

DOT 1452

REPORT NOS. 208-TRC-90-011
212-TRC-90-011
301-TRC-90-011

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

CHRYSLER MOTORS CORPORATION

1990 DODGE DYNASTY

4-DOOR SEDAN

NHTSA NO. CL0308

TRC TEST NO. 900308

THE TRANSPORTATION RESEARCH CENTER OF OHIO

10820 STATE ROUTE 347

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MARCH 26, 1990

FINAL REPORT

PREPARED FOR:

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Technical Report Documentation Page

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16. Abstract A 30 mph flat frontal barrier impact compliance test was conducted on a 1990 Dodge Dynasty 4-door sedan, VIN 1B3XC4631LD716225, NHTSA No. CL0308 at the Transportation Research Center of Ohio on March 8, 1990. 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 29.6 mph. The ambient temperature was 72° 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	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

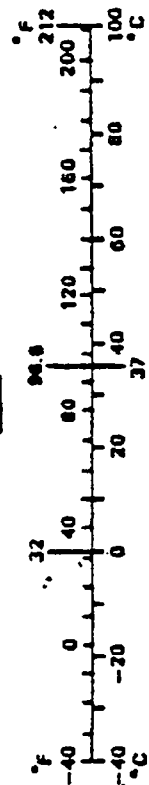


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SECTION 1.0

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 1990 Dodge Dynasty 4-door sedan, NHTSA No. CL0308, 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 1990 Dodge Dynasty 4-door sedan, NHTSA No. CL0308, was equipped with a 3.0 liter, transverse engine, automatic transmission, and power brakes. The test weight of the vehicle was 3638 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 E and Part 572 B dummies seated in the front outboard designated seating positions. (See DATA ACQUISITION EXPLANATIONS.) For the Part 572 E dummy, the thorax displacement did not exceed 3.0 inches. 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.

One (1) Part 572 E, adult male anthropomorphic test device (ATD) was seated in the left front outboard designated seating position. The dummy was positioned according to the dummy placement procedure specified in Notice 45 of Federal Motor Vehicle Safety Standard No. 208.

One (1) Part 572 B adult male anthropomorphic test device (ATD) was seated in the right front outboard designated seating position. The dummy was positioned according to the dummy placement procedures specified in Appendices B and C of Laboratory Procedure 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 Part 572 E dummy's instrumentation also included a chest displacement potentiometer.

The vehicle was instrumented with seven (7) 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 pre-test and post-test events were recorded with one (1) real-time camera.

The twenty-four (24) 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 March 8, 1990. The test vehicle's impact speed was 29.6 mph. The vehicle sustained 20.8 inches of static crush.

The FMVSS 208, 212, 219 (partial), and 301 compliance data are 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.:	CL0308	PROJECT:	208 Compliance
DATE:	03/08/90	TIME:	1253 TEMP: 72° F
VEHICLE:	1990 Dodge Dynasty 4-door sedan		
TEST WEIGHT (LBS):	3638		
IMPACT ANGLE (DEG)*:	0		
IMPACT VELOCITY (MPH)**:	PRIMARY = 29.6	SECONDARY = 29.6	
MAXIMUM STATIC CRUSH (IN):	20.8		
VEHICLE REBOUND (IN):	12.3		
DUMMIES:	Driver #230	Passenger #690	
TYPE:	Part 572 E	Part 572 B	
LOCATION:	Left front	Right front	
RESTRAINT:	Airbag	3-point unbelt	
NUMBER OF DATA CHANNELS:	24		
NUMBER OF HIGH SPEED CAMERAS:	HIGH-SPEED: 14	REAL-TIME: 2	

*With respect to tow track centerline.

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

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Chrysler Motors Corporation

MAKE/MODEL: Dodge Dynasty

VIN: 1B3XC4631LD716225

BODY STYLE: 4-door sedan

MODEL YEAR: 1990

NHTSA NO.: CL0308

COLOR: Blue

ENGINE DATA: TYPE: transverse CYLINDERS: 6 DISPLACEMENT: 3.0 liter

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

DATE VEHICLE RECEIVED: 01/12/90

ODOMETER READING: 88.0

DEALER'S NAME AND ADDRESS: Carriage Towne Chrysler, Plymouth, Dodge, Inc.
256 S. Sandusky
Delaware, OH 43015

ACCESSORIES:

POWER STEERING Yes

AUTOMATIC TRANSMISSION Yes

POWER BRAKES Yes

AUTOMATIC SPEED CONTROL Yes

POWER SEATS No

TILTING STEERING WHEEL Yes

POWER WINDOWS No

TELESCOPING STEERING WHEEL No

TINTED GLASS Yes

AIR CONDITIONING Yes

RADIO Yes

ANTI-SKID BRAKE Yes

CLOCK Yes

REAR WINDOW DEFROSTER Yes

OTHER None

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: Chrysler Motors Corporation

DATE OF MANUFACTURE: 8/89

GVWR: 4383 LBS

GAWR: FRONT 2370 LBS., REAR 2063 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 32 psi; REAR 32 psi

RECOMMENDED TIRE SIZE: P195/75R14 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear Invicta GL P195/75R14

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

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

TYPE OF FRONT SEAT BACKS: Non-adjustable

NUMBER OF OCCUPANTS 3 FRONT 3 REAR 6 TOTAL

CARGO LOAD 200 LBS. TOTAL 1100 LBS.

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

RIGHT FRONT 970 lbs. RIGHT REAR 566 lbs.

LEFT FRONT 1018 lbs. LEFT REAR 564 lbs.

TOTAL FRONT WEIGHT 1988 lbs. (63.8% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1130 lbs. (36.2% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 3118 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (3118 LBS)

VCW = VEHICLE CAPACITY WEIGHT (1100 LBS)

DSC = DESIGNATED SEATING CAPACITY (6)

$RCLW = VCW - 150 (DCS) = 1100 - 150(6) = 200 \text{ LBS}$

$TARGET \text{ TEST WEIGHT} = UDW + RCLW + (1 \text{ DUMMY} \times 164 \text{ LBS/DUMMY} + 1 \text{ DUMMY} \times 167 \text{ LBS/DUMMY})$

$= 3118 + 200 + 164 + 167 \text{ LBS}$

TARGET TEST WEIGHT = 3649 LBS

TABLE 2 TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 189 LBS. CARGO:

RIGHT FRONT	1013 lbs.	RIGHT REAR	774 lbs.
LEFT FRONT	1070 lbs.	LEFT REAR	781 lbs.
TOTAL FRONT WEIGHT	2083 lbs.	(57.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1555 lbs.	(42.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3638 lbs.	(0.3% UNDER TARGET WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 100 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: None

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE: LF 28.1; RF 28.2; LR 27.3; RR 27.4

PRE-TEST ATTITUDE: LF 27.8; RF 27.9; LR 24.4; RR 24.8

POST-TEST ATTITUDE: LF 29.4; RF 24.8; LR 26.5; RR 21.7

MAXIMUM WIDTH: 69.5 INCHES

WHEELBASE: 104.8 INCHES

CG = 44.8 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TABLE 3 TEST CONDITIONS

TEST NUMBER: 900308

DATE OF TEST: 03/08/90

TIME OF TEST: 1253

TYPE OF TEST: Frontal barrier impact

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA:

72° F

TEMPERATURE IN OCCUPANT COMPARTMENT:

70° F

IMPACT VELOCITY: PRIMARY = 29.6 MPH

SECONDARY = 29.6 MPH

(SPECIFIED RANGE = 28.9 TO 29.9 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES):

