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REPORT NUMBER 214-CAL-01-08

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

KIA MOTORS CORP
2001 KIA SPECTRA
4-DOOR HATCHBACK

NHTSA NUMBER C10509

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
P O BOX 400
BUFFALO, NEW YORK 14225



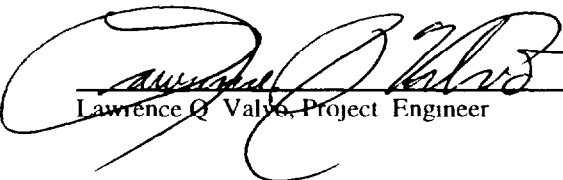
February 7, 2001

FINAL REPORT

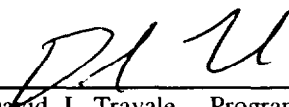
U S DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Compliance
400 Seventh Street, SW
Room 6111 (NSA-30)
Washington, DC 20590

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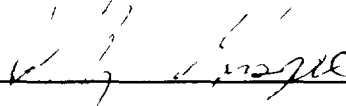

David J. Travale, Program Manager
Transportation Sciences Center

Approval Date

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Accepted By



Acceptance Date

4/12/01

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16 Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 2001 Kia Spectra 4-Door Hatchback in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No TP-214D-04 to determine FMVSS 214 Side Impact Protection compliance This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on February 7, 2001 The impact velocity of the Moving Deformable Barrier (MDB) was 32.9 kph, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.1°C The target vehicle post-test maximum crush was 298 mm at level 2 The test or target vehicle's performance is given below <table border="0"> <thead> <tr> <th></th> <th align="center"><u>Front SID</u></th> <th></th> <th align="center"><u>Rear SID</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration</td> <td align="center"><u>66</u></td> <td align="center">g's</td> <td align="center"><u>50</u></td> <td align="center">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration</td> <td align="center"><u>49</u></td> <td align="center">g's</td> <td align="center"><u>53</u></td> <td align="center">g's</td> </tr> <tr> <td>Lower Spine Acceleration</td> <td align="center"><u>69</u></td> <td align="center">g's</td> <td align="center"><u>60</u></td> <td align="center">g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td align="center"><u>67</u></td> <td align="center">g's</td> <td align="center"><u>56</u></td> <td align="center">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV)</td> <td align="center"><u>57</u></td> <td align="center">g's</td> <td align="center"><u>61</u></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</u>		<u>Rear SID</u>		Left Upper Rib Acceleration	<u>66</u>	g's	<u>50</u>	g's	Left Lower Rib Acceleration	<u>49</u>	g's	<u>53</u>	g's	Lower Spine Acceleration	<u>69</u>	g's	<u>60</u>	g's	Thoracic Trauma Index (TTI)	<u>67</u>	g's	<u>56</u>	g's	Pelvis Acceleration (PEV)	<u>57</u>	g's	<u>61</u>	g's
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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 Room 5108 (NAD-52) 400 Seventh st , S W Washington, D C 20590 Telephone No (202) 366-4946 ATTN Robert Hornicle																																
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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. DTNH22-97-C-01033. The purpose of this test was to evaluate side impact protection in a 2001 Kia Spectra 4-Door Hatchback. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-04, dated September 1, 1995).

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 2001 Kia Spectra 4-Door Hatchback 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 52.95 kph (32.9 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 Veridian Engineering Transportation Sciences Center in Buffalo, New York on February 7, 2001. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are included in Appendix A.

Two restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-04, dated September 1, 1995). Both SIDs were certified prior to this test. 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 SIDs 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)

A summary of the side impact dummy (SID) configuration and verification test data can be found in Appendix C. A total of 48 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	Rear SID
TTI (g)	67	56
PEV (g)	57	61

FMVSS 214D requires that the TTI not exceed 85 for 4 door vehicles and not exceed 90 for 2 door vehicles. Peak lateral pelvis acceleration shall not exceed 130 g's.

SECTION 3

SUMMARY OF TEST RESULTS

DATA SHEET 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION

Year/Make/Model/Body Style	2001 Kia Spectra 4-Door Hatchback				
Vehicle Body Color	Blue	VIN	KNAFB161515212002		
Vehicle NHTSA No	C10509	Month & Year of Manufacture	7/00		
Engine Data	4 Cylinders,	-	CID	1 8	Liters, - cc
Engine Placement	-	Longitudinal, or	X	Lateral	
Transmission	5	Speed, X Manual	-	Automatic	- Overdrive
Final Drive	-	Rear Wheel Drive, X	Front Wheel Drive,	-	Four Wheel
Odometer Reading	119 km				
Options	X A/C,	X Power Steering,	X Pwr Brakes,	-	Pwr Windows

DATA FROM TIRE PLACARD

Tire Pressure* (at capacity),	180 kPa FRONT
	180 kPa REAR
Recommended Tire Size	P185/65R14
Tires on Test Vehicle	P185/65R14 Manufacturer Hankook
Vehicle Capacity Data	
Number of Occupants	2 Front, 3 Rear - 3rd Seat, 5 Total
Type of Front Seats	X Bucket, Bench, Split Bench
Type of Front Seat Back	- Fixed, X Adjustable with X Lever or - Knob
Vehicle Max Capacity Loading =	385 0 kg (A)
No. of Occupants x 68 04 kg =	340 2 kg (B)
Vehicle Cargo Capacity =	44 8 kg (A-B)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS

Left Front =	373 0 kg	Left Rear =	230 0 kg
Right Front =	370 5 kg	Right Rear =	233 5 kg
TOTAL FRONT =	743 5 kg	TOTAL REAR =	463 5 kg
% of Total Weight =	61 6 %	% of Total Weight =	38 4 %
TOTAL WEIGHT =	1207 0 kg		

* Tire pressure used in test

DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle 2001 Kia Spectra

NHTSA No C10509

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT

Total Test Vehicle Delivered Weight with Max Fluids	=	<u>1207 0</u>	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>44 8</u>	kg (B)
Weight of instrumented Side Impact Dummies (1 or 2 X <u>81 2</u> kg)	=	<u>162 4</u>	kg (C)
TEST VEHICLE TARGET WEIGHT	=	<u>1414 2</u>	kg (A+B+C)

FULLY LOADED TEST VEHICLE (UDVW + 1 or 2 SID(s) + CARGO)

Left Front	=	<u>419 5</u>	kg	Left Rear	=	<u>327 0</u>	kg
Right Front	=	<u>373 0</u>	kg	Right Rear	=	<u>295 0</u>	kg
TOTAL FRONT	=	<u>792 5</u>	kg	TOTAL REAR	=	<u>622 0</u>	kg
% of Total Weight	=	<u>56 0</u>	%	% of Total Weight	=	<u>44 0</u>	%
TOTAL TEST WEIGHT	=	<u>1414 5</u>	kg				

AS TESTED WEIGHT OF TEST VEHICLE (1 OR 2 SID(s) + CARGO + EQUIPMENT & INSTRUMENTATION)

Left Front	=	<u>408 0</u>	kg	Left Rear	=	<u>322 5</u>	kg
Right Front	=	<u>374 0</u>	kg	Right Rear	=	<u>303 0</u>	kg
TOTAL FRONT	=	<u>782 0</u>	kg	TOTAL REAR	=	<u>625 5</u>	kg
% of Total Weight	=	<u>55 6</u>	%	% of Total Weight	=	<u>44 4</u>	%
TOTAL TEST WEIGHT	=	<u>1407 5</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters)

AS DELIVERED

Left Front	<u>648</u>	Right Front	<u>649</u>	Left Rear	<u>642</u>	Right Rear	<u>642</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

FULLY LOADED

Left Front	<u>626</u>	Right Front	<u>643</u>	Left Rear	<u>591</u>	Right Rear	<u>607</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

READY FOR TEST

Left Front	<u>633</u>	Right Front	<u>647</u>	Left Rear	<u>596</u>	Right Rear	<u>607</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

Test Vehicle Wheelbase 2558 millimeters

C G = 1137 millimeters rearward of front wheel centerline

TOTAL VEHICLE LENGTH

Right Side	=	<u>4330</u>	millimeters
Left Side	=	<u>4330</u>	millimeters
Centerline	=	<u>4475</u>	millimeters

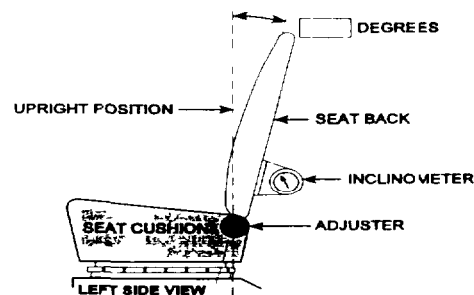
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle 2001 Kia Spectra

NHTSA No C 10509

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 TRACK POSITION The seat track was placed in detent 10, where the forward most is defined as 0

Total Length of Adjustment Travel 229 millimeters

Total Number of Adjustment Positions or Detents 20

FRONT SEAT BACK ADJUSTMENT POSITION With the vehicle sills level, the seat back was placed at 23°

from vertical as measured on the seat back frame midway between the top of the seat back and the seat back pivot

Seat Back Torso Angle 23.0 degrees

SECOND POSITION SEAT

Total Length of Fore/Aft Adjustment Travel 0 millimeters

Seat Back Adjustment Position Fixed

ADJUSTABLE STEERING COLUMN POSITION Fixed

WINDOW POSITIONS Left Front Closed Left Rear Closed

Right Front Removed Right Rear Removed

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

AMOUNT OF SODDARD SOLVENT IN FUEL TANK

50 liters (Fuel Tank Usable Capacity)

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

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED

Wheelbase = 2558 millimeters

Impact Point is 339 millimeters rearward of front axle centerline

(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 342 millimeters rearward of front axle centerline

DATA SHEET 2

TEST VEHICLE SUMMARY OF RESULTS

VEHICLE IDENTIFICATION

Vehicle Year/Make/Model 2001 Kia Spectra

Body Style 4-Door Hatchback

VIN KNAFB161515212002

NHTSA No C10509

Test Date February 7, 2001

Overall Length = 4475 millimeters, Overall Width = 1702 millimeters

VEHICLE TEST WEIGHT (Pre-Test)

Left Front = 408 0 kg Left Rear = 322 5 kg

Right Front = 374 0 kg Right Rear = 303 0 kg

TOTAL FRONT = 782 0 kg TOTAL REAR = 625 5 kg

TOTAL VEHICLE WEIGHT 1407 5 kg

Wheelbase = 2558 millimeters

Longitudinal C G from Center of Front Axle = 1136 8 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 3 mm rearward of nominal impact ref line (Lateral)

Actual Impact Point is 4 mm above nominal impact point (Vertical)

MAXIMUM EXTERIOR STATIC CRUSH

1 LEVEL 1 (242 mm above ground) = 102 millimeters

2 LEVEL 2 (465 mm above ground) = 298 millimeters

3 LEVEL 3 (589 mm above ground) = 259 millimeters

4 LEVEL 4 (794 mm above ground) = 234 millimeters

5 LEVEL 5 (1318 mm above ground) = 40 millimeters

Maximum Post-Test Intrusion = 298 millimeters

OCCUPANTS

Front Passenger

Rear Passenger

Dummy Identification 015

016

Restraints Used 3-Point Active Seat Belt

3-Point Active Seat 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 2001 Kia Spectra

NHTSA No C10509

MDB FACE MANUFACTURER AND SERIAL NUMBER

Plascore 077C1200-1, 001B1200

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>52.95</u>	kph				

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

1 Row A at Center of Bumper Level	=	<u>166</u>	millimeters
2 Row B at Top of Bumper Level	=	<u>74</u>	millimeters
3 Row C at Mid Level	=	<u>111</u>	millimeters
4 Row D at Top of Stack Level	=	<u>91</u>	millimeters

INSTRUMENTATION

Number of MDB Data Channels	=	<u>5</u>
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DATA SHEET 4

POST-TEST OBSERVATIONS

Vehicle 2001 Kia Spectra

NHTSA No C10509

VISIBLE DUMMY CONTACT POINTS

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	Left side of head to forward edge of B-pillar trim	Left side of head to upper C-pillar trim
Upper Torso	Left arm to rear portion of door trim above arm rest and forward edge of B-pillar trim	Left arm to rear portion of door trim above arm rest
Lower Torso	Pelvis to rear portion of door trim below arm rest	Pelvis to rear portion of door trim below arm rest
Left Knee	Left knee to door trim forward of window crank	Left knee to door trim forward of window crank
Right Knee	Right knee to left knee	Right knee to left knee

DOOR OPENING

	<u>LEFT DOOR</u>	<u>RIGHT DOOR</u>
Front	Closed / Inoperable	Closed / Operable
Rear	Closed / Inoperable	Closed / Operable

MDB DISTANCE FROM TARGET IMPACT POINT

Vertical	4 mm above target
Horizontal	3 mm rearward of target

ARM REST LOCATIONS

Front	245 mm side below window opening
Rear	245 mm side below window opening

SEAT MOVEMENT

Front	Seat was deformed inboard against center console
Rear	Left seat bolster was deformed inboard

GLAZING DAMAGE

Windshield	None
Window	Left side moveable windows shattered at impact

PILLAR PERFORMANCE

No tears or separations

SILL SEPARATION

None

AIR BAG DEPLOYMENT STATUS

	DRIVER	FRONT PASSENGER	REAR PASSENGER
FRONT	No	No	N/A
SIDE	N/A	N/A	N/A

OTHER NOTABLE IMPACT EFFECTS

None

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID INSTRUMENTATION DATA

Vehicle 2001 Kia Spectra

NHTSA No 210509

		Front Dummy ID# 015				Rear Dummy ID# 016			
		Pos Direction		Neg Direction		Pos Direction		Neg Direction	
		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS									
Upper Rib Lateral	Y	65.6	28.8	-11.8	91.9	49.8	36.3	-9.4	108.8
Upper Rib Lateral	Y(R)	59.3	29.4	-11.1	91.3	48.7	36.3	9.8	108.8
Lower Rib Lateral	Y	48.6	28.2	11.0	92.5	52.5	38.1	10.3	108.8
Lower Rib Lateral	Y(R)	52.6	28.2	-11.2	92.5	52.2	38.1	10.8	108.8
SPINE ACCELERATIONS									
Lower Lateral	Y	68.5	31.9	17.0	68.1	59.5	50.0	-16.9	71.3
Lower Lateral	Y(R)	67.6	31.9	-17.9	68.1	57.3	50.0	-16.4	71.3
PELVIC ACCELERATIONS									
Lateral	Y	57.4	34.4	-9.1	56.3	61.0	43.1	-4.4	108.2
Lateral	Y(R)	58.8	34.4	9.6	63.1	60.3	43.1	-4.4	108.2

REFERENCE Positive Direction - Longitudinal (X) = forward
 Lateral (Y) = to right
 Vertical (Z) = up
 Negative Direction - Longitudinal (X) = rearward
 Lateral (Y) = to left
 Vertical (Z) = down

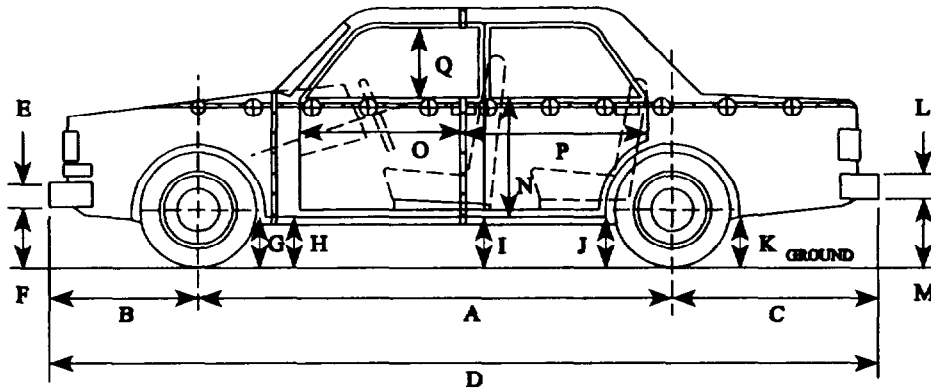
Note Above data has been FIR filtered Y(R) denotes redundant Y direction accelerometer

DATA SHEET 6

VEHICLE SIDE MEASUREMENTS

Vehicle 2001 Kia Spectra

NHTSA No C10509



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)	Δ CHANGE
A	2556	2558	2540	-18
B	899	895	913	18
C	1020	1022	1015	7
D	4475	4475	4468	7
E	179		179	0
F	379	375	396	21
G	203	180	201	21
H	201	180	205	25
I	209	178	168	10
J1	189	150	151	1
J2	211	172	170	2
K	253	200	213	13
L	403	-	403	0
M	313	256	270	14
N	618	-	542	76
O	716		696	-20
P	1211	-	1140	71
Q	475	-	451	24
R	4330	-	4337	7
S	4330	-	4309	21
T	1702		1581	121

D = Length at Centerline
T = Width at B Pillar

E&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

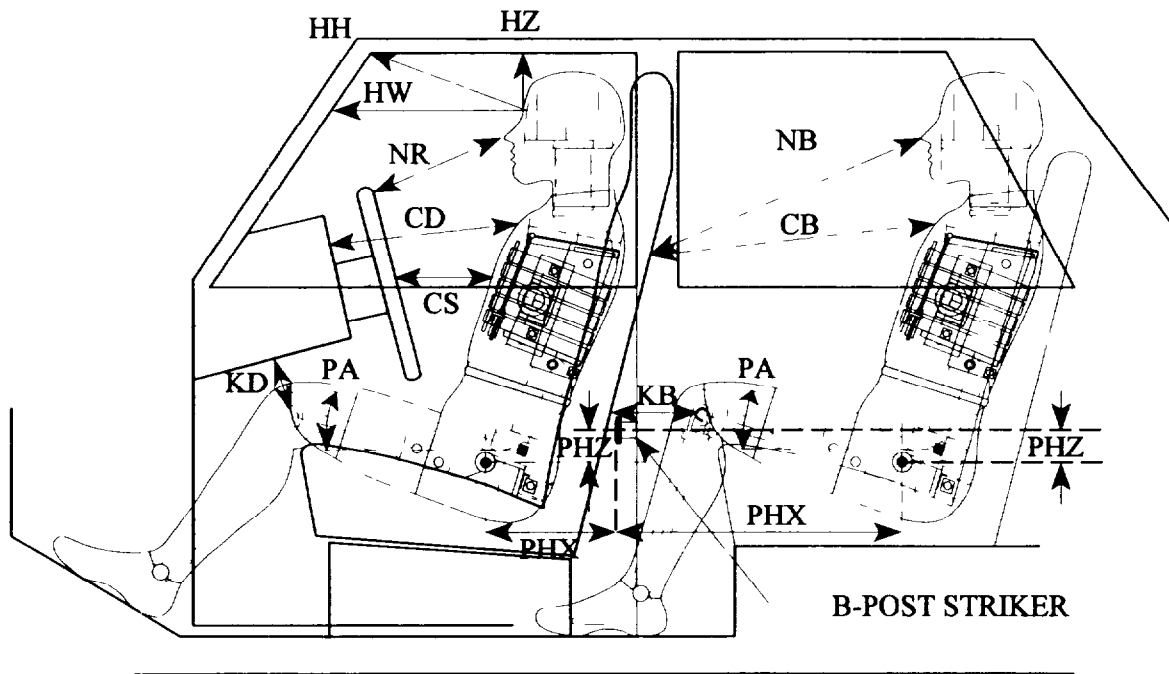
S = Left Side Length

DATA SHEET 7

SID LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle 2001 Kia Spectra

NHTSA No 010509



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# <u>015</u>	LEFT REAR PASS ID# <u>016</u>
HH	439	N/A
HW	705	N/A
HZ	178	143
NR/NB	665	541
CD/CB	596	463
CS	356	N/A
KDL(KDA°)/KBL(KDA°)	196 / (25°)	174 / (40°)
KDR(KBA°)/KBR(KBA°)	186 / (24°)	166 / (36°)
PA°	24 0°	23 6°
PHX	188	306
PHZ	115	317

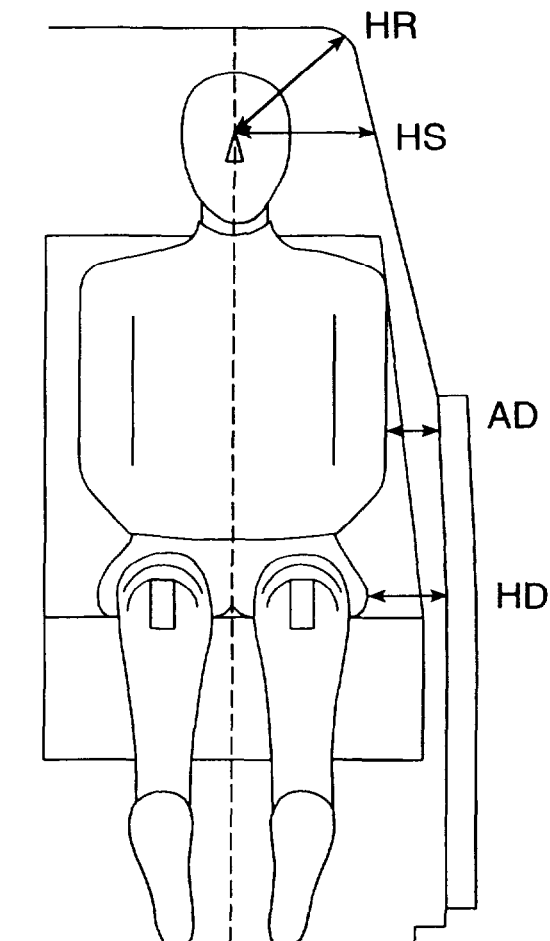
Note 2-door vehicle shown Rear dummy PHX & PHZ measurements for 4 door vehicle would use the C-post striker as a reference point

DATA SHEET 8

SID LATERAL CLEARANCE DIMENSIONS

Vehicle 2001 Kia Spectra

NHTSA No C10509



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

	DRIVER ID # <u>015</u>				LEFT REAR PASS ID # <u>016</u>			
HR	186				175			
HS	310				287			
AD*	LOWER	110	UPPER	132	LOWER	117	UPPER	97
HD	170				181			

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

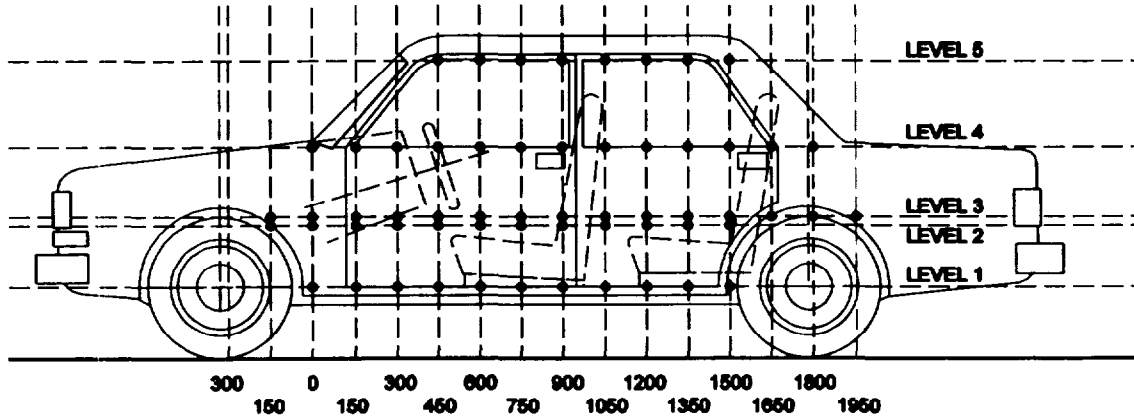
Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID arm segment to the closest part of the vehicle side

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle 2001 Kia Spectra

NHTSA No. C10509



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 - SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE AS TESTED CONFIGURATION
 Measurements Along the Vertical 750 mm Line Shown Above

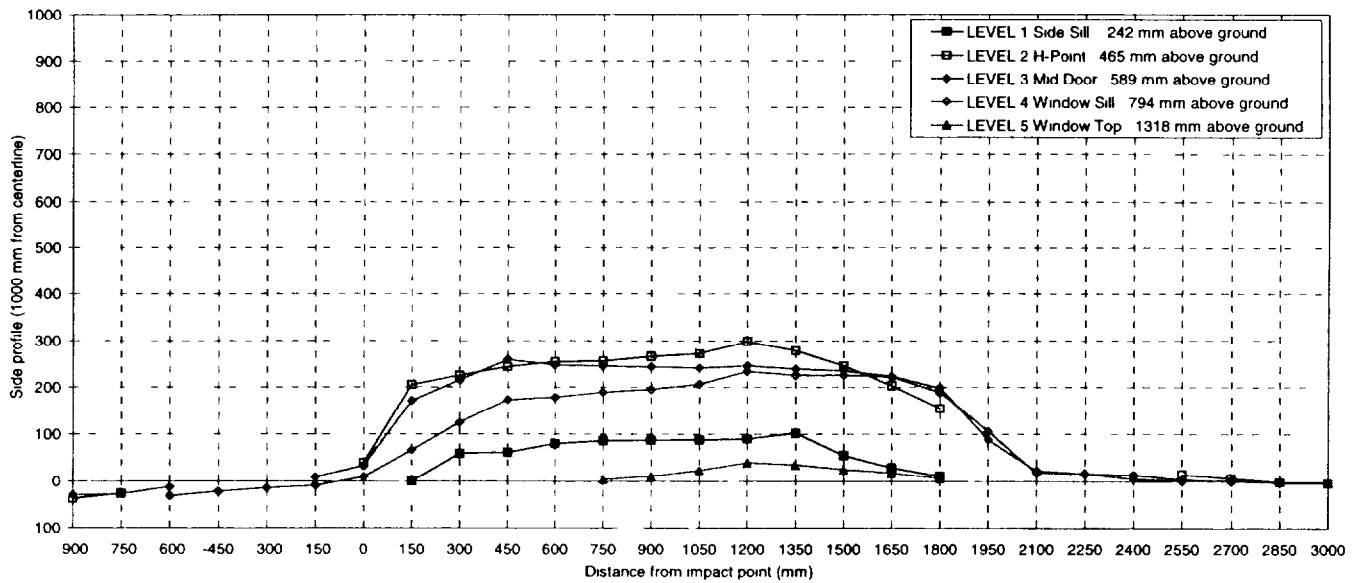
Level 5 @ Window Top	=	<u>1318</u>	millimeters
Level 4 @ Window Sill	=	<u>794</u>	millimeters
Level 3 @ Mid Door	=	<u>589</u>	millimeters
Level 2 @ Occupant H-Point	=	<u>465</u>	millimeters
Level 1 @ Sill Top Height	=	<u>242</u>	millimeters

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle 2001 Kia Spectra

NHTSA No C10509



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

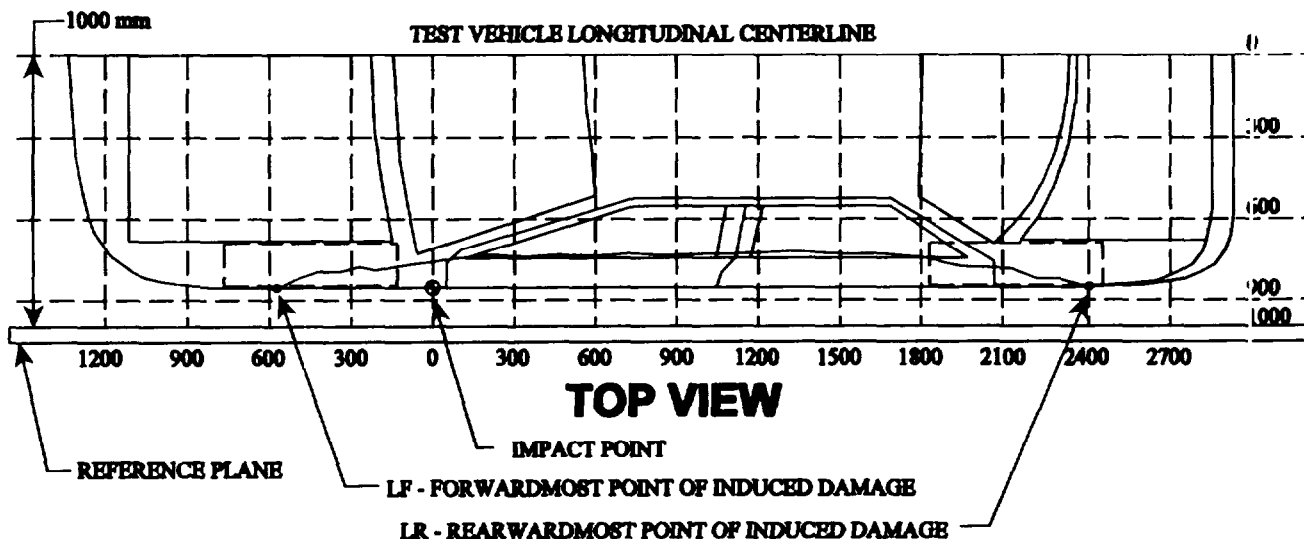
		DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																											
LEVEL	HEIGHT (mm)		900	750	600	450	300	150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000
LEVEL 1	242	PRE		--						229	234	232	227	227	227	227	226	227	229	229	228		--					--	
SIDE		POST				--				229	293	293	307	313	314	315	316	329	284	258	239		--				--		
SILL		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0	59	61	80	86	87	88	90	102	55	29	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 2	465	PRE	243	208				--		172	173	170	170	172	167	168	171	169	168	175	172		--		--	191	215	243	278
H		POST	206	182				--		377	398	414	424	428	433	440	469	447	414	378	326				--	206	222	242	274
POINT		CRUSH	37	26	N/A	N/A	N/A	N/A	N/A		205	225	244	254	256	266	272	298	278	246	203	154	N/A	N/A	N/A	N/A	15	7	1
LEVEL 3	589	PRE	264	225	193	--		162		167	165	164	164	165	164	165	164	164	163	167	167	164	159	162	173	193	212	239	271
MID		POST	235	198	181	--		172		338	380	423	411	410	408	406	410	403	398	390	365	252	182	178	187	197	212	237	270
DOOR		CRUSH	29	27	12	N/A	N/A	10		171	215	259	247	245	244	241	246	239	235	223	198	88	23	16	14	4	0	2	1
LEVEL 4	794	PRE			441	336	261	230		202	197	193	191	189	189	187	187	188	188	190	191	191	194	197	205	223	237	260	301
WINDOW		POST		--	410	314	247	221		268	322	366	369	378	384	393	421	413	413	411	379	297	212	214	210	224	239	257	298
SILL		CRUSH	N/A	N/A	31	22	14	9		66	125	173	178	189	195	206	234	225	225	221	188	106	18	17	5	1	2	3	3
LEVEL 5	1318	PRE		--											603	470	462	461	463	466	467	471							
WINDOW		POST													607	481	486	501	498	492	485	477		--		--			
TOP		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	11	24	40	35	26	18	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle 2001 Kia Spectra

NHTSA No C10509



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.

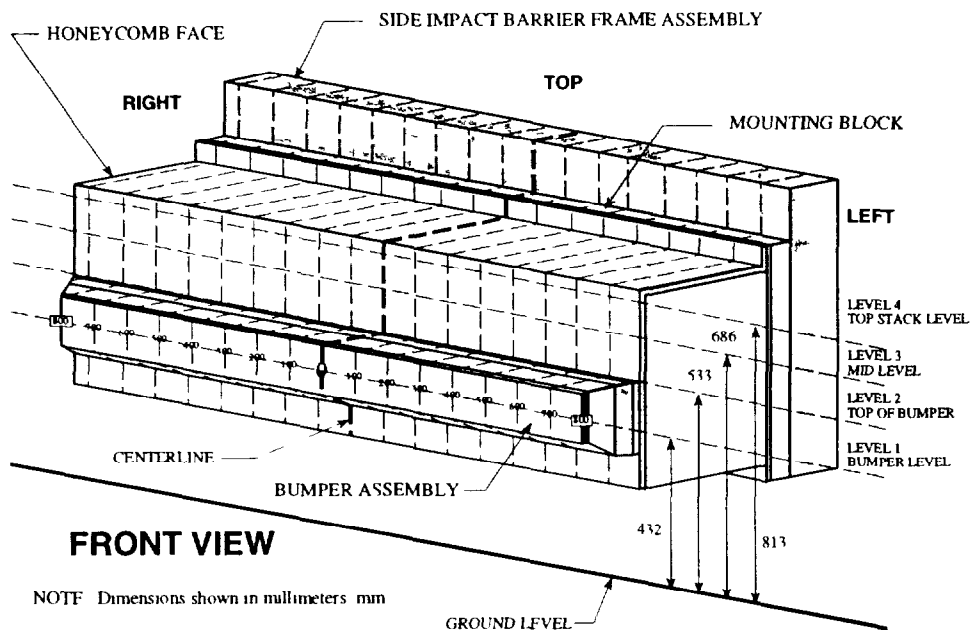
DPD MEASUREMENTS		POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1	(LR = 2800 mm)	235	234	1
2	2210	179	161	18
3	1620	392	166	226
4	1030	439	168	271
5	440	420	164	256
6	(LF = -150 mm)	172	162	10

DATA SHEET 12

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE (Grid as looking at MDB from front)

Vehicle 2001 Kia Spectra

NHTSA No C10509



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

LEVEL	HEIGHT AT CL (mm)*		DISTANCE RIGHT OF CENTER (mm)									DISTANCE LEFT OF CENTER (mm)							
			800	700	600	500	400	300	200	100		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	672	627	618	616	616	617	618	620	619	625	624	628	629	638	665	687	710
		CRUSH	53	8	1	-3	-3	2	1	1	0	6	5	9	10	19	46	68	91
LEVEL 3 MID LEVEL	686	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
		POST	667	634	628	624	623	626	626	626	626	626	627	628	629	634	639	679	730
		CRUSH	48	15	9	5	4	7	7	7	7	7	8	9	10	15	20	60	111
LEVEL 2 TOP BUMPER	533	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
		POST	693	684	673	651	636	638	639	640	637	639	638	640	643	644	649	659	693
		CRUSH	74	65	54	32	17	19	20	21	19	20	19	21	24	25	30	40	74
LEVEL 1 MID BUMPER	432	PRE	535	519	518	518	518	518	518	518	518	518	518	518	518	518	518	519	535
		POST	701	673	648	623	605	600	598	597	590	585	582	582	581	584	590	606	631
		CRUSH	166	154	130	105	87	82	80	79	72	67	64	64	63	66	72	87	96

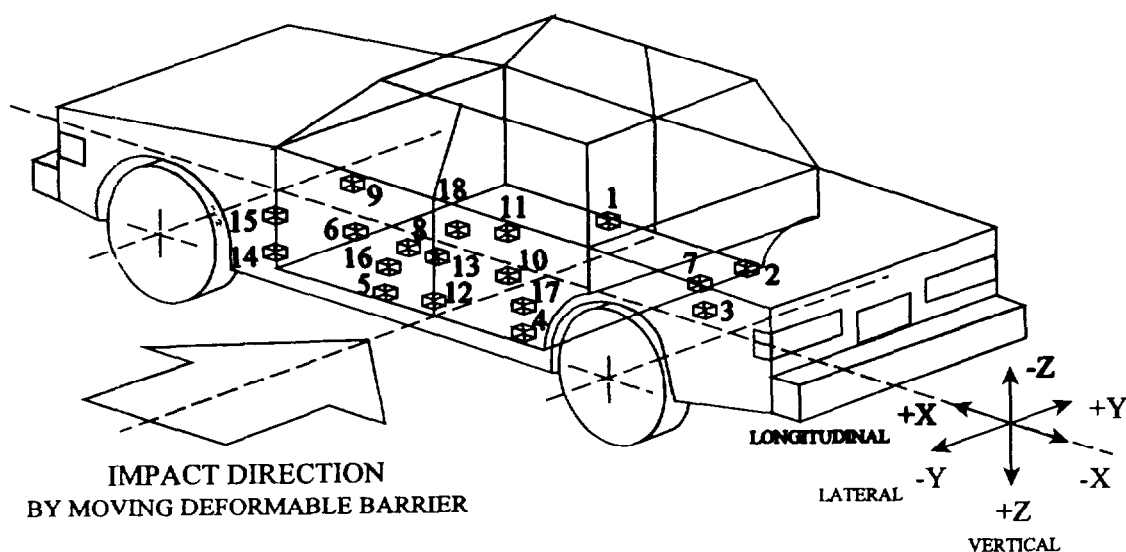
*Heights measured above ground level

DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle 2001 Kia Spectra

NHTSA No C10509



- 1-Right Side Sill @ Front Seat
- 2-Right Side Sill @ Rear Seat
- 3-Rear Floorpan Above Axle
- 4-Left Side Sill @ Rear Seat
- 5-Left Side Sill @ Front Seat
- 6-Left Front Door on Centerline
- 7-Right Rear Occupant Compartment
- 8-Midrear of Left Front Door
- 9-Left Front Door Upper Centerline

- 10-Midrear of Left Rear Door
- 11 Left Rear Door Upper Centerline
- 12-Left Lower B-Pillar
- 13-Left Middle B-Pillar
- 14-Left Lower A-Pillar
- 15-Left Middle A-Pillar
- 16-Front Seat Track
- 17-Rear Seat Track
- 18-Vehicle CG

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle 2001 Kia Spectra

NHTSA No C10509

Accel No	Location	Coordinates (mm)±3 mm			Long (x)		Lat (y)		Vert (z)		Resultant		
		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	2677	684	-276	pos neg	2.7 -4.1	57.4 10.5	26.1 -2.9	7.0 134.6	60.7 -132.3	197.0 58.5	132.4 -	58.5 -
2	Right Side Sill at Rear Seat	1895	678	-255	pos neg	2.8 -4.3	56.1 10.6	24.6 -2.1	7.0 120.4	5.1 -4.7	53.4 18.2	24.6 -	7.0 -
3	Rear Floorpan Above Axle	1070	-4	-432	pos neg	2.2 -8.9	58.2 19.3	21.6 -1.9	32.1 75.0	11.8 -8.6	19.8 41.5	23.4 -	33.2 -
4	Left Side Sill at Rear Seat	2681	-689	-283	pos neg	- -	- -	34.0 -2.3	6.6 120.1	- -	- -	- -	- -
5	Left Side Sill at Front Seat	1899	-687	-267	pos neg	- -	- -	53.8 -8.2	6.2 17.4	- -	- -	- -	- -
6	Left Front Door on Centerline	-	-	-	pos neg	- -	- -	- -	- -	- -	- -	- -	- -
7	Right Rear Occupant Compartment	1878	357	-185	pos neg	- -	- -	23.4 -2.1	7.0 120.4	- -	- -	- -	- -
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

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle 2001 Kia Spectra

NHTSA No C10509

Accel No	Location	Coordinates (mm)±3			Long (x)		Lat (y)		Vert (z)		Resultant	
		X*	Y*	Z*	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
12	Left Lower B-Pillar	2063	-640	-424	pos	-	+	-	-	-	-	-
					neg	-	-125.2	12.4	-	-	-	-
13	Left Middle B-Pillar	2018	-657	-794	pos	-	126.0	8.8	-	-	-	-
					neg	-	-75.6	14.2	-	-	-	-
14	Left Lower A-Pillar	3052	-649	-401	pos	-	196.8	3.9	-	-	-	-
					neg	-	-81.1	9.3	-	-	-	-
15	Left Middle A-Pillar	3034	-636	-903	pos	-	35.8	45.2	-	-	-	-
					neg	-	-34.0	40.7	-	-	-	-
16	Front Seat Track	2191	-554	-261	pos	-	45.2	6.4	-	-	-	-
					neg	-	-7.6	27.0	-	-	-	-
17	Rear Seat Track	1087	-441	-439	pos	-	21.3	31.8	-	-	-	-
					neg	-	-1.9	74.8	-	-	-	-
18	Vehicle CG	2490	6	-393	pos	12.2	51.3	21.5	50.6	28.9	65.0	22.1
					neg	-21.8	-13.7	29.1	-42.0	22.5	-	-

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

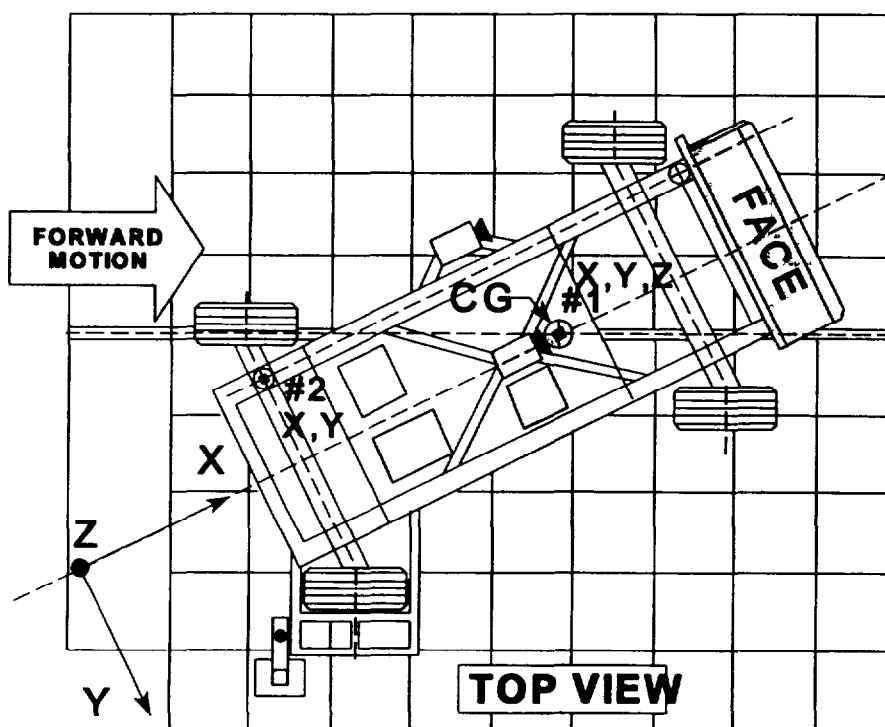
† Transducer wire was cut approximately 15 ms into the impact

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle 2001 Kia Spectra

NHTSA No C10509



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				1 5	83 0	-18 4	45 9
	Lateral Y	1859	0	-330	2 4	60 8	-8 0	42 2
	Vertical Z				17 2	57 9	-18 4	50 7
	Resultant R				24 7	45 5	-	-
2	Rear Frame Member							
	Longitudinal X	386	-660	-660	1 3	106 3	-18 7	36 0
	Lateral Y				3 5	28 3	-1 0	145 9

*Reference

X = Rear Bumper (+ Forward)

Y = Vehicle Centerline (+ To Right)

Z = Ground Level (+ Down)

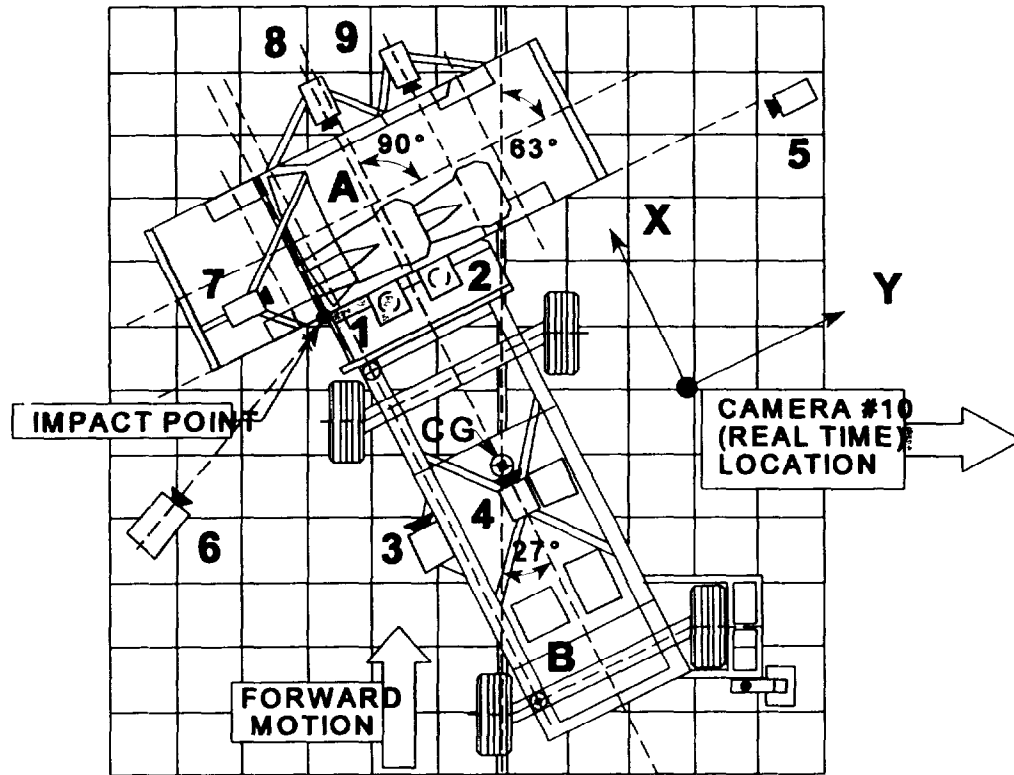
All measurements accurate to within ± 3 mm

DATA SHEET 15

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle 2001 Kia Spectra

NHTSA No C10509



Camera No	View	Coordinates (millimeters)			Angle (deg)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead view of test vehicle	58	802	4880	-90	8	1010
2	Overhead closeup view of impact plane	194	865	4880	-90	12.5	1005
3	MDB onboard closeup view of impact point	-1470	0	847	0	13	1040
4	MDB onboard view of driver dummy	-1140	838	1586	-17	7.5	1035
5	Right side ground level overall view	135	9105	1100	-4	25	1015
6	Left side ground level overall view	-1821	-1660	1086	-9	13	1010
7	Test vehicle onboard driver front view	515	-322	1218	-9	13	1010
8	Test vehicle onboard driver side view	1635	885	940	-11	8	1000
9	Test vehicle onboard passenger side view	1639	1787	980	-10	8	1015
10	Real time film coverage of test	-	-	-	-	-	24

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

+X = Forward

+Y = To Right

+Z = Upward

SECTION 5

FUEL SYSTEM INTEGRITY

DATA SHEET 16

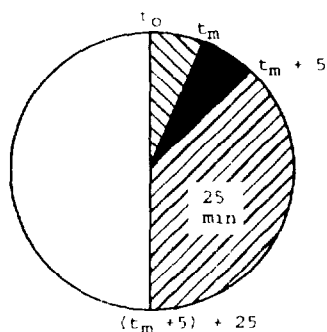
FMVSS 301 FUEL SYSTEM INTEGRITY DATA

NHTSA No C10509 TEST DATE February 7, 2001
 Vehicle Mfr /Make/Model 2001 Kia Spectra 4-Door Hatchback

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)
- ☒ Side Impact Moving Deformable Barrier (52 95 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 ALLCWED
0 g	28 g
0 g	142 g
0 g	28 g/1 min

SOLVENT SPILLAGE DETAILS

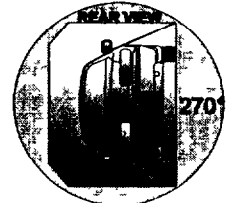
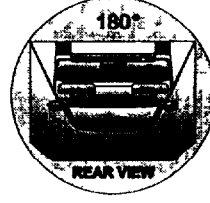
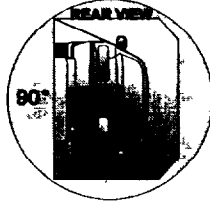
None

DATA SHEET 17

ROLLOVER DATA

Vehicle 2001 Kia Spectra

NHTSA No C10509



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	16	seconds	5	minutes	6	minutes	16	seconds	7	minutes
90° - 180°	1	minutes	17	seconds	5	minutes	6	minutes	17	seconds	7	minutes
180° - 270°	1	minutes	2	seconds	5	minutes	6	minutes	2	seconds	7	minutes
270° - 360°	1	minutes	9	seconds	5	minutes	6	minutes	9	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°	-
90° - 180°	-
180° - 270°	-
270° - 360°	-

APPENDIX A

PHOTOGRAPHS

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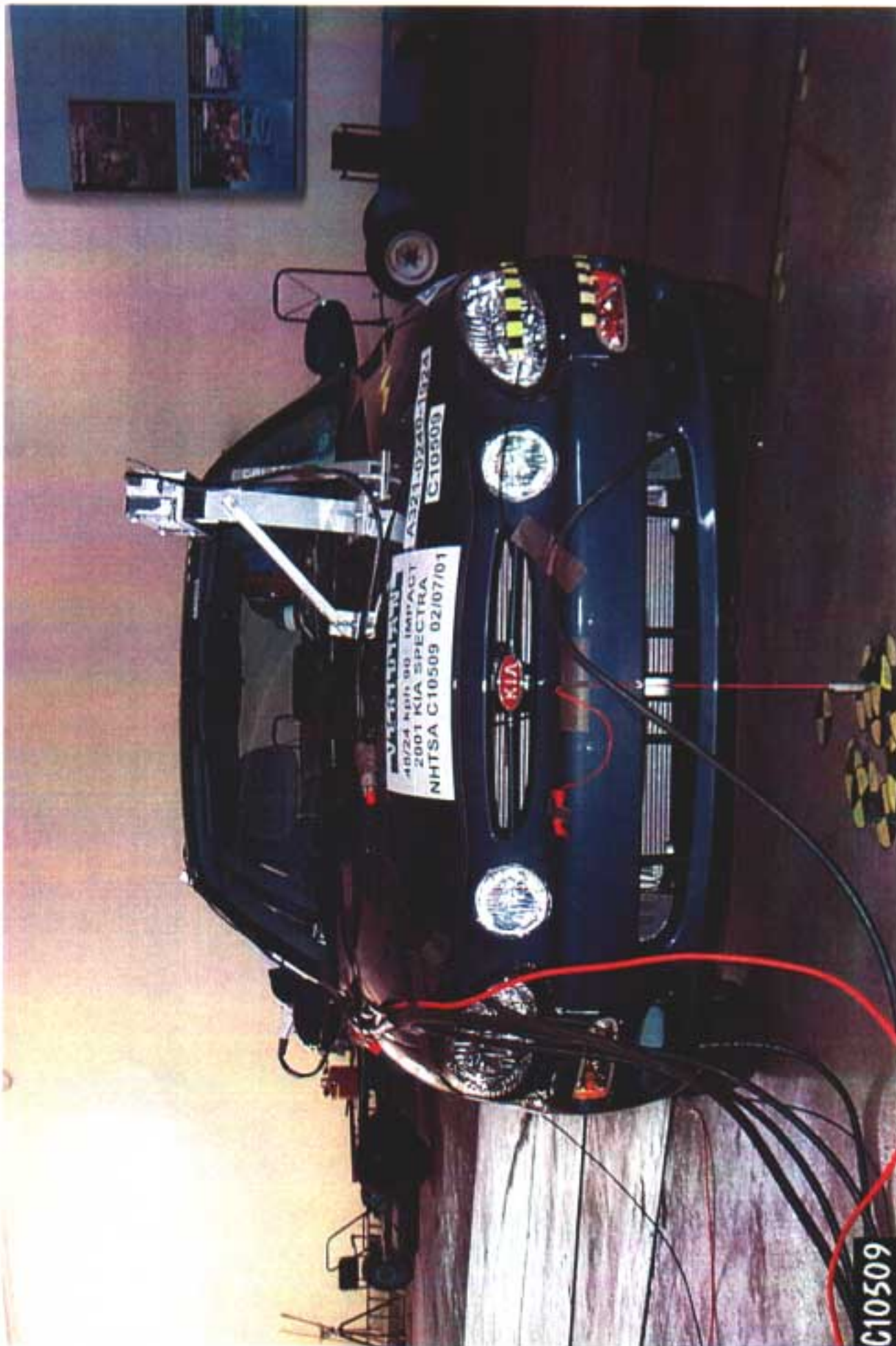


Figure A-1: PRE-TEST FRONTAL VIEW OF TEST VEHICLE

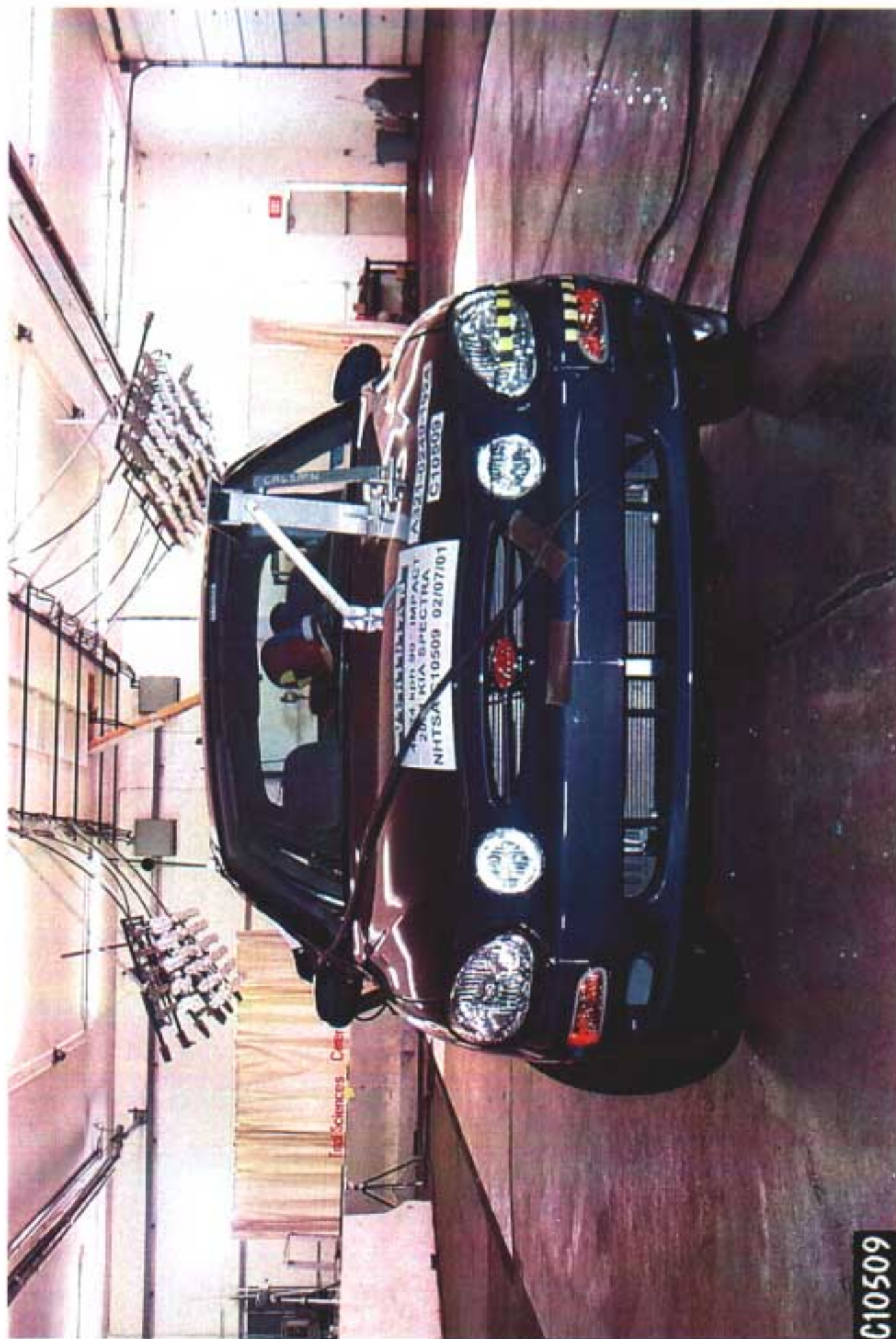


Figure A-2: POST-TEST FRONTAL VIEW OF TEST VEHICLE



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



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

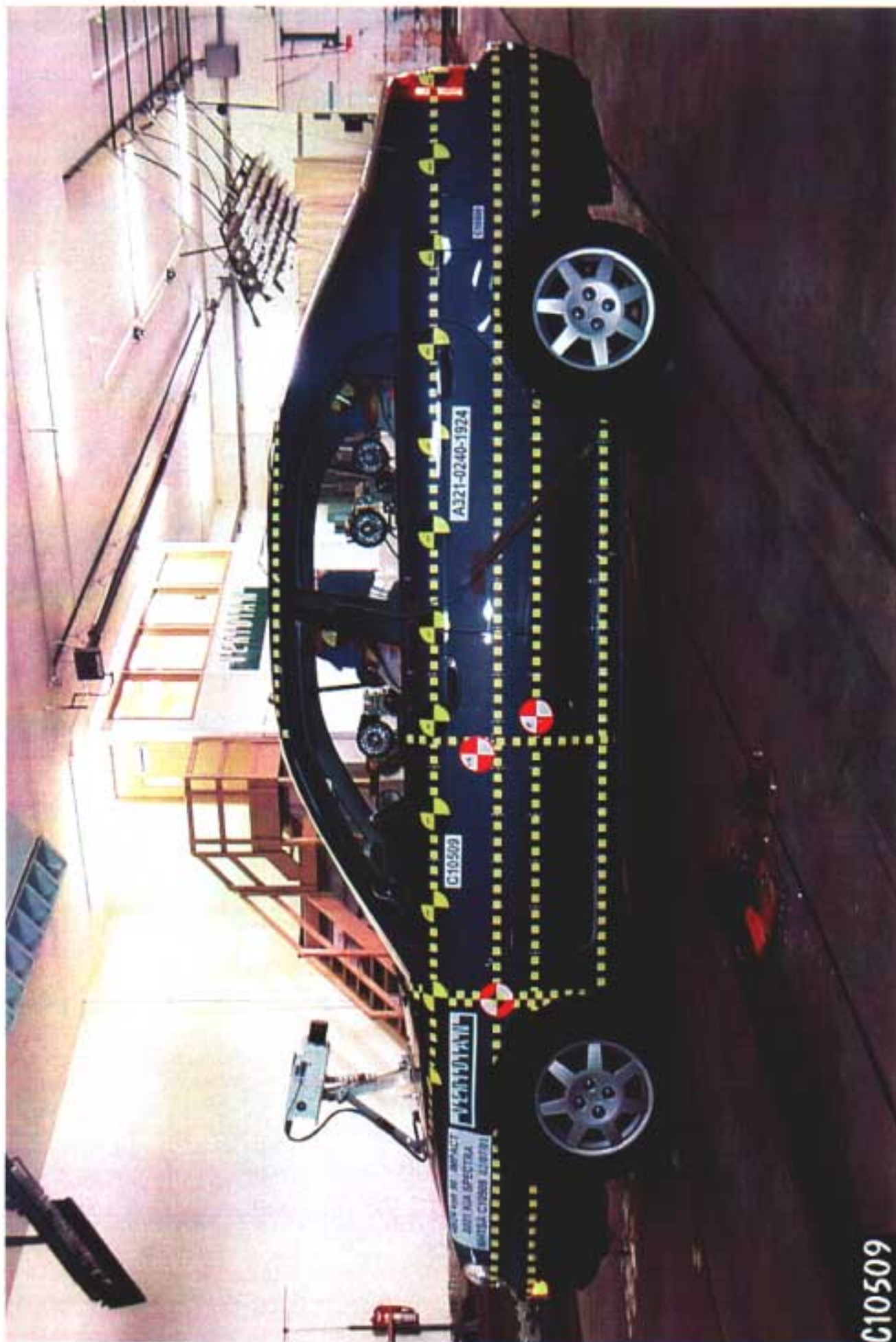


Figure A-5: PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

C10509

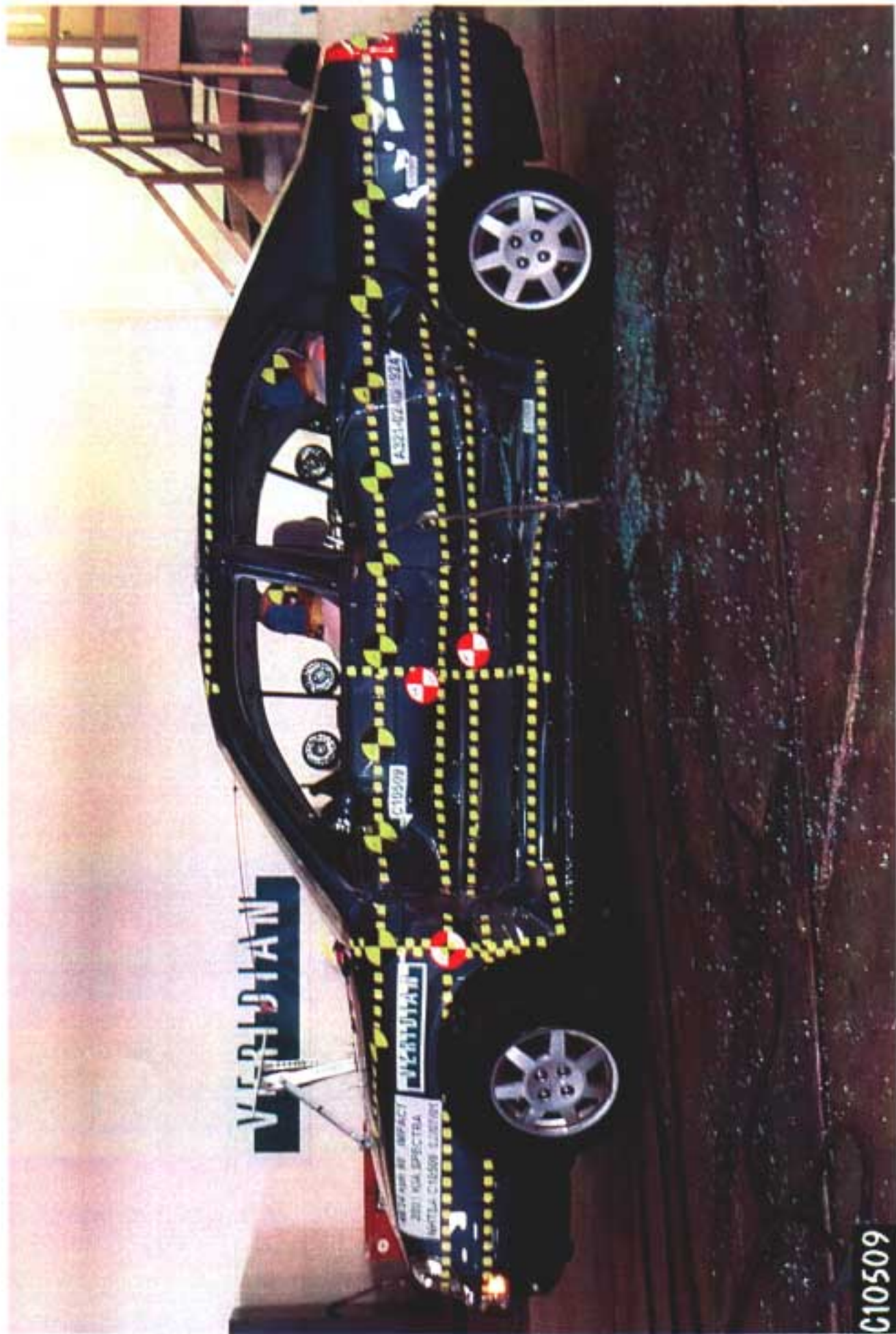


Figure A-6: POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-7: PRE-TEST FRONTAL VIEW OF IMPACTOR FACE

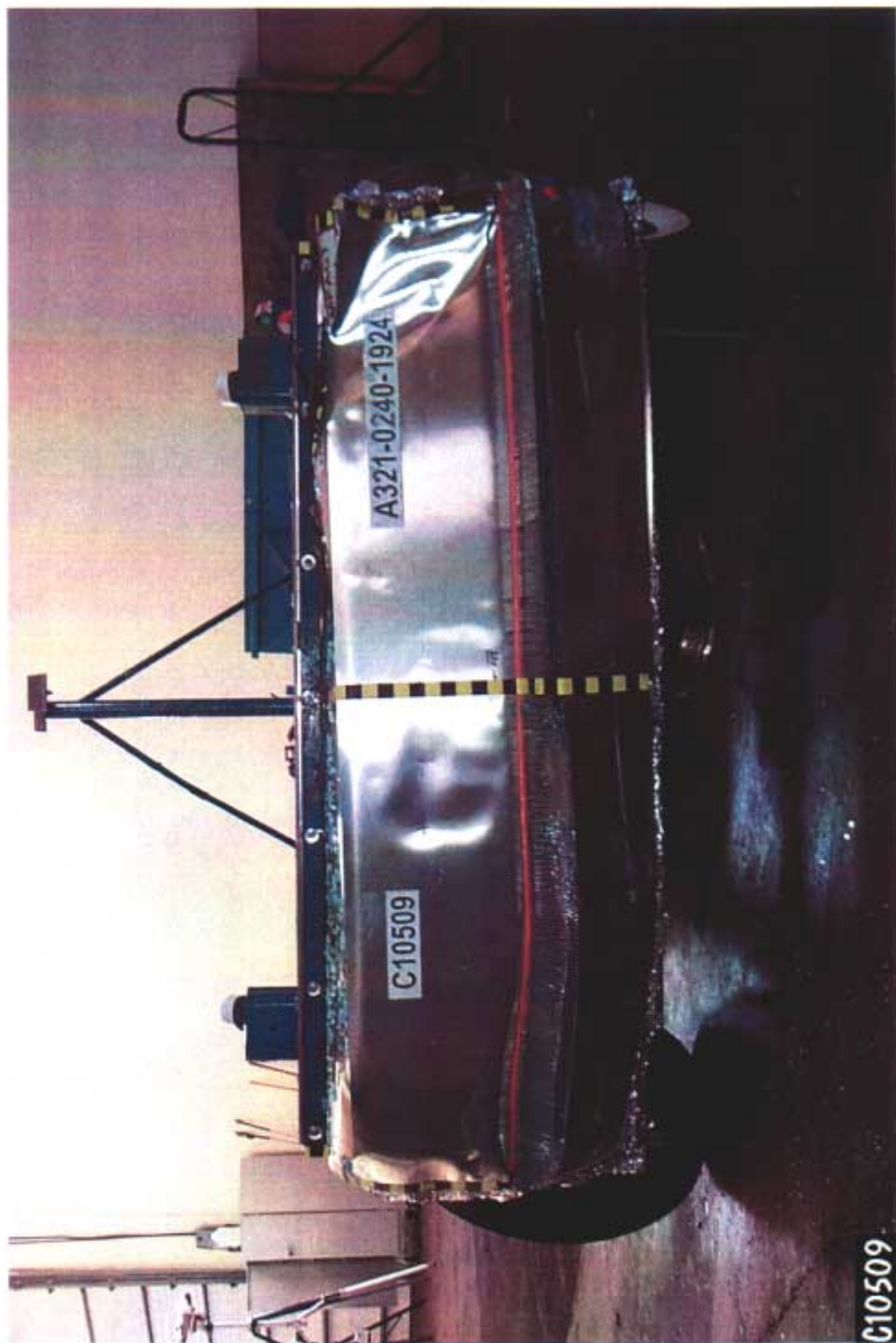


Figure A-8: POST-TEST FRONTAL VIEW OF IMPACTOR FACE

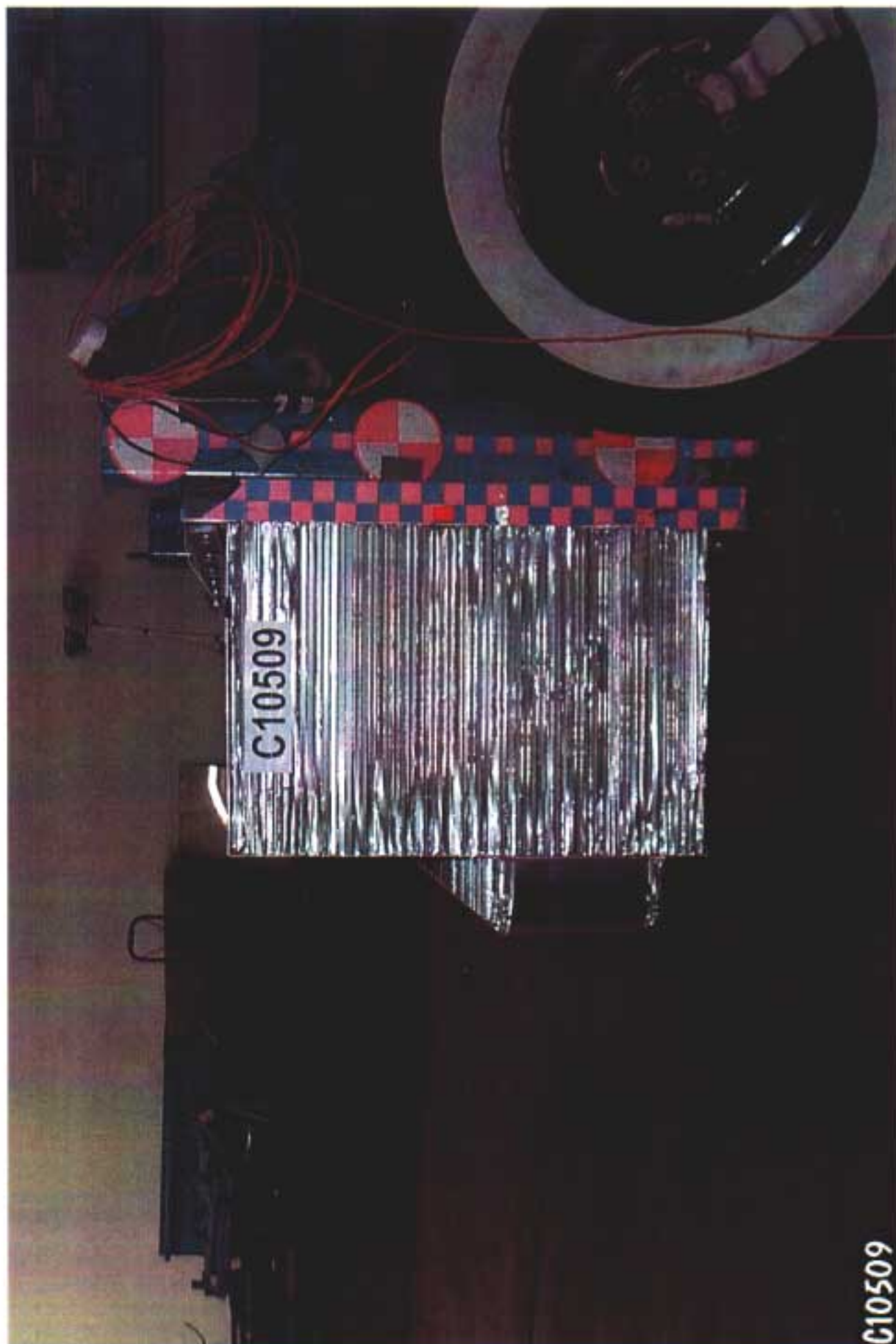


Figure A-9: PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-10: POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-11: PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-12: POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE

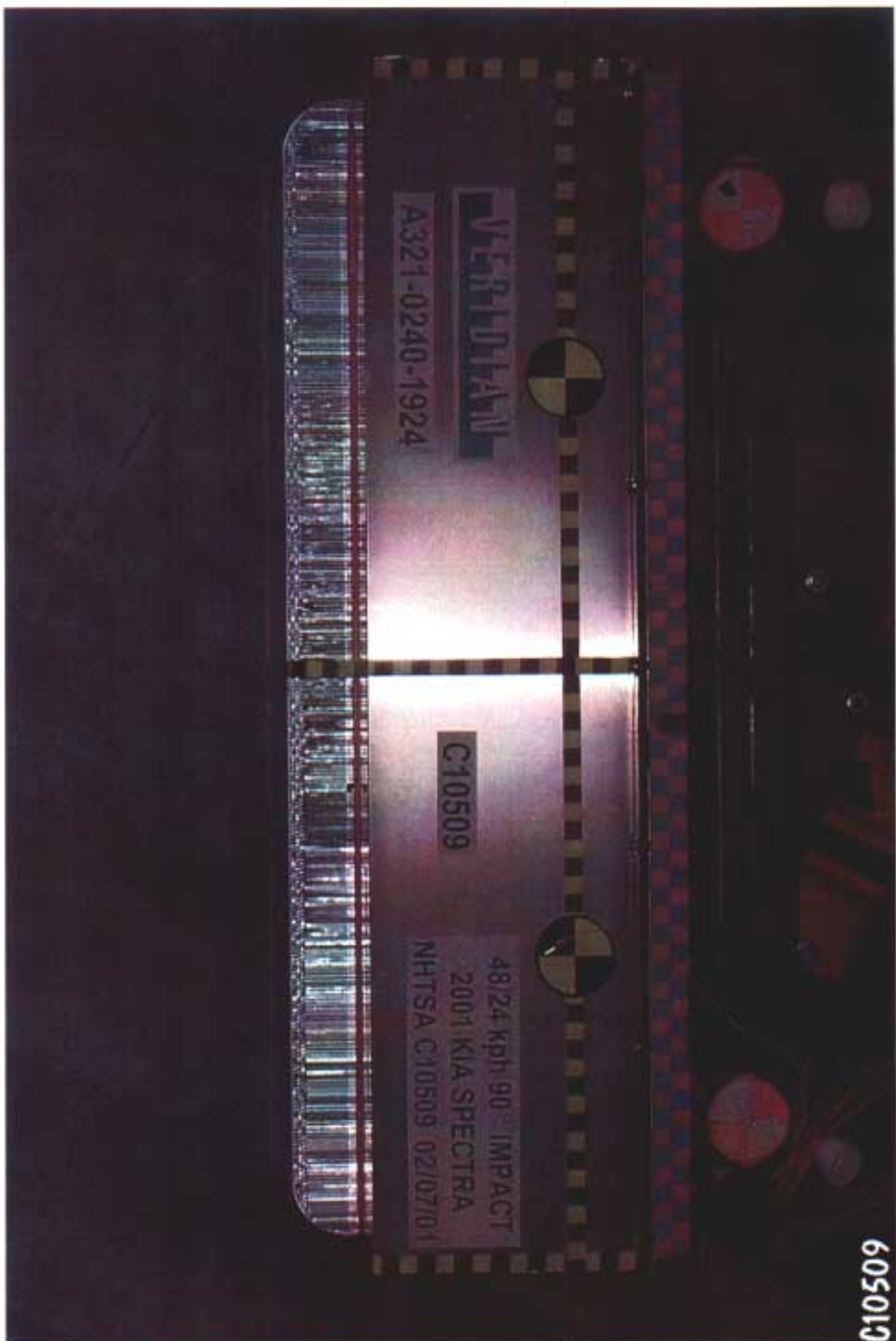


Figure A-13: PRE-TEST TOP VIEW OF IMPACTOR FACE

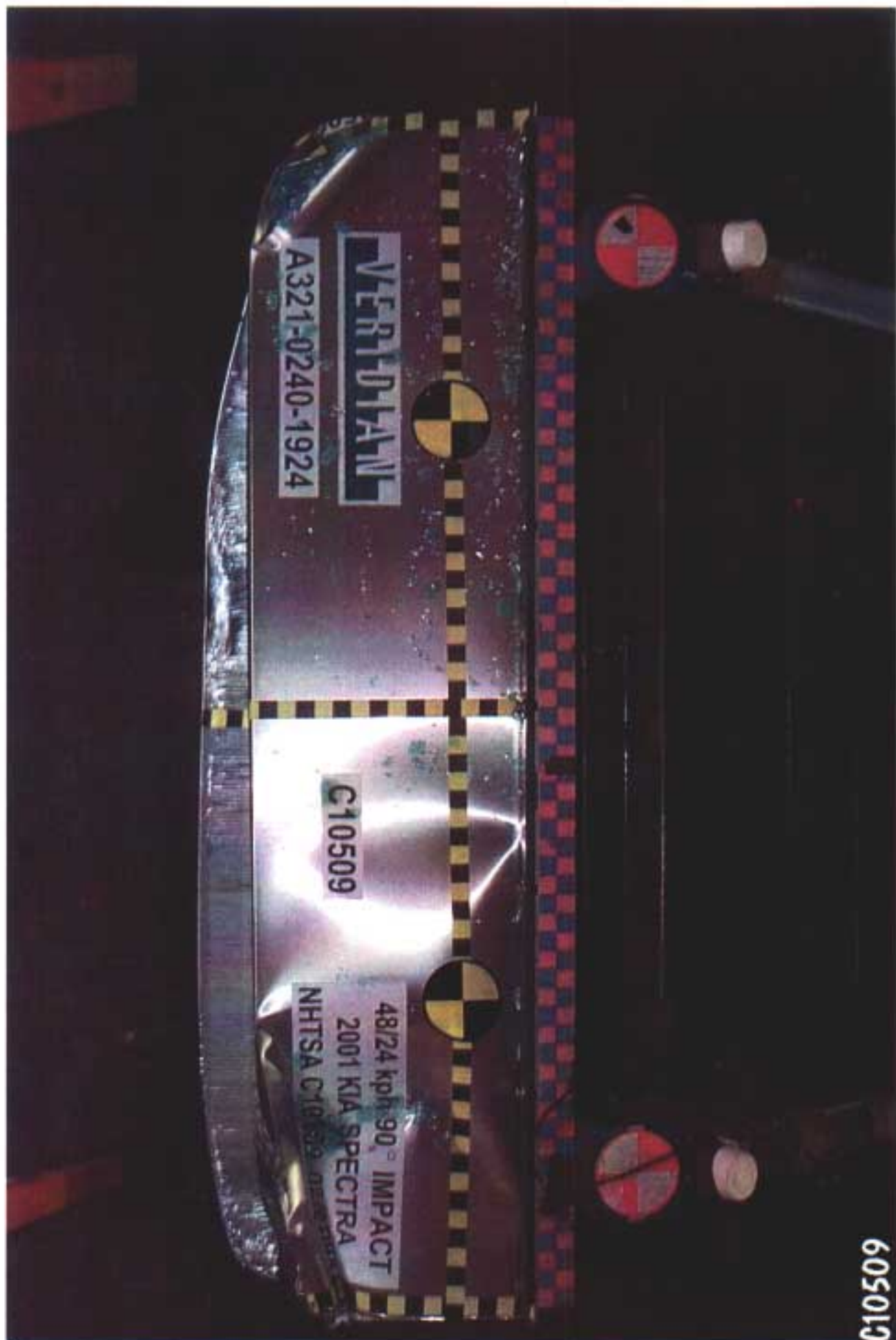


Figure A-14: POST-TEST TOP VIEW OF IMPACTOR FACE

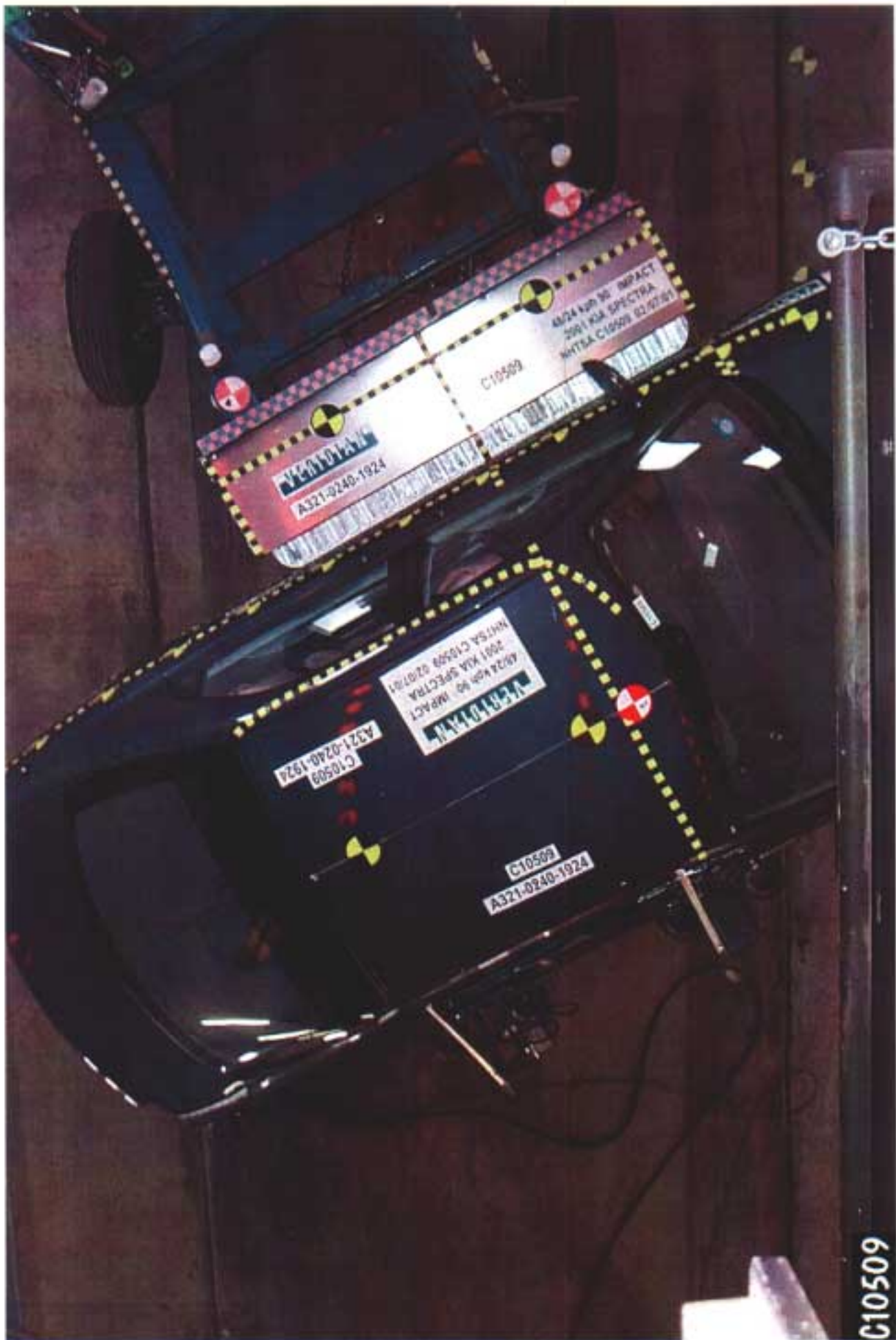


Figure A-15: PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE

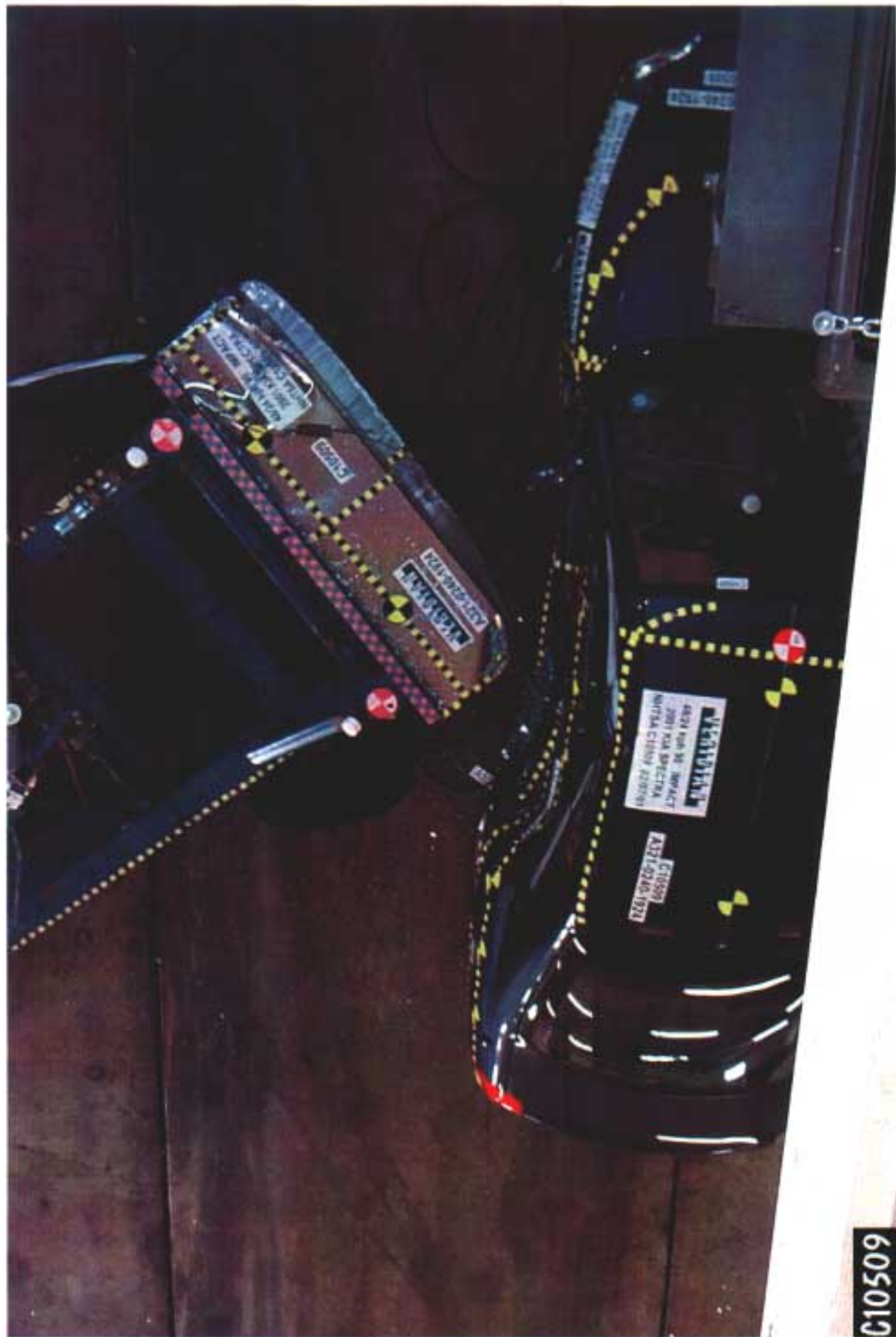


Figure A-16: POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE



Figure A-17: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID

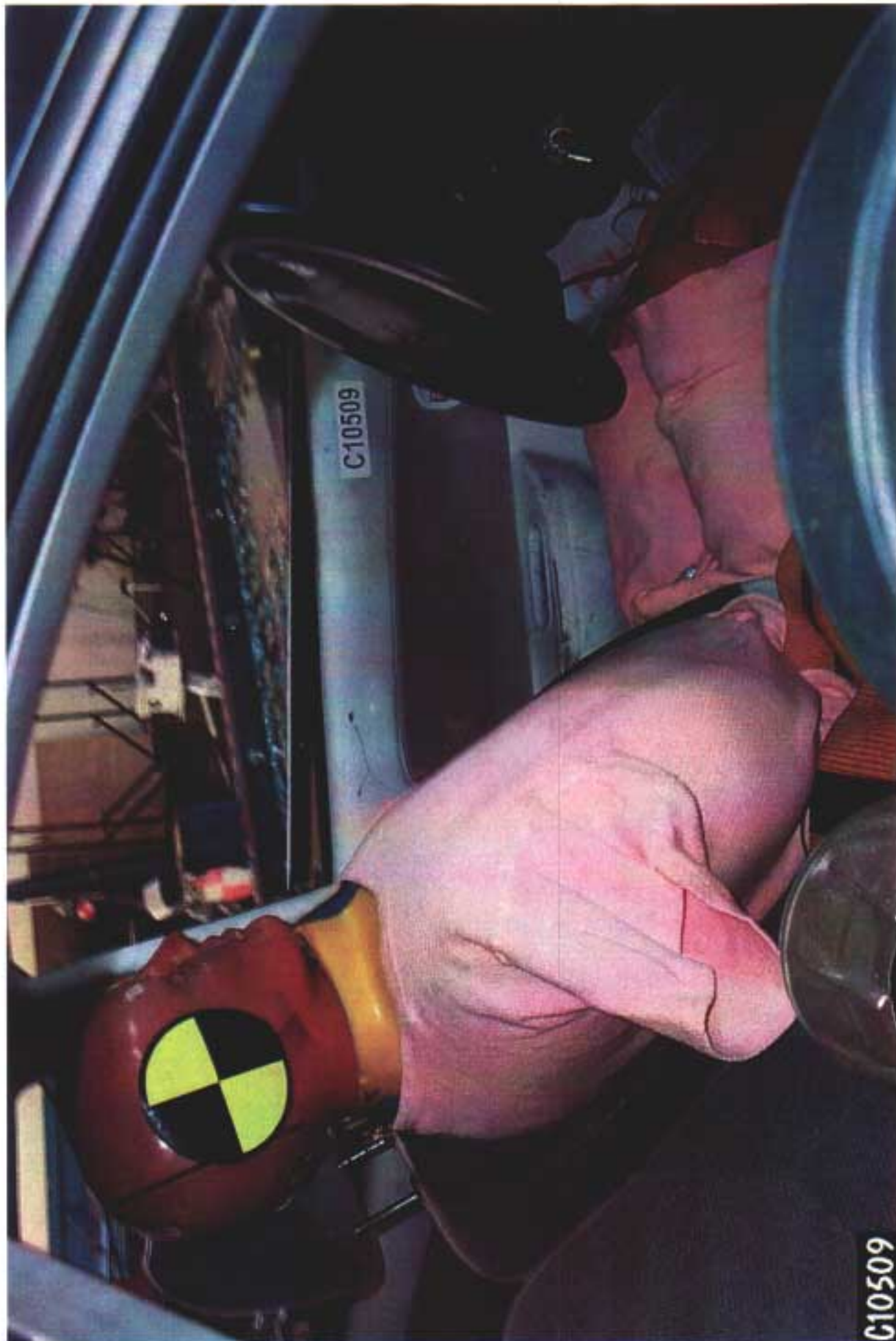


Figure A-18: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-19; PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID

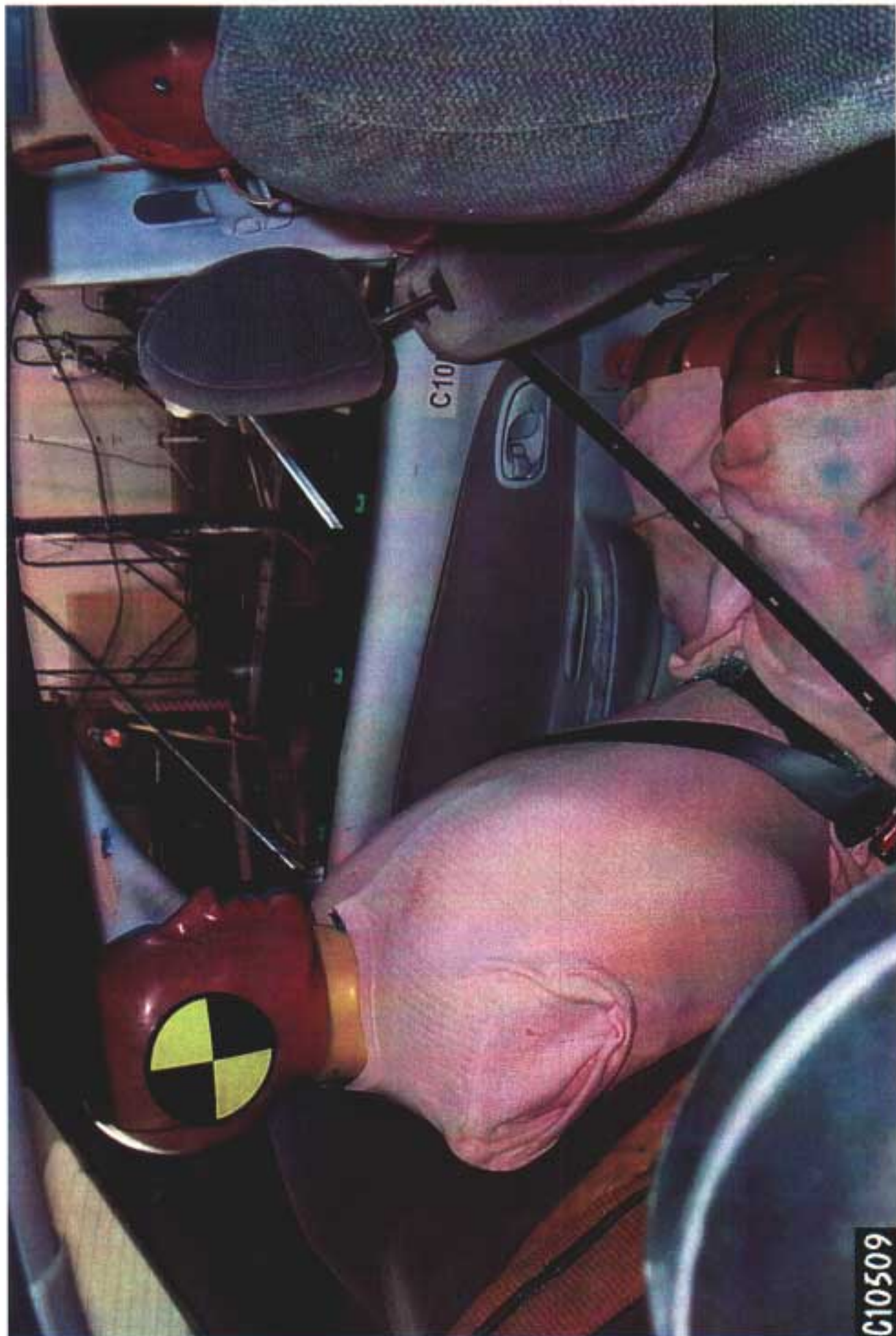


Figure A-20: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-21: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

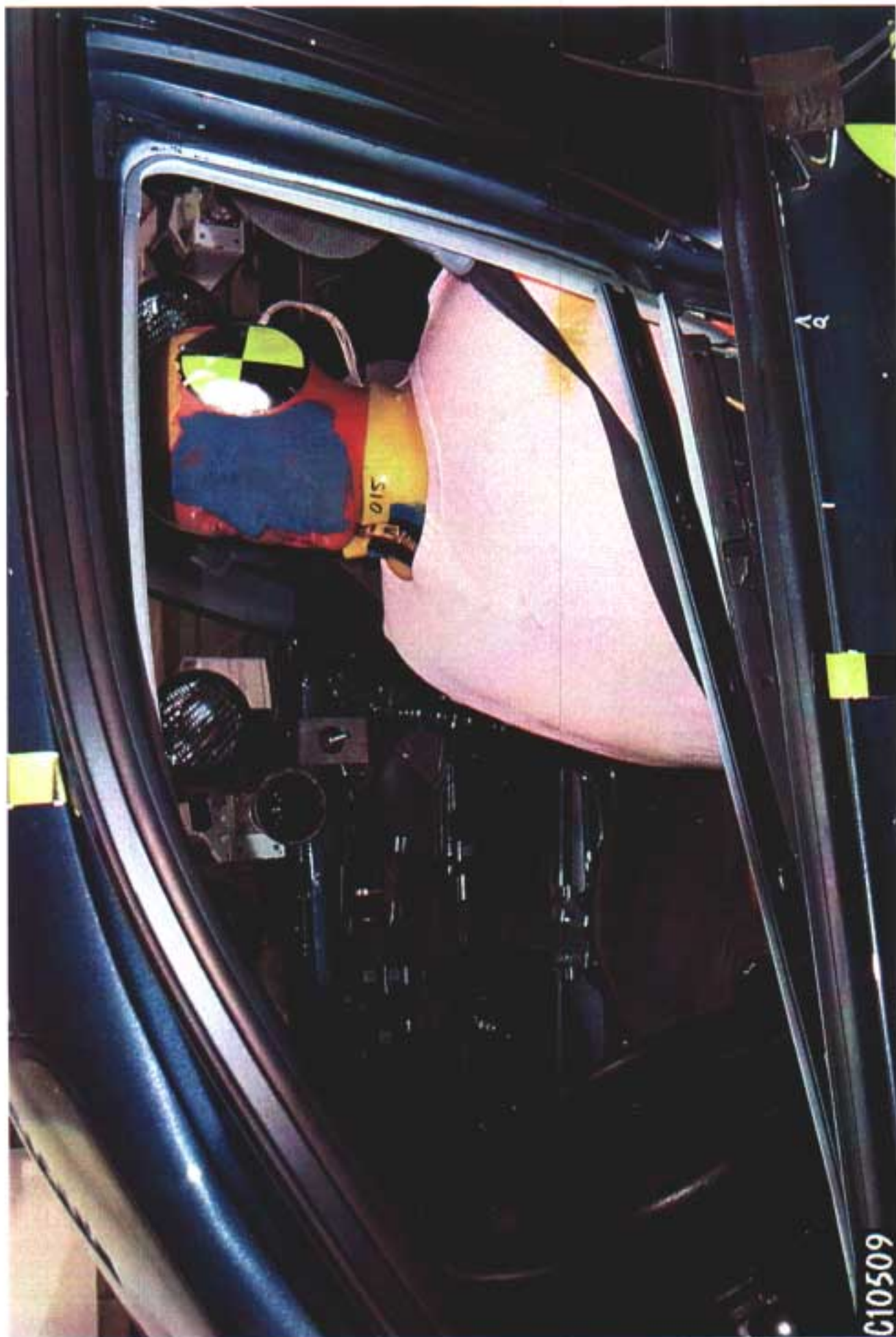


Figure A-22: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

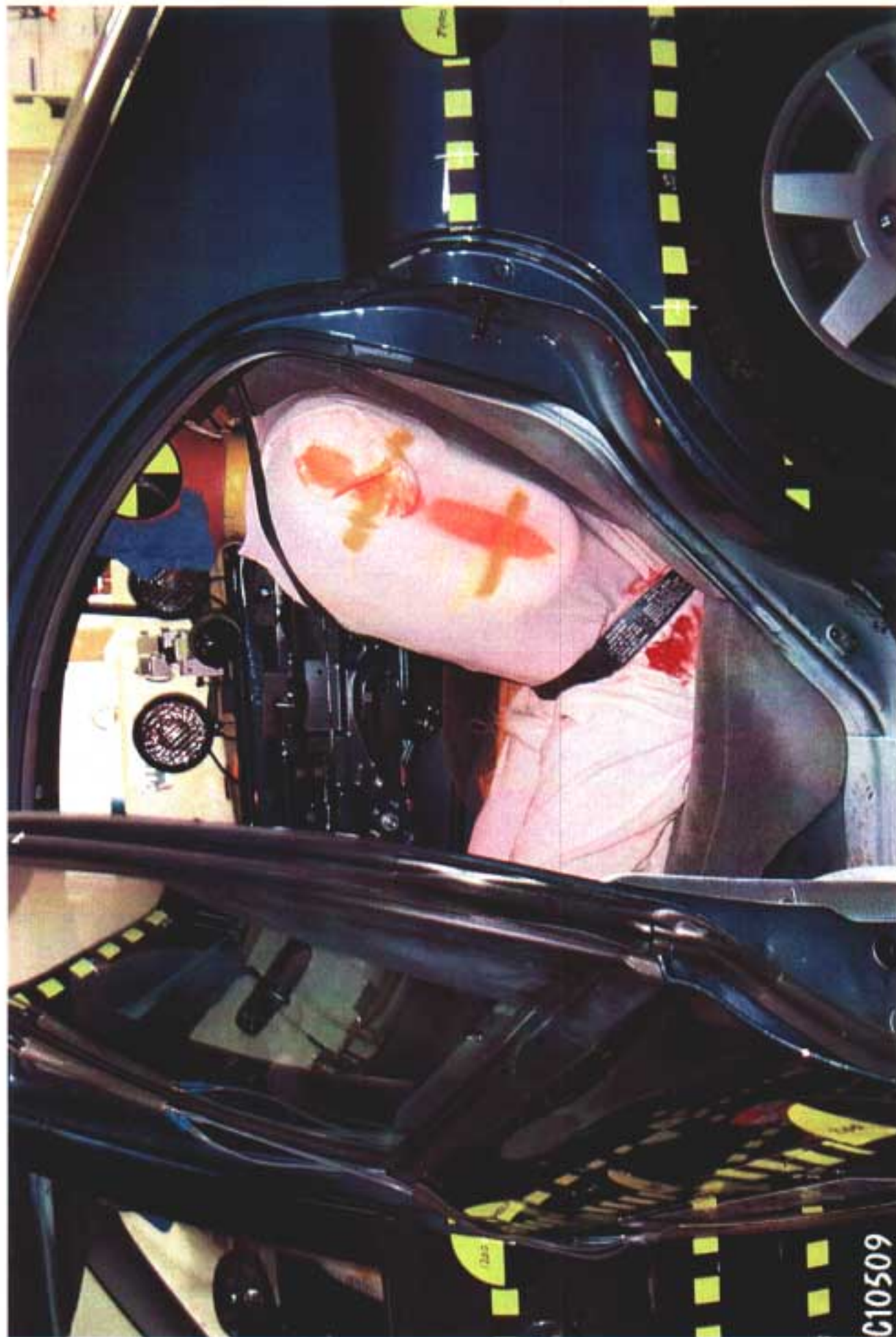


Figure A-23: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID

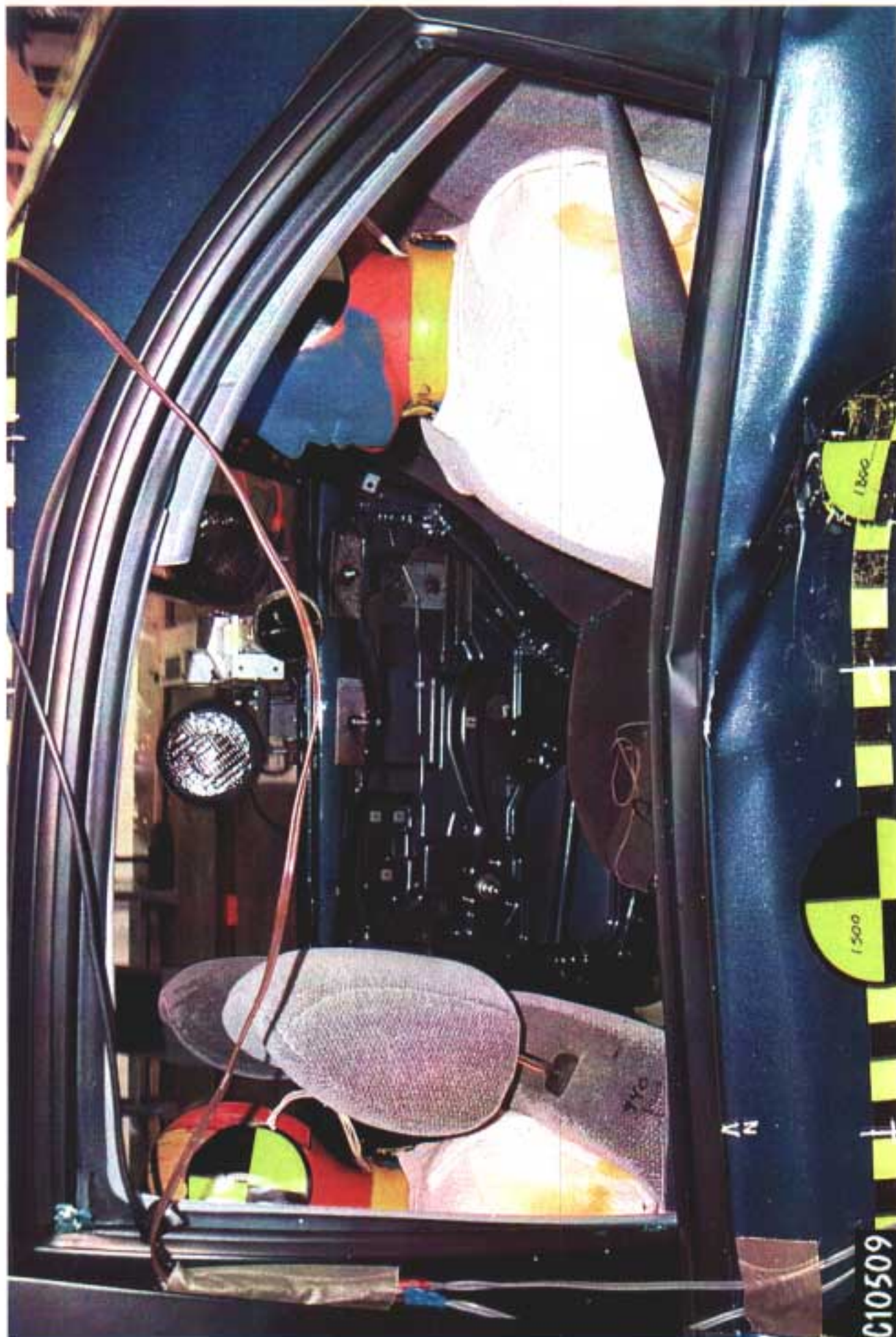


Figure A-24: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-25: PRE-TEST FRONT INTERIOR TRIM

