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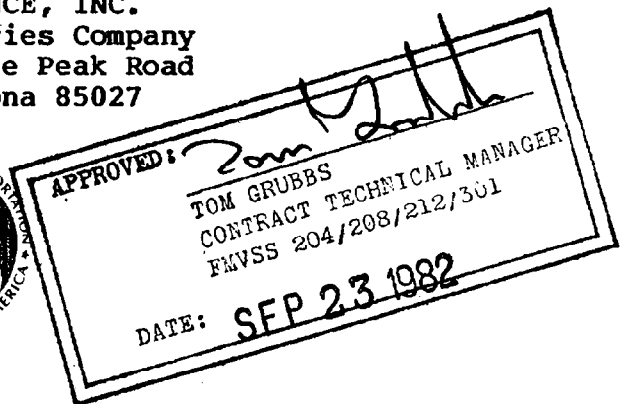
NEW VEHICLE ASSESSMENT AND
STANDARDS ENFORCEMENT INDICANT
TESTING

FMVSS 212, 219, AND 301-75

NISSAN MOTOR COMPANY, LTD.
1982 NISSAN SENTRA 4-DOOR COUPE
NHTSA 820513

Prepared by:

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Phoenix, Arizona 85027



September 1982

FINAL REPORT

Prepared for:

U.S. DEPARTMENT OF TRANSPORTATION
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Approved by Rod Garn

Date 9-20-82

Report Accepted by:

TOM GRUBBS

Contract Technical Manager
Office of Vehicle Safety Compliance

SEP 23 1982

Date

TECHNICAL REPORT STANDARD TITLE PAGE

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16. Abstract The vehicle was tested using test parameter values which are in excess of the current upper limits of the subject FMVSS in order to obtain research and vehicle rating data. This test, therefore, can only be viewed as an "indicant" test by the Office of Vehicle Safety Compliance. The front of the test vehicle impacted the NHTSA fixed load-measuring barrier at a speed of 35.18 mph. The test was conducted at the Dynamic Science Phoenix facility on July 29, 1982, with the following results: a) FMVSS 212 - Loss of windshield periphery exceeded allowable range. b) FMVSS 219 - No intrusion into windshield protected zone. c) FMVSS 301 - Fuel leakage exceeded the allowable range during the first 5 minutes from onset of rollover. Approximately 147 ounces of Stoddard was collected. Test was terminated at this point by Bob Gardner (CTM).					
17. Key Words FMVSS 212 - Windshield Mounting; FMVSS 219 - Windshield Zone Intrusion; FMVSS 301-75 - Fuel System Integrity, Vehicle Assessment, Frontal Impact, Load-Measuring Barrier, Occupant Response				18. Distribution Statement Available from the Technical Reference Division, National Highway Traffic Safety Administration, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590	
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
acres	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	metric ton	t
	(2000 lb)			
VOLUME				
tsp	teaspoons	5	milliliters	mL
Tbsp	tablespoons	15	milliliters	mL
in ³	cubic inches	16	milliliters	mL
fl oz	fluid ounces	30	milliliters	mL
c	cups	0.24	liters	L
pt	pints	0.47	liters	L
qt	quarts	0.95	liters	L
gal	gallons	3.8	liters	L
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	degrees Fahrenheit	5 (after subtracting 32)	degrees Celsius	°C

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares	2.5	acres	acres
	(10 000 m ²)			
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton	1.1	short tons	
	(1000 kg)			
VOLUME				
mL	milliliters	0.03	fluid ounces	fl oz
mL	milliliters	0.06	cubic inches	in ³
L	liters	2.1	pints	pt
L	liters	1.06	quarts	qt
L	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	degrees Celsius	9.5 (then add 32)	degrees Fahrenheit	°F

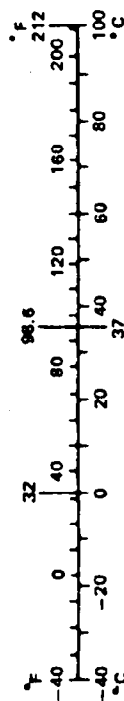


TABLE OF CONTENTS

	<u>Page</u>
1.0 PURPOSE AND TEST INTRODUCTION	1-1
1.1 PURPOSE	1-1
1.2 INTRODUCTION	1-1
2.0 GENERAL TEST AND VEHICLE PARAMETER DATA	2-2
3.0 COMPLIANCE-RELATED DATA FMVSS 212, 219, 301-75 INDICANT TESTING	3-1
4.0 DATA REQUIRED BY R&D AND OAR	4-1
APPENDIX A - PHOTOGRAPHS	A-1
APPENDIX B - CALCOMP PLOT PRESENTATION	B-1
APPENDIX C - DUMMY CALIBRATIONS	C-1

1.0 PURPOSE AND TEST INTRODUCTION

1.1 PURPOSE

The purpose of the test was to subject a 1982 Nissan Sentra 4-Door Coupe to the indicant test requirements of DOT Test Plan TP-212-02, April 4, 1980, Standard Enforcement Indicant Testing for FMVSS 212, "Windshield Mounting," FMVSS No. 219, "Windshield Zone Intrusion," and FMVSS No. 301-75, "Fuel System Integrity." Calibrated Part 572 50th-percentile male dummies were utilized to acquire data relative to FMVSS 208, "Occupant Crash Protection." The vehicle was tested using test parameters which are in excess of the current upper limits of the subject FMVSS in order to obtain research and vehicle rating data. This test, therefore, can only be viewed as an "indicant" test by the Office of Vehicle Safety Compliance (OVSC).

1.2 INTRODUCTION

Section 2 contains General Test and Vehicle Parameter Data. Section 3 contains Compliance Related Data for FMVSS 212, 219, 301-75 Indicant Testing, together with photographs related to these tests. Section 4 contains occupant and vehicle response data. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Calcomp plots. Appendix C contains dummy certification data.

2.0 GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets describe the General Test and Vehicle Parameter Data.

GENERAL TEST AND VEHICLE PARAMETER DATA

PRE-IMPACT DATA

Make/Model: Nissan Sentra
 Body Style: 4-Door Coupe Model Year 1982
 NHTSA No. 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
 Date of Manufacture: 2/82; VIN: JN1HB11S6CU501672
 GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL

Vehicle Capacity: FRONT REAR RECOMMENDED LOAD RANGE:
 Tire Pressure: 26 psi 26 psi TIRE SIZE: Standard
155/SR13
 Designated Seating: 2 Front 3 Rear 5 Total
 Cargo load = 75 lb Is Spare Tire: Space Saver? No
 TOTAL = 825 lb Standard Equipment? Yes
 Engine: 4 Cylinder/Transverse Mount (CNS1.5V2ADC9) 90.8 cu.in.
 Transmission: 5-Speed Standard Front Wheel Drive
 Date Vehicle Received by Laboratory: 7/9/82; Odometer 438.8
 Dealer Name & Address: NTW Via Autodriveaway

WEIGHT (LB) OF TEST VEHICLE AS RECEIVED (WITH MAX. FLUIDS) = UDW

Right Front = 570 lb Right Rear = 375 lb
 Left Front = 593 lb Left Rear = 391 lb
 TOTAL FRONT WEIGHT = 1163 lb (60 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 766 lb (40 % of Total Vehicle Weight)
 TOTAL DELV. WEIGHT = 1929 lb

TARGET WEIGHT = UDW + Cargo Load + 328 lbs Dummies = 2332 lb

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 75 LB CARGO:

Right Front = 652 lb Right Rear = 580 lb
 Left Front = 652 lb Left Rear = 571 lb
 TOTAL FRONT WEIGHT = 1304 lb (53 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 1151 lb (47 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 2455 lb†

Weight of ballast secured in vehicle trunk area = 0 lb

VEHICLE ATTITUDE: (inches)

Delivered Attitude: RF 29 LF 29 RR 29 LR 29
 Test Attitude: RF 28-1/4 LF 28-3/8 RR 26-3/4 LR 26-7/8

REMARKS: Vehicle stock.

†Weight exceeds tolerance band called for in TP-212-02. The weight requirement was waived for this test by Vince Quarles (CTM).

GENERAL TEST AND VEHICLE PARAMETER DATA (CONT)

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
 Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph

Distance from the vehicle's front bumper to barrier face entering the vehicle velocity measurement device is 5.0 feet and distance exiting the vehicle velocity measurement device is 1.0 foot.

VEHICLE REBOUND AND CRUSH (in.)

Vehicle Length: Pre-test = R 164.1 C 166.7 L 164.3
 Post-test = R 141.2 C 142.1 L 141.2
 Crush = R 22.9 C 24.6 L 23.1
 Distance from front of test vehicle to point of impact:
 R 26.0 C 25.1 L 25.7

VISIBLE DUMMY CONTACT POINTS

	Driver	Passenger
Head	<u>Upper right side rim and center hub of steering wheel, instrument panel</u>	<u>Dash panel near glove box</u>
Chest	<u>Lower rim of steering wheel</u>	<u>None</u>
Abdomen	<u>None apparent</u>	<u>None</u>
Left Knee	<u>Dash panel</u>	<u>Glove box door</u>
Right Knee	<u>Dash panel</u>	<u>Glove box door</u>

DOOR OPENING

Front		Rear	
Left	Right	Left	Right
<u>Tools</u>	<u>Tools</u>	<u>Easily</u>	<u>Easily</u>
<u>Required</u>	<u>Required</u>		

SEAT MOVEMENT

Seat back Failure	<u>None</u>	<u>None</u>
Seat Shift (in.)	<u>None</u>	<u>None</u>

GLAZING DAMAGE

Backlight/Windshield Severe windshield retention loss.

OTHER NOTABLE IMPACT EFFECTS: Front wheels pinned by crushed sheet metal.

3.0 COMPLIANCE-RELATED DATA FMVSS 212, 219, 301-75 INDICANT TESTING

The following data sheets and photographs document compliance data related to FMVSS 212, 219, and 301-75.

SUMMARY OF FMVSS 212 DATA

PRE-IMPACT DATA

Make/Model: Nissan Sentra
Body Style: 4-Door Coupe Model Year: 1982
NHTSA No. 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
Date of Manufacture: 2/82; VIN JN1HB11S6CU501672
GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear 1465 lb

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
Required Impact Velocity Range: 34.5 to 35.5 mph
Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph
Test Weight: 2455† lb Static Crush: 24.6 in.
Rebound Distance: 25.1 in.

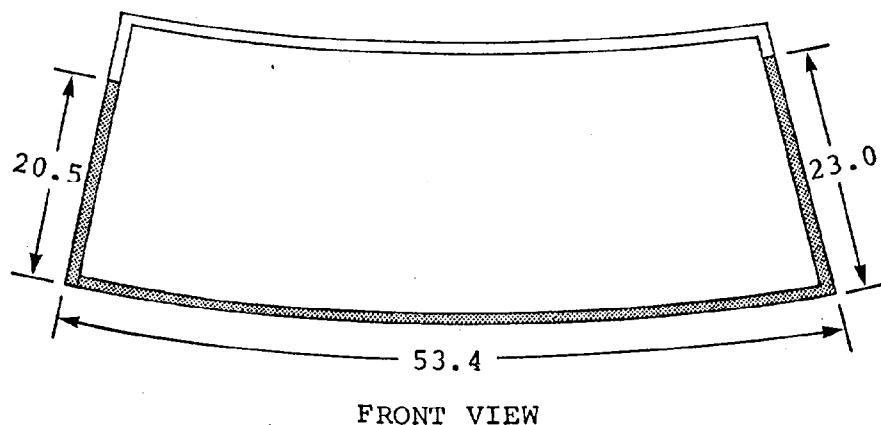
DETAILS OF WINDSHIELD MOUNTING: S-shaped rubber grommet with the windshield in one bend of the S and the lip of the frame in the other bend.

	WINDSHIELD PERIPHERY		
	Pre-test	Post-test	Retention
RIGHT SIDE	71.5	21.8	30%
LEFT SIDE	71.5	24.3	34%
TOTAL	143.0	46.1	32%

The standard requires that POST-TEST be a minimum of 75 percent of the PRE-TEST total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles which are equipped with occupant passive restraints.

†Weight exceeds tolerance band called for in TP-212-02. The weight requirement was waived for this test by Vince Quarles (CTM).

SUMMARY OF FMVSS 212 DATA (Continued)



AREA OF RETENTION FAILURE: Retention loss starts in the upper left hand corner of the windshield and traverses down the left side, along the bottom edge and four-fifths of the way up the right side of the windshield.

SUMMARY OF FMVSS 219 DATA

PRE-IMPACT DATA

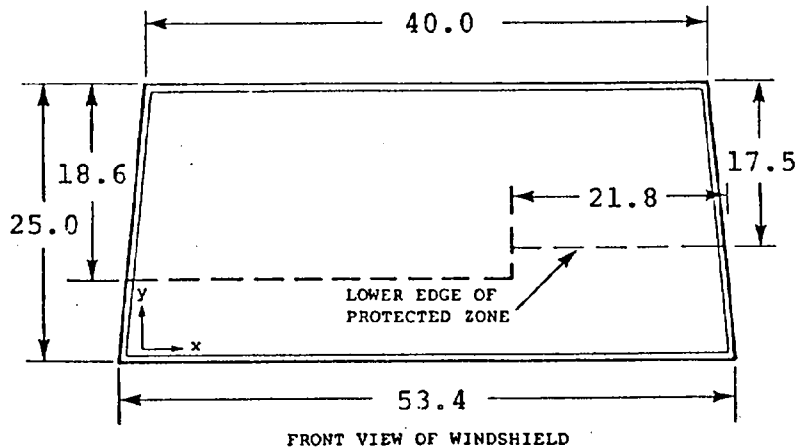
Make/Model: Nissan Sentra
Body Style: 4-Door Coupe Model Year: 1982
NHTSA No.: 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
Date of Manufacture: 2/82; VIN: JN1HB11S6CU501672
GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
Required Impact Velocity Range: 34.5 to 35.5 mph
Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph
Test weight 2455† lb Static Crush 24.6 in. Rebound 25.1 in.



- A. The area that the "Protected Zone" template was penetrated more than 0.25 inch by a vehicle component other than one which is normally in contact with the windshield.

Coordinates

<u>X</u>	<u>Y</u>
<u>None</u>	<u>None</u>

†Weight exceeds tolerance band called for in TP-212-02. The weight requirement was waived for this test by Vince Quarles (CTM).

SUMMARY OF FMVSS 219 DATA (CONTD)

- B. The area beneath the "Protected Zone" that the inner surface of the windshield was penetrated by a vehicle component.

Coordinates

X

Y

None

None

NOTE: No windshield protected zone penetration.

SUMMARY OF FMVSS 301 DATA

PRE-IMPACT DATA

Make/Model: Nissan Sentra
Body Style: 4-Door Coupe Model Year: 1982
NHTSA No.: 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
Date of Manufacture: 2/82 ; VIN: JN1HBL1S6CU501672
GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
Required Impact Velocity Range: 34.5 to 35.5 mph
Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph
Test Weight 2455† lb Static Crush 24.6 in. Rebound 25.1 in.

FUEL SYSTEM DATA

Test fluid: Stoddard Solvent Specific Gravity: 0.764
Temperature: 95 °F
Kinematic Viscosity: 0.99 Centistokes Test Volume: 12.2 U.S. gal

Test vehicle fuel tank filled to 93% of "usable" plus "unusable" capacity with Stoddard Solvent and with electric fuel pump operating (if it will operate without engine operation) until start of static roll.

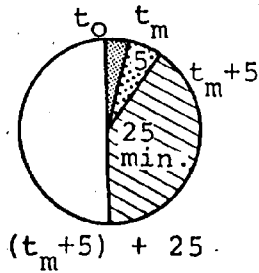
Details of fuel system: The screw on, ratcheted, filler neck cap is located on the right side quarter panel aft of the rear wheel behind a locking vent door. The filler neck traverses inward and downward at 45 degrees until it reaches the top of the tire level and then makes a 90 degree bend forward and enters the right rear corner of the fuel tank. The filler neck is paralleled by a vent tube. The rectangular shaped fuel tank is bolted to the under-carriage by six bolts (two in front, four in rear) between the rear axle and the rear cargo well.

Three lines exit the top forward edge of the fuel tank and traverse forward to the rear of the floorpan, bend outwards to the inside of the right side subframe rail, then forward to the firewall and into the engine compartment. One line attaches to the fuel filter, one line attaches to the carburetor, and the third line attaches to the vapor canister.

†Weight exceeds tolerance band called for in TP-212-02. The weight requirement was waived for this test by Vince Quarles (CTM).

SUMMARY OF FMVSS 301 DATA (Continued)

FUEL SPILLAGE MEASUREMENT

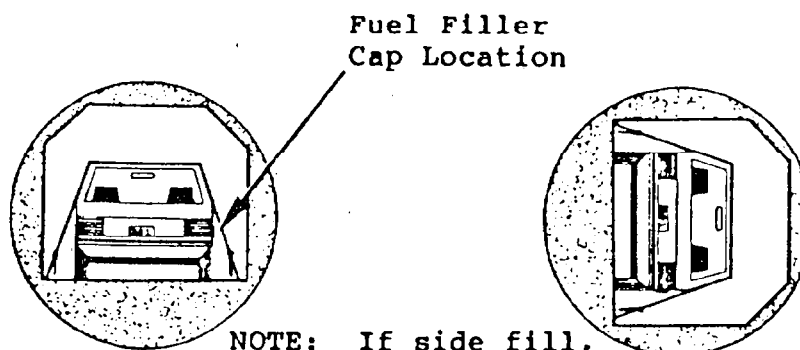


	ACTUAL	MAXIMUM ALLOWABLE
1. From impact until vehicle motion ceases. . . .	0.0	1 oz
2. For 5-minute period after vehicle motion ceases	0.0	5 oz
3. For next 25 minutes. . .	0.0	1 oz/min

SOLVENT SPILLAGE DETAILS: None.

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° to 90° VEHICLE NHTSA NO. 820513



NOTE: If side fill, rotate so that filler cap is down.

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time.... = 1 min, 39 sec +
 (Spec. Range = 1 to 3 min)
 FMVSS 301 Position Hold Time..... = 5 min, 0 sec =
 Total..... = 6 min, 39 sec
 Next Whole Minute Interval..... = 7 min

FMVSS 301 REQUIREMENTS AND ACTUAL TEST RESULTS:

Time Period	First 5 min (from onset)	6th min	7th min	8th min (if req'd)
Maximum Spillage Allowed (oz)	5	1	1	1
Actual Spillage Recorded	146.9 oz.*			---

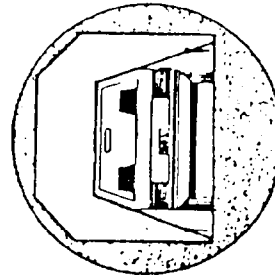
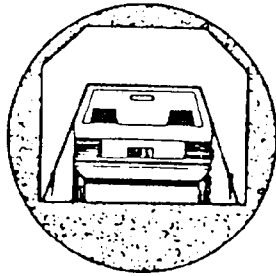
NOTE: Spillage is recorded in whole minute intervals only - as determined above.

SOLVENT SPILLAGE LOCATION(S): Relief valve on filler cap.

*Test halted at this point by Bob Gardner (CTM) due to excessive leakage.

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 90° to 180° VEHICLE NHTSA NO. 820513



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time.... = _____ min, _____ sec +
 (Spec. Range = 1 to 3 min)
 FMVSS 301 Position Hold Time..... = _____ min, _____ sec =
 Total..... = _____ min, _____ sec
 Next Whole Minute Interval..... = _____ min

FMVSS 301 REQUIREMENTS AND ACTUAL TEST RESULTS:

Time Period	First 5 min (from onset)	6th min	7th min	8th min (if req'd)
Maximum Spillage Allowed (oz)	5	1	1	1
Actual Spillage Recorded				

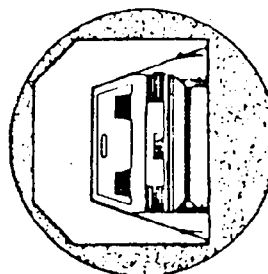
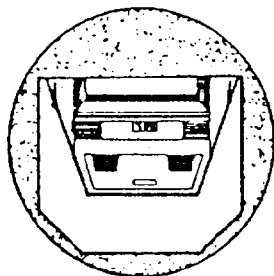
NOTE: Spillage is recorded in whole minute intervals only - as determined above.

SOLVENT SPILLAGE LOCATION(S):

Test halted during initial rollover phase by Bob Gardner (CTM).

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 180° to 270° VEHICLE NHTSA NO. 820513



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time.... = _____ min, _____ sec +
 (Spec. Range = 1 to 3 min)
 FMVSS 301 Position Hold Time..... = _____ min, _____ sec =
 Total..... = _____ min, _____ sec
 Next Whole Minute Interval..... = _____ min

FMVSS 301 REQUIREMENTS AND ACTUAL TEST RESULTS:

Time Period	First 5 min (from onset)	6th min	7th min	8th min (if req'd)
Maximum Spillage Allowed (oz)	5	1	1	1
Actual Spillage Recorded				

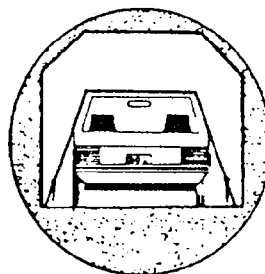
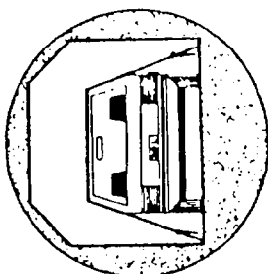
NOTE: Spillage is recorded in whole minute intervals only - as determined above.

SOLVENT SPILLAGE LOCATION(S):

Test halted during initial rollover phase by Bob Gardner (CTM).

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 270° to 360° VEHICLE NHTSA NO. 820513



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time.... = _____ min, _____ sec +
 (Spec. Range = 1 to 3 min)
 FMVSS 301 Position Hold Time..... = _____ min, _____ sec =
 Total..... = _____ min, _____ sec
 Next Whole Minute Interval..... = _____ min

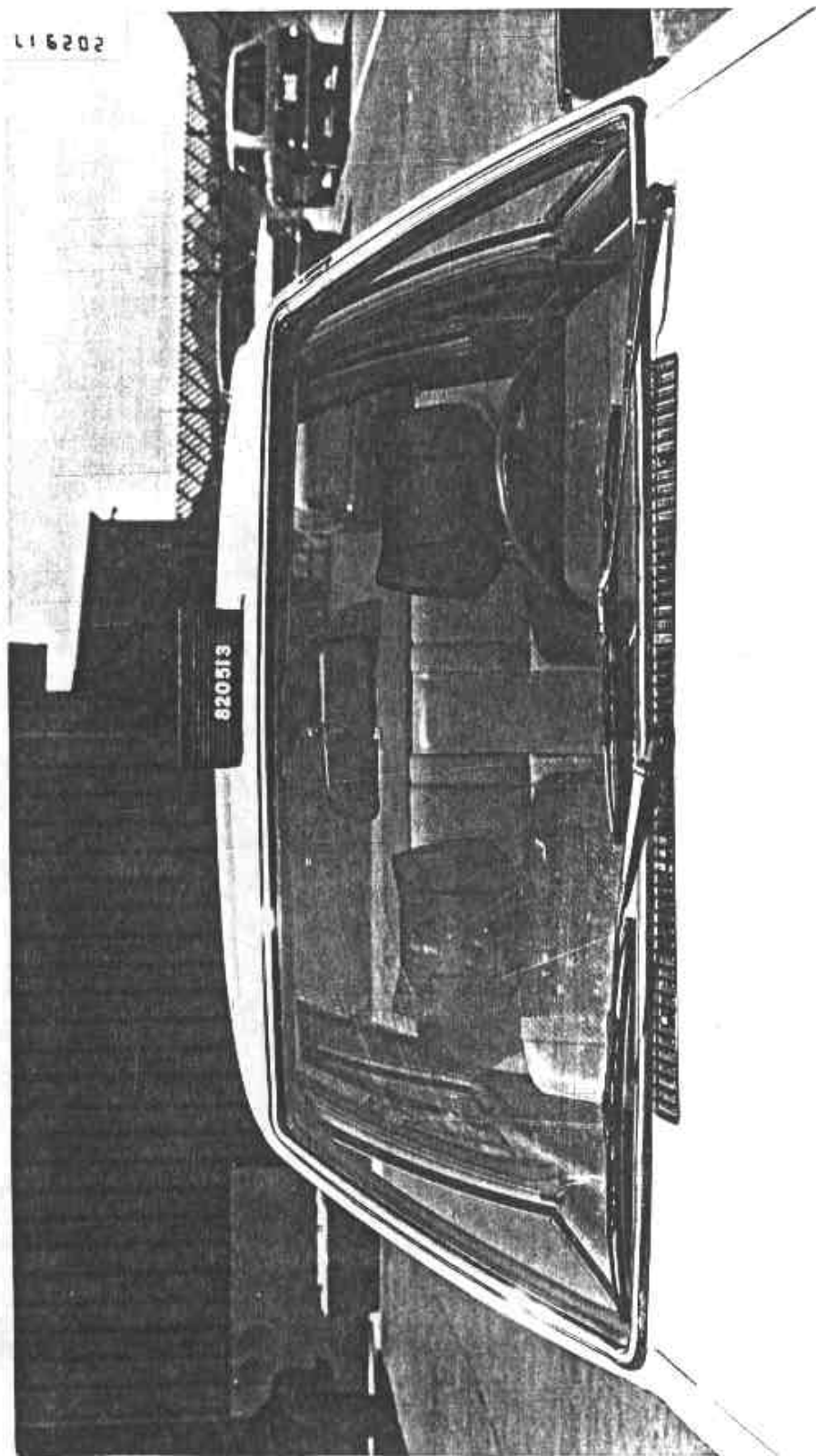
FMVSS 301 REQUIREMENTS AND ACTUAL TEST RESULTS:

Time Period	First 5 min (from onset)	6th min	7th min	8th min (if req'd)
Maximum Spillage Allowed (oz)	5	1	1	1
Actual Spillage Recorded				

NOTE: Spillage is recorded in whole minute intervals only - as determined above.

SOLVENT SPILLAGE LOCATION(S):

Test halted during initial rollover phase by Bob Gardner (CTM).



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FIGURE 3-1. PRE-TEST WINDSHIELD - 1982 NISSAN SENTRA - NHTSA 820513.

