

REPORT NUMBER: 301-CAL-99-05

V3242

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

Volkswagen De Mexico S.A. De C.V.
1999 Volkswagen Beetle GL
2 Door

NHTSA NUMBER: CX5801

VERIDIAN TEST NUMBER: 8480-5

VERIDIAN ENGINEERING
P.O. BOX 400
BUFFALO, NEW YORK 14225



June 3, 1999

FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
ENFORCEMENT
Office of Vehicle Safety Compliance
400 Seventh Street, S. W.
Room No. 6115 (NEF-30)
Washington, DC 20590

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Prepared By:

Patrick G. MacDiarmid, Jr.

Patrick G. MacDiarmid, Jr., Project Engineer

Approved By:

David J. Travale

David J. Travale, Program Manager
Transportation Sciences Center

Approval Date:

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Acceptance Date:

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16. Abstract Compliance tests were conducted on the subject 1999 Volkswagen Beetle GL 2 Door 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 2

COMPLIANCE TEST RESULTS SUMMARY

A 3395 pound 1999 Volkswagen Beetle GL 2 Door was impacted from the rear by a 3961 pound moving barrier at a velocity of 29.5 mph. The test was performed by Veridian Engineering on June 3, 1999.

One instrumented Part 572 E and 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 (160 pounds) was secured in the vehicle cargo area.

Average longitudinal crush was 4.7 inches. Pre- and post-test photographs of the vehicle can be found in appendix A.

The 14.5 gallon fuel tank was filled to 92 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. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity." Section 3 presents the results of these tests.

The crash event was recorded by one real-time and eight high-speed cameras. Camera locations and other pertinent camera information are found on pages 3-9 and 3-10 of this report.

Table 1

CRASH TEST SUMMARY

Vehicle NHTSA No.: CX5801 Test Mode: 30 mph Rear Barrier
 Test Date: June 3, 1999 Time: 14:00 Temperature : 60 °F
 Vehicle Make/Model/Body Style: 1999 Volkswagen Beetle GL 2 Door
 Vehicle Test Weight: 3395 lbs Impact Velocity: 29.5 mph
 Static Crush: Left Side = 4.2 inches
 Right Side = 4.3 inches
 Centerline = 5.5 inches
 Average Crush: 4.7 inches

TYPE OF FRONT OCCUPANT RESTRAINT SYSTEM INSTALLED IN TEST VEHICLE:

Driver's DSP: Air Bag with 3 point belt system
 Right Passenger's DSP: Air Bag with 3 point belt system

VISIBLE DUMMY CONTACT POINTS:

Driver: Rear and top of head with headrest.

 Passenger: Rear of head with headrest

DOOR OPENING DATA:

closed operable - Left Front
closed operable - Right Front

Stoddard Solvent Spillage from Vehicle's Fuel System: None

Remarks: Driver seatback reclined 18 degrees, passenger seatback reclined 18 degrees. Rear glass remained intact.
Charcoal canister in right rear broke open. All doors opened easily after crash. Air bags did not deploy.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATATEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1999 Volkswagen Beetle GL 2 Door

NHTSA No.: CX5801 ; VIN: 3VWBC21C2XM427415 ; Color: white

Engine Data: 4 cylinders; CID; Liters; cc

Placement: Longitudinal or In-Line; X Transverse or Lateral

Transmission Data: 5 speeds; X Manual; X Automatic; Overdrive

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

Major Options: X A/C; X Pwr.Strg.; X Pwr. Brakes

 Pwr. Windows; X Pwr. Door Locks; X Tilt Wheel

Date Received: 3/2/99 ; Odometer Reading 170 miles

Selling Dealer: Stohlman Volkswagen, Inc.

& Address: 8433 Leesburg Pike, Vienna VA 22182

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Volkswagen De Mexico S.A. De C.V.

Date of Manufacture: 11/98

GVWR: 3704 lbs.; GAWR: 2051 lbs. FRONT; 1874 lbs. REAR

DATA FROM TIRE PLACARD:

Location of Placard on Vehicle: Inside fuel filler door

Tire Pressure with Maximum Capacity Vehicle Load: 32 psi FRONT 35 psi REAR

Recommended Tire Size: 205/60R15H

* Recommended Cold Tire Pressure: 29 psi FRONT; 29 psi REAR

Size of Tires on Test Vehicle: 205/60R15H

Type of Spare Tire: temporary

Vehicle Capacity Data:

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

Number of Occupants: 2 Front; 2 Rear; 4 Total

Vehicle Capacity Weight (VCW) = 860 lbs.

No. of Occupants x 150 lbs. = 600 lbs.

Rated Cargo/Luggage Weight (RCLW) = 260

*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>895</u>	lbs.	Right Rear	=	<u>513</u>	lbs.
Left Front	=	<u>884</u>	lbs.	Left Rear	=	<u>527</u>	lbs.
TOTAL FRONT	=	<u>1,779</u>	lbs.	TOTAL REAR	=	<u>1,040</u>	lbs.
TOTAL DELIVERED WEIGHT	=	<u>2,819</u>	lbs.				
% of Total Front of Vehicle Weight	=	<u>63</u>	%	% of Total Rear Weight	=	<u>37</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight	=	<u>2,819</u>	lbs.
Rated Cargo/Luggage Weight (RCLW)	=	<u>260</u>	lbs.
Weight of 2 p.572 Dummies, 167 & 164 lbs	=	<u>331</u>	lbs.
TARGET TEST WEIGHT	=	<u>3,410</u>	lbs.

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 245 POUNDS OF CARGO WEIGHT:

Right Front	=	<u>1077</u>	lbs.	Right Rear	=	<u>616</u>	lbs.
Left Front	=	<u>1076</u>	lbs.	Left Rear	=	<u>626</u>	lbs.
TOTAL FRONT	=	<u>2,153</u>	lbs.	TOTAL REAR	=	<u>1,242</u>	lbs.
TOTAL TEST WEIGHT	=	<u>3,395.0</u>	lbs.				
% of Total Front Weight	=	<u>63.4</u>	%	% of Total Rear Weight	=	<u>36.6</u>	%

* Weight of Ballast Secured in Vehicle Trunk Area = 160 lbs.

Type of Ballast: leadshot

Method of Securing Ballast: placement and tape

Vehicle Components Removed for Weight Reduction: none

VEHICLE ATTITUDE (all dimension in inches):

AS DELIVERED:	RF	<u>27.7</u>	LF	<u>27.7</u>	RR	<u>28.3</u>	LR	<u>28.1</u>
AS TESTED:	RF	<u>26.4</u>	LF	<u>26.4</u>	RR	<u>27.4</u>	LR	<u>27.4</u>

Vehicle's Wheel Base: 99.3 in.

Location of Vehicle's C.G.: 36.3 inches rearward of front wheel center.

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual	=	<u>14.5</u>	gallons
Usable Capacity Figure Furnished by COTR	=	<u>14.53</u>	gallons
Test Volume Range (91 to 94% of Usable Capacity)	=	<u>13.4</u>	to <u>13.7</u> gallons
ACTUAL TEST VOLUME=		<u>13.4</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:	Fuel filler is on right rear quarter panel. Fuel lines run along right side frame rail.
Fuel tank is fore of rear axle and is centered laterally on the vehicle.	

Table 3

MOVING BARRIER PARAMETER DATA

WEIGHT 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>2,215</u>	lbs.	TOTAL REAR	=	<u>1,746</u>	lbs.
TOTAL BARRIER WEIGHT	=	<u>3,961</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.	

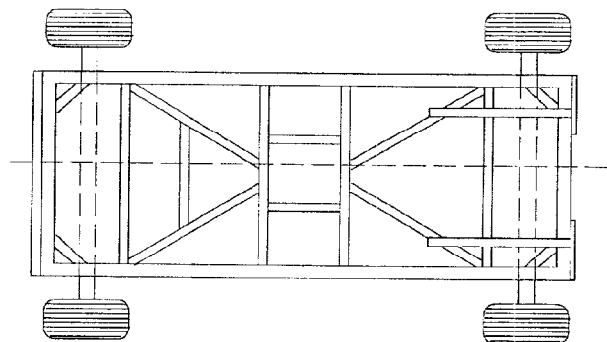
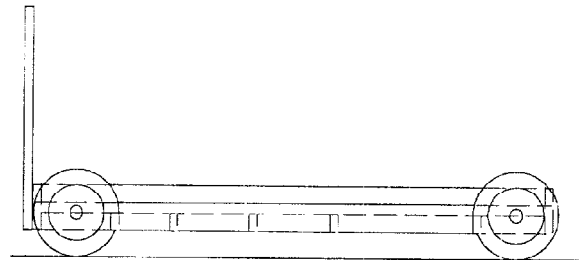


Table 4

POST IMPACT DATATYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°
 Test Date: June 3, 1999 Time: 14:00 Temperature: 60 °F
 Vehicle NHTSA No.: CX5801
 Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.5 mph; Trap No. 2 = 29.5 mph
 Average Impact Speed = 29.5 mph

VEHICLE STATIC CRUSH: (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test	Right =	<u>155.8</u>	; C/L =	<u>160.7</u>	; Left =	<u>155.2</u>
Post-Test	Right =	<u>151.5</u>	; C/L =	<u>155.2</u>	; Left =	<u>151.0</u>
Crush	Right =	<u>4.3</u>	; C/L =	<u>5.5</u>	; Left =	<u>4.2</u>
AVERAGE	=	<u>4.7</u>	inches			

Section 3

COMPLIANCE TEST DATA

Figure 1

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

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS

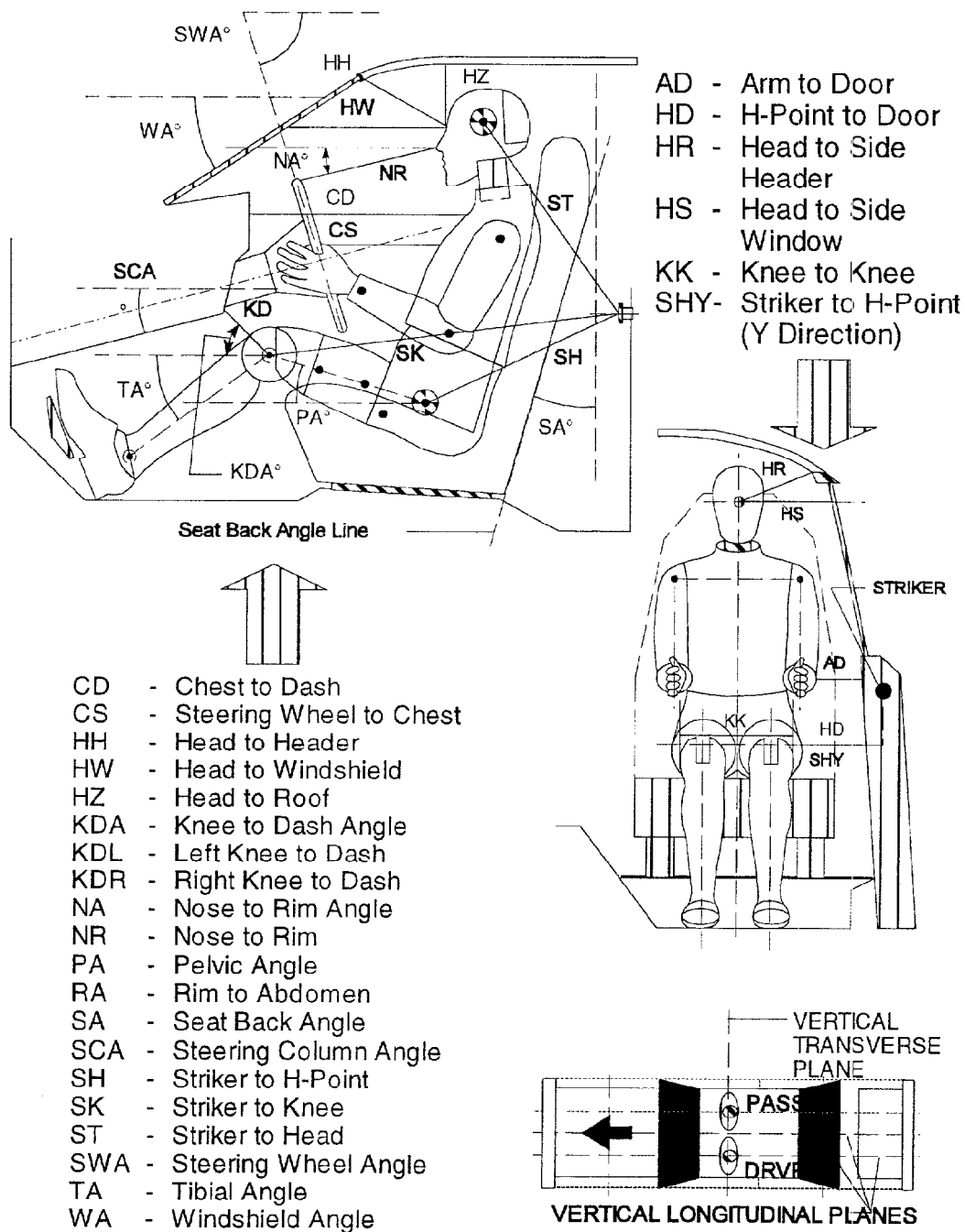


Table 5

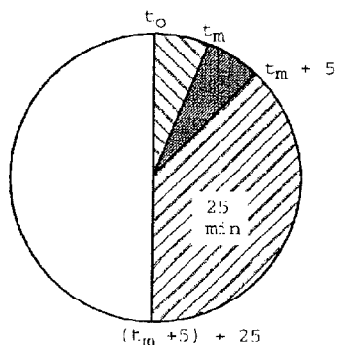
FRONT SEAT OCCUPANT MEASUREMENTS
(FOR REAR IMPACT ONLY)

	DRIVER (Serial #152)		
WA°	32 deg.		
SWA°	65 deg.		
SCA°	25 deg.		
SA°	1 deg. measured at base deg.		
HZ	10.0		
HH	20.3		
HW	30.0		
HR	9.4		
NR	14.8	Angle	18 deg.
CD	19.5		
CS	10.1		
RA	8.5		
KDL	5.7	Angle (KDA)	23 deg.
KDR	5.7		
PA°	21 deg.		
TA°	46 deg.		
KK	13.8		
ST	20.9	Angle	17 deg.
SK	29.6	Angle	100 deg.
SH	15.7	Angle	127 deg.
SHY	9.0		
HS	13.2		
HD	7.1		
AD	3.3		

FMVSS NO. 301

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.

FUEL SPILLAGE MEASUREMENT:

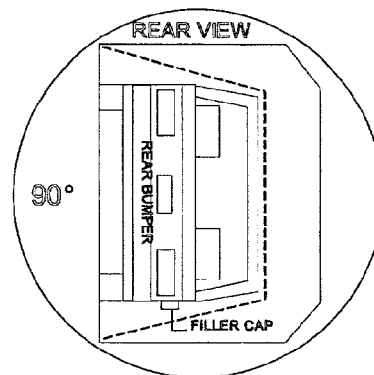
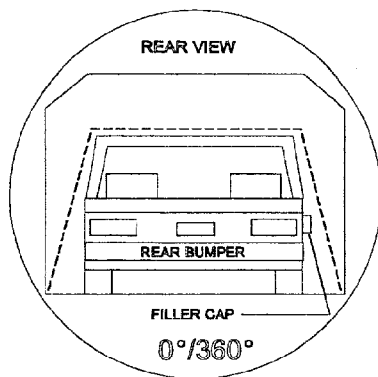


1. From impact until vehicle motion ceases
2. For five minute period after vehicle motion ceases
3. For next 25 minutes

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

None

Table 7

FMVSS NO. 301 STATIC ROLLOVER DATA SHEETTEST PHASE :0-90 Deg.Vehicle NHTSA ID No. :CX5801I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time
(Spec. Range = 1 to 3 minutes)

1 minutes 17 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 17 seconds

Next whole minute interval

7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
---	---	---	-----

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

None

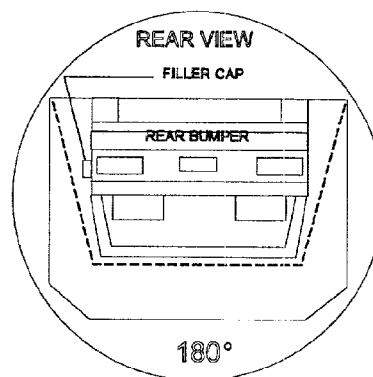
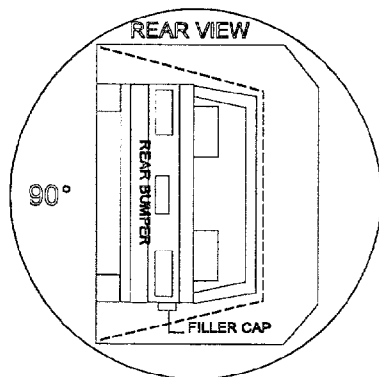
Table 7

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE :

90-180 Deg.

Vehicle NHTSA ID No. :

CX5801

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time
(Spec. Range = 1 to 3 minutes)

1 minutes 02 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 2 seconds

Next whole minute interval

7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
---	---	---	-----

Note: Record spillage for whole minute
intervals only as determined above.

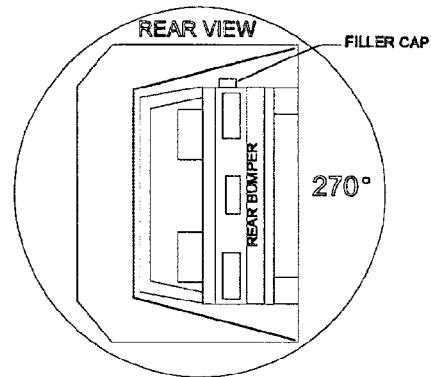
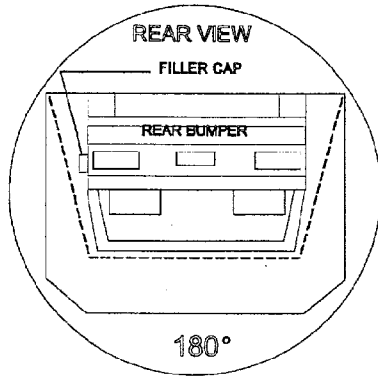
IV. SOLVENT SPILLAGE LOCATION(S):

None

Table 7

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)TEST PHASE :180-270 Deg.

Vehicle NHTSA ID No. :

CX5801I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time
(Spec. Range = 1 to 3 minutes)1 minutes 04 seconds

FMVSS 301 Position Hold Time +

5 minutes 00 seconds

TOTAL

6 minutes 4 seconds

Next whole minute interval

7 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
---	---	---	-----

Note: Record spillage for whole minute
intervals only as determined above.IV. SOLVENT SPILLAGE LOCATION(S):

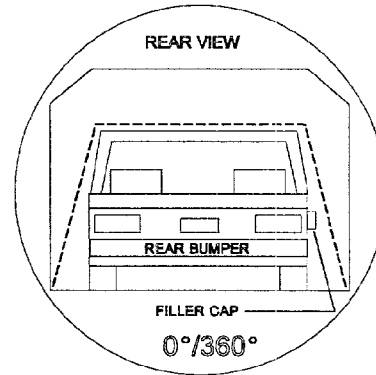
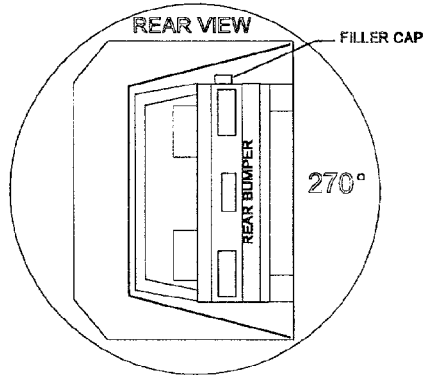
None

Table 7

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (cont.)

TEST PHASE :
270-360 Deg.

Vehicle NHTSA ID No. :
CX5801



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 1 minutes 10 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 00 seconds

TOTAL 6 minutes 10 seconds

Next whole minute interval 7 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 minutes FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
--	----------	----------	----------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	n/a
---	---	---	-----

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

None

Figure 2

CAMERA POSITIONS FOR REAR IMPACTS

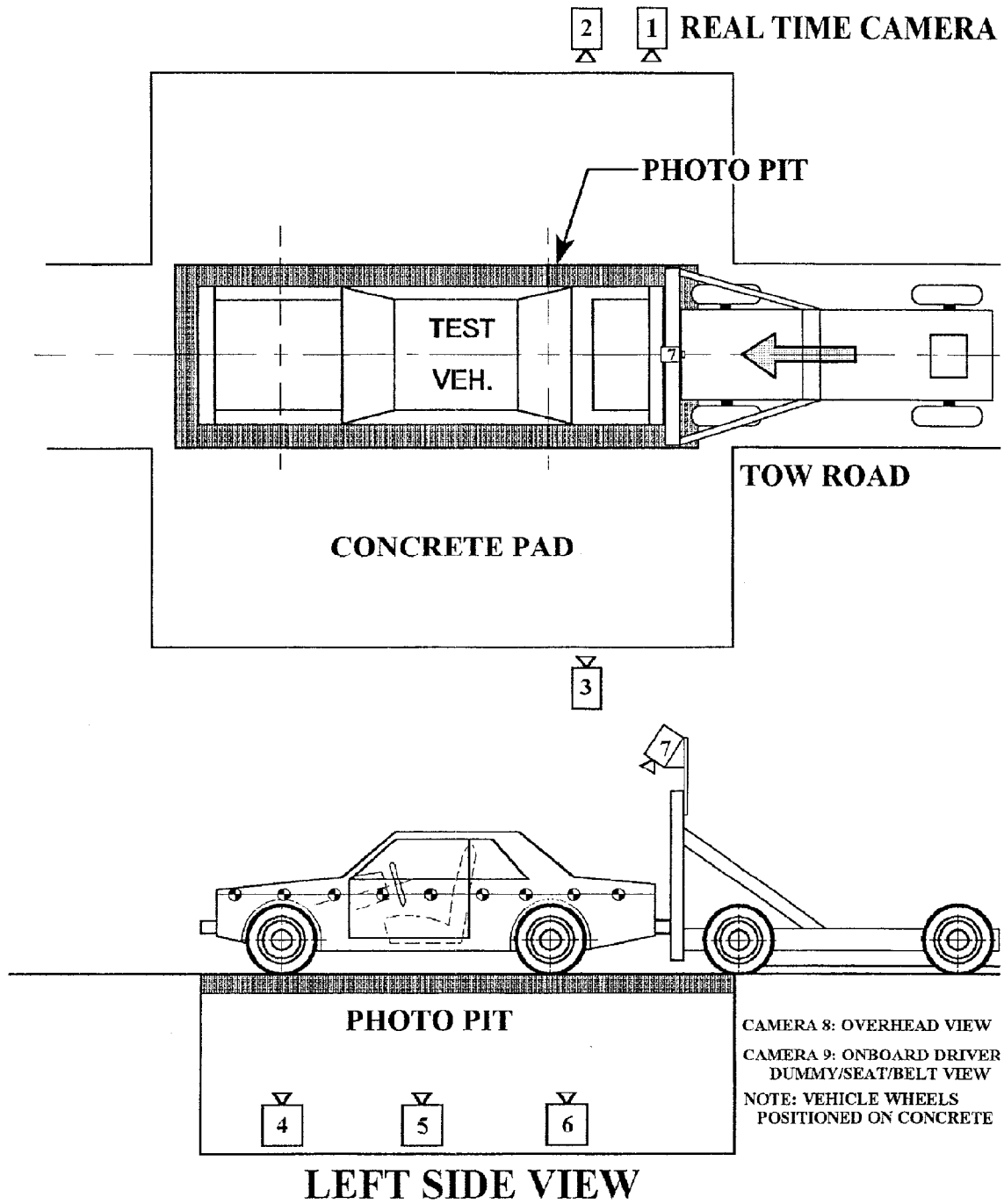


Table 8

HIGH-SPEED CAMERA LOCATIONSNHTSA No. : CX5801 Vehicle : 1999 Volkswagen Beetle GL 2 Door

CAMERA NO.	VIEW	CAMERA POSITIONS (inches)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	-480	75	43	0	25	750
3	Left Side View	473	87	46	-2	25	750
4	Vehicle Front Underbody View	0	128	-77	90	13	610
5	Vehicle Mid-Section Underbody View	0	78	-77	90	13	610
6	Vehicle Rear Underbody View	0	46	-77	90	13	625
7	Moving Barrier View	0	0	99	-105	13	1010
8	Overhead Overall View	-20	0	386	-90	13	750
9	Onboard Driver Dummy/Seat/Belt View	-	-	-	-	13	340

* 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

Section 4

NONCOMPLIANCE DATA

Table 9

TEST VEHICLE NONCOMPLIANCE NOTICE

NHTSA Contract Lab: Veridian Engineering

Lab Project Manager & Telephone No.: David J. Travale (716) 632 - 7500

Date of Test: June 3, 1999 Vehicle NHTSA No.: CX5801

Vehicle Manufacturer: Volkswagen De Mexico S.A. De C.V.