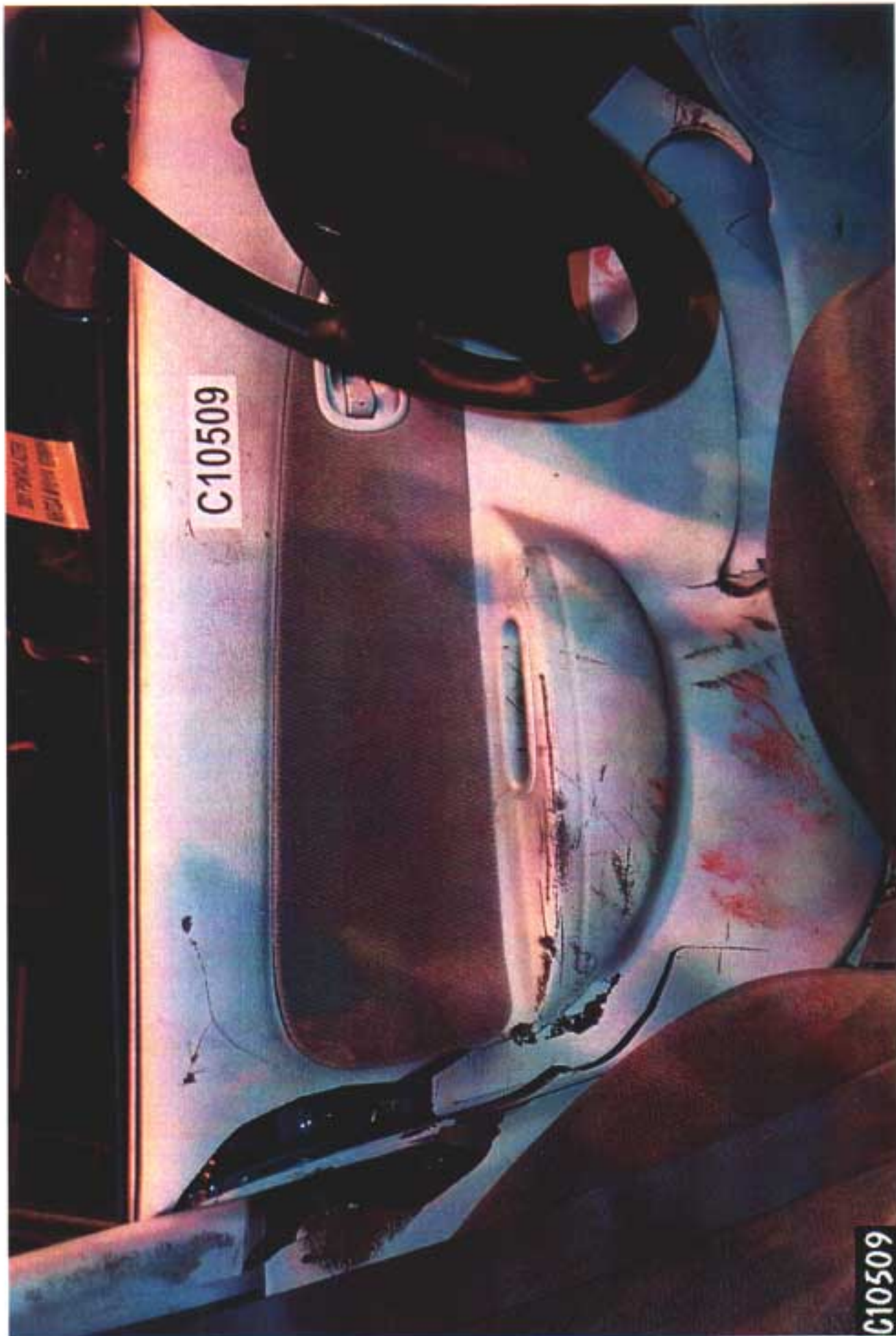


Figure A-26: POST-TEST FRONT INTERIOR TRIM SHOWING SID IMPACT LOCATIONS

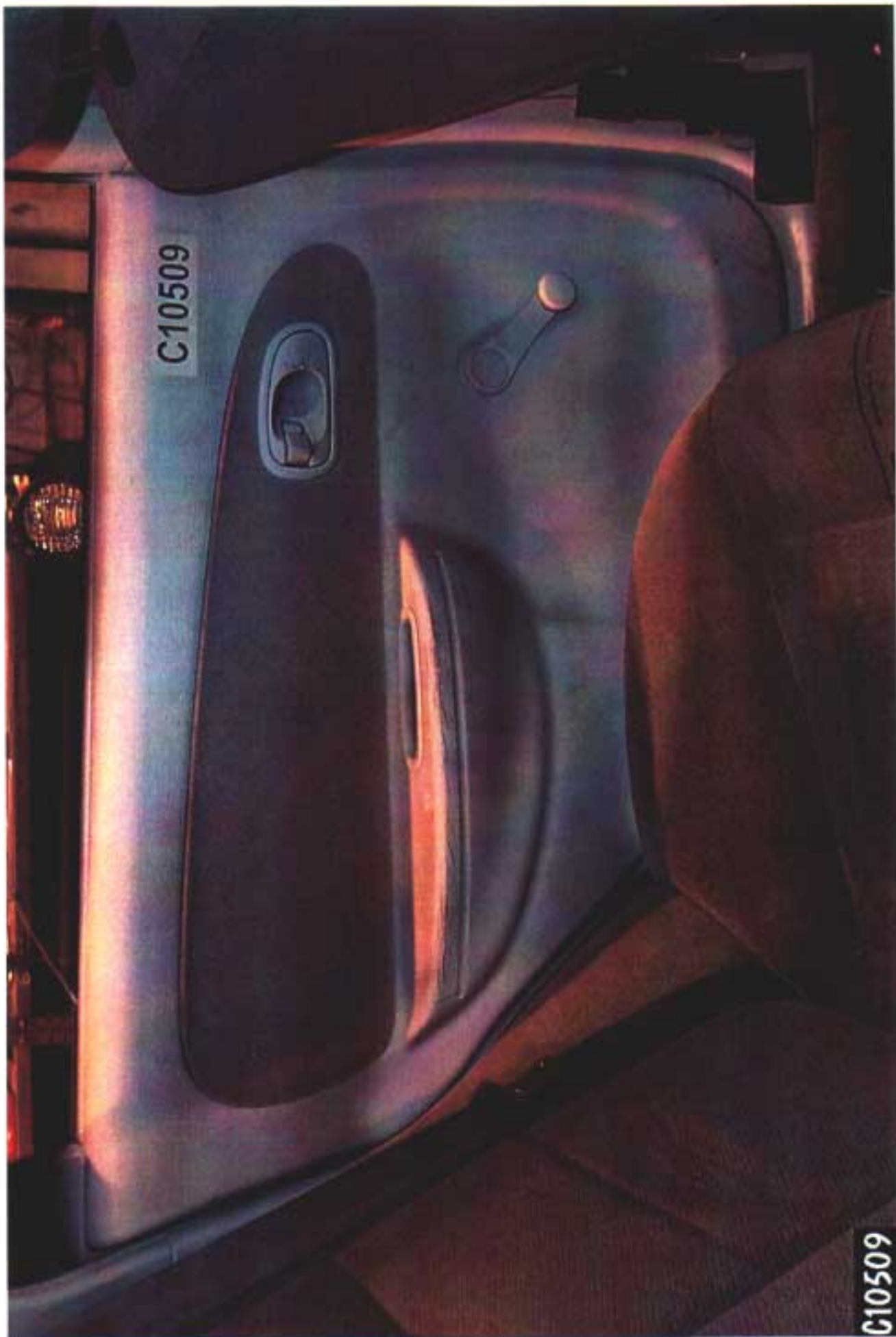


Figure A-27: PRE-TEST REAR INTERIOR TRIM



Figure A-28: POST-TEST REAR INTERIOR TRIM SHOWING SID IMPACT LOCATIONS

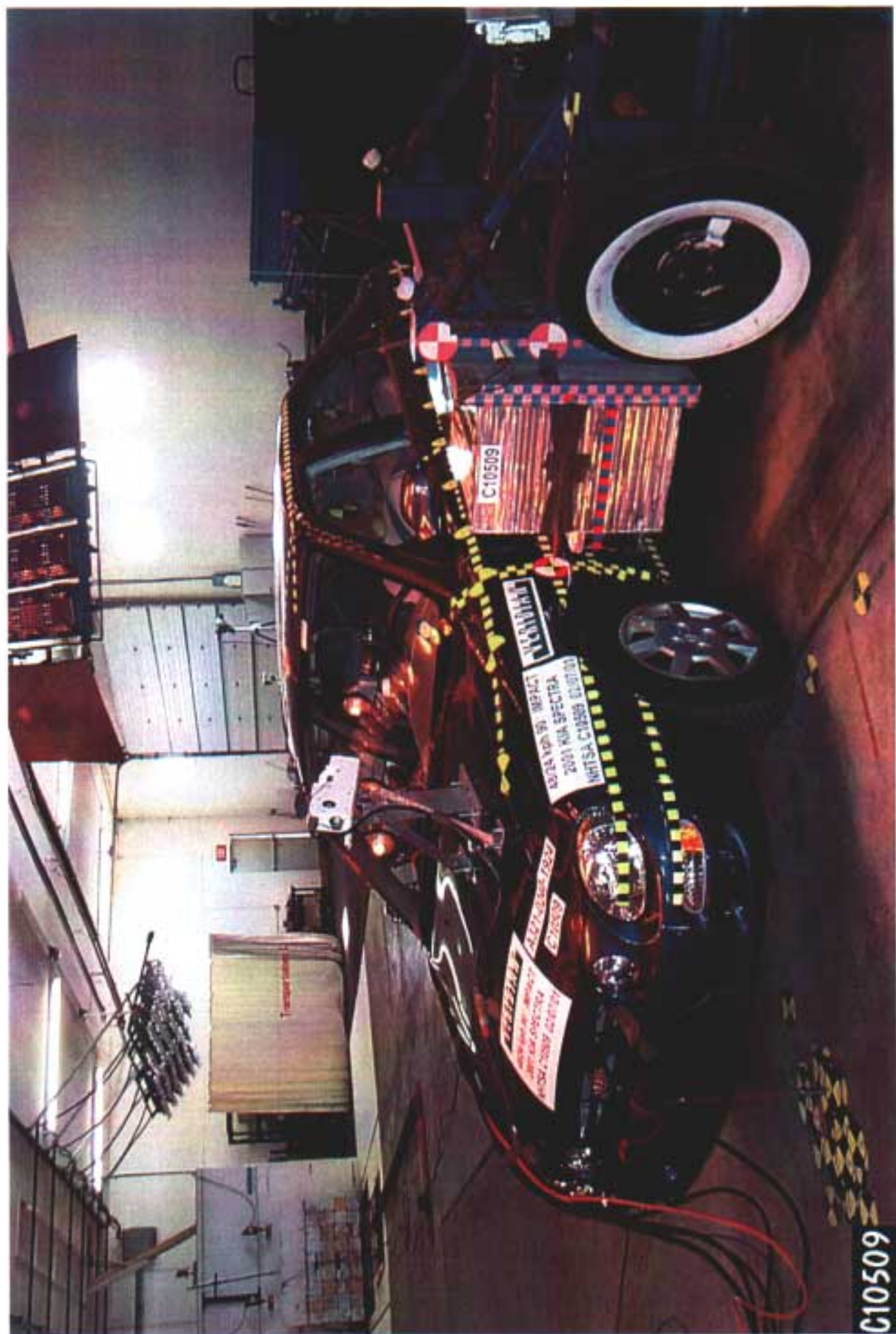


Figure A-29: PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

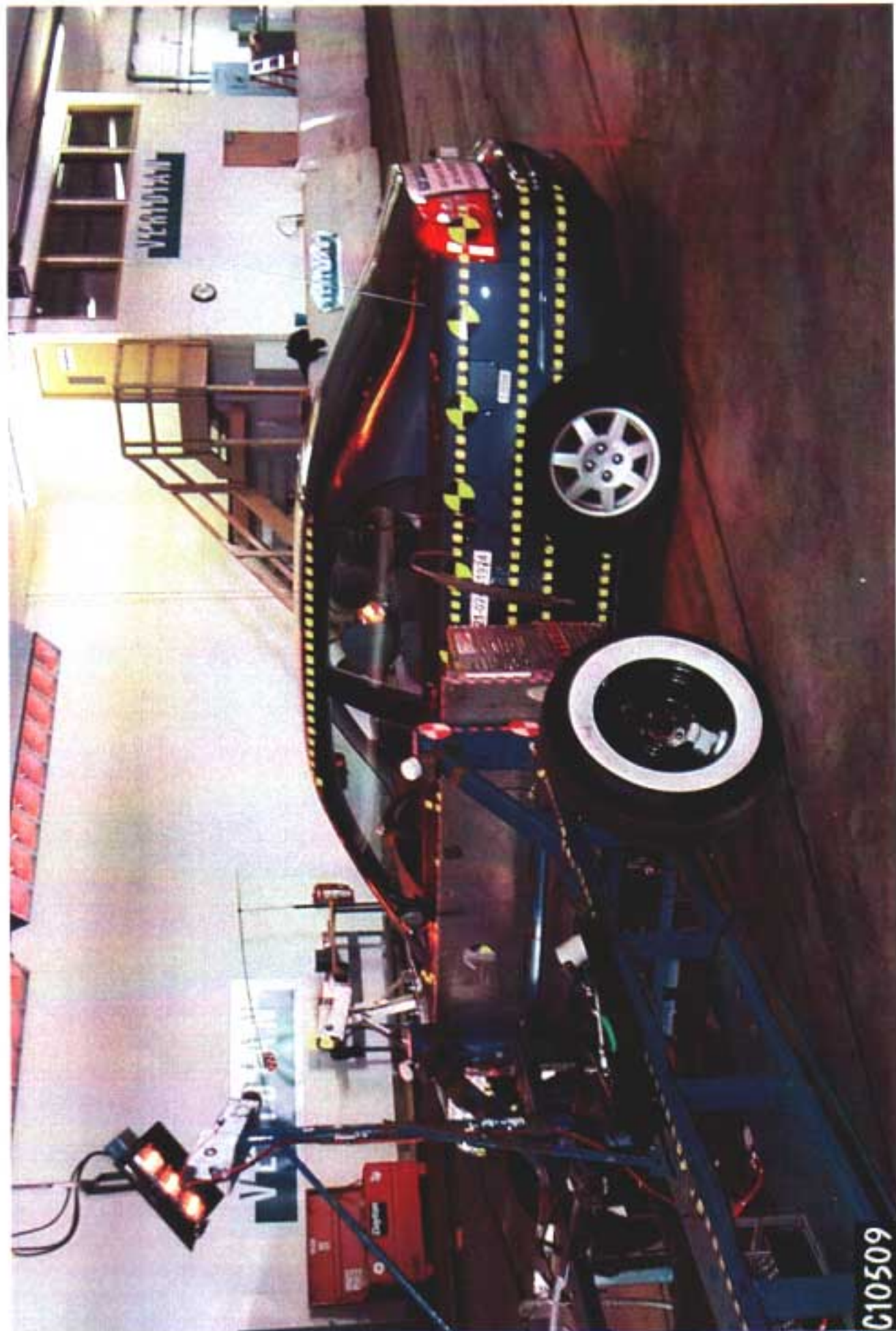


Figure A-30: PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

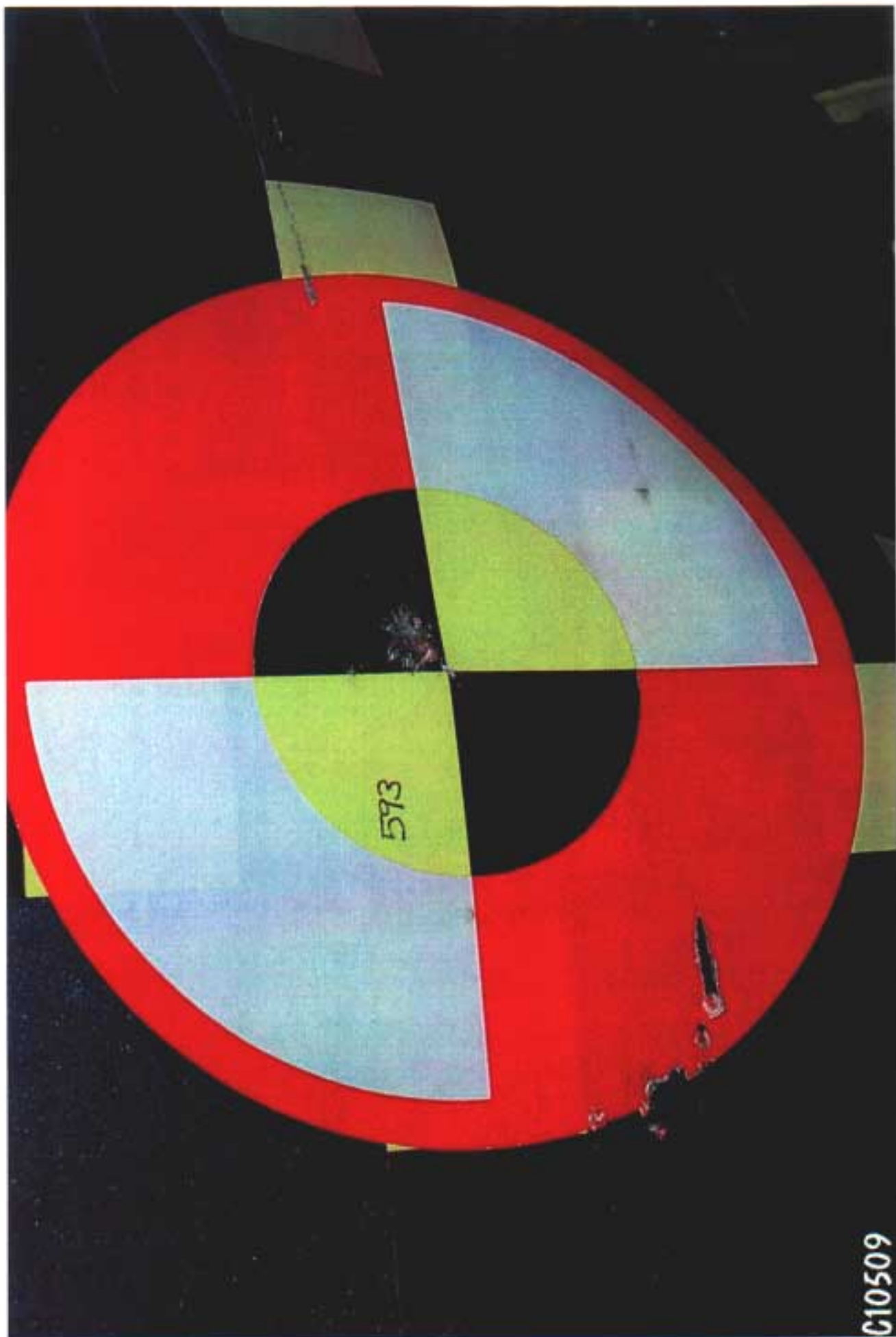


Figure A-31: POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET

C10509

MFD. BY KIA MOTORS CORP. IN KOREA

DATE: 07/25/00 GWR 3594 LB 3594 1698 LB 1698
PNBV 1630 KG PNBV 1630 770 KG 770

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

VIN KNAFB161515212002

TYPE PASSENGER CAR
6B

EXTERIOR PAINT COLORS

BODY

VR

MIDG.

INT. TRIM

TARE

W

S

AX

N

5

Y2

C10509

Figure A-32: CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL

SPECTRA**RECOMMENDED TIRE SIZE AND INFLATION PRESSURE (COLD)**
DIMENSIONS DES PNEUS et PRESSIONS DE GONFLAGE RECOMMANDÉES (à froid)**A**

LOAD RANGE CHARGE NOMINALE	TIRE SIZE (LOAD RANGE C&D NOT PERMISSIBLE) DIMENSIONS DES PNEUS (CHARGES NOMINALES C ET D NON PERMISES)	PRESSURE PRESSION		
		FRONT AVANT	REAR ARRIÈRE	
STD	P185/65R14 85H	26 psi 180 kPa	26 psi 180 kPa	
T	T115/70D15 TEMPORARY SPARE PNEU DE SECOURS PROVISoire	60 psi 415 kPa		
TOTAL LOAD = OCCUPANTS PLUS LUGGAGE CHARGE GLOBALE = OCCUPANTS PLUS BAGAGES				
MODEL MODÈLE	MAXIMUM LOAD CHARGE MAXIMALE	OCCUPANTS OCCUPANTS	DISTRIBUTION RÉPARTITION	
			FRONT AVANT	REAR ARRIÈRE LUGGAGE BAGAGES
ALL TOUS	849 lb/385 kg	5	2	3 99 lb/45 kg
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION		VOIR MANUEL DE CONDUCTEUR POUR DES INFORMATIONS SUPPLÉMENTAIRES		

Figure A-33: CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL

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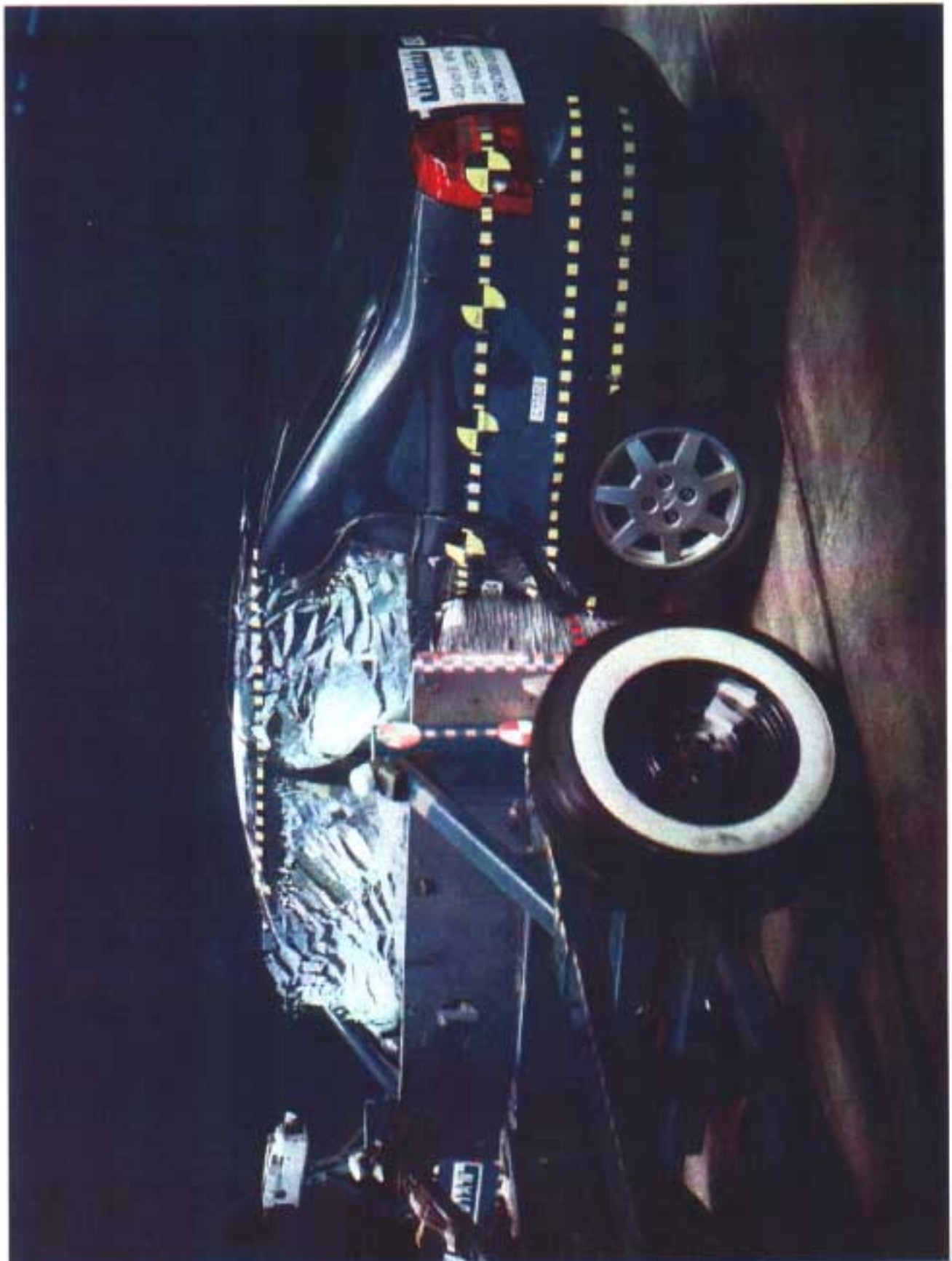


Figure A-34: IMPACT PHOTO

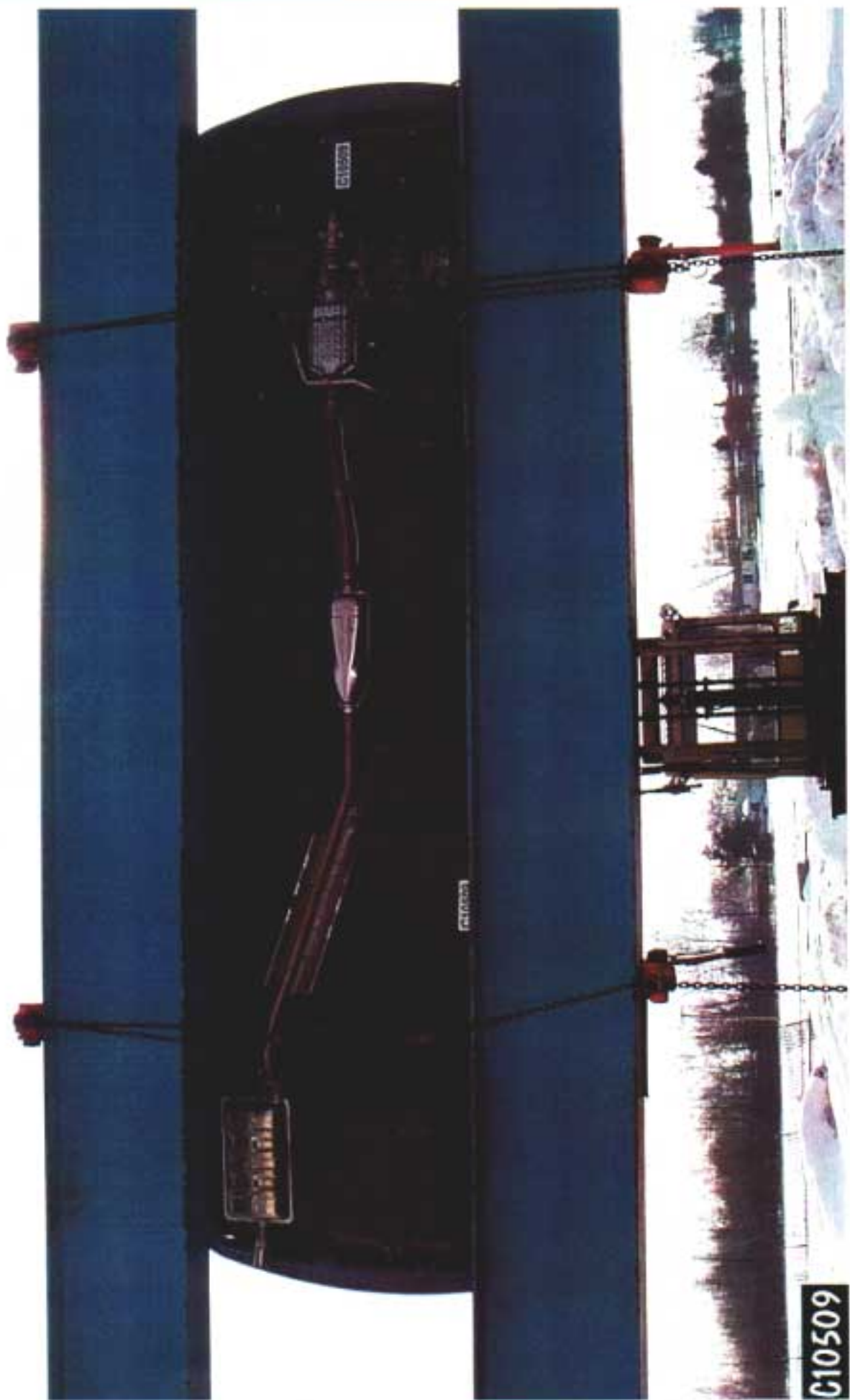


Figure A-35: ROLLOVER 90 DEGREES



Figure A-36: ROLLOVER 180 DEGREES

C10509



Figure A-37: ROLLOVER 270 DEGREES

C10509



Figure A-38: ROLLOVER 360 DEGREES

APPENDIX B

VEHICLE, MDB AND SID RESPONSE DATA

TABLE OF DATA PLOTS

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS ACCELERATION DATA - FILTER CLASS 1000 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 VS TIME	B 12
8	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B 13
9	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B 14
10	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B 15
11	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B 16
12	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B 17
13	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B 18
14	DRIVER PELVIC (Y) ACCELERATION VS TIME	B 19
15	DRIVER PELVIC (Y) VELOCITY VS TIME	B 20
16	PASSENGER HEAD (X) ACCELERATION VS TIME	B 21
17	PASSENGER HEAD (X) VELOCITY VS TIME	B 22
18	PASSENGER HEAD (Y) ACCELERATION VS TIME	B 23
19	PASSENGER HEAD (Y) VELOCITY VS TIME	B 24
20	PASSENGER HEAD (Z) ACCELERATION VS TIME	B 25
21	PASSENGER HEAD (Z) VELOCITY VS TIME	B 26
22	PASSENGER HEAD RESULTANT VS TIME	B 27
23	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B 28
24	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B 29
25	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 30
26	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B 31
27	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B 32
28	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 33
29	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 34
30	PASSENGER PELVIC (Y) VELOCITY VS TIME	B 35

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS ACCELERATION DATA FIR FILTERED

<u>Plot No</u>	<u>Data Plot Title</u>	<u>Page</u>
31	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B 36
32	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 37
33	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 38
34	DRIVER PELVIC (Y) ACCELERATION VS TIME	B 39
35	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B 40
36	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B 41
37	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B 42
38	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B 43

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>
39	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME	B- 44
40	RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME	B- 45
41	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 46
42	RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B 47
43	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME	B- 48
44	RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME	B- 49
45	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME	B- 50
46	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME	B- 51
47	RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME	B- 52
48	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 53
49	RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 54
50	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME	B- 55
51	RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY VS TIME	B- 56
52	RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION VS TIME	B 57
53	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME	B 58
54	REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME	B 59
55	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME	B 60
56	REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME	B 61
57	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME	B- 62
58	REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME	B- 63
59	REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION VS TIME	B 64
60	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 65
61	LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 66
62	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B 67
63	LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 68
64	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME	B 69
65	RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY VS TIME	B- 70
66	LOWER B POST (Y) ACCELERATION VS TIME	B 71
67	LOWER B POST (Y) VELOCITY VS TIME	B- 72
68	UPPER B POST (Y) ACCELERATION VS TIME	B- 73
69	UPPER B POST (Y) VELOCITY VS TIME	B- 74
70	LOWER A-POST (Y) ACCELERATION VS TIME	B- 75
71	LOWER A POST (Y) VELOCITY VS TIME	B- 76
72	UPPER A POST (Y) ACCELERATION VS TIME	B- 77
73	UPPER A POST (Y) VELOCITY VS TIME	B 78
74	FRONT SEAT TRACK (Y) ACCELERATION VS TIME	B 79
75	FRONT SEAT TRACK (Y) VELOCITY VS TIME	B 80
76	REAR SEAT TRACK (Y) ACCELERATION VS TIME	B 81
77	REAR SEAT TRACK (Y) VELOCITY VS TIME	B- 82

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>
78	VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME	B 83
79	VEHICLE CENTER OF GRAVITY (X) VELOCITY VS TIME	B 84
80	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B 85
81	VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME	B 86
82	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B 87
83	VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME	B 88
84	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B 89

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>
85	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME	B 90
86	MDB CENTER OF GRAVITY (X) VELOCITY VS TIME	B 91
87	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B 92
88	MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME	B 93
89	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B 94
90	MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME	B 95
91	MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B 96
92	MDB REAR (X) ACCELERATION VS TIME	B 97
93	MDB REAR (X) VELOCITY VS TIME	B 98
94	MDB REAR (Y) ACCELERATION VS TIME	B 99
95	MDB REAR (Y) VELOCITY VS TIME	B 100

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)

ACCELERATION DATA - FILTER CLASS 1000

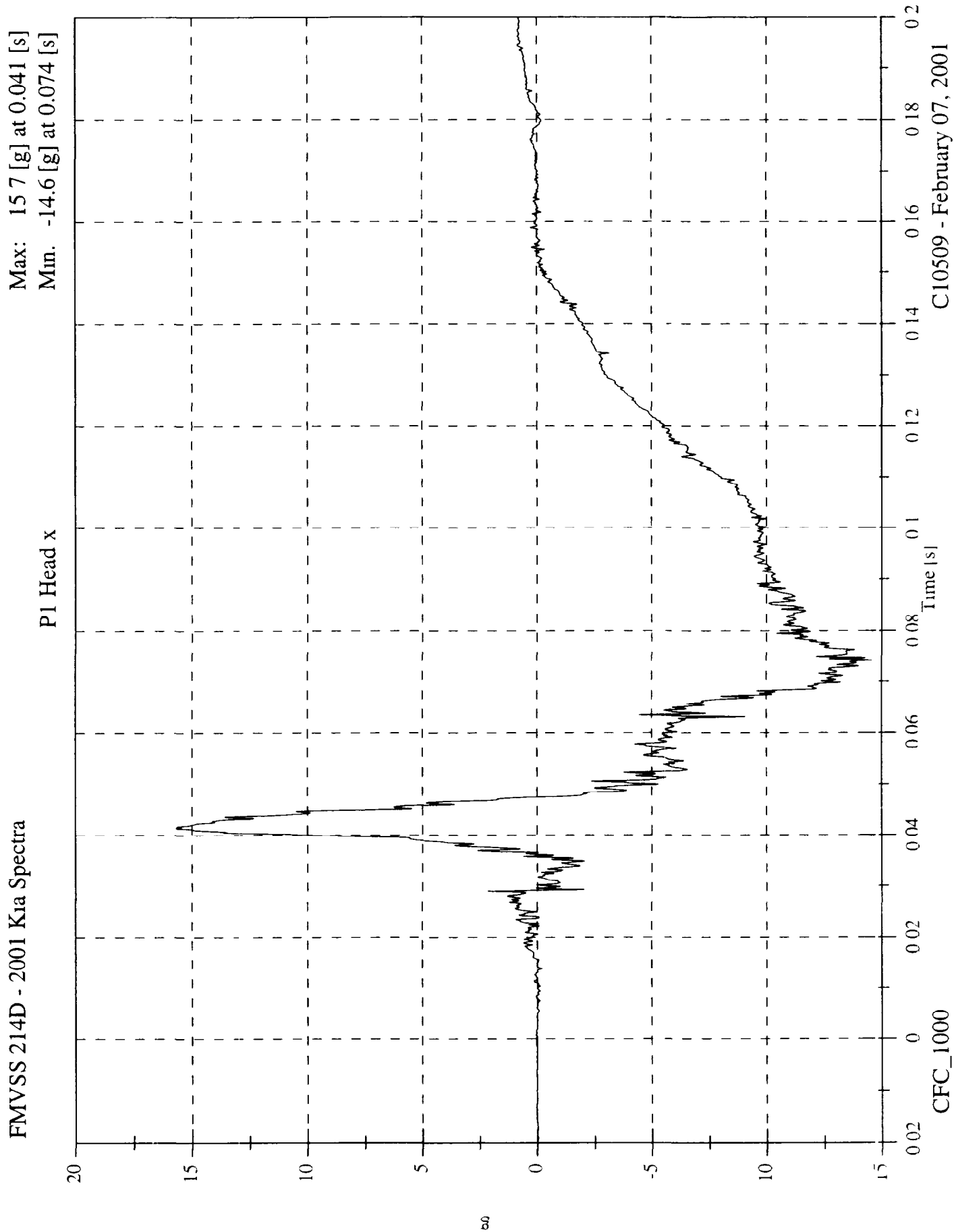
INTEGRATION DATA FILTER CLASS 180

<u>Plot No</u>	<u>Data Plot Title</u>	<u>Page</u>
96	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B 101
97	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B 102
98	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B 103
99	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 104
100	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 105
101	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B 106
102	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 107
103	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 108
104	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 109
105	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 110
106	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 111
107	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 112
108	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 113
109	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B 114
110	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B 115
111	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 116

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)

ACCELERATION DATA FIR FILTERED

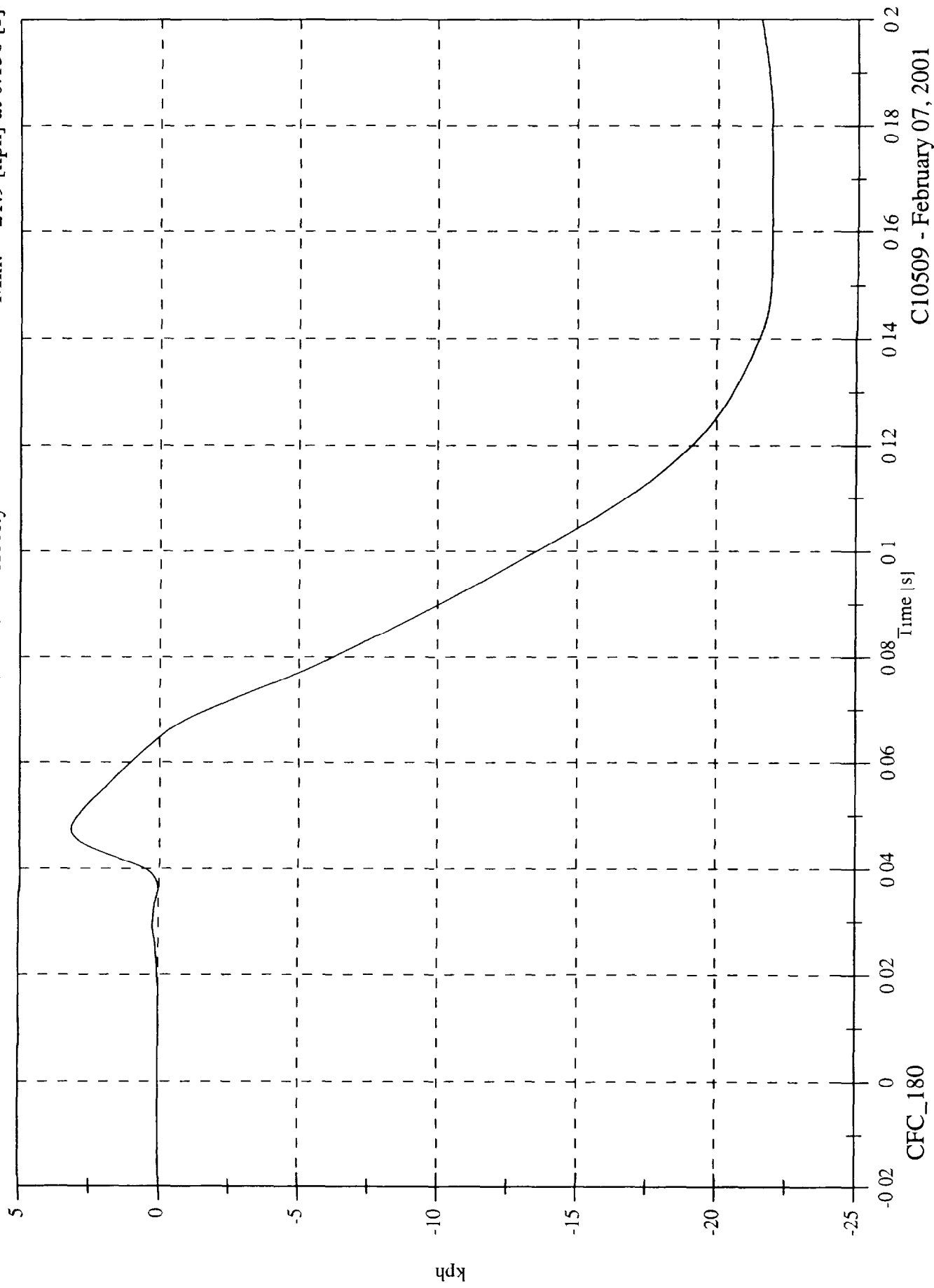
<u>Plot No</u>	<u>Data Plot Title</u>	<u>Page</u>
112	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B 117
113	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 118
114	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B 119
115	DRIVER PELVIC (Y) ACCELERATION VS TIME	B 120
116	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B 121
117	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B 122
118	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 123
119	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 124



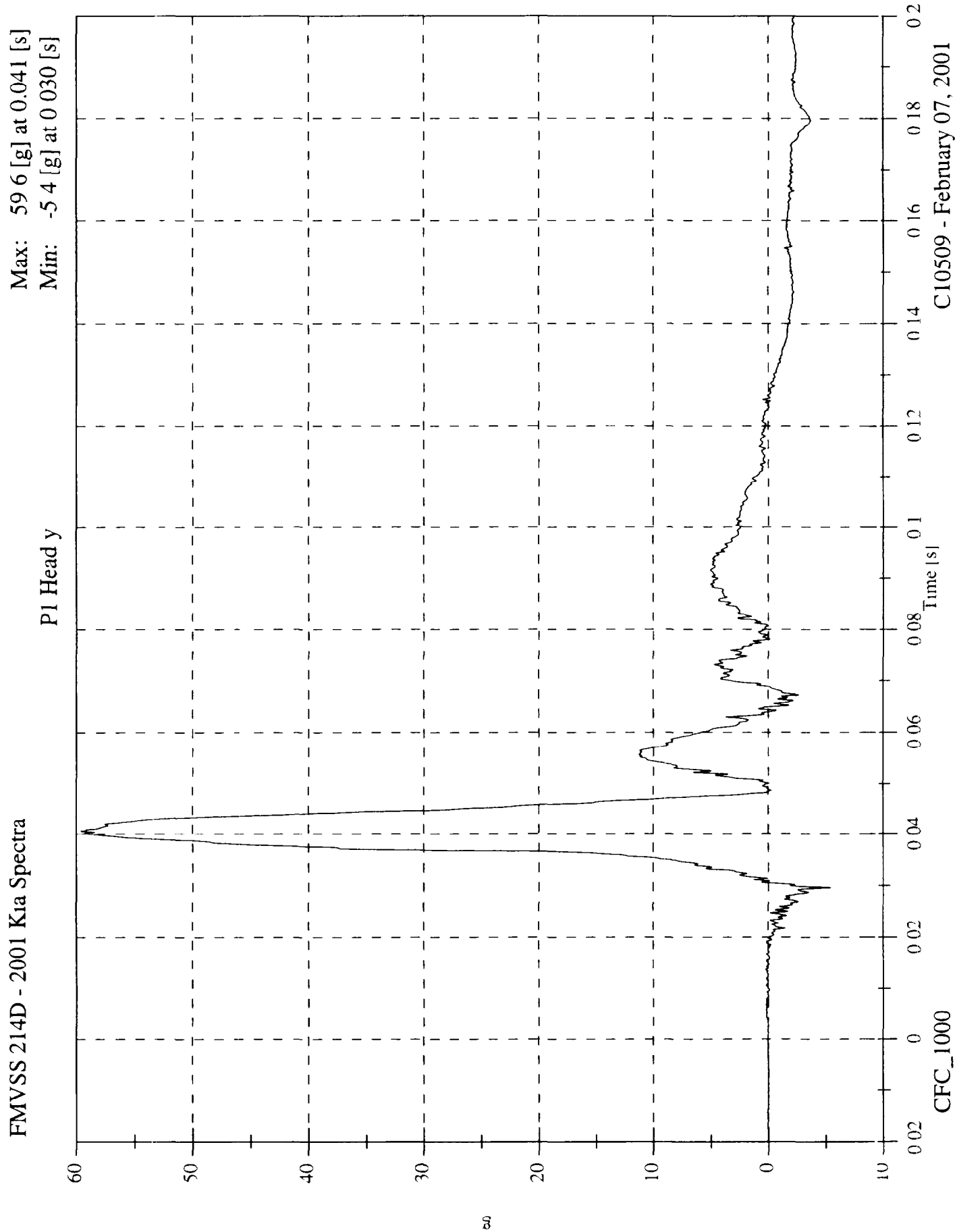
FMVSS 214D - 2001 Kia Spectra

Max: 3.2 [kph] at 0.047 [s]
Min: -21.9 [kph] at 0.158 [s]

PI Head x Velocity



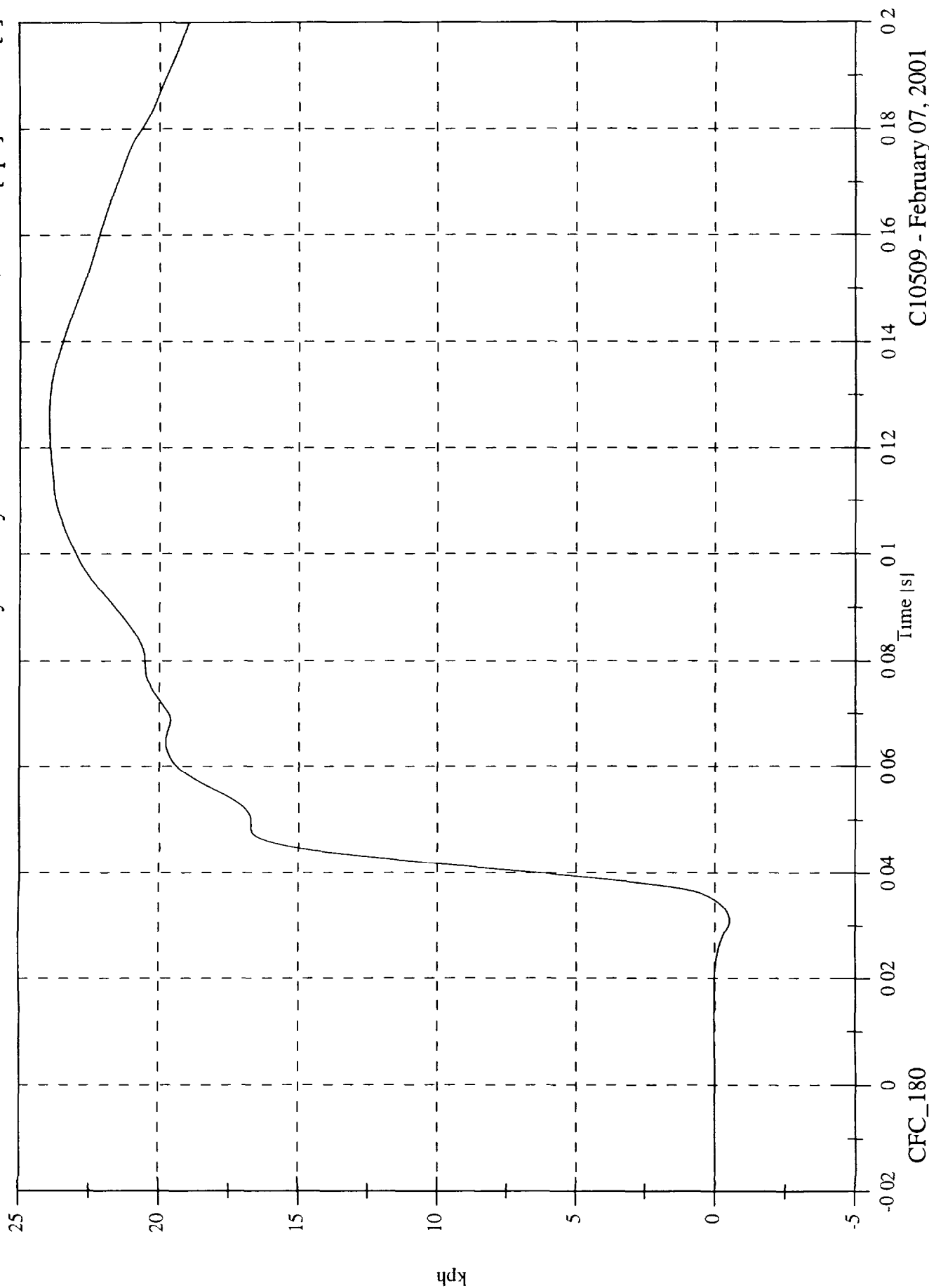
C10509 - February 07, 2001



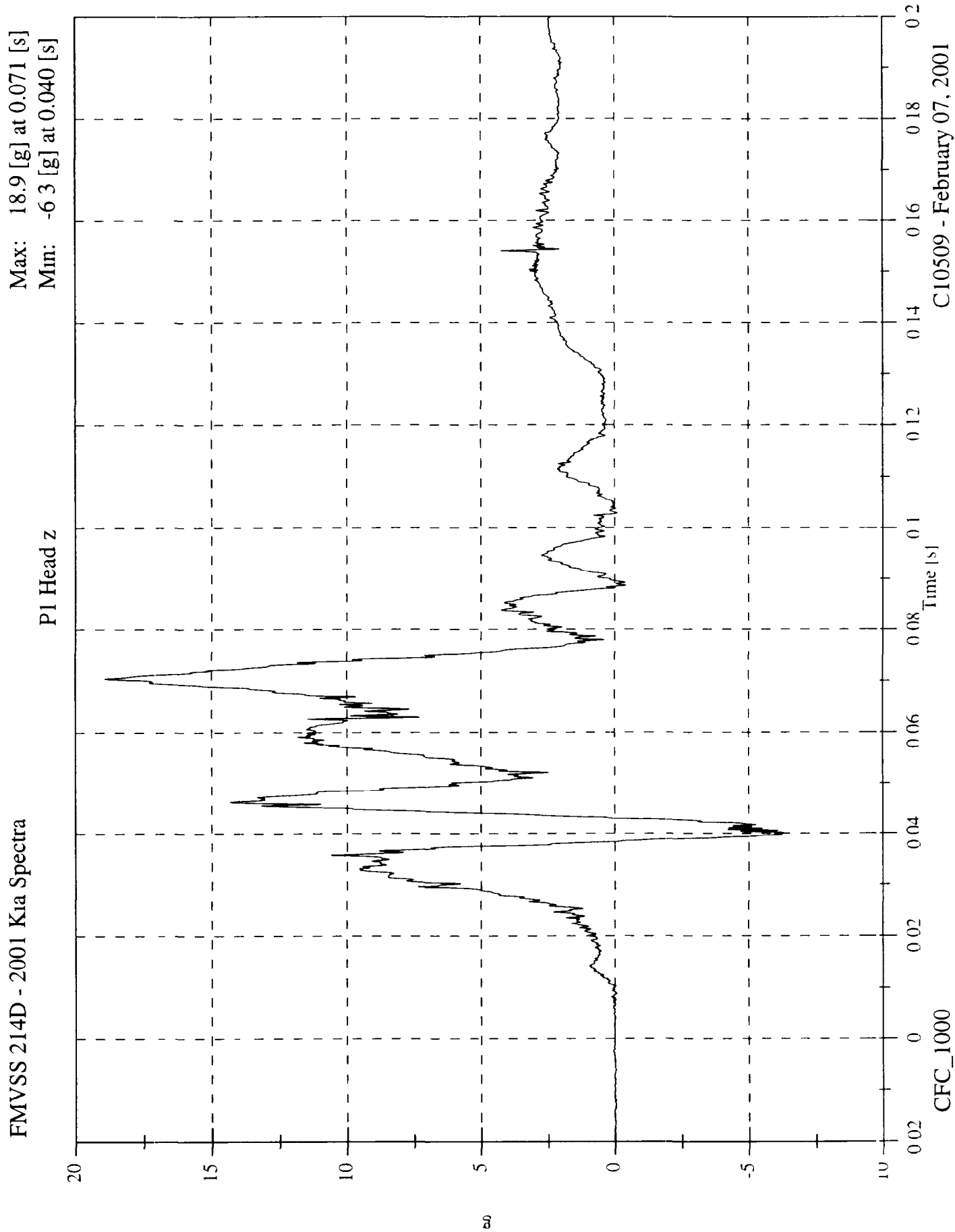
FMVSS 214D - 2001 Kia Spectra

P1 Head y Velocity

Max: 24.0 [kph] at 0.126 [s]
Min: -0.5 [kph] at 0.031 [s]



C10509 - February 07, 2001

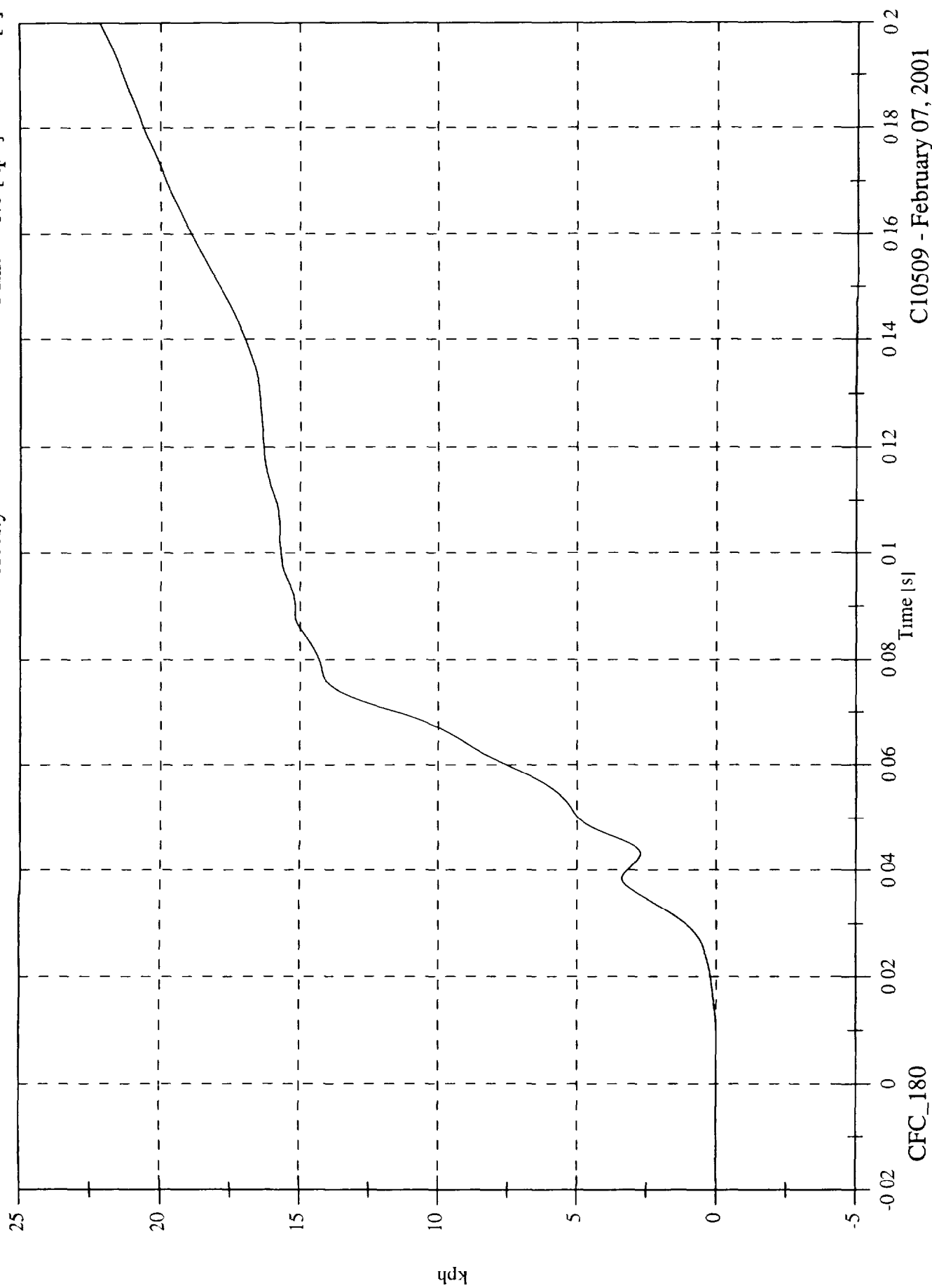


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

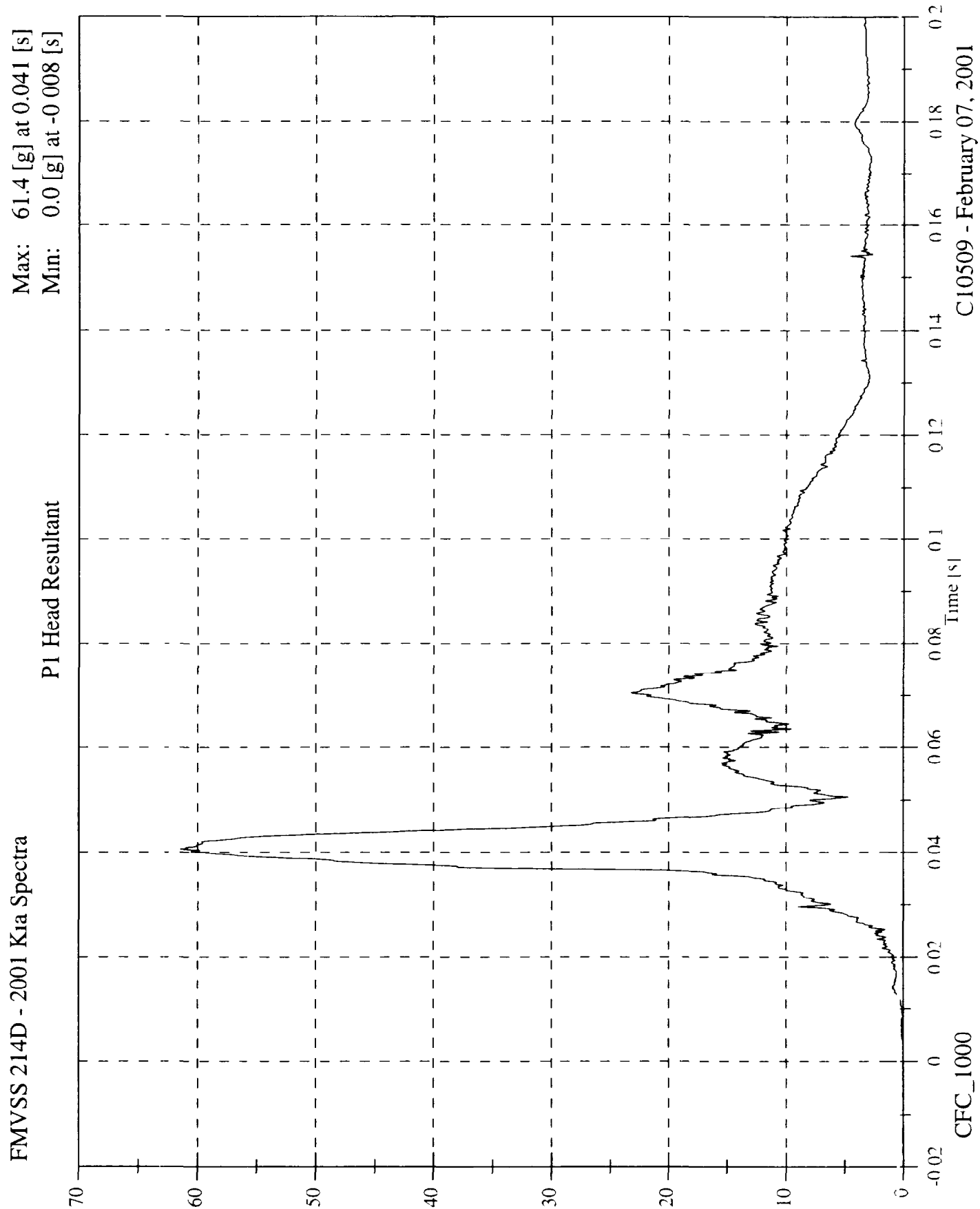
Max: 22.1 [kph] at 0.200 [s]
Min: -0.0 [kph] at -0.004 [s]

P1 Head z Velocity



CFC_180

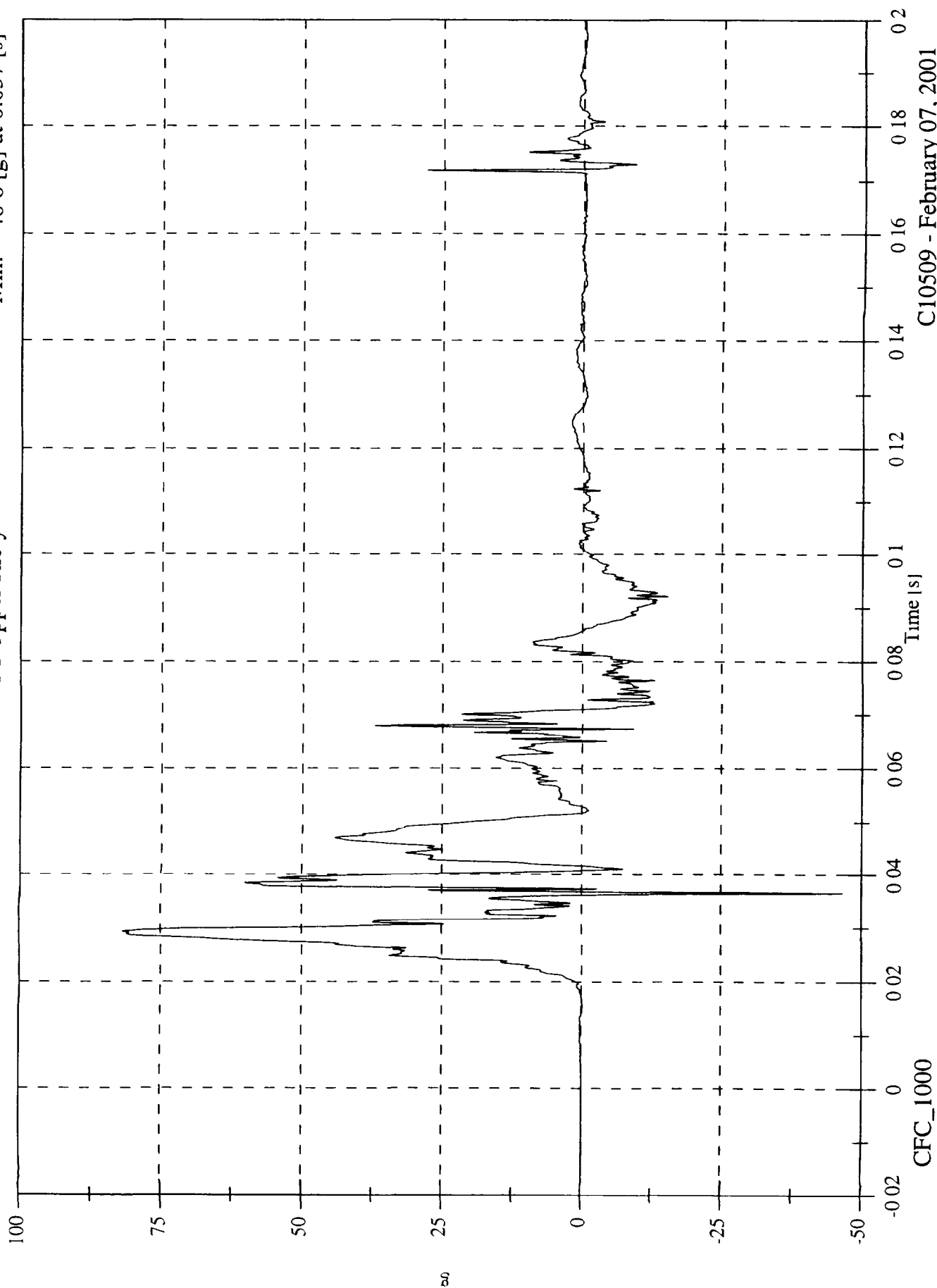
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

P1 Upper Rib y

Max: 81.7 [g] at 0.029 [s]
Min: -46.6 [g] at 0.037 [s]

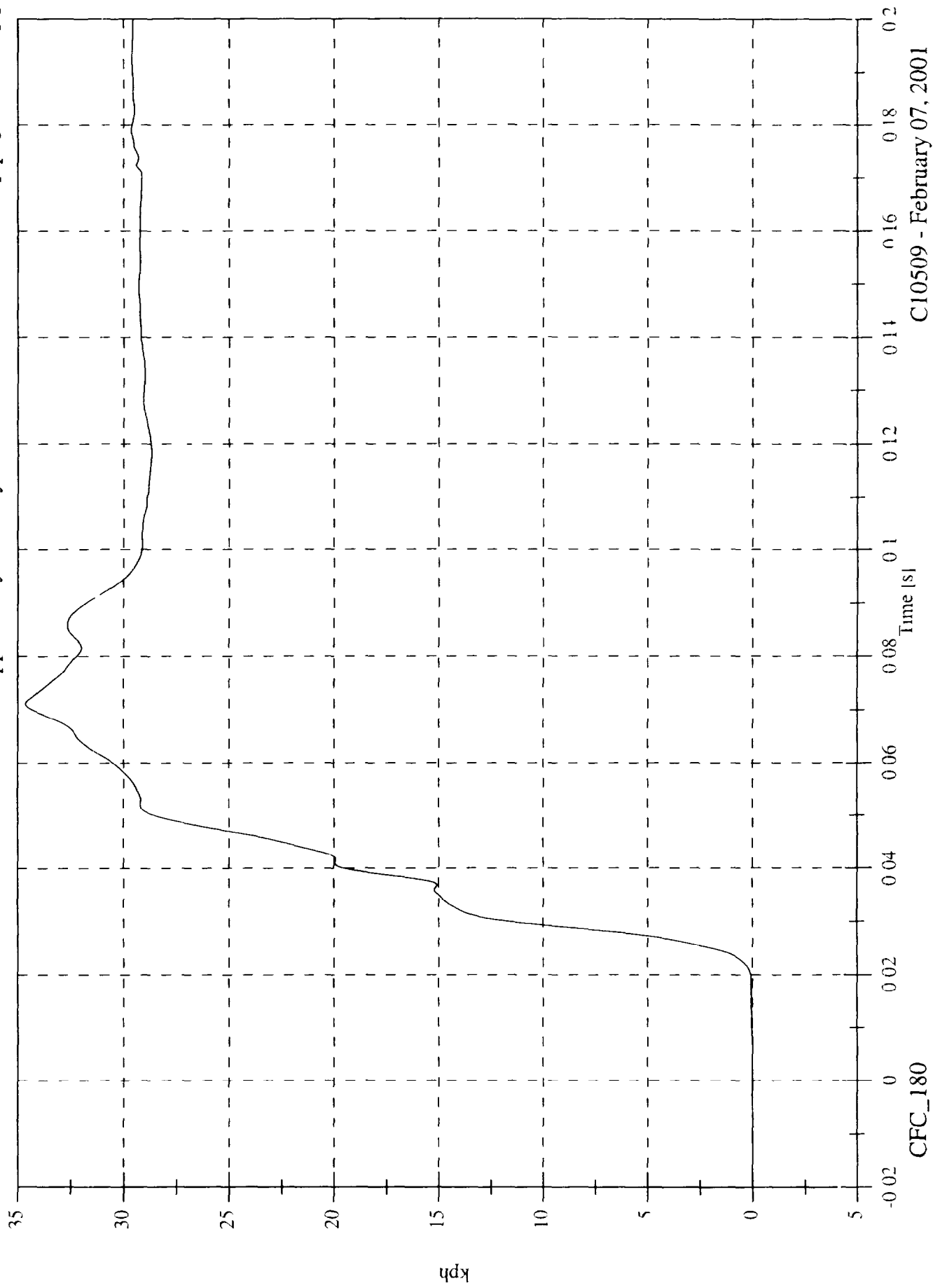


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max: 34.6 [kph] at 0.071 [s]
Min: -0.0 [kph] at -0.014 [s]

P1 Upper Rib y Velocity



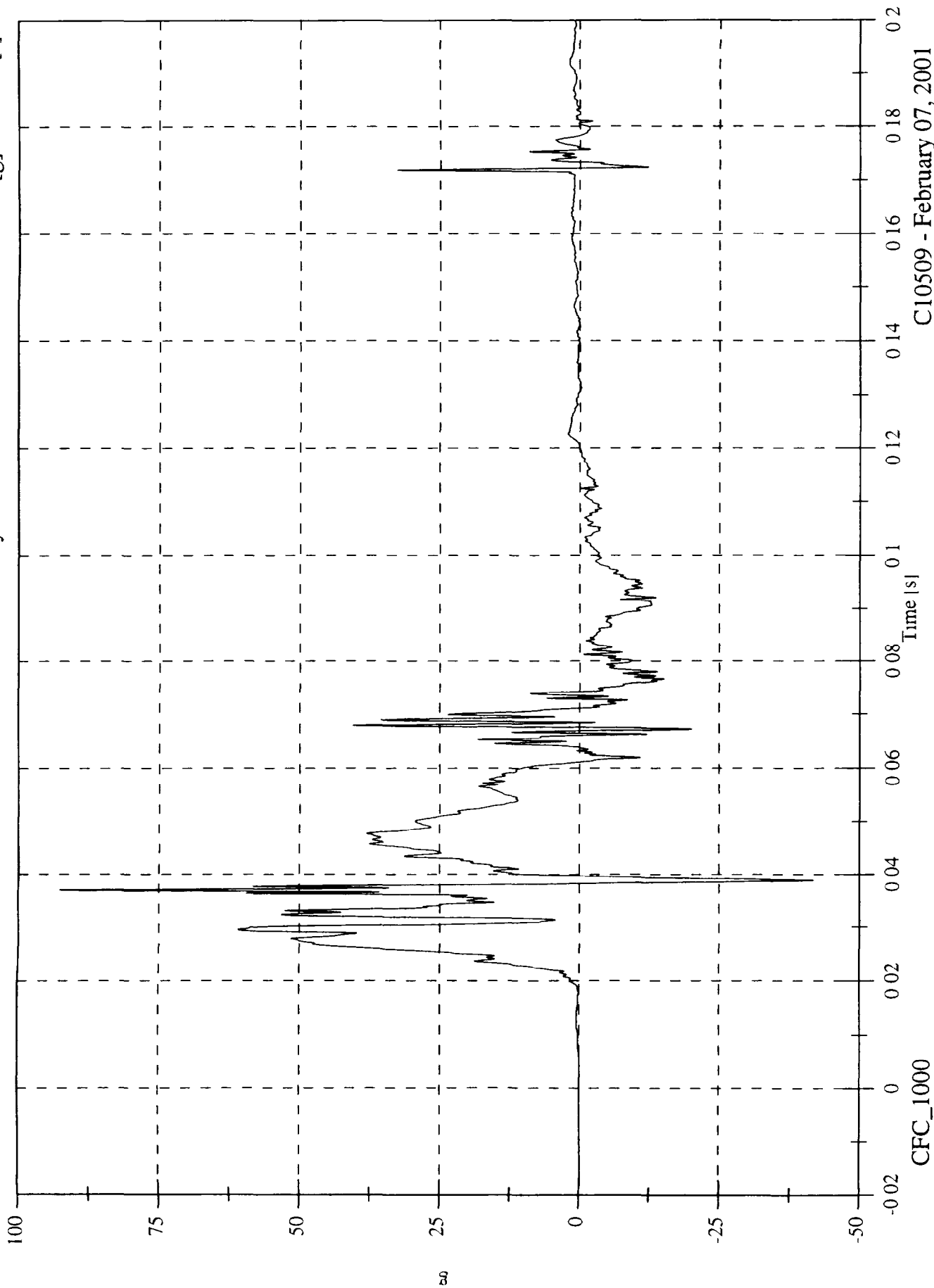
CFC_180

C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

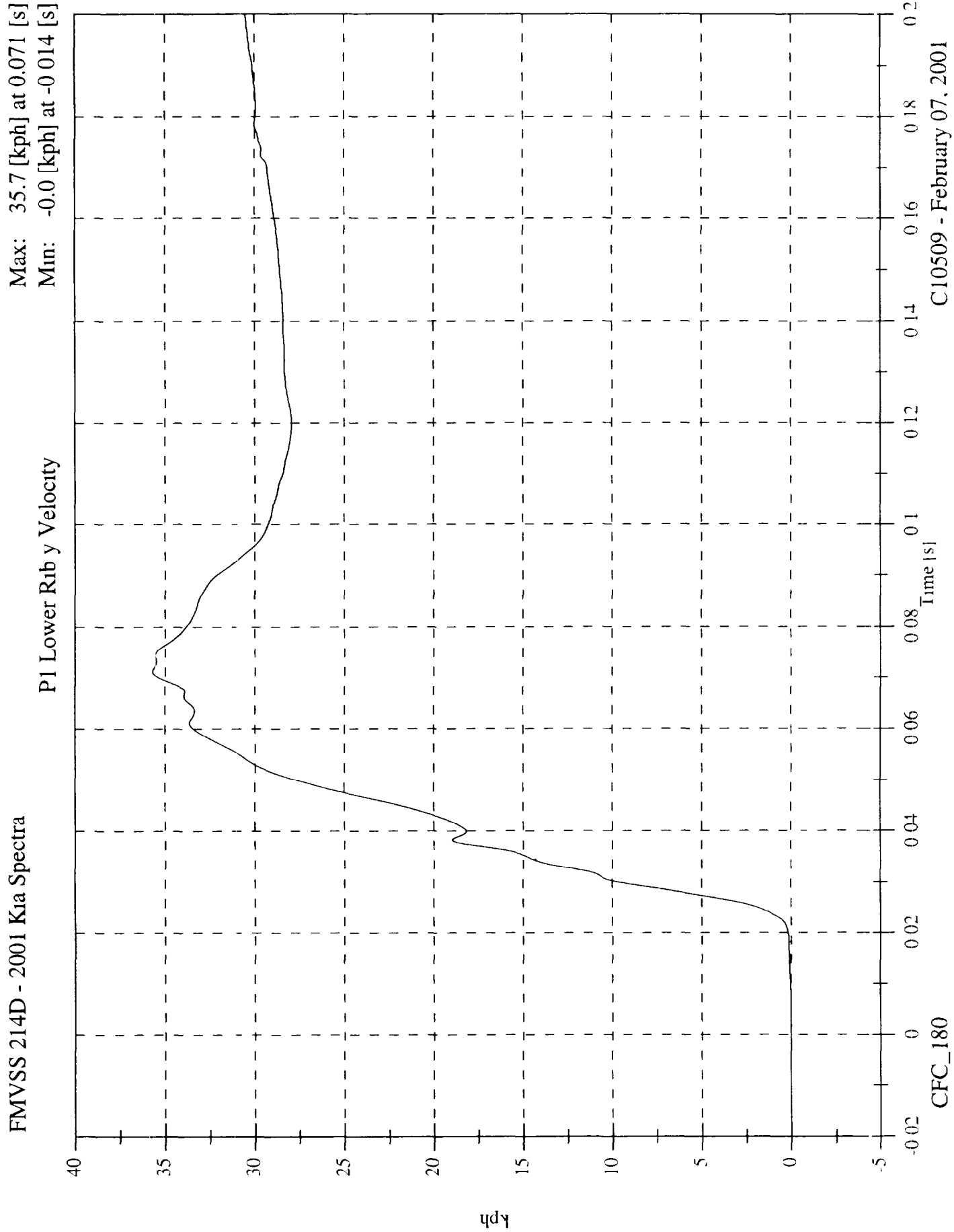
Max: 92.5 [g] at 0.037 [s]
Min: -41.8 [g] at 0.039 [s]

P1 Lower Rib y



CFC_1000

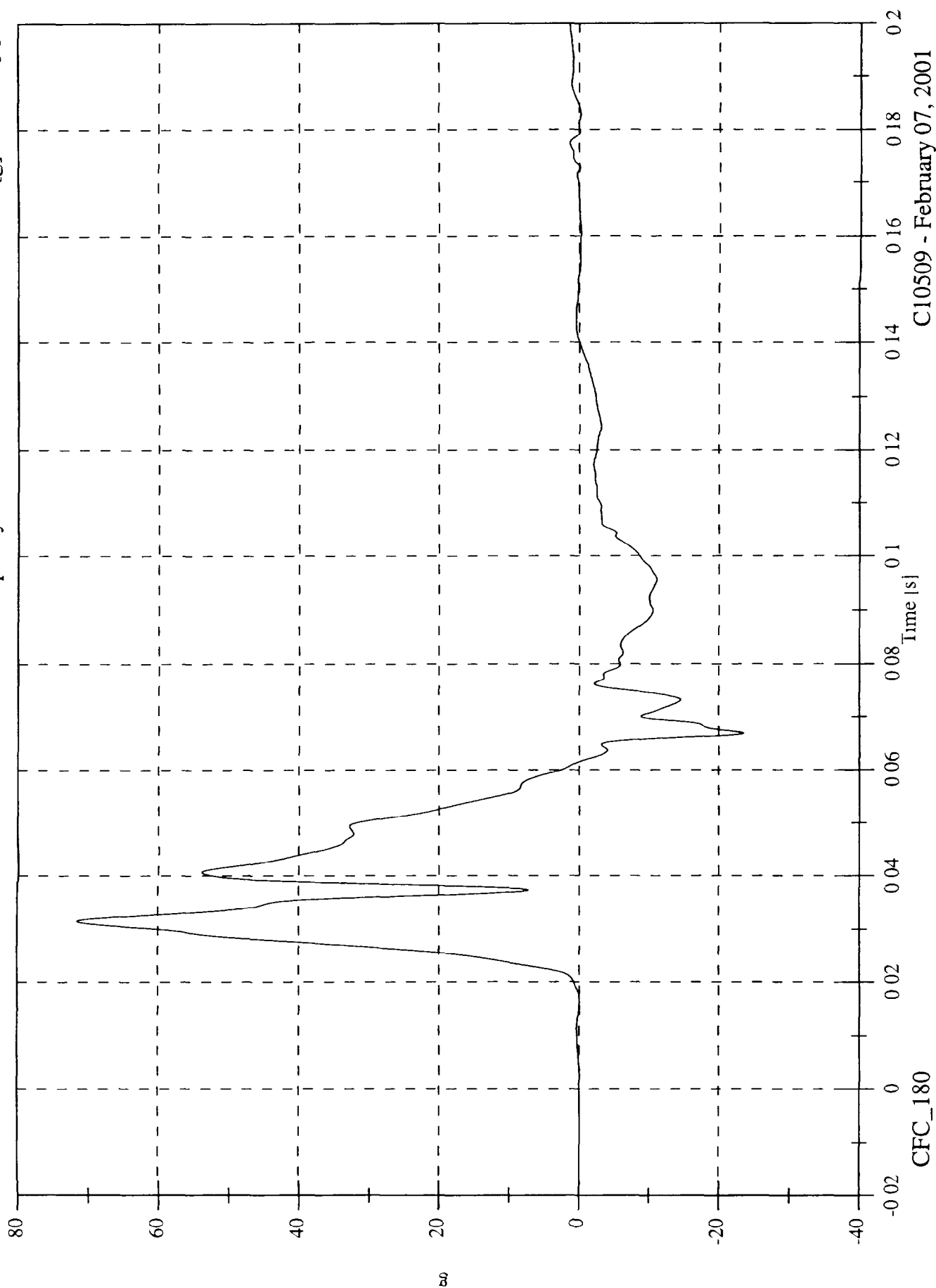
C10509 - February 07, 2001



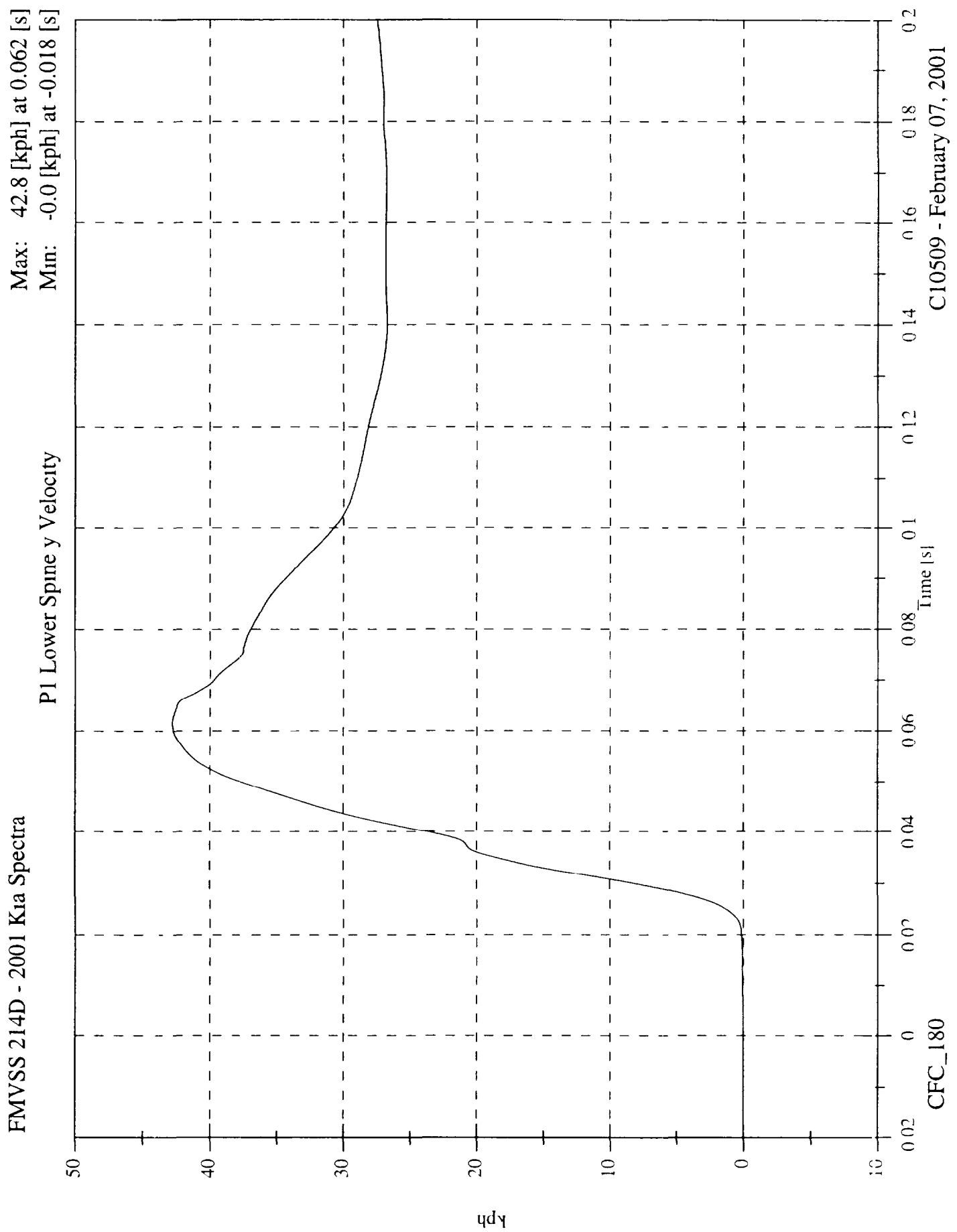
FMVSS 214D - 2001 Kia Spectra

P1 Lower Spine y

Max: 71.5 [g] at 0.032 [s]
Min: -23.6 [g] at 0.067 [s]



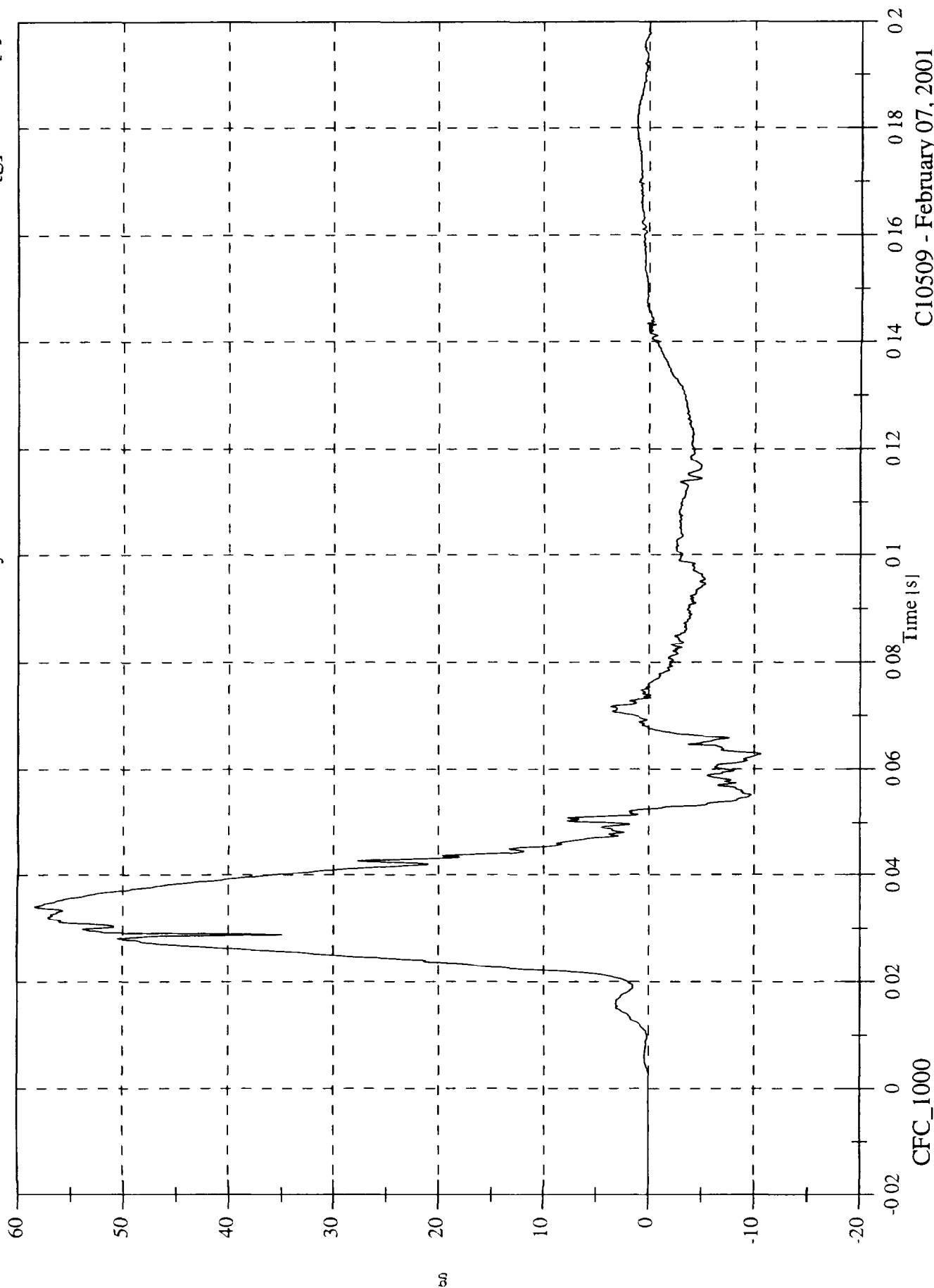
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

Max: 58.3 [g] at 0.034 [s]
Min: -10.7 [g] at 0.063 [s]

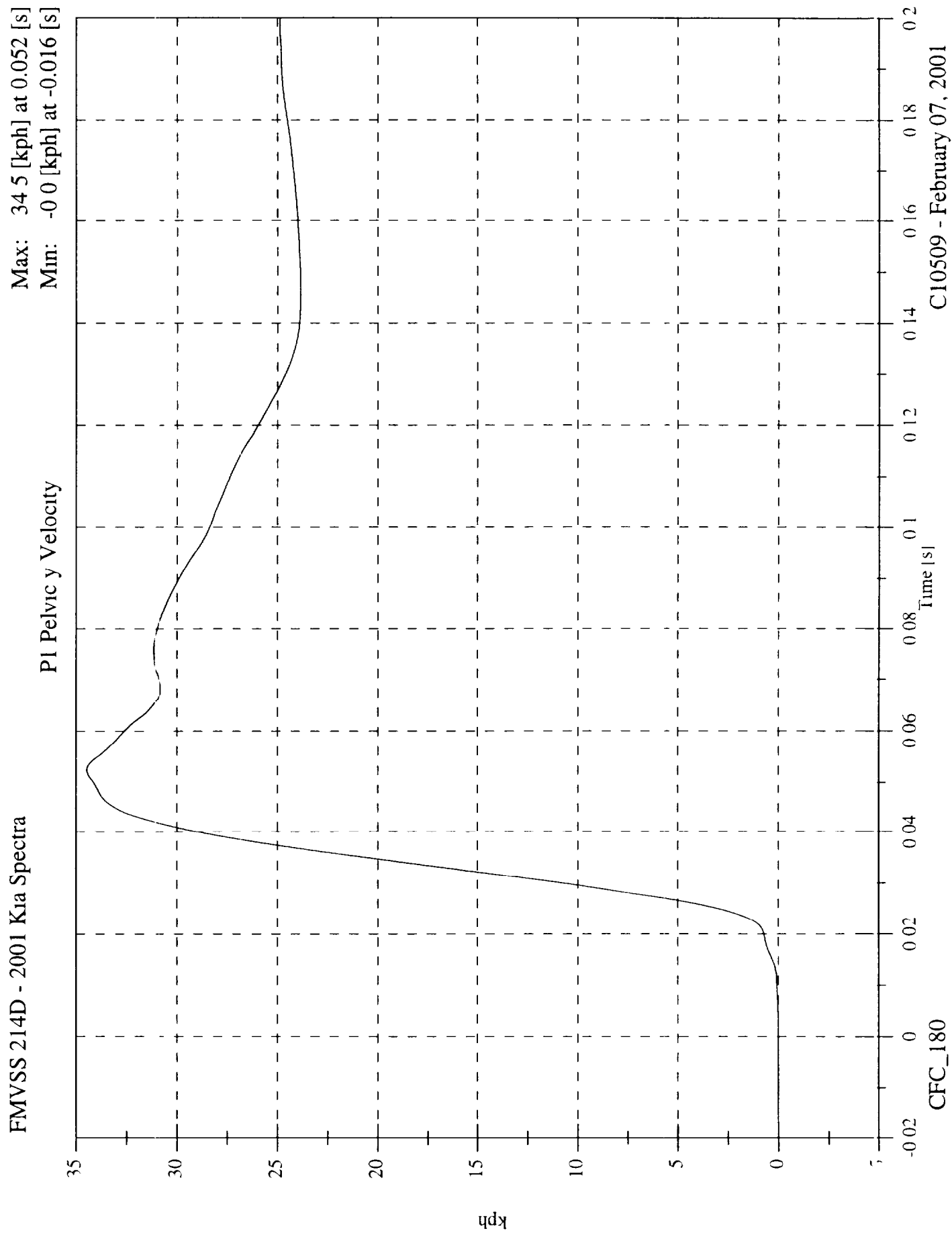
P1 Pelvic y



CFC_1000

Time [s]

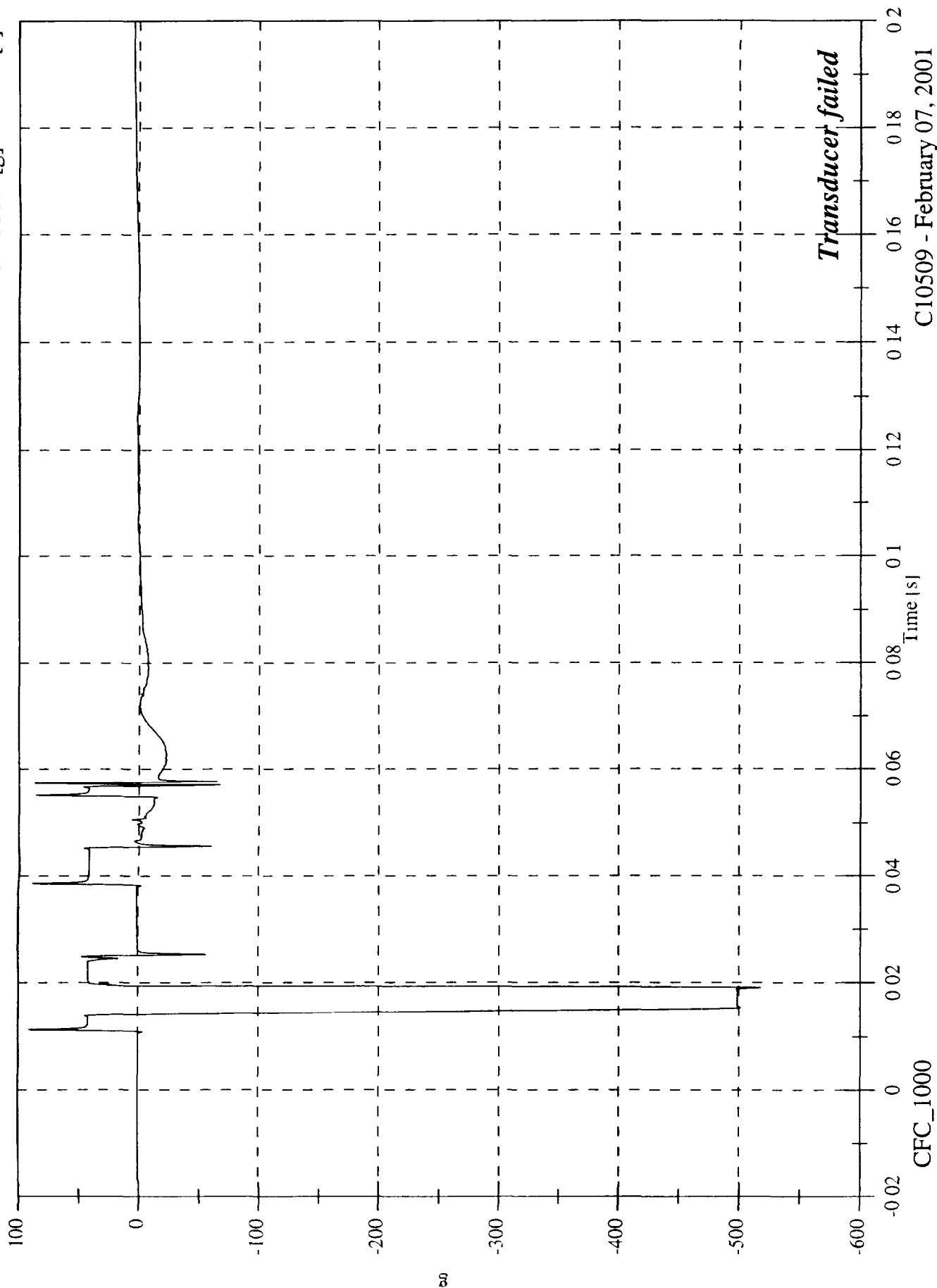
CI0509 - February 07, 2001



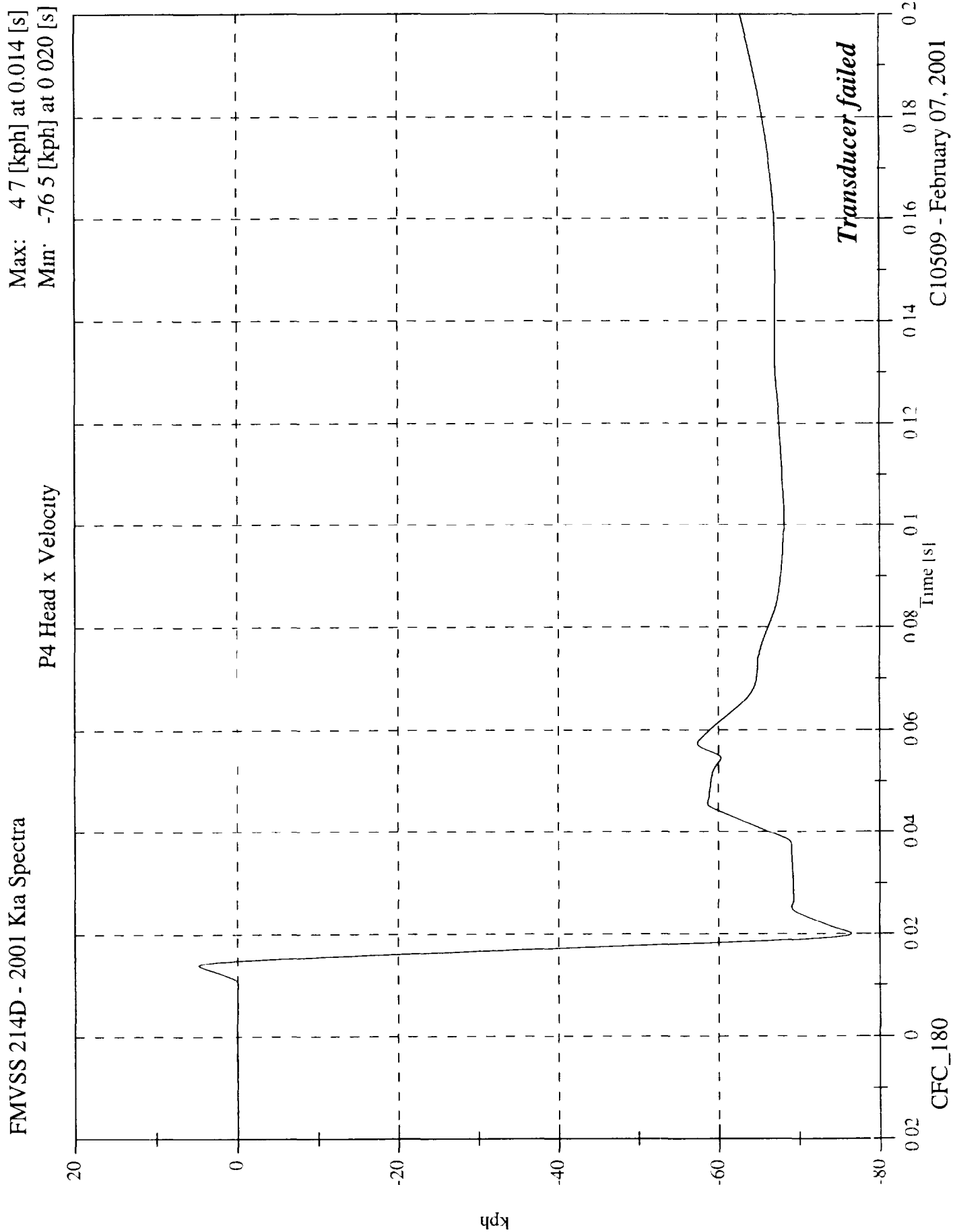
FMVSS 214D - 2001 Kia Spectra

Max: 90.7 [g] at 0.011 [s]
Min: -518.1 [g] at 0.019 [s]

