

REPORT NOS. 208-TRC-88-002

212-TRC-88-002

301-TRC-88-002

VEHICLE SAFETY COMPLIANCE TESTING
FOR OCCUPANT CRASH PROTECTION,
WINDSHIELD MOUNTING, WINDSHIELD ZONE
INTRUSION, AND FUEL SYSTEM INTEGRITY

NISSAN MOTOR COMPANY, LTD.

1988 NISSAN MAXIMA

4-DOOR SEDAN

NHTSA NO. CJ5200

TRC TEST NO. 880805

THE TRANSPORTATION RESEARCH CENTER OF OHIO

U.S. RT. 33, LOGAN COUNTY

EAST LIBERTY, OHIO 43319



AUGUST 25, 1988

FINAL REPORT

PREPARED FOR:

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REPORT PREPARED BY:

Jeffrey W. Sankay
J.W. Sankay, Project Engineer
Transportation Research Center of Ohio

Date 8/25/88

REPORT APPROVED BY:

Kay Latimer
C.K. Latimer, Project Manager
Transportation Research Center of Ohio

Date 8-25-88

FINAL REPORT ACCEPTED BY:

Glen S. Brammer
Contracting Officer's Technical Representative (COTR),
NHTSA, Office of Vehicle Safety Compliance

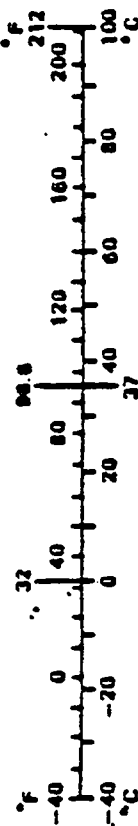
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16. Abstract A 30 mph flat frontal barrier impact compliance test was conducted on a 1988 Nissan Maxima 4-door sedan, VIN JN1HU11P4JT625562, NHTSA No. CJ5200, at the Transportation Research Center of Ohio on August 5, 1988. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards: FMVSS No. 208, "Occupant Crash Protection" FMVSS No. 212, "Windshield Mounting" FMVSS No. 219, (Partial), "Windshield Zone Intrusion" FMVSS No. 301, "Fuel System Integrity" The barrier impact velocity was 29.3 mph. The ambient temperature was 87° F The vehicle appears to comply with the applicable requirements of FMVSS Nos. 208, 212, 219 (partial), and 301.					
17. Key Words Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"			18. Distribution Statement Available from: Technical Reference Division National Highway Traffic Safety Admin Nassif Building, Room 5108 400 Seventh Street, SW Washington, DC 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	5/9 (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	
	(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

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SECTION 1.0

PURPOSE AND TEST SUMMARY

PURPOSE

This 30 mph frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (Partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center of Ohio (TRC) under Contract No. DTNH22-88-C-11038. The purpose of this test was to determine if the subject vehicle, a 1988 Nissan Maxima 4-door sedan, NHTSA No. CJ5200, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity." The test was conducted in accordance with the Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-07.

TEST SUMMARY

The 1988 Nissan Maxima 4-door sedan, NHTSA No. CJ5200, was equipped with a 3.0 liter, transverse engine, automatic transmission, power steering, and power brakes. The test weight of the vehicle was 3634 pounds. The test vehicle appeared to comply with the performance requirements of FMVSS test Nos. 208, 212, 219 (partial), and 301. The Head Injury Criteria (HIC) calculations were less than 1000, the resultant accelerations of the thorax did not exceed 60 g's and the compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 B dummies seated in the driver's and right front passenger's seats. (See DATA ACQUISITION EXPLANATIONS.) There was 100 percent windshield retention. There was no intrusion into the windshield. There was no fluid spillage from the fuel system following the impact or during the static rollover test.

Two Part 572 B, 50th percentile, adult male anthropomorphic test devices (ATDs) were seated in the front outboard designated seating positions. The dummies were positioned according to the dummy placement procedures specified in Appendices B and C of the Laboratory Test Procedure No. TP-208-07.

Both ATDs were instrumented with head and chest accelerometers oriented to measure accelerations in the longitudinal, lateral, and vertical directions and with right and left femur load cells.

The vehicle was instrumented with seven accelerometers oriented to measure longitudinal axis acceleration.

The crash event was recorded by one (1) real time panning camera and fourteen (14) high speed motion picture cameras operating at approximately 500 frames per second.

The twenty-three (23) channels of data were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 8000 samples per second and digitally processed per sections 12.8 and 12.9 of the Laboratory Procedure.

The vehicle was impacted into the rigid, flat frontal barrier at the Transportation Research Center of Ohio on August 5, 1988. The test vehicle's impact speed was 29.3 mph. The vehicle sustained 18.1 inches of static crush.

The FMVSS 208, 212, 219 (partial) and 301 compliance data is presented in Section 2.0. The camera information is presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the vehicle and dummy data plots.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: CJ5200

PROJECT: 208 Compliance

DATE: 8/05/88

TIME: 1320 TEMP: 87° F

VEHICLE: 1988 Nissan Maxima 4-door sedan

TEST WEIGHT (LBS): 3634

IMPACT ANGLE (DEG)*: 0°

IMPACT VELOCITY (MPH)**: PRIMARY = 29.3 SECONDARY = 29.3

MAXIMUM STATIC CRUSH (IN): 18.1

VEHICLE REBOUND (IN): 42.6

DUMMIES: Driver #690 Passenger #1173

TYPE: Part 572 B Part 572 B

LOCATION: Left front Right front

RESTRAINT: 2-point passive belt 2-point passive belt

NUMBER OF DATA CHANNELS: 23

NUMBER OF HIGH SPEED CAMERAS: 14 and 1 real-time panning camera

*With respect to tow track centerline.

**Speed trap measurement ($\pm$.05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Nissan Motor Company, Ltd.

MAKE/MODEL: Nissan/Maxima

VIN: JN1HU11P4JT625562

BODY STYLE: 4-door sedan

MODEL YEAR: 1988

NHTSA NO.: CJ5200

COLOR: white

ENGINE DATA: TYPE: transverse CYLINDERS: 6 DISPLACEMENT: 2960cc

TRANSMISSION DATA: 3 SPEED, MANUAL, X AUTOMATIC, X FWD, RWD, 4WD

DATE VEHICLE RECEIVED: 6/8/88

ODOMETER READING: 85.0

DEALER'S NAME AND ADDRESS: Nissan North
8645 N. High St.
Columbus, OH 43085

ACCESSORIES:

POWER STEERING Yes
POWER BRAKES Yes
POWER SEATS Yes
POWER WINDOWS Yes
TINTED GLASS Yes
RADIO Yes
CLOCK Yes
OTHER None

AUTOMATIC TRANSMISSION Yes
AUTOMATIC SPEED CONTROL Yes
TILTING STEERING WHEEL Yes
TELESCOPING STEERING WHEEL No
AIR CONDITIONING Yes
ANTI-SKID BRAKE No
REAR WINDOW DEFROSTER Yes

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Nissan Motor Company, Ltd.

DATE OF MANUFACTURE: 1/88

GVWR: 4090 LBS

GAWR: FRONT 2215 LBS., REAR 2050 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 36 psi; REAR 36 psi

RECOMMENDED TIRE SIZE: 195-60R15 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFR., LINE, SIZE): TOYO Z Radial 195-60R15

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

VEHICLE CAPACITY: TYPES OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manual adjustable

NUMBER OF OCCUPANTS 2 FRONT 3 REAR 5 TOTAL

CARGO LOAD 150 LBS. TOTAL 900 LBS.

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	1038 lbs.	RIGHT REAR	545 lbs.
LEFT FRONT	1033 lbs.	LEFT REAR	552 lbs.
TOTAL FRONT WEIGHT	2071 lbs.	(65.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1097 lbs.	(34.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 3168 lbs.			

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (3168 LBS)

VCW = VEHICLE CAPACITY WEIGHT (900 LBS)

DSC = DESIGNATED SEATING CAPACITY (5)

RCLW = VCW - 150 (DCS) = 900 - 150(5) = 150 LBS

TARGET TEST WEIGHT = UDW + RCLW + (2 DUMMIES X 164 LBS/DUMMY)

= 3168 + 150 + 328 LBS

TARGET TEST WEIGHT = 3646 LBS

TABLE 2 TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 138 LBS. CARGO

RIGHT FRONT	1099 lbs.	RIGHT REAR	720 lbs.
LEFT FRONT	1075 lbs.	LEFT REAR	740 lbs.
TOTAL FRONT WEIGHT	2174 lbs.	(59.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1460 lbs.	(40.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3634 lbs.	(0.3% UNDER TARGET WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 50 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: None

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	LF 26.7;	RF 26.6;	LR 26.6;	RR 26.7
PRE-TEST ATTITUDE:	LF 26.2;	RF 26.4;	LR 25.3;	RR 25.3
POST-TEST ATTITUDE:	LF 27.9;	RF 28.4;	LR 25.1;	RR 24.6

WHEELBASE: 100.2 INCHES

CG = 40.2 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TABLE 3 TEST CONDITIONS

TEST NUMBER: 880805

DATE OF TEST: 8/05/88

TIME OF TEST: 1320

TYPE OF TEST: Frontal barrier impact

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA:

87° F

TEMPERATURE IN OCCUPANT COMPARTMENT:

76° F

IMPACT VELOCITY: PRIMARY = 29.3 MPH

SECONDARY = 29.3 MPH

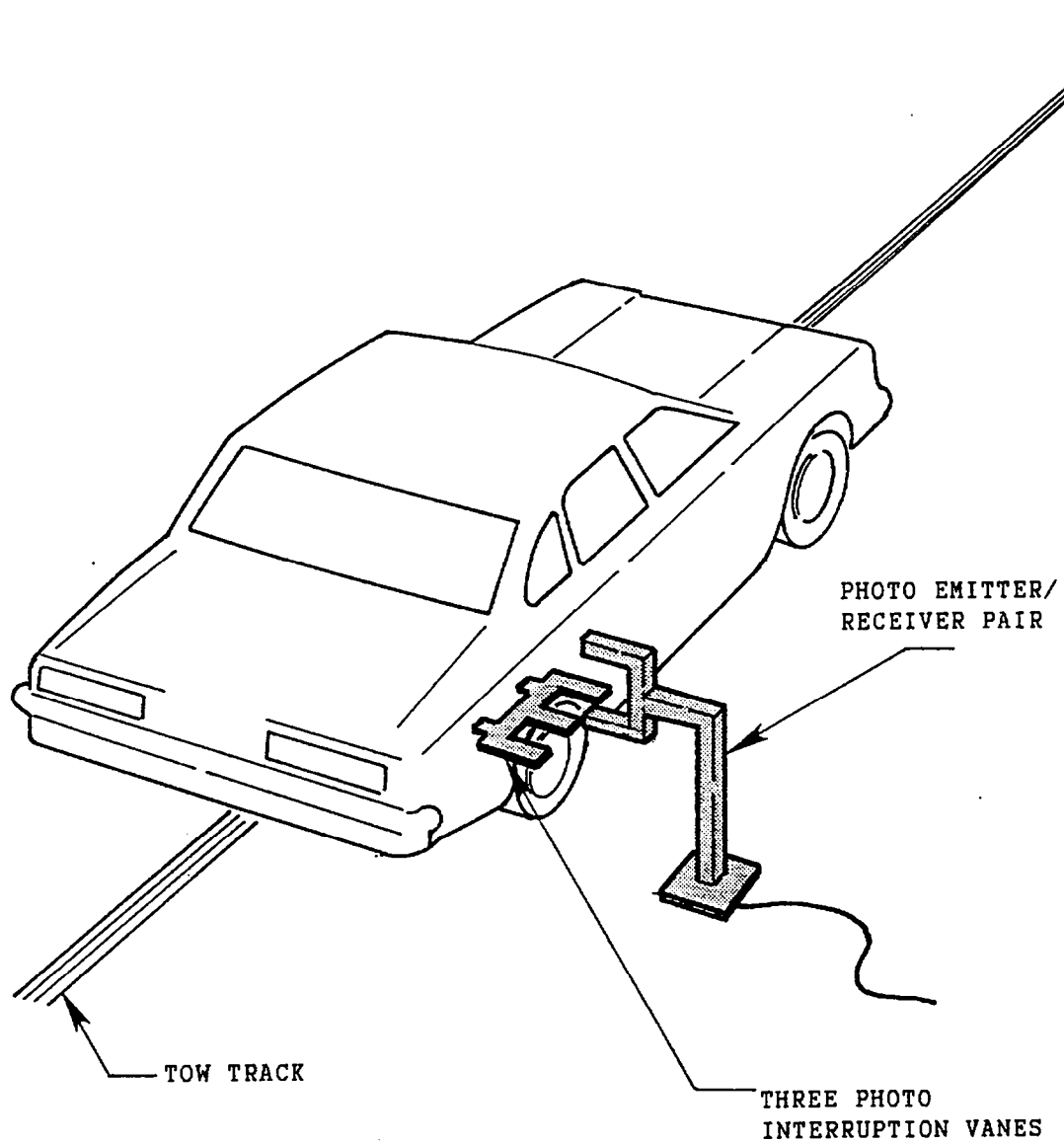
(SPECIFIED RANGE = 28.9 TO 29.9 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES):

OVERALL LENGTH OF TEST VEHICLE:	PRE-TEST:	L 177.3;	C 182.2;	R 177.2
	POST-TEST:	L 163.0;	C 164.4;	R 162.5
	TOTAL CRUSH:	L 14.3;	C 17.8;	R 14.7

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: L: 42.8; C: 41.2; R: 43.9; AVG: 42.6

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver two inches before impact.

The vanes have one foot spacing.

FIGURE 2
VEHICLE ACCELEROMETER LOCATIONS

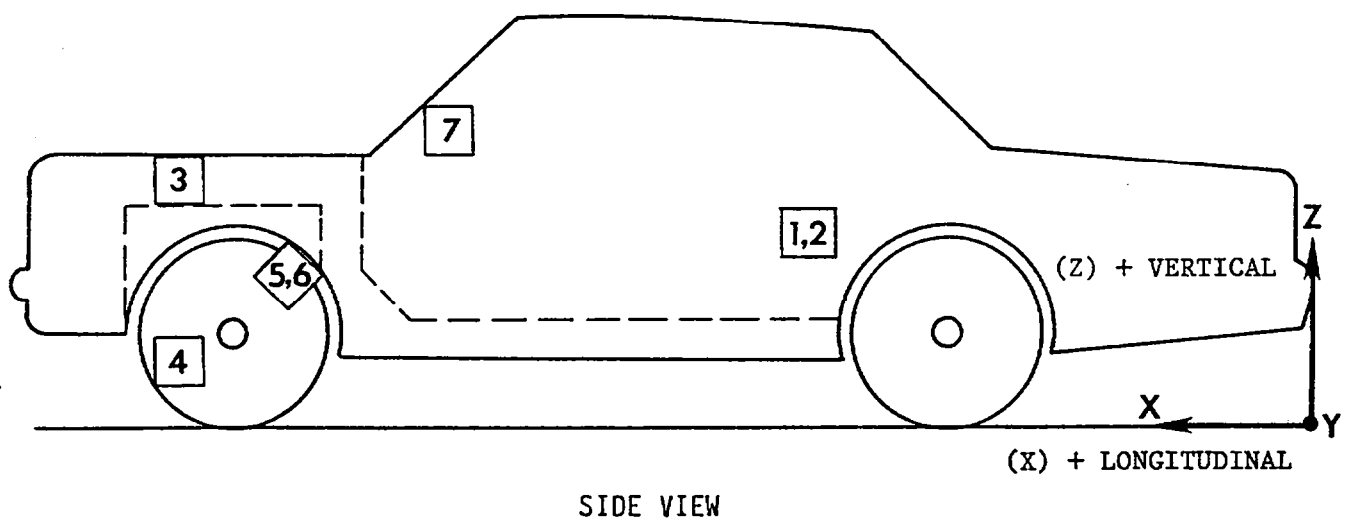
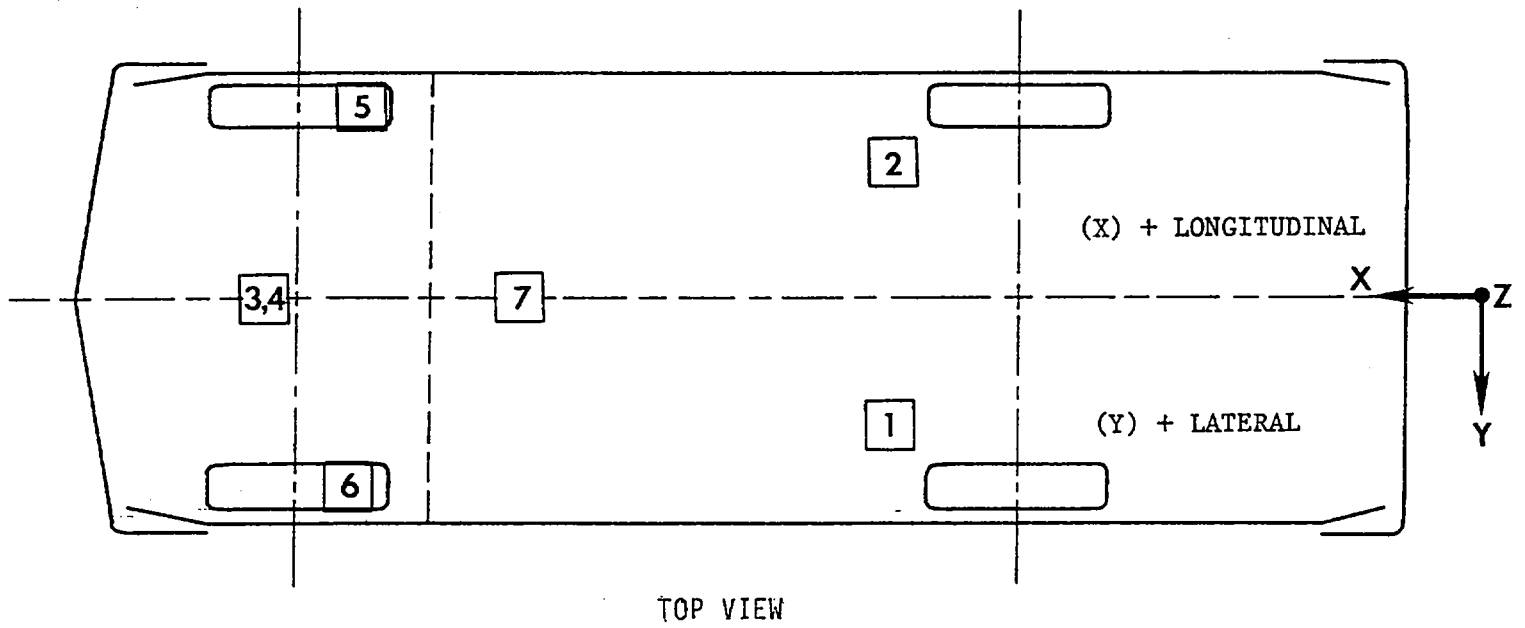


TABLE 4

TEST NUMBER 880805

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
						MAX G	MSEC	MAX G	MSEC
1	REAR SEAT CROSSMEMBER AT LEFT SIDE LONGITUDINAL	PRE	67.8	22.2	13.0				
		POST	67.8	22.2	13.1				
						0.8	210.0	31.9	45.4
2	REAR SEAT CROSSMEMBER AT RIGHT SIDE LONGITUDINAL	PRE	67.7	-22.3	13.0				
		POST	67.7	-22.3	12.9				
						0.7	213.8	30.6	45.8
3	TOP OF ENGINE BLOCK LONGITUDINAL	PRE	148.2	0.0	32.4				
		POST	142.8	0.0	32.0				
						35.8	49.1	118.3	33.3
4	BOTTOM OF ENGINE BLOCK LONGITUDINAL	PRE	150.0	11.1	6.9				
		POST	144.6	11.1	5.9				
						29.4	46.4	112.1	36.6
5	BRAKE CALIPER AT RIGHT SIDE LONGITUDINAL	PRE	146.9	-25.4	11.7				
		POST	143.1	-25.4	11.0				
						42.1	77.6	80.7	54.3
6	BRAKE CALIPER AT LEFT SIDE LONGITUDINAL	PRE	146.6	25.4	12.0				
		POST	143.2	25.4	10.6				
						32.7	73.0	95.5	47.0
7	DASH PANEL LONGITUDINAL	PRE	116.5	0.0	35.7				
		POST	116.2	0.0	36.3				
						21.2	41.5	55.4	79.8

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

FIGURE 3 ACCIDENT INVESTIGATION DIVISION DATA
FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Nissan/Maxima/4-door sedan
 VEH. NHTSA NO.: CJ5200; VIN: JN1HU11P4JT625562
 MODEL YEAR: 1988; BUILD DATE: 1/88; TEST DATE: 8/05/88
 VEH. SIZE CATEGORY: Compact; TEST WEIGHT: 3634
 VEH. WHEELBASE: 100.2
 MAX. WIDTH: 66.2
 FRONT OVERHANG: 40.5

COLLISION DEFORMATION
 CLASSIFICATION (CDC) CODE: 12FDEW2

F (Frontal)
 CRUSH DEPTH
 DIMENSIONS:

C1 =	<u>14.3</u>	inches
C2 =	<u>16.2</u>	inches
C3 =	<u>18.1</u>	inches
C4 =	<u>17.9</u>	inches
C5 =	<u>17.6</u>	inches
C6 =	<u>14.7</u>	inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitudinal)

LENGTH OF DAMAGED REGION: L = 59.1 inches

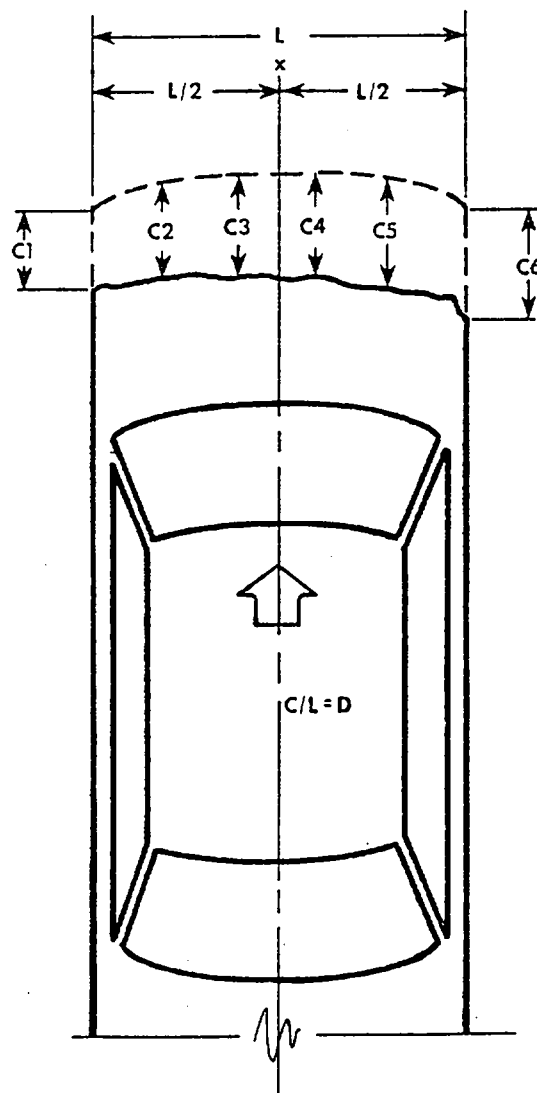


FIGURE 4
PRE-TEST AND POST-TEST MEASUREMENT POINTS

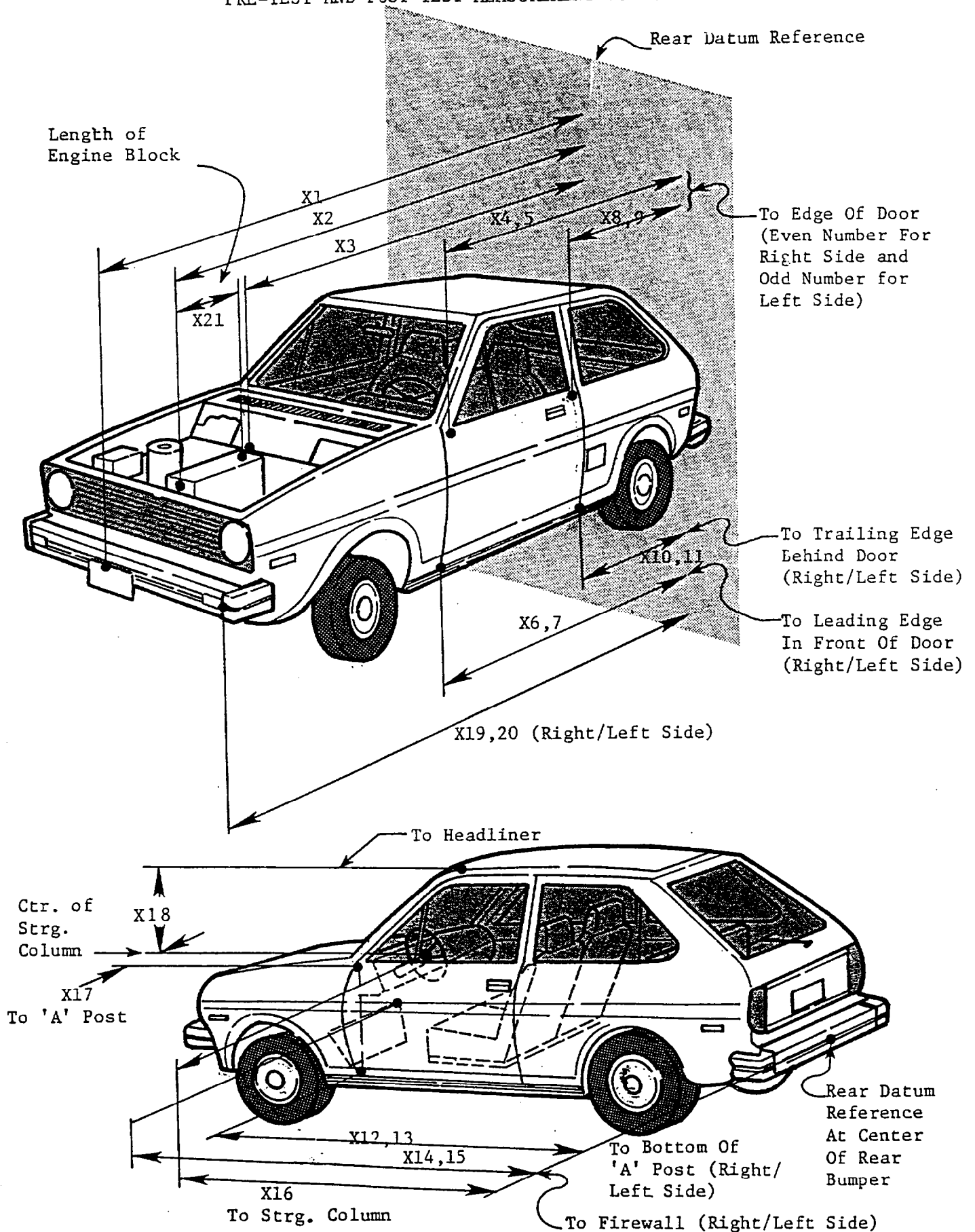
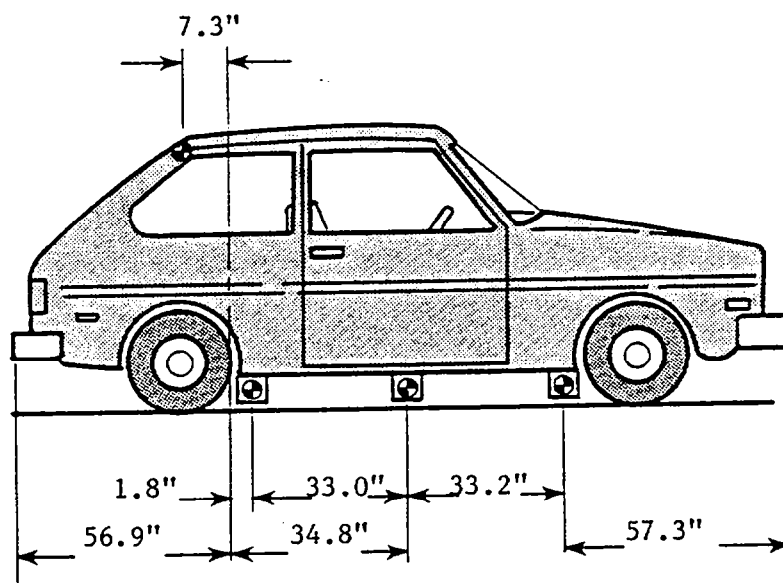
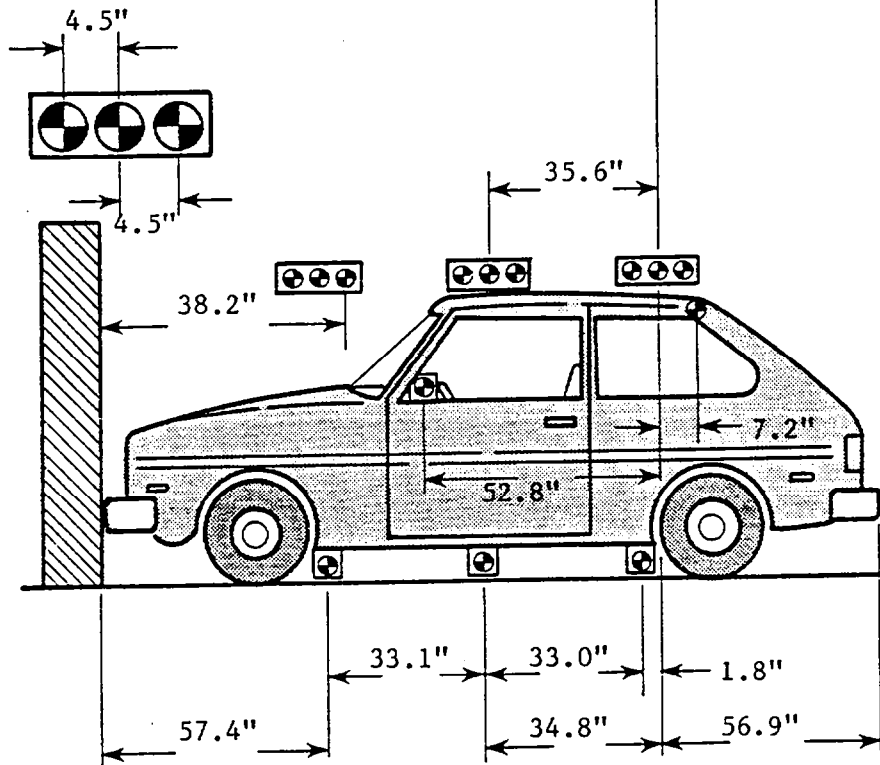
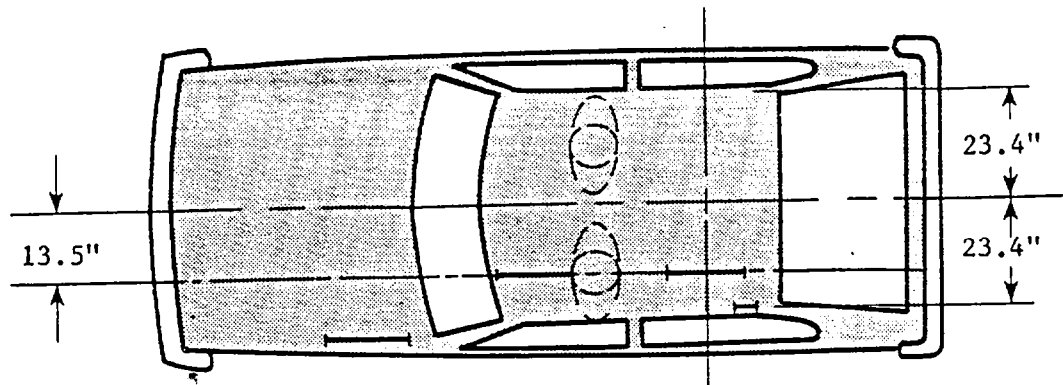


TABLE 5 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Nissan/Maxima		TEST NUMBER: 880805		DIMENSIONS IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.		
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	182.2	164.4	17.8		
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	161.2	154.5	6.7		
X3	REAR SURFACE OF VEHICLE TO FIREWALL	131.2	131.2	0.0		
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	120.5	120.4	0.1		
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	120.0	120.2	-0.2		
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	121.9	121.5	0.4		
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	121.9	121.8	0.1		
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	81.9	82.1	-0.2		
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	81.9	82.0	-0.1		
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	81.2	81.2	0.0		
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	81.2	81.3	-0.1		
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	121.9	121.6	0.3		
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	122.1	122.2	-0.1		
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	131.2	130.6	0.6		
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	131.2	130.5	0.7		
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	104.2	103.9	0.3		
X17	CENTER OF STEERING COLUMN TO "A" POST	12.8	10.3	2.5		
X18	CENTER OF STEERING COLUMN TO HEADLINING	18.3	16.3	2.0		
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	177.2	162.5	14.7		
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	177.3	163.0	14.3		
X21	LENGTH OF ENGINE BLOCK	20.8	20.8	0.0		

VEHICLE TARGET LOCATION



DATA ACQUISITION EXPLANATIONS

The driver's left femur force load cell, LFMF1, data was lost after 57 milliseconds due to mechanical vibration of a voltage-controlled oscillator on the signal conditioning card interrupting the data signal circuit.