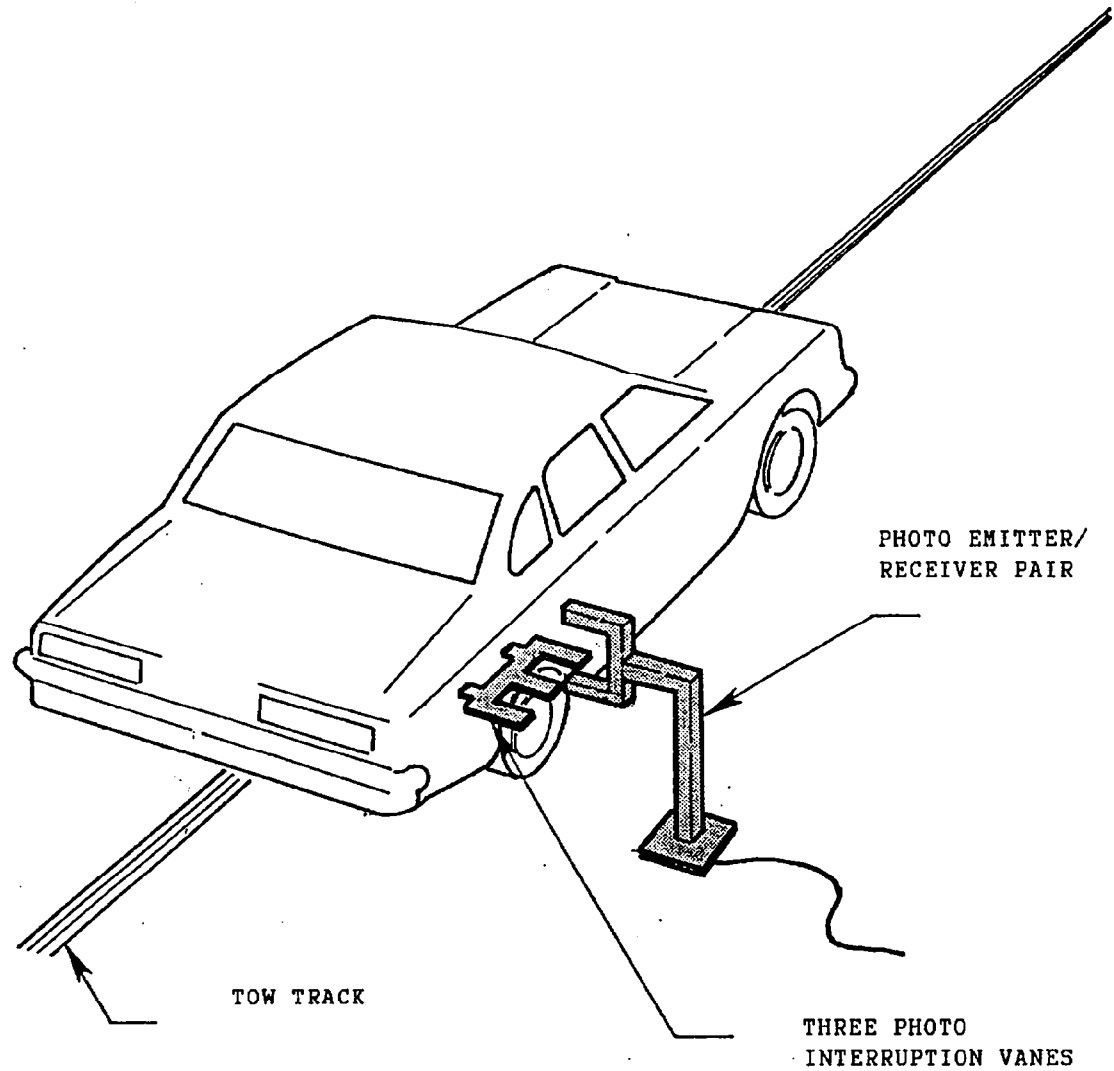
OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 187.5; C 192.2; R 187.4

POST-TEST: L 169.3; C 171.4; R 168.4

TOTAL CRUSH: L 18.2; C 20.8; R 19.0

FOR FRONTAL IMPACTS, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER
IMPACT: L: 13.1; C: 10.5; R: 13.4; AVG: 12.3

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM

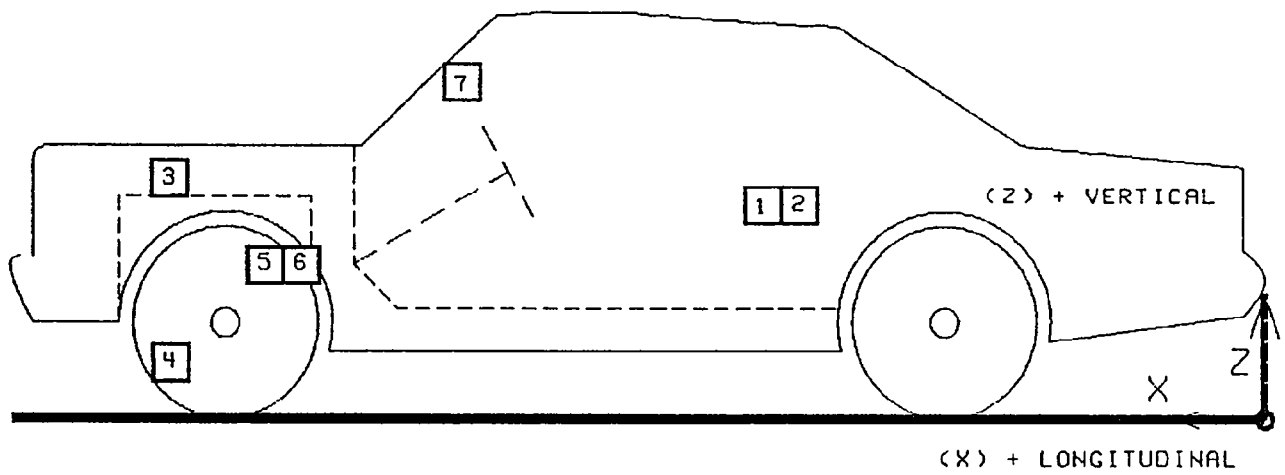


The final vane clears emitter/receiver two inches before impact.

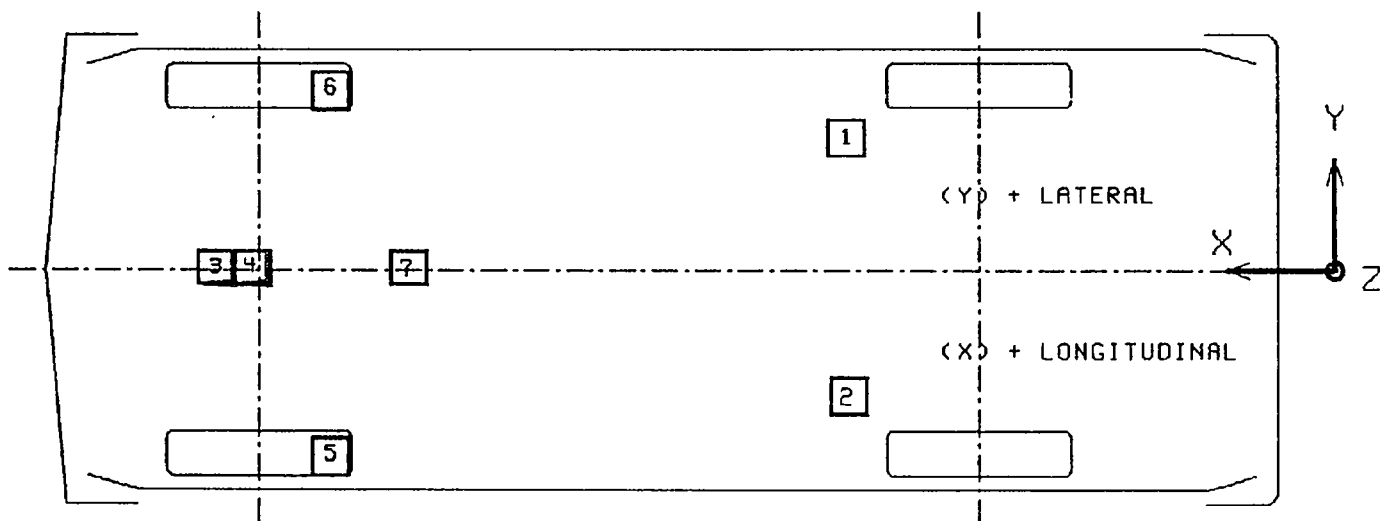
The vanes have one foot spacing.

FIGURE 2

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900308

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
						MAX G MSEC		MAX G MSEC	
1	REAR SEAT CROSSMEMBER AT LEFT SIDE LONGITUDINAL	PRE	71.2	20.5	12.5				
		POST	71.6	20.5	16.1				
						2.5	160.8	26.2	51.9
2	REAR SEAT CROSSMEMBER AT RIGHT SIDE LONGITUDINAL	PRE	71.4	-20.5	11.5				
		POST	71.2	-20.5	13.1				
						2.4	162.3	25.3	77.6
3	TOP OF ENGINE BLOCK LONGITUDINAL	PRE	154.0	-1.5	34.2				
		POST	150.9	-2.2	32.9				
						35.1	61.6	79.0	44.0
4	BOTTOM OF ENGINE BLOCK LONGITUDINAL	PRE	157.5	-6.2	8.4				
		POST	148.8	-6.2	6.5				
						54.1	55.1	106.7	45.8
5	BRAKE CALIPER AT RIGHT SIDE LONGITUDINAL	PRE	153.5	-24.8	11.9				
		POST	149.0	-25.0	7.1				
						40.5	84.0	110.1	68.0
6	BRAKE CALIPER AT LEFT SIDE LONGITUDINAL	PRE	153.5	24.8	12.0				
		POST	148.9	25.0	10.1				
						---	---Y	---	---Y
7	DASH PANEL LONGITUDINAL	PRE	123.0	0.0	40.4				
		POST	123.9	0.2	41.0				
						24.3	109.8	59.0	60.3

