

REPORT NUMBER: 201U-CAL-05-07

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT
UPPER INTERIOR HEAD IMPACT PROTECTION**

**KIA MOTORS CORPORATION
2005 KIA SPORTAGE MPV 4-DOOR**

NHTSA NUMBER: C50504

CALSPAN TEST NUMBER: 8754-FMH-07

CALSPAN
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



Test Date: June 1, 2005

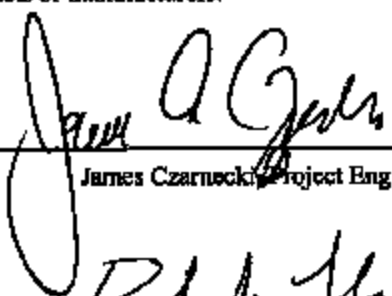
FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
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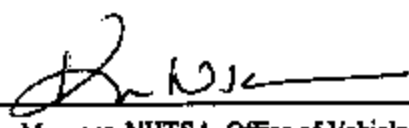
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David J. Travie, Program Manager
Transportation Science Center

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16. Abstract Compliance tests were conducted on the subject vehicle, a 2005 Kia Sportage MPV, 4-door, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:					
Target Point	Horizontal	Vertical	Velocity	HIC	HICd
None	-	-	-	-	-
None	-	-	-	-	-
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TABLE OF CONTENTS

SECTION		PAGE
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF UPPER INTERIOR HEAD IMPACTS	2-1
3	SUMMARY OF TEST RESULTS AND DATA PLOTS	3-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT	B-1

LIST OF DATA SHEETS

DATA SHEET	DESCRIPTION	PAGE NO.
2-1	SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS	2-2
2-2	GENERAL TEST AND VEHICLE PARAMETER DATA	2-4
2-3	APPROACH ANGLE LIMITS	2-6
2-4	TARGET IMPACT LOCATION ON FMH SUMMARY	2-7

SECTION 1

PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-04-C-01027. The purpose of this head impact compliance test was to determine whether the subject vehicle, 2005 Kia Sportage MPV, 4-door, NHTSA No. C50504, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted in accordance with the OVSC Laboratory Test Procedure No. TP-201U-01 dated April_03, 1998.

SECTION 2

SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2005 Kia Sportage MPV, 4-door, NHTSA No.C50504, was impacted at various locations throughout its upper interior by a 4.54 kg 50th percentile headform. A total of twelve (12) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officers Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The twelve (12) areas chosen for testing were:

OP2	RP1	RH	URRP	UROP
SR3	URSR3	BP4	BPI	AP3
AP1	SR2A			

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201.

Five Free Motion Headforms (FMH), were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed 4.54 ± 0.5 kg and has an orthogonal tri-axis accelerometer pack mounted at the center of gravity (c.g.).

A total of three (3) channels of data for each target impact test are recorded on a Keyser-Threde data acquisition system. Data plots along with still photographs can be found in Section 3 of this report.

To document each target area impact test, one Weinberger high-speed video camera was placed at various locations to view the headform contact with the selected target area.

DATA SHEET 2-1

SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (gph)	FMH HIC	HIC(d)
	Driver Side			Passenger Side							
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)	Horizontal	Vertical			
AP1	1045.22	-557.93	1183.77	1038.08	556.71	1182.74	124°	45°	18.81	349.1	429.8
AP2	878.87	-598.28	1096.17	875.22	598.61	1095.57	-	-	-	-	-
AP3	752.75	-624.96	1020.19	750.27	621.55	1022.34	137°	40°	18.42	251.0	355.8
BP1	1571.51	-479.01	1282.99	1578.39	482.89	1278.81	90°	25°	18.65	550.6	581.8
BP2	1545.22	-612.80	1011.50	1548.33	611.66	1013.78	-	-	-	-	-
BP3	1513.52	-612.27	1064.17	1515.30	611.31	1062.05	-	-	-	-	-
BP4	1605.85	-649.91	946.06	1605.67	645.12	953.46	134°	-10°	23.84	655.5	661.0
FH1	985.40	-475.72	1234.58	981.16	473.31	1236.27	Relocated 2 circles		-	-	-
FH1_R2	984.66	-447.44	1242.54	969.29	435.82	1240.00	-	-	-	-	-
FH2	965.43	-326.63	1247.76	958.84	325.79	1246.64	-	-	-	-	-
OP1	2473.48	-600.29	1063.58	2484.67	600.11	1053.88	-	-	-	-	-
OP2	2506.93	-600.80	1060.94	2509.50	598.24	1058.87	90°	-6°	23.70	696.0	691.5
RH	2736.86	-339.50	1226.05	2772.47	342.90	1220.46	0°	50°	23.78	366.0	442.5
RP1	2733.02	-507.29	1197.94	2733.65	503.97	1198.71	39°	38°	18.52	371.3	446.5
RP2	2915.50	-569.89	1048.72	2912.32	564.70	1051.68	-	-	-	-	-
SR1	1191.67	-492.31	1276.88	1192.05	488.27	1275.96	Relocated 1 circle		-	-	-
SR1_R1	1196.43	-474.18	1273.36	1201.45	471.98	1273.72	-	-	-	-	-
SR2A	1342.80	-492.32	1286.26	1337.56	494.08	1284.98	Relocated 1 circle		-	-	-
SR2A_R1	1354.98	-469.41	1262.40	1352.12	466.40	1260.60	90°	50°	18.75	267.7	368.4
SR2B	1271.12	-496.22	1282.92	1275.87	498.12	1280.55	Relocated 2 circles		-	-	-

SR2B_R2	1270.74	-465.37	1255.10	1276.81	463.65	1254.50	-	-	-	-	-
SR3R	2135.74	-463.06	1279.52	2132.00	460.32	1276.69	90°	37°	18.67	244.5	350.8
URAP	1293.52	-363.00	1324.79	1266.24	376.93	1315.64	-	-	-	-	-
URBP	1576.55	-370.67	1341.20	1583.48	368.92	1341.01	-	-	-	-	-
URRP	2355.04	-381.02	1317.12	2358.63	372.32	1319.23	90°	47°	23.70	403.9	471.1
URRP	2545.52	-330.06	1303.31	2526.62	305.11	1310.15	43°	39°	23.62	401.0	468.9
URSR3	1900.70	-372.86	1338.32	1920.90	374.93	1335.48	90°	40°	23.69	843.6	802.8

*HIC(d)=0.75446(Free Motion Headform HIC)+166.4

NOTES:

URRP - PASSENGER SIDE REARSEAT BELT ANCHORAGE TRIM POPPED OUT OF CLIPS WITH SOME TRIM CRACKING

URSR3 -- CREASED UPPER ROOF MATERIAL, ALL THE WAY TO URBP TARGET

BP4 - TRIM CRACKED UPON IMPACT

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:									
Year/Make/Model/Body Style:					2005 Kia Sportage MPV 4-door				
VIN:					KNDJF724257040736				
Month & Year of Manufacture:					12/04(SEE CERTIFICATION LABEL)				
Vehicle Body Color:					Olive Green				
Engine Data:	4	Cylinders:	-	CID:	2.0	Liters:	-	cc	
Engine Placement:	x		Longitudinal;	or		-		Lateral	
Transmission:	4	Speed:	-	Manual;	x	Automatic;	-	Overdrive	
Final Drive:	-	Rear Wheel Drive;	x	Front Wheel Drive;	-	Four Wheel Drive			
Odometer Reading:	70		km						
Options:	x	A/C;	x	Power Steering;	x	Pwr.Brakes;	x	Pwr. Windows	
Interior Trim Information :									
1. Grab handles located on first and second row outboard seating position side rails									
2. Adjustable seat belt anchorages on the B-pillars									
3. Non-adjustable seat belt anchorages on the Other pillars									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity):					210		kPa FRONT		
					210		kPa REAR		
Recommended Tire Size:					P215/65R16				
Tires on Test Vehicle:			P215/65R16		Manufacturer:			Kombo	
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 Capacity Weight (VCW)=					390		kg (A)		
No. of Occupants x 68 kg. =					340		kg (B)		
Rated Cargo/Luggage Weight (RCLW) =					50		kg (A-B) Max. RCLW = 136 kg.		

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:						
Left Front	=	457.5	kg	Left Rear	=	305.5 kg
Right Front	=	453.0	kg	Right Rear	=	305.5 kg
TOTAL FRONT	=	910.5	kg	TOTAL REAR	=	611.0 kg
% of Total Weight	=	59.8	%	% of Total Weight	=	40.2 %
TOTAL WEIGHT	=	1521.5		kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1521.5	kg (A)
+ Rated Cargo/Luggage Weight =	50.0	kg (B)
TEST VEHICLE TARGET WEIGHT =	1571.5	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):						
Left Front	=	456.5	kg	Left Rear	=	329.0 kg
Right Front	=	458.5	kg	Right Rear	=	327.5 kg
TOTAL FRONT	=	910.0	kg	TOTAL REAR	=	656.5 kg
% of Total Weight	=	58.1	%	% of Total Weight	=	41.9 %
TOTAL TEST WEIGHT	=	1566.5				
Weight of vehicle secured in test vehicles cargo area	=	45		kg		

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	785	Left Rear	823
	Right Front	790	Right Rear	830
FULLY LOADED:	Left Front	787	Left Rear	812
	Right Front	789	Right Rear	817
Test Vehicle Wheelbase:	2630		millimeters	

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.8↓	Front Bumper	↑0.5↓
	Right Door Sill	↓0.7↑	Rear Bumper	0.0
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.5↓	Front Bumper	↑0.4↓
	Right Door Sill	↓0.4↑	Rear Bumper	0.0
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.6↓	Front Bumper	↑0.5↓
	Right Door Sill	↓0.5↑	Rear Bumper	0.0

DATA SHEET 2-3

APPROACH ANGLE LIMITS

Left Side					Right Side				
Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)		Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	202	254	-5	-	AP1	106	158	-5	45
AP2	202	254	-5	-	AP2	106	158	-5	44
AP3	202	254	-5	-	AP3	106	158	-5	40
BP1	203	276	-10	-	BP1	84	157	-10	25
BP2	ANY	ANY	0	-	BP2	ANY	ANY	0	0
BP3	203	276	-10	-	BP3	84	157	-10	-6
BP4	203	276	-10	-	BP4	84	157	-10	-10
OP1	270	270	-10	-	OP1	90	90	-10	-2
OP2	270	270	-10	-	OP2	90	90	-10	-6
RP1	270	345	-10	-	RP1	15	90	-10	38
RP2	270	345	-10	-	RP2	15	90	-10	-
FH1	180	180	0	-	FH1	180	180	0	50
FH2	180	180	0	-	FH2	180	180	0	50
RH	360	360	0	-	RH	0	0	0	50
SR1	270	270	0	-	SR1	90	90	0	38
SR2A	270	270	0	-	SR2A	90	90	0	50
SR2B	270	270	0	-	SR2B	90	90	0	38
SR3	270	270	0	-	SR3	90	90	0	37
URAP	ANY	ANY	0	-	URAP	ANY	ANY	0	47
URBP	ANY	ANY	0	-	URBP	ANY	ANY	0	41
UROF	ANY	ANY	0	-	UROF	ANY	ANY	0	47
URRP	ANY	ANY	0	-	URRP	ANY	ANY	0	39
URSR3	ANY	ANY	0	-	URSR3	ANY	ANY	0	40

Note : BP2 target location - Seat belt anchorage

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green



◀ RIGHT SIDE OF FACE

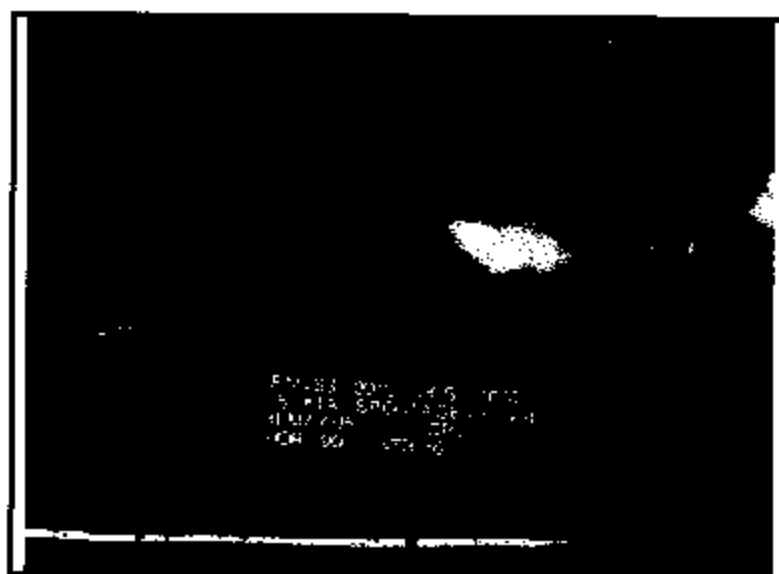
TARGET	Distance Above Point O (mm)	Distance Over From Pt. O (mm)
OP2	22	5L
RP1	38	8R
RH	39	0
URRP	7	5R
UROP	20	9L
SR3	9	22L
URSR3	40	0
BP4	10	7L
BP1	22	9L
AP3	8	4L
AP1	9	0
SR2A	10	25L

SECTION 3
SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	01
Test Date:	05/31/05
Target Location:	OTHER PILLAR
Target Code:	OP2
Horizontal Impact Angle:	90°
Vertical Impact Angle:	-6°
Ambient Temperature:	22.7C°
Relative Humidity:	41.5
Time of Impact:	9:30
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	mm right	x mm left
On Centerline	22	mm up	



POST-IMPACT OP2 HEADFORM

Free Motion HIC	696.0
HIC(d)	691.5
Impact Velocity (kph)	23.7
HIC T1 (msec)	2.9
HIC T2 (msec)	12.5

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - OP2

FMH Headform 0062

Location: OP2

Test Date: May 31, 2005

Work File: OP2

TEST RESULTS

Lab Temperature: 22.7 C

HICd: 691.5

Lab Humidity: 41.5 %

HIC (36ms): 696.0

Velocity at Impact: 23.70 KPH

t1: 2.9 msec

t2: 12.5 msec

Free Flight Distance: 213.40 mm

Duration: 9.6 msec

Maximum: 105.7 g

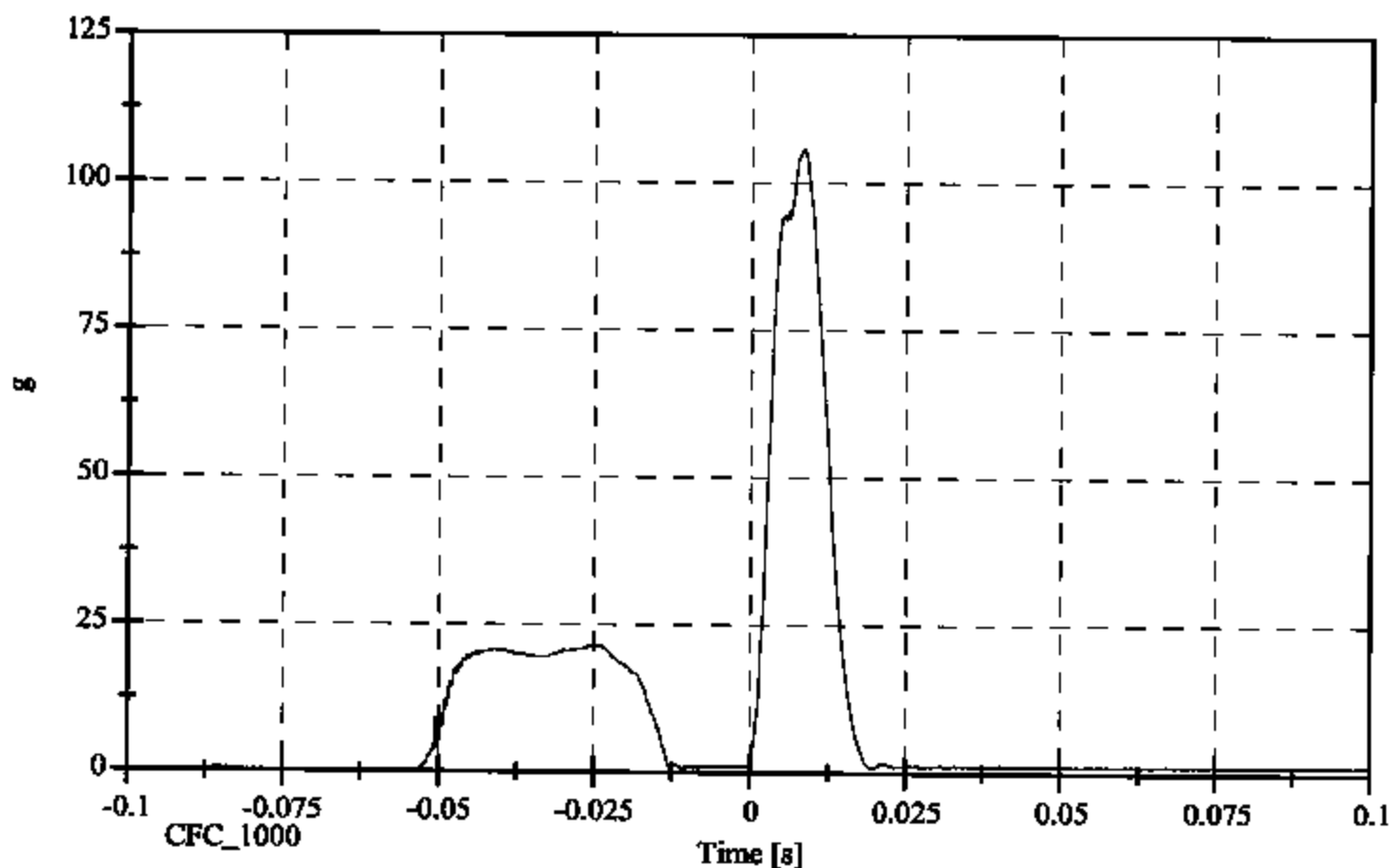
Average Acceleration: 9.1 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 105.7 [g] at 0.008 [s]

Min: 0.0 [g] at -0.062 [s]

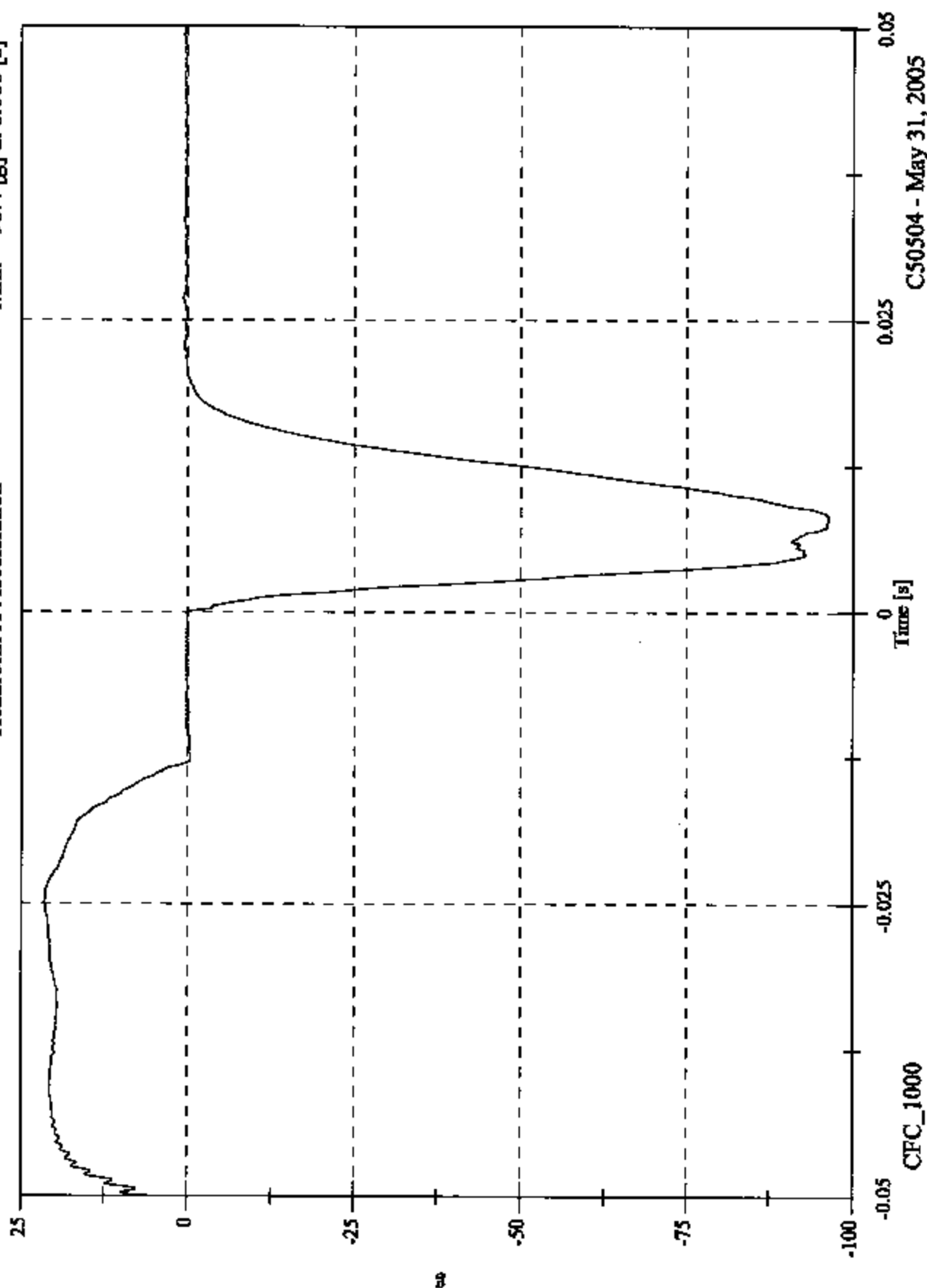


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 21.6 [g] at -0.025 [s]

Min: -96.4 [g] at 0.008 [s]

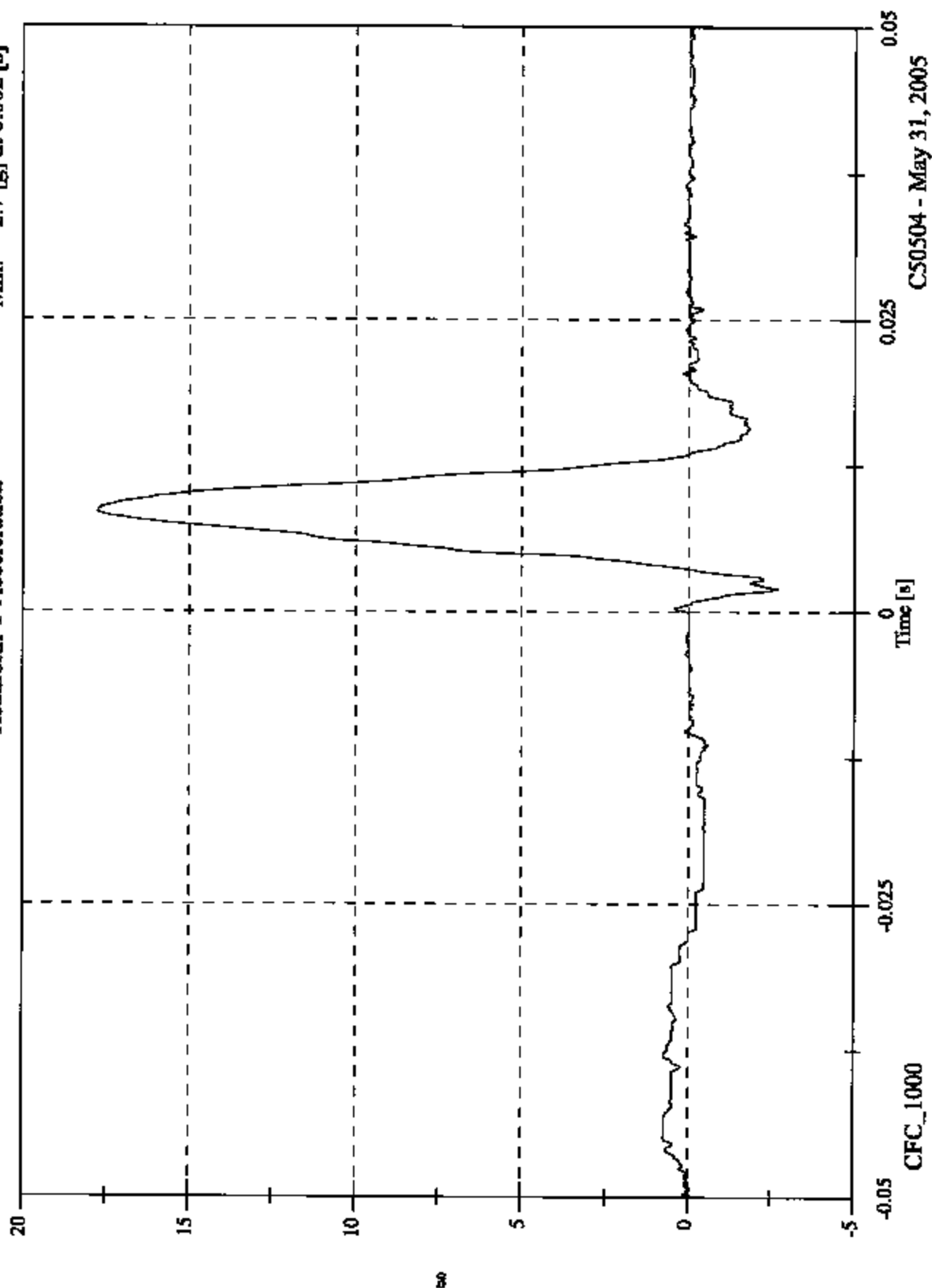


C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 17.8 [g] at 0.008 [s]
Min: -2.7 [g] at 0.002 [s]



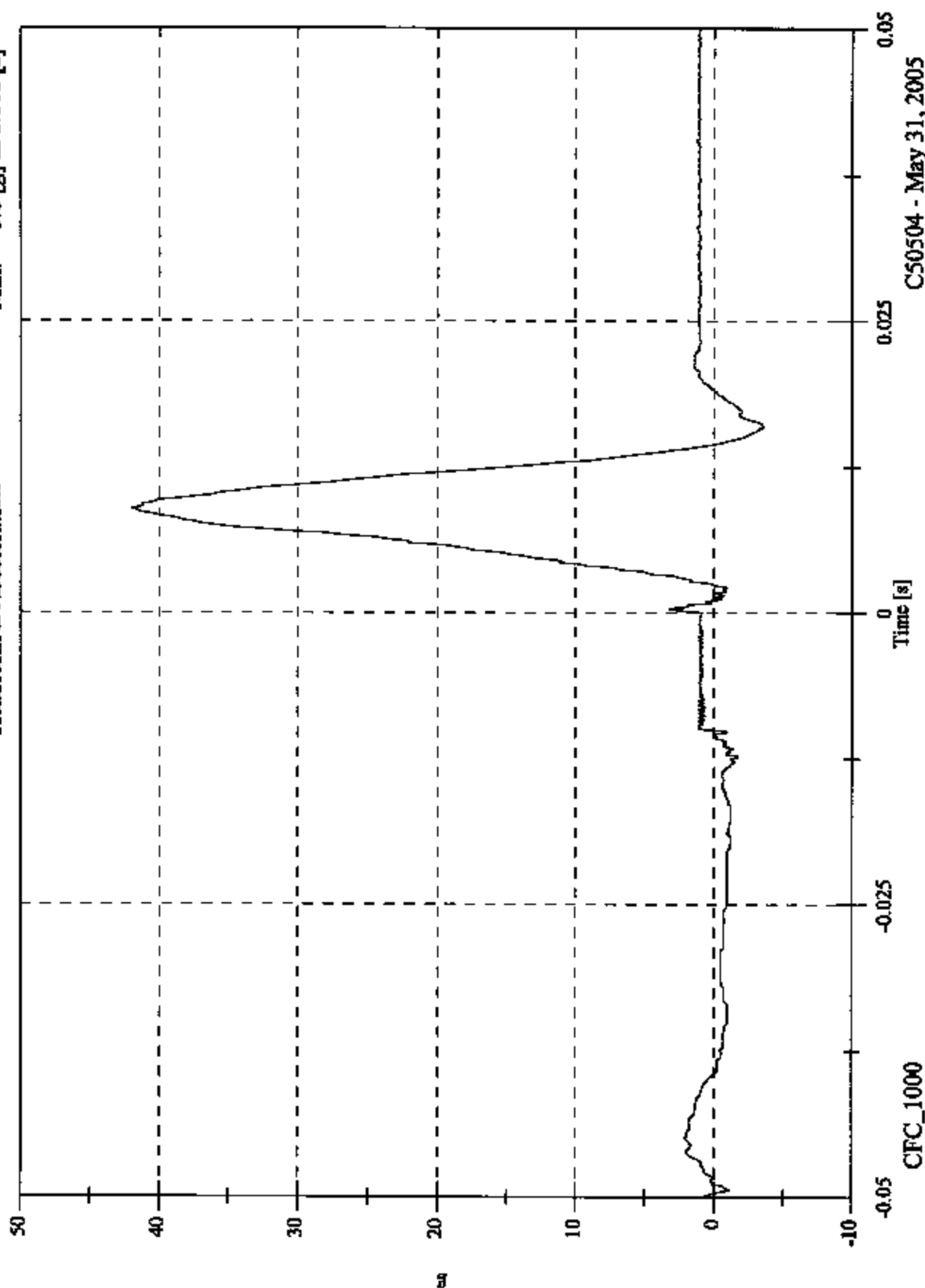
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 42.0 [g] at 0.009 [s]

Min: -3.6 [g] at 0.016 [s]



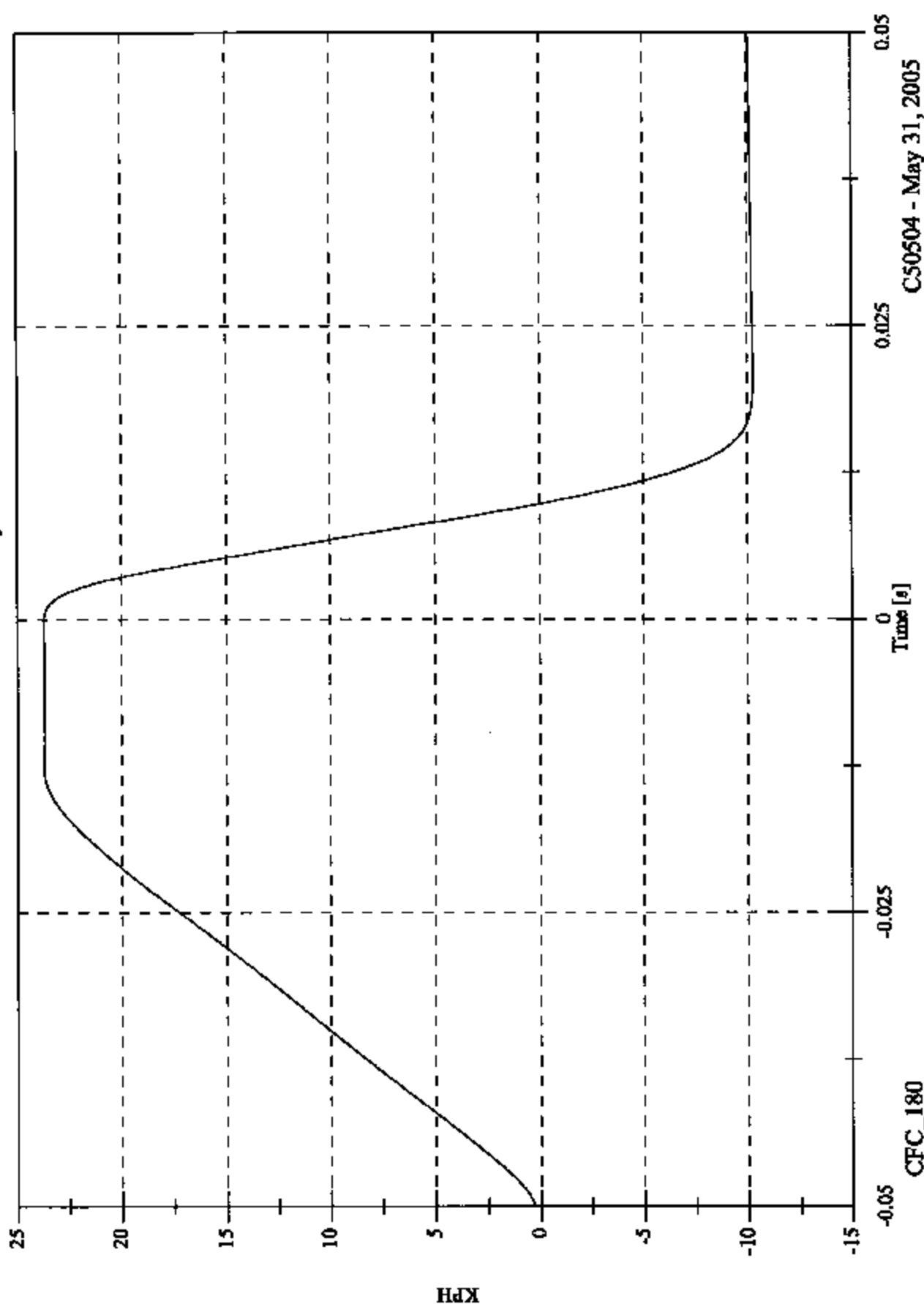
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 23.7 [KPH] at -0.013 [s]

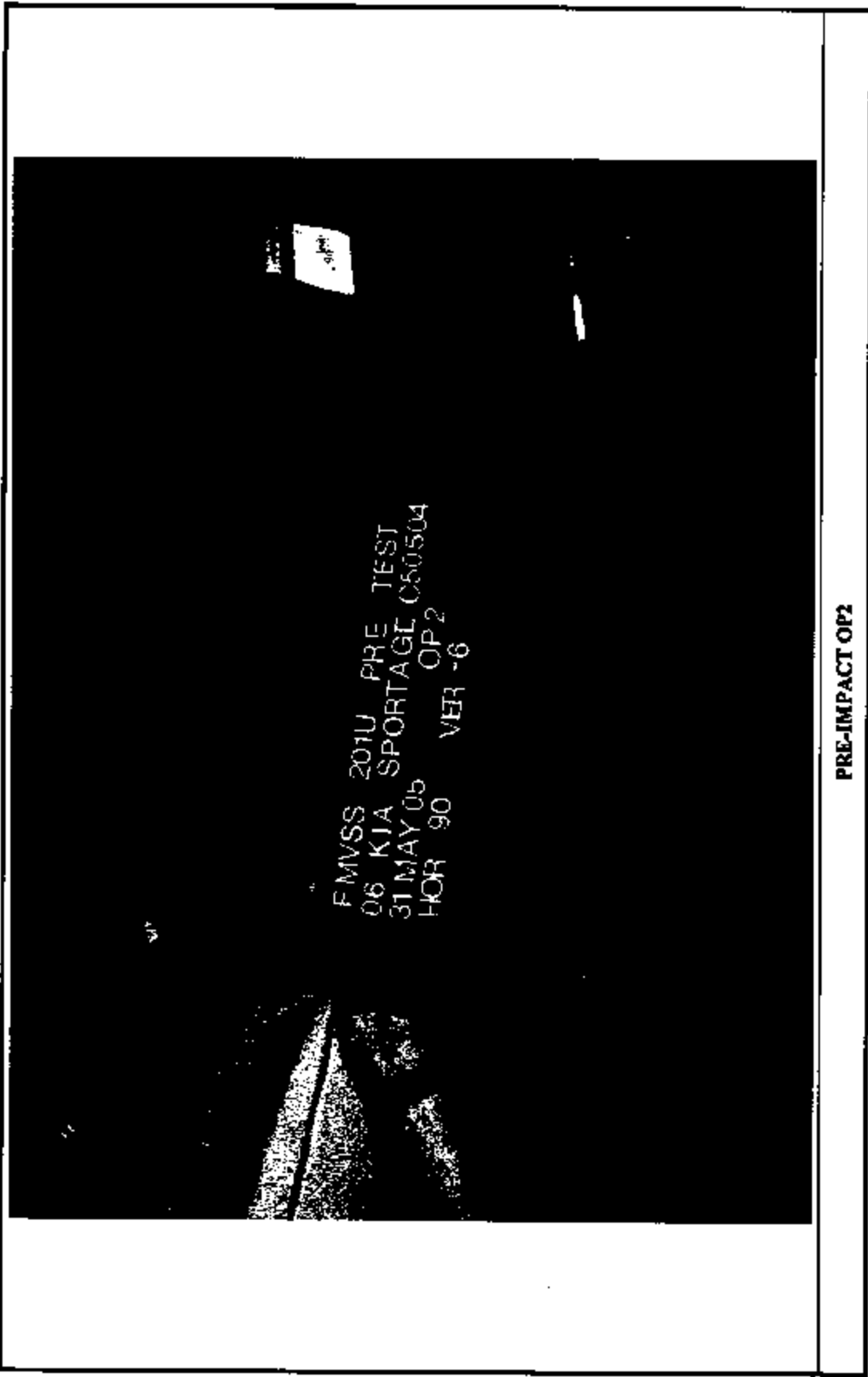
Min: -10.3 [KPH] at 0.021 [s]

Headform Velocity

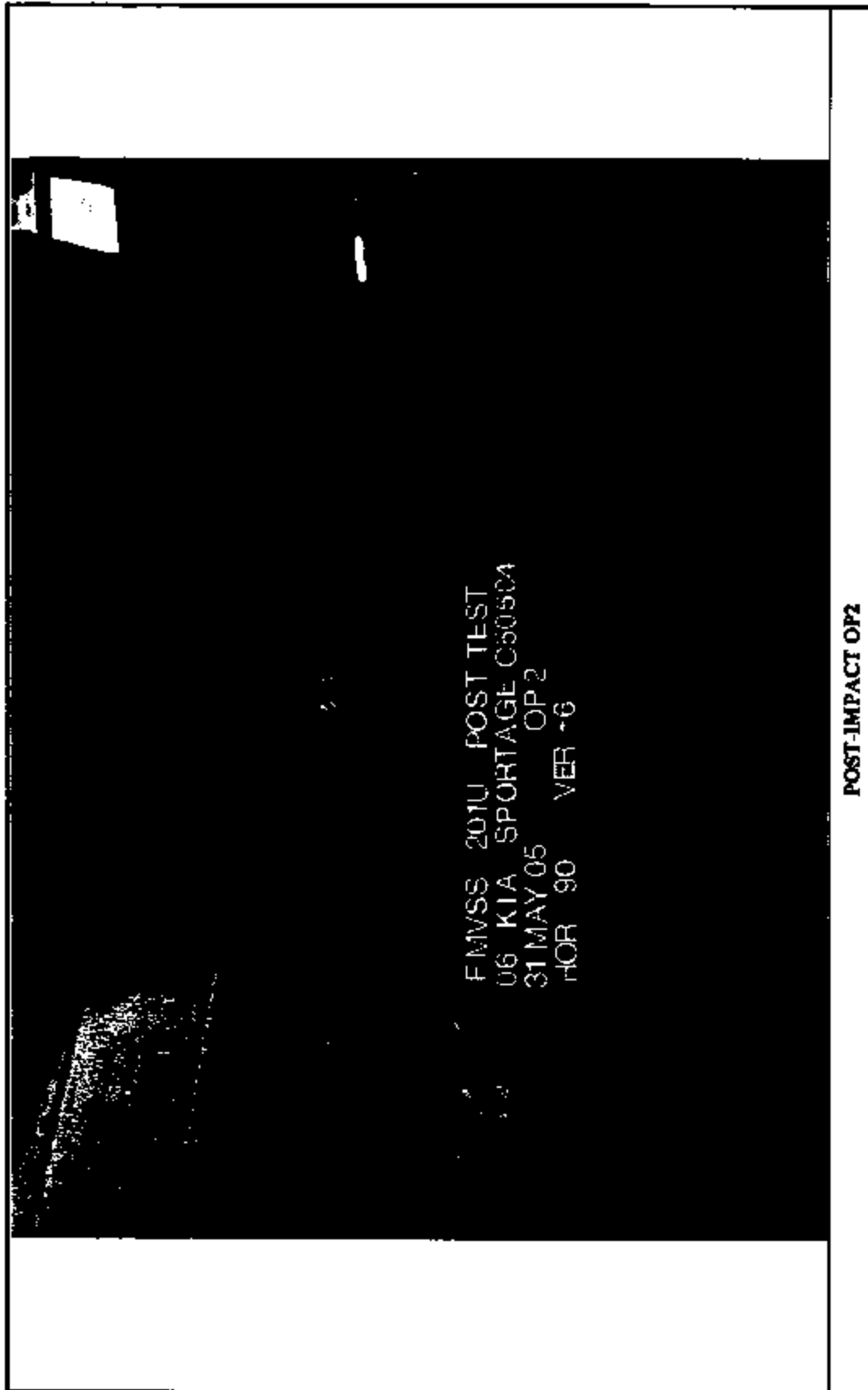


CFC_180

C50504 - May 31, 2005



PRE-IMPACT OP2



POST-IMPACT OP2

8730-08

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SBE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	02
Test Date:	05/31/05
Target Location:	REAR PILLAR
Target Code:	RP1
Horizontal Impact Angle:	39°
Vertical Impact Angle:	38°
Ambient Temperature:	22.3C°
Relative Humidity:	41.5
Time of Impact:	10:15
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	8	☒	mm right	☐ mm left
On Centerline	38		mm up	



POST-IMPACT RP1 HEADFORM

Free Motion HIC	371.3
HIC(d)	446.5
Impact Velocity (kph)	18.52
HIC T1 (msec)	7.0
HIC T2 (msec)	13.2

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - RP1

FMH Headform 0355

Location: RP1

Test Date: May 31, 2005

Work File: RP1

TEST RESULTS

Lab Temperature: 22.3 C

HICd: 446.5

Lab Humidity: 41.5 %

HIC (36ms): 371.3

Velocity at Impact: 18.52 KPH

t1: 7.0 msec

t2: 13.2 msec

Free Flight Distance: 214.00 mm

Duration: 6.1 msec

Maximum: 102.9 g

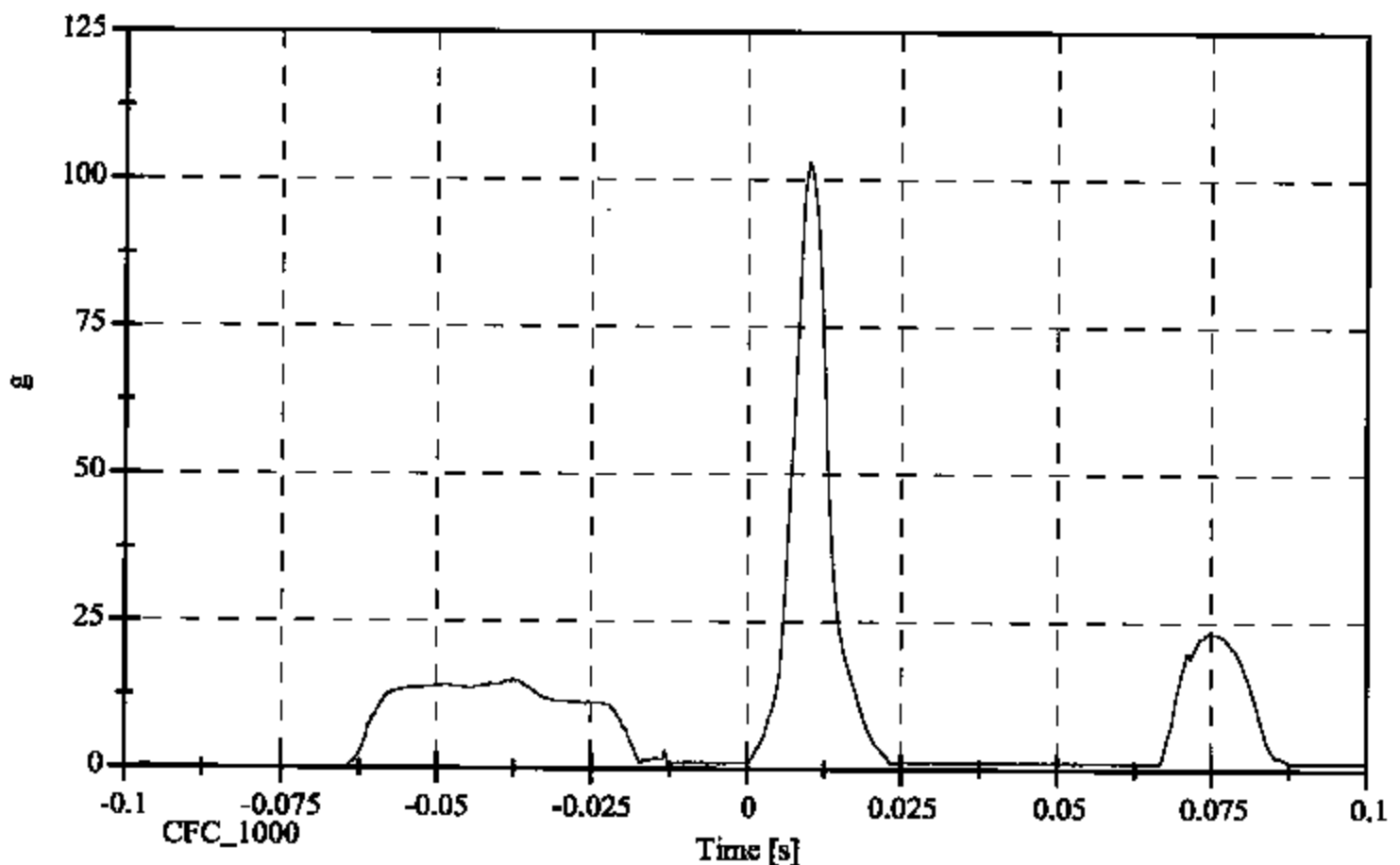
Average Acceleration: 8.4 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 102.9 [g] at 0.010 [s]

Headform Resultant

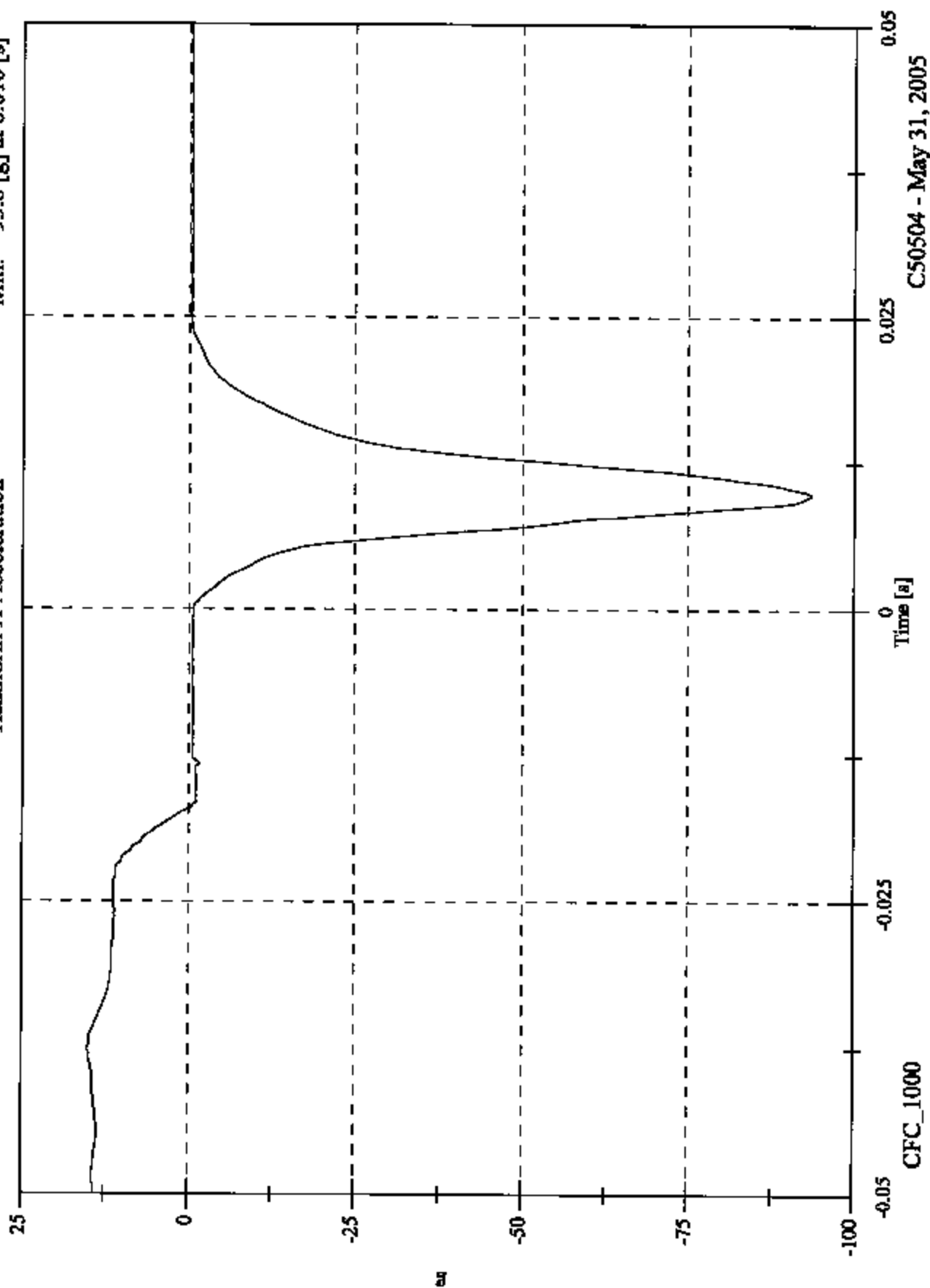
Min: 0.0 [g] at -0.085 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 15.0 [g] at -0.038 [s]
Min: -93.6 [g] at 0.010 [s]

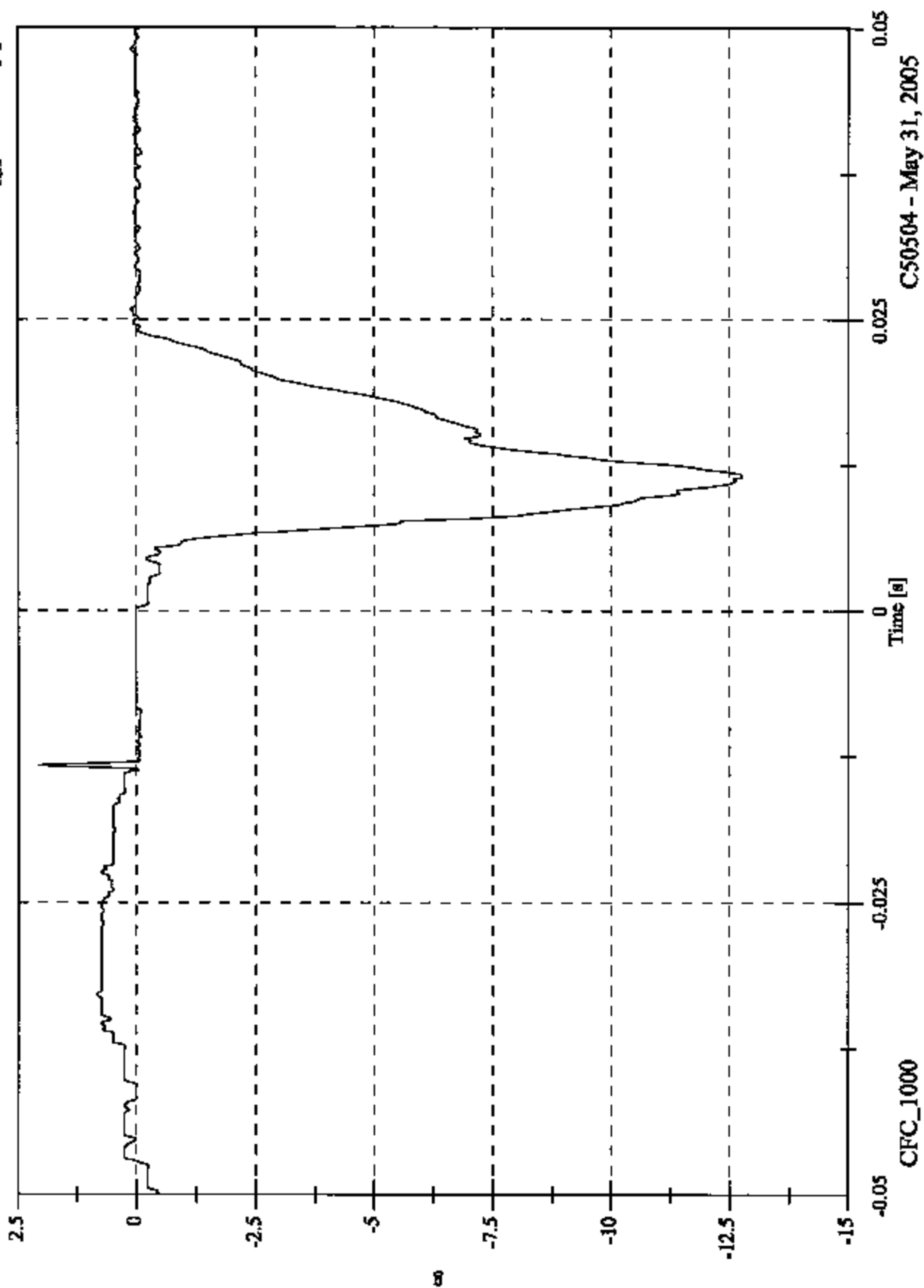


C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 2.1 [g] at -0.013 [s]
Min: -12.8 [g] at 0.012 [s]

Headform Y Acceleration



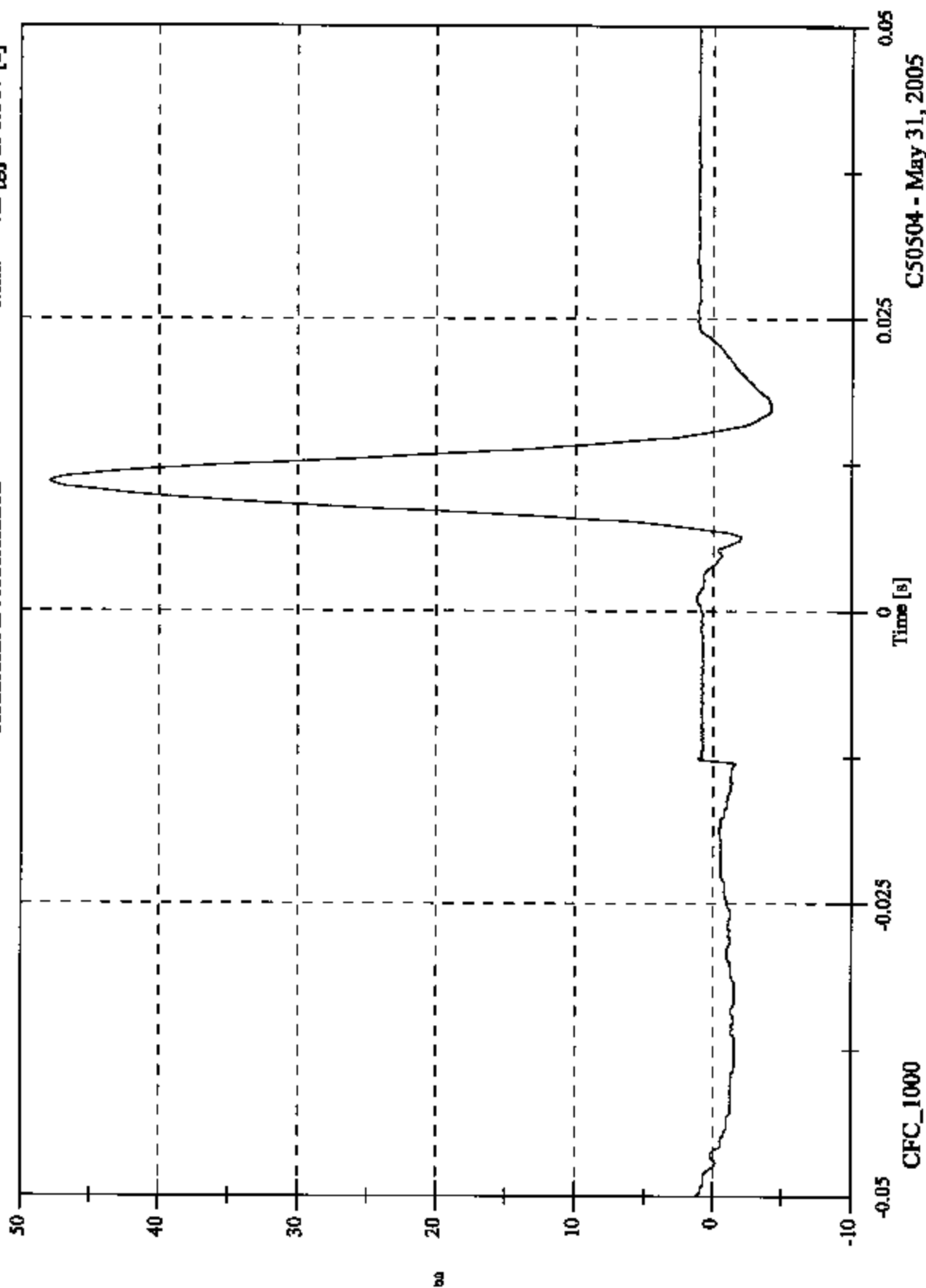
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 47.9 [g] at 0.011 [s]

Min: -4.2 [g] at 0.017 [s]



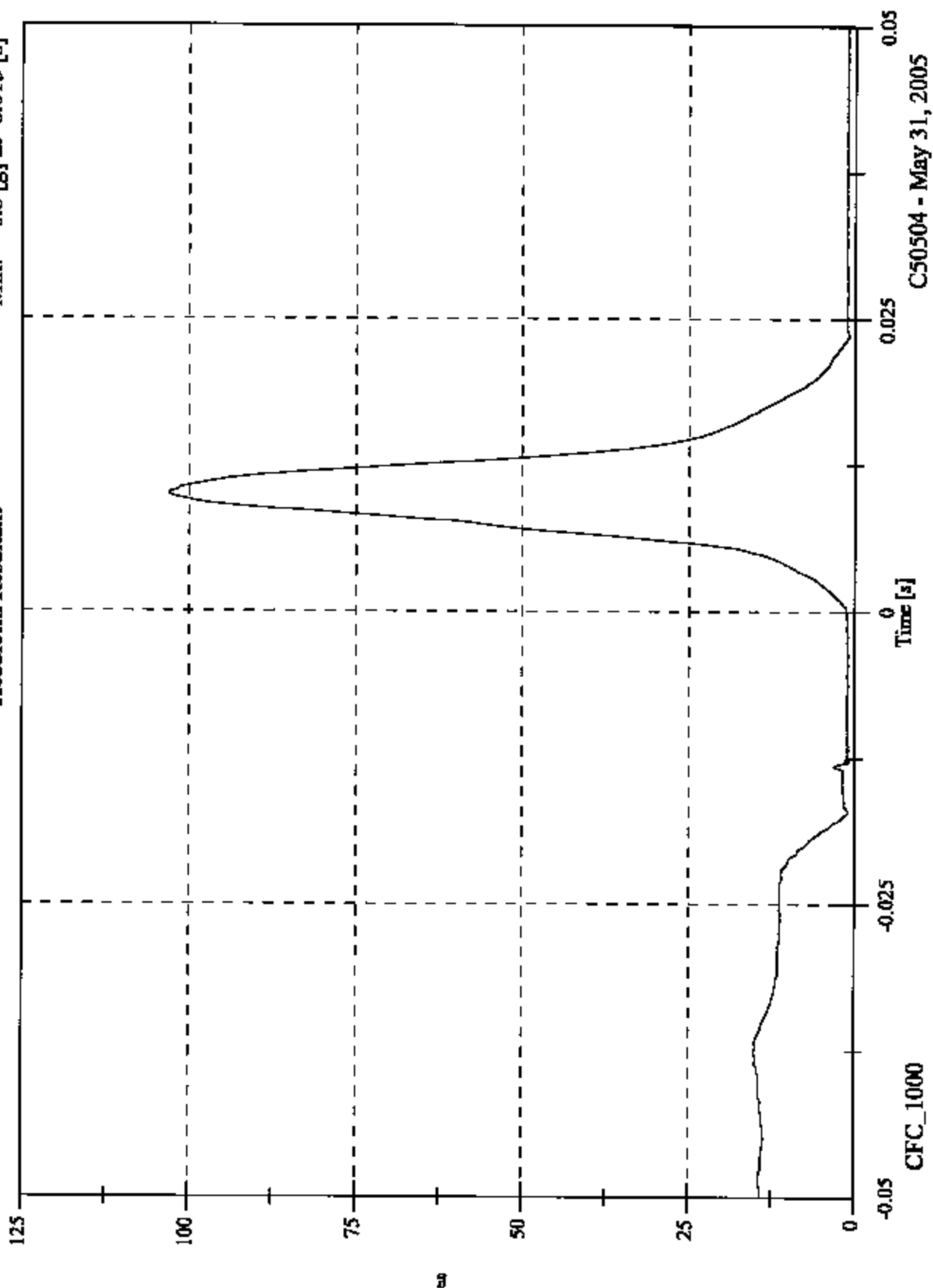
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 102.9 [g] at 0.010 [s]