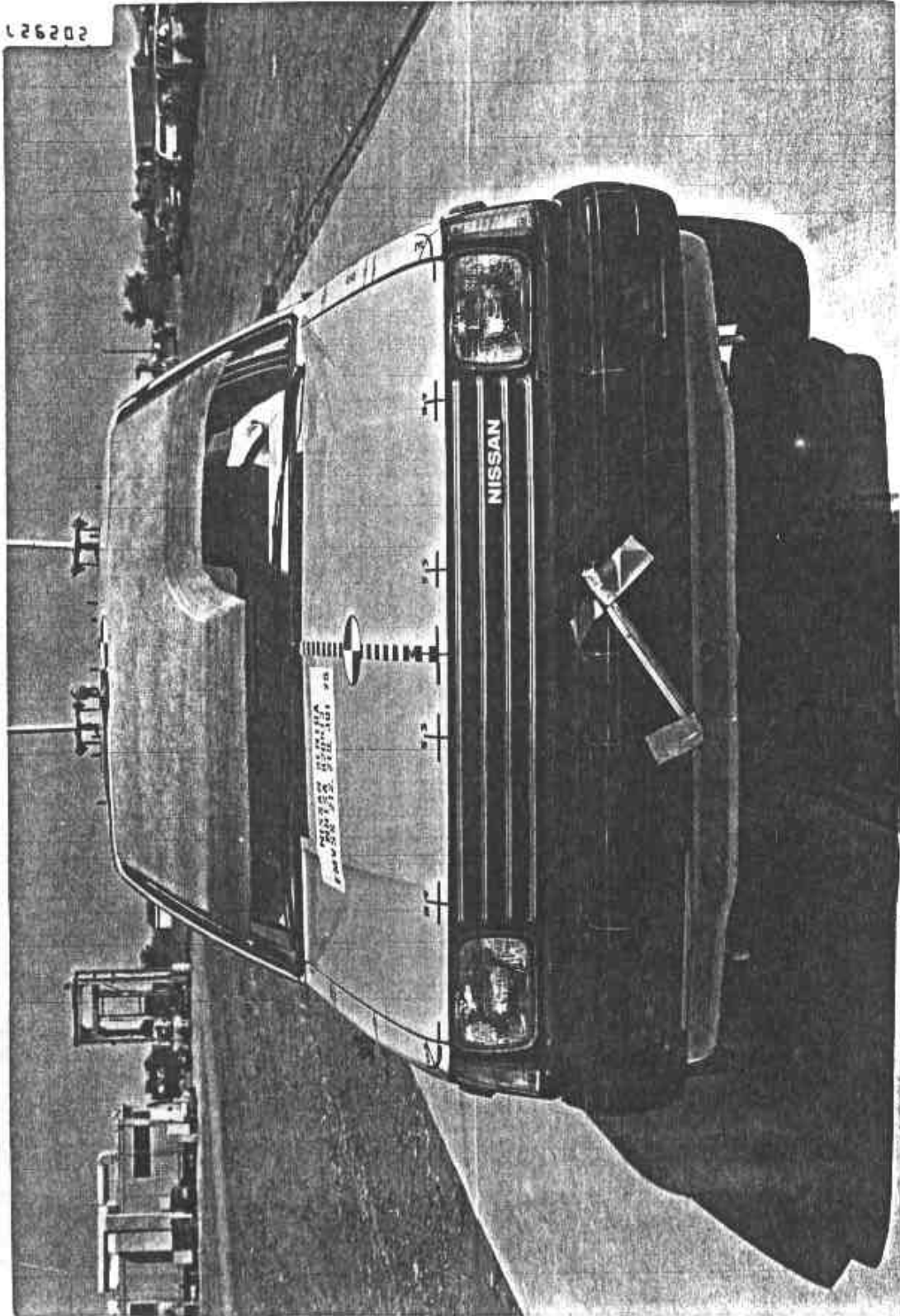
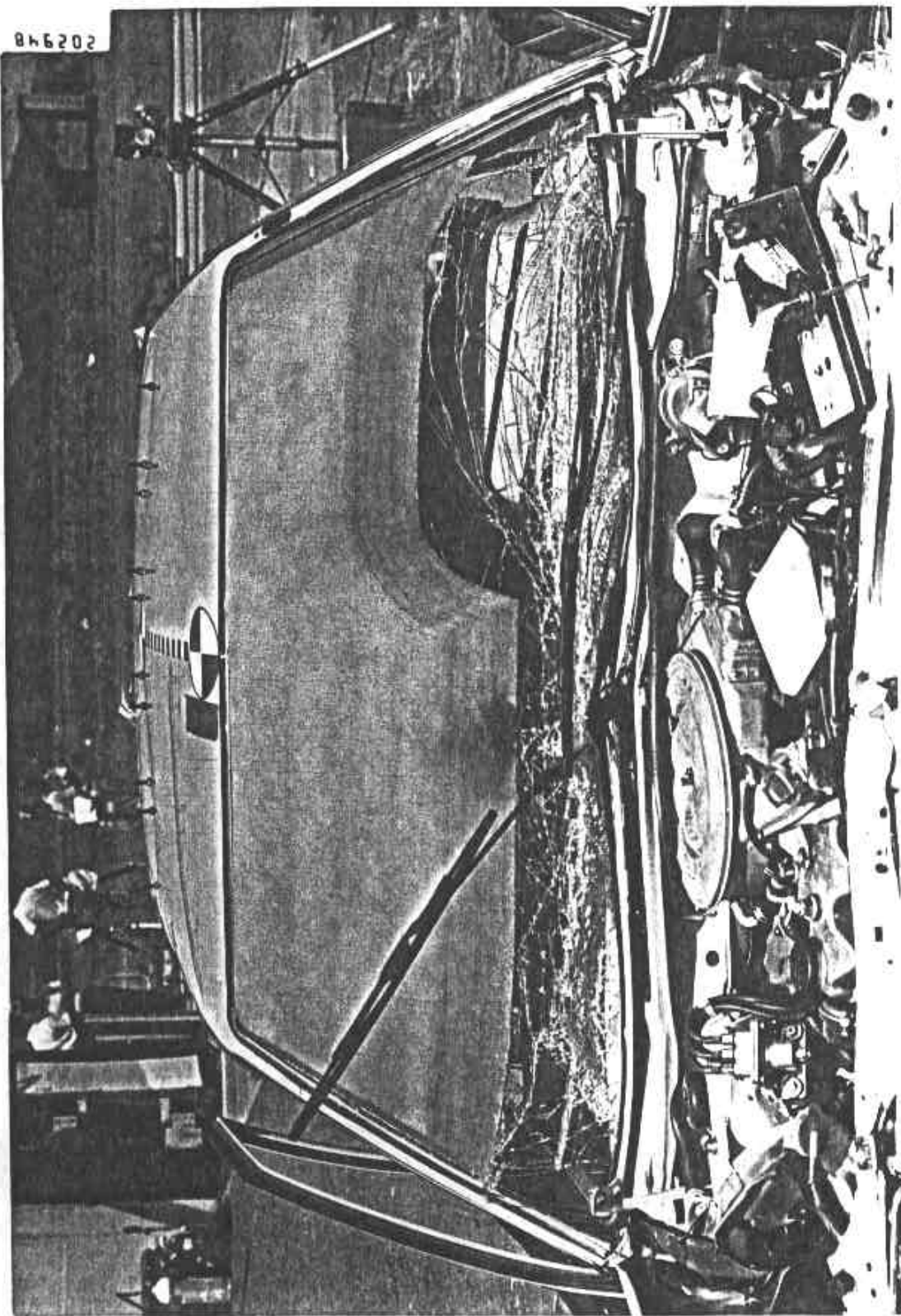


FIGURE 3-2. PRE-TEST WINDSHIELD WITH STYROFOAM TEMPLATE IN PLACE - 1982 NISSAN SENTRA - NHTSA 820513.



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FIGURE 3-3. POST-TEST WINDSHIELD - 1982 NISSAN SENTRA - NHTSA 820513.

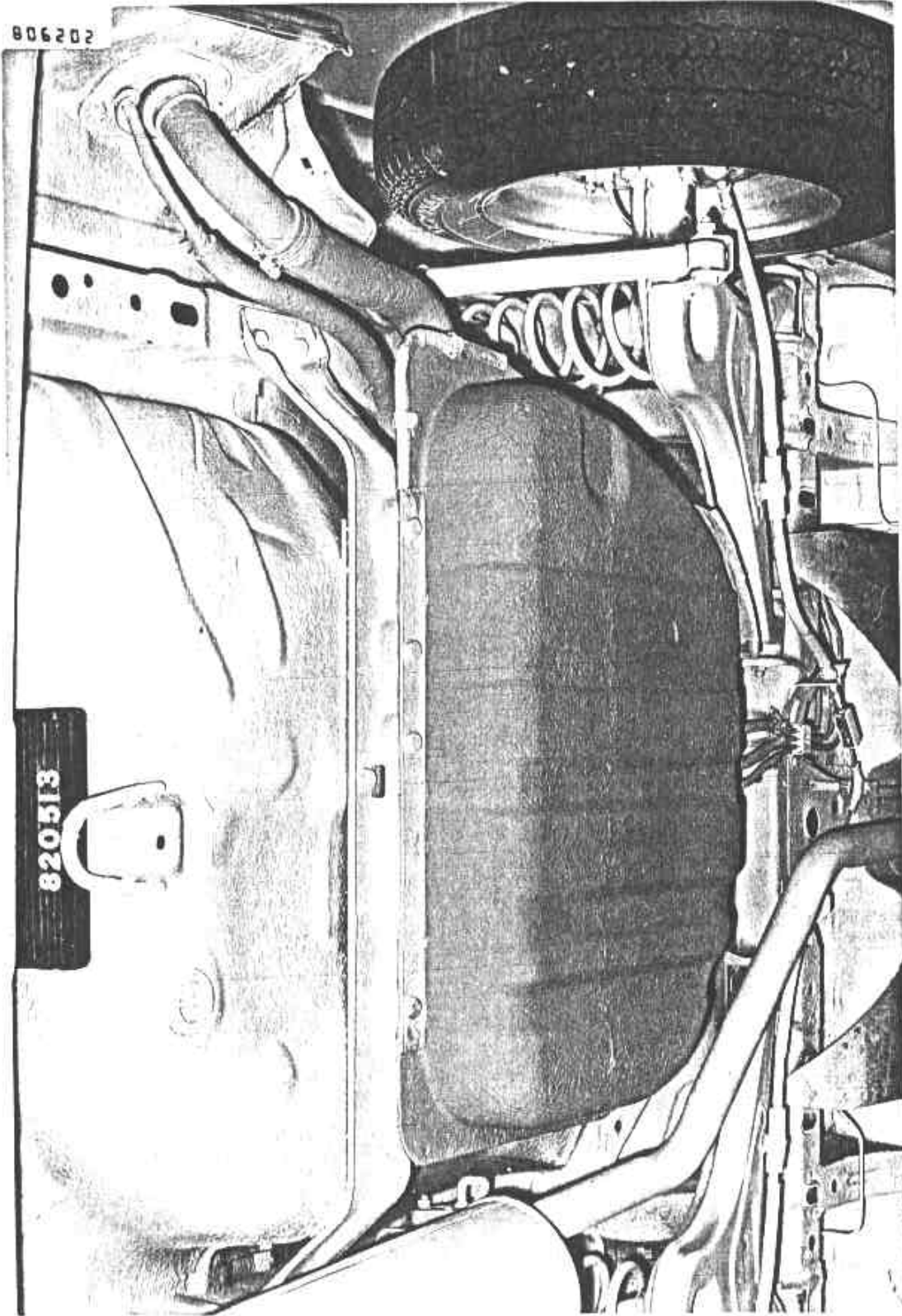


FIGURE 3-4. PRE-TEST FUEL TANK - 1982 NISSAN SENTRA - NHTSA 820513.

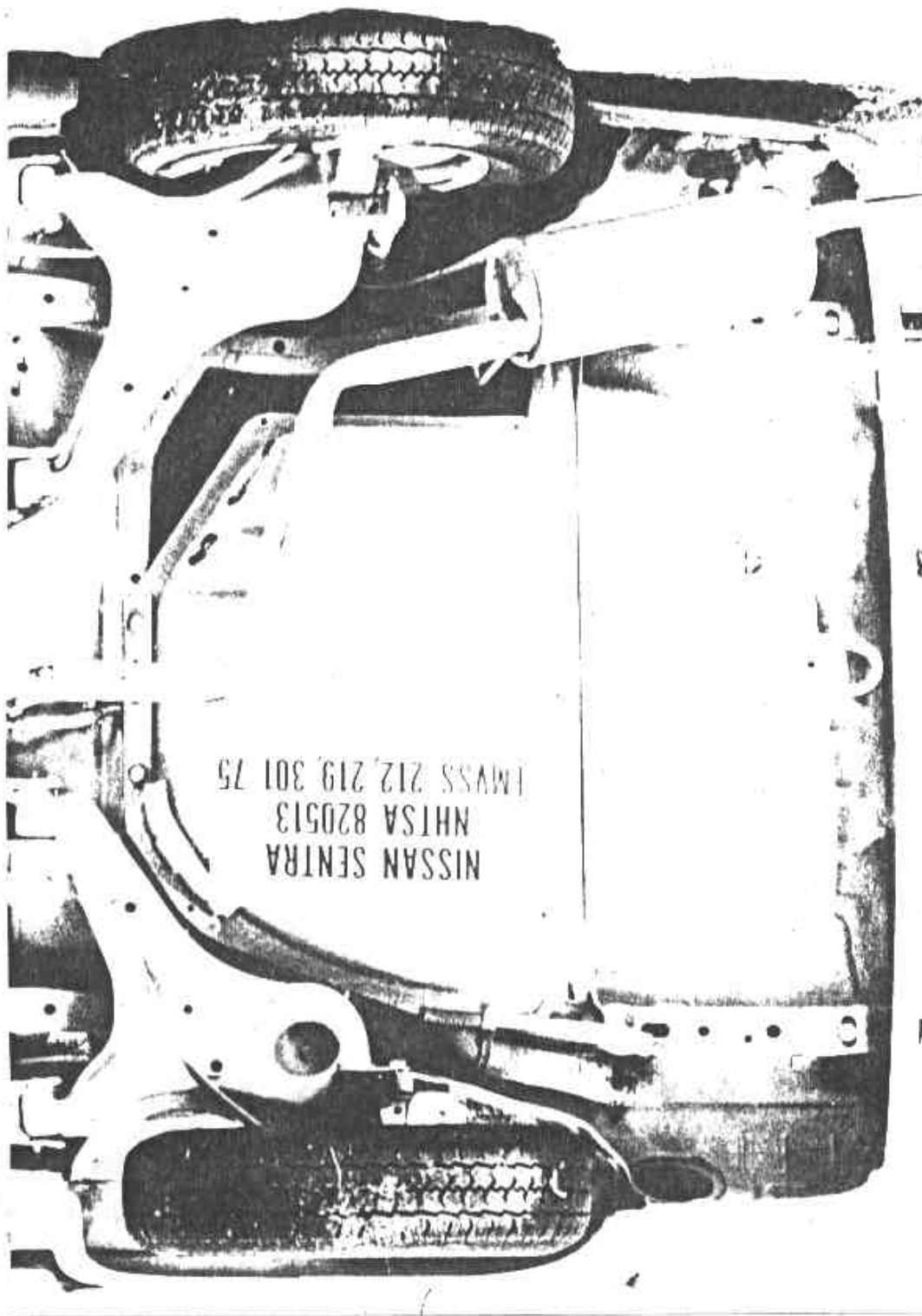


FIGURE 3-5. POST-TEST FUEL TANK - 1982 NISSAN SENTRA - NHTSA 820513.

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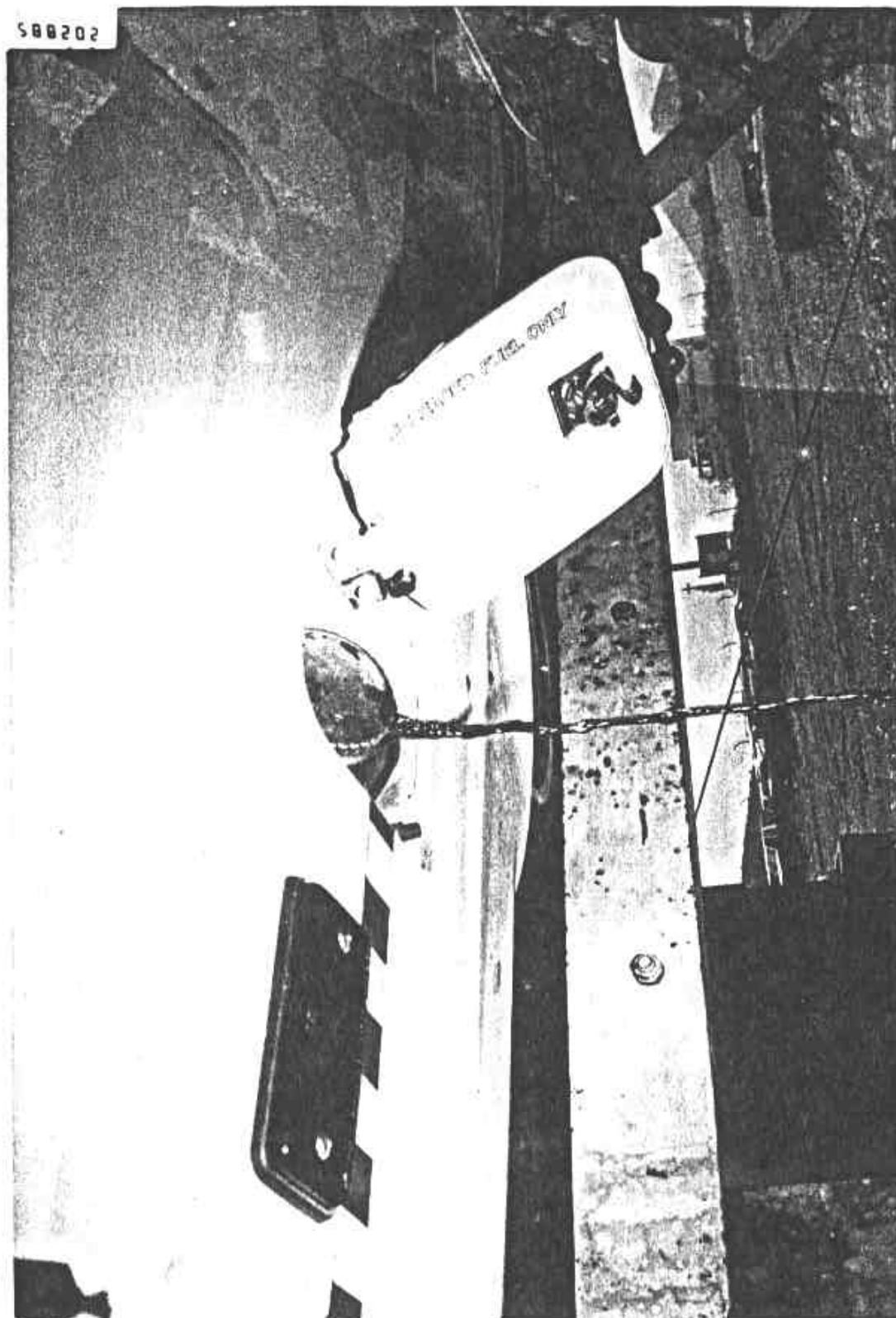


FIGURE 3-6. STODDARD LEAKING THROUGH FILLER CAP - 1982 NISSAN SENTRA - NHTSA 82513.

4.0 DATA REQUIRED BY R&D AND OAR

The following pages are included in this section:

1. Dummy positional data
2. Dummy injury summaries
3. Vehicle crush data
4. Accelerometer location and data summary
5. High-speed movie camera location and specification summary

Pertinent photographs are presented in Appendix A. Calcomp plots of dummy and vehicle accelerometer data are presented in Appendix B.

Part 572 DUMMY IN-VEHICLE POSITION RECORDING SHEET

PRE-IMPACT DATA

Make/Model: Nissan Sentra
 Body Style: 4-Door Coupe Model Year: 1982
 NHTSA No.: 820513 DSI No. 1252 Color: Cream

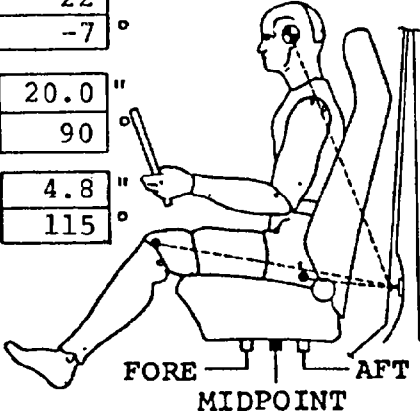
DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
 Date of Manufacture: 2/82; VIN: JN1HB11S6CU501672
 GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

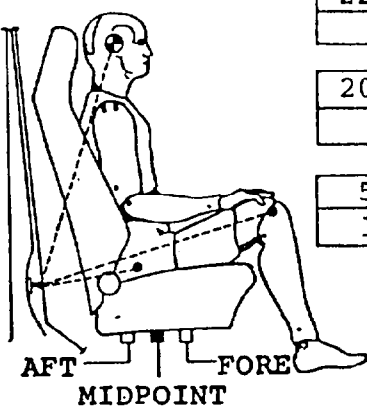
POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
 Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph
 Seat Type: Bucket Adjuster Type: Manual
 Rebound Distance 25.1 in. Static Crush: 24.6 in.
 Technicians: M. Rodack, B. Hyden, L. Johnson

DRIVER DUMMY# A 0 8		PASSENGER DUMMY # A 0 9	
HEAD TARGET	22" -7°	22.5" -6°	HEAD TARGET
KNEE JOINT	20.0" 90°	20.5" 93°	KNEE JOINT
APPROX- IMATE "H" POINT	4.8" 115°	5.0" 113°	APPROX- IMATE "H" POINT



FORE
MIDPOINT
AFT



AFT
MIDPOINT
FORE

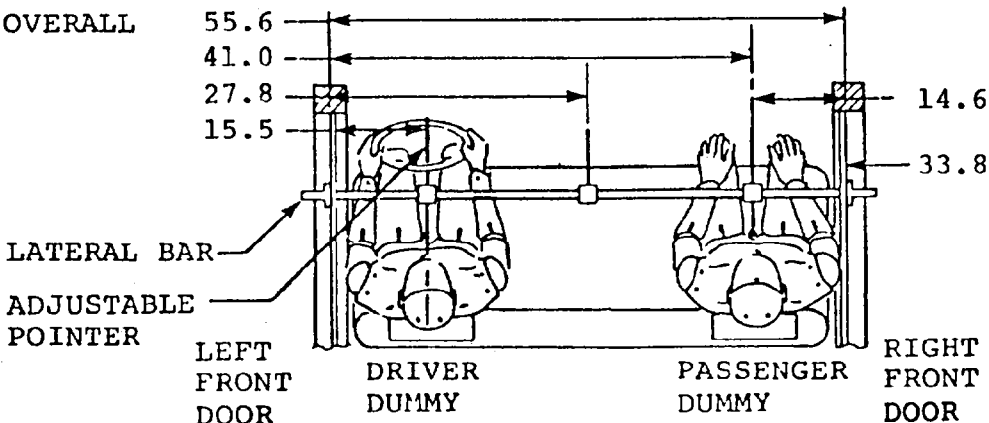
OVERALL

55.6

41.0

27.8

15.5



LATERAL BAR

ADJUSTABLE POINTER

LEFT FRONT DOOR

DRIVER DUMMY

PASSENGER DUMMY

RIGHT FRONT DOOR

14.6

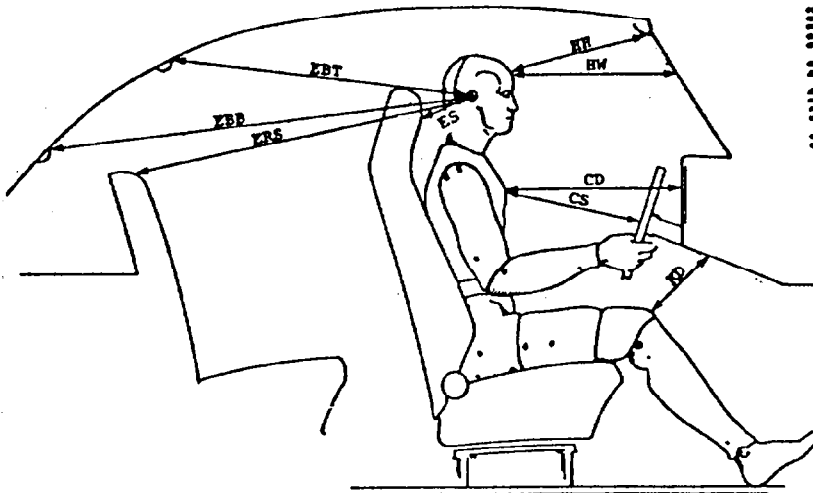
33.8

DOOR GLASS HEIGHT

A 0 8

A 0 9

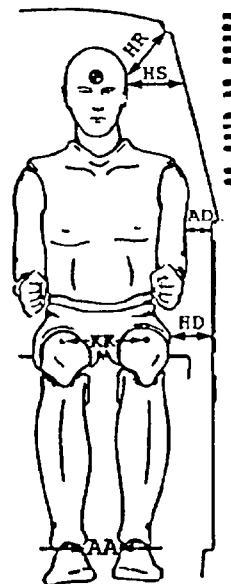
PART 572 DUMMY IN-VEHICLE POSITION RECORDING SHEET



	Driver	Passenger
HH	16.0	17.4
HW	24.0	24.5
CD	23.2	23.3
CS	14.7	N/A
KD R	6.3	6.3
KD L	7.0	6.5
Torso	Torso	
Angle	25°	Angle 25°
Seat Back	Seat Back	
Angle	25°	Angle 25°
HSW	22.1	N/A

HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knees to Dash
 HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee
 Torso and seat back angles are relative to vertical.

REMARKS: Dummies positioned according to OVSC recommended procedure for positioning Part 572 dummies in test vehicle.



	Driver	Passenger
HR	7.0	6.1
HS	6.4	5.5
AD	4.0	4.0
HD	6.0	6.0
KK	14.5	13.5
AA	15.5	14.0

PART 572 DUMMY DATA SUMMARY

	Driver Dummy				Passenger Dummy			
	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	6.0	40	114.4	83	11.1	48	169.7	88
Lateral	16.2	71	68.9	83	20.0	97	7.8	101
Vertical	53.5	96	15.8	68	70.8	93	5.9	14
Resultant	134.1	83	-	-	177.3	88	-	-
HIC	548.9 between 68 and 108 msec, 865.0 between 87 and 104 msec							
Chest Acceleration								
Longitudinal	4.2	200	42.5	80	1.0	146	48.5	96
Lateral	5.4	67	23.7	71	10.6	78	3.0	101
Vertical	7.7	105	11.7	74	10.6	106	10.8	76
Resultant (Max)	45.6	80	-	-	49.0	96	-	-
Resultant (clip)	43.3	78-81	-	-	45.9	95-98	-	-
TIME > 60 G	0 msec				0 msec			
SEVERITY INDEX	485 @ 200 msec				339 @ 200 msec			
	Peak (lb)	Time (msec)	Peak (lb)	Time (msec)	Peak (lb)	Time (msec)	Peak (lb)	Time (msec)
Femur Loads								
Left	563.8	60	499.4	35	261.3	55	1111.4	66
Right	267.5	52	103.4	67	150.5	76	250.7	91
Belt Loads								
Lap	1528.9	67			1359.8	67		
Torso	1317.9	83			1496.4	94		
Belt Stretch/Spoolout Measurements								
	Peak (in.)		Time (msec)		Peak (in.)		Time (msec)	
String Pot	5.5 (5.2)		92 (83)		6.0		92	
Extensiometer @ Max Load	0.6 (12%)		83 (1318 lb)		0.2 (4%)		92 (1496 lb)	
Extensiometer	1.3 (26%)		-		0.2		92	
Film Data	4.3		84		4.5		92	
Vehicle Impact Speed (mph): 35.18								
*Longitudinal:	Forward				**Longitudinal:	Rearward		
Lateral:	Rightward				Lateral:	Leftward		
Vertical:	Downward				Vertical:	Upward		

DUMMY KINEMATIC SUMMARY

1982 Nissan Sentra 4-Door Coupe
NHTSA 820513

DRIVER - The driver torso rocked forward on impact. Instrument panel rotated upward and aft dislodging the windshield. The steering wheel also rotated upward and aft. The lower rim contacted the chest at 65 ms and lightly touched the chest of the dummy until the hub of the steering wheel collided with the face of the occupant at 75 ms. The head rebounded off the wheel at 126 ms. The driver then leaned inboard and recontacted the seat back.

PASSENGER - The passenger torso rotated forward after impact as the dash rotated upward and aft. The forehead and nose contacted the dash just above the glove box at 85 ms slightly forcing the dash forward and further pushing the windshield out (increased retention loss on right side). The head rebounded at 130 ms and recontacted the seat back headrest at 230 ms.