The right front passenger's chest X-axis, Y-axis, and Z-axis accelerometers; CSTXG2, CSTYG2, and CSTZG2; recorded spikes at 70 and 73 milliseconds due to the left side of the two lower ribs fracturing at the bolts which attach the ribs to the spine.

SECTION 2.0

SUMMARY OF RESULTS FOR:

FMVSS 208, "Occupant Crash Protection"

FMVSS 212, "Windshield Mounting"

FMVSS 219, (Partial), "Windshield Zone Intrusion"

FMVSS 301, "Fuel System Integrity"

COMPLIANCE DATA SUMMARY

The test vehicle, a 1988 Nissan Maxima 4-door sedan, NHTSA No. CJ5200, appeared to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial), and 301.

The driver's Head Injury Criteria (HIC) was 658. The driver's maximum chest deceleration over three milliseconds was 45.0 g. The driver's right and left compressive femur loads were 1361 pounds and 1163 pounds, respectively. (SEE DATA ACQUISITION EXPLANATIONS)

The right front passenger's Head Injury Criteria (HIC) was 662. The right front passenger's maximum chest deceleration over three milliseconds was 50.6 g (See DATA ACQUISITION EXPLANATIONS). The right front passenger's right and left compressive femur loads were 1013 pounds and 1071 pounds, respectively.

The vehicle's restraint system met the comfort and convenience requirements of FMVSS 208.

The windshield retention was 100 percent.

There was no intrusion into the inner surface of the windshield below the protected zone.

There was no Stoddard fluid spillage following the crash test event or during any phase of the rollover test.

TABLE 6 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION ('G')

	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DRIVER	-74.2	23.3	-60.9	97.4	-48.6	10.7	10.2	45.0
PASSENGER	-34.7	-11.0	-63.2	65.3	253.5 γ	-82.1 γ	365.7 γ	50.6 γ

MAXIMUM FORCE-FEMUR LOAD (LBS)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	1163 γ	1361
PASSENGER	1071	1013

HEAD INJURY CRITERIA**

	HIC	TIME t_1 (MSEC) ¹	TIME t_2 (MSEC) ²
DRIVER	658	69.4	105.4
PASSENGER	662	67.9	103.9

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

γ See DATA ACQUISITION EXPLANATIONS

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The driver's head rotated forward impacting the steering wheel hub. The driver's upper torso rotated forward and leftward and impacted the lower steering wheel rim as the dummy was restrained by the two-point passive belt. The driver's head rotated rearward as the dummy rebounded rearward and rightward into the right portion of the driver's seat back. The driver's shoulder and head contacted the passenger's shoulder and head. The driver dummy came to rest seated in the driver's seat, leaning to the right against the passenger dummy, restrained by the two-point passive belt.

PASSENGER DUMMY

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the instrument panel. The passenger's head rotated forward impacting the passenger's chest. The dummy's upper torso rotated forward and rightward as the dummy was restrained by the two-point passive belt. The passenger's head rotated rearward as the dummy rebounded rearward and leftward into the left portion of the passenger's seat back. The passenger's shoulder and head contacted the driver's shoulder and head. The passenger dummy came to rest seated in the passenger's seat, leaning to the left against the driver dummy, restrained by the two-point passive belt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #690	PASSENGER #1173
Head	<u>Steering wheel hub and passenger dummy</u>	<u>Chest & driver dummy</u>
Chest	<u>None</u>	<u>None</u>
Abdomen	<u>None</u>	<u>None</u>
Left knee	<u>Instrument panel</u>	<u>Instrument panel</u>
Right knee	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Easy</u>	<u>Easy</u>
Rear	<u>Easy</u>	<u>Easy</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>None</u>	<u>None</u>
Rear	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

The windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

None

FIGURE 6 DUMMY POSITIONING DATA FOR 30 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

Make/Model: Nissan/Maxima
 Body Style: 4-door sedan Model Year: 1988
 NHTSA No.: CJ5200 Color: white

DATA FROM CERTIFICATION LABEL:

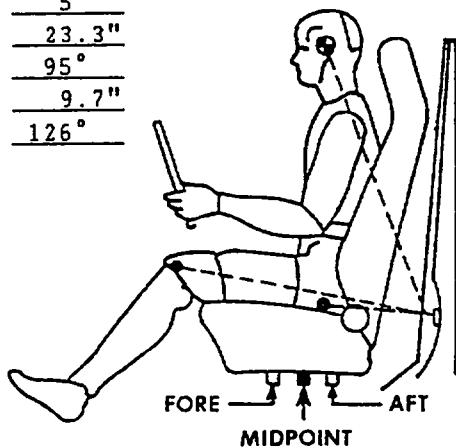
Vehicle Manufacturer: Nissan Motor Company, Ltd.
 Date of Manufacture: 1/88 VIN: JN1HU11P4JT625562
 GVWR: 4090 lb; GAWR: Front = 2215 lb; Rear = 2050 lb

POST-IMPACT DATA:

Date of Test: 8/05/88 Time: 1320 Temperature: 87 ° F
 Required Impact Velocity Range: 28.9 to 29.9 mph
 Impact Velocity: Primary = 29.3 mph Secondary = 29.3 mph
 Seat Type: Bucket Adjuster Type: Power
 Bucket Seat Back Type: Manual adjustable
 Technicians: R. Branham, B. Fishbaugh, P. Cummins

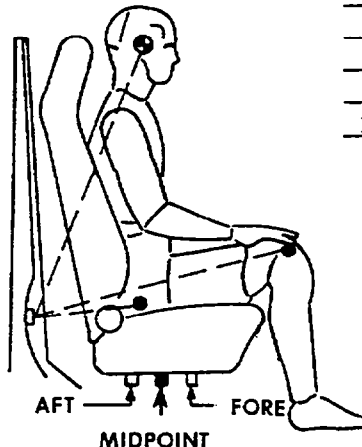
DRIVER DUMMY #690

Head 20.5"
 Target 5°
 Knee 23.3"
 Joint 95°
 Approx-imate 9.7"
 "H" Point 126°



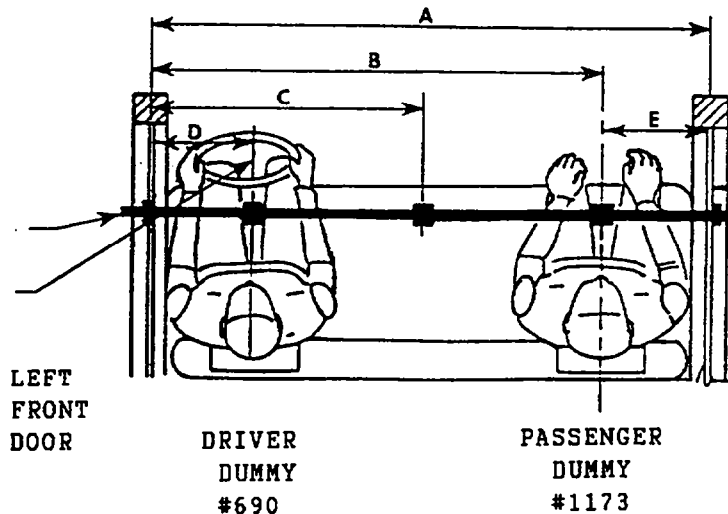
PASSENGER DUMMY #1173

19.9" Head
6° Target
22.9" Knee
95° Joint
9.4" Approx-imate
128° "H" Point



A = 50.0"
 B = 39.0"
 C = 25.0"
 D = 11.0"
 E = 11.0"

LATERAL BAR
 ADJUSTABLE
 POINTER

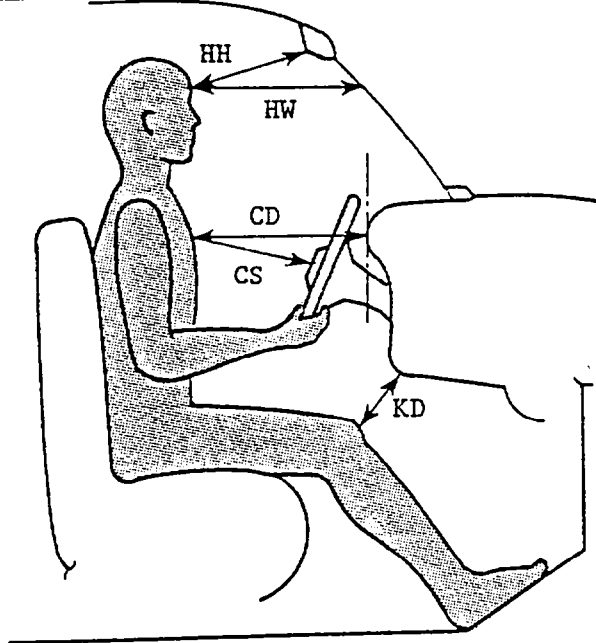


10.6" DOOR
 GLASS
 HEIGHT

RIGHT
 FRONT
 DOOR

FIGURE 7 DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER	PASSENGER
HH	14.1	14.6
HW	18.1	20.7
CD	22.4	23.0
CS	15.0	NA
KDL	5.4	5.5
KDR	5.4	5.1
TA	22°	25°
SA	25°	25°
HA	12.6	13.9

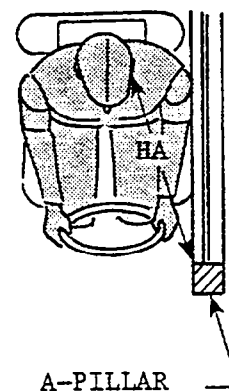
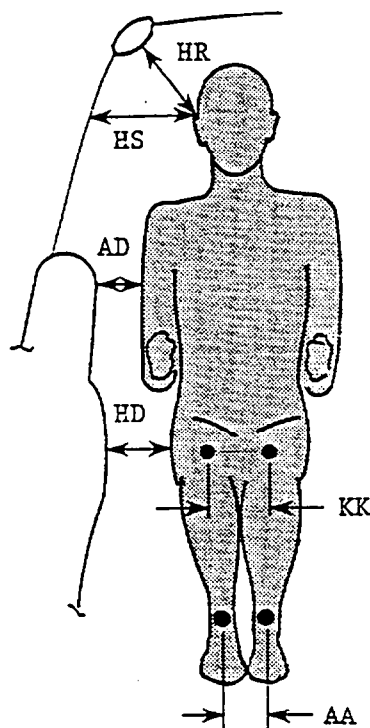


	DRIVER	PASSENGER
HR	5.2	5.6
HS	8.1	8.8
AD	3.6	3.7
HD	5.6	5.7
KK	10.0	7.7
AA	11.5	6.5

Knee outer bolt head to outer bolt head spacing:

Driver = 14.4

Passenger = 11.8



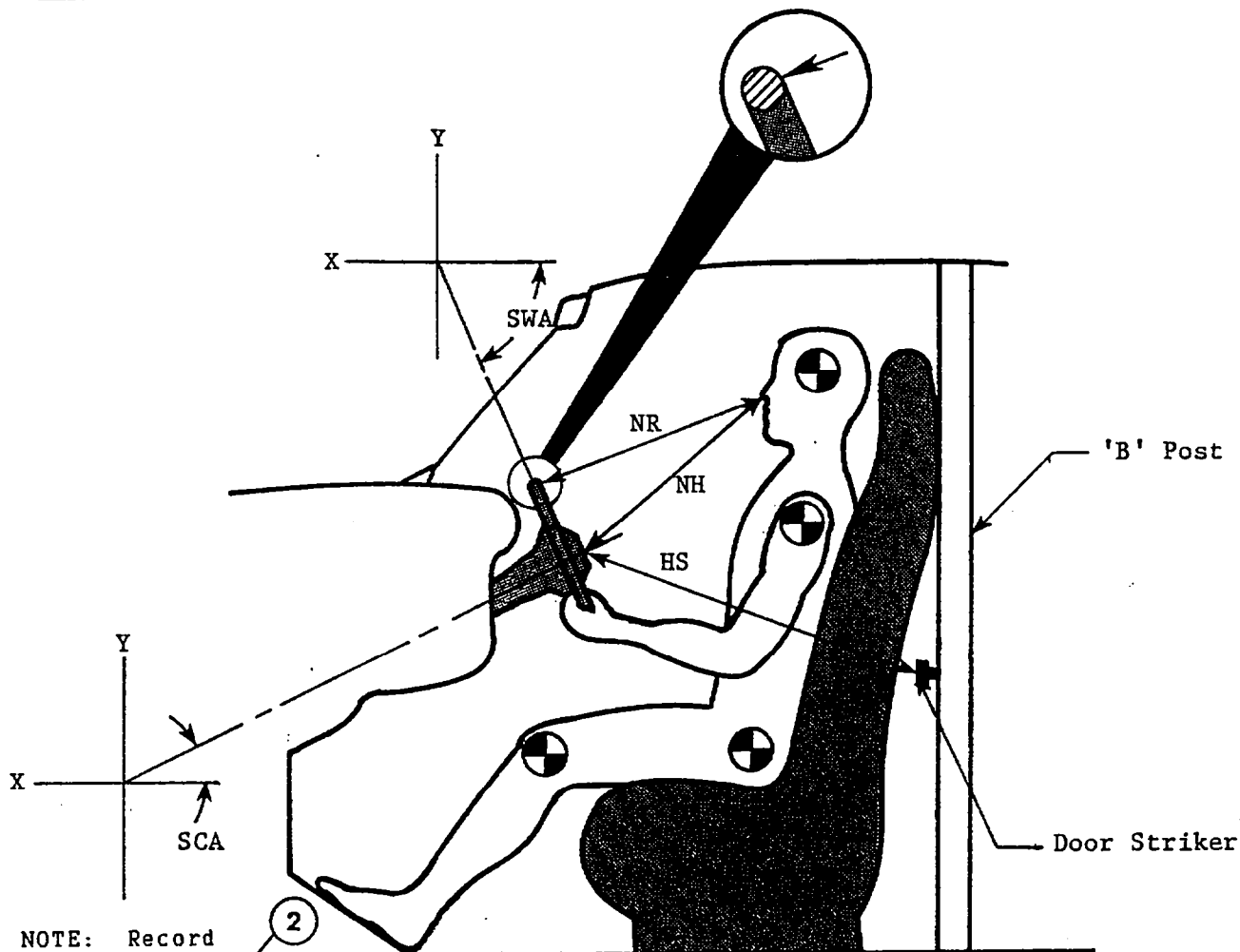
HH = Head to Windshield Header
 HW = Head to Windshield
 CD = Chest to Dash
 CS = Chest to Steering Wheel
 KD = Knee to Dash
 TA = Torso Angle
 SA = Seat Back Angle

HR = Head to Side Roof
 HS = Head to Side Window
 AD = Arm to Door
 HD = Hip to Door
 KK = Knee to Knee
 AA = Ankle to Ankle
 HA = Head to A-Pillar

Torso and seat back angles are relative to vertical.

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 8 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS

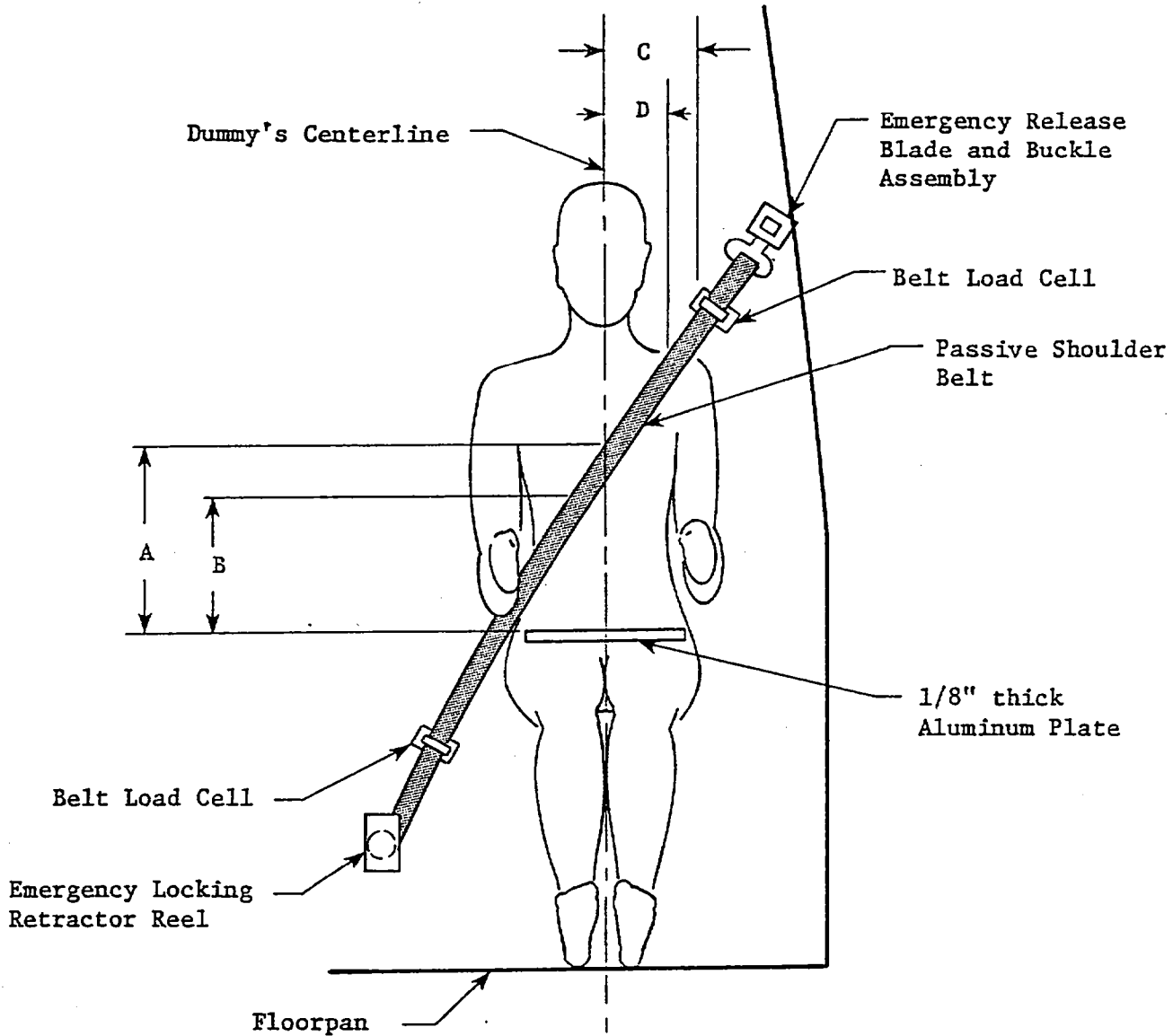


REMARKS: Steering column was positioned in the midpoint of the infinitely-adjustable tilt range.

MEASUREMENTS

NR	- Distance from tip of dummy's nose to top rear surface of steering wheel rim. (in.)	18.0
NH	- Distance from tip of dummy's nose to center of steering column hub. (in.)	19.0
HS	- Distance from center of steering column hub to the forward surface of the door lock striker pin. (in.)	22.4
SCA	- Angle of steering column relative to the horizontal X axis	22°
SWA	- Angle of steering wheel relative to the horizontal X axis	68°

FIGURE 9 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	12.5	14.7
B - Top surface of alum. plate to belt lower edge (in)	10.3	10.8
C - Dummy centerline to outer edge of belt at chest flesh top (in)	5.5	4.6
D - Dummy centerline to inner edge of belt at chest flesh top (in)	3.0	2.1

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN NO: JN1HU11P4JT625562 NHTSA NO: CJ5200
MAKE: Nissan MODEL: Maxima
VEHICLE BUILD DATE: 1/88 VEHICLE TYPE: 4-door sedan
FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:
(check one): X Automatic belts
 Type 2 lap/shoulder belts
 Other

CONVENIENCE HOOKS:

DEVICE AUTOMATICALLY RELEASES WHEN IGNITION IS TURNED TO "ON" OR "START"
AND (check one):

 Vehicle's drivetrain is engaged
 Vehicle's parking brake is in the released mode
 X Not applicable, vehicle's restraint system does not
include convenience hooks

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITON BELTS HAVE TENSION - RELIEVING DEVICES?
 No

BELT CONTACT FORCE:

FOR BELTS WITHOUT TENSION-RELIEVING DEVICES: BELT CONTACT FORCE:
 0 .1 POUNDS

LATCHPLATE ACCESS: NA

RETRACTION: NA

ACCESSIBILITY: NA

LATCH MECHANISM: NA

TABLE 8 FMVSS NO. 208 - SEAT BELT WARNING SYSTEM DATA

WITH OCCUPANT IN DRIVER'S POSITION AND PASSIVE BELT IN STOWED POSITION AND
IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 6 sec.

Duration of reminder light operation = continuous sec.

WITH OCCUPANT IN DRIVER'S POSITION AND PASSIVE BELT IN USE AND THE IGNITION
SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 0 sec.

(NOTE: audible warning should not operate)

Duration of reminder light operation = 6 sec.

Wording of visual warning:

Fasten Seat Belt

Fasten Belt

Symbol 101-80 X

TABLE 9 FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER'S MAINTENANCE OR REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM: NA, vehicle did not contain a crash-deployed occupant protection system.

TABLE 10 FMVSS NO. 208 - READINESS INDICATOR DATA

AN OCCUPANT RESTRAINT SYSTEM THAT DEPLOYS IN THE EVENT OF A CRASH SHALL HAVE A MONITORING SYSTEM WITH A READINESS INDICATOR. A TOTALLY MECHANICAL SYSTEM IS EXEMPT FROM THIS REQUIREMENT. NA, vehicle did not contain a crash-deployed occupant protection system.

TABLE 11 SUMMARY OF FMVSS 301 DATA

PRE-IMPACT DATA

MAKE/MODEL: Nissan/Maxima

BODY STYLE: 4-door sedan

MODEL YEAR: 1988

NHTSA NO.: CJ5200

COLOR: white

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Nissan Motor Company, Ltd.

DATE OF MANUFACTURE: 1/88

VIN: JN1HU11P4JT625562

GVWR: 4090 LBS., GAWR: FRONT 2215 LBS., REAR 2050 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Barrier Impact

DATE OF TEST: 8/05/88 TIME: 1320 TEMP: 87° F

REQUIRED IMPACT VELOCITY RANGE: 28.9 MPH TO 29.9 MPH

IMPACT VELOCITY: PRIMARY = 29.3 MPH, SECONDARY = 29.3 MPH

TEST WEIGHT = 3634 LBS., STATIC CRUSH MAX. = 18.1 IN., REBOUND = 42.6 IN.

FUEL SYSTEM DATA

TEST FLUID TYPE: PURPLE SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 16.1 GALLONS (FURNISHED BY COTR)

TEST VOLUME: 15.0 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 17.1 GALLONS

DETAILS OF FUEL SYSTEM: Fuel tank is located in front of rear axle.
Fuel filler neck is located on left side and enters left rear corner
of fuel tank.

ELECTRIC FUEL PUMP: Yes

FUEL INJECTON: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? No

*WITH ENTIRE FUEL SYSTEM FILLED.

FIGURE 10 FMVSS NO. 212. "WINDSHIELD MOUNTING". DATA SHEET

Details of windshield mounting such as retention method, trim type, etc.:

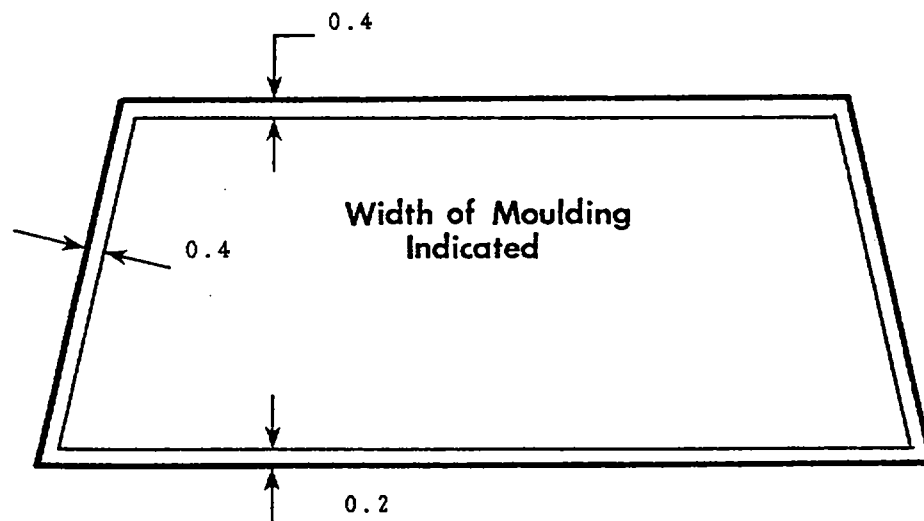
FMVSS 212 REQUIREMENTS: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

WINDSHIELD PERIPHERY

	PRE-TEST (in)	POST-TEST (in)	PERCENT RETENTION
RIGHT SIDE	77.8	77.8	100%
LEFT SIDE	77.8	77.8	100%
TOTAL	155.6	155.6	100%

AREA OF RETENTION FAILURE:



FAILURE DETAILS: None

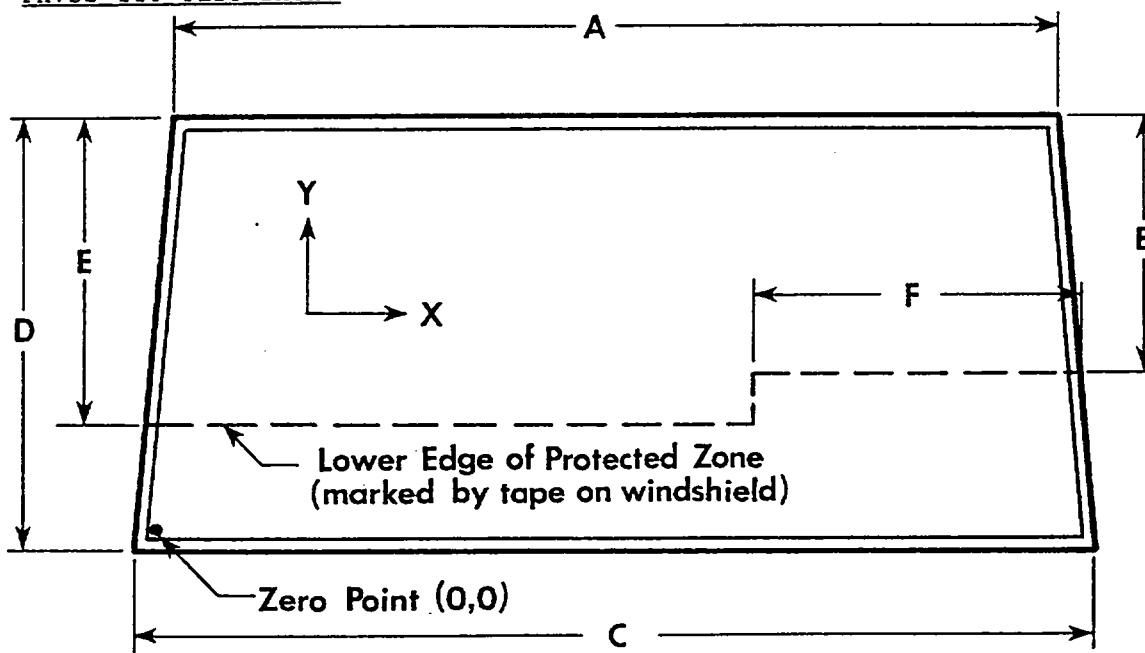
Windshield Temperature: 76° F

FIGURE 11 FMVSS NO. 219, "WINDSHIELD ZONE INTRUSION", DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 1/2" from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

FMVSS 219 TEST DATA:



FRONT VIEW

A = 44.1

C = 57.6

E = 19.5

B = 15.9

D = 27.8

F = 18.2

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":
(Show location of penetration on above sketch)

COORDINATES
X Y

None

1.