Min: 0.8 [g] at -0.013 [s]

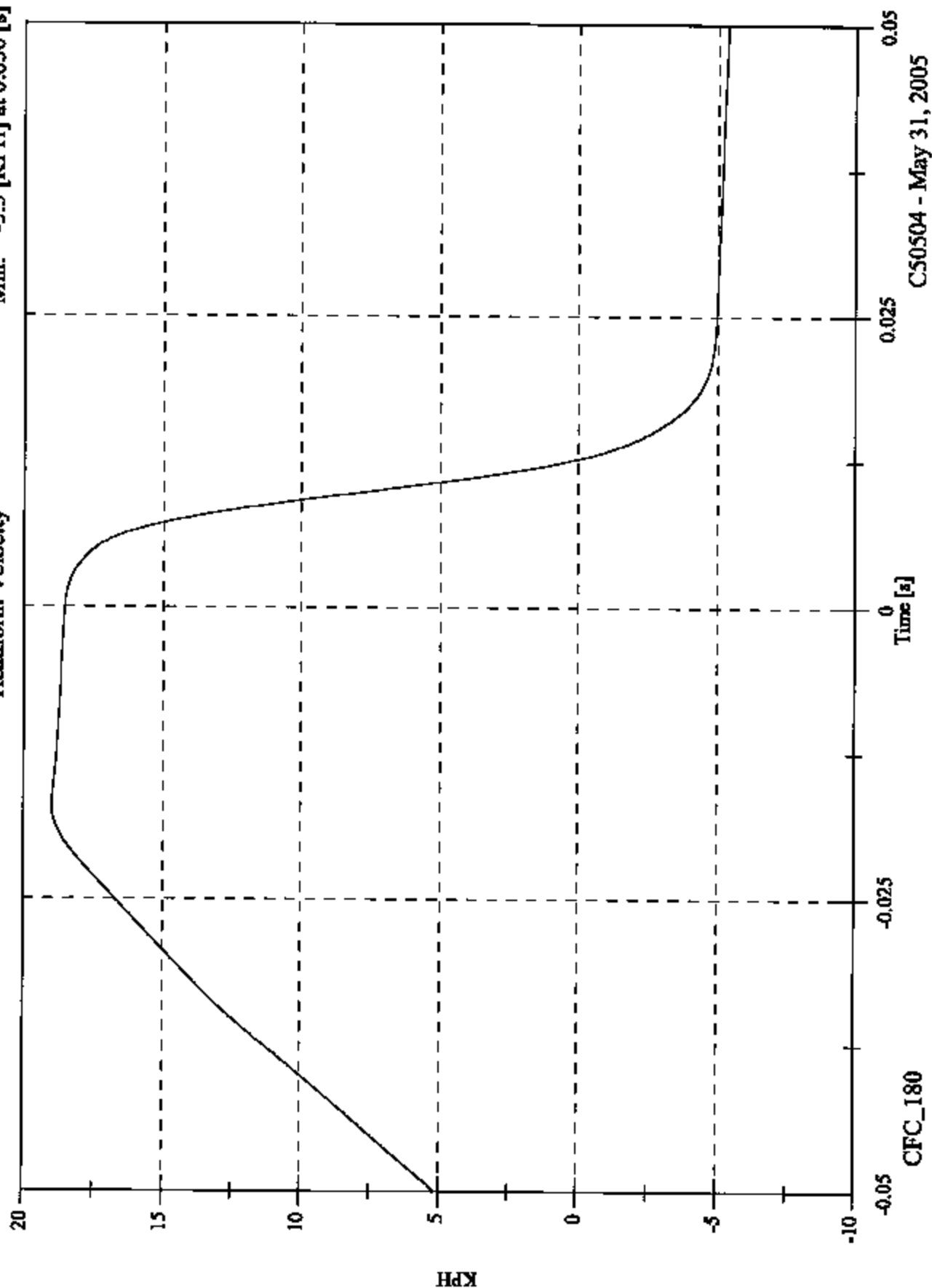


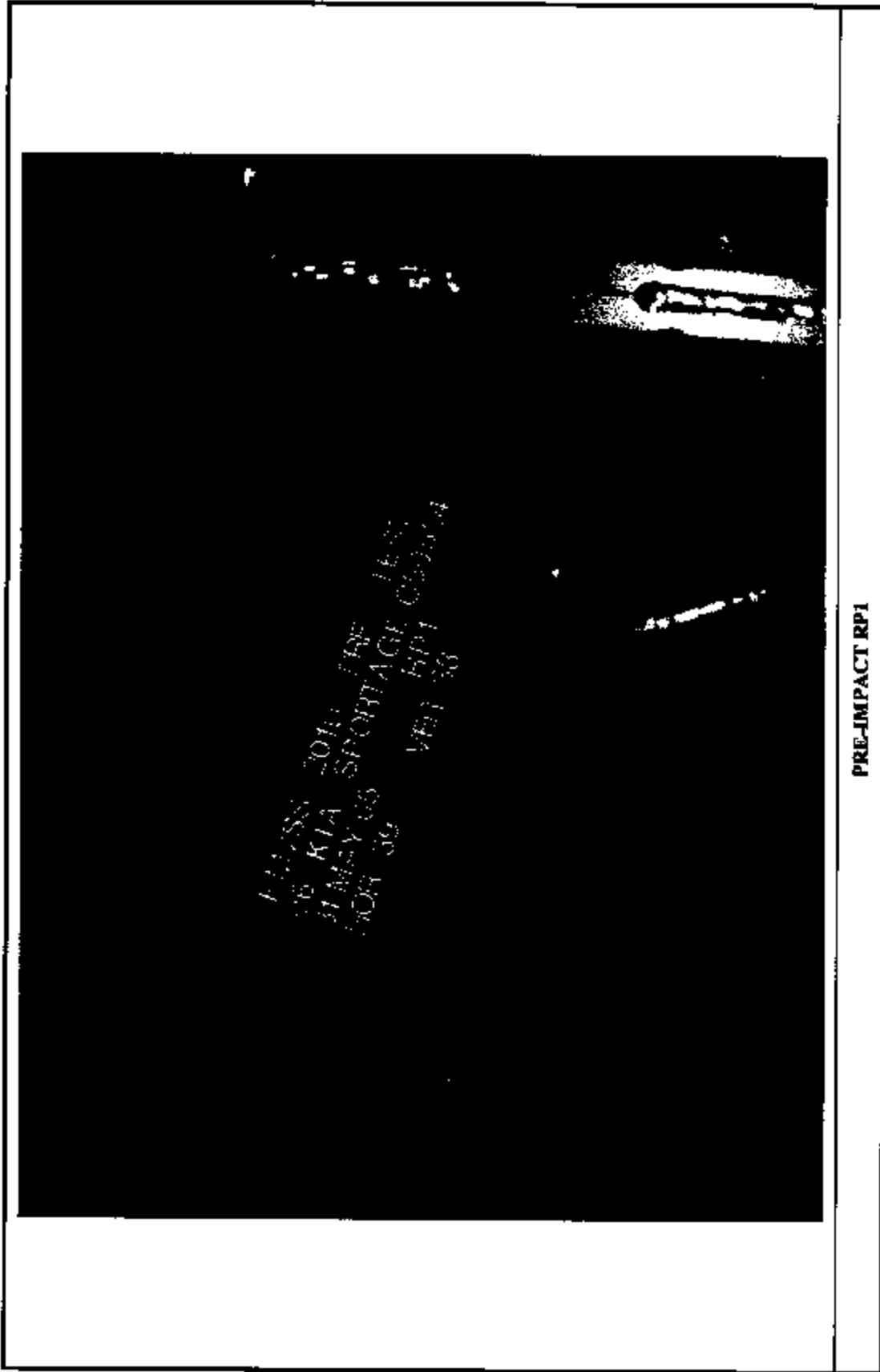
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

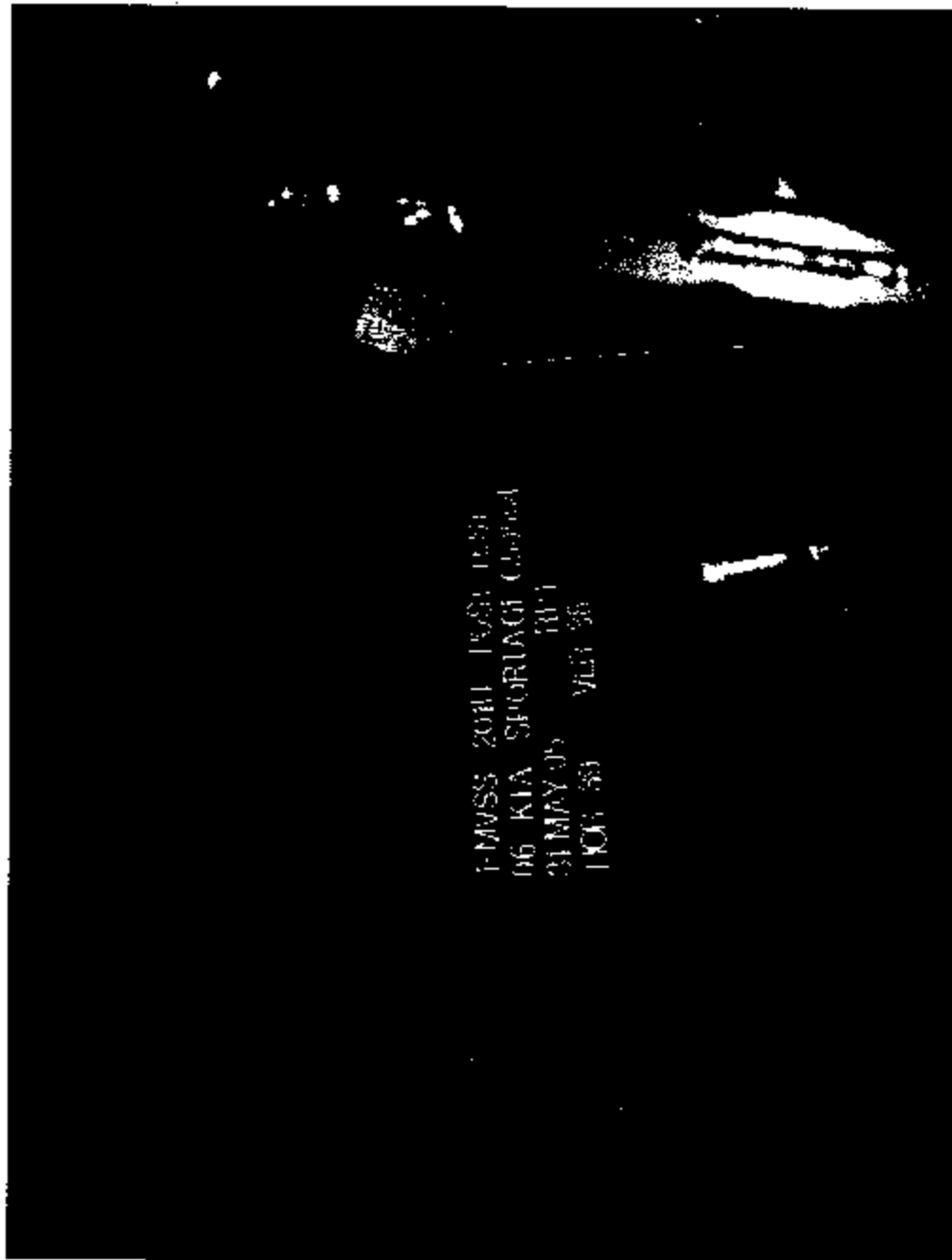
Headform Velocity

Max: 19.0 [KPH] at -0.017 [s]
Min: -5.3 [KPH] at 0.050 [s]





PRE-IMPACT RP1



1-MISS 2041 PCSI 1251
06 KIA SPORLAGI Capped
31 MAY 05 1811
1001 50 943 56

POST-IMPACT RFI

8730-08

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	03
Test Date:	05/31/05
Target Location:	REAR HEADER
Target Code:	RH
Horizontal Impact Angle:	0°
Vertical Impact Angle:	50°
Ambient Temperature:	22.2C°
Relative Humidity:	41.5
Time of Impact:	10:35
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	mm right	mm left
On Centerline	39	mm up	



POST-IMPACT RH HEADFORM

Free Motion HIC	366.0
HIC(d)	442.5
Impact Velocity (kph)	23.78
HIC T1 (msec)	3.9
HIC T2 (msec)	9.6

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - RH

FMH Headform 0642

Location: RH

Test Date: May 31, 2005

Work File: RH

TEST RESULTS

Lab Temperature: 22.2 C

HICd: 442.5

Lab Humidity: 41.5 %

HIC (36ms): 366.0

Velocity at Impact: 23.78 KPH

t1: 3.9 msec

t2: 9.6 msec

Free Flight Distance: 213.59 mm

Duration: 5.7 msec

Maximum: 114.4 g

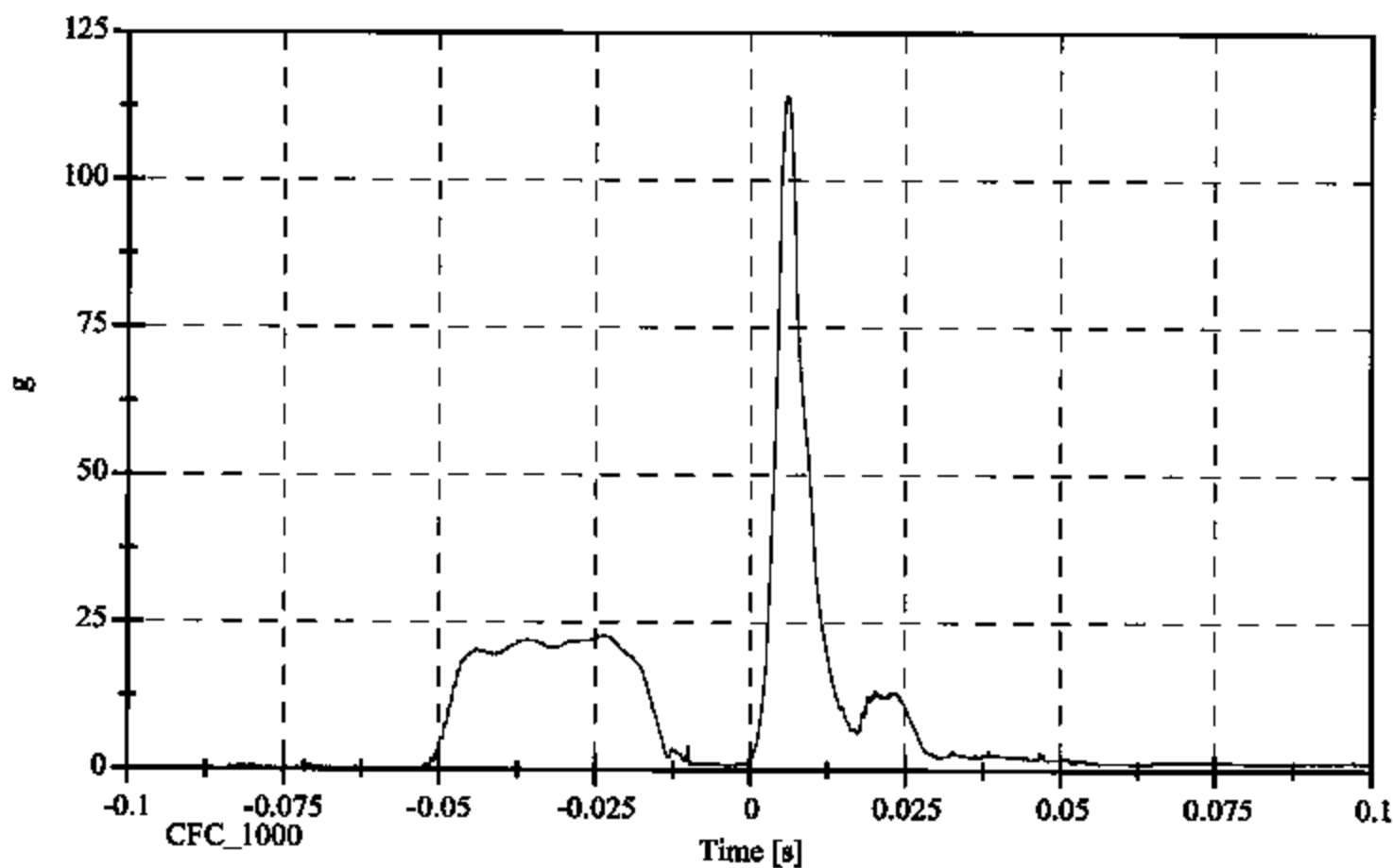
Average Acceleration: 8.2 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 114.4 [g] at 0.006 [s]

Headform Resultant

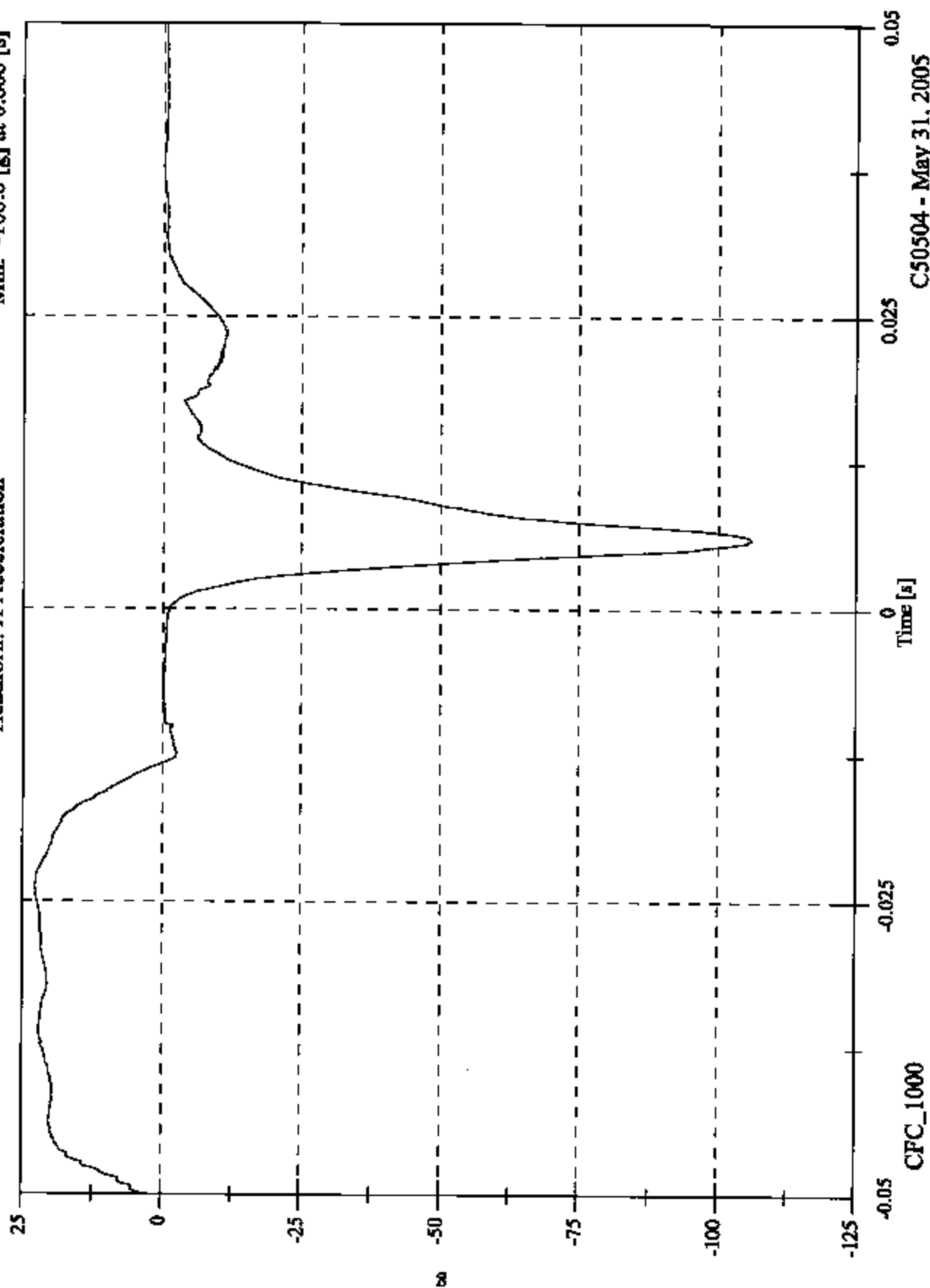
Min: 0.0 [g] at -0.085 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 22.9 [g] at -0.024 [s]
Min: -106.0 [g] at 0.006 [s]



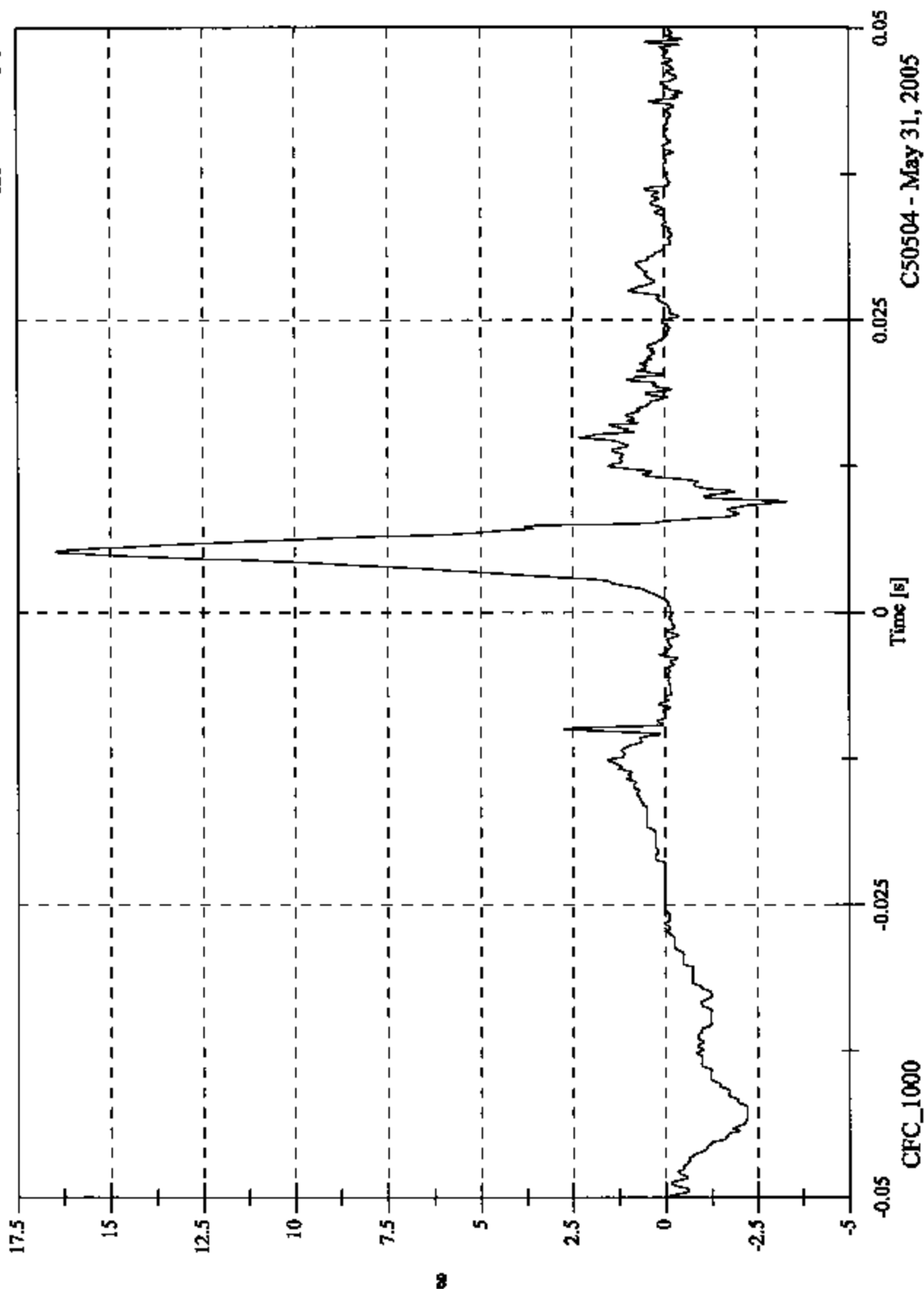
CFC_1000

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 16.5 [g] at 0.005 [s]

Min: -3.3 [g] at 0.009 [s]

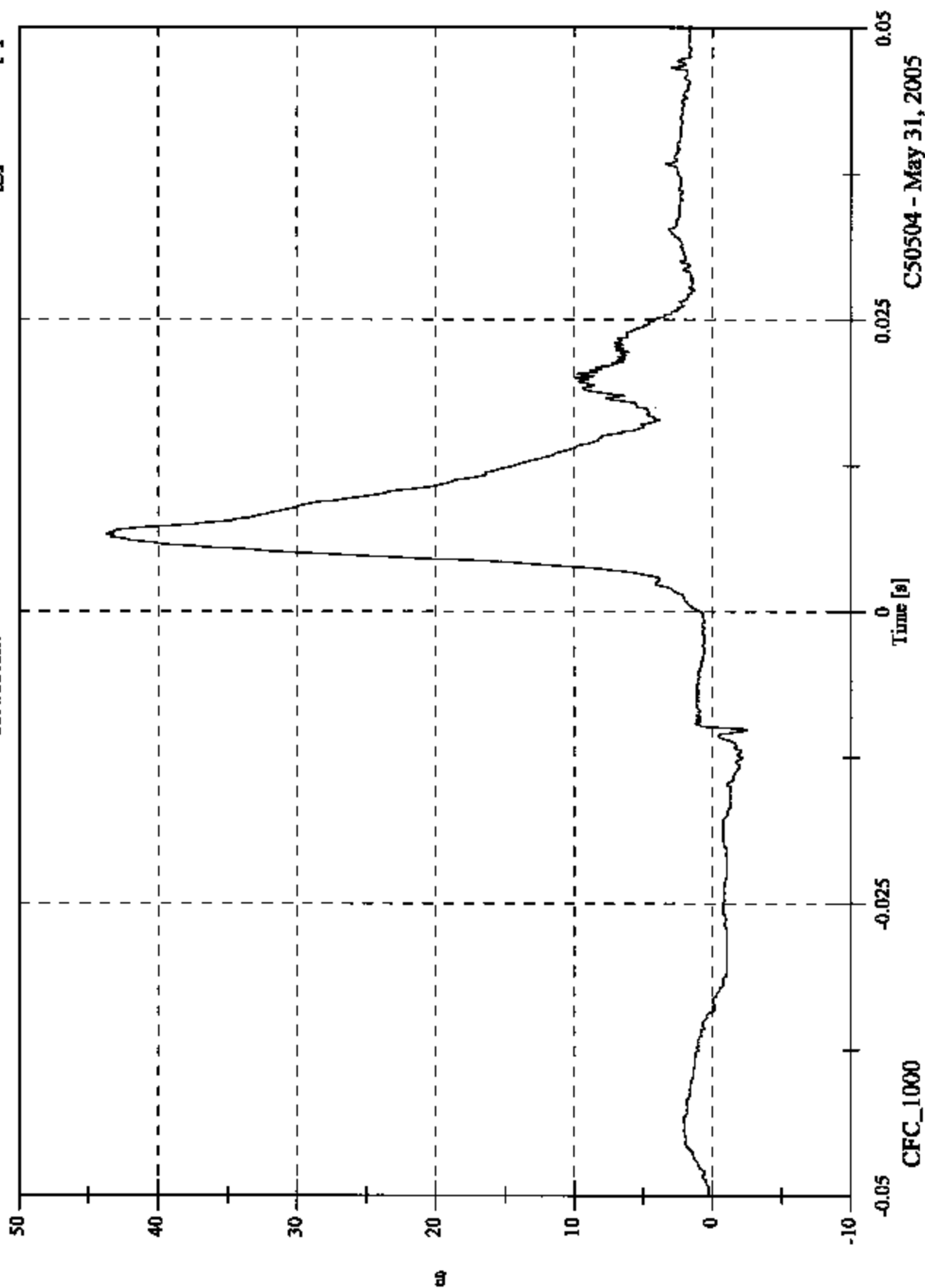


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 43.7 [g] at 0.007 [s]

Min: -2.5 [g] at -0.010 [s]

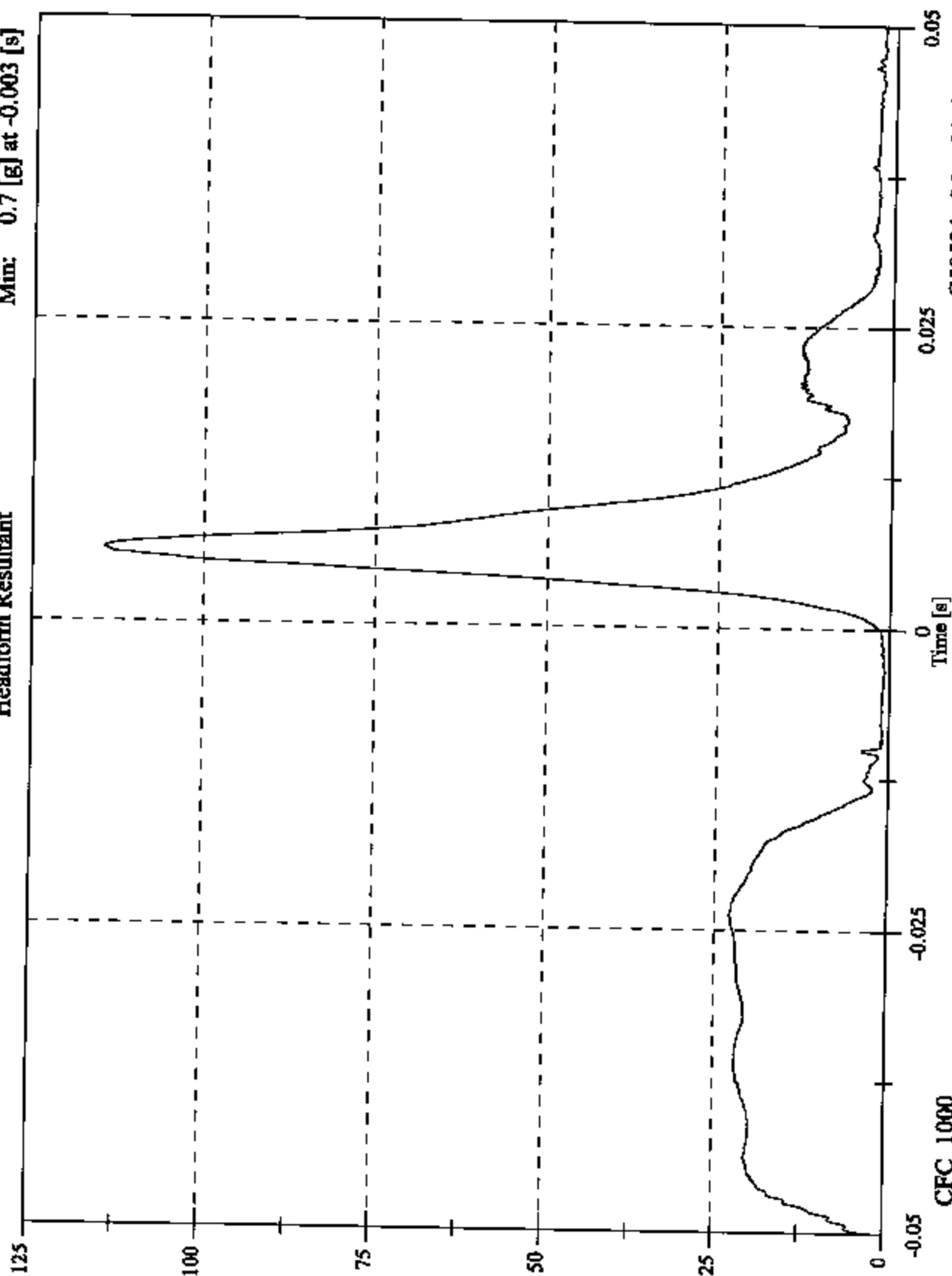


C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 114.4 [g] at 0.006 [s]
Min: 0.7 [g] at -0.003 [s]



C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

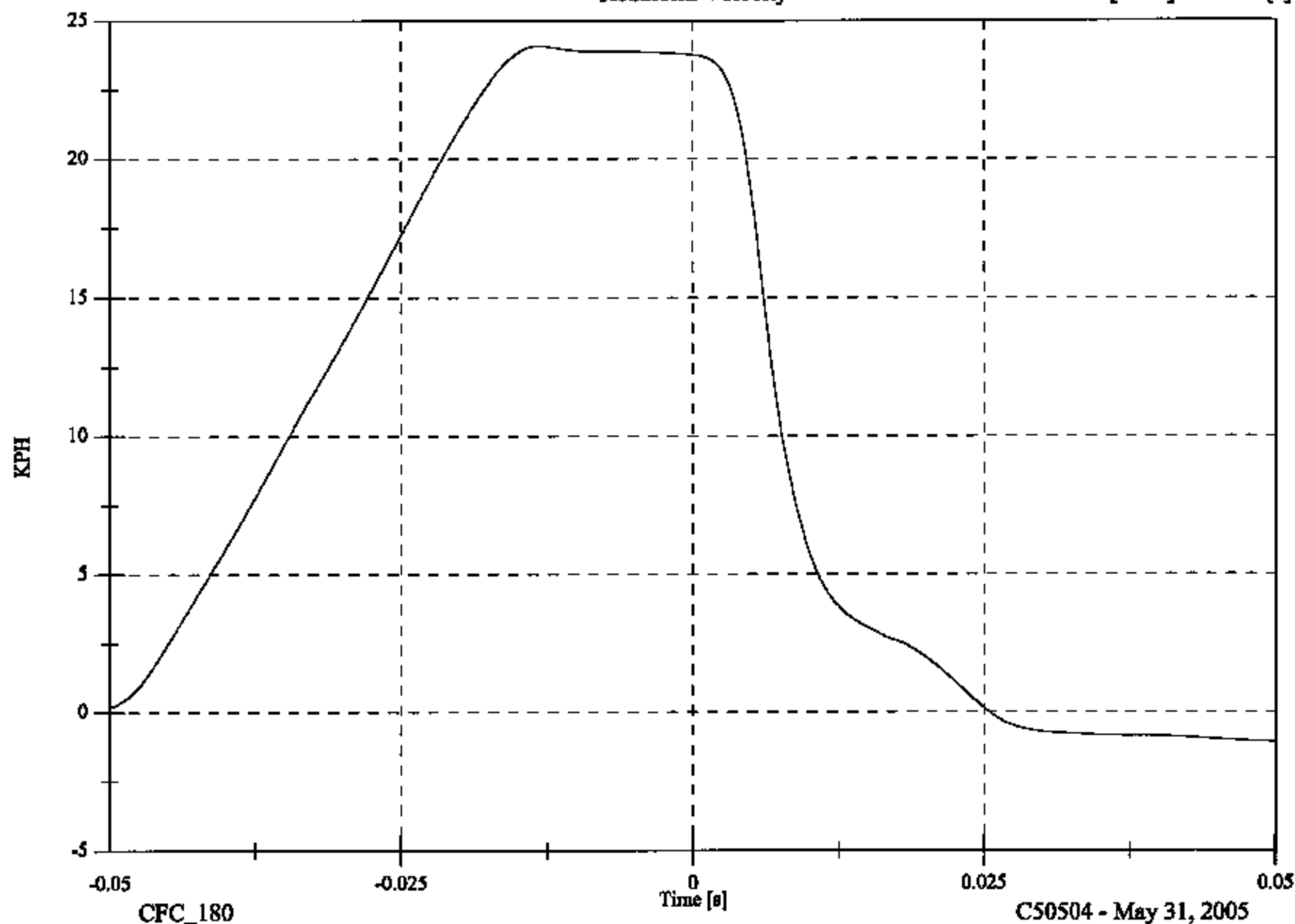
Headform Velocity

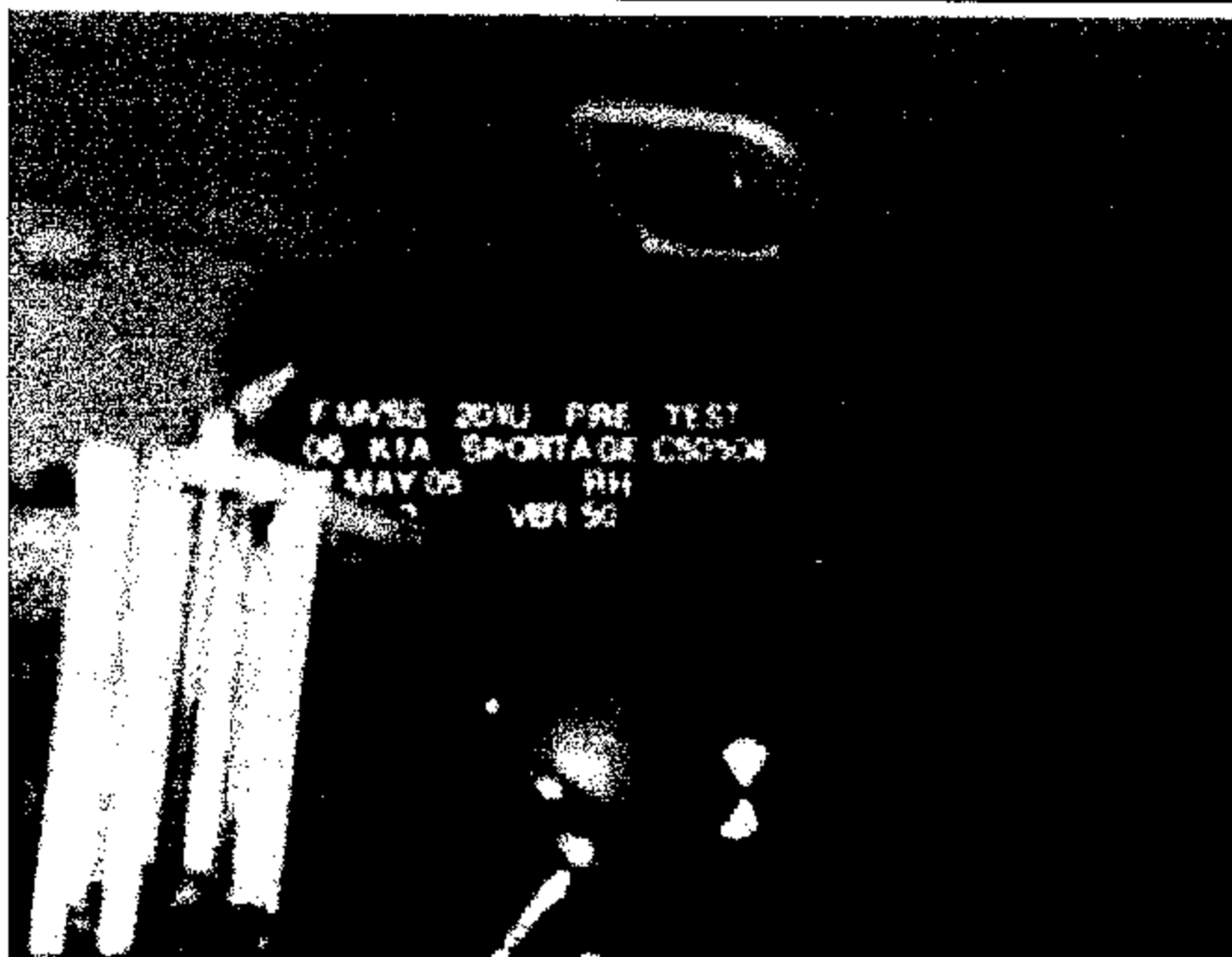
Max: 24.1 [KPH] at -0.013 [s]

Min: -1.1 [KPH] at 0.050 [s]

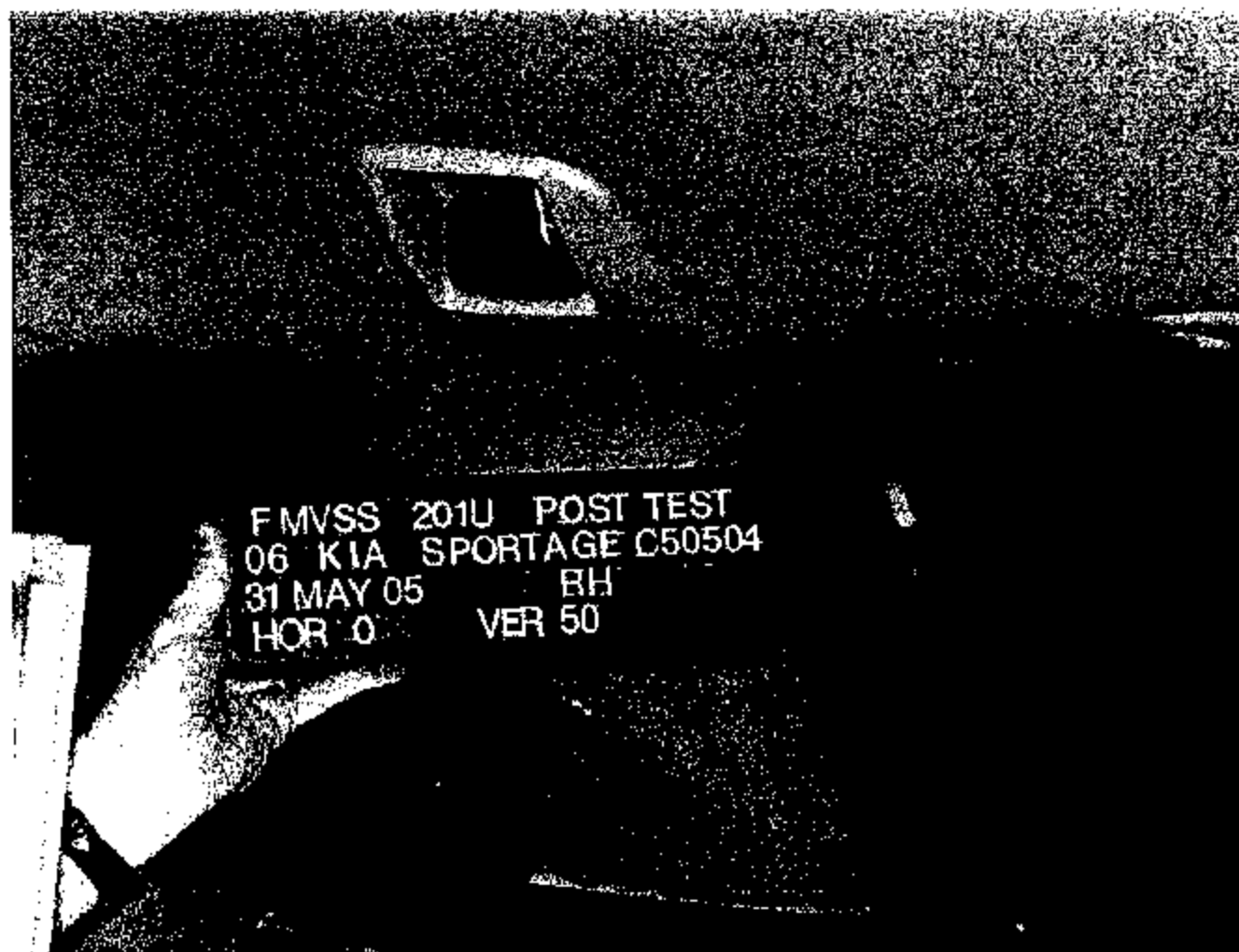
C50504 PASSENGER SIDE RH IMPACT PLOT #5

8754-FMH-07





PRE-IMPACT RH



POST-IMPACT RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	04
Test Date:	05/31/05
Target Location:	UPPER ROOF
Target Code:	URRP
Horizontal Impact Angle:	43°
Vertical Impact Angle:	39°
Ambient Temperature:	22.7C°
Relative Humidity:	40.9
Time of Impact:	10:56
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	5	x	mm right	mm left
On Centerline	7		mm up	



POST-IMPACT URRP HEADFORM

Free Motion HIC	401
HIC(d)	468.9
Impact Velocity (kph)	23.62
HIC T1 (msec)	4.2
HIC T2 (msec)	14.3

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - URRP

FMH Headform 805

Location: URRP

Test Date: May 31, 2005

Work File: URRP

TEST RESULTS

Lab Temperature: 22.7 C

HICd: 468.9

Lab Humidity: 40.9 %

HIC (36ms): 401.0

Velocity at Impact: 23.62 KPH

t1: 4.2 msec

t2: 14.3 msec

Free Flight Distance: 218.88 mm

Duration: 10.1 msec

Maximum: 101.0 g

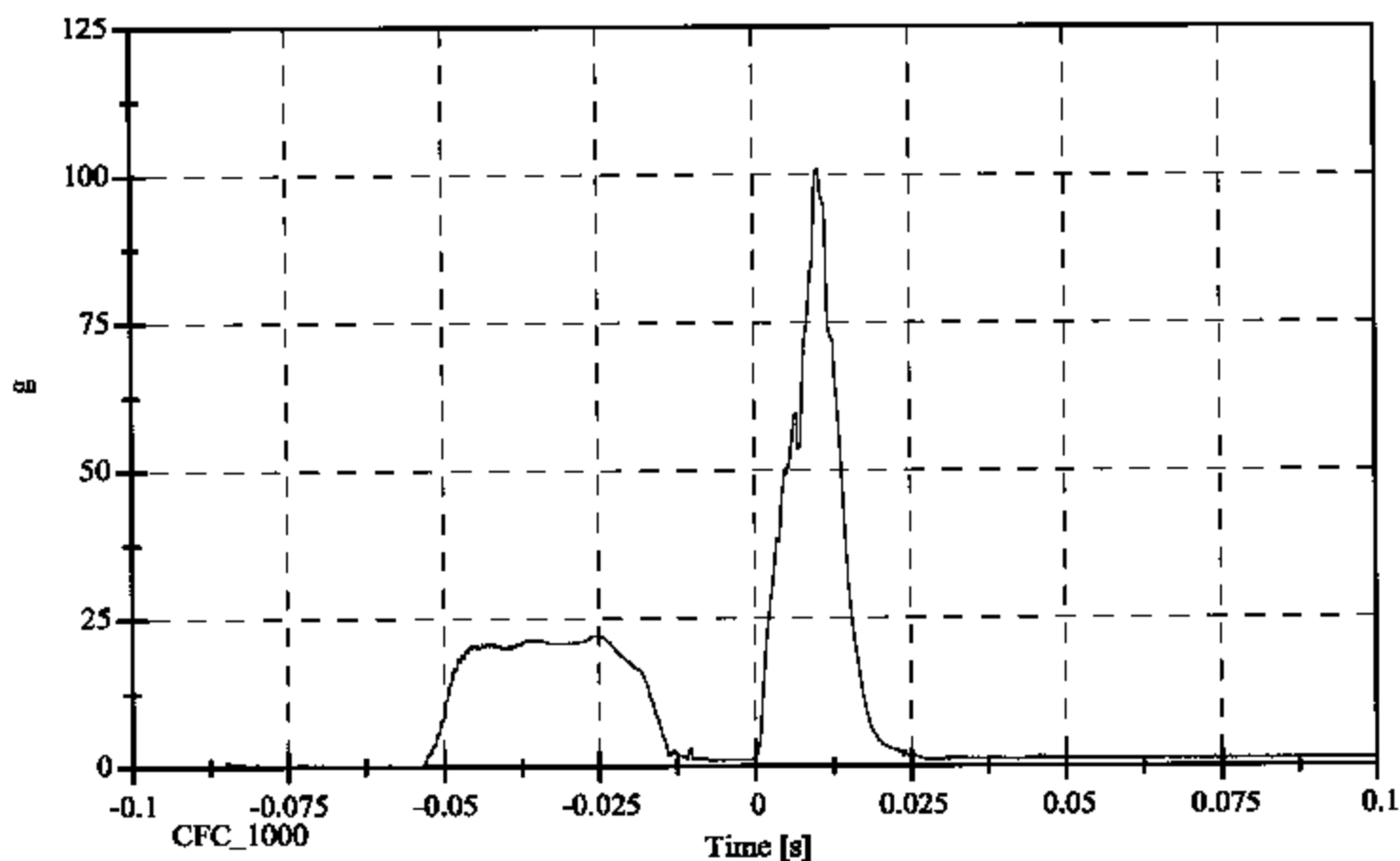
Average Acceleration: 8.5 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 101.0 [g] at 0.010 [s]

Headform Resultant

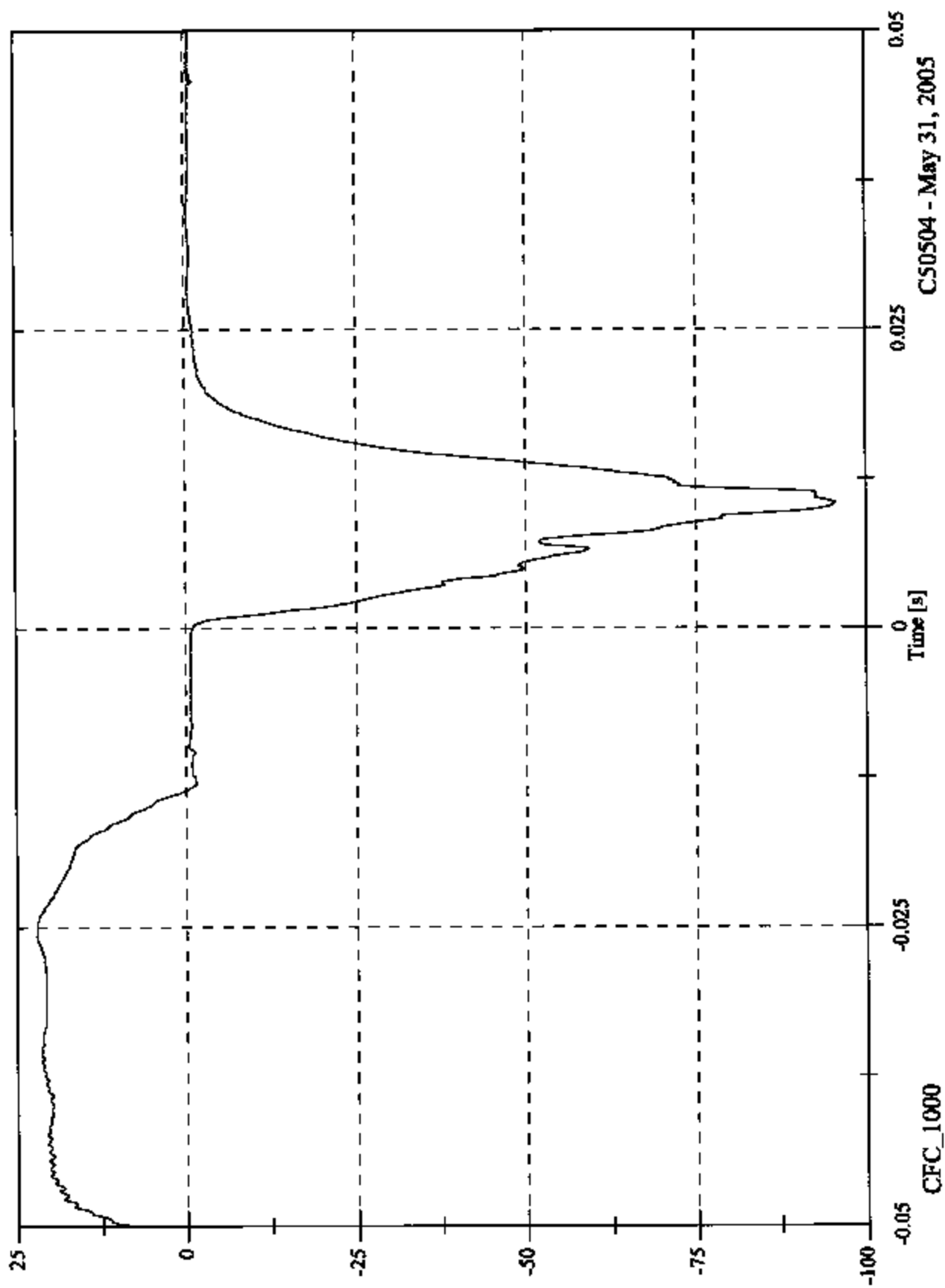
Min: 0.0 [g] at -0.098 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 22.1 [g] at -0.026 [s]
Min: -95.6 [g] at 0.010 [s]

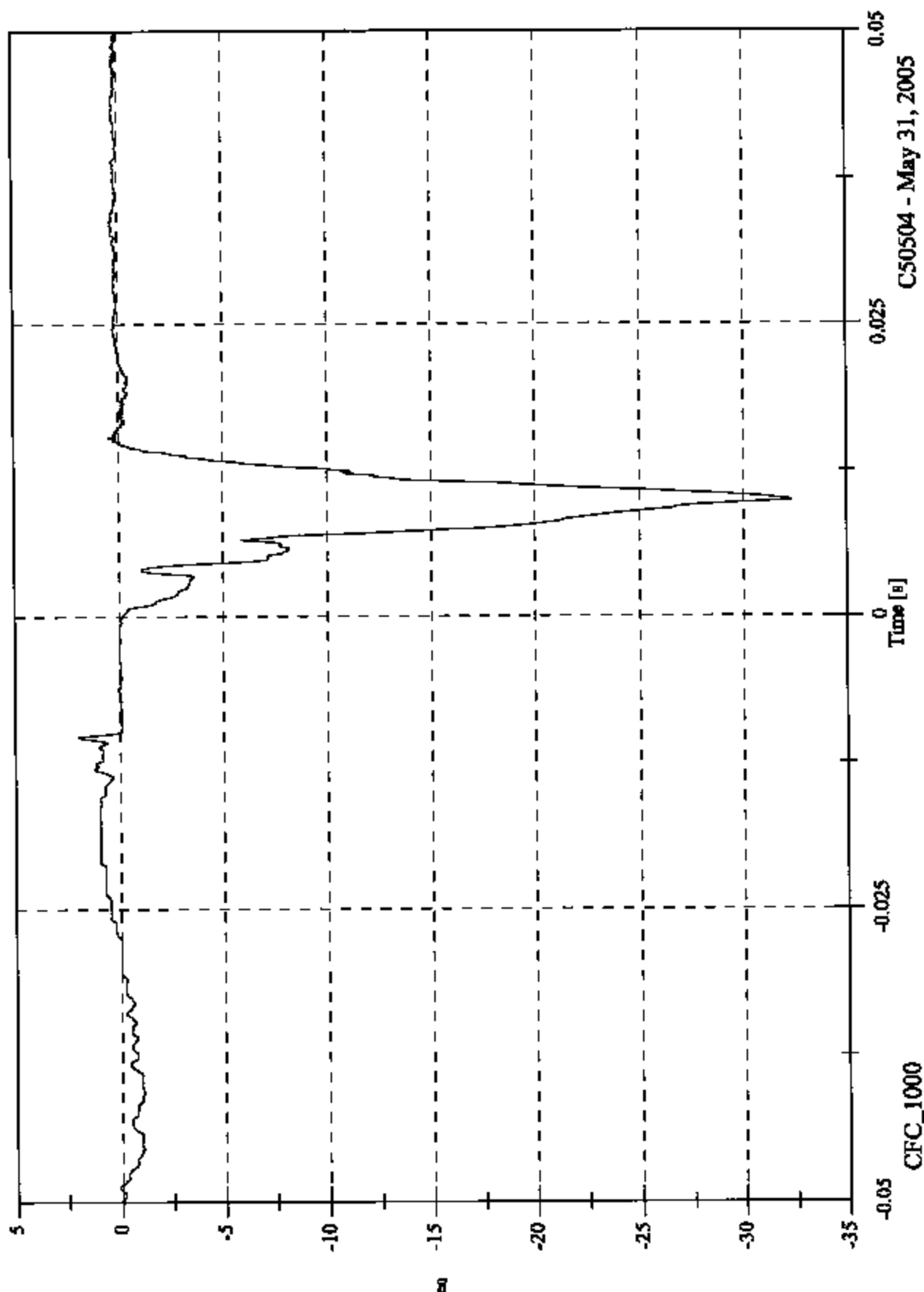


C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 2.0 [g] at -0.010 [s]
Min: -32.3 [g] at 0.010 [s]

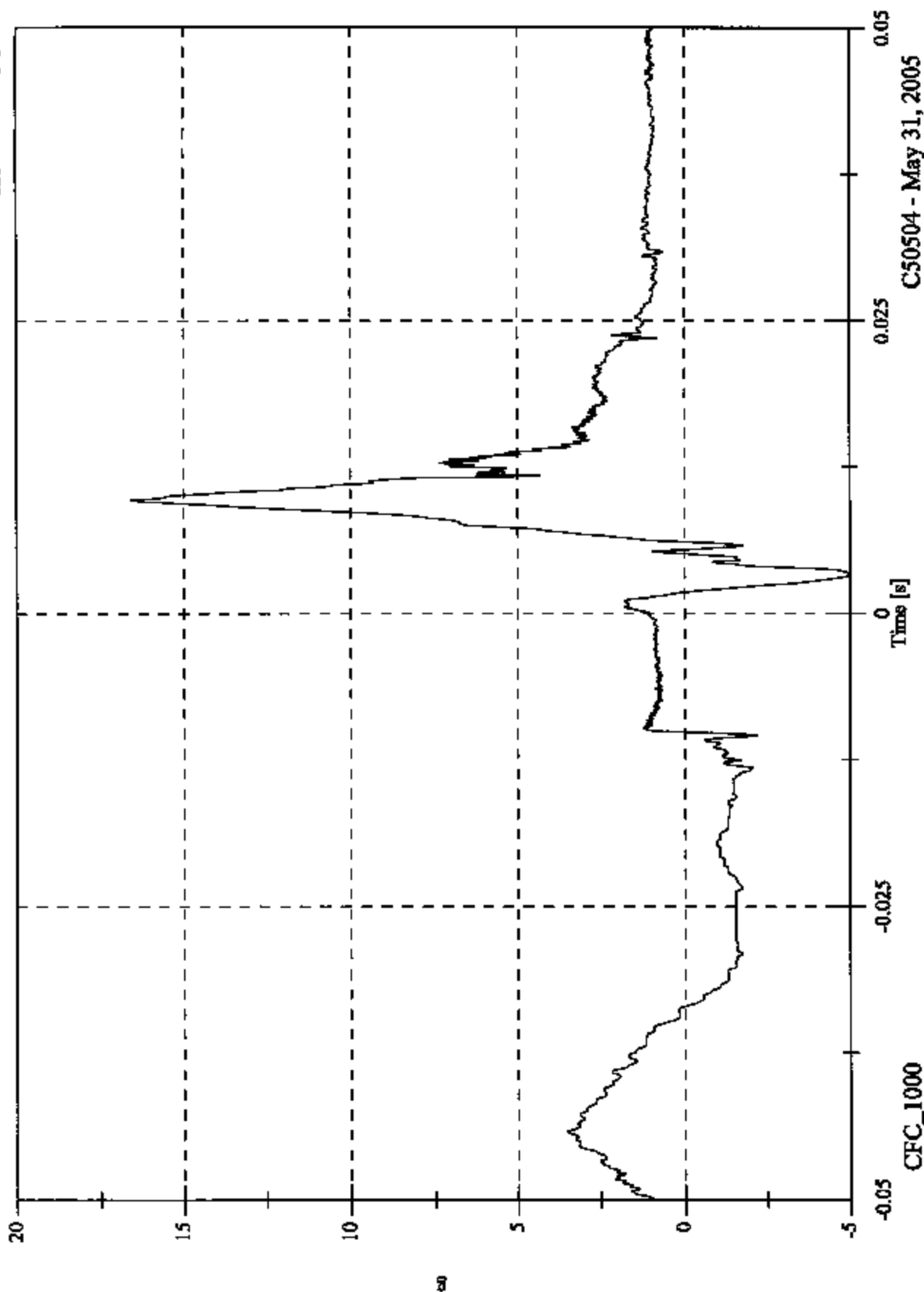


C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 16.6 [g] at 0.010 [s]
Min: -5.0 [g] at 0.003 [s]



