

V375C

REPORT NUMBER 301-CAL-01-8

**SAFETY COMPLIANCE TESTING FOR FMVSS 301
FUEL SYSTEM INTEGRITY**

SAAB AUTOMOBILE AB
2001 SAAB
9-3 5 DOOR HATCHBACK

NHTSA NUMBER C10516

VERIDIAN TEST NUMBER 8606-8

August 14, 2001

VERIDIAN ENGINEERING
P O BOX 400
BUFFALO, NEW YORK 14225



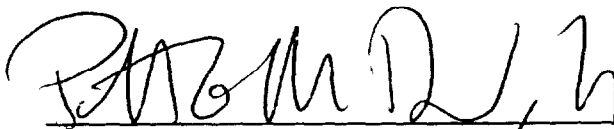
FINAL REPORT

PREPARED FOR

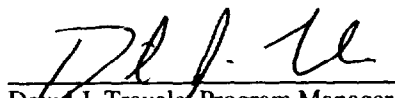
U S Department of Transportation
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
400 Seventh Street, S W
Room No 6115 (NSA-30)
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16 Abstract Compliance tests were conducted on the subject 2001 Saab 9-3 5 Door Hatchback in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No TP-301-01 for the determination of FMVSS 301 compliance Test failures identified were as follows The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity "			
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Section 1

PURPOSE OF COMPLIANCE TEST

This 30 mph rear moving barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 301 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by Veridian Engineering under Contract No DTNH22-01-C-01025. The purpose of this test was to determine if the subject vehicle, a 2001 Saab 9-3 5 Door Hatchback, meets the performance requirements of FMVSS No 301, "Fuel System Integrity." This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No TP-301-01, dated March 28, 1994.

Section 2

COMPLIANCE TEST RESULTS SUMMARY FOR C10516

A 3595 pound 2001 Saab 9-3 5 Door Hatchback was impacted from the rear by a 3961 pound moving barrier at a velocity of 29.3 mph. The test was performed by Veridian Engineering on August 14, 2001.

One instrumented Part 572 E and one non-instrumented Part 572 B, 50th percentile male Anthropomorphic Test Device (ATD) were placed in the driver and right-front passenger seating positions respectively. Additional ballast (0 pounds) was secured in the vehicle cargo area.

The crash event was recorded by eight high-speed cameras and one real-time camera. Camera locations and other pertinent camera information are found on pages 3-9 and 3-10 of this report. Pre- and post-test photographs of the vehicle can be found in Appendix A. Vehicle and ATD electronic data plots are presented in Appendix B.

The 16.9 gallon fuel tank was filled to 92.5 percent capacity with orange Stoddard fluid prior to the impact. After the impact, there was no fluid leakage for the first 30 minutes nor during any phase of the rollover test. Average vehicle longitudinal crush was 14.47 inches. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity." Section 3 presents the results of these tests.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No	<u>C10516</u>	Test Mode	<u>30 mph Rear Barrier</u>
Test Date	<u>August 14, 2001</u>	Time	<u>10 30</u> Temperature <u>68</u> °F
Vehicle Make/Model/Body Style	<u>2001 Saab 9-3 5 Door Hatchback</u>		
Vehicle Test Weight	<u>3595</u> lbs	Impact Velocity	<u>29 3</u> mph
Static Crush			
	Left Side	<u>15 3</u>	inches
	Centerline	<u>14 8</u>	inches
	Right Side	<u>13 3</u>	inches
	Average	<u>14 47</u>	inches

TYPE OF FRONT OCCUPANT RESTRAINT SYSTEM INSTALLED IN TEST VEHICLE

Driver's DSP	<u>Seatbelt, Airbag, Knee Bolster</u>
Right Passenger's DSP	<u>Seatbelt, Airbag, Knee Bolster</u>

VISIBLE DUMMY CONTACT POINTS

Driver	<u>The back of the head to the center of the headrest</u>	<u>The left and right knee to the bottom of the steering wheel rim</u>
Passenger	<u>The back of the head to the center of the headrest</u>	

<u>DOOR OPENING DATA</u>	<u>Closed/Operable</u>	- Left Front
	<u>Closed/Operable</u>	- Right Front

Stoddard Solvent Spillage from Vehicle's Fuel System	<u>None</u>
--	-------------

Remarks	<u>The rear glass shattered upon impact</u>	<u>The rear doors were inoperable after the event</u>	<u>The driver's seat angle was 12 2 degrees after the event after a pre test angle of 0 6 degrees</u>
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Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION

Year/Make/Model/Body Style	2001 Saab 9-3 5 Door Hatchback				
NHTSA No	C10516	VIN	YS3DD58H312023834	Color	White
Engine Data	4	cylinders,	-	CID,	2 0 Liters, - cc
Placement	-	Longitudinal or In-Line,	X	Transverse or Lateral	
Transmission Data	4	speeds,	-	Manual, X	Automatic, X Overdrive
Final Drive	-	Rear Wheel Drive,	X	Front Wheel Drive,	- Four Wheel Drive
Major Options	X	A/C,	X	Power Steering,	X Power Brakes
	X	Power Windows,	X	Power Door Locks,	X Tilt Wheel
Date Received	June 14, 2001	Odometer Reading	134	miles	
Selling Dealer	Vehicle Transfer				
& Address					

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL

Vehicle Manufactured by	Saab Automobile AB
Date of Manufacture	10/00
GVWR	4100 lbs , GAWR 2300 lbs FRONT, 1930 lbs REAR

DATA FROM TIRE PLACARD

Location of Placard on Vehicle	Left B-Pillar
Tire Pressure with Maximum Capacity Vehicle Load	44 psi FRONT 44 psi REAR
Recommended Tire Size	P195/60R15
* Recommended Cold Tire Pressure	36 psi FRONT, 36 psi REAR
Size of Tires on Test Vehicle	P195/60R15 Manufacturer Michelin
Type of Spare Tire	P195/60R15
Vehicle Capacity Data	
Type of Front Seats	- Bench, X Bucket, - Split Bench
Number of Occupants	2 Front, 3 Rear, 5 Total
Vehicle Capacity Weight (VCW) =	890 lbs
No of Occupants x 150 lbs =	750 lbs
Rated Cargo/Luggage Weight (RCLW) =	140 lbs

*Tire pressure used for test

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont)

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

Right Front	=	<u>967</u>	lbs	Right Rear =	<u>575</u>	lbs
Left Front	=	<u>1001</u>	lbs	Left Rear =	<u>593</u>	lbs
TOTAL FRONT	=	<u>1968</u>	lbs	TOTAL REAR =	<u>1168</u>	lbs
TOTAL DELIVERED WEIGHT	=	<u>3136</u>	lbs			
% of Total Front of Vehicle Weight	=	<u>62 8%</u>		of Total Rear Weight	=	<u>37 2%</u>

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT

Total Delivered Weight	=	<u>3136</u>	lbs
Rated Cargo/Luggage Weight (RCLW)	=	<u>140</u>	lbs
Weight of 2 p 572 Dummies, 167 & 164 lbs	=	<u>331</u>	lbs
TARGET TEST WEIGHT	=	<u>3607</u>	lbs

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 128 POUNDS OF CARGO WEIGHT

Right Front	=	<u>1100</u>	lbs	Right Rear =	<u>685</u>	lbs
Left Front	=	<u>1155</u>	lbs	Left Rear =	<u>655</u>	lbs
TOTAL FRONT	=	<u>2255</u>	lbs	TOTAL REAR =	<u>1340</u>	lbs
TOTAL TEST WEIGHT	=	<u>3595</u>	lbs			
% of Total Front of Vehicle Weight	=	<u>62 7%</u>		of Total Rear Weight	=	<u>37 3%</u>

* Weight of Ballast Secured in Vehicle Trunk Area = 40 lbsType of Ballast Lead ShotMethod of Securing Ballast Secured to floorVehicle Components Removed for Weight Reduction None

VEHICLE ATTITUDE (all dimension in inches)

AS DELIVERED	RF	<u>26 6</u>	LF	<u>26 5</u>	RR	<u>27 1</u>	LR	<u>26 8</u>
AS TESTED	RF	<u>25 6</u>	LF	<u>25 5</u>	RR	<u>26 4</u>	LR	<u>26 3</u>
Vehicle's Wheel Base		<u>102 5</u>	in					
Location of Vehicle's C G		<u>38 2</u>	inches rearward of front wheel center					

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual	=	<u>16 9</u>	gallons
Usable Capacity Figure Furnished by COTR	=	<u>16 9</u>	gallons
Test Volume Range (91 to 94% of Usable Capacity)	=	<u>15 38</u>	to <u>15 89</u> gallons
ACTUAL TEST VOLUME	=	<u>15 6</u>	gallons (with entire fuel system filled)

* Ballast weight includes the RCLW, the weight of drained vehicle fluids and the weight of any removed vehicle components less the weight of onboard instrumentation, cameras, and hardware

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont)

FUEL SYSTEM DATA (continued)

Test Fluid Type	Stoddard Solution
Test Fluid Specific Gravity	0.764
Test Fluid Kinematic Viscosity	0.96 centistokes
Test Fluid Color	Orange ("red" is preferred)
Type of Vehicle Fuel Pump	Electric
Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF -	
Fuel pump operated	
Details of Fuel System	Tank – Centered ahead of rear axle, Lines – Inside right frame stiffener,
Filler – right side behind rear axle	

Table 3

MOVING BARRIER PARAMETER DATAWEIGHT OF MOVING BARRIER

Right Front	=	<u>1113</u>	lbs	Right Rear	=	<u>868</u>	lbs
Left Front	=	<u>1102</u>	lbs	Left Rear	=	<u>878</u>	lbs
TOTAL FRONT	=	<u>2215</u>	lbs	TOTAL REAR	=	<u>1746</u>	lbs
TOTAL BARRIER WEIGHT	=	<u>3961</u>	lbs				

MOVING BARRIER DIMENSIONS

Barrier Face Height	<u>60 0</u>	in
Barrier Face Width	<u>78 0</u>	in
Barrier Face		
Ground Clearance	<u>5 0</u>	in
Tread Width	<u>59 5</u>	in
Wheel Base	<u>120 0</u>	in
Location of C G	X	<u>52 9</u> inches rearward of front wheel center
	Y	<u>0 0</u> inches from longitudinal-vertical plane of symmetry
	Z	<u>16 3</u> inches above ground

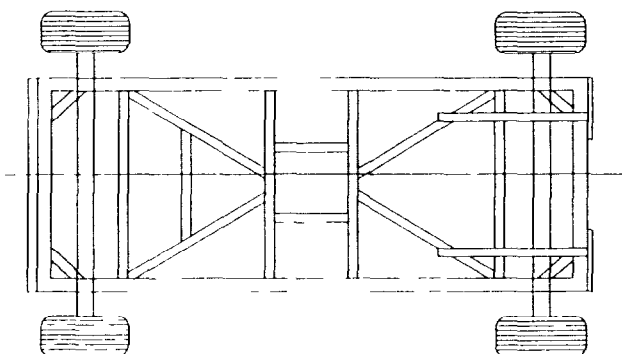
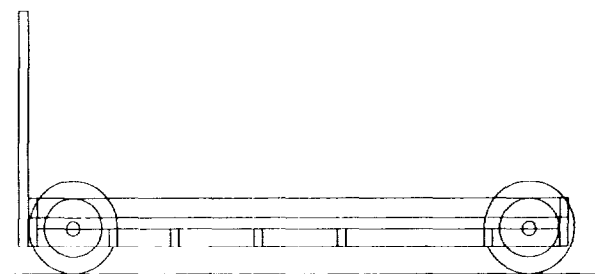


Table 4

POST IMPACT DATATYPE OF TEST

Type of Test Rear Barrier Impact Angle 0°
 Test Date August 14, 2001 Time 10 30 Temperature 68 °F
 Vehicle NHTSA No C10516
 Required Impact Velocity Range 28 9 to 29 9 mph

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

Trap No 1 = 29 3 mph, Trap No 2 = 29 3 mph
 Average Impact Speed = 29 3 mph

VEHICLE STATIC CRUSH

Vehicle Length

Pre-Test Left = 178 1, C/L = 182 4 Right = 178 1
 Post-Test Left = 162 8, C/L = 167 6 Right = 164 8
 Crush Left = 15 3, C/L = 14 8 Right = 13 3
 AVERAGE = 14 47 inches

Section 3
COMPLIANCE TEST DATA

Figure 1

PART 572 DUMMY IN-VEHICLE POSITION
(FOR REAR IMPACTS ONLY)

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

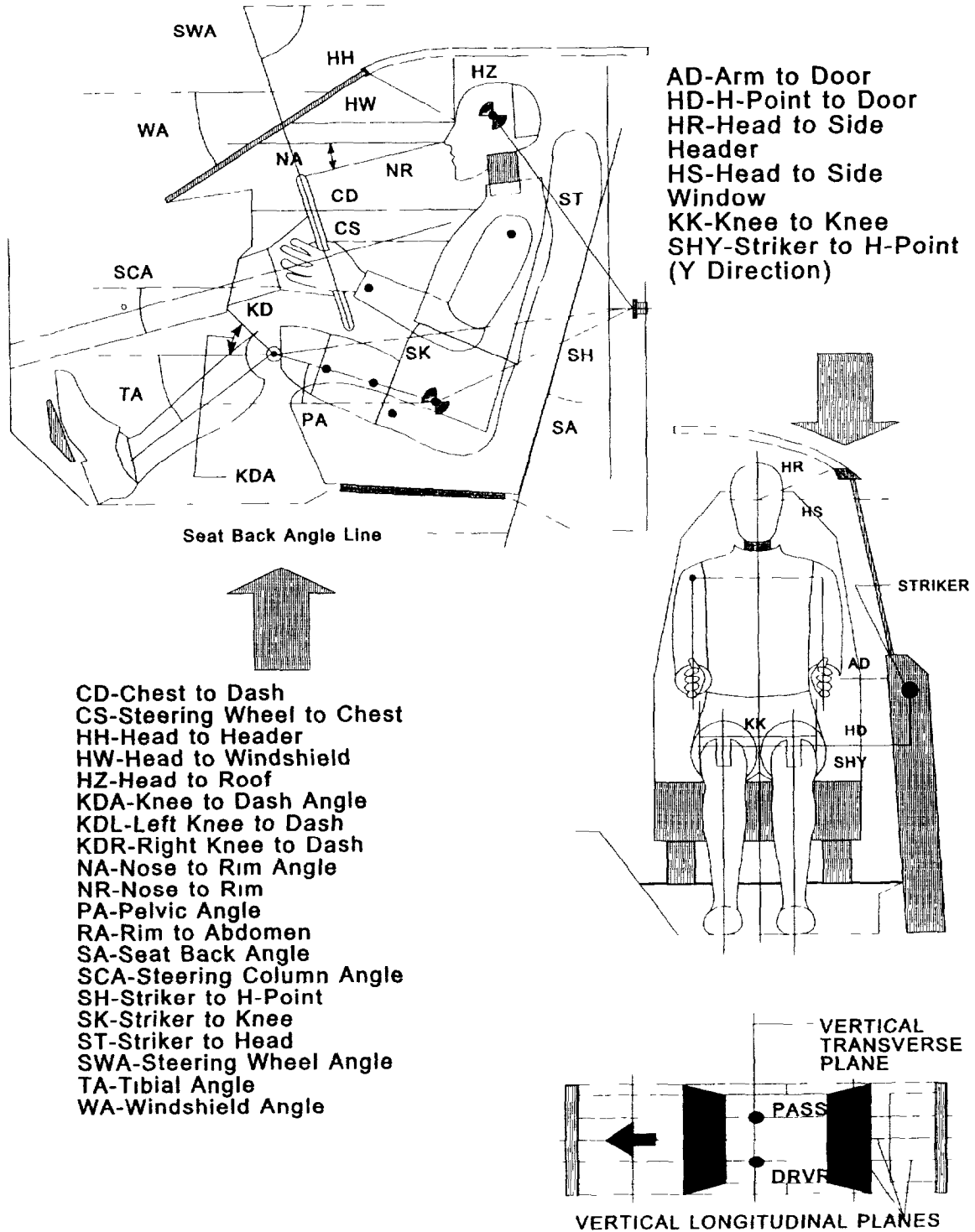


Table 5

**FRONT SEAT OCCUPANT MEASUREMENTS
(FOR REAR IMPACT ONLY)**

	DRIVER (Serial #152)			
WA°	34 1		deg	
SWA°	67 8		deg	
SCA°	22 2		deg	
SA°	0 6		deg	
HZ			7 4	
HH			16 4	
HW			24 4	
HR			7 9	
NR	15 2	Angle	-9	deg
CD			21 1	
CS			11 6	
RA			8 8	
KDL	5 9	Angle (KDA)	40	deg
KDR			5 9	
PA°			24 9	deg
TA°			38 6	deg
KK			11 8	
ST	18 9	Angle	13	deg
SK	22 6	Angle	96	deg
SH	10 6	Angle	142	deg
SHY			9 0	
HS			11 7	
HD			4 8	
AD			4 3	

(Measurements in inches)

Table 6
FUELSYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO 301

TEST VEHICLE NHTSA NO C10516 TEST DATE August 14, 2001

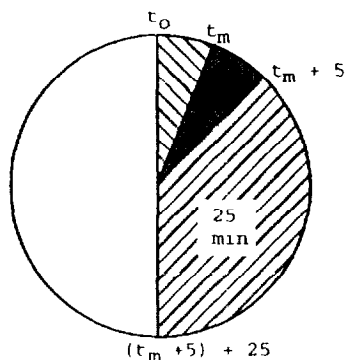
Vehicle Mfgr /Make/Model 2001 Saab 9-3 5 Door Hatchback

Test vehicle fuel tank filled to 91% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation) Part 572 test dummies located at each front designated seating position

TEST VEHICLE IMPACT TYPE

- Frontal (30 mph)
- Oblique (30 mph) with - ° barrier face first
 contacting _____
 (driver/passenger) side
X Rear Moving Barrier (30 mph)
- Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT



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

ACTUAL	MAX ALLOWED
0	1 oz
0	5 oz
0	1 oz / 1 min

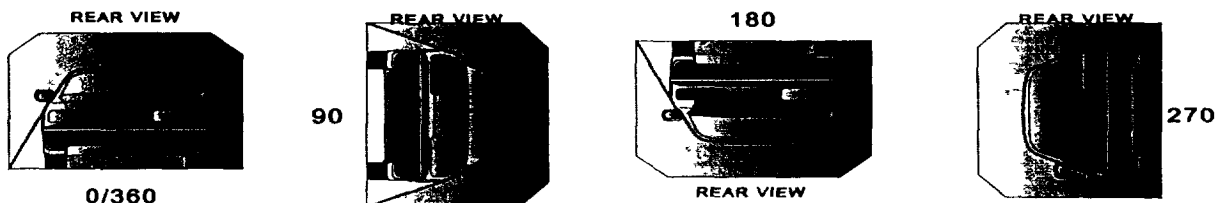
SOLVENT SPILLAGE DETAILS

None

Table 7 FMVSS NO 301 - STATIC ROLLOVER DATA SHEET

Vehicle 2001 Saab 9-3 5 Door Hatchback

NHTSA No C10516



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	03	seconds	5	minutes	6	minutes	3	seconds	7	minutes
180°-270°	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
270°-360°	1	minutes	11	seconds	5	minutes	6	minutes	11	seconds	7	minutes

II FMVSS 301 REQUIREMENTS (Maximum allowable solvent spillage)

First 5 minutes from onset of rotation	6th min	7th min	8th min (if required)
5 ounces	1 ounce	1 ounce	1 ounce

III ACTUAL TEST VEHICLE SOLVENT SPILLAGE

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

Note Record spillage for whole minute intervals only as determined above

IV SOLVENT SPILLAGE LOCATION(S)

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

Figure 2

CAMERA POSITIONS FOR REAR IMPACTS

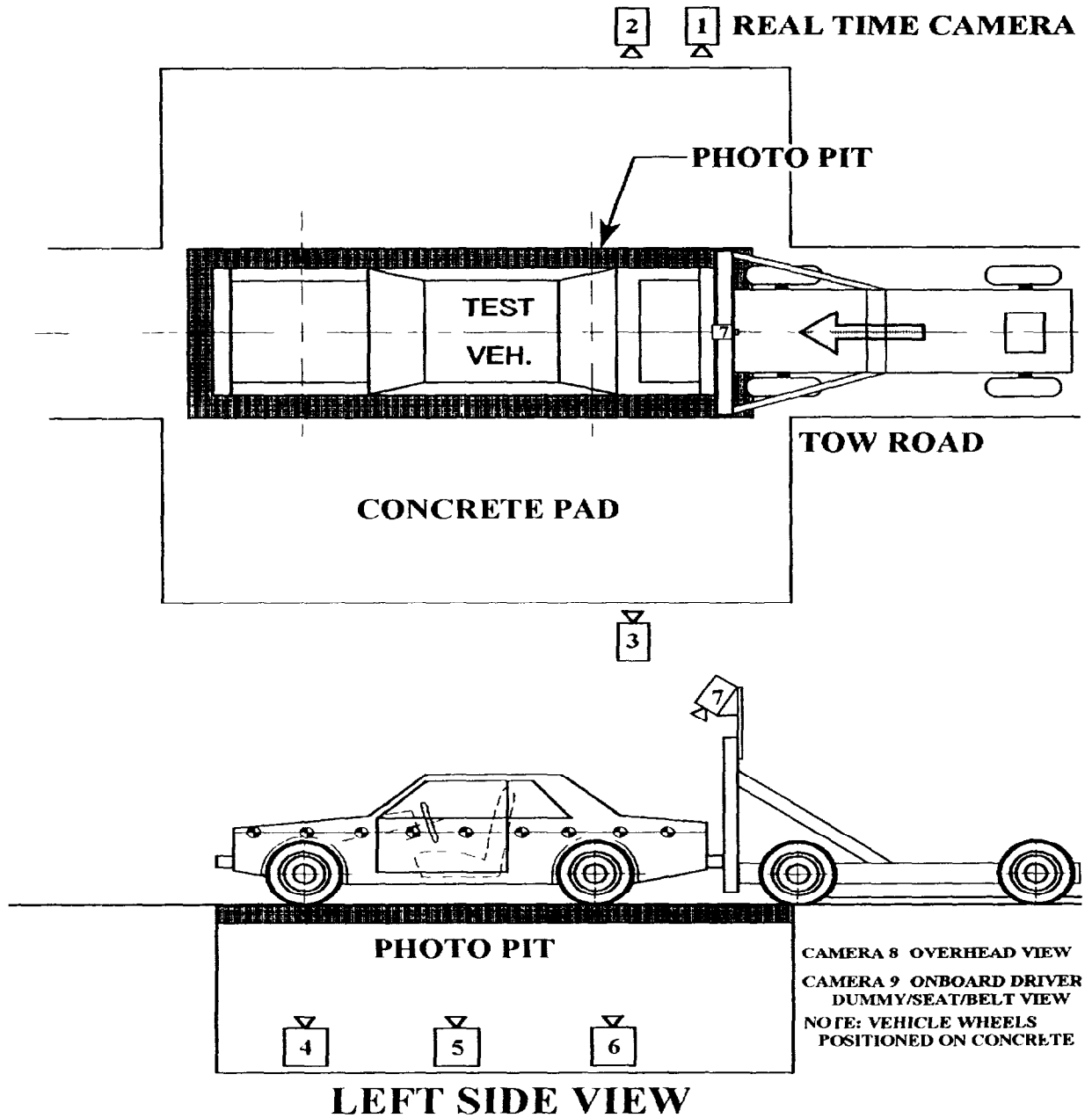


Table 8

HIGH-SPEED CAMERA LOCATIONSNHTSA No C10516Vehicle 2001 Saab 9-3 5 Door Hatchback

CAMERA NO	VIEW	CAMERA POSITIONS (inches)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	540 5	78 3	43 7	1 7	13	1000
3	Left Side View	541 75	74 2	42 3	0	13	1005
4	Vehicle Front Underbody View	0	116	-77	90	13	1000
5	Vehicle Mid-Section Underbody View	0	73	-77	90	13	1005
6	Vehicle Rear Underbody View	0	38	-77	90	13	1000
7	Moving Barrier View	0	0	99	-105	13	950
8	Overhead Overall View	-20	0	386	-90	13	1000
9	Onboard Driver Dummy/Seat/Belt View	-	-	-	-	8	750

* X = film plant to monorail centerline (+ to left of rail)

Y = film plane to impact location (+ ahead of impact location)

Z = film plane to ground (+ above ground)

** = referenced to horizontal plane

Appendix A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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Figure A-1 PRE-TEST FRONT VIEW

