1489-108

DOT 243

AETL

APPROVED ENGINEERING TEST LABORATORIES / 1536 EAST VALENCIA / FULLERTON, CALIFORNIA 92631 / TEL. (714) 879-6110

A NATIONAL TECHNICAL SERVICES COMPANY

OCCUPANT RESPONSE AND VEHICLE ACCELERATION IN A 30 MPH FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
1979 FORD CUSTOM STYLESIDE F350 - PICK UP
NHTSA 790608

APPROVED ENGINEERING TEST LABORATORIES
1536 EAST VALENCIA DRIVE
FULLERTON, CALIFORNIA 92631

APRIL 1980

CONTRACT NUMBER DOT-HS-6-01477

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF RESEARCH AND DEVELOPMENT
400 SEVENTH STREET S. W.
WASHINGTON, D. C. 20590

Prepared for the Department of Transportation, National Highway Traffic Safety Administration under Contract No. DOT-HS-6-01477. This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange, The United States Government assumes no liability for its contents or use thereof.

Prepared by D. W. Hamo

Approved by S. J. Valenzuela

Date 25 April 1980

Report Accepted by:

Contract Technical Manager
Office of Research and Development

Date

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle	5. Report Date
Occupant Response and Vehicle Acceleration in a 30 mph Frontal Barrier Impact Test - 1979 Ford Custom Styleside F350 - Pick Up - NHTSA 790608	April 29, 1980
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.

9. Performing Organization Name and Address	10. Work Unit. No.
Approved Engineering Test Laboratories 1536 East Valencia Drive Fullerton, California 92631 Phone No.: (714) 879-6110	11. Contract or Grant No. DOT-HS-6-01477

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U. S. Department of Transportation National Highway Traffic Safety Admin. Office of Research and Development 400 Seventh Street S. W. Washington, D. C. 20590	Final Report March 14 - March 20, 1980
	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

A 1979 Ford Custom Styleside F350 - Pick Up, NHTSA 790608, VIN-F35 HEDG2741, was impact tested for compliance with FMVSS 212/219/301-75 (Windshield Mounting, Windshield Zone Intrusion, and Fuel System Integrity) documented in Report No. 212-AETL-79-006, 219-AETL-79-043, 301-AETL-79-108.

As a parallel non-conflicting effort the anthropomorphic dummies and the test vehicle were instrumented with accelerometers to measure occupant response and vehicle acceleration. The results of this effort are documented herein.

The average test vehicle impact speed was 29.70 mph in the frontal (0°) mode.

17. Key Words	18. Distribution Statement
Frontal Barrier Impact Occupant Response Vehicle Acceleration	

19. Security Class. (of this report)	20. Security Class. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	80	

TABLE OF CONTENTS

TABLES

ILLUSTRATIONS

SECTION 1

SECTION 1

1.0 INTRODUCTION

The test was performed by Approved Engineering Test Laboratories under Contract Number DOT-HS-6-01477 in accordance with the Office of Vehicle Safety Compliance Laboratory Procedures.

The purpose of the effort documented herein was to acquire occupant response and vehicle acceleration data in a 1979 Ford Custom Styleside F350 - Pick Up, NHTSA 790608 during a 30 mph frontal fixed barrier impact test. This effort was conducted in conjunction with Federal Motor Vehicle Safety Standard (FMVSS) 212 - "Windshield Mounting", 219 - "Windshield Zone Intrusion", and 301-75 "Fuel System Integrity" compliance test. These compliance tests were previously documented in NHTSA/OVSC Report Nos. 212-AETL-79-006, 219-AETL-79-043, 301-AETL-79-108. Only the occupant response and vehicle acceleration aspects of the test are covered in the report.

The scope of the vehicle test was expanded to accommodate the acquisition of occupant response and vehicle acceleration data. This was accomplished without creating any conflict with the Laboratory Procedures (TP219-02) issued by the Office of Vehicle Safety Compliance (OVSC). Specific

procedures used to obtain the additional data are outlined in the Office of Vehicle Safety Compliance Laboratory Procedures (TP212-01) and detailed in Section 4 of this report.

SECTION 2

SECTION 2

2.0 TEST SUMMARY

The 1979 Ford Custom Styleside F350 - Pick Up was subjected to a frontal fixed barrier impact as required by Federal Motor Vehicle Safety Standard 212/219/301-75.

Color motion picture coverage of the vehicle impact are considered part of the accumulated pertinent data. Where applicable, still photographs are presented in this report; while the motion picture coverage was submitted separately with the compliance report.

TABLE 1

SUMMARY OF TEST CONDITIONS

TEST VEHICLE INFORMATION:

Manufacturer: Ford Motor Company

Make/Model: Ford Custom Styleside F350

Body Style: Pick Up Model Year: 1979

VIN: F35HEDG2741 Build Date: December 1978

NHTSA No.: 790608 Color: Blue

Engine Data: Eight (8) Cylinders; 351 Cu. In. Displ.

Transmission Data: Three (3) Speed ( ) Manual (X) Automatic

Major Options: Power Steering, Step Bumper

VEHICLE ATTITUDE:

Delivered Attitude: LF 34.1 in.; RF 33.3 in.; LR 38.0 in.; RR 37.8

Test Attitude: LF 33.7 in.; RF 32.9 in.; LR 37.3 in.; RR 37.3

VEHICLE TIRE DATA:

Recommended Cold Tire Pressure: Front = 35 psi

(Up to Vehicle Load Capacity) Rear = 70 psi

Recommended Tire Size: 9.50-16.5 Load Range: "E"

Tires on Vehicle: 9.50-16.5 - Firestone

Spare Tire: X Yes; No; Space Saver: Yes; X No

TABLE Ia

SUMMARY OF TEST CONDITIONS (Cont'd)

TEST CONDITIONS:

Date of Test: March 20, 1980 Time of Test: 1425

Ambient Temperature: 71 °F at Impact Area

VEHICLE CAPACITY:

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

Designated Seating Capacity: Front 3
Center 0
Rear 0
Total 3

Cargo: Unknown lbs.

Total Unknown lbs. (Vehicle Capacity Weight)

GVWR: 8,900 lbs. (Taken From Certification Label)

GAWR: Front 3,400 lbs.; Rear 5,950 lbs.

VEHICLE DELIVERED WEIGHT: (Fluids to Capacity)

Left Front 1,297 lbs. Left Rear 1,072 lbs.
Right Front 1,264 lbs. Right Rear 956 lbs.
Total Front Weight 2,561 lbs. (55.8 % of Total Vehicle Weight)
Total Rear Weight 2,028 lbs. (44.2 % of Total Vehicle Weight)
Total Delivered Weight 4,589 lbs.

CALCULATED VEHICLE TEST WEIGHT: 5,217 lbs.
(With Required Dummies and 300 lbs. Cargo)

ACTUAL VEHICLE TEST WEIGHT:

Left Front 1,369 lbs. Left Rear 1,153 lbs.
Right Front 1,432 lbs. Right Rear 1,263 lbs.
Total Front Weight 2,801 lbs. (53.7 % of Total Vehicle Weight)
Total Rear Weight 2,416 lbs. (46.3 % of Total Vehicle Weight)
Total Test Weight 5,217 lbs.

SECTION 2

2.1 SUMMARY OF TEST RESULTS

The following data sheets summarize:

1. The occupant response data (Part 572 Dummy Data Sheet)
2. The vehicle acceleration data (Vehicle Structural Data Sheet)
3. The Pre and Post-Test vehicle dimensions data (Vehicle Structural Data Sheets)

More comprehensive data is presented in Appendix A in the form of computer-generated plots.

PART 572 DUMMY DATA

Vehicle 1979 Ford F350 Pick Up NHTSA No. 790608

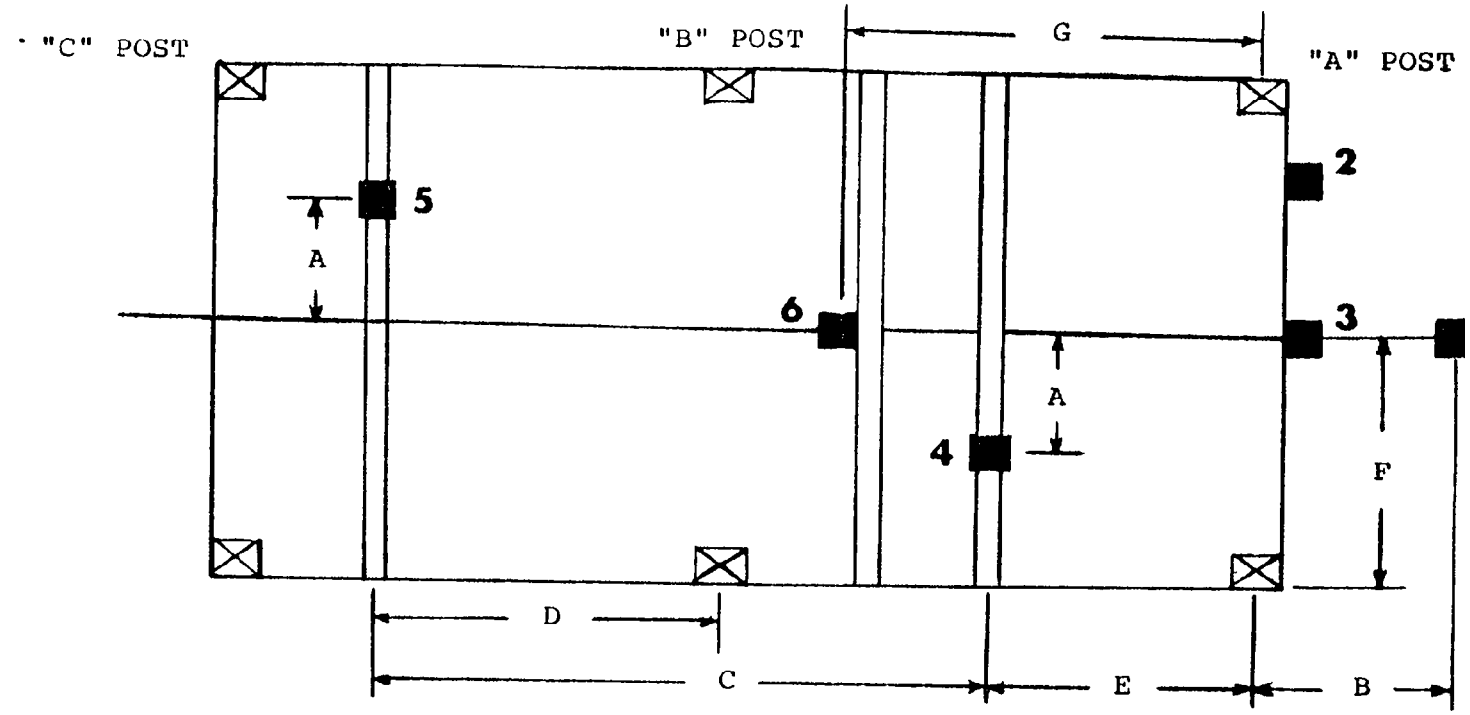
Driver S/N 0353 Passenger S/N 0354	DRIVER				PASSENGER			
	Positive* Direction		Negative* Direction		Positive* Direction		Negative* Direction	
	Peak G	Time (msec)	Peak G	Time (msec)	Peak G	Time (msec)	Peak G	Time (msec)
Head Acceleration								
Longitudinal	4.6	160.4	90.9	65.8	3.9	32.8	23.8	98.4
Lateral	14.6	64.6	15.0	95.2	9.1	191.2	29.5	122.8
Vertical	14.4	66.0	40.1	81.8	1.0	21.8	36.1	99.2
Resultant	91.8	65.8			45.5	119.0		
HIC								
Chest Acceleration								
Longitudinal	3.7	203.6	39.6	87.2	5.7	169.6	30.5	92.8
Lateral	10.7	98.8	2.0	39.0	10.8	180.0	27.8	113.4
Vertical	2.5	118.2	32.6	87.0	12.4	116.4	13.4	77.0
Resultant	51.5	87.0			34.9	110.8		
Severity Index								
Femur Loads	(lb)	Time (msec)	(lb)	Time (msec)	(lb)	Time (msec)	(lb)	Time (msec)
Left	115	105.2	612	61.4	113	61.2	570	87.6
Right	207	63.0	528	33.0	175	69.4	200	26.0
Belt Load								
Torso	1233	87.4	3	177.6	1757	104.8	14	204.4

Average Vehicle Impact Speed 29.70 mph

*Positive Direction - Longitudinal: Forward
Lateral: Leftward
Vertical: Upward
Femur: Tension

*Negative Direction - Longitudinal: Rearward
Lateral: Rightward
Vertical: Downward
Femur: Compression

VEHICLE STRUCTURAL DATA



DIMENSIONS			
LOCATION	MEASUREMENT (IN.)	LOCATION	MEASUREMENT (IN.)
A	19.5	E	11.2
B	27.0	F	38.6
C	47.7	G	32.5
D	20.5		

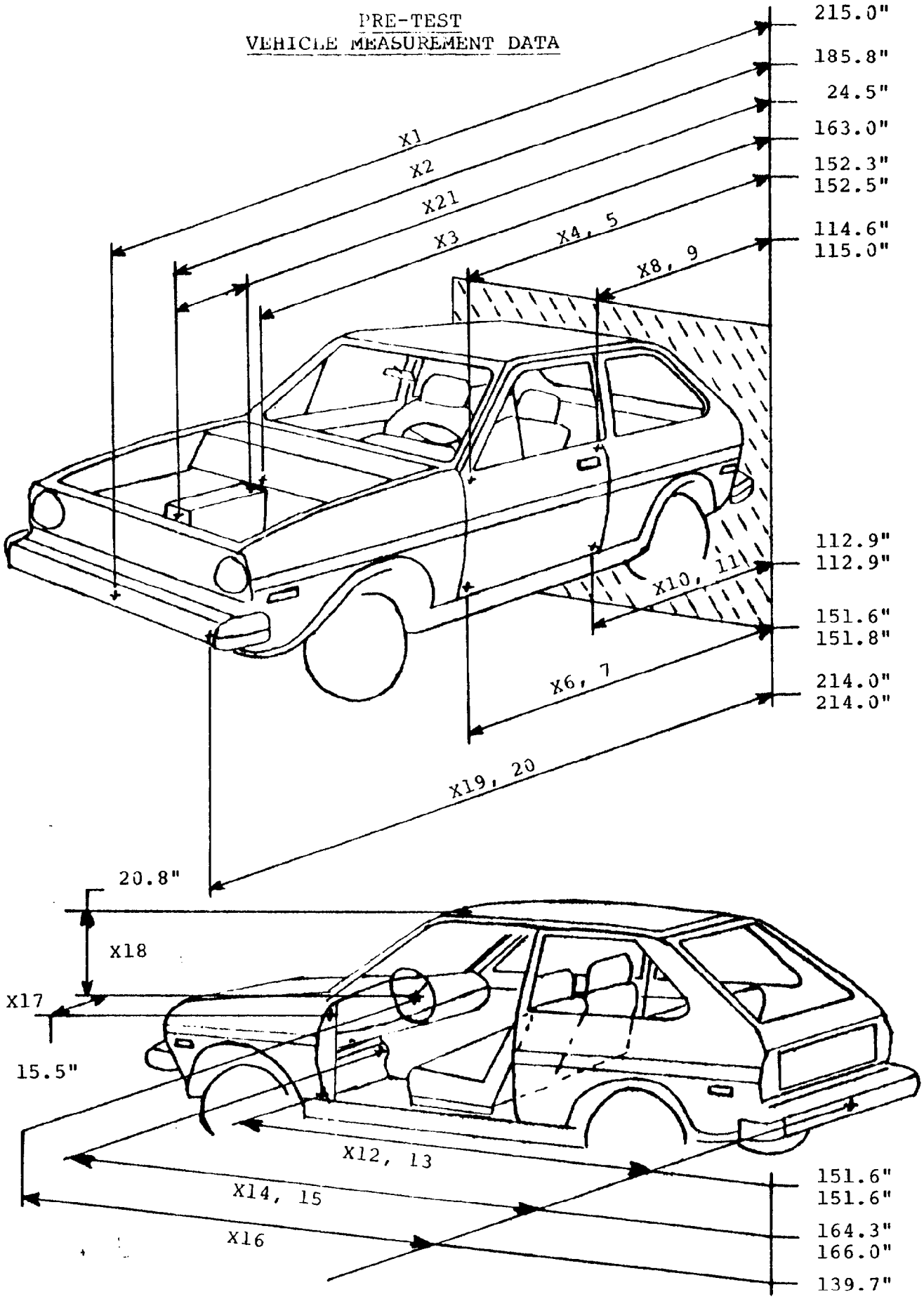
ACCELERATION PEAKS

ACCELEROMETER LOCATION	POSITIVE* DIRECTION		NEGATIVE* DIRECTION	
	PEAK "G"	TIME (MSEC)	PEAK "G"	TIME (MSEC)
NO. 1 LONGITUDINAL	26.5	60.0	102.6	49.4
NO. 1 VERTICAL	8.3	69.0	15.6	53.0
NO. 2 LONGITUDINAL	22.1	90.0	93.5	17.8
NO. 2 VERTICAL	43.6	84.4	24.1	53.0
NO. 3 LONGITUDINAL	67.9	56.0	154.5	50.8
NO. 3 VERTICAL	42.5	56.4	50.9	72.2
NO. 4 LONGITUDINAL	6.0	115.0	58.3	74.6
NO. 4 VERTICAL	49.1	80.8	36.3	65.4
NO. 5 LONGITUDINAL	9.0	26.2	72.4	15.8
NO. 5 VERTICAL	57.9	35.2	72.4	21.4
NO. 6 LONGITUDINAL	15.3	39.4	67.9	68.8
NO. 6 LATERAL	7.7	44.2	12.6	88.2
NO. 6 VERTICAL	46.5	17.6	83.2	39.4

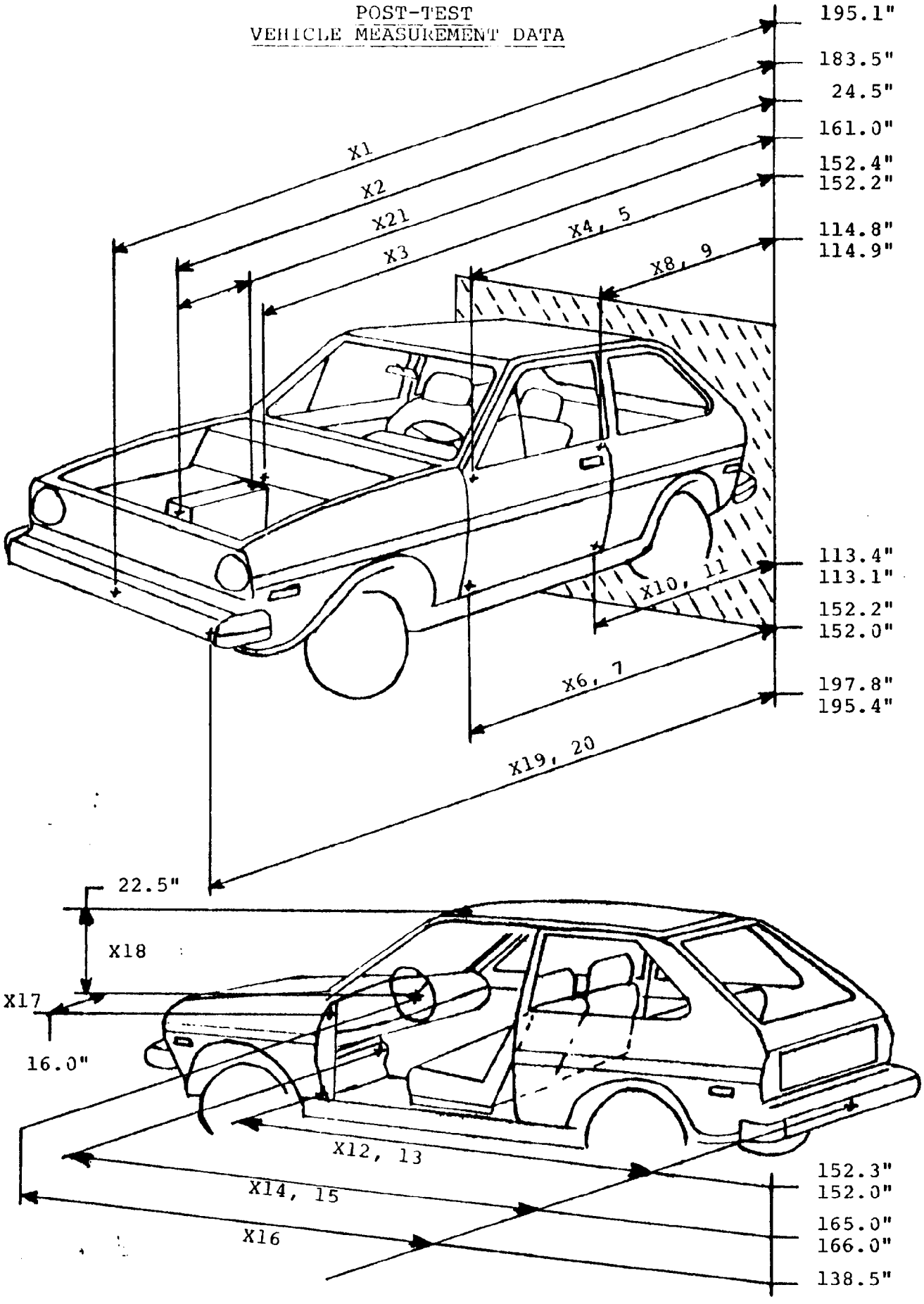
*POSITIVE DIRECTION - LONGITUDINAL: Forward; LATERAL: Leftward; VERTICAL: Upward

*NEGATIVE DIRECTION - LONGITUDINAL: Rearward; LATERAL: Rightward; VERTICAL: Downward

PRE-TEST
VEHICLE MEASUREMENT DATA



POST-TEST
VEHICLE MEASUREMENT DATA



SUMMARY

PRE-TEST AND POST-TEST VEHICLE DIMENSIONS

Measurement Point	Pre-Test	Post-Test	Difference
X1	215.0"	195.1"	19.9"
X2	185.8"	183.5"	2.3"
X3	163.0"	161.0"	2.0"
X4	152.3"	152.4"	+0.1"
X5	152.5"	152.2"	0.3"
X6	151.6"	152.2"	+0.6"
X7	151.8"	152.0"	+0.2"
X8	114.6"	114.8"	+0.2"
X9	115.0"	114.9"	0.1"
X10	112.9"	113.4"	+0.5"
X11	112.9"	113.1"	+0.2"
X12	151.6"	152.3"	+0.7"
X13	151.6"	152.0"	+0.4"
X14	164.3"	165.0"	0.7"
X15	166.0"	166.0"	0.0"
X16	139.7"	138.5"	1.2"
X17	15.5"	16.0"	+0.5"
X18	20.8"	22.5"	+1.7"
X19	214.0"	197.8"	16.2"
X20	214.0"	195.4"	18.6"
X21	24.5"	24.5"	0.0"

SECTION 3

SECTION 3

3.0 TEST RESULTS AND PHOTOGRAPHS

The test vehicle performance was determined by a frontal fixed barrier impact at an average speed of 29.70 mph. The average vehicle static crush was 17.4 inches.

