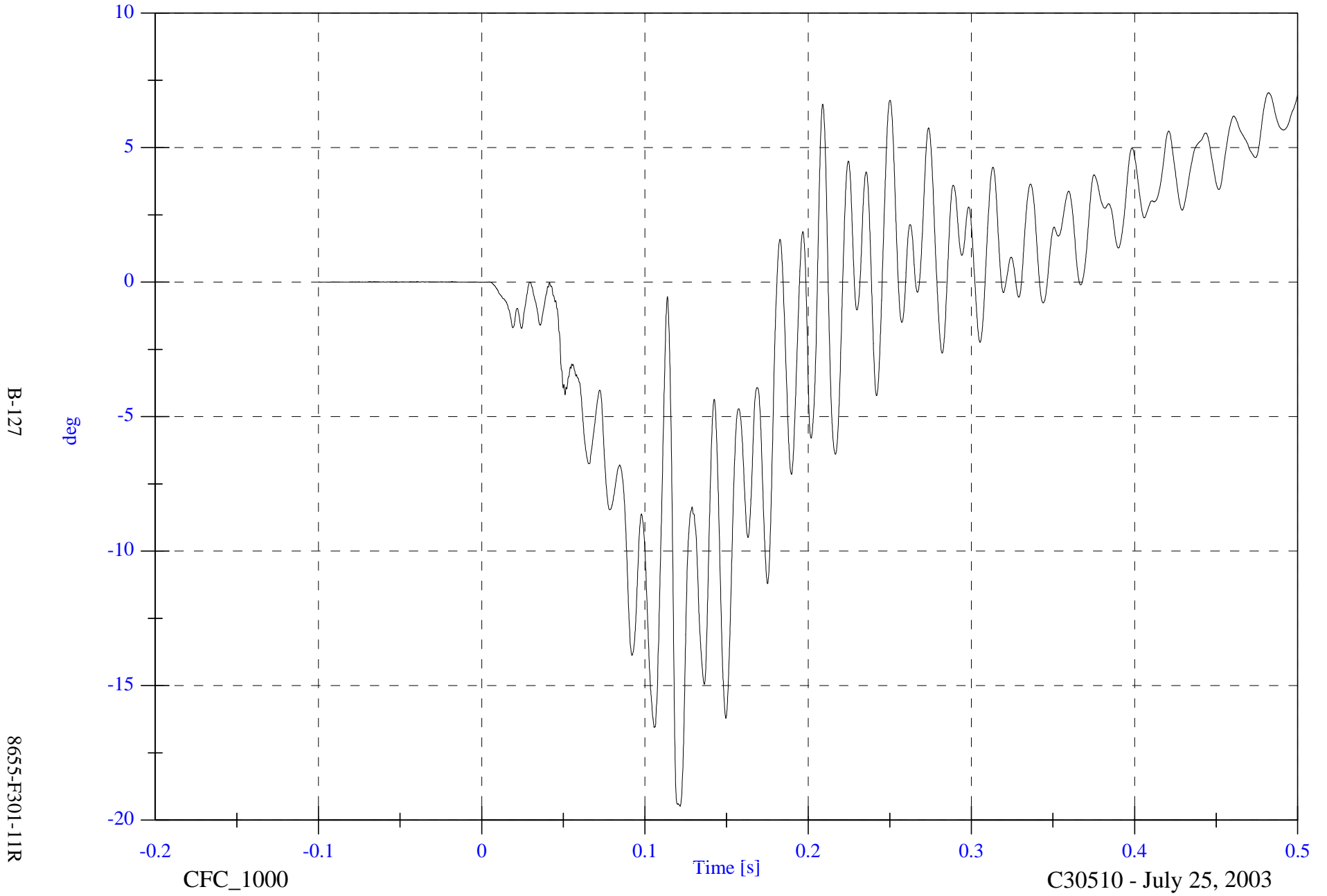


2003 FMVSS 301 Test 2 2003 Saab 9-3

P1 Left Change in String Angle

Max: 7.0 [deg] at 0.482 [s]

Min: -19.5 [deg] at 0.122 [s]

