V3418

REPORT NUMBER: 301-CAL-00-08

SAFETY COMPLIANCE TESTING FOR FMVSS 301 FUEL SYSTEM INTEGRITY

ISUZU MOTORS LIMITED
2000 ISUZU RODEO
4-DOOR SUV

NHTSA NUMBER: CY5700

VERIDIAN TEST NUMBER: 8480-18

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

July 13,2000

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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Approval Date: August 11, 2000

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: _____

Acceptance Date: _____

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
301-CAL-00-08		

4. Title and Subtitle	5. Report Date
Final Report of FMVSS 301 Compliance Testing of a 2000 Isuzu Rodeo 4-door SUV NHTSA No. CY5700	July 13,2000
	6. Performing Organization Code: CAL

7. Author(s)	8. Performing Organization Report No.
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9. Performing Organization Name and Address	10. Work Unit No.
Veridian Engineering 4455 Genesee Street Buffalo, New York 14225	11. Contract or Grant No.: DTNH22-95-D-11000

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-30) 400 Seventh St , S.W., Rm. 6115, Washington, D.C. 20590	Final Test Report July 2000
	14. Sponsoring Agency Code: NEF-30

15. Supplementary Notes

16. Abstract

Compliance tests were conducted on the subject 2000 Isuzu Rodeo 4-door SUV 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.

The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity."

17. Key Words	18. Distribution Statement
Compliance Testing Safety Engineering FMVSS 301	Copies of this report are available from: NHTSA Technical Reference Division Room 5108 (NAD-52), 400 Seventh , S.W., Washington, D.C. 20590 Telephone No. (202) 366-4946

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	87	

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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. DTNH22-95-D-11000. The purpose of this test was to determine if the subject vehicle, a 2000 Isuzu Rodeo 4-door SUV, 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

A 4591 pound 2000 Isuzu Rodeo 4-door SUV was impacted from the rear by a 3961 pound moving barrier at a velocity of 29.1 mph. The test was performed by Veridian Engineering on July 13,2000.

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 (280 pounds) was secured in the vehicle cargo area.

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. 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 21.1 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 10.7 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.: CY5700 Test Mode: 30 mph Rear Barrier

Test Date: July 13,2000 Time: 15:00 Temperature : 71 °F

Vehicle Make/Model/Body Style: 2000 Isuzu Rodeo 4-door SUV

Vehicle Test Weight: 4591 lbs Impact Velocity: 29.1 mph

Static Crush: Left Side = 9.9 inches

Right Side = 8.7 inches

Centerline = 13.4 inches

Average Crush: 10.7 inches

TYPE OF FRONT OCCUPANT RESTRAINT SYSTEM INSTALLED IN TEST VEHICLE:

Driver's DSP: 3-point belt system with airbag

Right Passenger's DSP: 3-point belt system with airbag

VISIBLE DUMMY CONTACT POINTS:

Driver: Back of head to seat head rest

Passenger: Back of head to seat head rest

DOOR OPENING DATA: Closed / Operable - Left Front

Closed / Operable - Right Front

Stoddard Solvent Spillage from Vehicle's Fuel System: None

Remarks: The driver seat back reclined approximately 26 degrees during the impact.

Table 2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2000 Isuzu Rodeo 4-door SUV

NHTSA No.: CY5700 ; VIN: 4S2DM58W5Y4321567 ; Color: Black

Engine Data: 6 cylinders; - CID; 3.2 Liters; - cc

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

Transmission Data: 4 speeds; - Manual; x Automatic; x Overdrive

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

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

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

Date Received: 6/26/00 ; Odometer Reading 64 miles

Selling Dealer: Not available

& Address: xx

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Isuzu Motors Limited

Date of Manufacture: 1-00

GVWR: 5200 lbs.; GAWR: 2500 lbs. FRONT; 2900 lbs. REAR

DATA FROM TIRE PLACARD:

Location of Placard on Vehicle: Left side door pillar

Tire Pressure with Maximum Capacity Vehicle Load: 26 psi FRONT 26 psi REAR

Recommended Tire Size: P245/70R16

* Recommended Cold Tire Pressure: 26 psi FRONT; 26 psi REAR

Size of Tires on Test Vehicle: P245/70R16

Type of Spare Tire: Full

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) = 1223 lbs.

No. of Occupants x 150 lbs. = 750 lbs.

Rated Cargo/Luggage Weight (RCLW) = 473 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 =	1061 lbs.	Right Rear =	903 lbs.
Left Front =	1084 lbs.	Left Rear =	929 lbs.
TOTAL FRONT =	2,145 lbs.	TOTAL REAR =	1,832 lbs.

TOTAL DELIVERED WEIGHT = 3,977 lbs.

% of Total Front of Vehicle Weight = 54 % of Total Rear Weight = 46 %

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight =	3,977 lbs.	
Rated Cargo/Luggage Weight (RCLW) =	300* lbs.	* 300 lb maximum
Weight of 2 p.572 Dummies, 167 & 164 lbs =	331 lbs.	
TARGET TEST WEIGHT =	4,608 lbs.	

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 283 POUNDS OF CARGO WEIGHT:

Right Front =	1259 lbs.	Right Rear =	1007 lbs.
Left Front =	1296 lbs.	Left Rear =	1029 lbs.
TOTAL FRONT =	2,555 lbs.	TOTAL REAR =	2,036 lbs.

TOTAL TEST WEIGHT = 4,591 lbs.

% of Total Front Weight = 55.7 % % of Total Rear Weight = 44.3 %

* Weight of Ballast Secured in Vehicle Trunk Area = 280 lbs.

Type of Ballast: Lead shot

Method of Securing Ballast: Tied down and compartment placement

Vehicle Components Removed for Weight Reduction: none

VEHICLE ATTITUDE (all dimension in inches):

AS DELIVERED:	RF	34.1	LF	33.5	RR	34.1	LR	34.1
AS TESTED:	RF	32.8	LF	32.3	RR	33.8	LR	33.3

Vehicle's Wheel Base: 106.5 in.

Location of Vehicle's C.G.: 47.2 inches rearward of front wheel center.

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 21.1 gallons

Usable Capacity Figure Furnished by COTR = 21.1 gallons

Test Volume Range (91 to 94% of Usable Capacity) = 19.2 to 19.8 gallons

ACTUAL TEST VOLUME= 19.5 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 on left side aft of rear axle, fuel lines run along left frame rail and fuel tank is centered fore of rear axle.

Table 3

MOVING BARRIER PARAMETER DATA

WEIGHT OF MOVING BARRIER:

Right Front	=	1113 lbs.	Right Rear	=	868 lbs.
Left Front	=	1102 lbs.	Left Rear	=	878 lbs.
TOTAL FRONT	=	2,215 lbs.	TOTAL REAR	=	1,746 lbs.

TOTAL BARRIER WEIGHT = 3,961 lbs.

MOVING BARRIER DIMENSIONS:

Barrier Face Height: 60.0 in.

Barrier Face Width: 78.0 in.

Barrier Face Ground Clearance: 5.0 in.

Tread Width: 59.5 in.

Wheel Base: 120.0 in.

Location of C.G.:

X: 52.9 inches rearward of front wheel center.

Y: 0.0 inches from longitudinal-vertical plane of symmetry.

Z: 16.3 inches above ground.

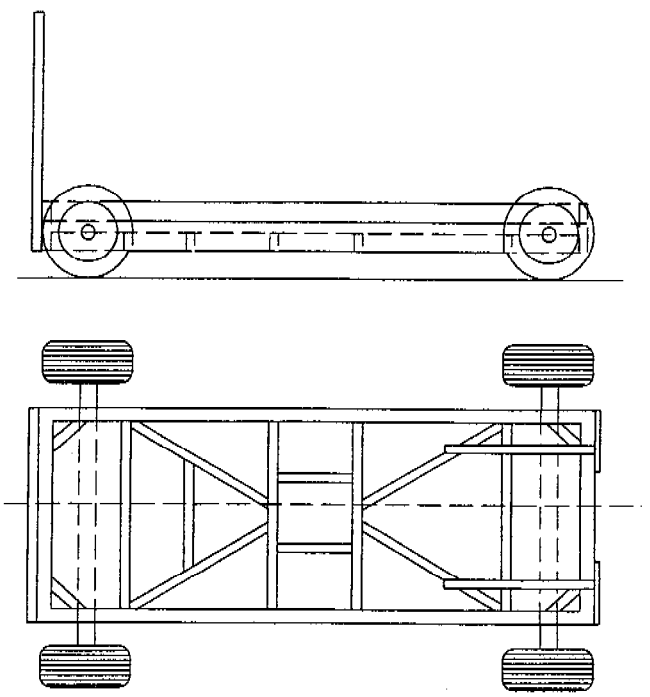


Table 4

POST IMPACT DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°

Test Date: July 13,2000 Time: 15:00 Temperature: 71 °F

Vehicle NHTSA No.: CY5700

Required Impact Velocity Range: 28.9 to 29.9 mph

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

Trap No. 1 = 29.1 mph; Trap No. 2 = 29.1 mph

Average Impact Speed = 29.1 mph

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

Vehicle Length:

Pre-Test	Right =	173.1	; C/L =	183.7	;Left =	173.4
Post-Test	Right =	164.4	; C/L =	170.3	;Left =	163.5
Crush	Right =	8.7	; C/L =	13.4	;Left =	9.9

AVERAGE = 10.7 inches

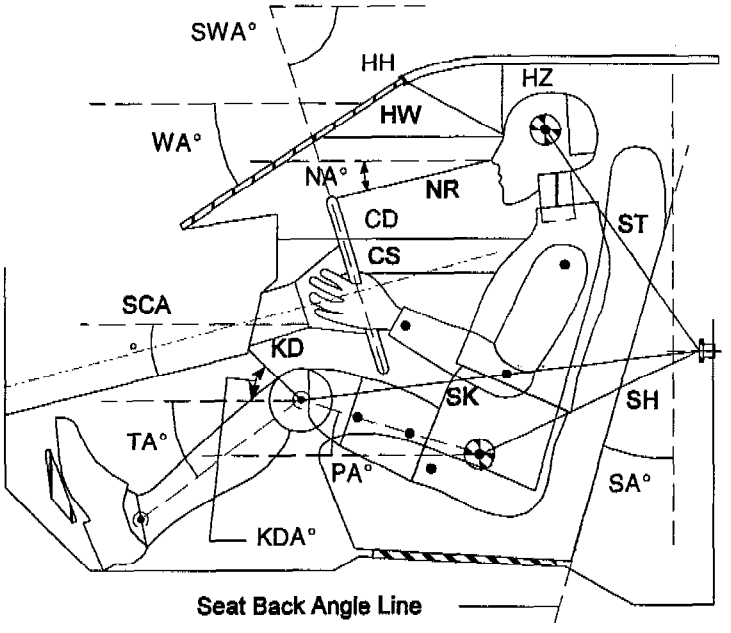
Section 3

COMPLIANCE TEST DATA

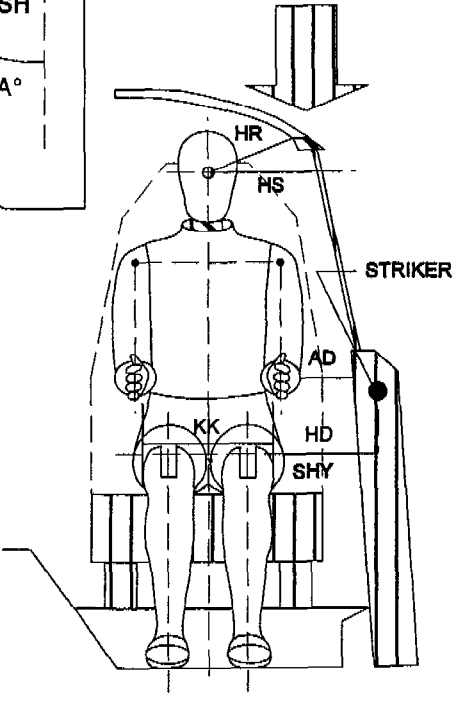
Figure 1

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

DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



AD - Arm to Door
HD - H-Point to Door
HR - Head to Side Header
HS - Head to Side Window
KK - Knee to Knee
SHY- Striker to H-Point (Y Direction)



CD - Chest to Dash
CS - Steering Wheel to Chest
HH - Head to Header
HW - Head to Windshield
HZ - Head to Roof
KDA - Knee to Dash Angle
KDL - Left Knee to Dash
KDR - Right Knee to Dash
NA - Nose to Rim Angle
NR - Nose to Rim
PA - Pelvic Angle
RA - Rim to Abdomen
SA - Seat Back Angle
SCA - Steering Column Angle
SH - Striker to H-Point
SK - Striker to Knee
ST - Striker to Head
SWA - Steering Wheel Angle
TA - Tibial Angle
WA - Windshield Angle

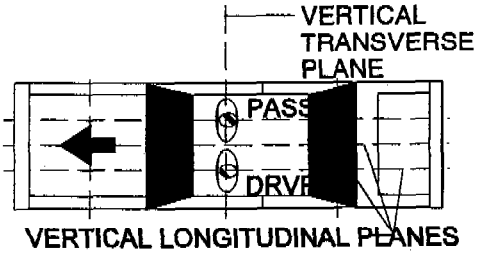


Table 5

FRONT SEAT OCCUPANT MEASUREMENTS
(FOR REAR IMPACT ONLY)

	DRIVER (Serial #116)		
WA°	38 deg.		
SWA°	63 deg.		
SCA°	27 deg.		
SA°	8 deg.		
HZ	8.4		
HH	13.3		
HW	19.9		
HR	10.6		
NR	15.1	Angle	12 deg.
CD	19.8		
CS	11.9		
RA	8.5		
KDL	5.5	Angle (KDA)	29 deg.
KDR	5.5		
PA°	23 deg.		
TA°	55 deg.		
KK	9.6		
ST	23.1	Angle	22 deg.
SK	27.4	Angle	0 deg.
SH	12.0	Angle	22 deg.
SHY	8.9		
HS	8.7		
HD	7.1		
AD	3.8		

(Measurements in inches)

Table 6
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CY5700 TEST DATE: July 13,2000

Vehicle Mfgr./Make/Model: 2000 Isuzu Rodeo 4-door SUV

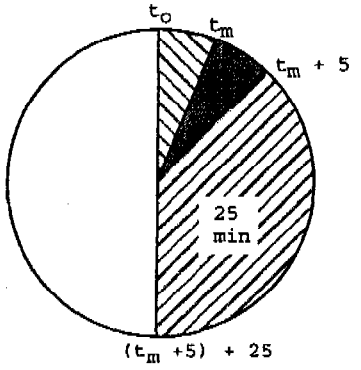
Test vehicle fuel tank filled to 91% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

****

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:

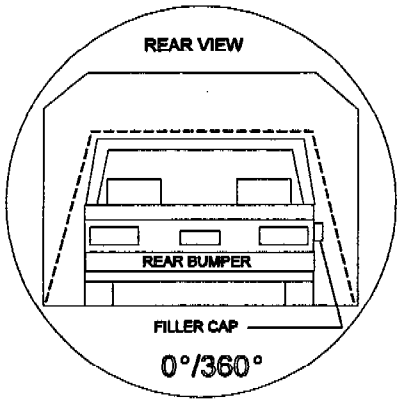
None

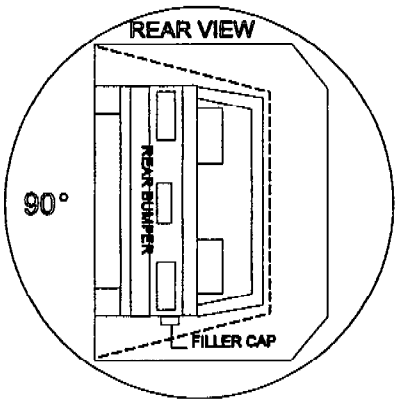
Table 7

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE :
0-90 Deg.

Vehicle NHTSA ID No. :
CY5700





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	12	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	12	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):

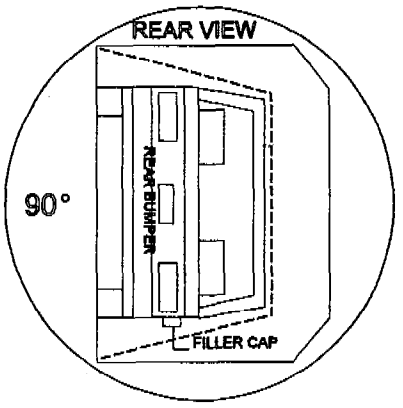
None

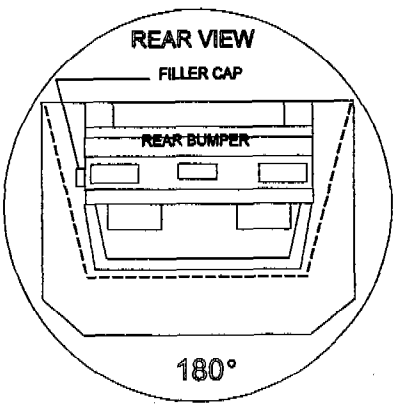
Table 7

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

TEST PHASE :
90-180 Deg.

Vehicle NHTSA ID No. :
CY5700





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	08 seconds
FMVSS 301 Position Hold Time +		5	minutes	00 seconds
	TOTAL	6	minutes	8 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):

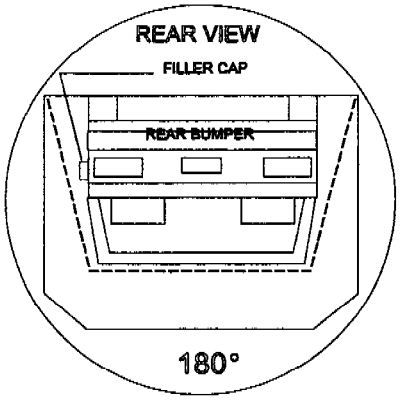
None

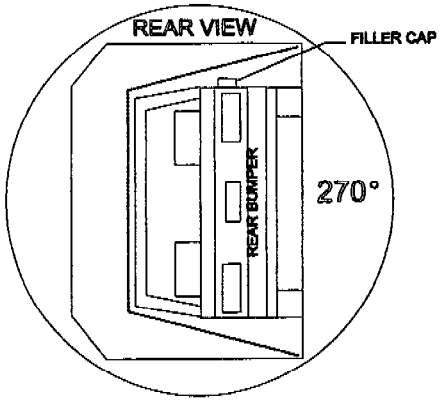
Table 7

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

TEST PHASE :
180-270 Deg.

Vehicle NHTSA ID No. :
CY5700





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)		1	minutes	19	seconds
FMVSS 301 Position Hold Time +		5	minutes	00	seconds
	TOTAL	6	minutes	19	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):

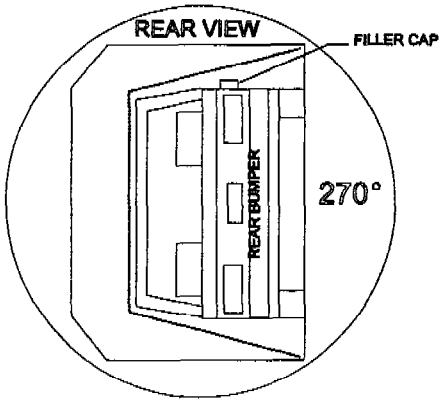
None

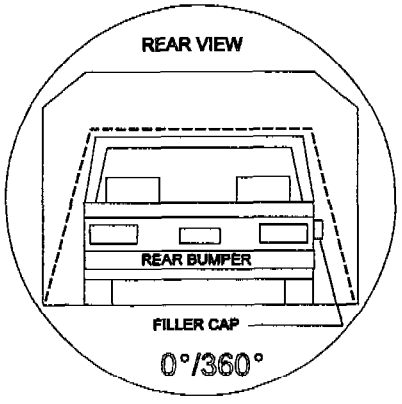
Table 7

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

TEST PHASE :
270-360 Deg.

Vehicle NHTSA ID No. :
CY5700





I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes)	1	minutes	15	seconds
FMVSS 301 Position Hold Time +	5	minutes	00	seconds
TOTAL	6	minutes	15	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

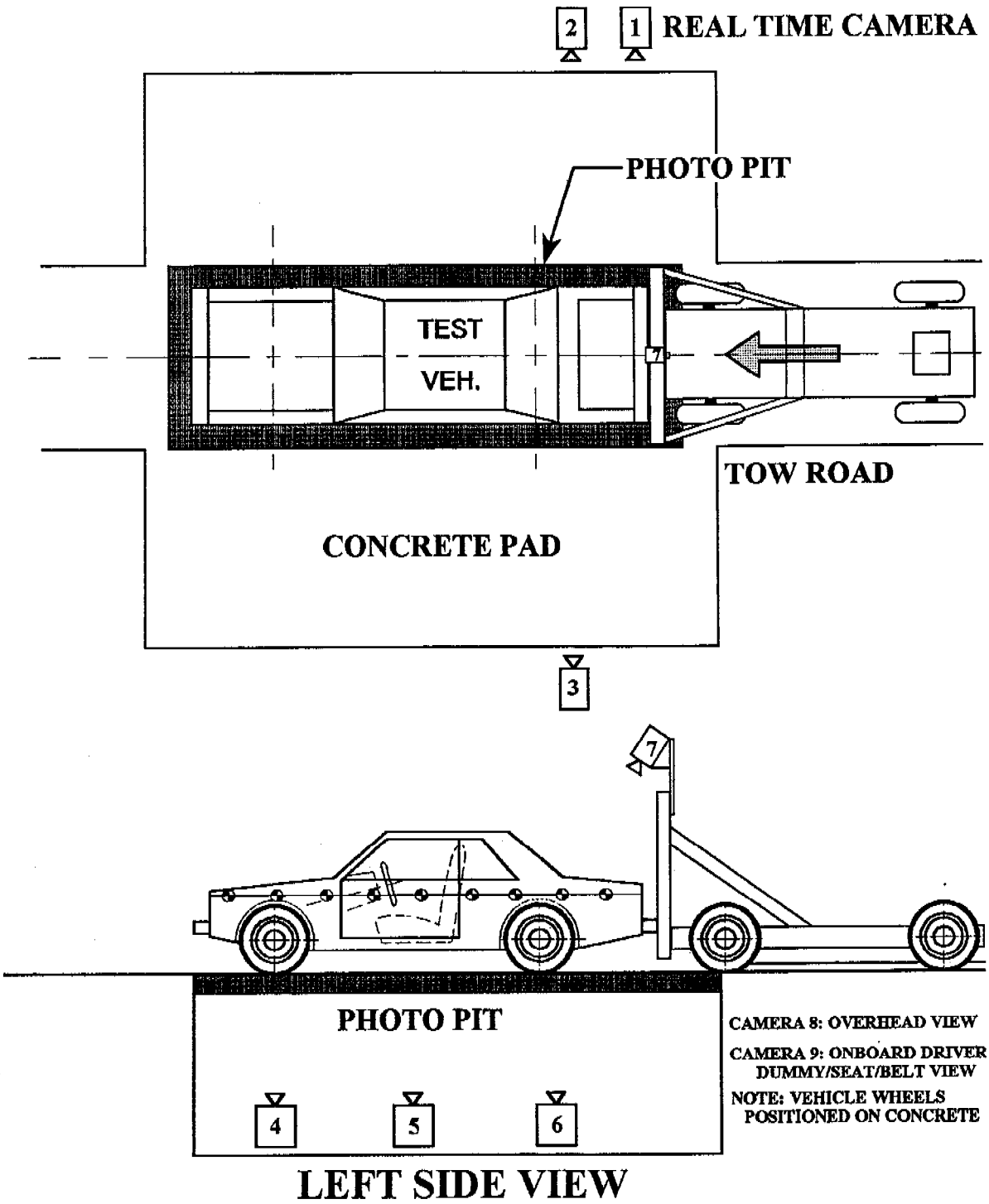


Table 8

HIGH-SPEED CAMERA LOCATIONS

NHTSA No. : CY5700 Vehicle : 2000 Isuzu Rodeo 4-door SUV

CAMERA NO.	VIEW	CAMERA POSITIONS (inches)*			ANGLE** (degrees)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time Camera	-	-	-	-	-	24
2	Right Side View	516	68.7	43.2	-1	25	1000
3	Left Side View	504.9	97.0	48.4	-1	25	1000
4	Vehicle Front Underbody View	0	139.5	-77	90	13	750
5	Vehicle Mid-Section Underbody View	0	82.0	-77	90	13	770
6	Vehicle Rear Underbody View	0	30.5	-77	90	13	750
7	Moving Barrier View	0	0	99	-105	13	1000
8	Overhead Overall View	-10	120	386	-90	13	990
9	Onboard Driver Dummy/Seat/Belt View	-	-	-	-	8	740

