



DOT 0153

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

REPORT NO. 301-AETL-80-008-971-3882-8

NEW VEHICLE ASSESSMENT
AND
STANDARDS ENFORCEMENT INDICANT TESTING

FMVSS 301-75

TOYO KOGYO COMPANY, LTD.
1980 MAZDA 626 - 4 DOOR SEDAN
NHTSA 800561

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



JULY 1980

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
- ENFORCEMENT -
OFFICE OF VEHICLE SAFETY COMPLIANCE
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APPROVED ENGINEERING TEST LABORATORIES

SECTION 1



APPROVED ENGINEERING TEST LABORATORIES

SECTION 1

1.0 INTRODUCTION

This report contains information regarding a joint program for the Office of Vehicle Safety Compliance (OVSC), Office of Automotive Ratings (OAR), and Research and Development (R&D) for a vehicle assessment and standards enforcement indicant tests of fuel system integrity relative to Federal Motor Vehicle Safety Standard (FMVSS) No. 301-75. This test was performed under Contract Number DOT-HS-9-02273 by Approved Engineering Test Laboratories, 1536 East Valencia Drive, Fullerton, California, in accordance with the Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures (TP212-02).

The specific purpose of this test was to obtain research and vehicle rating data in conjunction with fuel system integrity indicant data, when a vehicle is impacted in excess of the velocity (30 mph) requirements of FMVSS 301-75.

Section 2 contains general test and vehicle information, occupant/vehicle acceleration summary data, while Section 3 contains all compliance related data. Section 4 contains test dummy and vehicle measurements, along with camera positions. Section 5 discusses AETL's test facilities and data acquisition and reduction system.



APPROVED ENGINEERING TEST LABORATORIES

SECTION 1

Appendix A contains additional photographs not related to vehicle compliance. Appendix B contains the computer generated plots, while Appendix C contains the dummy certification reports if applicable.

1.1 ADMINISTRATIVE DATA

A. References

1. Federal Motor Vehicle Safety Standard No. 301-75 "Fuel System Integrity" as published in the Federal Register, Volume 38, No. 22397, dated August 20, 1973.
2. National Highway Traffic Safety Administration - Office of Vehicle Safety Compliance Laboratory Procedures for Vehicle Assessment and Standards Enforcement Indicant Testing for "Windshield Mounting", FMVSS 212 - "Windshield Zone Intrusion", FMVSS 219 - "Fuel System Integrity", FMVSS 301-75, TP212-02, dated April 1, 1980.



APPROVED ENGINEERING TEST LABORATORIES

SECTION 1

B. Description of Test Vehicle

1. 1980 Mazda 626 - 4 Door Sedan
2. Vehicle Identification No.: CB2MS-636563
3. NHTSA No.: 800561
4. Manufactured Date: April 1980
5. GVWR: 3,310 pounds

C. Dates

1. Vehicle Received: June 25, 1980
2. Start of Test: July 21, 1980
3. Completion of Test: July 24, 1980



APPROVED ENGINEERING TEST LABORATORIES

SECTION 2



SECTION 2

2.0 GENERAL TEST INFORMATION AND SUMMARY DATA

The 1980 Mazda 626 - 4 Door Sedan was subjected to a rear moving barrier impact and a static rollover maneuver as required by Federal Motor Vehicle Safety Standard No. 301-75.

Two (2) Part 572 test dummies were positioned in each front designated outboard seating position and were restrained by the belt system in the test vehicle. Just prior to the impact event, the driver dummy head was painted with red chalk and the passenger dummy head with blue chalk to provide post-impact visual inspection of possible dummy head contact with interior compartment during the impact event.

TABLE 1

SUMMARY OF TEST CONDITIONS

TEST VEHICLE INFORMATION:

Manufacturer: Toyo Kogyo Company Ltd.
Make/Model: Mazda 626
Body Style: 4 Door Sedan Model Year: 1980
VIN: CB2MS-636563 Build Date: April 1980
NHTSA No.: 800561 Color: Ivory
Engine Data: Four (4) Cylinders; 120.2 Cu. In. Displ.
Transmission Data: Five (5) Speed (X) Manual () Automatic
Major Options: None

VEHICLE ATTITUDE:

Delivered Attitude: LF 25.50 in.; RF 25.80 in.; LR 24.40 in.; RR 24.80 in.
Test Attitude: LF 24.70 in.; RF 24.80 in.; LR 23.70 in.; RR 23.50 in.

VEHICLE TIRE DATA:

Recommended Cold Tire Pressure: Front = 26 psi
(Up to Vehicle Load Capacity) Rear = 26 psi
Recommended Tire Size: 165R13 Load Range: "B"
Tires on Vehicle: 165SR13 - W/S/W - Goodrich
Spare Tire: X Yes; No; Space Saver: Yes; X No

NOTE: Spare - 185/70SR13 - Goodrich

TABLE 1a

SUMMARY OF TEST CONDITIONS (Cont'd)

TEST CONDITIONS:

Date of Test: July 24, 1980 Time of Test: 1630
Ambient Temperature: 84 °F at Impact Area

VEHICLE CAPACITY:

Type of Seats: Bench; X Bucket; Split Bench

Designated Seating Capacity: Front 2
Center 0
Rear 2
Total 4

Cargo: 80 lbs.

Total 680 lbs. (Vehicle Capacity Weight)

GVWR: 3,310 lbs. (Taken From Certification Label)

GAWR: Front 1,750 lbs.; Rear 1,750 lbs.

VEHICLE DELIVERED WEIGHT: (Fuel - 93% of NFC)

Left Front 720 lbs. Left Rear 572 lbs.
Right Front 619 lbs. Right Rear 610 lbs.
Total Front Weight 1,339 lbs. (53.1 % of Total Vehicle Weight)
Total Rear Weight 1,182 lbs. (46.9 % of Total Vehicle Weight)
Total Delivered Weight 2,521 lbs.

CALCULATED VEHICLE TEST WEIGHT: 2,929 lbs.

(With Required Dummies and 80 lbs. Cargo)

ACTUAL VEHICLE TEST WEIGHT:

Left Front 805 lbs. Left Rear 673 lbs.
Right Front 715 lbs. Right Rear 718 lbs.
Total Front Weight 1,520 lbs. (52.2 % of Total Vehicle Weight)
Total Rear Weight 1,391 lbs. (47.8 % of Total Vehicle Weight)
Total Test Weight 2,911 lbs.

TABLE 1L

SUMMARY OF TEST CONDITIONS (Cont'd)

TEST FLUID DATA:Test Fluid Type: Red Stoddard Solvent ; Specific Gravity: 0.764Kinematic Viscosity: 1.31Nominal Fuel Capacity: 14.50 gals. (NFC)Test Volume: 13.49 gals. (92-94% of NFC)Fuel System Capacity: 14.50 gals.
(Data from Owner's Manual)Electric Fuel Pump: X Yes; No; Fuel Injection: Yes; X No

Does Electric Fuel Pump Operate with Ignition Switch "On"

And the Engine Not Operating: X Yes; No; N/A

Details of Fuel System: Fuel filler located on left rear fender aft of
wheel opening recessed behind a hinged door, fuel tank located hori-
zontally between frame side rails under trunk floor pan between
differential and bumper.

VEHICLE TEST CONDITIONS:Temperature in Occupant Compartment: N/A °FTemperature of Windshield Glazing/Moulding: N/A °FVEHICLE CRUSH AND REBOUND:Overall Length of Test Vehicle: Pre-Test - Left 169.3 in.; Right 169.3 in.Post-Test - Left 154.8 in.; Right 155.3 in.Crush: Left 14.5 in.; Right 14.0 in.Rebound (From Rigid Barrier Only): N/A in.

TABLE III
POST IMPACT SUMMARY

Vehicle 1980 Mazda 626

NHTSA No. 800561

Test Date July 24, 1980

TYPE OF TEST: ☐ 0° Frontal Impact

☐ 30° Oblique Impact (Driver/Passenger) Side

☒ Rear Impact

REQUIRED IMPACT VELOCITY RANGE: 34.5 to 35.5 mph

IMPACT VELOCITY: (Traps within 5 feet of impact event)

Trap 1 = 35.10 mph

Trap 2 = 35.11 mph

Average = 35.105 mph

Actual distance from vehicle rear bumper to barrier face when entering timing trap 50.5 in.

Actual distance from vehicle rear bumper to barrier face when exiting timing trap 26.5 in.

VEHICLE STATIC CRUSH: Driver's Side = 14.5 inches

Passenger's Side = 14.0 inches

Average = 14.25 inches

Crush Details: Roof buckled over both "B" and "C" posts, all doors were jammed, both dummies made contact with rear seat back, both front seat backs bent backward onto rear seat cushion.

VEHICLE REBOUND: (From rigid barrier only)

Driver's Side = N/A inches

Passenger's Side = N/A inches

Average = N/A inches



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SECTION 3



SECTION 3

3.0 TEST DATA

The 1980 Mazda 626 - 4 Door Sedan was subjected to a rear moving barrier impact and a static rollover maneuver as required by Federal Motor Vehicle Safety Standard No. 301-75.

Color motion picture coverage of the impact along with the static rollover test are considered part of the accumulated pertinent data. Where applicable, still photographs are presented in this report; while the motion picture coverage is submitted separately.

TABLE VI
POST IMPACT SUMMARY
FUEL SYSTEM INTEGRITY - FMVSS 301-75

Vehicle 1980 Mazda 626

NHTSA No. 800561

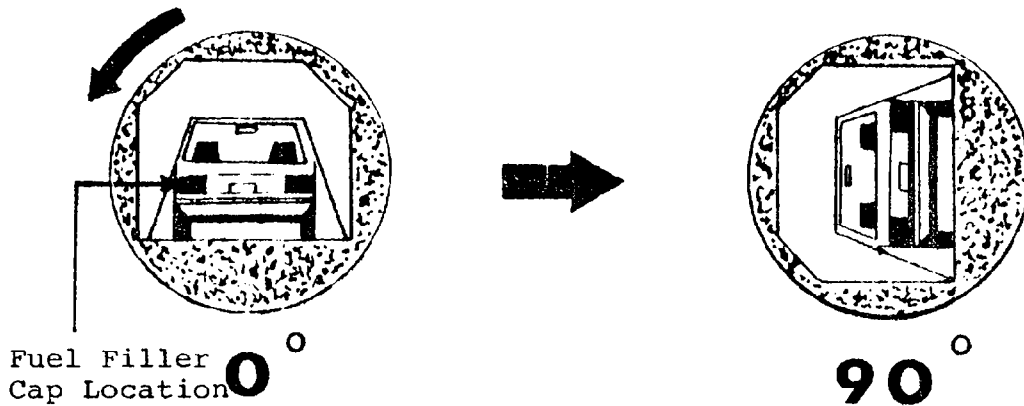
Test Date July 24, 1980

	Actual	Max. Allow.
Fuel spillage from impact until vehicle motion ceases.	- 0 -	1 ounce
Fuel spillage for 5 minute period following cessation of vehicle motion after impact.	- 0 -	5 ounces
Fuel spillage for next 25 minute period.	- 0 -	1 ounce/ 1 minute
Time duration from impact until start of rollover test periods.	28 minutes	30 minutes

Fuel Spillage Location: Not Applicable

TABLE VII
FUEL SYSTEM INTEGRITY - FMVSS 301-75
STATIC ROLLOVER

Vehicle 1980 Mazda 626 NHTSA No. 800561



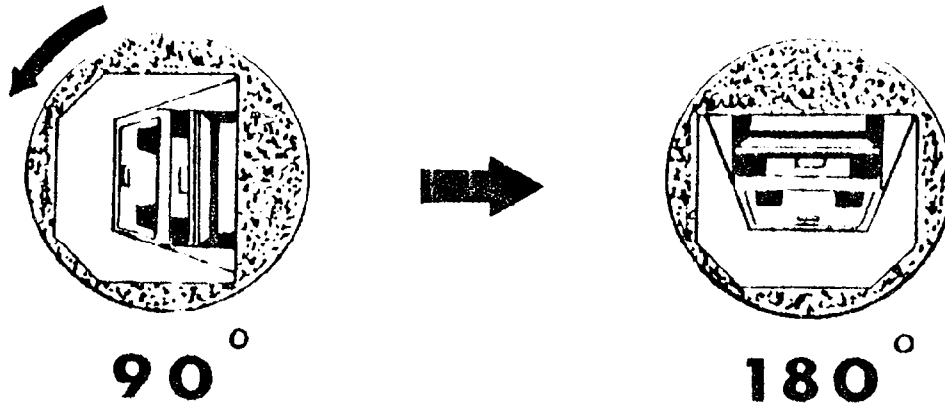
	Actual	Max. Allowed
Rollover fixture 90° rotation time	2 Minutes, 15 seconds	1 to 3 Minutes
Fuel spillage during 5 minute period from onset of rotation	0.25 ounces	5 ounces
Fuel spillage during 6th minute period from onset of rotation	0.01 ounces	1 ounce
Fuel spillage during 7th minute period from onset of rotation	0.02 ounces	1 ounce

Fuel Spillage Location: Carburetor air cleaner assembly area.

TABLE VIII
FUEL SYSTEM INTEGRITY - FMVSS 301-75
STATIC ROLLOVER

Vehicle 1980 Mazda 626

NHTSA No. 800561



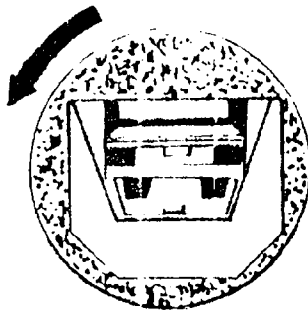
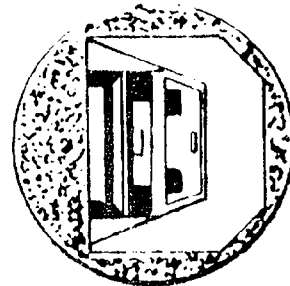
	Actual	Max. Allowed
Rollover fixture 90° rotation time	2 minutes, 17 seconds	1 to 3 Minutes
Fuel spillage during 5 minute period from onset of rotation	0.25 ounces	5 ounces
Fuel spillage during 6th minute period from onset of rotation	- 0 -	1 ounce
Fuel spillage during 7th minute period from onset of rotation	- 0 -	1 ounce

Fuel Spillage Location: Carburetor air cleaner assembly area.

TABLE IX

FUEL SYSTEM INTEGRITY - FMVSS 301-75

STATIC ROLLOVER

Vehicle 1980 Mazda 626NHTSA No. 800561**180°****270°**

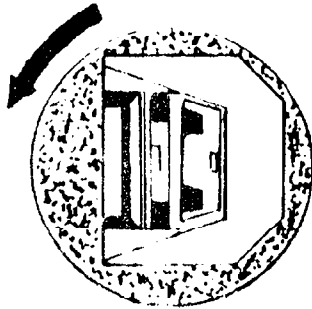
	Actual	Max. Allowed
Rollover fixture 90° rotation time	2 minutes, 14 seconds	1 to 3 Minutes
Fuel spillage during 5 minute period from onset of rotation	0.06 ounces	5 ounces
Fuel spillage during 6th minute period from onset of rotation	- 0 -	1 ounce
Fuel spillage during 7th minute period from onset of rotation	- 0 -	1 ounce

Fuel Spillage Location: Carburetor air cleaner assembly area.

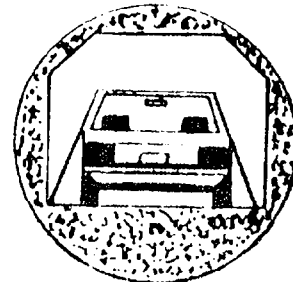
TABLE X
FUEL SYSTEM INTEGRITY - FMVSS 301-75
STATIC ROLLOVER

Vehicle 1980 Mazda 626

NHTSA No. 800561



270°



360°

	Actual	Max. Allowed
Rollover fixture 90° rotation time	2 minutes, 10 seconds	1 to 3 Minutes
Fuel spillage during 5 minute period from onset of rotation	- 0 -	5 ounces
Fuel spillage during 6th minute period from onset of rotation	- 0 -	1 ounce
Fuel spillage during 7th minute period from onset of rotation	- 0 -	1 ounce

Fuel Spillage Location: Not Applicable



SECTION 3

3.1 TEST RESULTS AND PHOTOGRAPHS

Post-impact inspection of the test vehicle revealed almost all crush occurred rearward of the front doors.

All four doors were jammed and required a crow bar to open. Both rear wheels were jammed and the spare tire remained inflated. The roof buckled over both left and right "B" and "C" posts. Both front seat backs bent backward onto the rear seat cushion and both driver and passenger dummy head made contact with the rear seat back.

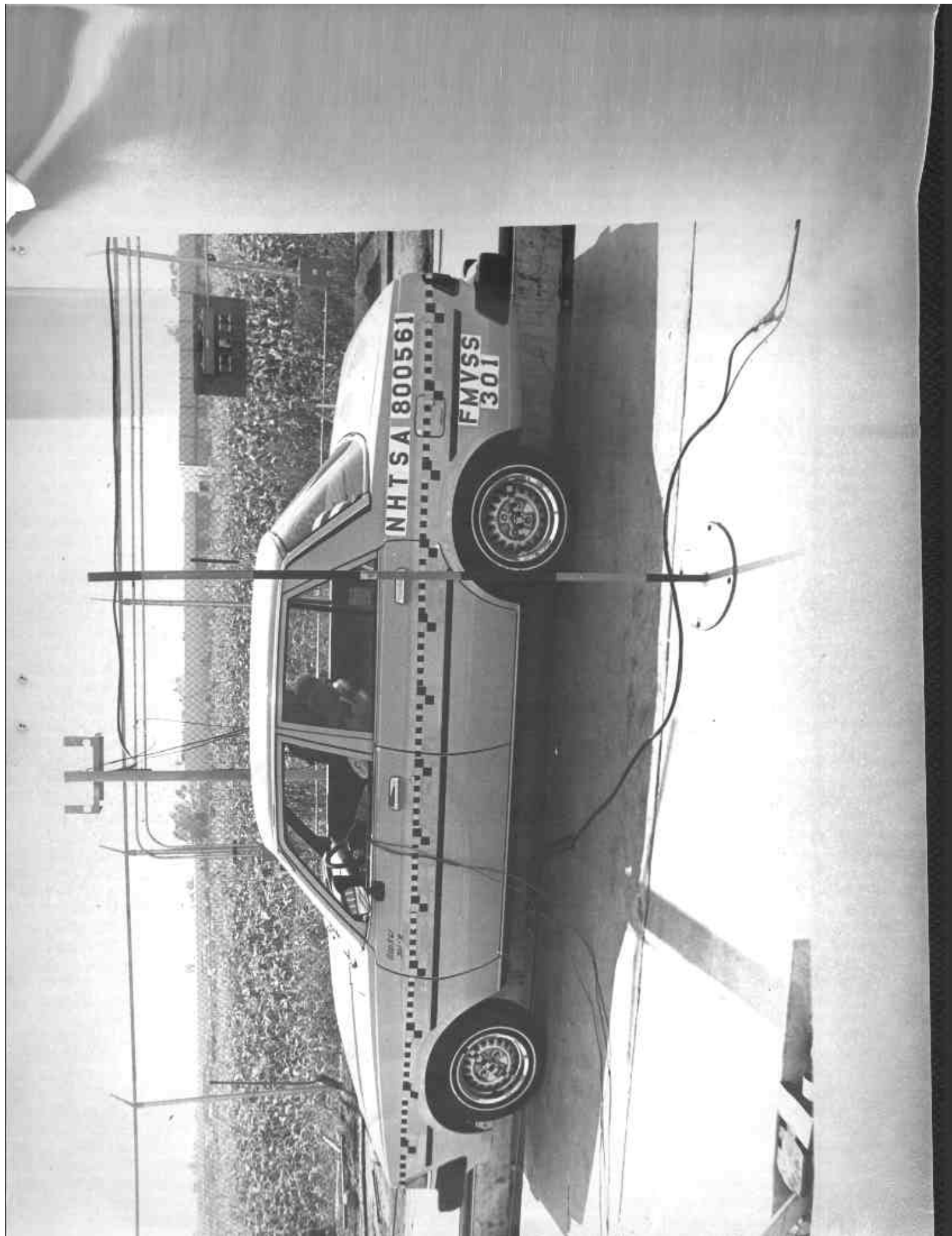
No fuel spillage was recorded following the test vehicle impact, nor during the time period before the start of the rollover test. However, as the vehicle was approaching the 90° test increment, fuel spillage was noted emitting from the carburetor air cleaner assembly area. The fuel spillage continued as recorded for the subsequent test increment time periods.

The 1980 Mazda 626 - 4 Door Sedan test vehicle appears to comply with all the requirements of FMVSS 301-75.