Model Year: 1999 VIN: 3VWBC21C2XM427415

Model: Beetle GL Body Style: 2 Door Build Date: 11/98

Dummy Stabilized Temperature at Time of Test: 70 °F (Spec. = 69 - 72 °F)

Impact Velocity: 29.5 mph; Time of Test: 14:00

Type of Automatic Restraint System:

Driver: Air Bag with 3 point belt system

Passenger: Air Bag with 3 point belt system

Failure Details:

None

Requirements:

Approximate date that final test report will be made available to CTM:

Date Mfg. Rep. Notified: _____ Rep. Name: _____

Remarks: _____

Date of Proposed Joint Inspection of Test Vehicle: _____

NHTSA CMT: _____ CIR No.: _____ Date: _____

Table 10

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NO.: 301 ; Test Date: June 3, 1999

Laboratory: Veridian Engineering

Contract No.: DTNH22-95-D-11000; Delv. Order No.: _____

Laboratory Project Engineer's Name: _____

Test Vehicle Year/Make/Model/Body Style:

1999 Volkswagen Beetle GL 2 Door

Vehicle NHTSA No.: CX5801 ; VIN: 3VWBC21C2XM427415

Manufacturer: Volkswagen De Mexico S.A. De C.V.

Test Failure Description: None

FMVSS Requirement, Paragraph(s) _____:

Notification to NHTSA (COTR): _____

Date: _____; By: _____

Remarks:

Table 11

ANTI-SIPHONING DEVICE FOR ALCOHOL FUEL VEHICLES

Vehicle Model Year/Make/Model/Body: 1999 Volkswagen Beetle GL 2 Door

Vehicle NHTSA No.: CX5801 VIN: 3VWBC21C2XM427415

Vehicle Build Date: 11/98 Test Date: June 3, 1999

Test Laboratory: Veridian Engineering

Observers: _____

1. Provide a description of the anti-siphoning device if possible.

Not Applicable

2. Did the test hose pass through the anti-siphoning device opening?

Yes - _____ No - _____

3. The test hose length outside of the fuel filler neck at maximum insertion:

Length = _____ cm

4. The maximum inserted test hose length is (120.00 cm - measurement from item 3):

Length = _____ cm

5. Was there evidence that the test hose contacted the surface of the Stoddard fluid in the fuel tank of the test vehicle?

Yes - _____ (Fail) No - _____ (Pass)

6. Measure the length of the portion of the hose that was submerged in the Stoddard solvent:

Length = _____ cm

Appendix A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page No.</u>
A-1	PRE-TEST FRONT VIEW	A-3
A-2	POST-TEST FRONT VIEW	A-4
A-3	PRE-TEST LEFT SIDE VIEW	A-5
A-4	POST-TEST LEFT SIDE VIEW	A-6
A-5	PRE-TEST RIGHT SIDE VIEW	A-7
A-6	POST-TEST RIGHT SIDE VIEW	A-8
A-7	PRE-TEST REAR VIEW	A-9
A-8	POST-TEST REAR VIEW	A-10
A-9	PRE-TEST LEFT FRONT THREE-QUARTER VIEW	A-11
A-10	POST-TEST LEFT FRONT THREE-QUARTER VIEW	A-12
A-11	PRE-TEST RIGHT REAR THREE-QUARTER VIEW	A-13
A-12	POST-TEST RIGHT REAR THREE-QUARTER VIEW	A-14
A-13	PRE-TEST FRONT UNDERBODY VIEW	A-15
A-14	POST-TEST FRONT UNDERBODY VIEW	A-16
A-15	PRE-TEST REAR UNDERBODY VIEW	A-17
A-16	POST-TEST REAR UNDERBODY VIEW	A-18
A-17	CERTIFICATION PLACARD	A-19
A-18	TIRE PLACARD	A-20
A-19	ROLLOVER 90°	A-21
A-20	ROLLOVER 180°	A-22
A-21	ROLLOVER 270°	A-23
A-22	ROLLOVER 360°	A-24



Figure A-1 PRE-TEST FRONT VIEW

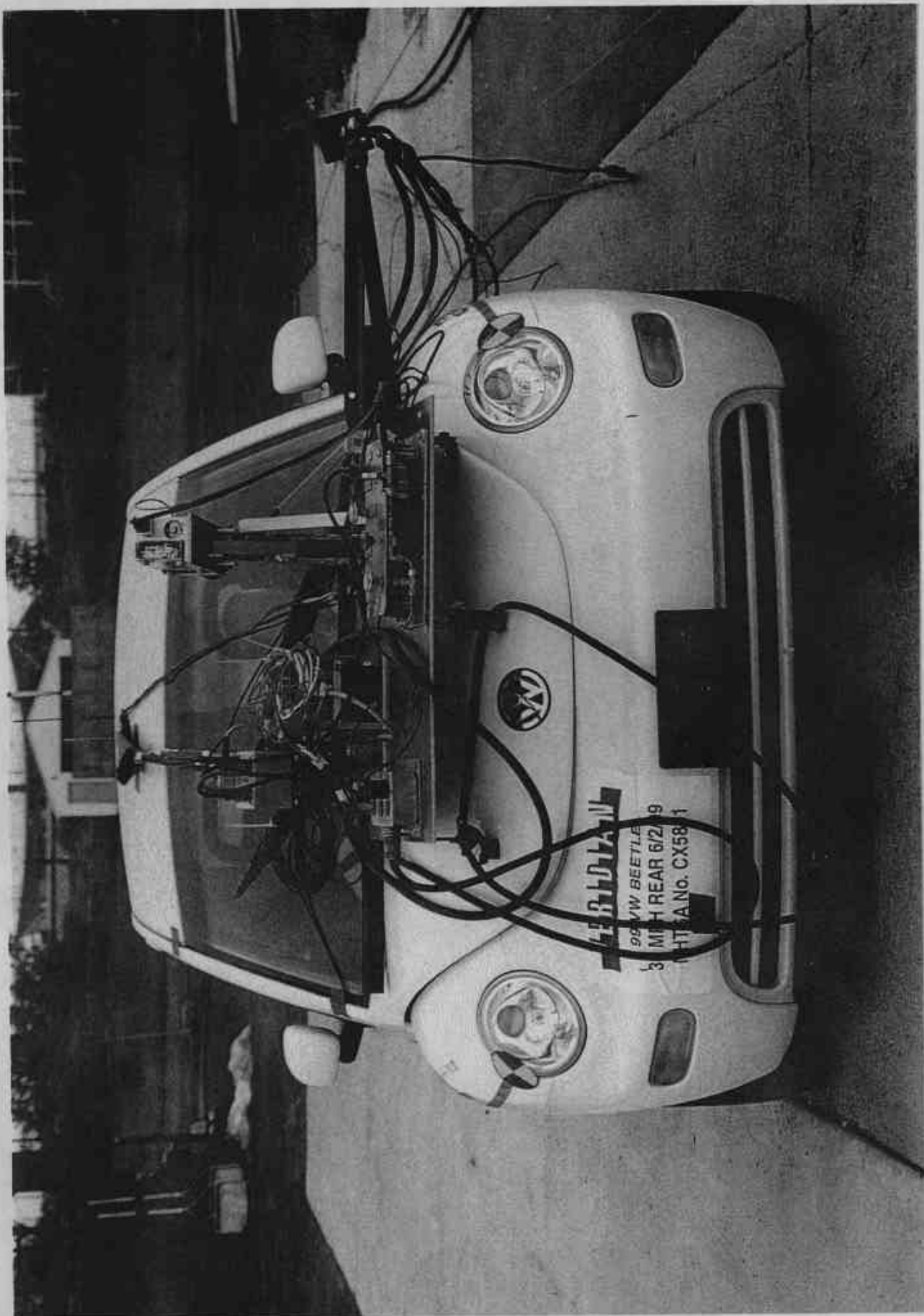


Figure A-2 POST-TEST FRONT VIEW

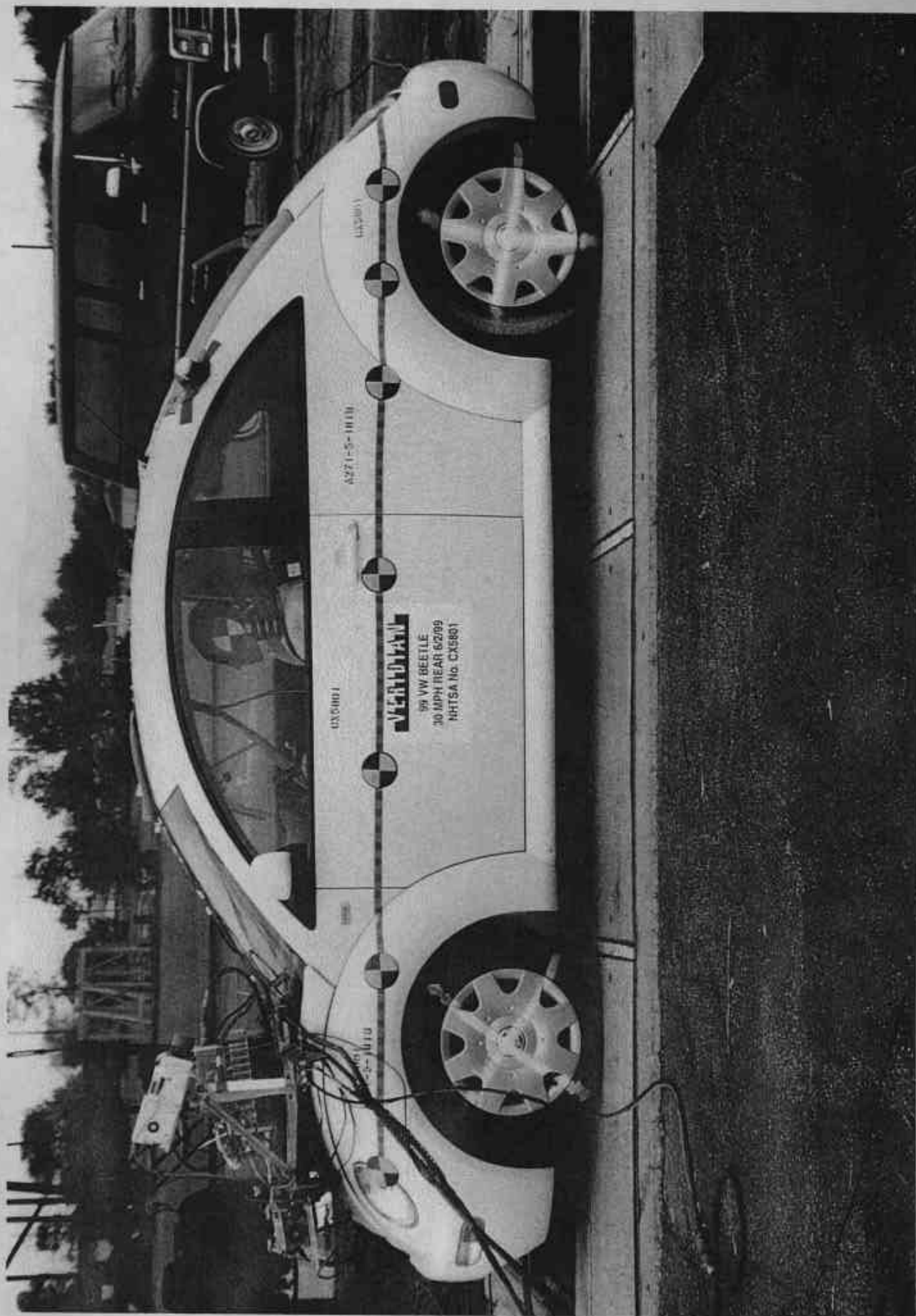


Figure A-3 PRE-TEST LEFT SIDE VIEW

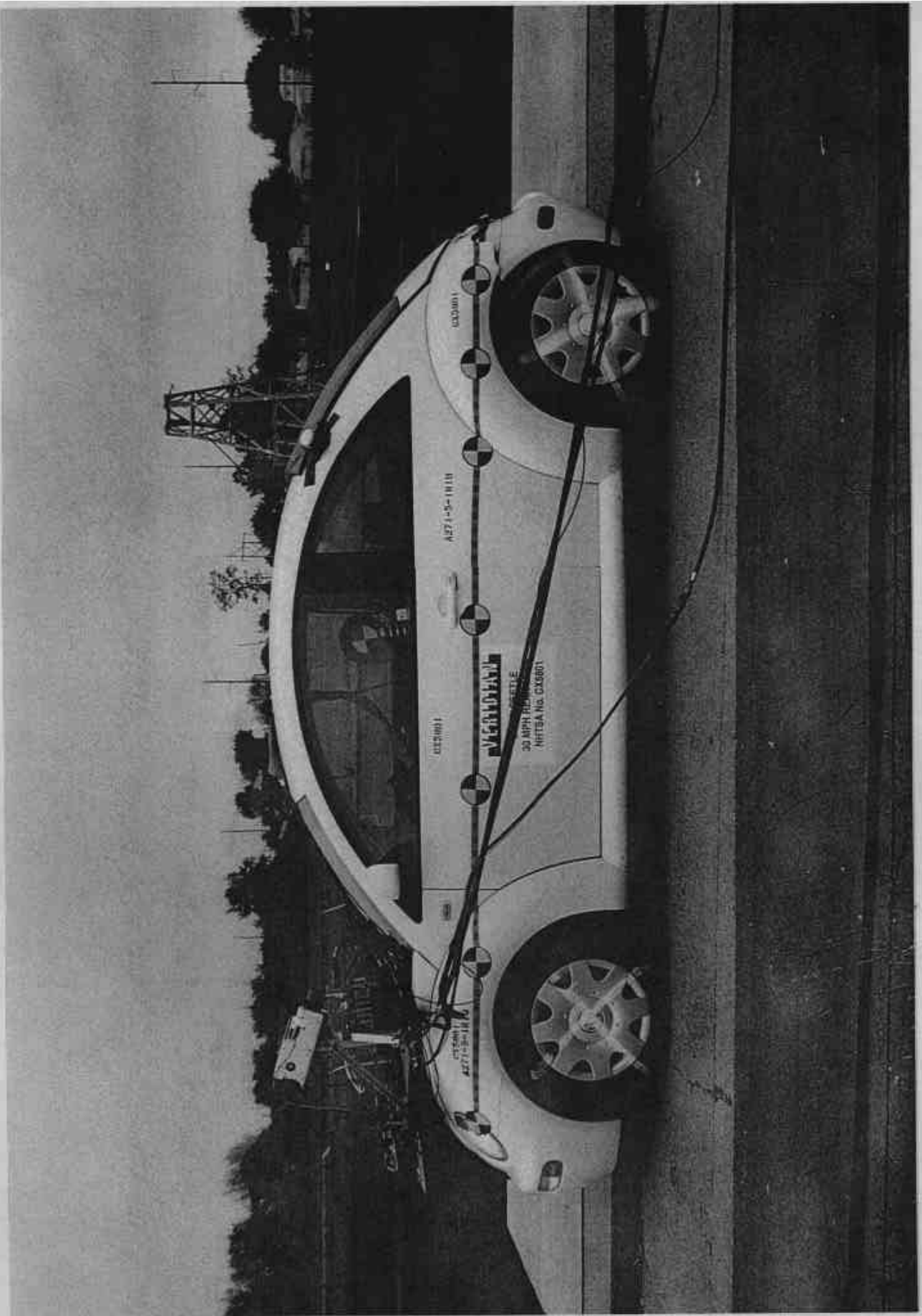


Figure A-4 POST-TEST LEFT SIDE VIEW

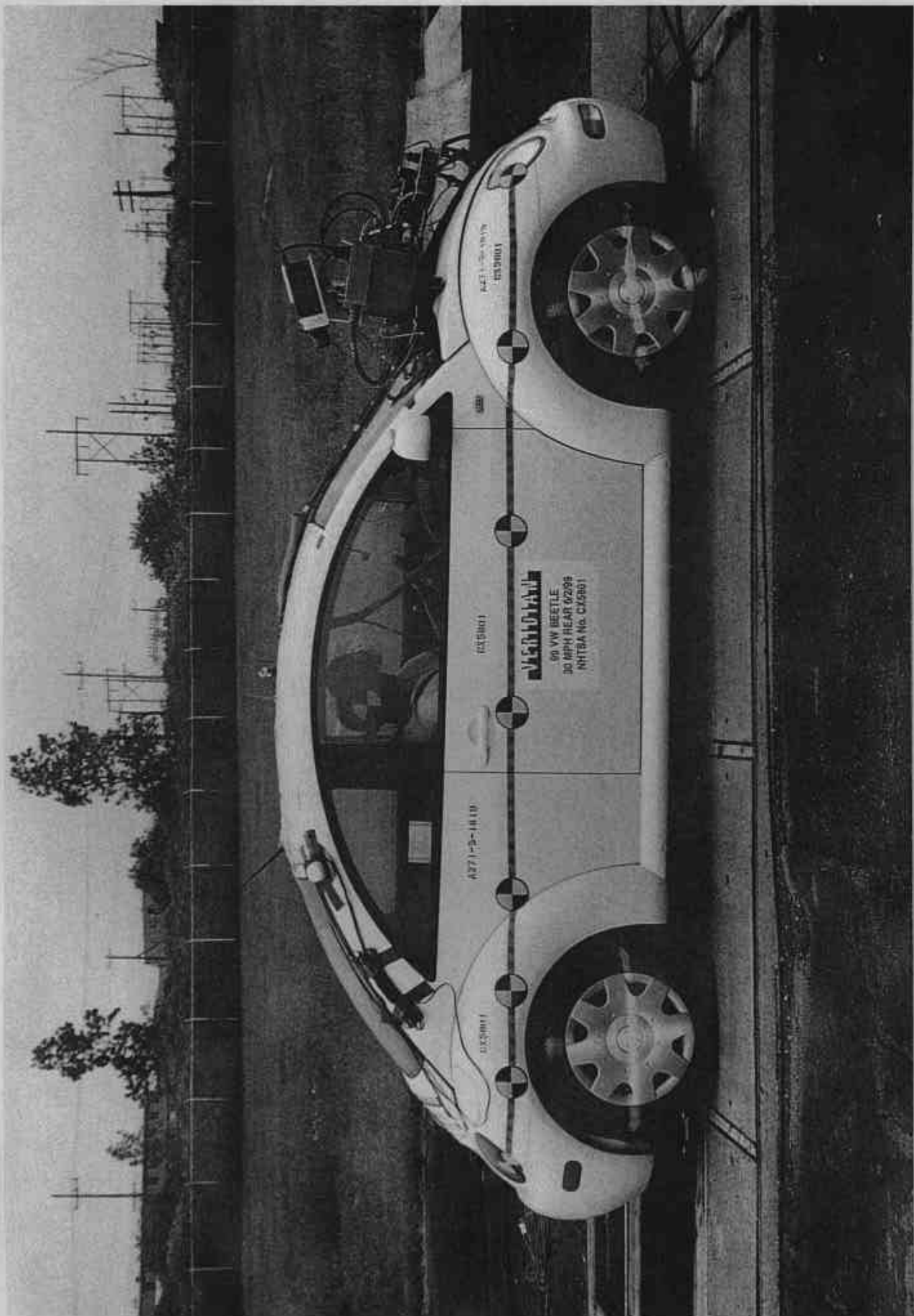


Figure A-5 PRE-TEST RIGHT SIDE VIEW



Figure A-6 POST-TEST RIGHT SIDE VIEW



Figure A-7 PRE-TEST REAR VIEW



Figure A-8 POST-TEST REAR VIEW

PHOTOGRAPH NOT AVAILABLE

PHOTOGRAPH NOT AVAILABLE



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



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

PHOTOGRAPH NOT AVAILABLE

PHOTOGRAPH NOT AVAILABLE

PHOTOGRAPH NOT AVAILABLE

PHOTOGRAPH NOT AVAILABLE

**ATTENTION-CONSIGNES
DE SECURITE !**

Le véhicule est équipé d'airbags
latéraux montés dans les sièges
N'utilisez pas de housses
de protection pour sièges
La Notice d'Utilisation contient
d'autres remarques importantes

4D0 010 142 A

VWZ9Z7W5009579

DATE 11/98

GAWR REAR 1874 LBS

GAWR FRONT 2051 LBS

MADE IN MEXICO BY VOLKSWAGEN DE MEXICO S.A. DE C.V.

THIS VEHICLE IS EQUIPPED WITH AIR BAGS. PLEASE READ THE INSTRUCTIONS IN THE OWNER'S MANUAL.