* 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

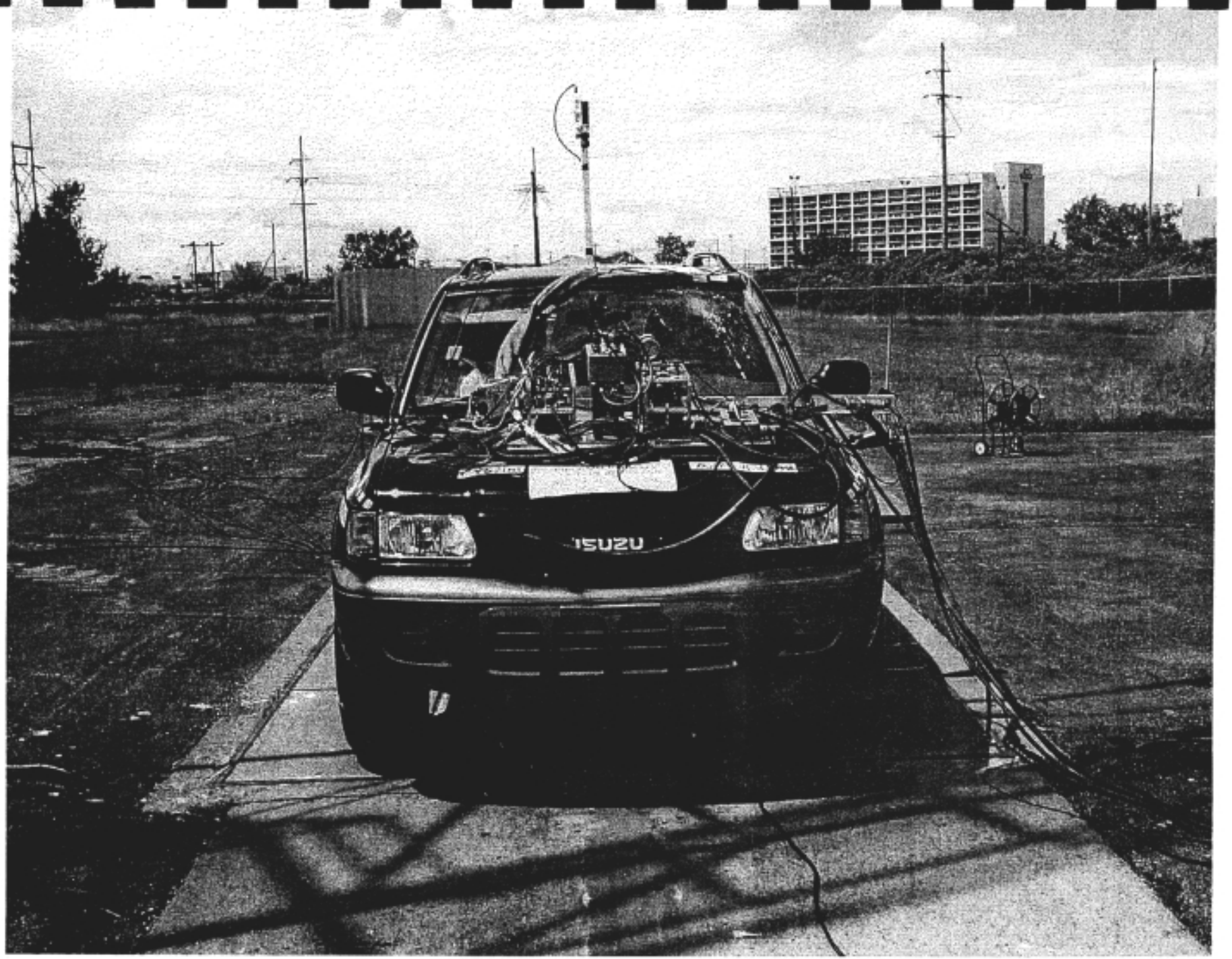


Figure A-1 PRE-TEST FRONT VIEW

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

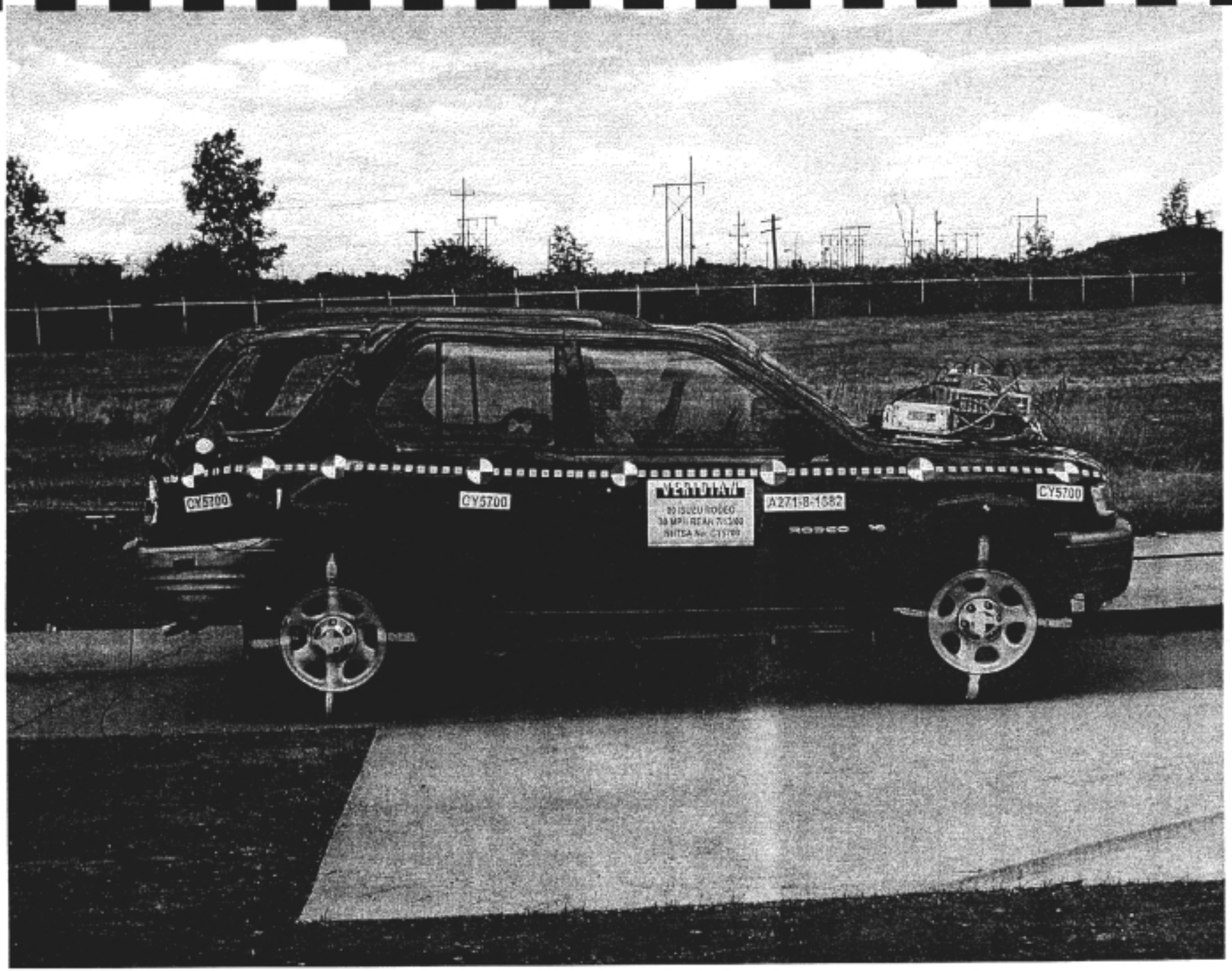


Figure A-6 POST-TEST RIGHT SIDE VIEW

Figure A-7 PRE-TEST REAR VIEW

Figure A-8 POST-TEST REAR VIEW

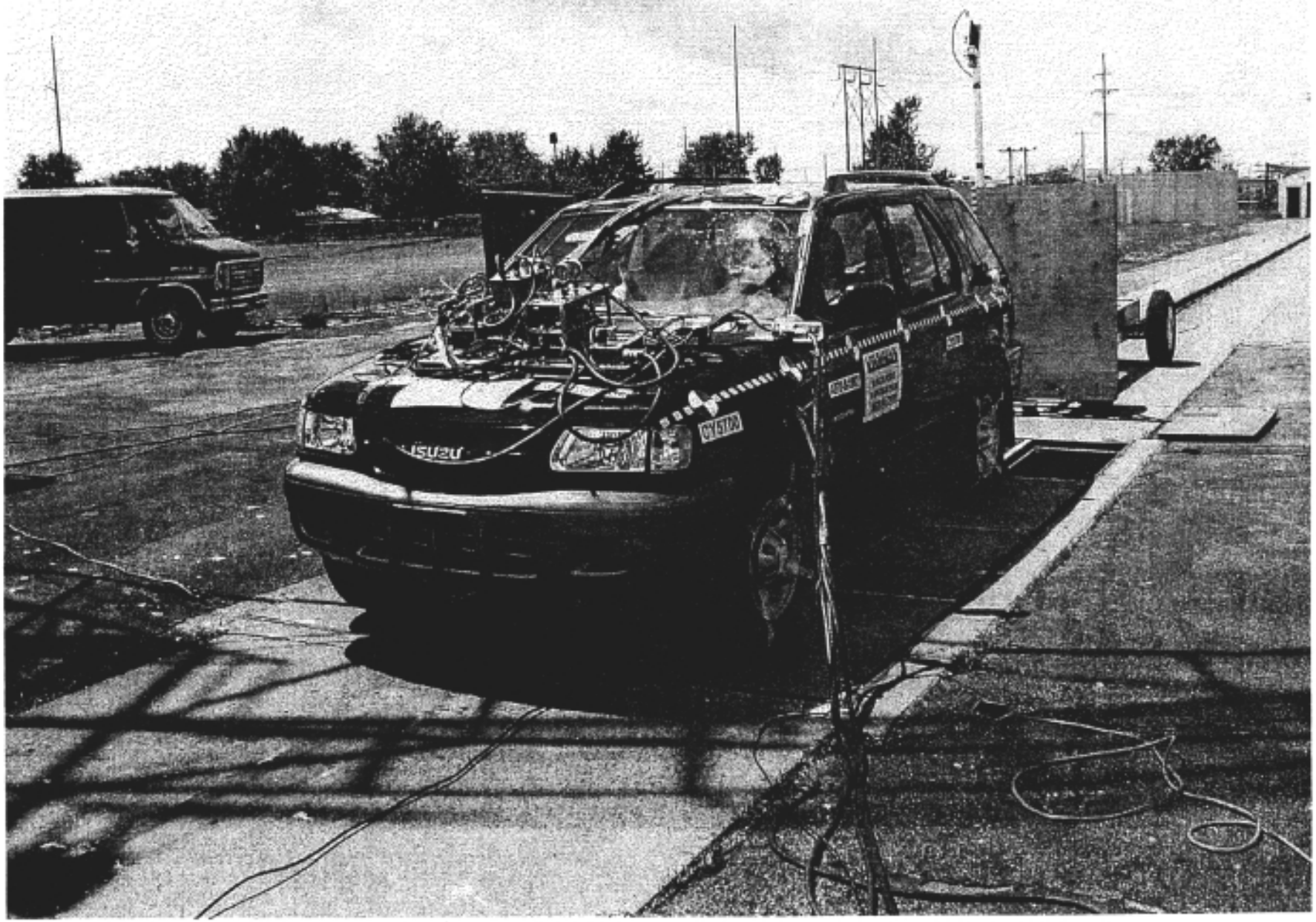


Figure A-9 PRE-TEST LEFT FRONT THREE-QUARTER VIEW

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

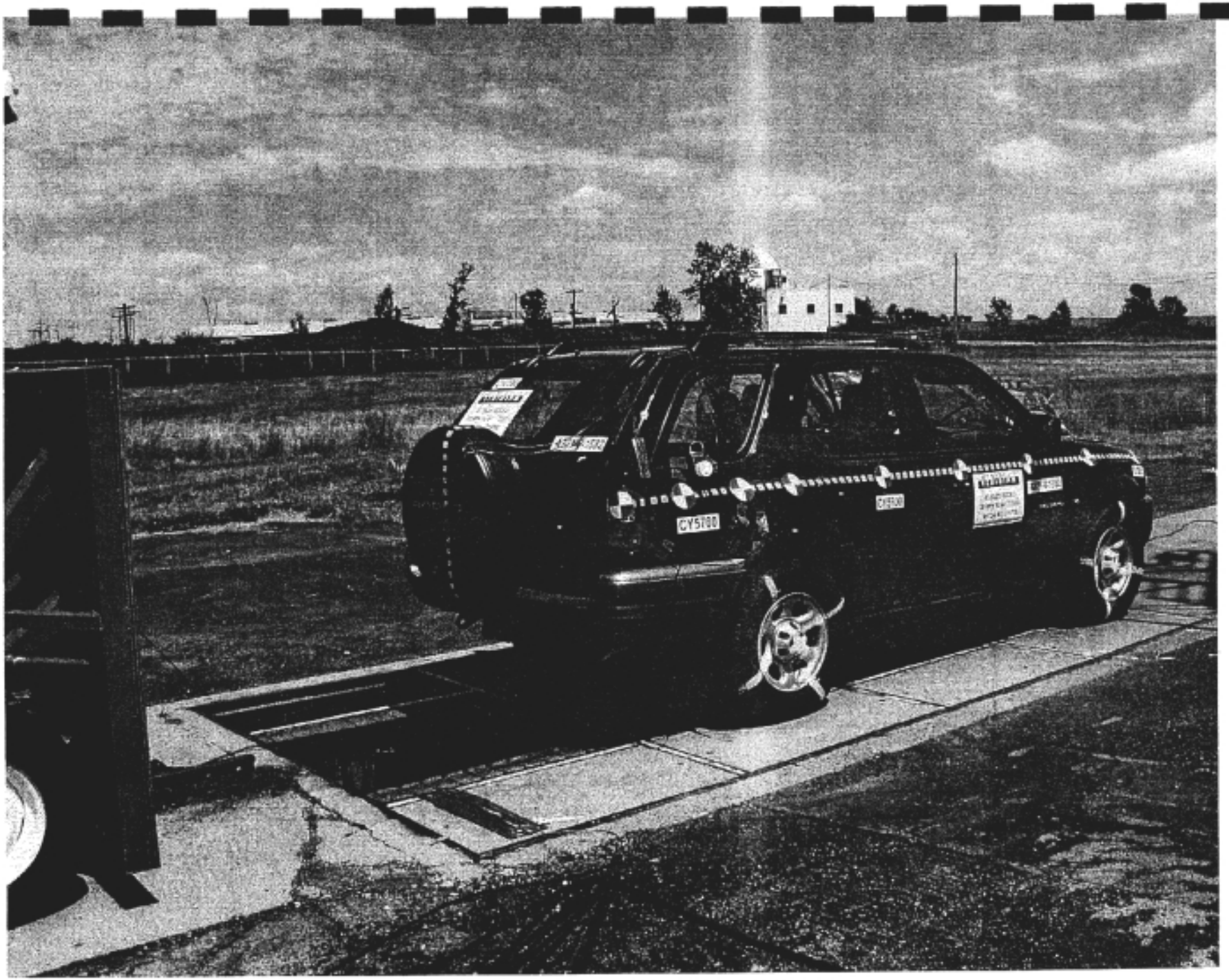


Figure A-11 PRE-TEST RIGHT REAR THREE-QUARTER VIEW

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

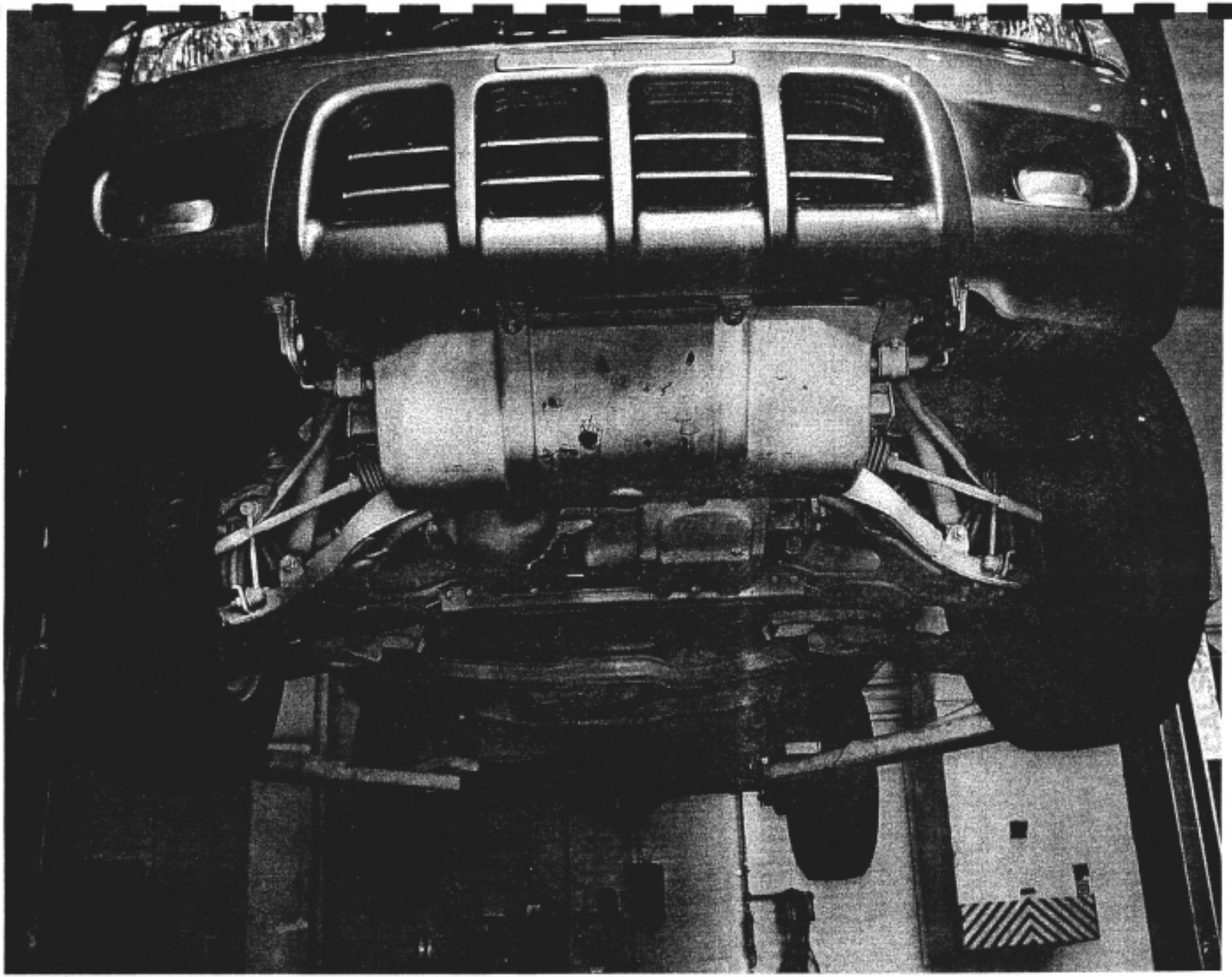


Figure A-13 PRE-TEST FRONT UNDERBODY VIEW

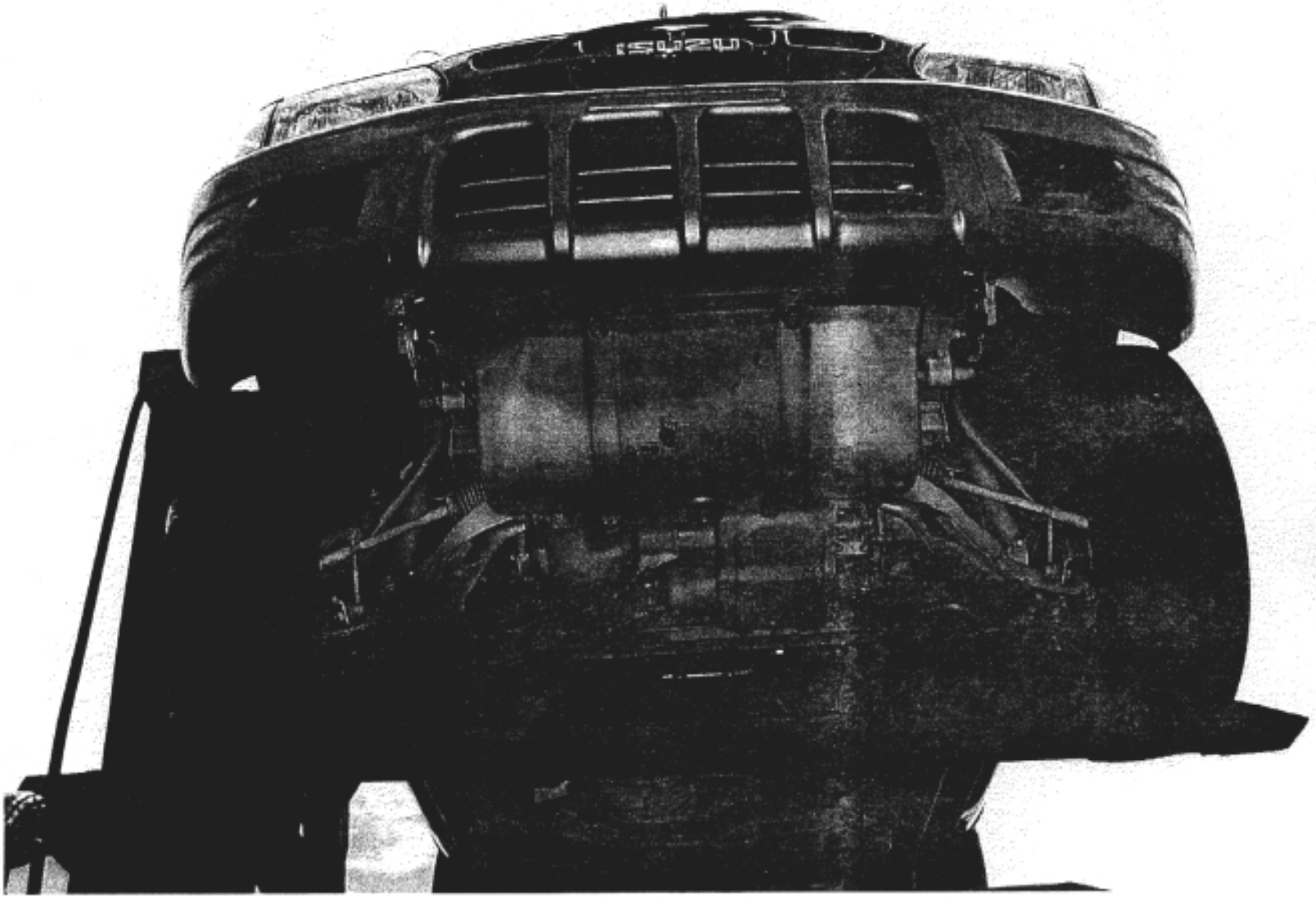


Figure A-14 POST-TEST FRONT UNDERBODY VIEW

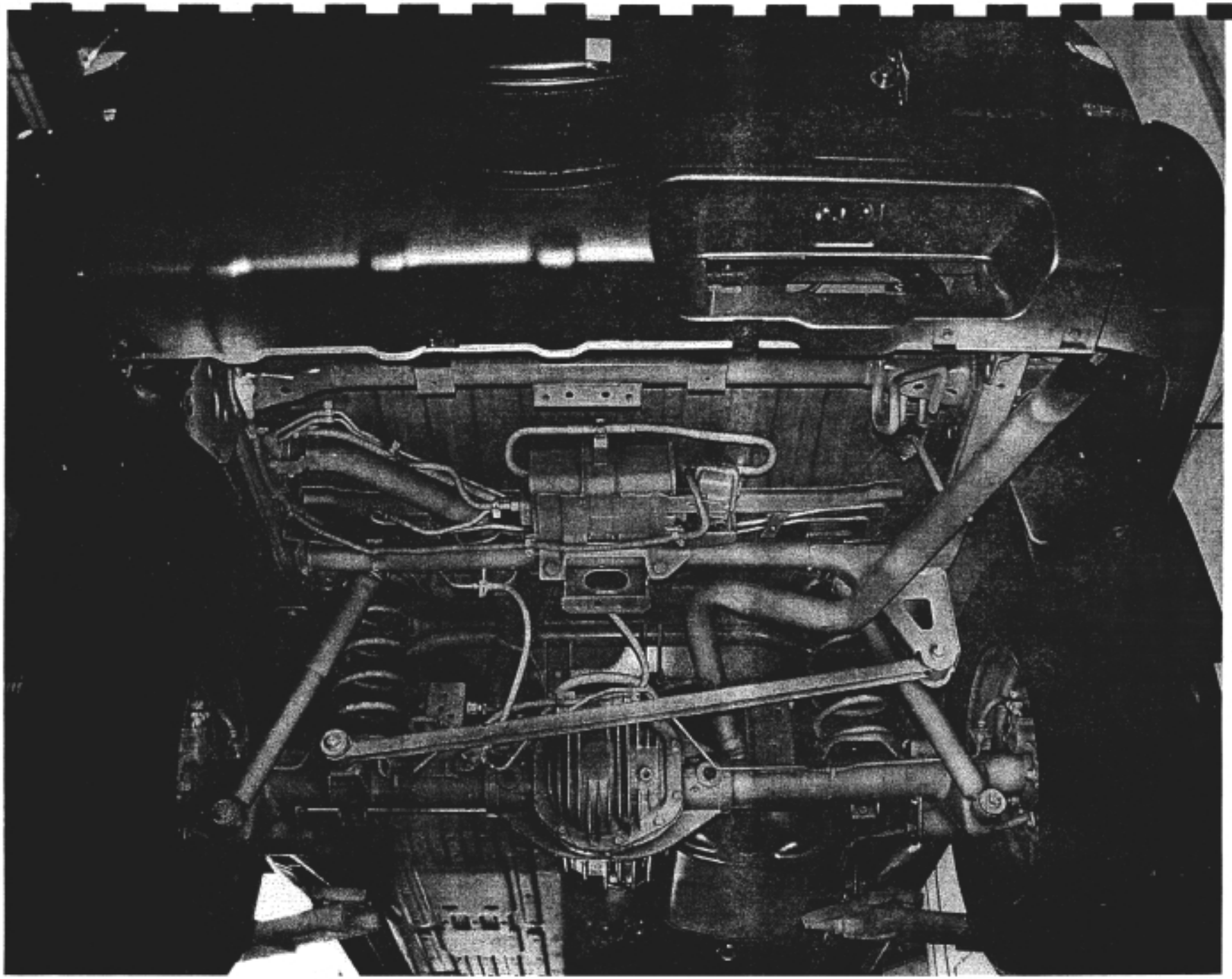


Figure A-15 PRE-TEST REAR UNDERBODY VIEW

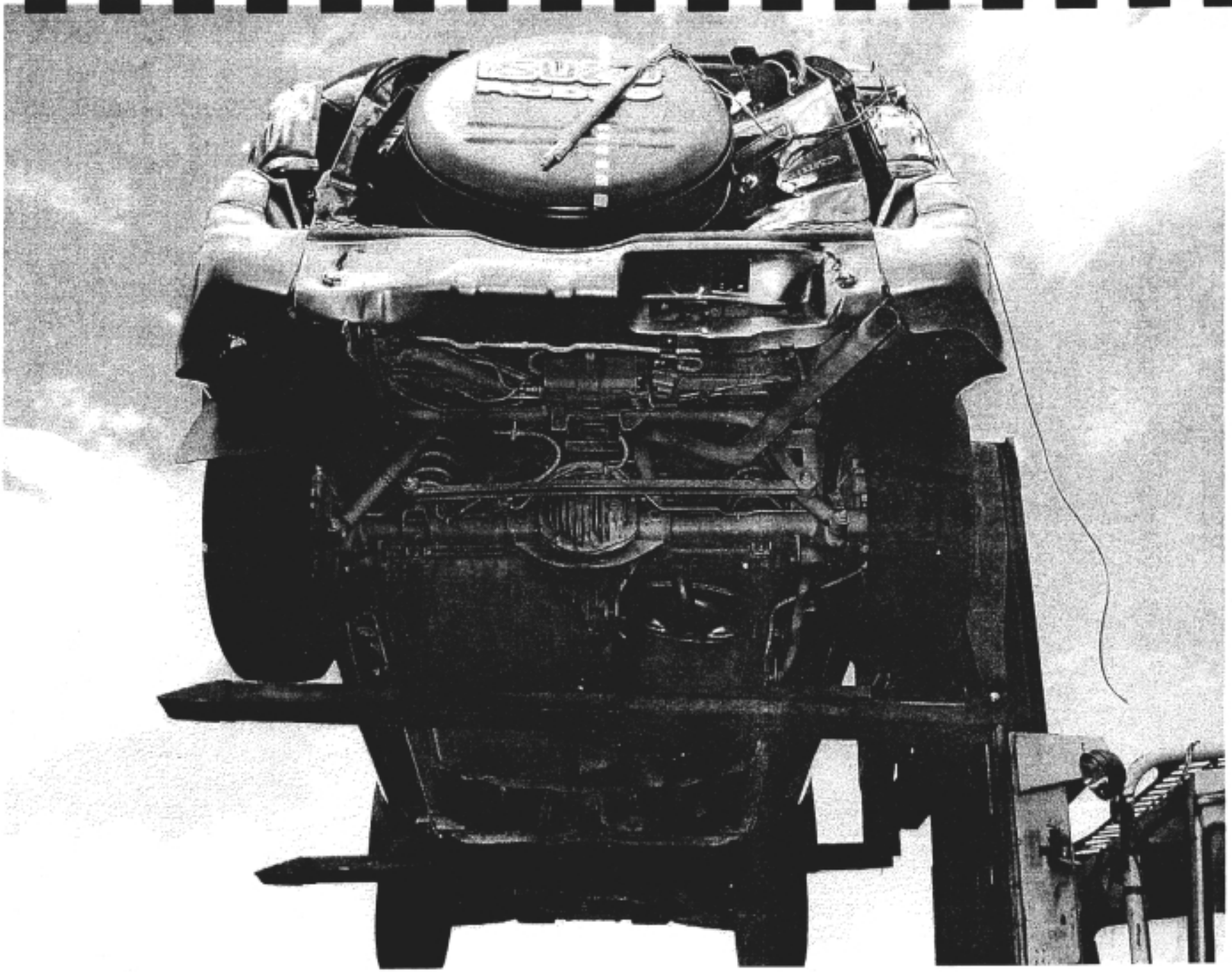


Figure A-16 POST-TEST REAR UNDERBODY VIEW

Tire Placard is the same as the Certification Placard

Figure A-18 TIRE PLACARD

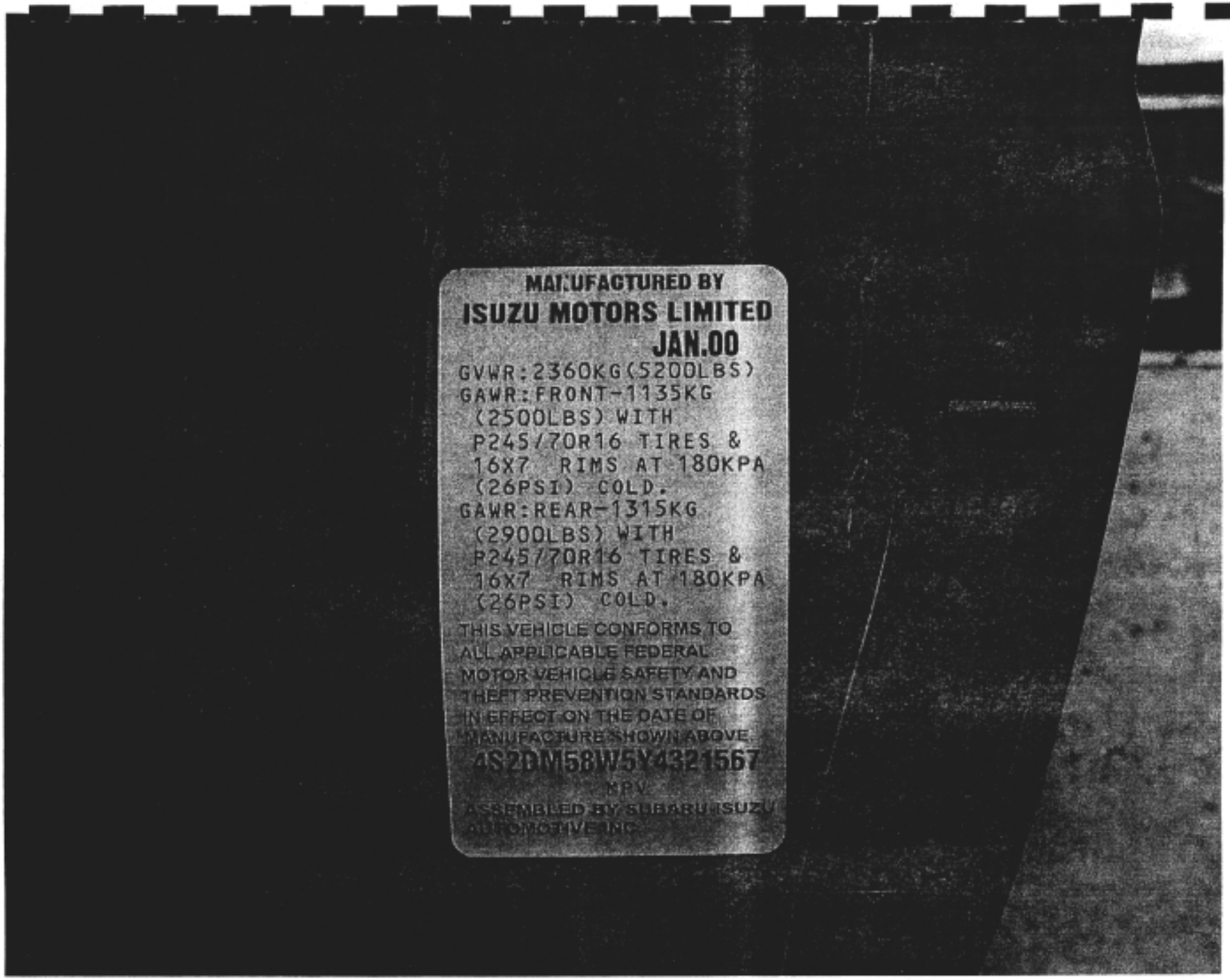


Figure A-17 CERTIFICATION PLACARD

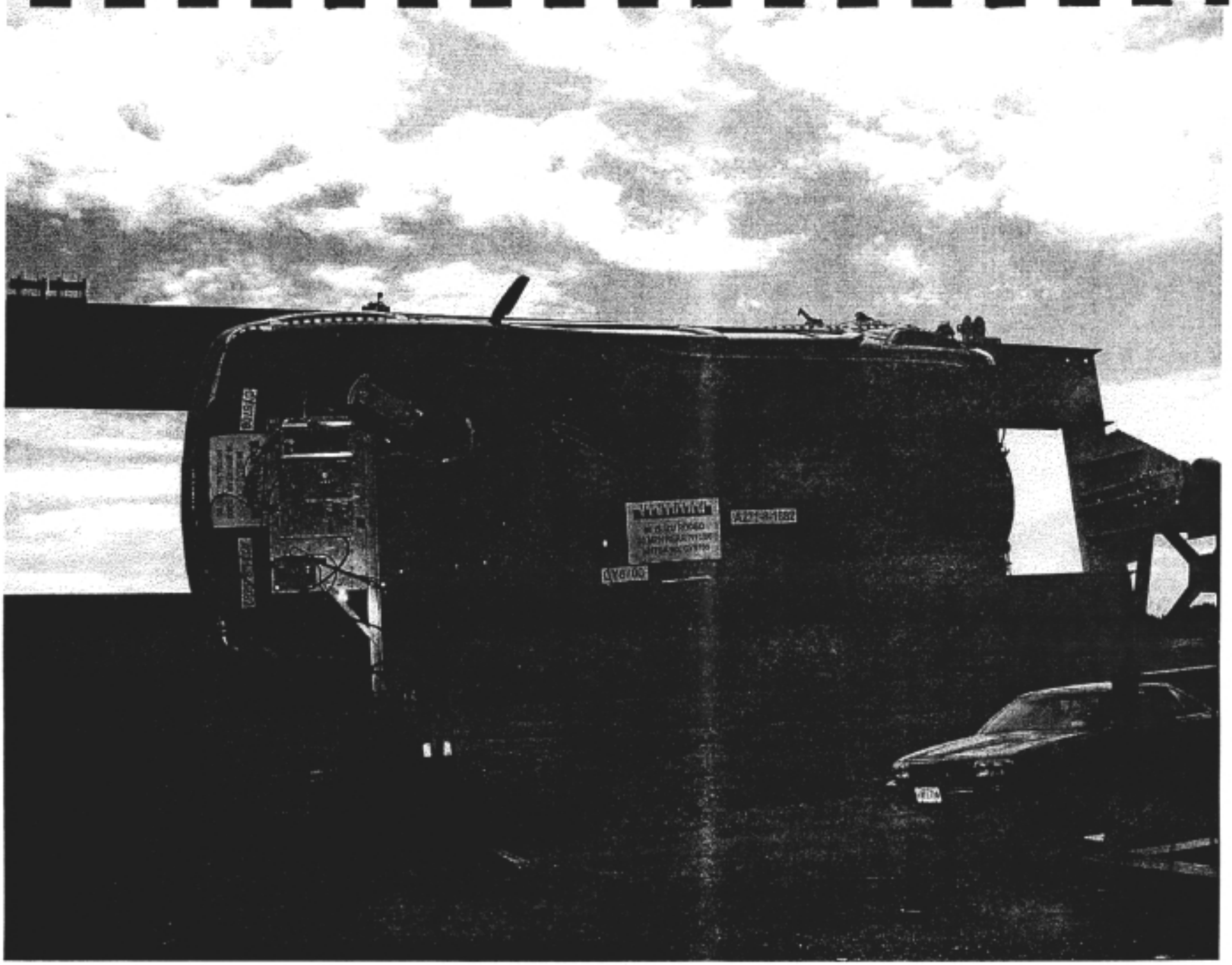


Figure A-19 ROLLOVER 90°

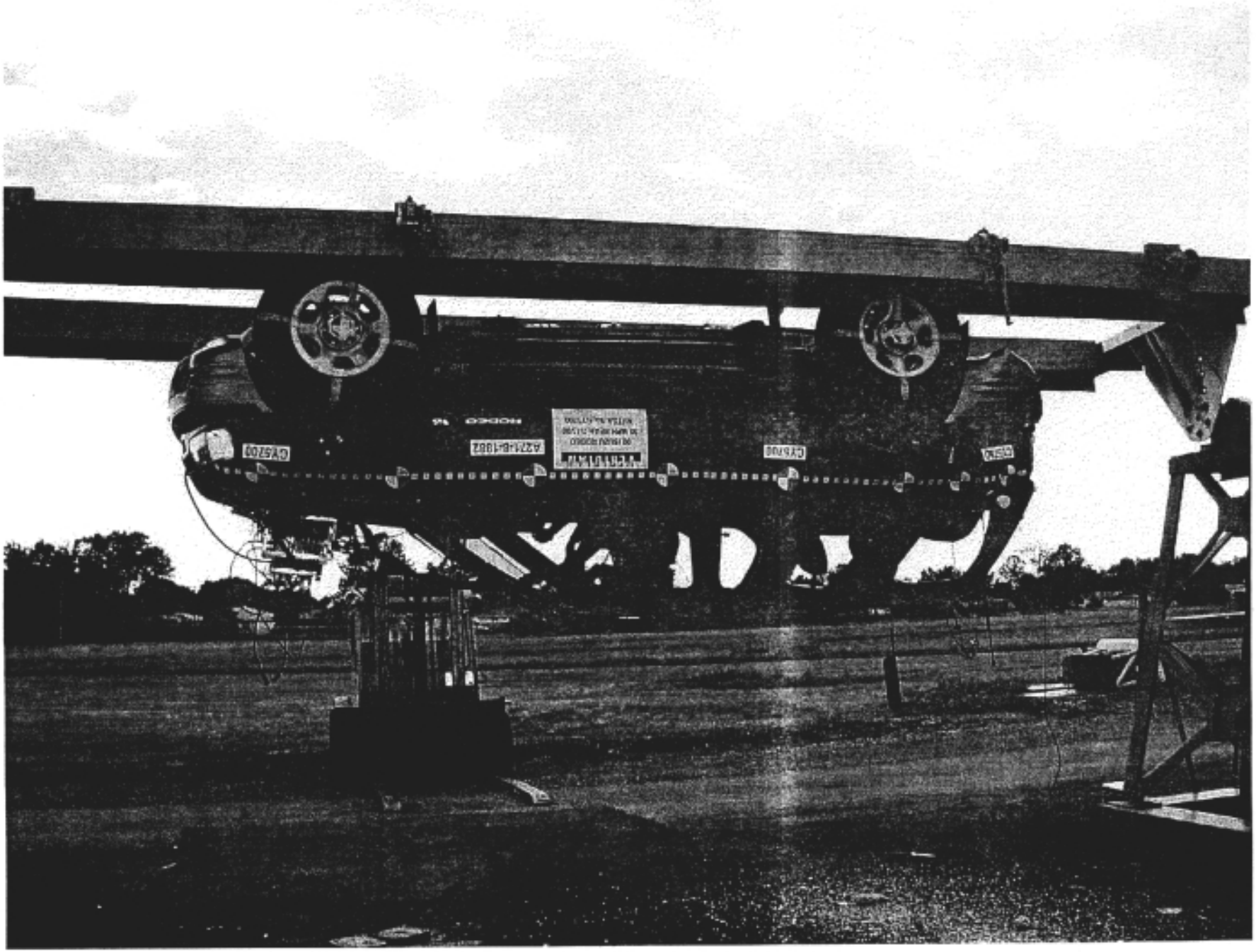


Figure A-20 ROLLOVER 180°

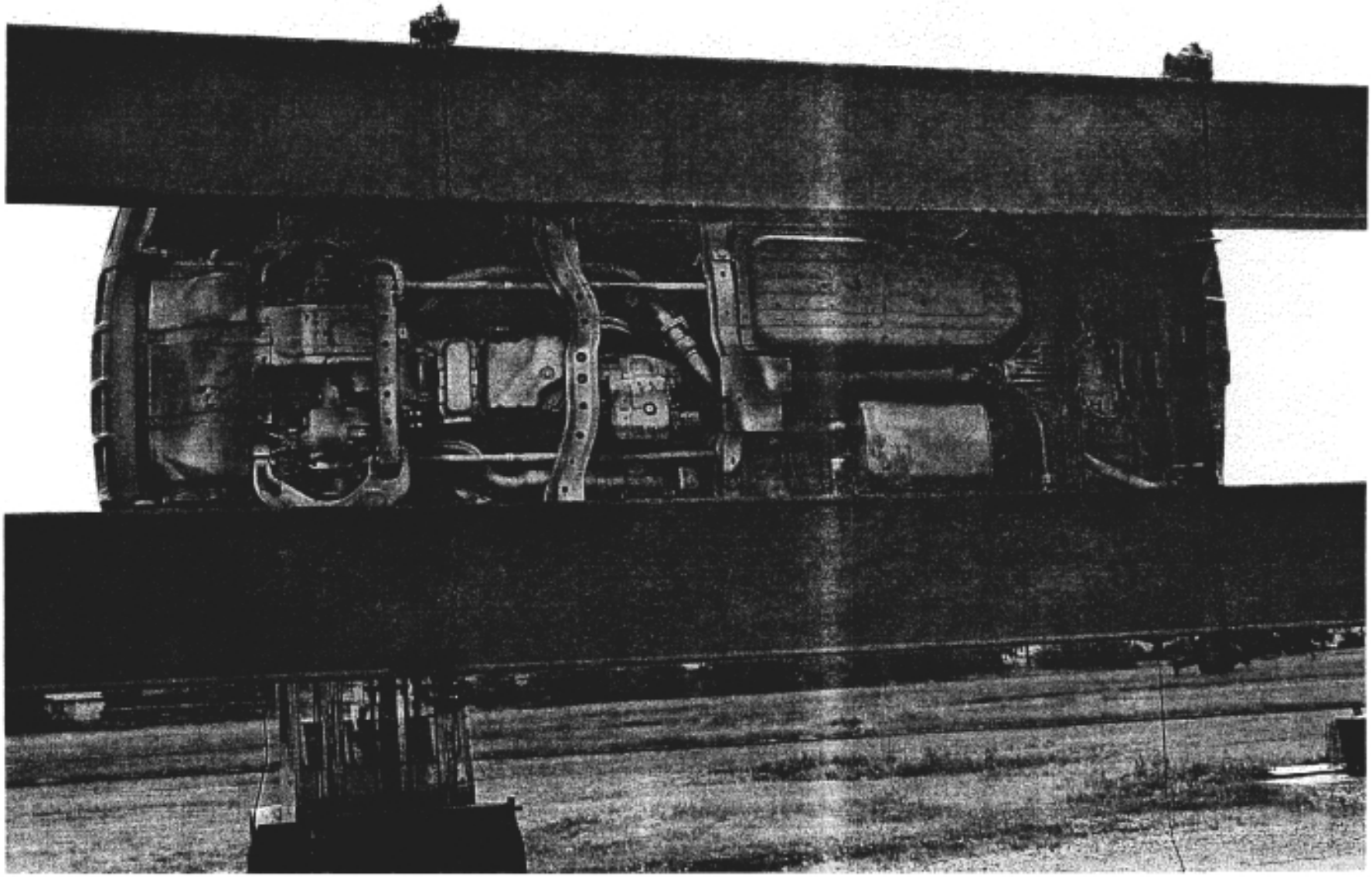


Figure A-21 ROLLOVER 270°

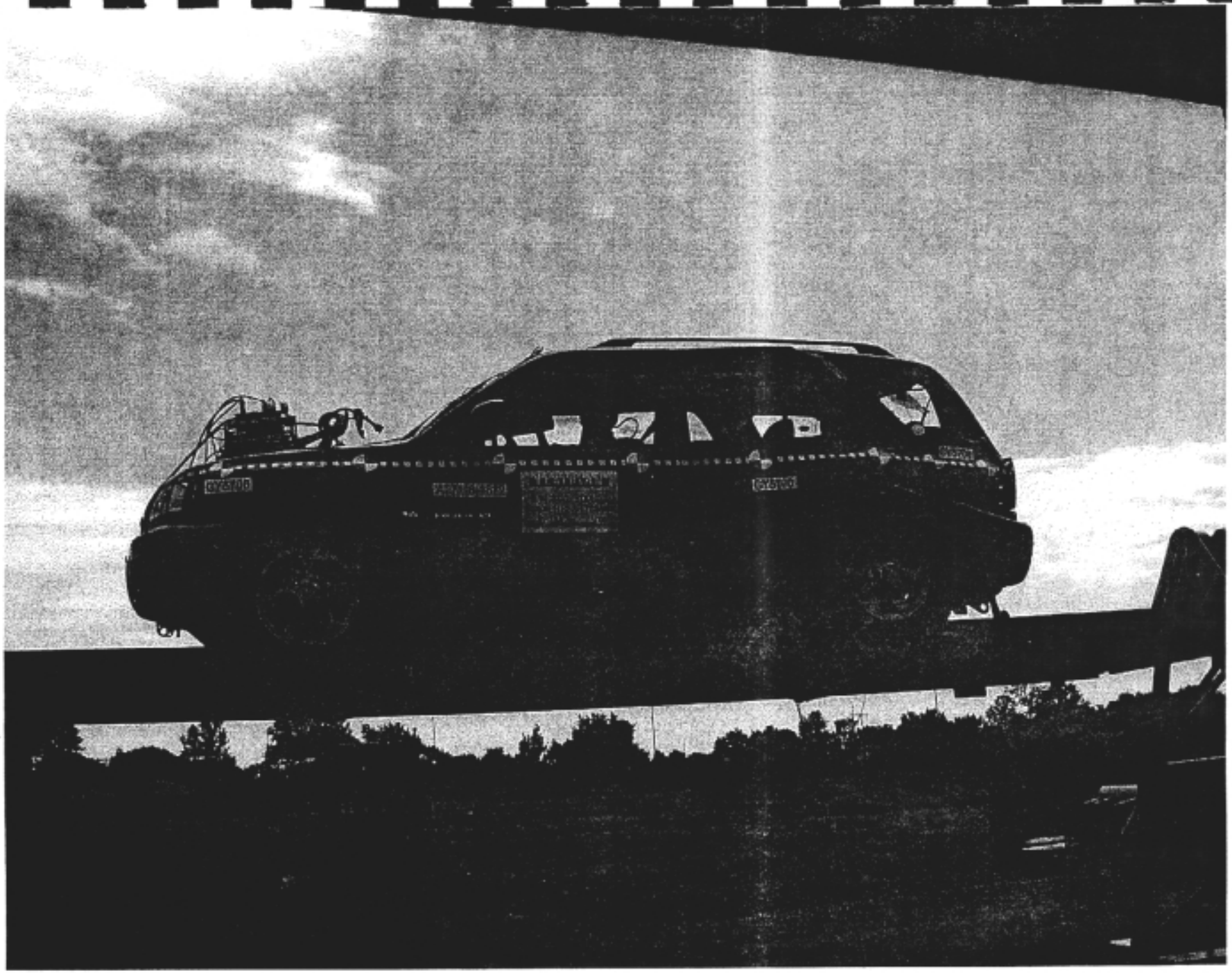


Figure A-22 ROLLOVER 360°

Appendix B

VEHICLE AND DUMMY RESPONSE DATA

(REAR IMPACT ONLY)

FACILITY: VERF DATE: July 13, 2000
TEST#: A271-0080
TITLE: NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo CY5700

CHN	NAME	Unit	Max	msec	Min	msec	Filt
25	P1 Head x	g	23.0	159.3	-2.4	342.7	CFC_1000
26	P1 Head y	g	1.7	95.7	-9.3	164.3	CFC_1000
27	P1 Head z	g	21.3	146.2	-0.5	342.1	CFC_1000
28	P1 Head Resultant	g	26.7	147.9	0.0	-28.0	CFC_1000
29	P1 Chest x	g	10.4	102.4	-3.4	161.3	CFC_180