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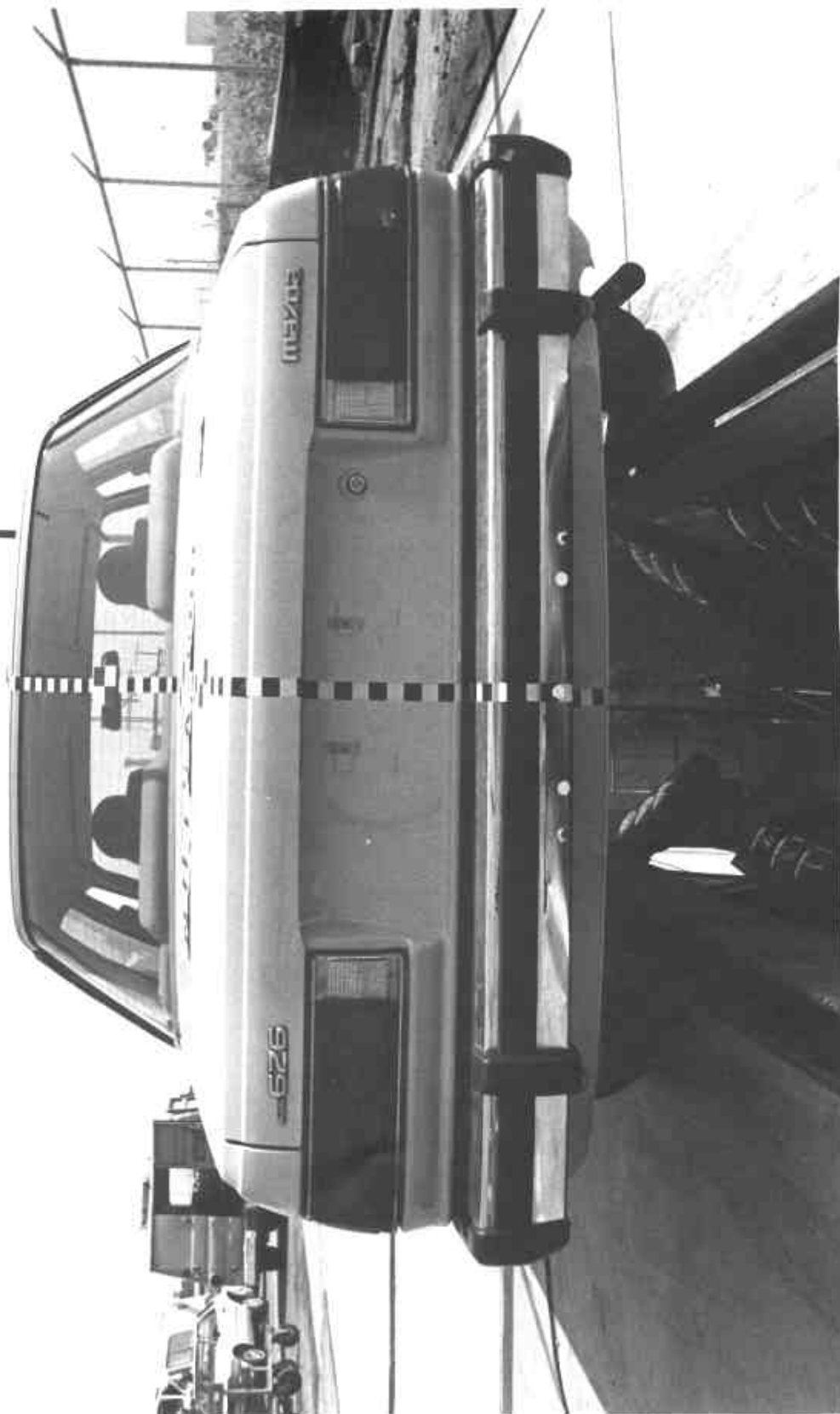
Figure 3-1
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Pre-Test, Left Side View





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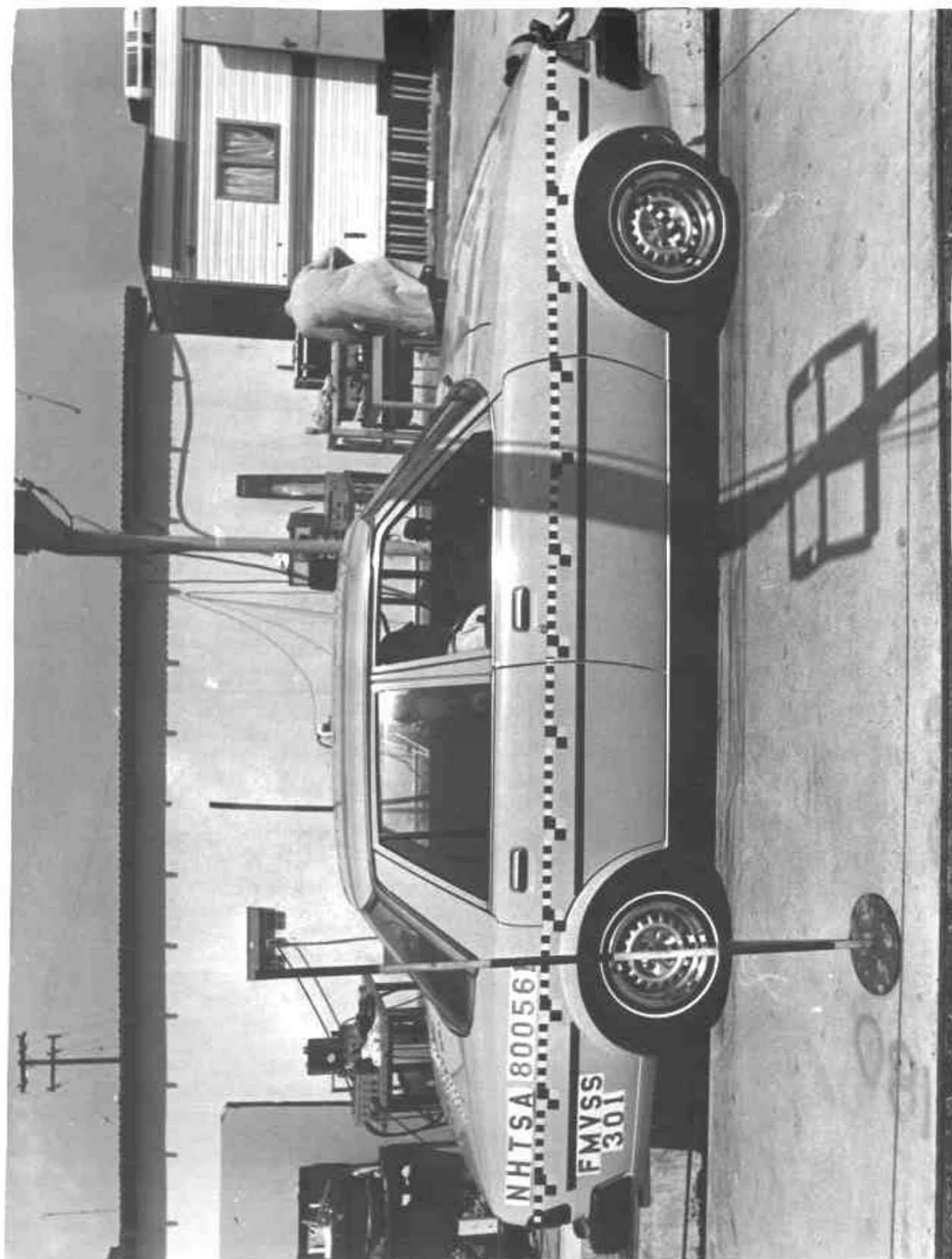
Figure 3-2
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Pre-Test, Full Rear View





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Figure 3-3
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Pre-Test, Right Side View





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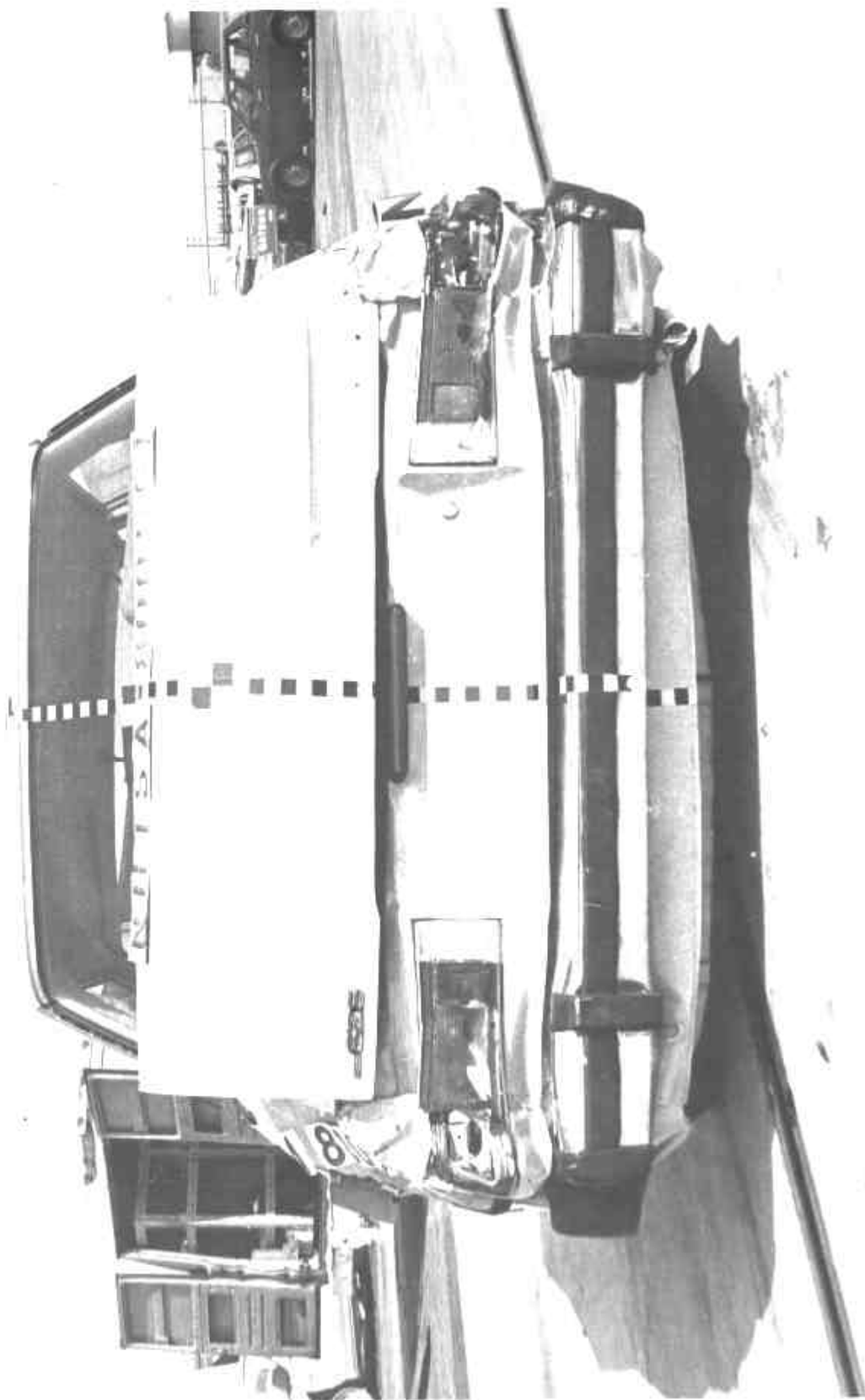
Figure 3-4
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Post-Impact, Left Side View





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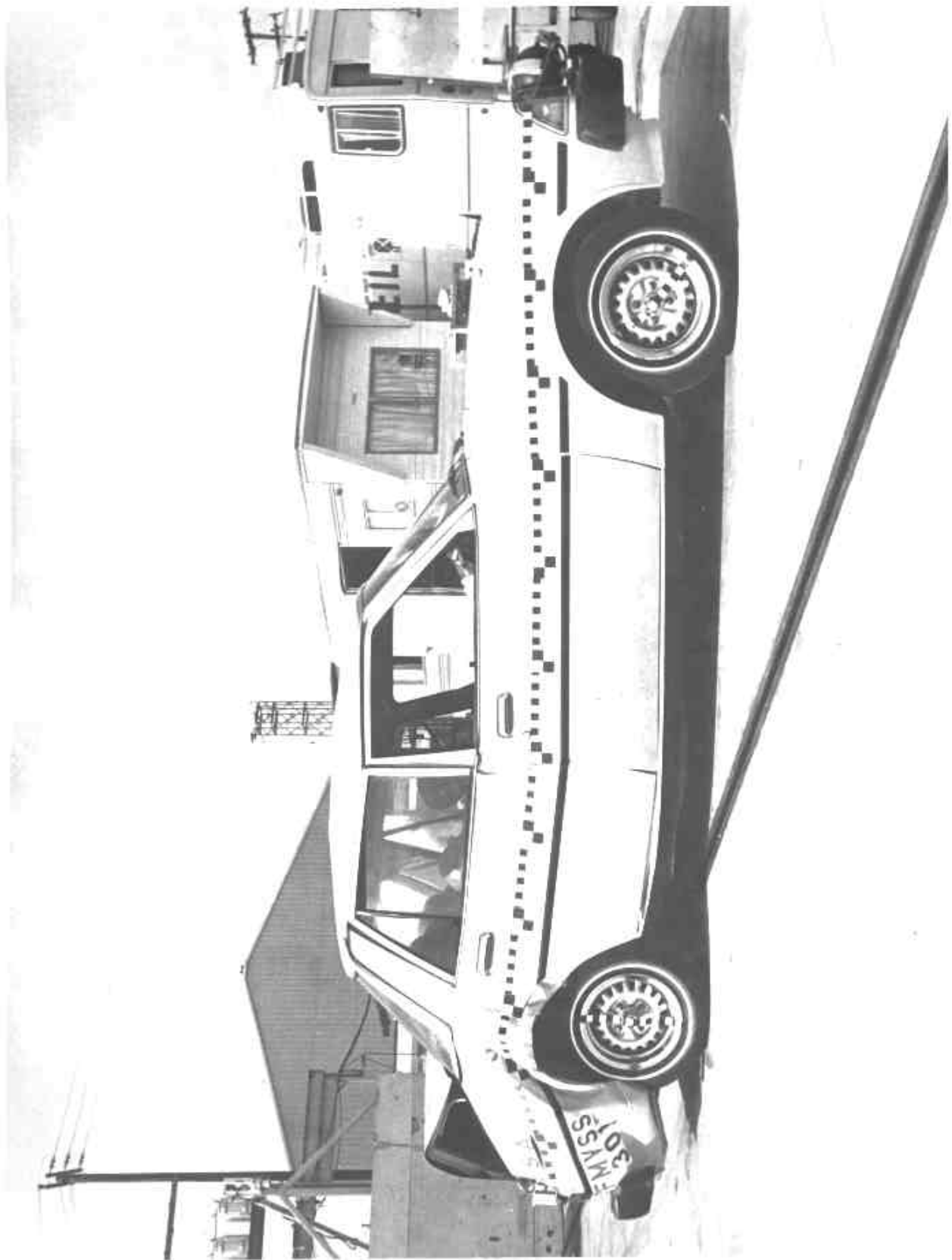
Figure 3-5
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Post-Impact, Full Rear View





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Figure 3-6
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Post-Impact, Right Side View





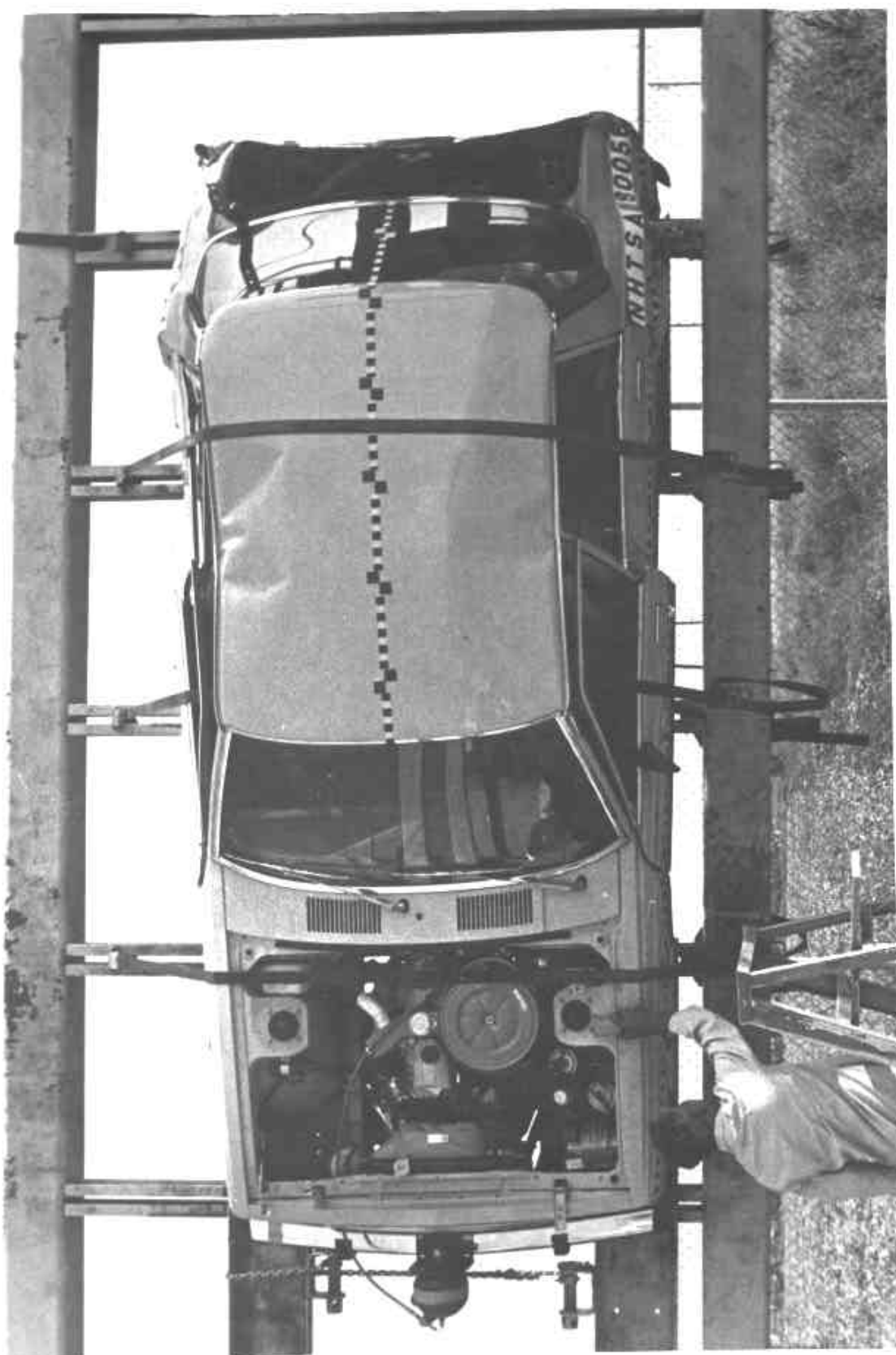
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Figure 3-7

1980 Mazda 626 - 4 Door Sedan

NHTSA 800561

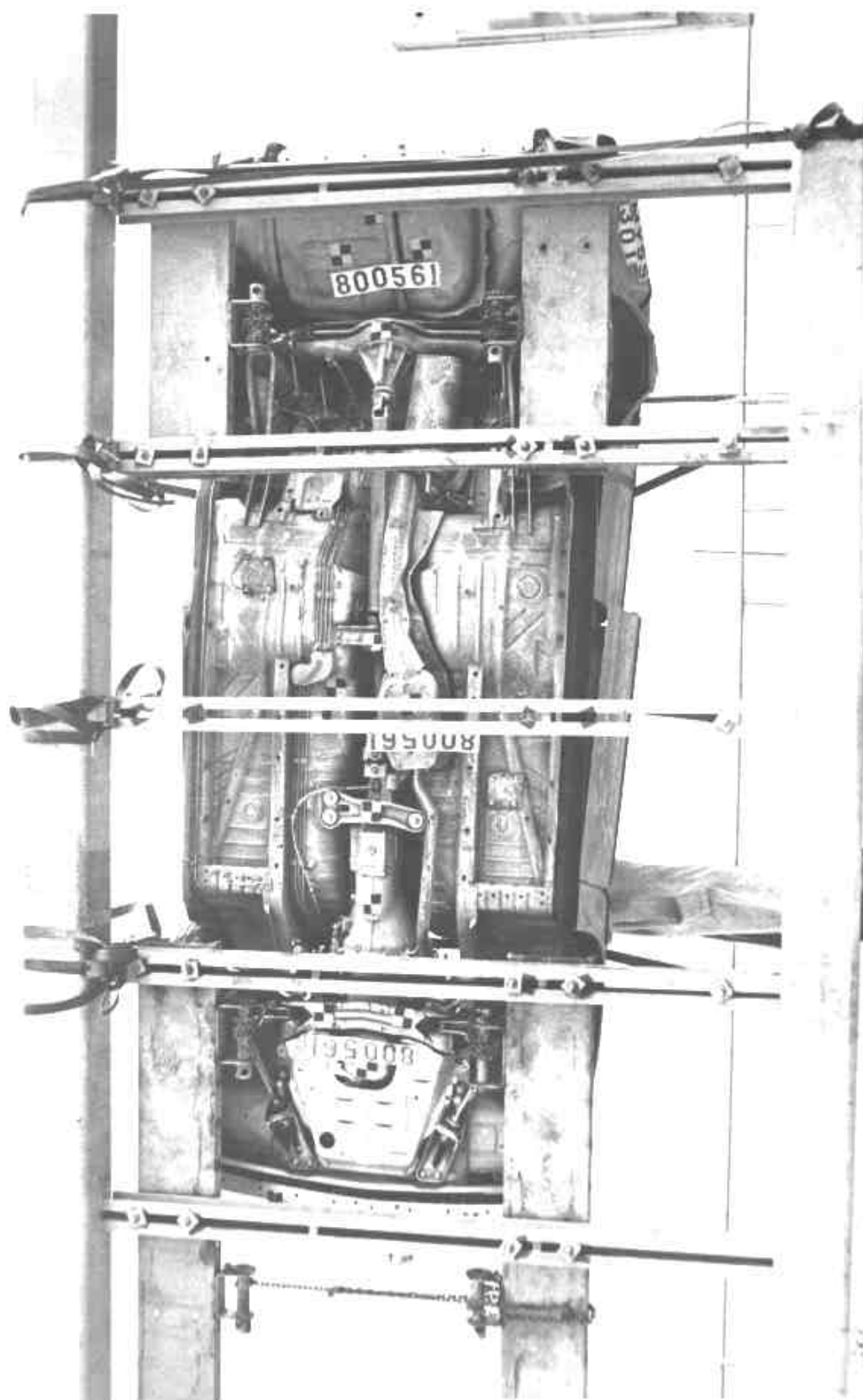
Post-Impact, Rollover Test, 90° Increment





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Figure 3-8
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Post-Impact, Rollover Test, 270° Increment





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SECTION 4



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SECTION 4

4.0 OCCUPANT RESPONSE AND VEHICLE ACCELERATION SUMMARY DATA

The following data sheets summarize:

- A. The dummy position data (Part 572 Dummy Pre-Test Dummy Clearance Distances Sheet)
- B. The vehicle acceleration data (Vehicle Structural Data Sheet)
- C. The pre and post-test vehicle dimensions data (Vehicle Measurement Data Sheet)

More comprehensive data is presented in Appendix B in the form of computer plots.