VEHICLE PROFILE DATA SHEET

PRE-IMPACT DATA

Make/Model: Nissan Sentra
 Body Style: 4-Door Coupe Model Year: 1982
 NHTSA No.: 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

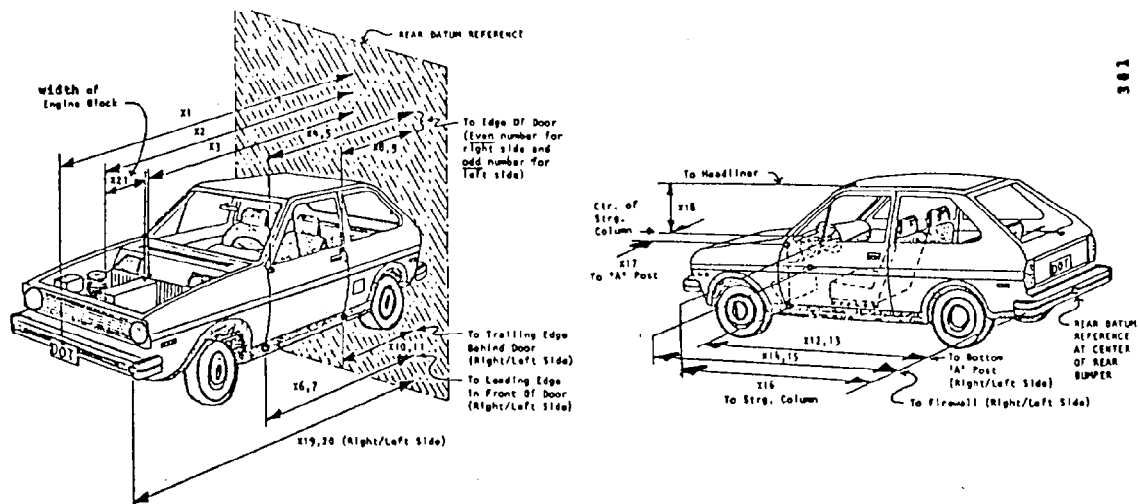
Vehicle Manufacturer: Nissan Motor Company, Ltd.
 Date of Manufacture: 2/82; VIN: JN1HB11S6CU501672
 GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
 Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph

Measurements Referenced to Plane 14.4 Feet Forward of Rear Bumper ℄

Location	Height	Vehicle Left (in.)				Vehicle Right (in.)			
		28.0	16.8	5.6	℄	5.6	16.8	28.0	
		26.5	15.9	5.3	℄	5.3	15.9	26.5	
Pre-test Profile (in.)									
Top of Front Bumper	20.1	2.5	0.6	0.3	0.3	0.3	0.8	2.6	
Front of Hood	29.5	10.3	8.6	8.2	8.0	8.1	8.7	10.6	
Post-test Profile (in.)									
Top of Front Bumper	19.5	25.4	24.3	24.3	24.4	24.6	25.1	25.4	
Front of Hood	29.5	29.3	28.8	28.8	29.0	29.4	29.7	28.9	
Post-test Static Crush (in.)									
Top of Front Bumper		22.9	23.7	24.0	24.1	24.3	24.3	22.8	
Front of Hood		19.0	20.2	20.6	21.0	21.3	21.0	18.3	



PRE-/POST-TEST STATIC MEASUREMENT DATA

Vehicle: Nissan Sentra

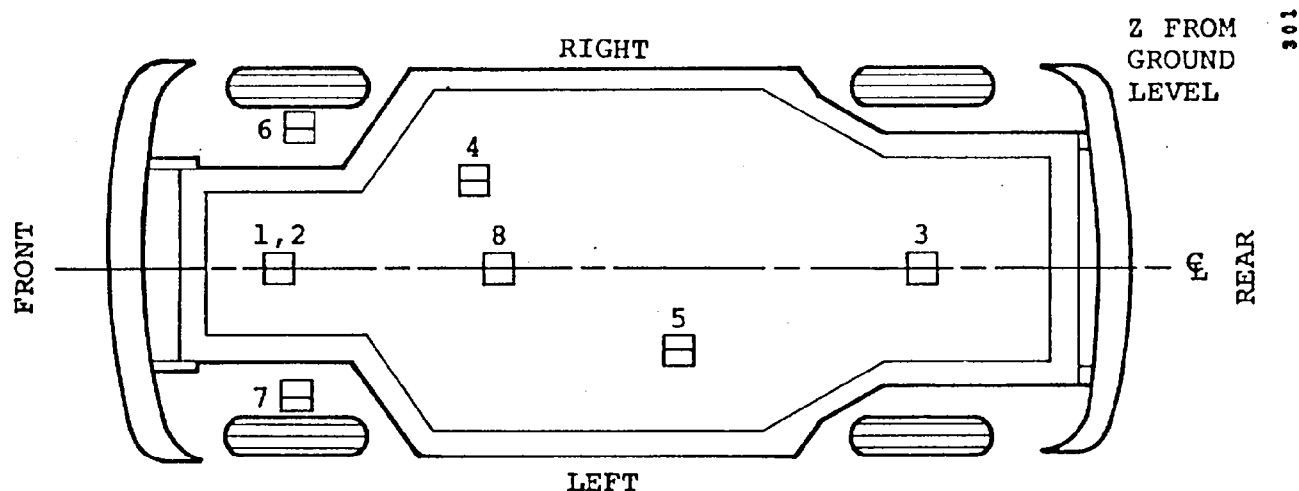
NHTSA No.: 820513

Test Date: 7/29/82

D.S. No.: 1252

Reference Dimension	Pre-test Measurement	Post-test Measurement	Change
X1	166.7	142.1	24.6
X2	144.8	132.0	12.8
X3	127.3	117.9	9.4
X4	114.1	114.0	0.1
X5	114.4	114.1	0.3
X6	114.2	111.9	2.3
X7	114.5	111.9	2.6
X8	75.3	76.3	-1.0
X9	75.4	76.1	-0.7
X10	76.1	75.1	-1.0
X11	75.8	75.5	0.3
X12	113.7	111.3	2.4
X13	113.8	110.6	3.2
X14	126.4	118.6	7.8
X15	126.6	119.3	7.3
X16	100.5	97.3	3.2
X17	15.1	12.9	2.2
X18	16.8	12.5	4.3
X19	164.3	141.2	23.1
X20	164.1	141.2	22.9
X21	12.9	12.9	0.0

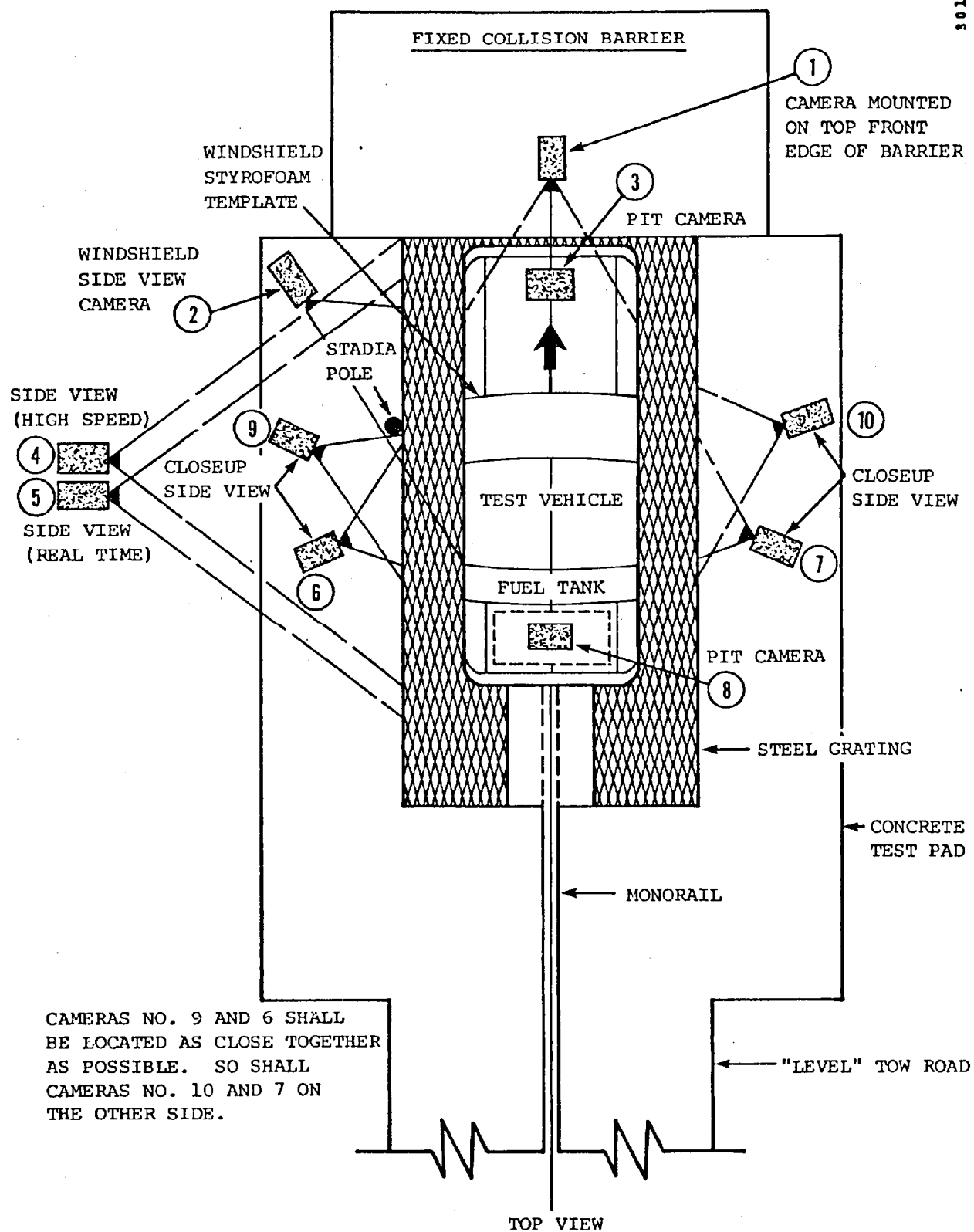
VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY



LINEAR ACCELEROMETERS

☐ LONGITUDINAL

Vehicle Accelerometer Locations and Coordinates					Maximum Readings			
No.	Description of Location	X	Y	Z	+G's MS	-G's MS		
1	Top of Engine	142.6	-0.5	31.0	18.3	41	147.6	35
2	Bottom of Engine	135.2	9.3	12.2	77.9	44	114.7	39
3	Differential Housing	NA - Front Wheel Drive Vehicle						
4	Right "B" Pillar $\Delta V = 36.6$ mph	75.4	25.0	9.0	4.3	180	34.3	42
5	Left "B" Pillar $\Delta V = 38.5$ mph	75.3	-25.0	9.0	4.1	170	29.5	52
6	Right Front Brake Caliper	138.3	24.0	11.8	36.2	61	156.1	47
7	Left Front Brake Caliper	138.2	-24.0	11.8	77.2	63	135.0	47
8	Vehicle C.G. $\Delta V = 37.3$ mph	94.5	0.0	14.5	20.1	47	61.3	51



SUMMARY OF CAMERA LOCATIONS AND DESCRIPTIONS

Loc. No.	Location	Field of View	Lens Size	Frame Rate	Timing Speed	Serial Number	Impact Dist-X	Center-line Dist-Y	Camera Height
1	Overhead (Barrier)	Windshield styrofoam up to barrier-vehicle contact if possible	10 mm	407 fps	100 Hz	M3	-1'	0	9'
2	Ground Based (Left)	Windshield	16 mm	396 fps	99 Hz	M9	-1'	11'	66"
3	Pit	Engine underside and fuel pump	13 mm	660 fps	99 Hz	6	4'	0	-8'
4	Ground Based (left)	Views entire left of vehicle	25 mm	392 fps	100 Hz	M7	8'	34'	52"
5	Ground Based (Real Time)	Documentary	Vari-able	24 fps	-	Scoopic	-	-	-
6	Ground Based (Left)	Driver dummy closeup	16 mm	500 fps	100 Hz	LC 327	9'	16'	52"
7	Ground Based (Right)	Passenger dummy closeup	15 mm	541 fps	99 Hz	10	8'	-12'	52"
8	Pit	Fuel tank	13 mm	550 fps	100 Hz	7	9'	0	-8'
9	Ground Based (Left)	Same view as Camera No. 6	13 mm	613 fps	99 Hz	8	8'	16'	52"
10	Ground Based (Right)	Same view as Camera No. 7	15 mm	460 fps	100 Hz	LC 326	9'	-12'	54"
11	On-board (Right)	Passenger retractor	8 mm	455 fps	99 Hz	12	-	-	-
12	On-board (Left)	Driver retractor	8 mm	392 fps	100 Hz	11	-	-	-

APPENDIX A
PHOTOGRAPHS

626202

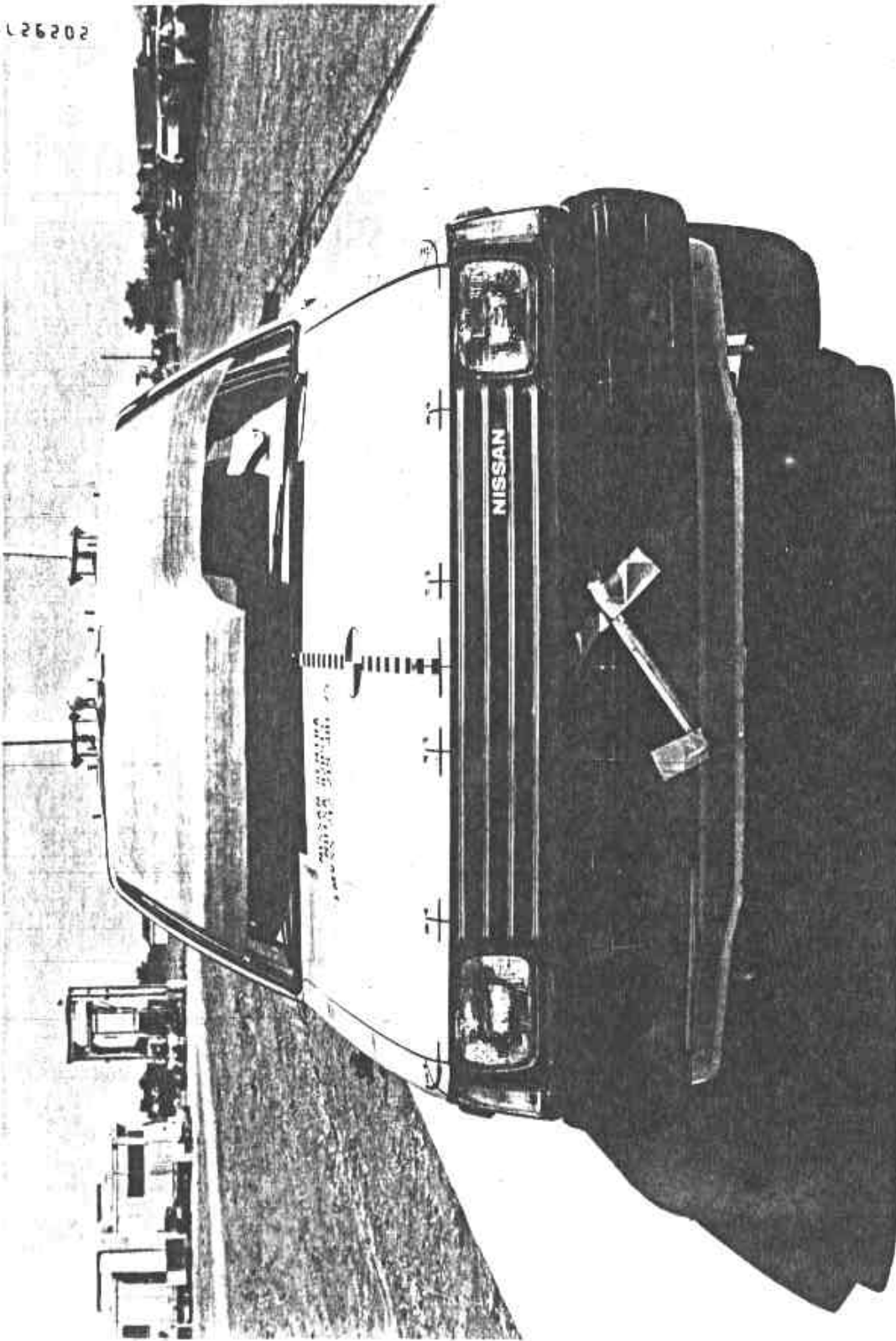


FIGURE A-1. PRE-TEST FRONT VIEW - 1982 NISSAN SENTRA - NHTSA 82513.

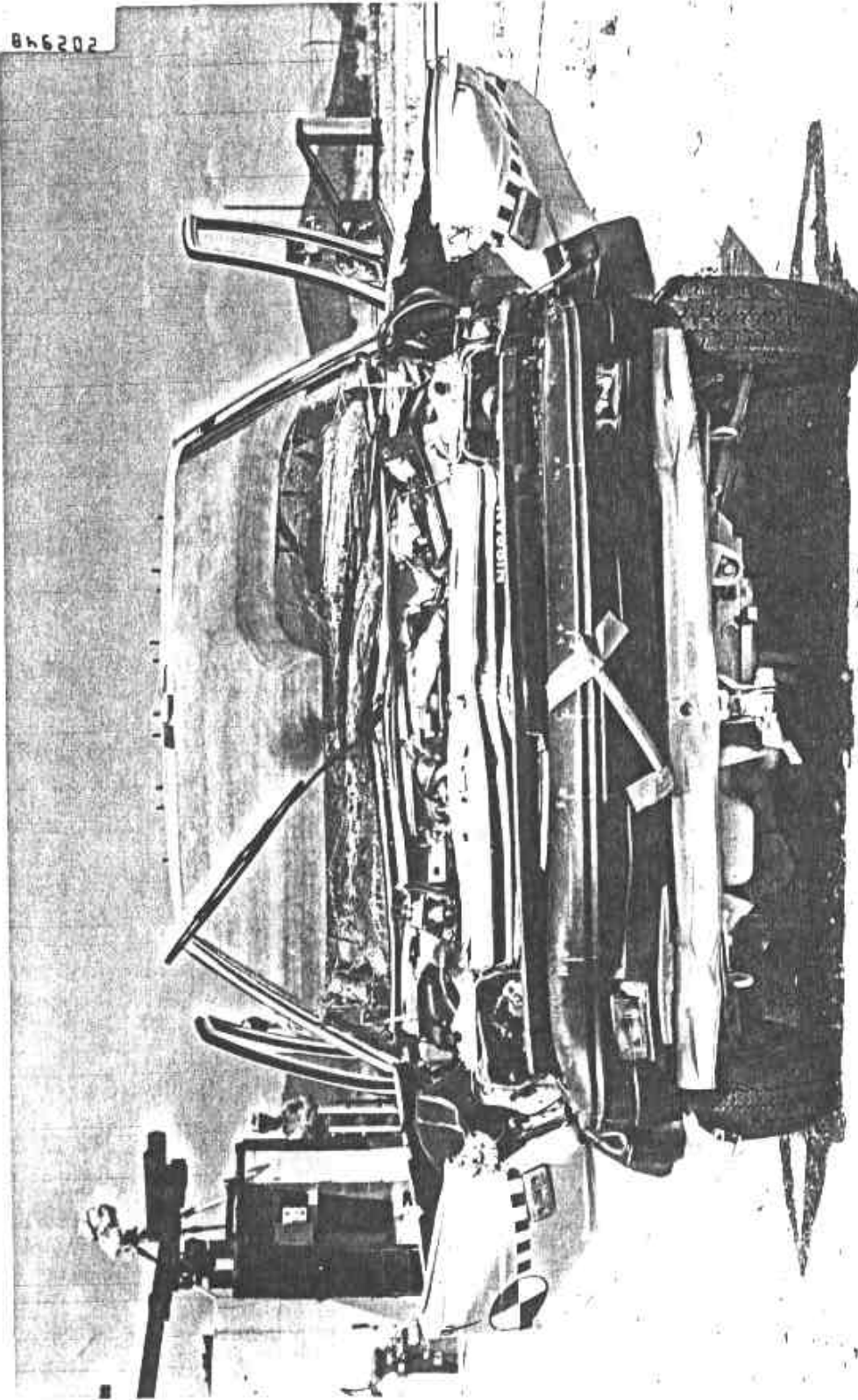


FIGURE A-2. POST-TEST FRONT VIEW - 1982 NISSAN SENTRA - NHTSA 82513.

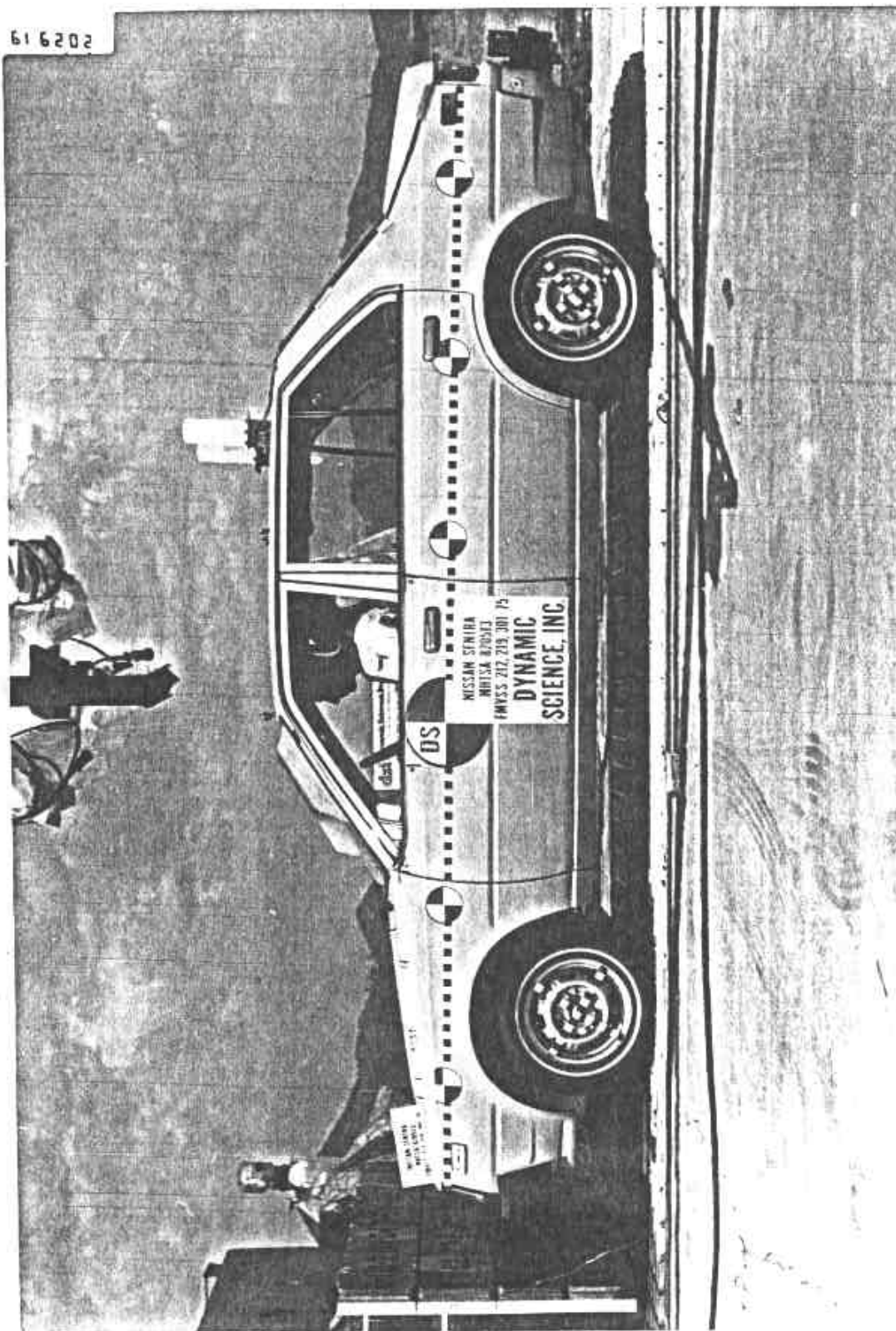


FIGURE A-3. PRE-TEST VIEW - 1982 NISSAN SENTRA - NHTSA 82513.

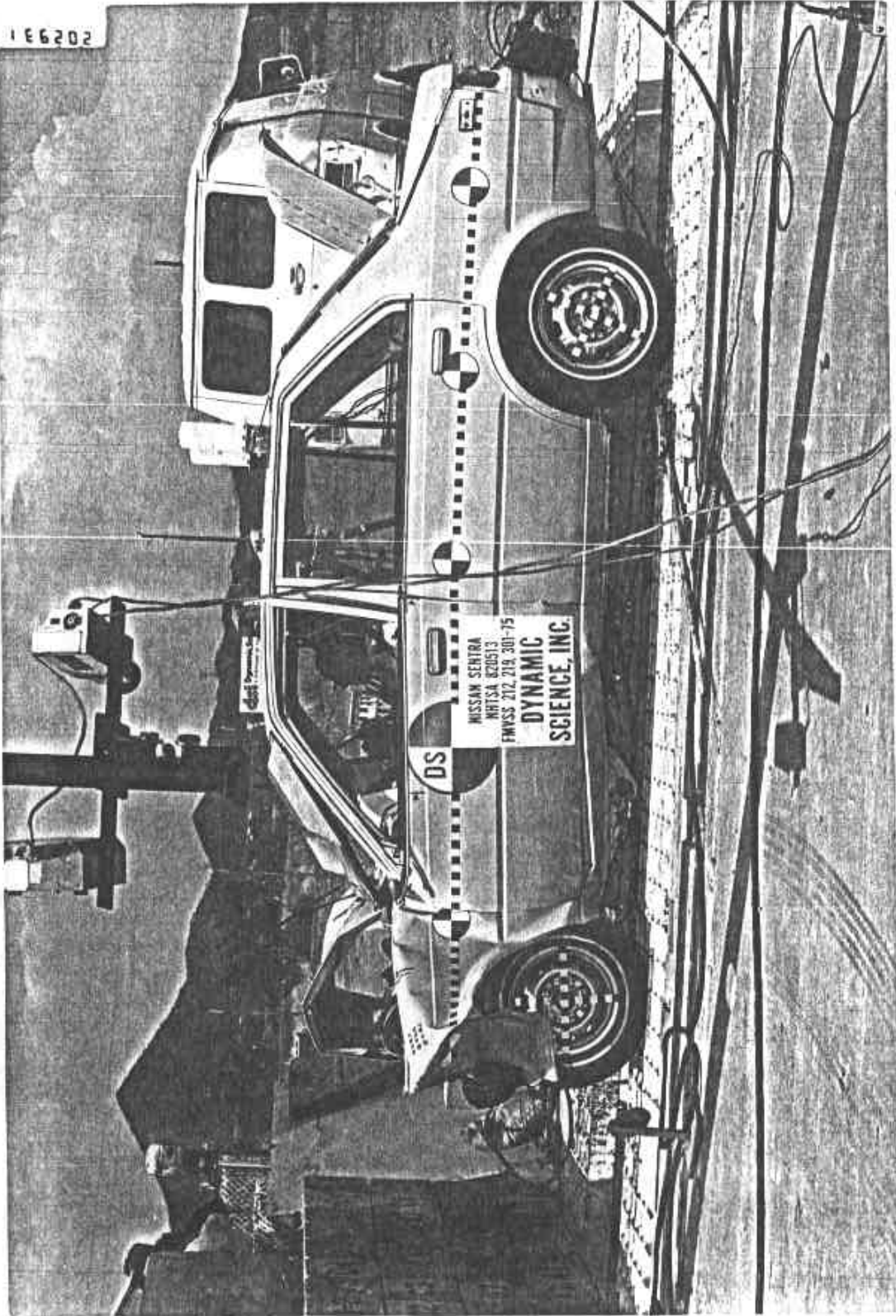


FIGURE A-4. POST-TEST SIDE VIEW - 1982 NISSAN SENTRA - NHTSA 82513.



FIGURE A-5. PRE-TEST DRIVER DUMMY POSITION -
1982 NISSAN SENTRA - NHTSA 82513.



FIGURE A-6. POST-TEST DRIVER DUMMY POSITION -
1982 NISSAN SENTRA - NHTSA 82513.



FIGURE A-7. PRE-TEST PASSENGER DUMMY POSITION -
1982 NISSAN SENTRA - NHTSA 82513.



FIGURE A-8. POST-TEST PASSENGER DUMMY POSITION -
1982 NISSAN SENTRA - NHTSA 82513.

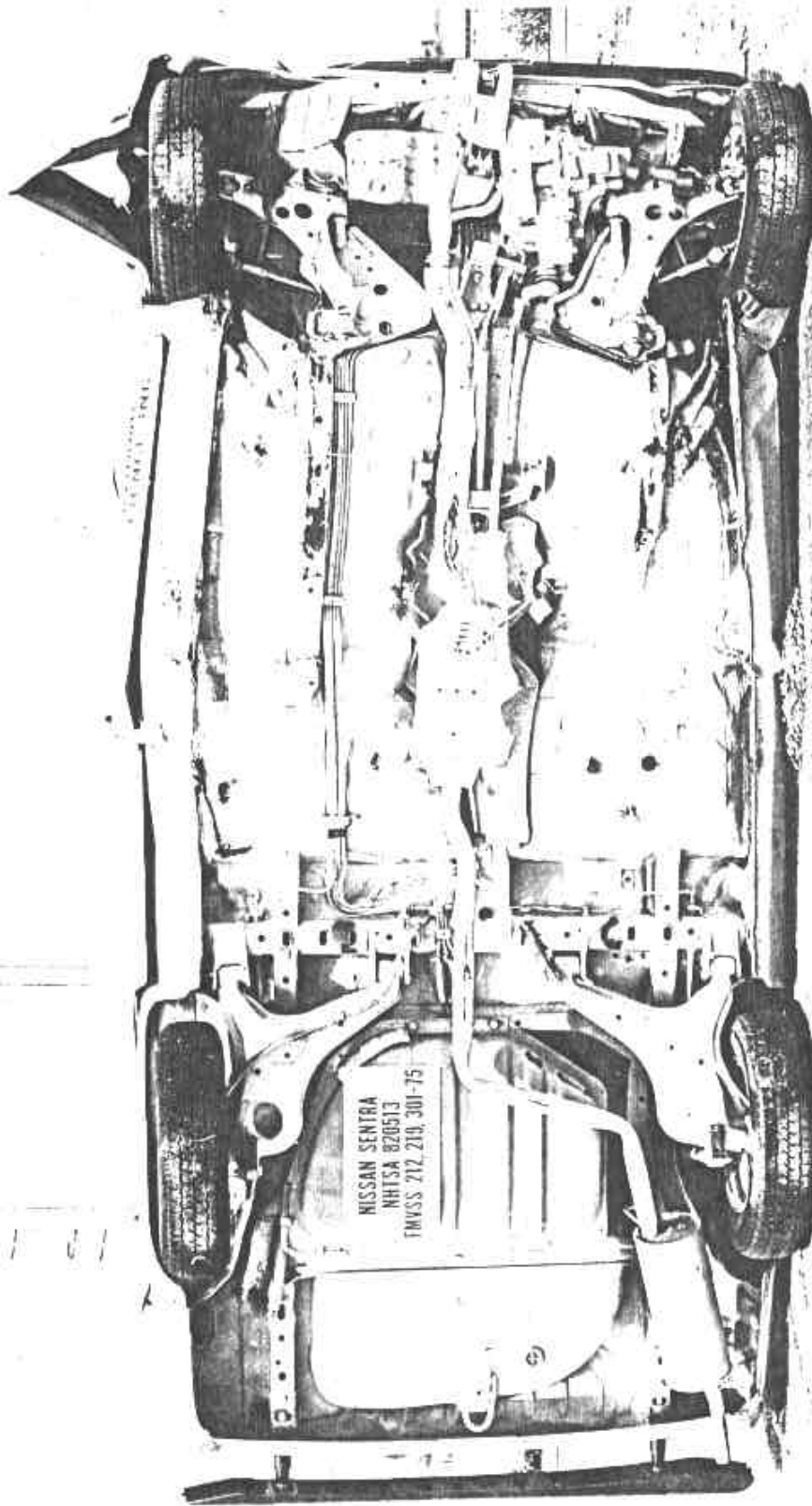


FIGURE A-9. POST-TEST VIEW OF VEHICLE UNDERSIDE - 1982 NISSAN SENTRA - NHTSA 82513.