Post-impact inspection of the vehicle revealed almost all crush occurred forward of the cab doors. The driver dummy impacted the steering wheel and dash assembly. The passenger dummy also impacted the dash assembly.

Figures 3-1 through 3-4 are pre-test and post-test views of the occupant compartment, restraint system, and test dummies.

Figure 3-1

1979 Ford Custom Styleside F350 - Pick Up

NHTSA 790608

Pre-Test, Driver Dummy View


79060/8

Figure 3-2

1979 Ford Custom Styleside F350 - Pick Up

NHTSA 790608

Pre-Test, Passenger Dummy View


790608

Figure 3-3

1979 Ford Custom Styleside F350 - Pick Up

NHTSA 790608

Post-Impact, Driver Dummy View

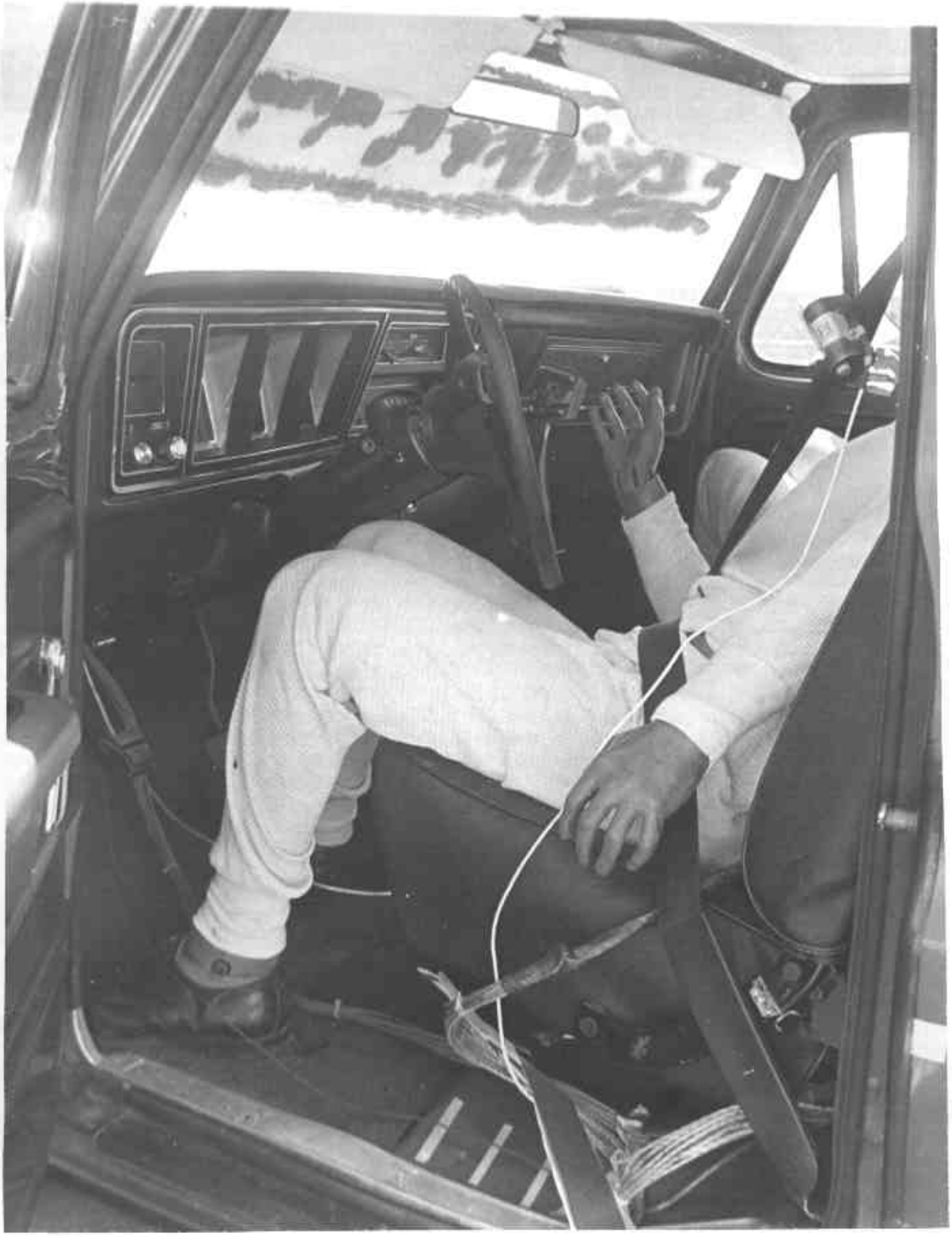


Figure 3-4

1979 Ford Custom Styleside F350 - Pick Up

NHTSA 790608

Post-Impact, Passenger Dummy View

SECTION 4

SECTION 4

4.0 TEST PROCEDURES

4.1 FIXED BARRIER IMPACT TEST

The procedures for conducting the frontal fixed barrier impact test are presented in detail in the FMVSS 212/219/301-75 "Windshield Mounting, Windshield Zone Intrusion, and Fuel System Integrity" report previously submitted to DOT-NHTSA Office of Vehicle Safety Compliance.

4.2 TEST DUMMY POSITIONING

The driver and right front passenger dummies were placed in the center of the seat cushion and pushed into the seat back. The shoulders were pushed back against the seat back and the head centered on the head restraint. The thighs were pushed down on the seat cushion and the heels placed on the floor pan. The thumbs and index fingers of the driver dummy were positioned around the steering wheel rim at the 3 and 9 o'clock position. The upper position of the passenger dummy arms were pushed against the seat back and the hands placed to the side of the thighs.

SECTION 4

4.3 DATA ACQUISITION AND REDUCTION

The data acquisition and analysis system used for acquiring occupant response and vehicle acceleration are shown schematically in Figure 4-1. A complete list of instrumentation is provided in Table 4-1. An itemized procedure for acquiring data is provided on Table 4-2.

Prior to the vehicle impact test the onboard instrumentation package is installed and a calibration and null reference check is performed to checkout all data analog devices including the FM magnetic tape recorders. The moment of impact trigger switch attached to the vehicle is also checked out. Immediately following vehicle impact a post-impact calibration and null reference check is performed.

The analog data is then played back into a Hewlett Packard Digital Fourier Analyzer (DFA) system using a HP 2100S mini computer with 32K word core storage. This system uses four program controlled analog filters which provides predigitizing filter capability of 60 db/octave above 1250 Hz.

SECTION 4

The DFA is a hard disc based system with standard HP design software for performing data acquisition and analysis functions. The HP software is programmed using direct keyboard functions to automate the data reduction process. The data is entered into temporary storage, four channels (one set) at a time with six total sets. Table 4-3 defines each data channel and data set. The data sets are divided into driver and passenger tape recorder groups to facilitate simultaneous data acquisition for the head, chest and vehicle accelerometers to assure appropriate calibration of injury criteria and vehicle dynamics. At the time of entry, test personnel enter the appropriate calibration for each data channel and the computer then scales the data appropriately. When all data has been acquired it is moved as a vehicle set to permanent storage on a removable magnetic disc. (Nine vehicle sets are stored on each magnetic disc. All magnetic discs and FM recorder tapes are retained on file at AETL).

SECTION 4

The only modification to the data at the time of permanent storage is the filtering and digitizing process of the FM recorder tape (2500 Hz) and the DFA (1250 Hz, 200 ms). Immediately after the data is moved to permanent storage it is recalled by the test personnel and plotted with the appropriate label and vehicle designation. As the data is recalled the DFA is programmed to automatically filter the data with the appropriate SAE filter. Figure 4-2 illustrates the SAE class 60, 180, 600 and 1000 filters applied to the data. These filters are in accordance with SAE J211a, Instrumentation for Impact Tests. The class 60 filter is applied to the vehicle acceleration and belt restraint forces. The class 180 filter is applied to the chest acceleration forces. The class 600 filter is applied to the femur forces and the class 1000 filter is applied to the head acceleration forces.

The SAE recommended filters are quadratic double pole filters with 65% damping and 12 db/octave rolloff. They are applied to the data using a Fast Fourier Transform (FFT) of the data, frequency domain multiplication, and inverse FFT operation on the product.

SECTION 4

It should be noted in Figure 4-2 that the predigitizing analog filter attenuates all signals above the 1250 Hz cutoff frequency. This has no effect on the class 60 or class 180 data. The class 600 data is within SAE J211a recommendation to 1900 Hz and -20 db. Above 1900 Hz the class 600 data is attenuated at 60 db/octave instead of 24 db/octave. This has very negligible effect on the class 600 data. The modification of class 1000 data by the predigitizing filter is attenuation of 60 db/octave above 1250 Hz instead of 24 db/octave above 1650 Hz. Examination of typical class 1000 data shows the high frequency components between 1250 Hz and 1650 Hz are uniformily less than 3 percent of the largest components at lower frequencys. The effect of the predigitizing filter has a very slight smoothing of the plotted data.

4.4 IMPACT DATA

All impact data is presented in computer plots of data digitized at 200 microseconds. Special SAE filters are applied to each data set. Each data plot includes labeling, defining the test vehicle, filter class, and the complete identification of the data plotted.

SECTION 4

4.4.1 DUMMY HEAD DATA

The dummy head accelerations are processed as class 1000 data, and the Head Injury Criteria (HIC) calculation is performed. The HIC calculations are maximized for start time (T1) and end time (T2), using a manual iteration routine, usually requiring about ten interations and between 5,000 and 10,000 combinations of start and end times. Data output is in the form of computer plots with the final HIC calculations. Listing of data value and HIC calculations are available, but not provided in the final report.

4.4.2 DUMMY CHEST DATA

The dummy chest accelerations are processed as class 180 data, and direct Chest Severity Index (CSI) calculations are performed. Data output is in the form of computer plots with the CSI calculations.

4.4.3 FEMUR LOAD DATA

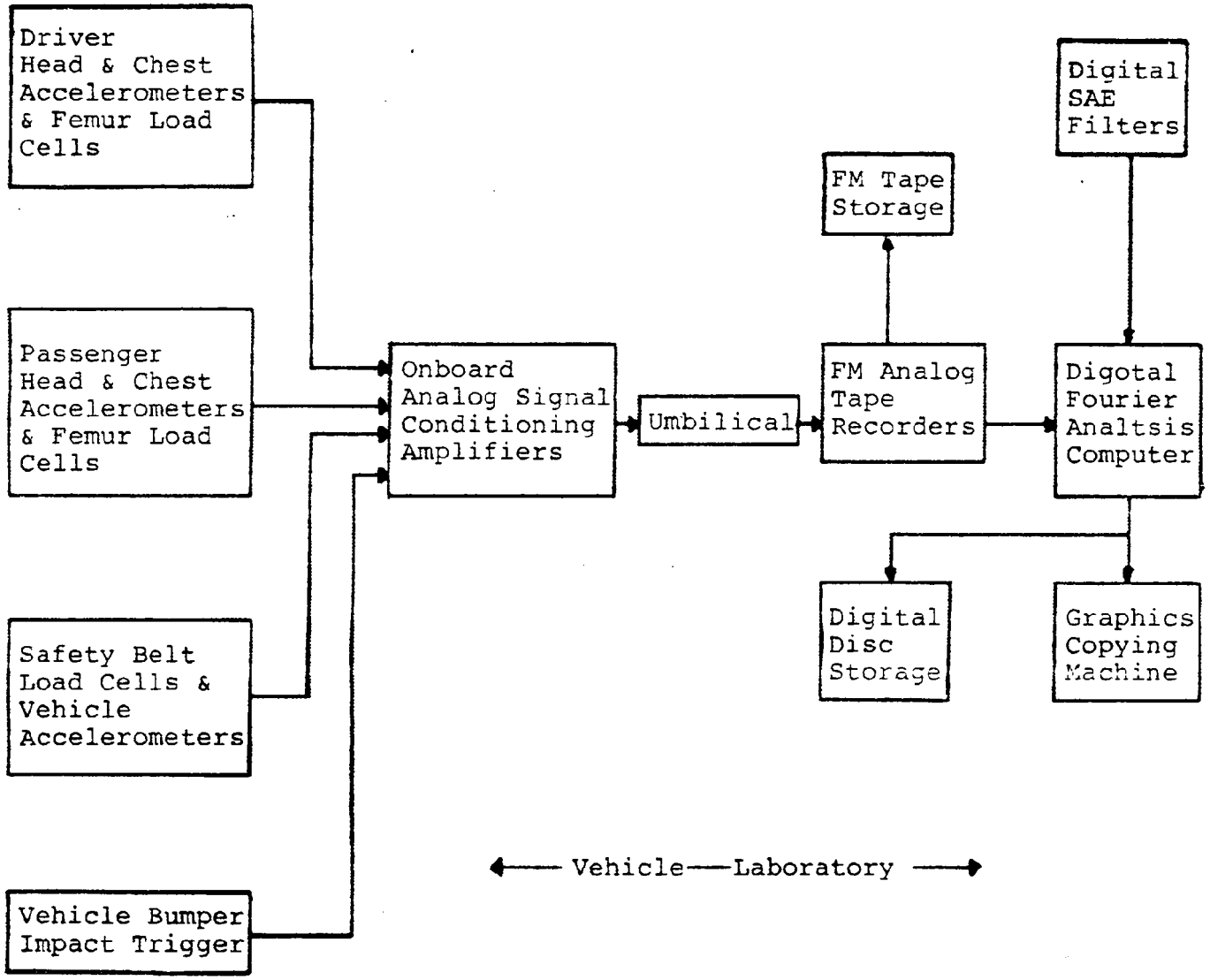
The dummy femur loads are processed as class 600 data, and presented as computer plots.

4.4.4 RESTRAINT LOAD DATA

The dummy restraint loads are processed as class 60 data, and presented as computer plots.

4.4.5 VEHICLE ACCELERATION DATA

The vehicle accelerations are processed as class 60 data, and presented as computer plots. Additionally, the longitudinal vehicle acceleration is integrated to provide approximate vehicle velocity change and vehicle crush during the impact event.



VEHICLE AND OCCUPANT CRASH IMPACT DATA ACQUISITION SYSTEM

FIGURE 4-1

TABLE 4-1 INSTRUMENTATION FOR CRASH TEST

Instrument	Manufacturer	Model No.	Full Scale	Accuracy	Frequency Max.
Accelerometers, Head, Chest, Vehicle	Endevco	2262C-200	200g	±1%	3600 Hz
Load Cells, Femurs	GSE	2430	3000 lb	±1%	>3600 Hz
Load Cells, Safety Belts	GSE	2500	3000 lb	±1%	>3600 Hz
Contact Switch, Impact	AETL	-	2 V	-	<200 us rise time
FM Tape Recorder	Bell & Howell	4020	±2.8 V	47 db SNR	2500 Hz WB
Programmable Filter, All Data	Hewlett Packard	54440A	-	0.5%	1250 Hz, 60 db/oct
Analog-Digital Converter, All Data	Hewlett Packard	5466B	-	0.5%	200 us sampling
Analysis Computer All Analysis	Hewlett Packard	2100S	32 K Words	16 Bit Word	-
Disc Drive	Hewlett Packard	7900A	5 Meg Words	-	-

TABLE 4-2

DATA ACQUISITION AND REDUCTION PROCESS

STEP	DESCRIPTION
1	DA System Installation
2	DA System Pre-Impact Calibration
3	Impact Trigger Checkout
4	Vehicle Impact Performed
5	DA System Post-Impact Calibration
6	Data Reproduced From FM Tape Into Computer a) Data analog filtered at 1250 Hz b) Data digitized at 500 ms sample rate c) Data sychronized by impact trigger signal
7	Digitized Data Examined
8	Data Transfered Permanent Disc Storage
9	Appropriate SAE Filters Are Applied
10	Each Data Signal Plotted With Labels
11	Chest Severity Index Values Determined
12	Head Injury Criteria Values Determined
13	Vehicle Dynamics Evaluated (MPH & Crush)

TABLE 4-3

DATA DESIGNATIONS FOR VEHICLE CRASH IMPACT DATA ACQUISITION

DATA SET	TAPE NO.	CHANNEL NO.	DESCRIPTION
1	1	1	Driver Longitudingal Head Acceleration A_x
1	1	2	Driver Lateral Head Acceleration A_y
1	1	3	Driver Vertical Head Acceleration A_z
1	1	4	Driver Right Femur Force
2	1	5	Driver Longitudinal Chest Acceleration A_x
2	1	6	Driver Lateral Chest Acceleration A_y
2	1	7	Driver Vertical Chest Acceleration A_z
2	1	8	Driver Left Femur Force
3	1	9	Driver Restraint Belt Force
3	1	10	Longitudinal Vehicle Acceleration (Front) A_x
3	1	11	Longitudinal Vehicle Acceleration (Rear) A_x
3	1	12	Vertical Vehicle Acceleration (Rear) A_z
4	2	1	Passenger Longitudinal Head Acceleration A_x
4	2	2	Passenger Lateral Head Acceleration A_y
4	2	3	Passenger Vertical Head Acceleration A_z
4	2	4	Passenger Right Femur Force
5	2	5	Passenger Longitudinal Chest Acceleration A_x
5	2	6	Passenger Lateral Chest Acceleration A_y
5	2	7	Passenger Vertical Chest Acceleration A_z
5	2	8	Passenger Left Femur Force
6	2	9	Passenger Restraint Belt Force
6	2	10-12	Same as Tape 1, Ch's 10-12

COMPARISON PLOT OF SAE CLASS 60, 180, 600, 1000 FILTERS AND
THE DATA ANALYSIS 1250 HZ PREDIGITIZING ANALOG FILTER.

SAE FILTERS ROLL OFF IS 12DB/OCT, ANALOG FILTER ROLL OFF IS 60DB/OCT

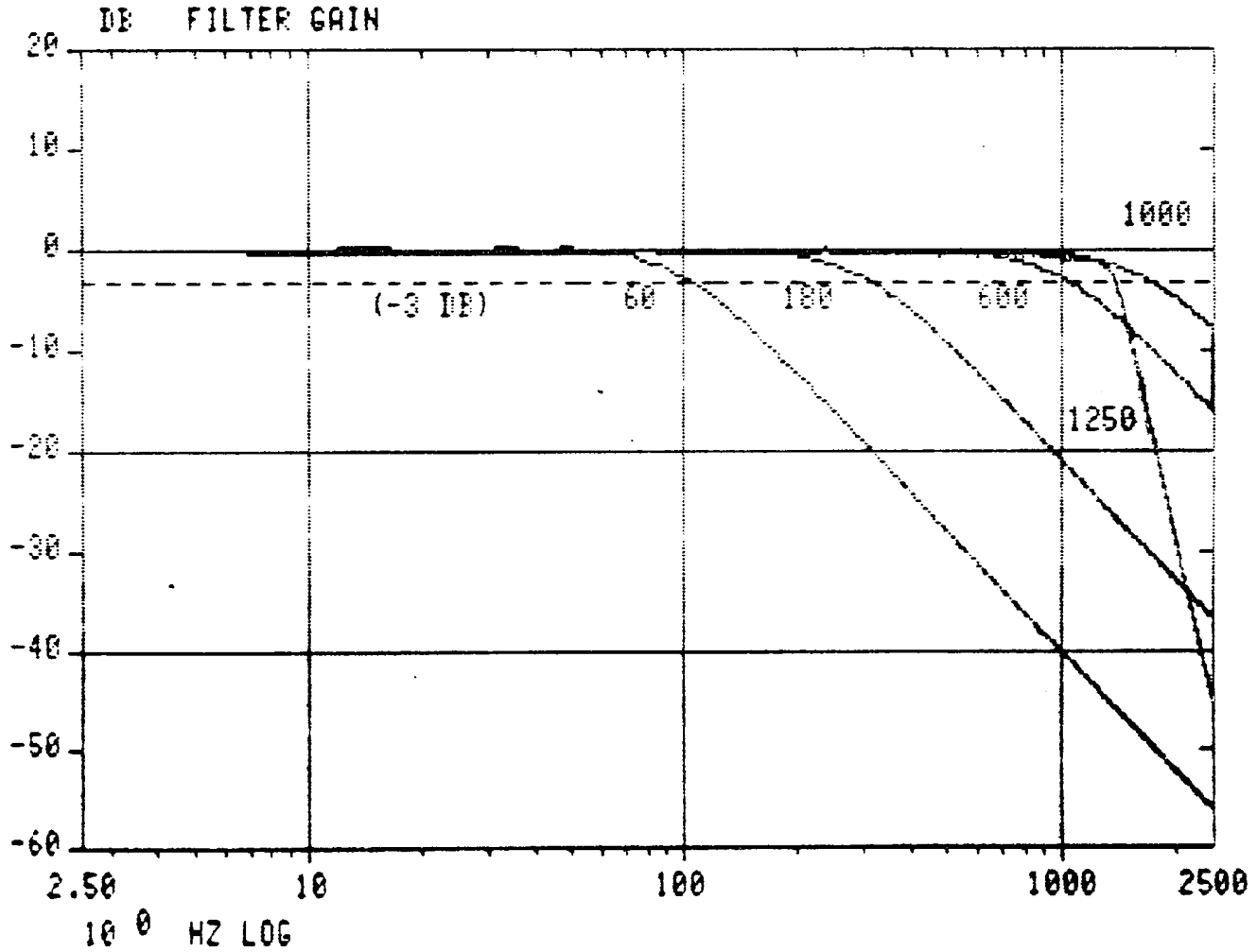


FIGURE 4-2

APPENDIX A

APPENDIX A

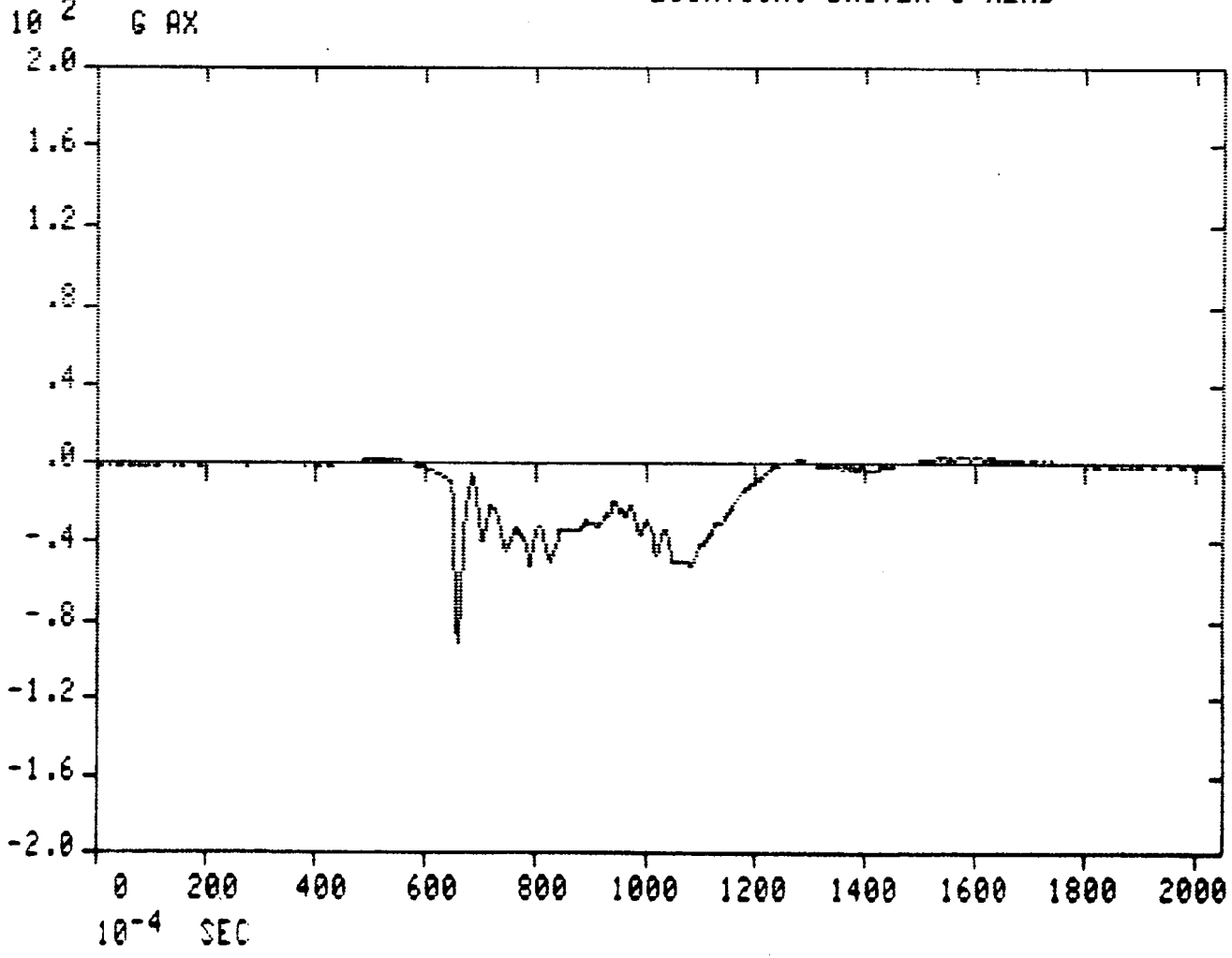
The following computer plots provide complete and comprehensive occupant response and vehicle acceleration during the impact event of the 1979 Ford Custom Styleside F350 - Pick Up, NHTSA 790608.

DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 1, CH 1
DIRECTION: FORWARD
LOCATION: DRIVER'S HEAD

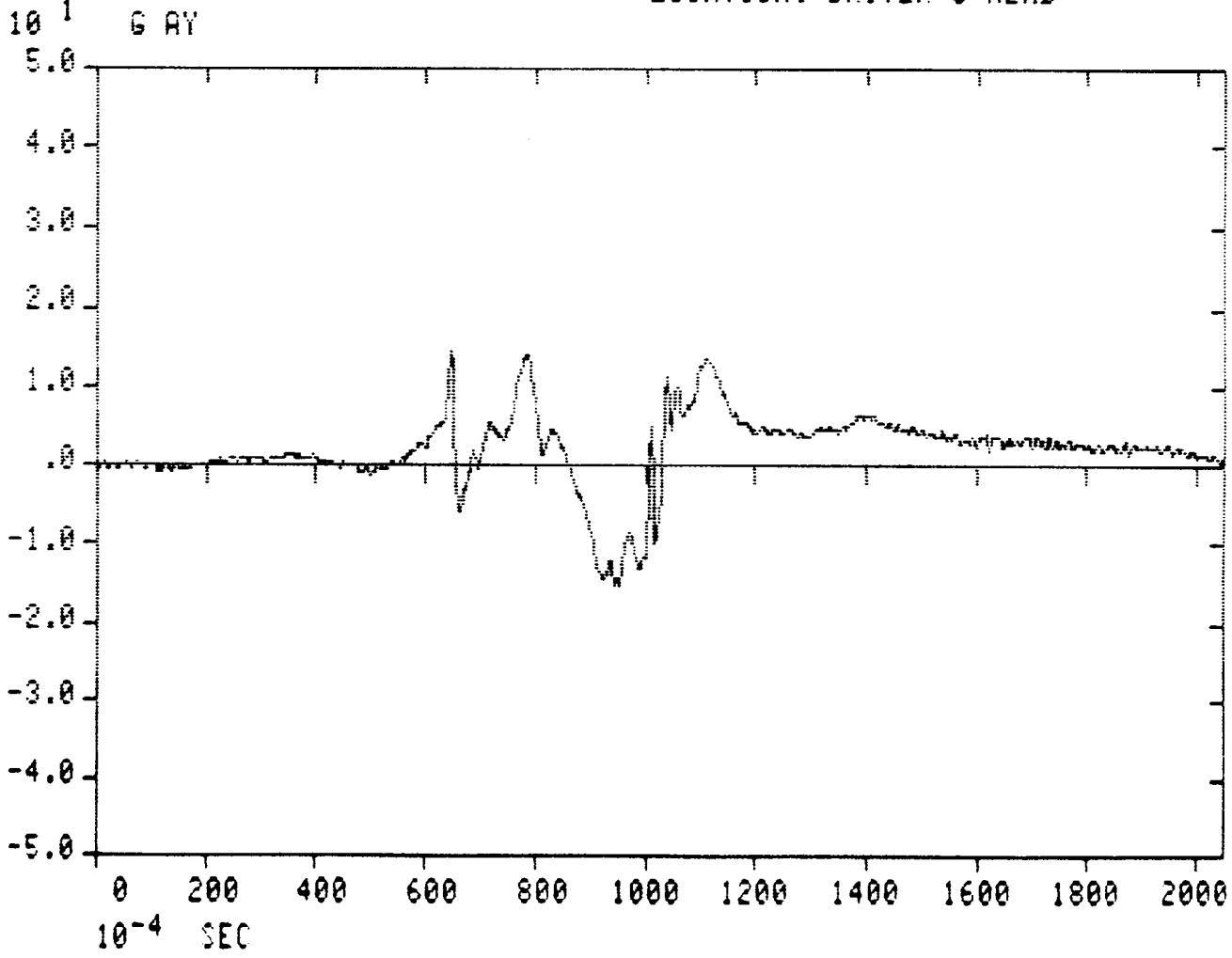


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 1, CH 2
DIRECTION: LEFT
LOCATION: DRIVER'S HEAD

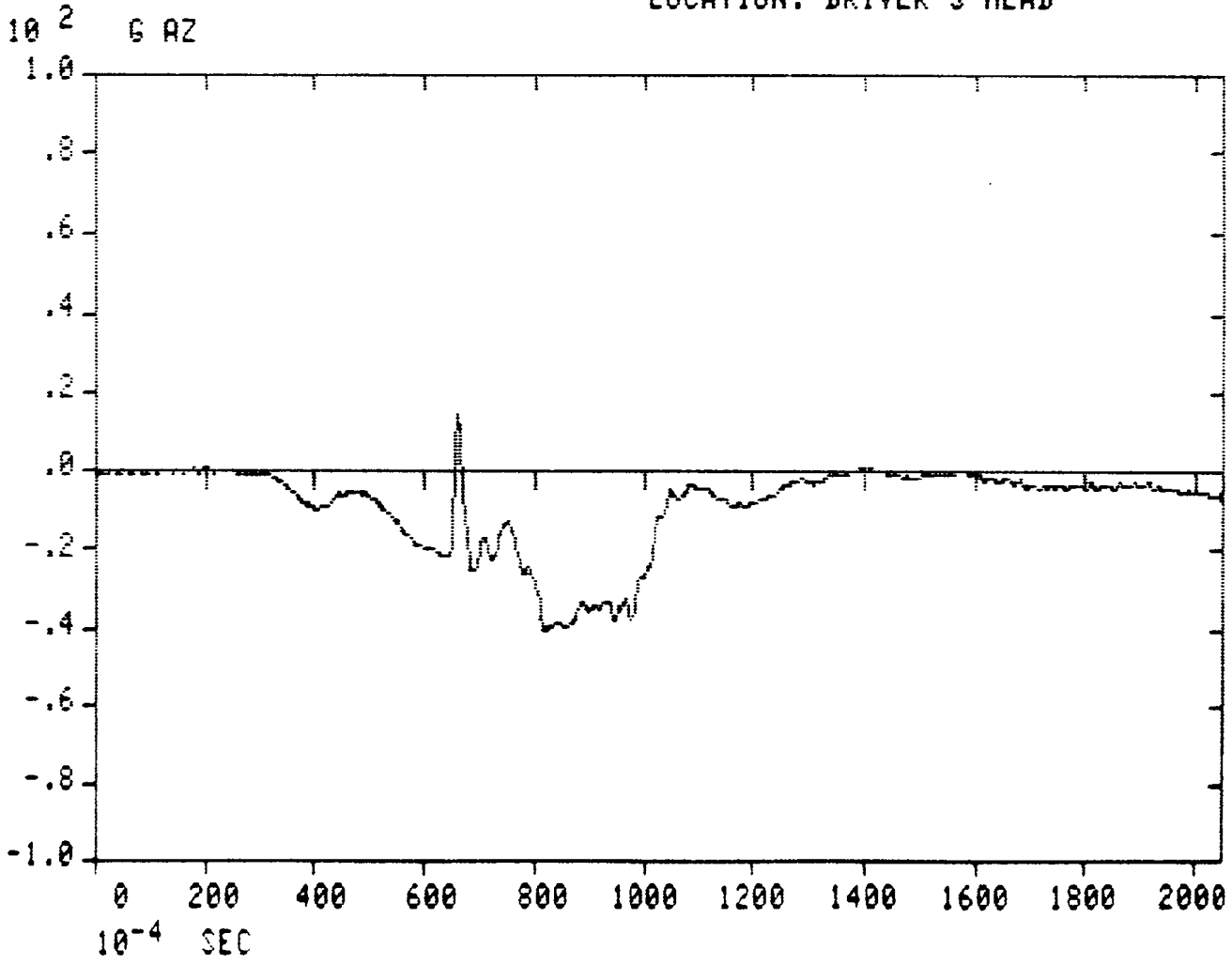


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 1, CH 3
DIRECTION: UPWARD
LOCATION: DRIVER'S HEAD

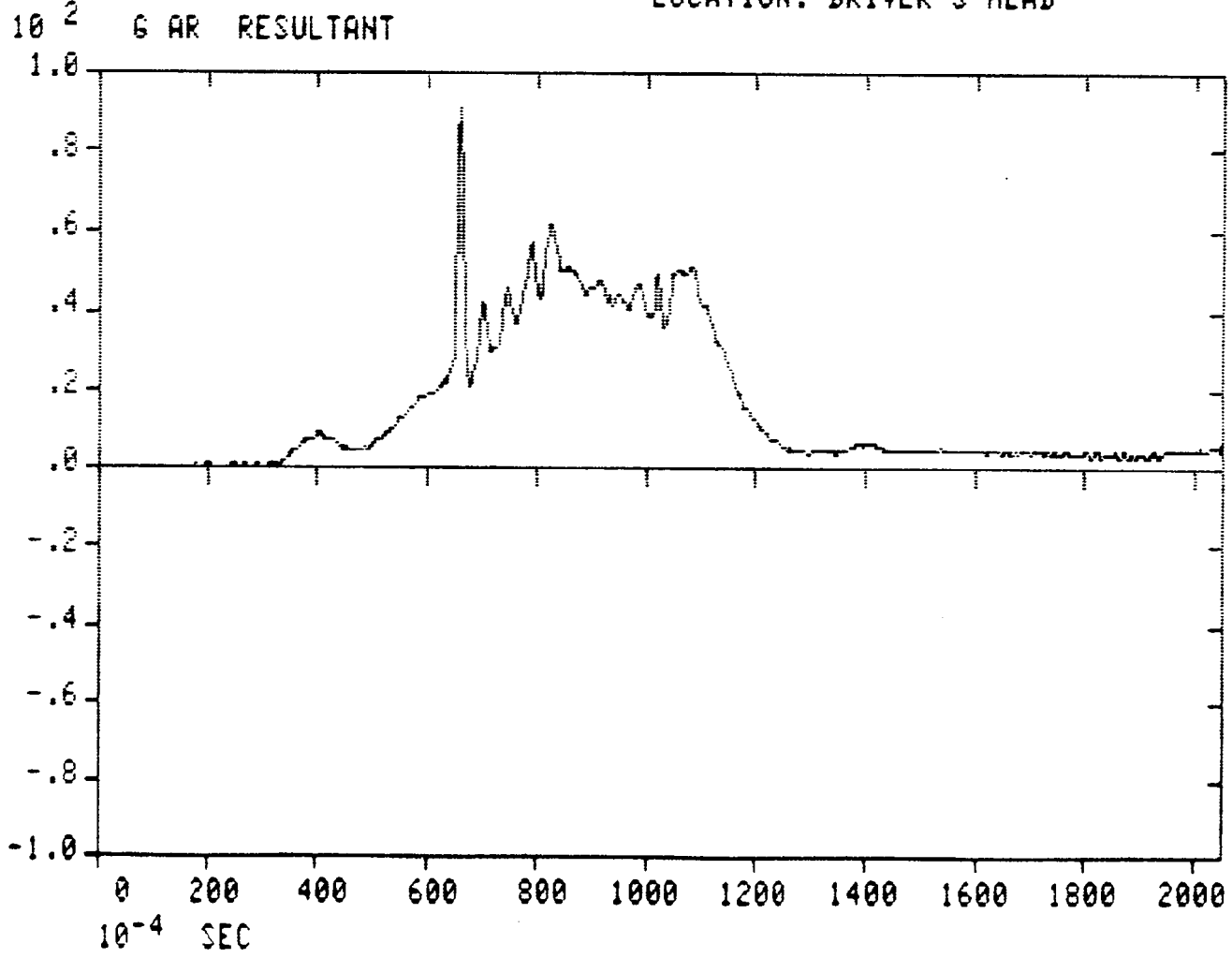


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 1, CH 1-3
DIRECTION: RESULTANT OF XYZ
LOCATION: DRIVER'S HEAD

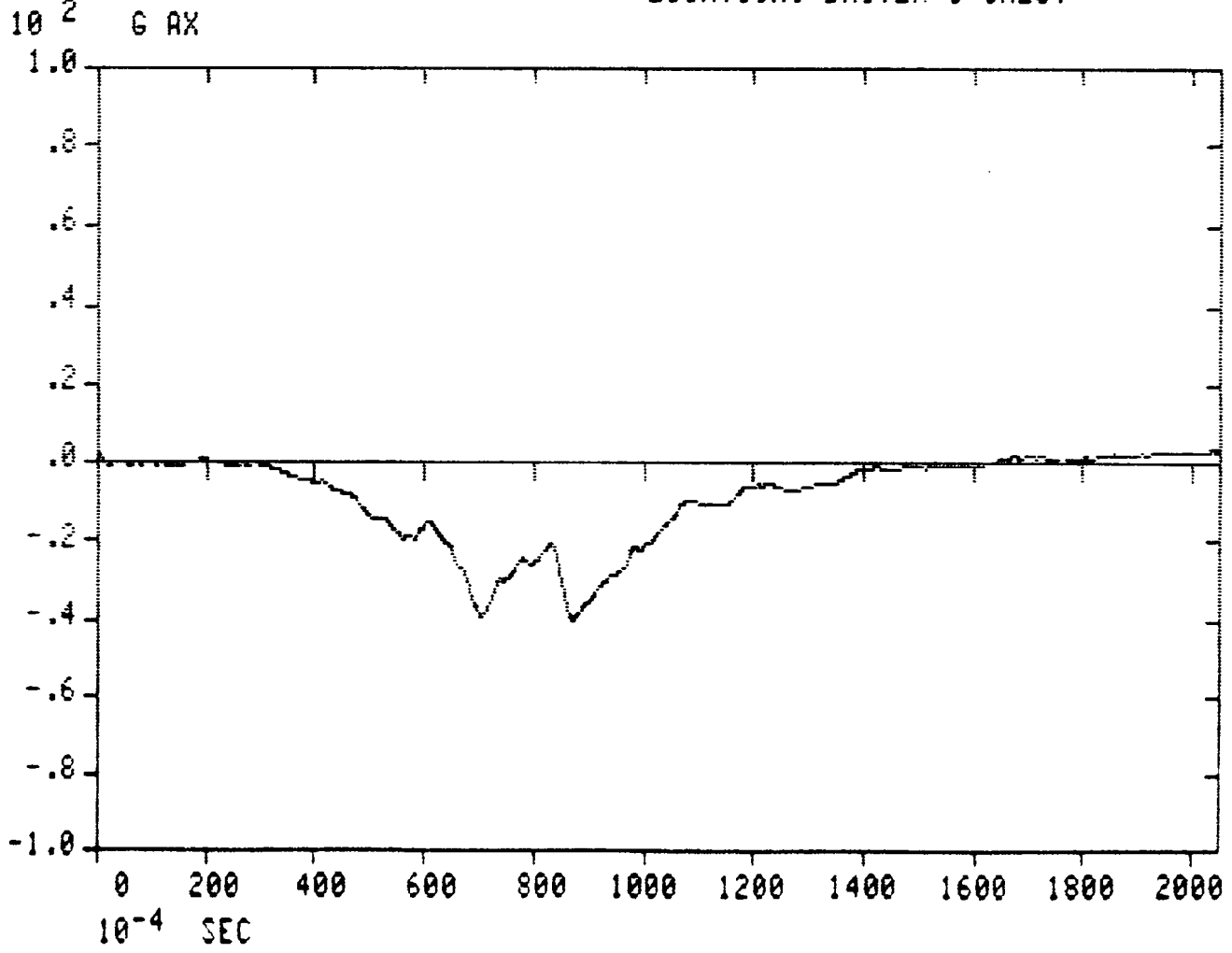


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 1, CH 5
DIRECTION: FORWARD
LOCATION: DRIVER'S CHEST

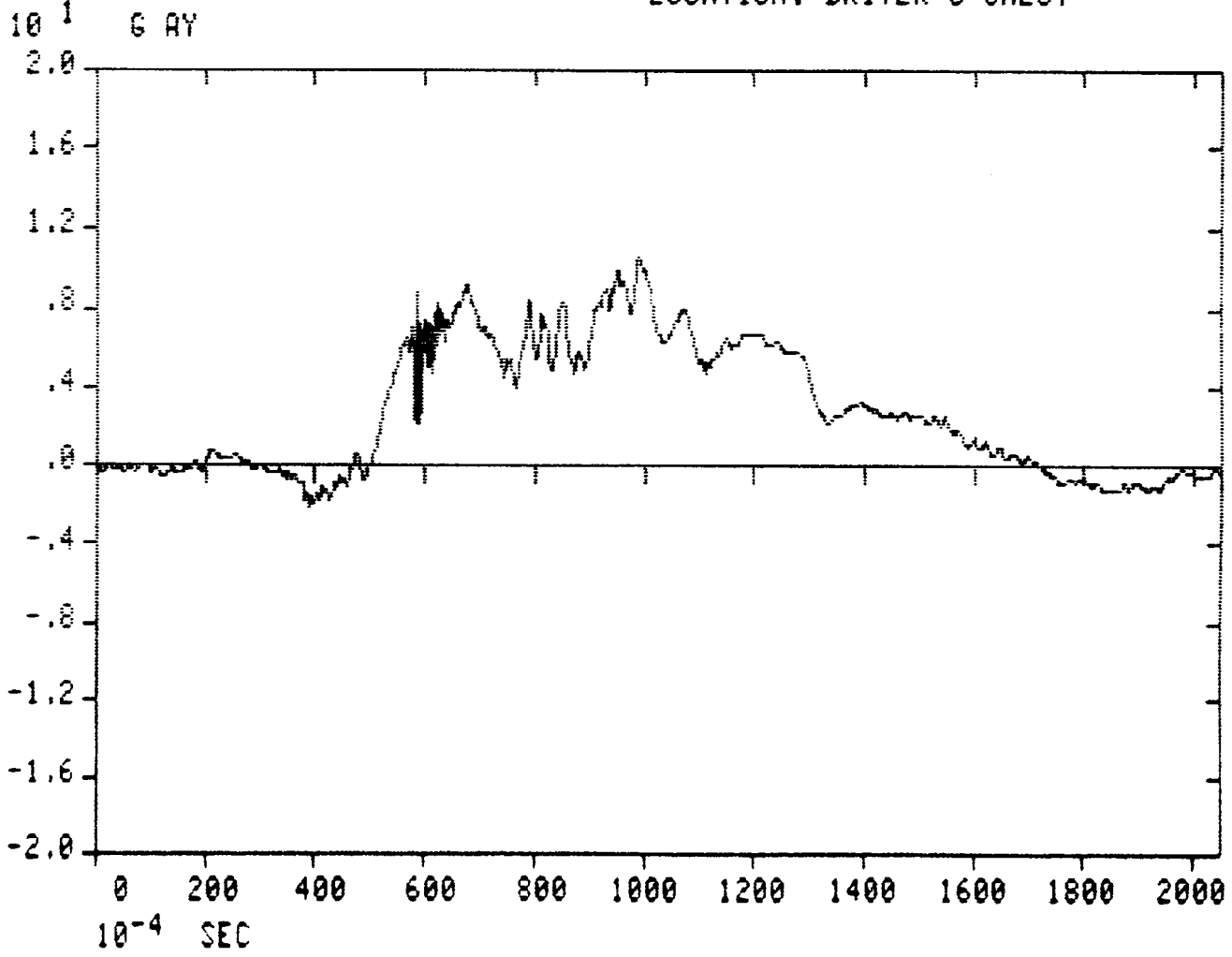


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 1, CH 6
DIRECTION: LEFT
LOCATION: DRIVER'S CHEST