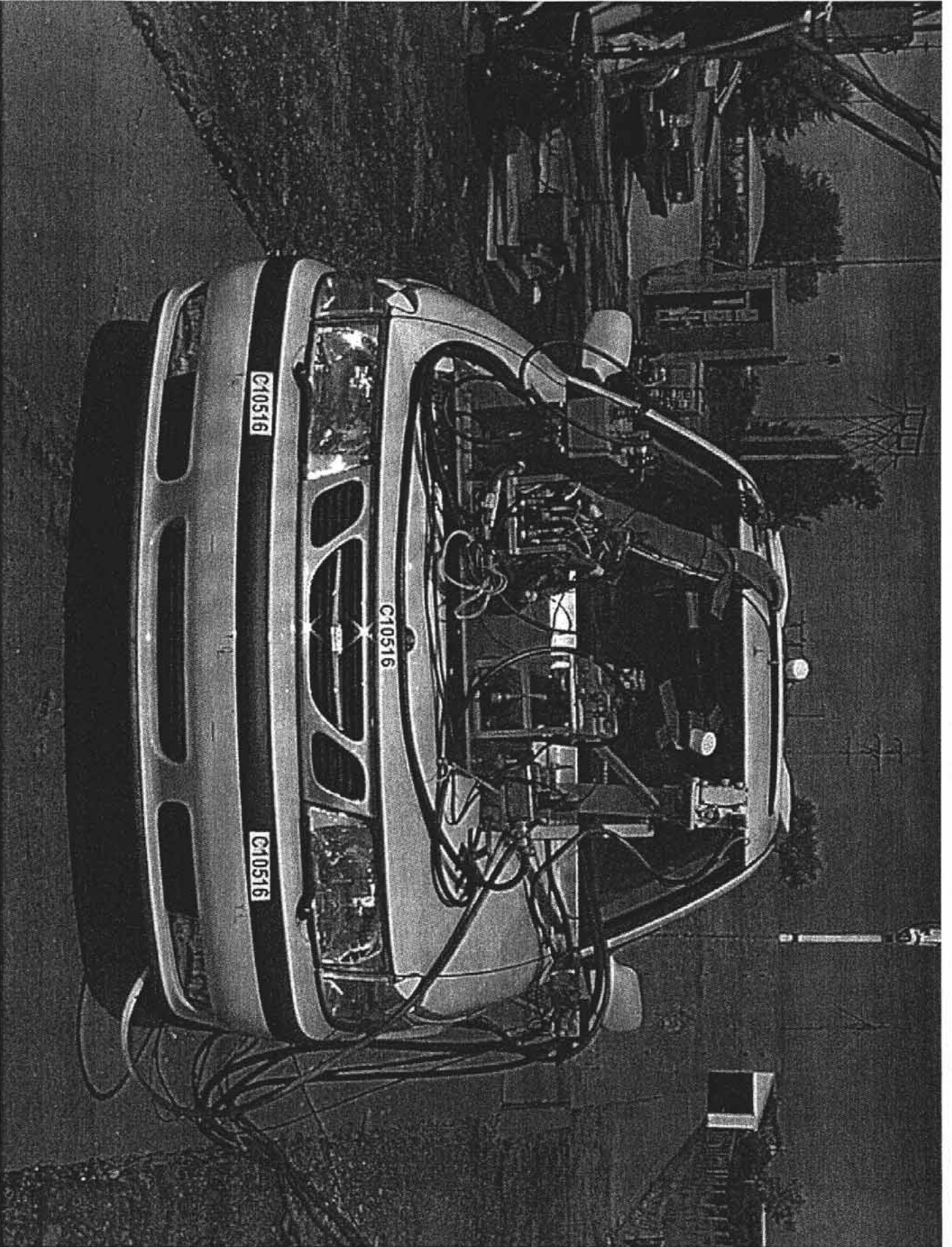


Figure A-2 POST-TEST FRONT VIEW

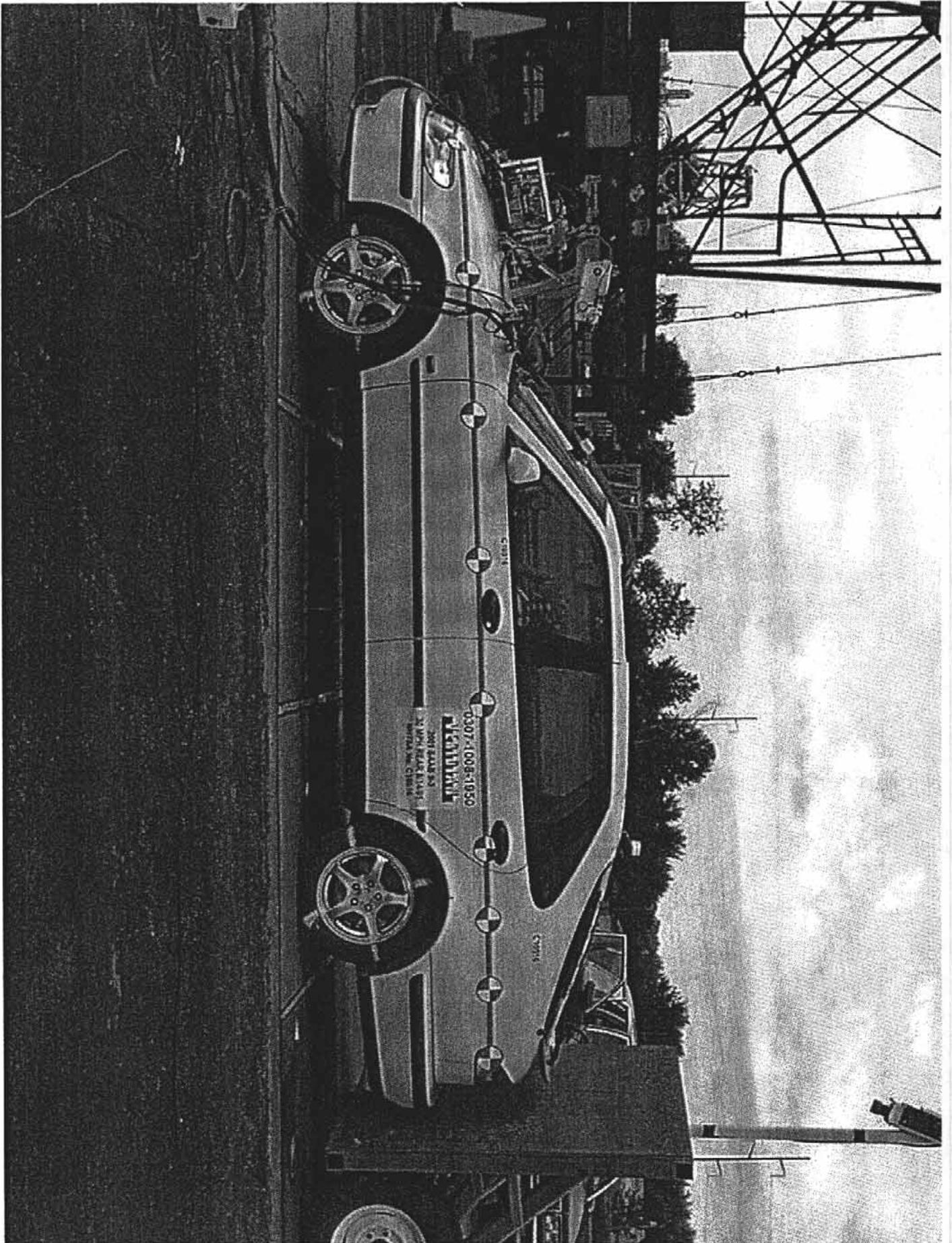


Figure A-3 PRE-TEST LEFT SIDE VIEW



Figure A-4 POST-TEST LEFT SIDE VIEW

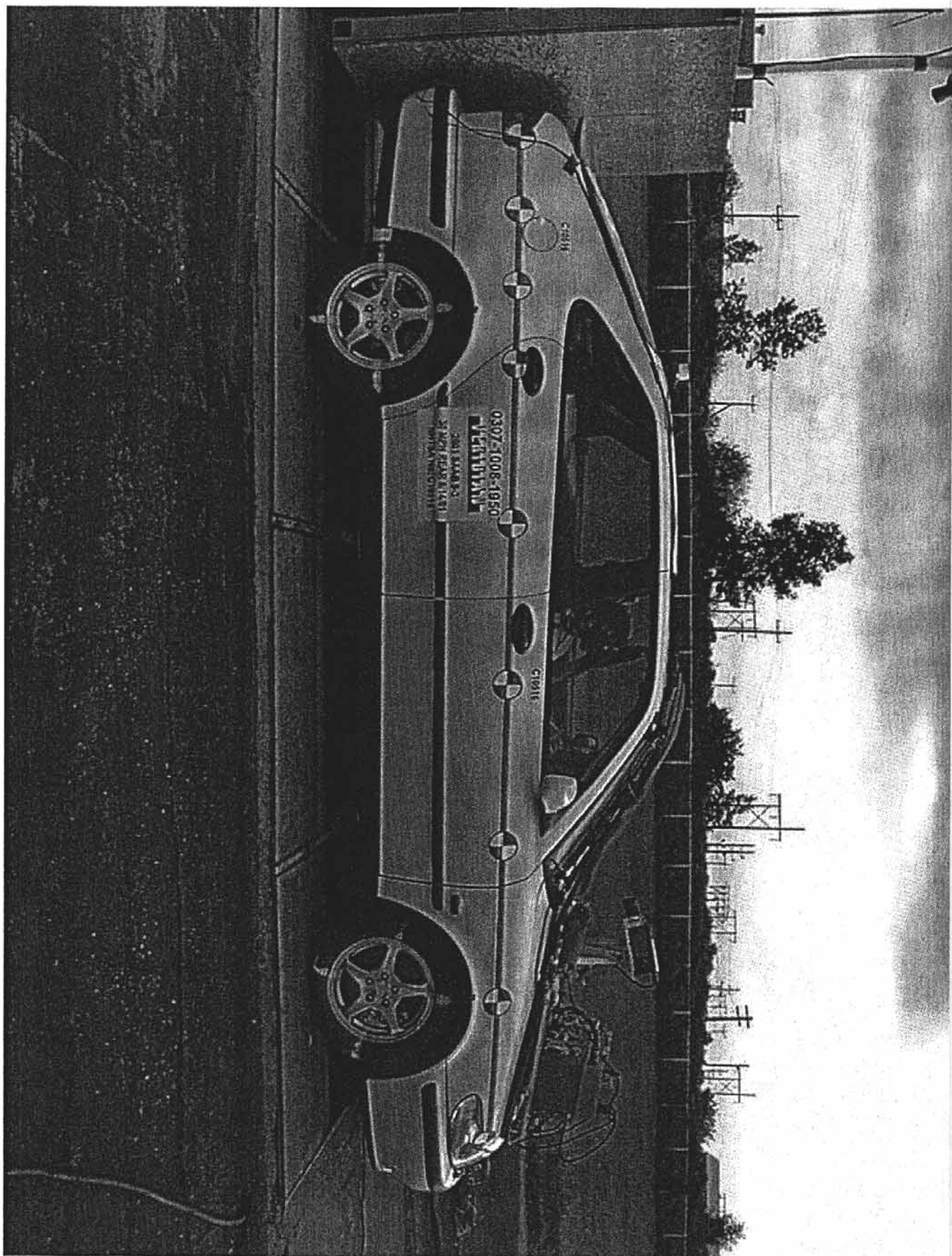


Figure A-5 PRE-TEST RIGHT SIDE VIEW

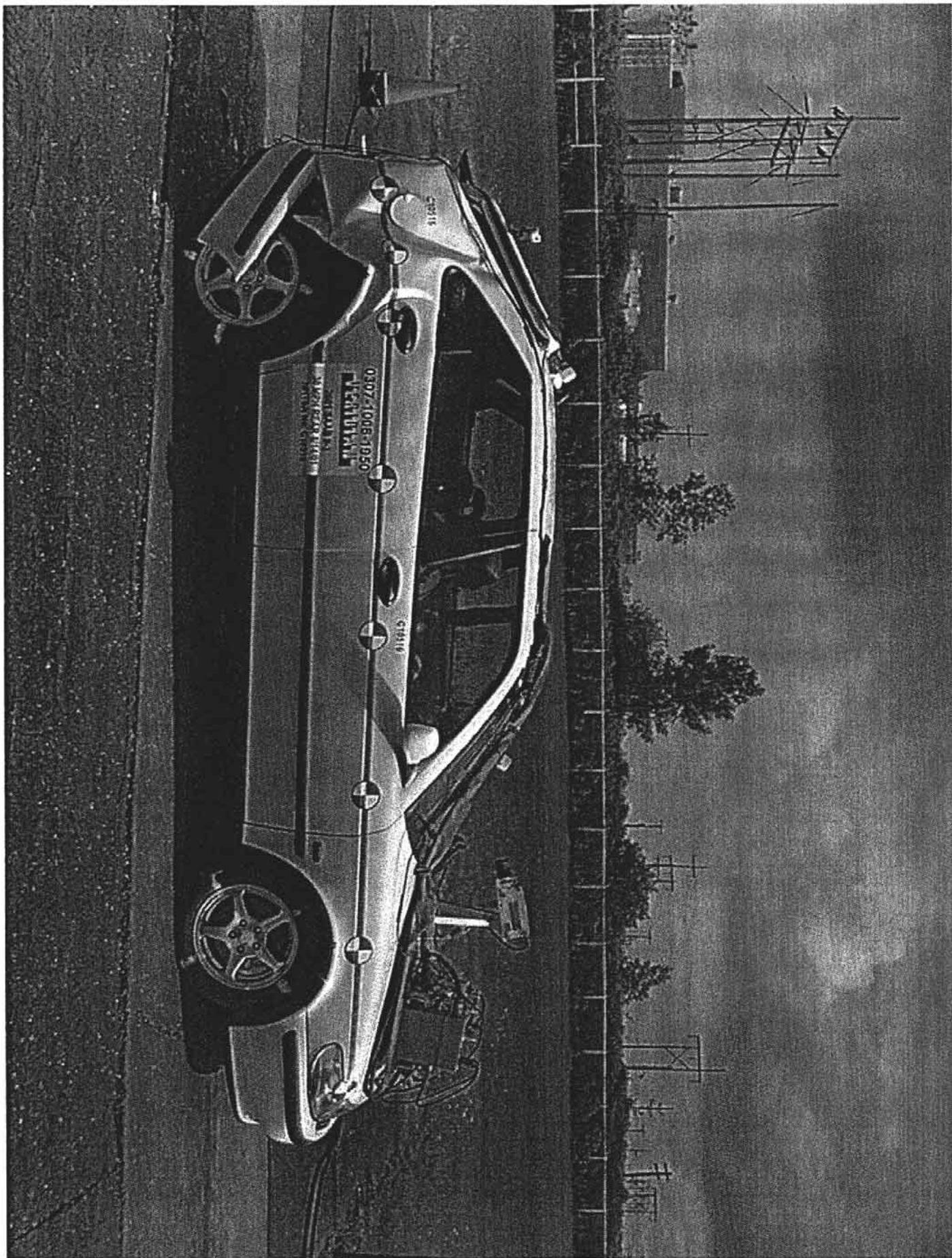


Figure A-6 POST-TEST RIGHT SIDE VIEW

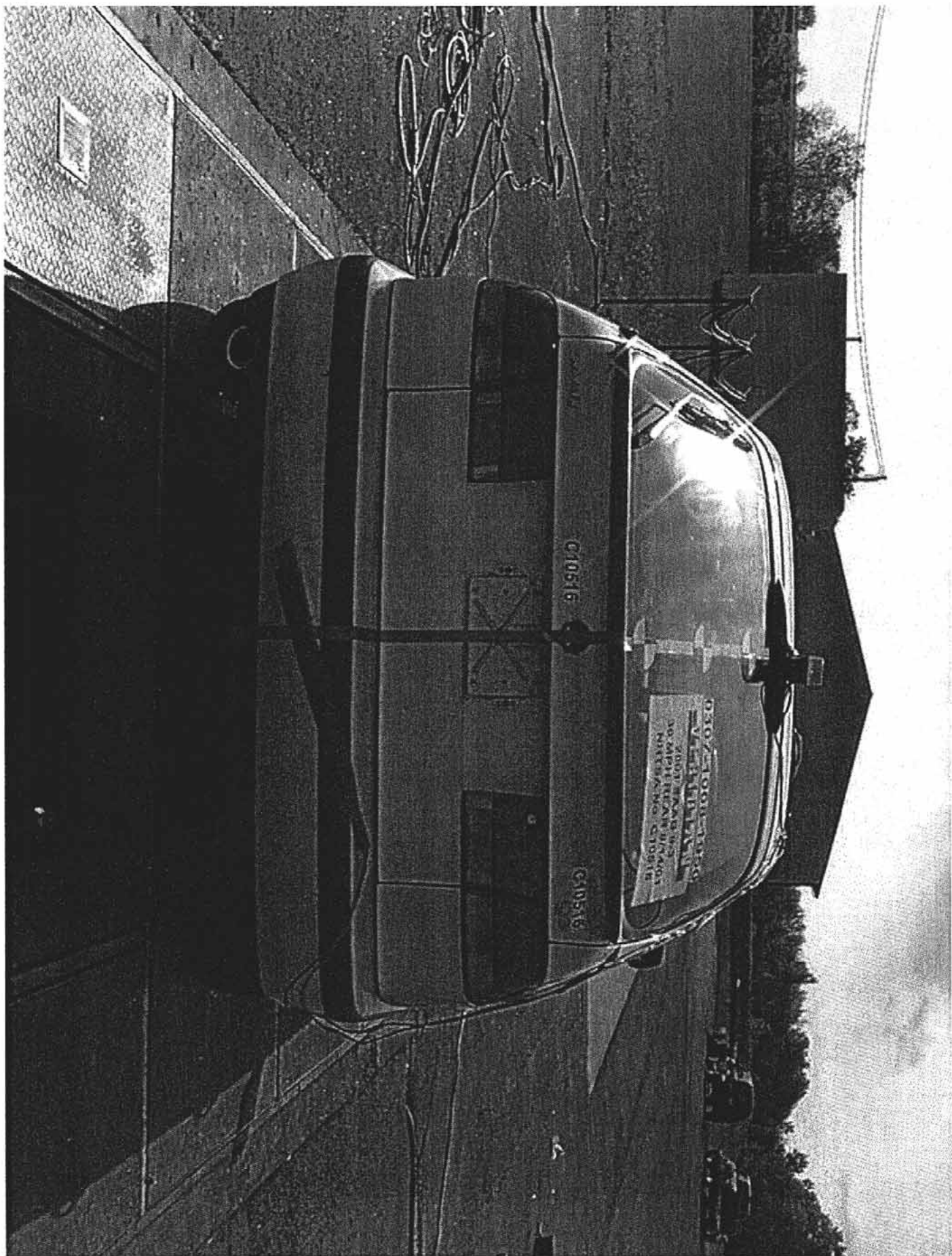


Figure A-7 PRE-TEST REAR VIEW

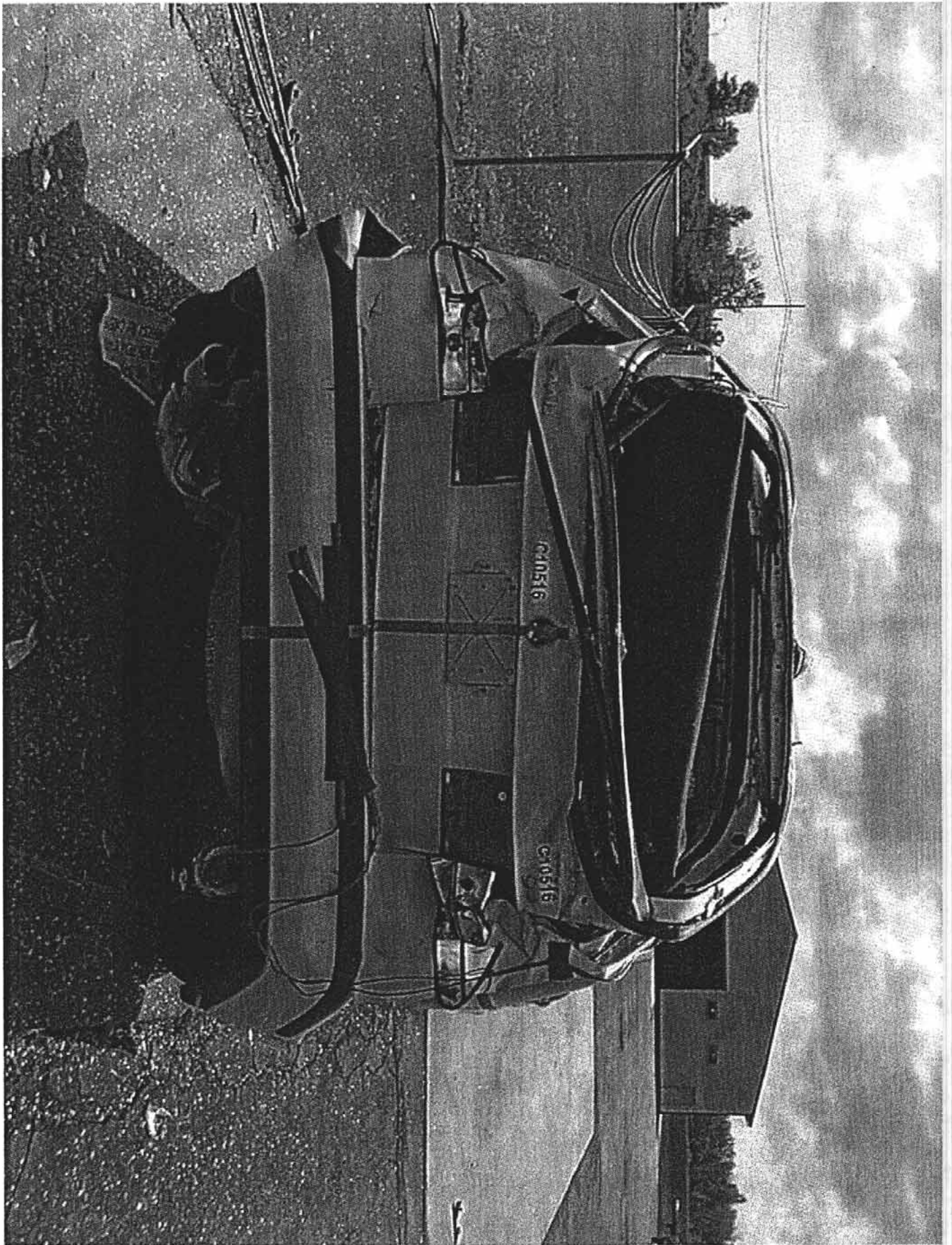


Figure A-8 POST-TEST REAR VIEW

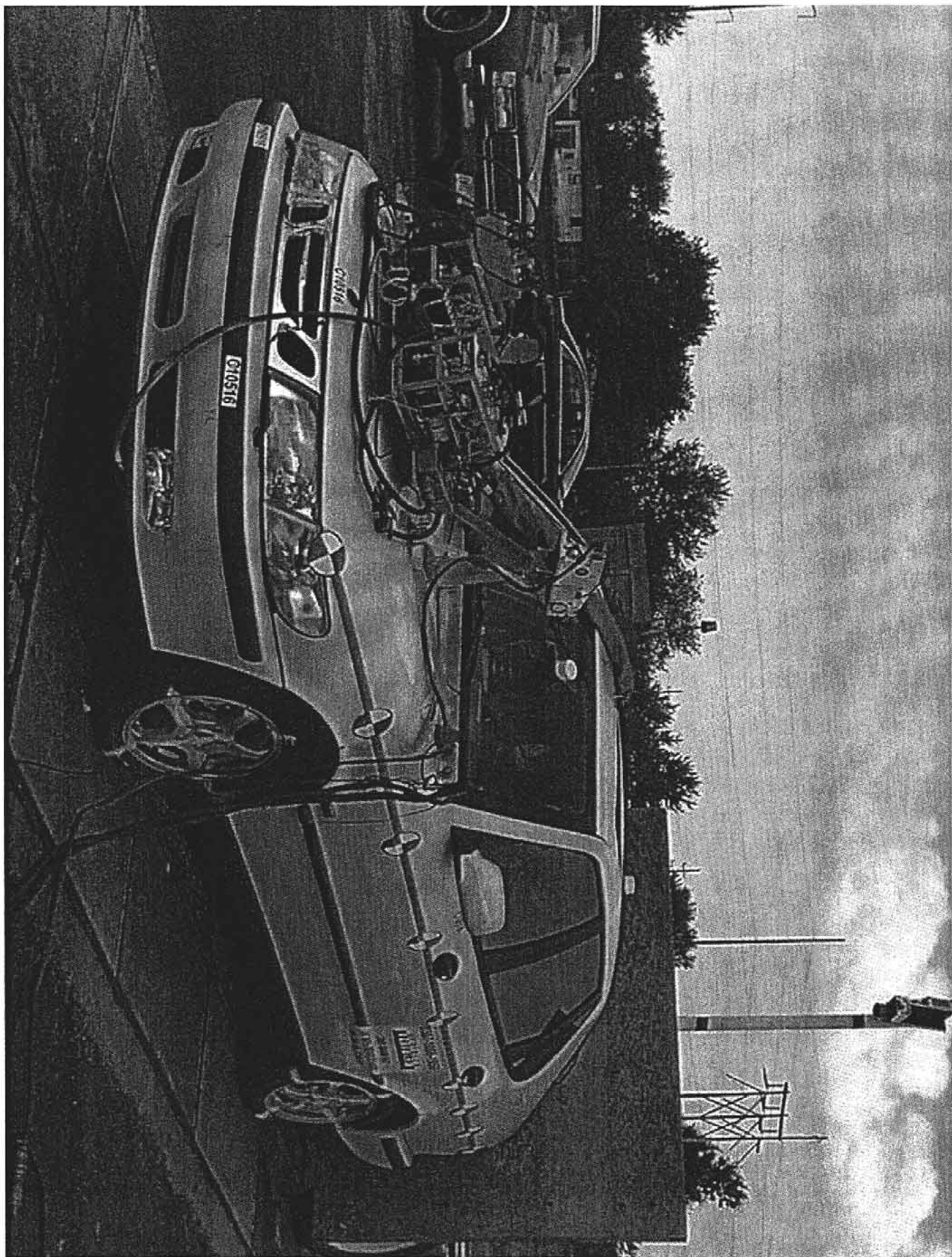


Figure A-9 PRE-TEST LEFT FRONT THREE-QUARTER VIEW

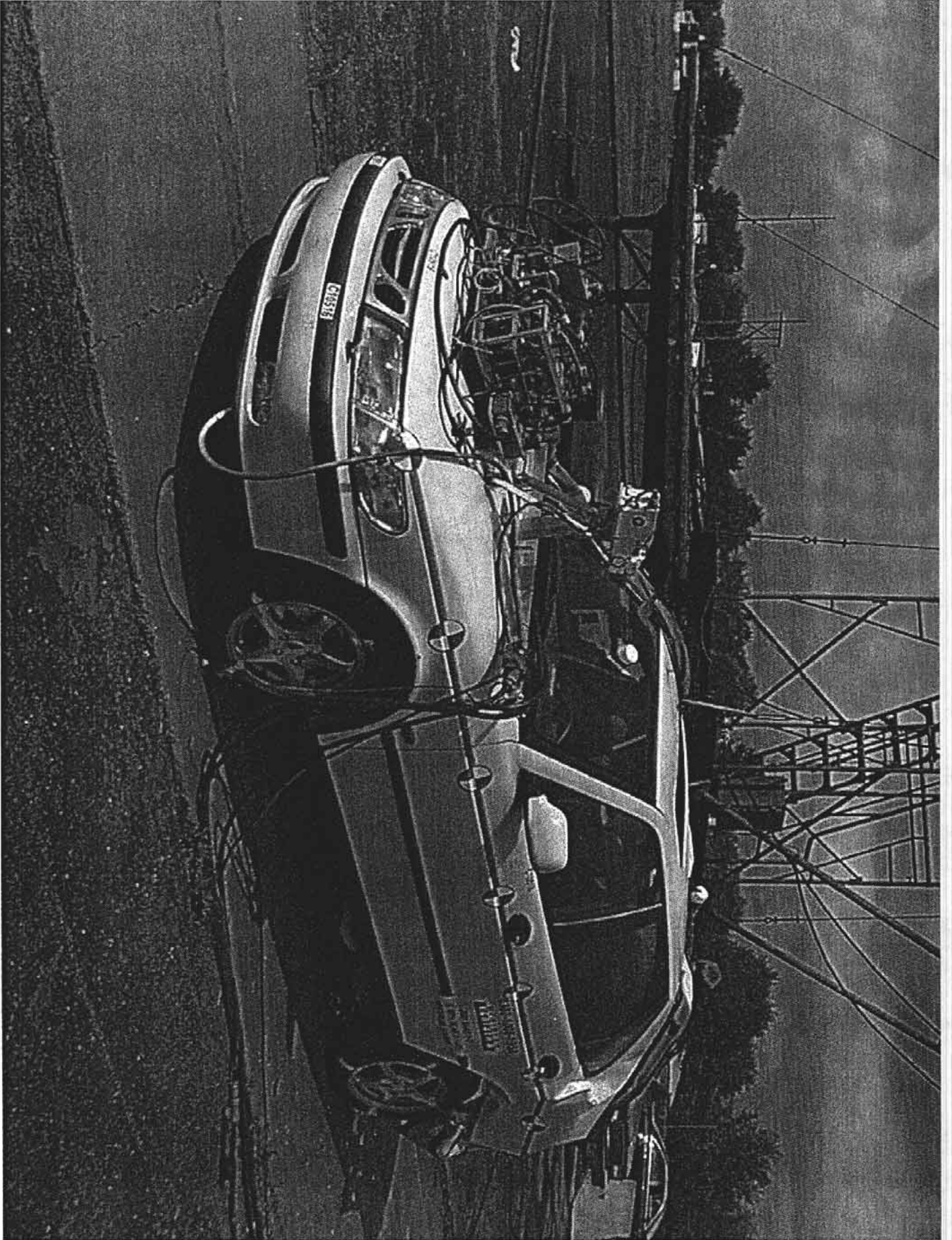
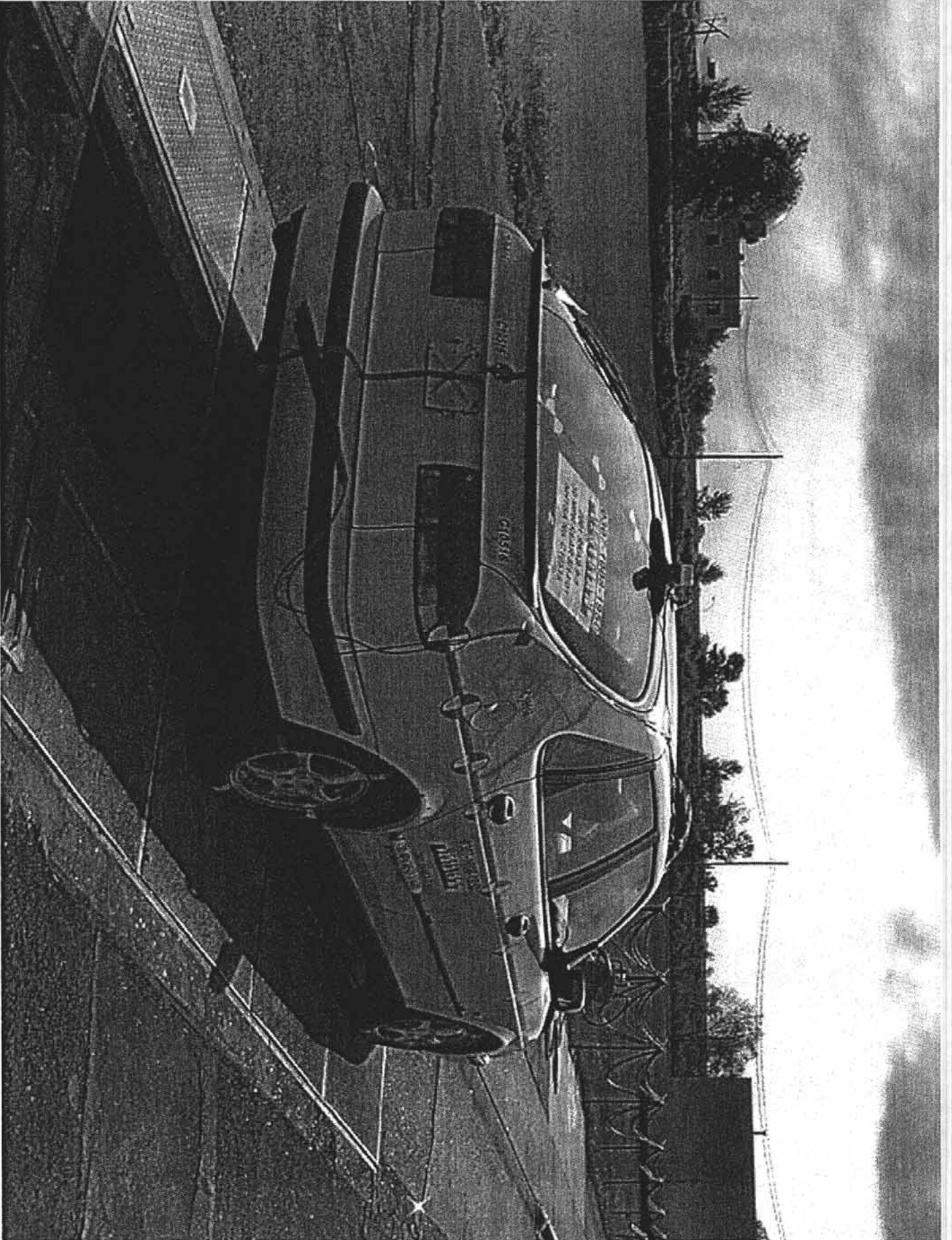