P4 Head x



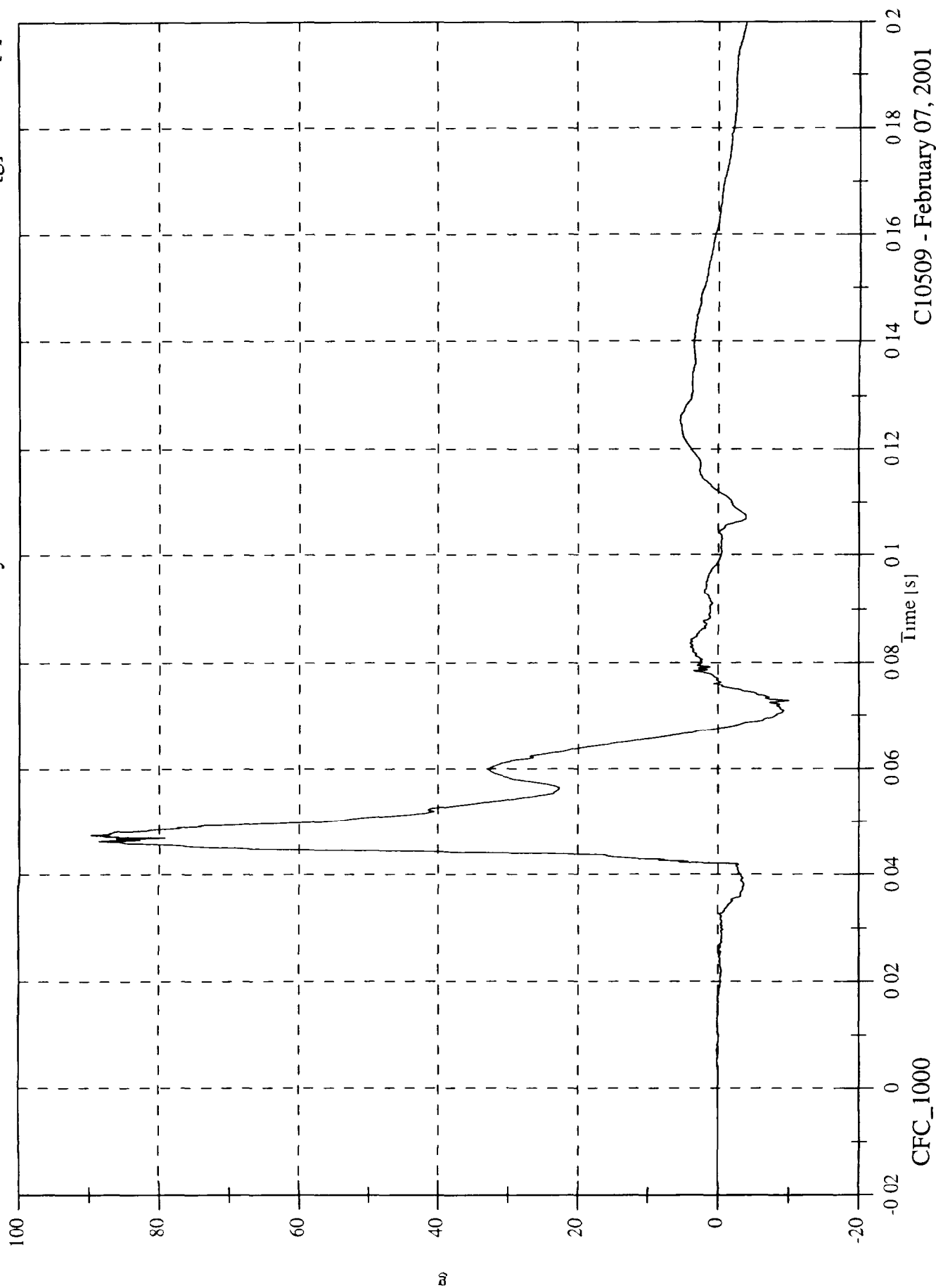
C10509 - February 07, 2001



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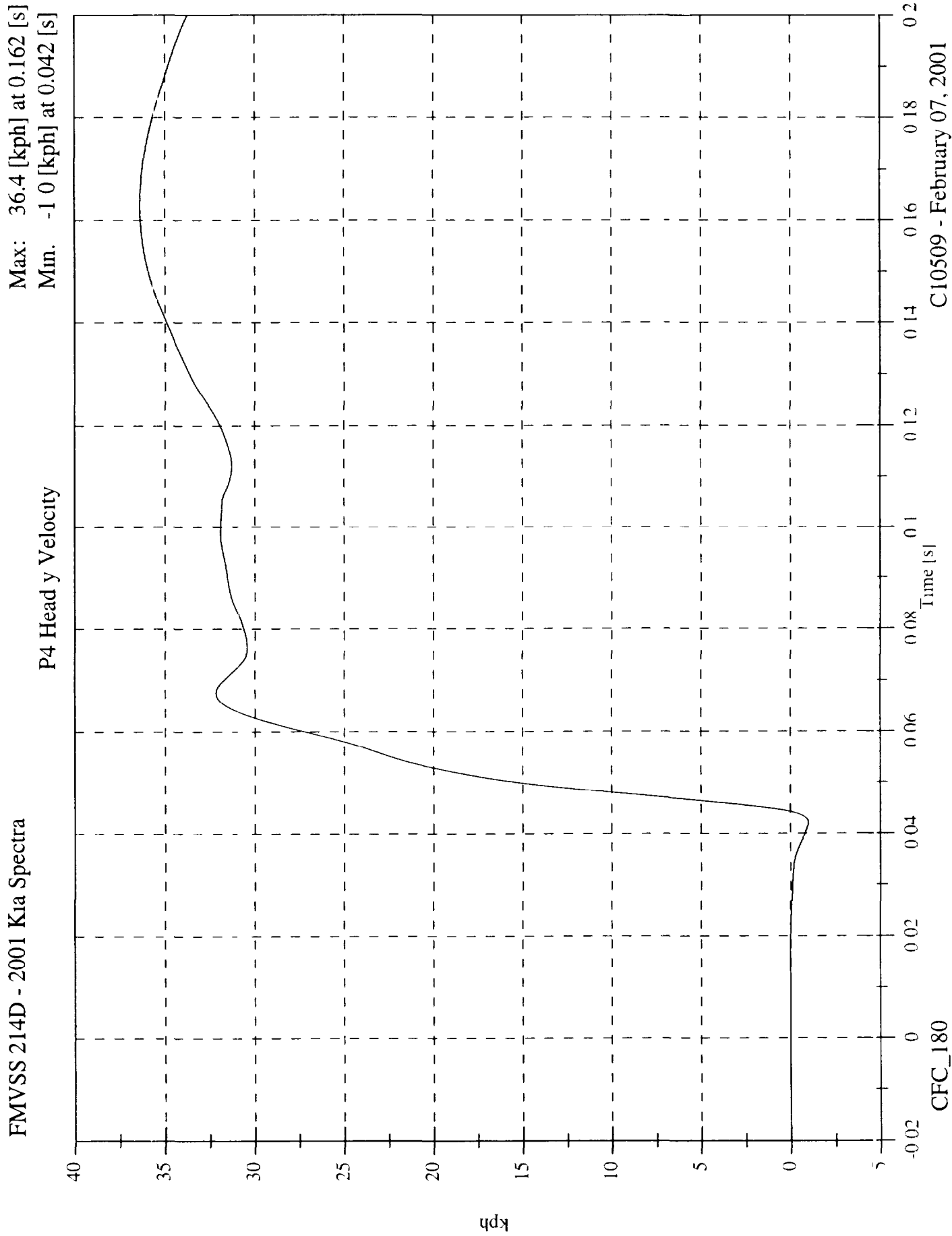
Max: 89.8 [g] at 0.047 [s]
Min: -10.1 [g] at 0.073 [s]

P4 Head y



CFC_1000

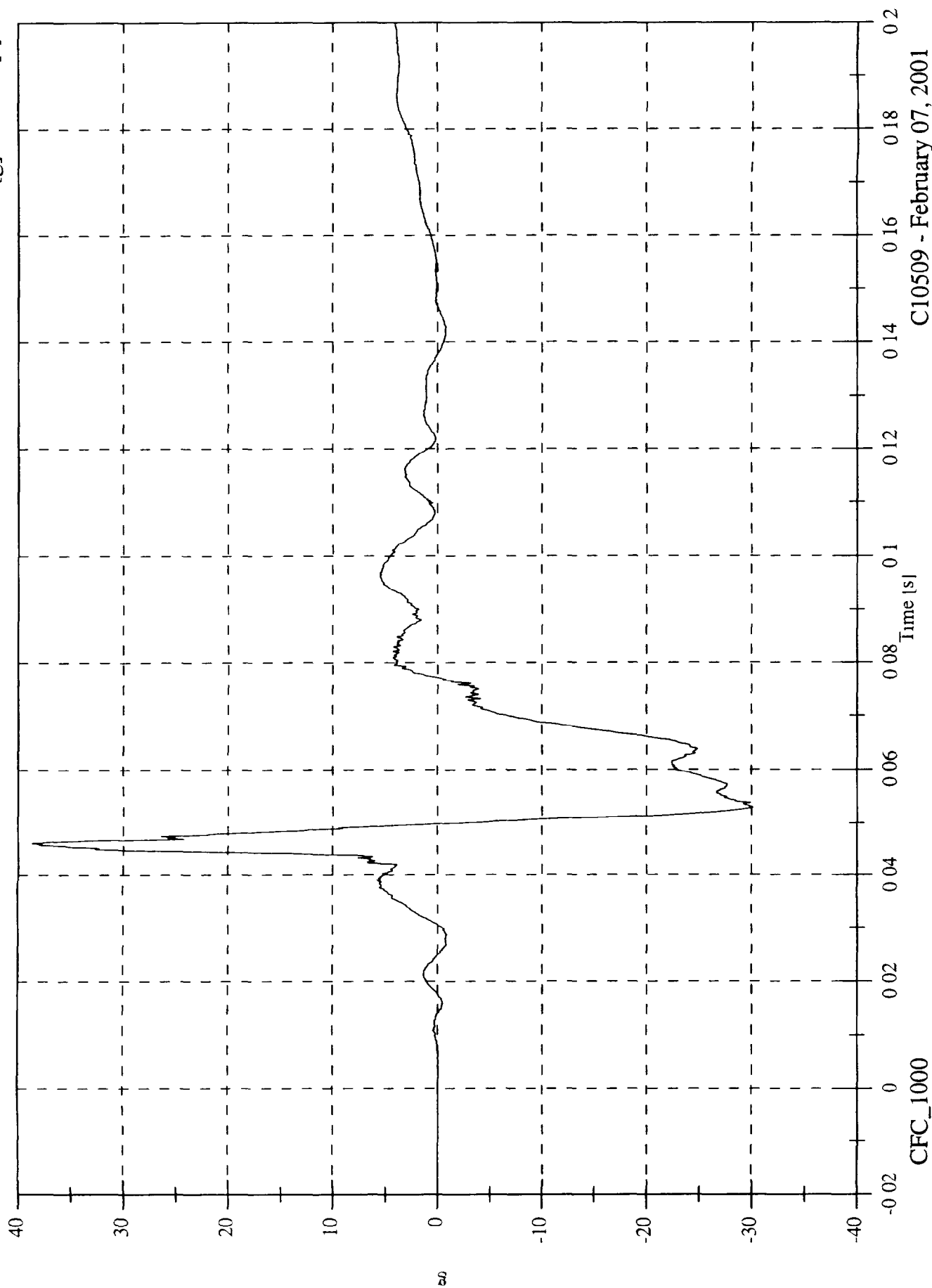
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

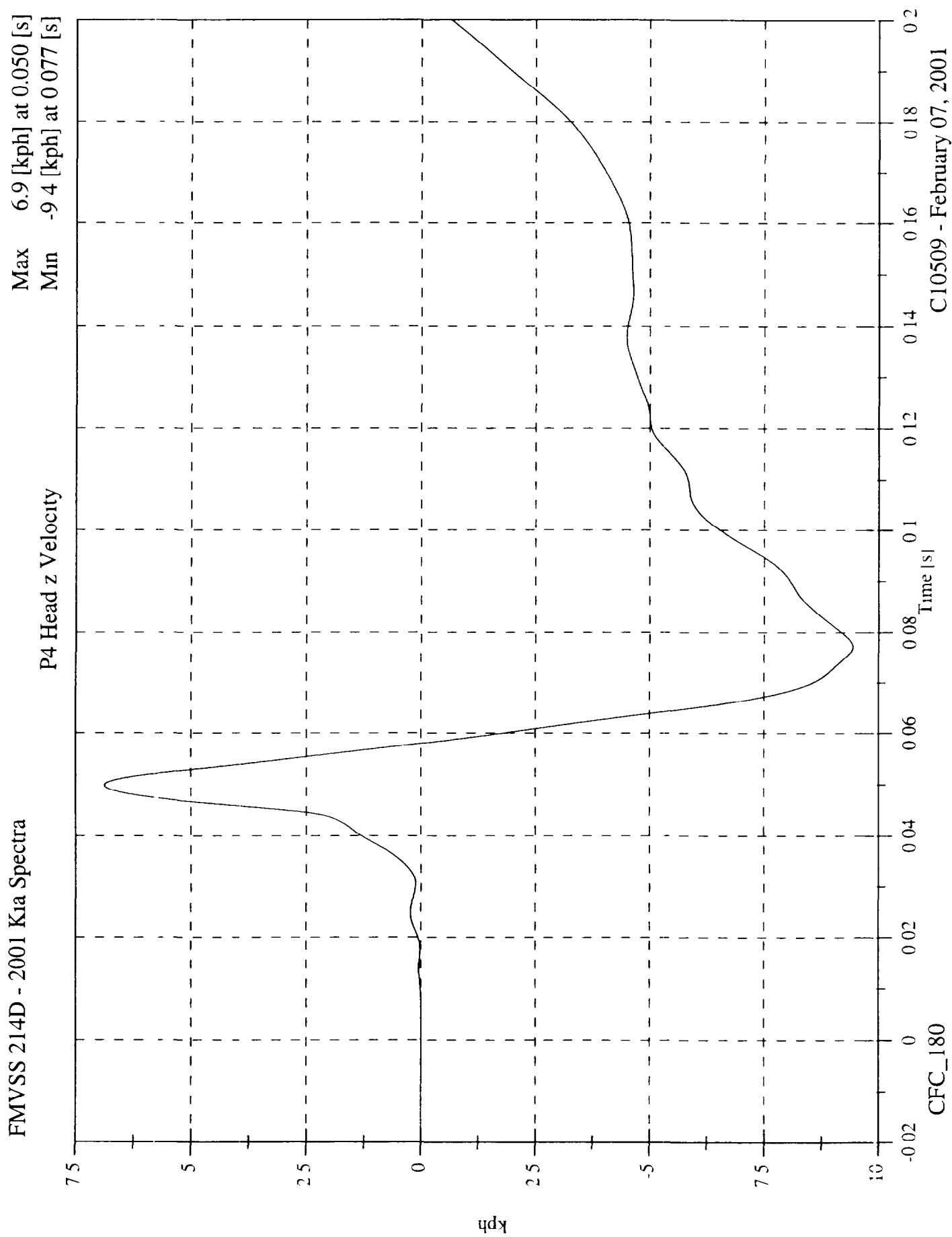
Max: 38.7 [g] at 0.046 [s]
Min: -30.1 [g] at 0.053 [s]

P4 Head z



CFC_1000

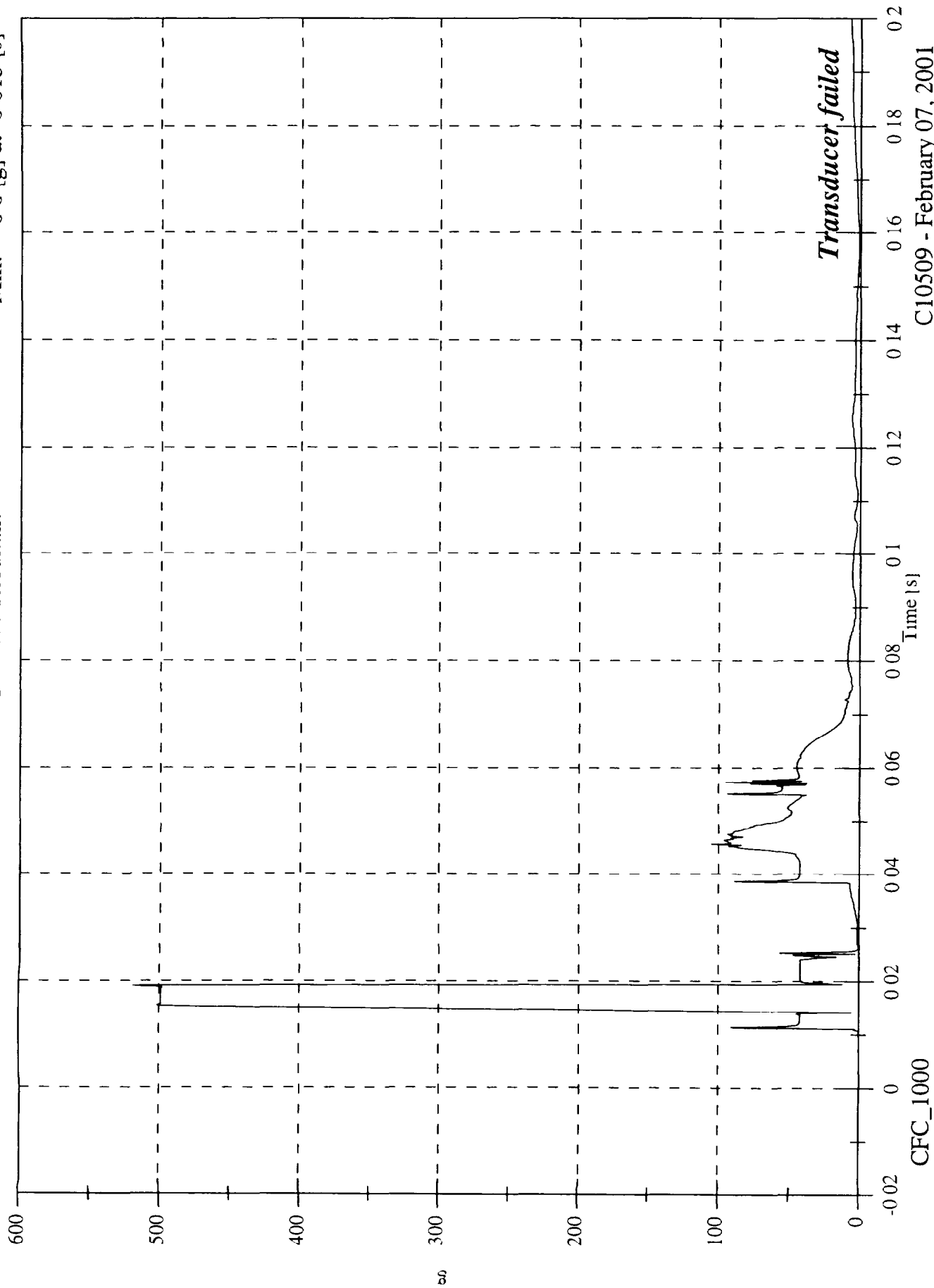
CI0509 - February 07, 2001



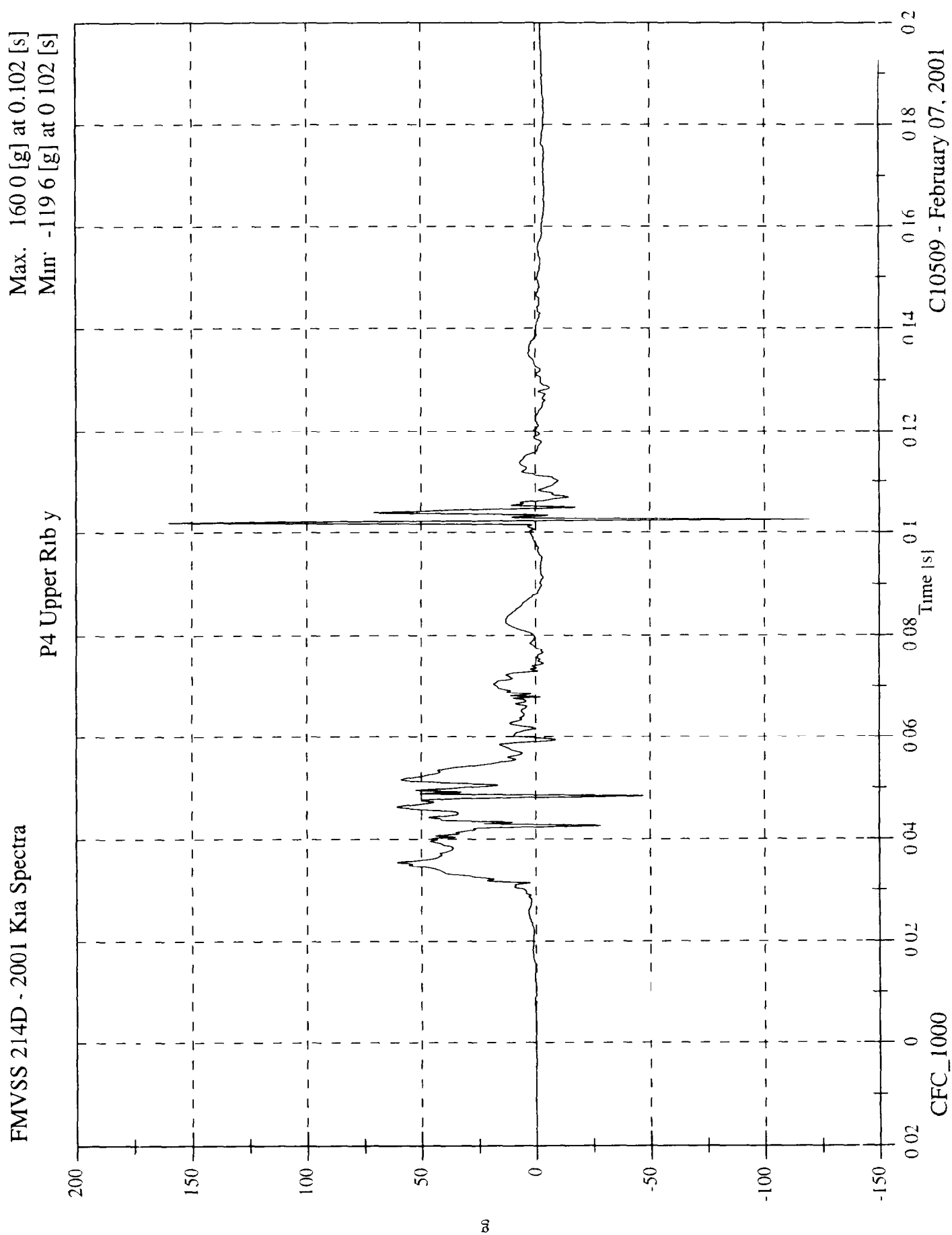
FMVSS 214D - 2001 Kia Spectra

P4 Head Resultant

Max: 518.1 [g] at 0.019 [s]
Min: 0.0 [g] at -0.015 [s]



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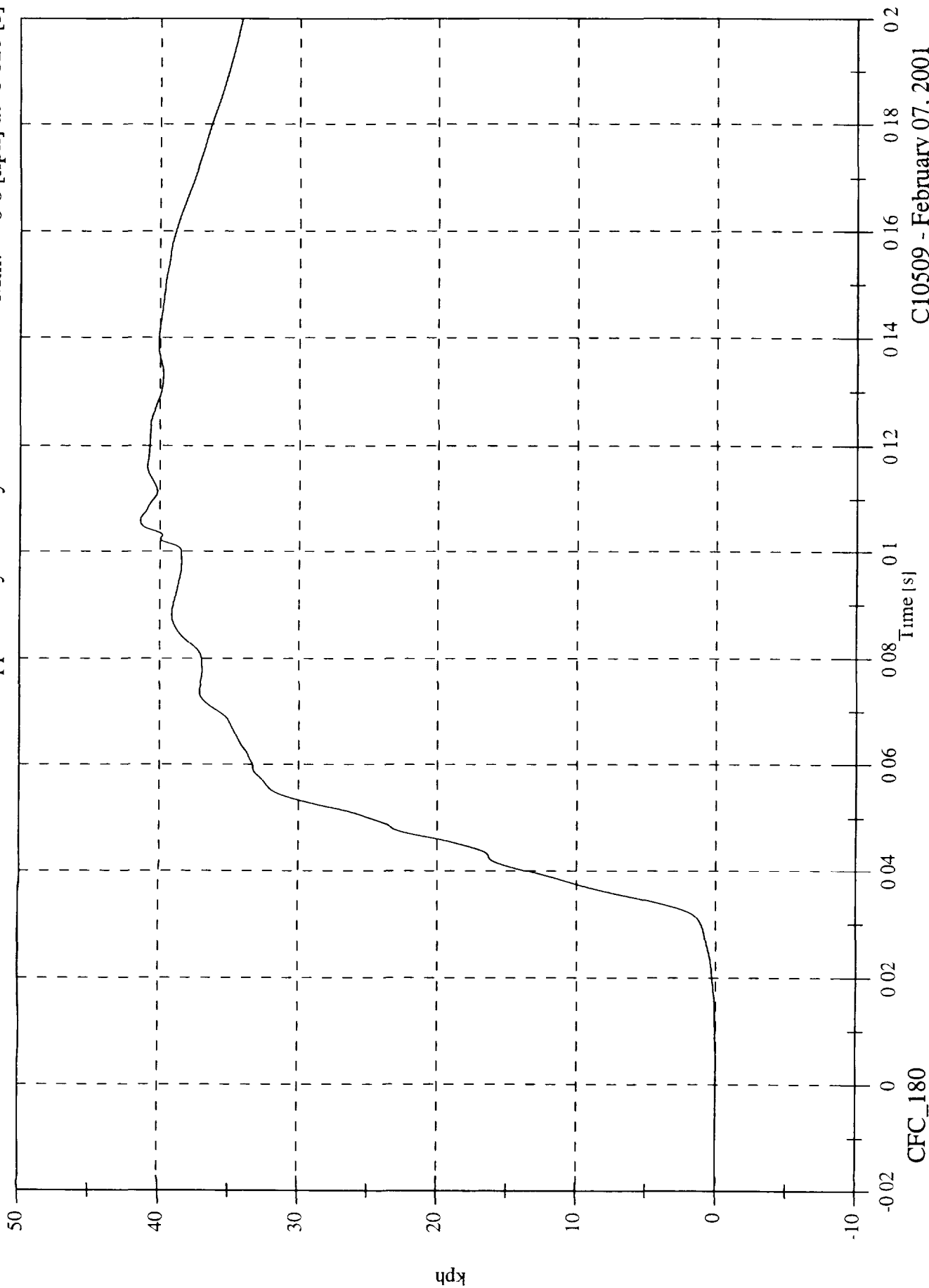


C10509 - February 07, 2001

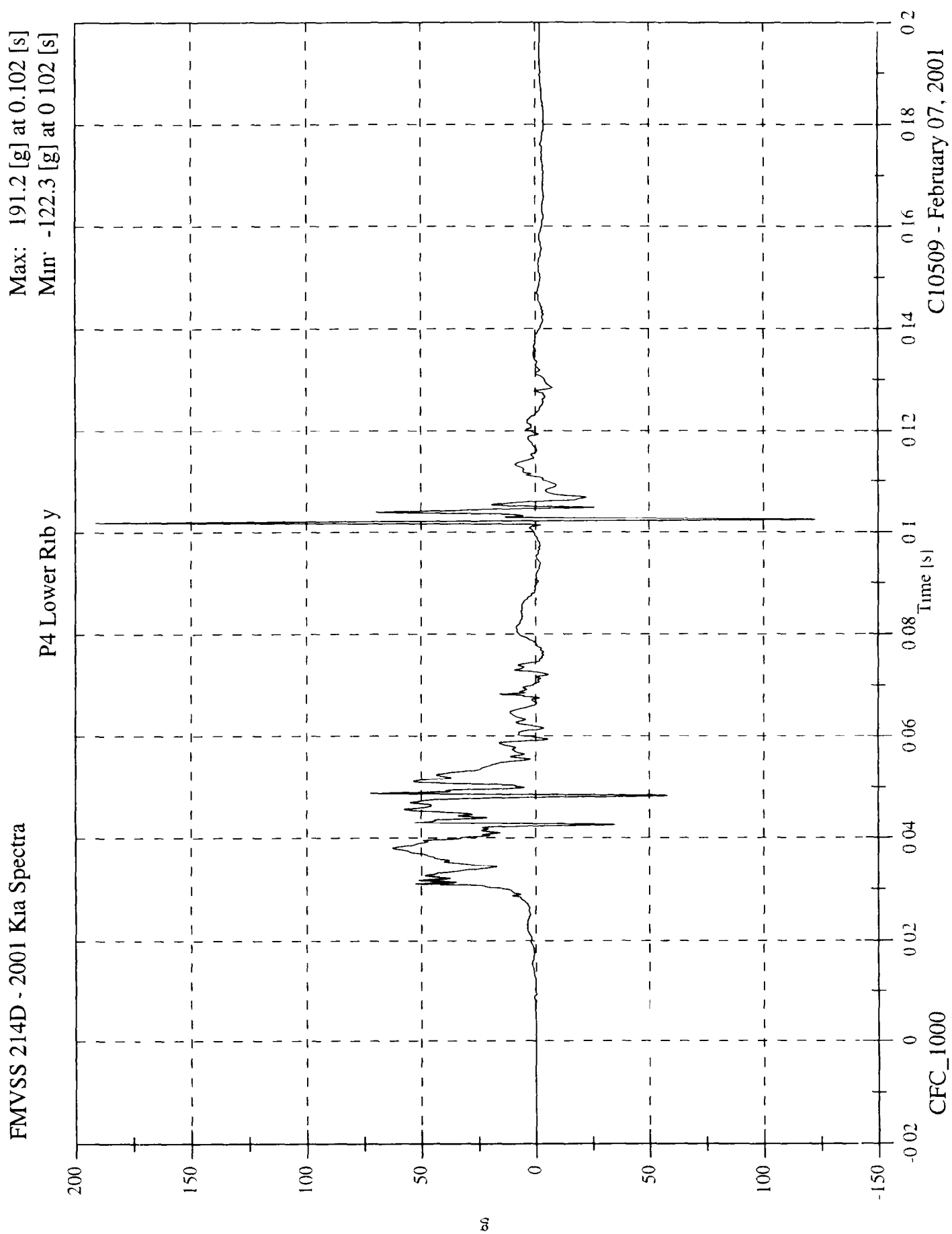
FMVSS 214D - 2001 Kia Spectra

P4 Upper Rib y Velocity

Max: 41.4 [kph] at 0.106 [s]
Min: -0.0 [kph] at -0.020 [s]



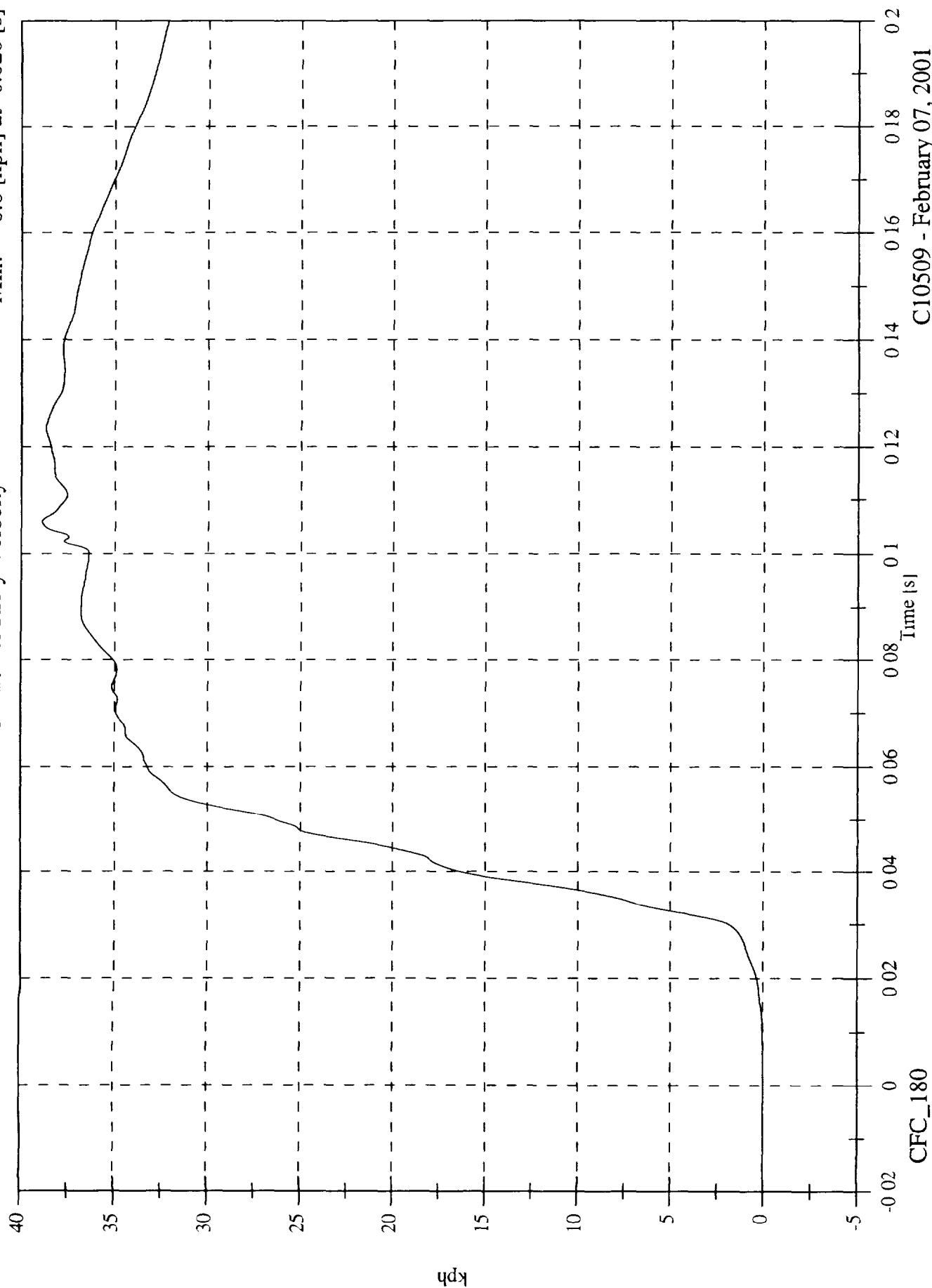
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

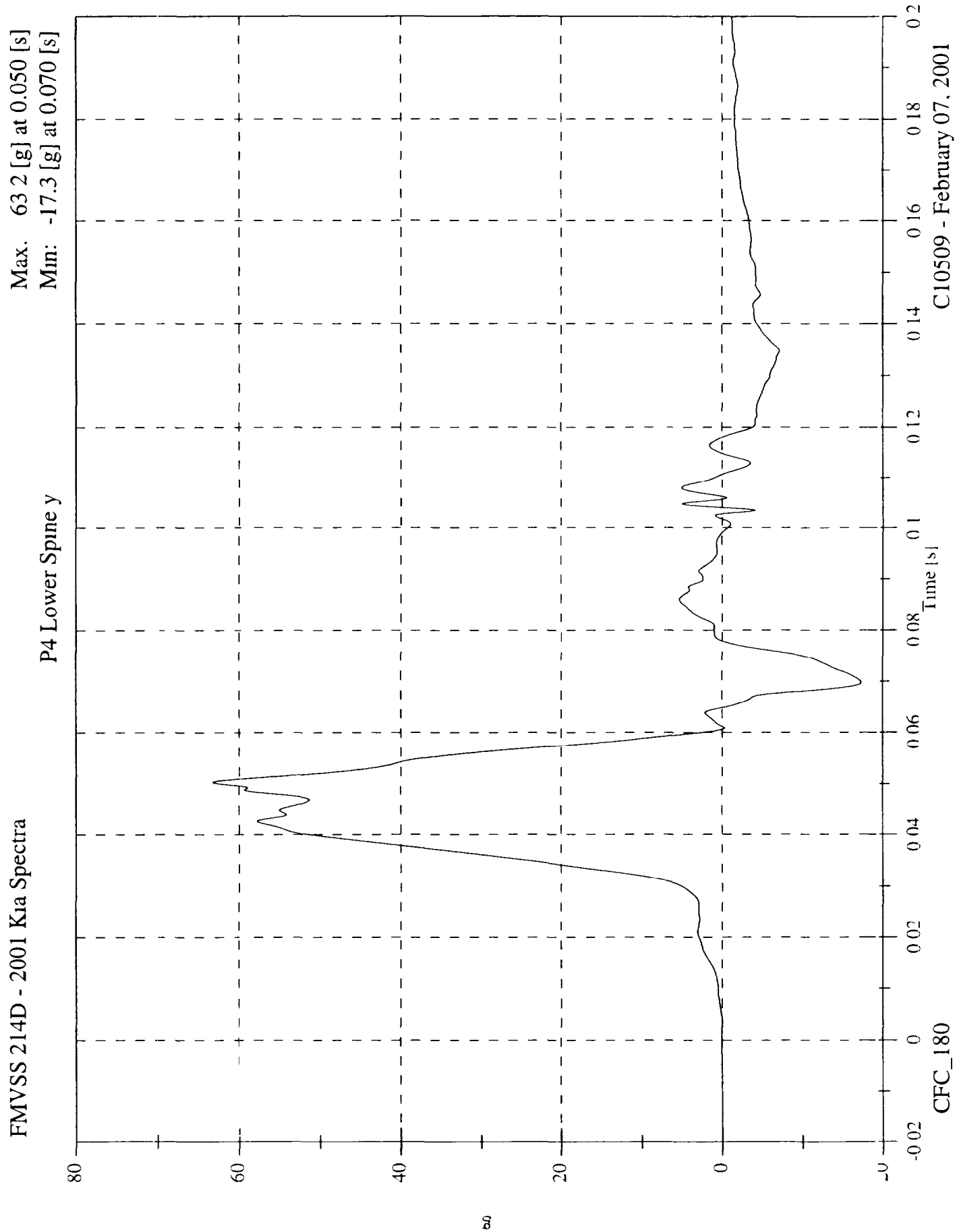
Max: 38.9 [kph] at 0.106 [s]
Min: -0.0 [kph] at -0.020 [s]

P4 Lower Rib y Velocity



CFC_180

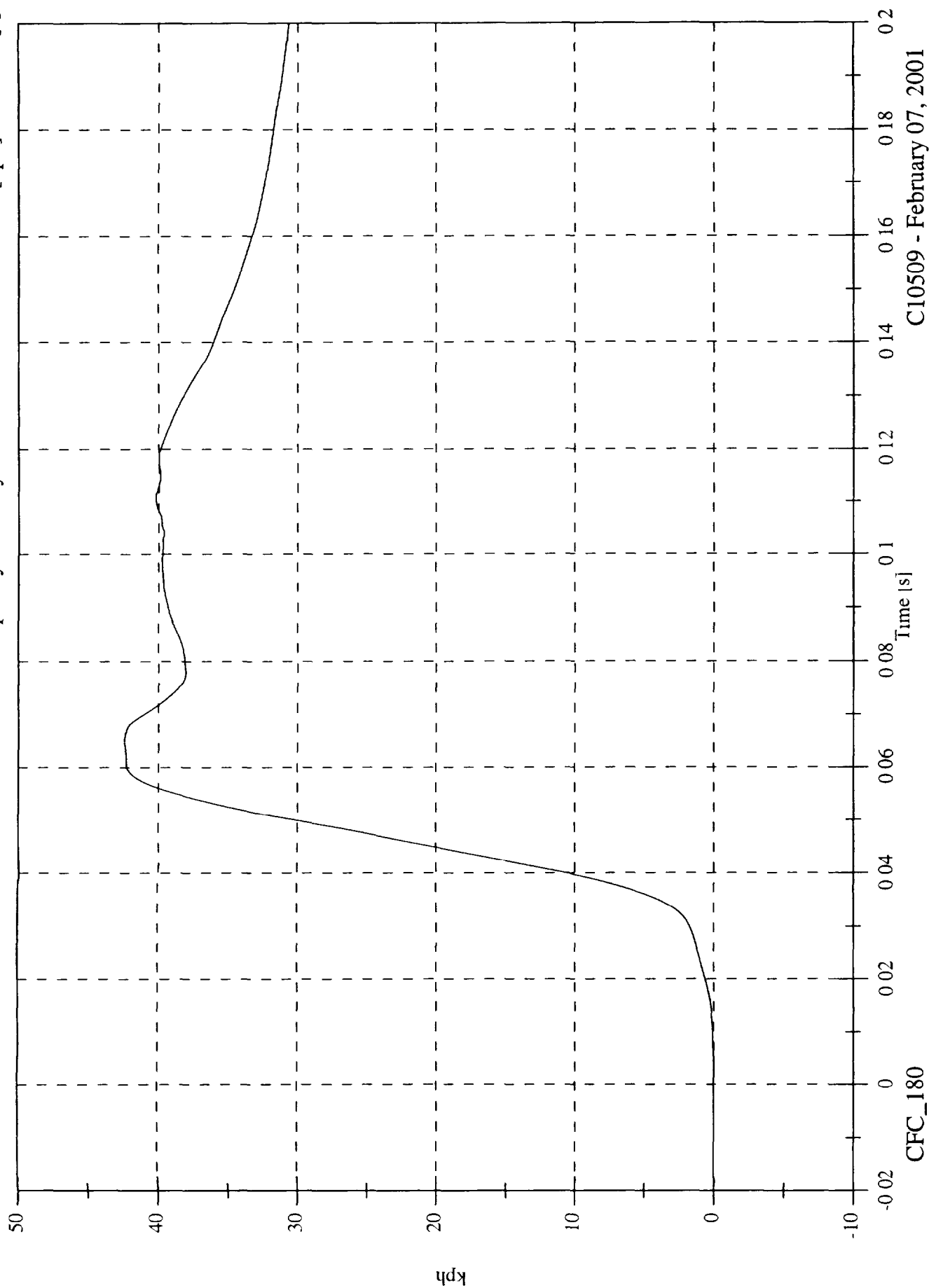
C10509 - February 07, 2001



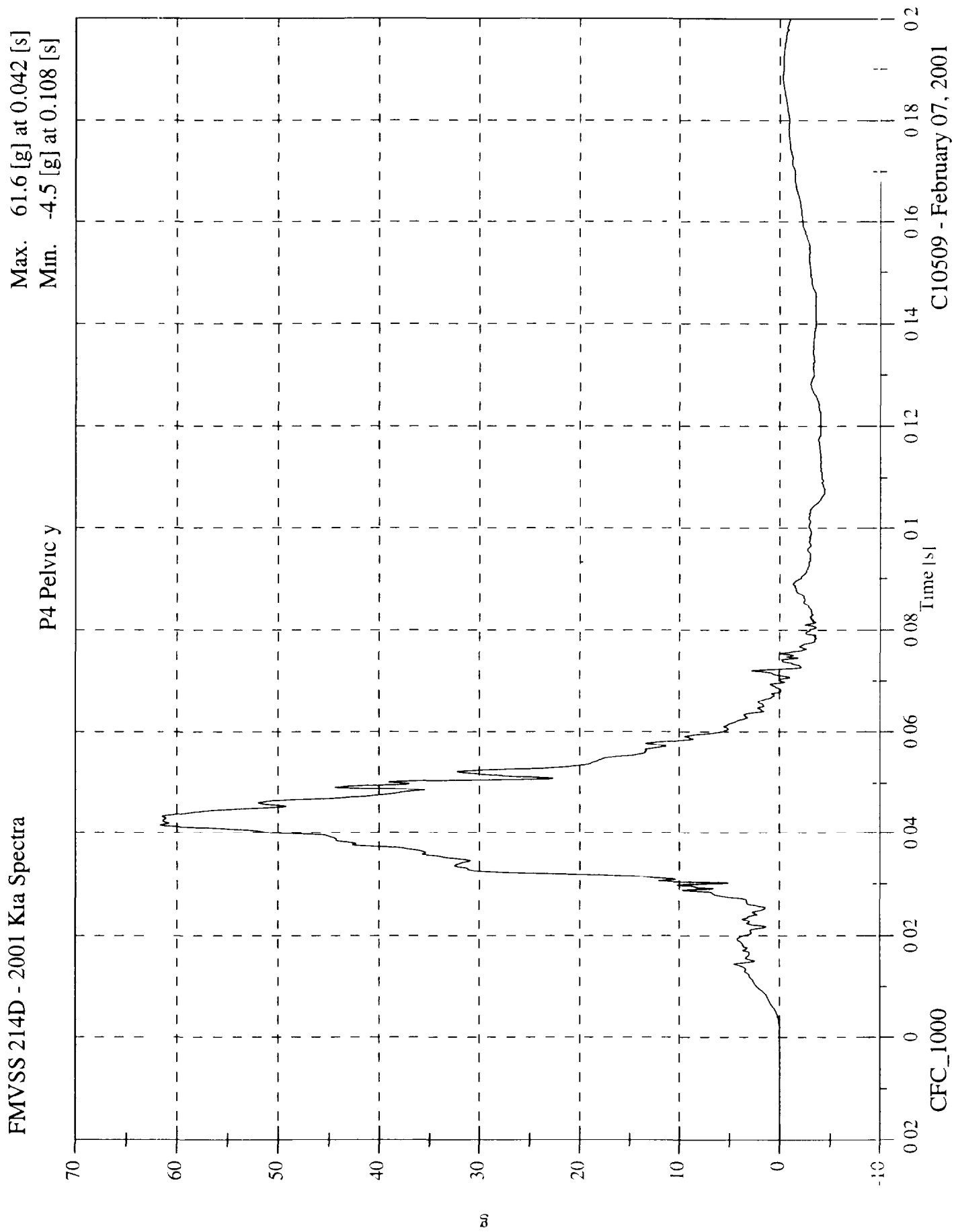
FMVSS 214D - 2001 Kia Spectra

P4 Lower Spine y Velocity

Max: 42.4 [kph] at 0.065 [s]
Min: -0.0 [kph] at -0.019 [s]



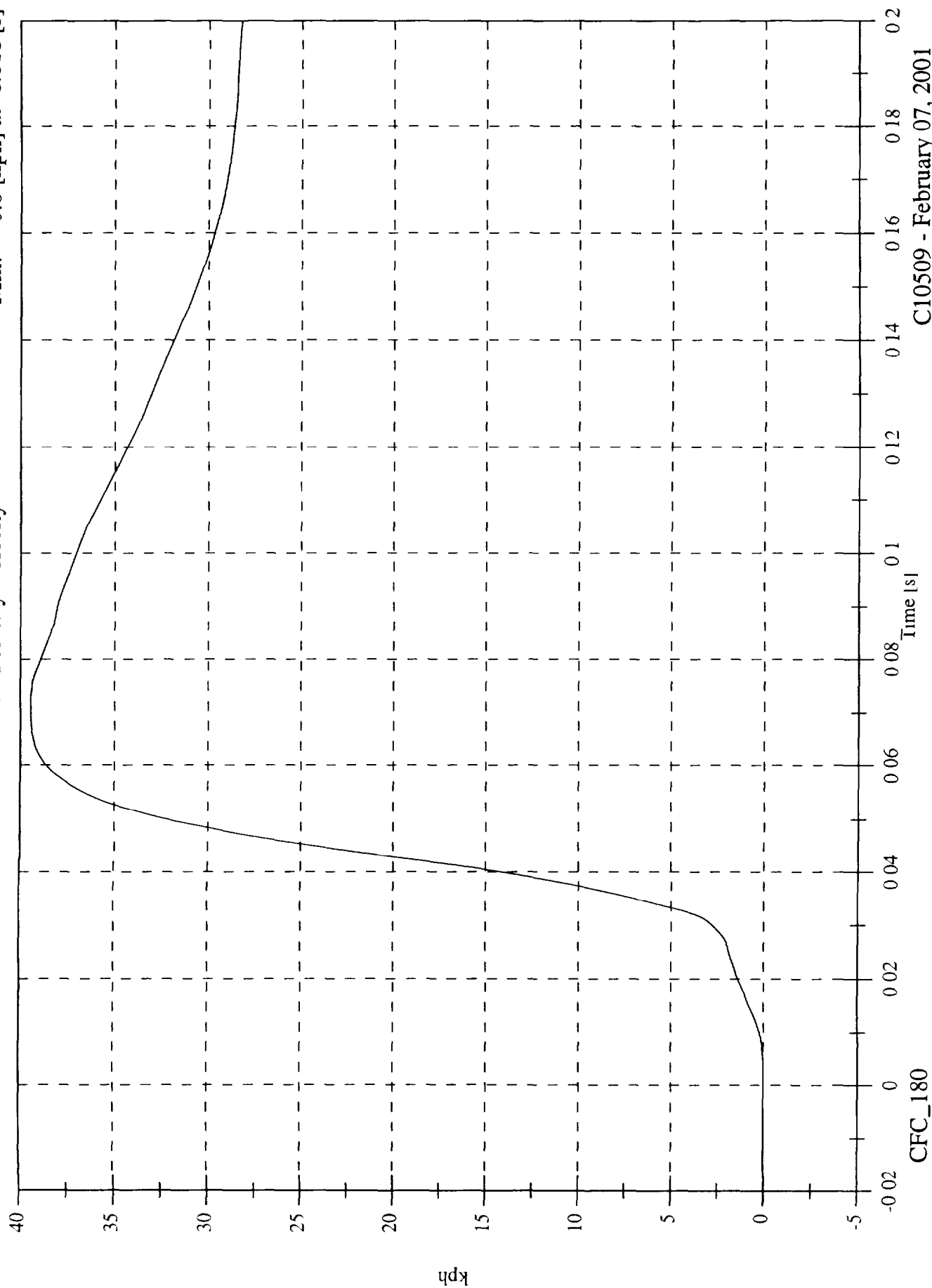
CI0509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

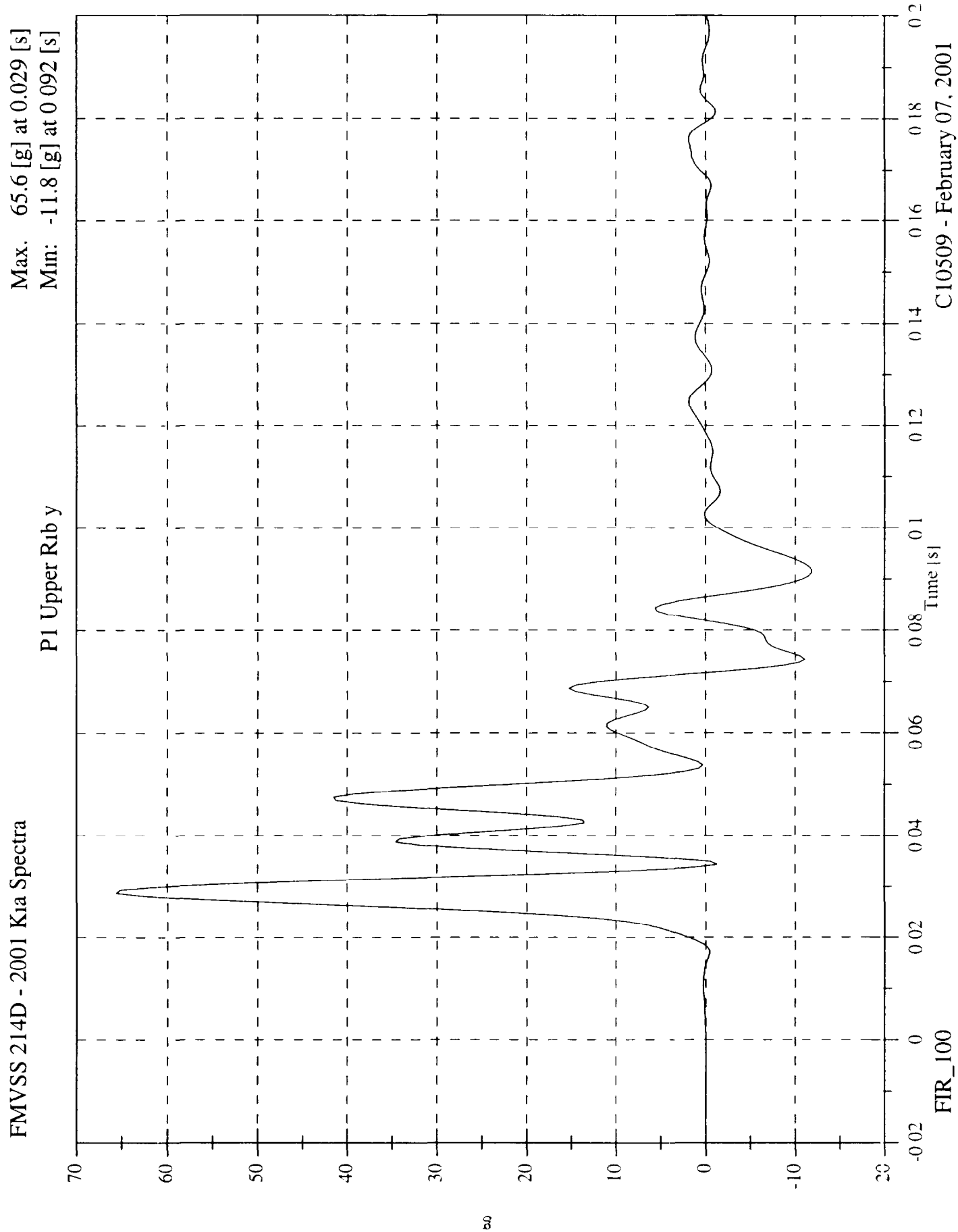
Max: 39.5 [kph] at 0.072 [s]
 Min: -0.0 [kph] at -0.018 [s]

P4 Pelvic y Velocity



CFC_180

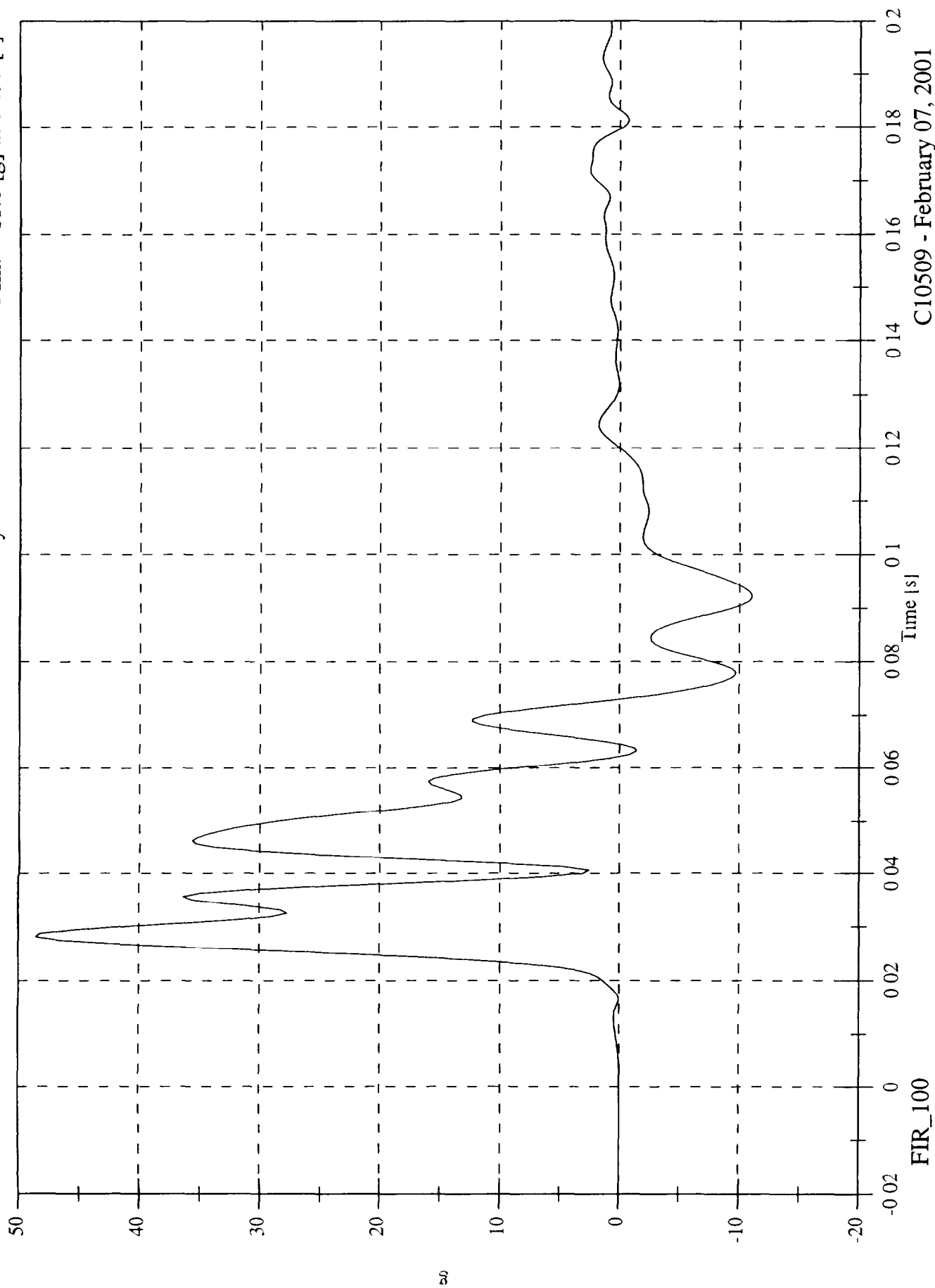
C10509 - February 07, 2001



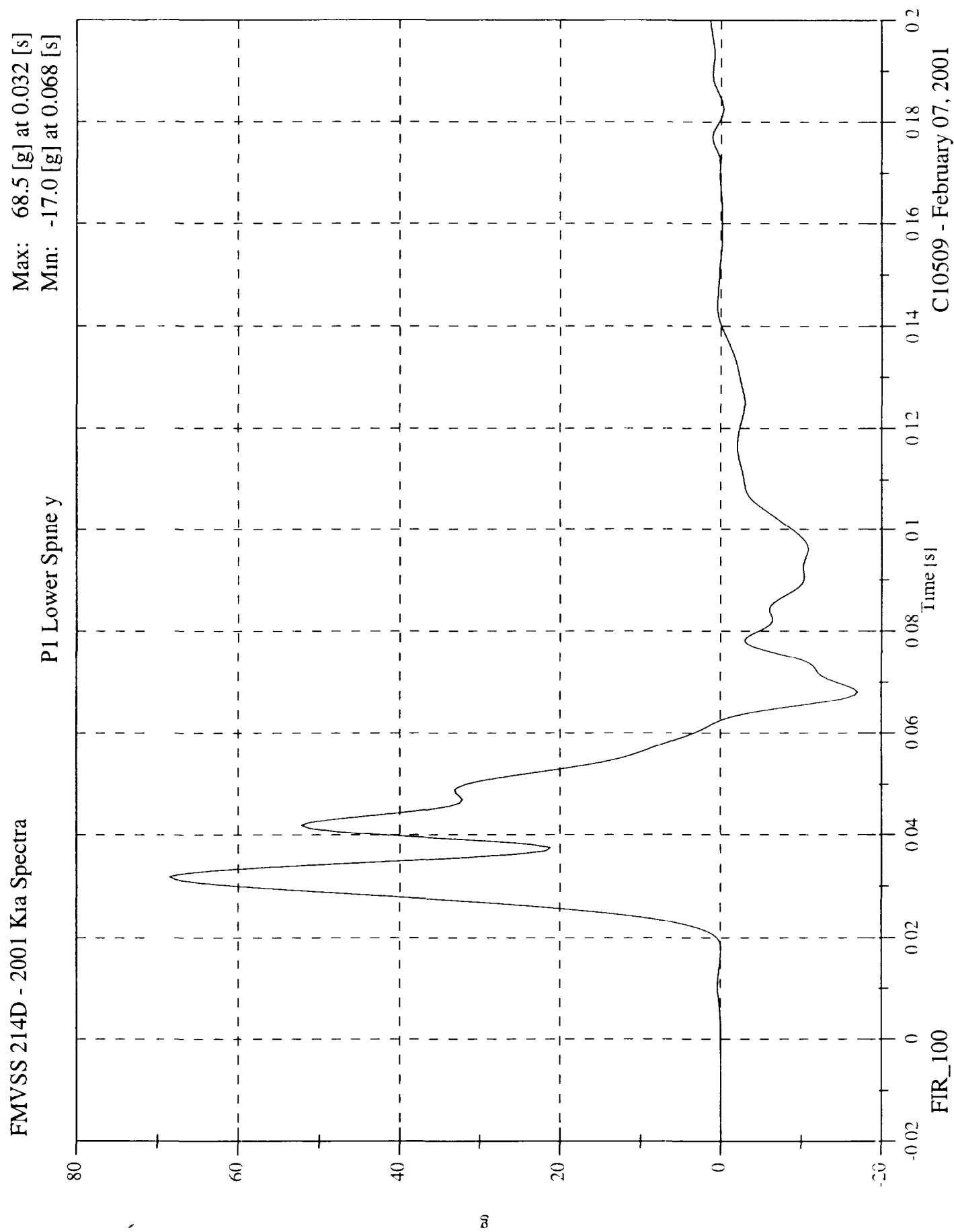
FMVSS 214D - 2001 Kia Spectra

P1 Lower Rib y

Max: 48.6 [g] at 0.028 [s]
Min: -11.0 [g] at 0.093 [s]



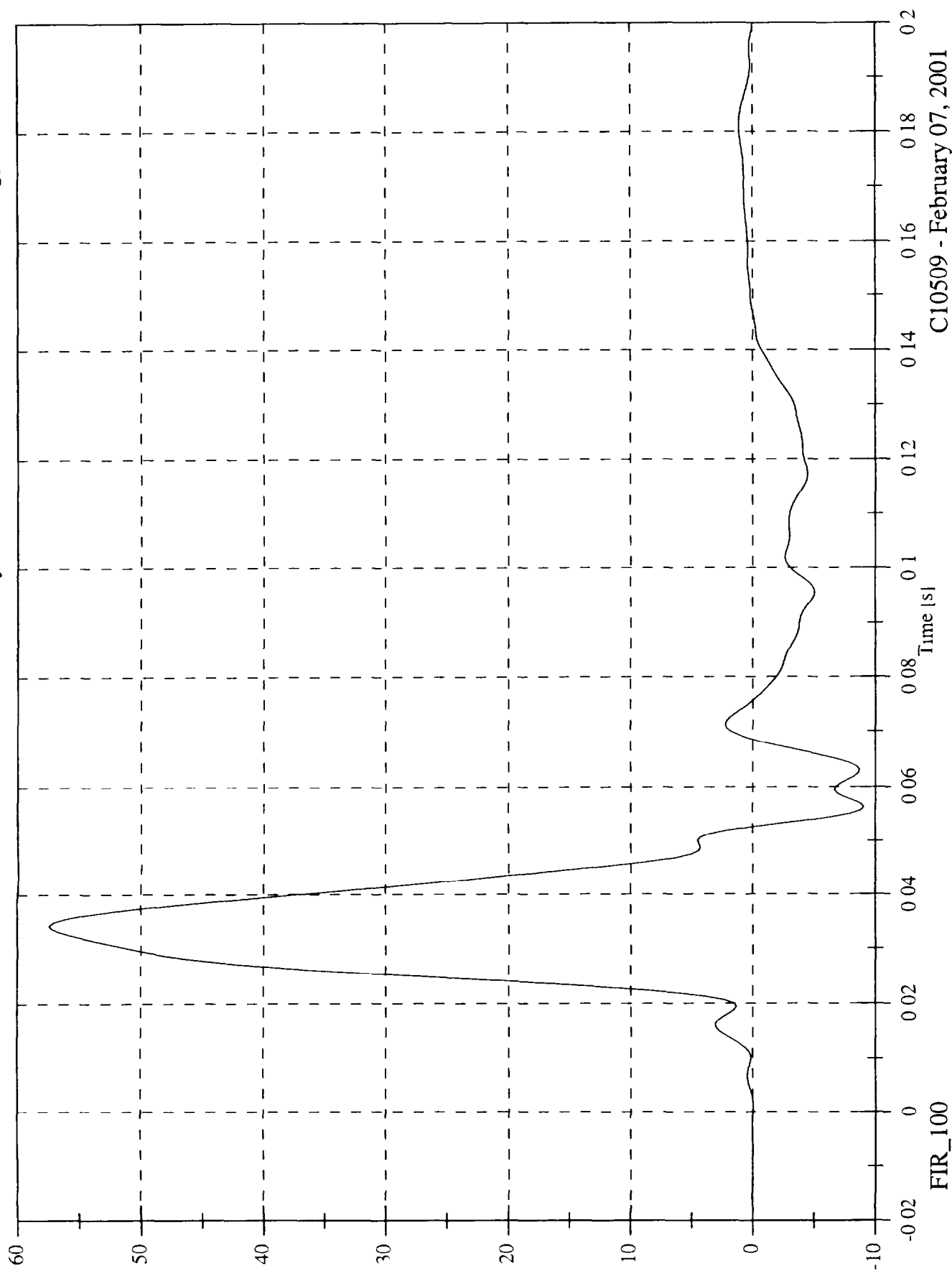
C10509 - February 07, 2001



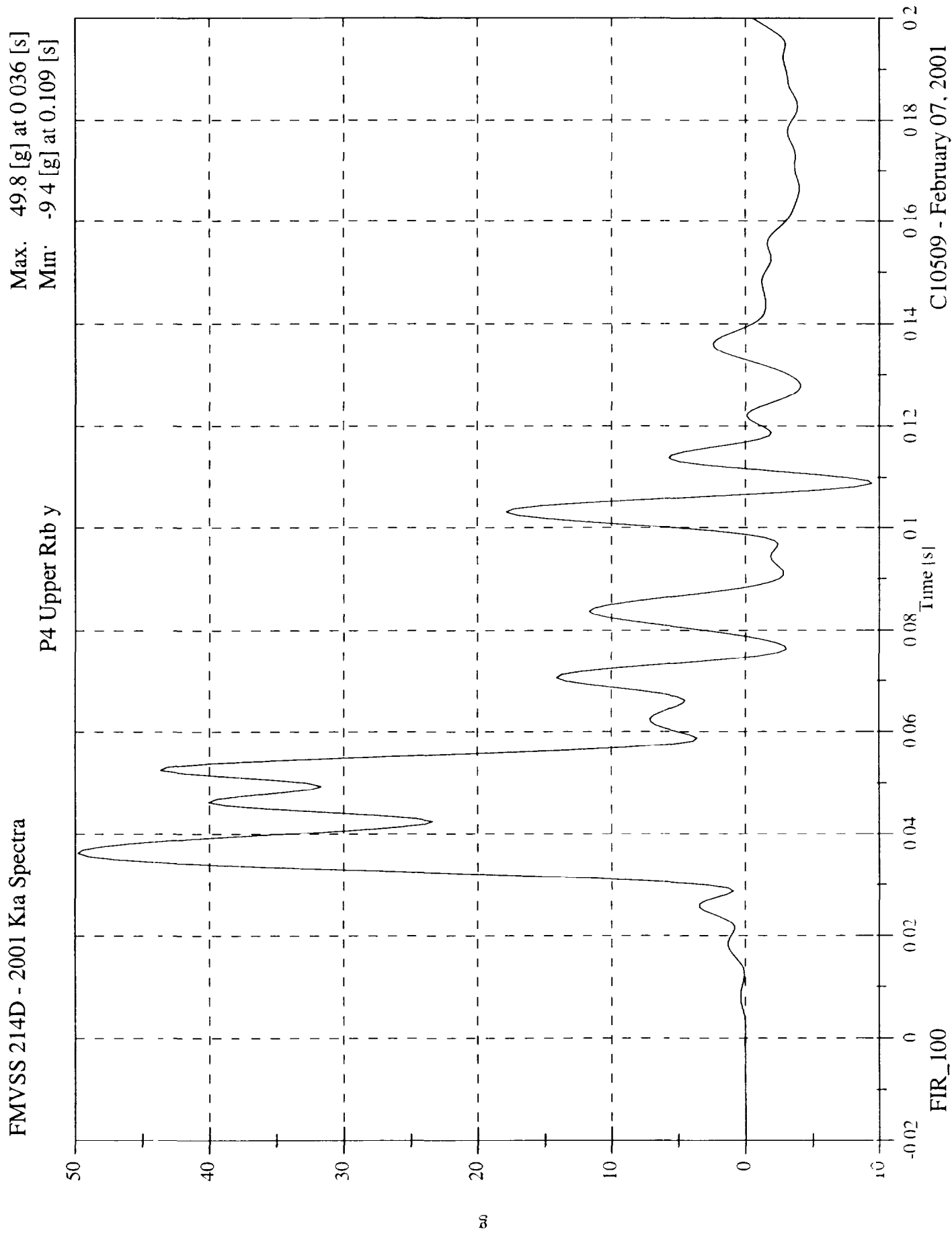
FMVSS 214D - 2001 Kia Spectra

P1 Pelvic y

Max: 57.4 [g] at 0.034 [s]
Min: -9.1 [g] at 0.056 [s]



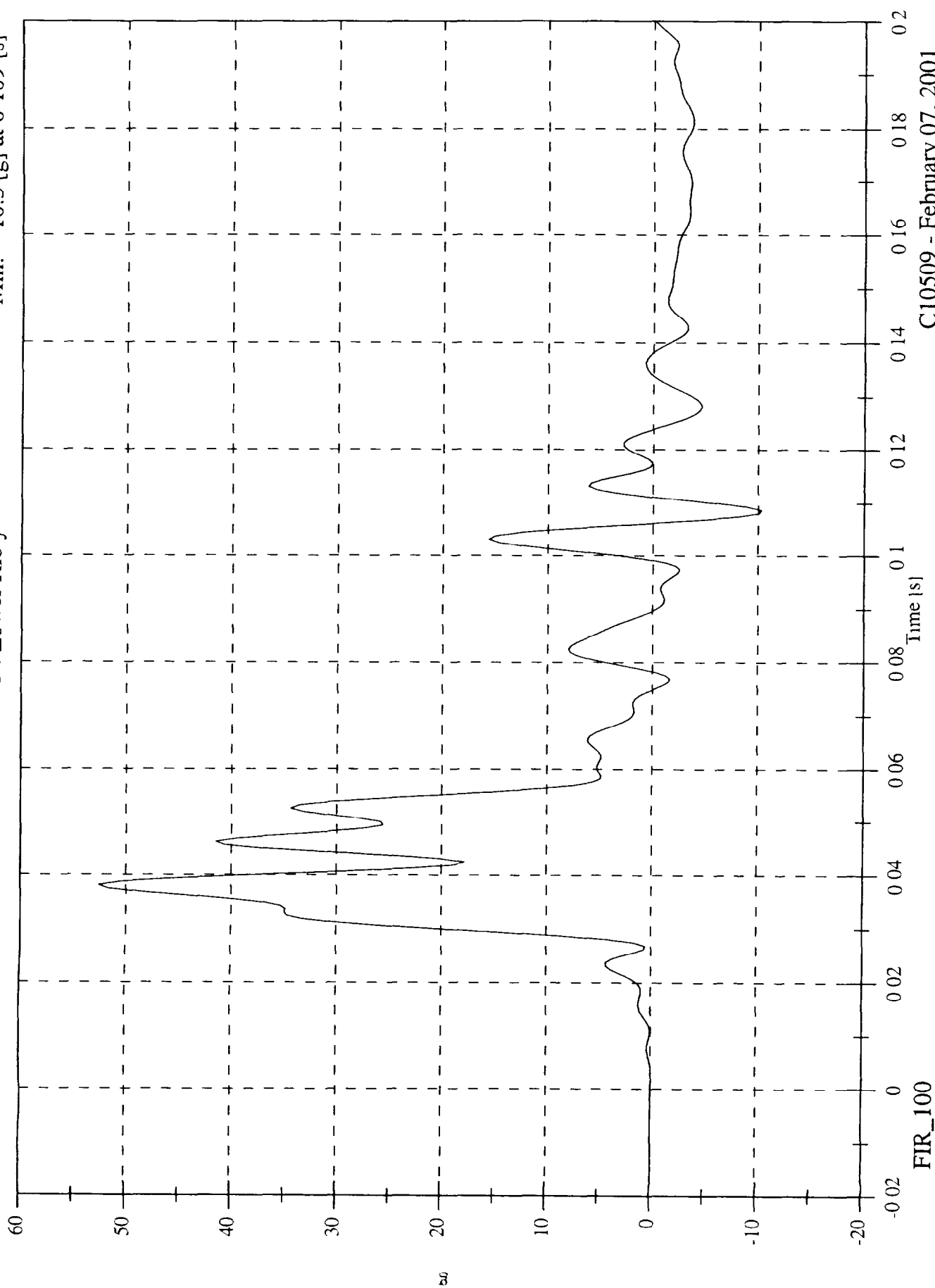
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

P4 Lower Rib y

Max: 52.5 [g] at 0.038 [s]
Min: -10.3 [g] at 0.109 [s]

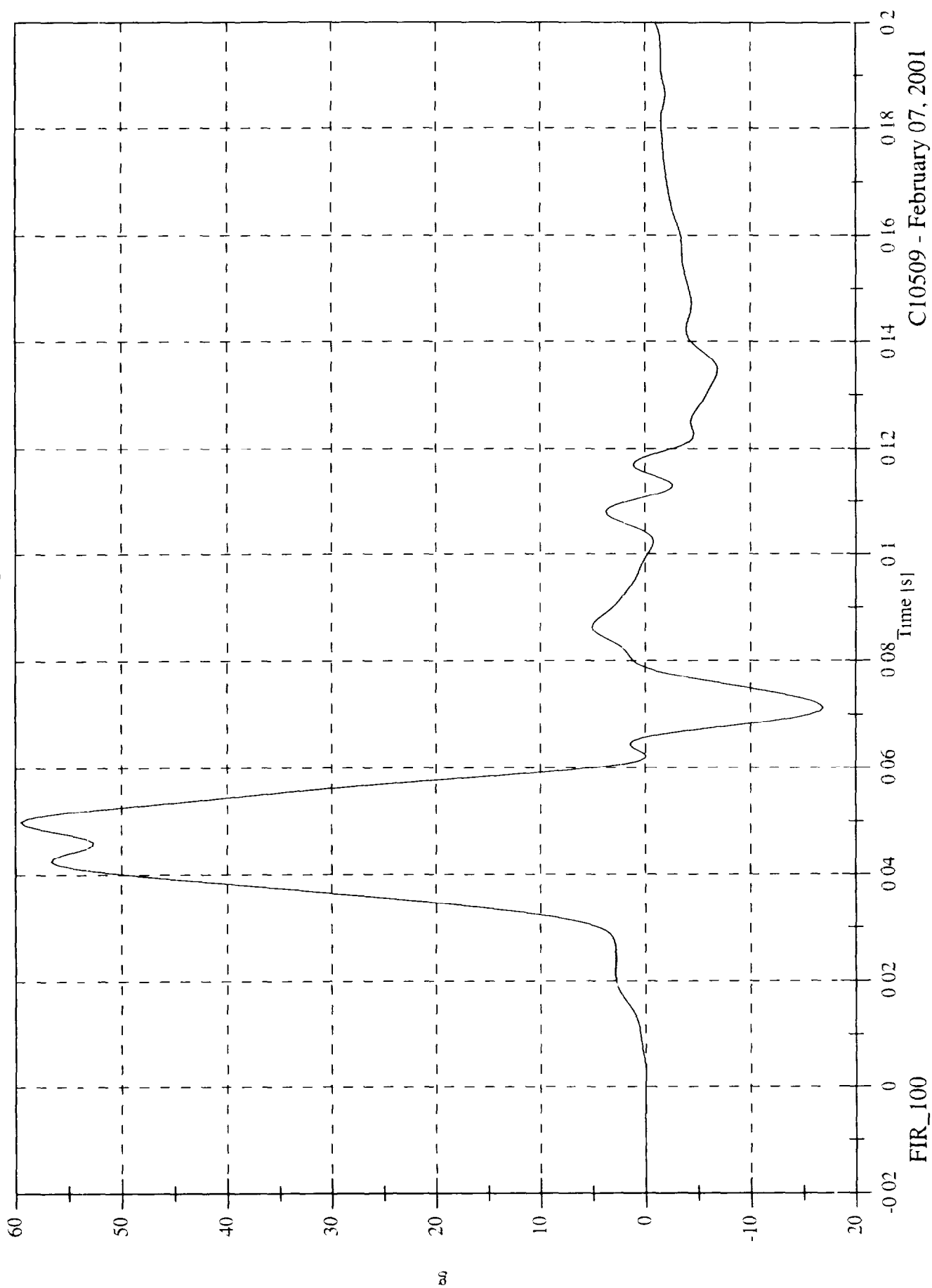


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FMVSS 214D - 2001 Kia Spectra

Max. 59.5 [g] at 0.050 [s]
Min. -16.9 [g] at 0.071 [s]

P4 Lower Spine y

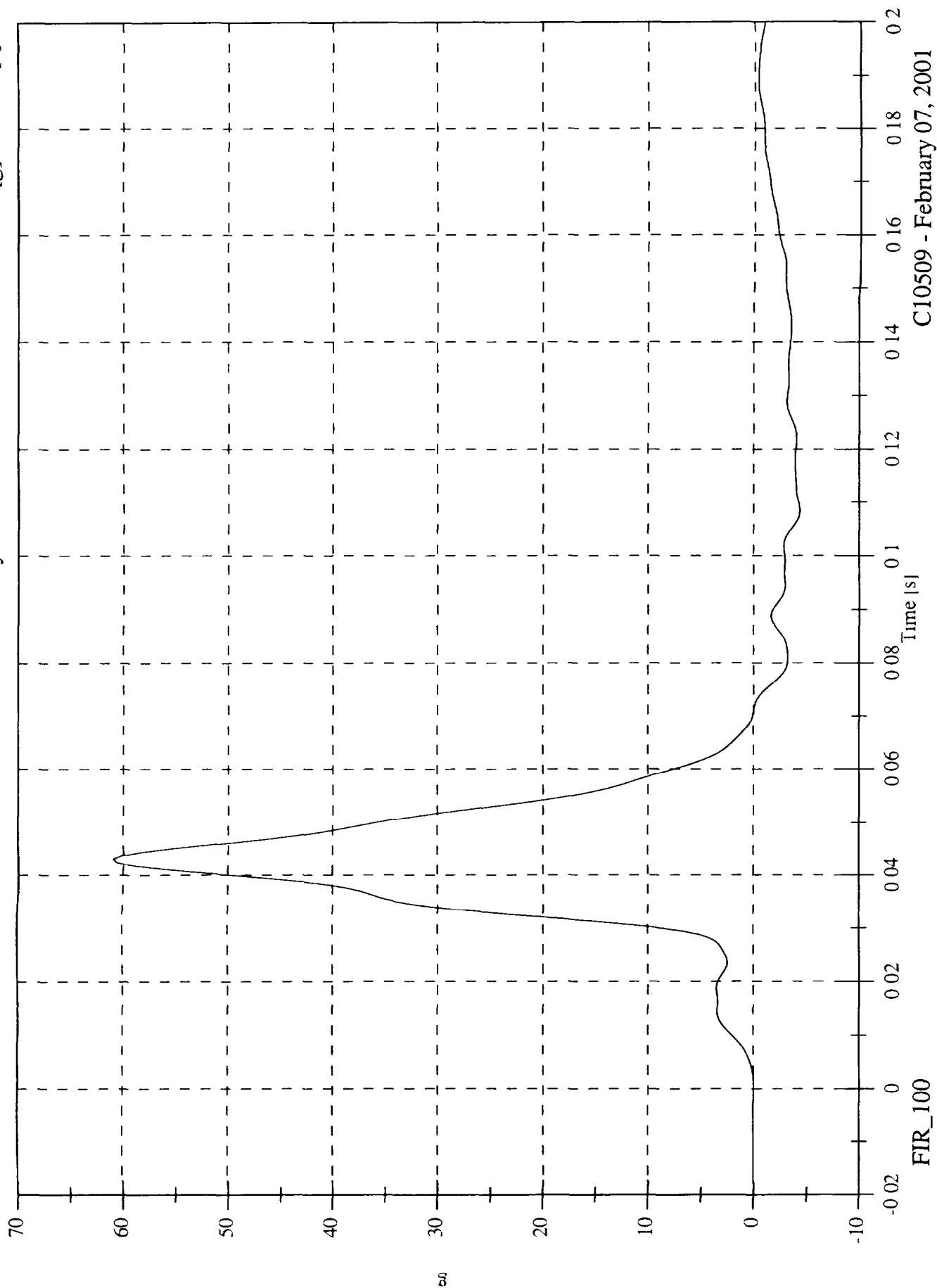


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

P4 Pelvic y

Max: 61.0 [g] at 0.043 [s]
Min: -4.4 [g] at 0.108 [s]

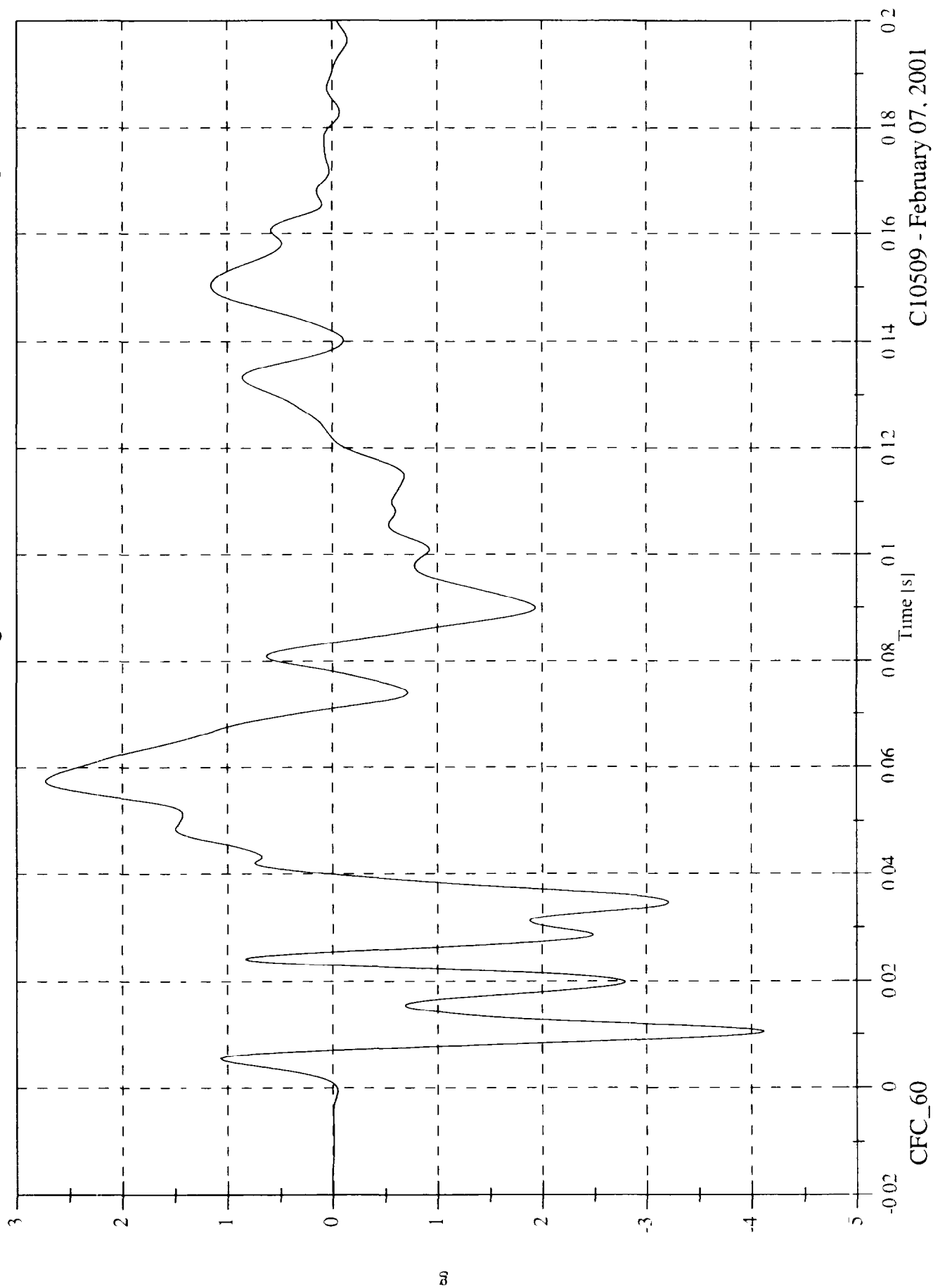


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FMVSS 214D - 2001 Kia Spectra

Max. 2.7 [g] at 0.057 [s]
Min: -4.1 [g] at 0.010 [s]

Acc 1 Right Front Sill X

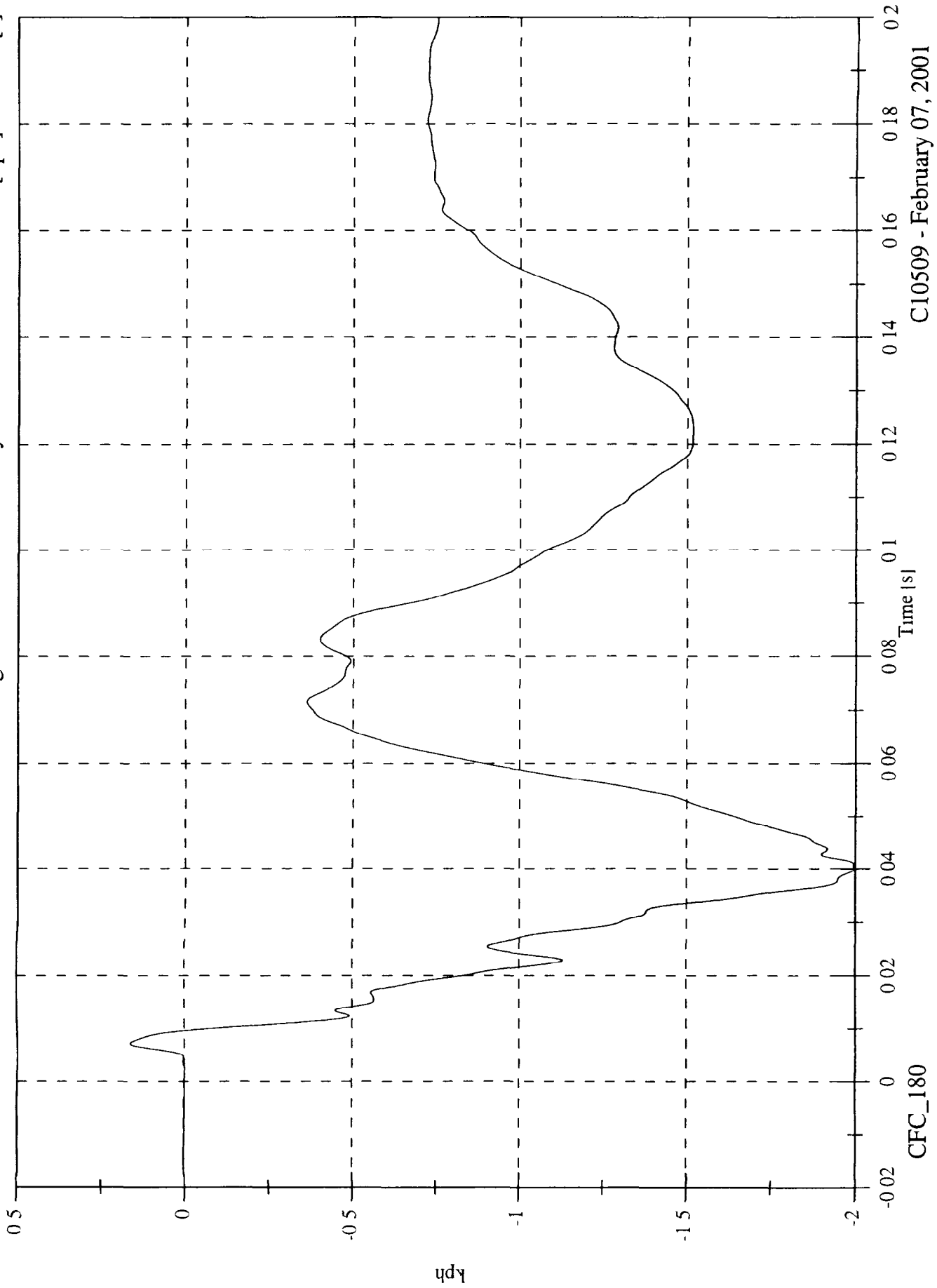


C10509 - February 07, 2001

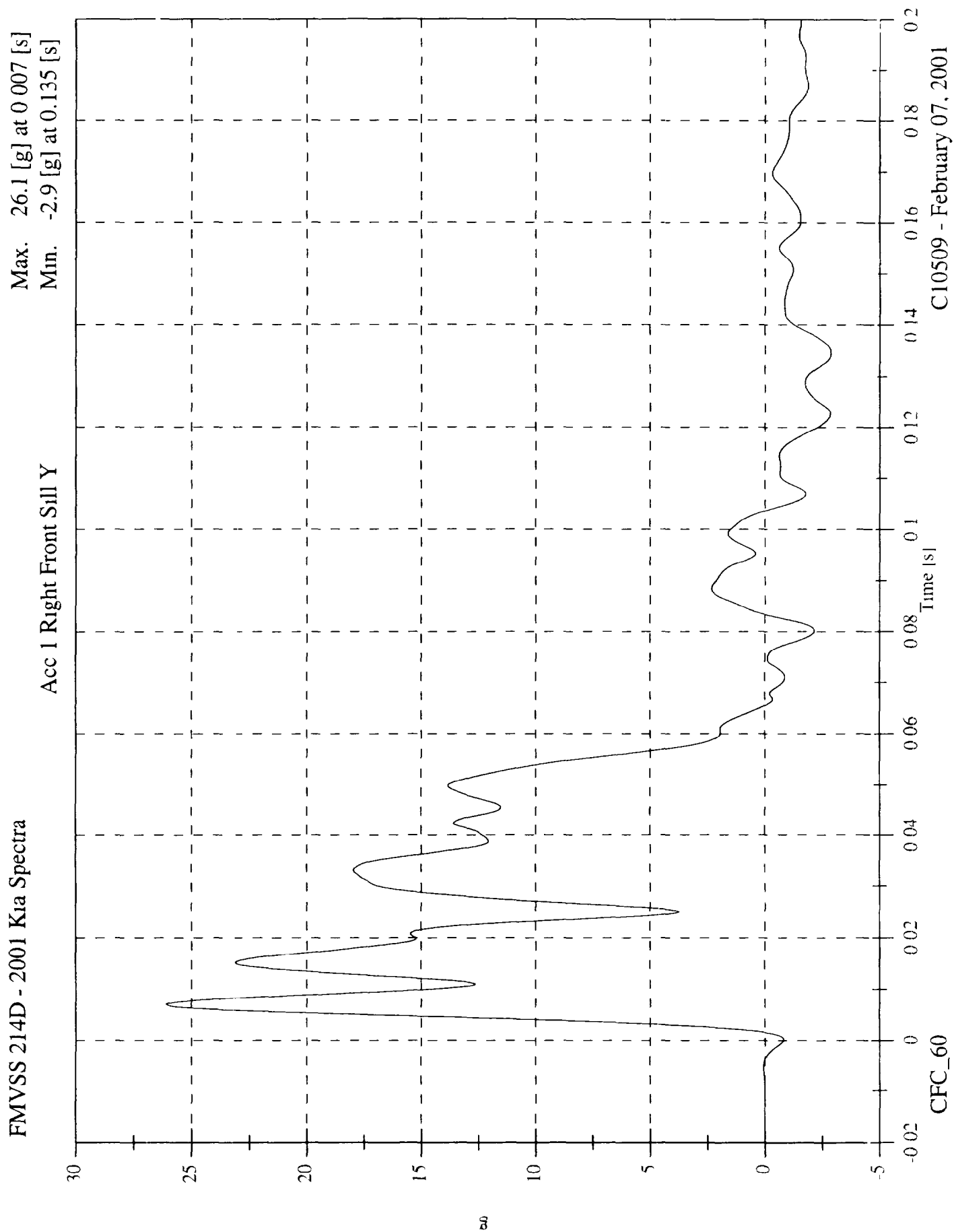
FMVSS 214D - 2001 Kia Spectra

Max: 0.2 [kph] at 0.007 [s]
Min: -2.0 [kph] at 0.040 [s]

Acc 1 Right Front Sill X Velocity



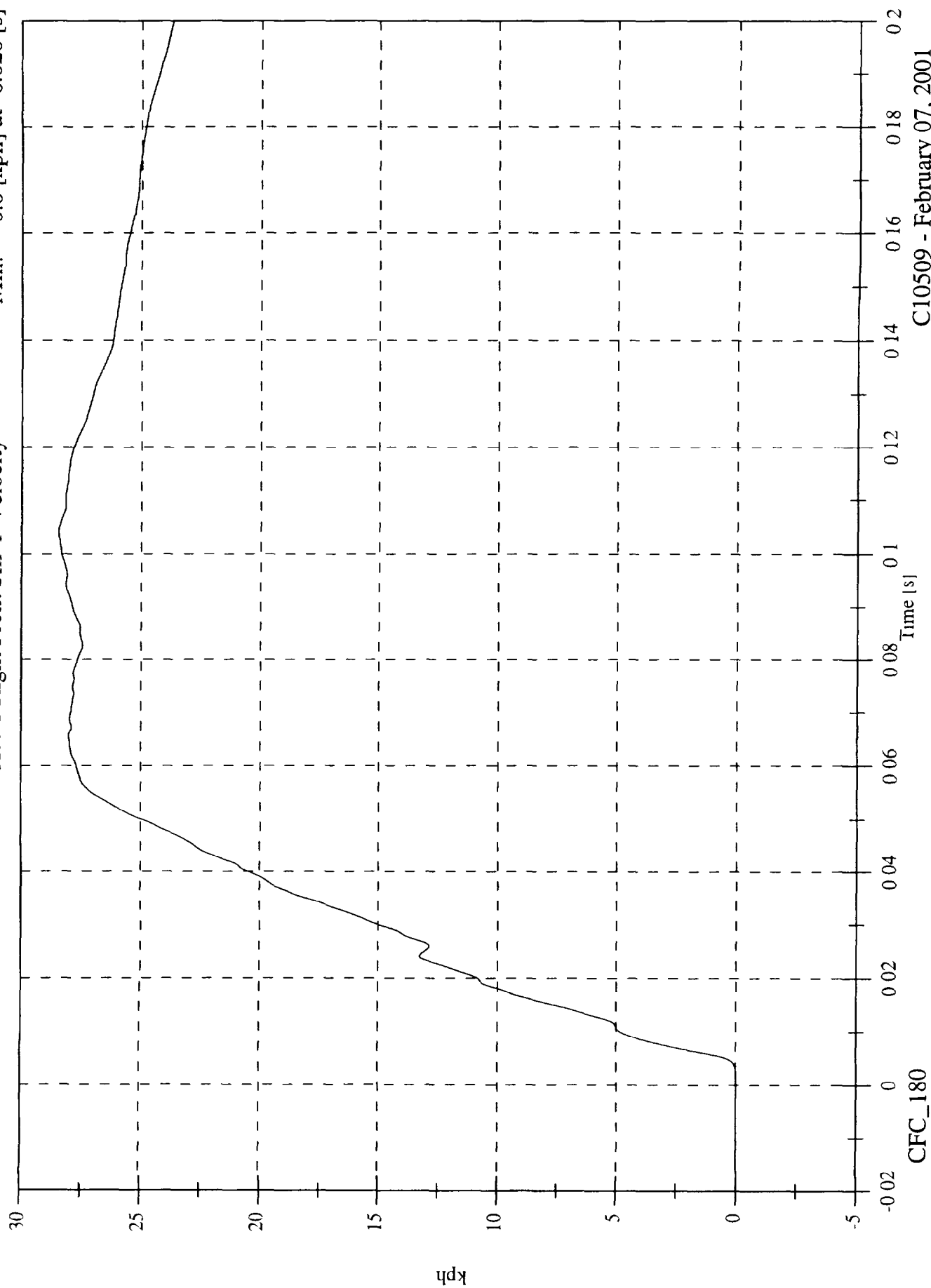
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

Max: 28.5 [kph] at 0.104 [s]
 Min: -0.0 [kph] at -0.020 [s]