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COUNTRY OF ORIGIN: MEXICO

Figure A-17 CERTIFICATION PLACARD

UNLEADED FUEL ONLY
 REGULAR MNR + M/2 87
 CARBURANT SANS PLOMB
 NORMALE MNRON 91



MAX. LOAD (VEHICLE CAPACITY WEIGHTS)			
If provided	Shift Tr.	Aut Tr.	
	860	860	
DESIGNATED SEATING CAPACITY: 4 2 front / 2 rear			
COLD TIRE INFLATION PRESSURE			
Tire size	RIM	150 dia 235 B	
195 / 85 R15 91H	6J	half load	non. load
205 / 60 R15 91H	6 1/2 J	front	rear
205 / 55 R16 91H	6 1/2 J	front	rear
Up to 100 miles/h 160 km/h	32	26	29
more than 100 miles/h 160 km/h	32	26	32

Figure A-18 TIRE PLACARD

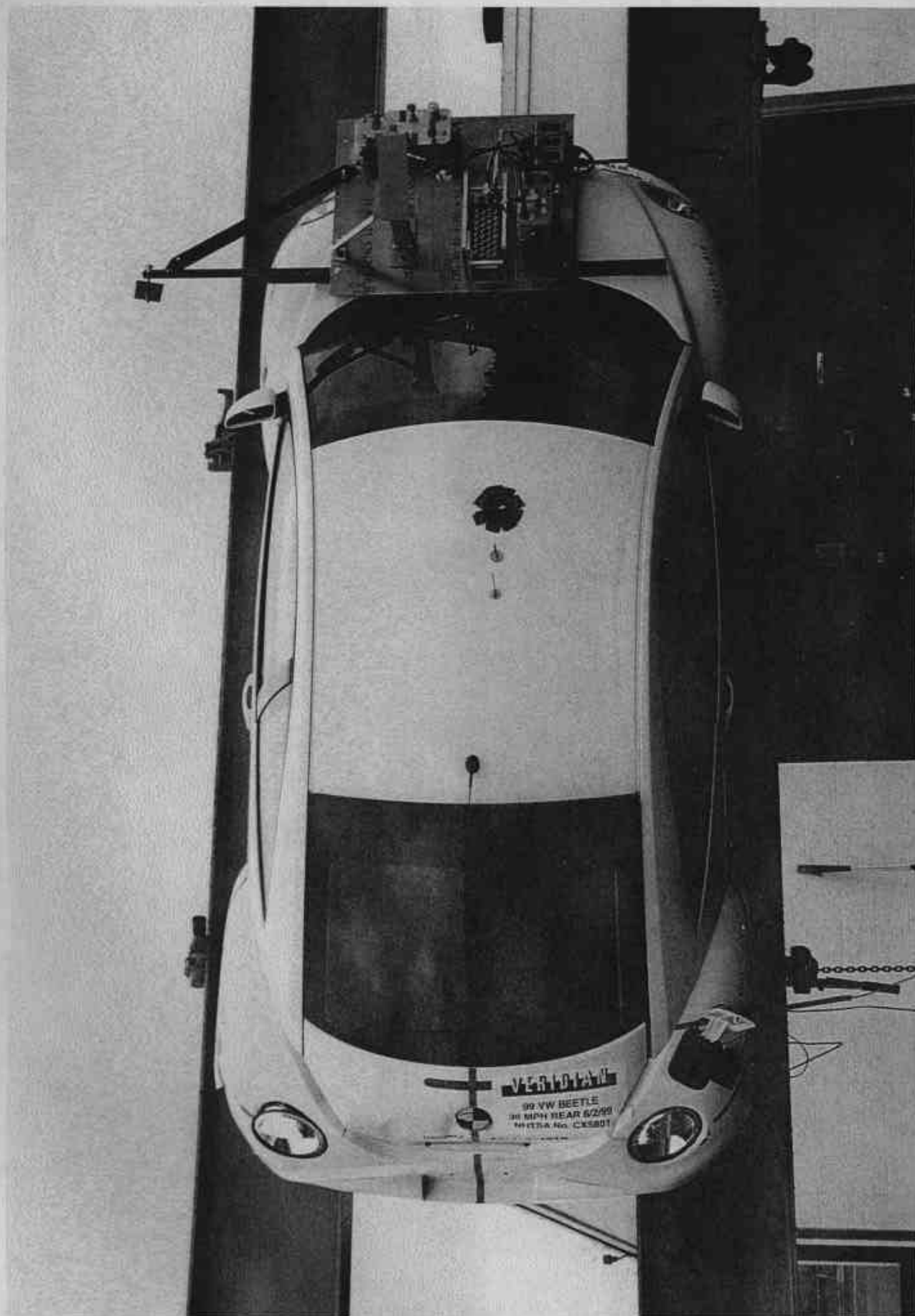


Figure A-19 ROLLOVER 90°

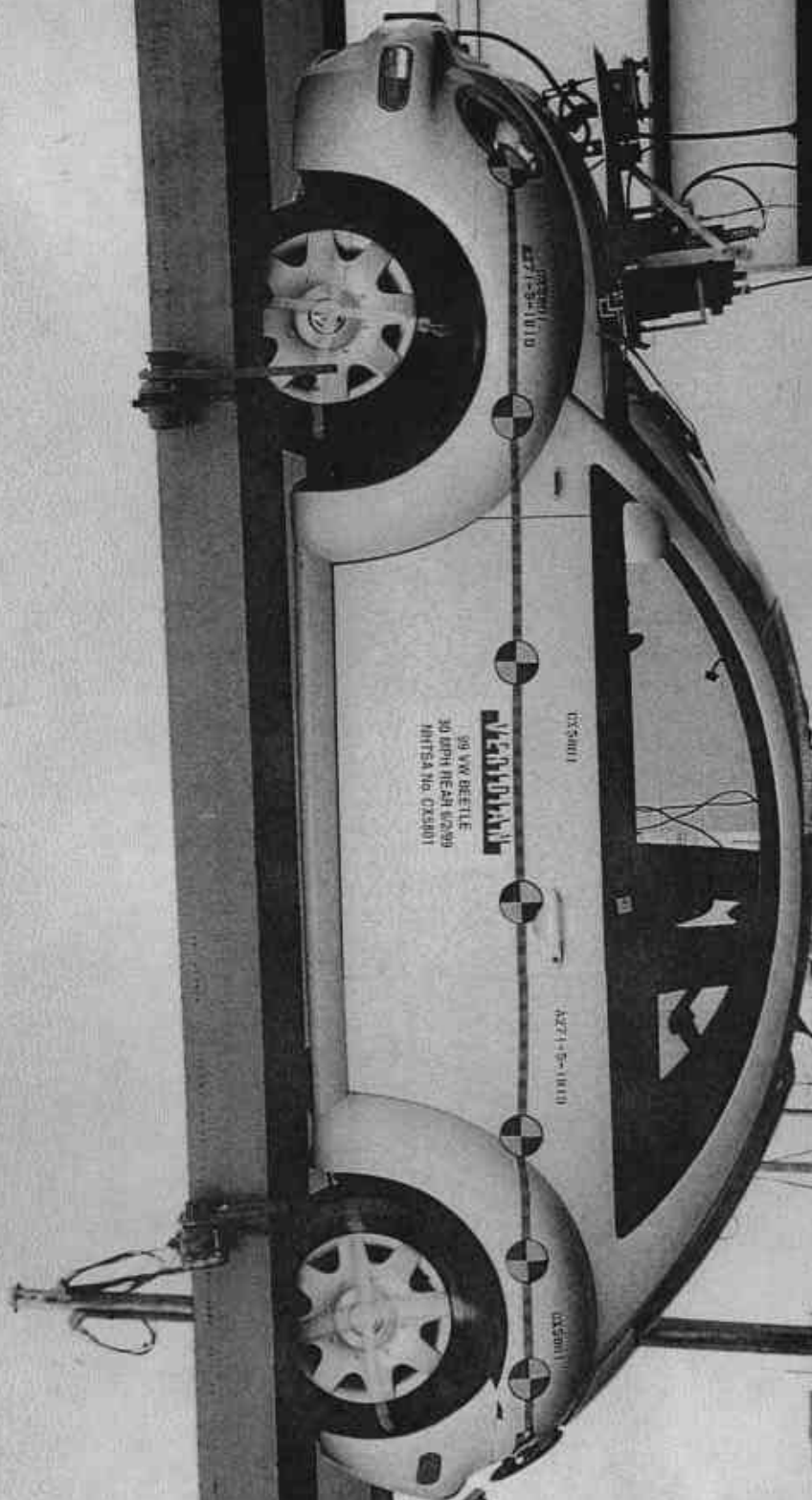


Figure A-20 ROLLOVER 180°

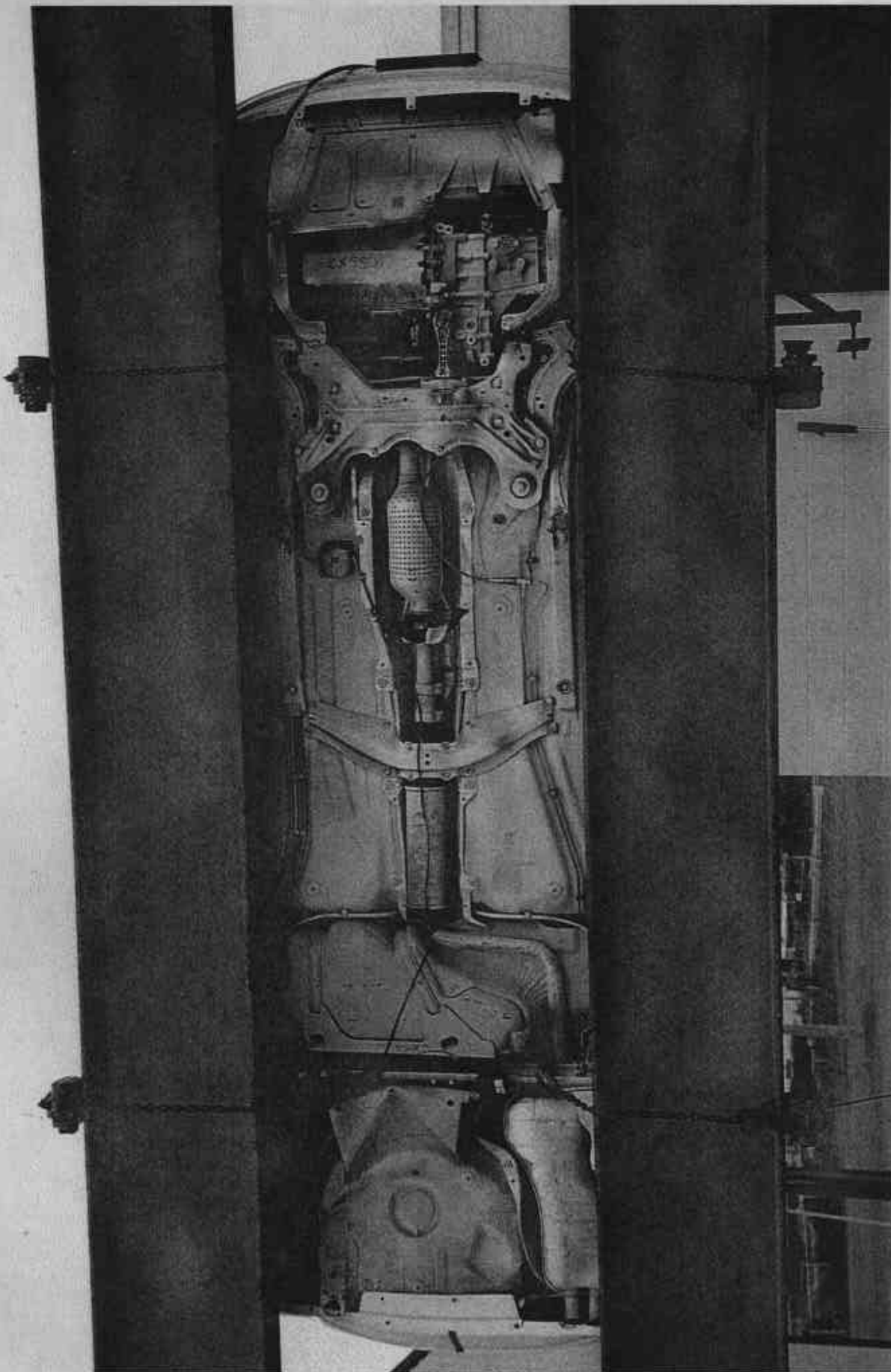


Figure A-21 ROLLOVER 270°

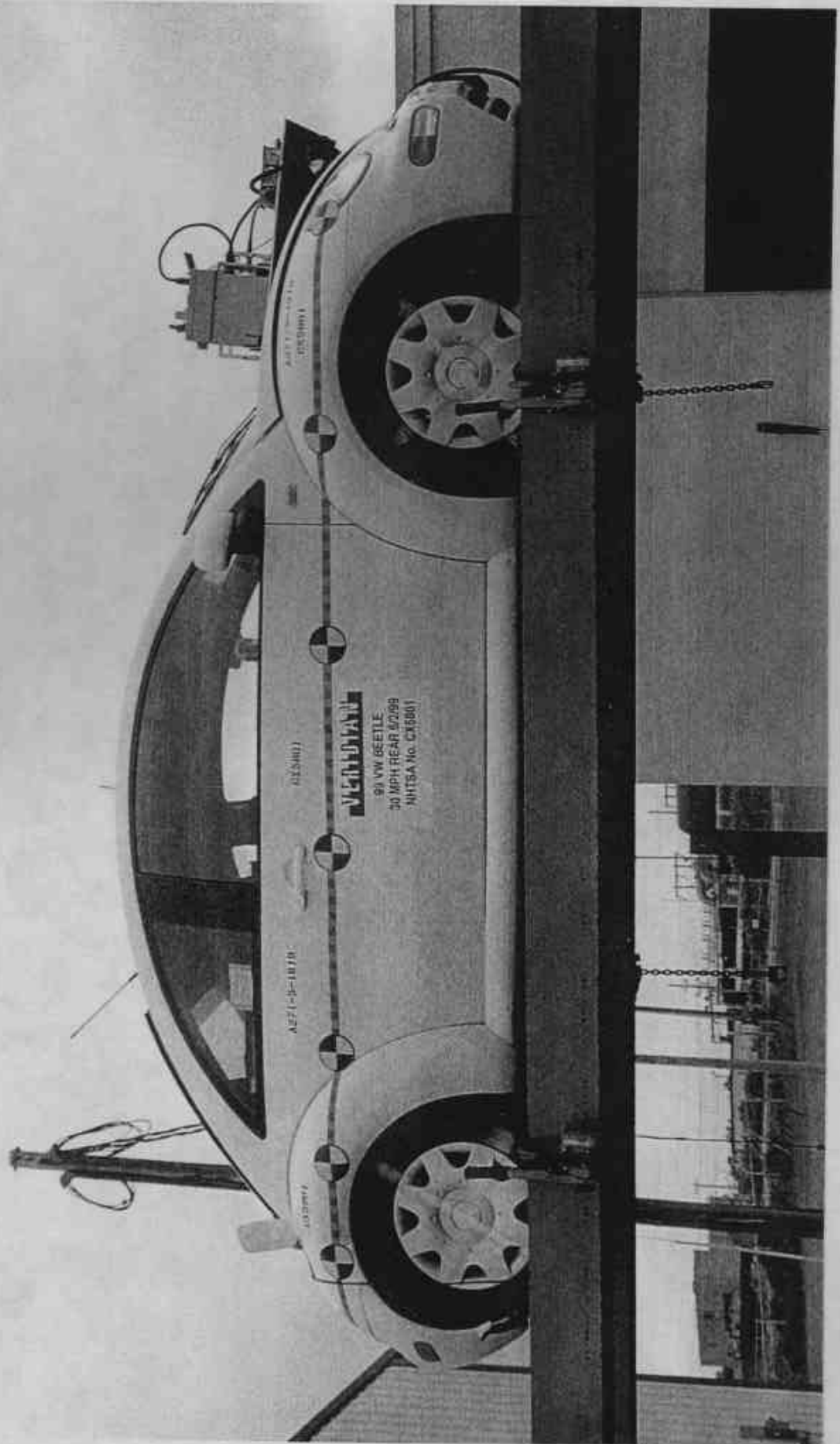


Figure A-22 ROLLOVER 360°

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

(REAR IMPACT ONLY)

FACILITY: VERF

DATE: June 03, 1999

TEST#: A271-0050-1819

TITLE: 301 Test #5 1999 VW Beetle CX5801

CHN	NAME	Unit	Max	msec	Min	msec	Filt
24	Acc #1(X) Left Rear Xmember	g	33.7	4.2	-7.3	14.2	60
27	Acc #2(X) Right Rear Xmember	g	33.6	4.2	-2.8	92.0	60
30	Acc #3(X) Upper Seat Back X	g	20.4	106.9	-7.8	222.2	60
31	Acc #4(X) Lower Seat Back X	g	20.4	14.7	-2.7	216.1	60
35	Driver Head X	g	43.0	129.4	-6.2	307.1	1000
36	Driver Head Y	g	4.8	129.1	-1.0	370.8	1000
37	Driver Head Z	g	30.2	112.4	-0.2	496.2	1000
38	Driver Head Resultant	g	46.0	129.4	0.0	-88.0	1000
39	Driver Upper Neck Fx	lbf	99.8	125.8	-57.6	305.5	1000
40	Driver Upper Neck Fy	lbf	26.2	130.9	-9.5	369.3	1000
41	Driver Upper Neck Fz	lbf	349.5	100.7	-92.4	153.7	1000
42	Driver Upper Neck F Resultant	lbf	351.2	100.7	0.0	-71.3	1000
43	Driver Upper Neck Mx	in-lb	20.8	234.0	-48.3	132.3	600
44	Driver Upper Neck My	in-lb	170.9	80.3	-267.2	161.8	600
45	Driver Upper Neck Mz	in-lb	41.0	127.0	-21.1	253.0	600
46	Driver Upper Neck M Resultant	in-lb	268.3	161.8	0.0	-48.6	600
47	Driver Chest X	g	13.9	71.1	-2.4	227.9	180
48	Driver Chest Y	g	2.0	221.5	-1.0	69.6	180
49	Driver Chest Z	g	6.3	53.3	-1.4	149.6	180
50	Driver Chest Displacement	in	0.0	492.2	0.0	115.6	600
51	Driver Chest Resultant	g	14.7	69.6	0.0	-42.6	180
52	Driver Pelvic X	g	21.6	52.3	-3.5	192.1	1000
53	Driver Pelvic Y	g	3.0	28.5	-2.5	191.9	1000
54	Driver Pelvic Z	g	10.6	63.1	-1.9	192.2	1000
55	Driver Pelvic Resultant	g	23.5	52.3	0.0	-47.8	1000
56	Driver Lap Belt Load	lbf	44.0	71.6	-10.5	114.8	60
57	Driver Belt Spoolout	in	0.1	14.3	-10.2	229.4	180

P1 HIC(36ms): 241.7
t1: 97.3 msec
t2: 133.3 msec
Duration: 36.0 msec
Average Acceleration: 33.9 g
Input channels: Driver Head X (2) CFC_1000
Driver Head Y (3) CFC_1000
Driver Head Z (4) CFC_1000

P1 CLIP(3ms): 14.6 g
t1: 68.7 msec
t2: 71.8 msec
Duration: 3.1 msec

P1 CSI: 42.7

TEST NO. CX5801

VEHICLE

SAE FILTER CHANNEL CLASS

60

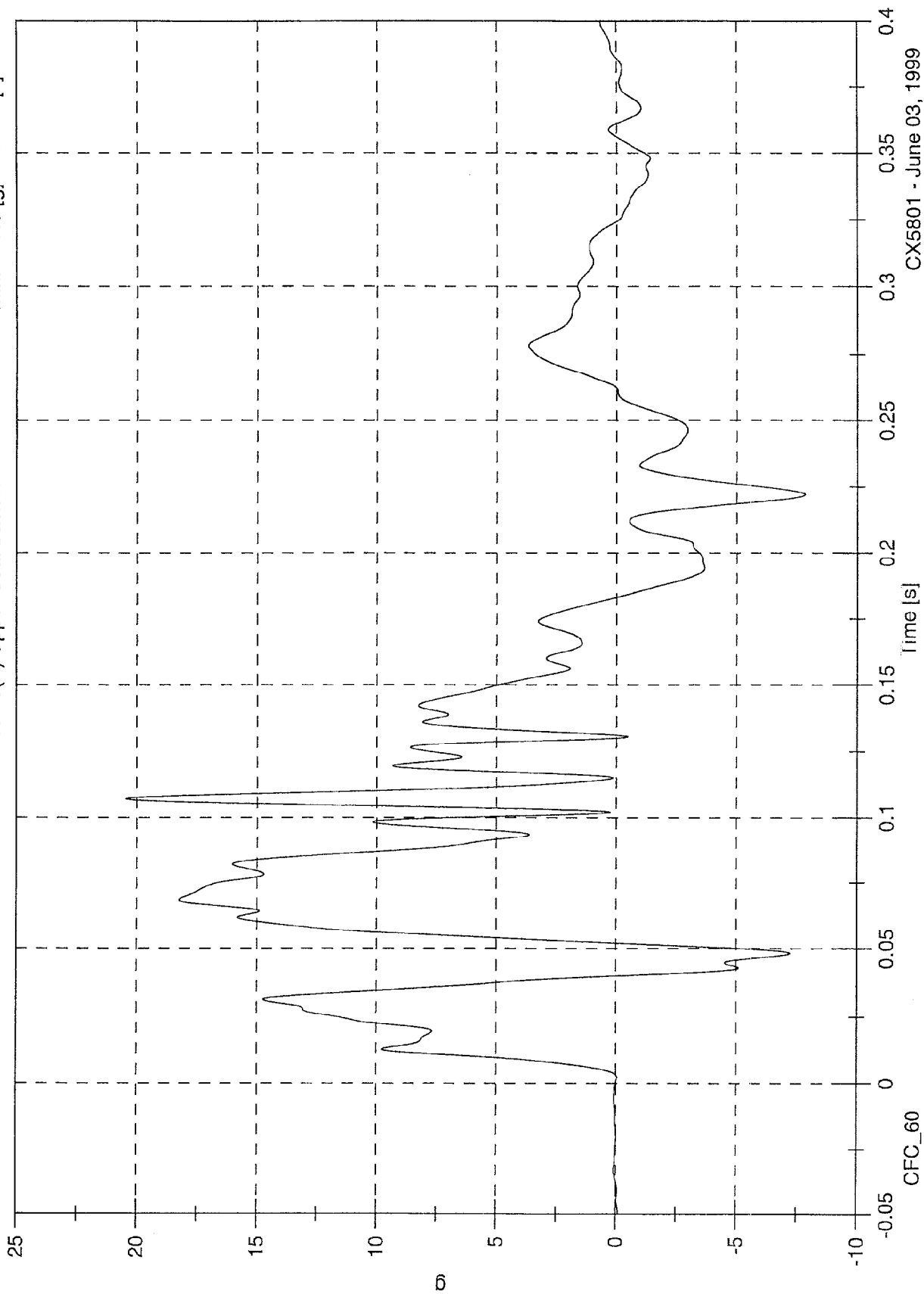
Note: Angular seatback position is measured in degrees of rotation from the initial (design) position.

301 Test #5 1999 VW Beetle CX5801

Max: 20.4 [g] at 0.107 [s]

Min: -7.8 [g] at 0.222 [s]

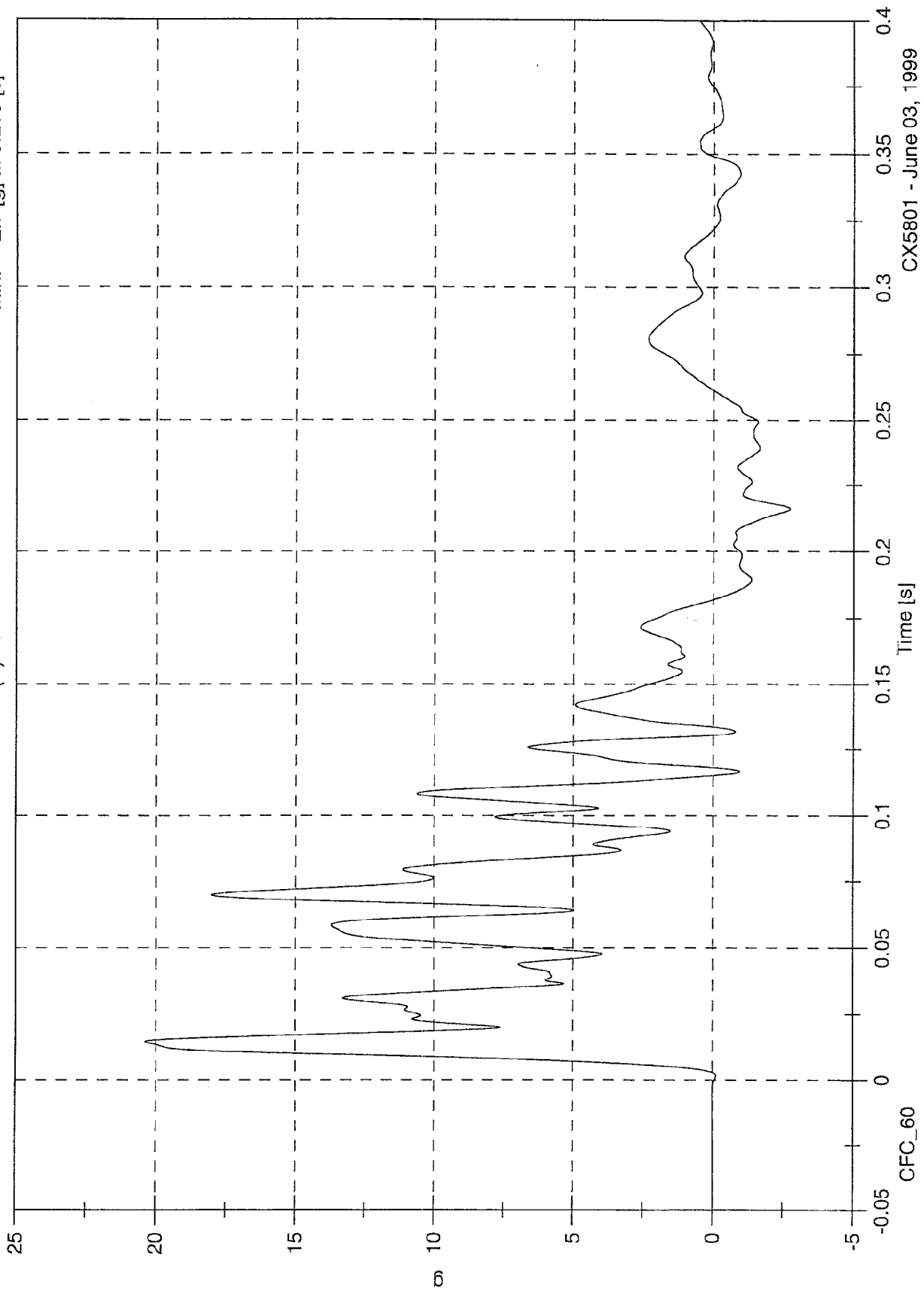
Acc #3(X) Upper Seat Back X



301 Test #5 1999 VW Beetle CX5801

Max: 20.4 [g] at 0.015 [s]
Min: -2.7 [g] at 0.216 [s]

