

REPORT NUMBER: 214-CAL-04-02

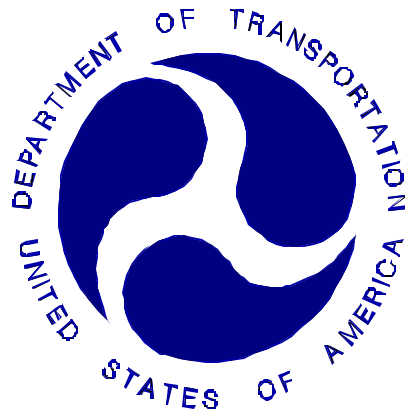
**SAFETY COMPLIANCE TESTING FOR FMVSS 214
SIDE IMPACT PROTECTION
INDICANT**

TOYOTA MOTOR MANUFACTURING INDIANA, INC.
2004 TOYOTA SIENNA
MPV

NHTSA NUMBER: C45100

ADVANCED INFORMATION ENGINEERING SERVICES TEST NUMBER: 8675-F214-12

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



September 30, 2003

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
400 Seventh Street, SW
Room 6111 (NVS-220)
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-02-D-01114. This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufactures' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By:

Patrick G. MacDiarmid, Jr., Project Engineer

Approved By:

David J. Travale, Program Manager
Transportation Sciences Center

Approval Date:

FINAL REPORT ACCEPTANCE BY:

Accepted By:

Acceptance Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 214-CAL-04-02		2. Government Accession No.		3. Recipient's Catalog No.																															
4. Title and Subtitle Final Report of FMVSS 214 Compliance Side Impact Testing of a 2004 Toyota Sienna MPV NHTSA No.: C45100				5. Report Date September 30, 2003																															
				6. Performing Organization Code CAL																															
7. Author(s) Patrick G. MacDiarmid, Jr., Project Engineer David J. Travale, Program Manager				8. Performing Organization Report No. 8675-F214-12																															
9. Performing Organization Name and Address Advanced Information Engineering Services Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225				10. Work Unit No.																															
				11. Contract or Grant No. DTNH22-02-D-01114																															
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance 400 Seventh Street, SW, Room 6111 Washington, D.C. 20590				13. Type of Report and Period Covered Final Report, October 2004																															
				14. Sponsoring Agency Code NVS-220																															
15. Supplementary Notes																																			
16. Abstract A 55/28 kph 90° Side Impact (Moving Deformable Barrier) Indicant Test was conducted on the subject Toyota Sienna MPV. This test was performed at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001). This test was conducted at the Advanced Information Engineering Services Crash Test Facility in Buffalo, New York, on September 30, 2003. The impact velocity of the Moving Deformable Barrier (MDB) was 61.48 kph, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 331 mm at level 3. The test or target vehicle's performance is given below: <table border="0"> <thead> <tr> <th></th> <th align="center"><u>Front SID H3</u></th> <th></th> <th align="center"><u>Rear SID H3</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td align="center">43.6</td> <td align="center">g's</td> <td align="center">40.9</td> <td align="center">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td align="center">53.4</td> <td align="center">g's</td> <td align="center">48.3</td> <td align="center">g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td align="center">59.3</td> <td align="center">g's</td> <td align="center">60.2</td> <td align="center">g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td align="center">56</td> <td align="center">g's</td> <td align="center">54</td> <td align="center">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td align="center">66</td> <td align="center">g's</td> <td align="center">97</td> <td align="center">g's</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.							<u>Front SID H3</u>		<u>Rear SID H3</u>		Left Upper Rib Acceleration:	43.6	g's	40.9	g's	Left Lower Rib Acceleration:	53.4	g's	48.3	g's	Lower Spine Acceleration:	59.3	g's	60.2	g's	Thoracic Trauma Index (TTI):	56	g's	54	g's	Pelvis Acceleration (PEV):	66	g's	97	g's
	<u>Front SID H3</u>		<u>Rear SID H3</u>																																
Left Upper Rib Acceleration:	43.6	g's	40.9	g's																															
Left Lower Rib Acceleration:	53.4	g's	48.3	g's																															
Lower Spine Acceleration:	59.3	g's	60.2	g's																															
Thoracic Trauma Index (TTI):	56	g's	54	g's																															
Pelvis Acceleration (PEV):	66	g's	97	g's																															
17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID)			18. Distribution Statement <u>Copies of this report are available from</u> National Highway Traffic Safety Administration Technical Reference Division (TIS) Room 5108 (NPO-230) 400 Seventh St., S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946																																
19. Security Classification of Report UNCLASSIFIED		20. Security Classification of Page UNCLASSIFIED		21. No. of Pages 293																															
				22. Price																															

TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
1 PURPOSE AND TEST PROCEDURE	1-1
2 SUMMARY OF SIDE IMPACT TEST	2-1
3 SUMMARY OF TEST RESULTS	3-1
Data Sheet 1 - General Vehicle Test Parameter Data	3-2
Data Sheet 2 - Test Vehicle Summary of Results	3-5
Data Sheet 3 - Moving Deformable Barrier (MDB) Summary	3-6
Data Sheet 4 - Post Test Observations	3-7
4 OCCUPANT AND VEHICLE INFORMATION	4-1
Data Sheet 5 – SID HYBRID III Instrumentation Data	4-2
Data Sheet 6 - Vehicle Pre- And Post Test Measurements	4-3
Data Sheet 7 - SID HYBRID III Longitudinal Clearance Dimensions	4-4
Data Sheet 8 - SID HYBRID III Lateral Clearance Dimensions	4-5
Data Sheet 9 - Vehicle Side Measurements	4-6
Data Sheet 10 - Vehicle Exterior Crush Profiles - All Levels	4-7
Data Sheet 11 - Vehicle Damage Profile Distances	4-8
Data Sheet 12 - Exterior Static Crush For Impactor Face	4-9
Data Sheet 13 - Test Vehicle Accelerometer Locations And Data Summary	4-10
Data Sheet 14 - MDB Accelerometer Locations and Data Summary	4-13
Data Sheet 15 - High Speed Camera Locations and Data	4-14
5 VEHICLE FUEL SYSTEM INTEGRITY	5-1
Data Sheet 16 - FMVSS 301 Fuel System Integrity Data	5-2
Data Sheet 17 - FMVSS 301 Rollover Data	5-3
APPENDIX A PHOTOGRAPHS	A-1
APPENDIX B VEHICLE, MDB AND SID HYBRID III RESPONSE DATA	B-1
APPENDIX C SID HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA	C-1
APPENDIX D TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	D -1

SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-01114. The purpose of this indicant test was to evaluate side impact protection in a 2004 Toyota Sienna MPV when tested at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001).

SECTION 2

SUMMARY OF SIDE IMPACT TEST

This Side Impact Protection Indicant Test was performed at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001).

A 2004 Toyota Sienna MPV was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 61.48 kph (38.2 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Advanced Information Engineering Services Transportation Sciences Center in Buffalo, New York on September 30, 2003. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the Side Impact Hybrid III Dummies (SID H3s) are included in Appendix A.

Two restrained Side Impact Hybrid III Dummies (SID H3s) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OCWS Side Impact Laboratory Test Procedure which is dated July, 1997. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID H3s were instrumented with the following accelerometers:

1. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)
5. Head triaxial accelerometers (X-, Y- and Z-direction)
6. Upper neck force and moment (X-, Y and Z-direction) load cells

A summary of the Side Impact Hybrid III Dummy (SID H3) configuration and verification test data can be found in Appendix C. A total of 60 channels of data were recorded. Appendix B contains the vehicle, MDB and dummy response data traces.

The following table summarizes the results of the test.

Injury Criteria	Front SID H3	Rear SID H3
TTI (g)	56	54
PEV (g)	66	97

AIR BAG DEPLOYMENT STATUS

	DRIVER	FRONT PASSENGER	REAR PASSENGER
Front Air Bag	No	No	N/A
Knee Bolster Bag	N/A	N/A	N/A
Side Air Bag	N/A	N/A	N/A
Side Curtain Bag	N/A	N/A	N/A

SECTION 3

SUMMARY OF TEST RESULTS

DATA SHEET 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2004 Toyota Sienna MPV

Vehicle Body Color: Silver VIN: 5TDZA23C74S038480

Vehicle NHTSA No.: C45100 Month & Year of Manufacture: 06/03

Engine Data: 6 Cylinders; - CID; 3.3 Liters; - cc

Engine Placement: - Longitudinal; or X Lateral

Transmission: 5 Speed; - Manual; X Automatic; X Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

Odometer Reading 175 km

Supplemental Airbag Restraints:

Front Occupant: X Frontal; - Knee; - Side; - Curtain

Rear Occupant: X Frontal; - Knee; - Side; - Curtain

Options: X A/C; X Power Steering; X Power Brakes; X Power Windows

DATA FROM TIRE PLACARD

Recommended Tire Size: P215/65R16 96T

* Recommended Cold Tire Pressure: 240 kPa FRONT; 240 kPa REAR

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P215/65R16 96T ; Manufacturer: Michelin

Tire Pressure with Maximum Capacity Vehicle Load: Front: 240 kPa; Rear: 240 kPa

Treadwear: 500 ; Traction: A ; Temperature: B

VEHICLE CAPACITY DATA:

Number of Occupants: 2 Front; 2 Rear; 3 3rd Seat; 7 Total

Type of Front Seats: X Bucket; - Bench; - Split Bench;

Type of Rear Seats: X Bucket; - Bench; - Split Bench; X Contoured

Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob

Type of Rear Seat Back: - Fixed; X Adjustable with X Lever or - Knob

Vehicle Max Capacity Loading = 526 kg (A)

No. of Occupants x 68.04 kg. = 476.28 kg (B)

Vehicle Cargo Capacity = 49.72 kg (A-B)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front = 561.0 kg Left Rear = 397.5 kg

Right Front = 529.0 kg Right Rear = 398.0 kg

TOTAL FRONT = 1090.0 kg TOTAL REAR = 795.5 kg

% of Total Weight = 57.8% % % of Total Weight = 42.2 %

TOTAL WEIGHT = 1885.5 kg

* Tire pressure used in test.

DATA SHEET 1 (continued)**GENERAL TEST VEHICLE PARAMETER DATA**Vehicle: 2004 Toyota Sienna MPVNHTSA No. C45100**CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:**

Total Test Vehicle Delivered Weight with Max. Fluids	=	<u>1885.5</u>	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>49.72</u>	kg (B)
Weight of instrumented SID H3 Dummies (2 X 81.2 kg)	=	<u>162.4</u>	kg (C)
TEST VEHICLE TARGET WEIGHT:	=	<u>2097.62</u>	kg (A+B+C)

FULLY LOADED TEST VEHICLE (UDVW + 2 SID H3(s) + CARGO):

Left Front	=	<u>616.5</u>	kg	Left Rear	=	<u>494.0</u>	kg
Right Front	=	<u>541.5</u>	kg	Right Rear	=	<u>448.0</u>	kg
TOTAL FRONT	=	<u>1158.0</u>	kg	TOTAL REAR	=	<u>942.0</u>	kg
% of Total Weight	=	<u>55.1%</u>	%	% of Total Weight	=	<u>44.9%</u>	%
TOTAL TEST WEIGHT =		<u>2100.0</u>	kg				

AS TESTED WEIGHT OF TEST VEHICLE (2 SID H3(s) + CARGO + EQUIPMENT & INSTRUMENTATION):

Left Front	=	<u>612.0</u>	kg	Left Rear	=	<u>479.0</u>	kg
Right Front	=	<u>559.0</u>	kg	Right Rear	=	<u>439.0</u>	kg
TOTAL FRONT	=	<u>1171.0</u>	kg	TOTAL REAR	=	<u>918.0</u>	kg
% of Total Weight	=	<u>56.1%</u>	%	% of Total Weight	=	<u>43.9%</u>	%
TOTAL TEST WEIGHT =		<u>2089</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):**AS DELIVERED:**

Left Front	<u>789</u>	Right Front	<u>795</u>	Left Rear	<u>781</u>	Right Rear	<u>796</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

FULLY LOADED:

Left Front	<u>772</u>	Right Front	<u>785</u>	Left Rear	<u>754</u>	Right Rear	<u>773</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

READY FOR TEST:

Left Front	<u>772</u>	Right Front	<u>785</u>	Left Rear	<u>764</u>	Right Rear	<u>777</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

Test Vehicle Wheelbase: 3030 millimetersC.G. = 1331.52 millimeters rearward of front wheel centerline**TOTAL VEHICLE LENGTH:**

Right Side =	<u>4990</u>	millimeters
Left Side =	<u>4990</u>	millimeters
Centerline =	<u>5085</u>	millimeters

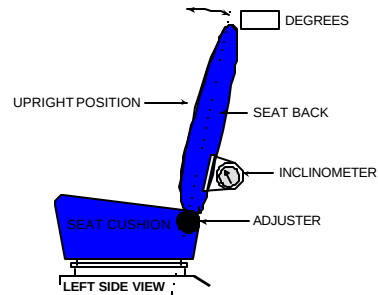
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



FRONT SEAT ASSEMBLY

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 240 millimeters

Total Number of Adjustment Positions or Detents: 17 (0 to 16 placed in detent 8)

FRONT SEAT BACK ADJUSTMENT POSITION:

4th Notch Rearward

Seat Back Torso Angle: 81.8 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: 150 millimeters

Seat Back Adjustment Position: 78° (4th notch rearward)

ADJUSTABLE STEERING COLUMN POSITION:

Mid tilt (62°) and telescope (20 mm)

WINDOW POSITIONS:

Left Front: Closed

Left Rear: Closed

Right Front: Open

Right Rear: Open

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

79 liters (Fuel Tank Usable Capacity)

73.4 liters used for test (92% -94% of Fuel Tank Usable Capacity)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase = 3030 millimeters

Impact Point is 508 millimeters rearward of front axle centerline

Actual Impact Point is 506 millimeters rearward of front axle centerline

DATA SHEET 2

TEST VEHICLE SUMMARY OF RESULTS

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2004 Toyota Sienna

Body Style: MPV

VIN: 5TDZA23C74S038480

NHTSA No.: C45100

Test Date: September 30, 2003

Overall Length = 5085 millimeters; Overall Width = 1960 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 612.0 kg Left Rear = 479.0 kg

Right Front = 559.0 kg Right Rear = 439.0 kg

TOTAL FRONT = 1171.0 kg TOTAL REAR = 918.0 kg

TOTAL VEHICLE WEIGHT 2089.0 kg

Wheelbase = 3030 millimeters

Longitudinal C.G. from Center of Front Axle = 1331.52 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 2 mm forward of nominal impact ref. line (Lateral)

Actual Impact Point is 10 mm below nominal impact point (Vertical)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (310 mm above ground) = 142 millimeters

2. LEVEL 2 (695 mm above ground) = 322 millimeters

3. LEVEL 3 (614 mm above ground) = 331 millimeters

4. LEVEL 4 (969 mm above ground) = 253 millimeters

5. LEVEL 5 (1658 mm above ground) = 12 millimeters

Maximum Post-Test Intrusion = 331 millimeters

OCCUPANTS:

Front Passenger:

Rear Passenger:

Dummy Identification SID H3/ 269

SID H3/ 270

Restraints Used Three point safety belt

Three point safety belt

INSTRUMENTATION:

Number of Vehicle Data Channels: = 21

Number of Cameras: Onboard = 3

Offboard = 6

TOTAL = 9

DATA SHEET 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore, Inc. 042B0303-2 033A0303

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>1250</u>	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4120</u>	millimeters
Wheelbase of Framework Carriage	=	<u>2590</u>	millimeters
Tread of Framework Carriage (Front & Rear)	=	<u>1875</u>	millimeters
C.G. Location Rearward of Front Axle	=	<u>1104</u>	millimeters

MDB WEIGHT:

Left Front	=	<u>409.5</u>	kg	Left Rear	=	<u>281.5</u>	kg
Right Front	=	<u>372.5</u>	kg	Right Rear	=	<u>299.0</u>	kg
TOTAL FRONT	=	<u>782.0</u>	kg	TOTAL REAR	=	<u>580.5</u>	kg
TOTAL MDB WEIGHT	=	<u>1362.5</u>	kg				
Impact Angle (MDB C/L to Target Vehicle C/L)	=	<u>90</u>	degrees				
Impact Speed	=	<u>61.48</u>	kph				

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A at Center of Bumper Level	=	<u>193</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>89</u>	millimeters
3. Row C at Mid Level	=	<u>70</u>	millimeters
4. Row D at Top of Stack Level	=	<u>116</u>	millimeters

INSTRUMENTATION:

Number of MDB Data Channels	=	<u>5</u>
-----------------------------	---	----------

DATA SHEET 4**POST-TEST OBSERVATIONS**Vehicle: 2004 Toyota Sienna MPVNHTSA No. C45100TEST DUMMY INFORMATION AND CONTACT POINTS:

DESCRIPTION	FRONT SEAT	REAR SEAT
ATD Type/Serial No.	SID H3/ 269	SID H3/ 270
Head Contact:	None	Side of head to the side header
Upper Torso Contact:	Interior door trim panel	Interior door trim panel
Lower Torso Contact:	Interior door trim panel	Interior door trim panel
Left Knee Contact:	Interior door trim panel	Interior door trim panel
Right Knee Contact:	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, latched and inoperable	Closed, latched and inoperable
Right Side Doors	Closed, latched and operable without tools	Closed, latched and operable without tools
Hatch/Other Door	-	Closed, latched and operable without tools
Seat Movement (mm)	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

CRITICAL AREAS OF PERFORMANCE	
Pillar Performance	No visible tears or separations
Sill Separation	No visible tears or separations
Windshield Damage	None
Window Damage	Rear seat side glass and third row side glass shattered upon impact
Other Notable Effects	None

AIR BAG DEPLOYMENT STATUS:

	DRIVER	FRONT PASSENGER	REAR PASSENGER
Front Air Bag	No	No	N/A
Knee Bolster Bag	N/A	N/A	N/A
Side Air Bag	N/A	N/A	N/A
Side Curtain Bag	N/A	N/A	N/A

MDB LEFT EDGE IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	? 50 mm	2
Vertical Offset	mm	? 20 mm	10

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID H3 INSTRUMENTATION DATA

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100

		Front Dummy ID# 269				Rear Dummy ID# 270			
		Pos. Direction		Neg. Direction		Pos. Direction		Neg. Direction	
		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
HEAD ACCELERATIONS:									
Longitudinal	X	3.1	199.9	-18.5	69.9	38.3	93.5	-34.7	91.0
Lateral	Y	18.6	69.2	-3.9	37.5	138.7	91.0	-25.7	92.1
Vertical	Z	39.8	64.2	-4.6	48.7	79.8	90.8	-85.6	92.0
Resultant	R	45.1	64.3	0.0	-16.5	162.4	90.9	0.0	2.4
HIC		158.0				550.8			
NECK FORCES:									
Longitudinal	X	38.3	187.6	-660.2	68.4	73.2	199.9	-683.0	78.3
Lateral	Y	510.4	82.0	-373.0	40.1	1239.6	92.7	-488.2	51.8
Vertical	Z	1726.5	65.0	-255.7	42.9	2343.4	78.3	-2925.8	91.8
Resultant	R	1892.0	64.9	0.1	-4.5	3136.1	91.8	0.1	3.7
NECK MOMENTS:									
Longitudinal	X	55.2	72.7	-63.0	49.7	54.9	101.7	-74.7	60.4
Lateral	Y	55.0	83.8	-23.9	56.6	5.4	90.3	-5.2	74.5
Vertical	Z	28.1	86.4	-6.2	199.9	16.2	94.1	-7.2	60.2
Resultant	R	71.4	82.0	0.0	-14.5	75.0	60.4	0.0	-12.0
RIB ACCELERATIONS:									
Upper Rib Lateral	Y	43.6	42.5	-5.2	101.2	40.9	60.6	-4.9	106.3
Upper Rib Lateral	Y(R)	44.6	41.9	-5.3	86.9	39.9	60.6	-5.0	106.8
Lower Rib Lateral	Y	53.4	41.2	-4.6	101.9	48.3	48.8	-4.4	102.5
Lower Rib Lateral	Y(R)	55.0	41.2	-4.4	94.3	49.2	48.7	-4.2	116.9
SPINE ACCELERATIONS:									
Lower Lateral	Y	59.3	36.3	-10.4	63.2	60.2	46.3	-8.6	99.4
Lower Lateral	Y(R)	59.3	36.3	-10.5	63.1	59.7	46.8	-8.2	99.4
PELVIC ACCELERATIONS:									
Lateral	Y	66.5	33.7	-14.2	57.5	96.9	41.2	-18.7	64.4
Lateral	Y(R)	67.7	33.7	-14.6	57.5	96.0	41.2	-18.2	64.3

REFERENCE: Positive Direction: Longitudinal (X) = forward; Lateral (Y) = to right; Vertical (Z) = down

Note: Rib, Spine and Pelvis data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.

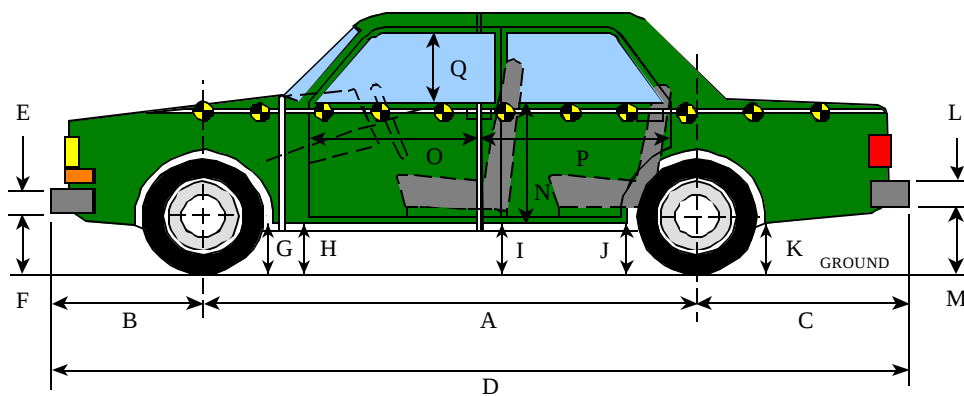
Head Accelerations and Neck Forces are filtered at SAE Class 1000, Neck Moments are filtered at SAE Class 600.

DATA SHEET 6

VEHICLE SIDE MEASUREMENTS

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



LEFT SIDE VIEW

NOTE: all dimensions are in millimeters with tolerance of ± 3 mm

	PRE-TEST (as delivered)	PRE-TEST (as tested)	POST-TEST (as tested)	▼ CHANGE
A	3030	3030	3025	-5
B	975	-	975	0
C	1080	-	1085	5
D	5085	-	5080	-5
E	300	-	300	0
F	290	284	315	31
G	246	227	236	9
H	259	241	257	16
I	262	246	206	-40
J1	236	208	230	22
J2	266	238	255	17
K	275	251	248	-3
L	230	-	230	0
M	350	326	308	-18
N	805	-	716	-89
O	919	-	861	-58
P	1330	-	1250	-80
Q	551	-	546	-5
R	4990	-	4982	-8
S	4990	-	4975	-15
T	1960	-	1803	-157

D = Length at Centerline
T = Width at B-Pillar

E&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

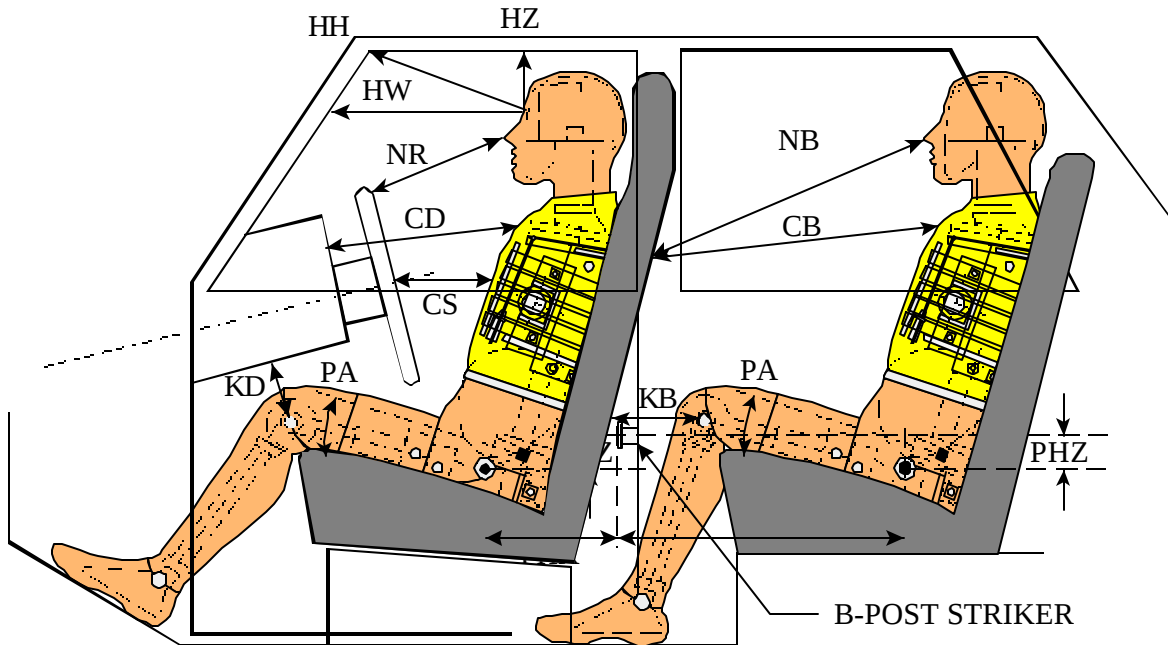
S = Left Side Length

DATA SHEET 7

SID H3 LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
REAR DUMMY PHX & PHZ
MEASUREMENTS FOR A 4-DOOR
VEHICLE WOULD USE THE C-POST
STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in millimeters with tolerance of ± 3 mm

	DRIVER ID# 269	LEFT REAR PASS. ID# 270
HH	492	N/A
HW	805	N/A
HZ	255	210
NR/NB	495	633
CD/CB	580	541
CS	344	N/A
KDL(KDA°)/KBL(KDA°)	152 / (27 °)	217 / (38 °)
KDR(KBA°)/KBR(KBA°)	166 / (29 °)	217 / (29 °)
PA°	23.0°	23.2°
PHX	241	483
PHZ	188	184

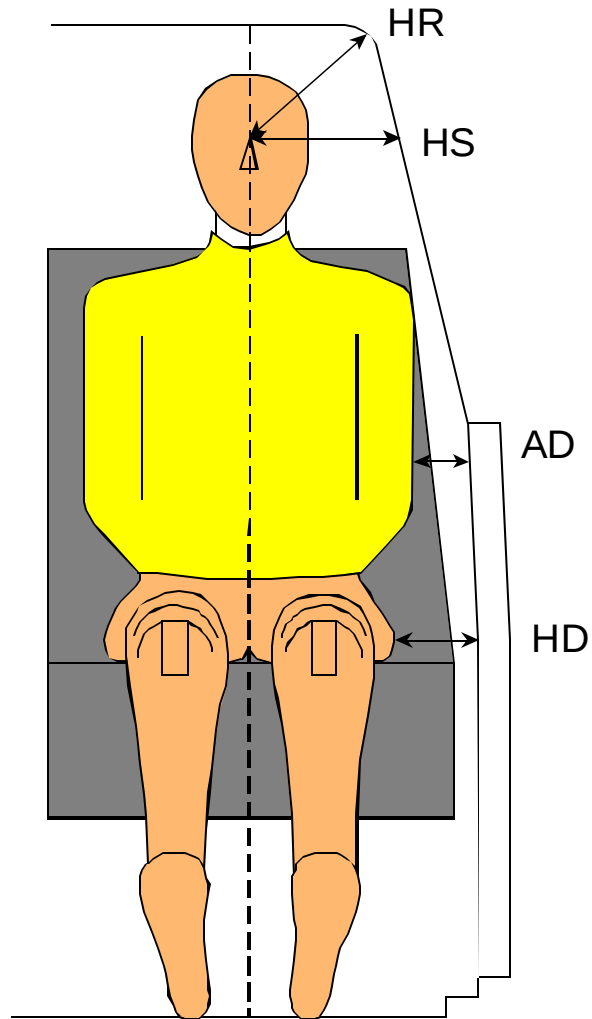
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

DATA SHEET 8

SID H3 LATERAL CLEARANCE DIMENSIONS

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



NOTE: All dimensions are in millimeters with tolerance of ± 3 mm

	DRIVER ID # 269		LEFT REAR PASS. ID # 270	
HR	239		192	
HS	371		376	
AD*	LOWER: 143	UPPER: 150	LOWER: 170	UPPER: 218
HD	142		276	

* Lower measurement is taken laterally at the center of the lower rib accelerometer height from the SID H3 arm segment to the closest part of the vehicle side.

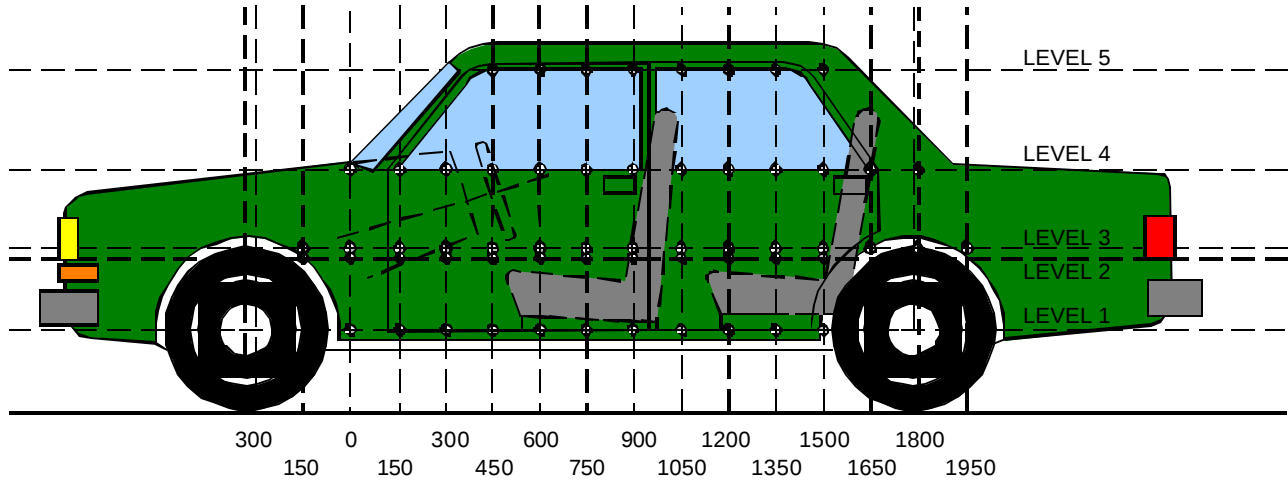
Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID H3 arm segment to the closest part of the vehicle side.

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



LEFT SIDE VIEW

NOTE: All measurements are in millimeters (mm)

LEVEL 5 - WINDOW TOP
 LEVEL 4 - WINDOW SILL
 LEVEL 3 - MID-DOOR
 LEVEL 2 - OCCUPANT H-POINT
 LEVEL 1 - AXLE CENTERLINE HEIGHT OR SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.

Measurements Along the Vertical 750 mm Line Shown Above:

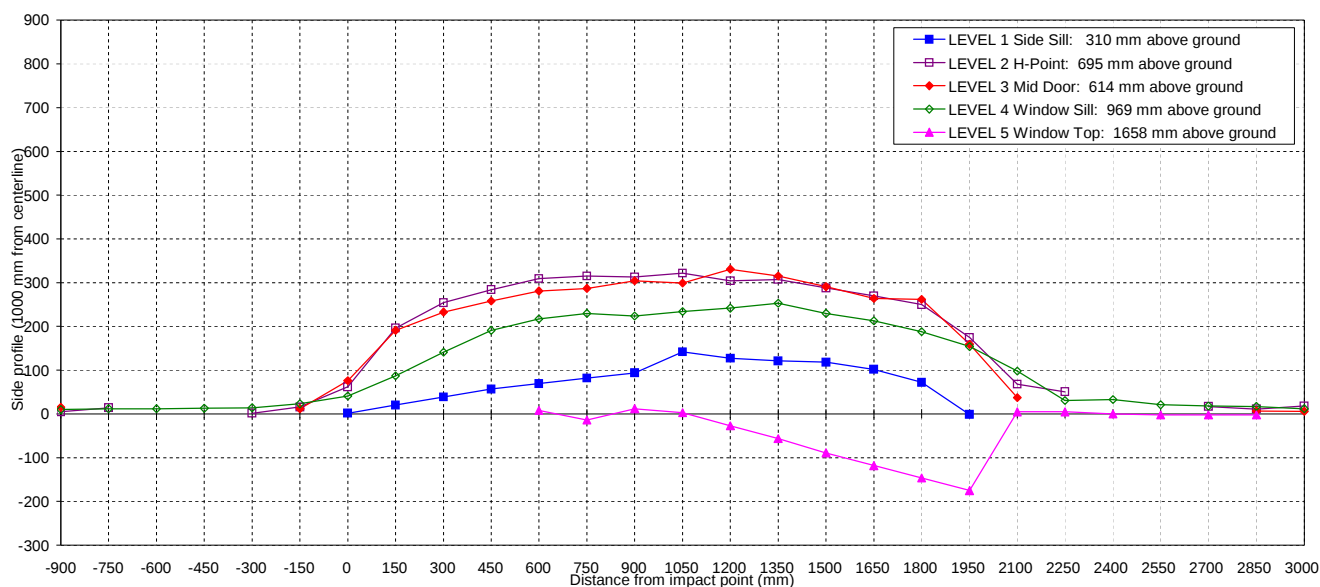
Level 5 @ Window Top	=	<u>1658</u>	millimeters
Level 4 @ Window Sill	=	<u>969</u>	millimeters
Level 3 @ Mid Door	=	<u>614</u>	millimeters
Level 2 @ Occupant H-Point	=	<u>695</u>	millimeters
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>310</u>	millimeters

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



NOTE: All dimensions are in millimeters with a tolerance of ± 3 mm

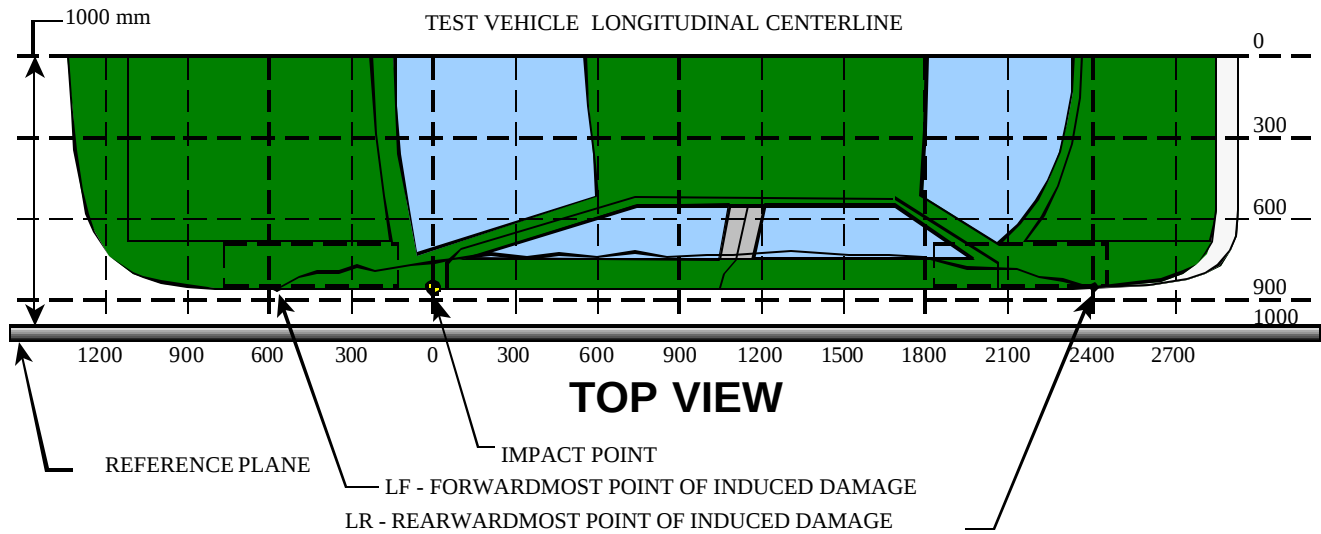
			DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																											
LEVEL	HEIGHT (mm)		-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	
LEVEL 1 SIDE SILL	310	PRE	--	--	--	--	--	--	85	95	92	94	91	91	91	94	96	95	95	97	96	86	--	--	--	--	--	--	--	
		POST	--	--	--	--	--	--	87	115	131	151	160	173	185	236	223	216	213	199	168	85	--	--	--	--	--	--	--	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	2	20	39	57	69	82	94	142	127	121	118	102	72	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 2 H POINT	695	PRE	86	58	--	--	47	48	50	45	44	43	37	38	35	36	38	35	36	39	41	37	33	31	--	--	30	50	71	
		POST	91	72	--	--	49	64	112	241	298	327	346	353	348	358	342	342	324	309	291	212	101	82	--	--	47	61	89	
		CRUSH	5	14	N/A	N/A	2	16	62	196	254	284	309	315	313	322	304	307	288	270	250	175	68	51	N/A	N/A	17	11	18	
LEVEL 3 MID DOOR	614	PRE	71	--	--	--	--	50	50	45	48	40	43	40	41	42	39	39	43	45	46	43	41	--	--	--	--	46	70	
		POST	86	--	--	--	--	62	126	236	281	298	324	327	345	341	370	354	334	309	308	202	78	--	--	--	--	53	76	
		CRUSH	15	N/A	N/A	N/A	N/A	12	76	191	233	258	281	287	304	299	331	315	291	264	262	159	37	N/A	N/A	N/A	N/A	7	6	
LEVEL 4 WINDOW SILL	969	PRE	211	163	137	117	105	95	86	80	73	67	64	48	34	48	53	46	45	44	45	47	49	51	55	62	66	75	88	
		POST	221	175	149	130	119	118	127	167	214	258	281	278	258	282	295	299	275	257	233	201	147	82	88	83	84	92	100	
		CRUSH	10	12	12	13	14	23	41	87	141	191	217	230	224	234	242	253	230	213	188	154	98	31	33	21	18	17	12	
LEVEL 5 WINDOW TOP	1658	PRE	--	--	--	--	--	--	--	--	--	--	623	404	321	300	293	288	289	290	292	295	300	308	320	337	354	379	--	
		POST	--	--	--	--	--	--	--	--	--	--	631	390	333	303	266	232	200	172	146	120	305	313	320	335	352	377	--	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	-14	12	3	-27	-56	-89	-118	-146	-175	5	5	0	-2	-2	-2	N/A	

DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



MEASUREMENT CONVENTIONS:
 Forward of the impact point (towards front of vehicle) is considered negative (—).
 Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

NOTE: All dimensions are in millimeters with tolerance of ± 3 mm.

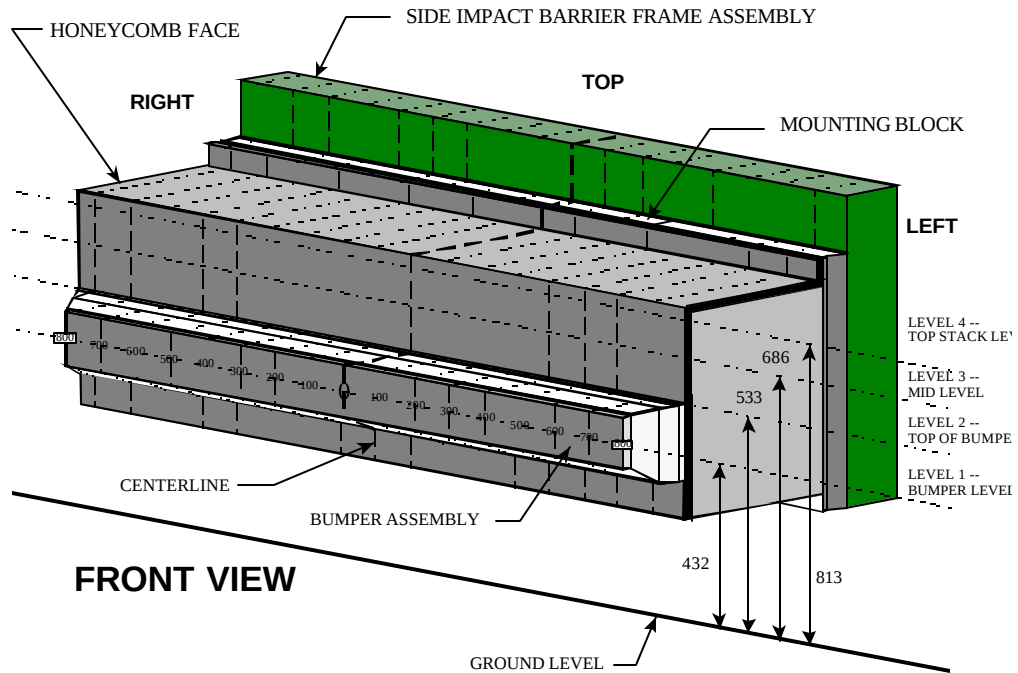
DPD MEASUREMENTS		POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1	(LR = <u>2550</u> mm)	335	337	-2
2	1980	190	36	154
3	1410	346	41	305
4	840	350	36	314
5	270	287	44	243
6	(LF = <u>-300</u> mm)	49	47	2

DATA SHEET 12

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



NOTE: Dimensions are shown in millimeters, mm

NOTE: All dimensions are in millimeters with a tolerance of ± 3 mm

			NOTE: All dimensions are in millimeters with a tolerance of ±1 mm																		
			DISTANCE RIGHT OF CENTER (mm)										DISTANCE LEFT OF CENTER (mm)								
LEVEL	HEIGHT AT CL (mm)*		800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800		
LEVEL 4 TOP STACK	813	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619		
		POST	685	664	646	628	618	619	628	646	669	658	642	634	638	650	668	701	735		
		CRUSH	66	45	27	9	-1	0	9	27	50	39	23	15	19	31	49	82	116		
LEVEL 3 MID LEVEL	686	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619		
		POST	689	665	646	635	629	624	633	625	639	626	629	626	629	632	644	666	687		
		CRUSH	70	46	27	16	10	5	14	6	20	7	10	7	10	13	25	47	68		
LEVEL 2 TOP BUMPER	533	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619		
		POST	695	678	675	676	677	676	674	674	671	670	672	670	670	670	672	683	708		
		CRUSH	76	59	56	57	58	57	55	55	52	51	53	51	51	51	53	64	89		
LEVEL 1 MID BUMPER	432	PRE	535	519	518	518	518	518	518	518	518	518	518	518	518	518	518	519	535		
		POST	728	709	701	697	696	693	700	700	696	693	696	692	694	691	691	688	694		
		CRUSH	193	190	183	179	178	175	182	182	178	175	178	174	176	173	173	169	159		

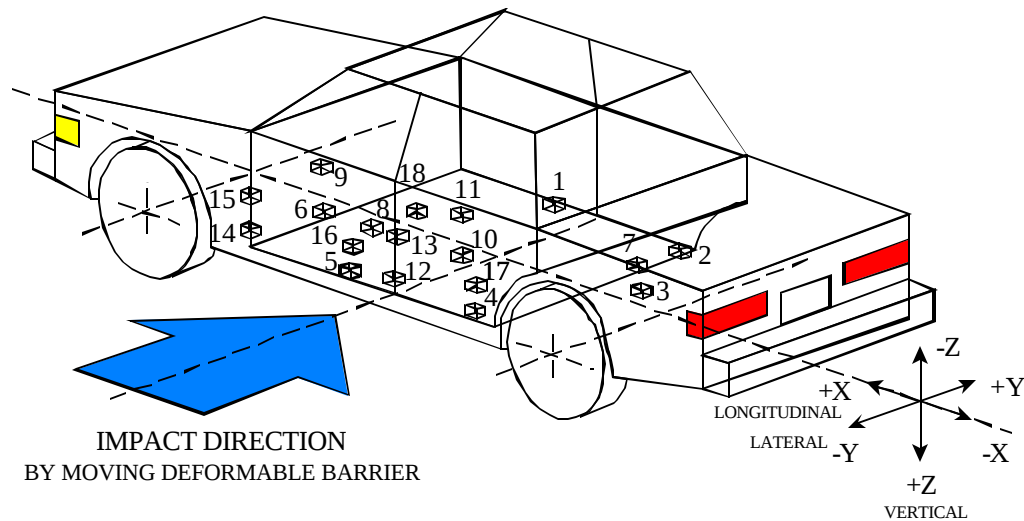
*Heights measured above ground level.

DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



- | | |
|------------------------------------|------------------------------------|
| 1-Right Side Sill @ Front Seat | 10-Midrear of Left Rear Door |
| 2-Right Side Sill @ Rear Seat | 11-Left Rear Door Upper Centerline |
| 3-Rear Floorpan Above Axle | 12-Left Lower B-Pillar |
| 4-Left Side Sill @ Rear Seat | 13-Left Middle B-Pillar |
| 5-Left Side Sill @ Front Seat | 14-Left Lower A-Pillar |
| 6-Left Front Door on Centerline | 15-Left Middle A-Pillar |
| 7-Right Rear Occupant Compartment | 16-Front Seat Track |
| 8-Midrear of Left Front Door | 17-Rear Seat Track |
| 9-Left Front Door Upper Centerline | 18-Vehicle CG |

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100

Accel. No.	Location	Coordinates (mm)±3 mm				Long. (x)		Lat. (y)		Vert. (z)		Resultant	
						Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
		X*	Y*	Z*		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
1	Right Side Sill at Front Seat	3474	772	-371	pos.	4.1	10.3	37.1	7.0	4.9	75.4	38.6	7.1
					neg.	-3.8	17.2	-1.4	160.4	-12.7	8.5	0.0	-11.3
2	Right Side Sill at Rear Seat	2380	717	-422	pos.	3.0	67.3	35.8	7.1	4.0	81.0	36.1	7.1
					neg.	-4.3	6.9	-4.1	15.4	-6.7	22.5	0.0	-12.8
3	Rear Floorpan Above Axle	1385	44	-476	pos.	2.6	65.7	36.7	7.9	10.3	35.6	36.8	7.9
					neg.	-6.2	33.7	-5.5	15.5	-9.7	30.7	0.0	-19.9
4	Left Side Sill at Rear Seat	2354	-675	-404	pos.	-	-	163.3	5.4	-	-	-	-
					neg.	-	-	-31.2	36.8	-	-	-	-
5	Left Side Sill at Front Seat	3535	-639	-446	pos.	-	-	37.1	6.1	-	-	-	-
					neg.	-	-	-1.3	160.3	-	-	-	-
6	Left Front Door on Centerline**	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
7	Right Rear Occupant Compartment	2595	435	-426	pos.	-	-	36.3	6.9	-	-	-	-
					neg.	-	-	-4.3	15.1	-	-	-	-
8	Midrear of Left Front Door**	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
9	Left Front Door Upper Centerline**	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
10	Midrear of Left Rear Door**	-	-	-	Pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
11	Left Rear Door Upper Centerline**	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

**Accelerometer was not requested by COTR.

4-11

8675-F214-12

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100

Accel. No.	Location	Coordinates (mm)±3 mm				Long. (x)		Lat. (y)		Vert. (z)		Resultant	
						Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
		X*	Y*	Z*									
12	Left Lower B-Pillar	2606	-781	-525	pos.	-	-	192.9	5.2	-	-	-	-
					neg.	-	-	-69.1	29.4	-	-	-	-
13	Left Middle B-Pillar	2548	-761	-1032	pos.	-	-	123.8	5.1	-	-	-	-
					neg.	-	-	-79.0	18.1	-	-	-	-
14	Left Lower A-Pillar	3681	-722	-462	pos.	-	-	90.7	5.2	-	-	-	-
					neg.	-	-	-34.4	24.2	-	-	-	-
15	Left Middle A-Pillar	3688	-746	-1141	pos.	-	-	23.0	13.9	-	-	-	-
					neg.	-	-	-9.7	33.6	-	-	-	-
16	Front Seat Track	2749	-623	-392	pos.	-	-	57.9	5.4	-	-	-	-
					neg.	-	-	-22.8	37.3	-	-	-	-
17	Rear Seat Track	2216	-535	-431	pos.	-	-	72.7	19.0	-	-	-	-
					neg.	-	-	-108.1	53.8	-	-	-	-
18	Vehicle CG	2953	33	-417	pos.	2.8	65.7	35.8	6.7	16.3	10.4	36.1	6.5
					neg.	-5.4	40.9	-1.4	159.8	-7.4	5.2	0.0	-4.9

*Reference: X - Rear Bumper (+ Forward) Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

4-12

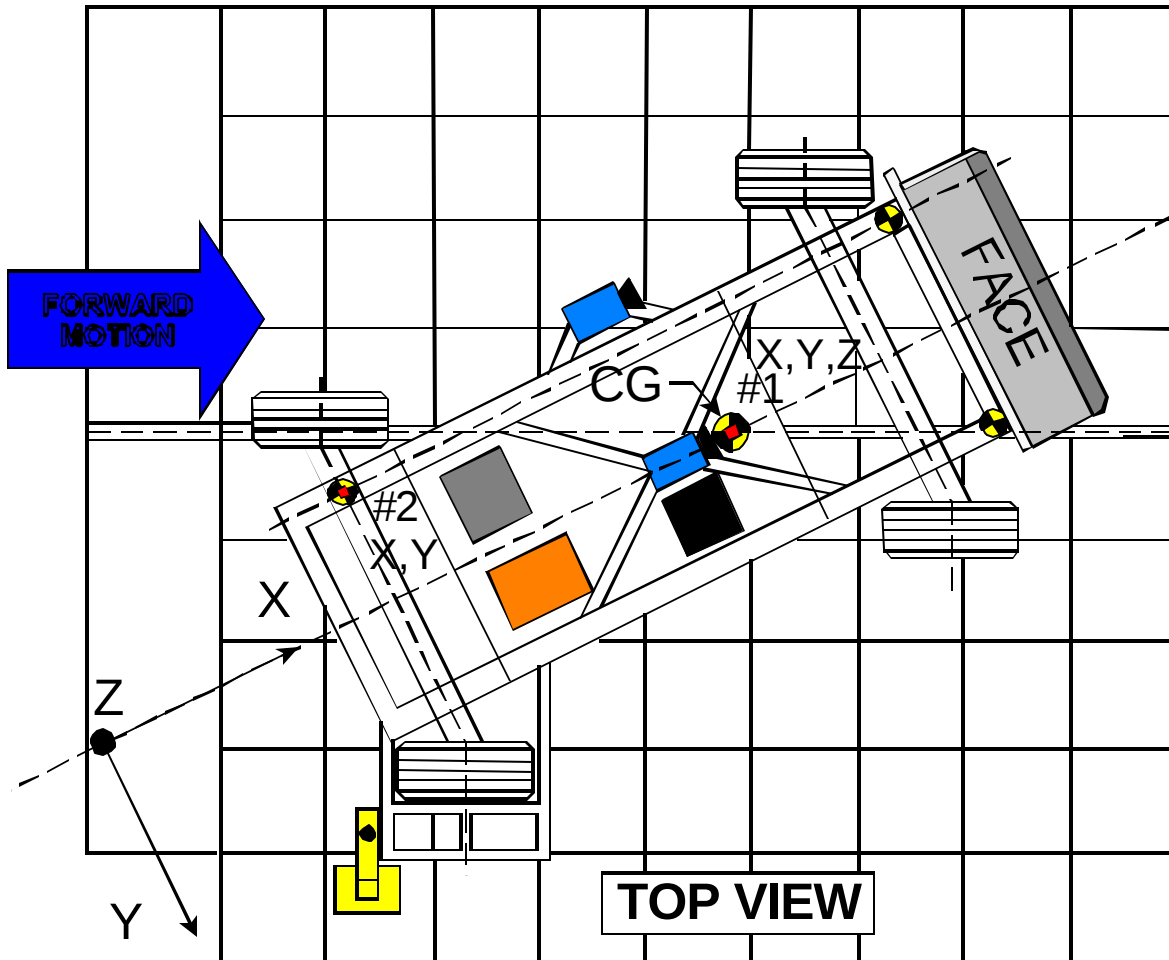
8675-F214-12

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



Accel. No.	Location	Coordinates (millimeters)			Pos. Direct.		Neg. Direct.	
		X*	Y*	Z*	Max (g)	Time (msec)	Max (g)	Time (msec)
1	MDB Center of Gravity							
	Longitudinal... X	1859	0	-330	0.9	125.6	-17.6	20.0
	Lateral..... Y				2.2	70.2	-7.3	41.0
	Vertical..... Z				12.5	38.9	-13.1	15.8
	Resultant..... R				22.3	38.9	0.3	172.1
2	Rear Frame Member							
	Longitudinal... X	386	-660	-660	1.3	172.2	-19.9	27.3
	Lateral..... Y				2.4	52.2	-2.3	71.7

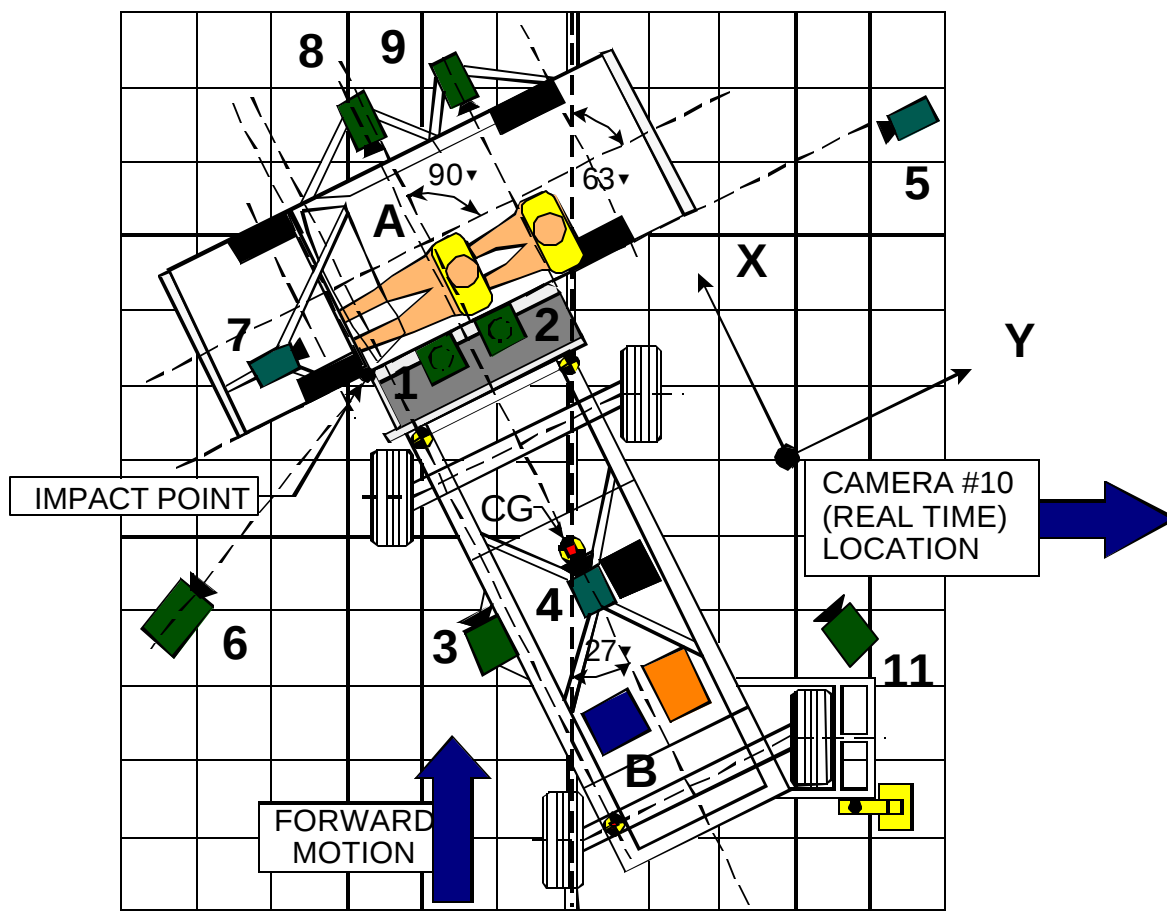
*Reference: X = Rear Bumper (+ Forward)
Y = Vehicle Centerline (+ To Right)
Z = Ground Level (+ Down)
All measurements accurate to within ± 3 mm.

DATA SHEET 15

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Toyota Sienna MPV

NHTSA No. C45100



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead view of test vehicle	223	823	-4880	-90	8	1000
2	Overhead closeup view of impact plane	340	844	-4880	-90	12.5	1005
3	MDB onboard closeup view of impact point	-1470	0	-847	0	13	1000
4	MDB onboard view of driver dummy	-1140	838	-1586	-17	7.5	1005
5	Right side ground level overall view	9344	165	-1086	-3	25	1005
6	Left side ground level overall view	-2366	-626	-1114	-5	13	1000
7	Test vehicle onboard driver front view	539	-767	-370	-6	13	1005
8	Test vehicle onboard driver side view	2645	644	-1183	-10	8	1000
9	Test vehicle onboard passenger side view	2664	1536	-1210	-9	8	1000
10	Real time film coverage of test	-	-	-	-	-	24

* Reference (from point of impact); all measurements accurate to within ± 6 mm.

X = (Impact Point) + Forward

Y = (Impact Point) + To Right

Z = (Ground Level) + Down

SECTION 5

FUEL SYSTEM INTEGRITY

DATA SHEET 16

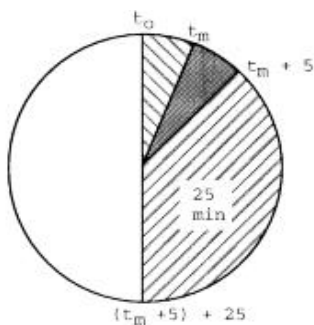
FMVSS 301 FUEL SYSTEM INTEGRITY DATA

NHTSA No.: C45100 TEST DATE: September 30, 2003
 Vehicle Mfr./Make/Model: Toyota Motor Manufacturing Indiana, Inc. 2004 Toyota Sienna MPV

TEST VEHICLE IMPACT TYPE:

- Frontal (48.28 kph)
- Oblique (48.28 kph) with - ° barrier face first
 contacting the - side
 (driver/passenger)
- Rear Moving Barrier (48.28 kph)
- Lateral Moving Barrier (32.19 kph)
- X Side Impact Moving Deformable Barrier (62.0 kph)
 contacting the driver side side
 (driver/passenger)

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 g	28 g
0 g	142 g
0 g	28 g/1 min.

SOLVENT SPILLAGE DETAILS:

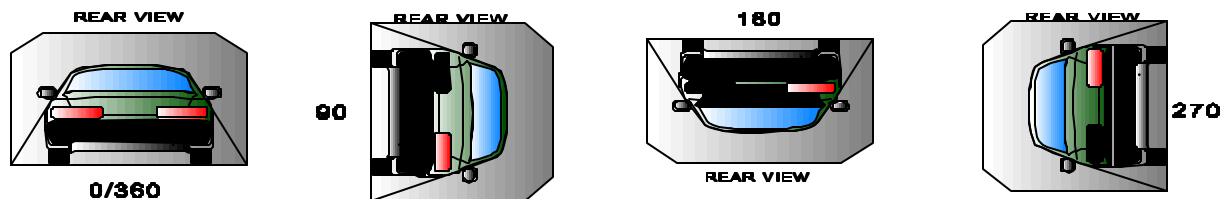
None

DATA SHEET 17

ROLLOVER DATA

Vehicle: 2004 Toyota Sienna MPV

NHTSA No.: C45100



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	11	seconds	5	minutes	6	minutes	11	seconds	7	minutes
90° - 180°	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
180°-270°	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
270°-360°	1	minutes	11	seconds	5	minutes	6	minutes	11	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	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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

TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page</u>
Figure A- 1	PRE-TEST FRONTAL VIEW OF TEST VEHICLE	A- 3
Figure A- 2	POST-TEST FRONTAL VIEW OF TEST VEHICLE	A- 4
Figure A- 3	PRE-TEST REAR VIEW OF TEST VEHICLE	A- 5
Figure A- 4	POST-TEST REAR VIEW OF TEST VEHICLE	A- 6
Figure A- 5	PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE	A- 7
Figure A- 6	POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE	A- 8
Figure A- 7	PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE	A- 9
Figure A- 8	POST-TEST LEFT FRONT VIEW OF TEST VEHICLE	A- 10
Figure A- 9	PRE-TEST LEFT REAR VIEW OF TEST VEHICLE	A- 11
Figure A- 10	POST-TEST LEFT REAR VIEW OF TEST VEHICLE	A- 12
Figure A- 11	PRE-TEST RIGHT FRONT VIEW OF TEST VEHICLE	A- 13
Figure A- 12	POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE	A- 14
Figure A- 13	PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE	A- 15
Figure A- 14	POST-TEST RIGHT REAR VIEW OF TEST VEHICLE	A- 16
Figure A- 15	PRE-TEST FRONTAL VIEW OF IMPACTOR FACE	A- 17
Figure A- 16	POST-TEST FRONTAL VIEW OF IMPACTOR FACE	A- 18
Figure A- 17	PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE	A- 19
Figure A- 18	POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE	A- 20
Figure A- 19	PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE	A- 21
Figure A- 20	POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE	A- 22
Figure A- 21	PRE-TEST TOP VIEW OF IMPACTOR FACE	A- 23
Figure A- 22	POST-TEST TOP VIEW OF IMPACTOR FACE	A- 24
Figure A- 23	PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE	A- 25
Figure A- 24	POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE	A- 26
Figure A- 25	PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 27
Figure A- 26	POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 28
Figure A- 27	PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 29
Figure A- 28	POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 30
Figure A- 29	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 31
Figure A- 30	POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 32
Figure A- 31	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 33
Figure A- 32	POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 34
Figure A- 33	PRE-TEST INTERIOR OF FRONT DOOR	A- 35
Figure A- 34	POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS	A- 36
Figure A- 35	PRE-TEST INTERIOR OF REAR DOOR	A- 37
Figure A- 36	POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS	A- 38
Figure A- 37	PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION	A- 39
Figure A- 38	PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION	A- 40
Figure A- 39	POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET	A- 41
Figure A- 40	CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL	A- 42
Figure A- 41	CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL	A- 43
Figure A- 42	IMPACT PHOTO	A- 44
Figure A- 43	ROLLOVER 90 DEGREES	A- 45
Figure A- 44	ROLLOVER 180 DEGREES	A- 46
Figure A- 45	ROLLOVER 270 DEGREES	A- 47
Figure A- 46	ROLLOVER 360 DEGREES	A- 48



Figure A-1 PRE-TEST FRONTAL VIEW OF TEST VEHICLE

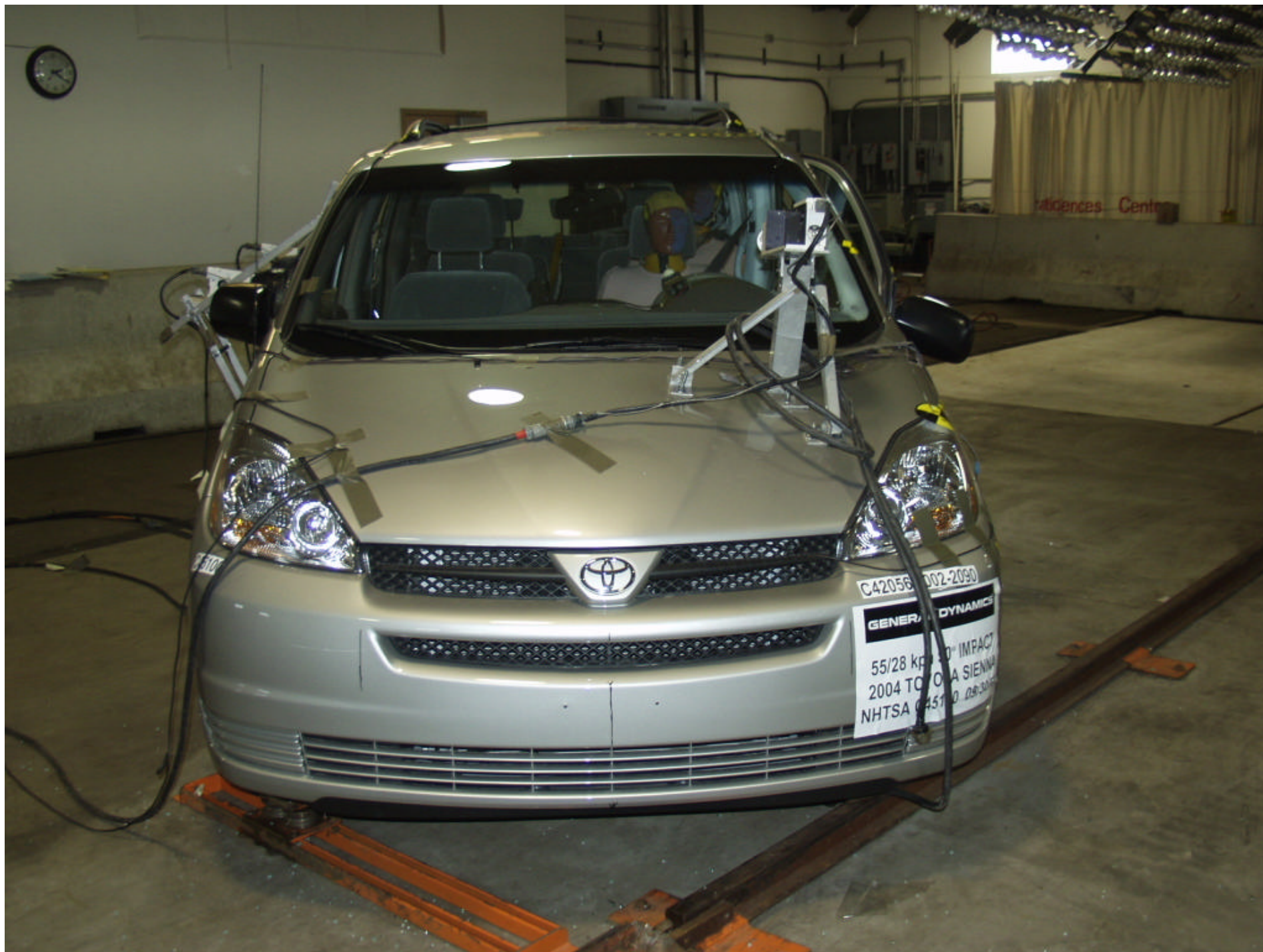


Figure A-2 POST-TEST FRONTAL VIEW OF TEST VEHICLE



Figure A-3 PRE-TEST REAR VIEW OF TEST VEHICLE



Figure A-4 POST-TEST REAR VIEW OF TEST VEHICLE



Figure A-5 PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-6 POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-7 PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE



Figure A-8 POST-TEST LEFT FRONT VIEW OF TEST VEHICLE



Figure A-9 PRE-TEST LEFT REAR VIEW OF TEST VEHICLE



Figure A-10 POST-TEST LEFT REAR VIEW OF TEST VEHICLE



Figure A-11 PRE-TEST RIGHT FRONT VIEW OF TEST VEHICLE



Figure A-12 POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE



Figure A-13 PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE



Figure A-14 POST-TEST RIGHT REAR VIEW OF TEST VEHICLE

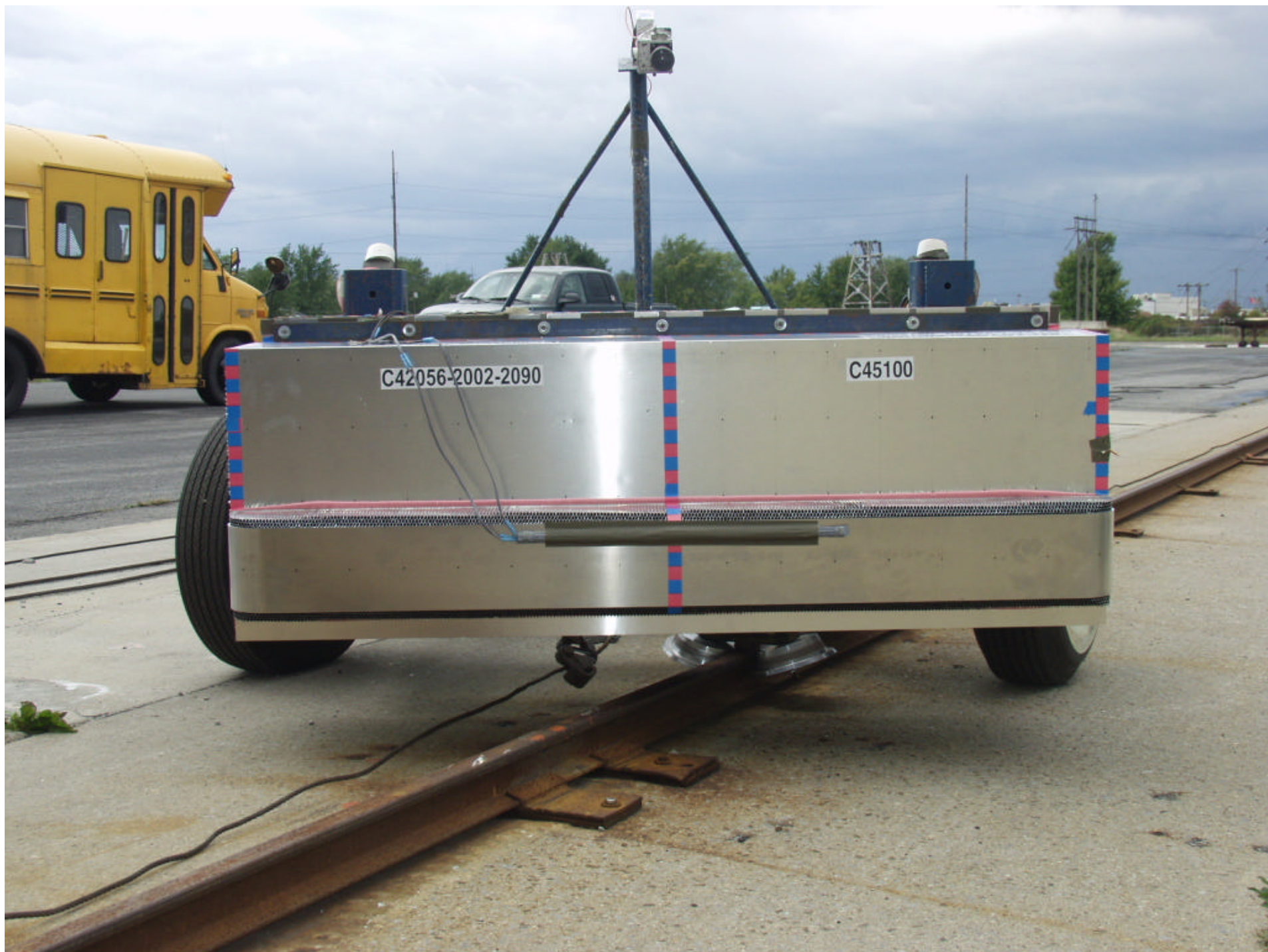


Figure A-15 PRE-TEST FRONTAL VIEW OF IMPACTOR FACE



Figure A-16 POST-TEST FRONTAL VIEW OF IMPACTOR FACE



Figure A-17 PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-18 POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-19 PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-20 POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-21 PRE-TEST TOP VIEW OF IMPACTOR FACE

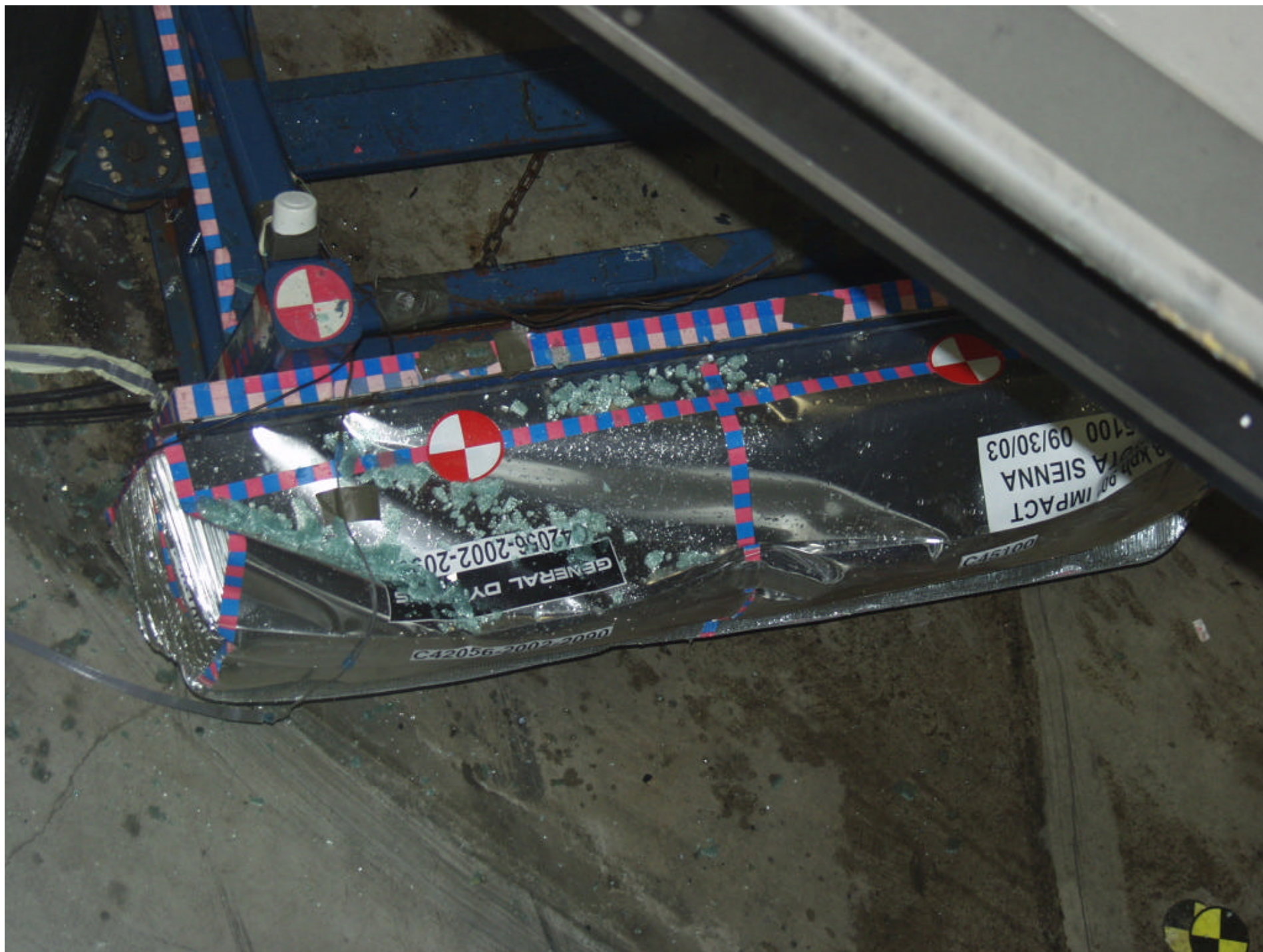


Figure A-22 POST-TEST TOP VIEW OF IMPACTOR FACE



Figure A-23 PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE



Figure A-24 POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE



Figure A-25 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-26 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-27 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-28 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-29 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-30 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-31 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-32 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-33 PRE-TEST INTERIOR OF FRONT DOOR



Figure A-34 POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-35 PRE-TEST INTERIOR OF REAR DOOR



Figure A-36 POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-37 PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-38 PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-39 POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET

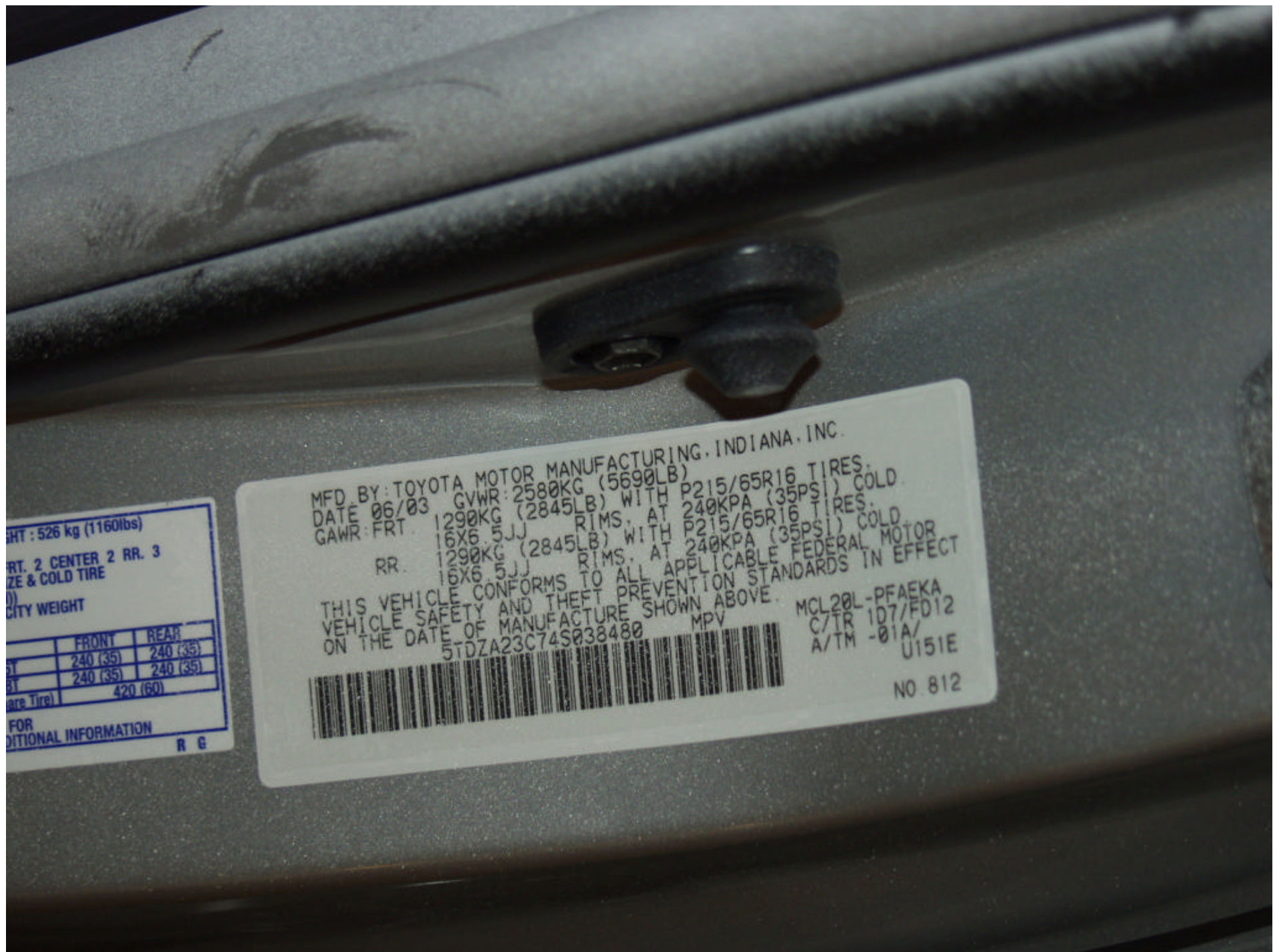


Figure A-40 CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL

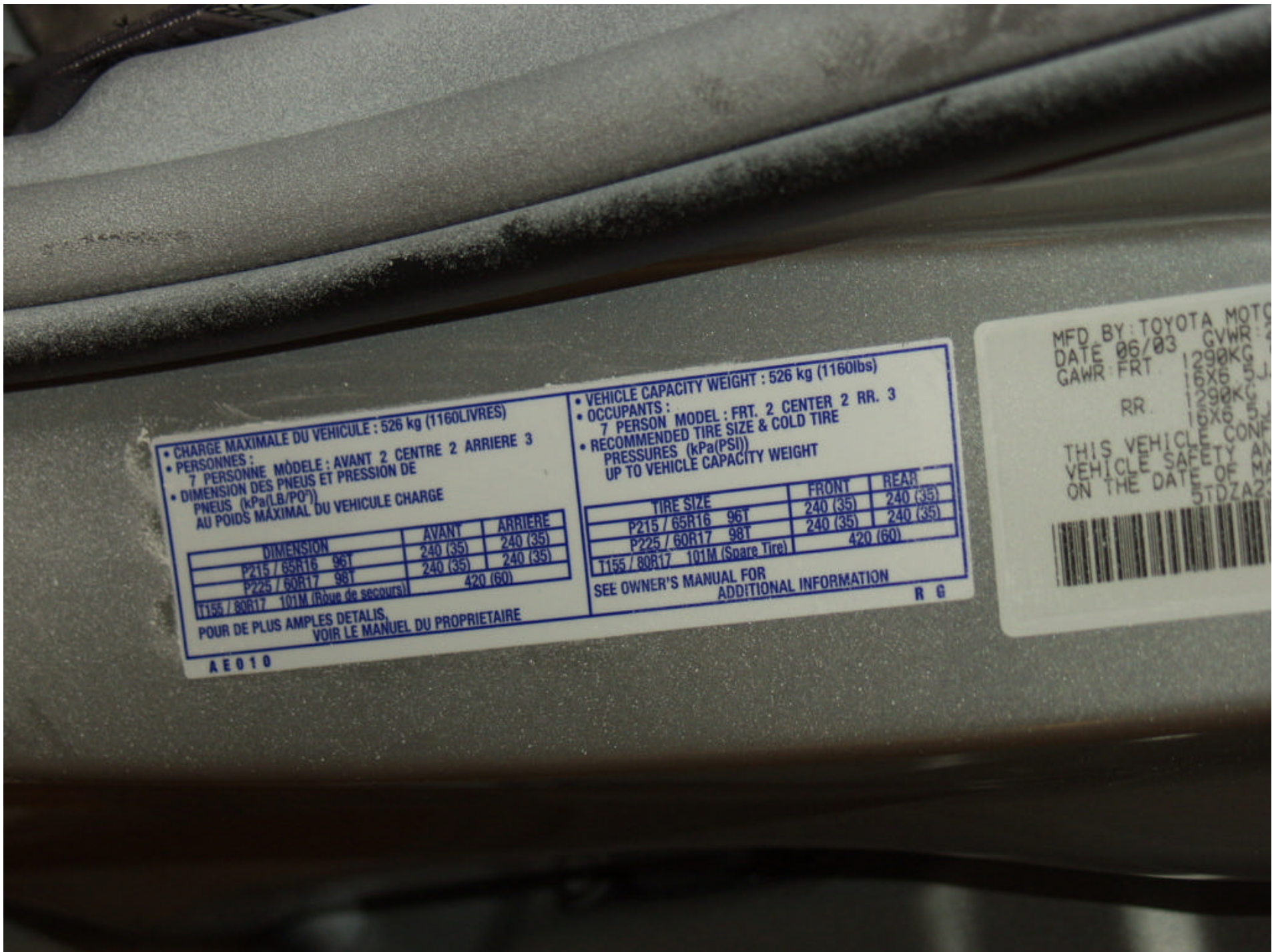


Figure A-41 CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL



Figure A-42 IMPACT PHOTO



Figure A-43 ROLLOVER 90 DEGREES



Figure A-44 ROLLOVER 180 DEGREES



Figure A-45 ROLLOVER 270 DEGREES



Figure A-46 ROLLOVER 360 DEGREES

APPENDIX B

VEHICLE, MDB AND SID HYBRID III RESPONSE DATA

TABLE OF DATA PLOTS

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION, FORCE AND MOMENT DATA - FILTER CLASS 1000, LOWER SPINE - FILTER CLASS 180
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	DRIVER HEAD (X) ACCELERATION VS TIME	B- 6
2	DRIVER HEAD (X) VELOCITY VS TIME	B- 7
3	DRIVER HEAD (Y) ACCELERATION VS TIME	B- 8
4	DRIVER HEAD (Y) VELOCITY VS TIME	B- 9
5	DRIVER HEAD (Z) ACCELERATION VS TIME	B- 10
6	DRIVER HEAD (Z) VELOCITY VS TIME	B- 11
7	DRIVER HEAD RESULTANT ACCELERATION VS TIME	B- 12
8	DRIVER UPPER NECK (X) FORCE VS TIME	B- 13
9	DRIVER UPPER NECK (Y) FORCE VS TIME	B- 14
10	DRIVER UPPER NECK (Z) FORCE VS TIME	B- 15
11	DRIVER UPPER NECK RESULTANT FORCE VS TIME	B- 16
12	DRIVER UPPER NECK (X) MOMENT VS TIME	B- 17
13	DRIVER UPPER NECK (Y) MOMENT VS TIME	B- 18
14	DRIVER UPPER NECK (Z) MOMENT VS TIME	B- 19
15	DRIVER UPPER NECK RESULTANT MOMENT VS TIME	B- 20
16	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 21
17	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 22
18	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 23
19	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 24
20	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 25
21	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 26
22	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 27
23	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 28
24	PASSENGER HEAD (X) ACCELERATION VS TIME	B- 29
25	PASSENGER HEAD (X) VELOCITY VS TIME	B- 30
26	PASSENGER HEAD (Y) ACCELERATION VS TIME	B- 31
27	PASSENGER HEAD (Y) VELOCITY VS TIME	B- 32
28	PASSENGER HEAD (Z) ACCELERATION VS TIME	B- 33
29	PASSENGER HEAD (Z) VELOCITY VS TIME	B- 34
30	PASSENGER HEAD RESULTANT ACCELERATION VS TIME	B- 35
31	PASSENGER UPPER NECK (X) FORCE VS TIME	B- 36
32	PASSENGER UPPER NECK (Y) FORCE VS TIME	B- 37
33	PASSENGER UPPER NECK (Z) FORCE VS TIME	B- 38
34	PASSENGER UPPER NECK RESULTANT FORCE VS TIME	B- 39
35	PASSENGER UPPER NECK (X) MOMENT VS TIME	B- 40
36	PASSENGER UPPER NECK (Y) MOMENT VS TIME	B- 41
37	PASSENGER UPPER NECK (Z) MOMENT VS TIME	B- 42
38	PASSENGER UPPER NECK RESULTANT MOMENT VS TIME	B- 43
39	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 44
40	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 45
41	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 46
42	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 47
43	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 48
44	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 49
45	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 50
46	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 51

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION DATA - FIR FILTERED

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
47	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 52
48	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 53
49	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 54
50	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 55
51	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 56
52	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 57
53	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 58
54	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 59

TEST VEHICLE INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 60
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
55	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME	B- 60
56	RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME	B- 61
57	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 62
58	RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 63
59	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME	B- 64
60	RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME	B- 65
61	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME	B- 66
62	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME	B- 67
63	RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME	B- 68
64	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 69
65	RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 70
66	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME	B- 71
67	RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY VS TIME	B- 72
68	RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION VS TIME	B- 73
69	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME	B- 74
70	REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME	B- 75
71	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME	B- 76
72	REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME	B- 77
73	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME	B- 78
74	REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME	B- 79
75	REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION VS TIME	B- 80
76	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 81
77	LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 82
78	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 83
79	LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 84
80	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME	B- 85
81	RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY VS TIME	B- 86
82	LOWER B-POST (Y) ACCELERATION VS TIME	B- 87
83	LOWER B-POST (Y) VELOCITY VS TIME	B- 88
84	UPPER B-POST (Y) ACCELERATION VS TIME	B- 89
85	UPPER B-POST (Y) VELOCITY VS TIME	B- 90
86	LOWER A-POST (Y) ACCELERATION VS TIME	B- 91
87	LOWER A-POST (Y) VELOCITY VS TIME	B- 92
88	UPPER A-POST (Y) ACCELERATION VS TIME	B- 93
89	UPPER A-POST (Y) VELOCITY VS TIME	B- 94
90	FRONT SEAT TRACK (Y) ACCELERATION VS TIME	B- 95
91	FRONT SEAT TRACK (Y) VELOCITY VS TIME	B- 96
92	REAR SEAT TRACK (Y) ACCELERATION VS TIME	B- 97
93	REAR SEAT TRACK (Y) VELOCITY VS TIME	B- 98

TEST VEHICLE INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 60
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
94	VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 99
95	VEHICLE CENTER OF GRAVITY (X) VELOCITY VS TIME	B- 100
96	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 101
97	VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME	B- 102
98	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 103
99	VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 104
100	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 105

MDB INSTRUMENTATION PLOTS
ACCELERATION DATA - FILTER CLASS 60
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
101	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 106
102	MDB CENTER OF GRAVITY (X) VELOCITY VS TIME	B- 107
103	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 108
104	MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME	B- 109
105	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 110
106	MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 111
107	MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 112
108	MDB REAR (X) ACCELERATION VS TIME	B- 113
109	MDB REAR (X) VELOCITY VS TIME	B- 114
110	MDB REAR (Y) ACCELERATION VS TIME	B- 115
111	MDB REAR (Y) VELOCITY VS TIME	B- 116

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)
ACCELERATION DATA - FILTER CLASS 1000, LOWER SPINE - FILTER CLASS 180
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
112	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 117
113	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 118
114	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 119
115	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 120
116	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 121
117	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 122
118	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 123
119	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 124
120	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 125
121	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 126
122	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 127
123	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 128
124	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 129
125	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 130
126	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 131
127	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 132

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)
ACCELERATION DATA - FIR FILTERED