TABLE 4-1

MANUFACTURERS SEAT BELT INSTRUCTIONS

SEAT BELT RESTRAINT SYSTEM

To help protect you and your passengers from injuries in the event of an accident, your Mazda is equipped with seat lap-shoulder belts.

The front seat lap-shoulder belts are equipped with retractors which have inertia locks.

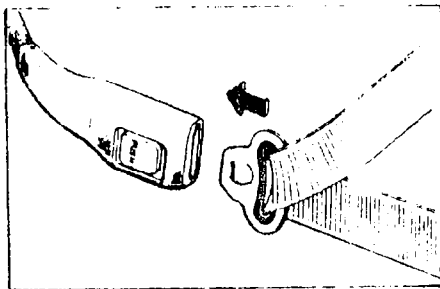
The retractors keep the belts out of the way for convenient entrance and exit from the vehicle. The inertia locks allow the belts to remain slack for comfort, until a deceleration force occurs, such as in a sudden stop or collision. At that time, the retractors automatically lock the belts in position and restrain the seat occupants from being thrown forward.

NOTE:

- The retractor will lock automatically if the car inclines to an angle greater than about 25 degrees.
- Always adjust the seat to the position in which you will drive before fastening the seat belts.

To Fasten Front Seat Belts:

1. Grasp the buckle end and tongue plate.
2. Slowly pull the lap-shoulder belt webbing out.
3. If the lap belt is not far enough to permit buckling, hold the tongue plate at right angles to the lap belt and pull the lap belt webbing until the desired length is obtained.
4. Insert the tongue plate into the open end of the buckle. An audible click will indicate that the belt is securely locked.



WARNING - Do not wear the shoulder belt under the arm. This practice may reduce the restraint system effectiveness.

Position the lap belt across your lap as **LOW ON THE HIPS** as possible. To reduce the risk of sliding under the belt during an accident, adjust to a **SNUG FIT** by pulling the belt extending from the tongue plate. The belt retractor is designed to automatically take up excess webbing and maintain tension on the belt.

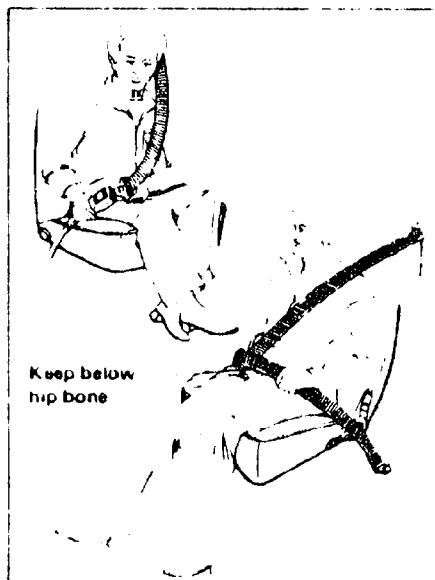


TABLE 4-2

PART 572 DUMMY PRE-TEST DUMMY CLEARANCE DISTANCES

DRIVER

HH = 17.5 in.

HW = 22.5 in.

HR = 4.5 in.

HS = 6.7 in.

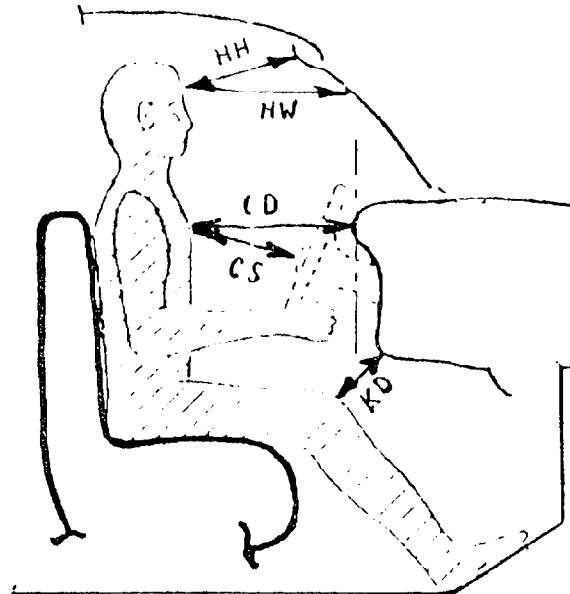
CD = 22.0 in.

CS = 14.0 in.

AD = 2.5 in.

HD = 5.8 in.

KD = 4.7 in.



PASSENGER

HH = 16.5 in.

HW = 21.5 in.

HR = 6.3 in.

HS = 8.9 in.

CD = 22.0 in.

AD = 3.0 in.

HD = 5.6 in.

KD = 4.3 in.

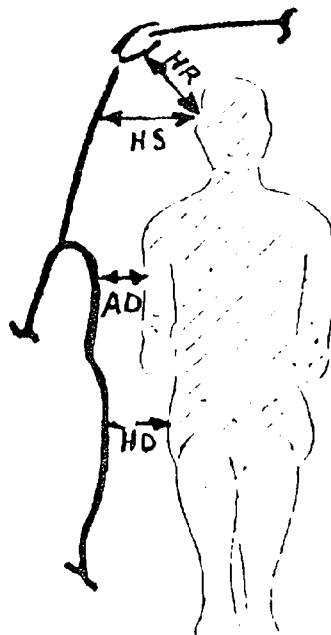
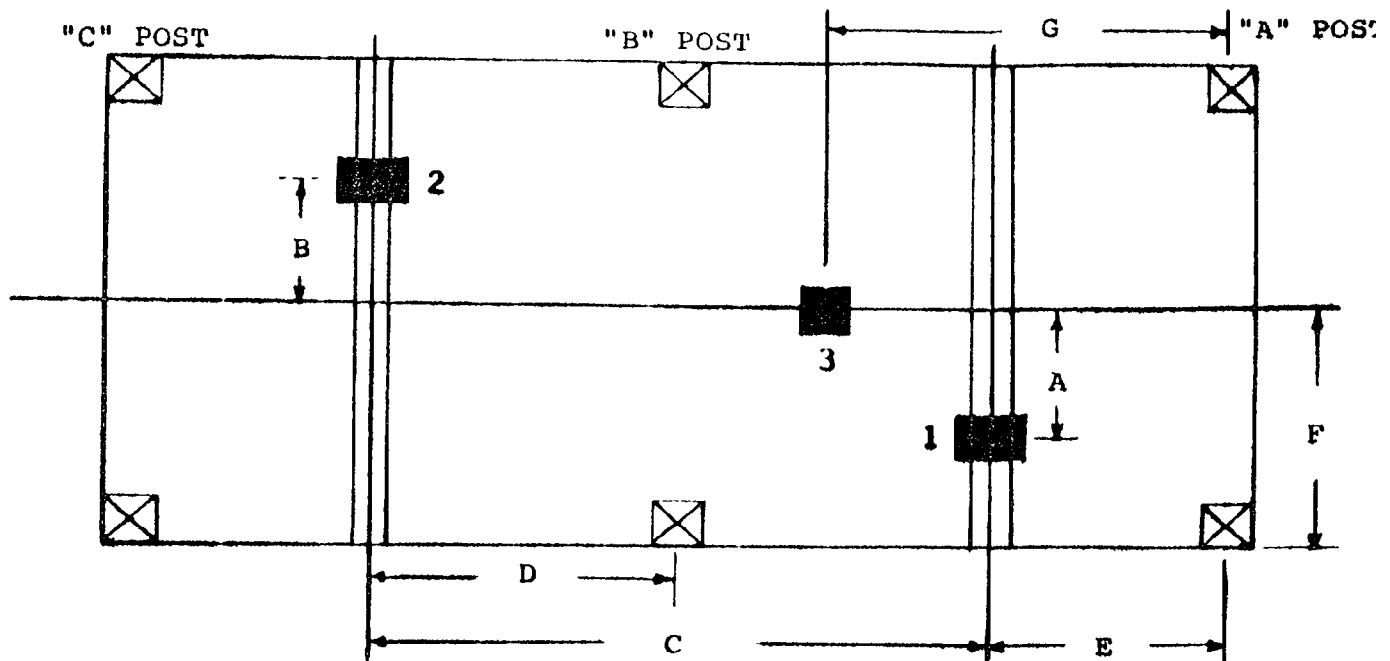


TABLE 4-3

VEHICLE STRUCTURAL DATA

VEHICLE 1980 Mazda 626

NHTSA NO. 800561



DIMENSIONS			
LOCATION	MEASUREMENT (IN.)	LOCATION	MEASUREMENT (IN.)
A	18.5	E	11.3
B	17.8	F	32.7
C	30.5	G	23.5
D	3.0		

ACCELERATION PEAKS				
ACCELEROMETER LOCATION	POSITIVE* DIRECTION		NEGATIVE* DIRECTION	
	PEAK "G"	TIME (MSEC)	PEAK "G"	TIME (MSEC)
NO. 1 LONGITUDINAL	44.2	13.0	5.3	80.0
NO. 2 LONGITUDINAL	50.1	13.0	5.0	28.0
NO. 3 LONGITUDINAL	36.0	13.0	15.4	15.0
*POSITIVE - LONGITUDINAL: FORWARD DIRECTION *NEGATIVE - LONGITUDINAL: REARWARD DIRECTION				

TABLE 4-4

PRE-TEST

VEHICLE MEASUREMENT DATA

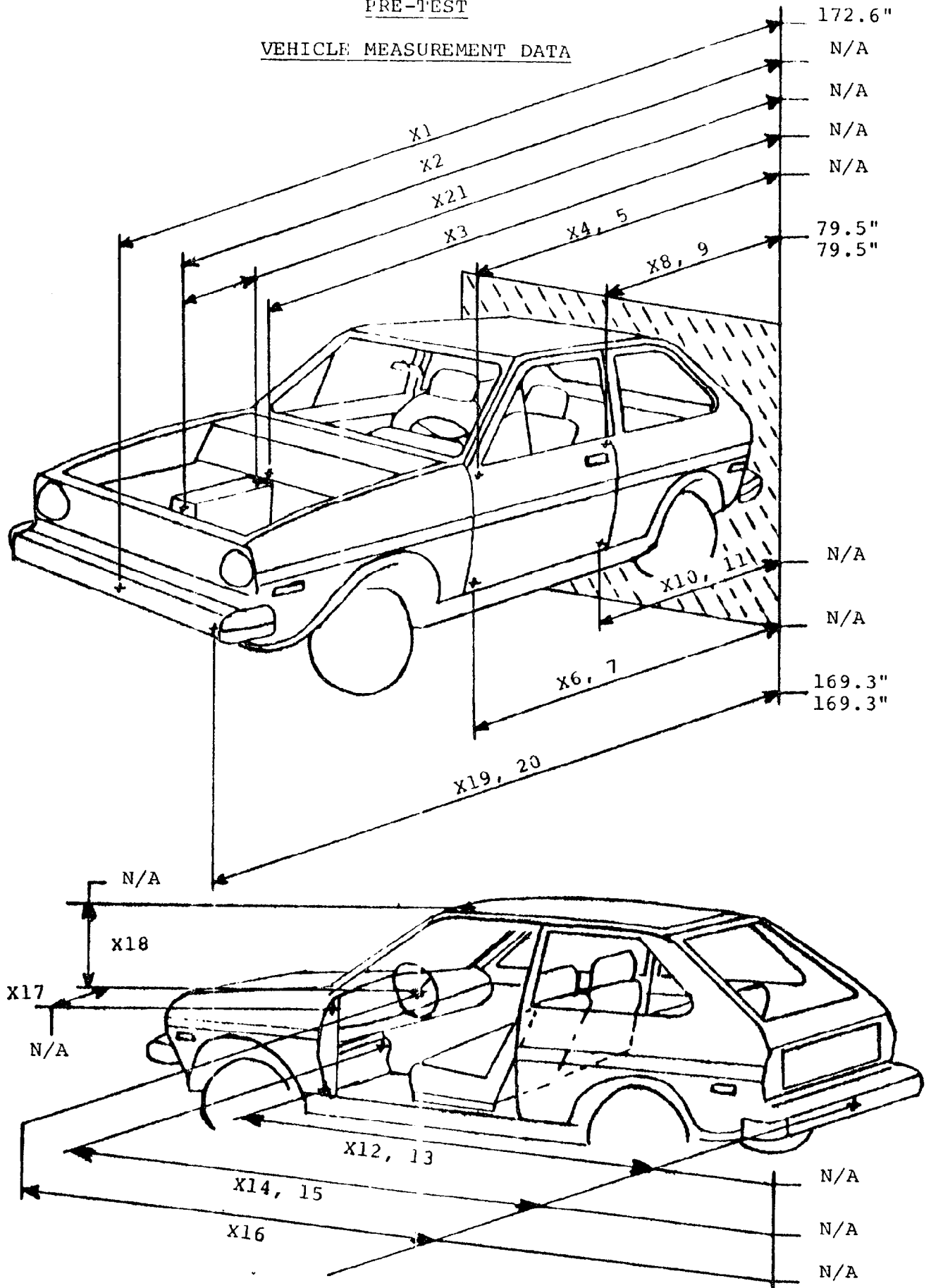
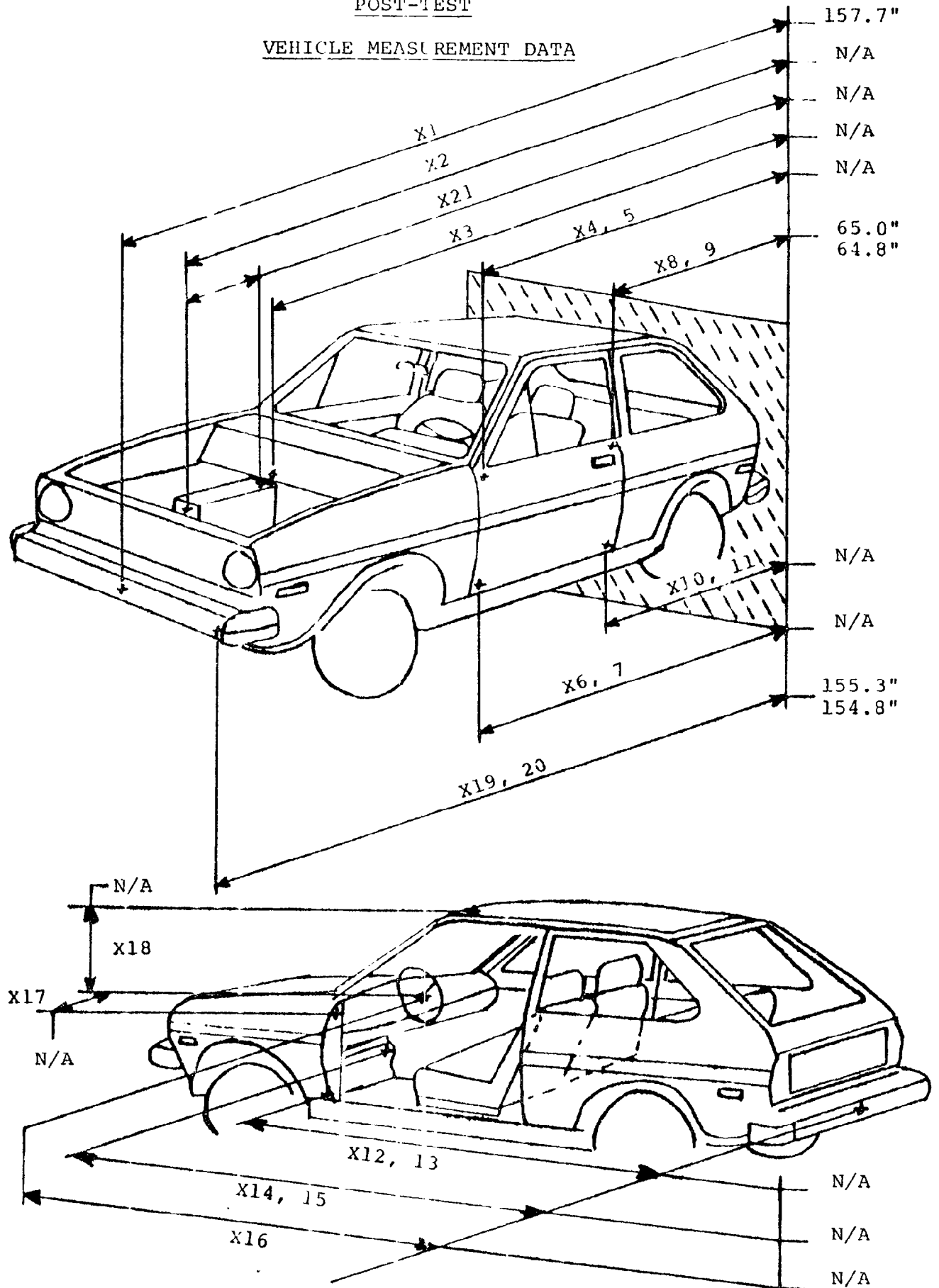


TABLE 4-5

POST-TEST

VEHICLE MEASUREMENT DATA





APPROVED ENGINEERING TEST LABORATORIES

TABLE 4-6

SUMMARY

PRE-TEST AND POST-TEST VEHICLE DIMENSIONS

<u>Measurement Point</u>	<u>Pre-Test</u>	<u>Post-Test</u>	<u>Difference</u>
X1	172.5"	157.7"	14.9"
X8	79.5"	65.0"	14.5"
X9	79.5"	64.8"	14.7"
X19	169.3"	155.3"	14.0"
X20	169.3"	154.8"	14.5"

TABLE 4-7
FMVSS 301-75
CAMERA POSITIONS

VEHICLE 1980 Mazda 626

NHTSA NO. 800561

TEST DATE July 24, 1980

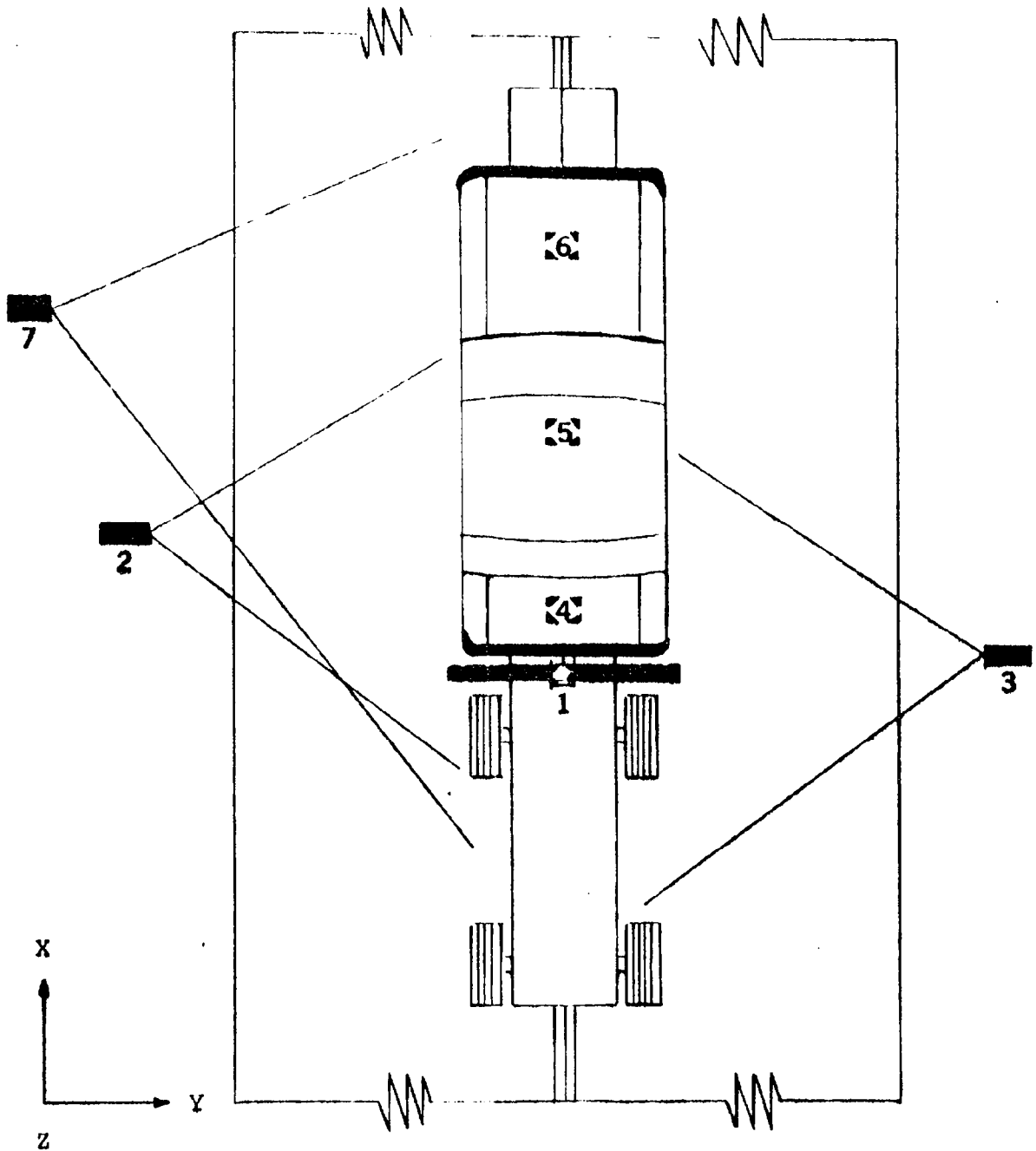


TABLE 4-8

FMVSS 301-75

CAMERA POSITIONS

VEHICLE 1980 Mazda 626

NHTSA NO. 800561 TEST DATE July 24, 1980

1. Photo-Sonics X 7.5"
13mm 500FPS Y - 0 -
Z 99.0"

2. Photo-Sonics X 68.0"
13mm 500FPS Y 216.5"
Z 42.0"

3. Photo-Sonics X 57.0"
13mm 500FPS Y 145.0"
Z 36.0"

4. Photo-Sonics X 2.0"
13mm 500FPS Y 5.0"
Z -47.0"

5. Photo-Sonics X 110.0"
13mm 500 FPS Y 3.0"
Z -40.0"

6. Photo-Sonics X 186.0"
13mm 500FPS Y 2.0"
Z -43.0"

7. Canon Scoopic
12.5 - 75mm 24FPS
- Documentary -



APPROVED ENGINEERING TEST LABORATORIES

SECTION 5



SECTION 5

5.0 TEST FACILITIES AND EQUIPMENT

Approved Engineering Test Laboratories (AETL) collision barriers, vehicle static rollover machine, and data processing/computer analysis test facilities are located at the Fullerton, California Division.