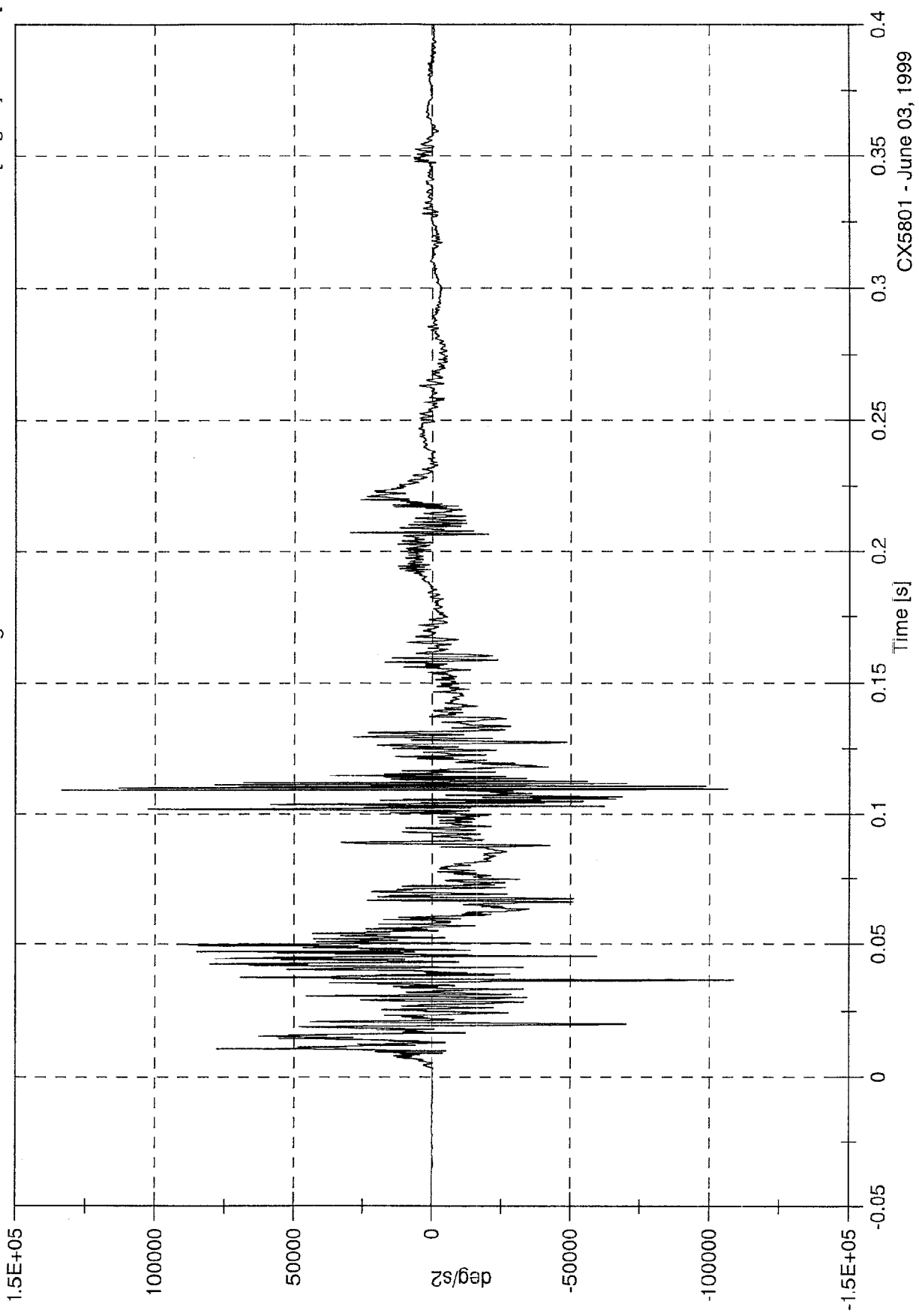
Acc #4(X) Lower Seat Back X



301 Test #5 1999 VW Beetle CX5801

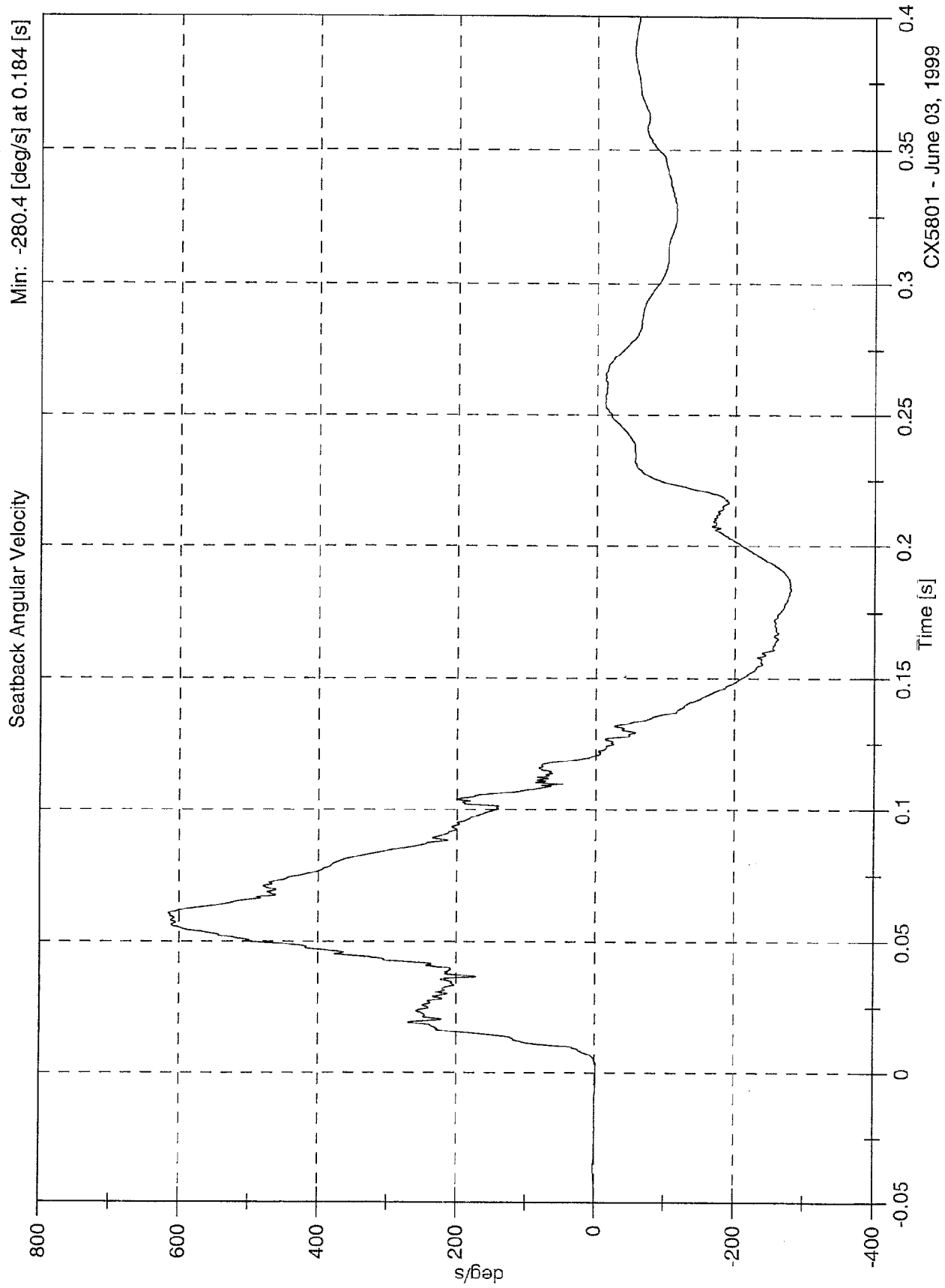
Max: 133428.5 [deg/s2] at 0.109 [s]
Min: -108771.5 [deg/s2] at 0.037 [s]

Seatback Angular Acceleration



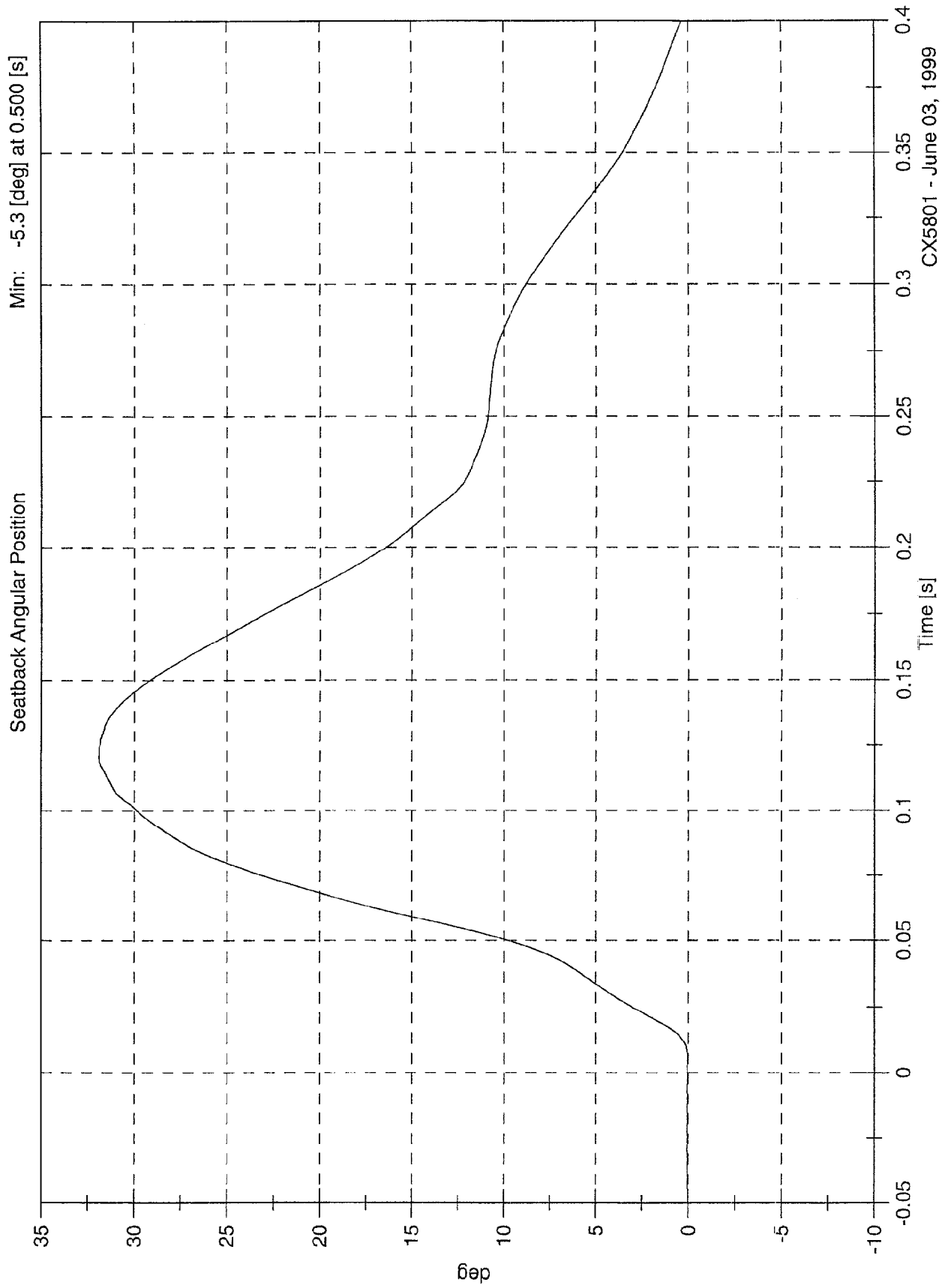
301 Test #5 1999 VW Beetle CX5801

Max: 615.8 [deg/s] at 0.061 [s]
Min: -280.4 [deg/s] at 0.184 [s]



301 Test #5 1999 VW Beetle CX5801

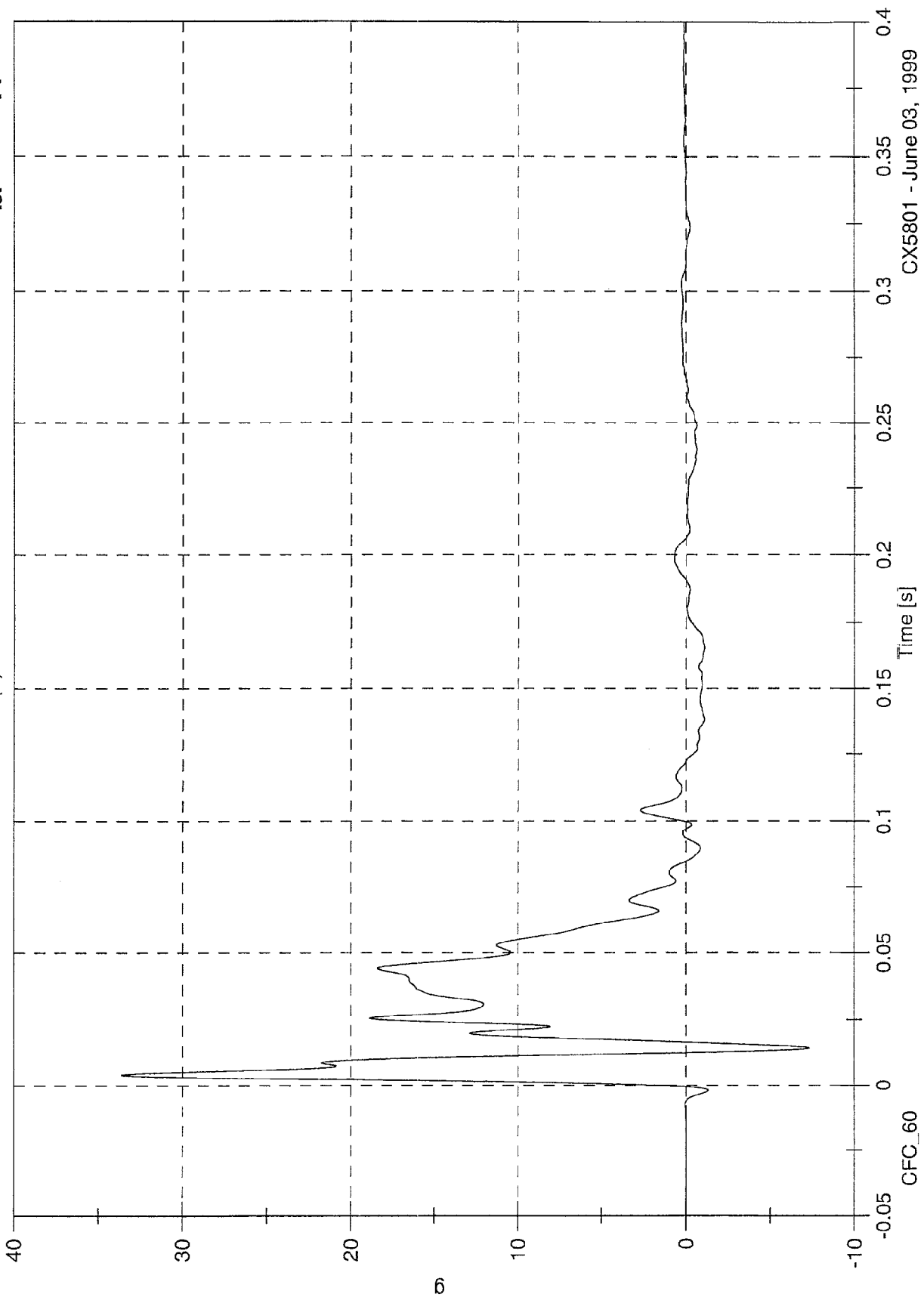
Max: 31.9 [deg] at 0.120 [s]
Min: -5.3 [deg] at 0.500 [s]



301 Test #5 1999 VW Beetle CX5801

Max: 33.7 [g] at 0.004 [s]
Min: -7.3 [g] at 0.014 [s]

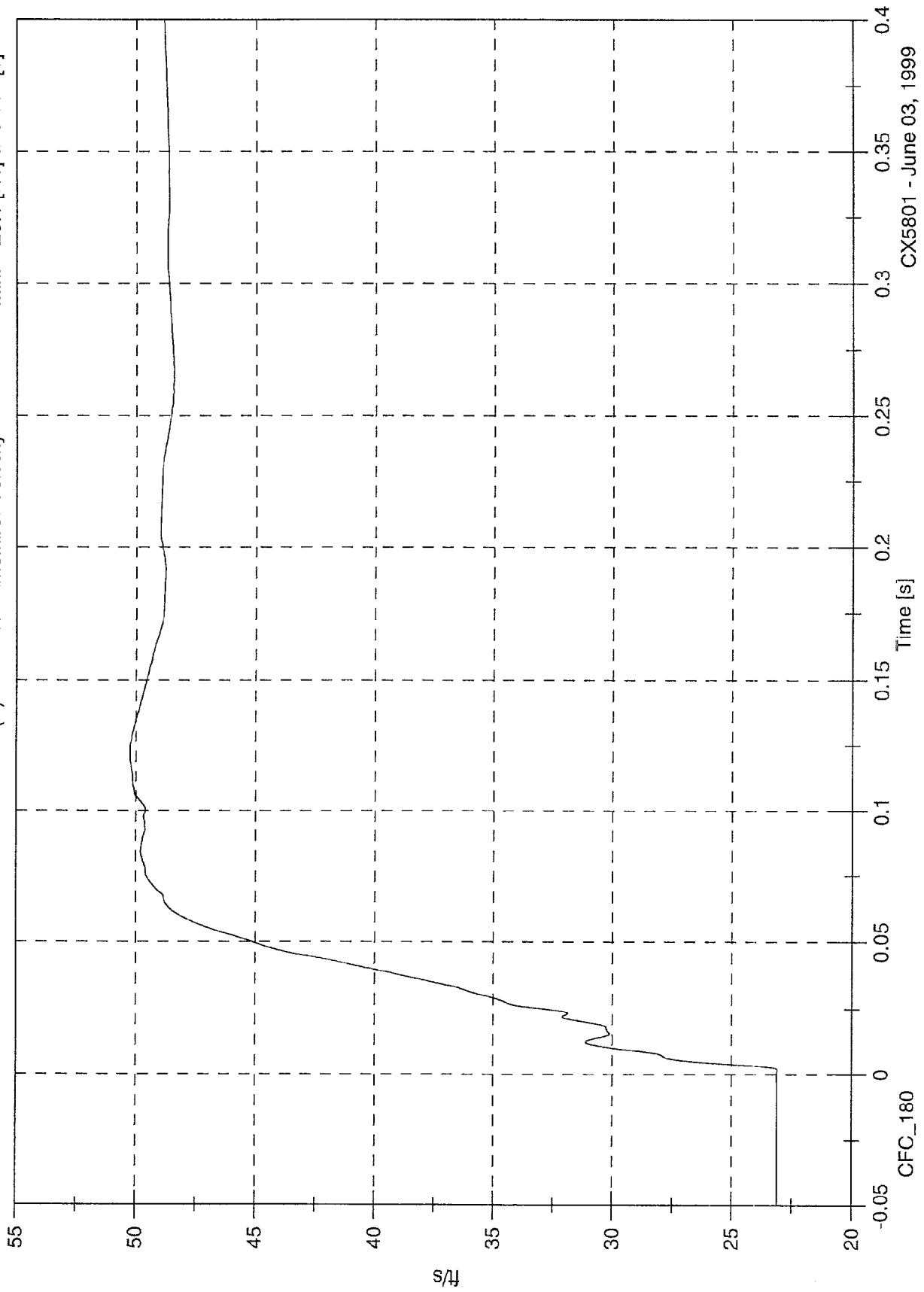
Acc #1(X) Left Rear Xmember



301 Test #5 1999 VW Beetle CX5801

Max: 50.3 [ft/s] at 0.121 [s]
Min: 23.1 [ft/s] at 0.002 [s]

Acc #1(X) Left Rear Xmember Velocity

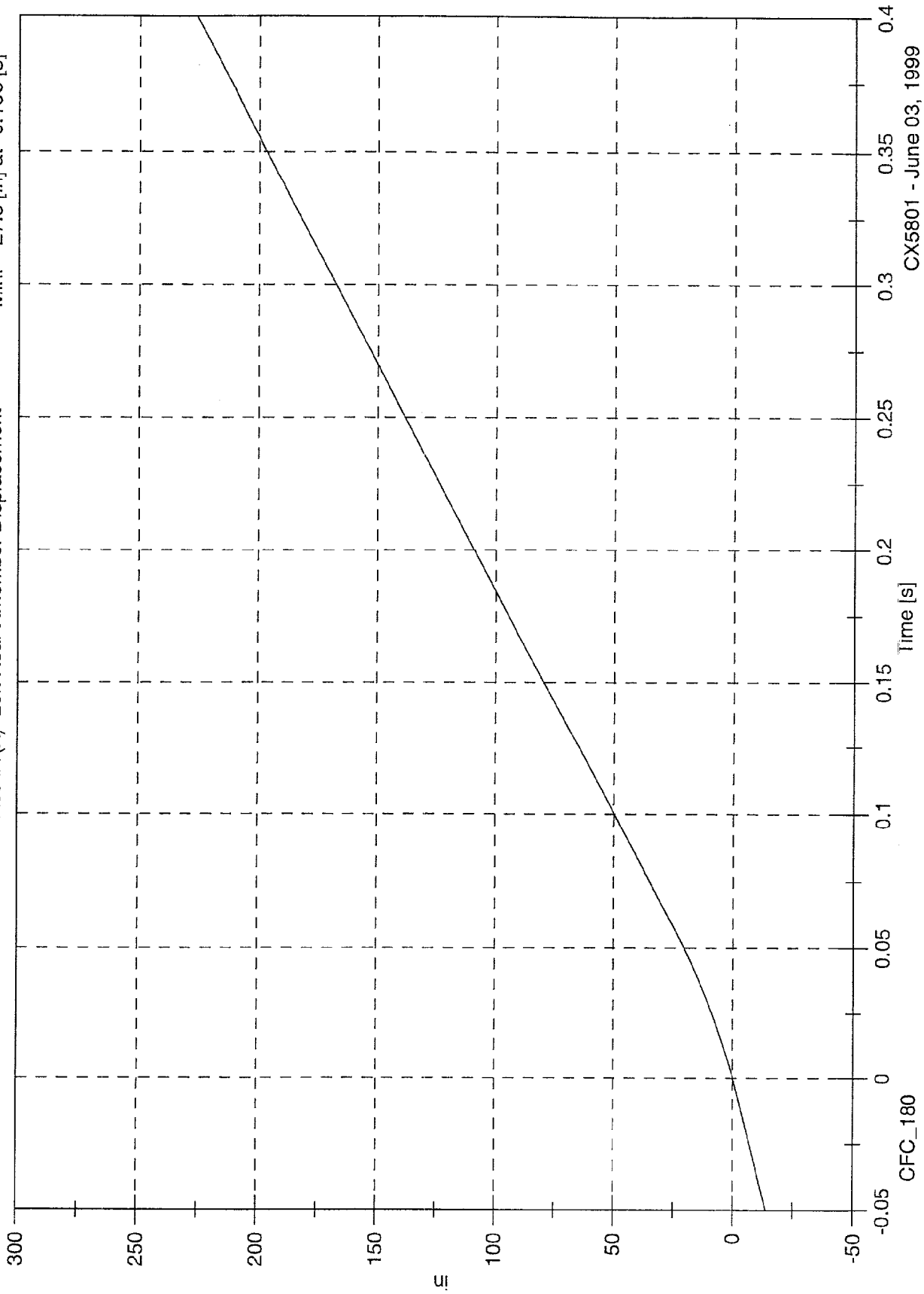


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX580 i

Max: 284.7 [in] at 0.500 [s]
Min: -27.8 [in] at -0.100 [s]