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

Y See DATA ACQUISITION EXPLANATIONS

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

VEHICLE MAKE/MODEL/BODY STYLE: Dodge/Dynasty/4-door sedan
 VEH. NHTSA NO.: CL0308; VIN: 1B3XC4631LD716225
 MODEL YEAR: 1990; BUILD DATE: 8/89; TEST DATE: 03/08/90
 VEH. SIZE CATEGORY: Midsize; TEST WEIGHT: 3638
 VEH. WHEELBASE: 104.8
 MAX. WIDTH: 69.5
 FRONT OVERHANG: 43.2

COLLISION DEFORMATION
 CLASSIFICATION (CDC) CODE: 12FDEW2

F (Frontal)
 CRUSH DEPTH
 DIMENSIONS:

C1 = 18.2 inches
 C2 = 19.8 inches
 C3 = 20.5 inches
 C4 = 20.8 inches
 C5 = 20.6 inches
 C6 = 19.0 inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitudinal)

LENGTH OF DAMAGED
 REGION: L = 60.6 inches

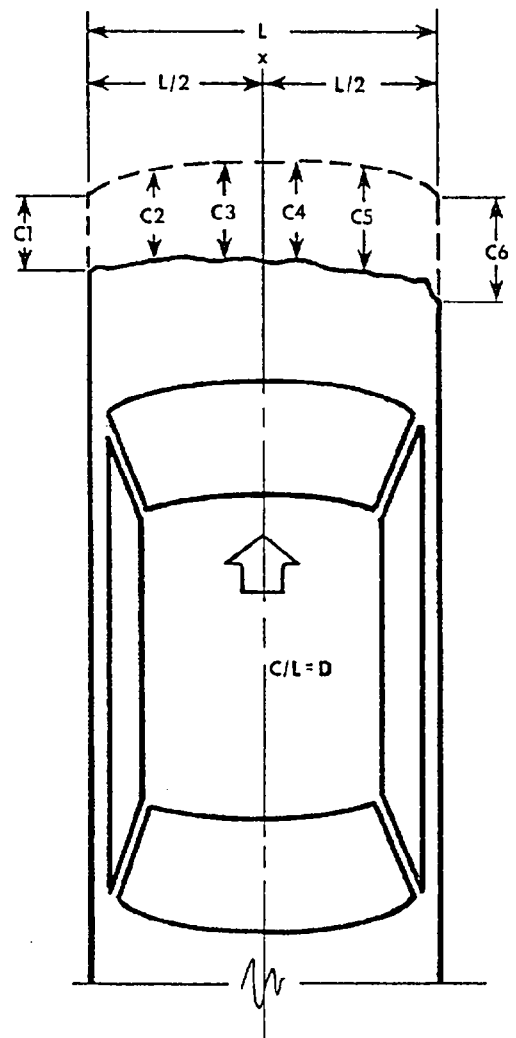


FIGURE 4

PRE-TEST AND POST-TEST MEASUREMENT POINTS

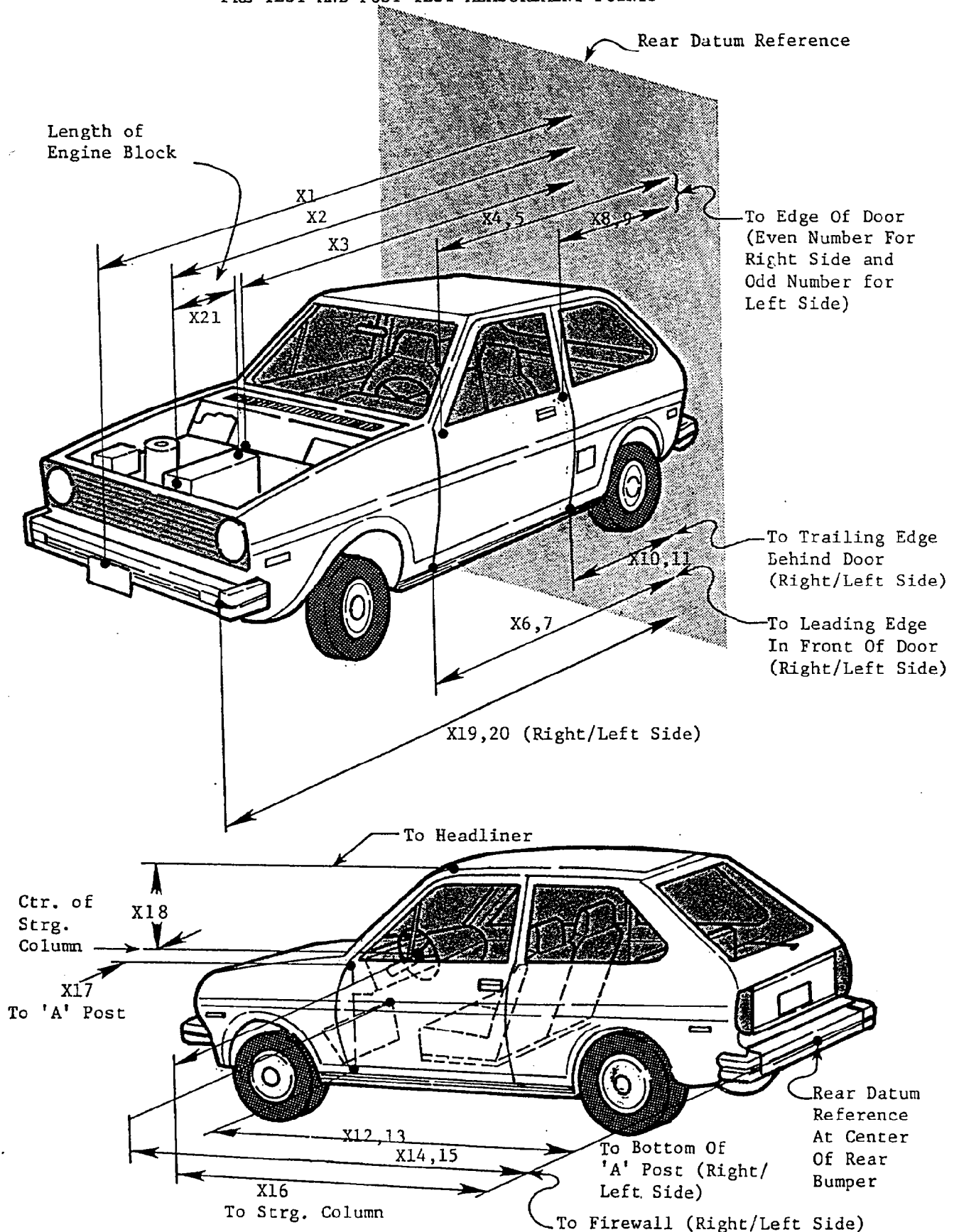


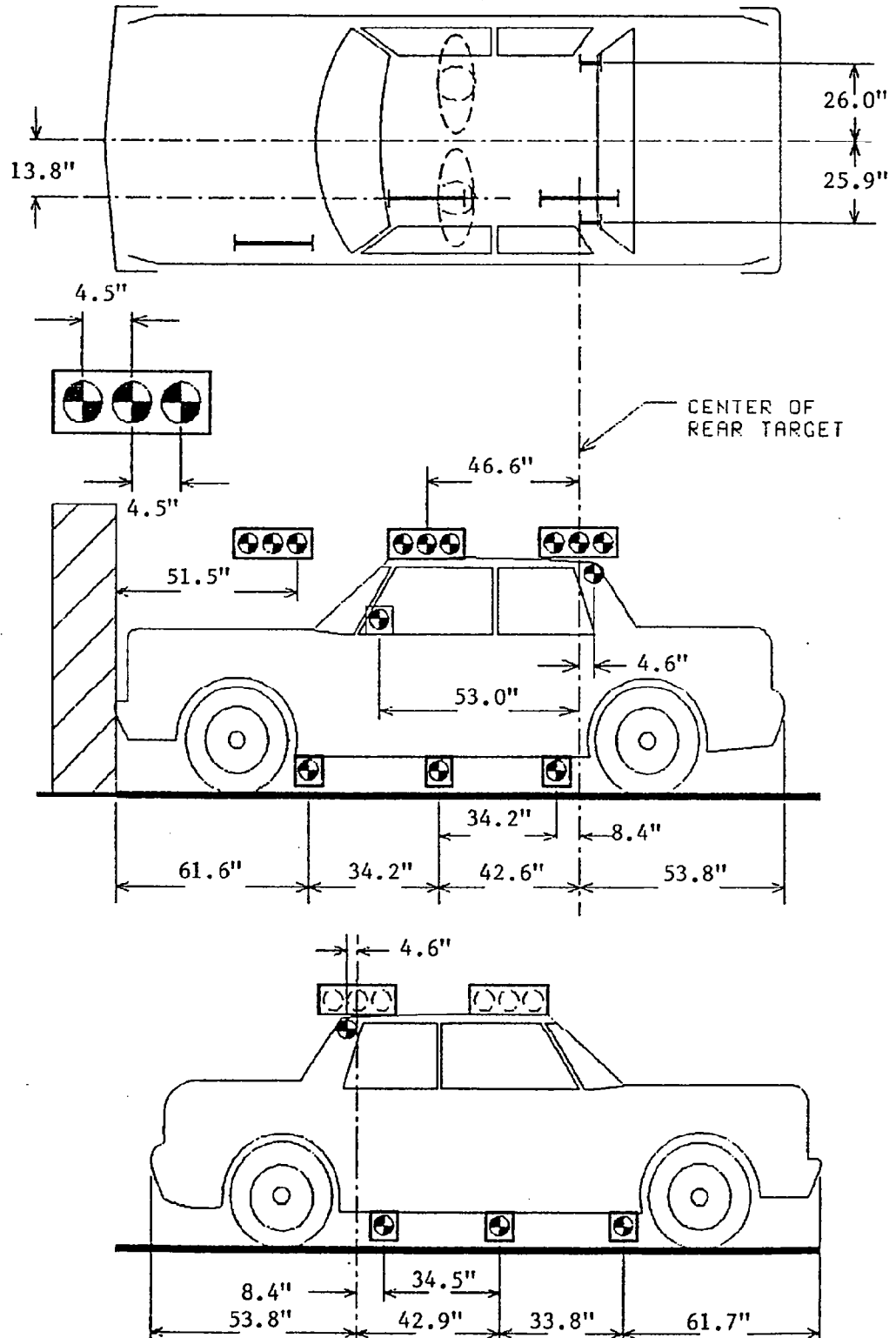
TABLE 5 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Dodge/Dynasty TEST NUMBER: 900308