C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

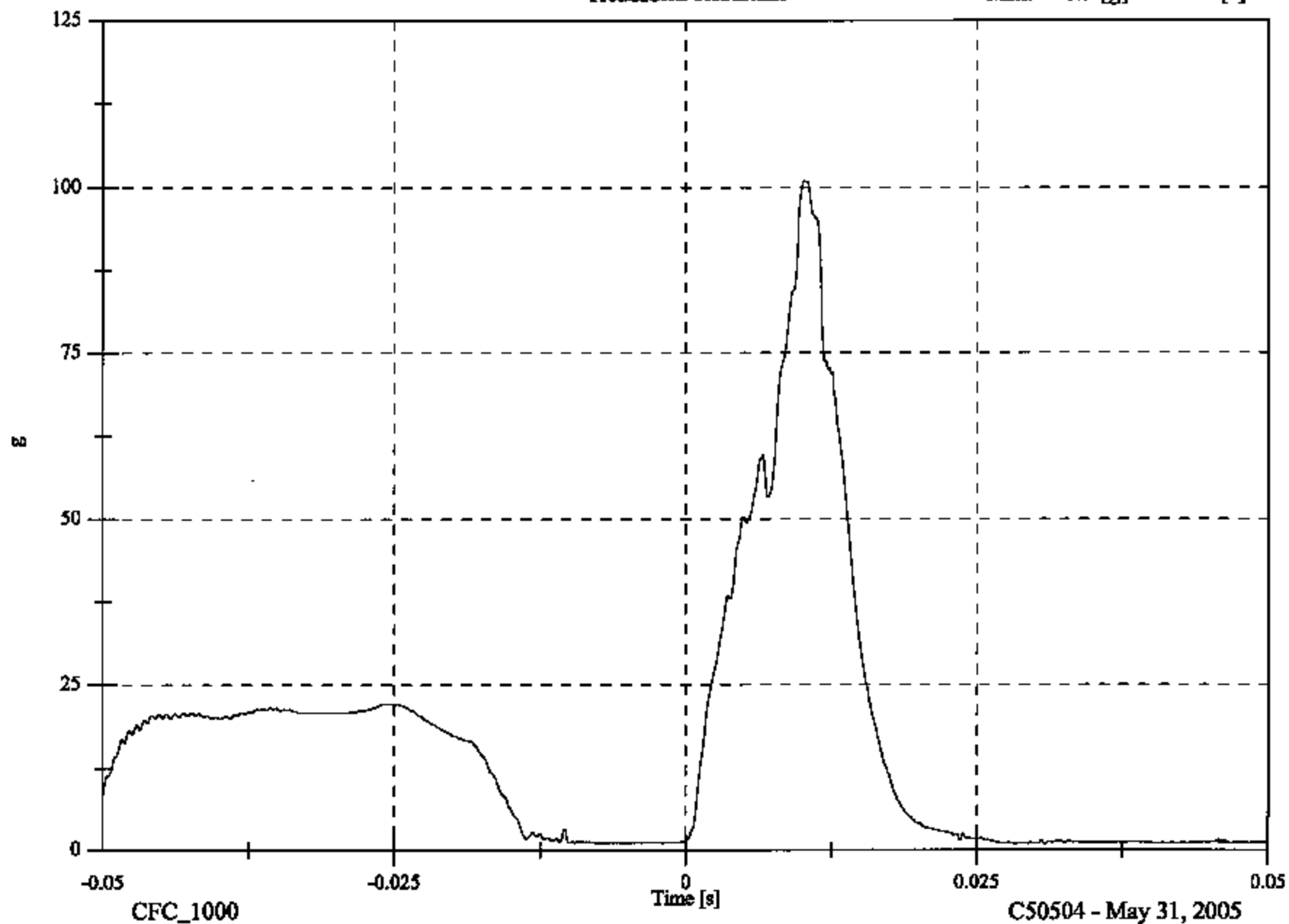
Headform Resultant

Max: 101.0 [g] at 0.010 [s]

Min: 0.9 [g] at 0.028 [s]

C50504 PASSENGER SIDE URHP IMPACT PLOT #4

8754.FMH-07

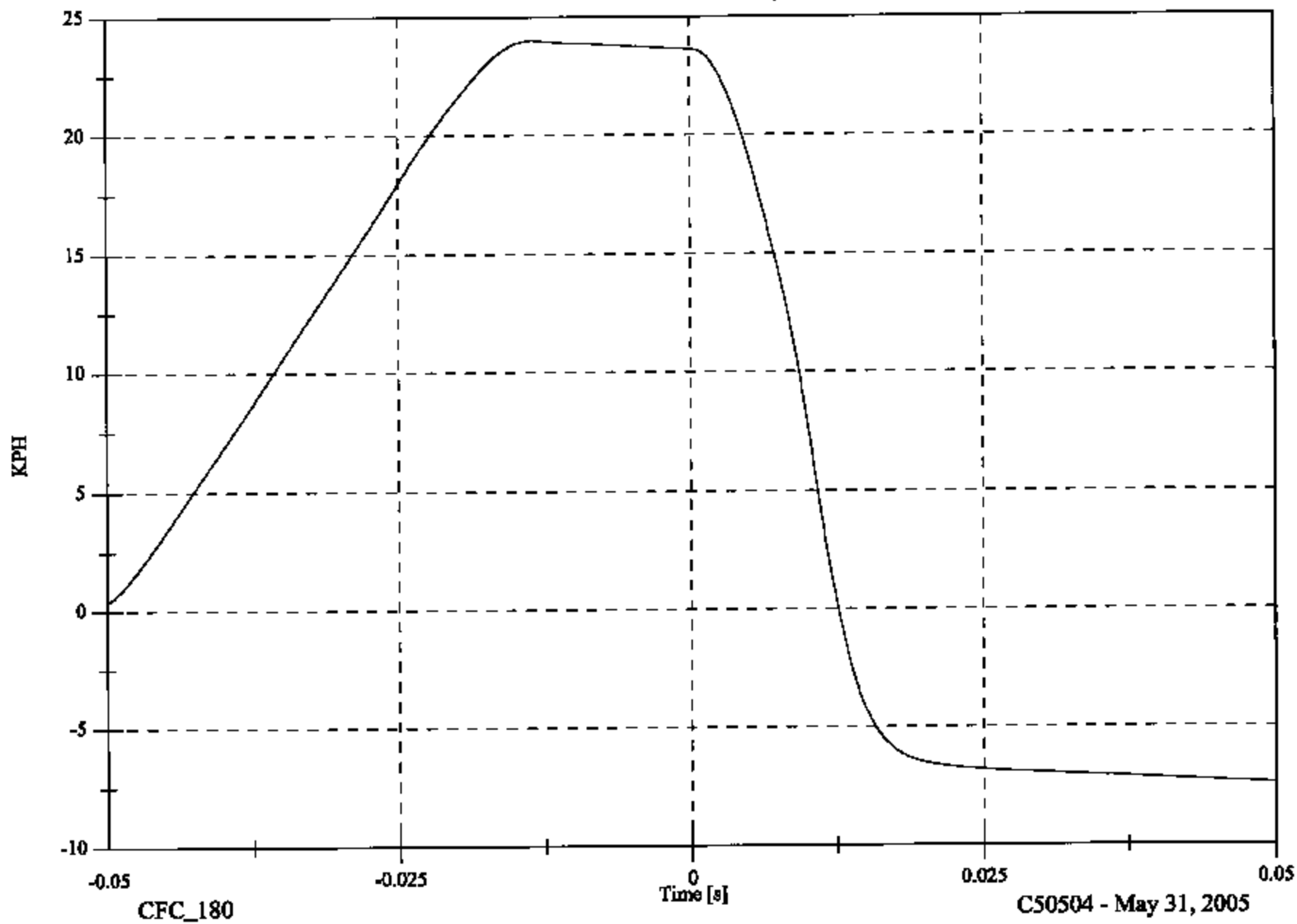


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Velocity

Max: 24.0 [KPH] at -0.013 [s]

Min: -7.4 [KPH] at 0.050 [s]



C50504 PASSENGER SIDE URRP IMPACT PLOT #5

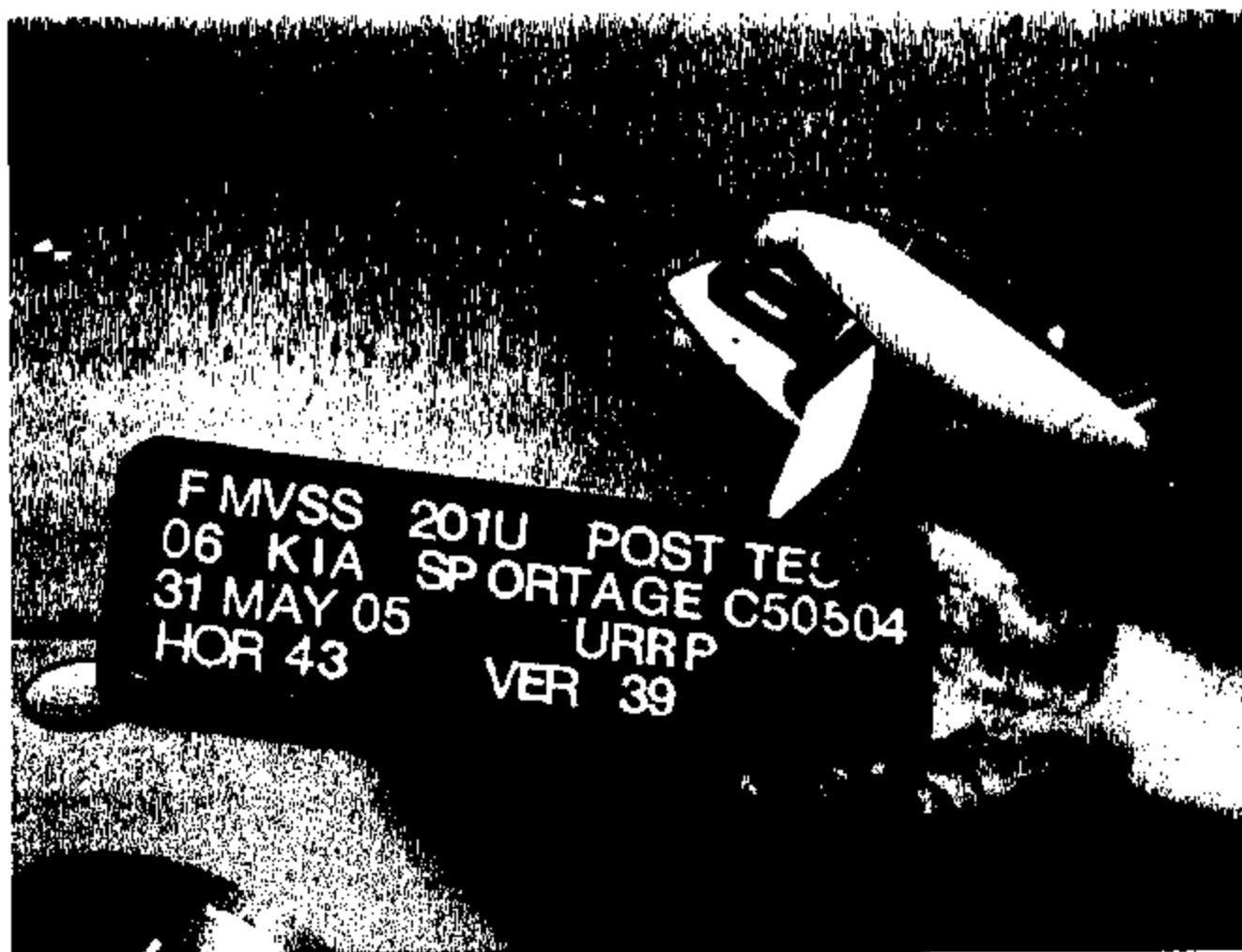
8754-FMH-07

CFC_180

C50504 - May 31, 2005



PRE-IMPACT URRP

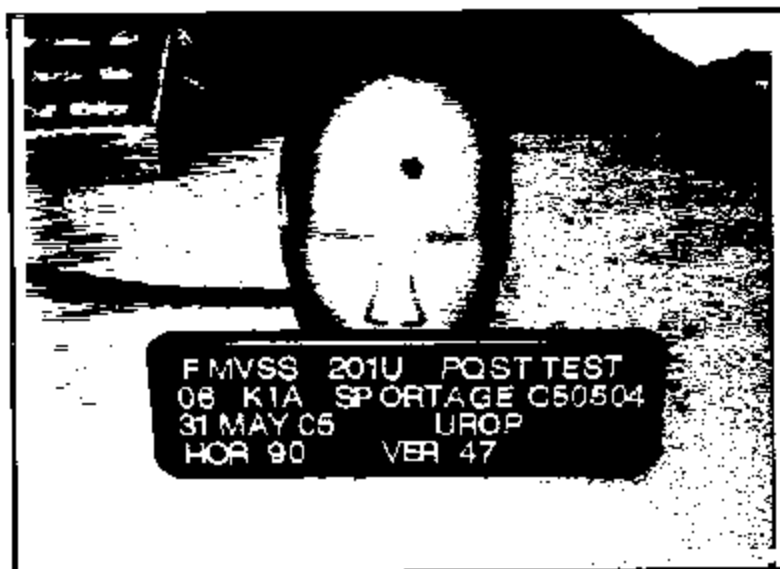


POST-IMPACT URRP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	05
Test Date:	05/31/05
Target Location:	UPPER ROOF
Target Code:	UROP
Horizontal Impact Angle:	90°
Vertical Impact Angle:	47°
Ambient Temperature:	22.2C°
Relative Humidity:	41.1
Time of Impact:	12:55
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	2	☒ mm right	☐ mm left
On Centerline	20	mm up	



POST-IMPACT UROP HEADFORM

Free Motion HIC	403.9
HIC(d)	471.1
Impact Velocity (kph)	23.70
HIC T1 (msec)	3.5
HIC T2 (msec)	15.8

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - UROP

FMH Headform 1255

Location: UROP

Test Date: May 31, 2005

Work File: UROP

TEST RESULTS

Lab Temperature: 22.2 C

HICd: 471.1

Lab Humidity: 41.1 %

HIC (36ms): 403.9

Velocity at Impact: 23.70 KPH

t1: 3.5 msec

t2: 15.8 msec

Free Flight Distance: 216.70 mm

Duration: 12.3 msec

Maximum: 79.6 g

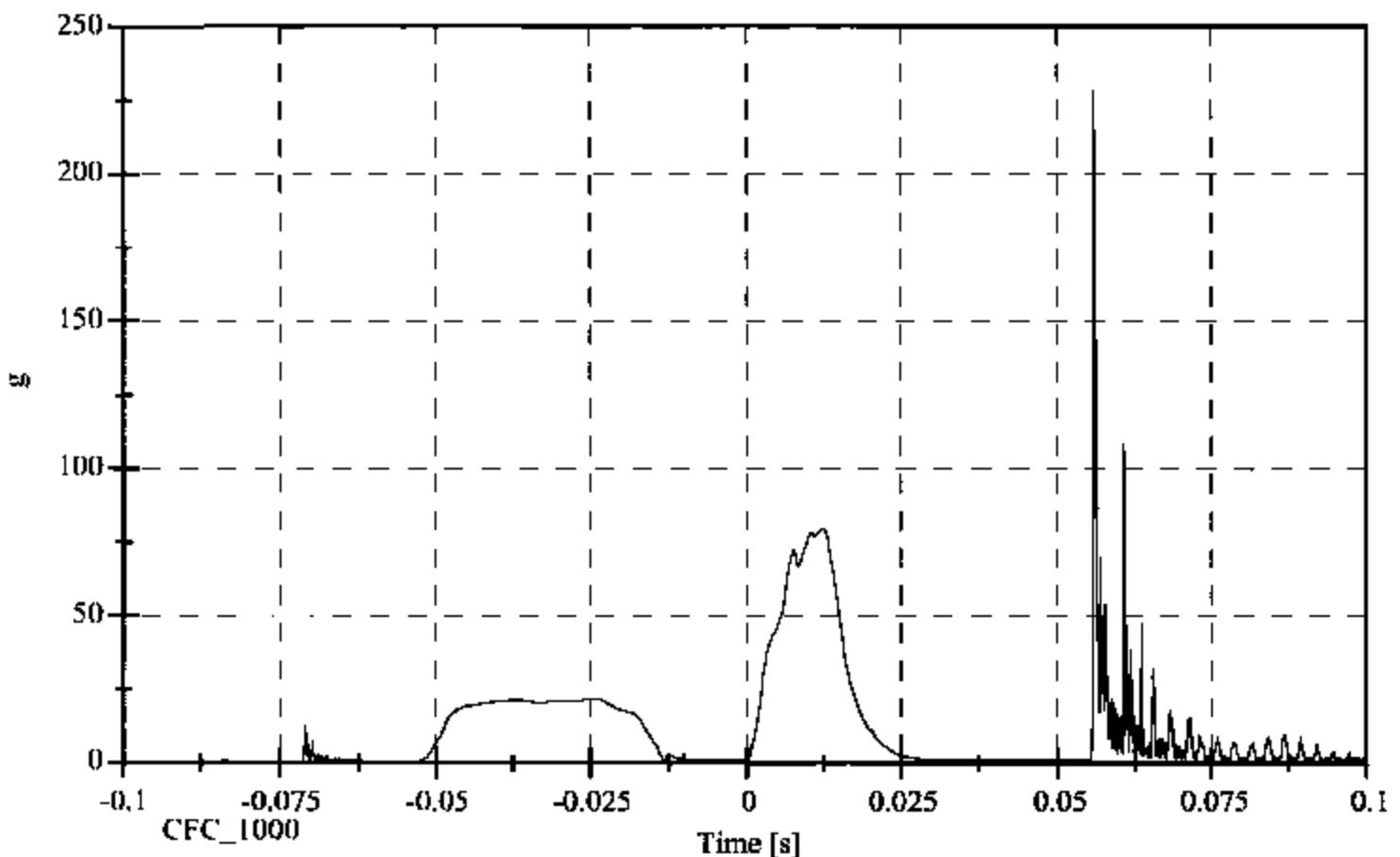
Average Acceleration: 10.6 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 79.6 [g] at 0.013 [s]

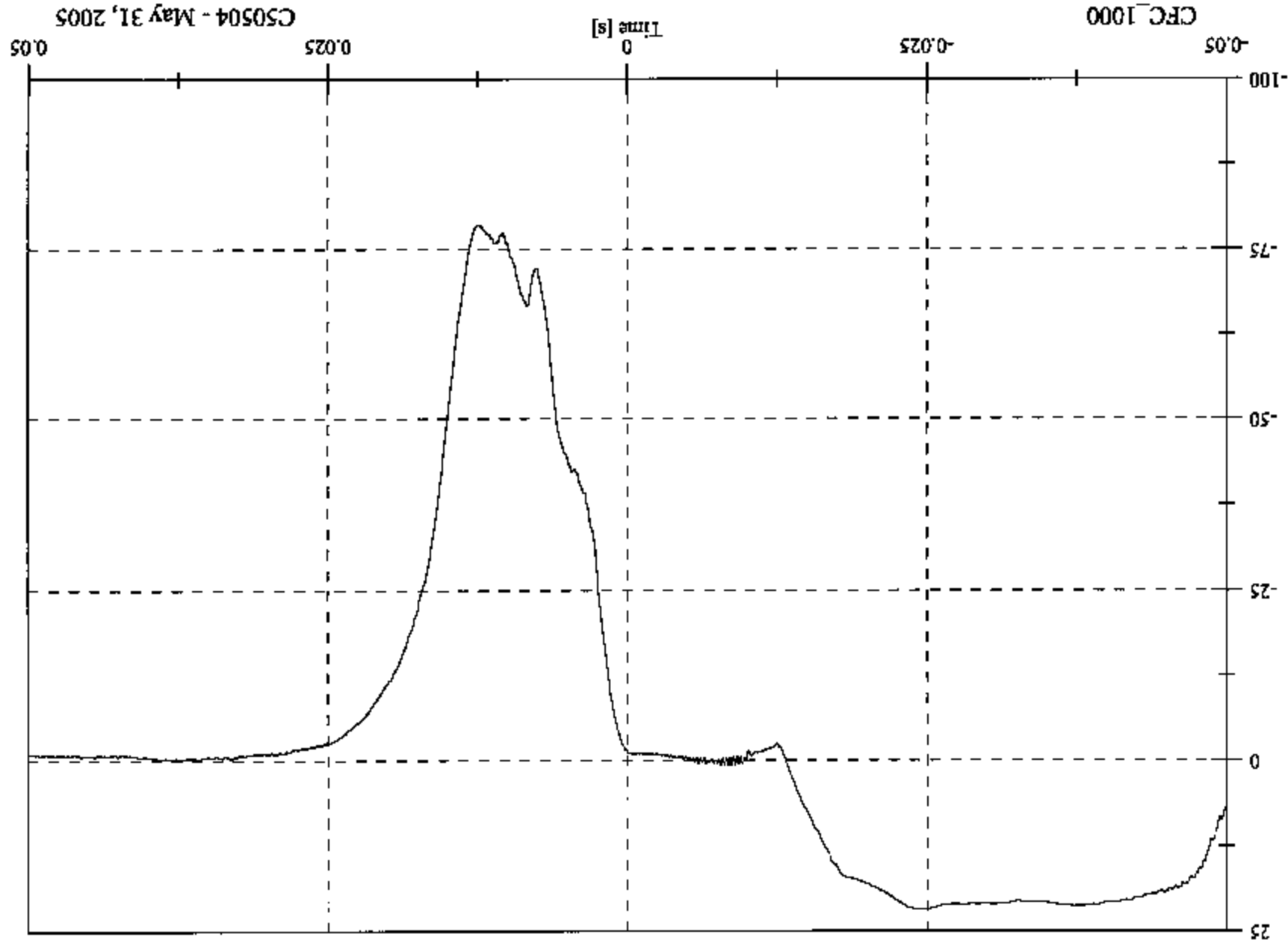
Headform Resultant

Min: 0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE
 Headform X Acceleration

Max: 21.8 [g] at 0.025 [s]
 Min: -78.6 [g] at 0.012 [s]



C50504 PASSENGER SIDE UROP IMPACT PLOT #1

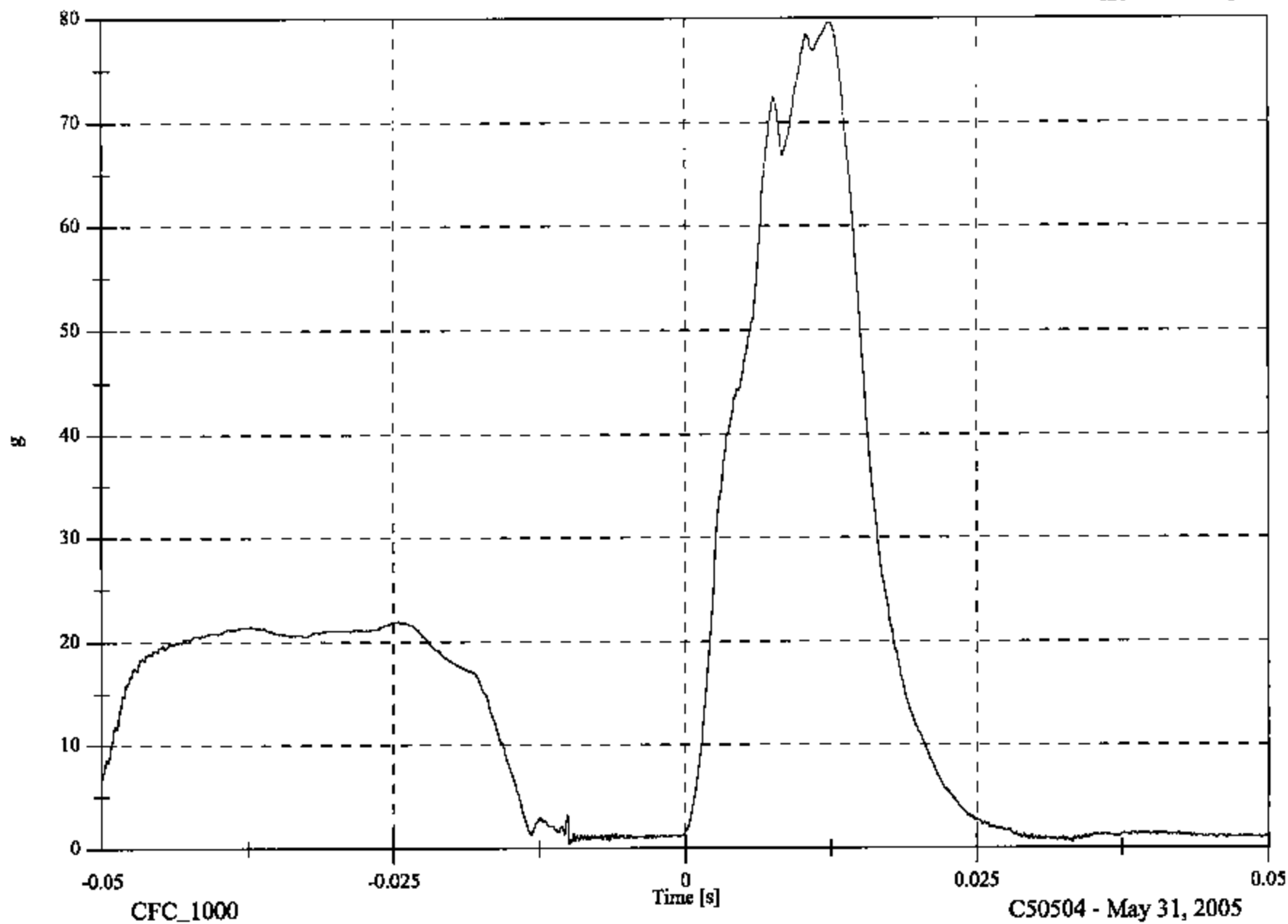
8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 79.6 [g] at 0.013 [s]

Min: 0.4 [g] at -0.010 [s]



C50504 PASSENGER SIDE UROP IMPACT PLOT #4

8734-FMH-07

CFC_1000

Time [s]

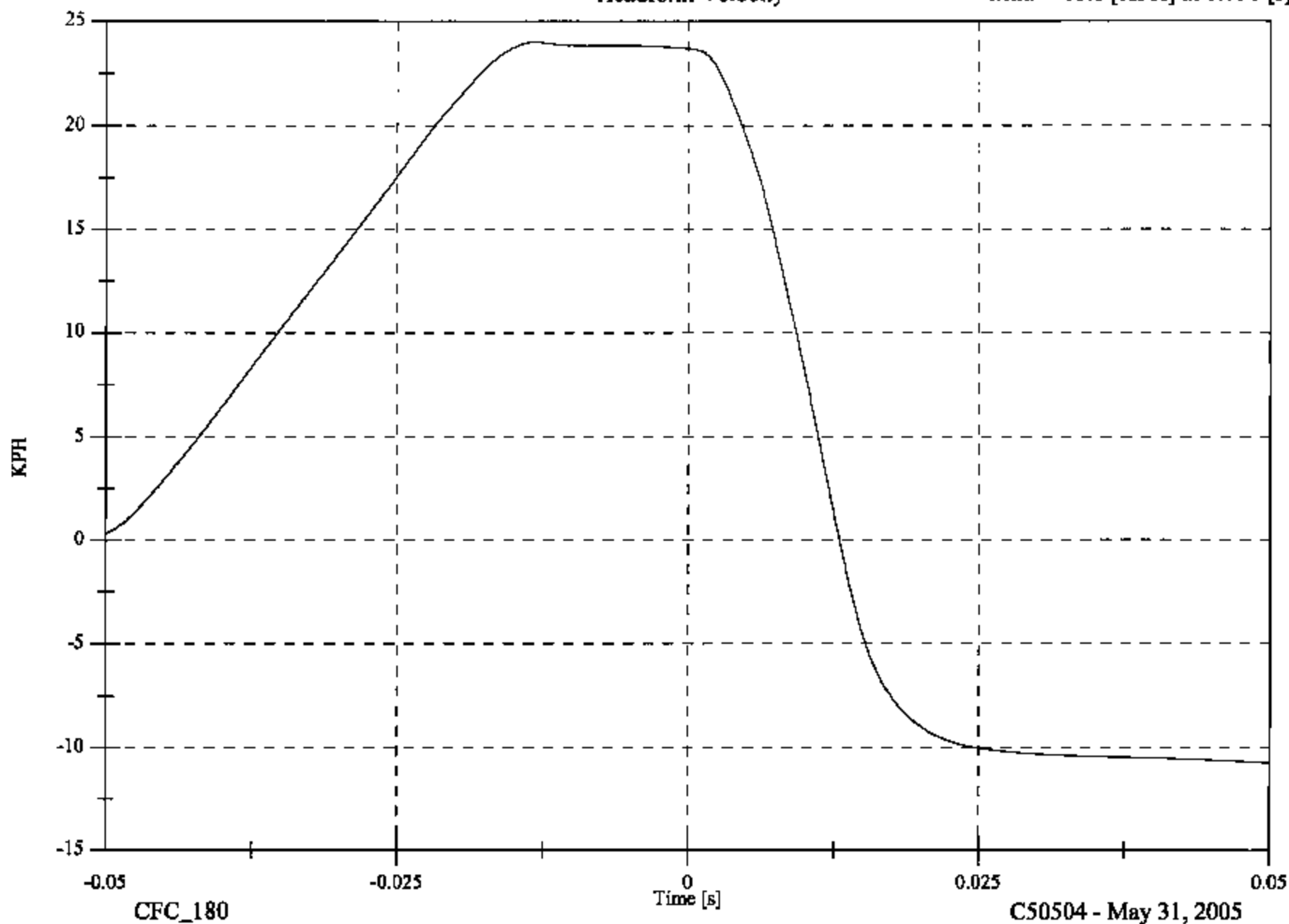
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 24.0 [KPH] at -0.013 [s]

Headform Velocity

Min: -10.8 [KPH] at 0.050 [s]

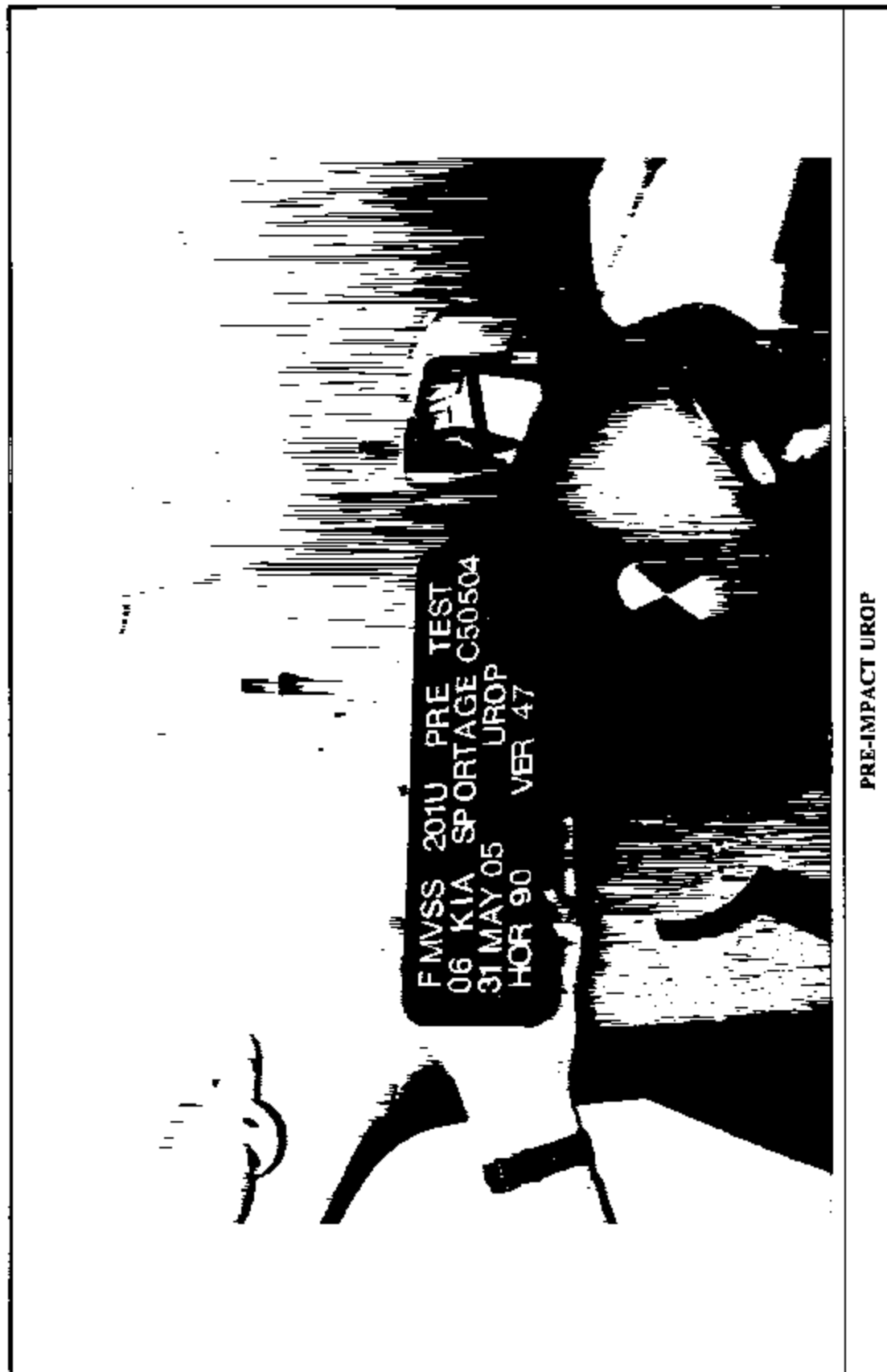


C50504 PASSENGER SIDE UROP IMPACT PLOT #5

8754-FMH-07

CFC_180

C50504 - May 31, 2005



FMVSS 201U PRE TEST
06 KIA SPORTAGE C50504
31 MAY 05 UROP
HOR 90 VER 47

PRE-IMPACT UROP

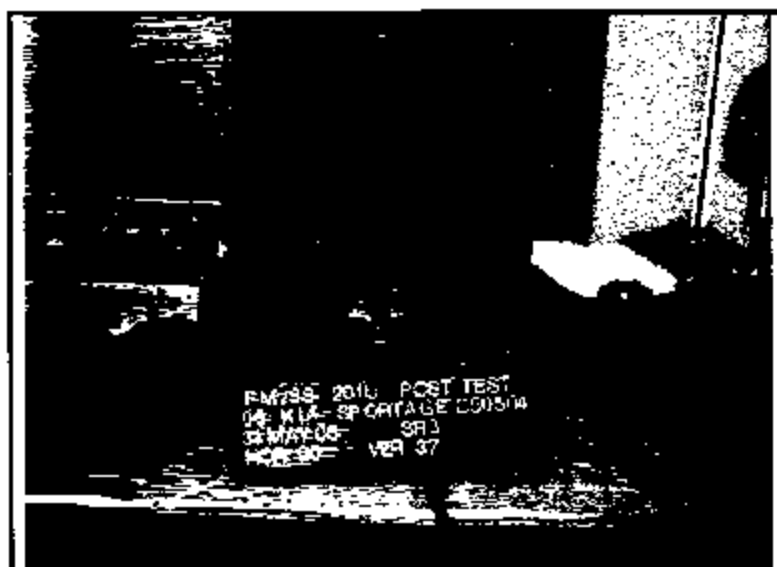


POST-IMPACT UROP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	06
Test Date:	05/31/05
Target Location:	SIDE RAIL
Target Code:	SR3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	37°
Ambient Temperature:	22.8C°
Relative Humidity:	39.8
Time of Impact:	13:15
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	22	☐ mm right	☒ mm left
On Centerline	9	mm up	



POST-IMPACT SR3 HEADFORM

Free Motion HIC	244.5
HIC(d)	350.8
Impact Velocity (kph)	18.67
HIC T1 (msec)	2.3
HIC T2 (msec)	9.2

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - SR3

FMH Headform 0062

Location: SR3

Test Date: May 31, 2005

Work File: SR3

TEST RESULTS

Lab Temperature: 22.8 C

HICd: 350.8

Lab Humidity: 39.8 %

HIC (36ms): 244.5

Velocity at Impact: 18.67 KPH

t1: 2.2 msec

t2: 9.2 msec

Free Flight Distance: 210.80 mm

Duration: 7.0 msec

Maximum: 85.5 g

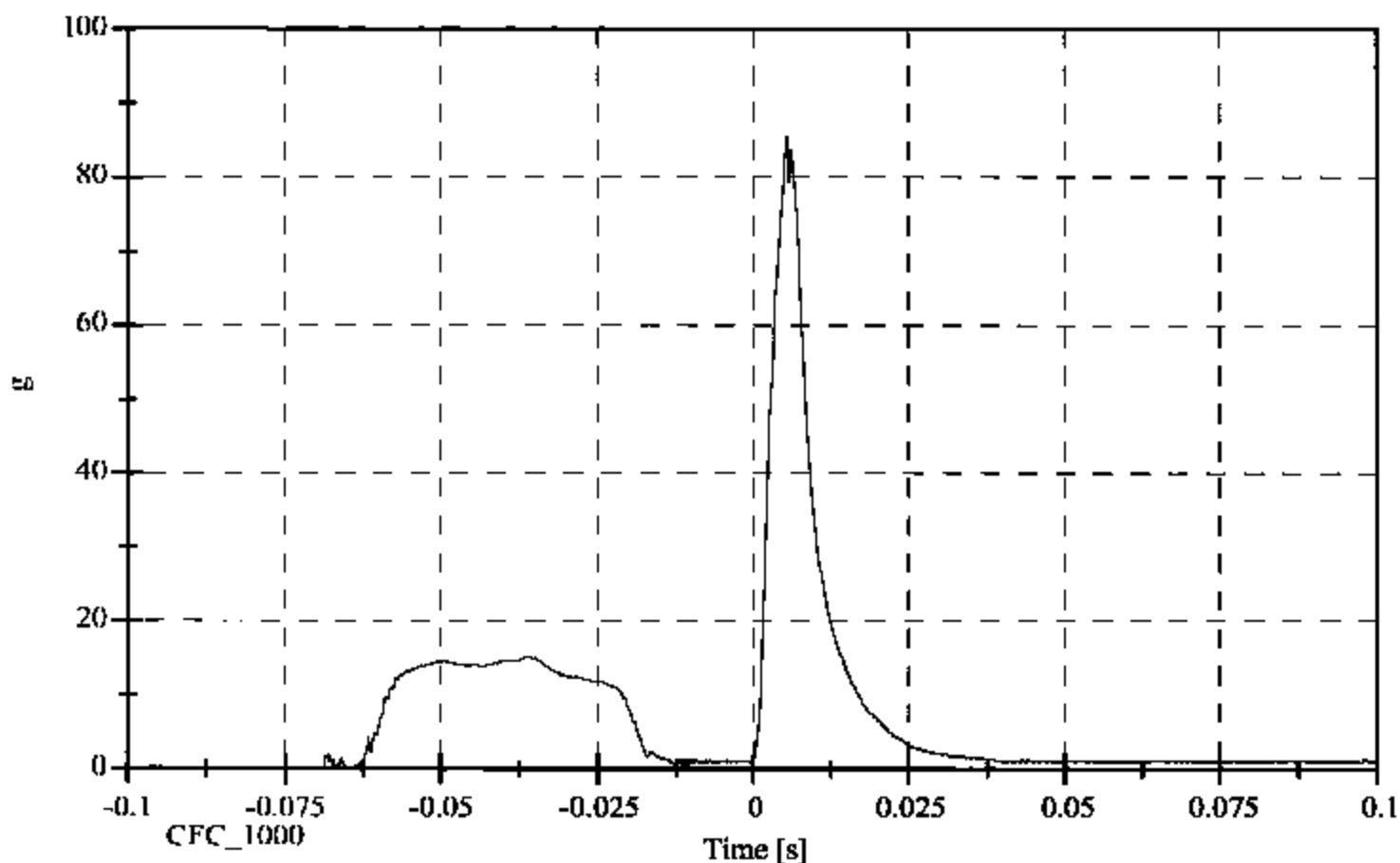
Average Acceleration: 6.8 g

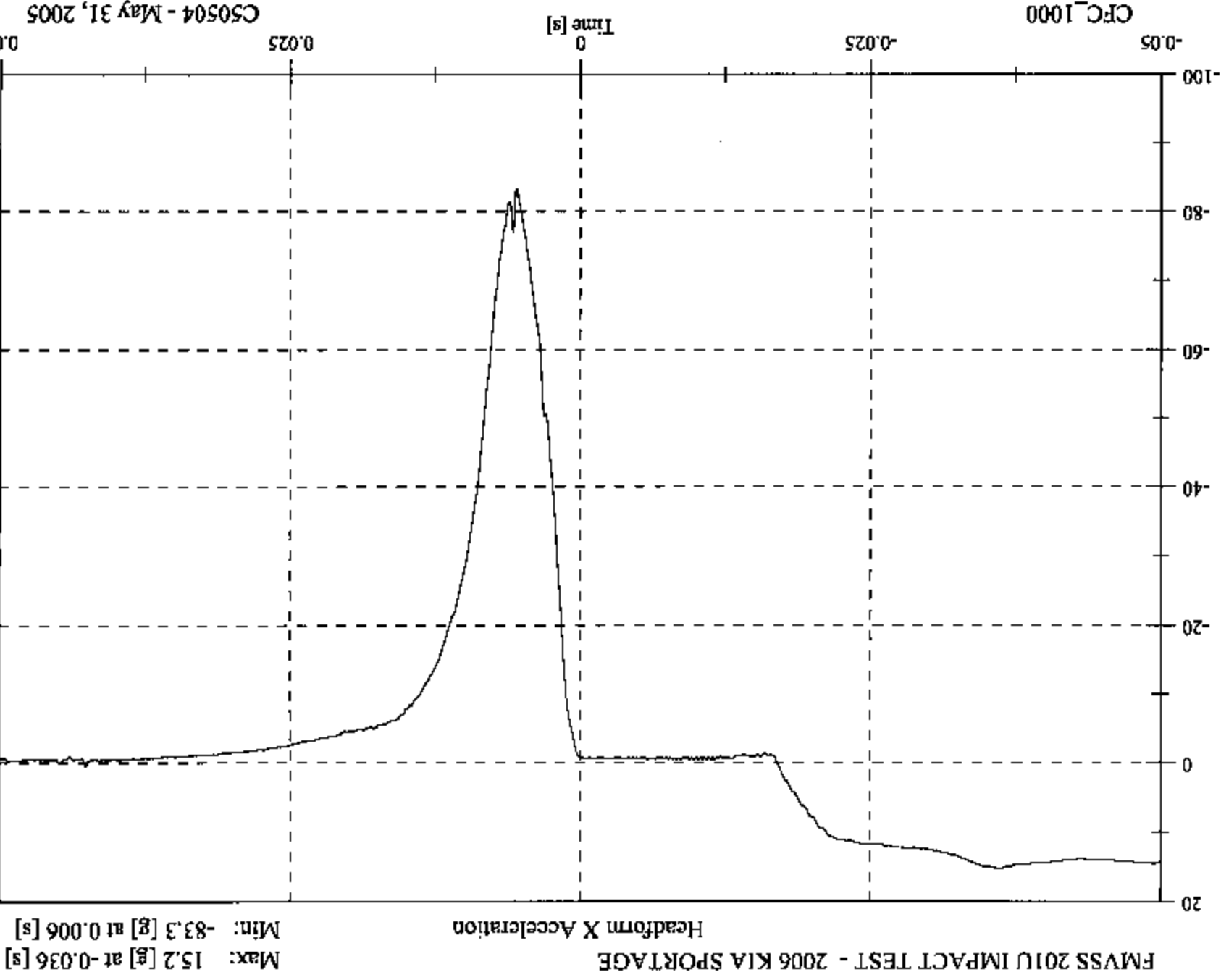
FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 85.5 [g] at 0.006 [s]

Headform Resultant

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



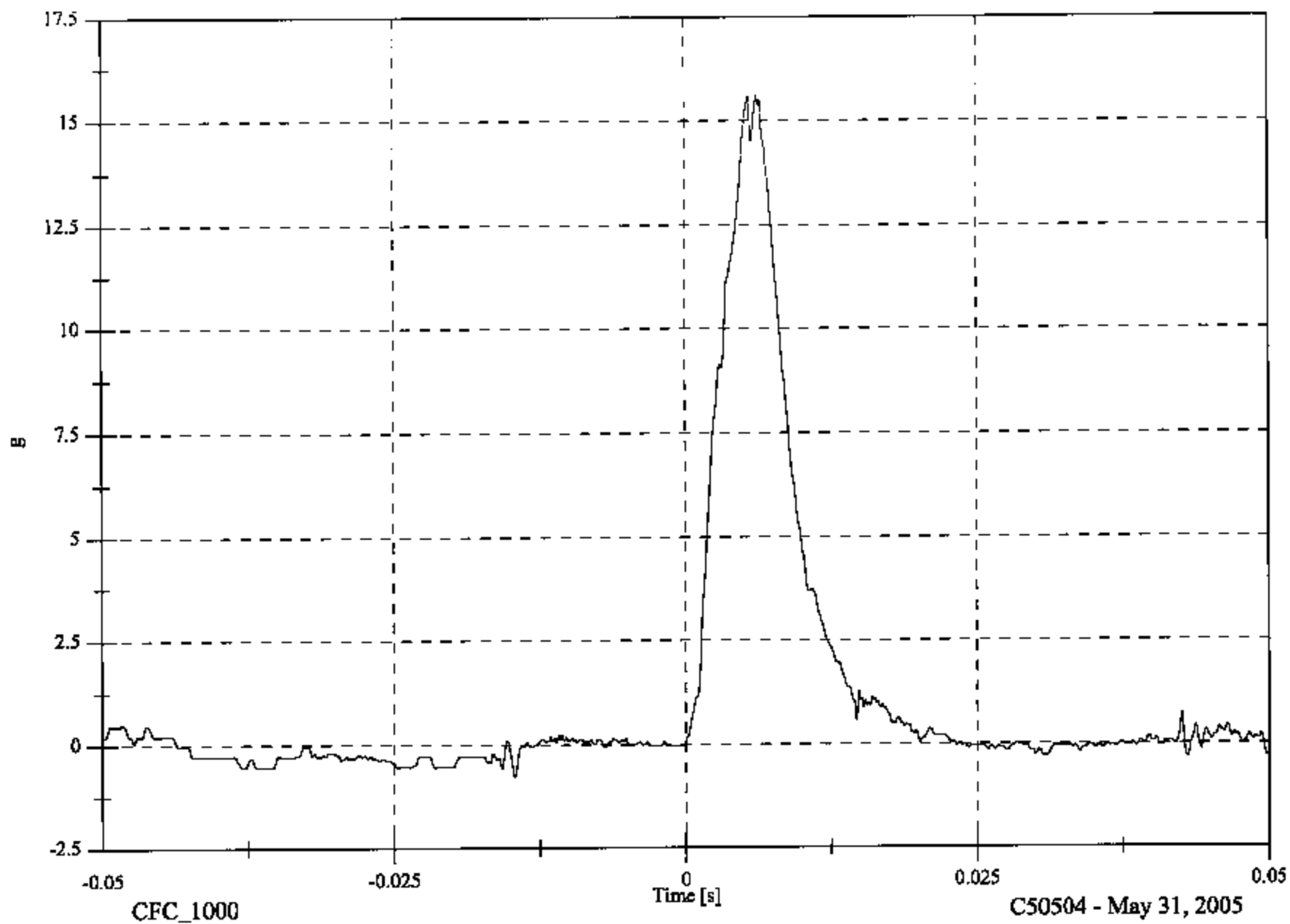


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 15.6 [g] at 0.006 [s]

Min: -0.8 [g] at -0.015 [s]



C50504 PASSENGER SIDE SR3 IMPACT PLOT #2

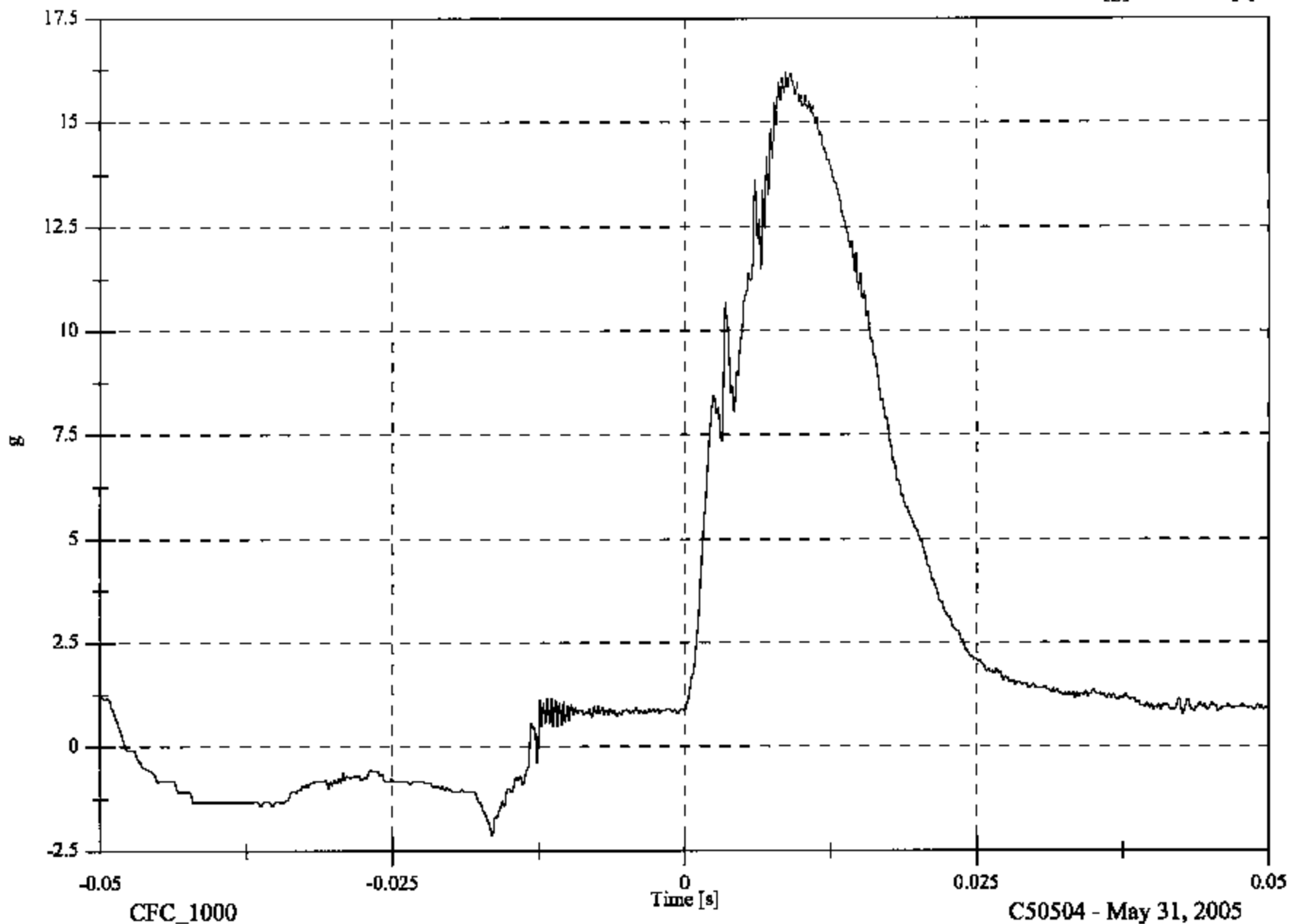
8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 16.2 [g] at 0.009 [s]

Min: -2.1 [g] at -0.017 [s]



C50504 PASSENGER SIDE SR3 IMPACT PLOT #3

8754-FMH-07

CFC_1000

Time [s]

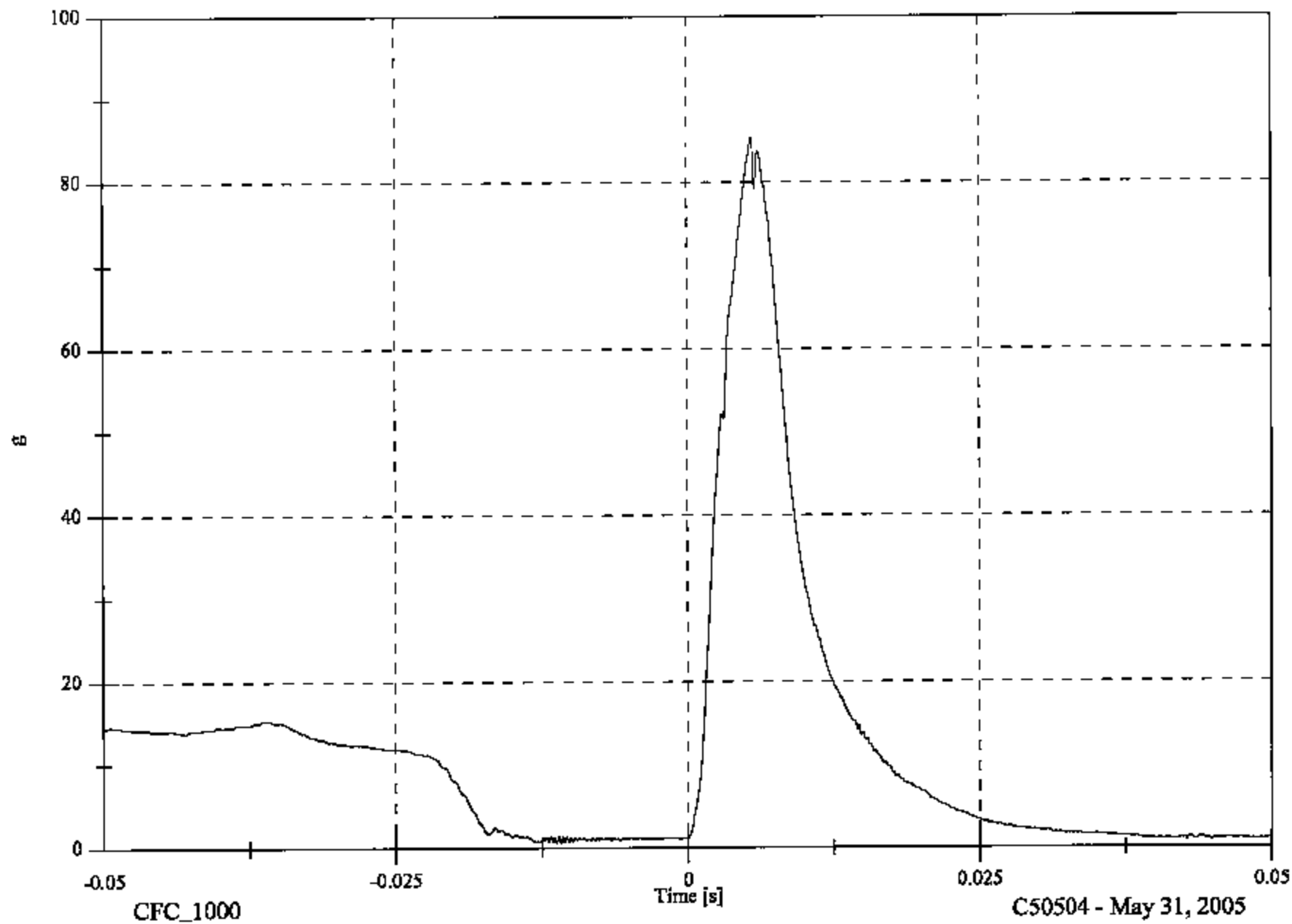
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 85.5 [g] at 0.006 [s]

Min: 0.6 [g] at -0.011 [s]