Acc #1(X) Left Rear Xmember Displacement



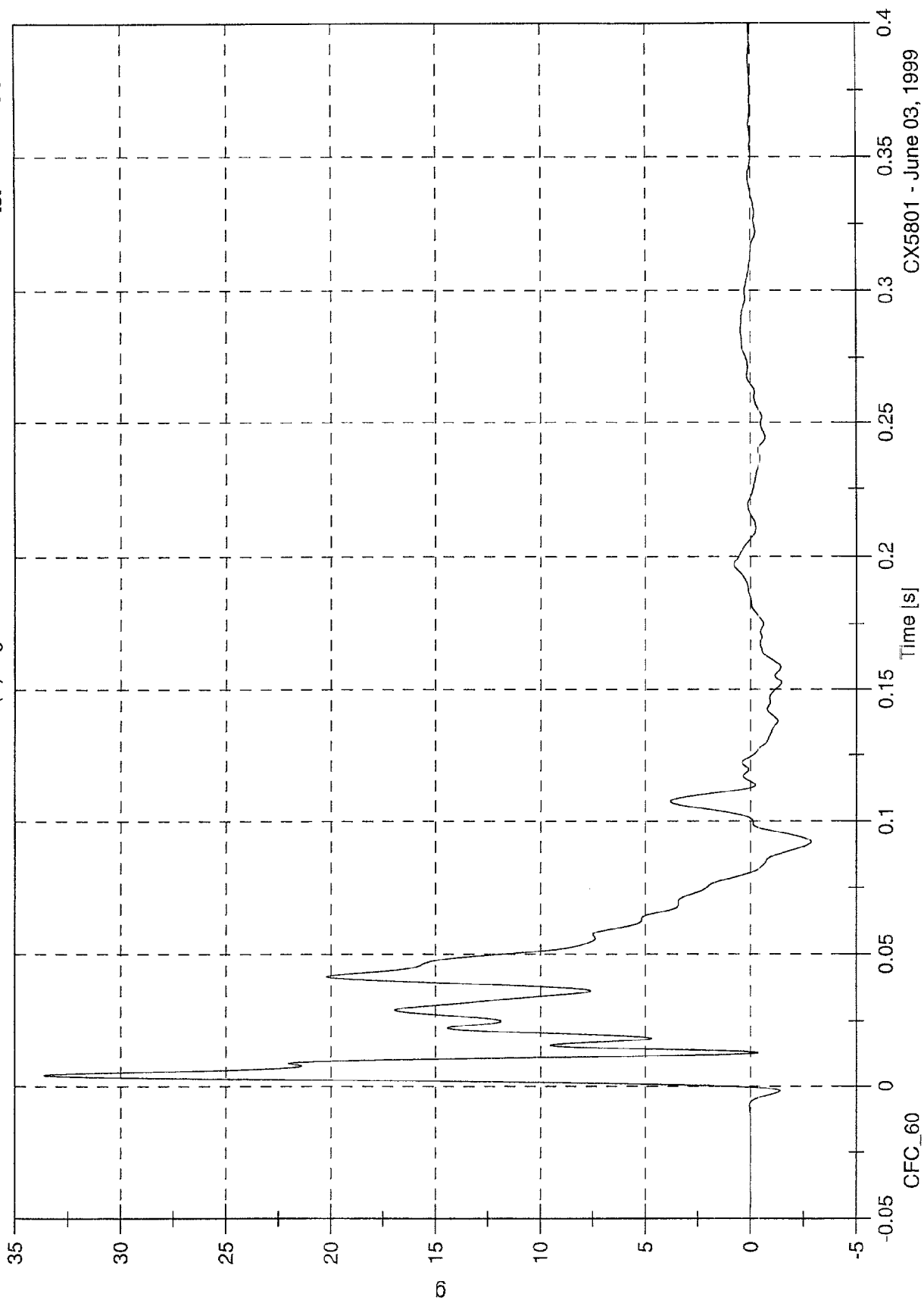
CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Max: 33.6 [g] at 0.004 [s]

Min: -2.8 [g] at 0.092 [s]

Acc #2(X) Right Rear Xmember

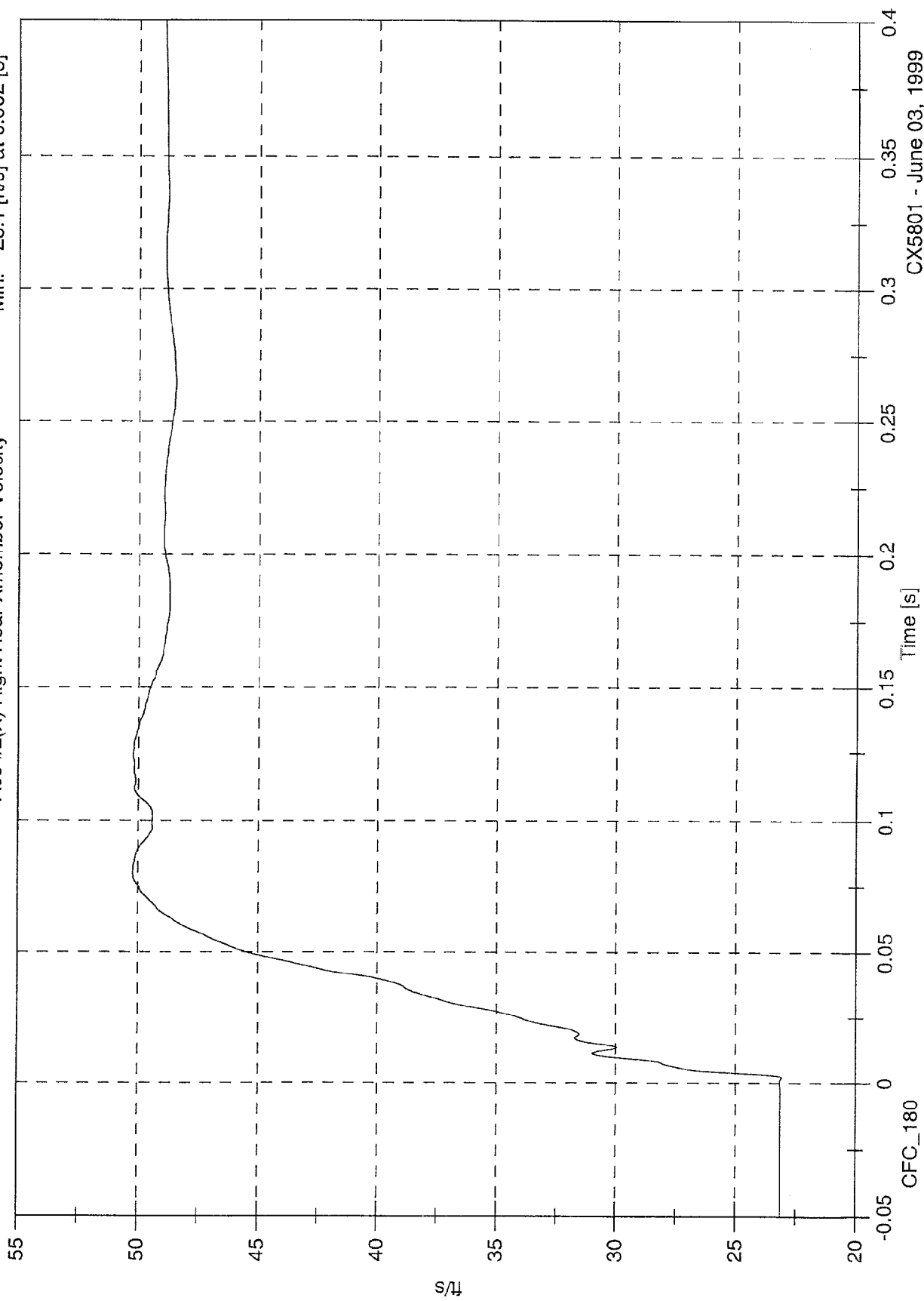


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Max: 50.2 [ft/s] at 0.080 [s]
Min: 23.1 [ft/s] at 0.002 [s]

Acc #2(X) Right Rear Xmember Velocity

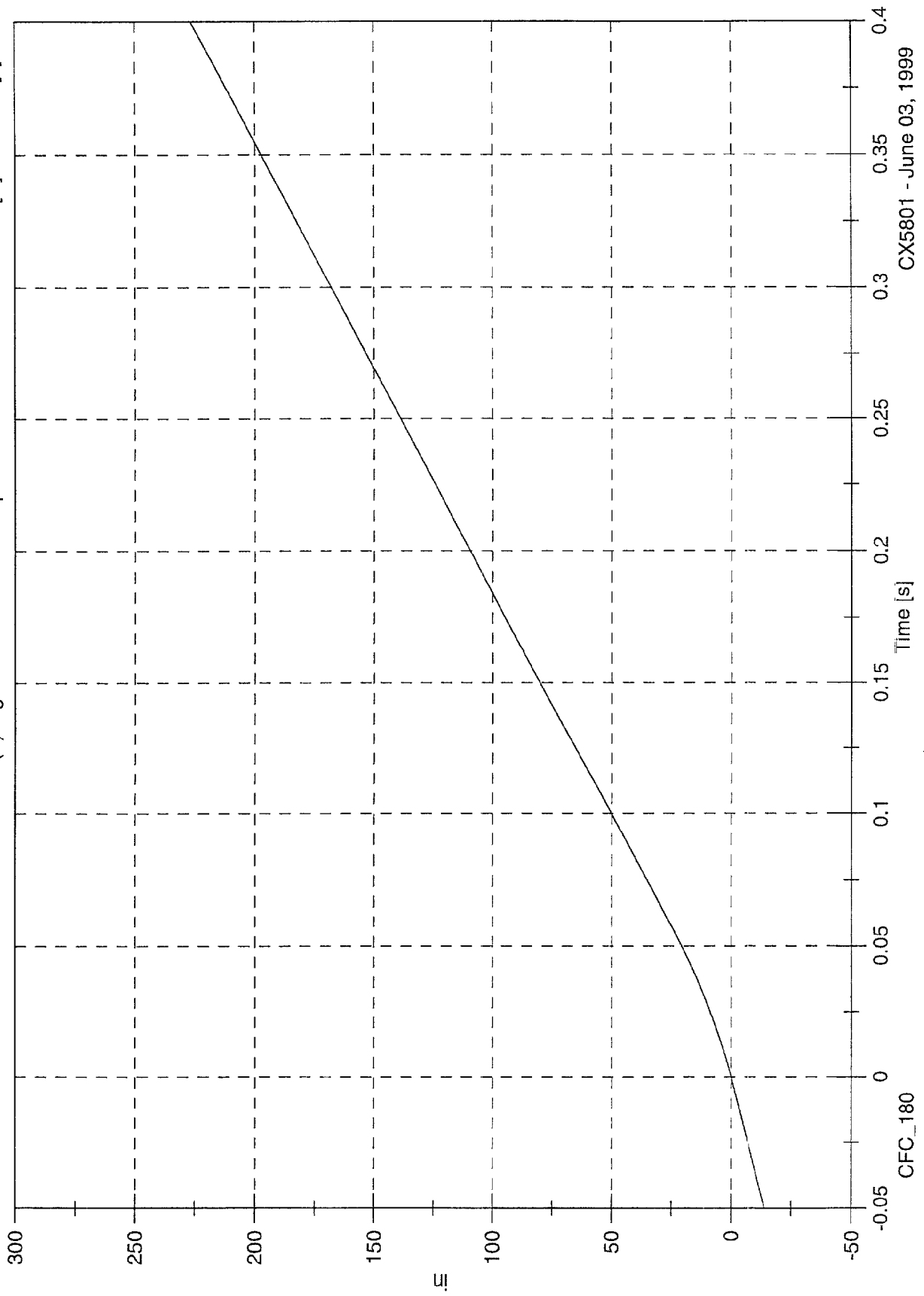


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Max: 285.2 [in] at 0.500 [s]
Min: -27.8 [in] at -0.100 [s]

Acc #2(X) Right Rear Xmember Displacement



CX5801 - June 03, 1999

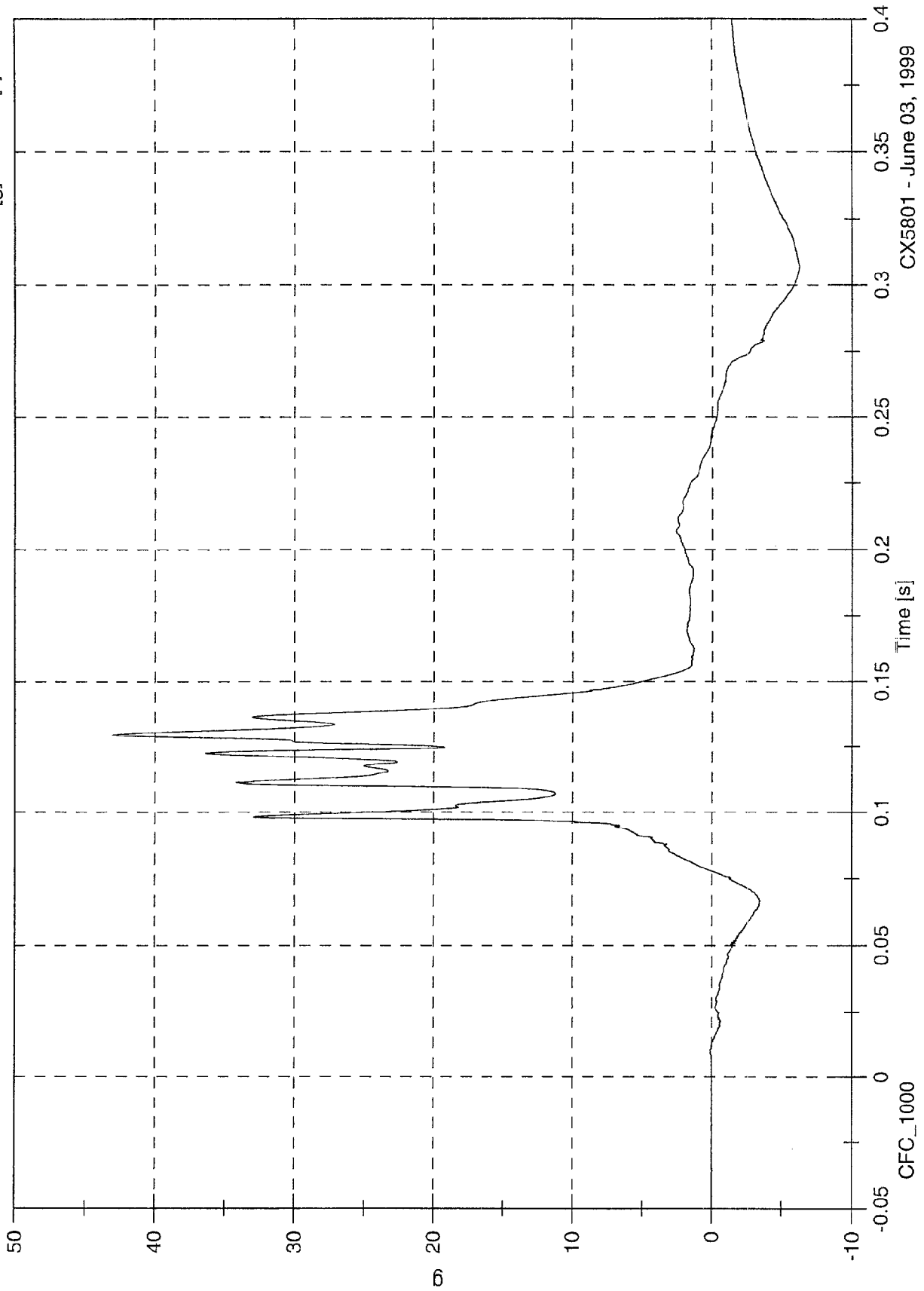
TEST NO. CX5801

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

301 Test #5 1999 VW Beetle CX5801

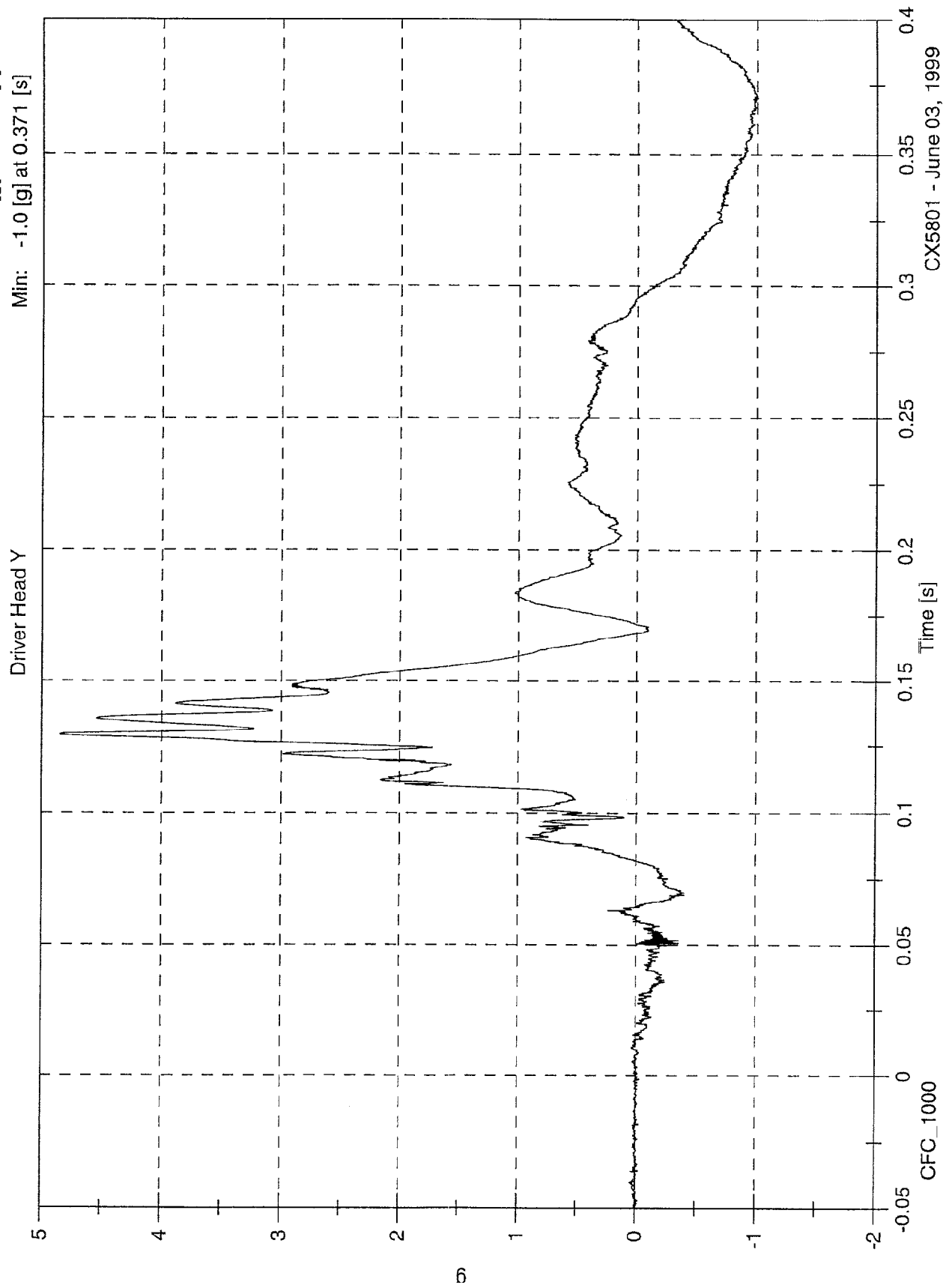
Max: 43.0 [g] at 0.129 [s]
Min: -6.2 [g] at 0.307 [s]

Driver Head X



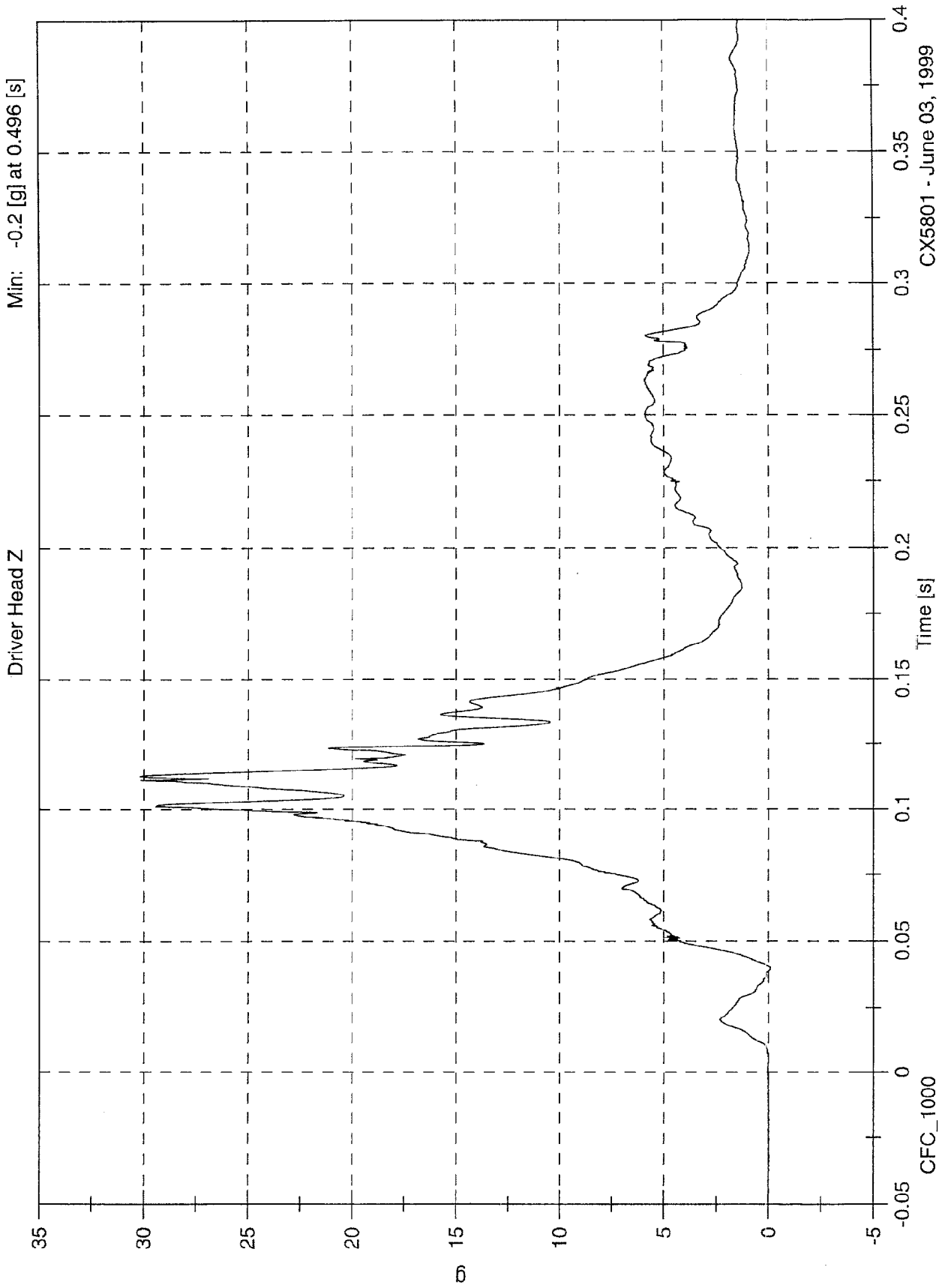
301 Test #5 1999 VW Beetle CX5801

Max: 4.8 [g] at 0.129 [s]
Min: -1.0 [g] at 0.371 [s]



301 Test #5 1999 VW Beetle CX5801

Max: 30.2 [g] at 0.112 [s]
Min: -0.2 [g] at 0.496 [s]