Acc 1 Right Front Sill Y Velocity



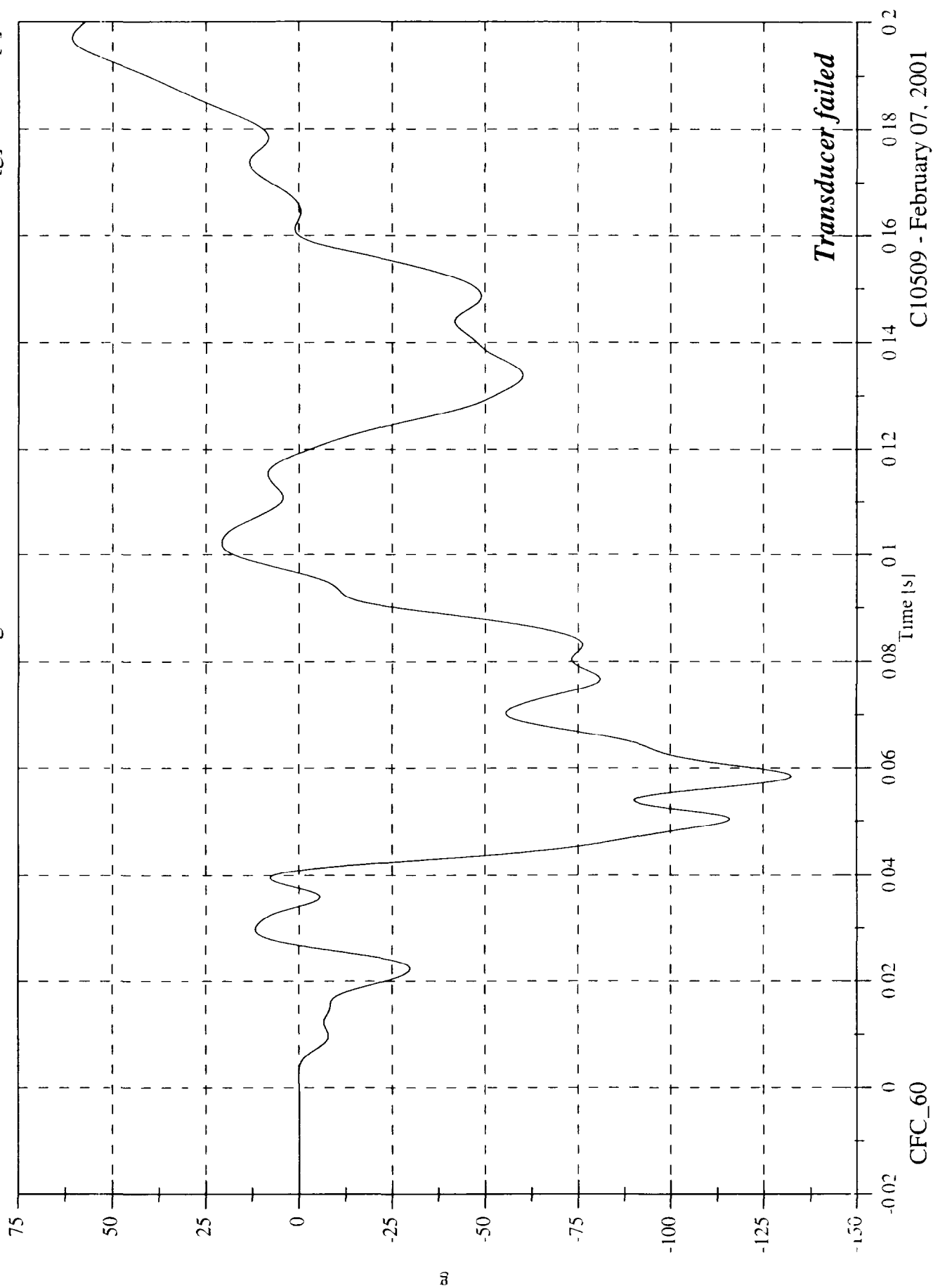
C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Acc 1 Right Front Sill Z

Max. 60.7 [g] at 0.197 [s]

Min. -132.3 [g] at 0.058 [s]

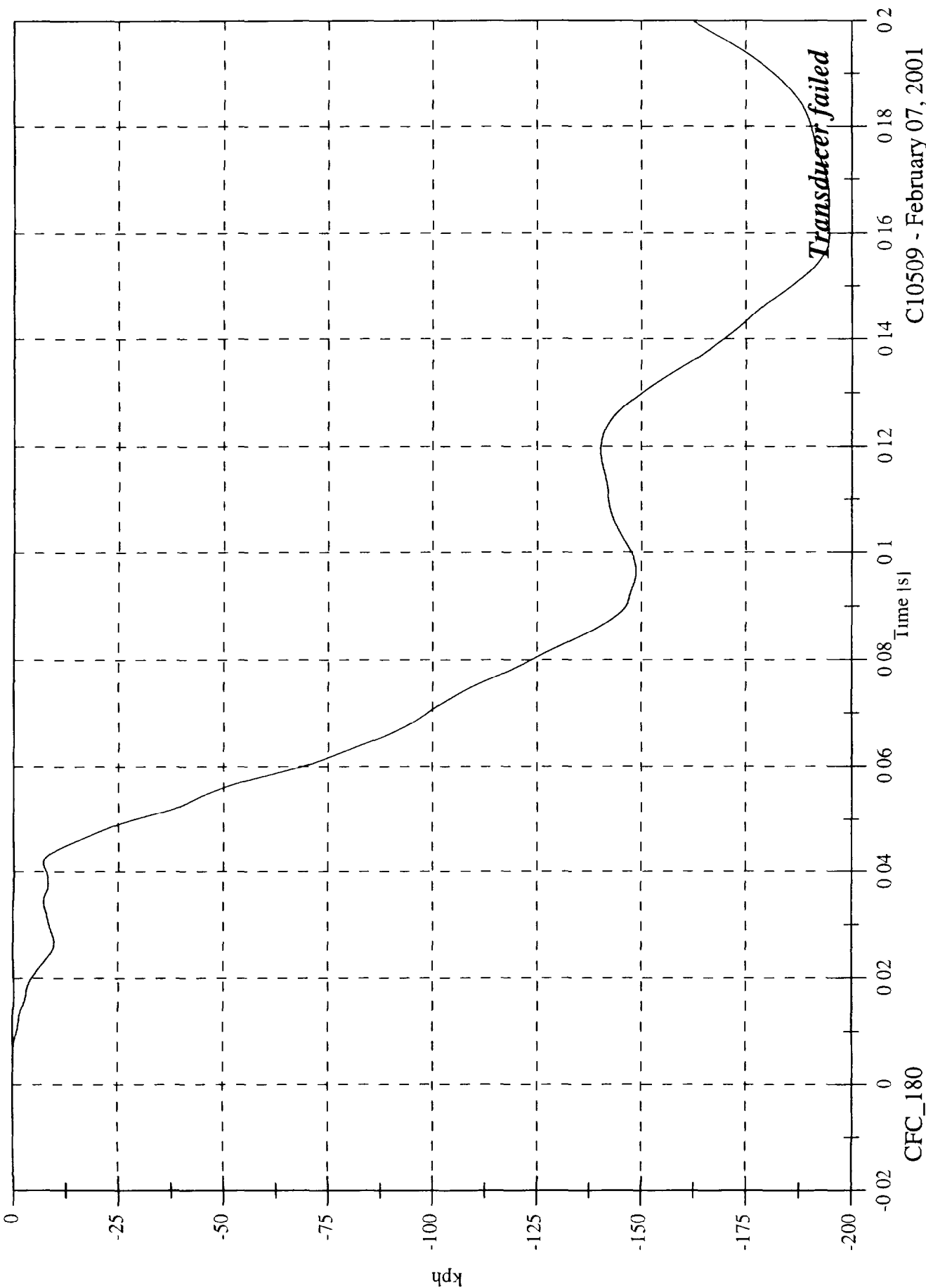


C10509 - February 07, 2001

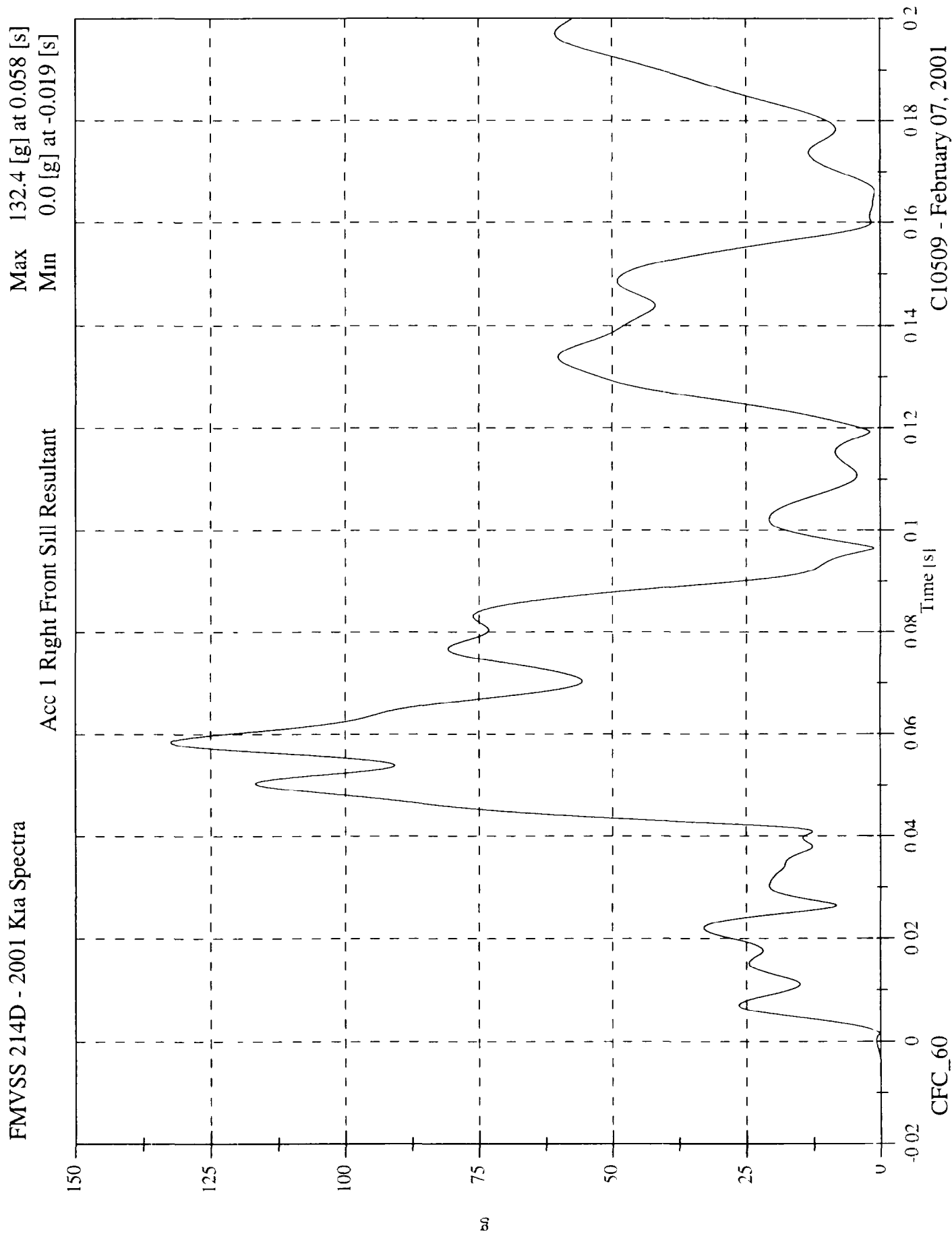
FMVSS 214D - 2001 Kia Spectra

Max: 0.0 [kph] at -0.020 [s]
 Min: -194.7 [kph] at 0.159 [s]

Acc 1 Right Front Sill Z Velocity



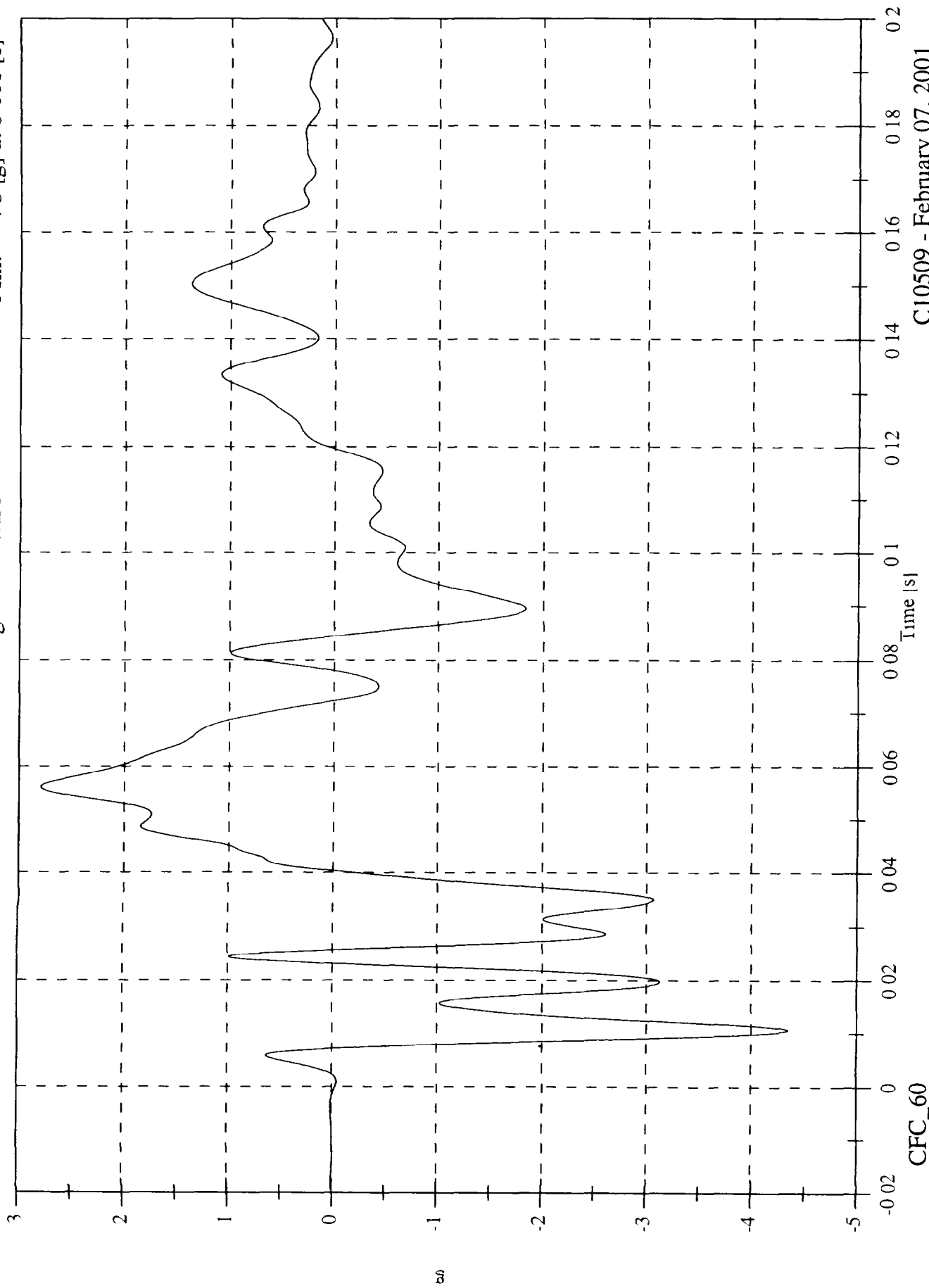
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

Acc 2 Right Rear Sill X

Max: 2.8 [g] at 0.056 [s]
Min: -4.3 [g] at 0.011 [s]

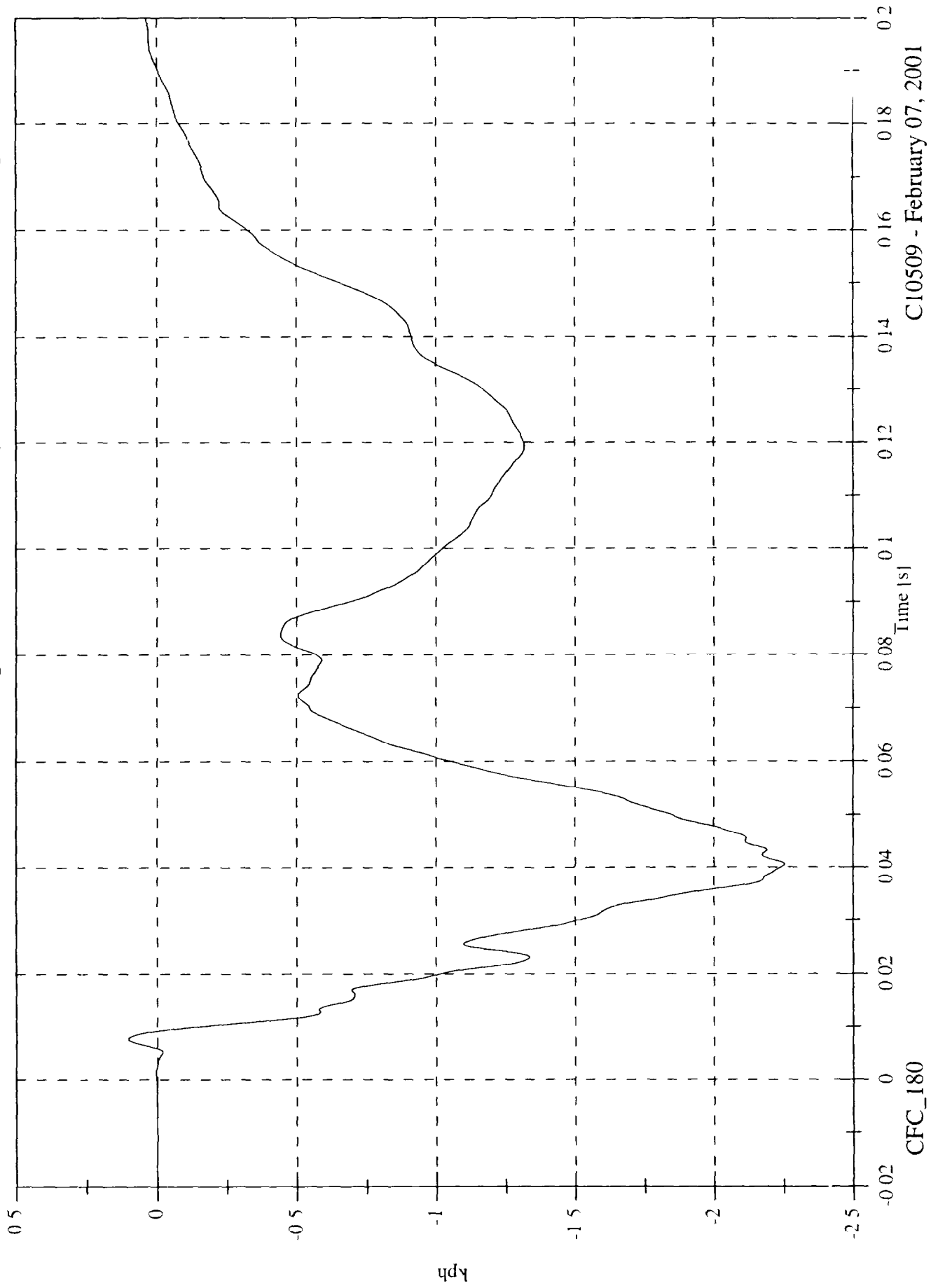


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max: 0.1 [kph] at 0.008 [s]
Min: -2.3 [kph] at 0.041 [s]

Acc 2 Right Rear Sill X Velocity



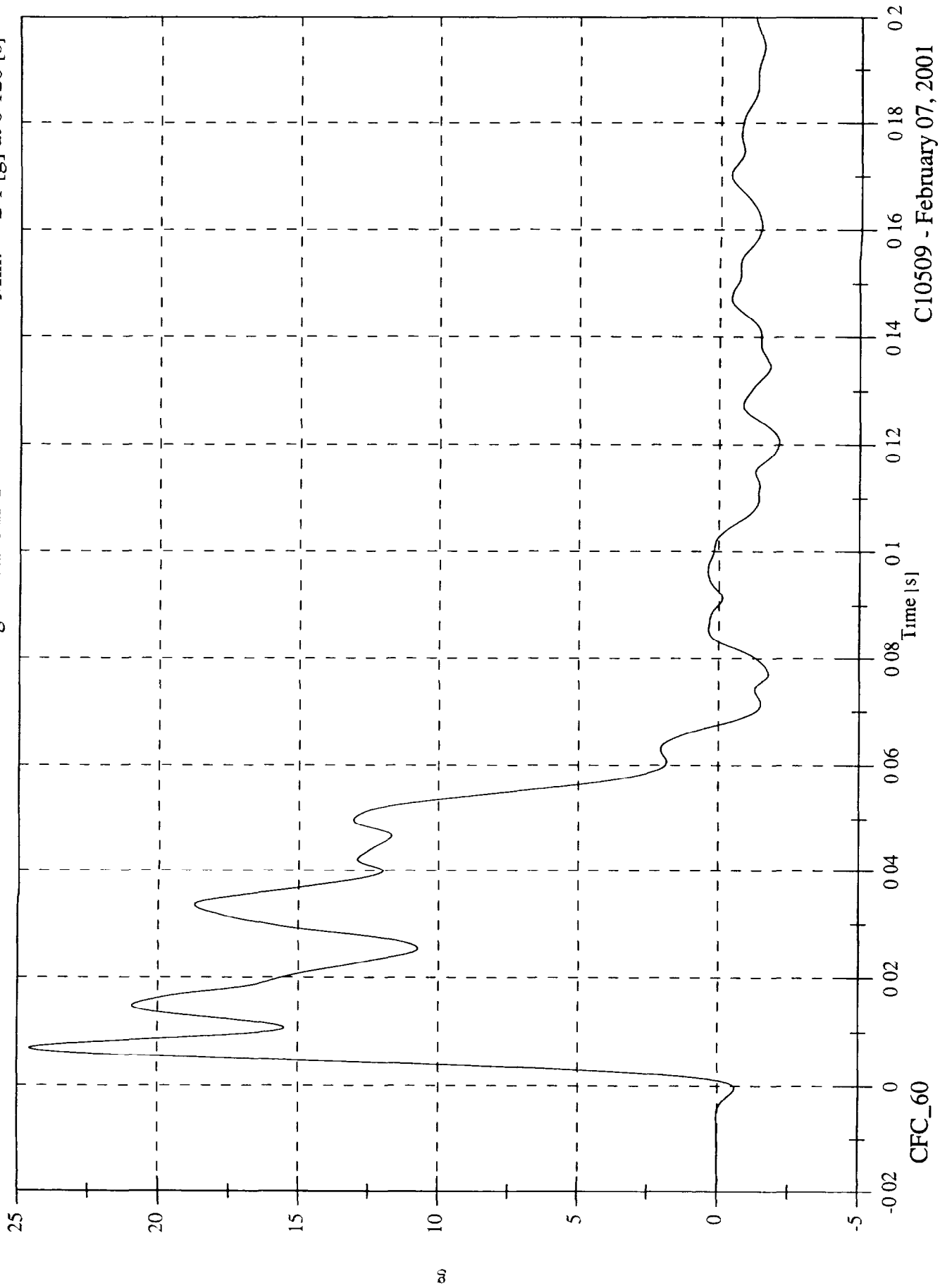
CI0509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

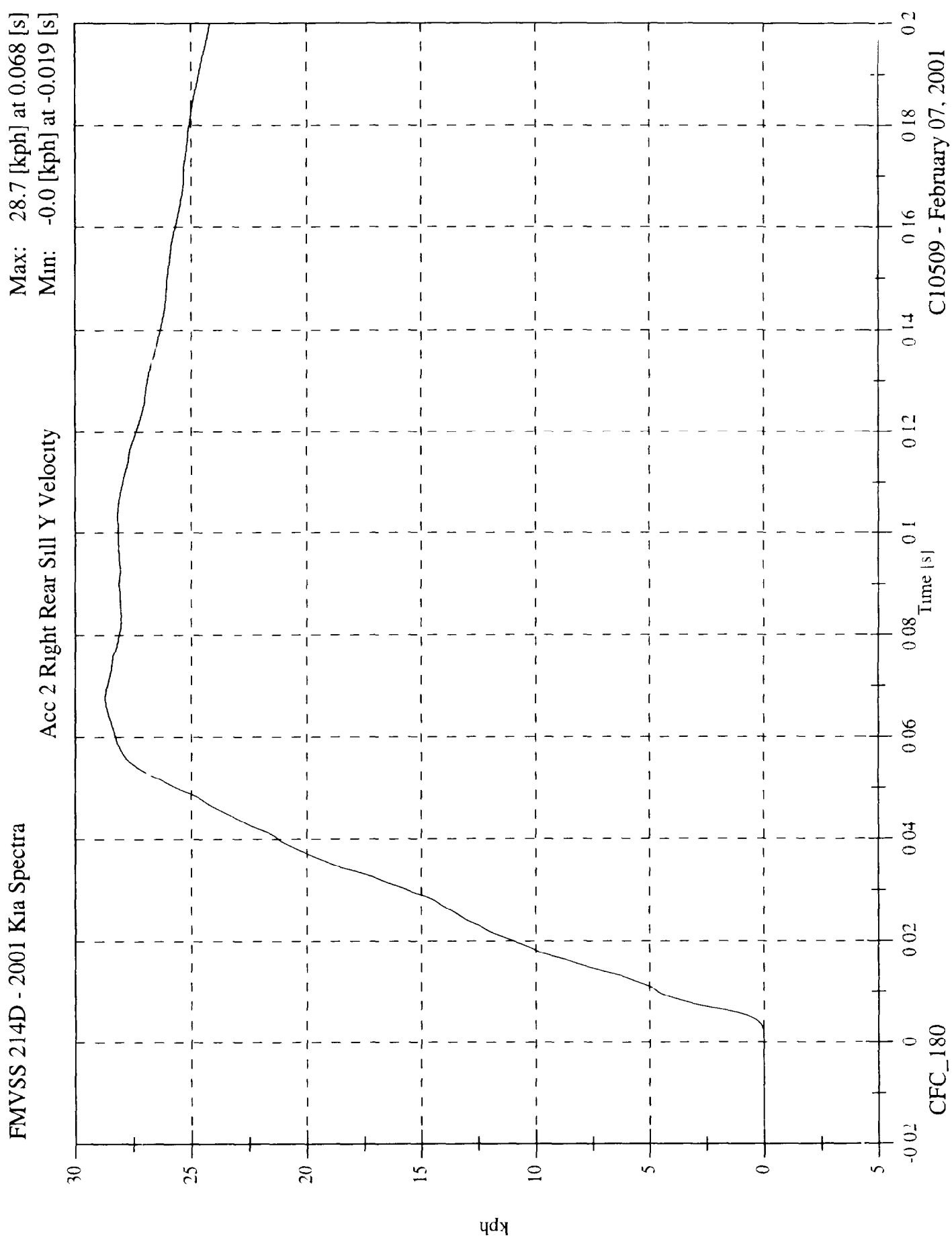
Acc 2 Right Rear Sill Y

Max: 24.6 [g] at 0.007 [s]

Min: -2.1 [g] at 0.120 [s]



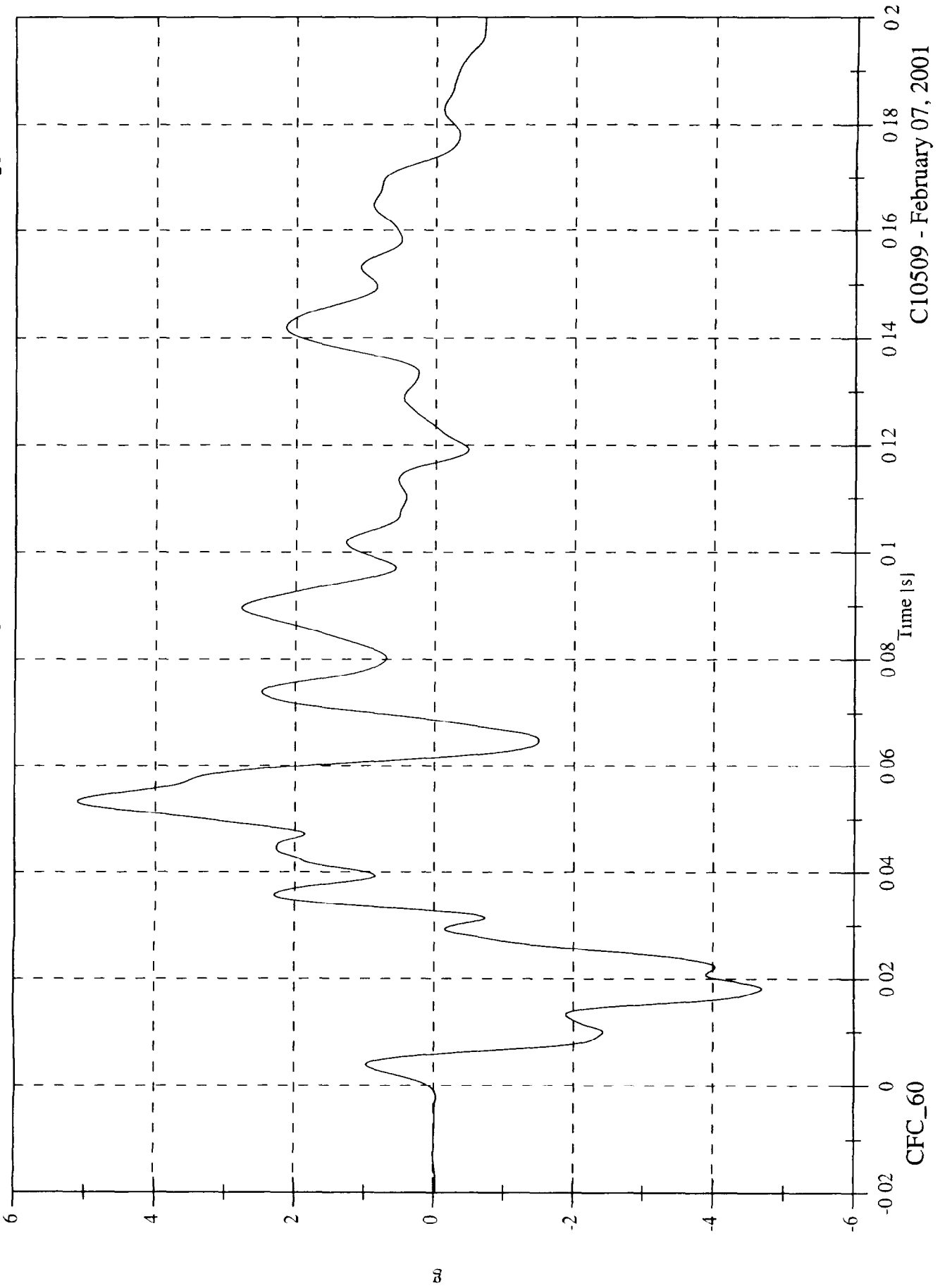
C10509 - February 07, 2001



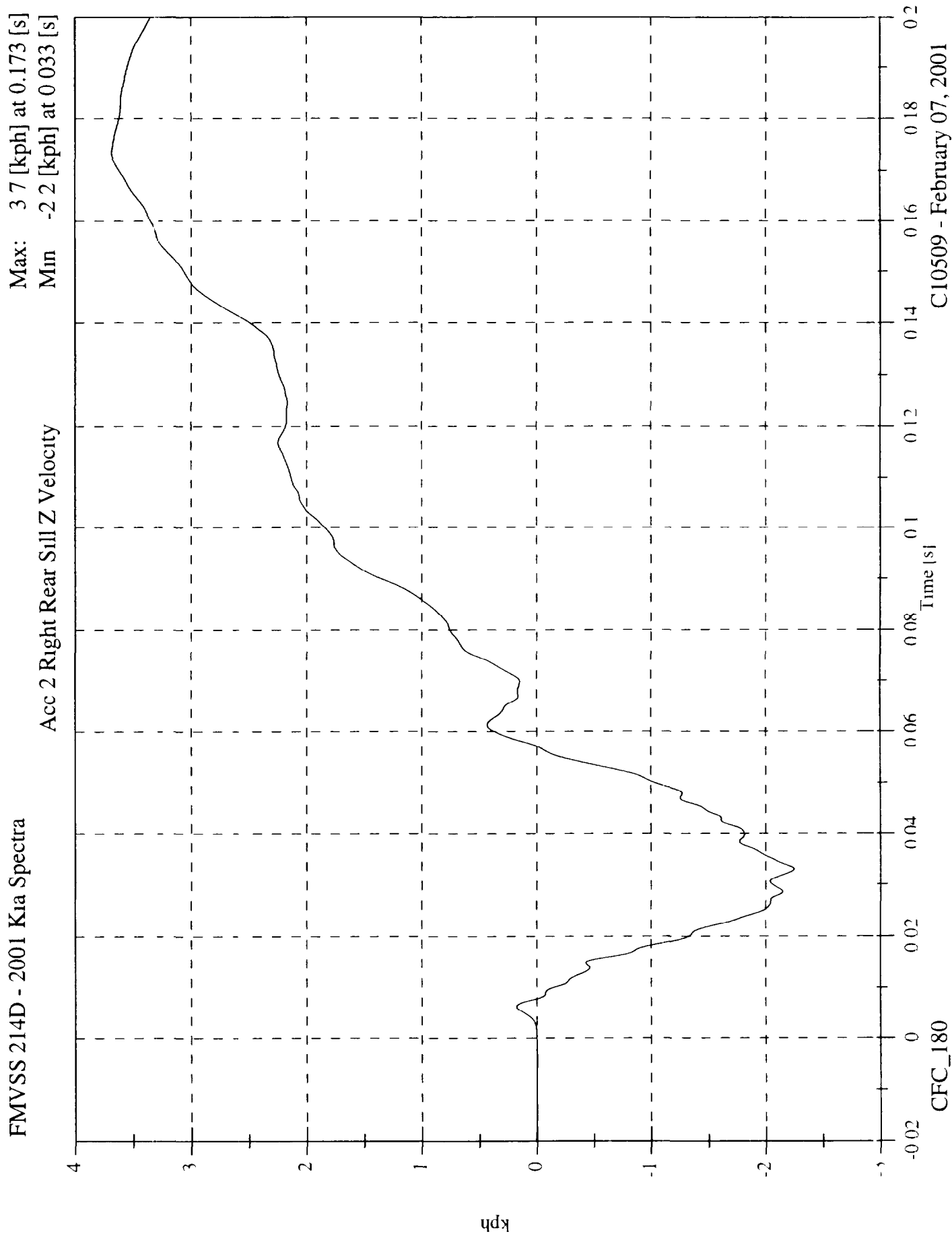
FMVSS 214D - 2001 Kia Spectra

Max: 5.1 [g] at 0.053 [s]
 Min: -4.7 [g] at 0.018 [s]

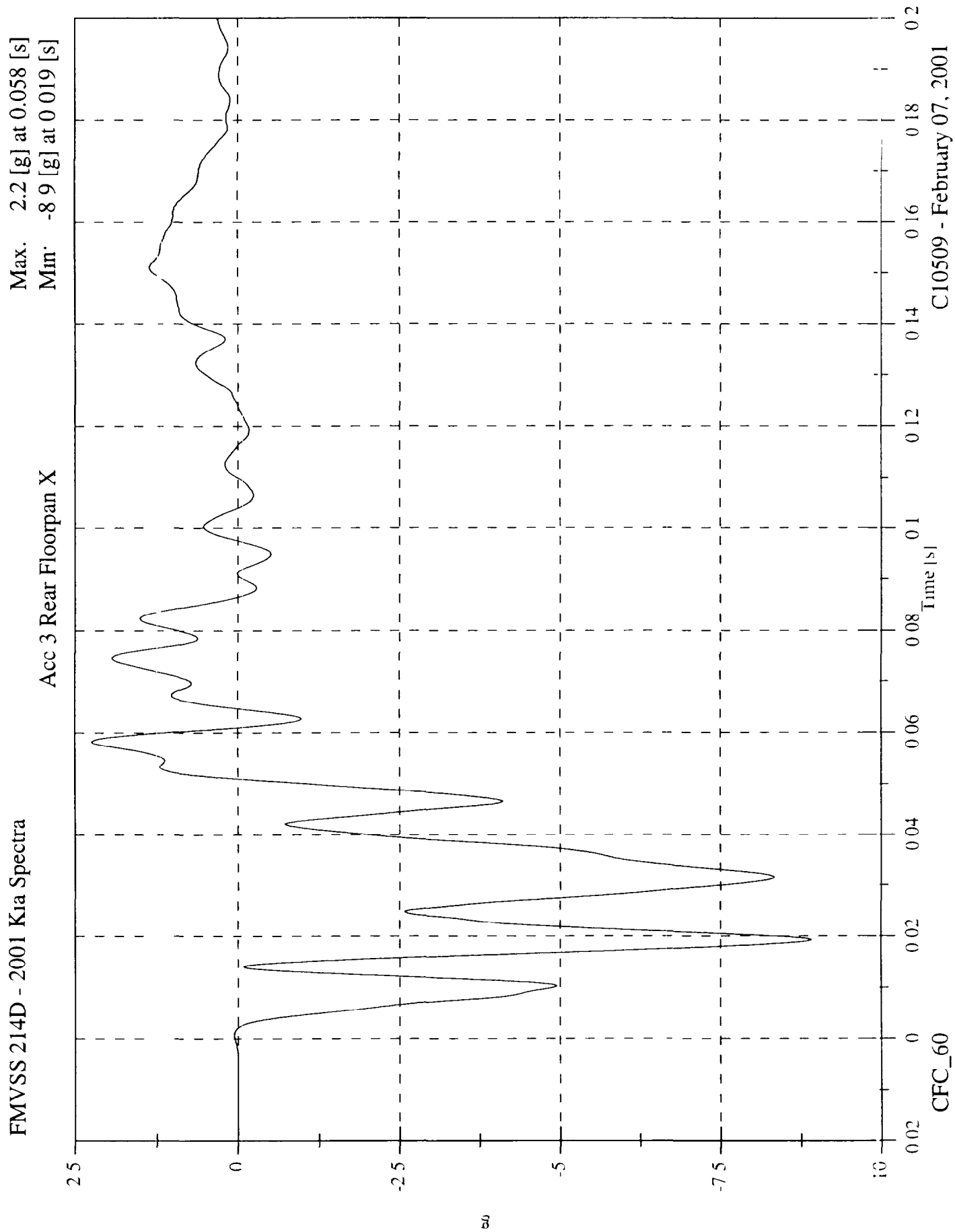
Acc 2 Right Rear Sill Z



C10509 - February 07, 2001



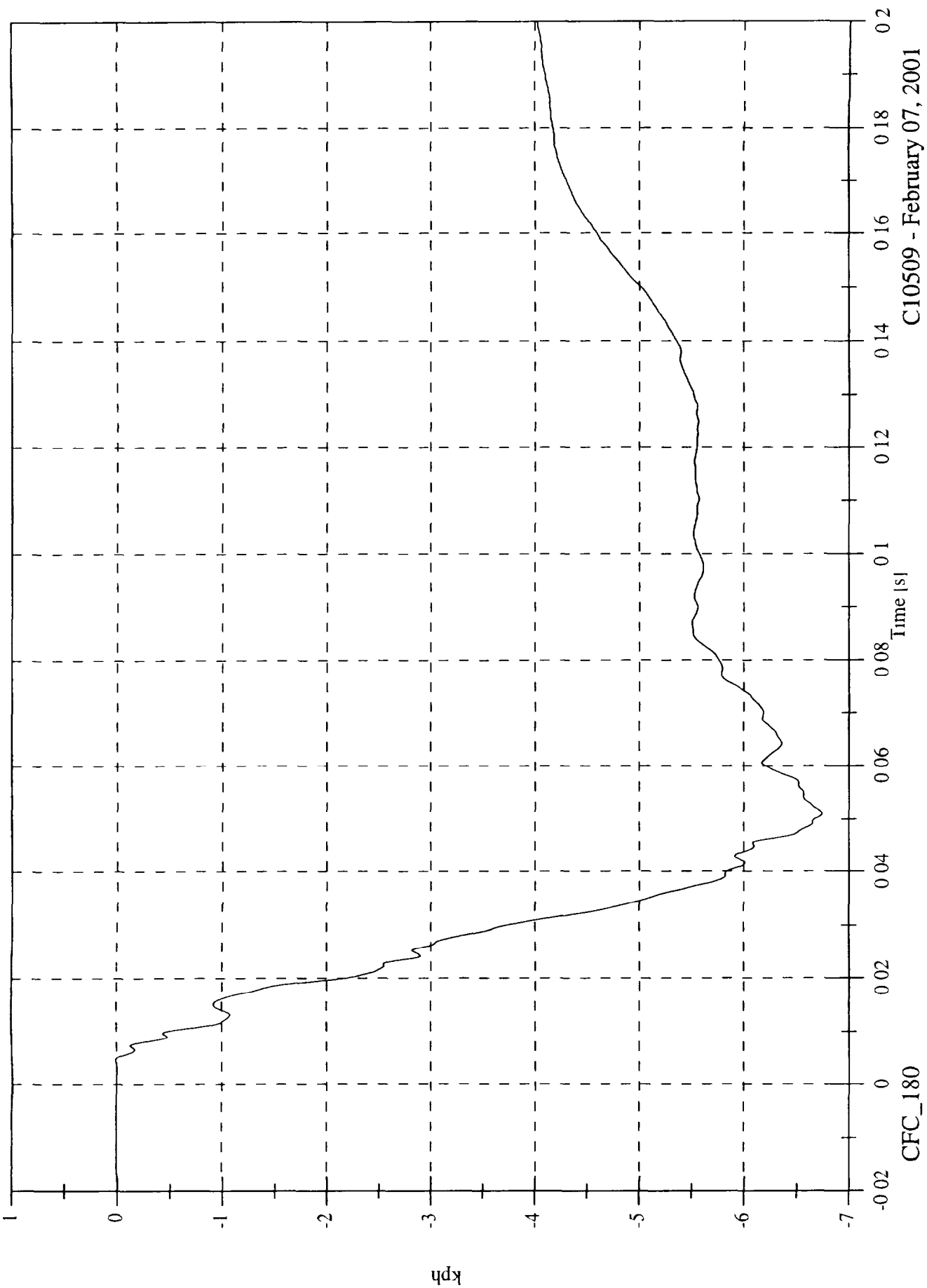




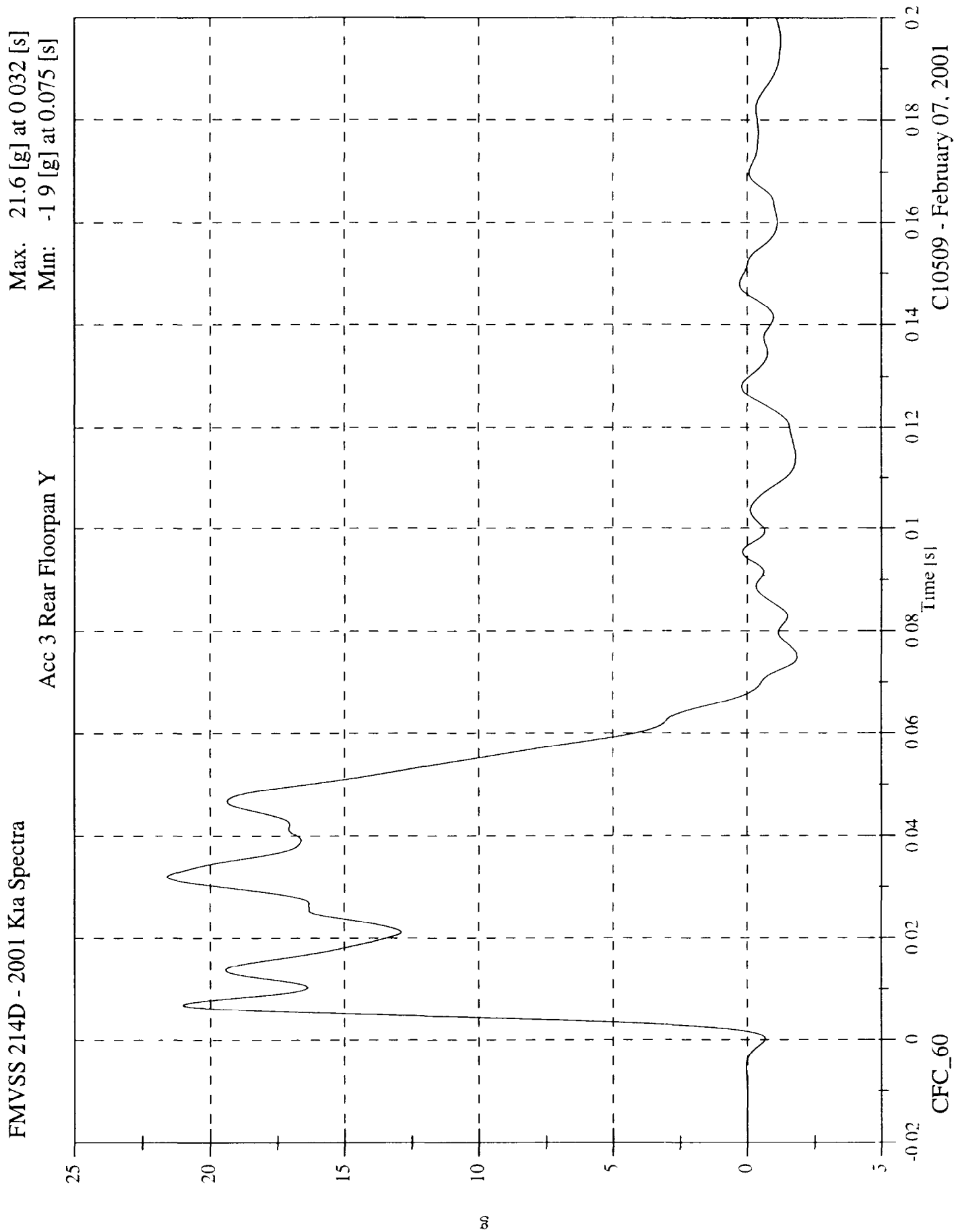
FMVSS 214D - 2001 Kia Spectra

Max: 0.0 [kph] at 0.005 [s]
Min: -6.7 [kph] at 0.051 [s]

Acc 3 Rear Floorpan X Velocity



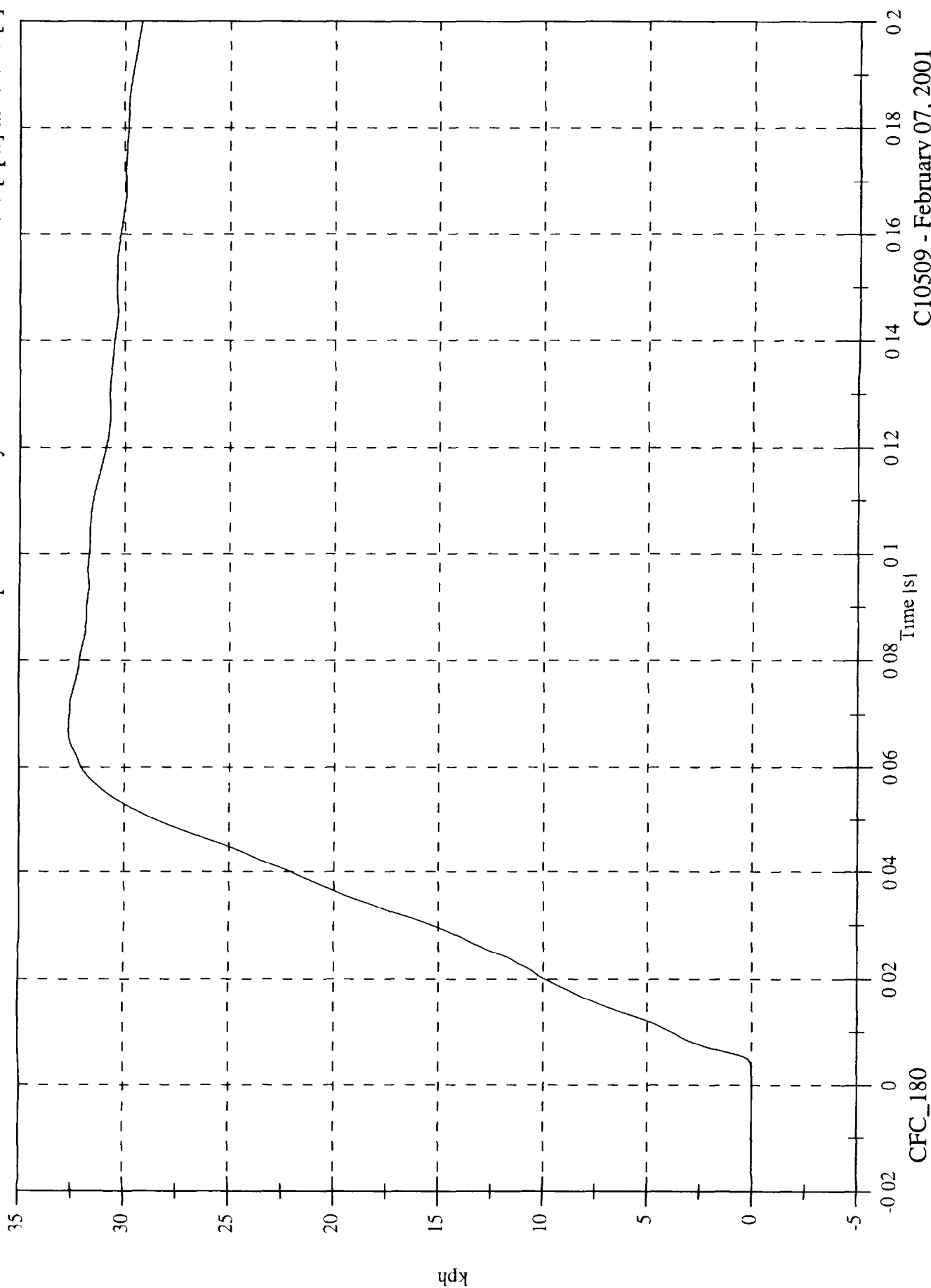
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

Acc 3 Rear Floorpan Y Velocity

Max: 32.6 [kph] at 0.067 [s]
Min: -0.0 [kph] at -0.020 [s]



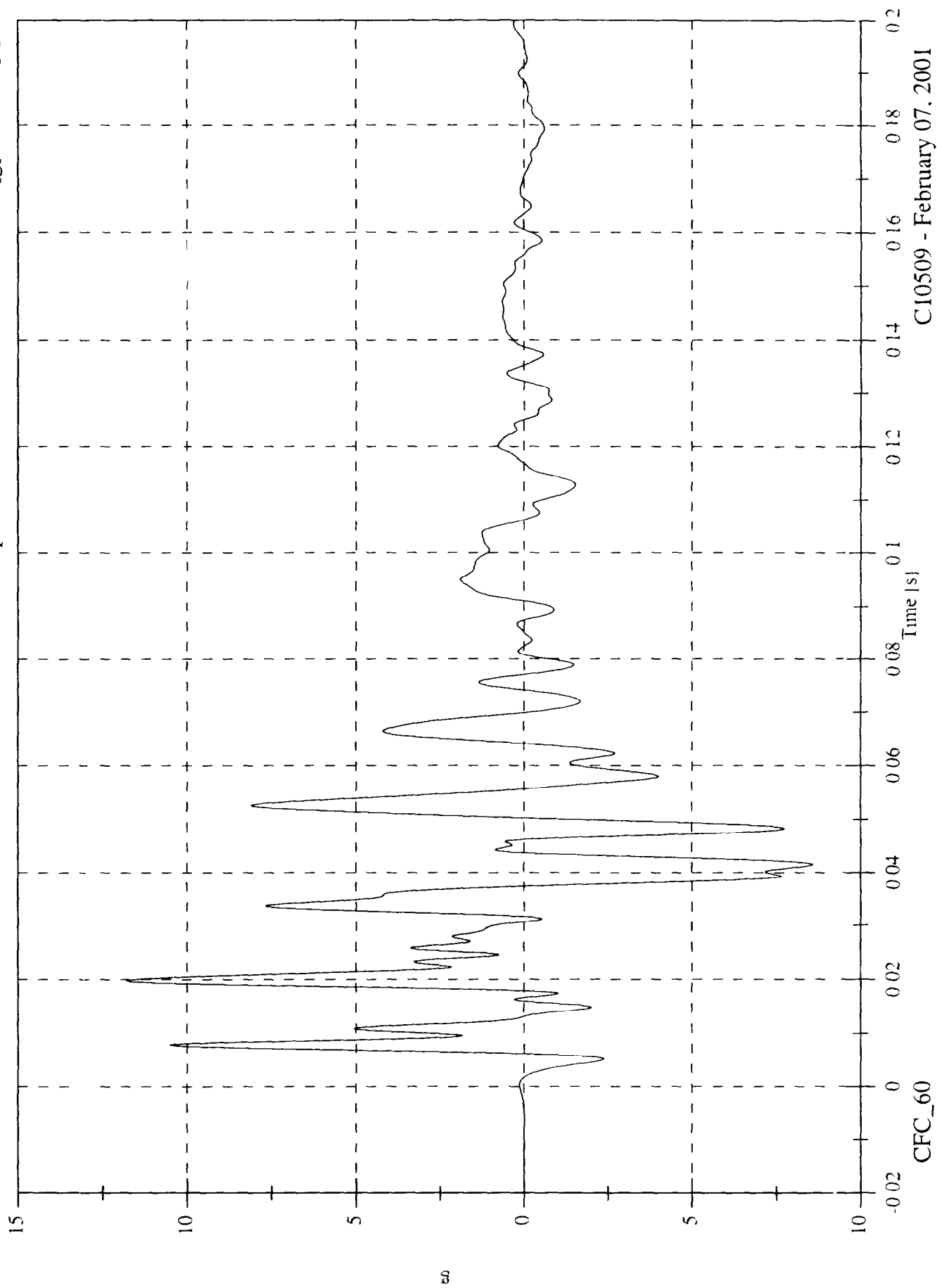
CFC_180

C10509 - February 07, 2001

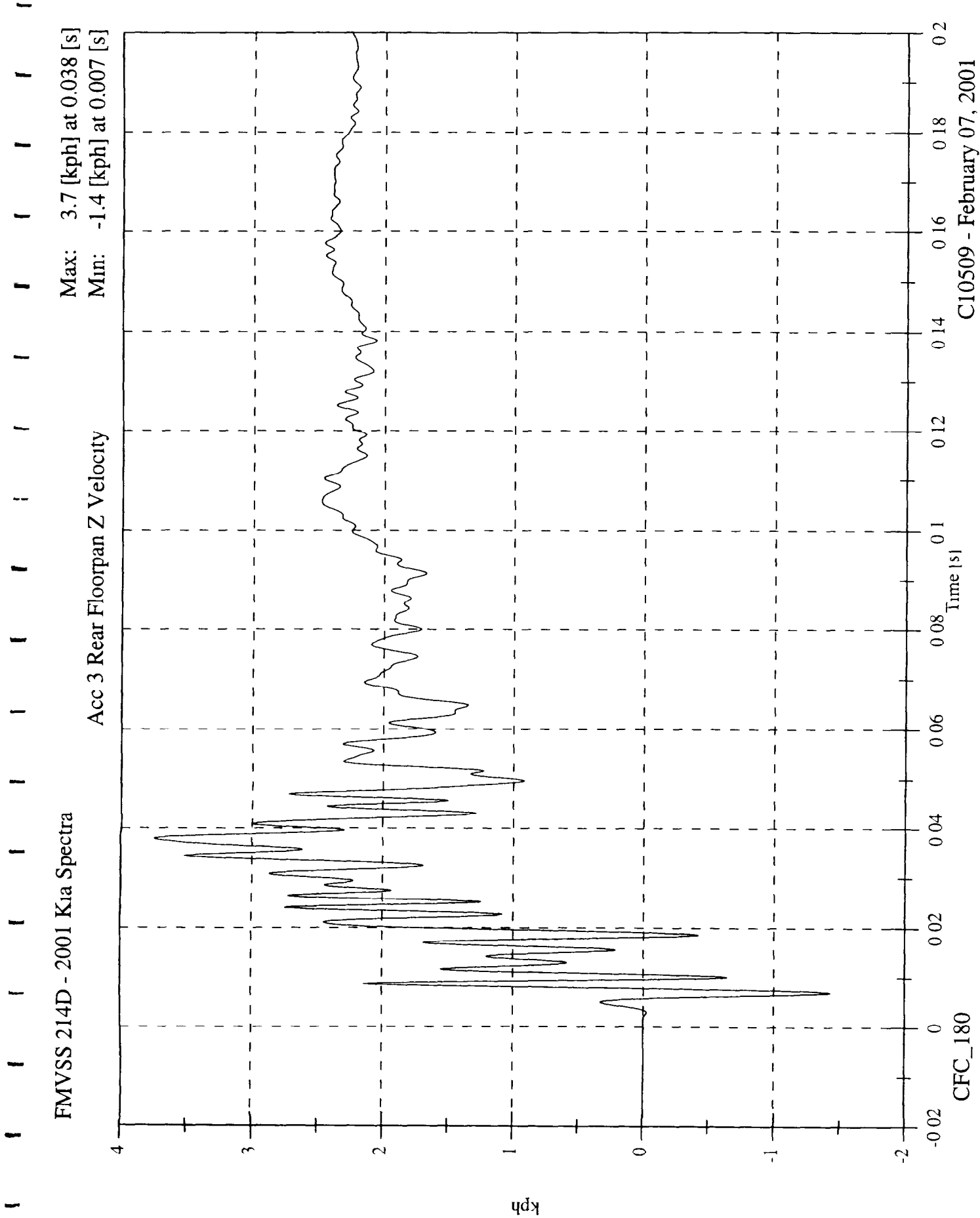
FMVSS 214D - 2001 Kia Spectra

Acc 3 Rear Floorpan Z

Max: 11.8 [g] at 0.020 [s]
Min: -8.6 [g] at 0.042 [s]



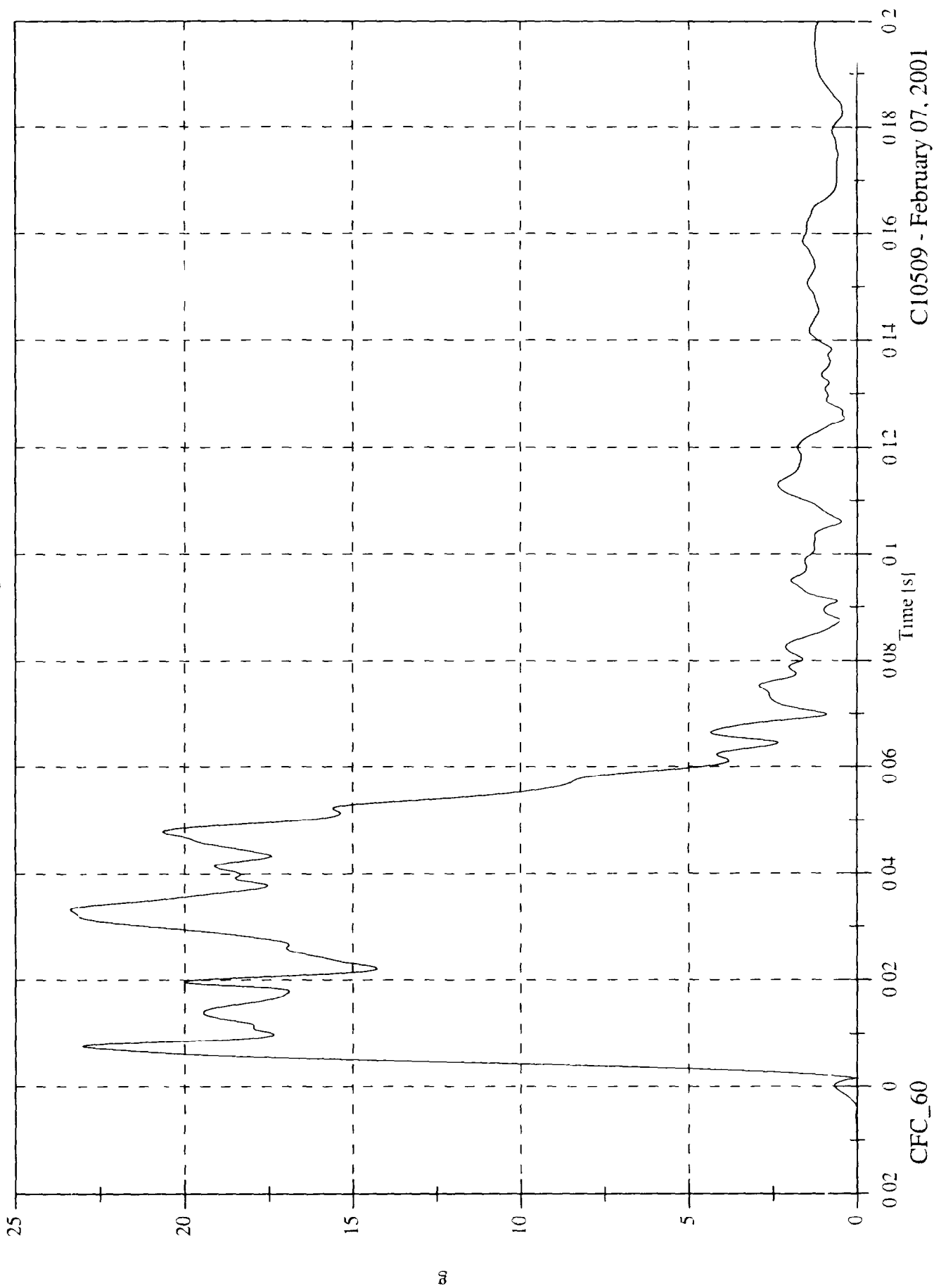
C10509 - February 07, 2001



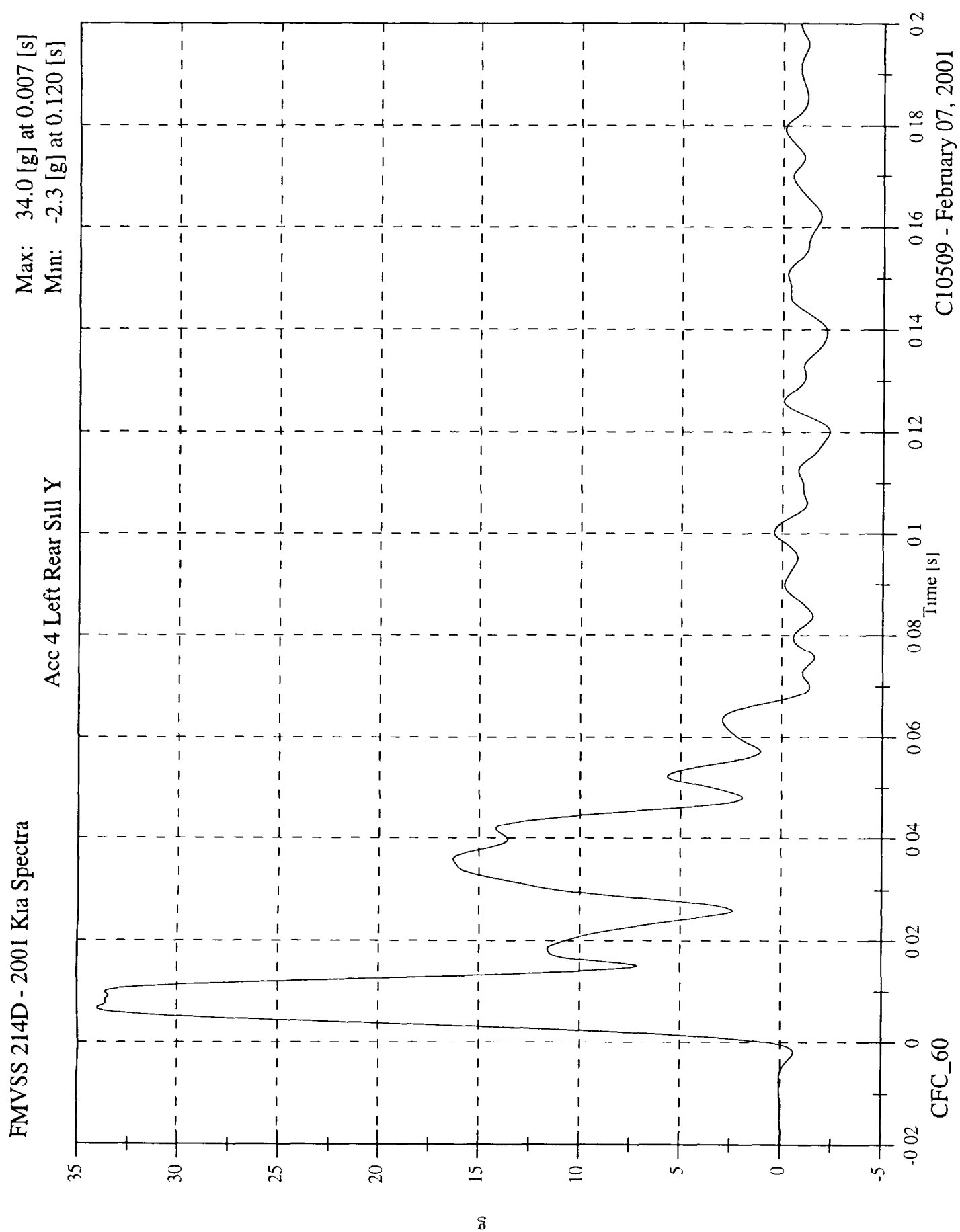
FMVSS 214D - 2001 Kia Spectra

Acc 3 Rear Floorpan Resultant

Max: 23.4 [g] at 0.033 [s]
Min: 0.0 [g] at -0.012 [s]



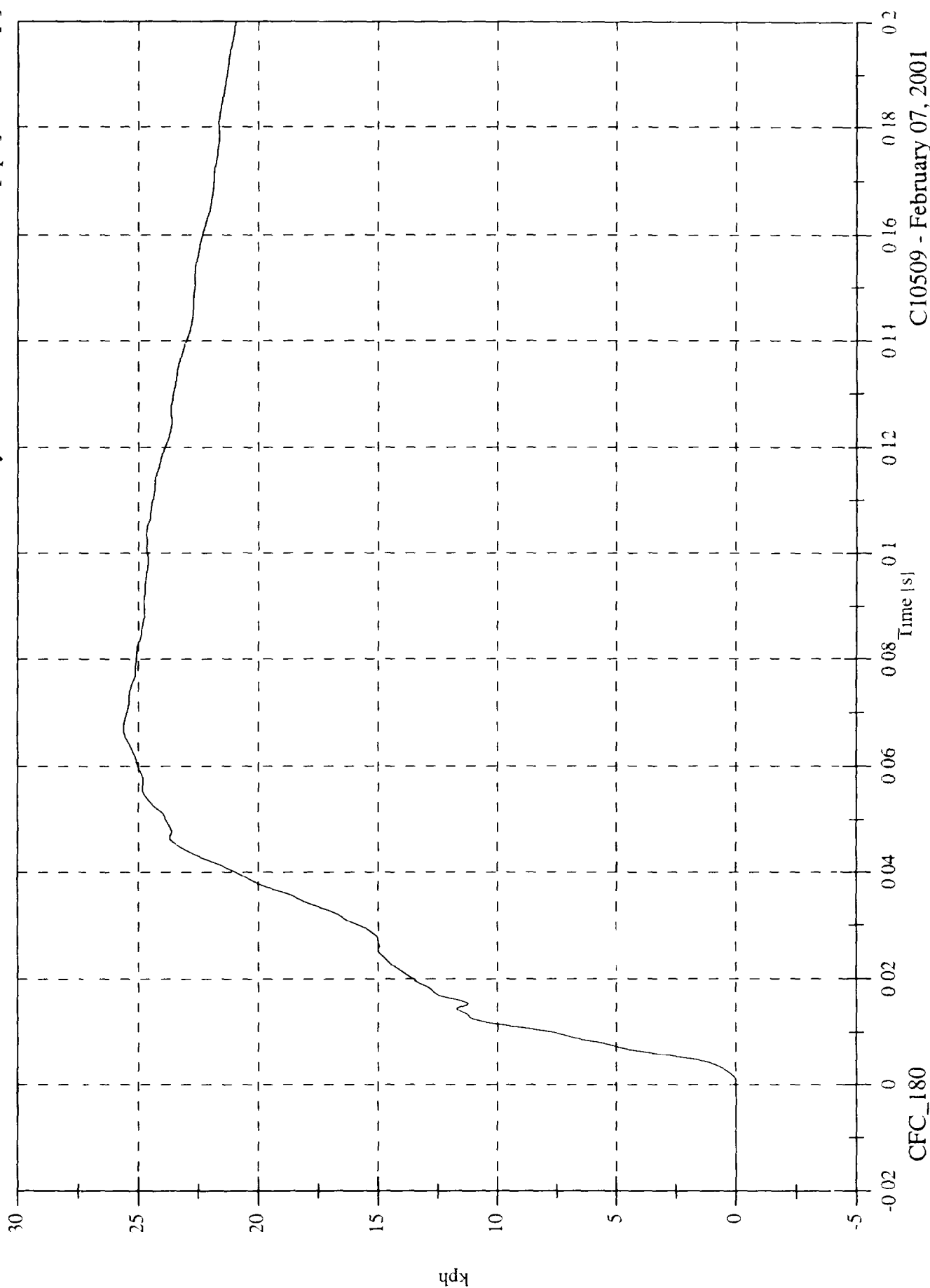
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

Max. 25.6 [kph] at 0.067 [s]
Min. -0.0 [kph] at -0.020 [s]

Acc 4 Left Rear Sill Y Velocity



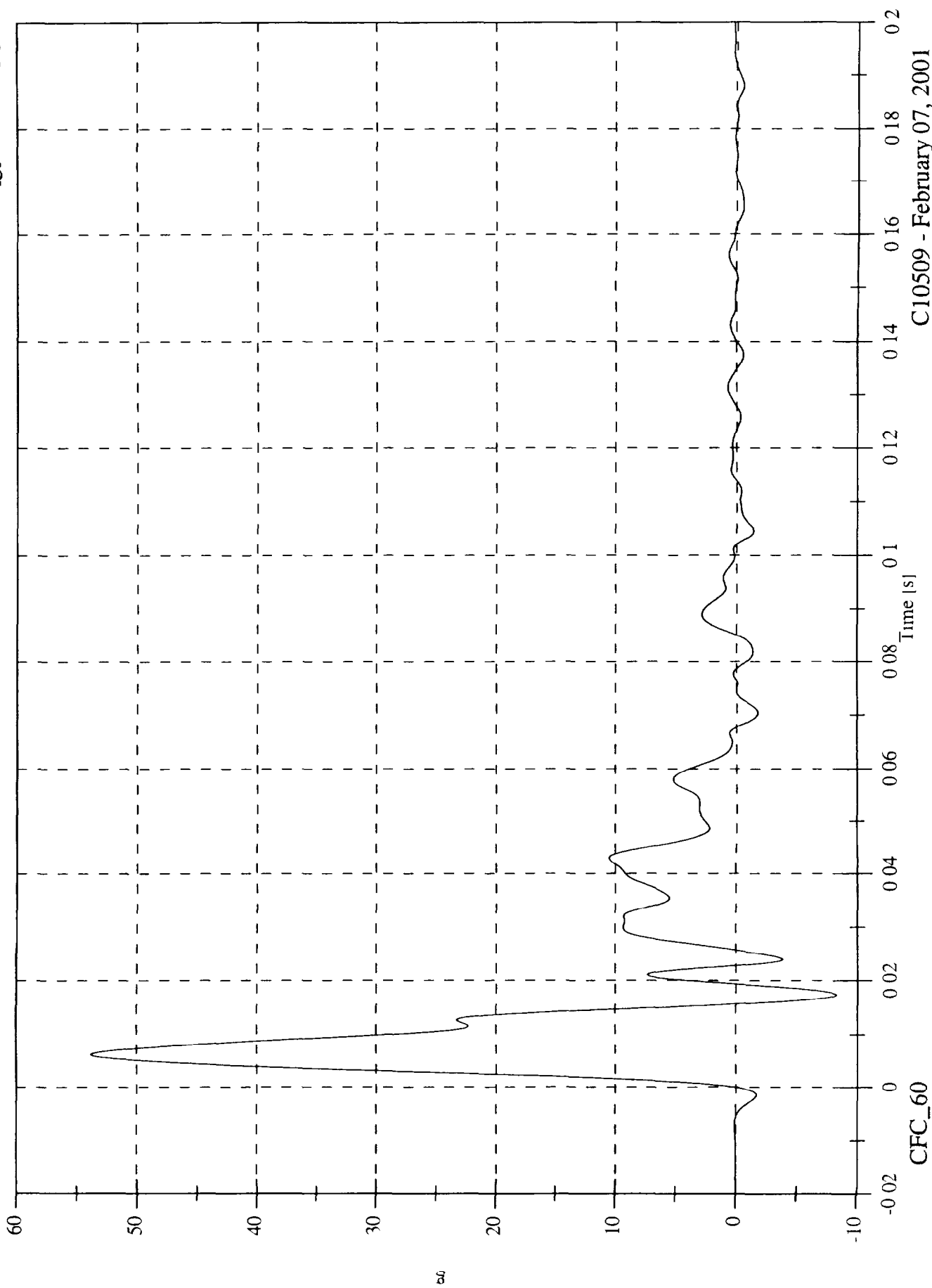
C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

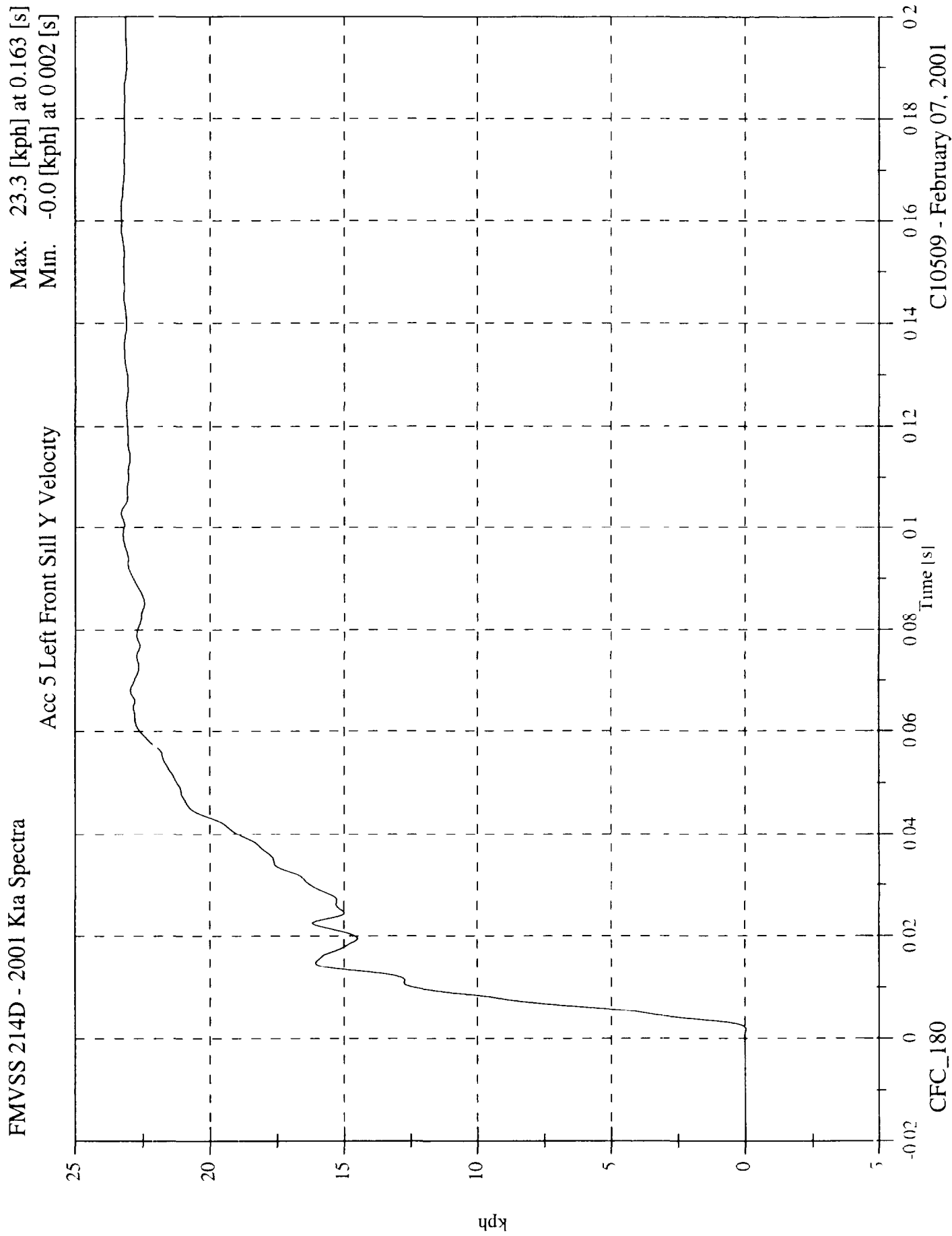
Acc 5 Left Front Sill Y

Max: 53.8 [g] at 0.006 [s]

Min: -8.2 [g] at 0.017 [s]



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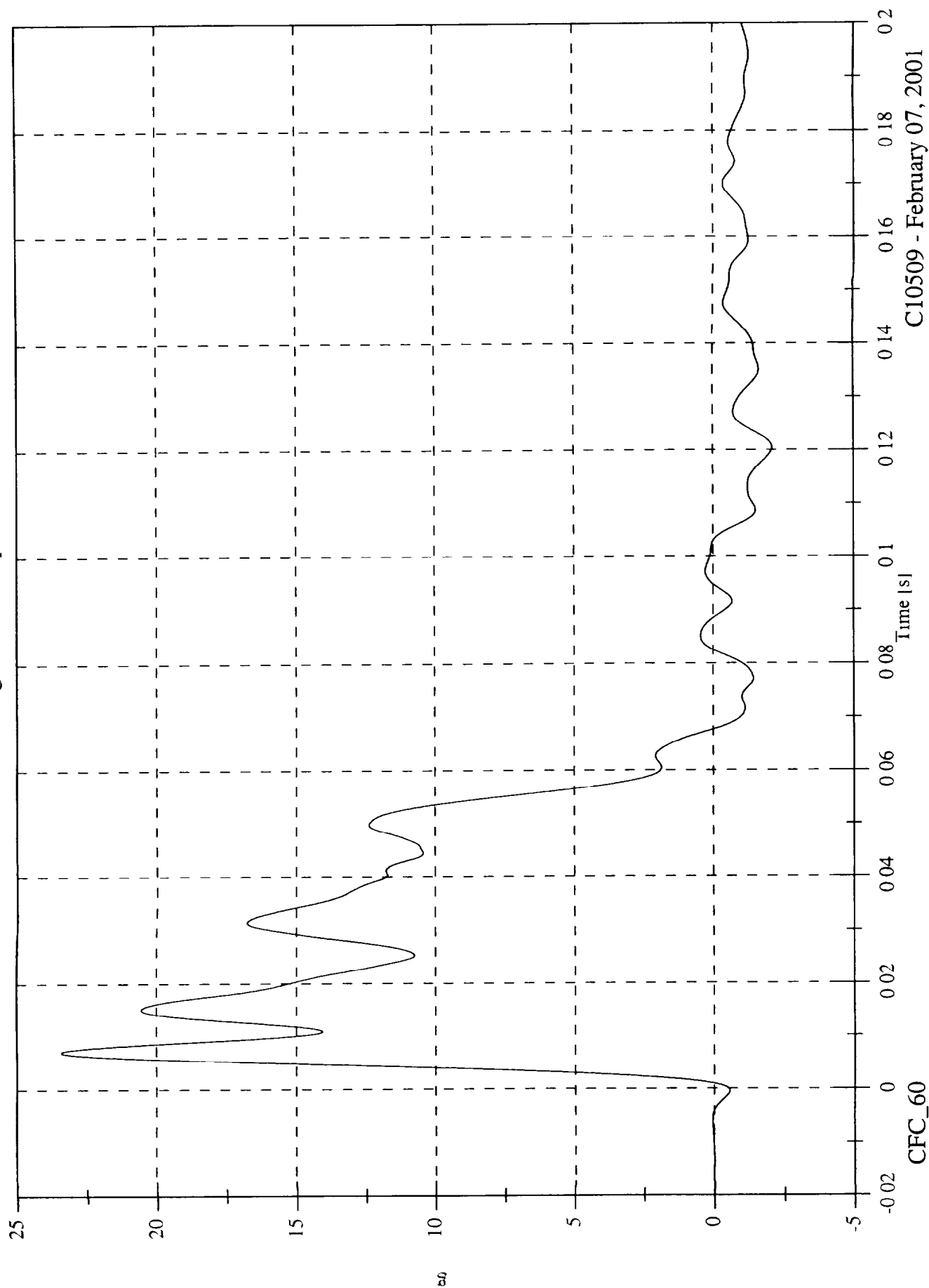


FMVSS 214D - 2001 Kia Spectra

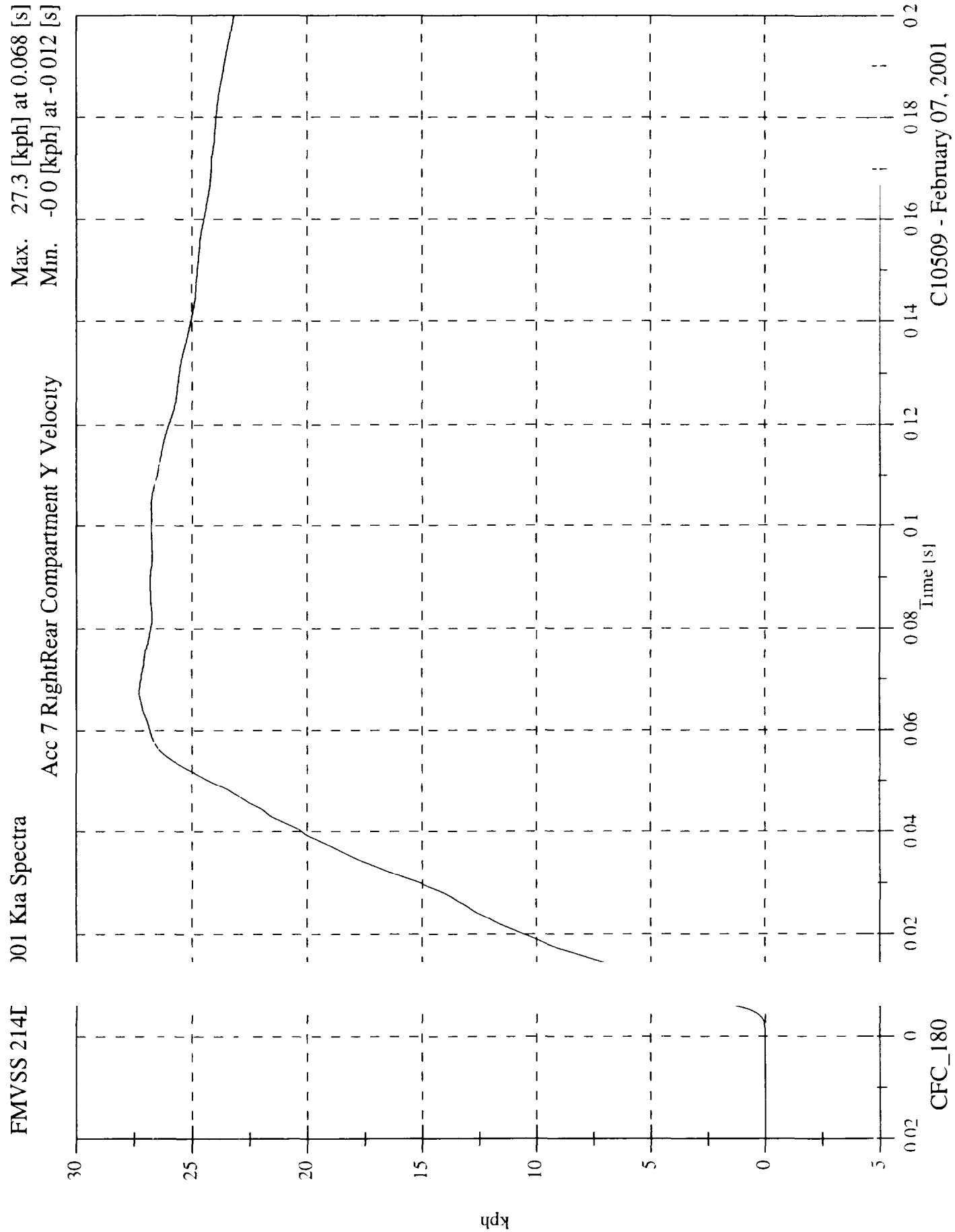
Acc 7 RightRear Compartment Y

Max: 23.4 [g] at 0.007 [s]

Min: -2.1 [g] at 0.120 [s]



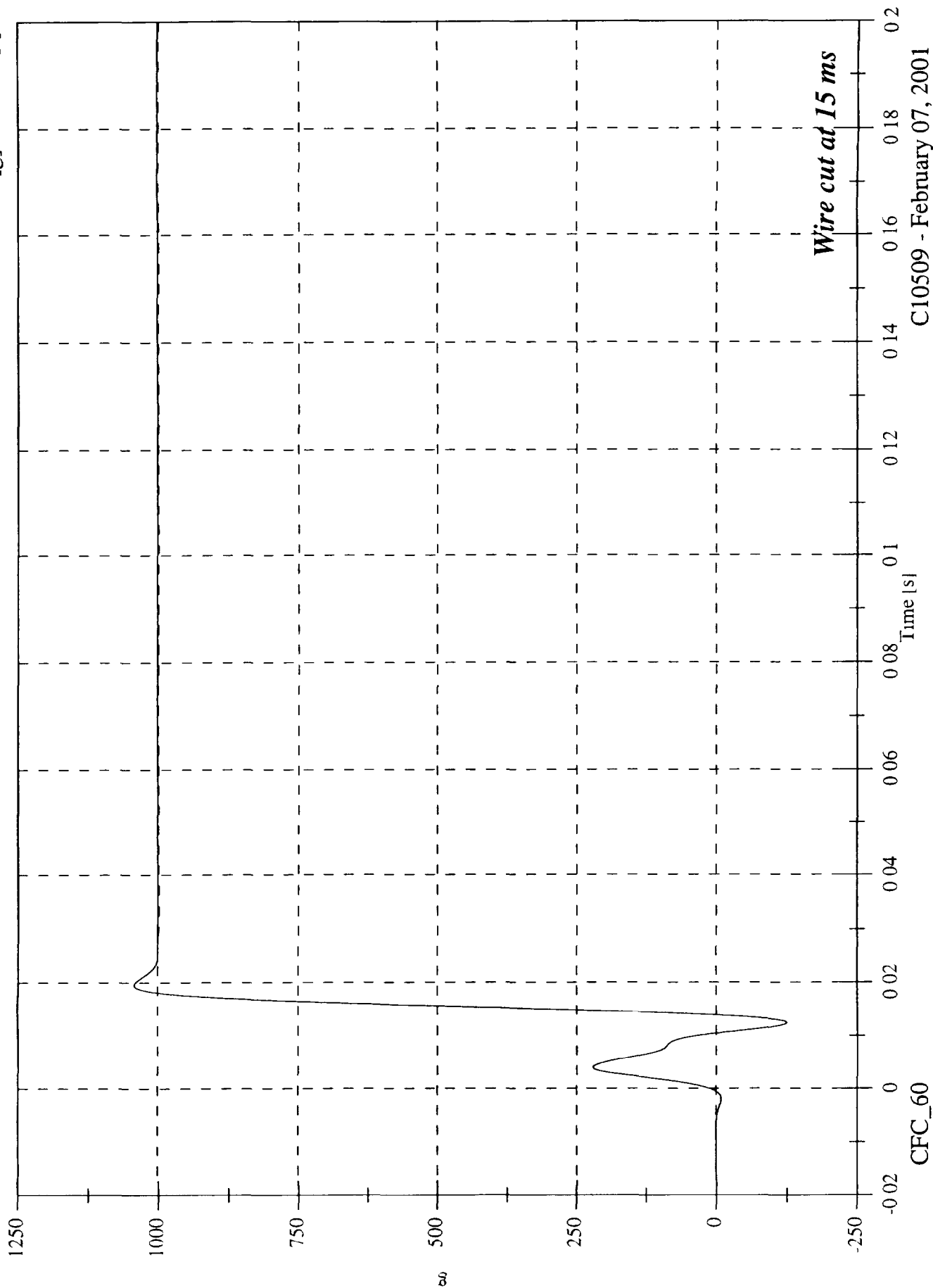
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

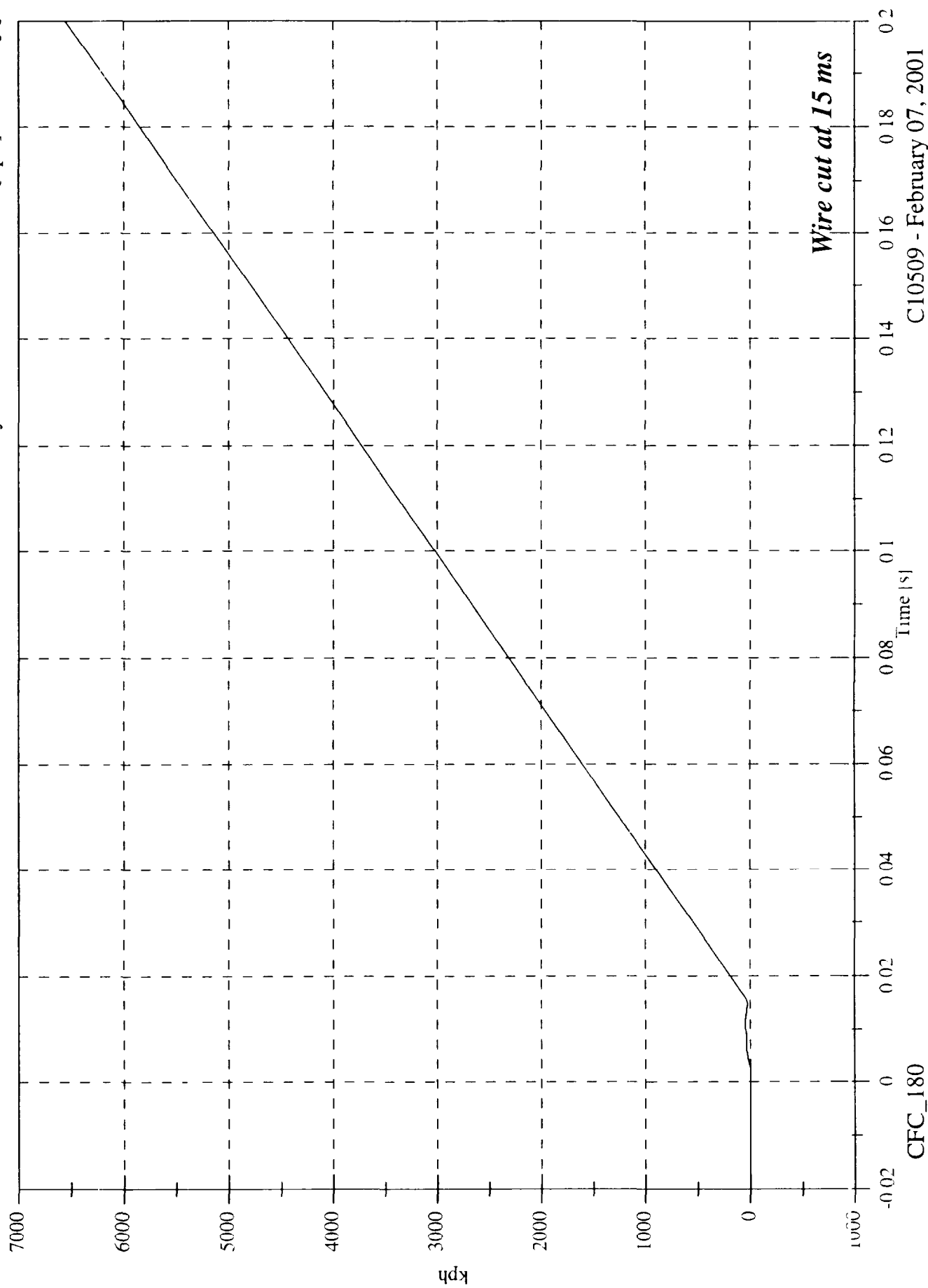
Acc 12 Left Lower B Post Y

Max: 1041.6 [g] at 0.020 [s]
Min: -125.2 [g] at 0.012 [s]



CFC_60

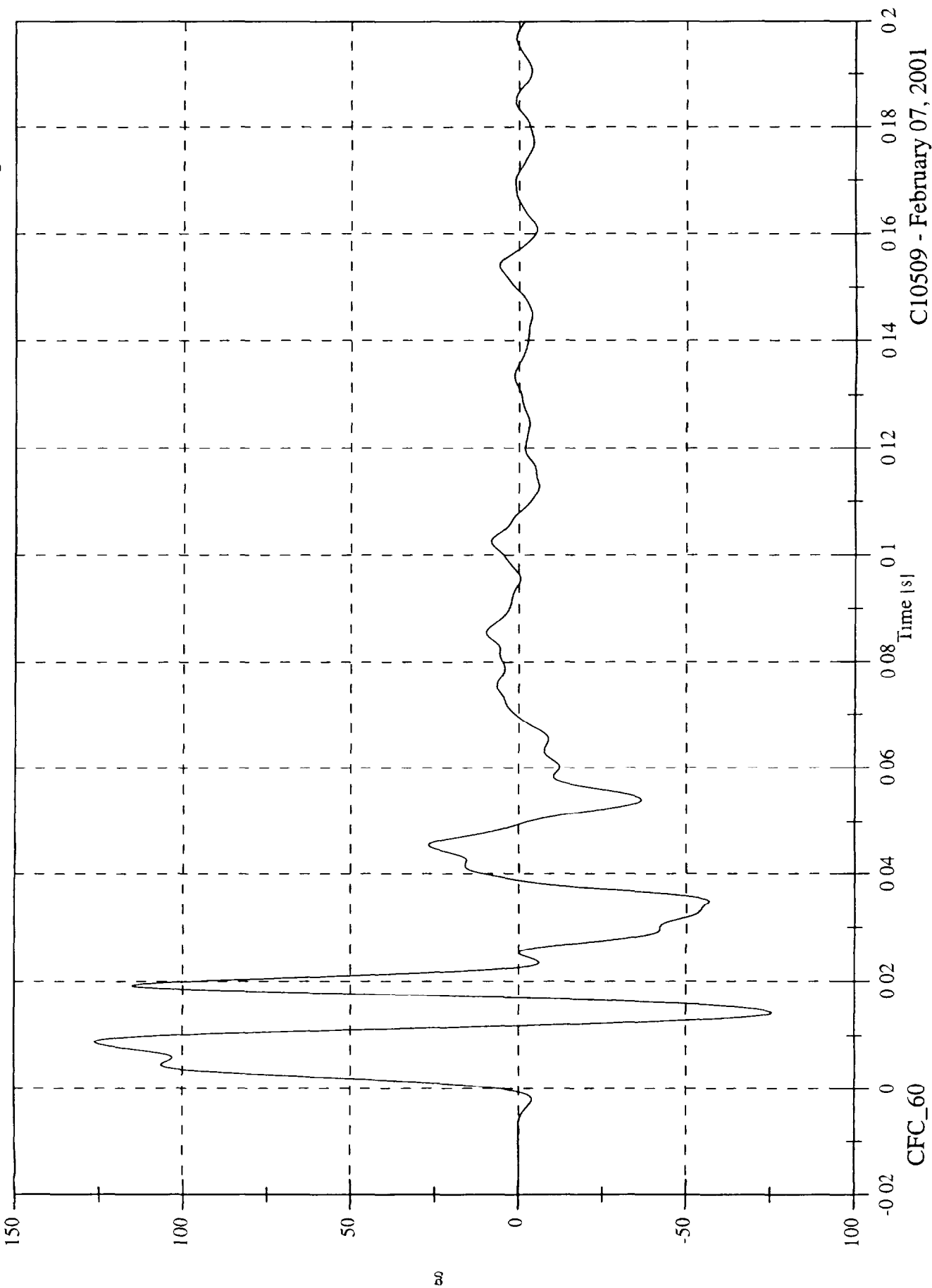
C10509 - February 07, 2001



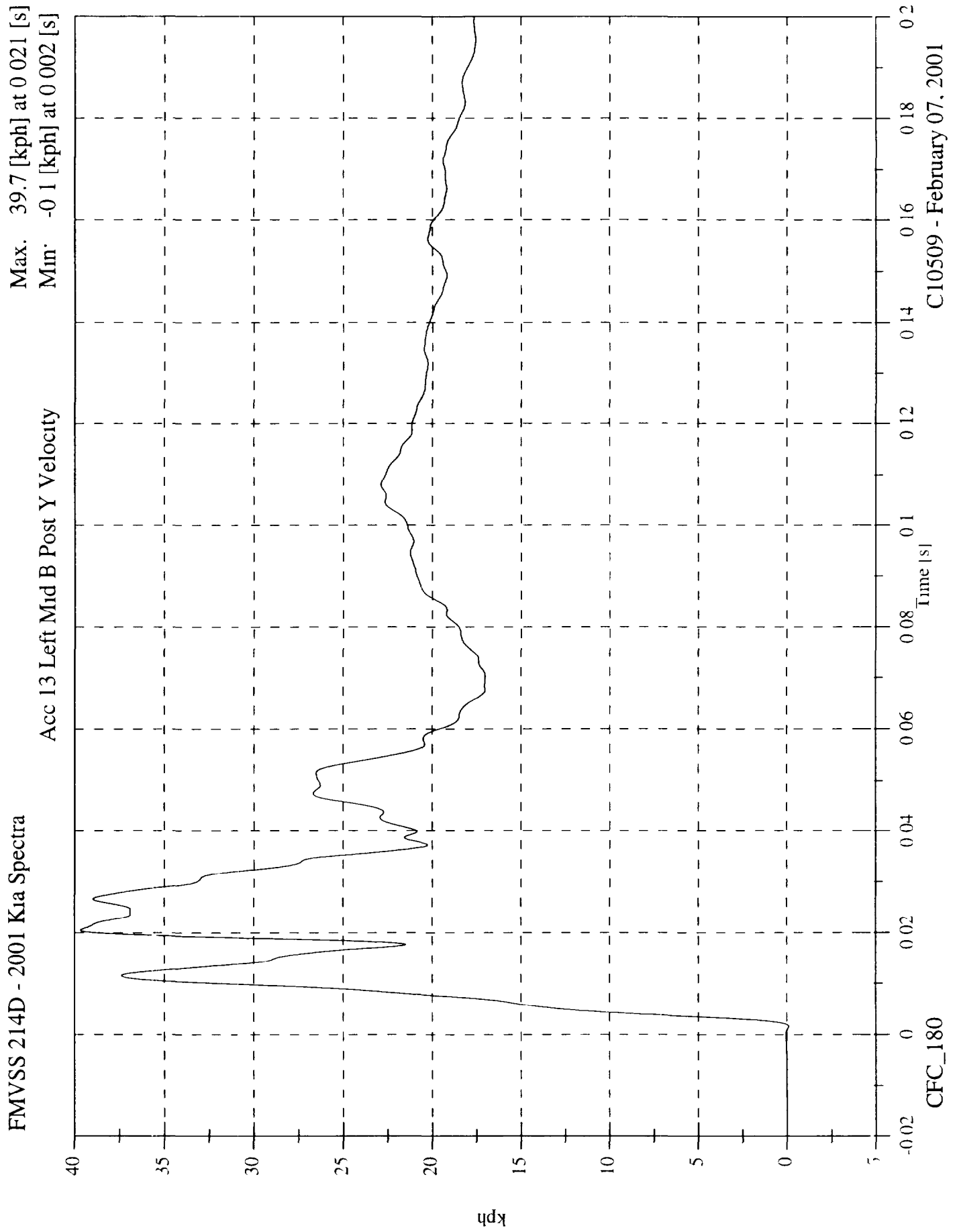
FMVSS 214D - 2001 Kia Spectra

Acc 13 Left Mid B Post Y

Max: 126.0 [g] at 0.009 [s]
Min: -75.6 [g] at 0.014 [s]



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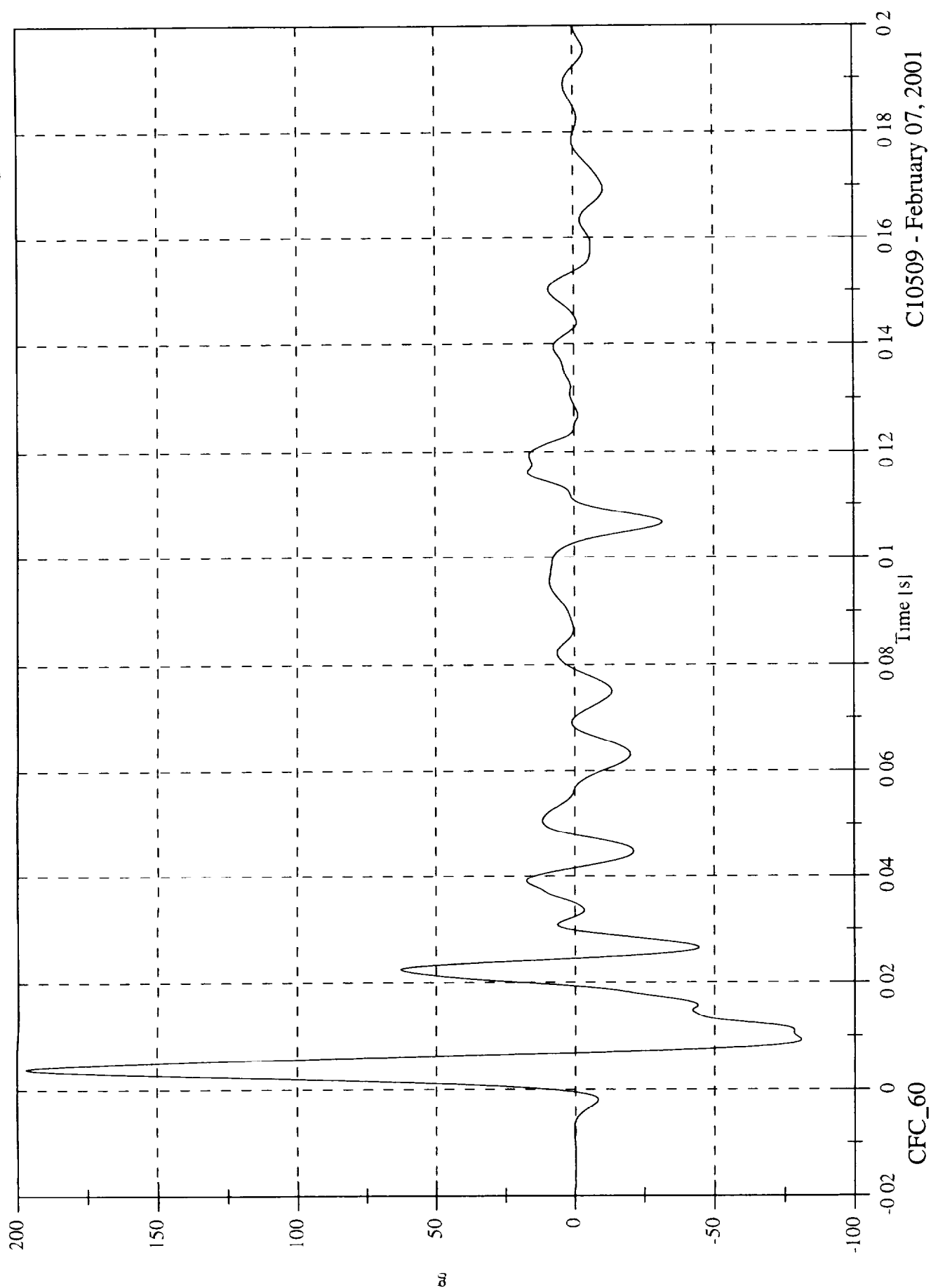