This section discusses these specialized facilities, along with associated equipment and instrumentation required for the performance of this test.

5.1 FRONTAL COLLISION BARRIER FACILITY

5.1.1 The frontal (fixed) collision barrier conforms to the requirements as set by the NHTSA Office of Vehicle Safety Compliance (OVSC) and as defined in the Laboratory Procedures for FMVSS 212/219/301-75, TP219-02, dated January 9, 1979, with the following special characteristics.

5.1.2 The fixed collision barrier is a steel clad, steel reinforced concrete block with a 6'4" X 12' face. The face is 1" steel plate faced with 3/4 inch plywood. The total mass of the structure is approximately 200,000 pounds, with a substantial portion below ground to provide resistance against sliding or tipping of the barrier during impact.



SECTION 5

5.1.3 The facility consists of a 500 foot concrete paved runway, with a steel monorail embedded in the approach surface. Two camera pits are provided to allow photographing the test vehicle at impact. One pit is located immediately in front of the fixed collision barrier and is 36 inches wide (expandable to 48 inches), 7 feet deep, and 23 feet long (3 feet of the pit length extends under the barrier face). The second (mid) pit with removable monorail section is located approximately 160 feet from the fixed collision barrier and is 43 inches wide, 7 feet deep, and 23 feet long.

5.1.4 Tow propulsion is provided by a fixed prime mover and continuous cable drive system located near the mid camera pit position. The power plant for the tow cable system is a 200 h.p. synchronous electric motor, coupled to an electronically controlled Eddy Current Clutch and a 4:1 gear reduction transfer assembly.

The endless 1/2 inch diameter steel tow cable is wrapped around the drive pulley and is tensioned by a pneumatic loaded idler wheel. The tow cable passes through the fixed collision barrier and around fixed idler pulleys to complete the loop. The test vehicle or moving collision barrier is towed by a dolly assembly attached to the vehicle

SECTION 5

or moving collision barrier by a shear pin release mechanism. For a fixed collision barrier test, the test vehicle is towed within 20 feet of the fixed barrier, at which point the towing dolly assembly is disconnected from the test vehicle and the test vehicle proceeds under its own momentum for the final 20 feet to impact. For a moving collision barrier test, the moving collision barrier is towed within 5 feet of the test vehicle, at which point the towing dolly is disconnected from the moving collision barrier and the moving collision barrier proceeds under its own momentum for the final 5 feet to impact. Heavy steel stops actuate the tow cable release mechanism and prevent the towing dolly from continuing past the point of impact. The towing dolly is designed to fit inside the monorail such that it is constrained in the vertical and lateral directions, and capable of sliding freely along the monorail.

5.2 OBLIQUE ANGLE COLLISION BARRIER

- 5.2.1 The oblique angle collision barrier conforms to the requirements as set by NHTSA Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures TP219-02, with the following special characteristics.



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5.2.2 The oblique angle collision barrier is constructed of a flat 1 1/2 inch steel plate faced with 3/4 inch plywood. The barrier face is 6' X 12' and is adjustable for left or right angle impacts by means of seven tubular gussets that attach to the standard fixed frontal collision barrier to form a rigid buttress structure.

5.3 MOVING COLLISION BARRIER

5.3.1 The moving collision barrier conforms to the requirements as set by Federal Motor Vehicle Safety Standard No. 208, Paragraph 58.2 with the following special characteristics.

5.3.2 The chassis is constructed of 12 inch steel channel with tubular frame gussets. The flat impacting face plate is 1/2 inch steel plate faced with 3/4 inch plywood. The face plate is reinforced with 6 inch steel channel horizontally welded to the chassis to form a rigid symmetrical structure. A camera boom extends above the barrier face plane to provide a view of barrier to vehicle impact. The barrier assembly weighs 3,977 pounds and has a four wheel electric brake system.



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5.4 VEHICLE STATIC ROLLOVER MACHINE

5.4.1 The vehicle static rollover machine conforms to the requirements as set by the NHTSA Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures TP219-02 with the following special characteristics.

5.4.2 The vehicle static rollover machine is constructed of 10 inch square tube with adjustable wheelbase and tread width platforms to accommodate the various test vehicles. The total usable platform area is 8 feet wide and 25 feet long with special design feature to accommodate vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less with various body configuration heights to 12 feet. The test vehicle can be rotated left or right and can turn each 90° rotational increment in approximately two (2) minutes.

5.5 IMPACT VELOCITY MEASUREMENT

The test vehicle impact velocity is measured by two (2) separate certification timing trap systems located within five (5) feet of the vehicle to fixed collision barrier face and to one side on the approach apron. Each timing



SECTION 5

trap system contains two (2) optical beams, mounted twenty four (24) inches apart, in a mechanical housing assembly providing a start-stop signal to a digital display counter. As the test vehicle traverses the impact apron, a blade attached to the test vehicle rear fender interrupts each optical beam providing the precise measurement of time interval for the test vehicle to advance the known distance between the optical beams. Each interval of time measurement is stored in the digital display counter and photographically recorded.

The moving collision barrier impact velocity is measured by two (2) separate certification timing trap systems located within five (5) feet of the moving collision barrier to vehicle impact location and to one side on the approach apron. Each timing trap system contains two (2) optical beams, mounted twenty-four (24) inches apart, in a mechanical housing assembly providing a start-stop signal to a digital display counter. As the moving barrier traverses the impact apron, a blade attached to the moving barrier side interrupts each optical beam providing the precise measurement of time interval for the moving barrier to advance the known distance between the optical beams. Each interval of time measurement is stored in the digital display counter and photographically recorded.



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5.6 PHOTOGRAPH COVERAGE

5.6.1 Because FMVSS 212/219/301-75 may be a combined test, it is necessary that all photographic coverage of the test vehicle be done at one time with specific photographs to document the areas for Vehicle Safety Compliance consideration; windshield area and the fuel system. Each report will utilize only those photographs pertaining to the Vehicle Safety Compliance Test being reported.

5.6.2 FIXED BARRIER IMPACT TEST

Motion picture coverage of the event employs seven (7) 16mm 1B Photo-Sonics cameras and four (4) 16mm 51 Redlake Locam cameras using color film at 500 frames per second (fps). Also a 16mm Canon Scoopic 24 frames per second (fps) camera with color film is used to record vehicle pre-test condition, vehicle in-run, impact, and post-impact vehicle conditions including the rollover increments for documentary purposes. The eleven (11) high speed cameras are located at stationary positions near the point of impact. One is an overhead camera mounted on a tower above the fixed barrier face on centerline of the test vehicle at impact. Its field of view includes the barrier face and the front of the vehicle to a point about one foot aft of the windshield. A second and third camera are mounted on top of the fixed barrier with



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their field of view concentrating on the windshield area (FMVSS 212/219). The fourth and fifth cameras each have a side view of the test vehicle at impact. The sixth, seventh, eighth, and ninth cameras are located adjacent to the test vehicle front passengers compartment and positioned to photograph motion of each test dummy at impact. The tenth and eleventh cameras are located in the pit and positioned to photograph the underside of the engine compartment and fuel tank area.

5.6.3 MOVING BARRIER IMPACT TEST

Motion picture coverage of the event employs four (4) 16mm 1B Photo Sonics cameras and two (2) 16mm 51 Redlake Locam cameras using color film at 500 frames per second (fps). Also a 16mm Canon Scoopic 24 frames per second (fps) camera with color film is used to record vehicle pre-test condition, barrier in-run, impact, and post-impact vehicle conditions including the rollover increments for documentary purposes. Five (5) of the high speed cameras are located at stationary positions near the point of impact. Three (3) cameras are located in the pit and positioned to photograph the underside of the engine compartment, with overlapping field of views, aft to the fuel tank area. The fourth and fifth cameras each have a side view of the test vehicle at impact.



SECTION 5

The sixth camera is attached to the moving collision barrier to photograph the contact between the barrier and the test vehicle.

5.6.4 TIME PULSE GENERATOR

Time data from two (2) sources are contained in the high speed film coverage. The first is a time reference of 100 pulse per second (pps) light emitting diode event mark along the film edge. This pulse is generated by the time pulse generator and fed to all high speed cameras. Thus, it is possible to relate film data to a real time base. The second time record is an indication of time zero (moment of impact). This is accomplished by a trip switch and event mark system. The trip switch is positioned at the impact point so that it triggers the light emitting diode event mark along the film edge at the moment of bumper-barrier contact. Thus, the particular film frame corresponding to the point of impact is clearly indicated on all the high speed film.



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5.7 DATA ACQUISITION AND REDUCTION

The data acquisition and analysis system used for acquiring occupant response and vehicle acceleration are shown schematically in Figure 5-1. A complete list of instrumentation is provided in Table 5-1. An itemized procedure for acquiring data is provided on Table 5-2.

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 pre-digitizing filter capability of 60 db/octave above 1250 Hz.



SECTION 5

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 eight total sets. Table 5-3 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. (Eight vehicle sets are stored on each magnetic disc. All magnetic discs and FM recorder tapes are retained on file at AETL).

The only modifications to the data at the time of permanent storage is the filtering and digitizing process of the FM tape recorder (2500 Hz) and the DFA (2000 Hz sampling for a 500 ns window). After the data is moved to permanent storage it is recalled by test personnel and plotted with the appro-



SECTION 5

priate labels and vehicle designation. As the data is recalled, the DFA is programmed to automatically apply the appropriate SAE filter where applicable.

A 1250 Hz predigitizing analog filter with a rolloff of 60 db/octave, shown in figure 5-2, was applied to all data. Also shown in figure 5-2 are SAE class 60 and class 180 filters. These filters are in accordance with SAE J211A, Instrumentation for Impact Tests. These SAE recommended filters are quadratic double pole with 65% damping and a 12 db/octave rolloff. They are applied using a fast fourier transform of the data, frequency domain multiplication, and an inverse fast fourier transform of the product. The class 60 filters is applied to vehicle acceleration and belt restraint forces. The class 180 filter is applied to chest acceleration. SAE filters were not applied to head accelerations and femur forces.

5.7.1 IMPACT DATA

All impact data is presented in computer plots of data digitized at 500 microseconds. Special SAE filters are applied to appropriate data sets. Each data plot includes labeling, defining the test vehicle, filter class, and the complete identification of the data plotted.



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5.7.1.2 DUMMY HEAD DATA

The dummy head accelerations are processed 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 iterations 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.

5.7.1.3 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.

5.7.1.4 FEMUR LOAD DATA

The dummy femur loads are processed and presented as computer plots.



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5.7.1.5 RESTRAINT LOAD DATA

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

5.7.1.6 VEHICLE ACCELERATION DATA

The vehicle accelerations are processed as class 60 data, and presented as computer plots.

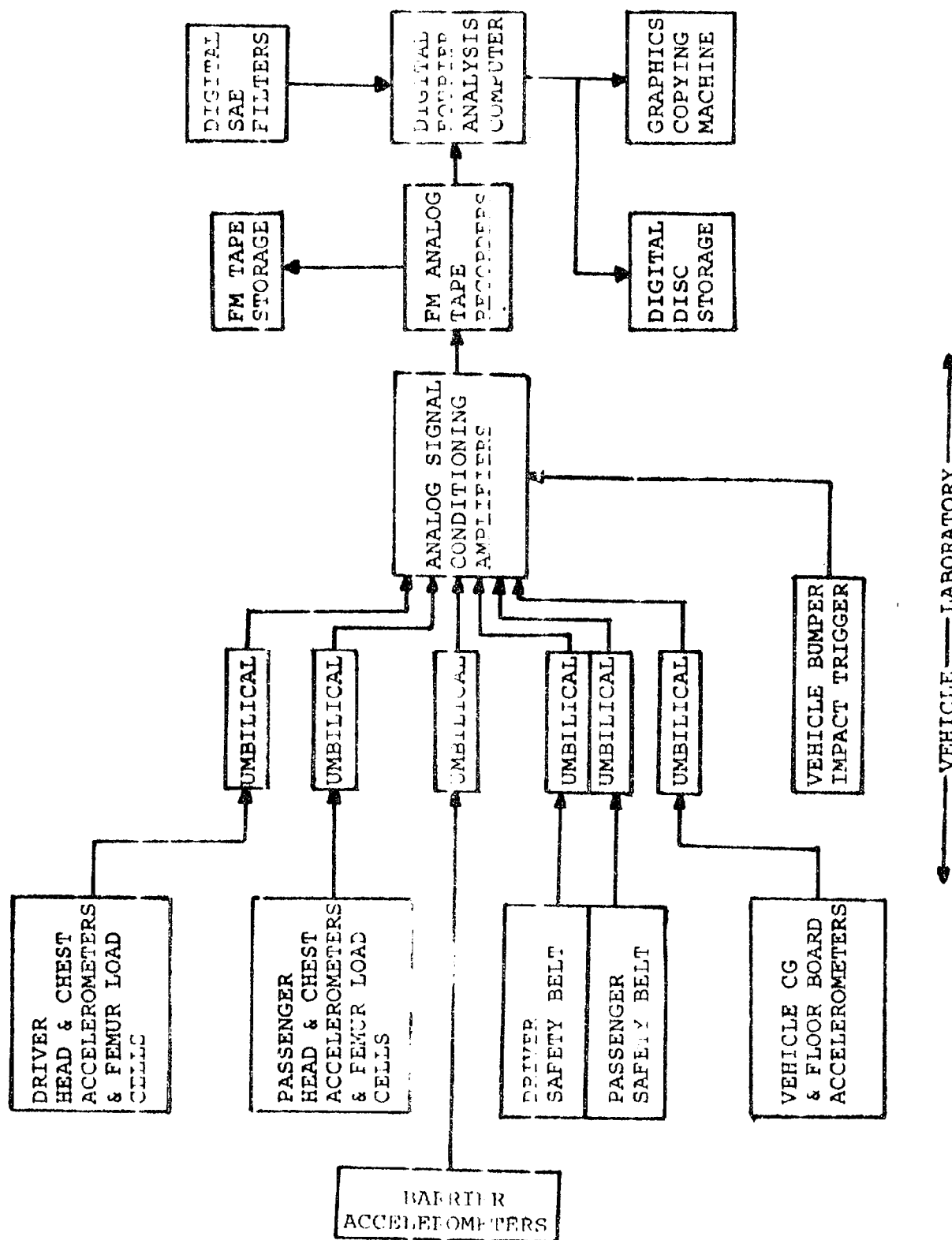


TABLE 5.1 INSTRUMENTATION FOR CRASH TEST

<u>Instrument</u>	<u>Manufacturer</u>	<u>Model No.</u>	<u>Full Scale</u>	<u>Accuracy</u>	<u>Frequency Max.</u>
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 5-2

DATA ACQUISITION AND REDUCTION PROCESS

<u>STEP</u>	<u>DESCRIPTION</u>
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 Transferred Permanent Disc Storage
9	Appropriate SAE Filters Are Applied
10	Each Data Signal Plotted With Lables
11	Chest Severity Index Values Determined
12	Head Injury Criteria Values Determined

TABLE 5-3

DATA DESIGNATIONS FOR VEHICLE CRASH IMPACT DATA ACQUISITION

DATA SET	TAPE NO.	CHANNEL NO.	DESCRIPTION
1	1	1	Driver Longitudinal Head Acceleration Ax
1	1	2	Driver Lateral Head Acceleration Ay
1	1	3	Driver Vertical Head Acceleration Az
1	1	4	Driver Right Femur Force
2	1	5	Driver Longitudinal Chest Acceleration Ax
2	1	6	Driver Lateral Chest Acceleration Ay
2	1	7	Driver Vertical Chest Acceleration Az
2	1	8	Driver Left Femur Force
3	1	9	Driver Restraint Belt Force
3	1	10	Vehicle Vertical CG Acceleration Az
3	1	11	Vehicle Lateral CG Acceleration Ay
3	1	12	Vehicle Longitudinal CG Acceleration Ax
4	1	13	Left Rear Floor Pan Longitudinal Acceleration Ax
4	1	14	Left Rear Floor Pan Vertical Acceleration Az
5	2	1	Passenger Longitudinal Head Acceleration Ax
5	2	2	Passenger Lateral Head Acceleration Ay
5	2	3	Passenger Vertical Head Acceleration Az
5	2	4	Passenger Right Femur Force
6	2	5	Passenger Longitudinal Chest Acceleration Ax
6	2	6	Passenger Lateral Chest Acceleration Ay
6	2	7	Passenger Vertical Chest Acceleration Az
6	2	8	Passenger Femur Force
7	2	9	Passenger Restraint Belt Force
7	2	10	Barrier Lateral Acceleration Ay
7	2	11	Barrier Longitudinal Acceleration Ax
7	2	12	Barrier Vertical Acceleration Az
8	2	13	Right Front Floor Pan Longitudinal Acceleration Ax
9	2	14	Right Front Floor Pan Vertical Acceleration Az

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

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

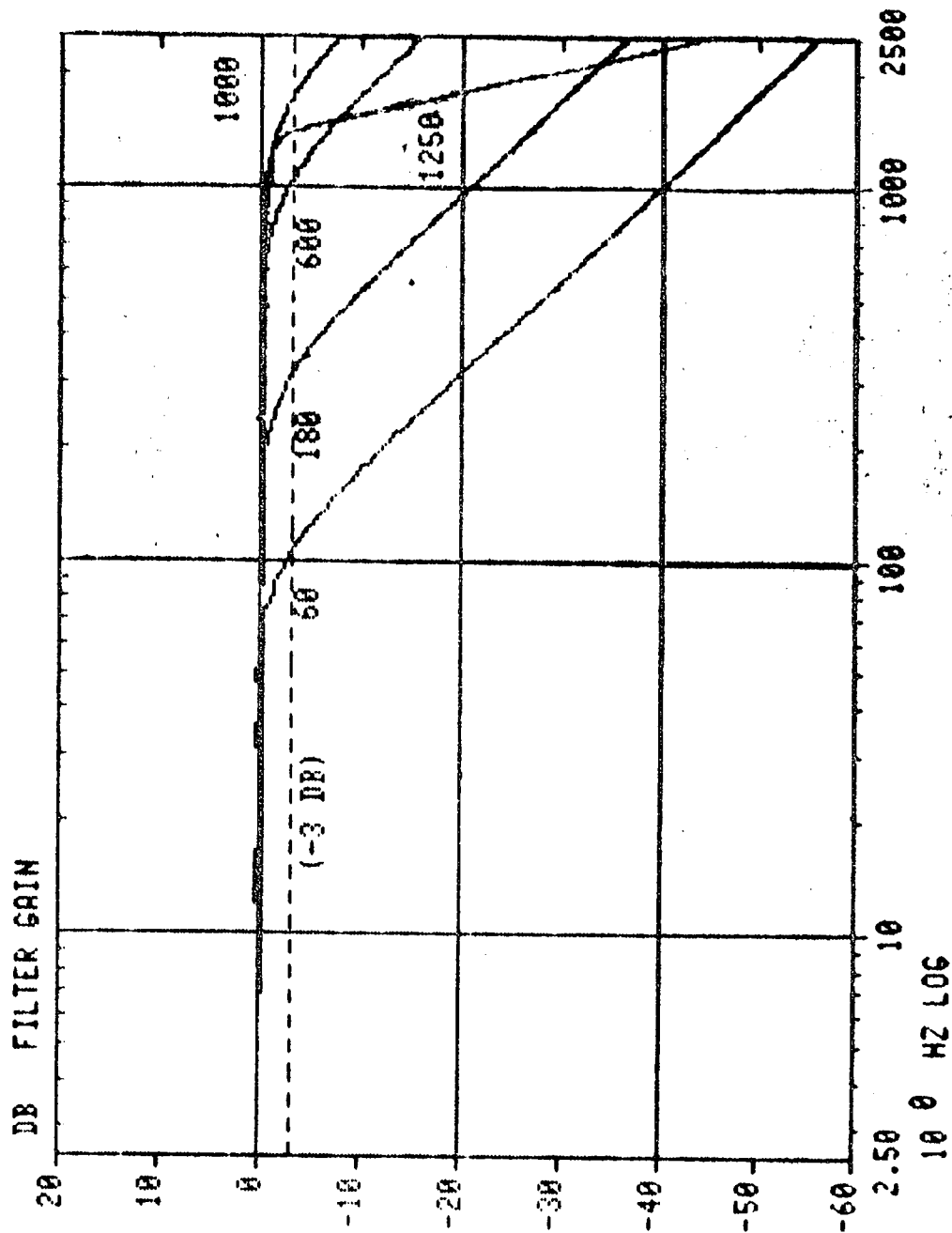


FIGURE 5-2



APPROVED ENGINEERING TEST LABORATORIES

APPENDIX A



APPROVED ENGINEERING TEST LABORATORIES

APPENDIX A

The following photographs are pre and post test dummy positions and interior compartment locations of dummy contact during the impact event.



APPROVED ENGINEERING TEST LABORATORIES

Figure A-1
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Pre-Test, Driver Dummy View





APPROVED ENGINEERING TEST LABORATORIES

Figure A-2

1980 Mazda 626 - 4 Door Sedan

NHTSA 800561

Pre-Test, Passenger Dummy View





APPROVED ENGINEERING TEST LABORATORIES

Figure A-3
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Post-Impact, Driver Dummy View





APPROVED ENGINEERING TEST LABORATORIES

Figure A-4
1980 Mazda 626 - 4 Door Sedan
NHTSA 800561
Post-Impact, Passenger Dummy View





APPENDIX B



APPENDIX B

The following computer plots provide complete and comprehensive vehicle acceleration during the rear moving barrier impact test of a 1980 Mazda 626 - 4 Door Sedan, NHTSA 800561.