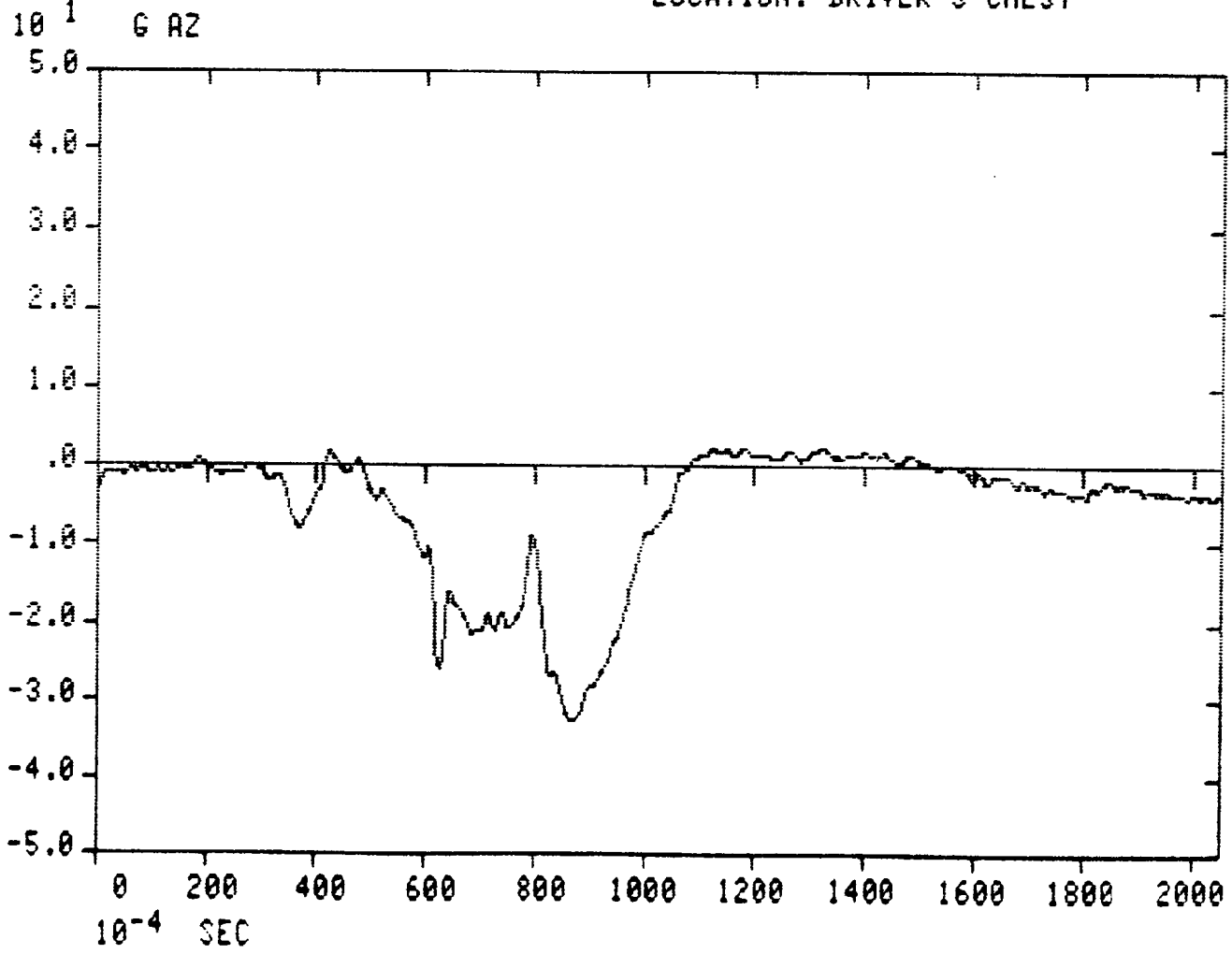


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 1, CH 7
DIRECTION: UPWARD
LOCATION: DRIVER'S CHEST

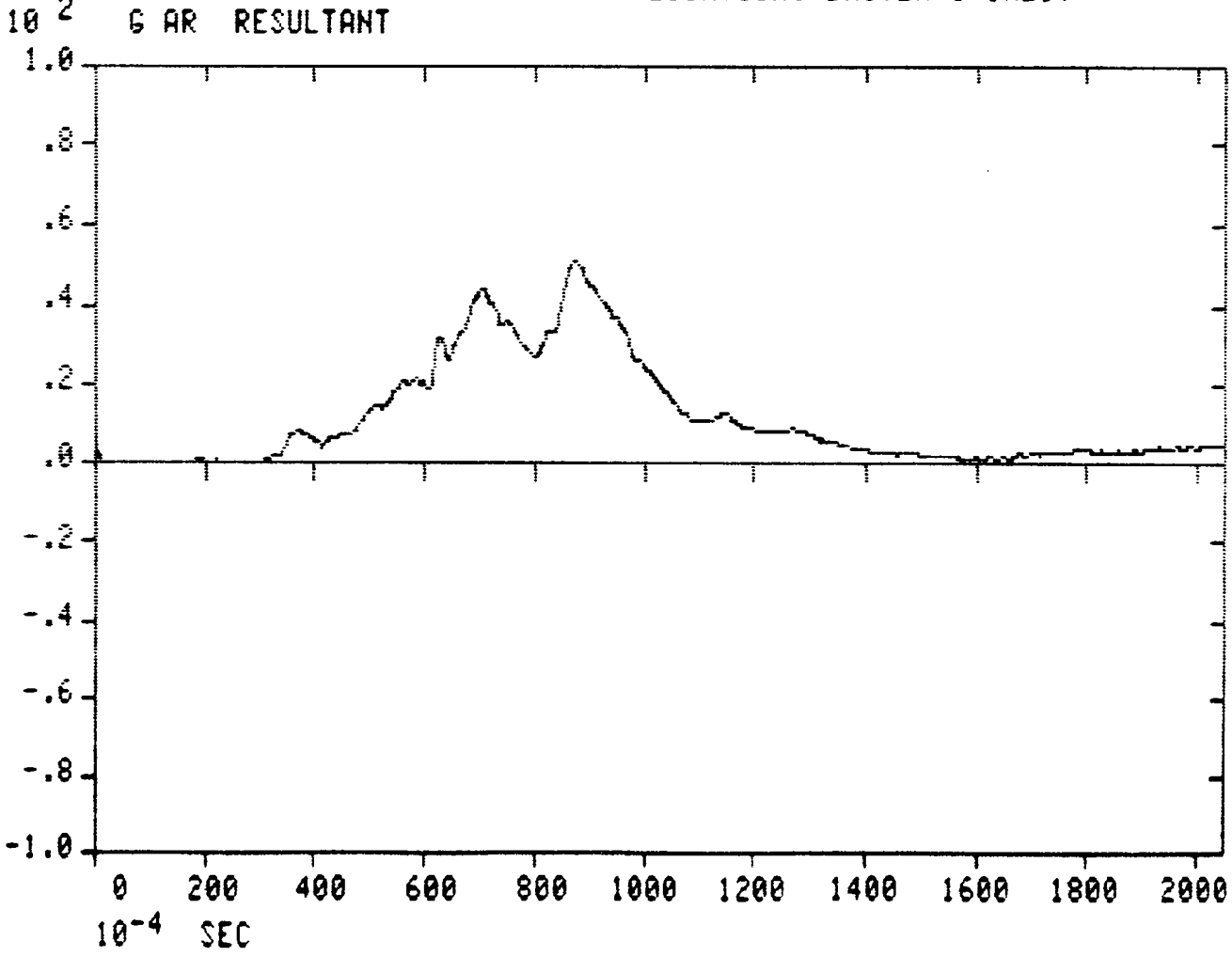


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 1, CH 5-7
DIRECTION: RESULTANT OF XYZ
LOCATION: DRIVER'S CHEST

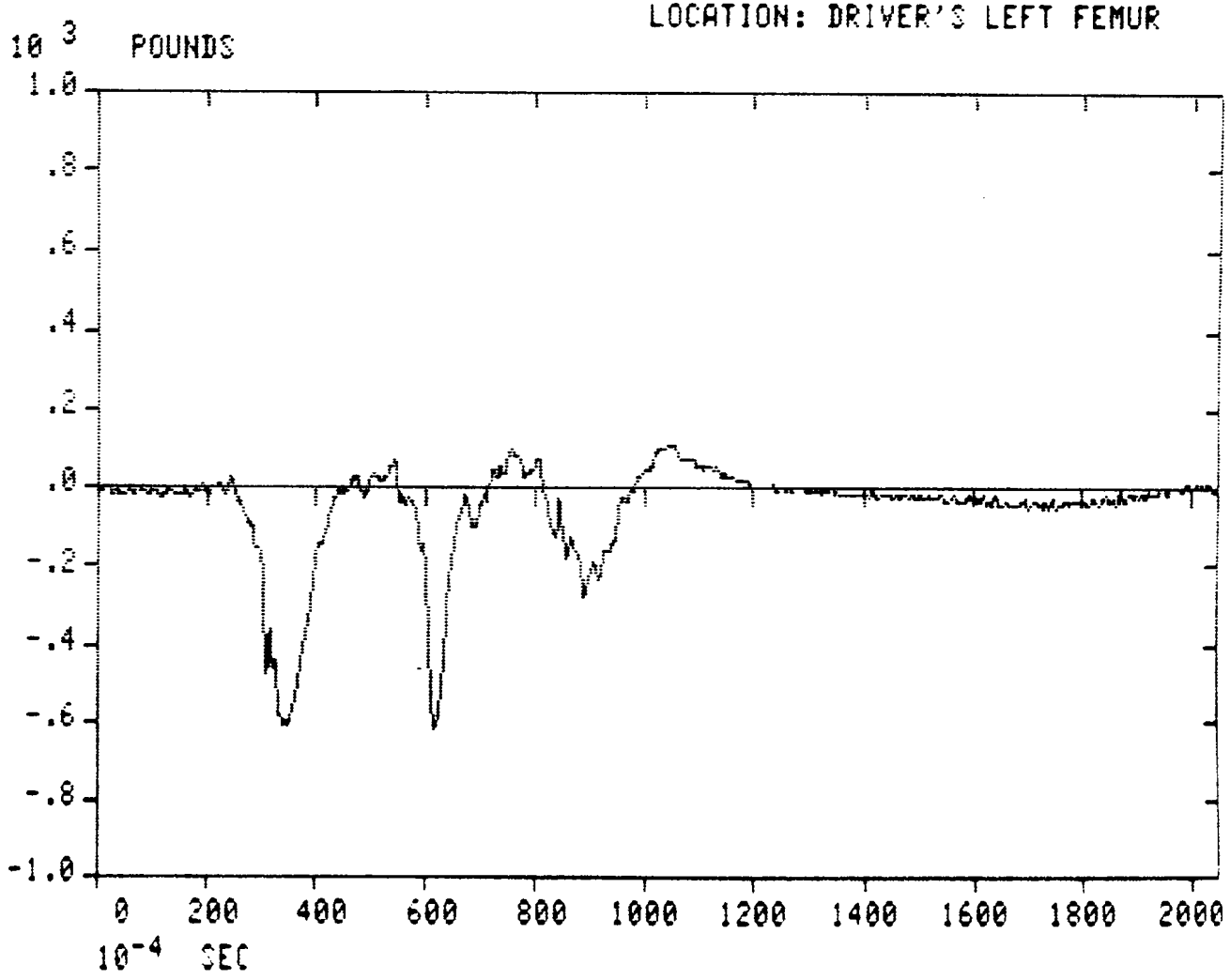


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 600
LOAD CELL: TAPE 1, CH 8
DIRECTION: TENSION
LOCATION: DRIVER'S LEFT FEMUR

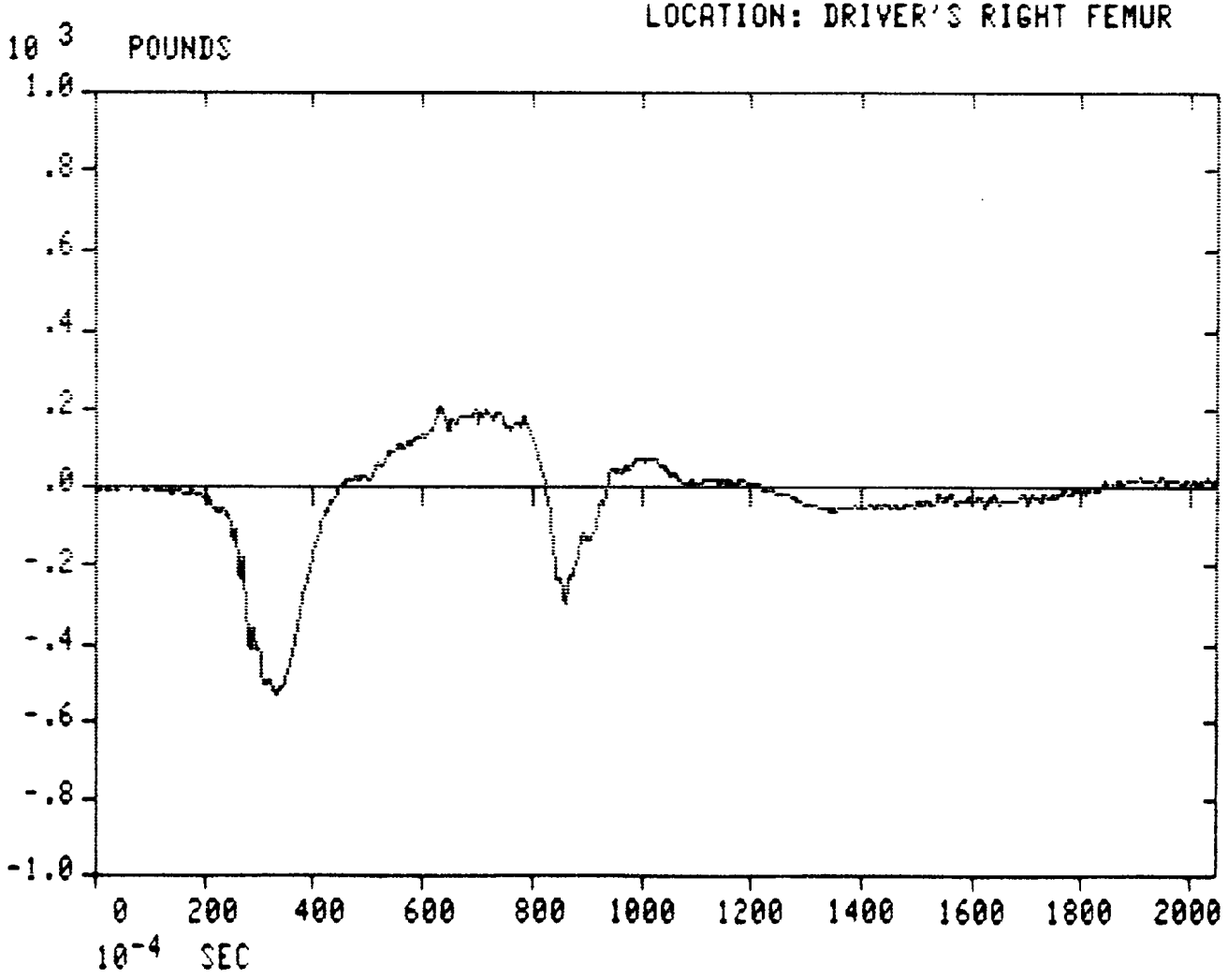


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 600
LOAD CELL: TAPE 1, CH 4
DIRECTION: TENSION
LOCATION: DRIVER'S RIGHT FEMUR

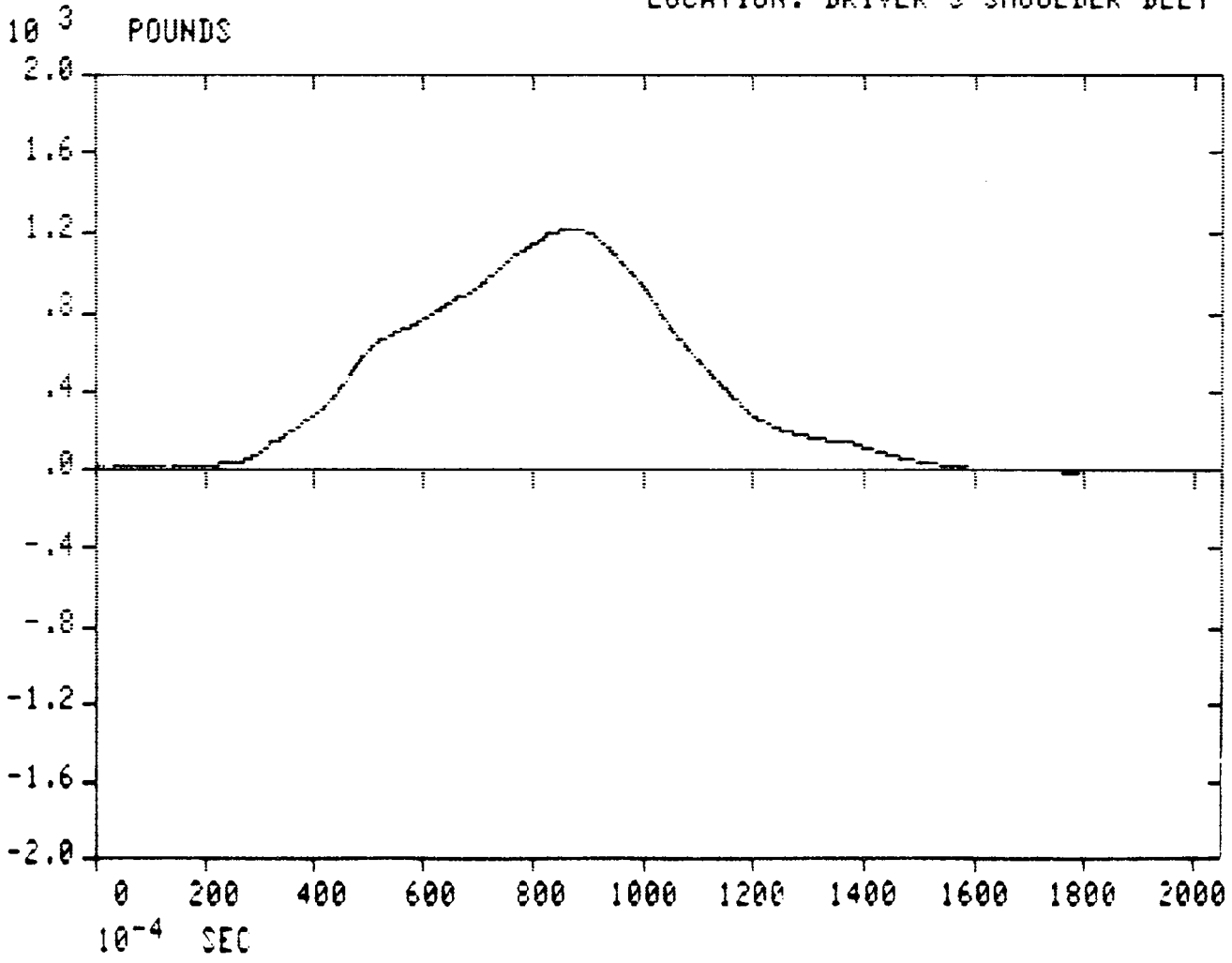


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
LOAD CELL: TAPE 1, CH 9
DIRECTION: TENSION
LOCATION: DRIVER'S SHOULDER BELT