30	P1 Chest y	g	2.2	151.9	-2.9	103.6	CFC_180
31	P1 Chest z	g	4.7	78.1	-1.5	148.9	CFC_180
32	P1 Chest Resultant	g	11.0	102.5	0.0	3.7	CFC_180
33	P1 Pelvic x	g	18.6	74.8	-4.6	142.2	CFC_1000
34	P1 Pelvic y	g	1.6	194.6	-1.8	169.6	CFC_1000
35	P1 Pelvic z	g	7.3	75.0	-2.8	134.8	CFC_1000
36	P1 Pelvic Resultant	g	19.9	74.8	0.0	-16.5	CFC_1000
37	P1 Chest Compression	in	0.0	166.7	-0.0	100.0	CFC_600
38	P1 Left Femur	lbf	8.1	120.4	-389.0	145.4	CFC_600
39	P1 Right Femur	lbf	125.8	134.2	-162.4	78.3	CFC_600
40	P1 Lap Belt	lbf	89.9	188.9	-33.5	61.0	CFC_60
41	P1 Upper Neck Fx	lbf	29.1	185.5	-53.9	163.6	CFC_1000
42	P1 Upper Neck Fy	lbf	57.3	165.3	-17.9	96.1	CFC_1000
43	P1 Upper Neck Fz	lbf	3.7	349.5	-314.4	150.4	CFC_1000
44	P1 Upper Neck F Resultant	lbf	315.4	150.4	0.0	-28.6	CFC_1000
45	P1 Upper Neck Mx	in-lb	133.2	150.5	-55.4	105.3	CFC_600
46	P1 Upper Neck My	in-lb	221.2	184.7	-155.4	115.0	CFC_600
47	P1 Upper Neck Mz	in-lb	139.6	176.3	-50.4	121.0	CFC_600
48	P1 Upper Neck M Resultant	in-lb	268.4	184.0	0.0	-45.6	CFC_600
49	Acc #1(X) Left Rear Xmember	g	29.6	44.4	-1.8	134.0	CFC_60
51	Acc #1(X) Left Rear Xmember Displace	in	84.7	399.9	-0.0	-12.0	CFC_180
52	Acc #2(X) Right Rear Xmember	g	27.2	43.5	-2.0	126.3	CFC_60
54	Acc #2(X) Right Rear Xmember Displac	in	90.8	399.9	-0.0	-13.5	CFC_180
55	Acc #3(X) Upper Seatback	g	20.2	72.3	-11.9	78.5	CFC_60
56	Acc #4(X) Lower Seatback	g	19.6	71.6	-8.7	82.0	CFC_60
59	Seatback Angular Position	deg	26.3	132.1	0.0	-50.0	CFC_180

==========

P1 HIC(36 ms): 93.2
t1: 134.8 msec
t2: 170.8 msec
Duration: 36.0 msec
Average Acceleration: 23.2 g
Input channels: P1 Head x (2) CFC_1000
P1 Head y (3) CFC_1000
P1 Head z (4) CFC_1000

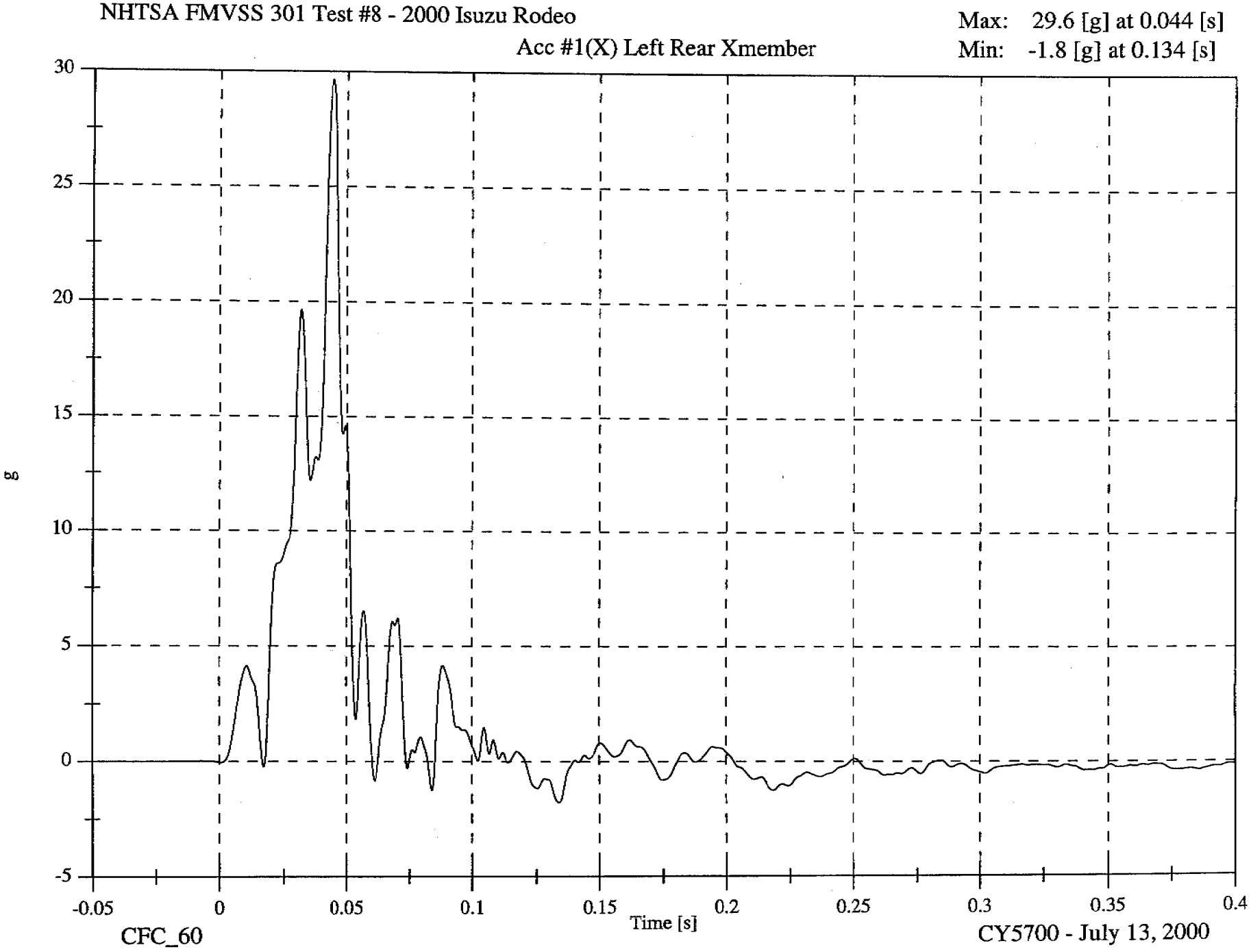
P1 CLIP(3 ms): 10.7 g
t1: 106.1 msec
t2: 109.1 msec
Duration: 3.0 msec
P1 CSI: 18.4
Input channels: P1 Chest x (5) CFC_180
P1 Chest y (6) CFC_180
P1 Chest z (7) CFC_180