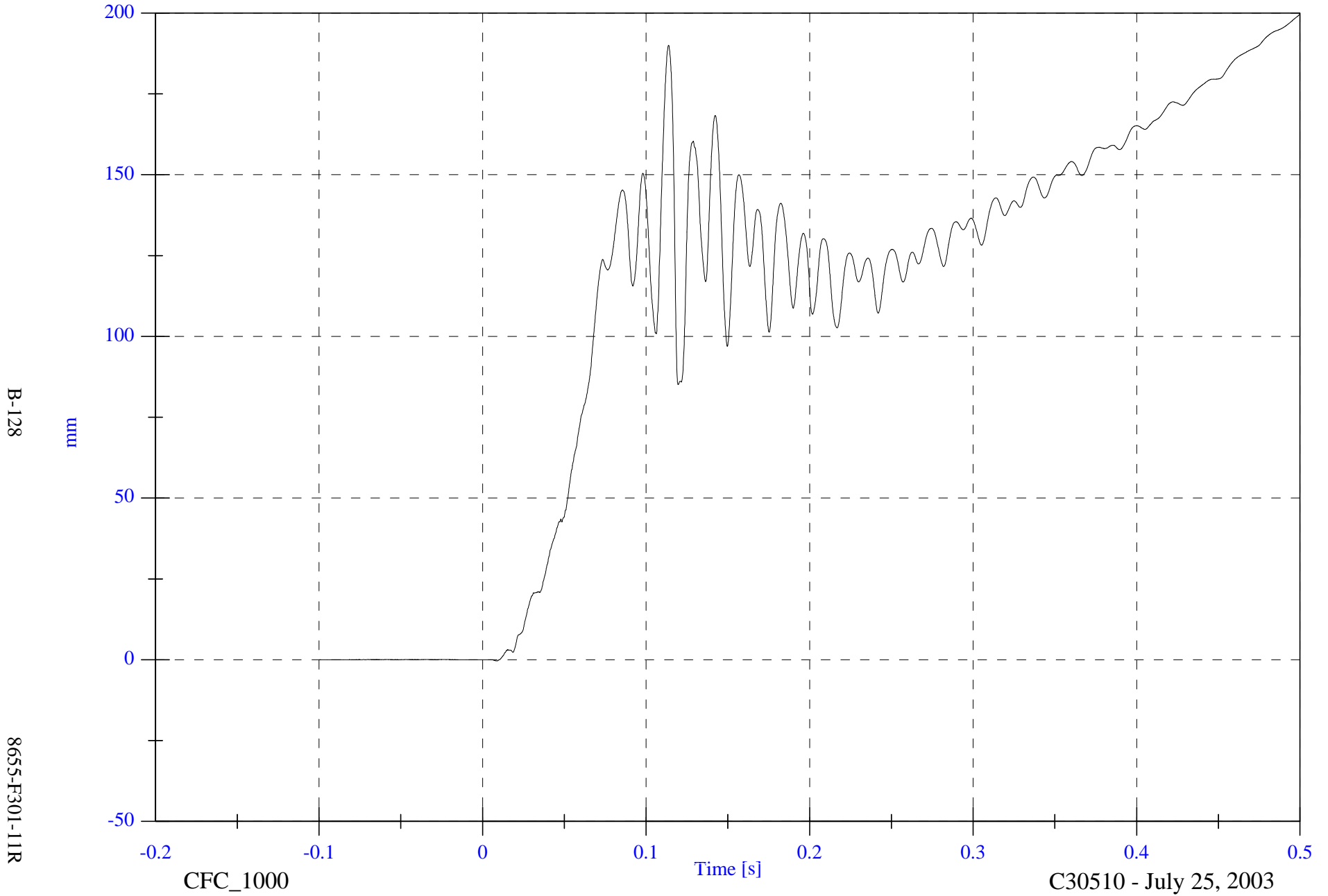


2003 FMVSS 301 Test 2 2003 Saab 9-3

P1 Left Seat X Displacement

Max: 199.7 [mm] at 0.500 [s]

Min: -0.4 [mm] at 0.008 [s]



B-128

8655-F301-11R

CFC\_1000

Time [s]

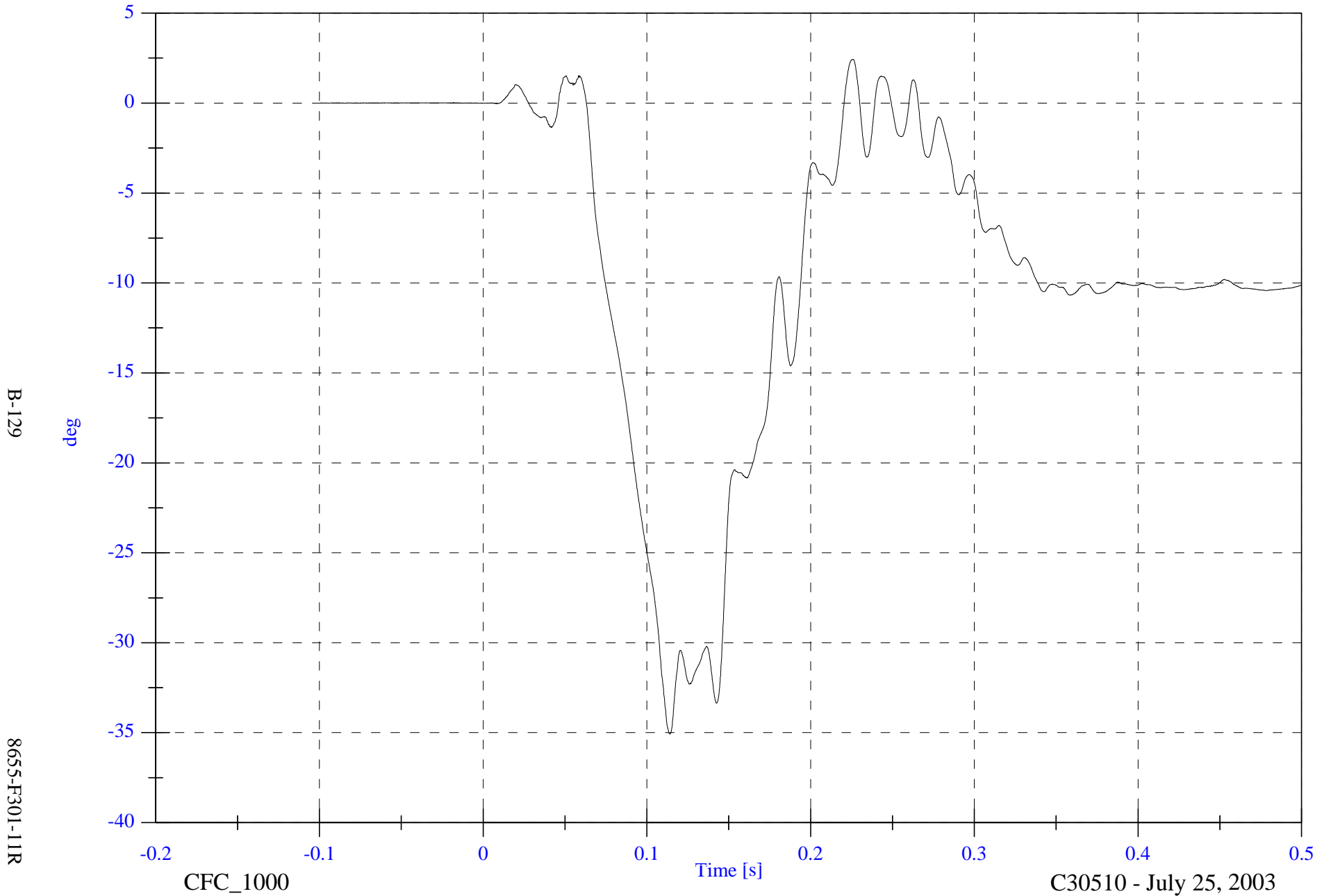
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

P1 Right Change in String Angle

Max: 2.4 [deg] at 0.226 [s]

Min: -35.1 [deg] at 0.114 [s]