Figure A-10 POST-TEST LEFT FRONT THREE-QUARTER VIEW



A-13

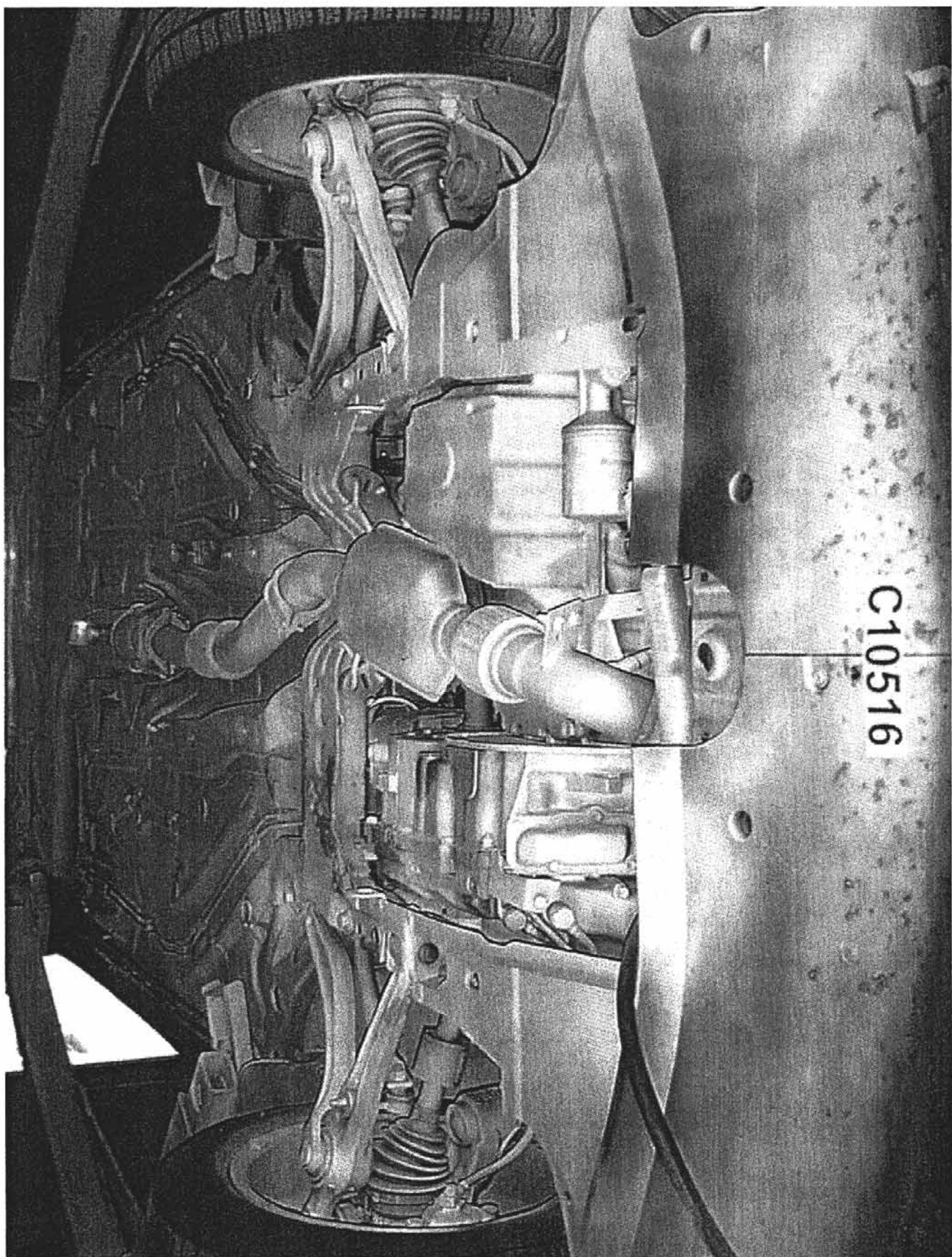
8606-8

Figure A-11 PRE-TEST RIGHT REAR THREE-QUARTER VIEW



Figure A-12 POST-TEST RIGHT REAR THREE-QUARTER VIEW

C10516



A-15

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Figure A-13 PRE-TEST FRONT UNDERBODY VIEW