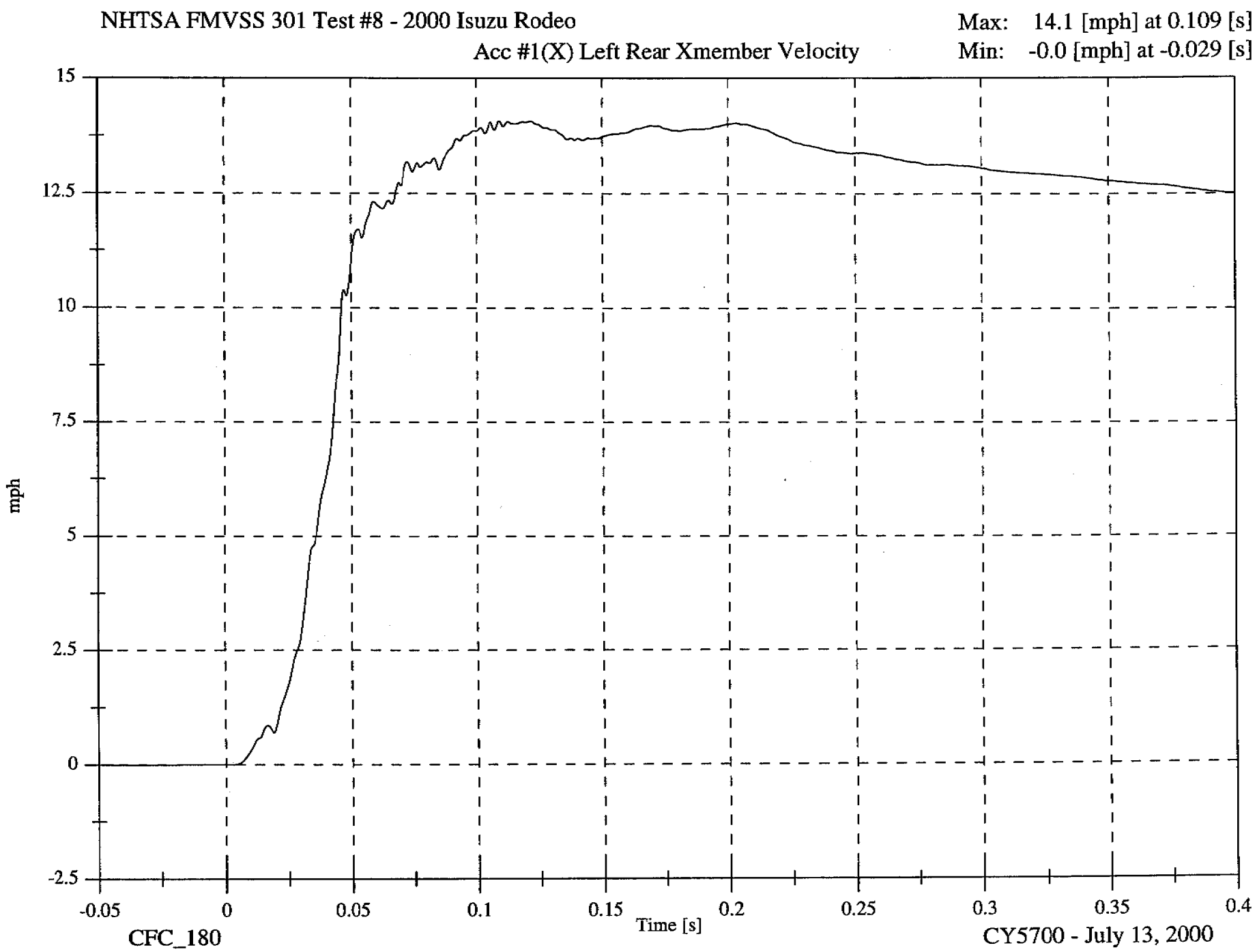
P1 CHEST DISP: Max: 0.0 in 166.7 msec
Min: -0.0 in 100.0 msec
Input channel: P1 Chest Compression (11) CFC_600

TEST NO. CY5700

VEHICLE	SAE FILTER CHANNEL CLASS
	60

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


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Acc #1(X) Left Rear Xmember
Max: 29.6 [g] at 0.044 [s]
Min: -1.8 [g] at 0.134 [s]
30
25
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
CY5700 - July 13, 2000

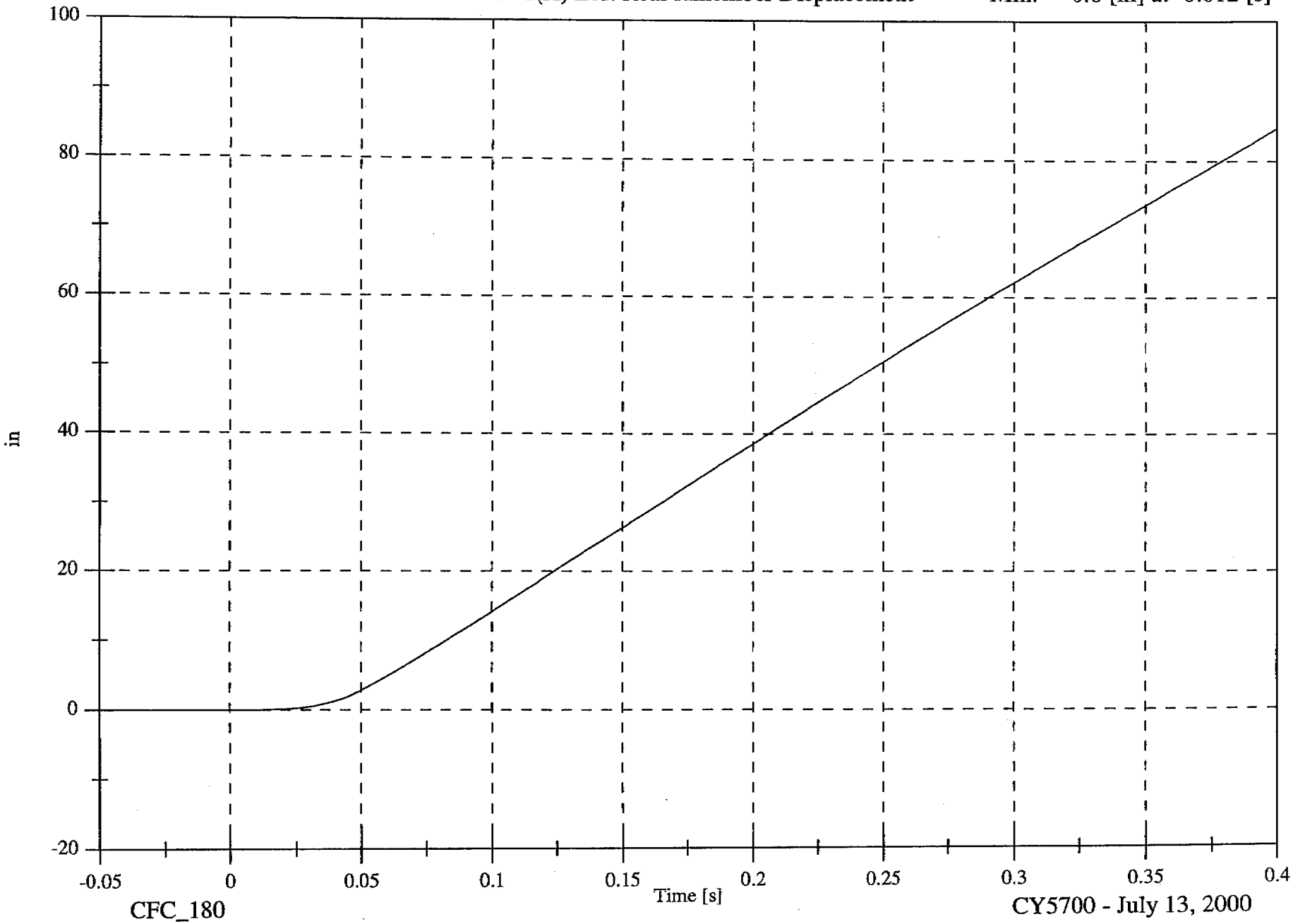

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Acc #1(X) Left Rear Xmember Velocity
Max: 14.1 [mph] at 0.109 [s]
Min: -0.0 [mph] at -0.029 [s]
15
12.5
10
7.5
5
2.5
0
-2.5
mph
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo

Acc #1(X) Left Rear Xmember Displacement

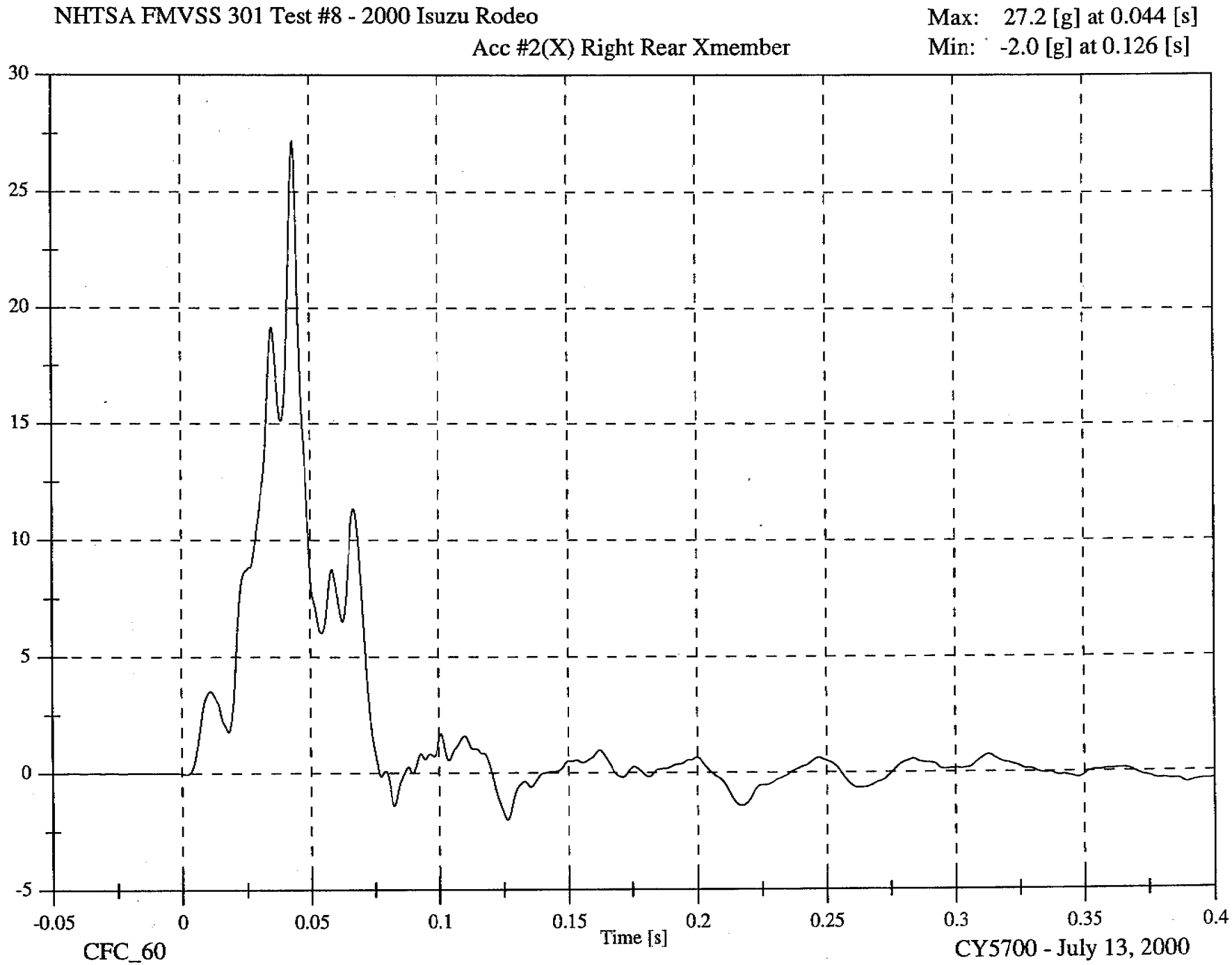
Max: 84.7 [in] at 0.400 [s]

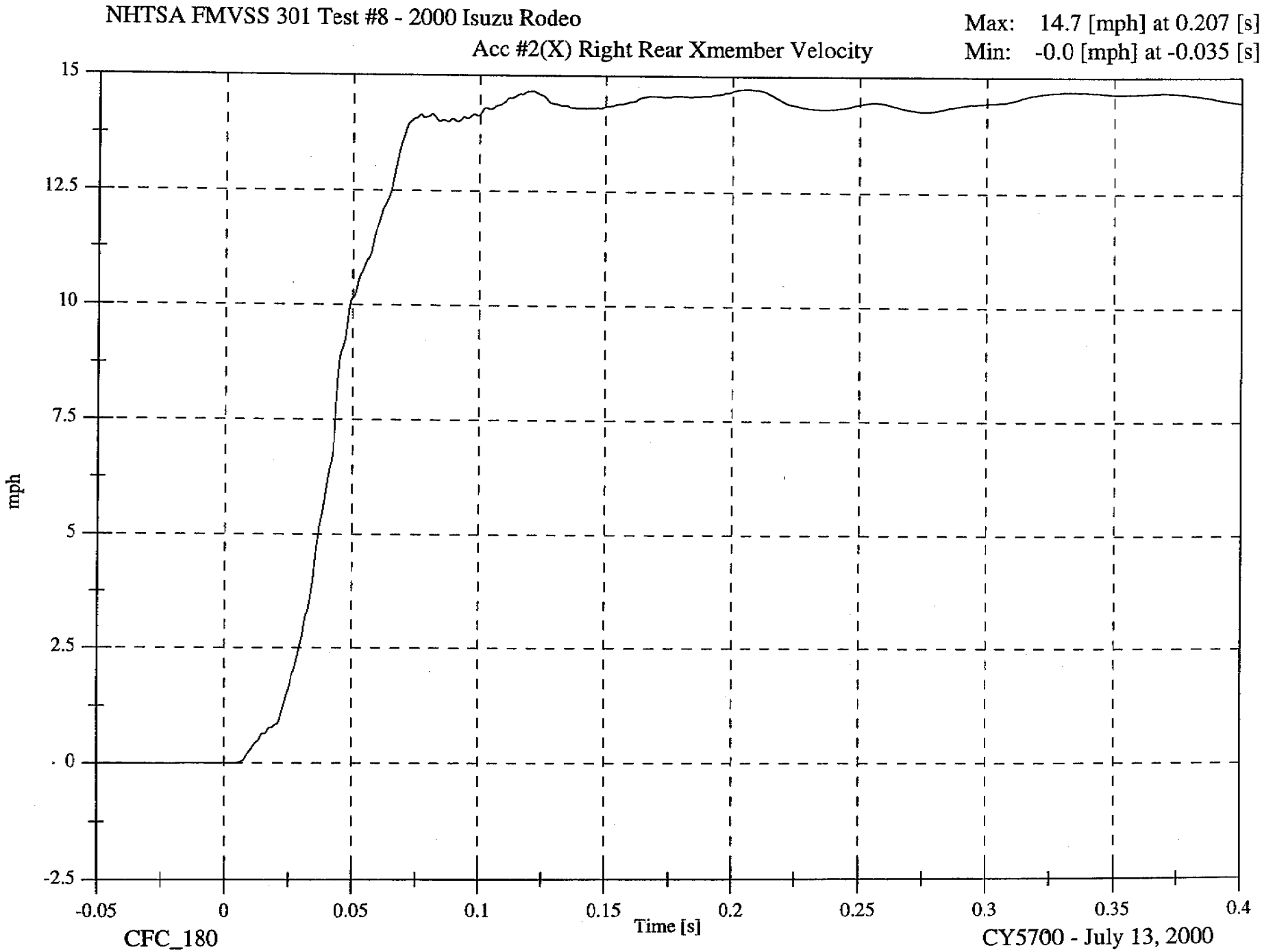
Min: -0.0 [in] at -0.012 [s]

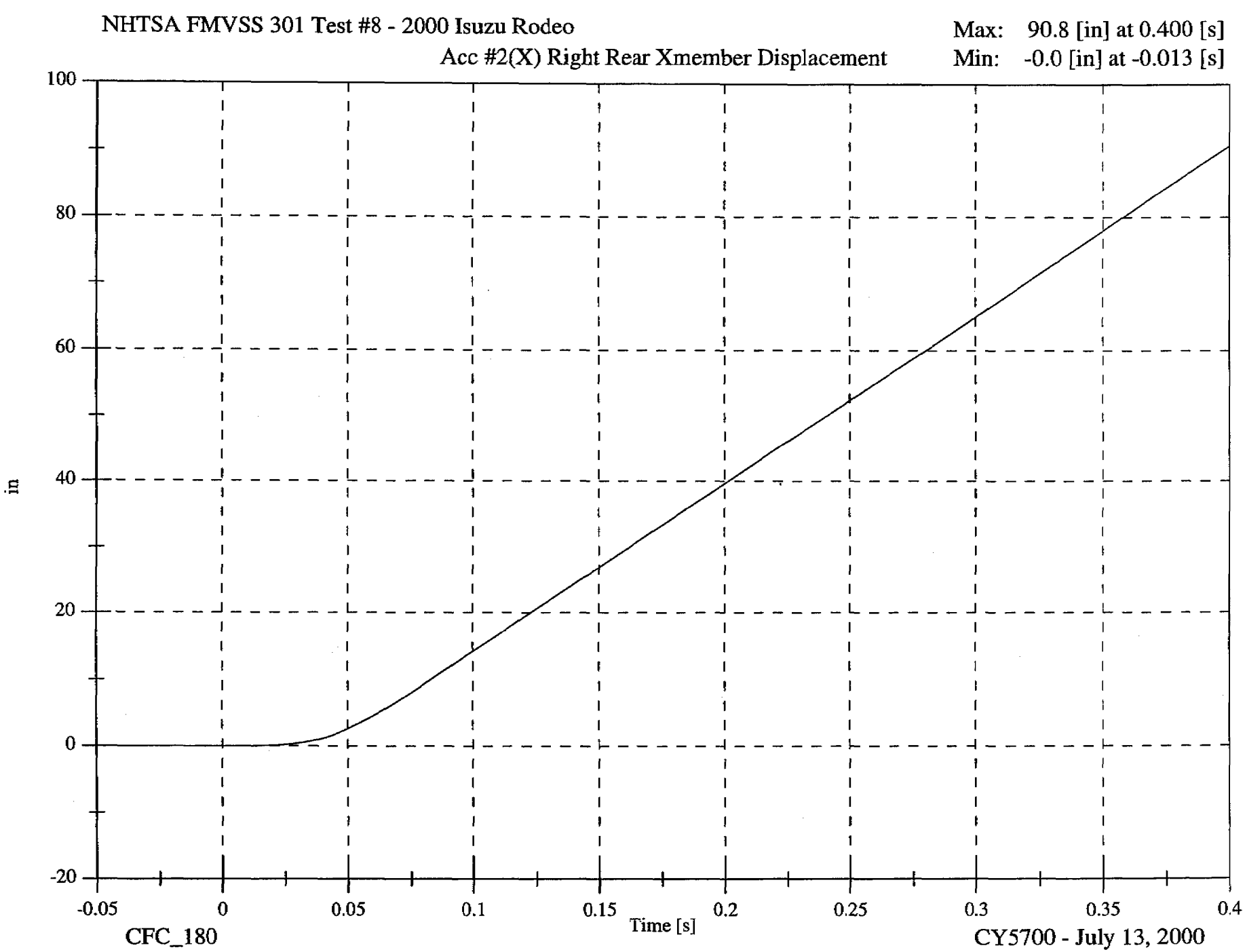


CFC_180

CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Acc #2(X) Right Rear Xmember
Max: 27.2 [g] at 0.044 [s]
Min: -2.0 [g] at 0.126 [s]
30
25
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Acc #2(X) Right Rear Xmember Velocity
Max: 14.7 [mph] at 0.207 [s]
Min: -0.0 [mph] at -0.035 [s]
15
12.5
10
7.5
5
2.5
0
-2.5
mph
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Acc #2(X) Right Rear Xmember Displacement
Max: 90.8 [in] at 0.400 [s]
Min: -0.0 [in] at -0.013 [s]
100
80
60
40
20
0
-20
in
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000

R-9

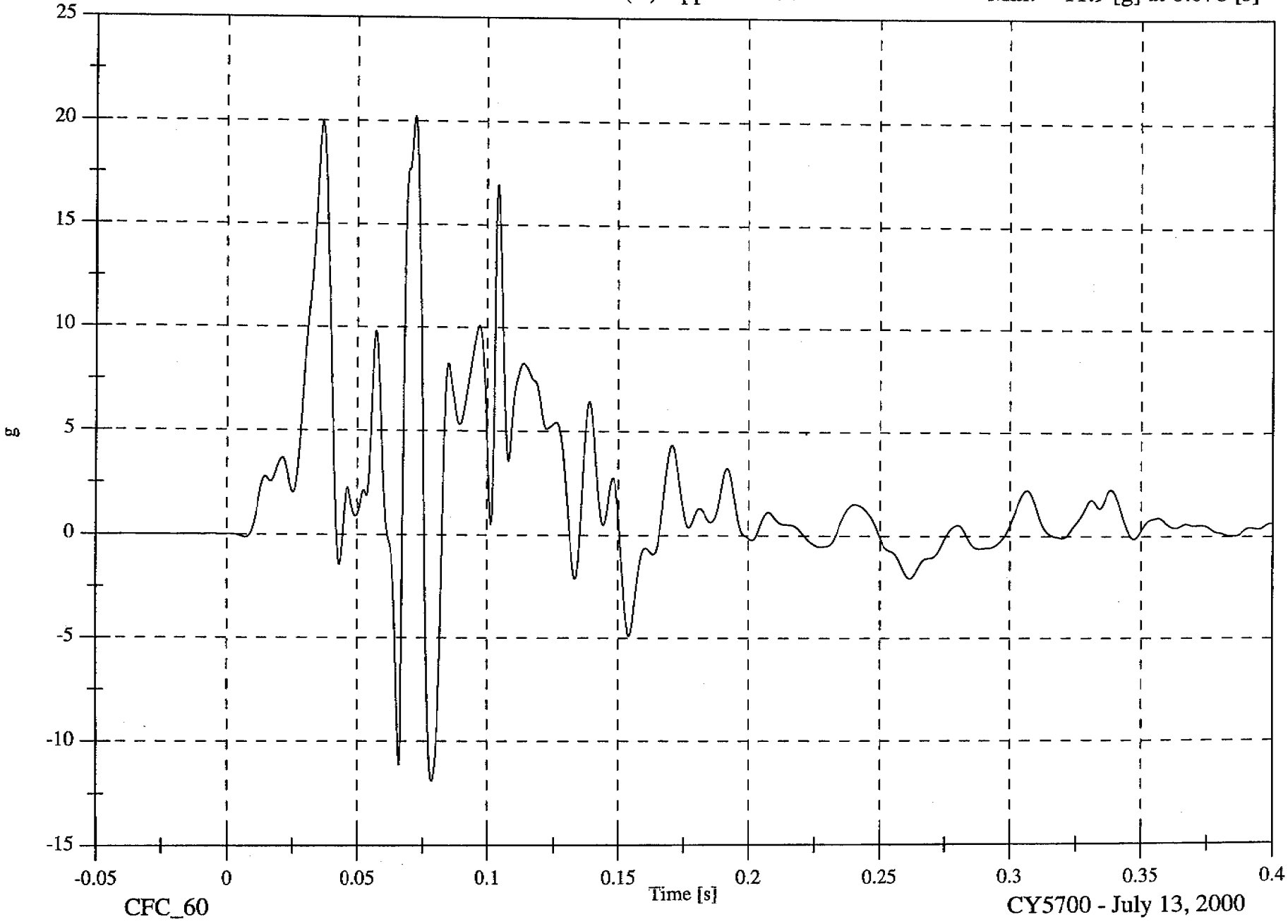
8480-18

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo

Acc #3(X) Upper Seatback

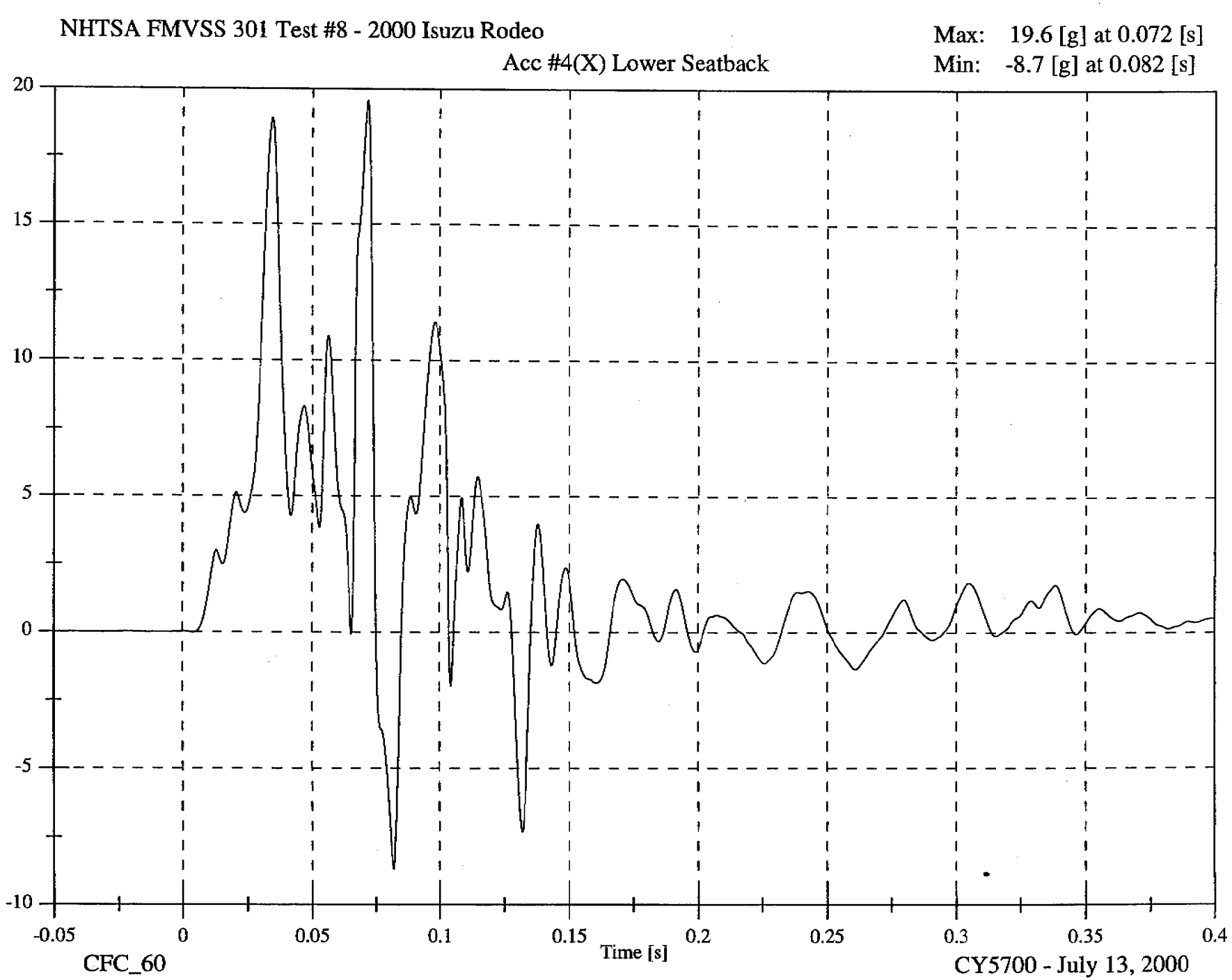
Max: 20.2 [g] at 0.072 [s]