B-129

8655-F301-11R

CFC\_1000

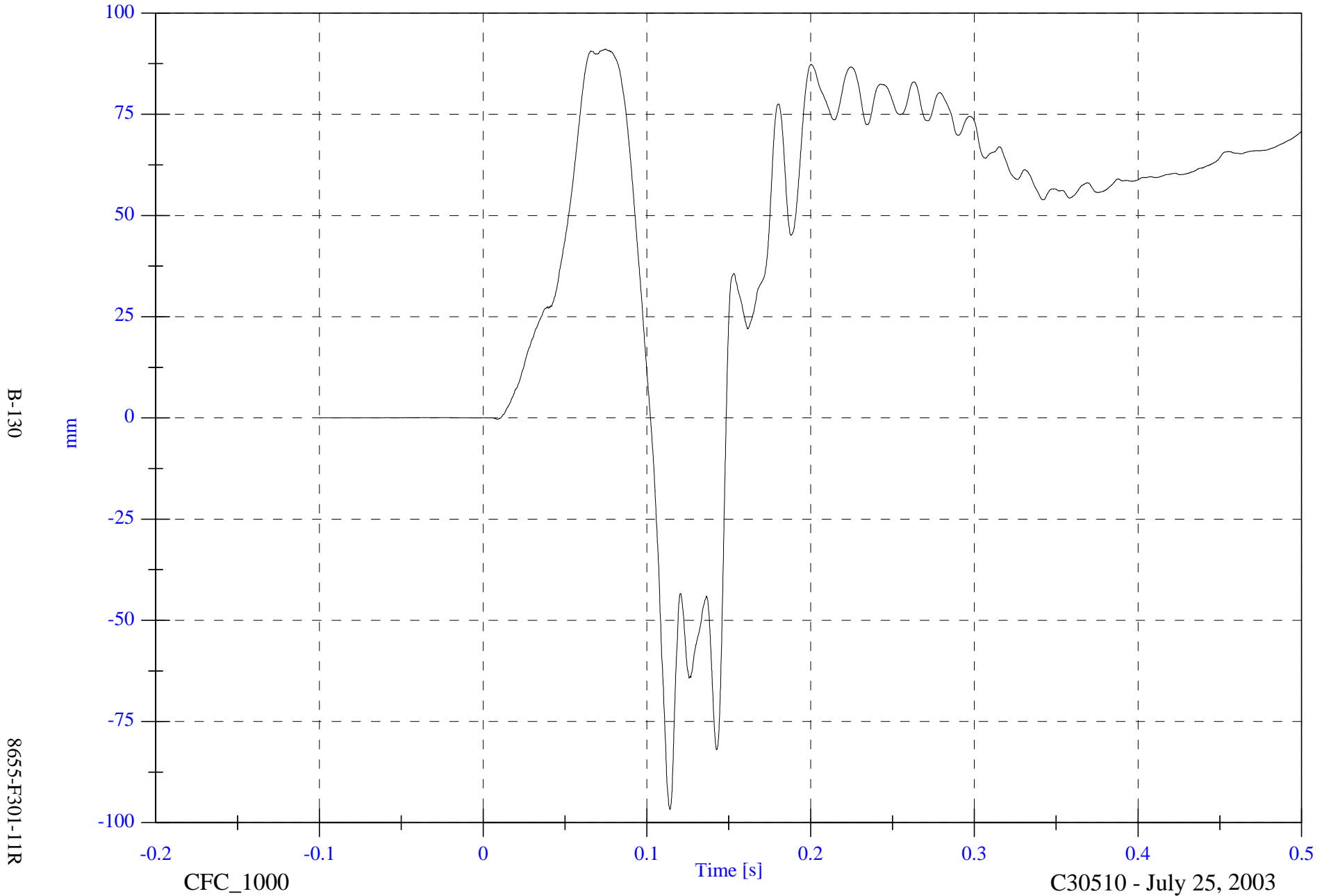
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 91.1 [mm] at 0.074 [s]

Min: -96.7 [mm] at 0.114 [s]