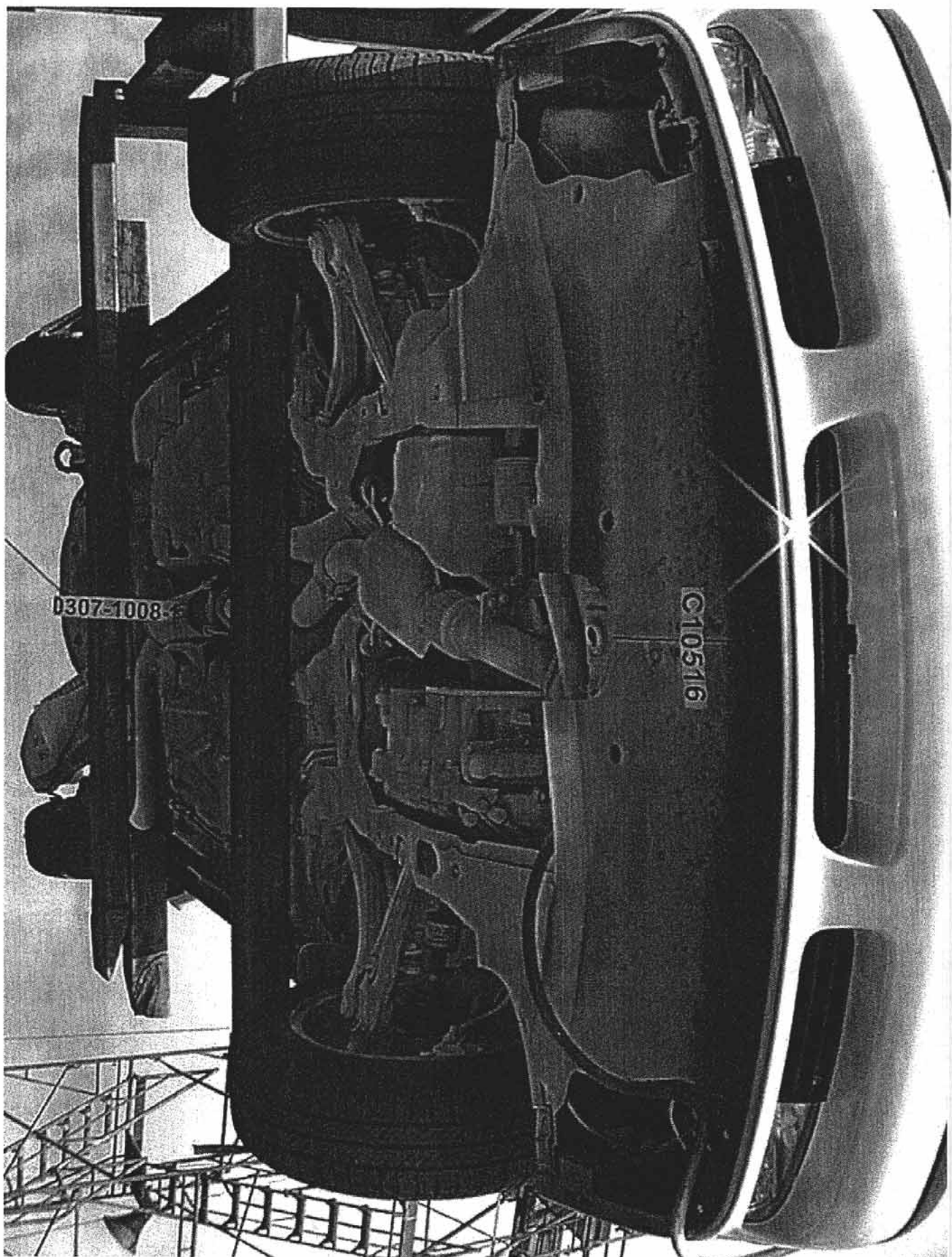


Figure A-14 POST-TEST FRONT UNDERBODY VIEW

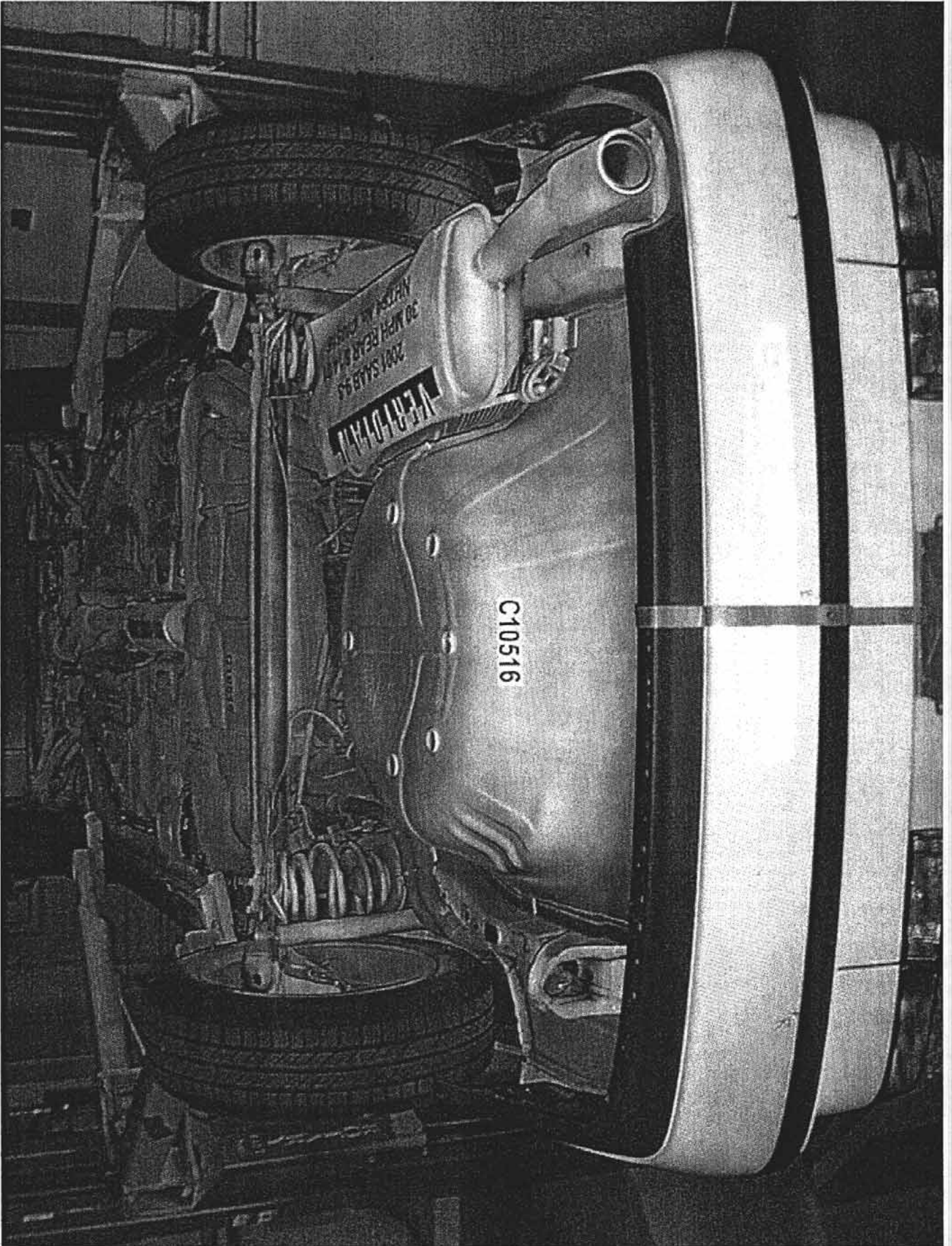


Figure A-15 PRE-TEST REAR UNDERBODY VIEW

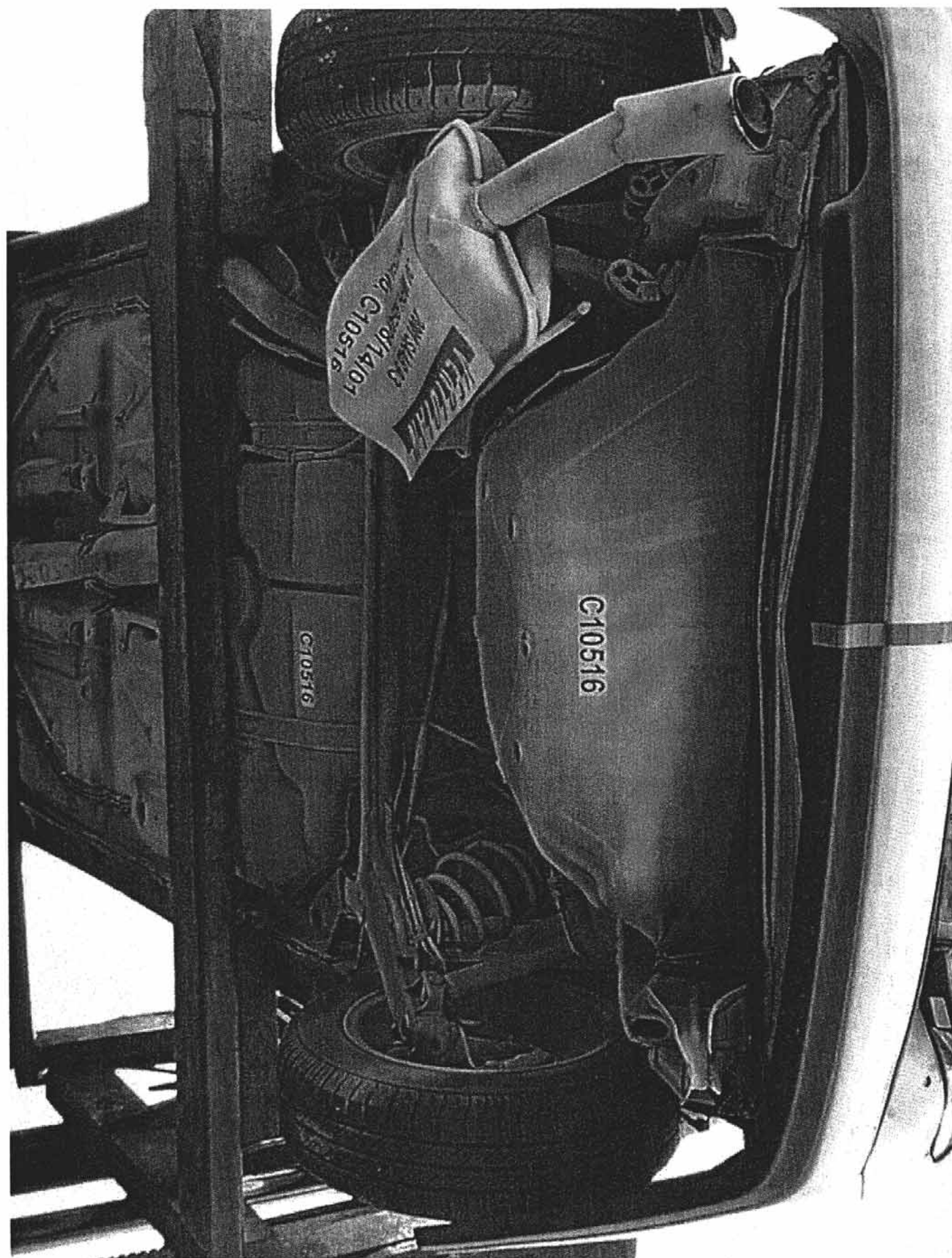


Figure A-16 POST-TEST REAR UNDERBODY VIEW

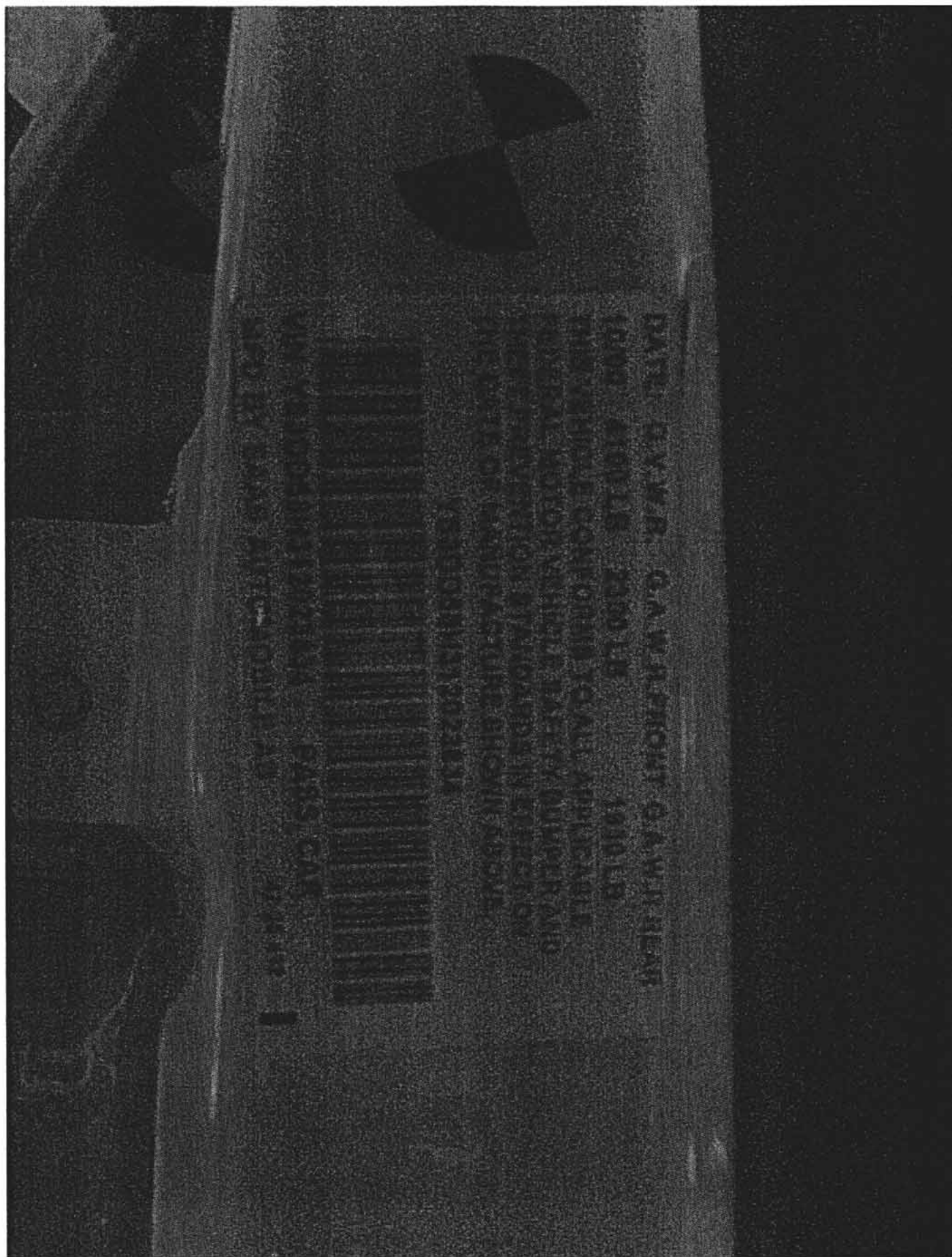


Figure A-17 CERTIFICATION PLACARD

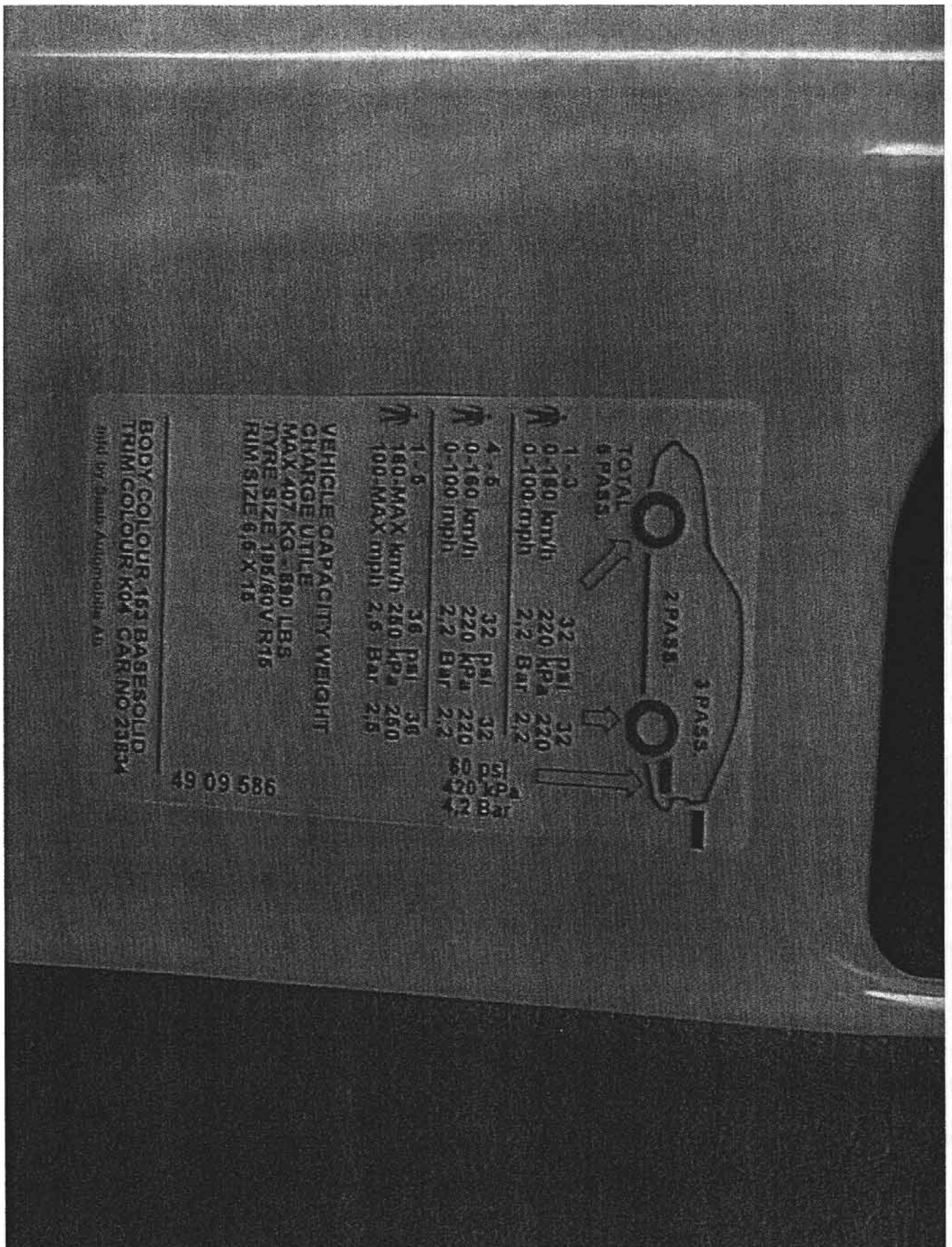


Figure A-18 TIRE PLACARD

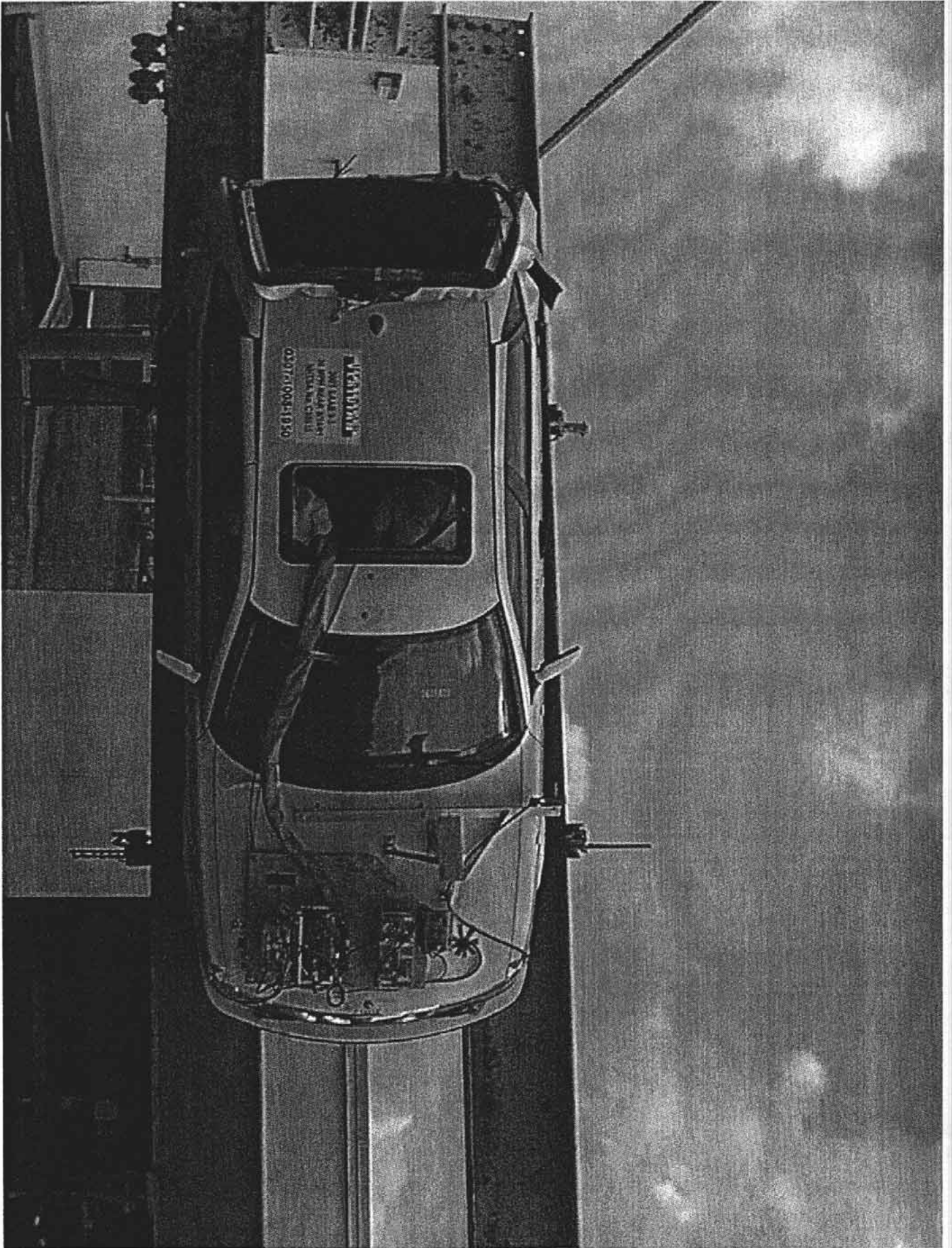


Figure A-19 ROLLOVER 90°

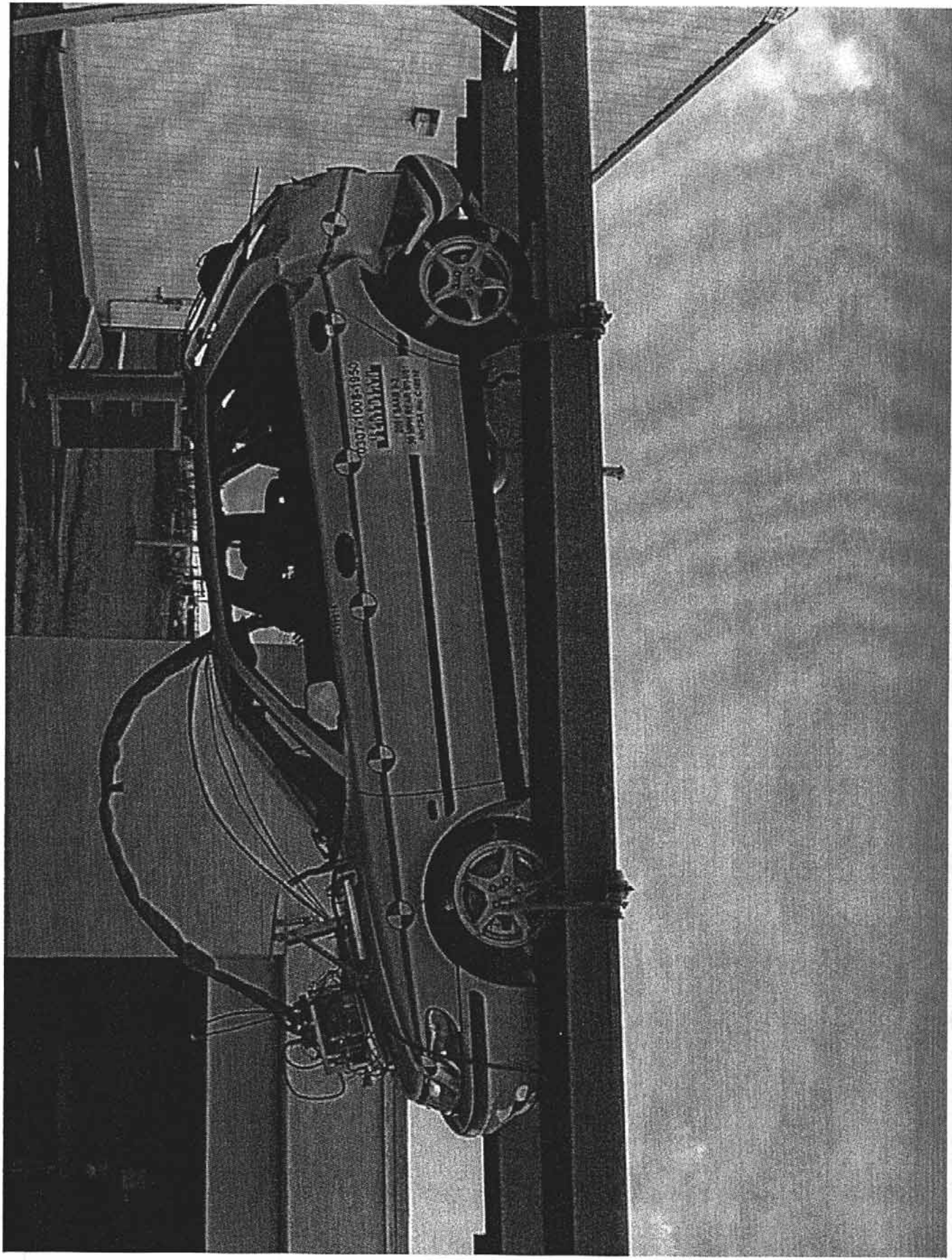


Figure A-20 ROLLOVER 180°

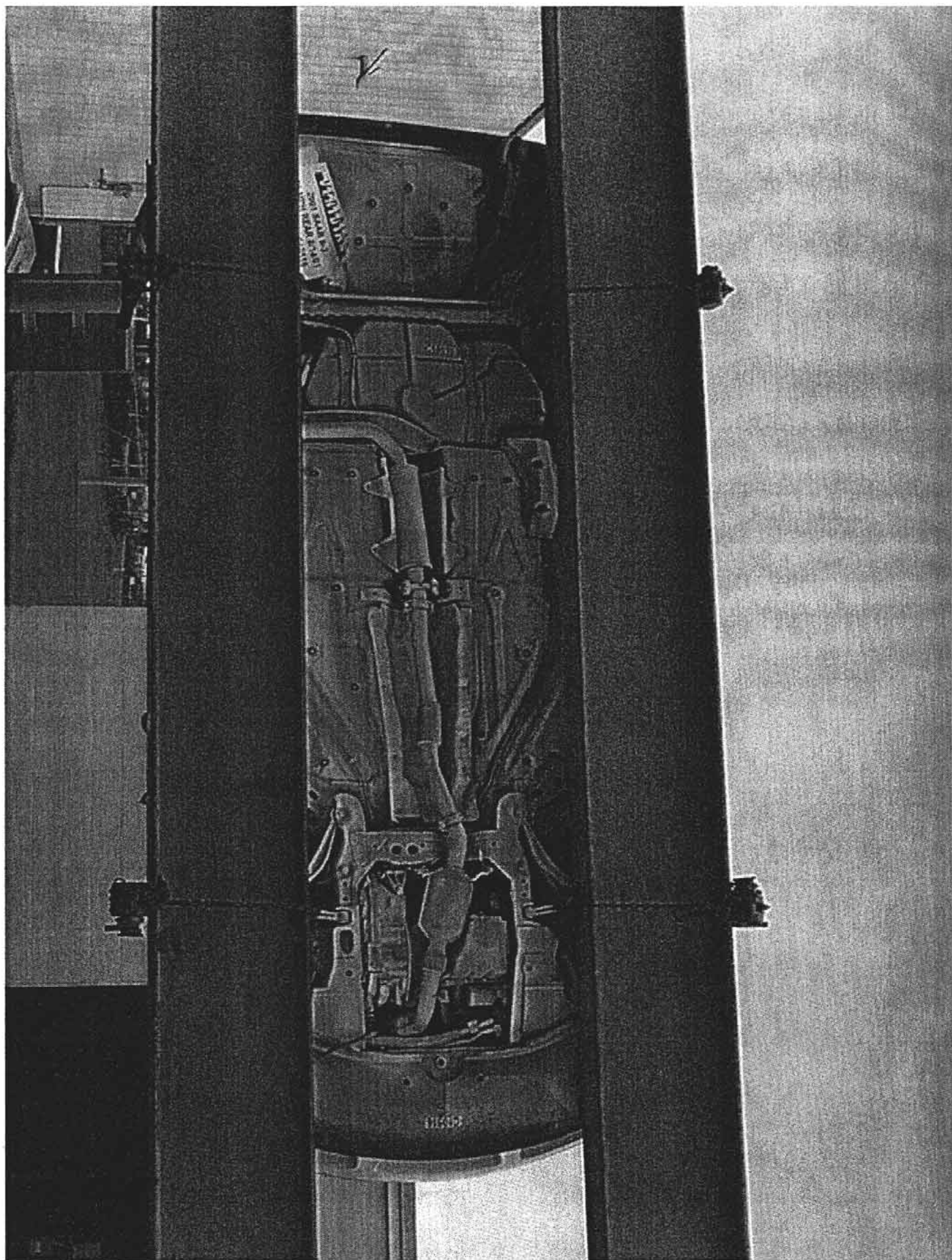


Figure A-21 ROLLOVER 270°

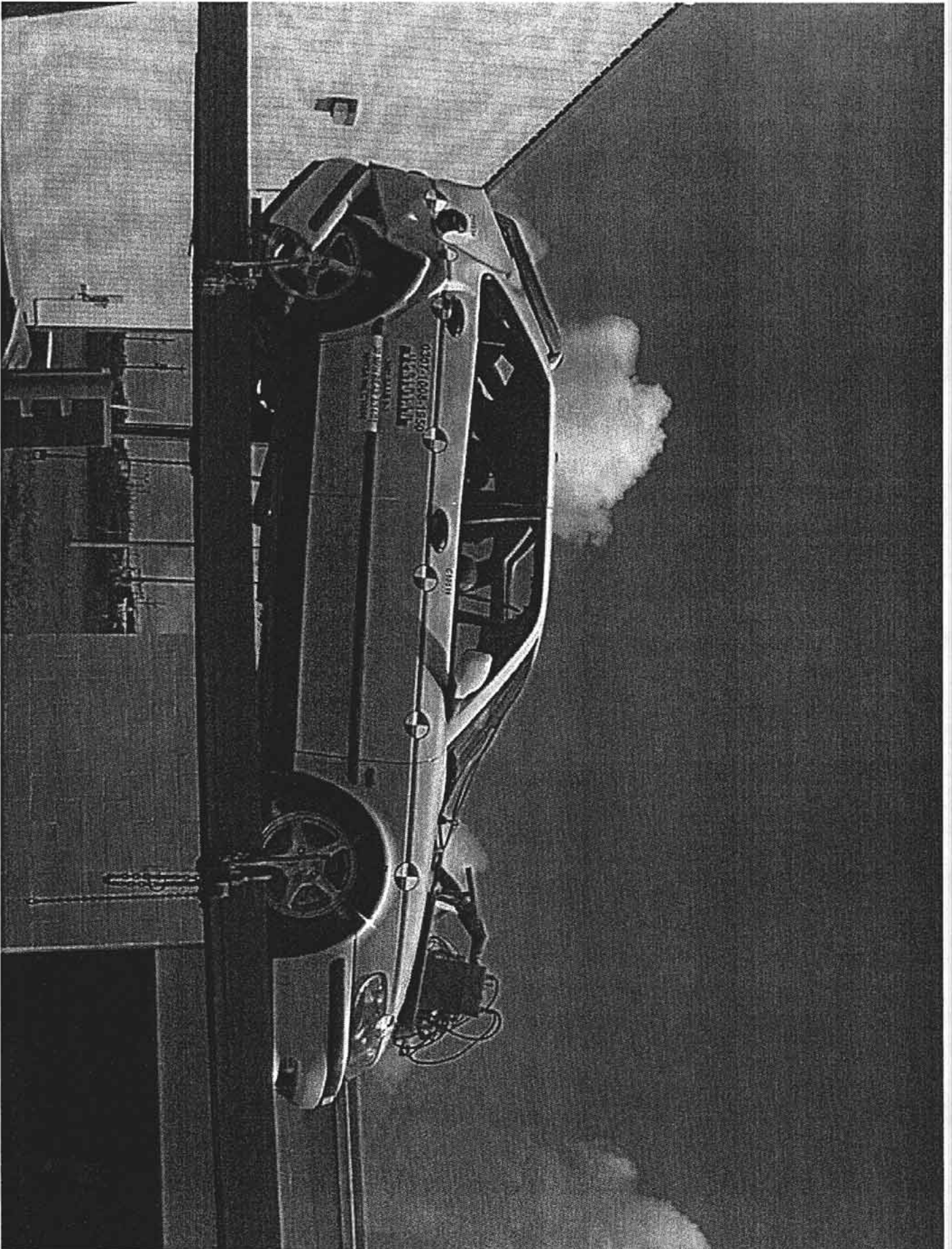


Figure A-22 ROLLOVER 360°

Appendix B
VEHICLE AND DUMMY RESPONSE DATA

FACILITY VERF
TEST# 307-1008-1950

DATE August 14, 2001

TITLE FMVSS 301 Rear Test #8 - 2001 Saab 9-3 C10516

NAME	Unit	Max	msec	Min	msec	Filt
P1 Head x	g	19.9	130.1	-4.5	310.9	CFC_1000
P1 Head y	g	0.9	59.4	-1.7	107.9	CFC_1000
P1 Head z	g	7.3	121.0	-1.5	70.1	CFC_1000
P1 Head Resultant	g	21.0	128.6	0.0	3.3	CFC_1000
P1 Upper Neck Fx	lbf	48.6	120.2	-13.4	76.8	CFC_1000
P1 Upper Neck Fy	lbf	5.4	86.5	-21.0	114.3	CFC_1000
P1 Upper Neck Fz	lbf	26.9	152.5	-51.6	96.7	CFC_1000
P1 Upper Neck F Resultant	lbf	63.5	121.4	0.0	-23.4	CFC_1000
P1 Upper Neck Mx	in-lb	44.3	113.6	-19.5	195.8	CFC_600
P1 Upper Neck My	in-lb	220.9	120.8	99.5	318.5	CFC_600
P1 Upper Neck Mz	in-lb	53.2	92.0	-23.2	202.5	CFC_600
P1 Upper Neck M Resultant	in-lb	223.1	120.8	0.0	-40.6	CFC_600
P1 Chest x	g	13.1	70.2	-2.3	275.8	CFC_180
P1 Chest y	g	1.7	38.4	2.3	111.4	CFC_180
P1 Chest z	g	4.6	104.2	-1.0	157.7	CFC_180
P1 Chest Resultant	g	13.1	70.1	0.0	-23.4	CFC_180
P1 Chest Compression	in	0.0	189.6	-0.1	37.5	CFC_600
P1 Pelvic x	g	15.8	72.3	-3.3	226.5	CFC_1000
P1 Pelvic y	g	2.8	67.1	-1.7	106.5	CFC_1000
P1 Pelvic z	g	5.2	103.8	-1.4	188.8	CFC_1000
P1 Pelvic Resultant	g	16.4	72.4	0.0	-22.9	CFC_1000
P1 Left Femur	lbf	51.0	103.6	-156.7	92.6	CFC_600
P1 Right Femur	lbf	0.8	8.4	-186.3	174.1	CFC_600
P1 Lap Belt	lbf	100.2	131.9	-7.7	292.8	CFC_60
Acc #1 Left Rear Xm Ax	g	14.7	5.5	-1.0	167.7	CFC_60
Acc #2 Right Rear Xm Ax	g	13.3	45.5	-0.7	205.4	CFC_60
Acc #3 Upper Seatback Ax	g	11.6	79.3	-5.3	69.8	CFC_60
Acc #4 Lower Seat back Ax	g	11.3	8.8	-2.8	194.1	CFC_60

P1 HIC(36 ms) 54.0
t1 101.9 msec
t2 137.9 msec
Duration 36.0 msec

P1 CLIP(3 ms) 12.9 g
t1 68.6 msec
t2 71.6 msec
Duration 3.0 msec
P1 CSI 28.5

TEST NO C10516

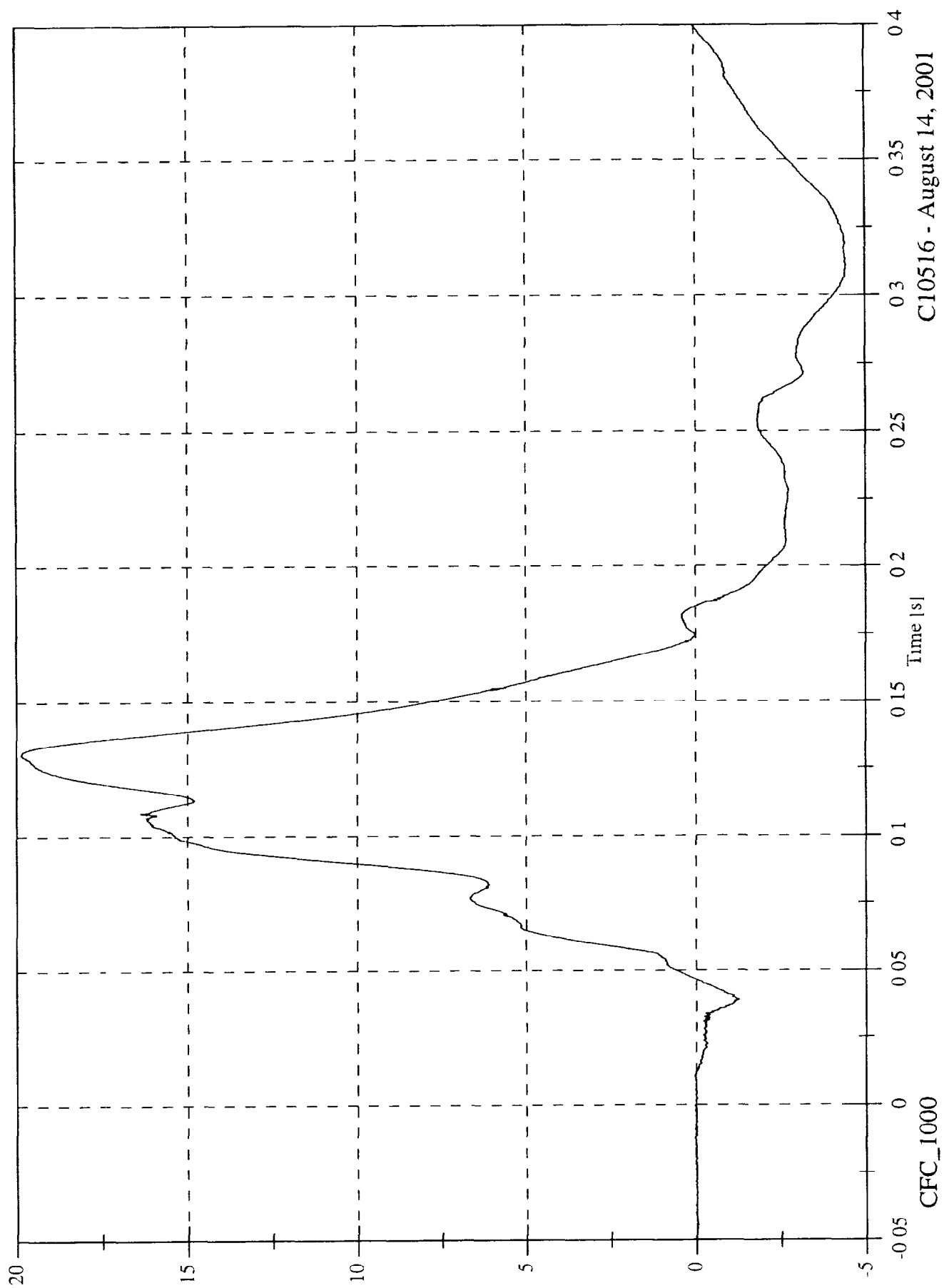
DRIVER DUMMY (Pos 1)	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Pelvic Accelerations	1000
Upper Neck Forces	1000
Upper Neck Moments	600
Belt Forces	60
Belt Spoolout	60
Vehicle	60

Note Angular seatback position is measured in degrees of rotation from the initial (design) position

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 19.9 [g] at 0.130 [s]
Min: -4.5 [g] at 0.311 [s]

P1 Head x

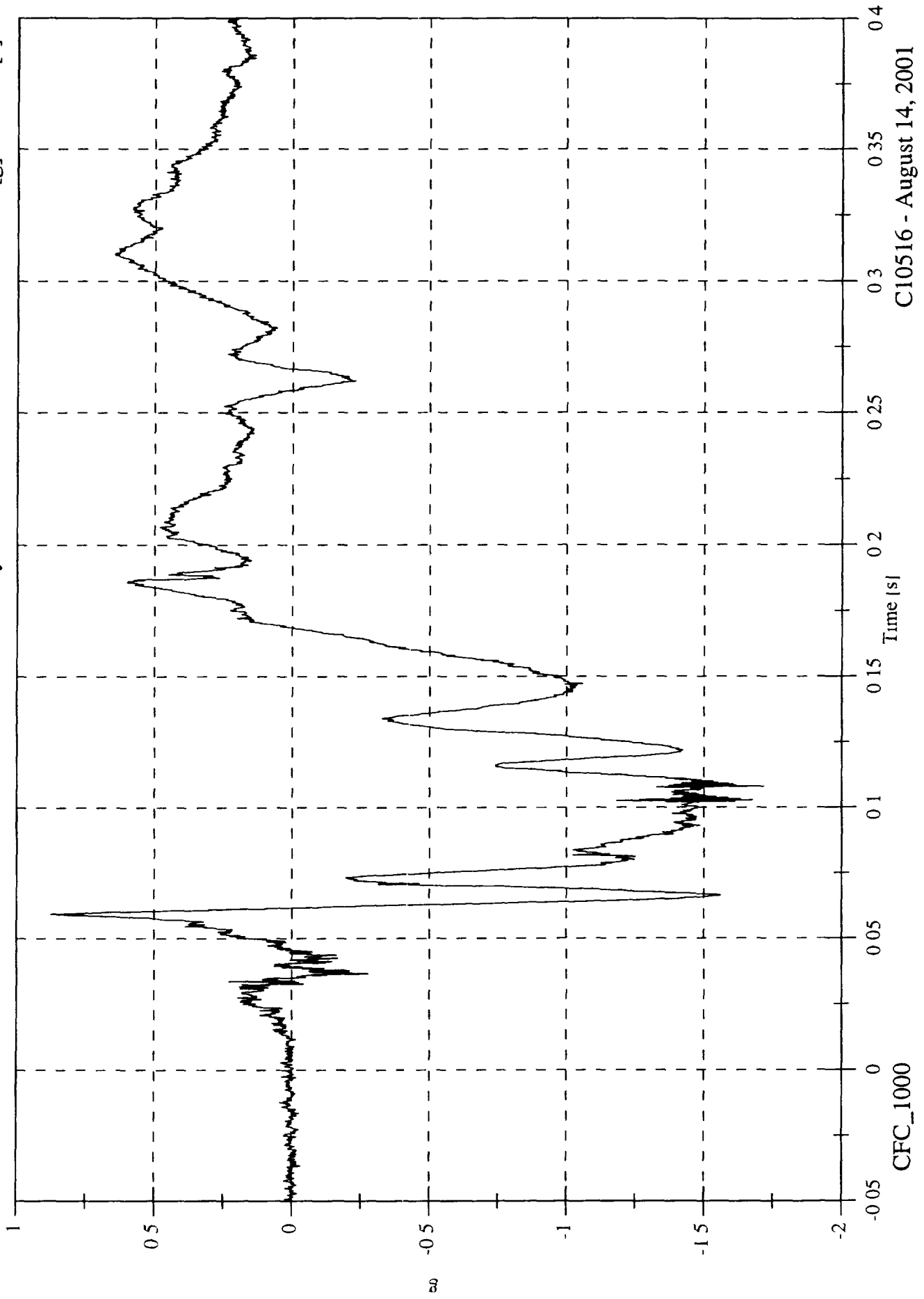


C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

P1 Head y

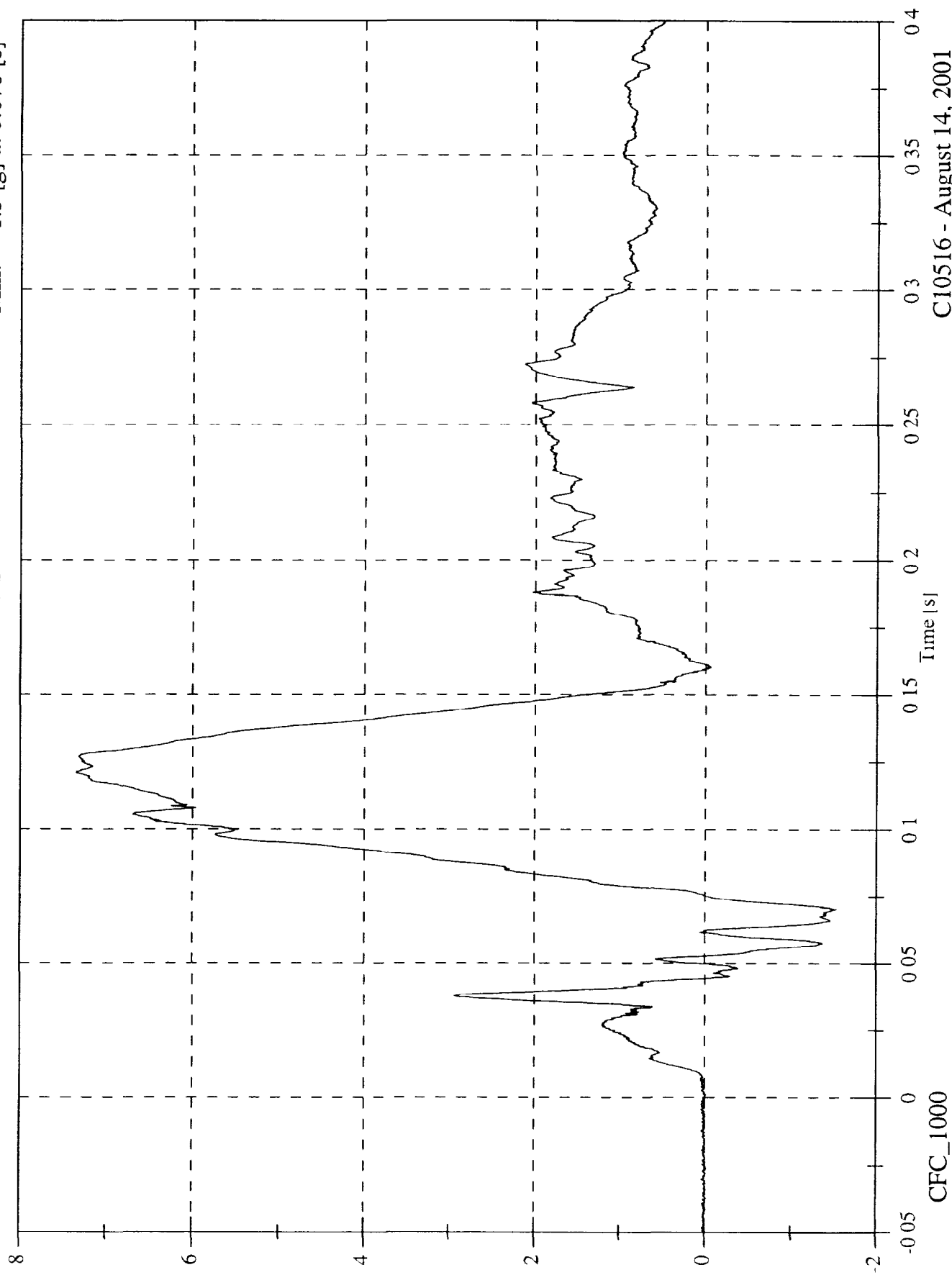
Max: 0.9 [g] at 0.059 [s]
Min: -1.7 [g] at 0.108 [s]



C10516 - August 14, 2001

Max: 7.3 [g] at 0.121 [s]
Min: -1.5 [g] at 0.070 [s]

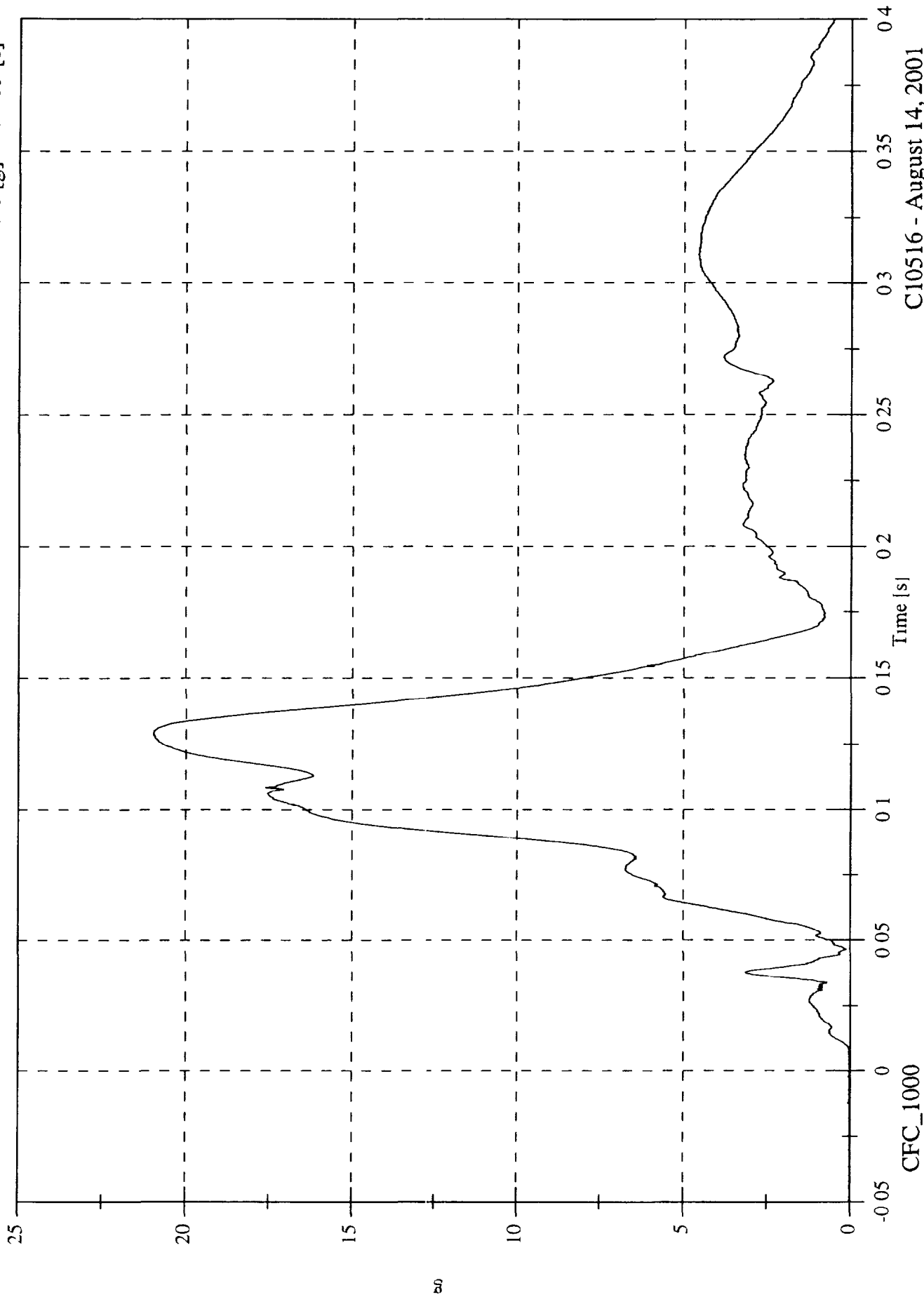
P1 Head z



C10516 - August 14, 2001

Max: 21.0 [g] at 0.129 [s]
Min: 0.0 [g] at 0.003 [s]

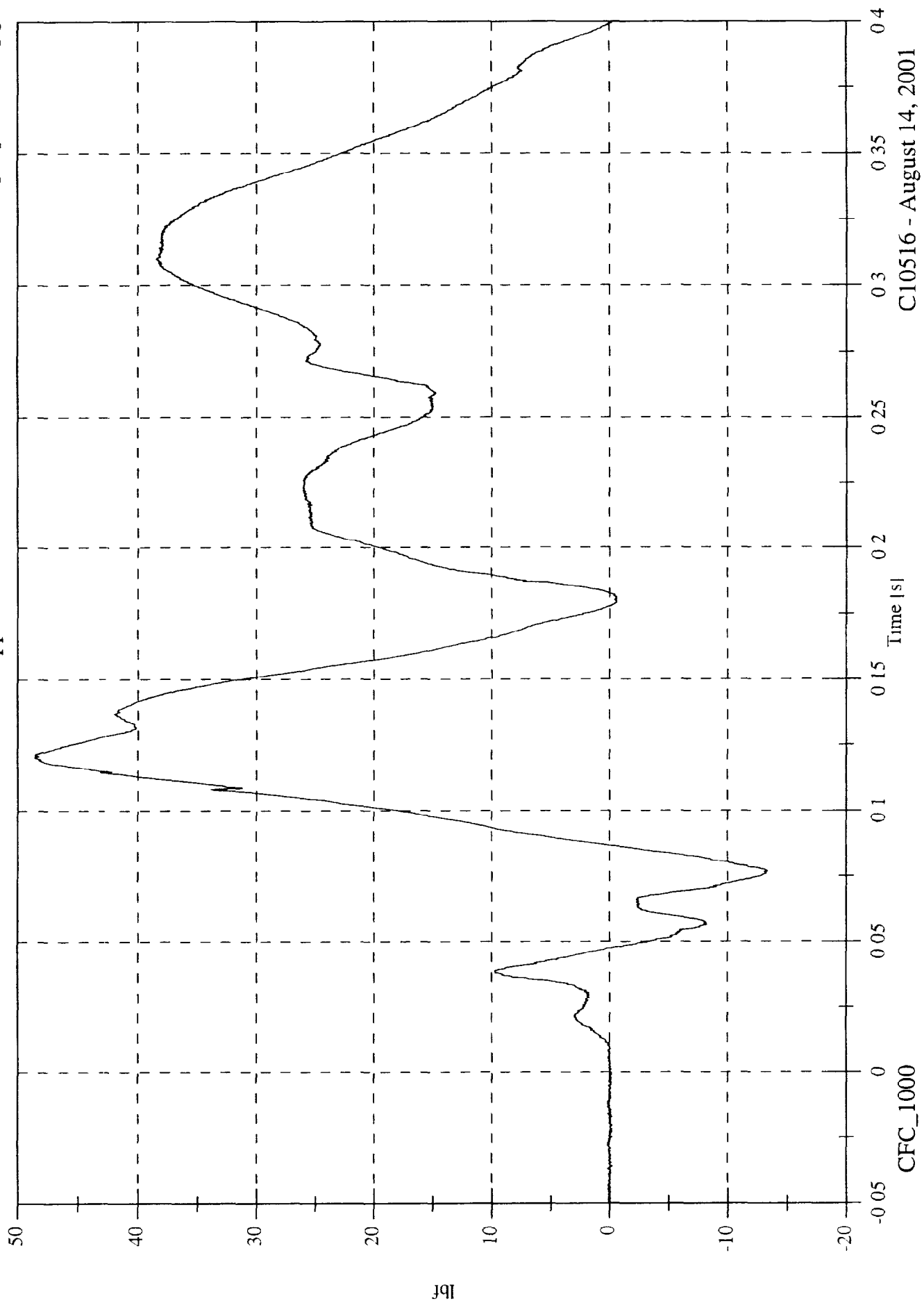
P1 Head Resultant



C10516 - August 14, 2001

P1 Upper Neck Fx

Max: 48.6 [lbf] at 0.120 [s]
Min: -13.4 [lbf] at 0.077 [s]