NO.	TYPE OF MEASUREMENT	DIMENSIONS IN INCHES		
		PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	192.2	171.4	20.8
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	163.2	159.4	3.8
X3	REAR SURFACE OF VEHICLE TO FIREWALL	142.2	140.9	1.3
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	128.8	129.0	-0.2
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	128.8	128.9	-0.1
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	128.0	127.9	0.1
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	128.0	128.5	-0.5
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	87.8	88.1	-0.3
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	87.8	88.0	-0.2
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	88.4	88.1	0.3
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	88.8	88.5	0.3
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	127.4	127.4	0.0
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	127.6	126.5	1.1
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	141.5	141.6	-0.1
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	141.6	141.4	0.2
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	111.1	111.6	-0.5
X17	CENTER OF STEERING COLUMN TO "A" POST	14.9	13.8	1.1
X18	CENTER OF STEERING COLUMN TO HEADLINER	16.4	15.4	1.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	187.4	168.4	19.0
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	187.5	169.3	18.2
X21	LENGTH OF ENGINE BLOCK	12.0	12.0	0.0

FIGURE 5

VEHICLE TARGET LOCATIONS



REPORT OF VEHICLE CONDITION AT THE
COMPLETION OF TESTING

Contract No.: DTNH22-88-C-11038
From: The Transportation Research Center of Ohio
10820 State Route 347
East Liberty, OH 43319

To: Karen Nuschler
COTR
Office of Vehicle Safety Compliance

The following vehicle has been subjected to testing for FMVSS 208. The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager/NAD-30, with a carbon copy to the responsible testing office. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

NHTSA NO.: CL0308

MAKE/MODEL/BODY STYLE: Dodge/Dynasty/4-door sedan

MODEL YEAR: 1990 BODY COLOR: Blue

VIN: 1B3XC4631LD716225

ODOMETER (ARRIVAL): 88.0 DATE: 01/12/90

ODOMETER (COMPLETION): 91.0 DATE: 03/08/90

COST: \$13,226.00

☒ Air Conditioner

☐ Console

Brakes: ☒ Power

☒ Tinted Glass

☐ Tachometer

Front: Disc

☒ Power Steering

☒ Speed Control

Rear: Drum

☐ Power Windows

☒ Rear Window Def.

☐ Power Door Locks

☐ Sun/Moon Roof

Front Seats: ☐ Power

☒ Radio

☐ T-Top

Seat Type: Bench

☒ Clock

☒ Tilt Steering Wheel

No. of Seats: 6

☐ Roof Rack

☐ Other Options: None

Engine: 6 Cylinders; 3.0 LITRES

Transmission: Automatic; Drive Type: Front

Tire Size: P195/75R14

Gasoline Type: Unleaded

Equipment that is no longer on the vehicle as noted above: None

Explanation: NA

Vehicle Condition: Vehicle has been subjected to a 30 mph frontal
barrier crash test.

DATA ACQUISITION EXPLANATIONS

The following data channels recorded spikes at 18, 20, 32, 141, 277, 287, 299, and 304 milliseconds due to the umbilical data cable connections shorting:

HEDXG1, driver's head X-axis acceleration
HEDYG1, driver's head Y-axis acceleration
HEDZG1, driver's head Z-axis acceleration
CSTXG1, driver's chest X-axis acceleration
CSTYG1, driver's chest Y-axis acceleration
CSTZG1, driver's chest Z-axis acceleration
CSTYG2, right front passenger's chest Y-axis acceleration

The following calculated data channels were affected by the above data spikes:

HEDRG1, driver's head resultant acceleration
CSTRG1, driver's chest resultant acceleration
CSTRG2, right front passenger's chest resultant acceleration

The left brake caliper X-axis acceleration, BCLXG1, data was lost after 69 milliseconds due to the vehicle's crush cutting the accelerometer cable.

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 1990 Dodge Dynasty 4-door sedan, NHTSA No. CL0308, appeared to comply with the requirements of FMVSS Nos. 208, 212, 219 (partial), and 301.

The driver's Head Injury Criteria (HIC) was 352. (See DATA ACQUISITION EXPLANATIONS.) The driver's maximum chest deceleration over three milliseconds was 44.9 g. (See DATA ACQUISITION EXPLANATIONS.) The driver's chest displacement was 0.8 inches. The driver's right and left compressive femur loads were 1142 pounds and 1027 pounds, respectively.

The right front passenger's Head Injury Criteria (HIC) was 287. The right front passenger's maximum chest deceleration over three milliseconds was 34.3 g. (See DATA ACQUISITION EXPLANATIONS.) The right front passenger's right and left compressive femur loads were 764 pounds and 620 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 post-test static rollover.

TABLE 6 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION ('G')

	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DRIVER	-55.6Y	-7.7Y	-21.8Y	56.8Y	-44.2Y	6.6Y	-12.6Y	44.9Y
PASSENGER	-42.7	-20.7	-37.7	52.5	-33.8	-15.3Y	-8.0	34.3Y

MAXIMUM FORCE-FEMUR LOAD (LBS)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	1027	1142
PASSENGER	620	764

HEAD INJURY CRITERIA**

	HIC	TIME t ₁ (MSEC) ¹	TIME t ₂ (MSEC) ²
DRIVER	352	67.0	100.9
PASSENGER	287	101.1	137.1

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Y 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 dummy's head rotated rearward as the dummy's head and chest were restrained by the driver's airbag. The dummy's head rotated forward and then rearward as the dummy rebounded into the seat back. The dummy came to rest seated in the driver's seat.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward and contacted the dummy's chest. The dummy's upper torso rotated clockwise as the dummy was restrained by the three-point unbelt. The dummy's head rotated rearward as the dummy rebounded into the seat back. The dummy came to rest seated in the right front passenger's seat, restrained by the three-point unbelt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #230	PASSENGER #690
Head	<u>Airbag</u>	<u>Chest</u>
Chest	<u>Airbag</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 lower right corner of the windshield was cracked
upon impact.

OTHER NOTABLE IMPACT EFFECTS:

The right front tire was flattened upon impact.