2.

3.

4.

ALL MEASUREMENTS ARE IN INCHES.

TABLE 12 "FUEL SYSTEM INTEGRITY" POST-IMPACT

TEST DATA, FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CJ5200; TEST DATE: 8/05/88

VEH. MFR./MAKE/MODEL: Nissan Motor Company, Ltd./Nissan/Maxima

Test vehicle fuel tank filled to 92 to 94% of manufacturer's "useable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

- ☒ Frontal (30 mph)
- ☐ Oblique (30 mph) with ☐ barrier face
first contacting ☐ (driver/pass.) side.
- ☐ Rear Moving Barrier (30 mph)
- ☐ Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:

	<u>ACTUAL</u>	<u>MAX. ALLOW.</u>
1. From impact until vehicle motion ceases - - -	0	1 oz.
2. For 5 min. period after veh. motion ceases- -	0	5 oz.
3. For next 25 minutes - - - - -	0	1 oz./1 min.

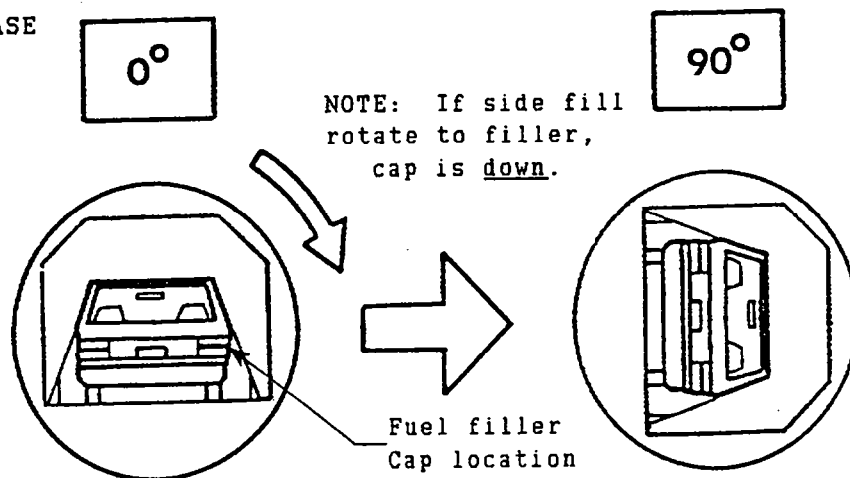
SOLVENT SPILLAGE DETAILS:

None

FIGURE 12 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

NHTSA NO.: CJ5200

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 position hold time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next whole minute interval - - - - = 7 minutes

FMVSS 301 REQUIREMENTS

	First 5 minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum allowable solvent spillage - -	<u>5 oz.</u>	<u>1 oz.</u>	<u>1 oz.</u>
0 to 90° (filler cap down) - - - - -	<u>0 oz.</u>	<u>0 oz.</u>	<u>0 oz.</u>

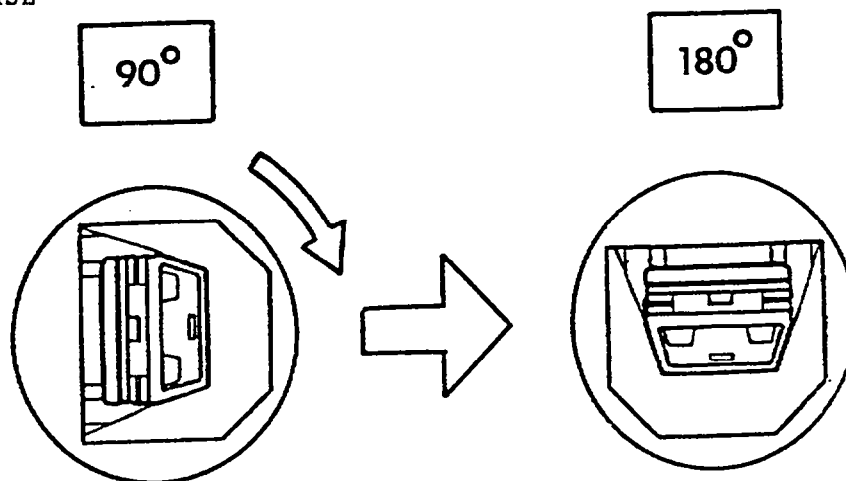
SOLVENT SPILLAGE LOCATION(S)

None

FIGURE 12 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET, CONT'D

NHTSA NO.: CJ5200

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 position hold time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next whole minute interval - - - - = 14 minutes

FMVSS 301 REQUIREMENTS

	First 5 minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum allowable solvent spillage - -	<u>5 oz.</u>	<u>1 oz.</u>	<u>1 oz.</u>
90° to 180° - - - - -	<u>0 oz.</u>	<u>0 oz.</u>	<u>0 oz.</u>

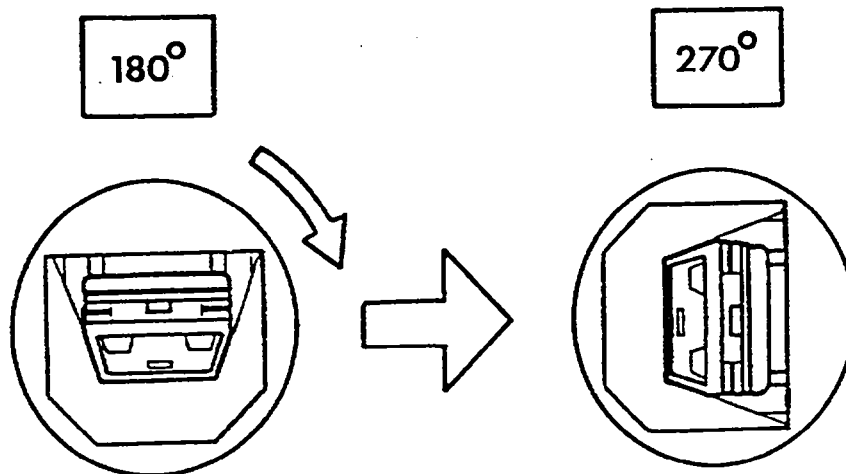
SOLVENT SPILLAGE LOCATION(S)

None

FIGURE 12 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET, CONT'D

NHTSA NO.: CJ5200

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 position hold time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next whole minute interval - - - - = 21 minutes

FMVSS 301 REQUIREMENTS

	First 5 minutes	6th	7th
	FROM ONSET OF ROTATION	Minute	Minute
Maximum allowable solvent spillage - -	<u> 5 oz. </u>	<u> 1 oz. </u>	<u> 1 oz. </u>
180° to 270° - - - - -	<u> 0 oz. </u>	<u> 0 oz. </u>	<u> 0 oz. </u>

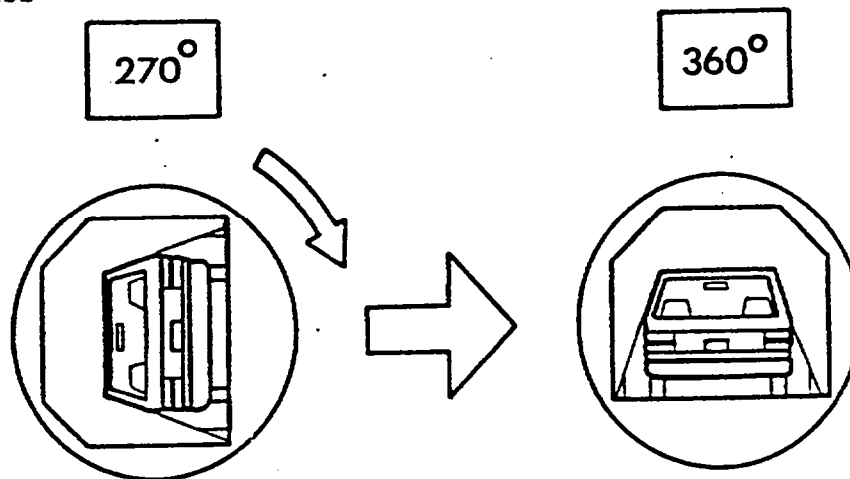
SOLVENT SPILLAGE LOCATION(S)

None

FIGURE 12 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET, CONT'D

NHTSA NO.: CJ5200

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

Time req. for machine to rotate 90° = 2 minutes, 00 seconds

FMVSS 301 position hold time = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

Next whole minute interval - - - - - = 28 minutes

FMVSS 301 REQUIREMENTS

	First 5 minutes FROM ONSET OF ROTATION	6th Minute	7th Minute
Maximum allowable solvent spillage - -	<u>5 oz.</u>	<u>1 oz.</u>	<u>1 oz.</u>
270° to 360° - - - - -	<u>0 oz.</u>	<u>0 oz.</u>	<u>0 oz.</u>

SOLVENT SPILLAGE LOCATION(S)

None

SECTION 3.0

CAMERA INFORMATION

FIGURE 13 CAMERA POSITIONS

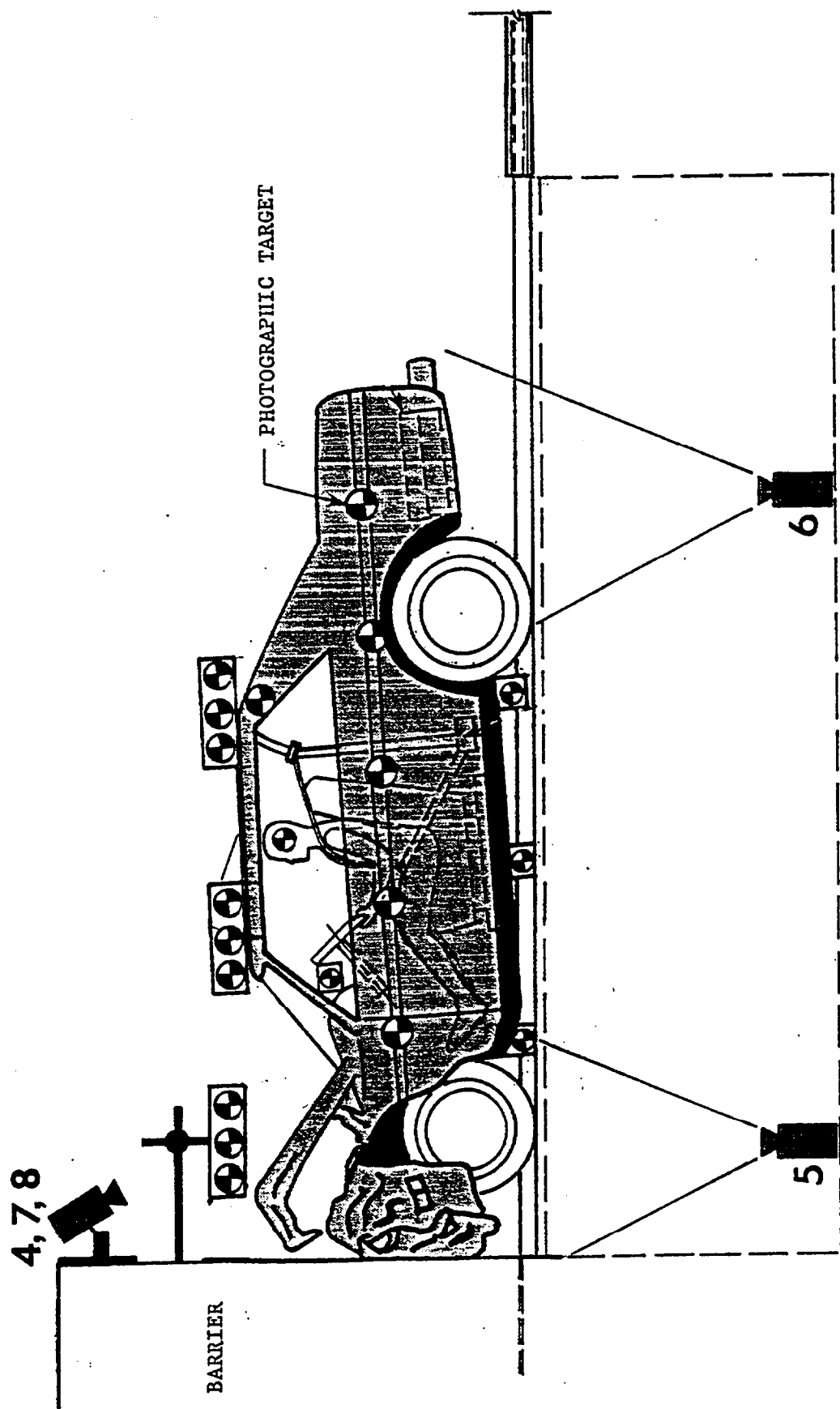


FIGURE 13 CAMERA POSITION CONT'D

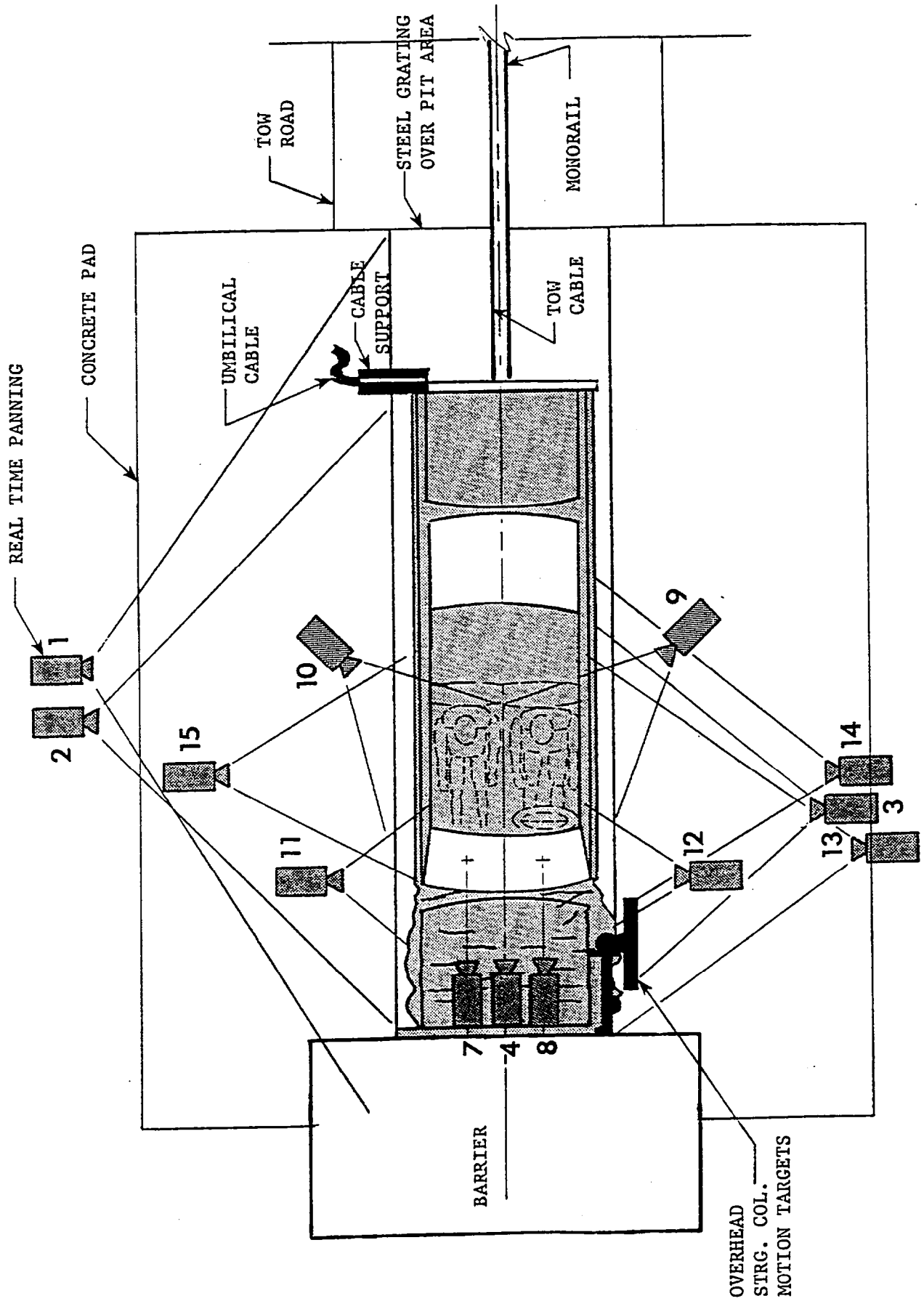


TABLE 13 HIGH SPEED CAMERA LOCATIONS

TEST NO.: 880805		VEHICLE: Nissan Maxima			FILM PLANE			
CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	TO HEAD TARGET	LENS (MM)	SPEED (FPS)
		X	Y	Z				
1	Real time panning	-142.0	504.0	61.0	NA	NA	16	24
2	Vehicle crush	-81.3	266.4	37.1	-2	NA	13	501
3	Dummy kinematics	-41.5	-295.0	44.0	-4	260.5	25	515
4	Windshield damage	-6.0	0.0	84.0	-40	NA	13	500
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	999
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	13	998
7	Passenger kinematics	-4.5	13.8	93.0	-50	NA	17	498
8	Driver kinematics	-6.8	-14.5	93.0	-50	NA	17	500
9	Driver kinematics	-157.3	-116.0	87.0	-27	131.0	25	498
10	Passenger kinematics	-152.1	116.0	87.0	-26	134.0	25	498
11	Windshield intrusion	-38.1	306.1	44.0	0	NA	50	500
12	Windshield intrusion	-53.0	-309.4	42.3	0	NA	50	500
13	Column movement	-90.0	-286.0	103.0	-14	NA	25	501
14	Column movement	-90.0	-286.0	75.1	-9	NA	25	500
15	Passenger kinematics	-38.8	293.0	45.3	-4	260.5	25	520

*X = Film plane to plane of barrier face

Y = Film plane to monorail centerline

Z = Film plane to ground

**Referenced to horizontal plane

APPENDIX A

PHOTOGRAPHS

1. PRE-TEST FRONT VIEW
2. POST-TEST FRONT VIEW
3. PRE-TEST LEFT SIDE VIEW
4. POST-TEST LEFT SIDE VIEW
5. PRE-TEST RIGHT SIDE VIEW
6. POST-TEST RIGHT SIDE VIEW
7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. PRE-TEST LEFT REAR THREE-QUARTER VIEW
10. POST-TEST LEFT REAR THREE-QUARTER VIEW
11. PRE-TEST REAR VIEW
12. POST-TEST REAR VIEW
13. PRE-TEST WINDSHIELD VIEW
14. POST-TEST WINDSHIELD VIEW
15. PRE-TEST ENGINE COMPARTMENT VIEW
16. POST-TEST ENGINE COMPARTMENT VIEW
17. PRE-TEST FUEL FILLER CAP VIEW
18. POST-TEST FUEL FILLER CAP VIEW
19. PRE-TEST FRONT UNDERBODY VIEW
20. POST-TEST FRONT UNDERBODY VIEW
21. PRE-TEST REAR UNDERBODY VIEW
22. POST-TEST REAR UNDERBODY VIEW
23. PRE-TEST FUEL LINES
24. PRE-TEST FUEL TANK VIEW
25. PRE-TEST BALLAST VIEW
26. PRE-TEST DRIVER DUMMY POSITION VIEW
27. POST-TEST DRIVER DUMMY POSITION VIEW
28. PRE-TEST PASSENGER DUMMY POSITION VIEW
29. POST-TEST PASSENGER DUMMY POSITION VIEW
30. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW
31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

PHOTOGRAPHS, CONT'D

- 33. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW
- 34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
- 35. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
- 36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1
- 37. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2
- 38. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3
- 39. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4
- 40. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1
- 41. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2
- 42. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 3
- 43. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW
- 44. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW
- 45. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW



Figure A-1. PRE-TEST FRONT VIEW



Figure A-2. POST-TEST FRONT VIEW



Figure A-3. PRE-TEST LEFT SIDE VIEW



Figure A-4. POST-TEST LEFT SIDE VIEW

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Figure A-5. PRE-TEST RIGHT SIDE VIEW



Figure A-6. POST-TEST RIGHT SIDE VIEW
A-5

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Figure A-7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-9. PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-10. POST-TEST LEFT REAR THREE-QUARTER VIEW
A-7

880805



Figure A-11. PRE-TEST REAR VIEW

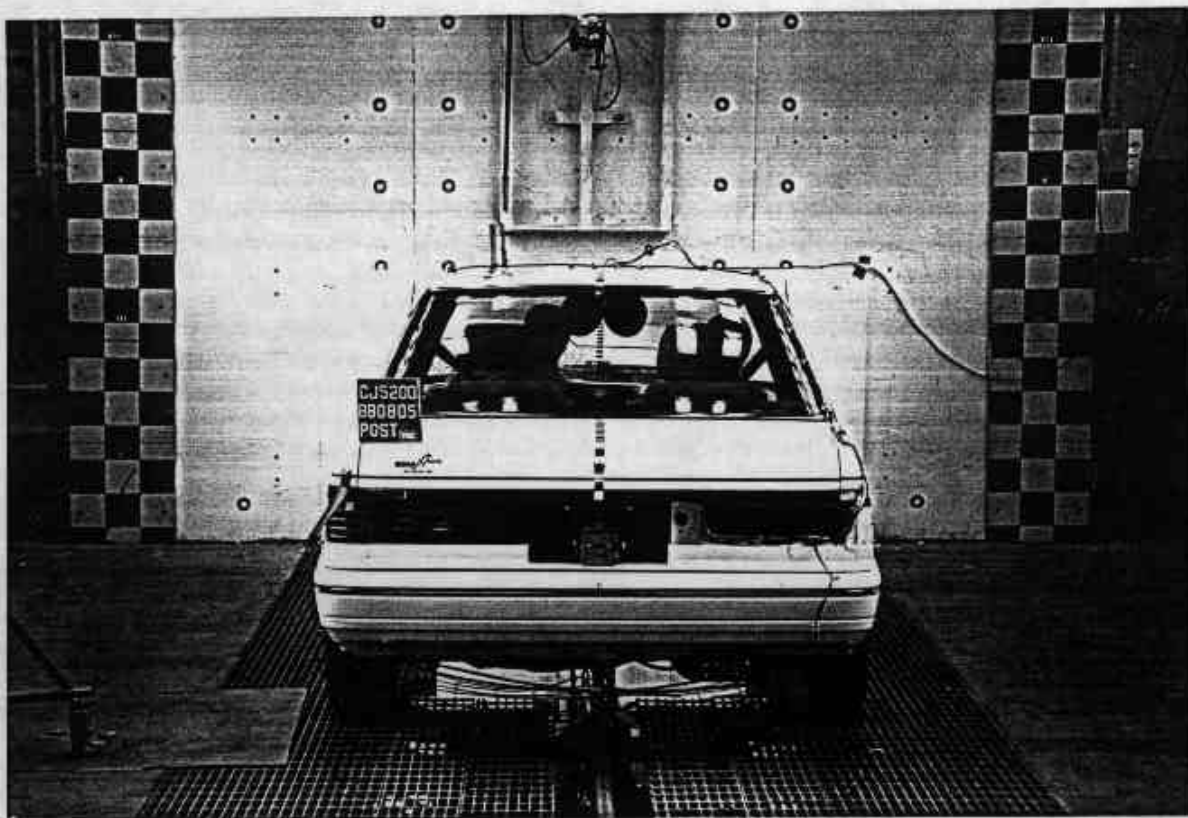


Figure A-12. POST-TEST REAR VIEW
A-8

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Figure A-13. PRE-TEST WINDSHIELD VIEW



Figure A-14. POST-TEST WINDSHIELD VIEW
A-9

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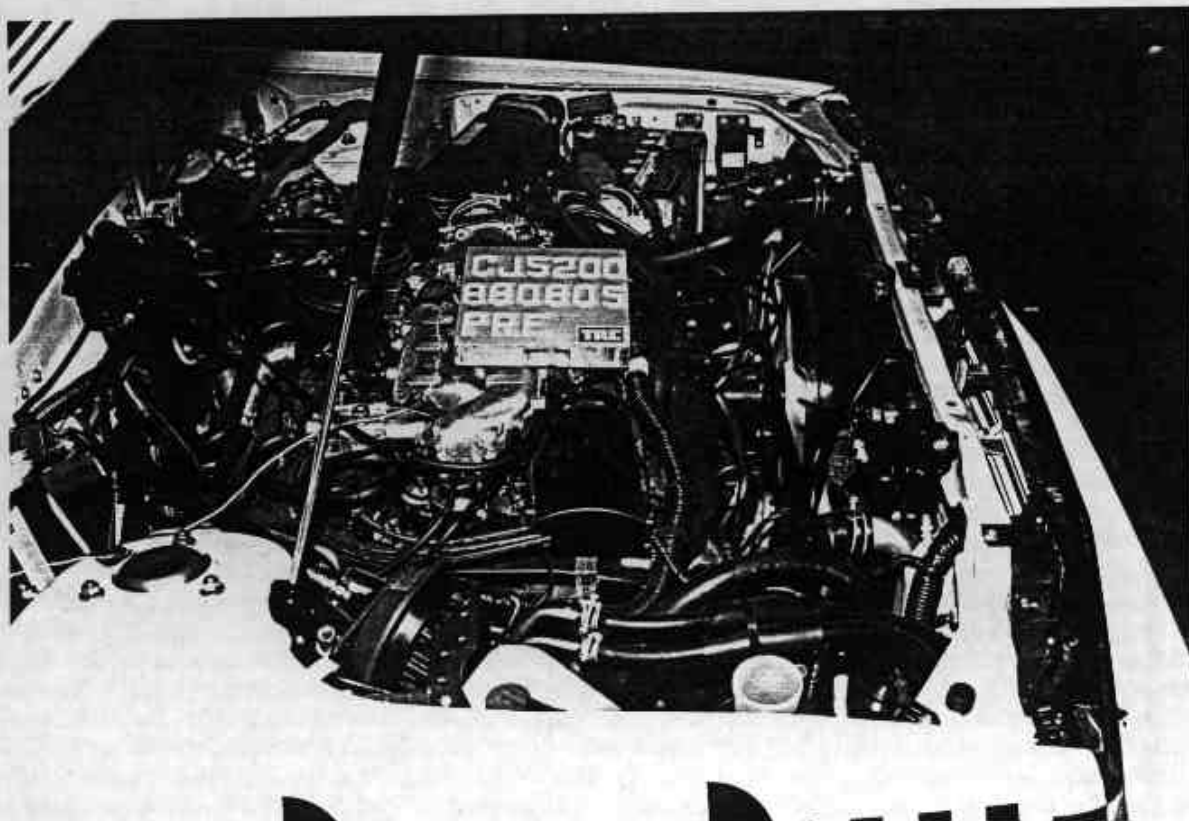