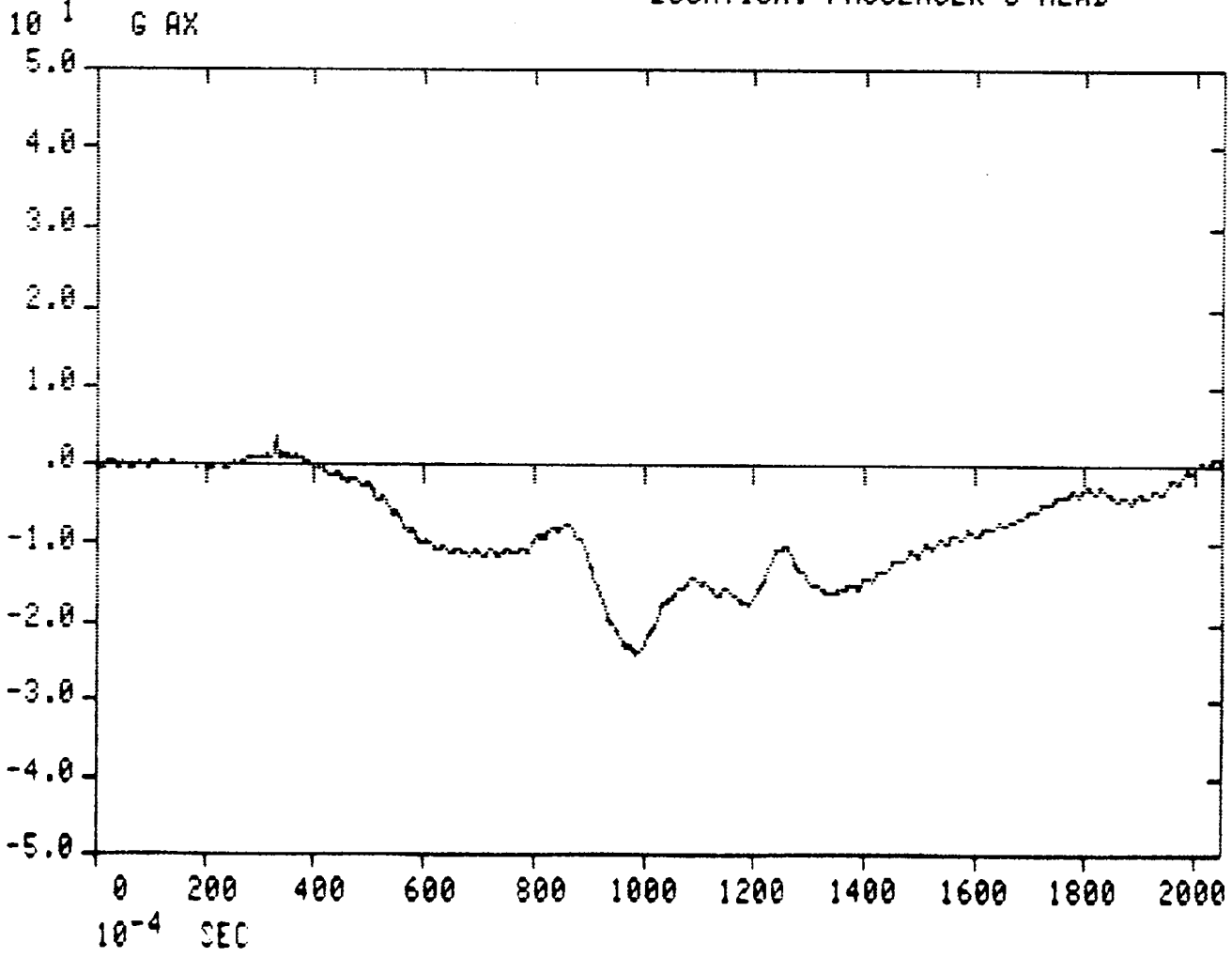


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 2, CH 1
DIRECTION: FORWARD
LOCATION: PASSENGER'S HEAD

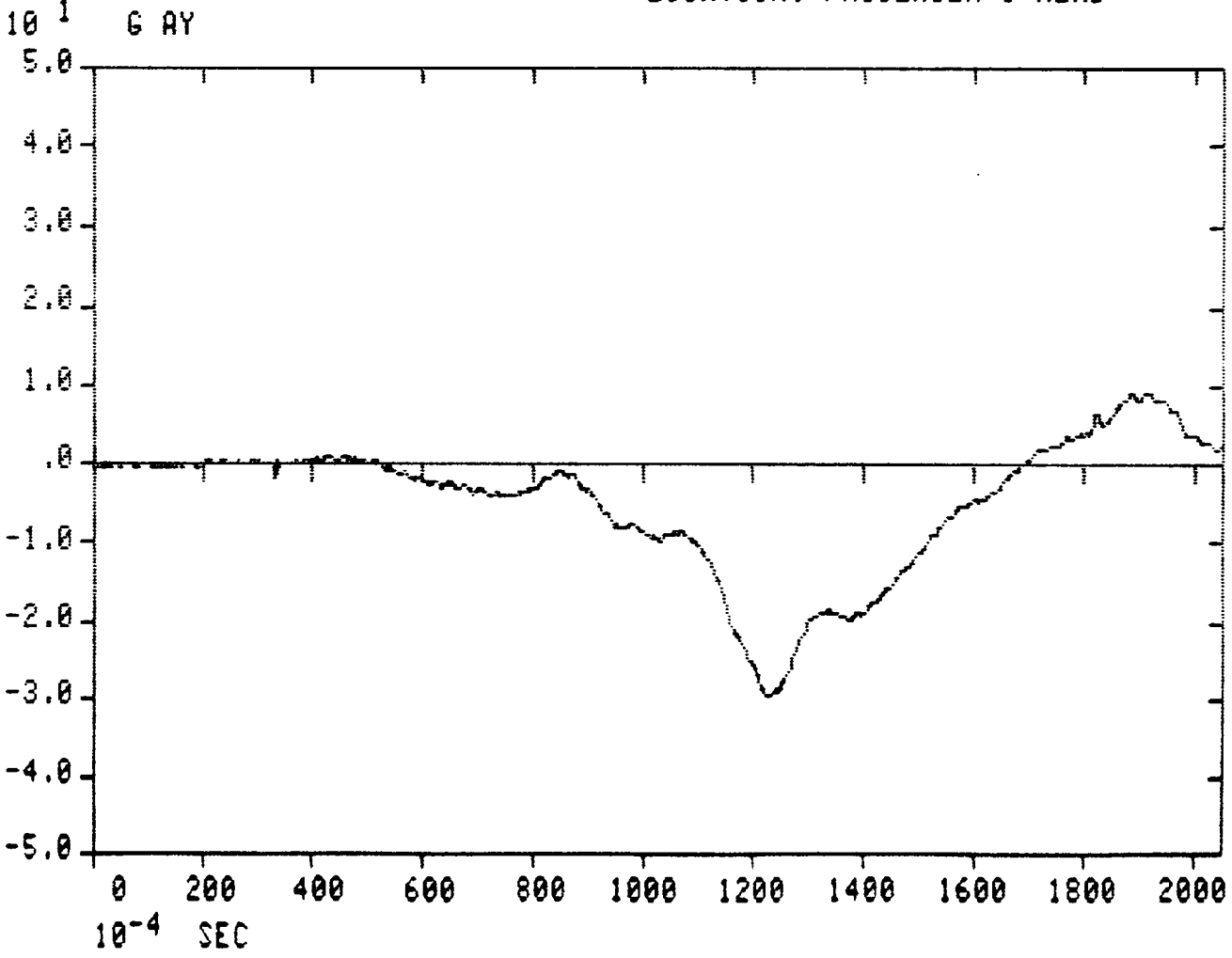


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 2, CH 2
DIRECTION: LEFT
LOCATION: PASSENGER'S HEAD

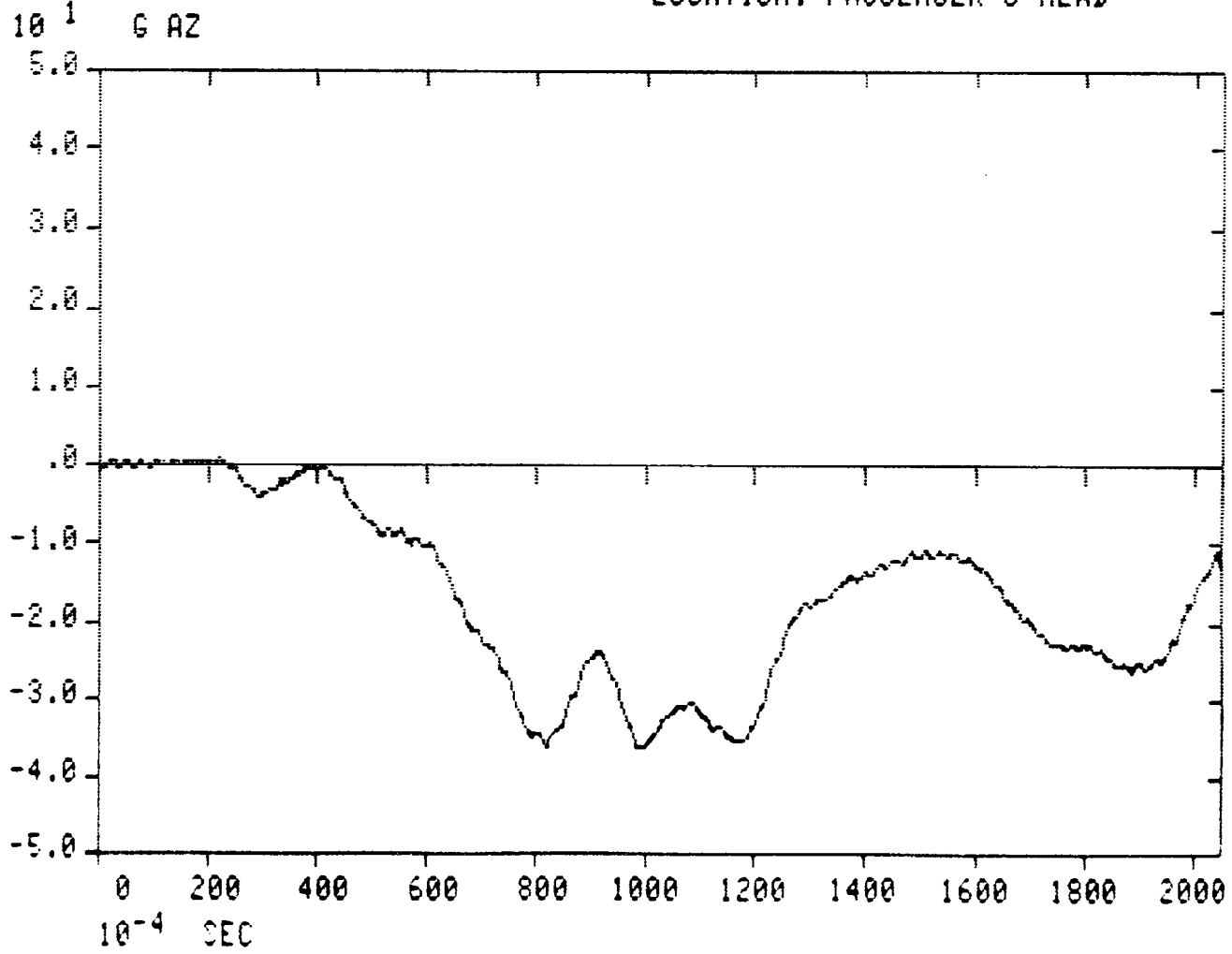


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 2, CH 3
DIRECTION: UPWARD
LOCATION: PASSENGER'S HEAD

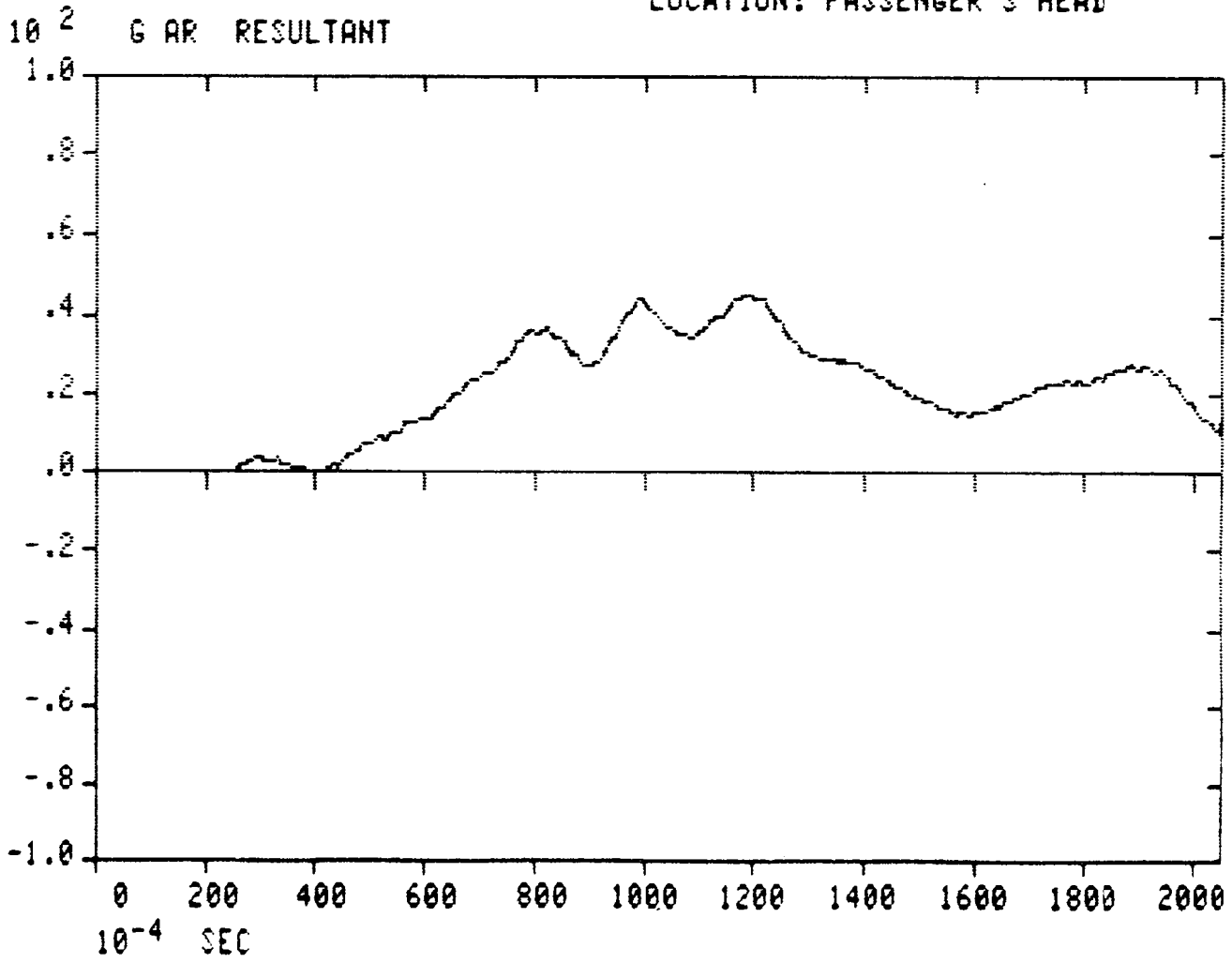


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 2, CH 1-3
DIRECTION: RESULTANT OF XYZ
LOCATION: PASSENGER'S HEAD

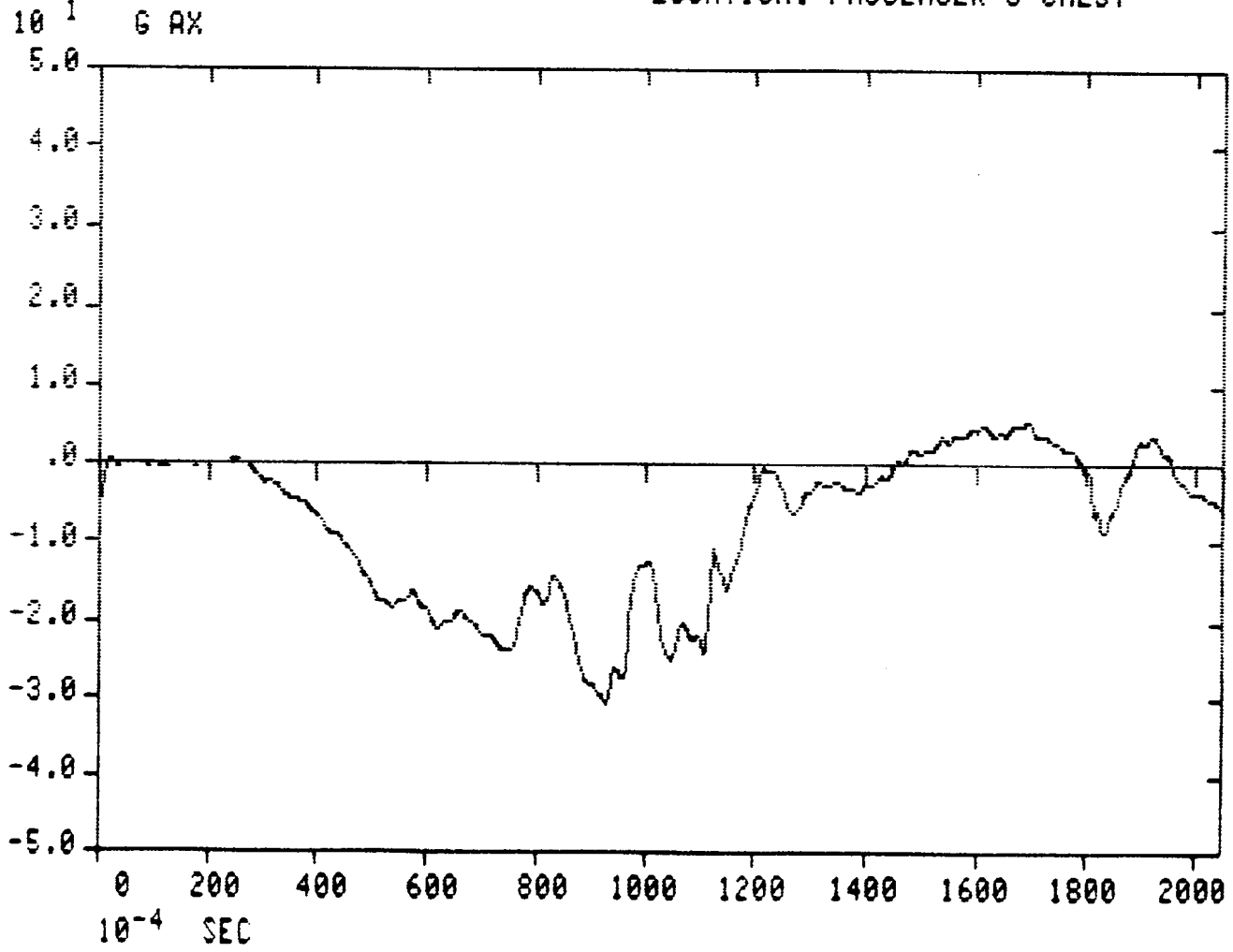


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 2, CH 5
DIRECTION: FORWARD
LOCATION: PASSENGER'S CHEST

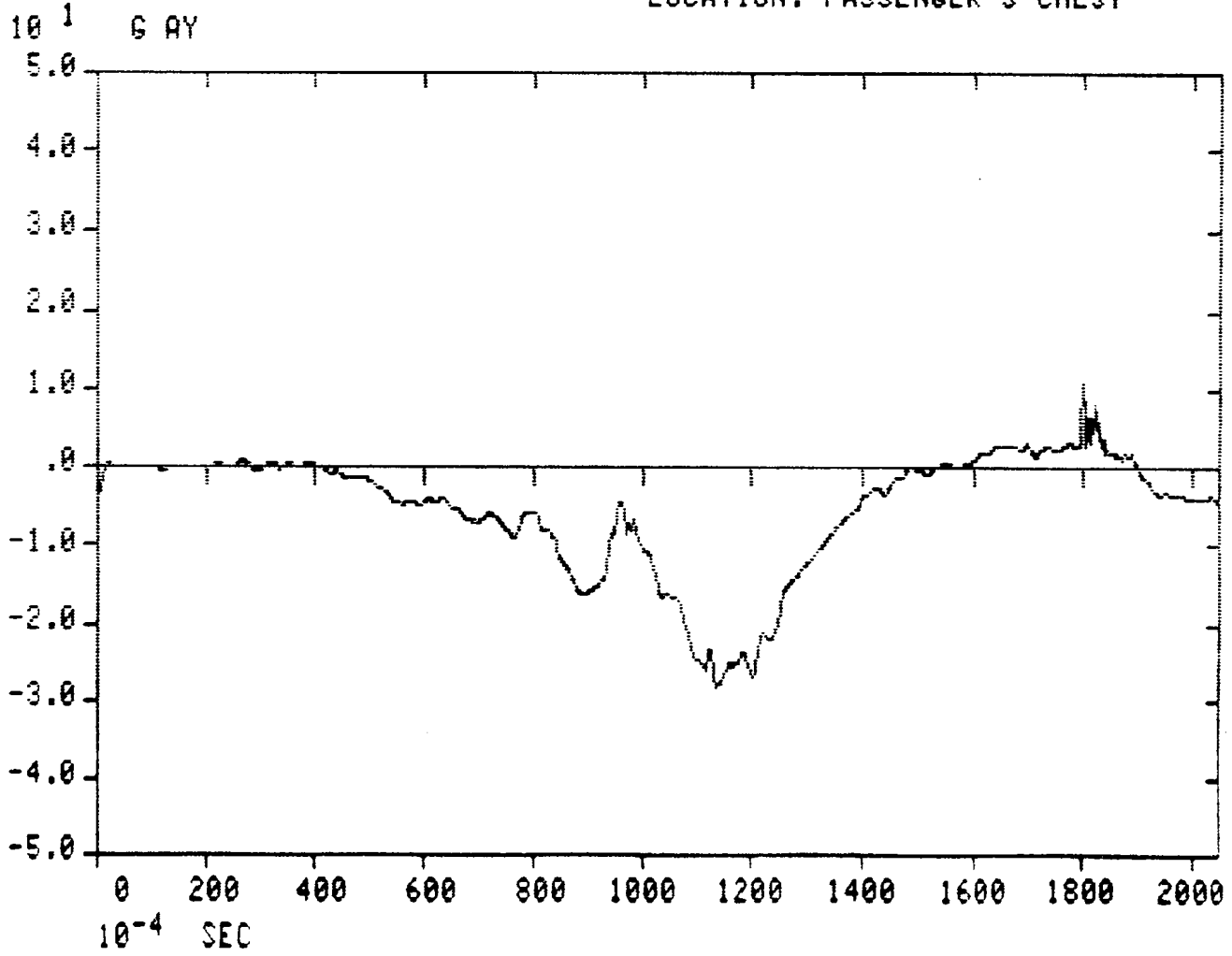


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE: 2, CH 6
DIRECTION: LEFT
LOCATION: PASSENGER'S CHEST