C50504 PASSENGER SIDE SR3 IMPACT PLOT #4

8754-FMH-07

CFC_1000

C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

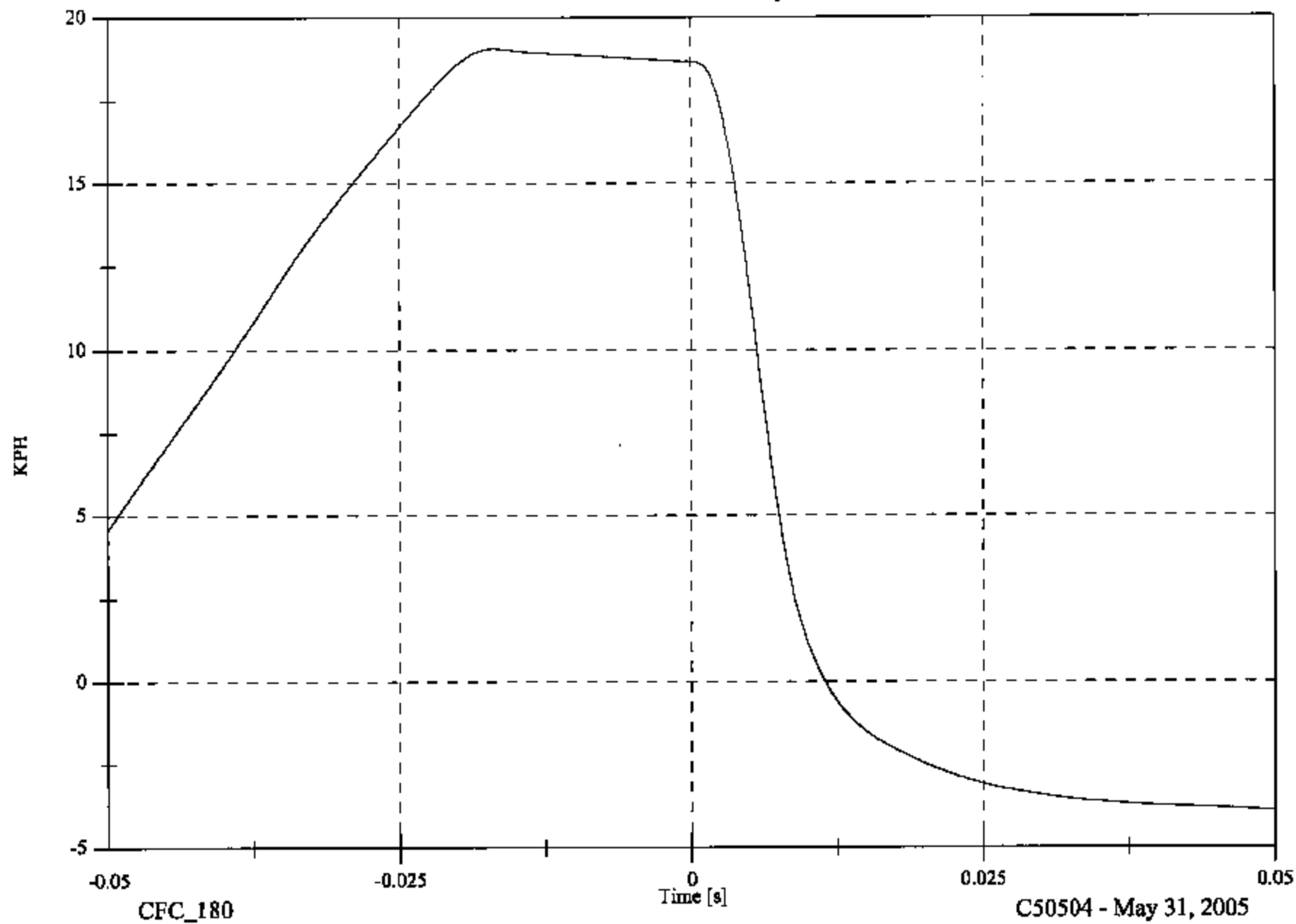
Headform Velocity

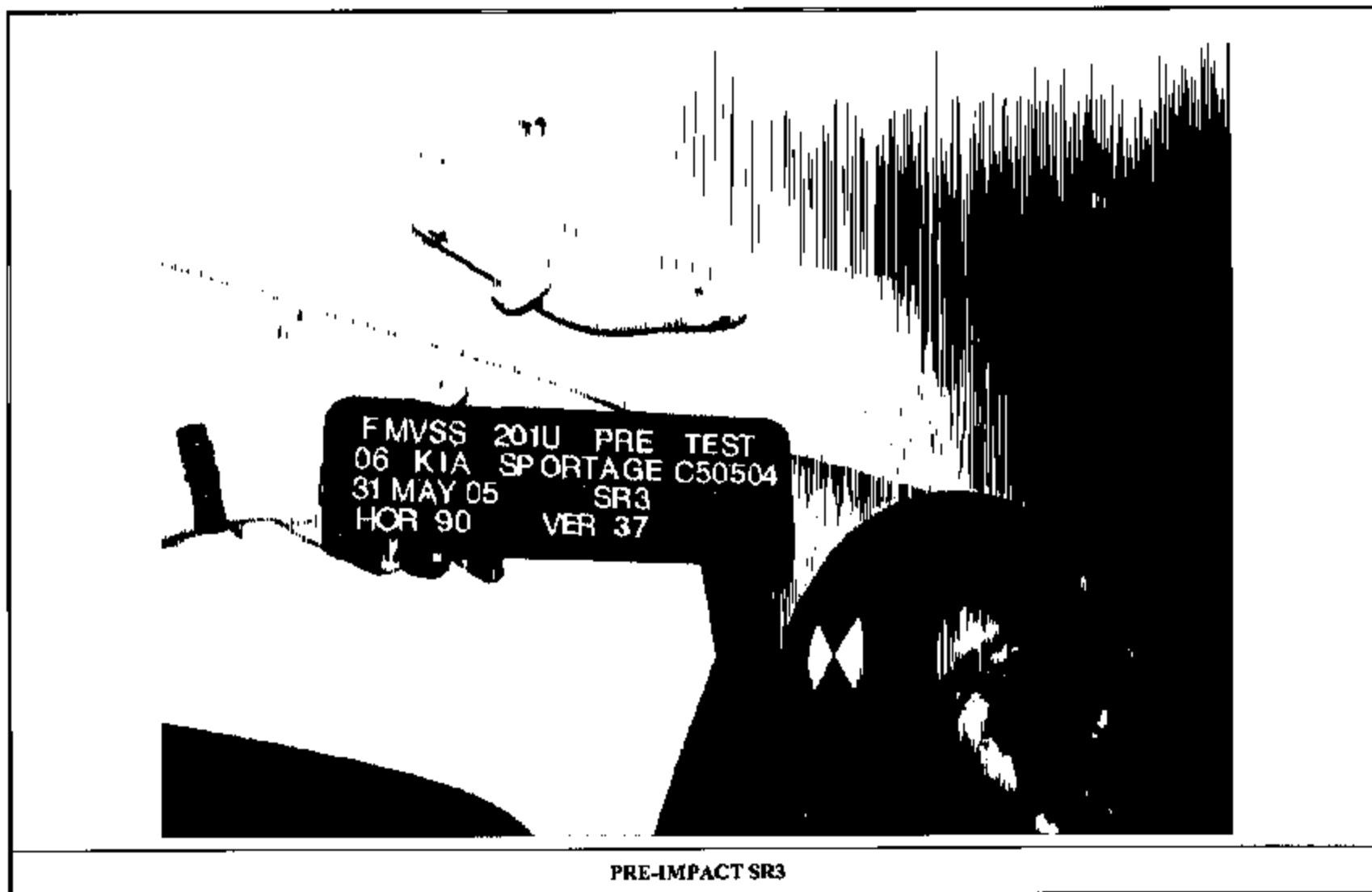
Max: 19.1 [KPH] at -0.017 [s]

Min: -3.9 [KPH] at 0.050 [s]

C50504 PASSENGER SIDE SR3 IMPACT PLOT #5

8734-FMH-07





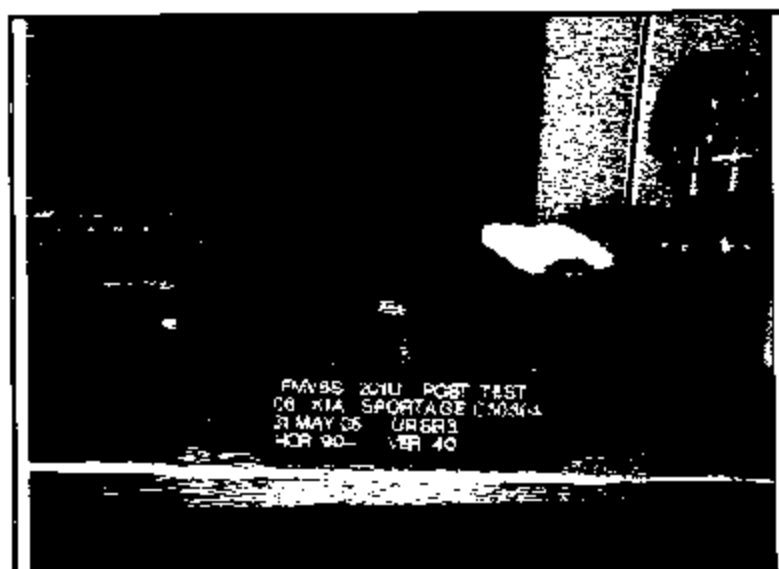
PRE-IMPACT SR3



VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	07
Test Date:	05/31/05
Target Location:	UPPER ROOF
Target Code:	URSR3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	40°
Ambient Temperature:	22.5C°
Relative Humidity:	39.9
Time of Impact:	13:45
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	☐ mm right	☐ mm left
On Centerline	40	mm up	



POST-IMPACT URSR3 HEADFORM

Free Motion HIC	843.6
HIC(d)	802.8
Impact Velocity (kph)	23.69
HIC T1 (msec)	4.0
HIC T2 (msec)	10.4

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - URSR3

FMH Headform 0355

Location: URSR3

Test Date: May 31, 2005

Work File: URSR3

TEST RESULTS

Lab Temperature: 22.5 C

HICd: 802.8

Lab Humidity: 39.9 %

HIC (36ms): 843.6

Velocity at Impact: 23.69 KPH

t1: 3.9 msec

t2: 10.4 msec

Free Flight Distance: 221.74 mm

Duration: 6.5 msec

Maximum: 136.8 g

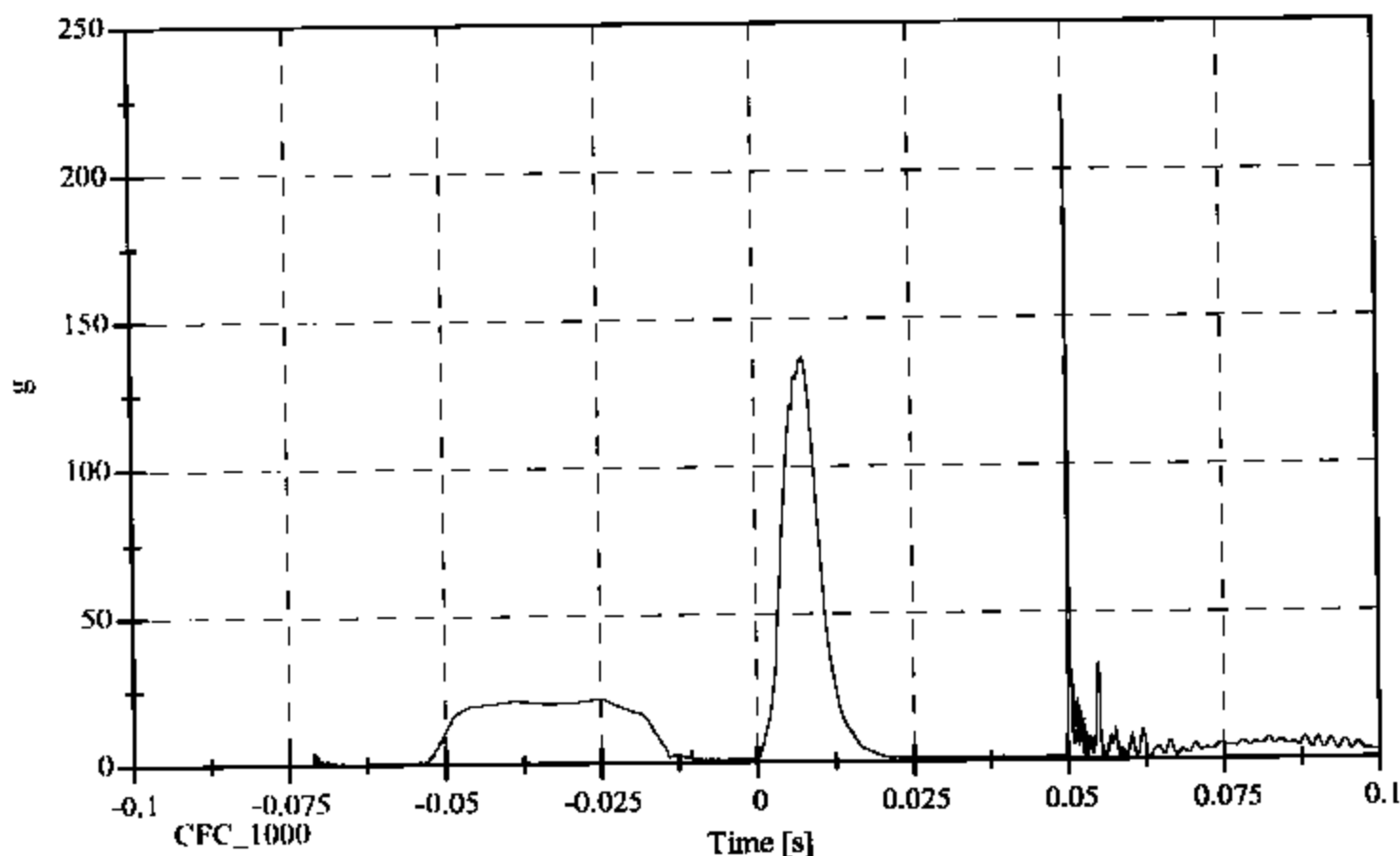
Average Acceleration: 10.2 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 136.8 [g] at 0.008 [s]

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

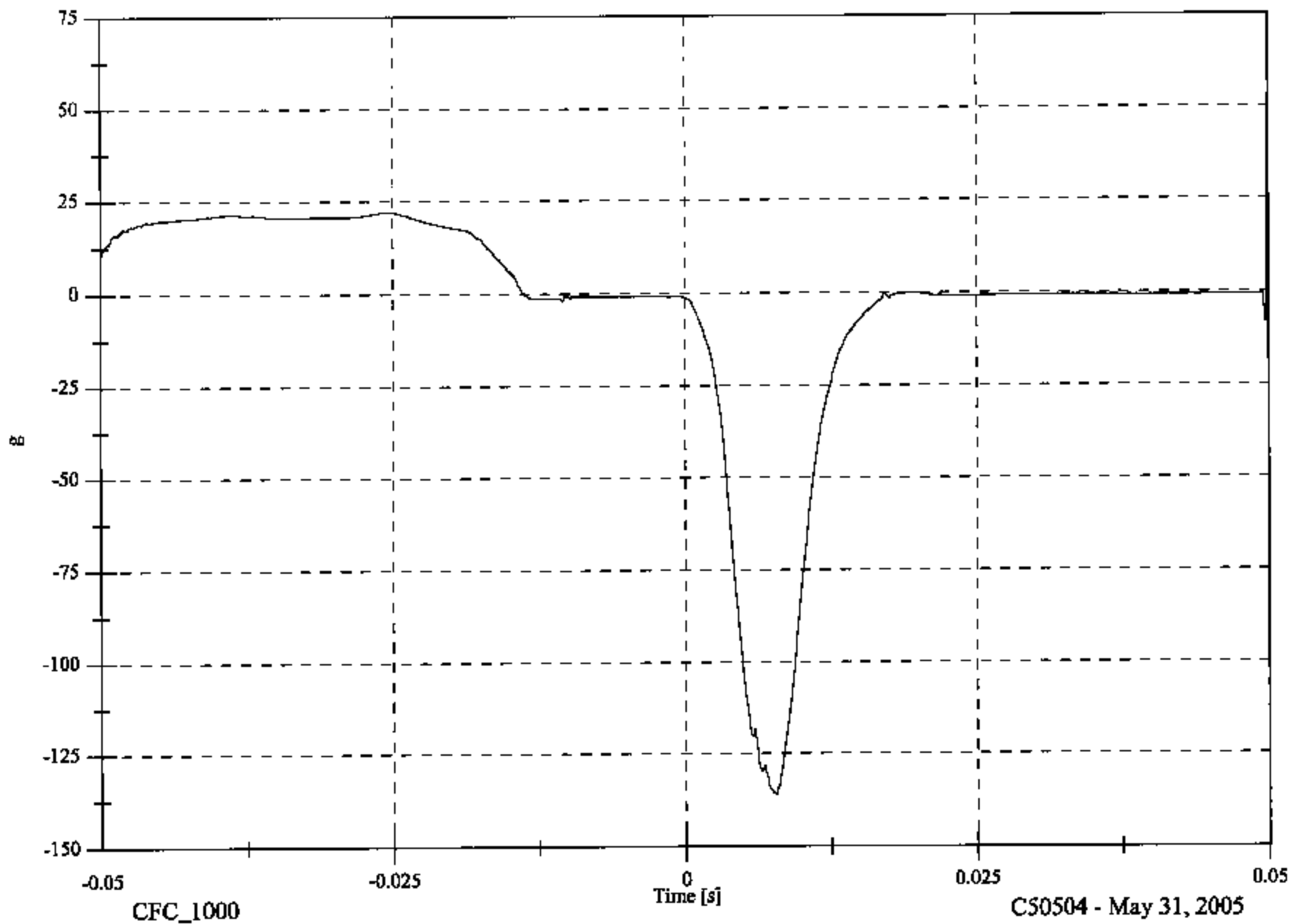


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 53.0 [g] at 0.050 [s]

Min: -136.1 [g] at 0.008 [s]



C50504 PASSENGER SIDE URSR3 IMPACT PLOT #1

8754-FMH-07

CFC_1000

Time [s]

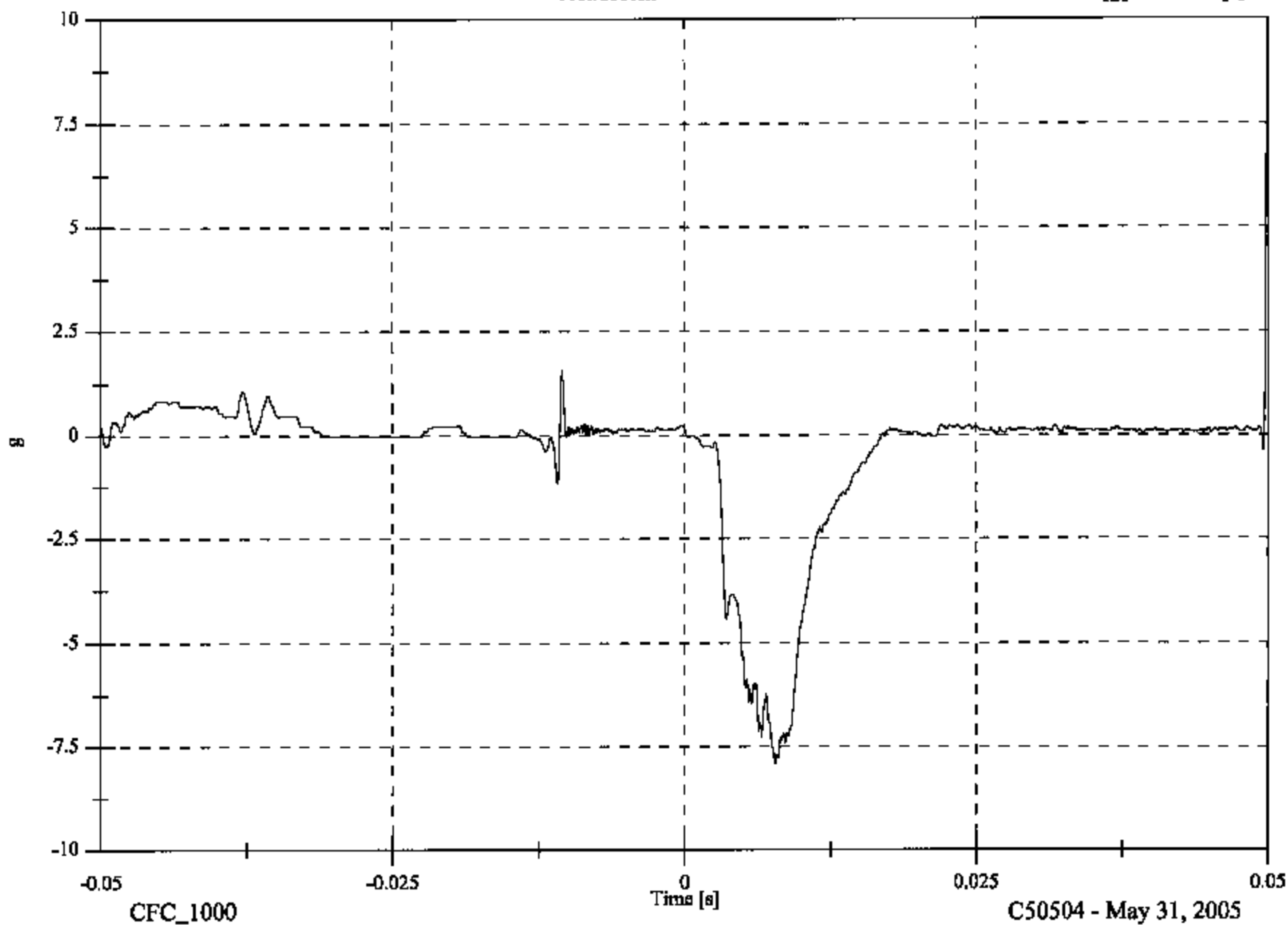
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 8.8 [g] at 0.050 [s]

Min: -7.9 [g] at 0.008 [s]



C50504 PASSENGER SIDE URSR3 IMPACT PLOT #2

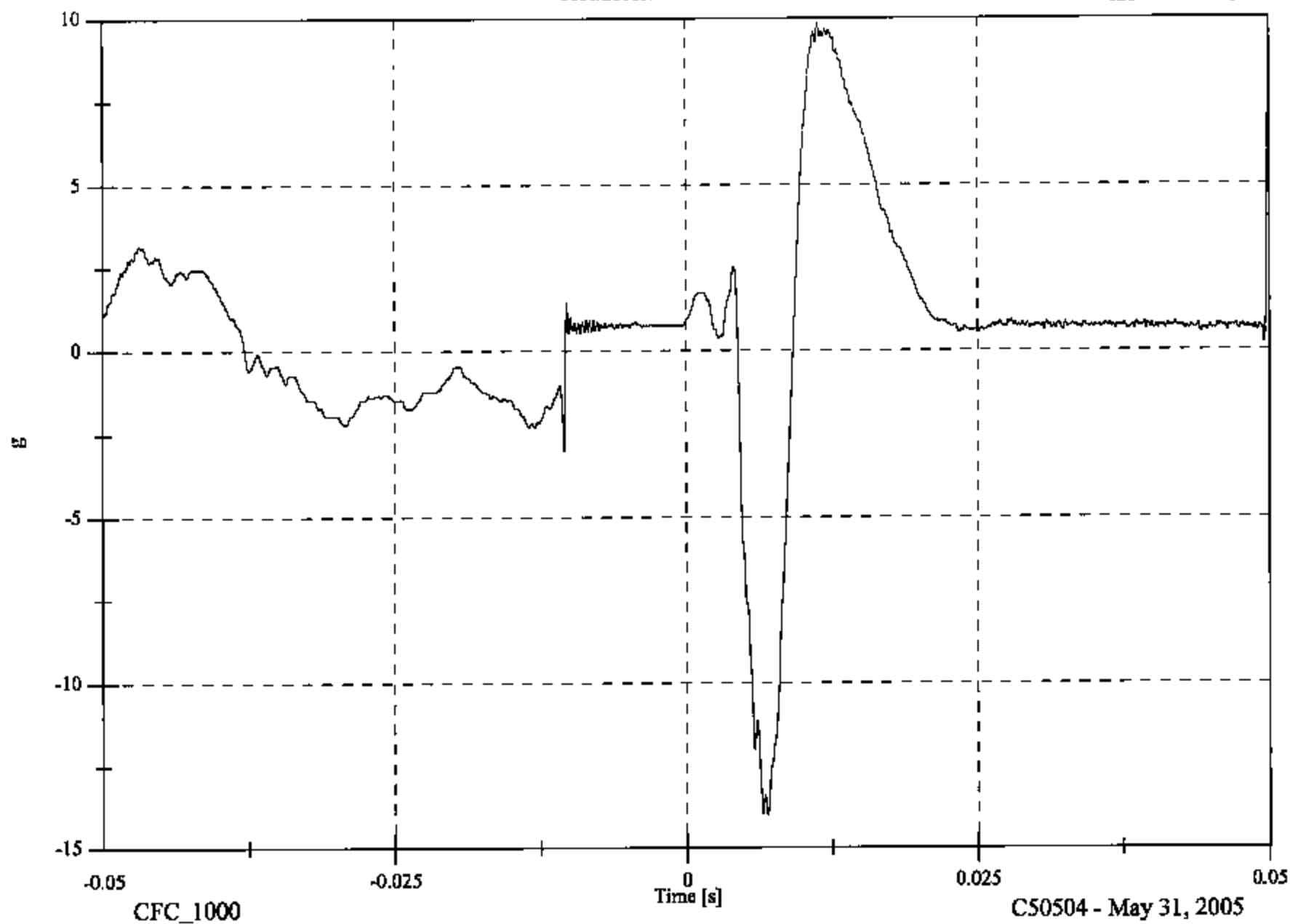
8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 9.9 [g] at 0.011 [s]

Min: -14.0 [g] at 0.007 [s]



C50504 PASSENGER SIDE URSR3 IMPACT PLOT #3

8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

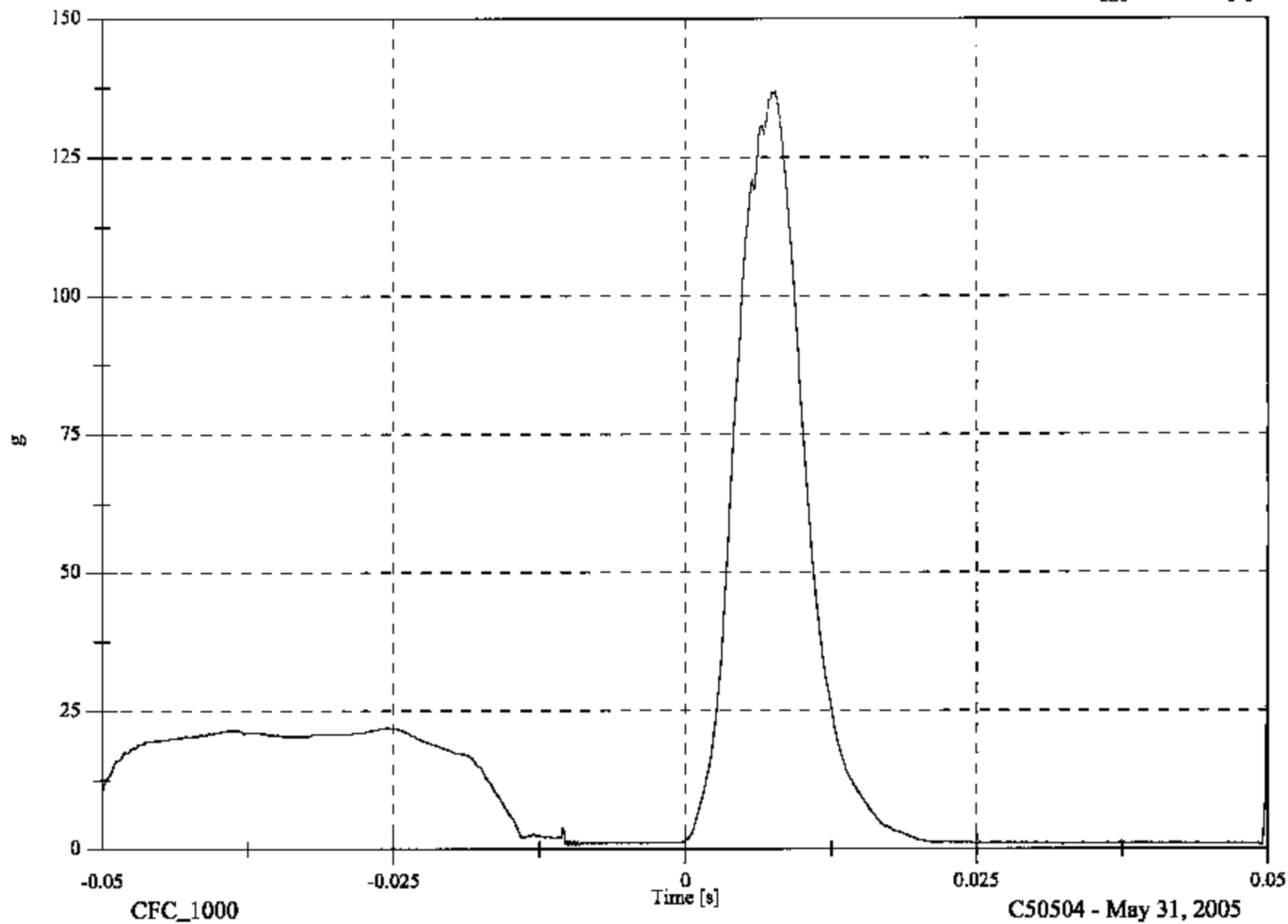
Headform Resultant

Max: 136.8 [g] at 0.008 [s]

Min: 0.7 [g] at -0.009 [s]

C50504 PASSENGER SIDE URSR3 IMPACT PLOT #4

8754-FMH-07



CFC_1000

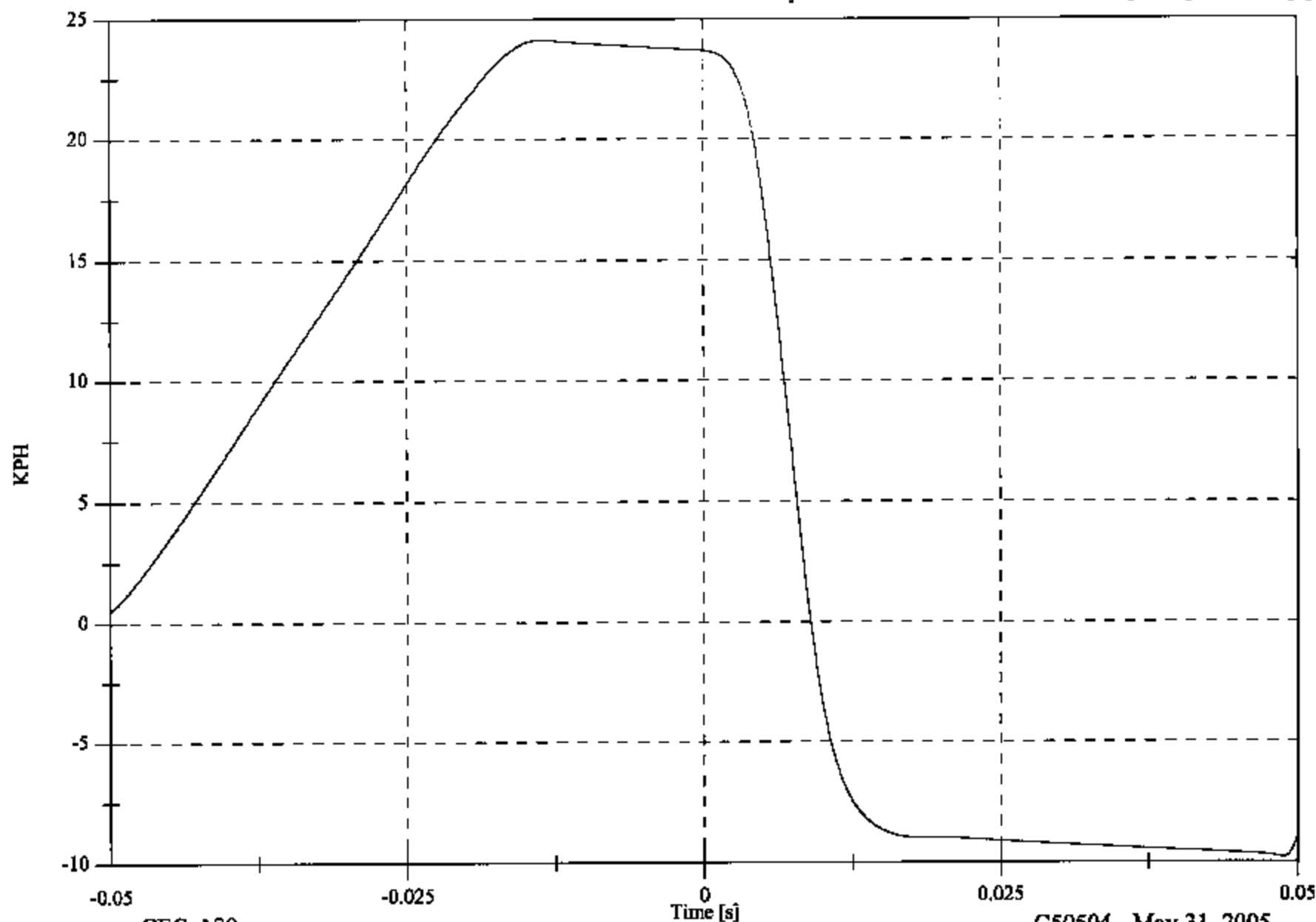
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Velocity

Max: 24.1 [KPH] at -0.014 [s]

Min: -9.8 [KPH] at 0.049 [s]

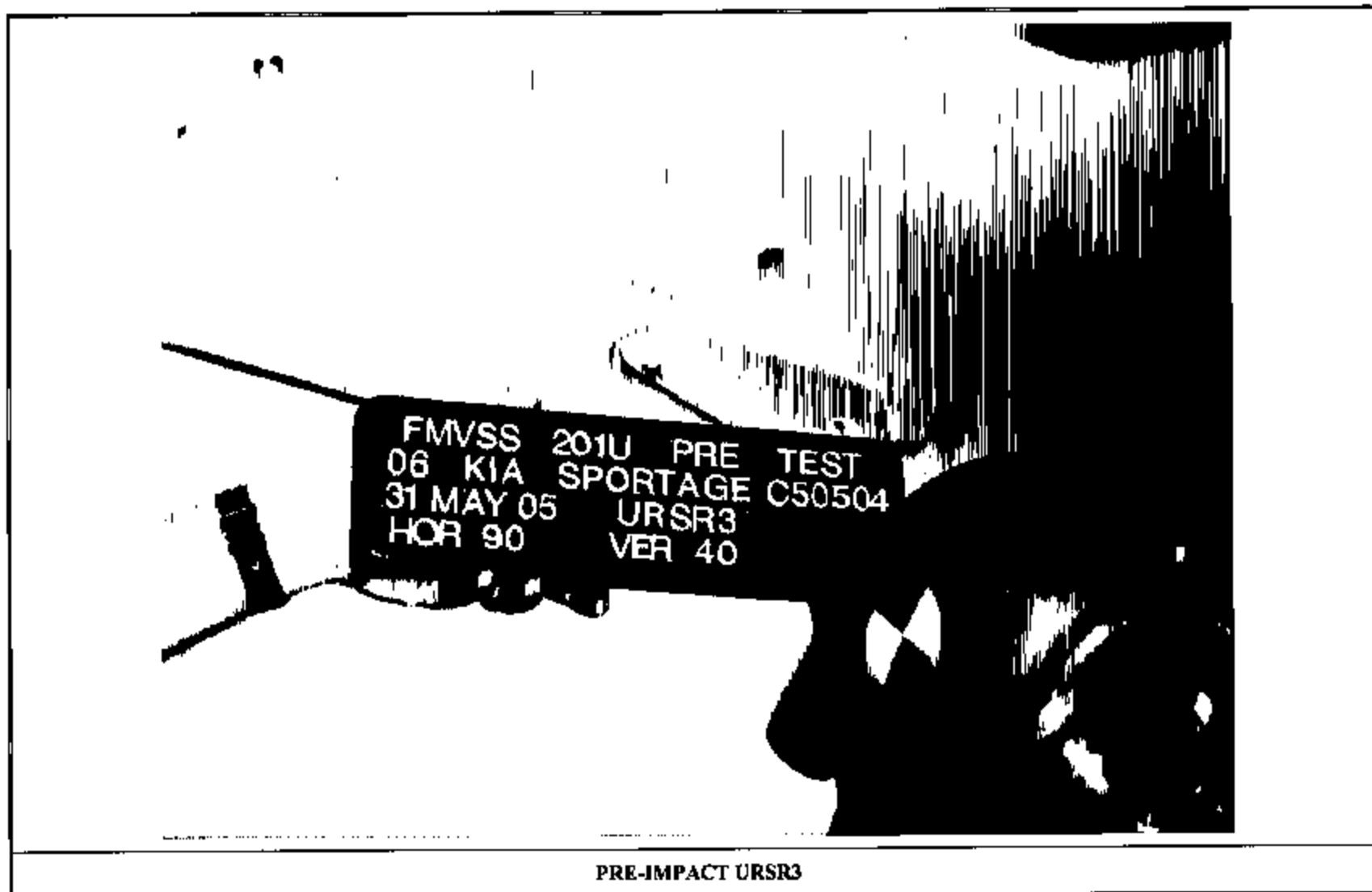


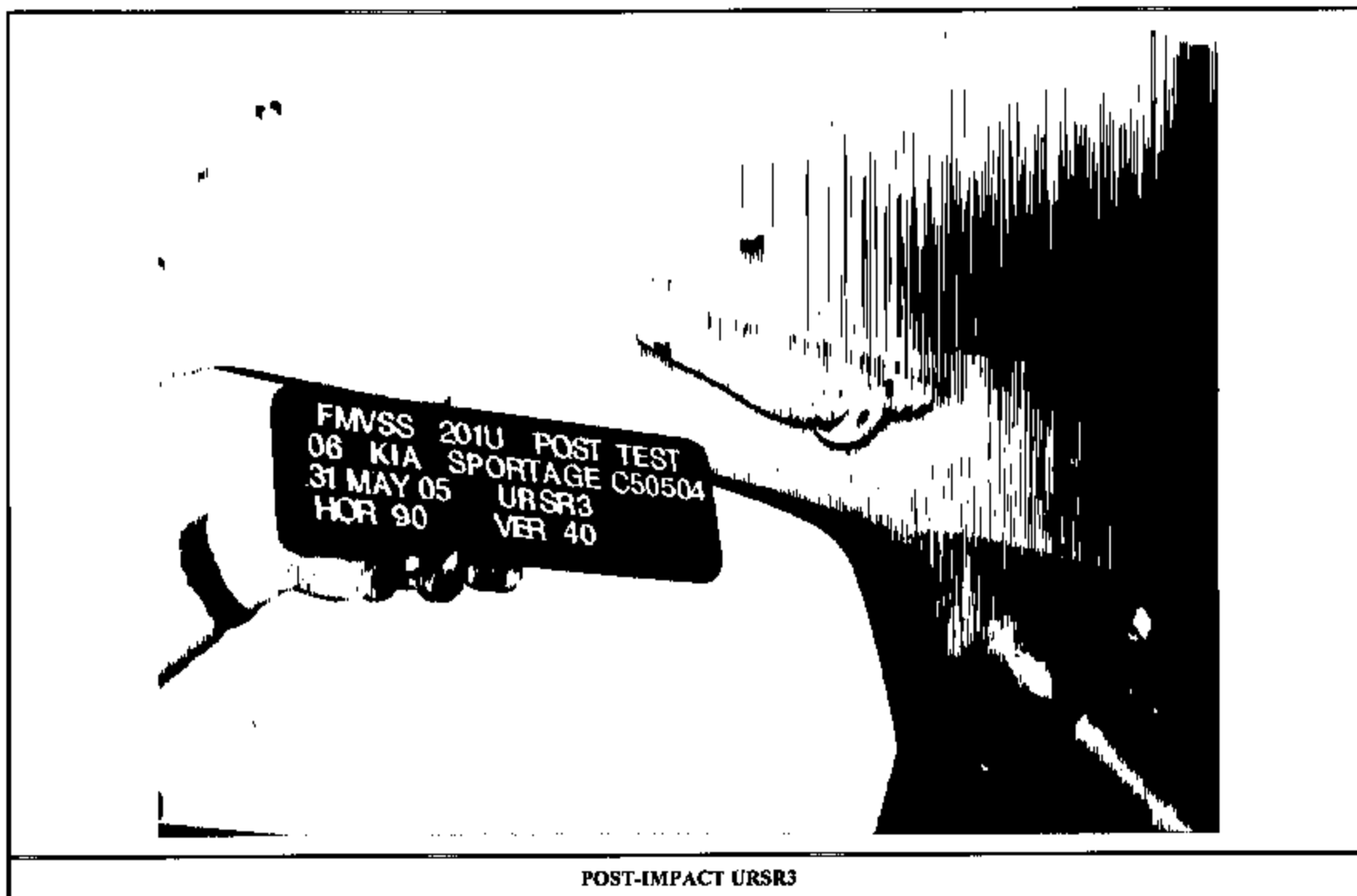
C50504 PASSENGER SIDE URSR3 IMPACT PLOT #5

8754-FMH-07

CFC_180

C50504 - May 31, 2005





POST-IMPACT URSR3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL.)
COLOR:	Olive Green

Test Number:	08
Test Date:	05/31/05
Target Location:	B-PILLAR
Target Code:	BP4
Horizontal Impact Angle:	134°
Vertical Impact Angle:	10°
Ambient Temperature:	22.6C°
Relative Humidity:	40.2
Time of Impact:	14:00
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	7	mm right	x mm left
On Centerline	10	mm up	



POST-IMPACT BP4 HEADFORM

Free Motion HIC	655.5
HIC(d)	661.0
Impact Velocity (kph)	23.84
HIC T1 (msec)	1.4
HIC T2 (msec)	9.3

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - BP4

FMH Headform 0642

Location: BP4

Test Date: May 31, 2005

Work File: BP4

TEST RESULTS

Lab Temperature: 22.6 C

HICd: 661.0

Lab Humidity: 40.2 %

HIC (36ms): 655.5

Velocity at Impact: 23.84 KPH

t1: 1.4 msec

t2: 9.2 msec

Free Flight Distance: 212.81 mm

Duration: 7.8 msec

Maximum: 151.1 g

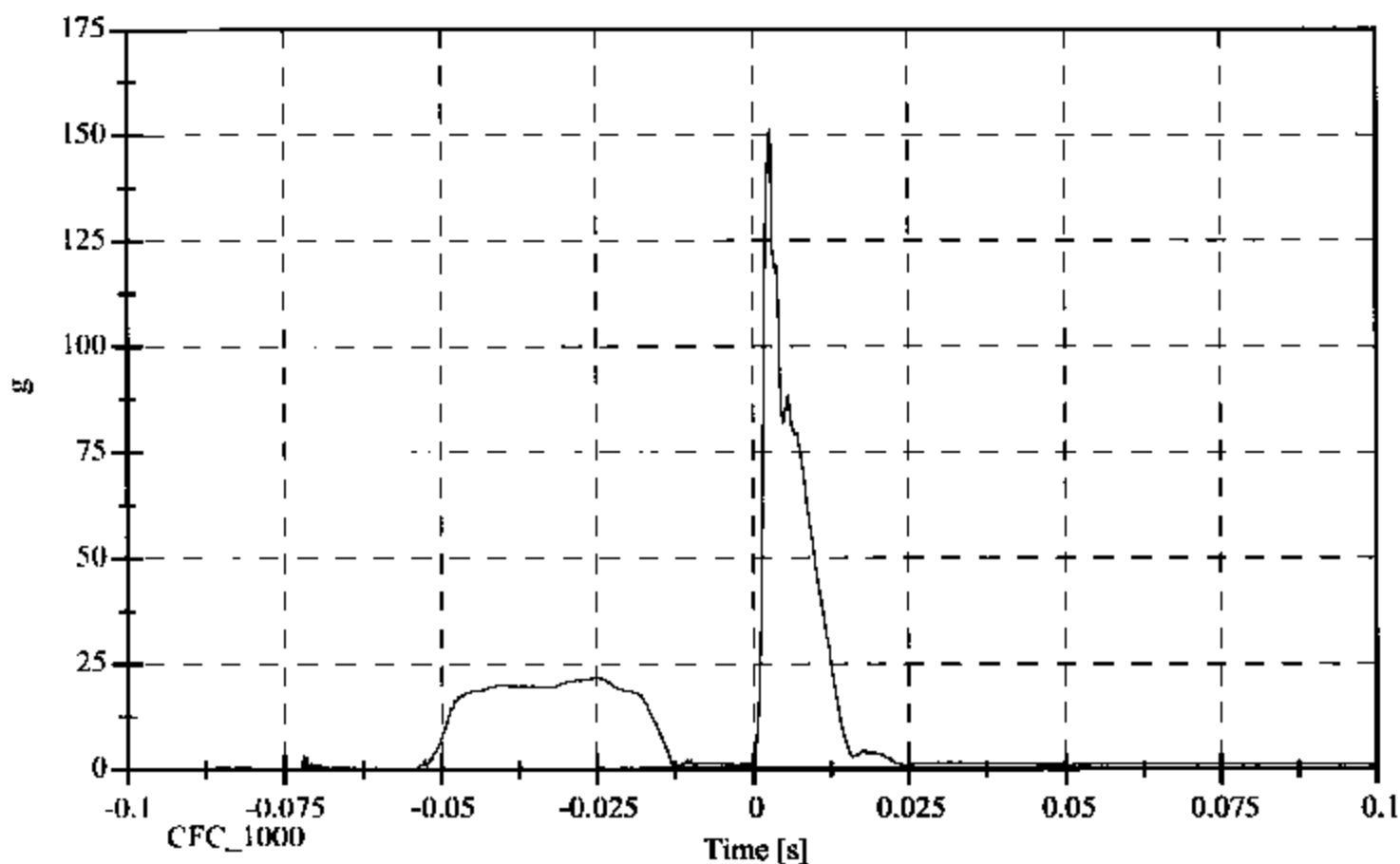
Average Acceleration: 8.7 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 151.1 [g] at 0.003 [s]

Headform Resultant

Min: 0.0 [g] at -0.054 [s]

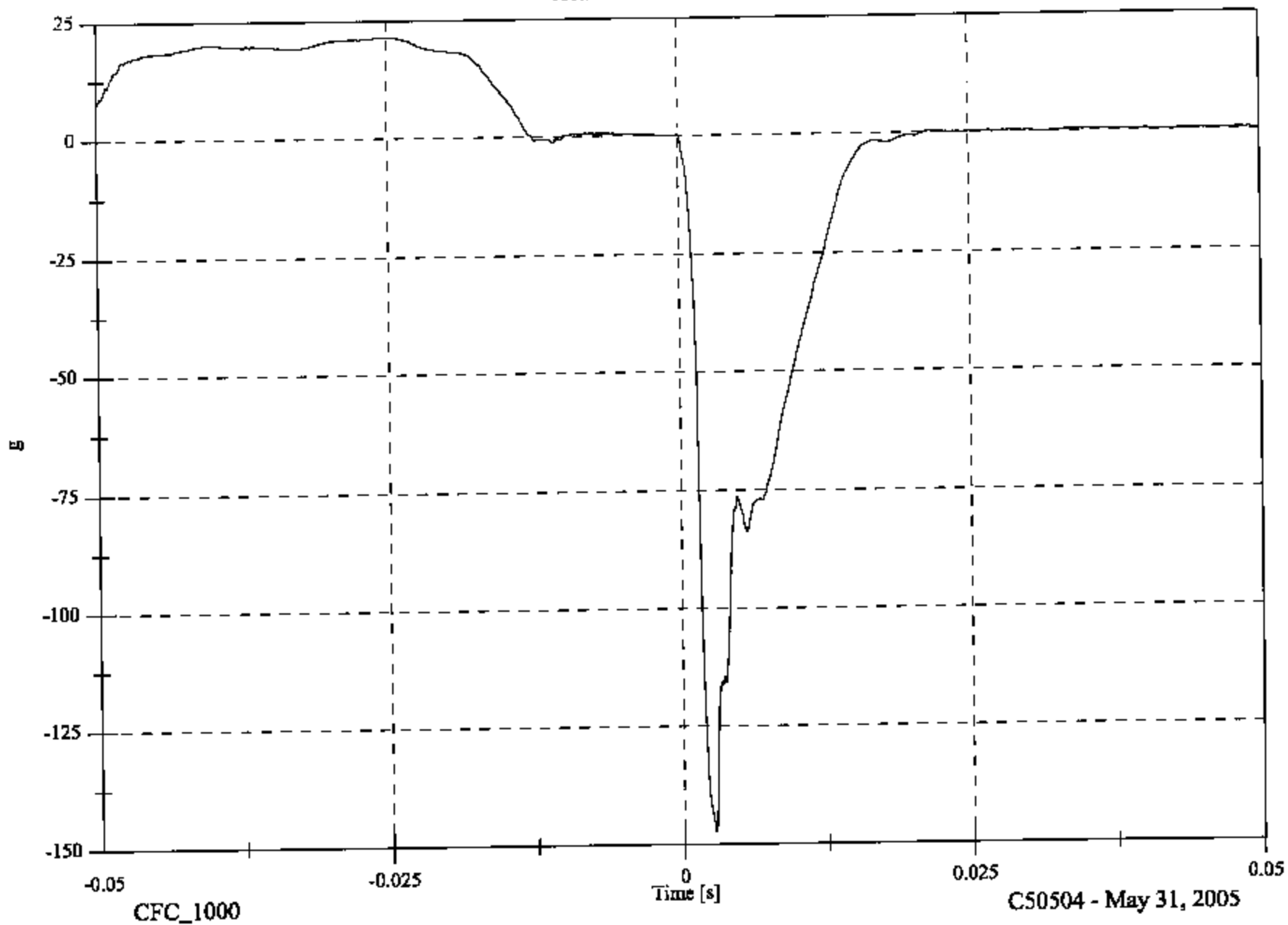


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 21.6 [g] at -0.025 [s]

Min: -147.2 [g] at 0.003 [s]



C50504 PASSENGER SIDE BP4 IMPACT PLOT #1

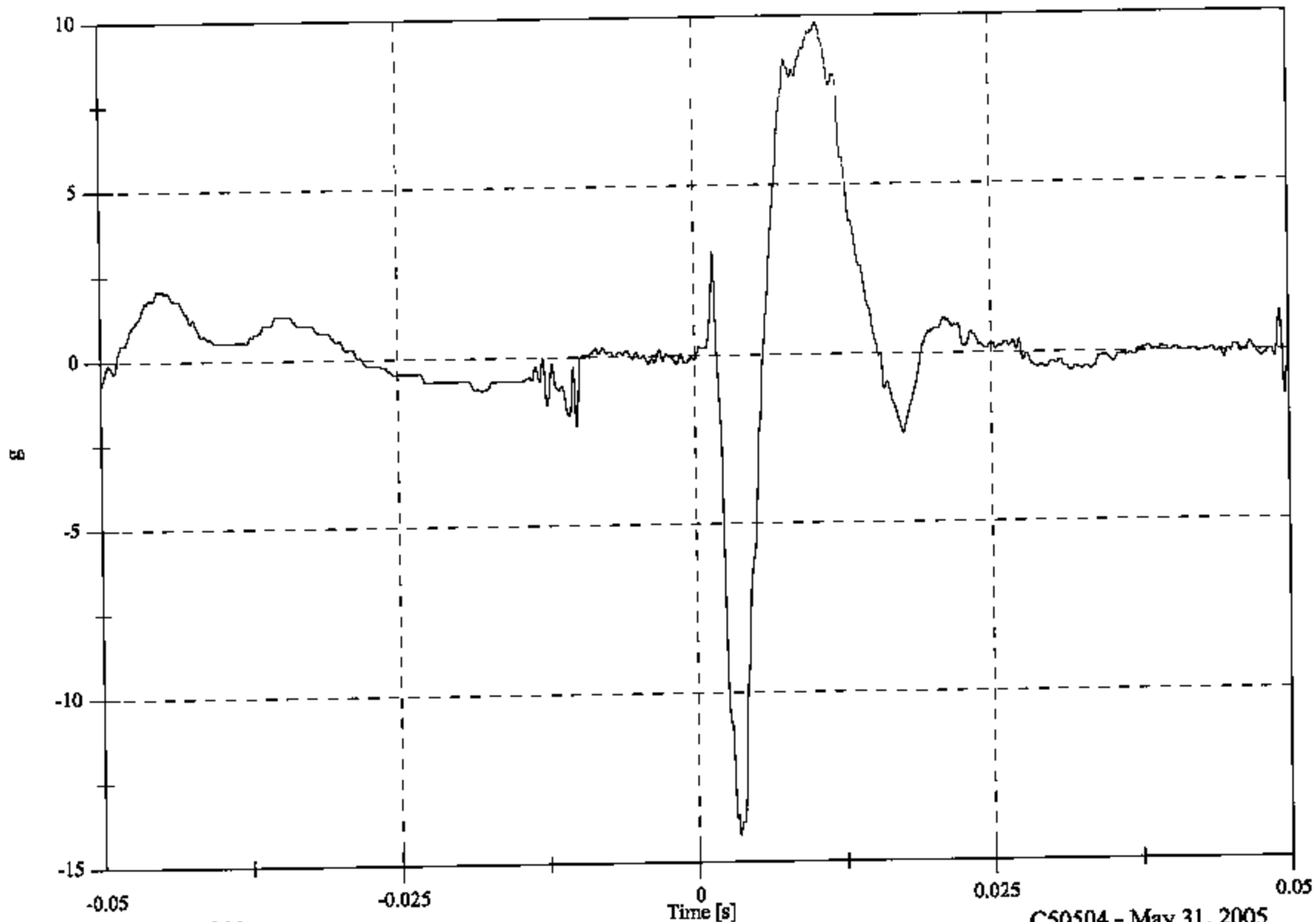
8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 9.8 [g] at 0.010 [s]

Min: -14.2 [g] at 0.003 [s]



C50504 PASSENGER SIDE BP4 IMPACT PLOT #2

8754-FMH-07

CFC_1000

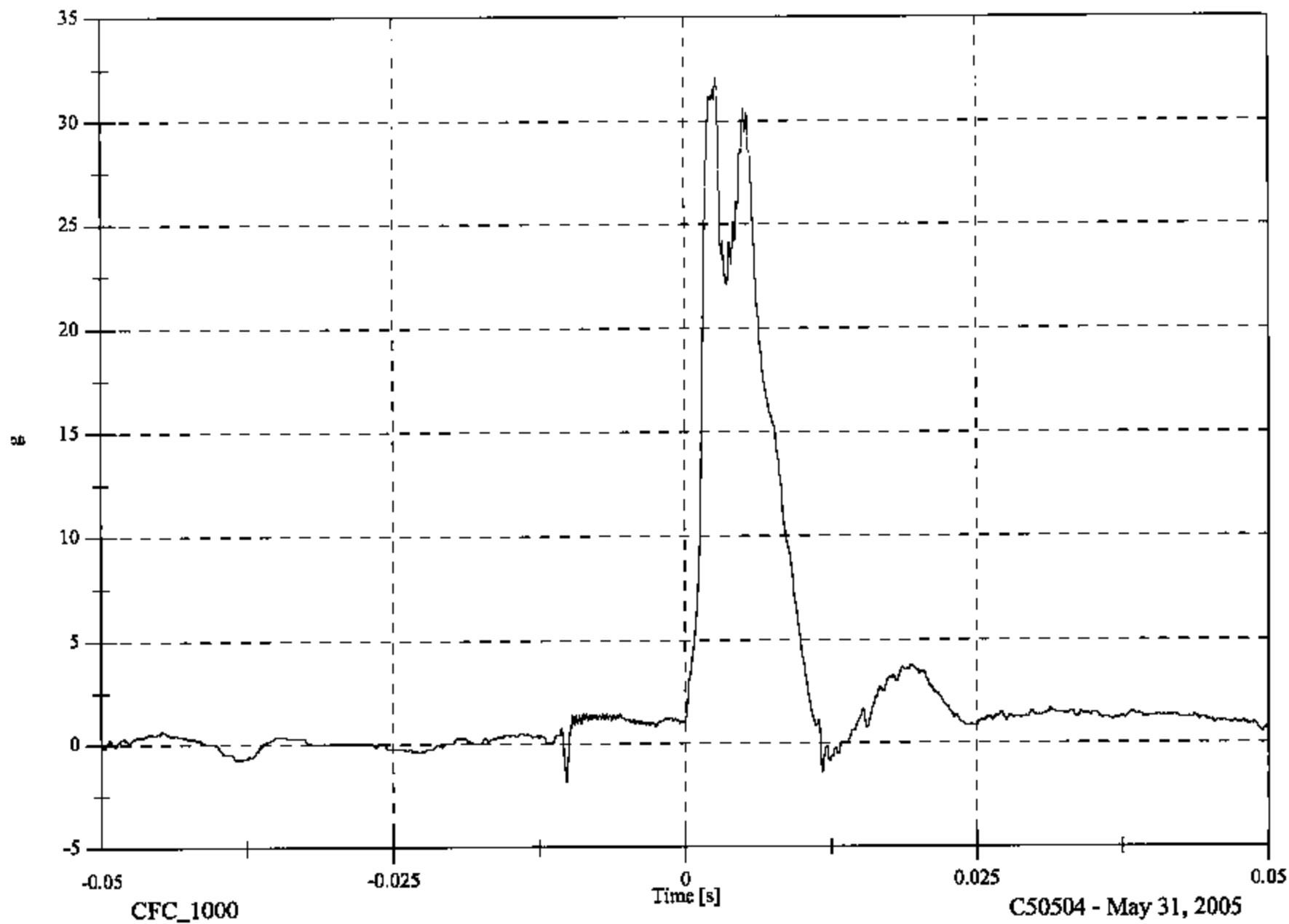
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 32.1 [g] at 0.003 [s]

Min: -1.8 [g] at -0.010 [s]



C50504 PASSENGER SIDE BP4 IMPACT PLOT #3

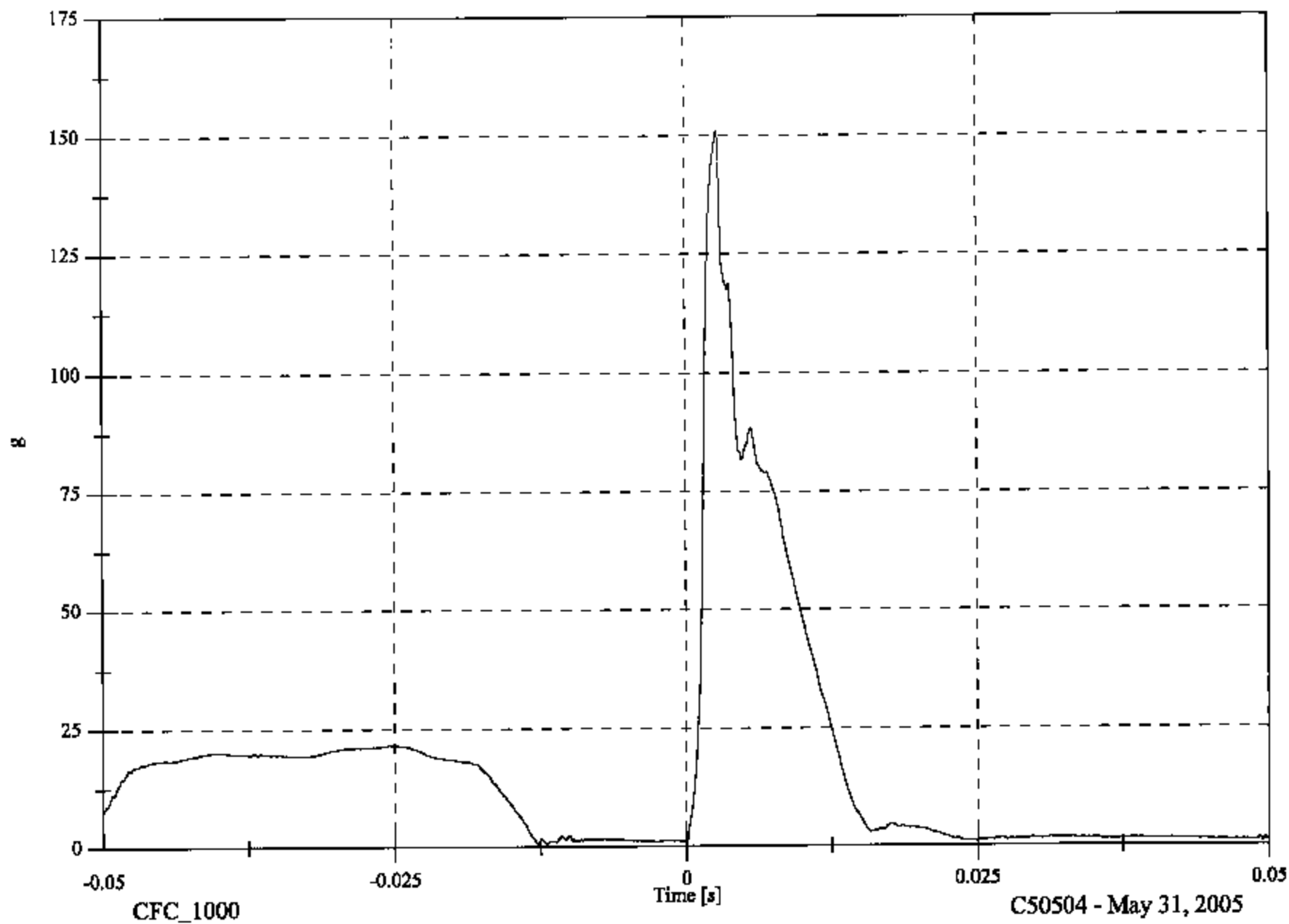
B754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 151.1 [g] at 0.003 [s]