Min: -11.9 [g] at 0.078 [s]



CFC_60

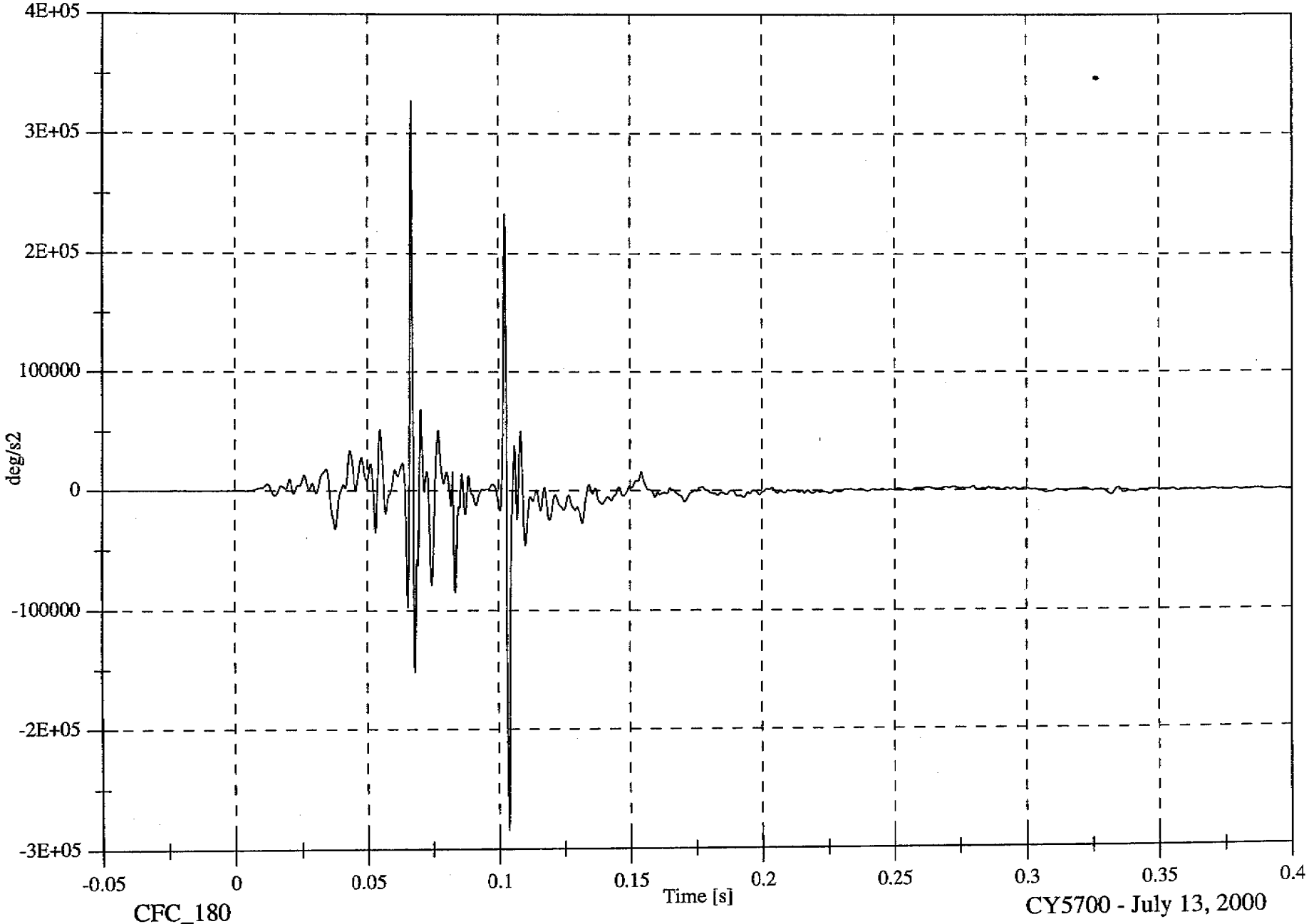
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Acc #4(X) Lower Seatback
Max: 19.6 [g] at 0.072 [s]
Min: -8.7 [g] at 0.082 [s]
20
15
10
5
0
-5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
CY5700 - July 13, 2000

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo

Seatback Angular Acceleration

Max: 327691.9 [deg/s2] at 0.067 [s]
Min: -283955.8 [deg/s2] at 0.104 [s]



CFC_180

CY5700 - July 13, 2000

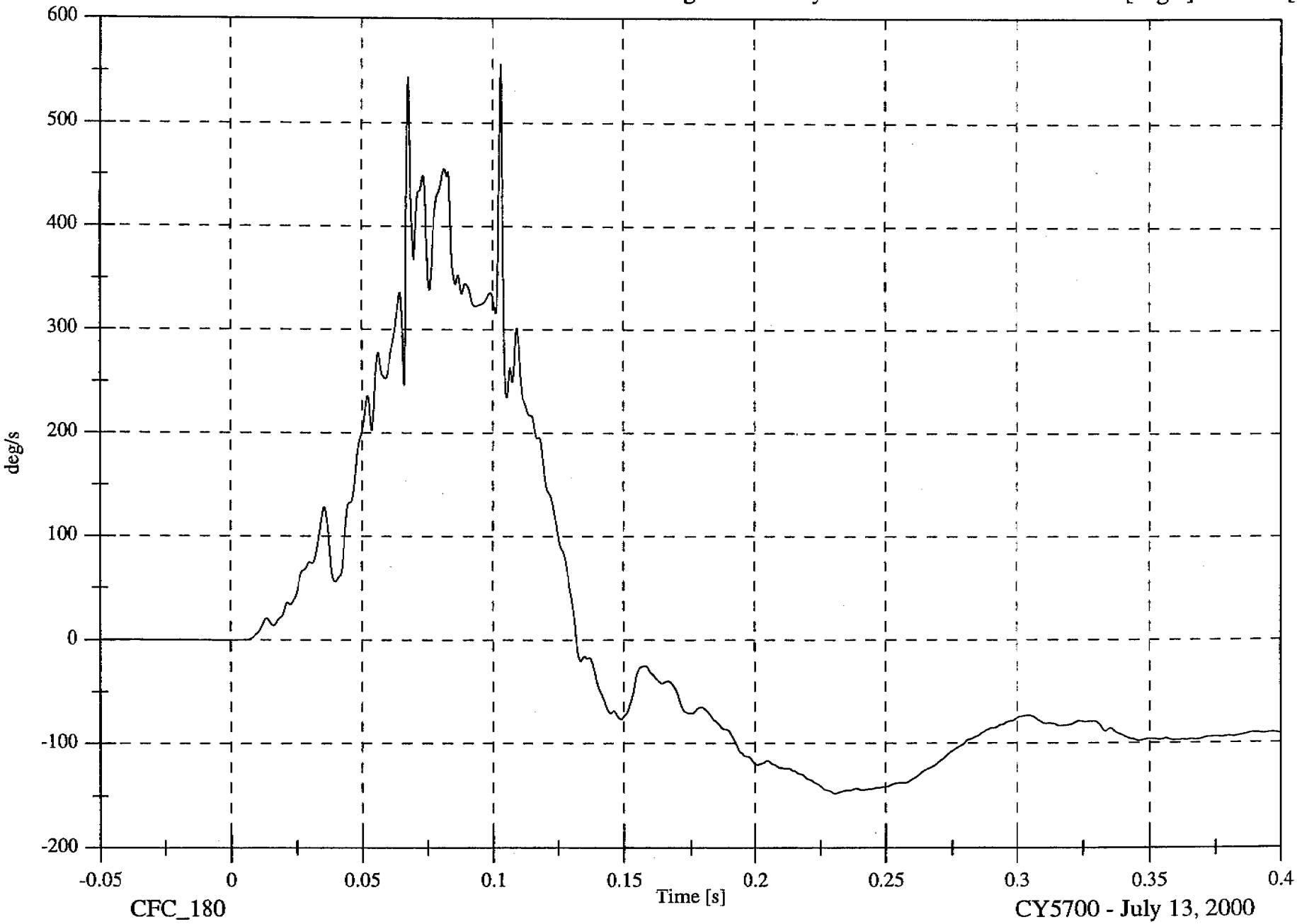
8480_18

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo

Seatback Angular Velocity

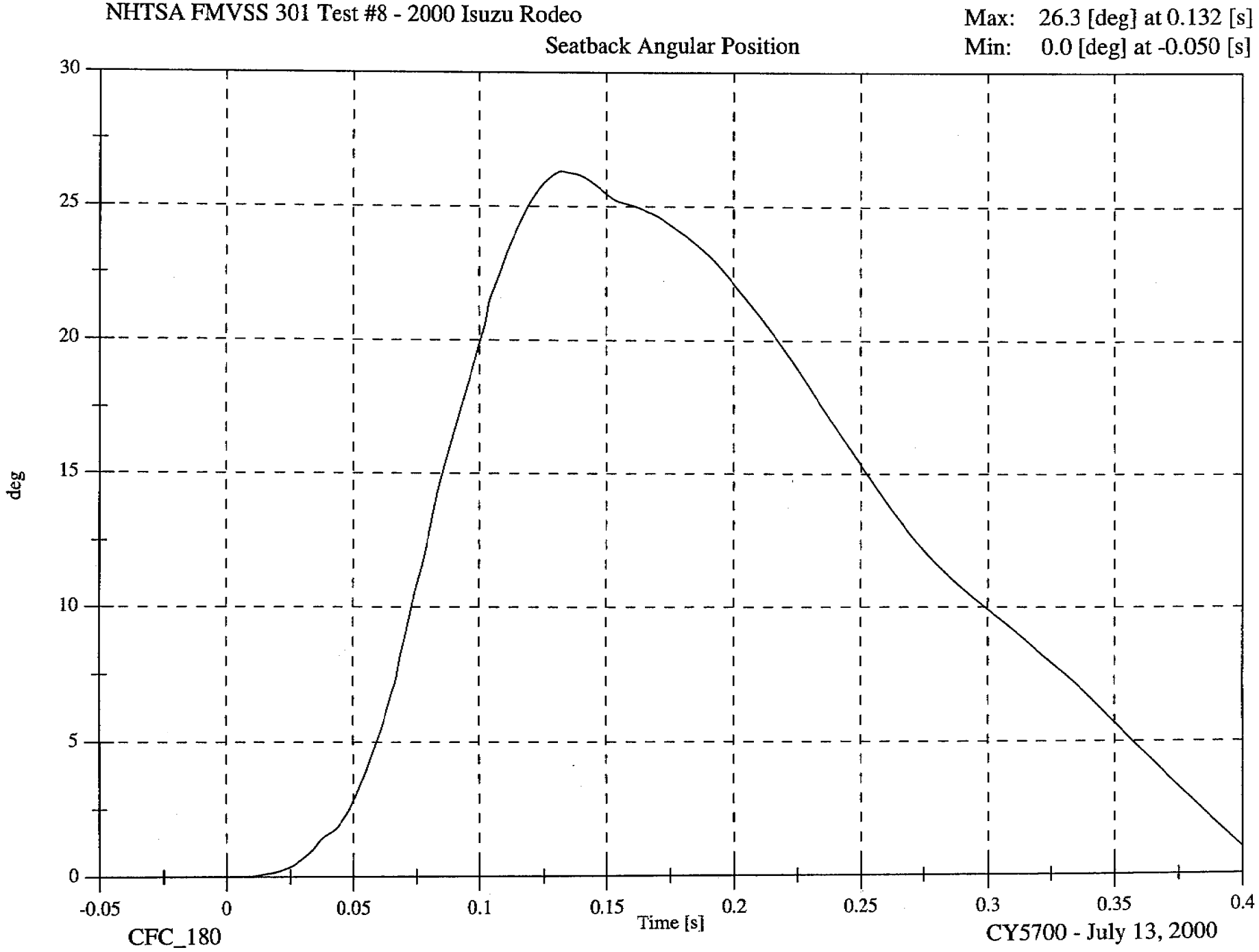
Max: 556.2 [deg/s] at 0.103 [s]

Min: -147.8 [deg/s] at 0.231 [s]



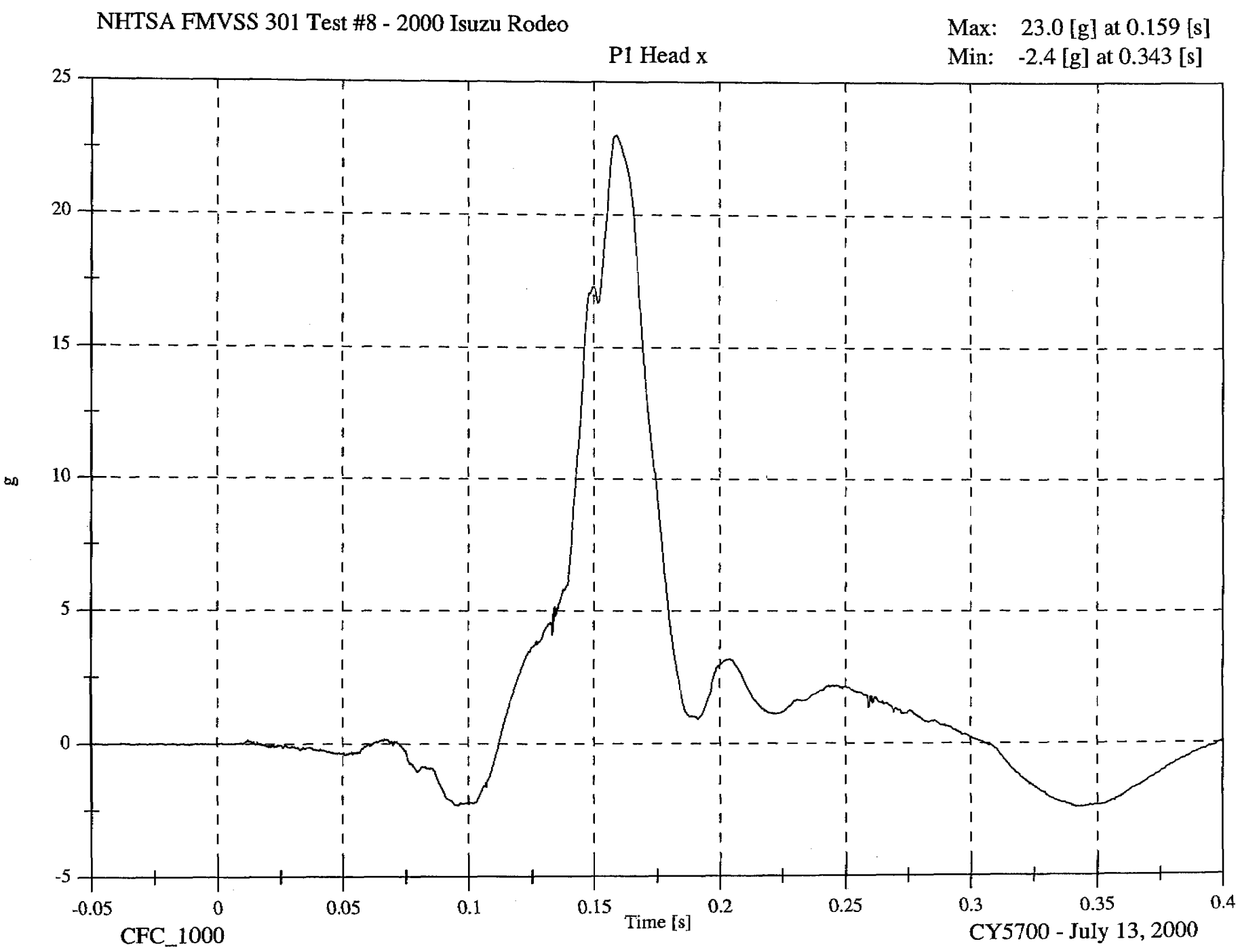
CFC_180

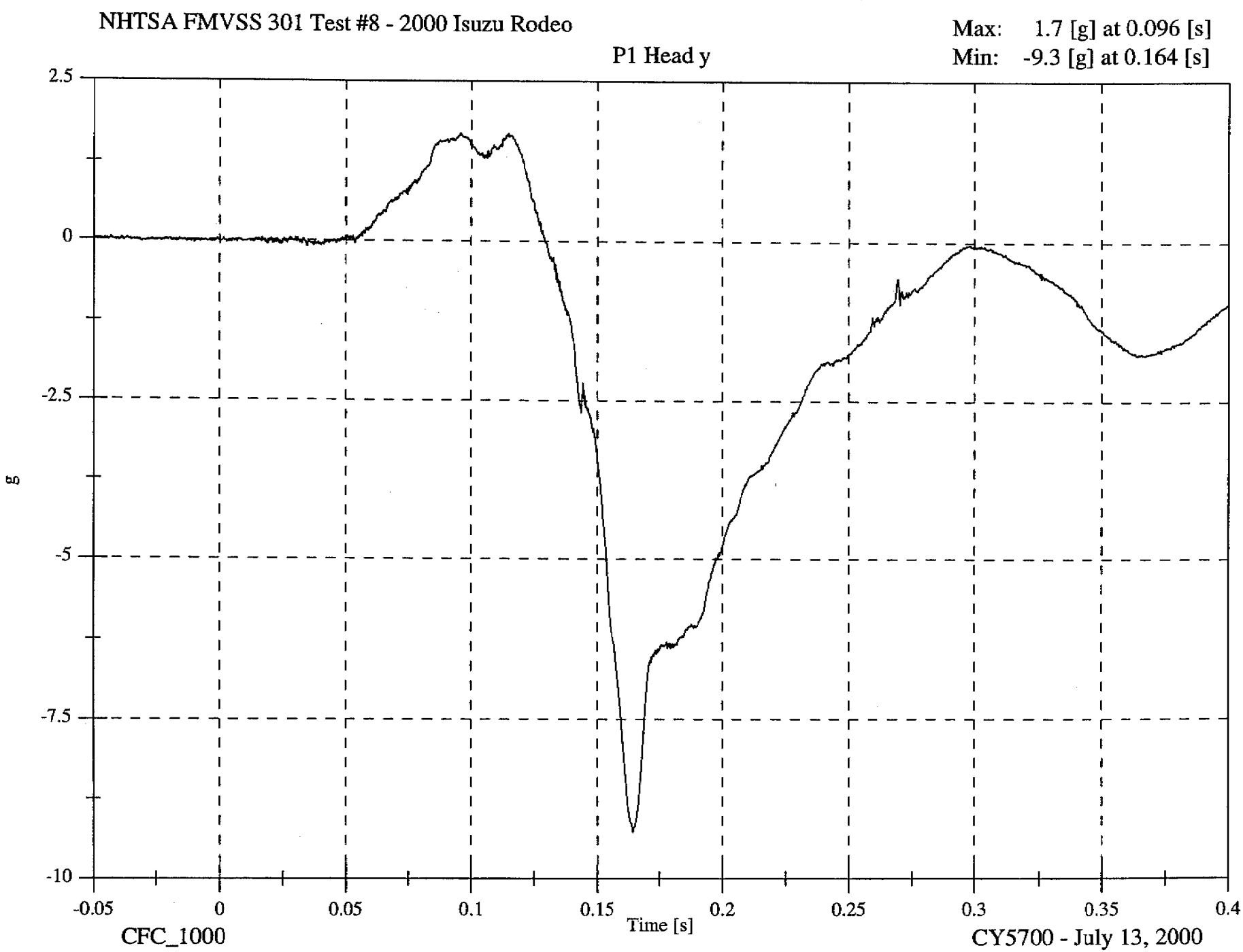
CY5700 - July 13, 2000

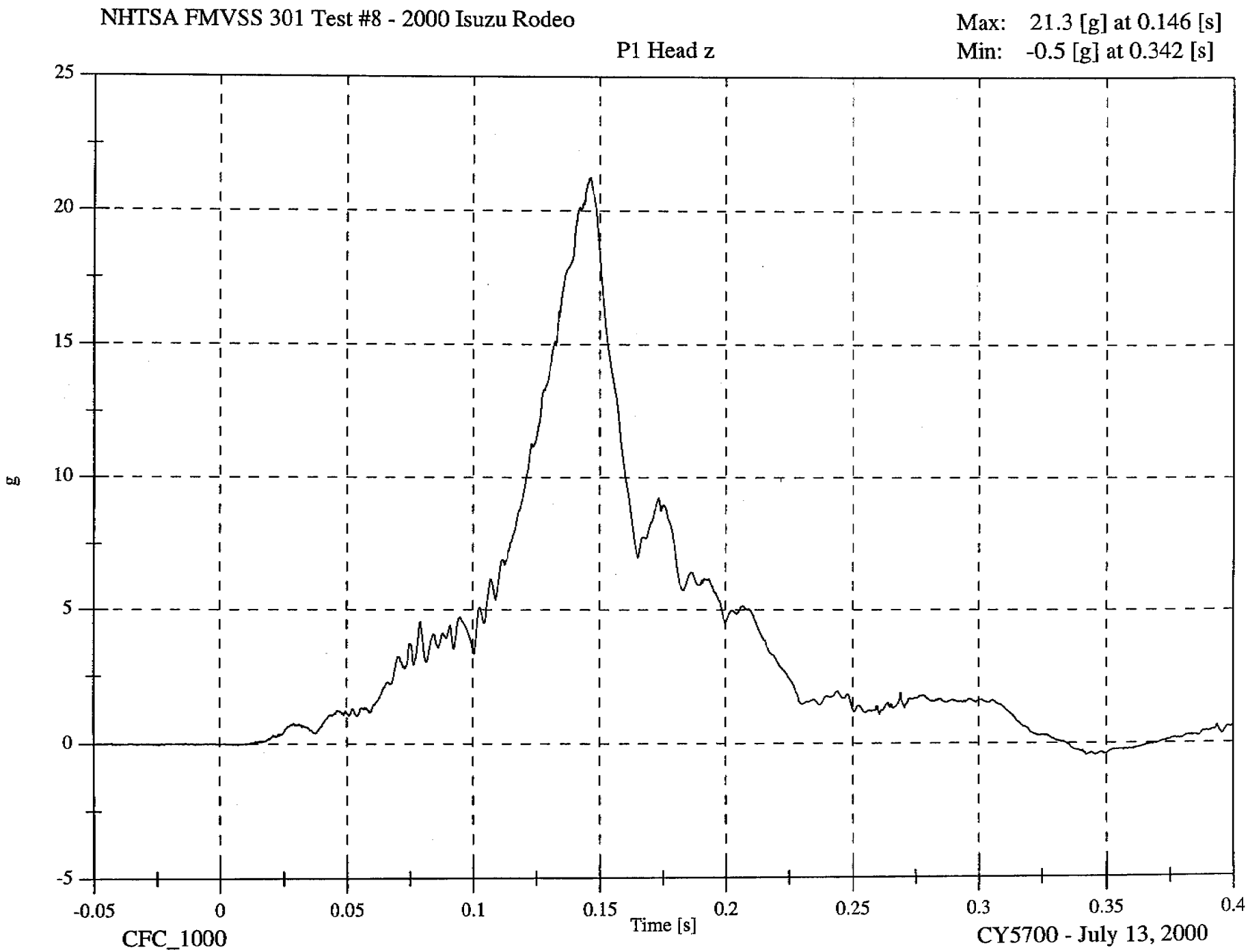

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
Seatback Angular Position
Max: 26.3 [deg] at 0.132 [s]
Min: 0.0 [deg] at -0.050 [s]
deg
30
25
20
15
10
5
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000