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

PRE-IMPACT DATA:

Make/Model: Dodge/Dynasty
 Body Style: 4-door sedan Model Year: 1990
 NHTSA No.: CLO308 Color: Blue

DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: Chrysler Motors Corporation
 Date of Manufacture: 8/89 VIN: 1B3XC4631LD716225
 GVWR: 4383 lb; GAWR: Front = 2370 lb; Rear = 2063 lb

POST-IMPACT DATA:

Date of Test: 03/08/90 Time: 1253 Temperature: 70° F
 Required Impact Velocity Range: 28.9 to 29.9 mph
 Impact Velocity: Primary = 29.6 mph Secondary = 29.6 mph
 Seat Type: Bench Adjuster Type: Manual
 Bucket Seat Back Type: Non-adjustable
 Technicians: B. Crabtree & R. Cribley

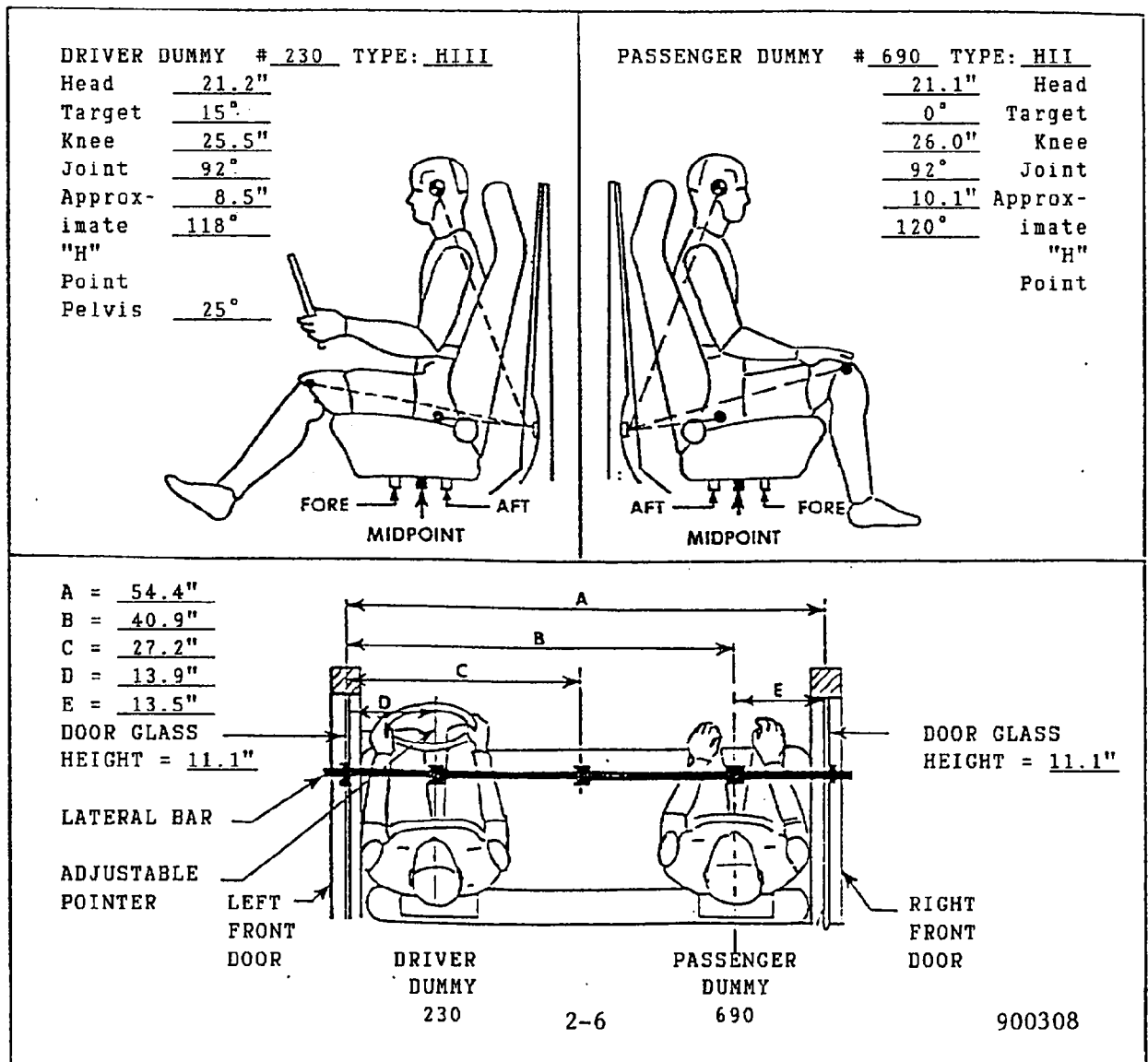
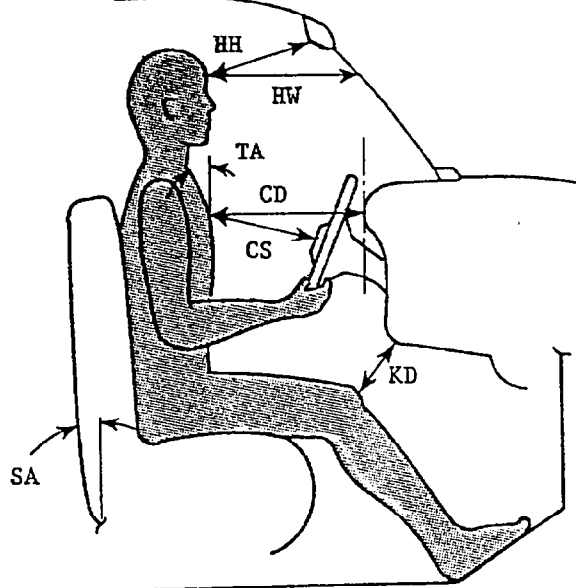


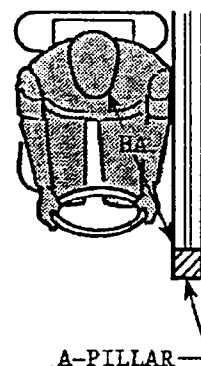
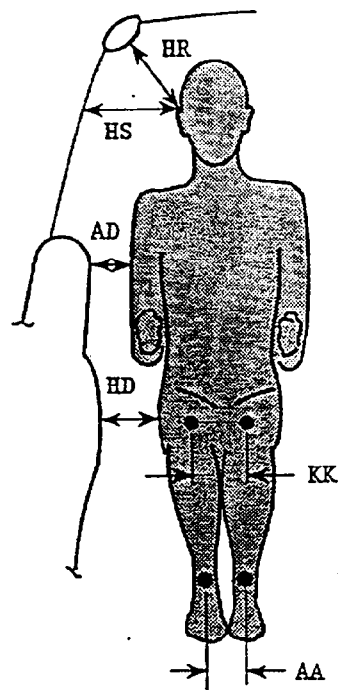
FIGURE 7 DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER	PASSENGER
HH	12.2	15.4
HW	17.0	21.1
CD	18.7	19.8
CS	9.9	NA
KDL	2.0	2.5
KDR	2.5	2.8
TA	20°	30°
SA	27°	27°
HA	11.4	12.8



	DRIVER	PASSENGER
HR	7.2	6.4
HS	10.2	9.6
AD	5.1	4.9
HD	4.8	4.0
KK	7.9	7.5
AA	9.8	7.1

Knee outer clevis to outer clevis spacing: Driver = 10.6
Knee outer bolt head to outer bolt head spacing: Passenger = 11.8

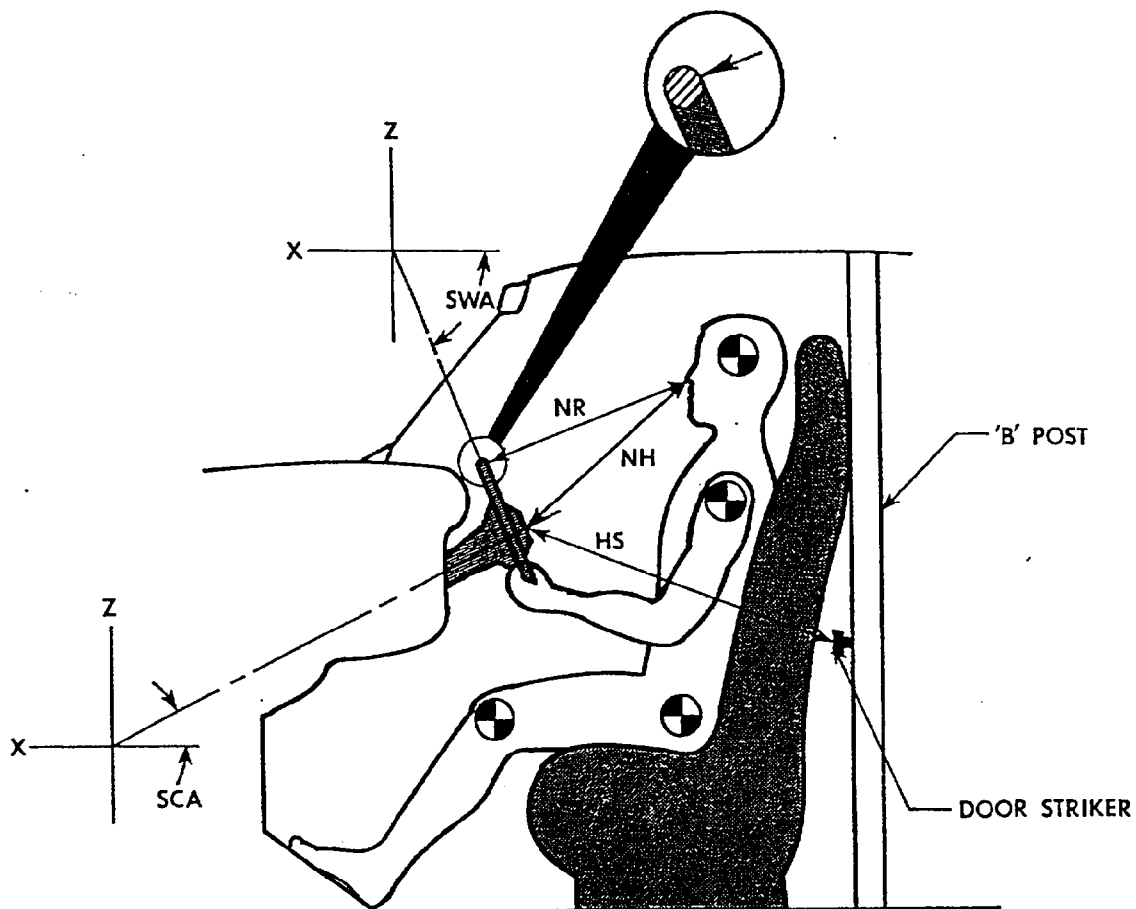


HH = Head to Windshield Header	HR = Head to Side Roof
HW = Head to Windshield	HS = Head to Side Window
CD = Chest to Dash	AD = Arm to Door
CS = Chest to Steering Wheel	HD = Hip to Door
KD = Knee to Dash	KK = Knee to Knee
TA = Torso Angle	AA = Ankle to Ankle
SA = Seat Back Angle	HA = Head to A-Pillar