APPENDIX B CALCOMP PLOT PRESENTATION

Calcomp plots generated from the crash test data are presented on the following pages. All data were recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data was filtered according to SAE J211. Plot legends and test anomalies are listed below:

PLOT LEGEND

Dummy Data*

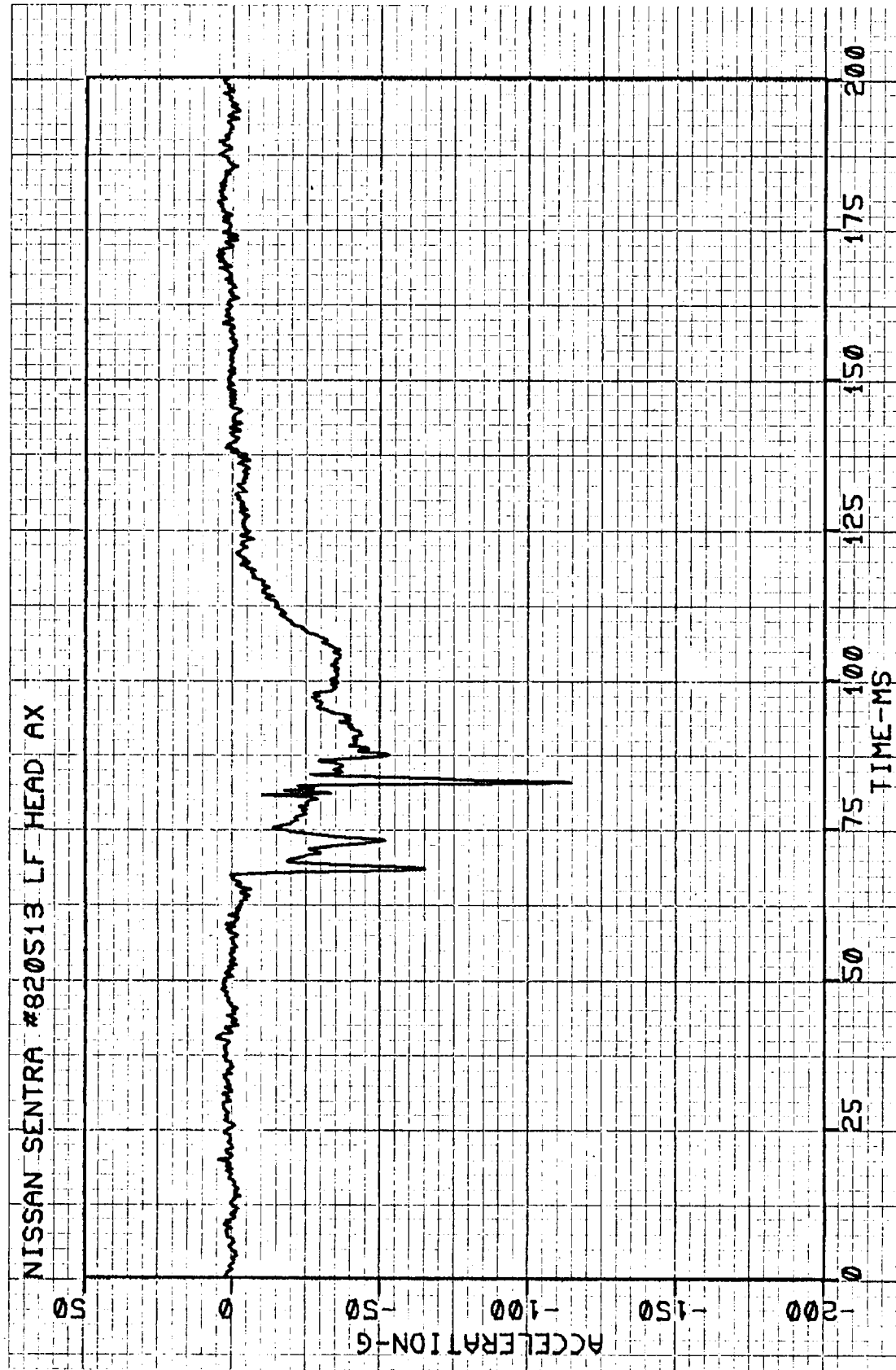
Driver	RF Outboard Passenger	Data Description
LF Head	RF Head	Head Acceleration (g)
LF Chest	RF Chest	Chest Acceleration (g)
LF Femurs	RF Femurs	Femur Loads (lb)
LF Belt Loads	RF Belt Loads	Lap and Torso Belt Loads (lb)
LF Belt Dis- placement	RF Belt Dis- placement	Belt Displacement (in.)
LF Extensio- meter	RF Extensio- meter	Belt Stretch

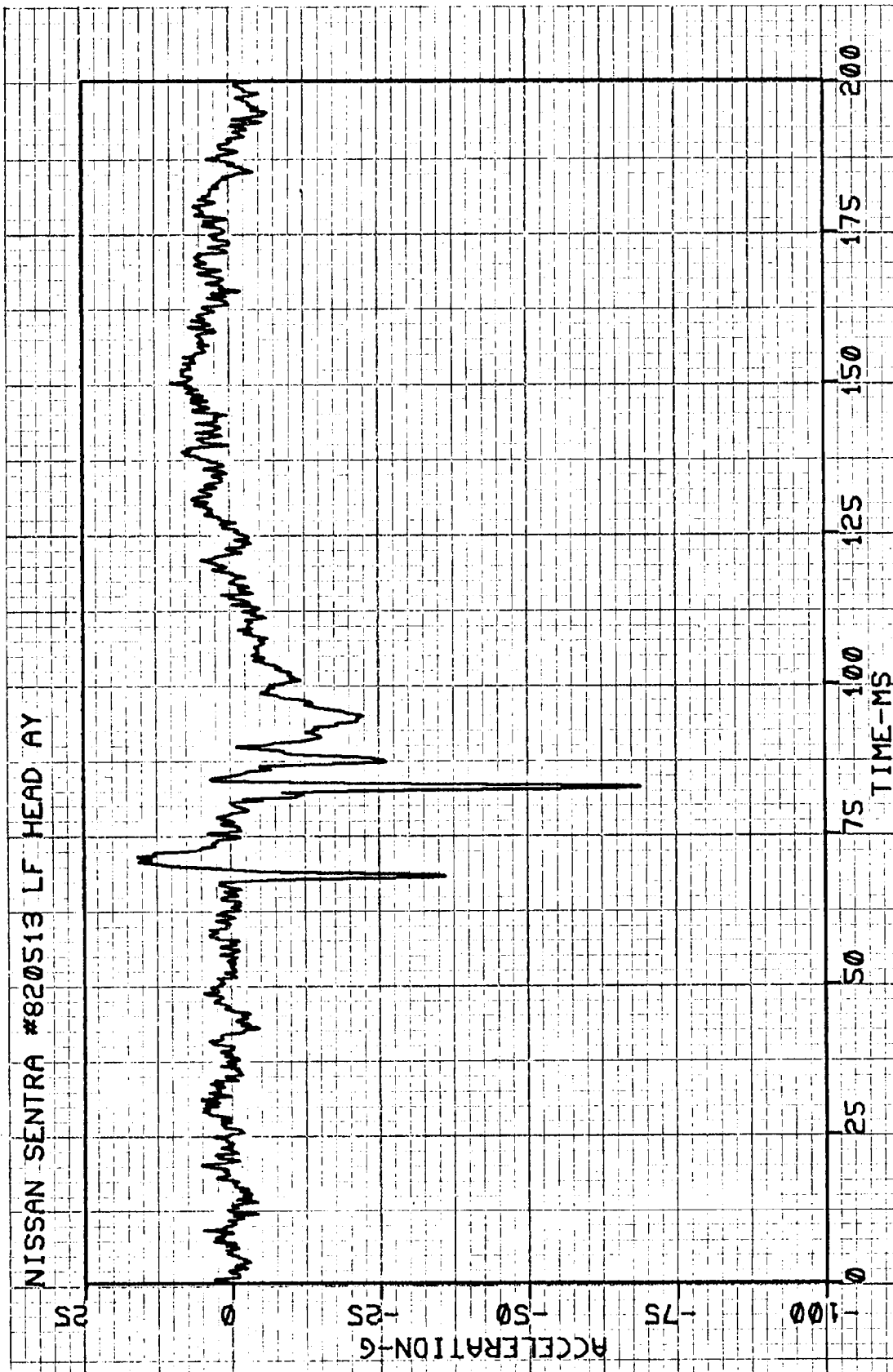
Vehicle Data**

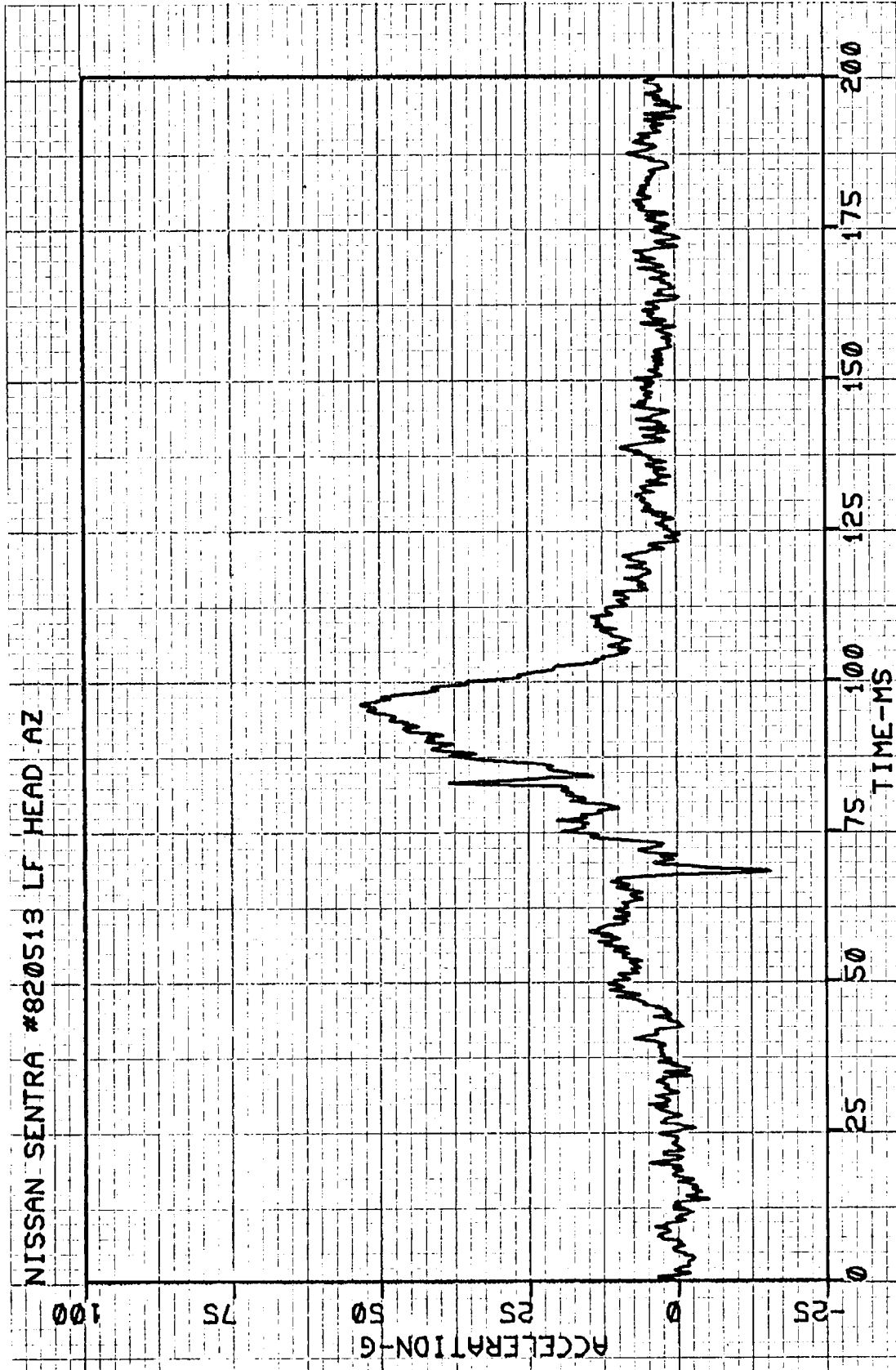
Location	Acceleration (g)
Loc 1	Top of Engine
Loc 2	Bottom of Engine
Loc 4	Right "B" Pillar
Loc 5	Left "B" Pillar
Loc 6	Right Front Brake Caliper
Loc 7	Left Front Brake Caliper
Loc 8	Vehicle C.G.

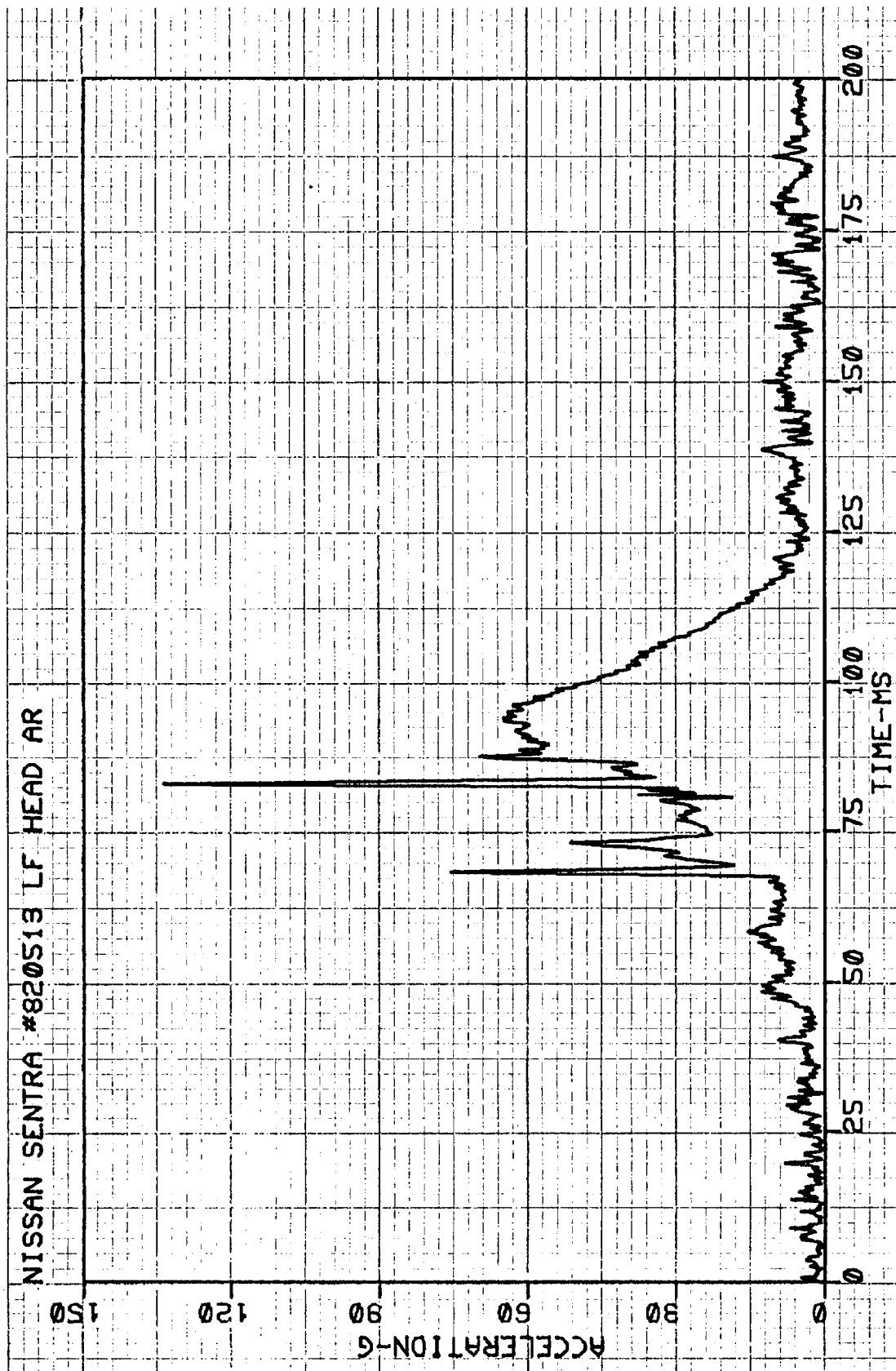
*Dummy Injury Summary presented on pages 4-4 and 4-5.

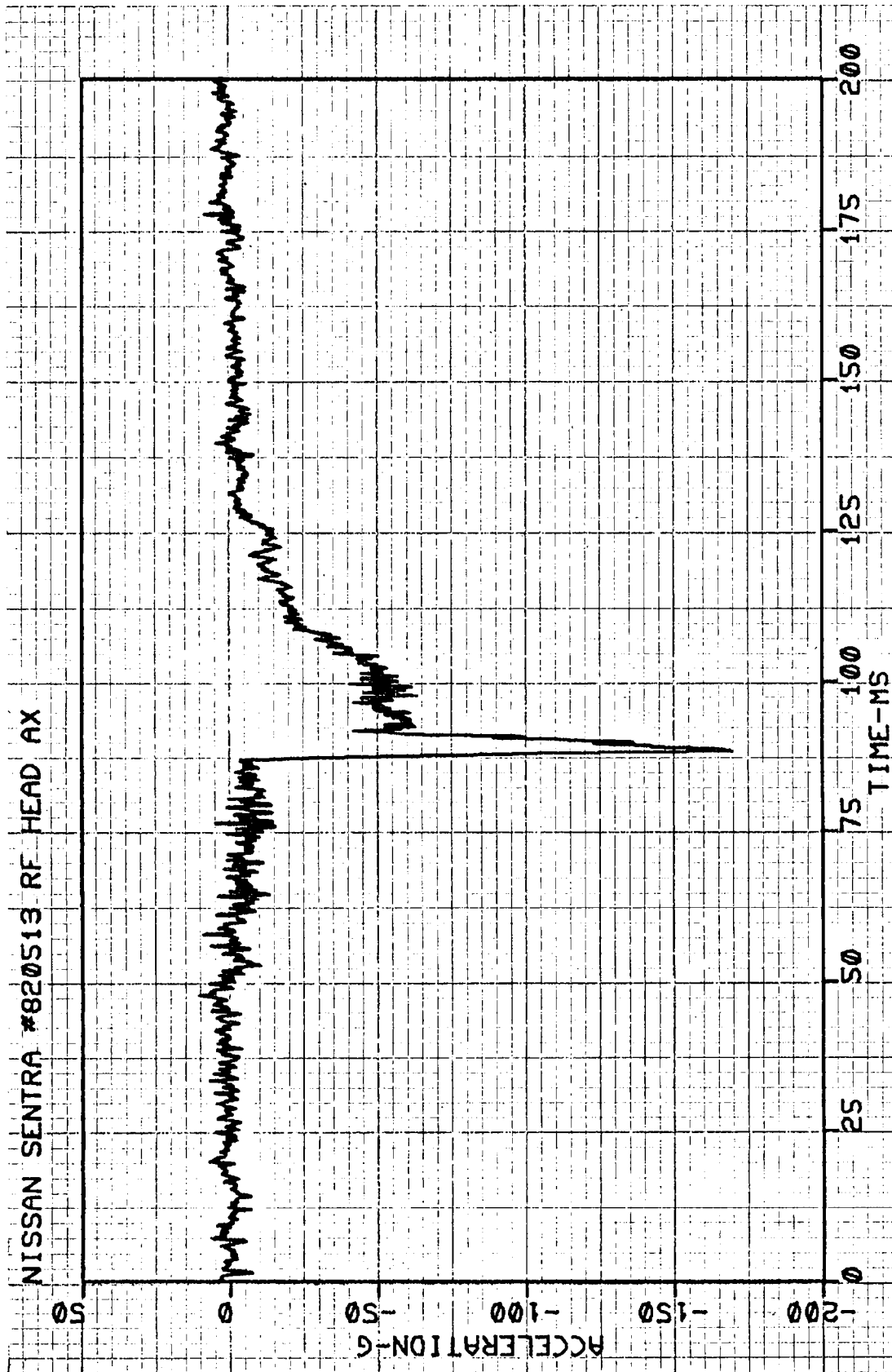
**Vehicle accelerometer locations and data summarized on page 4-8.