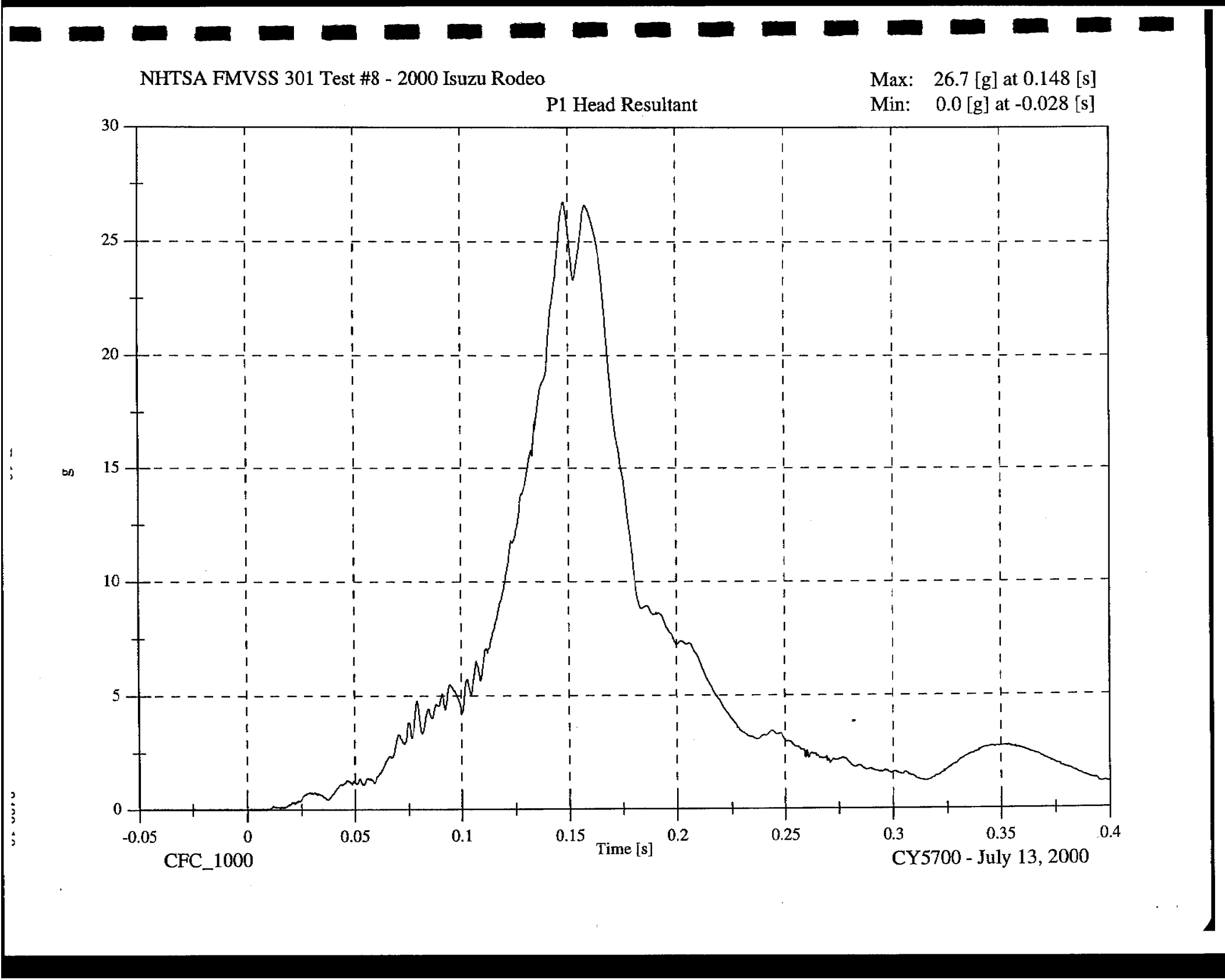
TEST NO. CY5700

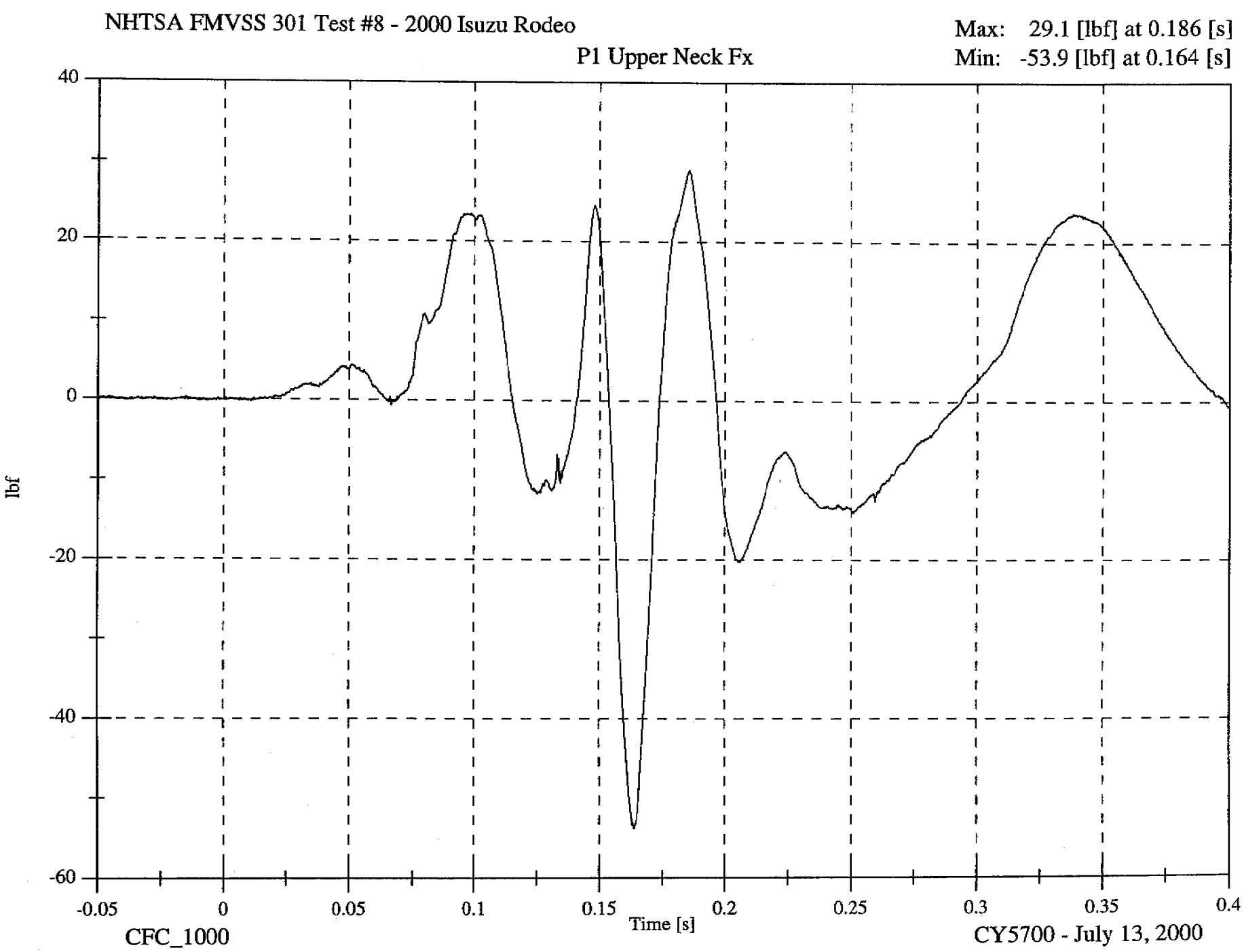
DRIVER DUMMY (Pos. 1)	SAE FILTER CHANNEL CLASS
Head Accelerations	1000
Chest Accelerations	180
Pelvic Accelerations	1000
Upper Neck Forces	1000
Upper Neck Moments	600
Belt Forces	60
Belt Spoolout	60

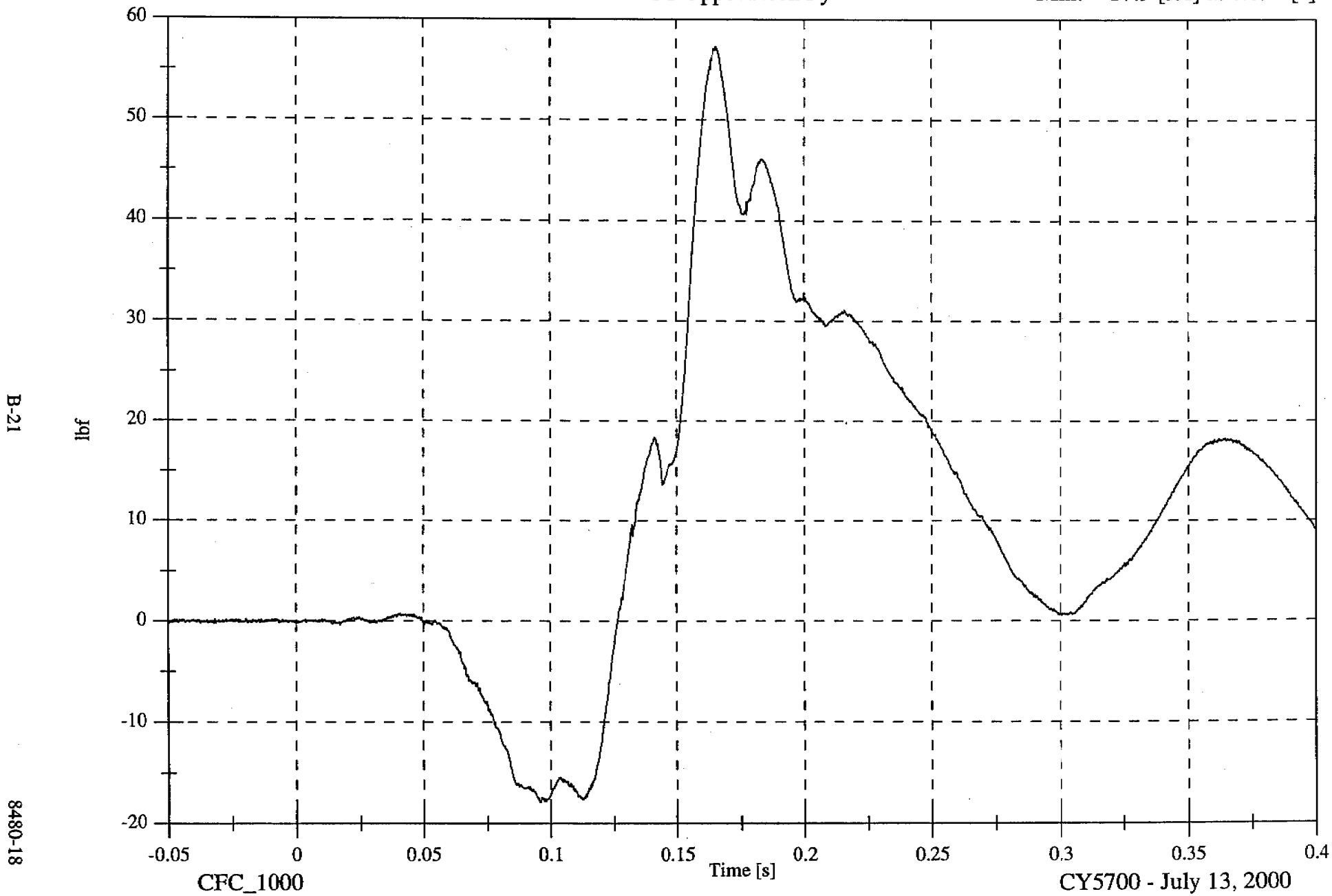

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Head x
Max: 23.0 [g] at 0.159 [s]
Min: -2.4 [g] at 0.343 [s]
g
25
20
15
10
5
0
-5
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

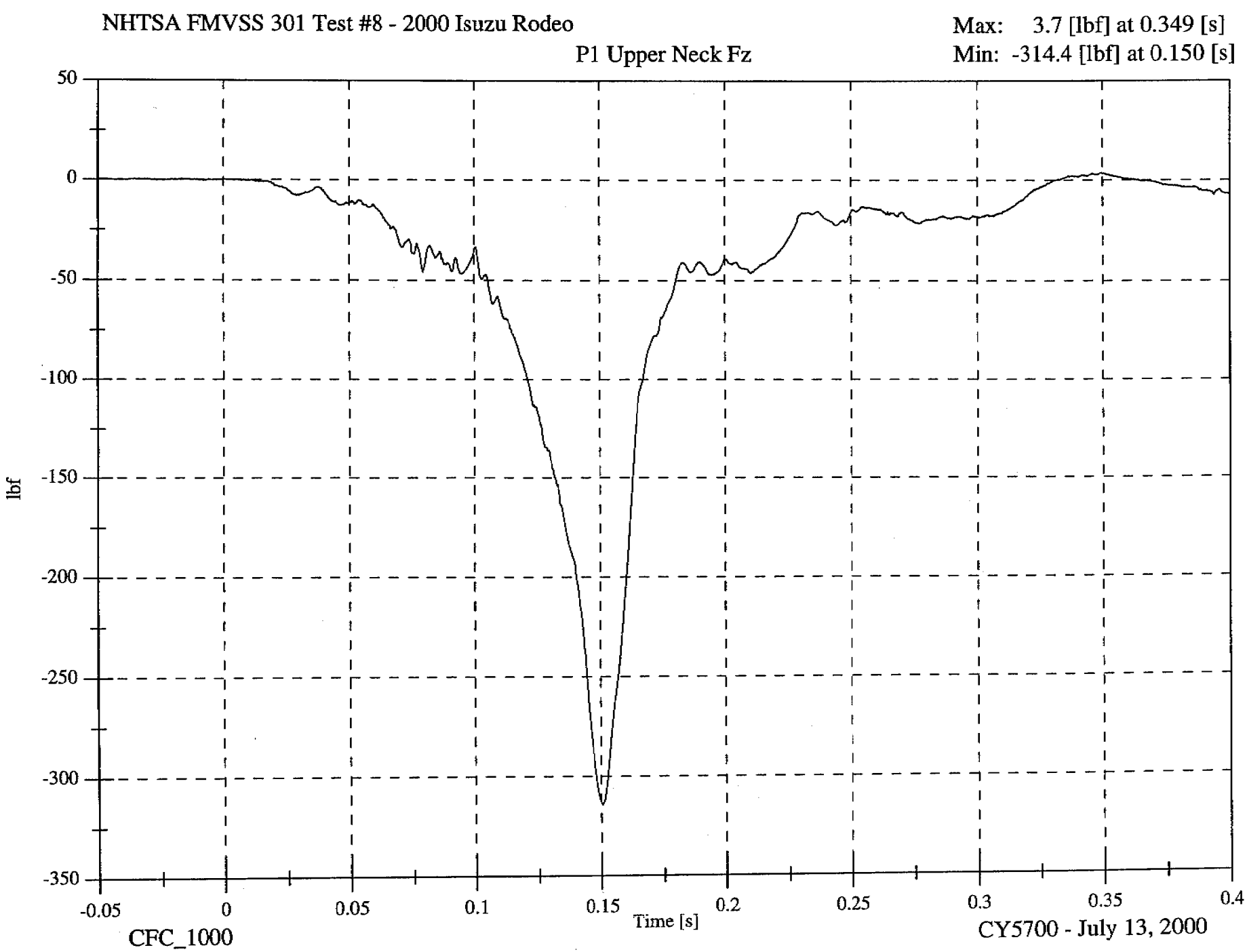

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Head y
Max: 1.7 [g] at 0.096 [s]
Min: -9.3 [g] at 0.164 [s]
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

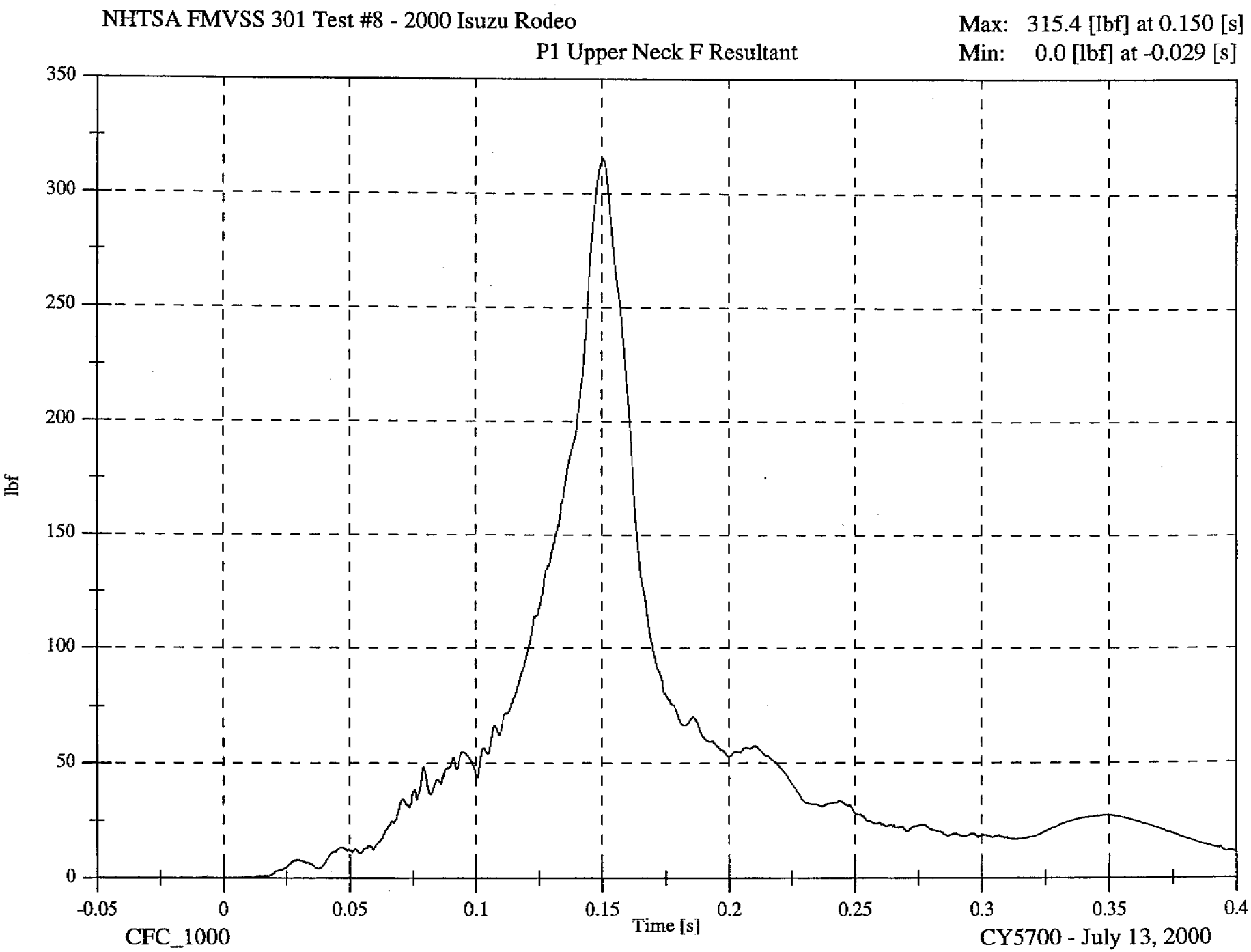

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Head z
Max: 21.3 [g] at 0.146 [s]
Min: -0.5 [g] at 0.342 [s]
25
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

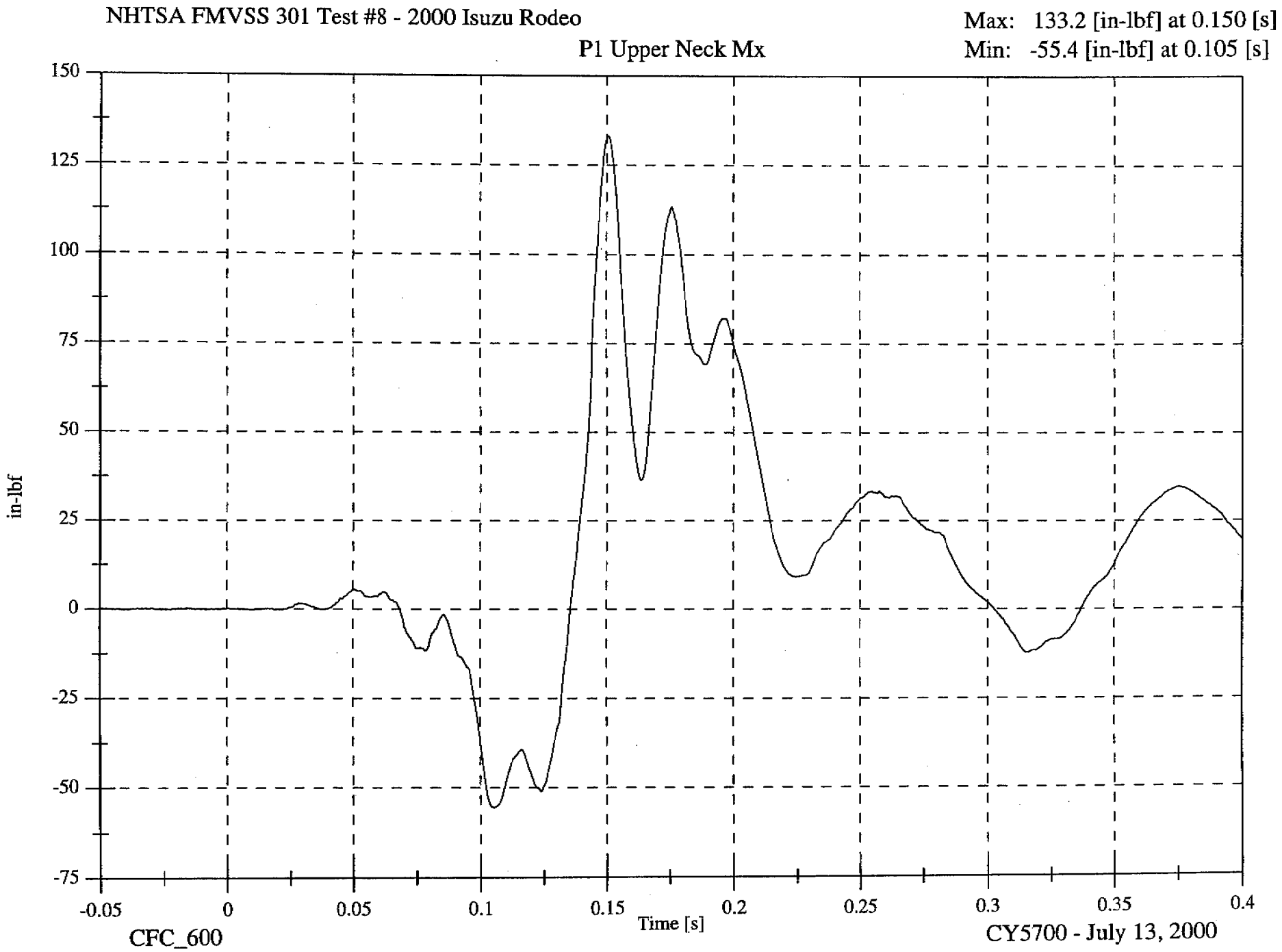

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Head Resultant
Max: 26.7 [g] at 0.148 [s]
Min: 0.0 [g] at -0.028 [s]
30
25
20
15
10
5
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

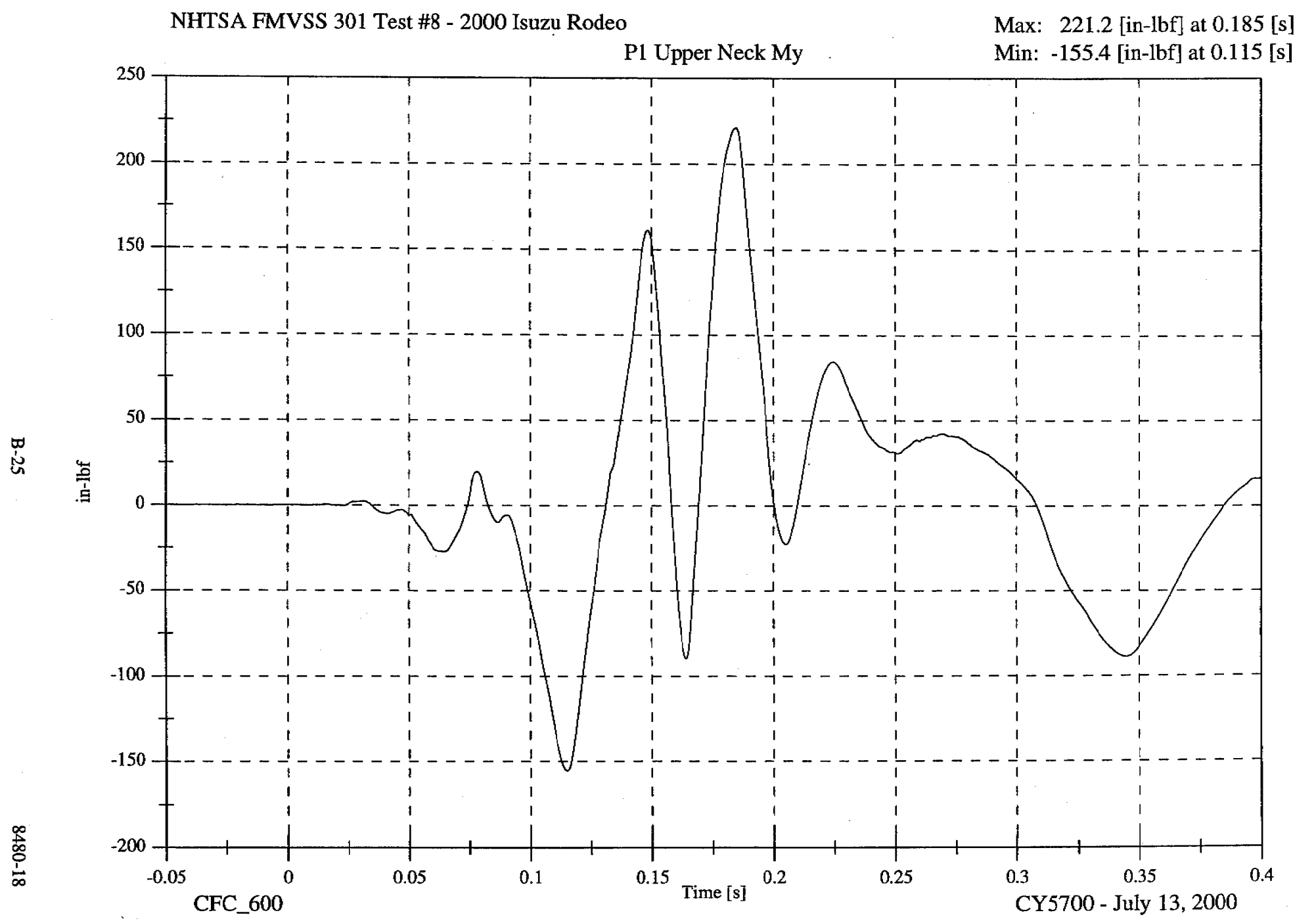

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck Fx
Max: 29.1 [lbf] at 0.186 [s]
Min: -53.9 [lbf] at 0.164 [s]
40
20
0
-20
-40
-60
lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

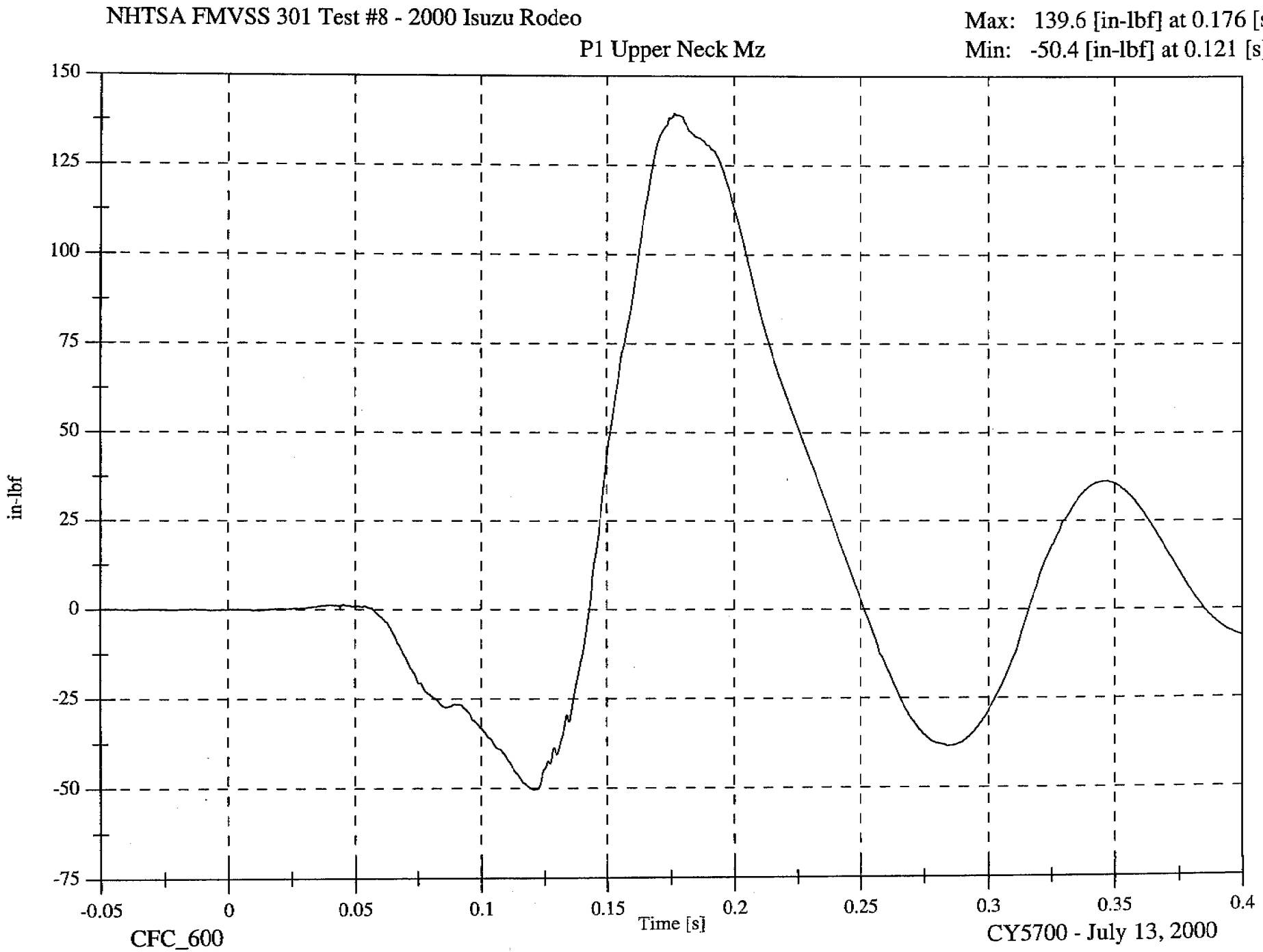

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck Fy
Max: 57.3 [lbf] at 0.165 [s]
Min: -17.9 [lbf] at 0.096 [s]
lbf
60
50
40
30
20
10
0
-10
-20
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