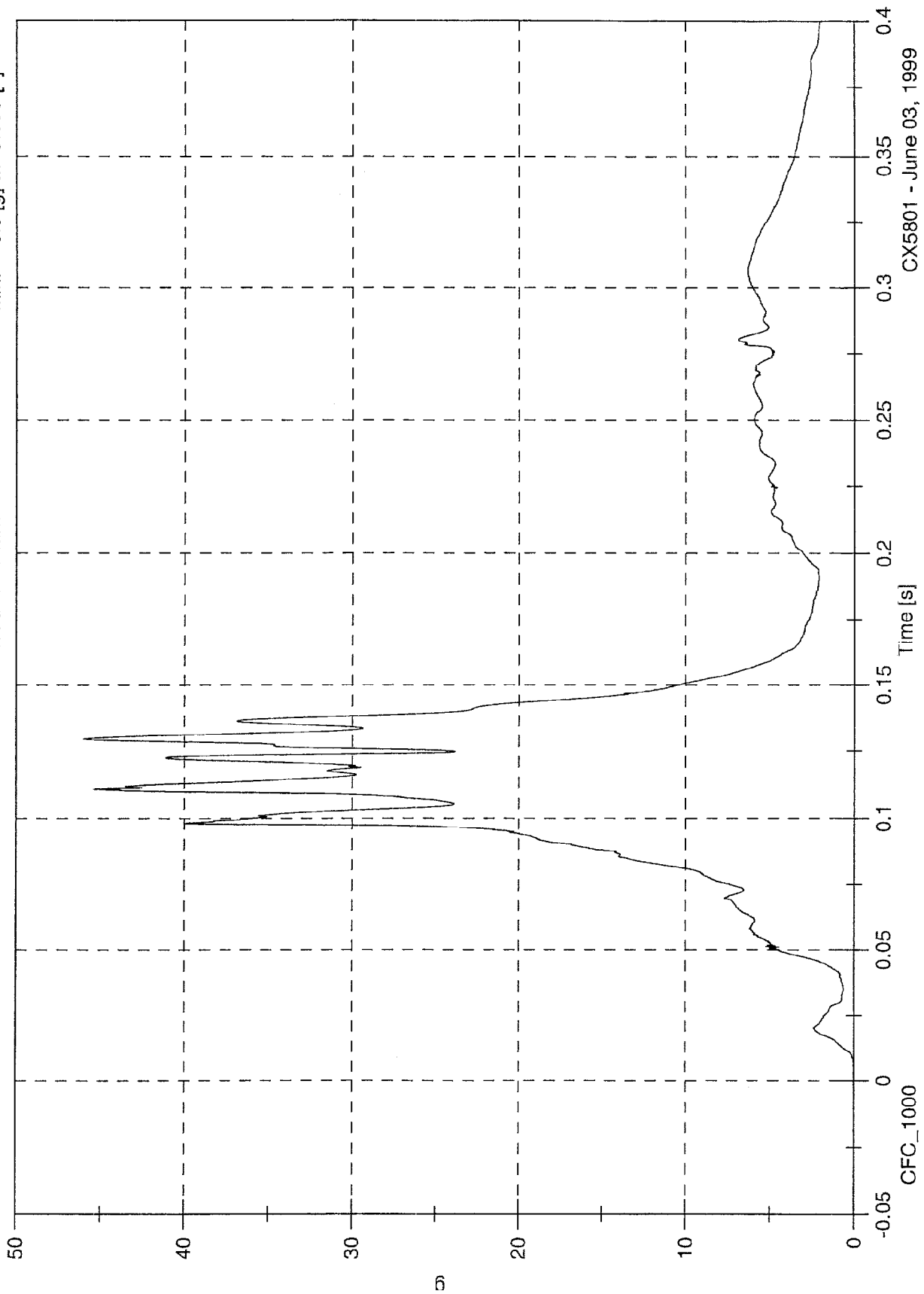


301 Test #5 1999 VW Beetle CX5801

Max: 46.0 [g] at 0.129 [s]

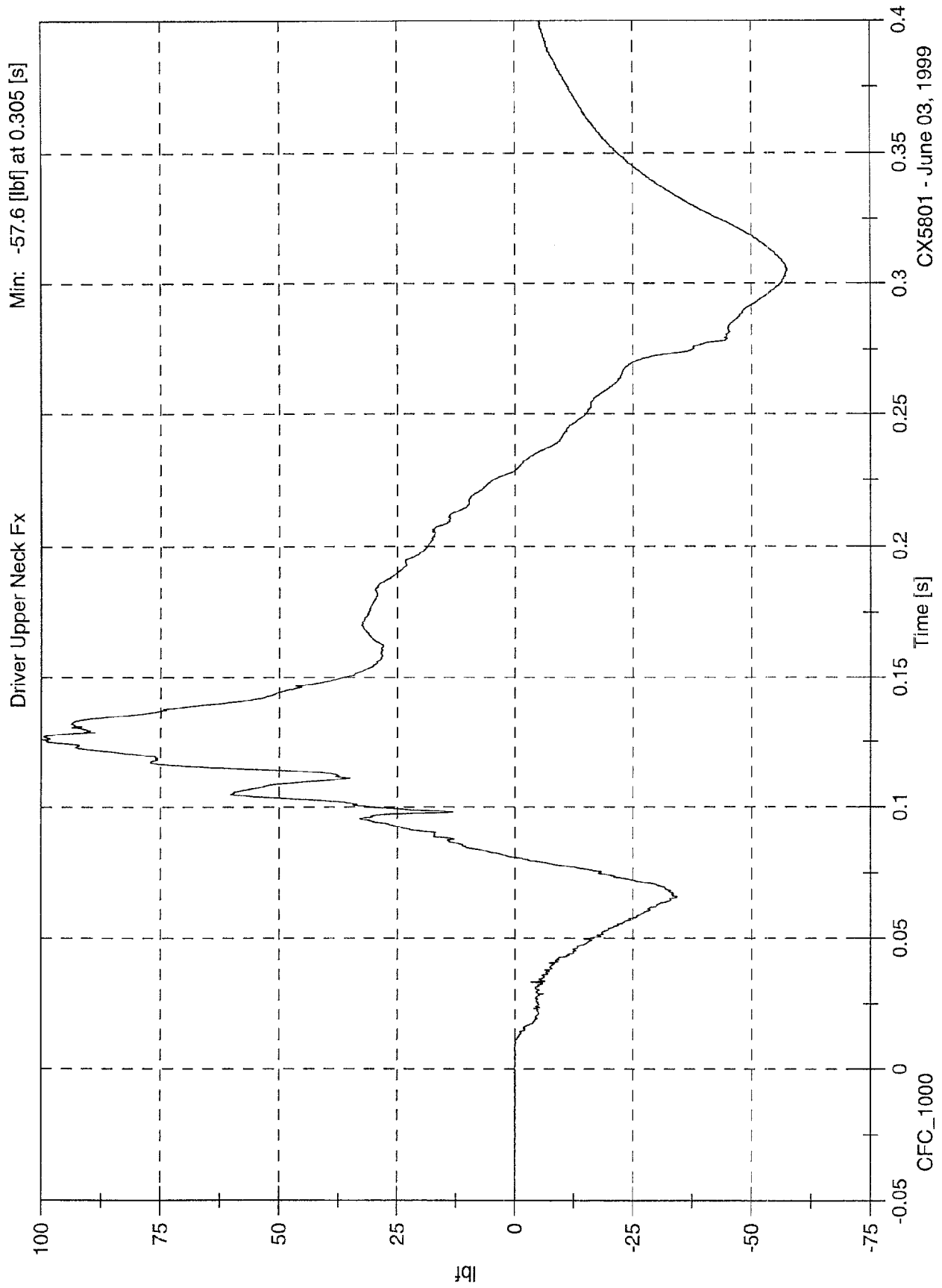
Min: 0.0 [g] at -0.088 [s]

Driver Head Resultant



301 Test #5 1999 VW Beetle CX5801

Max: 99.8 [lbf] at 0.126 [s]
Min: -57.6 [lbf] at 0.305 [s]

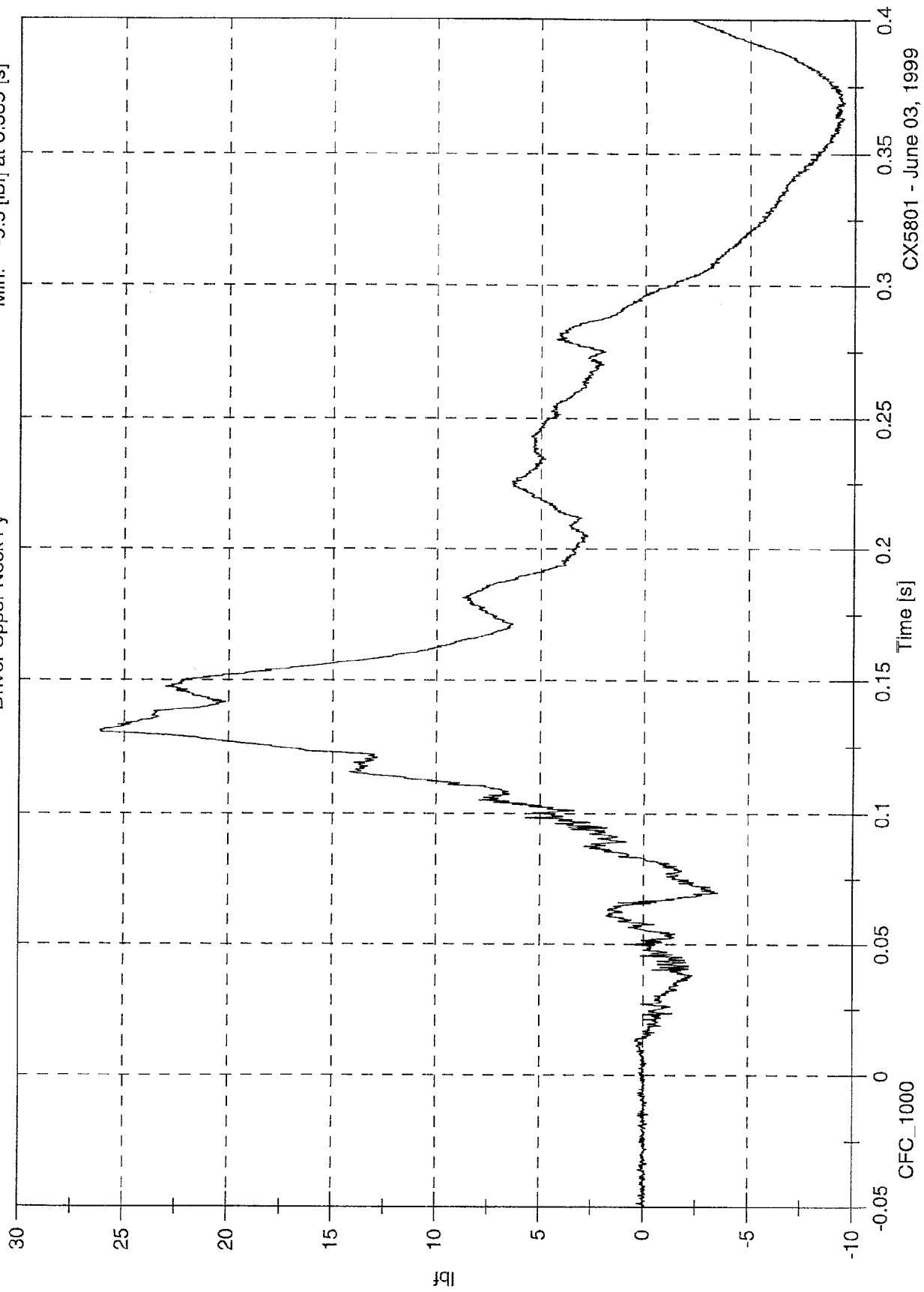


301 Test #5 1999 VW Beetle CX5801

Max: 26.2 [lbf] at 0.131 [s]

Min: -9.5 [lbf] at 0.369 [s]

Driver Upper Neck Fy

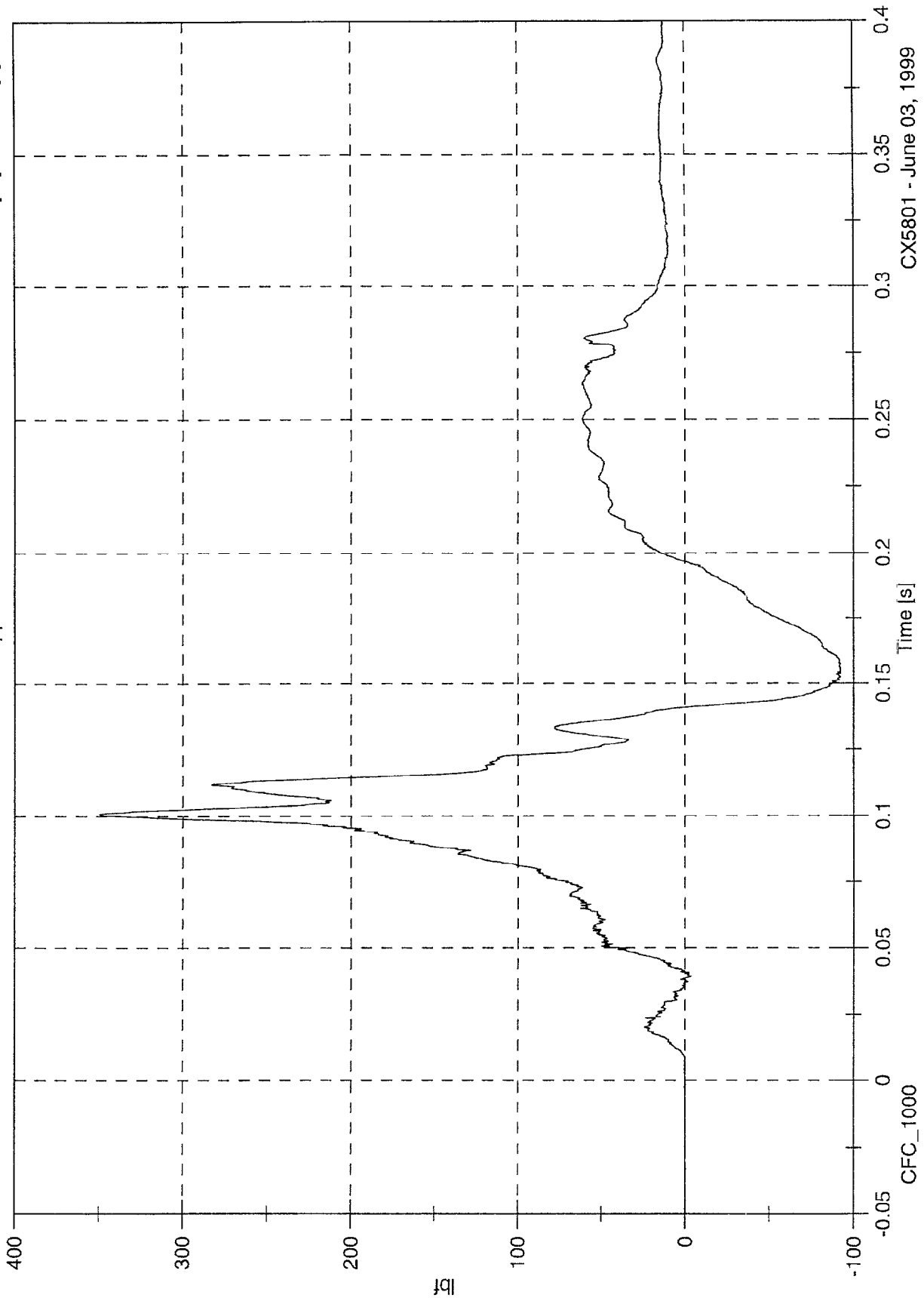


301 Test #5 1999 VW Beetle CX5801

Max: 349.5 [lb] at 0.101 [s]

Min: -92.4 [lb] at 0.154 [s]

Driver Upper Neck Fz

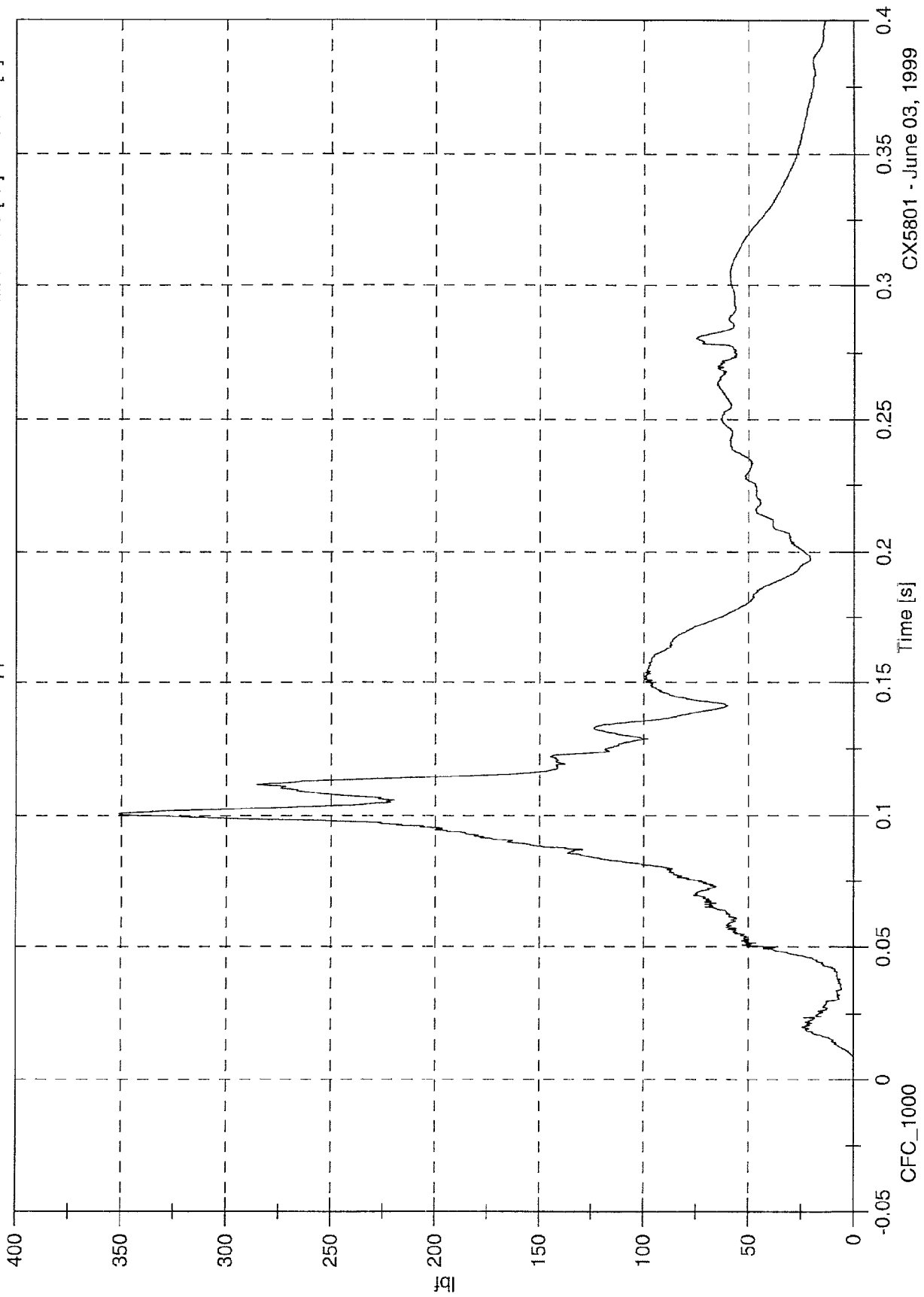


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Driver Upper Neck F Resultant

Max: 351.2 [lbf] at 0.101 [s]
Min: 0.0 [lbf] at -0.071 [s]



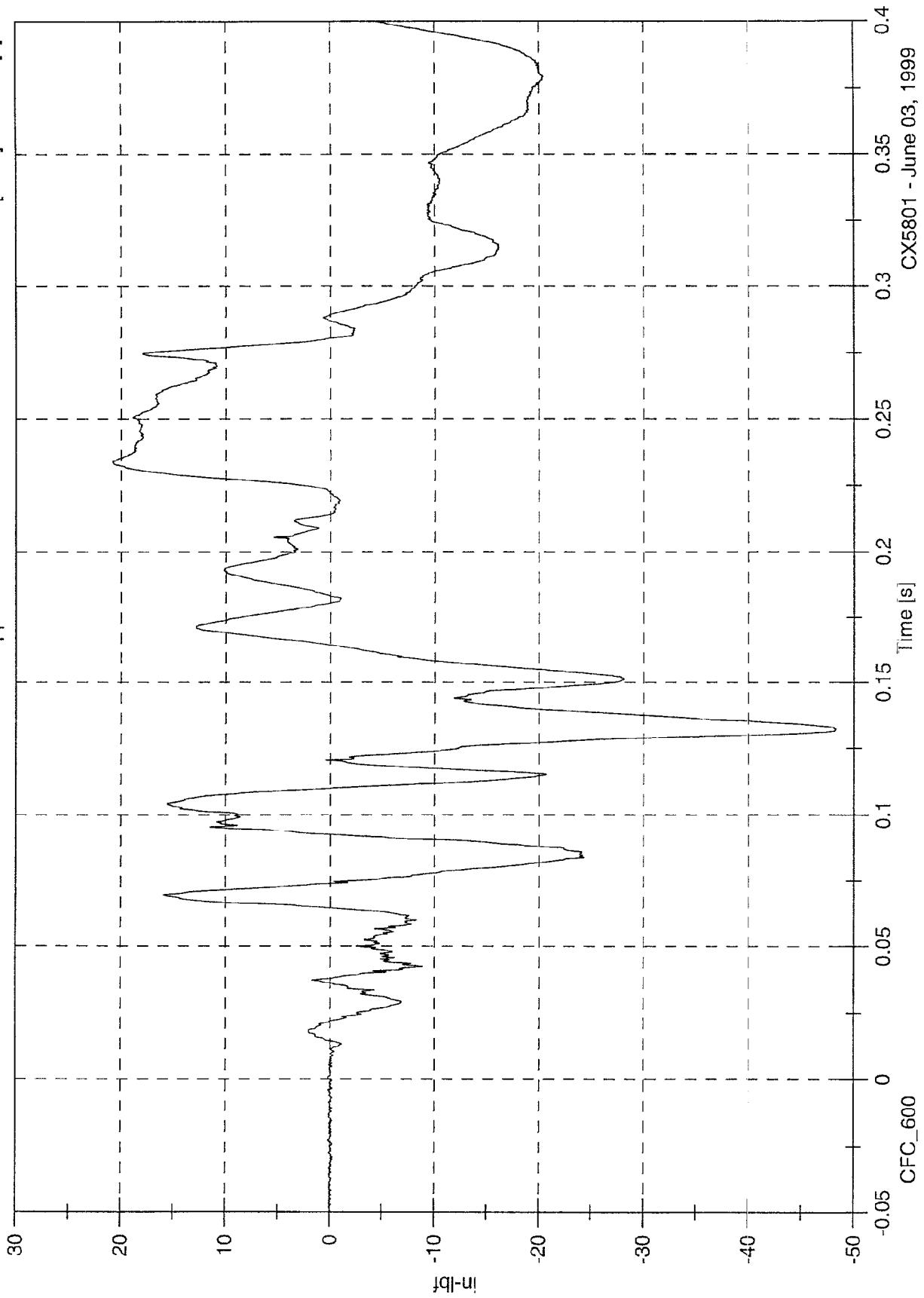
CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Driver Upper Neck Mx

Max: 20.8 [in-lbf] at 0.234 [s]

Min: -48.3 [in-lbf] at 0.132 [s]



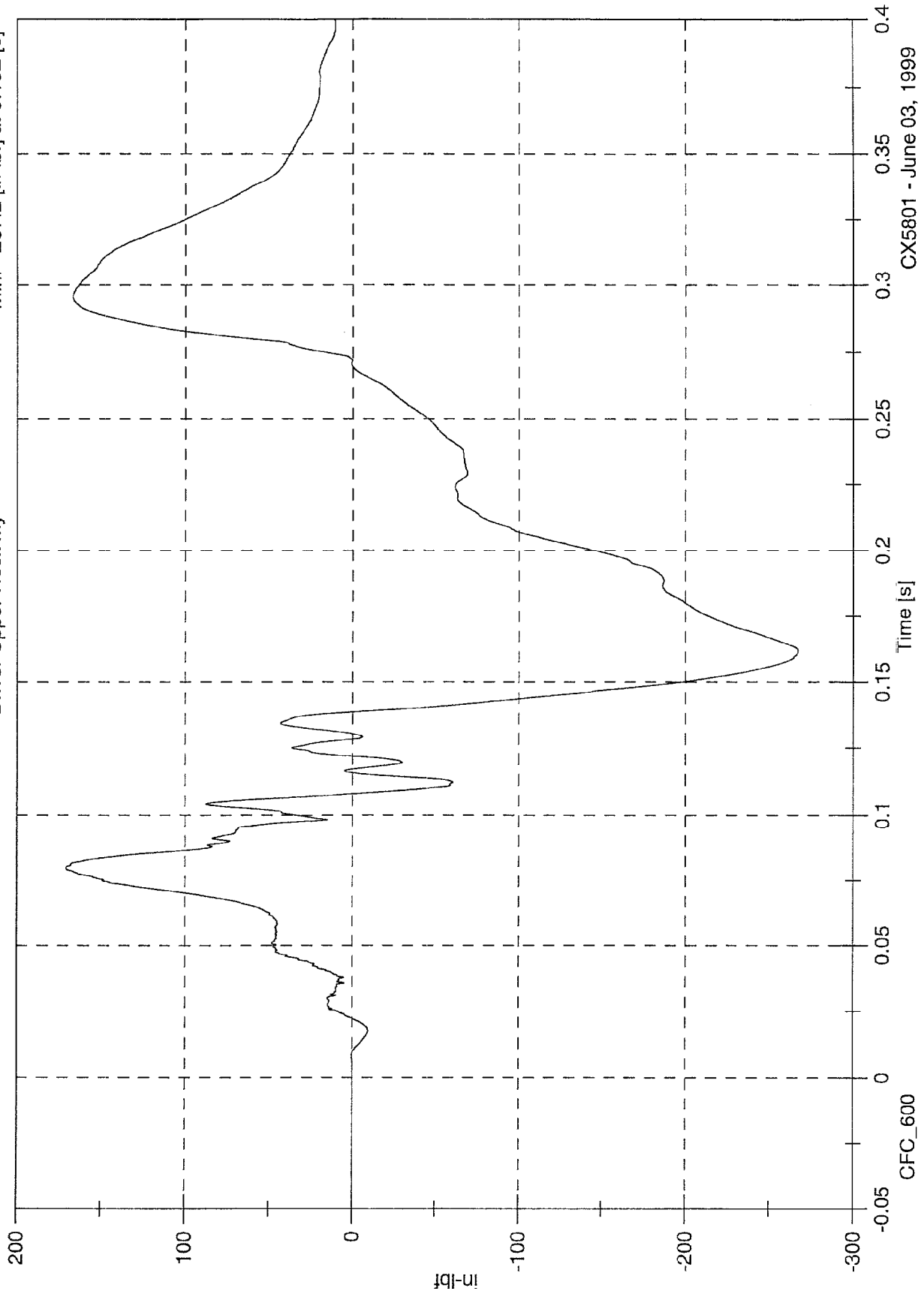
CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Driver Upper Neck My