FMVSS 214D - 2001 Kia Spectra

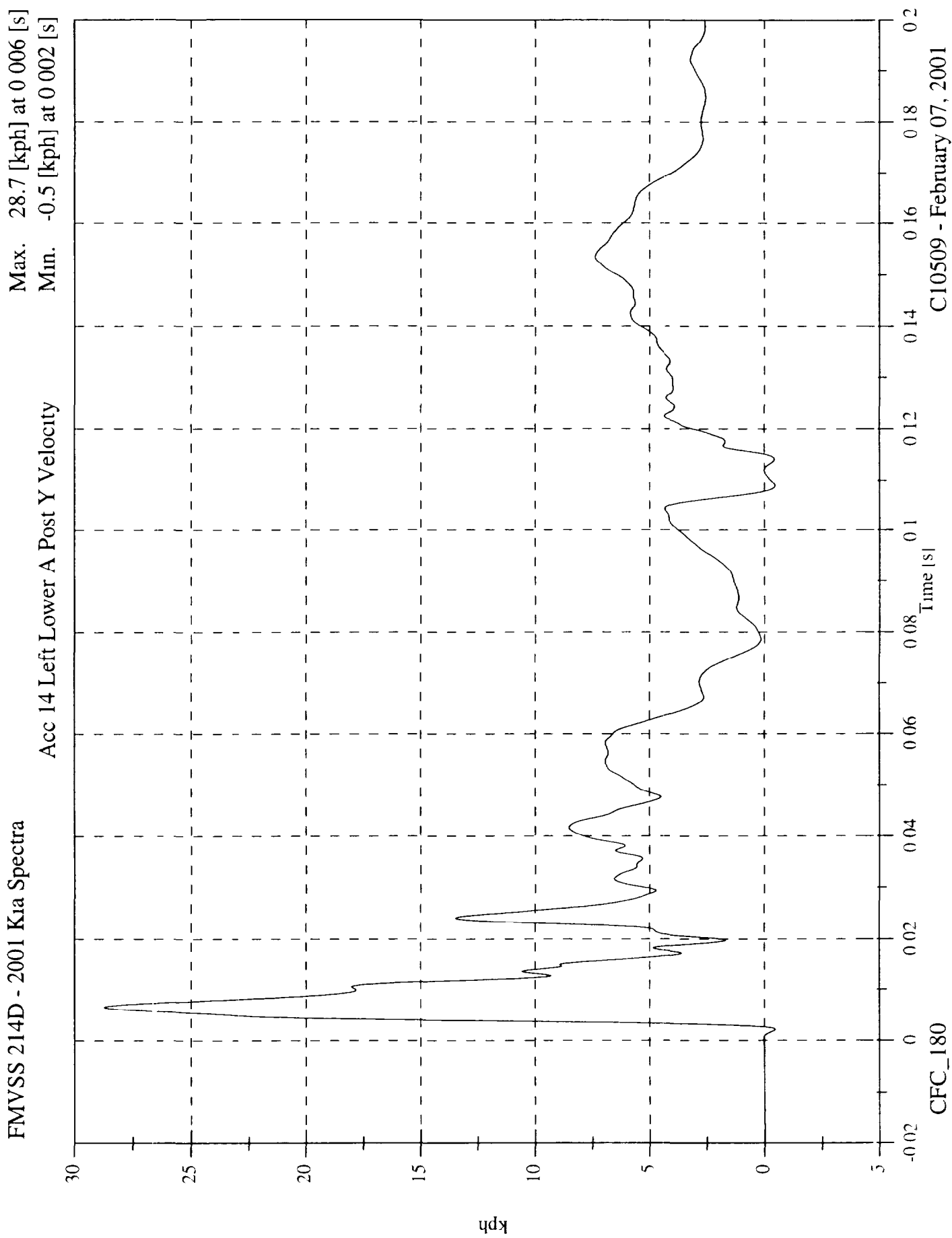
Acc 14 Left Lower A Post Y

Max: 196.8 [g] at 0.004 [s]

Min: -81.1 [g] at 0.009 [s]



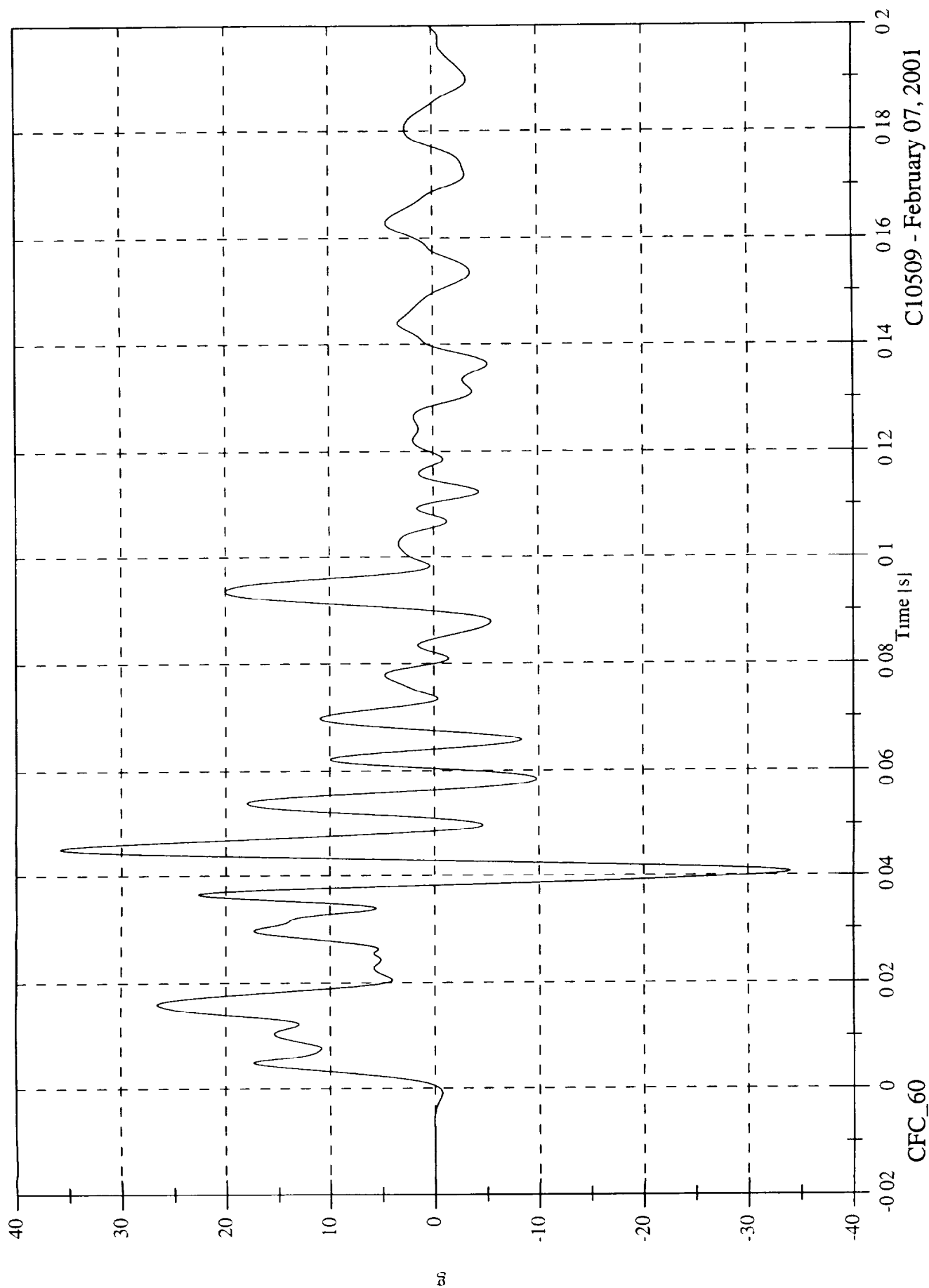
C10509 - February 07, 2001



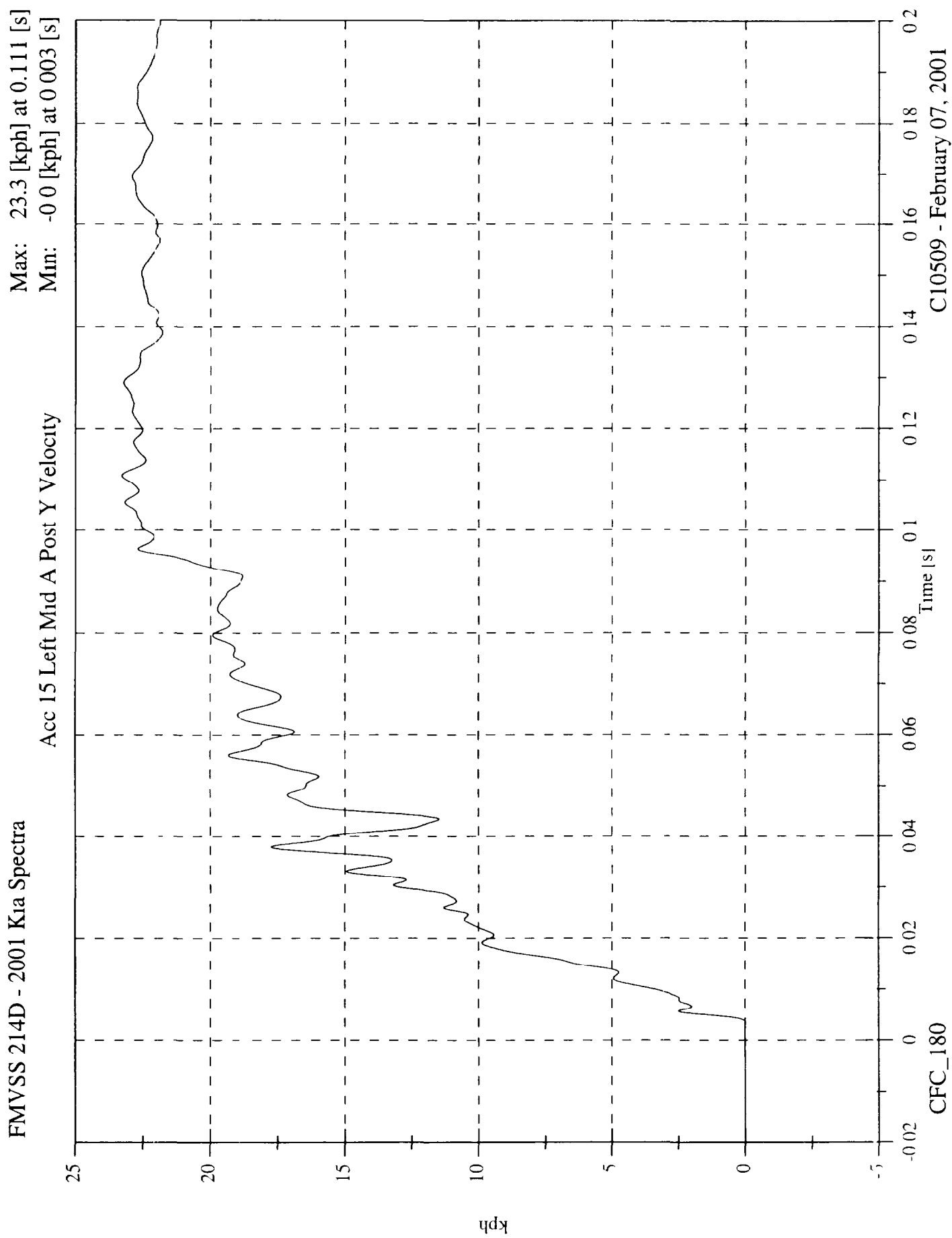
FMVSS 214D - 2001 Kia Spectra

Acc 15 Left Mid A Post Y

Max: 35.8 [g] at 0.045 [s]
Min: -34.0 [g] at 0.041 [s]



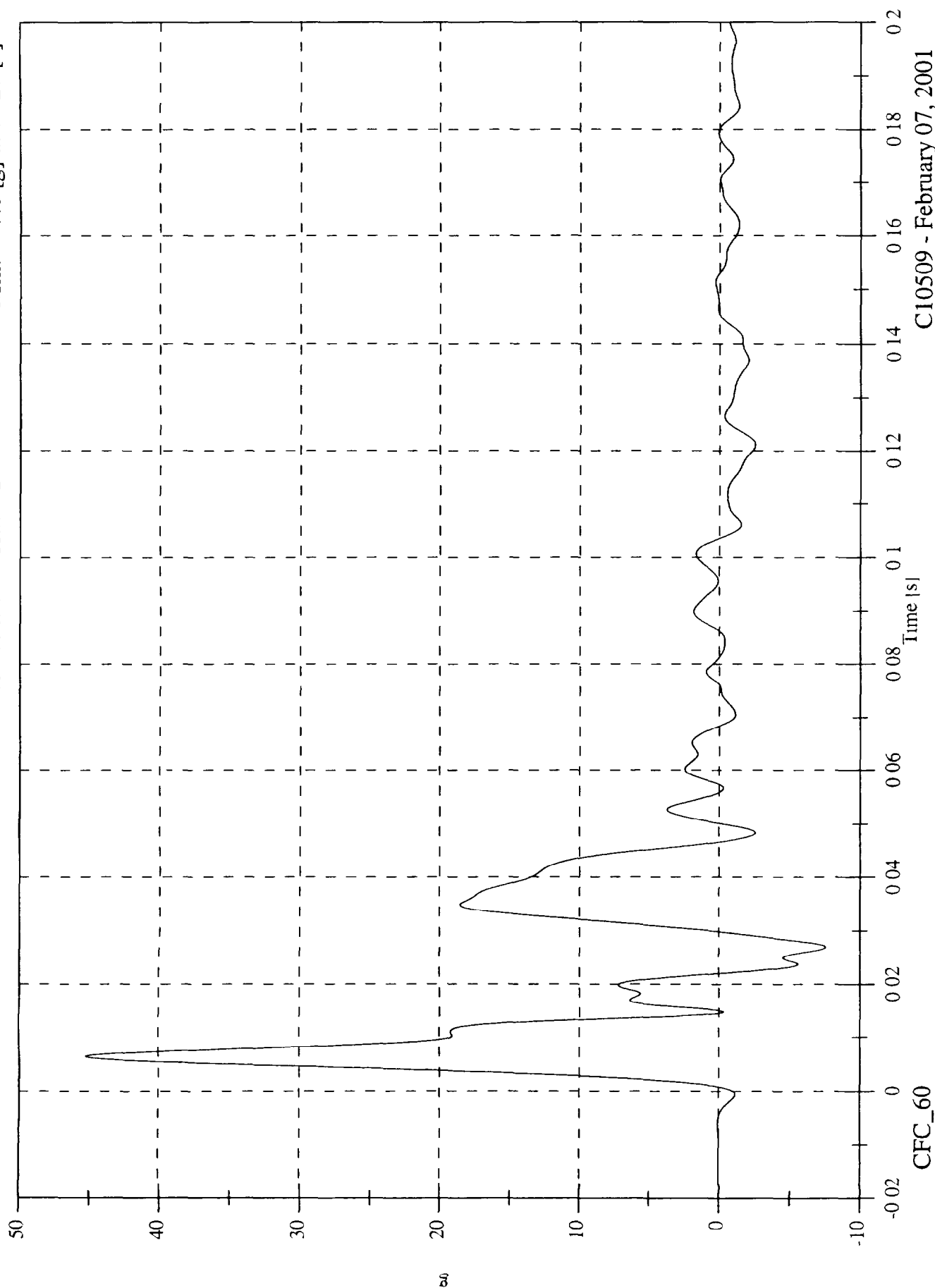
C10509 - February 07, 2001



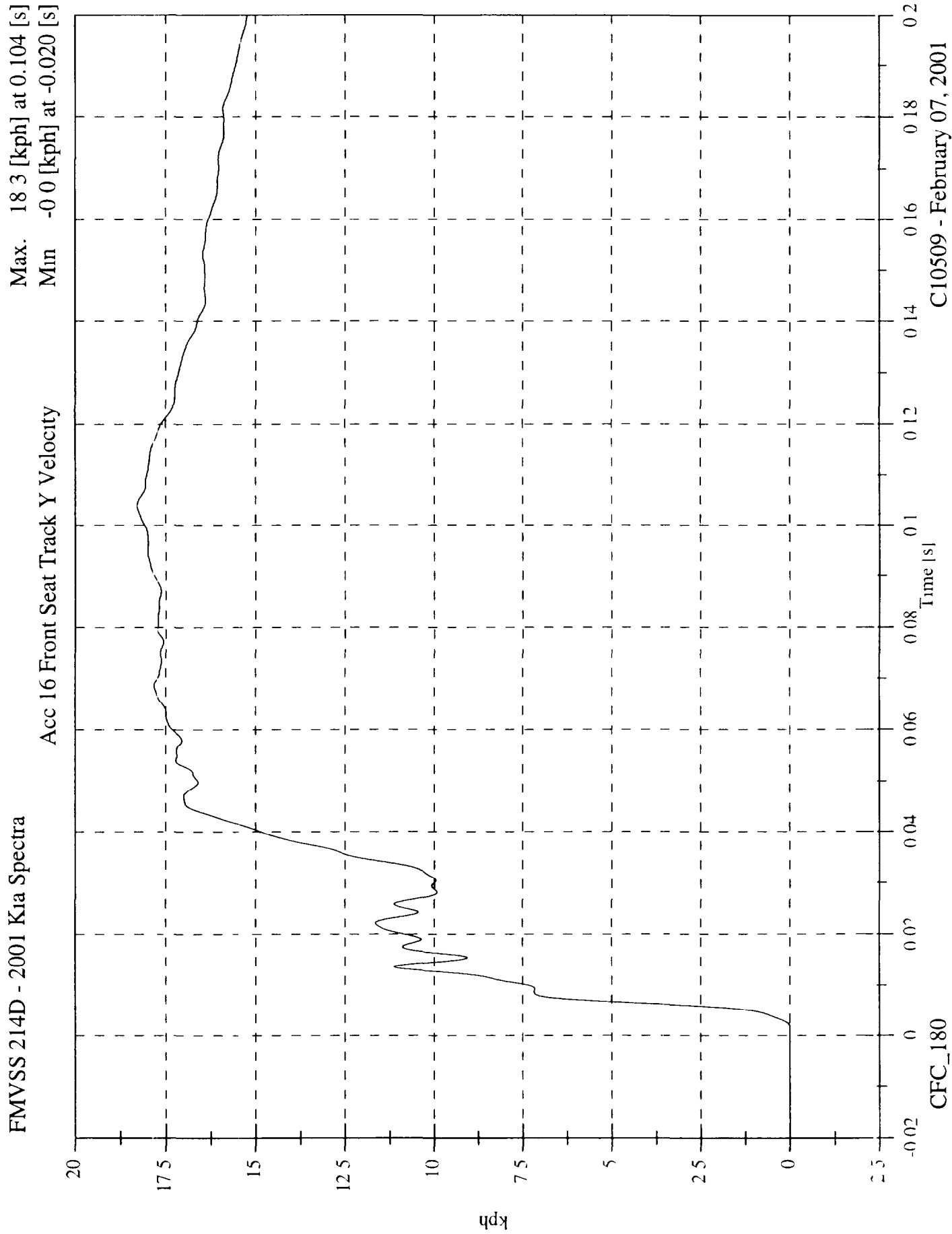
FMVSS 214D - 2001 Kia Spectra

Acc 16 Front Seat Track Y

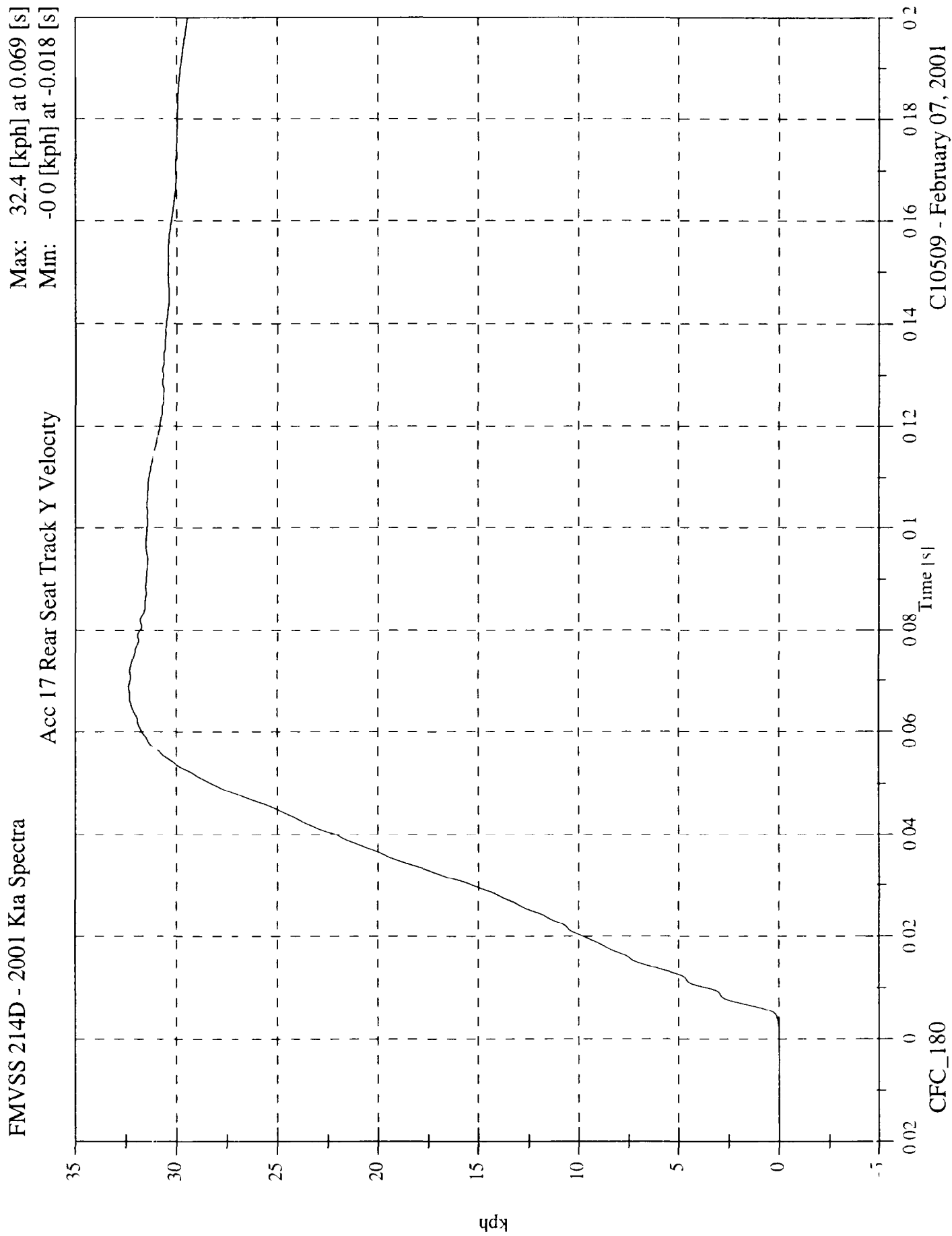
Max: 45.2 [g] at 0.006 [s]
Min: -7.6 [g] at 0.027 [s]



C10509 - February 07, 2001



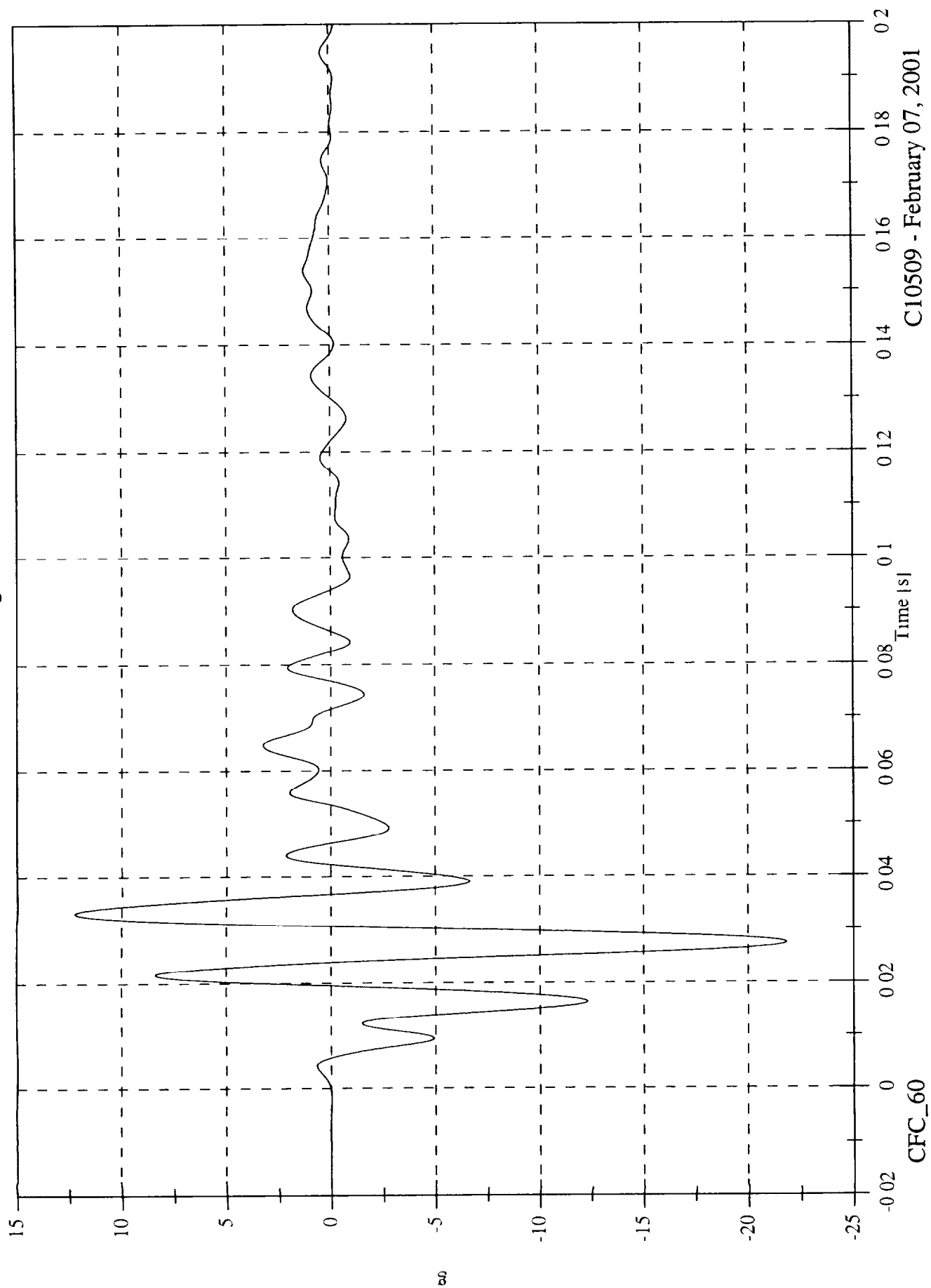




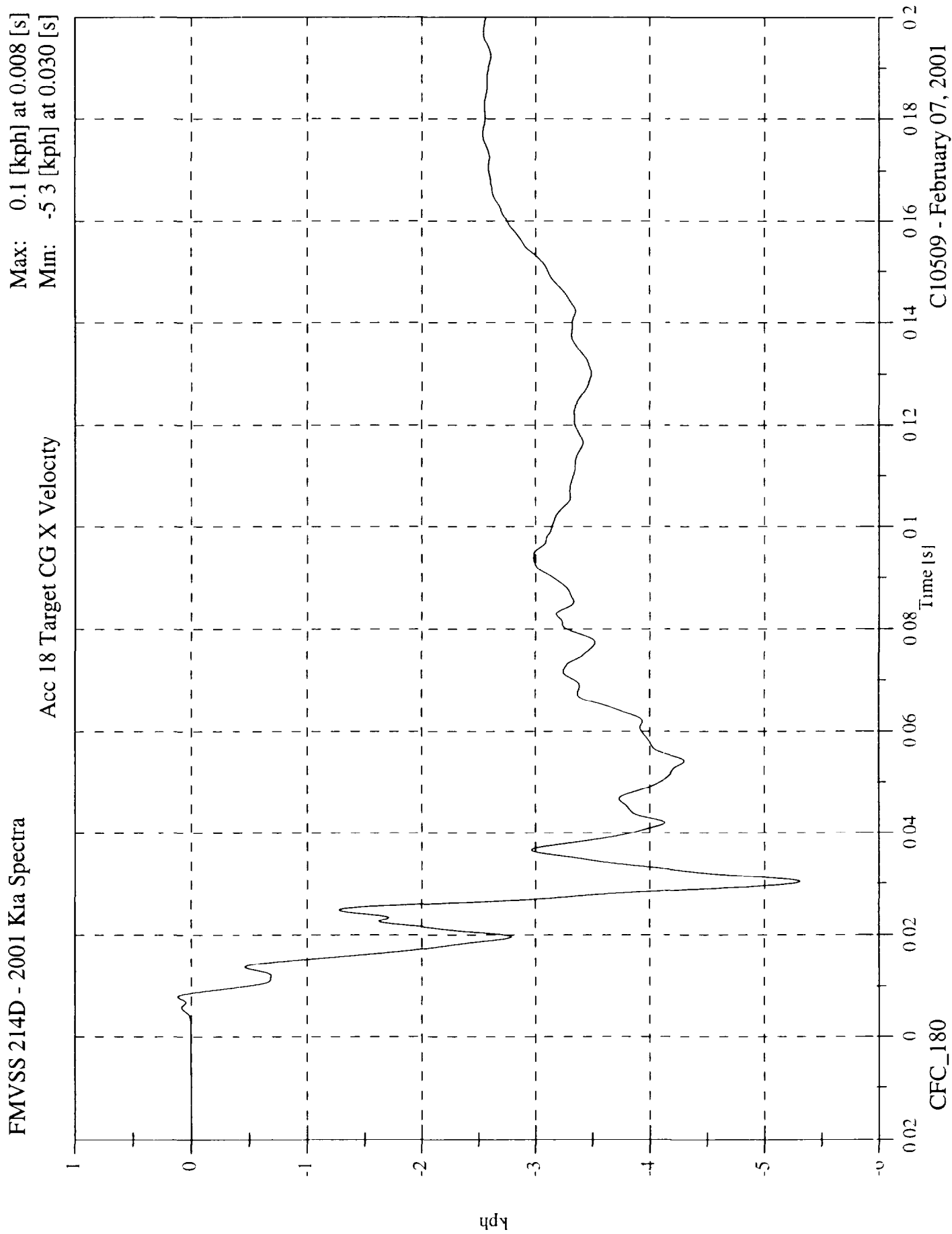
FMVSS 214D - 2001 Kia Spectra

Acc 18 Target CG X

Max: 12.2 [g] at 0.033 [s]
Min: -21.8 [g] at 0.027 [s]



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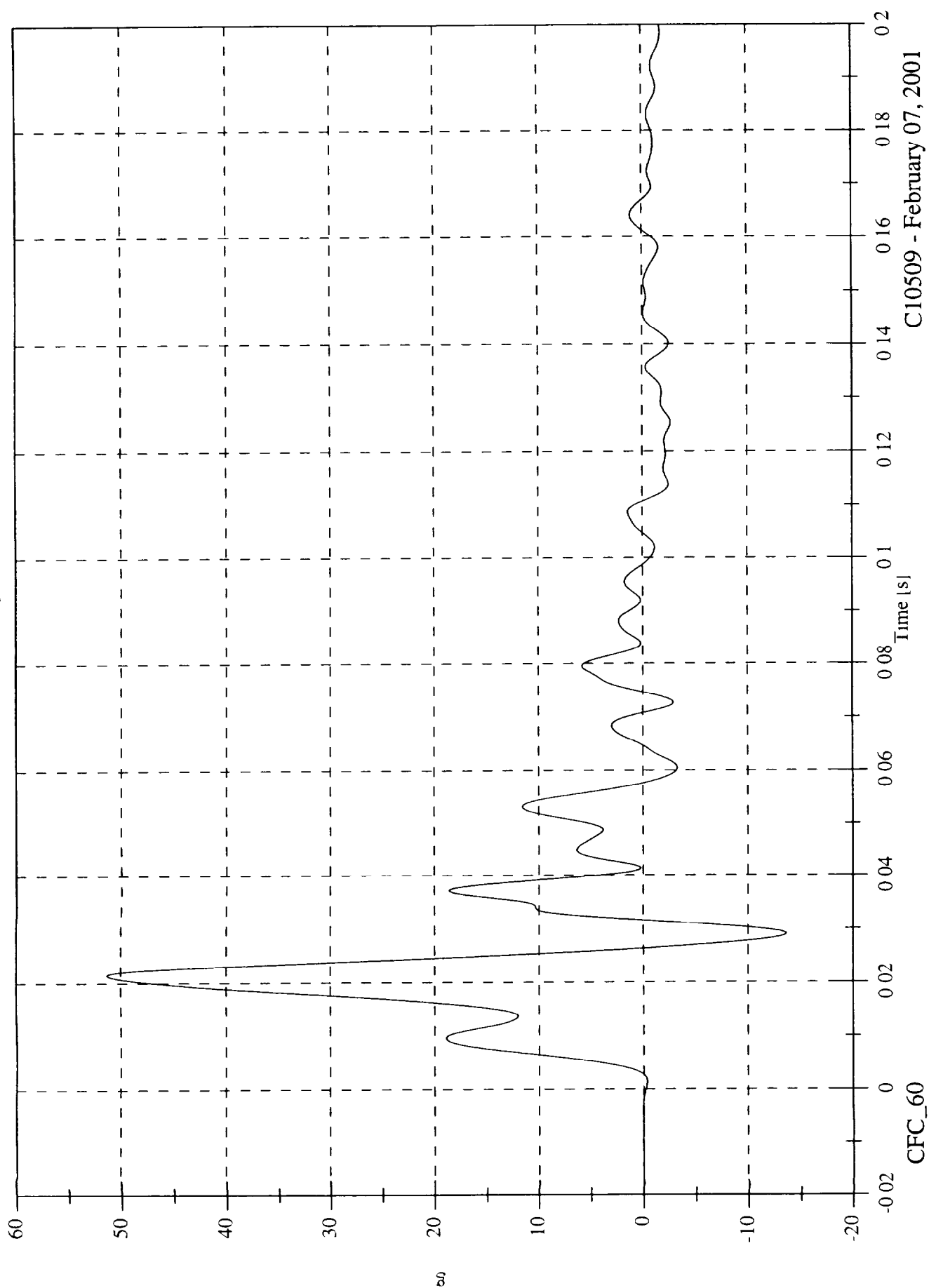


FMVSS 214D - 2001 Kia Spectra

Acc 18 Target CG Y

Max: 51.3 [g] at 0.021 [s]

Min: -13.7 [g] at 0.029 [s]

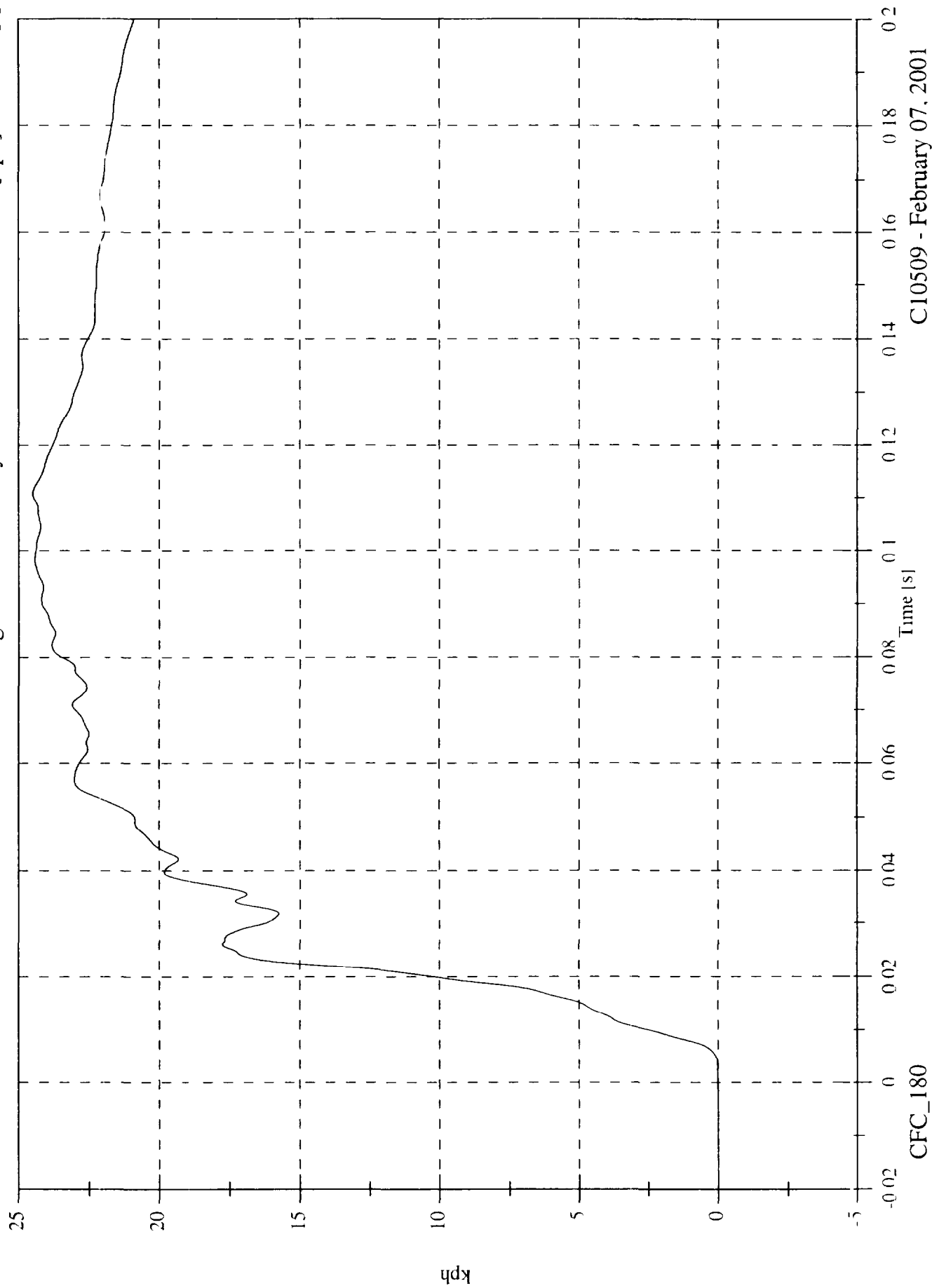


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FMVSS 214D - 2001 Kia Spectra

Max: 24.5 [kph] at 0.111 [s]
Min: -0.0 [kph] at -0.020 [s]

Acc 18 Target CG Y Velocity



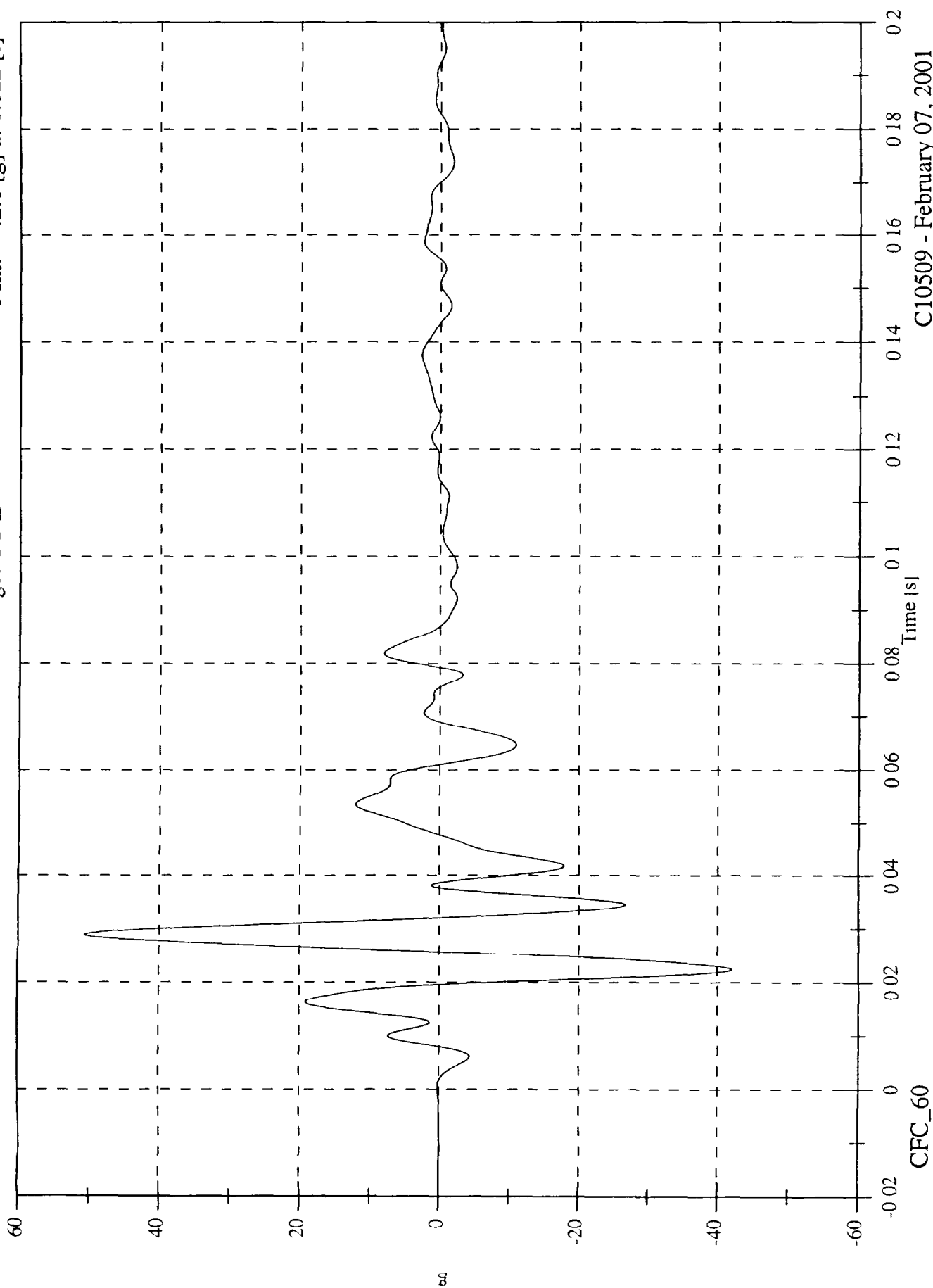
CFC_180

C10509 - February 07, 2001

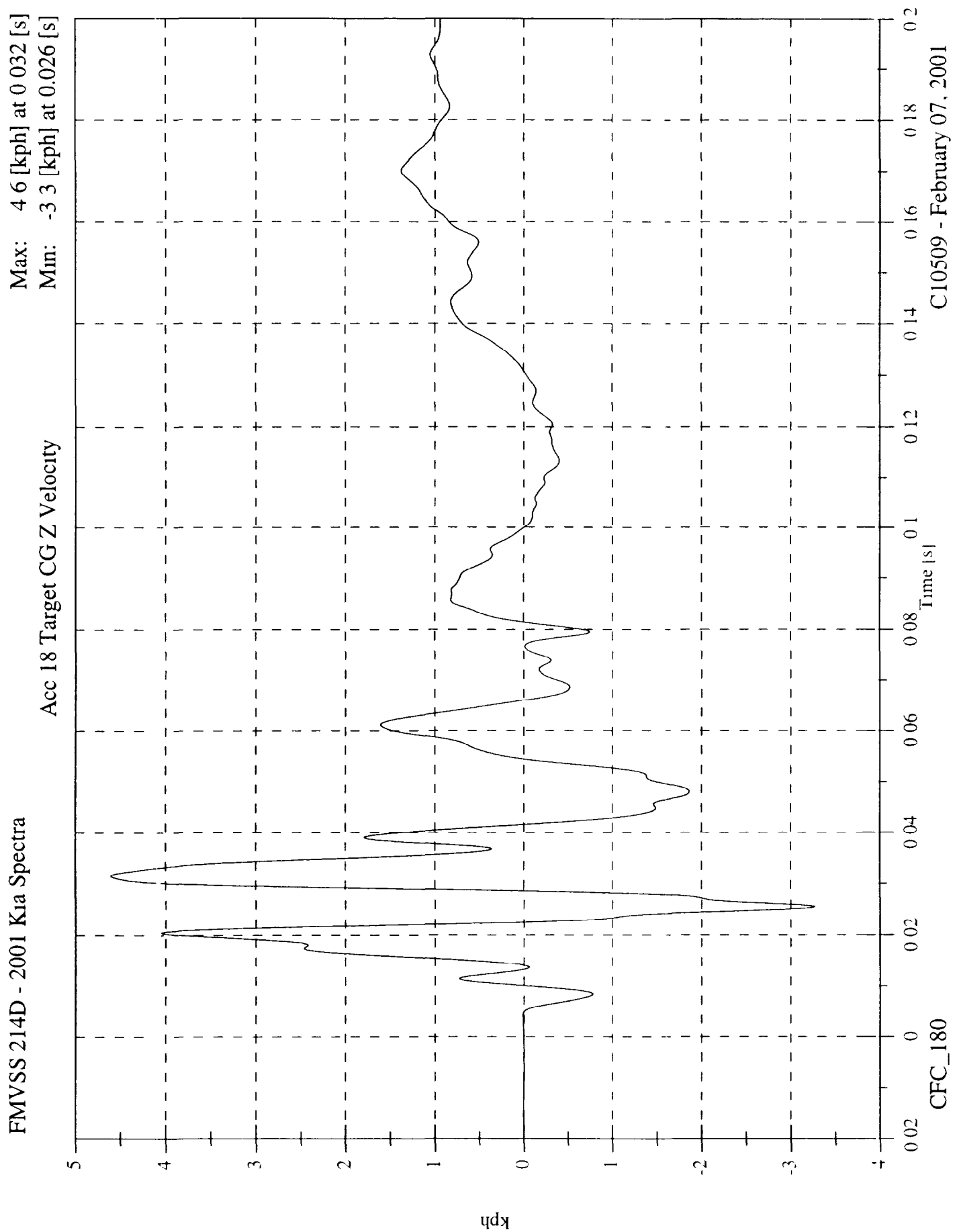
FMVSS 214D - 2001 Kia Spectra

Acc 18 Target CG Z

Max: 50.6 [g] at 0.029 [s]
Min: -42.0 [g] at 0.022 [s]



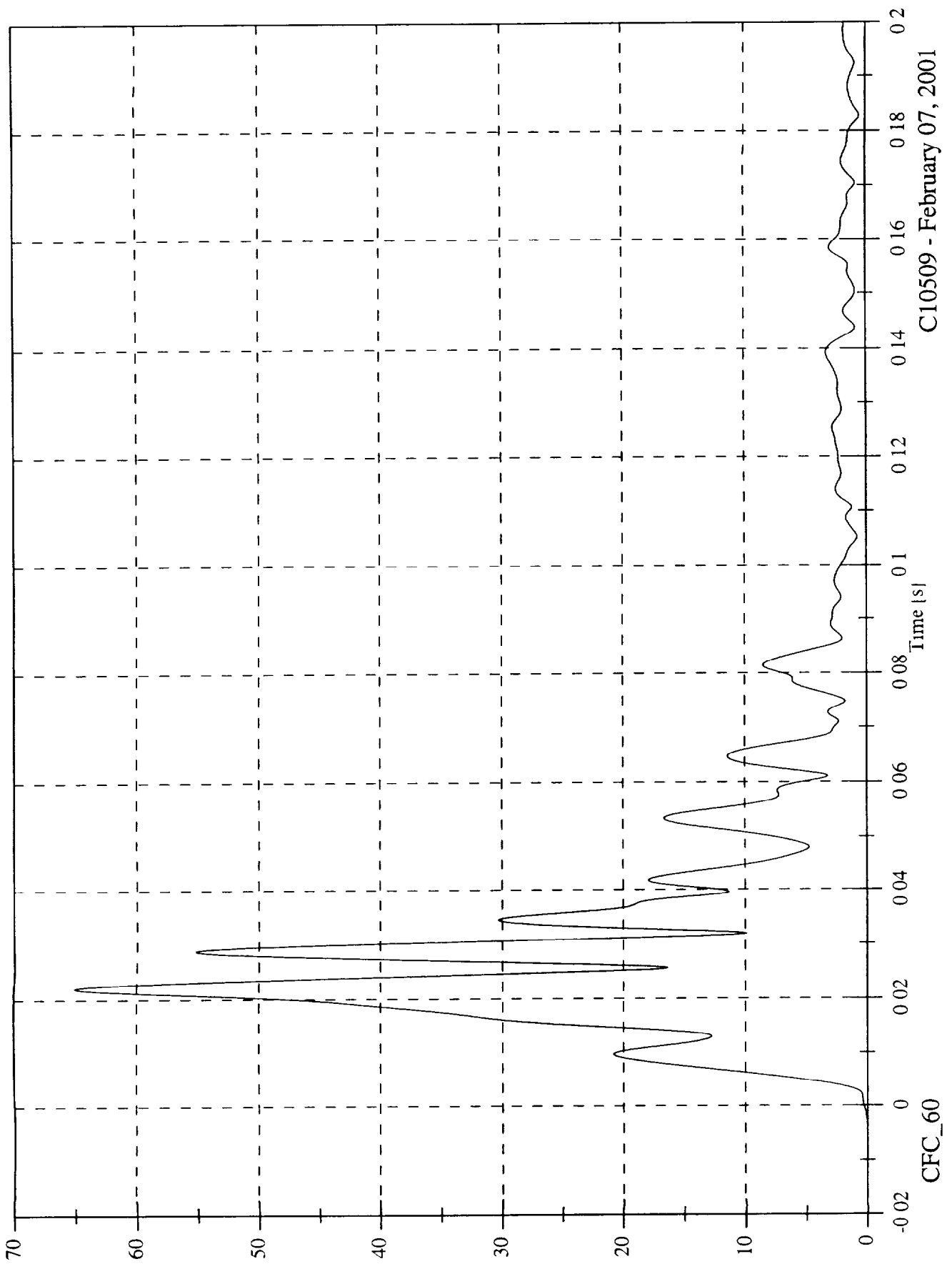
C10509 - February 07, 2001



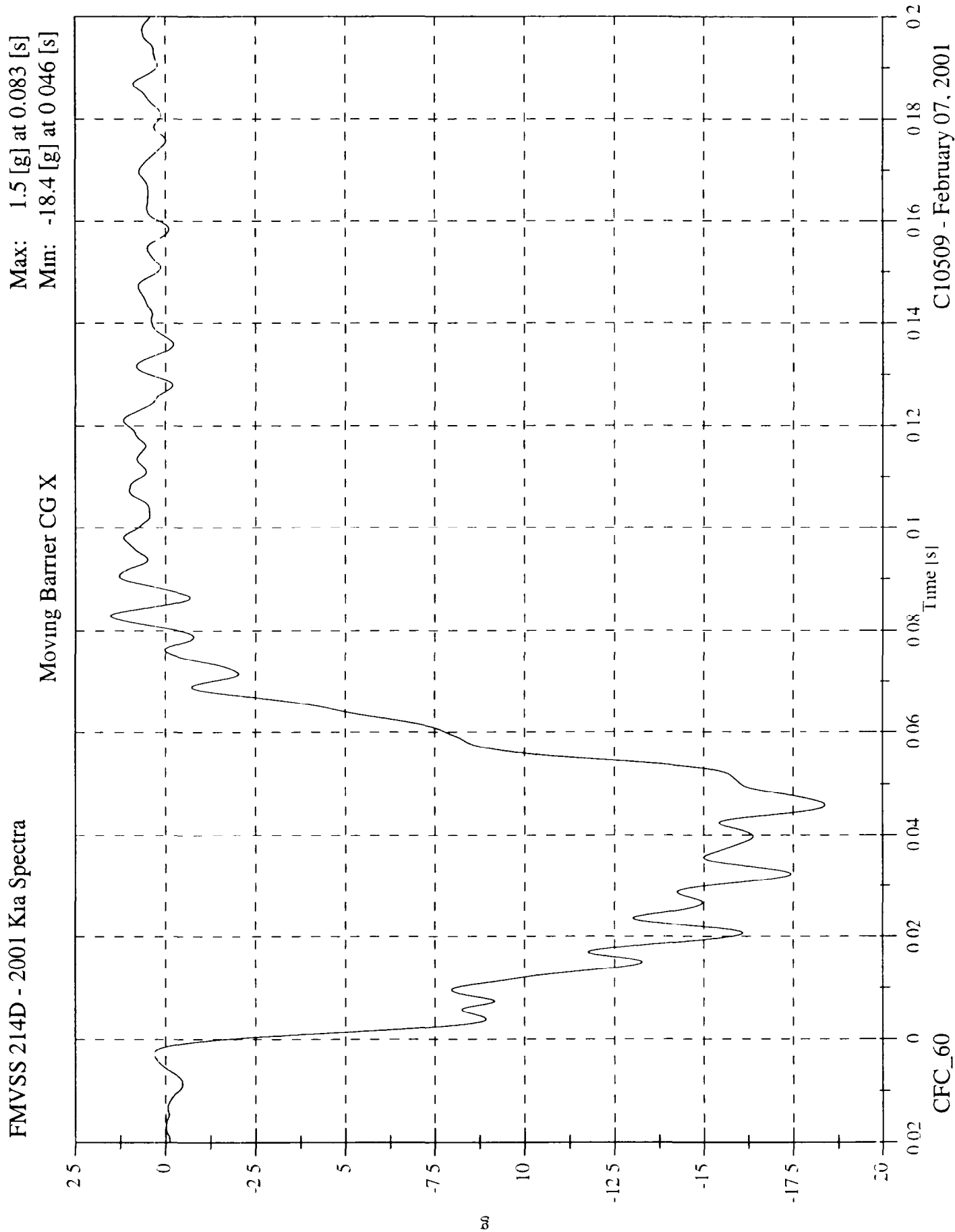
FMVSS 214D - 2001 Kia Spectra

Max: 65.0 [g] at 0.022 [s]
Min: 0.0 [g] at -0.013 [s]

Acc 18 Target CG Resultant



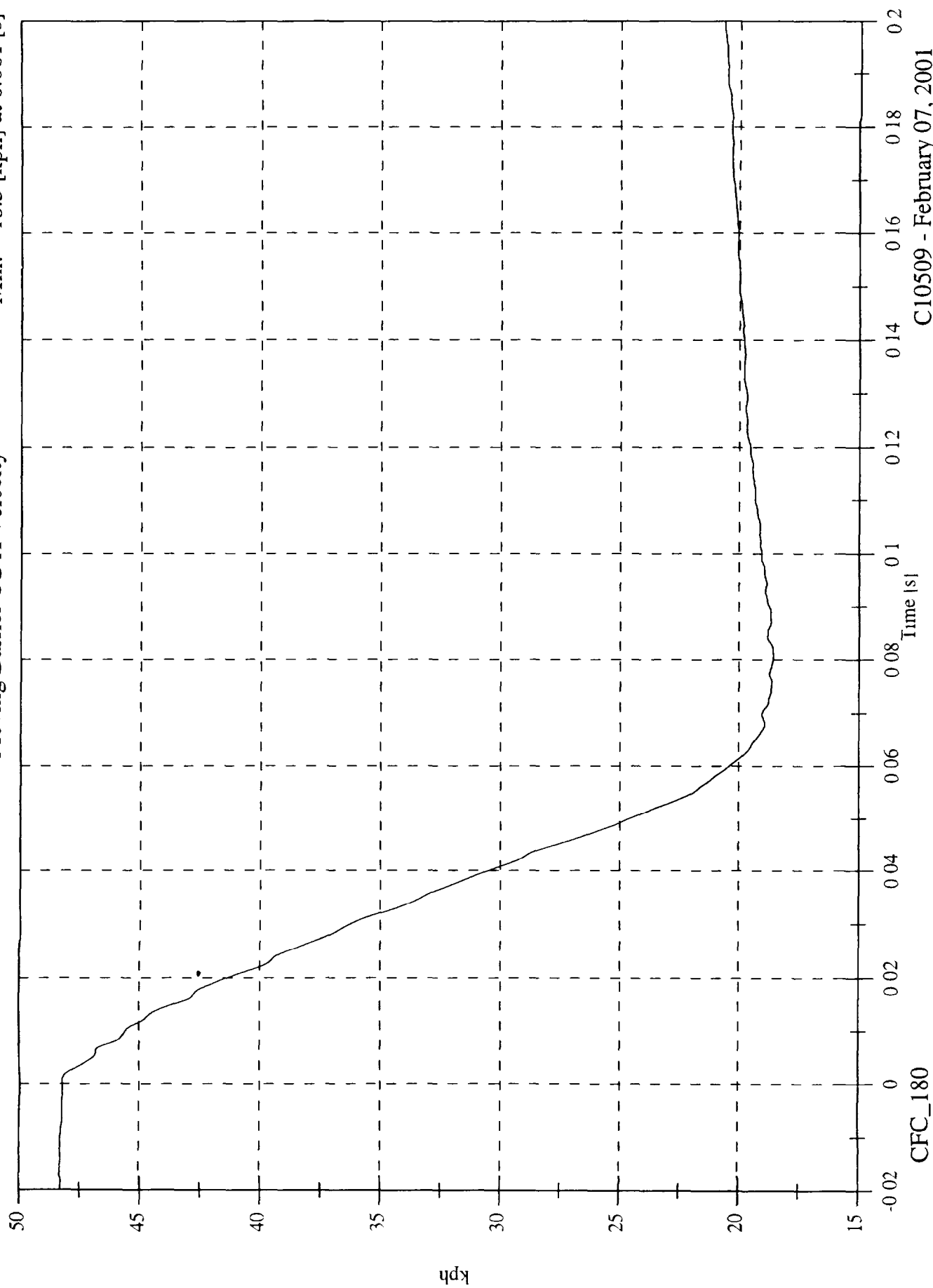
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

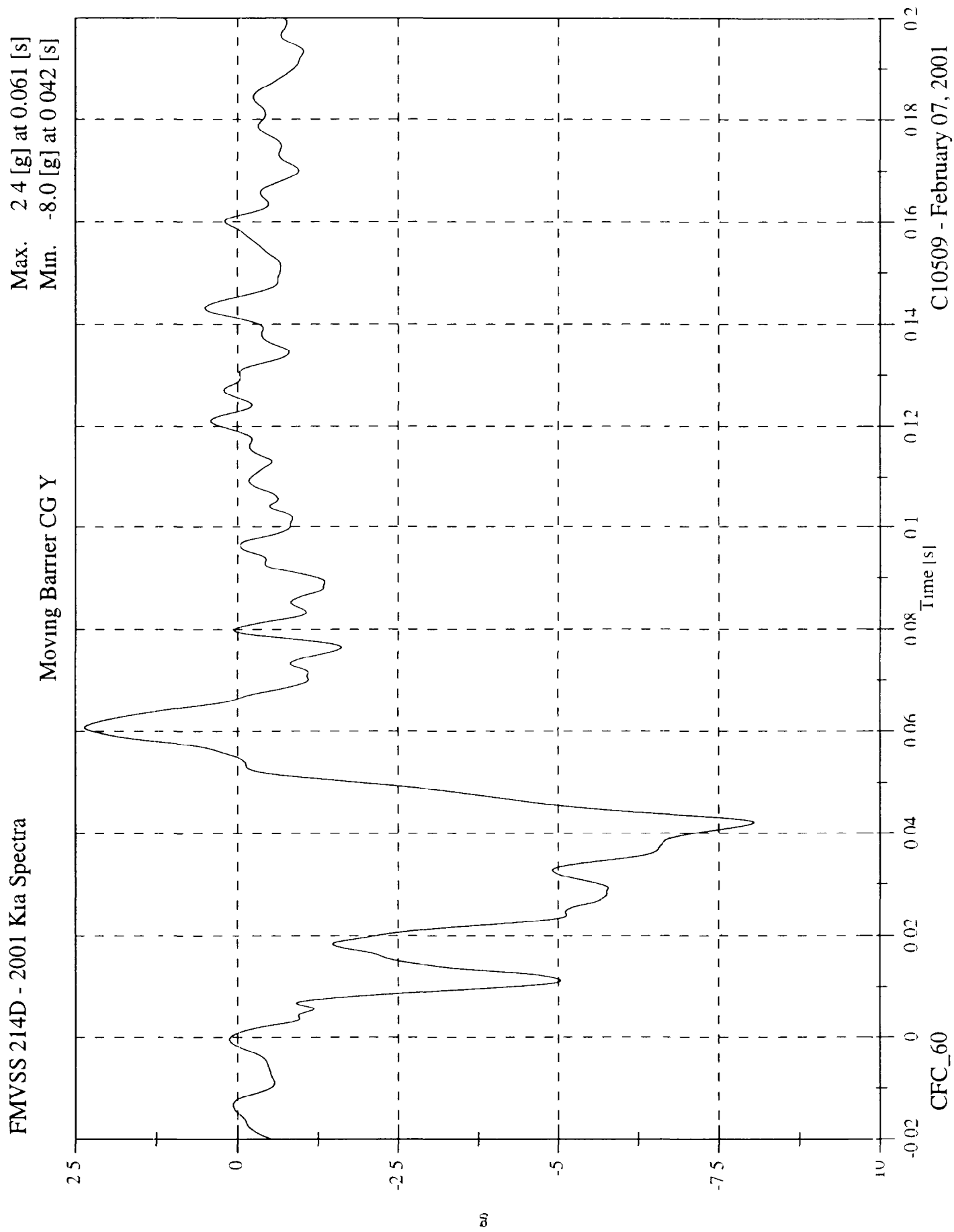
Moving Barrier CG X Velocity

Max: 48.3 [kph] at -0.020 [s]
Min: 18.5 [kph] at 0.081 [s]



CFC_180

C10509 - February 07, 2001

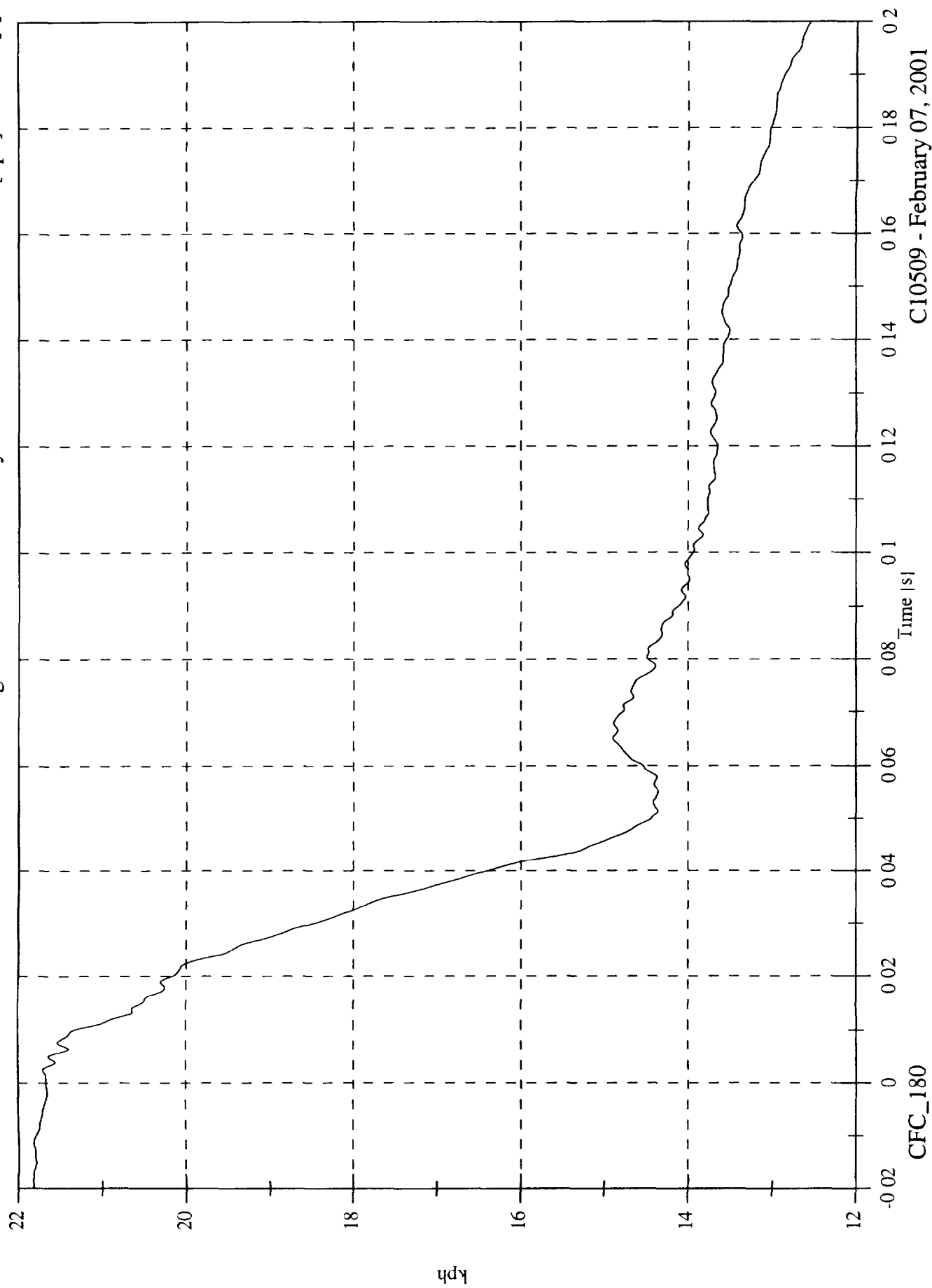


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max: 21.8 [kph] at -0.020 [s]
Min: 12.6 [kph] at 0.200 [s]

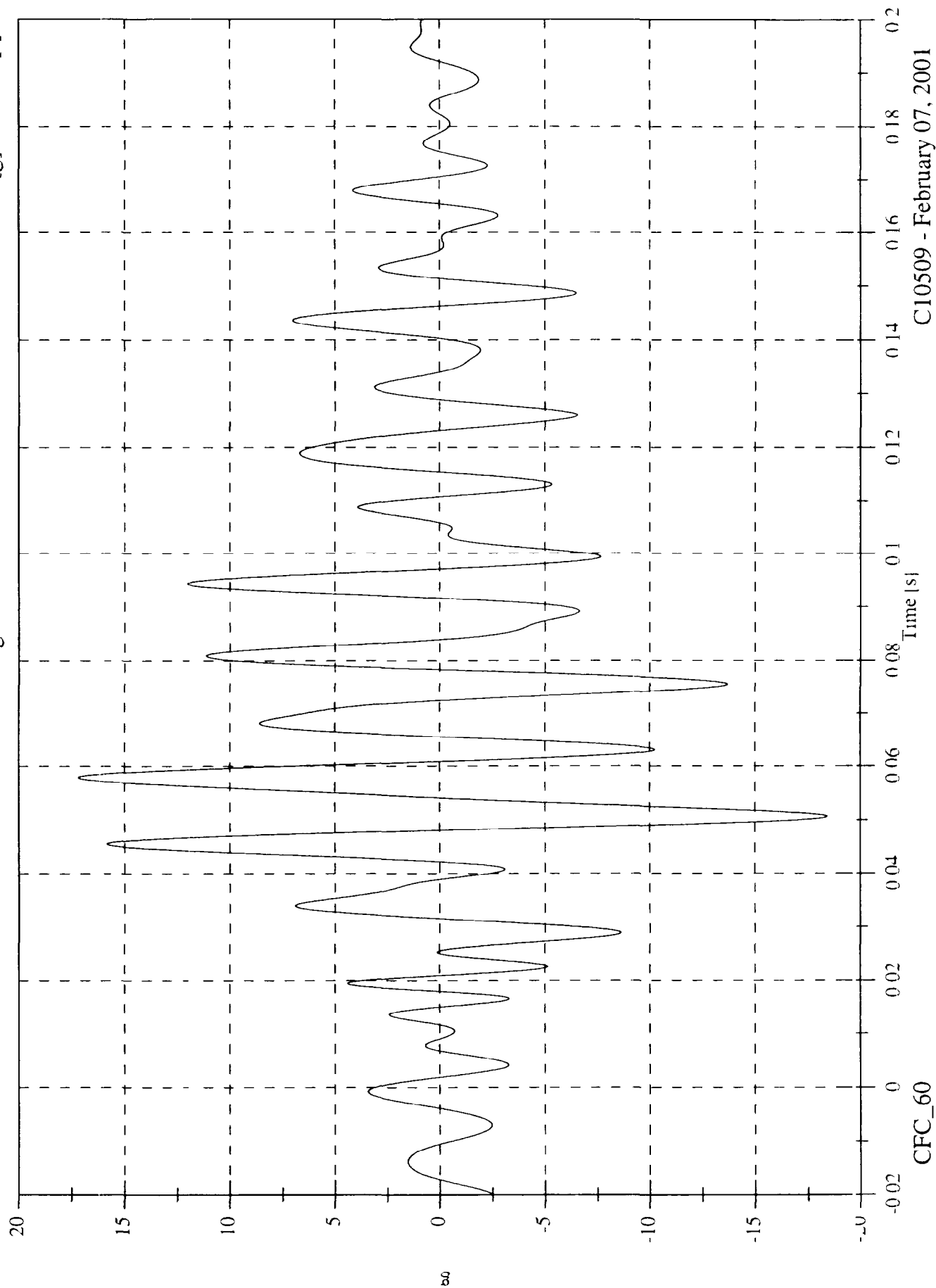
Moving Barrier CG Y Velocity



C10509 - February 07, 2001

Max: 17.2 [g] at 0.058 [s]
Min. -18.4 [g] at 0.051 [s]

Moving Barrier CG Z

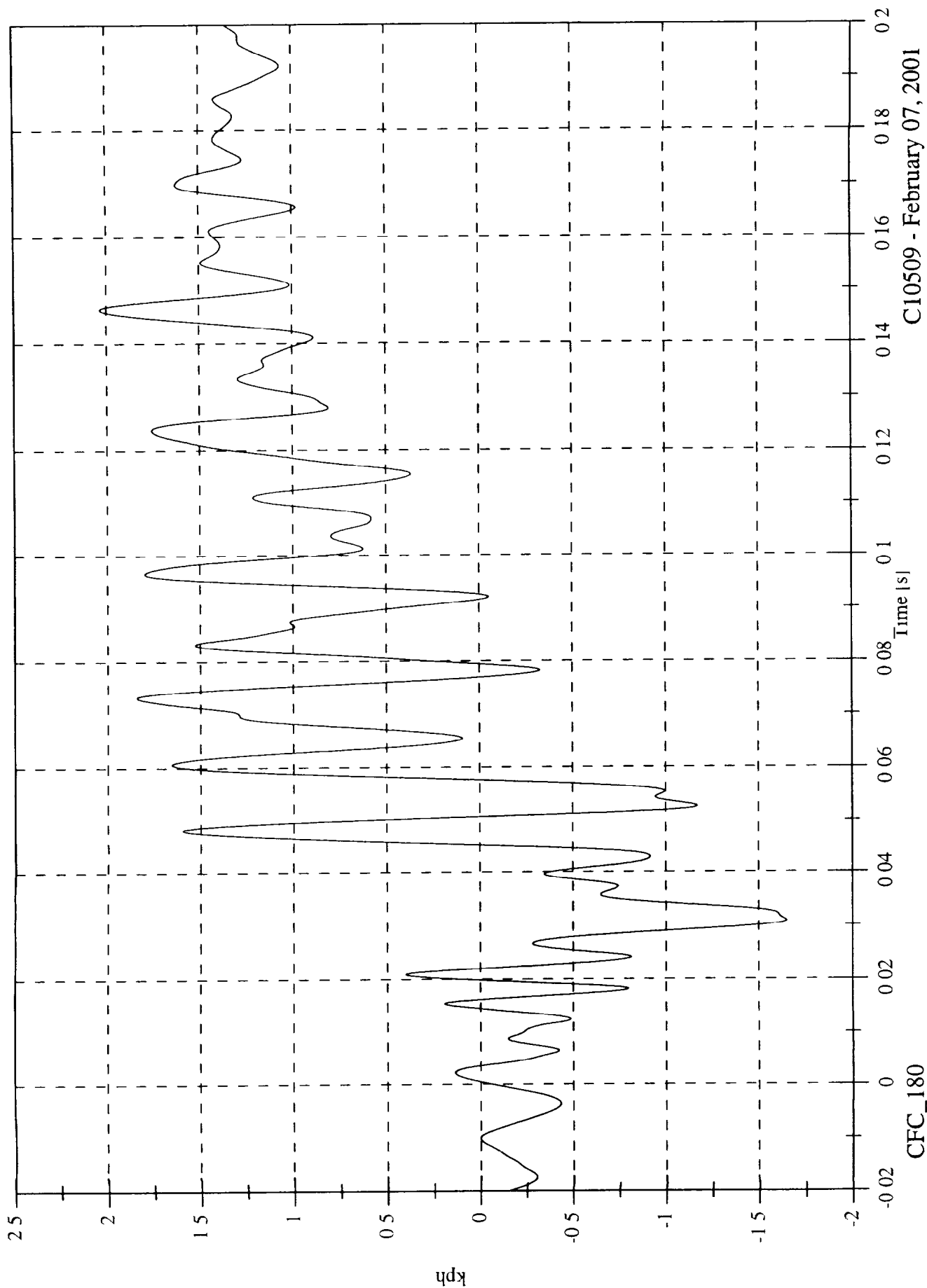


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

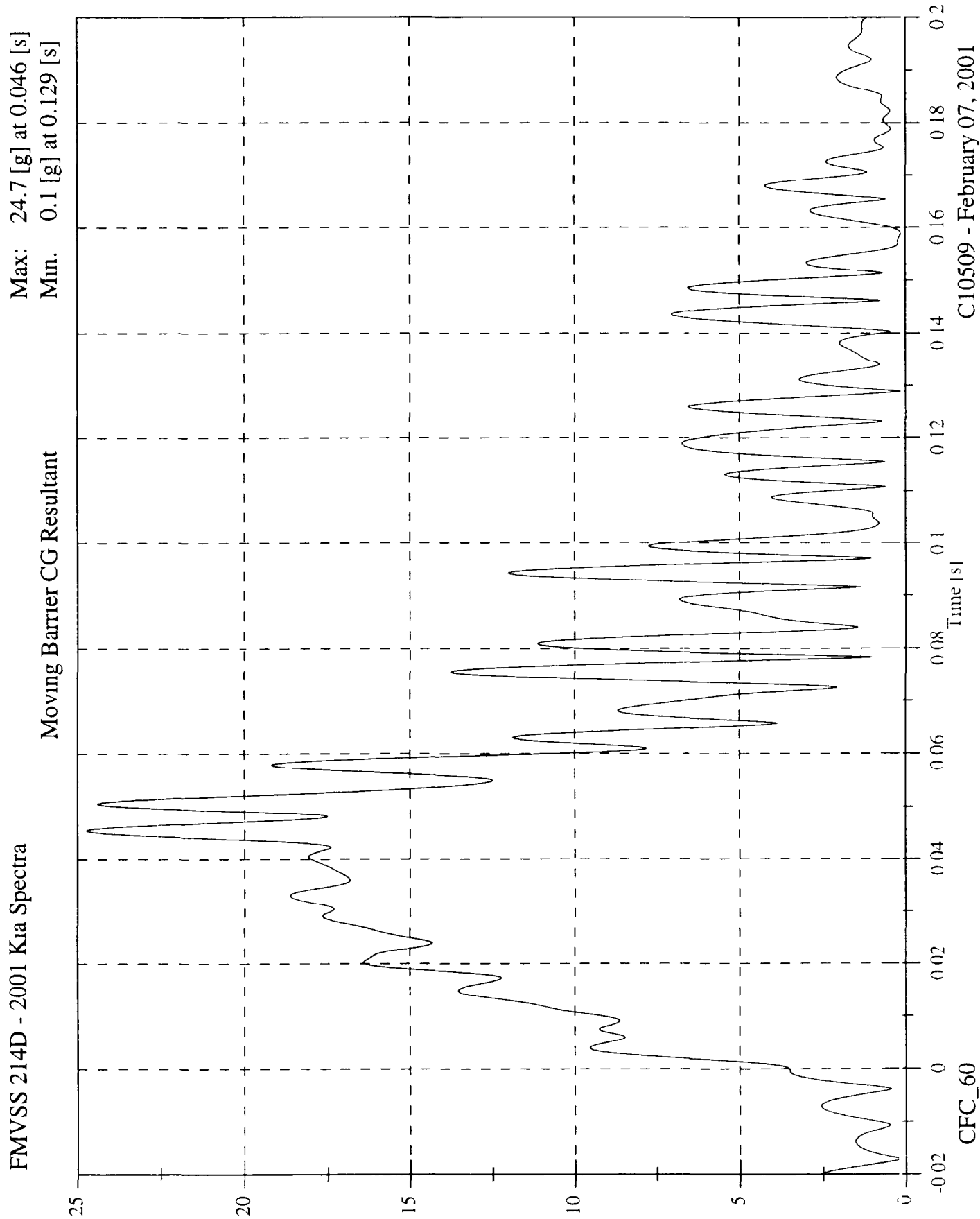
Max: 2.0 [kph] at 0.146 [s]
Min: -1.6 [kph] at 0.031 [s]

Moving Barrier CG Z Velocity



CFC_180

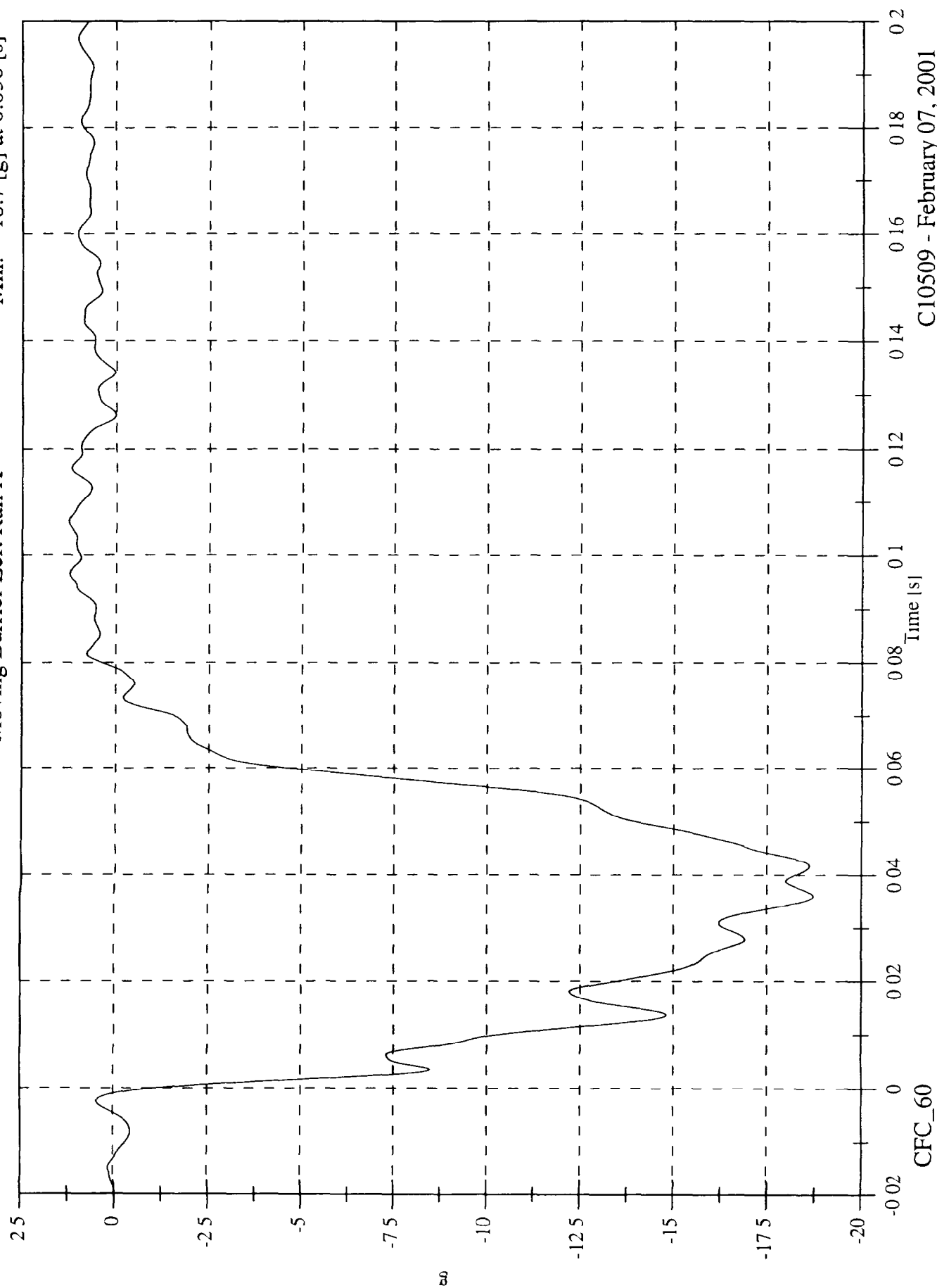
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

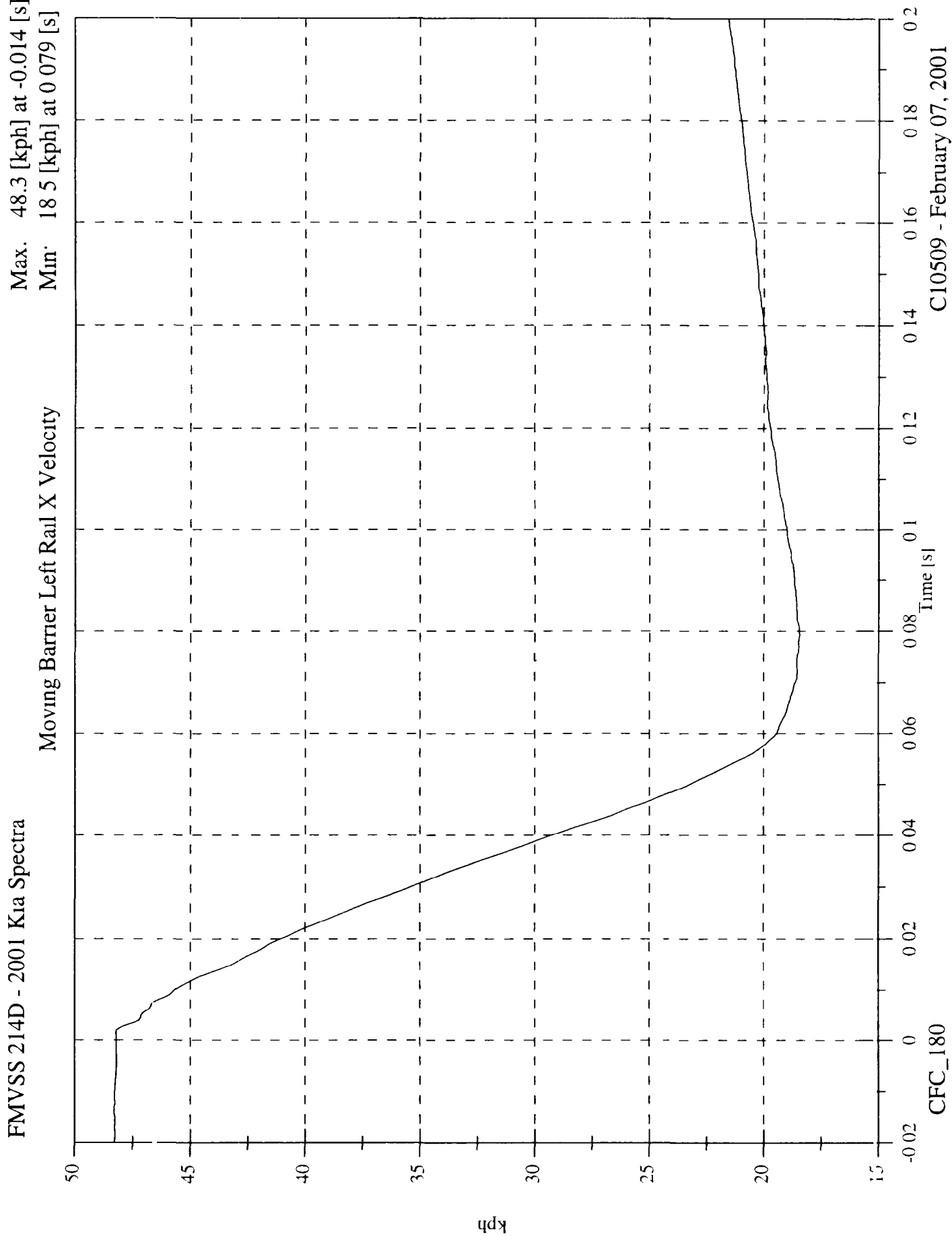
Moving Barrier Left Rail X

Max: 1.3 [g] at 0.106 [s]
Min: -18.7 [g] at 0.036 [s]



CFC_60

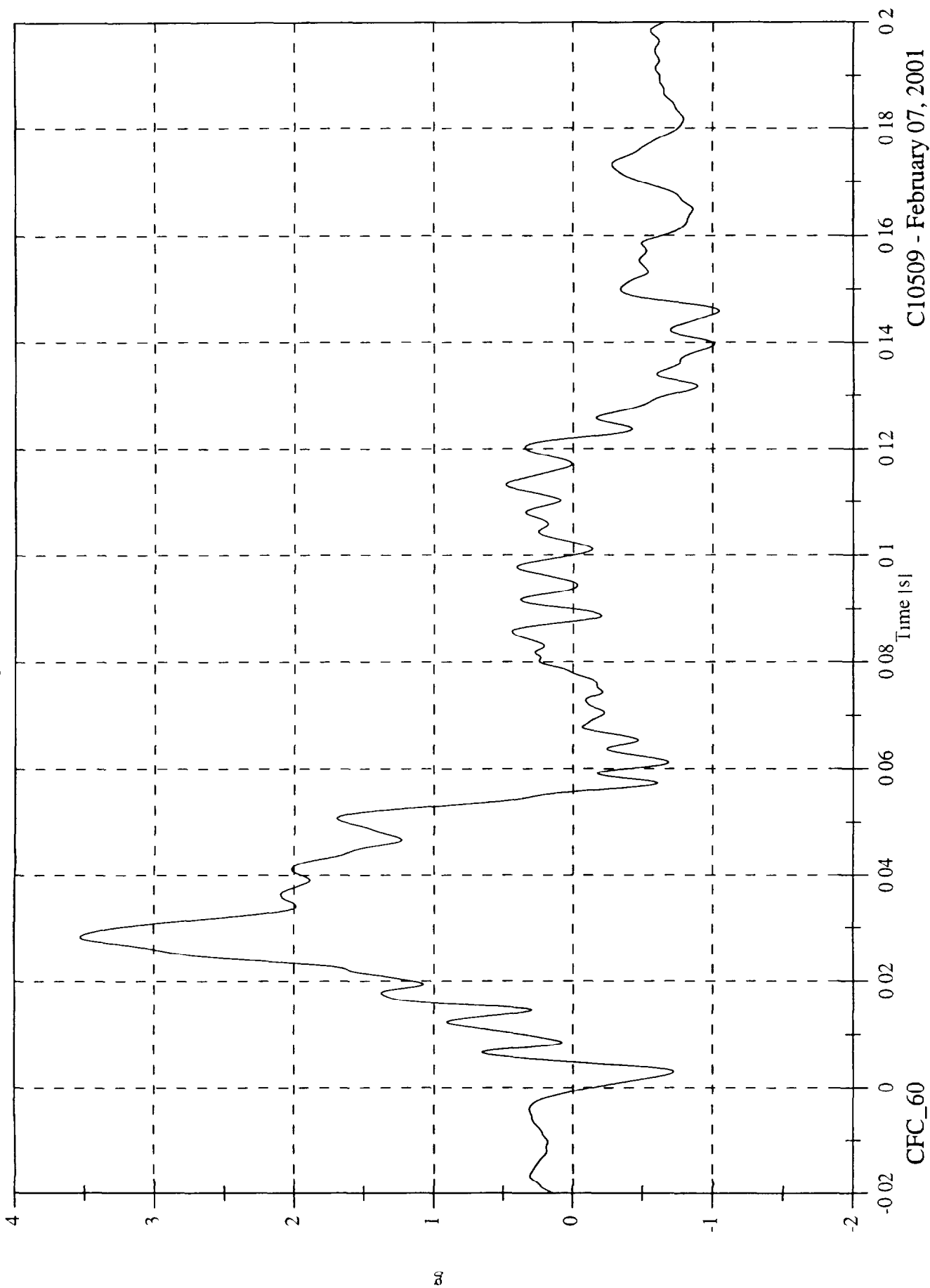
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

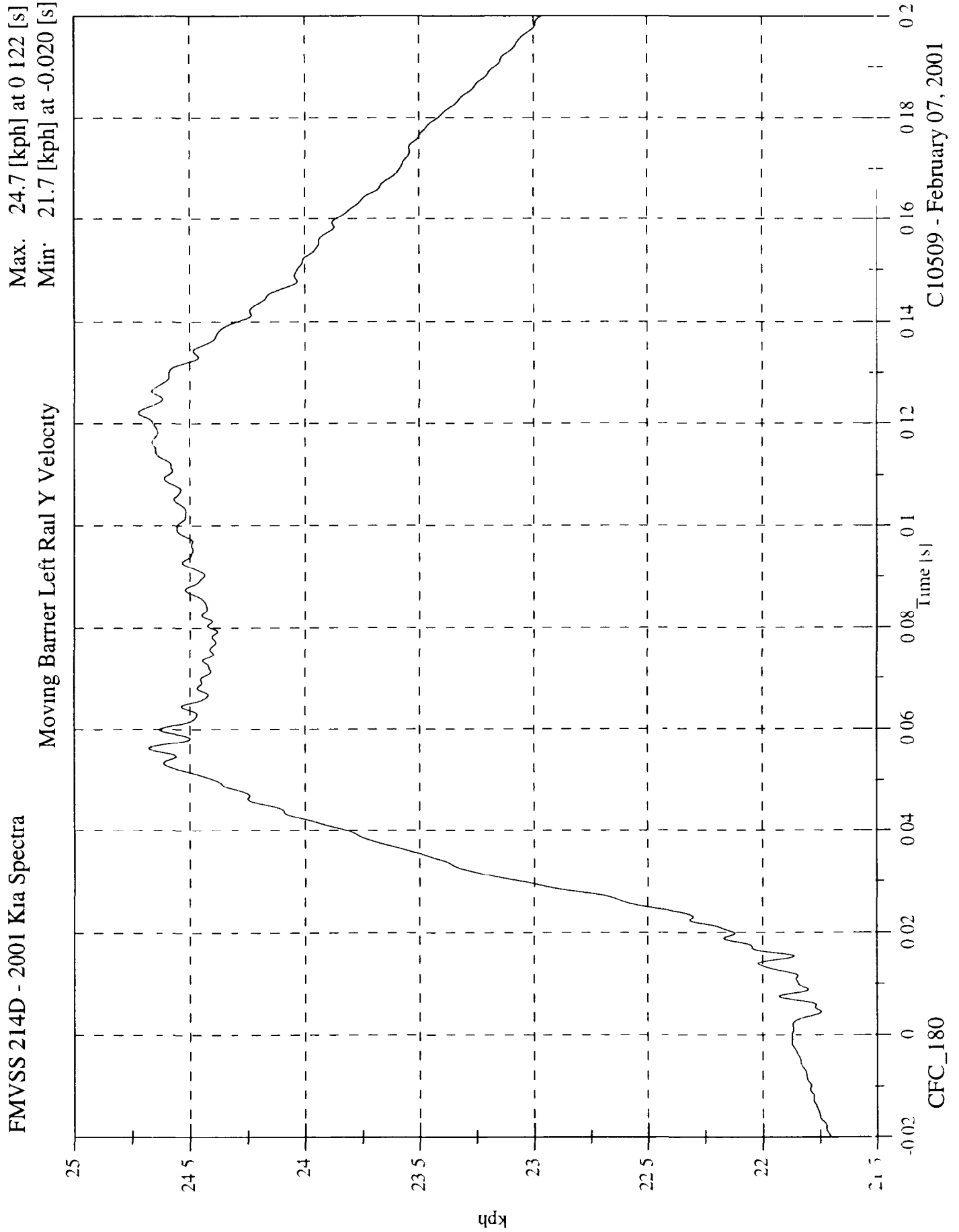
Moving Barrier Left Rail Y

Max: 3.5 [g] at 0.028 [s]
Min: -1.0 [g] at 0.146 [s]



CFC_60

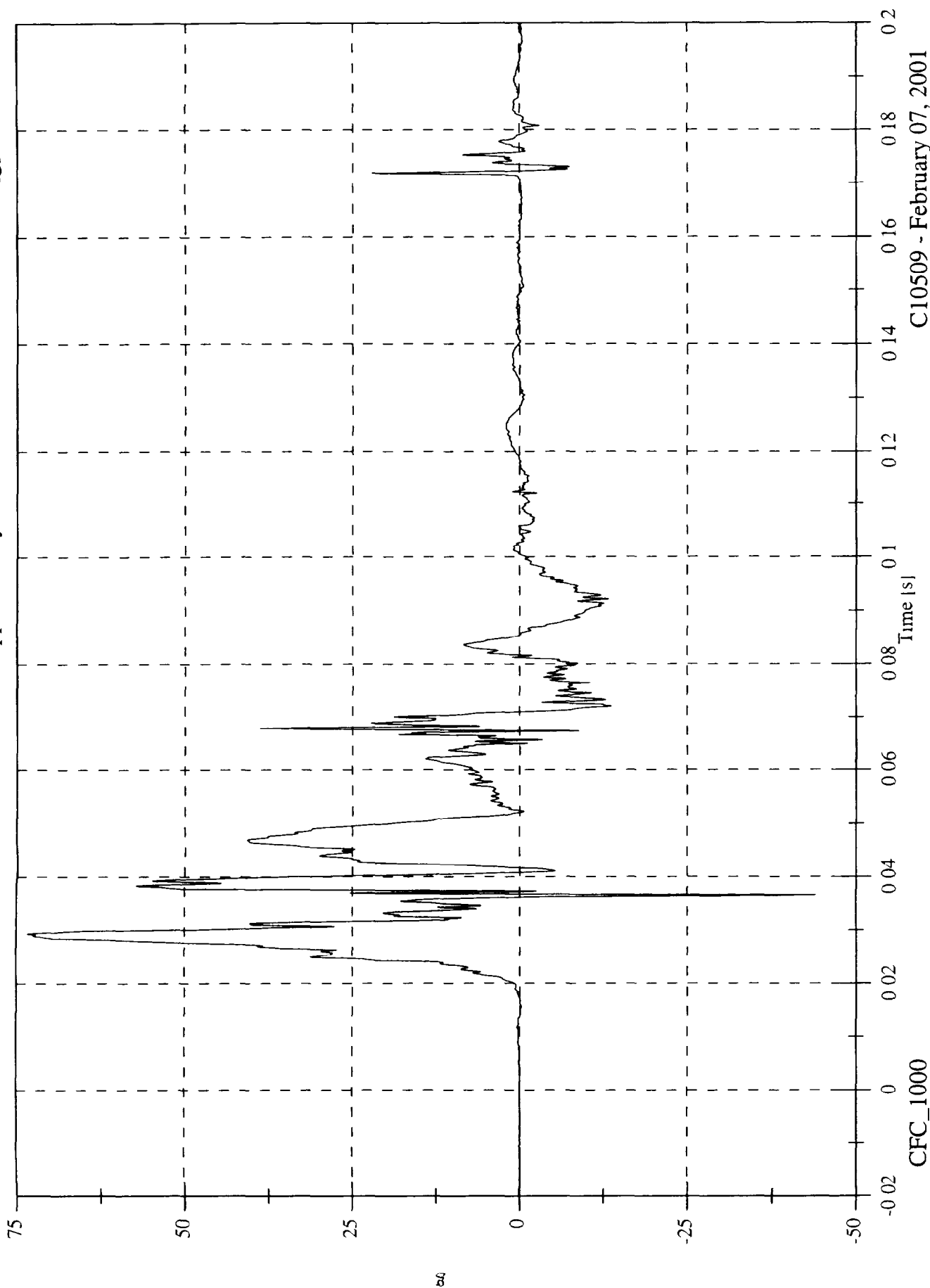
C10509 - February 07, 2001



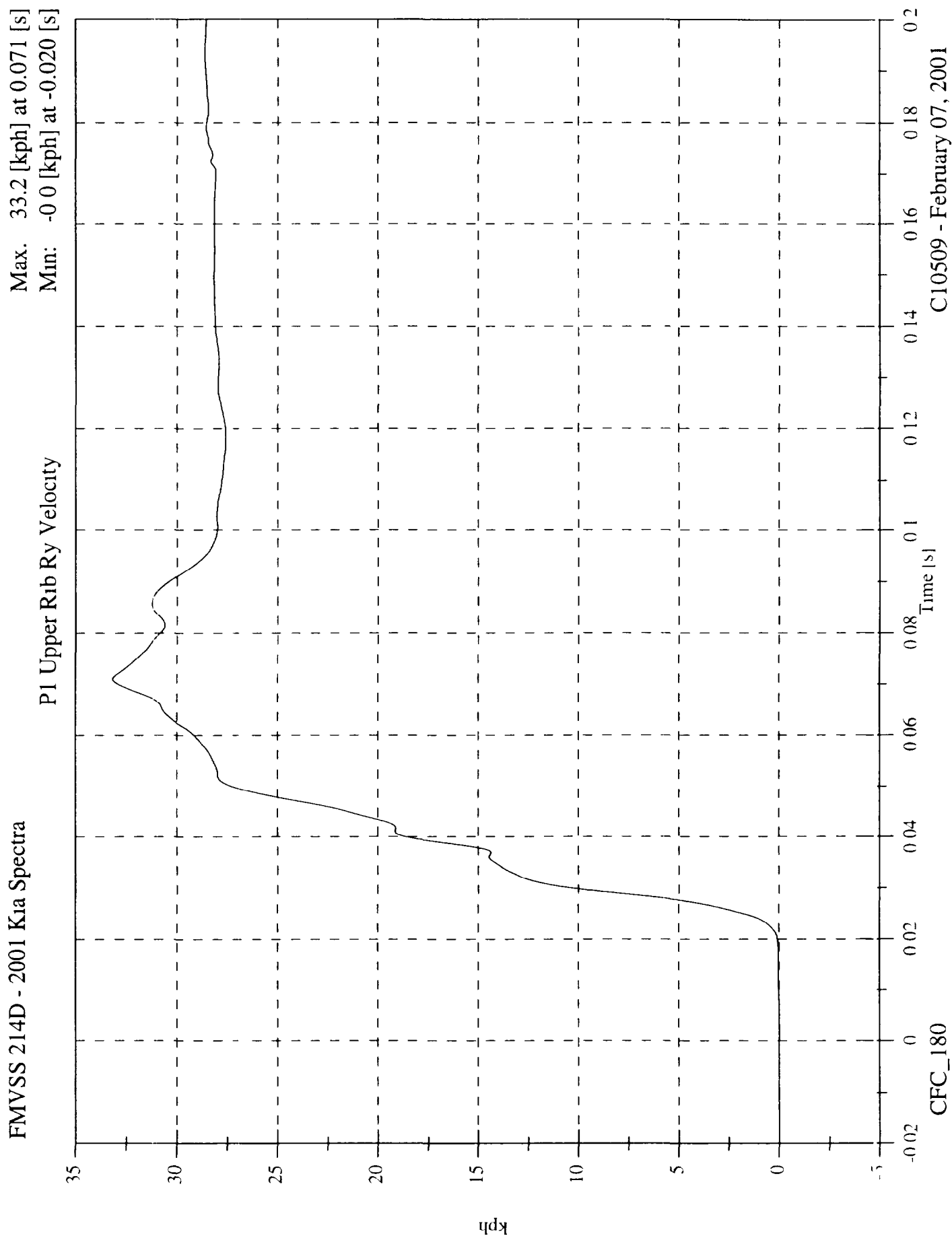
FMVSS 214D - 2001 Kia Spectra

P1 Upper Rib Ry

Max. 73.3 [g] at 0.029 [s]
Min: -44.0 [g] at 0.037 [s]