Min: 0.5 [g] at 0.049 [s]



C50504 PASSENGER SIDE BP4 IMPACT PLOT #4

8754-FMH-07

CFC_1000

Time [s]

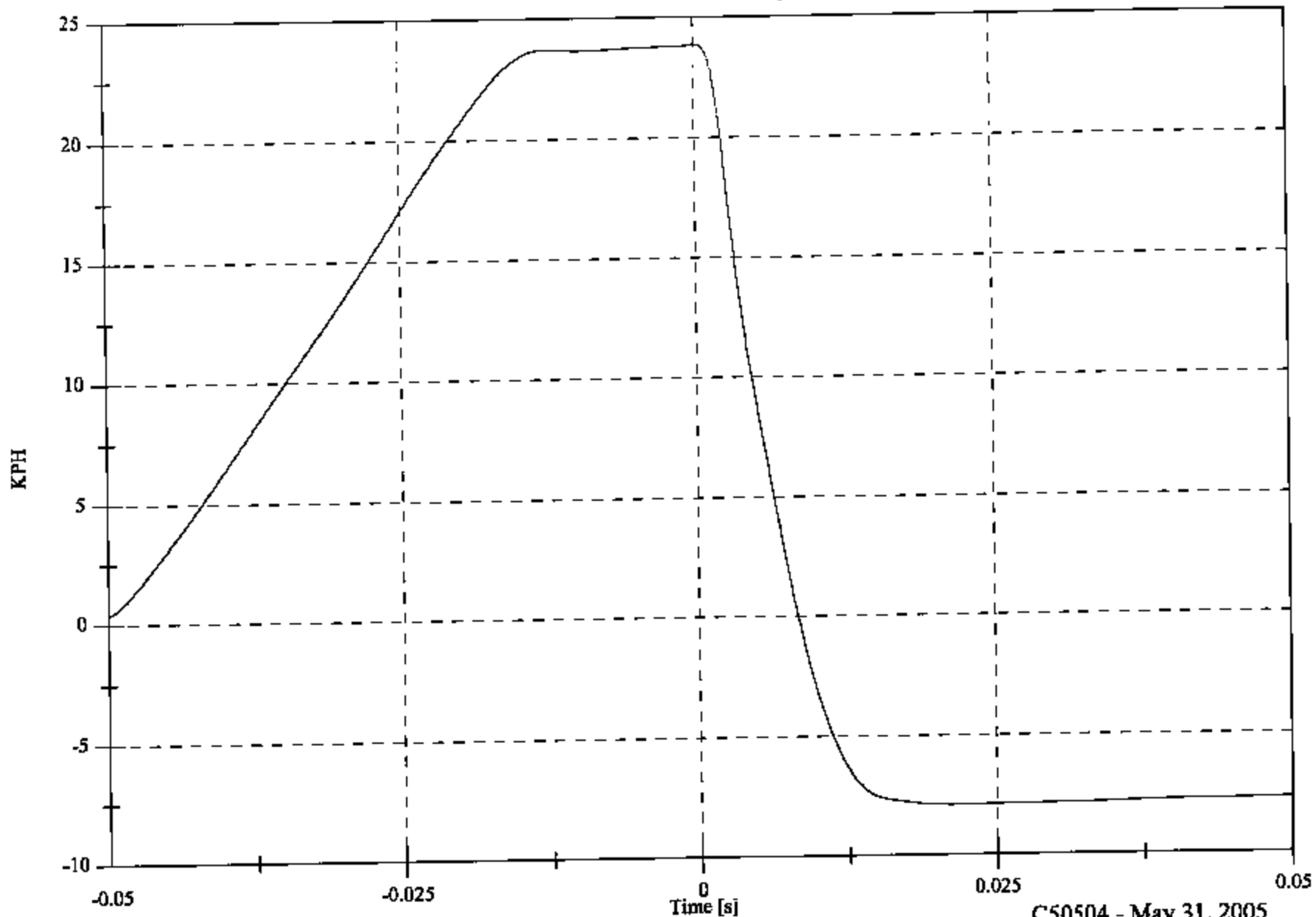
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Velocity

Max: 23.8 [KPH] at 0.000 [s]

Min: -7.9 [KPH] at 0.021 [s]



C50504 PASSENGER SIDE BP4 IMPACT PLOT #5

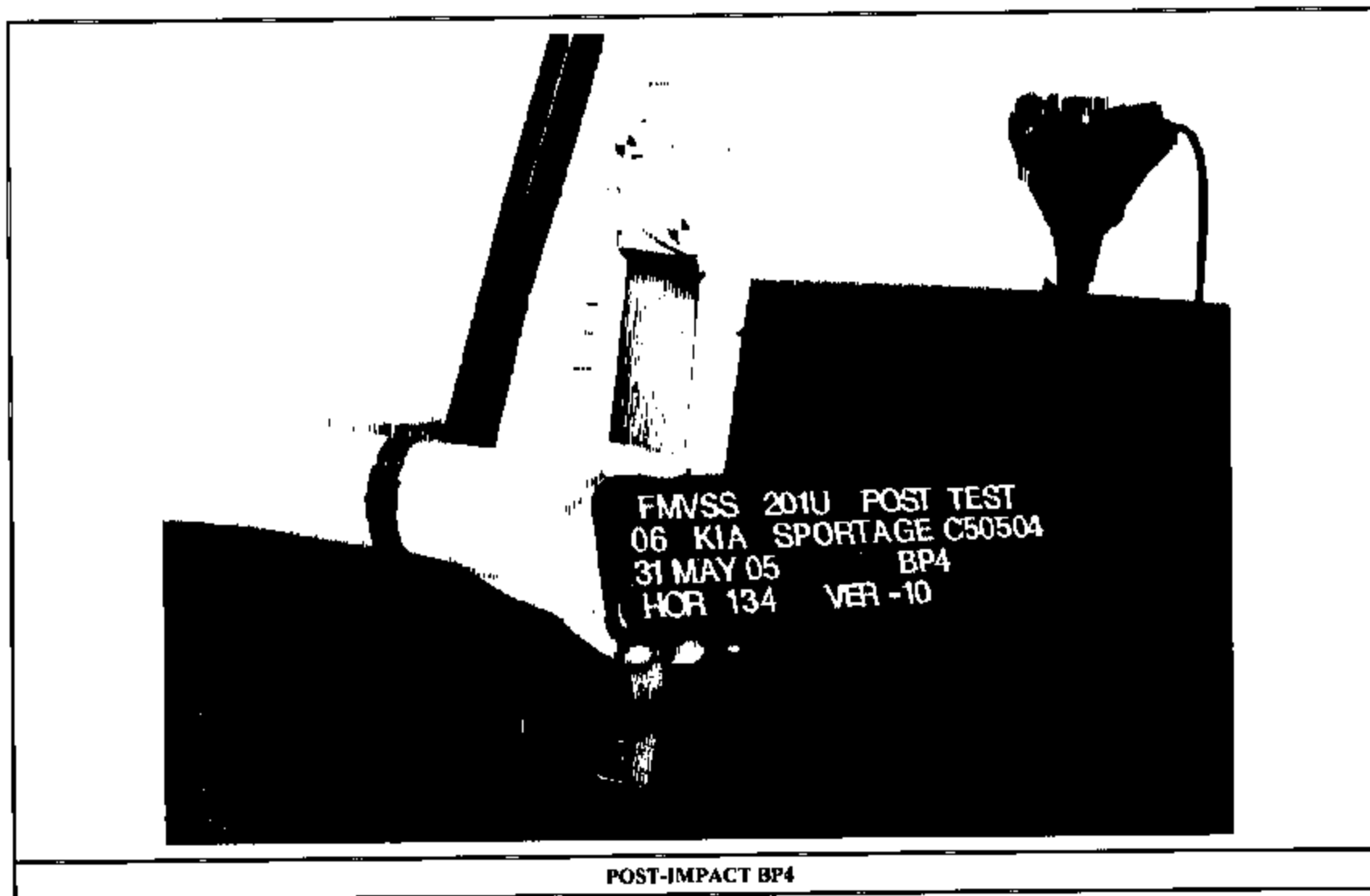
8754-FMH-07

CFC_180

C50504 - May 31, 2005



PRE-IMPACT BP4



VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL.)
COLOR:	Olive Green

Test Number:	09
Test Date:	05/31/05
Target Location:	B-PILLAR
Target Code:	BP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	25°
Ambient Temperature:	22.8C°
Relative Humidity:	40.8
Time of Impact:	15:20
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	9		mm right	x mm left
On Centerline	22		mm up	



POST-IMPACT BP1 HEADFORM

Free Motion HIC	550.6
HIC(d)	581.8
Impact Velocity (kph)	18.65
HIC T1 (msec)	5.5
HIC T2 (msec)	11.8

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - BP1

FMH Headform 0805

Location: BP1

Test Date: May 31, 2005

Work File: BP1

TEST RESULTS

Lab Temperature: 22.8 C

HICd: 581.8

Lab Humidity: 40.8 %

HIC (36ms): 550.6

Velocity at Impact: 18.65 KPH

t1: 5.5 msec

t2: 11.9 msec

Free Flight Distance: 210.56 mm

Duration: 6.3 msec

Maximum: 115.6 g

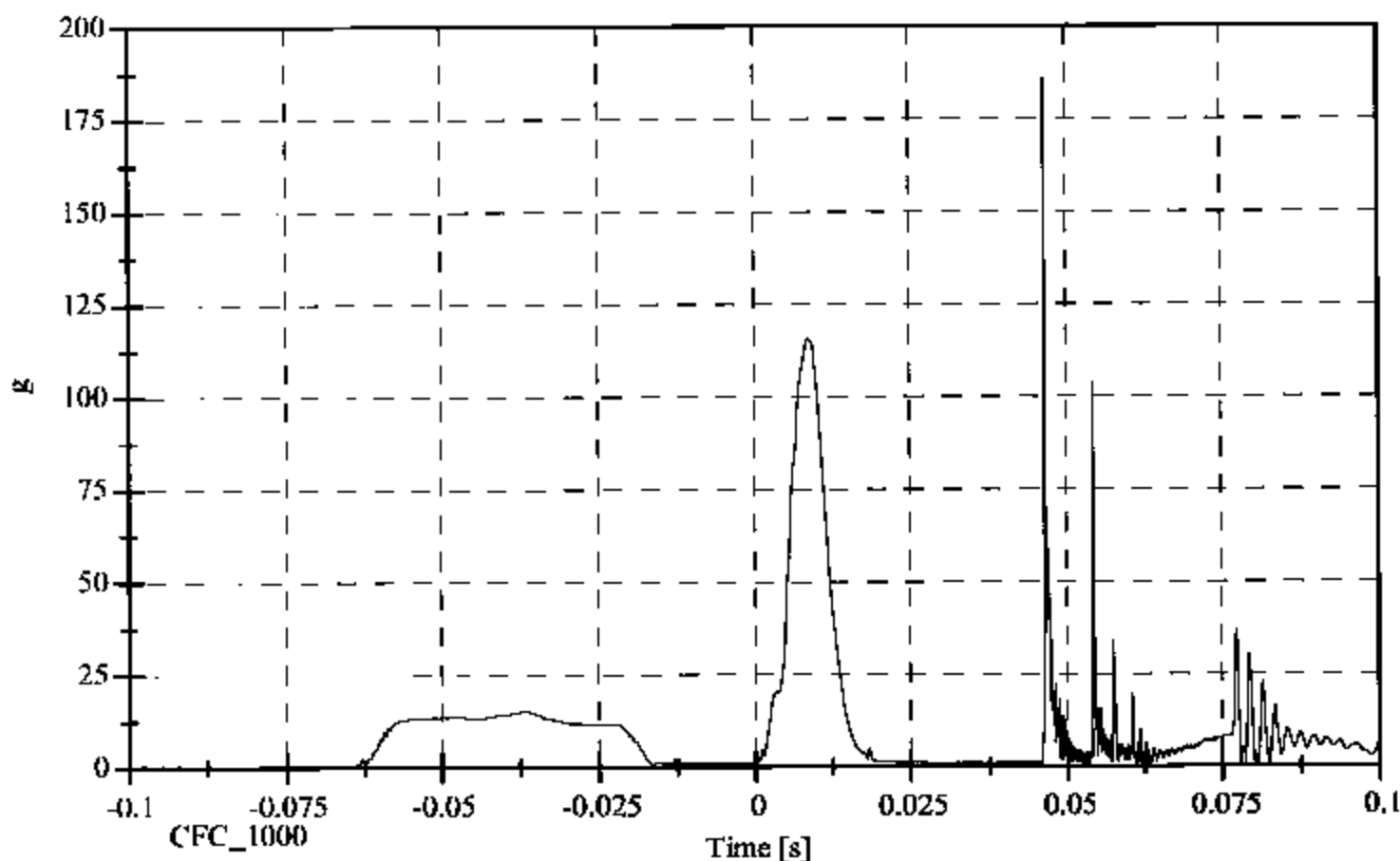
Average Acceleration: 9.4 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 115.6 [g] at 0.009 [s]

Headform Resultant

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

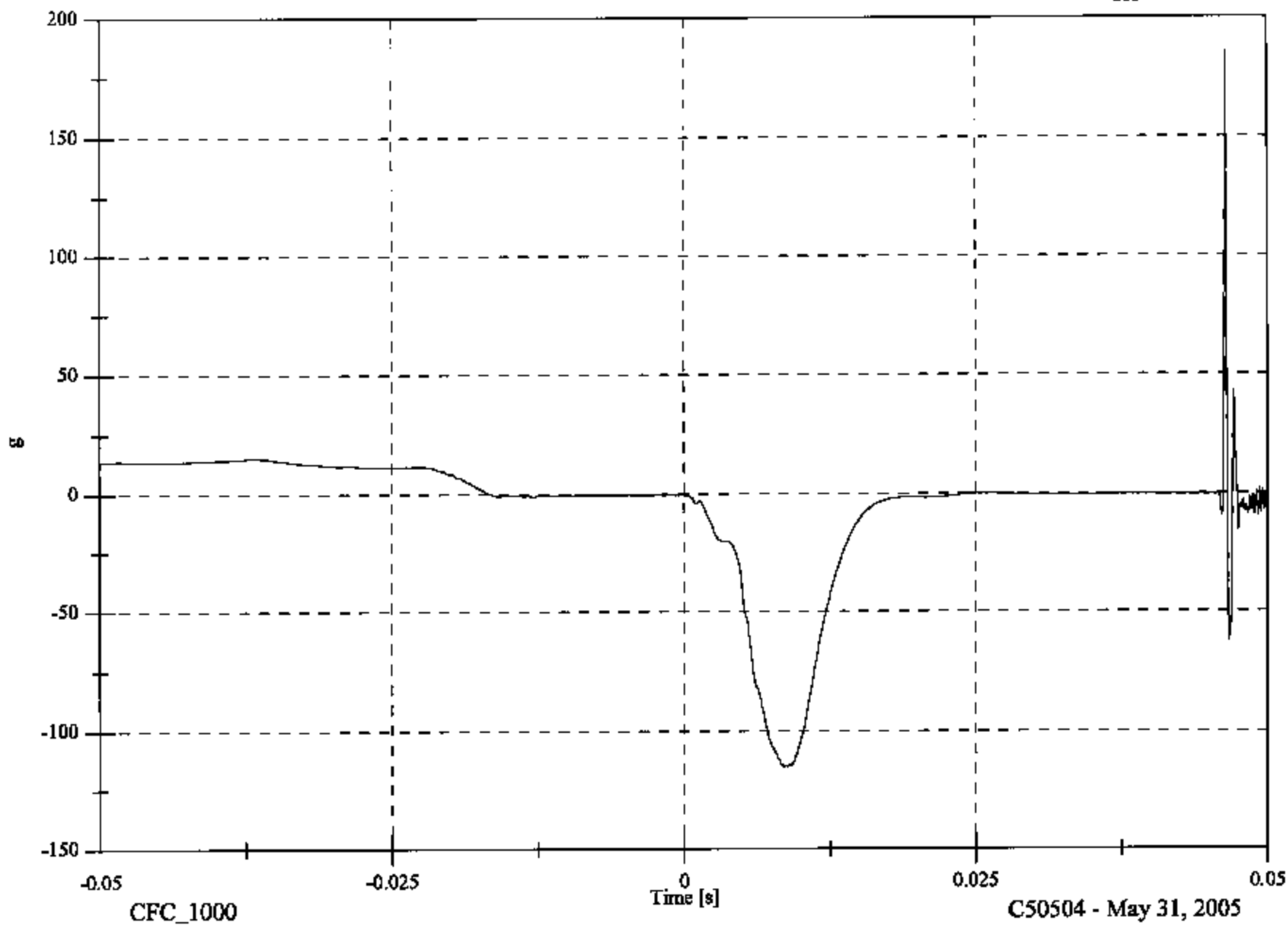


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 185.6 [g] at 0.046 [s]

Min: -115.2 [g] at 0.009 [s]



C50504 PASSENGER SIDE BP1 IMPACT PLOT #1

8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

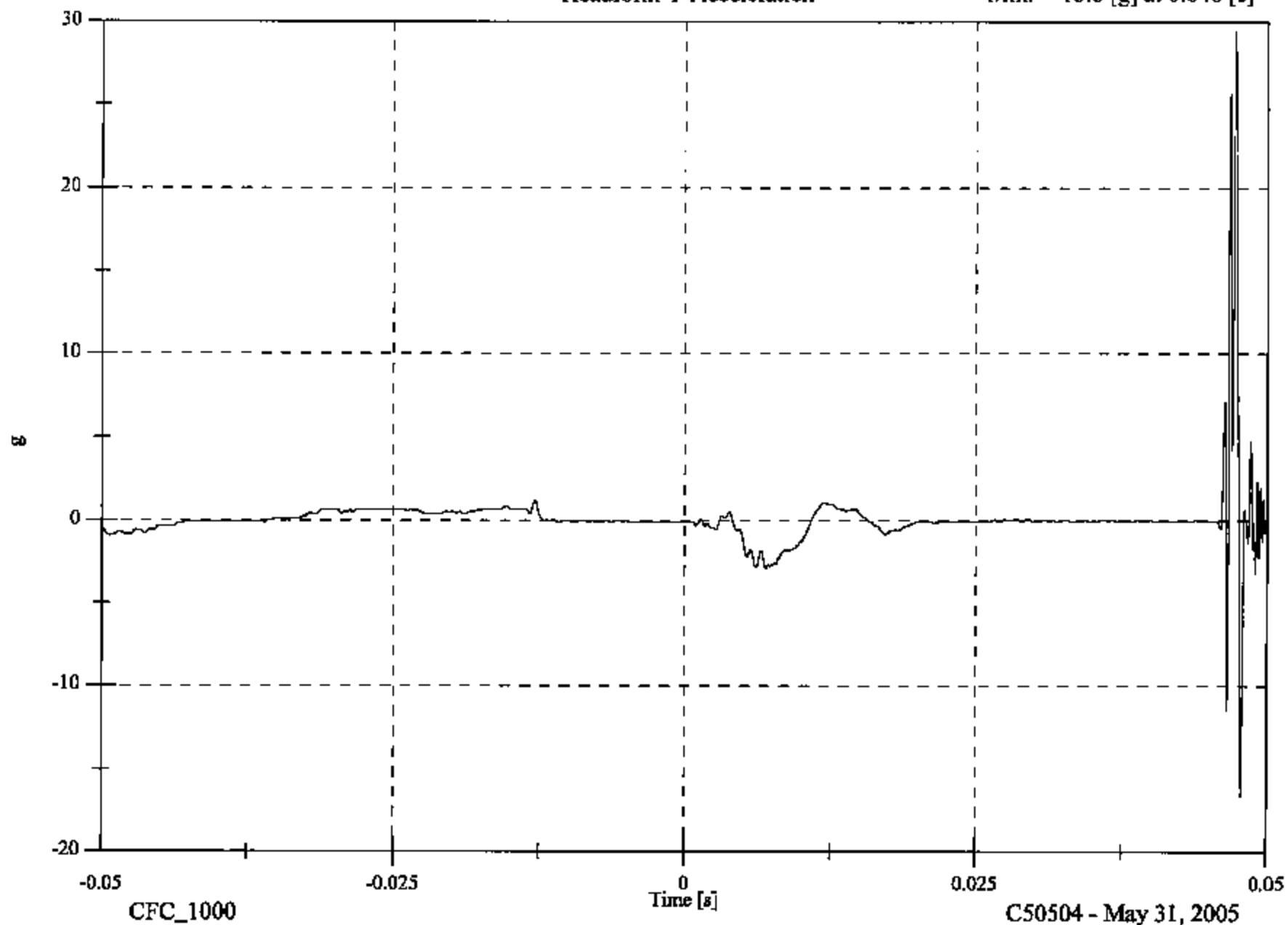
Headform Y Acceleration

Max: 29.4 [g] at 0.047 [s]

Min: -16.6 [g] at 0.048 [s]

C50504 PASSENGER SIDE BP1 IMPACT PLOT #2

8754-FMH-07



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

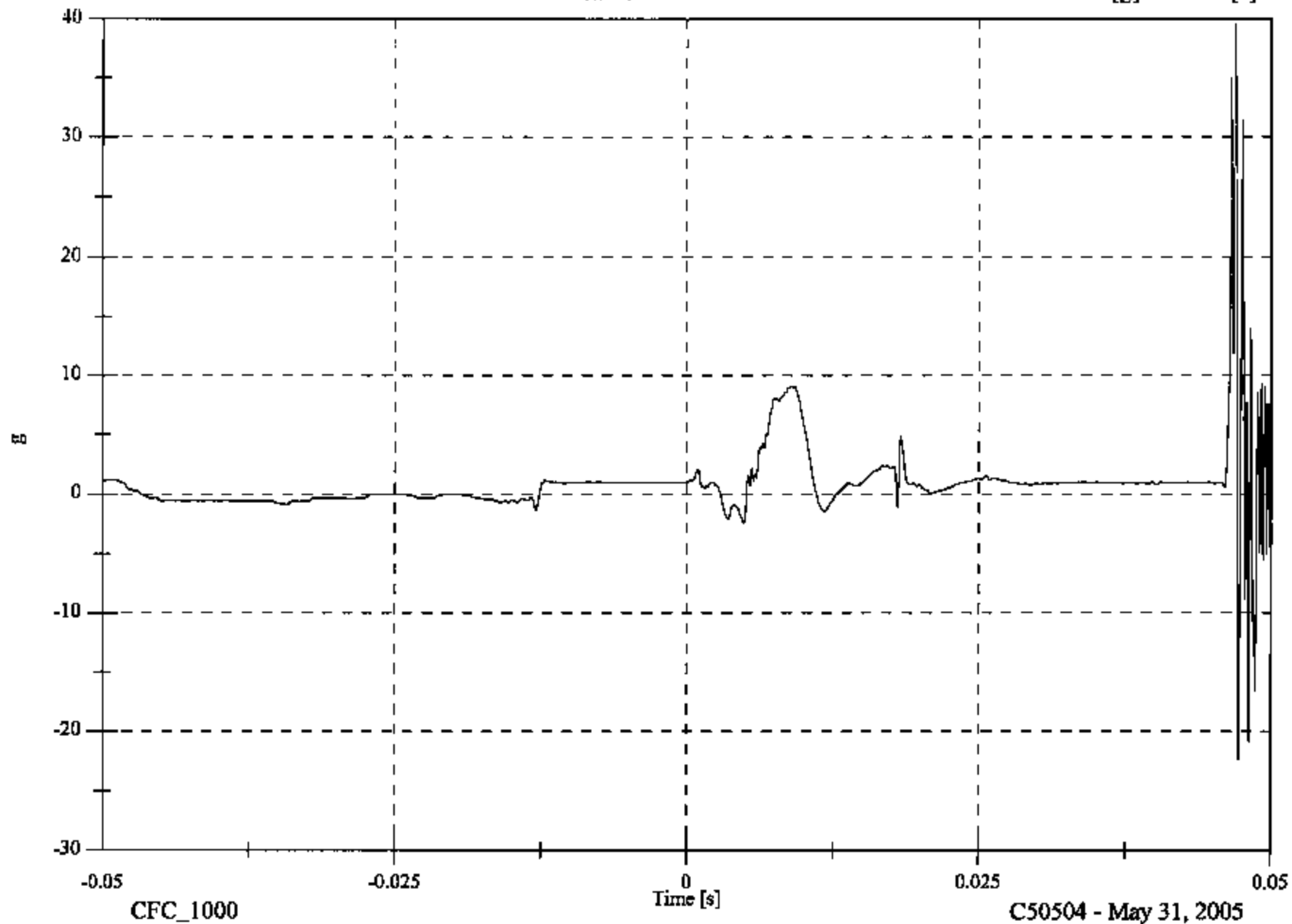
Headform Z Acceleration

Max: 39.5 [g] at 0.047 [s]

Min: -22.3 [g] at 0.047 [s]

C50504 PASSENGER SIDE BPI IMPACT PLOT #3

8754-FMH-07

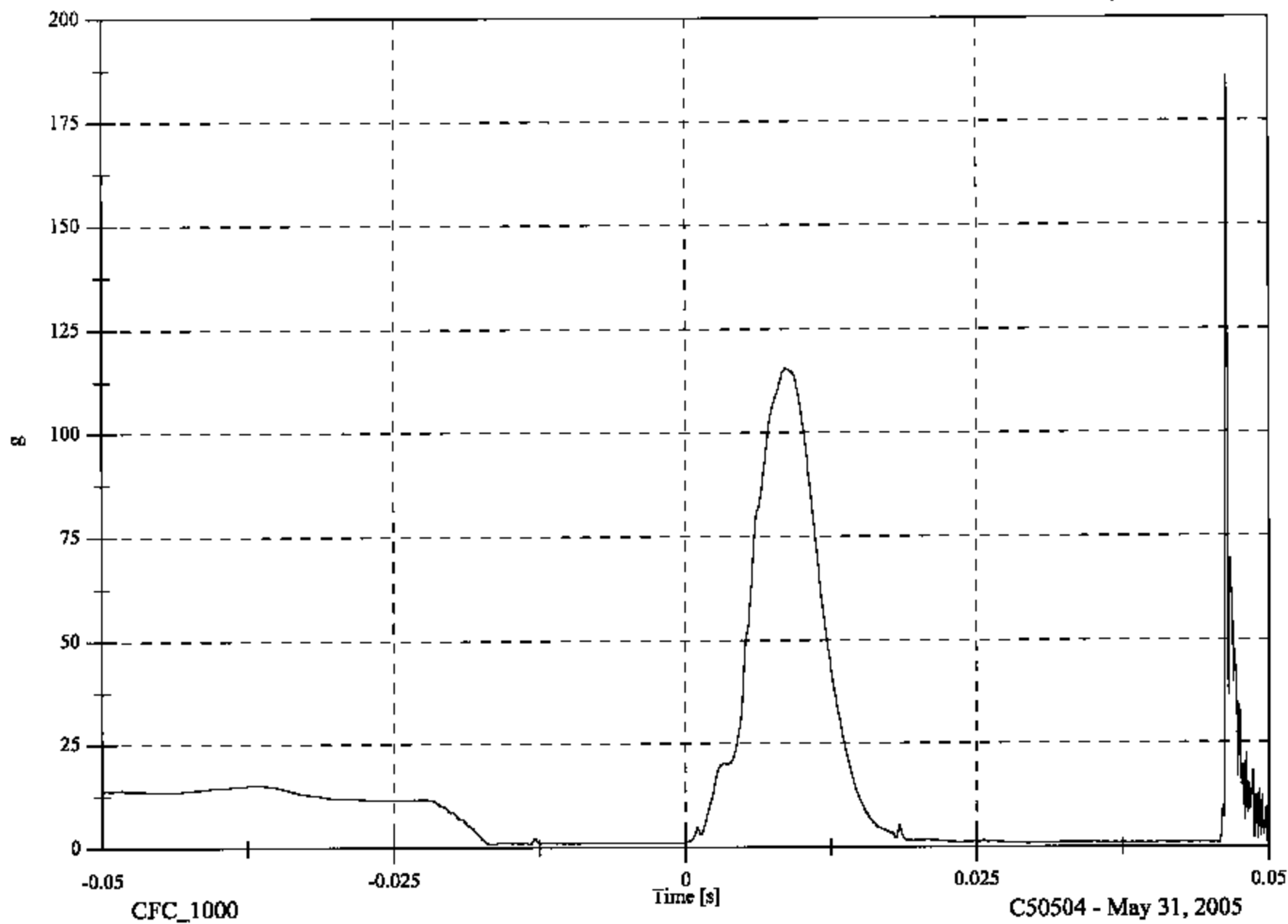


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 185.9 [g] at 0.046 [s]

Min: 0.8 [g] at -0.017 [s]



C50504 PASSENGER SIDE BPI IMPACT PLOT #4

8754-FMH-07

CFC_1000

Time [s]

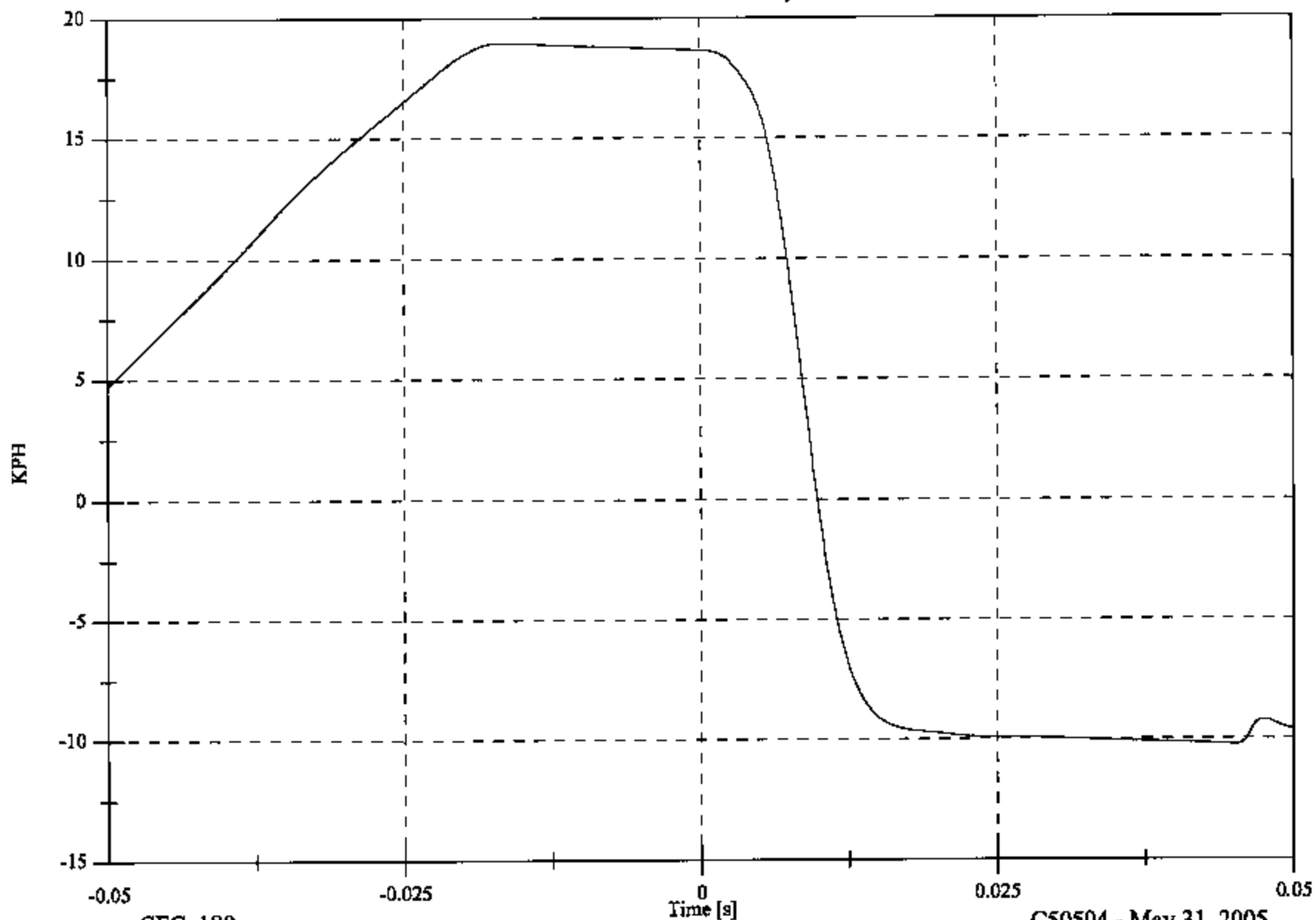
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Velocity

Max: 19.0 [KPH] at -0.017 [s]

Min: -10.3 [KPH] at 0.045 [s]

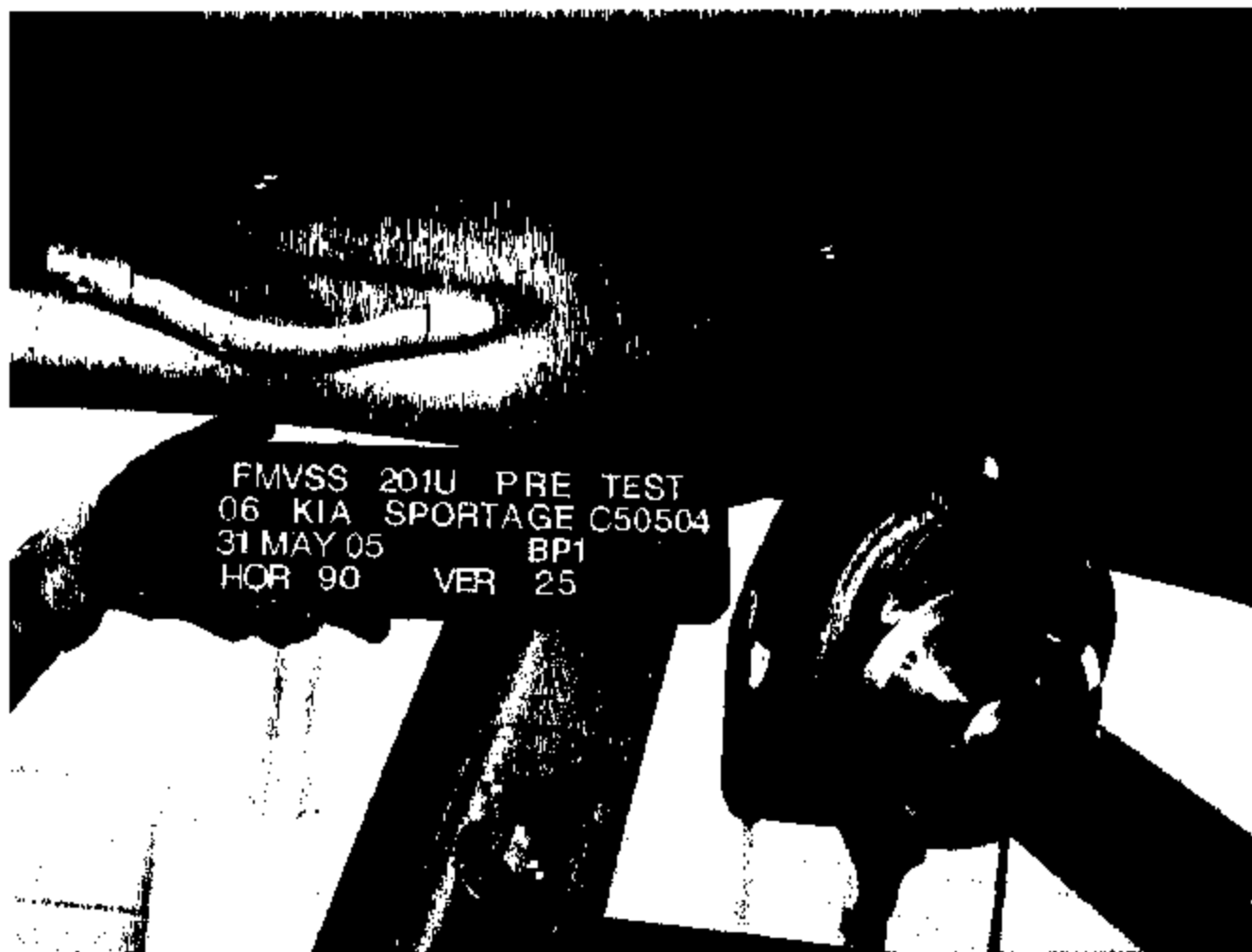


C50504 PASSENGER SIDE BPI IMPACT PLOT #5

8754-FMH-07

CFC_180

C50504 - May 31, 2005



PRE-IMPACT BP1

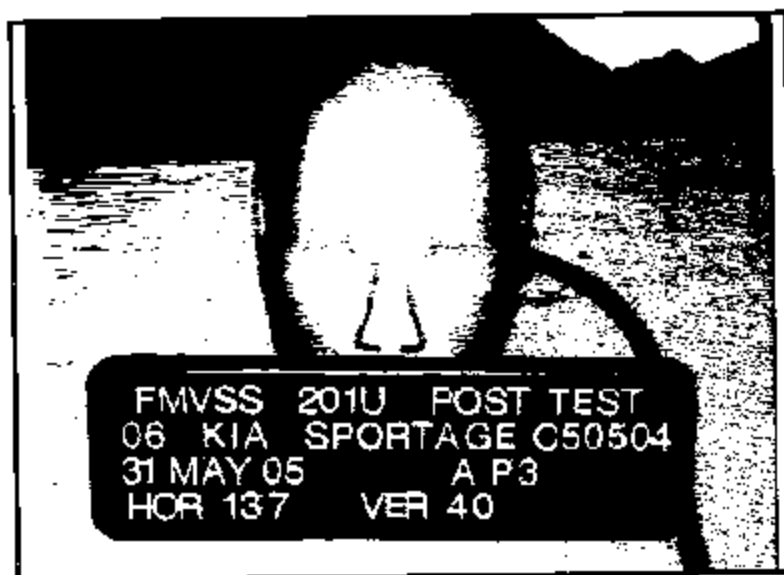


POST-IMPACT BP1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL)
COLOR:	Olive Green

Test Number:	10
Test Date:	05/31/05
Target Location:	A-PILLAR
Target Code:	AP3
Horizontal Impact Angle:	137°
Vertical Impact Angle:	40°
Ambient Temperature:	22.9C°
Relative Humidity:	40.8
Time of Impact:	16:00
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	4	☐ mm right	☒ mm left
On Centerline	8	mm up	



POST-IMPACT AP3 HEADFORM

Free Motion HIC	251.0
HIC(d)	355.8
Impact Velocity (kph)	18.42
HIC T1 (msec)	2.5
HIC T2 (msec)	15.2

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - AP3

FMH Headform 1255

Location: AP3

Test Date: May 31, 2005

Work File: AP3

TEST RESULTS

Lab Temperature: 22.9 C

HICd: 355.8

Lab Humidity: 40.8 %

HIC (36ms): 251.0

Velocity at Impact: 18.42 KPH

t1: 2.6 msec

t2: 15.2 msec

Free Flight Distance: 210.87 mm

Duration: 12.6 msec

Maximum: 82.5 g

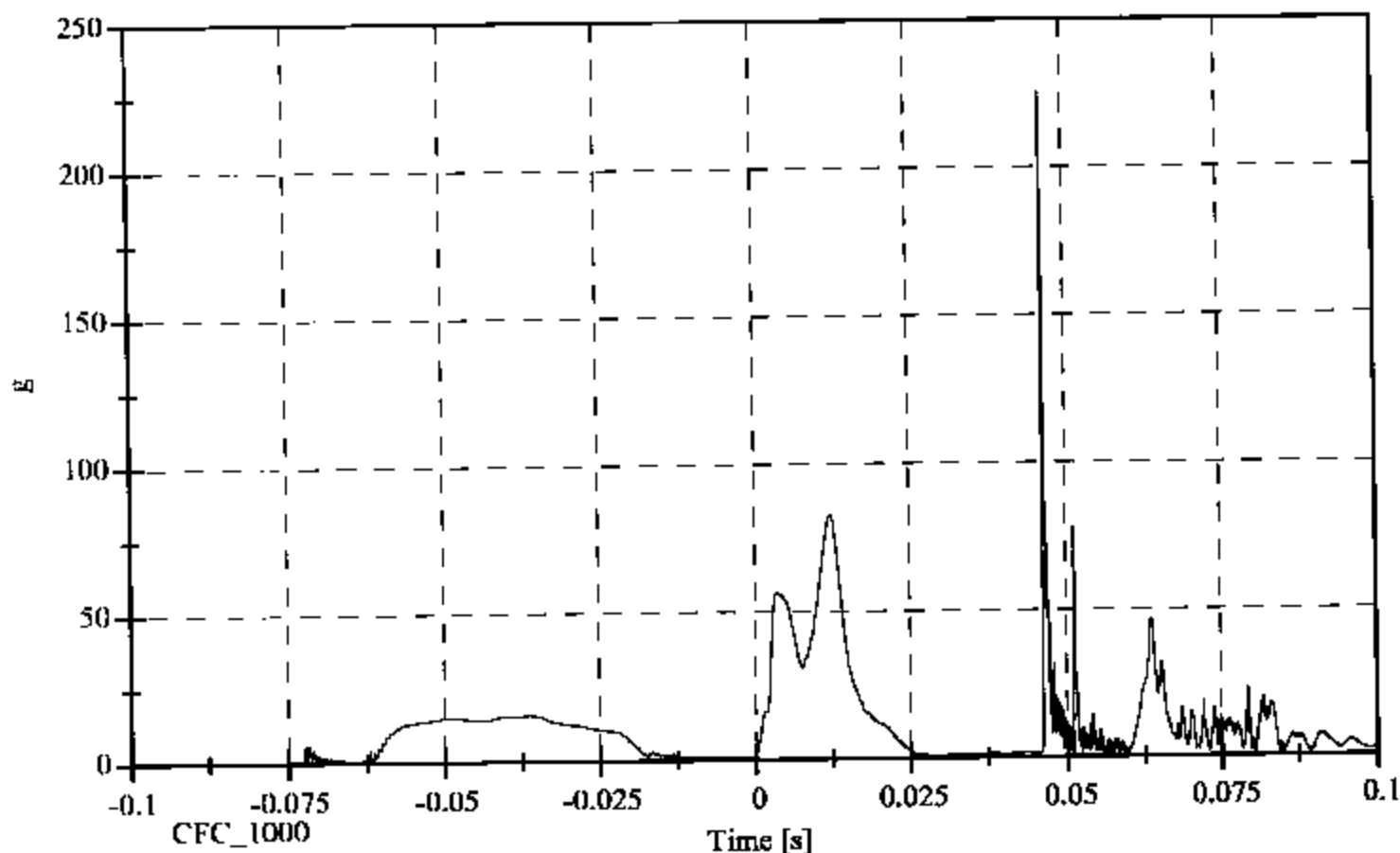
Average Acceleration: 10.0 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 82.5 [g] at 0.012 [s]

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



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

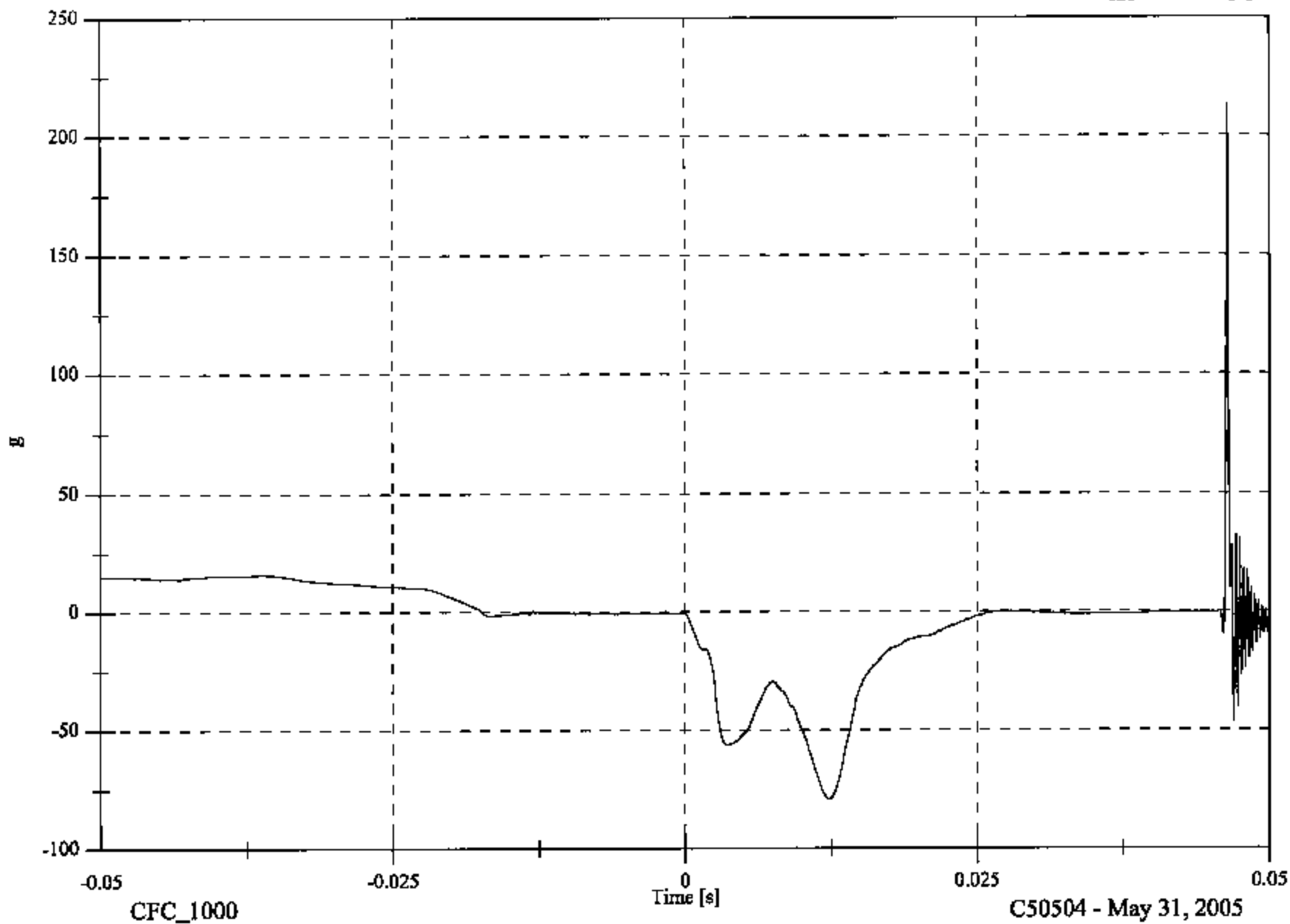
Headform X Acceleration

Max: 213.3 [g] at 0.046 [s]

Min: -79.3 [g] at 0.012 [s]

C50504 PASSENGER SIDE AP3 IMPACT PLOT #1

8754-FMH-07

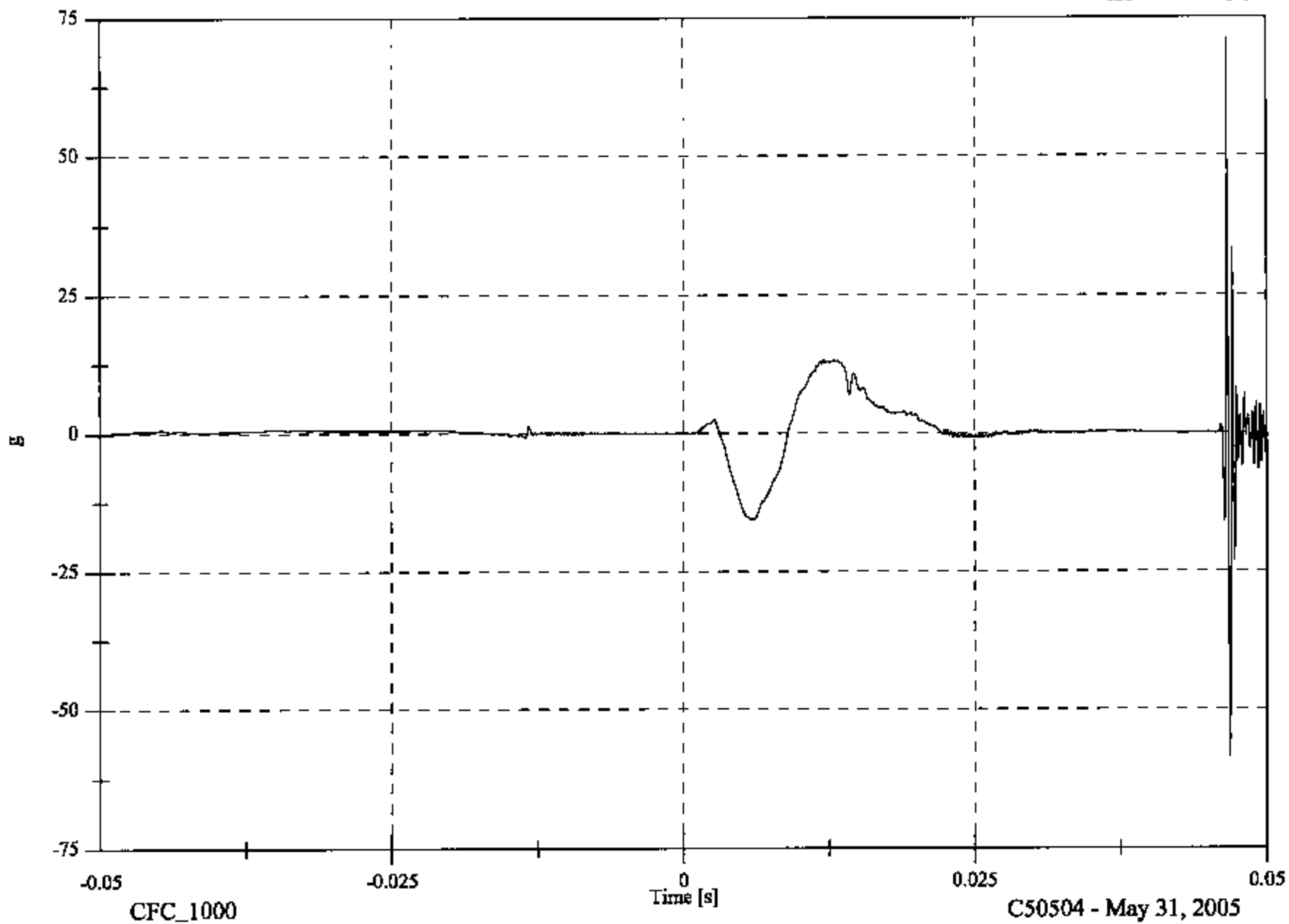


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 71.1 [g] at 0.047 [s]

Min: -58.5 [g] at 0.047 [s]



C50504 PASSENGER SIDE AP3 IMPACT PLOT #2

8754-FMH-07

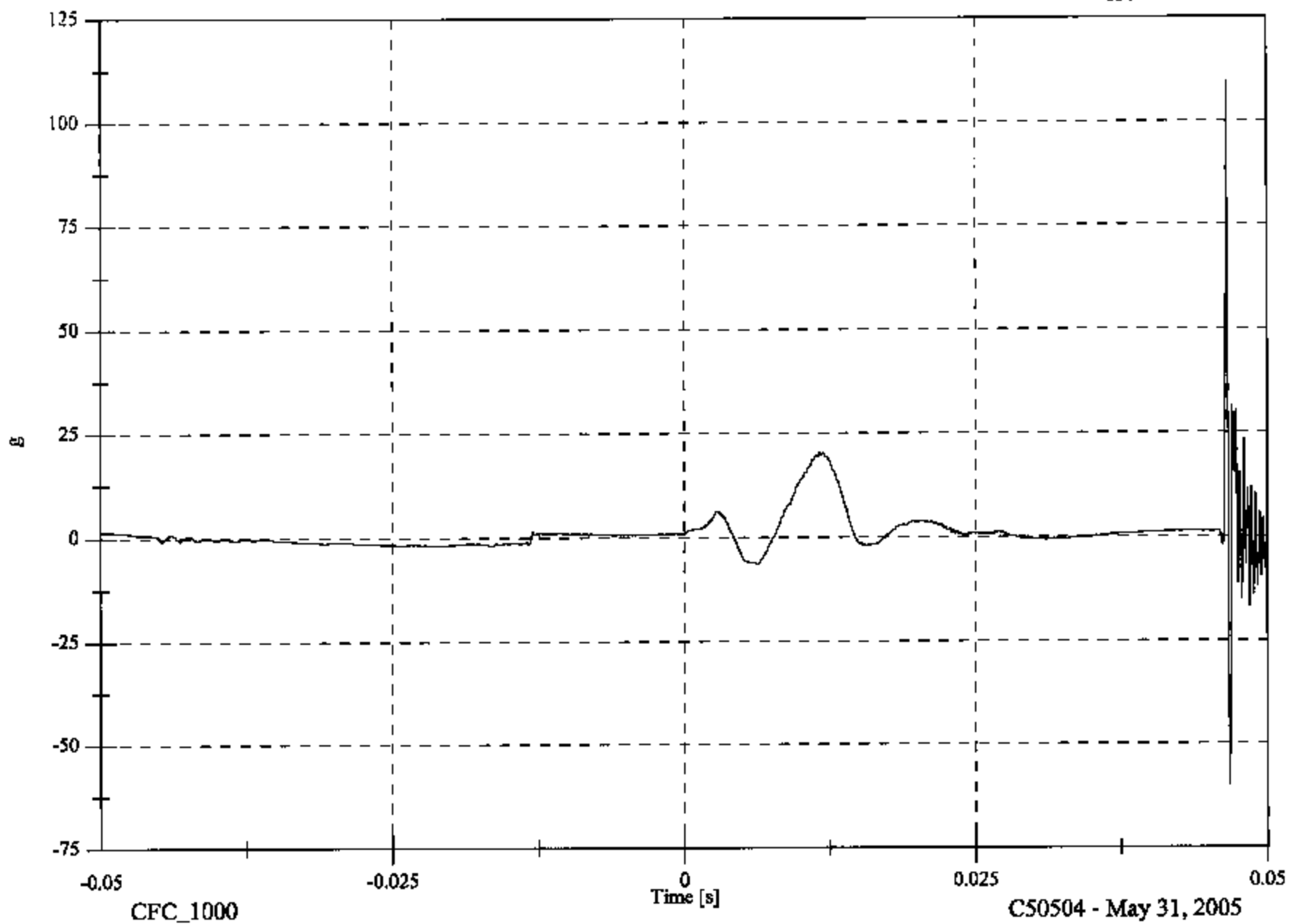
C50504 - May 31, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Z Acceleration

Max: 109.5 [g] at 0.047 [s]

Min: -60.0 [g] at 0.047 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

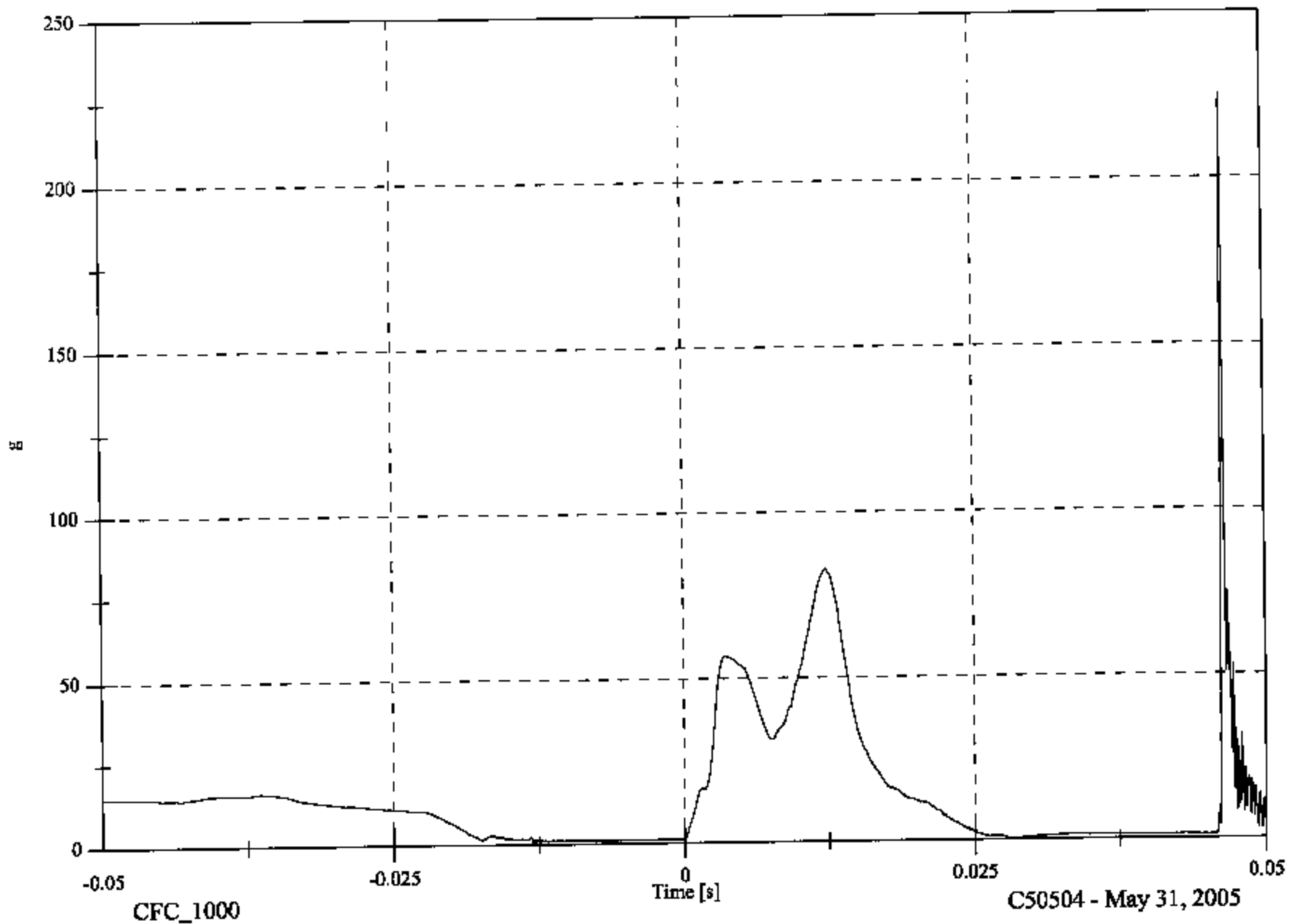
Headform Resultant

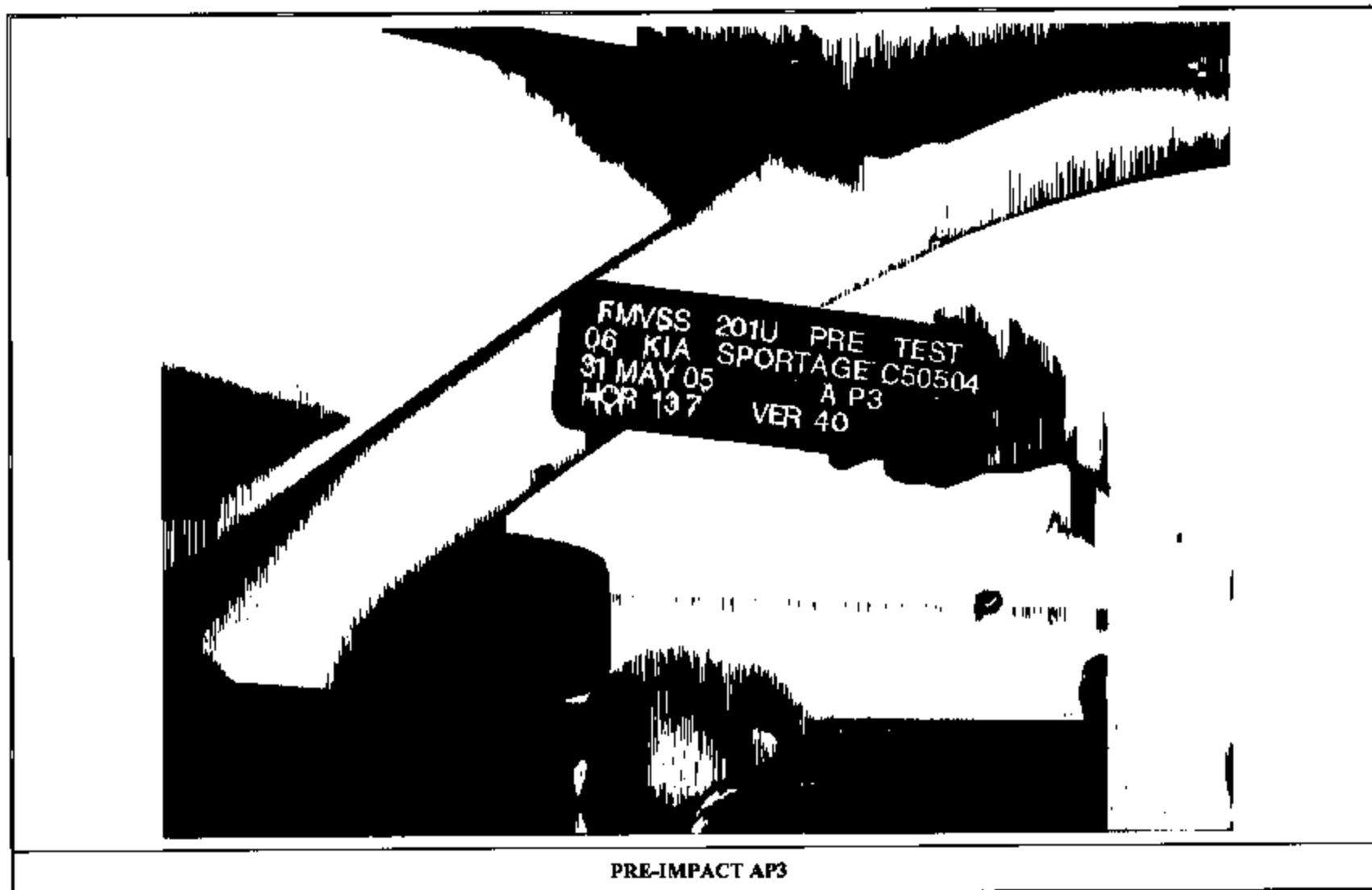
Max: 225.1 [g] at 0.046 [s]