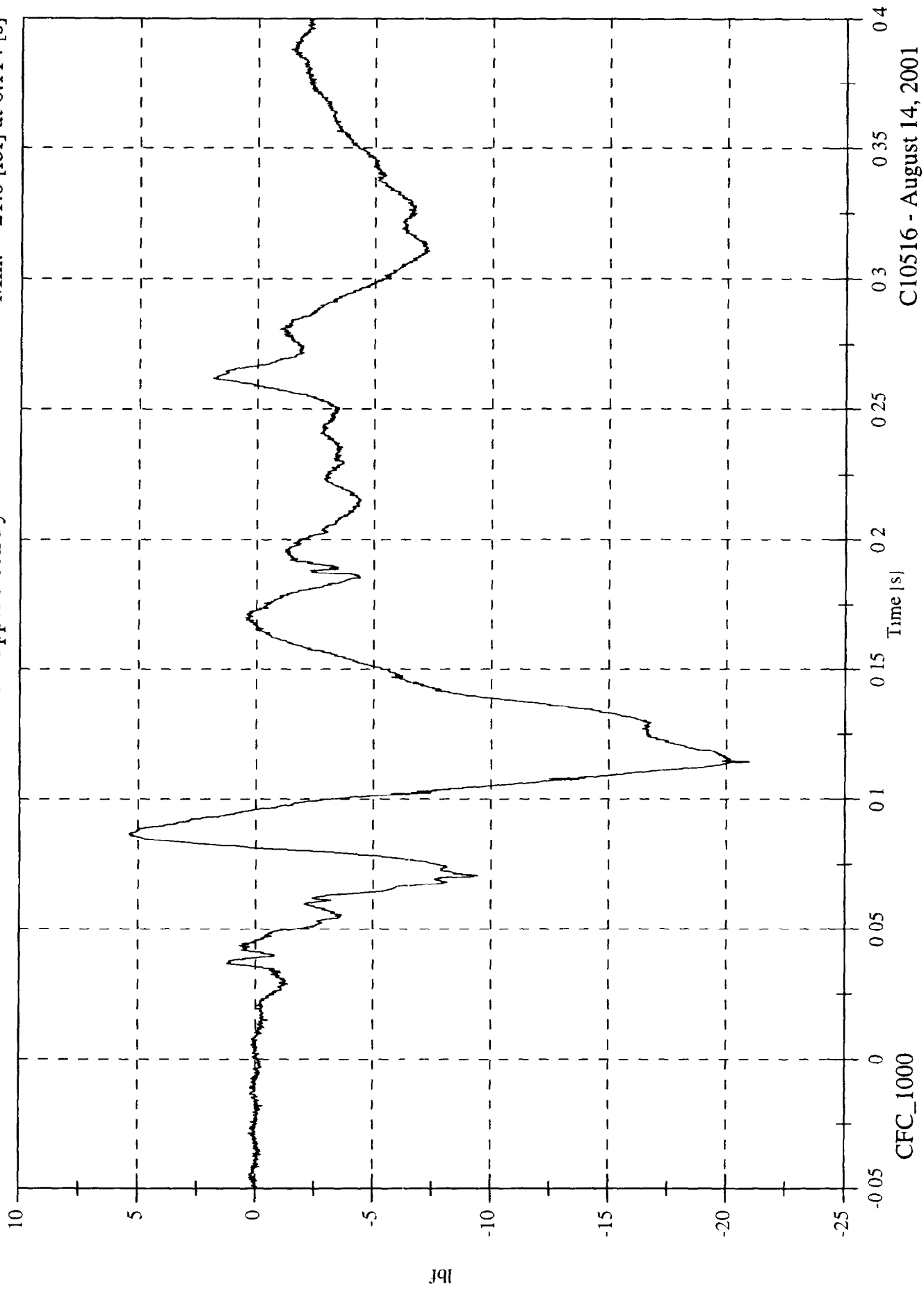


CI0516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 5.4 [lbf] at 0.087 [s]
Min: -21.0 [lbf] at 0.114 [s]

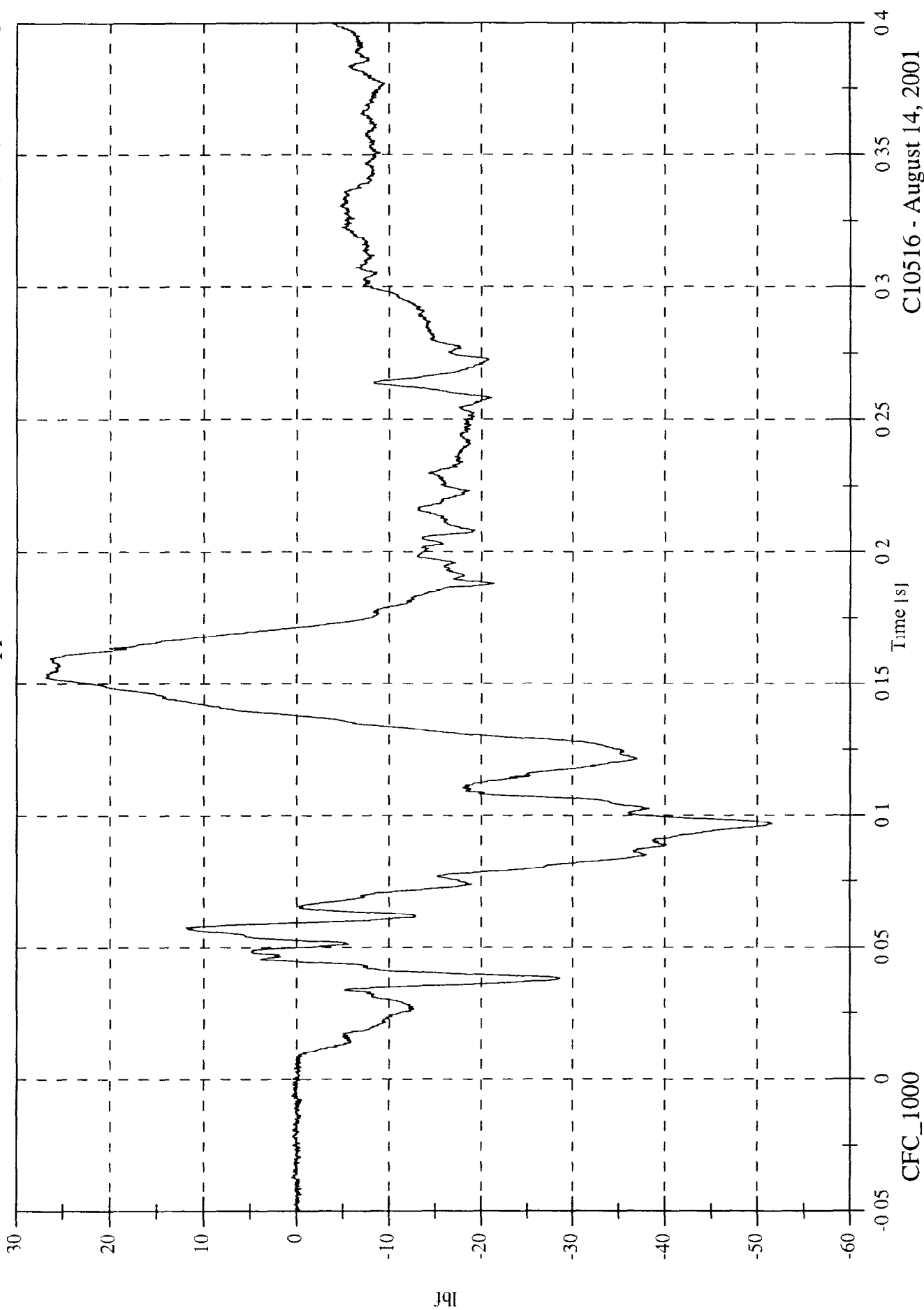
P1 Upper Neck Fy



CI0516 - August 14, 2001

Max: 26.9 [lbf] at 0.152 [s]
 Min: -51.6 [lbf] at 0.097 [s]

P1 Upper Neck Fz



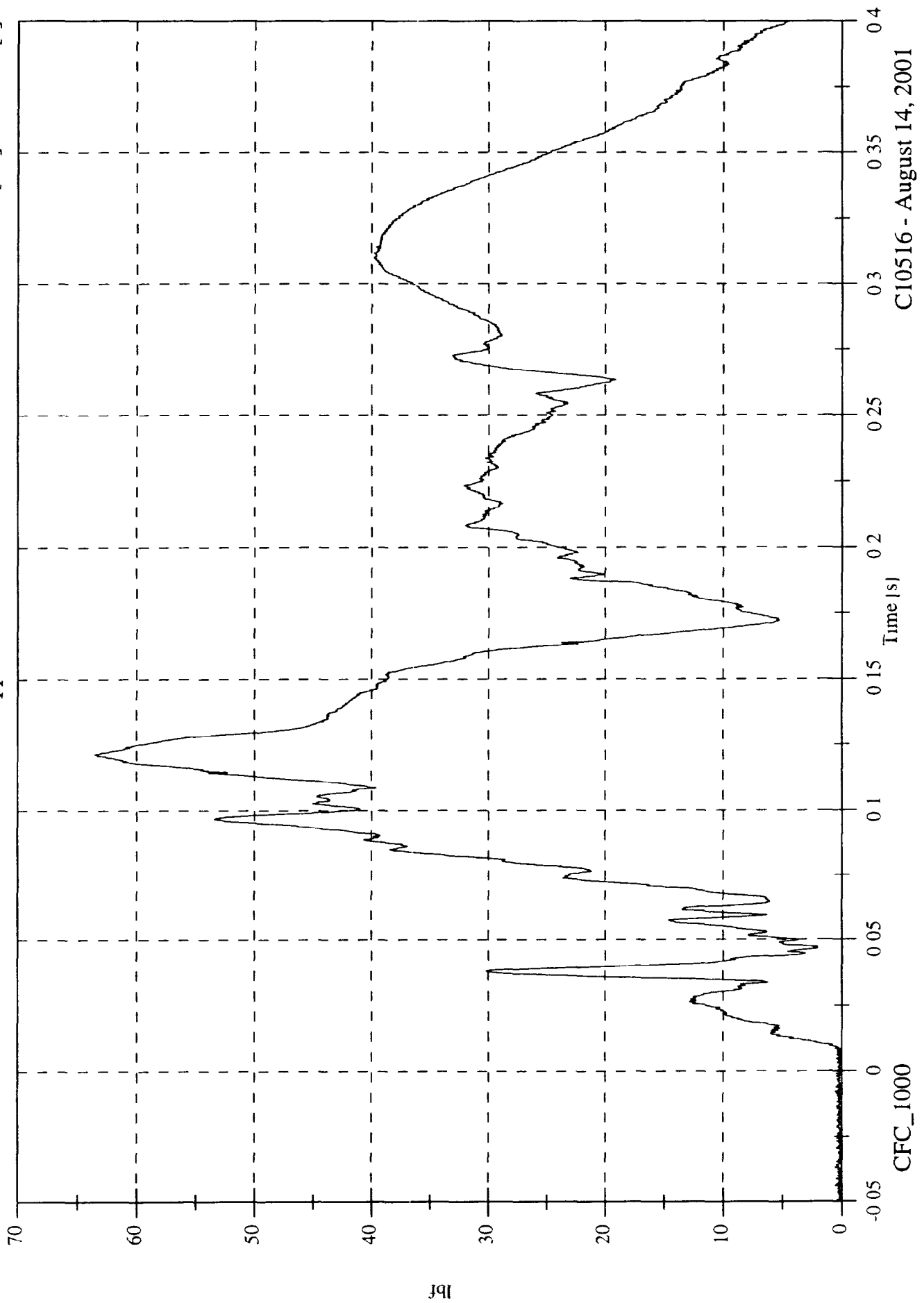
CFC_1000

Time [s]

C10516 - August 14, 2001

Max: 63.5 [lbf] at 0.121 [s]
Min: 0.0 [lbf] at -0.023 [s]

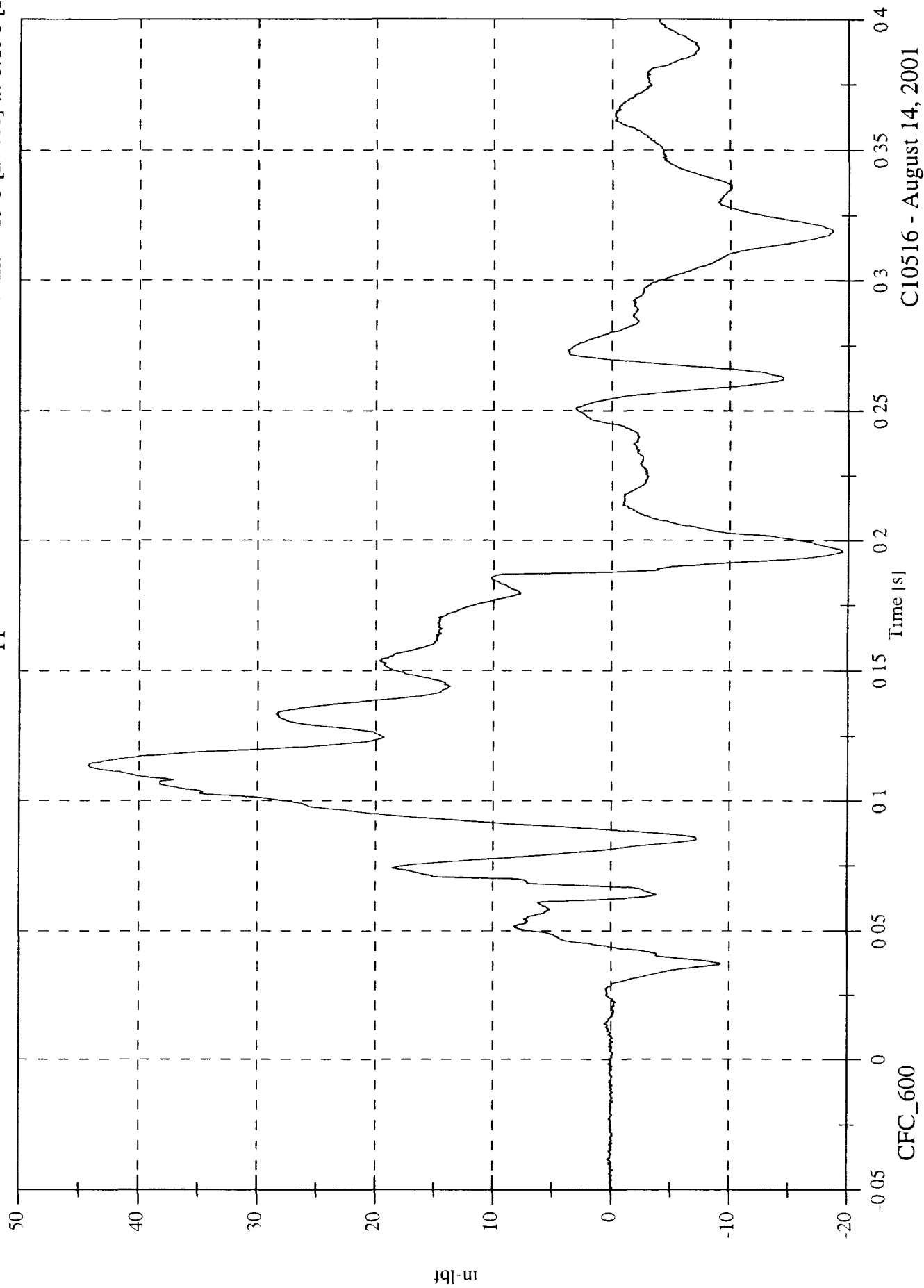
P1 Upper Neck F Resultant



C10516 - August 14, 2001

Max: 44.3 [in-lbf] at 0.114 [s]
Min: -19.5 [in-lbf] at 0.196 [s]

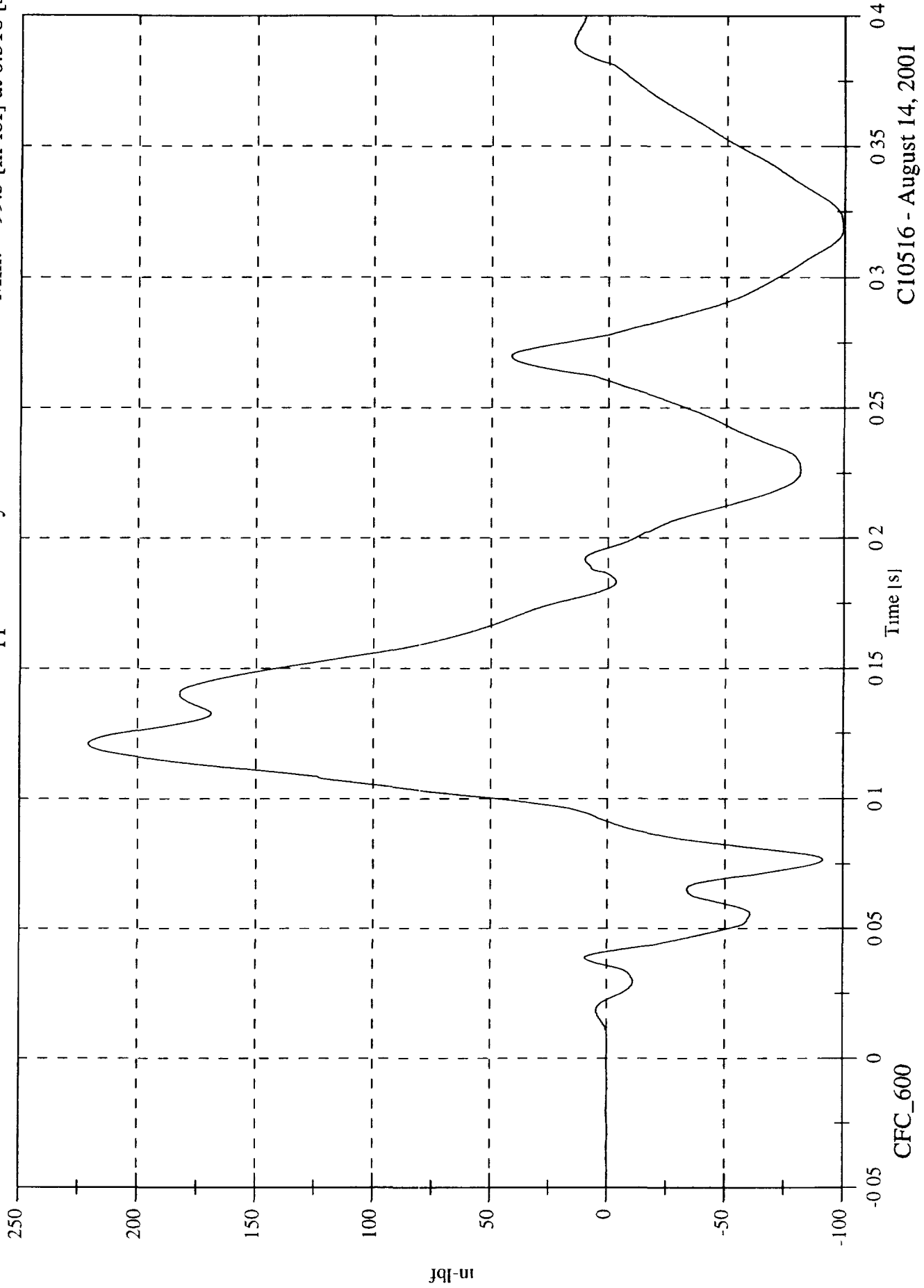
P1 Upper Neck Mx



C10516 - August 14, 2001

Max: 220.9 [in-lbf] at 0.121 [s]
Min: -99.5 [in-lbf] at 0.318 [s]

P1 Upper Neck My

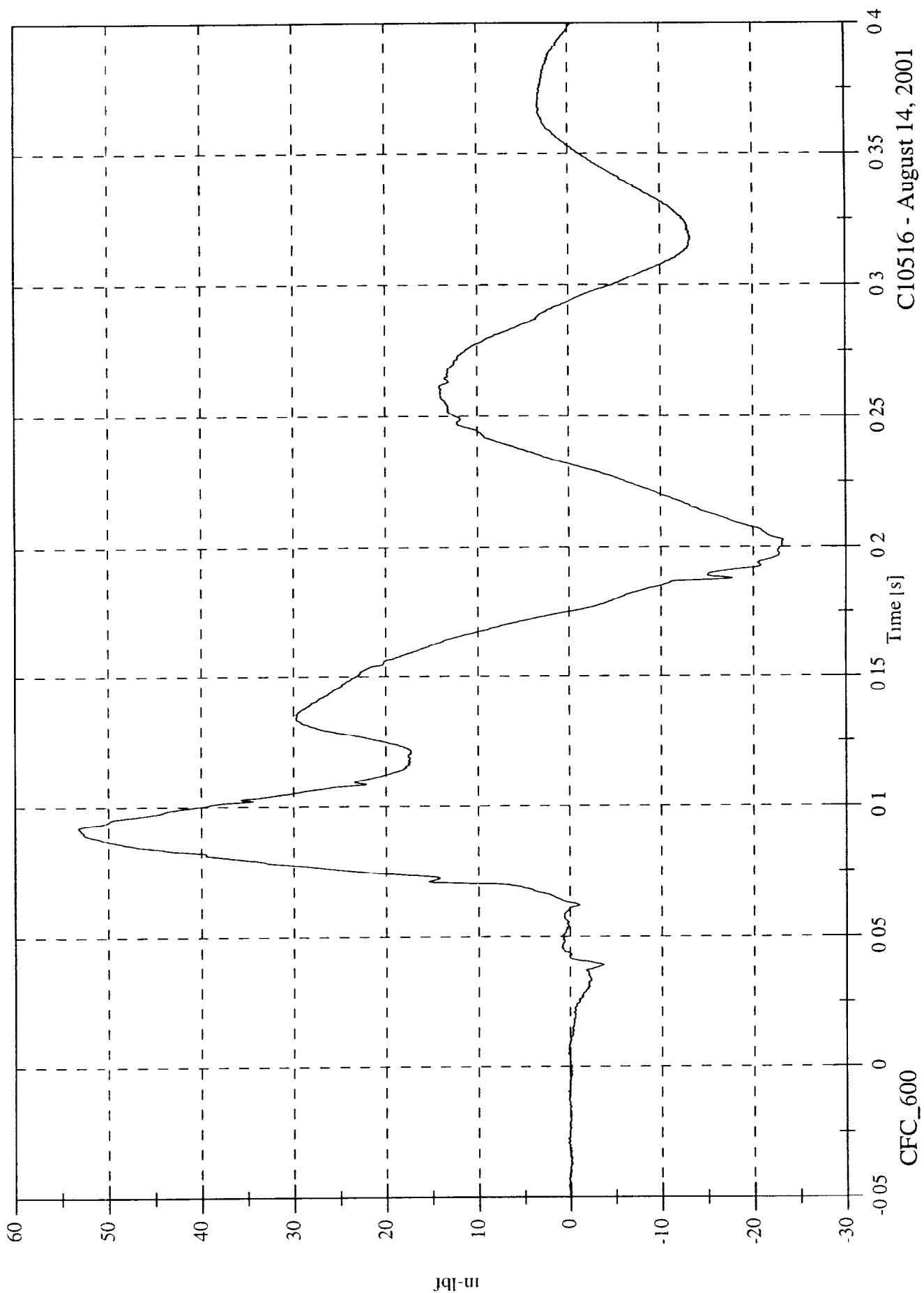


C10516 - August 14, 2001

Max: 53.2 [in-lbf] at 0.092 [s]
Min: -23.2 [in-lbf] at 0.202 [s]

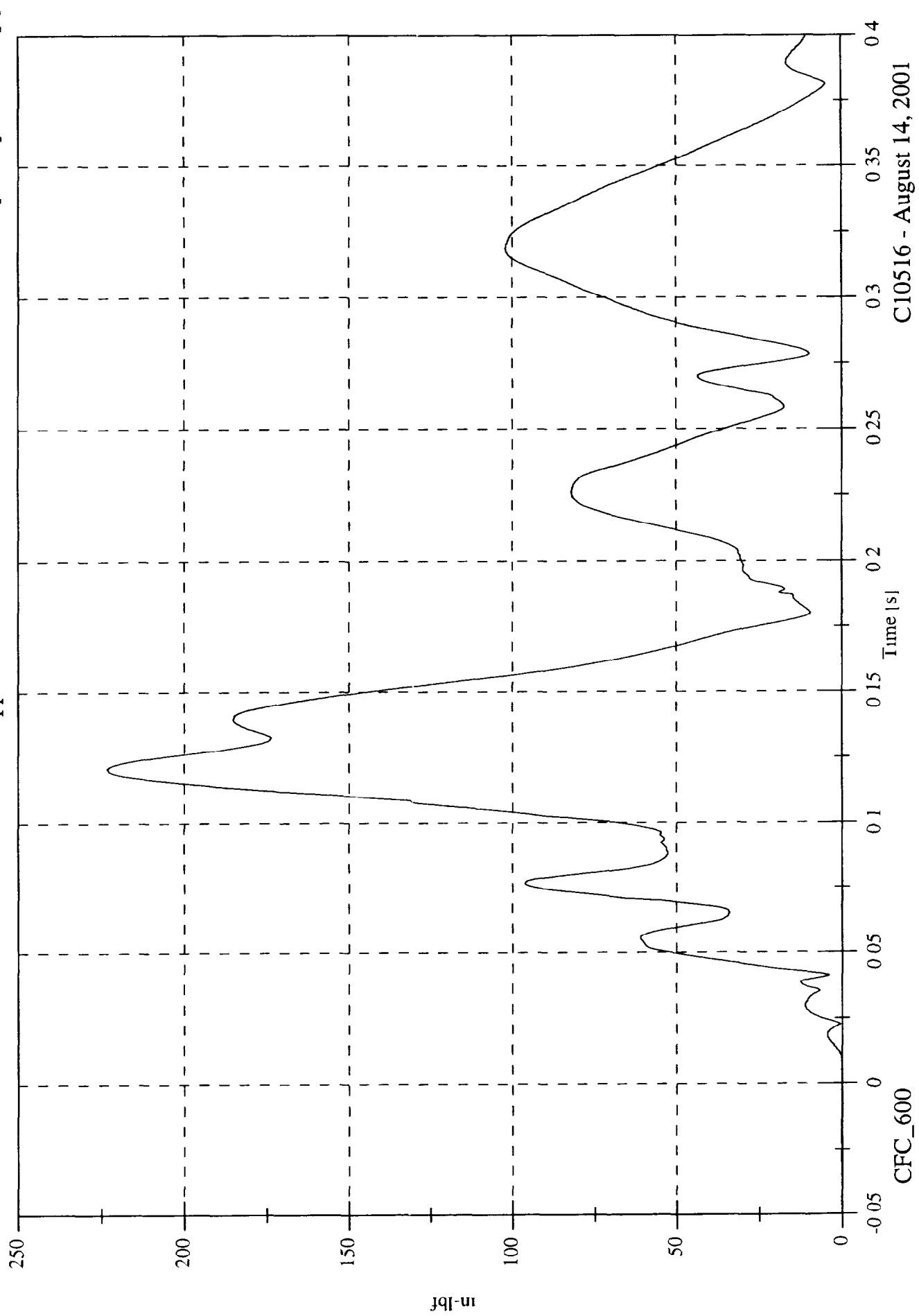
FMVSS 301 Rear Test #8 - 2001 Saab 9-3

P1 Upper Neck Mz



C10516 - August 14, 2001

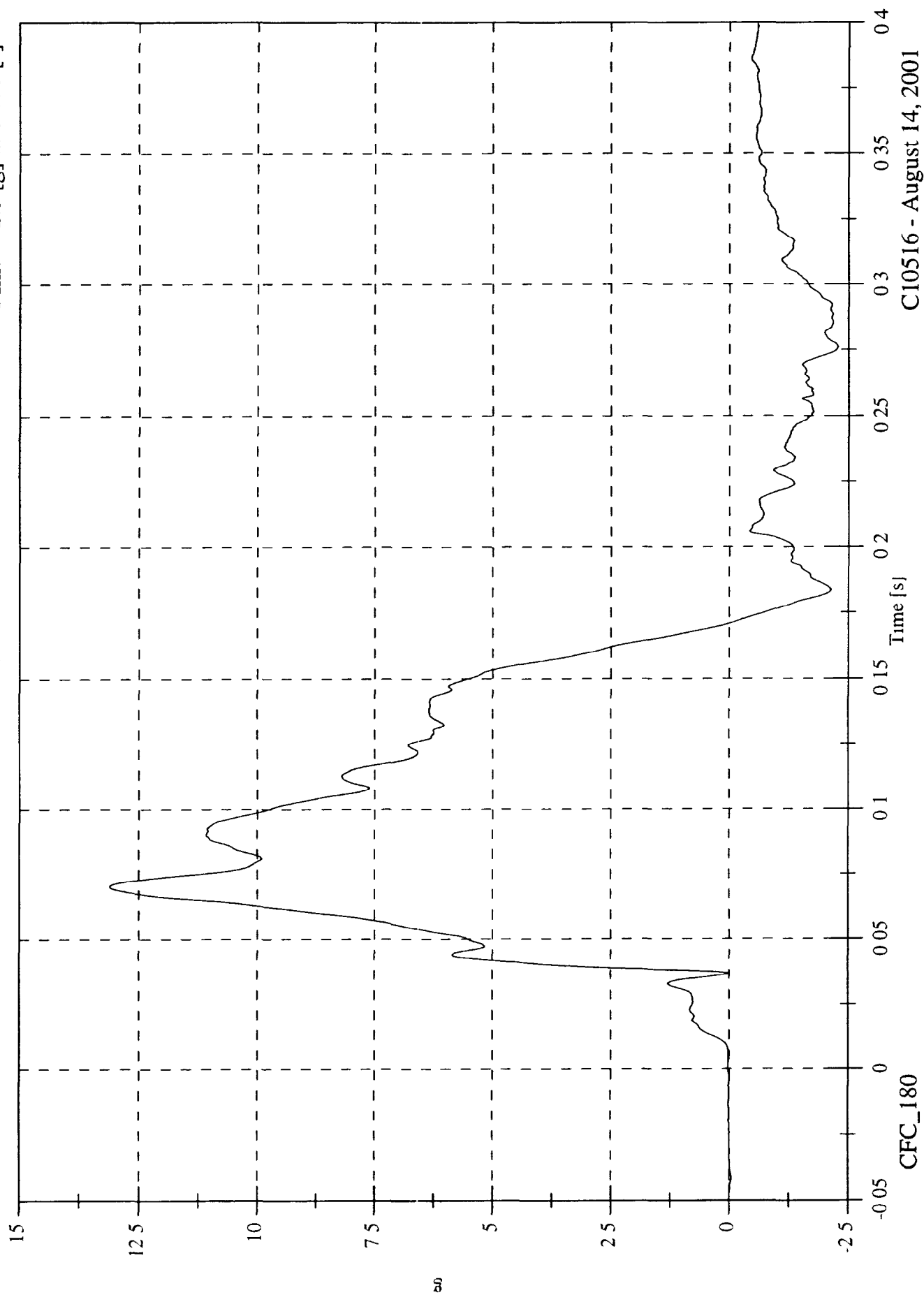
P1 Upper Neck M Resultant



C10516 - August 14, 2001

Max: 13.1 [g] at 0.070 [s]
Min: -2.3 [g] at 0.276 [s]