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

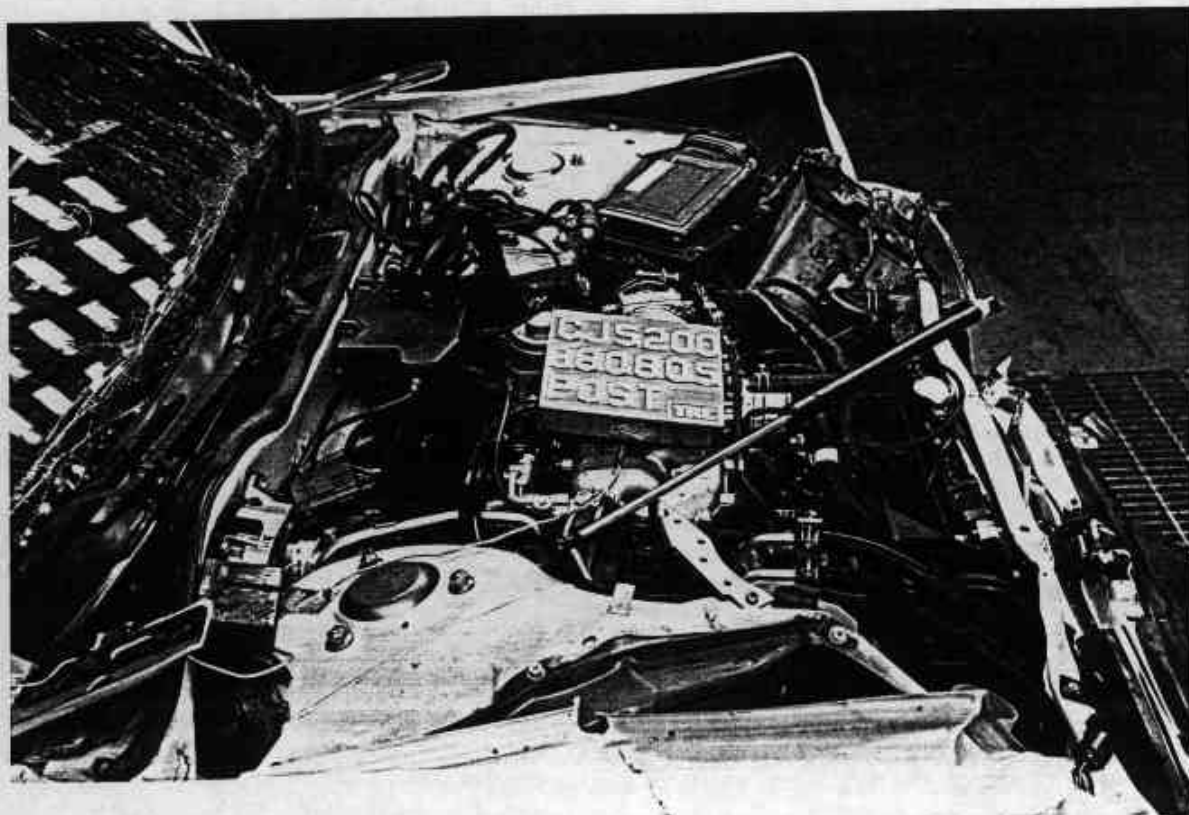


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW



Figure A-17. PRE-TEST FUEL FILLER CAP VIEW

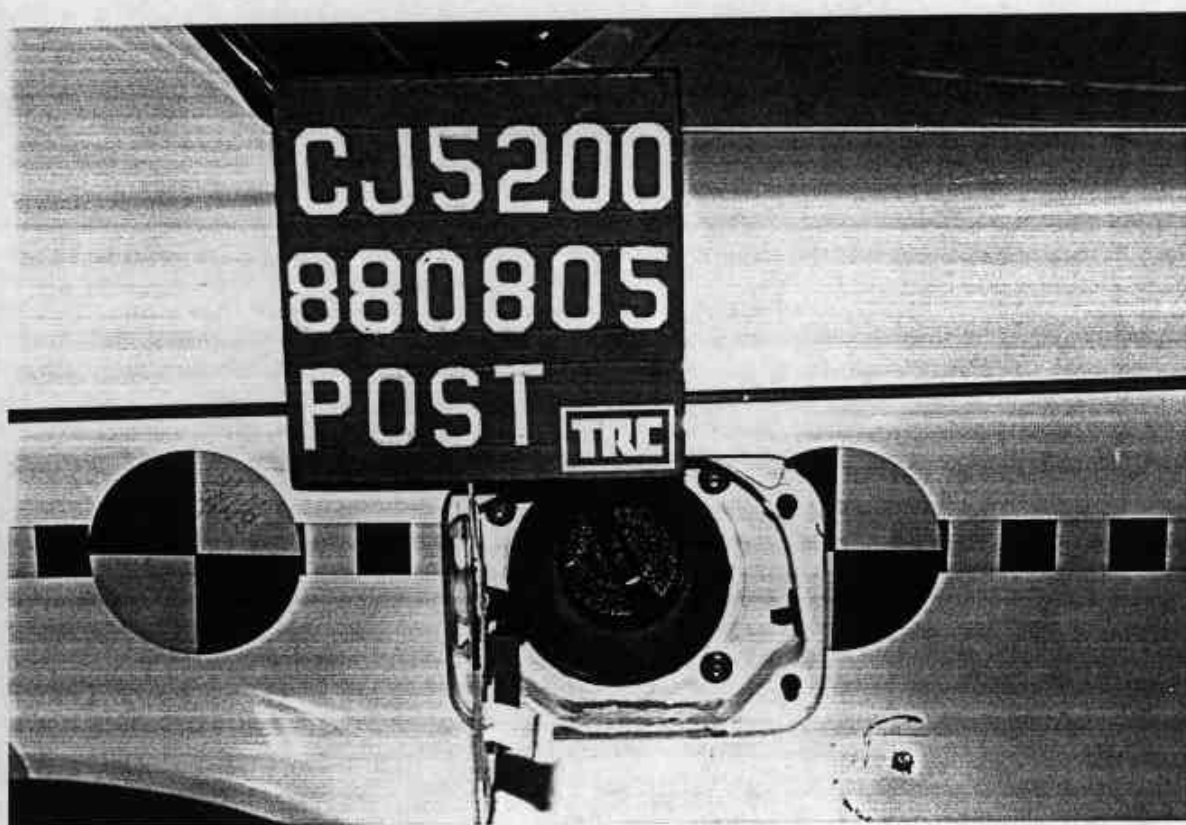


Figure A-18. POST-TEST FUEL FILLER CAP VIEW

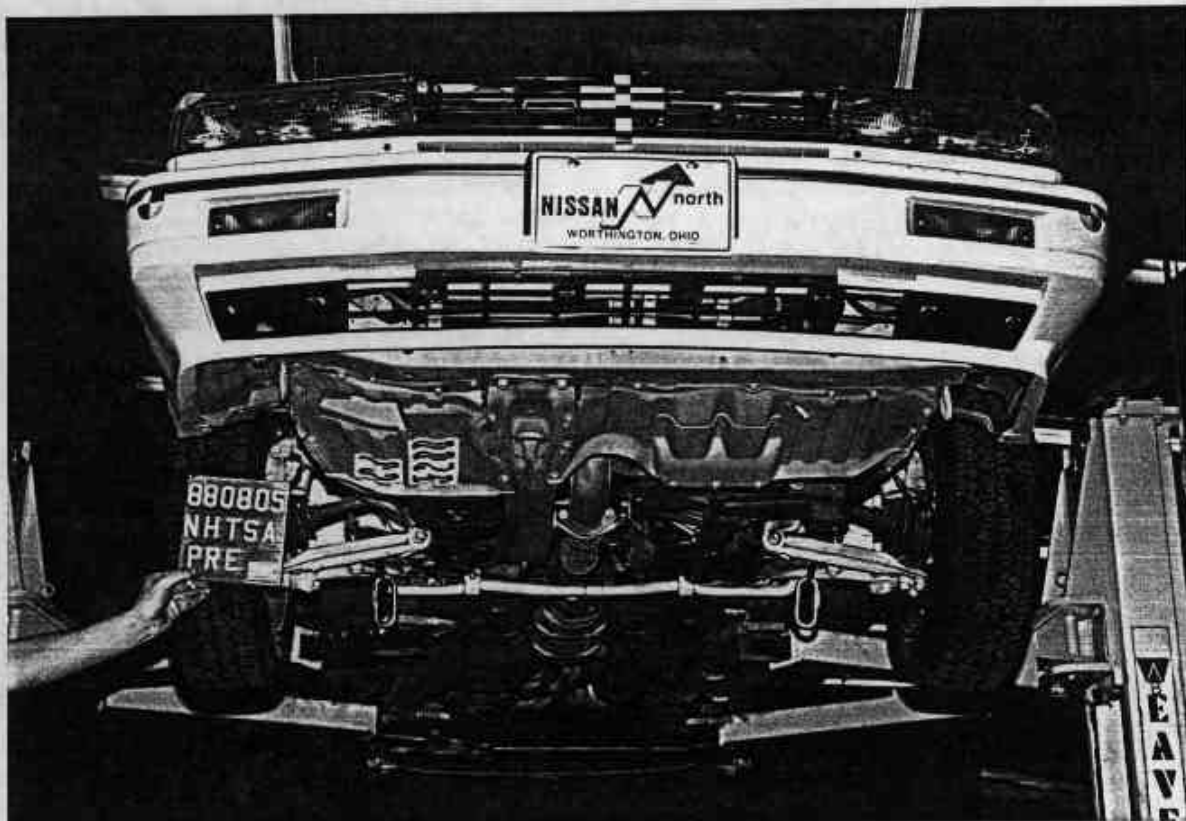


Figure A-19. PRE-TEST FRONT UNDERBODY VIEW

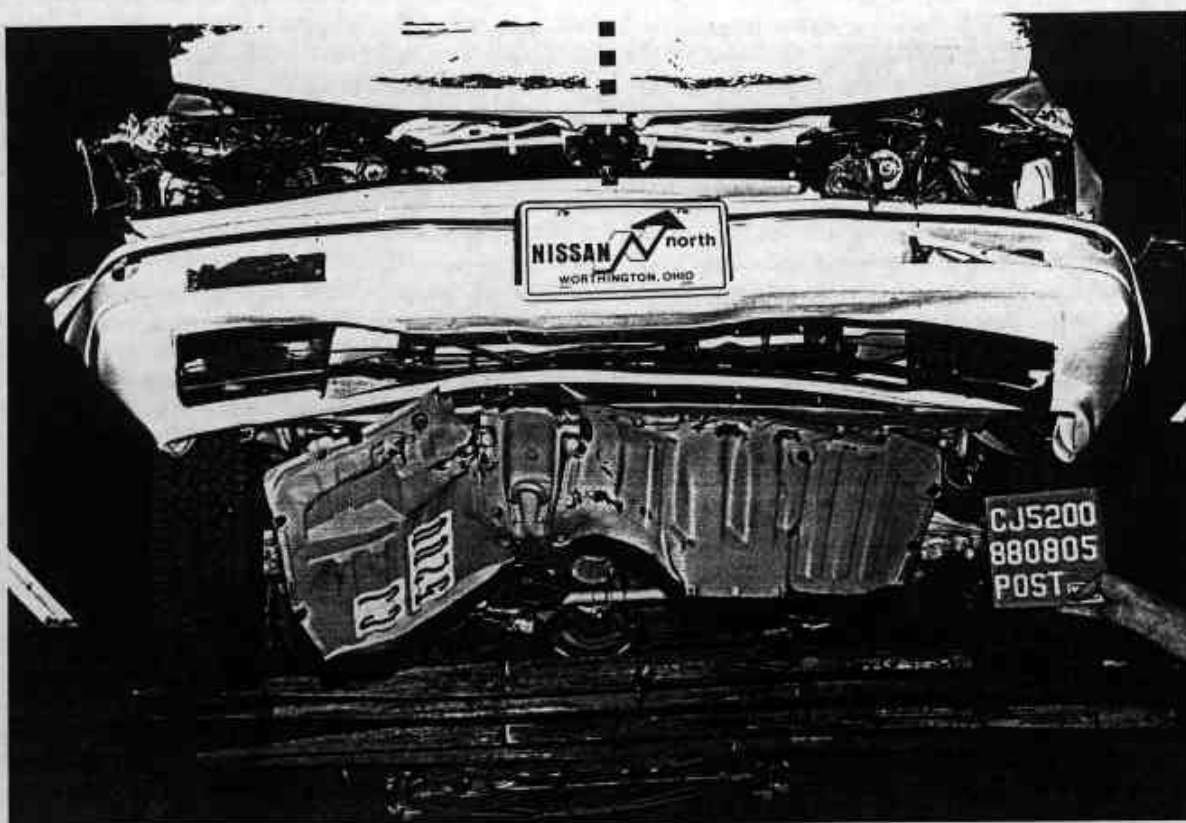


Figure A-20. POST-TEST FRONT UNDERBODY VIEW
A-12

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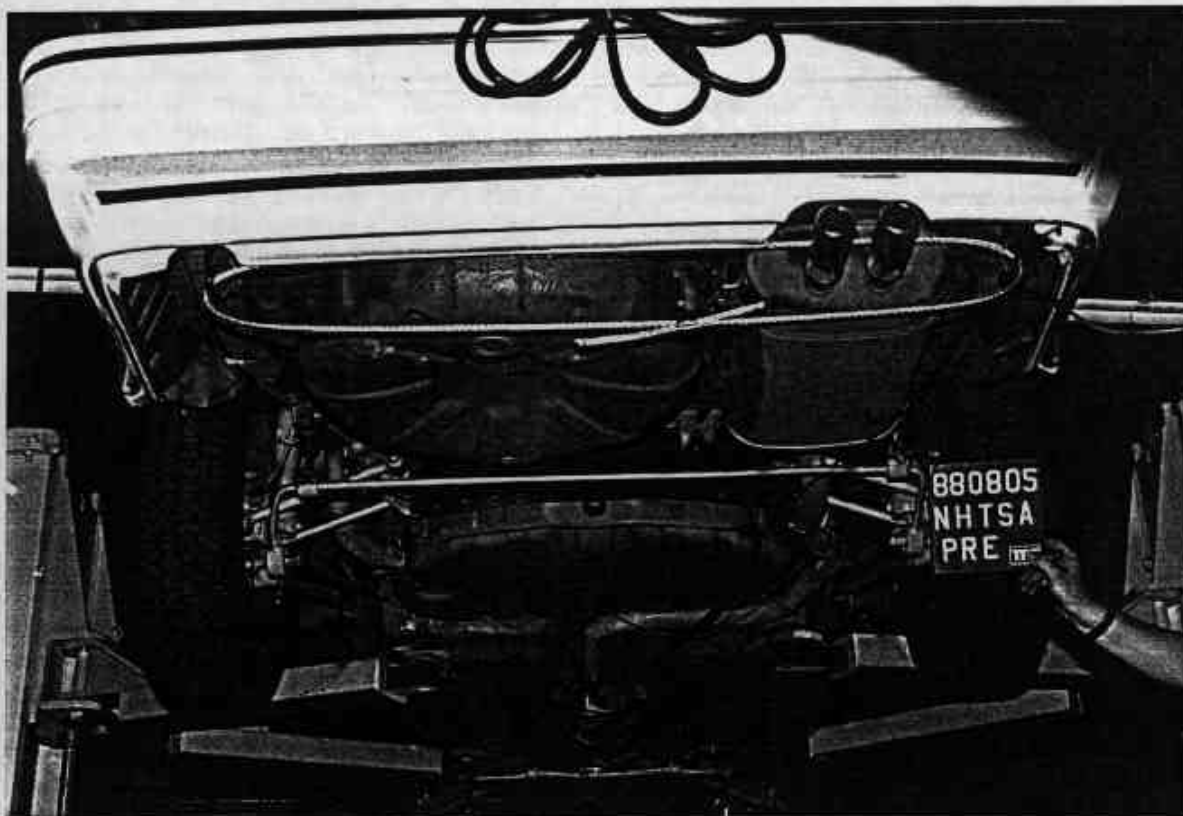