C10509 - February 07, 2001

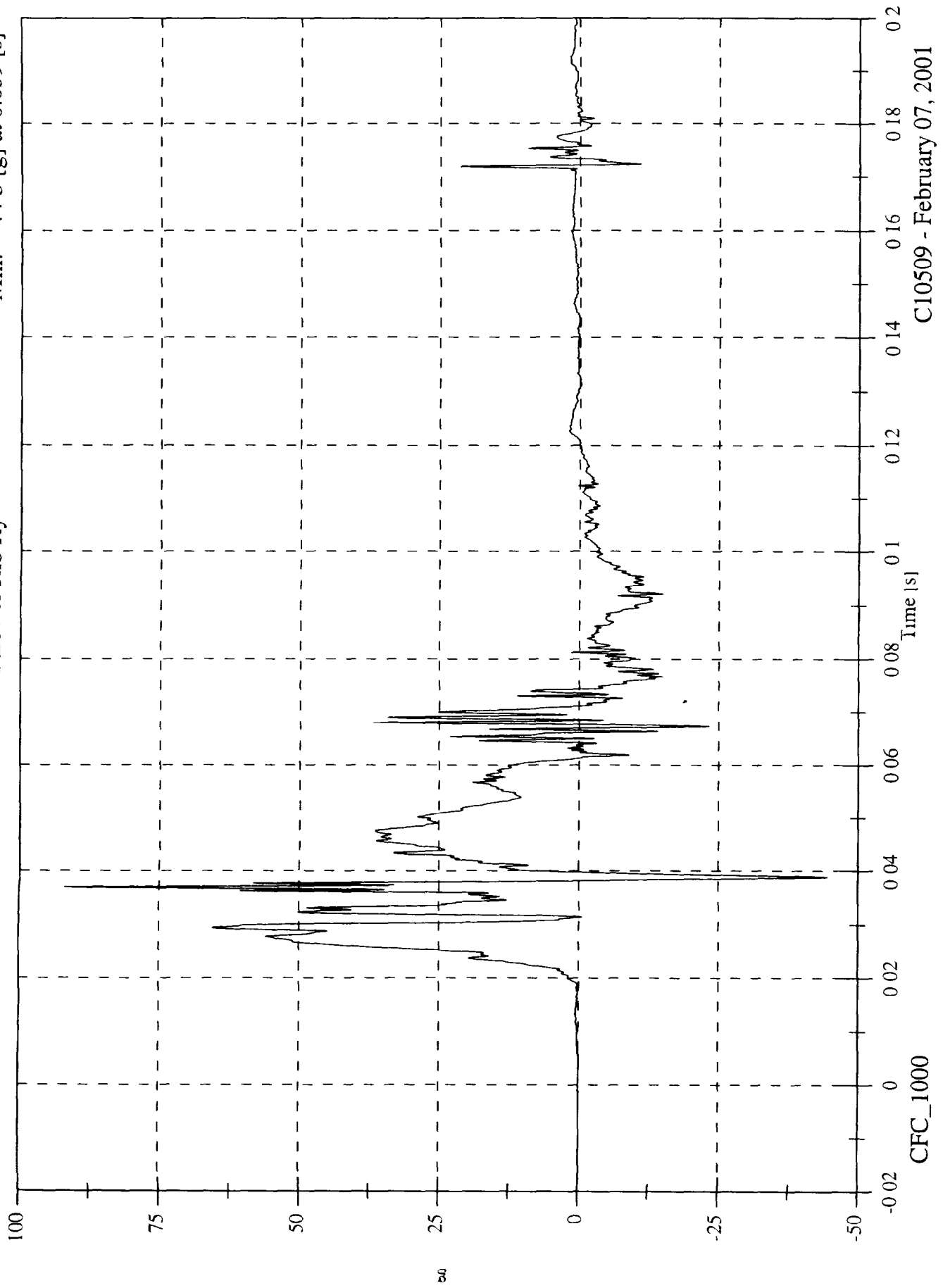


FMVSS 214D - 2001 Kia Spectra

P1 Lower Rib Ry

Max: 91.9 [g] at 0.037 [s]

Min: -44.5 [g] at 0.039 [s]

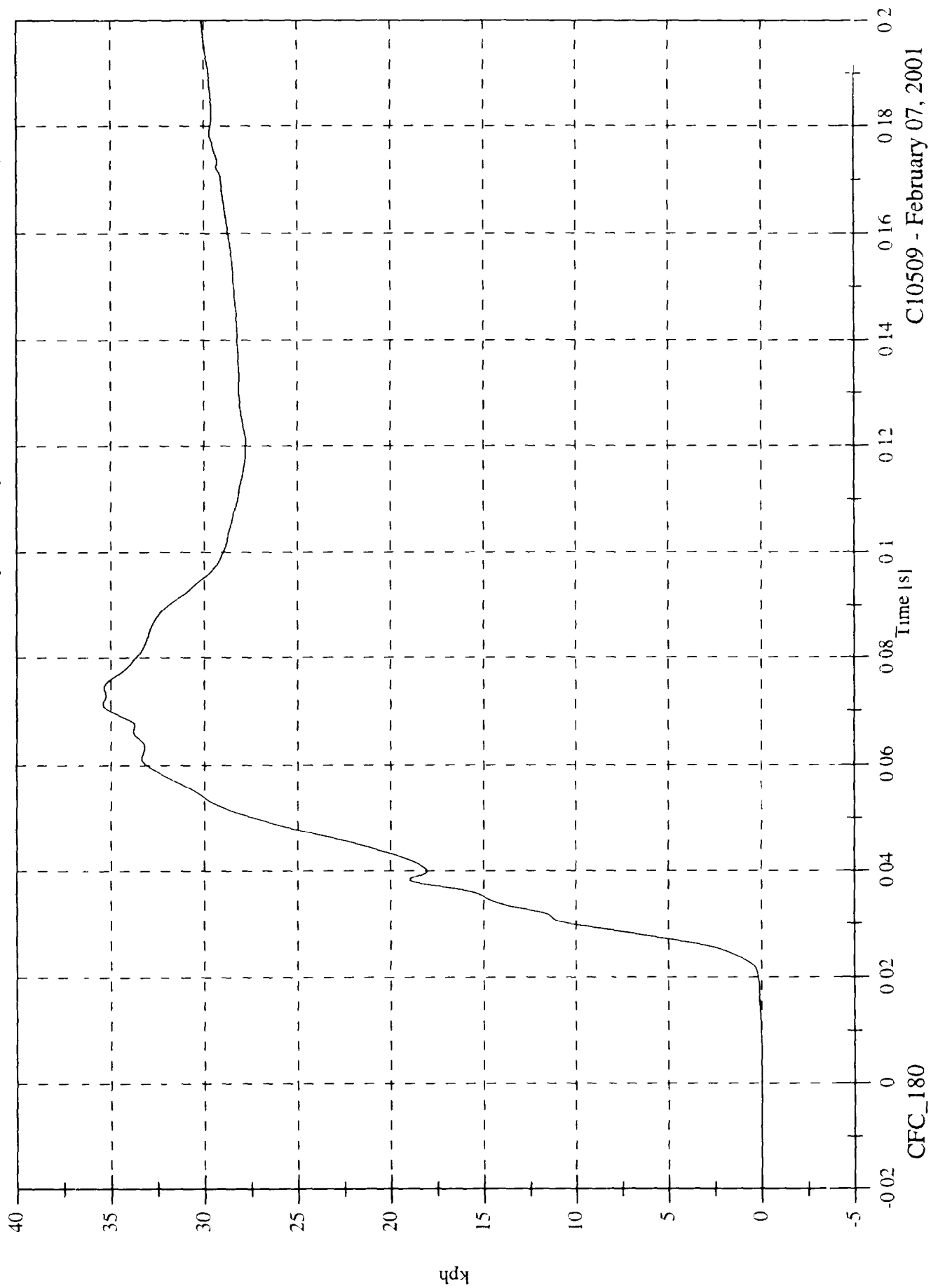


CI0509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max. 35.4 [kph] at 0.071 [s]
Min: -0.0 [kph] at -0.008 [s]

P1 Lower Rib Ry Velocity

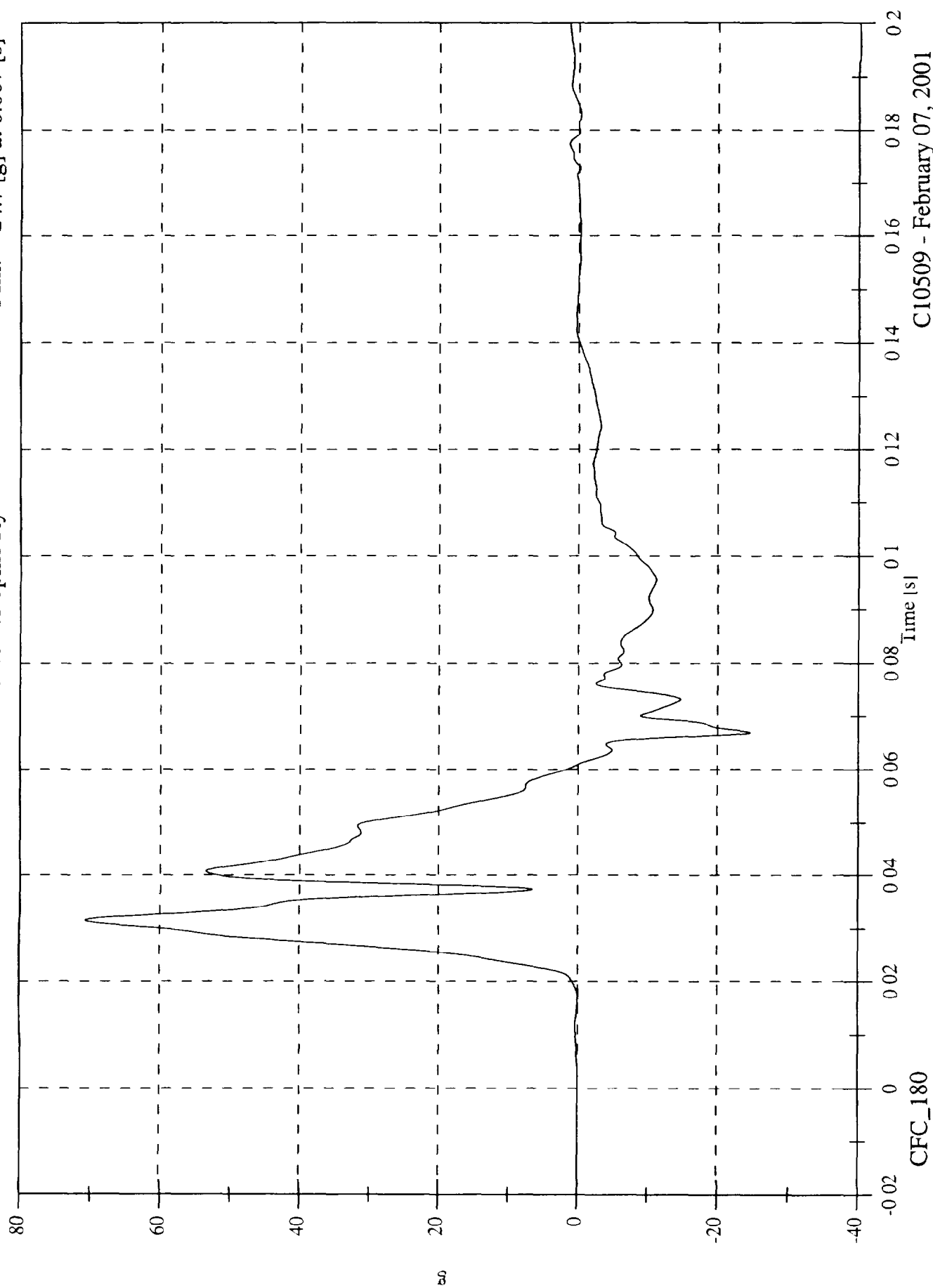


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

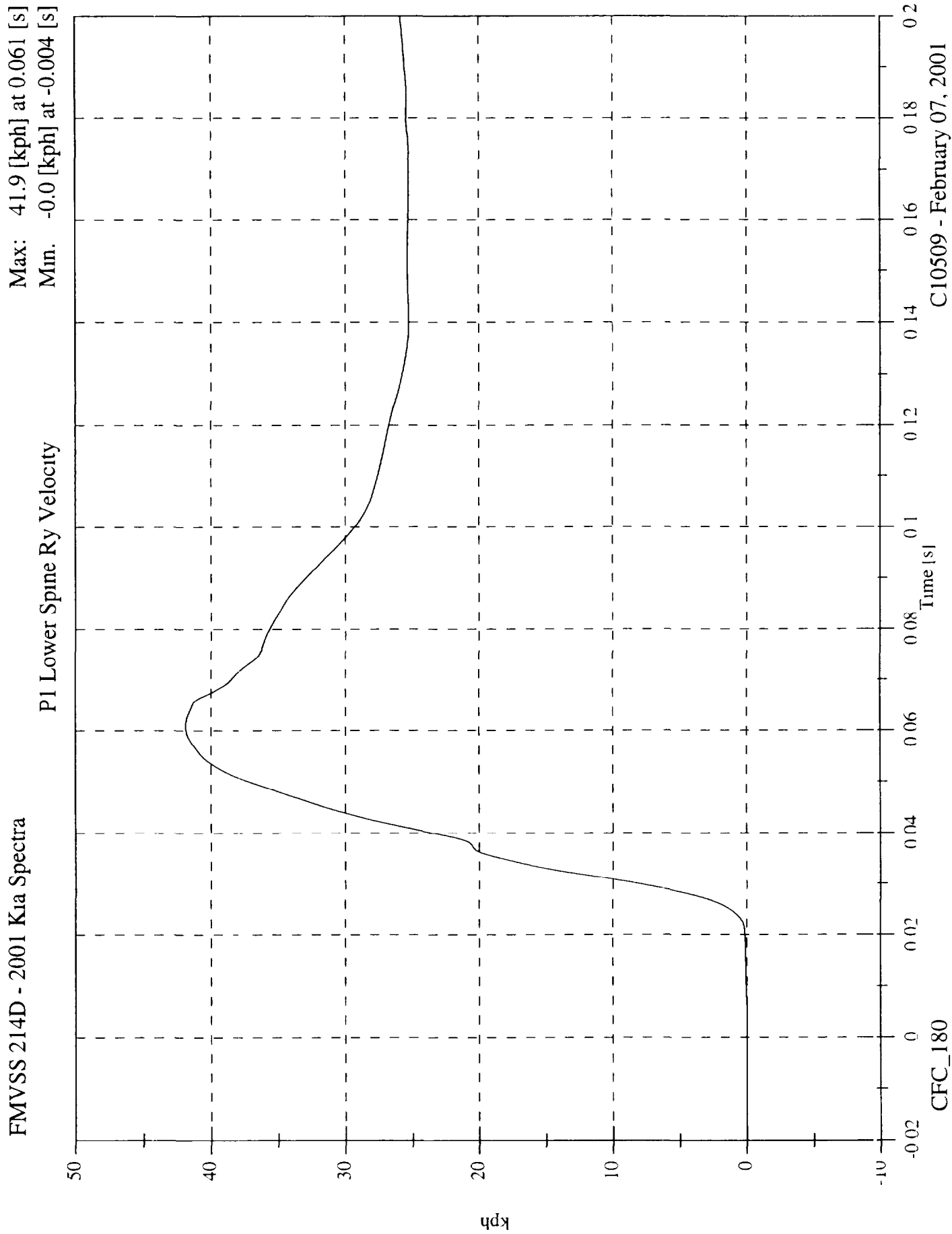
P1 Lower Spine Ry

Max: 70.6 [g] at 0.032 [s]
Min: -24.7 [g] at 0.067 [s]



CFC_180

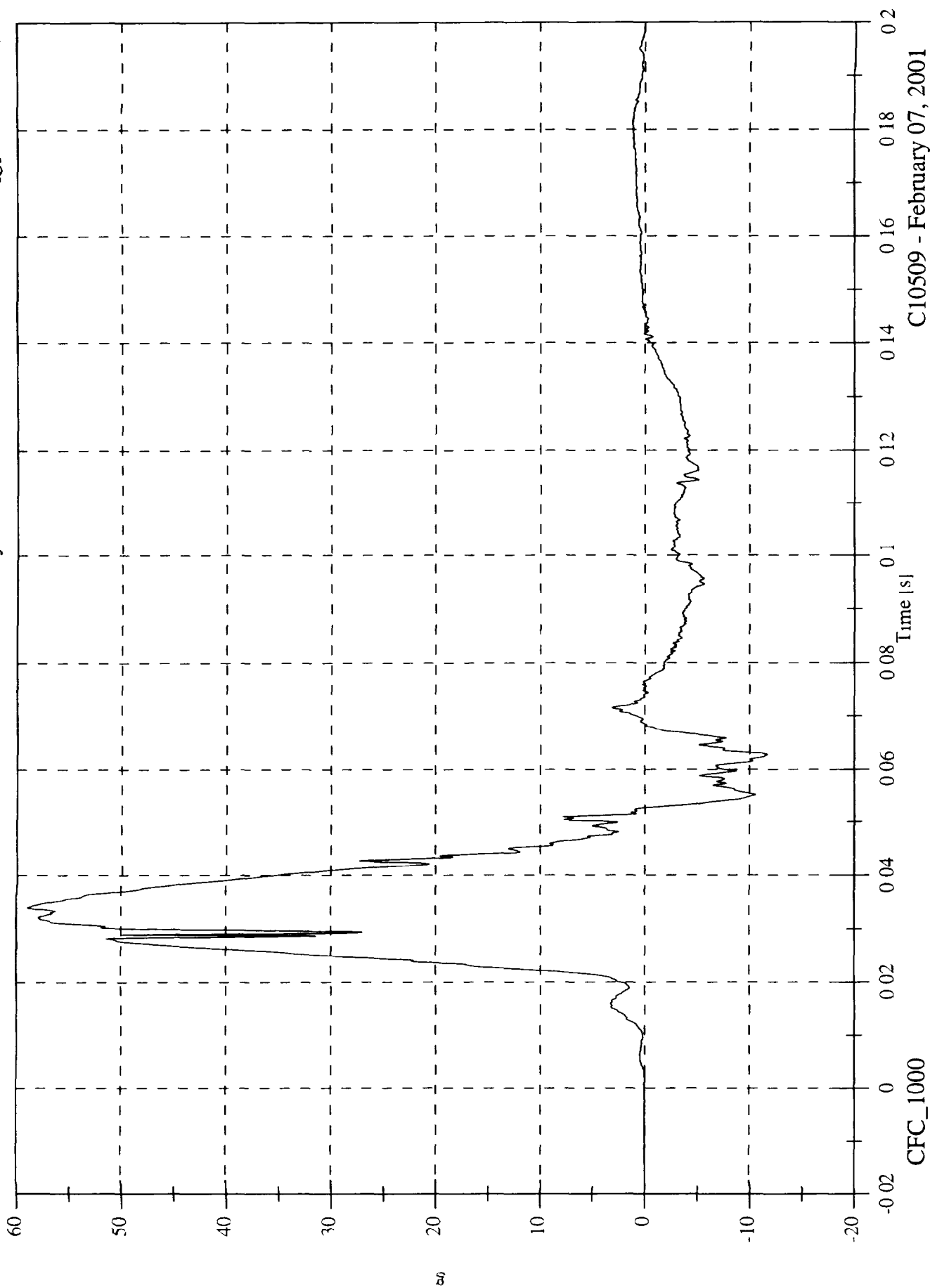
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

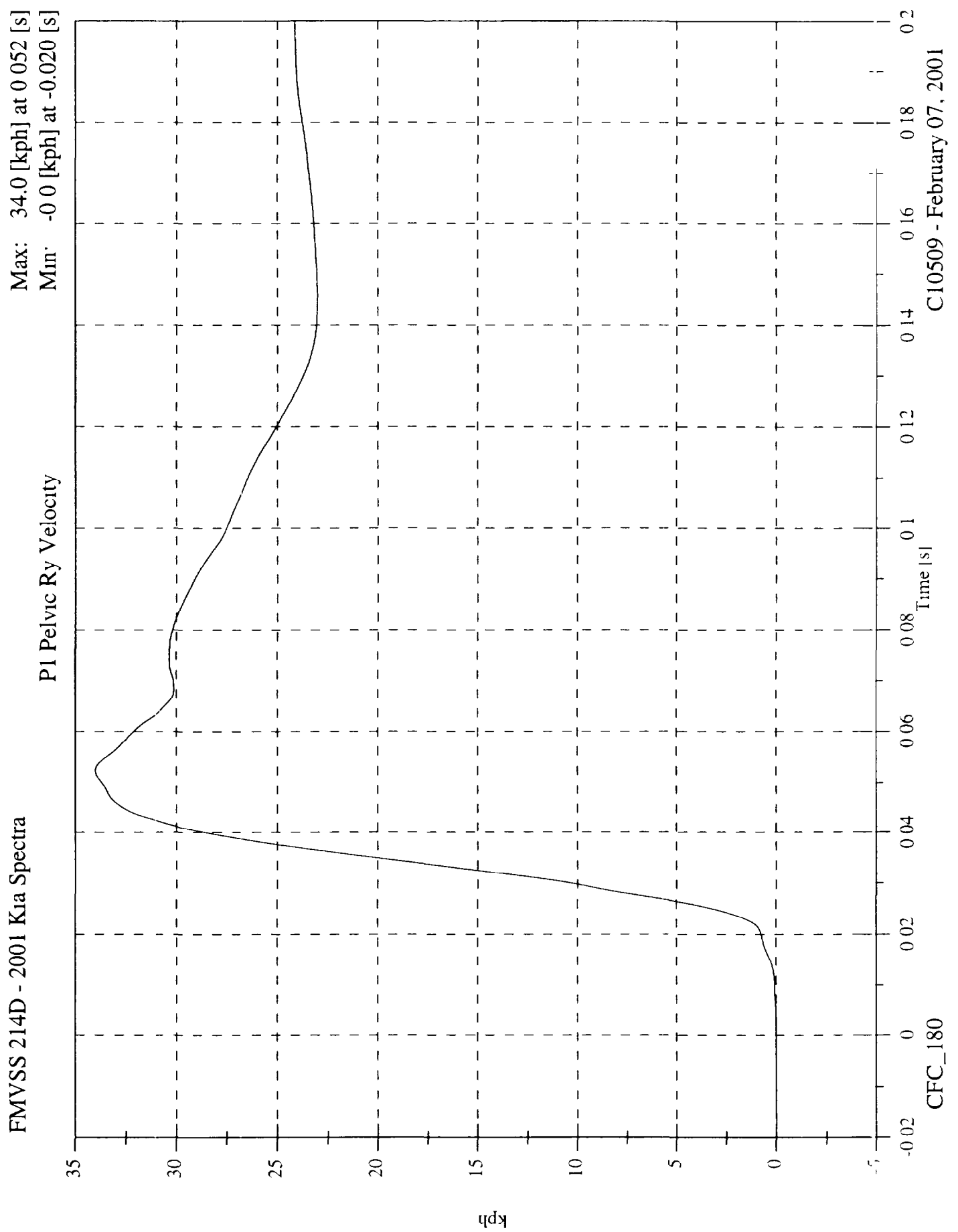
Max: 58.9 [g] at 0.034 [s]
Min: -11.7 [g] at 0.063 [s]

P1 Pelvic Ry



CFC_1000

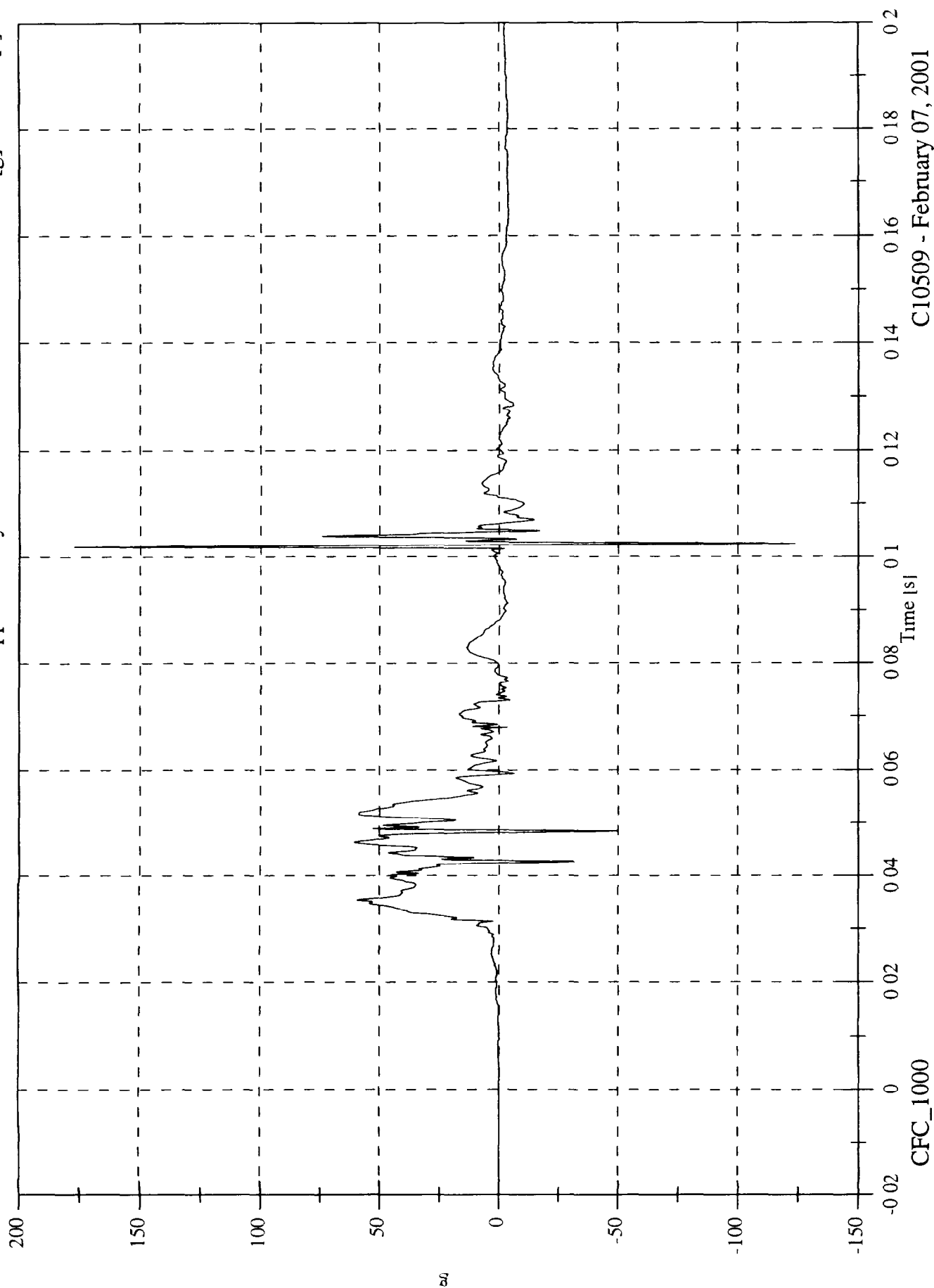
C10509 - February 07, 2001



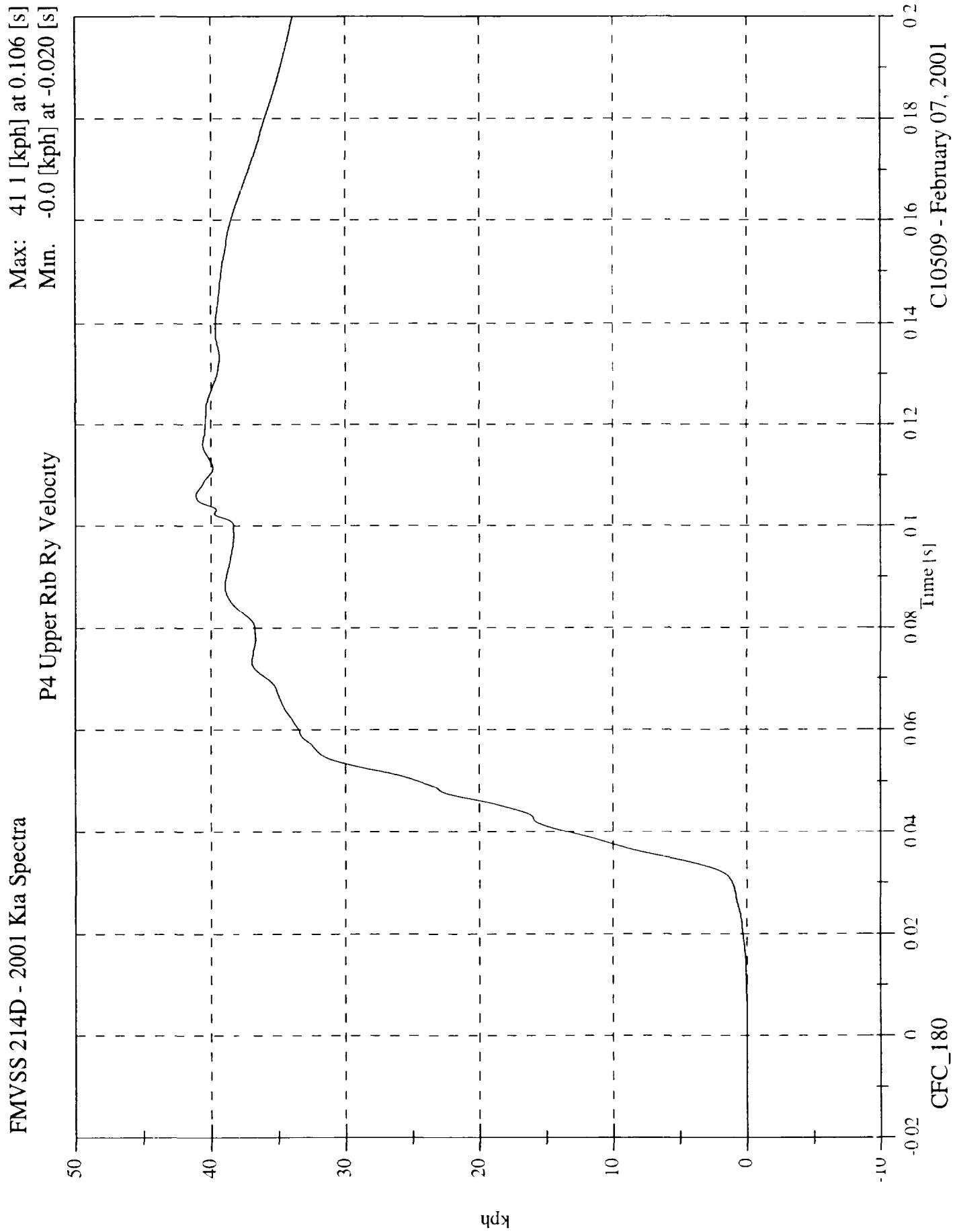
FMVSS 214D - 2001 Kia Spectra

Max: 177.3 [g] at 0.102 [s]
Min: -123.8 [g] at 0.102 [s]

P4 Upper Rib Ry



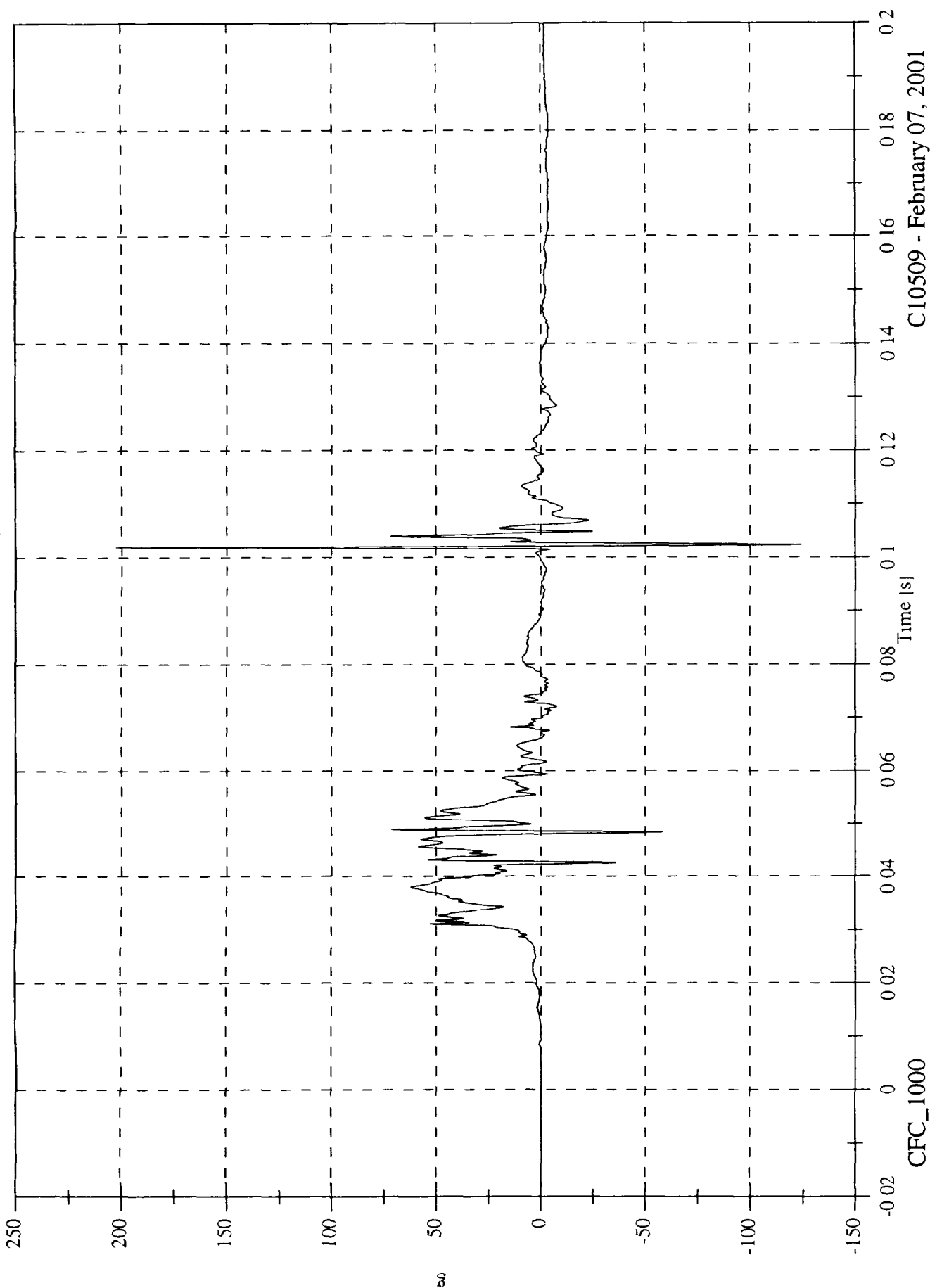
C10509 - February 07, 2001



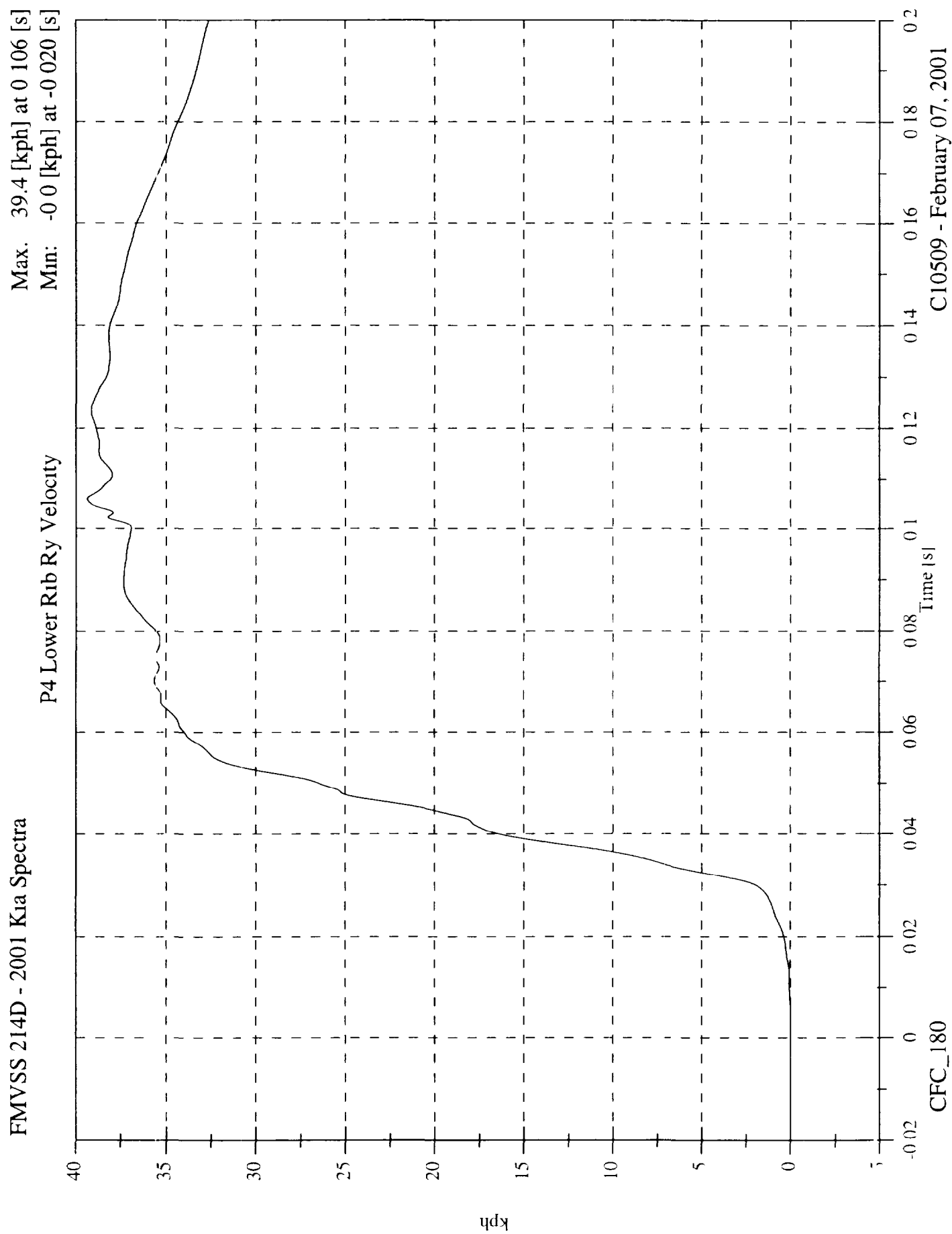
FMVSS 214D - 2001 Kia Spectra

P4 Lower Rib Ry

Max: 202.5 [g] at 0.102 [s]
Min: -124.4 [g] at 0.102 [s]



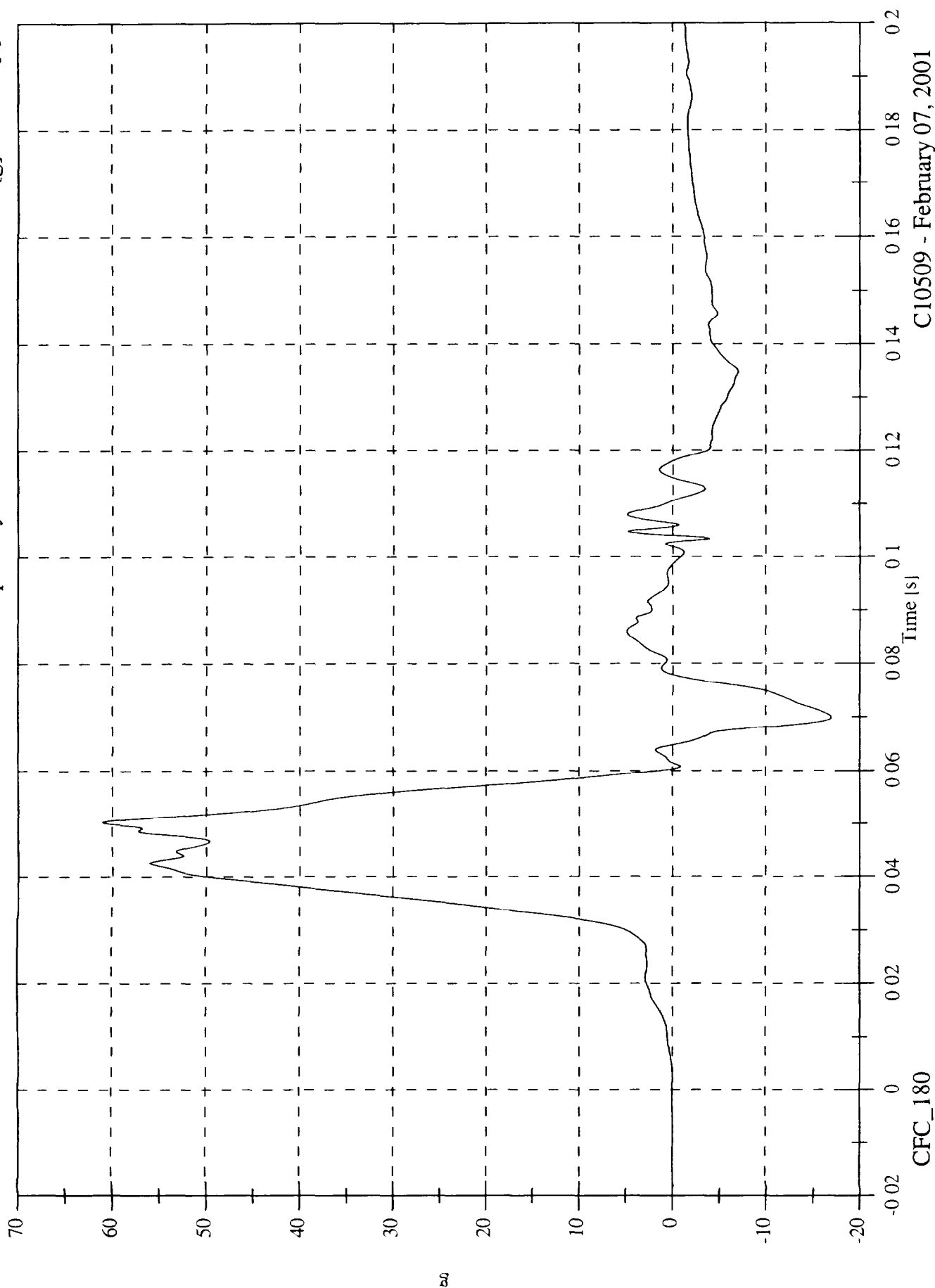
C10509 - February 07, 2001



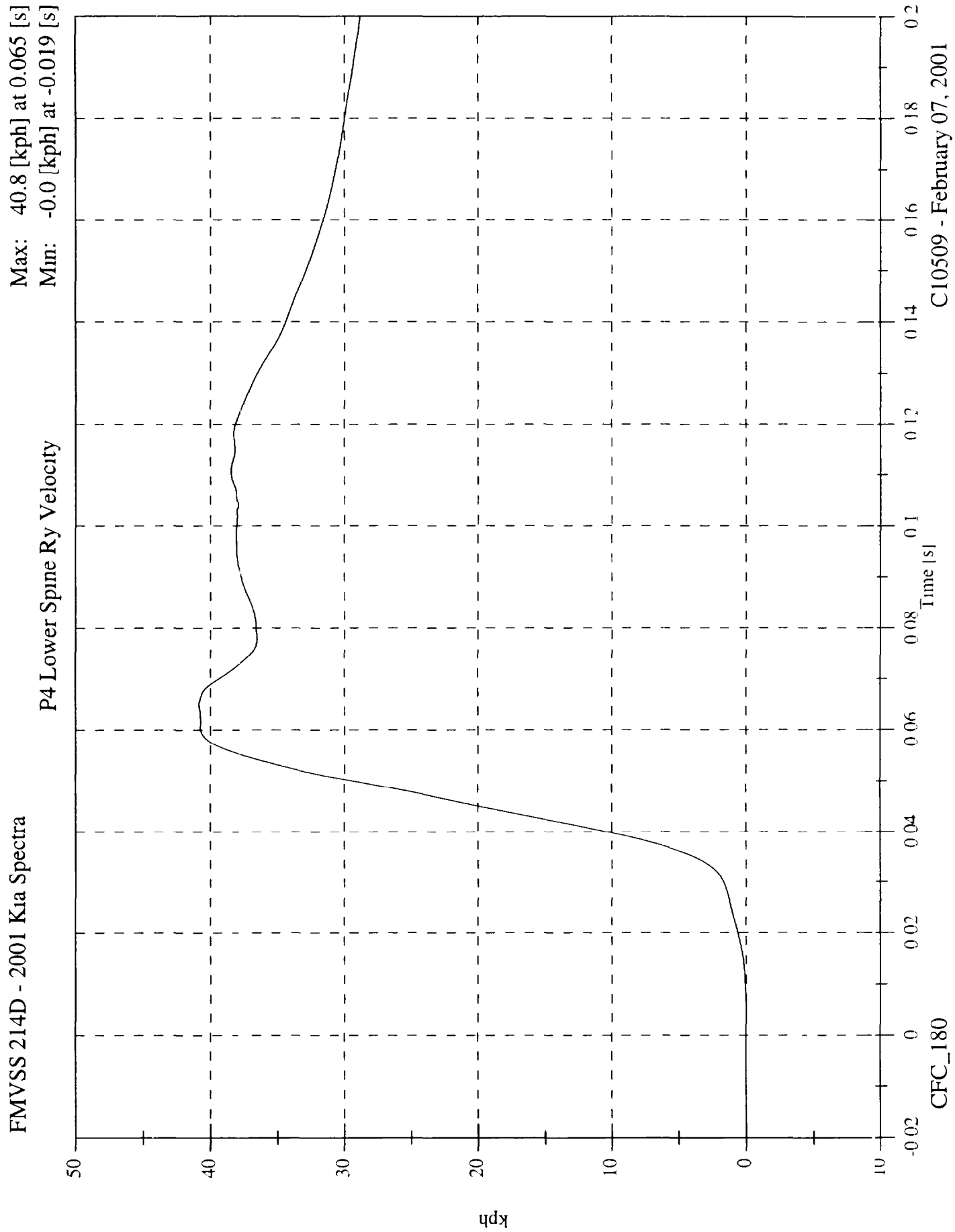
FMVSS 214D - 2001 Kia Spectra

P4 Lower Spine Ry

Max: 61.0 [g] at 0.050 [s]
Min: -17.0 [g] at 0.070 [s]



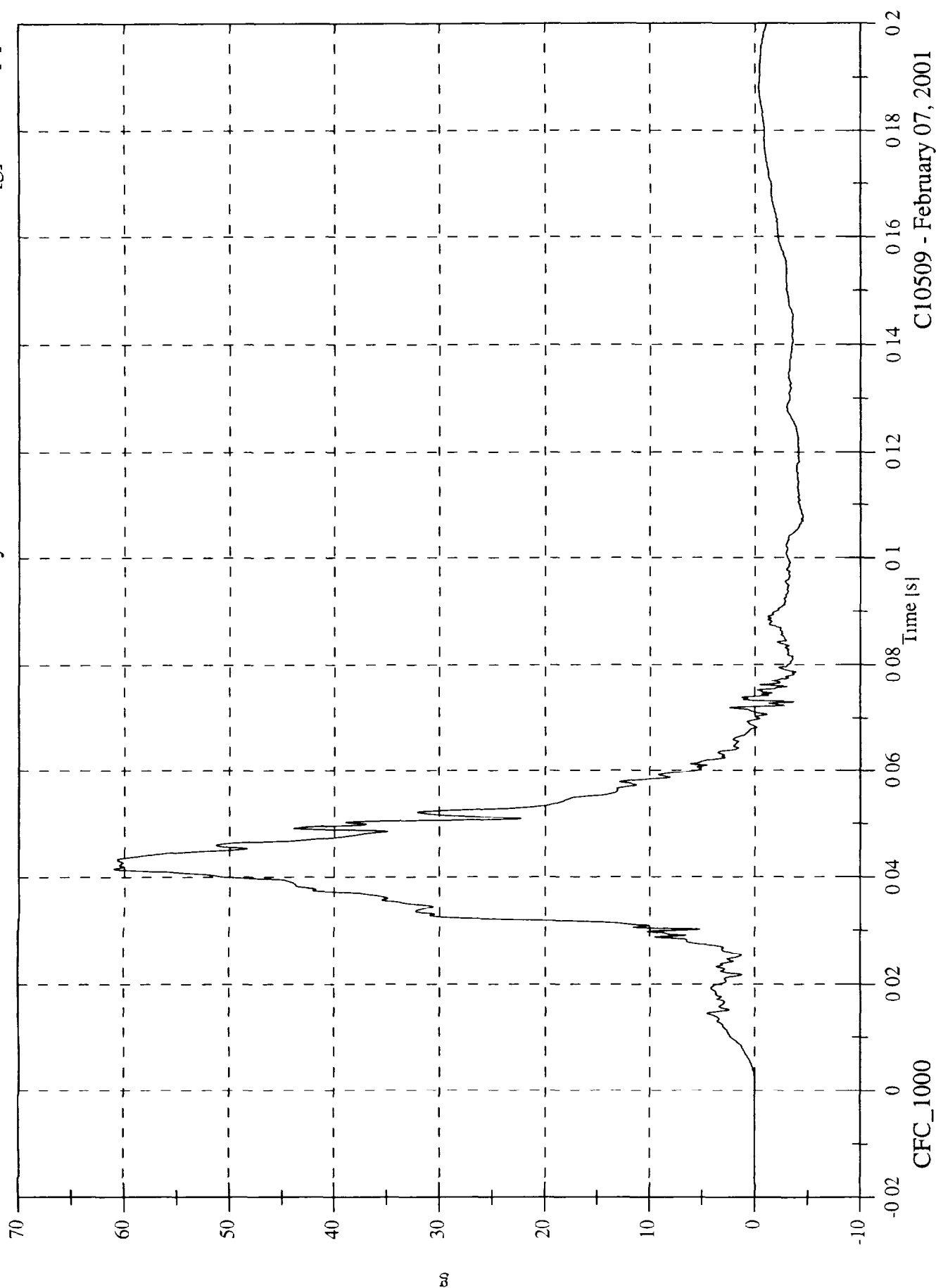
C10509 - February 07, 2001



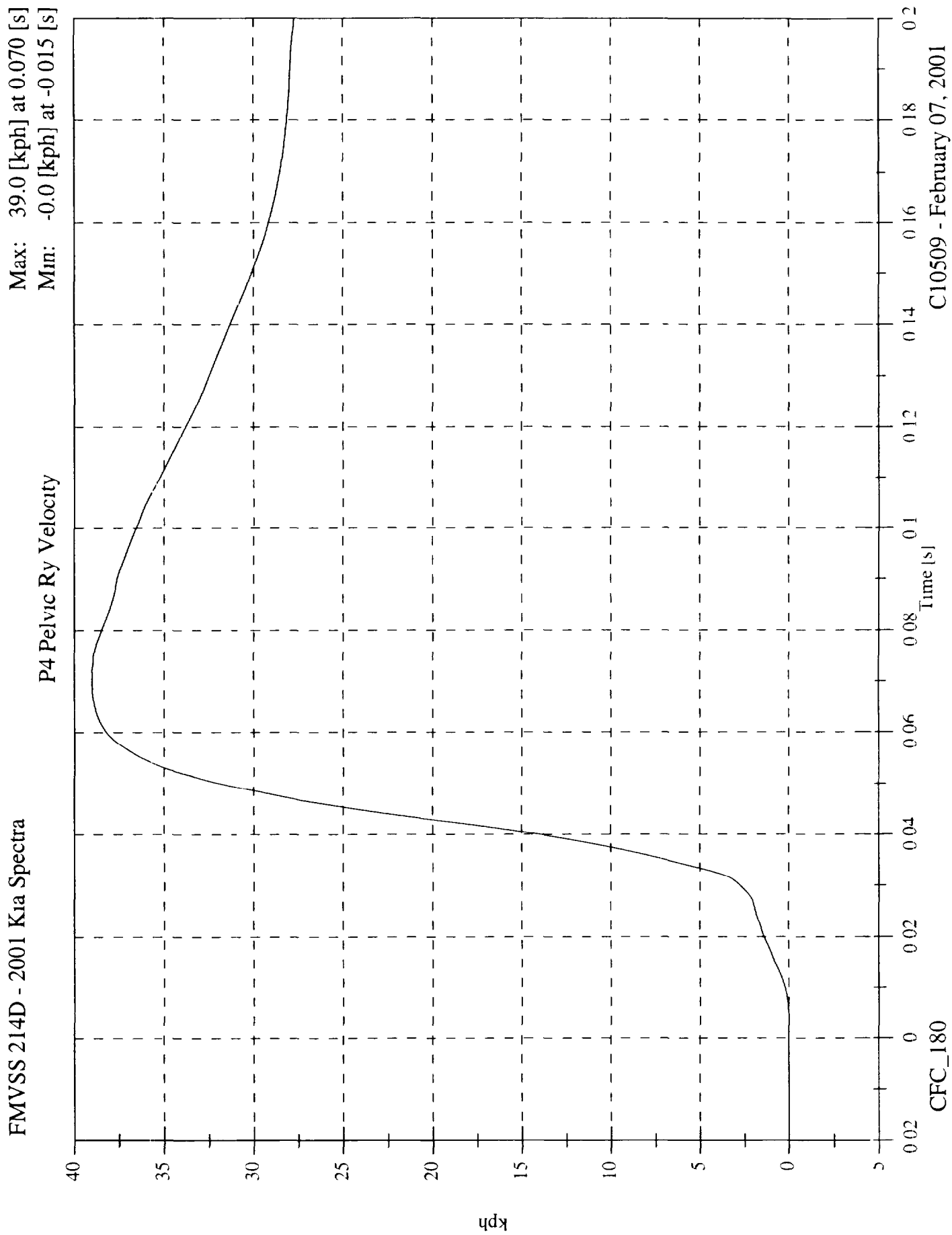
FMVSS 214D - 2001 Kia Spectra

Max: 61.0 [g] at 0.042 [s]
Min: -4.6 [g] at 0.108 [s]

P4 Pelvic Ry



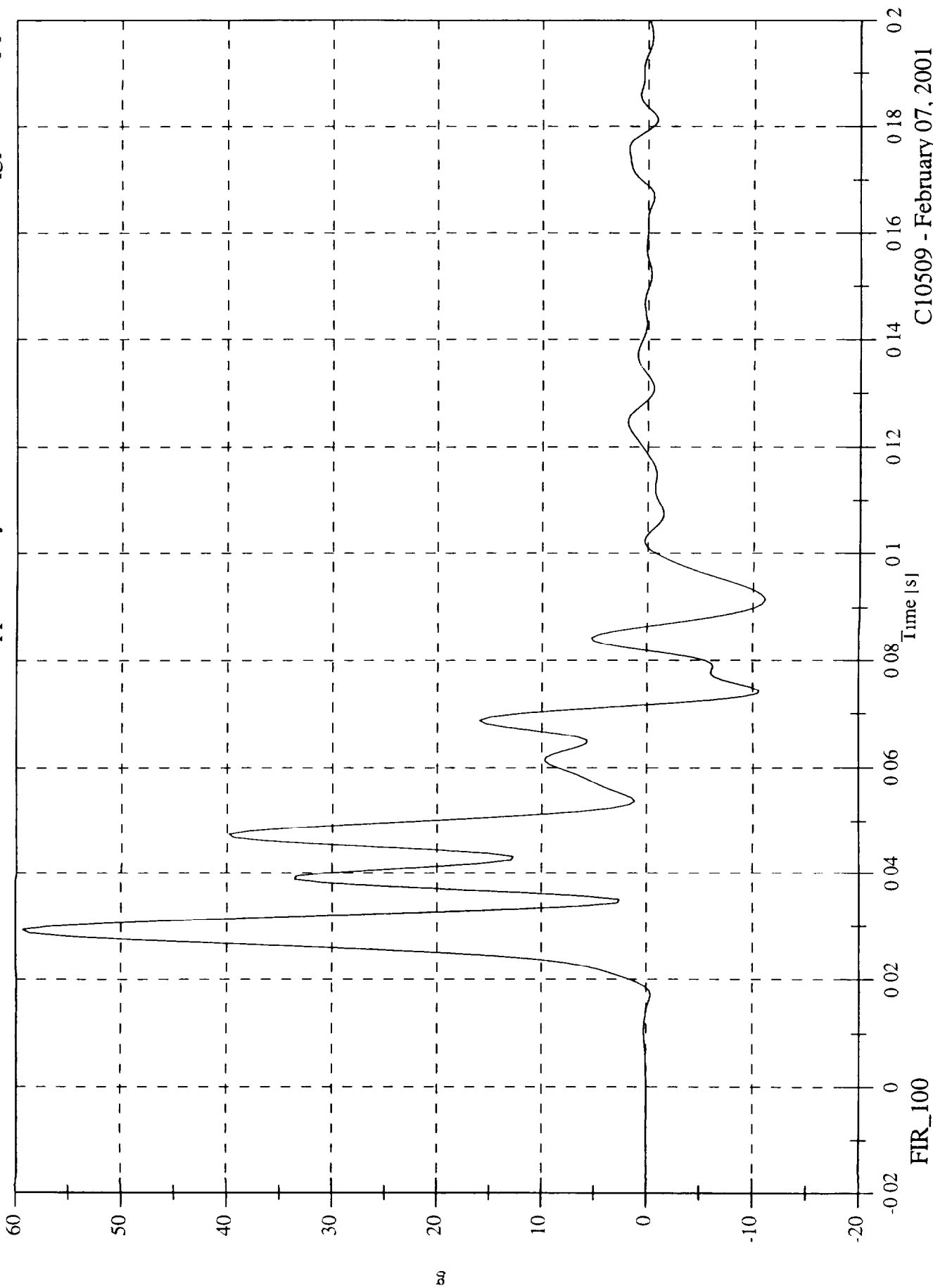
C10509 - February 07, 2001



FMVSS 214D - 2001 Kia Spectra

P1 Upper Rib Ry

Max: 59.3 [g] at 0.029 [s]
Min: -11.1 [g] at 0.091 [s]

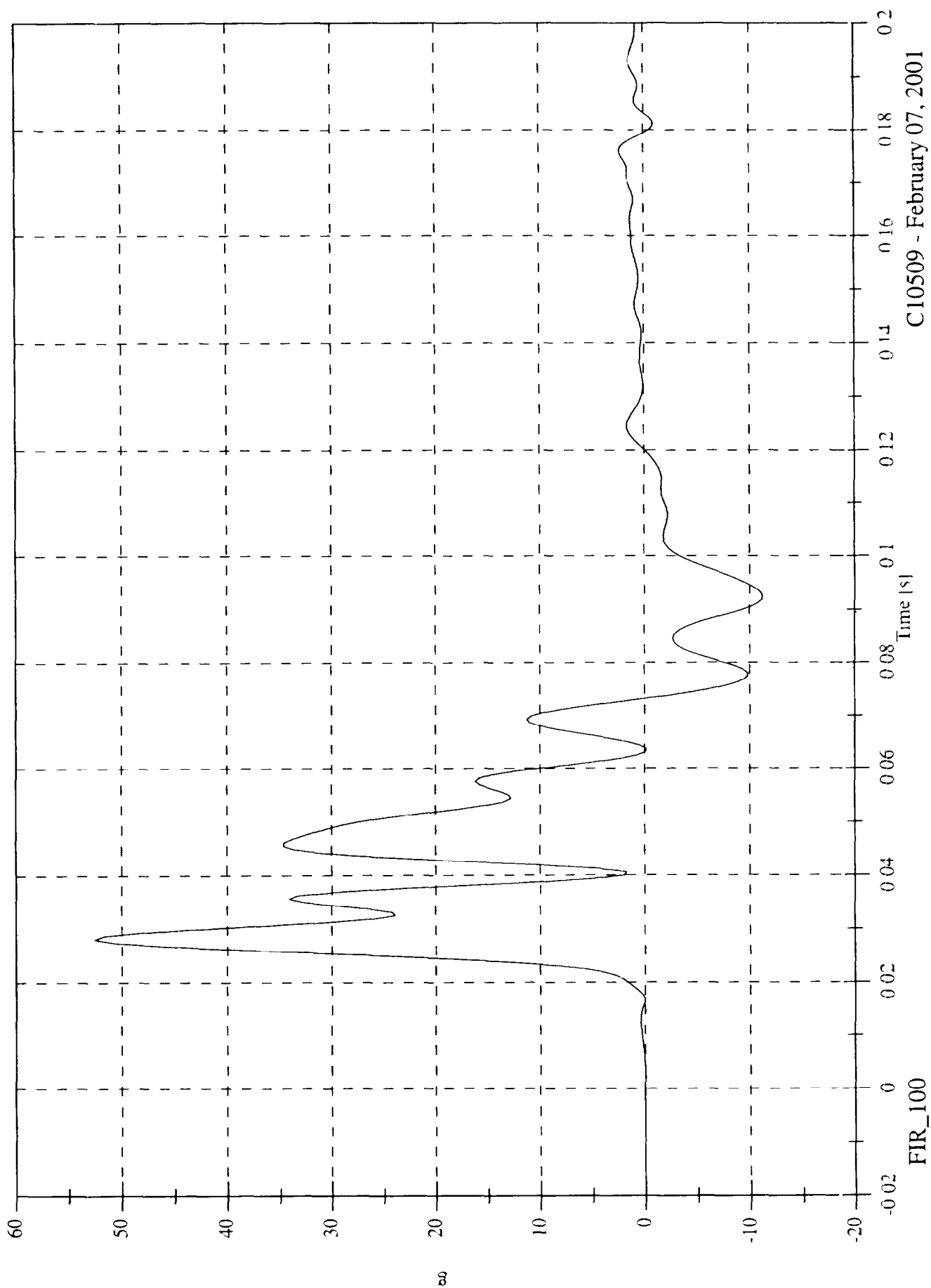


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max: 52.6 [g] at 0.028 [s]
Min: -11.2 [g] at 0.093 [s]

P1 Lower Rib Ry

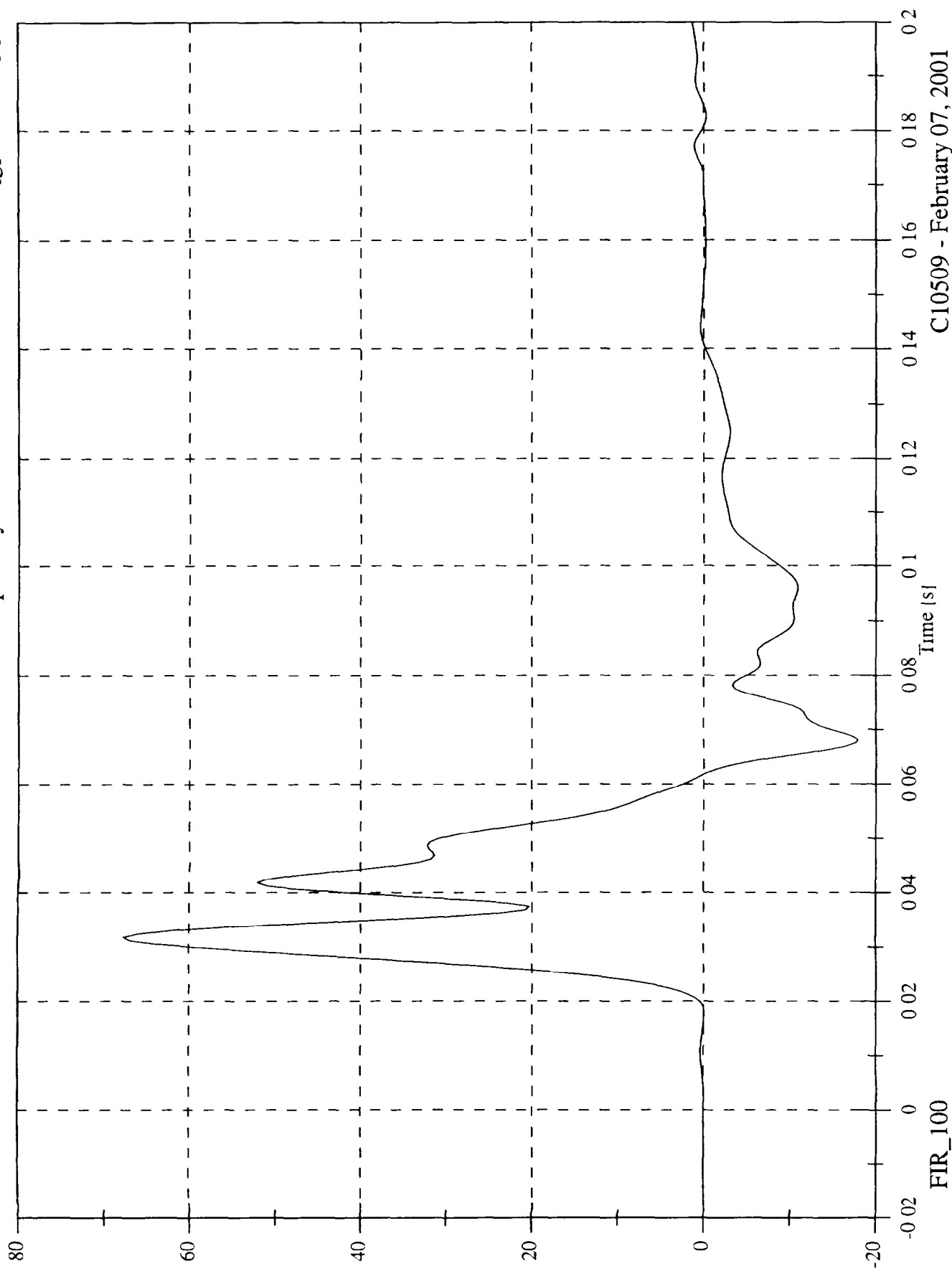


C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max: 67.6 [g] at 0.032 [s]
Min: -17.9 [g] at 0.068 [s]

P1 Lower Spine Ry



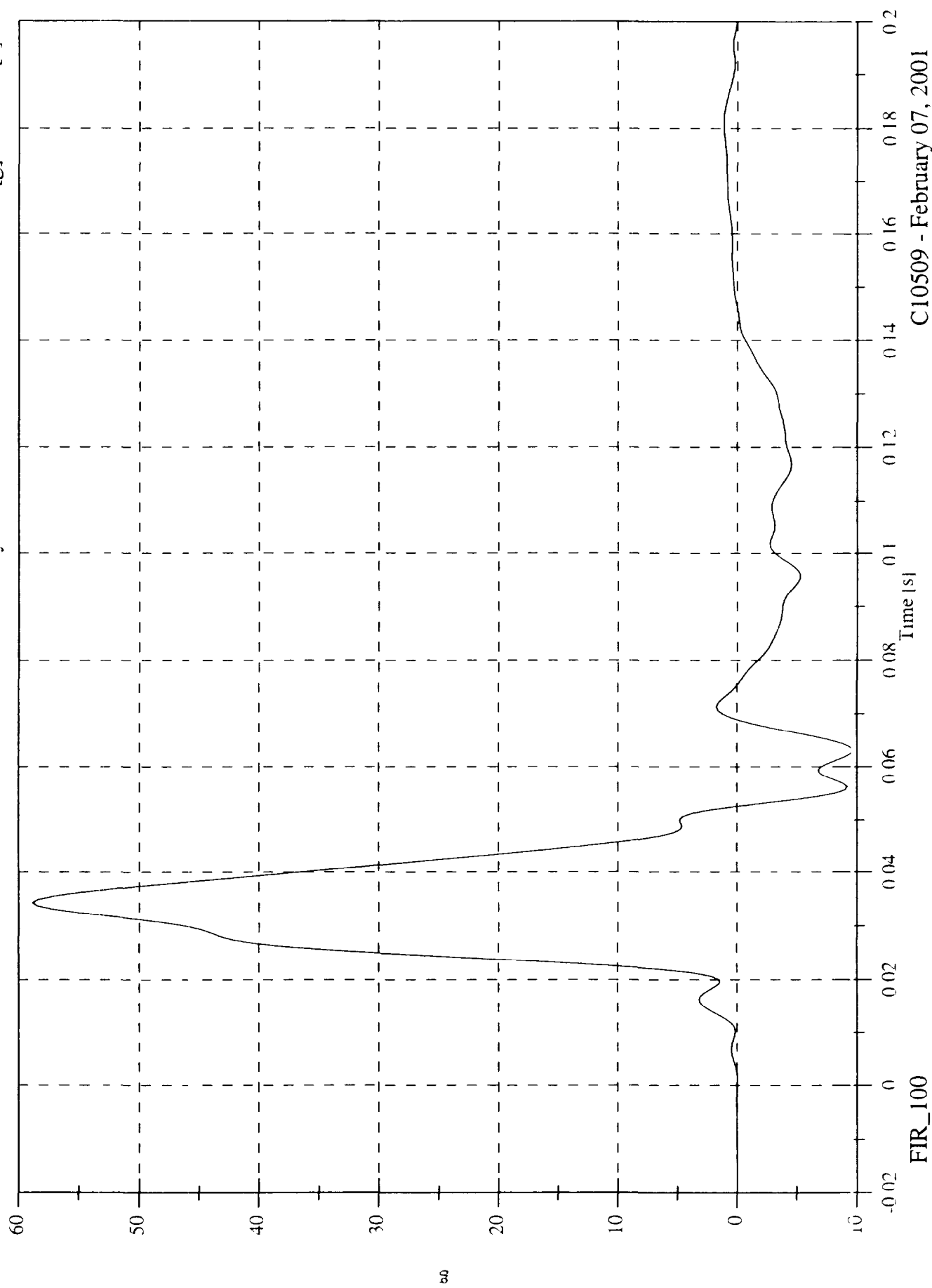
FIR_100

C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max. 58.8 [g] at 0.034 [s]
Min. -9.6 [g] at 0.063 [s]

P1 Pelvic Ry



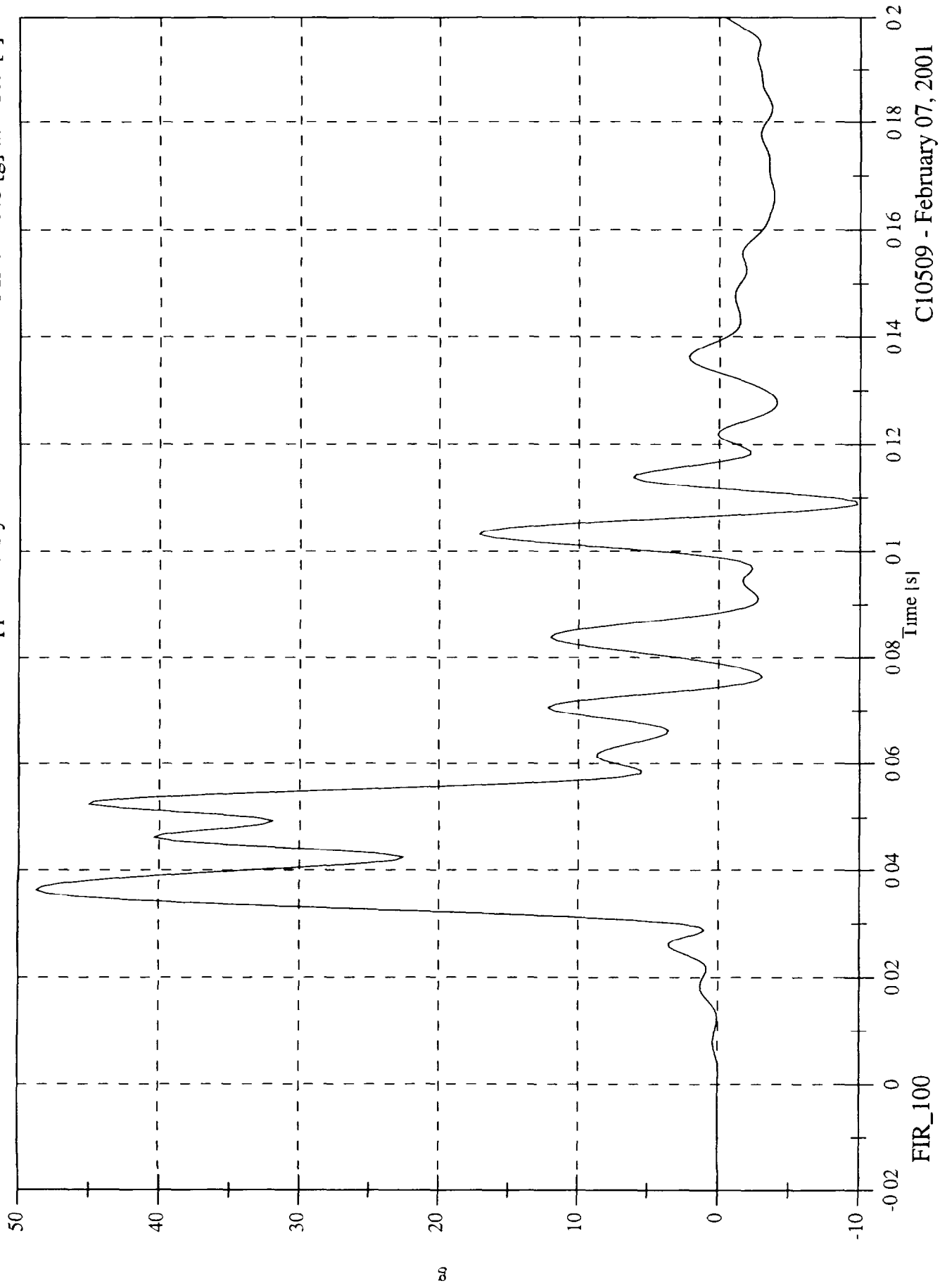
C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

P4 Upper Rib Ry

Max: 48.7 [g] at 0.036 [s]

Min: -9.8 [g] at 0.109 [s]



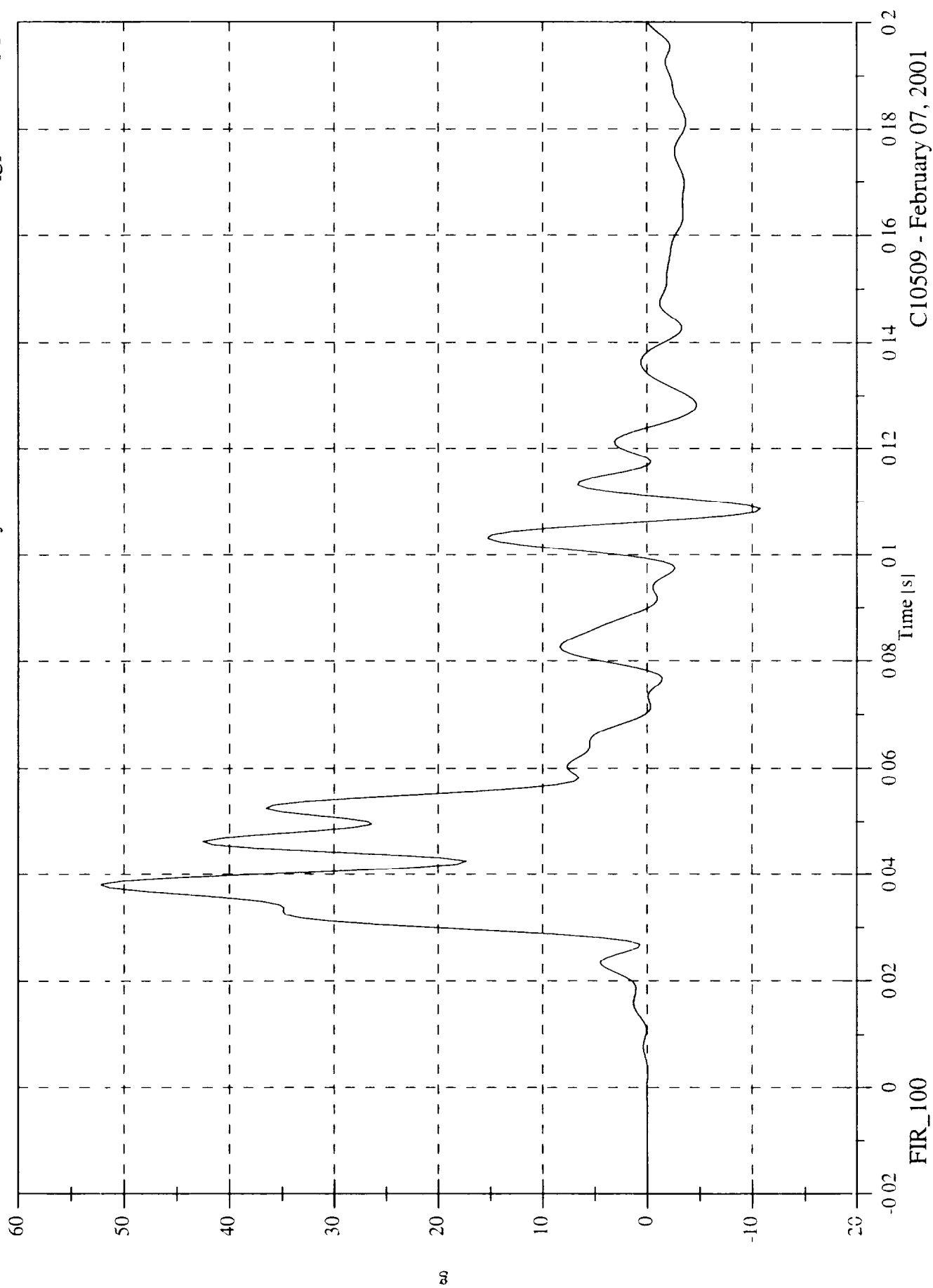
FIR_100

C10509 - February 07, 2001

FMVSS 214D - 2001 Kia Spectra

Max: 52.2 [g] at 0.038 [s]
Min: -10.8 [g] at 0.109 [s]

P4 Lower Rib Ry

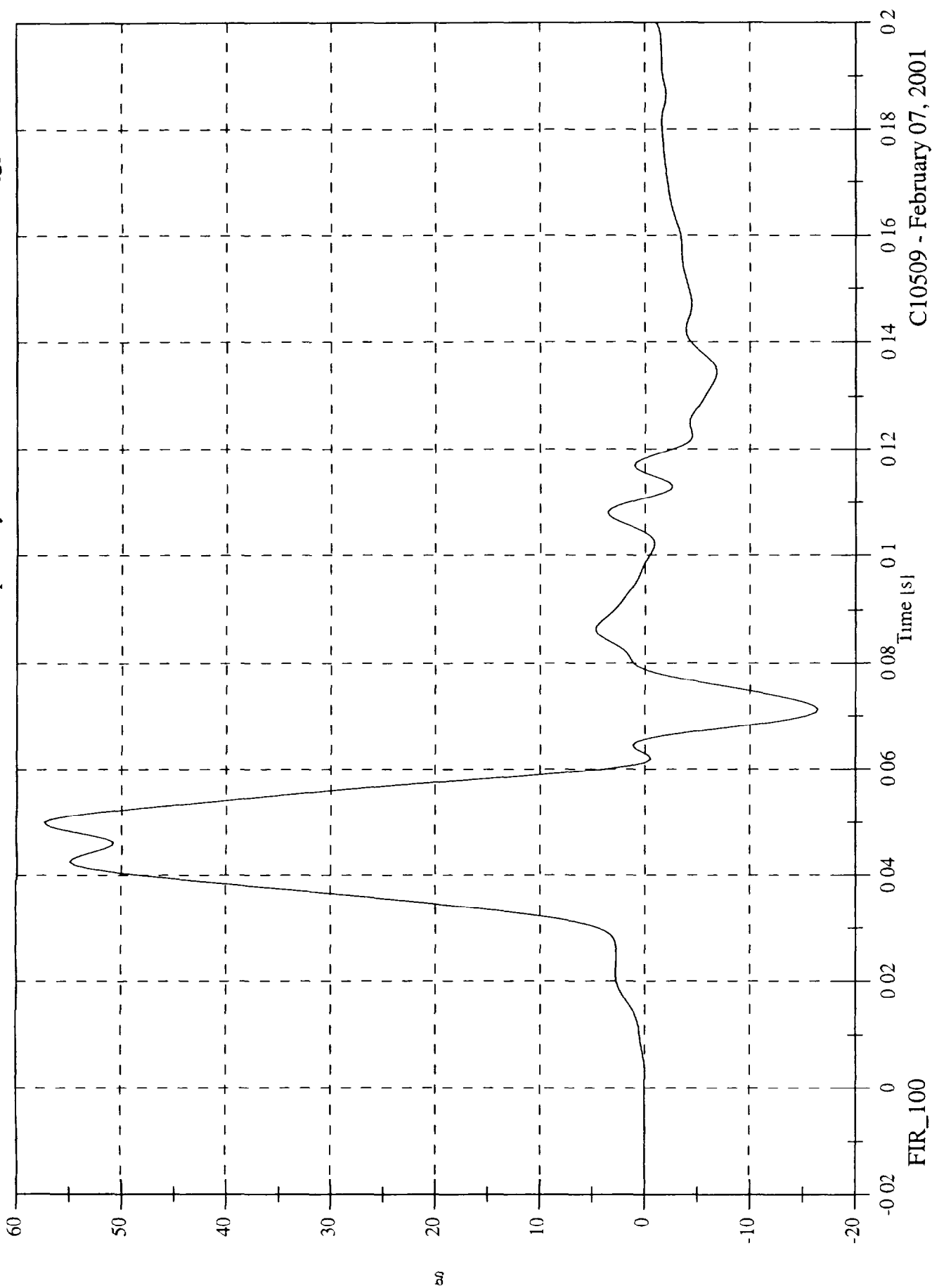


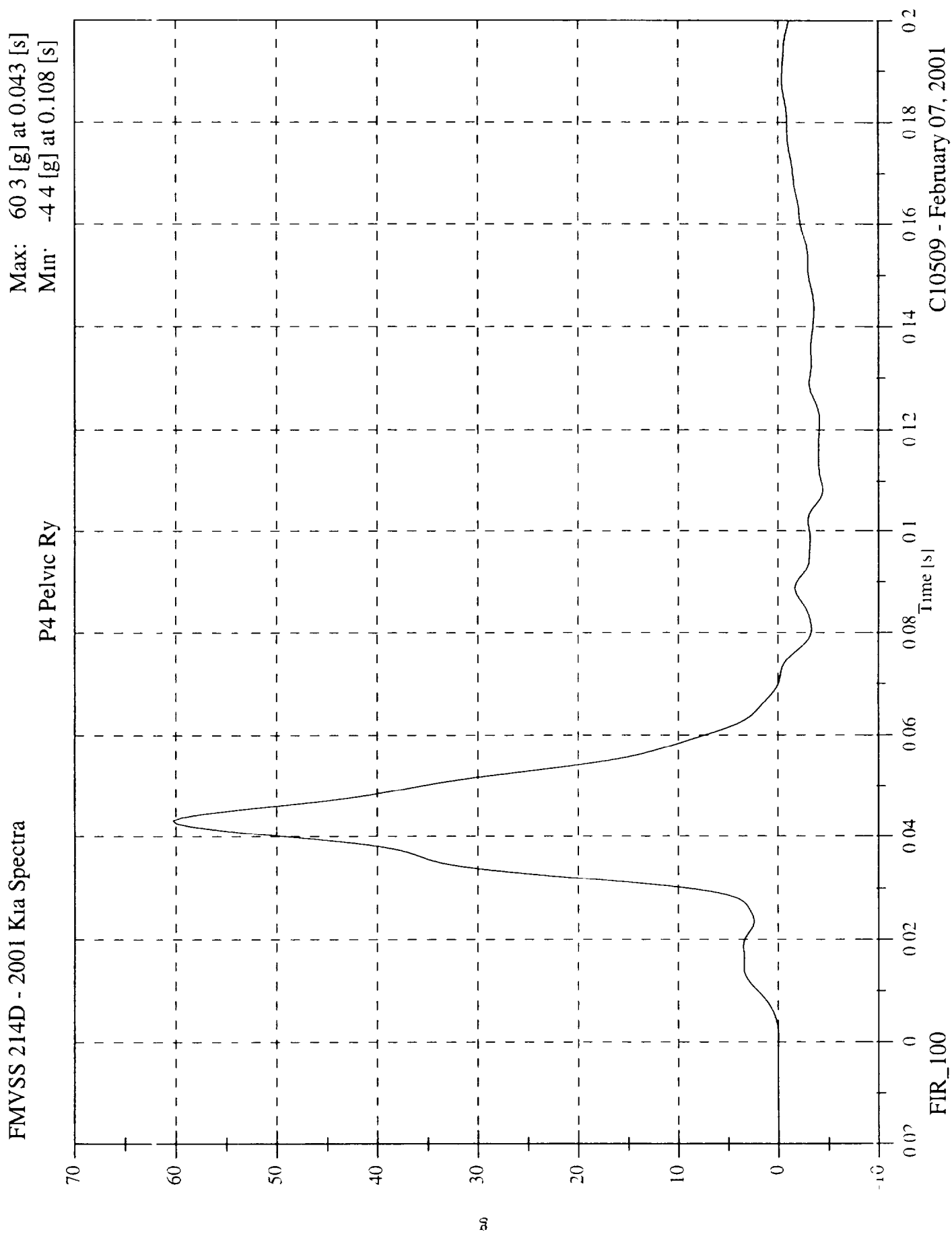
C10509 - February 07, 2001

FMVSS 214D - 2001 K_{1a} Spectra

Max: 57.3 [g] at 0.050 [s]
Min: -16.4 [g] at 0.071 [s]

P4 Lower Spine R_y





C10509 - February 07, 2001

APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID PRE & POST TEST CALIBRATION

CONFIGURED FOR LEFT SIDE IMPACT

Date 2/13/01, 2/13/01

Sequential Test Number

11, 15

Laboratory Technician

B Swiecicki

TEST PARAMETER	SPECIFICATION	SID NO 015		SID NO 016	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	902	902	902	902
RH- Rib Height (mm)	501 - 521	511	512	513	512
HP- Hip Pivot Height (mm)	99 ref	99	99	99	99
RD- Rib from Back Line (mm)	229 - 241	239	239	239	239
KV- Knee Pivot from Back Line (mm)	511 - 526	521	521	526	521
SW- Knee Pivot to Floor (mm)	490 - 505	493	493	495	493
HW- Hip Width (mm)	356 - 391	373	375	368	375
THORAX IMPACTS					
TEMPERATURE (°C)	18.9 - 25.5	21.7	21.7	21.1	21.7
RELATIVE HUMIDITY (%)	10 - 70	30	32	32	32
PROBE SPEED (m/s)	4.27 - 4.33	4.29	4.28	4.27	4.28
UPPER RIB (g's)	37 - 46	44.4	41.3	42.2	41.8
LOWER RIB (g's)	37 - 46	37.8	37.8	40.0	40.3
LOWER SPINE (g's)	15 - 22	21.3	21.7	21.9	21.8
PELVIS IMPACT					
TEMPERATURE (°C)	18.9 - 25.5	21.7	21.7	21.1	21.7
RELATIVE HUMIDITY (%)	10 - 70	30	32	32	32
PROBE SPEED (m/s)	4.27 - 4.33	4.28	4.32	4.28	4.27
PELVIS (g's)	40 - 60	52.7	59.1	57.6	52.3

REMARKS: None

**CALIBRATION TEST RESULTS
PRE-TEST**

SID NO.: 015

CONFIGURED FOR LEFT SIDE IMPACT

CONFIGURED FOR LEFT SIDE IMPACT

Sequential Test Number 1

Laboratory Technician B Swiecicki

* Test not required for SID certification

3502-24

**EXTERNAL DIMENSIONS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
Date 1/21/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	511
HP- Hip Pivot Height (mm)	99 ref	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	493
HW- Hip Width (mm)	356 - 391	373

REMARKS: None

THORACIC SHOCK ABSORBER TESTS
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 11
Date 1/20/01 Laboratory Technician B. Swiecicki

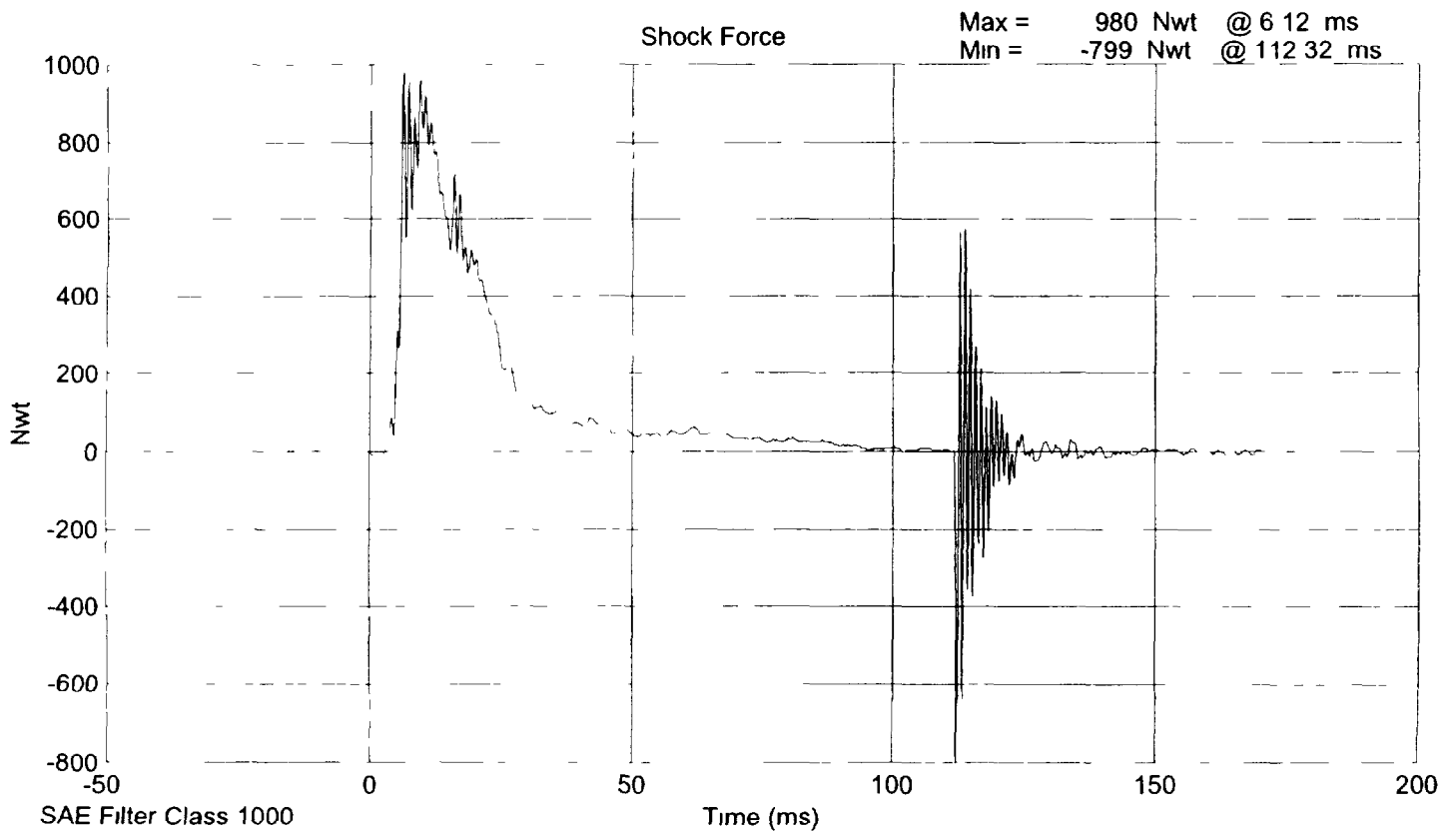
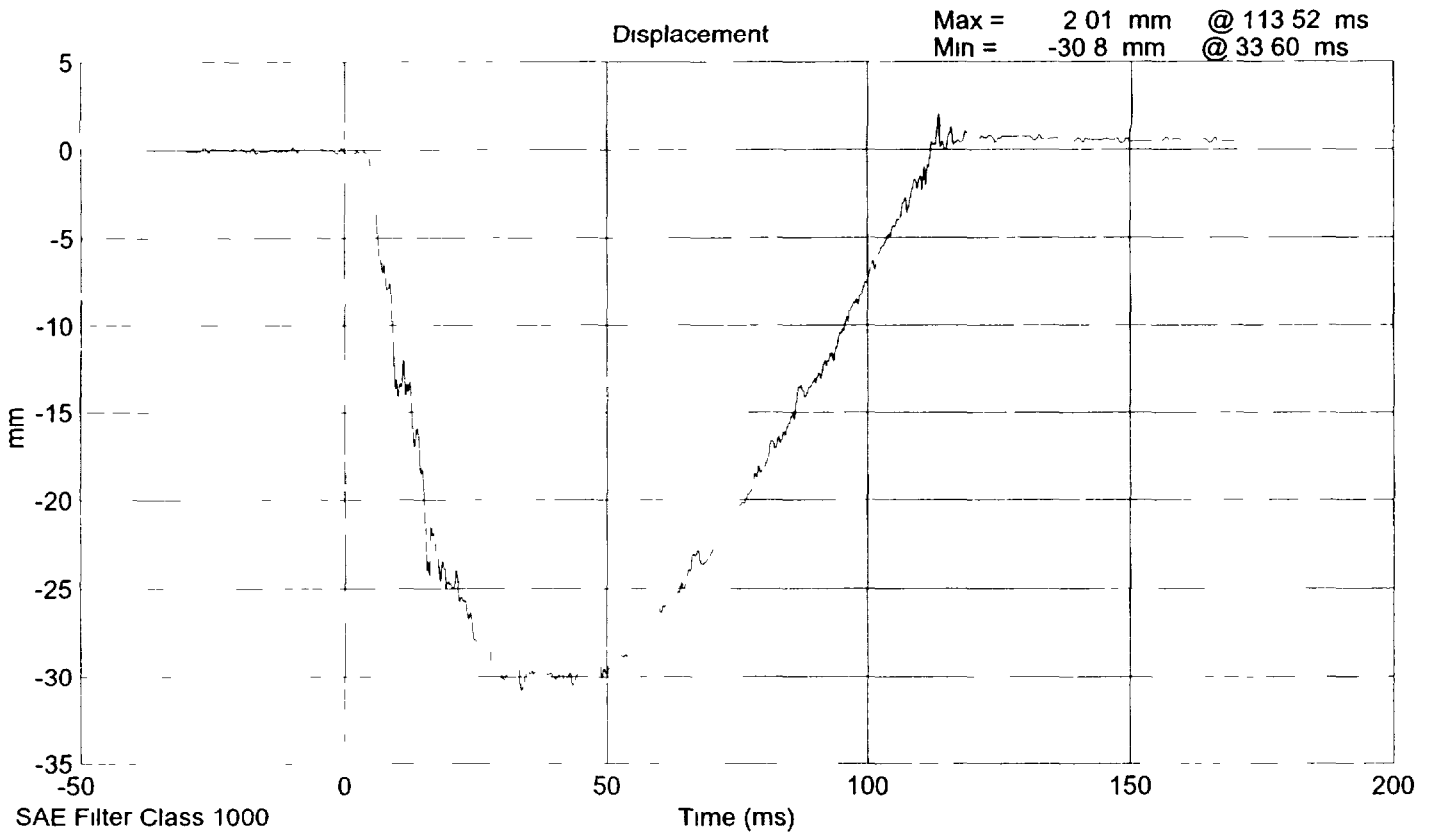
DAMPER IDENTIFICATION 015

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)		10 - 70	30
VELOCITY 3.05 m/s	FORCE (N)	836 - 1125	980
	DISPLACEMENT (mm)	30 - 35	30.8
VELOCITY 4.27 m/s	FORCE (N)	1730 - 2099	1893
	DISPLACEMENT (mm)	32 - 37	33.8
VELOCITY 6.10 m/s	FORCE (N)	3741 - 4448	3800
	DISPLACEMENT (mm)	33 - 40	37.0