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



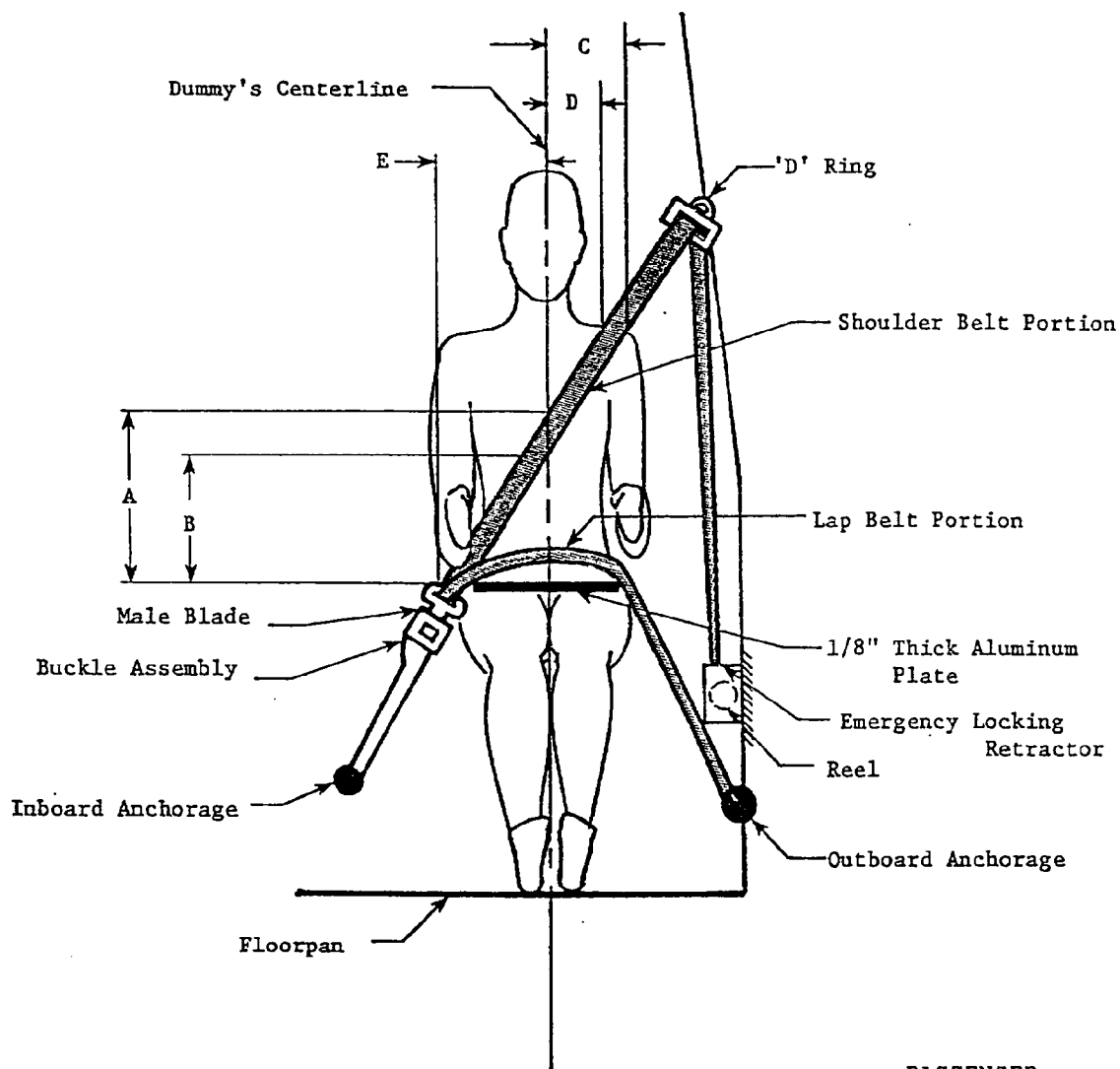
NOTE: Record position of tilt strg. column in REMARKS section

REMARKS: The steering column was latched in the mid position of five (5) latch positions.

MEASUREMENTS

NR	- Distance from tip of dummy's nose to top rear surface of steering wheel rim. (in.)	14.0
NH	- Distance from tip of dummy's nose to center of steering column hub. (in.)	14.3
HS	- Distance from center of steering column hub to the forward surface of the door lock striker pin. (in.)	24.6
SCA	- Angle of steering column relative to the horizontal X axis	25°
SWA	- Angle of steering wheel relative to the horizontal X axis	65°

FIGURE 9 SEAT BELT POSITIONING DATA



	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	15.3
B - Top surface of alum. plate to belt lower edge (in)	12.0
C - Dummy centerline to outer edge of belt at chest flesh top (in)	5.9
D - Dummy centerline to inner edge of belt at chest flesh top (in)	3.3
E - Dummy centerline to intersection of upper torso belt and lap belt (in)	7.8

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN: 1B3XC4631LD716225 NHTSA NO: CL0308
MAKE: Dodge MODEL: Dynasty
VEHICLE BUILD DATE: 8/89 VEHICLE TYPE: 4-door sedan
FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:
(check one): Automatic belts
 X 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 POSITION BELTS HAVE TENSION - RELIEVING DEVICES?
 No

BELT CONTACT FORCE:

FOR BELTS WITHOUT TENSION-RELIEVING DEVICES: BELT CONTACT FORCE:
 0.1 POUNDS

LATCHPLATE ACCESS:

ARE SEATBELT LATCHPLATES WITHIN REACH ENVELOPE: Yes
DOES CLEARANCE TEST BLOCK MOVE UNHINDERED TO LATCHPLATE OR BUCKLE?
 Yes

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA CONT'D

VEHICLE VIN: 1B3XC4631LD716225 NHTSA NO: CLO308
MAKE: Dodge MODEL: Dynasty
VEHICLE BUILD DATE: 8/89 VEHICLE TYPE: 4-door sedan
FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:
(check one): Automatic belts
 X Type 2 lap/shoulder belts
 Other

RETRACTION:

SEATBELT AUTOMATICALLY RETRACTS WHEN

(check one)" _____ Adjacent vehicle door is open and seatbelt
latchplate is released
 X Seatbelt latchplate is released

ARE THE STOWED WEBBING AND HARDWARE PINCHED WHEN THE DOOR IS CLOSED?

No

OPEN-BODY VEHICLE: DOES BELT SYSTEM FULLY RETRACT WHEN THE TENSION-RELIEVING DEVICE IS MANUALLY DEACTIVATED? NA

ACCESSIBILITY:

IS SEAT CUSHION REMOVABLE SO THE SEATBACK SERVES A FUNCTION OTHER THAN SEATING? No

IS SEAT REMOVABLE? No

IS SEAT MOVABLE SO THE SPACE CAN BE USED FOR A SECONDARY FUNCTION?
No

IF WEBBING IS DESIGNED TO PASS THROUGH THE SEAT CUSHION OR BETWEEN THE CUSHION AND SEAT BACK ARE ONE OF THE FOLLOWING PARTS NORMALLY ON TOP OF OR ABOVE THE SEAT CUSHION: LATCHPLATE, BUCKLE, WEBBING? NA

ARE THE REMAINING TWO PARTS ACCESSIBLE UNDER NORMAL CONDITIONS?
NA

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA CONT'D

VEHICLE VIN: 1B3XC4631LD716225 NHTSA NO: CL0308
MAKE: Dodge MODEL: Dynasty
VEHICLE BUILD DATE: 8/89 VEHICLE TYPE: 4-door sedan
FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:
(check one): Automatic belts
 X Type 2 lap/shoulder belts
 Other

ACCESSIBILITY CONT'D:

DO THE LATCHPLATE AND BUCKLE PASS THROUGH THE GUIDES PROVIDED AND FALL
BEHIND THE SEAT WHEN THE BELT IS COMPLETELY RETRACTED (OR UNATTACHED IF
NONRETRACTABLE); THE SEAT IS MOVED TO ANY POSITION; AND THE SEAT BACK,
IF FOLDABLE, IS FOLDED FORWARD AS FAR AS POSSIBLE AND THEN MOVED
BACKWARD INTO POSITION? No

IS THE INBOARD RECEPTACLE END ACCESSIBLE WITH THE CENTER ARM REST IN ANY
POSITION TO WHICH IT CAN BE ADJUSTED WITHOUT MOVING THE ARMREST FOR
ACCESS? Yes

LATCH MECHANISM:

ARE LATCH MECHANISM COMPONENTS ACCESSIBLE TO A SEATED OCCUPANT IN THE
STOWED AND OPERATIONAL POSITIONS? Yes

DOES LATCH MECHANISM RELEASE BOTH TORSO AND LAP BELTS SIMULTANEOUSLY?
 Yes

DOES LATCH MECHANISM RELEASE AT A SINGLE POINT BY A PUSH BUTTON ACTION?
 Yes

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

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

Duration of audible warning signal = 6 sec.