Figure A-21. PRE-TEST REAR UNDERBODY VIEW

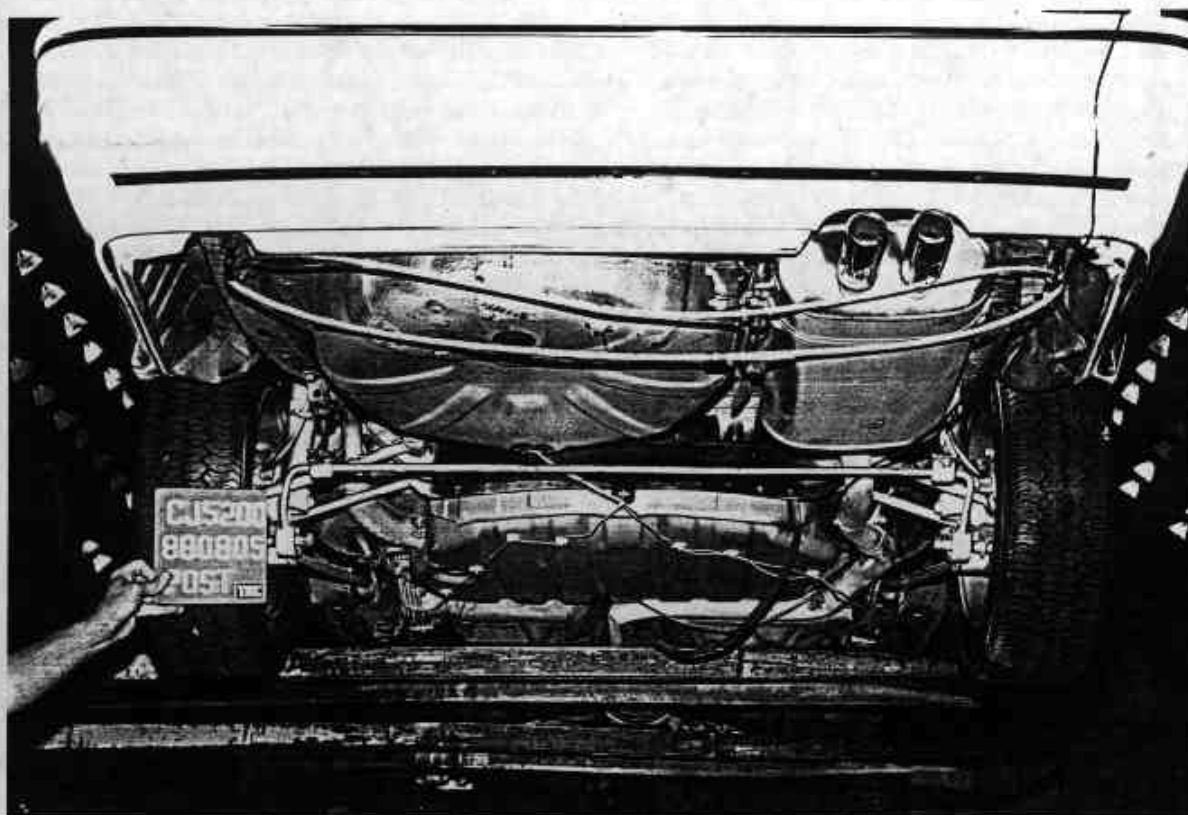


Figure A-22. POST-TEST REAR UNDERBODY VIEW

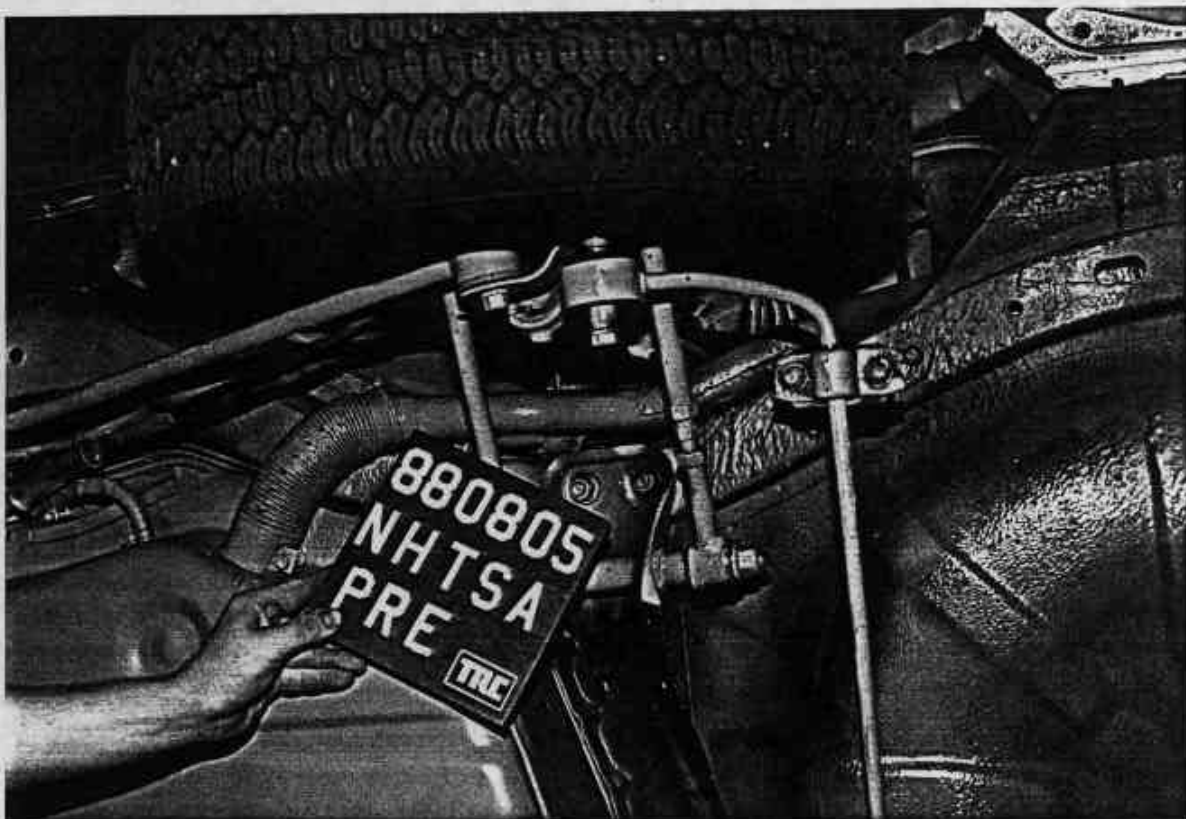


Figure A-23. PRE-TEST FUEL LINES

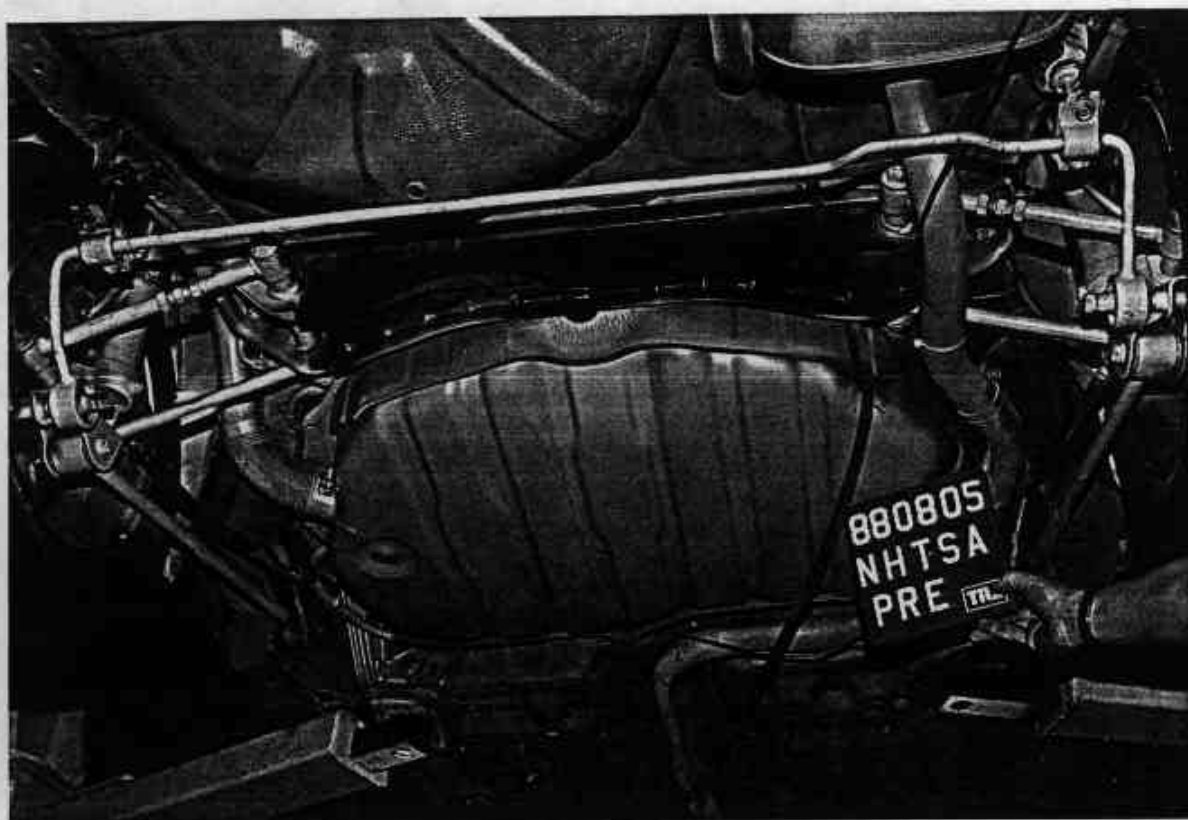


Figure A-24. PRE-TEST FUEL TANK VIEW
A-14

880805



Figure A-25. PRE-TEST BALLAST VIEW



Figure A-26. PRE-TEST DRIVER DUMMY POSITION VIEW
A-15

880805



Figure A-27. POST-TEST DRIVER DUMMY POSITION VIEW



Figure A-28. PRE-TEST PASSENGER DUMMY POSITION VIEW



Figure A-29. POST-TEST PASSENGER DUMMY POSITION VIEW

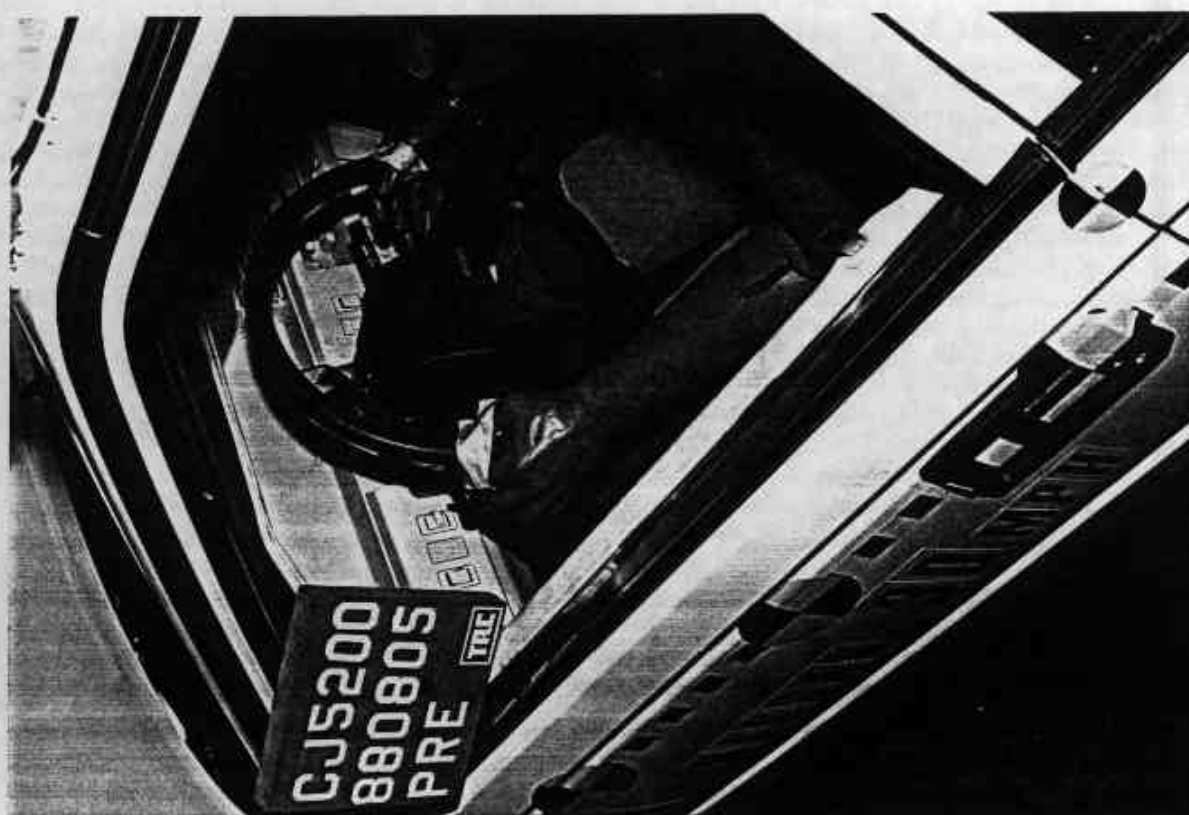


Figure A-30. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW

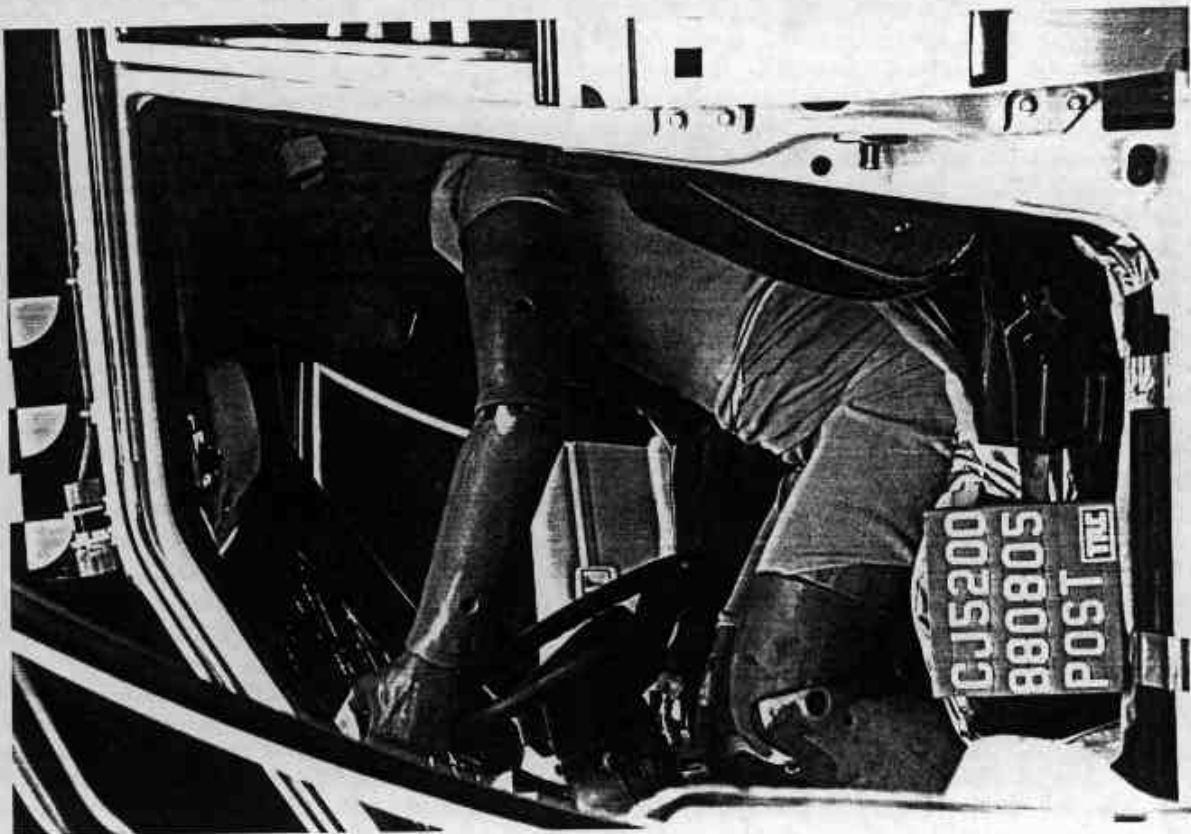


Figure A-31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW



Figure A-34. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-19 880805



Figure A-35. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1



Figure A-37. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2

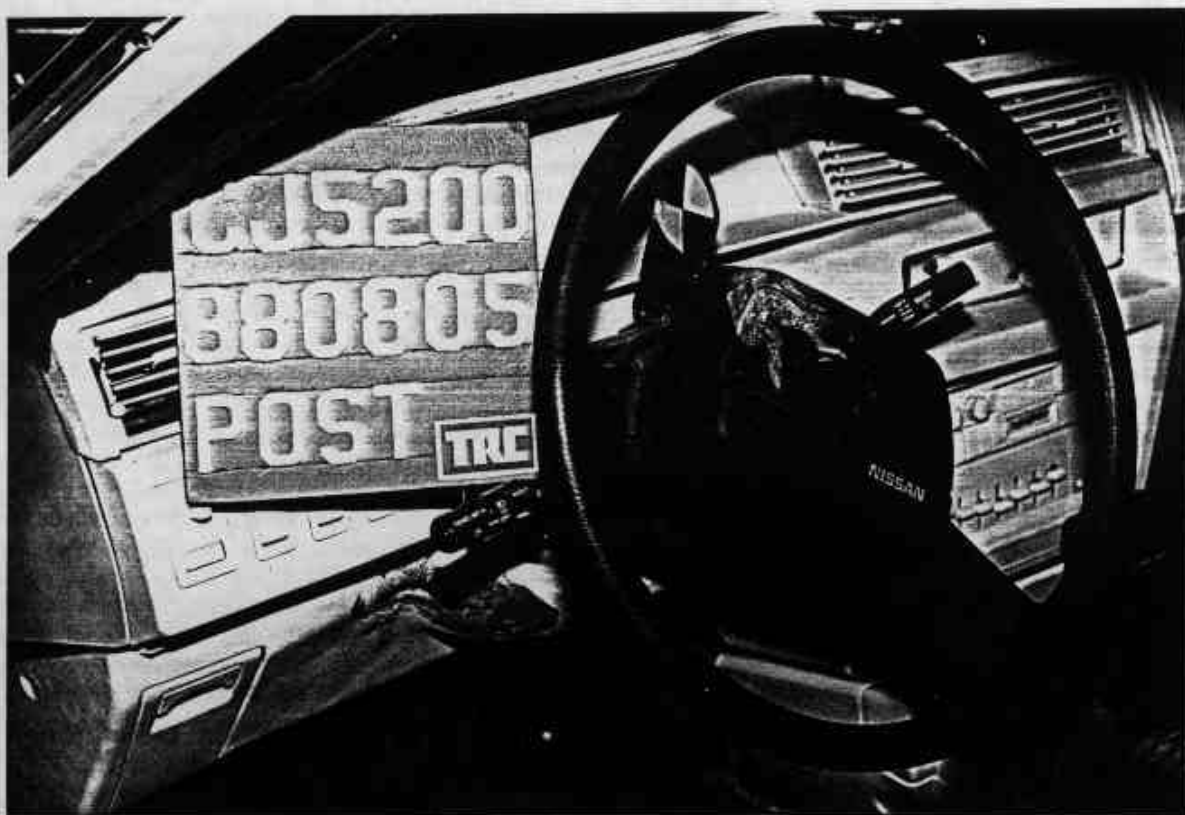


Figure A-38. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3

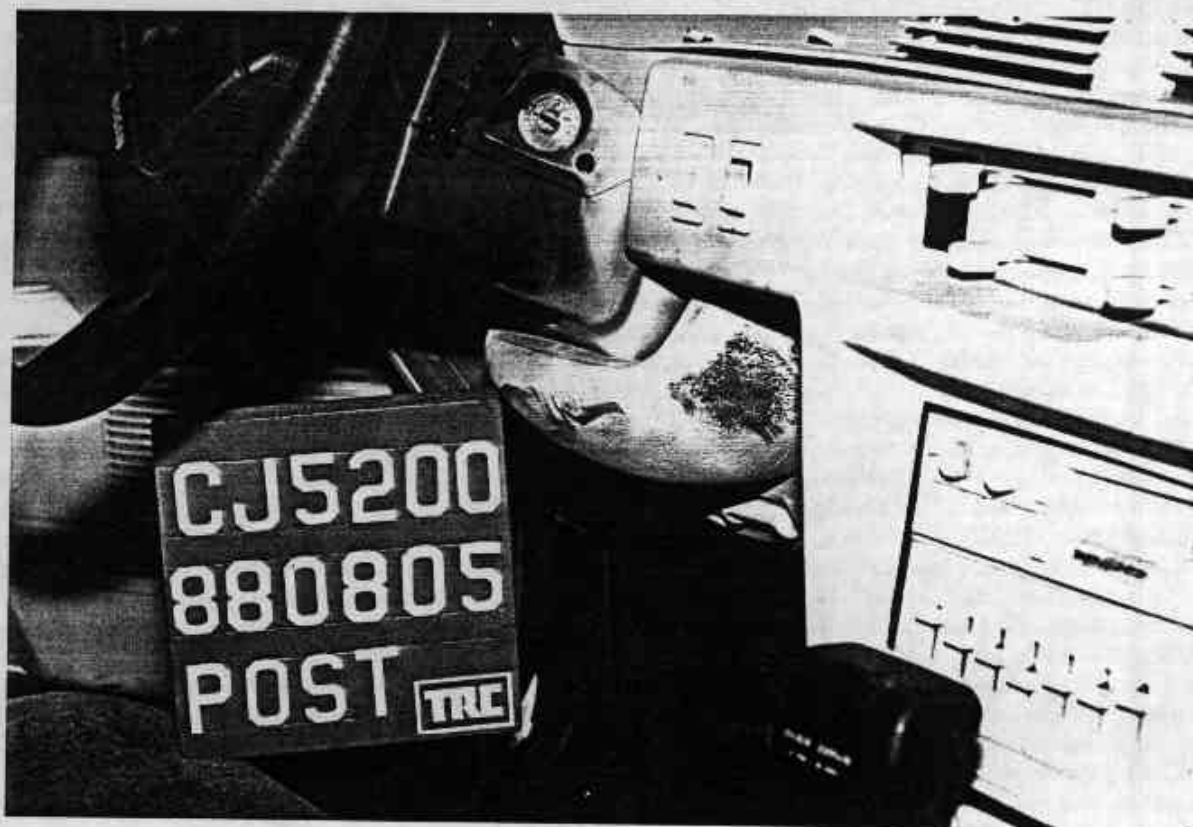


Figure A-39. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4

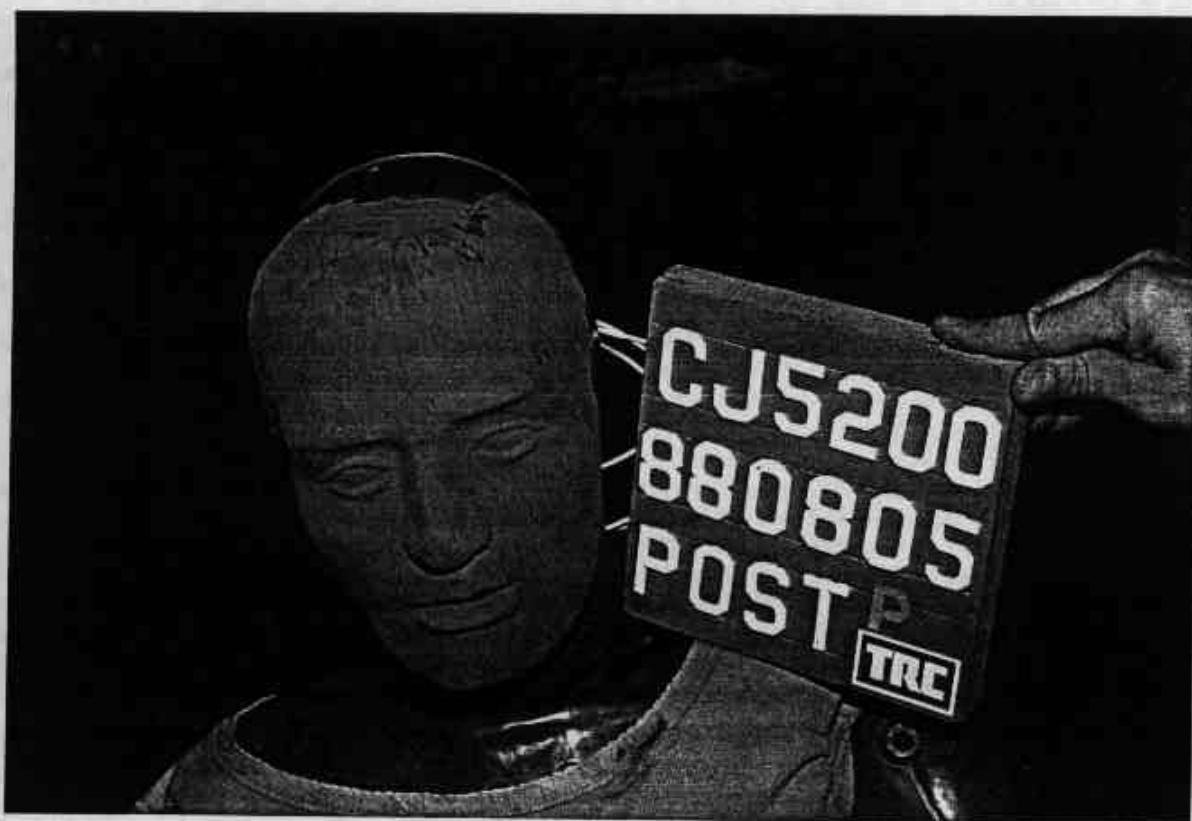


Figure A-40. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1



Figure A-41. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2



Figure A-42. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 3

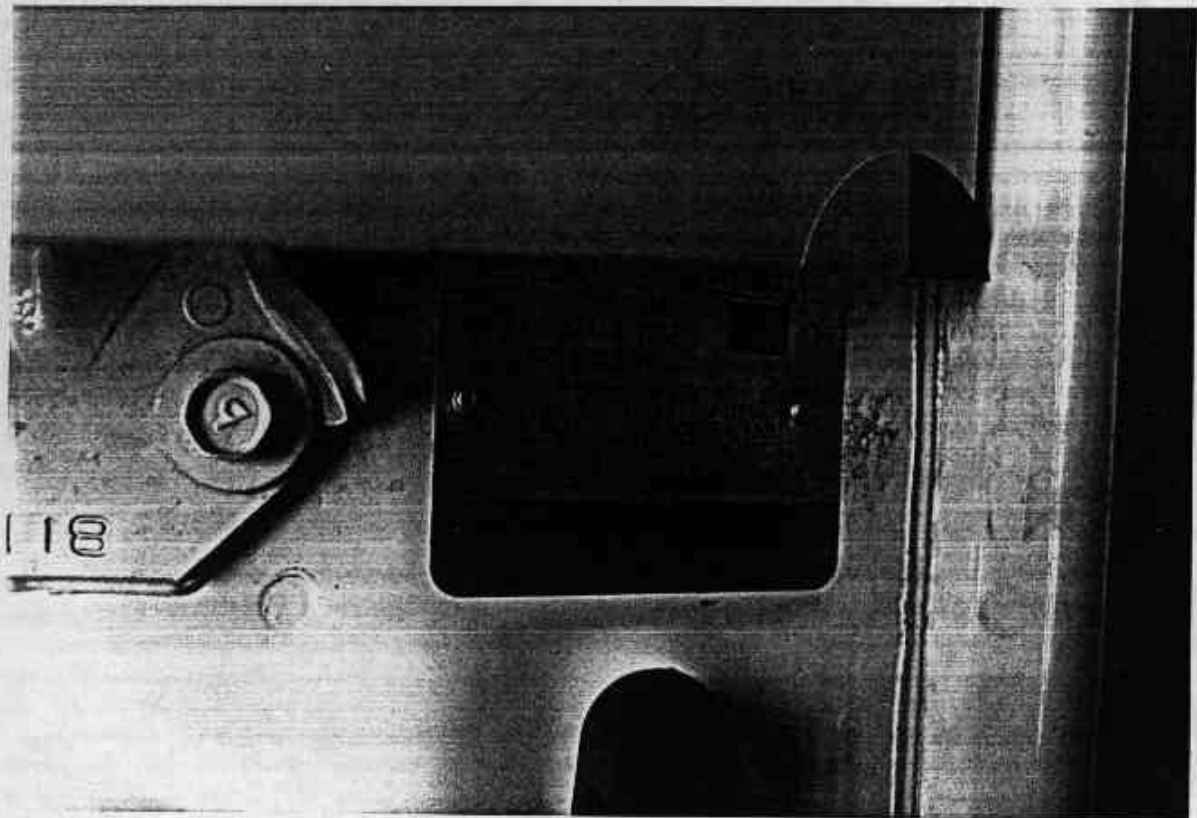


Figure A-43. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

VEHICLE CAPACITY WEIGHT	900 lbs	SEATING CAPACITY	FRONT 2 REAR 3	TOTAL 5
RECOMMENDED COLD TIRE INFLATION PRESSURE				
TIRE SIZE	FRONT ^{psi} (KPa)	REAR ^{psi} (KPa)		
195/60R15 86H	33(230)	29(200)		
SPARE TIRE T135/70 D15	60(420)	60(420)		
DO NOT USE IN EXCESS OF 50 mph, 80 km/h SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION				
16E00				

Figure A-44. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW

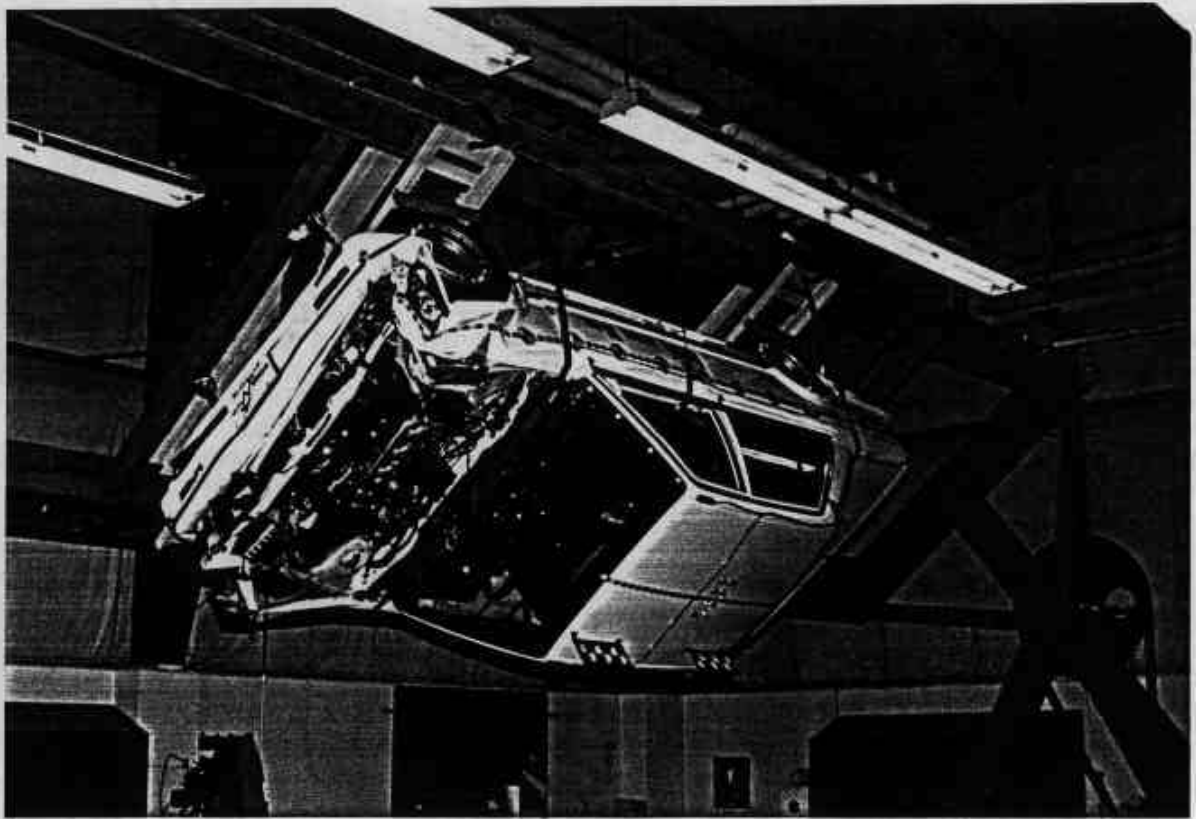


Figure A-45. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

APPENDIX B

DATA PLOTS

DUMMY AND VEHICLE AXES: X: FRONT/REAR
Y: LEFT/RIGHT
Z: UP/DOWN

200 COMPLIANCE TEST

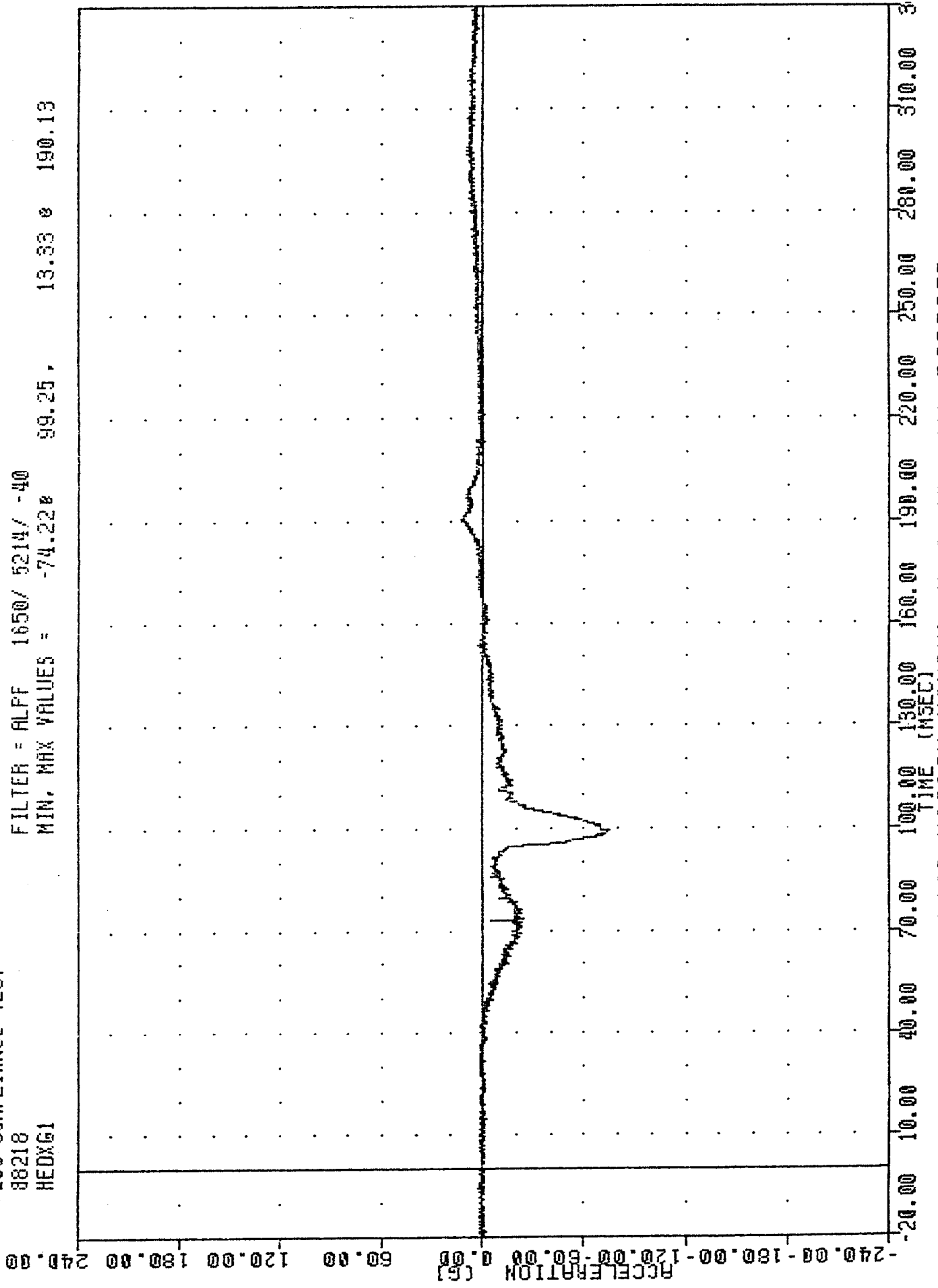
88218

HEDXG1

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -74.22 8

99.25 13.33 8 190.13



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER HEAD X AXIS ACCELERATION

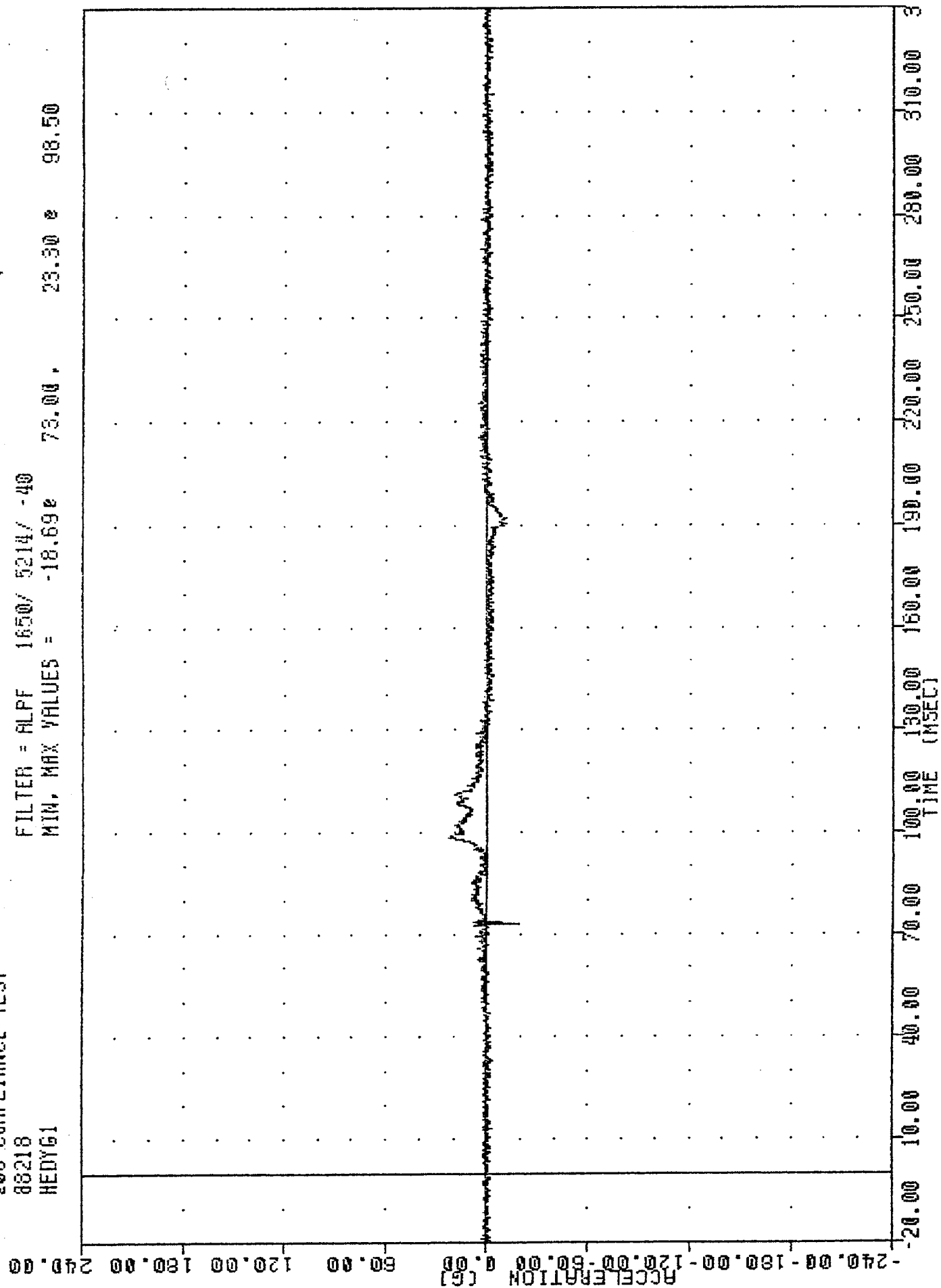
200 COMPLIANCE TEST

88218

HEDYG1

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -18.69% 73.00 , 23.30 % 98.50



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER HEAD Y AXIS ACCELERATION

2ND COMPLIANCE TEST

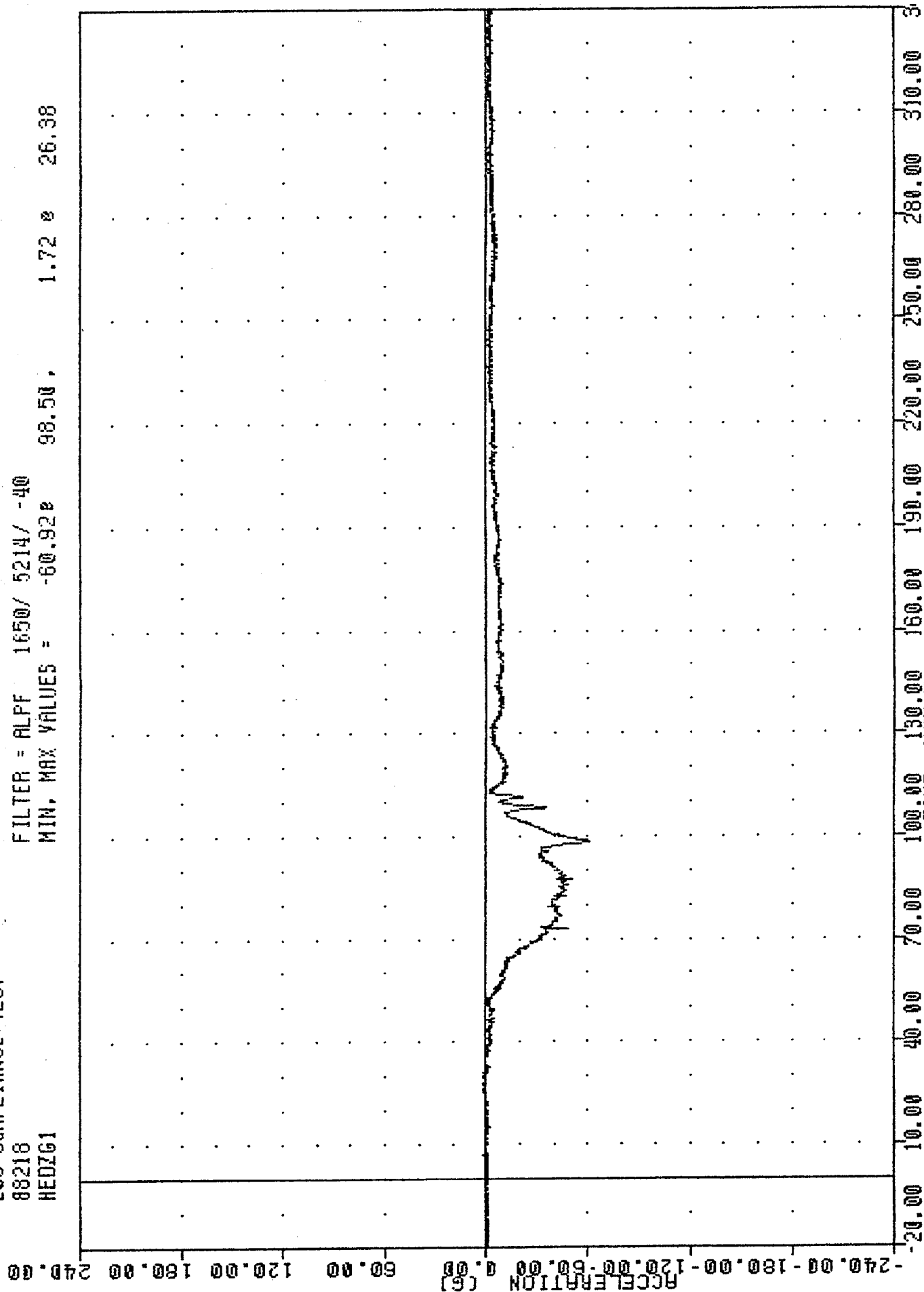
88218

HEDZG1

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -60.928 98.50 ,

1.72 0 26.38



1988 NISSAN MAXIMA INTO FRONTAL BARRIER

DRIVER HEAD Z AXIS ACCELERATION

200 COMPLIANCE TEST

88218

HEOR61

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 0.09%

0.88,

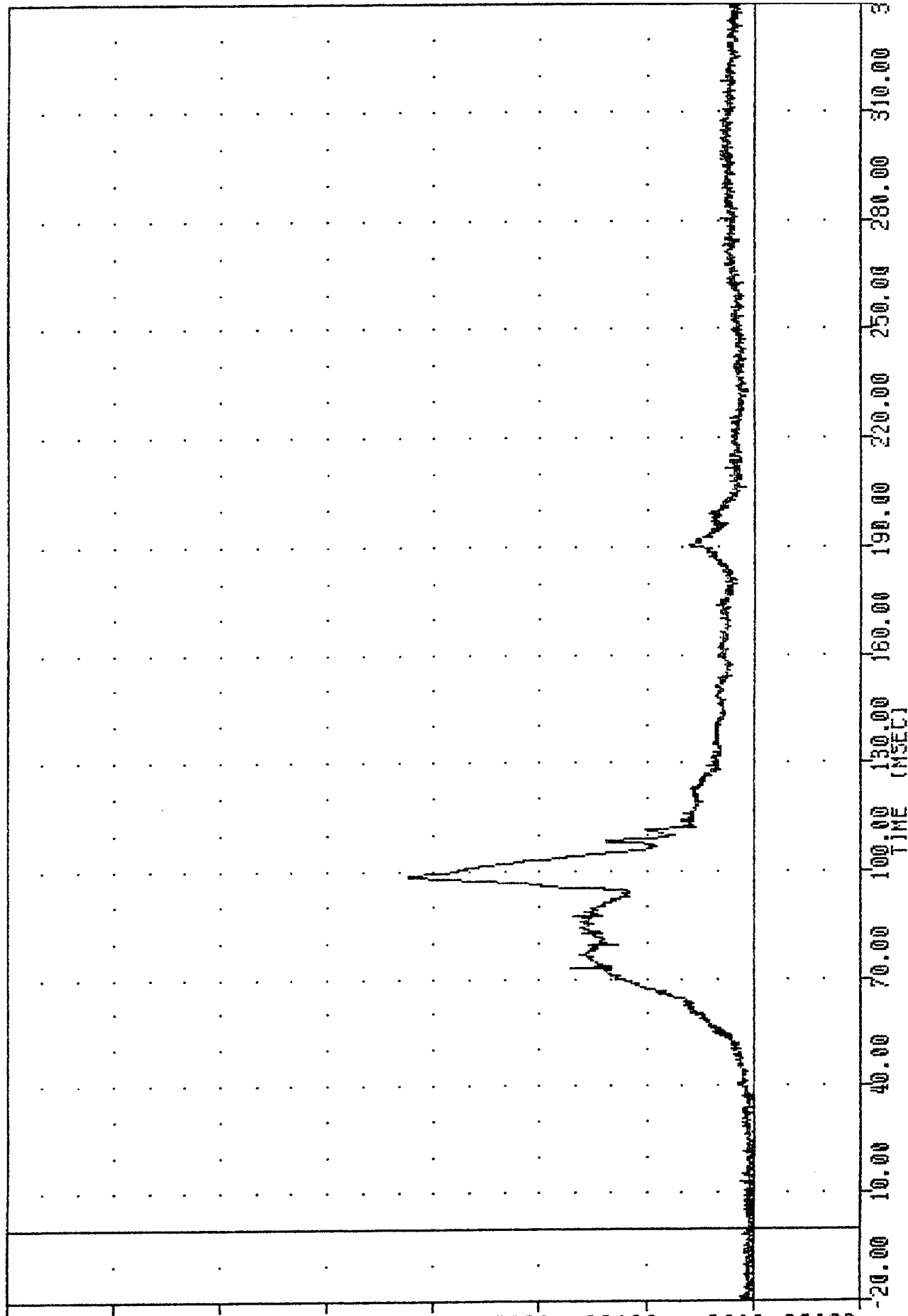
97.43 %

98.75

ACCELERATION (G)