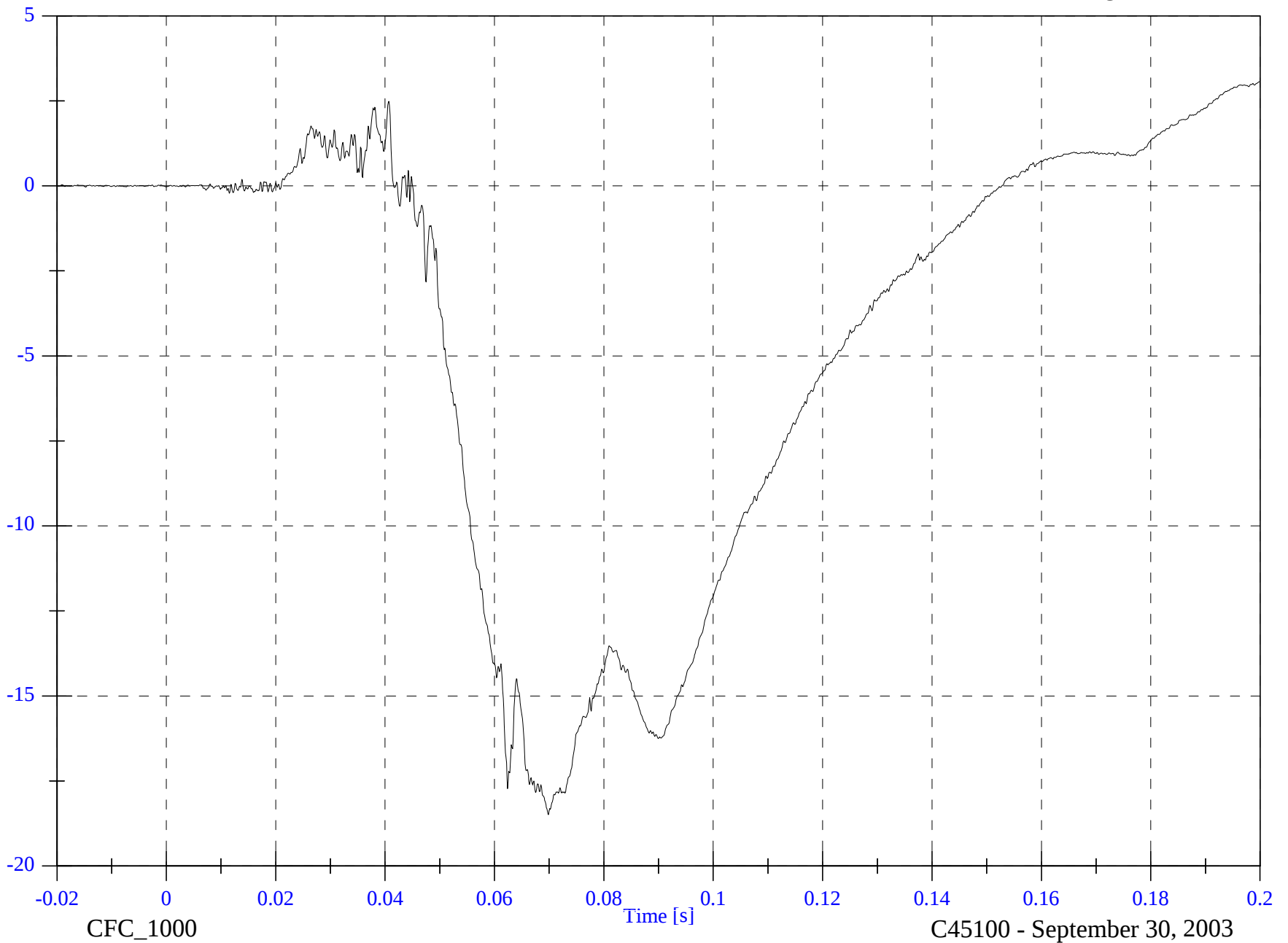
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
128	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 133
129	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 134
130	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 135
131	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 136
132	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 137
133	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 138
134	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 139
135	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 140

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head x

Max: 3.1 [g] at 0.200 [s]

Min: -18.5 [g] at 0.070 [s]



B-6

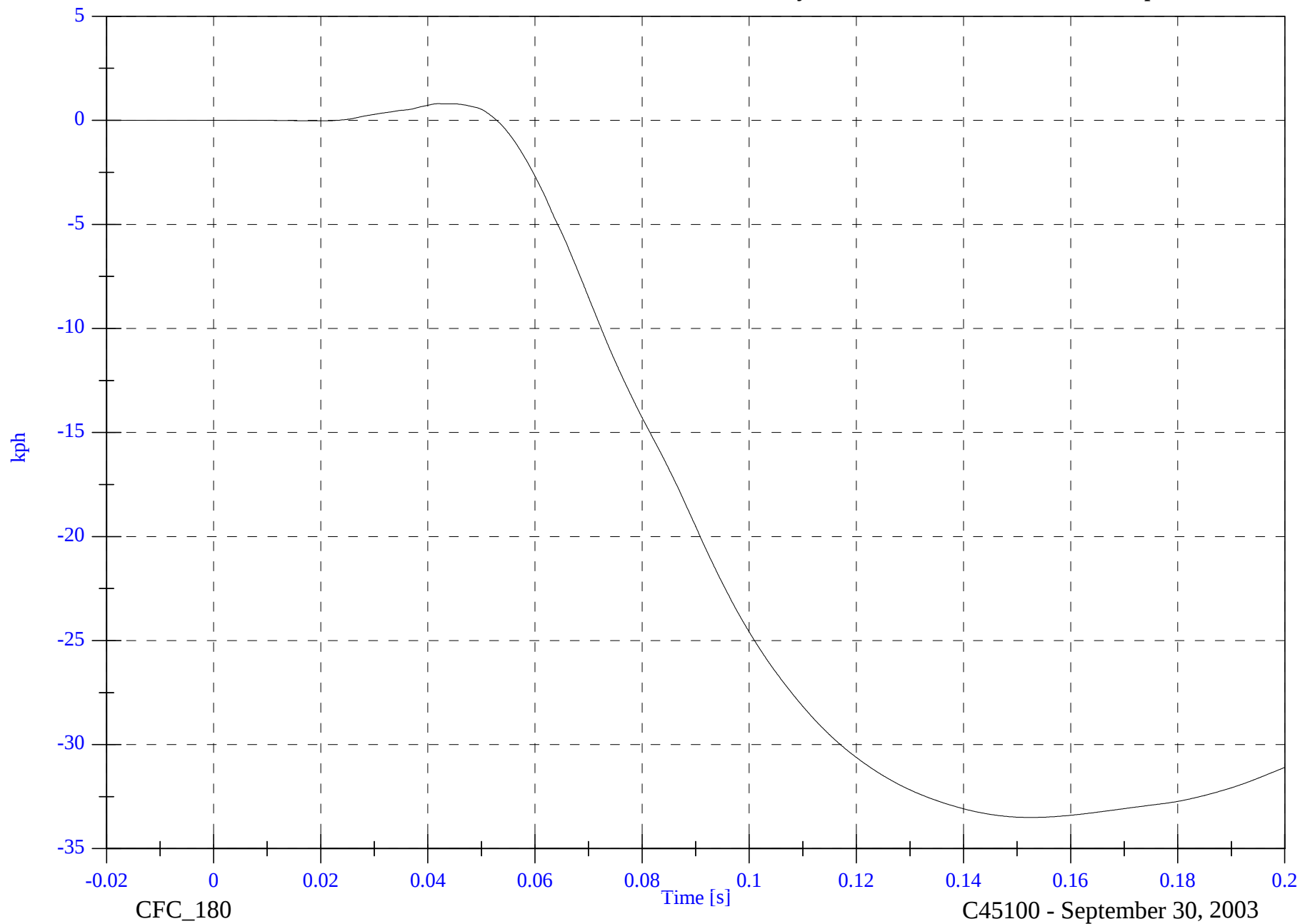
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head x Velocity

Max: 0.8 [kph] at 0.042 [s]

Min: -33.5 [kph] at 0.153 [s]



B-7

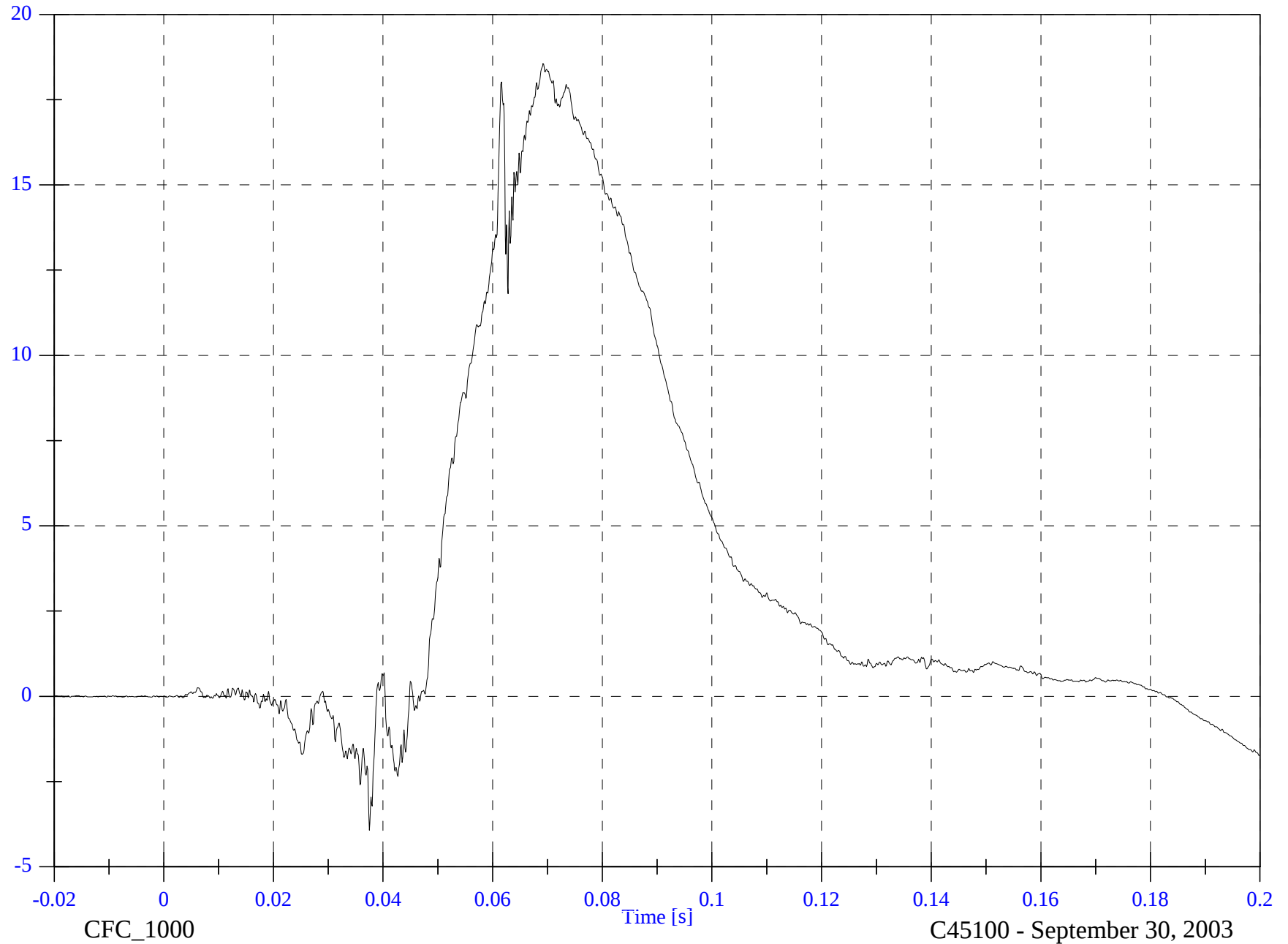
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head y

Max: 18.6 [g] at 0.069 [s]

Min: -3.9 [g] at 0.037 [s]



B-8

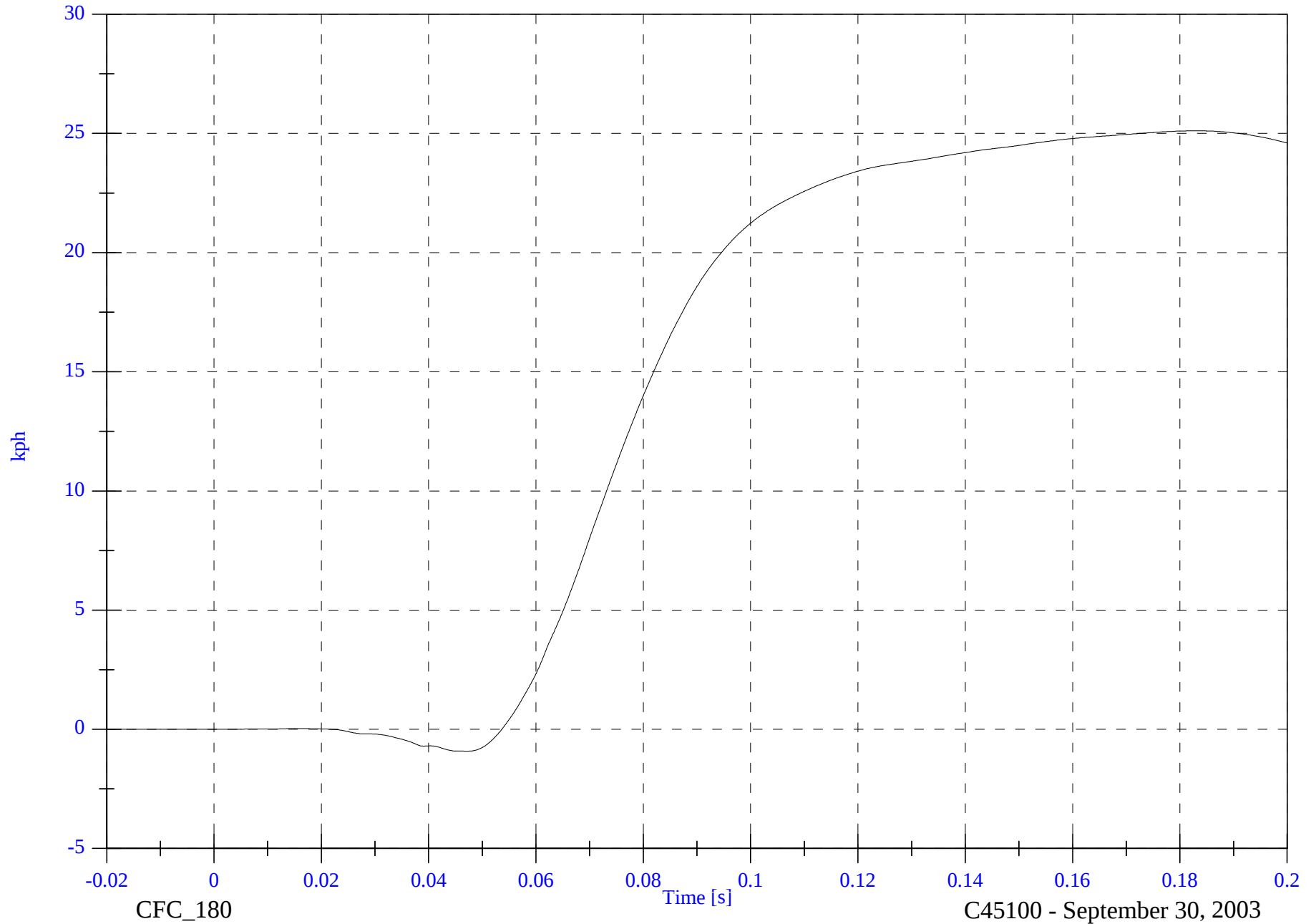
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head y Velocity

Max: 25.1 [kph] at 0.183 [s]

Min: -0.9 [kph] at 0.047 [s]



B-9

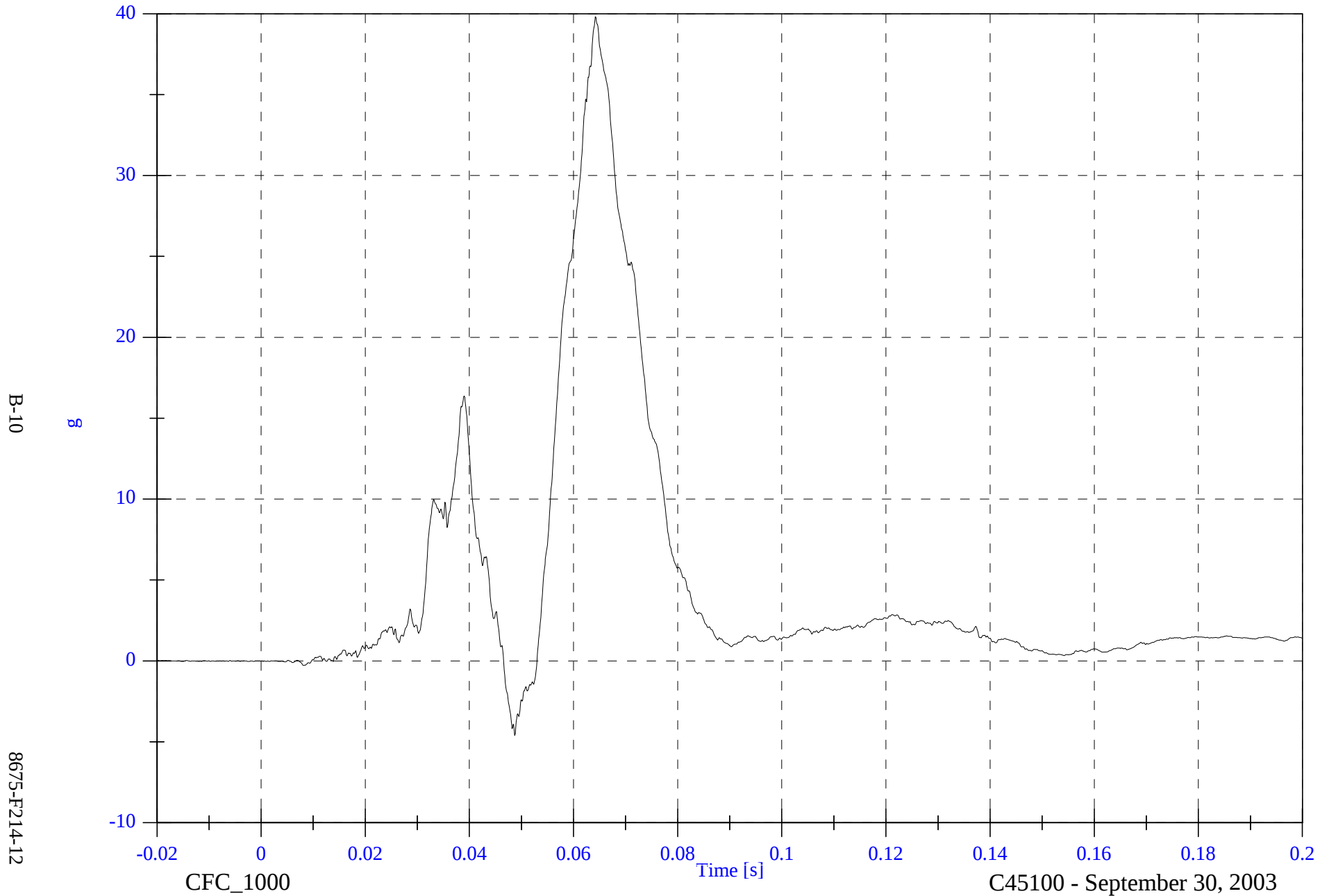
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head z

Max: 39.8 [g] at 0.064 [s]

Min: -4.6 [g] at 0.049 [s]

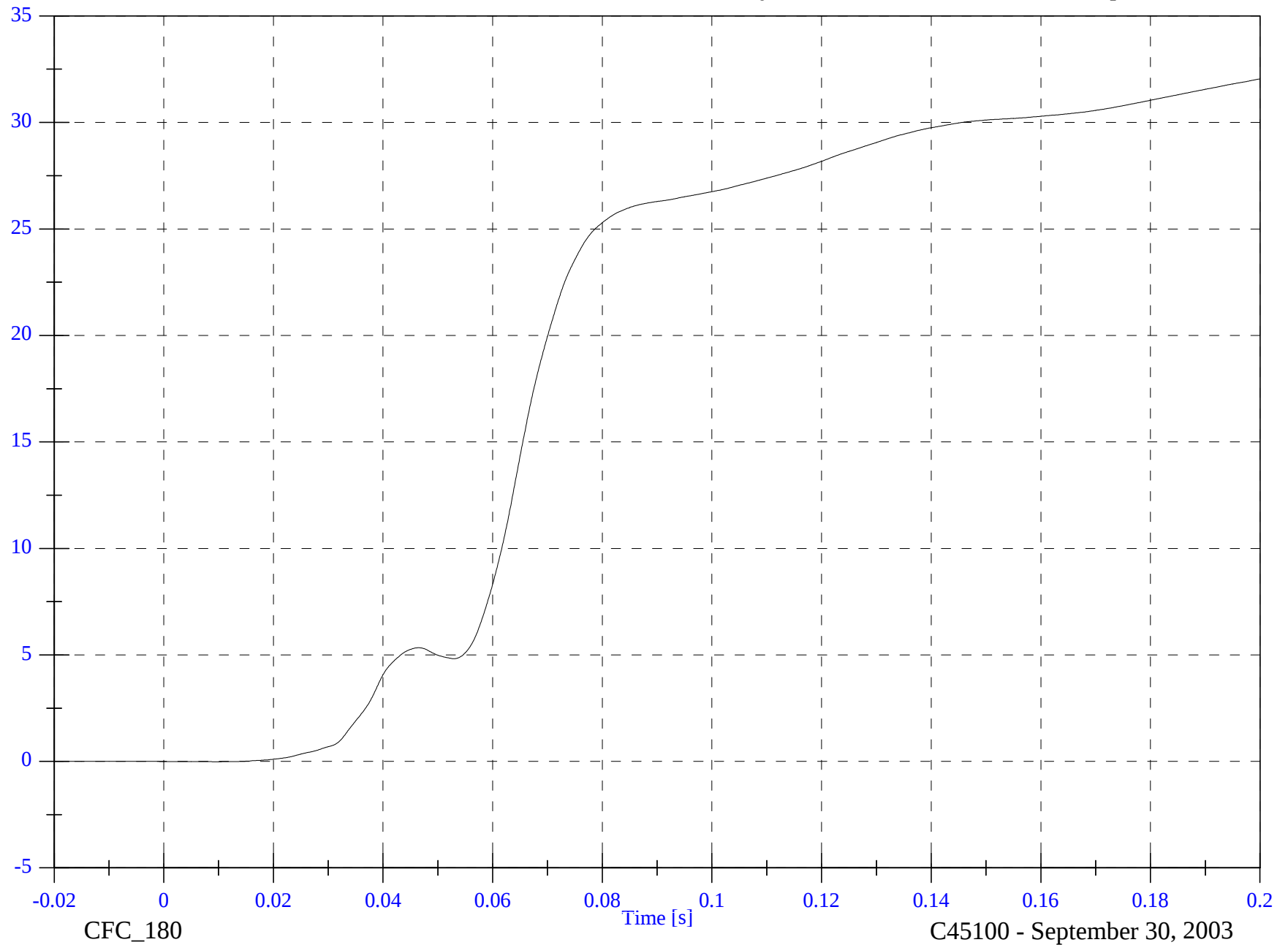


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head z Velocity

Max: 32.0 [kph] at 0.200 [s]

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



B-11

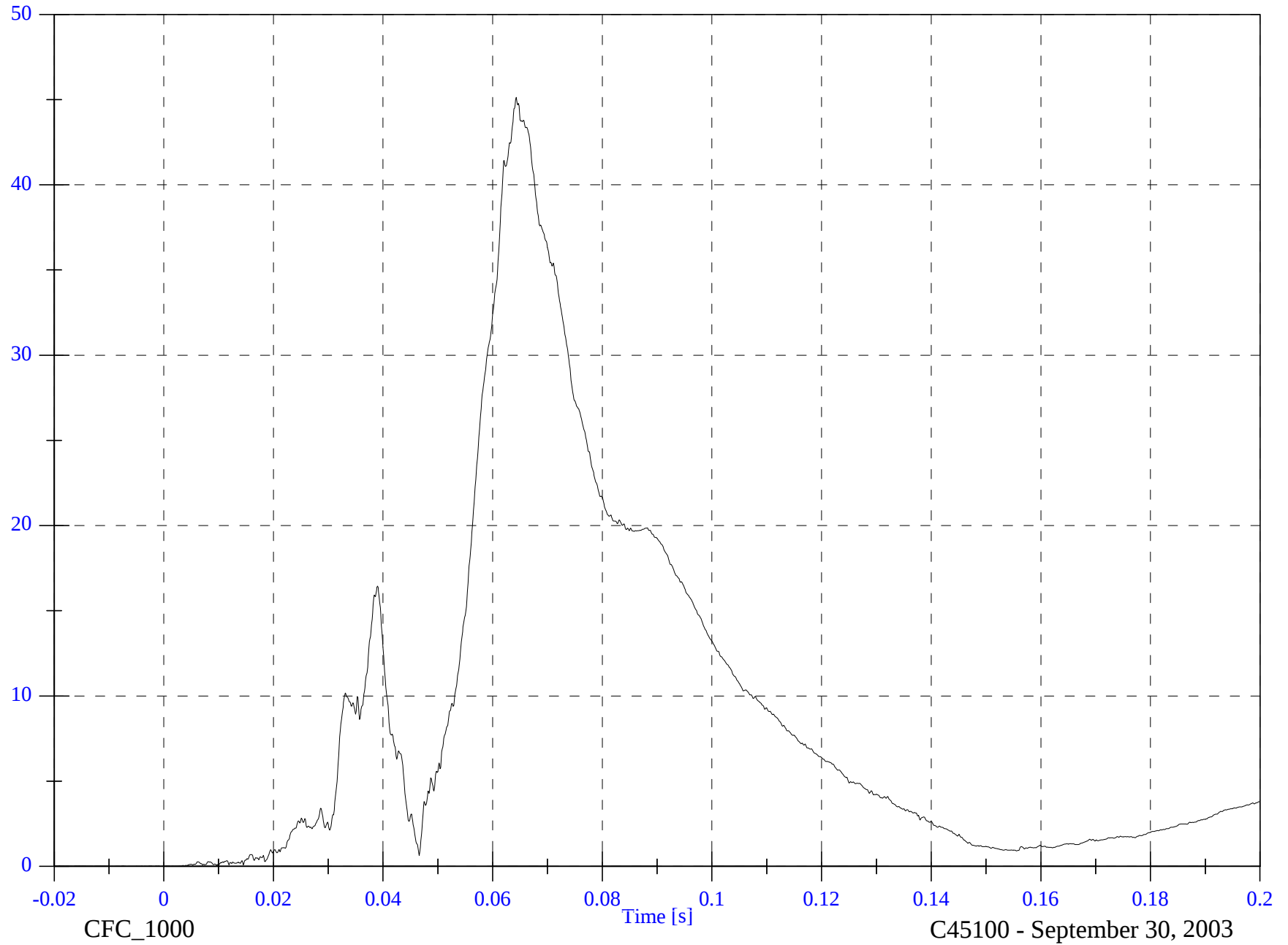
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Head Resultant

Max: 45.1 [g] at 0.064 [s]

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



B-12

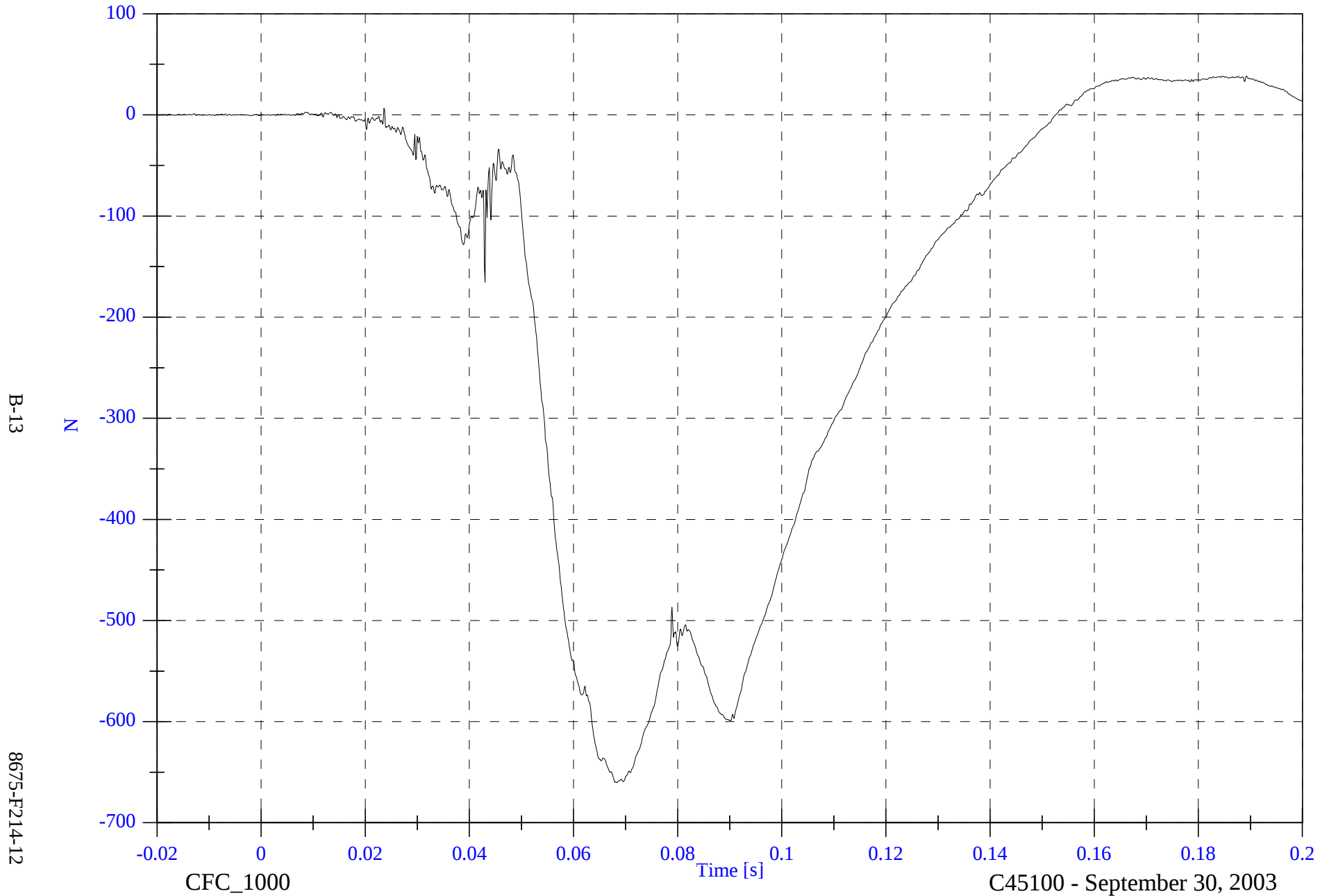
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck Fx

Max: 38.3 [N] at 0.188 [s]

Min: -660.2 [N] at 0.068 [s]

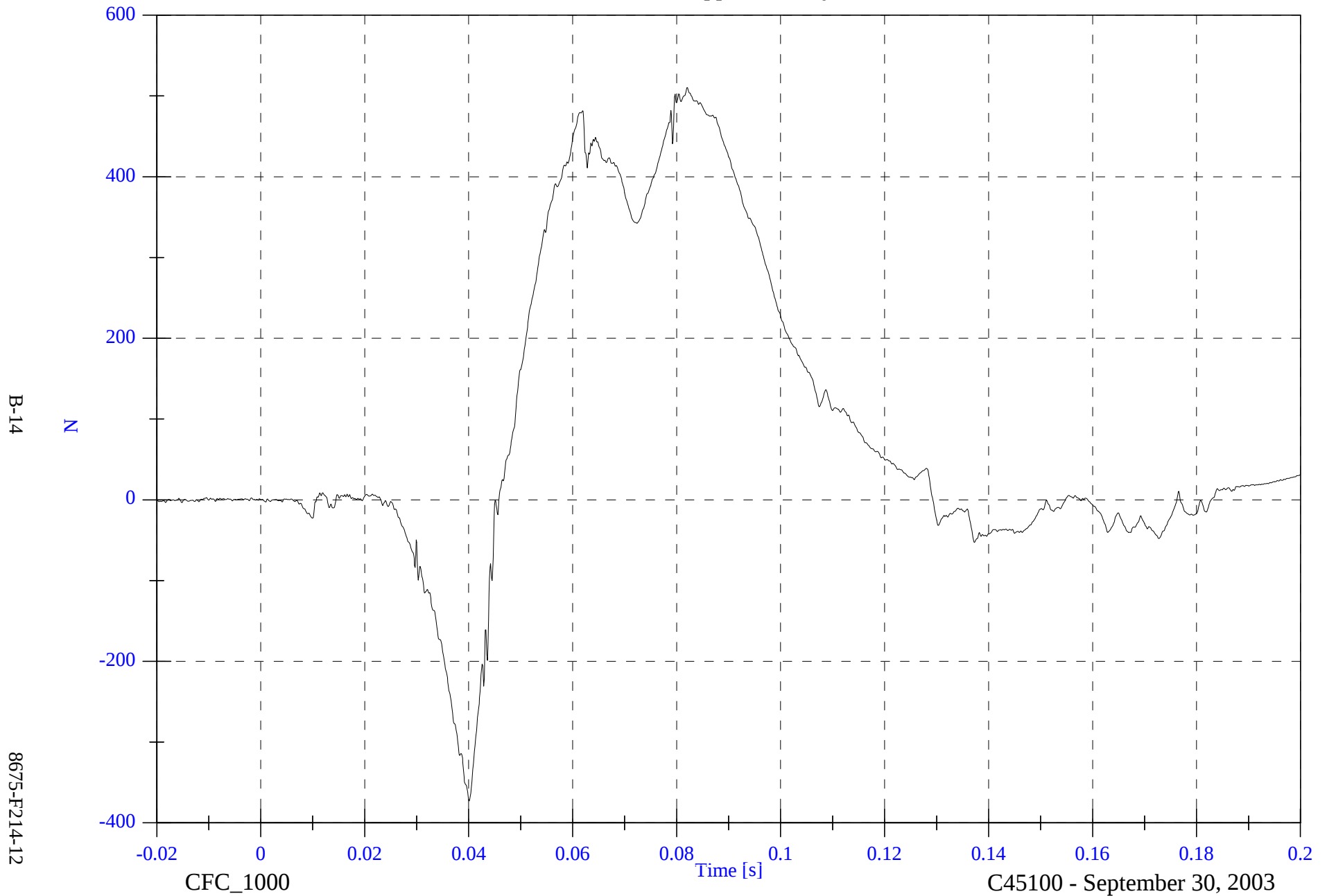


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck Fy

Max: 510.4 [N] at 0.082 [s]

Min: -373.0 [N] at 0.040 [s]

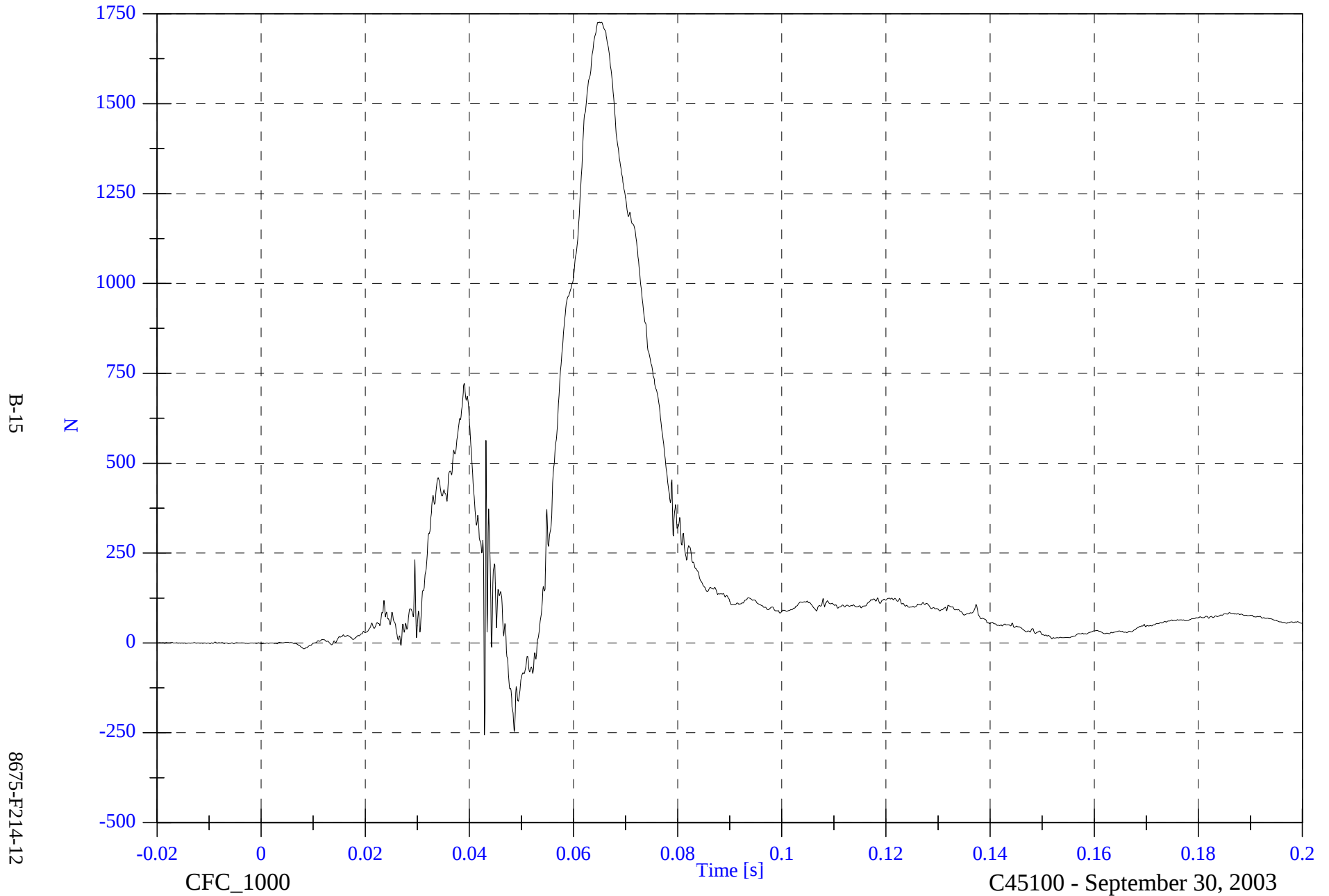


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck Fz

Max: 1726.5 [N] at 0.065 [s]

Min: -255.7 [N] at 0.043 [s]

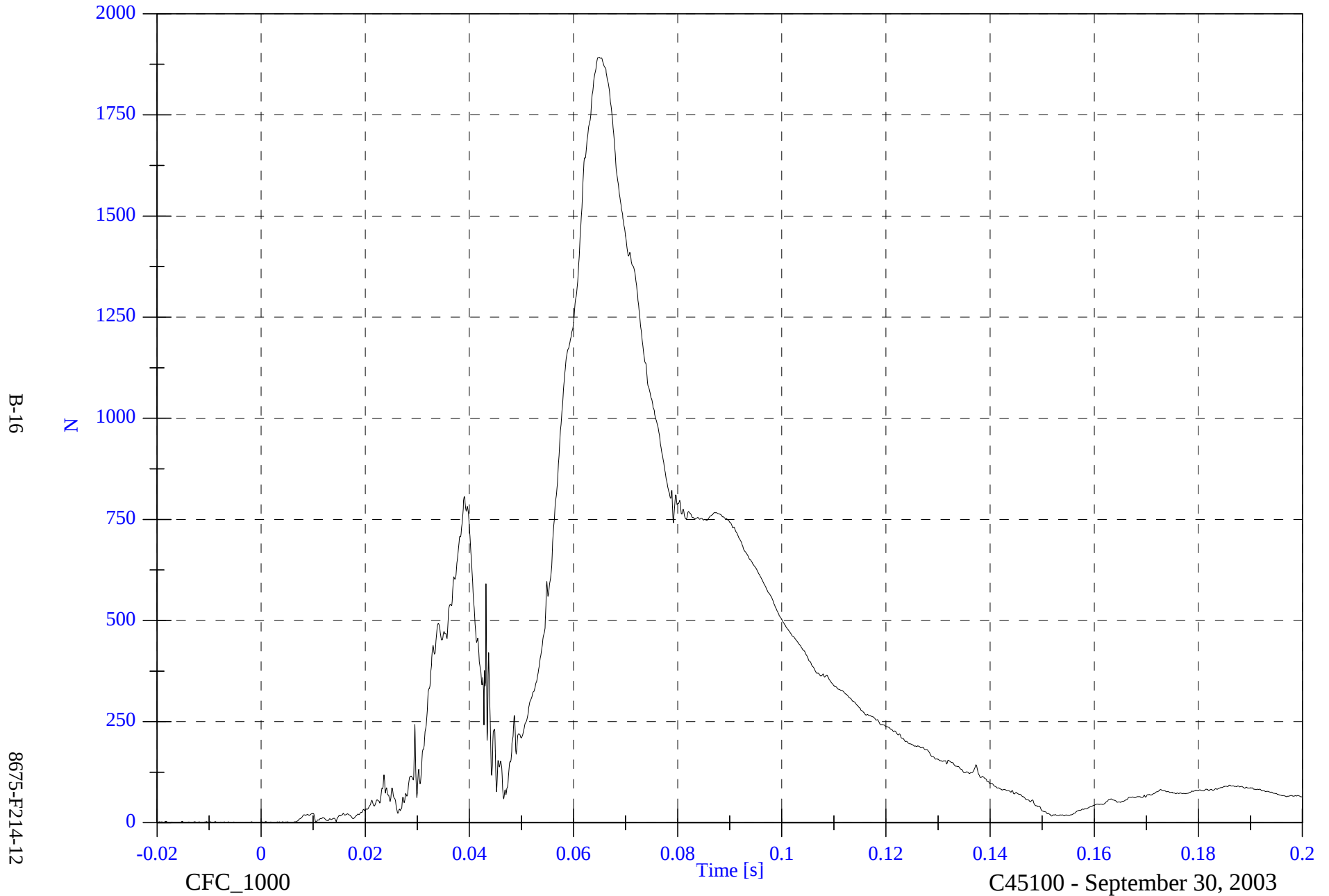


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck F Resultant

Max: 1892.0 [N] at 0.065 [s]

Min: 0.1 [N] at -0.004 [s]

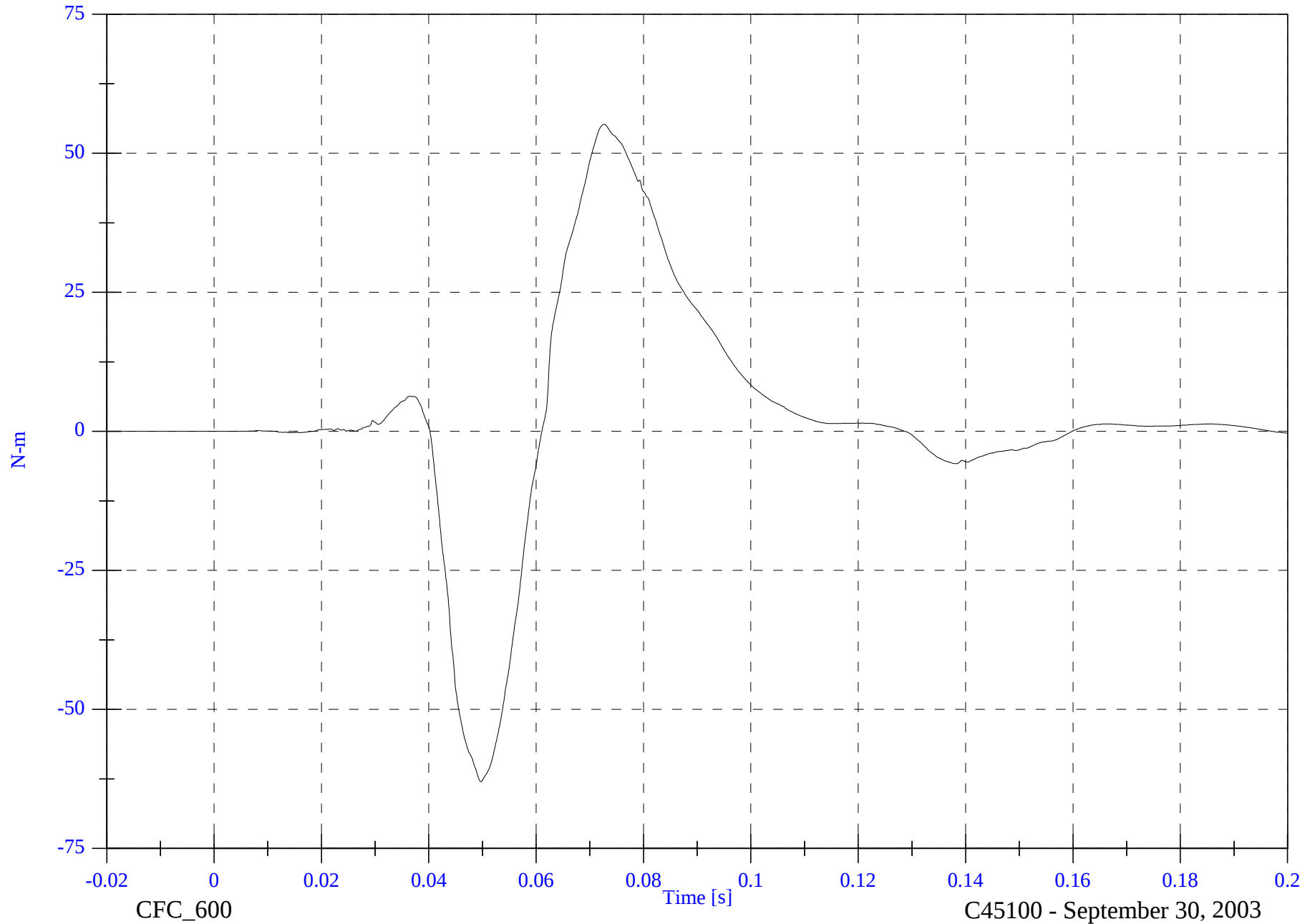


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck Mx

Max: 55.2 [N-m] at 0.073 [s]

Min: -63.0 [N-m] at 0.050 [s]

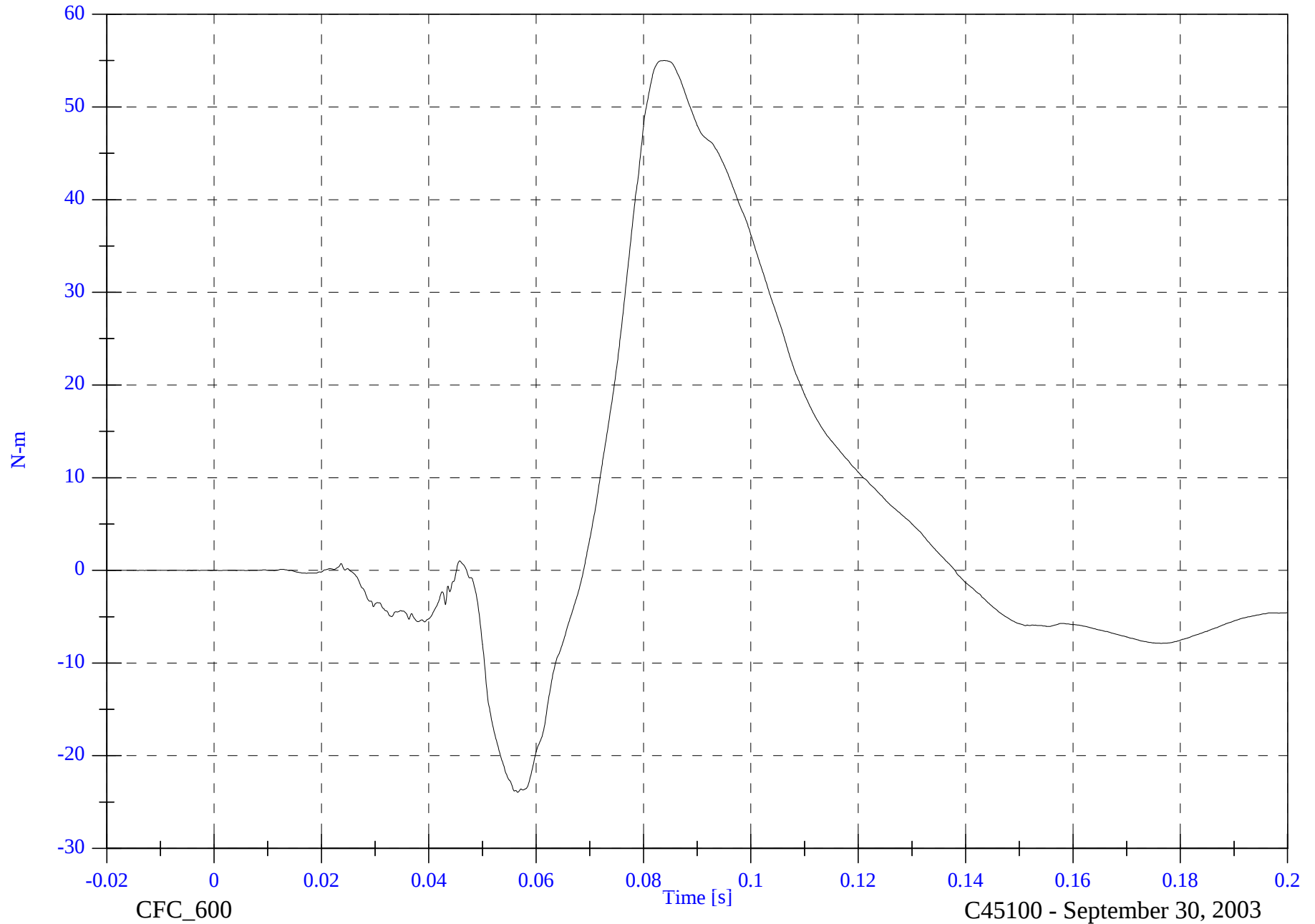


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck My

Max: 55.0 [N-m] at 0.084 [s]

Min: -23.9 [N-m] at 0.057 [s]



B-18

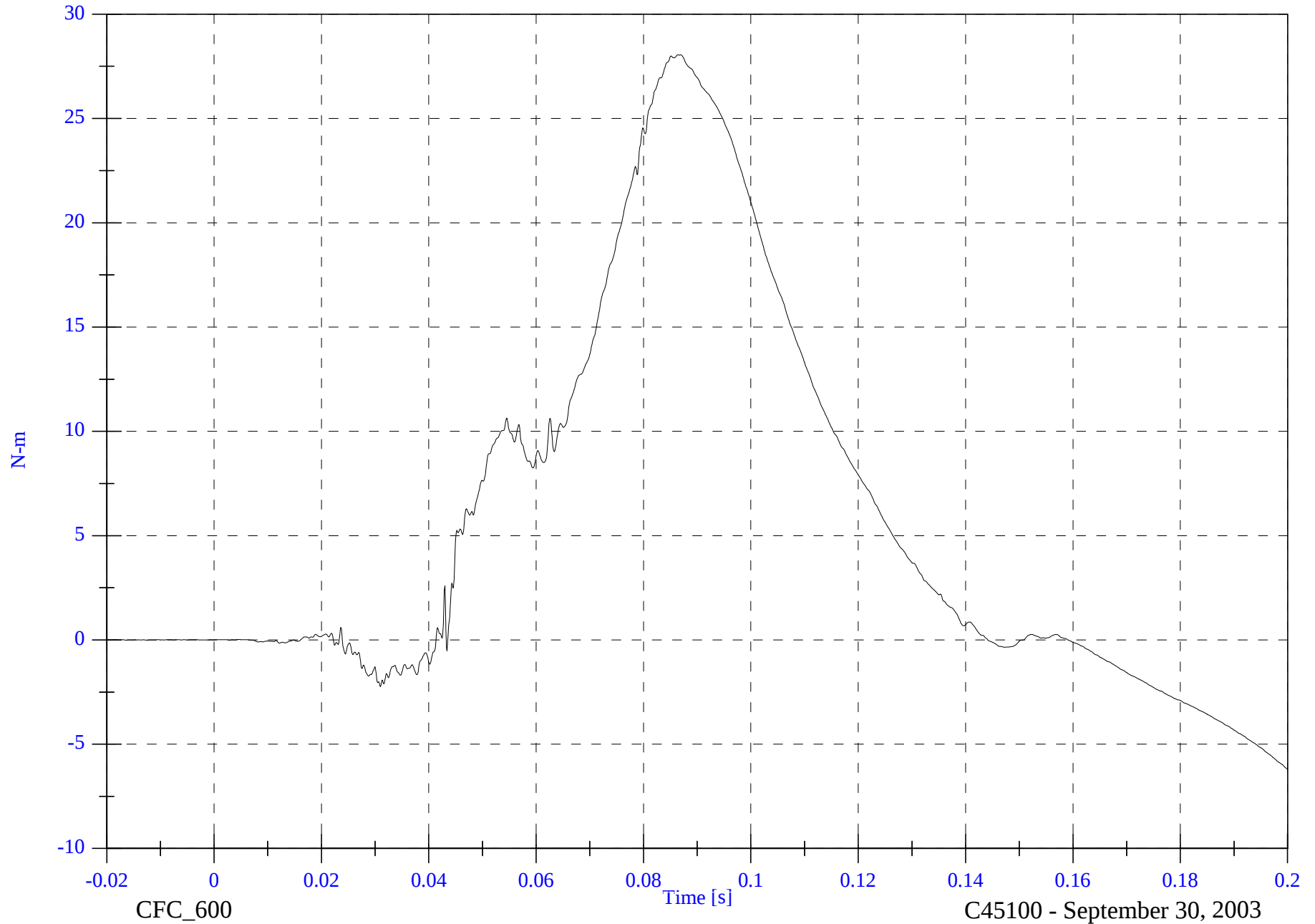
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck Mz

Max: 28.1 [N-m] at 0.086 [s]

Min: -6.2 [N-m] at 0.200 [s]



B-19

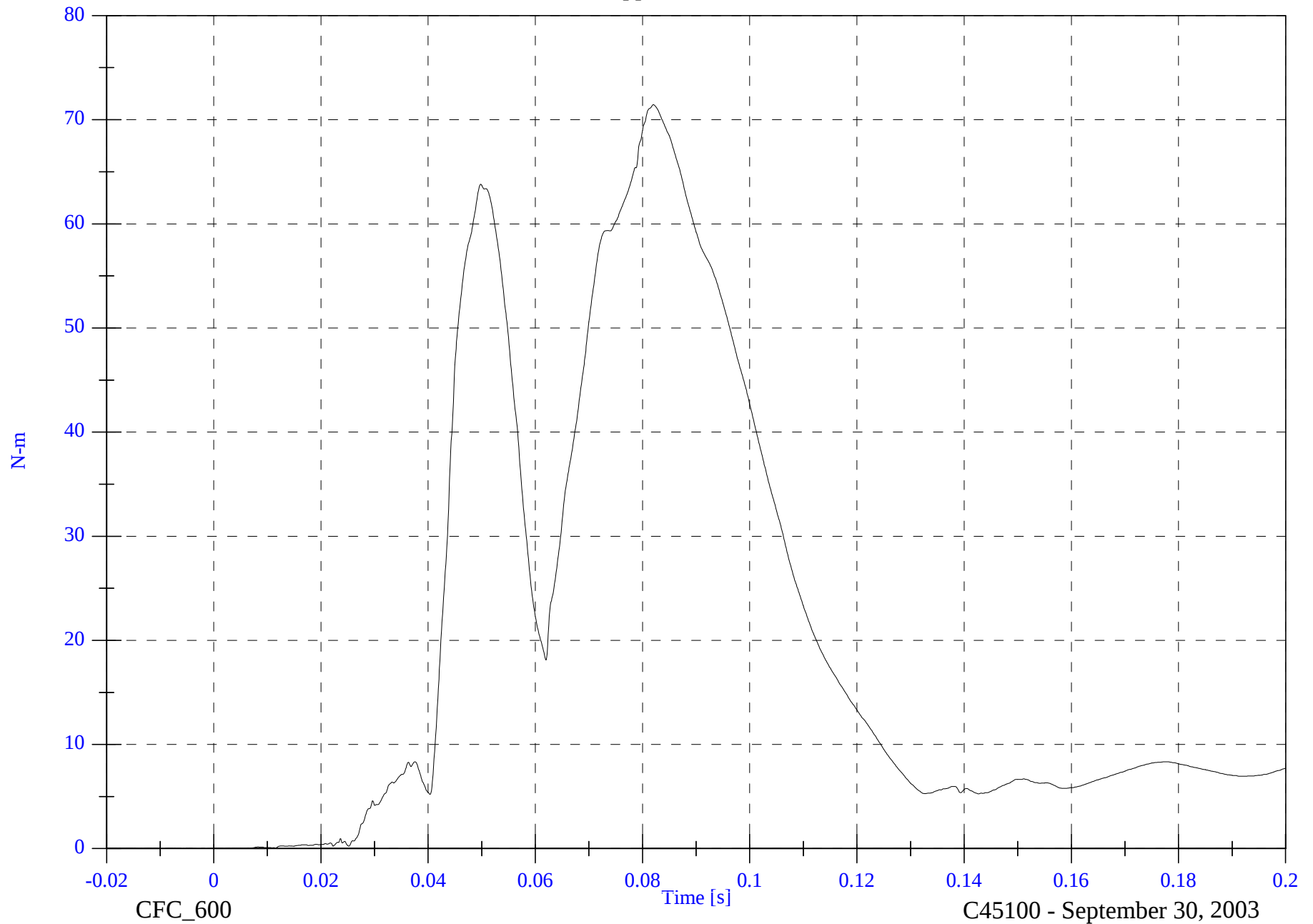
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Neck M Resultant

Max: 71.4 [N-m] at 0.082 [s]

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



B-20

8675-F214-12

CFC_600

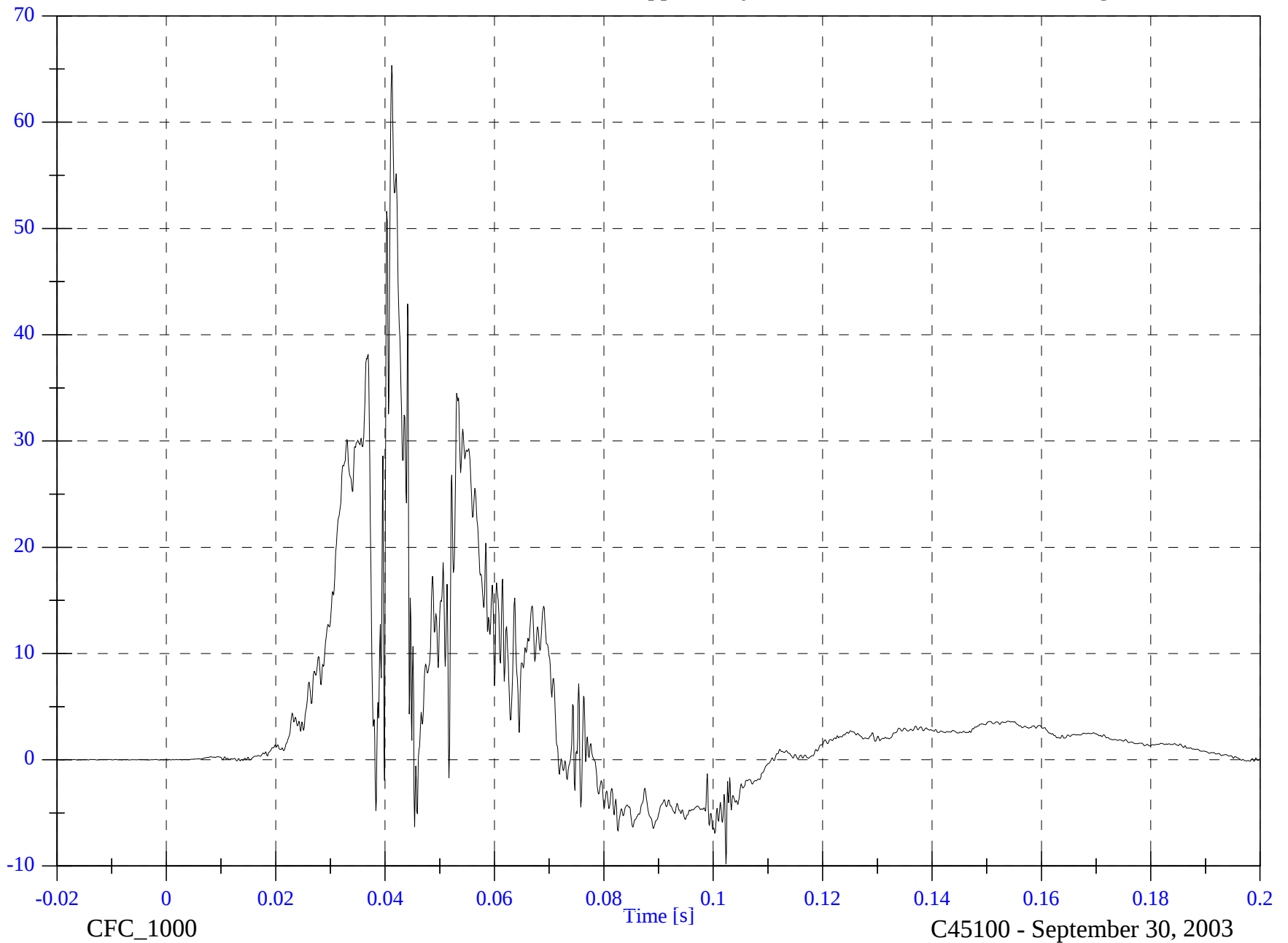
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Rib y

Max: 65.3 [g] at 0.041 [s]

Min: -9.8 [g] at 0.102 [s]



B-21

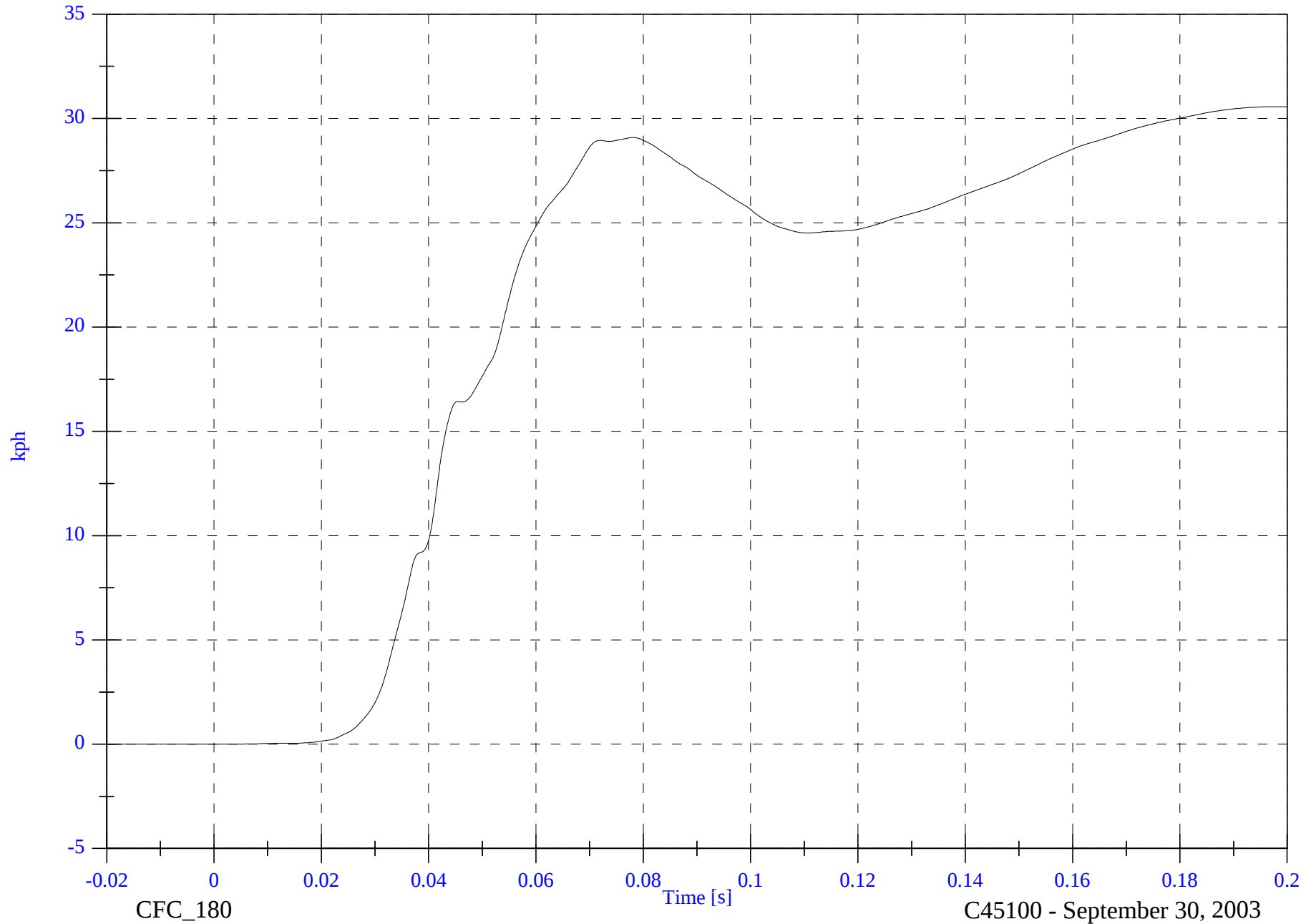
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Rib y Velocity

Max: 30.6 [kph] at 0.197 [s]

Min: -0.0 [kph] at -0.020 [s]



B-22

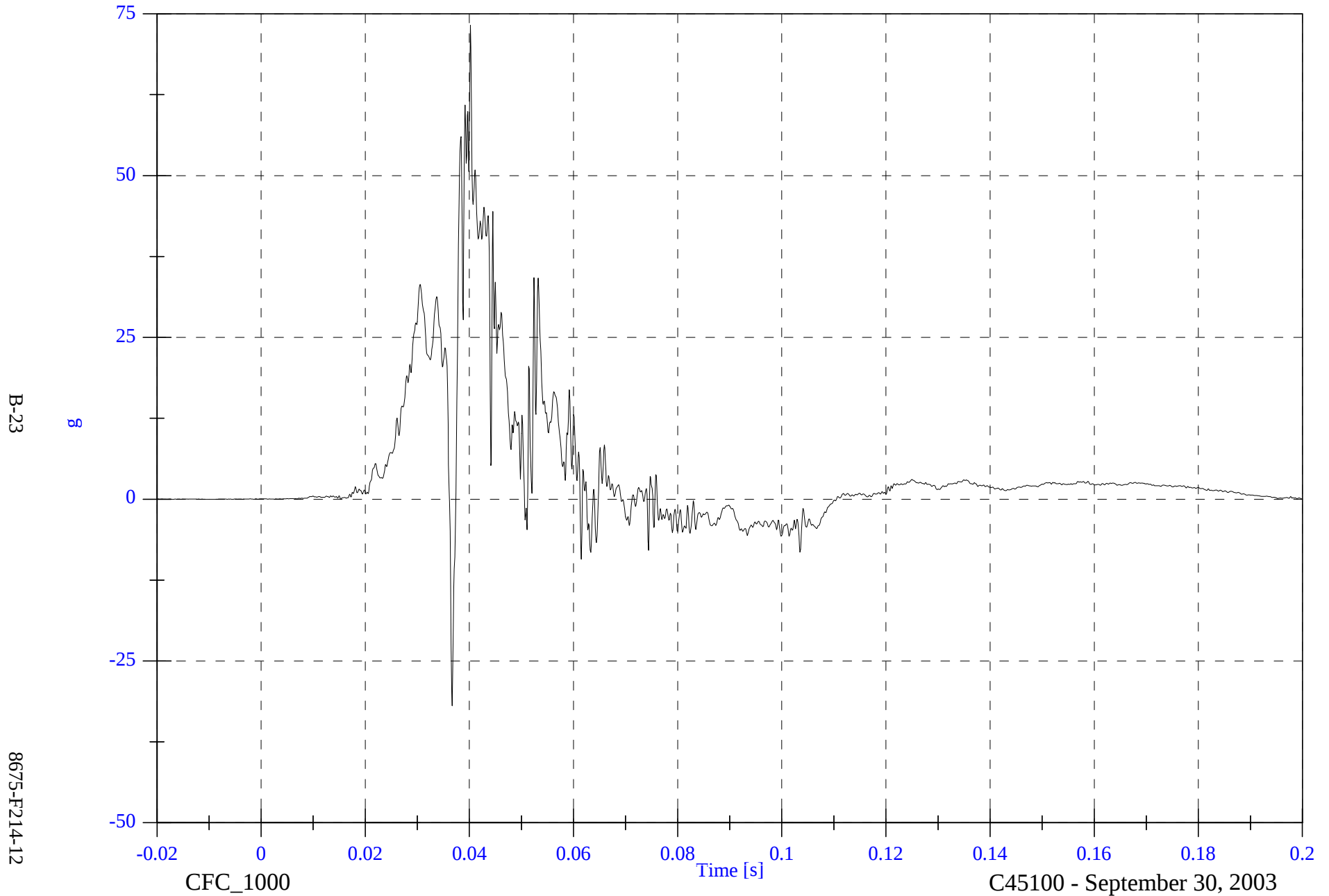
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Rib y

Max: 73.2 [g] at 0.040 [s]

Min: -31.9 [g] at 0.037 [s]

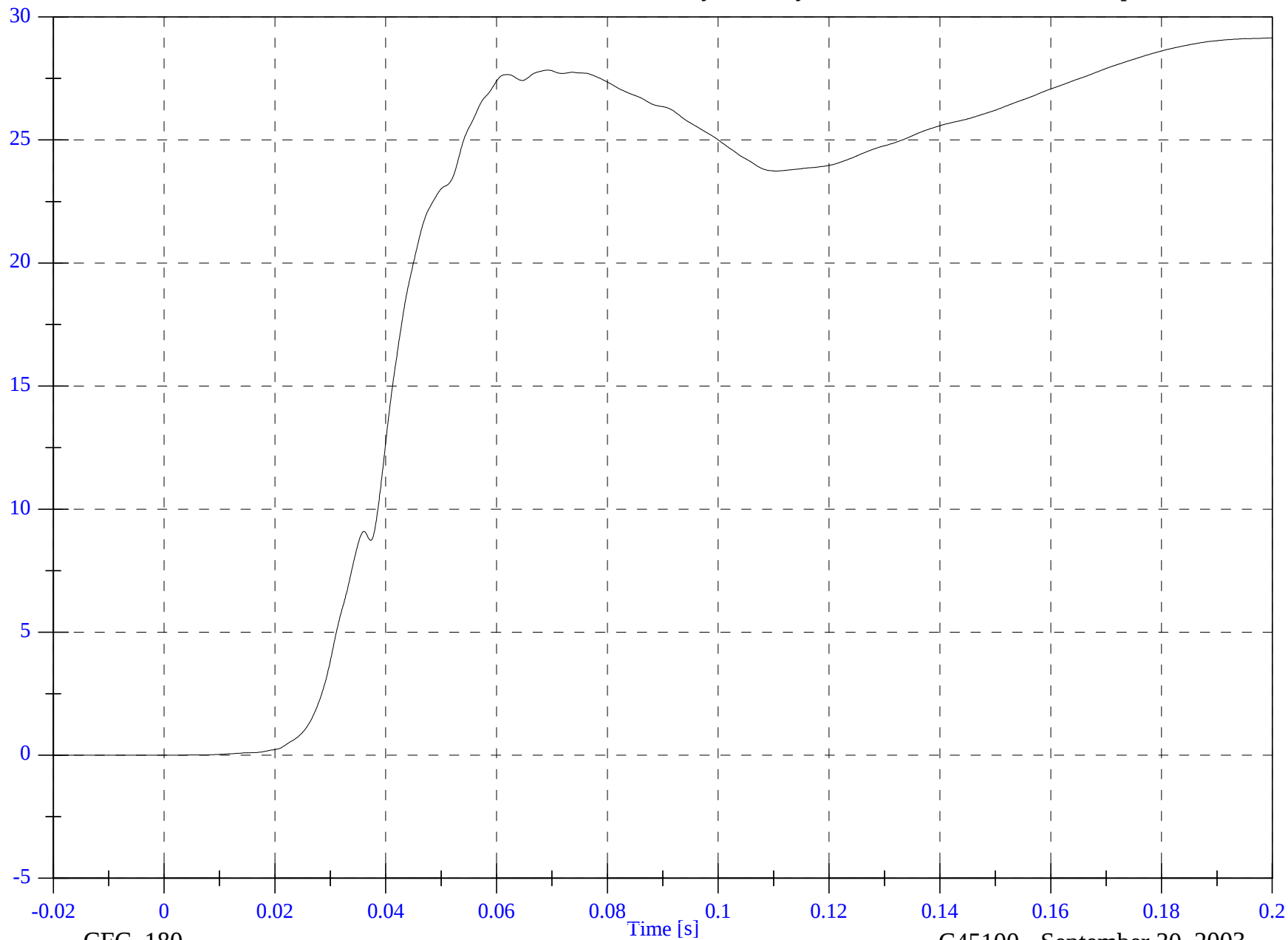


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Rib y Velocity

Max: 29.1 [kph] at 0.200 [s]

Min: -0.0 [kph] at -0.016 [s]



B-24

8675-F214-12

CFC_180

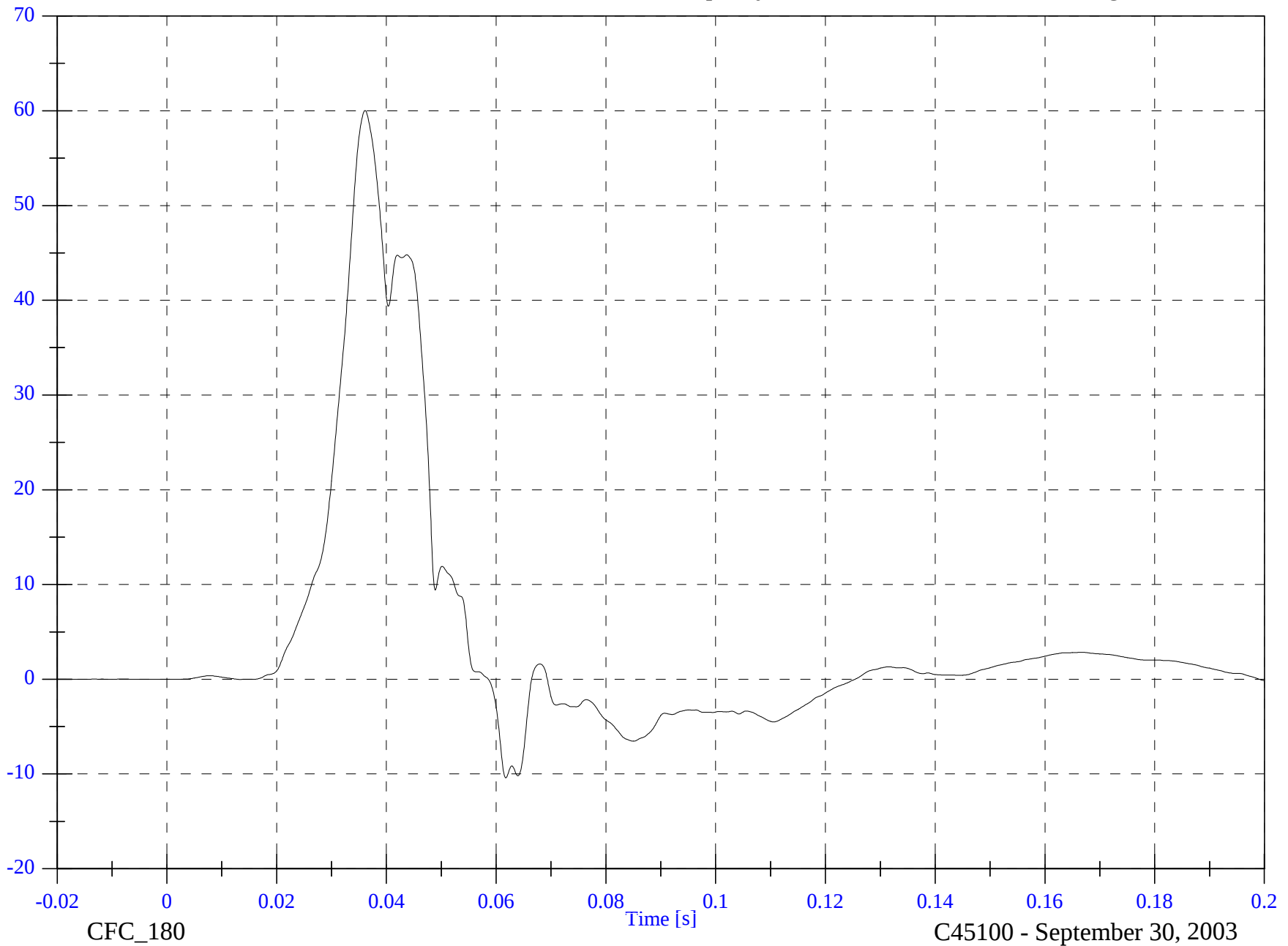
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Spine y

Max: 60.0 [g] at 0.036 [s]

Min: -10.4 [g] at 0.062 [s]



B-25

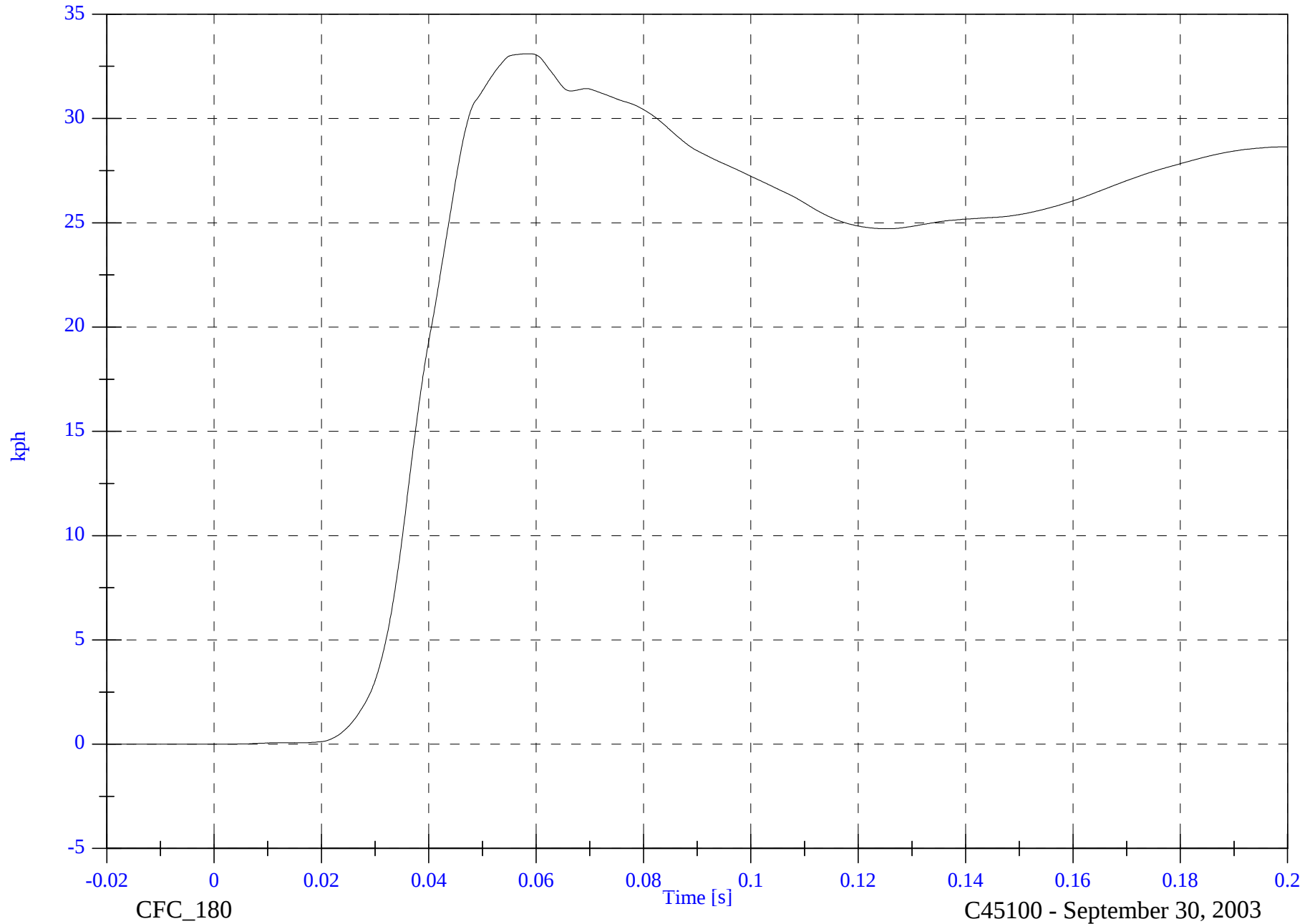
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Spine y Velocity

Max: 33.1 [kph] at 0.059 [s]

Min: -0.0 [kph] at -0.015 [s]

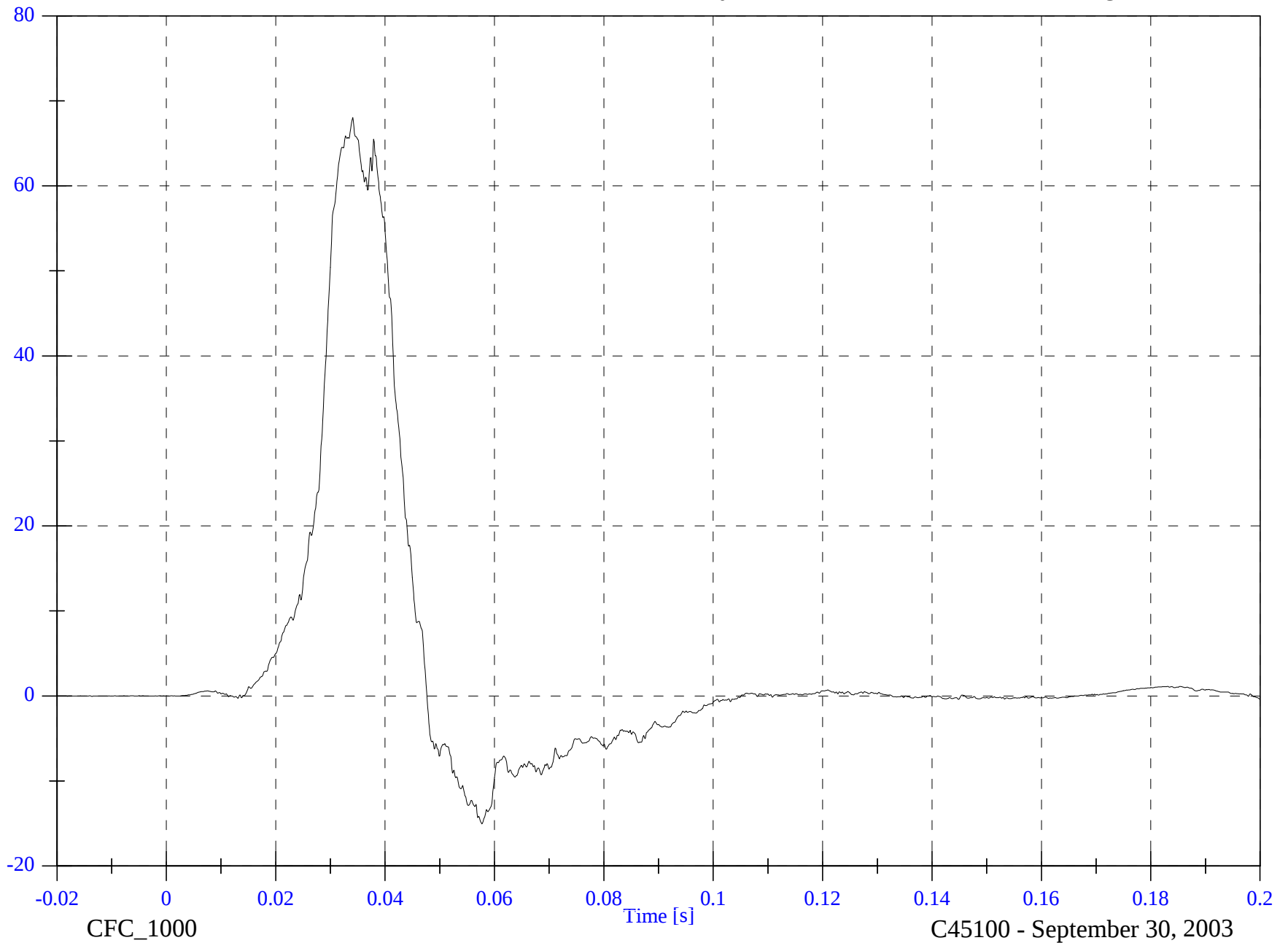


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Pelvic y

Max: 68.1 [g] at 0.034 [s]

Min: -15.0 [g] at 0.058 [s]



B-27

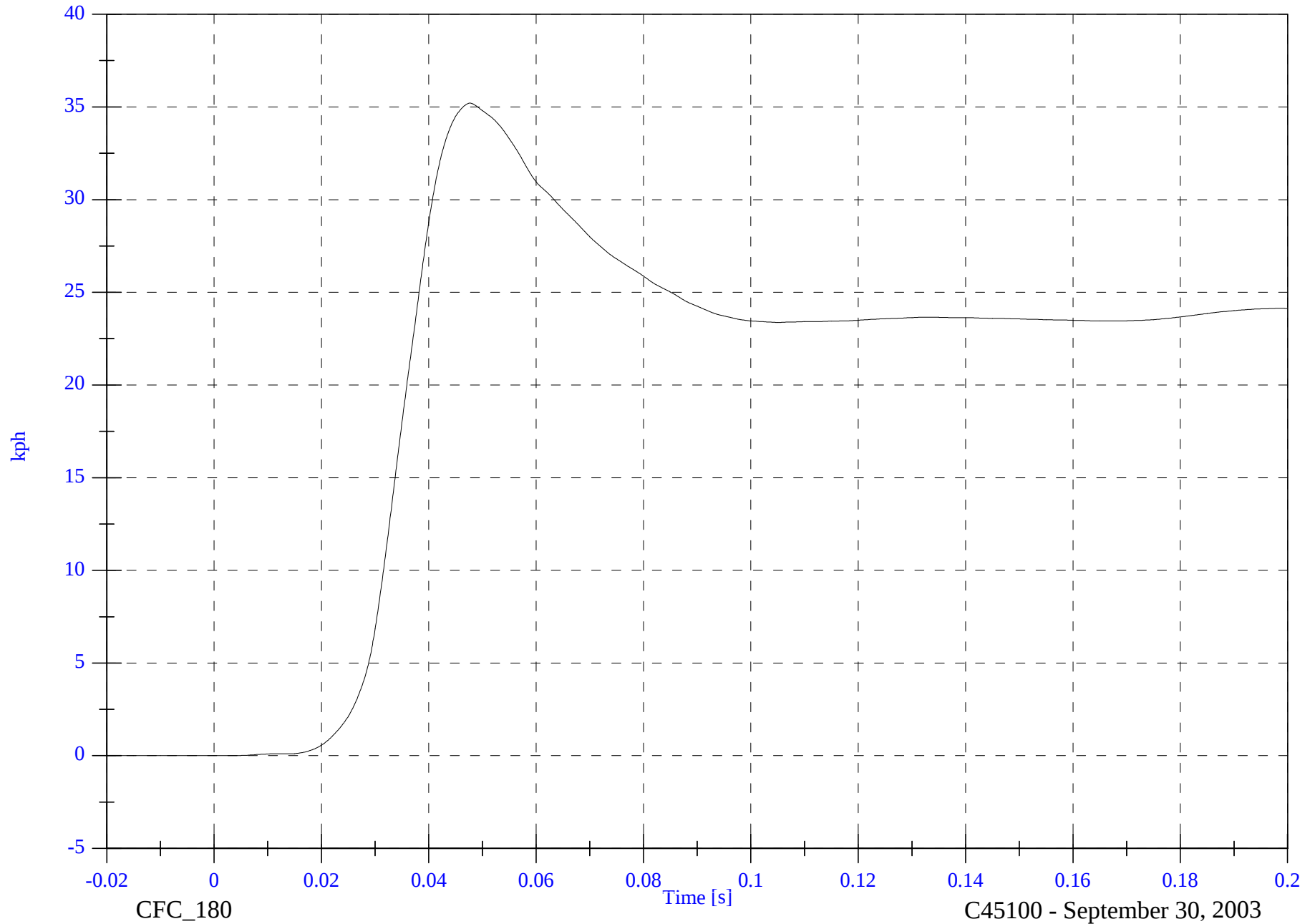
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Pelvic y Velocity

Max: 35.2 [kph] at 0.048 [s]

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



B-28

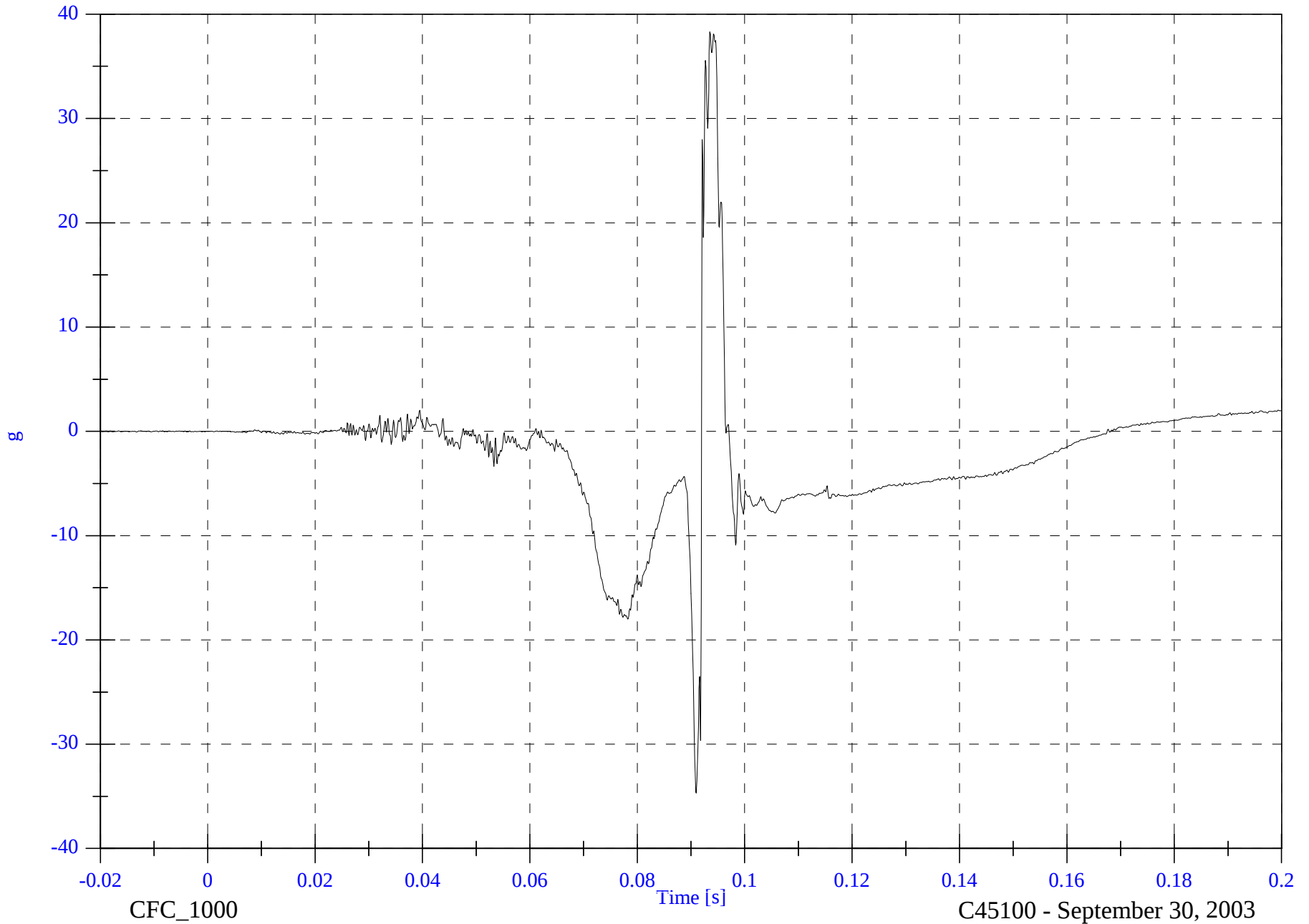
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Head x