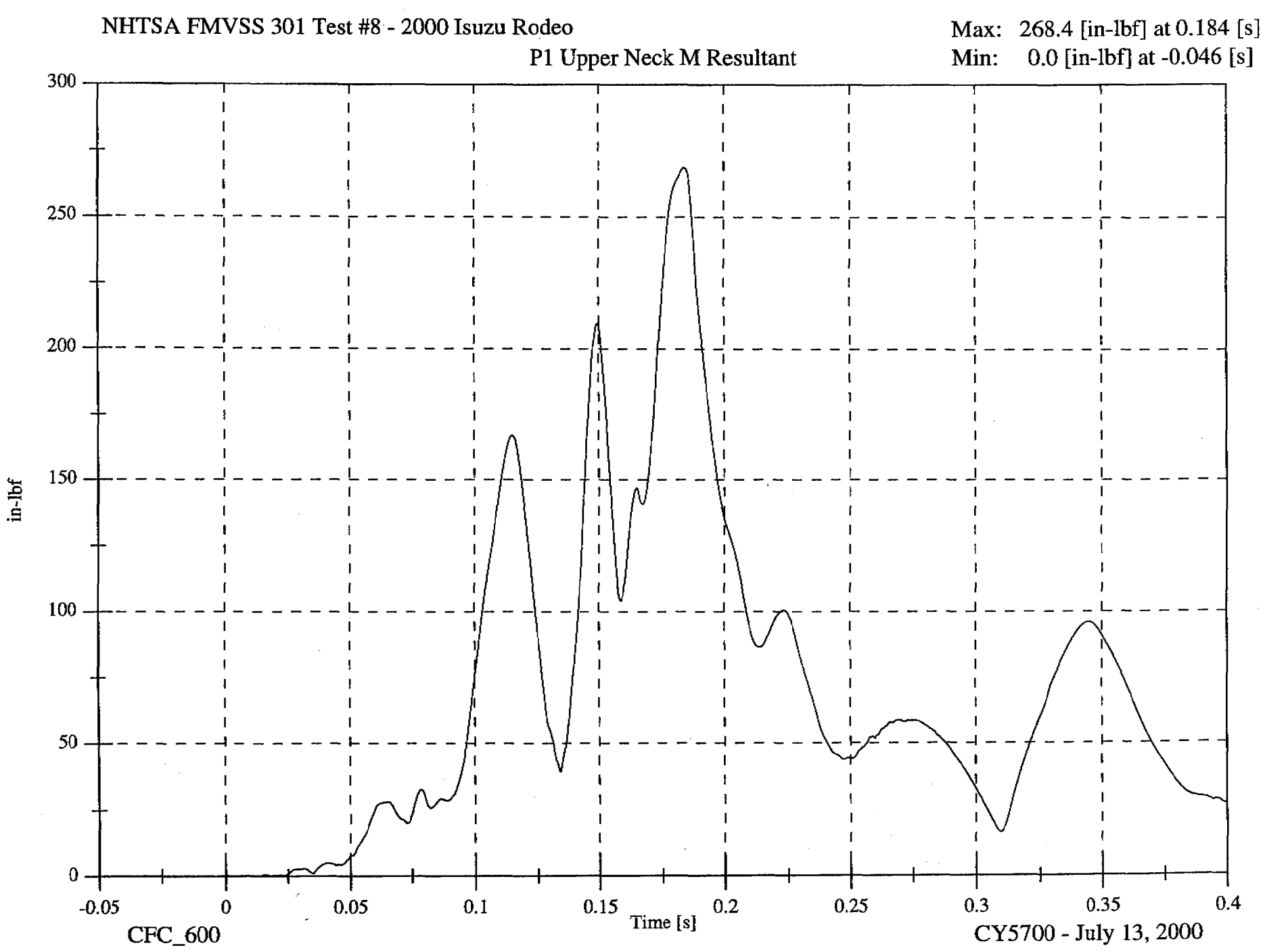

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck Fz
Max: 3.7 [lbf] at 0.349 [s]
Min: -314.4 [lbf] at 0.150 [s]
50
0
-50
-100
-150
-200
-250
-300
-350
lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

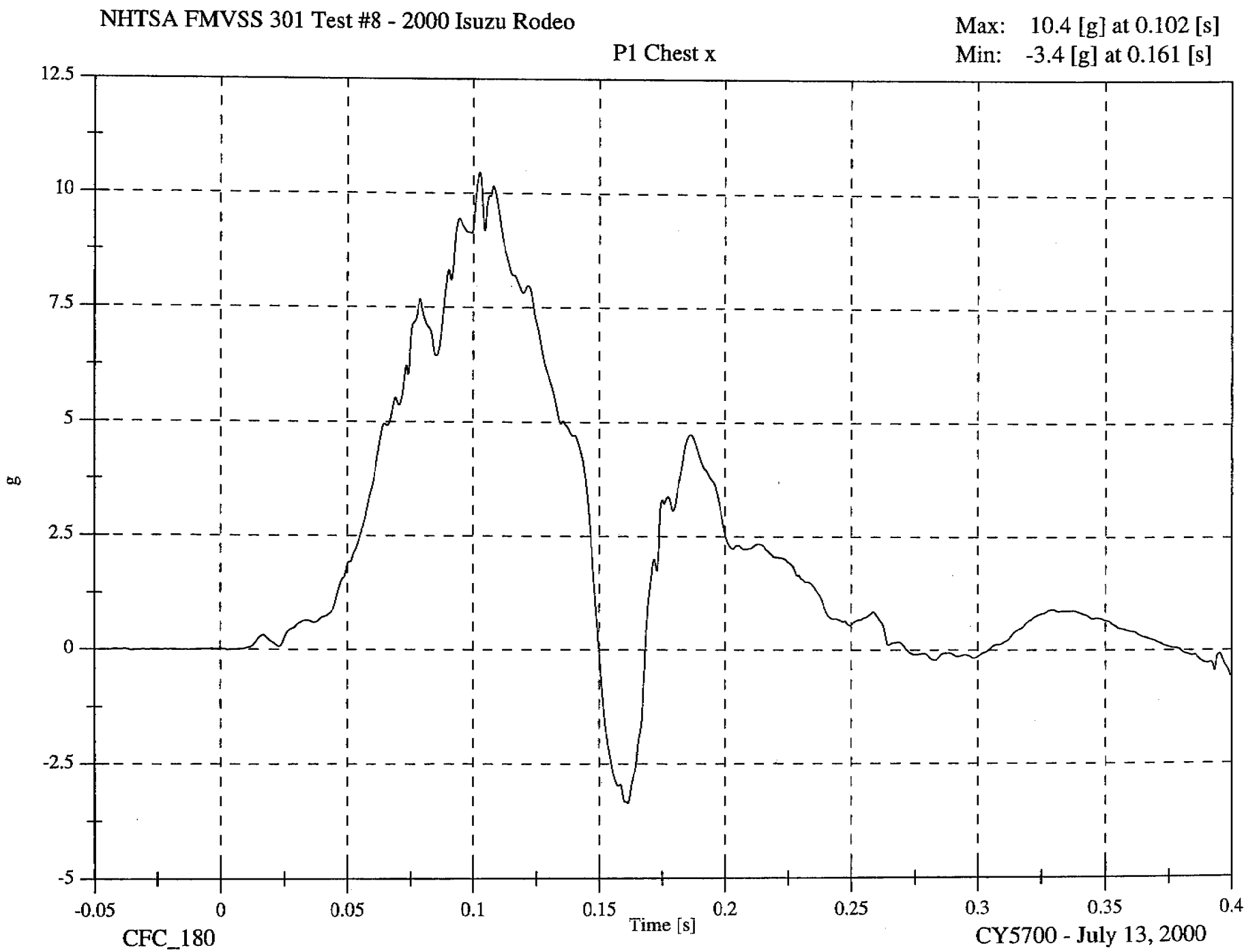

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck F Resultant
Max: 315.4 [lbf] at 0.150 [s]
Min: 0.0 [lbf] at -0.029 [s]
lbf
350
300
250
200
150
100
50
0
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000

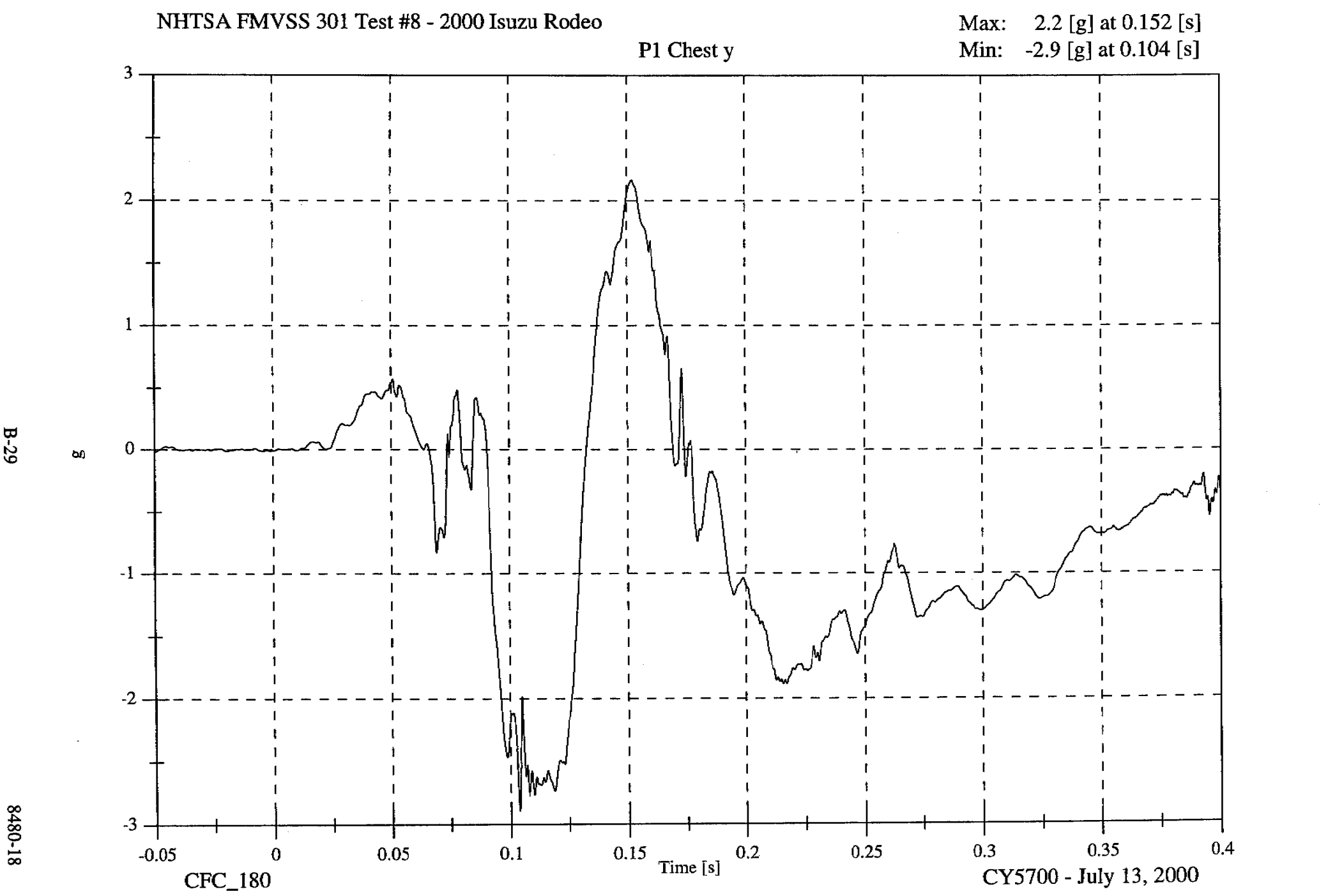

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck Mx
Max: 133.2 [in-lbf] at 0.150 [s]
Min: -55.4 [in-lbf] at 0.105 [s]
150
125
100
75
50
25
0
-25
-50
-75
in-lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000

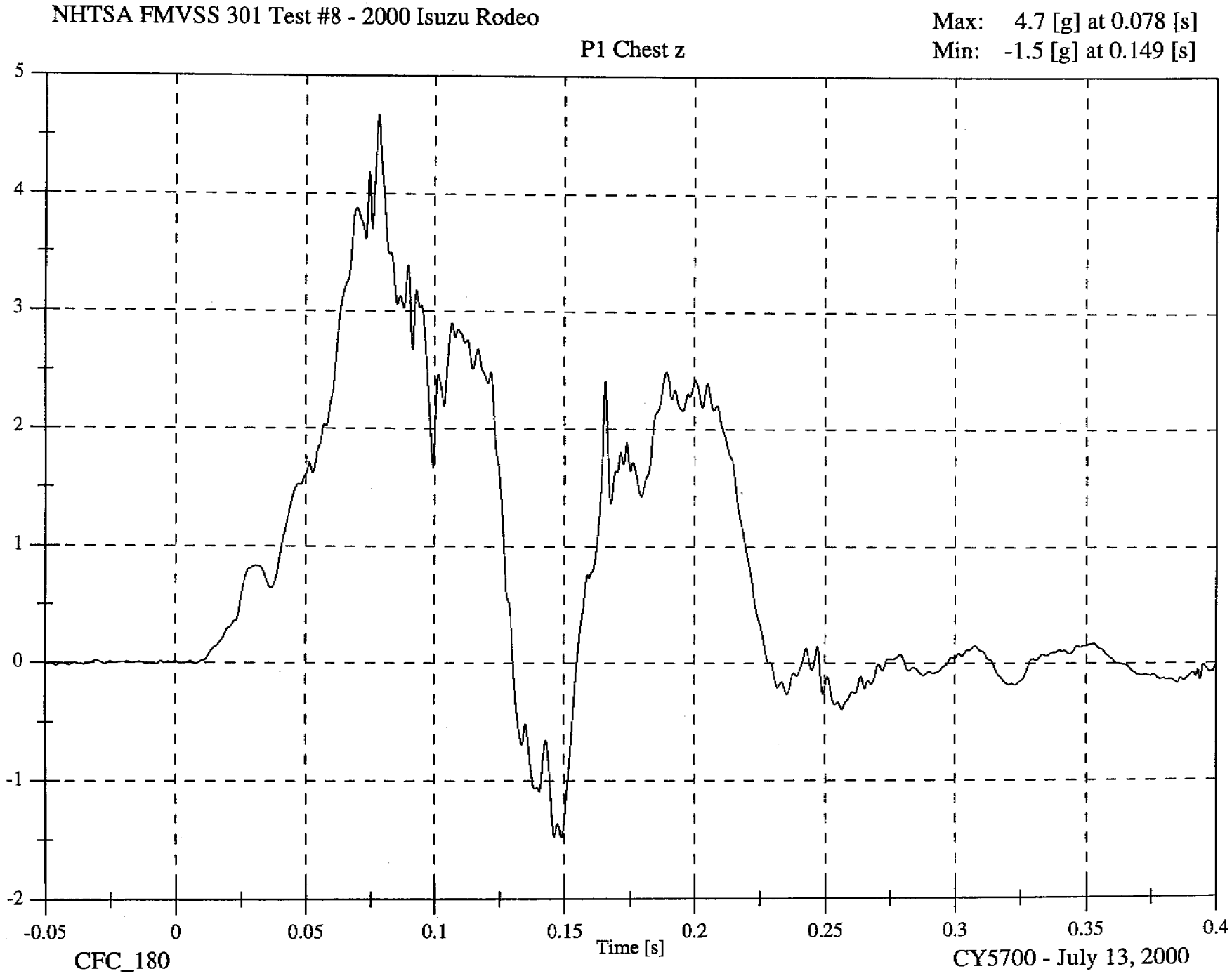

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck My
Max: 221.2 [in-lbf] at 0.185 [s]
Min: -155.4 [in-lbf] at 0.115 [s]
250
200
150
100
50
0
-50
-100
-150
-200
in-lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000

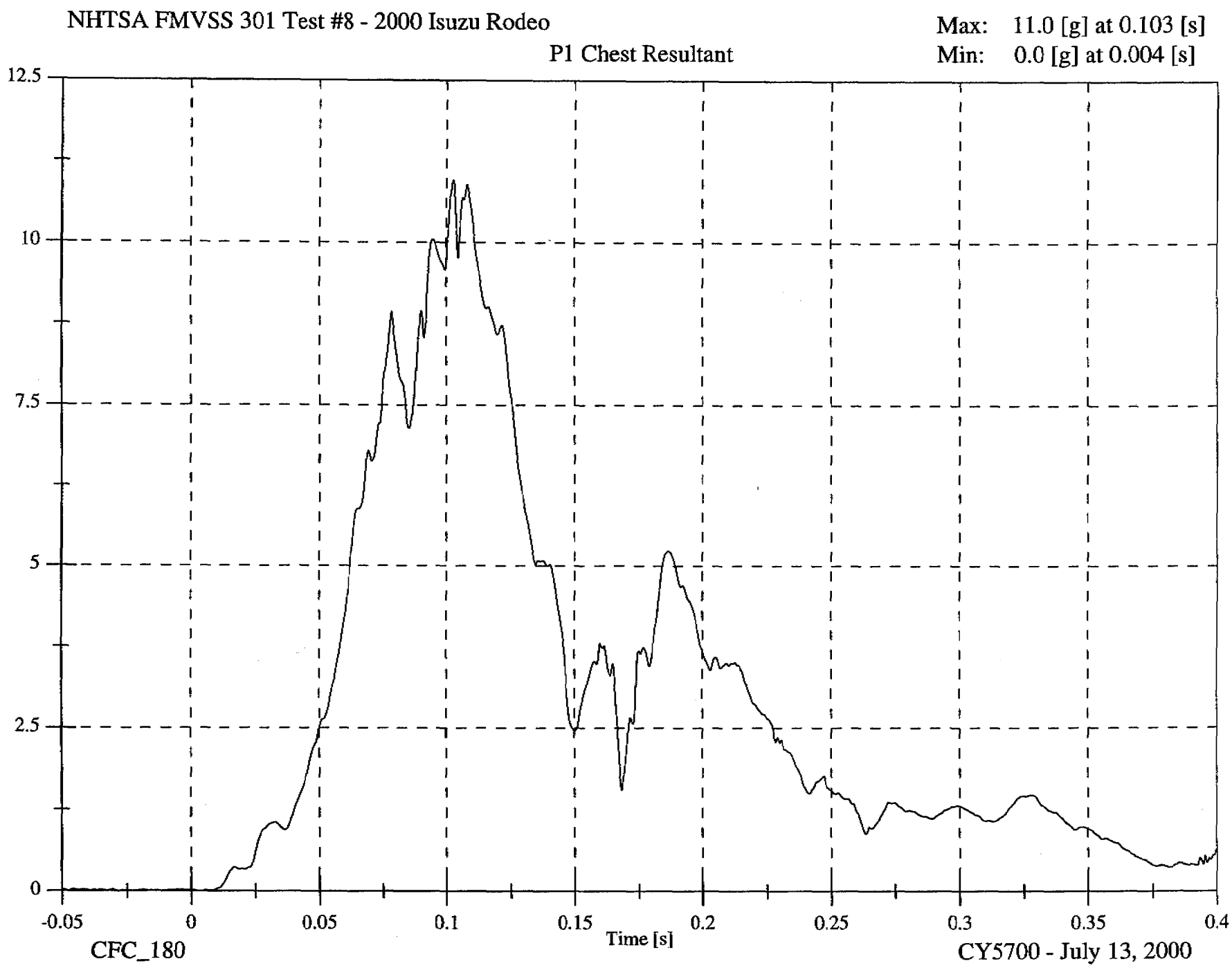

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck Mz
Max: 139.6 [in-lbf] at 0.176 [s]
Min: -50.4 [in-lbf] at 0.121 [s]
150
125
100
75
50
25
0
-25
-50
-75
in-lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000

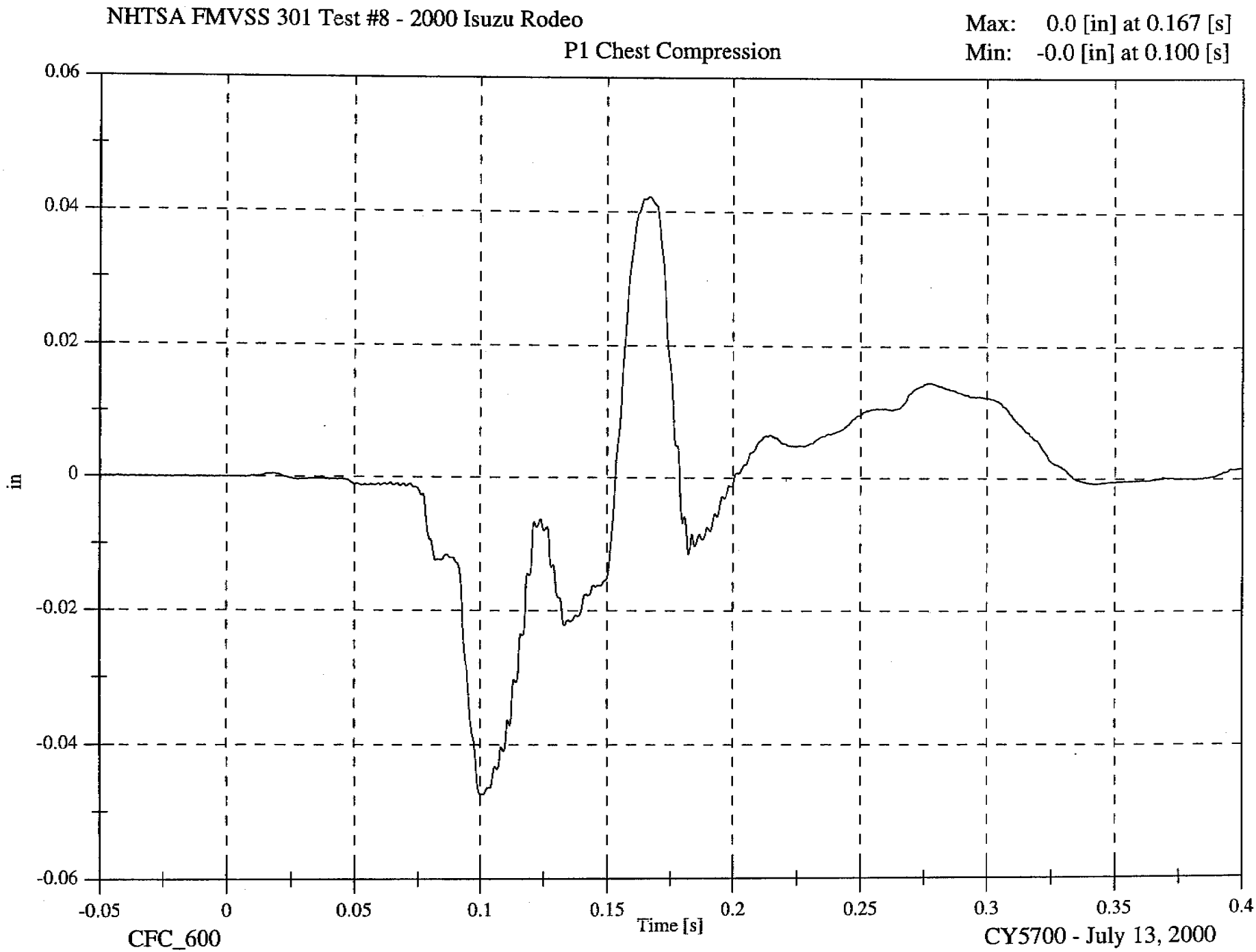

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Upper Neck M Resultant
Max: 268.4 [in-lbf] at 0.184 [s]
Min: 0.0 [in-lbf] at -0.046 [s]
300
250
200
150
100
50
0
in-lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000