B-5

880805



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

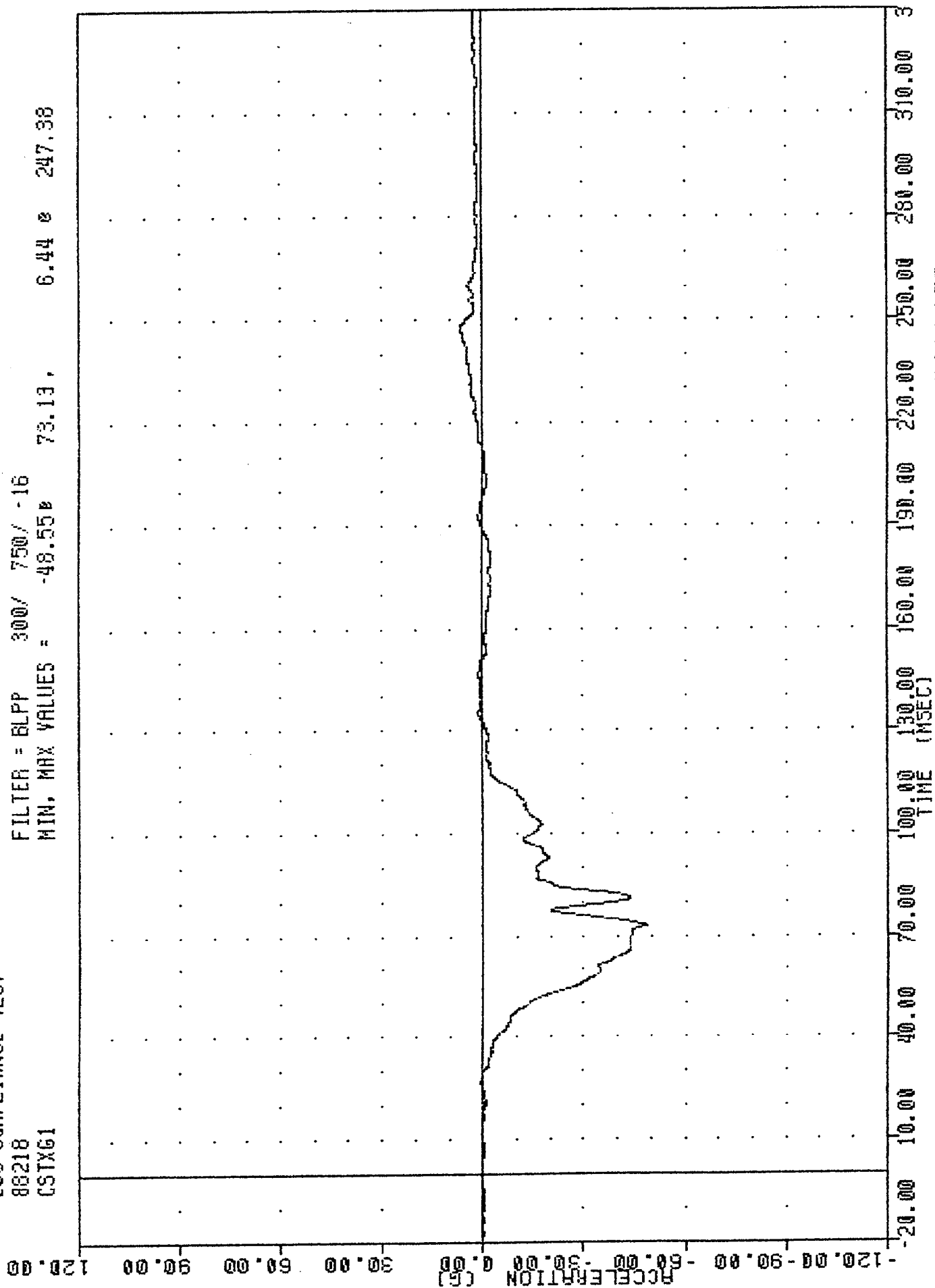
200 COMPLIANCE TEST

88218

CSTXG1

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -48.55 73.13, 6.44 247.38



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER CHEST X AXIS ACCELERATION

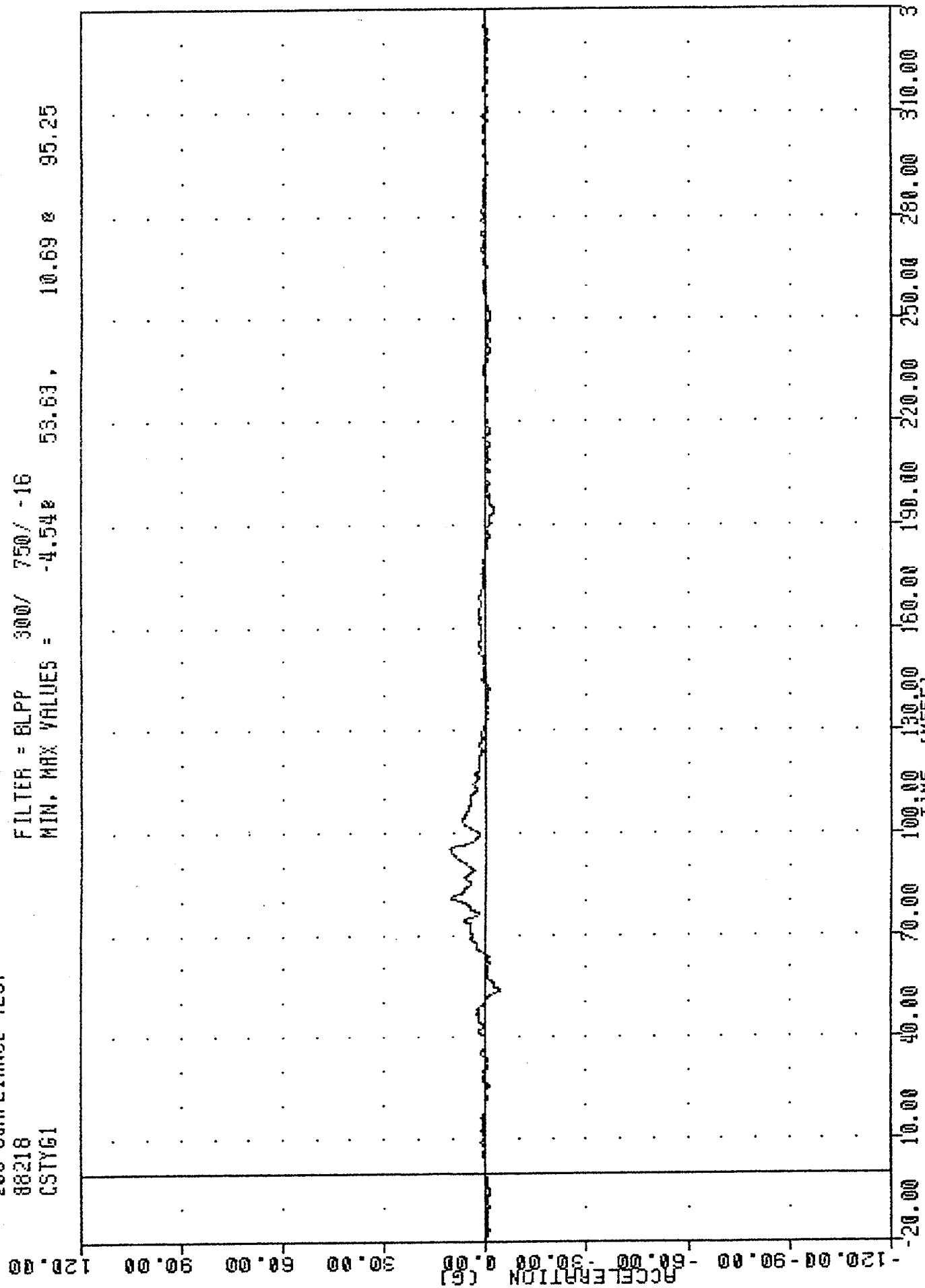
200 COMPLIANCE TEST

88218

CSTY61

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -4.548 53.63, 10.69 8 95.25



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER CHEST Y AXIS ACCELERATION

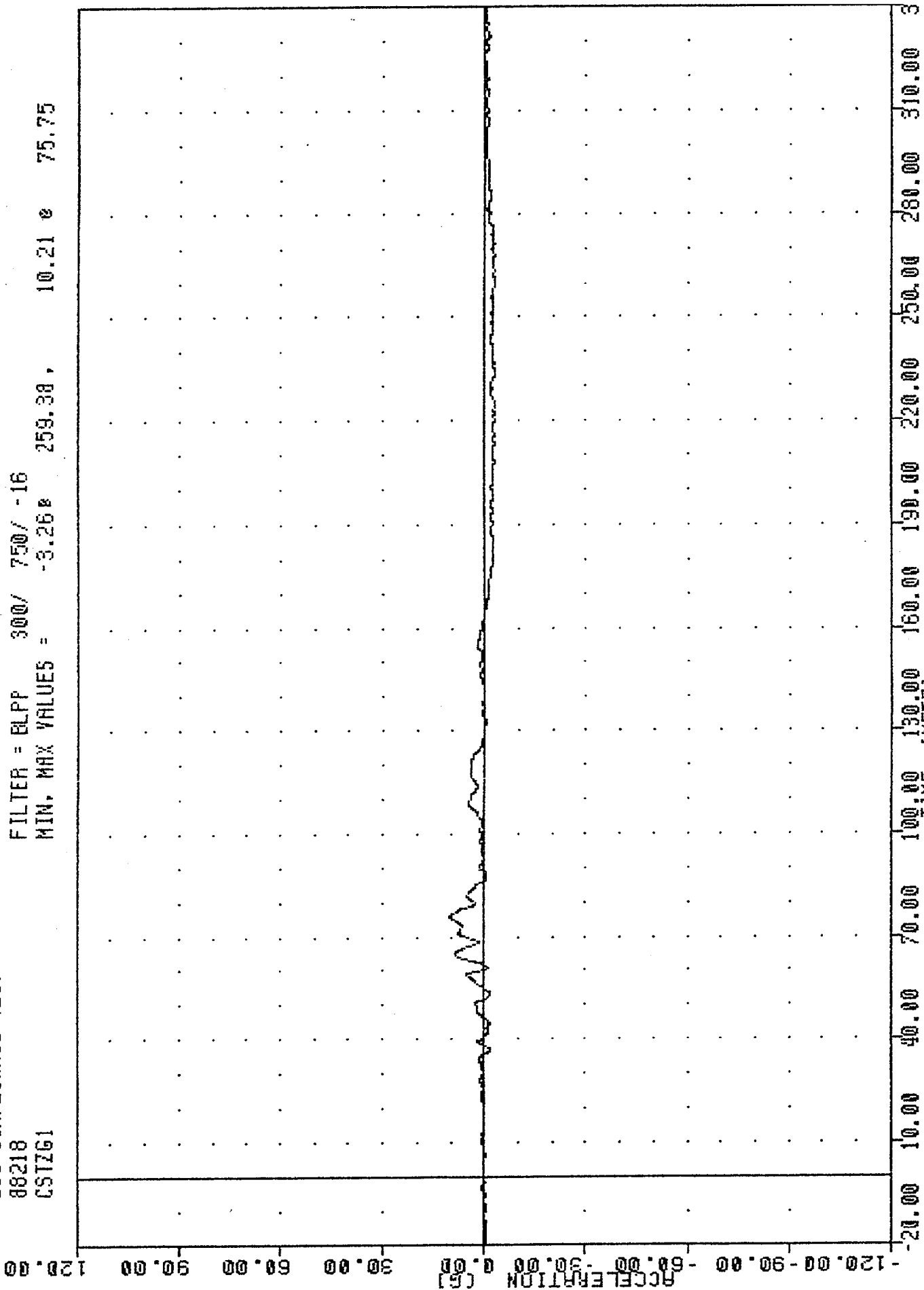
208 COMPLIANCE TEST

88218

CSTZG1

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -3.26 259.38 10.21 75.75



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880805

1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER CHEST Z AXIS ACCELERATION

200 COMPLIANCE TEST

88218

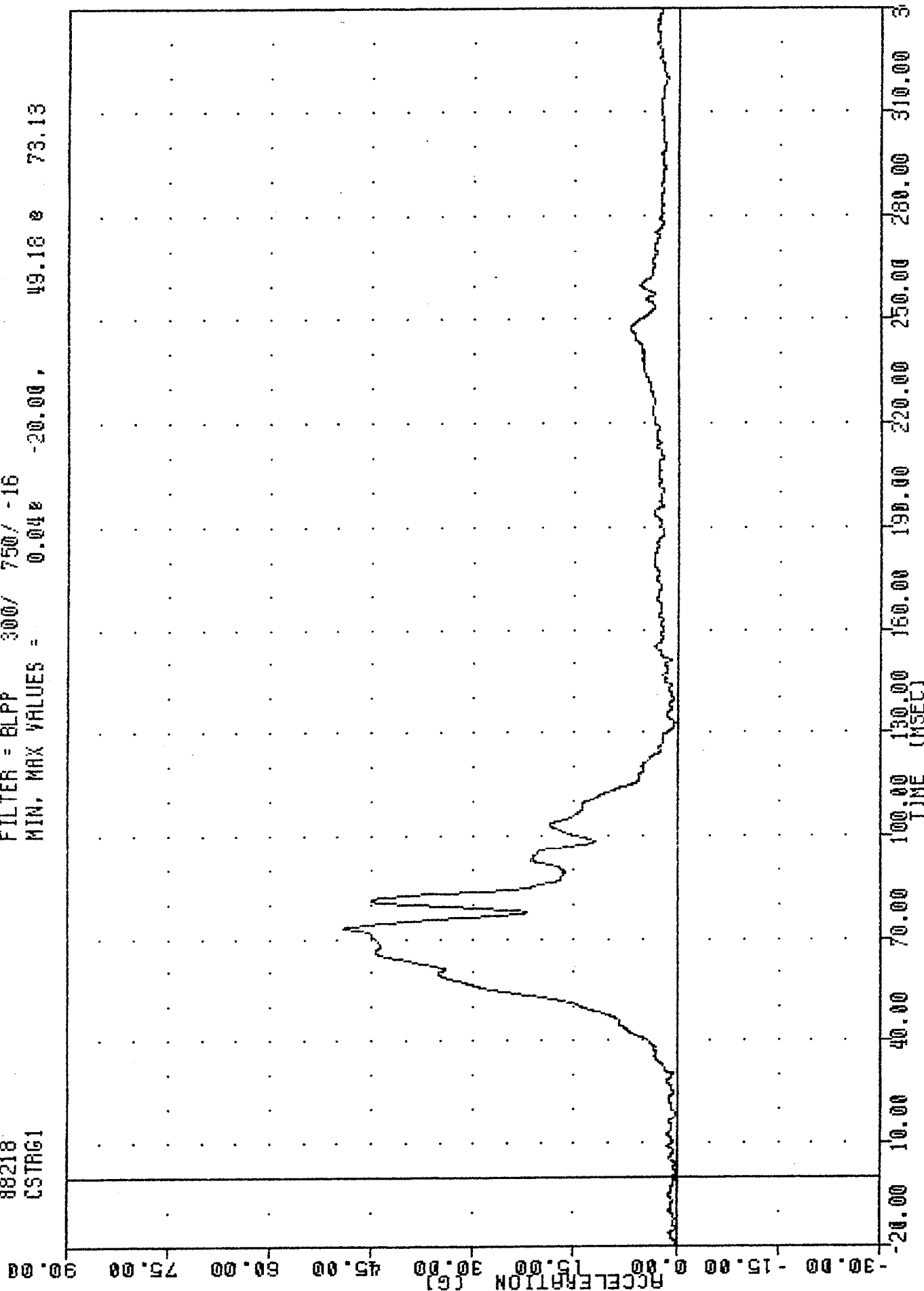
CSTRG1

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = 0.04e -20.00, 49.16 e 73.13

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880805



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

200 COMPLIANCE TEST

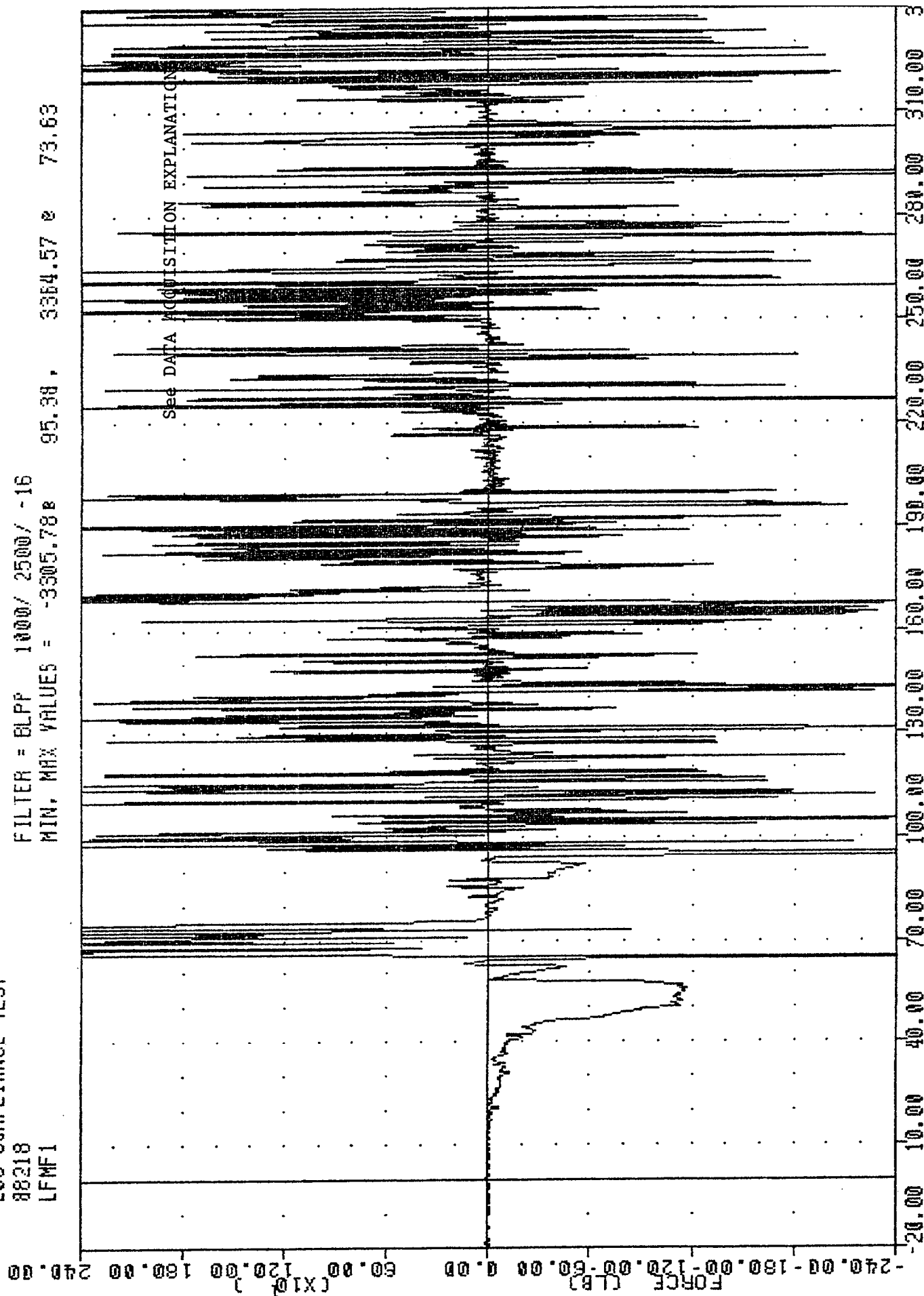
88218

LFMF1

FILTER = BLPP 1000/ 2500/ -16

MIN, MAX VALUES = -3505.788 95.38, 3364.57 @ 73.63

See DATA ACQUISITION EXPLANATION



200 COMPLIANCE TEST

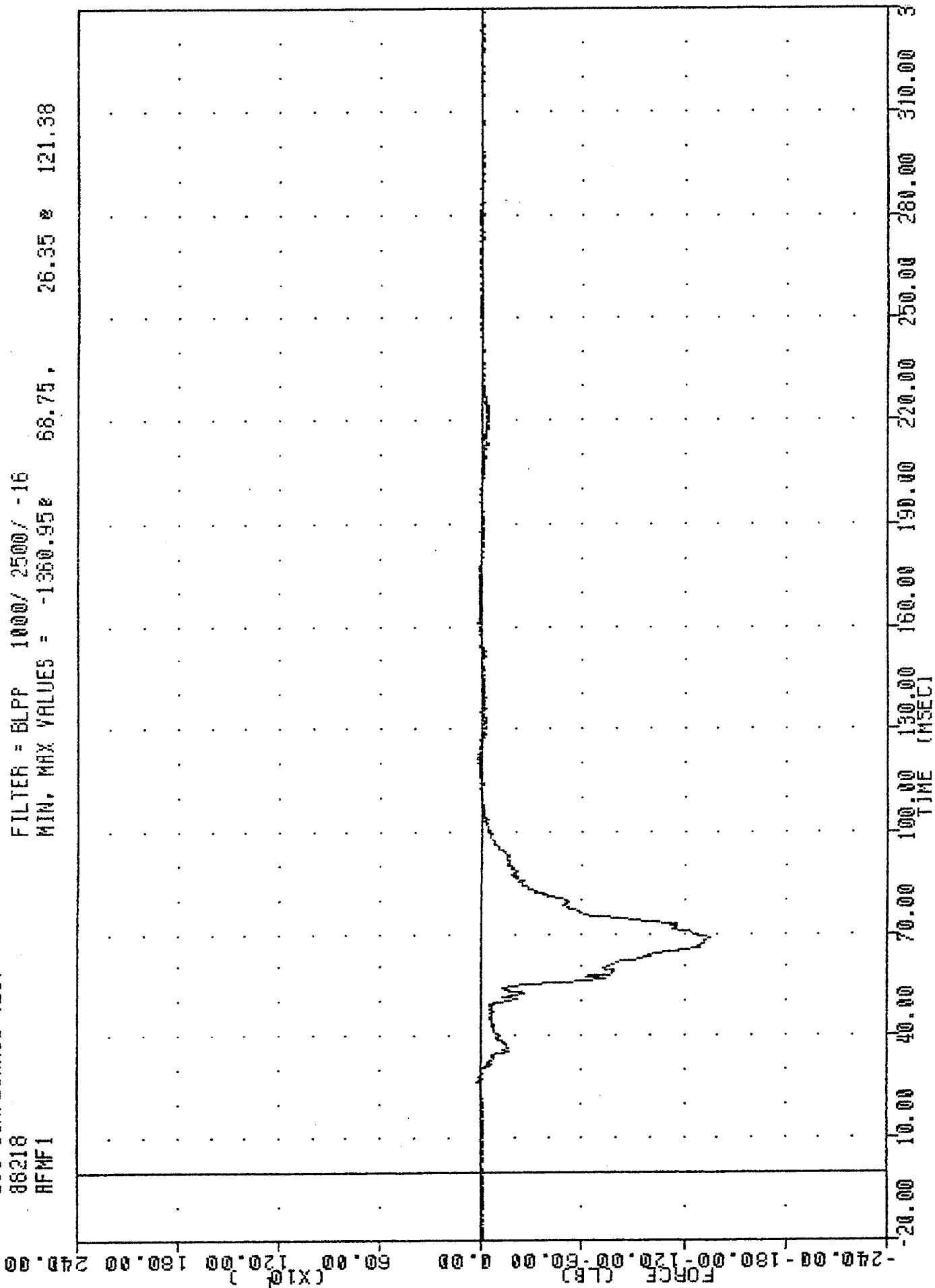
88218

AFMF1

FILTER = BLPP 1000/ 2500/ -16

MIN, MAX VALUES = -1360.95 68.75,

26.35 121.38



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE

200 COMPLIANCE TEST

88218

HEDXG2

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES =

-34.74%

108.50,

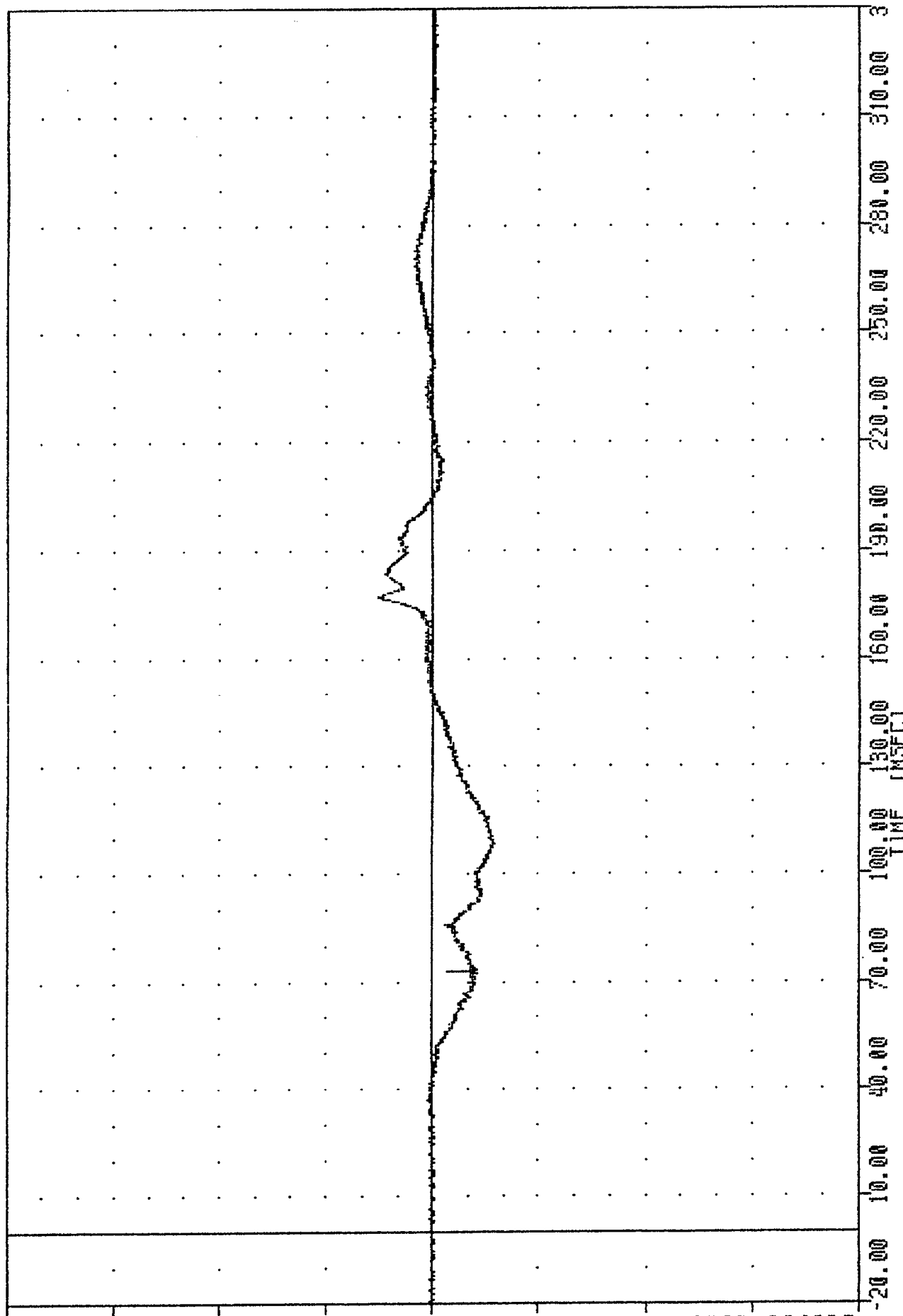
31.15 s

177.13

ACCELERATION (G)