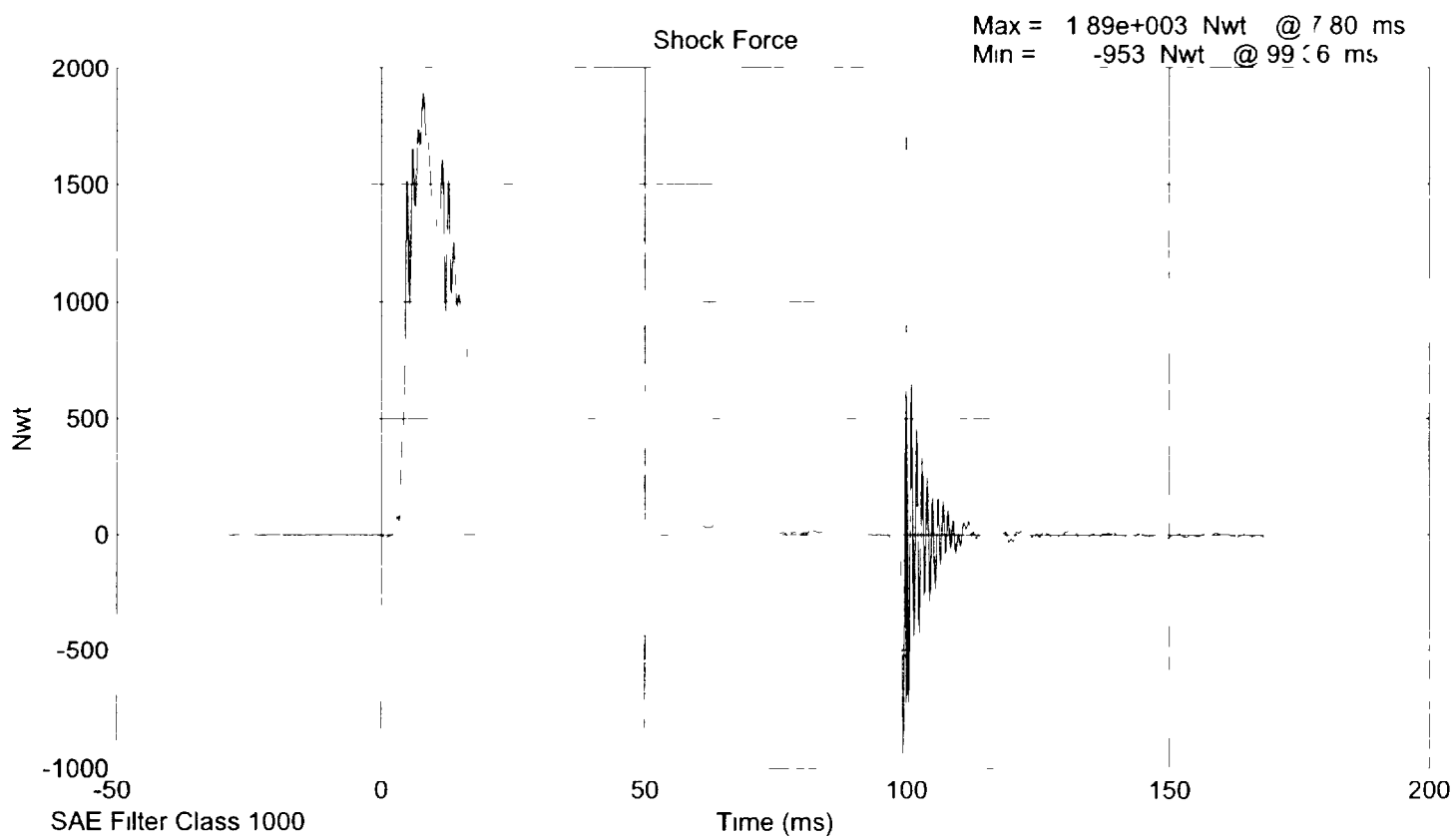
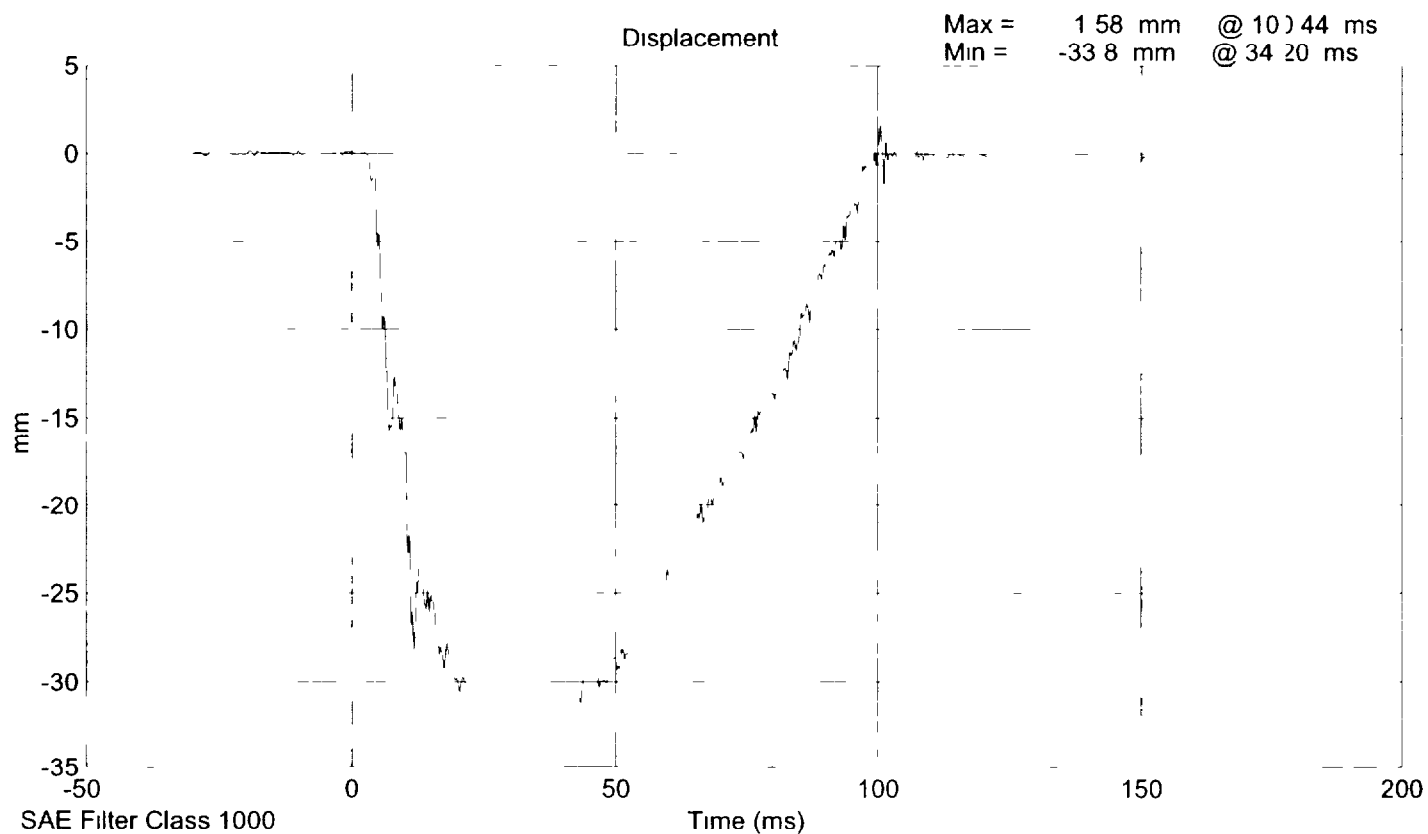
DAMPER SETTING 5

REMARKS: None

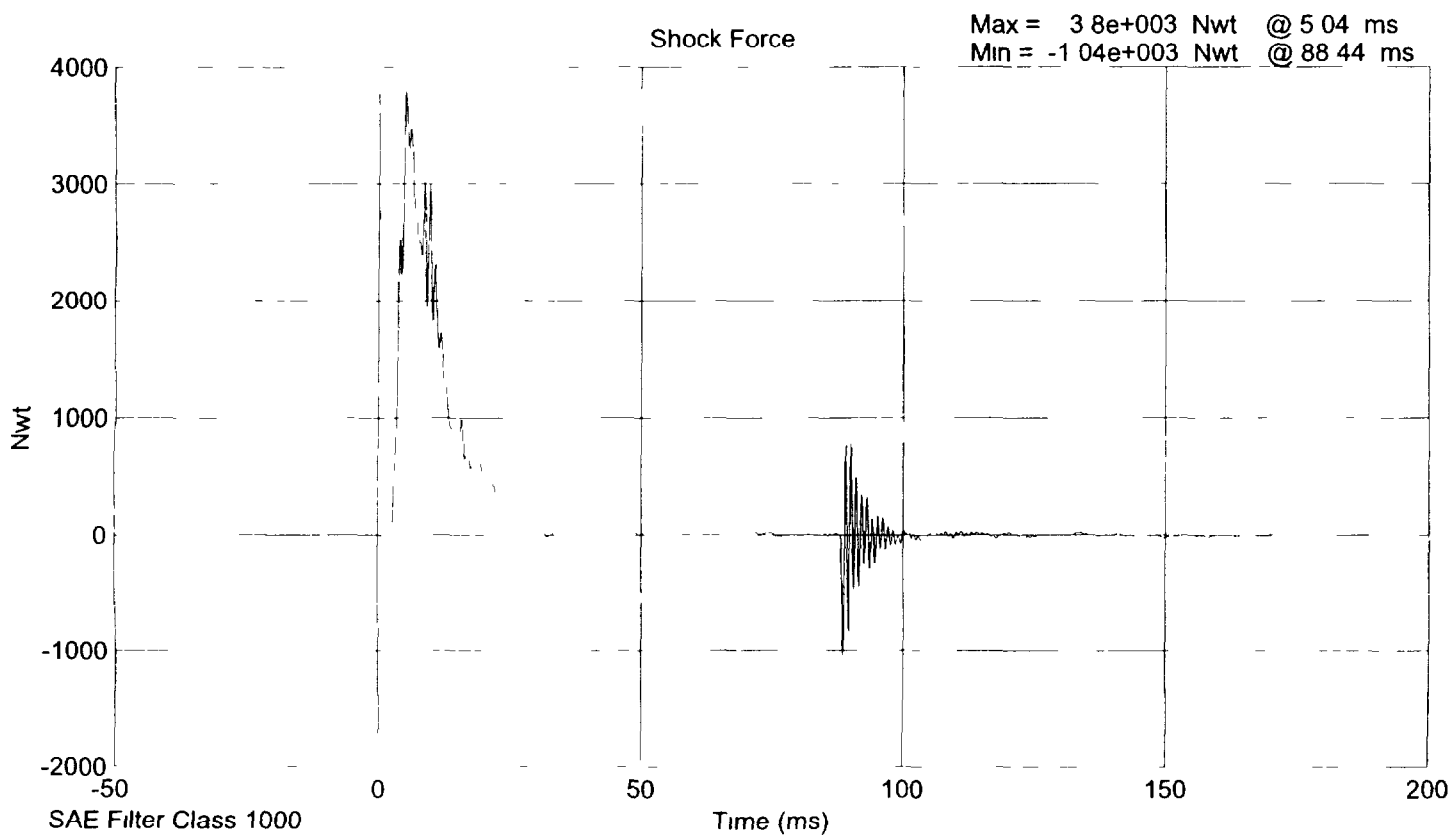
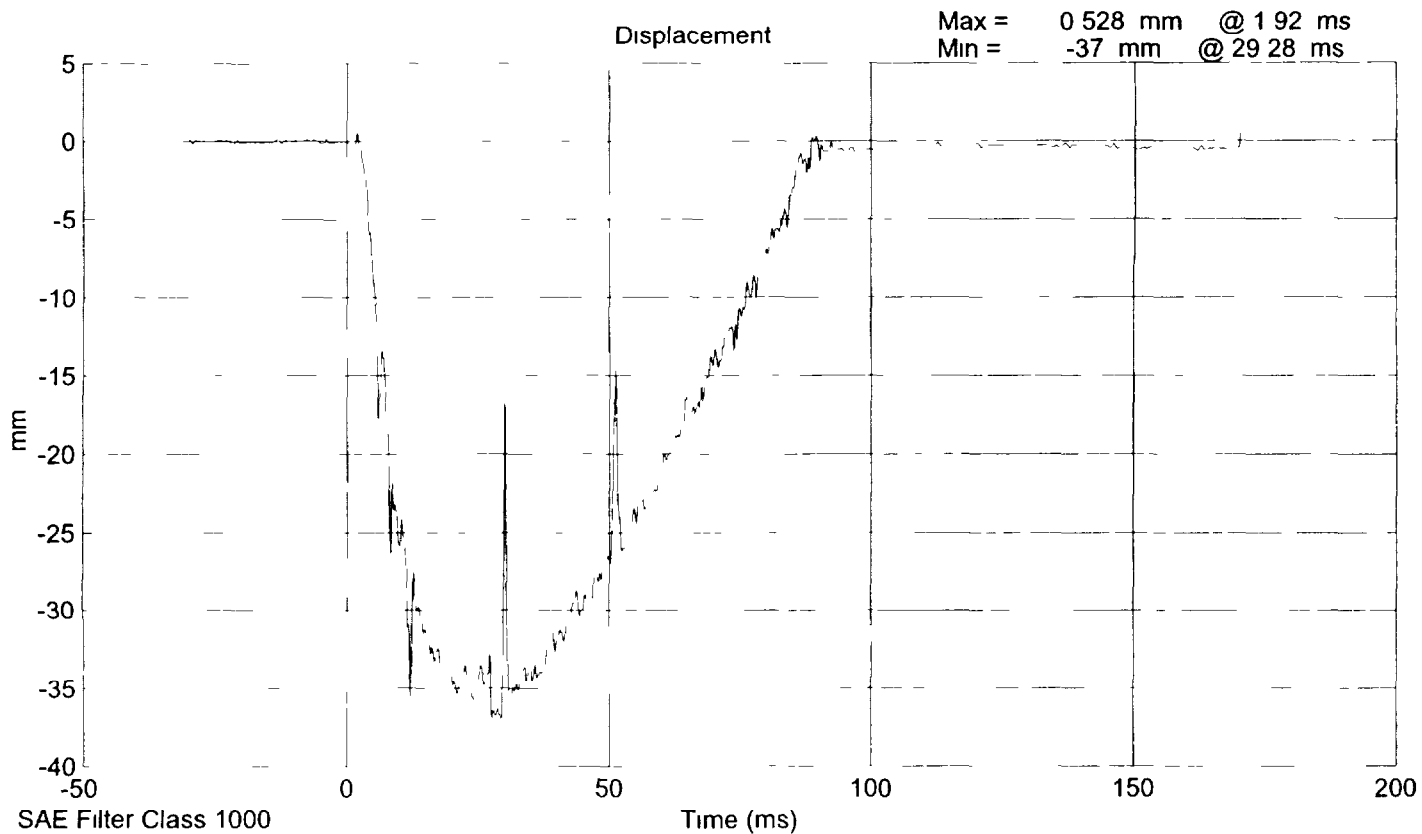
SID 015 Shock Absorber Impact Test @ 3 048 m/s



SID 015 Shock Absorber Impact Test @ 4 2672 m/s



SID 015 Shock Absorber Impact Test @ 6 096 m/s



**LATERAL THORAX IMPACT TEST
PRE-TEST**

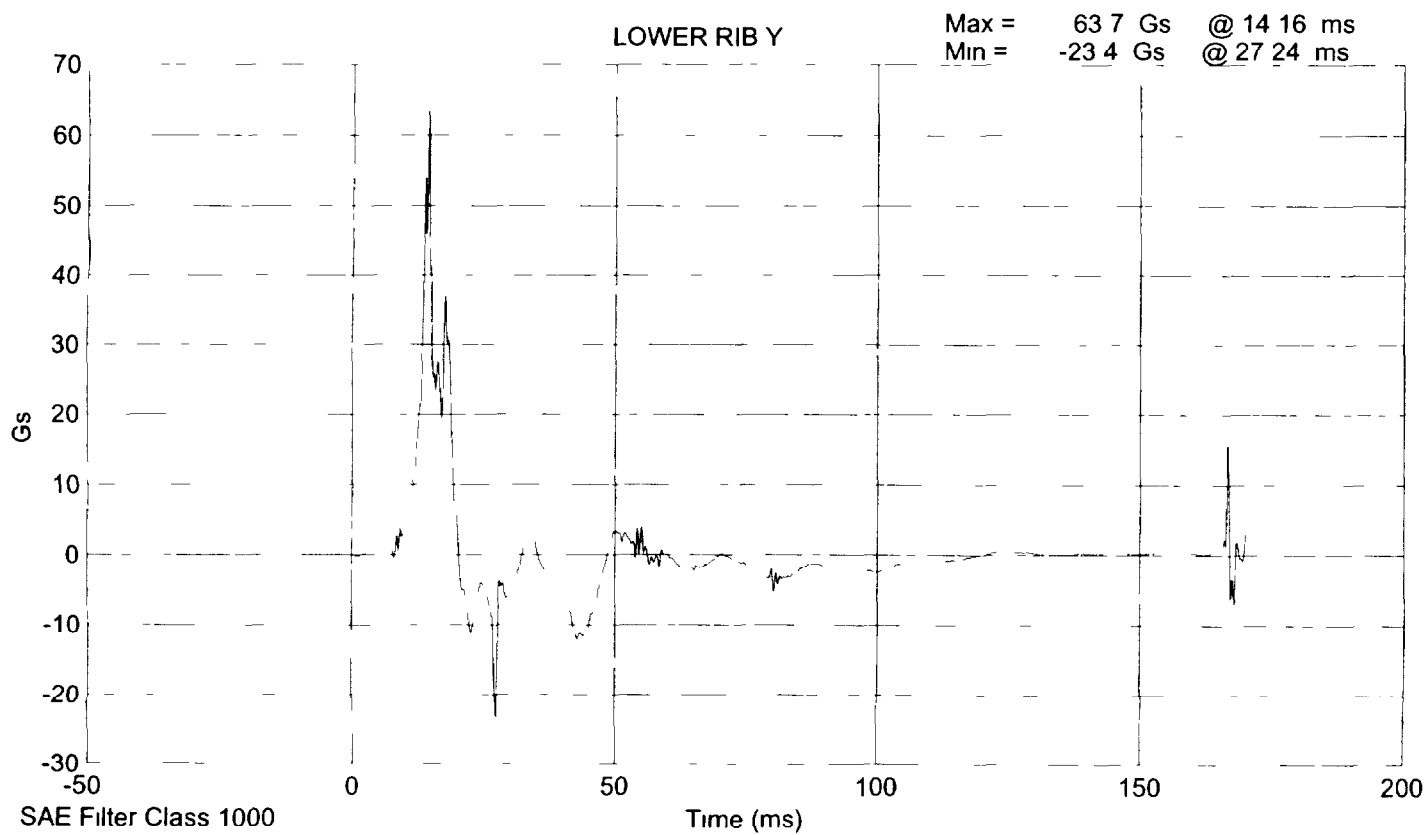
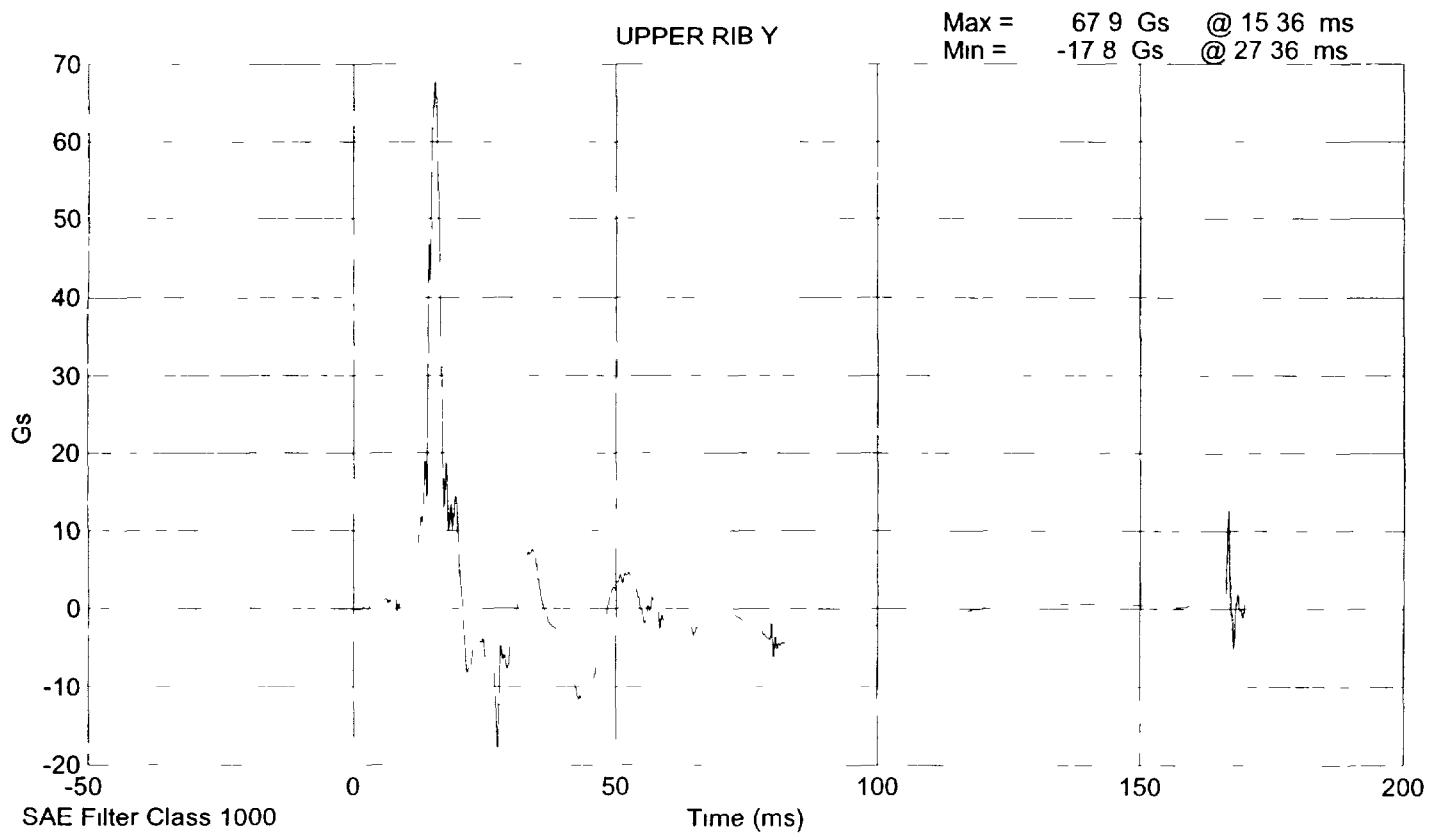
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
Date 1/29/01 Laboratory Technician B Swiecicki

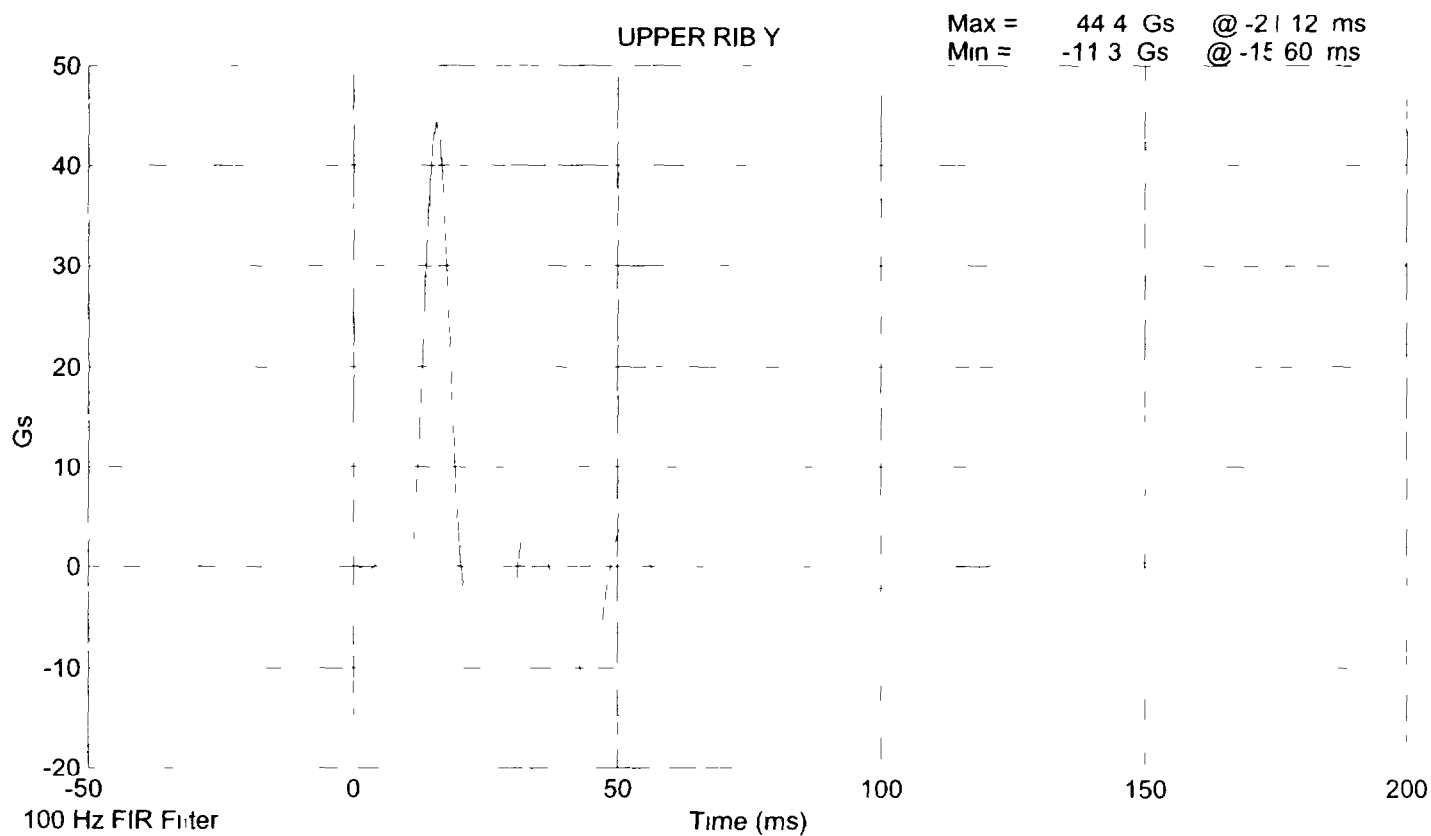
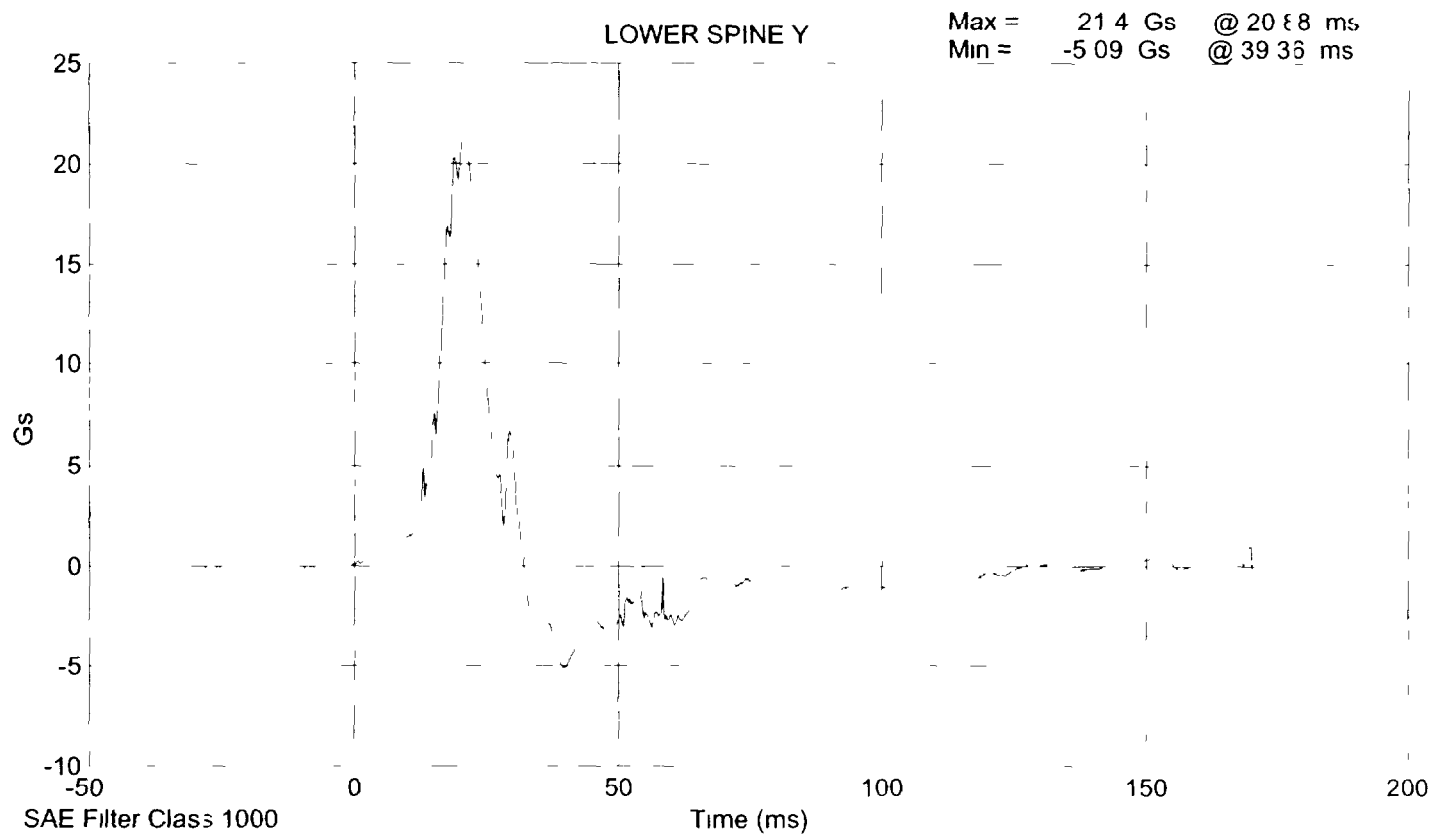
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	30
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46	44.4
LOWER RIB (g's)	37 - 46	37.8
LOWER SPINE (g's)	15 - 22	21.3

REMARKS: None

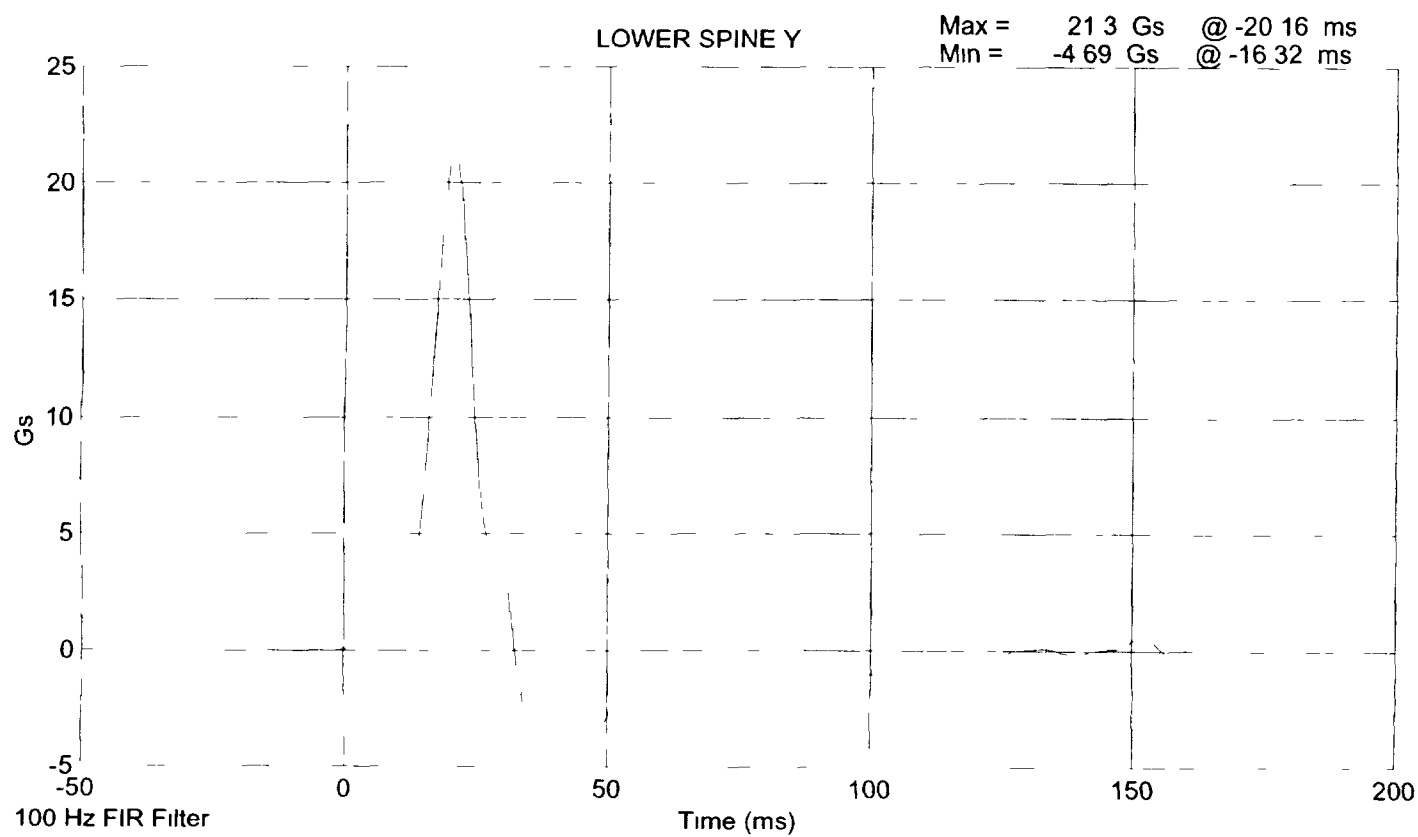
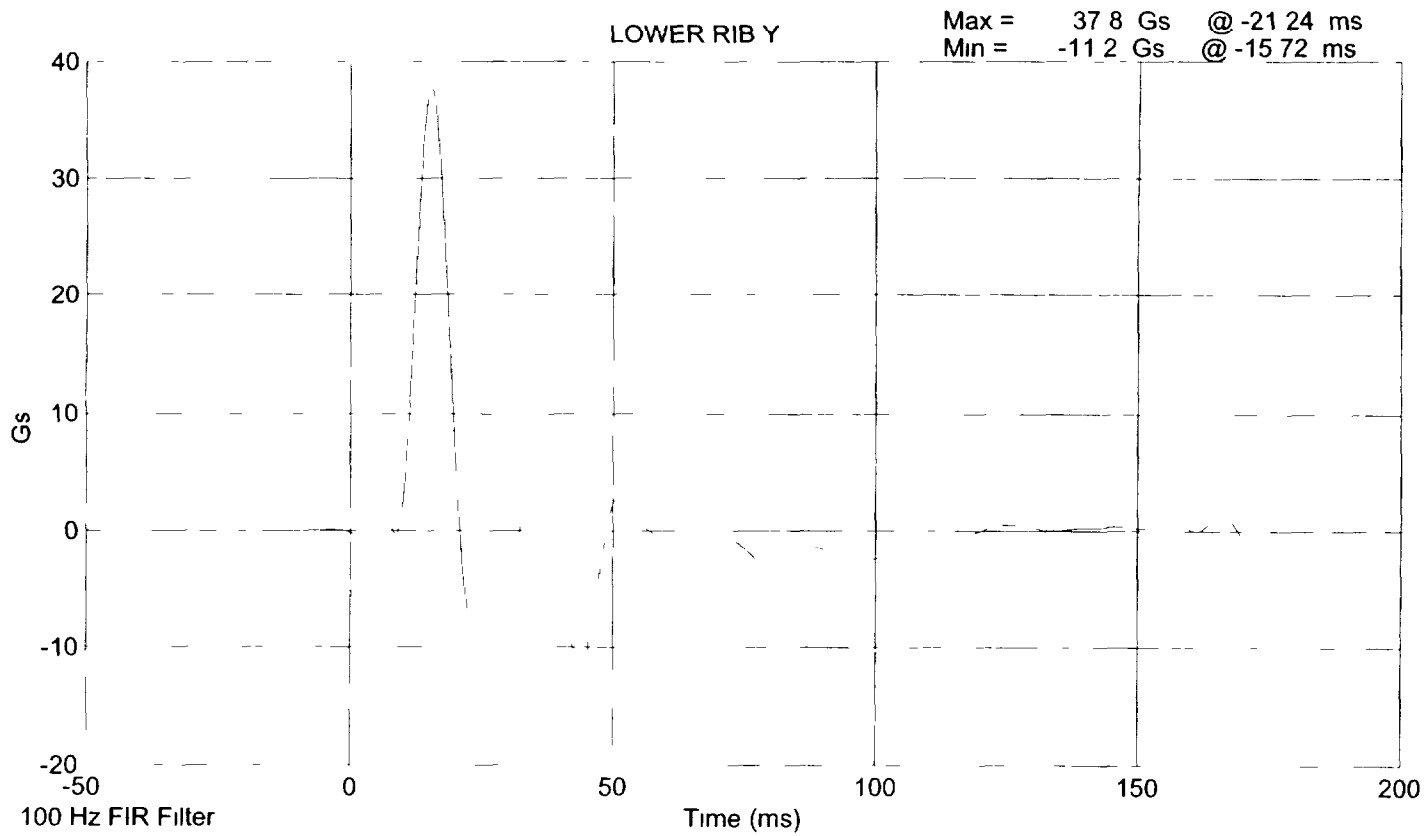
SID 015 Thorax Impact Test @ 4 2855 m/s



SID 015 Thorax Impact Test @ 4 2855 m/s



SID 015 Thorax Impact Test @ 4 2855 m/s



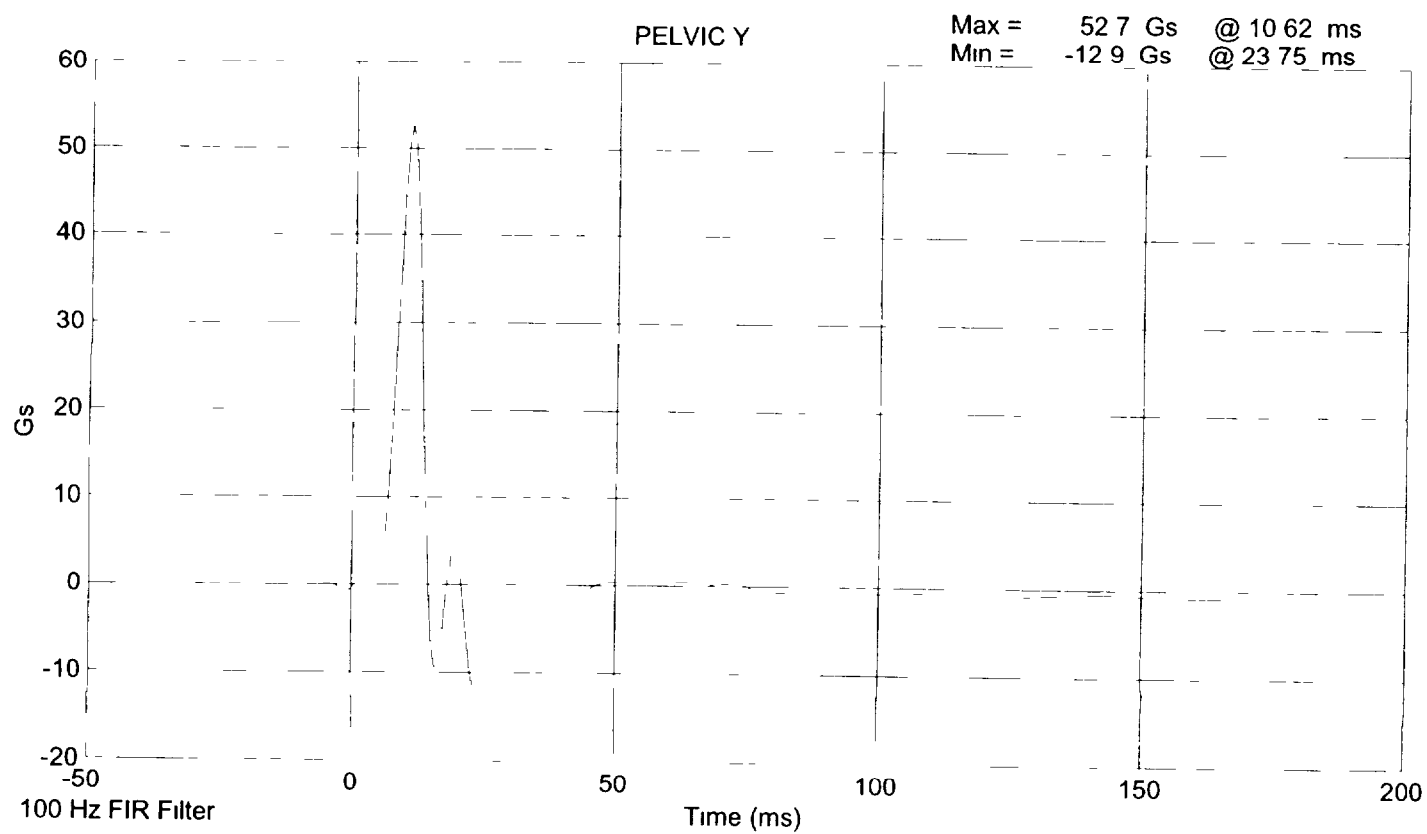
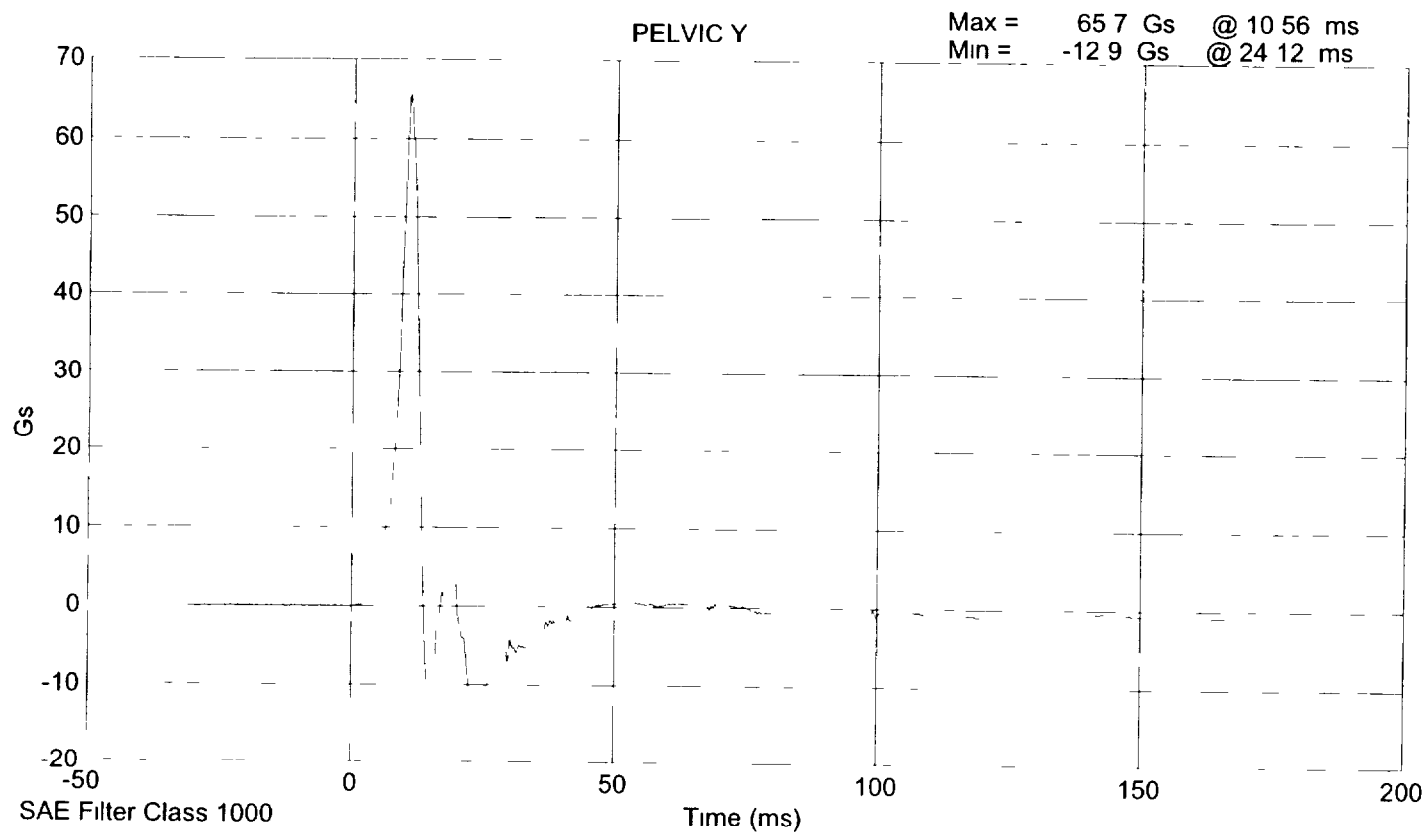
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No	015	Sequential Test Number	1
Date	1/29/01	Laboratory Technician	B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	30
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	52.7

REMARKS: None

SID 015 Pelvic Impact Test @ 4 2794 m/s



ABDOMINAL COMPRESSION TEST**PRE-TEST**

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
Date 1/21/01 Laboratory Technician B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	30
FORCE @ 13 mm (N)	104 - 162	111
FORCE @ 19 mm (N)	163 - 221	175
FORCE @ 25 mm (N)	222 - 280	253
FORCE @ 33 mm (N)	325 - 391	369

REMARKS: None

ORIGINAL

Dummy S/N 015

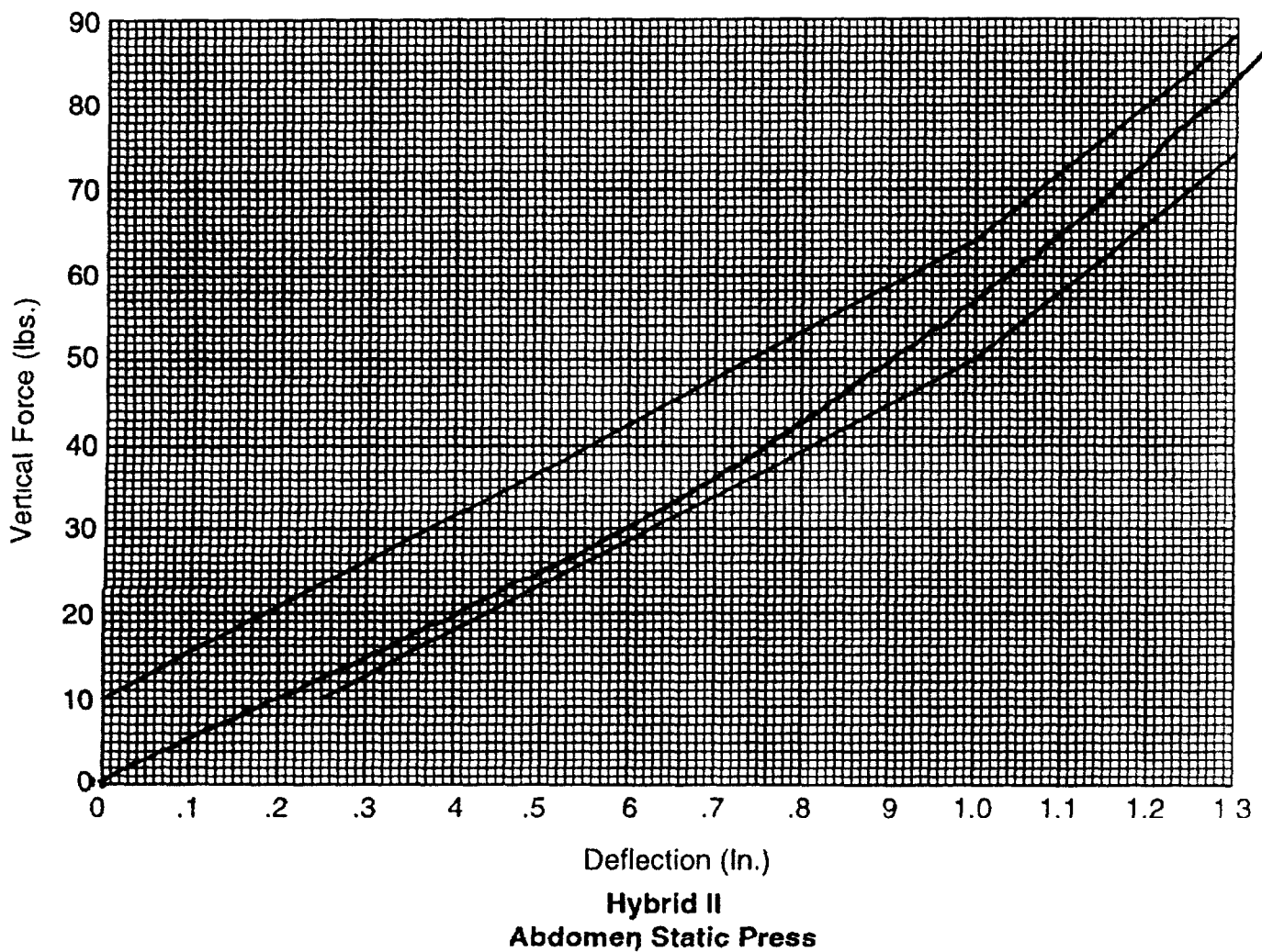
W/A _____

Date 1-21-2001

Performed By RS

Temp 71°

Humidity 30%



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

CONFIGURED FOR LEFT SIDE IMPACT

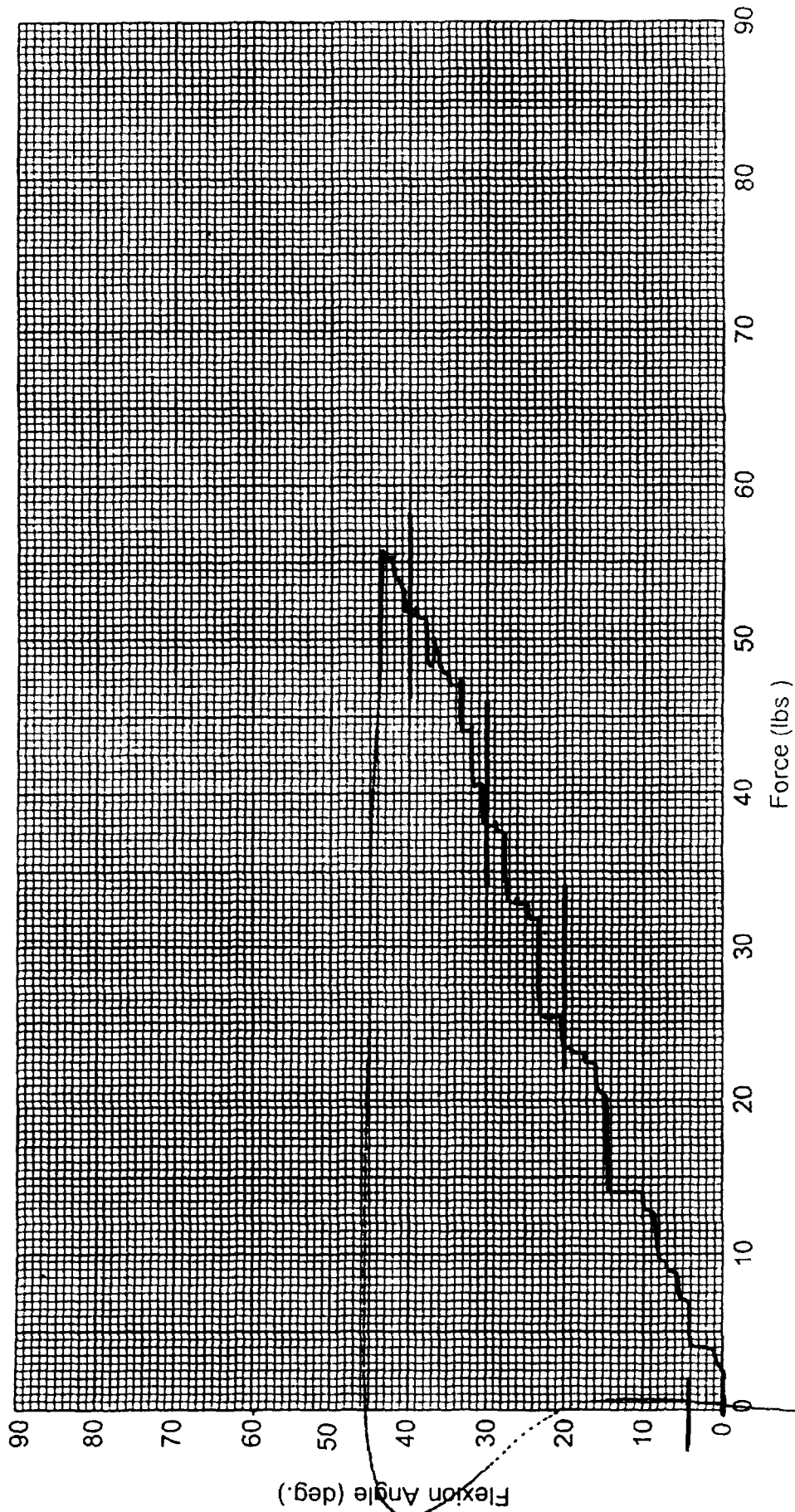
SID Serial No 015 Sequential Test Number 1
Date 1/21/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	30
FORCE @ 0° (N)	0 - 26.7	0.0
FORCE @ 20° (N)	97.8 - 151.2	103.6
FORCE @ 30° (N)	151.2 - 204.6	163.7
FORCE @ 40° (N)	204.6 - 258	229.5
RETURN ANGLE	12° max	4.2°

REMARKS: None

ORIGINAL

Dummy S/N 015
W/A _____
Date 1-21-2001
Performed By BS
Temp. 71°
Humidity 30%



Hybrid II Lumbar Spine Flexion Test

PRE-TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
 Date 1/29/01 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 NO.: 016

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
Date 1/26/01 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
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 Serial No 016 Sequential Test Number 1
Date 1/26/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	513
HP- Hip Pivot Height (mm)	99 ref	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	526
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	368

REMARKS: None

THORACIC SHOCK ABSORBER TESTS
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 15
Date 4/19/00 Laboratory Technician B Swiecicki

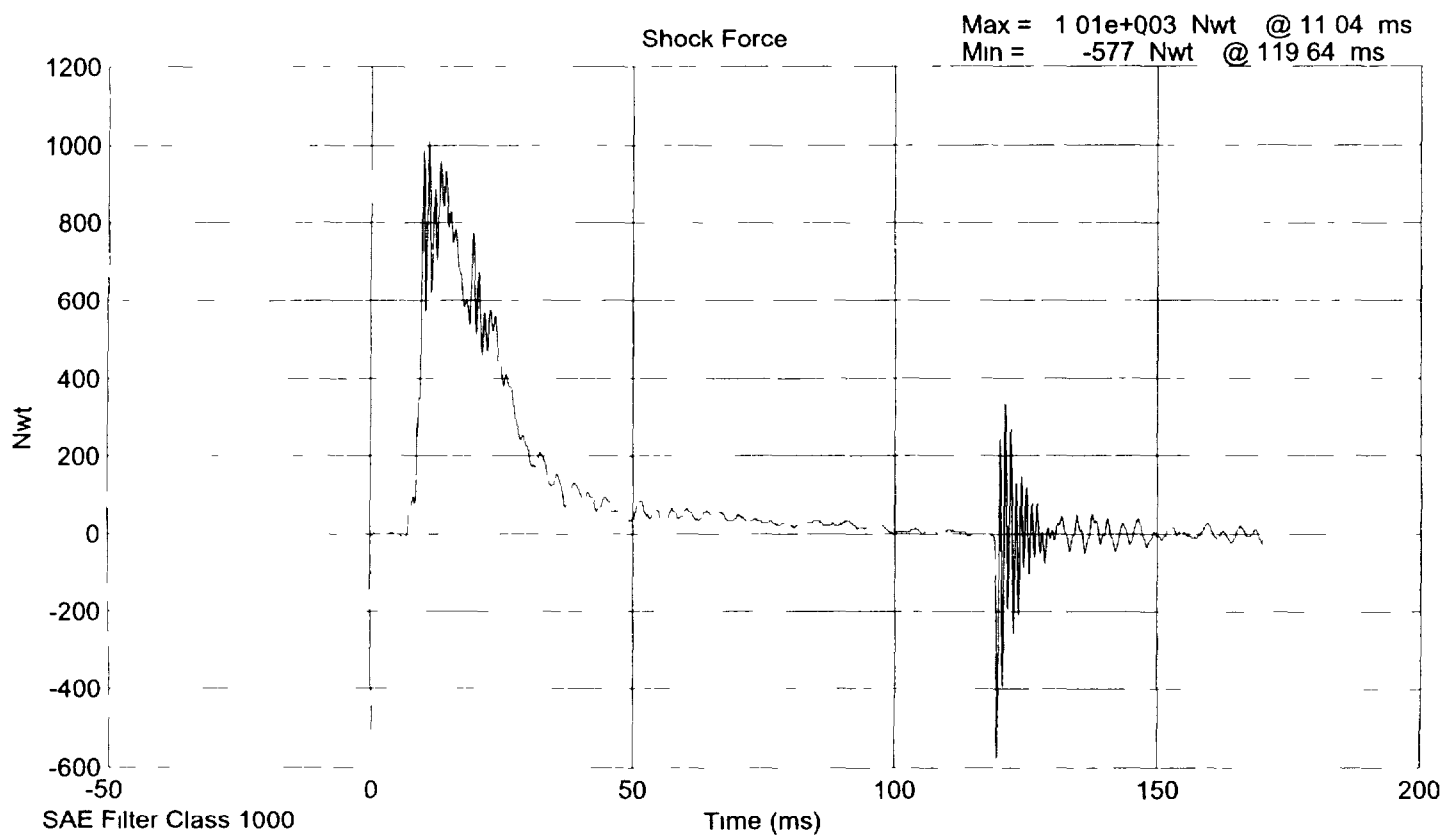
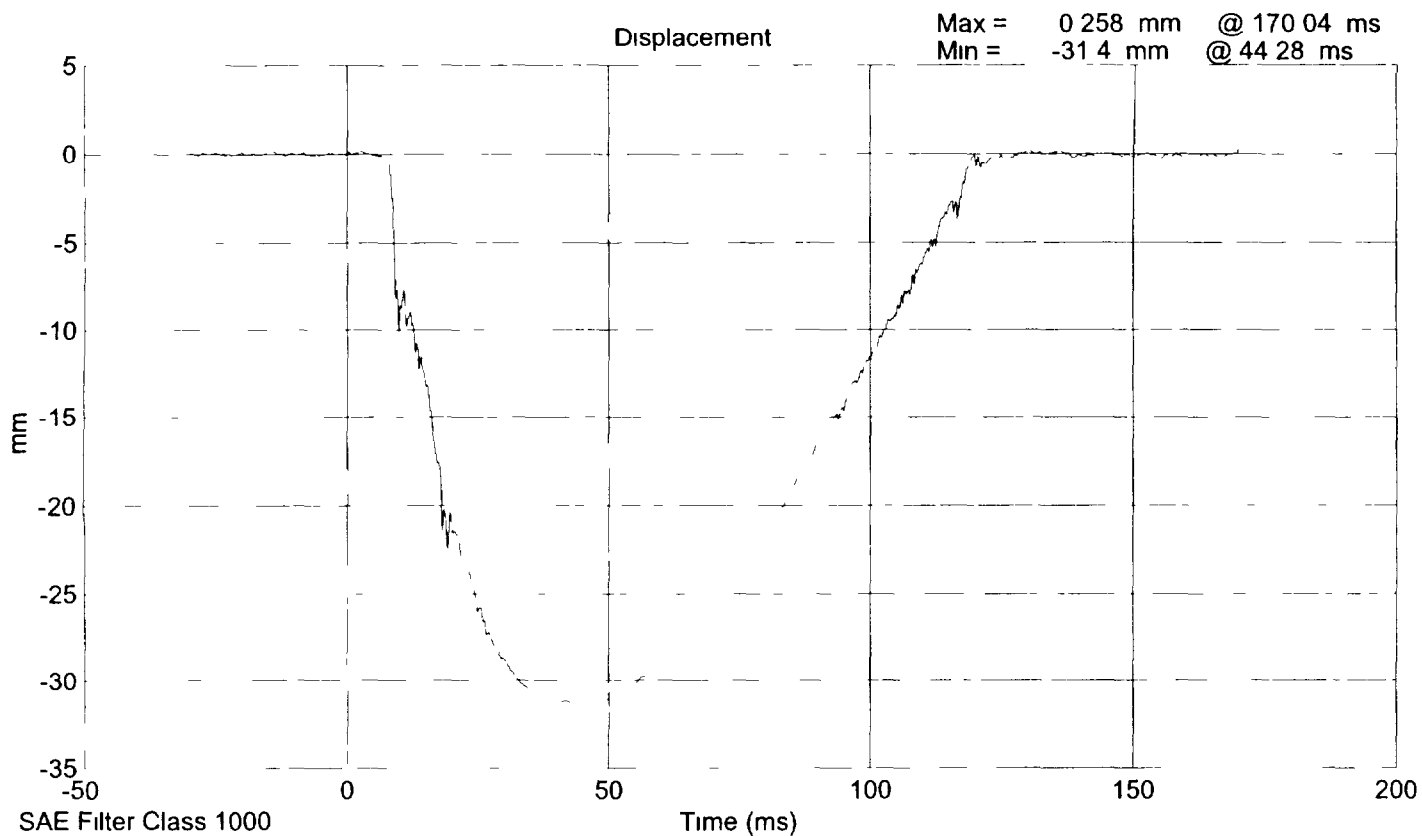
DAMPER IDENTIFICATION 016

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)		10 - 70	30
VELOCITY 3.05 m/s	FORCE (N)	836 - 1125	1010.8
	DISPLACEMENT (mm)	30 - 35	31.4
VELOCITY 4.27 m/s	FORCE (N)	1730 - 2099	1821.6
	DISPLACEMENT (mm)	32 - 37	34.5
VELOCITY 6.10 m/s	FORCE (N)	3741 - 4448	3946.4
	DISPLACEMENT (mm)	33 - 40	37.1

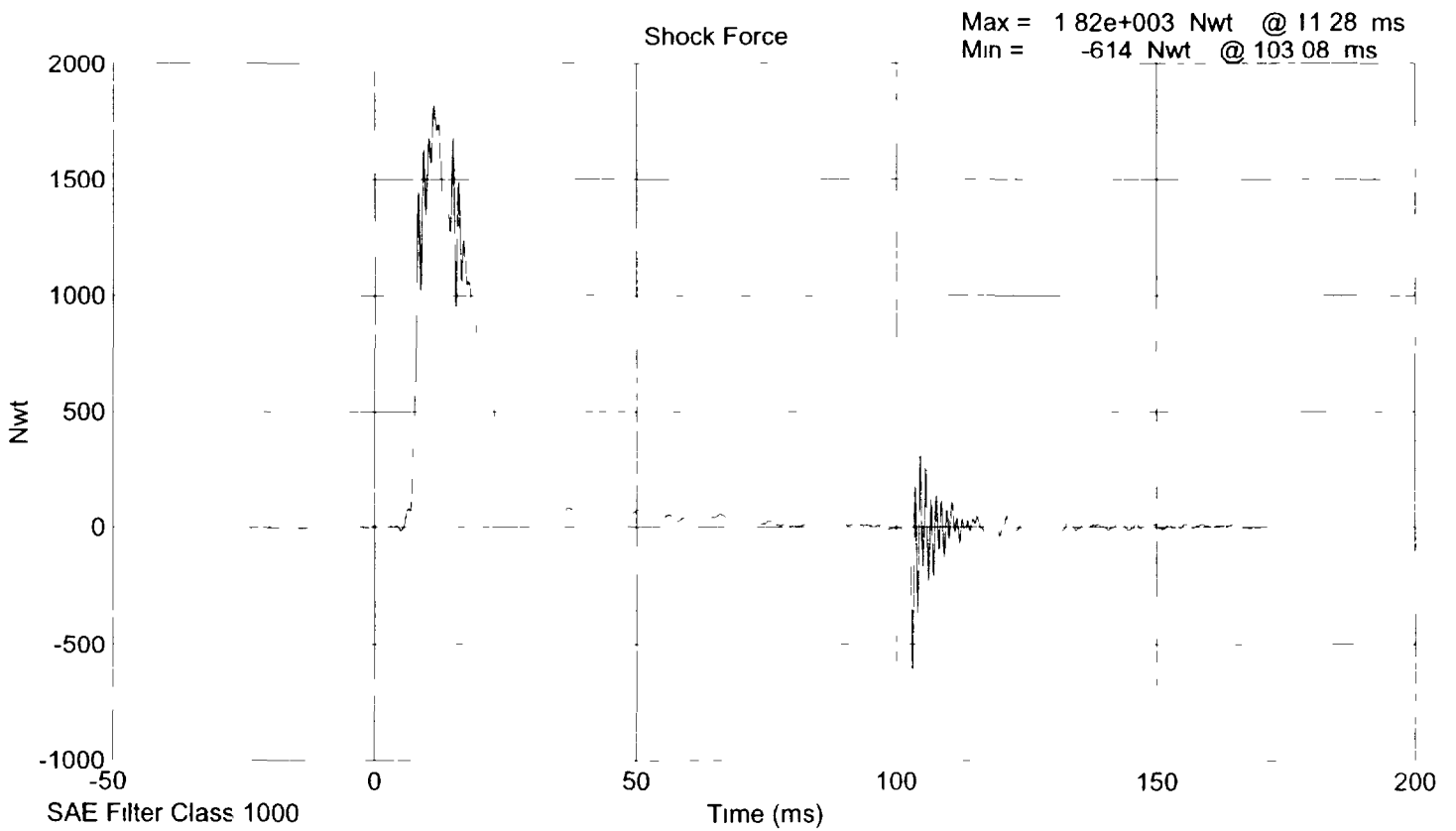
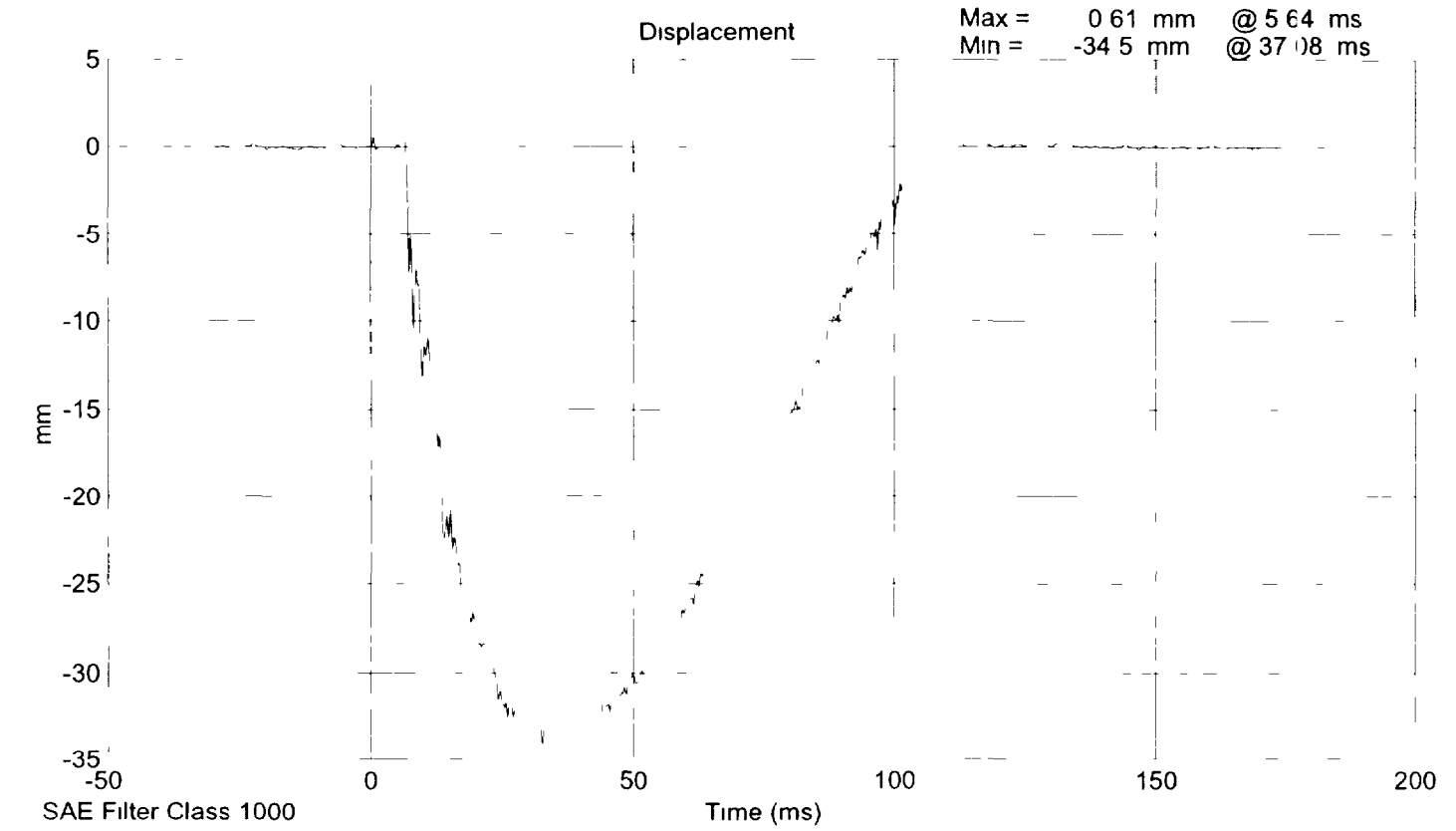
DAMPER SETTING 5

REMARKS: None

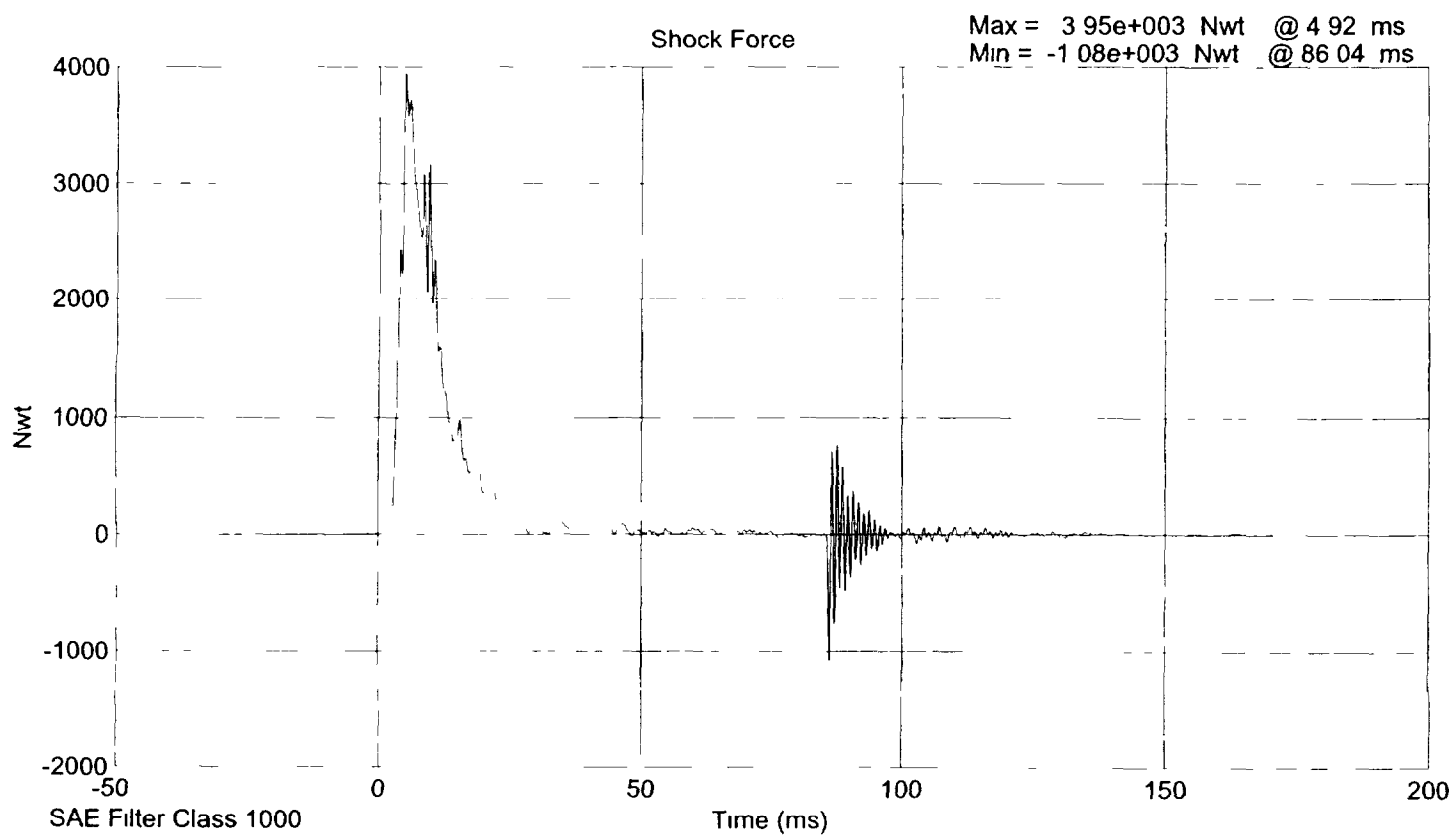
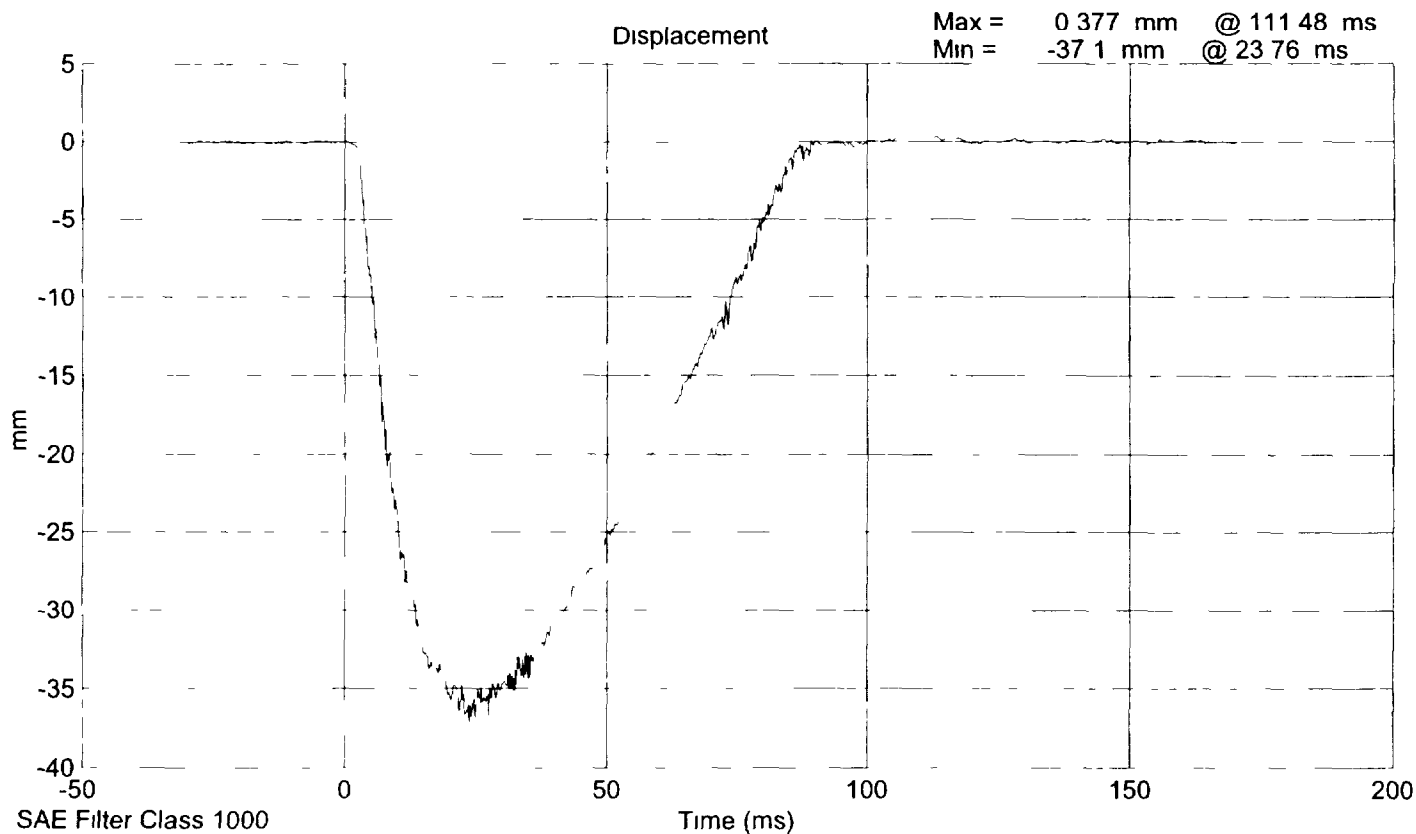
SID 016 Shock Absorber Impact Test @ 3 048 m/s



SID 016 Shock Absorber Impact Test @ 4 572 m/s



SID 016 Shock Absorber Impact Test @ 6 096 m/s



**LATERAL THORAX IMPACT TEST
PRE-TEST**

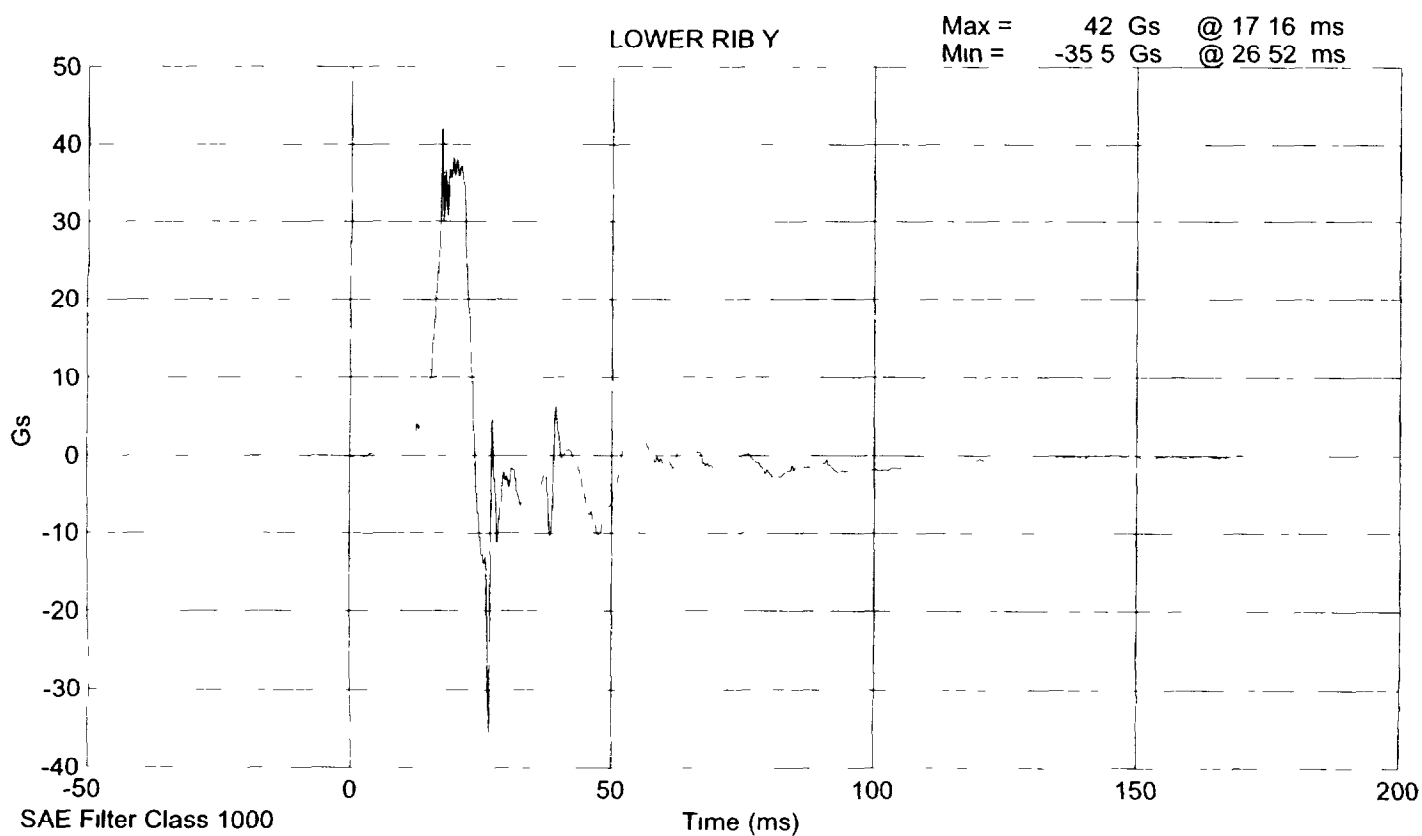
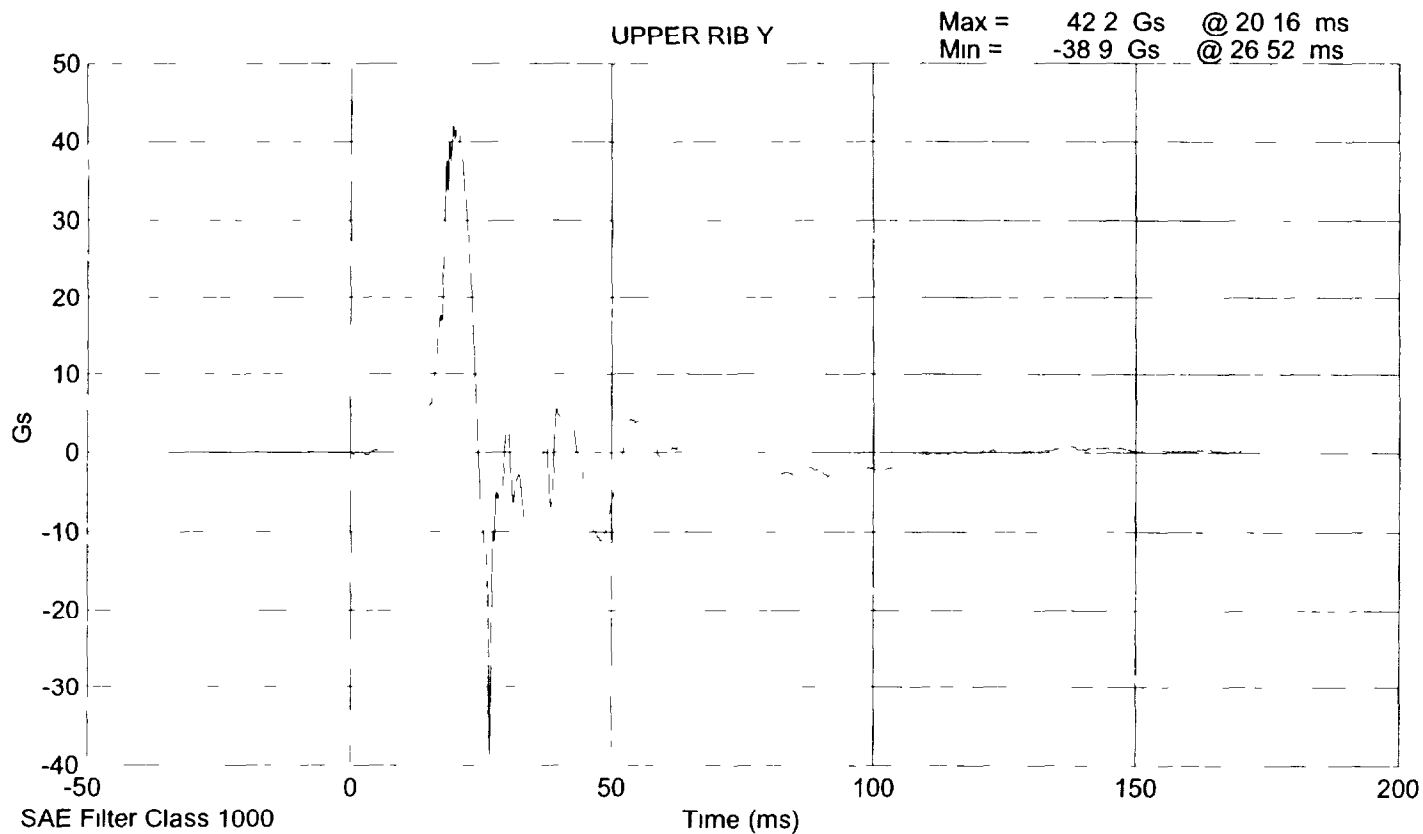
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
Date 1/26/01 Laboratory Technician B. Swiecicki

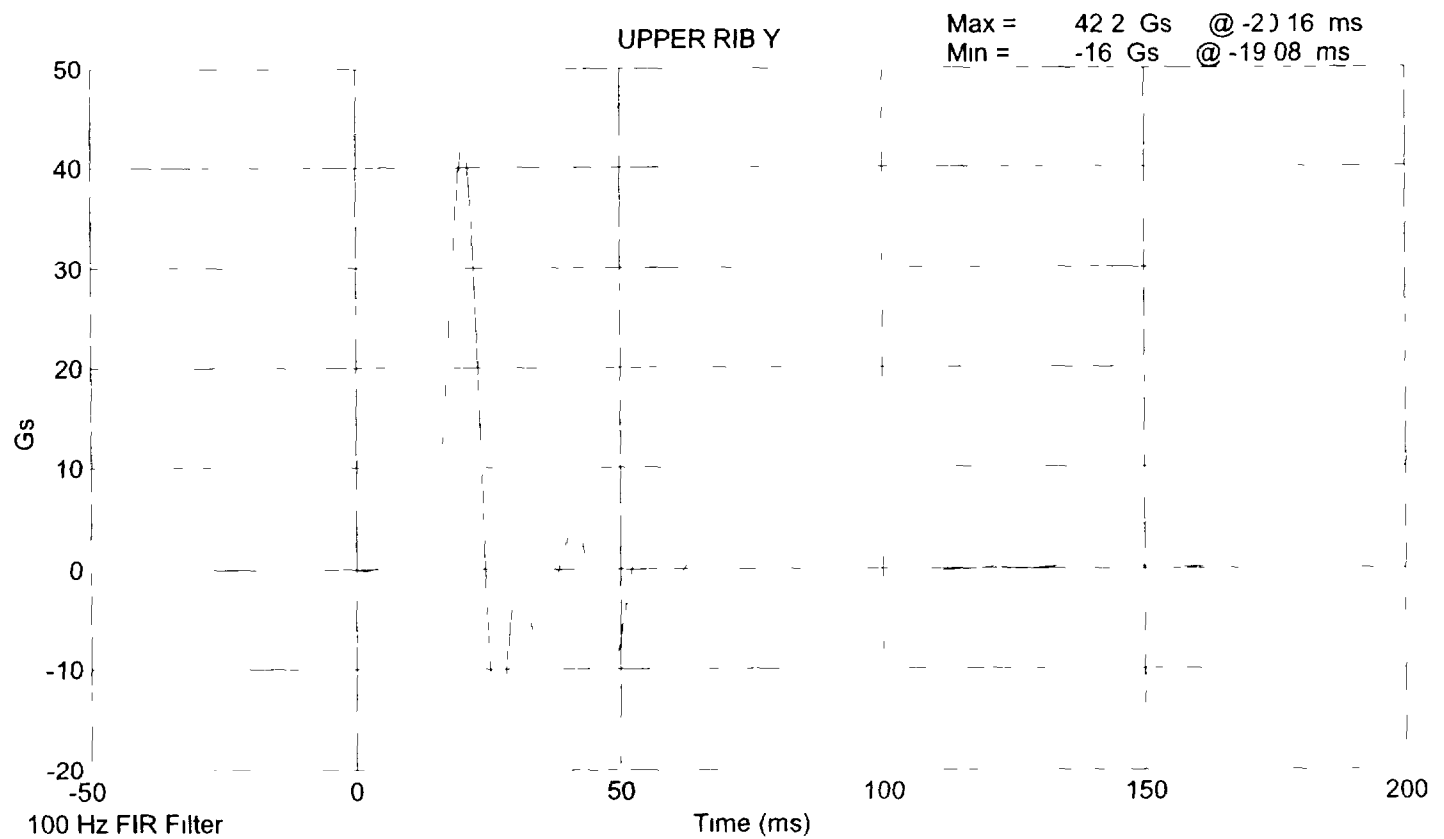
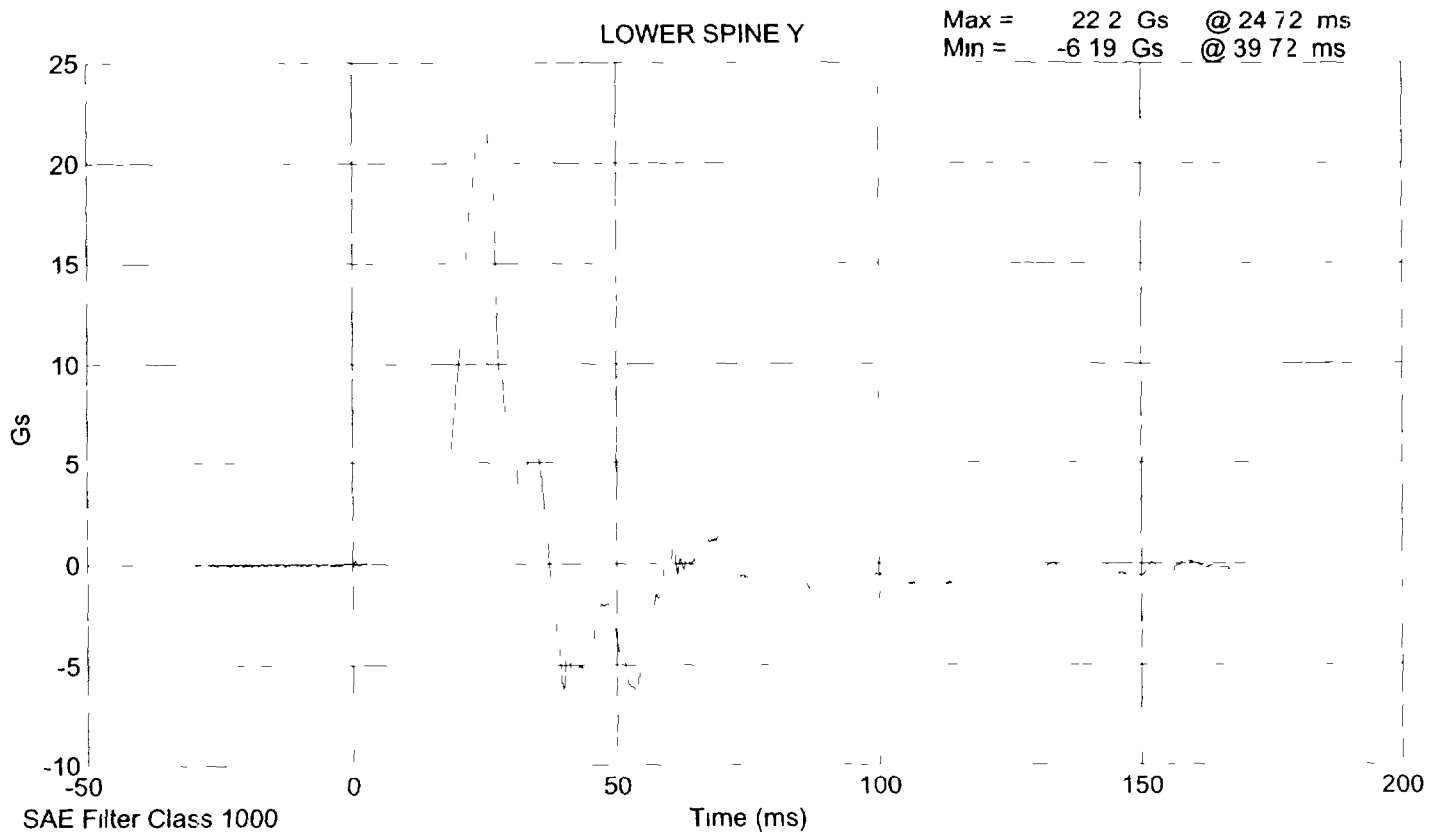
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	32
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46	42.2
LOWER RIB (g's)	37 - 46	40.0
LOWER SPINE (g's)	15 - 22	21.9

REMARKS: None

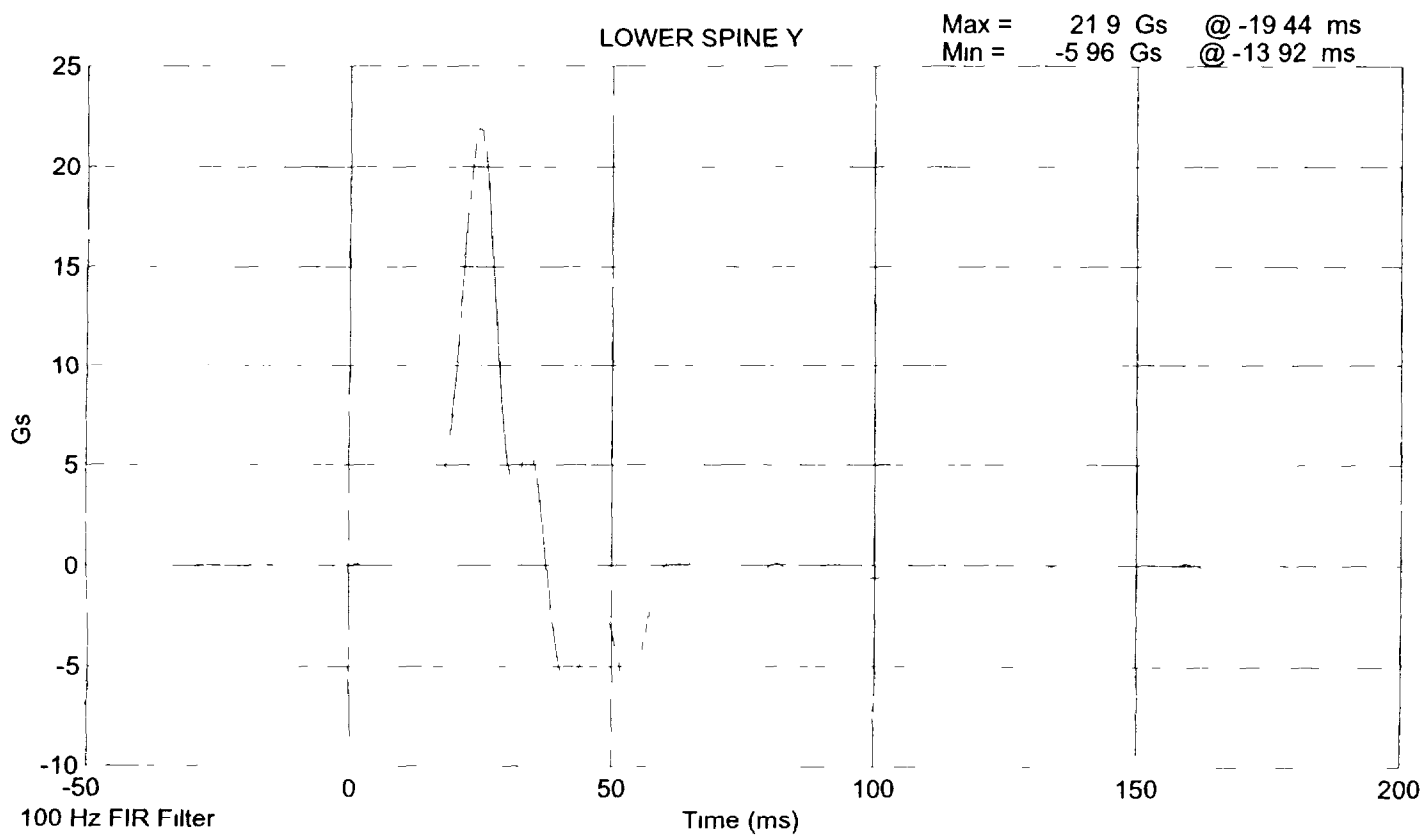
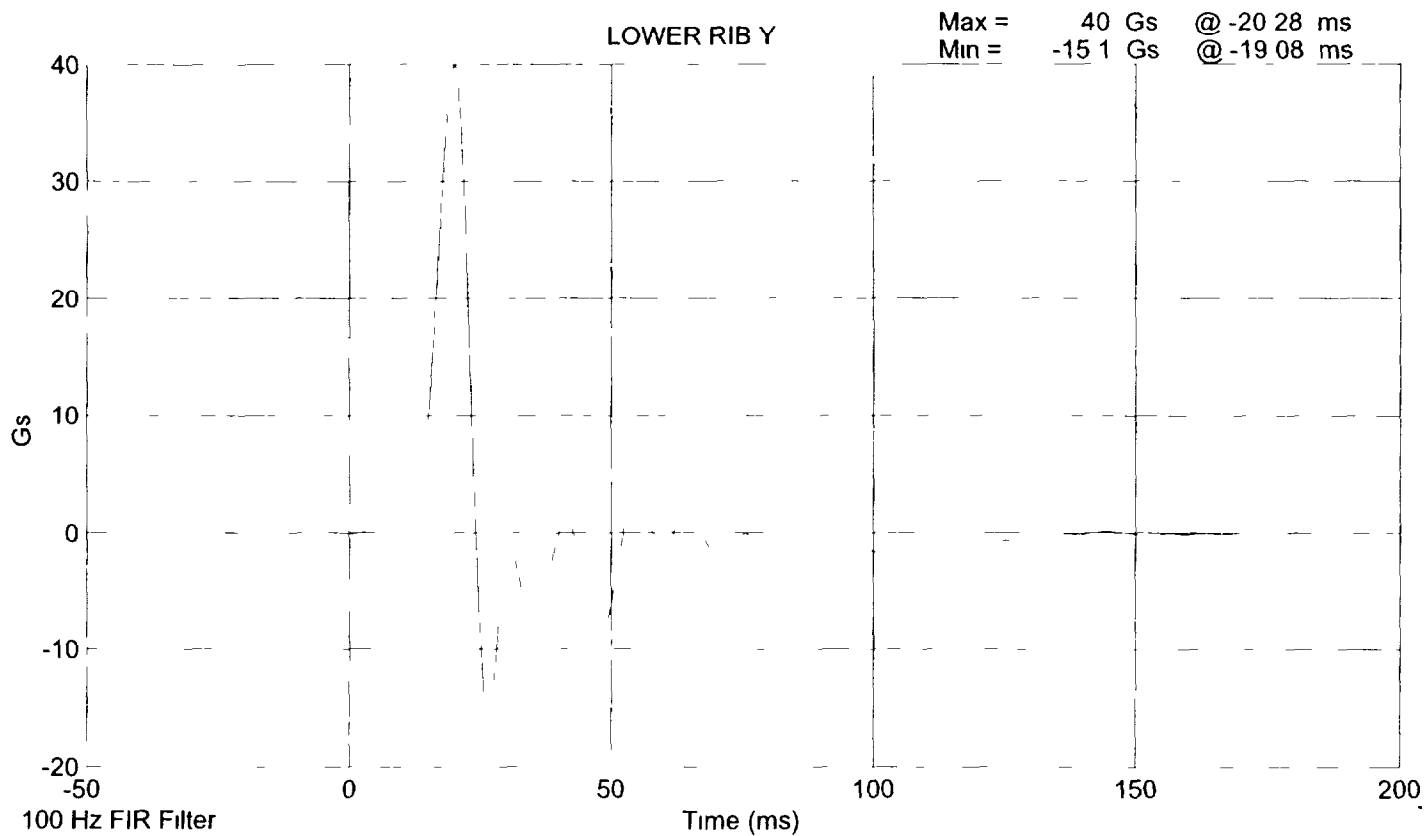
SID 016 Thorax Impact Test @ 4 2672 m/s