### P1 Right Seat X Displacement

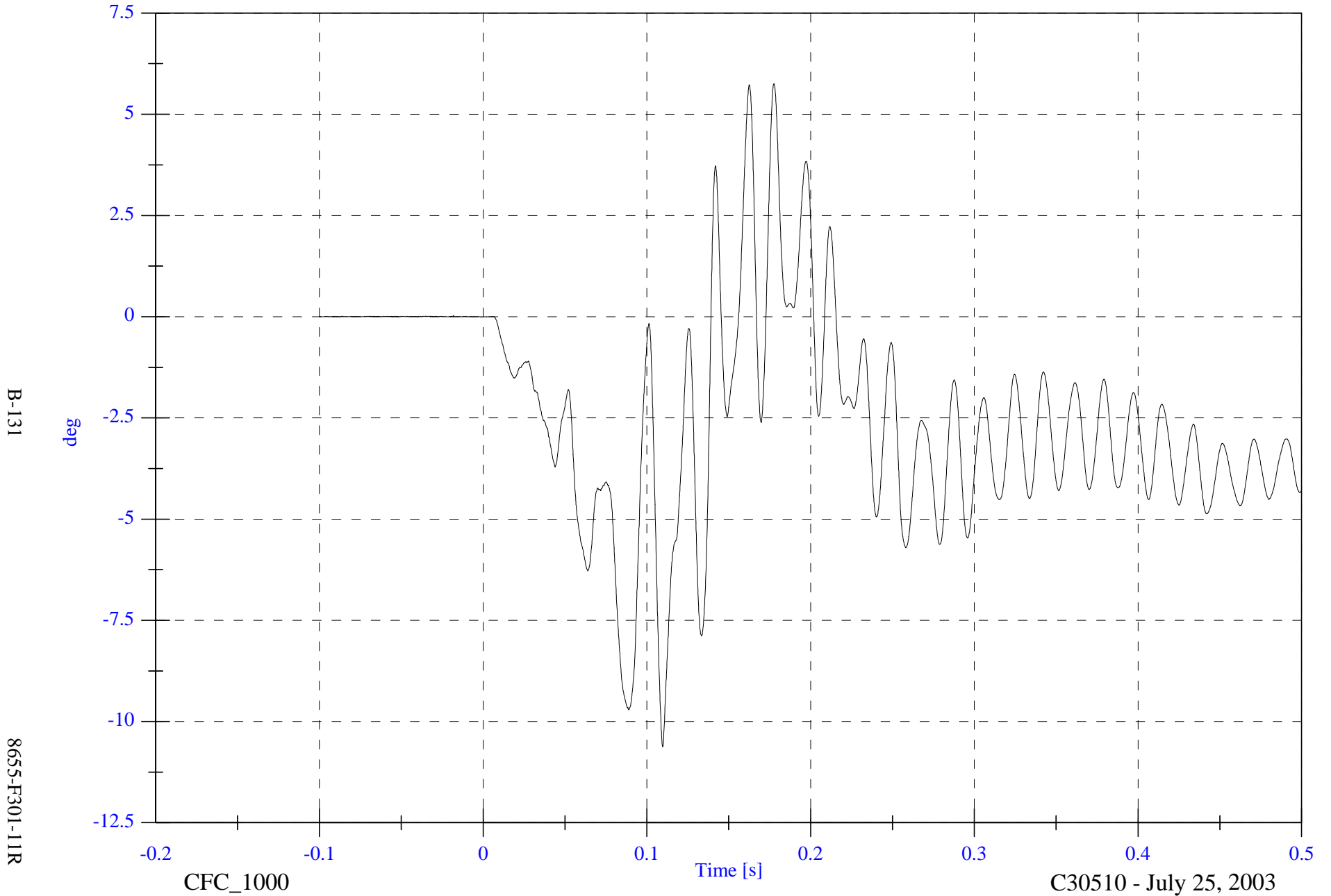


2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 5.8 [deg] at 0.178 [s]

P2 Left Change in String Angle

Min: -10.6 [deg] at 0.110 [s]



B-131

8655-F301-11R

CFC\_1000

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

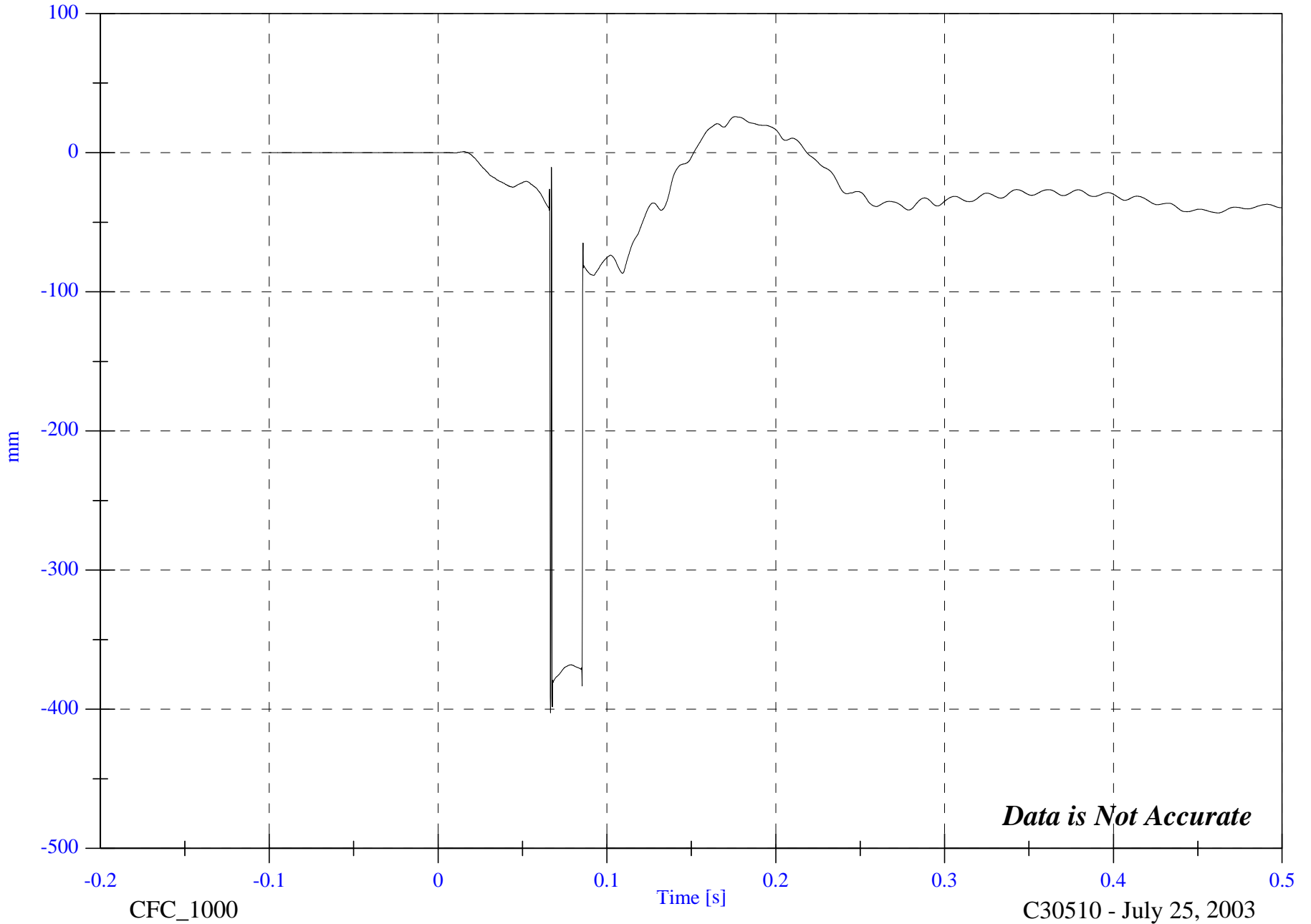
P2 Left Seat X Displacement

Max: 25.9 [mm] at 0.176 [s]

Min: -402.5 [mm] at 0.067 [s]

B-132

8655-F301-11R



*Data is Not Accurate*

CFC\_1000

Time [s]