Min: 0.2 [g] at 0.029 [s]

C50504 PASSENGER SIDE AP3 IMPACT PLOT #4

8754-FMH-07





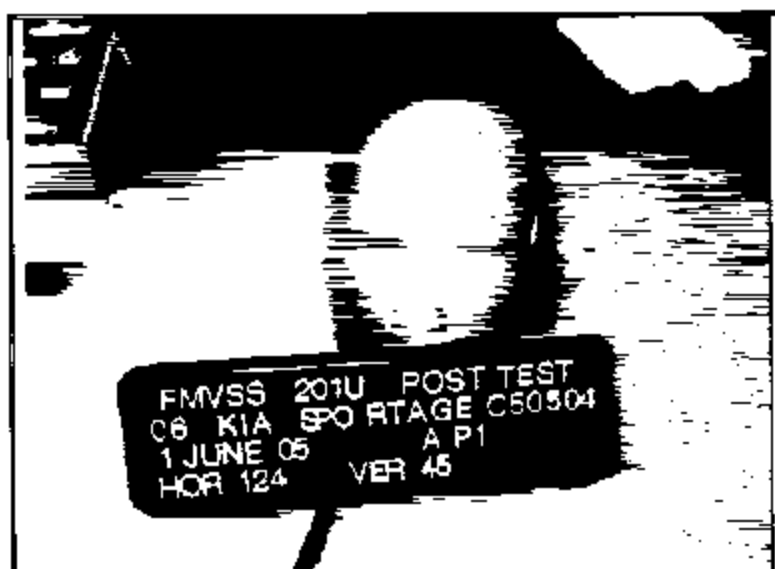
FMVSS 201U POST TEST
06 KIA SPORTAGE C50504
31 MAY 05 A P3
HOR 137 VER 40

POST-IMPACT AP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04(SEE CERTIFICATION LABEL.)
COLOR:	Olive Green

Test Number:	11
Test Date:	06/01/05
Target Location:	A-PILLAR
Target Code:	AP1
Horizontal Impact Angle:	124°
Vertical Impact Angle:	45°
Ambient Temperature:	22.3C°
Relative Humidity:	42.3
Time of Impact:	8:20
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	mm right	mm left
On Centerline	9	mm up	



POST-IMPACT AP1 HEADFORM

Free Motion HIC'	349.1
HIC'(d)	429.8
Impact Velocity (kph)	18.81
HIC' T1 (msec)	4.3
HIC' T2 (msec)	11.8

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - AP1

FMH Headform 1255

Location: AP1

Test Date: June 01, 2005

Work File: AP1

-----TEST RESULTS-----

Lab Temperature: 22.3 C

HICd: 429.8

Lab Humidity: 42.3 %

HIC (36ms): 349.1

Velocity at Impact: 18.81 KPH

t1: 4.4 msec

t2: 11.8 msec

Free Flight Distance: 214.89 mm

Duration: 7.4 msec

Maximum: 95.8 g

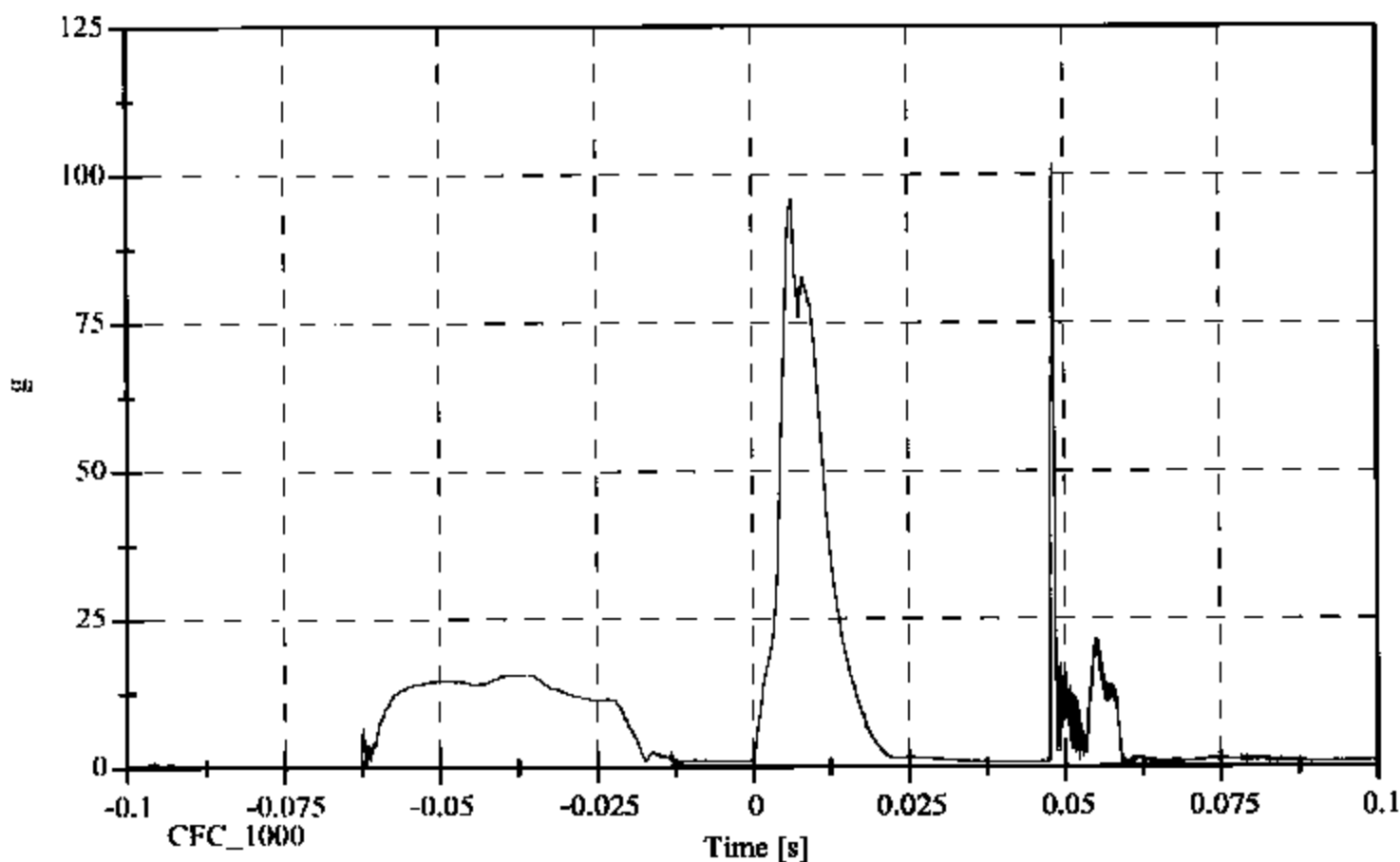
Average Acceleration: 8.0 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 95.8 [g] at 0.006 [s]

Headform Resultant

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

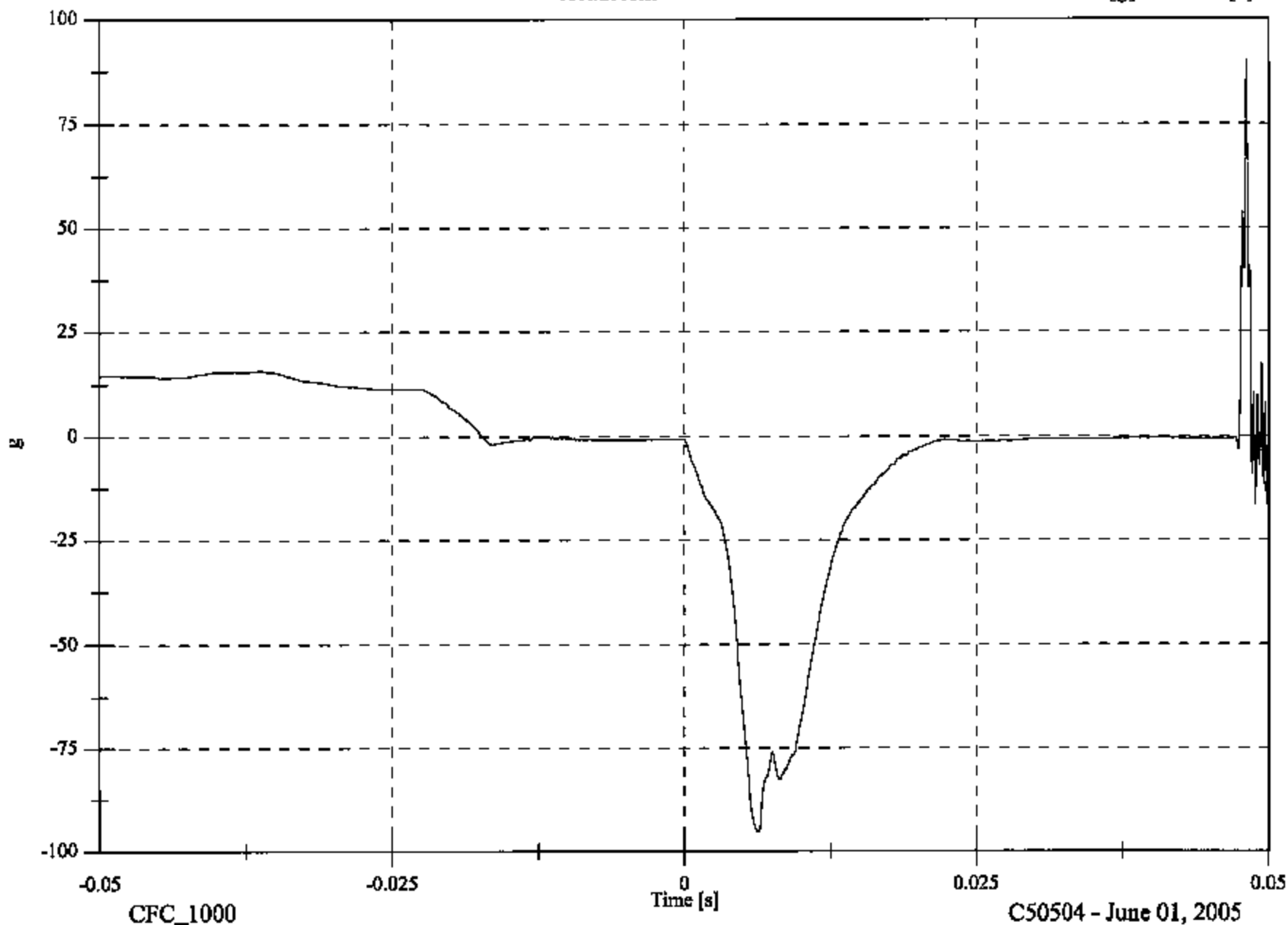


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 90.1 [g] at 0.048 [s]

Min: -95.4 [g] at 0.006 [s]



C50504 PASSENGER SIDE API IMPACT PLOT #1

8754-FMH-07

CFC_1000

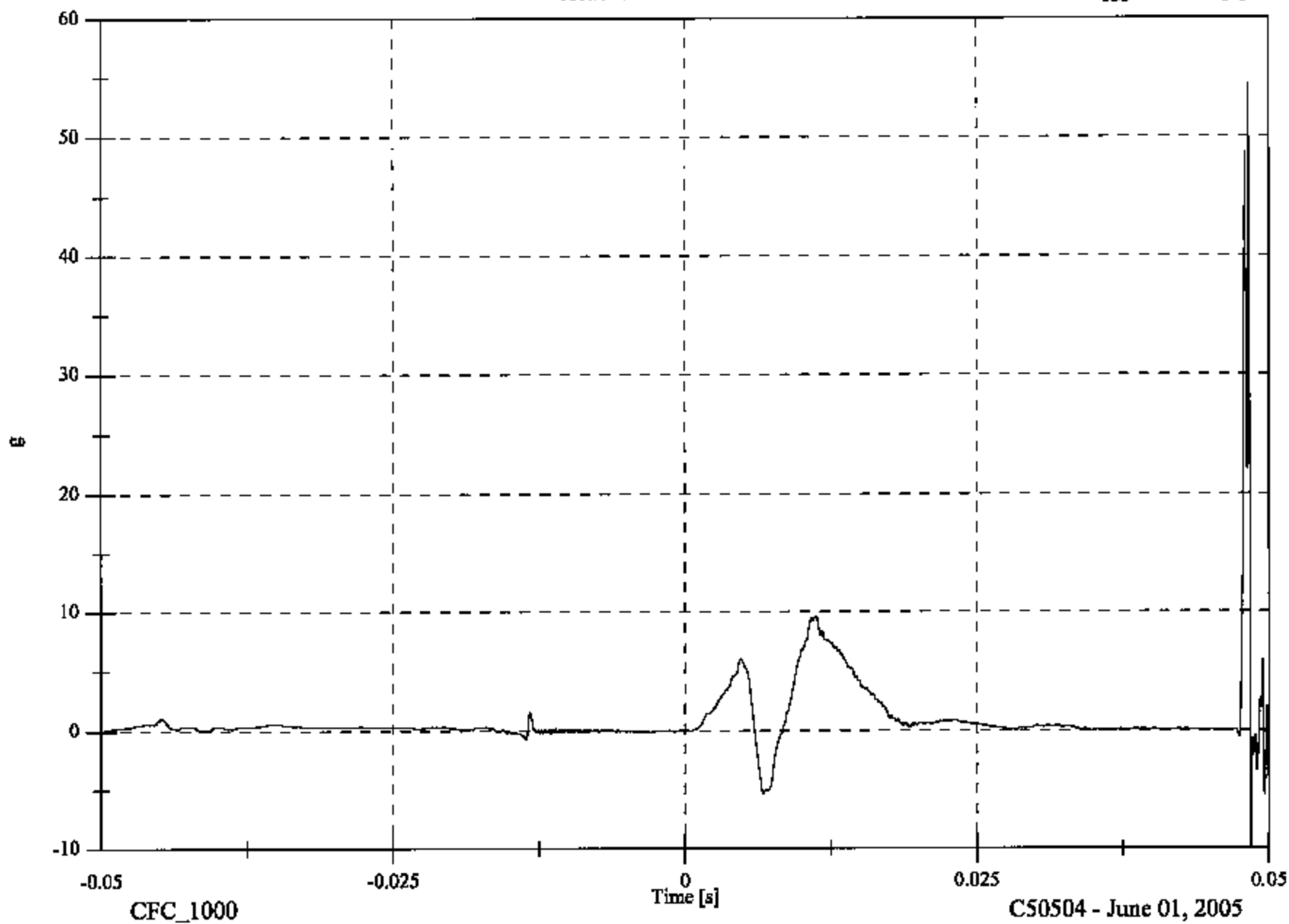
C50504 - June 01, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 54.4 [g] at 0.048 [s]

Min: -9.8 [g] at 0.049 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

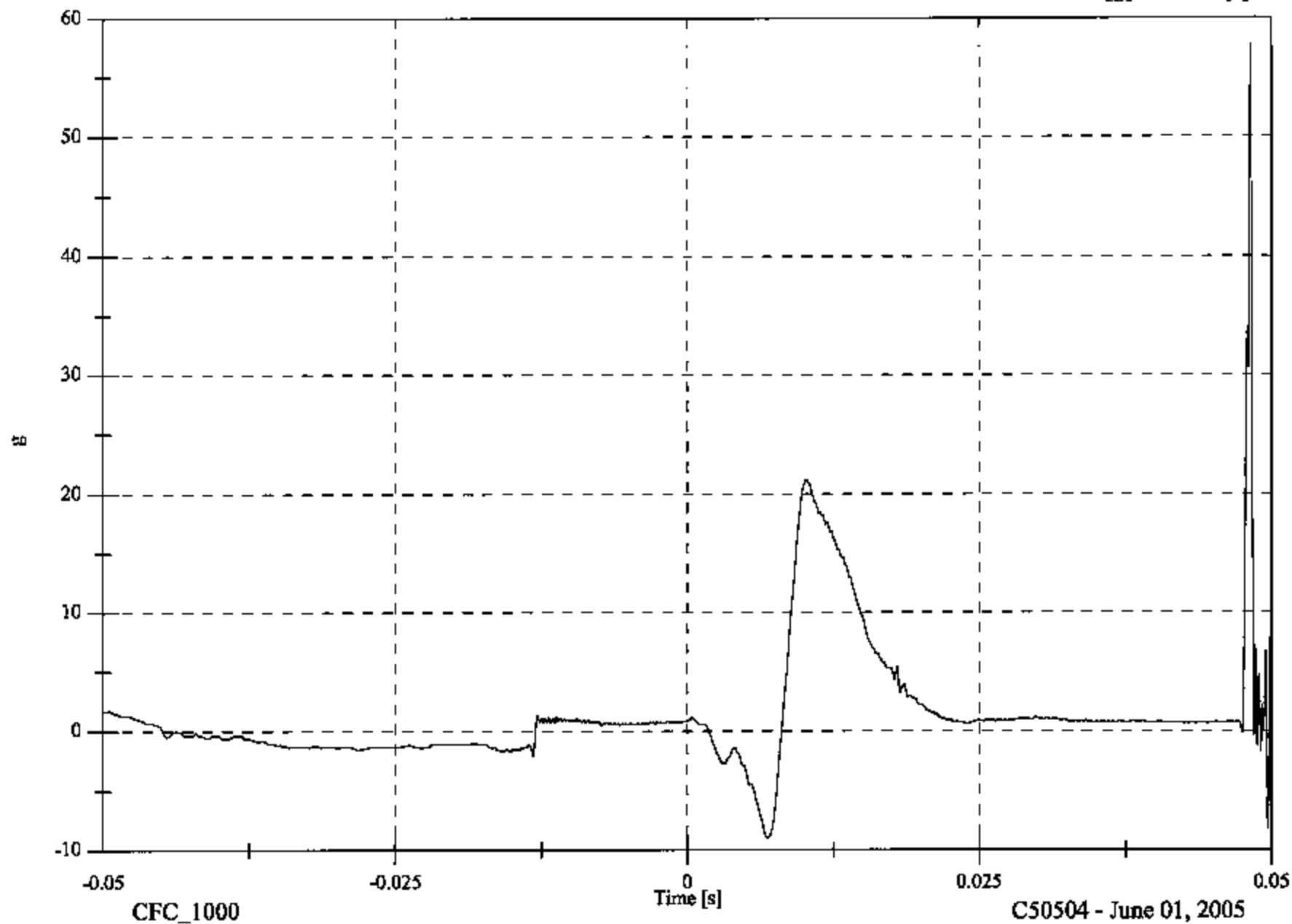
Headform Z Acceleration

Max: 57.8 [g] at 0.048 [s]

Min: -9.0 [g] at 0.007 [s]

C50504 PASSENGER SIDE AP1 IMPACT PLOT #3

8754-FMH-07



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

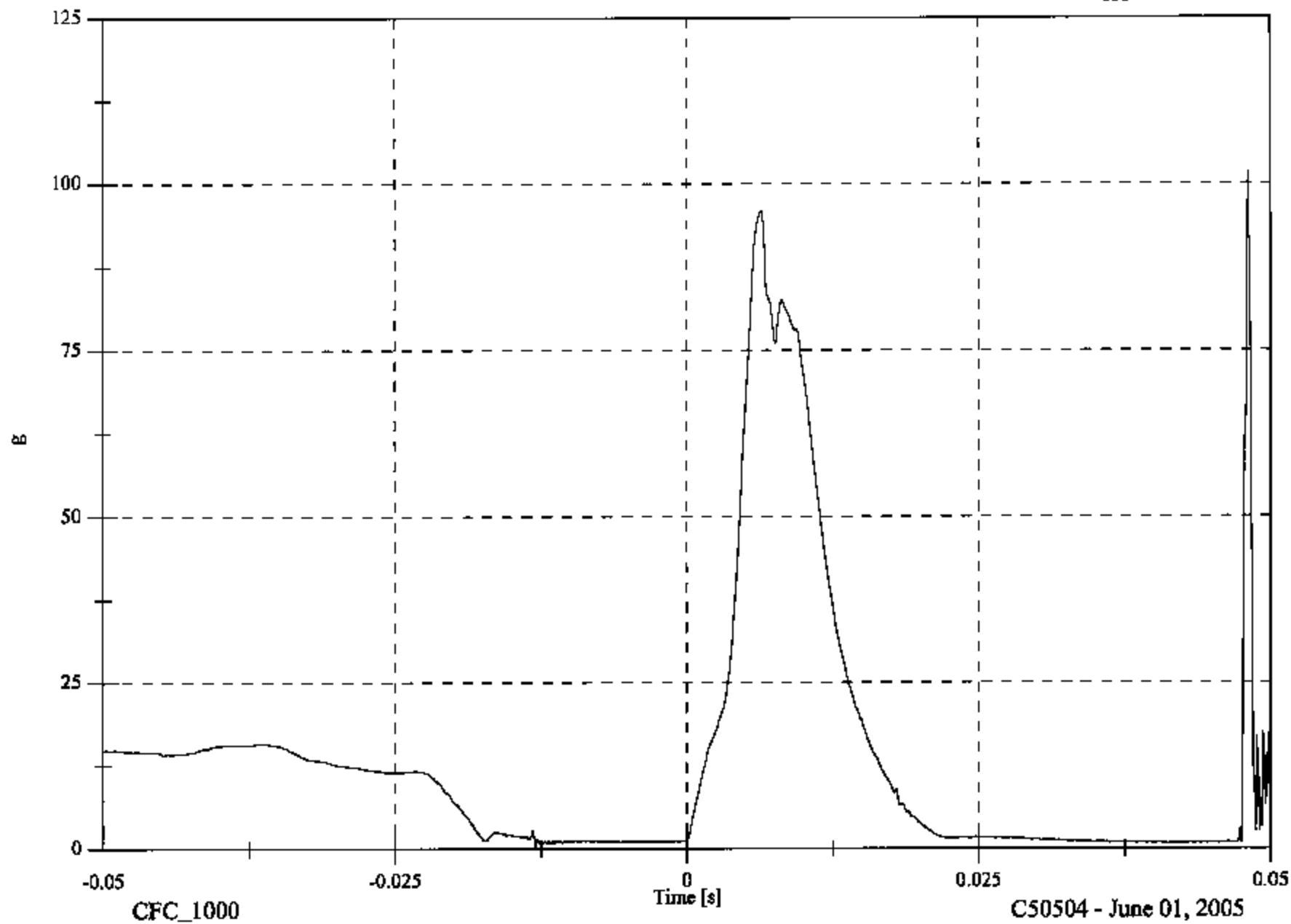
Headform Resultant

Max: 101.6 [g] at 0.048 [s]

Min: 0.4 [g] at -0.013 [s]

C50504 PASSENGER SIDE AP1 IMPACT PLOT #4

8754-FMH-07

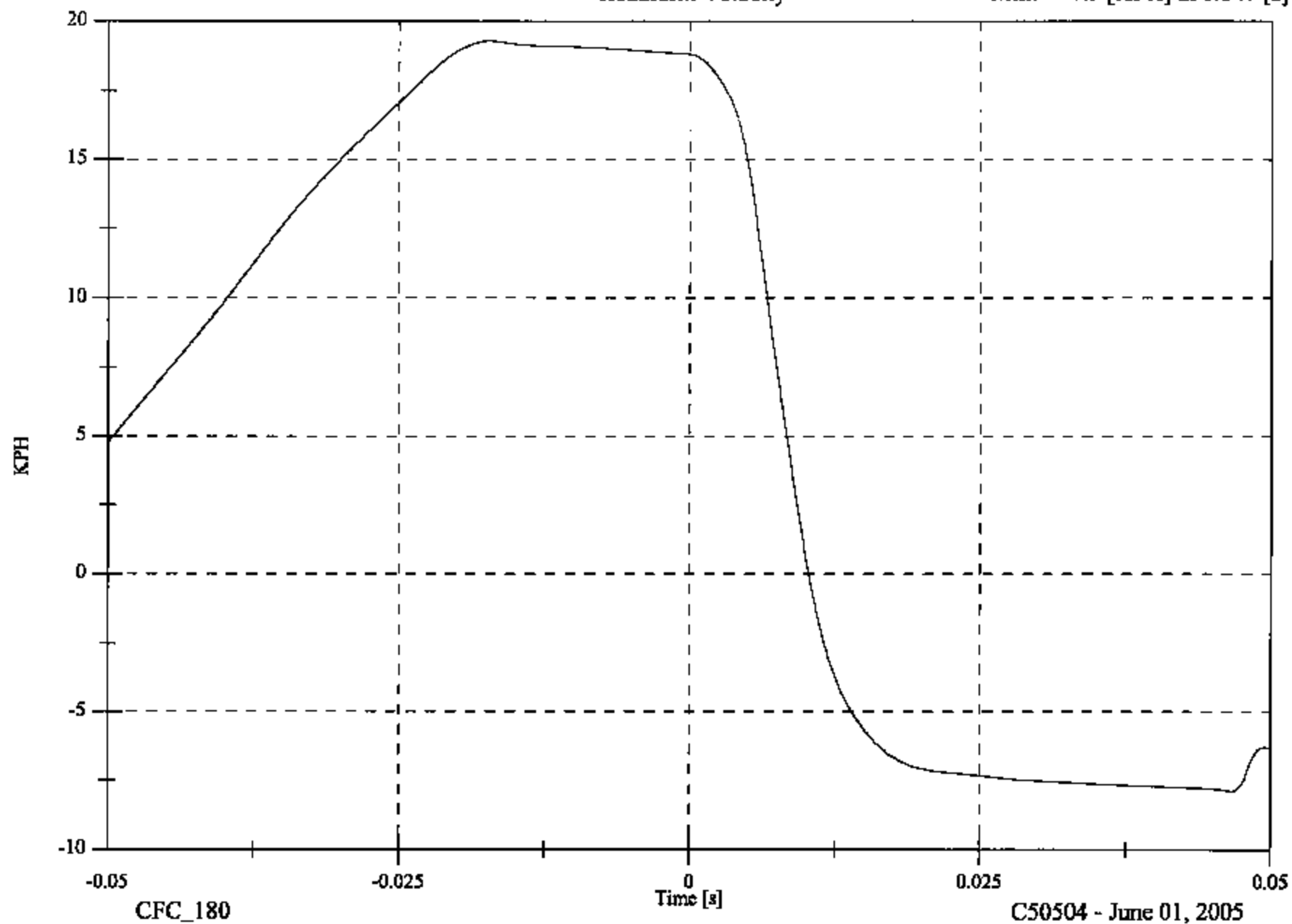


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Velocity

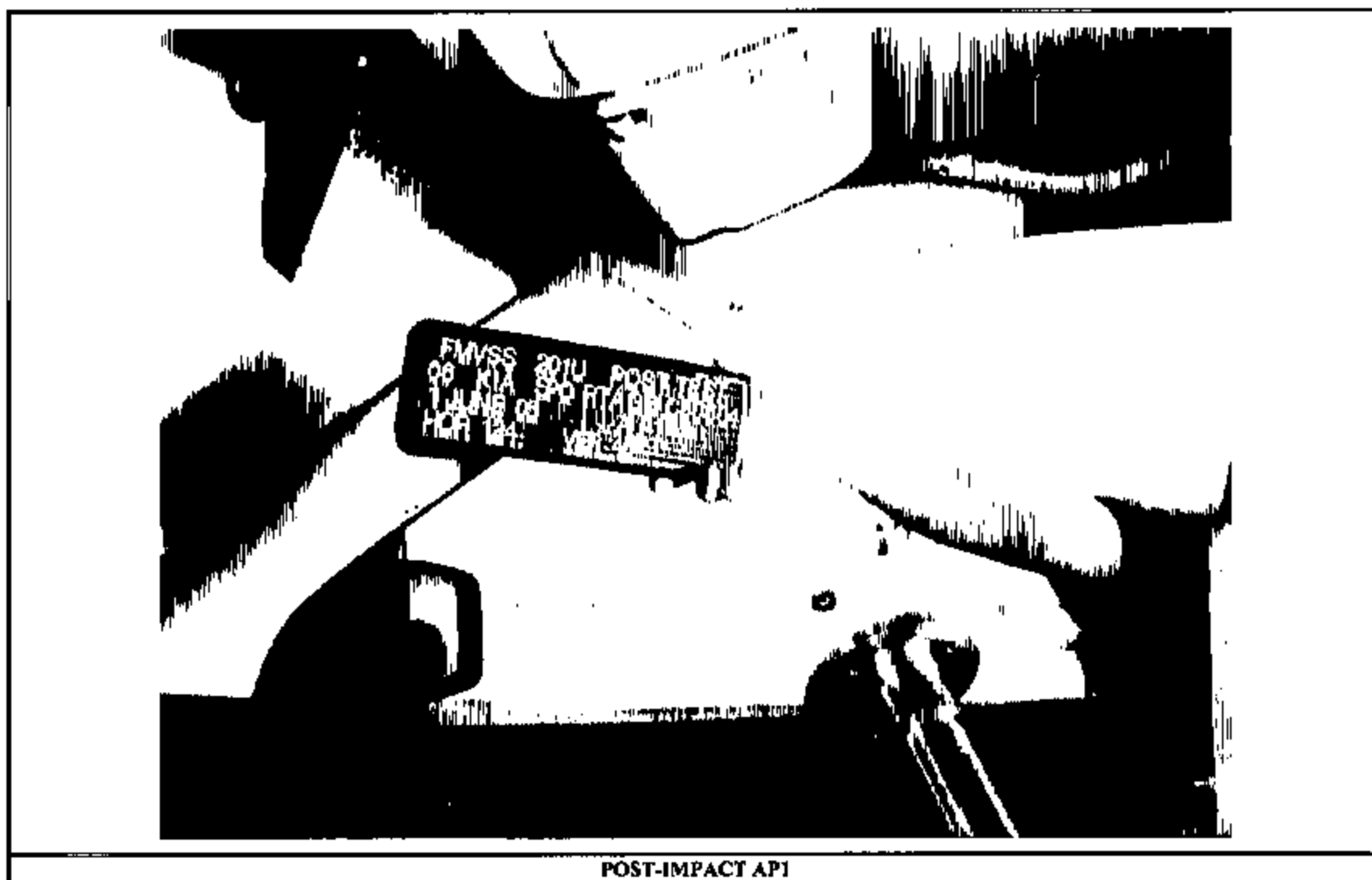
Max: 19.3 [KPH] at -0.017 [s]

Min: -7.9 [KPH] at 0.047 [s]





PRE-IMPACT AP1

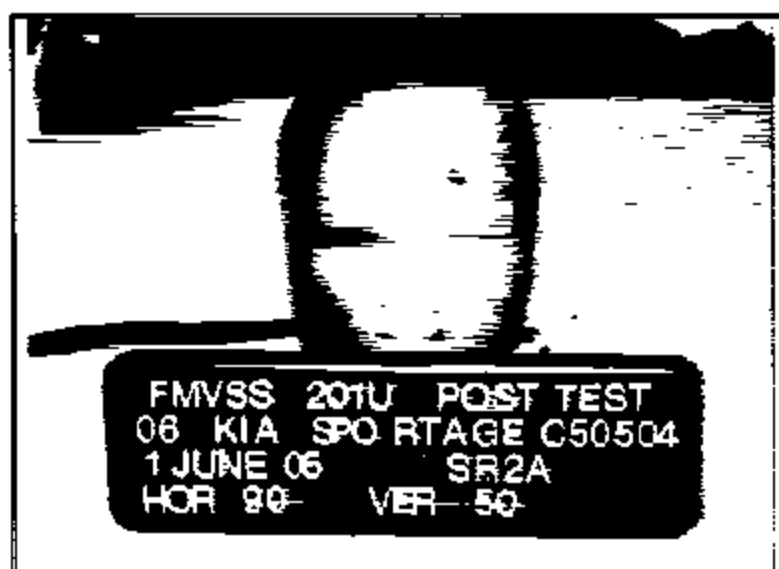


POST-IMPACT API

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Kia Sportage MPV 4-door
VIN:	KNDJF724257040736
DATE OF MANUFACTURE:	12/04 (SEE CERTIFICATION LABEL.)
COLOR:	Olive Green

Test Number:	12
Test Date:	06/01/05
Target Location:	SIDE RAIL
Target Code:	SR2A
Horizontal Impact Angle:	90°
Vertical Impact Angle:	50°
Ambient Temperature:	22.0C°
Relative Humidity:	42.6
Time of Impact:	8:40
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	25	mm right	x	mm left
On Centerline	10	mm up		



POST-IMPACT SR2A HEADFORM

Free Motion HIC'	267.7
HIC'(d)	368.4
Impact Velocity (kph)	18.75
HIC' T1 (msec)	5.5
HIC' T2 (msec)	16.3

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE C50504 - SR2A

FMH Headform 0062

Location: SR2A

Test Date: June 01, 2005

Work File: SR2A

TEST RESULTS

Lab Temperature: 22.0 C

HICd: 368.4

Lab Humidity: 42.6 %

HIC (36ms): 267.7

Velocity at Impact: 18.75 KPH

t1: 5.5 msec

t2: 16.3 msec

Free Flight Distance: 203.81 mm

Duration: 10.8 msec

Maximum: 76.4 g

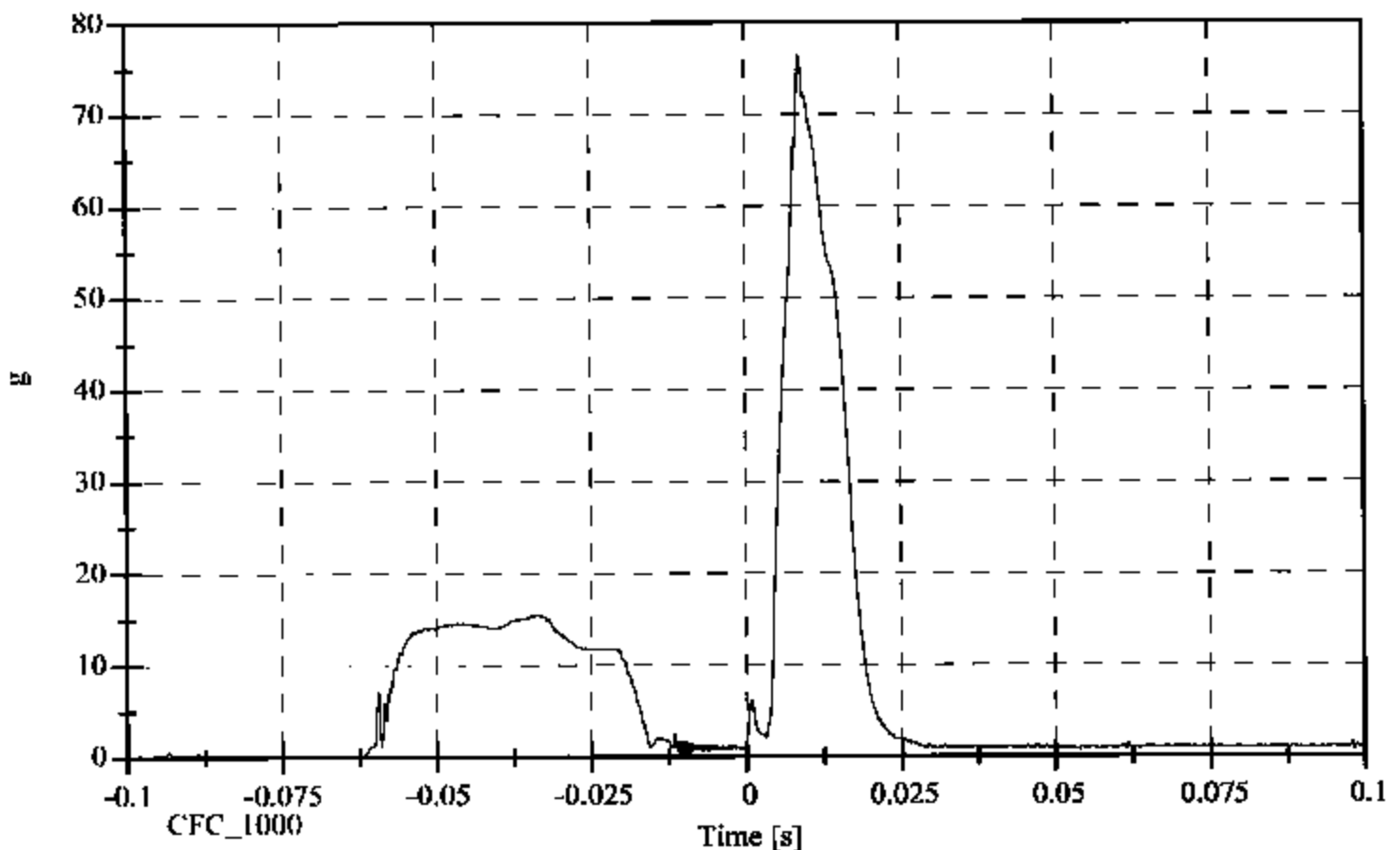
Average Acceleration: 7.0 g

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Max: 76.4 [g] at 0.009 [s]

Headform Resultant

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

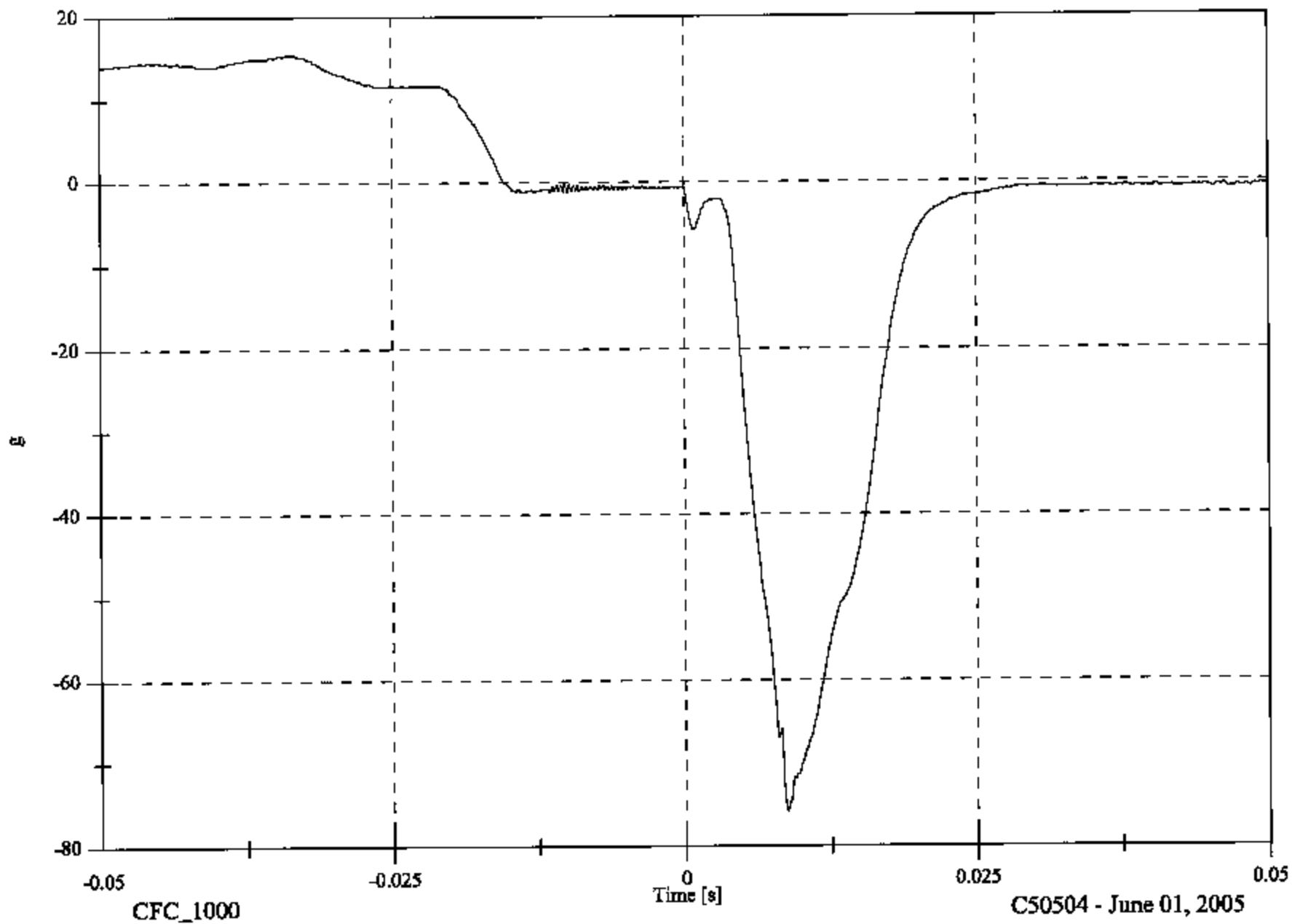


FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform X Acceleration

Max: 15.4 [g] at -0.033 [s]

Min: -75.9 [g] at 0.009 [s]



C50504 PASSENGER SIDE SR2A IMPACT PLOT #1

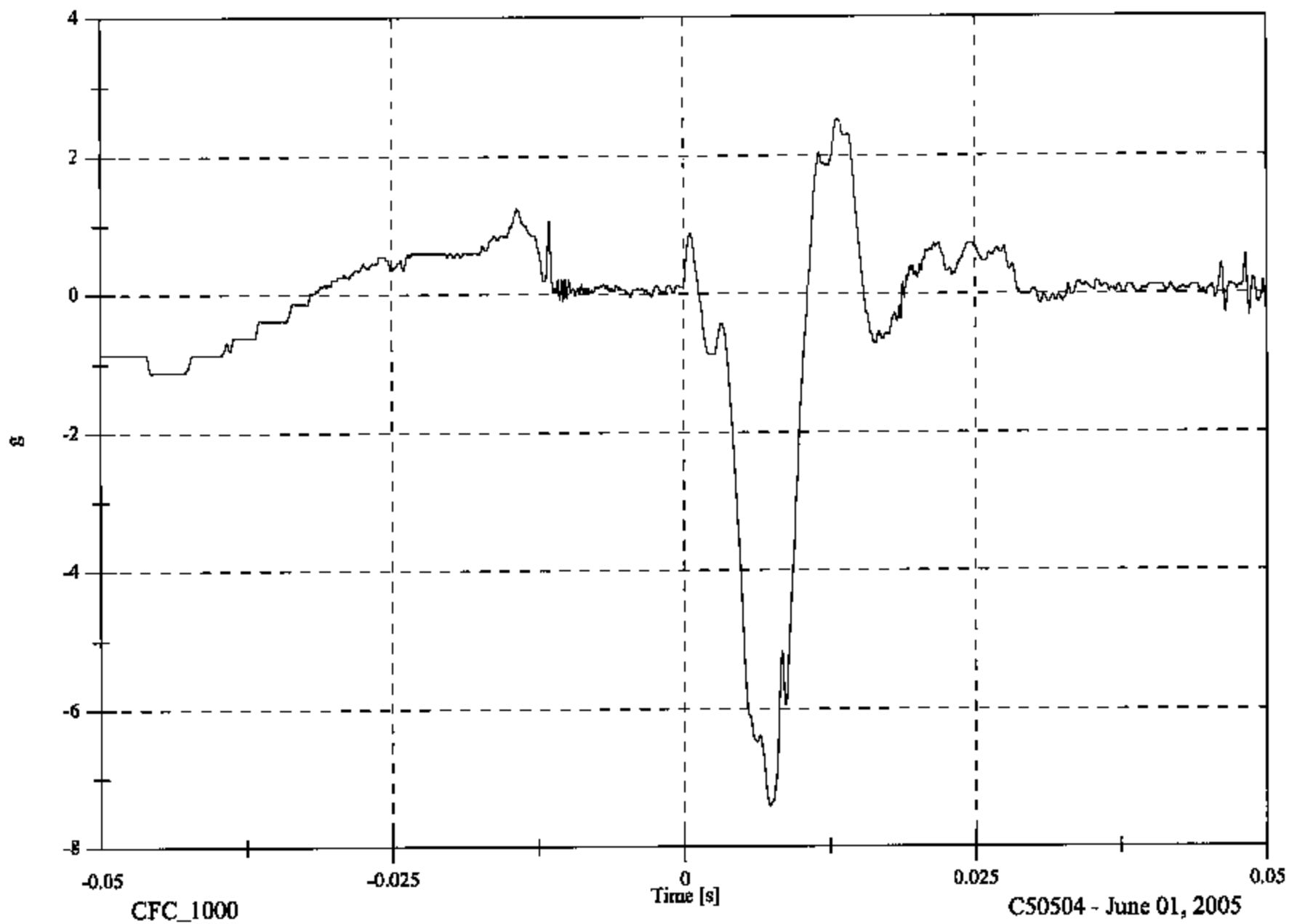
8754-FMH-07

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Y Acceleration

Max: 2.5 [g] at 0.013 [s]

Min: -7.4 [g] at 0.007 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

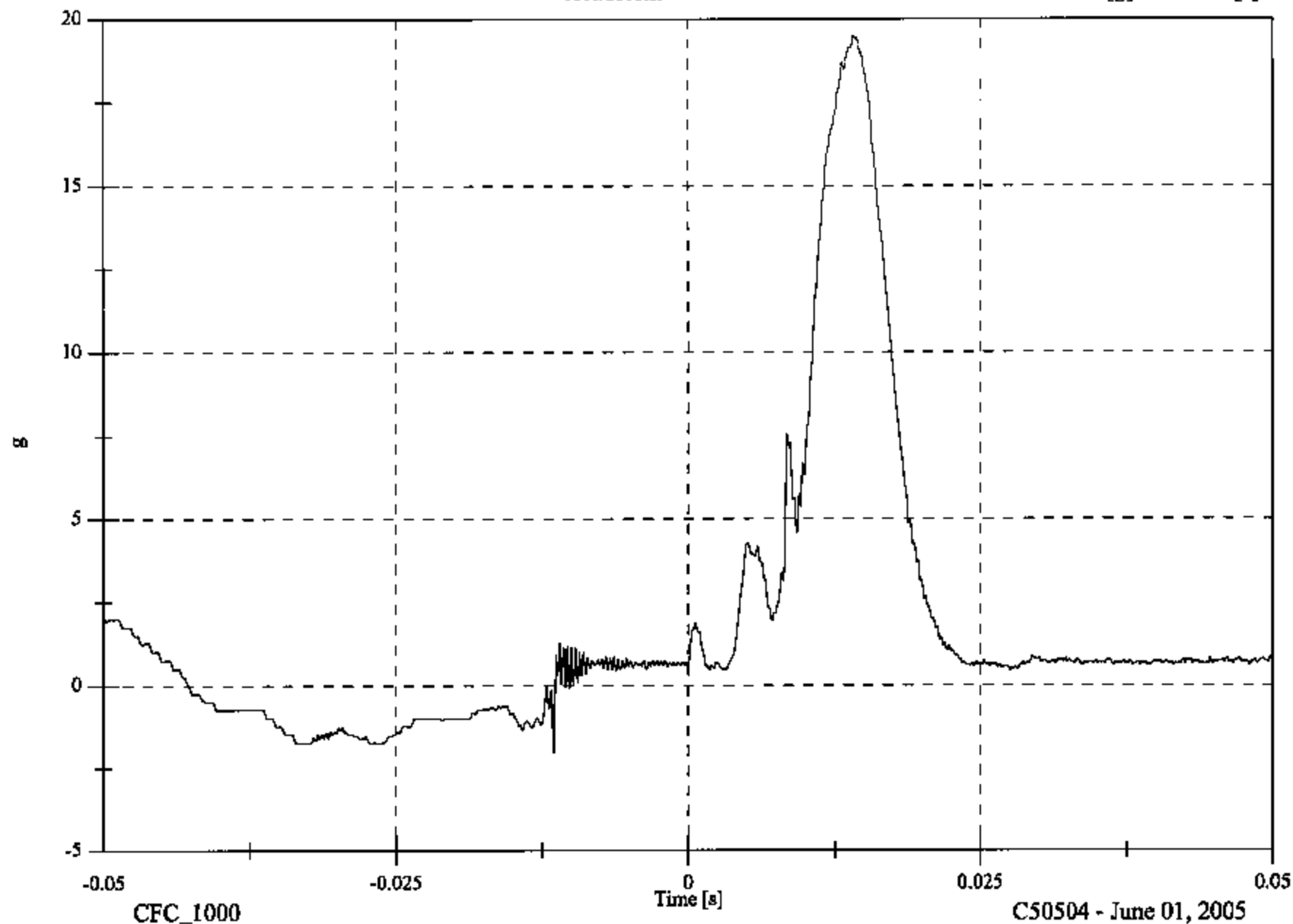
Headform Z Acceleration

Max: 19.5 [g] at 0.014 [s]

Min: -2.0 [g] at -0.012 [s]

C50504 PASSENGER SIDE SR2A IMPACT PLOT #3

8754-FMH-07



CFC_1000

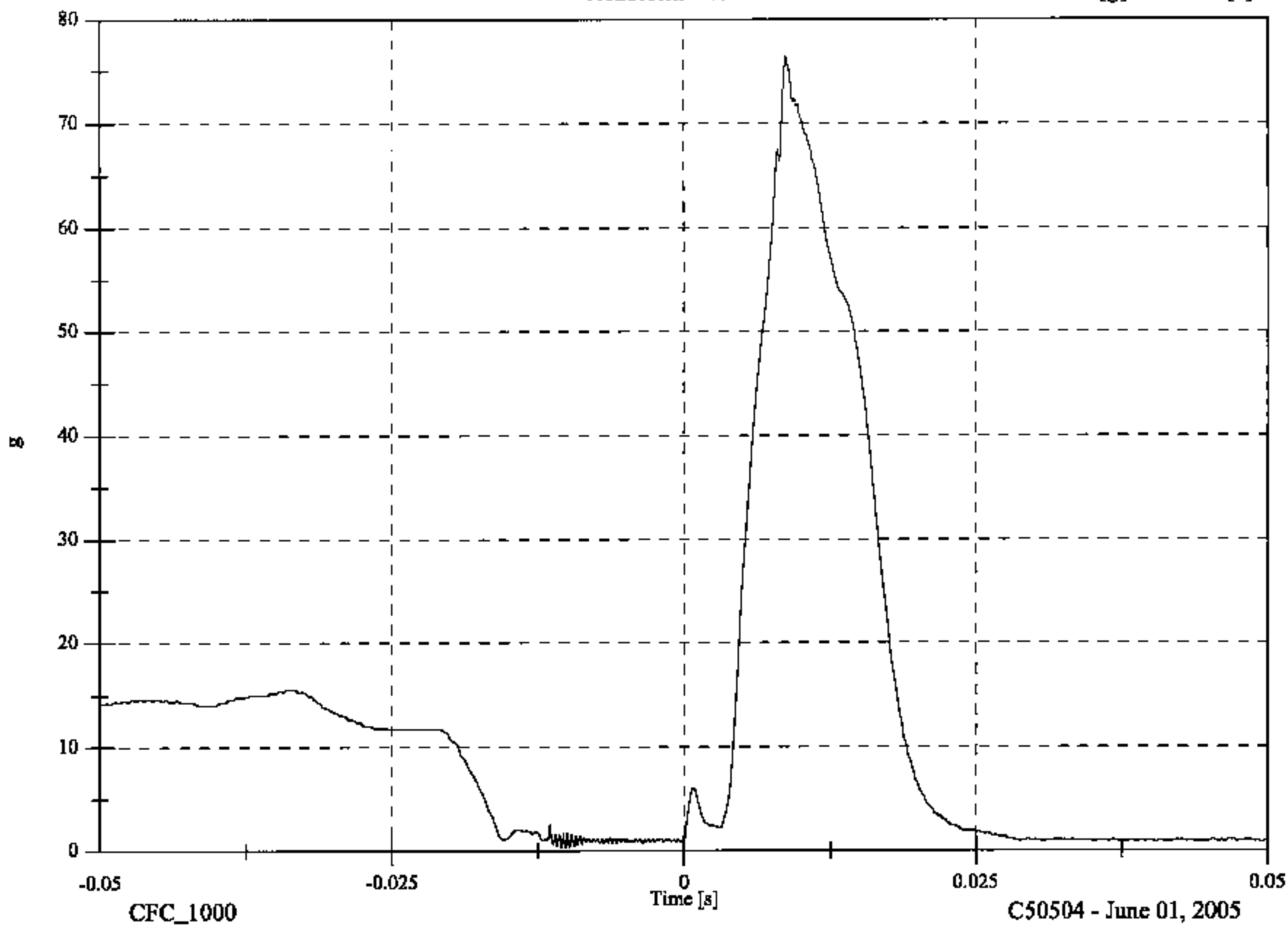
C50504 - June 01, 2005

FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

Headform Resultant

Max: 76.4 [g] at 0.009 [s]

Min: 0.3 [g] at -0.010 [s]



FMVSS 201U IMPACT TEST - 2006 KIA SPORTAGE

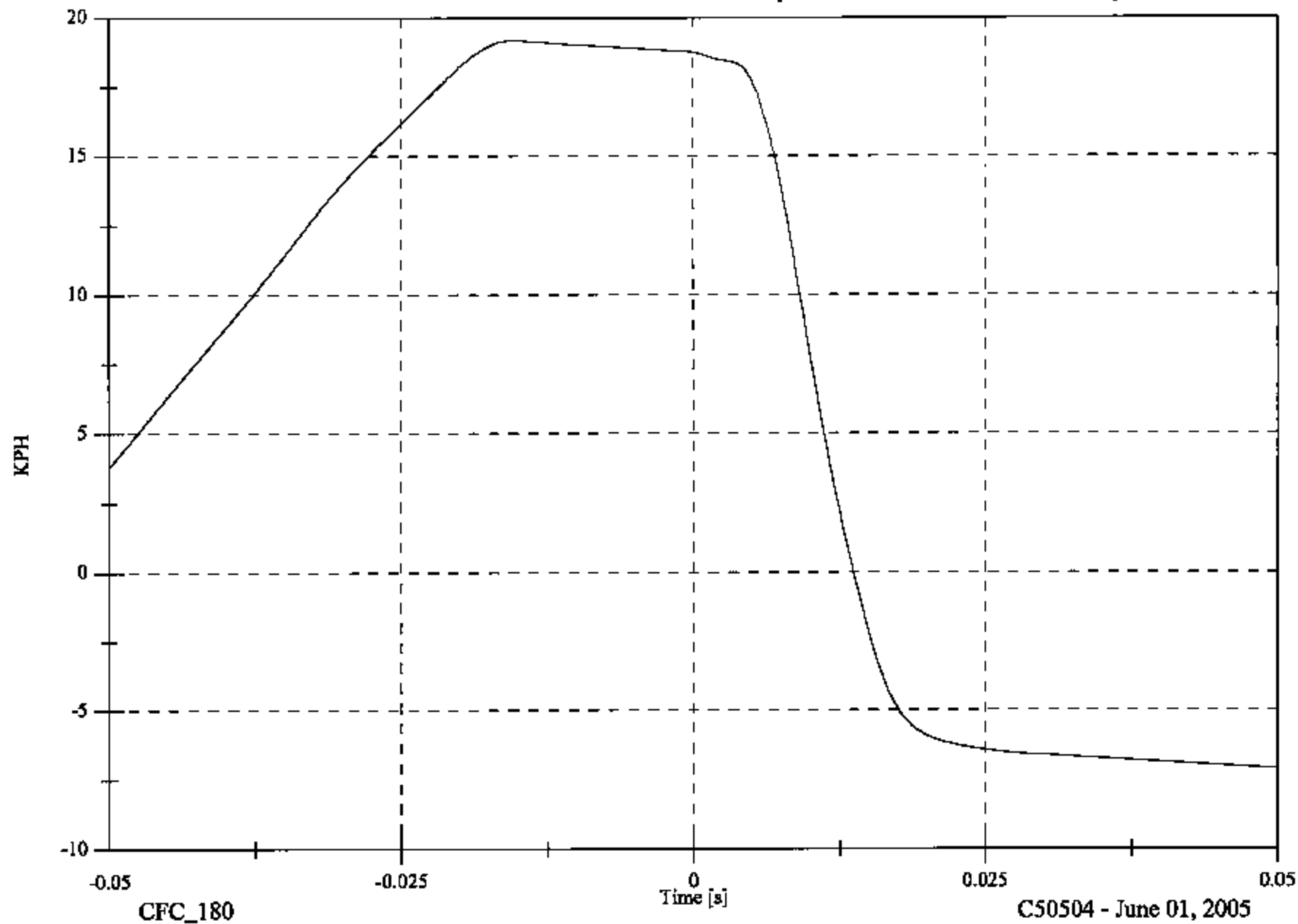
Headform Velocity

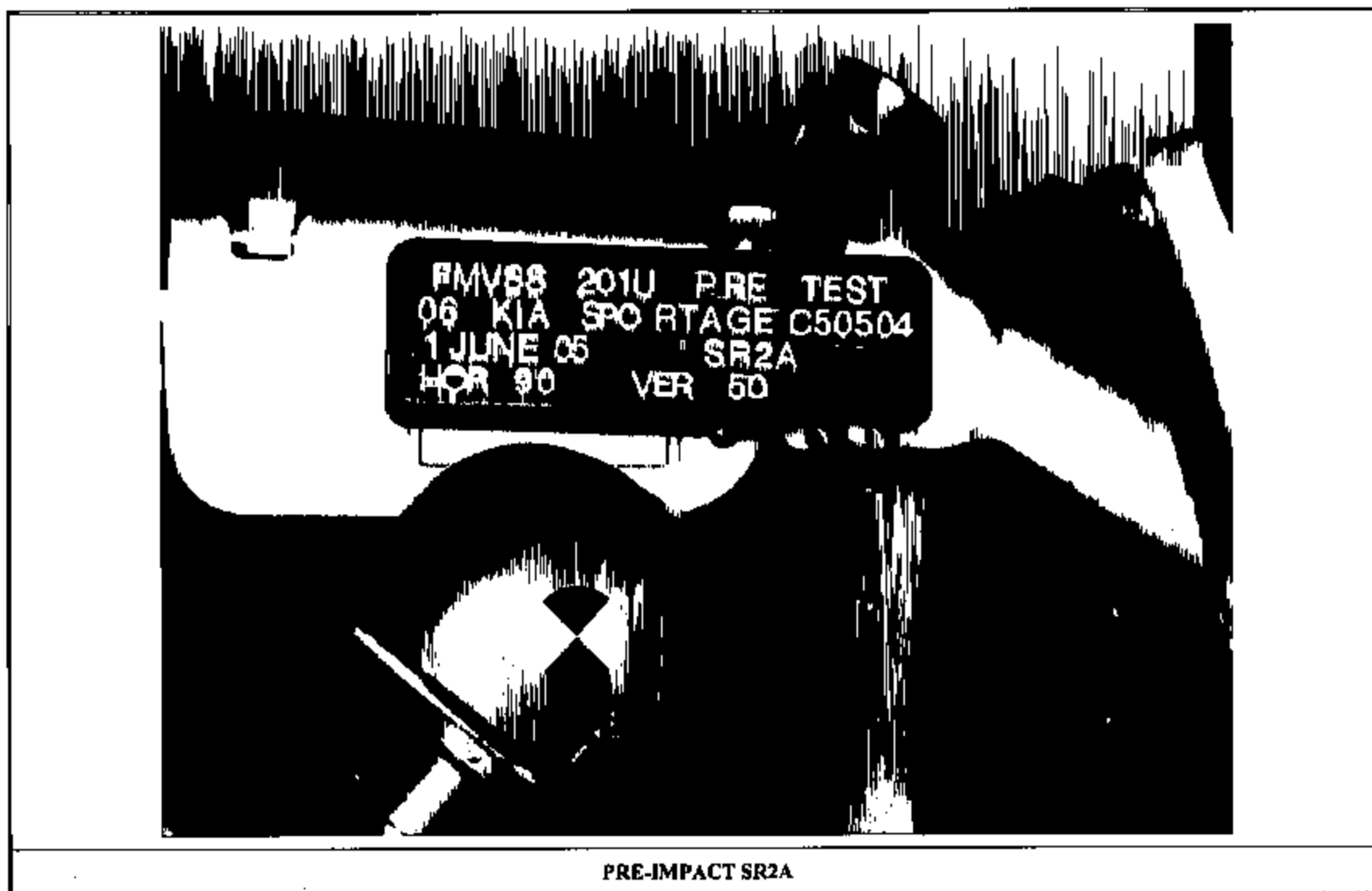
Max: 19.2 [KPH] at -0.015 [s]