Duration of reminder light operation = 6 sec.

WITH OCCUPANT IN DRIVER'S POSITION AND UNIBELT 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: The label is located on the inner surface of the glove box door.

THE MANUFACTURER'S RECOMMENDED SCHEDULE IS TO: (check one)

inspect X, replace _____, or repair _____ this system: (check one)

a. by _____ month, _____ year

b. by 30,000 miles

c. or after a time interval of _____ months or 3 years.

WERE APPROPRIATE INSTRUCTIONS CONCERNING MAINTENANCE AND/OR REPLACEMENT OF THIS SYSTEM PROVIDED? Yes

WAS A DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SYSTEM PROVIDED?

Yes, owner's manual pages 10 & 11

IS THERE A REFERENCE TO THE INSTRUCTIONS AND DESCRIPTION OF THE SYSTEM ON THE LABEL? Yes

WAS AN OWNER'S MANUAL PROVIDED? Yes

DID THE OWNER'S MANUAL CONTAIN APPROPRIATE INFORMATION CONCERNING MAINTENANCE AND/OR REPLACEMENT AND A DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SYSTEMS? Yes, page 11

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.

Is the system totally mechanical? No

IF NO:

Describe the location of the readiness indicator: The readiness indicator is a light stating "Airbag" on the instrument panel below the lower right corner of the speedometer.

Is the readiness indicator clearly visible to the driver? Yes

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided? Yes,
owner's manual page 10

TABLE 11 SUMMARY OF FMVSS 301 DATA

PRE-IMPACT DATA

MAKE/MODEL: Dodge/Dynasty

BODY STYLE: 4-door sedan

MODEL YEAR: 1990

NHTSA NO.: CLO308

COLOR: Blue

DATA FROM CERTIFICATION LABEL

VEHICLE MANUFACTURER: Chrysler Motors Corporation

DATE OF MANUFACTURE: 8/89

VIN: 1B3XC4631LD716225

GVWR: 4383 LBS., GAWR: FRONT 2370 LBS., REAR 2063 LBS.

POST-IMPACT DATA

TYPE OF TEST: Frontal Barrier Impact

DATE OF TEST: 03/08/90

TIME: 1253

TEMP: 72° F

REQUIRED IMPACT VELOCITY RANGE: 28.9 MPH TO 29.9 MPH

IMPACT VELOCITY: PRIMARY = 29.6 MPH, SECONDARY = 29.6 MPH

TEST WEIGHT = 3638 LBS., STATIC CRUSH MAX. = 20.8 IN., REBOUND = 12.3 IN.

FUEL SYSTEM DATA

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

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 15.7 GALLONS (FURNISHED BY COTR)

TEST VOLUME: 14.6 GALLONS (92-94% OF USEABLE)

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 16.0 GALLONS

DETAILS OF FUEL SYSTEM: The fuel tank is located in front of the rear
axle. The fuel filler neck is located on the right side and enters the
right rear corner of the tank. The fuel lines run along the right frame
rail to the front.

ELECTRIC FUEL PUMP: Yes

FUEL INJECTOR: 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.:

Adhesive around inner perimeter, plastic trim around outer perimeter.

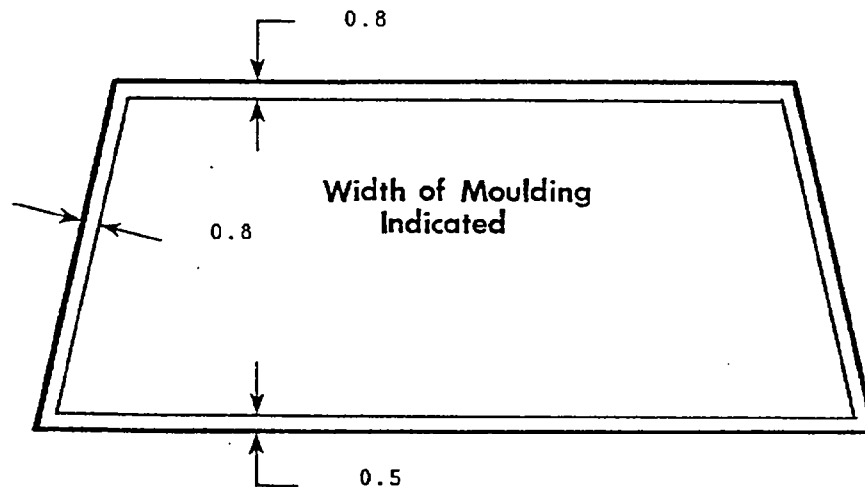
FMVSS 212 REQUIREMENTS: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

WINDSHIELD PERIPHERY

	PRE-TEST (in)	POST-TEST (in)	PERCENT RETENTION
RIGHT SIDE	80.5	80.5	100%
LEFT SIDE	80.5	80.5	100%
TOTAL	161.0	161.0	100%

AREA OF RETENTION FAILURE:



WINDSHIELD TEMPERATURE: 70° F

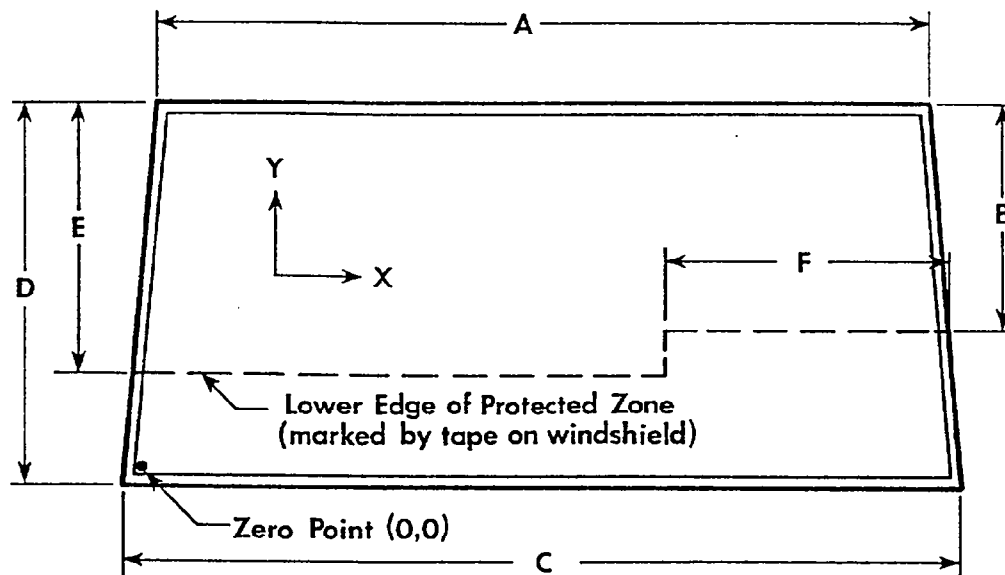
FAILURE DETAILS: None

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 = 62.0	C = 29.5	E = 17.0
B = 13.2	D = 27.0	F = 31.5

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

COORDINATES
X Y

None

1.

2.

3.

ALL MEASUREMENTS ARE IN INCHES.

4.

TABLE 12 "FUEL SYSTEM INTEGRITY" POST-IMPACT

TEST DATA, FMVSS NO. 301

TEST VEHICLE NHTSA NO.: CL0308; TEST DATE: 03/08/90

VEH. MFR./MAKE/MODEL: Chrysler Motors Corp./Dodge/Dynasty

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.