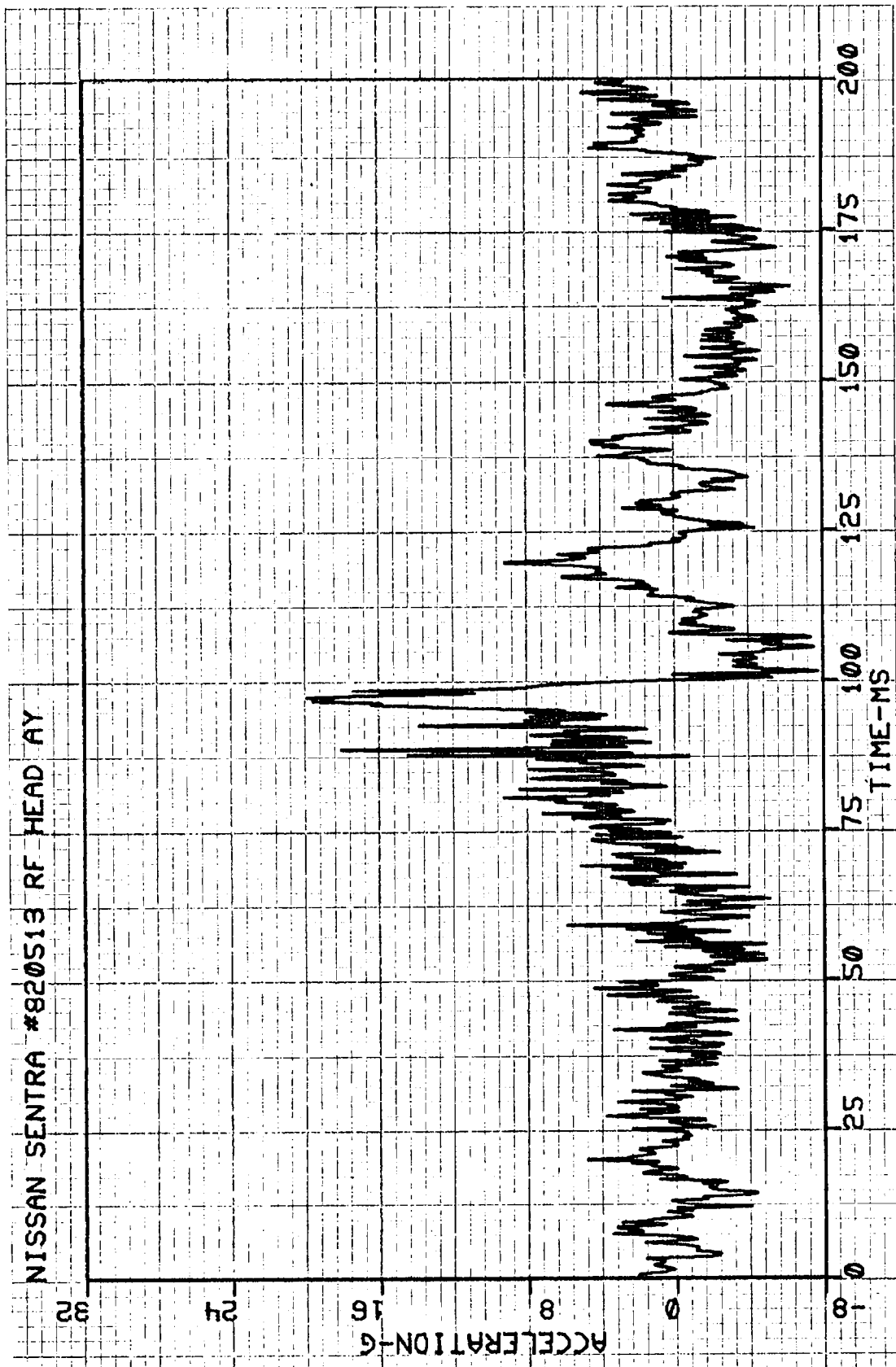












NISSAN SENTRA #820513 RF HEAD AZ

100

75

50

25

0

ACCELERATION-G

TIME-MS

200

175

150

125

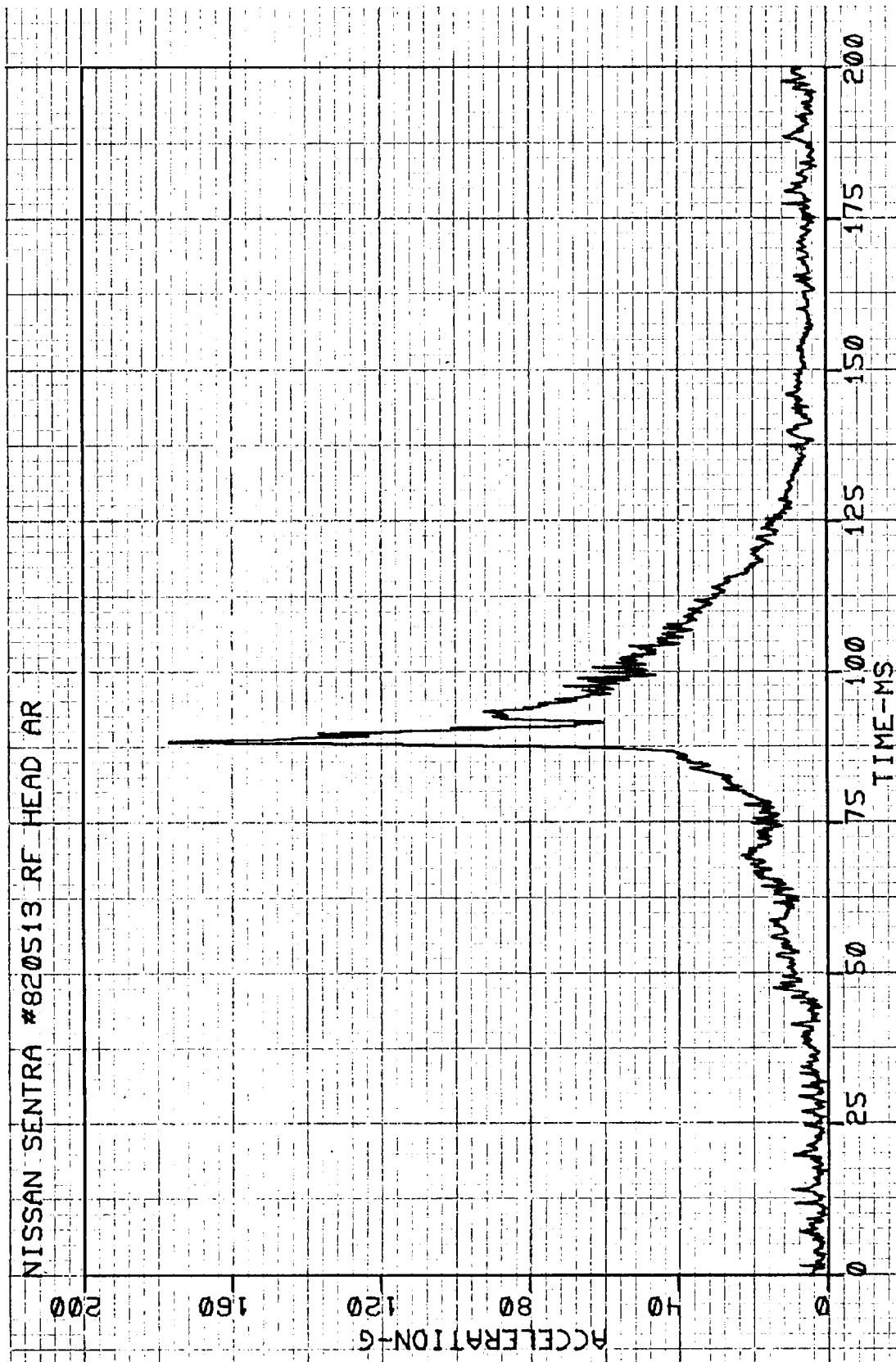
100

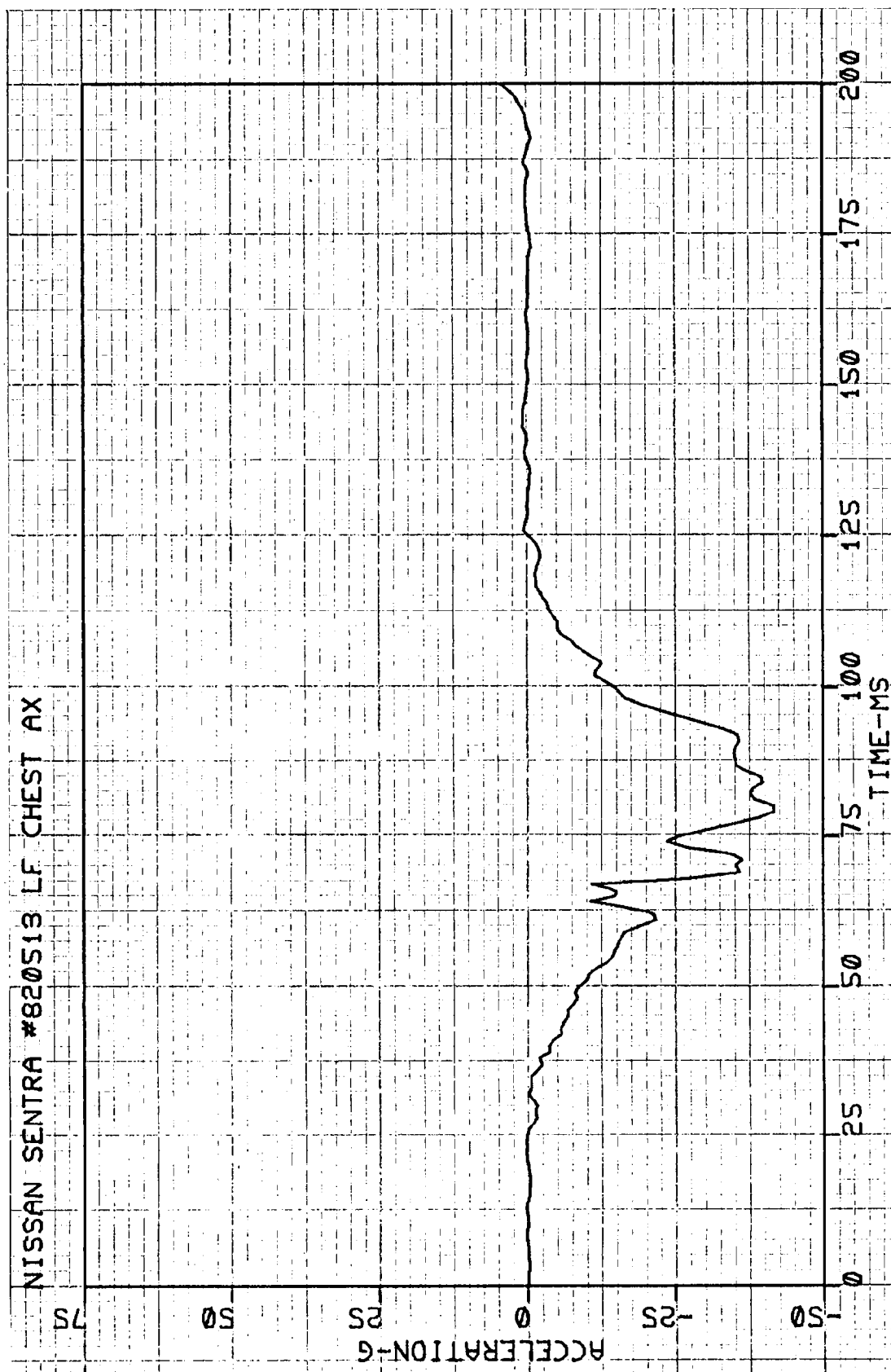
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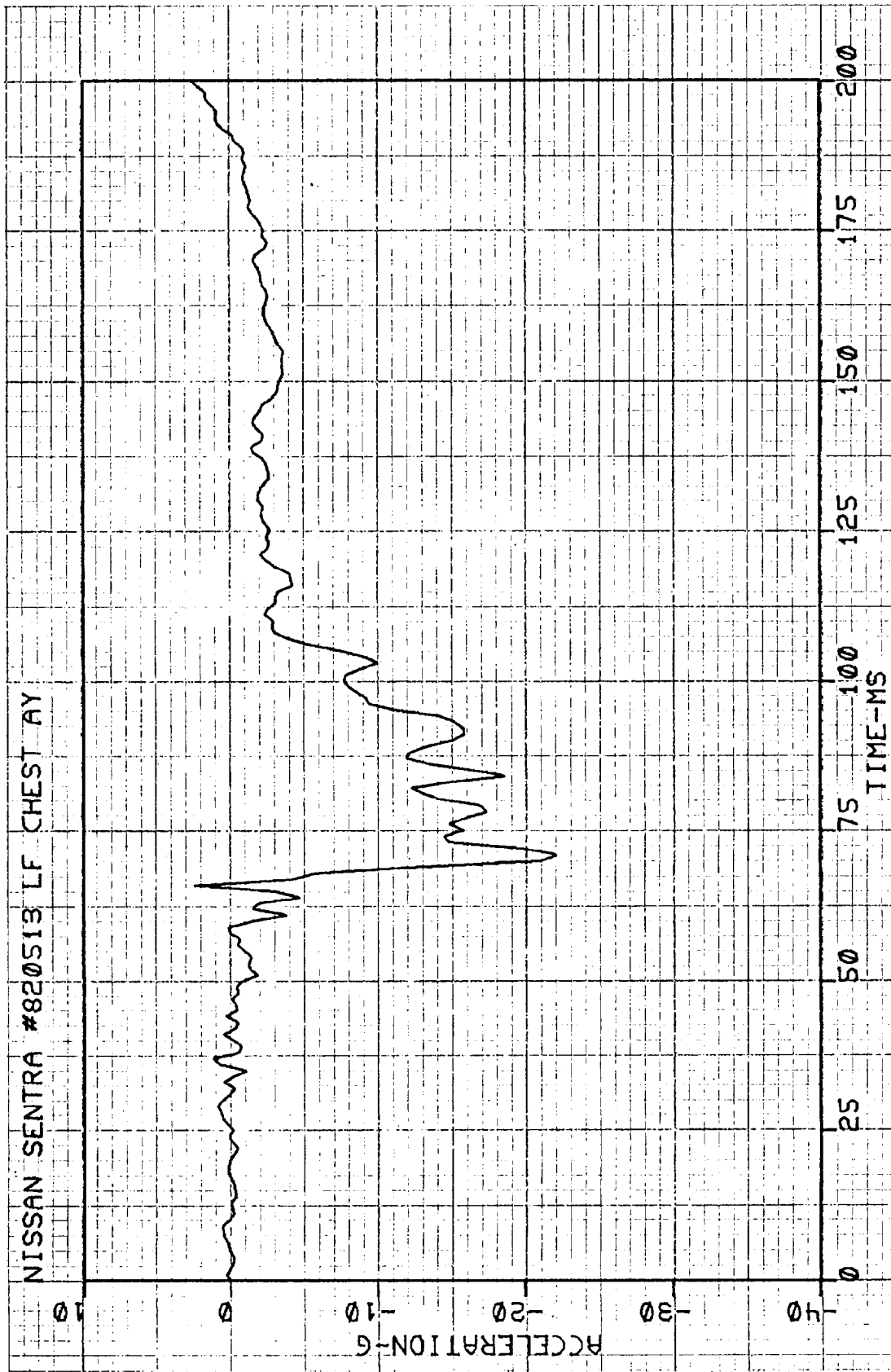
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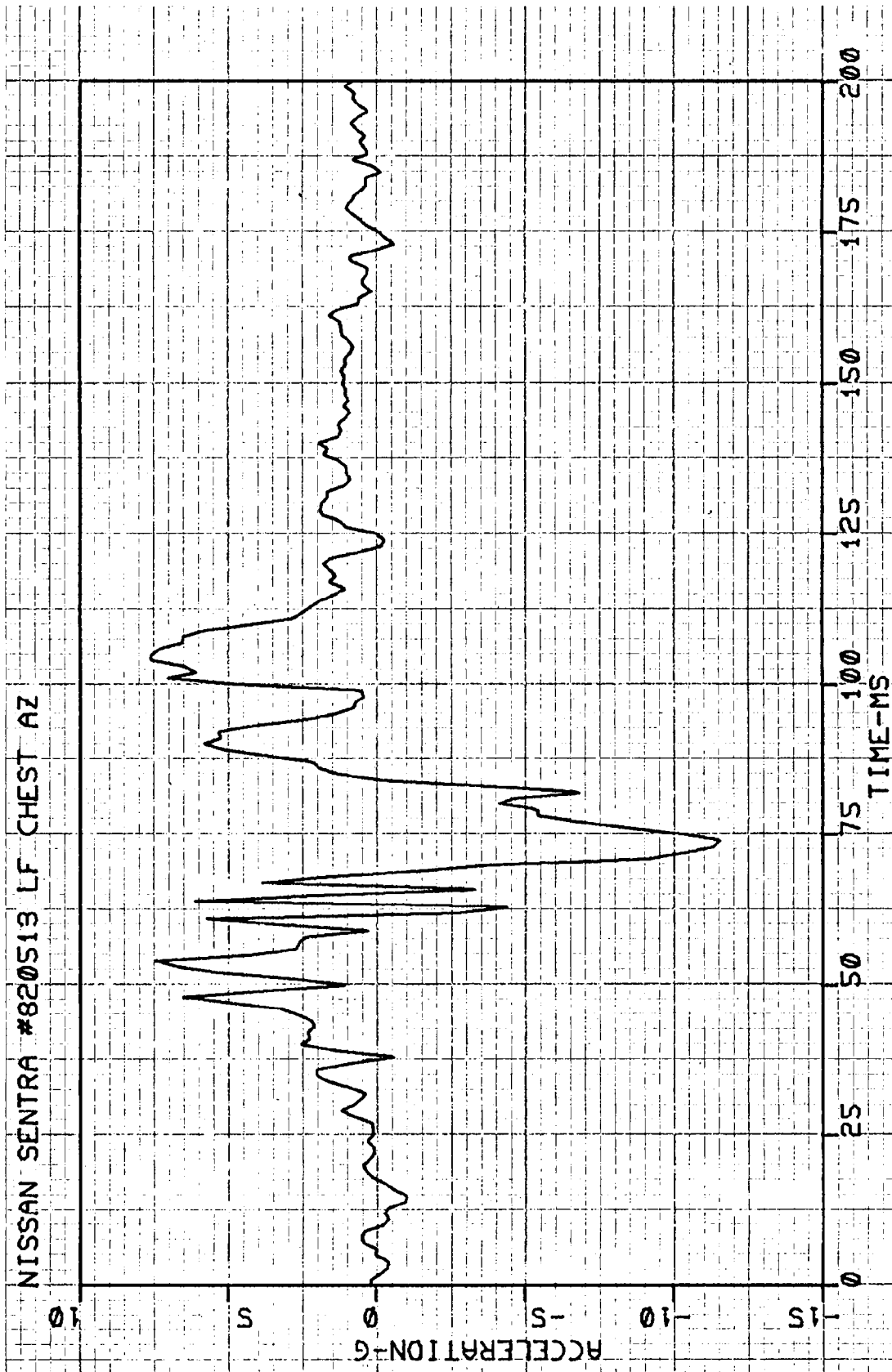
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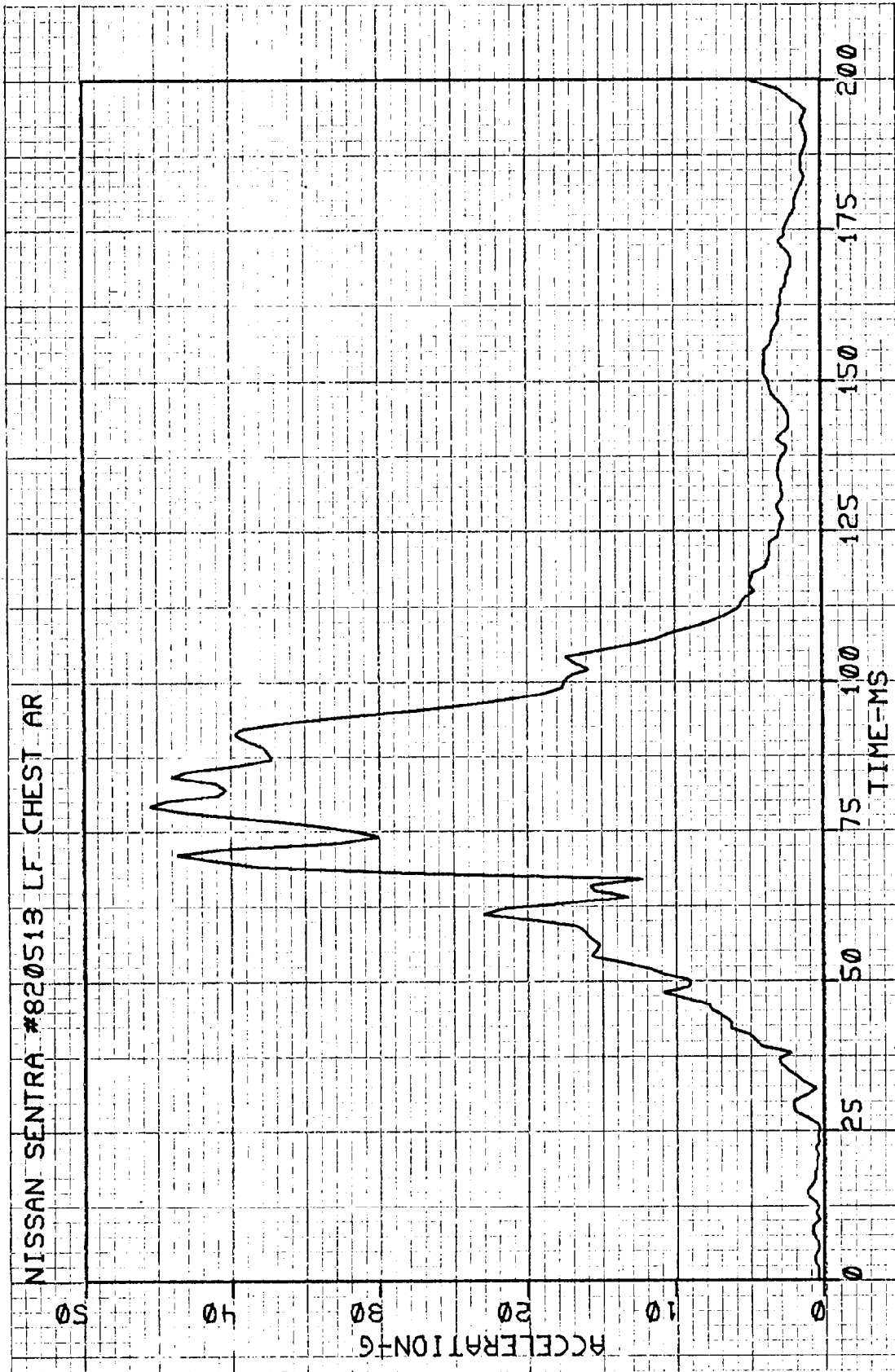
0