B-12

880805



1988 NISSAN MAXIMA INTO FRONTAL BARRIER

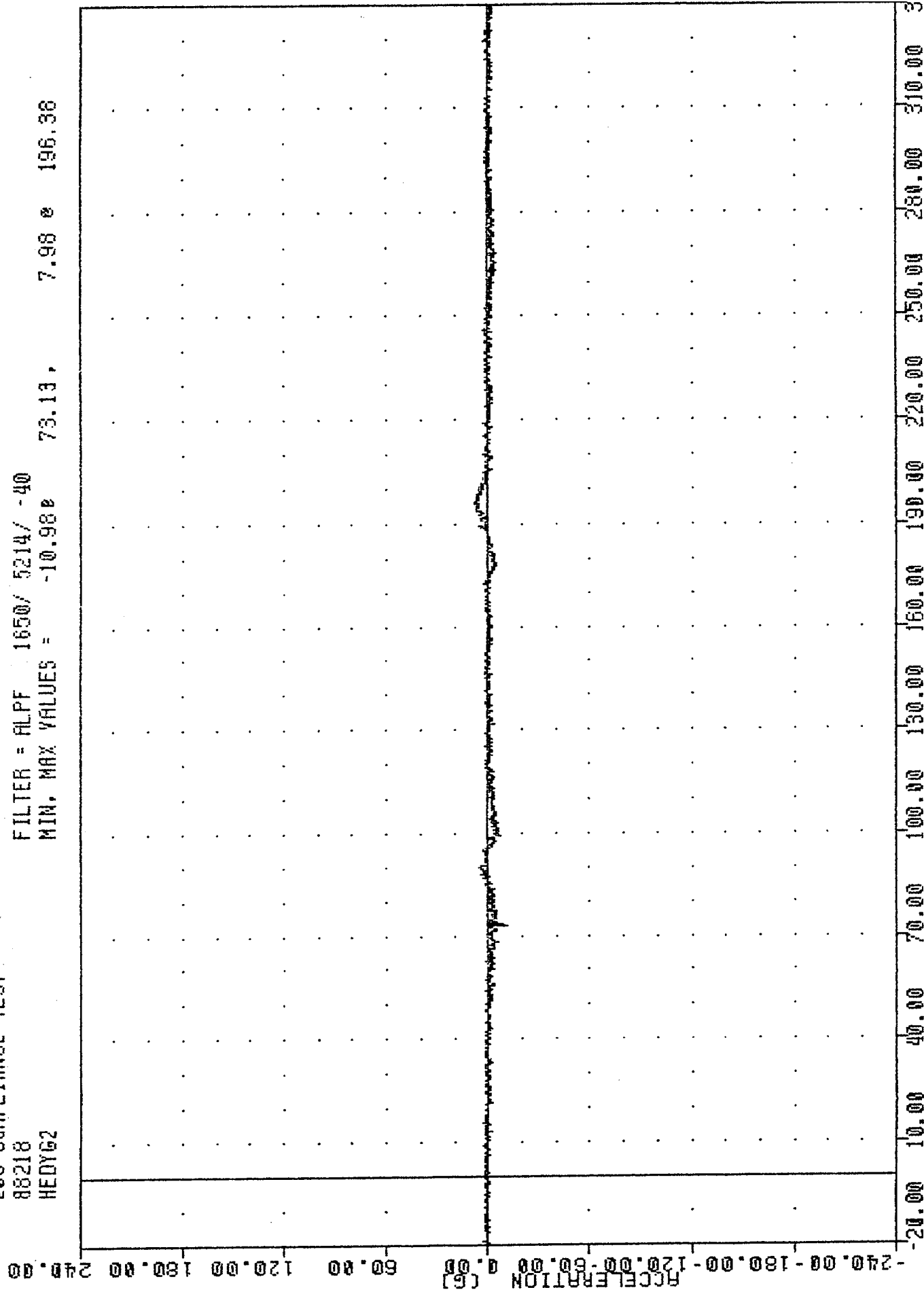
RIGHT FRONT PASSENGER HEAD X AXIS ACCELERATION

880805 1201

88218
HEDYG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -10.98 73.13

7.98 196.38



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y AXIS ACCELERATION

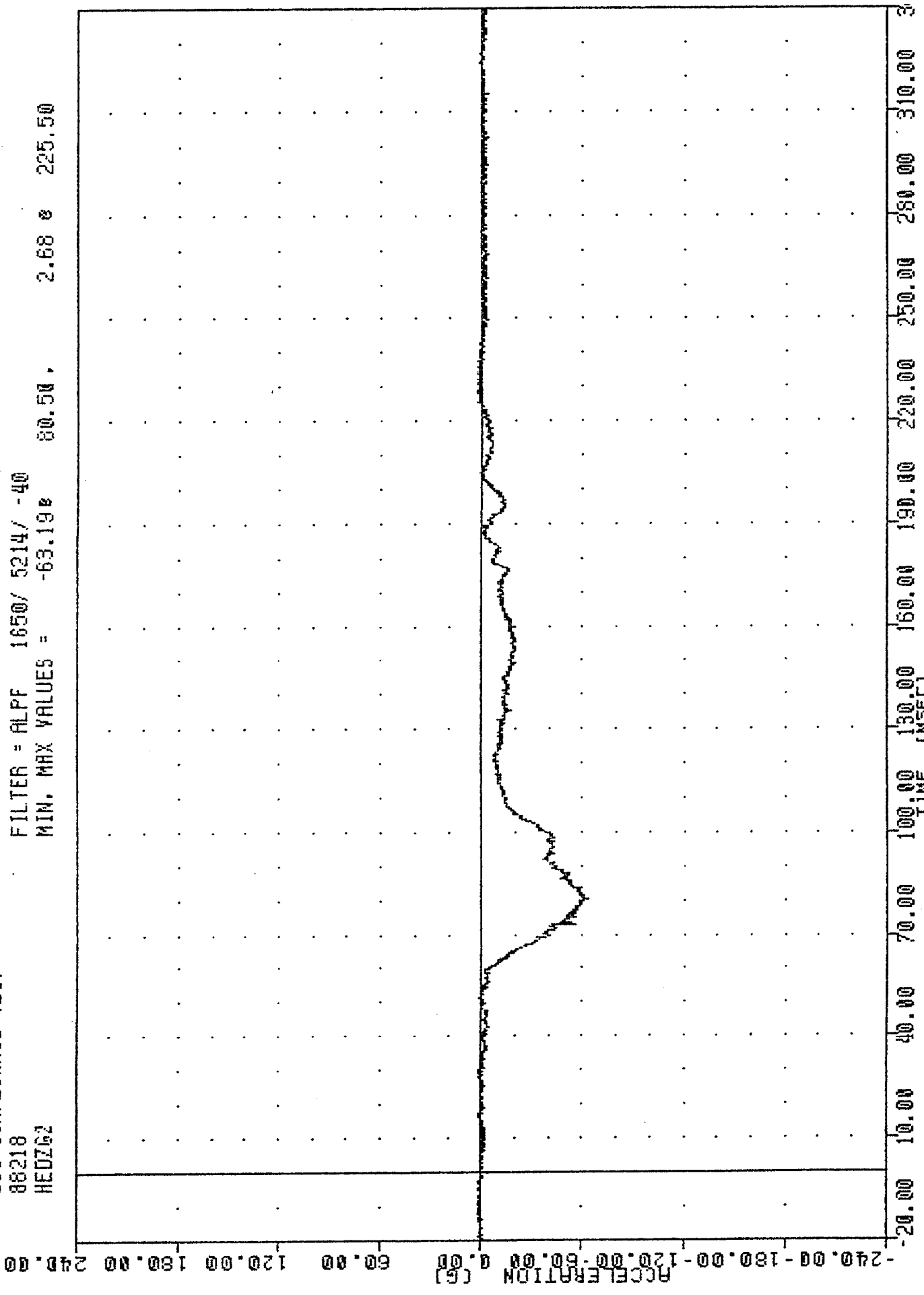
208 COMPLIANCE TEST

88218

HEDZ62

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -63.19% 80.50 , 2.68 @ 225.50



B-14

880805

1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z AXIS ACCELERATION

200 COMPLIANCE TEST

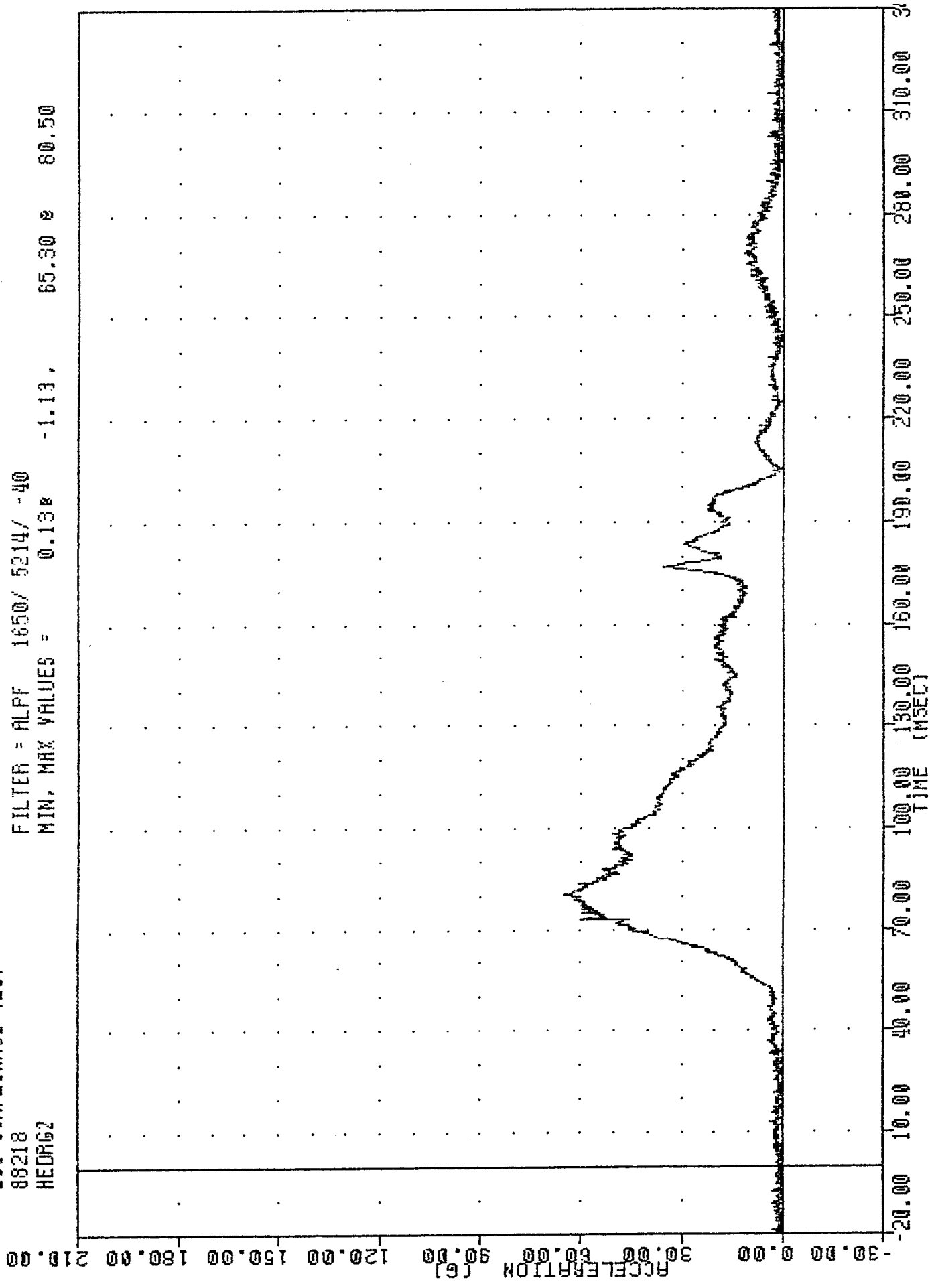
86218

HEOR62

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = 0.13

-1.13, 65.30 @ 80.50



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

200 CONTINUED 1201

88218

CSTX62

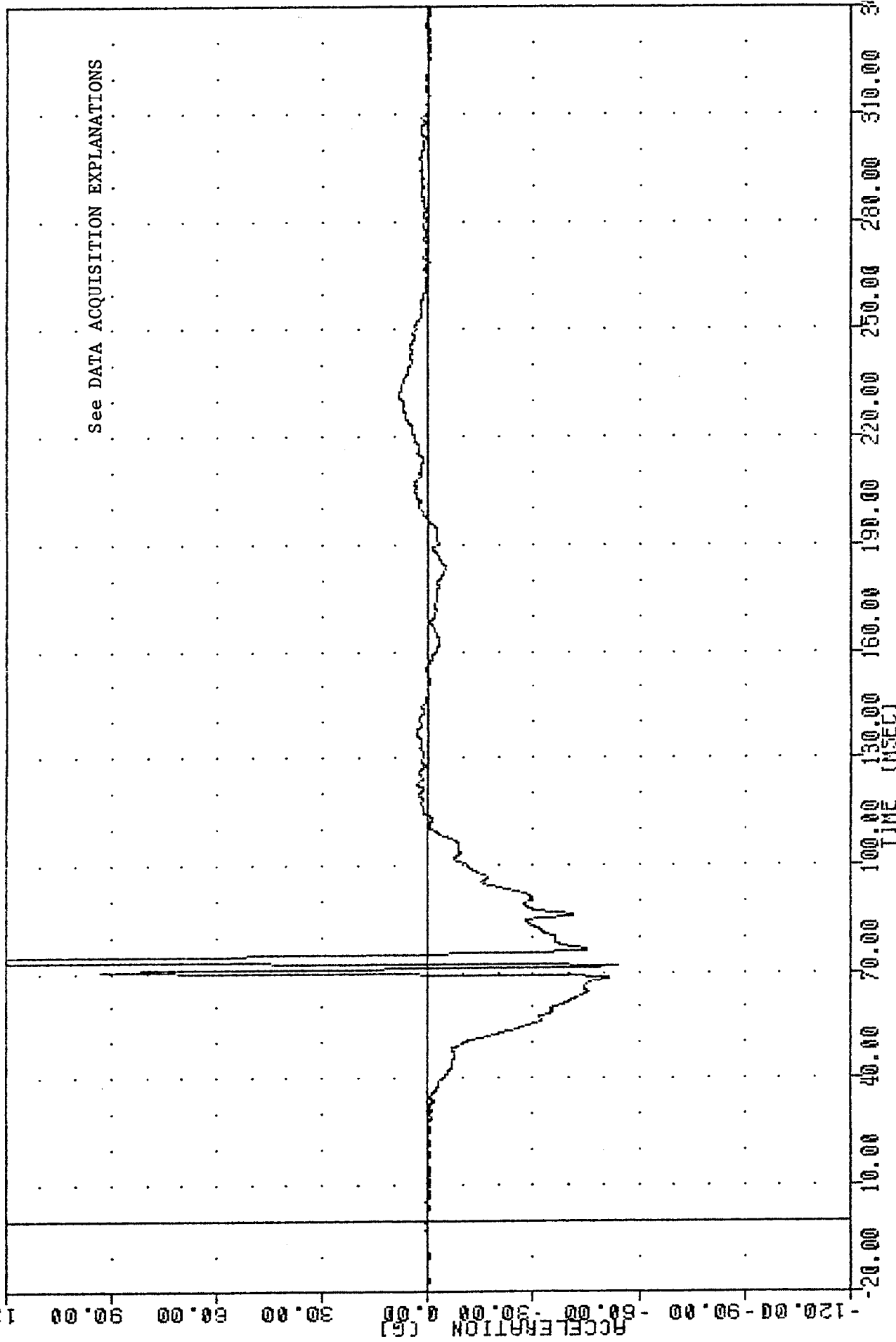
FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -54.000

71.88

253.52

73.63



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X AXIS ACCELERATION

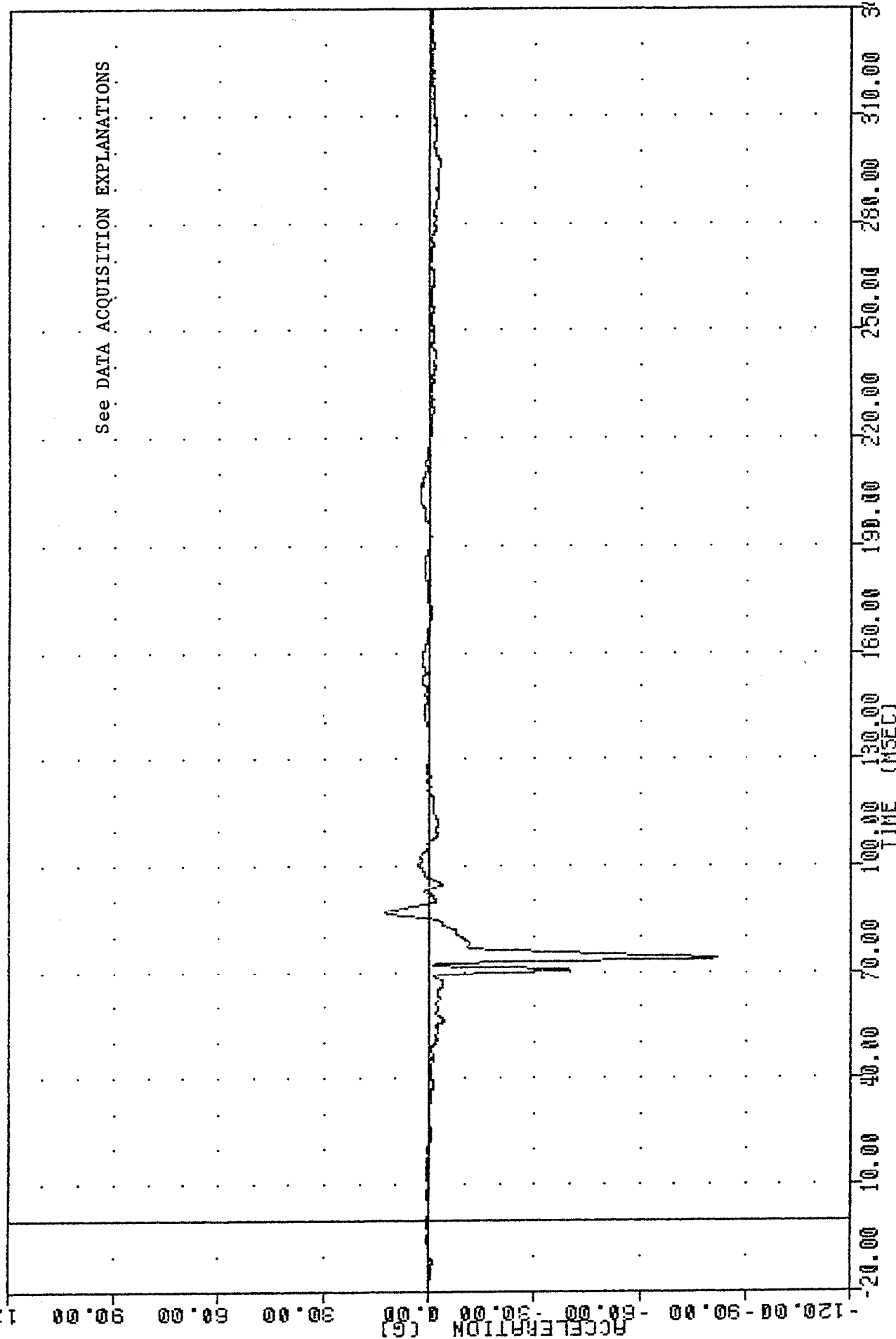
200 COMPLIANCE TEST

88218

CSTYG2

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -82.13e 74.00e 12.71e 86.50



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y AXIS ACCELERATION

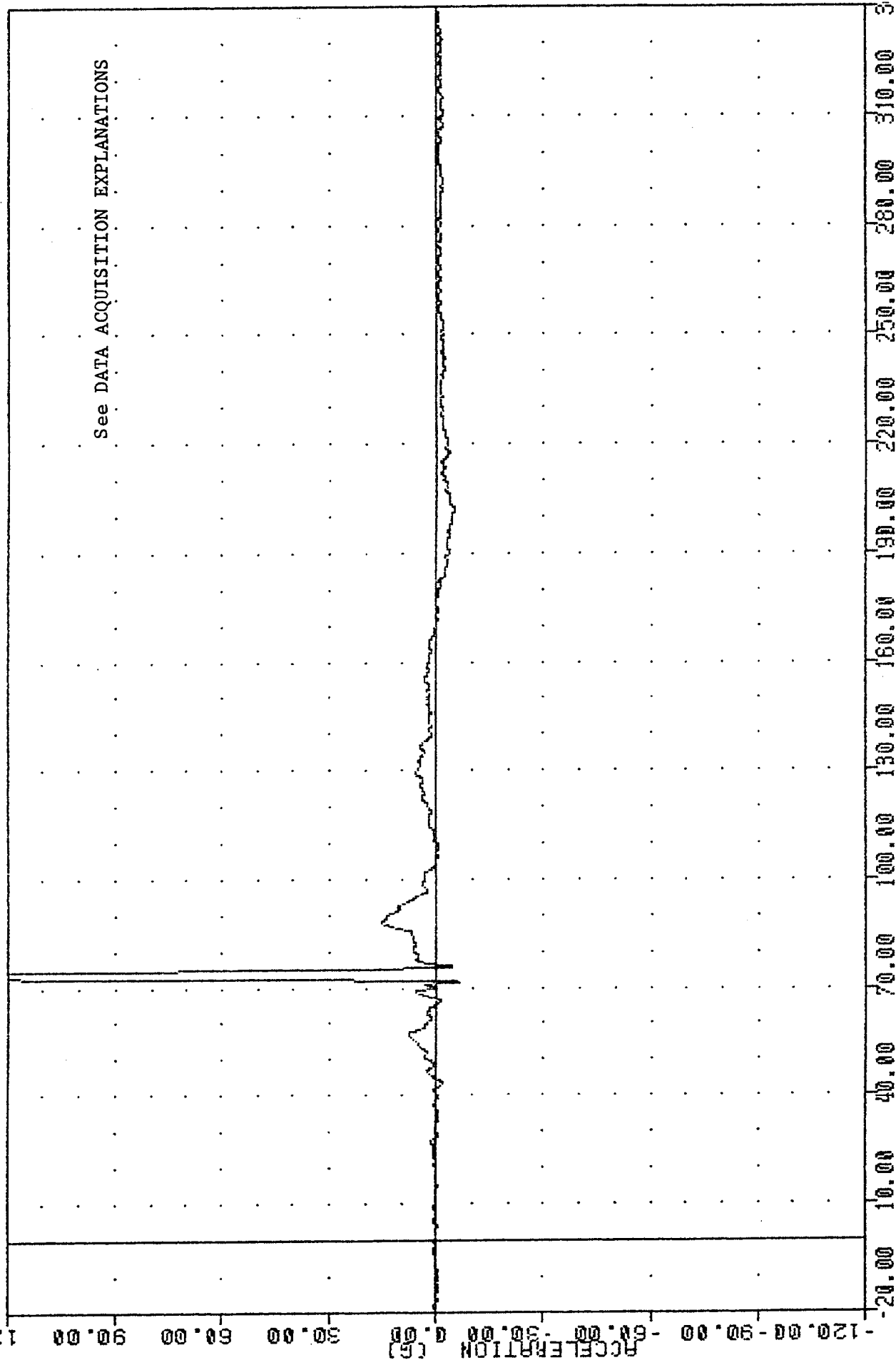
200 COMPLIANCE TEST

88218

CSTZG2

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -6.45 71.63 365.73 73.63



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Z AXIS ACCELERATION

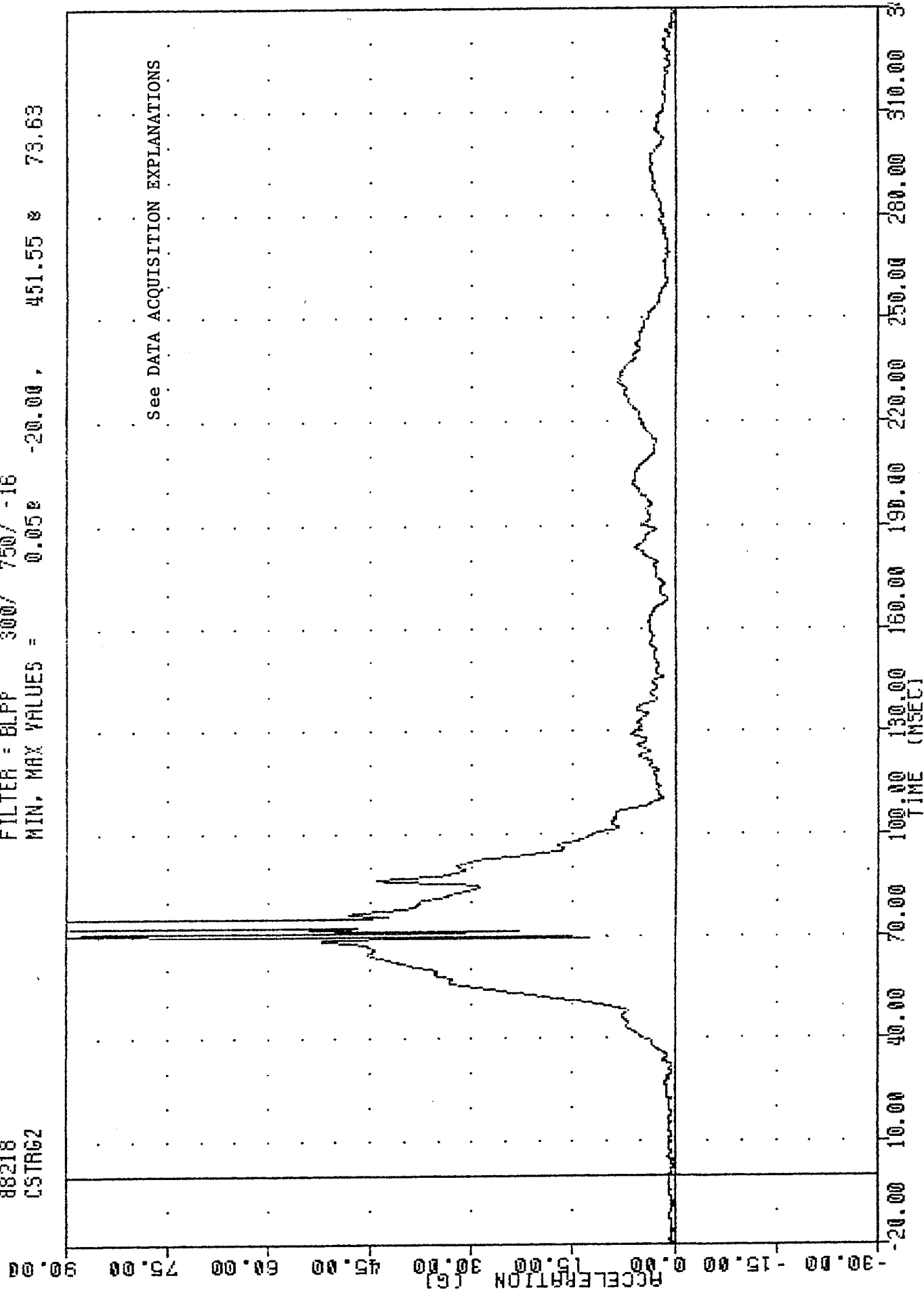
200 COMPLIANCE TEST

88218

CSTRG2

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = 0.052 -20.00, 451.55 & 73.63