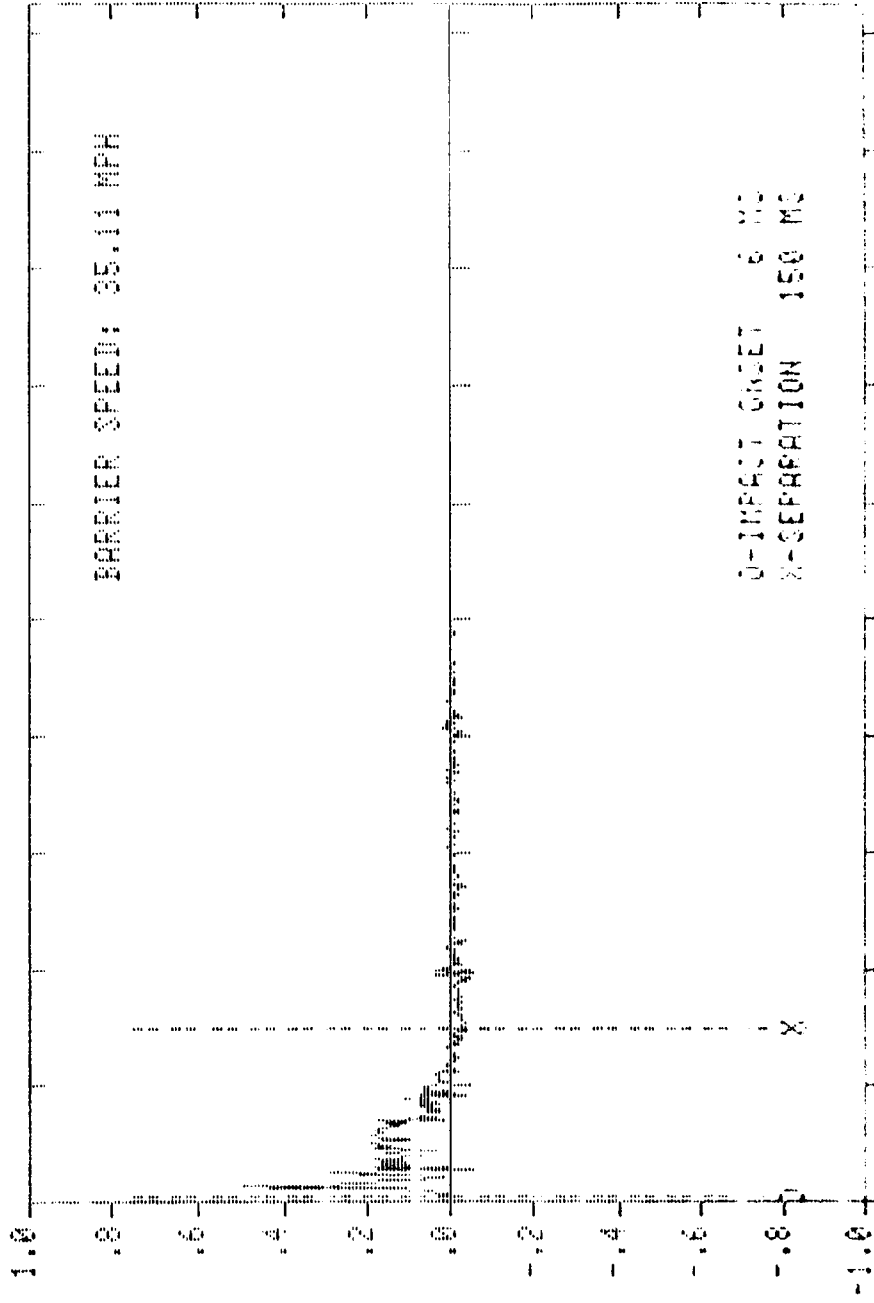
100 REAR FLOORPAN

REAR FLOOR ENGINEERING TEST LAB

VEHICLE: NATCHA 626
 VEHICLE ID: NATCHA 800581
 TEST FILE NO: 41 REAR
 DATE: JULY 24, 1980

WUC NO: 971-2092-006
 FOLDER: CLACC 180

10 2 G AX FWD+



VEHICLE LEFT REAR FLOORPAN LONGITUDINAL ACCELERATION

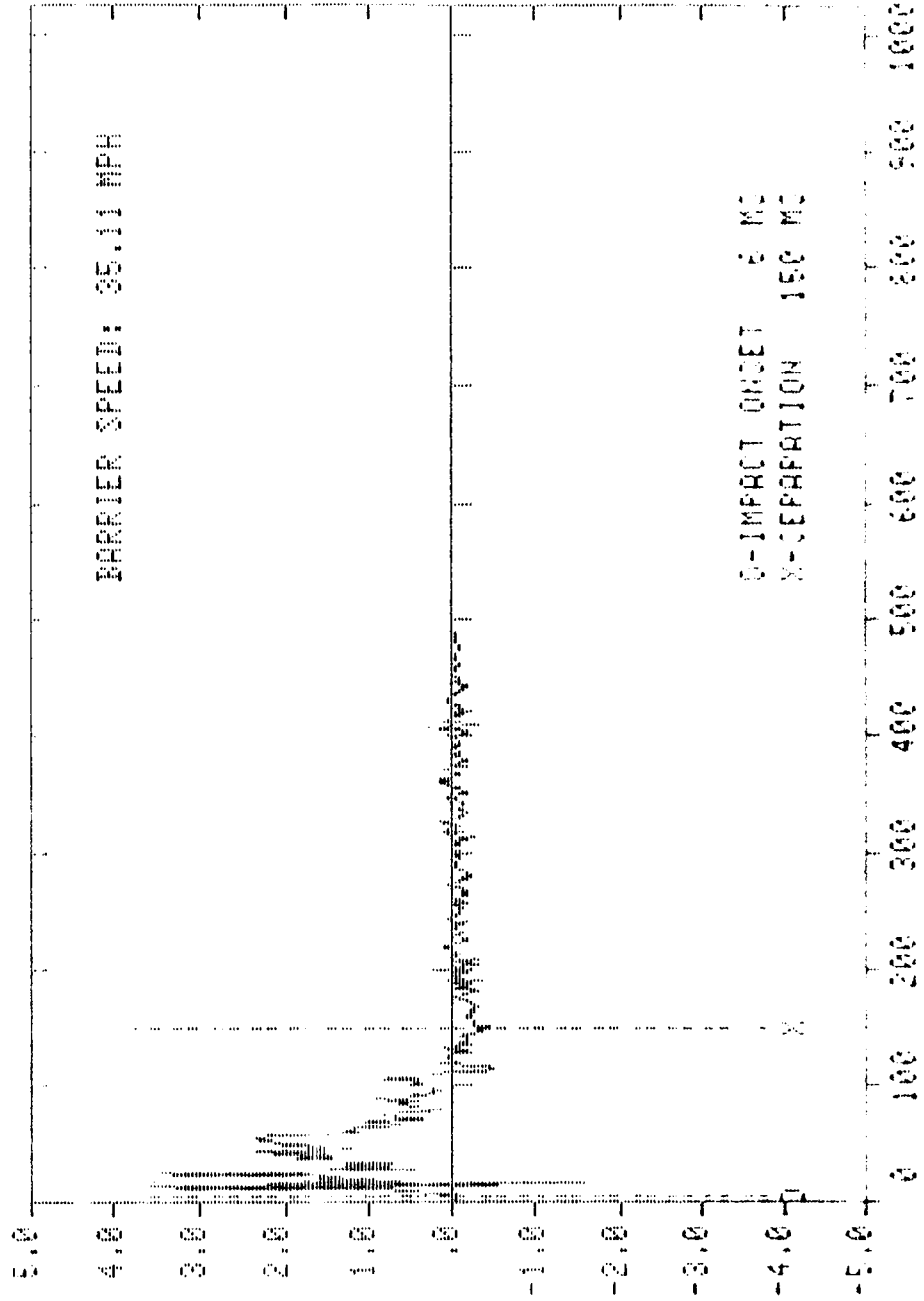
SAFARI ENGINEERING TEST LOG

TEST NO: 971-2892-002
 FILTER: CLACK 180

SAFARI ENGINEERING TEST LOG

VEHICLE: MAZDA RX7
 VEHICLE ID: NHTSA 800961
 TEST FILE NO: 41 RECS
 DATE: JULY 24, 1990

10 1 6 AX FWD+



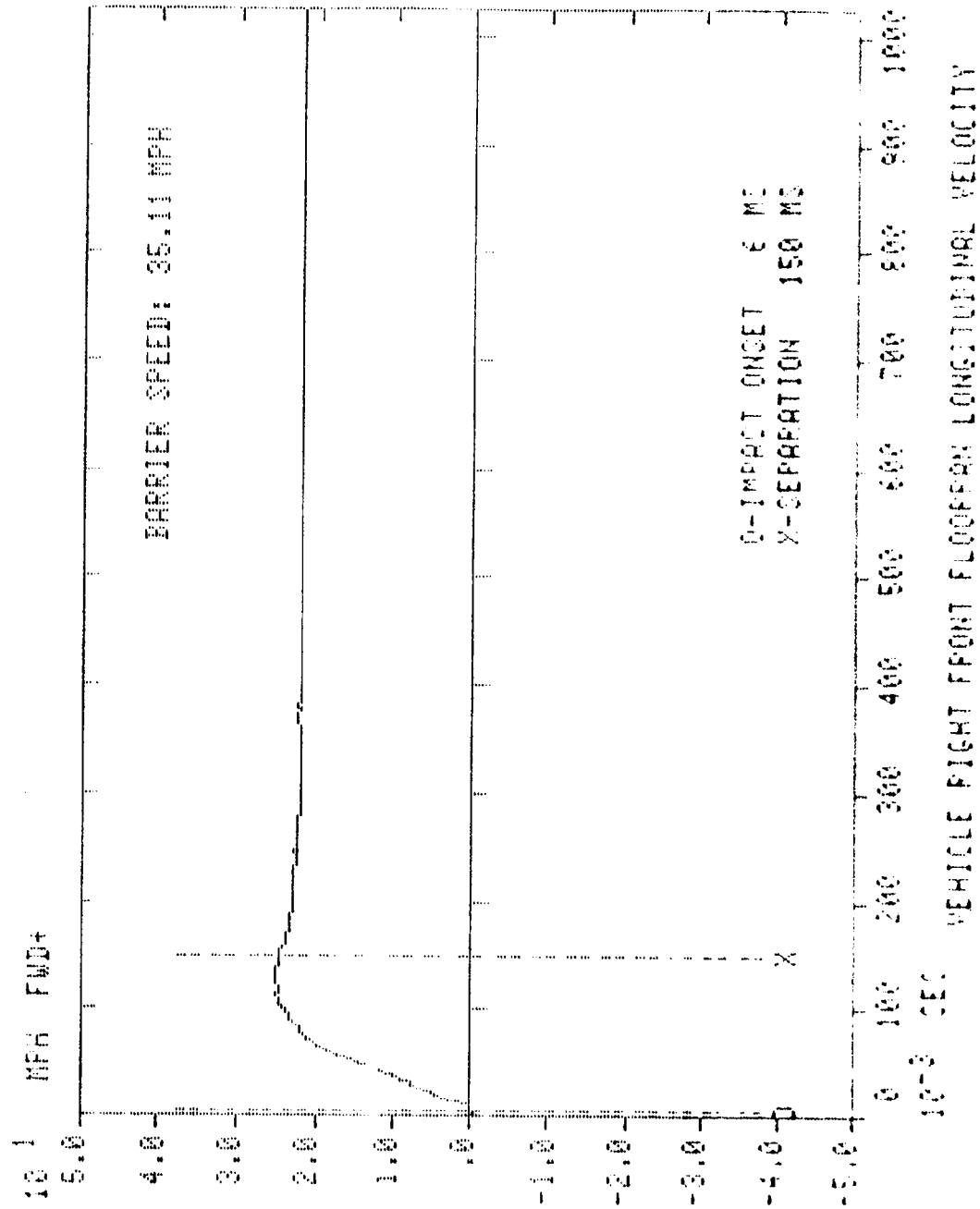
VEHICLE CG LONGITUDINAL ACCELERATION

111 CRASH PROGRAM

APPROVED ENGINEERING TEST LOGIC

VEHICLE: MDCR 128
 TRUCK ID: MDCR 800861
 TEST FILE NO: 41 REAR
 DATE: JULY 24, 1980

MIC NO: 871-2882-008
 FILTER: CLACC 180

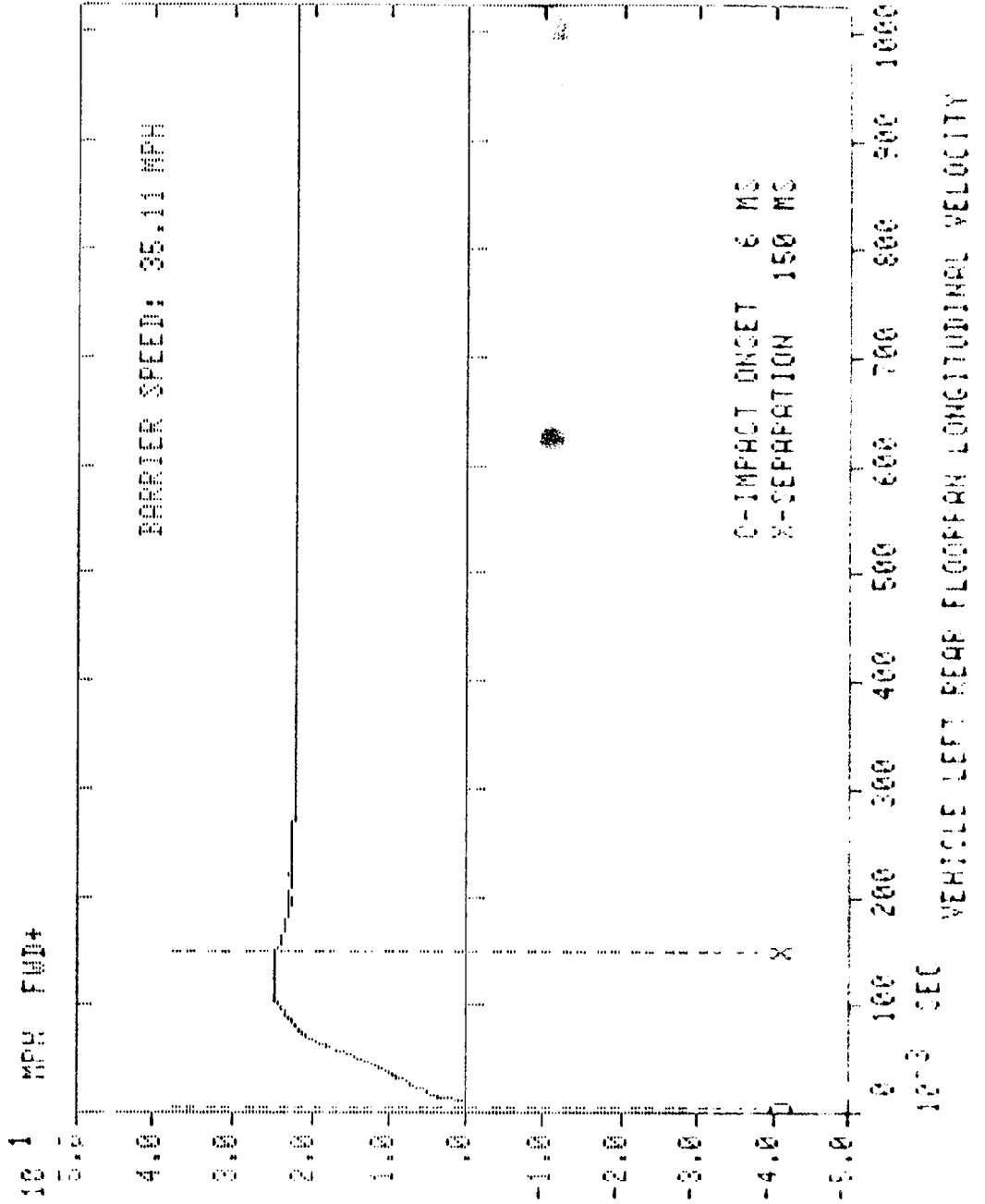


117 CRASH PROGRAM

APPROVED ENGINEERING TEST LAB

VEHICLE: MAZDA 626
 VEHICLE ID: NHTSA 800561
 TEST FILE NO: 41 REAR
 DATE: JULY 24, 1980

WJO NO: 971-3882-003
 FILTER: CLACC 180

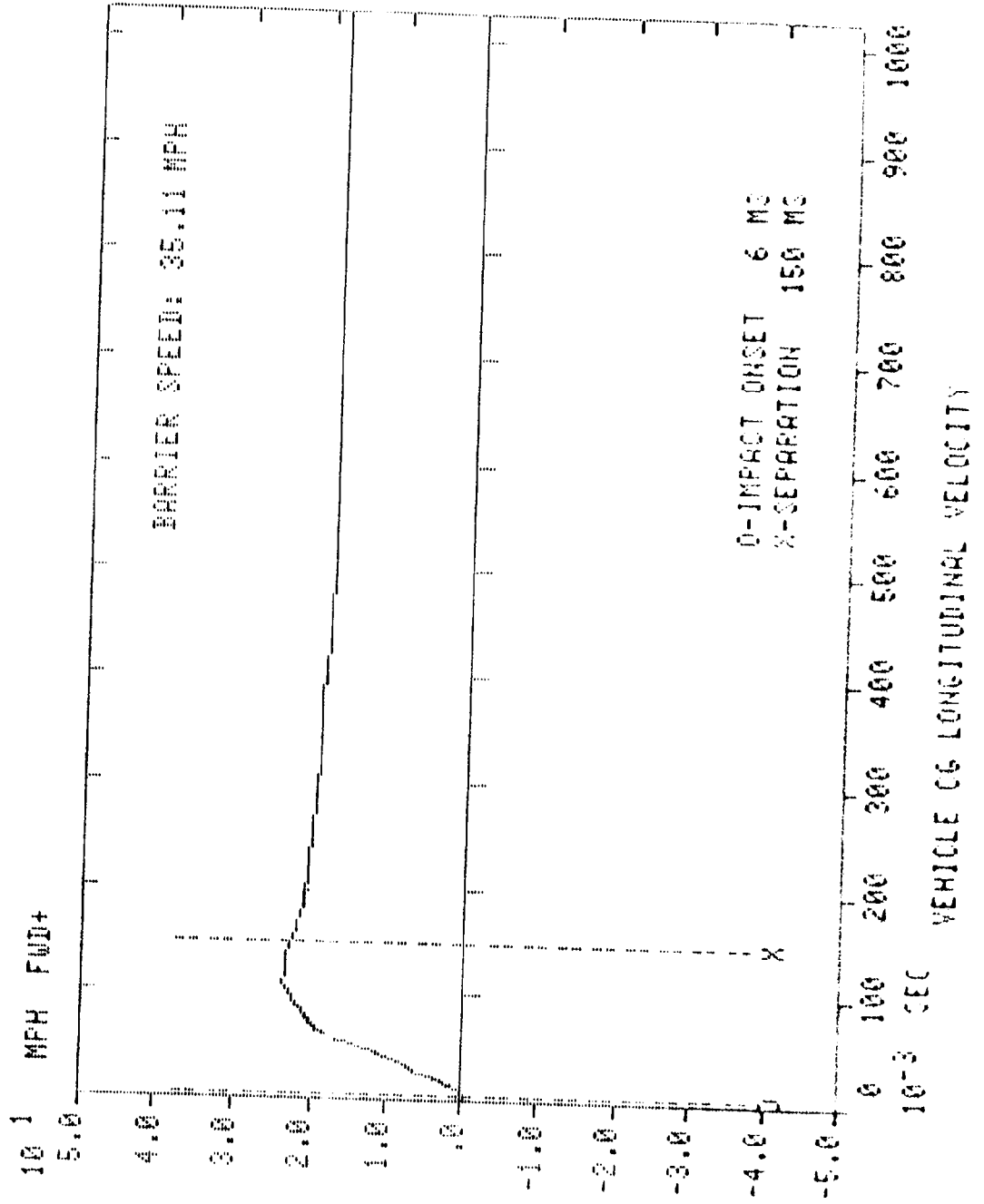


100 CRASH PROGRAM

VEHICLE: RADNR 626
 VEHICLE ID: NUTCA 800561
 TEST FILE NO: 41 REAR
 DATE: JULY 24, 1980

APPROVED ENGINEERING TEST LOGIC

MOD NO: 97-3882-000
 FILTER: CLACC 199

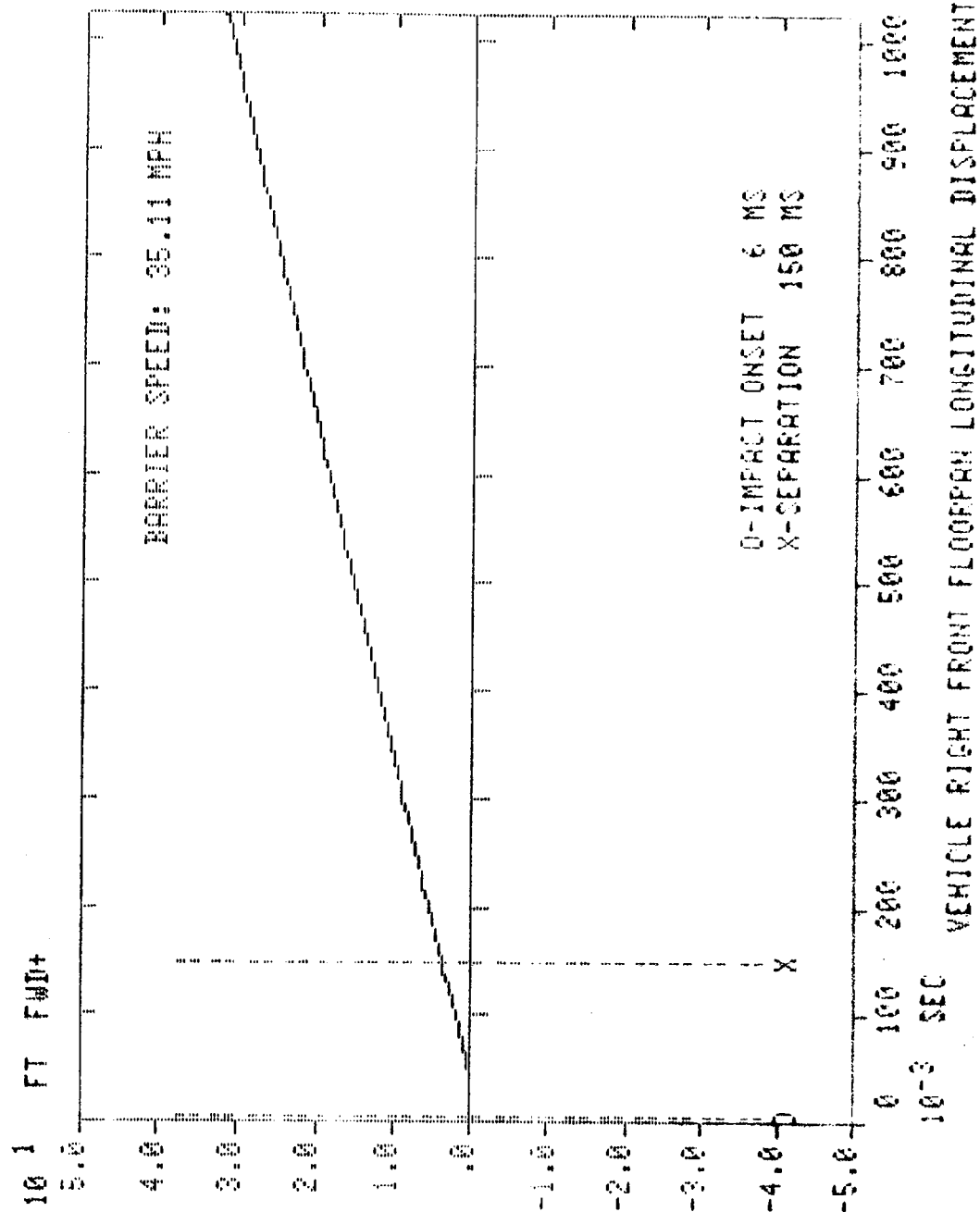


DOT CRASH PROGRAM

APPROVED ENGINEERING TEST LAB

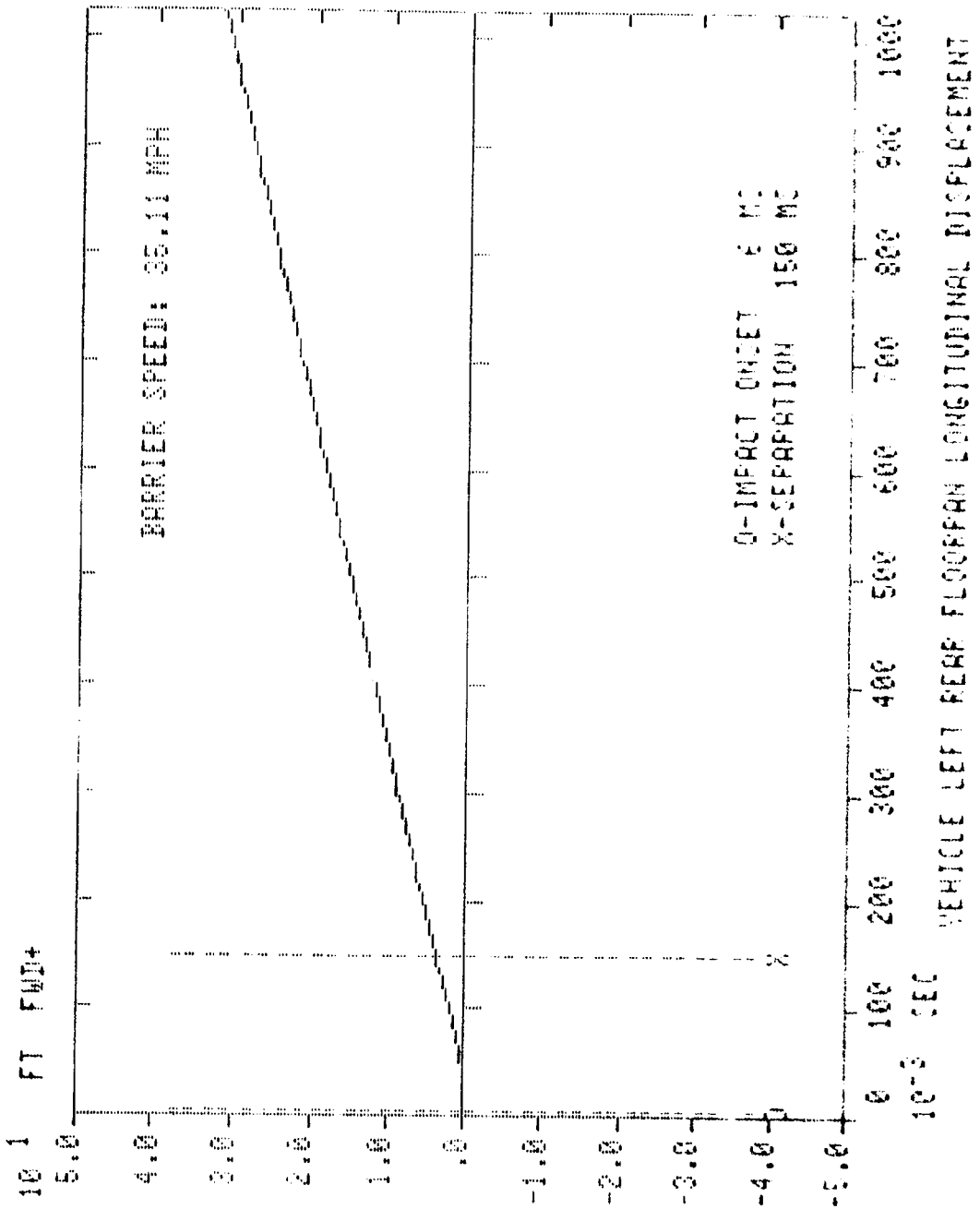
VEHICLE: RAMBA 626
 VEHICLE ID: NHTSA 808561
 TEST FILE NO: 41 REAR
 DATE: JULY 24, 1980

MIO NO: 971-3882-008
 FILTER: CLACC 180



VEHICLE ENGINEERING TEST CELL

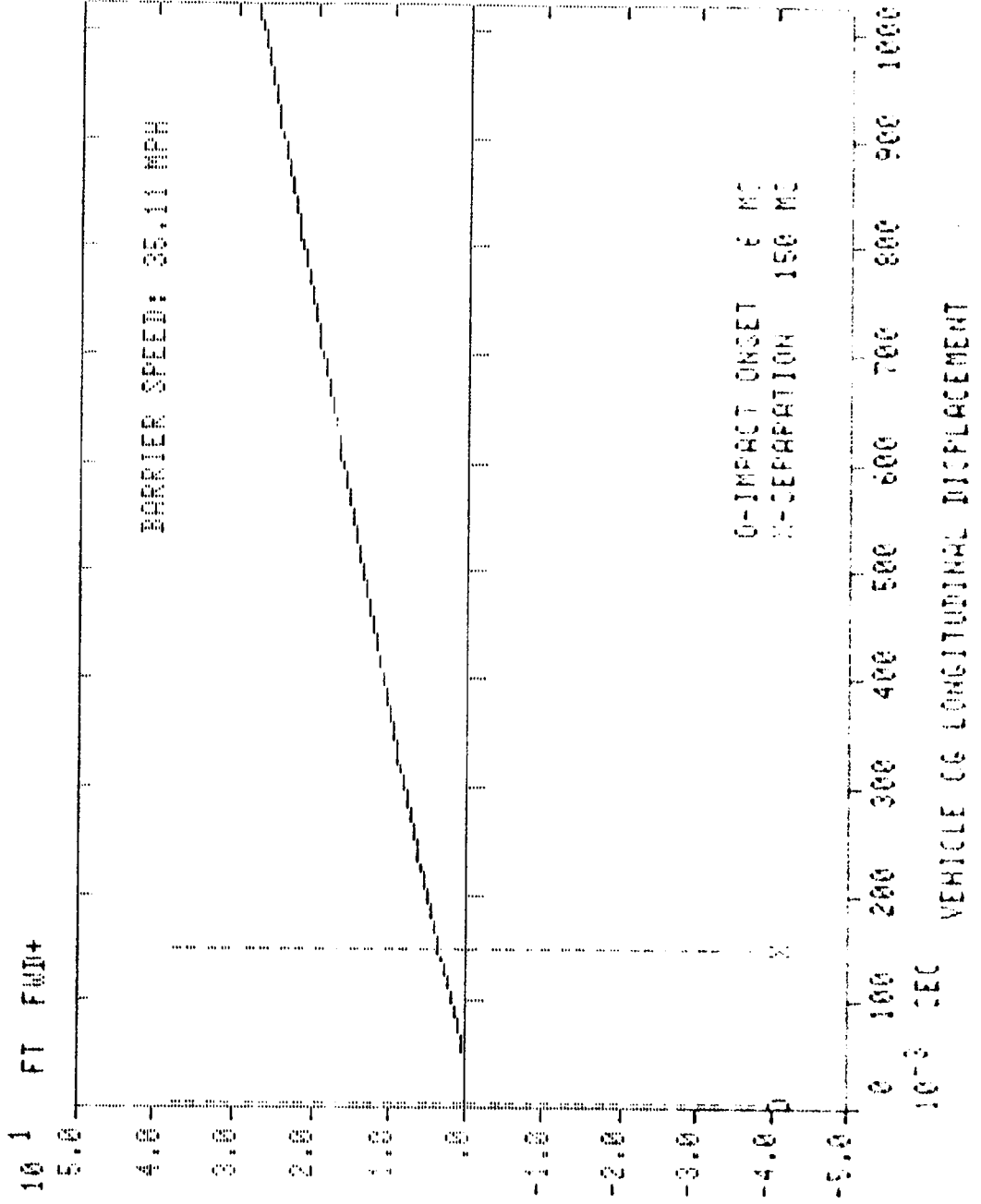
VEHICLE: MCDDA 628
 VEHICLE ID: NHICA 800561
 TEST FILE NO: 41 REAF
 DATE: JULY 24, 1988



1000 10 ENGINEERING TEST 1000

VEHICLE: M2010 624
VEHICLE ID: M2010 800581
TEST FILE NO: 41 PEAR

DATE: JULY 24, 1988





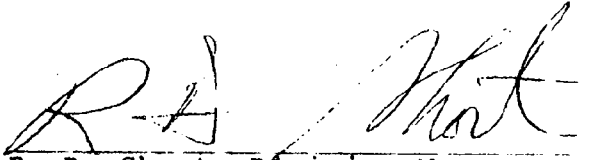
APPROVED ENGINEERING TEST LABORATORIES

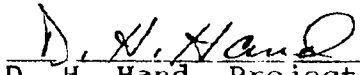
SERVICE FOR: U. S. Department of Transportation
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
400 Seventh Street S. W.
Washington, D. C. 20590

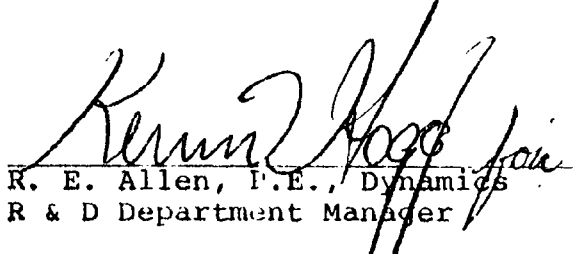
CONTRACT NUMBER: DOT-HS-9-02273

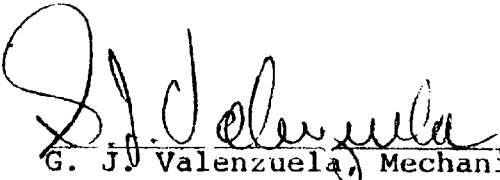
I hereby certify that the preceding report is true and correct to the best of my knowledge.

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 Supervisor


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

VIS3

DATE: 6-AUG-93

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
CRASH AUTOMOBILE RESEARCH SYSTEM
DYNAMIC CRASH FILE CATALOG

PAGE: 1

SELECTION CRITERION
VEND

VERSION 1 DATA

TABLE OF CONTENTS

HARD COPY REFERENCE NUMBER	CONTRACT NUMBER	TEST PERFORMER	TEST TITLE
153	DOT-HS-9-02273	NTC	FMVSS301-75 REAR IMPACT

DATE: 6-AUG-93

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
CRASH AUTOMOBILE RESEARCH SYSTEM
DYNAMIC CRASH FILE CATALOG

PAGE: 2

SELECTION CRITERION
VEHDB

VERSION 1 DATA

TEST INFORMATION
FOR TEST 153

Test Title: FWSS301-75 REAR IMPACT

Test Date: 24-JUL-80

Entry Date: 25-SEP-80

Hard Copy Reference Number: 153

Contract Number: DOT-HS-9-02273

Test Performer: NTS - CALIFORNIA

Test Reference Number: 3882-008

Test Configuration: IMPACTOR INTO VEHICLE

Test Type: NEW CAR ASSESSMENT TEST

Test Objectives: NEW VEHICLE ASSESSMENT AND STANDARDS ENFORCEMENT INDICANT TESTING

Closing Speed: 56.49 KPH

Impact Angle: 180

Test Track Surface: CONCRETE

Test Track Conditions: DRY

Impact Point: 0.0000 mm

Offset Distance: 0.0000 mm

Recorder Type: FM TAPE RECORDER

Data Link To Recorder: UMBILICAL CABLE

System Of Measurement: ENGLISH

Ambient Temperature: 28.9 C

Description Of Other Anomalies:

Total Curves: 4

DATE: 6-AUG-93

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
CRASH AUTOMOBILE RESEARCH SYSTEM
DYNAMIC CRASH FILE CATALOG

PAGE: 3

SELECTION CRITERION
VEH08

VERSION 1 DATA

VEHICLE INFORMATION
FOR TEST 153

Vehicle Identification Number: 1

Make: NHTSA Model: FLAT IMPACTOR Year: 99 Test Weight: 1803.9 KG

Engine Type: NOT APPLICABLE Engine Displacement: 999999999999

Transmission Type: NOT APPLICABLE Body Type: NOT APPLICABLE

Vehicle Length: 3657.5099 mm Vehicle Width: 1524.0000 mm Wheelbase: 3048.0000 mm

Vehicle C.G. Distance Behind Front Axle: 999.9000 mm

Steering Column Collapse Mechanism: NOT APPLICABLE

Steering Column Attachment To Dash: NOT APPLICABLE

Vehicle Modification Indicator: RESEARCH VEHICLE

General Description Of Vehicle Modifications:

POOF Angle: 999 Travel Angle: 0 Vehicle Speed: 56.49 KPH Vehicle Damage Index: 99999999

Bumper Engagement: NOT APPLICABLE

Still Engagement: NOT APPLICABLE

A-Pillar Engagement: NOT APPLICABLE

Length Of Direct Contact Damage: 9999.9004 mm

Maximum Crush Distance: 999.9000 mm

Distance Between Center Of Damage Area And C.G. Axis: 999.9000 mm

Point Number 1: 999.9000 mm Point Number 2: 999.9000 mm Point Number 3: 999.9000 mm

Point Number 4: 999.9000 mm Point Number 5: 999.9000 mm Point Number 6: 999.9000 mm