Max: 38.3 [g] at 0.093 [s]

Min: -34.7 [g] at 0.091 [s]

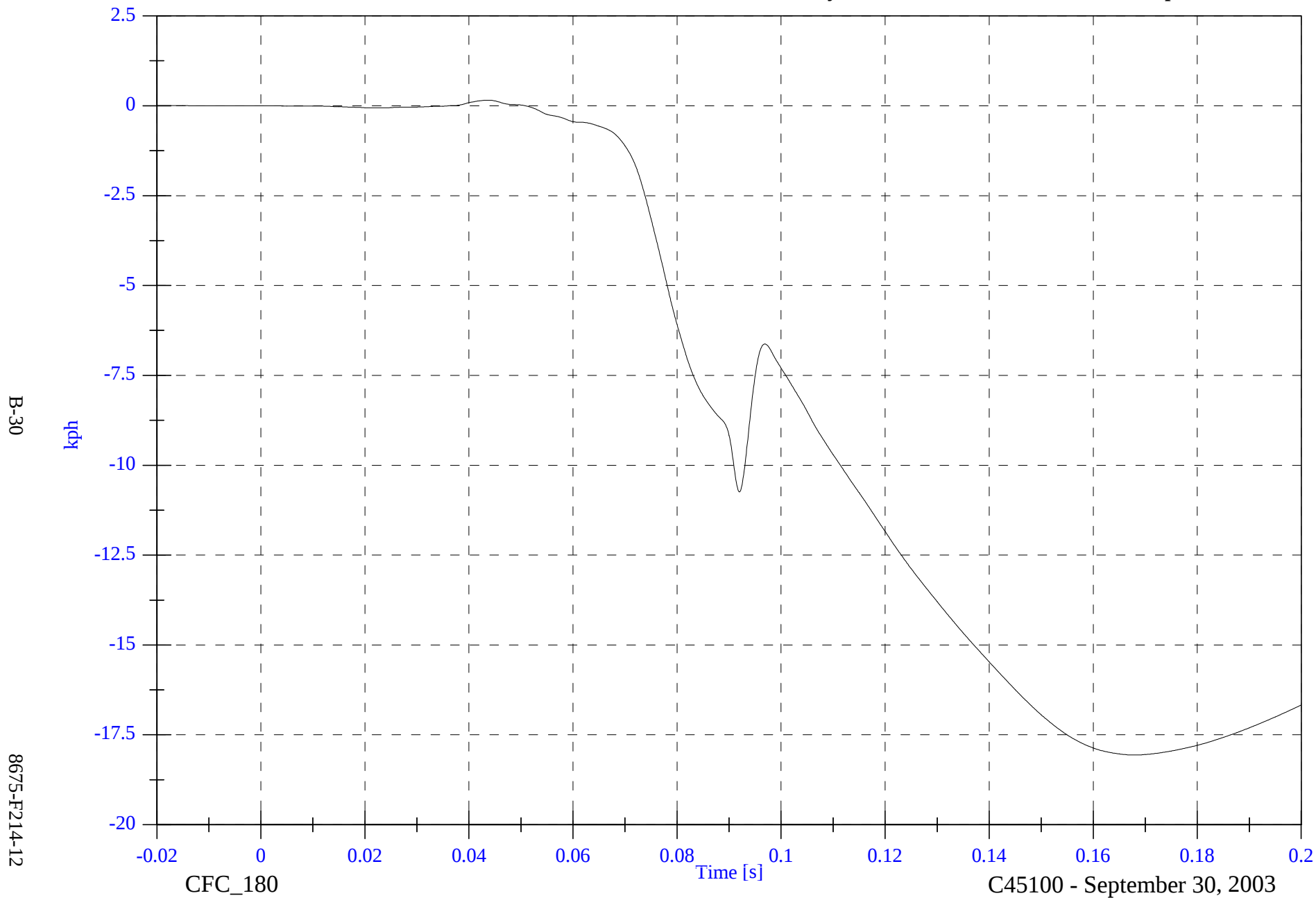


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Head x Velocity

Max: 0.2 [kph] at 0.044 [s]

Min: -18.1 [kph] at 0.168 [s]

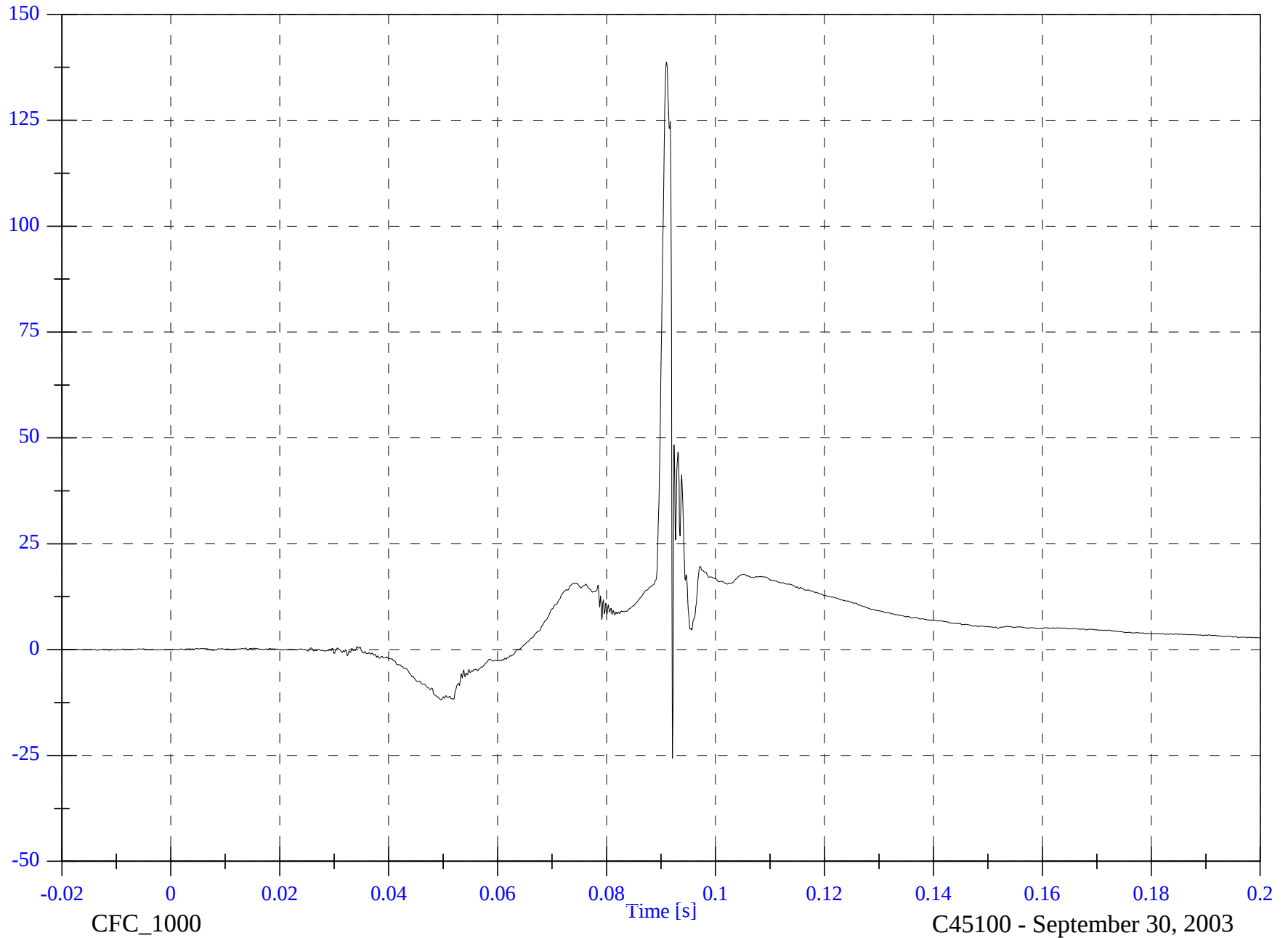


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Head y

Max: 138.7 [g] at 0.091 [s]

Min: -25.7 [g] at 0.092 [s]



B-31

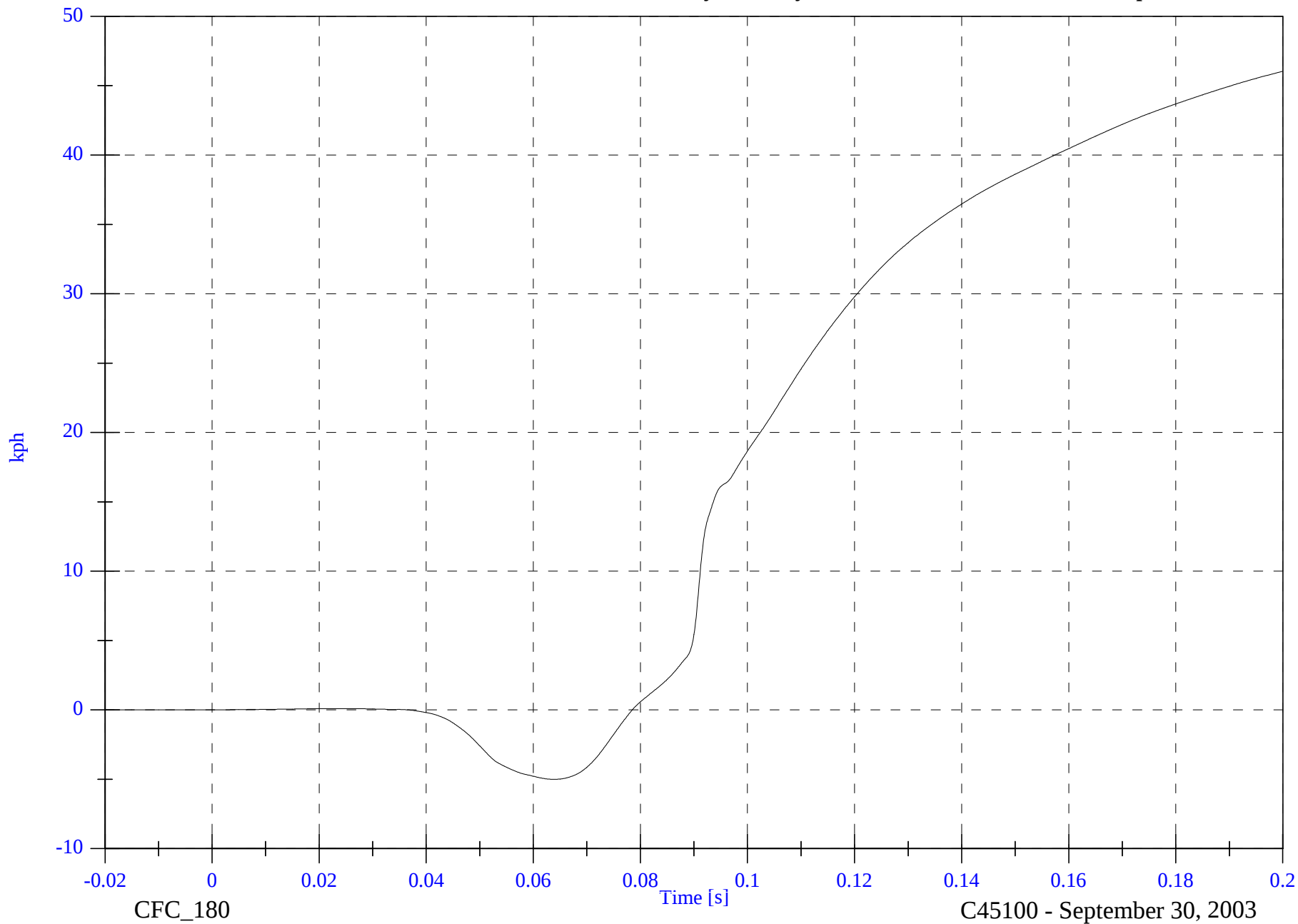
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Head y Velocity

Max: 46.0 [kph] at 0.200 [s]

Min: -5.0 [kph] at 0.064 [s]



B-32

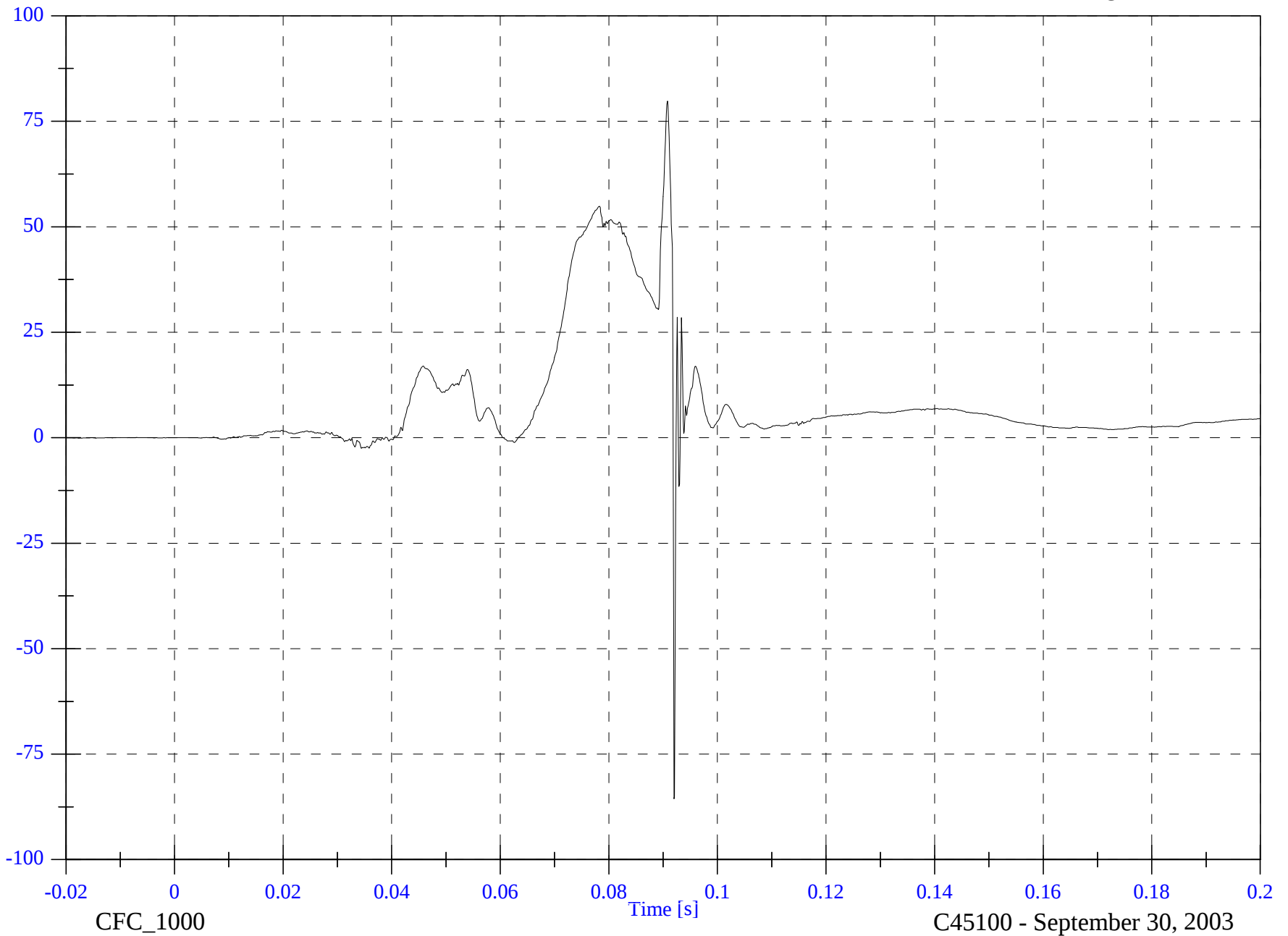
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Head z

Max: 79.8 [g] at 0.091 [s]

Min: -85.6 [g] at 0.092 [s]



B-33

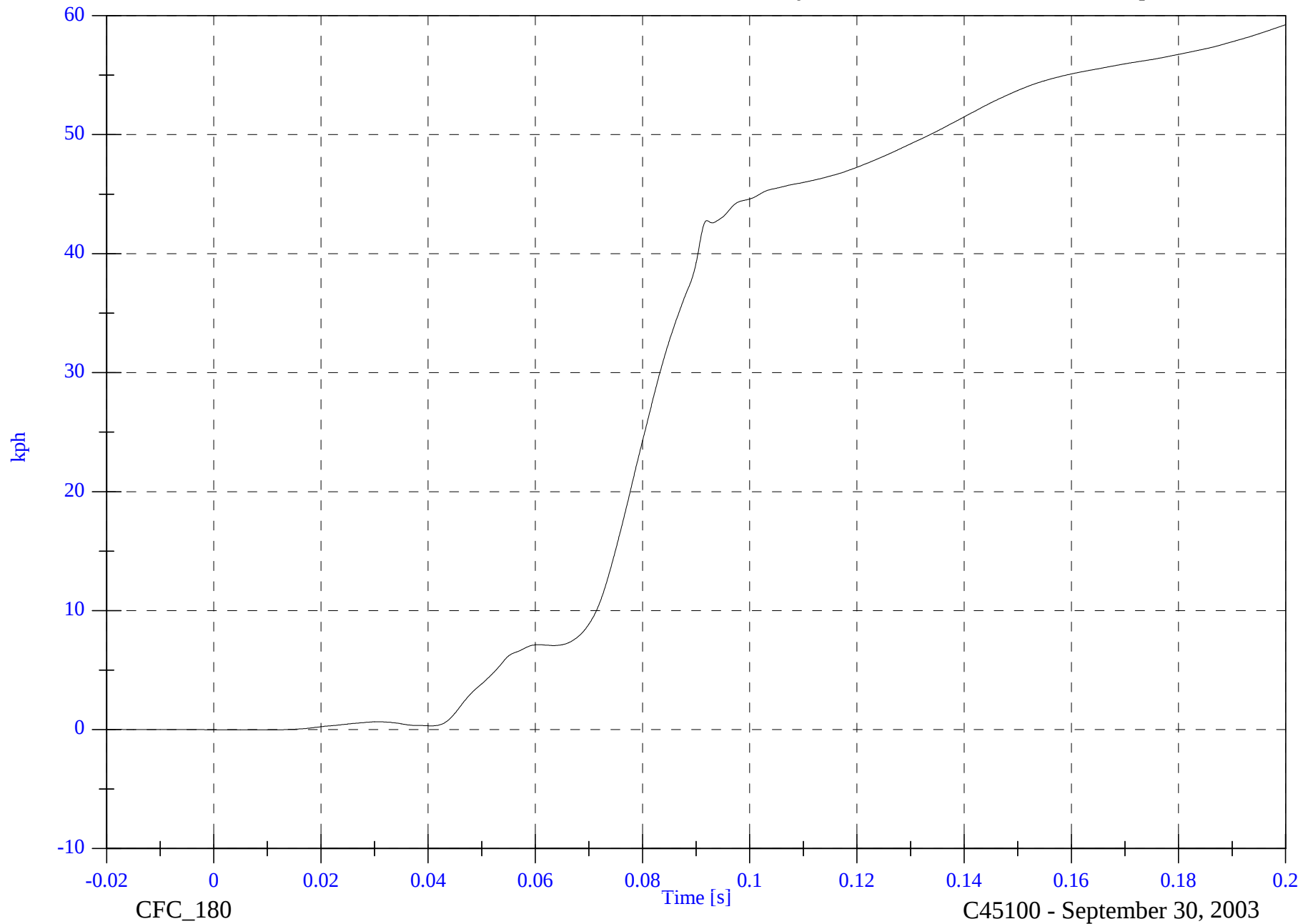
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Head z Velocity

Max: 59.2 [kph] at 0.200 [s]

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



B-34

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

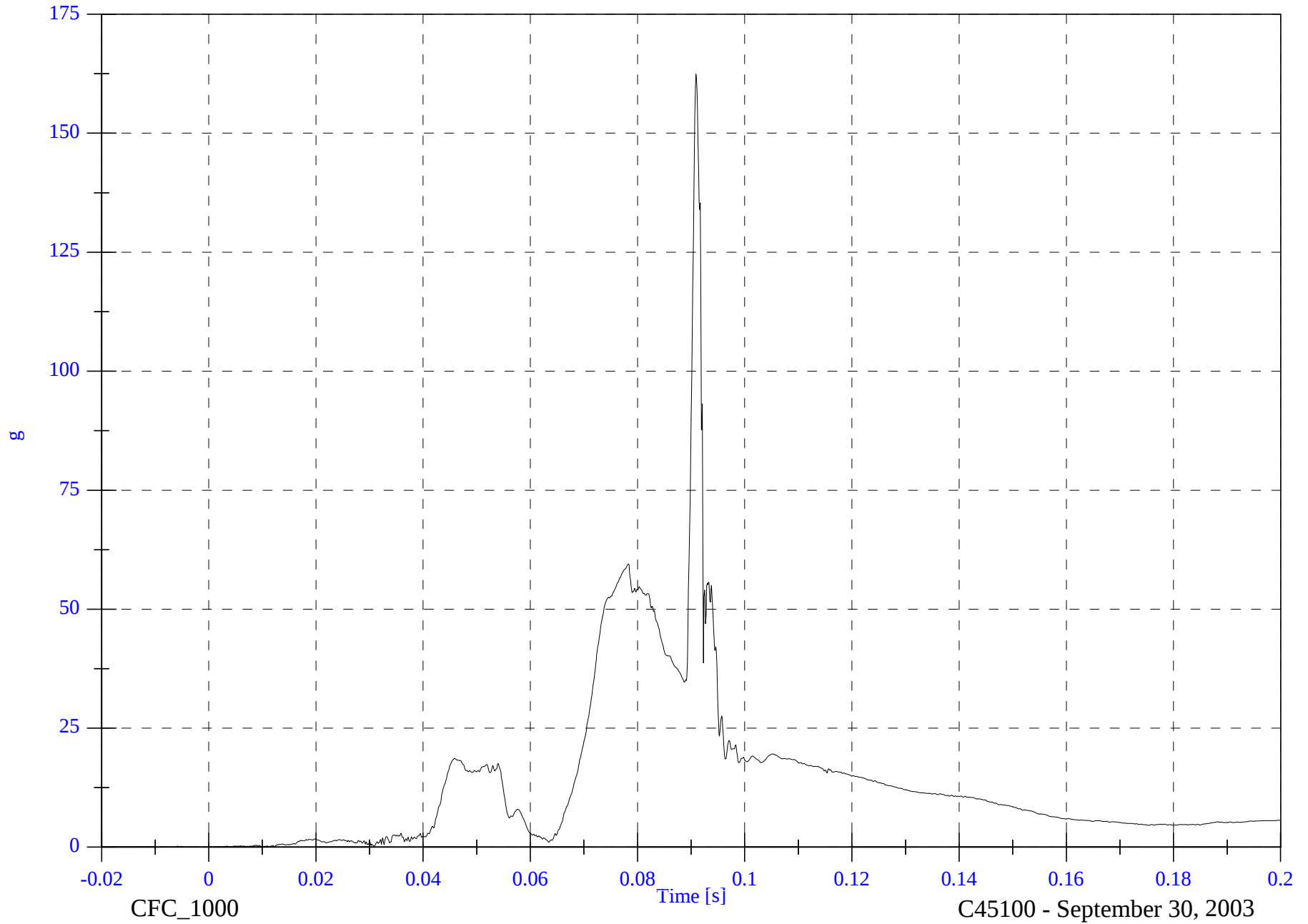
V2P4 Head Resultant

Max: 162.4 [g] at 0.091 [s]

Min: 0.0 [g] at 0.002 [s]

B-35

8675-F214-12

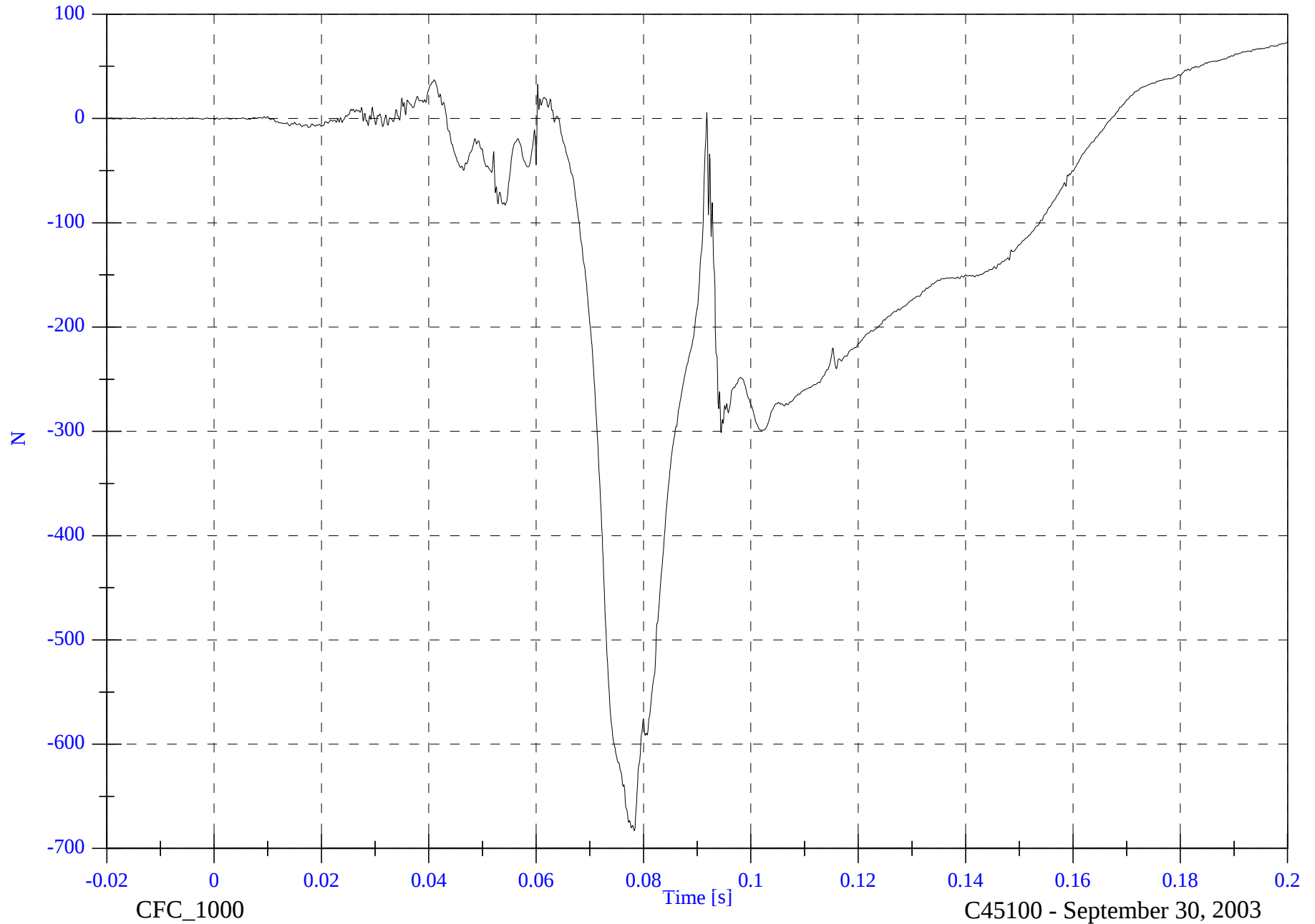


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Neck Fx

Max: 73.2 [N] at 0.200 [s]

Min: -683.0 [N] at 0.078 [s]



B-36

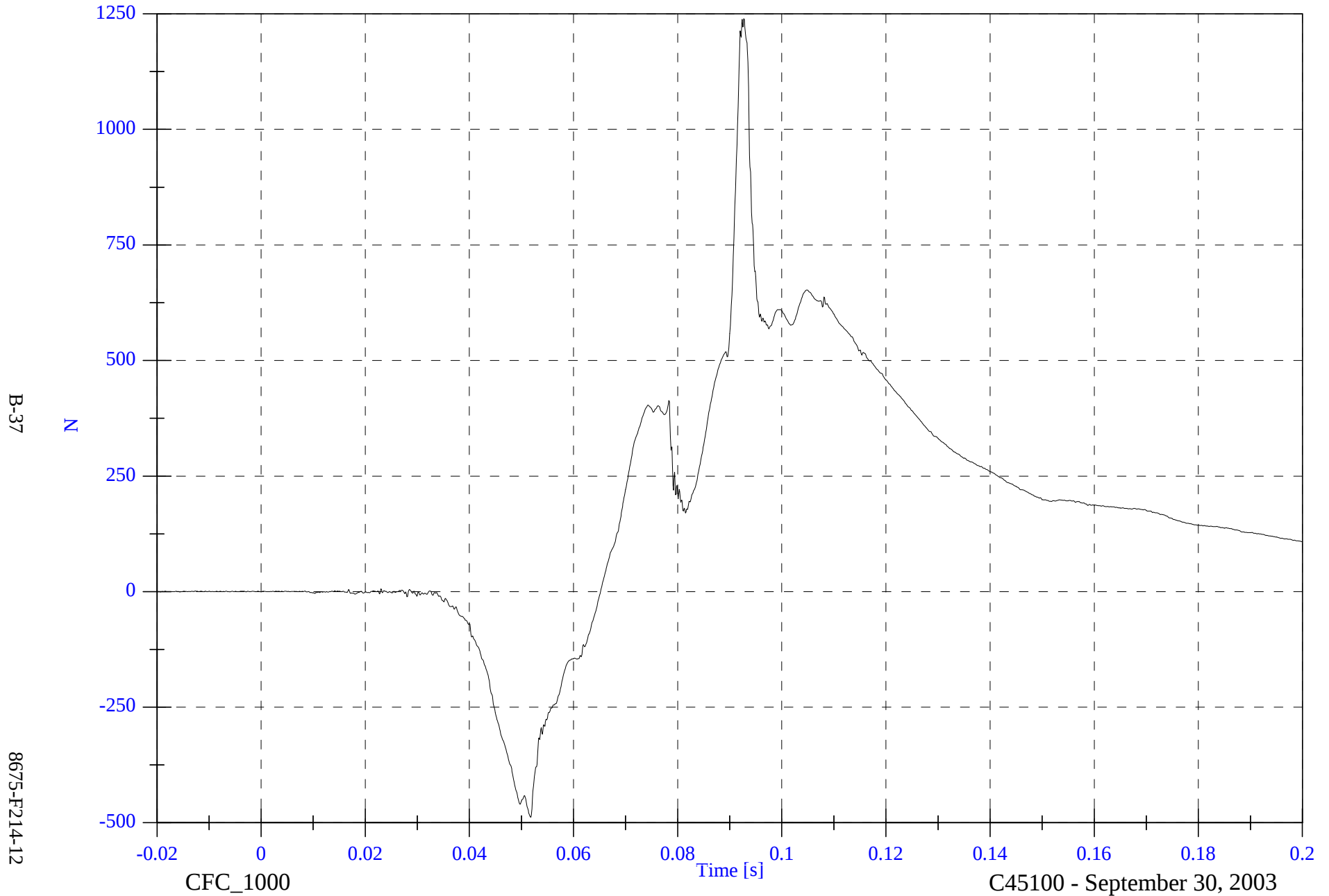
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 1239.6 [N] at 0.093 [s]

V2P4 Upper Neck Fy

Min: -488.2 [N] at 0.052 [s]

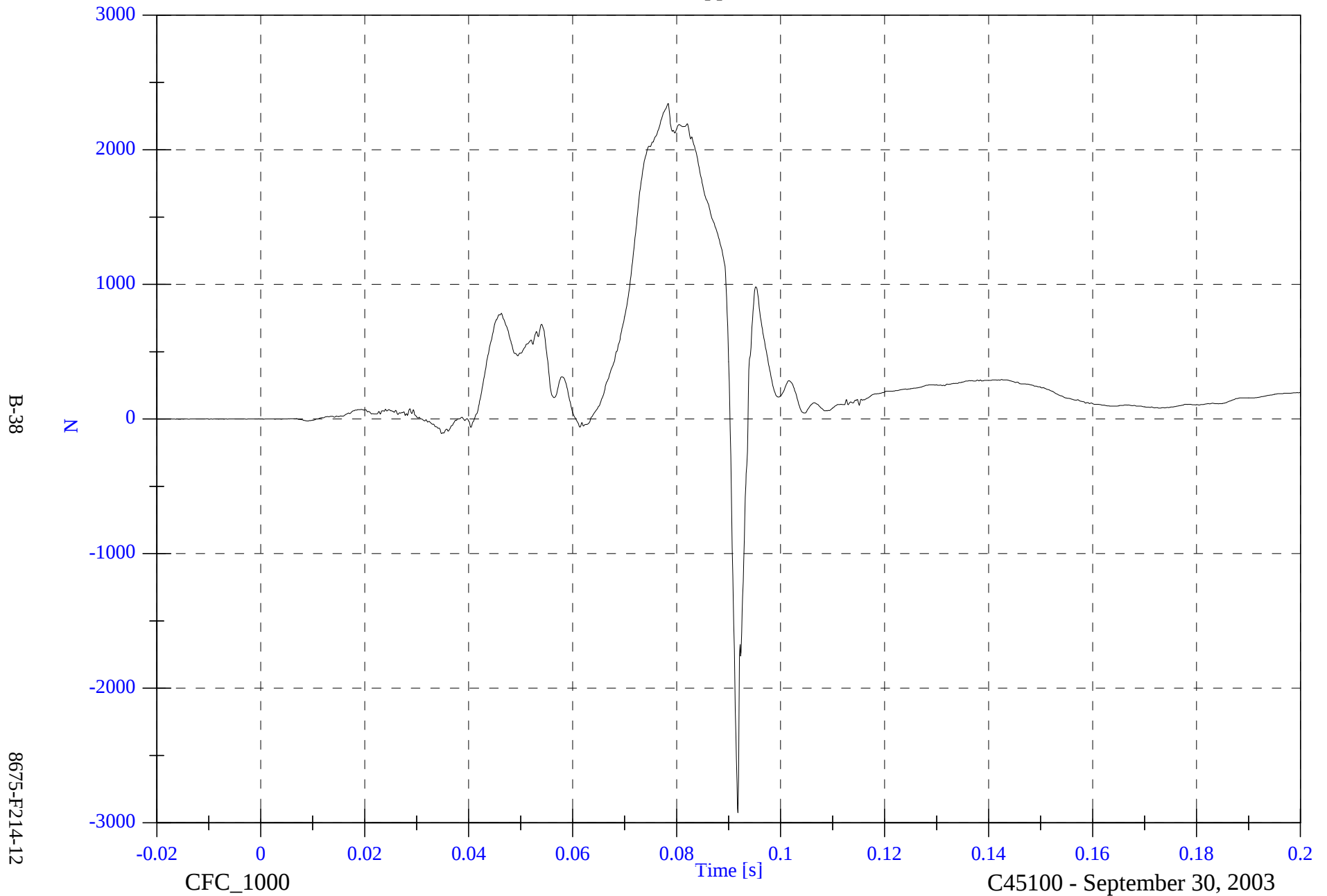


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Neck Fz

Max: 2343.4 [N] at 0.078 [s]

Min: -2925.8 [N] at 0.092 [s]



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

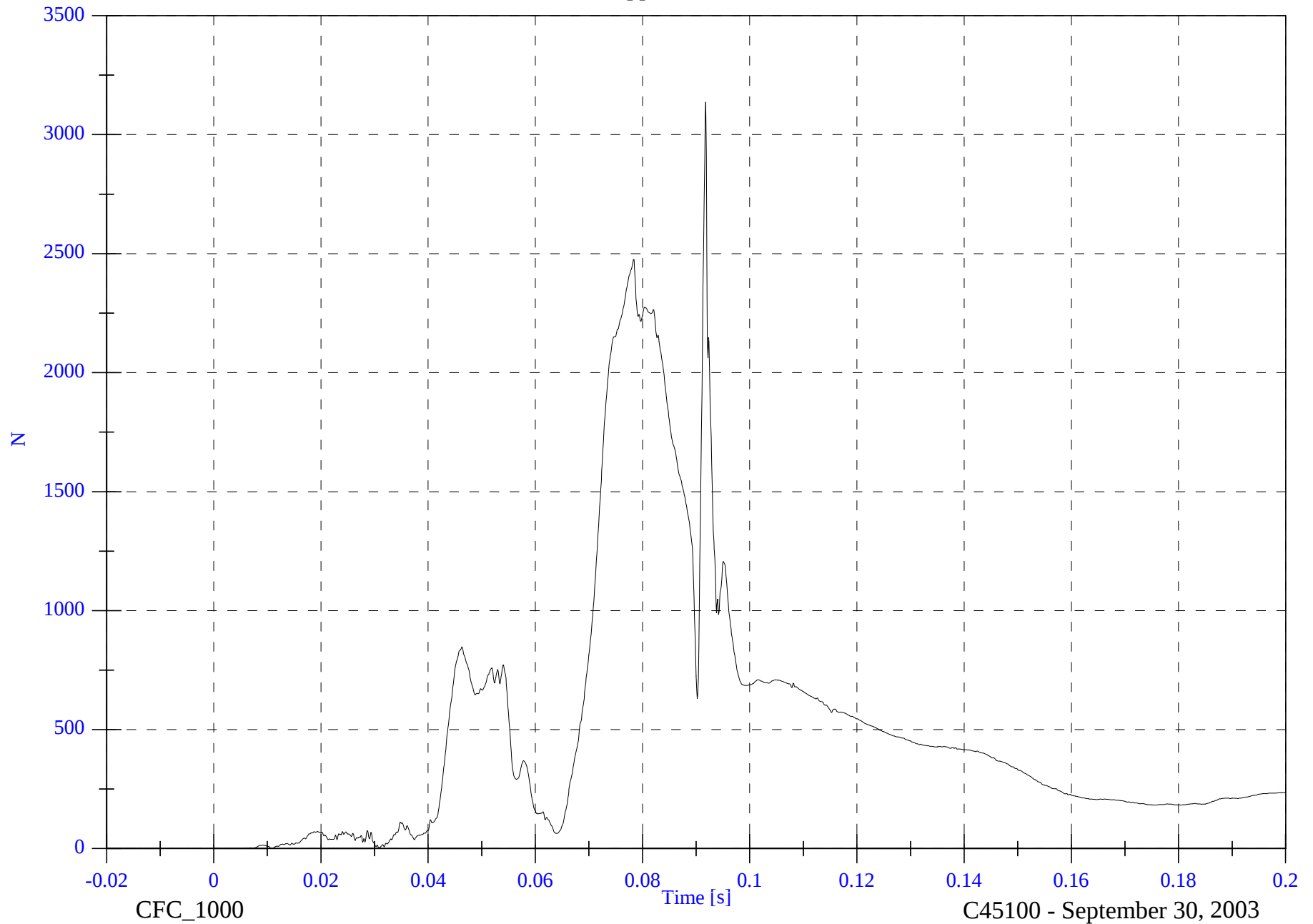
V2P4 Upper Neck F Resultant

Max: 3136.1 [N] at 0.092 [s]

Min: 0.1 [N] at 0.004 [s]

B-39

8675-F214-12

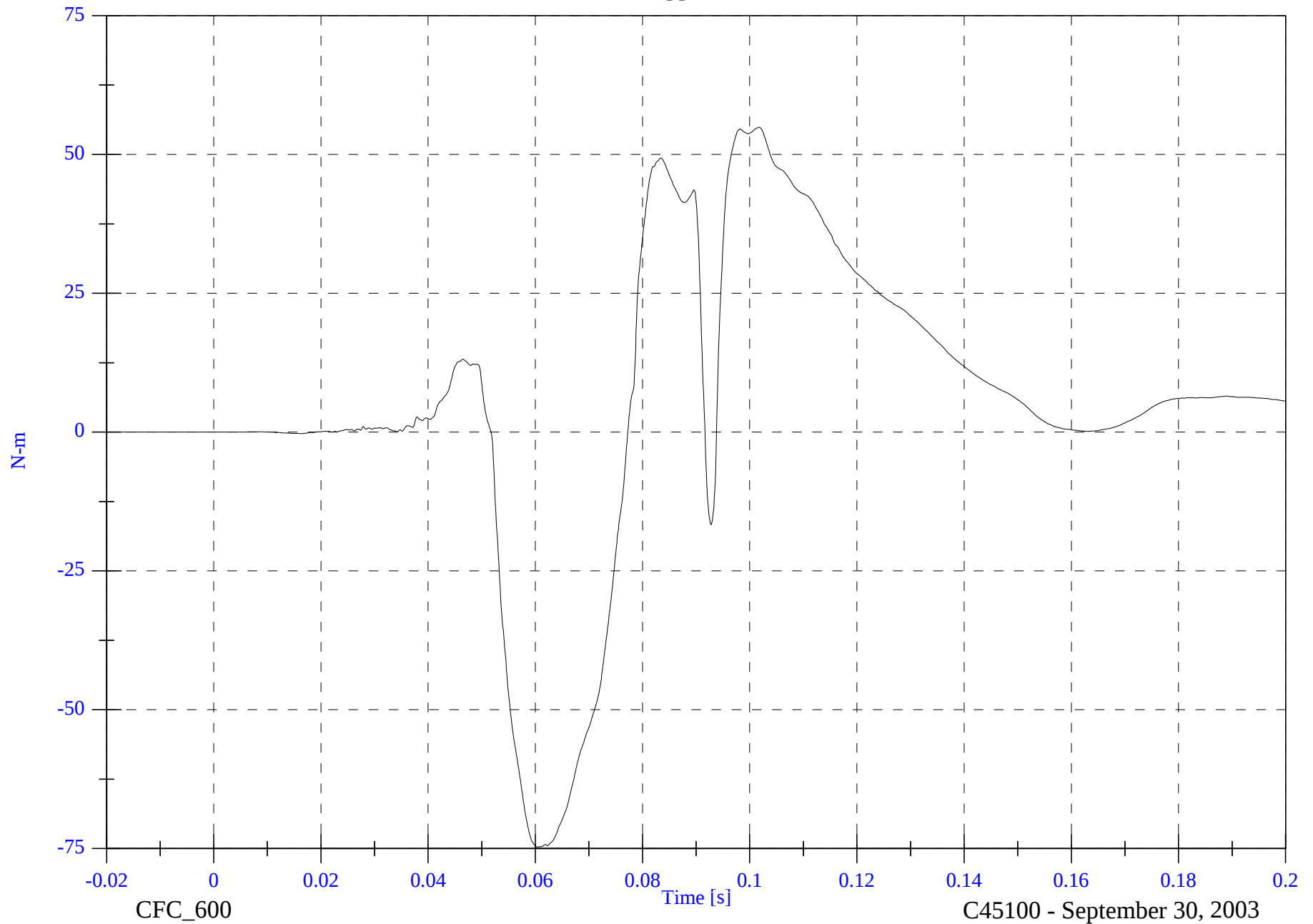


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Neck Mx

Max: 54.9 [N-m] at 0.102 [s]

Min: -74.7 [N-m] at 0.060 [s]

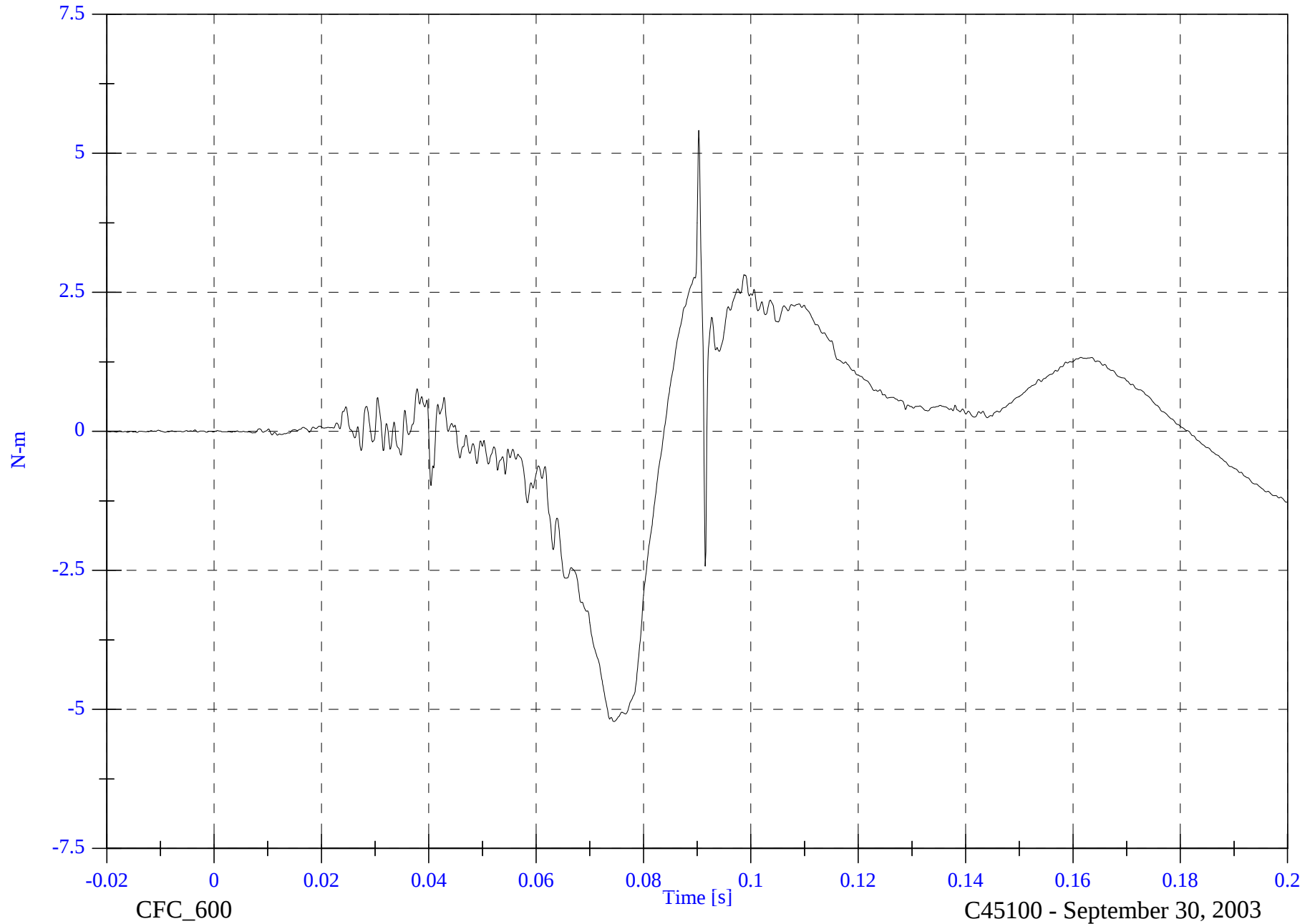


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Neck My

Max: 5.4 [N-m] at 0.090 [s]

Min: -5.2 [N-m] at 0.074 [s]



B-41

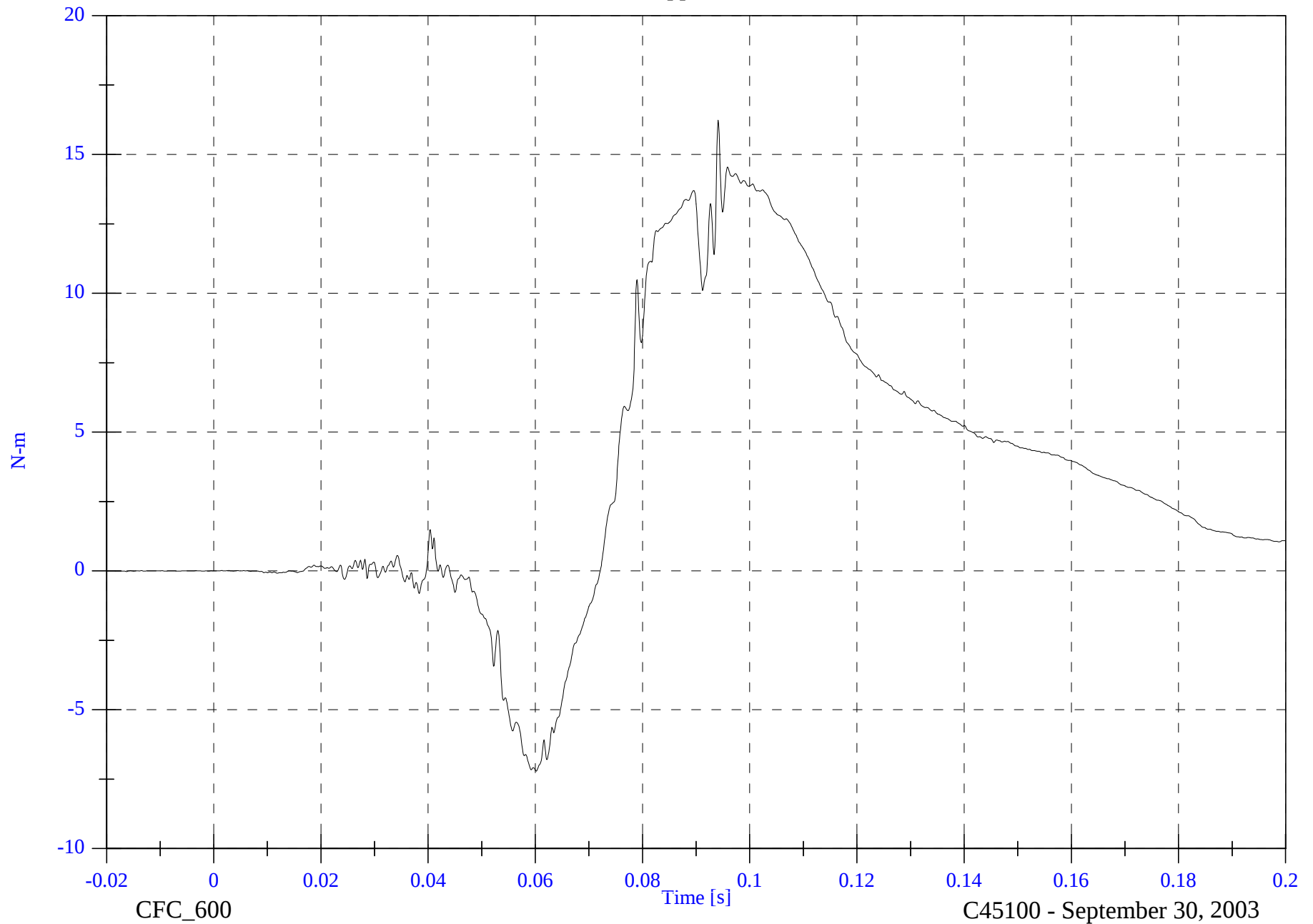
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Neck Mz

Max: 16.2 [N-m] at 0.094 [s]

Min: -7.2 [N-m] at 0.060 [s]



B-42

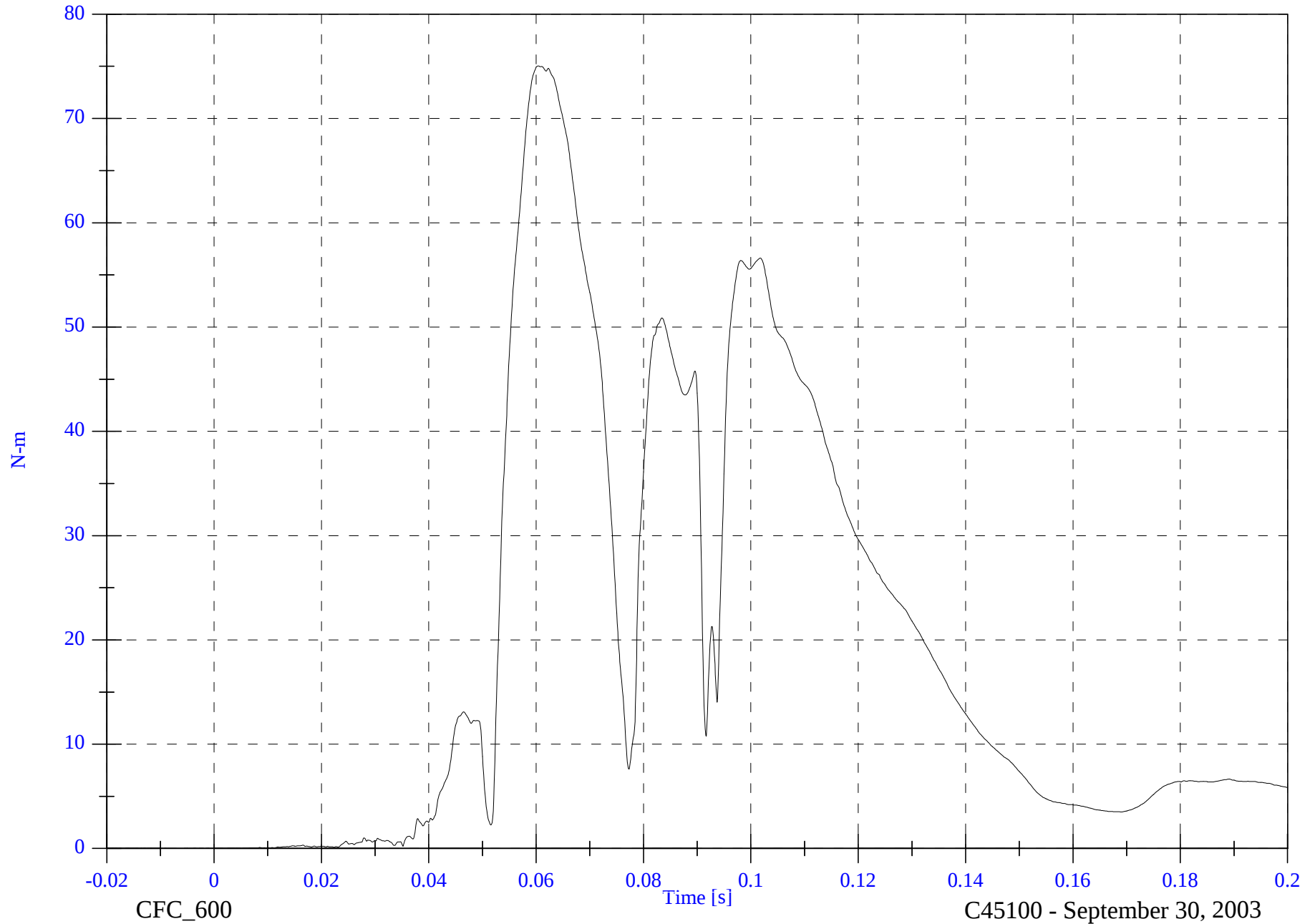
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Neck M Resultant

Max: 75.0 [N-m] at 0.060 [s]

Min: 0.0 [N-m] at -0.012 [s]



B-43

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

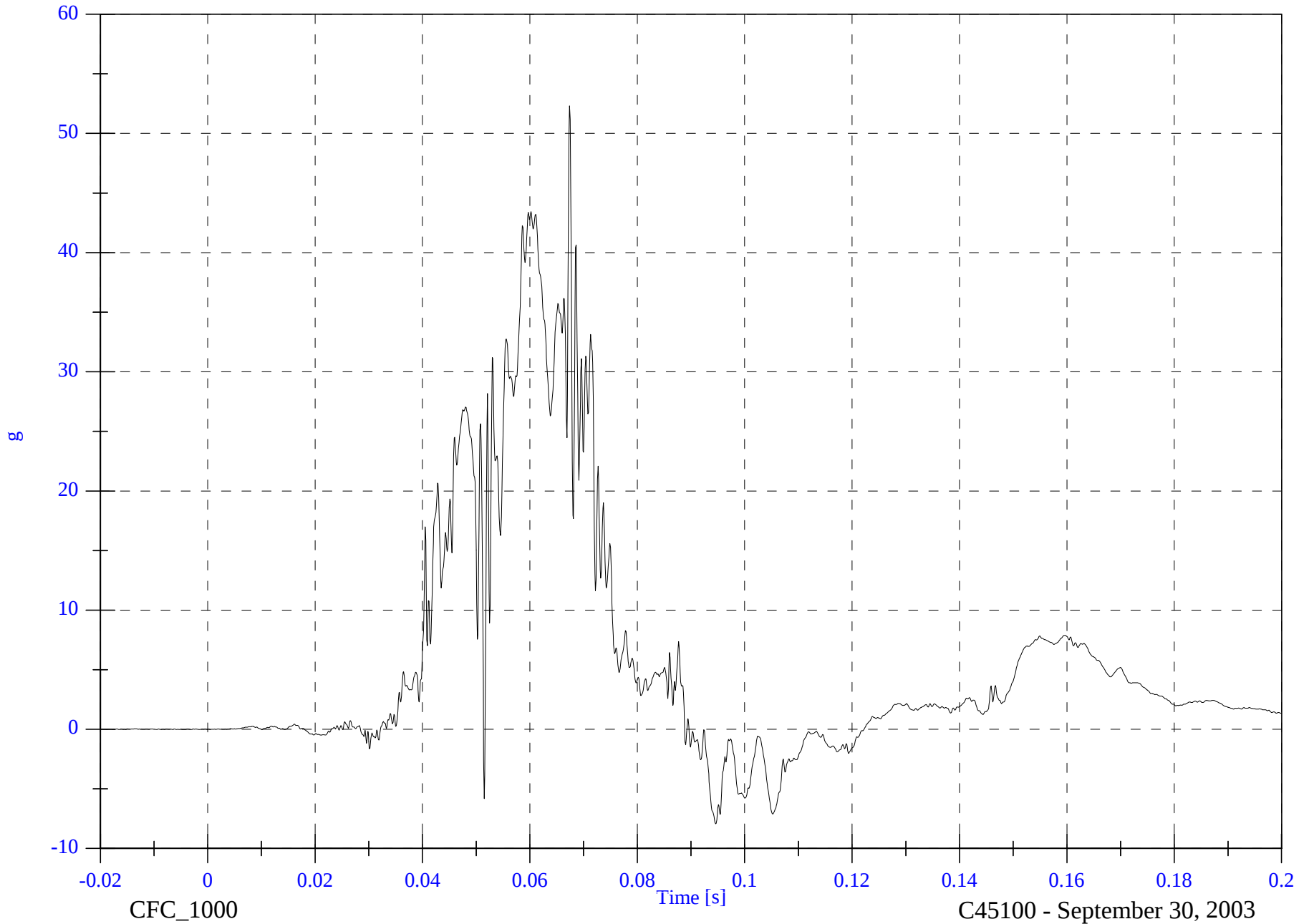
V2P4 Upper Rib y

Max: 52.3 [g] at 0.067 [s]

Min: -7.9 [g] at 0.095 [s]

B-44

8675-F214-12

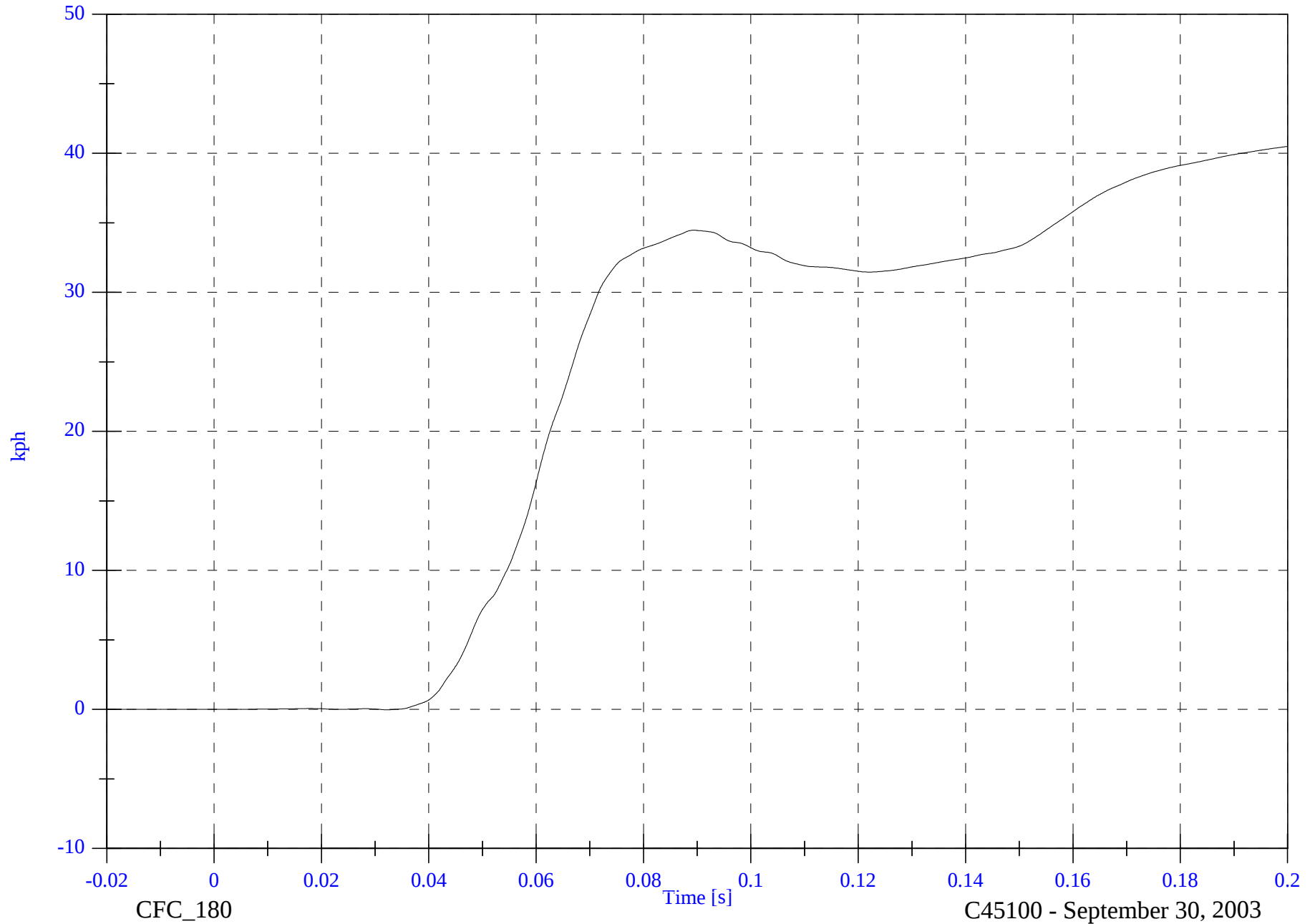


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Rib y Velocity

Max: 40.5 [kph] at 0.200 [s]

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



B-45

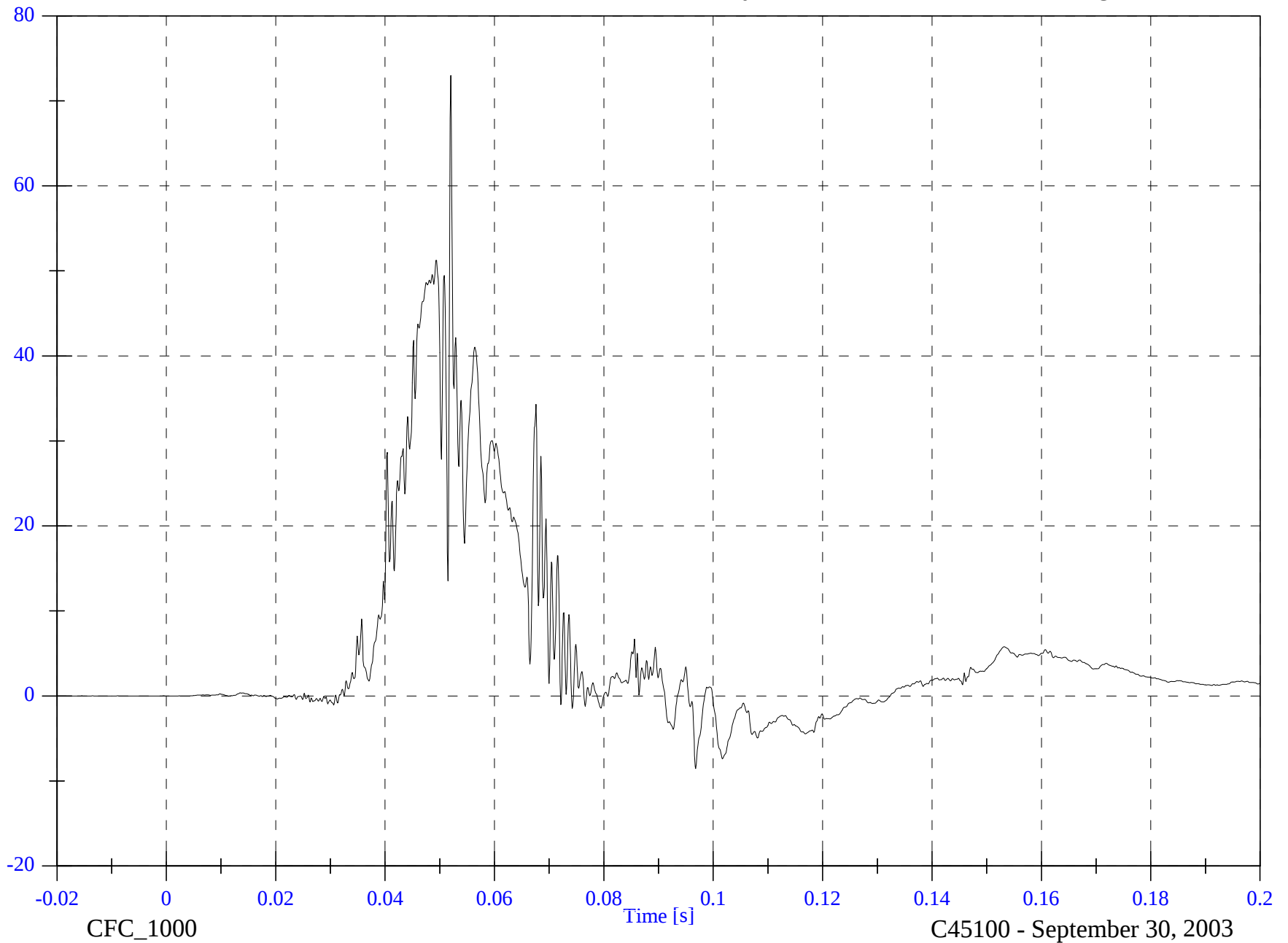
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Rib y

Max: 73.0 [g] at 0.052 [s]

Min: -8.5 [g] at 0.097 [s]

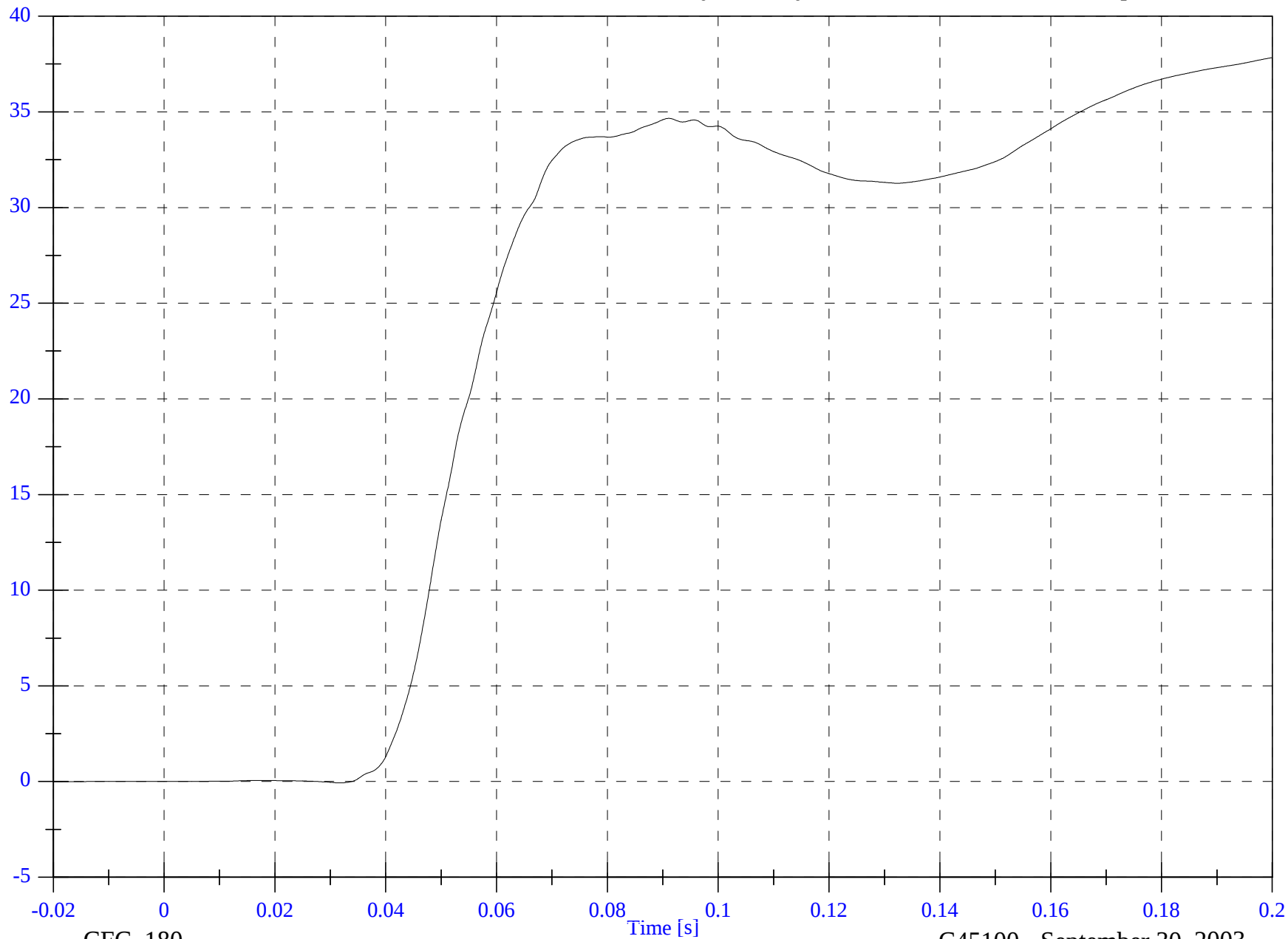


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Rib y Velocity

Max: 37.8 [kph] at 0.200 [s]

Min: -0.1 [kph] at 0.032 [s]



B-47

8675-F214-12

CFC_180

C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Spine y

Max: 60.4 [g] at 0.046 [s]

Min: -13.0 [g] at 0.092 [s]

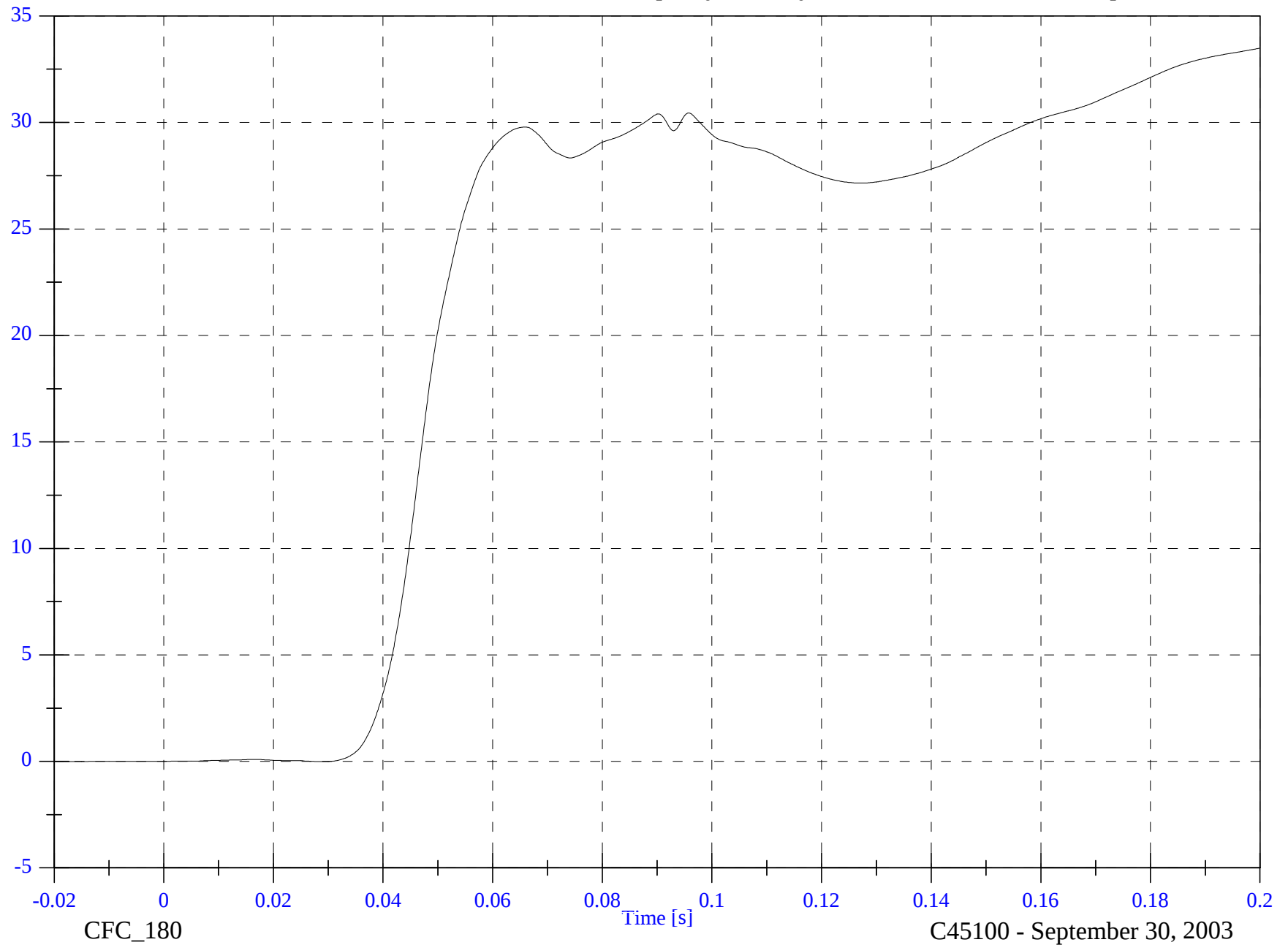


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Spine y Velocity

Max: 33.5 [kph] at 0.200 [s]

Min: -0.0 [kph] at 0.029 [s]



B-49

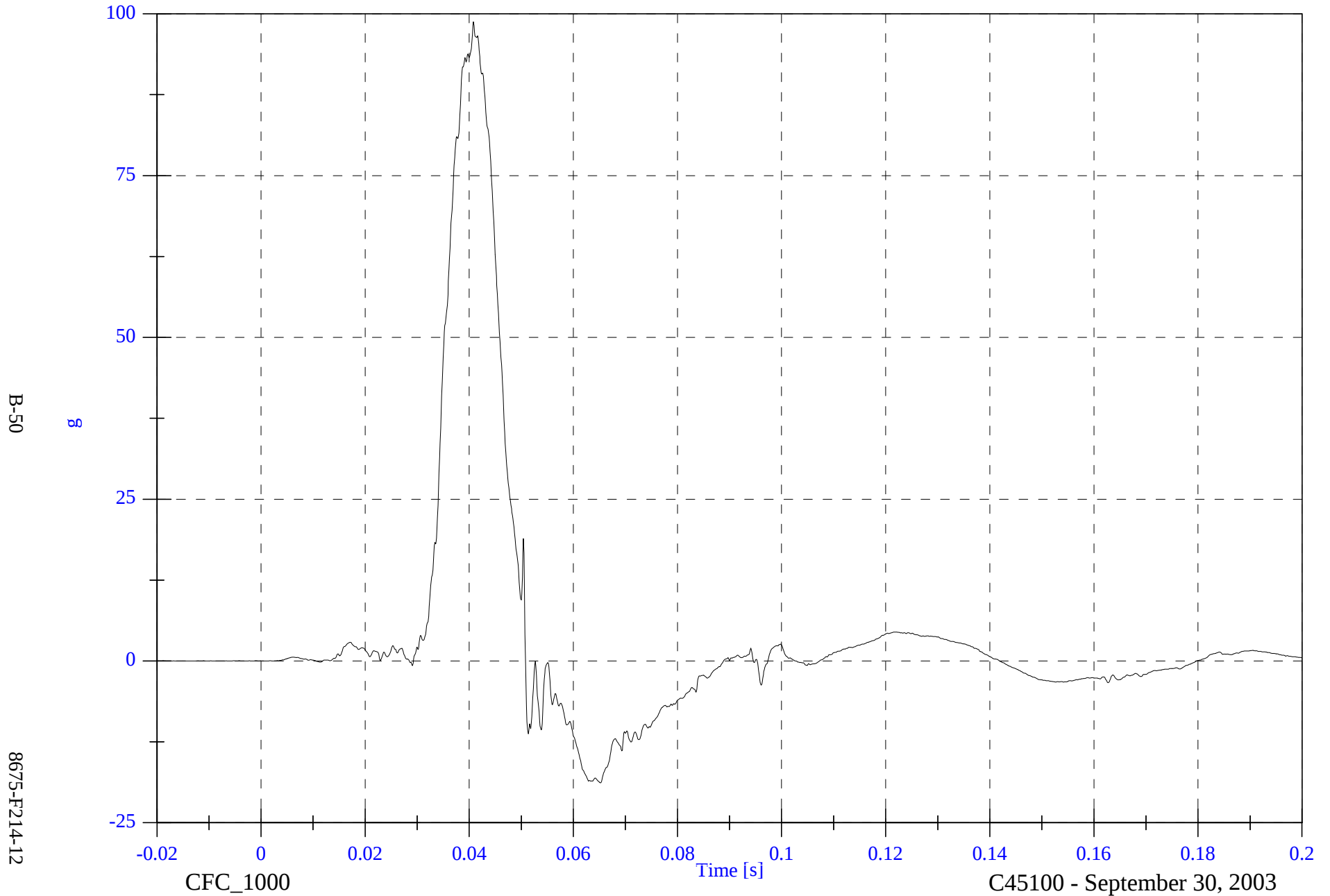
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Pelvic y

Max: 98.7 [g] at 0.041 [s]

Min: -18.9 [g] at 0.065 [s]

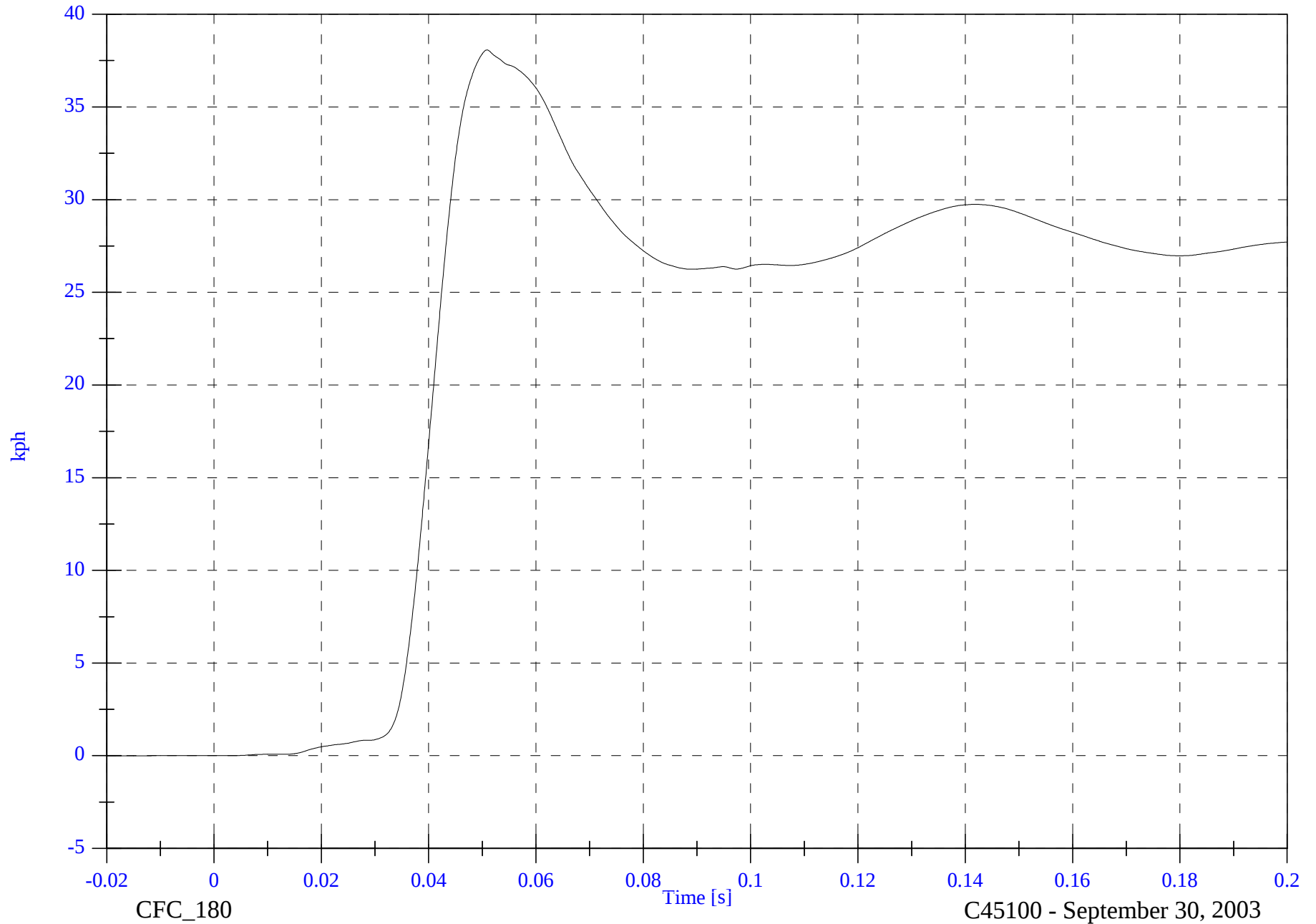


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Pelvic y Velocity

Max: 38.1 [kph] at 0.051 [s]

Min: -0.0 [kph] at -0.020 [s]



B-51

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

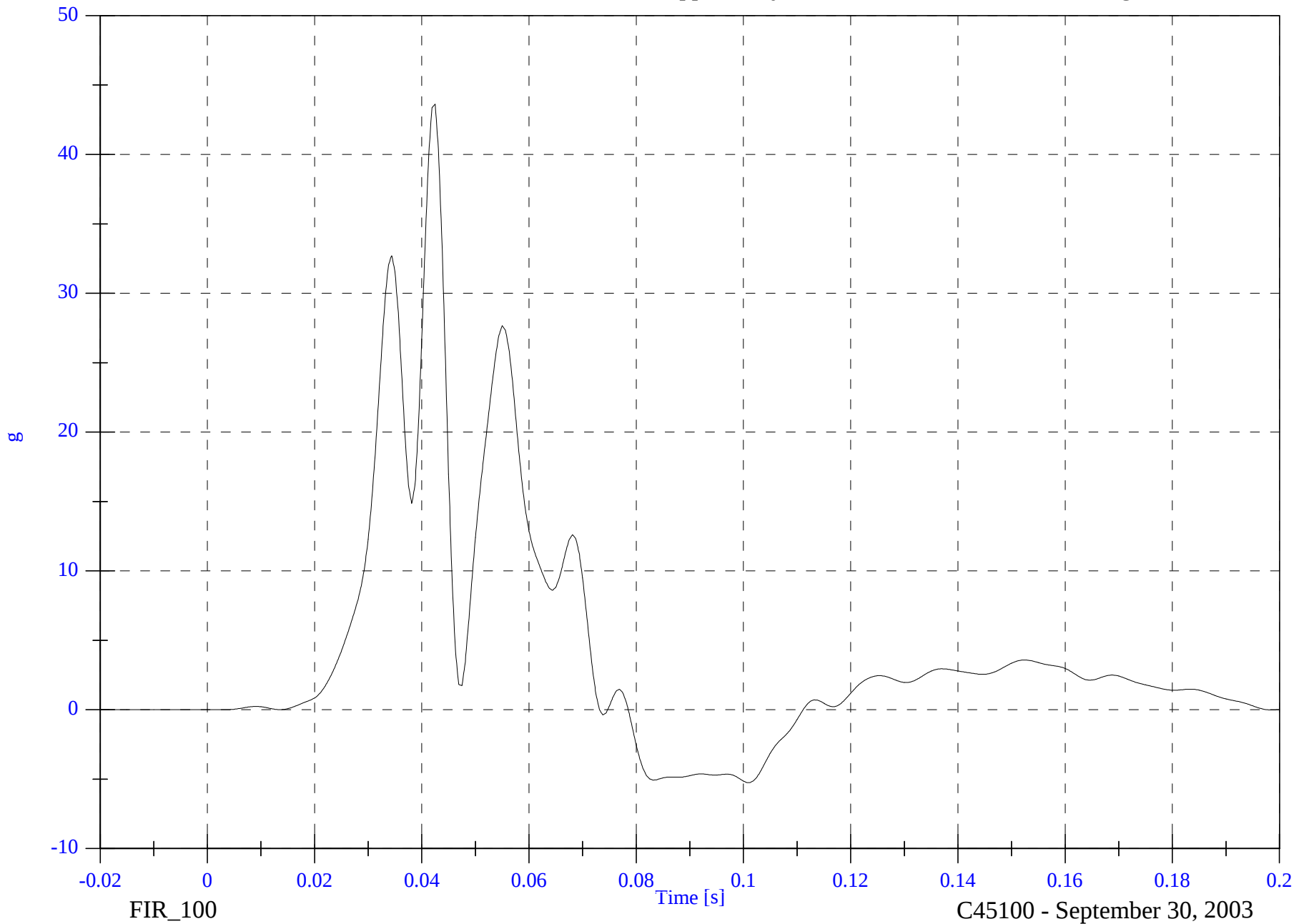
V2P1 Upper Rib y

Max: 43.6 [g] at 0.043 [s]

Min: -5.2 [g] at 0.101 [s]

B-52

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

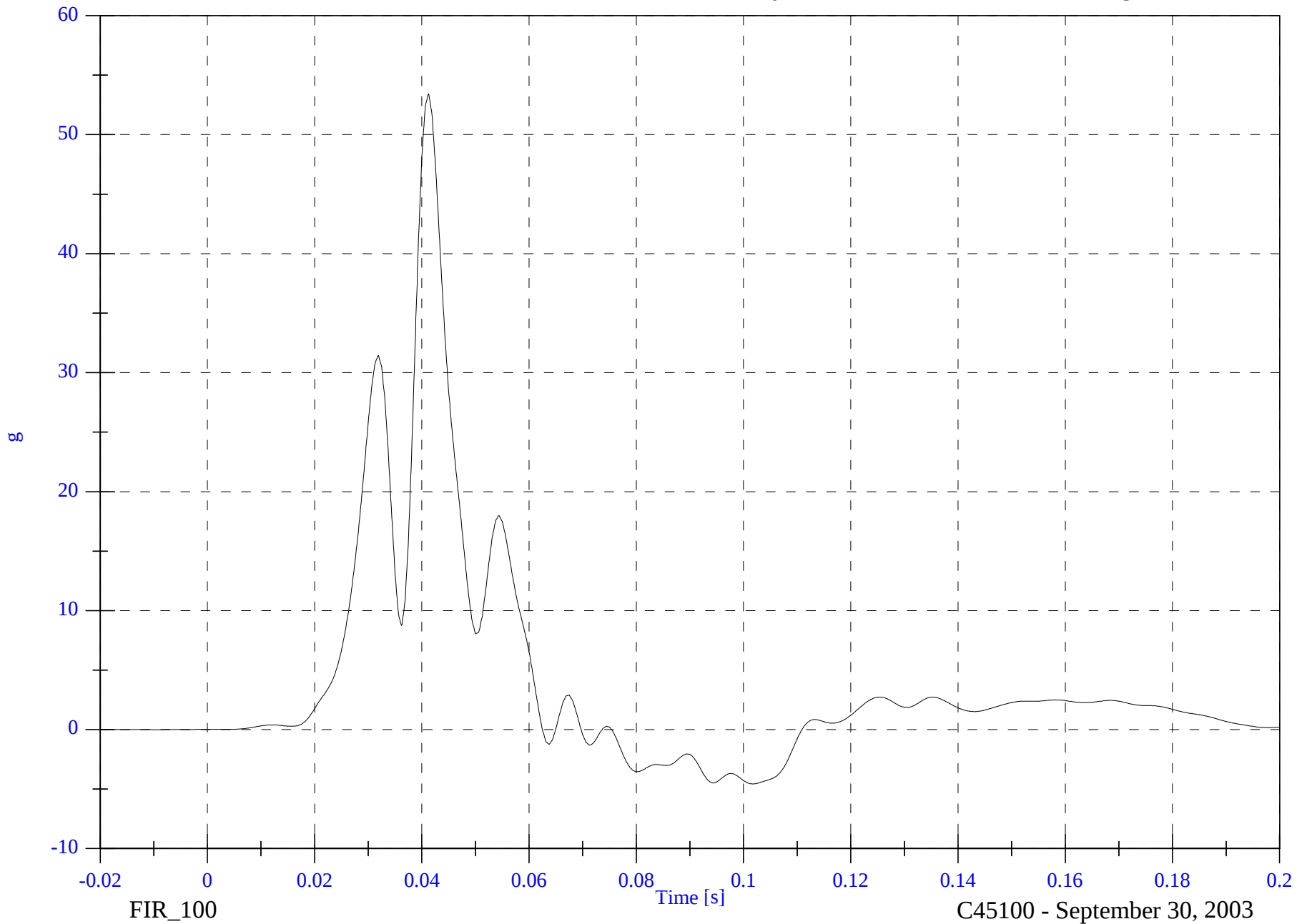
V2P1 Lower Rib y

Max: 53.4 [g] at 0.041 [s]