Min: -7.1 [KPH] at 0.050 [s]

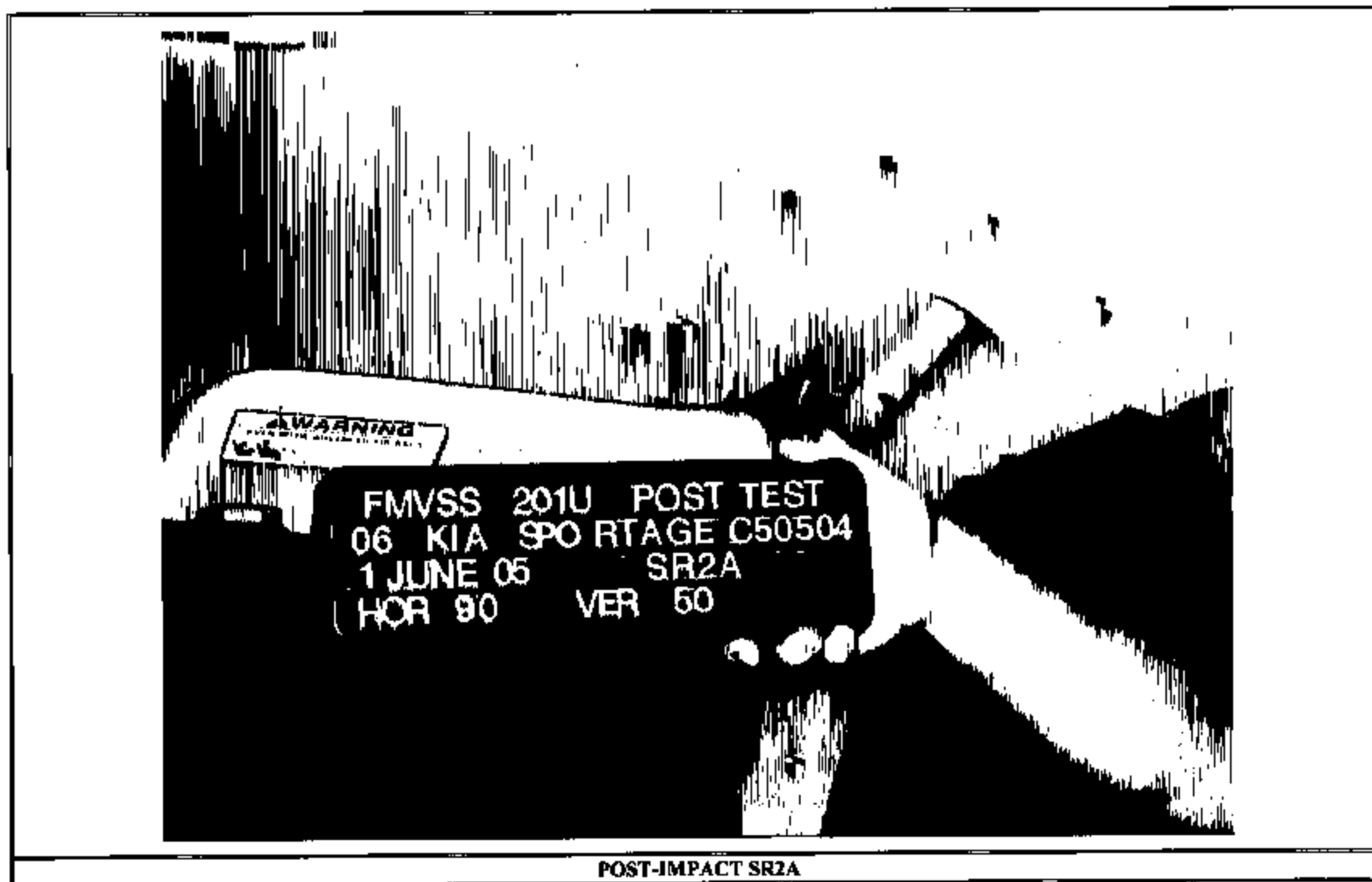
C50504 PASSENGER SIDE SRZA IMPACT PLOT #5

8754-FMH-07





PRE-IMPACT SR2A



APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

FIGURE	VIEW
A-1	LEFT SIDE VIEW OF VEHICLE
A-2	RIGHT SIDE VIEW OF VEHICLE
A-3	3/4 FRONTAL VIEW FROM RIGHT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM LEFT SIDE OF VEHICLE
A-5	VEHICLE'S CERTIFICATION LABEL
A-6	VEHICLE'S TIRE INFORMATION LABEL
A-7	PRE-TEST DRIVER SIDE A-PILLAR
A-8	PRE-TEST DRIVER SIDE FRONT HEADER
A-9	PRE-TEST DRIVER SIDE SIDE RAIL
A-10	PRE-TEST DRIVER SIDE B-PILLAR
A-11	PRE-TEST DRIVER SIDE OTHER PILLAR
A-12	PRE-TEST DRIVER SIDE REAR PILLAR
A-13	PRE-TEST PASSENGER SIDE A-PILLAR
A-14	PRE-TEST PASSENGER SIDE FRONT HEADER
A-15	PRE-TEST PASSENGER SIDE SIDE RAIL
A-16	PRE-TEST PASSENGER SIDE B-PILLAR
A-17	PRE-TEST PASSENGER SIDE OTHER PILLAR
A-18	PRE-TEST PASSENGER SIDE REAR PILLAR
A-19	POST-TEST DRIVER SIDE A-PILLAR
A-20	POST-TEST DRIVER FRONT HEADER
A-21	POST-TEST DRIVER SIDE SIDE RAIL
A-22	POST-TEST DRIVER SIDE B-PILLAR
A-23	POST-TEST DRIVER SIDE OTHER PILLAR
A-24	POST-TEST DRIVER SIDE REAR PILLAR
A-25	POST-TEST PASSENGER SIDE A-PILLAR
A-26	POST-TEST PASSENGER FRONT HEADER
A-27	POST-TEST PASSENGER SIDE SIDE RAIL
A-28	POST-TEST PASSENGER SIDE B-PILLAR
A-29	POST-TEST PASSENGER SIDE OTHER PILLAR
A-30	POST-TEST PASSENGER SIDE REAR PILLAR

A-3



8754-FMH-07

Figure A-1 : LEFT SIDE VIEW OF VEHICLE

A-4

8754-FMH-07



Figure A-2 : RIGHT SIDE VIEW OF VEHICLE

A-5

8754-FMH-07



Figure A-3 : 3/4 FRONTAL VIEW FROM RIGHT SIDE OF VEHICLE



Figure A-4: 3/4 REAR VIEW FROM LEFT SIDE OF VEHICLE

(EIA) MANUFACTURED IN KOREA BY
 KIA MOTORS CORPORATION
 12/04 GEAR 4513.6 FRONT 9L 1400 WK
 GMP 1850 2000 2000 2000
 FRONT 2579.18 4513.6 2000 2000
 REAR 2425.18 4513.6 2000 2000
 THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL
 MOTOR VEHICLE SAFETY AND EMISSION STANDARDS
 IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE
 VIN KNOJF24257040736
 MPV

TIRE AND LOAD
 PNEUMATIC

Figure A-5 : VEHICLE'S CERTIFICATION LABEL

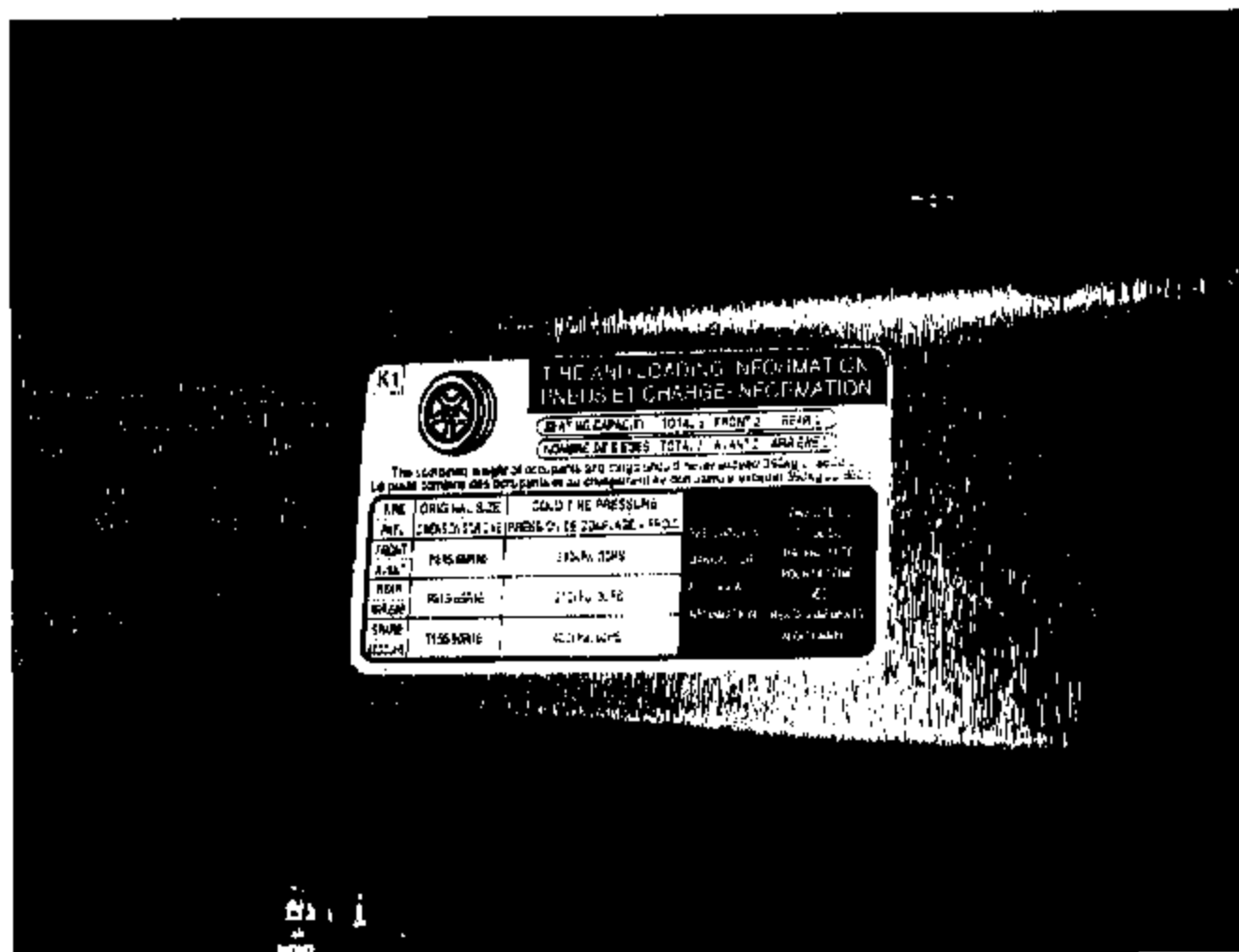


Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL



Figure A-7: PRE-TEST DRIVER SIDE A-PILLAR

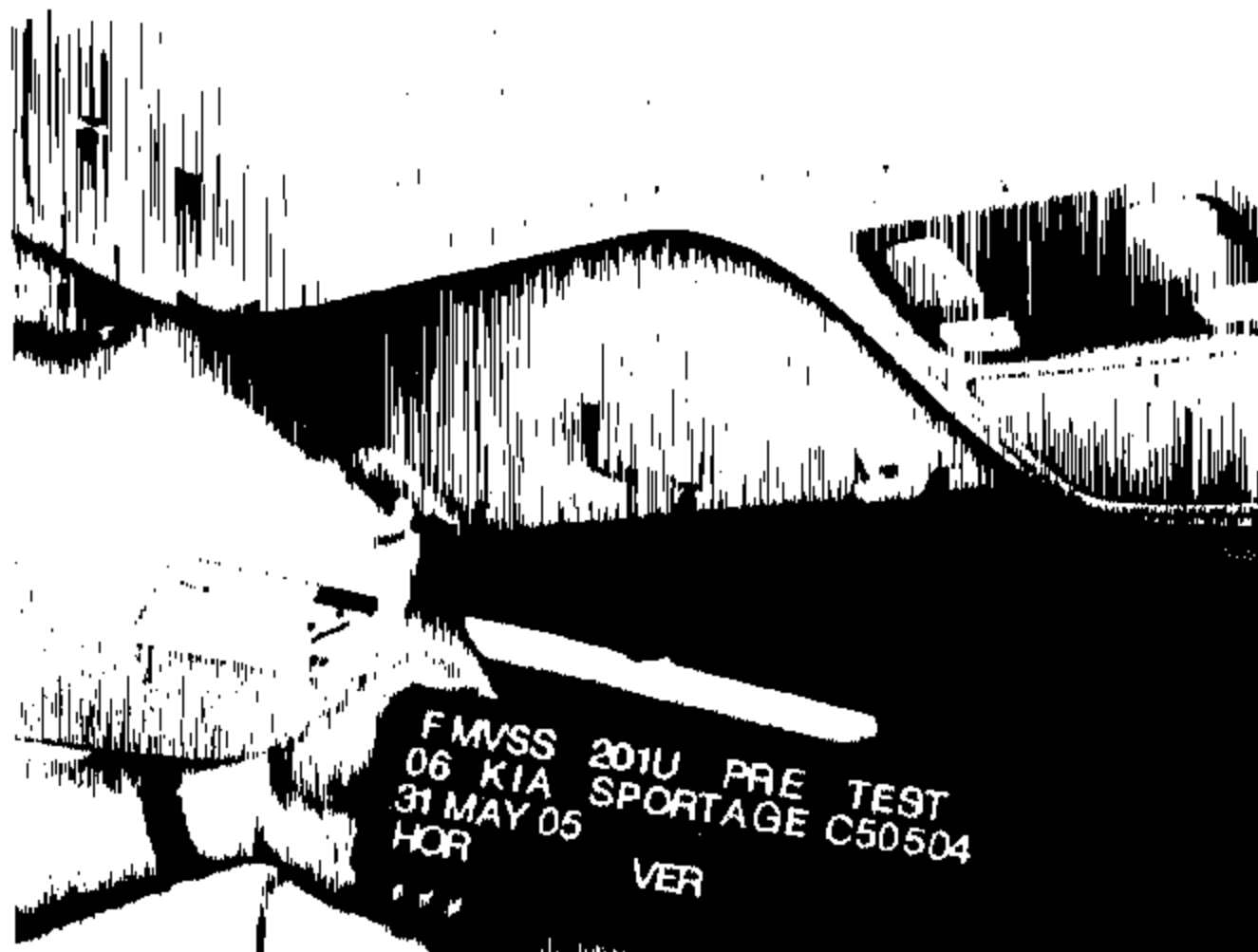


Figure A-8 : PRE-TEST DRIVER SIDE FRONT HEADER



Figure A-9 : PRE-TEST DRIVER SIDE SIDE RAIL

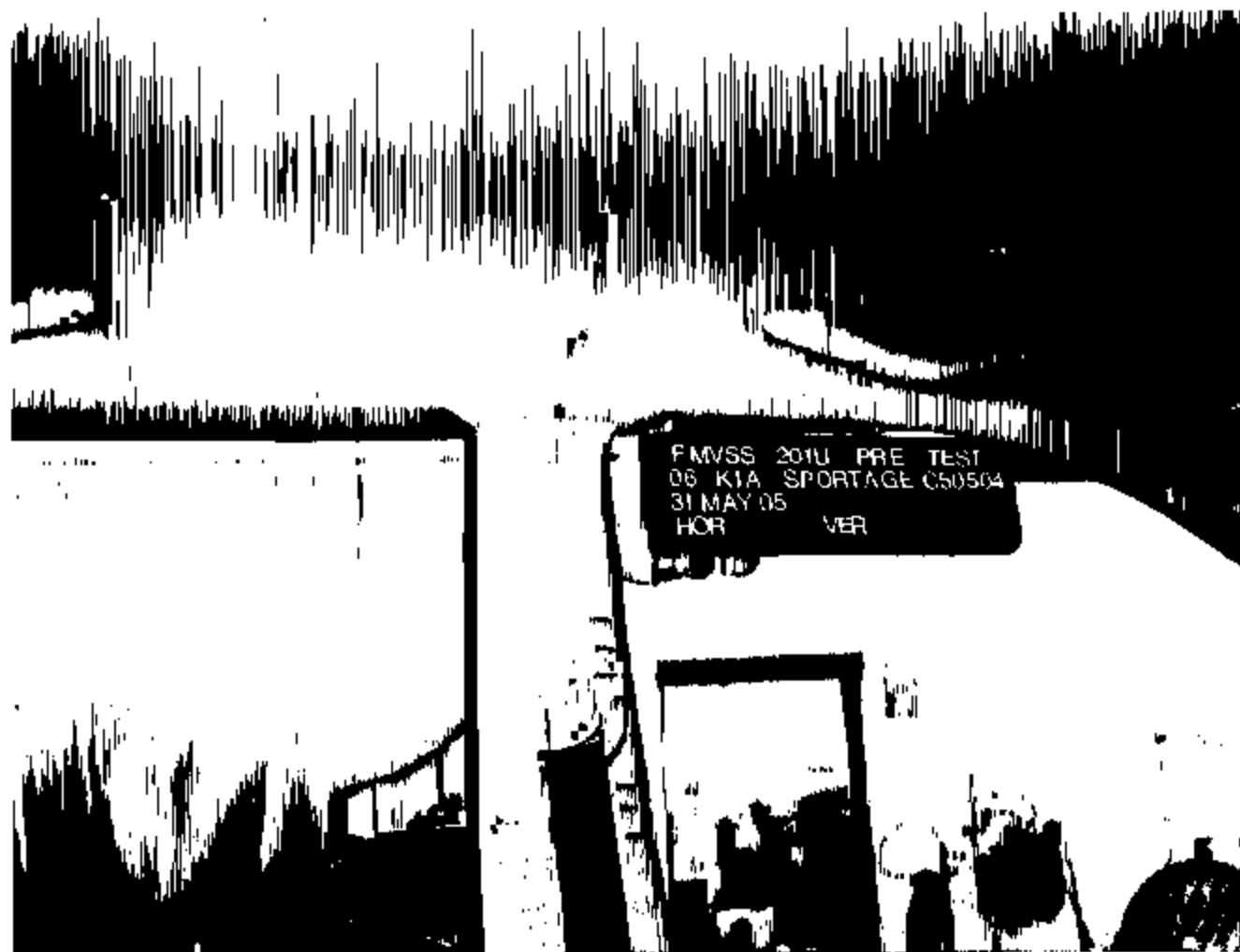


Figure A-10 : PRE-TEST DRIVER SIDE B-PILLAR

A-13

8754-FMH-07



Figure A-11 : PRE-TEST DRIVER SIDE OTHER PILLAR

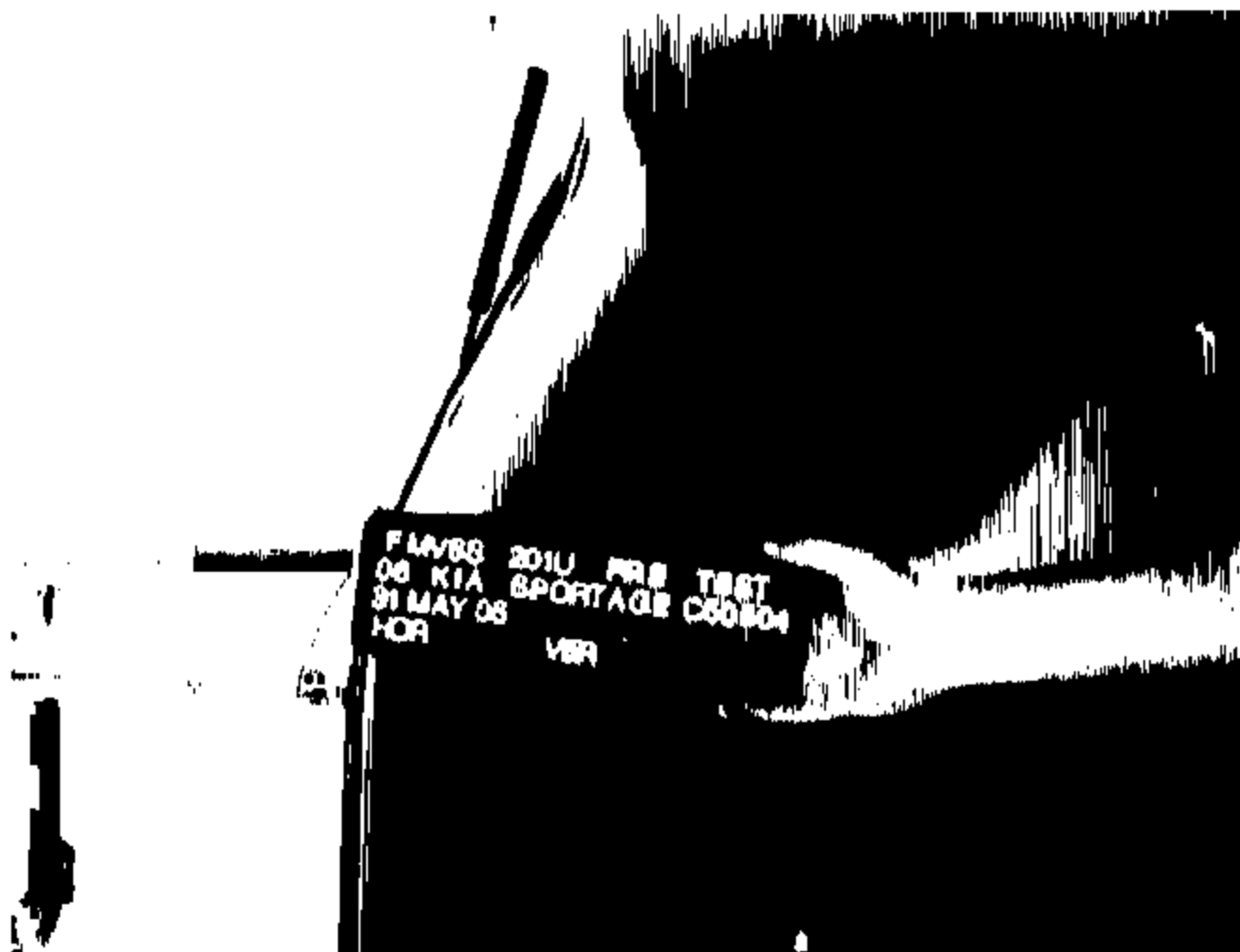


Figure A-12: PRE-TEST DRIVER SIDE REAR PILLAR

A-15

8754-FM11-07



Figure A-13 : PRE-TEST PASSENGER SIDE A-PILLAR



Figure A-14 : PRE-TEST PASSENGER SIDE FRONT HEADER



Figure A-15 : PRE-TEST PASSENGER SIDE SIDE RAIL



Figure A-16 : PRE-TEST PASSENGER SIDE B-PILLAR



Figure A-17: PRE-TEST PASSENGER SIDE OTHER PILLAR



Figure A-18 : PRE-TEST PASSENGER SIDE REAR PILLAR



Figure A-19 : POST-TEST DRIVER SIDE A-PILLAR

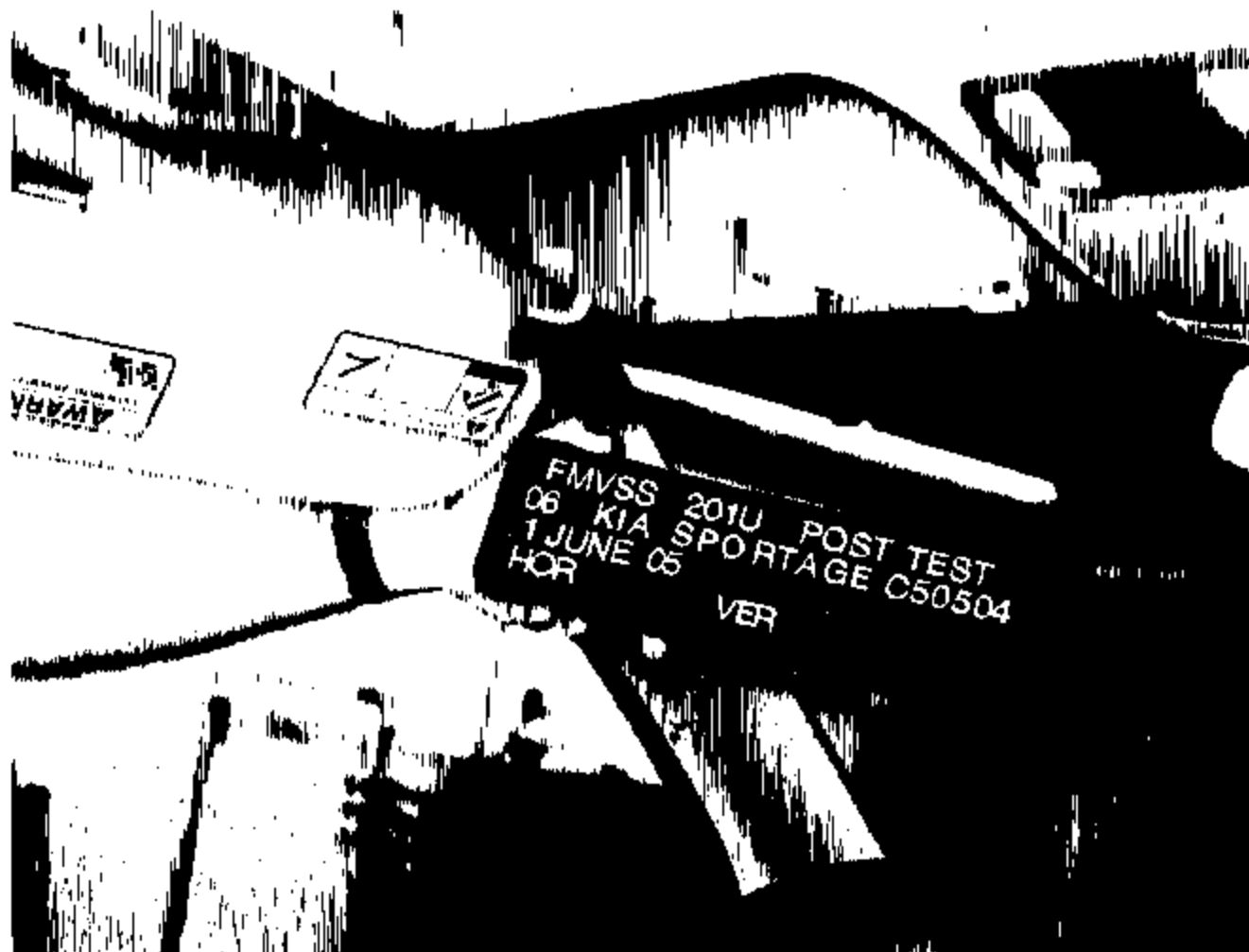


Figure A-20 : POST-TEST DRIVER SIDE FRONT HEADER



Figure A-21 : POST-TEST DRIVER SIDE SIDE RAIL



Figure A-22 : POST-TEST DRIVER SIDE B-PILLAR



Figure A-23 : POST-TEST DRIVER SIDE OTHER PILLAR



Figure A-24 : POST-TEST DRIVER SIDE REAR PILLAR

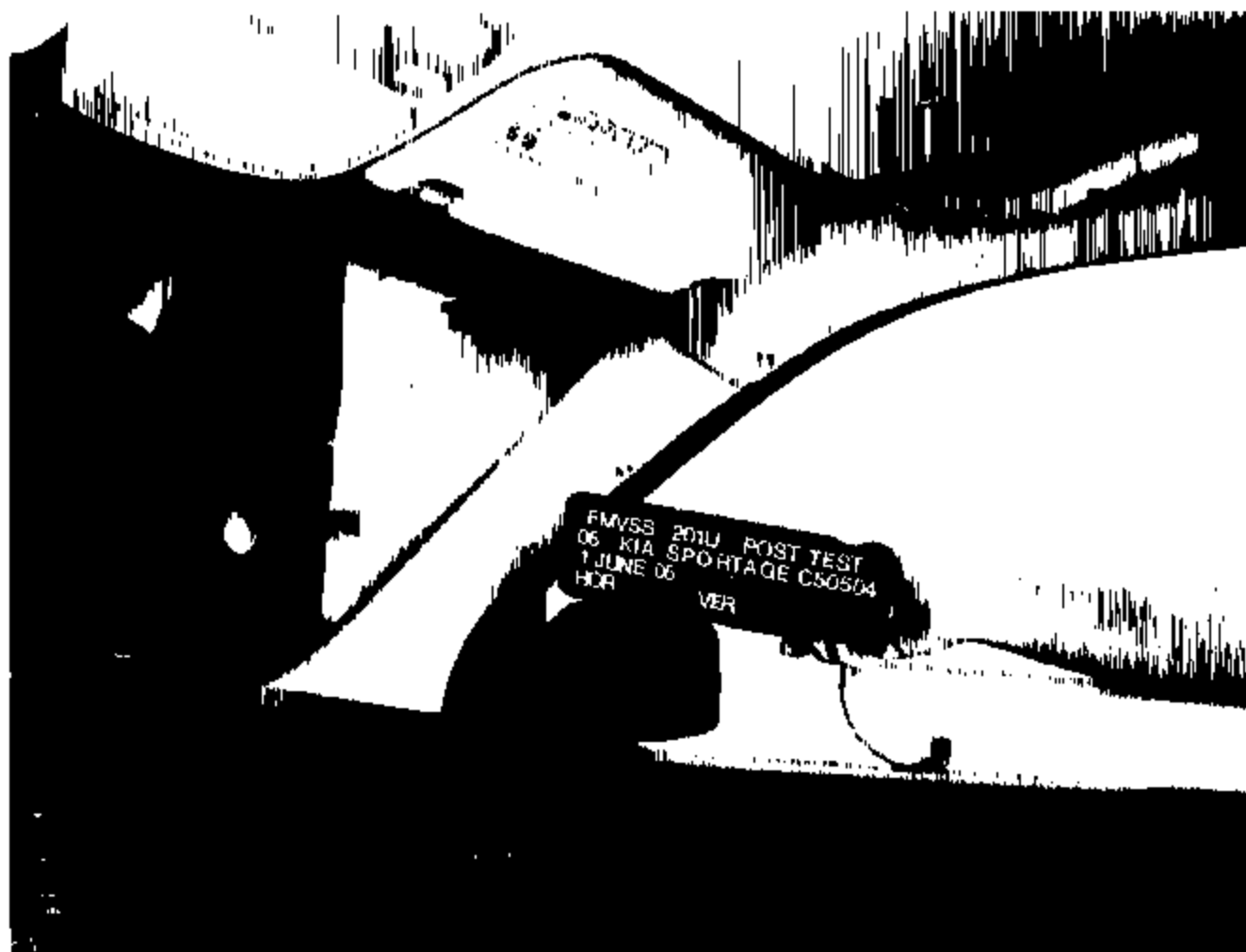


Figure A-25 : POST-TEST PASSENGER SIDE A-PILLAR

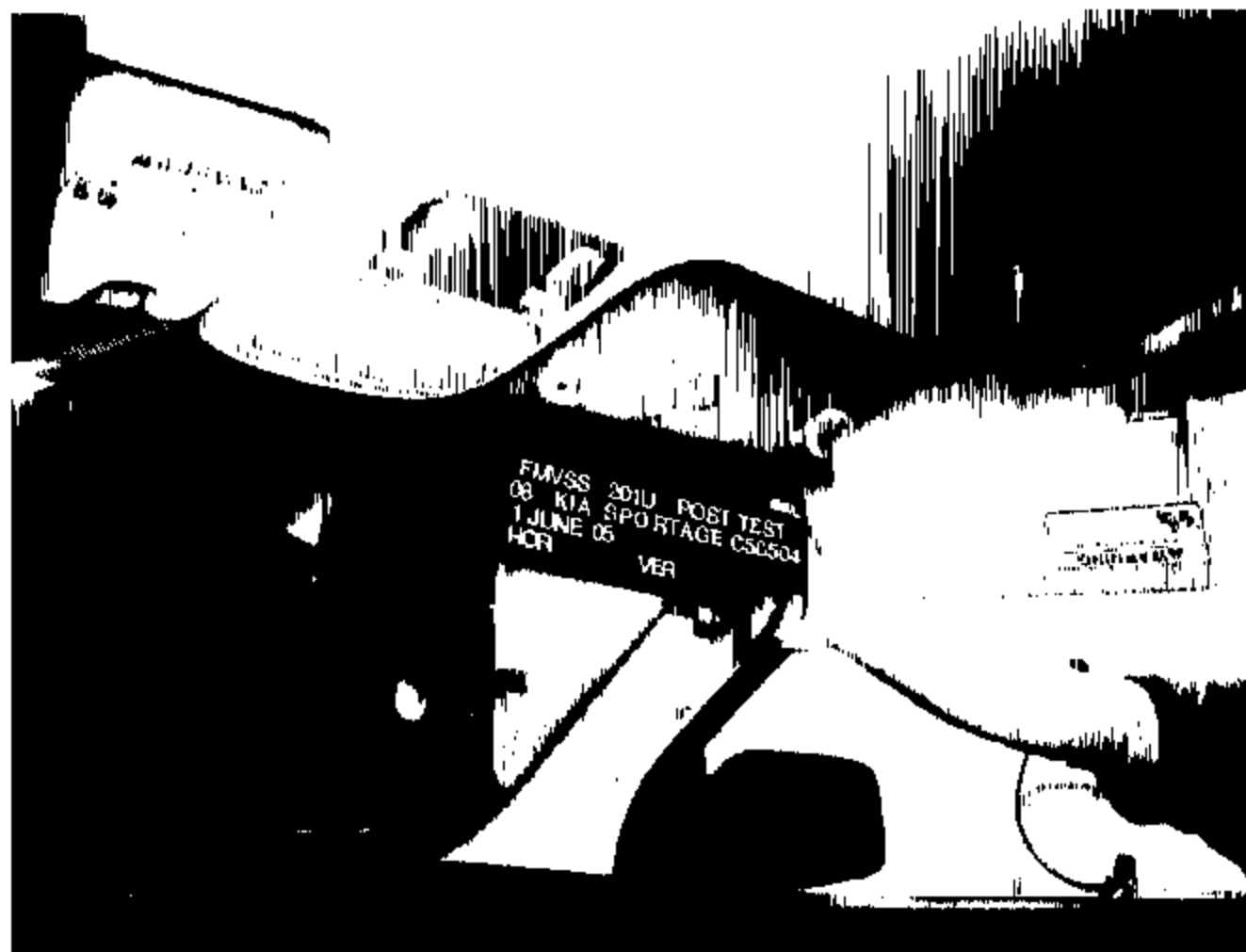


Figure A-26 : POST-TEST PASSENGER SIDE FRONT HEADER

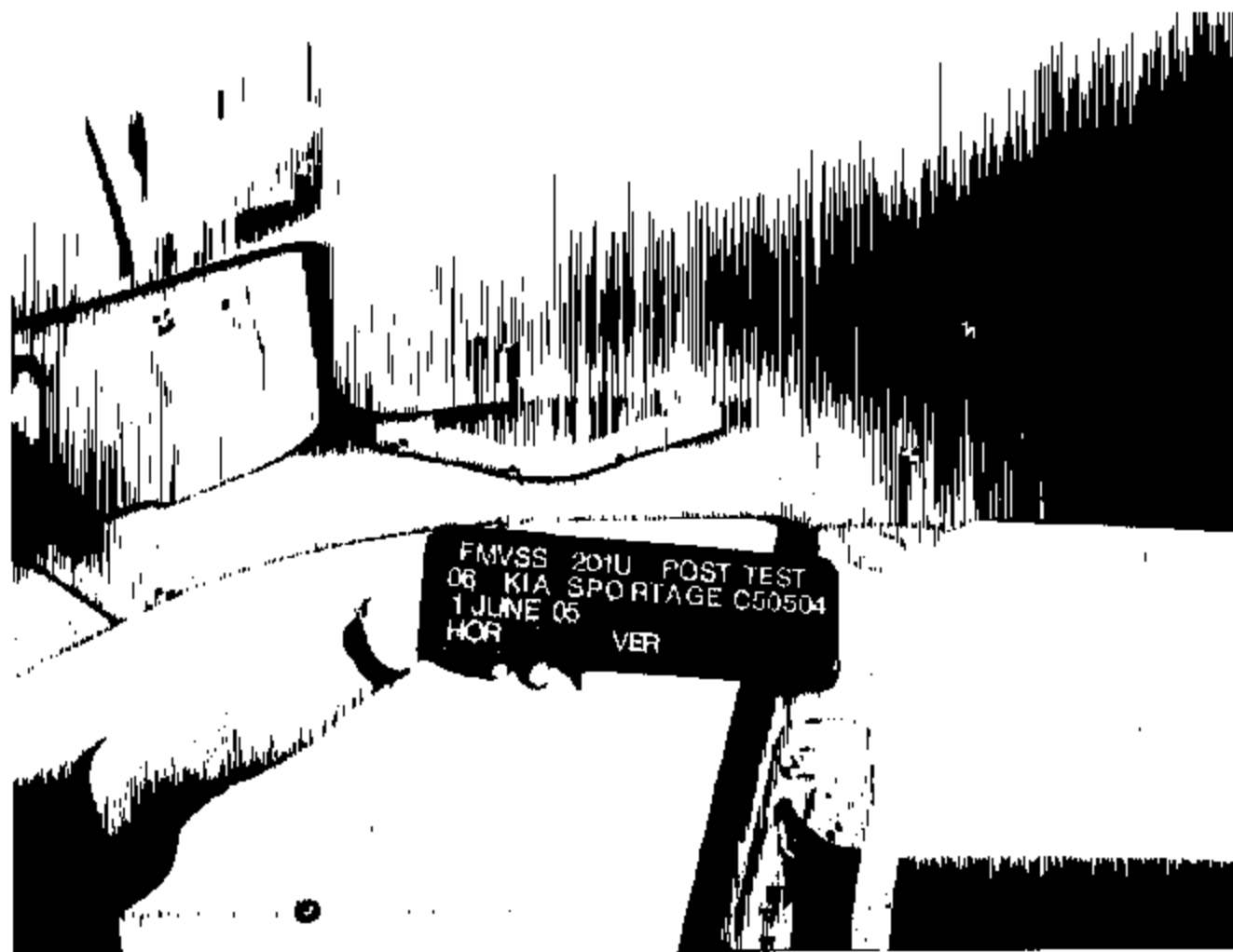


Figure A-27 : POST-TEST PASSENGER SIDE SIDE RAIL

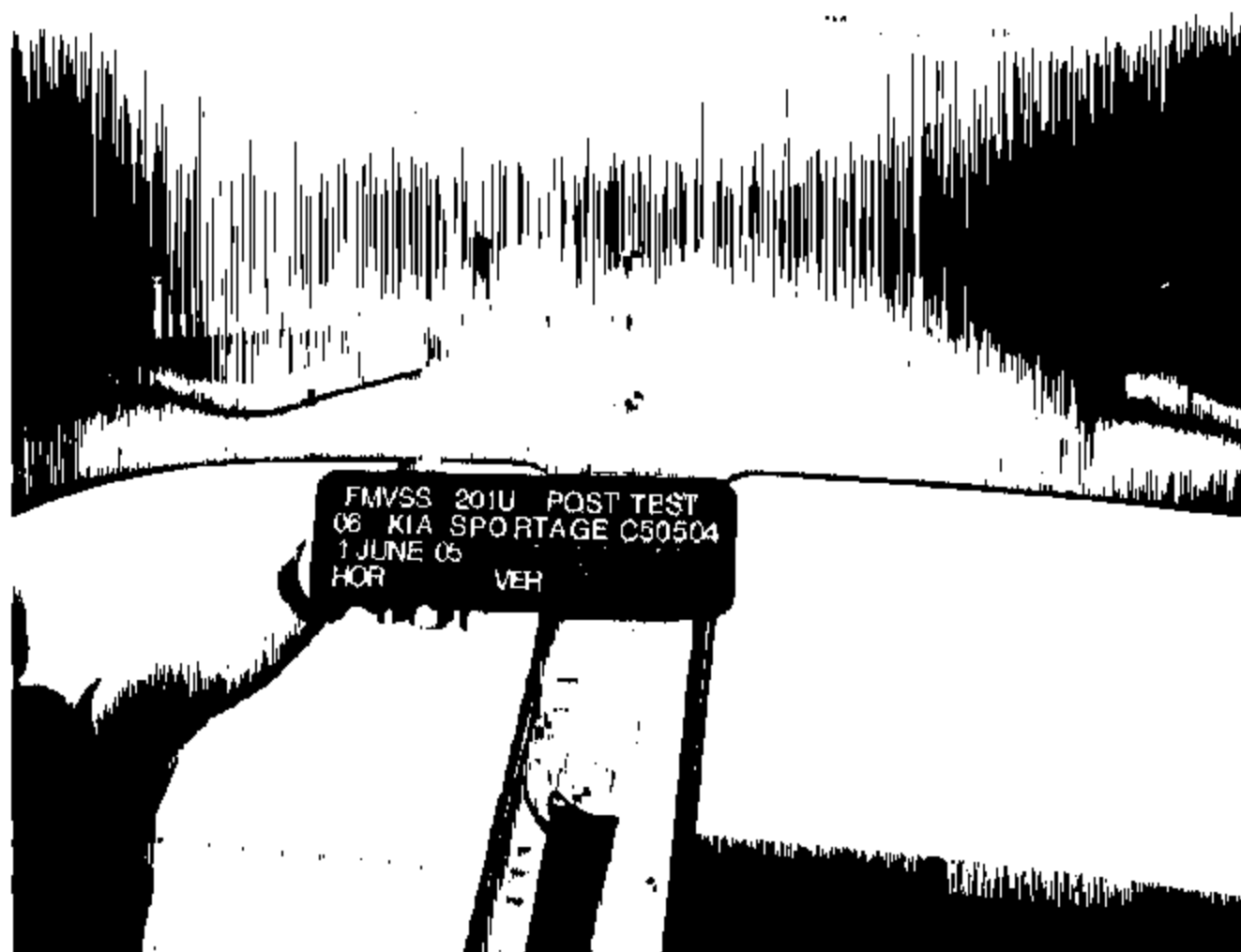


Figure A-28 : POST-TEST PASSENGER SIDE B-PILLAR



Figure A-29 : POST-TEST PASSENGER SIDE OTHER PILLAR

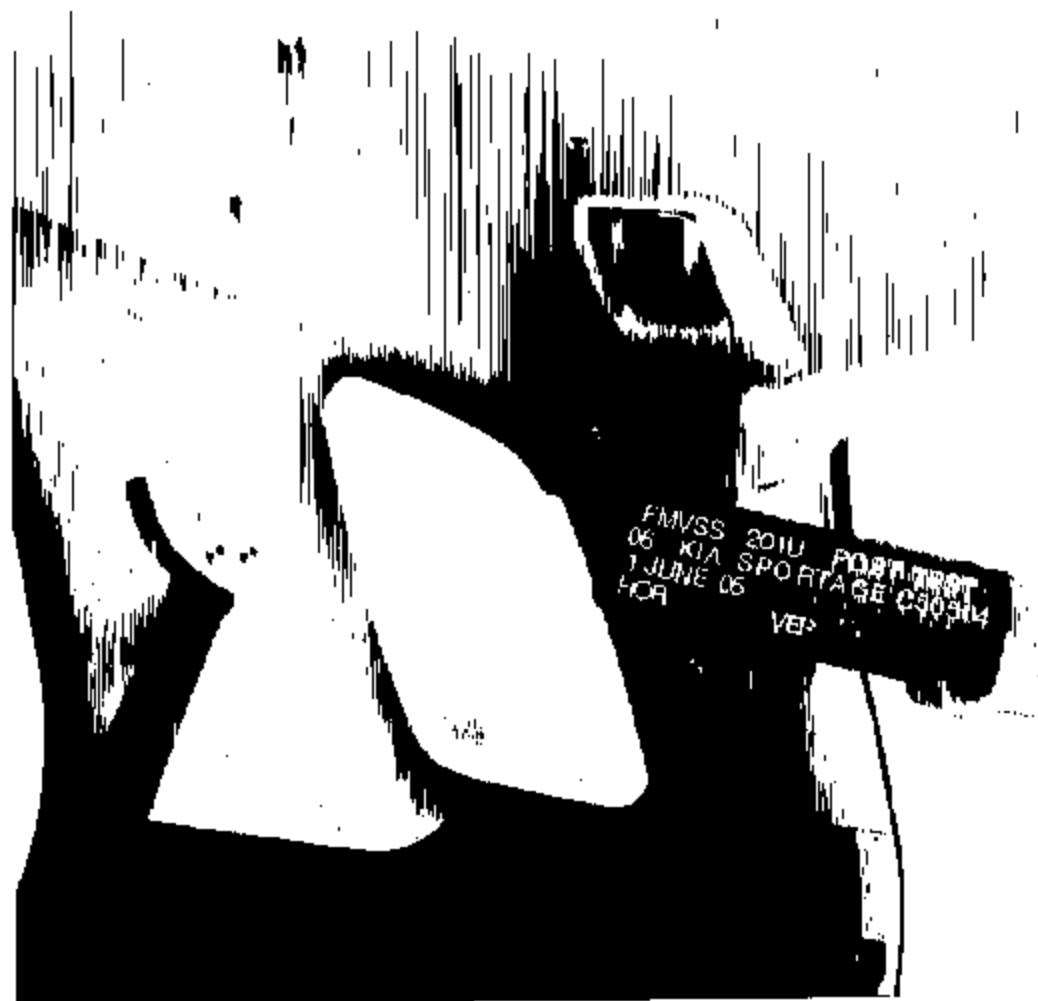


Figure A-30 : POST-TEST PASSENGER SIDE REAR PILLAR

APPENDIX B

PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Calspan. A summary of the test results are included in this Appendix.

**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		0642	
CALIBRATION DATE:		MAY 23, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.1
RELATIVE HUMIDITY	10% to 70%		47
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		266.8
PEAK LATERAL ACCELERATION	15 Gs Maximum		4.8
IS ACCELERATION CURVE UNIMODAL?	YES		YES

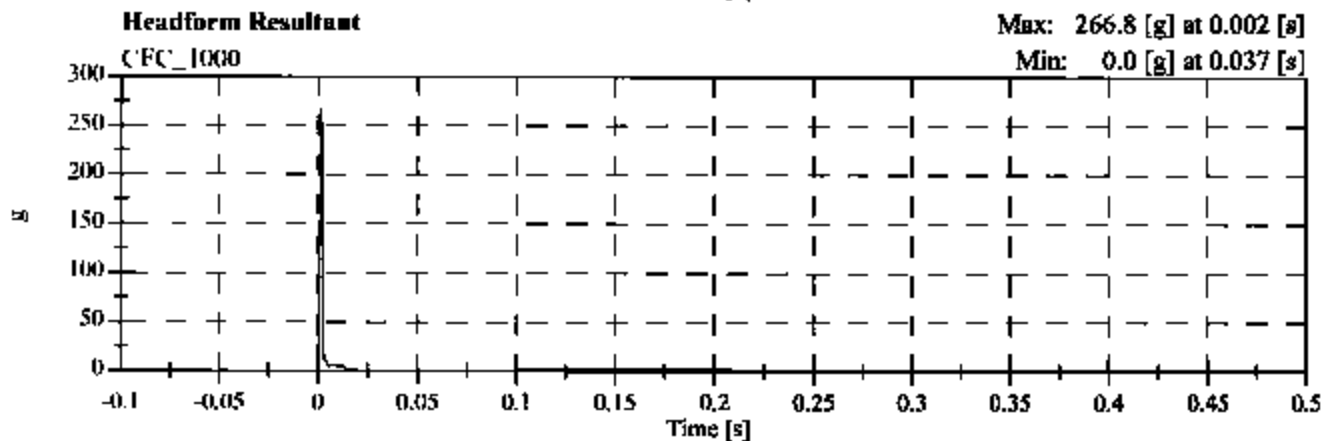
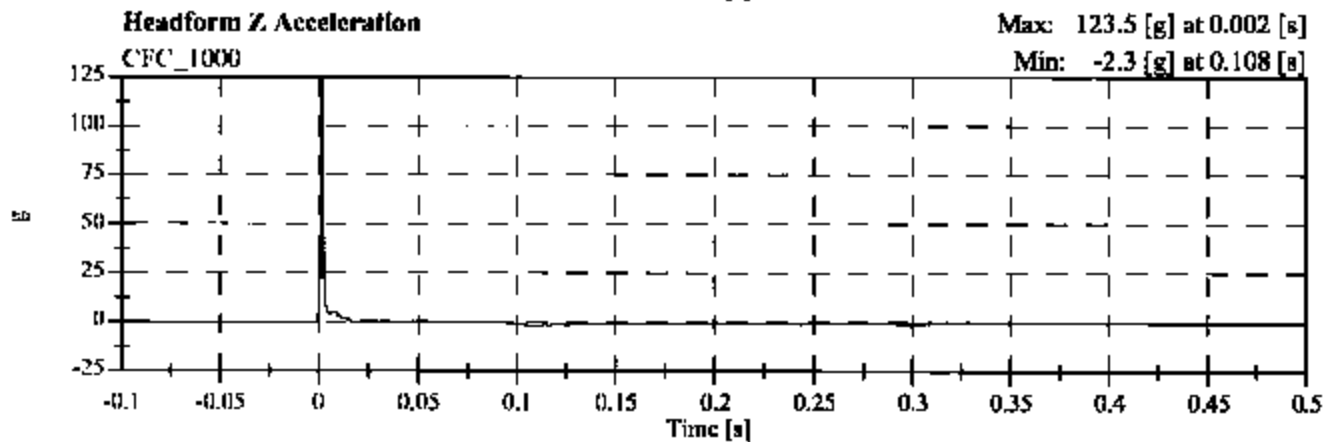
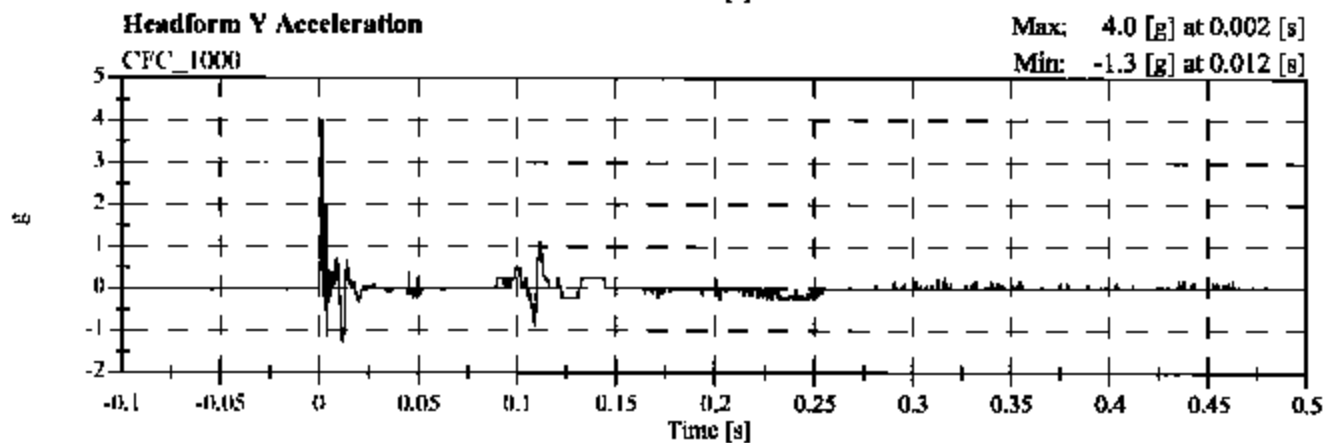
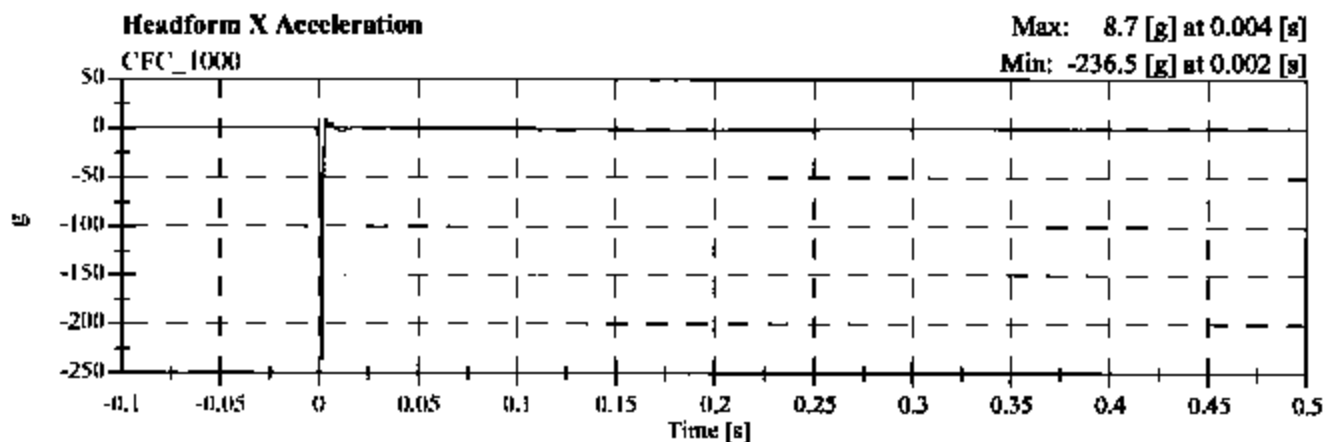
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33030	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J31049	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0642 - May 23, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON TECHNOLOGIES	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		MAY 23, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.1
RELATIVE HUMIDITY	10% to 70%		47
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		243.0
PEAK LATERAL ACCELERATION	15 Gs Maximum		5.1
IS ACCELERATION CURVE UNIMODAL?	YES		YES