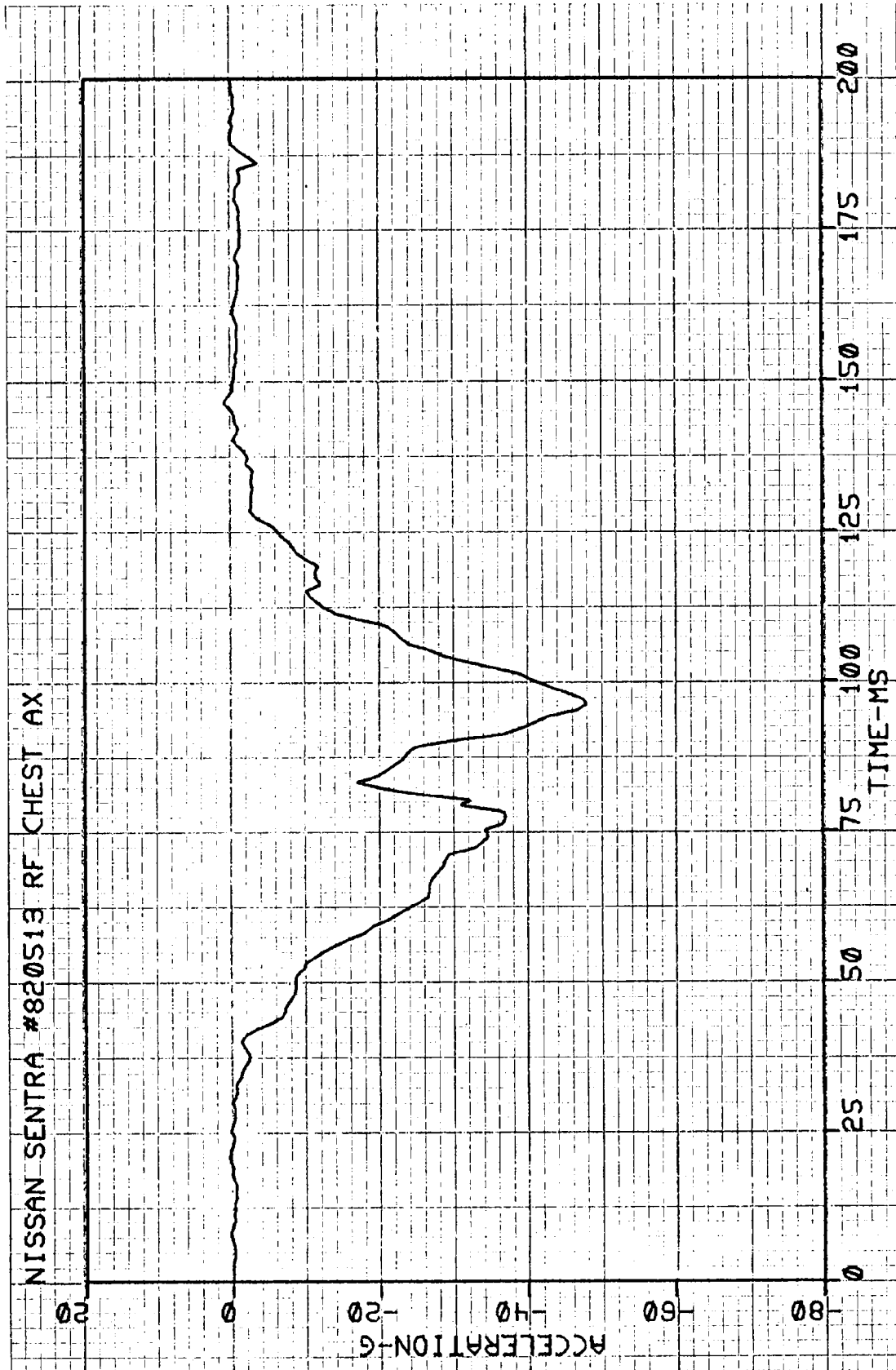




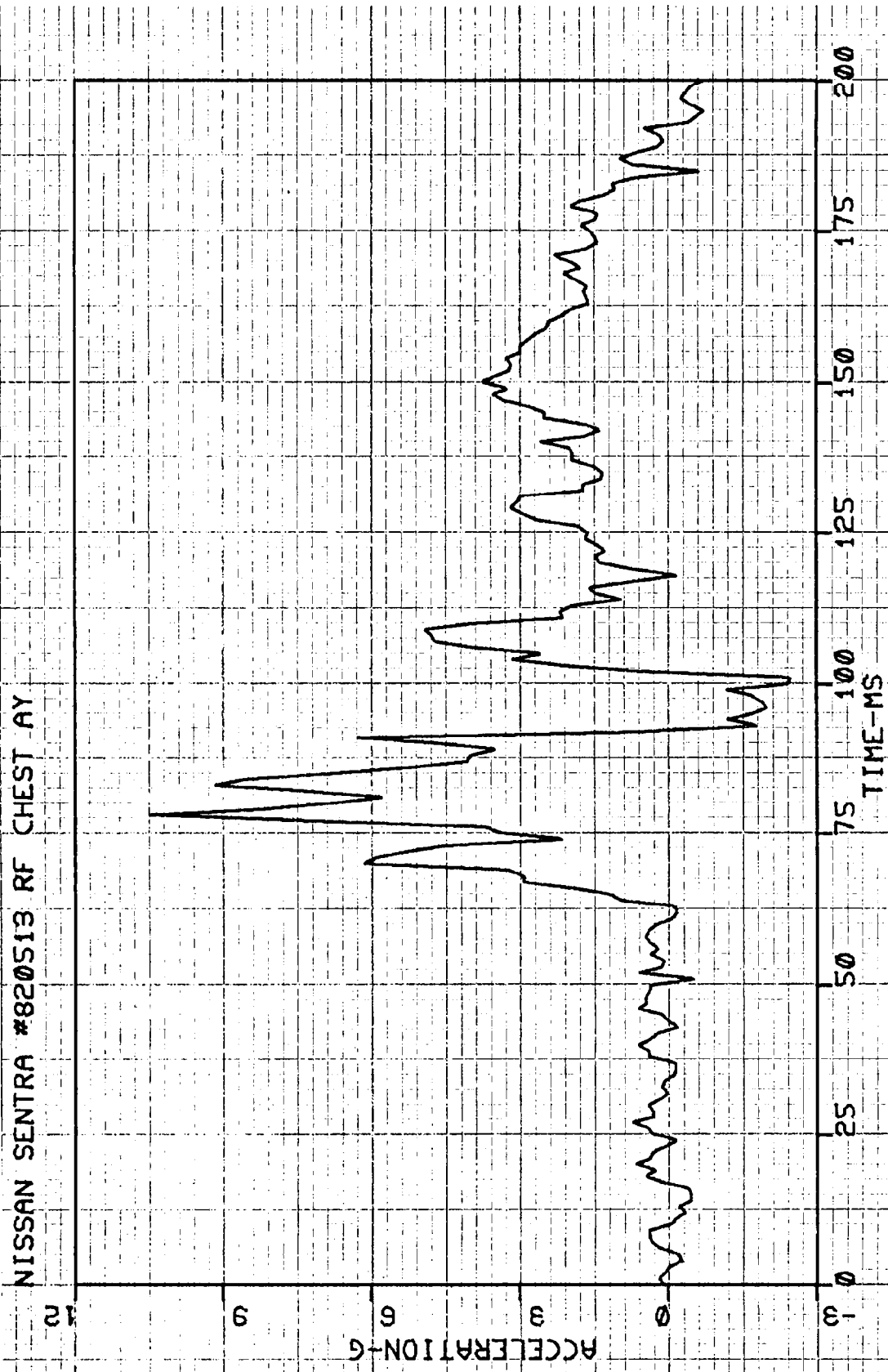




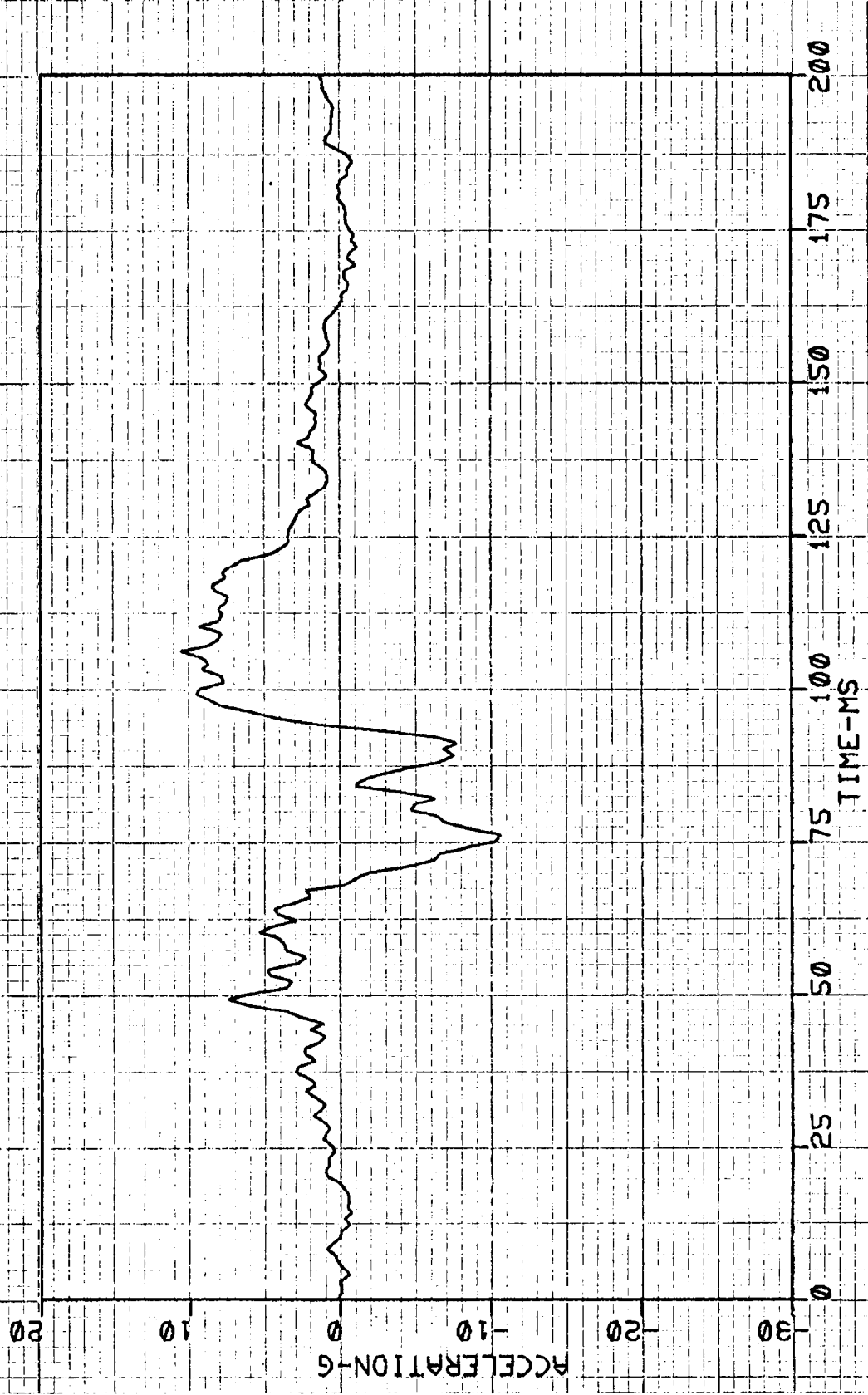


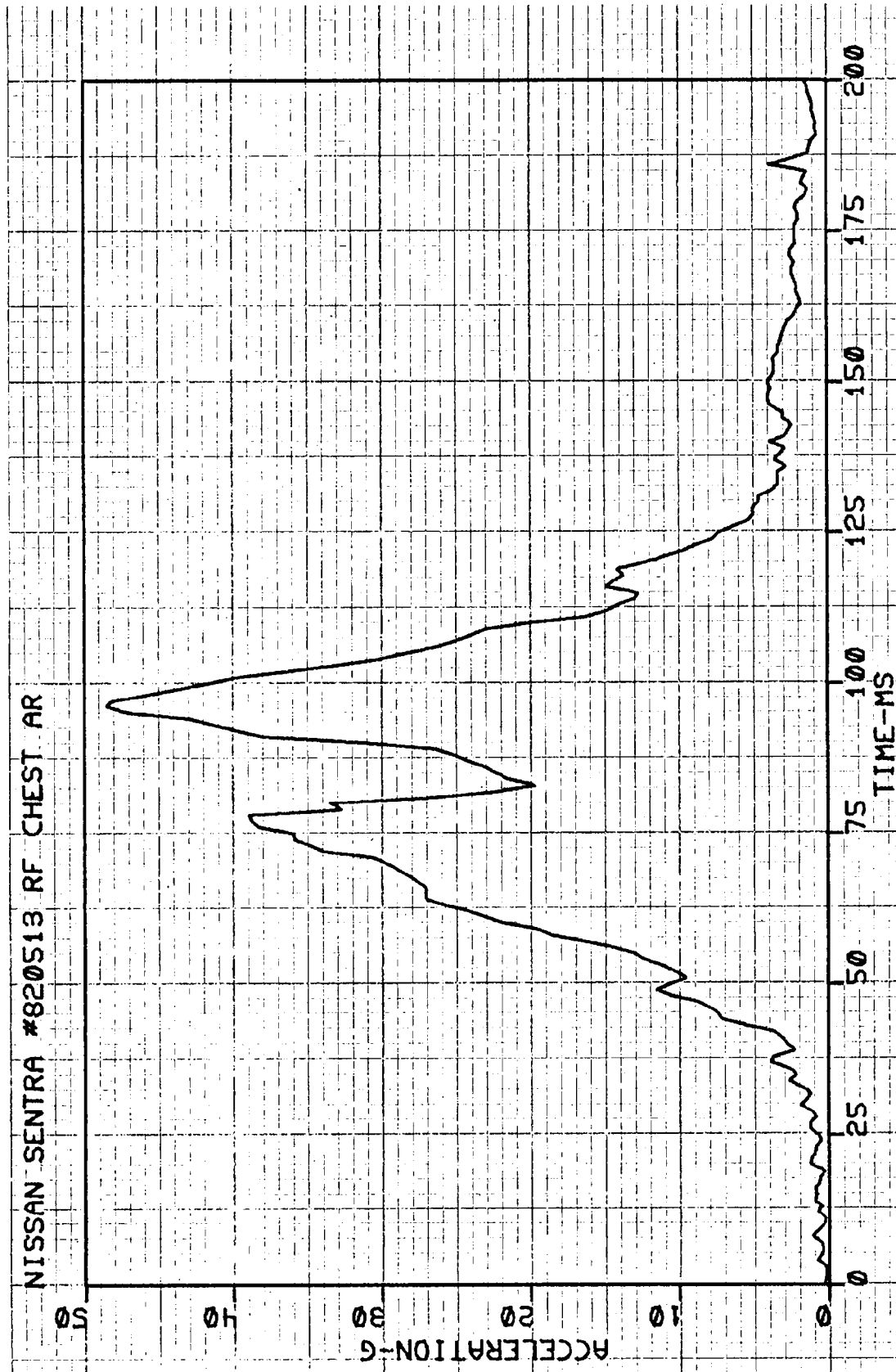


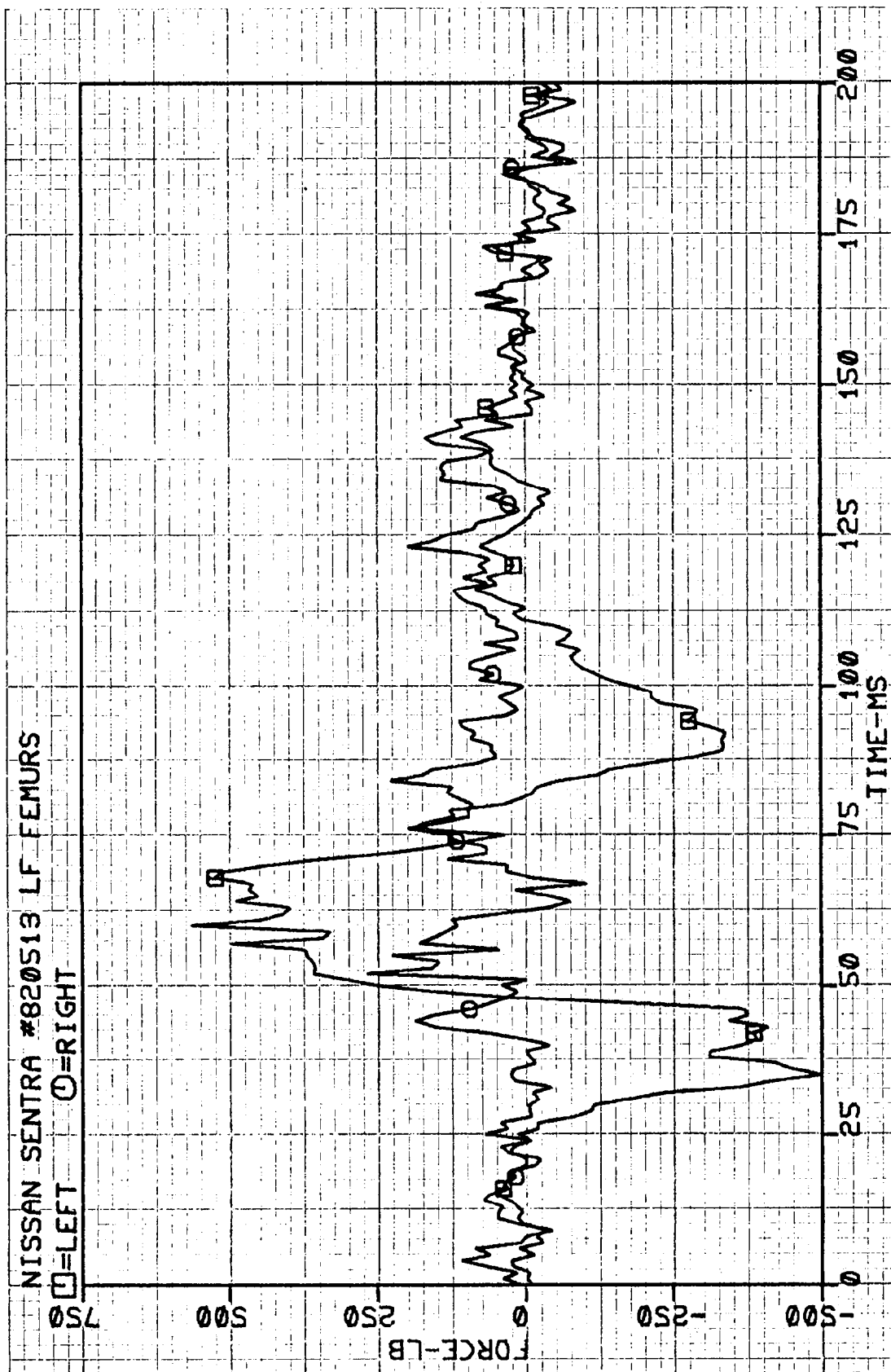
NISSAN SENTRA #820513 RF CHEST AY

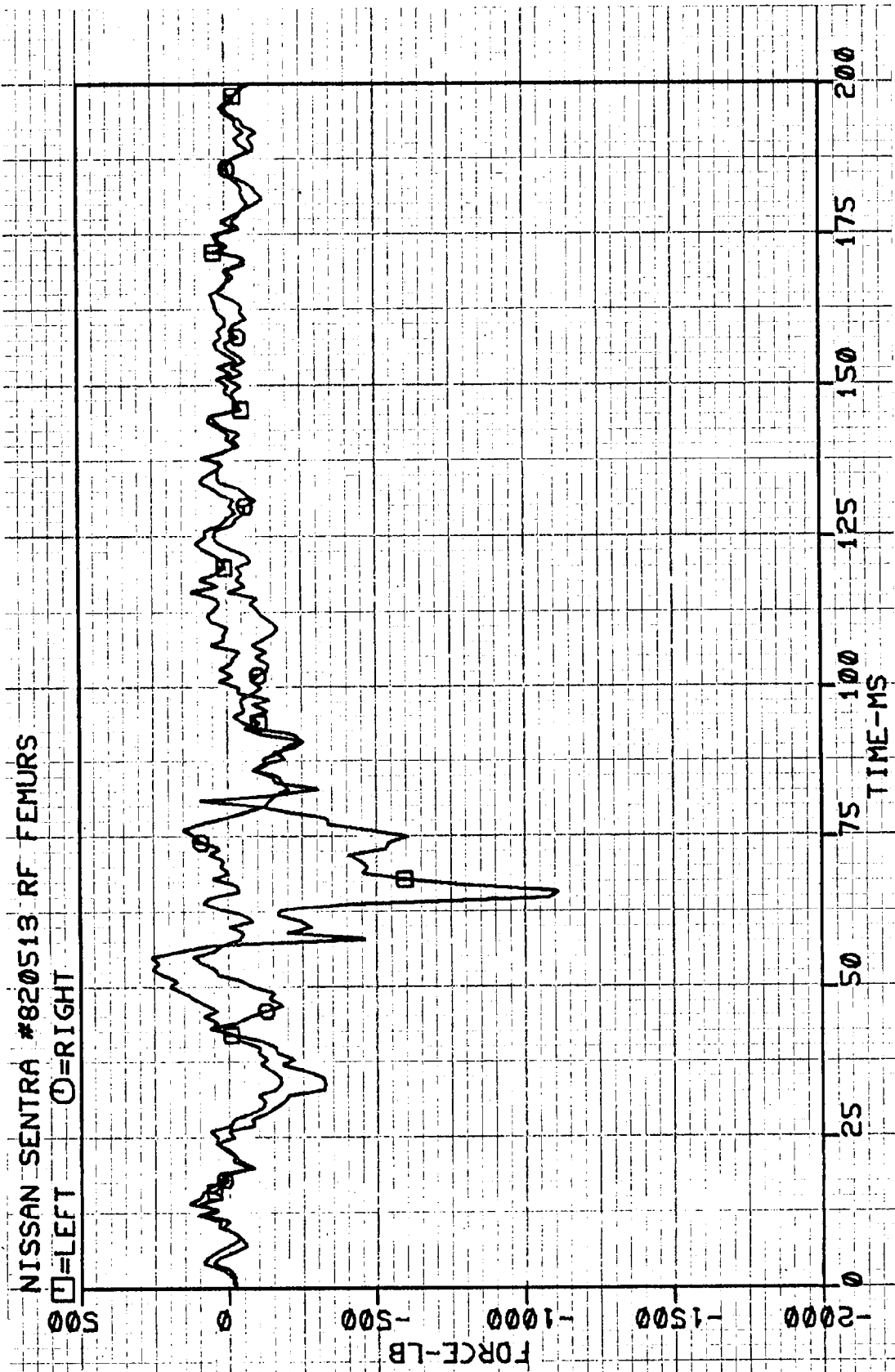


NISSAN SENTRA #820513 RF CHEST AZ



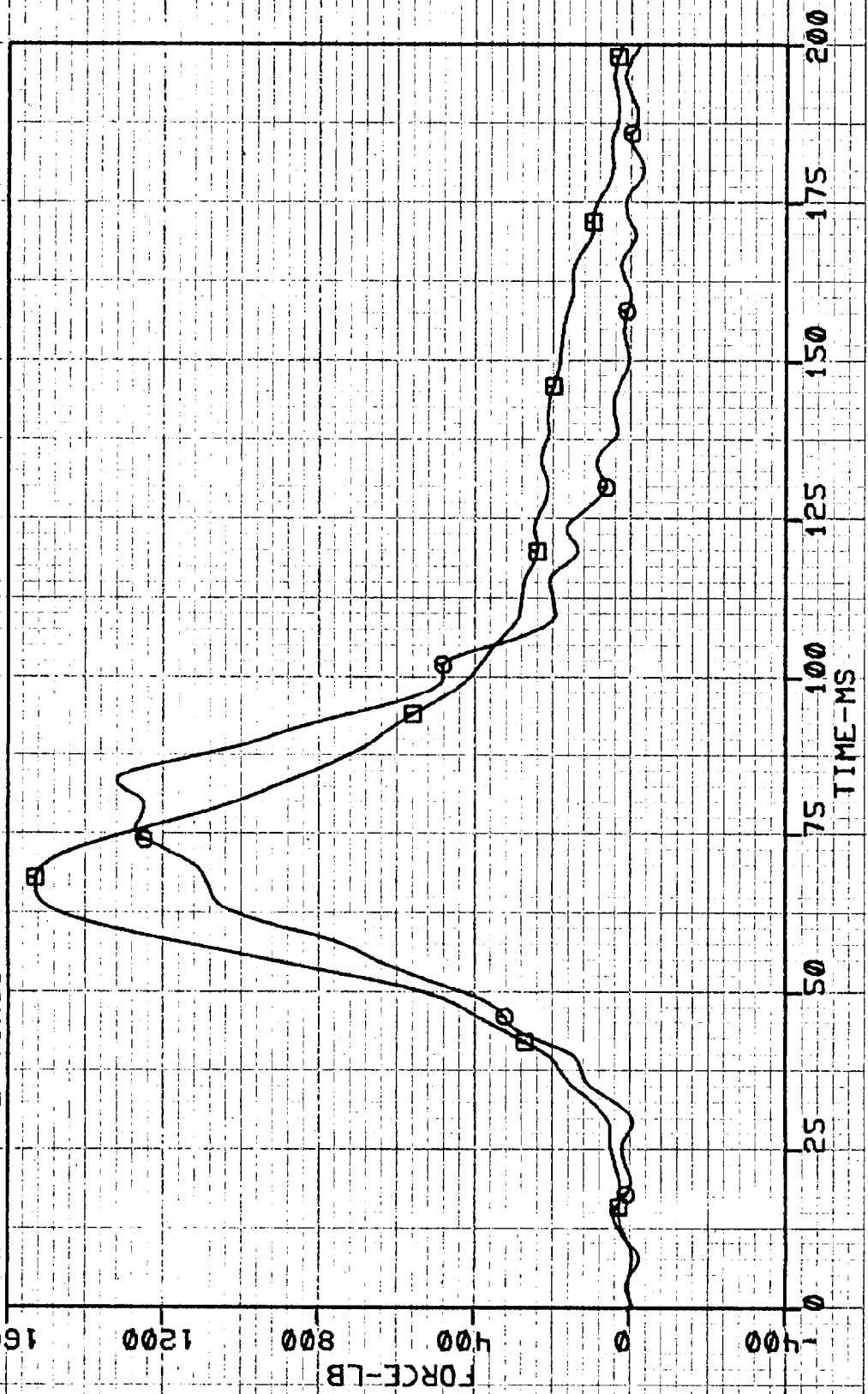


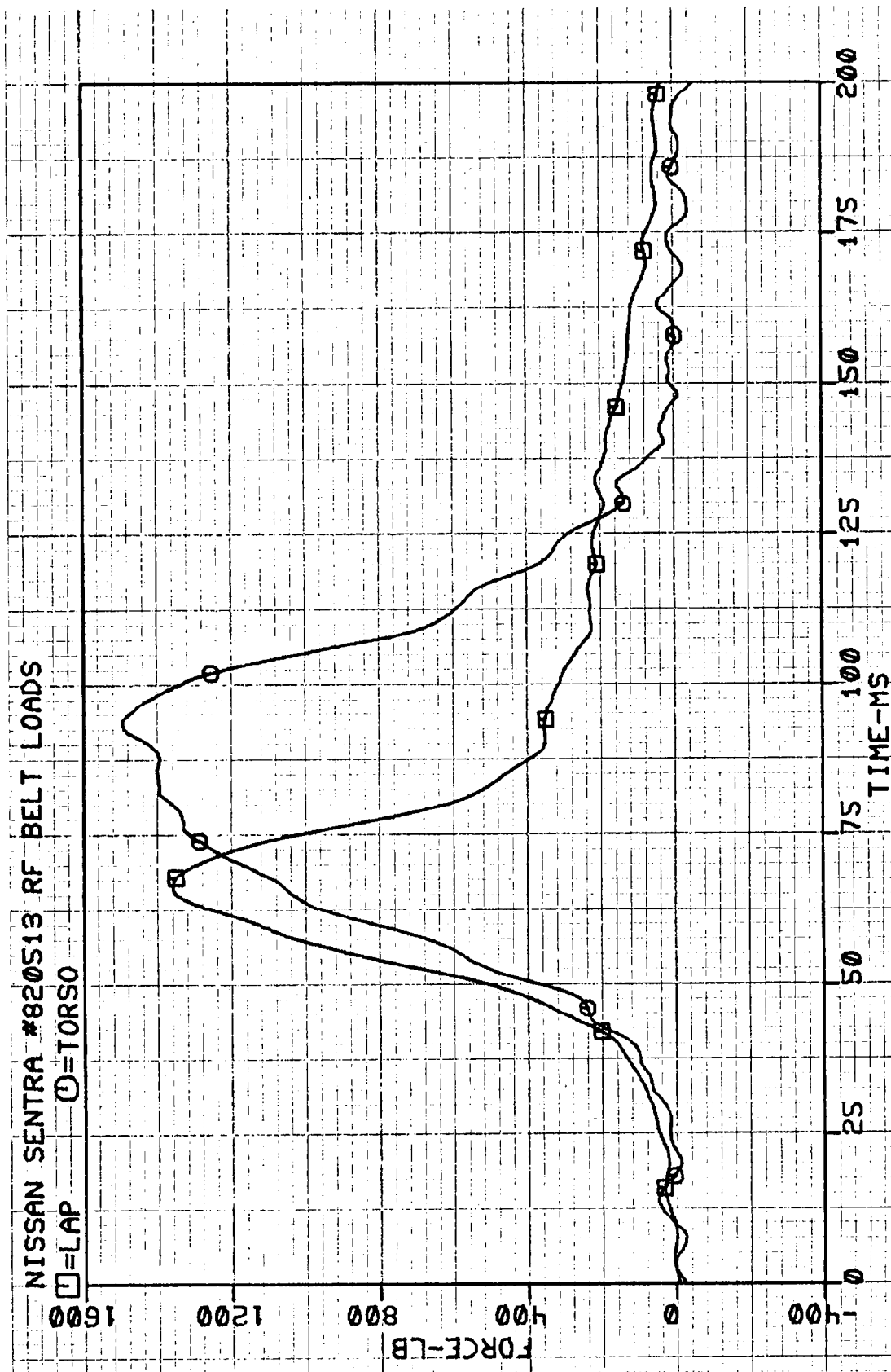




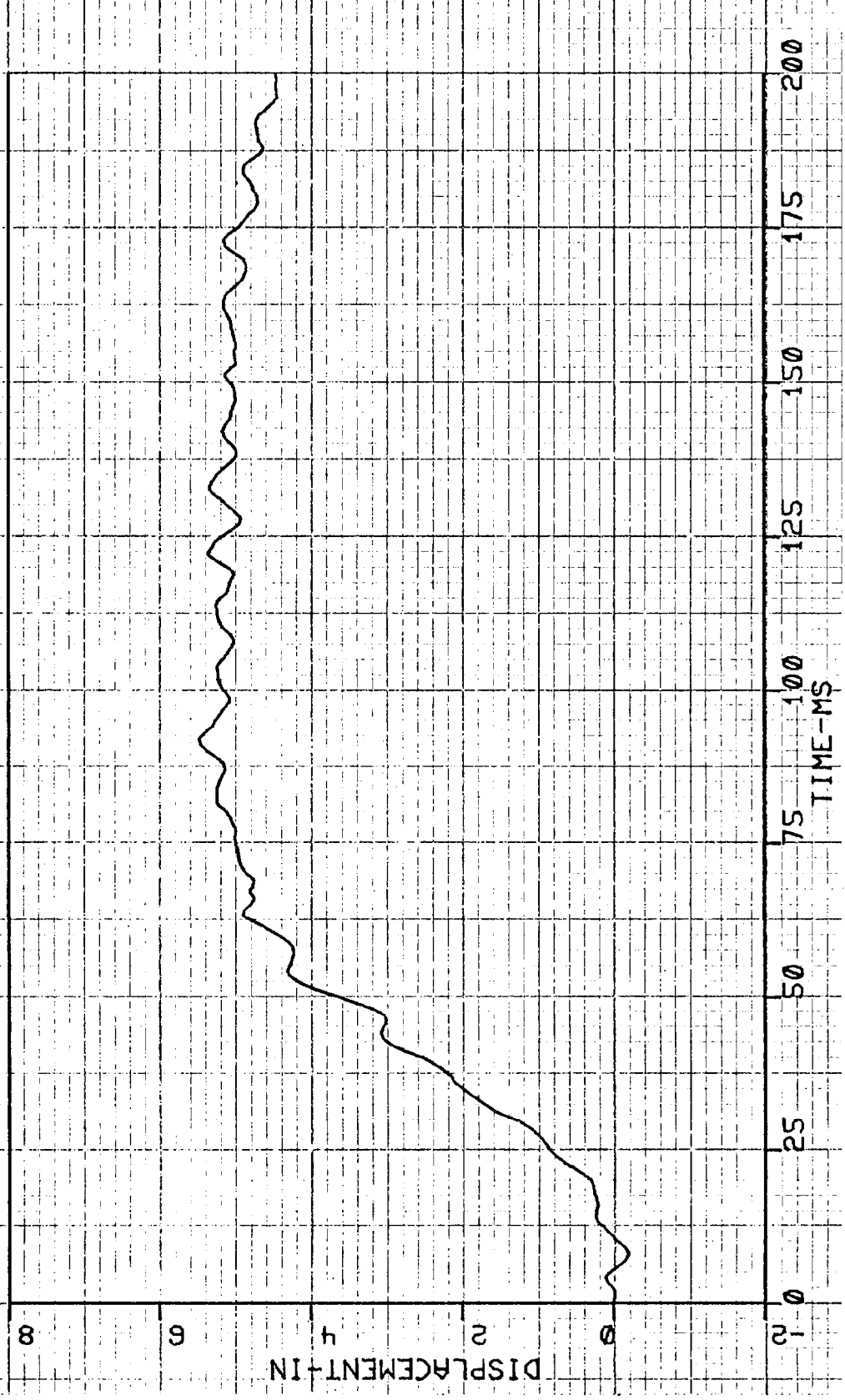
NISSAN SENTRA #820513 LF BELT LOADS

□=LAP ○=TORSO

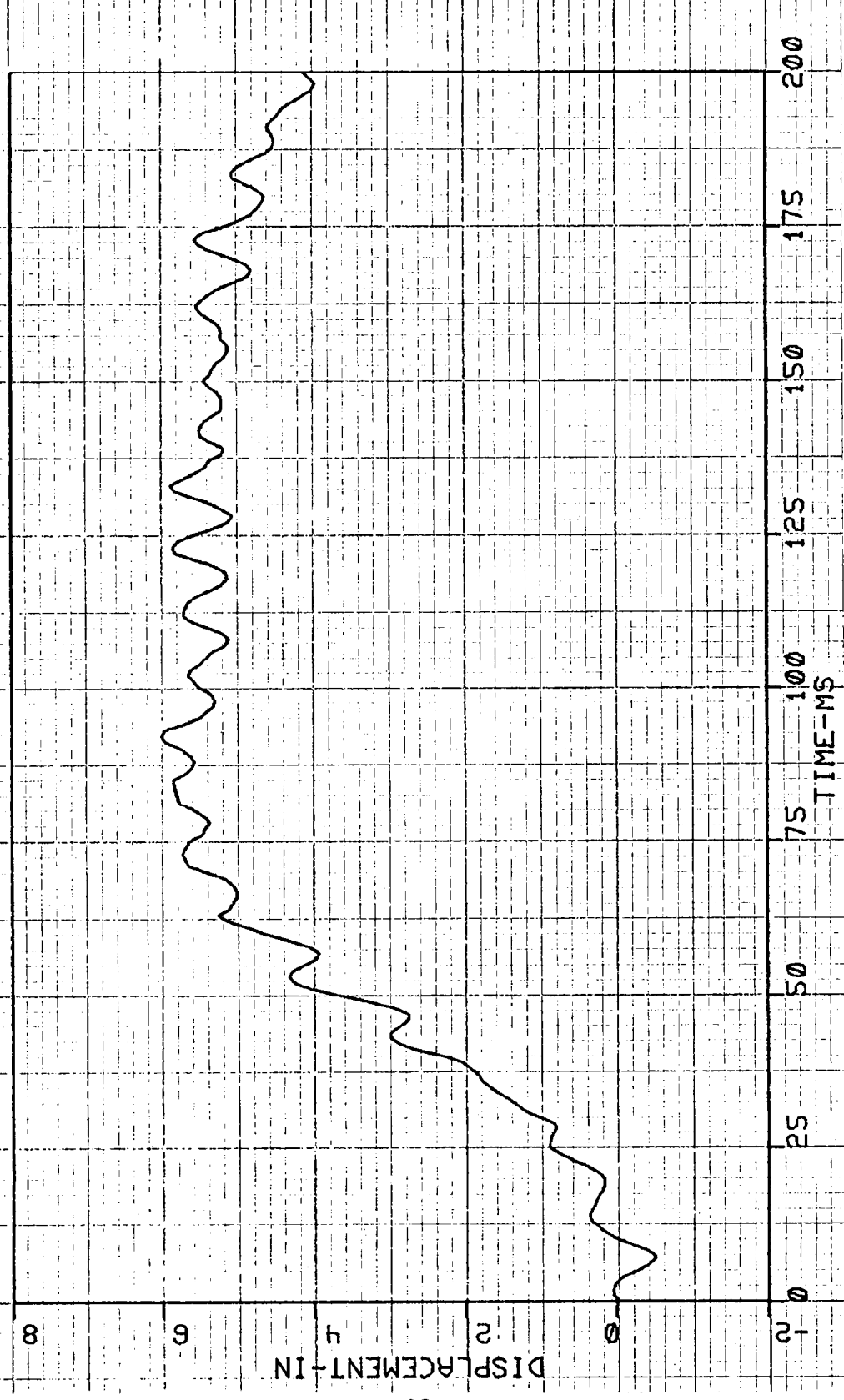




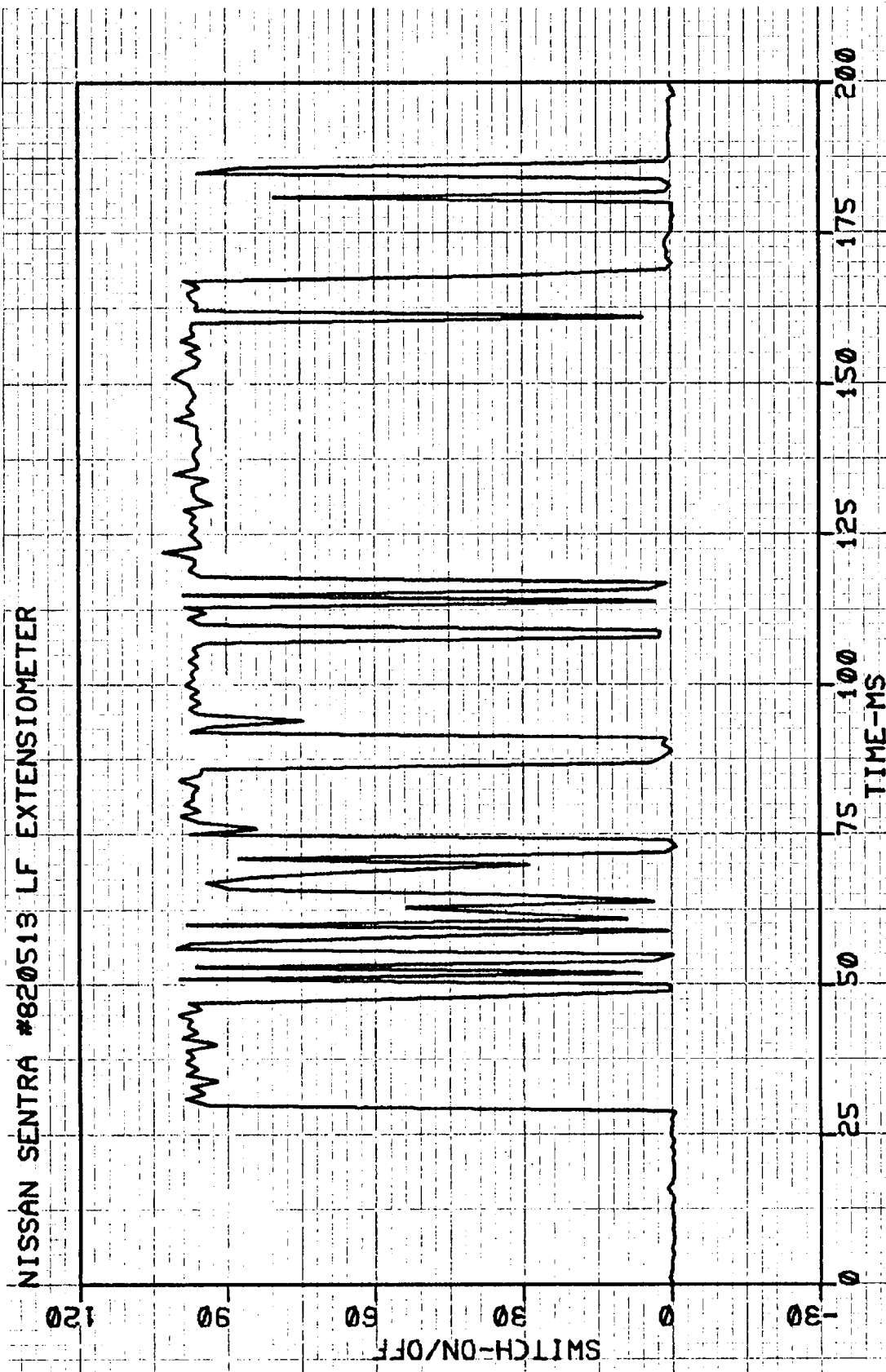
NISSAN SENTRA #820513 LF BELT STRING POT