Min: -4.6 [g] at 0.102 [s]

B-53

8675-F214-12

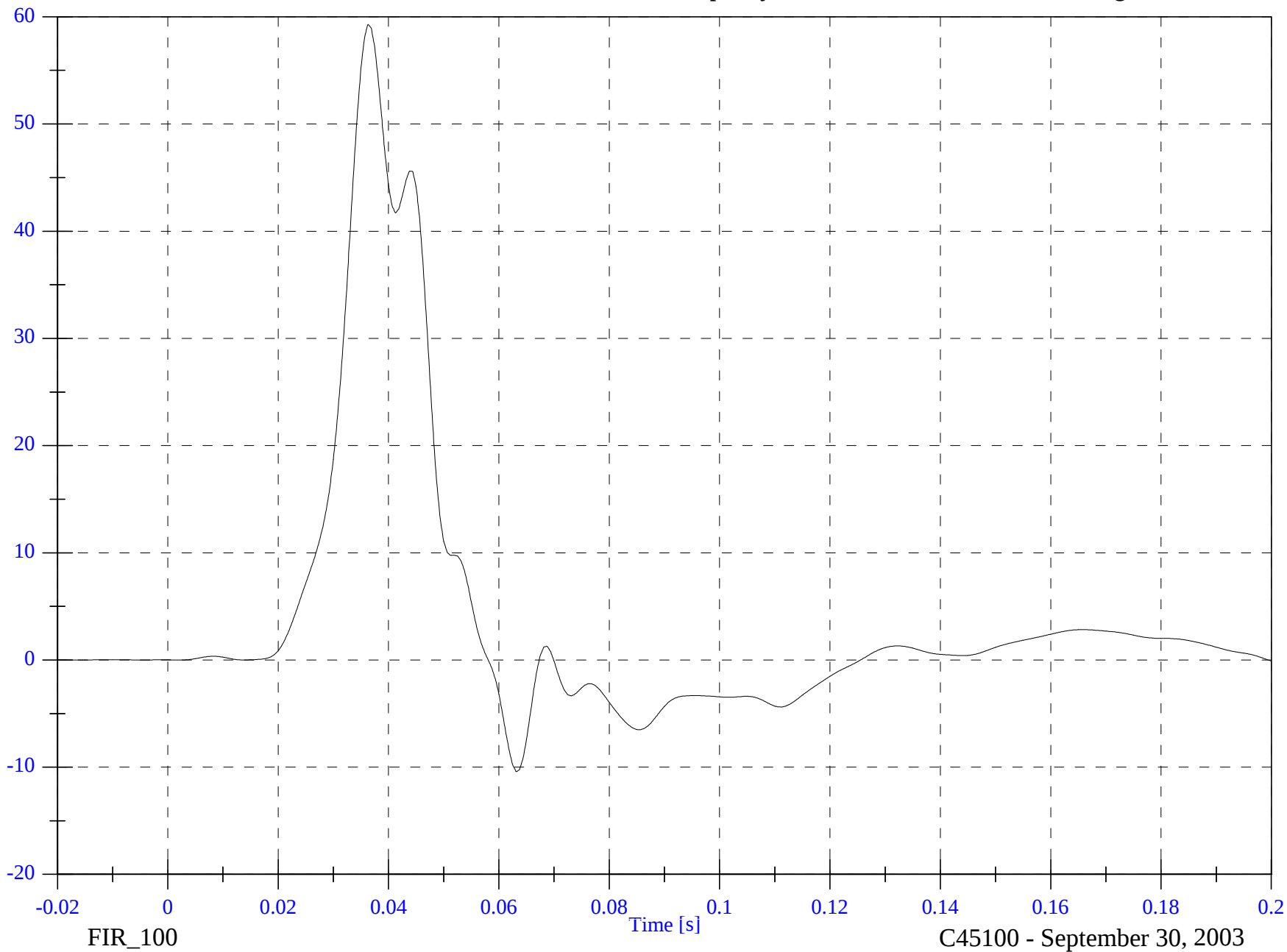


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Spine y

Max: 59.3 [g] at 0.036 [s]

Min: -10.4 [g] at 0.063 [s]



B-54

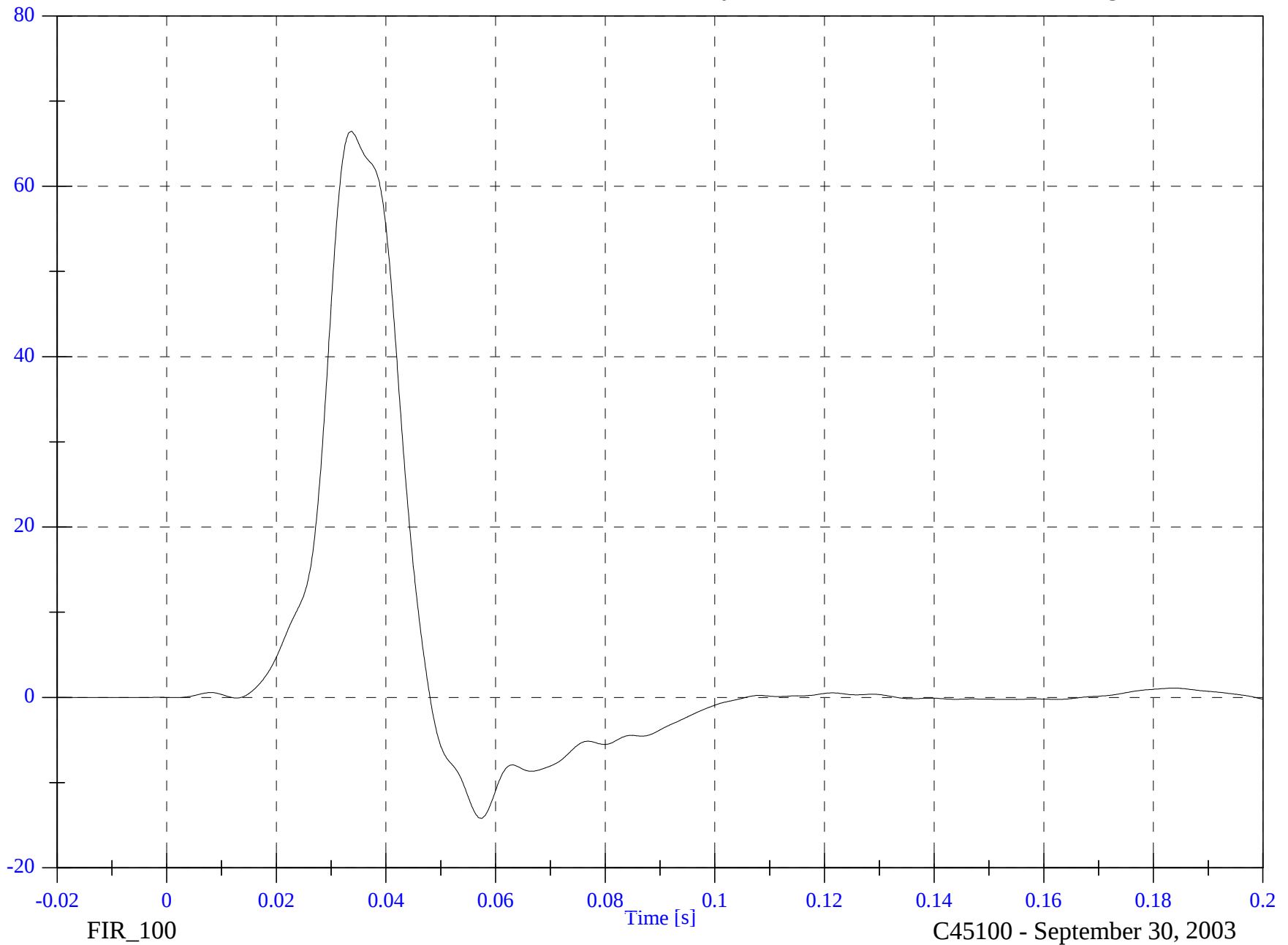
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Pelvic y

Max: 66.5 [g] at 0.034 [s]

Min: -14.2 [g] at 0.057 [s]



B-55

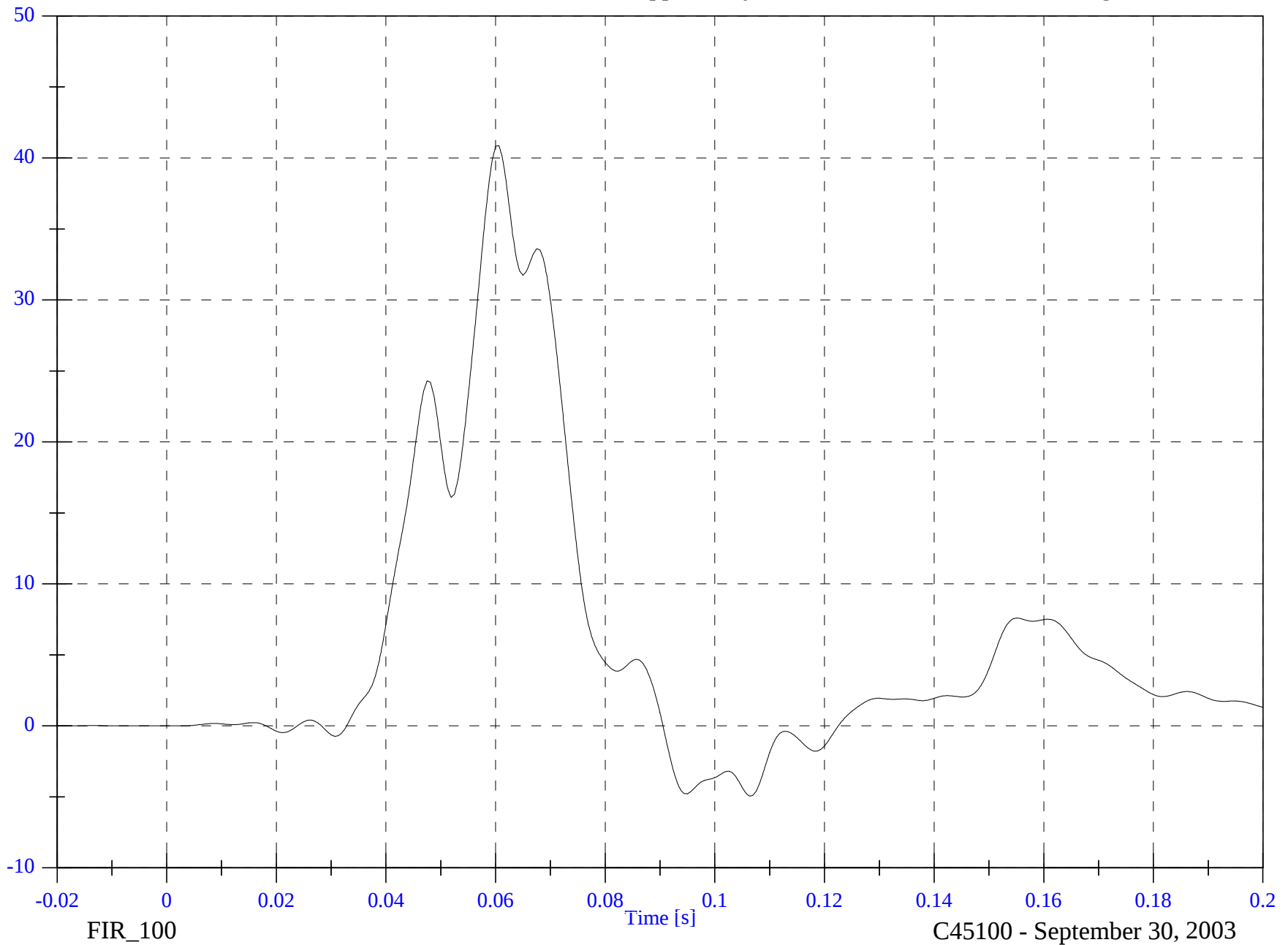
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Rib y

Max: 40.9 [g] at 0.061 [s]

Min: -4.9 [g] at 0.106 [s]



B-56

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

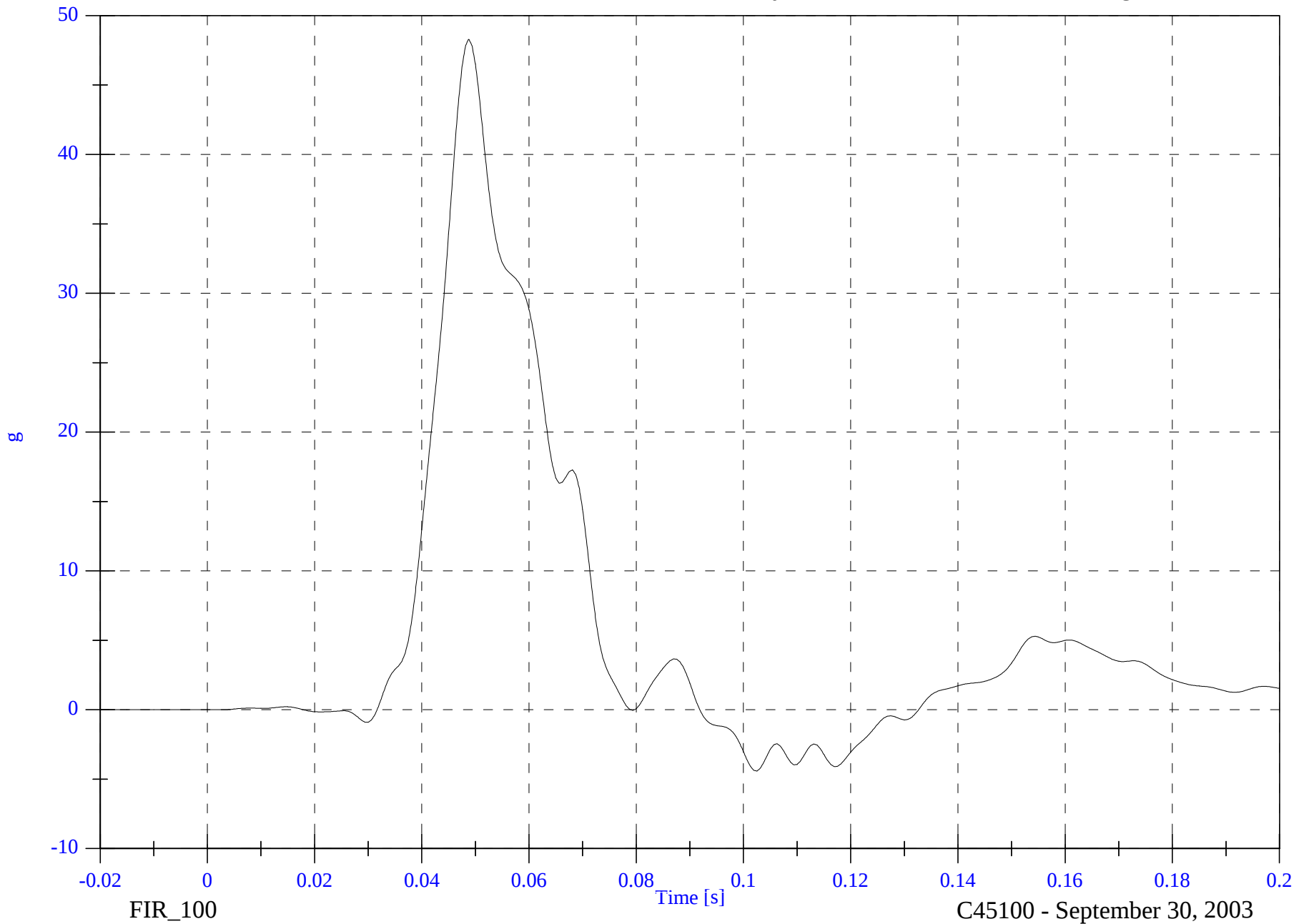
V2P4 Lower Rib y

Max: 48.3 [g] at 0.049 [s]

Min: -4.4 [g] at 0.102 [s]

B-57

8675-F214-12

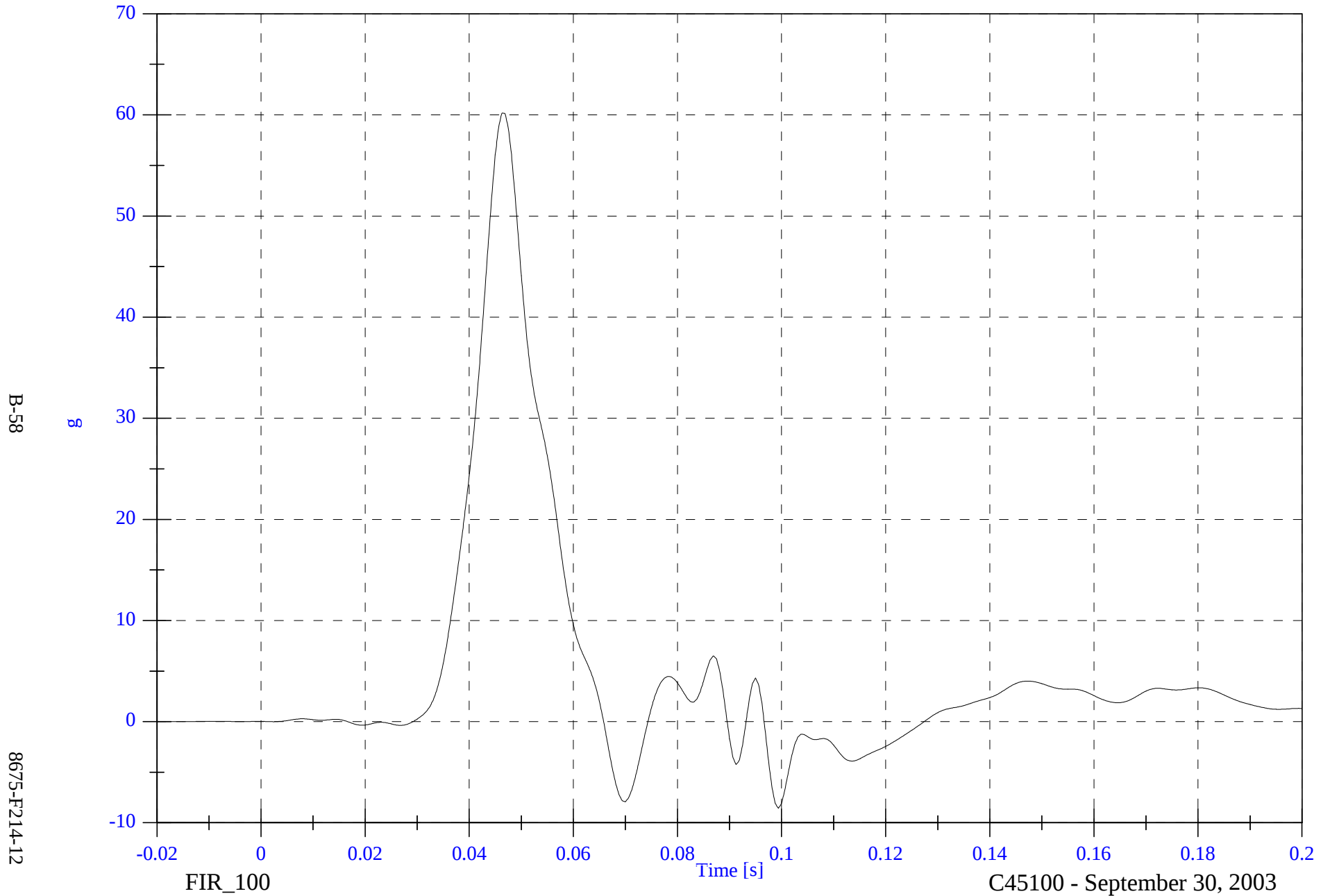


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Spine y

Max: 60.2 [g] at 0.046 [s]

Min: -8.6 [g] at 0.099 [s]

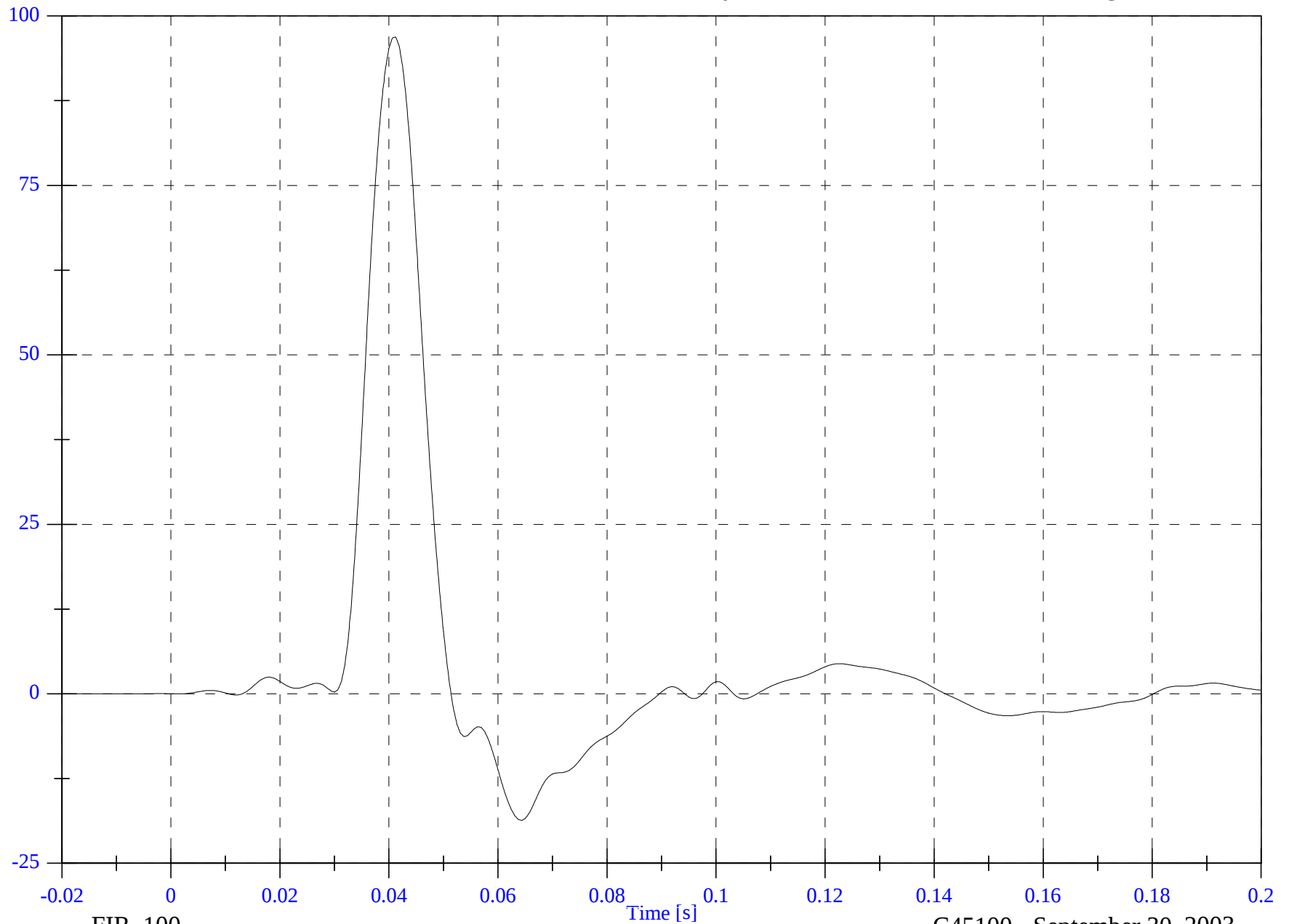


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Pelvic y

Max: 96.9 [g] at 0.041 [s]

Min: -18.7 [g] at 0.064 [s]



B-59

8675-F214-12

FIR_100

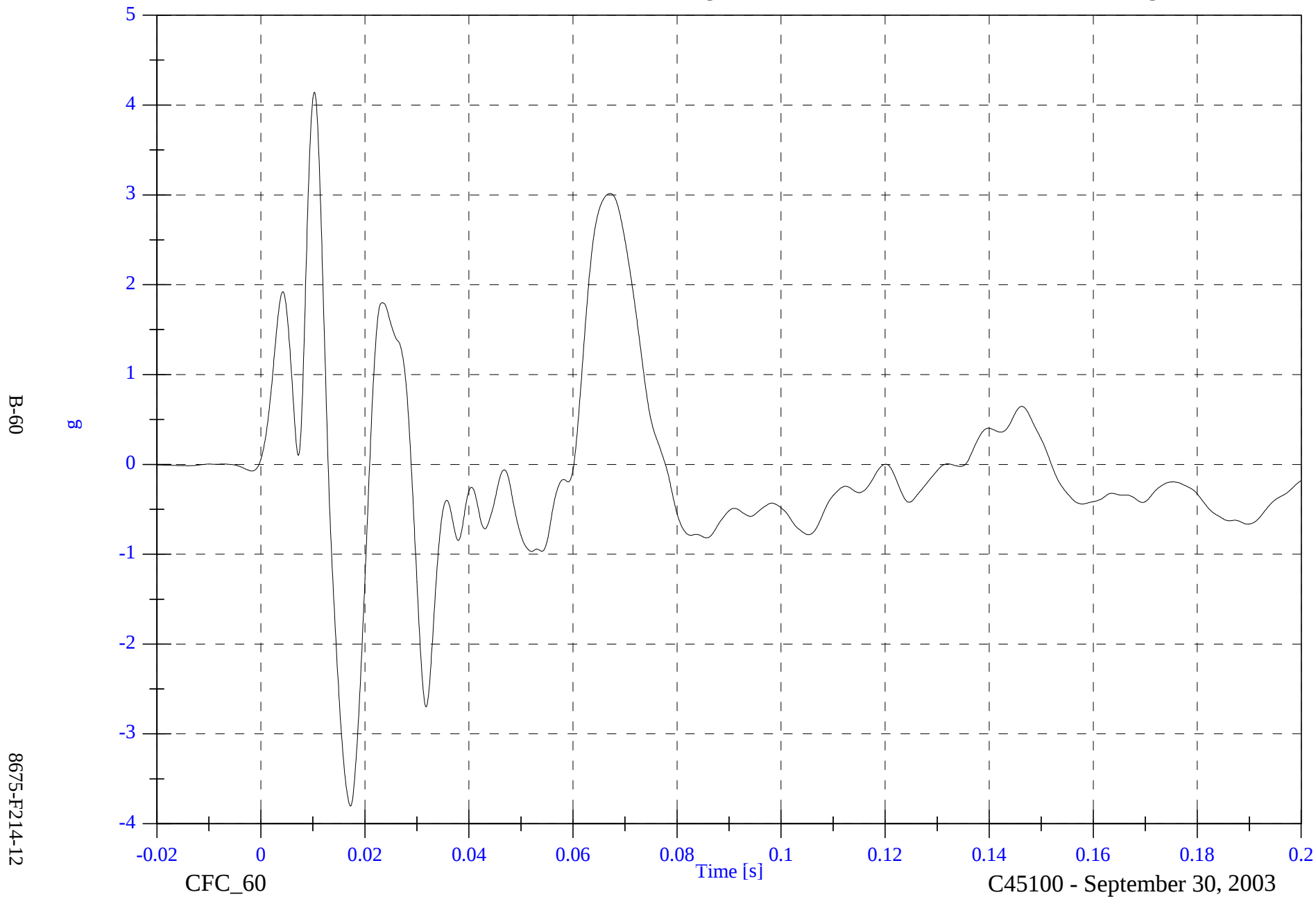
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A1 Right Front Sill x

Max: 4.1 [g] at 0.010 [s]

Min: -3.8 [g] at 0.017 [s]

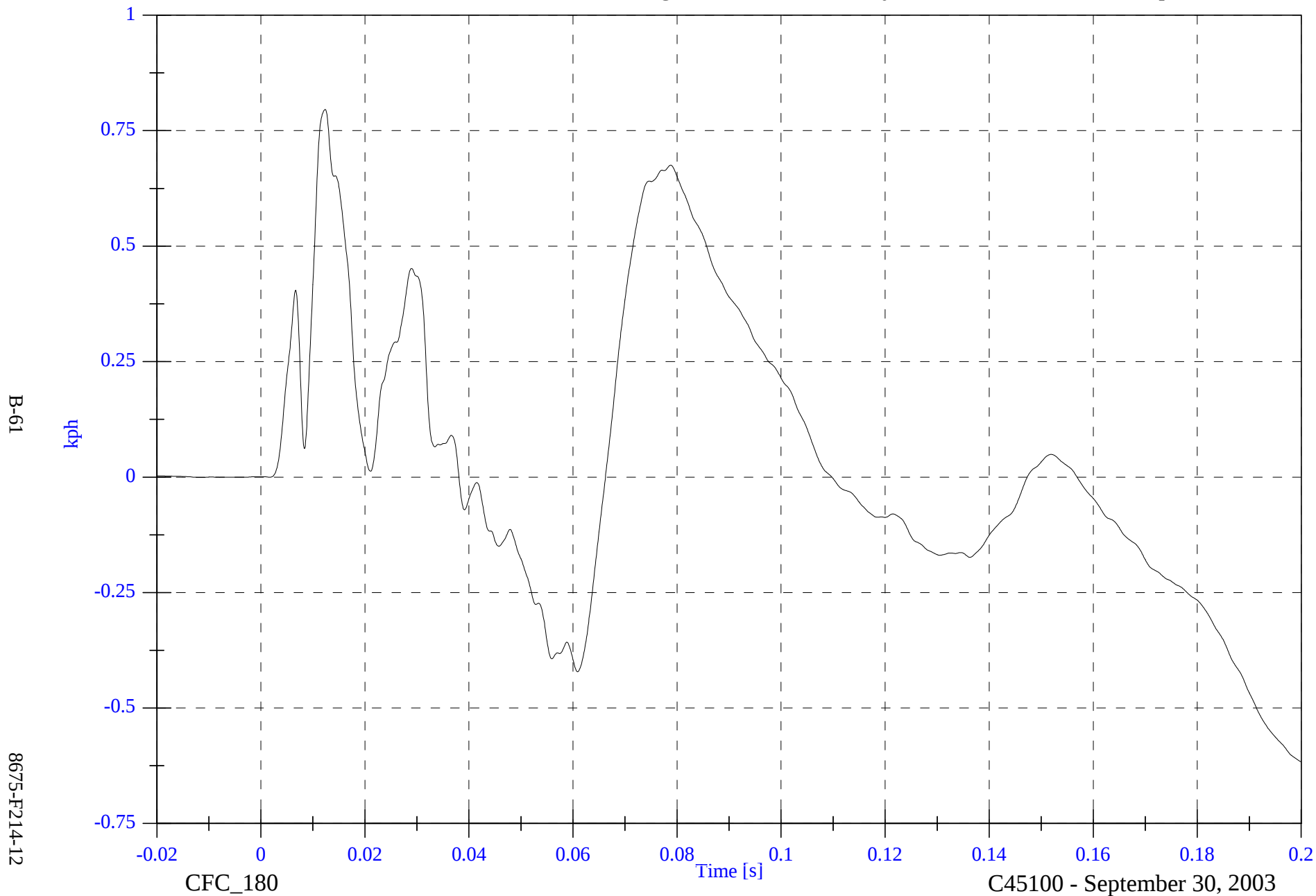


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A1 Right Front Sill x Velocity

Max: 0.8 [kph] at 0.012 [s]

Min: -0.6 [kph] at 0.200 [s]

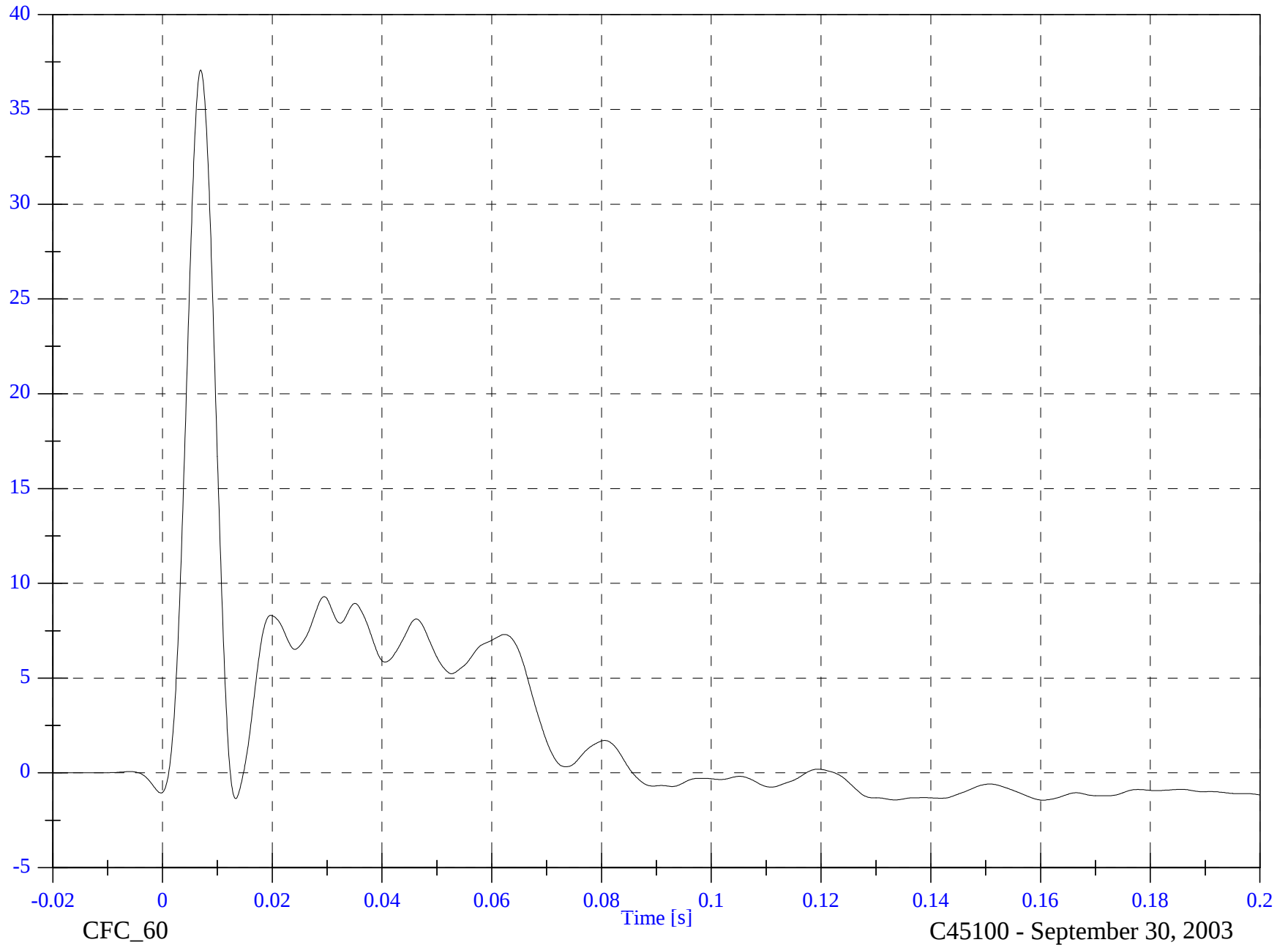


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A1 Right Front Sill y

Max: 37.1 [g] at 0.007 [s]

Min: -1.4 [g] at 0.160 [s]



B-62

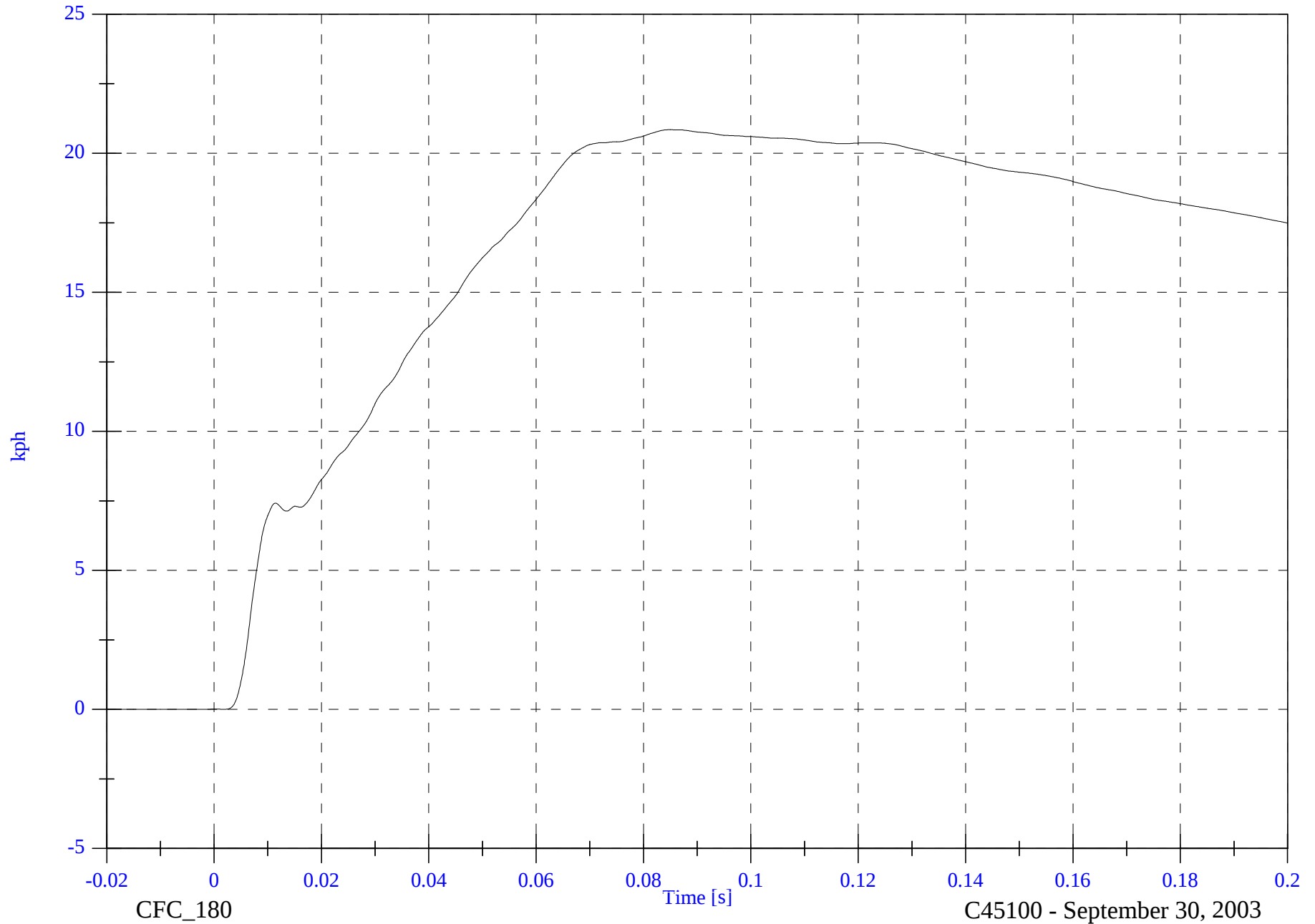
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 20.8 [kph] at 0.085 [s]

V2 A1 Right Front Sill y Velocity

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



B-63

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 4.9 [g] at 0.075 [s]

V2 A1 Right Front Sill z

Min: -12.7 [g] at 0.008 [s]



B-64

8675-F214-12

CFC_60

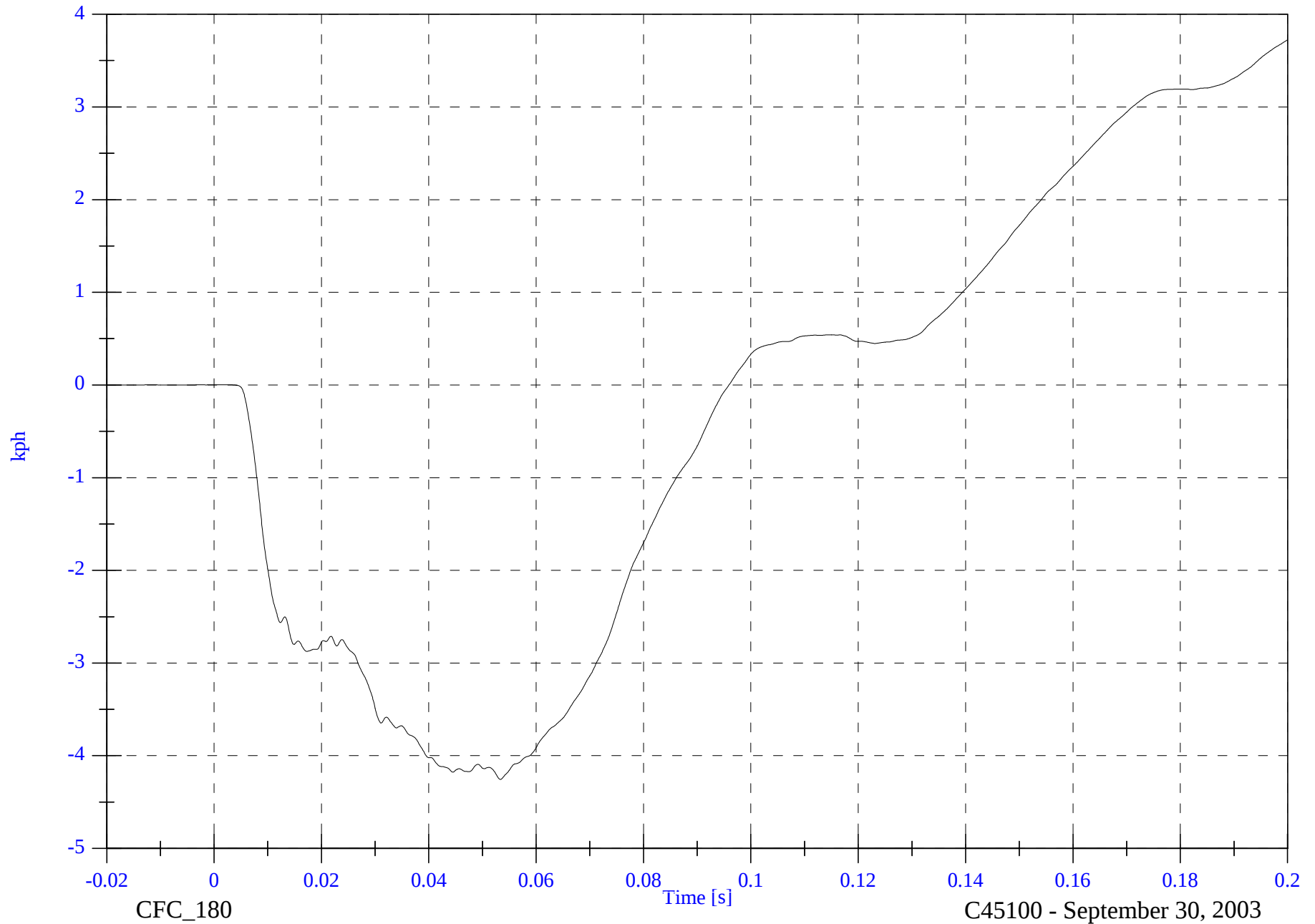
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A1 Right Front Sill z Velocity

Max: 3.7 [kph] at 0.200 [s]

Min: -4.3 [kph] at 0.053 [s]



B-65

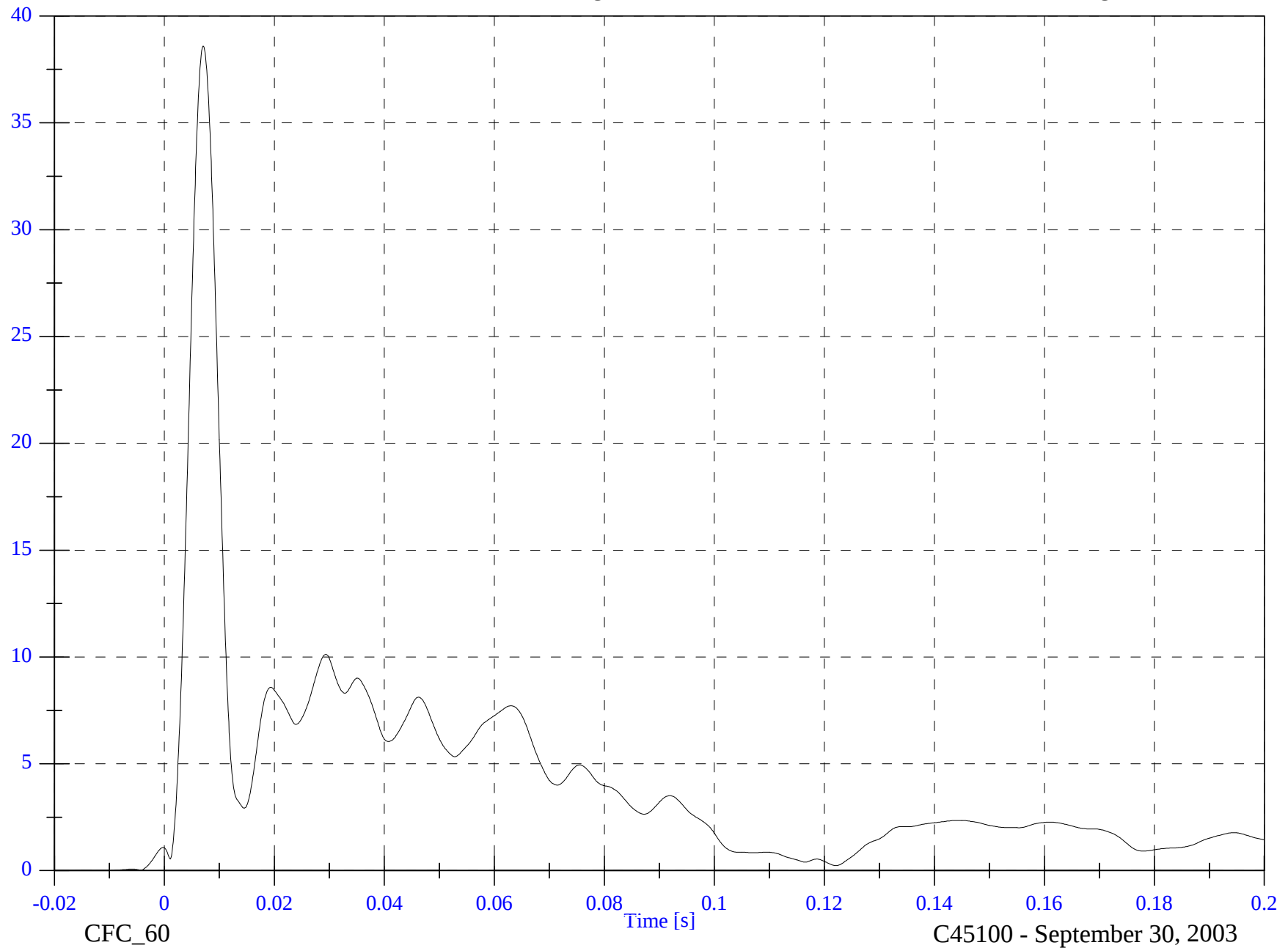
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A1 Right Front Sill Resultant

Max: 38.6 [g] at 0.007 [s]

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

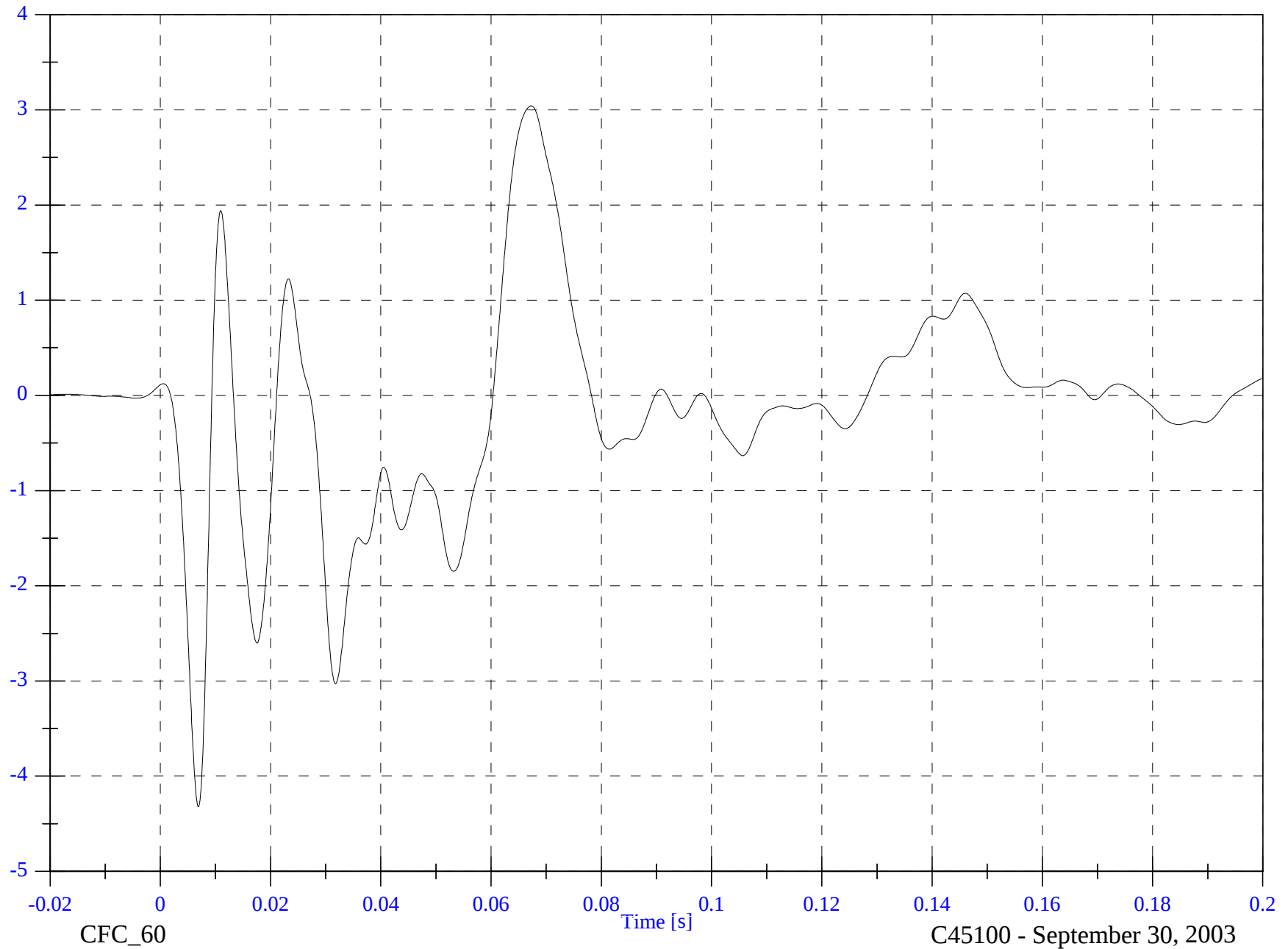


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A2 Right Rear Sill x

Max: 3.0 [g] at 0.067 [s]

Min: -4.3 [g] at 0.007 [s]

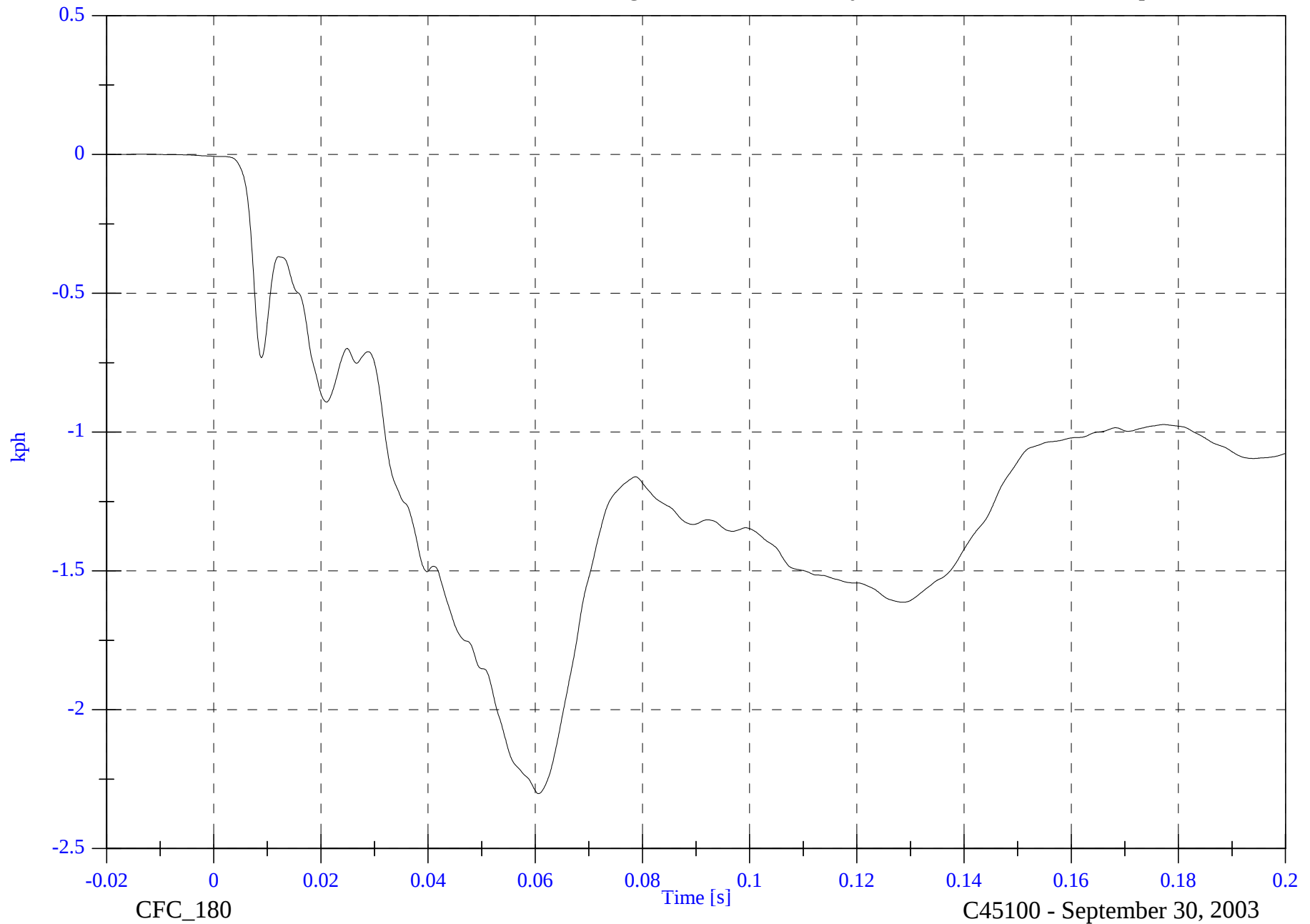


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A2 Right Rear Sill x Velocity

Max: 0.0 [kph] at -0.013 [s]

Min: -2.3 [kph] at 0.061 [s]



B-68

8675-F214-12

CFC_180

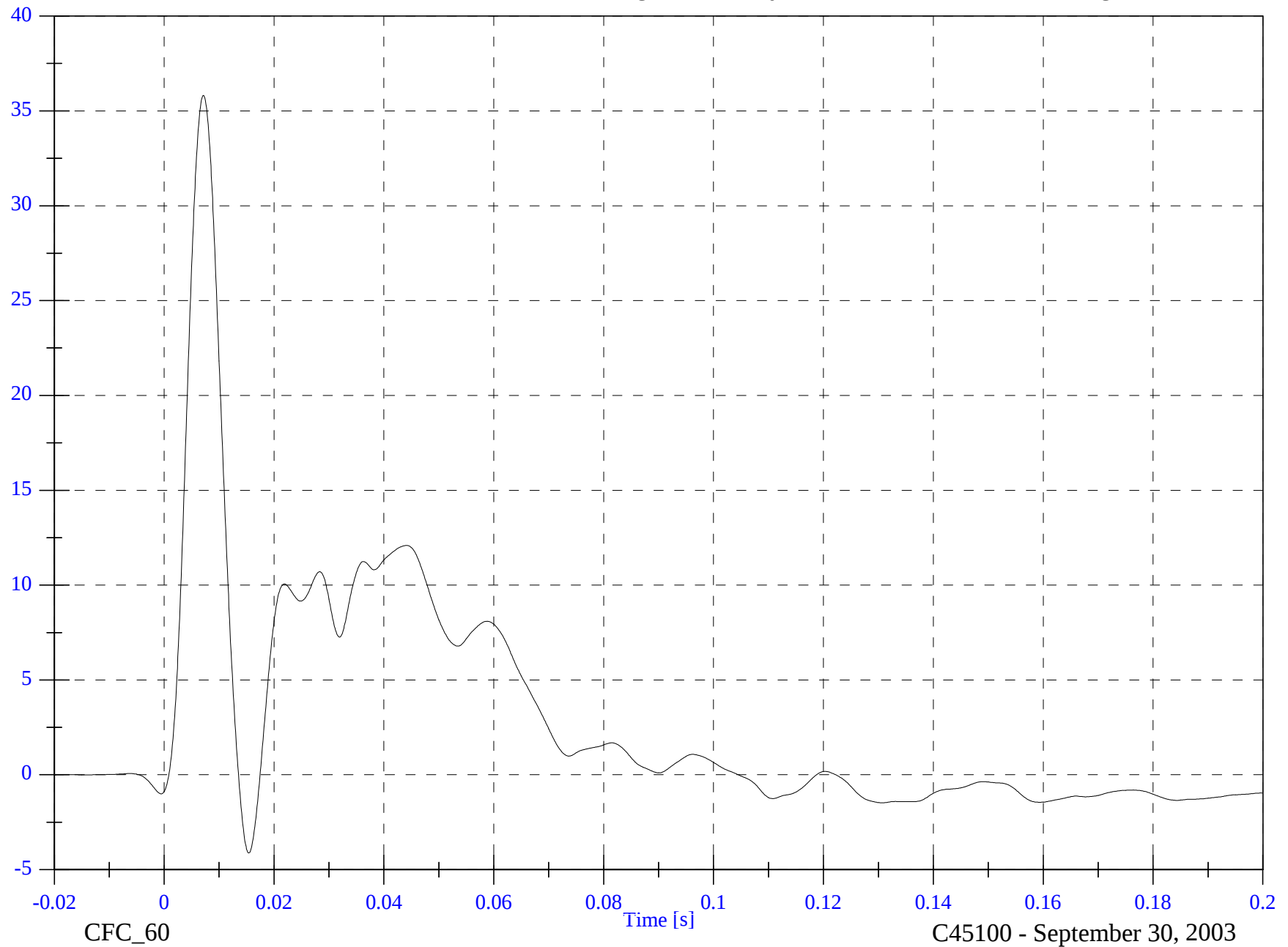
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A2 Right Rear Sill y

Max: 35.8 [g] at 0.007 [s]

Min: -4.1 [g] at 0.015 [s]



B-69

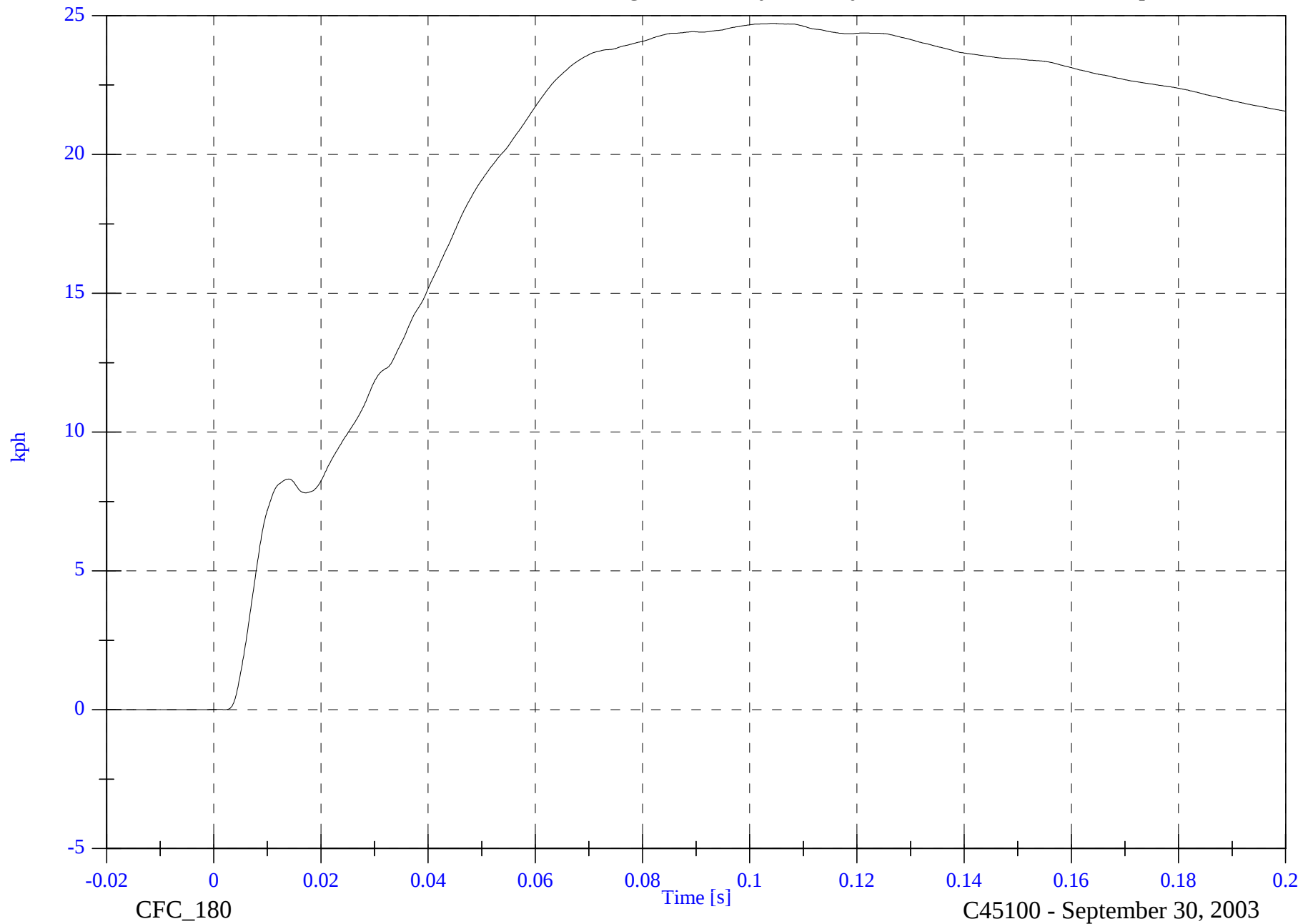
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 24.7 [kph] at 0.104 [s]

V2 A2 Right Rear Sill y Velocity

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



B-70

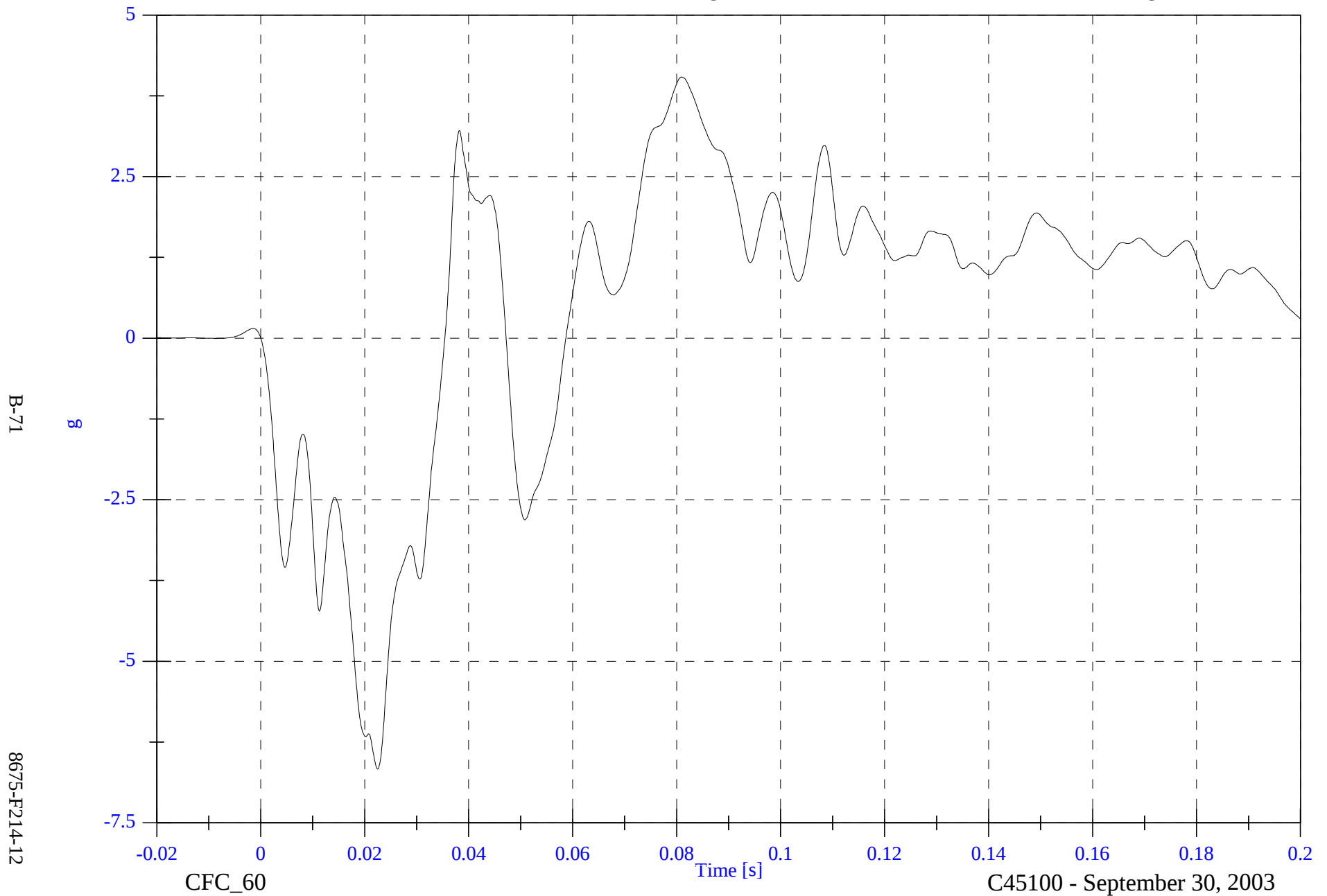
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A2 Right Rear Sill z

Max: 4.0 [g] at 0.081 [s]

Min: -6.7 [g] at 0.022 [s]

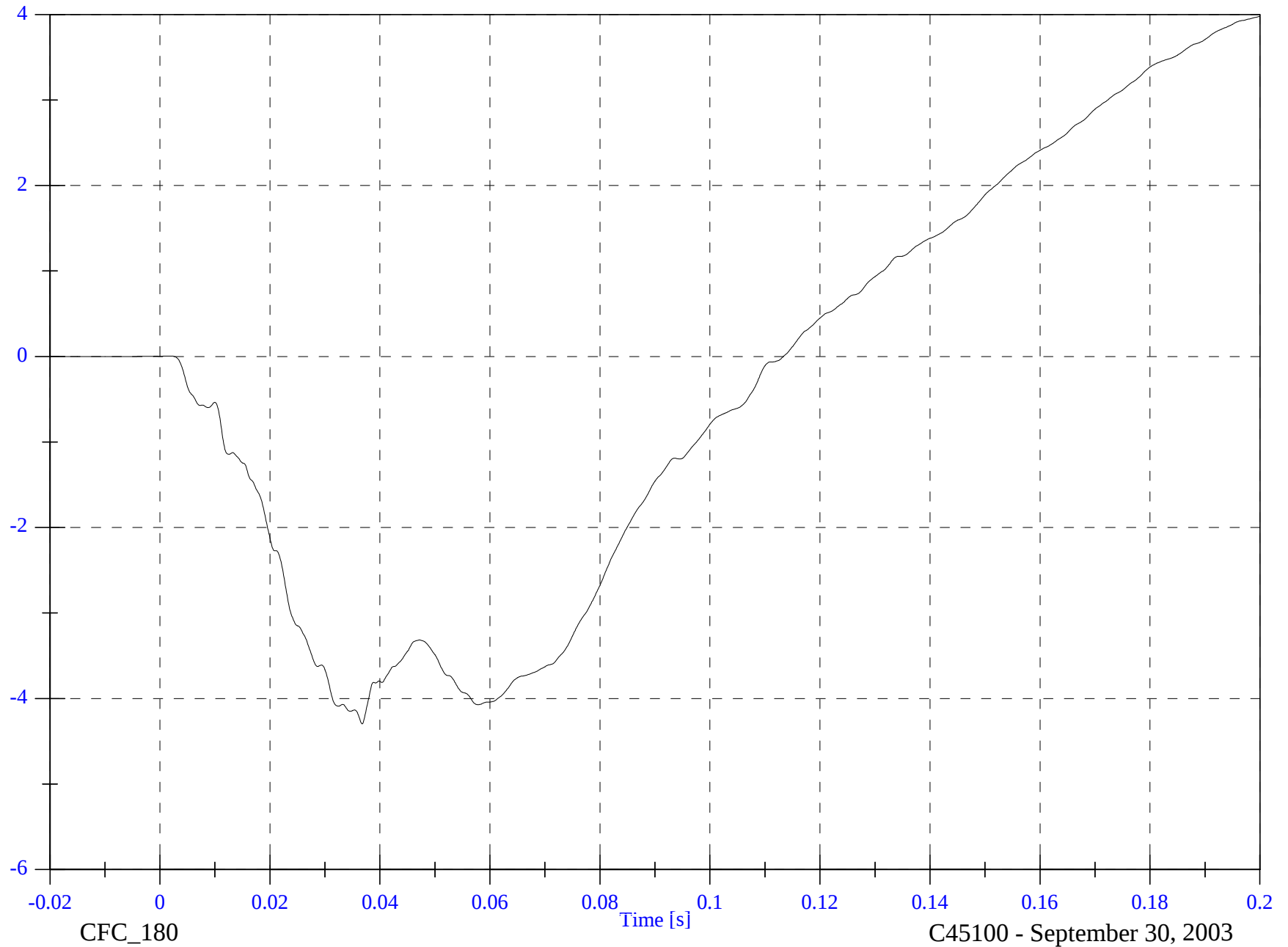


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A2 Right Rear Sill z Velocity

Max: 4.0 [kph] at 0.200 [s]

Min: -4.3 [kph] at 0.037 [s]



B-72

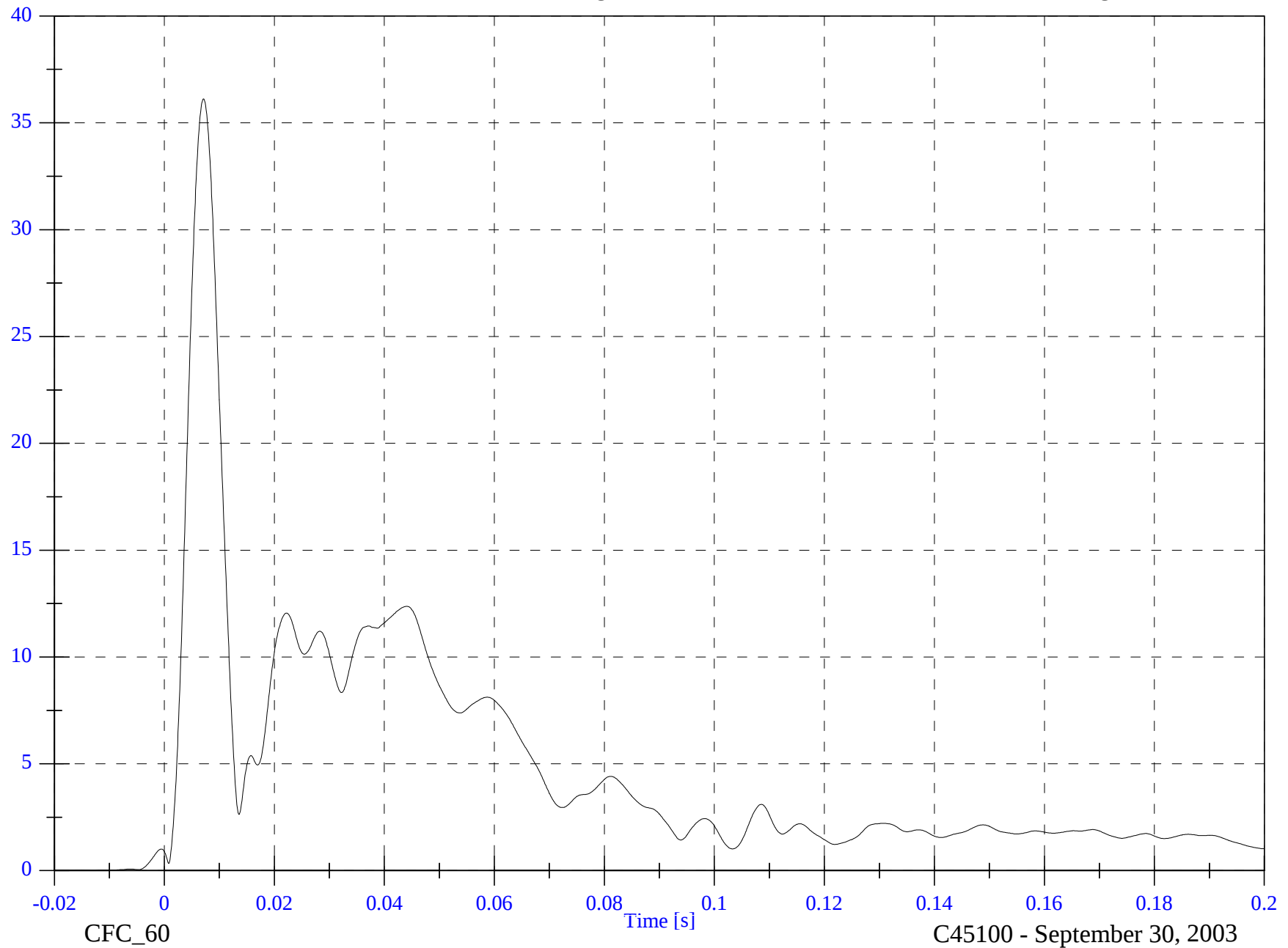
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A2 Right Rear Sill Resultant

Max: 36.1 [g] at 0.007 [s]

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



B-73

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A3 Rear Floorpan x

Max: 2.6 [g] at 0.066 [s]

Min: -6.2 [g] at 0.034 [s]



B-74

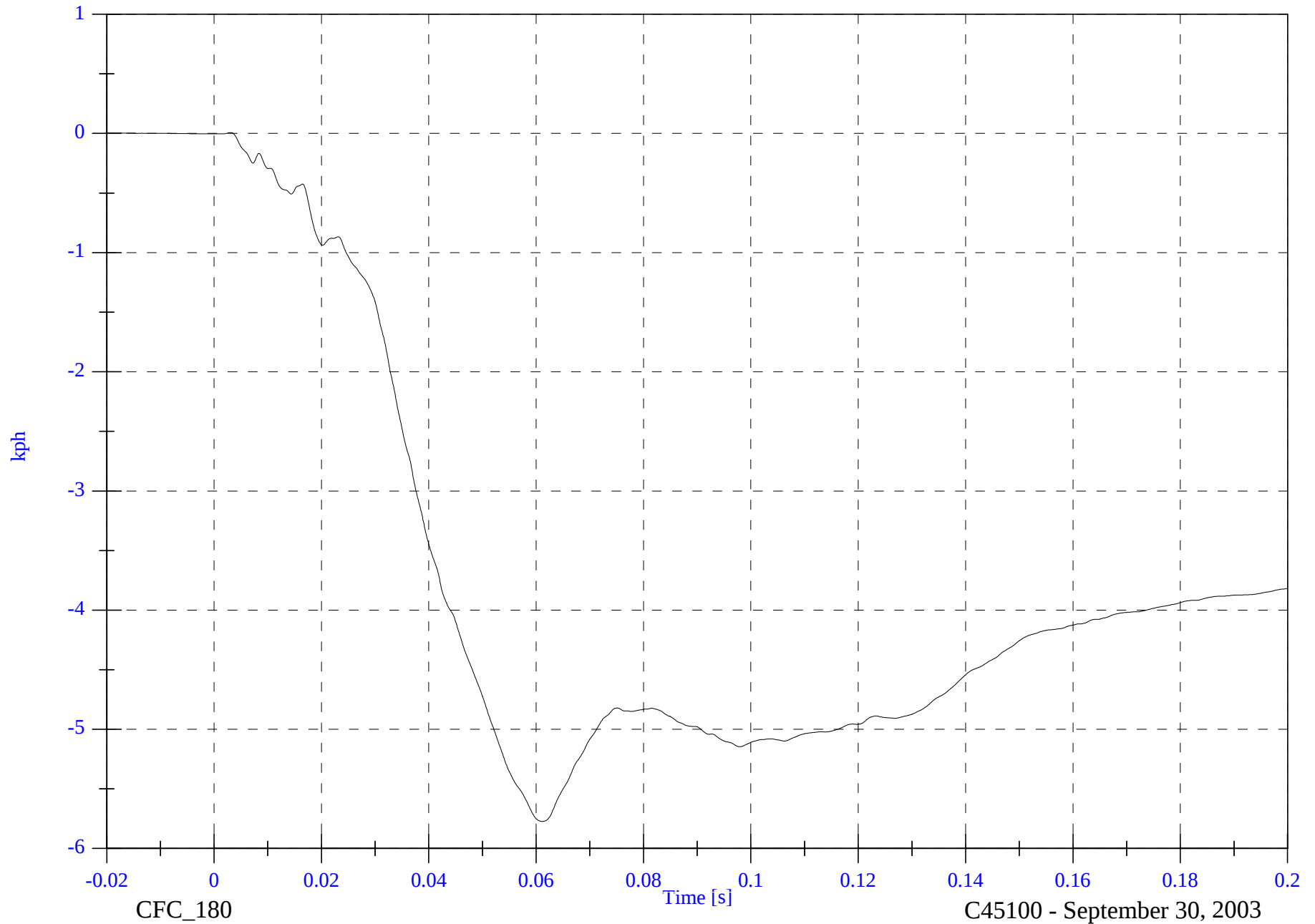
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A3 Rear Floorpan x Velocity

Max: 0.0 [kph] at 0.003 [s]

Min: -5.8 [kph] at 0.061 [s]



B-75

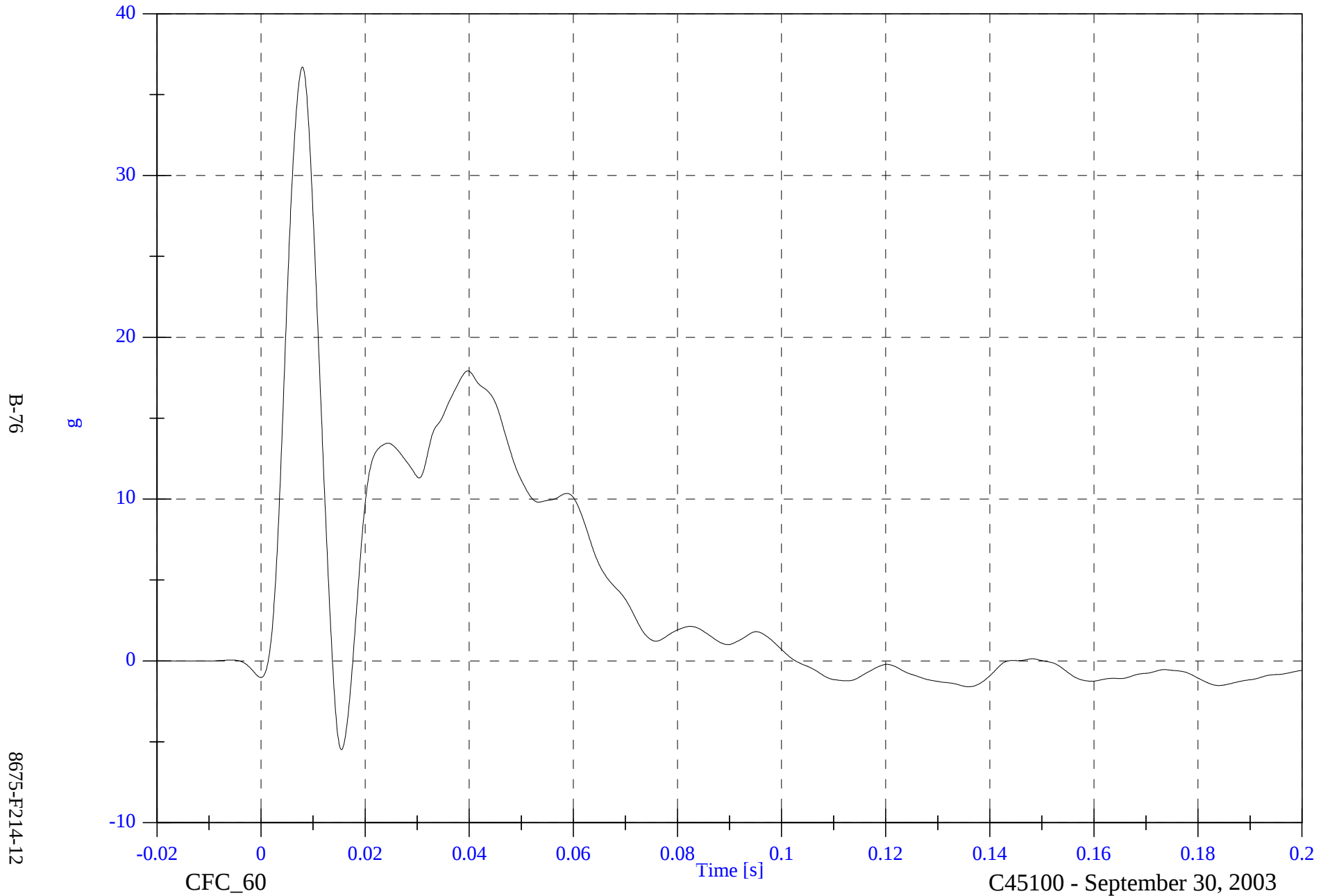
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A3 Rear Floorpan y

Max: 36.7 [g] at 0.008 [s]

Min: -5.5 [g] at 0.015 [s]

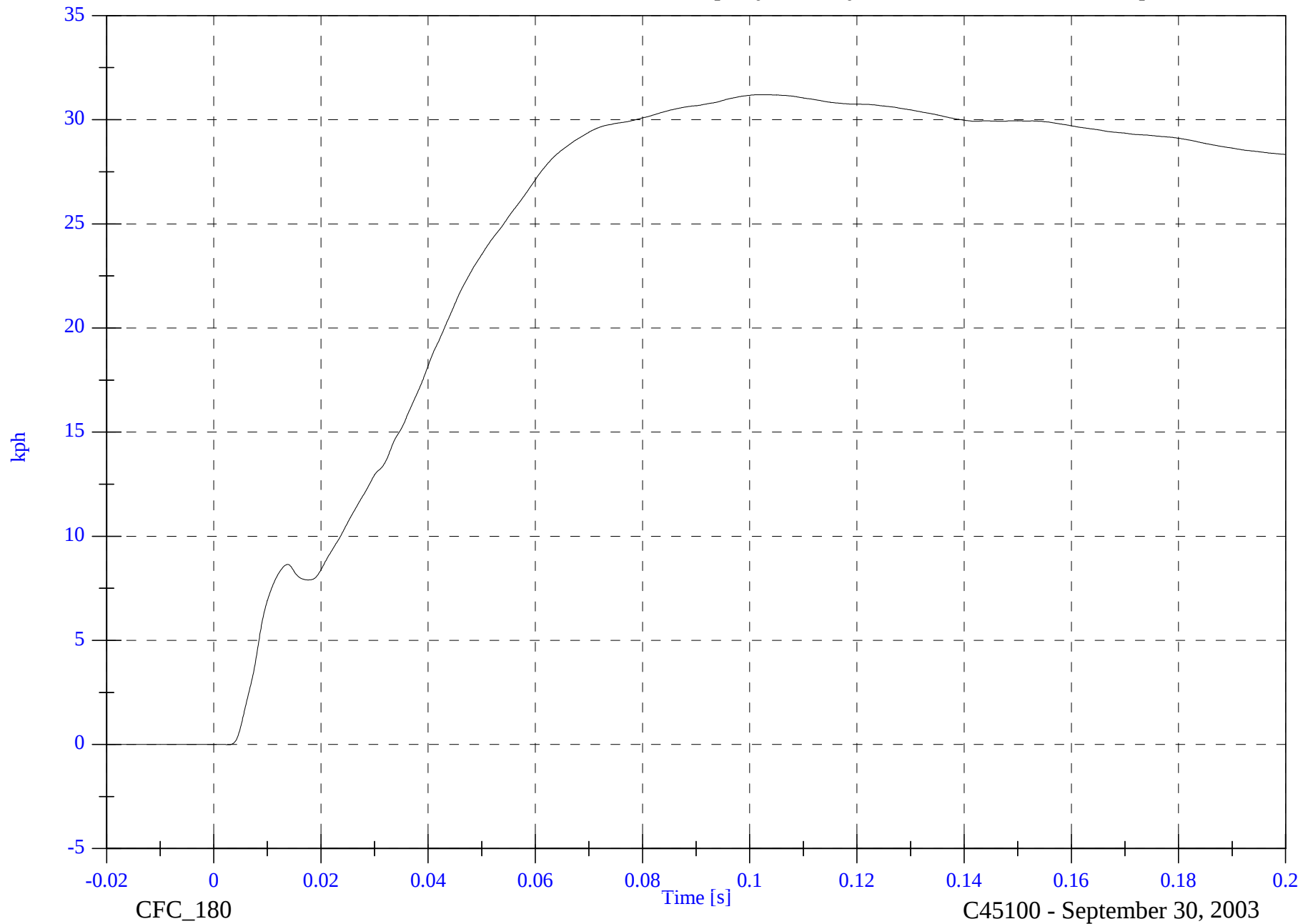


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 31.2 [kph] at 0.102 [s]

V2 A3 Rear Floorpan y Velocity

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



B-77

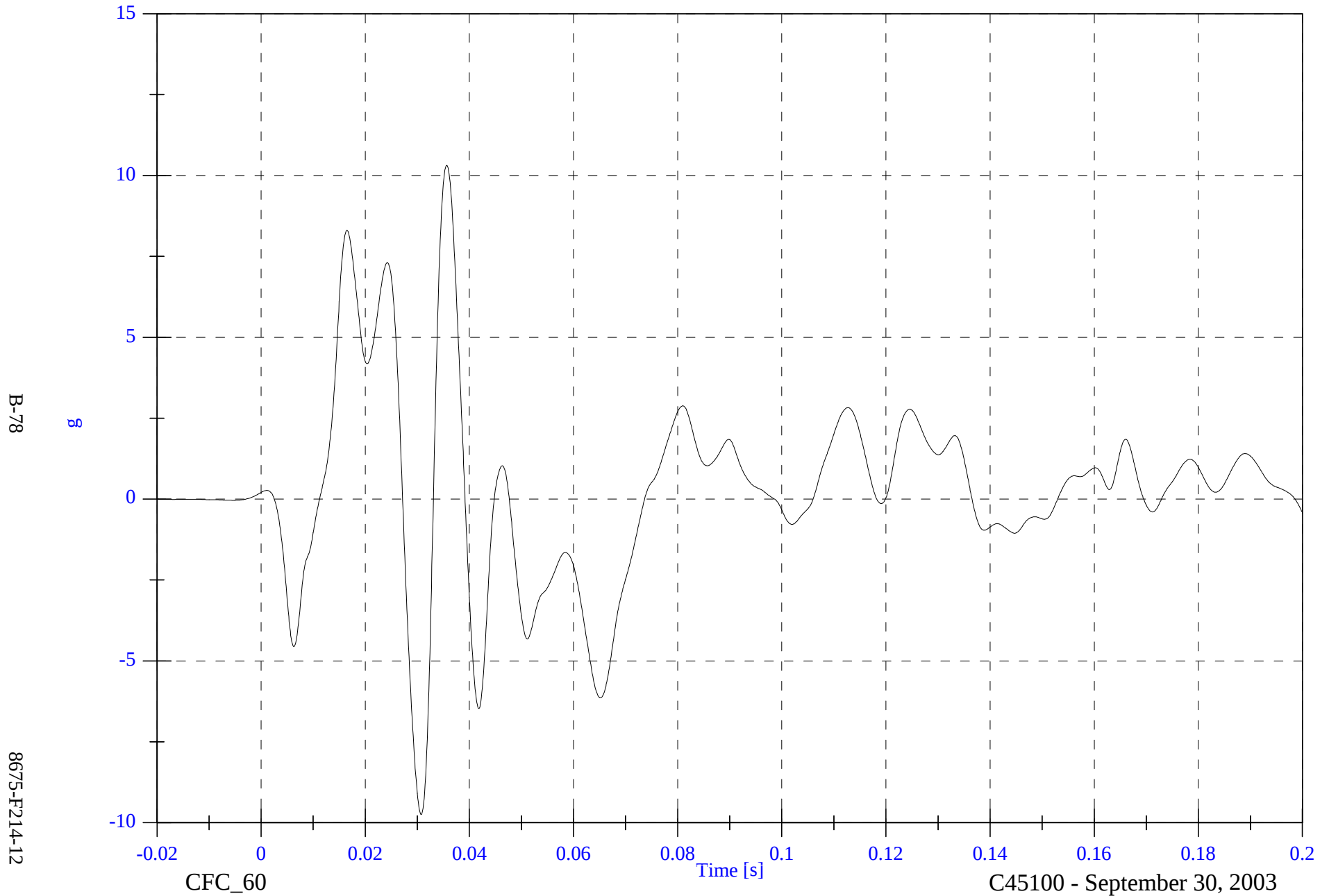
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A3 Rear Floorpan z