SID 016 Thorax Impact Test @ 4 2672 m/s



SID 016 Thorax Impact Test @ 4 2672 m/s



**LATERAL PELVIS IMPACT TEST
PRE-TEST**

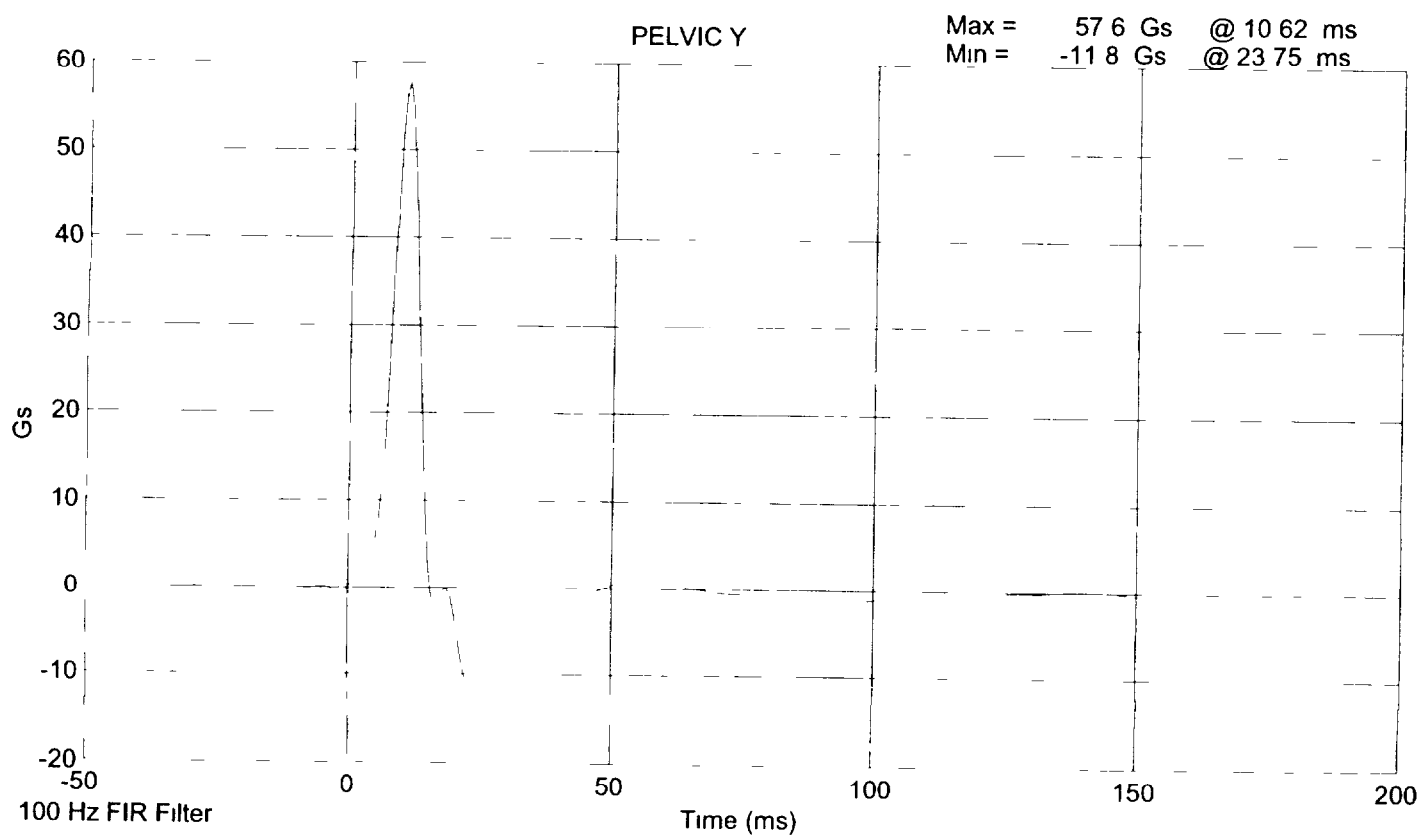
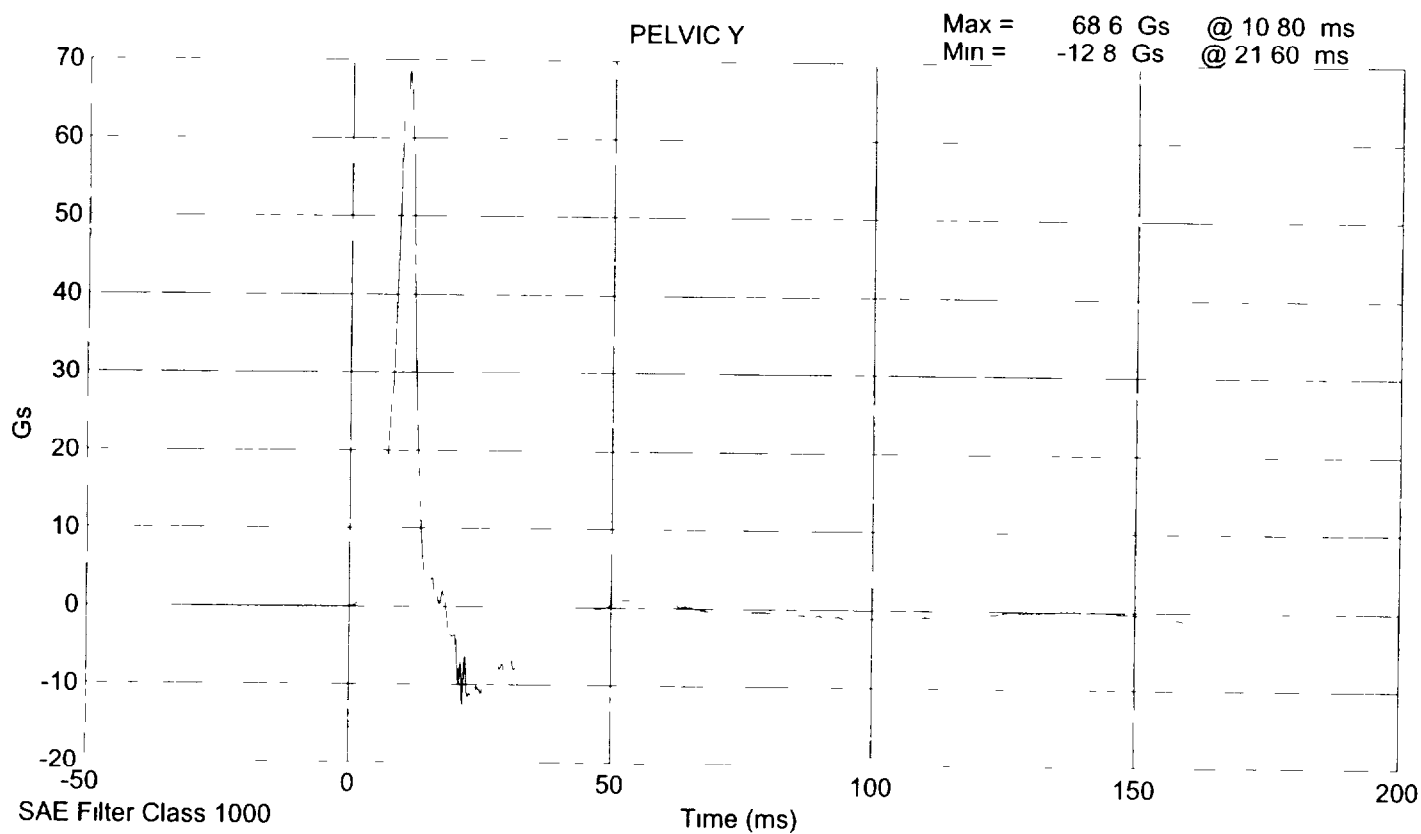
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
Date 1/26/01 Laboratory Technician B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	32
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	57.6

REMARKS: None

SID 016 Pelvic Impact Test @ 4 2824 m/s



ABDOMINAL COMPRESSION TEST**PRE-TEST**

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
Date 1/25/01 Laboratory Technician B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	31
FORCE @ 13 mm (N)	104 - 162	111
FORCE @ 19 mm (N)	163 - 221	181
FORCE @ 25 mm (N)	222 - 280	264
FORCE @ 33 mm (N)	325 - 391	391

REMARKS: None

ORIGINAL

Dummy S/N 016

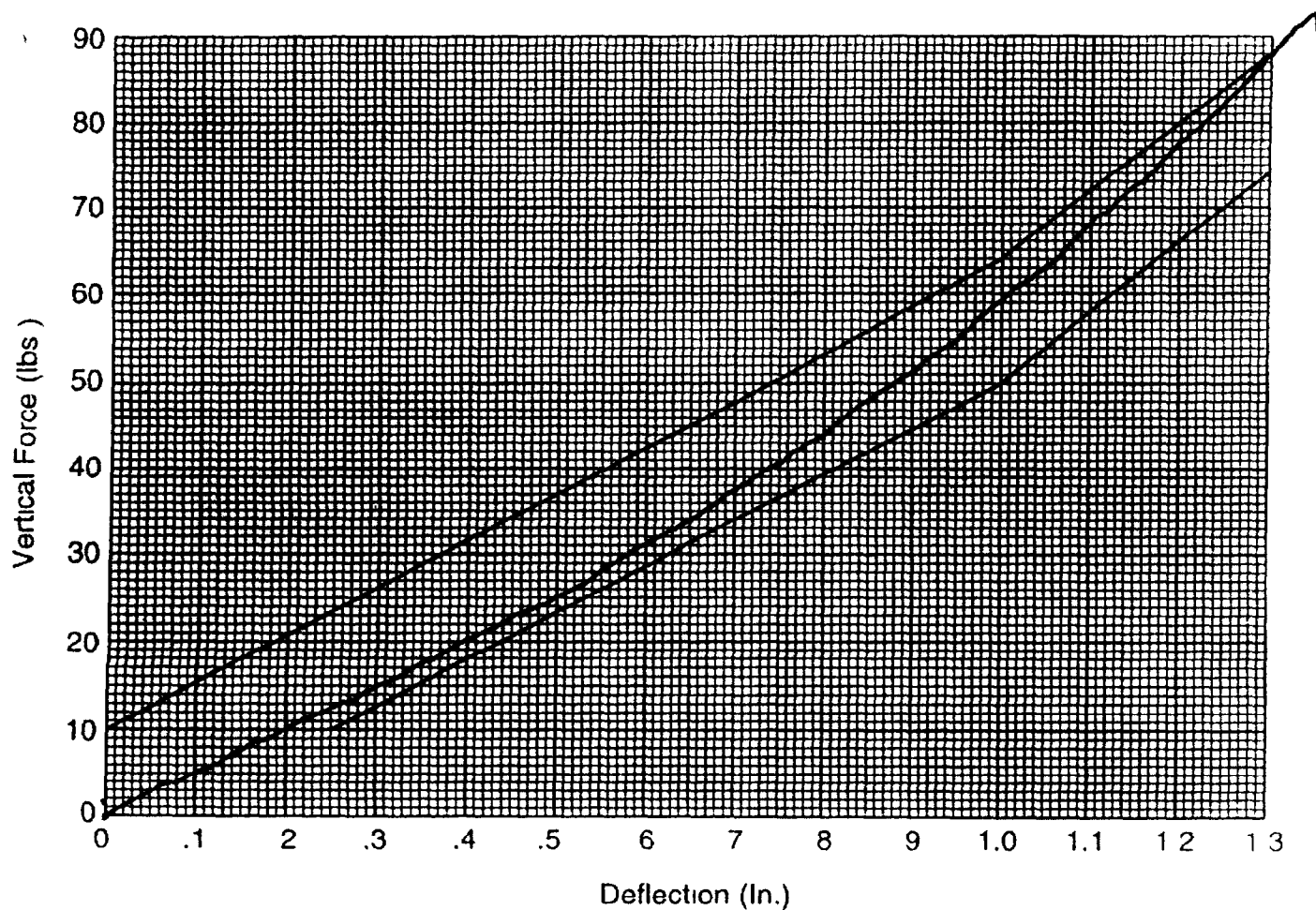
W/A _____

Date 1-25-2001

Performed By [Signature]

Temp. 71°

Humidity 31%



Hybrid II
Abdomen Static Press

LUMBAR FLEXION TEST

PRE-TEST

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
Date 1/25/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	31
FORCE @ 0° (N)	0 - 26.7	0
FORCE @ 20° (N)	97.8 - 151.2	113
FORCE @ 30° (N)	151.2 - 204.6	162
FORCE @ 40° (N)	204.6 - 258	224
RETURN ANGLE	12° max	2.9°

REMARKS: None

ORIGINAL

Dummy S/N Q16

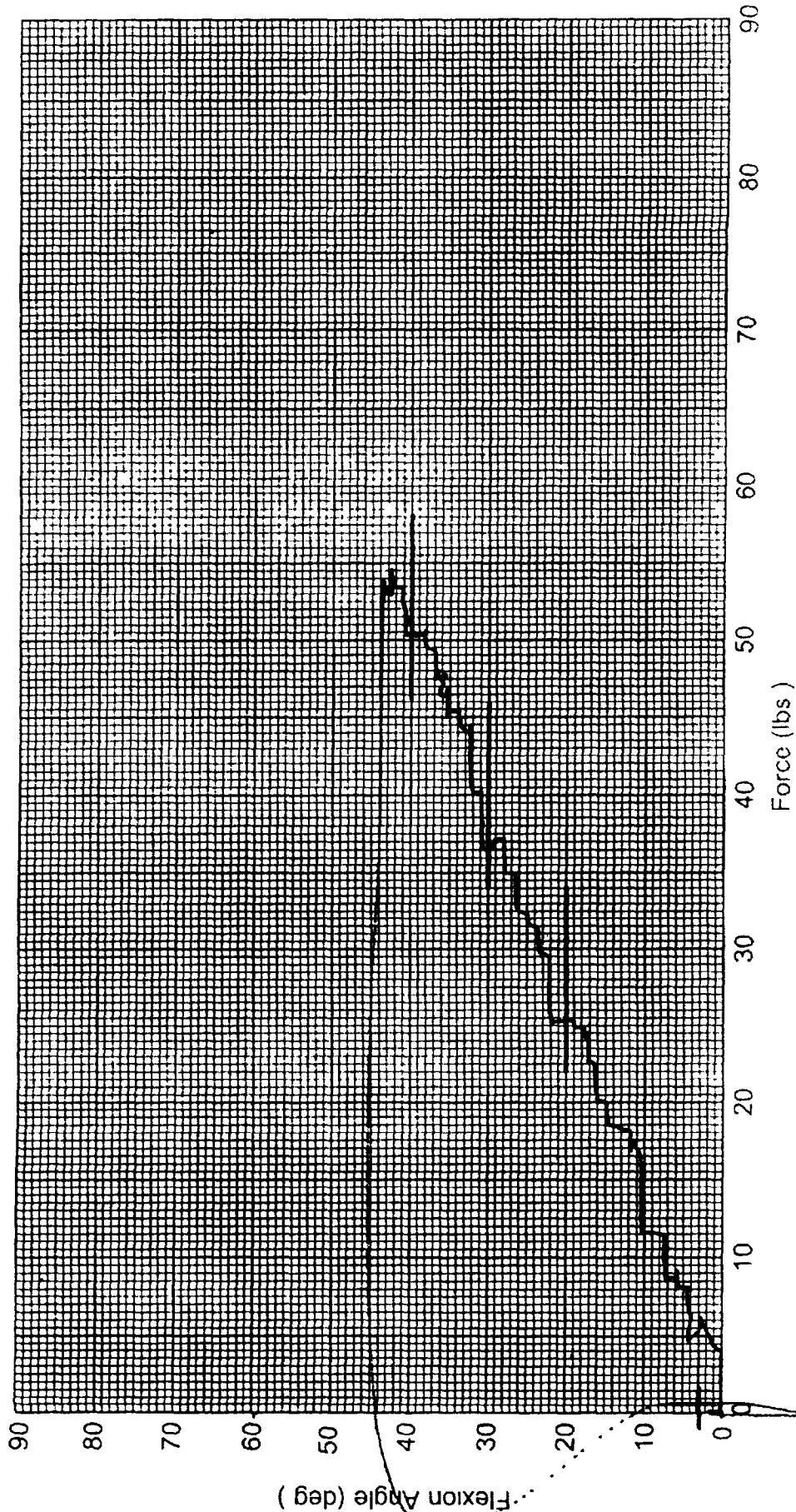
W/A

Date 1-25-2001

Performed By [Signature]

Temp 72°

Humidity 31%



Hybrid II Lumbar Spine Flexion Test

FM 052 CERT 0015 RJA

PRE-TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
 Date 1/26/01 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 NO.: 015

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No	<u>015</u>	Sequential Test Number	<u>1</u>
Date	<u>2/13/01</u>	Laboratory Technician	<u>B Swiecicki</u>

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements
LATERAL THORAX IMPACT TEST	Passed all requirements
LATERAL PELVIS IMPACT 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 Serial No 015 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	512
HP- Hip Pivot Height (mm)	99 ref	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	493
HW- Hip Width (mm)	356 - 391	375

REMARKS: None

**LATERAL THORAX IMPACT TEST
POST TEST**

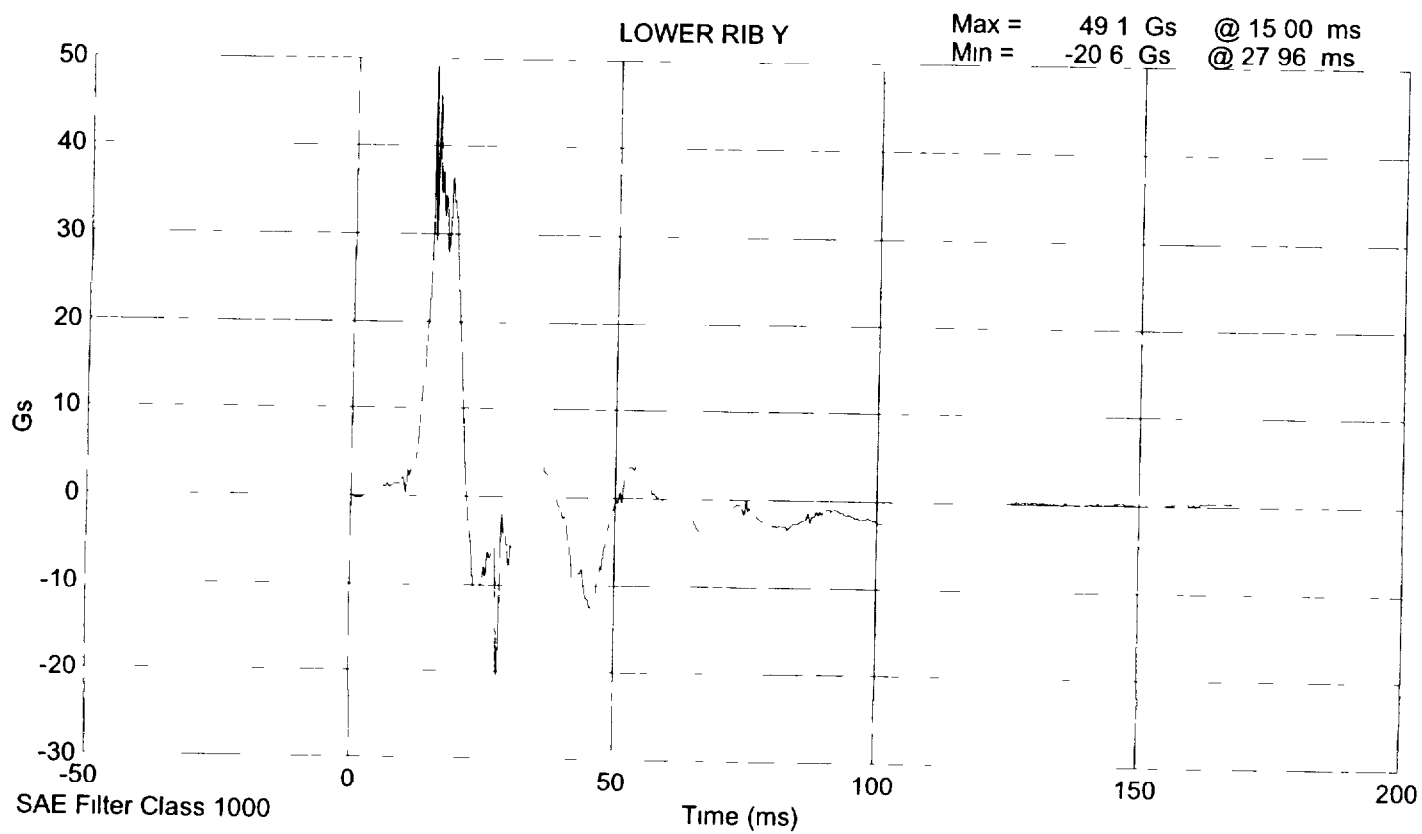
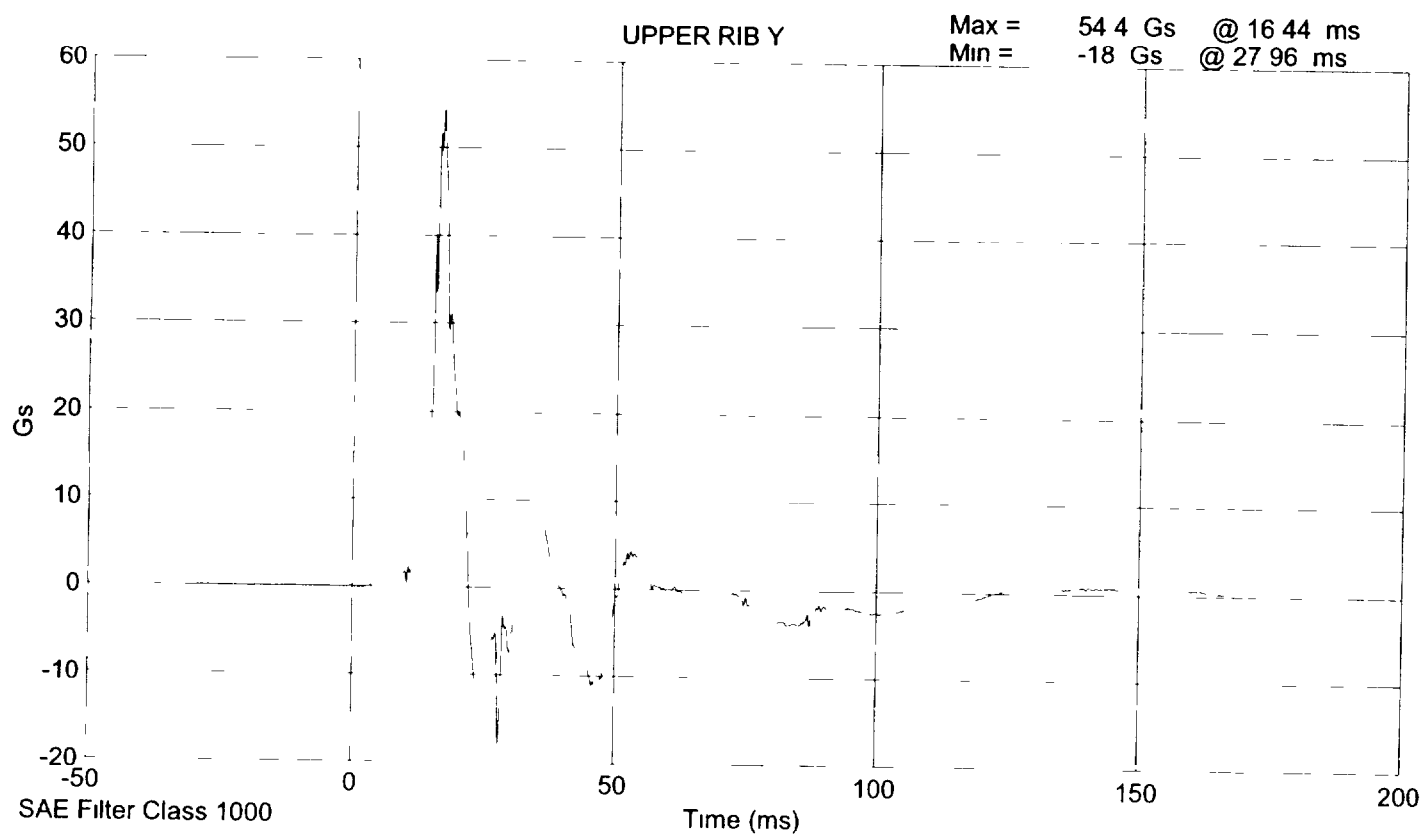
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B Swiecicki

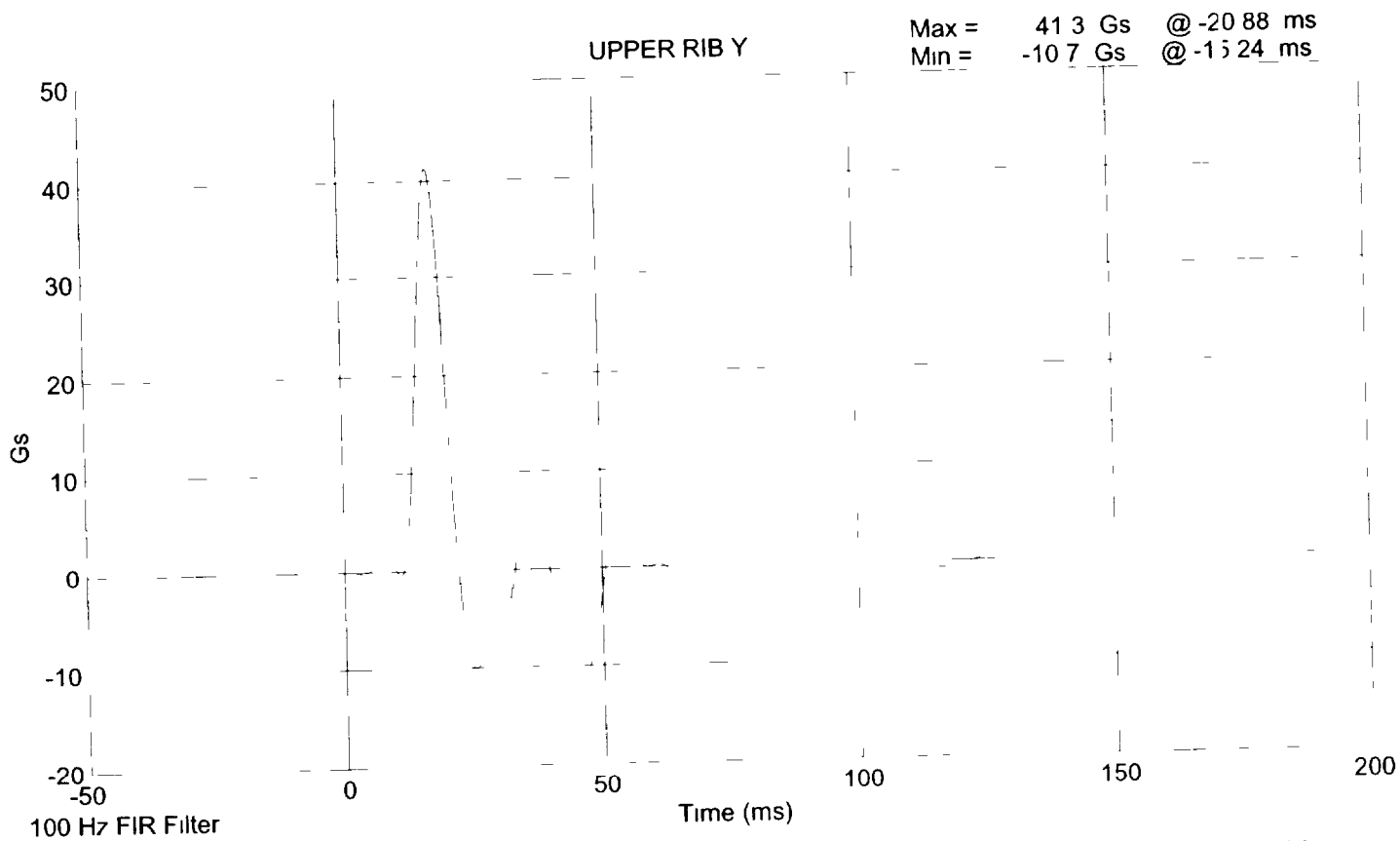
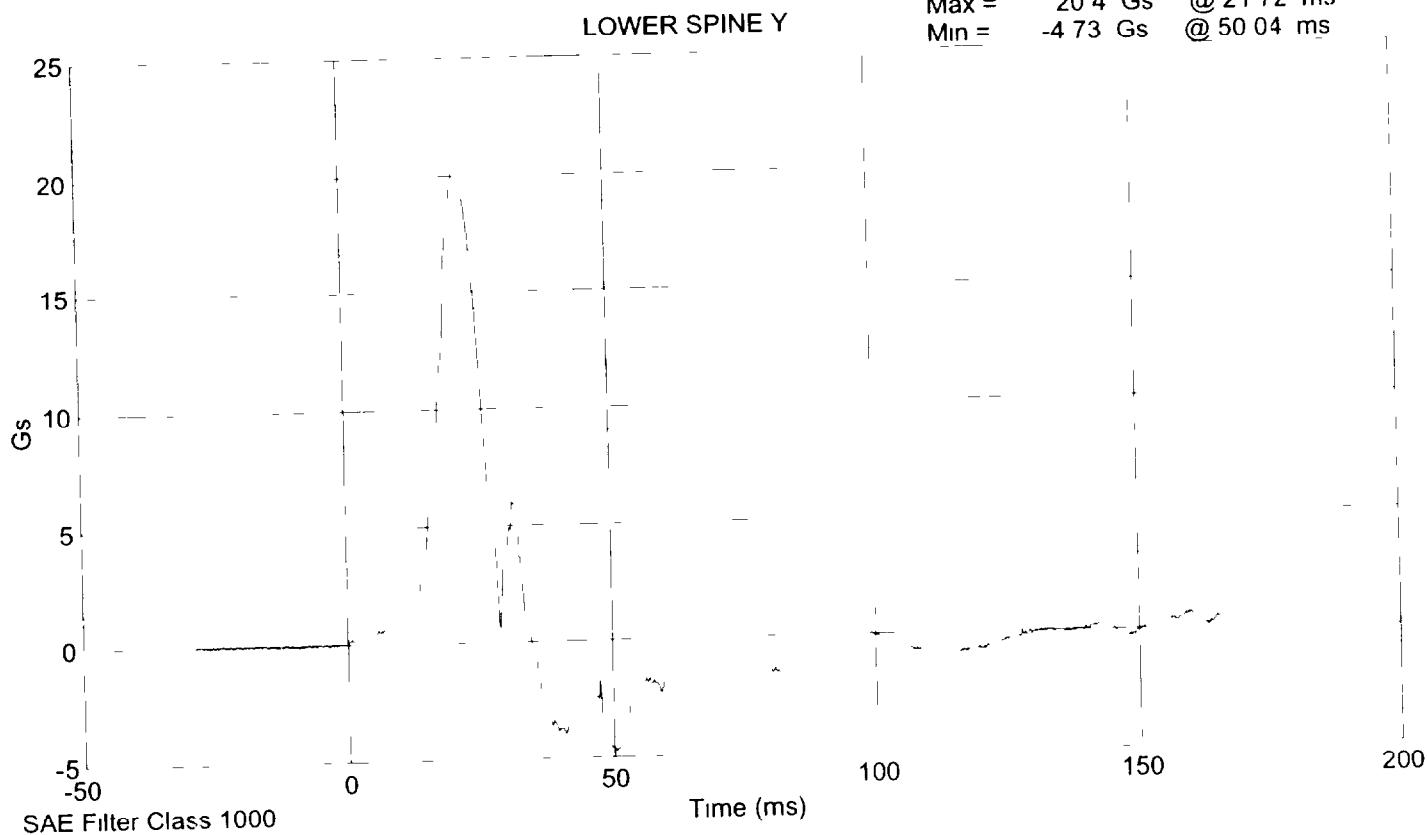
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46	41.3
LOWER RIB (g's)	37 - 46	37.8
LOWER SPINE (g's)	15 - 22	20.5

REMARKS: None

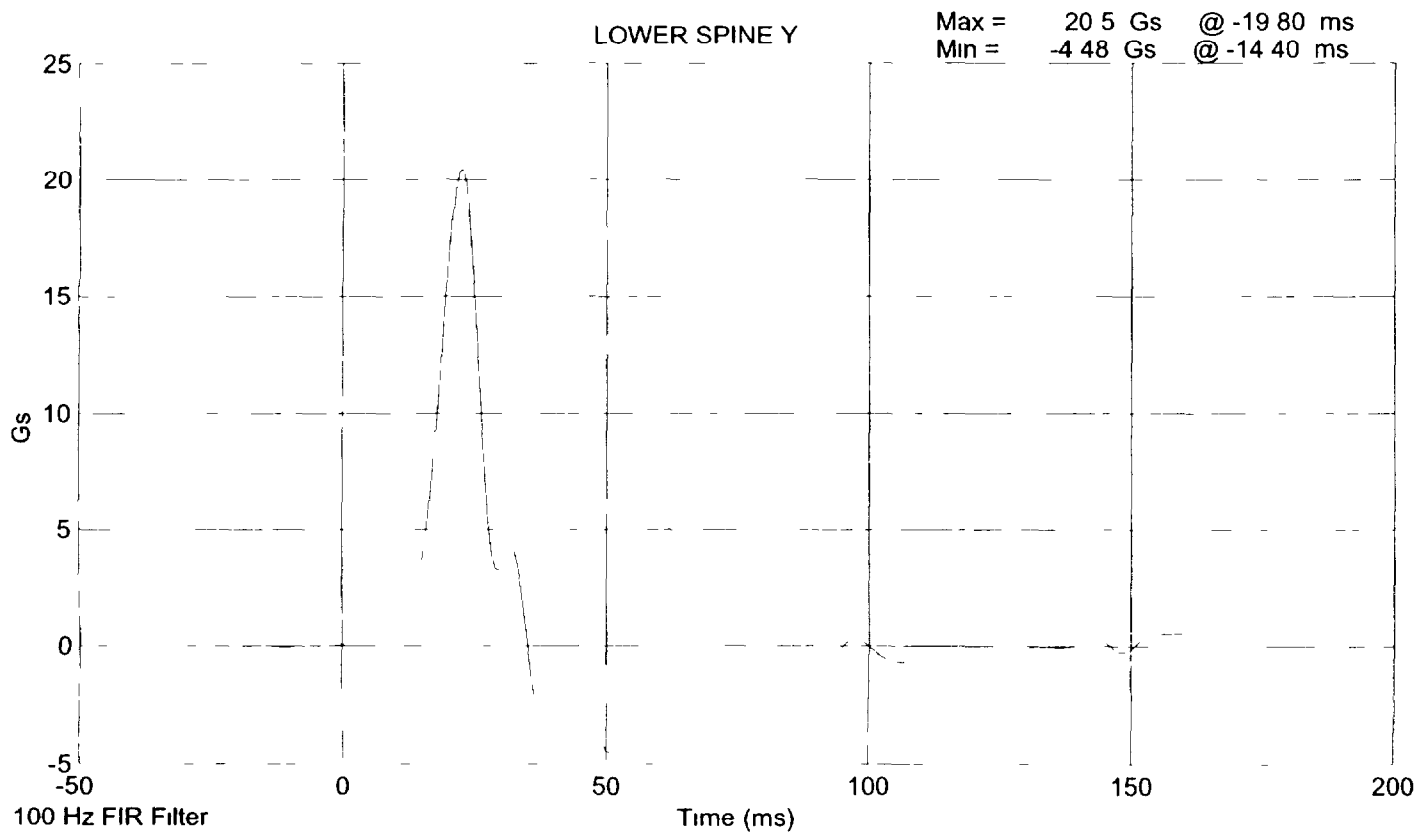
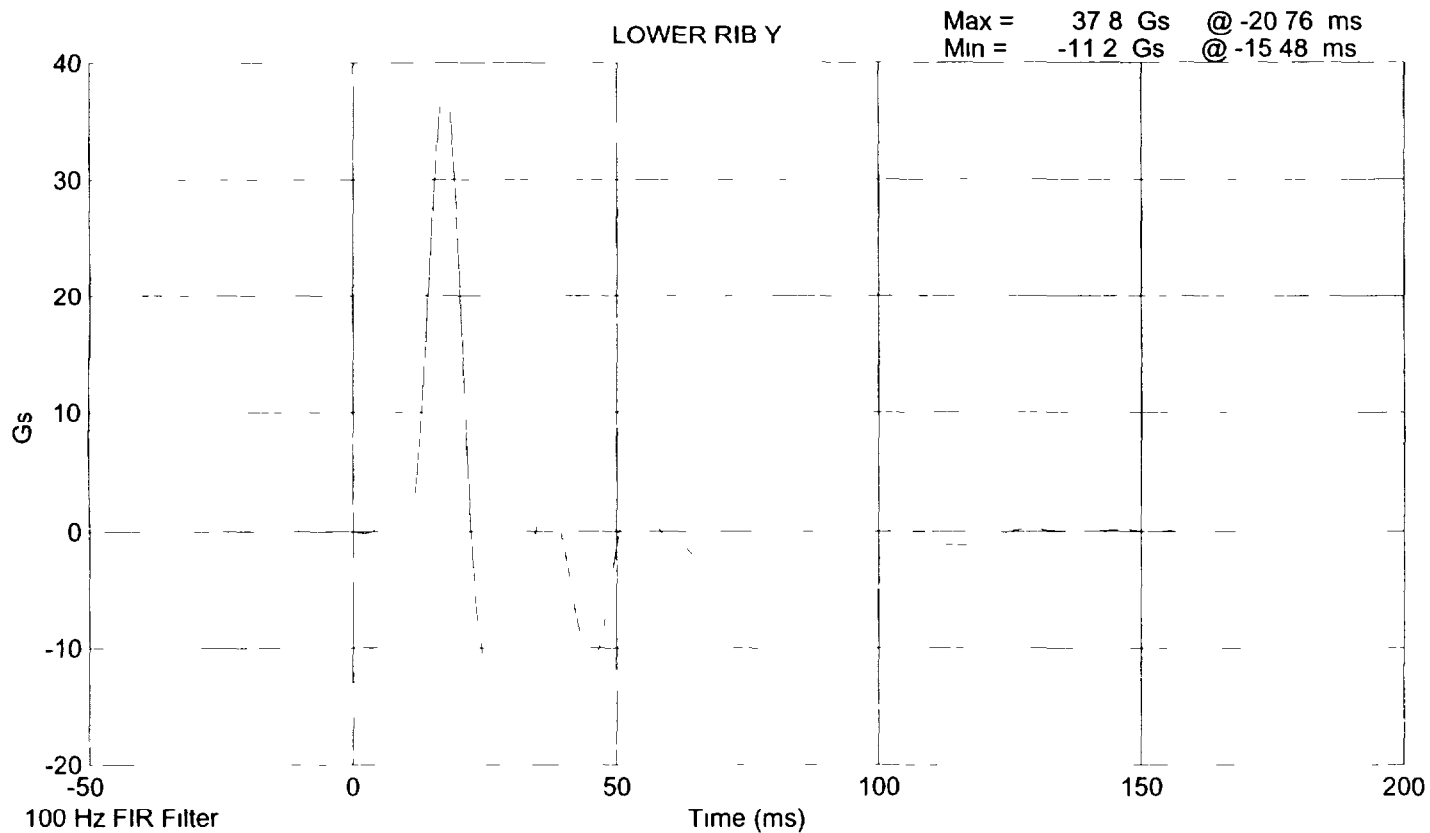
SID 015 Thorax Impact Test @ 4 2763 m/s



SID 015 Thorax Impact Test @ 4 2763 m/s



SID 015 Thorax Impact Test @ 4 2763 m/s



**LATERAL PELVIS IMPACT TEST
POST TEST**

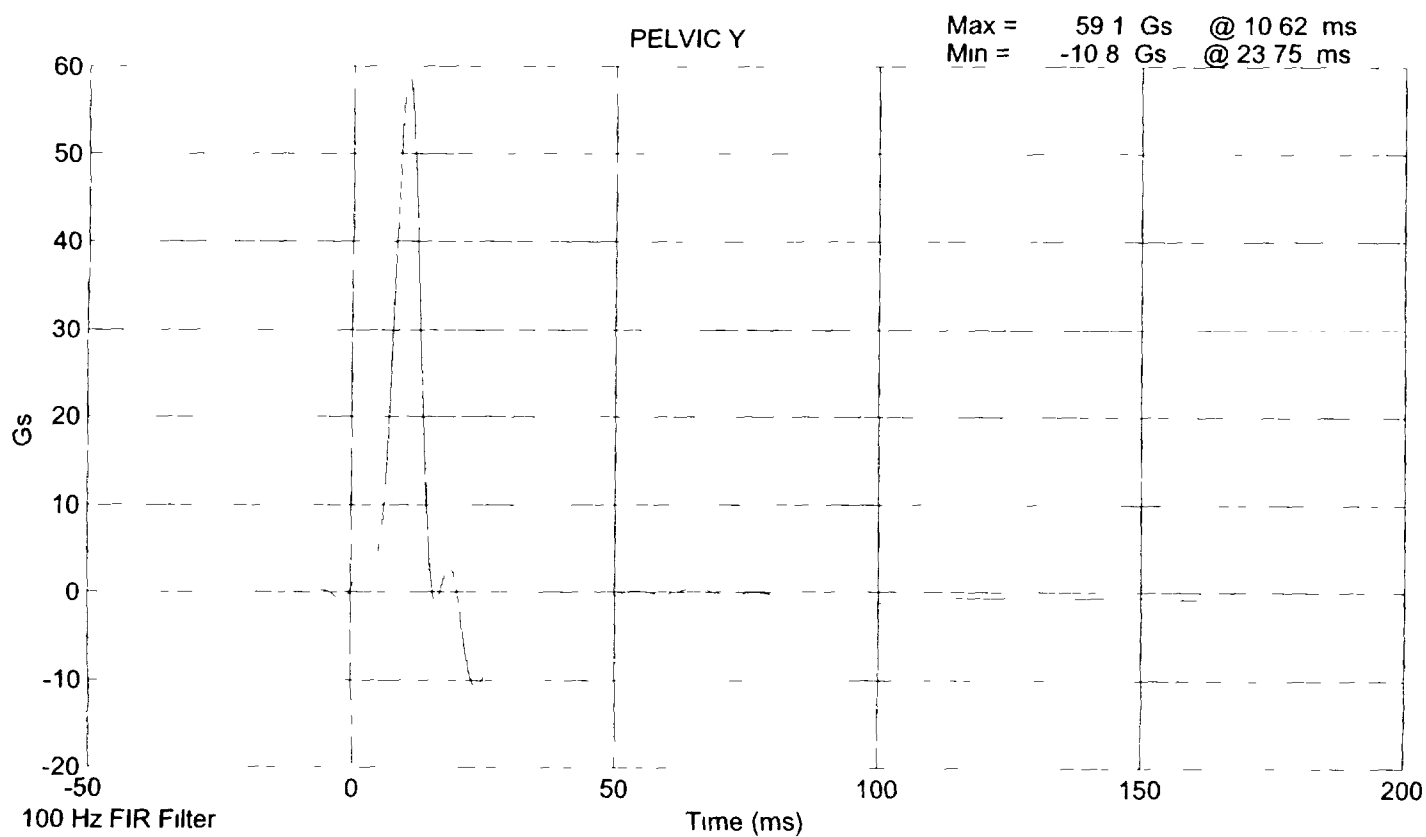
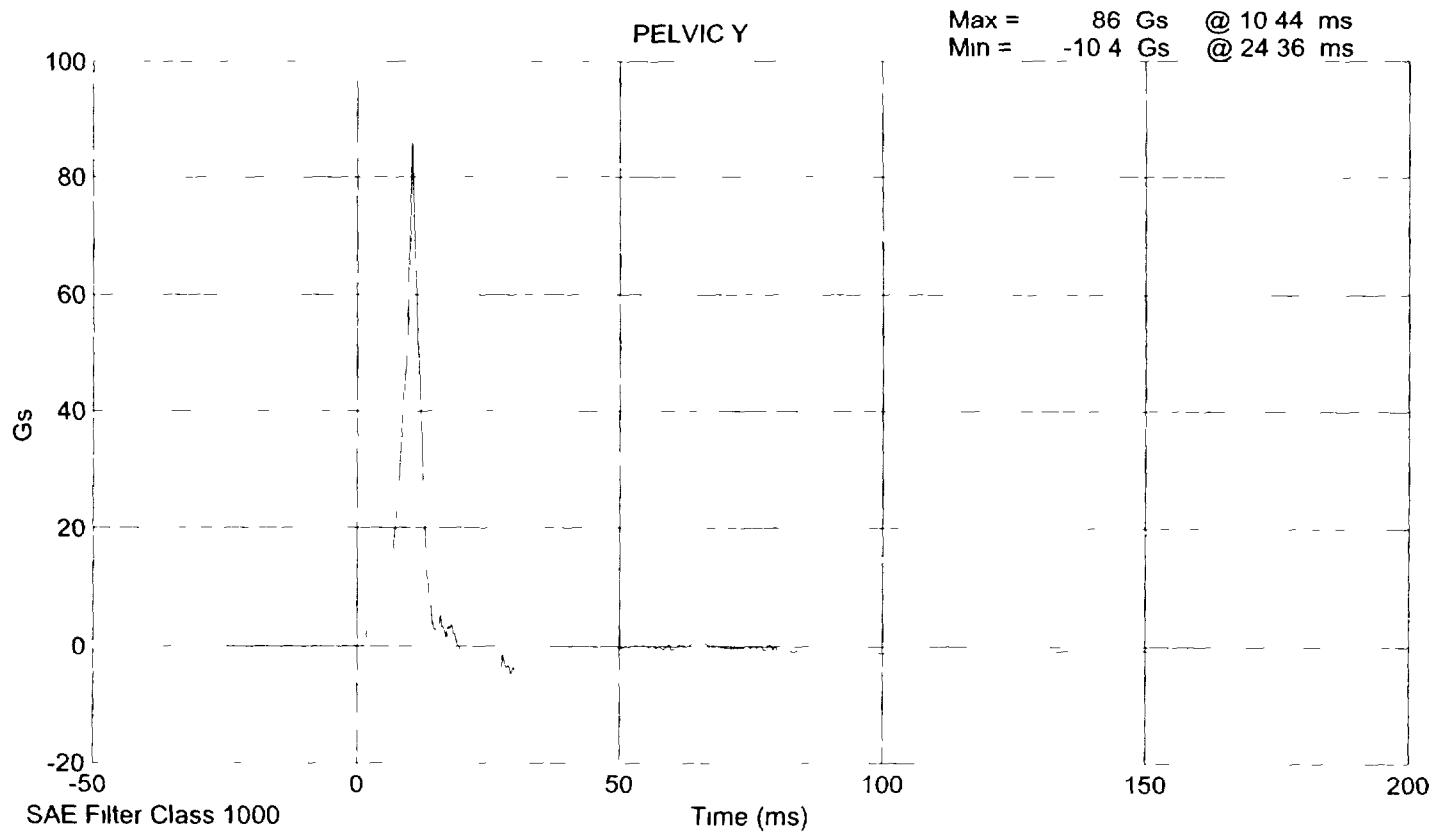
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number _____
Date 2/13/01 Laboratory Technician B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
PROBE SPEED (m/s)	4.27 - 4.33	4.32
PELVIS ACCELERATION (g's)	40 - 60	59.1

REMARKS: None

SID 015 Pelvic Impact Test @ 4 316 m/s



ABDOMINAL COMPRESSION TEST**POST TEST**

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
FORCE @ 13 mm (N)	104 - 162	113
FORCE @ 19 mm (N)	163 - 221	177
FORCE @ 25 mm (N)	222 - 280	258
FORCE @ 33 mm (N)	325 - 391	372

REMARKS: None

Dummy S/N 015

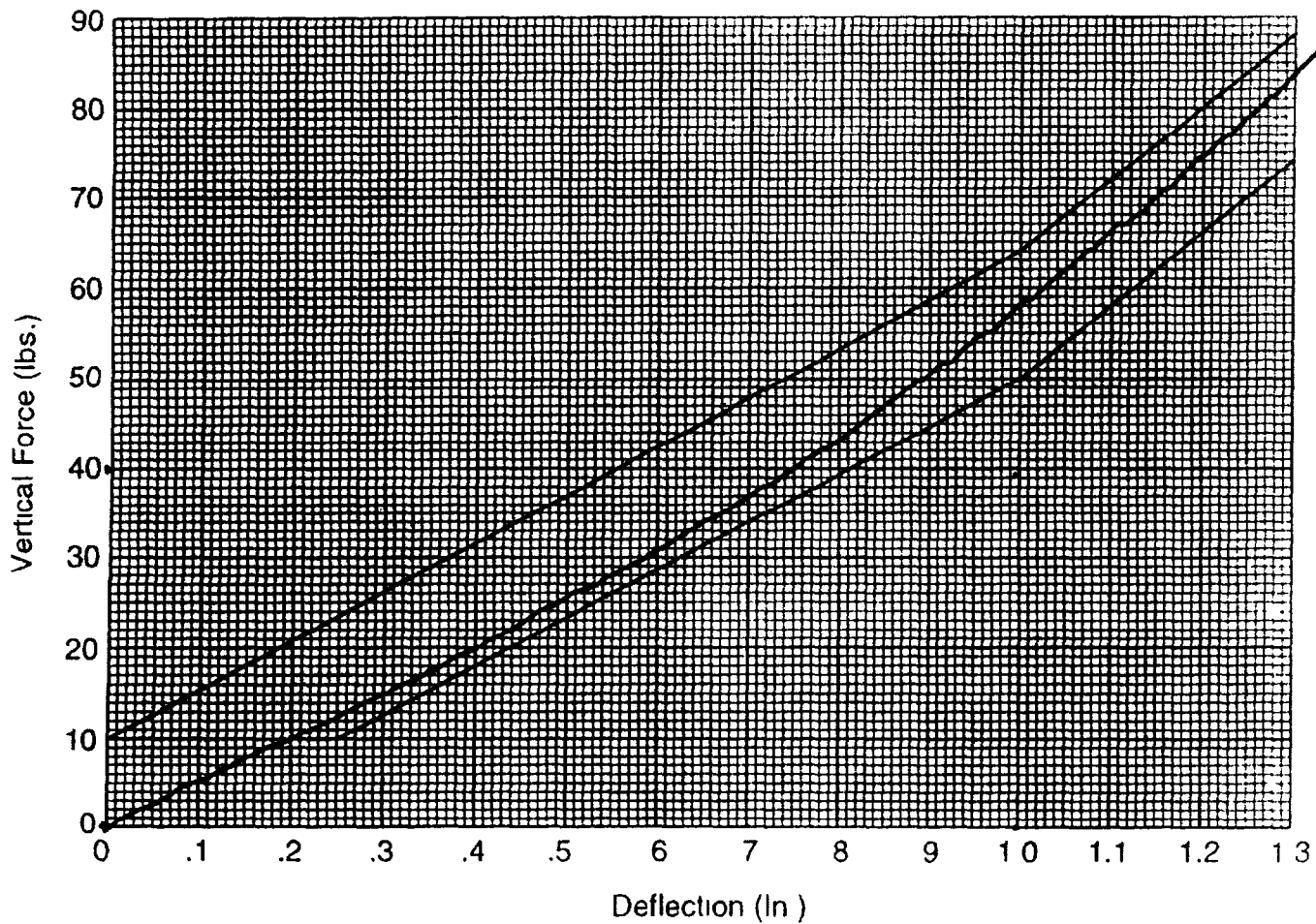
W/A

Date 2-13-2001

Performed By BS

Temp 71°

Humidity 32%



Hybrid II
Abdomen Static Press

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

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
FORCE @ 0° (N)	0 - 267	0
FORCE @ 20° (N)	97.8 - 151.2	127
FORCE @ 30° (N)	151.2 - 204.6	185
FORCE @ 40° (N)	204.6 - 258	255
RETURN ANGLE	12° max	4.5°

REMARKS: None

Dummy S/N - 015

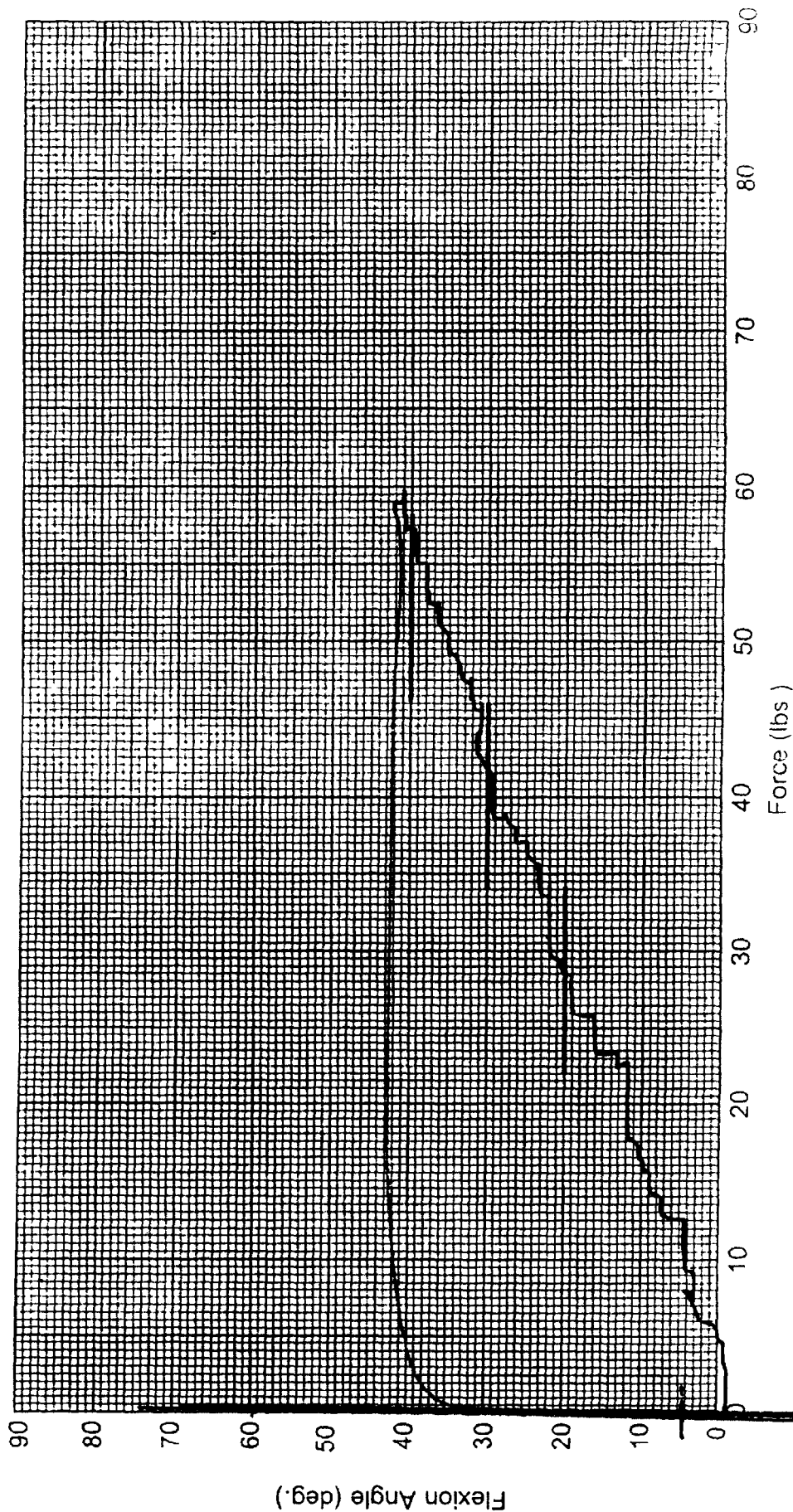
W/A

Date - 2-13-2001

Performed By

Temp. 71°

Humidity 32%



Hybrid II Lumbar Spine Flexion Test

FM 052 CE T-005 R1.0

POST TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 015 Sequential Test Number 1
 Date 2/13/01 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 NO.: 016

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No	<u>016</u>	Sequential Test Number	<u>1</u>
Date	<u>2/13/01</u>	Laboratory Technician	<u>B Swiecicki</u>

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements
LATERAL THORAX IMPACT TEST	Passed all requirements
LATERAL PELVIS IMPACT 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 Serial No 016 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	512
HP- Hip Pivot Height (mm)	99 ref	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	493
HW- Hip Width (mm)	356 - 391	375

REMARKS: None

**LATERAL THORAX IMPACT TEST
POST TEST**

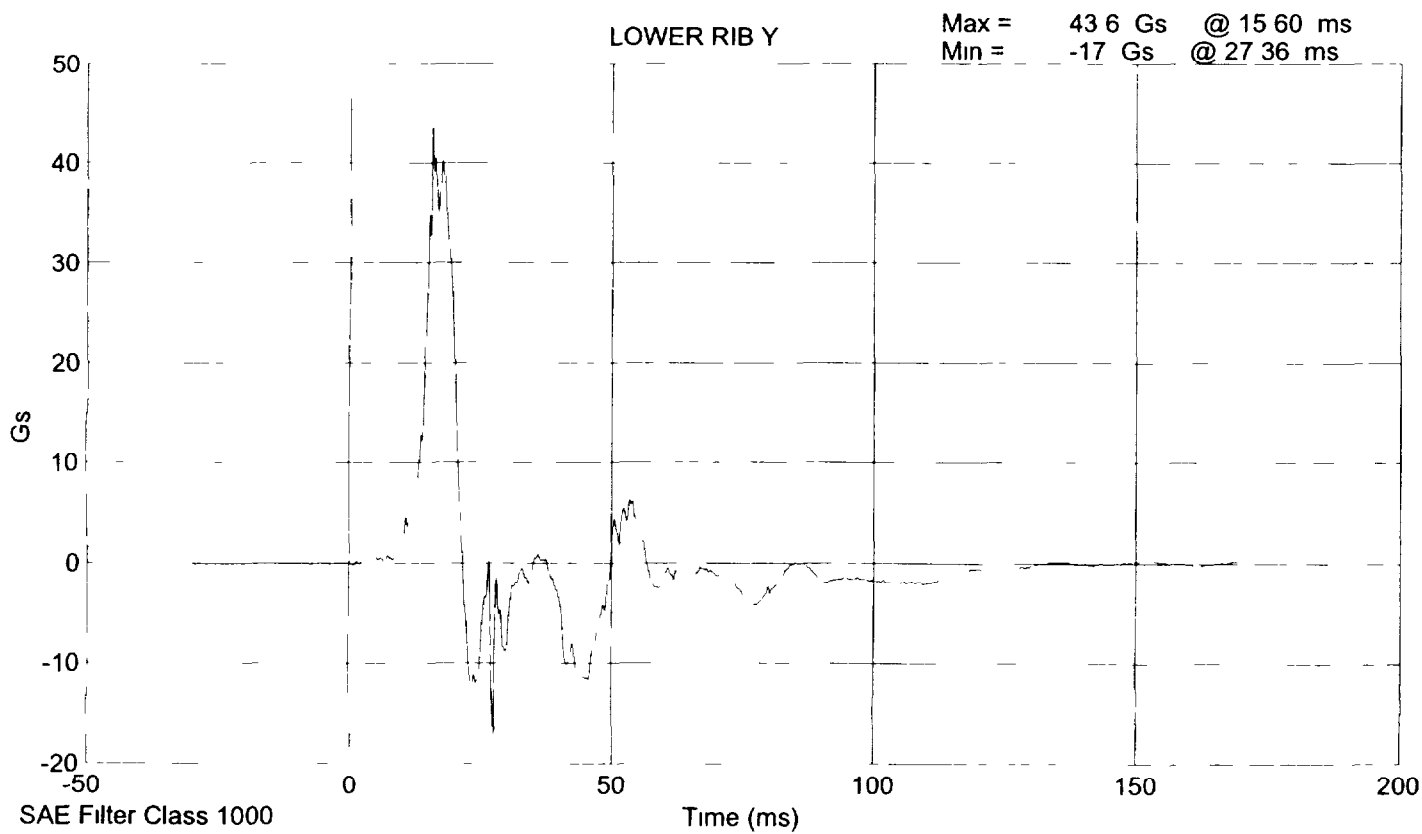
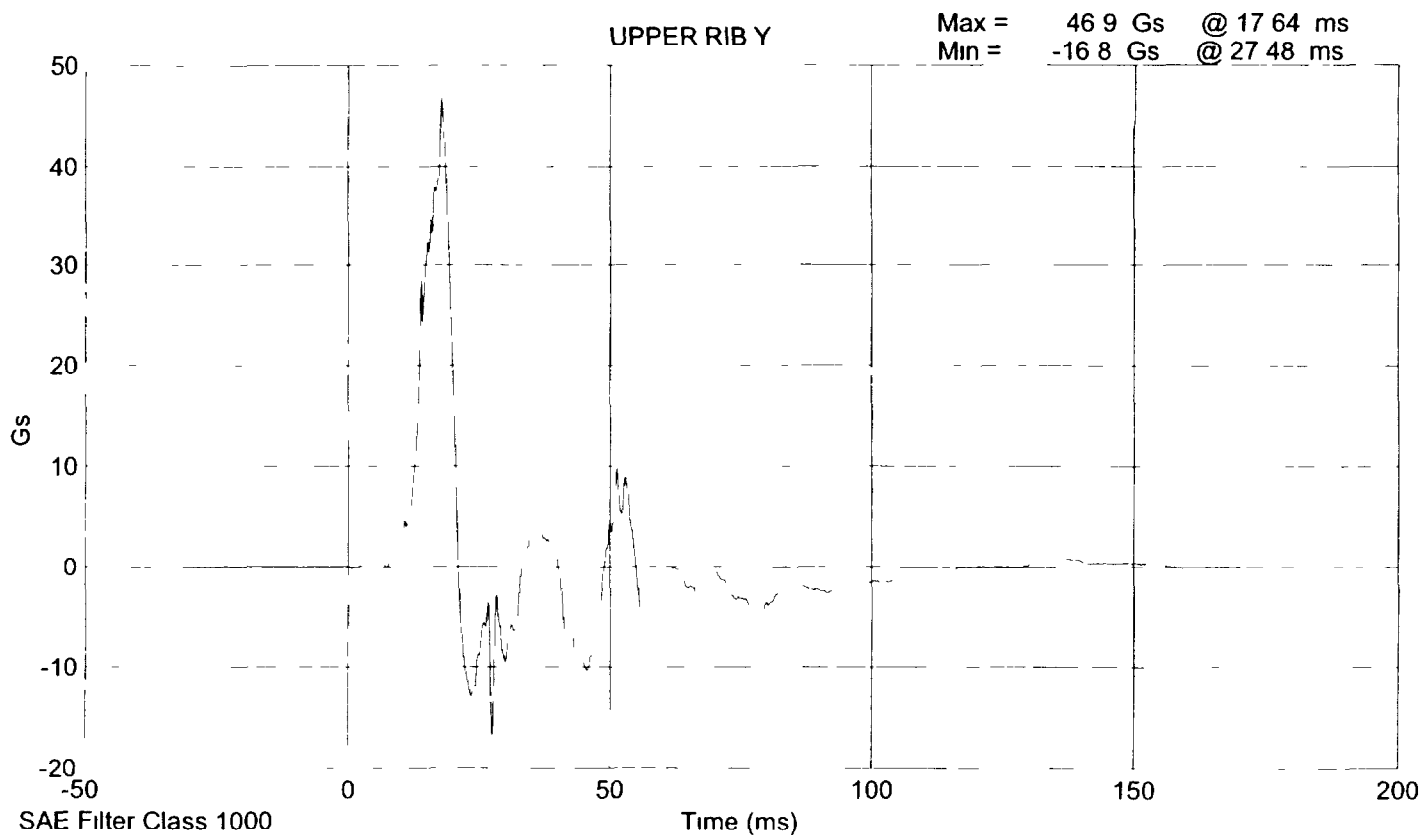
CONFIGURED FOR LEFT SIDE IMPACT

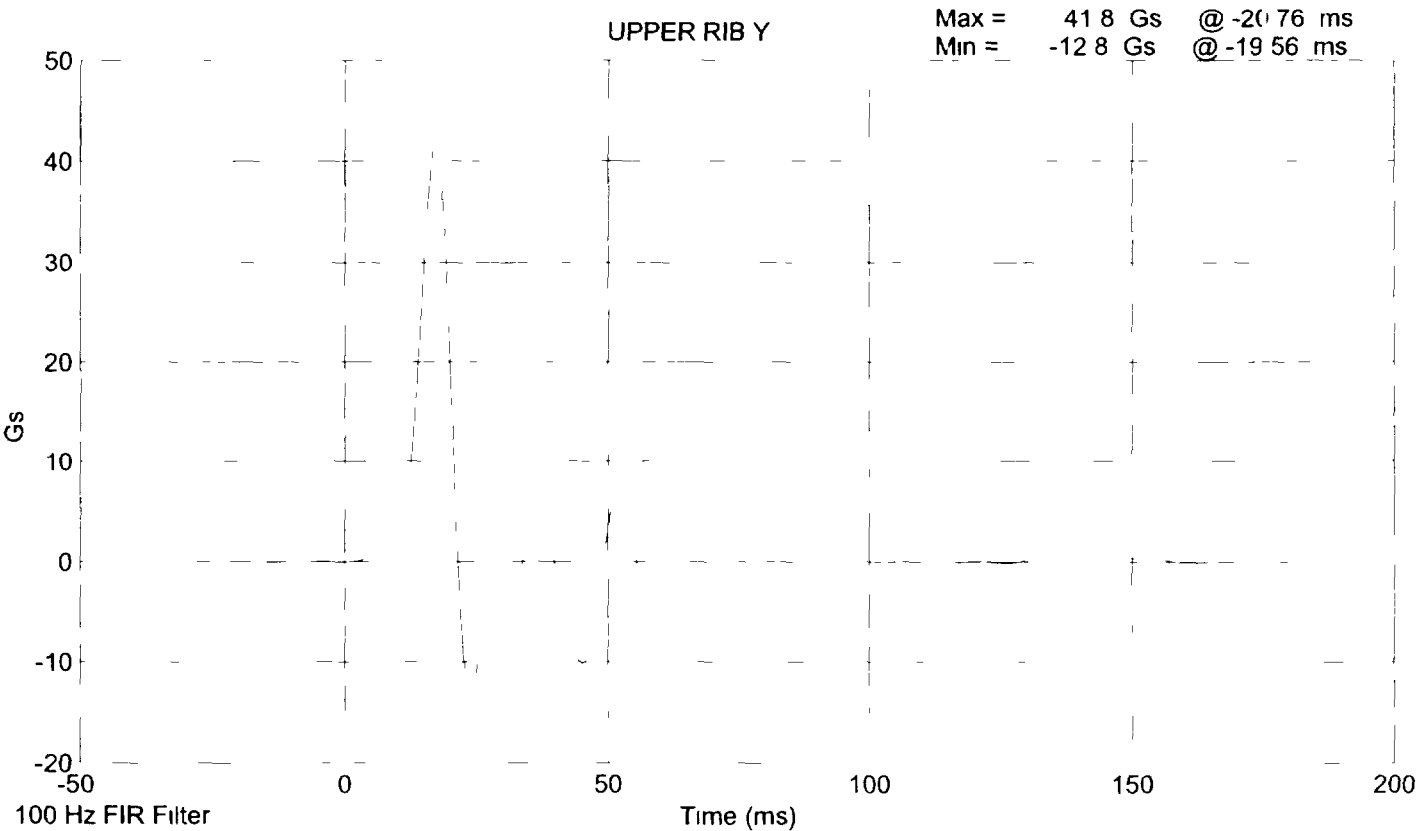
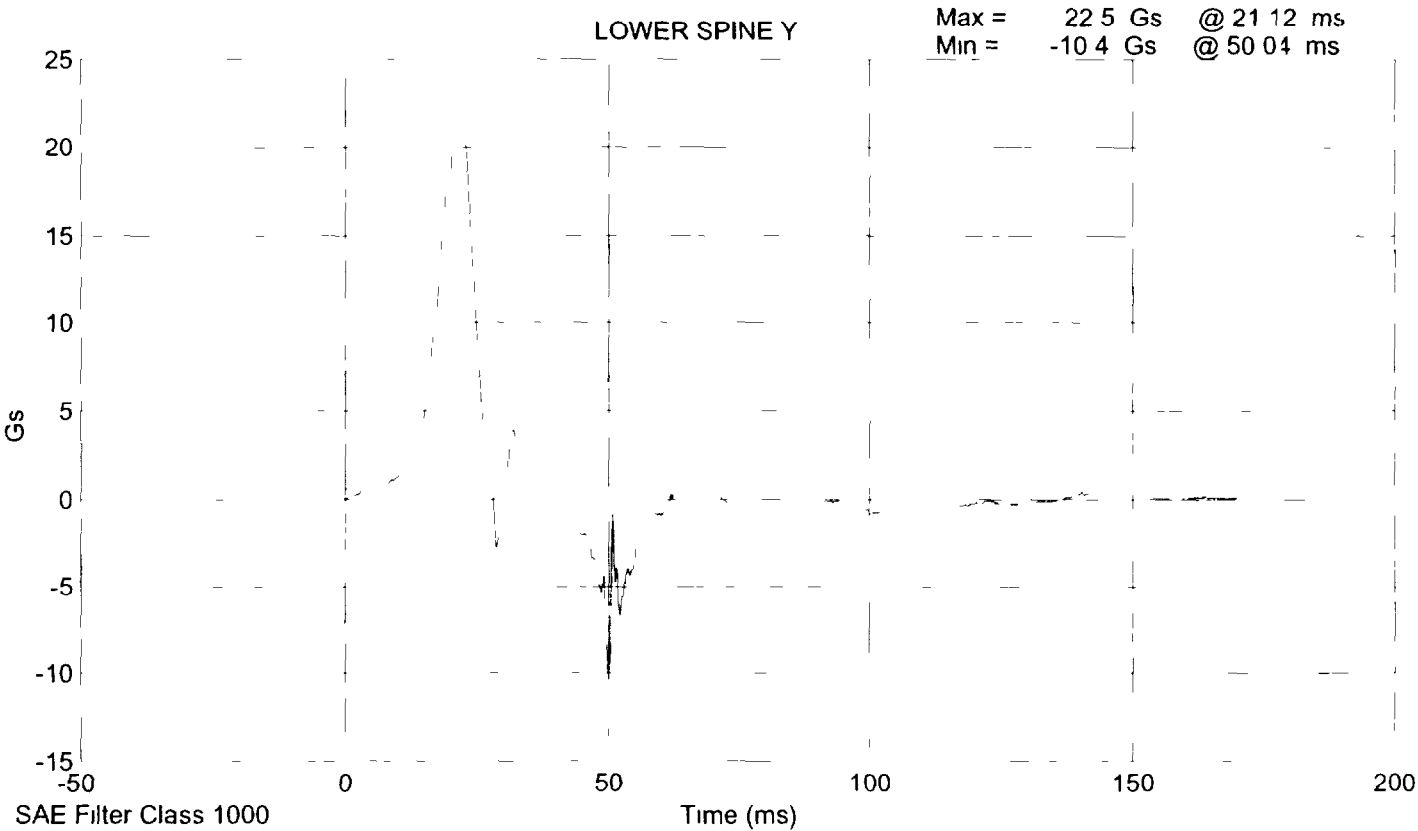
SID Serial No 016 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B Swiecicki

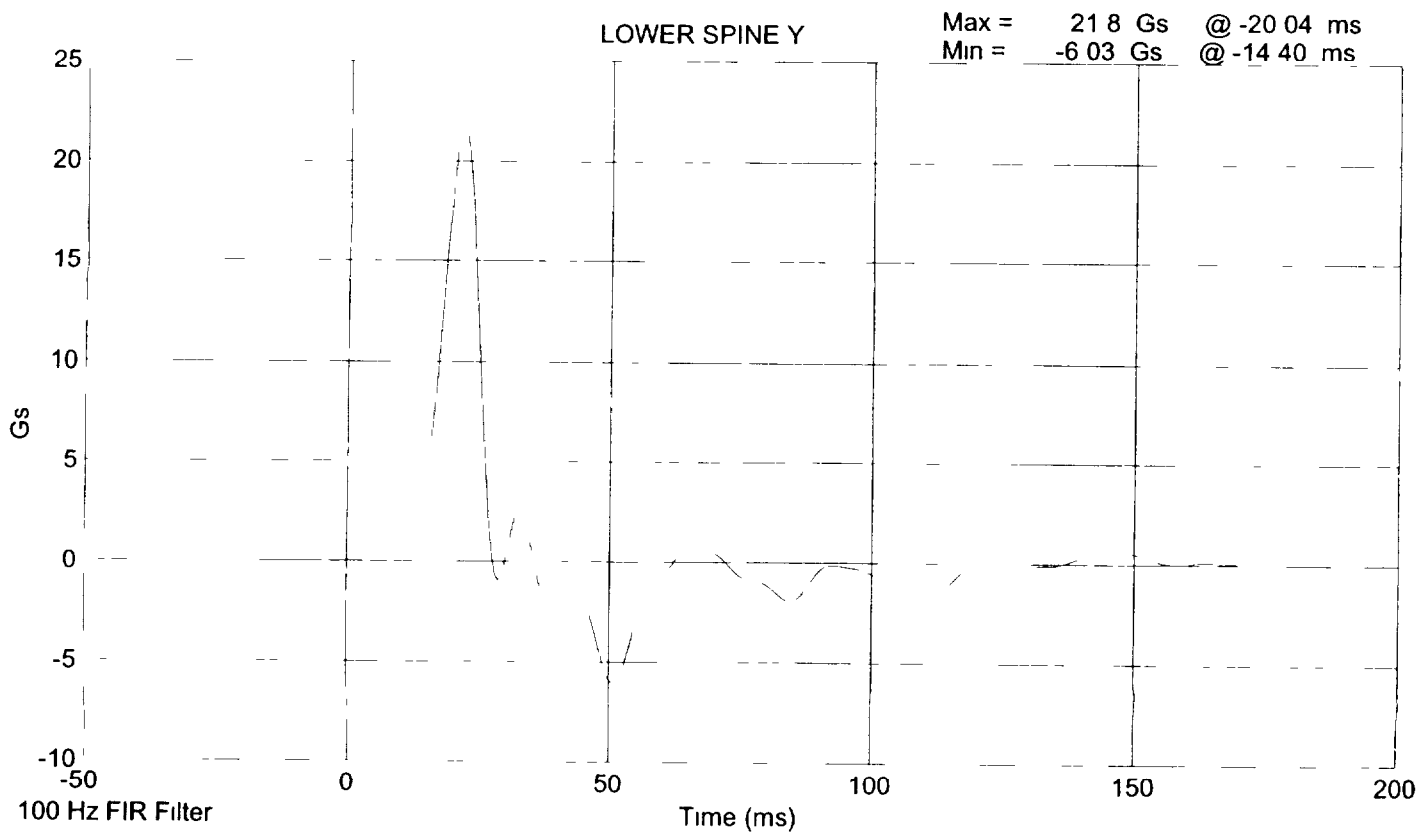
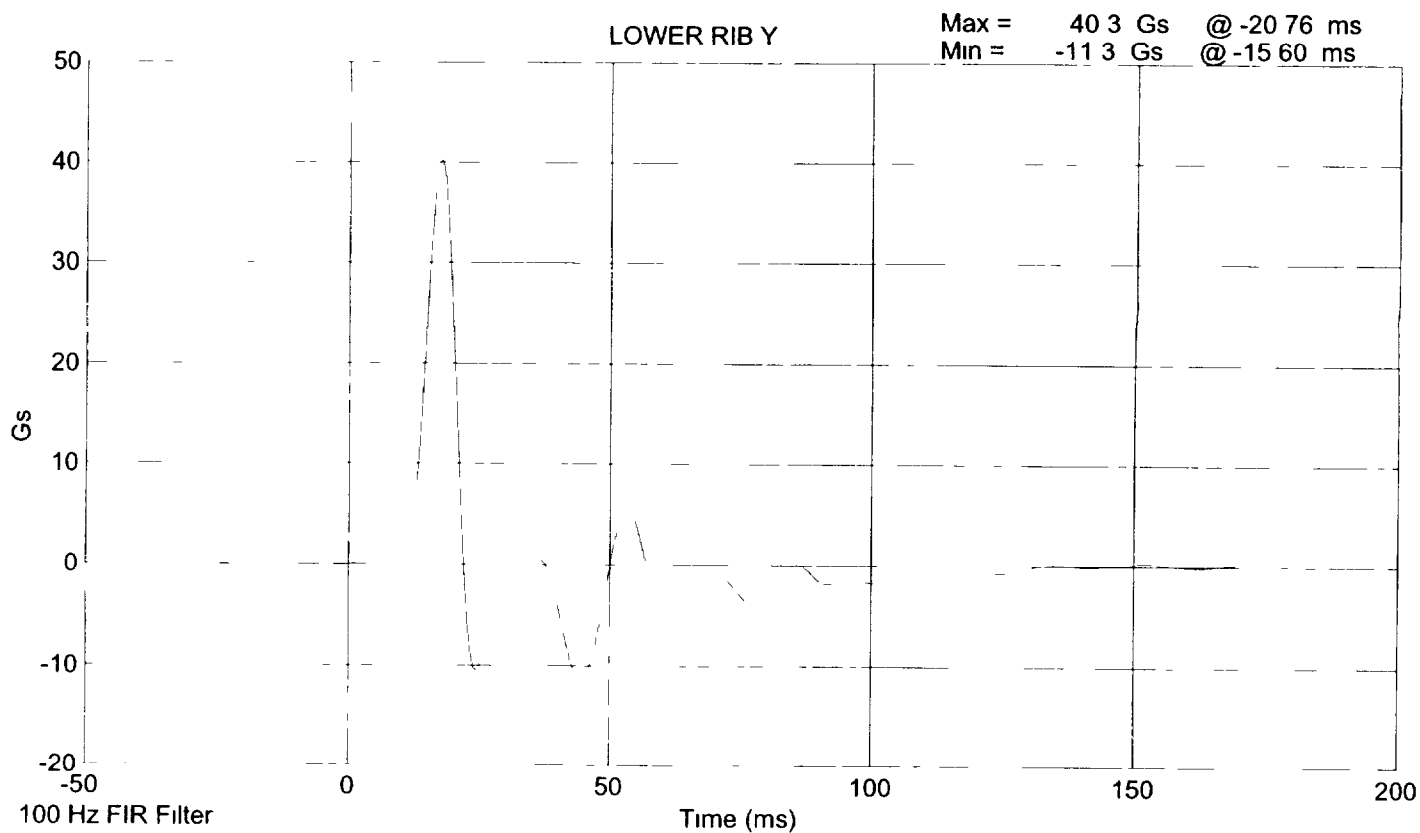
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46	41.8
LOWER RIB (g's)	37 - 46	40.3
LOWER SPINE (g's)	15 - 22	21.8

REMARKS: None

SID 016 Thorax Impact Test @ 4 2763 m/s







**LATERAL PELVIS IMPACT TEST
POST TEST**

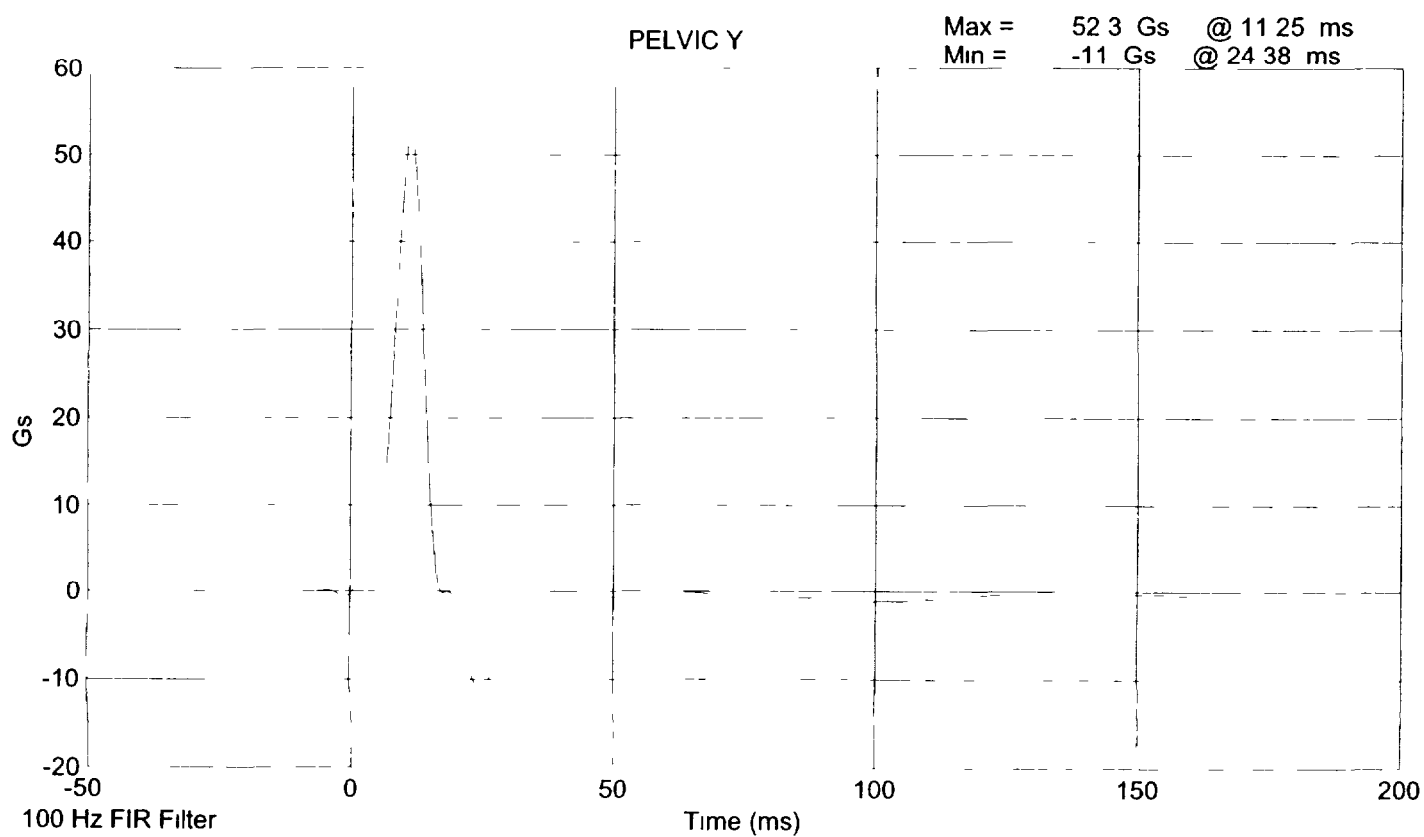
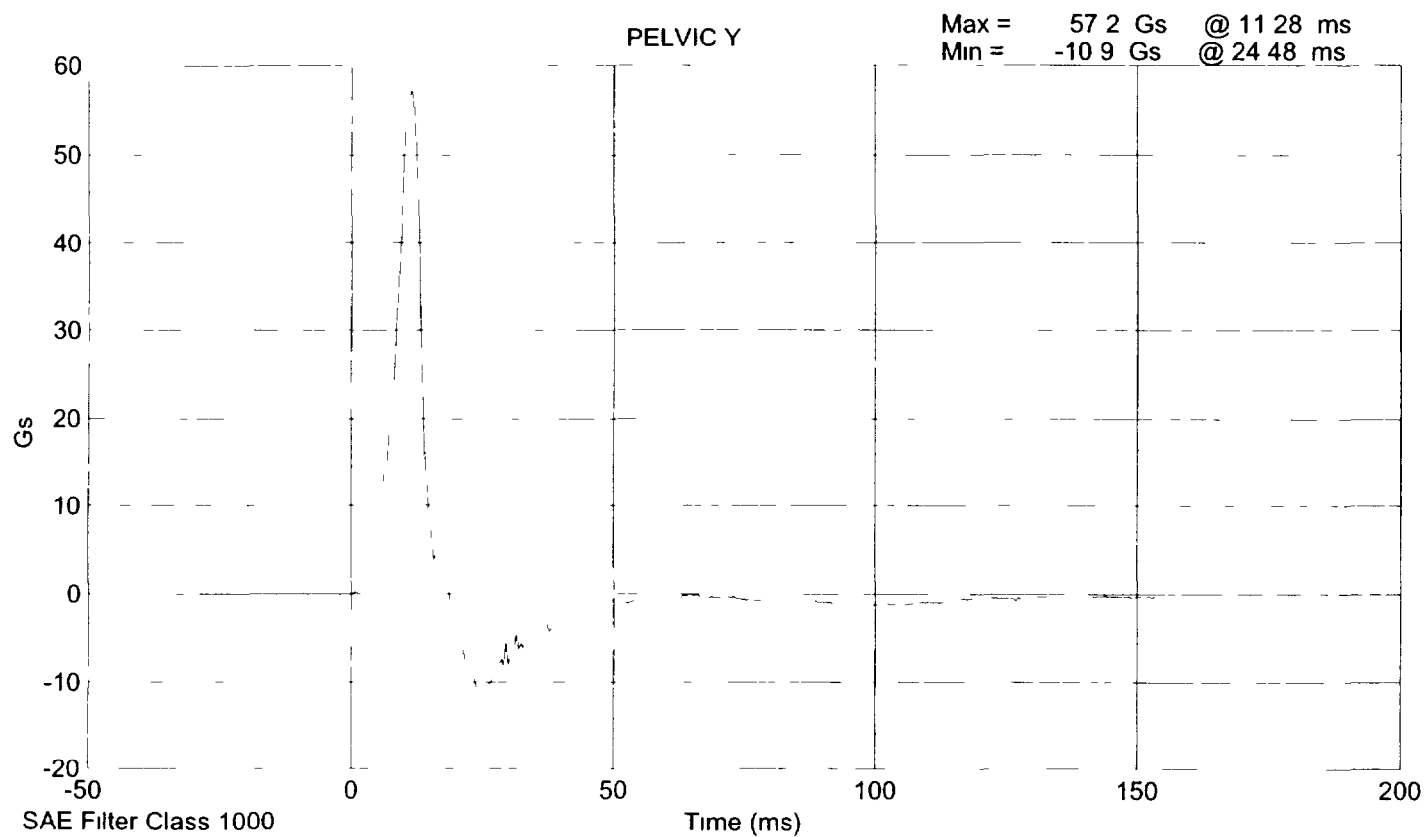
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No	<u>016</u>	Sequential Test Number	<u>1</u>
Date	<u>2/13/01</u>	Laboratory Technician	<u>B. Swiecicki</u>

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
PROBE SPEED (m/s)	4.27 - 4.33	4.27
PELVIS ACCELERATION (g's)	40 - 60	52.3

REMARKS: None

SID 016 Pelvic Impact Test @ 4 2672 m/s



ABDOMINAL COMPRESSION TEST**POST TEST**

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
Date 2/13/01 Laboratory Technician B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
FORCE @ 13 mm (N)	104 - 162	109
FORCE @ 19 mm (N)	163 - 221	170
FORCE @ 25 mm (N)	222 - 280	253
FORCE @ 33 mm (N)	325 - 391	370

REMARKS: None

Dummy S/N — 016

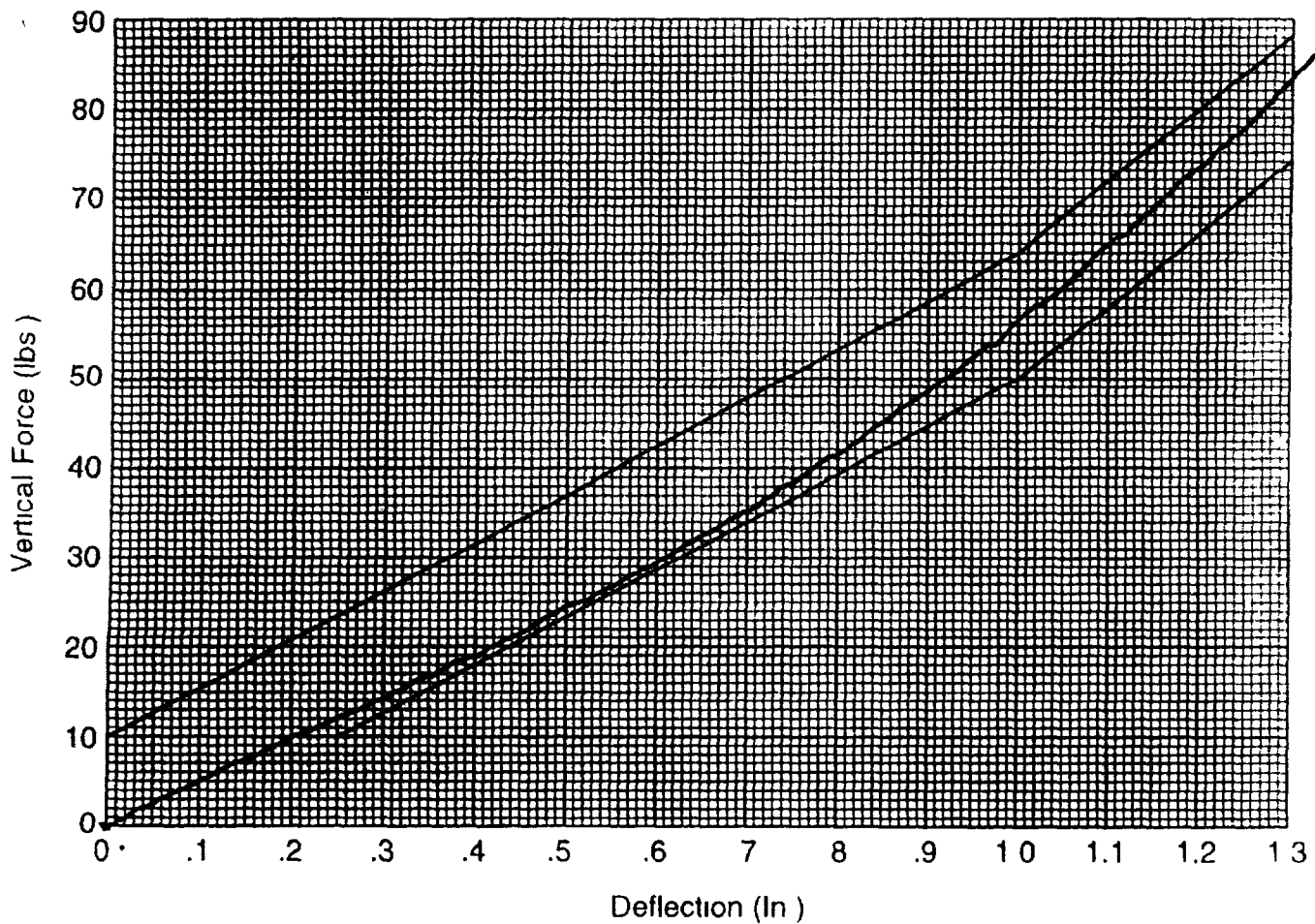
W/A — _____

Date 2-13-2001

Performed By [Signature]

Temp 71°

Humidity 32%



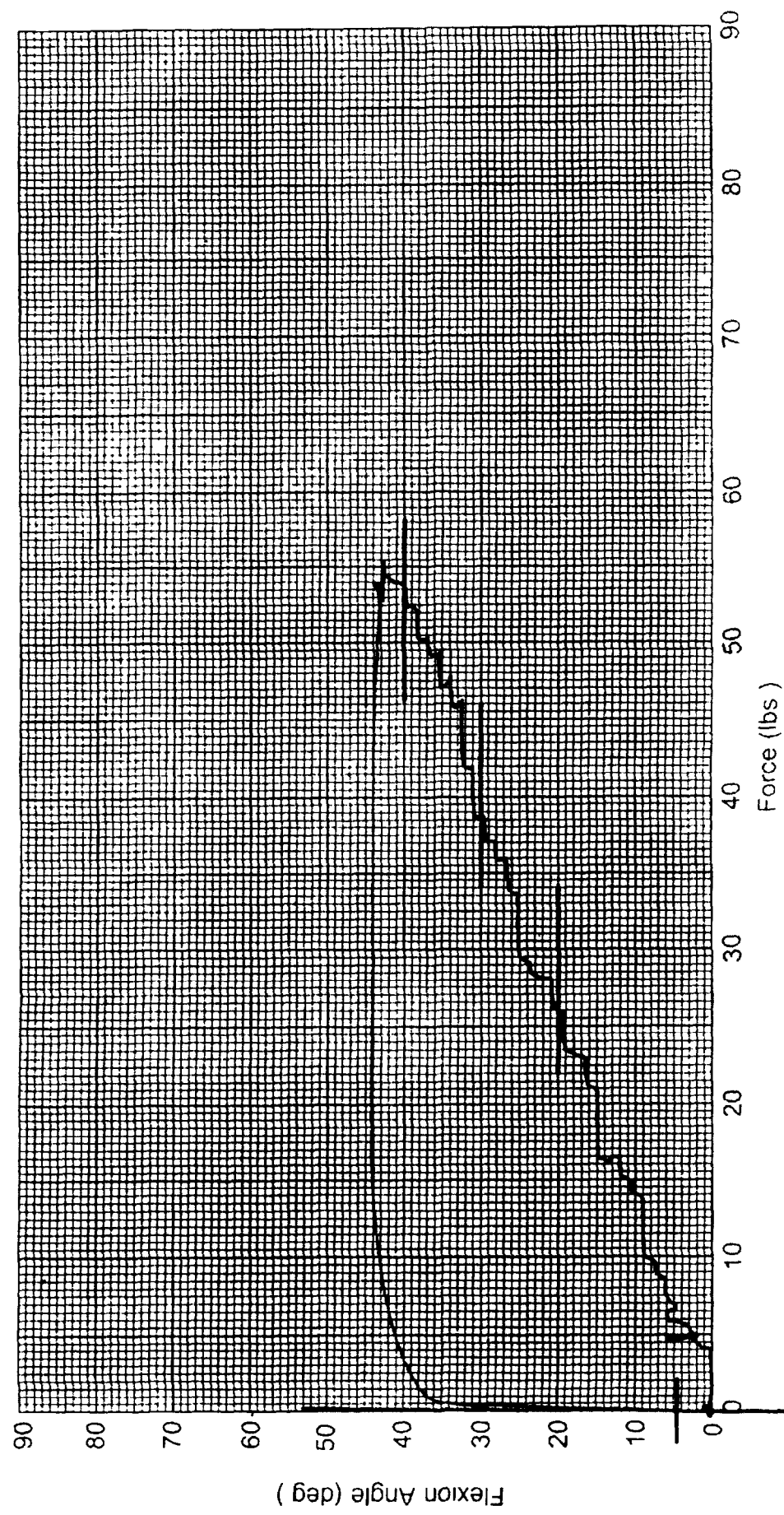
Hybrid II
Abdomen Static Press

CONFIGURED FOR LEFT SIDE IMPACT

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.7
RELATIVE HUMIDITY (%)	10 - 70	32
FORCE @ 0° (N)	0 - 26.7	0
FORCE @ 20° (N)	97.8 - 151.2	115
FORCE @ 30° (N)	151.2 - 204.6	172
FORCE @ 40° (N)	204.6 - 258	239
RETURN ANGLE	12° max	4.7°

3502-24

Dummy S/N 1018
 W/A ---
 Date 2-13-2001
 Performed By BS
 Temp 71°
 Humidity 32%



Hybrid II Lumbar Spine Flexion Test

FM 01 CERT 001 R100

POST TEST DUMMY INSPECTION LIST

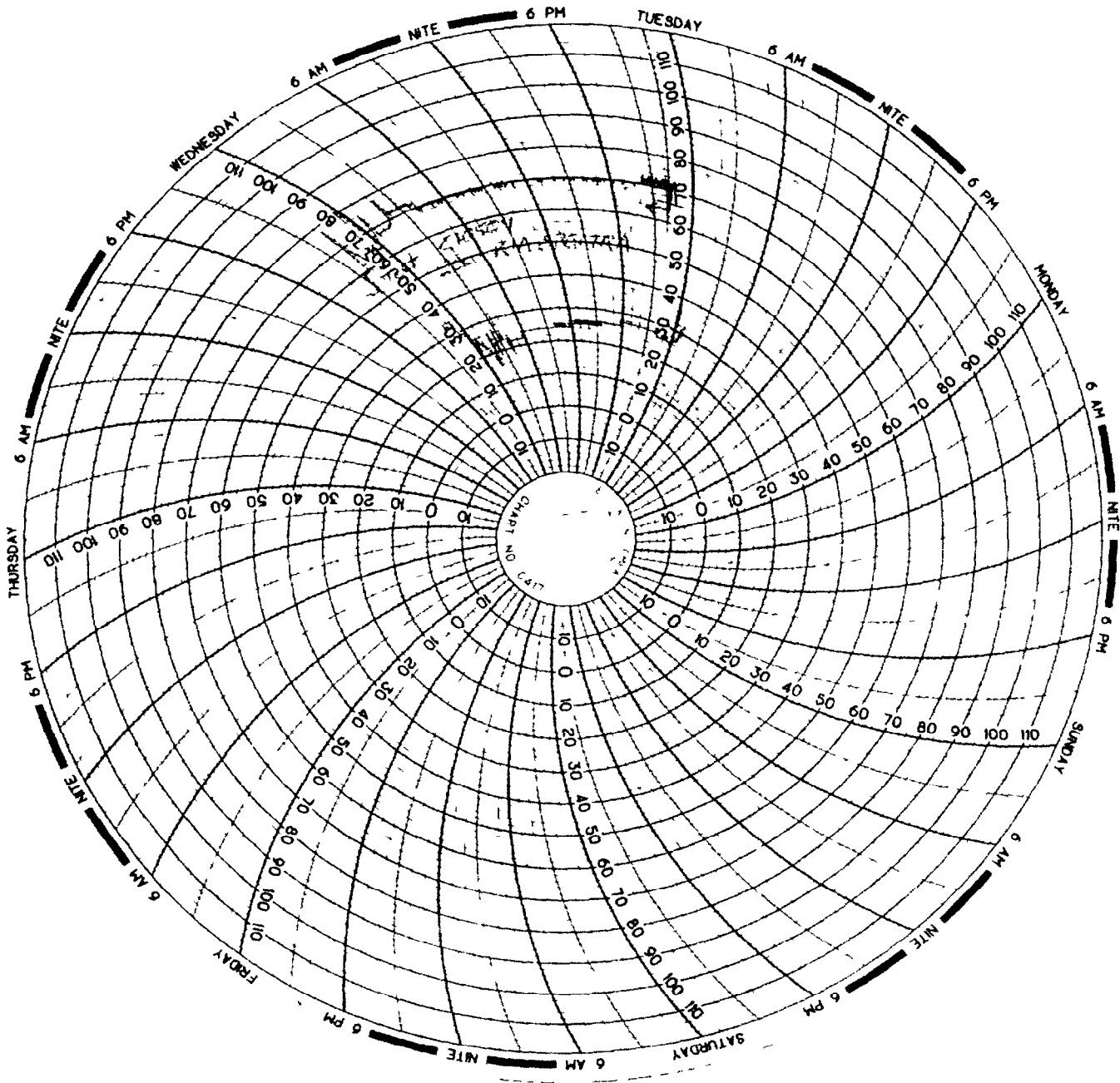
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No 016 Sequential Test Number 1
 Date 2/13/01 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 015		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD (X)	AC-J33030	ENDEVCO	1/16/01
HEAD (Y)	AC-J33032	ENDEVCO	1/16/01
HEAD (Z)	AC-J33021	ENDEVCO	1/16/01
UPPER RIB (Y)	AC-P16862	ENDEVCO	1/16/01
LOWER RIB (Y)	AC-P16656	ENDEVCO	1/16/01
LOWER SPINE (Y)	AC P16866	ENDEVCO	1/16/01
PELVIS (Y)	AC P16676	ENDEVCO	1/16/01
UPPER RIB REDUNDANT (Y)	AC J32779	ENDEVCO	1/16/01
LOWER RIB REDUNDANT (Y)	AC P16645	ENDEVCO	1/16/01
LOWER SPINE REDUNDANT (Y)	AC-P16823	ENDEVCO	1/16/01
PELVIS REDUNDANT (Y)	AC P16843	ENDEVCO	1/16/01

	REAR SID NO 016		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD (X)	AC-P18785	ENDEVCO	1/9/01
HEAD (Y)	AC-P18516	ENDEVCO	1/9/01
HEAD (Z)	AC-P18537	ENDEVCO	1/9/01
UPPER RIB (Y)	AC-P18524	ENDEVCO	1/6/01
LOWER RIB (Y)	AC P18533	ENDEVCO	1/9/01
LOWER SPINE (Y)	AC-P18514	ENDEVCO	1/9/01
PELVIS (Y)	AC-P18515	ENDEVCO	1/9/01
UPPER RIB REDUNDANT (Y)	AC-P18528	ENDEVCO	1/6/01
LOWER RIB REDUNDANT (Y)	AC-P18518	ENDEVCO	1/9/01
LOWER SPINE REDUNDANT (Y)	AC P18688	ENDEVCO	1/9/01
PELVIS REDUNDANT (Y)	AC-P18529	ENDEVCO	1/9/01

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-ACC06	ENDEVCO	9/8/00
RIGHT FRONT SILL (Y)	AC-B10481	ENDEVCO	9/8/00
RIGHT FRONT SILL (Z)	AC-B11351	ENDEVCO	9/8/00
RIGHT REAR SILL (X)	AC-AP064	ENDEVCO	9/18/00
RIGHT REAR SILL (Y)	AC-B10955	ENDEVCO	9/18/00
RIGHT REAR SILL (Z)	AC-BB14	ENDEVCO	9/18/00
REAR FLOORPAN ABOVE AXLE (X)	AC-B10827	ENDEVCO	8/7/00
REAR FLOORPAN ABOVE AXLE (Y)	AC-B11407	ENDEVCO	8/7/00
REAR FLOORPAN ABOVE AXLE (Z)	AC-B11408	ENDEVCO	8/7/00
LEFT REAR SILL (Y)	AC A13492	ENDEVCO	1/12/01
LEFT FRONT SILL (Y)	AC-A14433	ENDEVCO	9/5/00
RIGHT REAR SEAT OCCUPANT COMP (Y)	AC D82	ICS	8/17/00
LOWER LEFT B- PILLAR (Y)	AC-A13506	ENDEVCO	1/12/01
MIDDLE LEFT B-PILLAR (Y)	AC-A14481	ENDEVCO	1/12/01
LOWER LEFT A-PILLAR (Y)	AC-A13513	ENDEVCO	1/12/01
UPPER LEFT A-PILLAR (Y)	AC-J32143	ENDEVCO	11/30/00
FRONT SEAT TRACK (Y)	AC-A14312	ENDEVCO	1/12/01
REAR SEAT TRACK (Y)	AC-X33	ICS	8/25/00
VEHICLE CG (X)	AC-B11073	ENDEVCO	9/7/00
VEHICLE CG (Y)	AC-J27941	ENDEVCO	8/31/00
VEHICLE CG (Z)	AC-B10954	ENDEVCO	9/7/00
MDB CG (X)	AC CL60	ENDEVCO	8/31/00
MDB CG (Y)	AC-CJ54	ENDEVCO	8/31/00
MDB CG (Z)	AC-GK12	ENDEVCO	8/31/00
MDB REAR FRAME MEMBER (X)	AC-CX05	ENDEVCO	8/31/00
MDB REAR FRAME MEMBER (Y)	AC-A27F	ENDEVCO	8/31/00

REMARKS: None