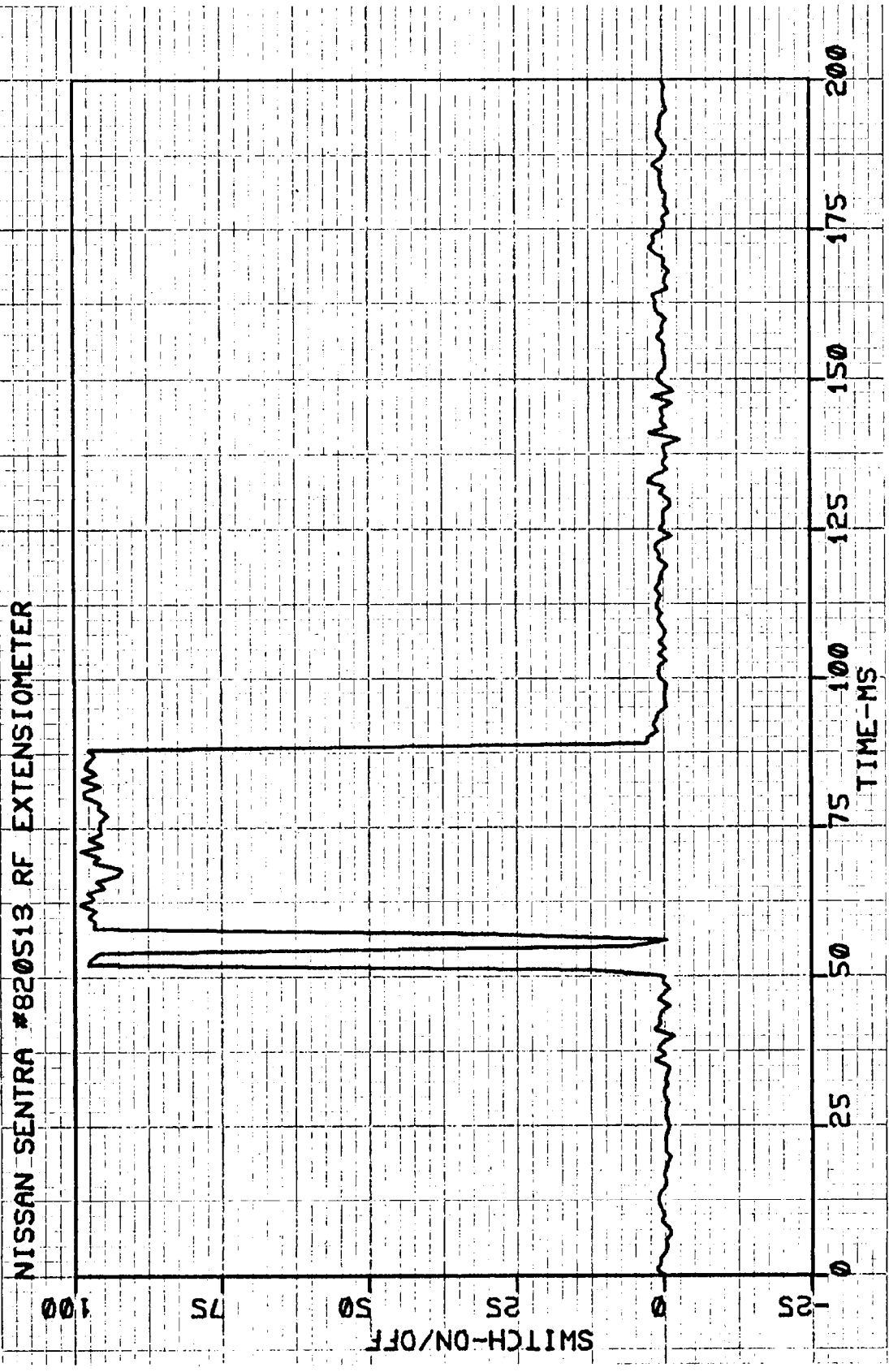


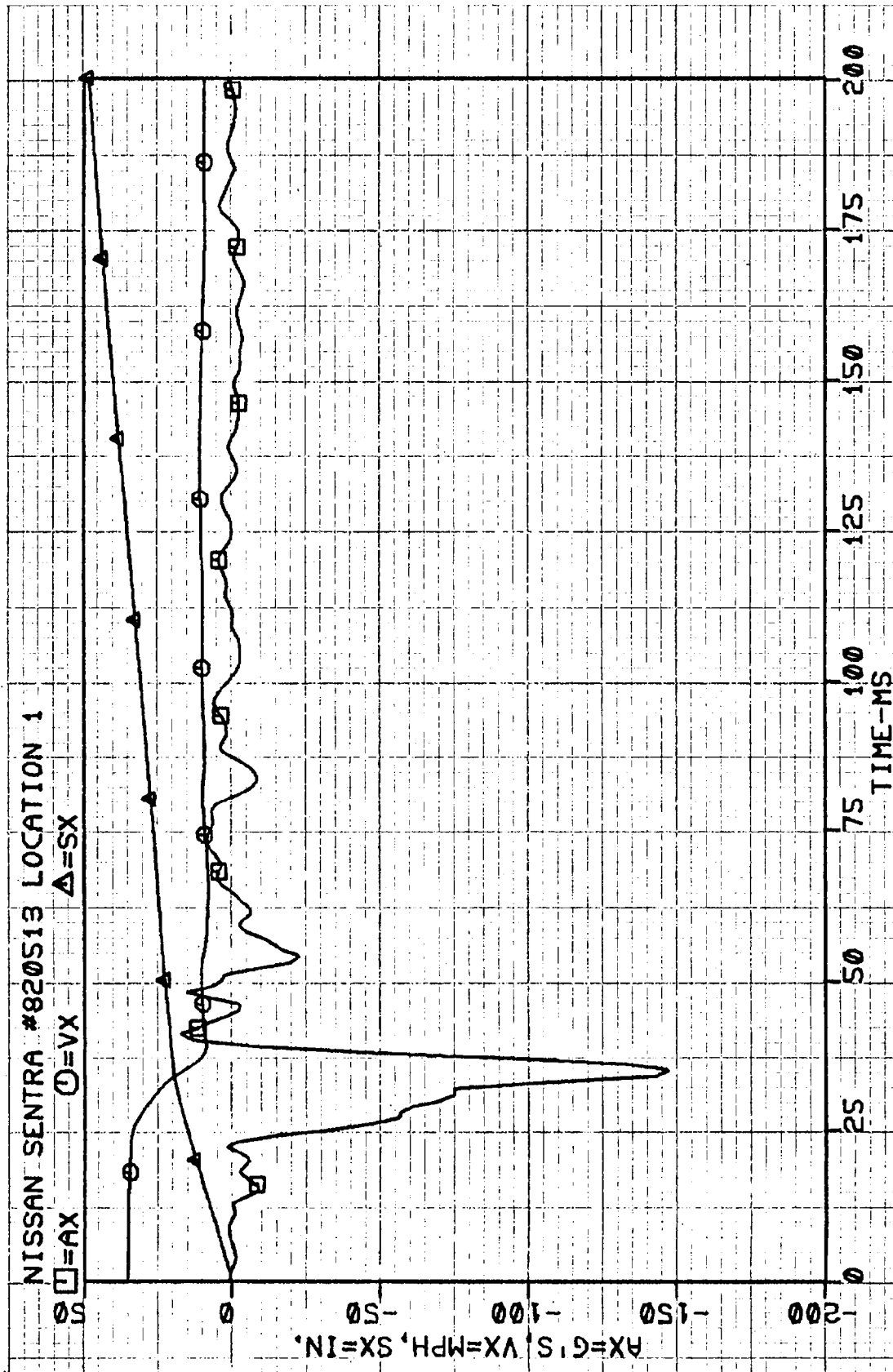
NISSAN SENTRA #820513 RF BELT STRING POT

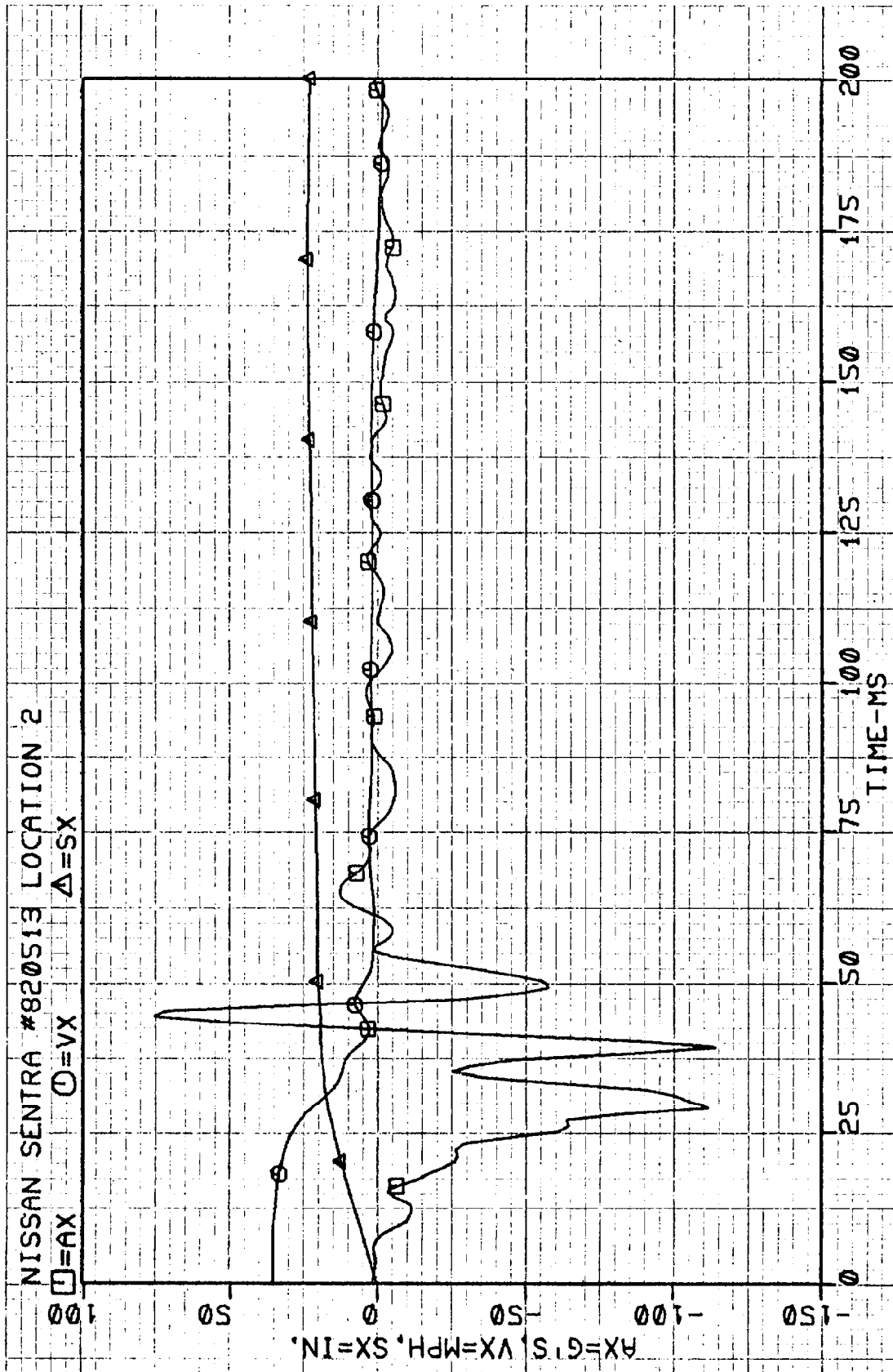


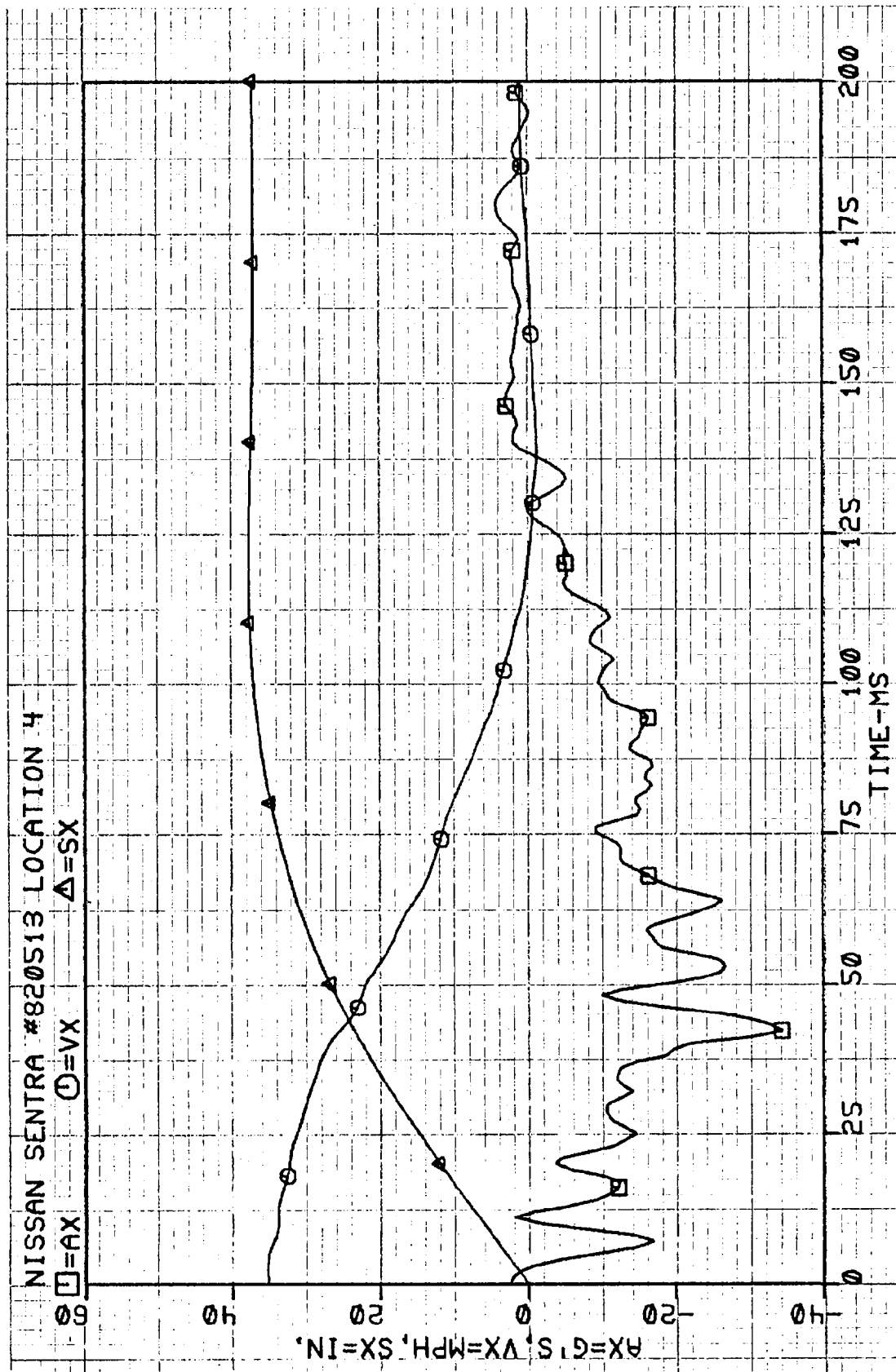
NISSAN SENTRA #820513 LF EXTENSION METER

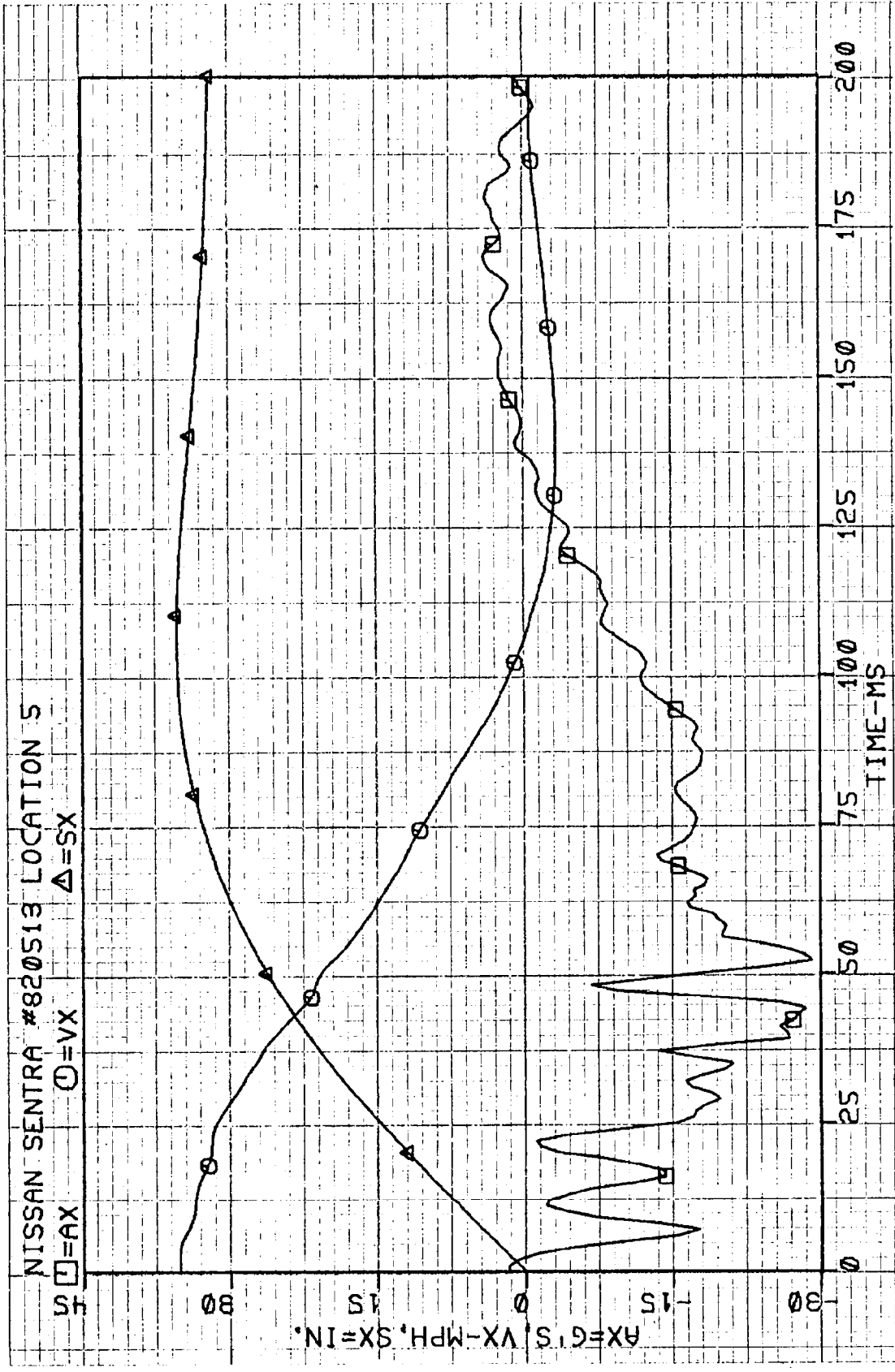


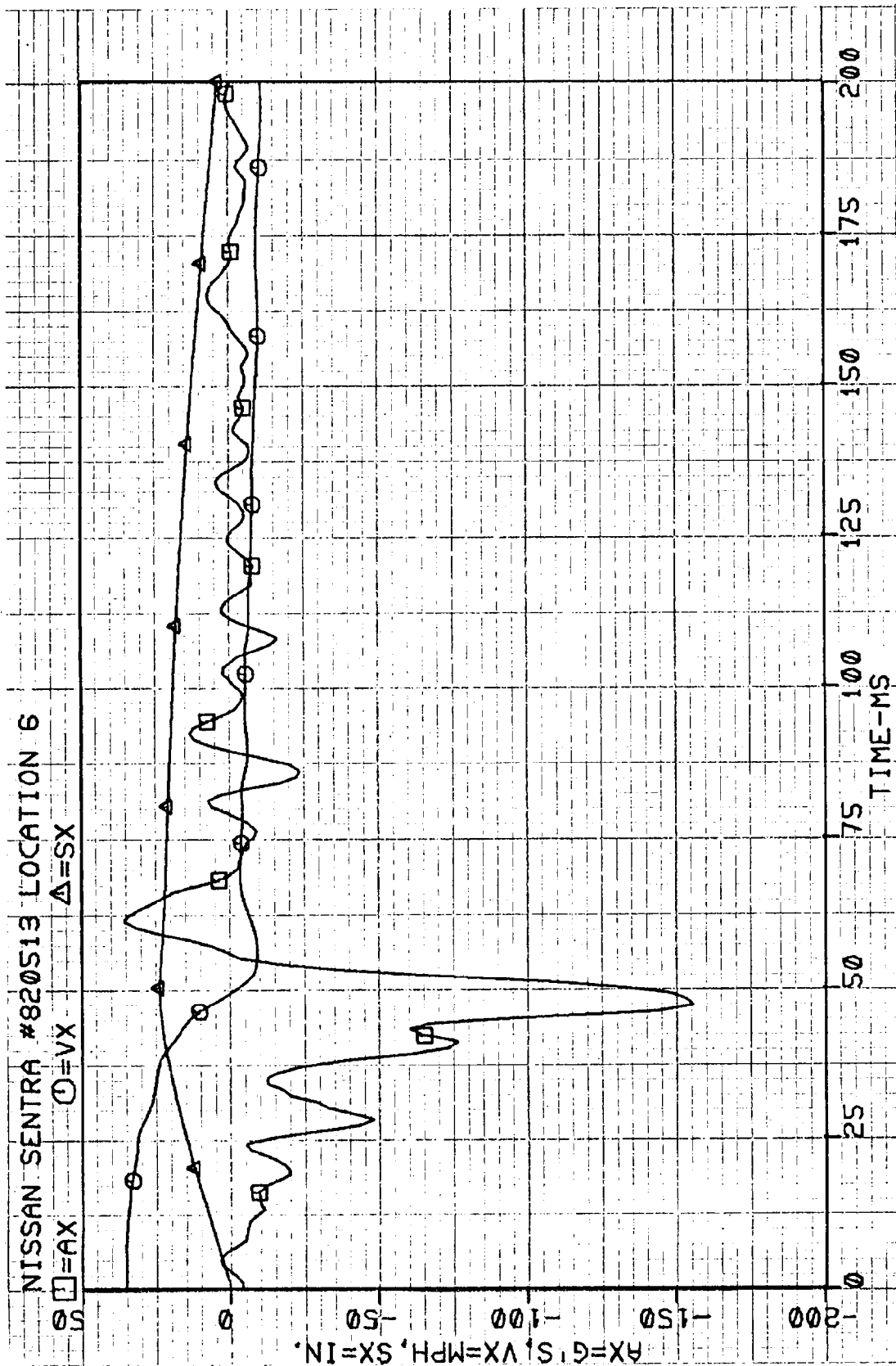












NISSAN SENTRA #820513 LOCATION 7

□=AX

○=VX

△=SX

100

50

AX=G'S, VX=MPH, SX=IN.

150

100

50

0

-50

-100

-150

-200

-250

-300

-350

-400

-450

-500

-550

-600

-650

-700

-750

-800

-850

-900

-950

-1000

-1050

-1100

-1150

-1200

-1250

-1300

-1350

-1400

-1450

-1500

-1550

-1600

-1650

-1700

-1750

-1800

-1850

-1900

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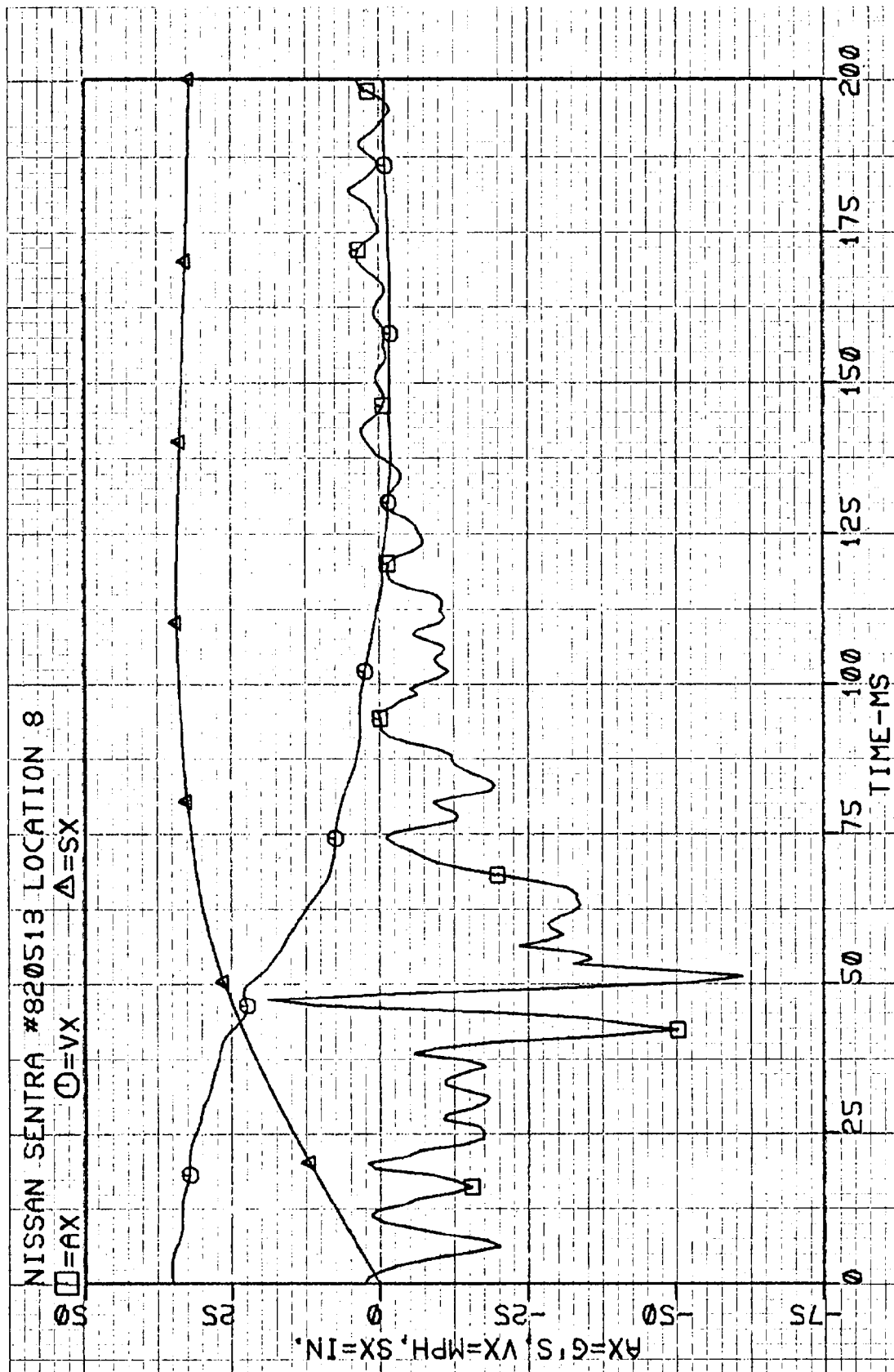
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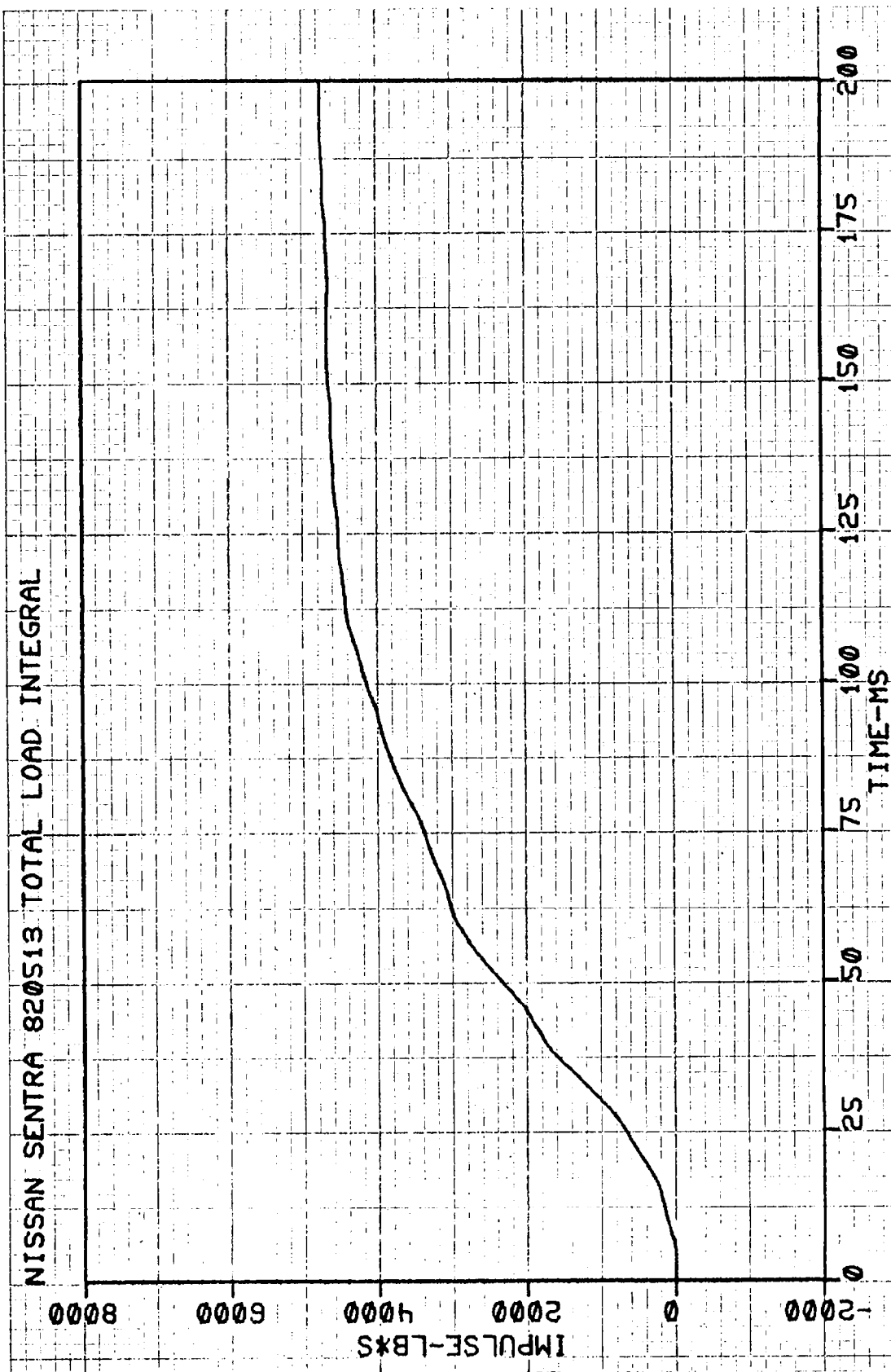
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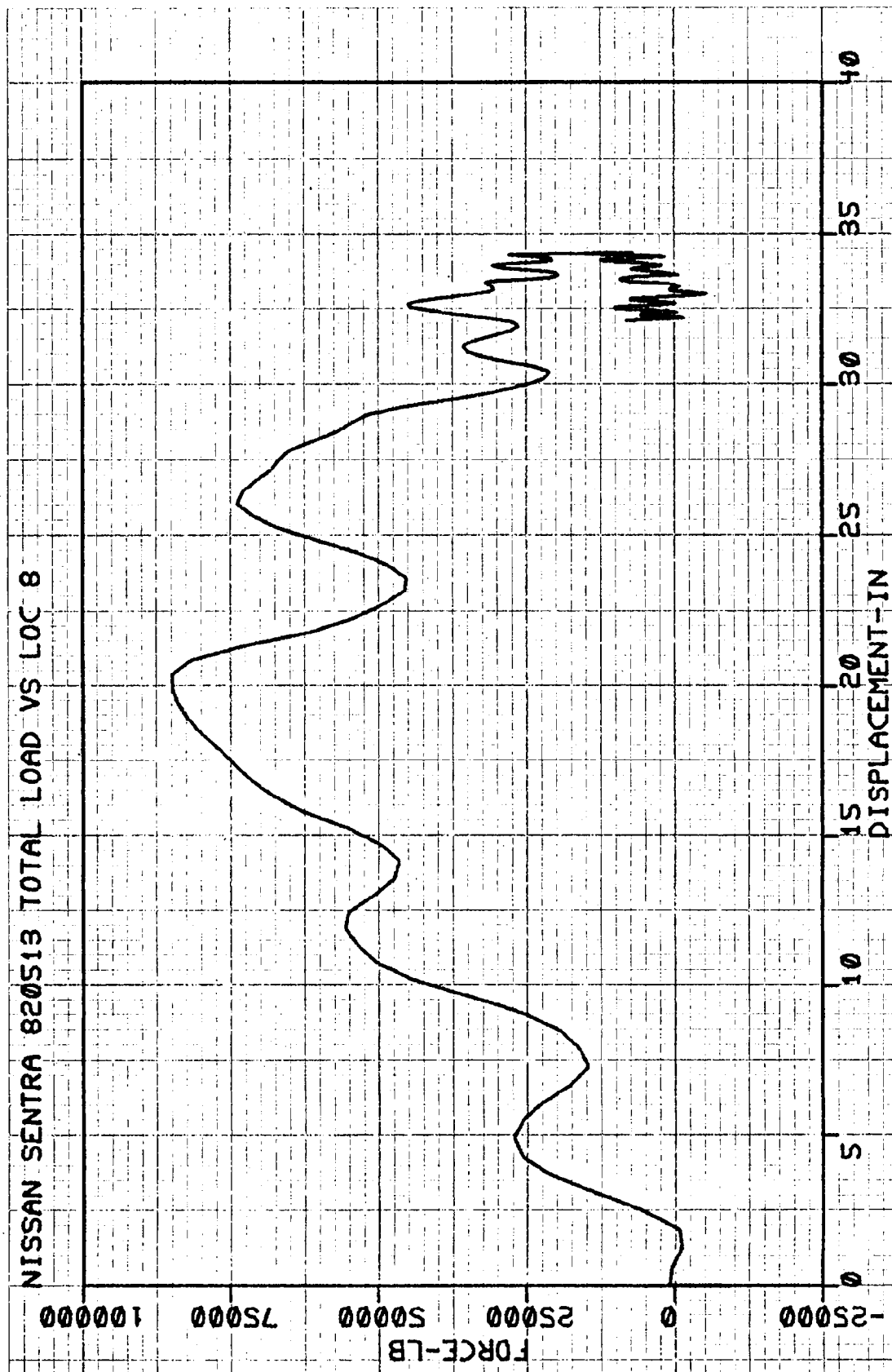
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APPENDIX C
DUMMY CALIBRATIONS