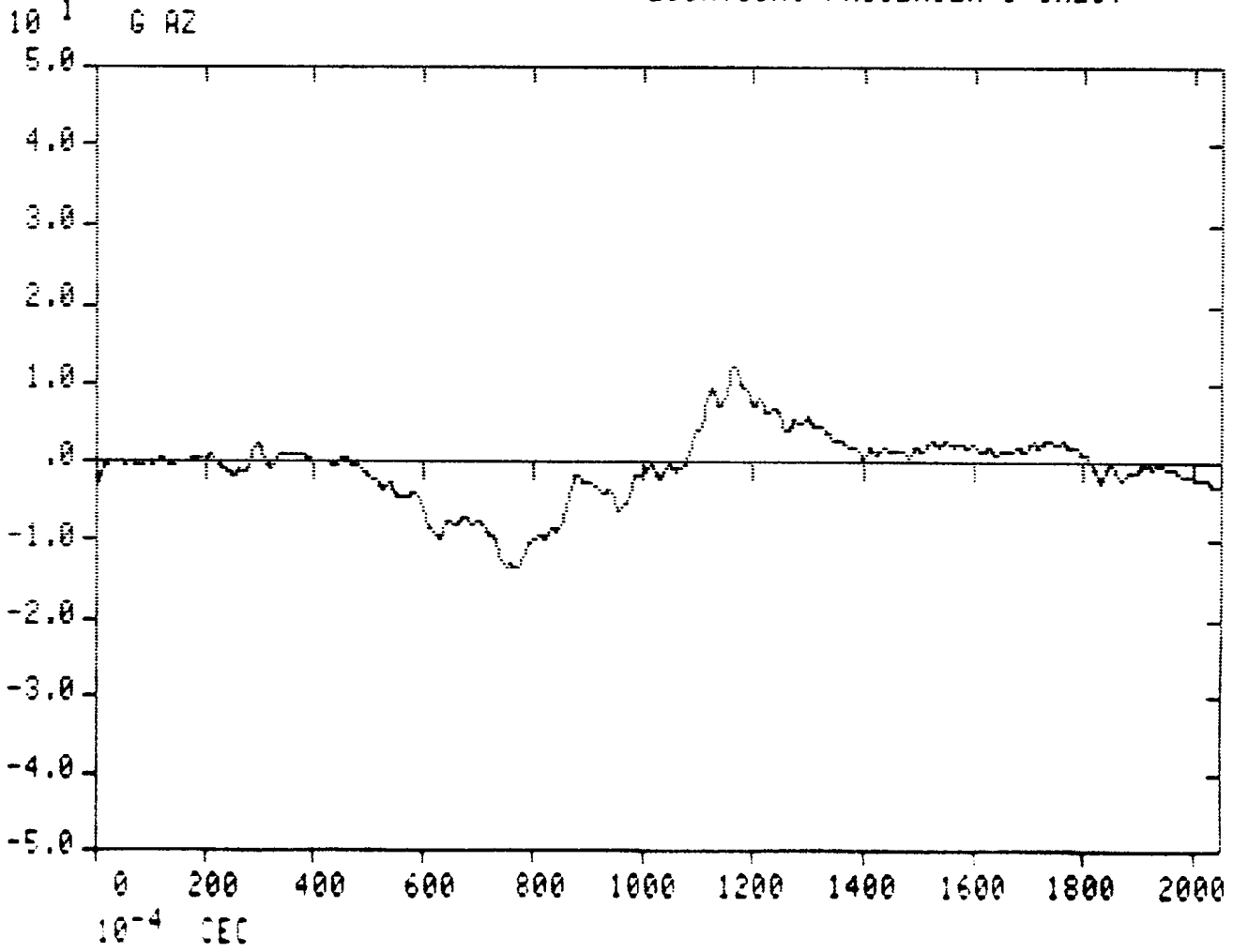


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 2, CH 7
DIRECTION: UPWARD
LOCATION: PASSENGER'S CHEST

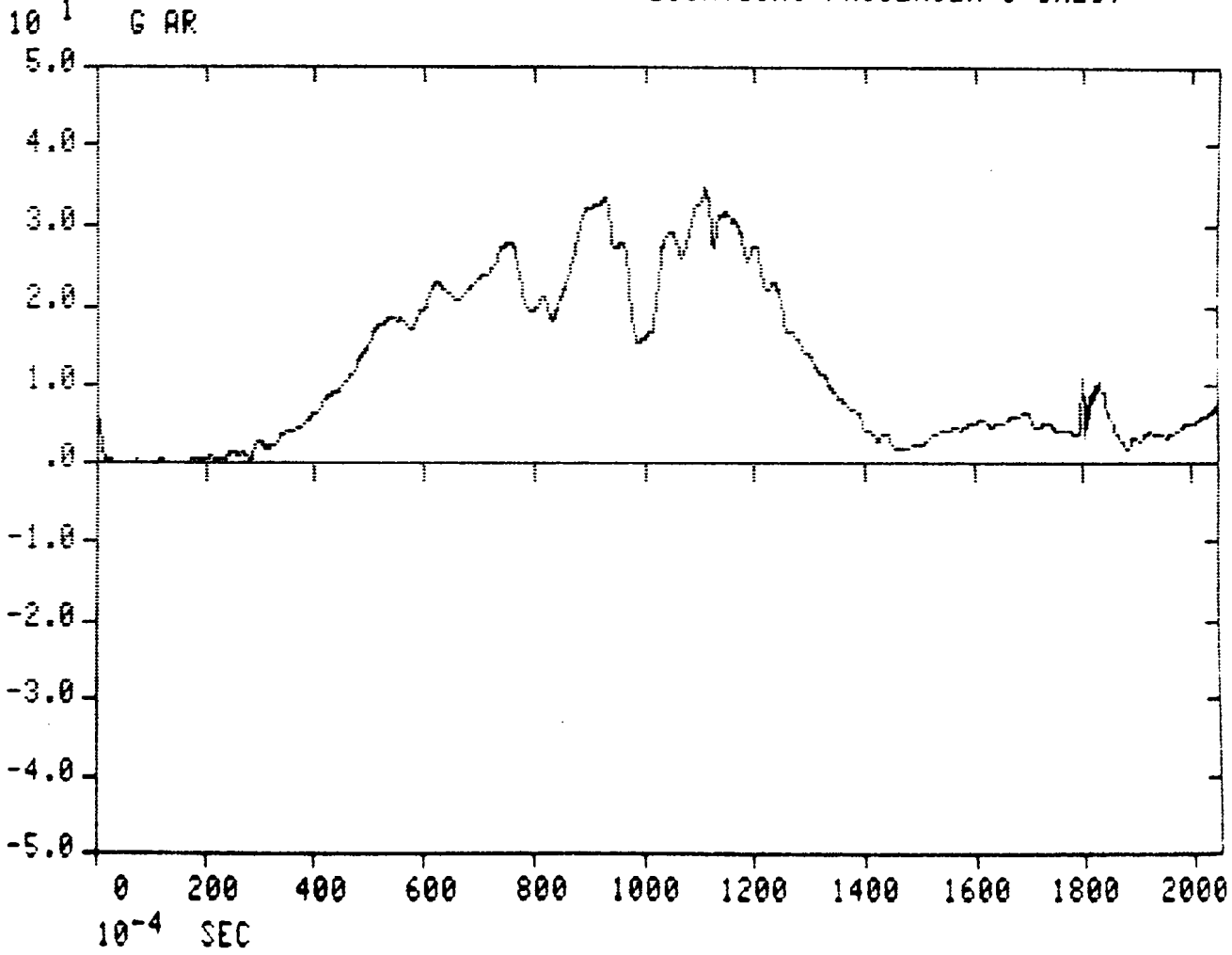


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPPOVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 1000
ACCELEROMETER: TAPE 2, CH 5-7
DIRECTION: RESULTANT OF XYZ
LOCATION: PASSENGER'S CHEST

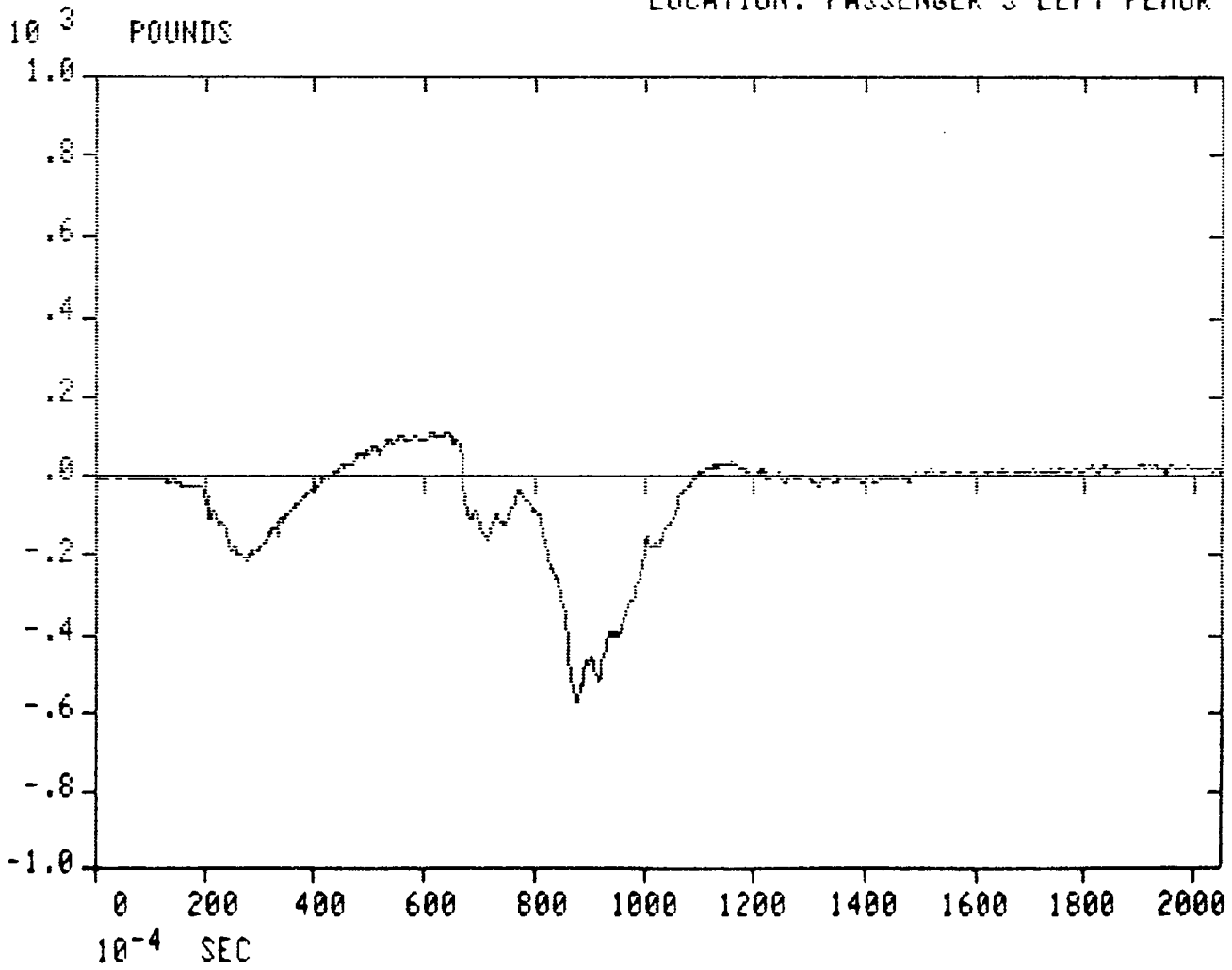


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 600
LOAD CELL: TAPE 2, CH 8
DIRECTION: TENSION
LOCATION: PASSENGER'S LEFT FEMUR

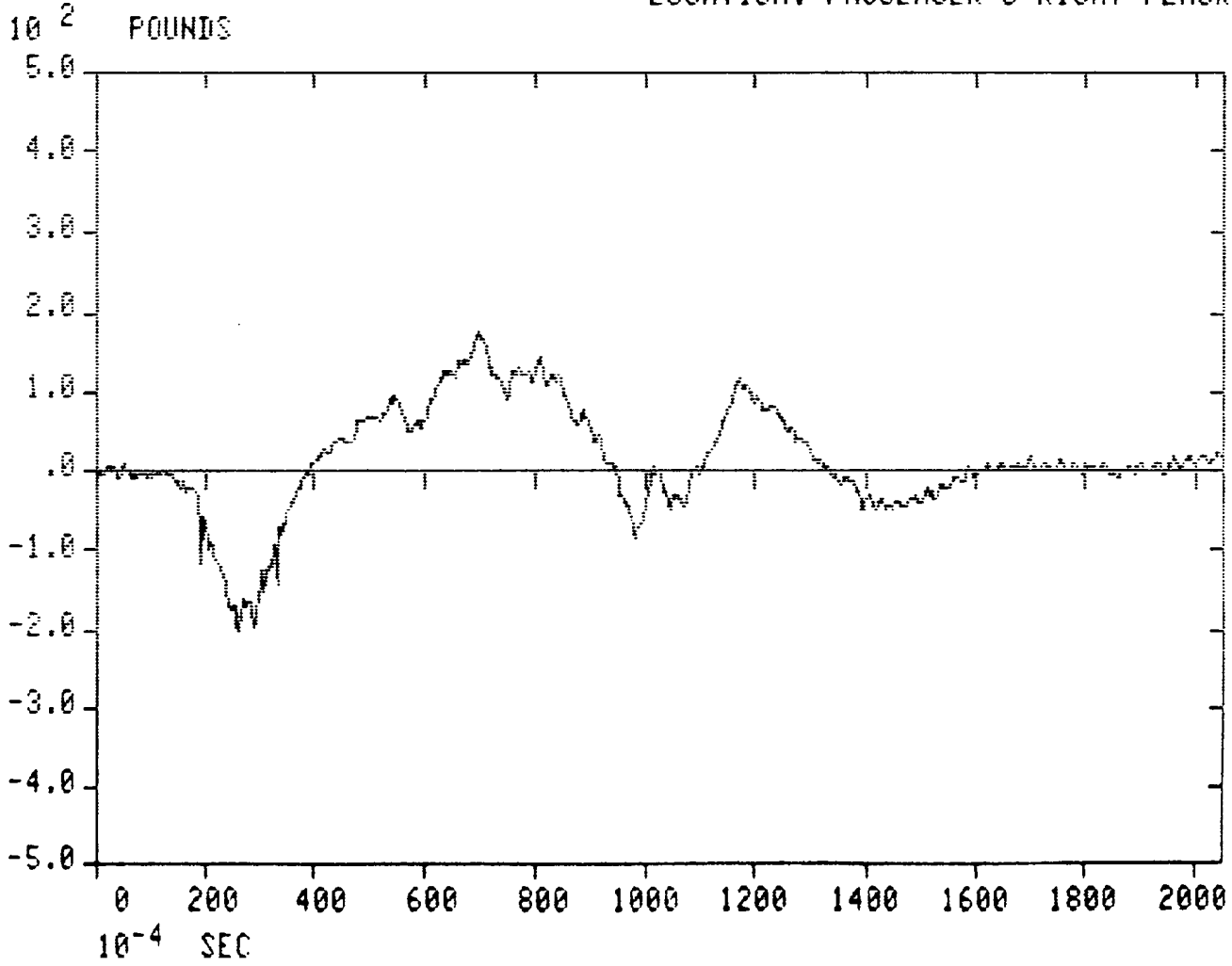


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 600
LOAD CELL: TAPE 2, CH 4
DIRECTION: TENSION
LOCATION: PASSENGER'S RIGHT FEMUR

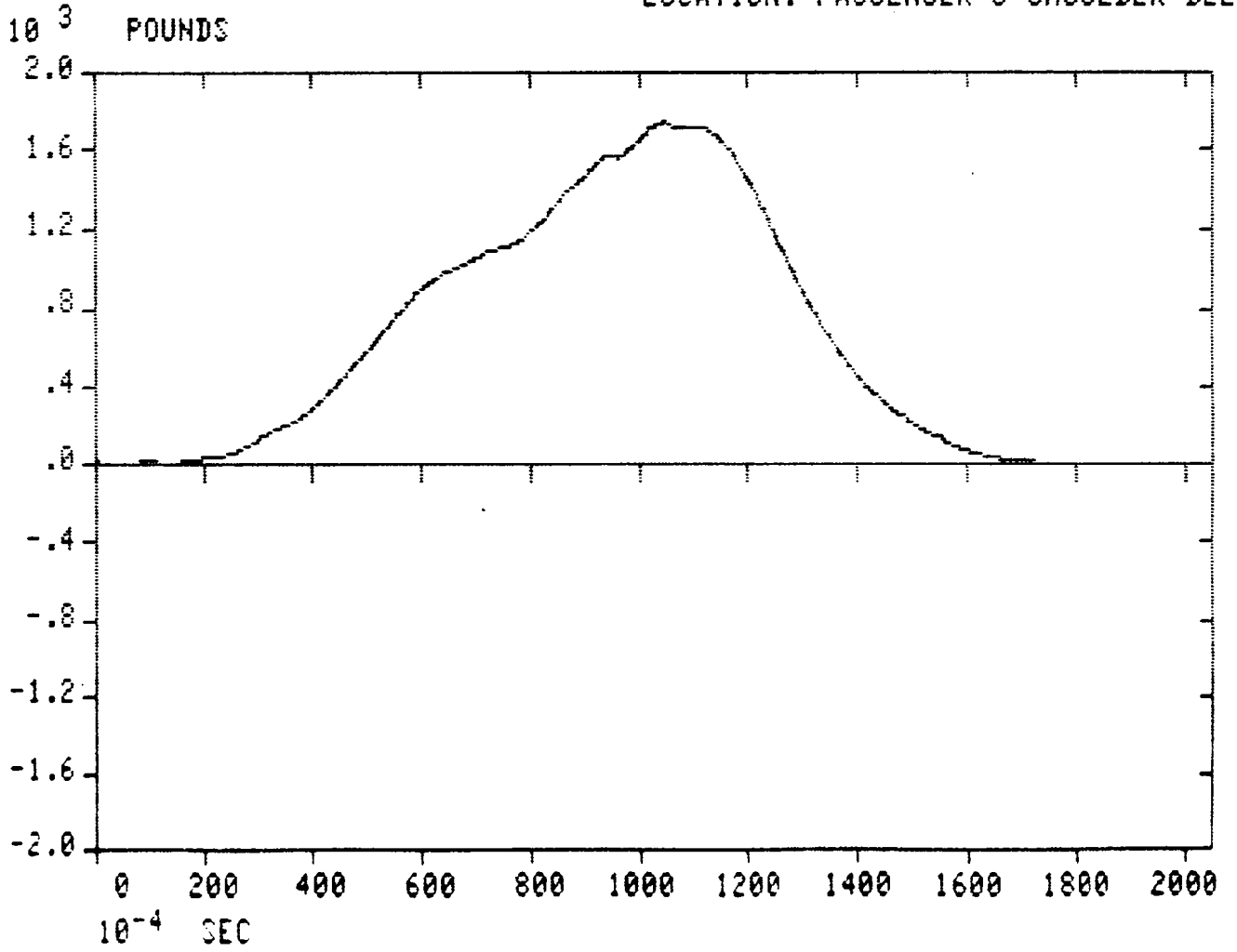


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
LOAD CELL: TAPE 2, CH 9
DIRECTION: TENSION
LOCATION: PASSENGER'S SHOULDER BELT