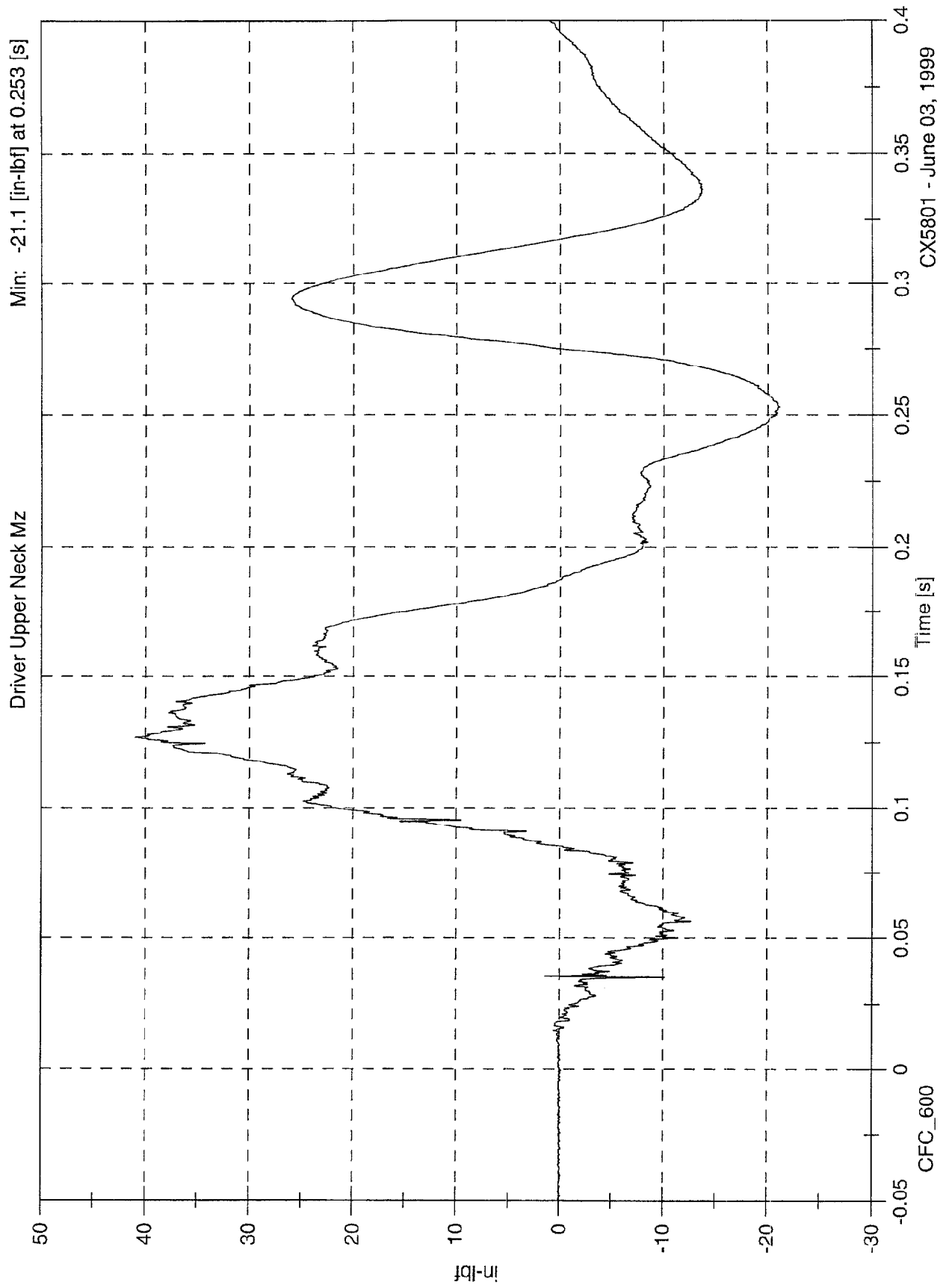
Max: 170.9 [in-lbf] at 0.060 [s]

Min: -267.2 [in-lbf] at 0.162 [s]



301 Test #5 1999 VW Beetle CX5801

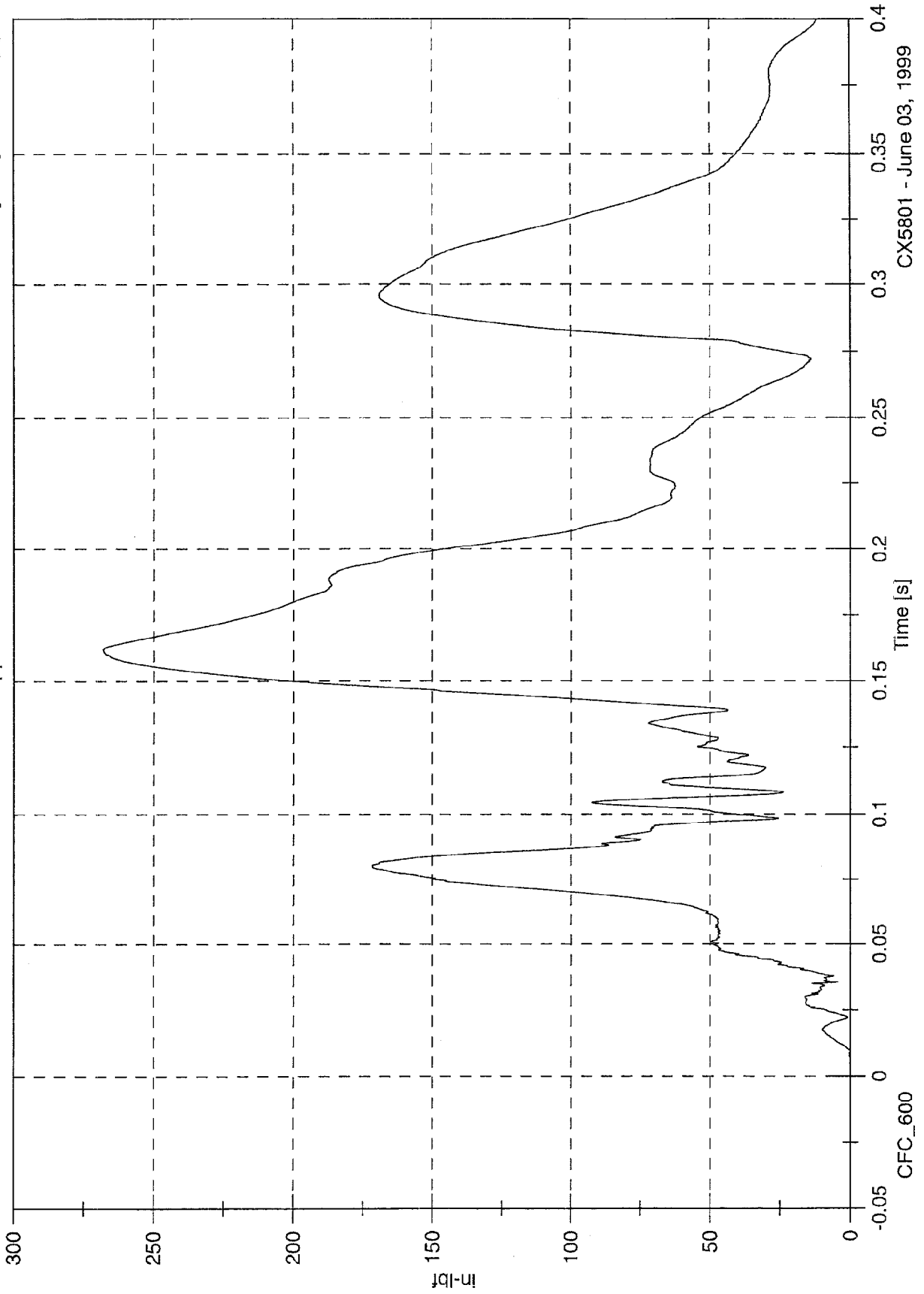
Max: 41.0 [in-lbf] at 0.127 [s]
Min: -21.1 [in-lbf] at 0.253 [s]



301 Test #5 1999 VW Beetle CX5801

Max: 268.3 [in-lbf] at 0.162 [s]
Min: 0.0 [in-lbf] at -0.049 [s]

Driver Upper Neck M Resultant

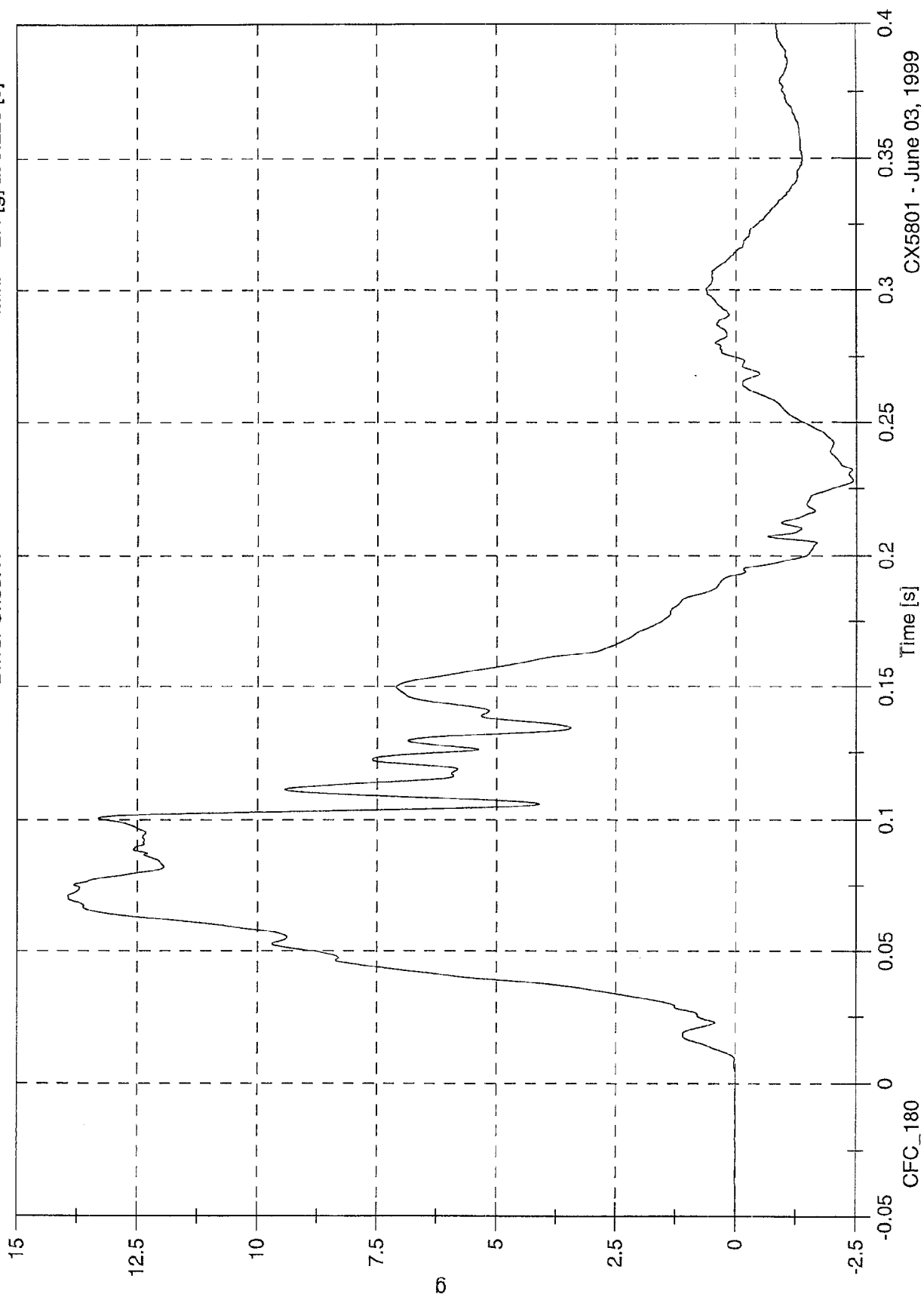


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

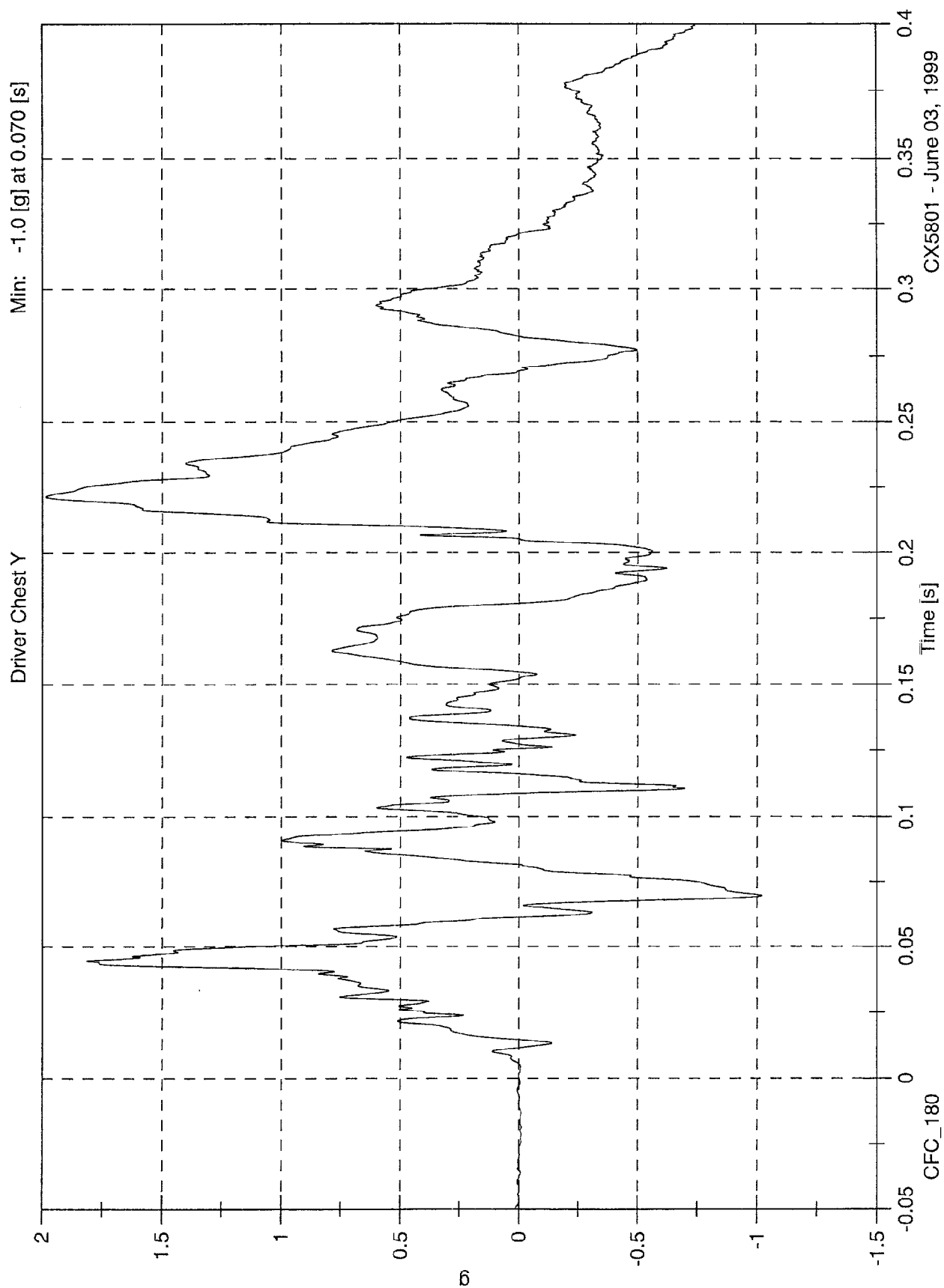
Max: 13.9 [g] at 0.071 [s]
Min: -2.4 [g] at 0.228 [s]

Driver Chest X



301 Test #5 1999 VW Beetle CX5801

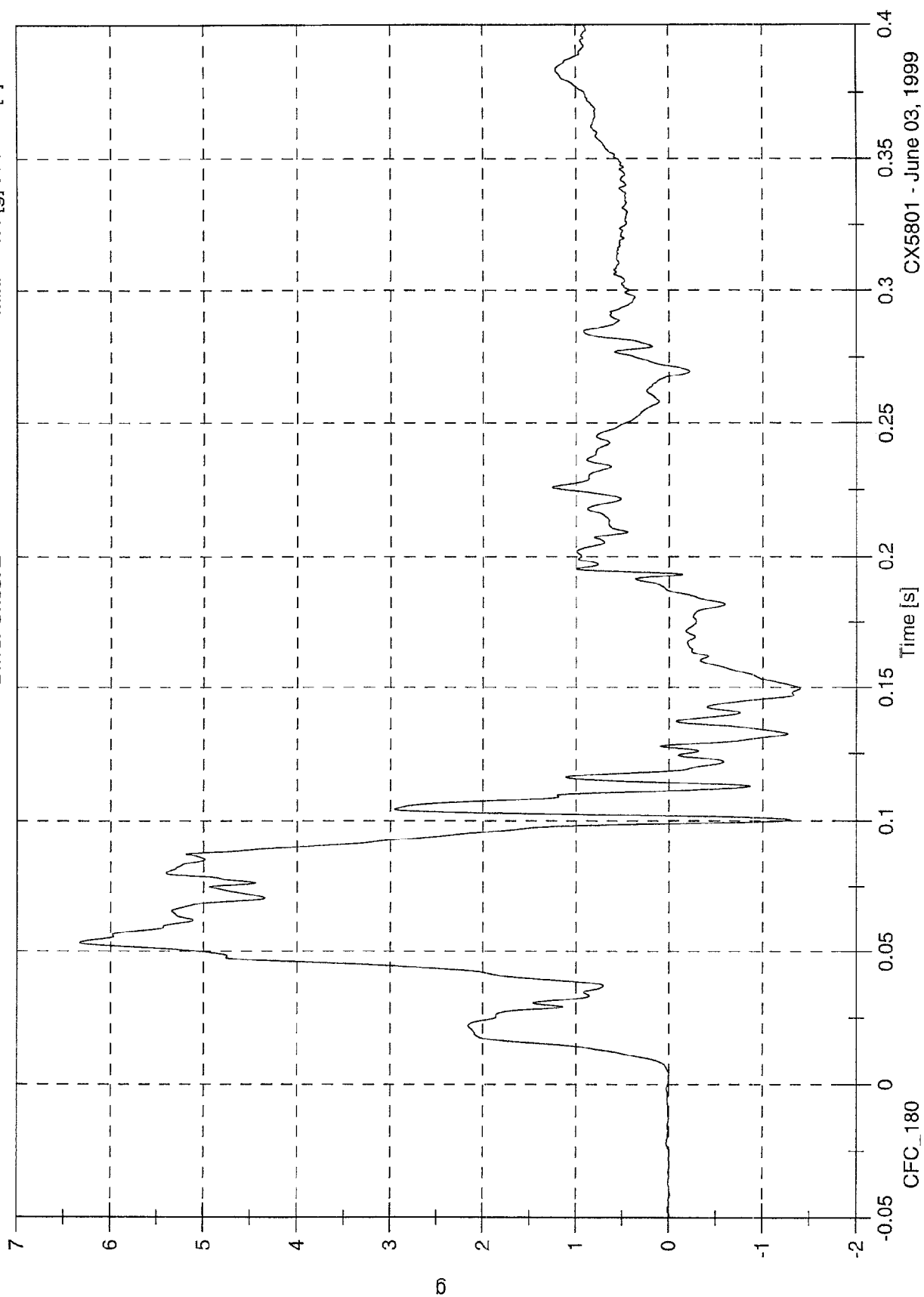
Max: 2.0 [g] at 0.222 [s]
Min: -1.0 [g] at 0.070 [s]



301 Test #5 1999 VW Beetle CX5801

Max: 6.3 [g] at 0.053 [s]
Min: -1.4 [g] at 0.150 [s]

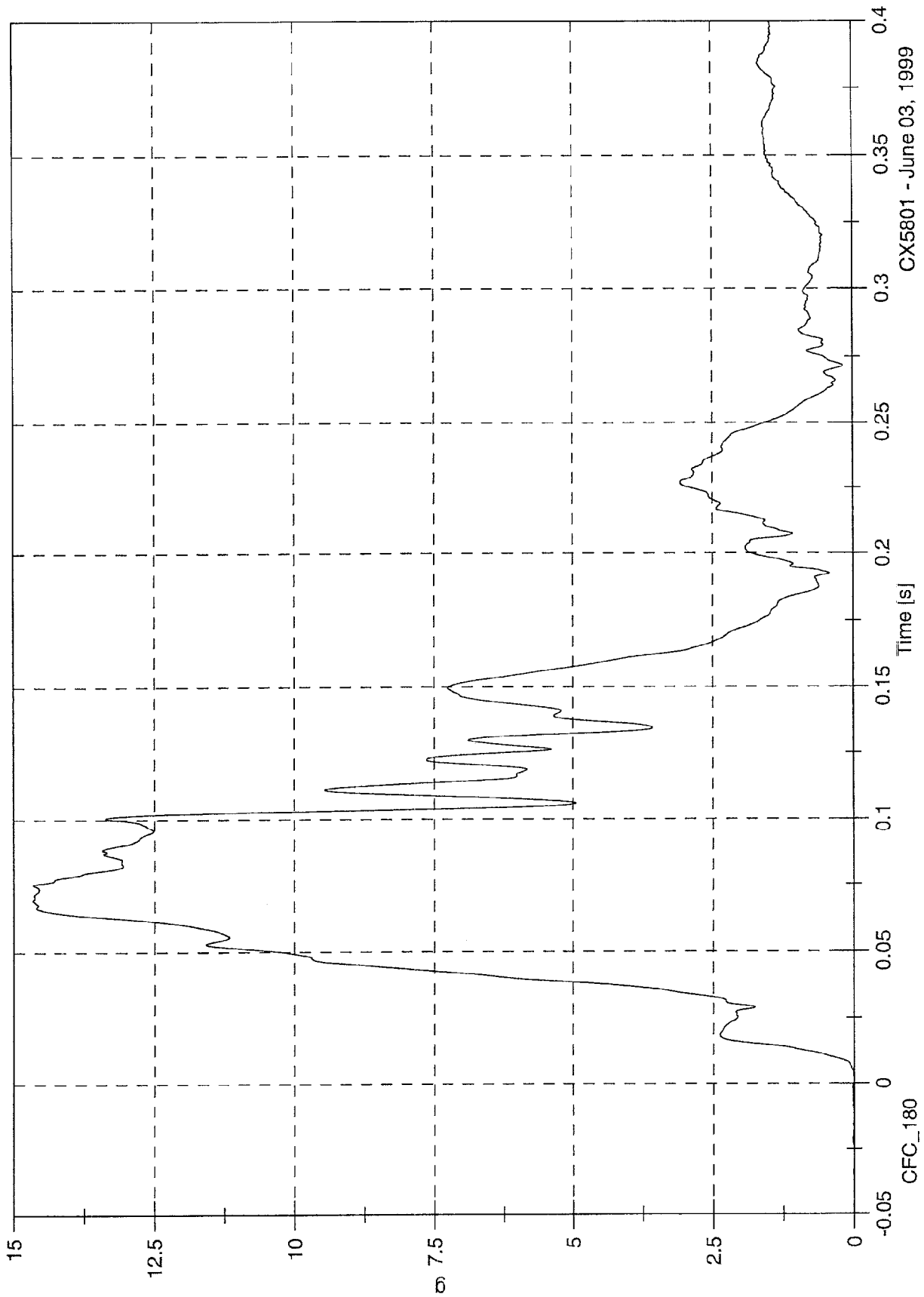
Driver Chest Z



301 Test #5 1999 VW Beetle CX5801

Max: 14.7 [g] at 0.070 [s]
Min: 0.0 [g] at -0.043 [s]