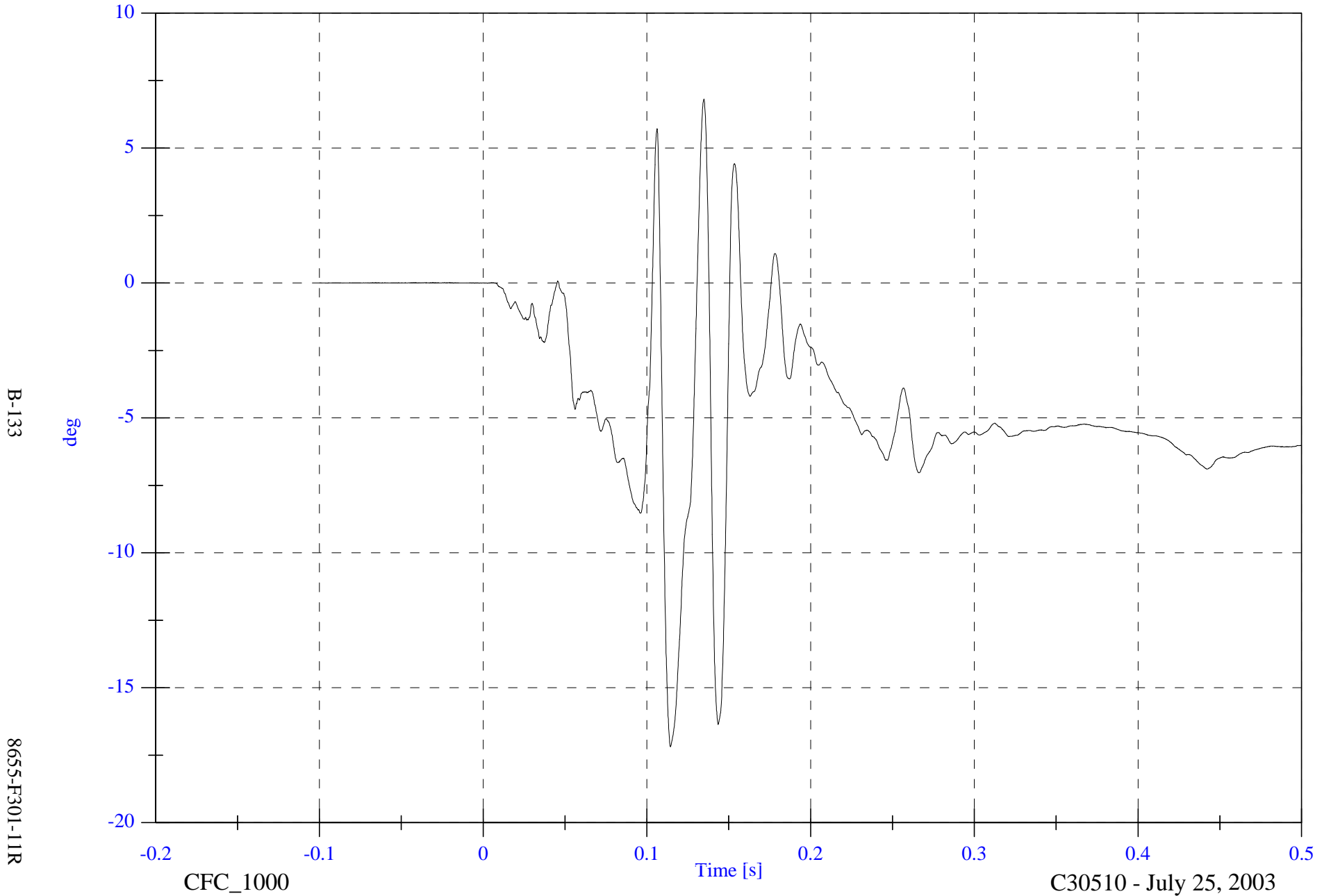
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

P2 Right Change in String Angle

Max: 6.8 [deg] at 0.135 [s]

Min: -17.2 [deg] at 0.114 [s]



B-133

8655-F301-11R

CFC\_1000

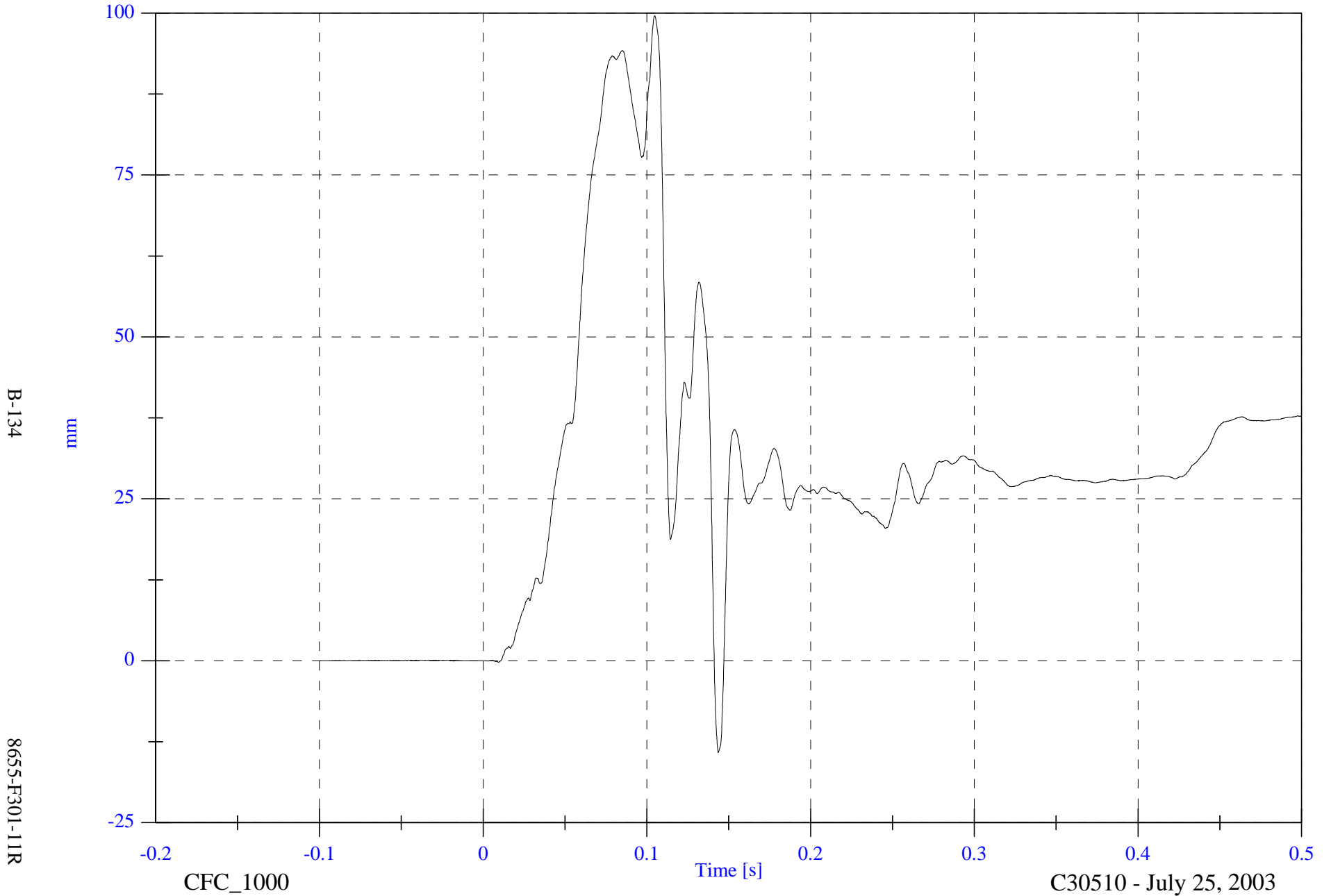
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