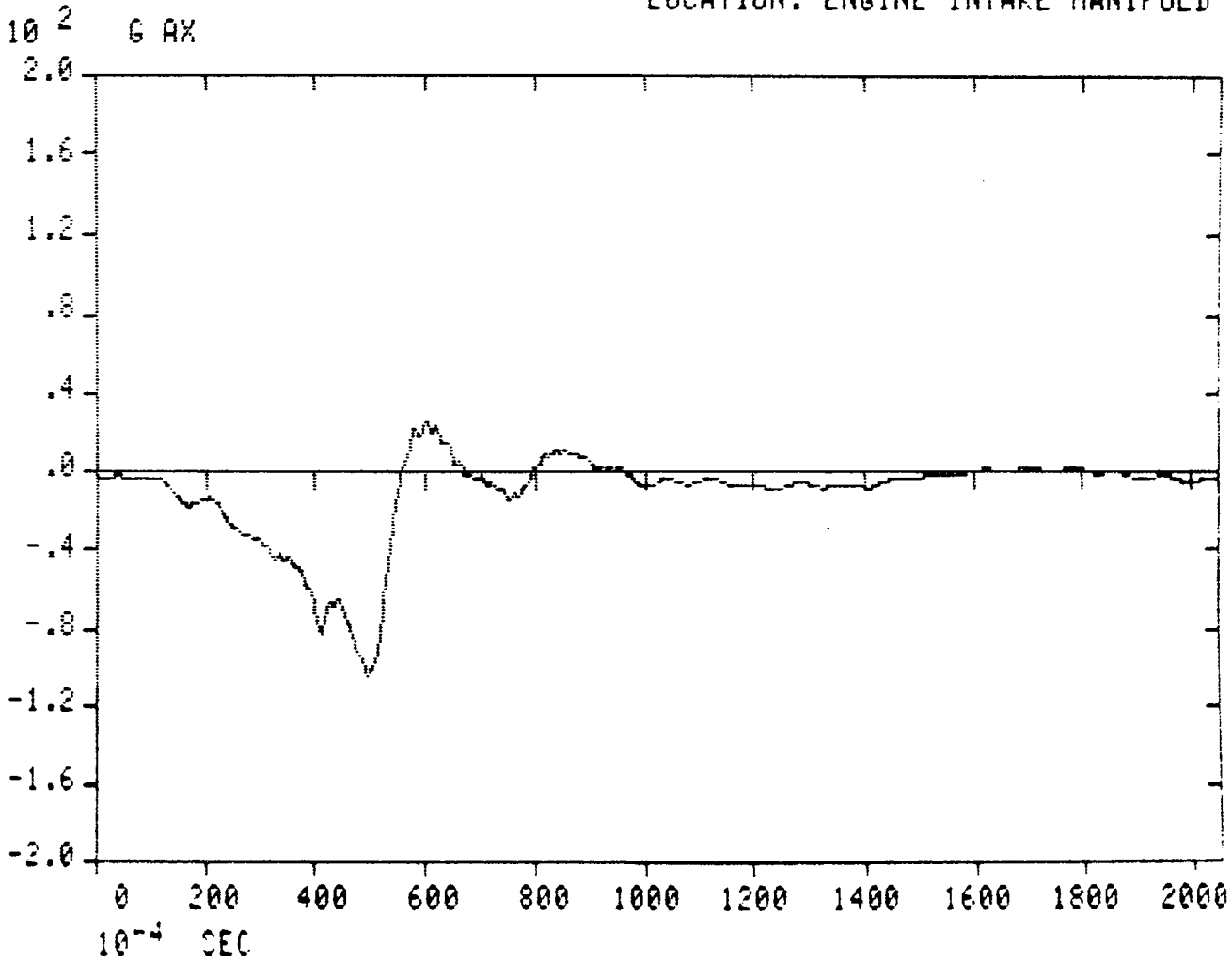


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 3, CH 1
DIRECTION: FORWARD
LOCATION: ENGINE INTAKE MANIFOLD

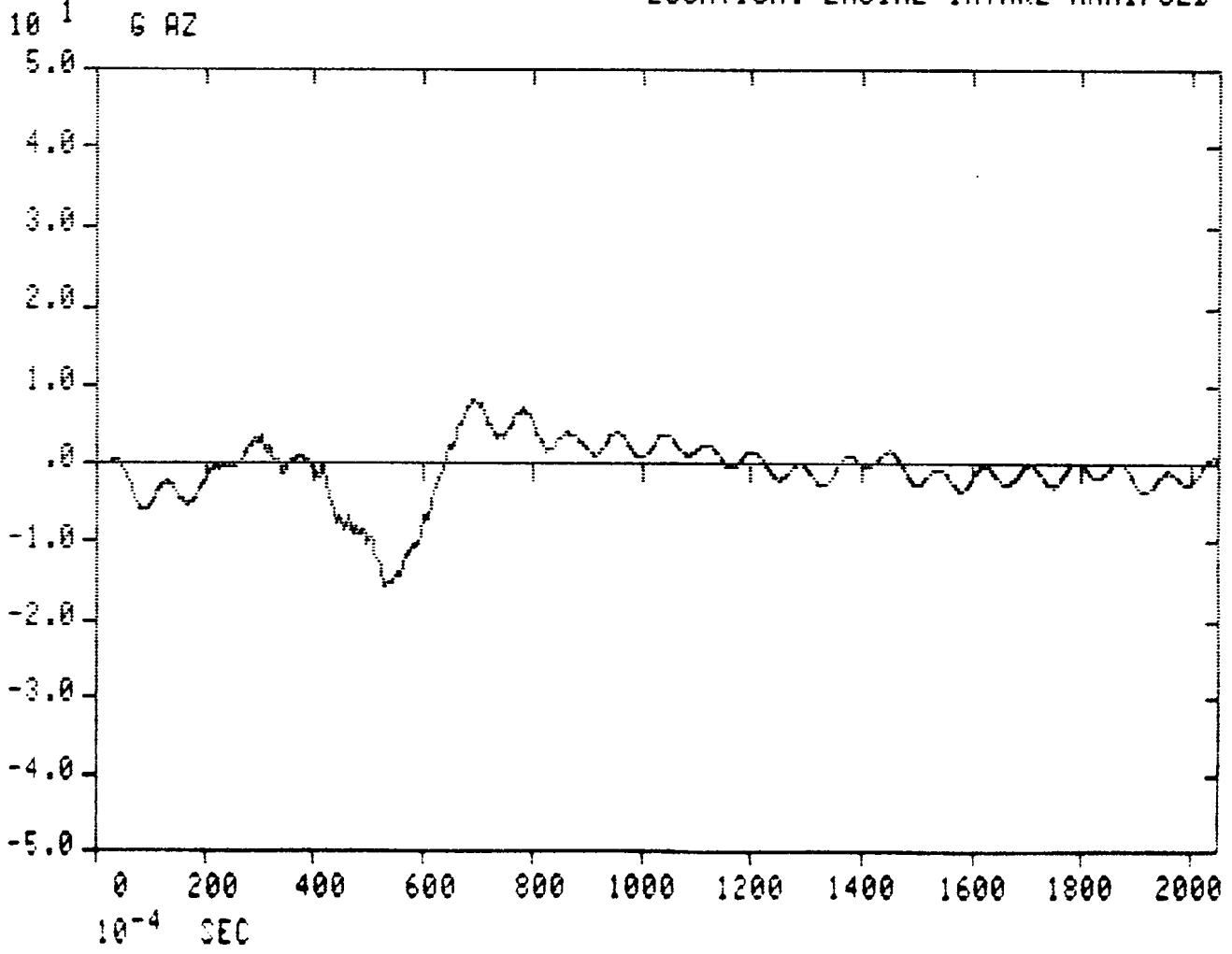


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 3, CH 2
DIRECTION: UPWARD
LOCATION: ENGINE INTAKE MANIFOLD

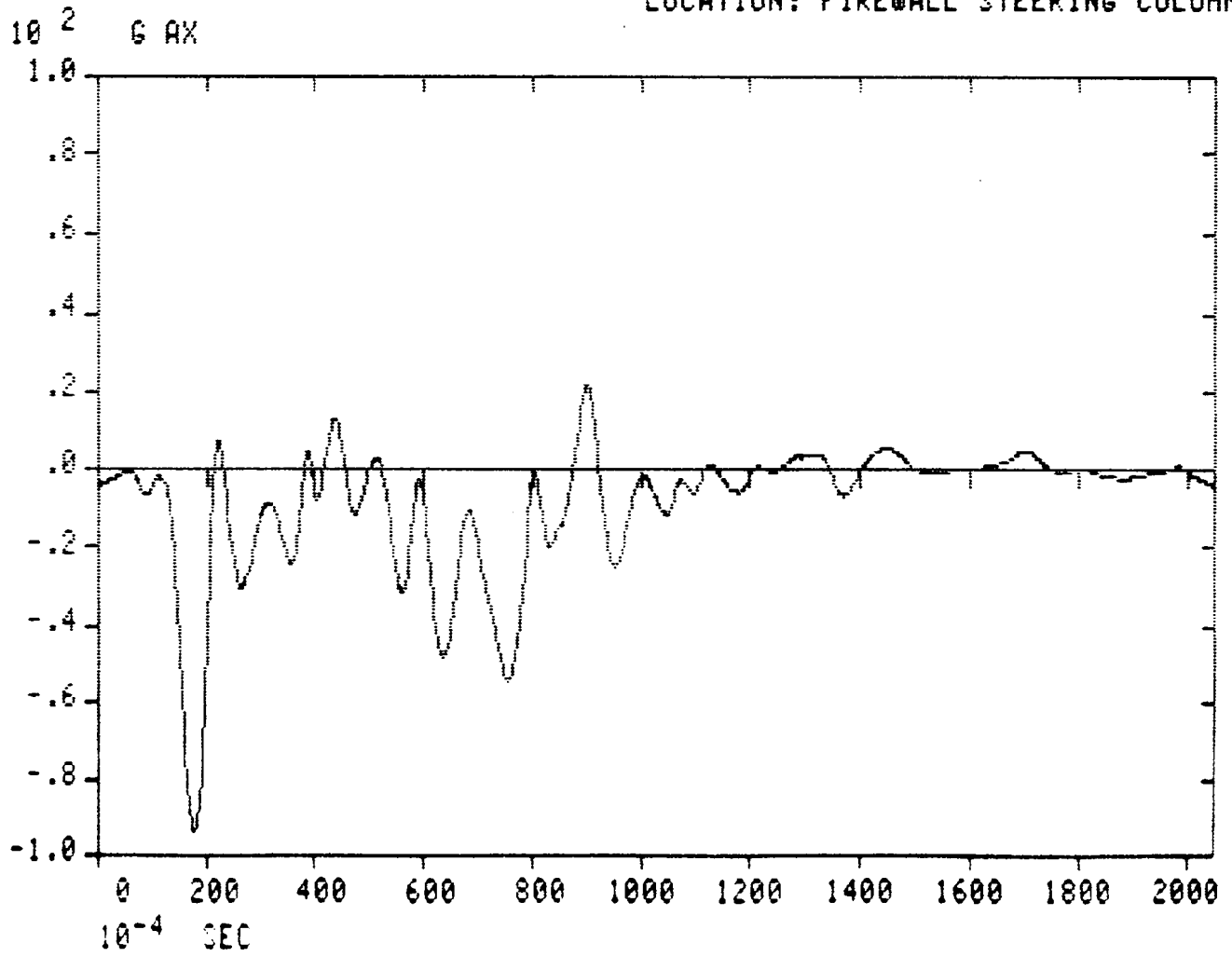


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 2, CH 10
DIRECTION: FORWARD
LOCATION: FIREWALL STEERING COLUMN

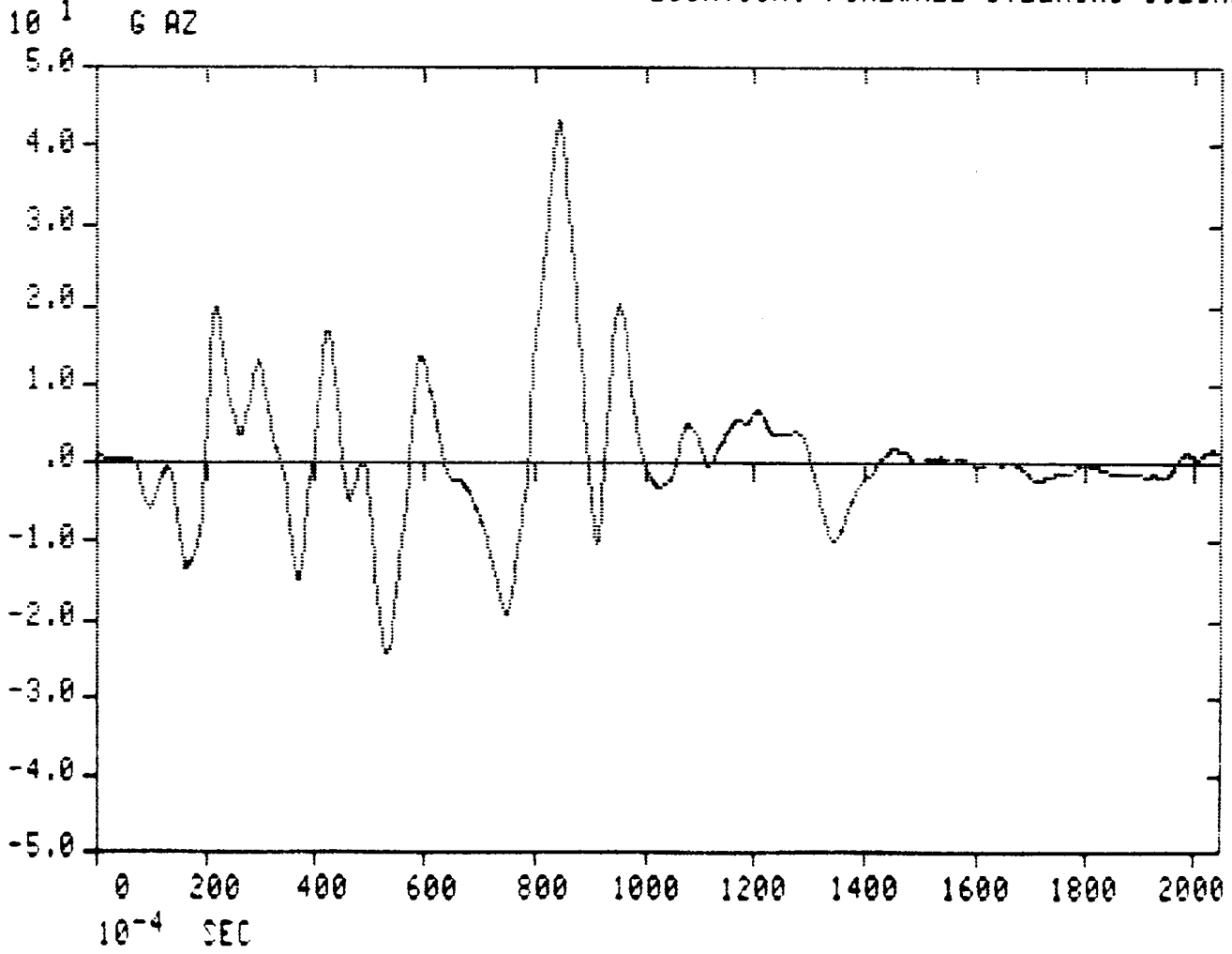


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 2, CH 11
DIRECTION: UPWARD
LOCATION: FIREWALL STEERING COLUMN

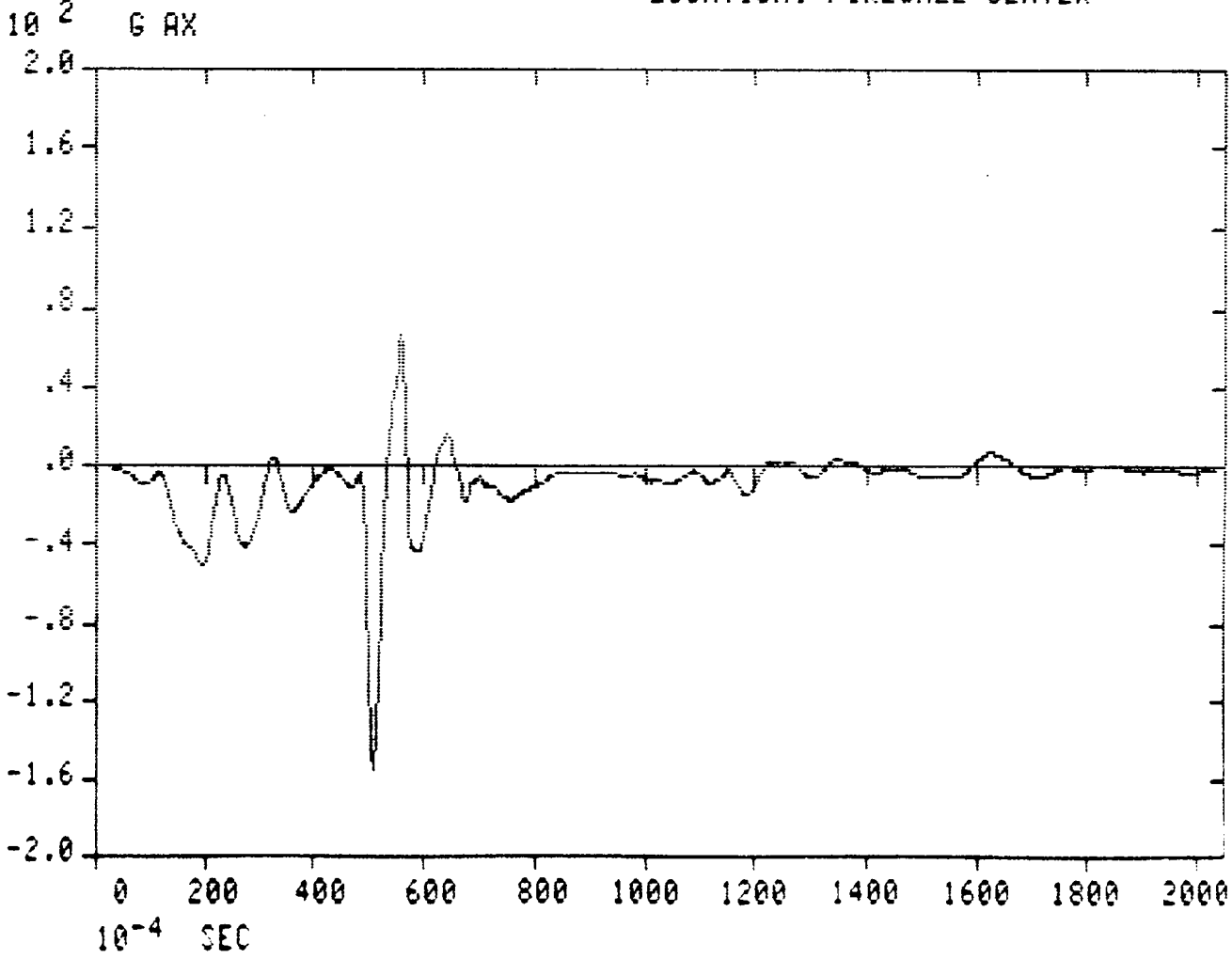


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 2, CH 12
DIRECTION: FORWARD
LOCATION: FIREWALL CENTER

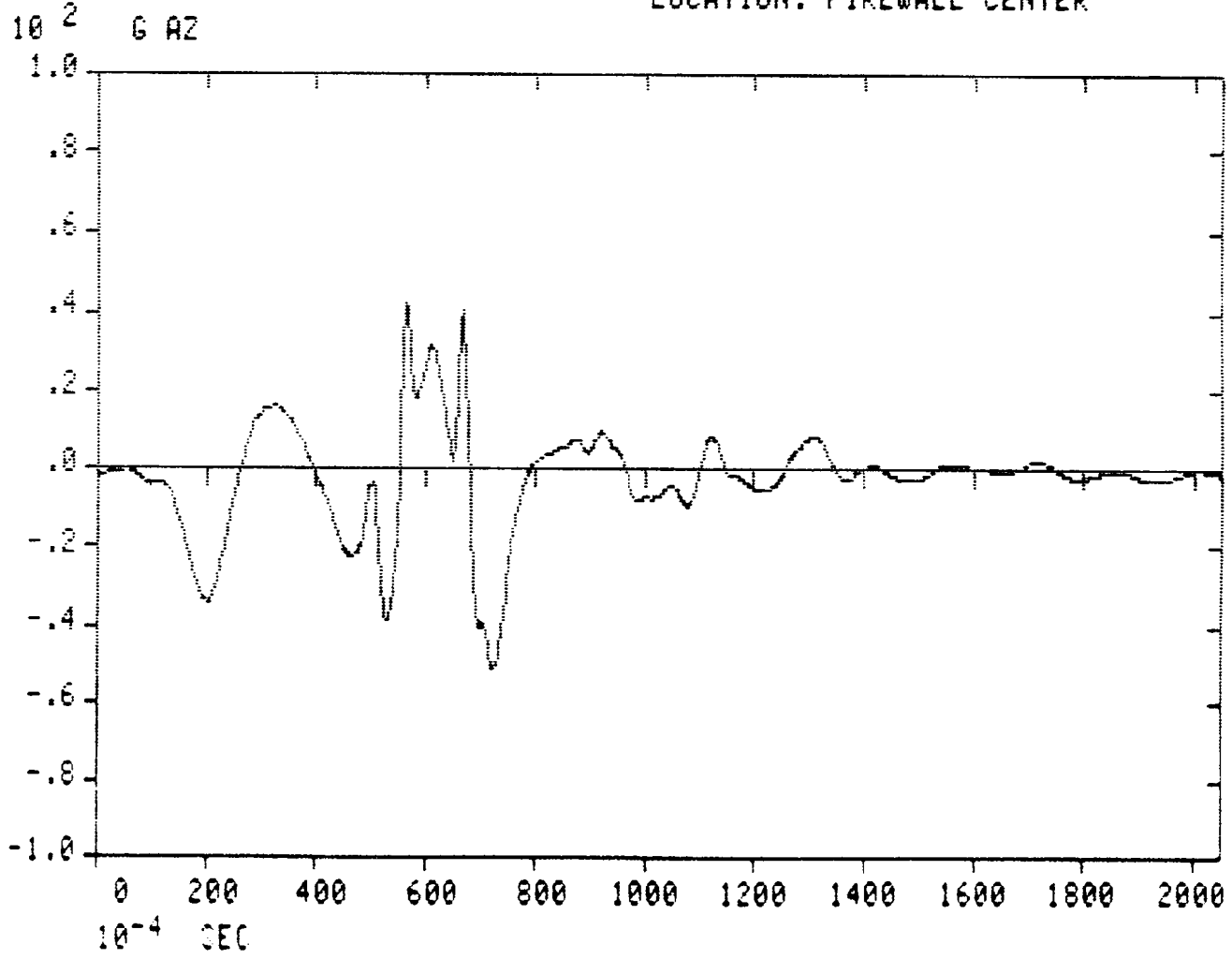


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 2, CH 13
DIRECTION: UPWARD
LOCATION: FIREWALL CENTER

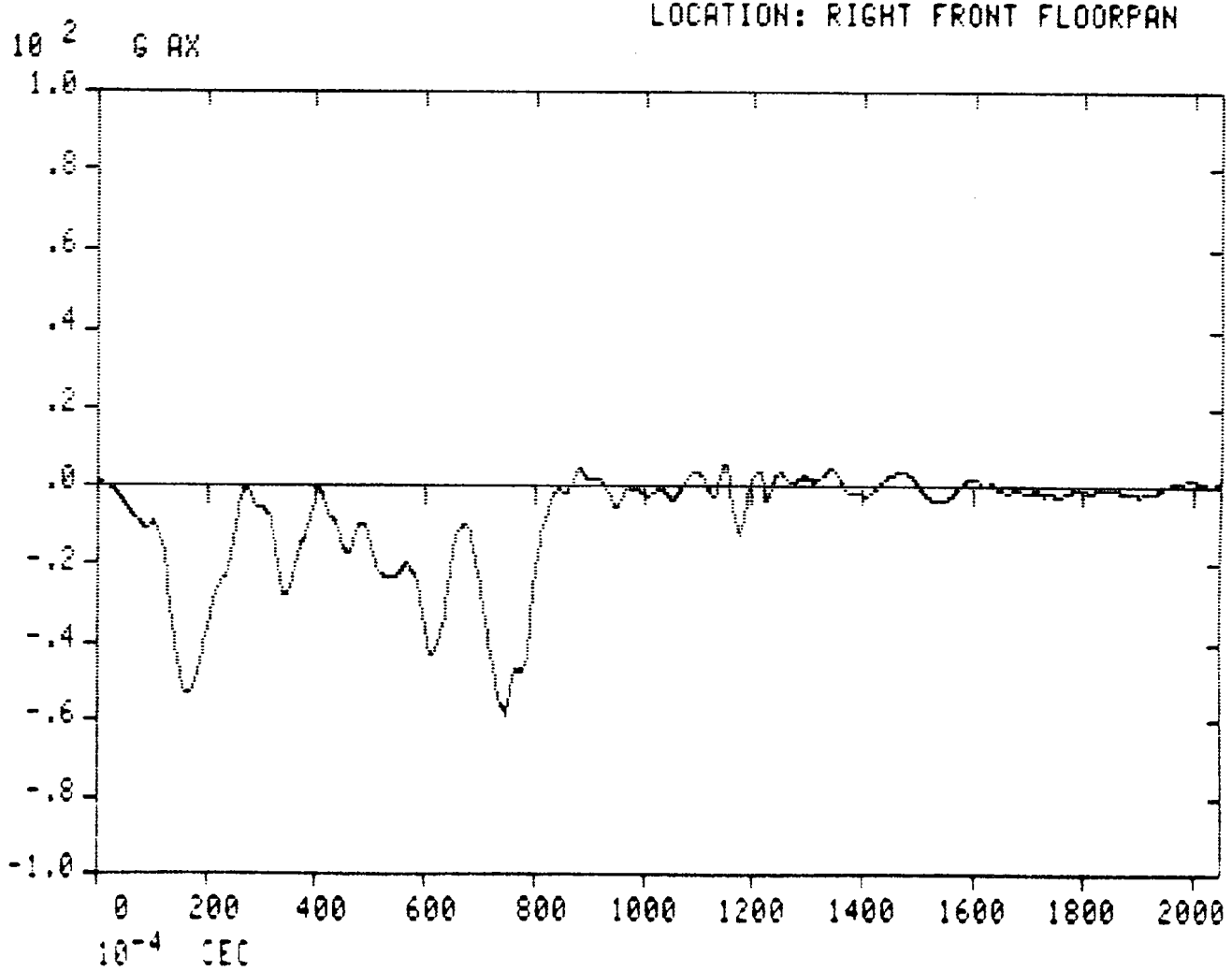


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 1, CH 12
DIRECTION: FORWARD
LOCATION: RIGHT FRONT FLOORPAN

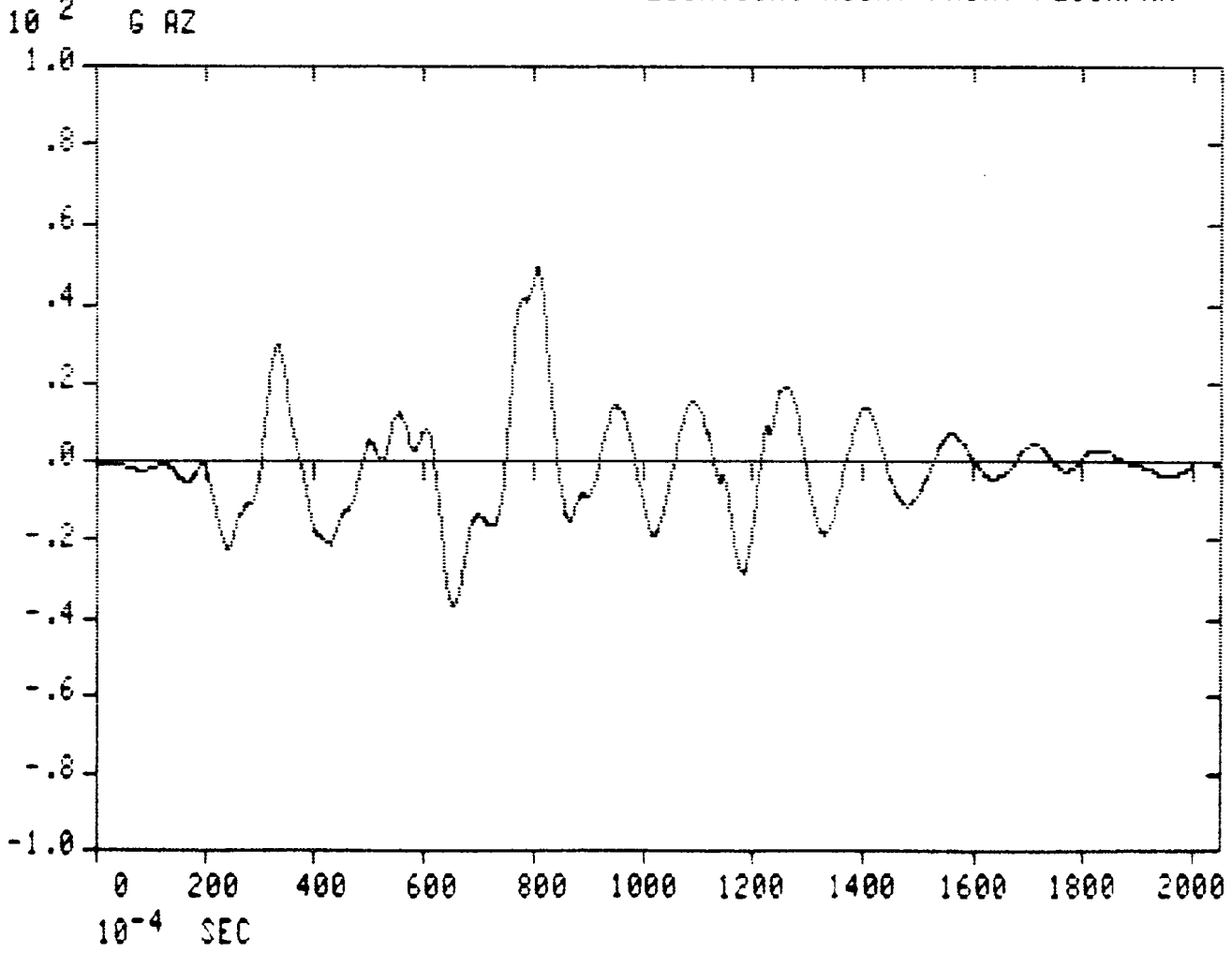


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 1, CH 13
DIRECTION: UPWARD
LOCATION: RIGHT FRONT FLOORPAN

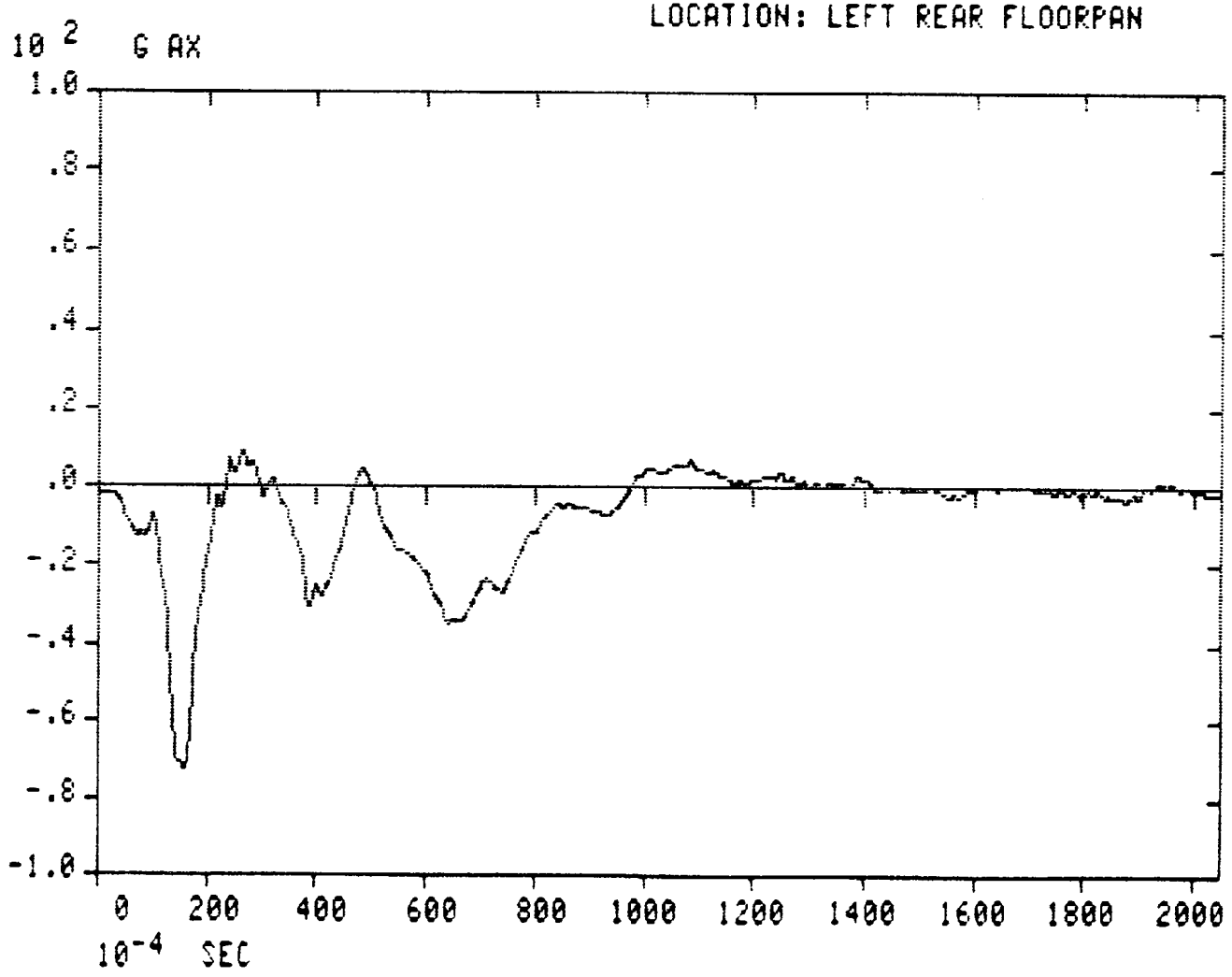


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 1, CH 10
DIRECTION: FORWARD
LOCATION: LEFT REAR FLOORPAN

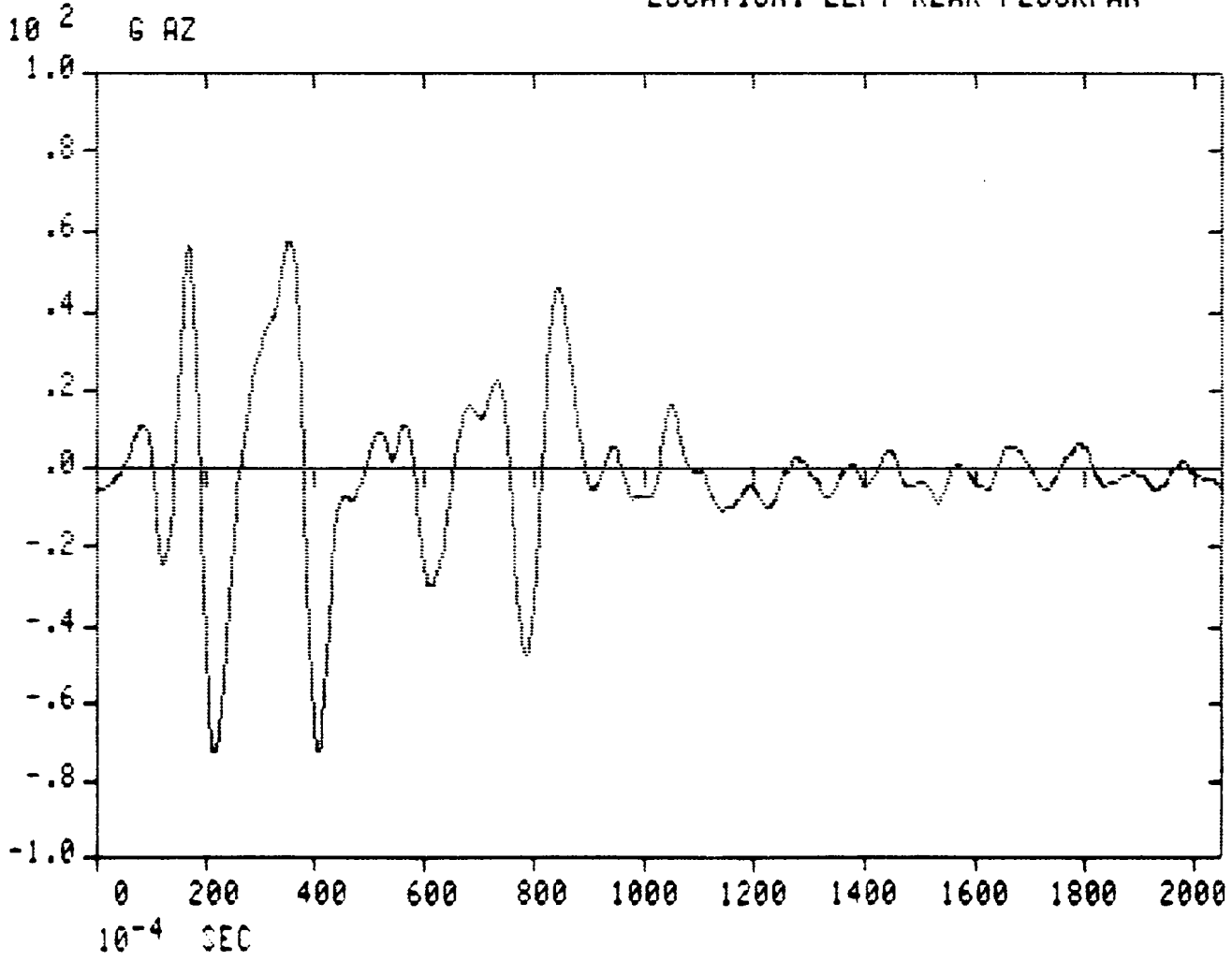