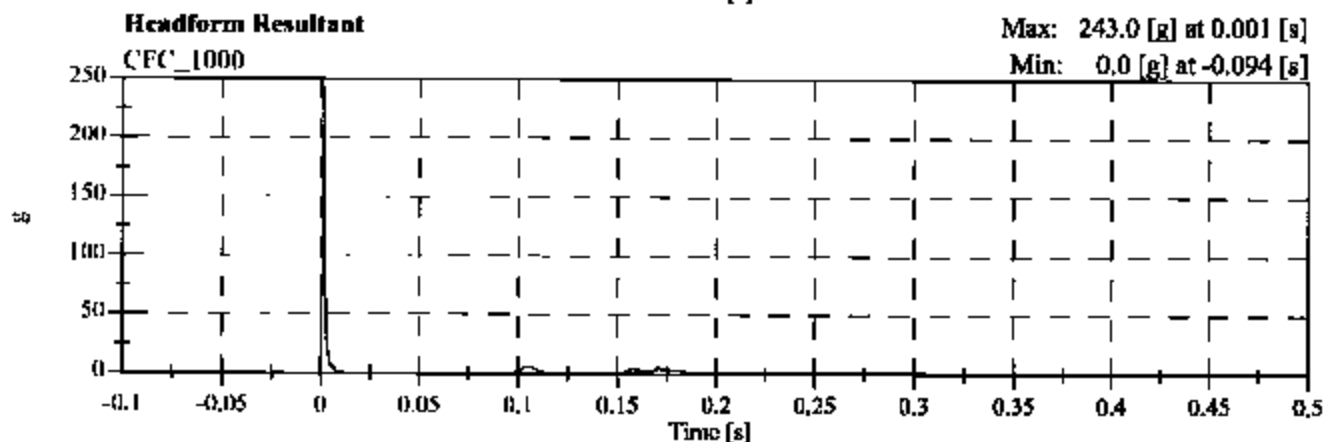
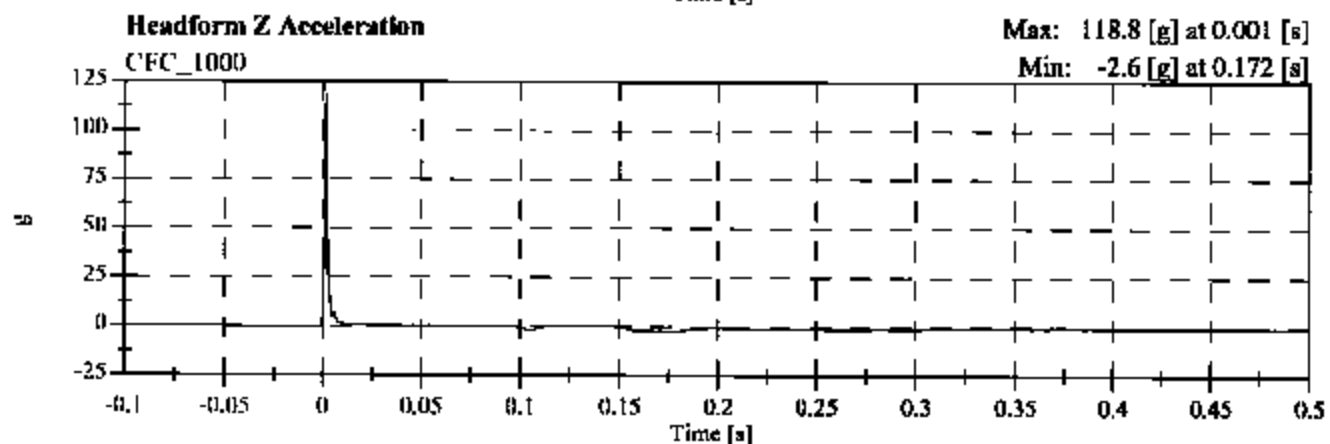
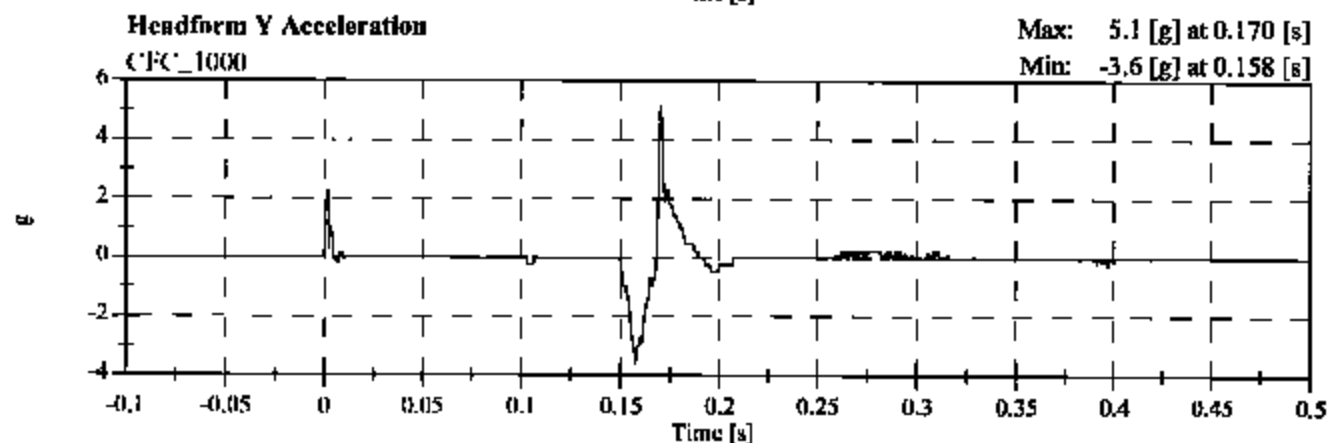
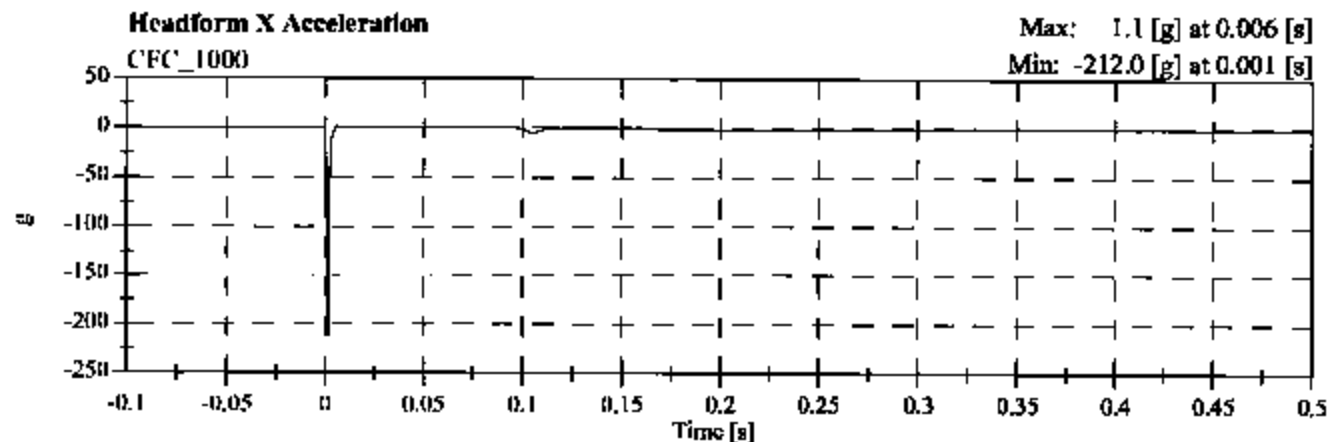
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33019	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0062 - May 23, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS
SERIAL NUMBER:		805
CALIBRATION DATE:		MAY 23, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23.1
RELATIVE HUMIDITY	10% to 70%	47
PEAK RESULTANT ACCELERATION	125 Gs to 275 Gs	256.3
PEAK LATERAL ACCELERATION	15 Gs Maximum	43
IS ACCELERATION CURVE UNIMODAL?	YES	YES

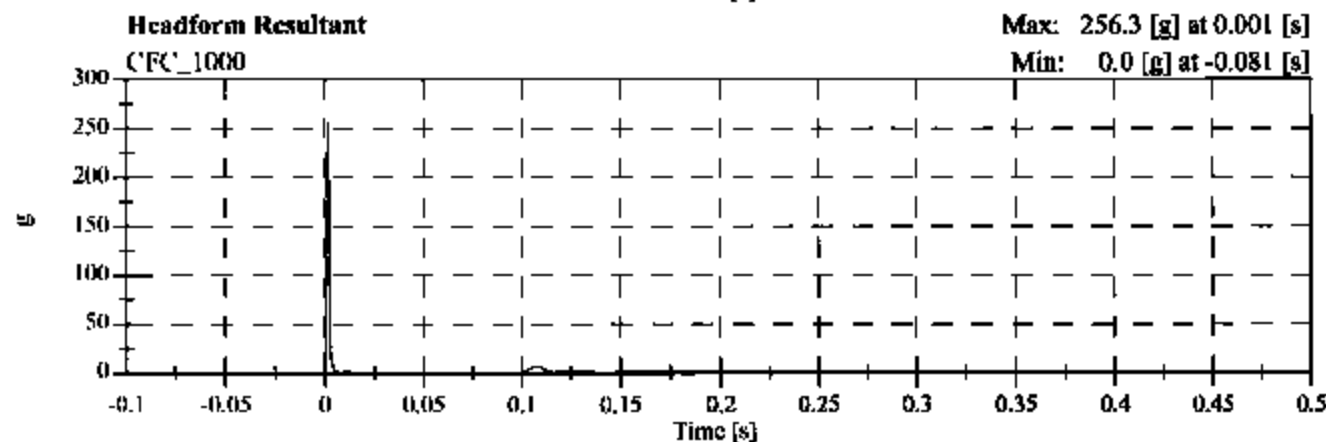
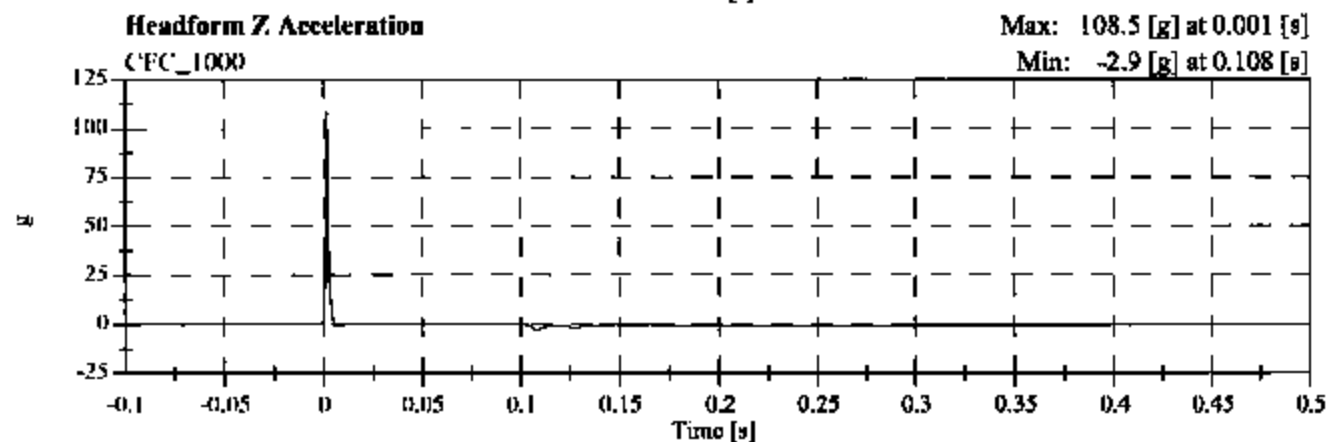
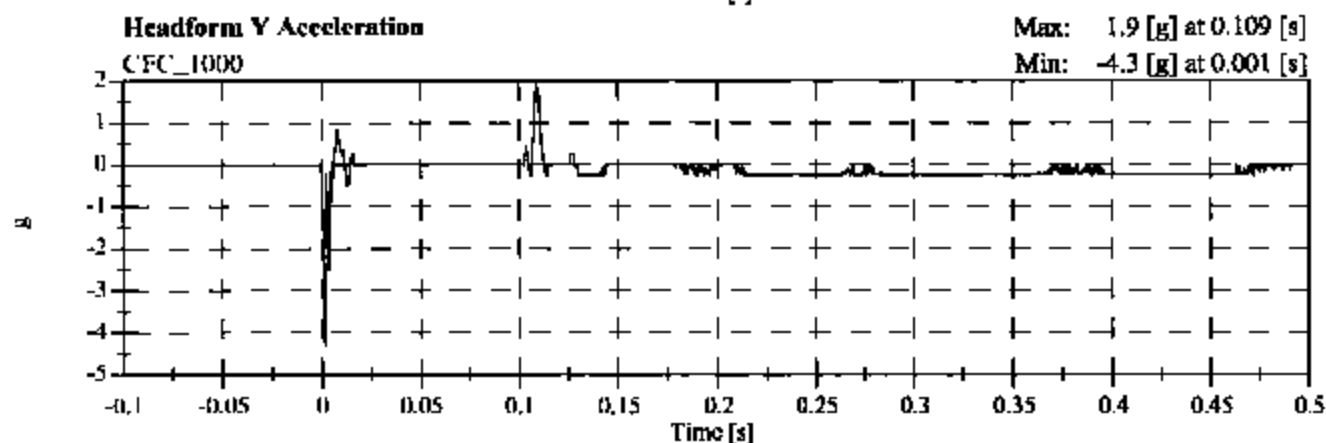
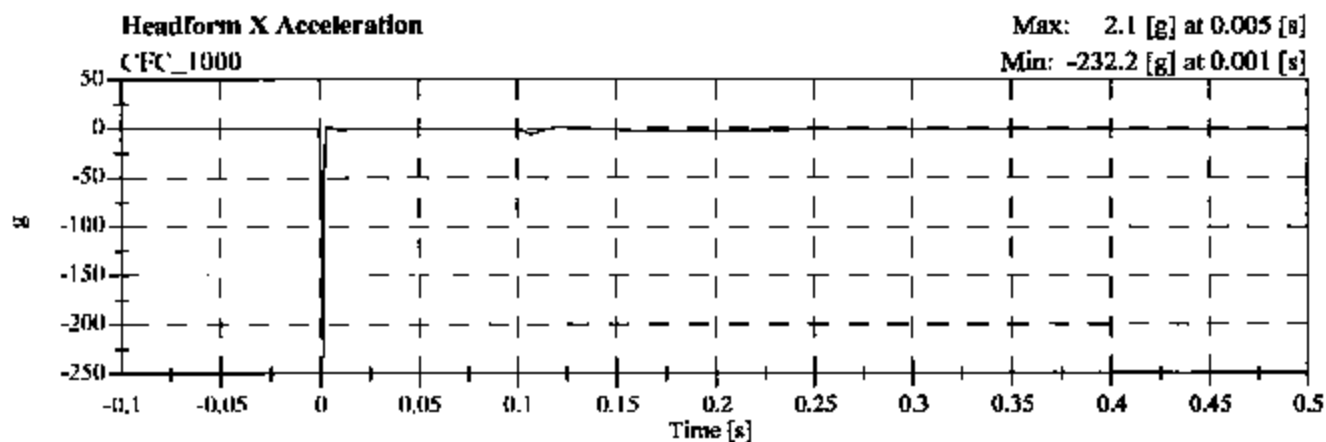
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J37980	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0805 - May 23, 2005



**PART 5721.
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON TECHNOLOGIES
SERIAL NUMBER:		0355
CALIBRATION DATE:		MAY 23, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23.1
RELATIVE HUMIDITY	10% to 70%	47
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	256.0
PEAK LATERAL ACCELERATION	15 Gs Maximum	3.2
IS ACCELERATION CURVE UNIMODAL?	YES	YES

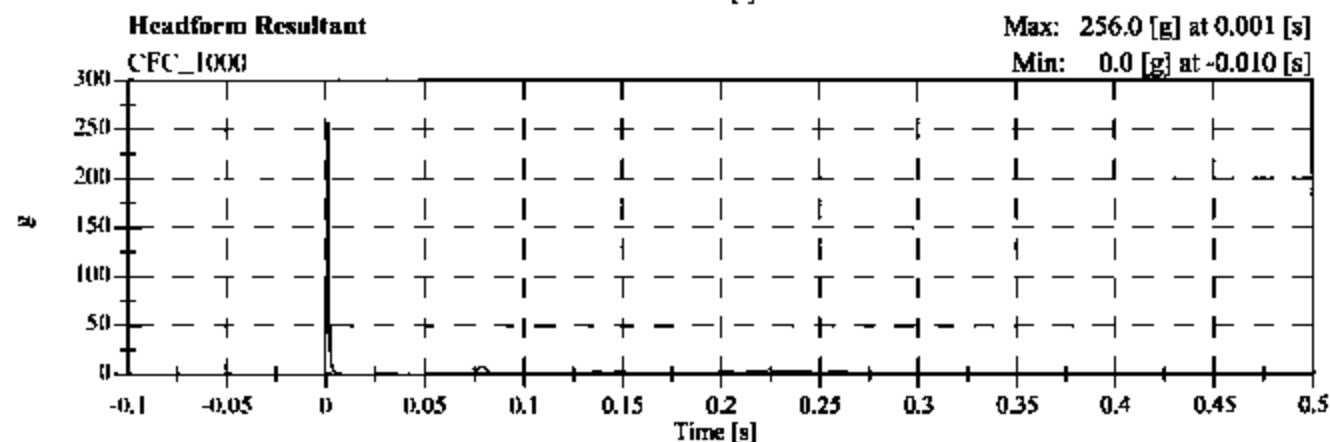
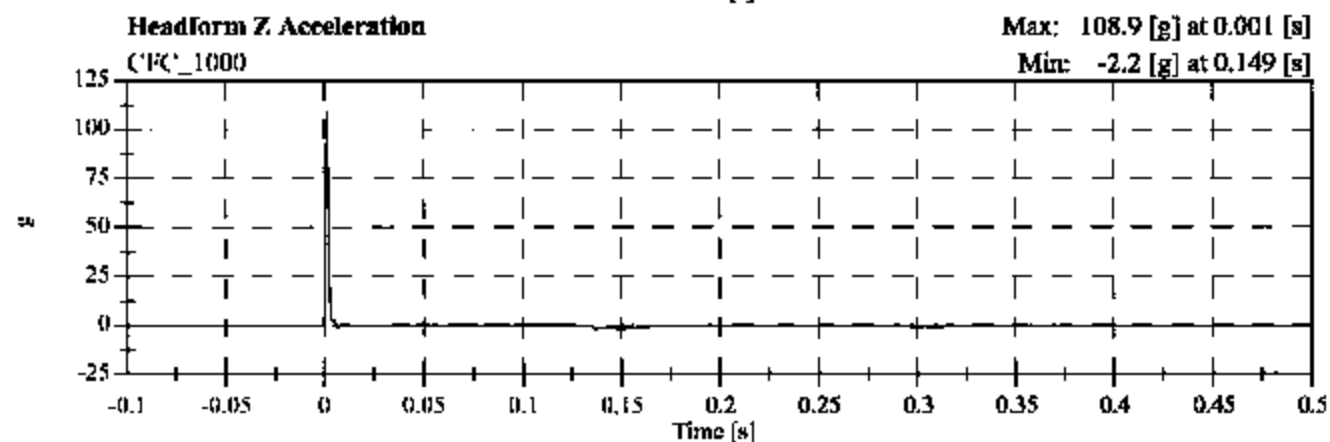
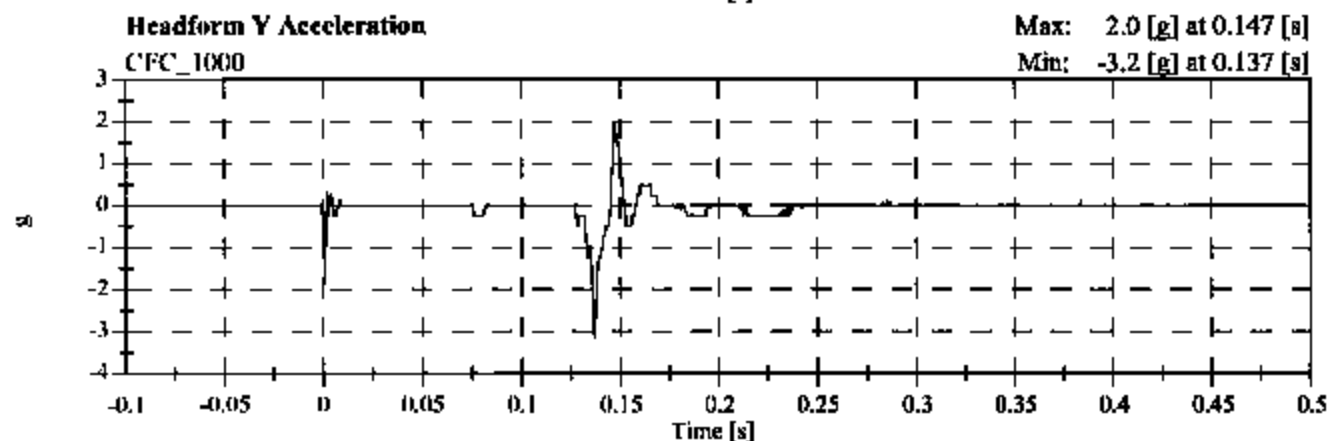
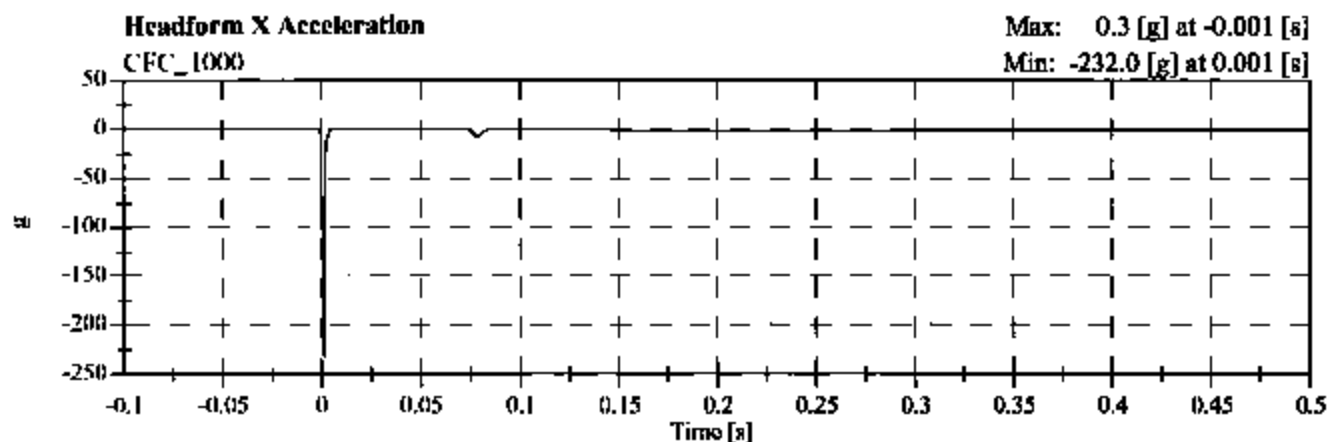
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
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2 - LATERAL	ENDEVCO	7264-2000T	J32779	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0355 - May 23, 2005



**PART 572L
HEAD DROP PRE-TEST**

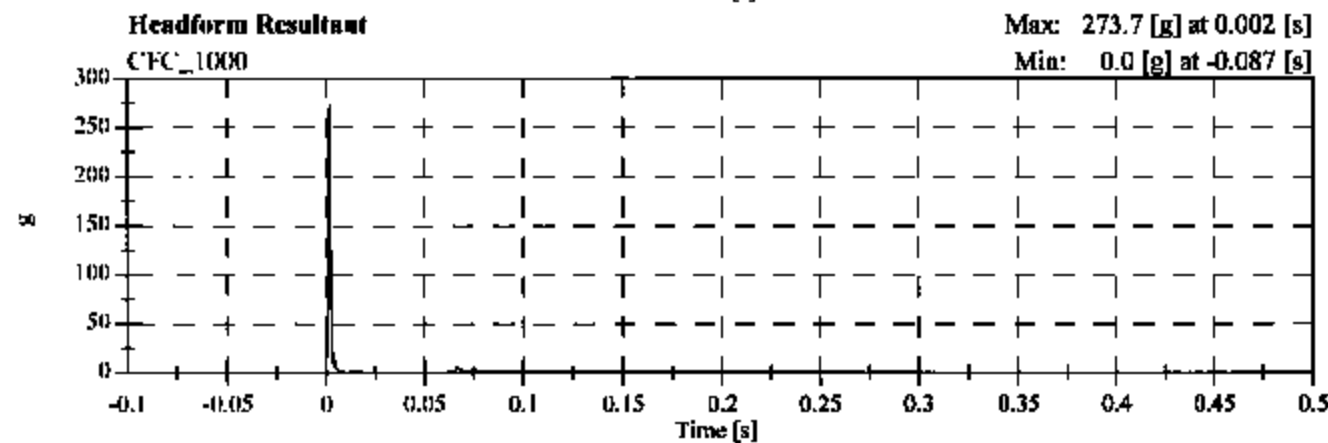
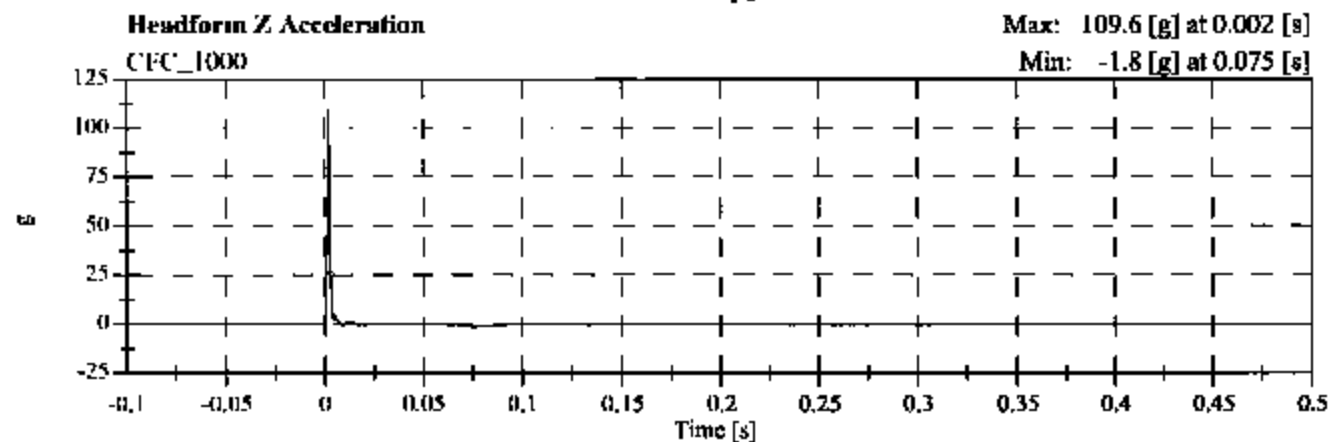
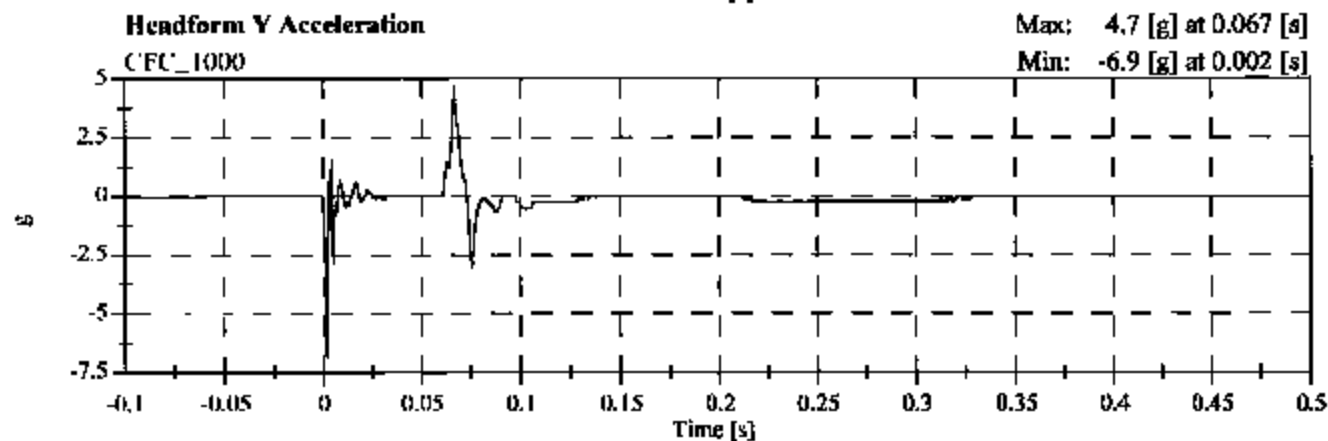
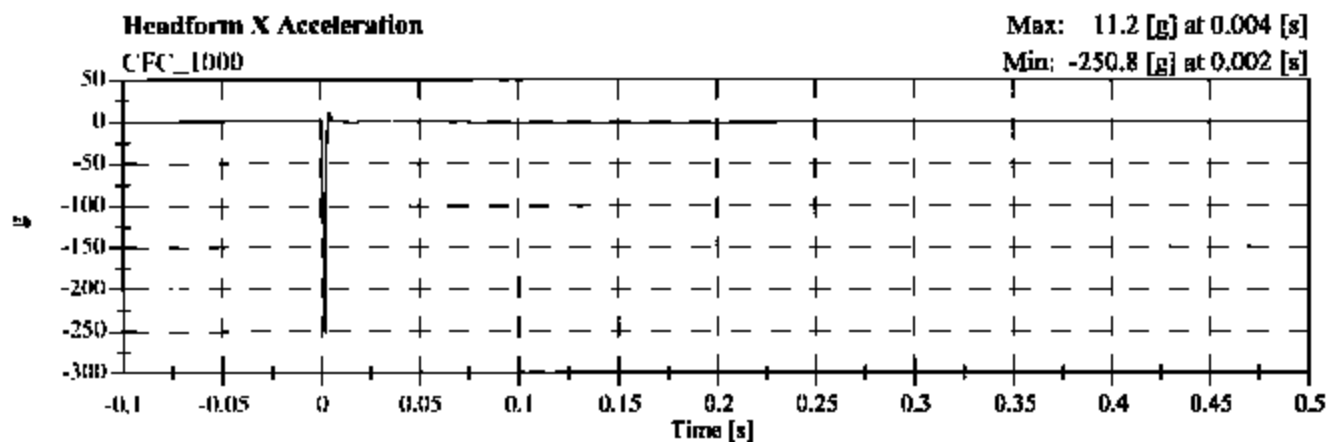
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SERIAL NUMBER:		1255	
CALIBRATION DATE:		MAY 23, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.1
RELATIVE HUMIDITY	10% to 70%		47
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		273.7
PEAK LATERAL ACCELERATION	15 Gs Maximum		6.9
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41046	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J40994	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops **FMH1255 - May 23, 2005**



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS
SERIAL NUMBER:		4642
CALIBRATION DATE:		June 3, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	42
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	244.4
PEAK LATERAL ACCELERATION	15 Gs Maximum	1.9
IS ACCELERATION CURVE UNIMODAL?	YES	YES

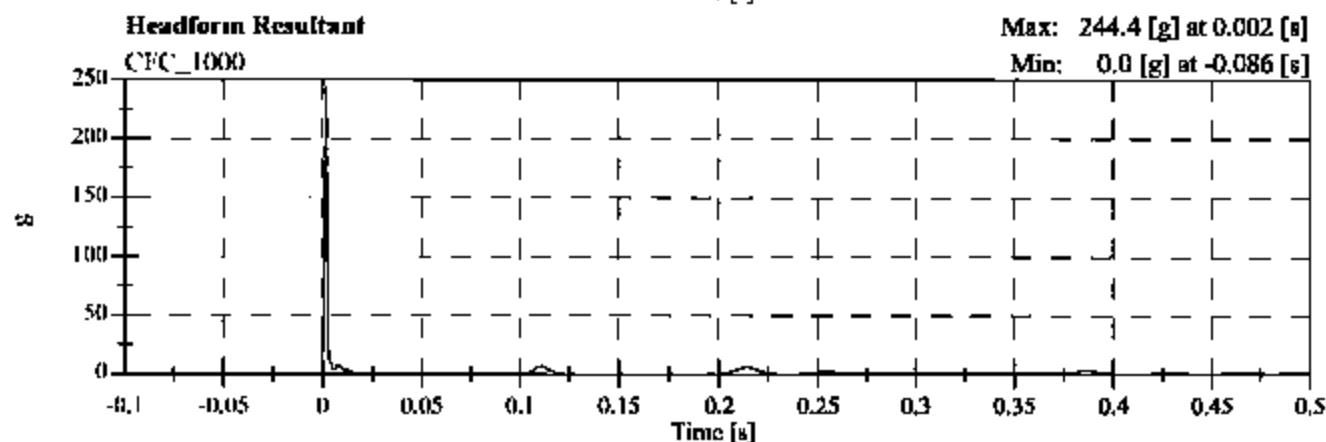
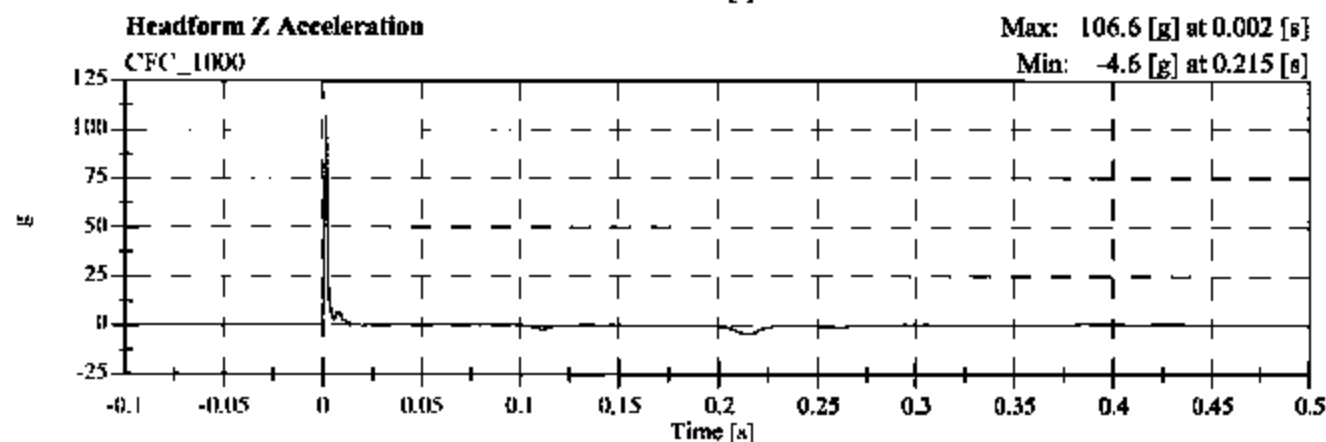
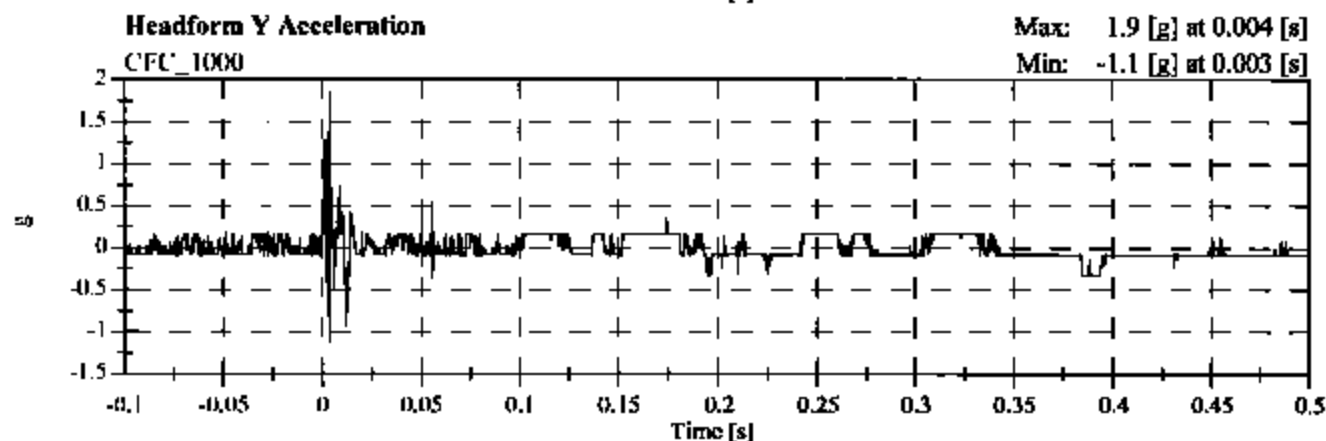
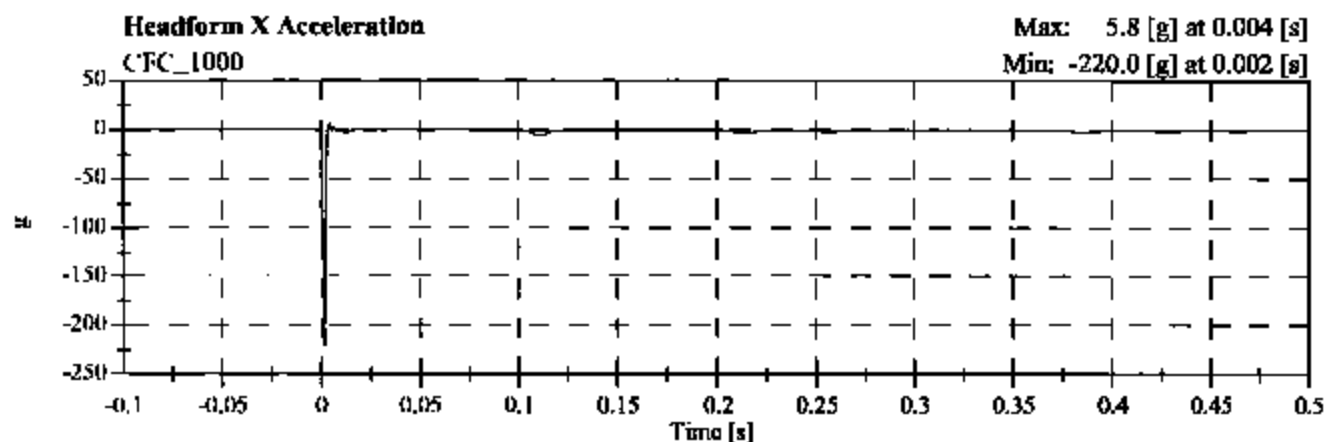
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33034	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J31089	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0642 - June 03, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON TECHNOLOGIES	
SERIAL NUMBER:		8062	
CALIBRATION DATE:		June 3, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		22
RELATIVE HUMIDITY	10% to 70%		42
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		241.7
PEAK LATERAL ACCELERATION	15 Gs Maximum		1.6
IS ACCELERATION CURVE UNIMODAL?	YES		YES

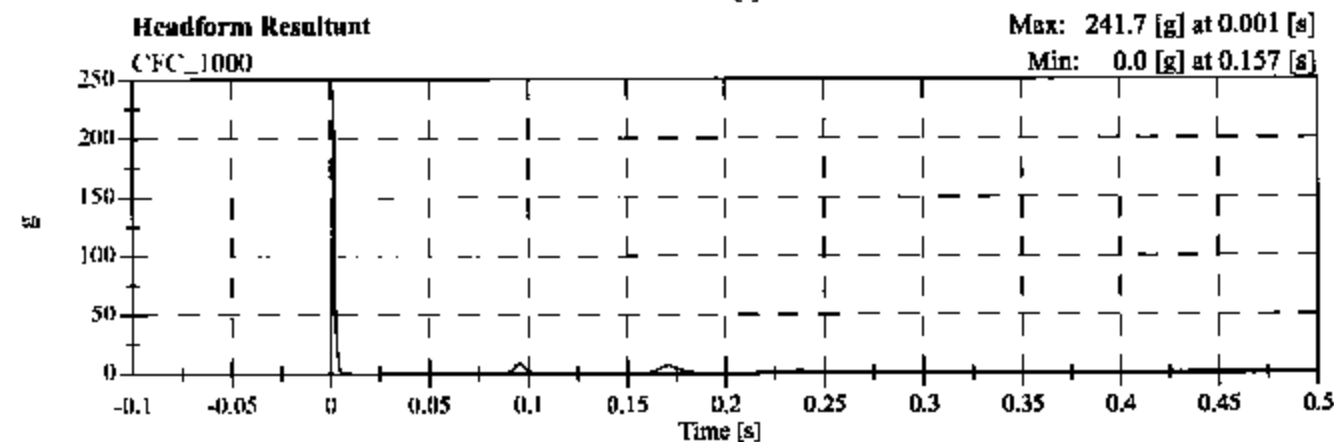
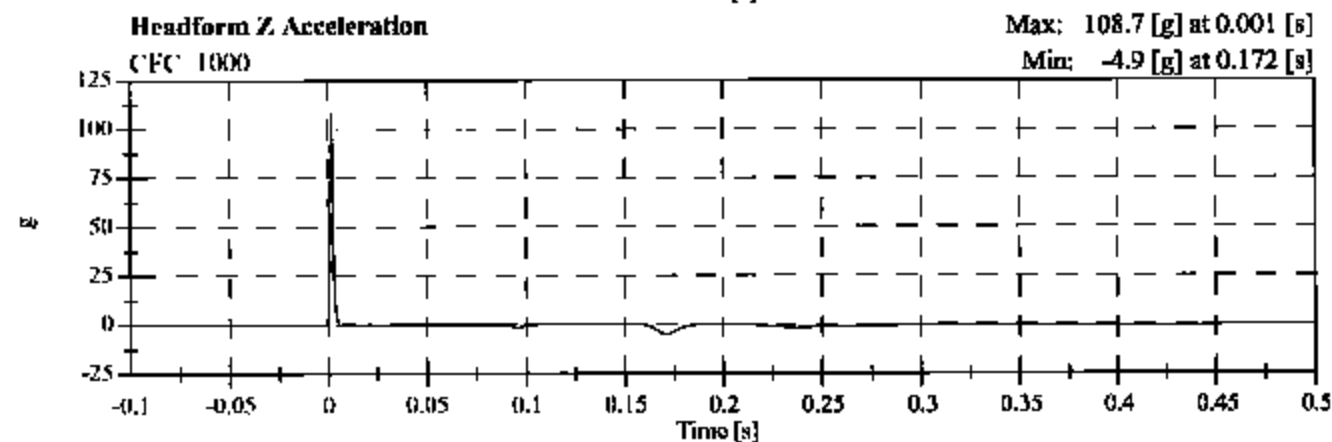
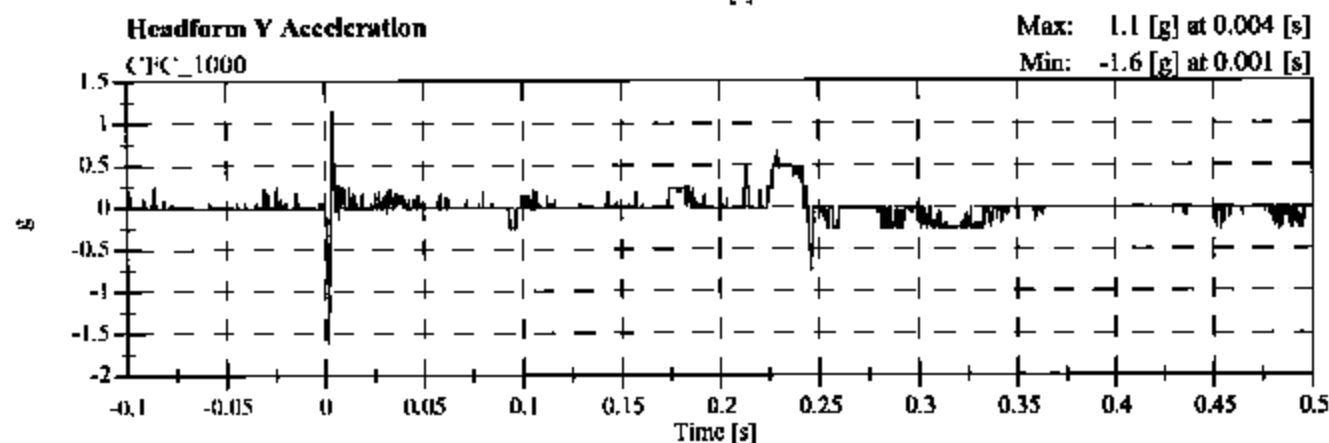
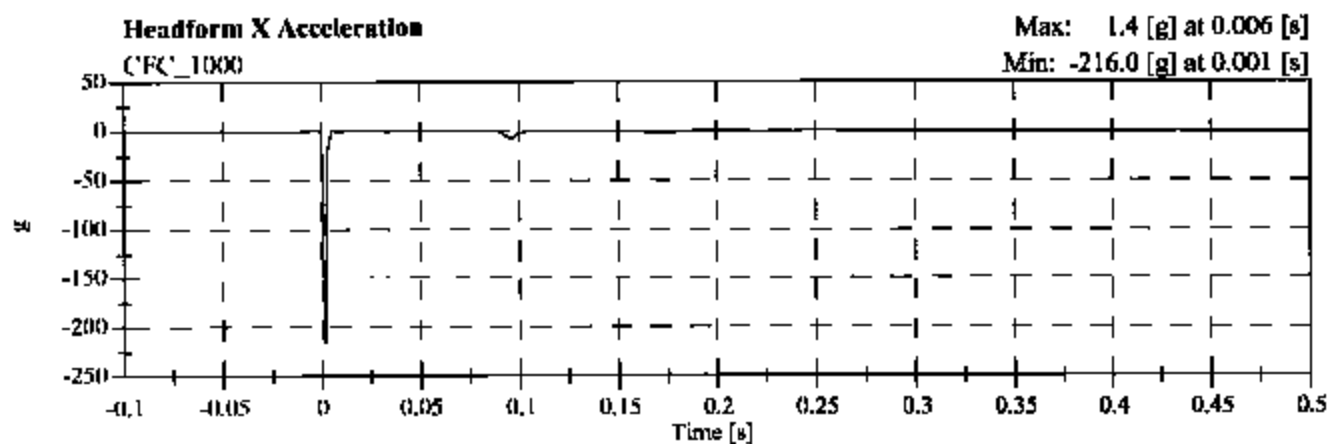
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33019	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0062 - June 03, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS
SERIAL NUMBER:		805
CALIBRATION DATE:		June 3, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	42
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	244.5
PEAK LATERAL ACCELERATION	15 Gs Maximum	11.8
IS ACCELERATION CURVE UNIMODAL?	YES	YES

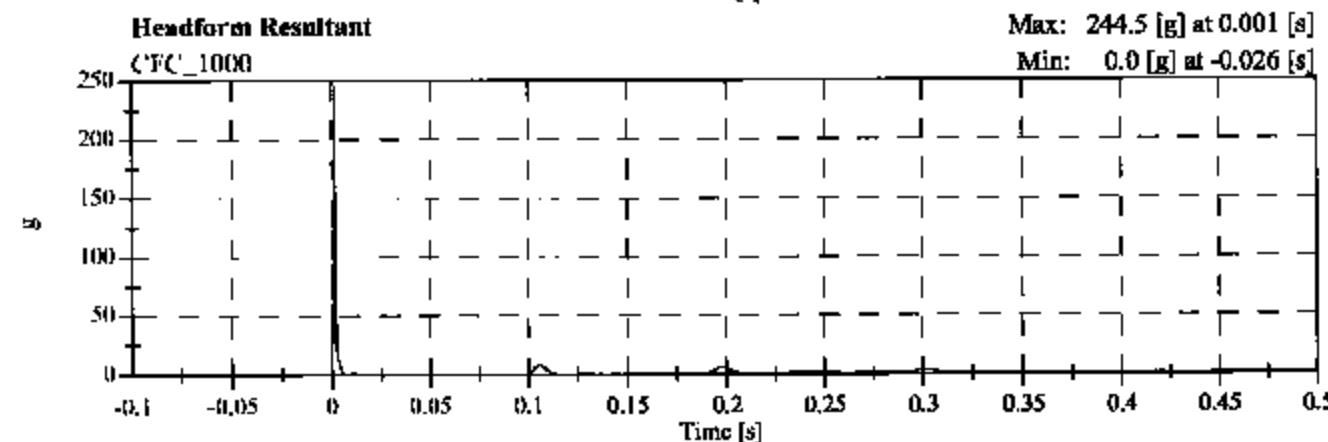
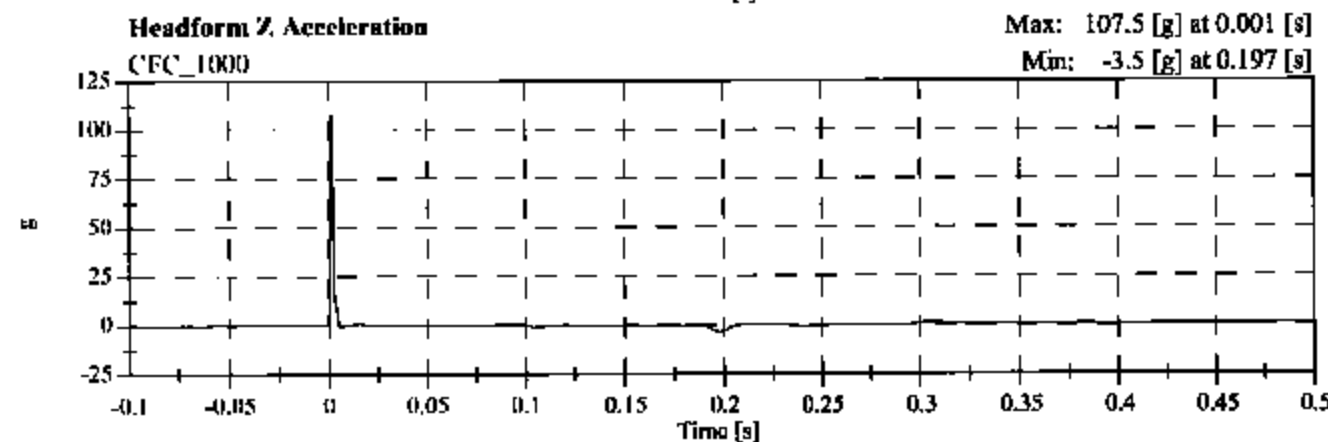
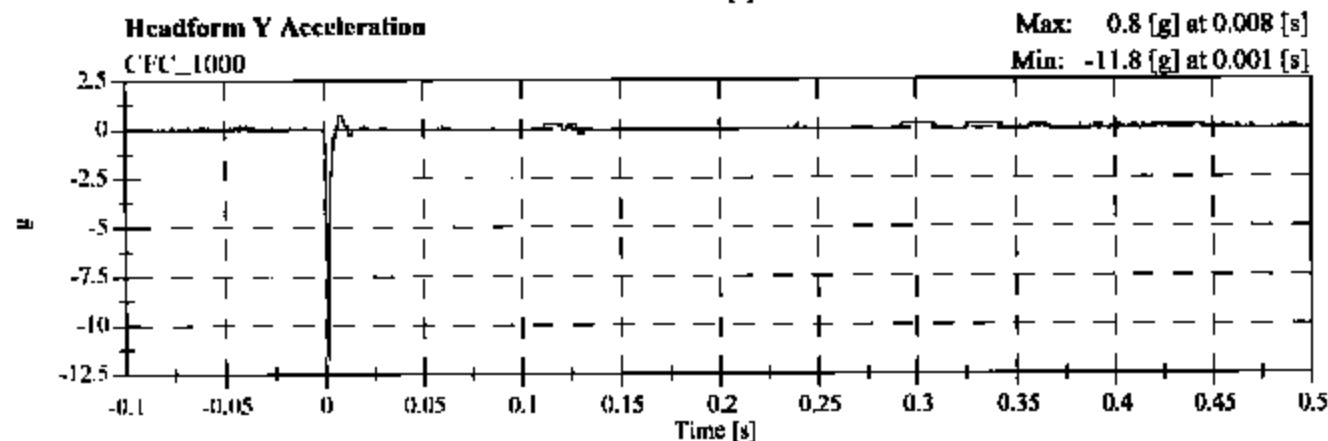
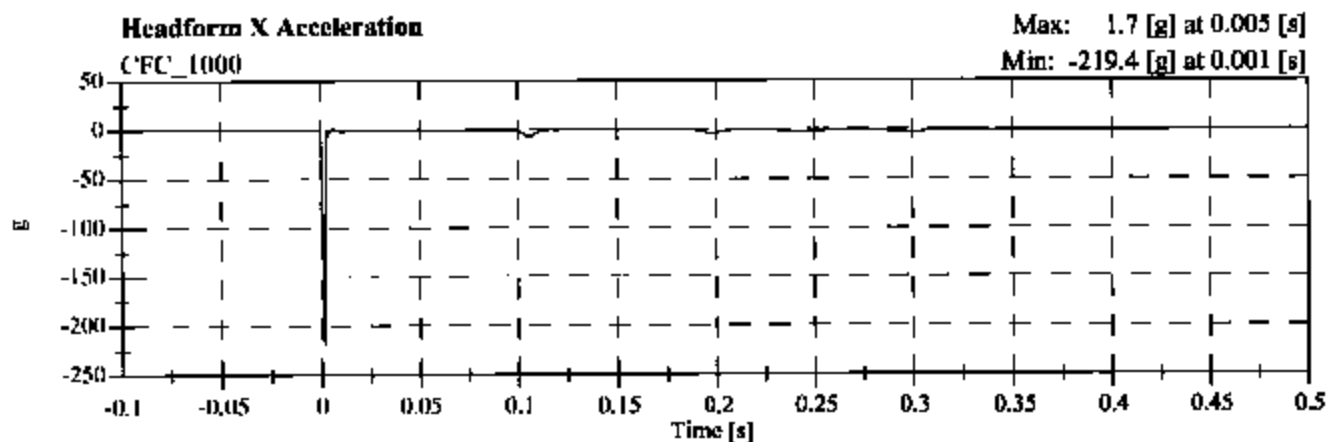
HEAD ACCELEROMETER CALIBRATION INFORMATION

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1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J37980	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0805 - June 03, 2005



**PART 572L
HEAD DROP POST-TEST**

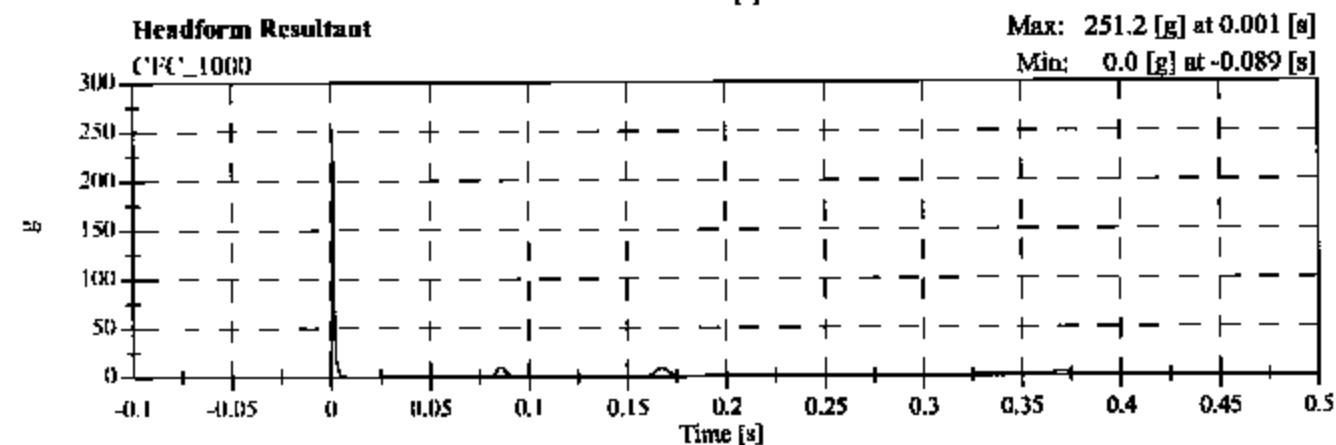
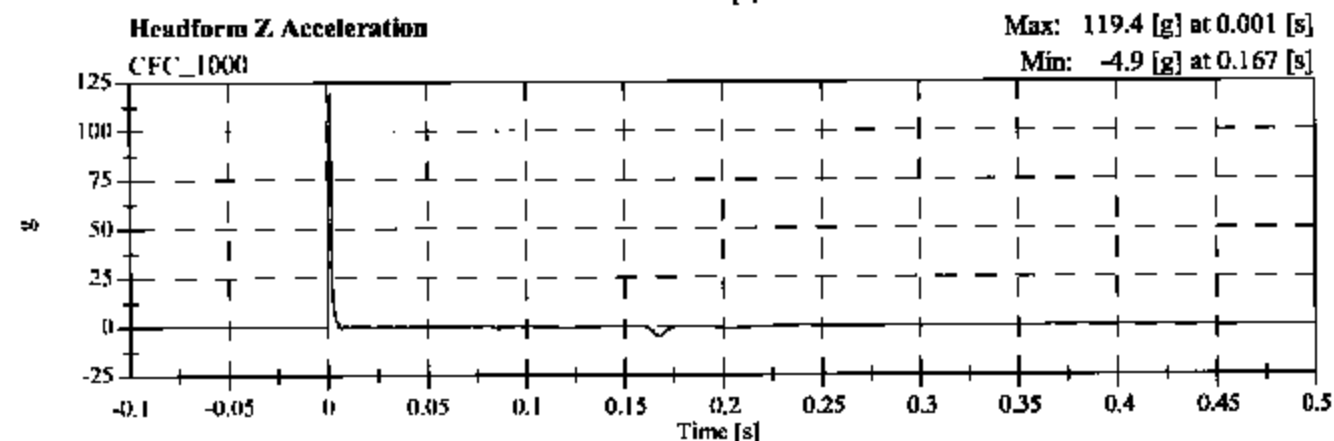
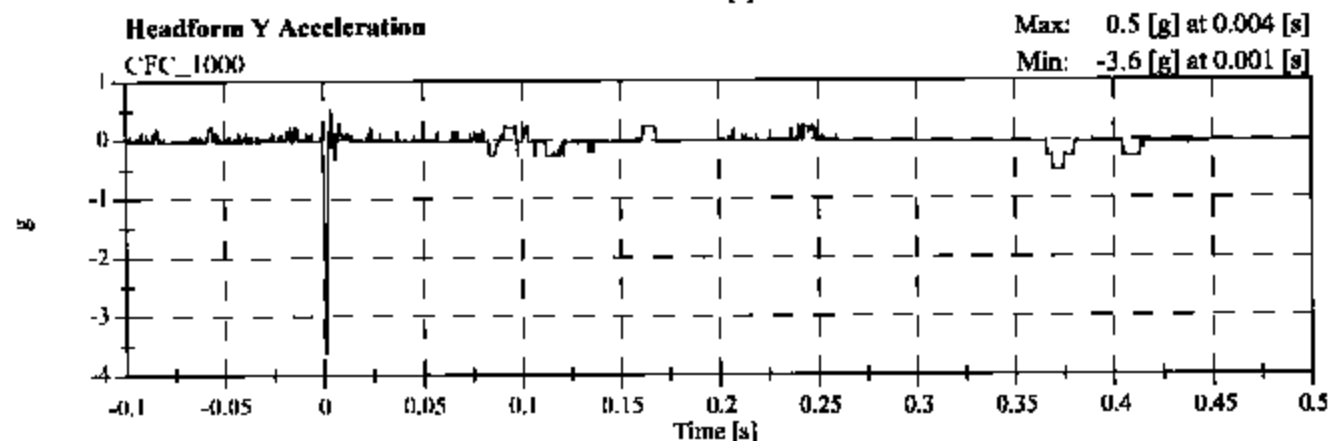
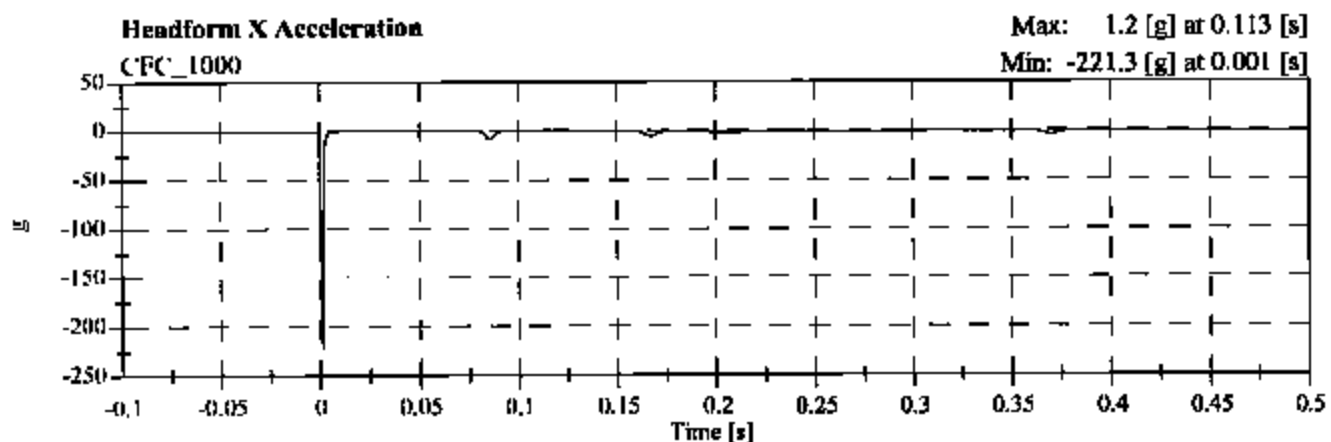
MANUFACTURER:		DENTON TECHNOLOGIES
SERIAL NUMBER:		0355
CALIBRATION DATE:		June 3, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	42
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	251.2
PEAK LATERAL ACCELERATION	15 Gs Maximum	3.6
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J32779	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops **FMH0355 - June 03, 2005**



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS
SERIAL NUMBER:		1255
CALIBRATION DATE:		June 3, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	42
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	262.5
PEAK LATERAL ACCELERATION	15 Gs Maximum	8.5
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	3/16/2005	9/16/2005
2 - LATERAL	ENDEVCO	7264-2000T	J40994	3/16/2005	9/16/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	3/16/2005	9/16/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH1255 - June 03, 2005