Max: 99.6 [mm] at 0.105 [s]

Min: -14.2 [mm] at 0.144 [s]

### P2 Right Seat X Displacement



B-134

8655-F301-11R

CFC\_1000

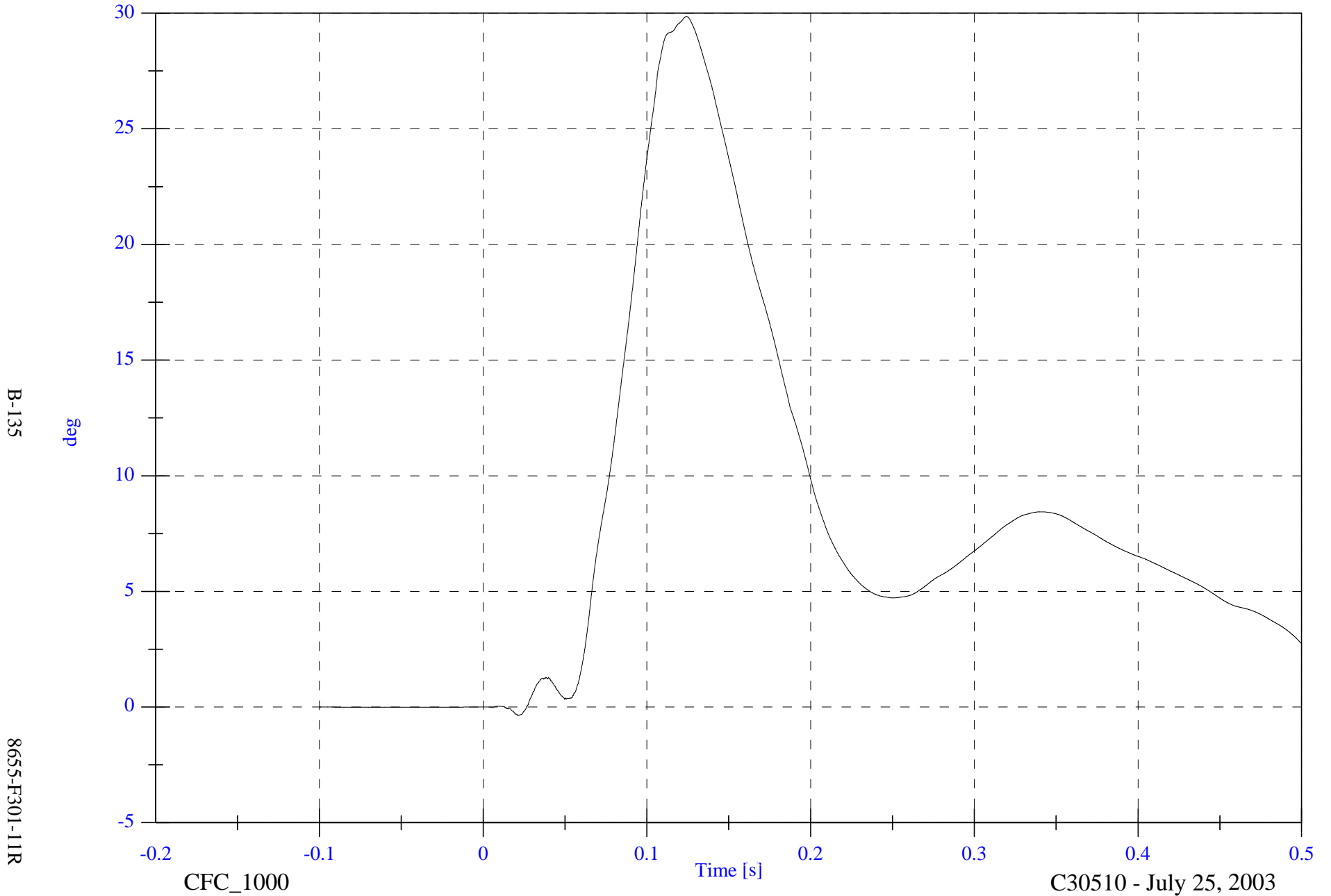
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

P1 Left Change in Seat Back Angle WRT Sill

Max: 29.9 [deg] at 0.124 [s]

Min: -0.4 [deg] at 0.021 [s]



B-135

8655-F301-11R

CFC\_1000

Time [s]