Angle Of Moving Test Cart: 0

Vehicle Orientation On Moving Cart: 0

DATE: 6-AUG-93

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
CRASH AUTOMOBILE RESEARCH SYSTEM
DYNAMIC CRASH FILE CATALOG

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SELECTION CRITERION
VEHDB

VERSION 1 DATA

VEHICLE INFORMATION
FOR TEST 153

Vehicle Identification Number: 2

Make: MAZDA Model: 626 Year: 80 Test Weight: 1320.4 KG

Engine Type: 4 CYLINDER INLINE FRONT Engine Displacement: 120.2 CU.IN.

Transmission Type: MANUAL - REAR WHEEL DRIVE Body Type: FOUR DOOR SEDAN

Vehicle Length: 4414.5205 mm Vehicle Width: 1661.1600 mm Wheelbase: 2514.6001 mm

Vehicle C.G. Distance Behind Front Axle: 1168.4000 mm

Steering Column Collapse Mechanism: OTHER Steering Column Attachment To Dash: UNKNOWN

Vehicle Modification Indicator: PRODUCTION VEHICLE

General Description Of Vehicle Modifications: 301-P 15.1=MAX.INT.COMP.INTRUSION

PDOF Angle: 180 Travel Angle: 0 Vehicle Speed: 0.00 KPH Vehicle Damage Index: 068DEW3

Bumper Engagement: NOT APPLICABLE

Sill Engagement: NOT APPLICABLE

A-Pillar Engagement: NOT APPLICABLE

Length Of Direct Contact Damage: 1549.4000 mm Maximum Crush Distance: 383.5400 mm

Distance Between Center Of Damage Area And C.G. Axis: 0.0000 mm

Point Number 1: 368.3000 mm Point Number 2: 368.3000 mm Point Number 3: 383.5400 mm

Point Number 4: 378.4600 mm Point Number 5: 365.7600 mm Point Number 6: 355.6000 mm

Angle Of Moving Test Cart: 0

Vehicle Orientation On Moving Cart: 0

DATE: 6-AUG-93

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
CRASH AUTOMOBILE RESEARCH SYSTEM
DYNAMIC CRASH FILE CATALOG

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SELECTION CRITERION
VEND8

VERSION 1 DATA

OCCUPANT INFORMATION
FOR TEST 153

Vehicle Containing Occupant: 2

Seating Position: LEFT FRONT SEAT

Seat Position: REARWARD OF CENTER POSITION

Occupant Type: PART 572 DUMMY

Dummy Size Percentile: OTHER

Age: 0

Height: 999.000 mm

Weight: 0.0 KG

Sex: MALE

Manufacturer Of Dummy And Serial Number:

HUMANOID SYSTEMS SW-0353

Clearance Distances:

Head To Windshield Header: 446.5000 mm
Head To Side Header: 116.3000 mm
Chest To Dash: 558.8000 mm
Arm To Door: 63.5000 mm
Knees To Dash: 119.3000 mm

Head To Windshield: 571.5000 mm
Head To Side Window: 170.1800 mm
Chest To Steering Wheel: 355.6000 mm
Hip To Door: 167.3200 mm

Primary Restraint: 3 POINT BELT

Air Bag/Belt Deployment: NOT APPLICABLE

Secondary Restraint: DASH/PANEL

Head Contact Region: SEAT BACK

Chest Or Abdomen Contact Region: UNKNOWN

Leg Contact Region: UNKNOWN

Head Injury: 0.000

Upper Boundary: 0.000

Low Boundary: 0.000

DATE: 6-AUG-93

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
CRASH AUTOMOBILE RESEARCH SYSTEM
DYNAMIC CRASH FILE CATALOG

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SELECTION CRITERION
VEHDB

VERSION 1 DATA

OCCUPANT INFORMATION
FOR TEST 153

Vehicle Containing Occupant: 2

Seating Position: RIGHT FRONT SEAT

Seat Position: REARWARD OF CENTER POSITION

Occupant Type: PART 572 DUMMY

Dummy Size Percentile: 50 PERCENTILE

Age: 0

Height: 999.000 mm

Weight: 0.0 KG

Sex: MALE

Manufacturer Of Dummy And Serial Number:

HUMANOID SYSTEMS SN-0354

Clearance Distances:

Head To Windshield Header: 419.1000 mm
Head To Side Header: 160.0200 mm
Chest To Dash: 558.8000 mm
Arm To Door: 76.2000 mm
Knees To Dash: 109.2200 mm

Head To Windshield: 546.1000 mm
Head To Side Window: 226.0600 mm
Chest To Steering Wheel: 999.9000 mm
Hip To Door: 142.2400 mm

Primary Restraint: 3 POINT BELT

Air Bag/Belt Deployment: NOT APPLICABLE

Secondary Restraint: DASHIPANEL

Head Contact Region: SEAT BACK

Chest Or Abdomen Contact Region: UNKNOWN

Leg Contact Region: UNKNOWN

Head Injury: 0.000

Upper Boundary: 0.000

Low Boundary: 0.000

SELECTION CRITERION
VEND8

VERSION 1 DATA

INSTRUMENTATION INFORMATION
FOR TEST 153

Sensor Type	Veh. No	Occupant Attachment	Region Attached	Axis	Crv Mo.	NLP	NLP	DAS	Prel. Freq.	Data Quality
ACCELEROMETER	1	NOT APPLICABLE	OTHER	XG	1	0	999	AM	1250	
ACCELEROMETER	2	NOT APPLICABLE	OTHER	XG	2	0	999	AM	1250	
ACCELEROMETER	2	NOT APPLICABLE	FLOORPAN - LEFT RE	XG	3	0	999	AM	1250	
ACCELEROMETER	2	NOT APPLICABLE	FLOORPAN - RIGHT F	XG	4	0	999	CF	1250	

25-MAY-94 11:53:38

Integ Run Report

Test / Curve	Veh. / Occ.	Veh./Comp. / Sensor Attachment	Axis	Independent Data	Dependent Data	Cutoff / Status
Reading: LOSSVEH08 ROOT: (V100.V153)V0153AA0.003;1						
153	2	80 HAZDA 626	XG	ACCELERATION	TIME	1250.00
3	A	FLOORPAN - LEFT REAR		G'S	SECONDS	AS MEASURED
Writing: OPER\$TMP ROOT: (WCAP\$153\$20E007C2)V0153VC0.003;1						
153	2	80 HAZDA 626	XG	VELOCITY	TIME	1250.00
3	A	FLOORPAN - LEFT REAR		KILOMETERS/HOUR	SECONDS	COMPUTED
Writing: OPER\$TMP ROOT: (WCAP\$153\$20E007C2)V0153VC0.003;1						
153	2	80 HAZDA 626	XG	DISPLACEMENT	TIME	1250.00
3	A	FLOORPAN - LEFT REAR		MILLIMETERS	SECONDS	COMPUTED
Integ Run Report						