Max: 10.3 [g] at 0.036 [s]

Min: -9.7 [g] at 0.031 [s]

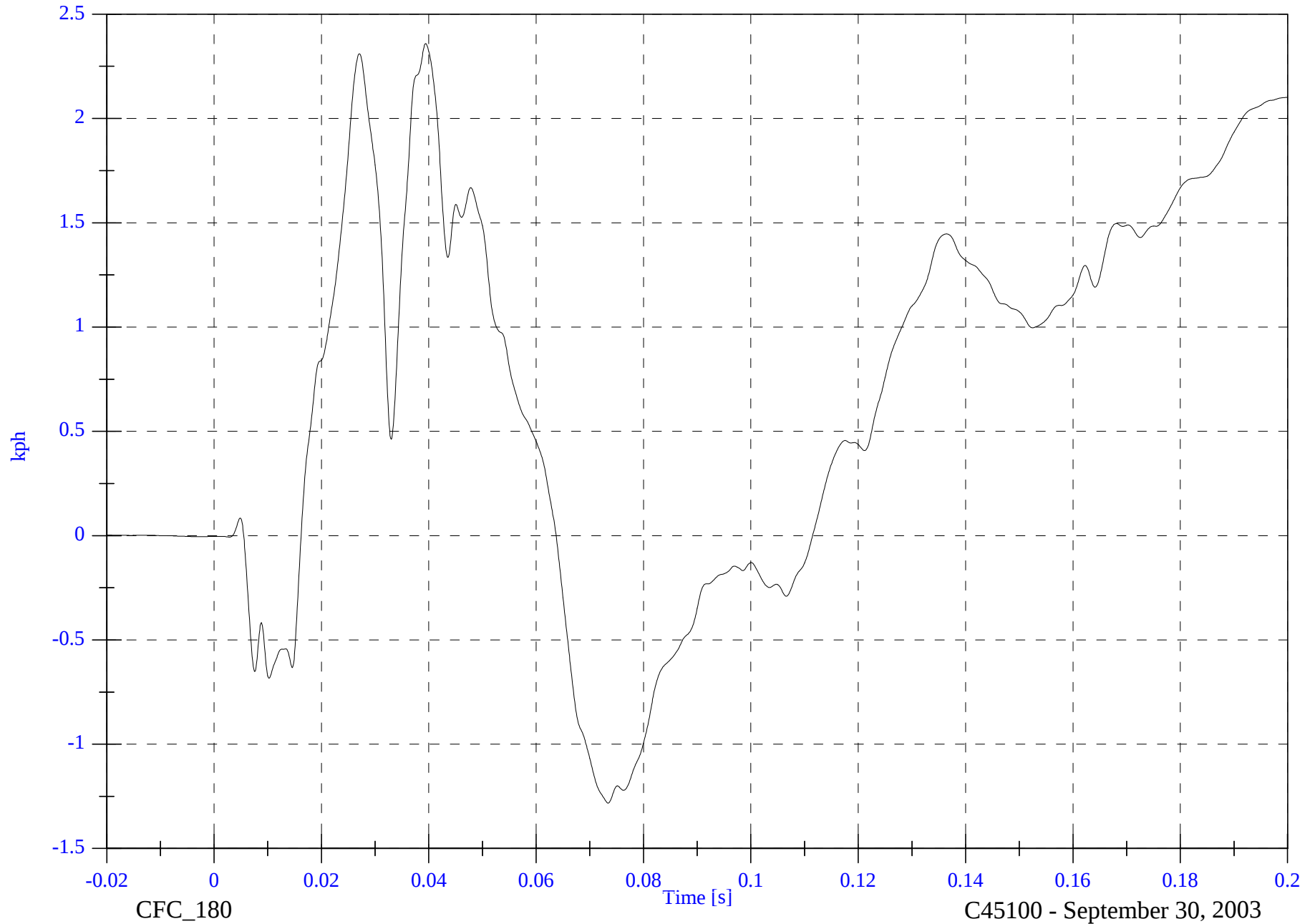


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A3 Rear Floorpan z Velocity

Max: 2.4 [kph] at 0.039 [s]

Min: -1.3 [kph] at 0.073 [s]



B-79

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

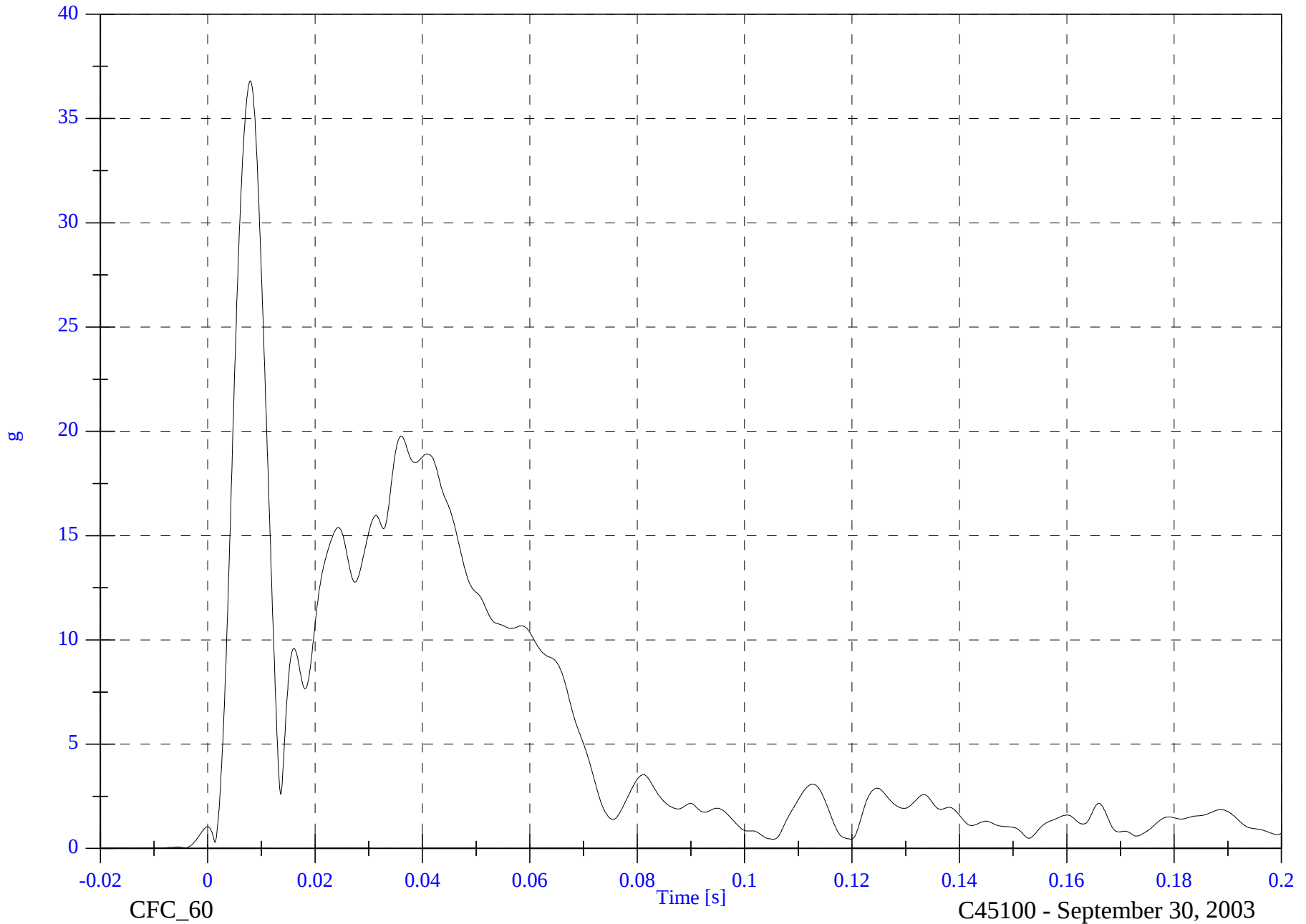
V2 A3 Rear Floorpan Resultant

Max: 36.8 [g] at 0.008 [s]

Min: 0.0 [g] at -0.020 [s]

B-80

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

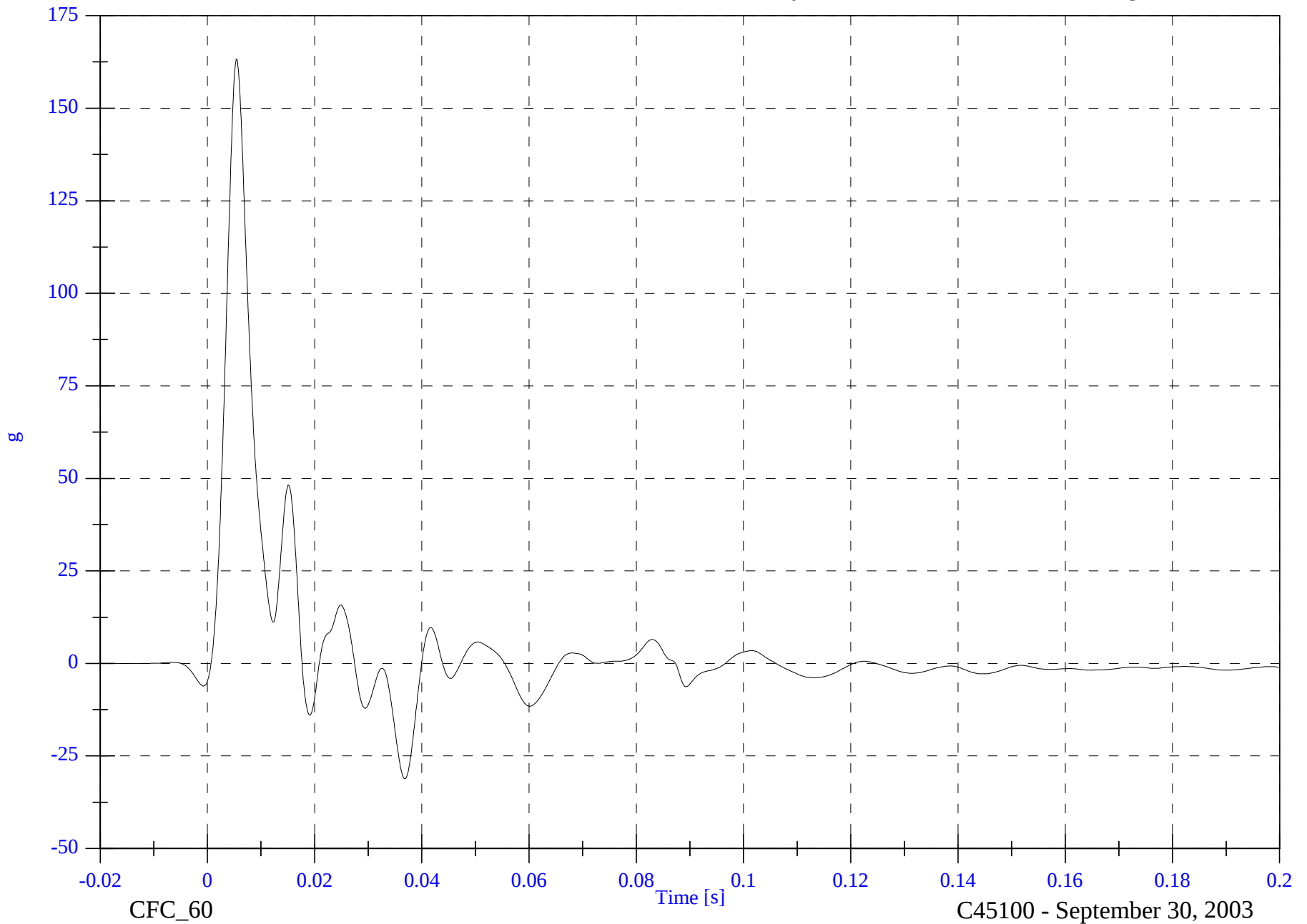
V2 A4 Left Rear Sill y

Max: 163.3 [g] at 0.005 [s]

Min: -31.2 [g] at 0.037 [s]

B-81

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A4 Left Rear Sill y Velocity

Max: 36.7 [kph] at 0.028 [s]

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



B-82

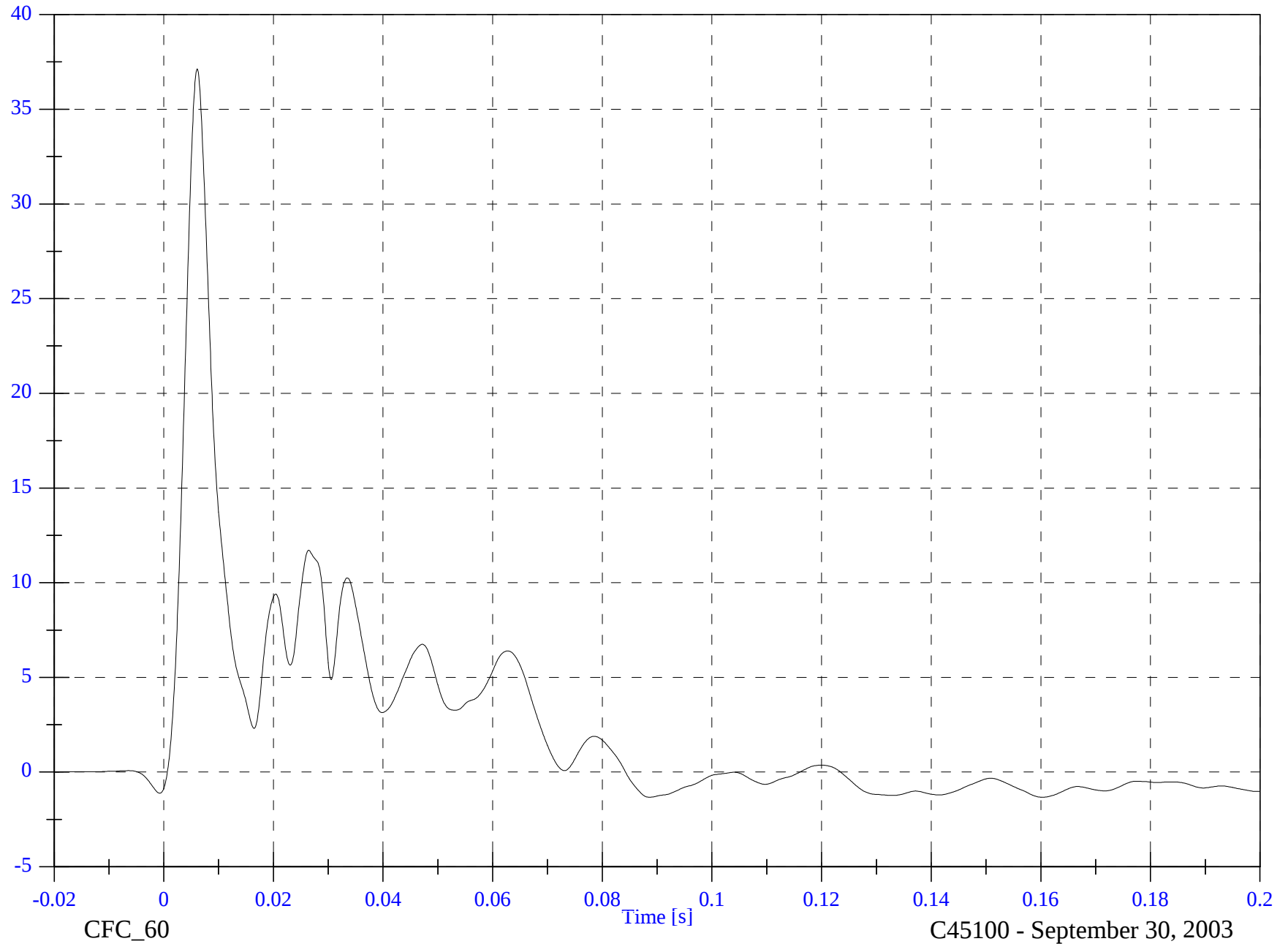
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A5 Left Front Sill y

Max: 37.1 [g] at 0.006 [s]

Min: -1.3 [g] at 0.160 [s]



B-83

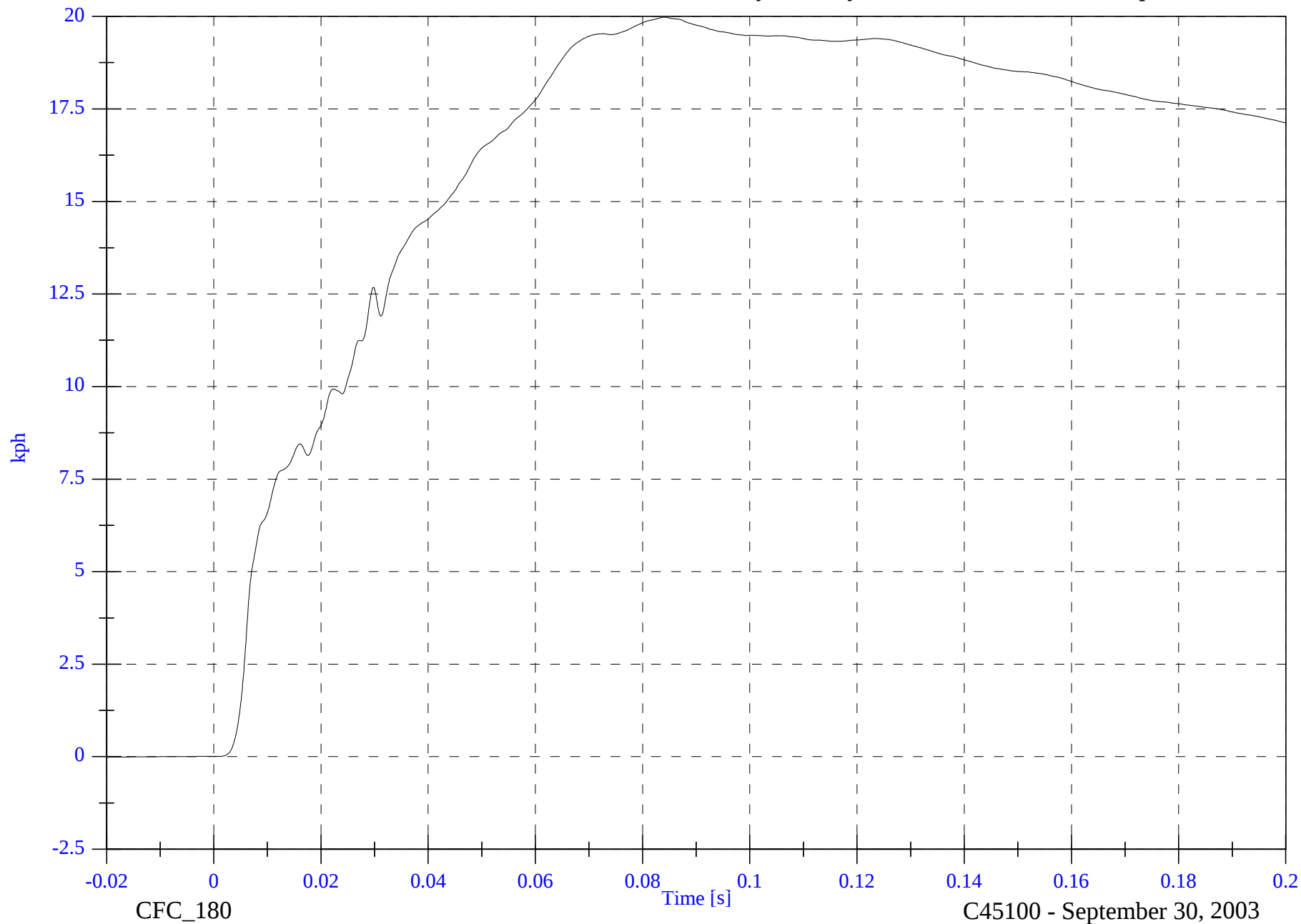
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 20.0 [kph] at 0.084 [s]

V2 A5 Left Front Sill y Velocity

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



B-84

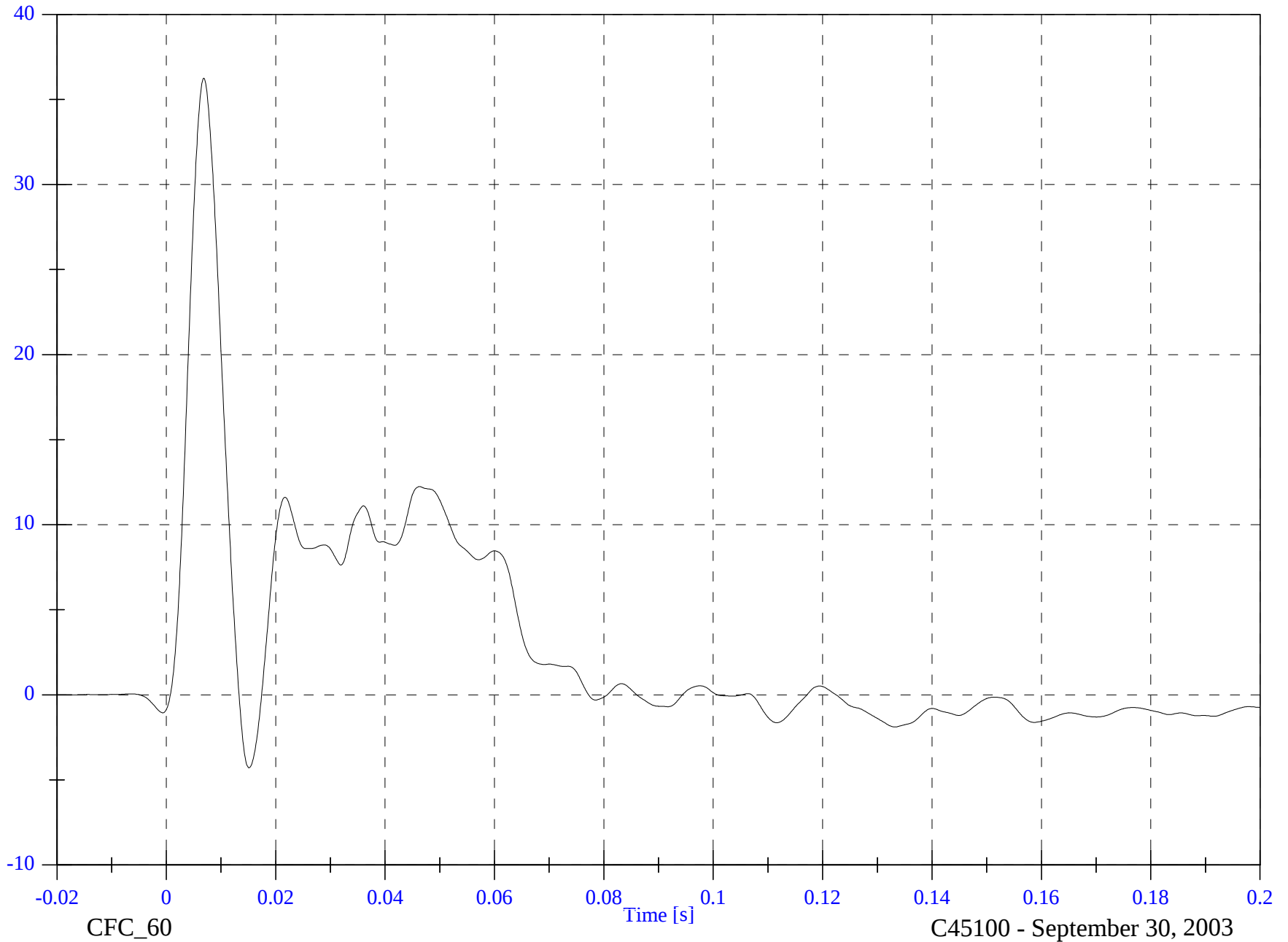
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A7 Right Rear Compartment y

Max: 36.3 [g] at 0.007 [s]

Min: -4.3 [g] at 0.015 [s]



B-85

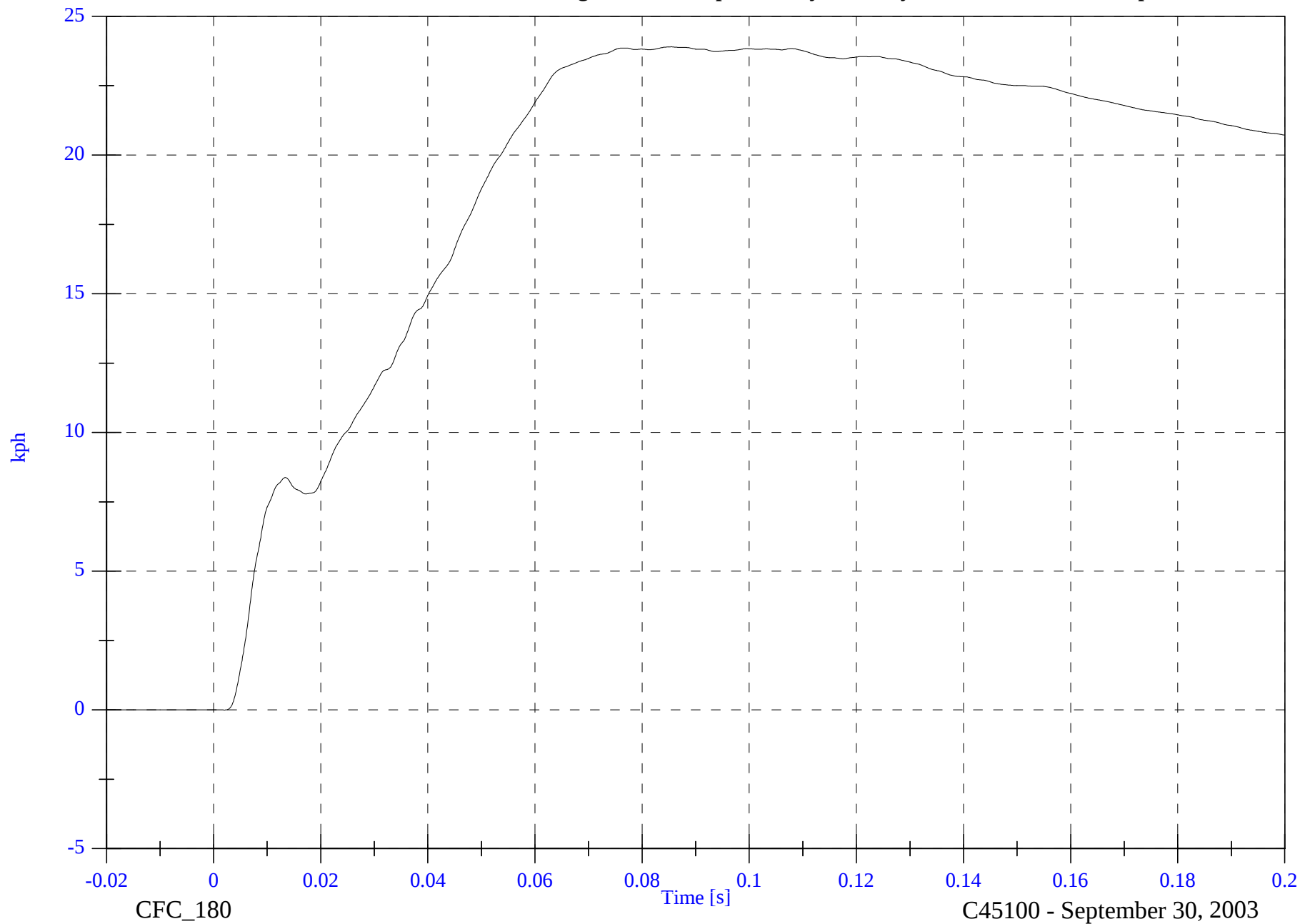
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 23.9 [kph] at 0.085 [s]

V2 A7 Right Rear Compartment y Velocity

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



B-86

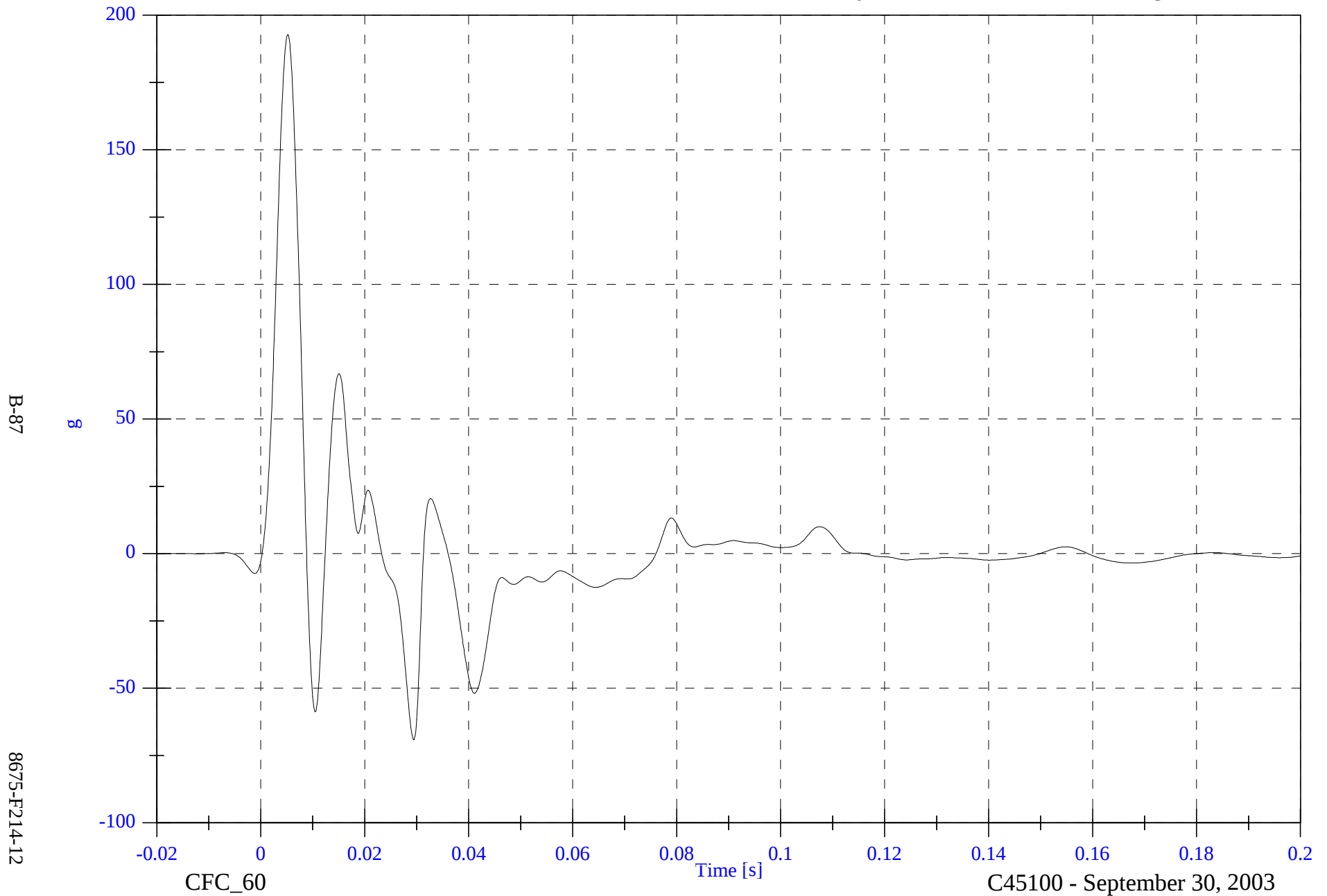
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A12 Left Lower B Post y

Max: 192.9 [g] at 0.005 [s]

Min: -69.1 [g] at 0.029 [s]

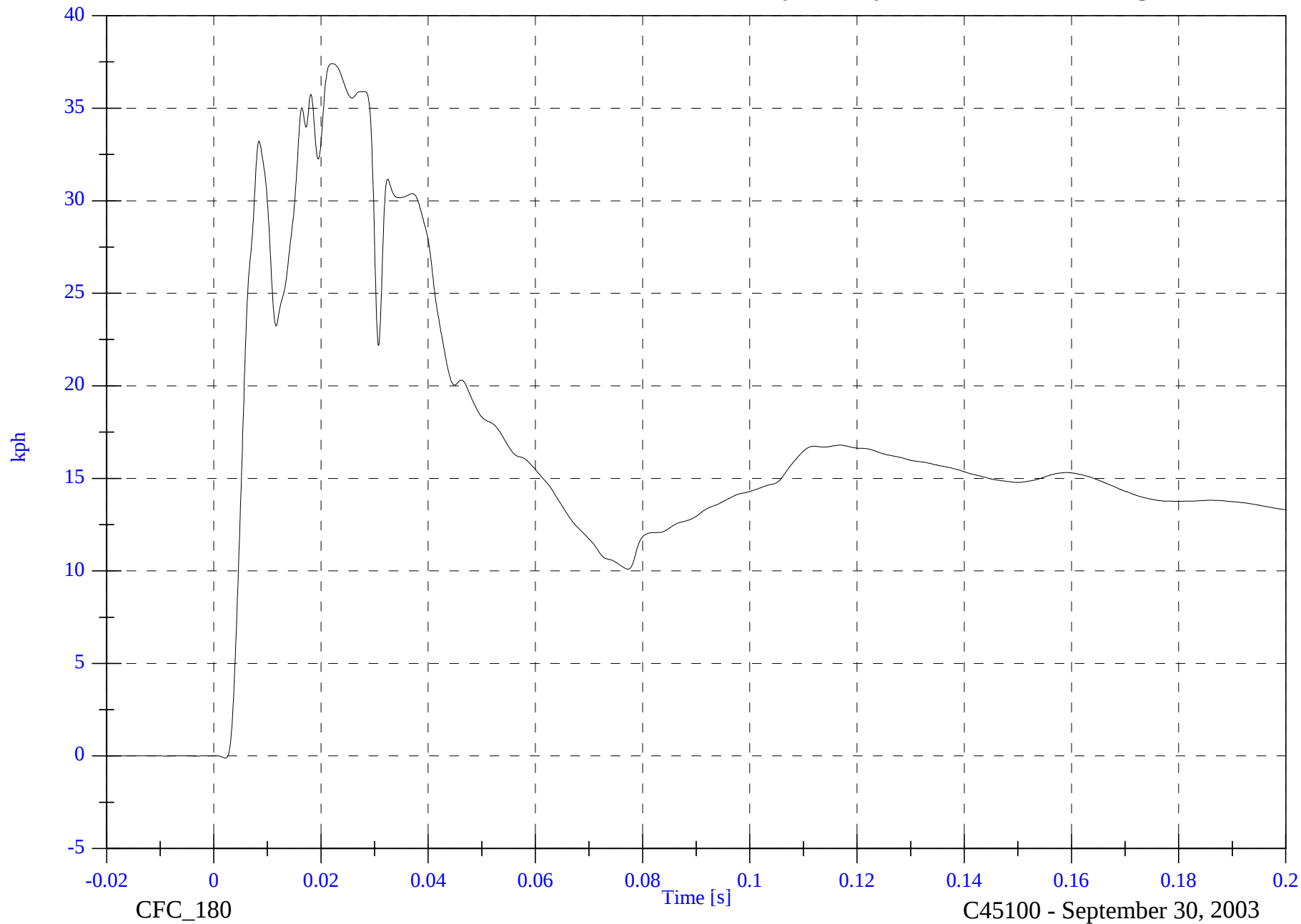


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A12 Left Lower B Post y Velocity

Max: 37.4 [kph] at 0.022 [s]

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



B-88

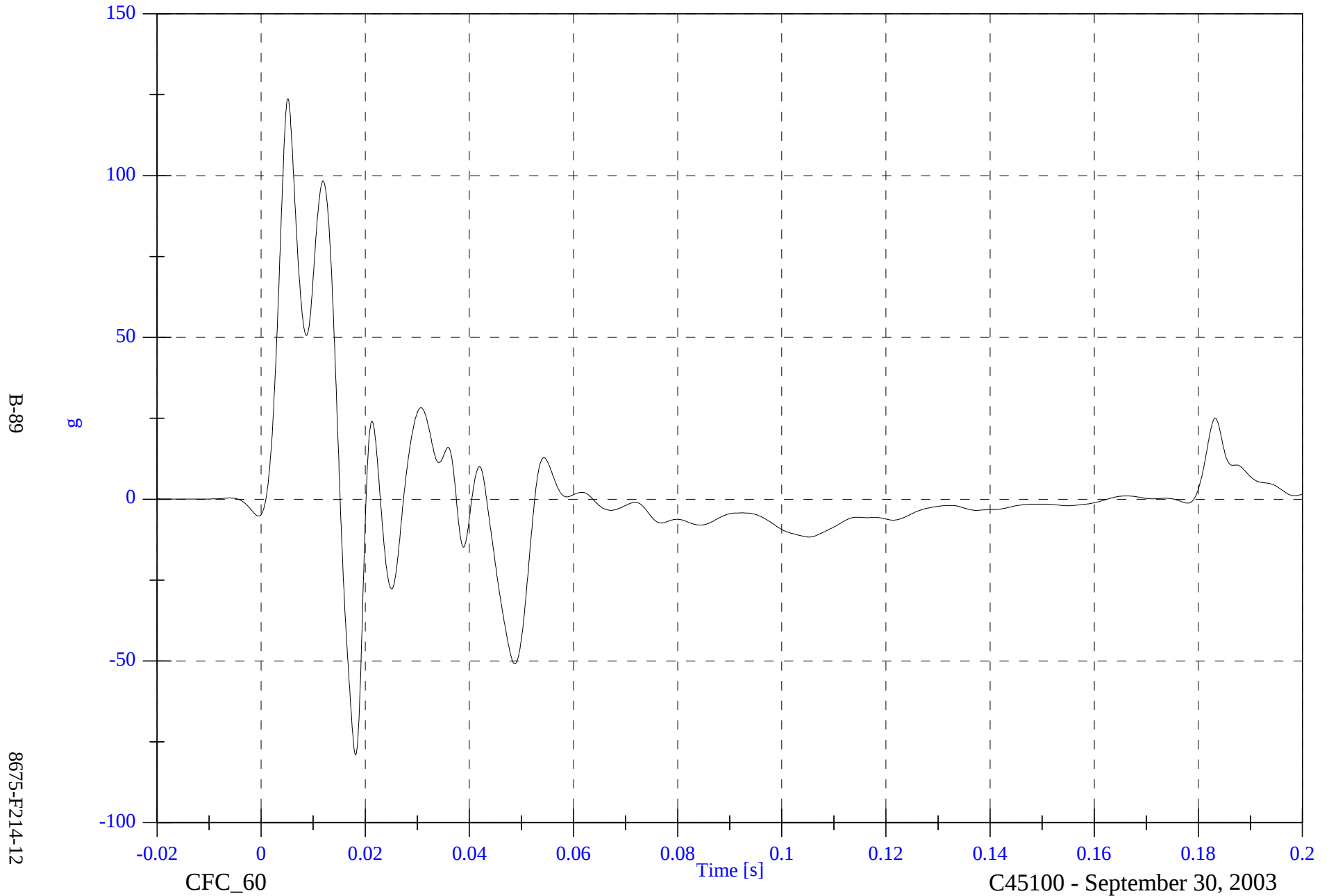
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A13 Left Middle B Post y

Max: 123.8 [g] at 0.005 [s]

Min: -79.0 [g] at 0.018 [s]



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

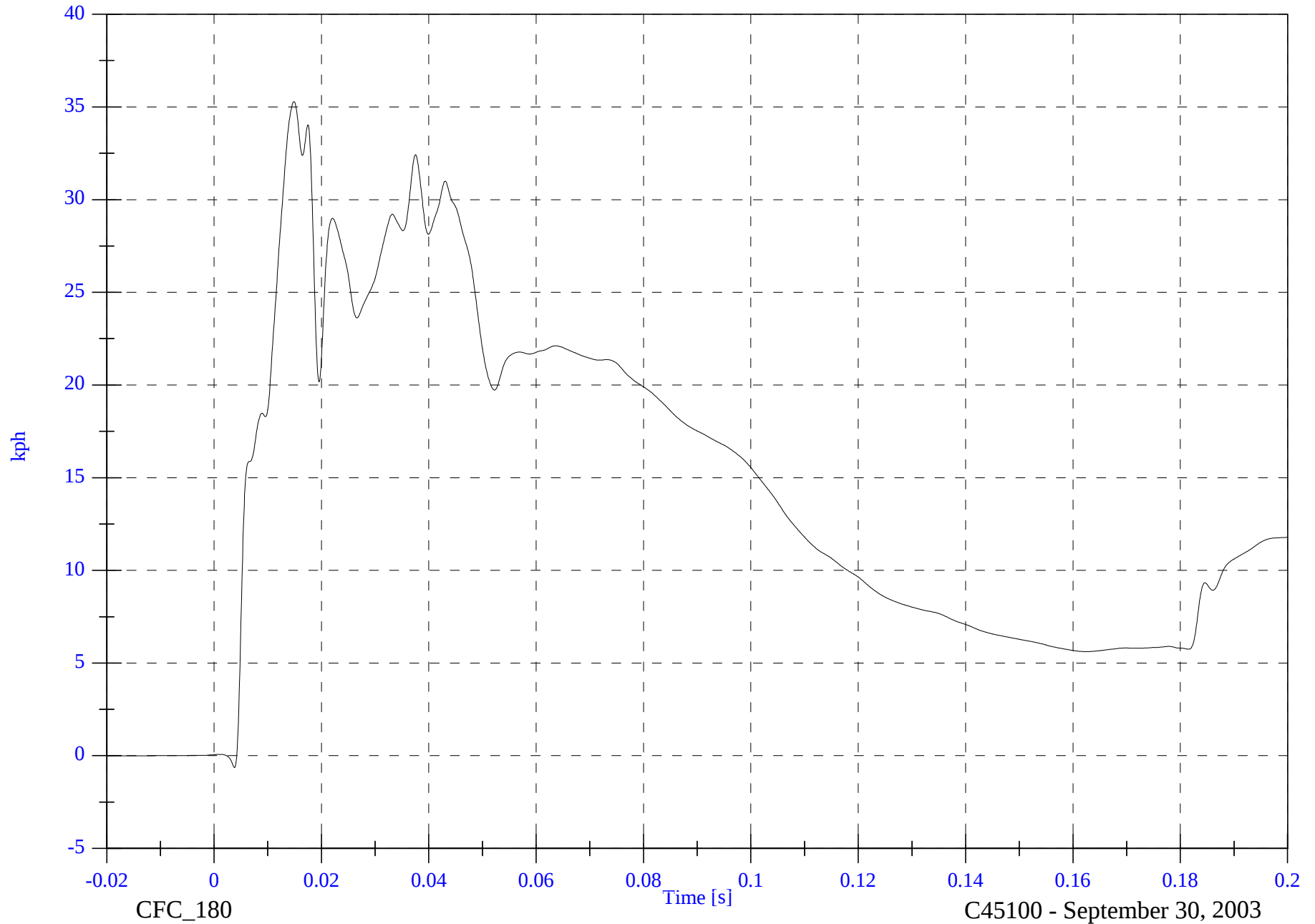
V2 A13 Left Middle B Post y Velocity

Max: 35.3 [kph] at 0.015 [s]

Min: -0.6 [kph] at 0.004 [s]

B-90

8675-F214-12

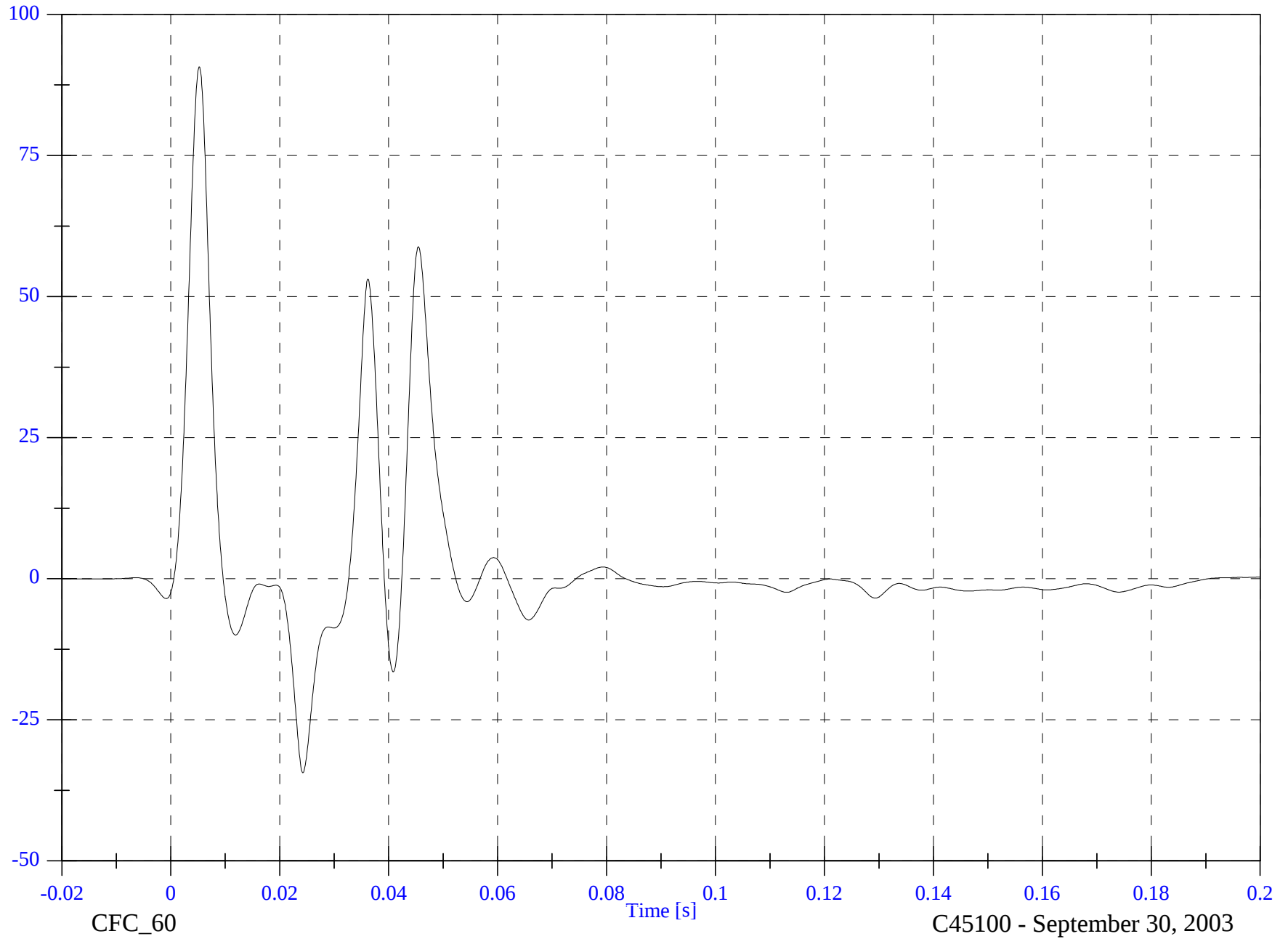


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A14 Left Lower A Post y

Max: 90.7 [g] at 0.005 [s]

Min: -34.4 [g] at 0.024 [s]



B-91

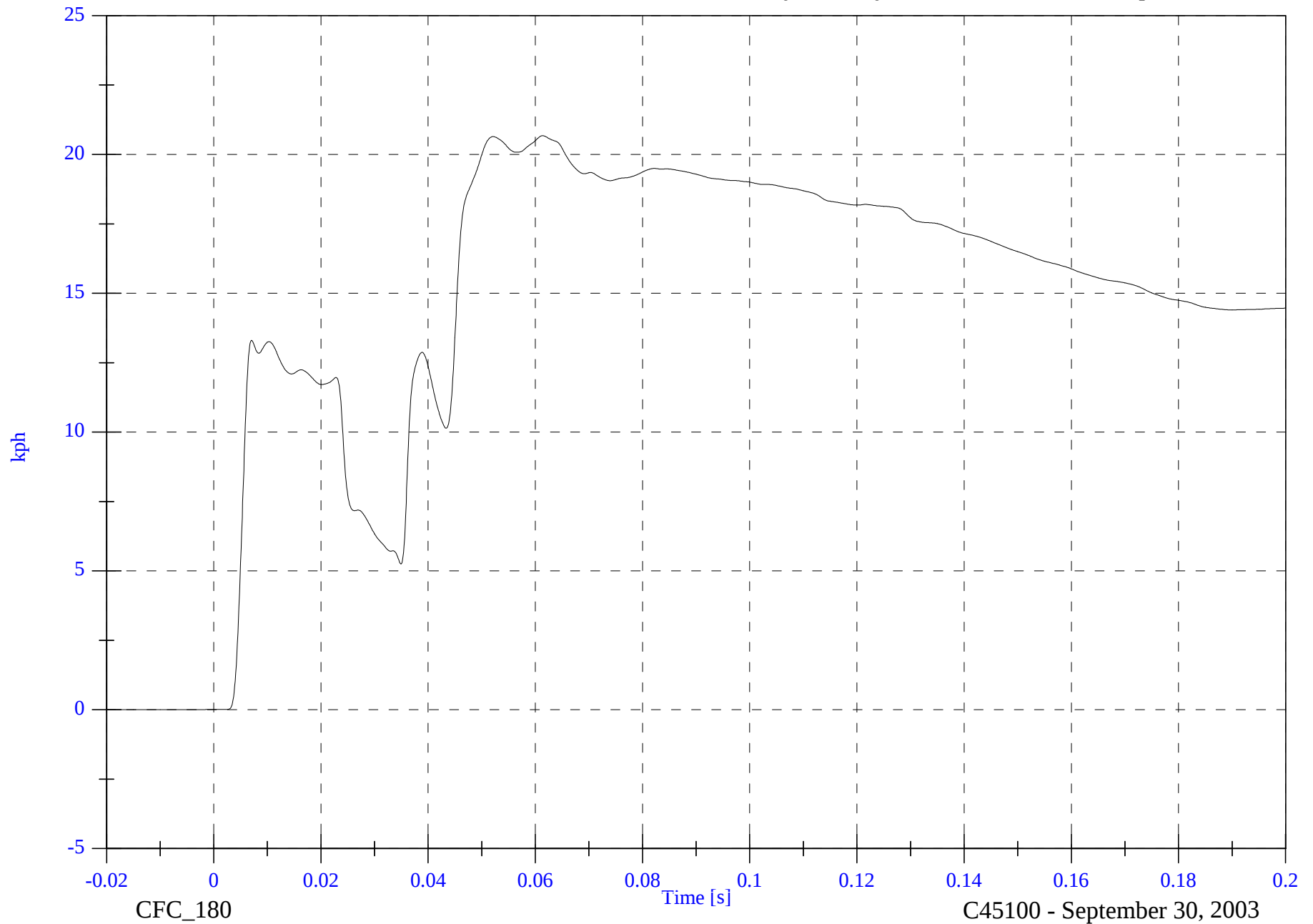
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 20.7 [kph] at 0.061 [s]

V2 A14 Left Lower A Post y Velocity

Min: -0.0 [kph] at -0.008 [s]



B-92

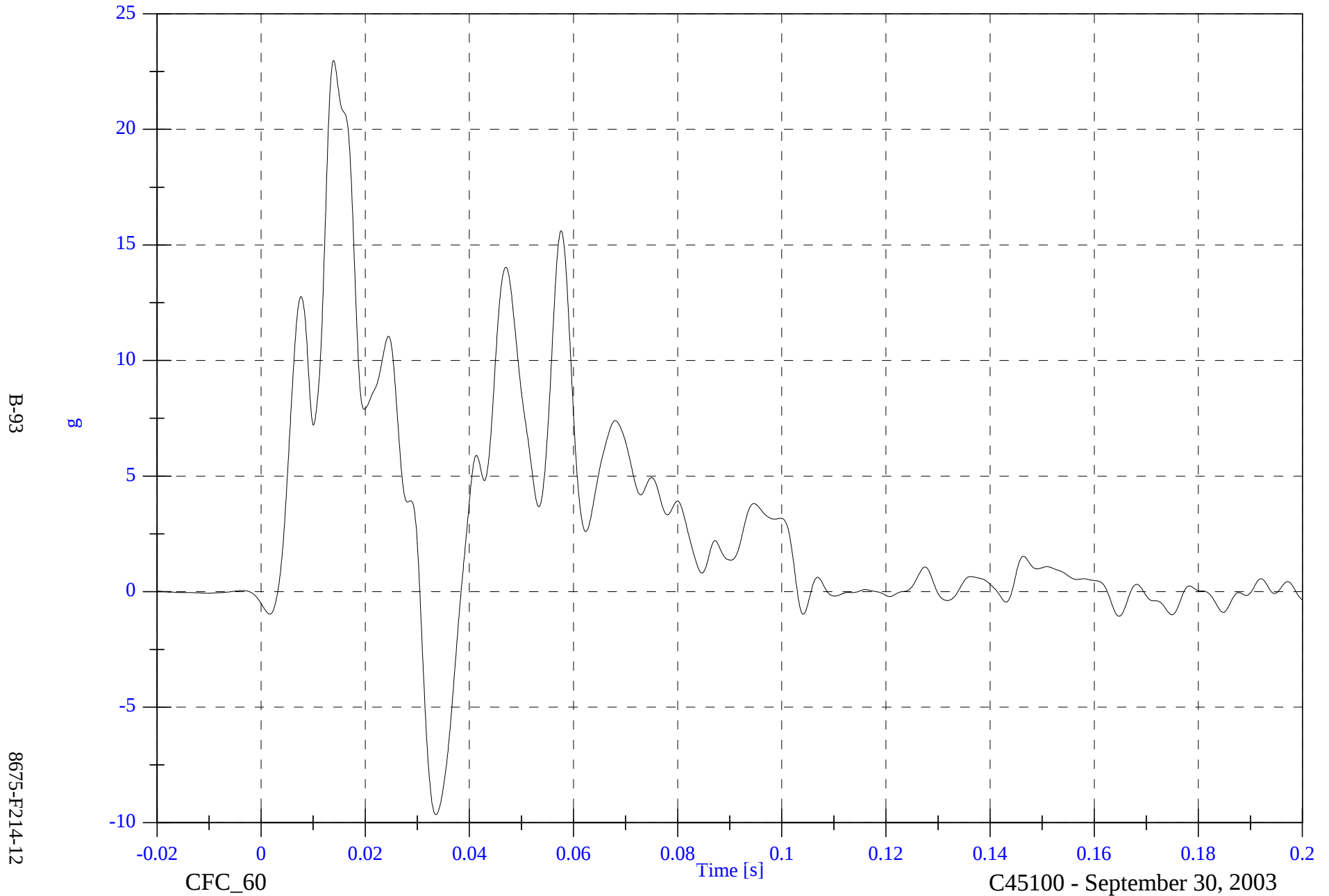
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A15 Left Mid A Post y

Max: 23.0 [g] at 0.014 [s]

Min: -9.7 [g] at 0.034 [s]

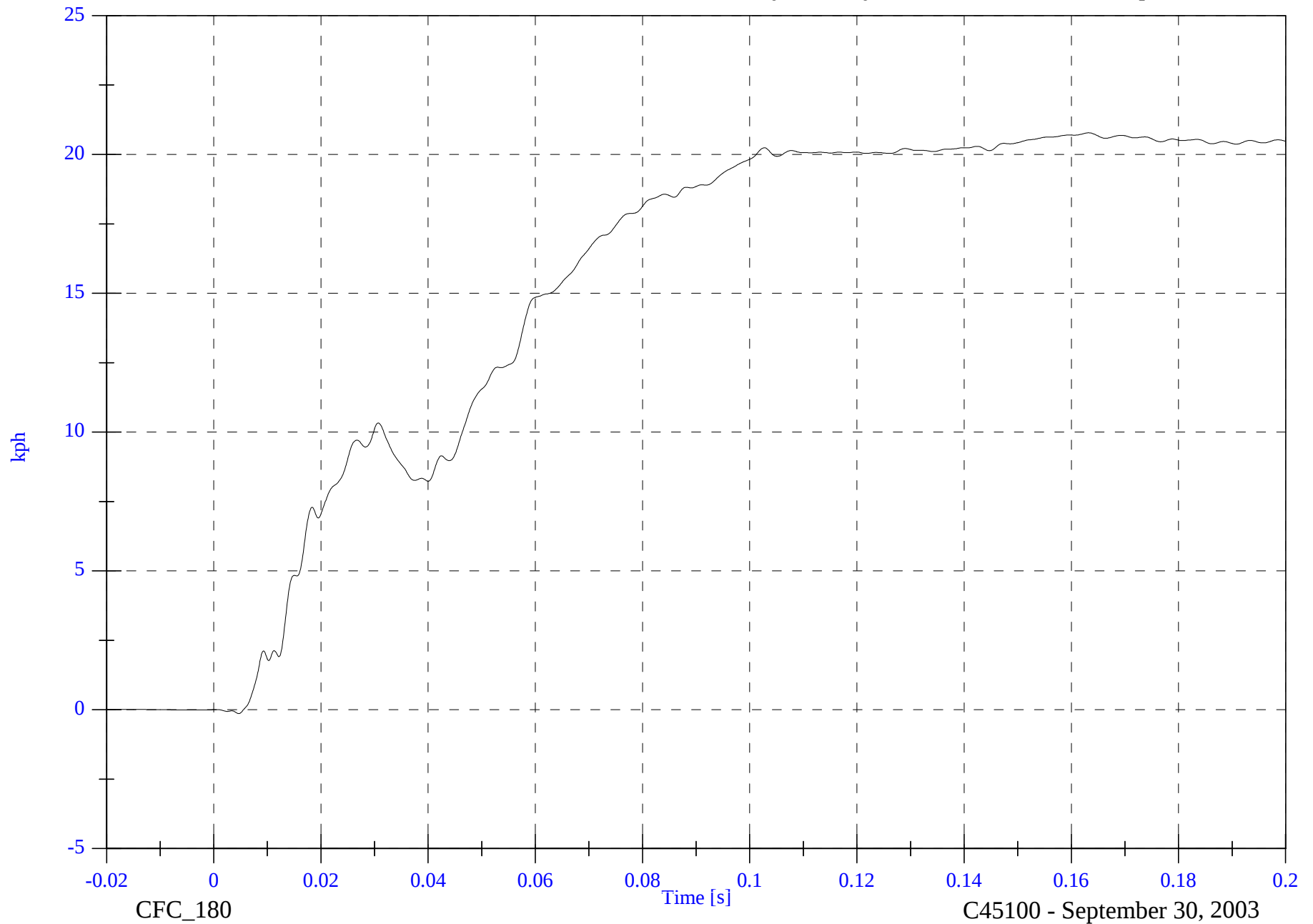


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 20.8 [kph] at 0.163 [s]

V2 A15 Left Mid A Post y Velocity

Min: -0.1 [kph] at 0.005 [s]



B-94

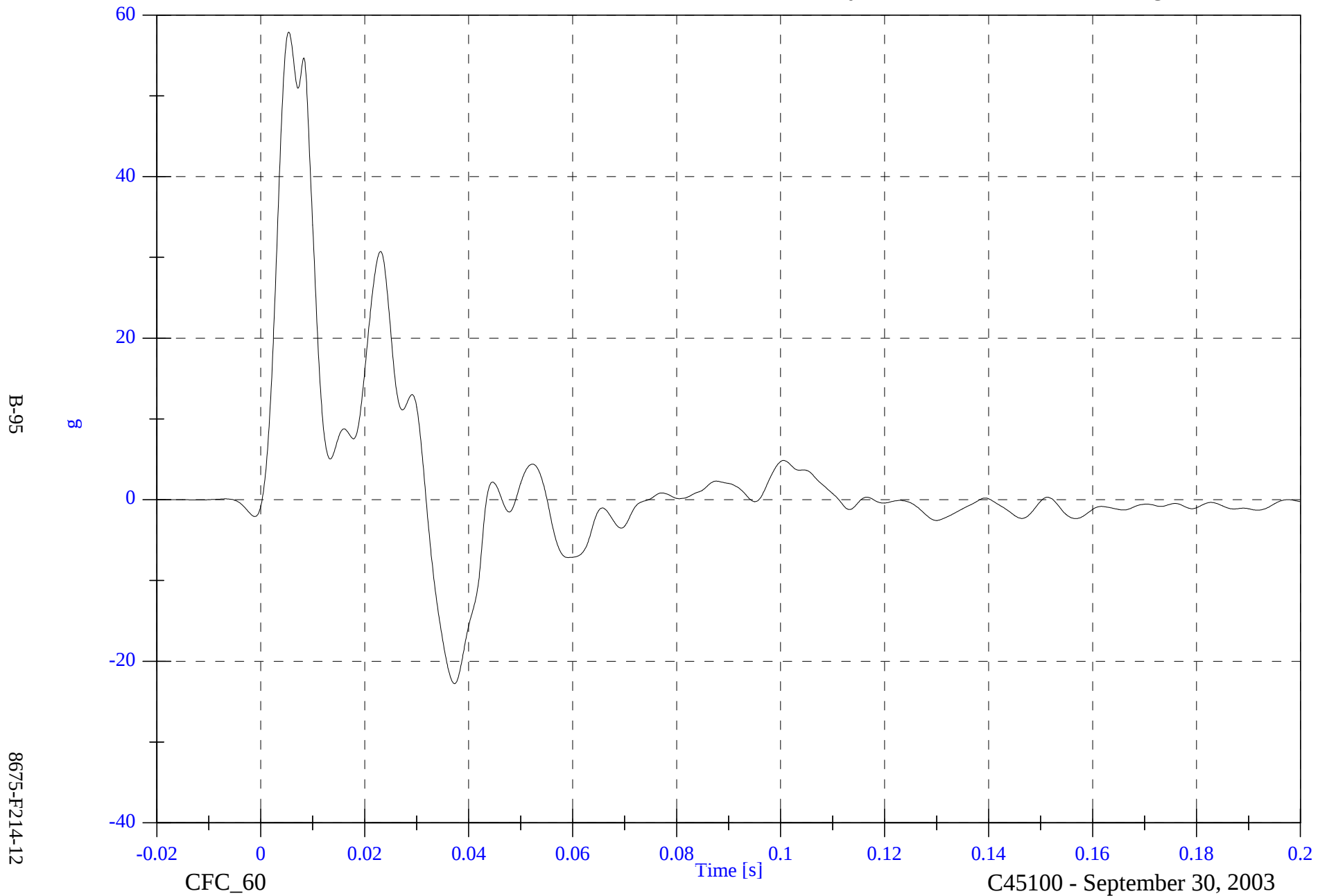
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A16 Front Seat Track y

Max: 57.9 [g] at 0.005 [s]

Min: -22.8 [g] at 0.037 [s]

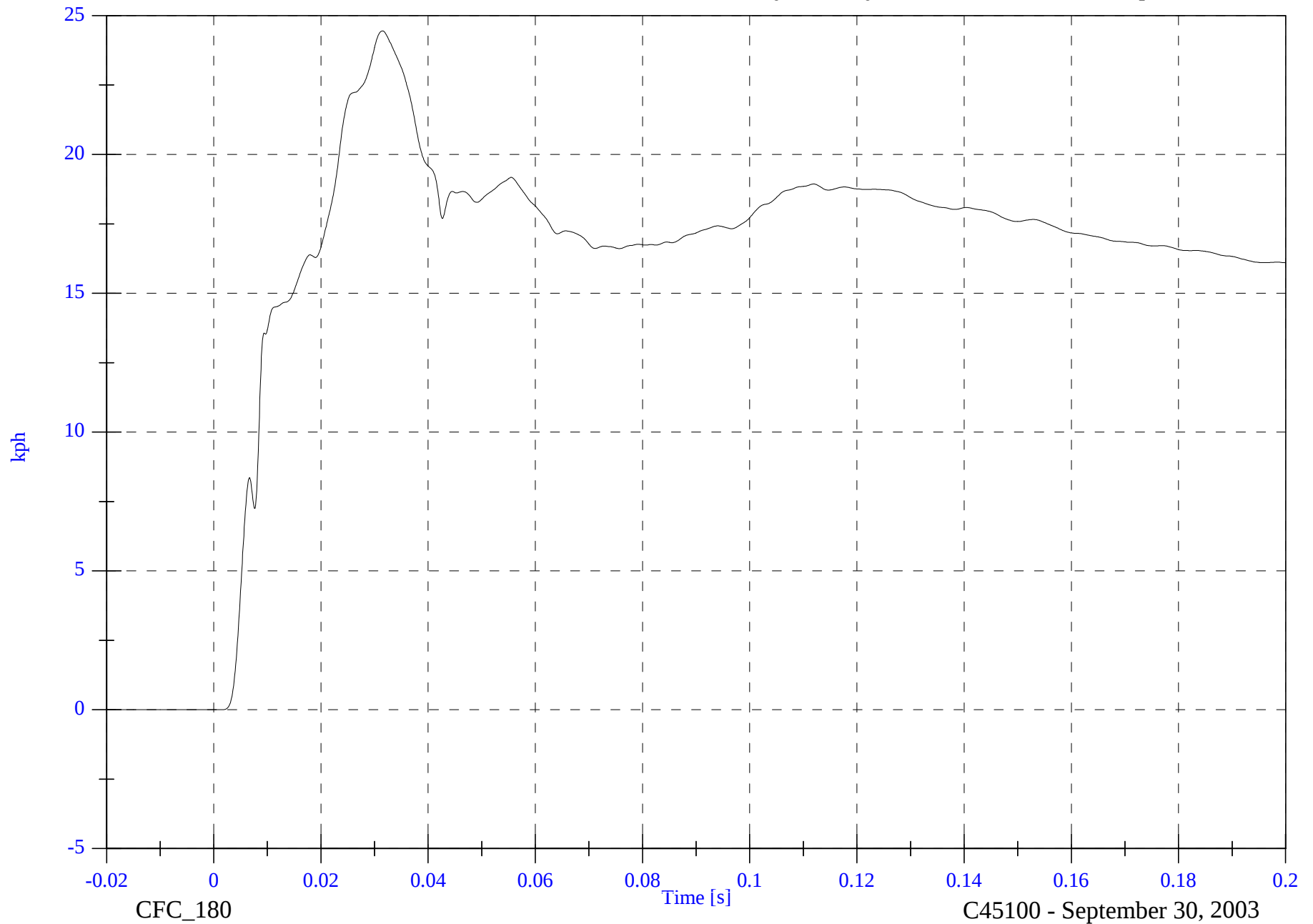


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 24.4 [kph] at 0.031 [s]

V2 A16 Front Seat Track y Velocity

Min: -0.0 [kph] at -0.020 [s]



B-96

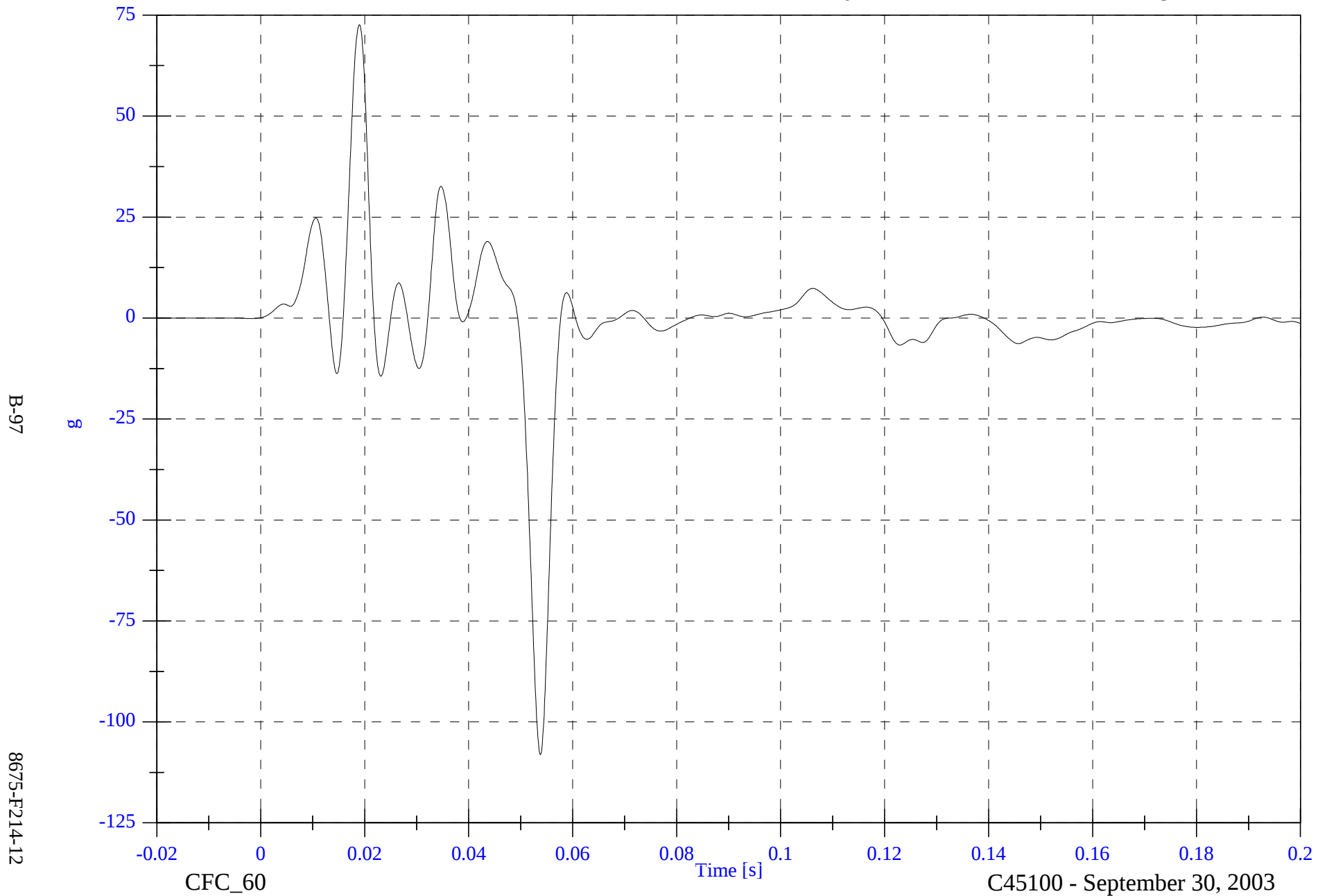
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A17 Rear Seat Track y

Max: 72.7 [g] at 0.019 [s]

Min: -108.1 [g] at 0.054 [s]



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

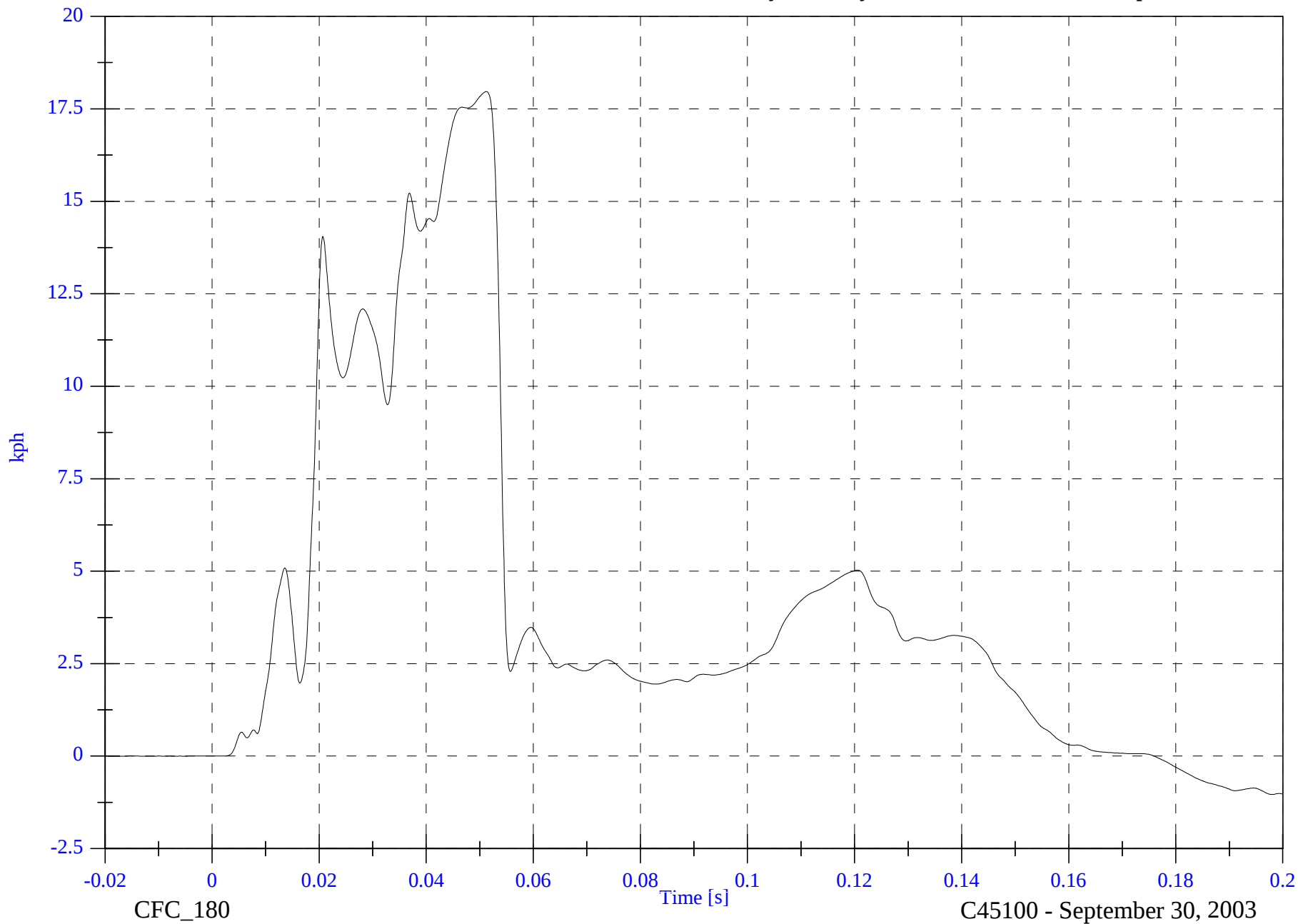
V2 A17 Rear Seat Track y Velocity

Max: 18.0 [kph] at 0.051 [s]

Min: -1.0 [kph] at 0.198 [s]

B-98

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

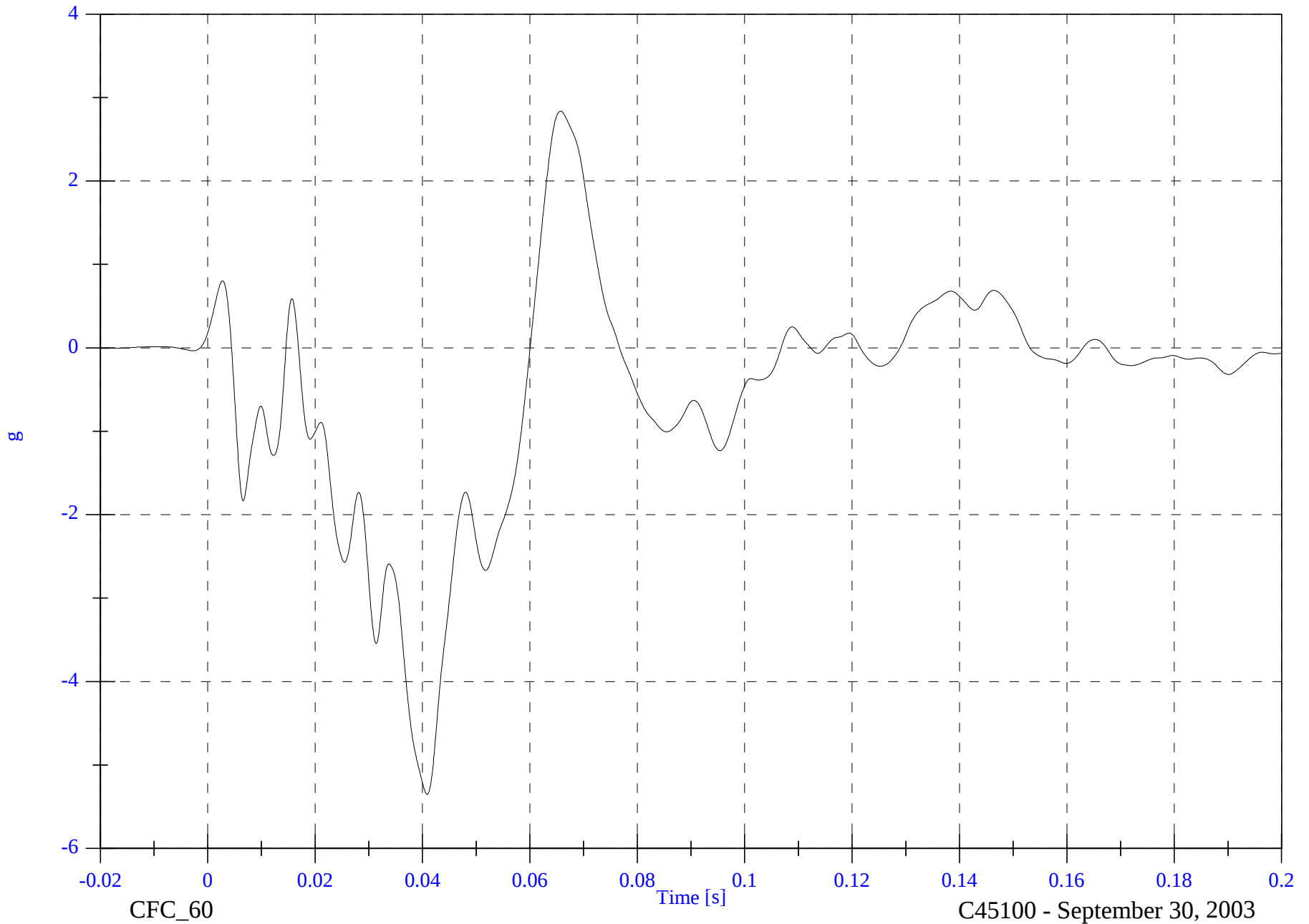
V2 A18 Target CG x

Max: 2.8 [g] at 0.066 [s]

Min: -5.4 [g] at 0.041 [s]

B-99

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A18 Target CG x Velocity

Max: 0.2 [kph] at 0.005 [s]

Min: -4.1 [kph] at 0.060 [s]



B-100

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

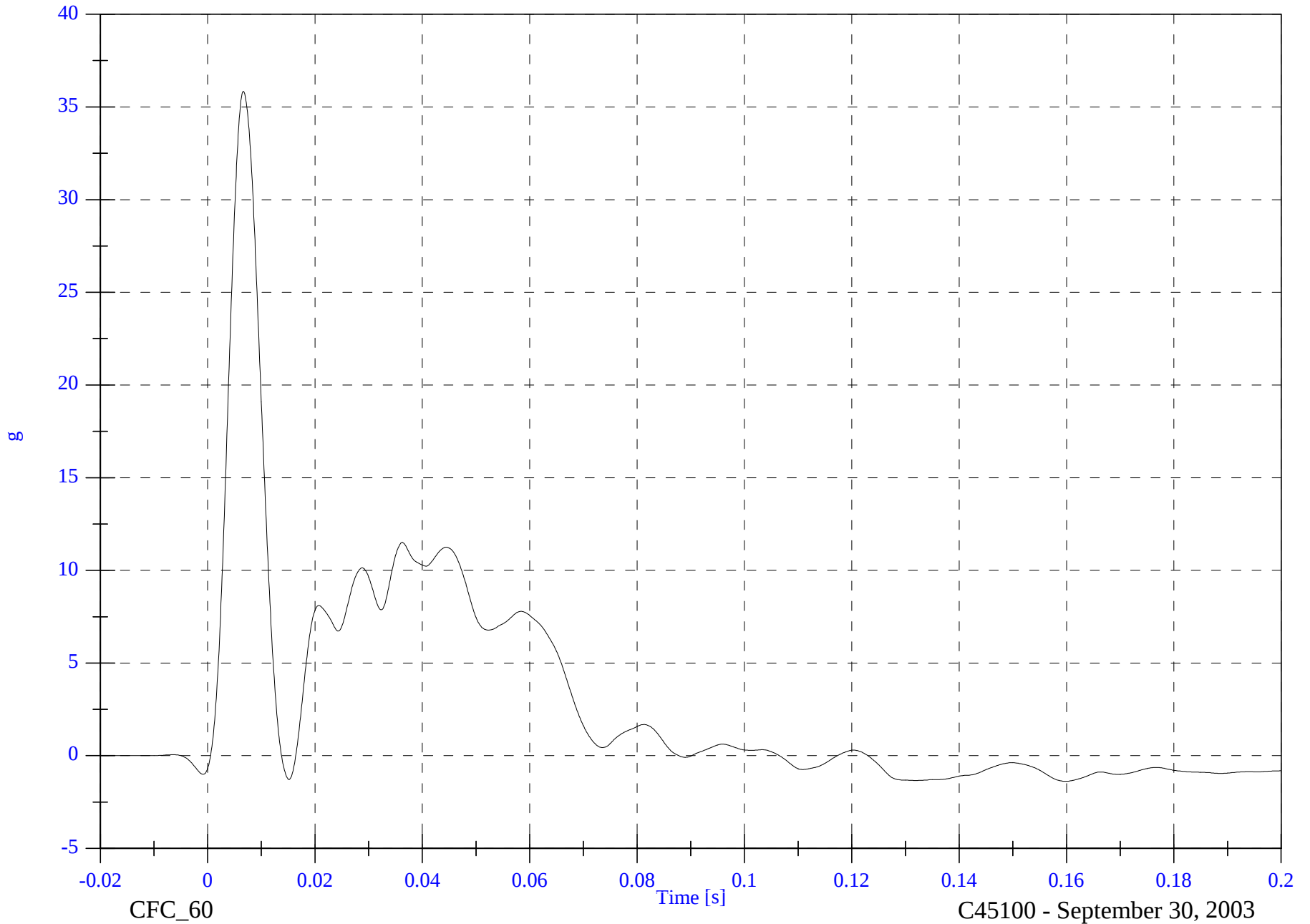
V2 A18 Target CG y

Max: 35.8 [g] at 0.007 [s]

Min: -1.4 [g] at 0.160 [s]

B-101

8675-F214-12

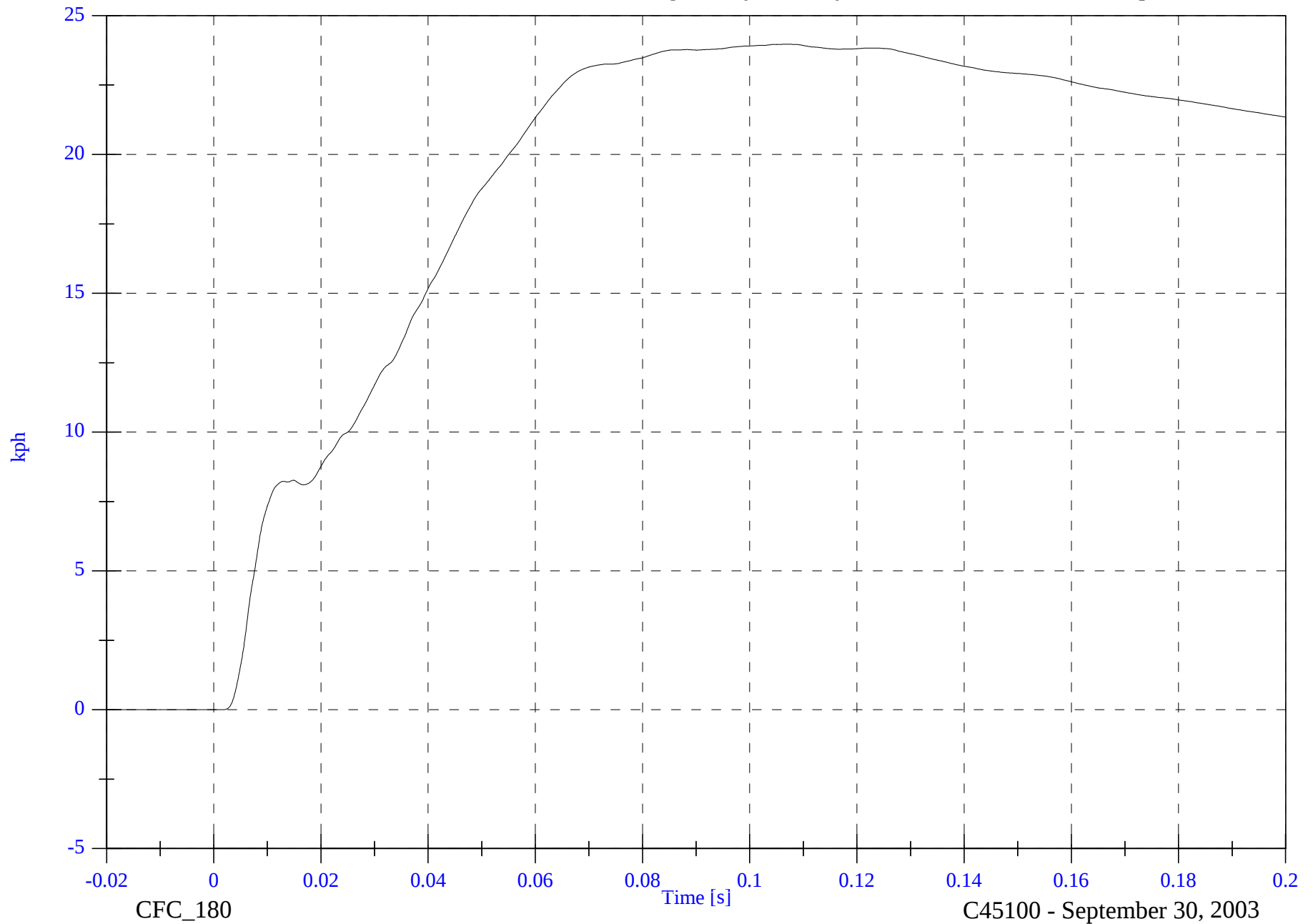


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A18 Target CG y Velocity

Max: 24.0 [kph] at 0.107 [s]

Min: -0.0 [kph] at -0.020 [s]



B-102

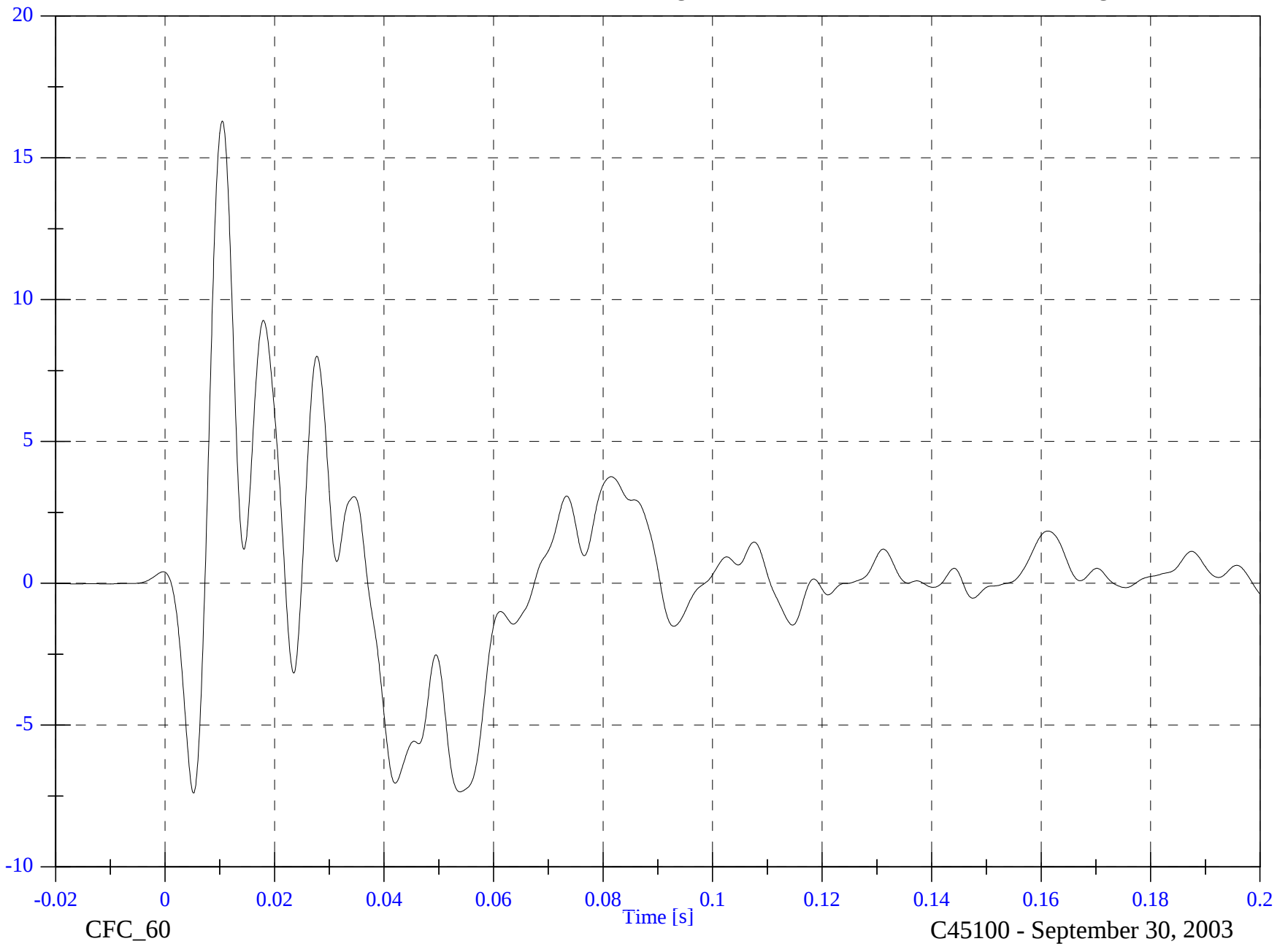
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A18 Target CG z

Max: 16.3 [g] at 0.010 [s]

Min: -7.4 [g] at 0.005 [s]