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

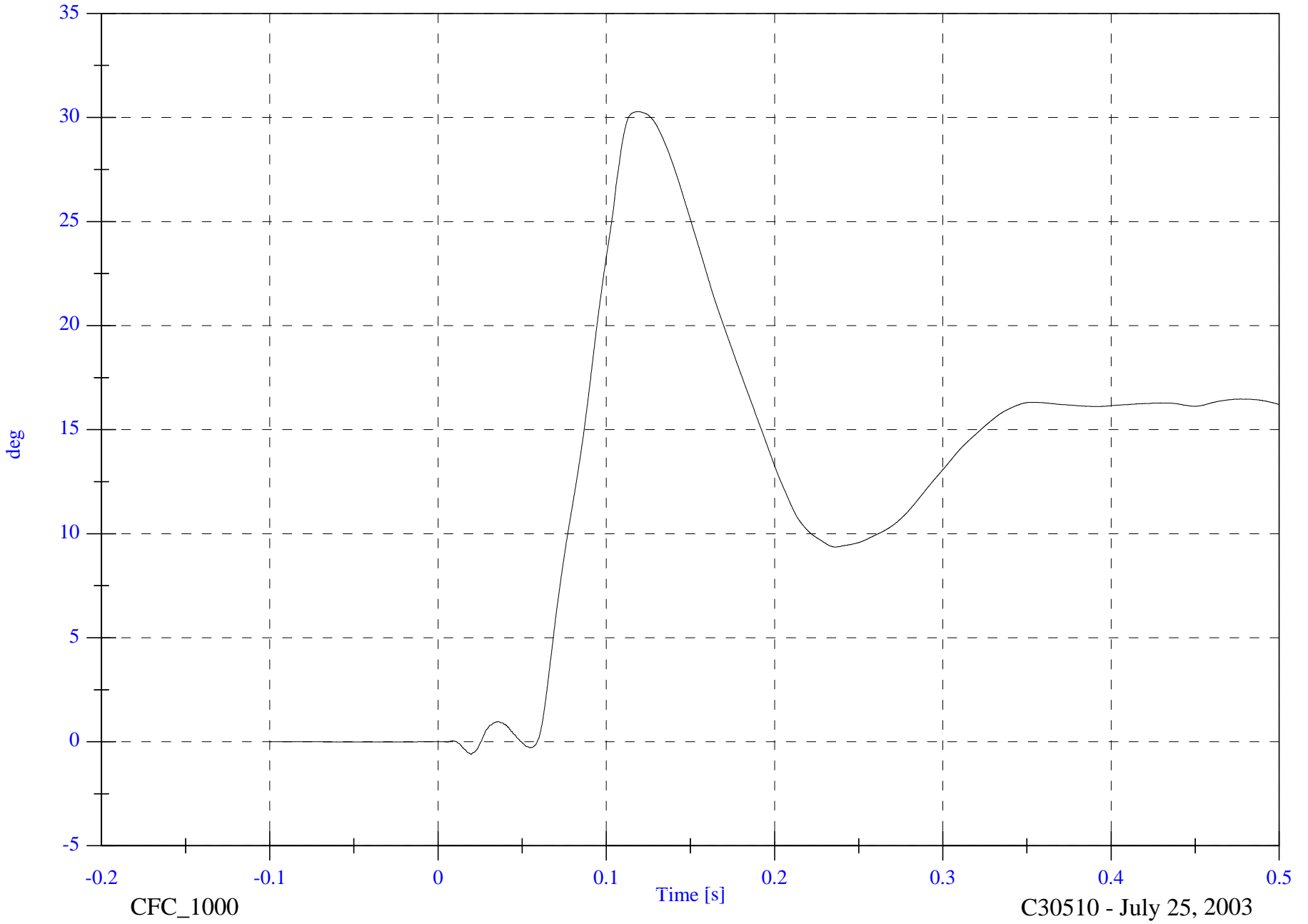
P1 Right Change in Seat Back Angle WRT Sill

Max: 30.3 [deg] at 0.119 [s]

Min: -0.6 [deg] at 0.020 [s]

B-136

8655-F301-11R



CFC\_1000

Time [s]

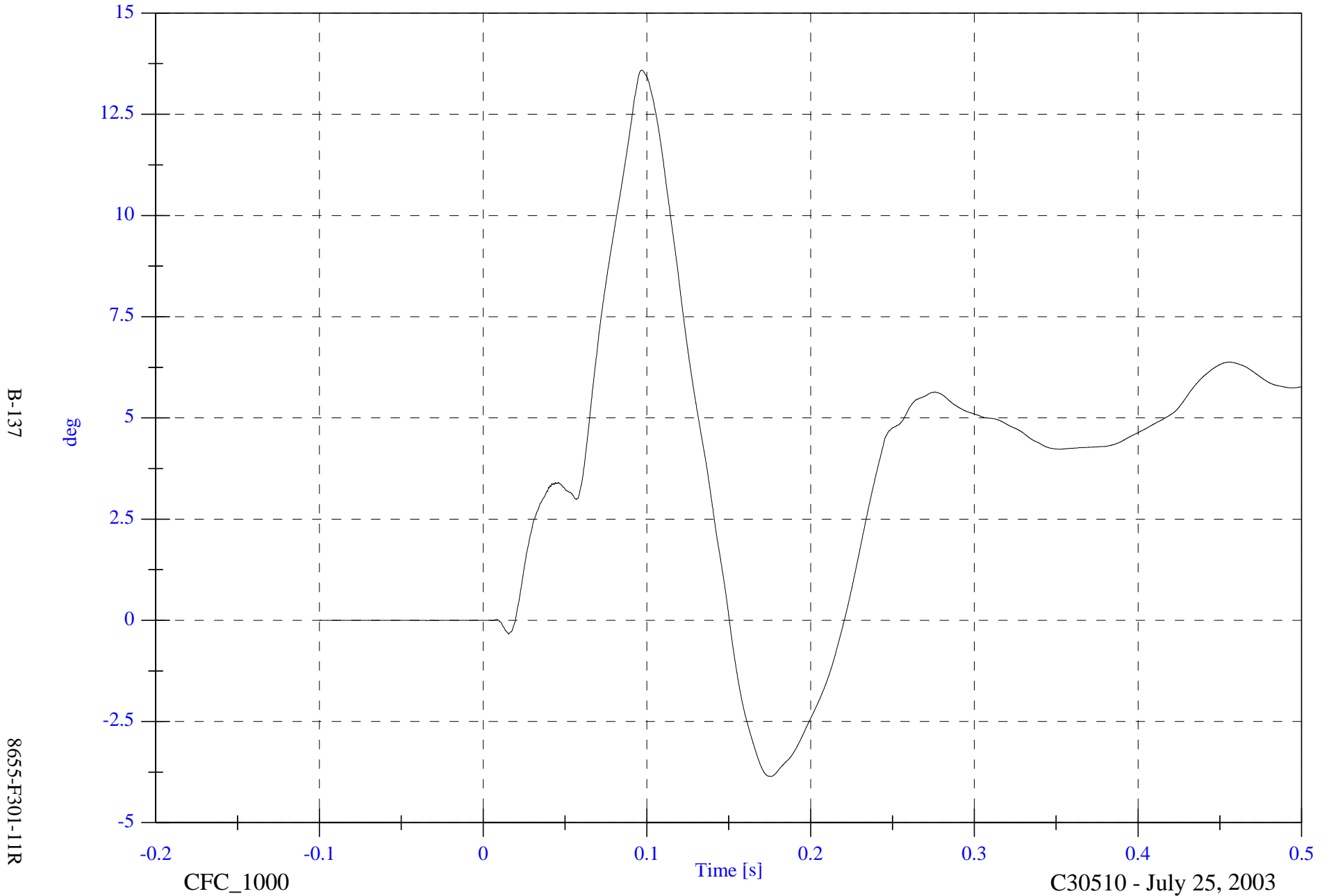
C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