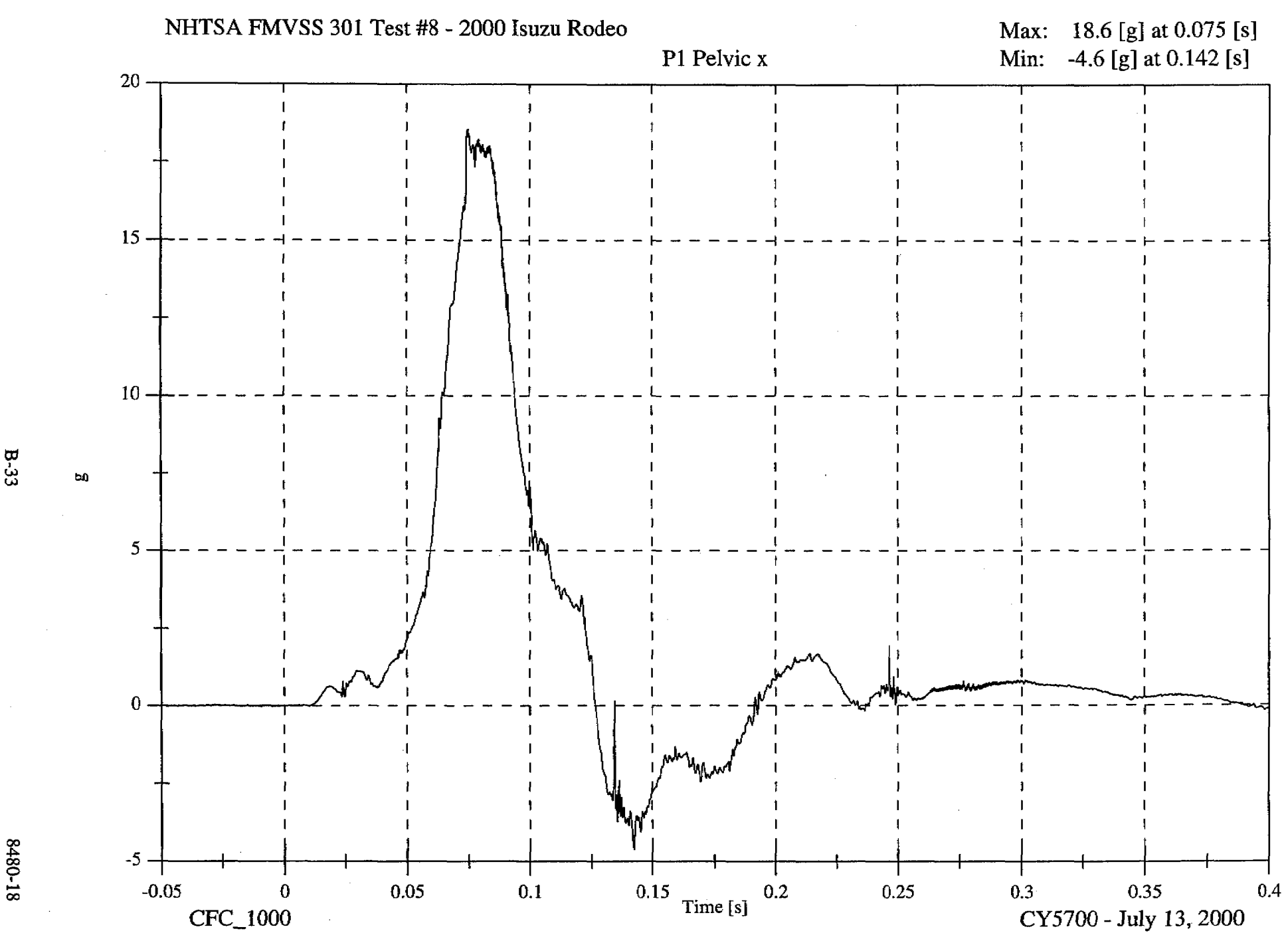

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Chest x
Max: 10.4 [g] at 0.102 [s]
Min: -3.4 [g] at 0.161 [s]
12.5
10
7.5
5
2.5
0
-2.5
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000

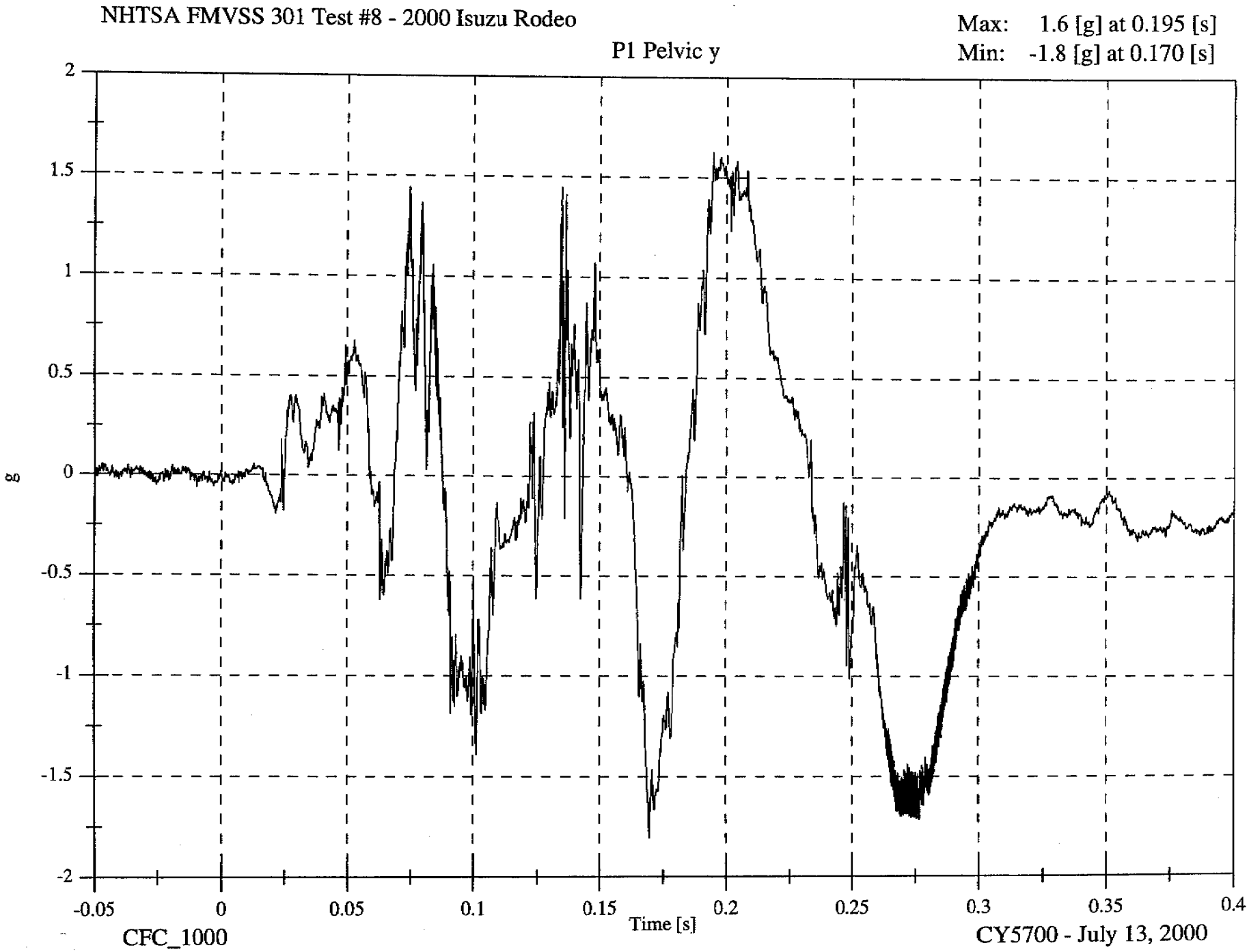

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Chest y
Max: 2.2 [g] at 0.152 [s]
Min: -2.9 [g] at 0.104 [s]
g
3
2
1
0
-1
-2
-3
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Chest z
Max: 4.7 [g] at 0.078 [s]
Min: -1.5 [g] at 0.149 [s]
5
4
3
2
1
0
-1
-2
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Chest Resultant
Max: 11.0 [g] at 0.103 [s]
Min: 0.0 [g] at 0.004 [s]
12.5
10
7.5
5
2.5
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_180
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Chest Compression
Max: 0.0 [in] at 0.167 [s]
Min: -0.0 [in] at 0.100 [s]
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
in
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000

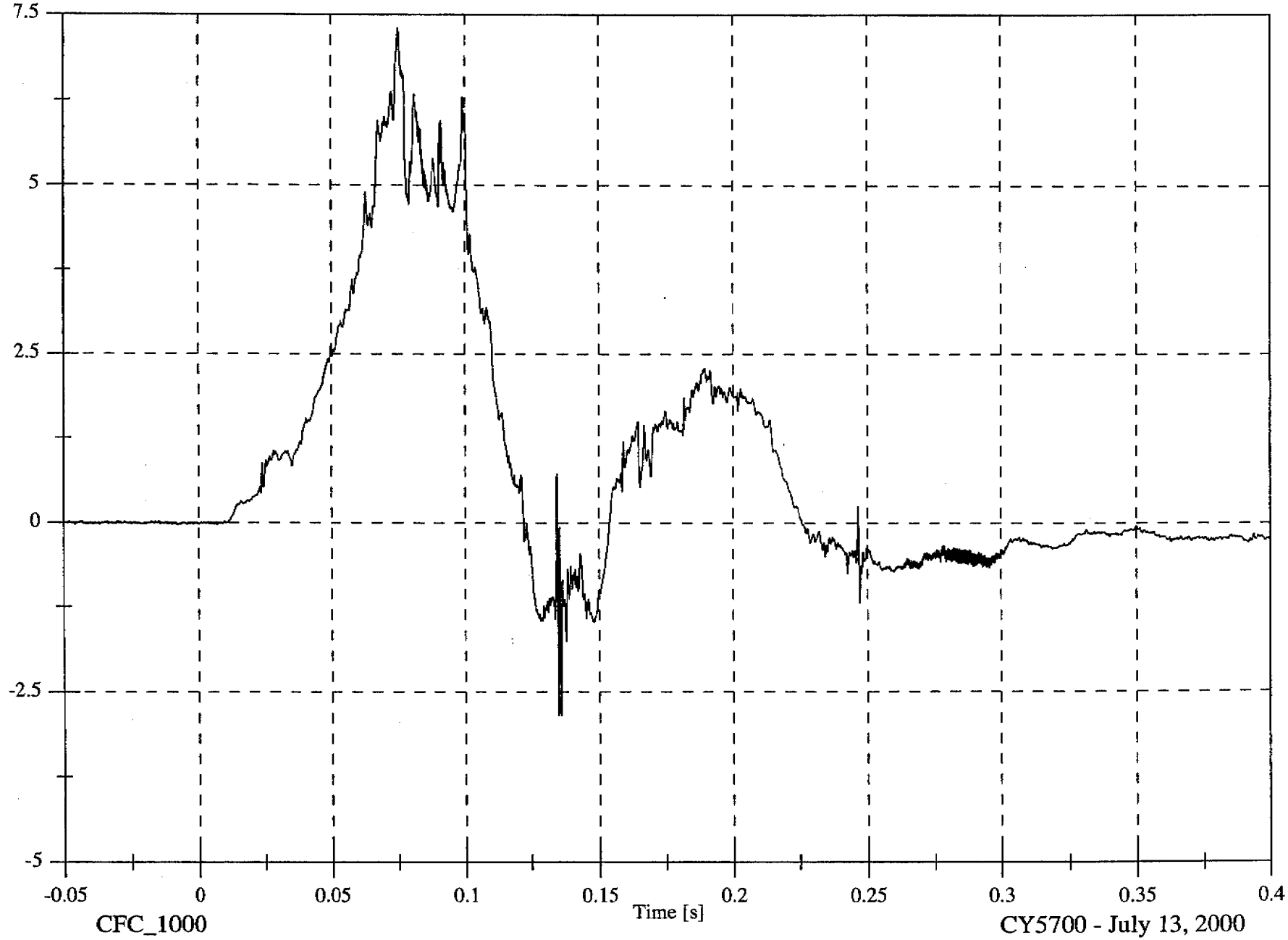

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Pelvic x
Max: 18.6 [g] at 0.075 [s]
Min: -4.6 [g] at 0.142 [s]
20
15
10
5
0
-5
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Pelvic y
Max: 1.6 [g] at 0.195 [s]
Min: -1.8 [g] at 0.170 [s]
g
Time [s]
CFC_1000
CY5700 - July 13, 2000

NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo

P1 Pelvic z

Max: 7.3 [g] at 0.075 [s]
Min: -2.8 [g] at 0.135 [s]

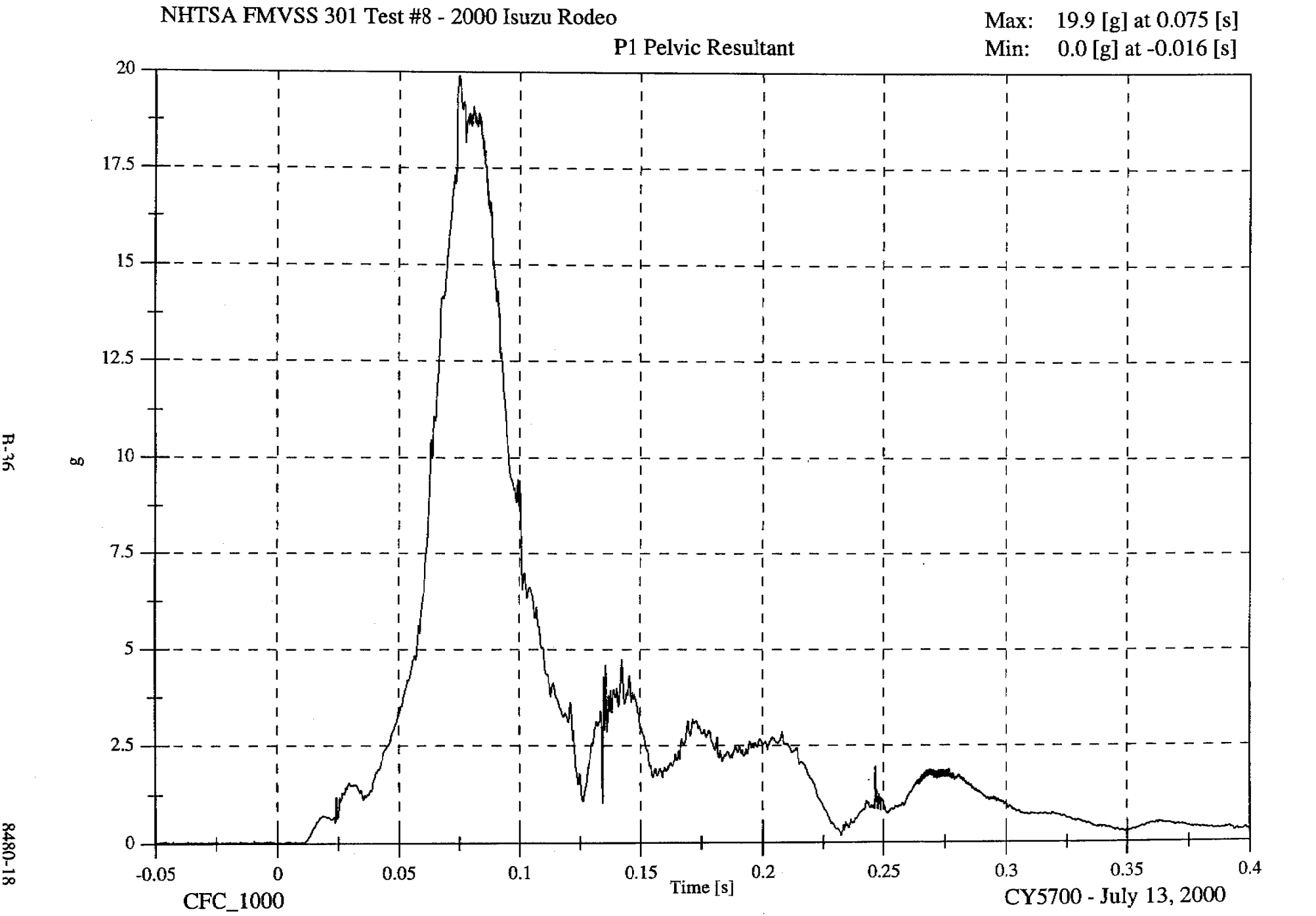


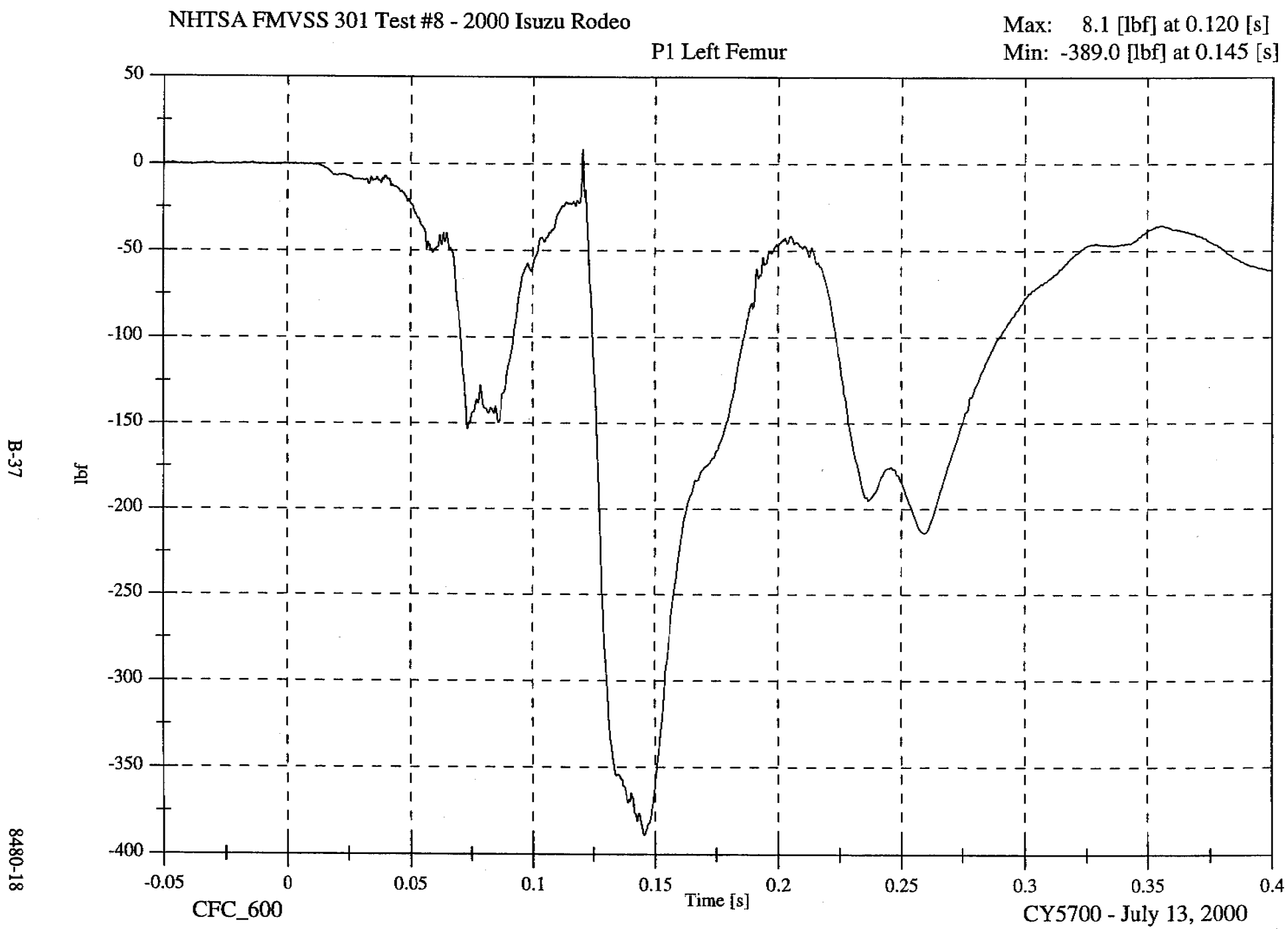
CFC_1000

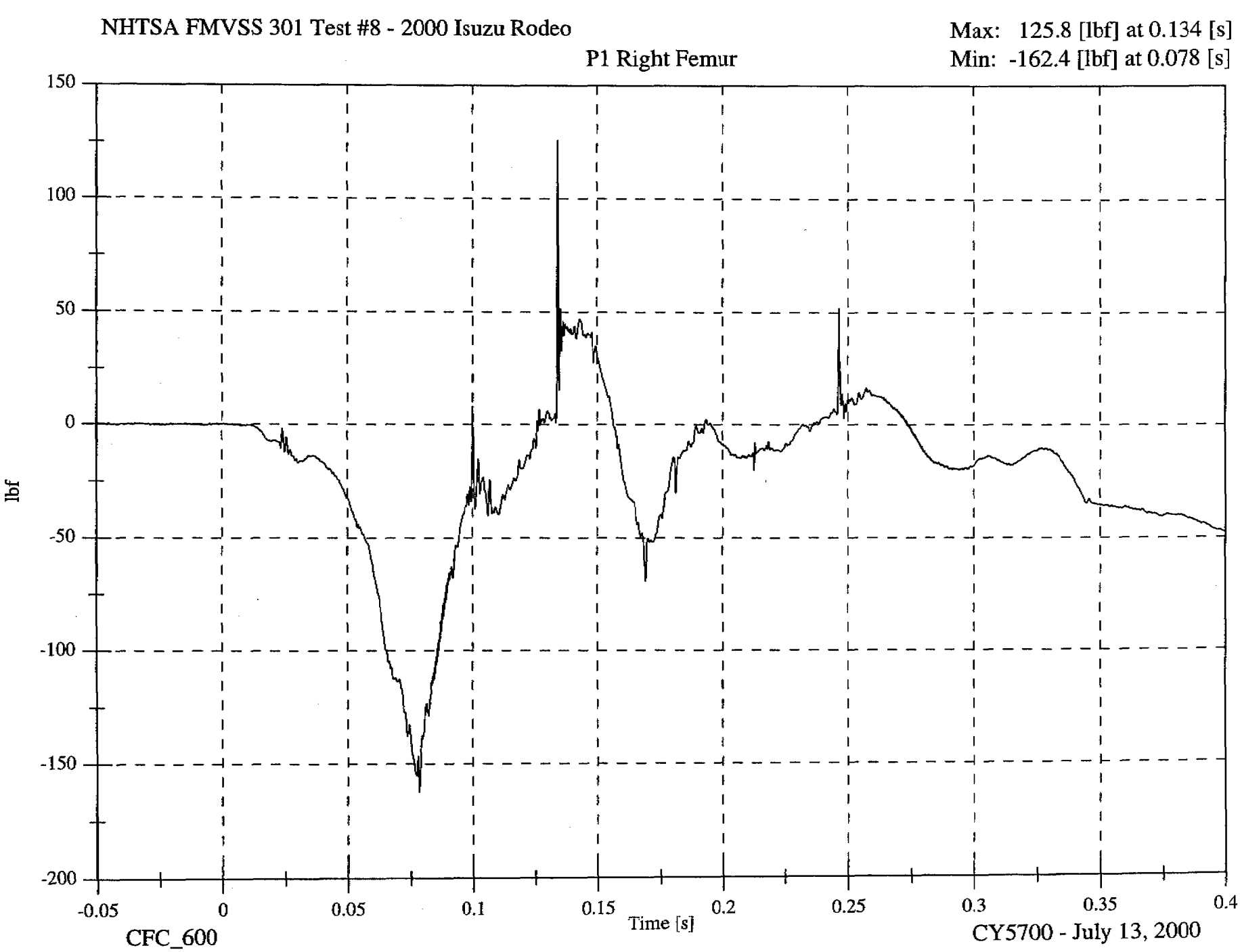
CY5700 - July 13, 2000

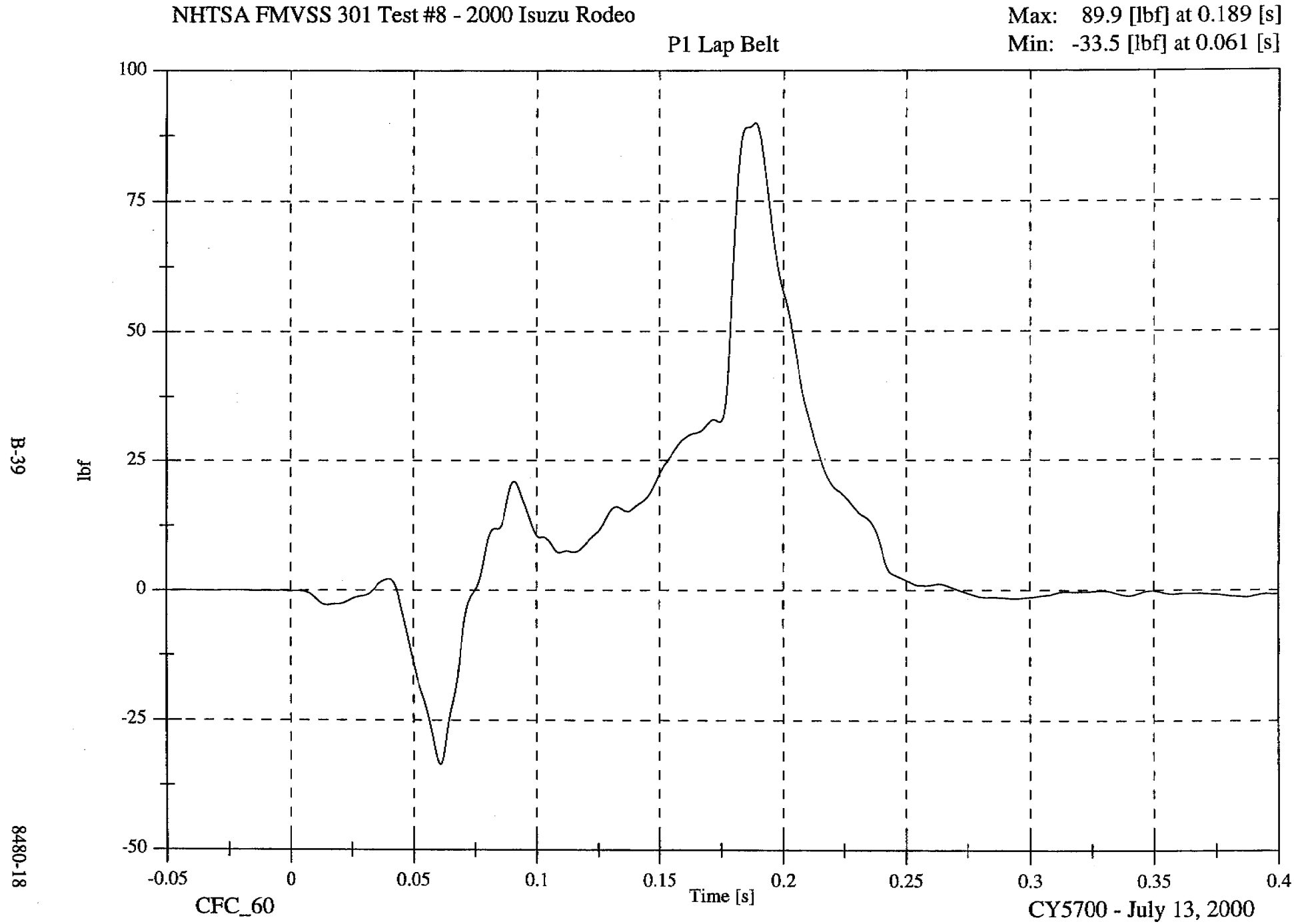
B-35

8480-18


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Pelvic Resultant
Max: 19.9 [g] at 0.075 [s]
Min: 0.0 [g] at -0.016 [s]
20
17.5
15
12.5
10
7.5
5
2.5
0
g
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_1000
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Left Femur
Max: 8.1 [lbf] at 0.120 [s]
Min: -389.0 [lbf] at 0.145 [s]
50
0
-50
-100
-150
-200
-250
-300
-350
-400
lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Right Femur
Max: 125.8 [lbf] at 0.134 [s]
Min: -162.4 [lbf] at 0.078 [s]
150
100
50
0
-50
-100
-150
-200
lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_600
CY5700 - July 13, 2000


NHTSA FMVSS 301 Test #8 - 2000 Isuzu Rodeo
P1 Lap Belt
Max: 89.9 [lbf] at 0.189 [s]
Min: -33.5 [lbf] at 0.061 [s]
100
75
50
25
0
-25
-50
lbf
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Time [s]
CFC_60
CY5700 - July 13, 2000

8480-18