Test / Curve	Veh. / Occ.	Veh./Comp. / Sensor Attachment	Axis	Independent Data	Dependent Data	Cutoff / Status
Reading: LOSSVEH08 ROOT: (V100.V153)V0153AA0.003;1						
153	2	80 HAZDA 626	XG	ACCELERATION	TIME	1250.00
3	A	FLOORPAN - LEFT REAR		G'S	SECONDS	AS MEASURED
Writing: OPER\$TMP ROOT: (WCAP\$153\$20E007C2)V0153VC0.003;2						
153	2	80 HAZDA 626	XG	VELOCITY	TIME	1250.00
3	A	FLOORPAN - LEFT REAR		KILOMETERS/HOUR	SECONDS	COMPUTED
Writing: OPER\$TMP ROOT: (WCAP\$153\$20E007C2)V0153VC0.003;2						
153	2	80 HAZDA 626	XG	DISPLACEMENT	TIME	1250.00
3	A	FLOORPAN - LEFT REAR		MILLIMETERS	SECONDS	COMPUTED

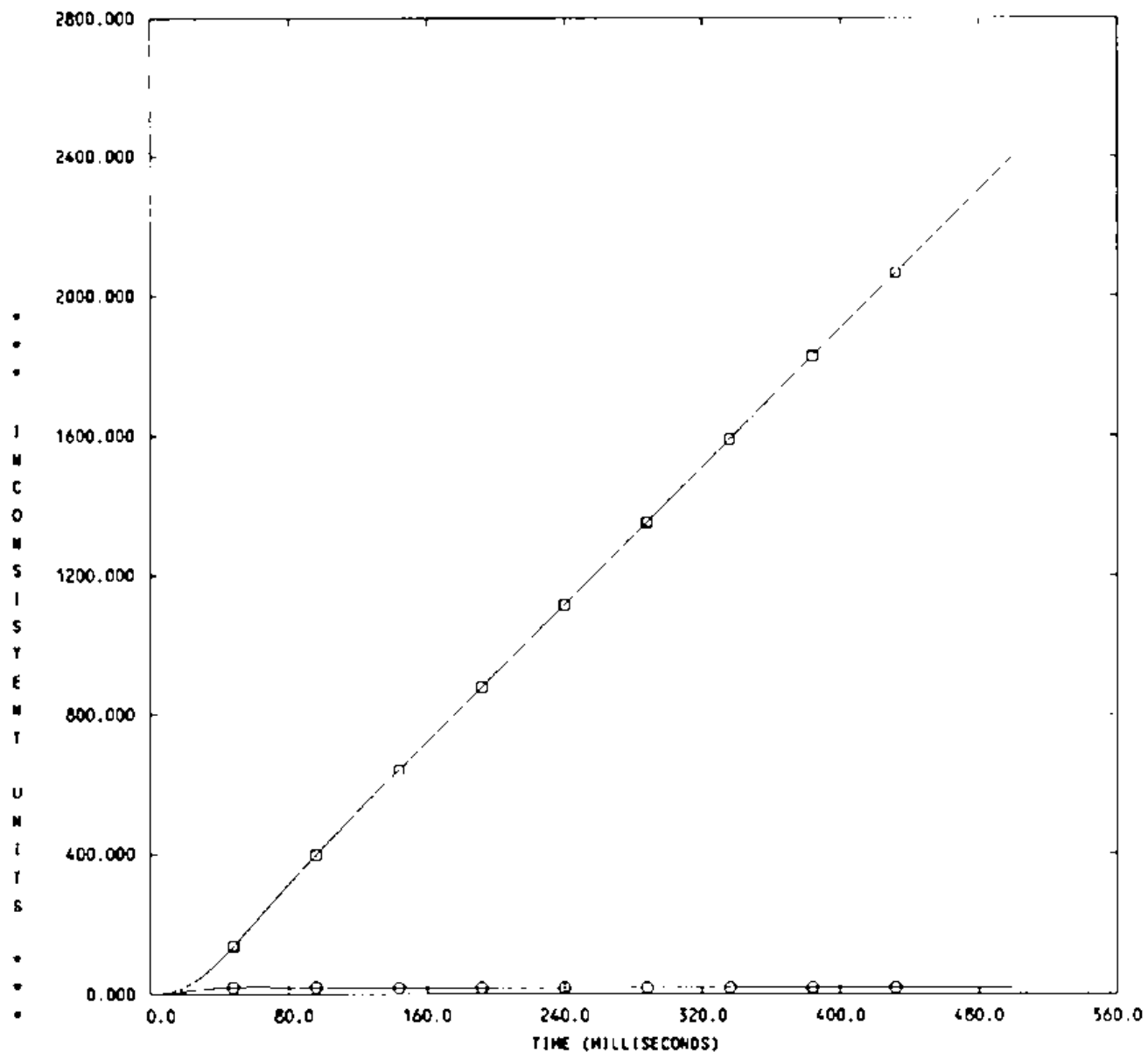
NTS TEST 153, OCCUPANT 1 HEAD, CHEST, VEH X VELOCITY

V01530C0.003 3882-008 ITV 80 MAZDA 626 VEH2
 OCCUPANT A FLOORPAN - LEFT REAR XG AXIS 1250Hz

□

V0153VC0.003 3882-008 ITV 80 MAZDA 626 VEH2
 OCCUPANT A FLOORPAN - LEFT REAR XG AXIS 1250Hz

○



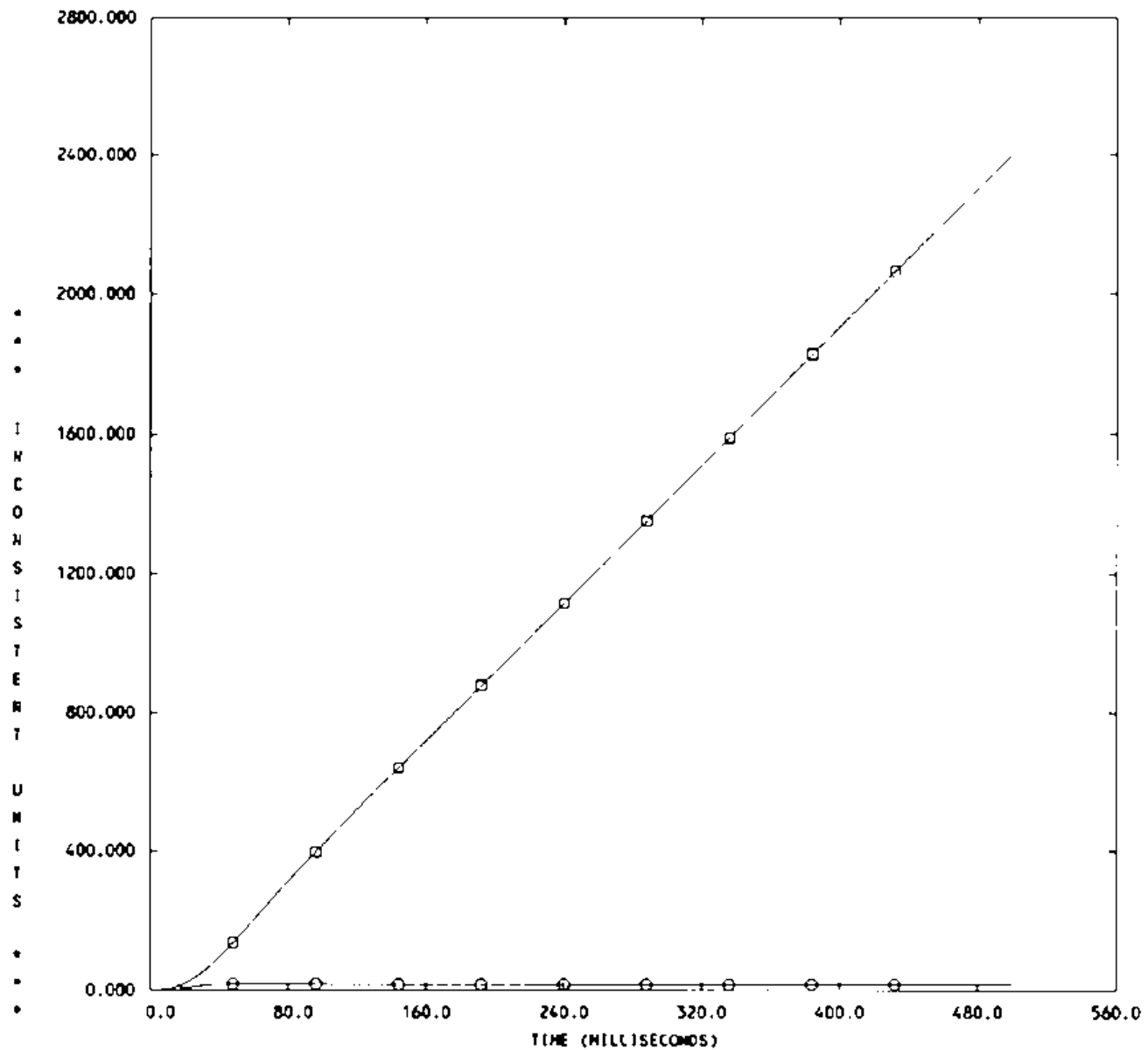
MTS TEST 153, OCCUPANT 2 HEAD, CHEST, VEH X VELOCITY

V01530C0.003 3882-008 ITV 80 MAZDA 626 VEH2
OCCUPANT A FLOORPAN - LEFT REAR XG AXIS 1250Hz

□

V0153VC0.003 3882-008 ITV 80 MAZDA 626 VEH2
OCCUPANT A FLOORPAN - LEFT REAR XG AXIS 1250Hz

○



File: V0153AFD.003

NTS - CALIFORNIA 3882-008 56.5 kph 17V

80 MAZDA 626 FOUR DOOR SEDAN

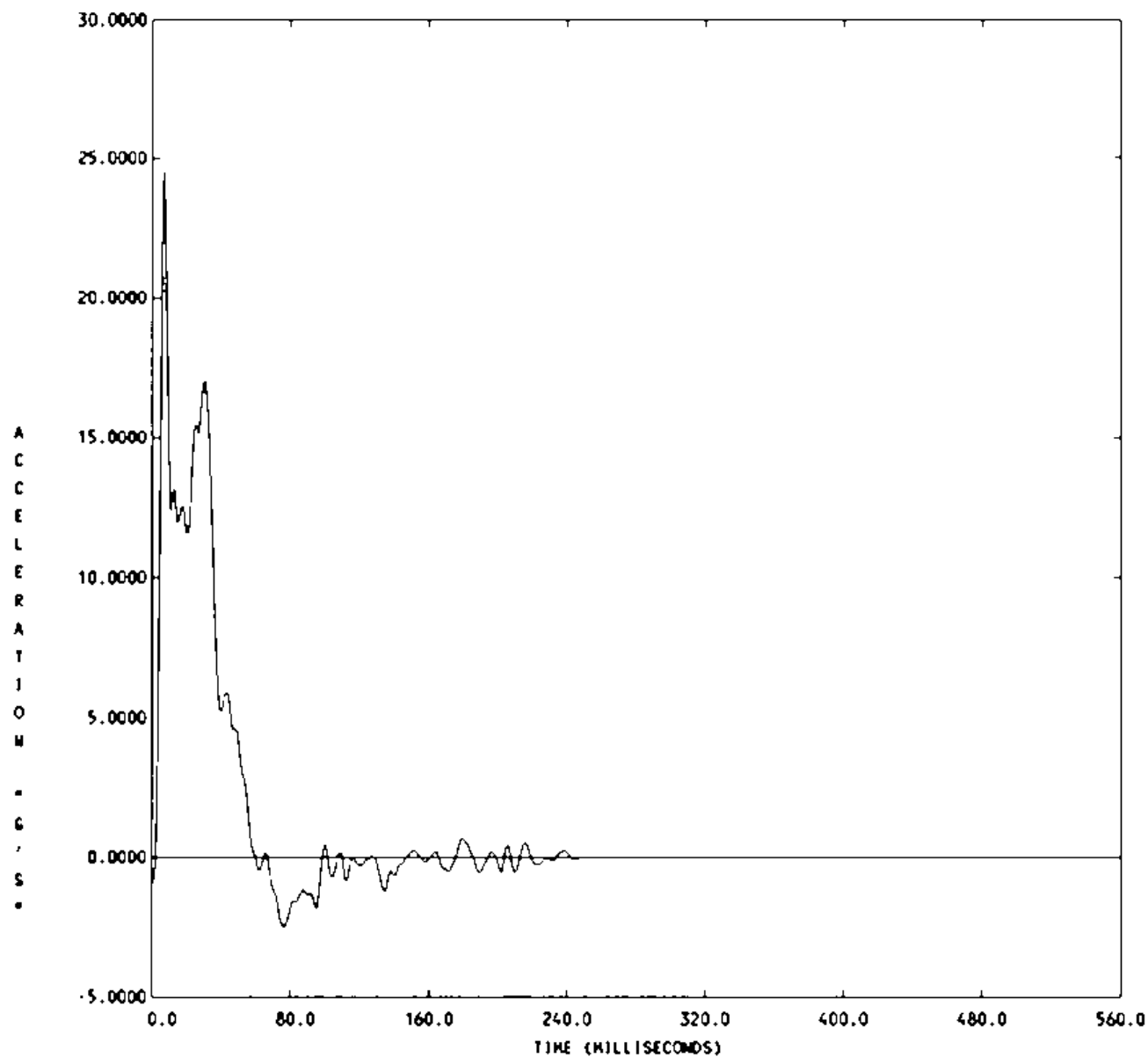
Vehicle number: 2

Occupant location, type: A

Sensor Attachment: FLOORPAM - LEFT REAR Axis: XG

Status: FILTERED YMIN = -2.4652 at 76.000

Filter cutoff: 100 Hz YMAX = 24.518 at 7.000



File: V0153AA0.001

HTS - CALIFORNIA 3882-008 56.5 kph ITV

0 HNTSA FLAT IMPACTOR 626

Vehicle number: 1

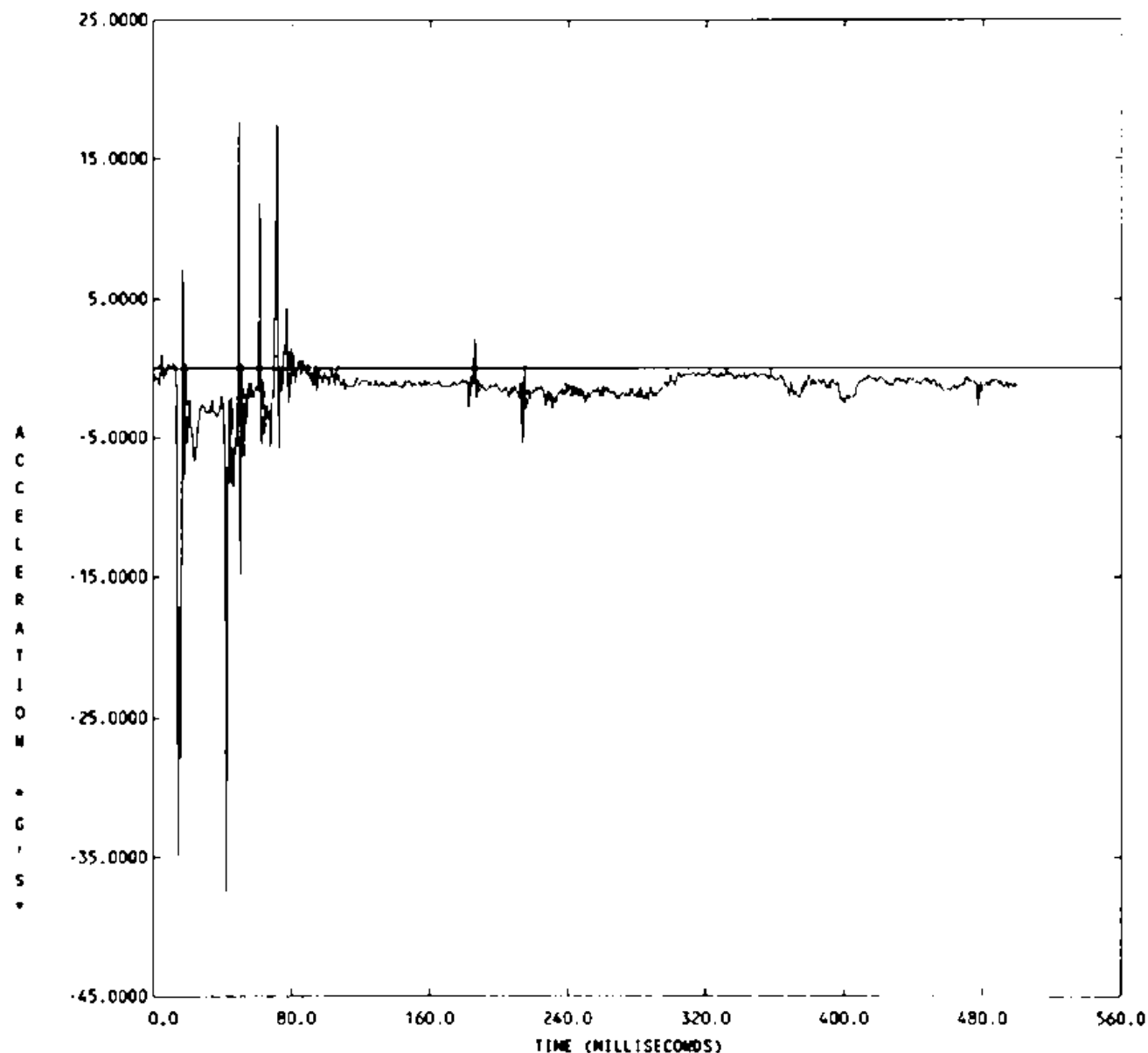
Occupant location, type: A

Sensor Attachment: OTHER

Axis: XG

Status: AS MEASURED YMIN = -37.505 at 42.500

Filter cutoff: 1250 Hz YMAX = 17.676 at 49.500



File: V0153AA0.D02

NTS - CALIFORNIA 3882-008 56.5 kph ITV

80 MAZDA 626 FOUR DOOR SEDAN

Vehicle number: 2

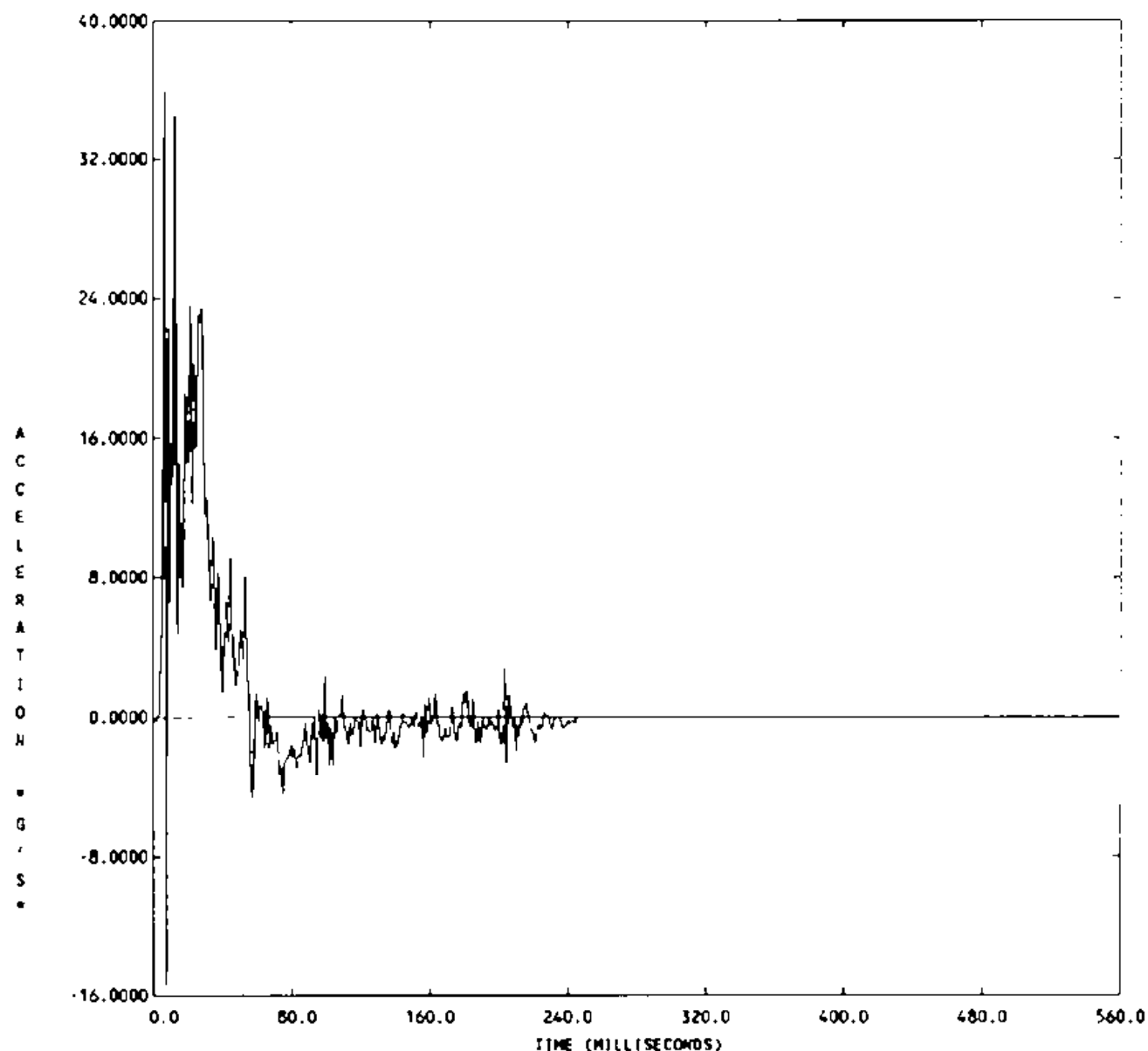
Occupant location, type: A