P2 Left Change in Seat Back Angle WRT Sill

Max: 13.6 [deg] at 0.097 [s]

Min: -3.9 [deg] at 0.176 [s]



B-137

8655-F301-11R

CFC\_1000

Time [s]

C30510 - July 25, 2003

2003 FMVSS 301 Test 2 2003 Saab 9-3

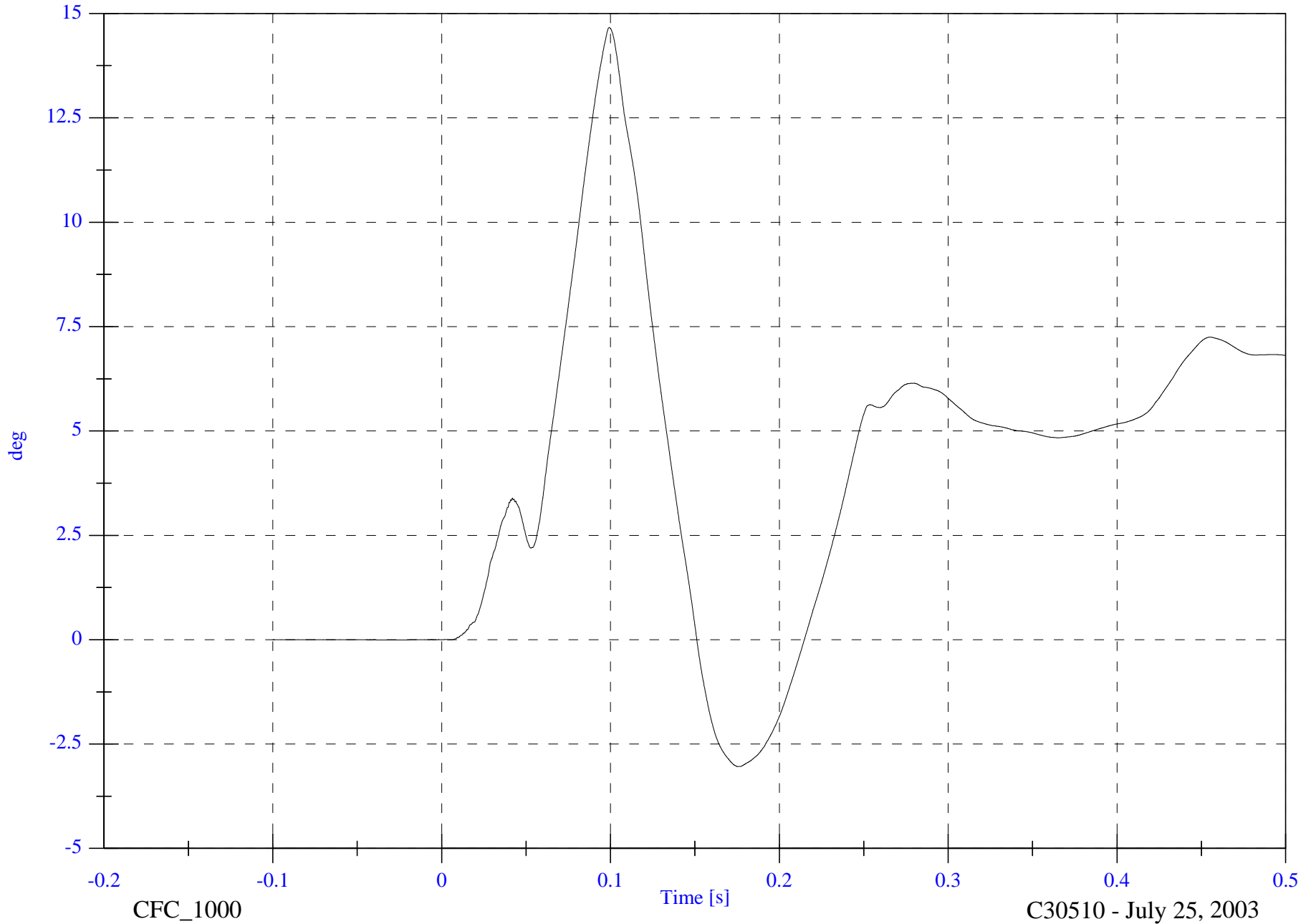
P2 Right Change in Seat Back Angle WRT Sill

Max: 14.7 [deg] at 0.099 [s]

Min: -3.0 [deg] at 0.176 [s]

B-138

8655-F301-11R



CFC\_1000

Time [s]

C30510 - July 25, 2003