B-103

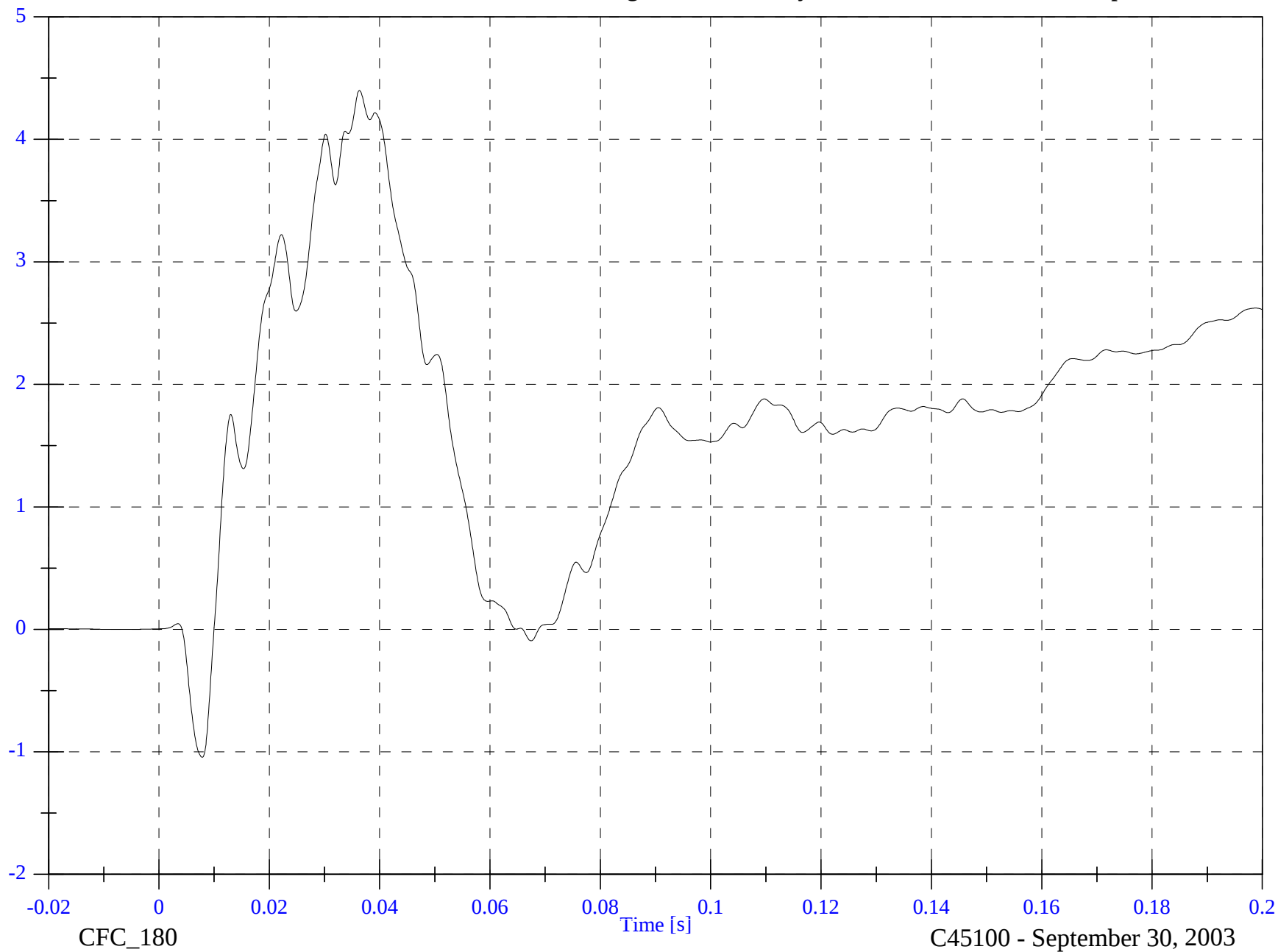
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A18 Target CG z Velocity

Max: 4.4 [kph] at 0.036 [s]

Min: -1.0 [kph] at 0.008 [s]



B-104

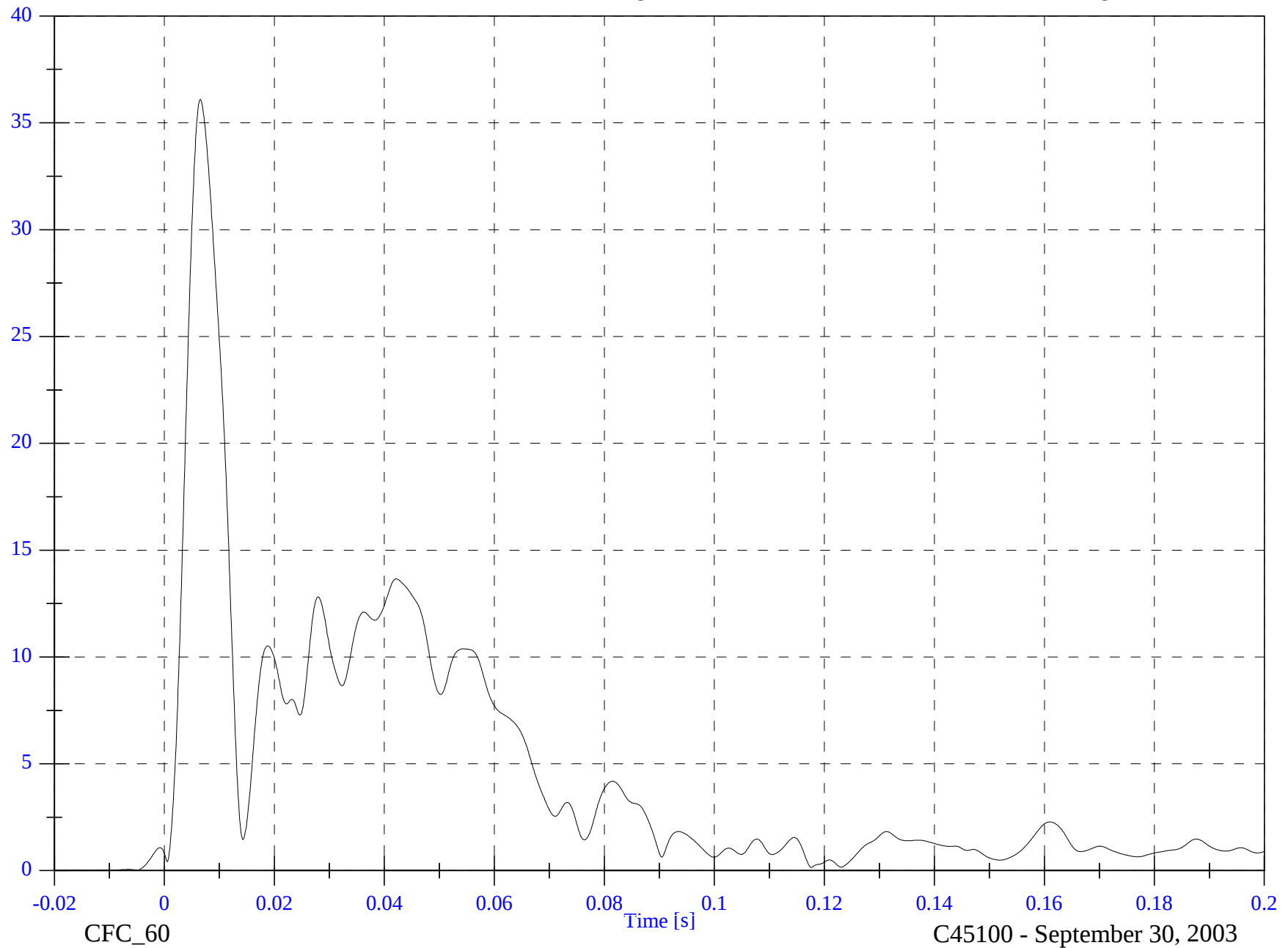
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2 A18 Target CG Resultant

Max: 36.1 [g] at 0.006 [s]

Min: 0.0 [g] at -0.005 [s]



B-105

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V1 Moving Barrier CG X

Max: 0.9 [g] at 0.126 [s]

Min: -17.6 [g] at 0.020 [s]

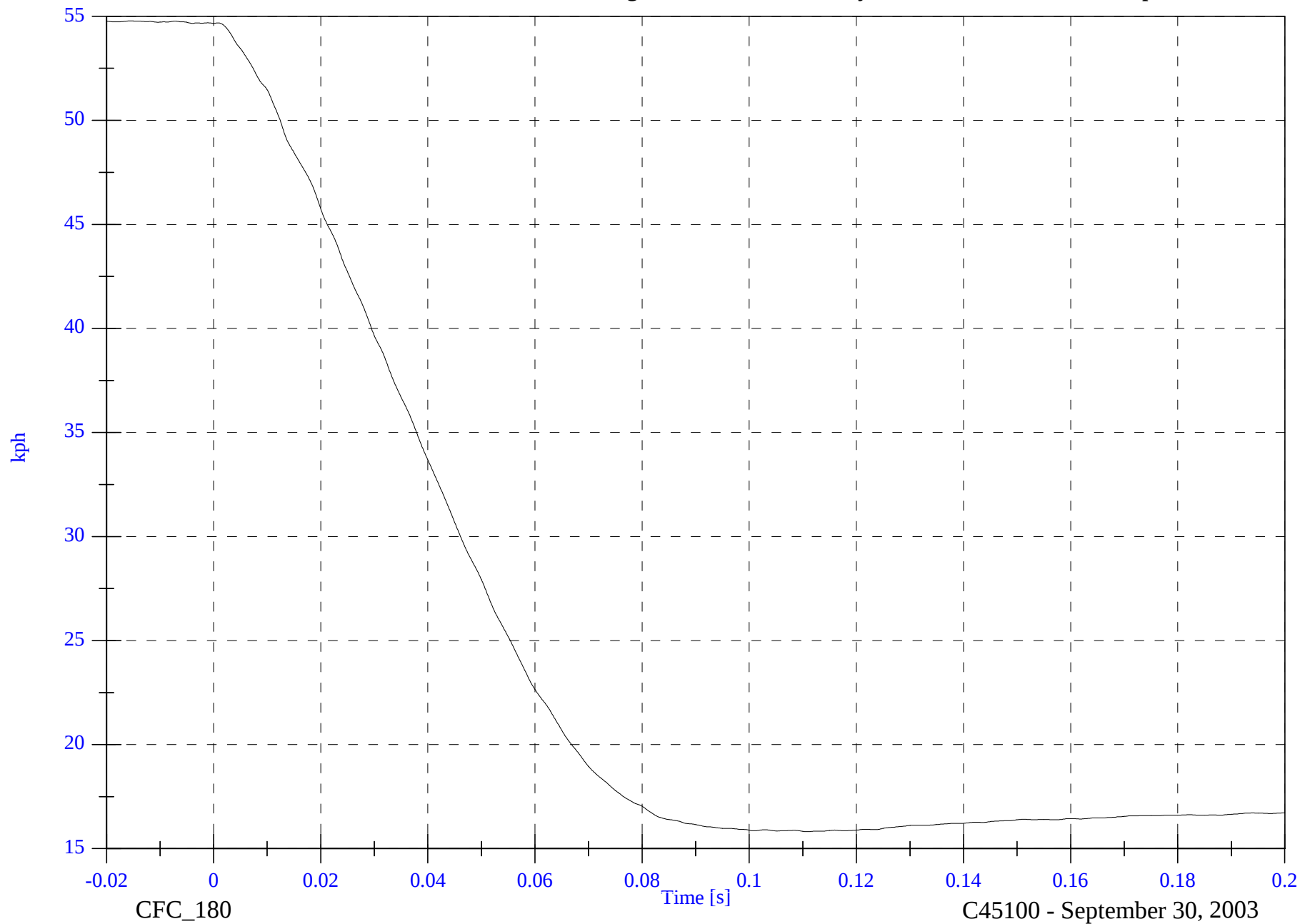


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 54.8 [kph] at -0.016 [s]

V1 Moving Barrier CG X Velocity

Min: 15.8 [kph] at 0.111 [s]



B-107

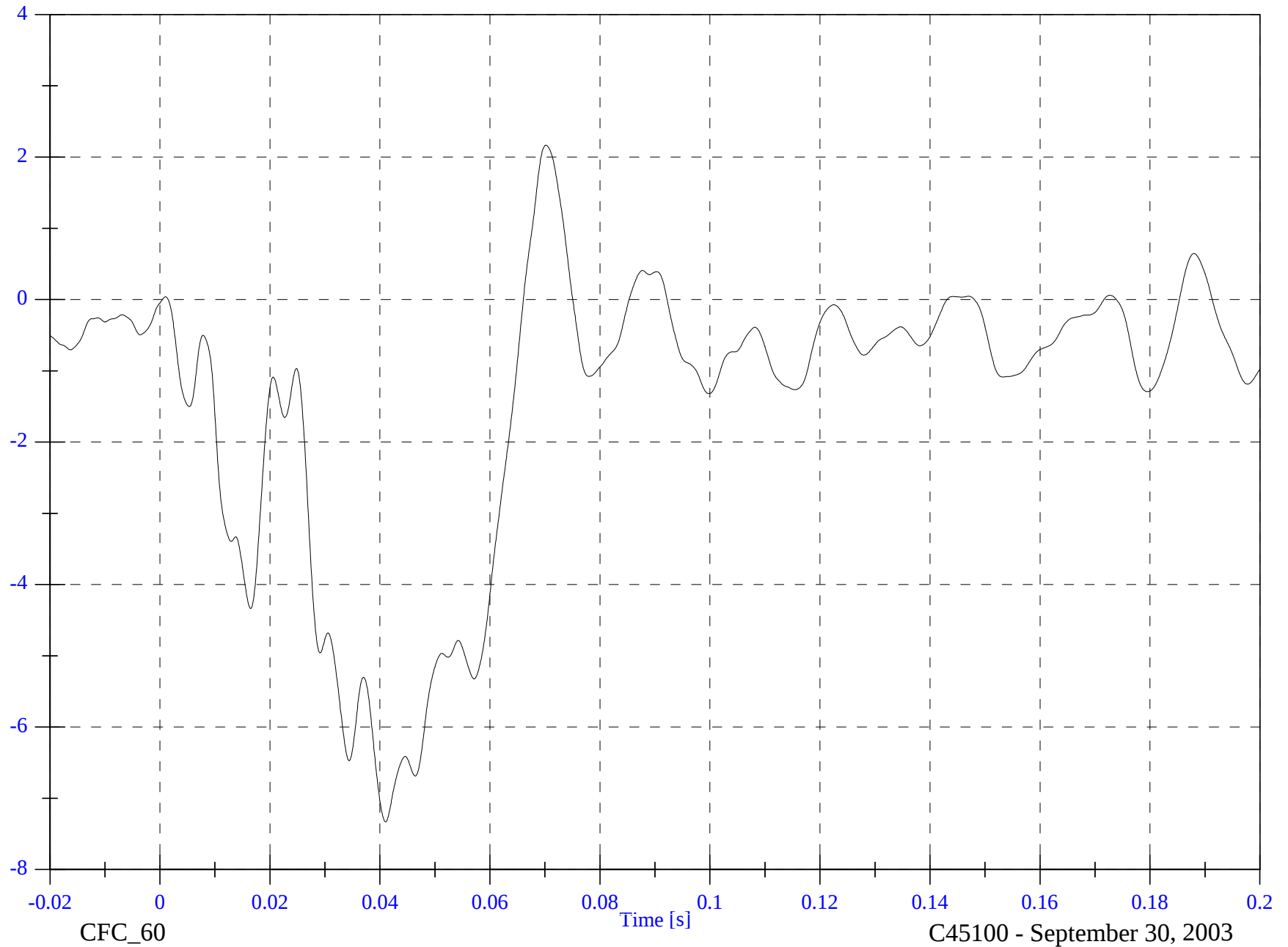
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V1 Moving Barrier CG Y

Max: 2.2 [g] at 0.070 [s]

Min: -7.3 [g] at 0.041 [s]



B-108

8675-F214-12

CFC_60

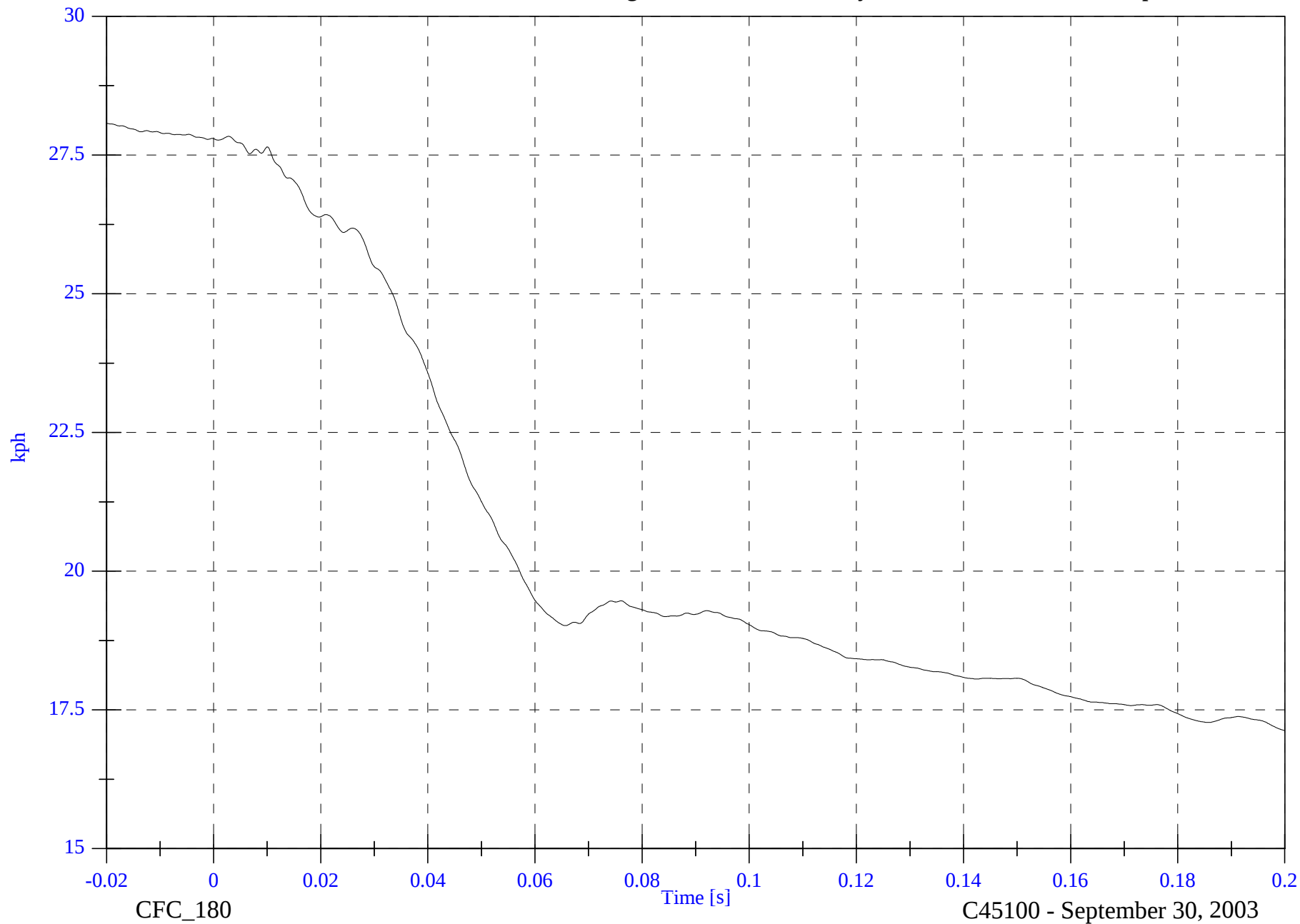
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 28.1 [kph] at -0.020 [s]

V1 Moving Barrier CG Y Velocity

Min: 17.1 [kph] at 0.200 [s]



B-109

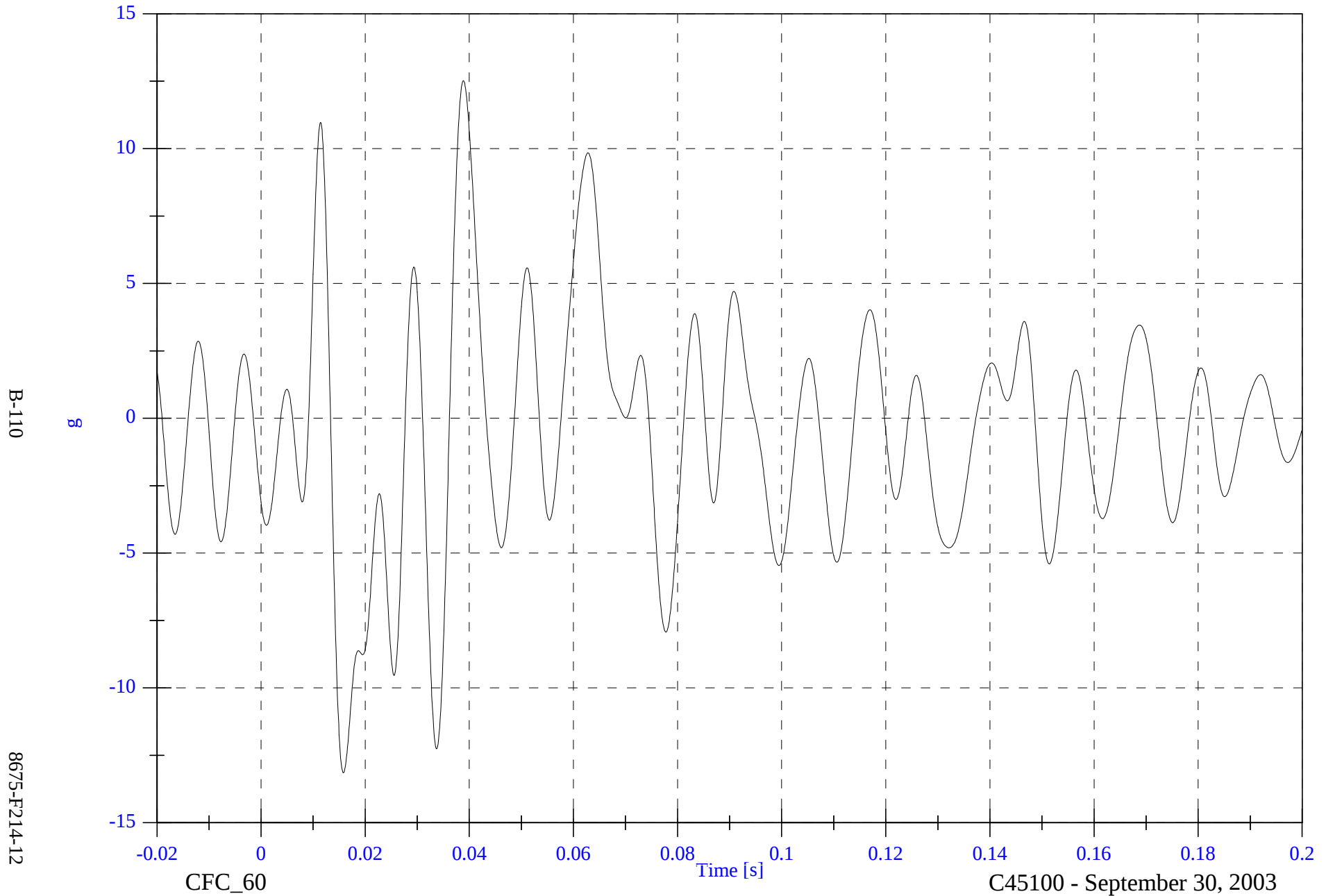
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V1 Moving Barrier CG Z

Max: 12.5 [g] at 0.039 [s]

Min: -13.1 [g] at 0.016 [s]

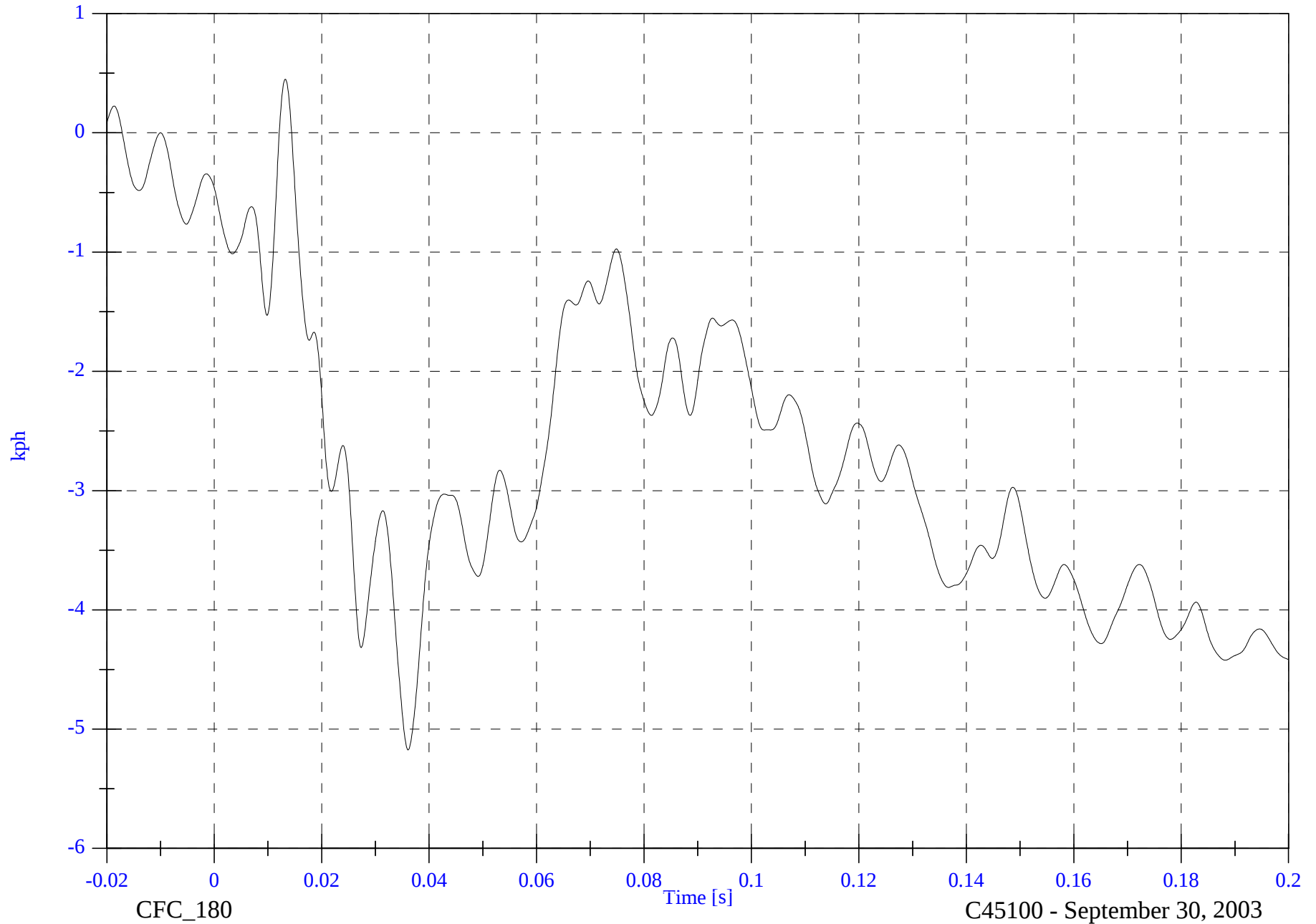


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V1 Moving Barrier CG Z Velocity

Max: 0.4 [kph] at 0.013 [s]

Min: -5.2 [kph] at 0.036 [s]



B-111

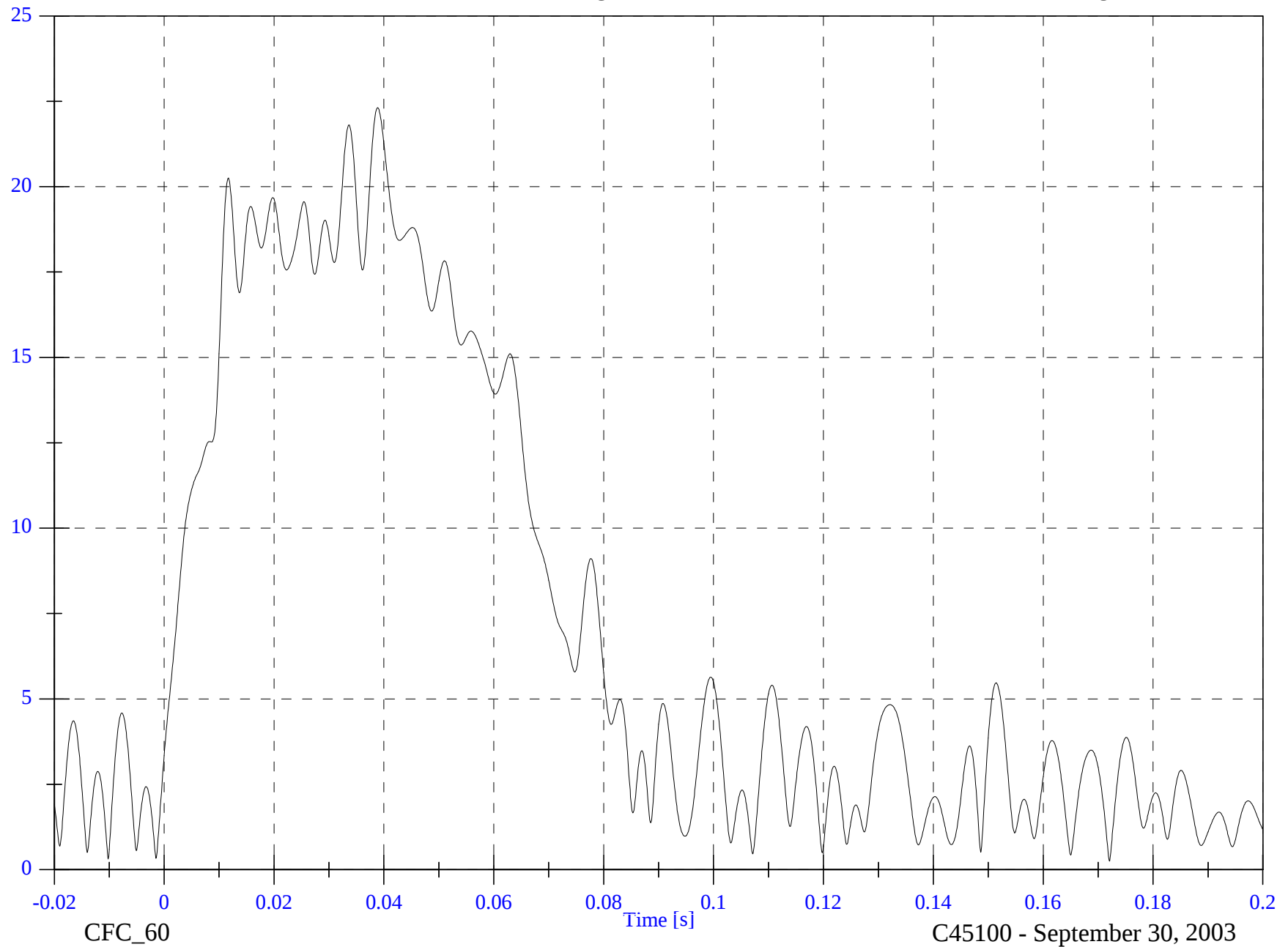
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V1 Moving Barrier CG Resultant

Max: 22.3 [g] at 0.039 [s]

Min: 0.3 [g] at 0.172 [s]



B-112

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

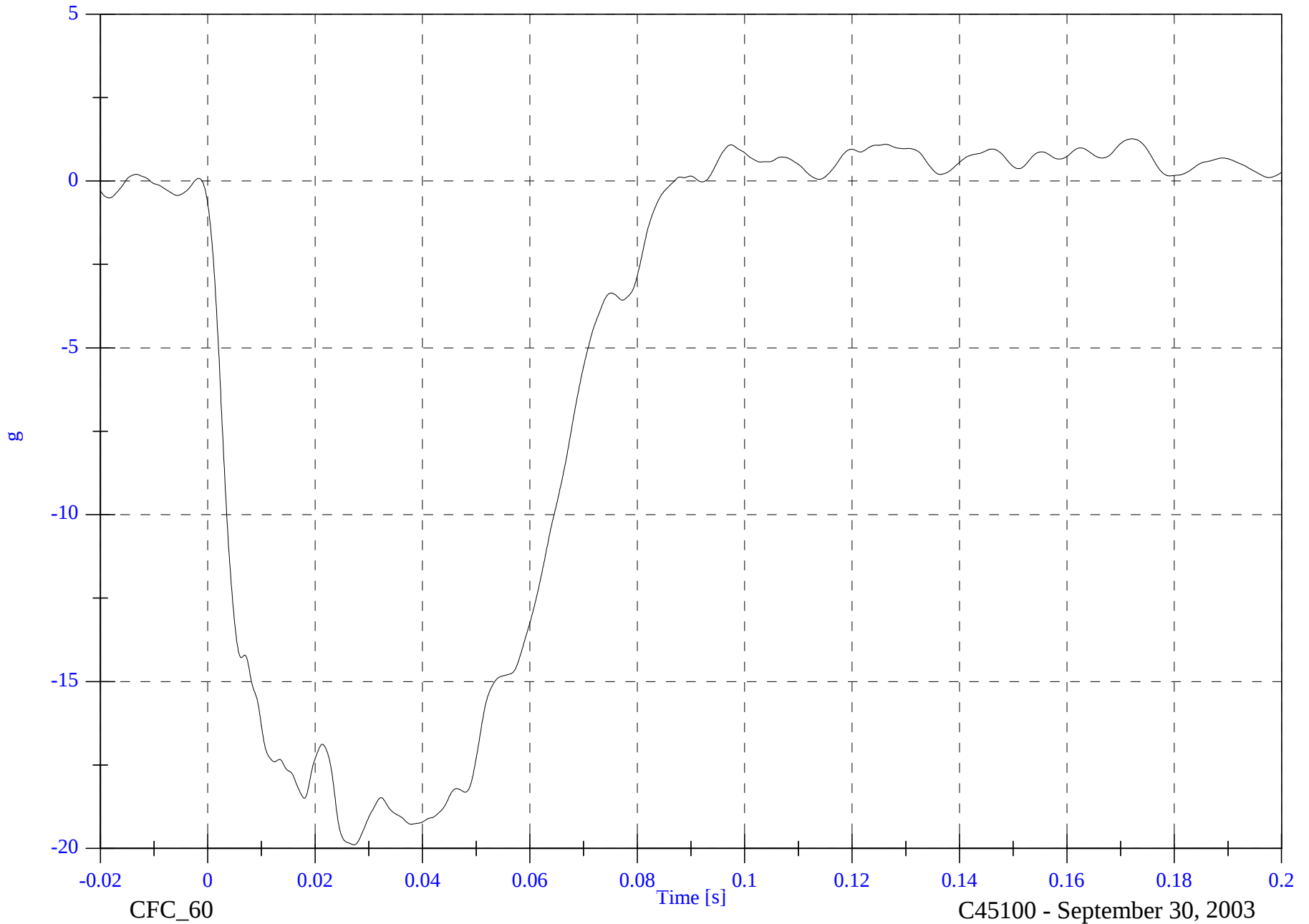
V1 Moving Barrier Left Rail X

Max: 1.3 [g] at 0.172 [s]

Min: -19.9 [g] at 0.027 [s]

B-113

8675-F214-12

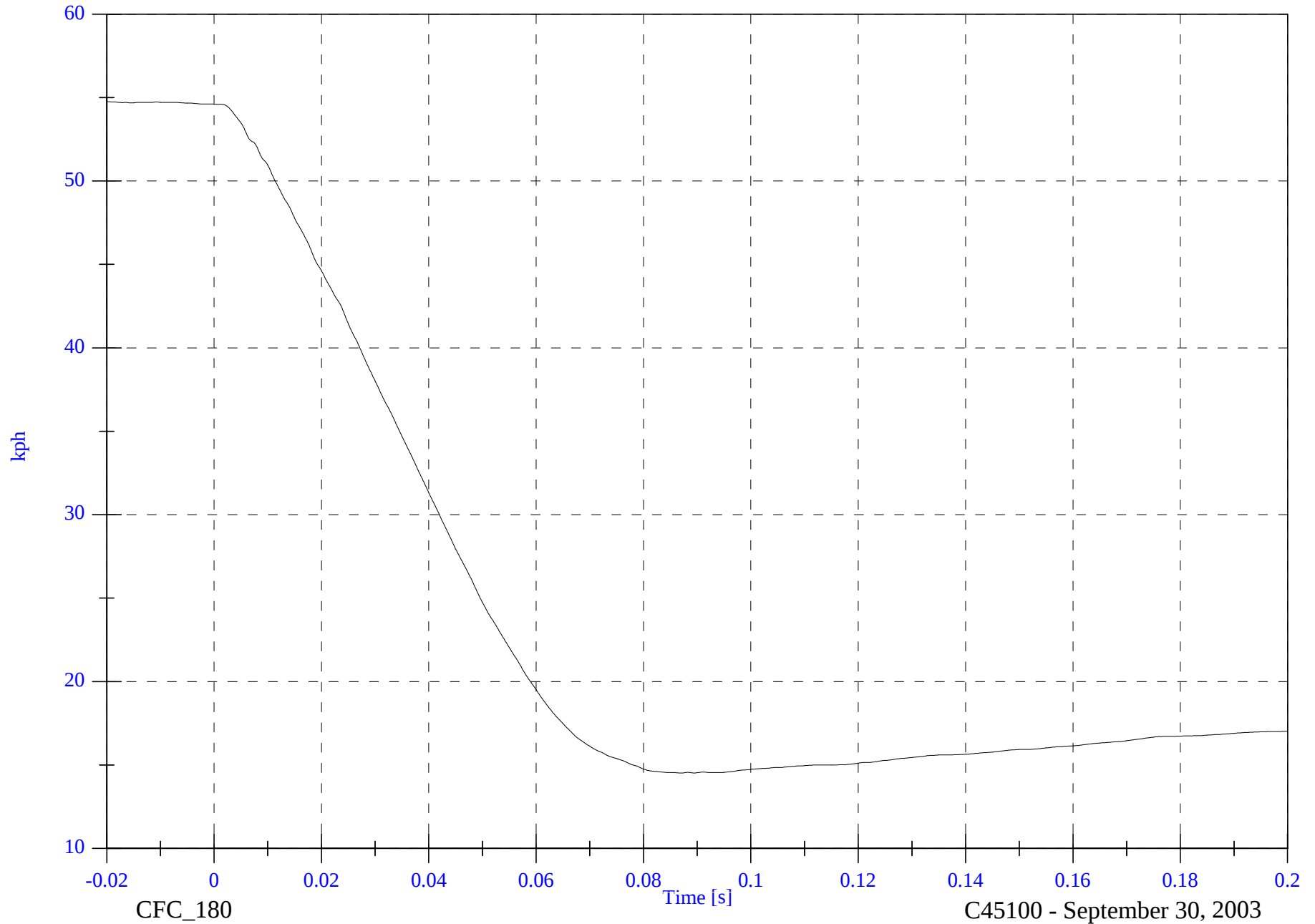


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 54.8 [kph] at -0.020 [s]

V1 Moving Barrier Left Rail X Velocity

Min: 14.5 [kph] at 0.087 [s]



B-114

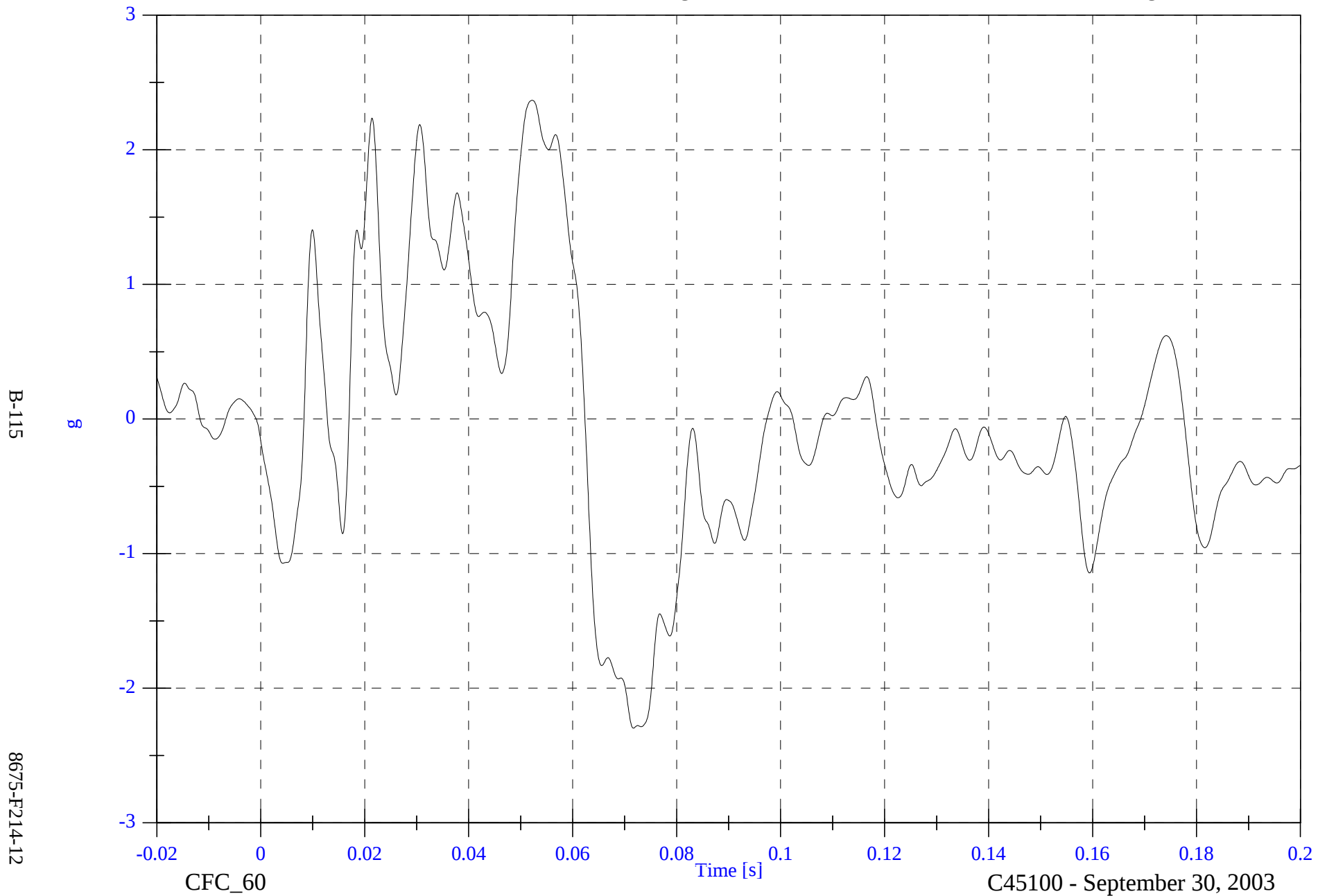
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V1 Moving Barrier Left Rail Y

Max: 2.4 [g] at 0.052 [s]

Min: -2.3 [g] at 0.072 [s]

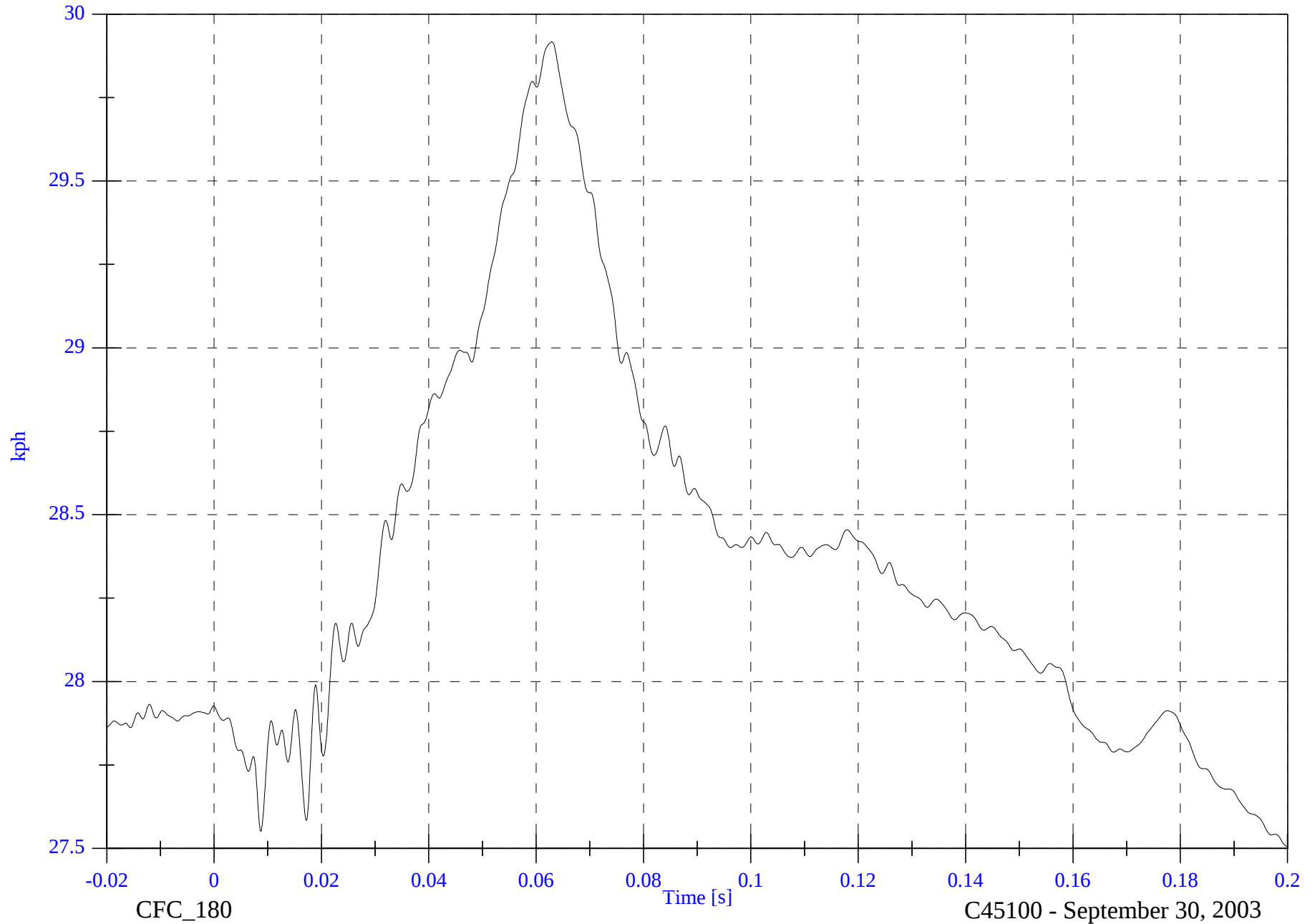


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

Max: 29.9 [kph] at 0.063 [s]

V1 Moving Barrier Left Rail Y Velocity

Min: 27.5 [kph] at 0.200 [s]



B-116

8675-F214-12

CFC_180

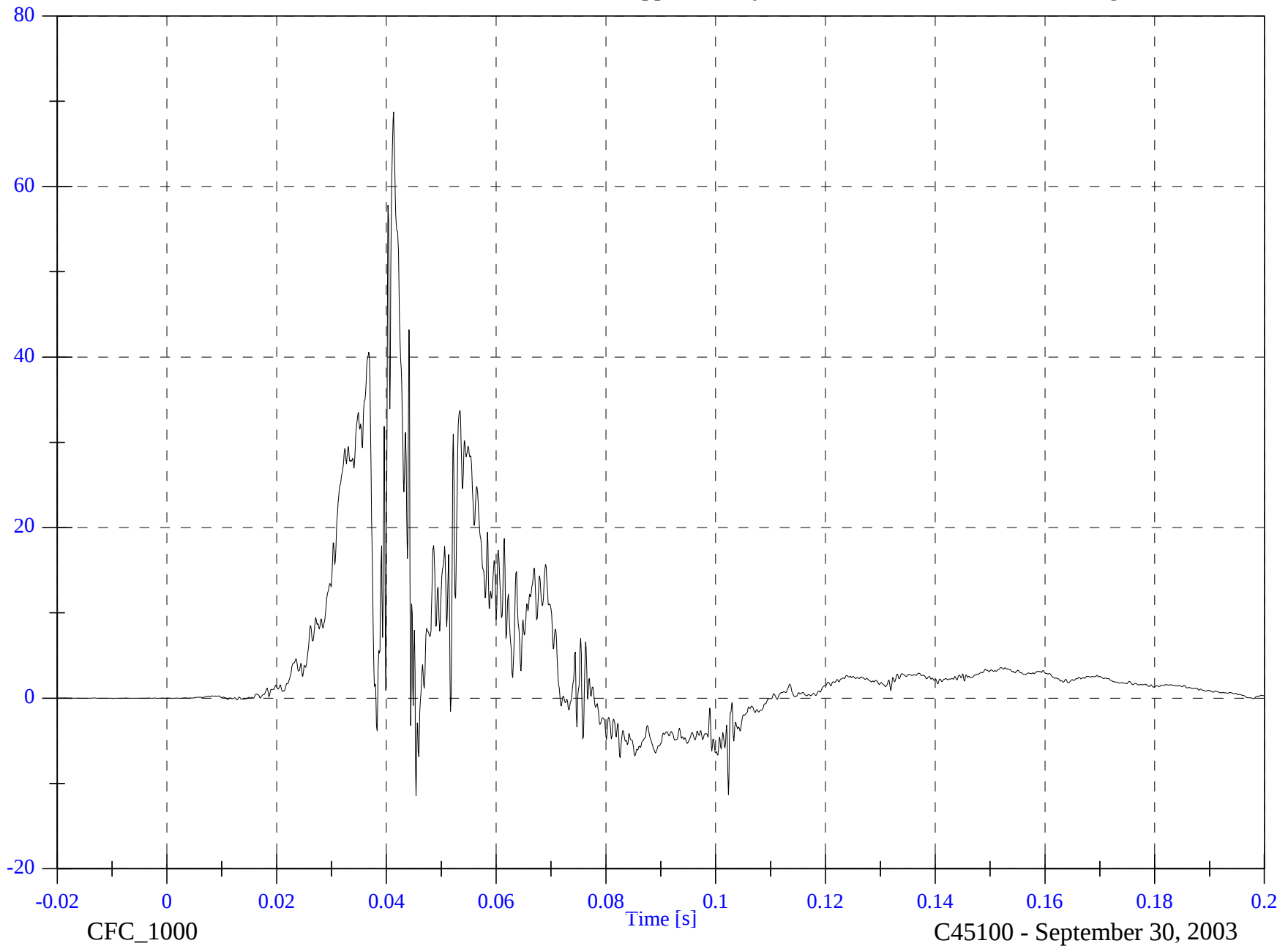
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Rib Ry

Max: 68.7 [g] at 0.041 [s]

Min: -11.4 [g] at 0.045 [s]



B-117

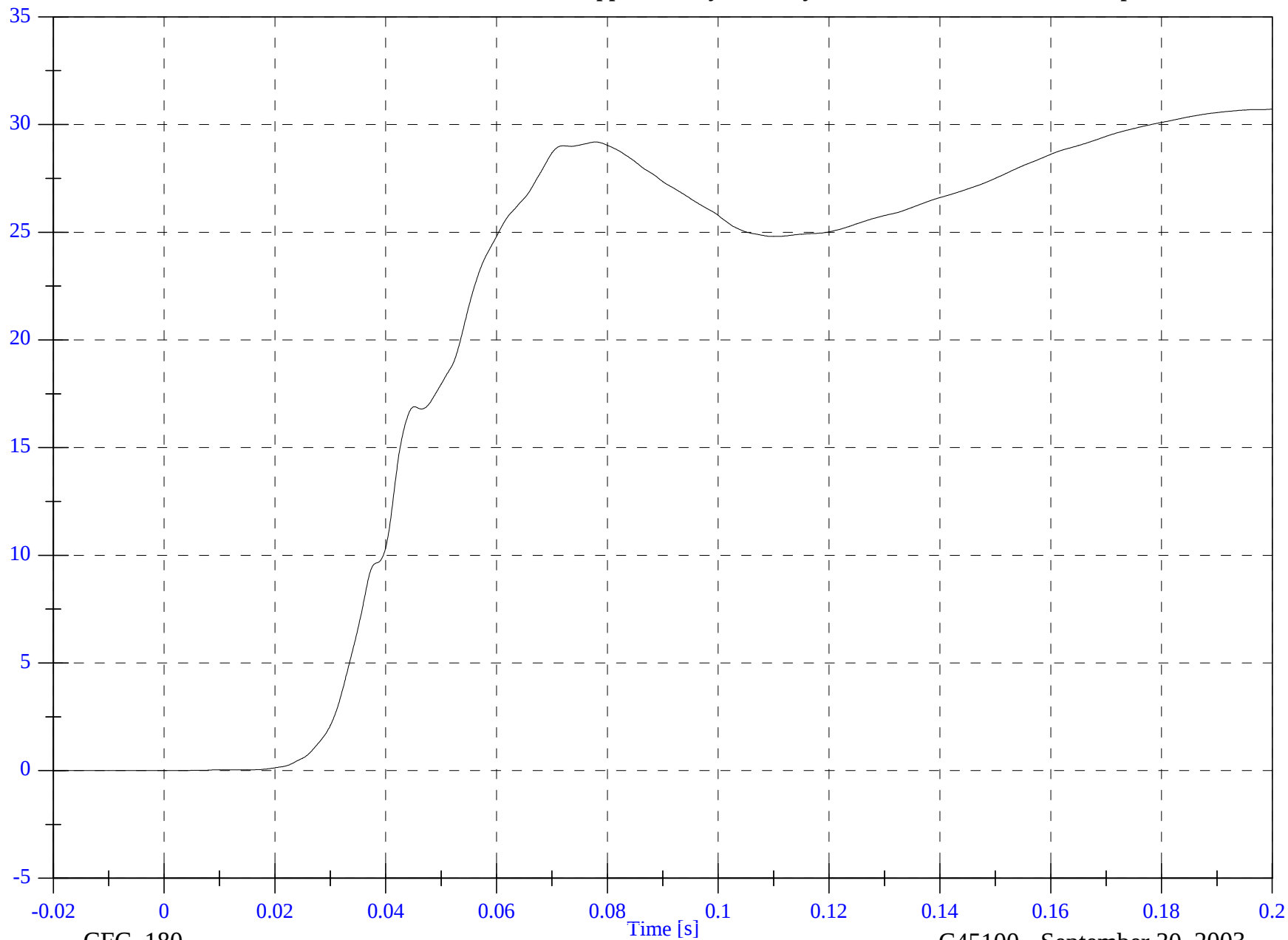
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Upper Rib Ry Velocity

Max: 30.7 [kph] at 0.200 [s]

Min: -0.0 [kph] at -0.020 [s]



B-118

8675-F214-12

CFC_180

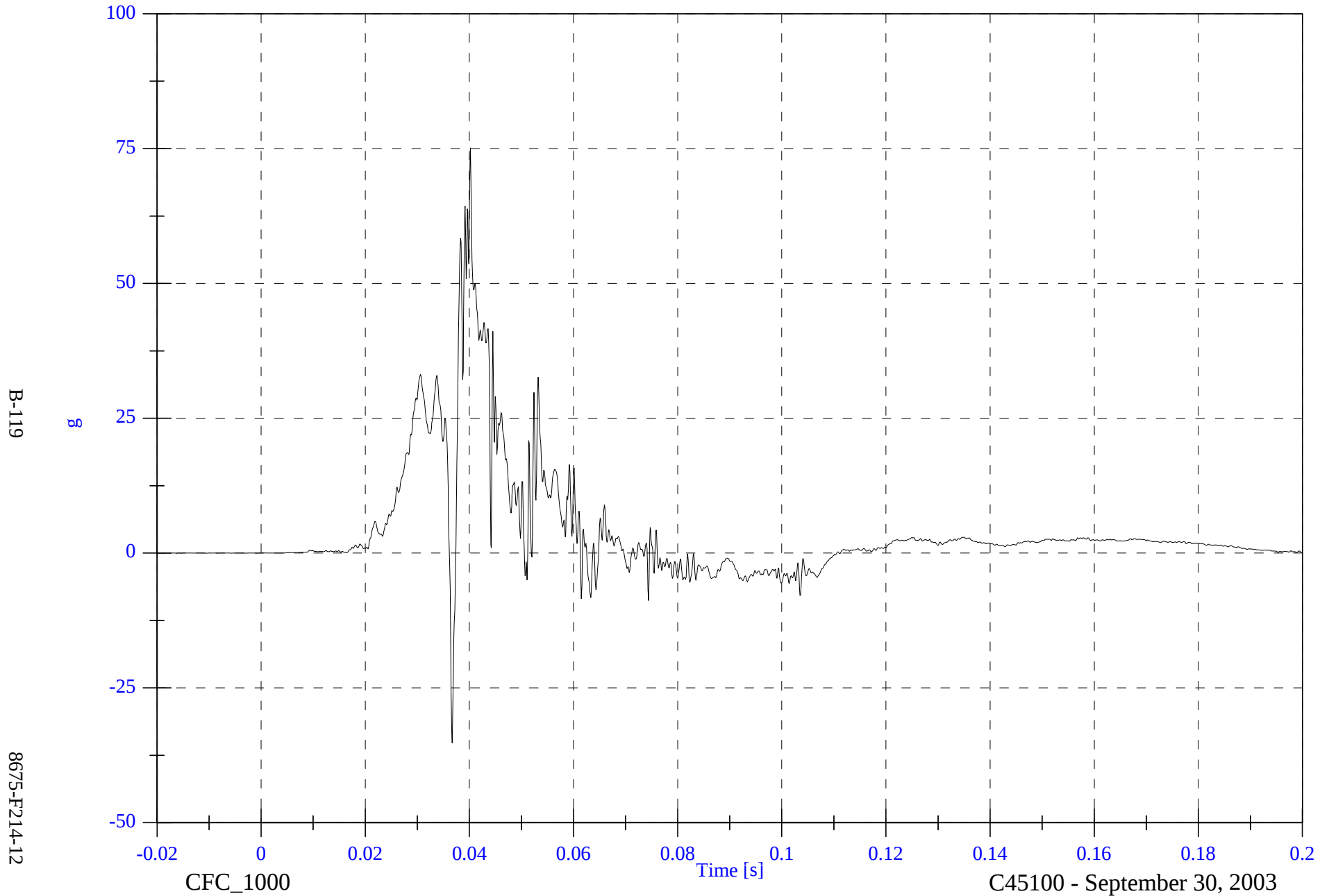
C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Rib Ry

Max: 75.1 [g] at 0.040 [s]

Min: -35.2 [g] at 0.037 [s]

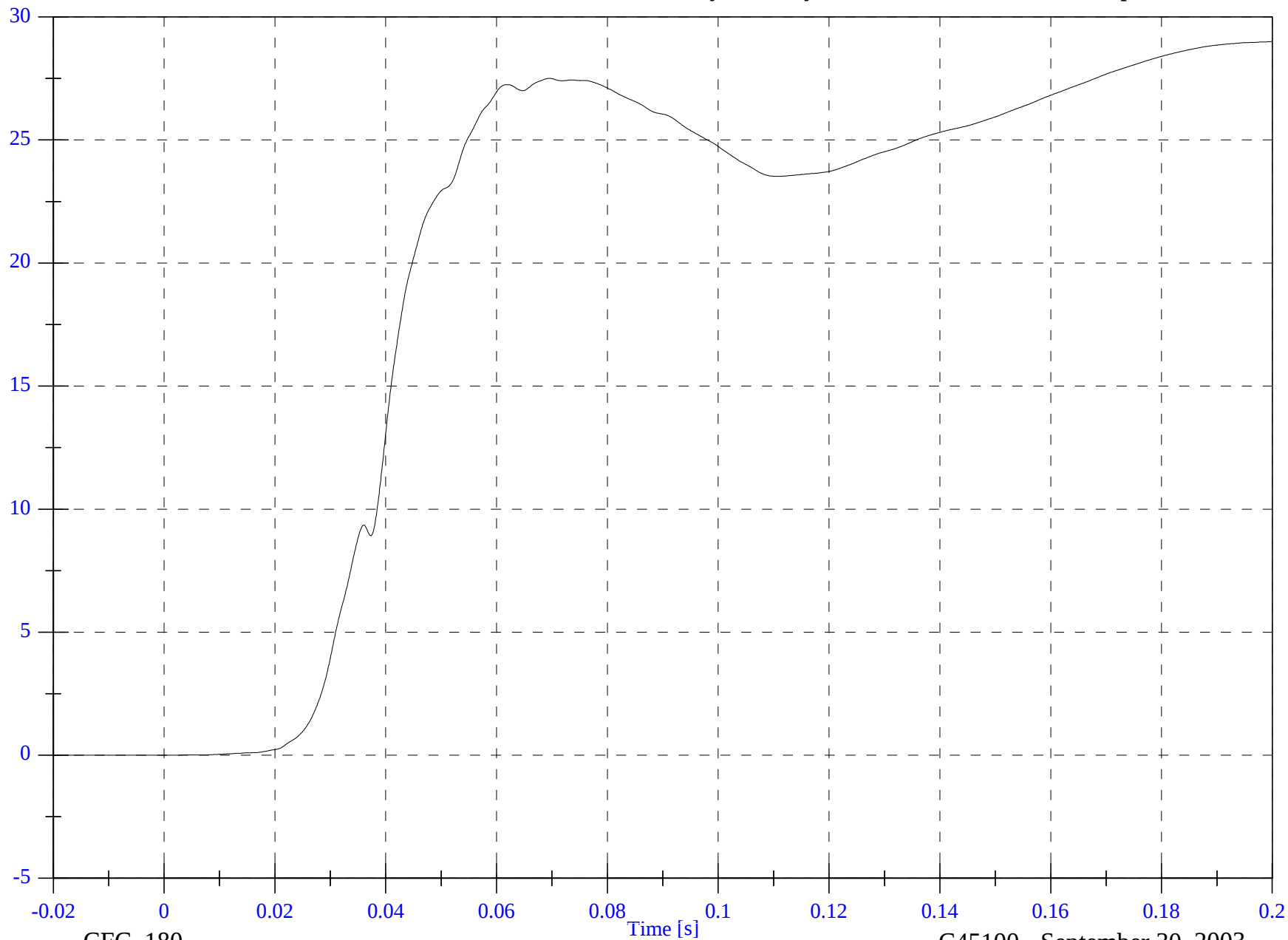


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Rib Ry Velocity

Max: 29.0 [kph] at 0.200 [s]

Min: -0.0 [kph] at -0.016 [s]



B-120

8675-F214-12

CFC_180

C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

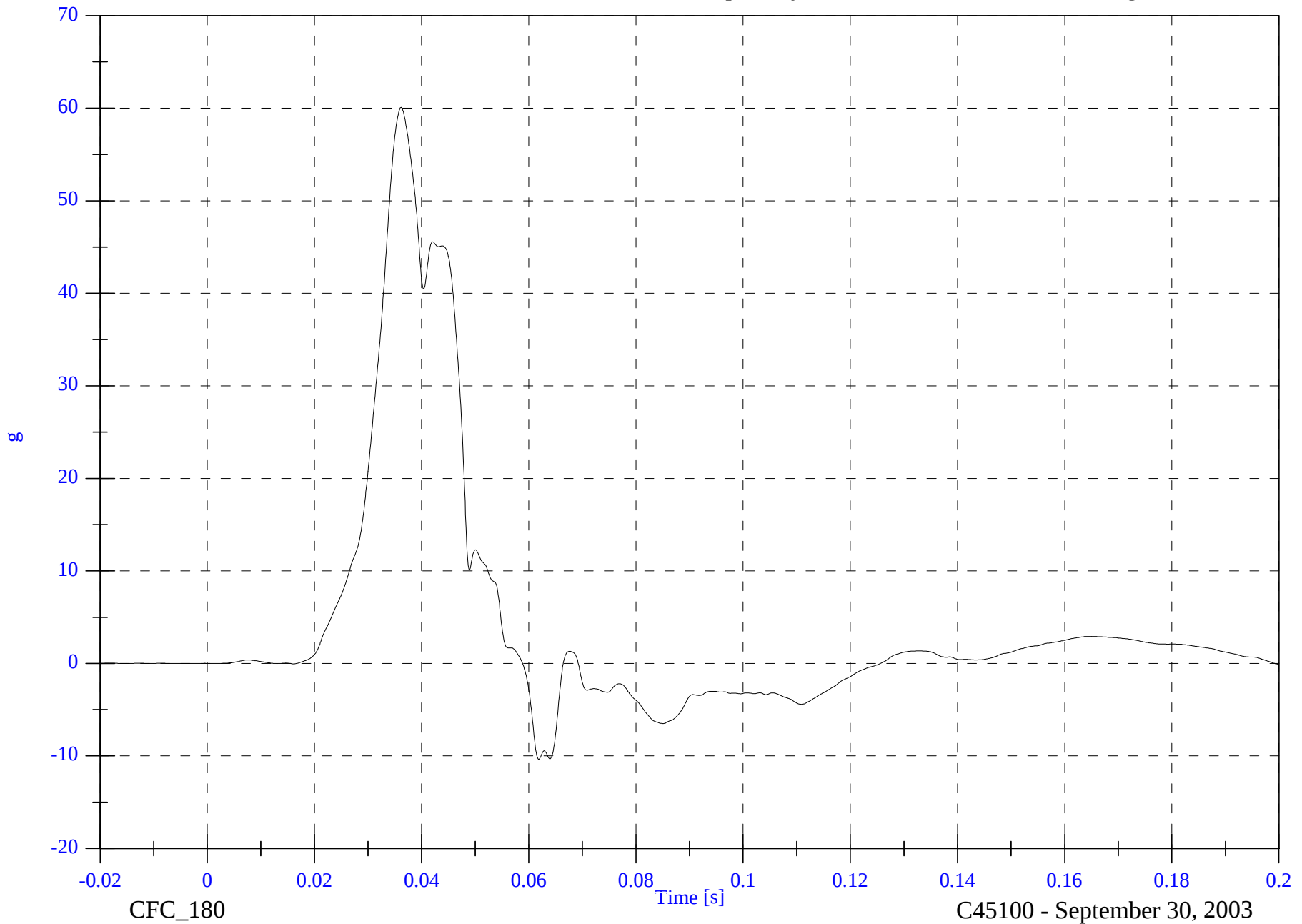
V2P1 Lower Spine Ry

Max: 60.1 [g] at 0.036 [s]

Min: -10.4 [g] at 0.062 [s]

B-121

8675-F214-12

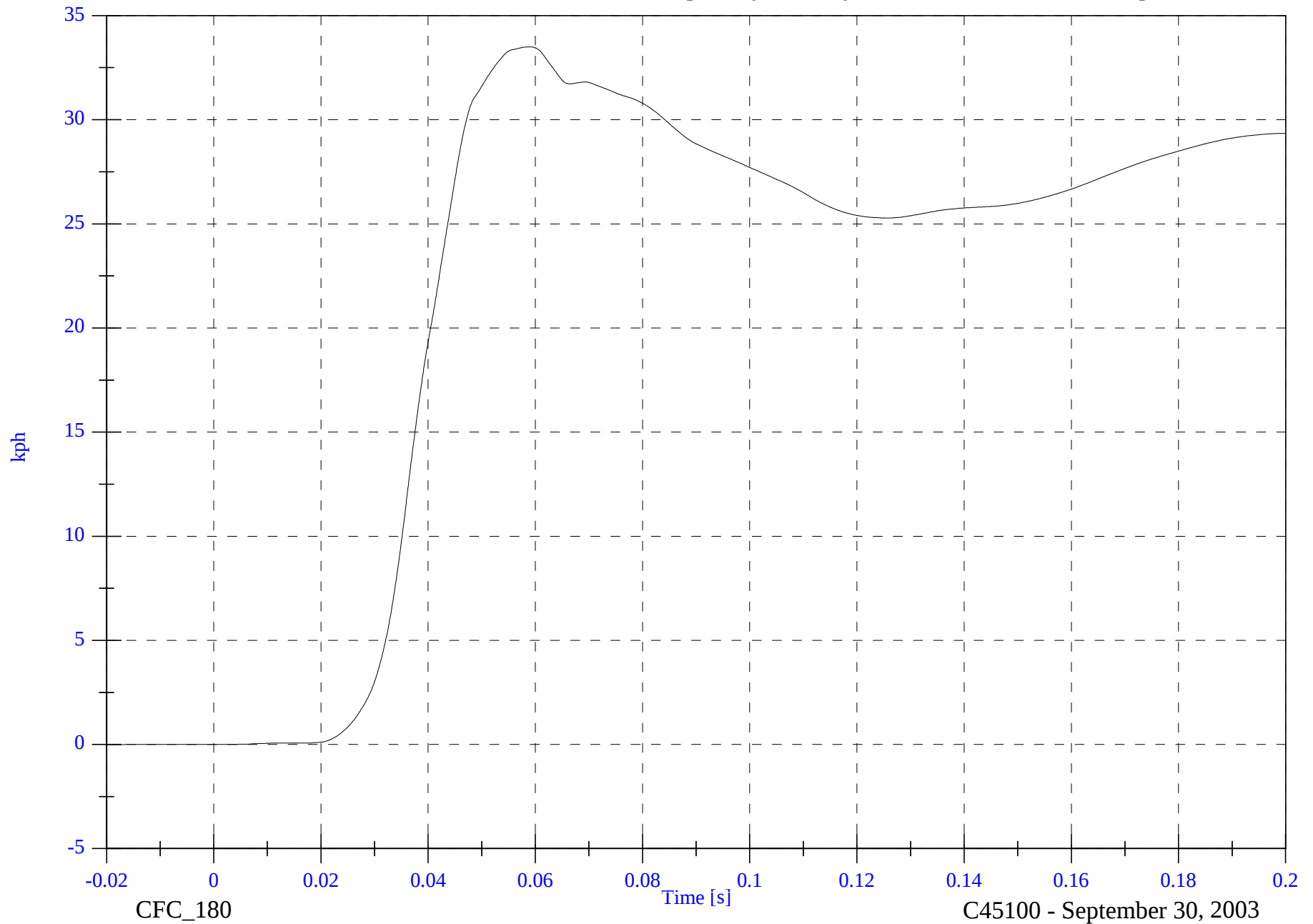


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Lower Spine Ry Velocity

Max: 33.5 [kph] at 0.059 [s]

Min: -0.0 [kph] at -0.020 [s]



B-122

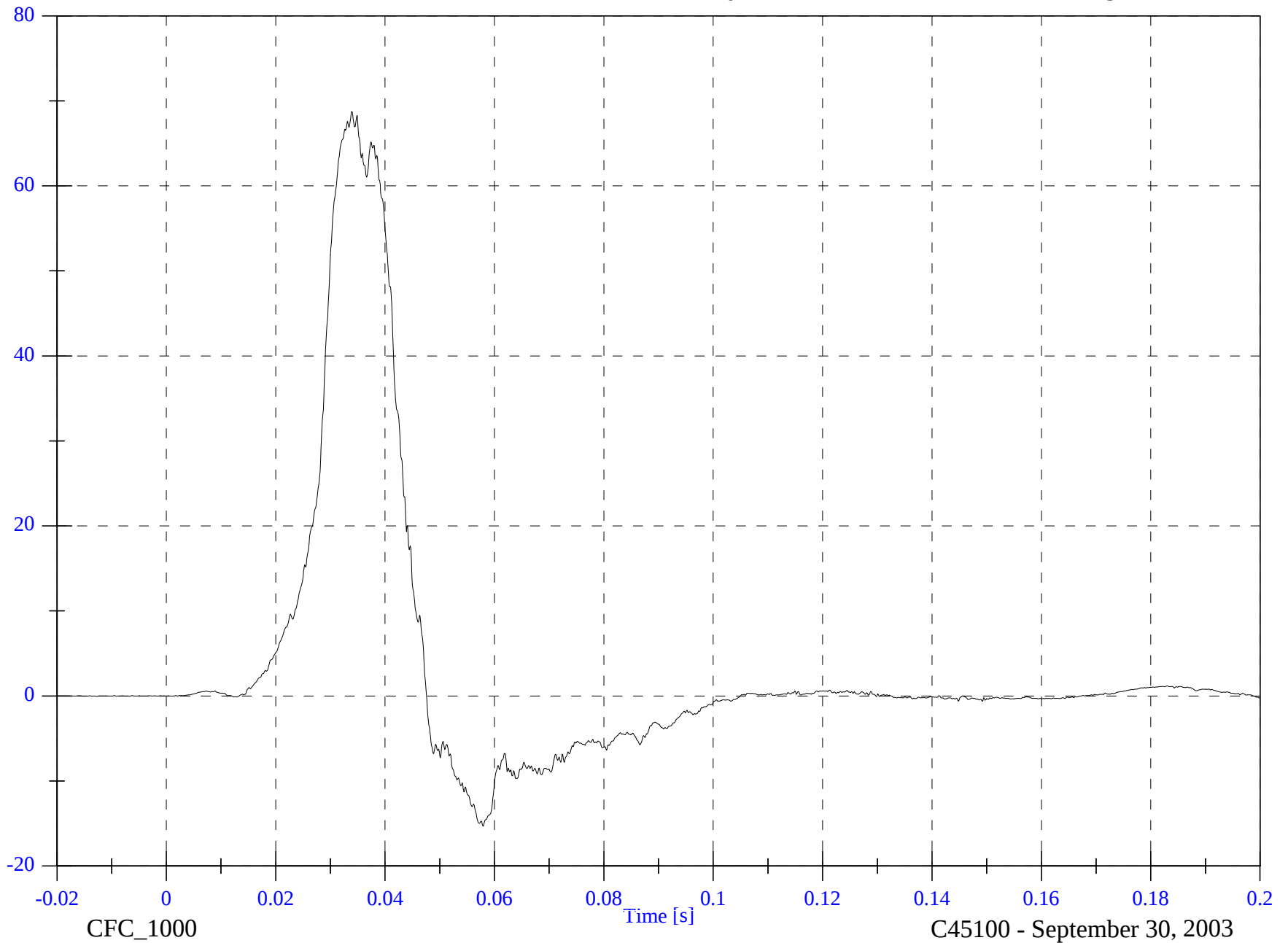
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Pelvic Ry

Max: 68.8 [g] at 0.034 [s]

Min: -15.3 [g] at 0.058 [s]



B-123

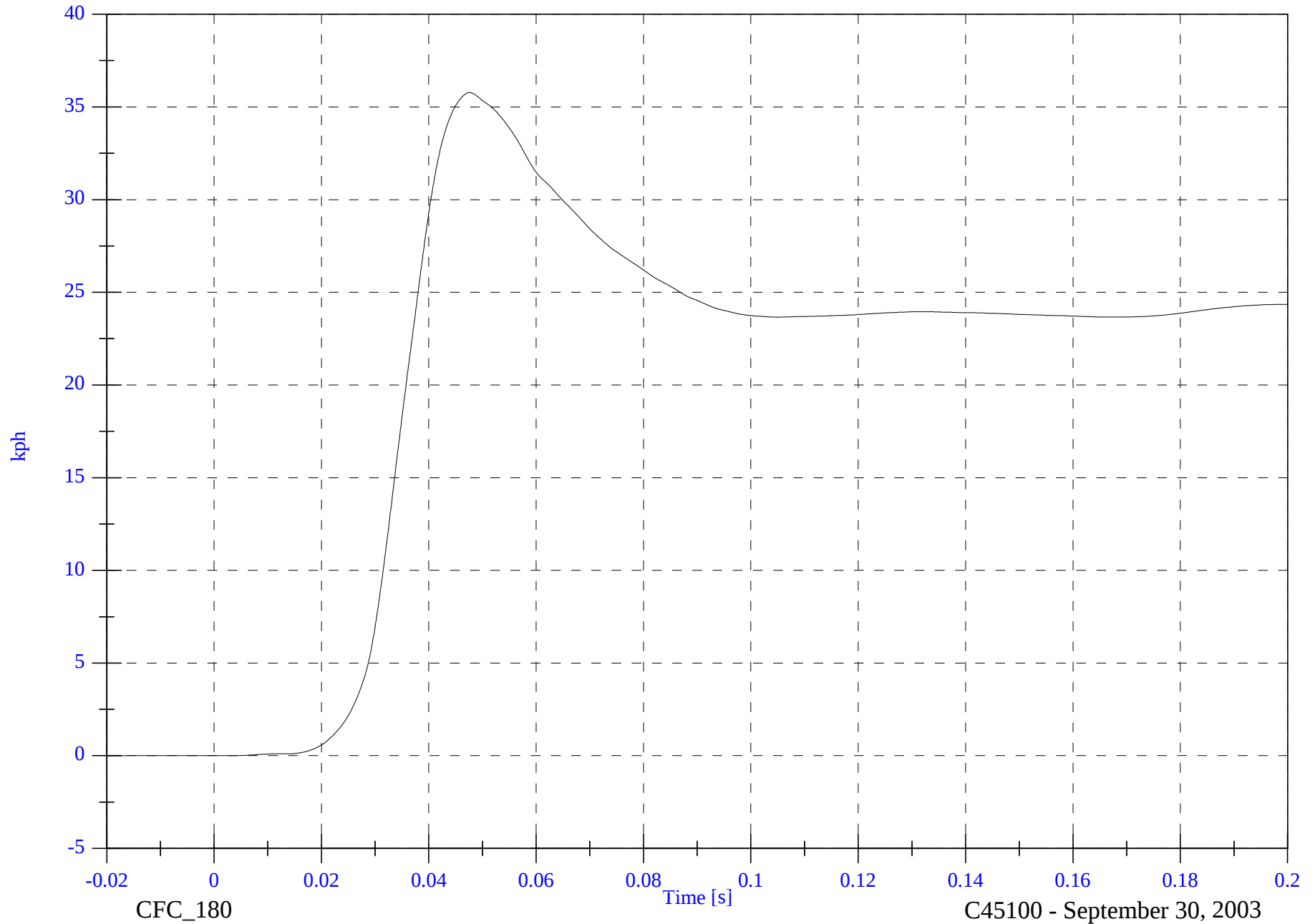
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Pelvic Ry Velocity

Max: 35.8 [kph] at 0.048 [s]

Min: -0.0 [kph] at -0.020 [s]



B-124

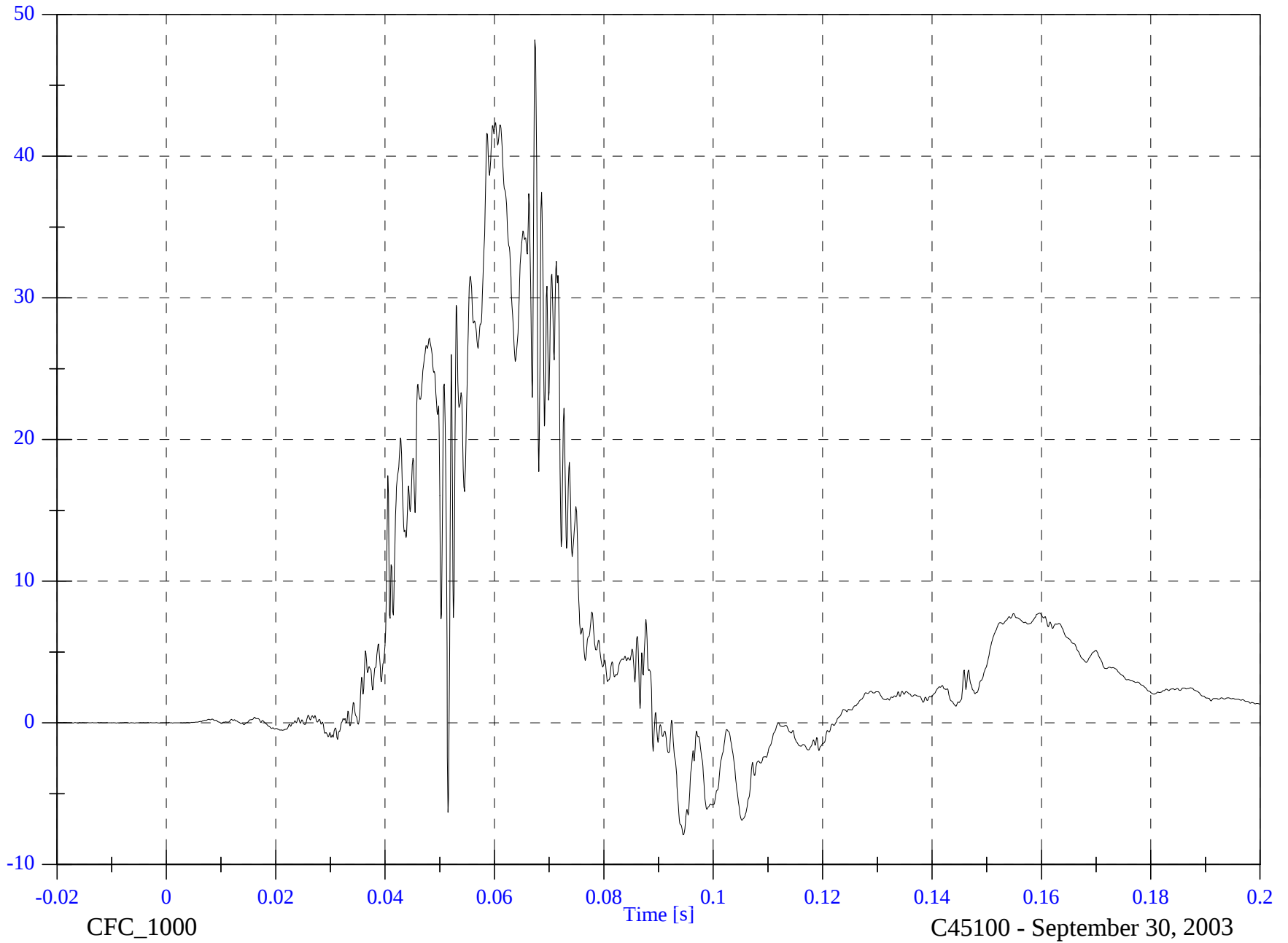
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Rib Ry

Max: 48.2 [g] at 0.067 [s]

Min: -7.9 [g] at 0.095 [s]



B-125

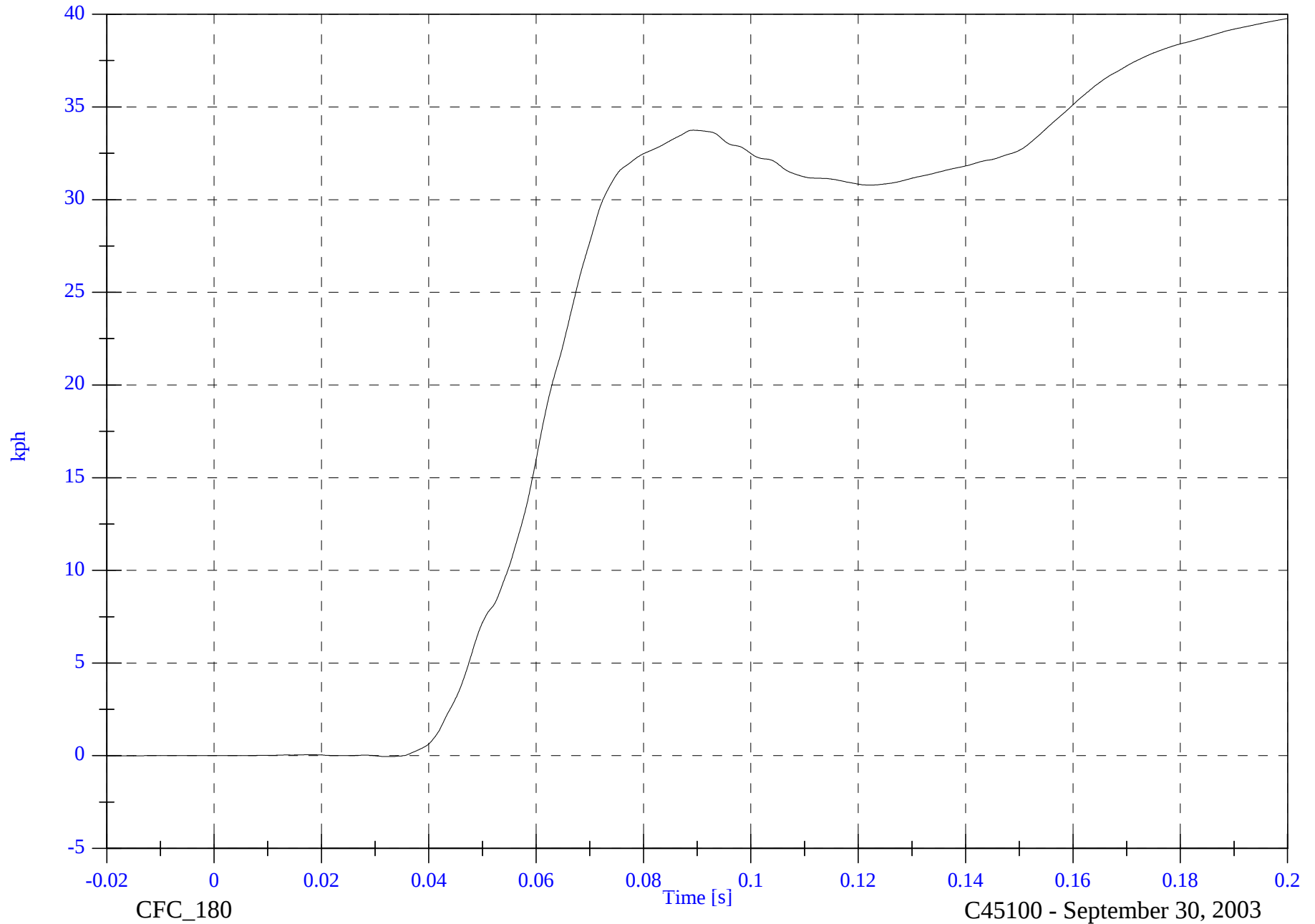
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Rib Ry Velocity

Max: 39.8 [kph] at 0.200 [s]

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



B-126

8675-F214-12

CFC_180

C45100 - September 30, 2003

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Rib Ry

Max: 71.6 [g] at 0.052 [s]

Min: -8.1 [g] at 0.097 [s]



B-127

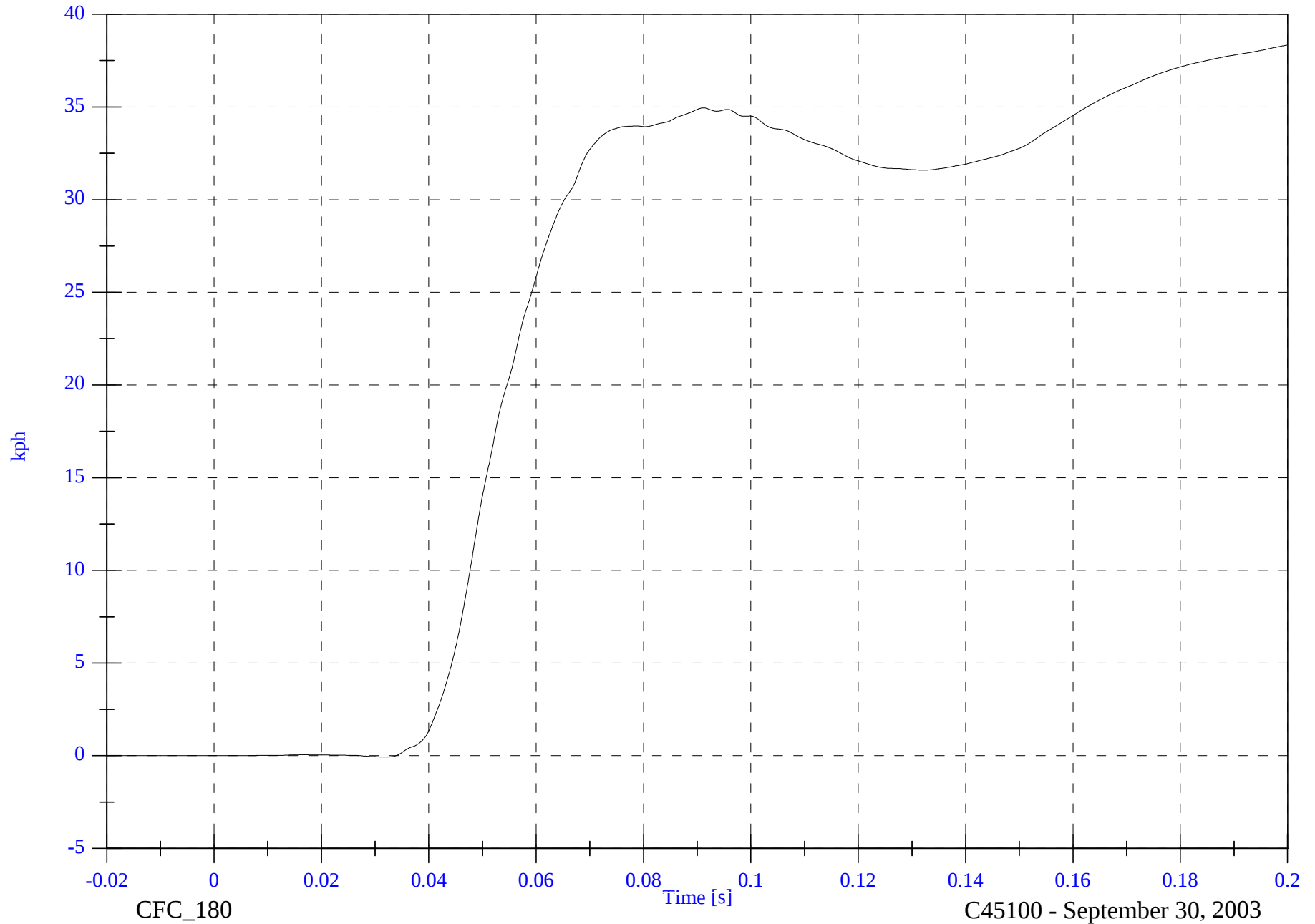
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Rib Ry Velocity

Max: 38.3 [kph] at 0.200 [s]

Min: -0.1 [kph] at 0.032 [s]