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

208 COMPLIANCE TEST

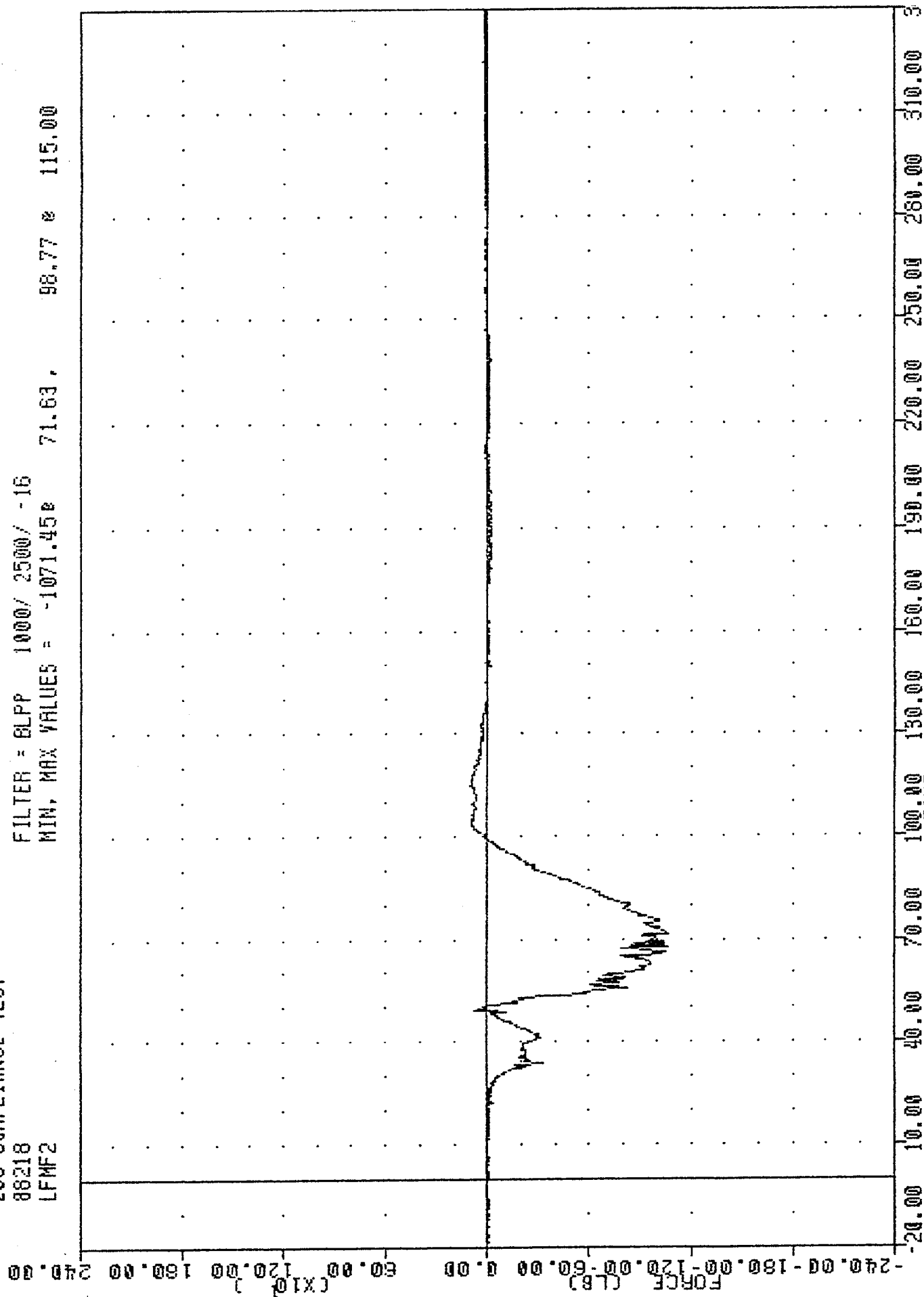
88218

LFMF2

FILTER = BLPP 1000/ 2500/ -16

MIN, MAX VALUES = -1071.45e 71.63,

98.77 e 115.00



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE

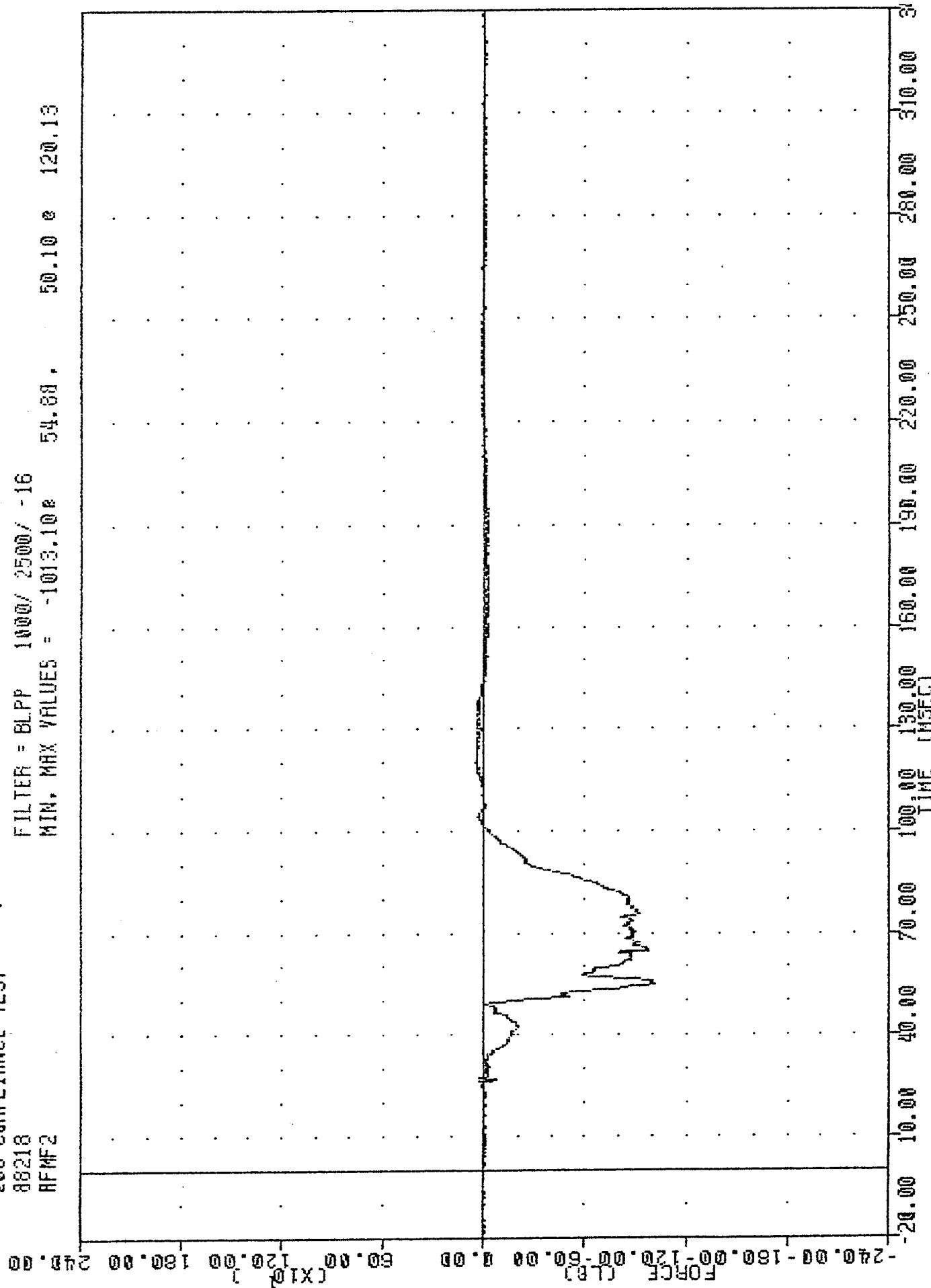
200 COMPLIANCE TEST

88218

RFMF2

FILTER = BLPP 1000/ 2500/ -16

MIN. MAX VALUES = -1013.10e 54.89. 50.10 e 120.13



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

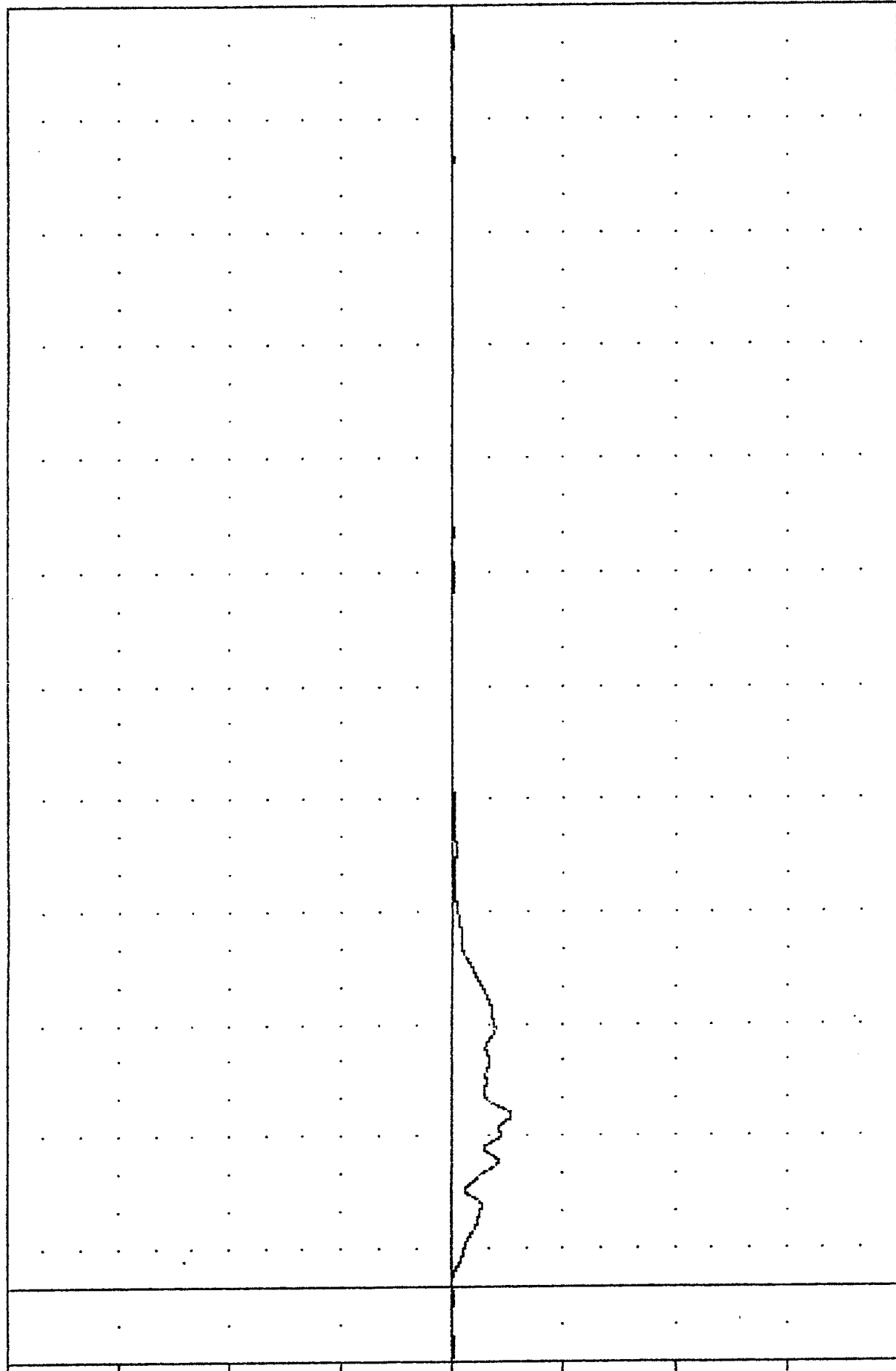
88218

TLRXG1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -31.92e 45.38, 0.77 e 210.00

ACCELERATION [G]



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
LEFT REAR SEAT X AXIS ACCELERATION

200 COMPLIANCE TEST

88218

TRRXG1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES =

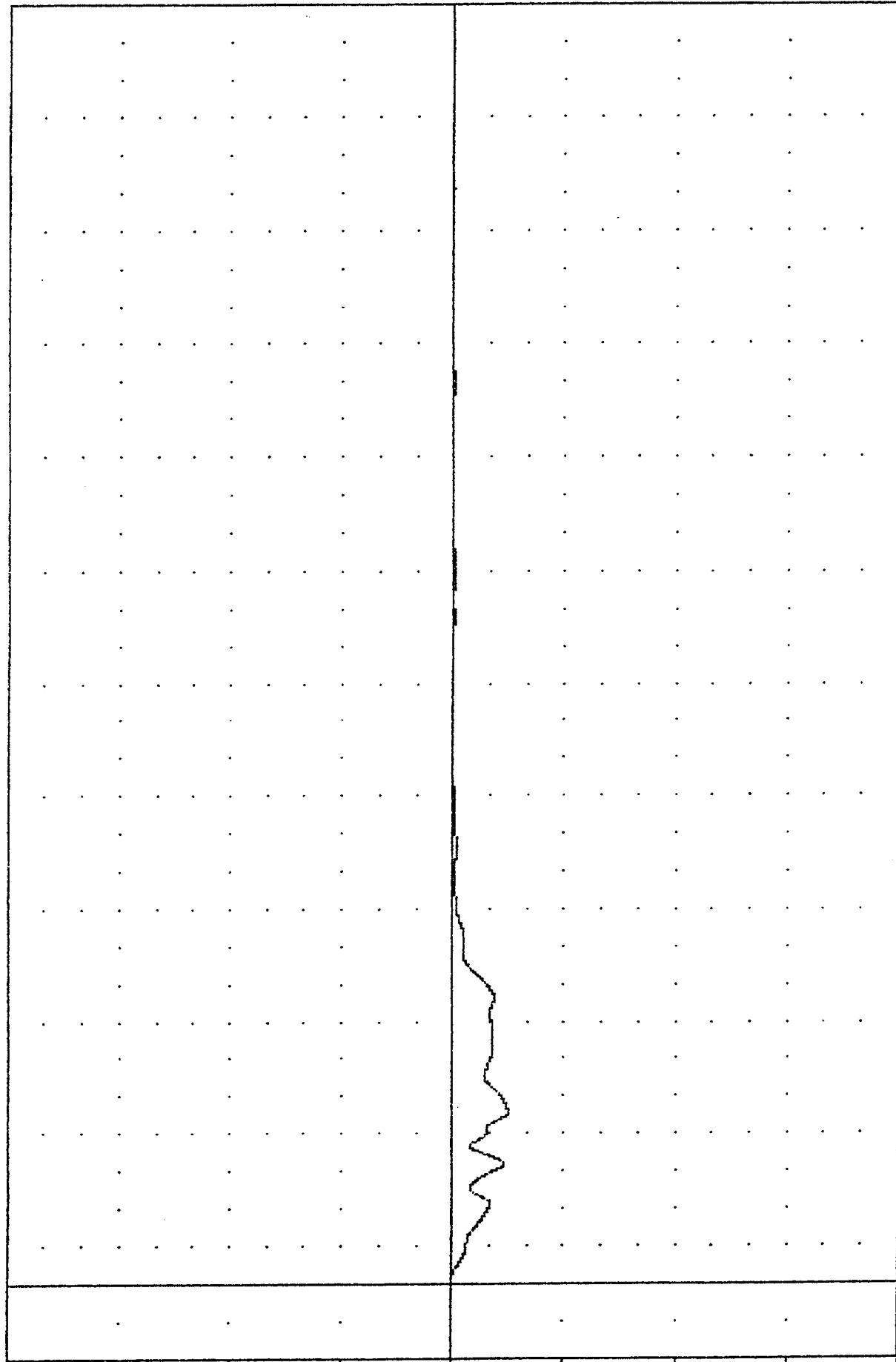
-30.58%

45.75,

0.69 @

213.75

ACCELERATION [G]



TIME (MSEC)

1988 NISSAN MAXIMA INTO FRONTAL BARRIER

RIGHT REAR SEAT X AXIS ACCELERATION

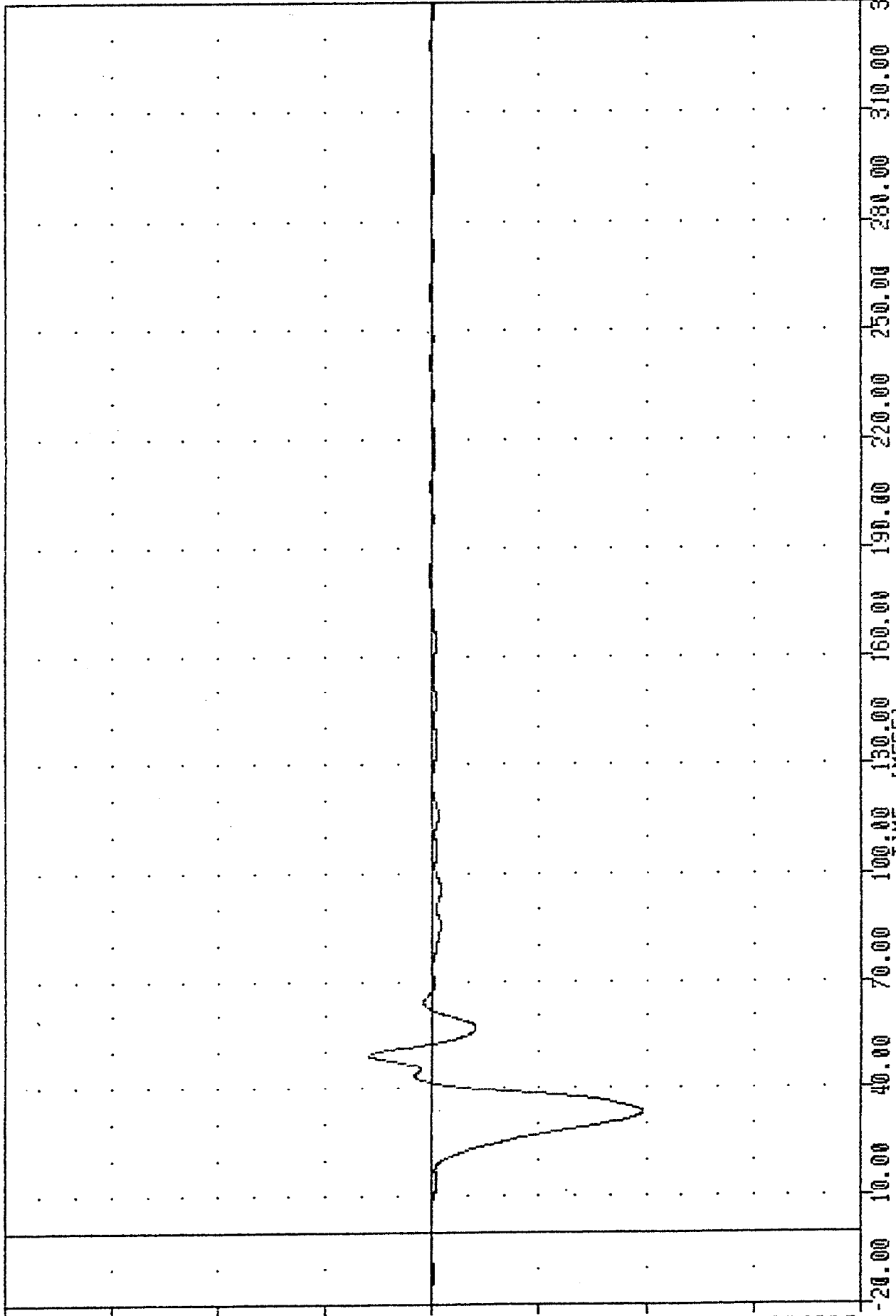
200 COMPLIANCE TEST

88218
ENGXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -118.30e 33.25 ,

35.76 e 49.13

ACCELERATION (G)



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
ENGINE UPPER BLOCK X AXIS ACCELERATION

200 COMPLIANCE TEST

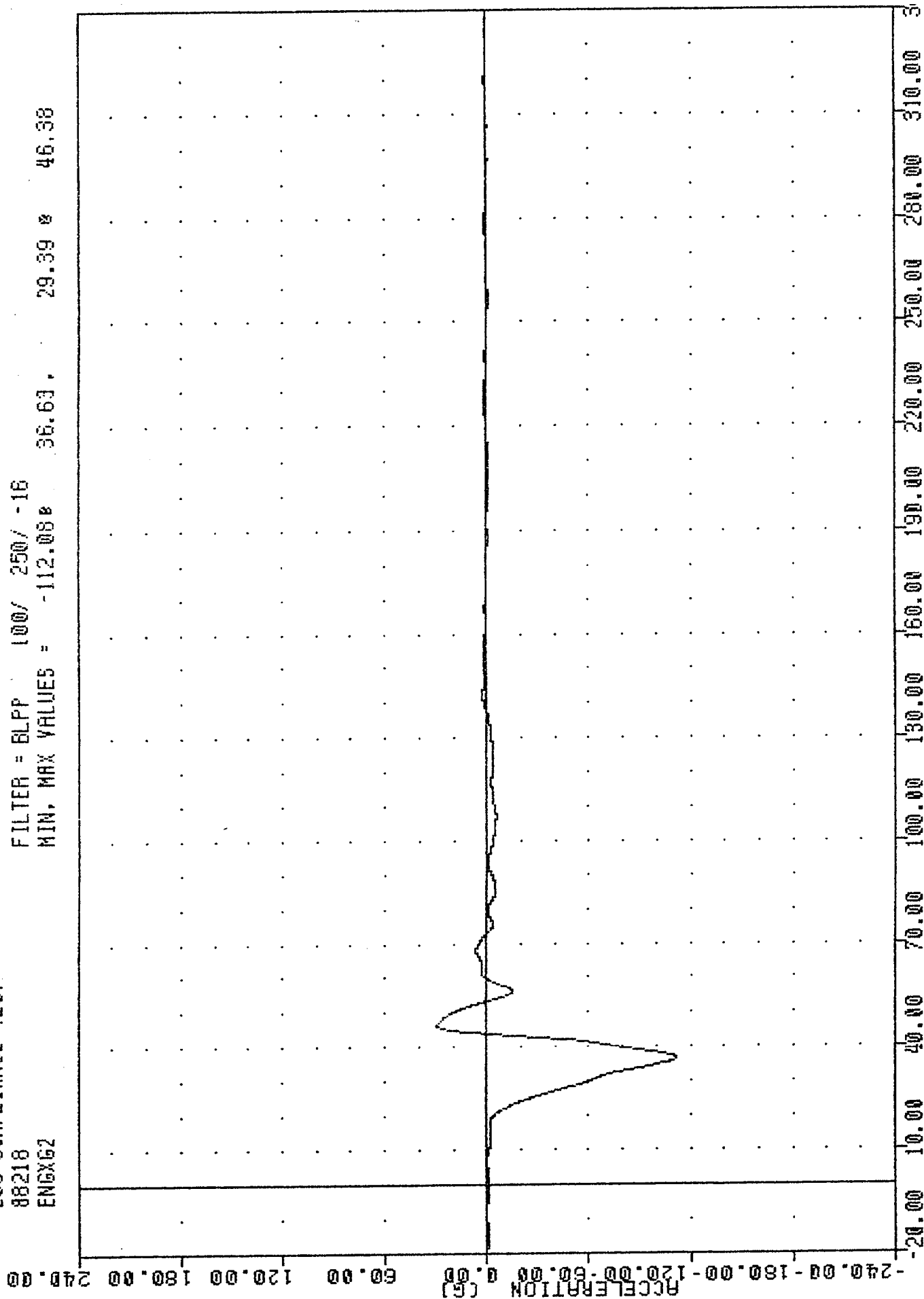
88218

ENGXG2

FILTER = BLPP 100/ 250/ -18

MIN, MAX VALUES = -112.08 36.63

29.39 46.38



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
ENGINE BOTTOM BLOCK X AXIS ACCELERATION

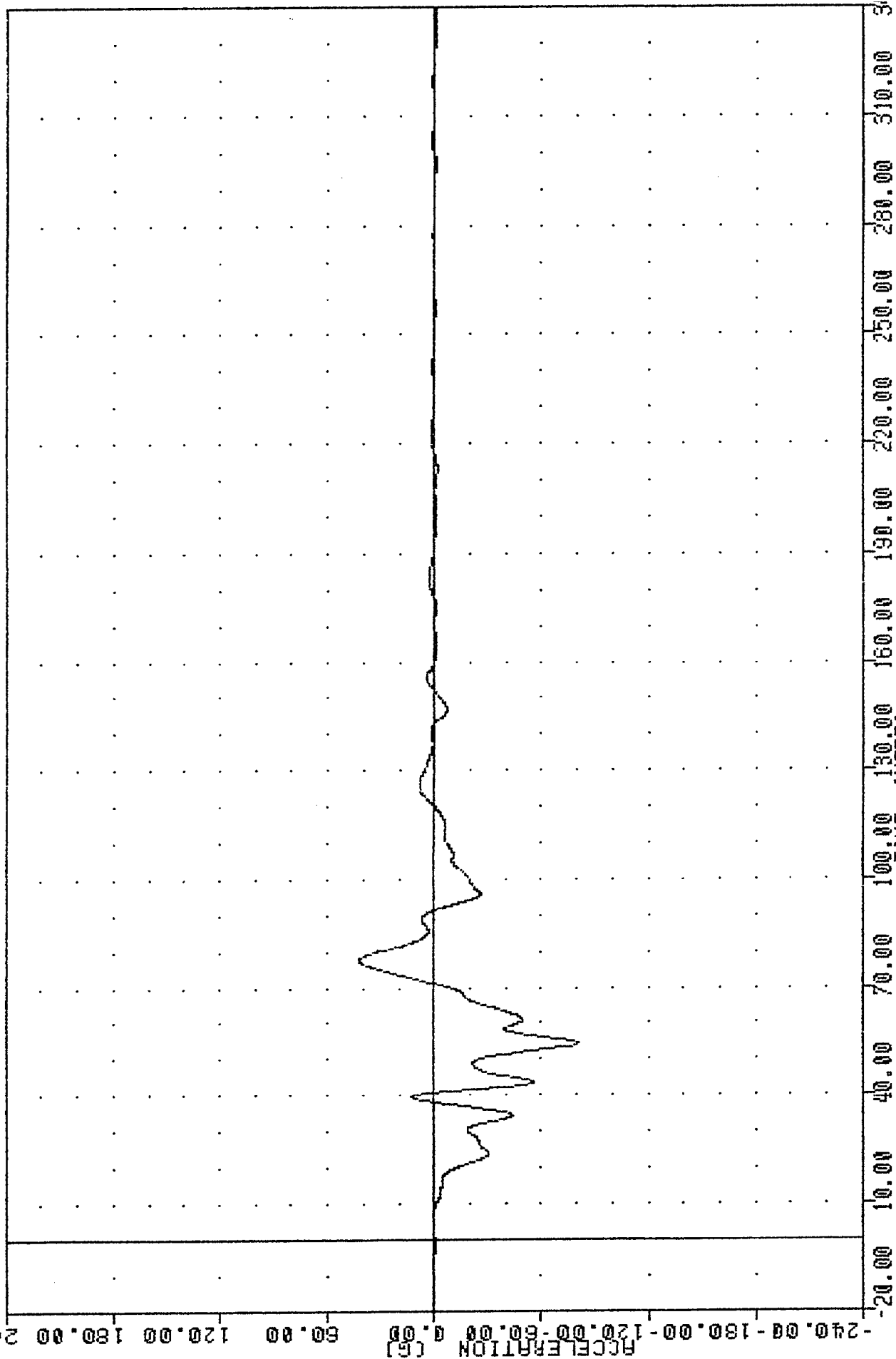
200 COMPLIANCE TEST

88218
BCRXG1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -80.65 54.25, 42.10 77.63

ACCELERATION (G)



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
RIGHT BRAKE CALIPER X AXIS ACCELERATION

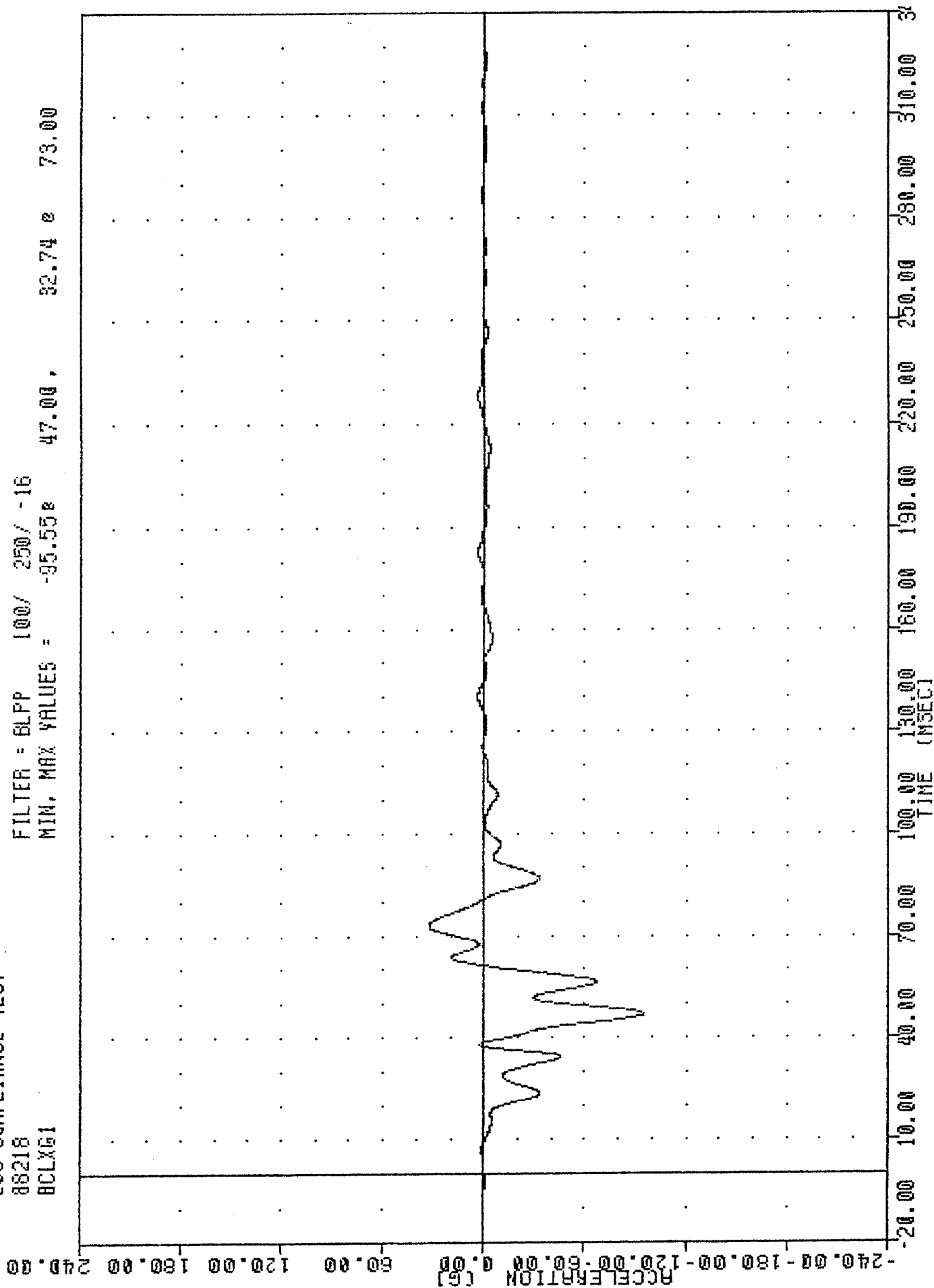
200 COMPLIANCE TEST

88218

BCLXG1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -95.55e 47.00, 32.74 e 73.00



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
LEFT BRAKE CALIPER X AXIS ACCELERATION

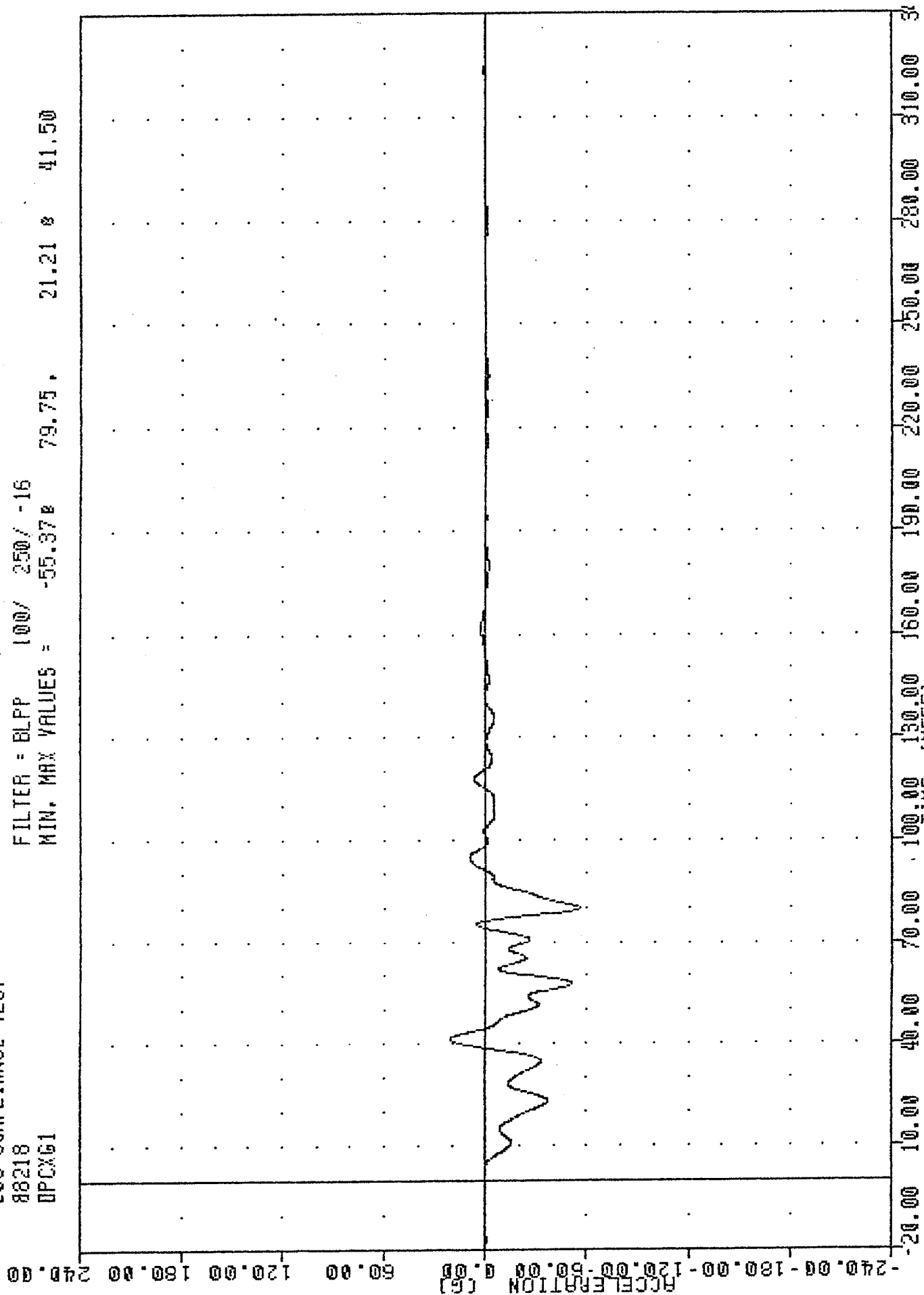
200 COMPLIANCE TEST

88218

OPCXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -55.37 79.75 21.21 41.50



1988 NISSAN MAXIMA INTO FRONTAL BARRIER
DASH PANEL CENTER X AXIS ACCELERATION