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 60
ACCELEROMETER: TAPE 1, CH 11
DIRECTION: UPWARD
LOCATION: LEFT REAR FLOORPAN

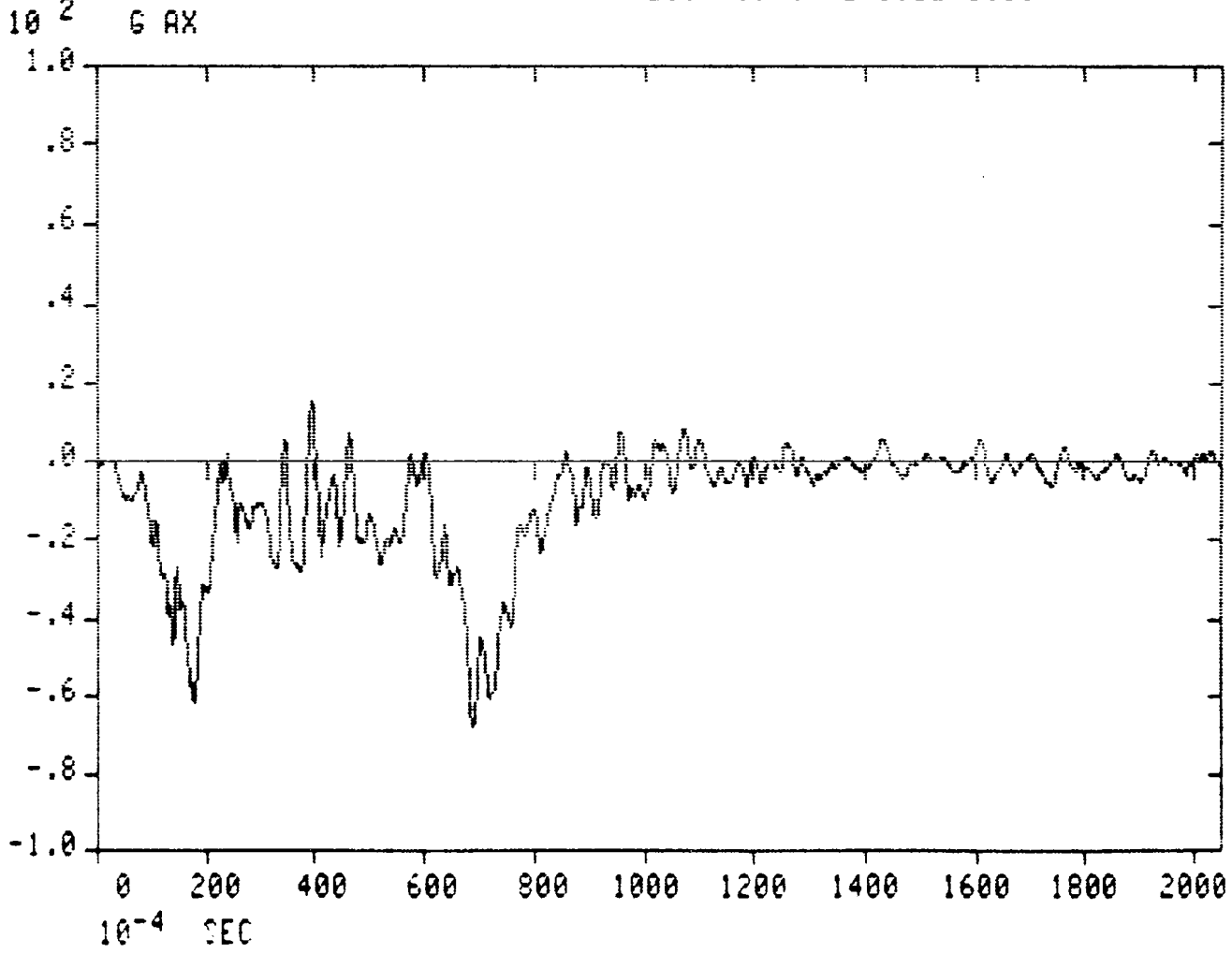


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 3, CH 5
DIRECTION: FORWARD
LOCATION: VEHICLE C.G.

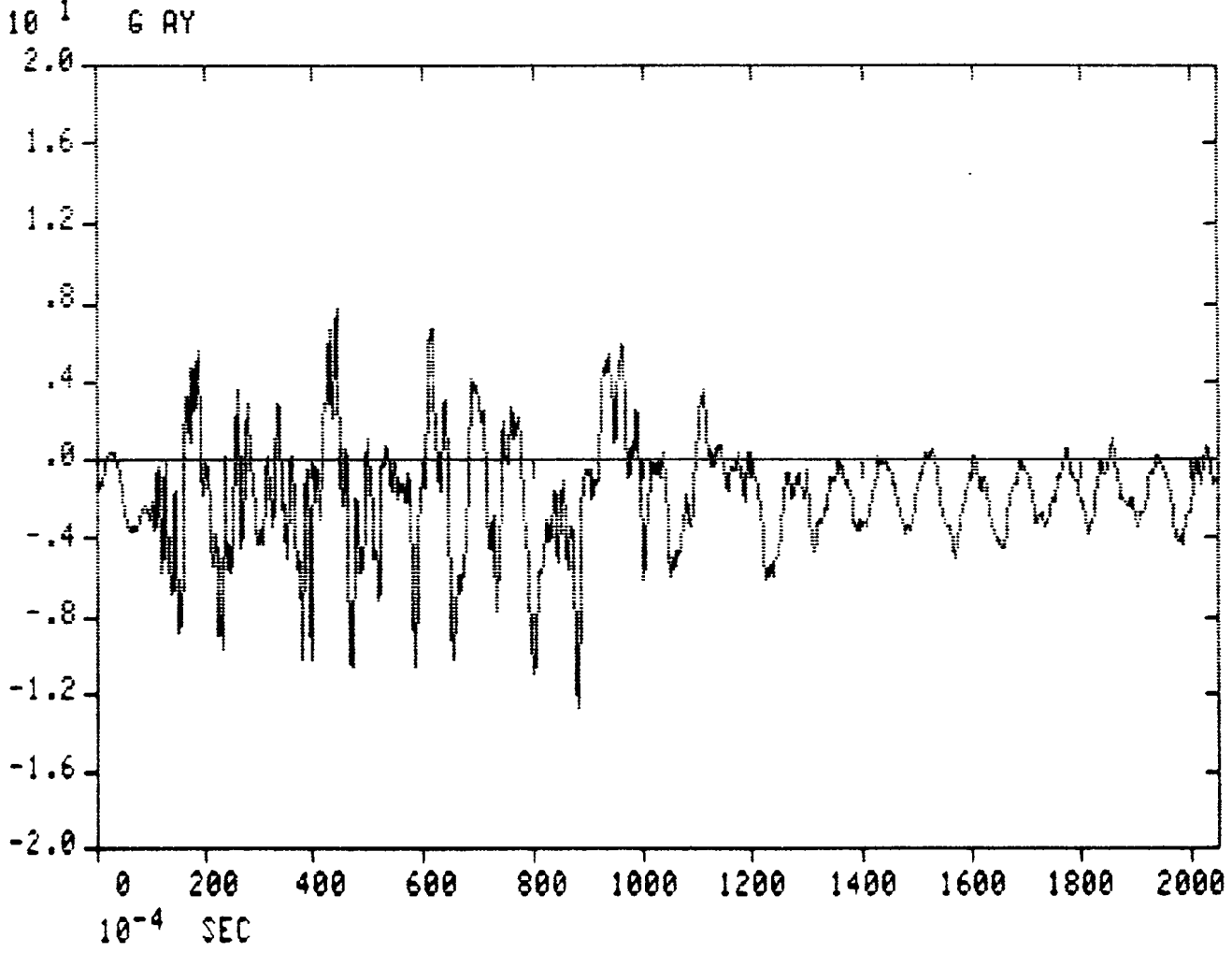


DOT CRASH PROGRAM

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

APPROVED ENGINEERING TEST LABS

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 3, CH 6
DIRECTION: RIGHT
LOCATION: VEHICLE C.G.

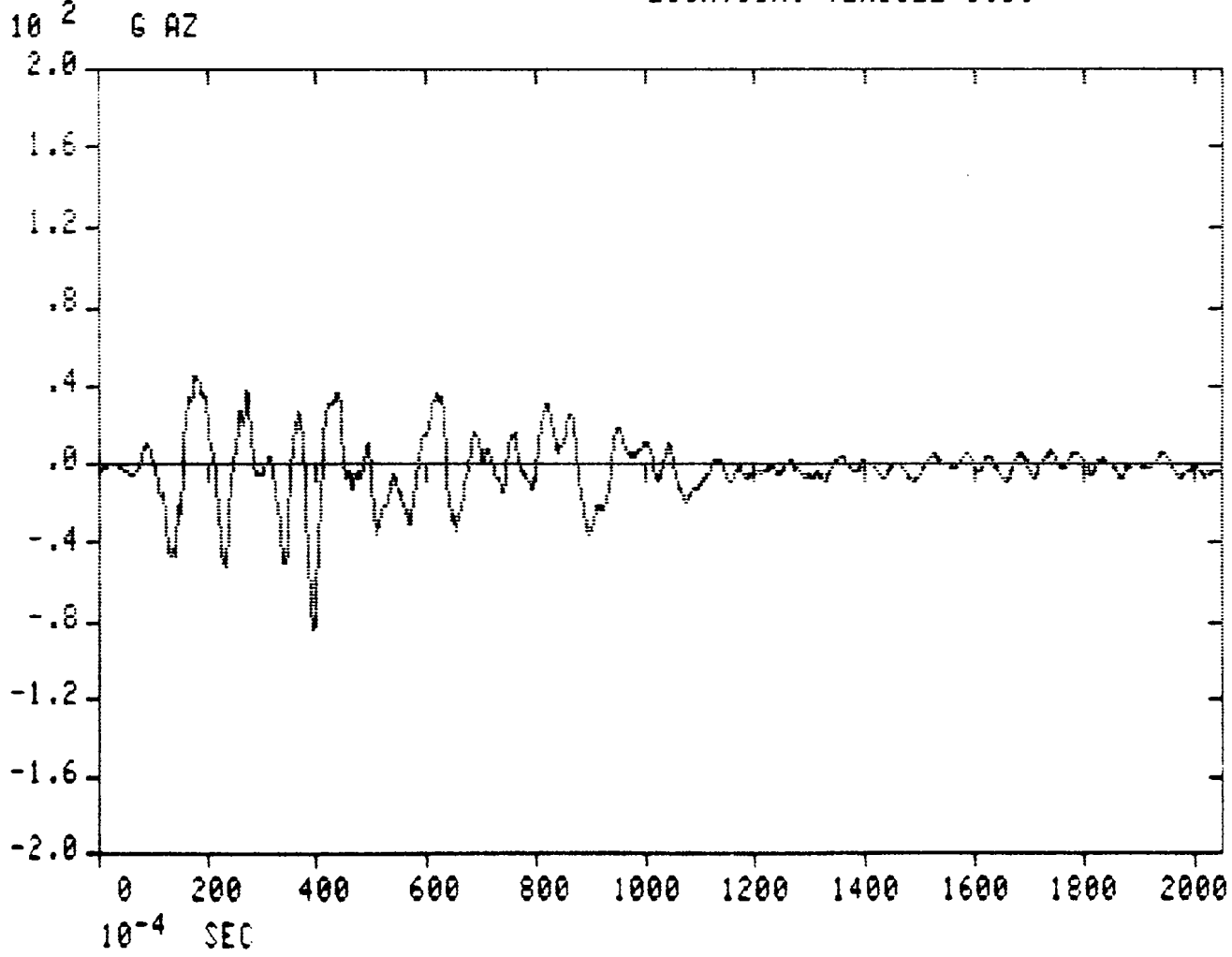


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LABS

VEHICLE: FORD F350 P/U
VEHICLE ID: NHTSA 790608
TEST FILE NO. : 61 FRONTAL IMPACT
DATE: MARCH 21, 1980 29.70 MPH

MJO NO. : 671-1489-108
FILTER: CLASS 180
ACCELEROMETER: TAPE 3, CH 7
DIRECTION: UPWARD
LOCATION: VEHICLE C.G.



APPROVED ENGINEERING TEST LABORATORIES

SERVICE FOR: U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Research and Development
400 Seventh Street S. W.
Washington, D. C. 20590

CONTRACT NUMBER: DOT-HS-6-01477

I hereby certify that the preceding report is true and correct to the best of my knowledge.

APPROVED ENGINEERING TEST LABORATORIES

R. D. Short, Division Manager

D. H. Hand, Project Engineer

R. E. Allen, P.E., Dynamics
R & D Department Manager

G. J. Valenzuela, Mechanical
Department Manager

R. J. McKelligott, P.E.
Quality Assurance Manager

rmh