PART 572 DUMMY CALIBRATION TEST DATA

NHTSA Dummy I.D. No.: A08

Laboratory Technician: C. Brugalletta, S. Bacon

Instrumentation Engineer: V. Agnihotri

	Pre-Test Calibration	Post-test Calibration
Date of Dummy Calibration	7/12/82	8/3/82
Calibration Sequential Number for Dummy	47	48
Temperature in Lab. (Spec. = 66 to 78 °F)	74°	70°
Relative Humidity in Lab. (Spec. = 10 to 70%)	60%	42%

Test Parameter	Specification		
1. Head Drop Test:			
a. Peak Resultant Accel	210 - 260G	239	241
b. Peak Lateral Accel	≤ 10G	4.3	2.3
c. Time above 100G (Resultant)	0.9 - 1.5 ms	1.1	1.0
2. Neck Bending Test:			
a. Pendulum Speed	21.5 - 25.5 fps	22.0	22.1
b. Pendulum Avg Decel (over t ₃ - t ₂)	20 - 24G	24	24
c. Peak Resultant Head Acceleration	26G Maximum	20	19
d. Pendulum Decel (t ₂ - t ₁)	≤ 3 ms	2.5	1.5
e. Pendulum Decel (t ₃ -t ₂)	25 - 30 ms	27	25
f. Pendulum Decel (t ₄ -t ₃)	≤ 10 ms	3	6
g. Pendulum Direction Reversal Time	≥ 123 ms	N/A	N/A
h. Maximum Head Rota- tion	63 to 73°	70	69
i. Chordal Displacement:			

Head Rotation Angle

0°	Time	-2 - 2 ms	0.0	-1
	Displ	-0.5 - 0.5 in.	0.0	0.05
30°	Time	25.6 - 34.4 ms	28.0	26.5
	Displ	2.1 - 3.1 in.	2.5	2.5
60°	Time	40.3 - 51.7 ms	45.0	43.0
	Displ	4.3 - 5.3 in.	4.6	4.7
Maximum 73°	Time	53.2 - 66.8 ms	59.5	59.0
	Displ	5.0 - 6.0 in.	5.3	5.3

PART 572 DUMMY CALIBRATION TEST DATA (Continued)

NHTSA Dummy I.D. No.: A08

Test Parameter	Specification	Pre-Test Calibration	Post-Test Calibration
2. Neck Bending Test: (Continued)			
Head Rotation Angle			
60°	Time	67.0 - 83.0 ms	74.0
	Displ	4.3 - 5.3 in.	4.5
30°	Time	85.4 - 104.6 ms	90.5
	Displ	2.1 - 3.1 in.	2.4
0°	Time	101.0 - 123.0 ms	102.5
	Displ	-0.5 - 0.5 in.	0.4
3. Abdominal Compression Test: (Preload = 10 pounds)			
a. Force at 0.5 in.	14 - 26 lb	21	20
b. Force at 0.75 in.	27 - 40 lb	33	34
c. Force at 1.0 in.	40 - 53 lb	47	51
d. Force at 1.3 in.	63 - 78 lb	70	76
4. Lumbar Flexion Test:			
a. Force at 20°	22 - 34 lb	34	33
b. Force at 30°	34 - 46 lb	46	44
c. Force at 40°	46 - 58 lb	58	50
d. Return Angle	12° Maximum	2°	4°
5. Chest Impact Tests:			
a. High Speed			
1) Probe Speed	21.78-22.22 fps	22.02	22.08
2) Peak Deflection	1.7 in. Maximum	1.6	1.4
3) Peak Resistive Force	2250 lb Maximum	1604	2017
4) Internal Hysteresis	50 - 70%	53%	62%
b. Low Speed			
1) Probe Speed	13.86-14.14 fps	14.02	14.03
2) Peak Deflection	1.1 in. Maximum	1.1	0.9
3) Peak Resistive Force	1450 lb Maximum	1007	1266
4) Internal Hysteresis	50 - 70%	53%	62%

PART 572 DUMMY CALIBRATION TEST DATA (Continued)

NHTSA Dummy I.D. No.: A08

Test Parameter	Specification	Pre-Test Calibration	Post-Test Calibration
6. Knee Impact Tests:			
a. Right Side			
1) Probe Speed	6.76 - 7.04 fps	6.99	7.03
2) Maximum Force	1850 - 2500 lb	2126	1954
3) Time >1000 lb	1.7 ms Minimum	1.9	2.0
b. Left Side			
1) Probe Speed	6.76 - 7.04 fps	6.98	6.94
2) Maximum Force	1850 - 2500 lb	2044	1931
3) Time >1000 lb	1.7 ms Minimum	2.0	2.0

PART 572 DUMMY CALIBRATION TEST DATA

NHTSA Dummy I.D. No.: A09

Laboratory Technician: C. Brugalletta, S. Bacon

Instrumentation Engineer: V. Agnihotri

	Pre-Test Calibration	Post-Test Calibration
Date of Dummy Calibration	7/8/82	8/3/82
Calibration Sequential Number for Dummy	42	43
Temperature in Lab. (Spec. = 66 to 78 °F)	72°	70°
Relative Humidity in Lab. (Spec. = 10 to 70%)	54%	52%

Test Parameter	Specification		
1. Head Drop Test:			
a. Peak Resultant Accel	210 - 260G	218	242
b. Peak Lateral Accel	≤ 10G	6	3
c. Time above 100G (Resultant)	0.9 - 1.5 ms	1.1	1.0
2. Neck Bending Test:			
a. Pendulum Speed	21.5 - 25.5 fps	22.2	22.1
b. Pendulum Avg Decel (over t ₃ - t ₂)	20 - 24G	23	24
c. Peak Resultant Head Acceleration	26G Maximum	19	19
d. Pendulum Decel (t ₂ - t ₁)	≤ 3 ms	3	2
e. Pendulum Decel (t ₃ -t ₂)	25 - 30 ms	27	26
f. Pendulum Decel (t ₄ -t ₃)	≤ 10 ms	4	6
g. Pendulum Direction Reversal Time	≥ 123 ms	N/A	N/A
h. Maximum Head Rota- tion	63 to 73°	70	70
i. Chordal Displacement:			

Head Rotation Angle

0°	Time	-2 - 2 ms	0	-.5
	Displ	-0.5 - 0.5 in.	0.5	0.02
30°	Time	25.6 - 34.4 ms	30.5	26.5
	Displ	2.1 - 3.1 in.	2.5	2.5
60°	Time	40.3 - 51.7 ms	47.0	43.0
	Displ	4.3 - 5.3 in.	4.6	4.6
Maximum	Time	53.2 - 66.8 ms	61.0	56.5
73°	Displ	5.0 - 6.0 in.	5.3	5.2

PART 572 DUMMY CALIBRATION TEST DATA (Continued)

NHTSA Dummy I.D. No.: A09

Test Parameter	Specification	Pre-Test Calibration	Post-Test Calibration
2. Neck Bending Test: (Continued)			
Head Rotation Angle			
60°	Time	67.0 - 83.0 ms	76.5
	Displ	4.3 - 5.3 in.	4.5
30°	Time	85.4 - 104.6 ms	94.0
	Displ	2.1 - 3.1 in.	2.4
0°	Time	101.0 - 123.0 ms	105.5
	Displ	-0.5 - 0.5 in.	0.4
3. Abdominal Compression Test: (Preload = 10 pounds)			
a. Force at 0.5 in.	14 - 26 lb	18	16
b. Force at 0.75 in.	27 - 40 lb	30	27
c. Force at 1.0 in.	40 - 53 lb	44	41
d. Force at 1.3 in.	63 - 78 lb	63	62
4. Lumbar Flexion Test:			
a. Force at 20°	22 - 34 lb	34	25
b. Force at 30°	34 - 46 lb	42	35
c. Force at 40°	46 - 58 lb	46	32
d. Return Angle	12° Maximum	9°	17°
5. Chest Impact Tests:			
a. High Speed			
1) Probe Speed	21.78-22.22 fps	22.05	22.02
2) Peak Deflection	1.7 in. Maximum	1.6	1.4
3) Peak Resistive Force	2250 lb Maximum	1550	1984
4) Internal Hysteresis	50 - 70%	51%	58%
b. Low Speed			
1) Probe Speed	13.86-14.14 fps	14.03	14.00
2) Peak Deflection	1.1 in. Maximum	1.0	0.9
3) Peak Resistive Force	1450 lb Maximum	1005	1225
4) Internal Hysteresis	50 - 70%	61%	60%

PART 572 DUMMY CALIBRATION TEST DATA (Continued)

NHTSA Dummy I.D. No.: A09

Test Parameter	Specification	Pre-Test Calibration	Post-Test Calibration
6. Knee Impact Tests:			
a. Right Side			
1) Probe Speed	6.76 - 7.04 fps	6.96	6.96
2) Maximum Force	1850 - 2500 lb	1997	1962
3) Time >1000 lb	1.7 ms Minimum	2.1	2.0
b. Left Side			
1) Probe Speed	6.76 - 7.04 fps	6.93	7.01
2) Maximum Force	1850 - 2500 lb	1870	1907
3) Time >1000 lb	1.7 ms Minimum	2.3	1.9

Dynamic Science Report No. 301-DYS-82-025A

BARRIER IMPACT LOAD DATA
NISSAN MOTOR COMPANY, LTD.
1982 NISSAN SENTRA 4-DOOR COUPE
NHTSA 820513

Prepared by:

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A Talley Industries Company
1850 West Pinnacle Peak Road
Phoenix, Arizona 85027



Prepared for:

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
-----ENFORCEMENT-----
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Prepared by

Michael J. Rodack

Approved by

Rod Carn

Date

9-20-82

Report Accepted by:

Contract Technical Manager
Office of Vehicle Safety Compliance

Date

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 INSTRUMENTATION DESCRIPTION	2-1
2.1 LOAD CELL BARRIER	2-1
2.2 PLACEMENT OF VEHICLE ACCELEROMETERS	2-1
3.0 GENERAL TEST AND VEHICLE PARAMETER DATA	3-1
4.0 DATA PRESENTATION	4-1

1.0 INTRODUCTION

This report is an addendum to Report No. 301-DYS-82-025 and presents the barrier load measurement data acquired in testing a 1982 Nissan Sentra 4-Door Coupe, NHTSA 820513.

Barrier impact speed was 35.18 mph.

Section 2.0 presents information on the load cell barrier and vehicle accelerometers.

Section 3.0 provides general test and vehicle parametric data.

Section 4.0 presents plots of load cell and accelerometer data versus time.

2.0 INSTRUMENTATION DESCRIPTION

2.1 LOAD CELL BARRIER

The load cell barrier face is pictured in Figure 2-1. The barrier consists of a 9 x 4 array of 50 klb load cells each faced with a section of 1-3/4-inch thick plywood. Plywood sections for Rows C and D (upper two rows) each measure 10 inches high and 9 inches wide. Plywood sections for Rows A and B (lower two rows) each measure 9 inches high and 9 inches wide. Overall width of the barrier is 83 inches and overall height is 38-3/4 inches. The lower edge of the barrier is 2-5/8 inches above the surface of the ground.

2.2 PLACEMENT OF VEHICLE ACCELEROMETERS

Eight longitudinal accelerometers were located on the vehicle as schematically illustrated herein. Three instruments (Locations 4, 5, and 8) represent occupant compartment accelerations. Two (Locations 1 and 2) represent engine accelerations and two (Locations 6 and 7) represent front wheel accelerations. One additional instrument is included (Location 3) for rear axle drive vehicles mounted on the differential housing.

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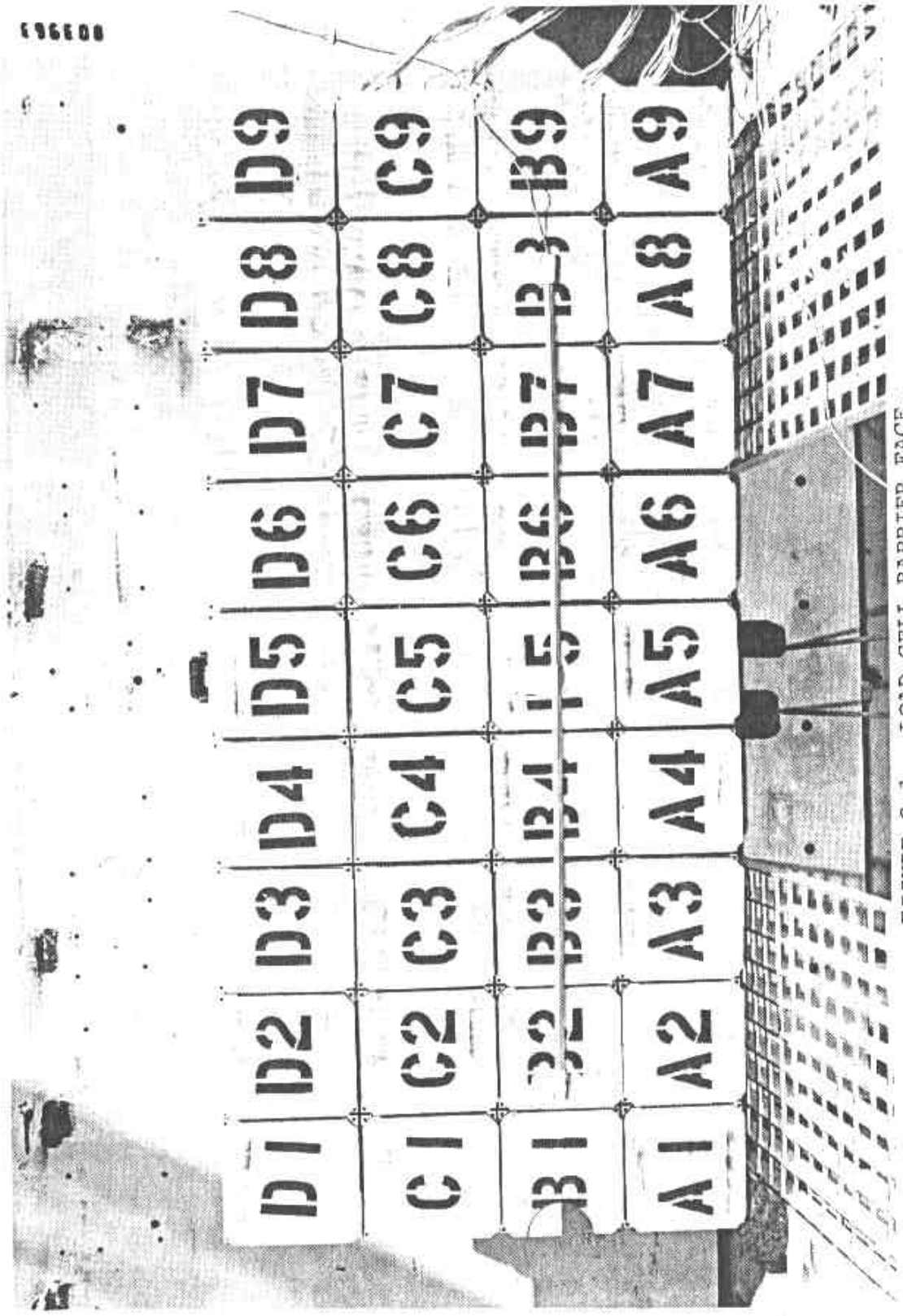
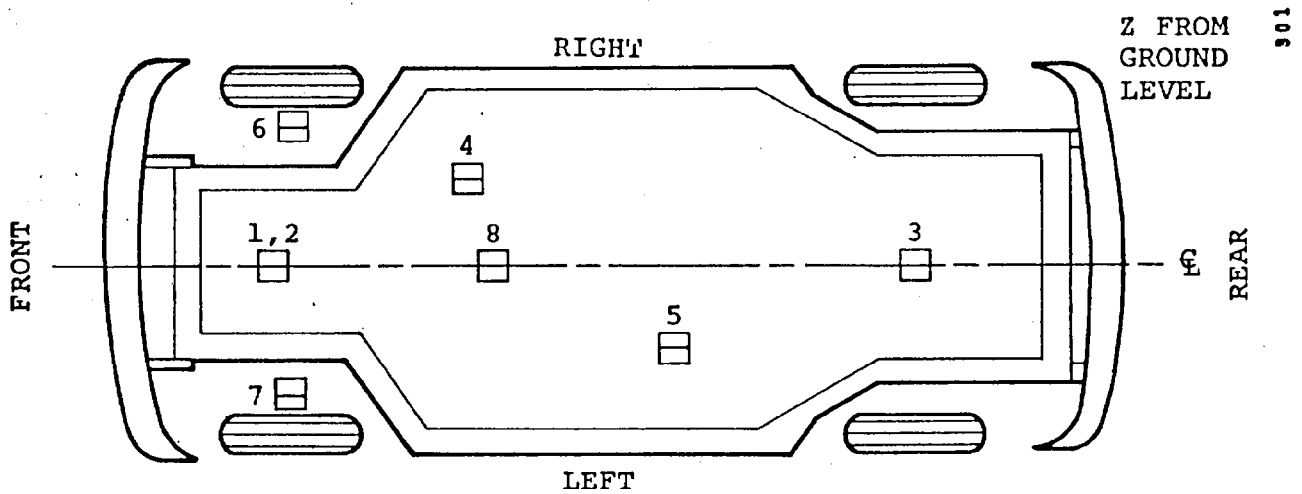


FIGURE 2-1. LOAD CELL BARRIER FACE.

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY



LINEAR ACCELEROMETERS

 LONGITUDINAL

Vehicle Accelerometer Locations and Coordinates					Maximum Readings			
No.	Description of Location	X	Y	Z	+G's	MS	-G's	MS
1	Top of Engine	142.6	-0.5	31.0	18.3	41	147.6	35
2	Bottom of Engine	135.2	9.3	12.2	77.9	44	114.7	39
3	Differential Housing	NA - Front Wheel Drive Vehicle						
4	Right "B" Pillar $\Delta V = 36.6$ mph	75.4	25.0	9.0	4.3	180	34.3	42
5	Left "B" Pillar $\Delta V = 38.5$ mph	75.3	-25.0	9.0	4.1	170	29.5	52
6	Right Front Brake Caliper	138.3	24.0	11.8	36.2	61	156.1	47
7	Left Front Brake Caliper	138.2	-24.0	11.8	77.2	63	135.0	47
8	Vehicle C.G. $\Delta V = 37.3$ mph	94.5	0.0	14.5	20.1	47	61.3	51

3.0 GENERAL TEST AND VEHICLE PARAMETER DATA

This section consists of three tables which document vehicle information, test conditions, and the post-impact crush configuration.

GENERAL TEST AND VEHICLE PARAMETER DATA

PRE-IMPACT DATA

Make/Model: Nissan Sentra
Body Style: 4-Door Coupe Model Year 1982
NHTSA No. 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
Date of Manufacture: 2/82; VIN: JN1HB11S6CU501672
GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL

Vehicle Capacity: FRONT REAR RECOMMENDED LOAD RANGE:
Tire Pressure: 26 psi 26 psi TIRE SIZE: Standard
155/SR13
Designated Seating: 2 Front 3 Rear 5 Total
Cargo load = 75 lb Is Spare Tire: Space Saver? No
TOTAL = 825 lb Standard Equipment? Yes
Engine: 4 Cylinder/Transverse Mount (CNS1.5V2ADC9) 90.8 cu.in.
Transmission: 5-Speed Standard Front Wheel Drive
Date Vehicle Received by Laboratory: 7/9/82; Odometer 438.8
Dealer Name & Address: NTW Via Autodriveaway

WEIGHT (LB) OF TEST VEHICLE AS RECEIVED (WITH MAX. FLUIDS) = UDW

Right Front = 570 lb Right Rear = 375 lb
Left Front = 593 lb Left Rear = 391 lb
TOTAL FRONT WEIGHT = 1163 lb (60 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 766 lb (40 % of Total Vehicle Weight)
TOTAL DELV. WEIGHT = 1929 lb

TARGET WEIGHT = UDW + Cargo Load + 328 lbs Dummies = 2332 lb

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 75 LB CARGO:

Right Front = 652 lb Right Rear = 580 lb
Left Front = 652 lb Left Rear = 571 lb
TOTAL FRONT WEIGHT = 1304 lb (53 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1151 lb (47 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 2455 lb†

Weight of ballast secured in vehicle trunk area = 0 lb

VEHICLE ATTITUDE: (inches)

Delivered Attitude: RF 29 LF 29 RR 29 LR 29
Test Attitude: RF 28-1/4 LF 28-3/8 RR 26-3/4 LR 26-7/8

REMARKS: Vehicle stock.

†Weight exceeds tolerance band called for in TP-212-02. The weight requirement was waived for this test by Vince Quarles (CTM).

GENERAL TEST AND VEHICLE PARAMETER DATA (CONT)

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
 Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph

Distance from the vehicle's front bumper to barrier face entering the vehicle velocity measurement device is 5.0 feet and distance exiting the vehicle velocity measurement device is 1.0 foot.

VEHICLE REBOUND AND CRUSH (in.)

Vehicle Length: Pre-test = R 164.1 C 166.7 L 164.3
 Post-test = R 141.2 C 142.1 L 141.2
 Crush = R 22.9 C 24.6 L 23.1
 Distance from front of test vehicle to point of impact:
 R 26.0 C 25.1 L 25.7

VISIBLE DUMMY CONTACT POINTS

	Driver	Passenger
Head	Upper right side rim and center hub of steering wheel, in- strument panel	Dash panel near glove box
Chest	Lower rim of steering wheel	None
Abdomen	None apparent	None
Left Knee	Dash panel	Glove box door
Right Knee	Dash panel	Glove box door
DOOR OPENING	Front	Rear
	Left Right	Left Right
	Tools Tools	Easily Easily
	Required Required	
SEAT MOVEMENT		
Seat back Failure	None None	
Seat Shift (in.)	None None	
GLAZING DAMAGE		
Backlight/Windshield	Severe windshield retention loss.	

OTHER NOTABLE IMPACT EFFECTS: Front wheels pinned by crushed sheet metal.

VEHICLE PROFILE DATA SHEET

PRE-IMPACT DATA

Make/Model: Nissan Sentra
 Body Style: 4-Door Coupe Model Year: 1982
 NHTSA No.: 820513 DSI No. 1252 Color: Cream

DATA FROM CERTIFICATION LABEL

Vehicle Manufacturer: Nissan Motor Company, Ltd.
 Date of Manufacture: 2/82 ; VIN: JN1HBL1S6CU501672
 GVWR: 2875 lb; GAWR: Front = 1420 lb; Rear = 1465 lb

POST-IMPACT DATA

Type of Test: Frontal (0°) Impact
 Date of Test: 7/29/82 Time: 1414 Temperature 95 °F
 Required Impact Velocity Range: 34.5 to 35.5 mph
 Impact Velocity: Primary = 35.18 mph Secondary = 35.17 mph

Measurements Referenced to Plane 14.4 Feet Forward of Rear Bumper ℄

Location	Height	Vehicle Left (in.)				Vehicle Right (in.)			
		<u>28.0</u>	<u>16.8</u>	<u>5.6</u>	<u>℄</u>	<u>5.6</u>	<u>16.8</u>	<u>28.0</u>	
		<u>26.5</u>	<u>15.9</u>	<u>5.3</u>	<u>℄</u>	<u>5.3</u>	<u>15.9</u>	<u>26.5</u>	
Pre-test Profile (in.)									
Top of Front Bumper	20.1	2.5	0.6	0.3	0.3	0.3	0.8	2.6	
Front of Hood	29.5	10.3	8.6	8.2	8.0	8.1	8.7	10.6	
Post-test Profile (in.)									
Top of Front Bumper	19.5	25.4	24.3	24.3	24.4	24.6	25.1	25.4	
Front of Hood	29.5	29.3	28.8	28.8	29.0	29.4	29.7	28.9	
Post-test Static Crush (in.)									
Top of Front Bumper		22.9	23.7	24.0	24.1	24.3	24.3	22.8	
Front of Hood		19.0	20.2	20.6	21.0	21.3	21.0	18.3	

4.0 DATA PRESENTATION

Data plots are presented for each accelerometer and consist of the accelerometer data plus the first integral versus time (velocity) and the second integral versus time (displacement) of the acceleration data.

For the load cells, all data are summed and presented as total load versus time, upper two rows (C and D) summed versus time and lower two rows (A and B) summed versus time. Additional plots are presented for each cell multi-plotted by column. Individual loads may be difficult to discern on some of these plots. Tabular data can be provided if necessary.