B-128

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

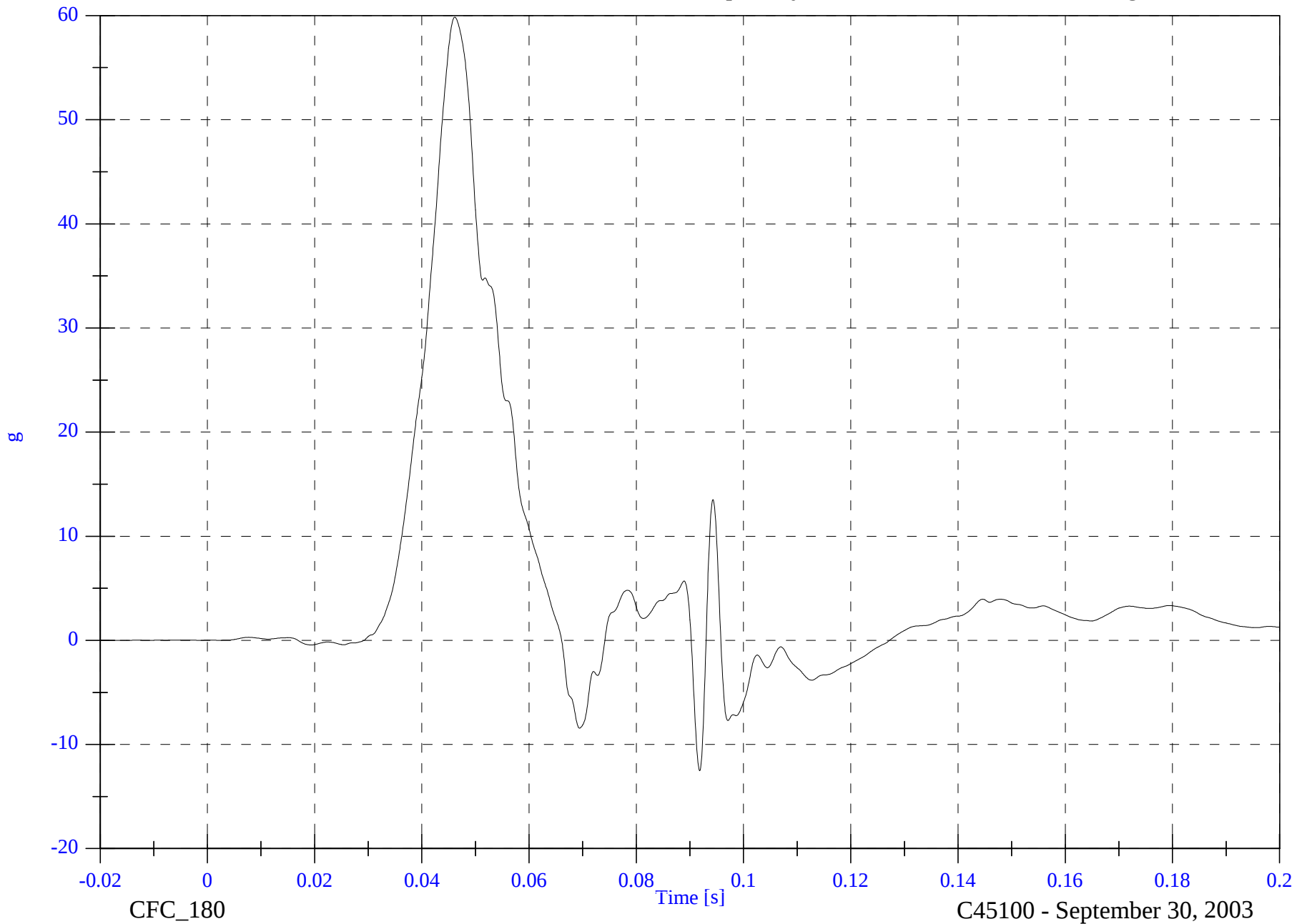
V2P4 Lower Spine Ry

Max: 59.9 [g] at 0.046 [s]

Min: -12.5 [g] at 0.092 [s]

B-129

8675-F214-12

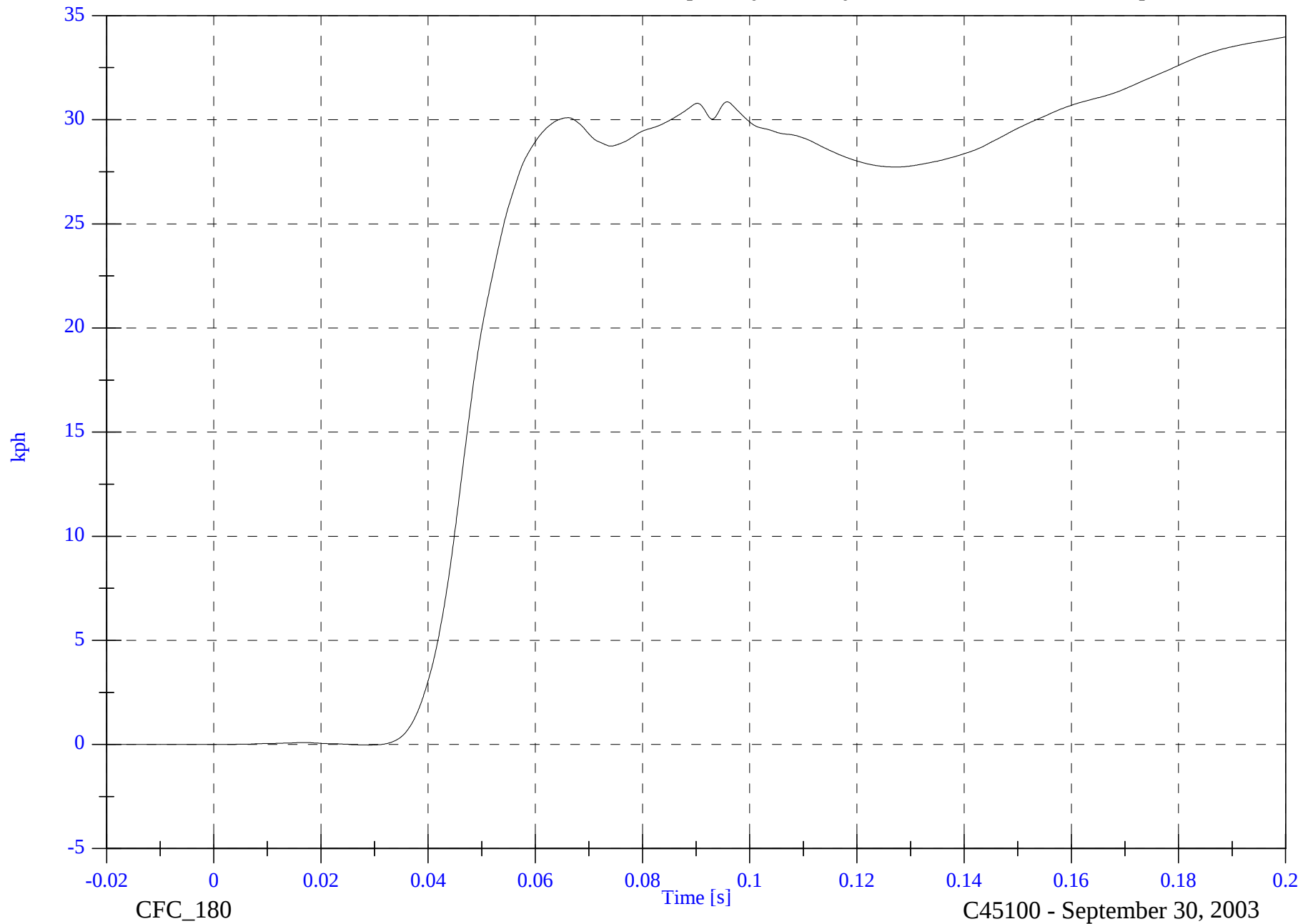


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Lower Spine Ry Velocity

Max: 34.0 [kph] at 0.200 [s]

Min: -0.0 [kph] at 0.029 [s]



B-130

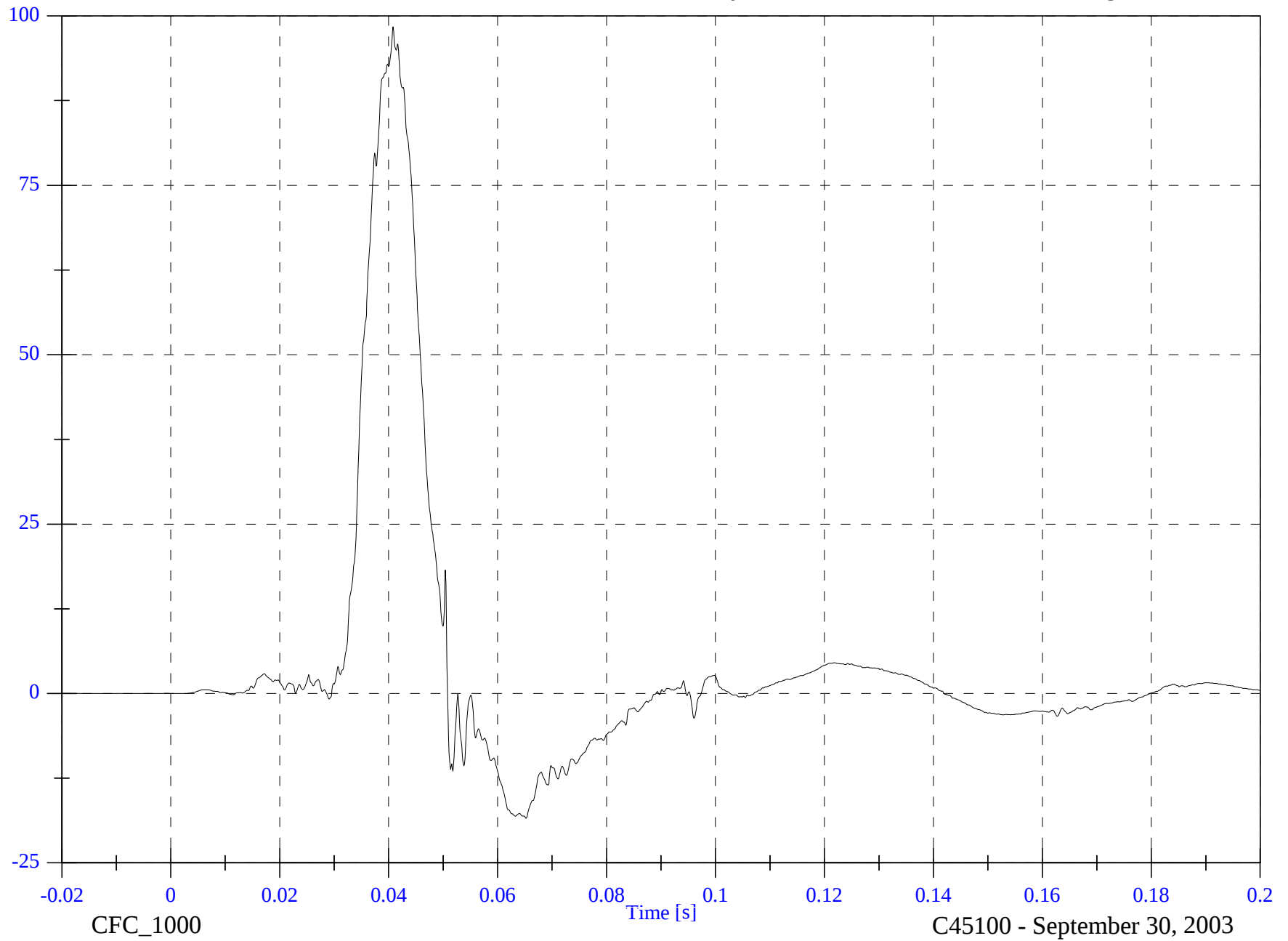
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Pelvic Ry

Max: 98.4 [g] at 0.041 [s]

Min: -18.5 [g] at 0.065 [s]

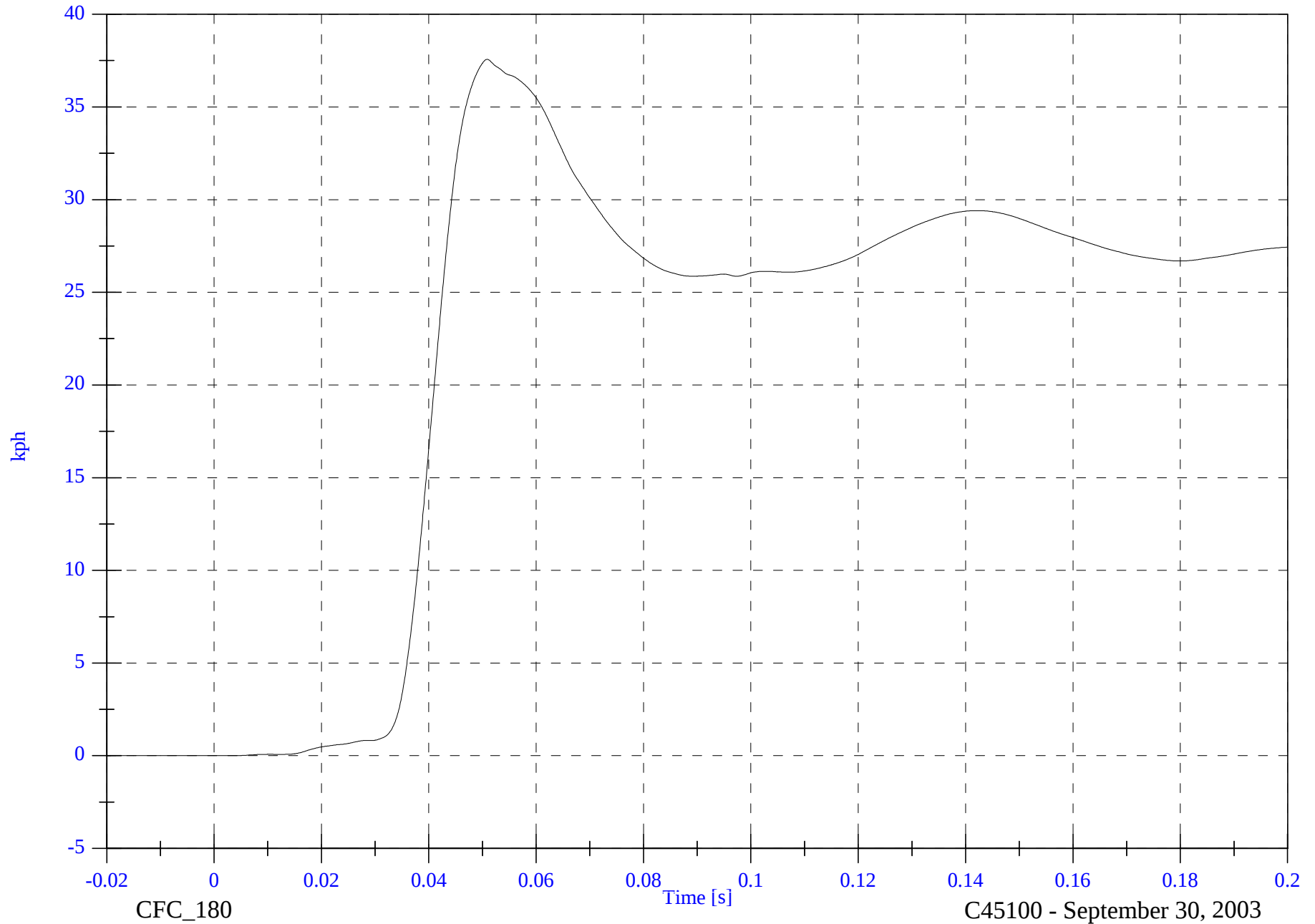


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Pelvic Ry Velocity

Max: 37.6 [kph] at 0.051 [s]

Min: -0.0 [kph] at -0.020 [s]



B-132

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

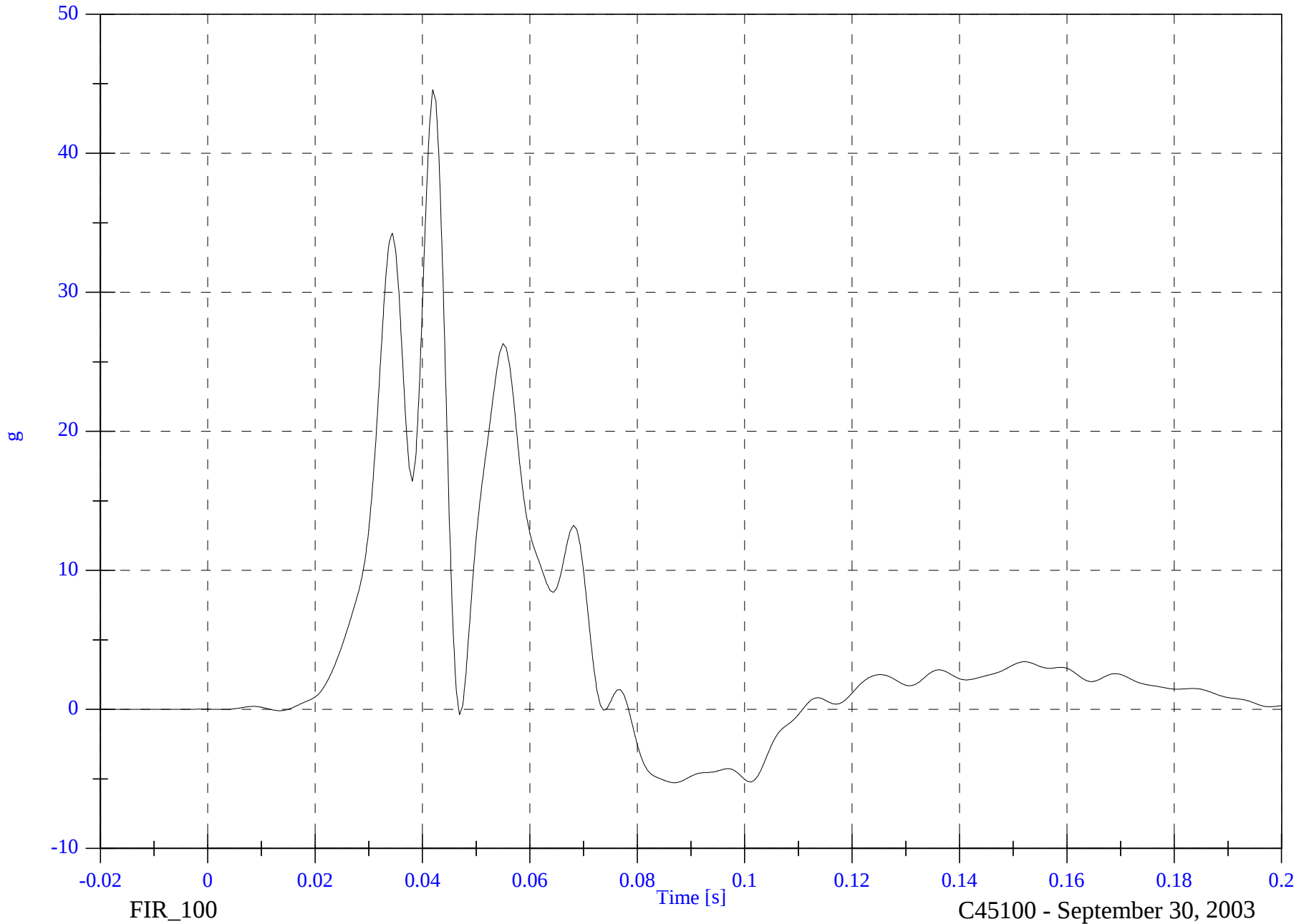
V2P1 Upper Rib Ry

Max: 44.6 [g] at 0.042 [s]

Min: -5.3 [g] at 0.087 [s]

B-133

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

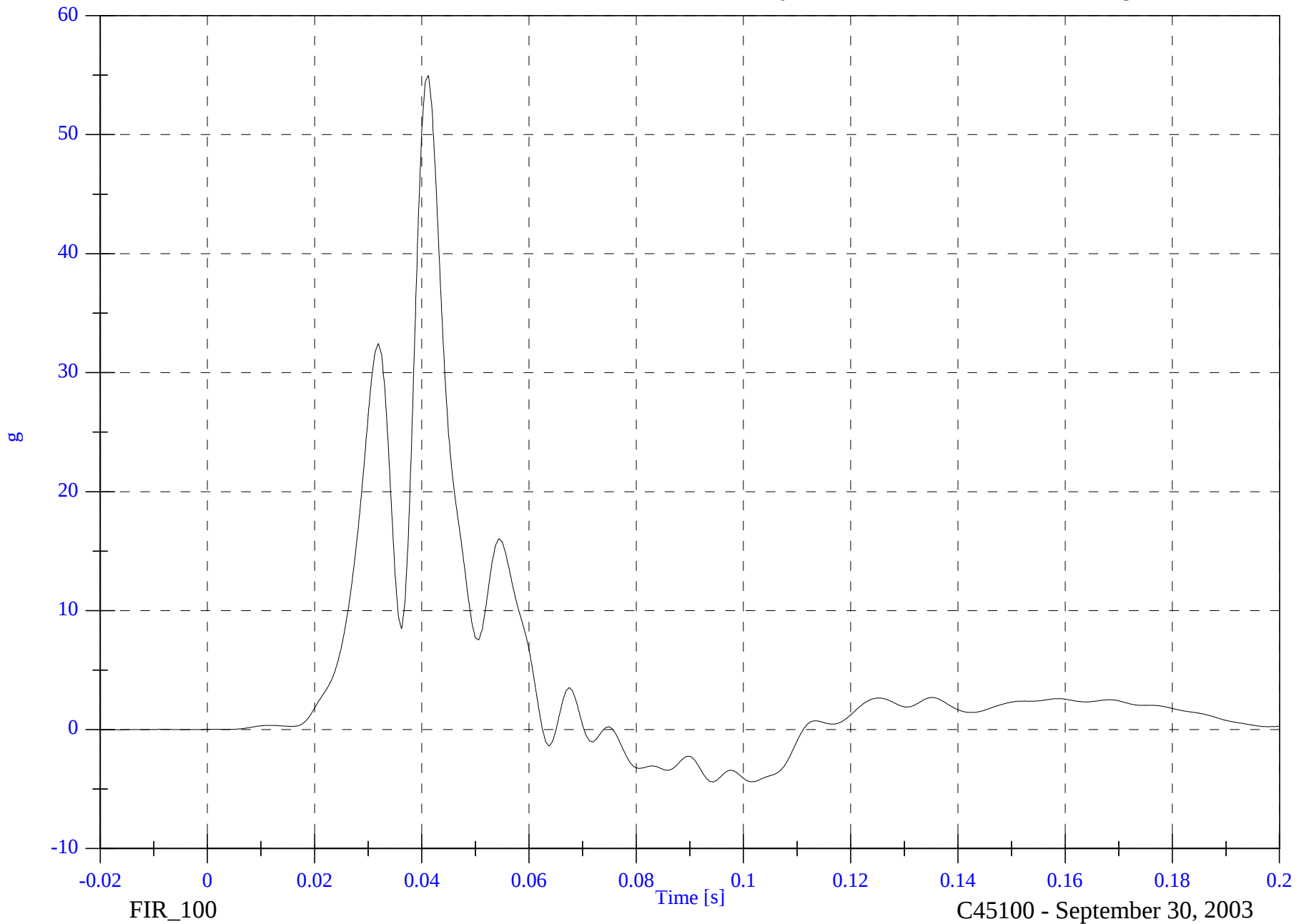
V2P1 Lower Rib Ry

Max: 55.0 [g] at 0.041 [s]

Min: -4.4 [g] at 0.094 [s]

B-134

8675-F214-12



2004 FMVSS 214D Test 2

2004 Toyota Sienna Minivan

V2P1 Lower Spine Ry

Max: 59.3 [g] at 0.036 [s]

Min: -10.5 [g] at 0.063 [s]



B-135

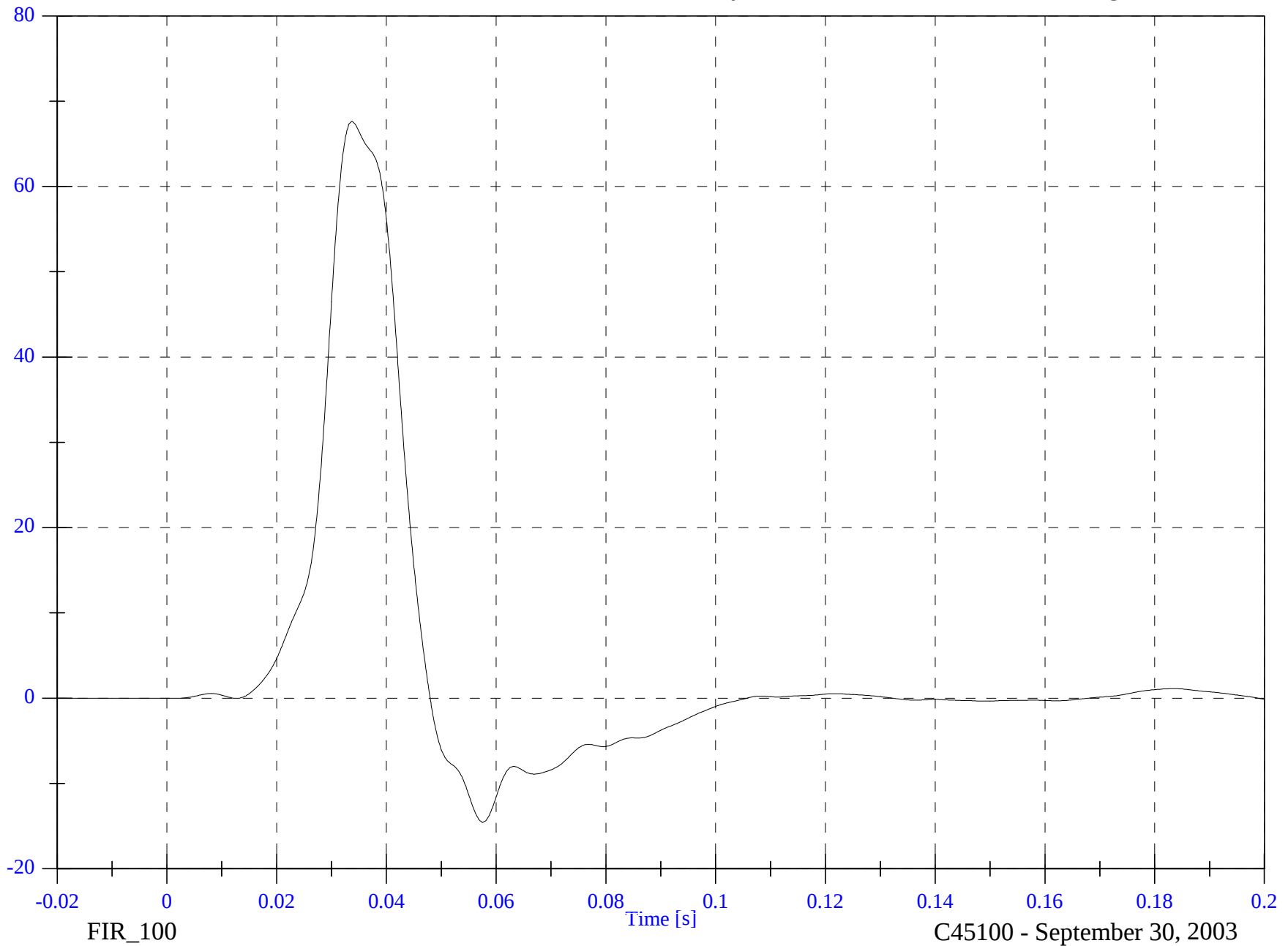
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P1 Pelvic Ry

Max: 67.7 [g] at 0.034 [s]

Min: -14.6 [g] at 0.057 [s]



B-136

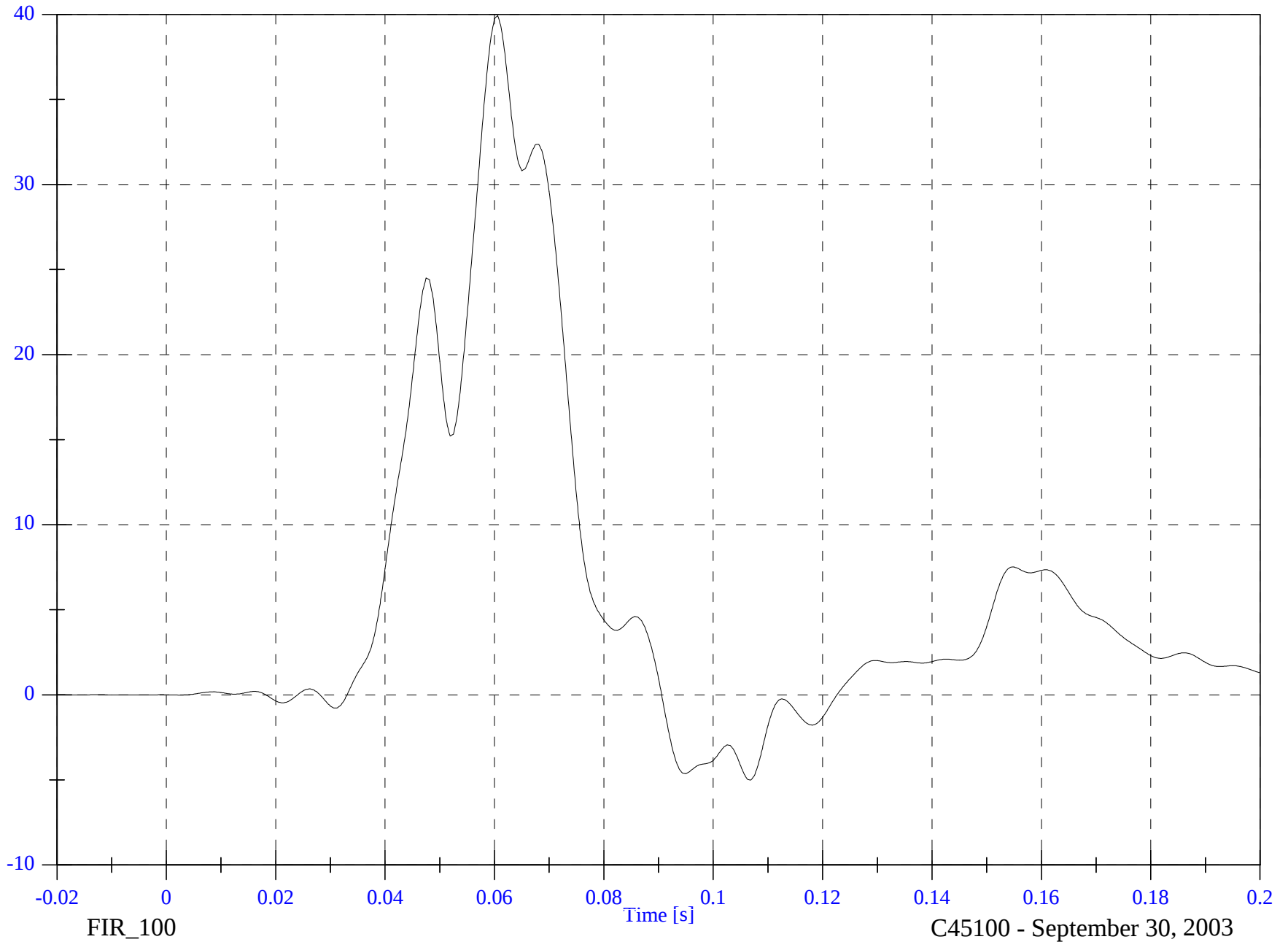
8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Upper Rib Ry

Max: 39.9 [g] at 0.061 [s]

Min: -5.0 [g] at 0.107 [s]



B-137

8675-F214-12

2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

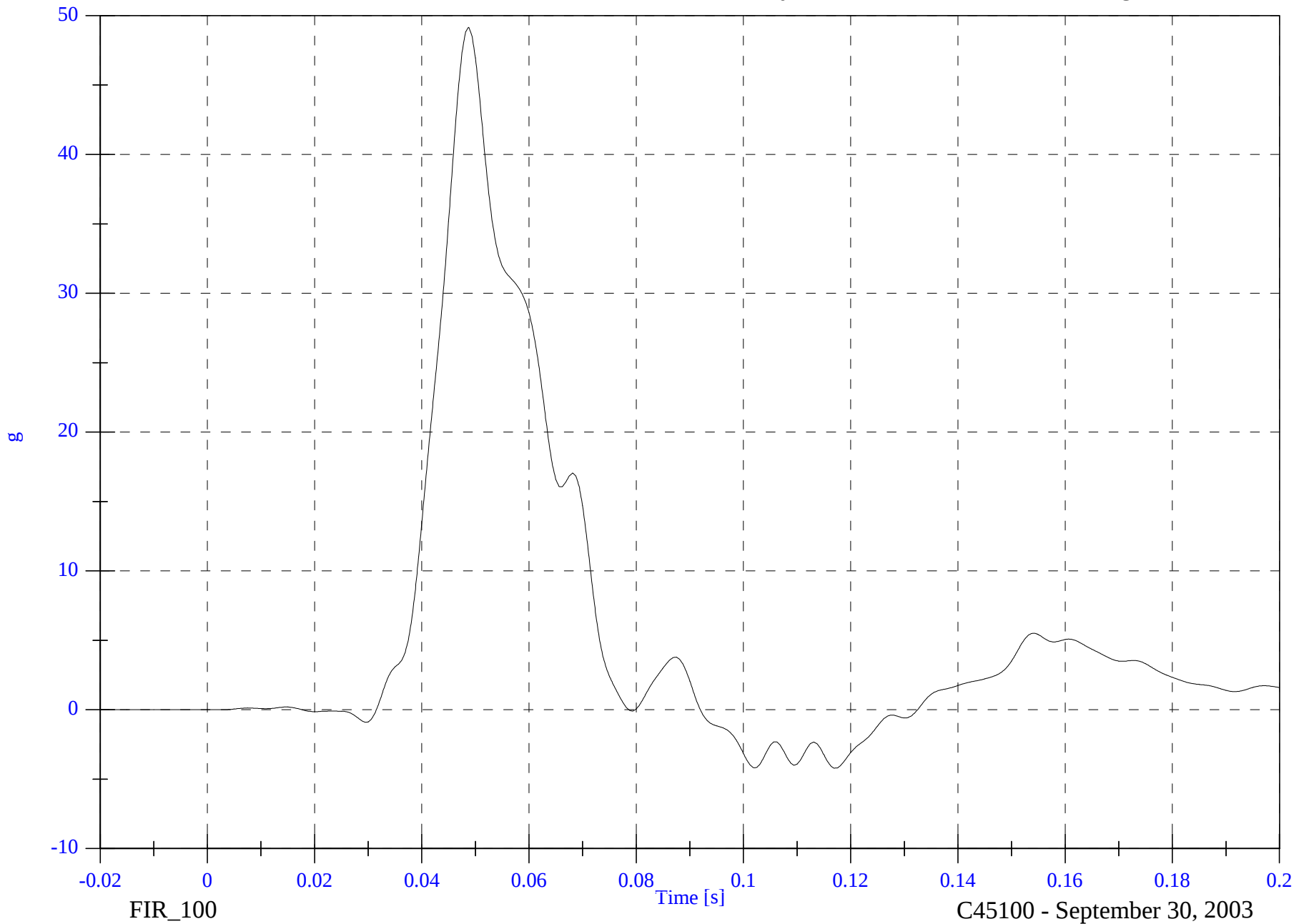
V2P4 Lower Rib Ry

Max: 49.2 [g] at 0.049 [s]

Min: -4.2 [g] at 0.117 [s]

B-138

8675-F214-12



2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

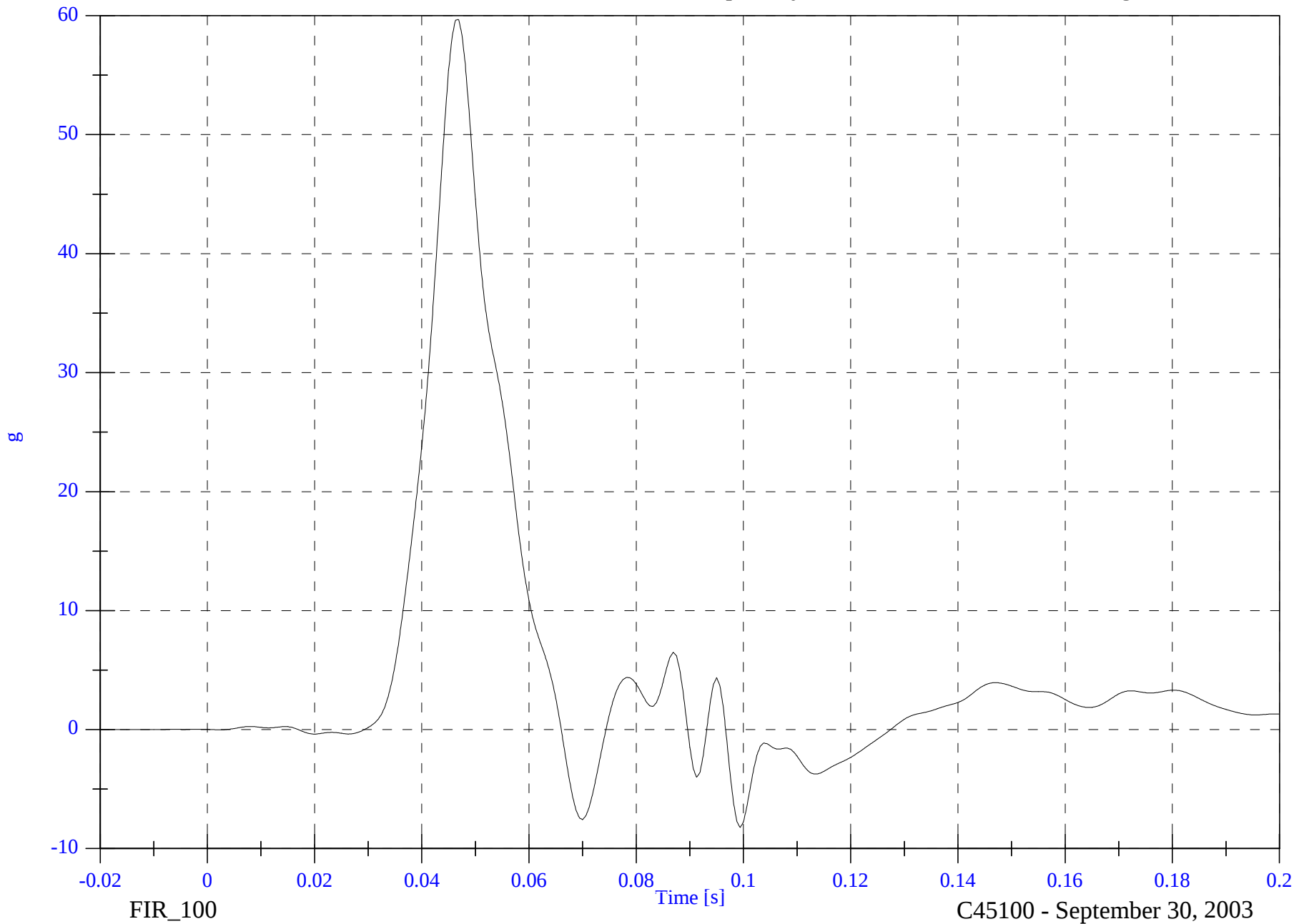
V2P4 Lower Spine Ry

Max: 59.7 [g] at 0.047 [s]

Min: -8.2 [g] at 0.099 [s]

B-139

8675-F214-12

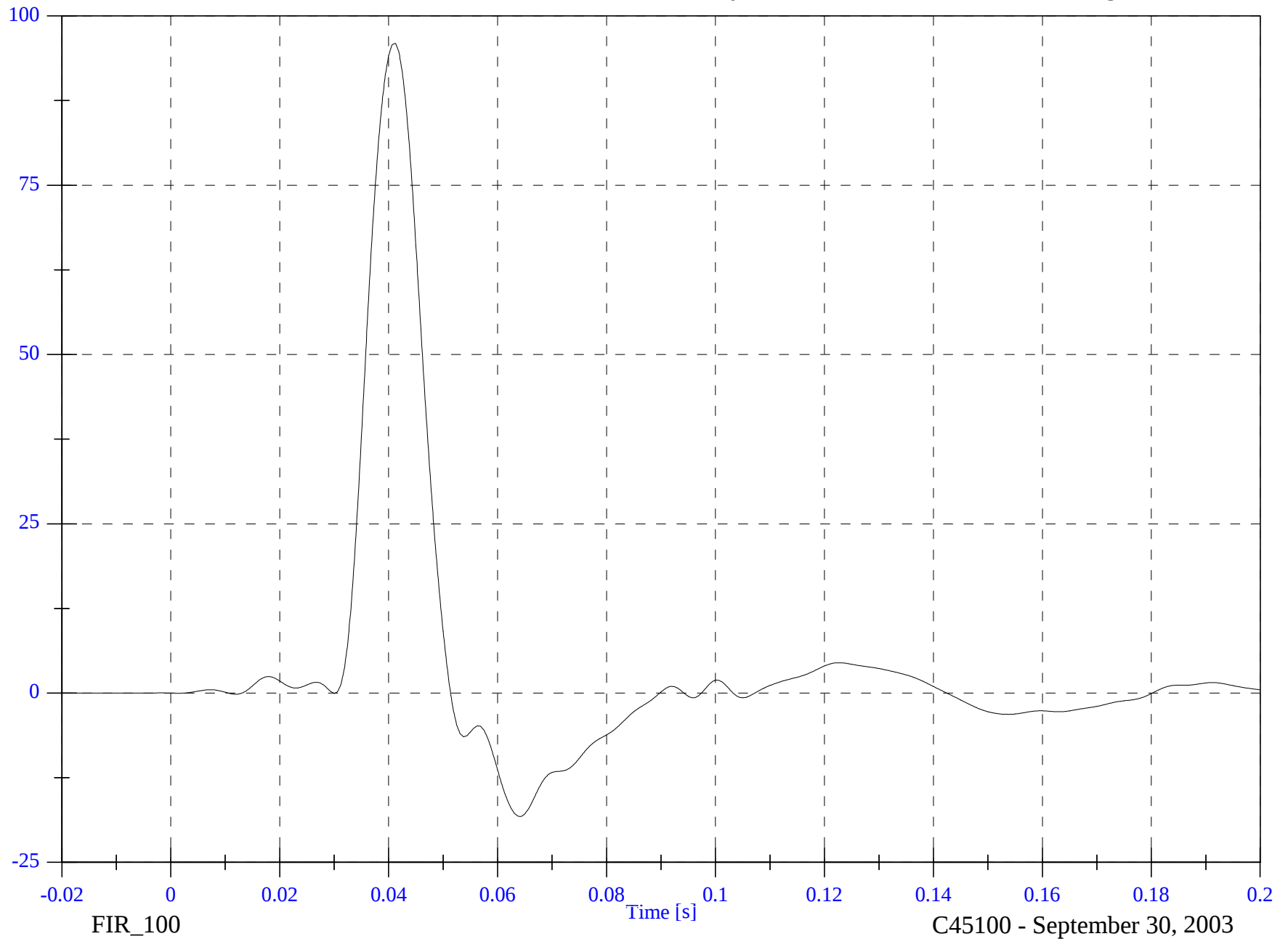


2004 FMVSS 214D Test 2 2004 Toyota Sienna Minivan

V2P4 Pelvic Ry

Max: 96.0 [g] at 0.041 [s]

Min: -18.2 [g] at 0.064 [s]



B-140

8675-F214-12

APPENDIX C

SID HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID H3 PRE & POST TEST CALIBRATION
CONFIGURED FOR LEFT SIDE IMPACT

Date: September 26, 2003; November 3, 2003 Sequential Test Number: 2;3
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	SID H3 269 NO.:		SID H3 270 NO.:	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	904	904	902	904
RH- Rib Height (mm)	501 - 521	502	502	505	505
HP- Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD- Rib from Back Line (mm)	229 - 241	234	234	234	234
KV- Knee Pivot from Back Line (mm)	511 - 526	518	518	516	518
SW- Knee Pivot to Floor (mm)	490 - 505	495	495	495	495
HW- Hip Width (mm)	356 - 391	371	373	376	378
THORAX IMPACTS					
TEMPERATURE (°C)	18.9 - 25.5	21.1	21.1	21.1	21.1
RELATIVE HUMIDITY (%)	10 - 70	28.0	34.0	28.0	34.0
PROBE SPEED (m/s)	4.27 - 4.33	4.30	4.28	4.27	4.33
UPPER RIB (g's)	37 - 46	40.30	39.27	40.71	41.08
LOWER RIB (g's)	37 - 46	38.34	35.57	40.53	39.24
LOWER SPINE (g's)	15 - 22	17.40	17.82	20.60	20.45
PELVIS IMPACT					
TEMPERATURE (°C)	18.9 - 25.5	21.1	21.1	21.1	21.1
RELATIVE HUMIDITY (%)	10 - 70	28.0	34.0	28.0	34.0
PROBE SPEED (m/s)	4.27 - 4.33	4.28	4.27	4.27	4.30
PELVIS (g's)	40 - 60	50.17	46.10	42.96	53.19

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID H3 NO.: 269

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269 Sequential Test Number: 2
Date: September 26, 2003 Laboratory Technician: B. Swiecicki

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269 Sequential Test Number: 2
Date: September 26, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	904
RH- Rib Height (mm)	502 – 520	502
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 – 241	234
KH- Knee Pivot from Back Line (mm)	511 – 526	518
KV- Knee Pivot to Floor (mm)	490 – 505	495
HW- Hip Width (mm)	356 - 391	371

REMARKS: None

Shock Low (3.05 m/s)

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

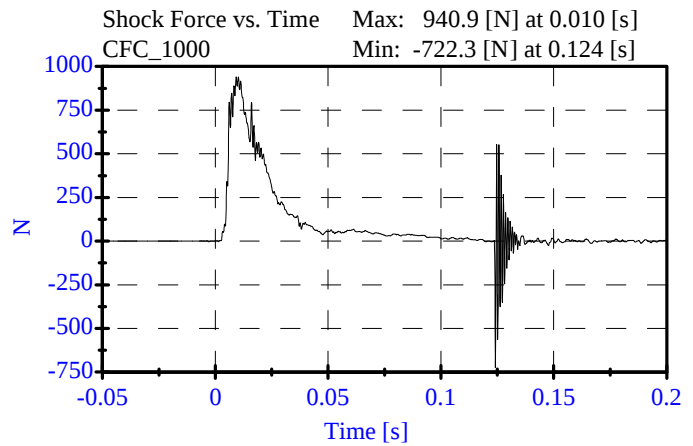
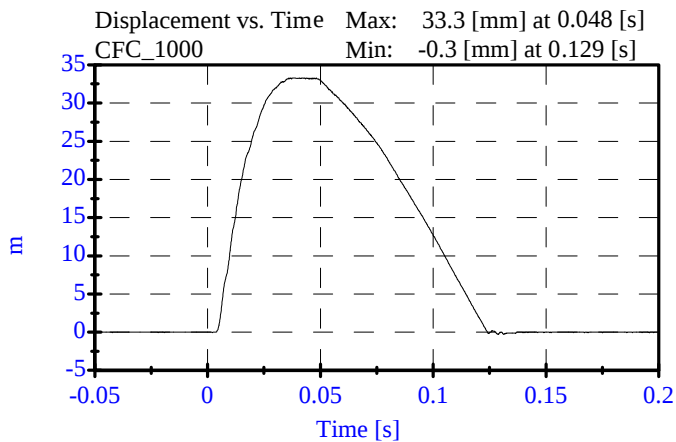
ATD Serial No: 269

Date: 09-22-03

Sequential Test Number: 1 File: 269SL1 09-22-03

Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Displacement:	30.00-35.00 mm	33.29 mm	Passed
Maximum Force:	836.00-1125.00 N	940.88 N	Passed
Impact Test Velocity:	3.05 m/s		
Damper Identification:	269		
Damper Setting:	5		

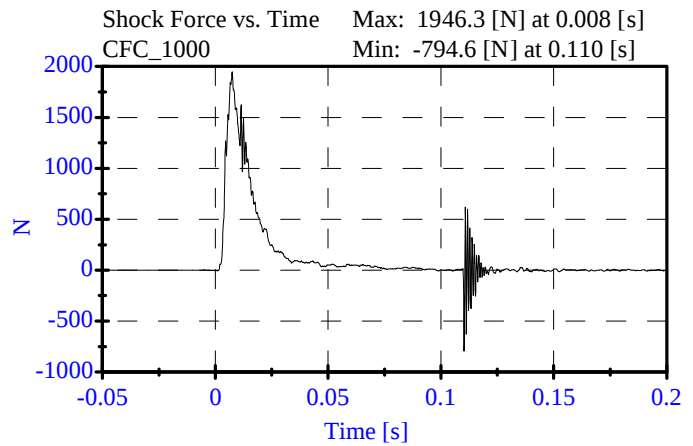
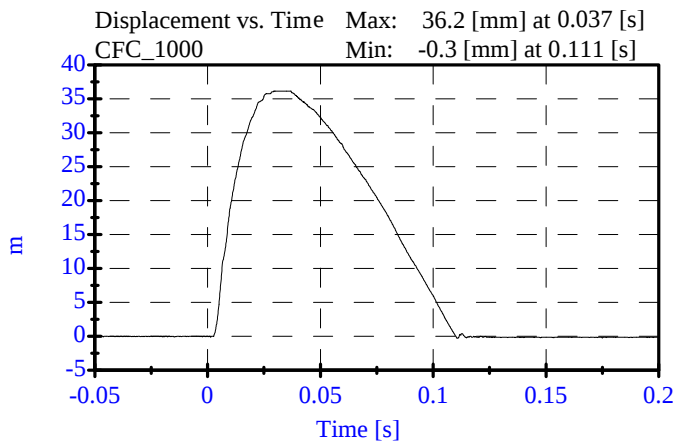


Shock Med (4.27 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 09-22-03

Sequential Test Number: 1 File: 269SM 09-22-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Displacement:	32.00-37.00 mm	36.17 mm	Passed
Maximum Force:	1730.00-2099.00 N	1946.25 N	Passed
Impact Test Velocity:	4.27 m/s		
Damper Identification:	269		
Damper Setting:	5		

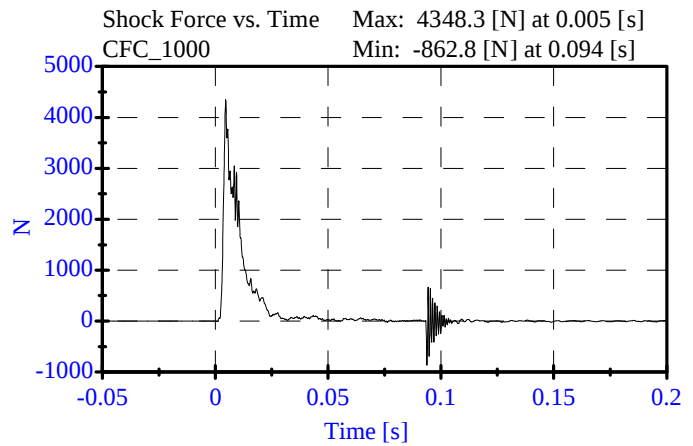
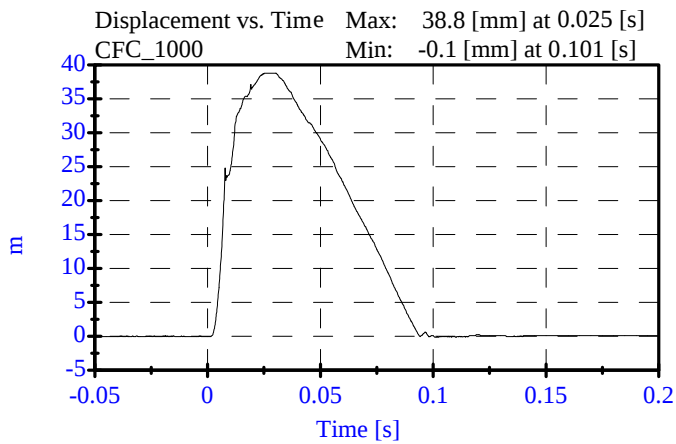


Shock High (6.10 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 09-22-03

Sequential Test Number: 1 File: 269SH 09-22-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Displacement:	33.00-40.00 mm	38.76 mm	Passed
Maximum Force:	3741.00-4448.00 N	4348.34 N	Passed
Impact Test Velocity:	6.10 m/s		
Damper Identification:	269		
Damper Setting:	5		

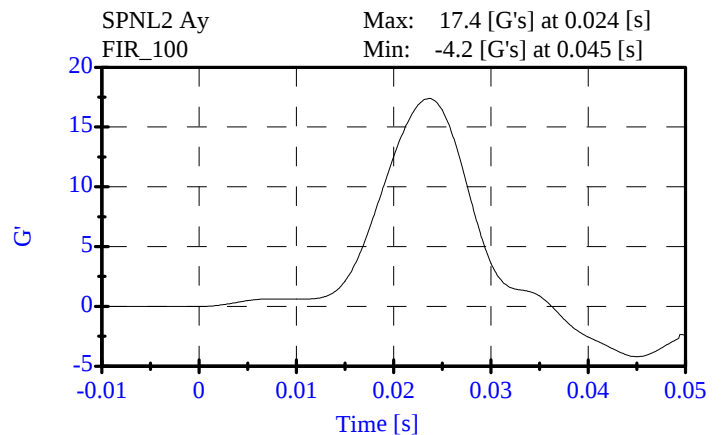
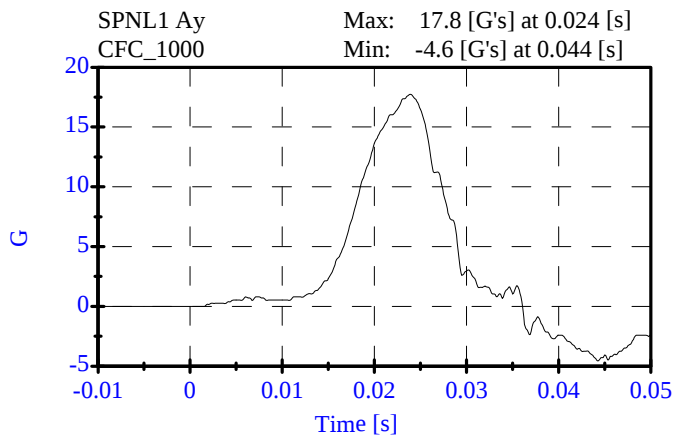
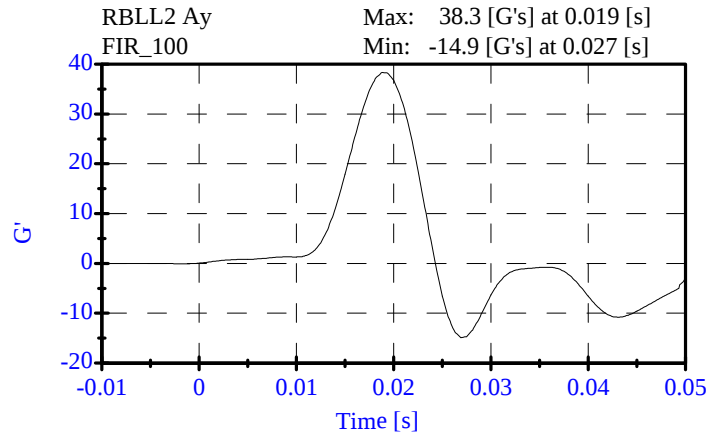
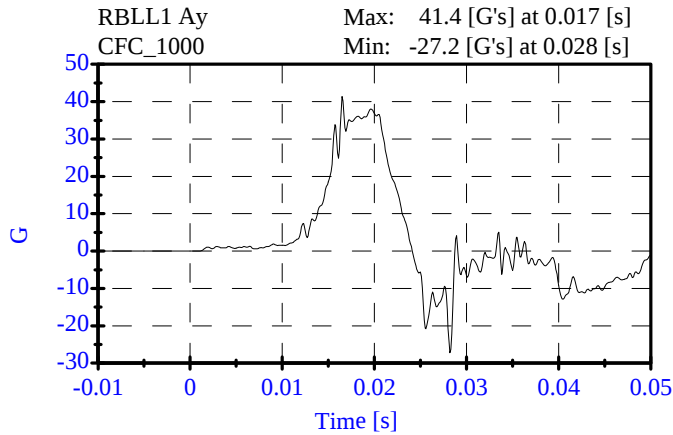
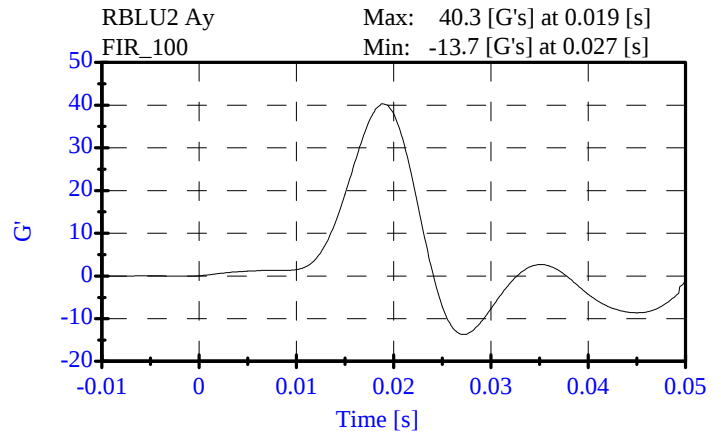
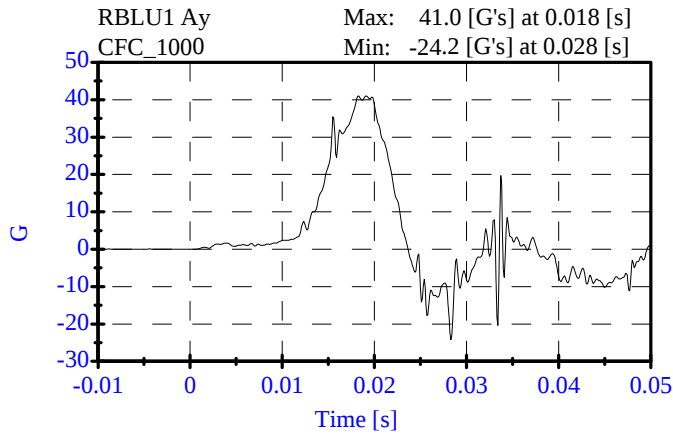


Thorax Impact
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 09-26-03

Sequential Test Number: 1 File: 269T 09-26-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.30 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	40.30 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	38.34 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	17.40 G's	Passed



Pelvic Impact

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

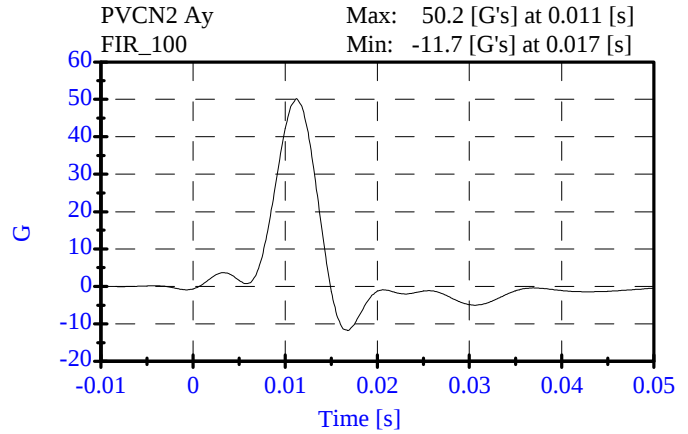
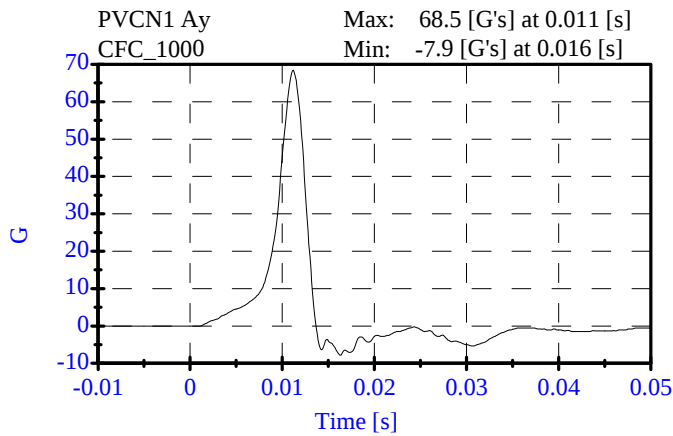
ATD Serial No: 269

Date: 09-26-03

Sequential Test Number: 1 File: 269P 09-26-03

Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	50.17 G's	Passed



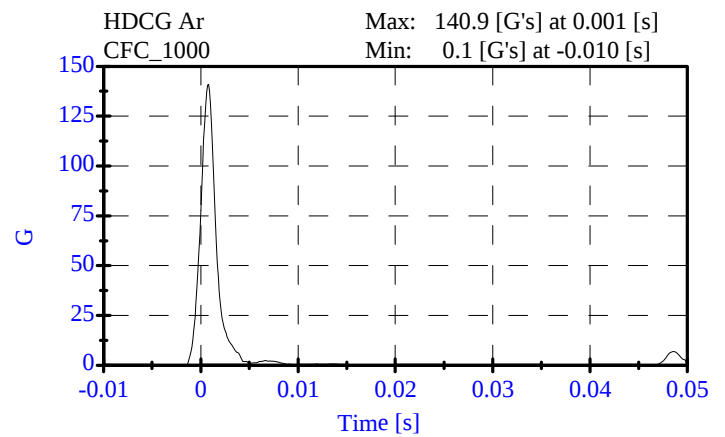
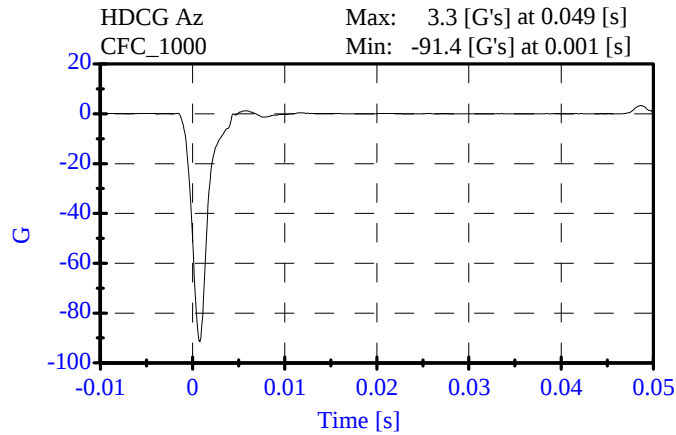
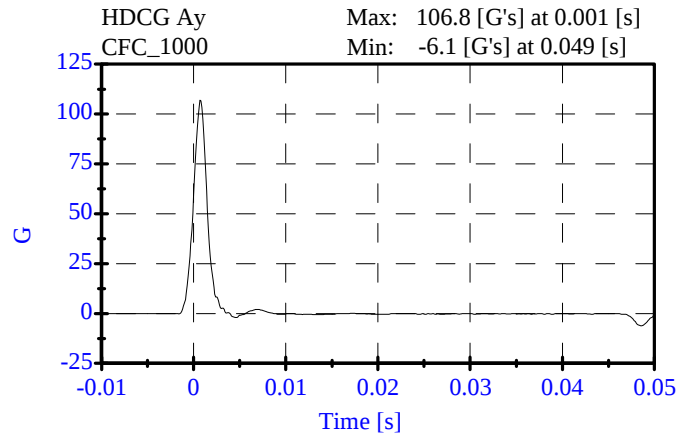
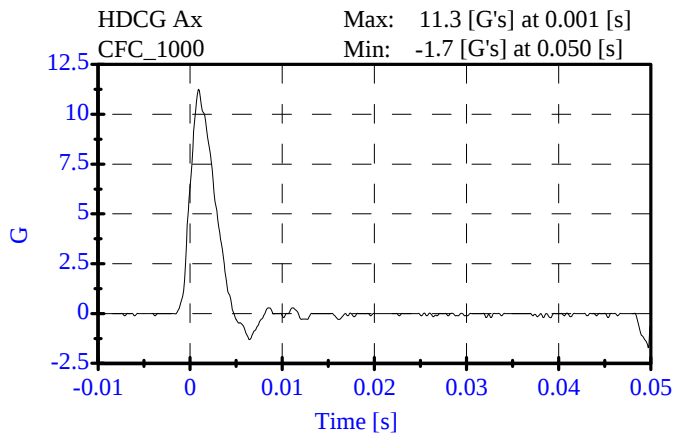
Head Drop PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 09-24-03

Sequential Test Number: 1 File: 269H 09-24-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	31.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	140.88 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	11.26 Gs	Passed
Curve PerCent NonModal:	< 15%	4.92 %	Passed



Neck Test
PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 09-25-03

Sequential Test Number: 1 File: 269N 09-25-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	6.92 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.05 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.18 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.06 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.00 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	64.0-78.0 Deg	73.49 Deg	Passed
Rotation Angle Decay:	50.0-70.0 ms	62.90 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	88.00-108.00 N-m	88.27 N-m	Passed
Occipital Moment Decay:	40.0-60.0 ms	57.40 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	0.0-20.0 ms	10.90 ms	Passed

Neck Test
PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

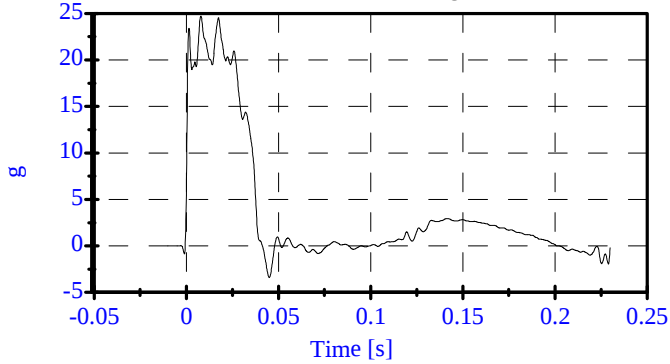
ATD Serial No: 269

Date: 09-25-03

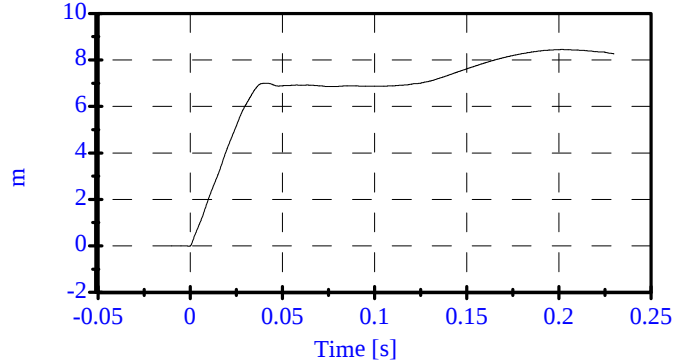
Sequential Test Number: 1 File: 269N 09-25-03

Laboratory Technician: B. Swiecicki

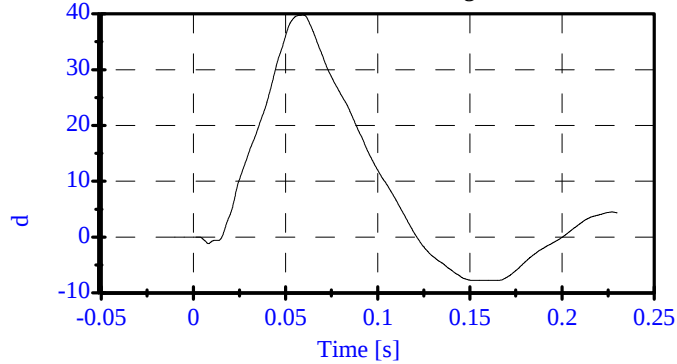
Pend Ax
CFC_180
Max: 24.7 [g's] at 0.008 [s]
Min: -3.4 [g's] at 0.045 [s]



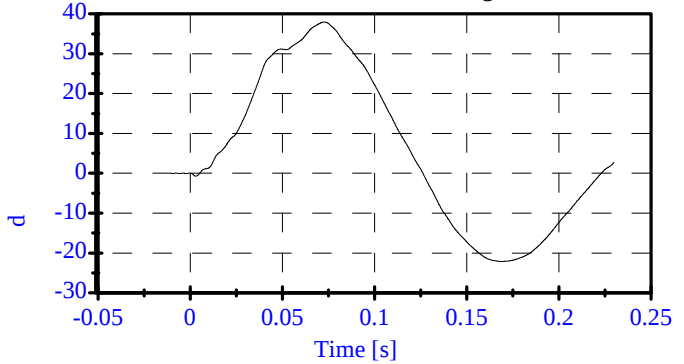
Pend Vx
CFC_180
Max: 8.4 [m/s] at 0.201 [s]
Min: -0.0 [m/s] at -0.001 [s]



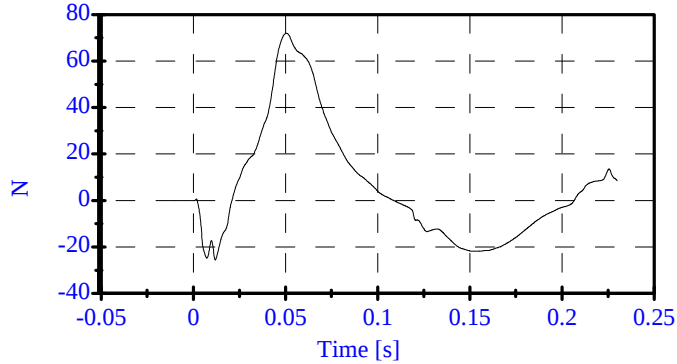
Head Rot
CFC_180
Max: 39.8 [degrees] at 0.060 [s]
Min: -7.8 [degrees] at 0.152 [s]



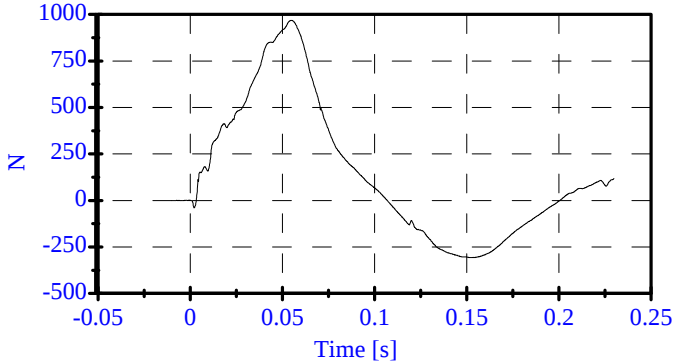
Arm Rot
CFC_180
Max: 37.9 [degrees] at 0.073 [s]
Min: -22.1 [degrees] at 0.168 [s]



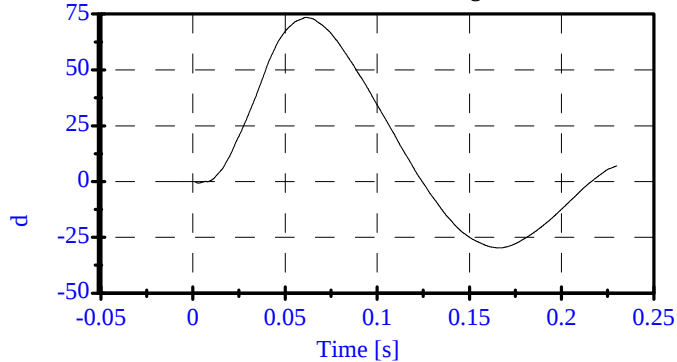
Neck Mx
CFC_600
Max: 71.9 [N-m] at 0.051 [s]
Min: -25.6 [N-m] at 0.012 [s]



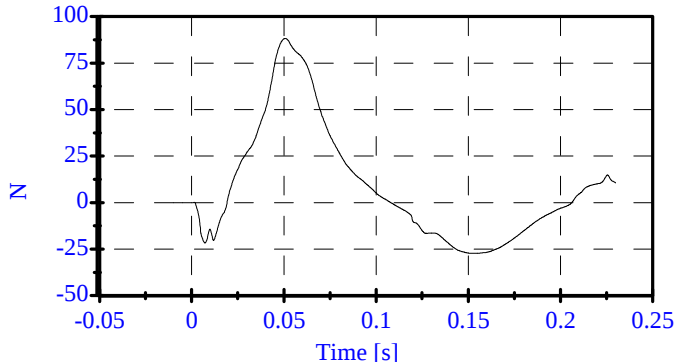
Neck Fy
CFC_1000
Max: 967.5 [N] at 0.055 [s]
Min: -307.7 [N] at 0.153 [s]



Tot Rot
CFC_180
Max: 73.5 [degrees] at 0.062 [s]
Min: -29.7 [degrees] at 0.167 [s]



Mocy
Max: 88.3 [N-m] at 0.051 [s]
Min: -27.3 [N-m] at 0.153 [s]



**ABDOMINAL COMPRESSION TEST
PRE-TEST**

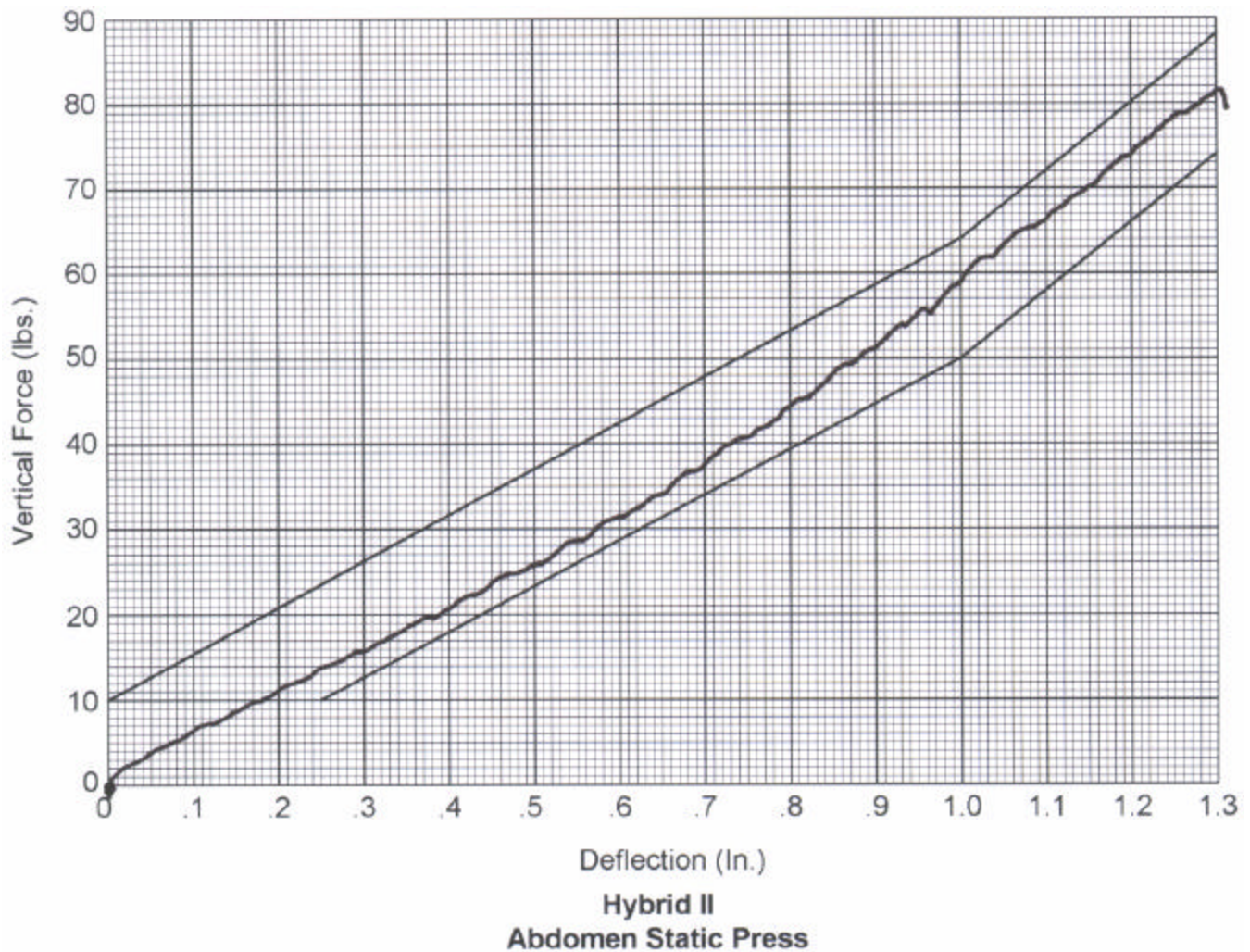
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.:	<u>269</u>	Sequential Test Number:	<u>2</u>
Date:	<u>September 26, 2003</u>	Laboratory Technician:	<u>B. Swiecicki</u>

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	28.0
FORCE @ 13 mm (N)	104 - 162	114.8
FORCE @ 19 mm (N)	163 - 221	182.4
FORCE @ 25 mm (N)	222 - 280	262.0
FORCE @ 33 mm (N)	325 - 391	362.1

REMARKS: None



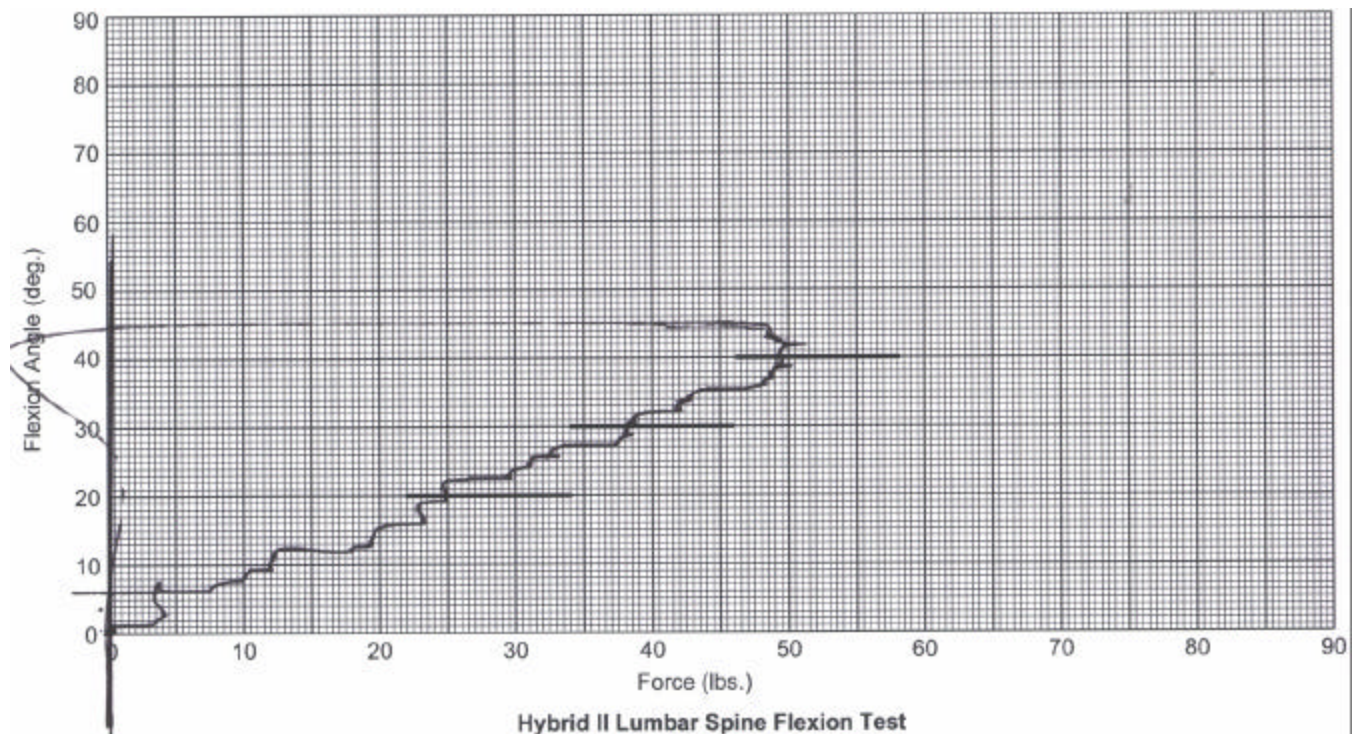
LUMBAR FLEXION TEST
PRE-TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: <u>269</u>	Sequential Test Number: <u>2</u>
Date: <u>September 26, 2003</u>	Laboratory Technician: <u>B. Swiecicki</u>

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	28.0
FORCE @ 0° (N)	0 - 26.7	0.0
FORCE @ 20° (N)	97.8 - 151.2	110.3
FORCE @ 30° (N)	151.2 - 204.6	171.7
FORCE @ 40° (N)	204.6 - 258	219.3
RETURN ANGLE	12° max.	6.2°

REMARKS: None



PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269 Sequential Test Number: 2
Date: September 26, 2003 Laboratory Technician: B. Swiecicki

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID H3 NO.: 270

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 2
Date: September 26, 2003 Laboratory Technician: B. Swiecicki

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 2
Date: September 26, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	505
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	234
KH- Knee Pivot from Back Line (mm)	511 - 526	516
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	376

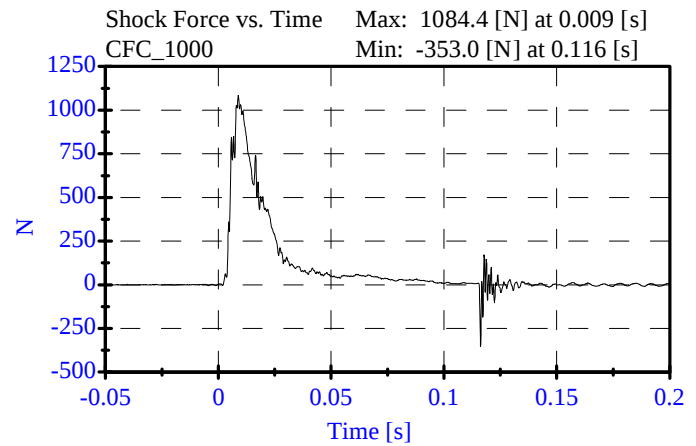
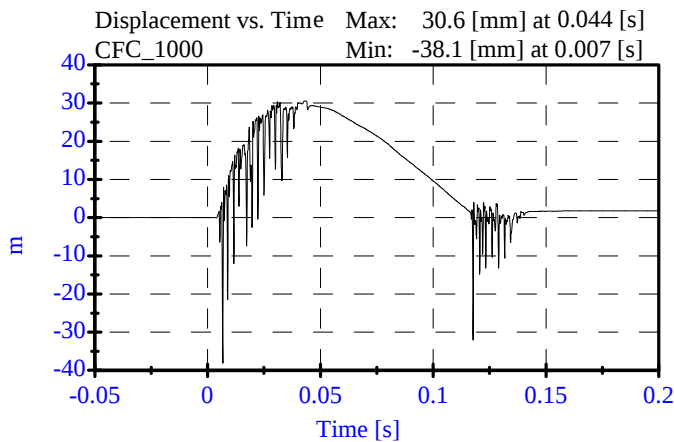
REMARKS: None

SID SHOCK LOW (3.05 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 07-15-03

Sequential Test Number: 1 File: 270SL2 7-15-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Displacement:	30.00-35.00 mm	30.58 mm	Passed
Maximum Force:	836.00-1125.00 N	1084.44 N	Passed
Impact Test Velocity:	3.05 m/s		
Damper Identification:	270		
Damper Setting:	5		

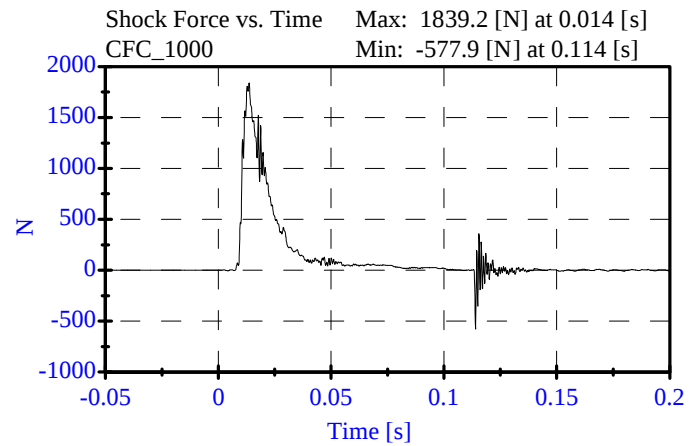
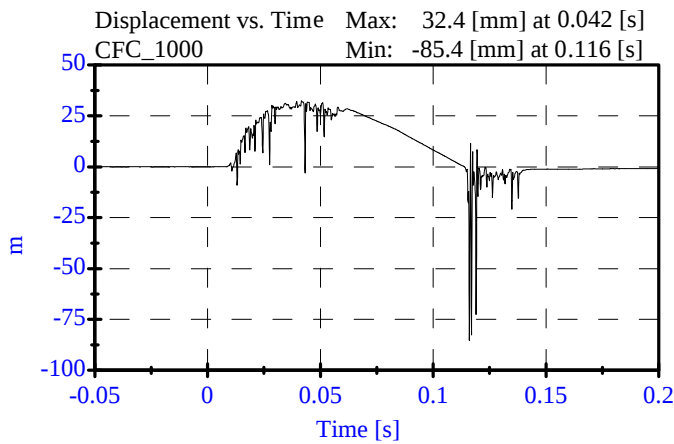


SID SHOCK MED (4.27 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 07-15-03

Sequential Test Number: 1 File: 270SM2 7-15-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Displacement:	32.00-37.00 mm	32.36 mm	Passed
Maximum Force:	1730.00-2099.00 N	1839.24 N	Passed
Impact Test Velocity:	4.27 m/s		
Damper Identification:	270		
Damper Setting:	5		



Shock - High (6.10 m/s)

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

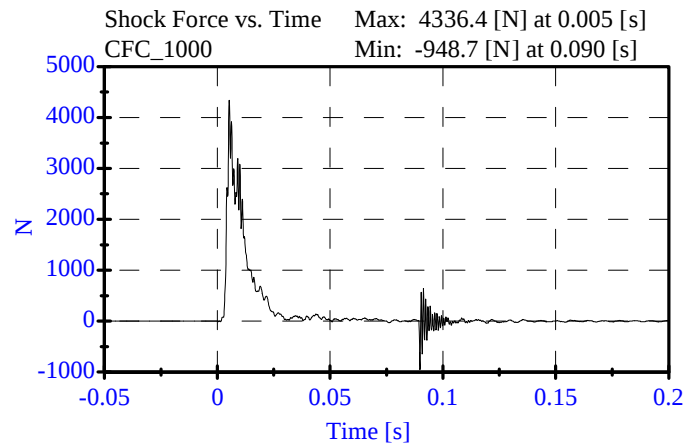
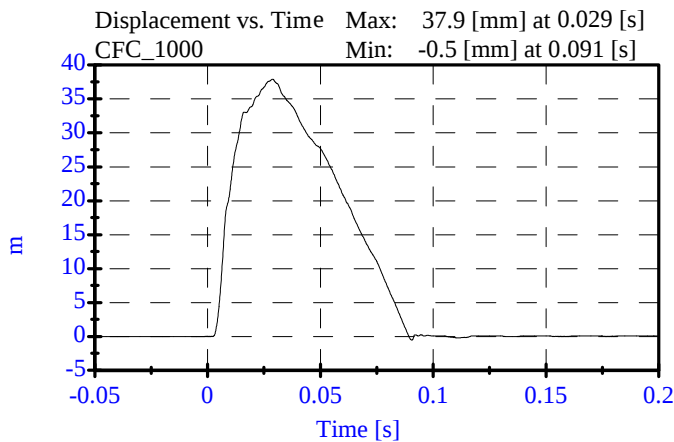
ATD Serial No: 270

Date: 07-15-03

Sequential Test Number: 1 File: 270SH1 7-15-03

Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Displacement:	33.00-40.00 mm	37.86 mm	Passed
Maximum Force:	3741.00-4448.00 N	4336.39 N	Passed
Impact Test Velocity:	6.10 m/s		
Damper Identification:	270		
Damper Setting:	5		