Sensor Attachment: OTHER

Axis: XG

Status: AS MEASURED YMIN = -15.389 at 7.500

Filter cutoff: 1250 Hz YMAX = 36.005 at 6.500



File: VD153AA0.003

NTS - CALIFORNIA 3882-008 56.5 kph ITV

80 MAZDA 626 FOUR DOOR SEDAN

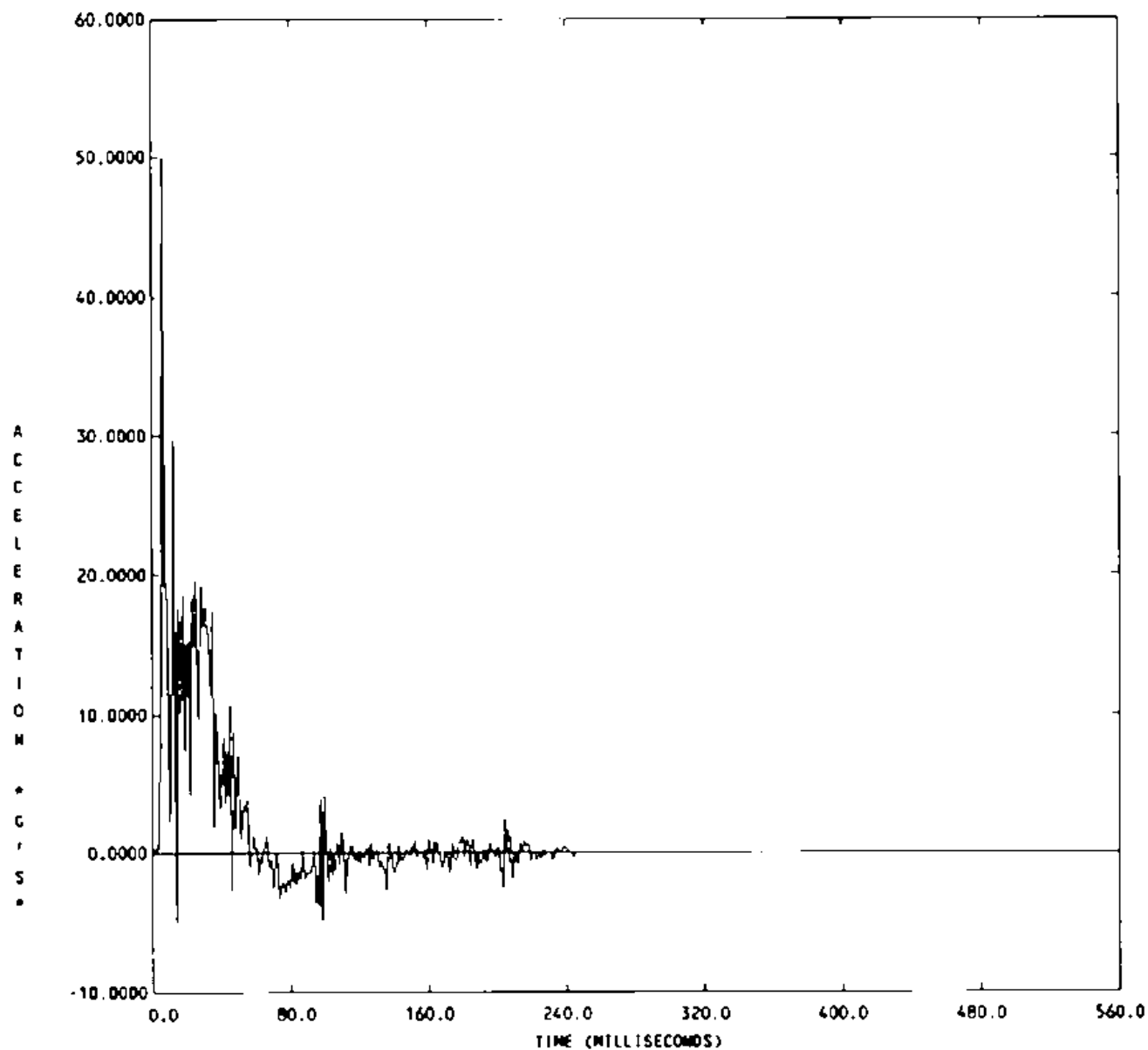
Vehicle number: 2

Occupant location, type: A

Sensor Attachment: FLOORPAN - LEFT REAR Axis: XG

Status: AS MEASURED YMIN = -4.9441 at 14.000

Filter cutoff: 1250 Hz YMAX = 50.052 at 6.500



File: V0153AF0.004

HTS - CALIFORNIA 3882-008 56.5 kph ITV

80 MAZDA 626 FOUR DOOR SEDAN

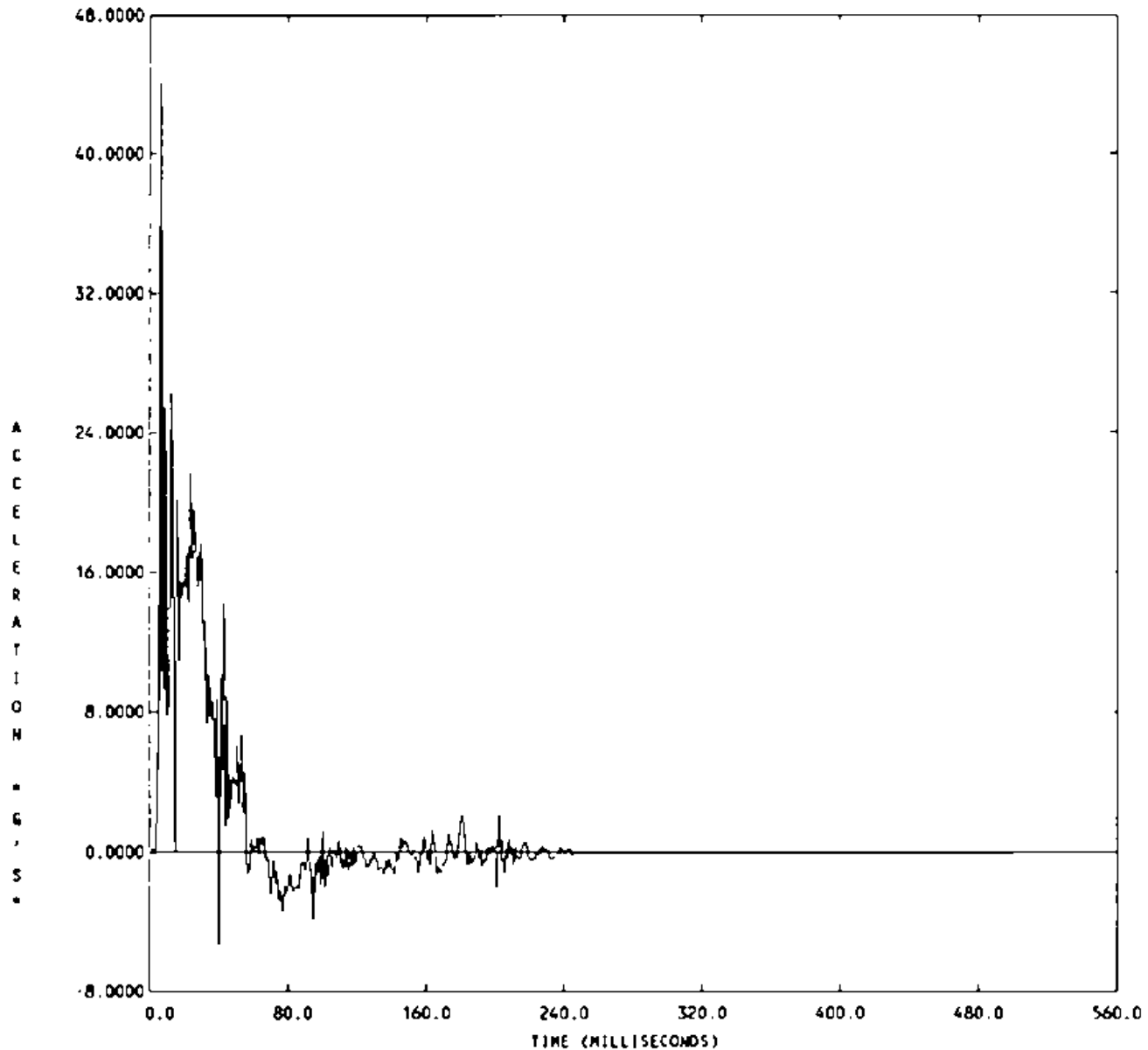
Vehicle number: 2

Occupant location, type: A

Sensor Attachment: FLOORPAN - RIGHT FRONT Axis: XG

Status: CHANNEL FAILED YMIN = -5.3229 dt 40.000

Filter cutoff: 1250 Hz YMAX = 44.183 dt 6.500



File: V0153AFD.001

NYS - CALIFORNIA 3882-008 56.5 kph 11V

0 NHTSA FLAT IMPACTOR 626

Vehicle number: 1

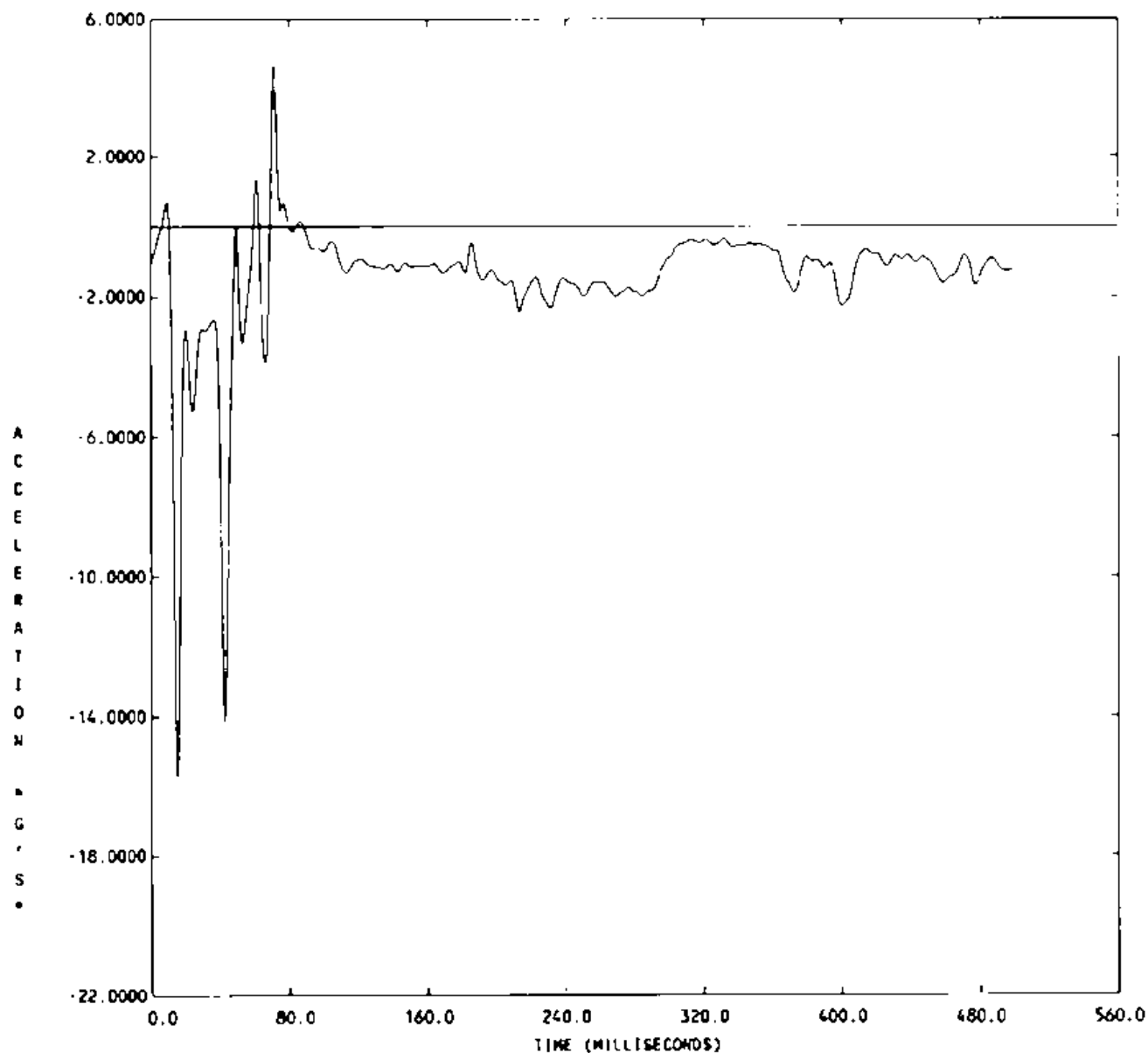
Occupant location, type: A

Sensor Attachment: OTHER

Axis: XG

Status: FILTERED YMIN = -15.727 at 15.000

Filter cutoff: 100 Hz YMAX = 4.6922 at 71.500



File: V0153AFD.002

NTS - CALIFORNIA 3882-008 56.5 kph ITV

80 MAZDA 626 FOUR DOOR SEDAN

Vehicle number: 2

Occupant location, type: A

Sensor Attachment: OTHER

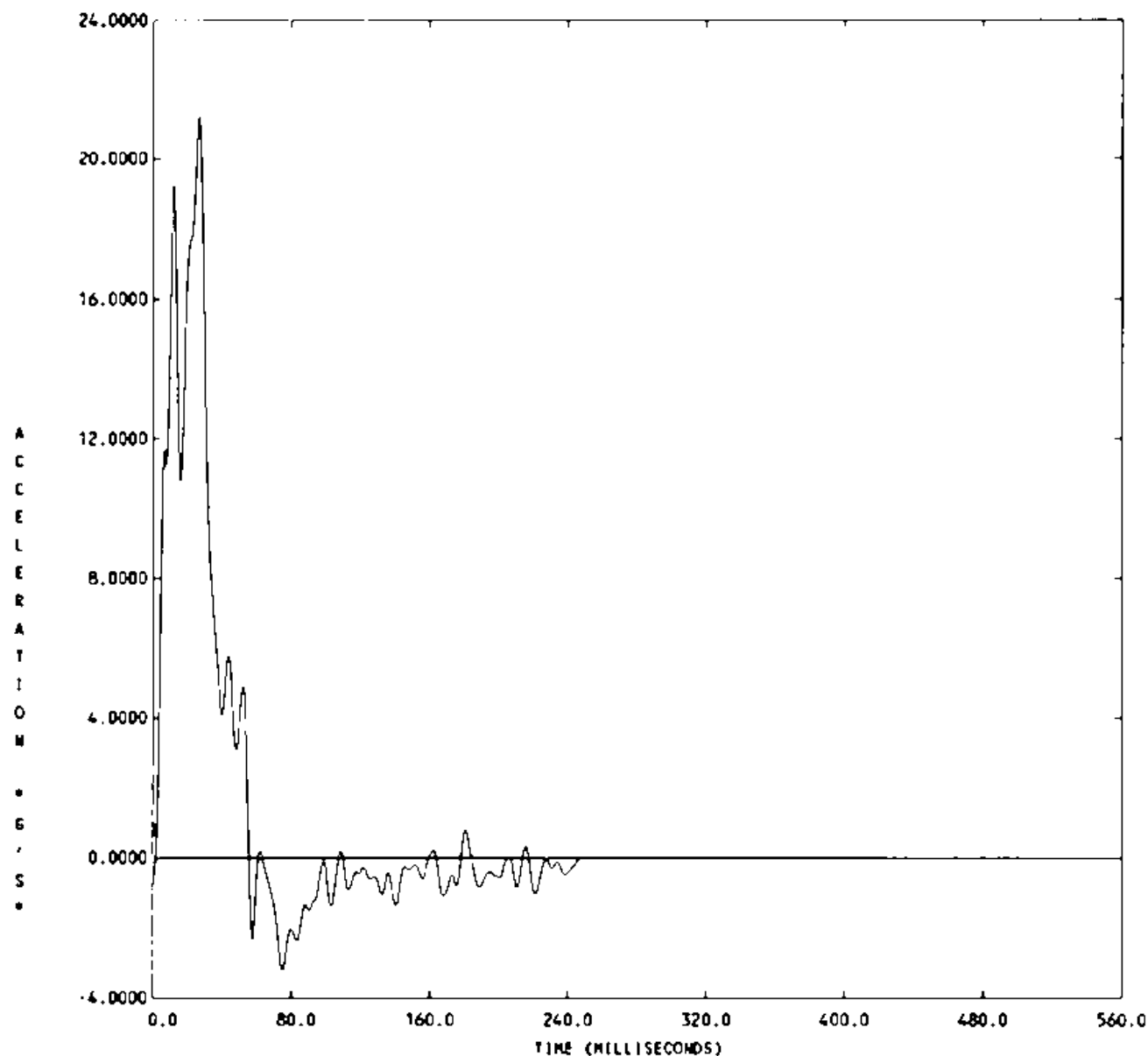
Axis: XG

Status: FILTERED

YMIN = -3.1941 at 75.000

Filter cutoff: 100 Hz

YMAX = 21.204 at 27.000



File: V0153AF0.003

HTS - CALIFORNIA 3882-008 56.5 kph 1TV

80 MAZDA 626 FOUR DOOR SEDAN

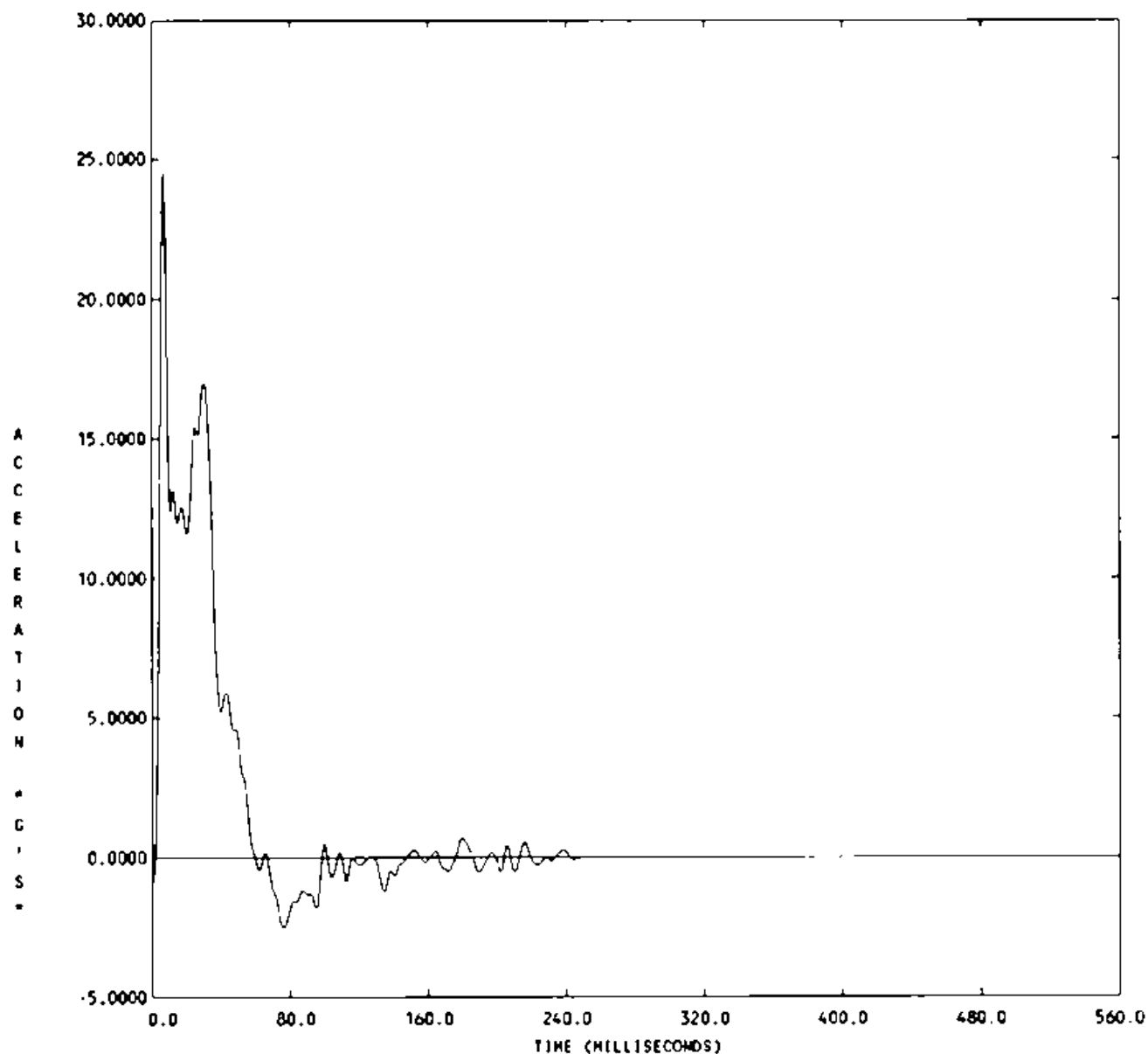
Vehicle number: 2

Occupant location, type: A

Sensor Attachment: FLOORPAN - LEFT REAR Axis: XG

Status: FILTERED YMIN = -2.4652 at 76.000

Filter cutoff: 100 Hz YMAX = 24.518 at 7.000



File: V0153AF0.004

MTS - CALIFORNIA

3882.008

56.5 kph 1TV

80 MAZDA

626

FOUR DOOR SEDAN

Vehicle number: 2

Occupant location, type: A

Sensor Attachment: FLOORPAN - RIGHT FRONT

Axis: XG

Status: FILTERED

YMIN = -2.5946

at

77.000

Filter cutoff: 100 Hz

YMAX = 21.039

at

7.000