P1 Chest x



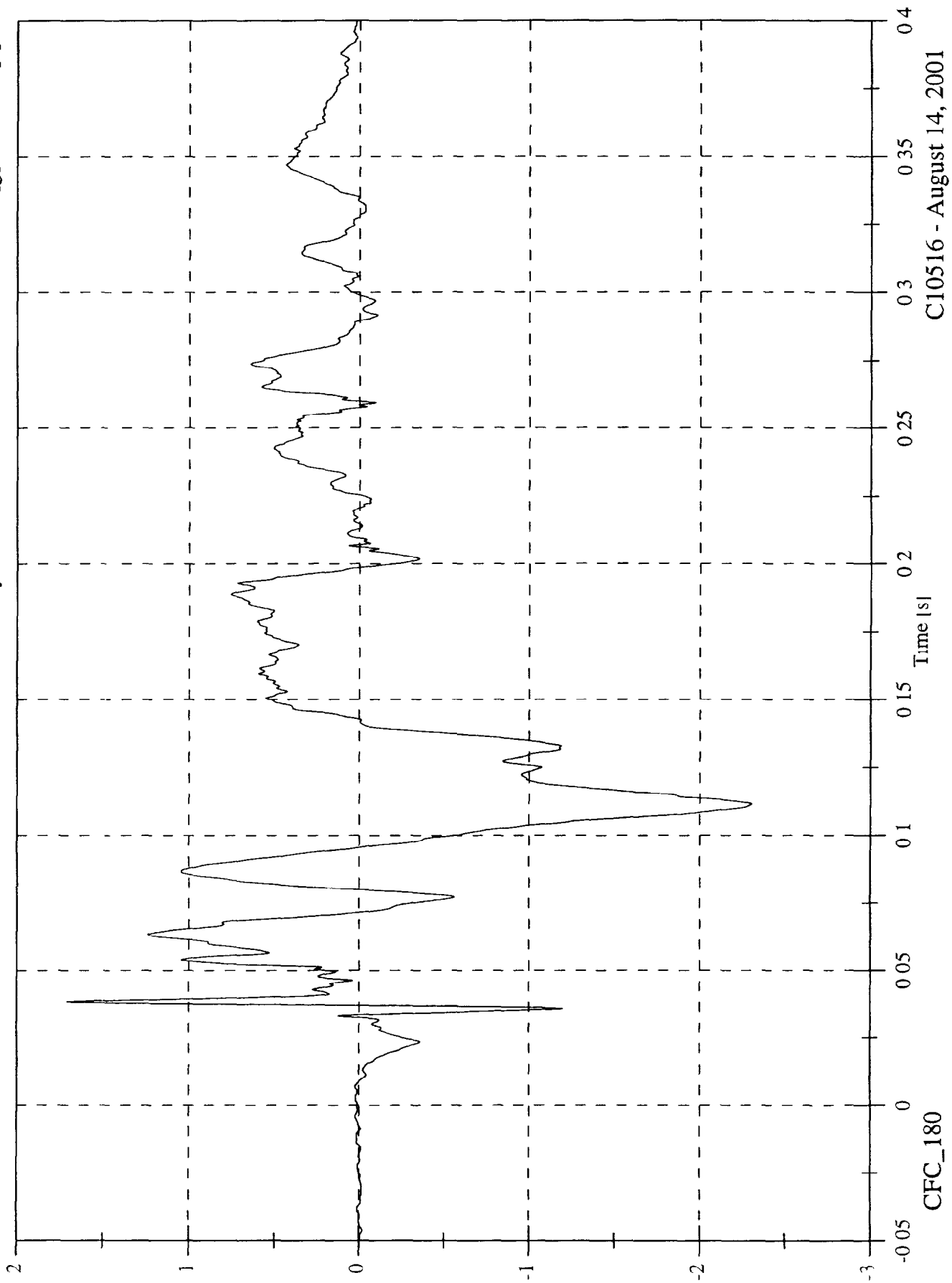
CFC_180

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

P1 Chest y

Max. 1.7 [g] at 0.038 [s]
Min: -2.3 [g] at 0.111 [s]

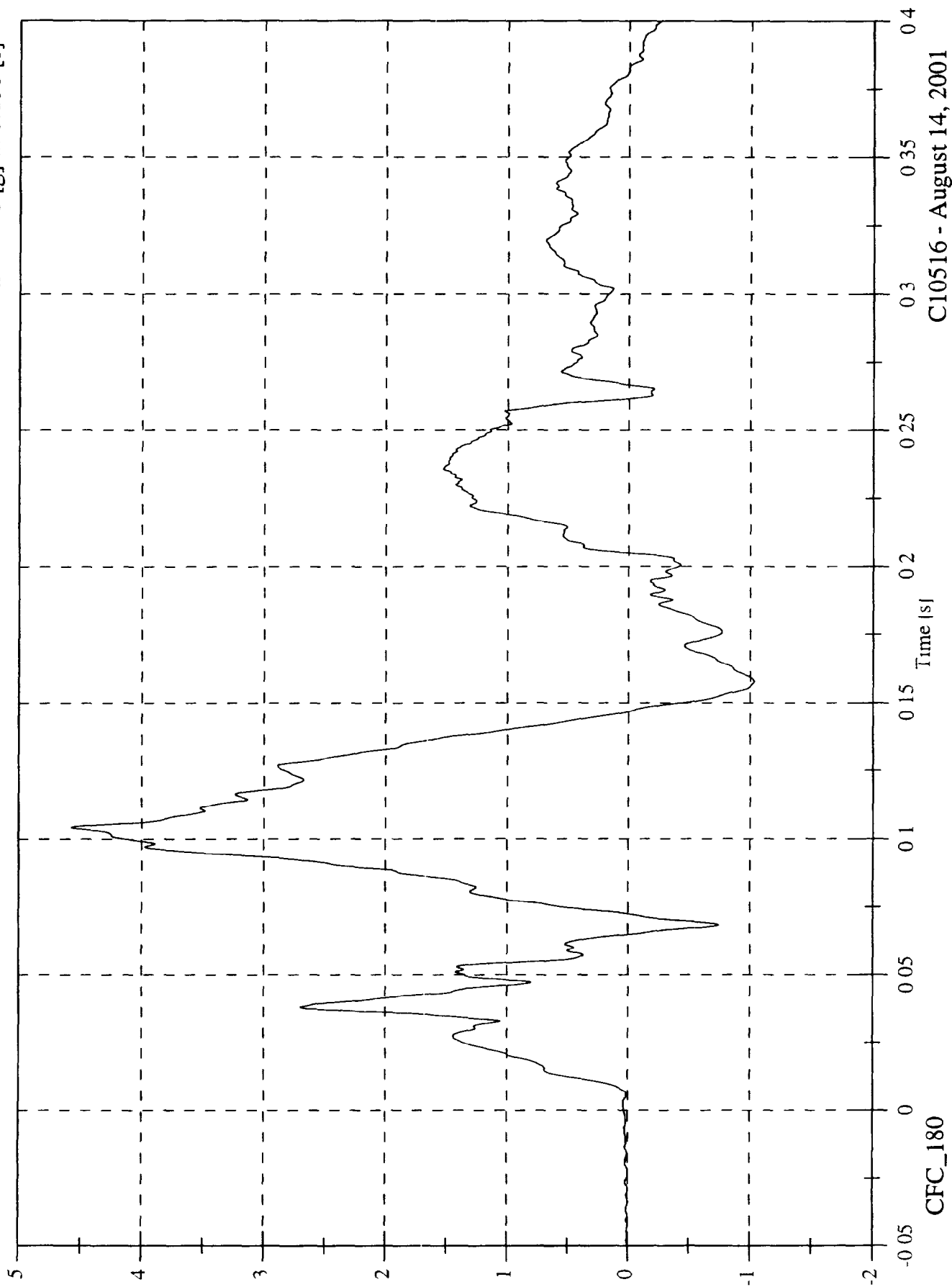


CFC_180

C10516 - August 14, 2001

Max: 4.6 [g] at 0.104 [s]
Min: -1.0 [g] at 0.158 [s]

P1 Chest z

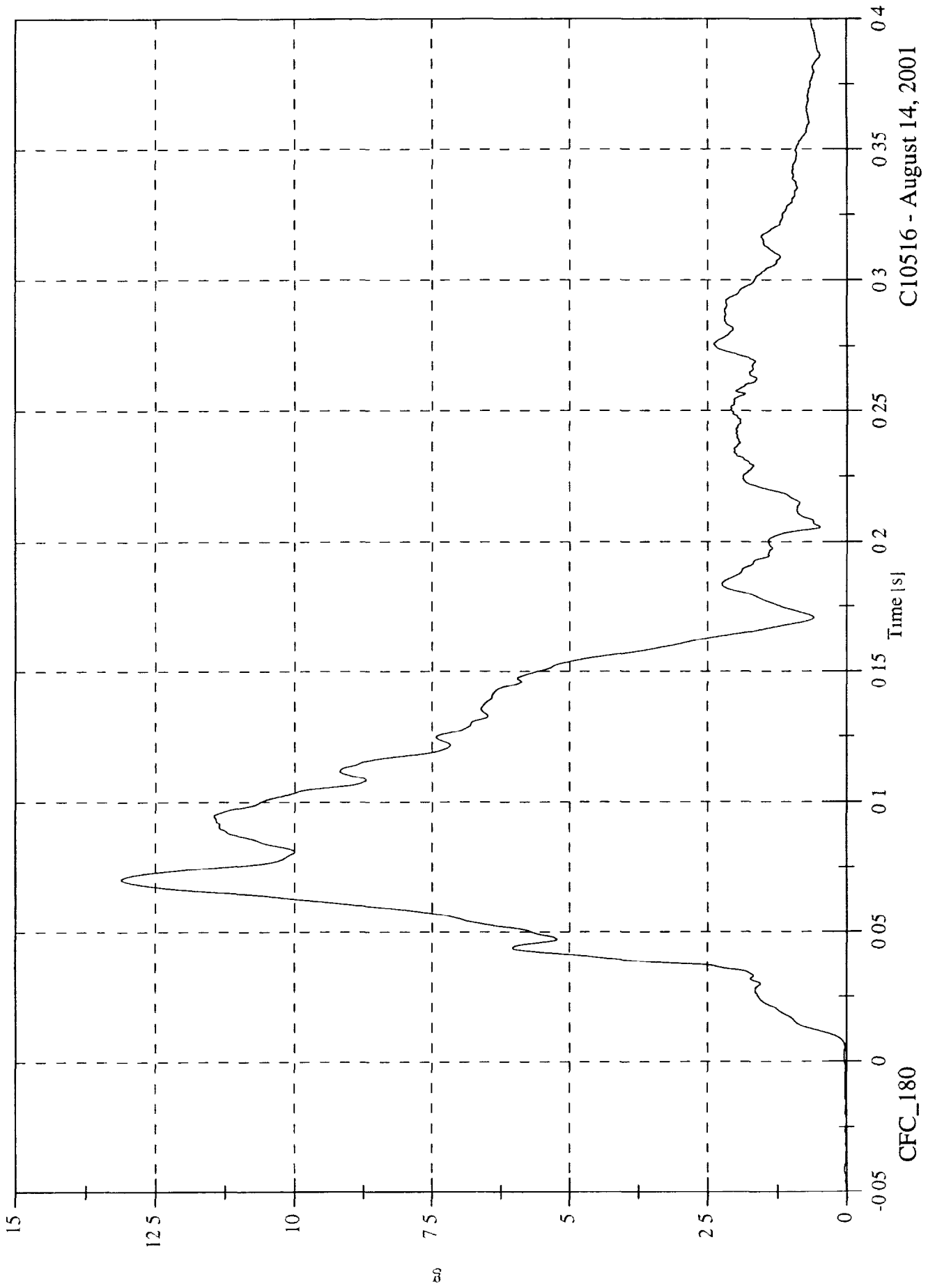


CI0516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max. 13.1 [g] at 0.070 [s]
Min: 0.0 [g] at -0.023 [s]

P1 Chest Resultant



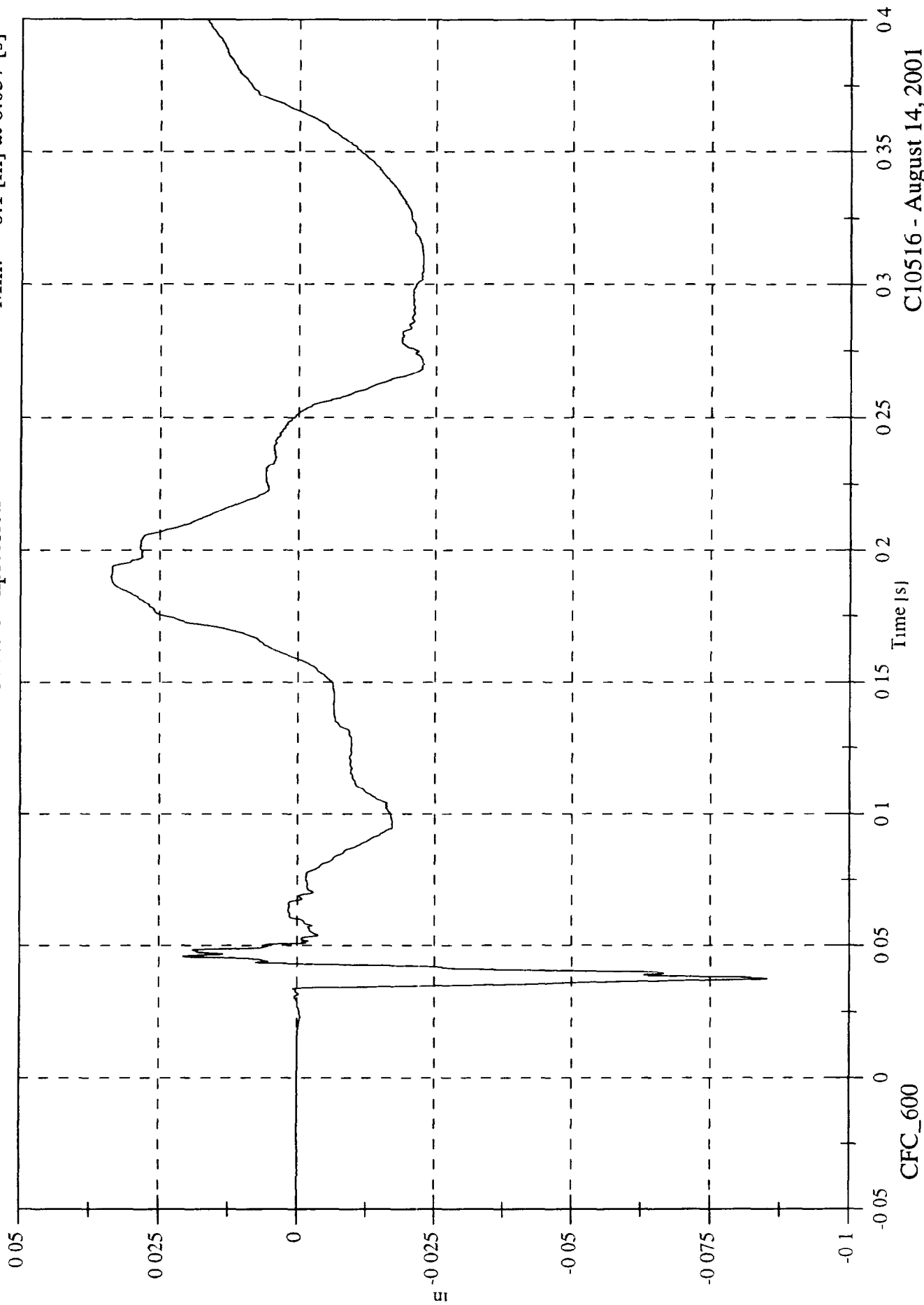
CFC_180

CI0516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

P1 Chest Compression

Max: 0.0 [in] at 0.190 [s]
Min: -0.1 [in] at 0.037 [s]



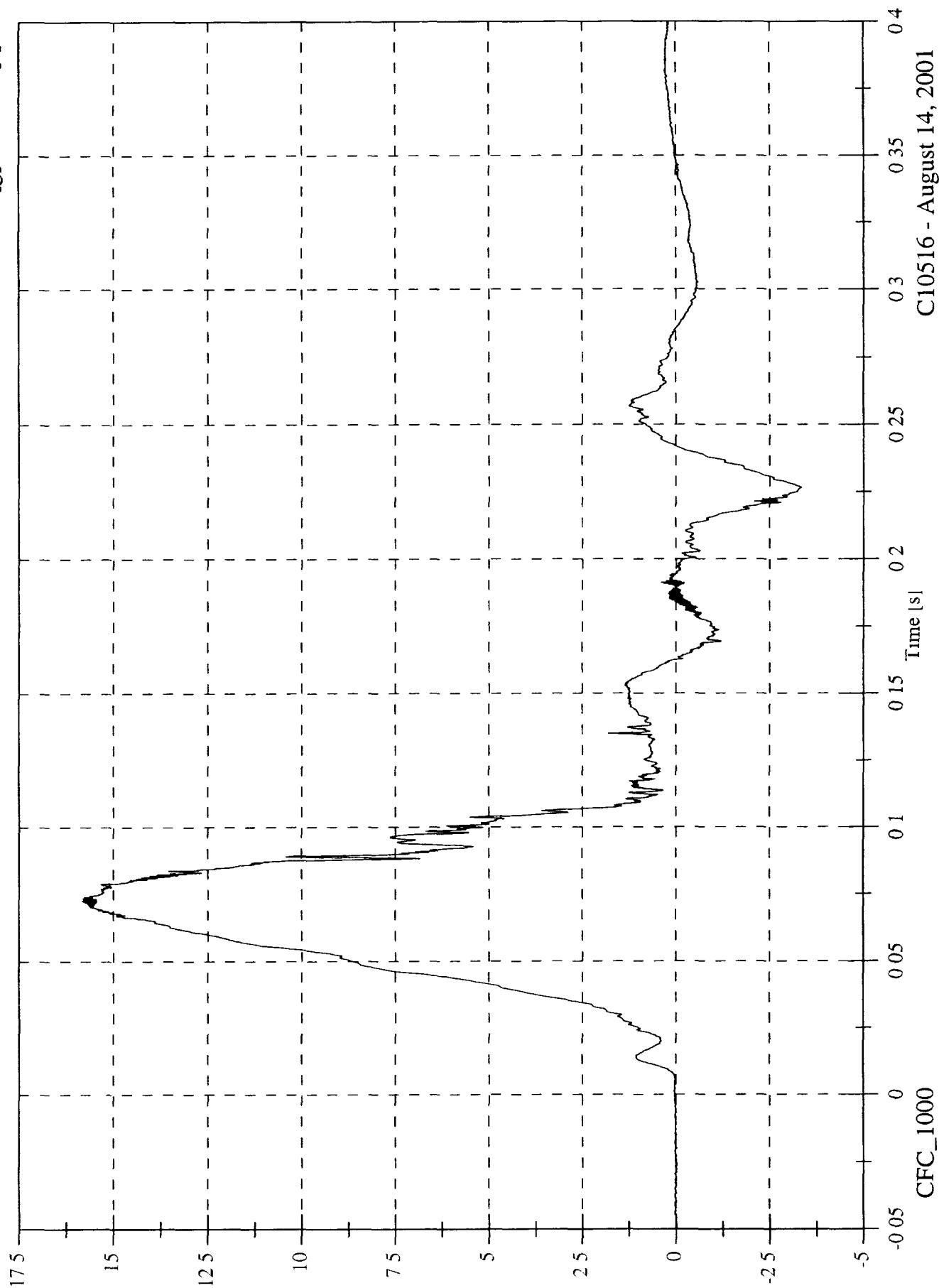
CFC_600

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 15.8 [g] at 0.072 [s]
Min: -3.3 [g] at 0.226 [s]

P1 Pelvic x

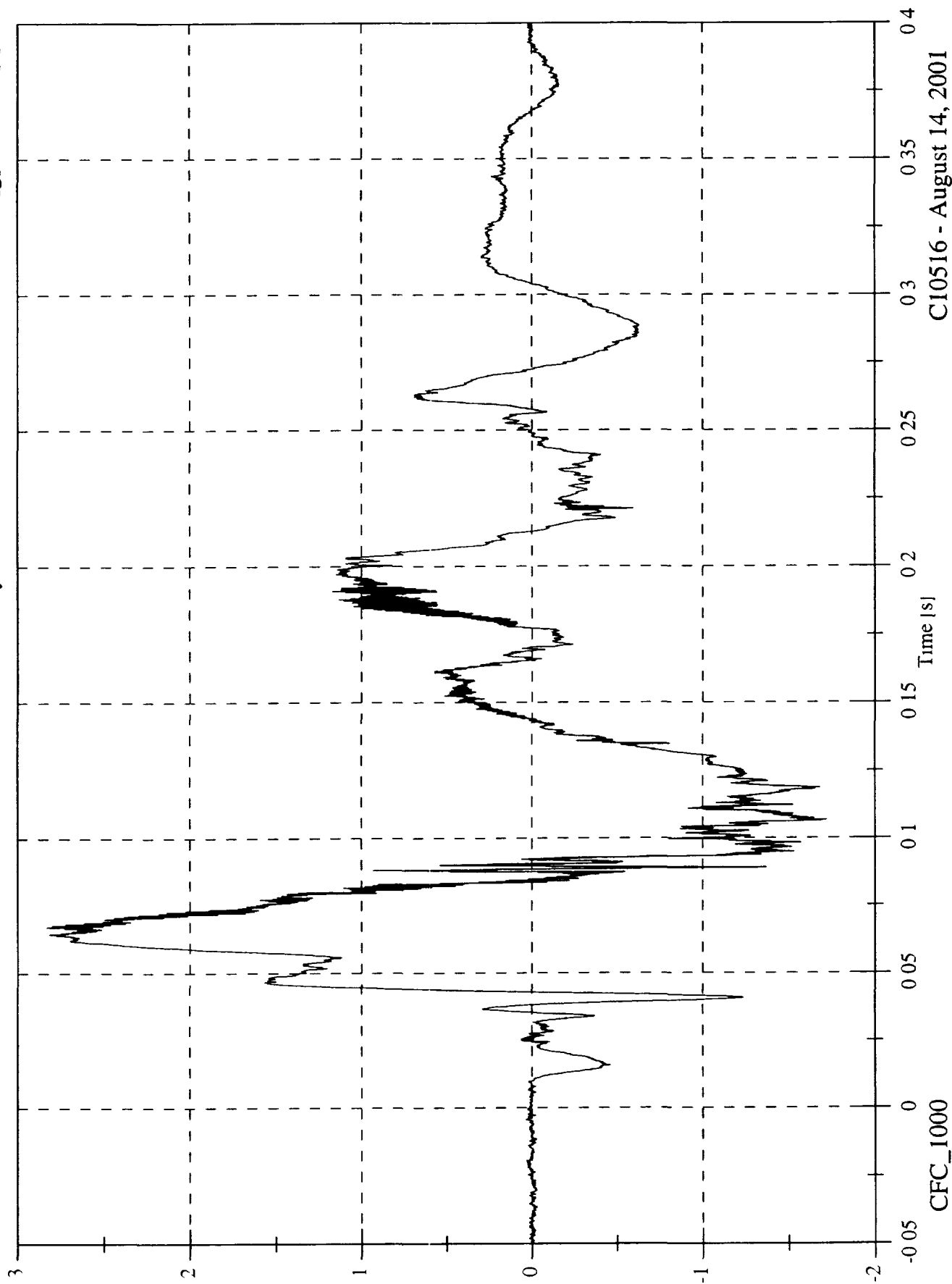


CFC_1000

C10516 - August 14, 2001

Max: 2.8 [g] at 0.067 [s]
Min: -1.7 [g] at 0.107 [s]

P1 Pelvic y



CFC_1000

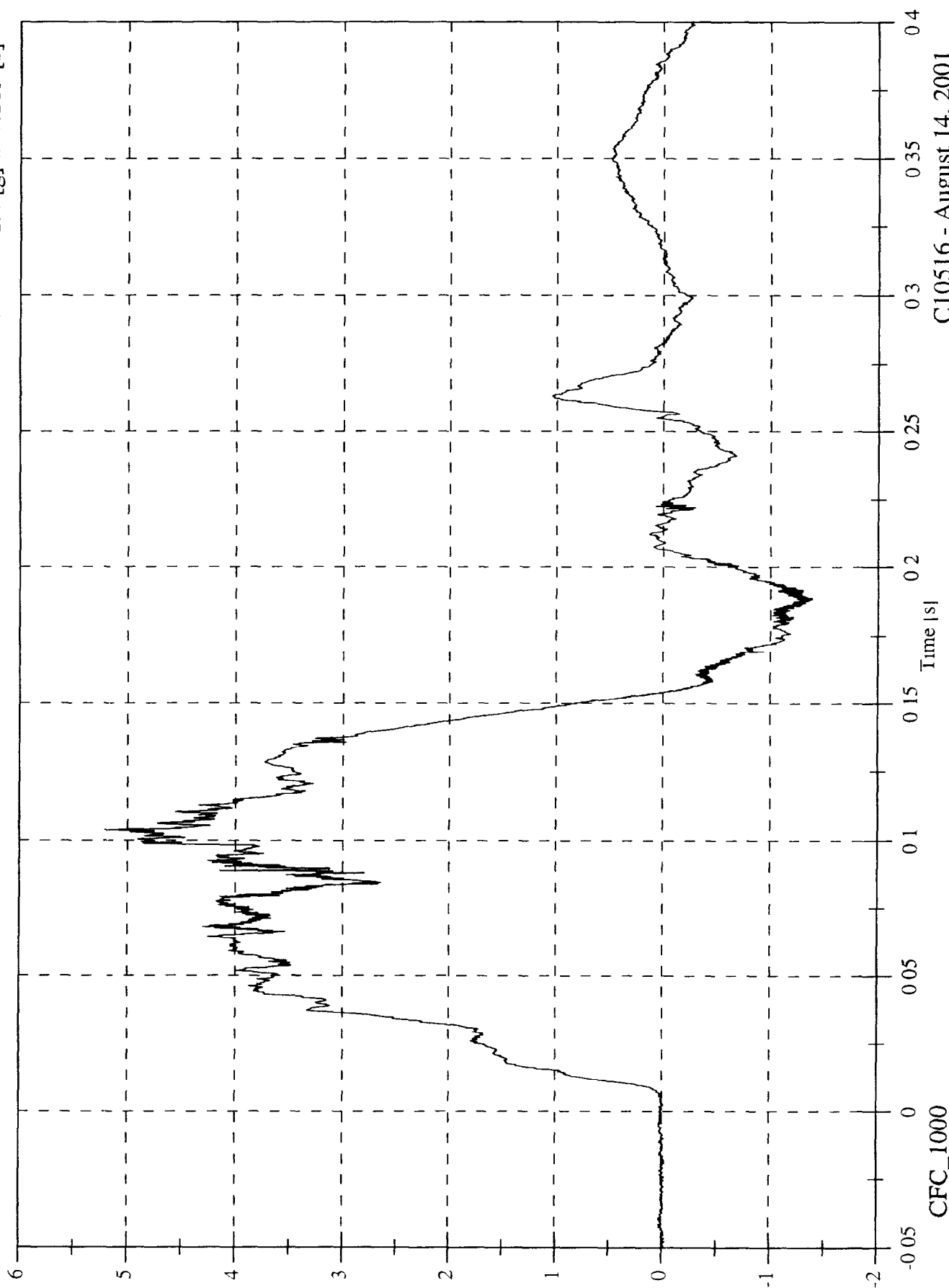
Time [s]