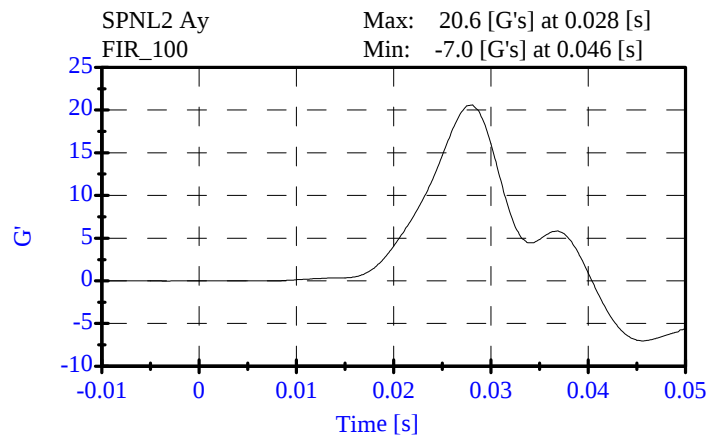
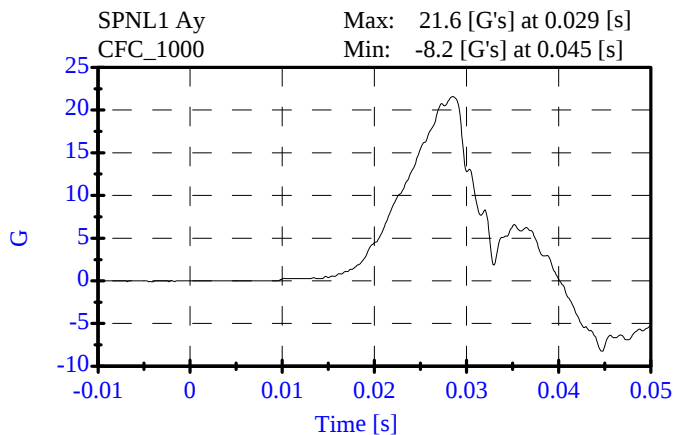
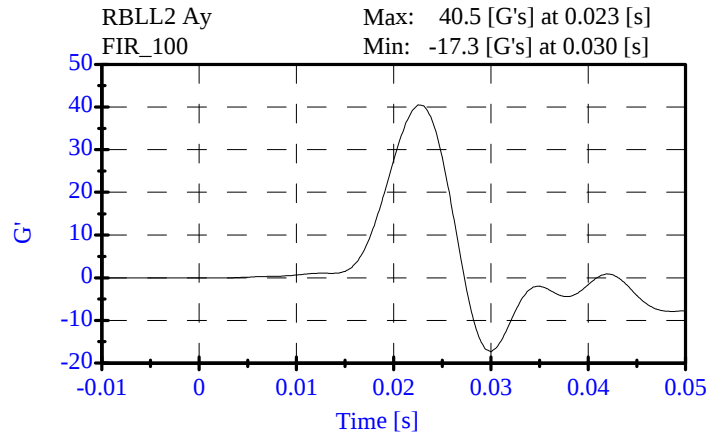
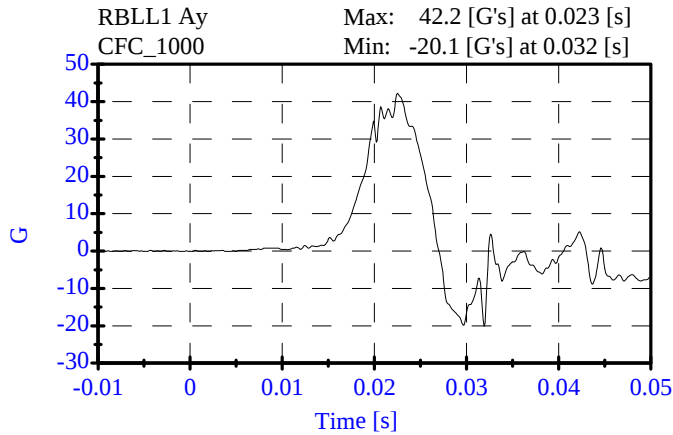
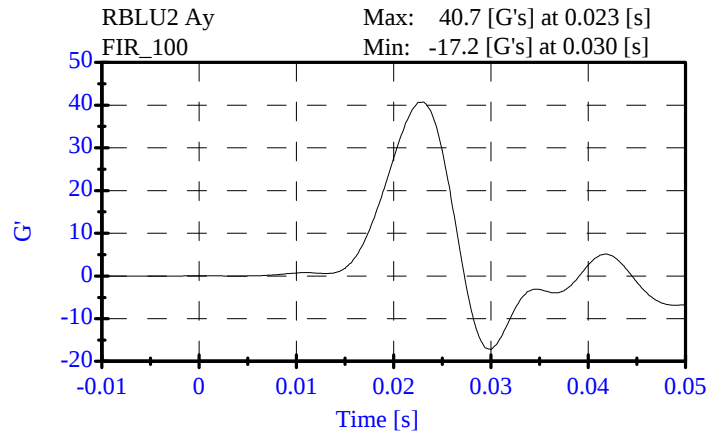
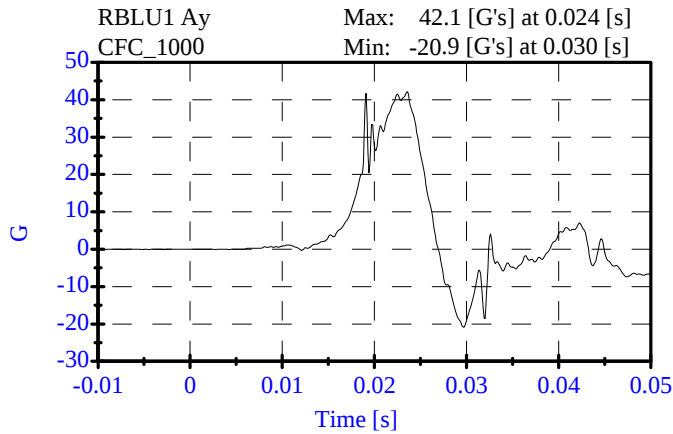


Thorax Impact
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 09-26-03

Sequential Test Number: 1 File: 270T 09-26-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.27 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	40.71 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	40.53 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.60 G's	Passed

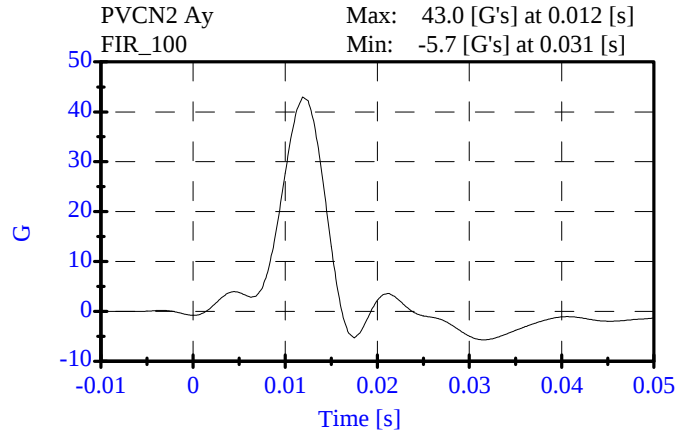
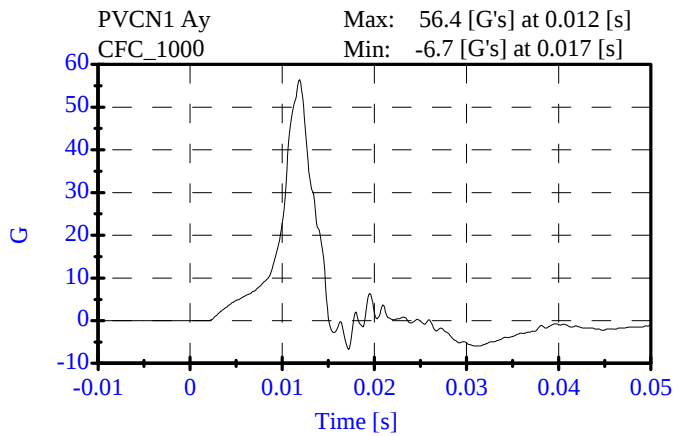


Pelvic Impact
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 09-26-03

Sequential Test Number: 1 File: 270P 09-26-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.27 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	42.96 G's	Passed



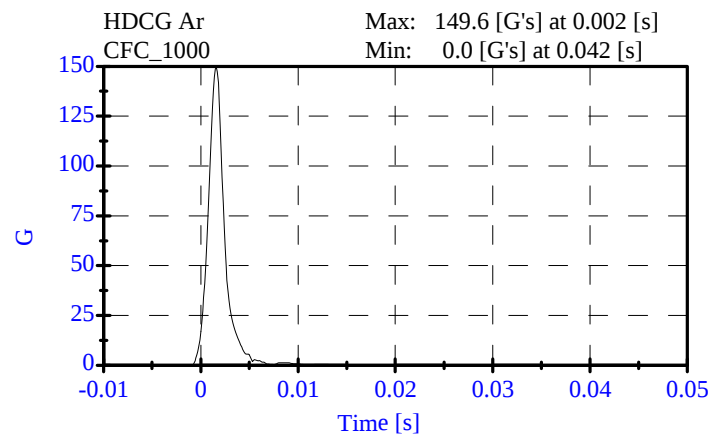
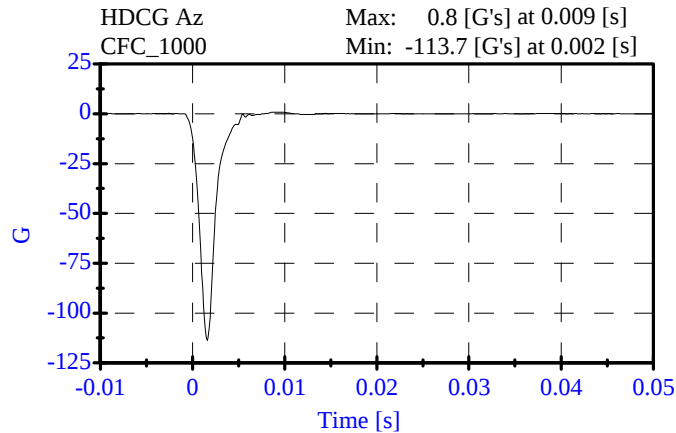
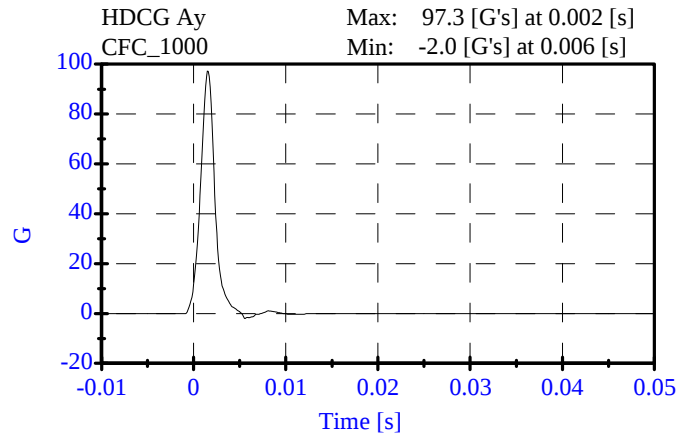
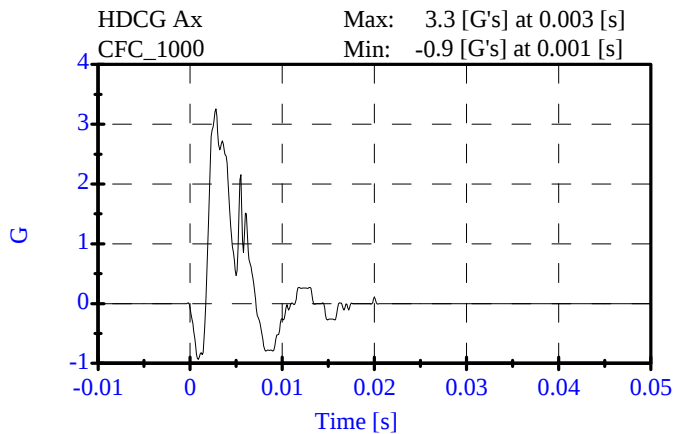
Head Drop PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 09-24-03

Sequential Test Number: 1 File: 270H 09-24-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	31.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	149.57 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	3.26 Gs	Passed
Curve PerCent NonModal:	< 15%	3.75 %	Passed



**Neck Test
PRE TEST**

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 09-25-03

Sequential Test Number: 1 File: 270N 09-25-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	6.89 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.01 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.13 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	5.97 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.11 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	64.0-78.0 Deg	73.71 Deg	Passed
Rotation Angle Decay:	50.0-70.0 ms	60.70 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	88.00-108.00 N-m	88.13 N-m	Passed
Occipital Moment Decay:	40.0-60.0 ms	53.70 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	0.0-20.0 ms	10.40 ms	Passed

Neck Test
PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

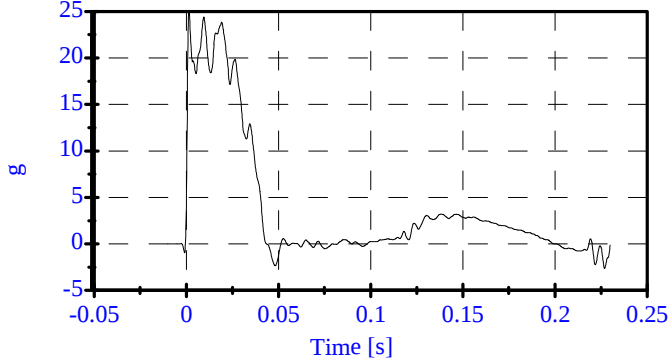
ATD Serial No: 270

Date: 09-25-03

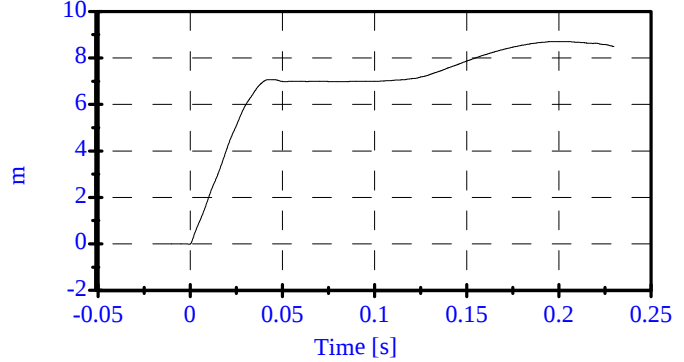
Sequential Test Number: 1 File: 270N 09-25-03

Laboratory Technician: B. Swiecicki

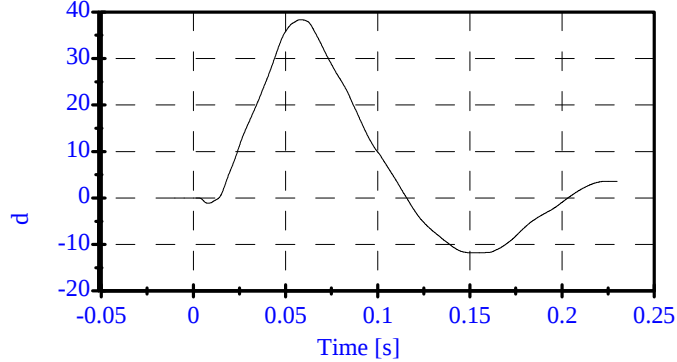
Pend Ax
CFC_180
Max: 24.9 [g's] at 0.001 [s]
Min: -2.6 [g's] at 0.227 [s]



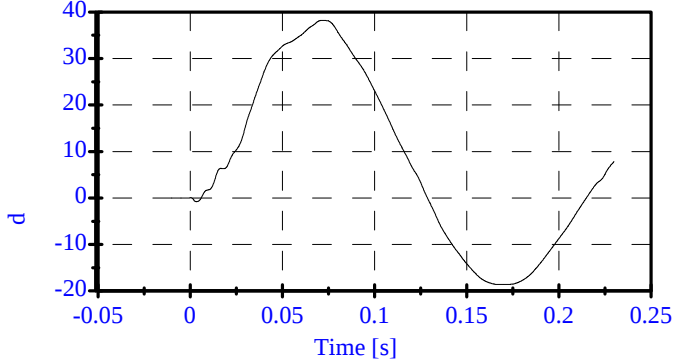
Pend Vx
CFC_180
Max: 8.7 [m/s] at 0.199 [s]
Min: -0.0 [m/s] at -0.000 [s]



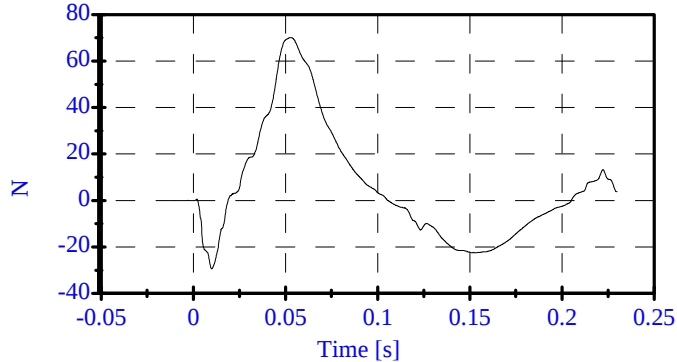
Head Rot
CFC_180
Max: 38.3 [degrees] at 0.058 [s]
Min: -11.7 [degrees] at 0.152 [s]



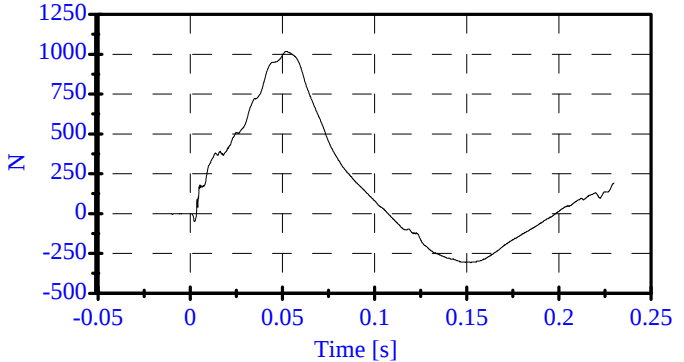
Arm Rot
CFC_180
Max: 38.2 [degrees] at 0.071 [s]
Min: -18.6 [degrees] at 0.167 [s]



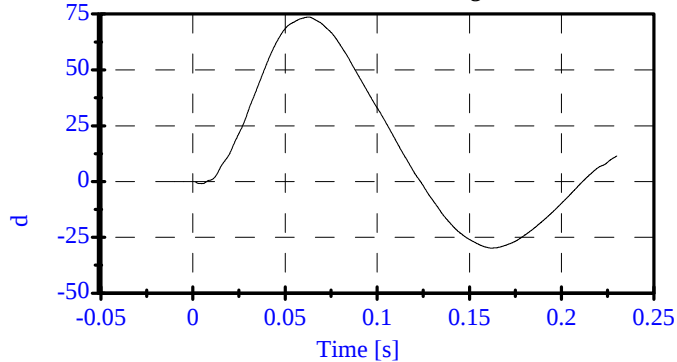
Neck Mx
CFC_600
Max: 70.0 [N-m] at 0.052 [s]
Min: -29.4 [N-m] at 0.010 [s]



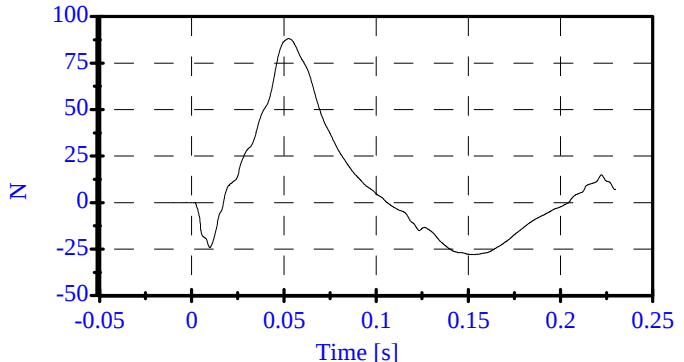
Neck Fy
CFC_1000
Max: 1017.3 [N] at 0.053 [s]
Min: -306.9 [N] at 0.152 [s]



Tot Rot
CFC_180
Max: 73.7 [degrees] at 0.063 [s]
Min: -29.8 [degrees] at 0.162 [s]



Mocy
Max: 88.1 [N-m] at 0.052 [s]
Min: -27.9 [N-m] at 0.152 [s]



**ABDOMINAL COMPRESSION TEST
PRE-TEST**

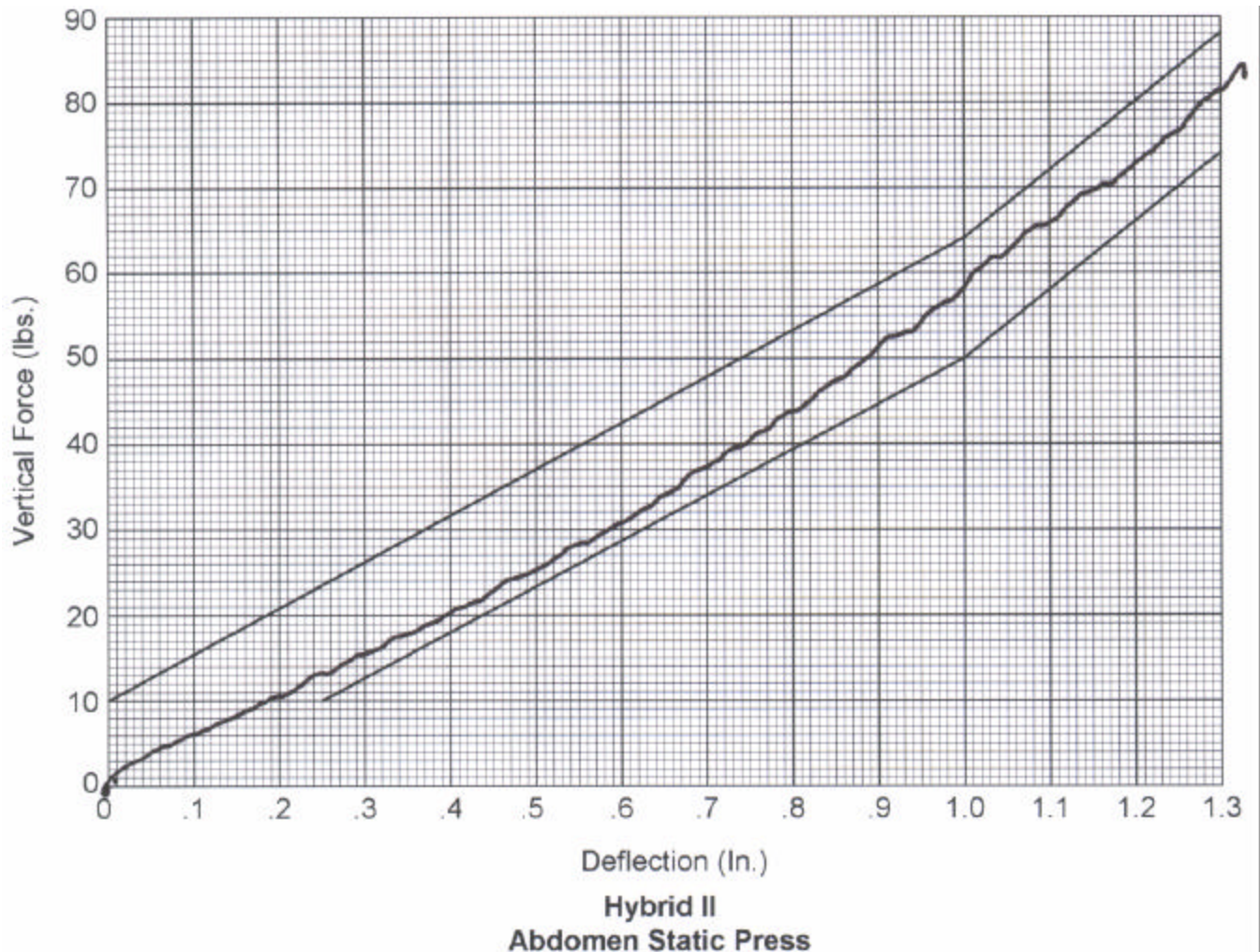
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: <u>270</u>	Sequential Test Number: <u>2</u>	
Date: <u>September 26, 2003</u>	Laboratory Technician: <u>B. Swiecicki</u>	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	28.0
FORCE @ 13 mm (N)	104 - 162	112.1
FORCE @ 19 mm (N)	163 - 221	179.7
FORCE @ 25 mm (N)	222 - 280	258.9
FORCE @ 33 mm (N)	325 - 391	361.6

REMARKS: None



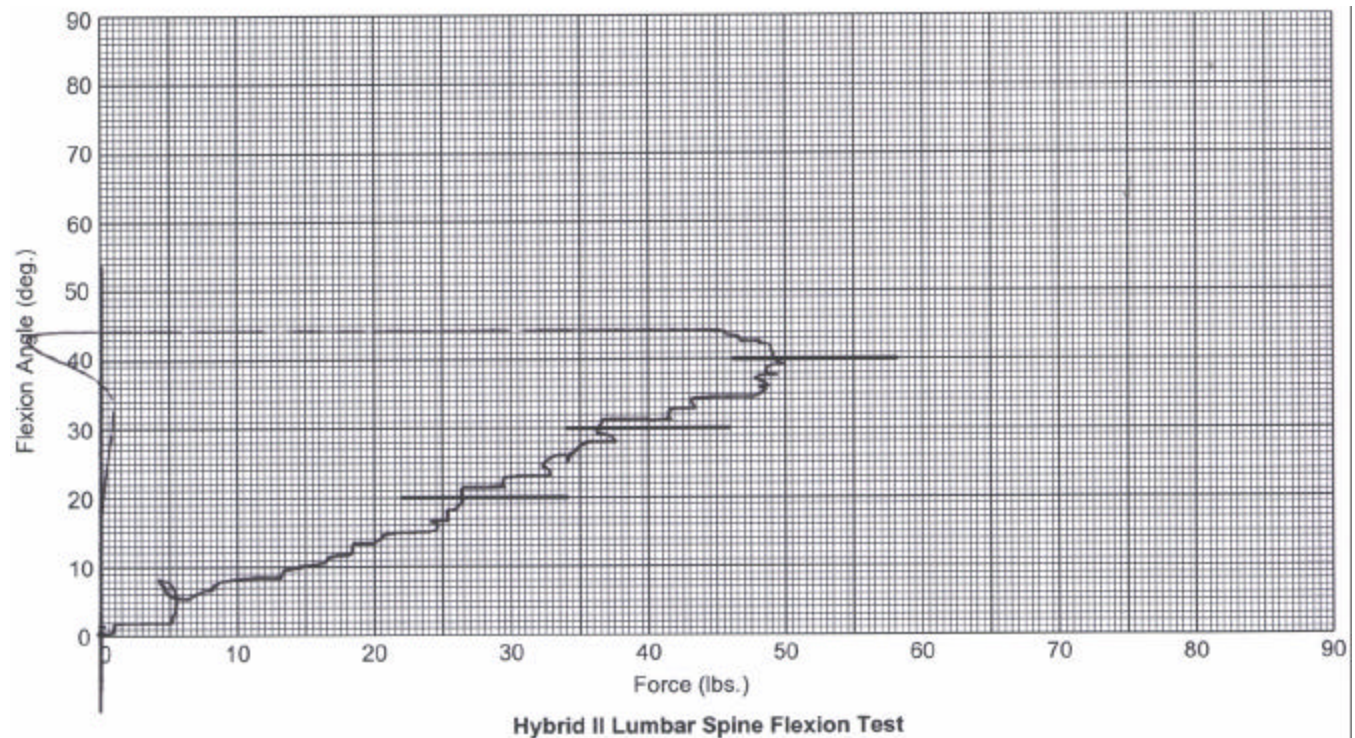
LUMBAR FLEXION TEST
PRE-TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: <u>270</u>	Sequential Test Number: <u>2</u>	
Date: <u>September 26, 2003</u>	Laboratory Technician: <u>B. Swiecicki</u>	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	28.0
FORCE @ 0° (N)	0 - 26.7	0.0
FORCE @ 20° (N)	97.8 - 151.2	117.9
FORCE @ 30° (N)	151.2 - 204.6	161.5
FORCE @ 40° (N)	204.6 - 258	219.1
RETURN ANGLE	12° max.	1.3°

REMARKS: None



PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 2
Date: September 26, 2003 Laboratory Technician: B. Swiecicki

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID H3 NO.: 269

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269 Sequential Test Number: 3
Date: November 3, 2003 Laboratory Technician: B. Swiecicki

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269 Sequential Test Number: 3
Date: November 3, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	904
RH- Rib Height (mm)	502 - 520	502
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	234
KH- Knee Pivot from Back Line (mm)	511 - 526	518
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	373

REMARKS: None

Thorax Impact POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

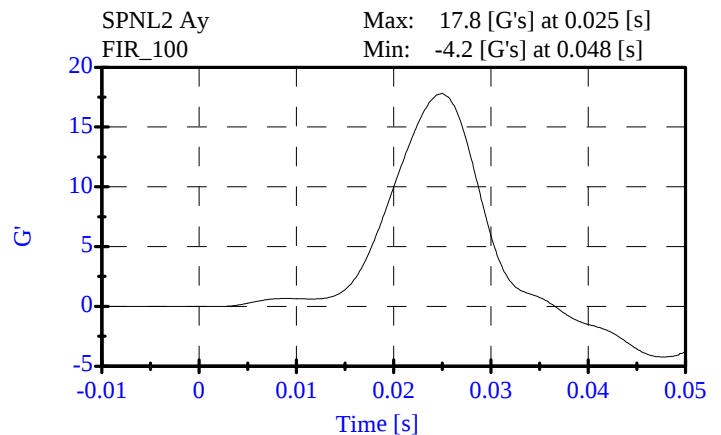
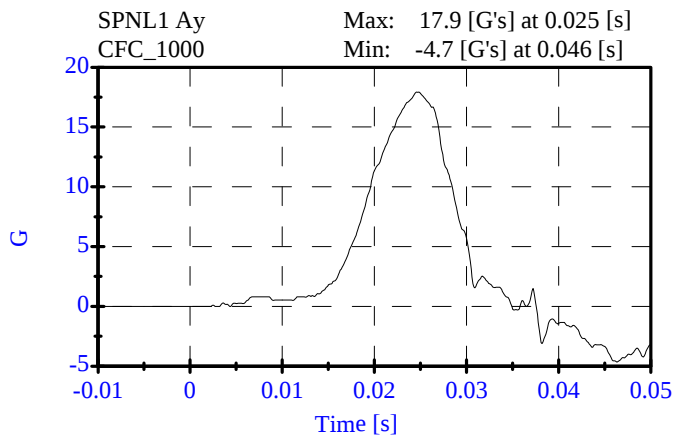
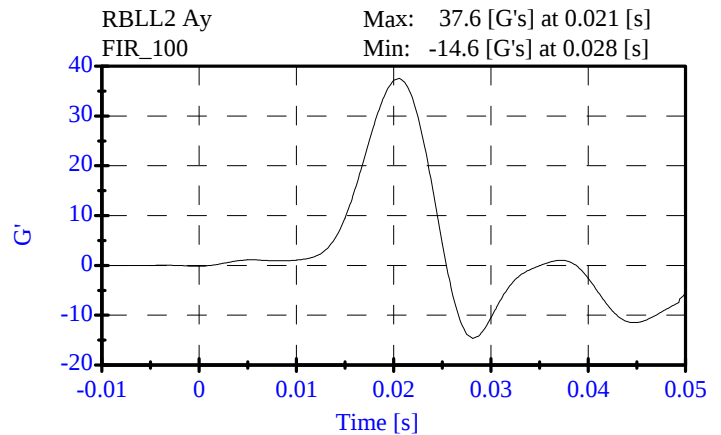
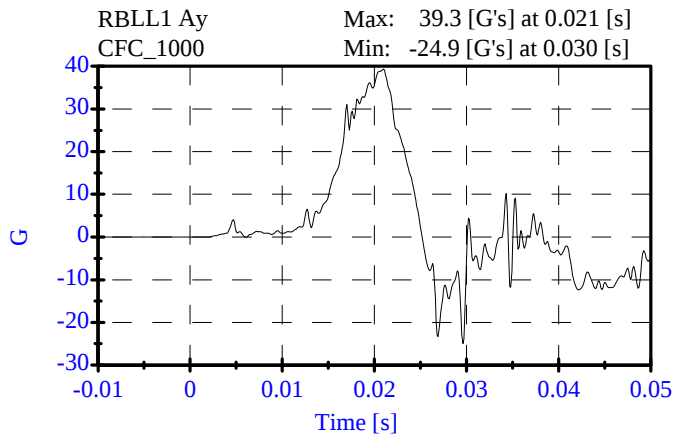
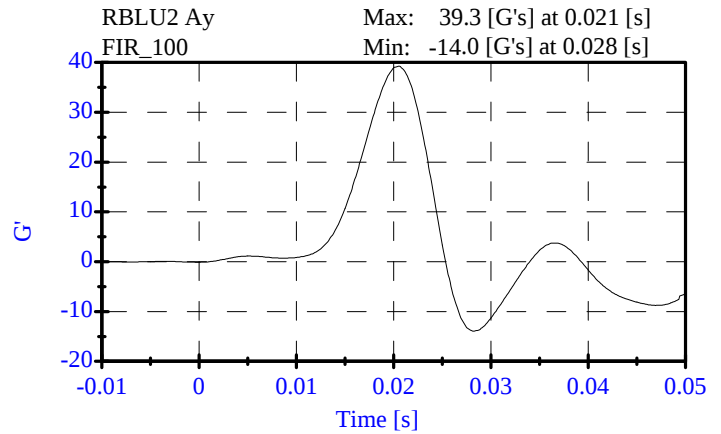
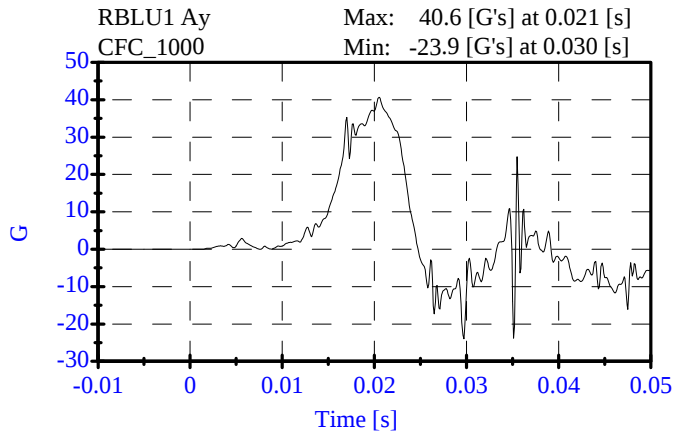
ATD Serial No: 269

Date: 11-03-03

Sequential Test Number: 1 File: 269T2 11-03-03

Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	34.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	39.27 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	37.57 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	17.82 G's	Passed



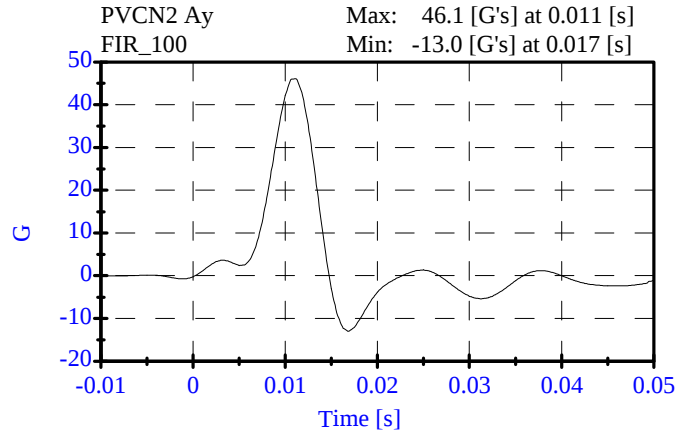
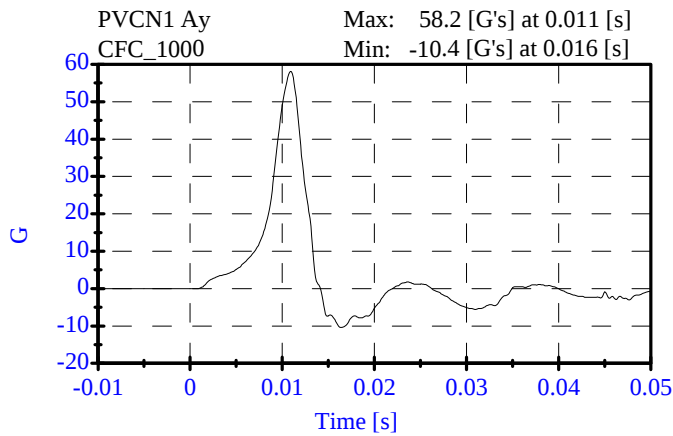
Pelvic Impact POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 11-03-03

Sequential Test Number: 1 File: 269P 11-03-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	34.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.27 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	46.10 G's	Passed



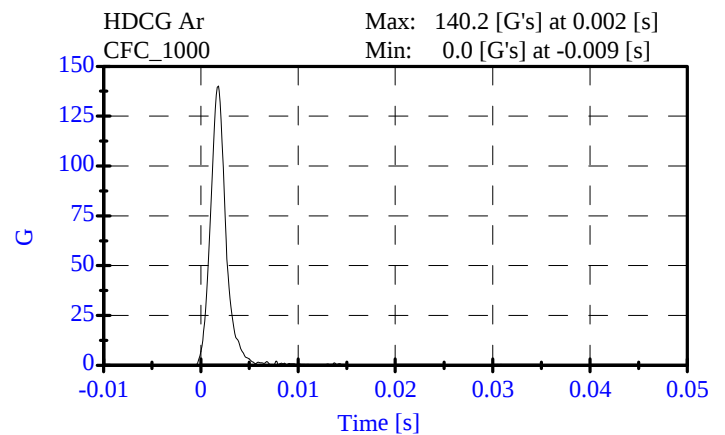
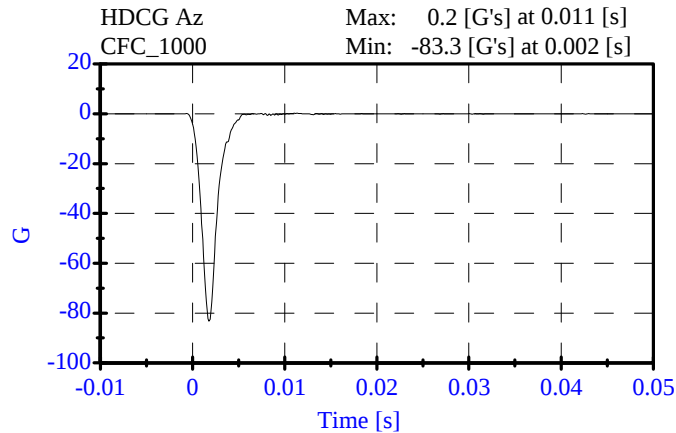
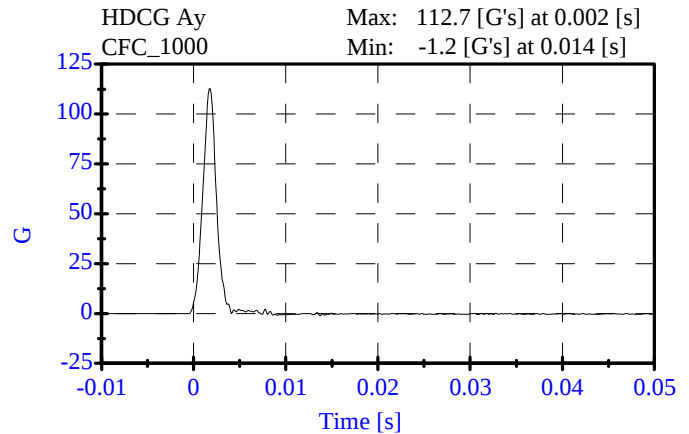
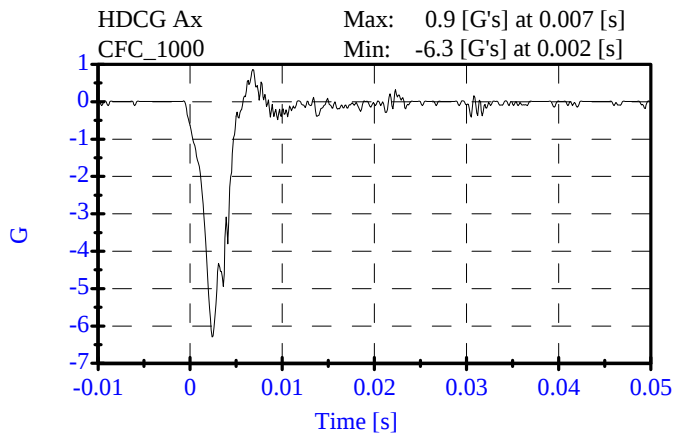
Head Drop POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 10-30-03

Sequential Test Number: 1 File: 269H 10-30-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	140.16 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	0.87 Gs	Passed
Curve PerCent NonModal:	< 15%	1.53 %	Passed



**Neck Test
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 10-31-03

Sequential Test Number: 1 File: 269N1 10-31-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	7.00 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.01 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.13 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	5.98 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.02 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	64.0-78.0 Deg	71.16 Deg	Passed
Rotation Angle Decay:	50.0-70.0 ms	64.40 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	88.00-108.00 N-m	89.56 N-m	Passed
Occipital Moment Decay:	40.0-60.0 ms	56.20 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	0.0-20.0 ms	8.70 ms	Passed

Neck Test
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

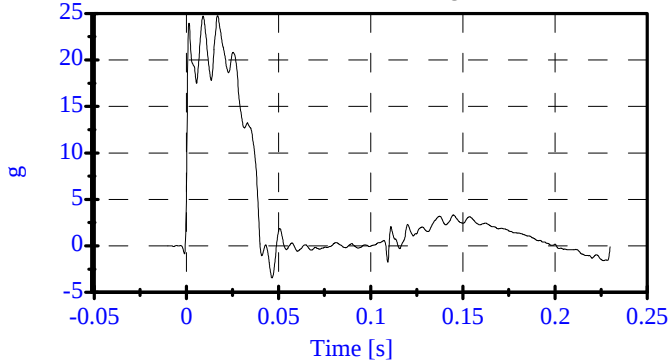
ATD Serial No: 269

Date: 10-31-03

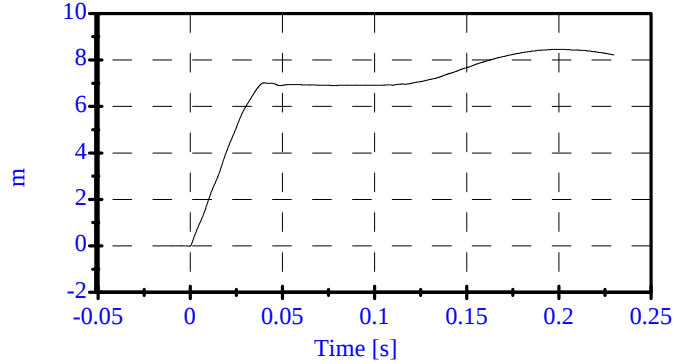
Sequential Test Number: 1 File: 269N1 10-31-03

Laboratory Technician: B. Swiecicki

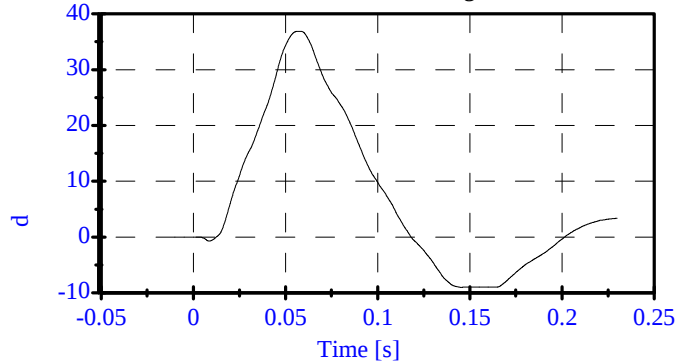
Pend Ax
CFC_180
Max: 24.8 [g's] at 0.017 [s]
Min: -3.4 [g's] at 0.047 [s]



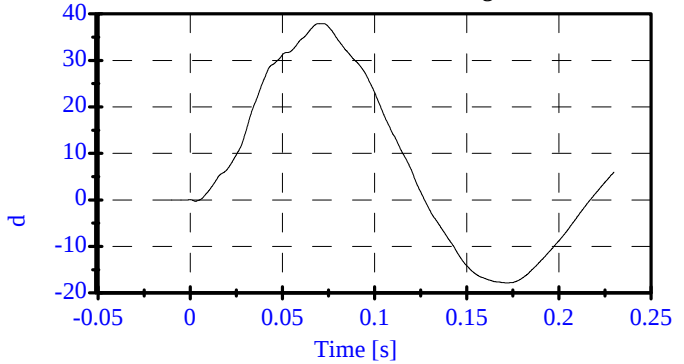
Pend Vx
CFC_180
Max: 8.5 [m/s] at 0.201 [s]
Min: -0.0 [m/s] at -0.001 [s]



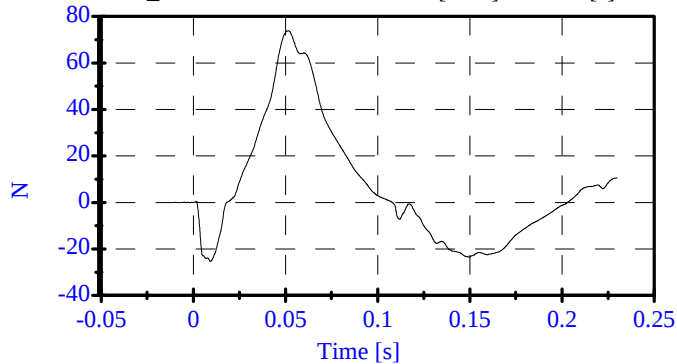
Head Rot
CFC_180
Max: 36.9 [degrees] at 0.058 [s]
Min: -9.0 [degrees] at 0.145 [s]



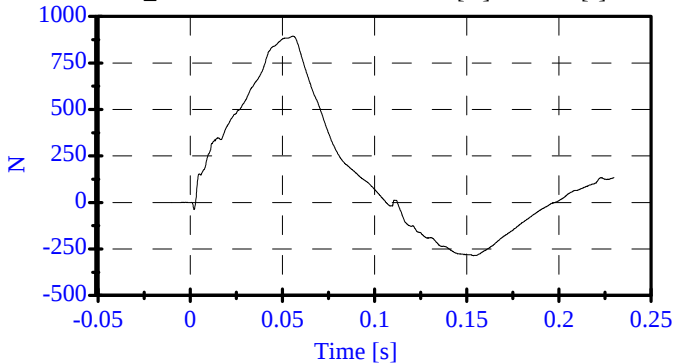
Arm Rot
CFC_180
Max: 37.9 [degrees] at 0.070 [s]
Min: -17.8 [degrees] at 0.171 [s]



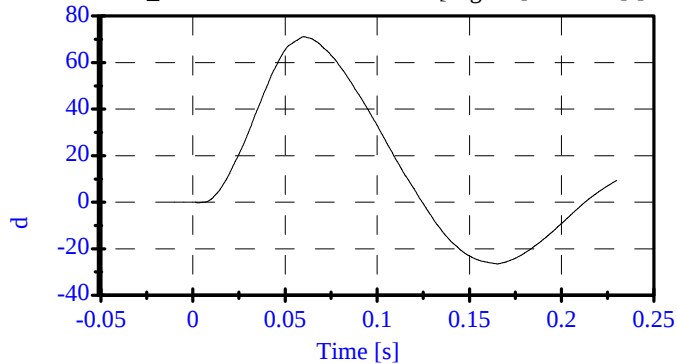
Neck Mx
CFC_600
Max: 73.8 [N-m] at 0.051 [s]
Min: -25.4 [N-m] at 0.009 [s]



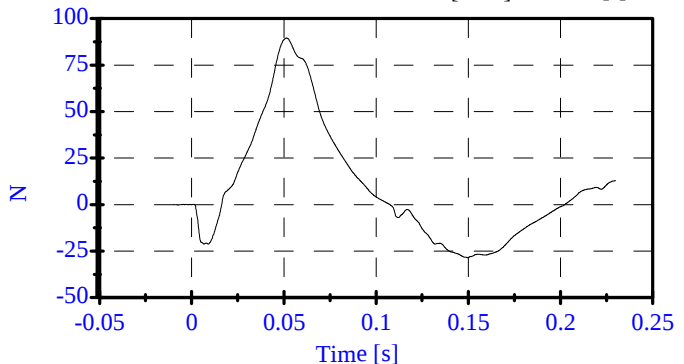
Neck Fy
CFC_1000
Max: 894.1 [N] at 0.056 [s]
Min: -285.8 [N] at 0.154 [s]



Tot Rot
CFC_180
Max: 71.2 [degrees] at 0.060 [s]
Min: -26.5 [degrees] at 0.165 [s]



Mocy
Max: 89.6 [N-m] at 0.051 [s]
Min: -28.5 [N-m] at 0.150 [s]

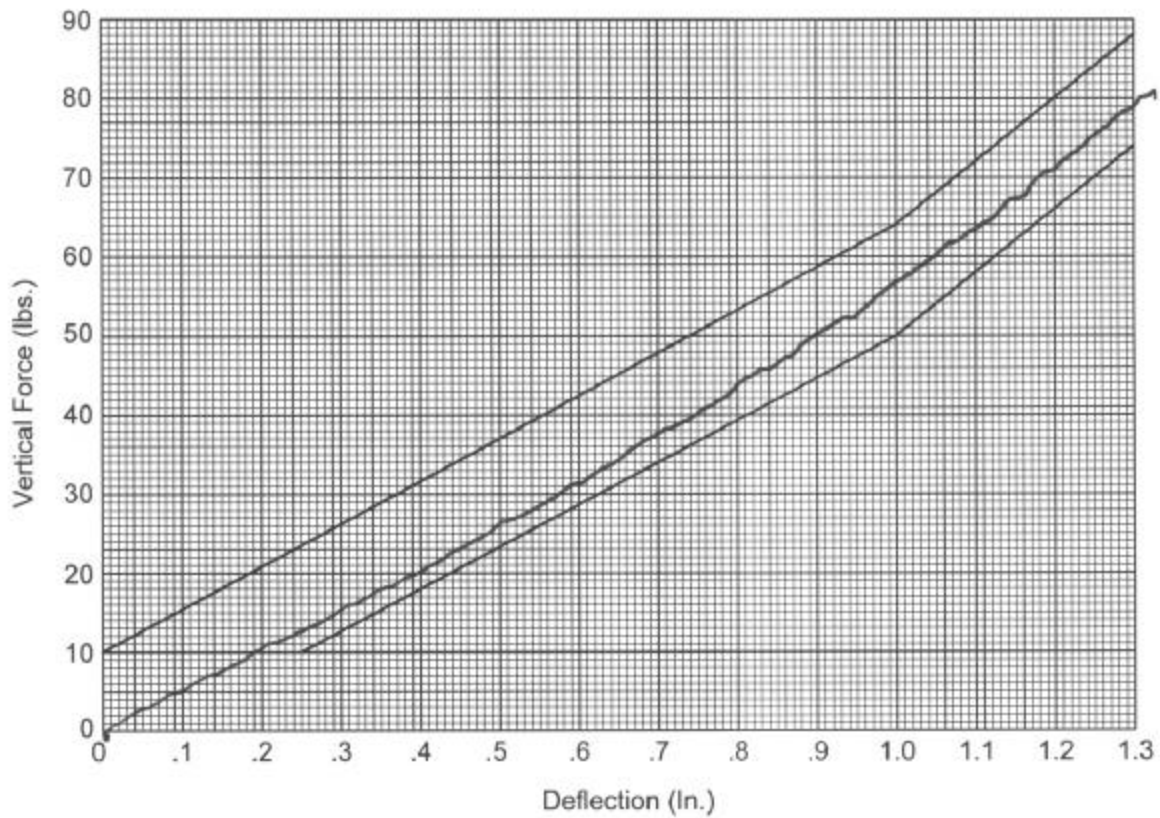


**ABDOMINAL COMPRESSION TEST
POST TEST**
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: <u>269</u>	Sequential Test Number: <u>3</u>	
Date: <u>November 3, 2003</u>	Laboratory Technician: <u>B. Swiecicki</u>	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37
FORCE @ 13 mm (N)	104 - 162	119.66
FORCE @ 19 mm (N)	163 - 221	177.93
FORCE @ 25 mm (N)	222 - 280	253.55
FORCE @ 33 mm (N)	325 - 391	351.41



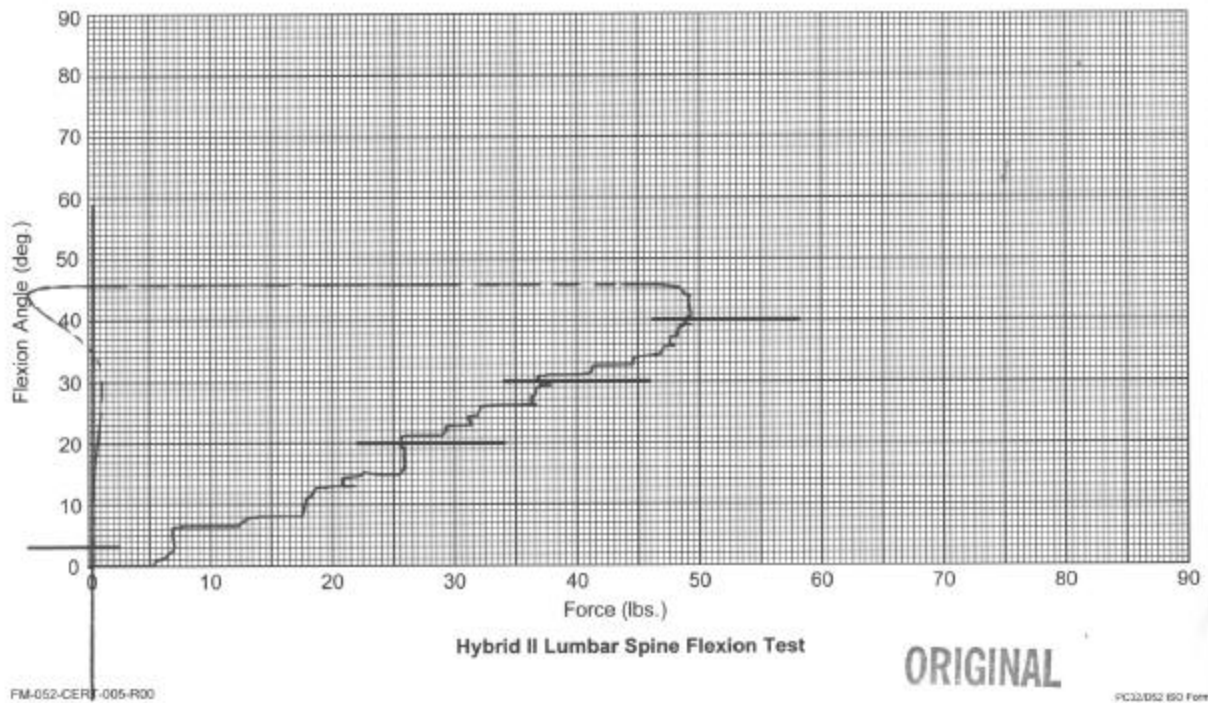
REMARKS: None

LUMBAR FLEXION TEST
POST TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269	Sequential Test Number: 3	
Date: November 3, 2003	Laboratory Technician: B. Swiecicki	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37
FORCE @ 0° (N)	0 - 26.7	0
FORCE @ 20° (N)	97.8 - 151.2	113.43
FORCE @ 30° (N)	151.2 - 204.6	164.58
FORCE @ 40° (N)	204.6 - 258	217.96
RETURN ANGLE	12° max.	3



REMARKS: None

POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 269 Sequential Test Number: 3
 Date: November 3, 2003 Laboratory Technician: B. Swiecicki

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID H3 NO.: 270

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 3
Date: November 3, 2003 Laboratory Technician: B. Swiecicki

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 3
Date: November 3, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	904
RH- Rib Height (mm)	502 - 520	505
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	234
KH- Knee Pivot from Back Line (mm)	511 - 526	518
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	378

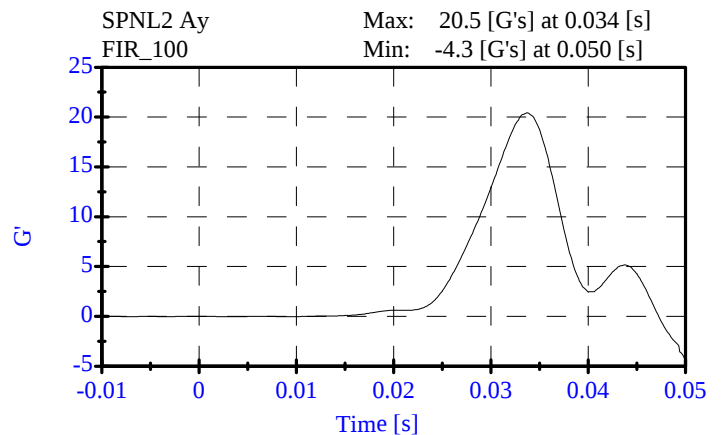
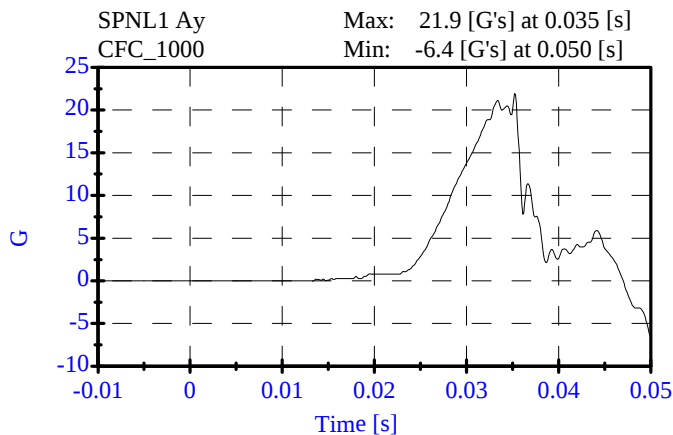
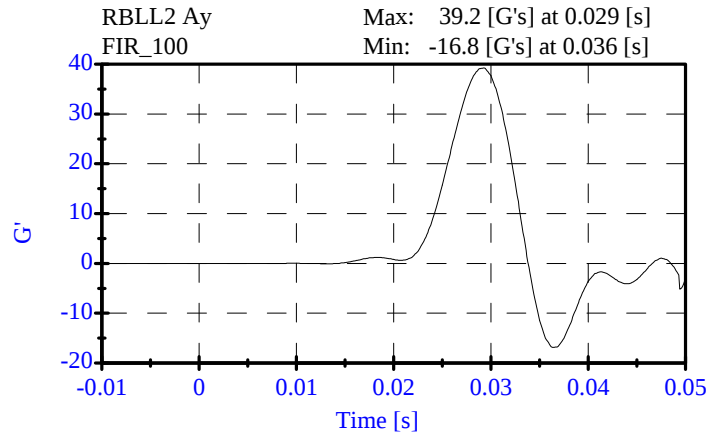
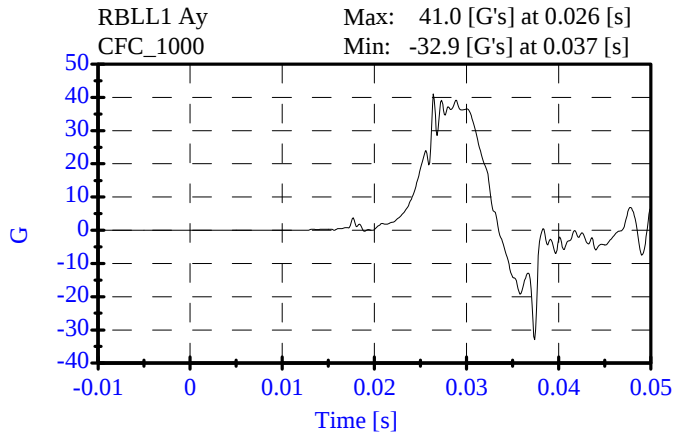
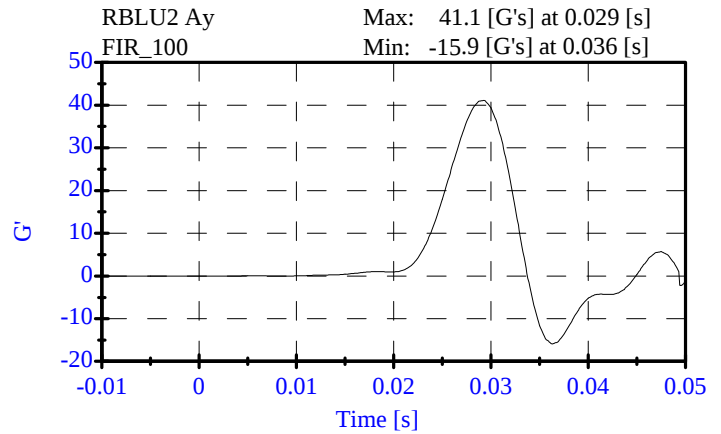
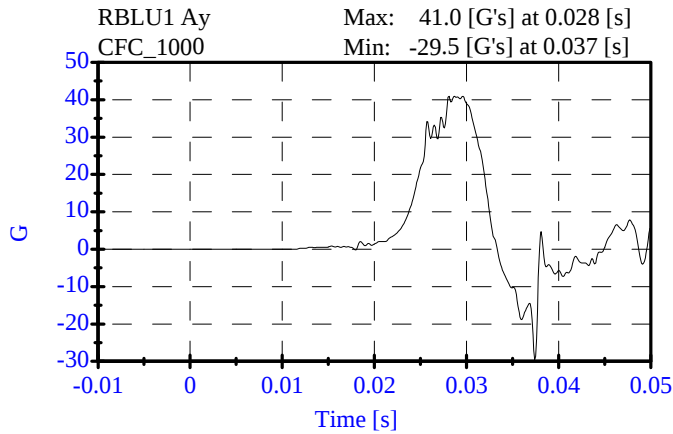
REMARKS: None

Thorax Impact
POST TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-03-03

Sequential Test Number: 1 File: 270T 11-03-03
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	34.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.33 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	41.08 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	39.24 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.45 G's	Passed



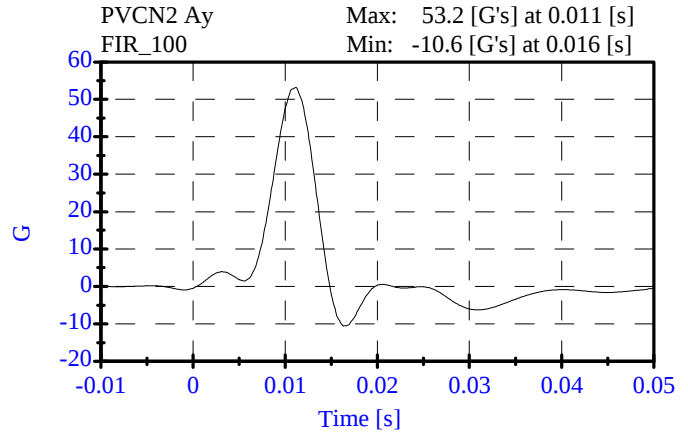
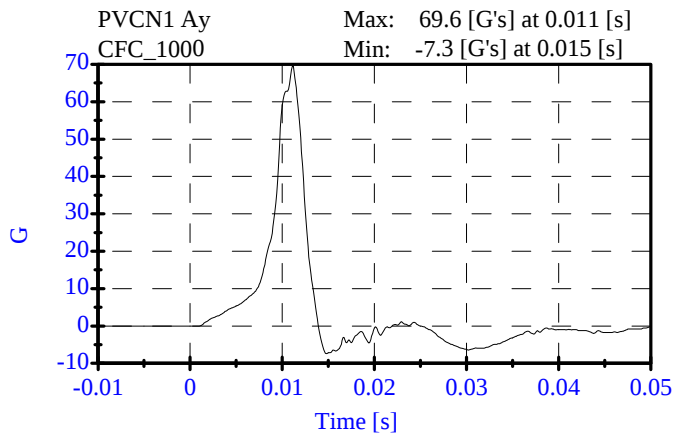
Pelvic Impact POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-03-03

Sequential Test Number: 1 File: 270P 11-03-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	34.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.30 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	53.19 G's	Passed



Head Drop POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

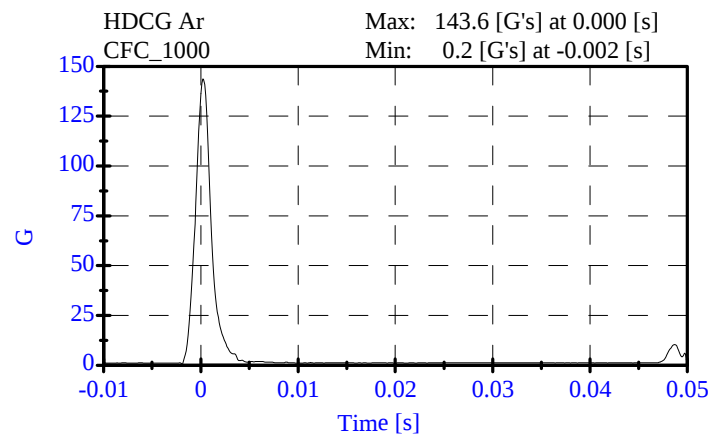
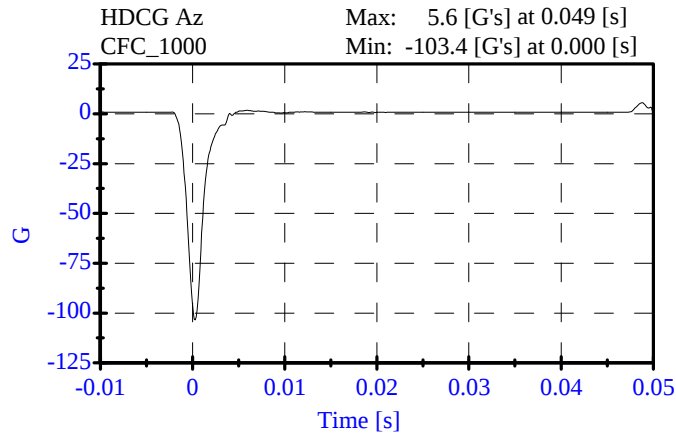
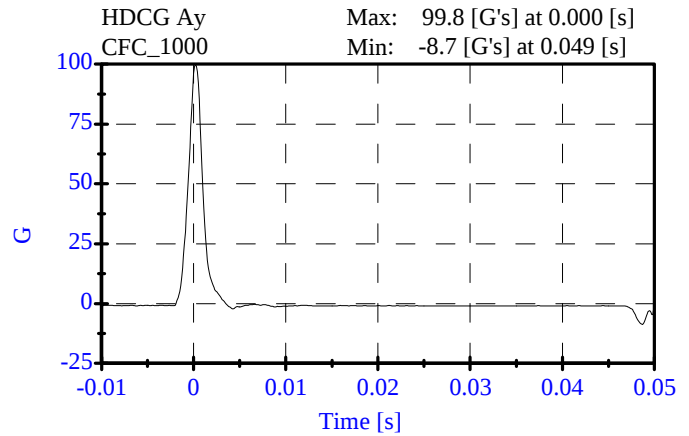
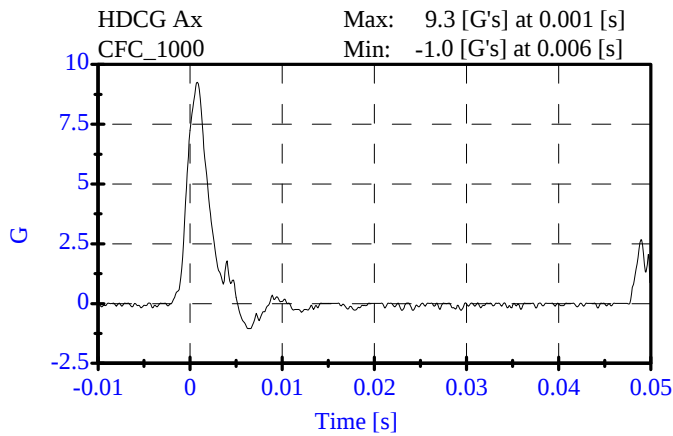
ATD Serial No: 270

Date: 10-30-03

Sequential Test Number: 1 File: 270H 10-30-03

Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	143.60 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	9.25 Gs	Passed
Curve PerCent NonModal:	< 15%	7.31 %	Passed



**Neck Test
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 10-31-03

Sequential Test Number: 1 File: 270N 10-31-03
Laboratory Technician: B. Swiecicki

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	33.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	6.90 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.10 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.24 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.05 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	6.97 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	64.0-78.0 Deg	74.87 Deg	Passed
Rotation Angle Decay:	50.0-70.0 ms	65.40 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	88.00-108.00 N-m	89.64 N-m	Passed
Occipital Moment Decay:	40.0-60.0 ms	57.40 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	0.0-20.0 ms	9.50 ms	Passed

Neck Test
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

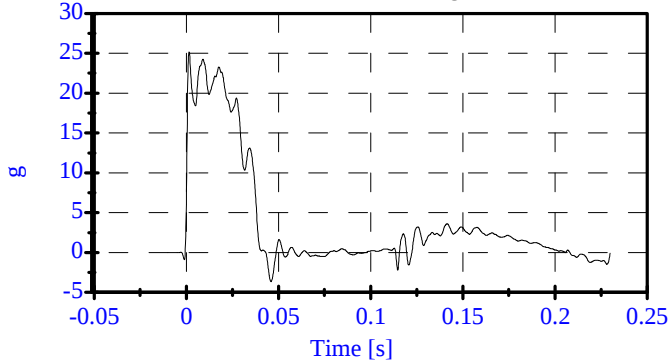
ATD Serial No: 270

Date: 10-31-03

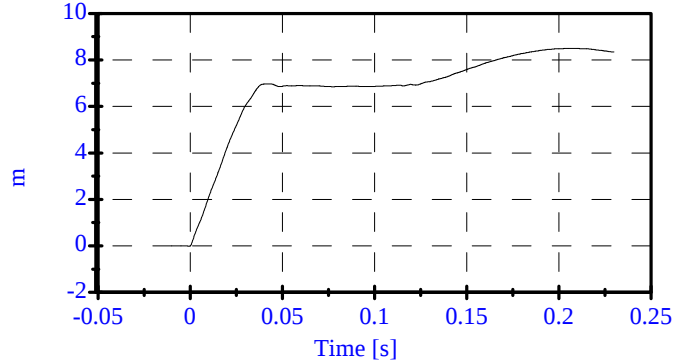
Sequential Test Number: 1 File: 270N 10-31-03

Laboratory Technician: B. Swiecicki

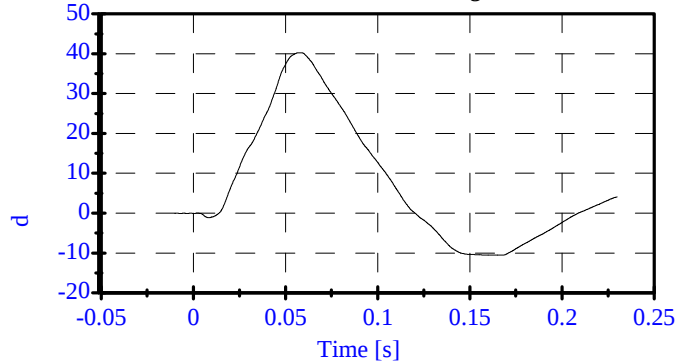
Pend Ax
CFC_180
Max: 25.2 [g's] at 0.002 [s]
Min: -3.6 [g's] at 0.046 [s]



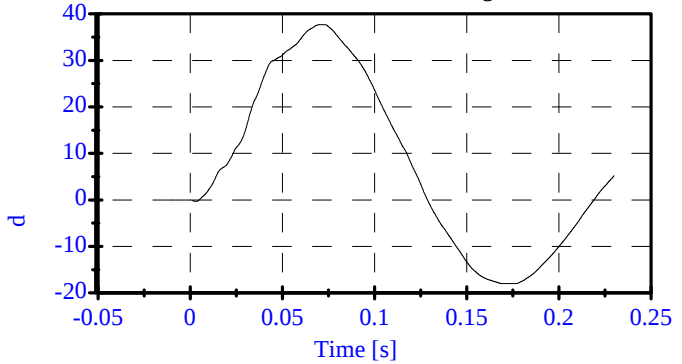
Pend Vx
CFC_180
Max: 8.5 [m/s] at 0.208 [s]
Min: -0.0 [m/s] at -0.001 [s]



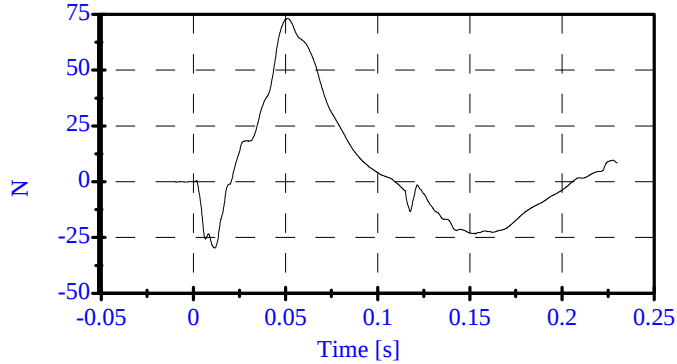
Head Rot
CFC_180
Max: 40.3 [degrees] at 0.058 [s]
Min: -10.5 [degrees] at 0.161 [s]



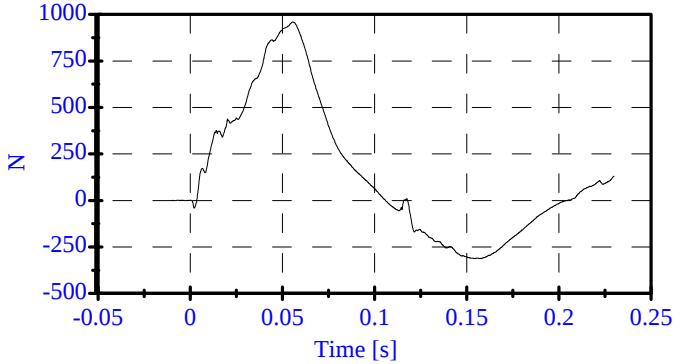
Arm Rot
CFC_180
Max: 37.7 [degrees] at 0.073 [s]
Min: -18.0 [degrees] at 0.174 [s]



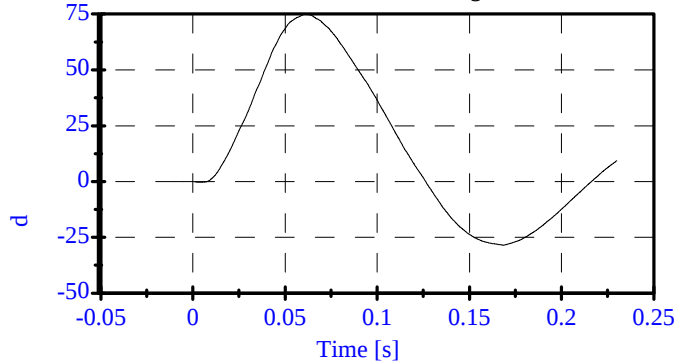
Neck Mx
CFC_600
Max: 73.2 [N-m] at 0.051 [s]
Min: -29.7 [N-m] at 0.012 [s]



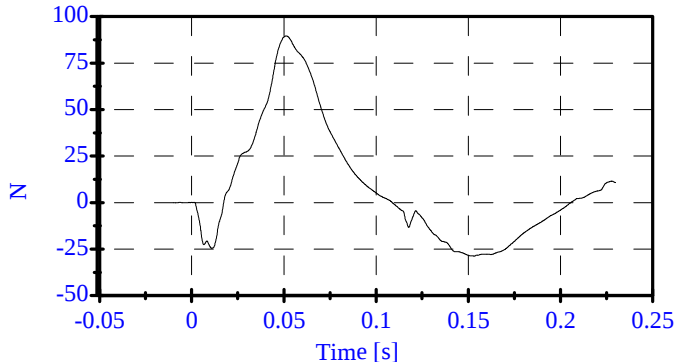
Neck Fy
CFC_1000
Max: 959.3 [N] at 0.056 [s]
Min: -312.4 [N] at 0.154 [s]



Tot Rot
CFC_180
Max: 74.9 [degrees] at 0.061 [s]
Min: -28.4 [degrees] at 0.169 [s]



Mocy
Max: 89.6 [N-m] at 0.051 [s]
Min: -28.7 [N-m] at 0.153 [s]

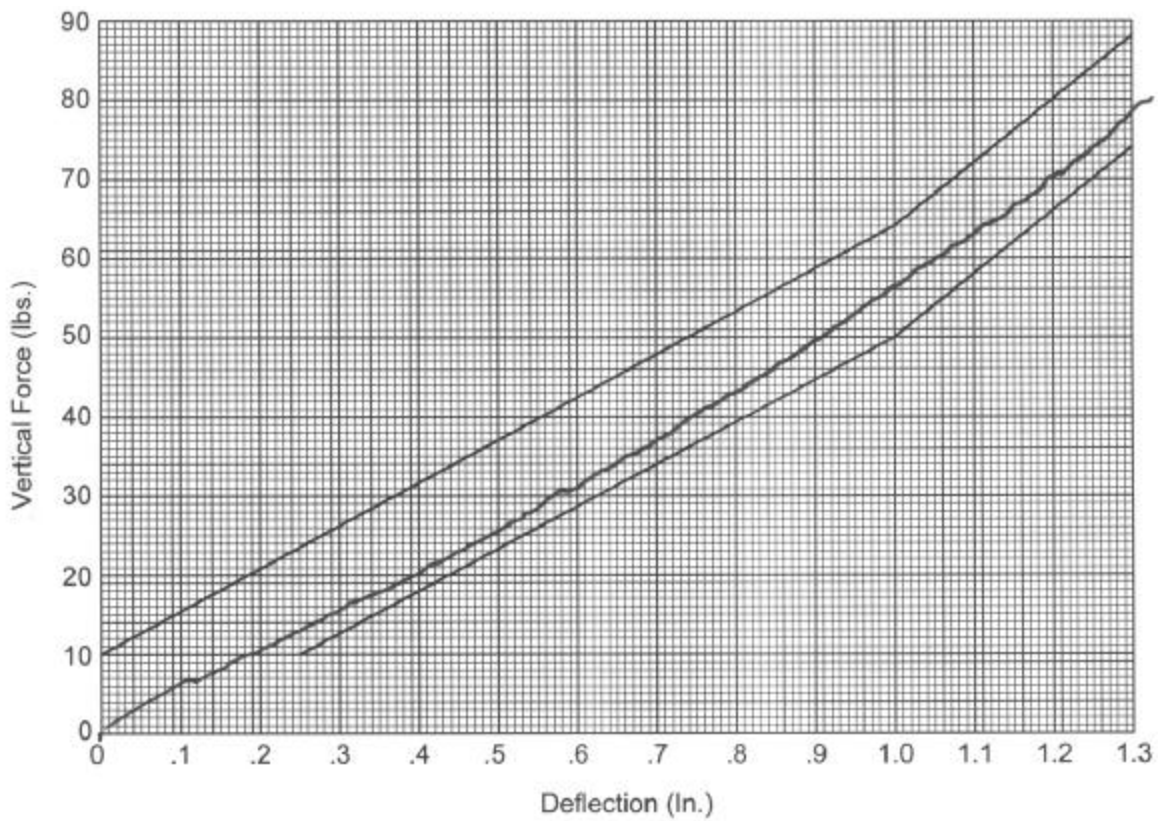


ABDOMINAL COMPRESSION TEST
POST TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 3
Date: November 3, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37
FORCE @ 13 mm (N)	104 - 162	117.43
FORCE @ 19 mm (N)	163 - 221	180.15
FORCE @ 25 mm (N)	222 - 280	251.32
FORCE @ 33 mm (N)	325 - 391	349.19



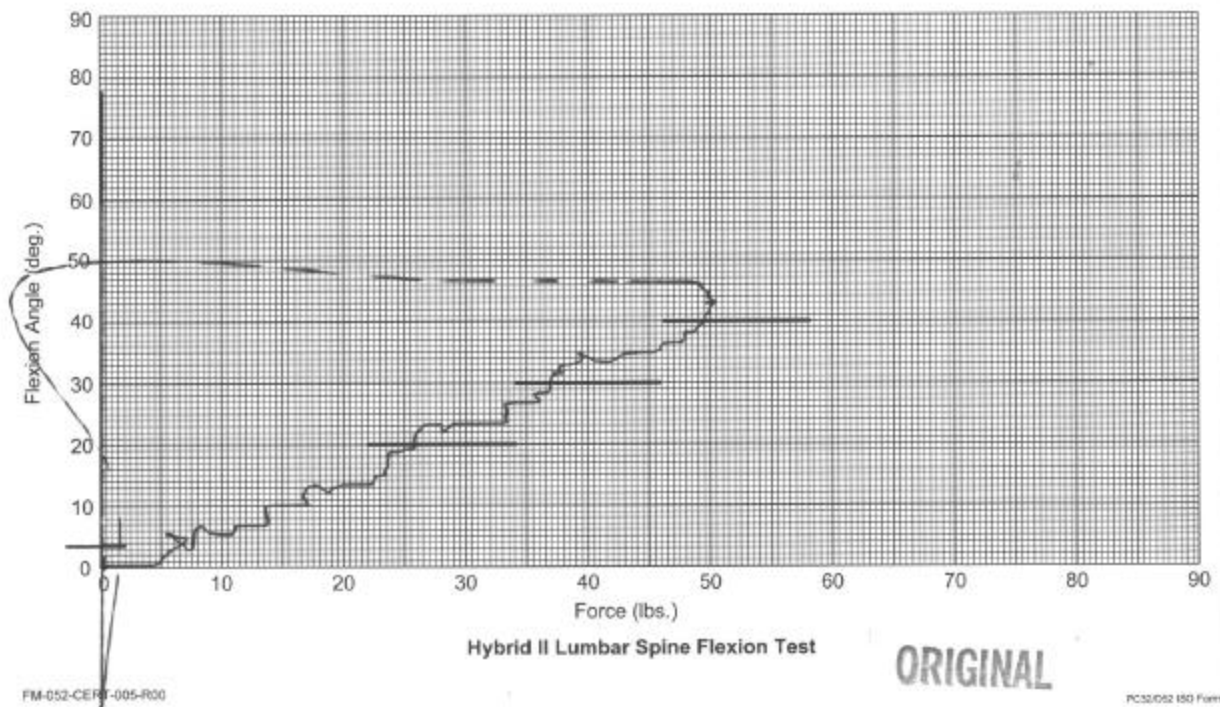
REMARKS: None

LUMBAR FLEXION TEST
POST TEST
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270	Sequential Test Number: 3	
Date: November 3, 2003	Laboratory Technician: B. Swiecicki	

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37
FORCE @ 0° (N)	0 - 26.7	0
FORCE @ 20° (N)	97.8 - 151.2	114.54
FORCE @ 30° (N)	151.2 - 204.6	164.58
FORCE @ 40° (N)	204.6 - 258	220.19
RETURN ANGLE	12° max.	3.5



REMARKS: None

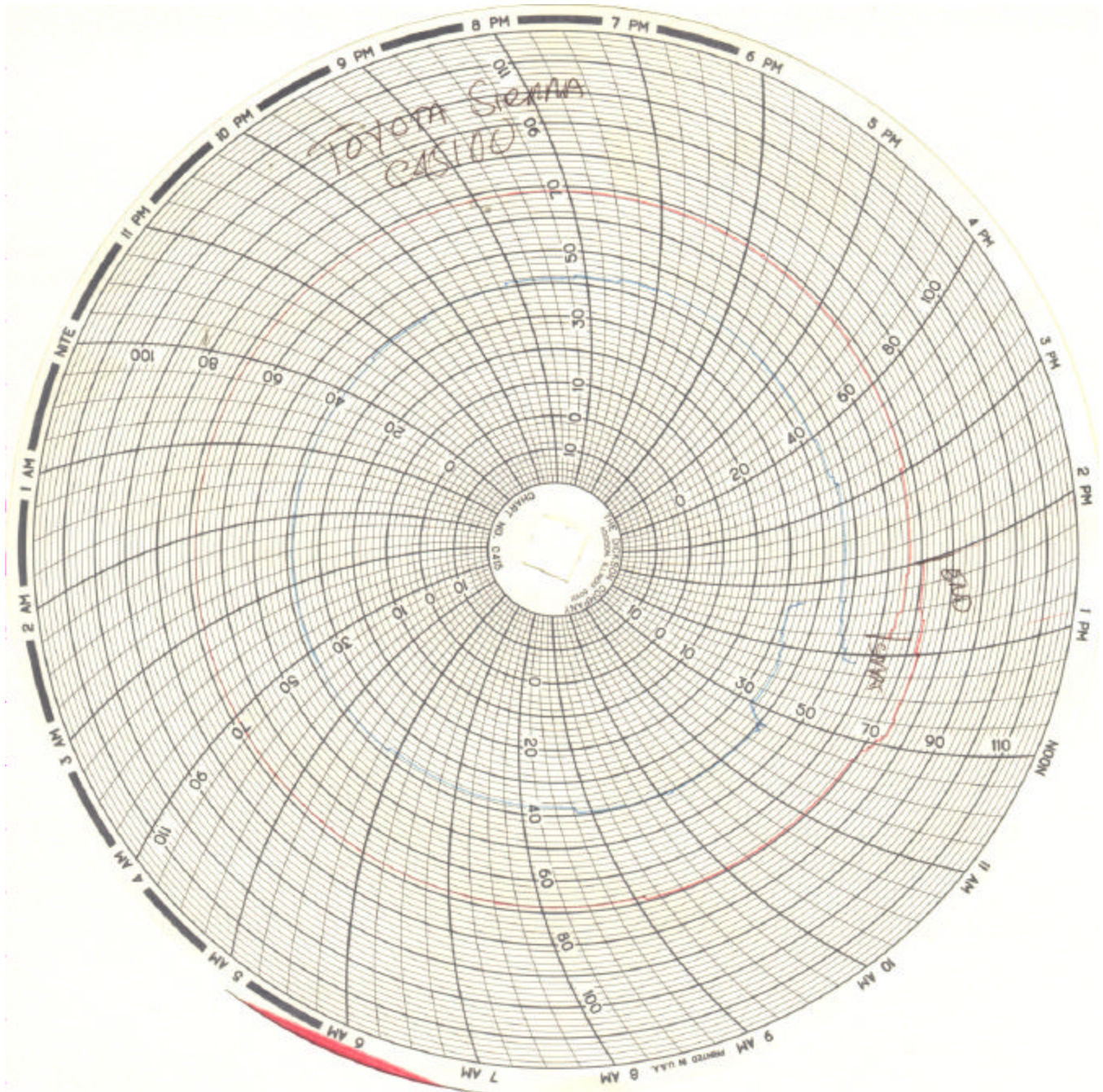
POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 3
Date: November 3, 2003 Laboratory Technician: B. Swiecicki

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

TEMPERATURE TRACE



APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

SID INSTRUMENTATION

	FRONT SID NO.: 269		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P23993	ENDEVCO	16-Sep-03
HEAD AY	AC-P23939	ENDEVCO	16-Sep-03
HEAD AZ	AC-P23999	ENDEVCO	16-Sep-03
UPPER NECK FX	LC-440Fx	DENTON	18-Jun-03
UPPER NECK FY	LC-440Fy	DENTON	18-Jun-03
UPPER NECK FZ	LC-440Fz	DENTON	18-Jun-03
UPPER NECK MX	LC-440Mx	DENTON	18-Jun-03
UPPER NECK MY	LC-440My	DENTON	18-Jun-03
UPPER NECK MZ	LC-440Mz	DENTON	18-Jun-03
UPPER RIB	AC-P16862	ENDEVCO	16-Sep-03
LOWER RIB	AC-P16656	ENDEVCO	16-Sep-03
LOWER SPINE	AC-P16866	ENDEVCO	16-Sep-03
PELVIS	AC-P16676	ENDEVCO	16-Sep-03
UPPER RIB REDUNDANT	AC-P23156	ENDEVCO	16-Sep-03
LOWER RIB REDUNDANT	AC-P16645	ENDEVCO	16-Sep-03
LOWER SPINE REDUNDANT	AC-P19343	ENDEVCO	16-Sep-03
PELVIS REDUNDANT	AC-P16843	ENDEVCO	16-Sep-03

	REAR SID NO.: 270		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P23960	ENDEVCO	10-Jun-03
HEAD AY	AC-P23940	ENDEVCO	10-Jun-03
HEAD AZ	AC-P23899	ENDEVCO	10-Jun-03
UPPER NECK FX	LC-205Fx	DENTON	18-Jun-03
UPPER NECK FY	LC-205Fy	DENTON	18-Jun-03
UPPER NECK FZ	LC-205Fz	DENTON	18-Jun-03
UPPER NECK MX	LC-205Mx	DENTON	18-Jun-03
UPPER NECK MY	LC-205My	DENTON	18-Jun-03
UPPER NECK MZ	LC-205Mz	DENTON	18-Jun-03
UPPER RIB	AC-P18524	ENDEVCO	17-Sep-03
LOWER RIB	AC-P18533	ENDEVCO	17-Sep-03
LOWER SPINE	AC-P18514	ENDEVCO	17-Sep-03
PELVIS	AC-P18519	ENDEVCO	17-Sep-03
UPPER RIB REDUNDANT	AC-P18528	ENDEVCO	17-Sep-03
LOWER RIB REDUNDANT	AC-P18518	ENDEVCO	17-Sep-03
LOWER SPINE REDUNDANT	AC-P18688	ENDEVCO	17-Sep-03
PELVIS REDUNDANT	AC-P18531	ENDEVCO	17-Sep-03

REMARKS: None

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL (X)	AC-B10827	ENDEVCO	25-Sep-03
RIGHT FRONT SILL (Y)	AC-B11408	ENDEVCO	25-Sep-03
RIGHT FRONT SILL (Z)	AC-A13513	ENDEVCO	25-Sep-03
RIGHT REAR SILL (X)	AC-J32143	ENDEVCO	24-Sep-03
RIGHT REAR SILL (Y)	AC-J32838	ENDEVCO	21-Apr-03
RIGHT REAR SILL (Z)	AC-J32174	ENDEVCO	24-Sep-03
REAR FLOORPAN ABOVE AXLE (X)	AC-P15747	ENDEVCO	24-Sep-03
REAR FLOORPAN ABOVE AXLE (Y)	AC-P16585	ENDEVCO	24-Sep-03
REAR FLOORPAN ABOVE AXLE (Z)	AC-P14438	ENDEVCO	24-Sep-03
LEFT REAR SILL (Y)	AC-Y05	ICS	27-May-03
LEFT FRONT SILL (Y)	AC-X92	ICS	27-May-03
LEFT FRONT DOOR CENTERLINE (Y)	-	-	-
RIGHT REAR SEAT OCCUPANT COMP. (Y)	AC-9440-028	GS SENSORS	06-Jun-03
MID REAR OF LEFT FRONT DOOR (Y)	-	-	-
LEFT FRONT DOOR UPPER C/L (Y)	-	-	-
MID REAR OF LEFT REAR DOOR (Y)	-	-	-
LEFT REAR DOOR UPPER C/L (Y)	-	-	-
LOWER LEFT B- PILLAR (Y)	AC-9440-039	GS SENSORS	02-Jun-03
MIDDLE LEFT B-PILLAR (Y)	AC-9440-011	GS SENSORS	10-Jun-03
LOWER LEFT A-PILLAR (Y)	AC-9440-034	GS SENSORS	02-Jun-03
UPPER LEFT A-PILLAR (Y)	AC-9440-032	GS SENSORS	02-Jun-03
FRONT SEAT TRACK (Y)	AC-9440-046	GS SENSORS	06-Jun-03
REAR SEAT TRACK (Y)	AC-9440-031	GS SENSORS	02-Jun-03
VEHICLE CG (X)	AC-P19253	ENDEVCO	10-Sep-03
VEHICLE CG (Y)	AC-P21392	ENDEVCO	10-Sep-03
VEHICLE CG (Z)	AC-P23138	ENDEVCO	10-Sep-03
MDB CG (X)	AC-C16433	ENDEVCO	17-Apr-03
MDB CG (Y)	AC-C16416	ENDEVCO	17-Apr-03
MDB CG (Z)	AC-C16499	ENDEVCO	17-Apr-03
MDB REAR FRAME MEMBER (X)	AC-C14948	ENDEVCO	17-Apr-03
MDB REAR FRAME MEMBER (Y)	AC-C16680	ENDEVCO	15-Apr-03

REMARKS: None