Driver Chest Resultant

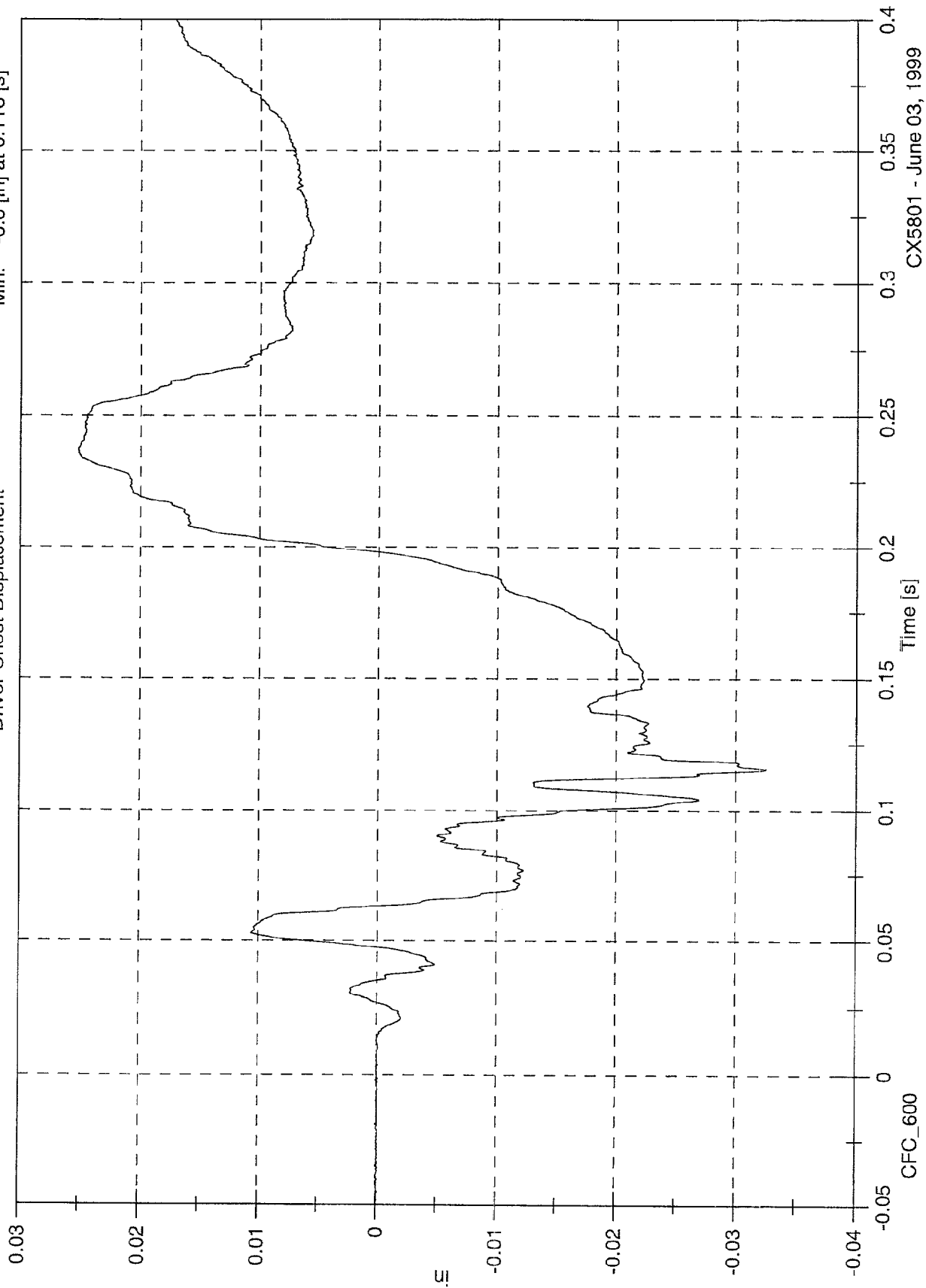


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Max: 0.0 [in] at 0.492 [s]
Min: -0.0 [in] at 0.116 [s]

Driver Chest Displacement

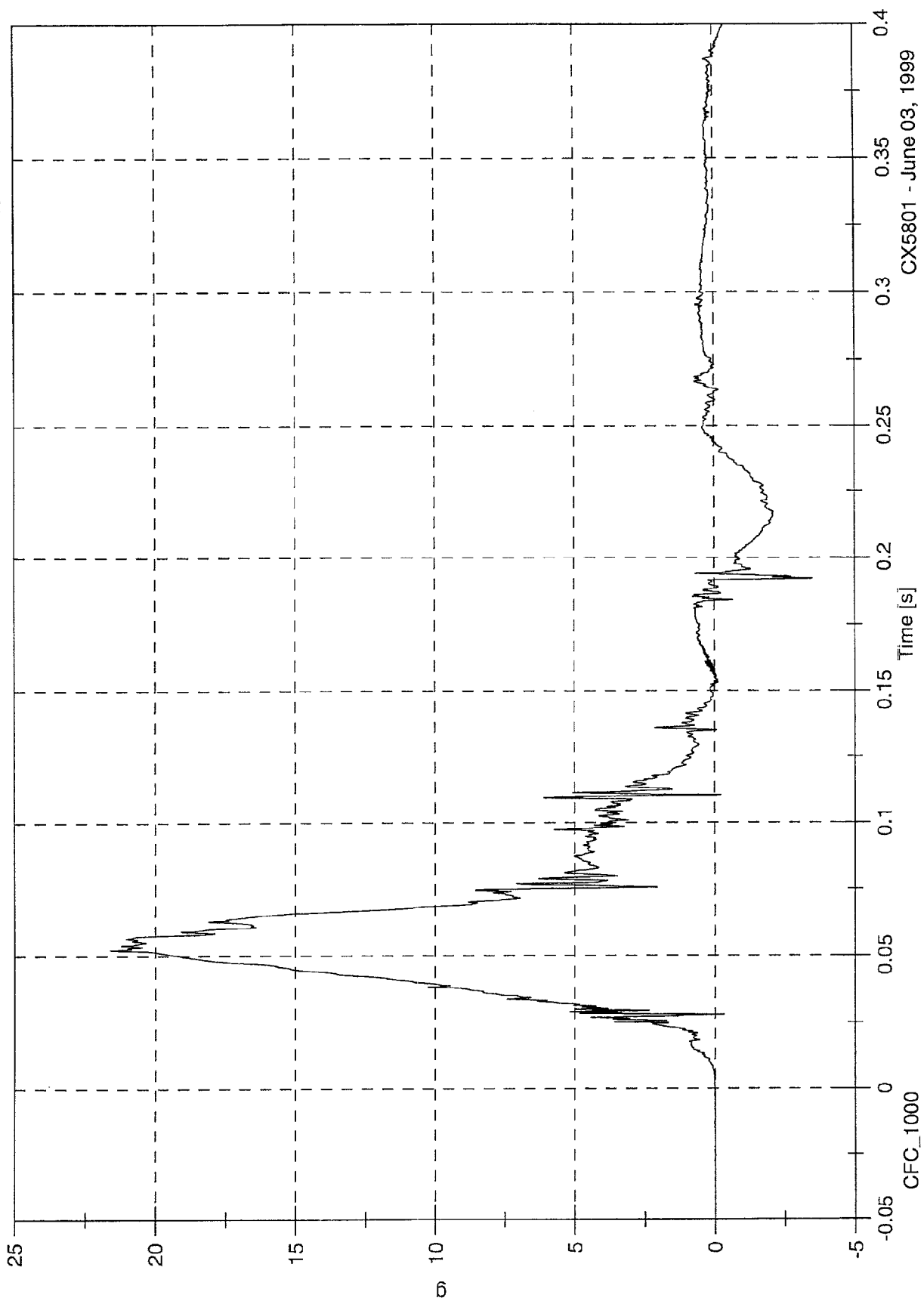


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Max: 21.6 [g] at 0.052 [s]
Min: -3.5 [g] at 0.192 [s]

Driver Pelvic X

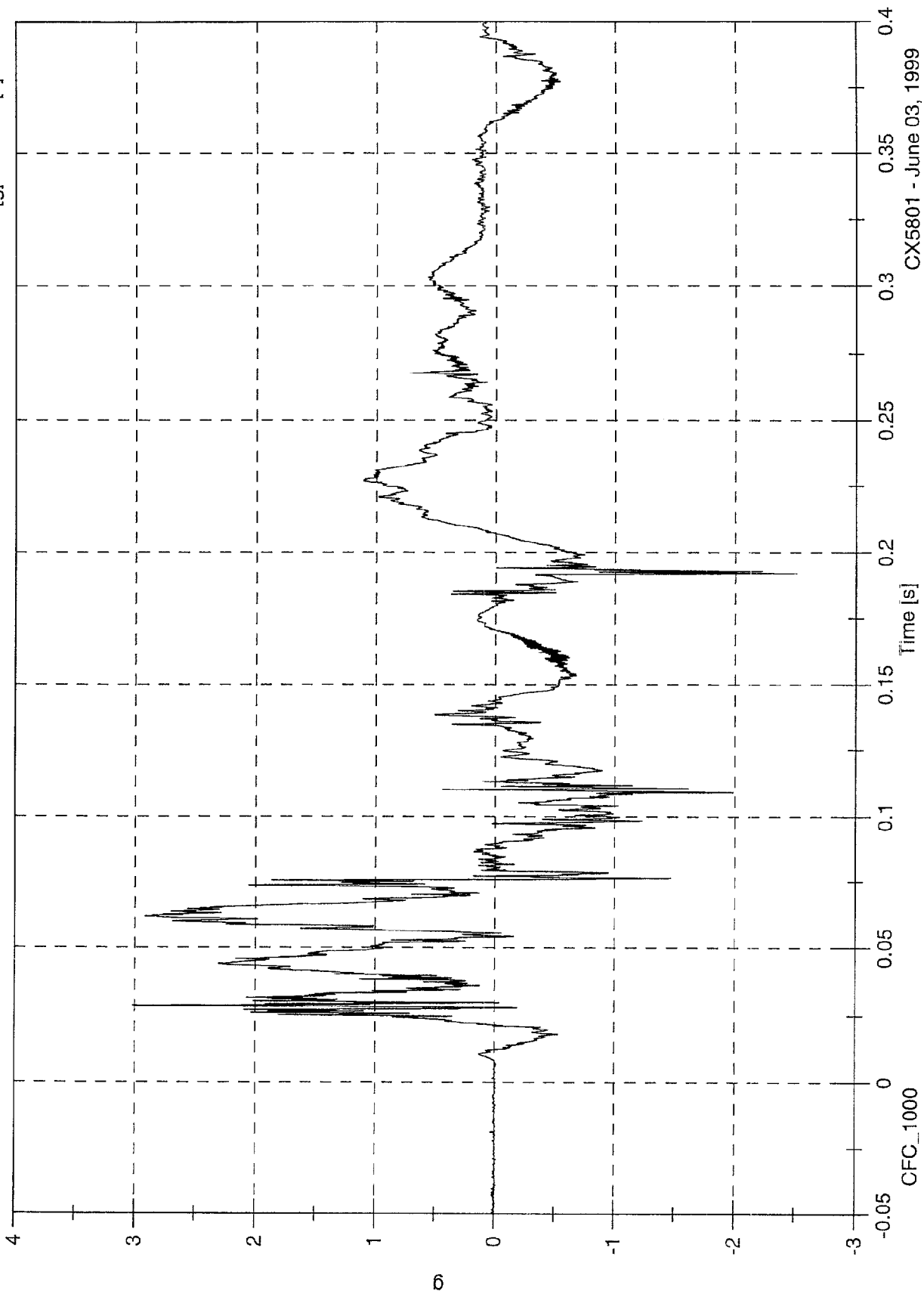


301 Test #5 1999 VW Beetle CX5801

Max: 3.0 [g] at 0.029 [s]

Min: -2.5 [g] at 0.192 [s]

Driver Pelvic Y



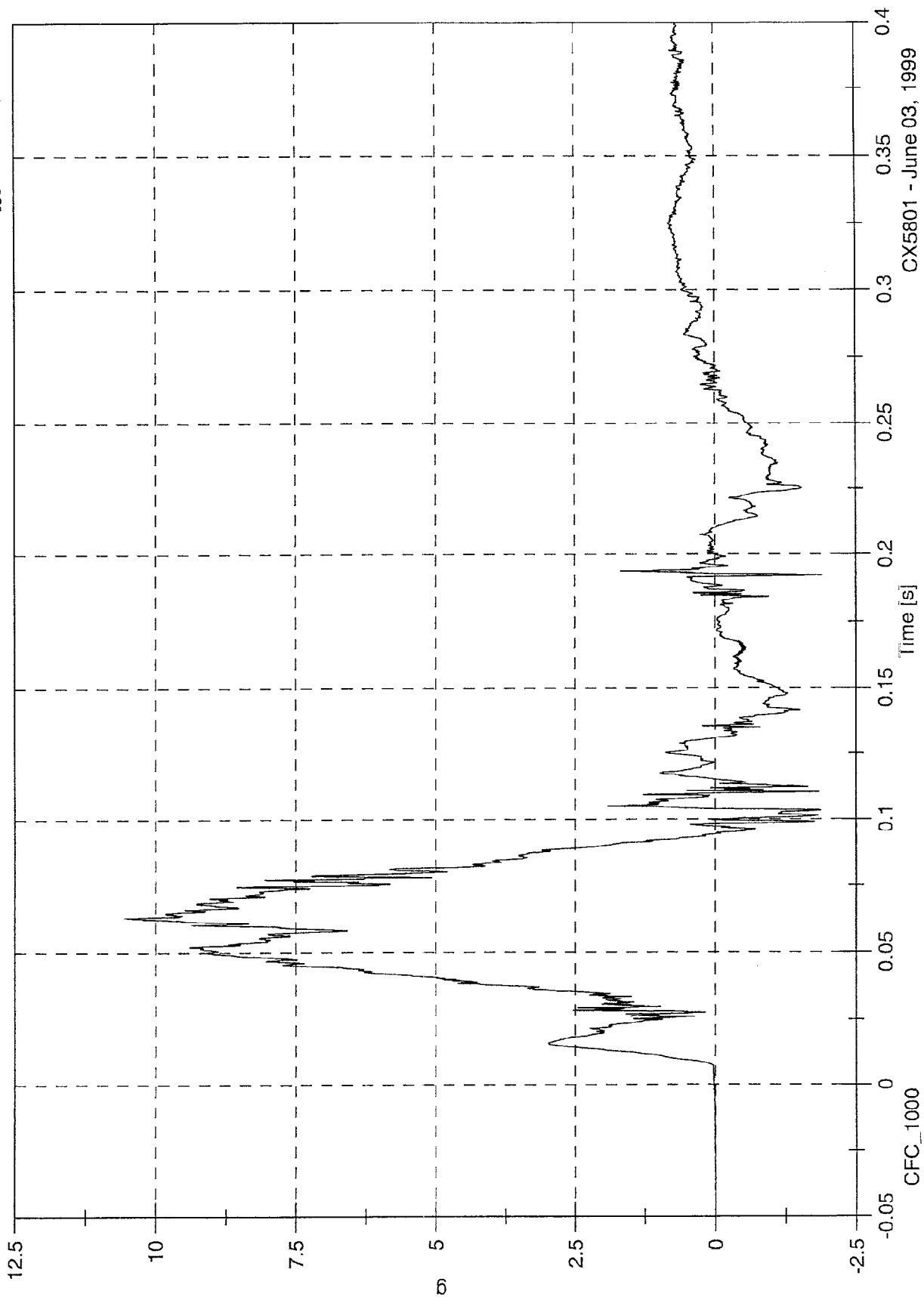
CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX580i

imax: i0.6 [g] at 0.063 [s]

Min: -1.9 [g] at 0.192 [s]

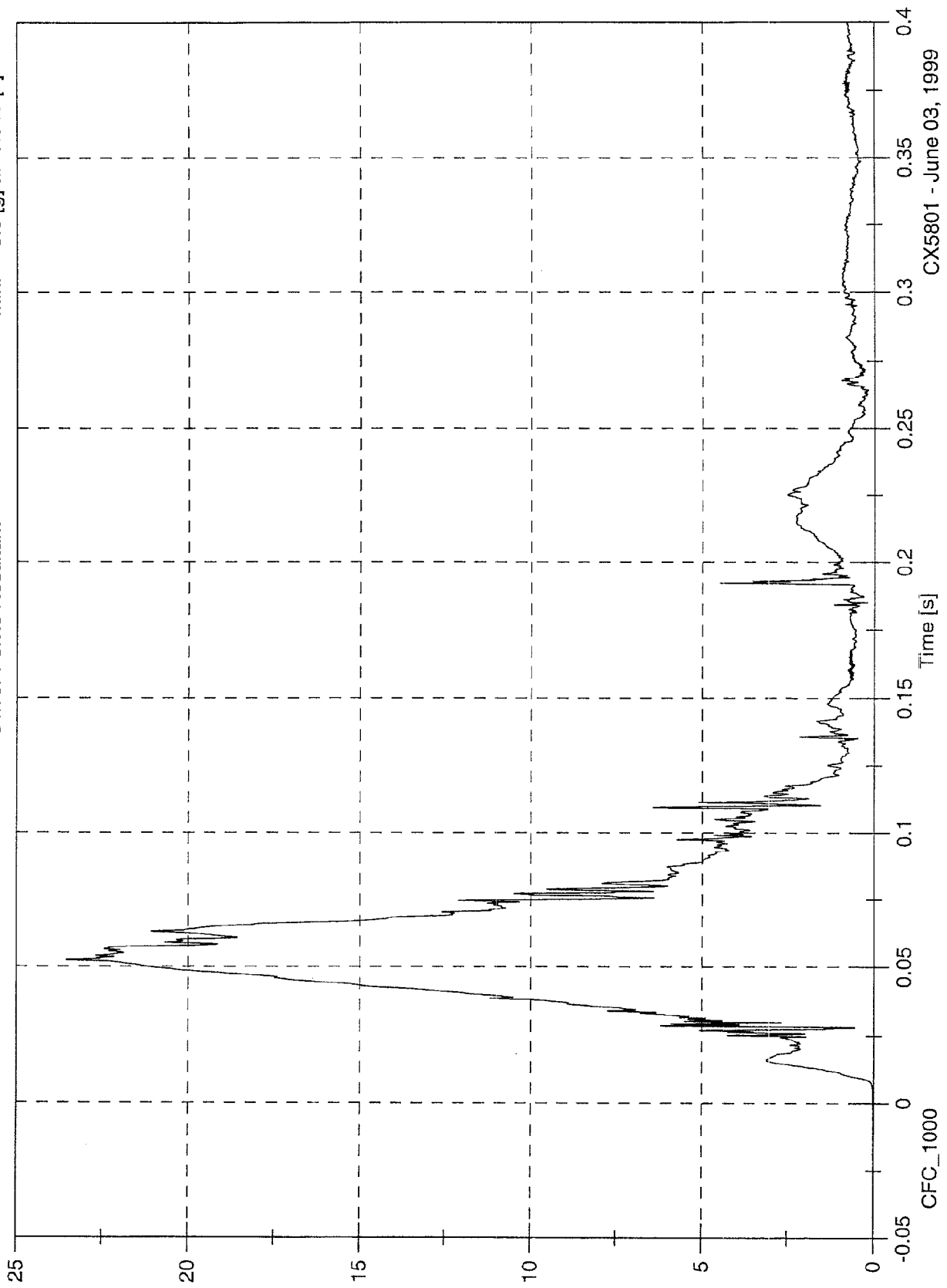
Driver Pelvic Z



301 Test #5 1999 VW Beetle CX5801

Max: 23.5 [g] at 0.052 [s]
Min: 0.0 [g] at -0.048 [s]

Driver Pelvic Resultant

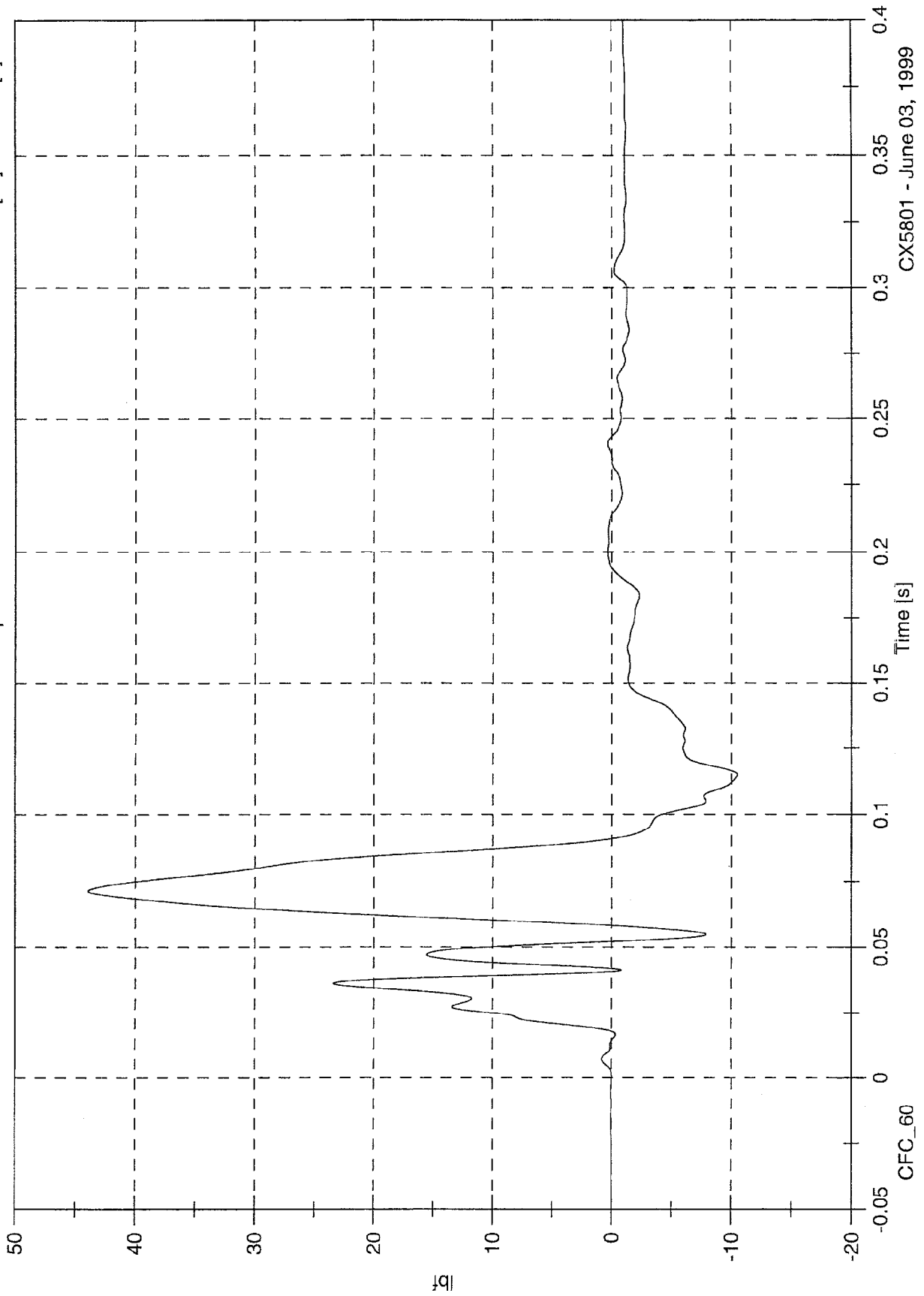


CX5801 - June 03, 1999

301 Test #5 1999 VW Beetle CX5801

Max: 44.0 [lbf] at 0.072 [s]
Min: -10.5 [lbf] at 0.115 [s]

Driver Lap Belt Load



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301 Test #5 1999 VW Beetle CX5801

Max: 0.1 [in] at 0.014 [s]
Min: -10.2 [in] at 0.229 [s]