CI0516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 5.2 [g] at 0.104 [s]
Min: -1.4 [g] at 0.189 [s]

P1 Pelvic z



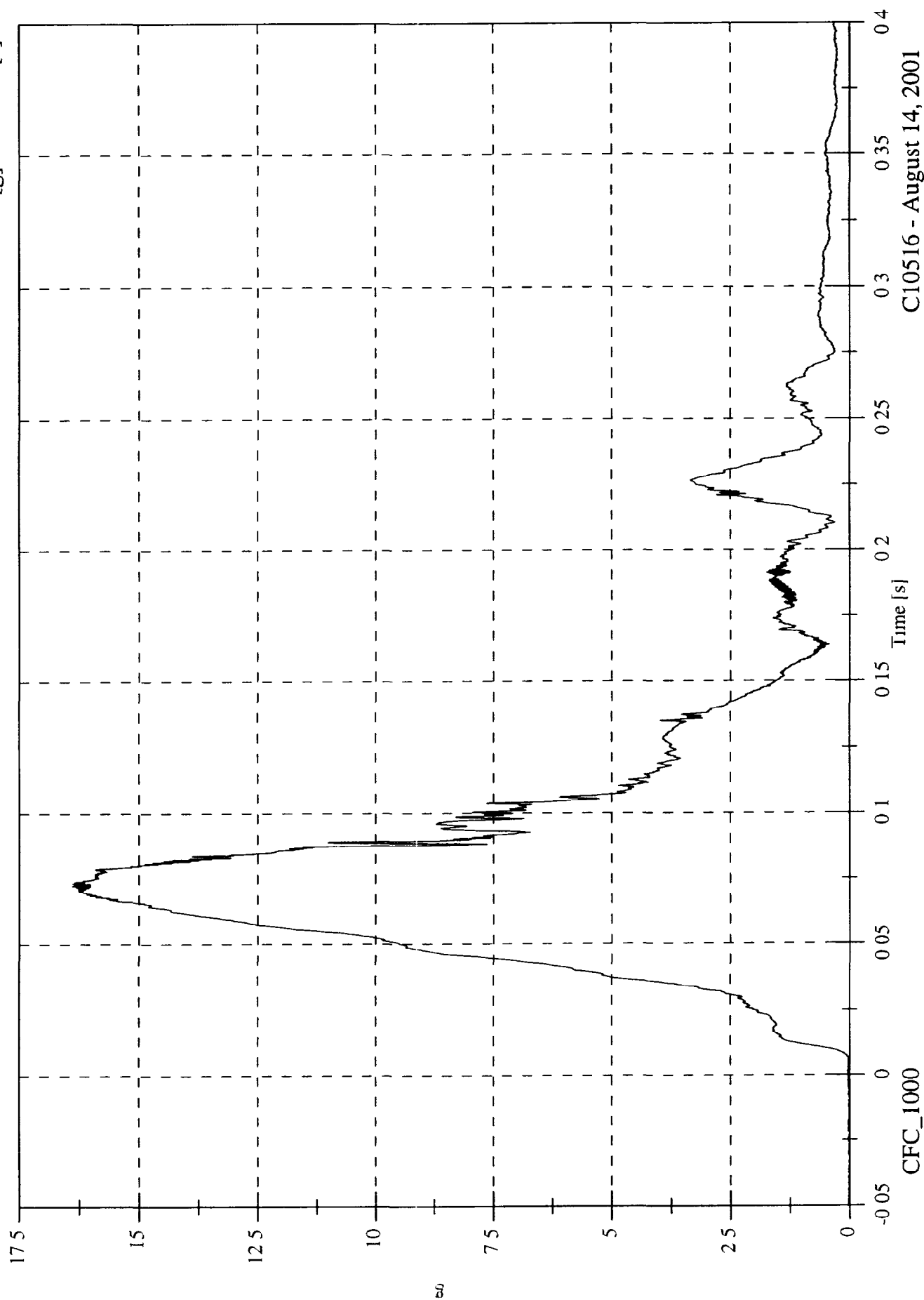
CFC_1000

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 16.4 [g] at 0.072 [s]
Min: 0.0 [g] at -0.023 [s]

P1 Pelvic Resultant

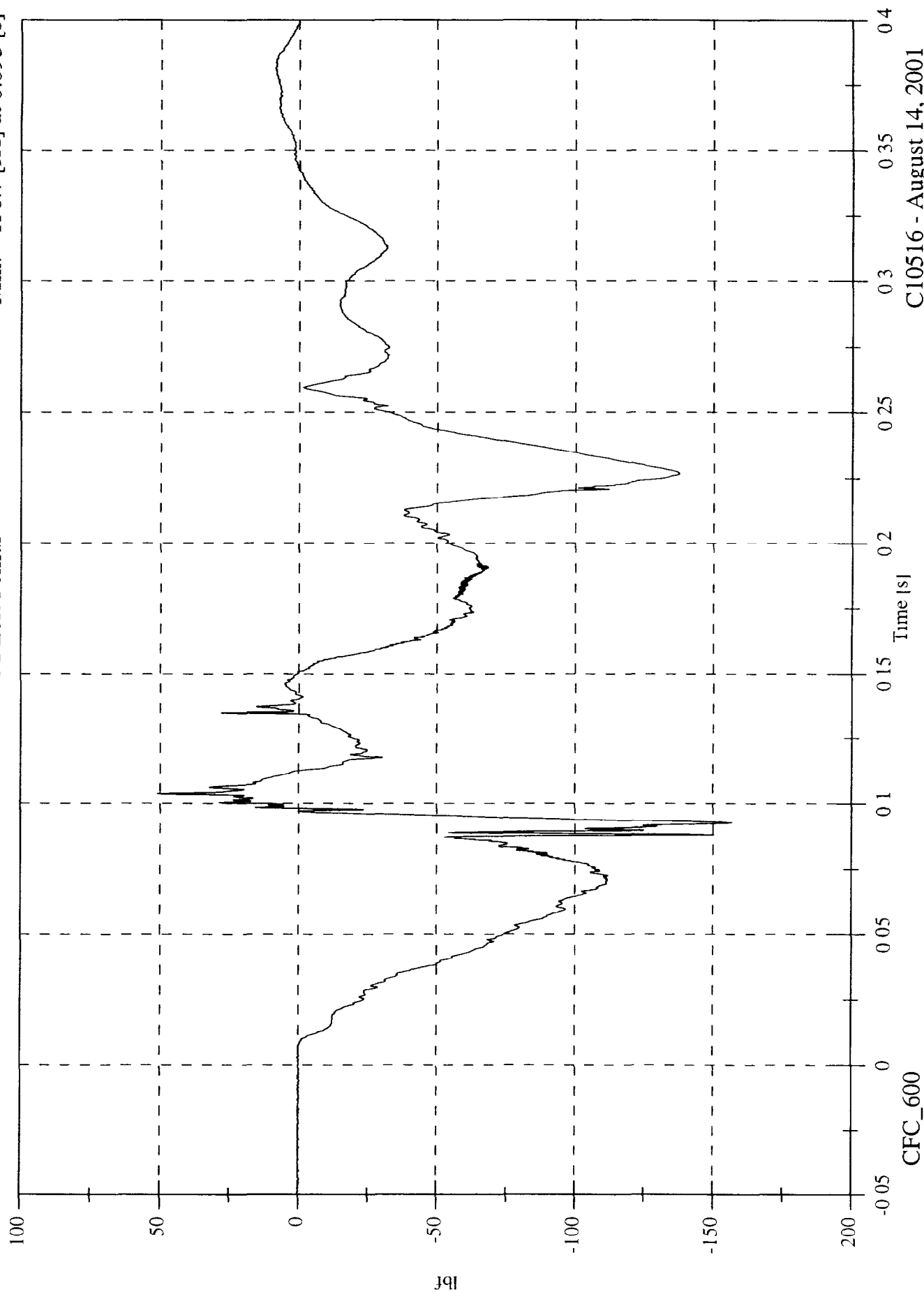


CFC_1000

C10516 - August 14, 2001

Max: 51.0 [lbf] at 0.104 [s]
Min: -156.7 [lbf] at 0.093 [s]

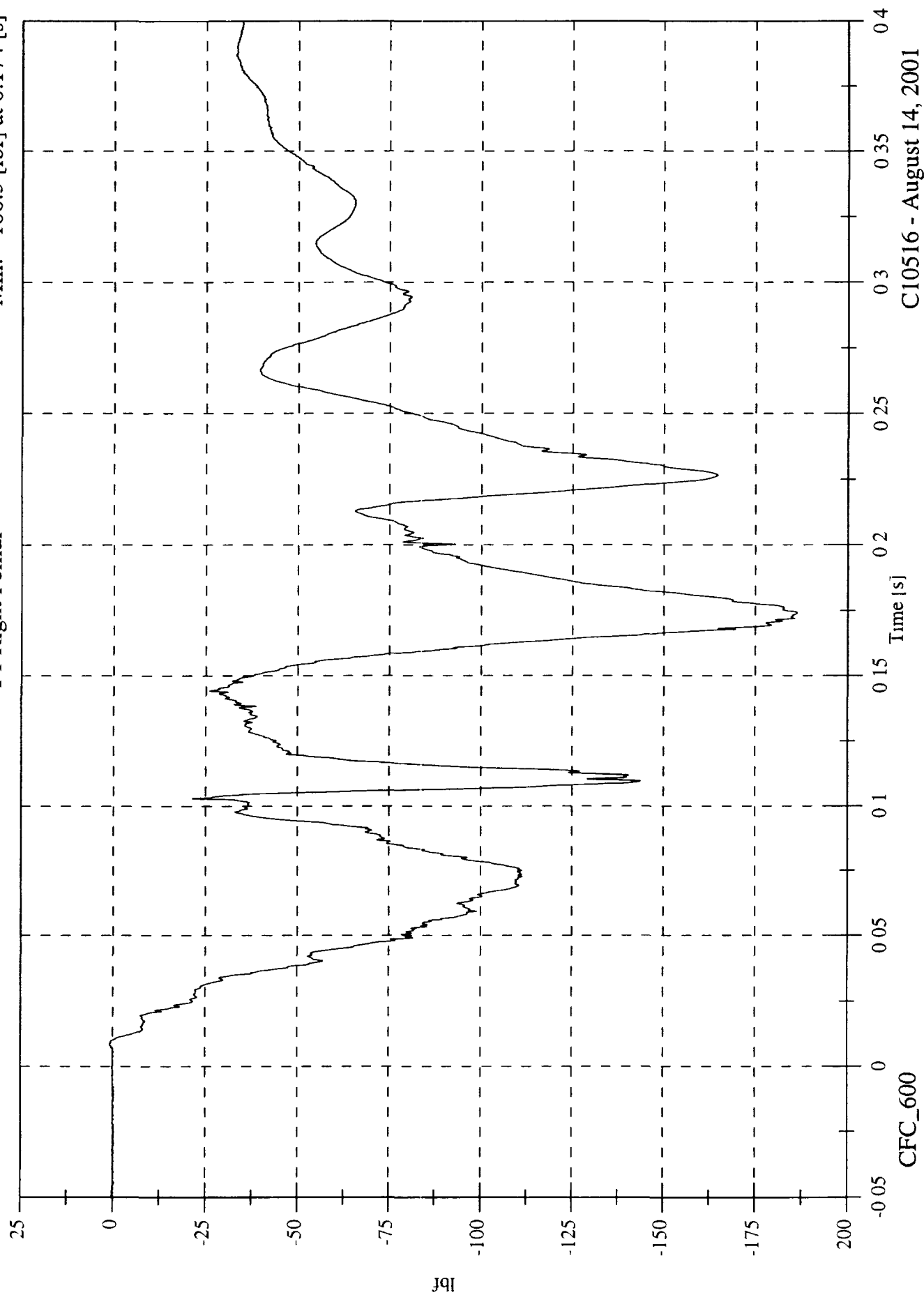
P1 Left Femur



C10516 - August 14, 2001

Max: 0.8 [lbf] at 0.008 [s]
Min: -186.3 [lbf] at 0.174 [s]

P1 Right Femur



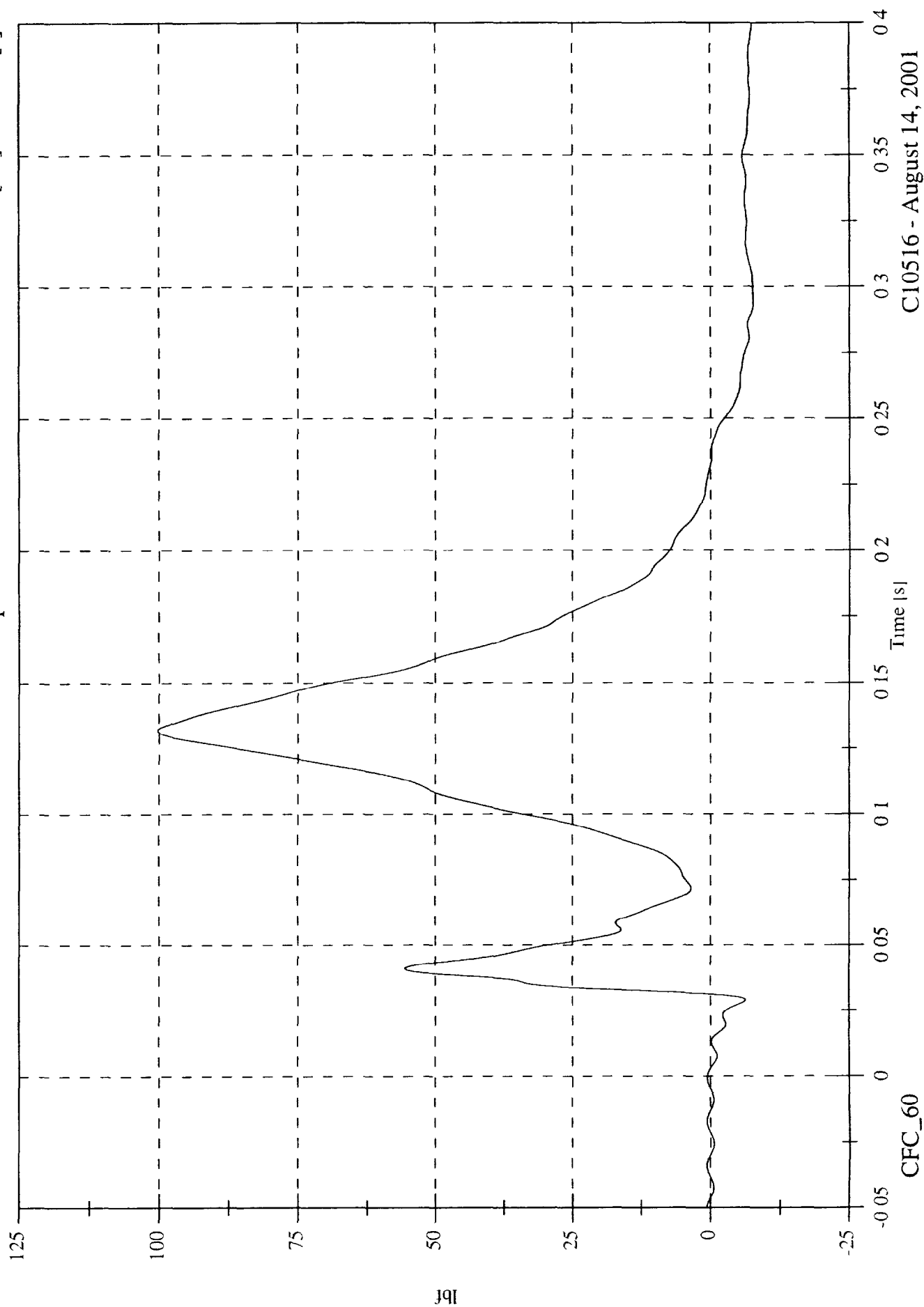
CFC_600

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

P1 Lap Belt

Max: 100.2 [lbf] at 0.132 [s]
Min: -7.7 [lbf] at 0.293 [s]



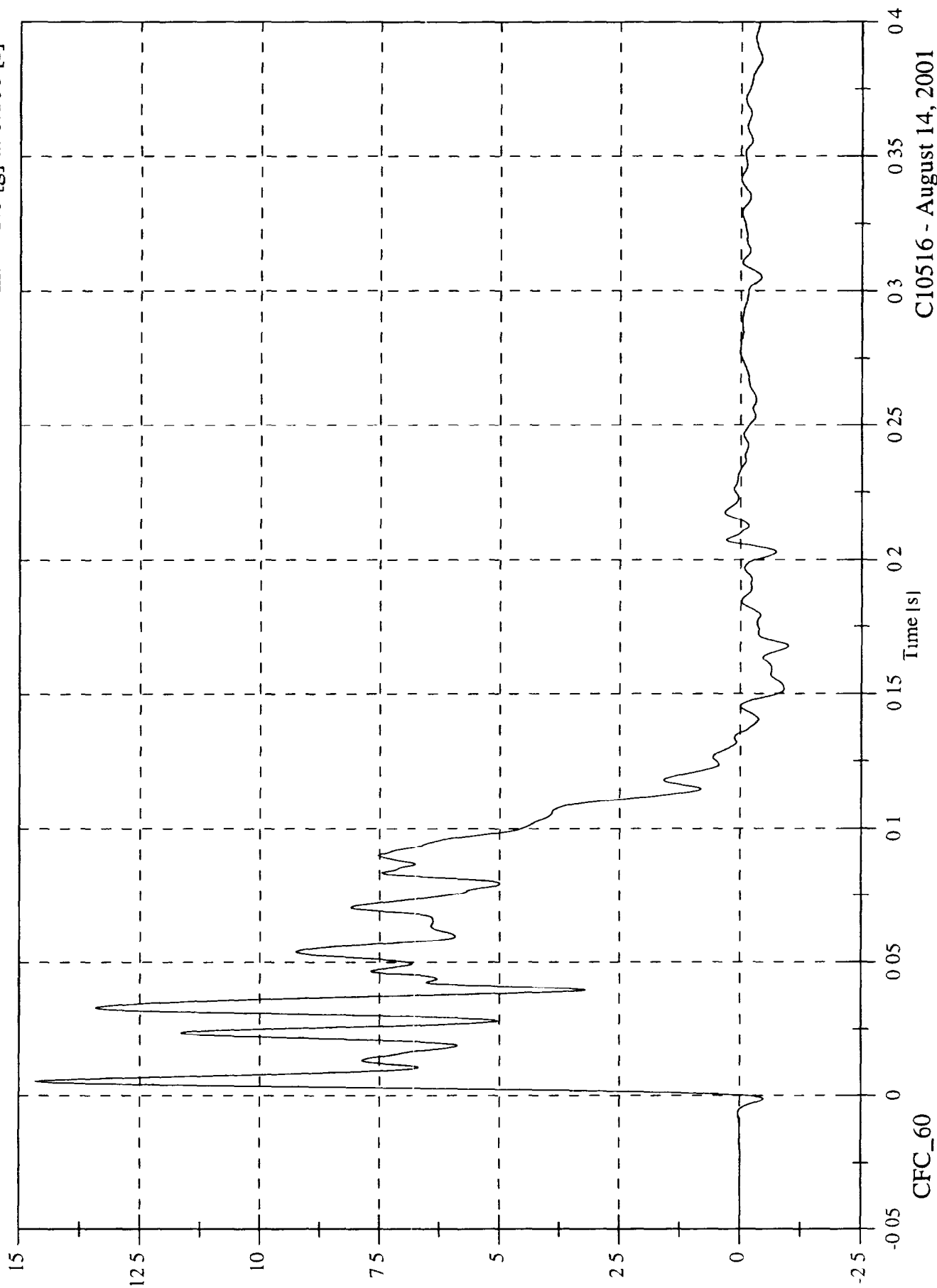
CFC_60

CI0516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 14.7 [g] at 0.006 [s]
Min: -1.0 [g] at 0.168 [s]

Acc #1 Left Rear Xm Ax



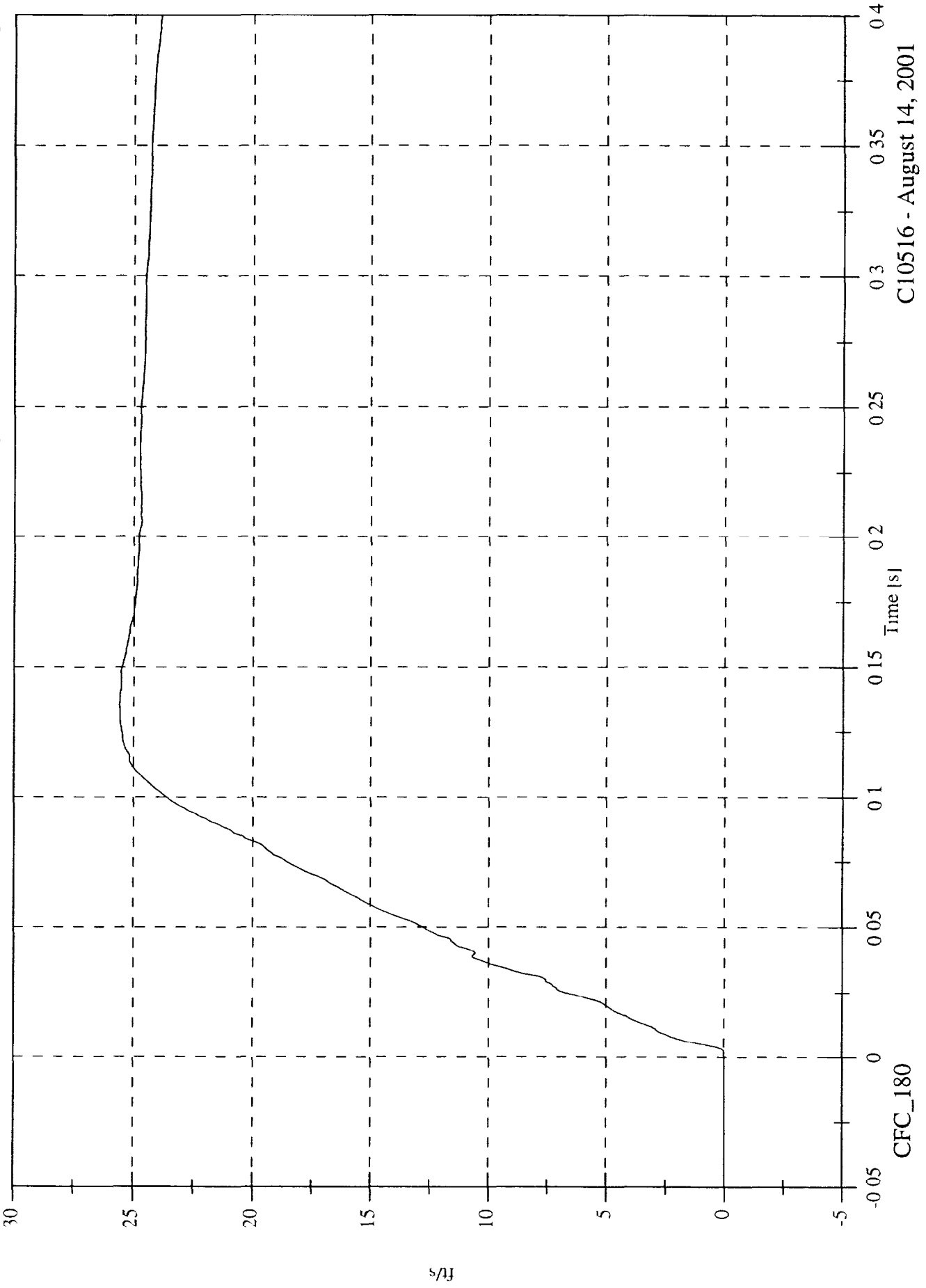
C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 25.6 [ft/s] at 0.136 [s]

Min: -0.0 [ft/s] at -0.036 [s]

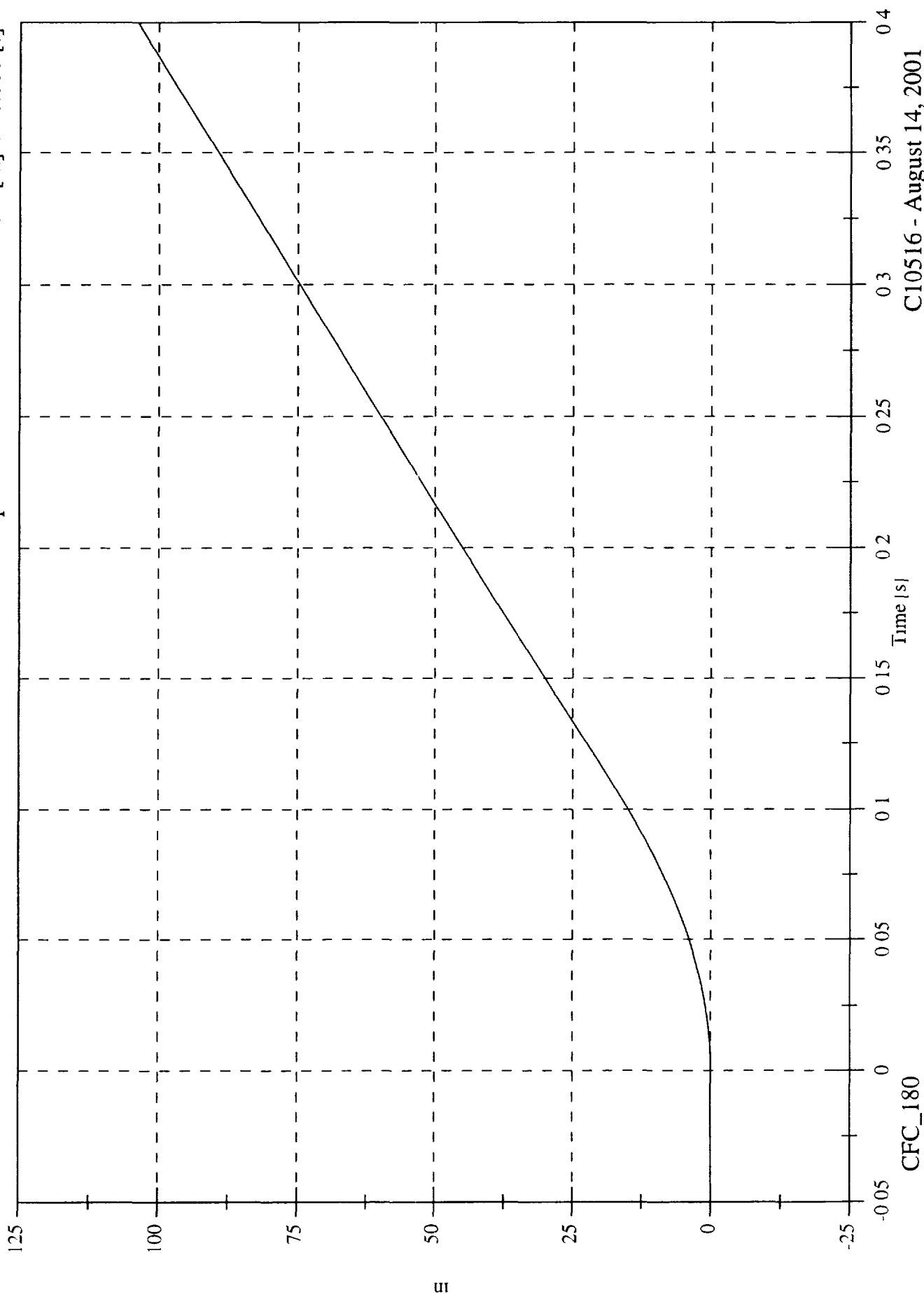
Acc #1 Left Rear Xm Ax Velocity



C10516 - August 14, 2001

Max: 103.8 [in] at 0.400 [s]
Min: -0.0 [in] at -0.008 [s]

Acc #1 Left Rear Xm Ax Displacement



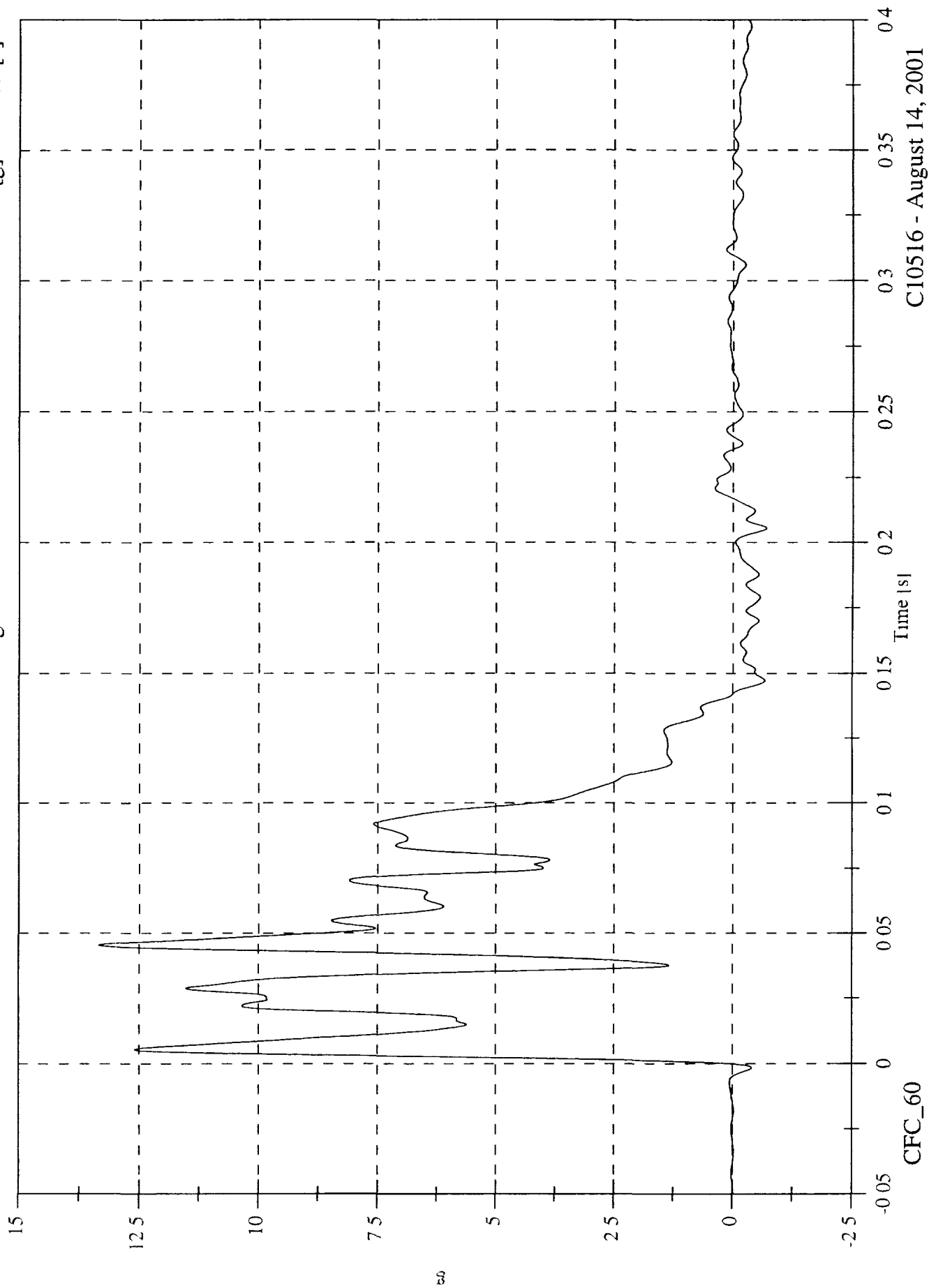
CFC_180

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 13.3 [g] at 0.045 [s]
 Min: -0.7 [g] at 0.205 [s]

Acc #2 Right Rear Xm Ax

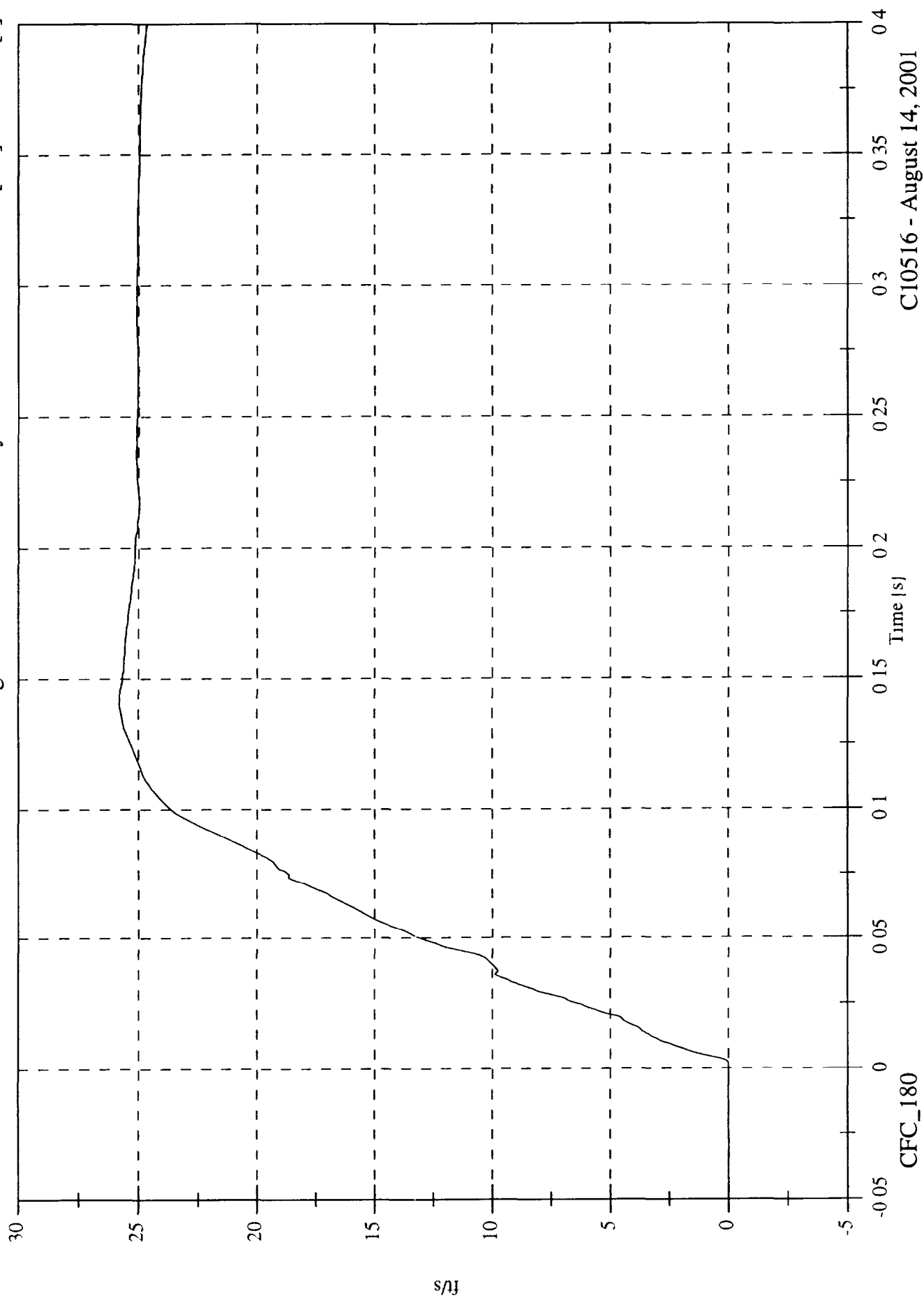


C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 25.8 [ft/s] at 0.140 [s]
Min: -0.0 [ft/s] at -0.031 [s]

Acc #2 Right Rear Xm Ax Velocity



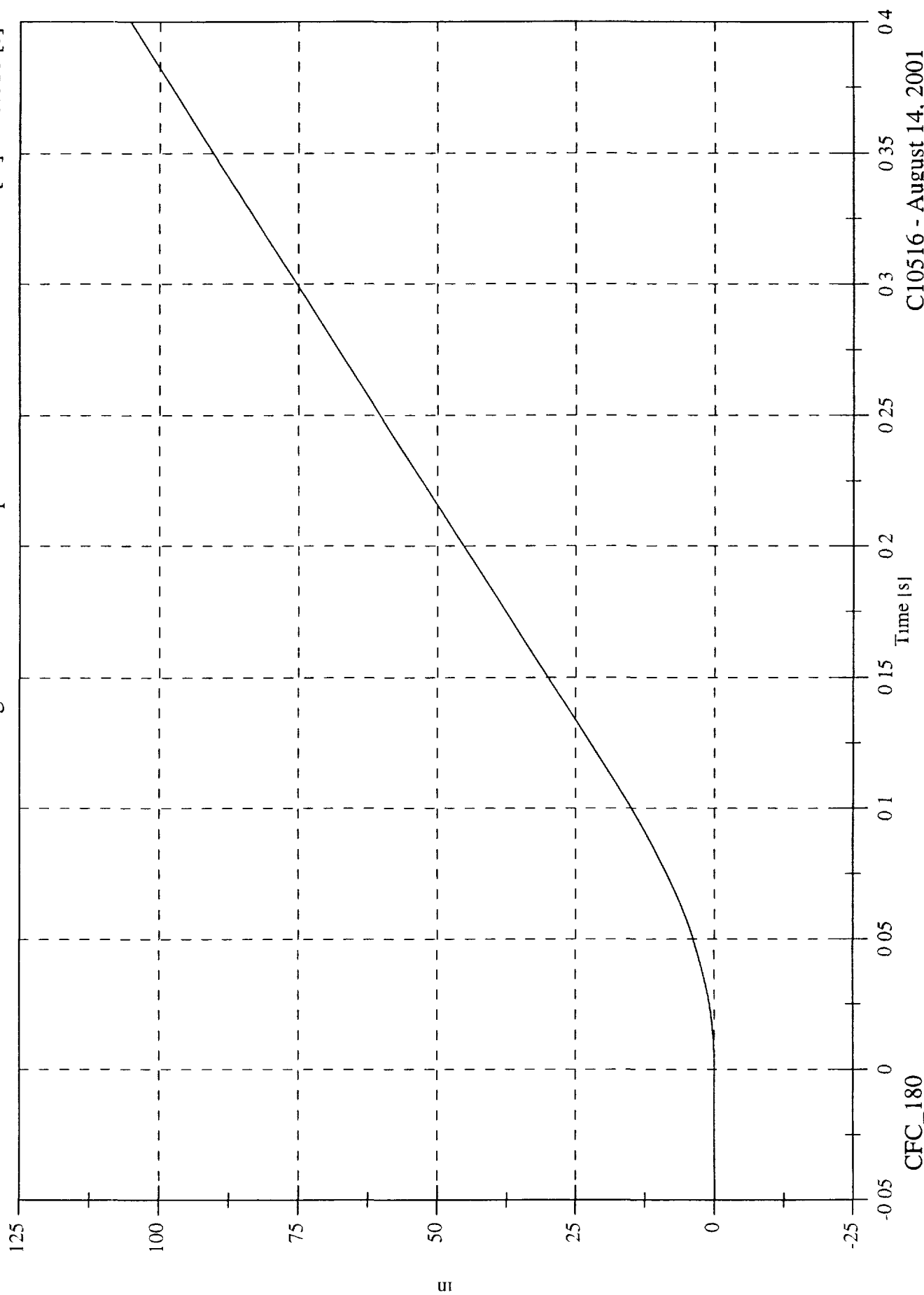
CFC_180

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 105.3 [in] at 0.400 [s]
 Min: -0.0 [in] at -0.010 [s]

Acc #2 Right Rear Xm Ax Displacement



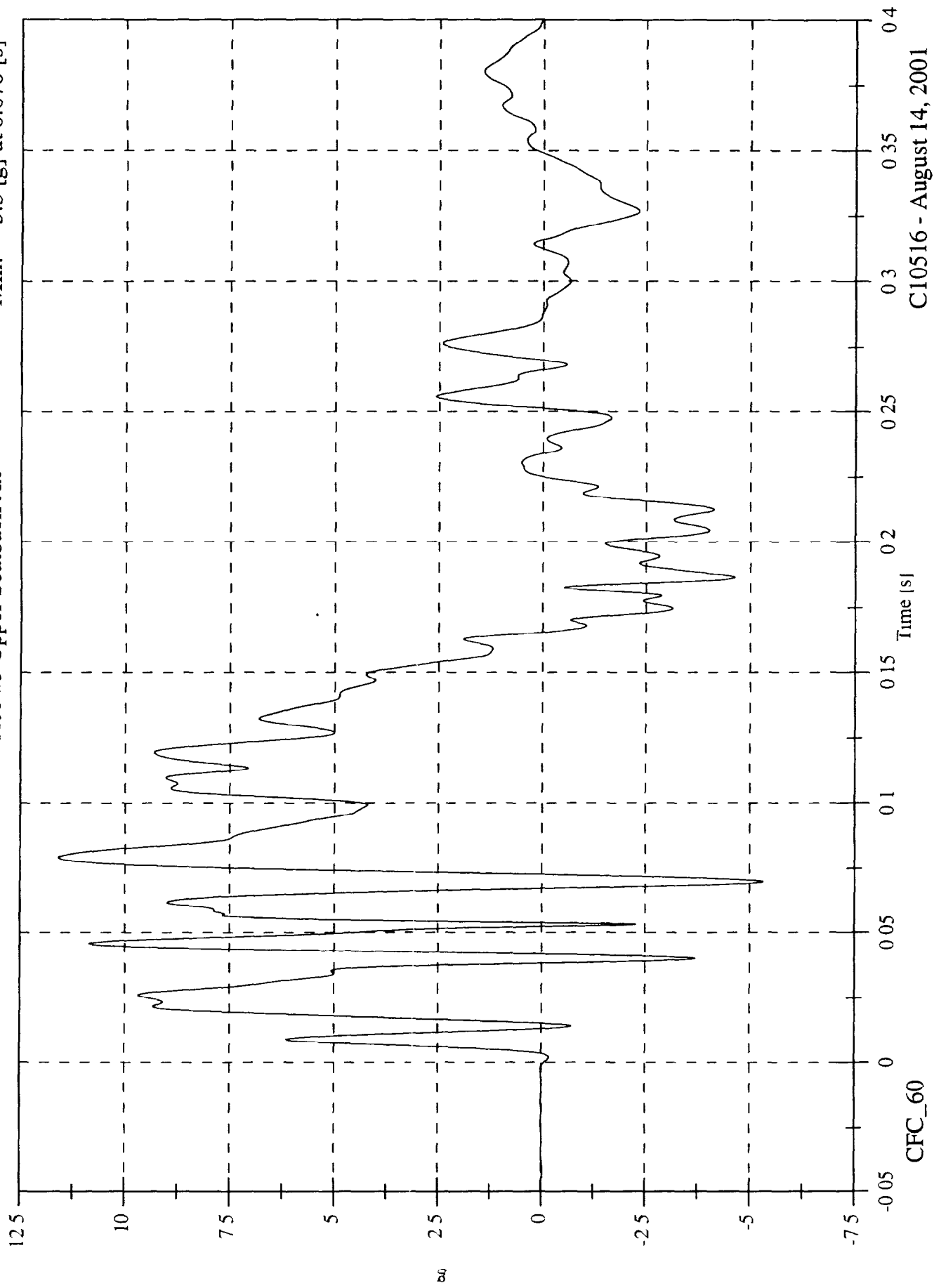
CFC_180

C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 11.6 [g] at 0.079 [s]
Min: -5.3 [g] at 0.070 [s]

Acc #3 Upper Seatback Ax

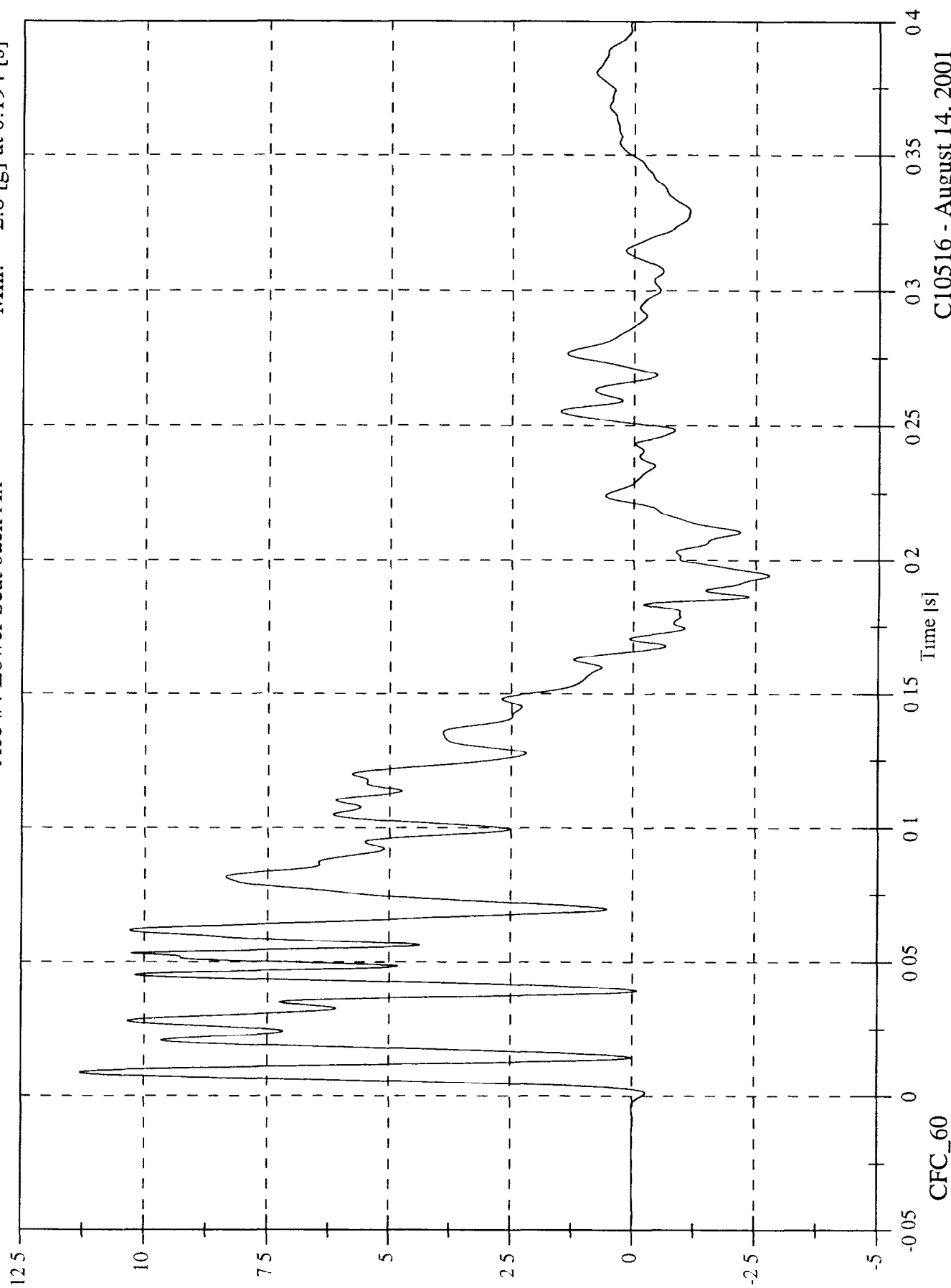


C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 11.3 [g] at 0.009 [s]
 Min: -2.8 [g] at 0.194 [s]

Acc #4 Lower Seat back Ax



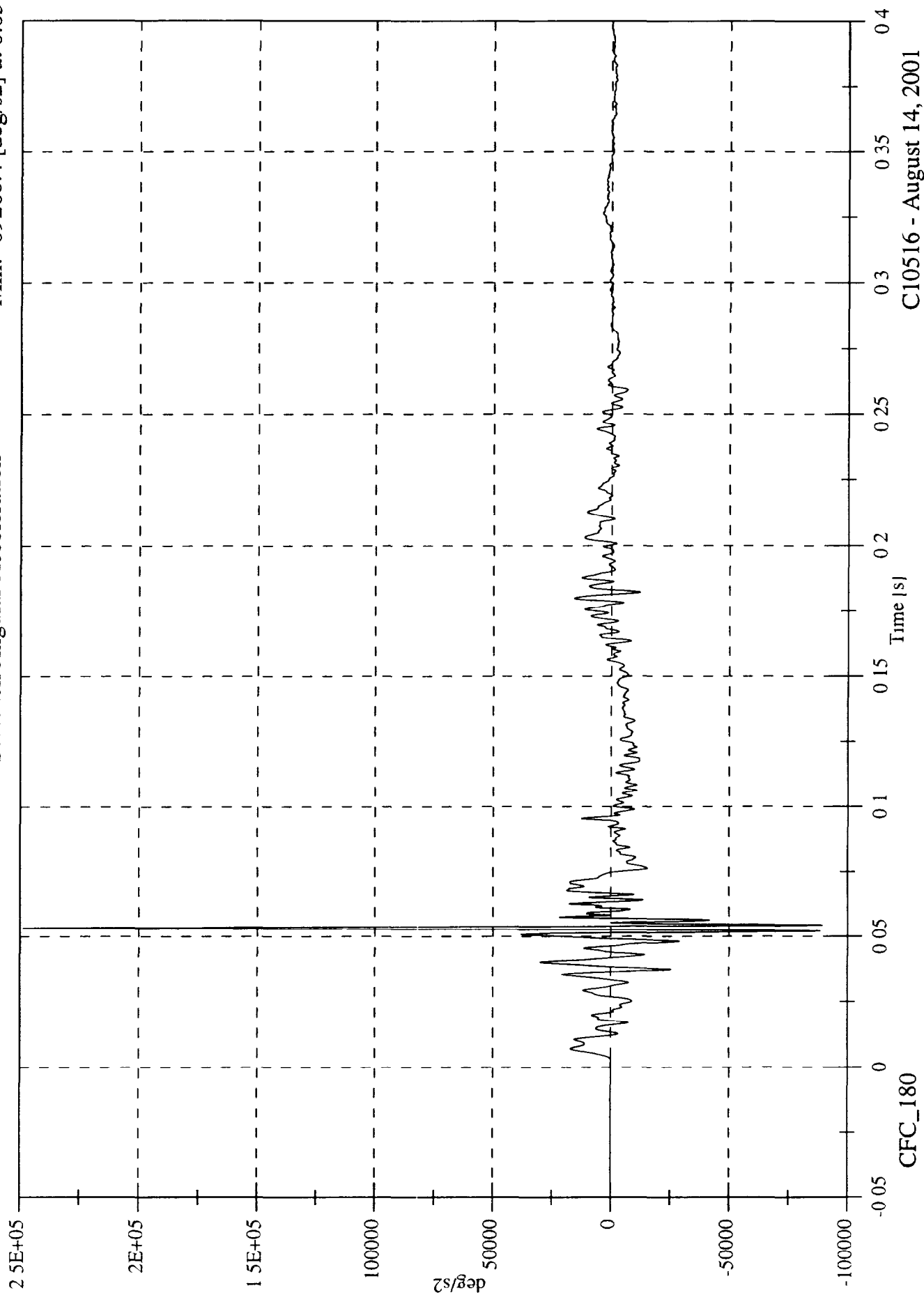
C10516 - August 14, 2001

FMVSS 301 Rear Test #8 - 2001 Saab 9-3

Max: 248698.2 [deg/s²] at 0.053 [s]

Min: -89266.4 [deg/s²] at 0.054 [s]

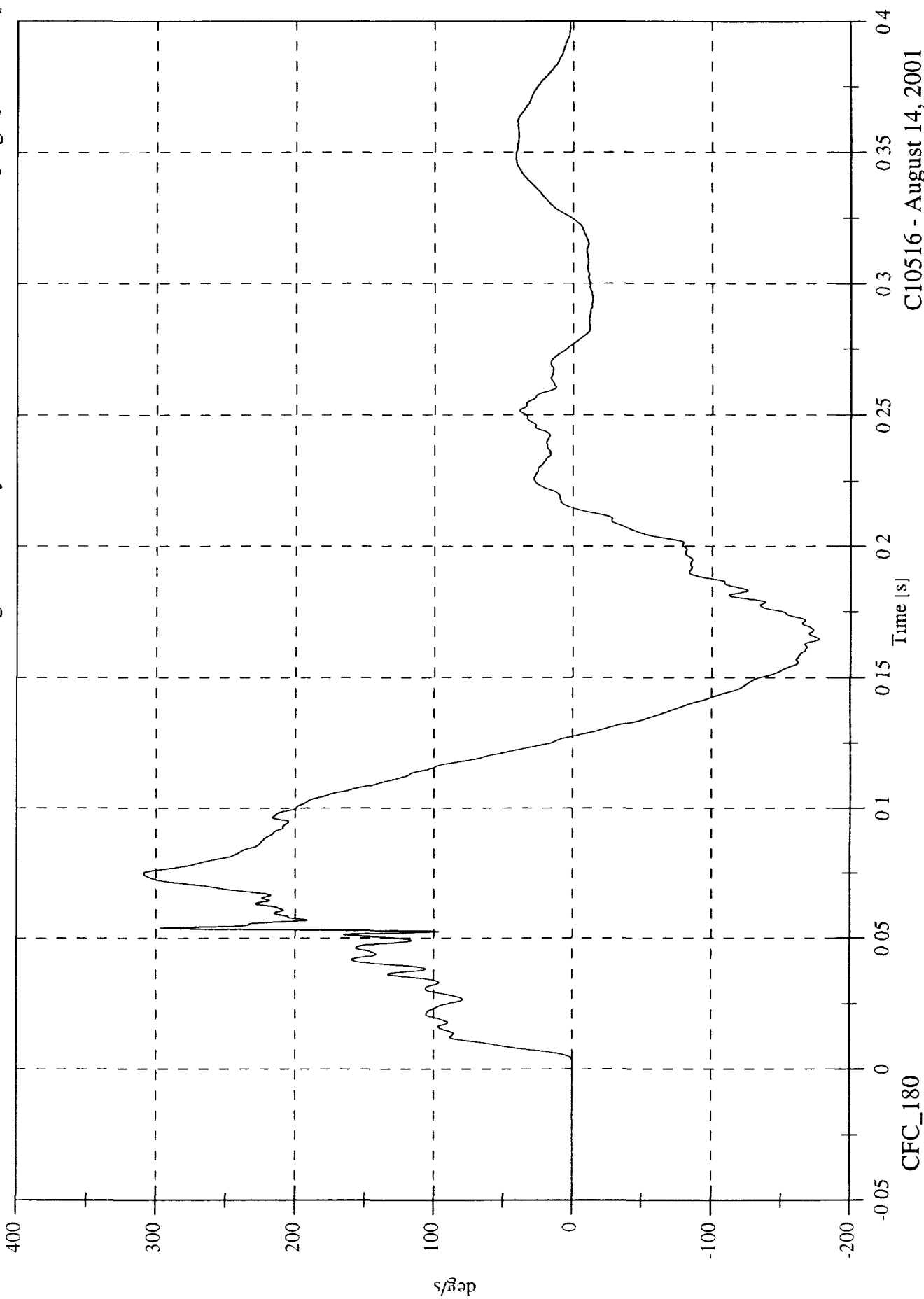
Seatback Angular Acceleration



CFC_180

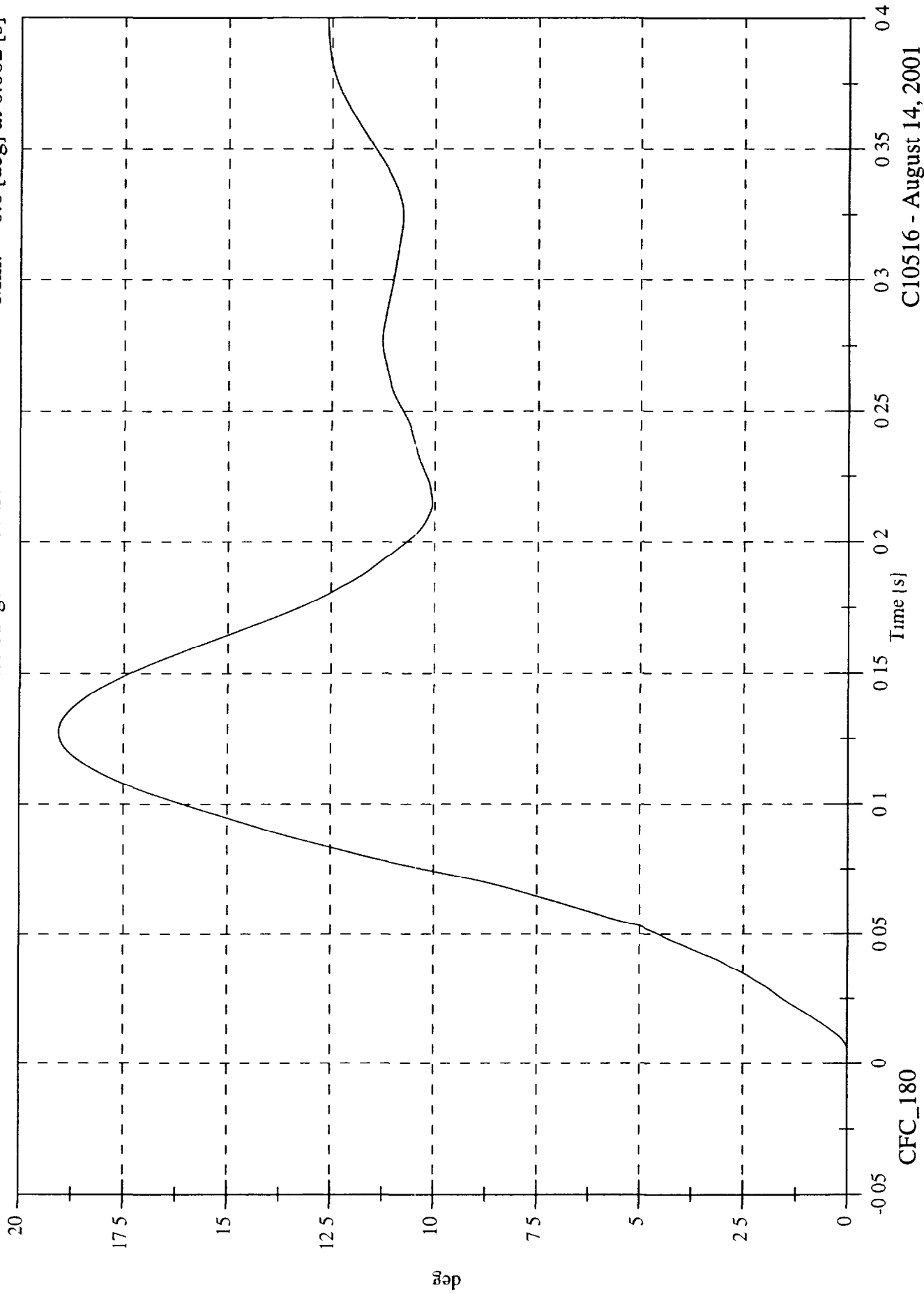
CI0516 - August 14, 2001

Seatback Angular Velocity



Max: 19.1 [deg] at 0.128 [s]
Min: 0.0 [deg] at 0.002 [s]

Seatback Angular Position



CFC_180

C10516 - August 14, 2001