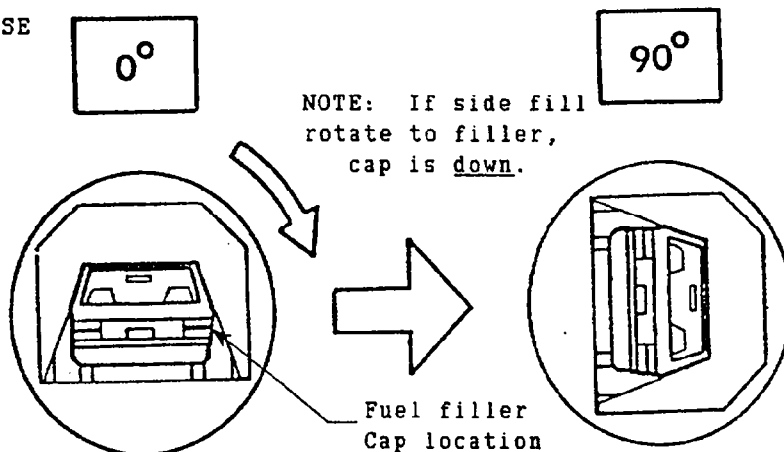
SOLVENT SPILLAGE DETAILS:

None

FIGURE 12 FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

NHTSA NO.: CL0308

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>

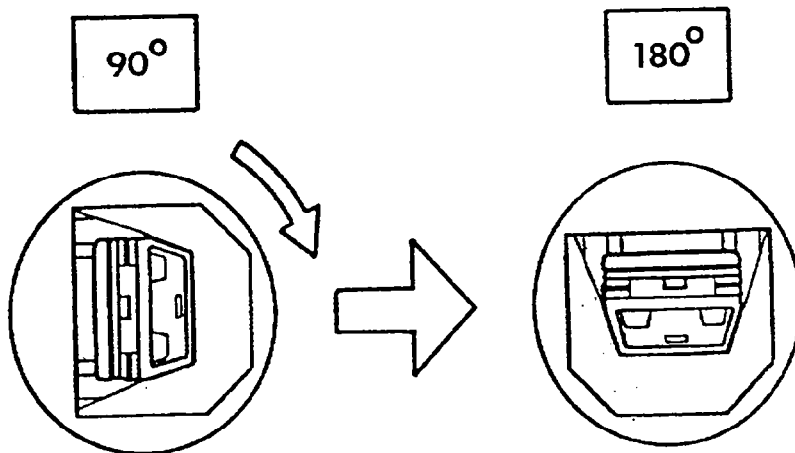
SOLVENT SPILLAGE LOCATION(S)

None

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

NHTSA NO.: CL0308

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>

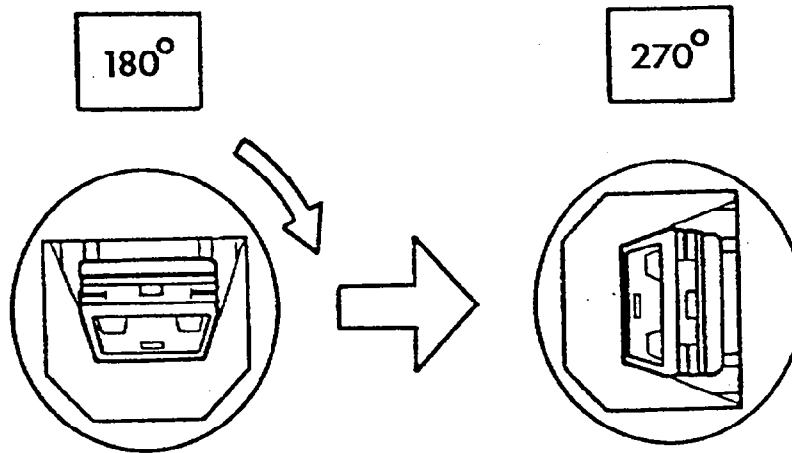
SOLVENT SPILLAGE LOCATION(S)

None

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

NHTSA NO.: CLO308

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>

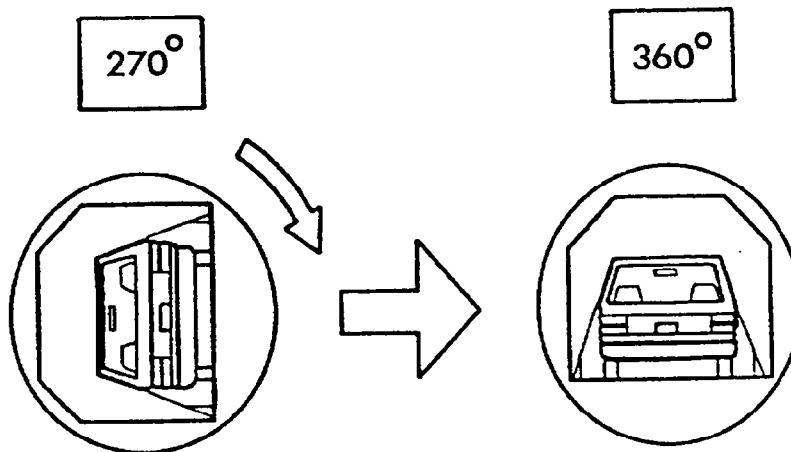
SOLVENT SPILLAGE LOCATION(S)

None

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

NHTSA NO.: CL0308

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

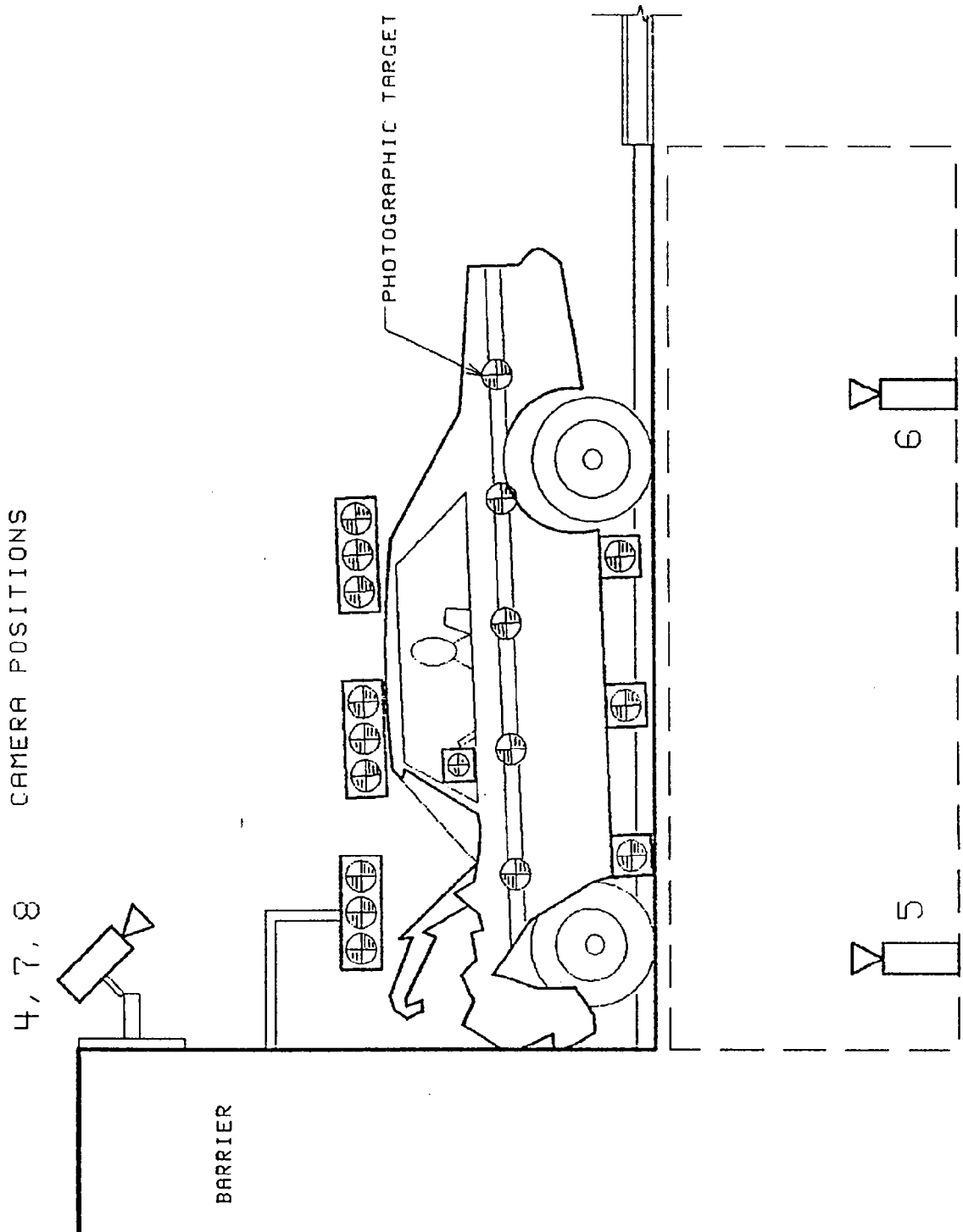


FIGURE 13
CAMERA POSITIONS, CONTINUED

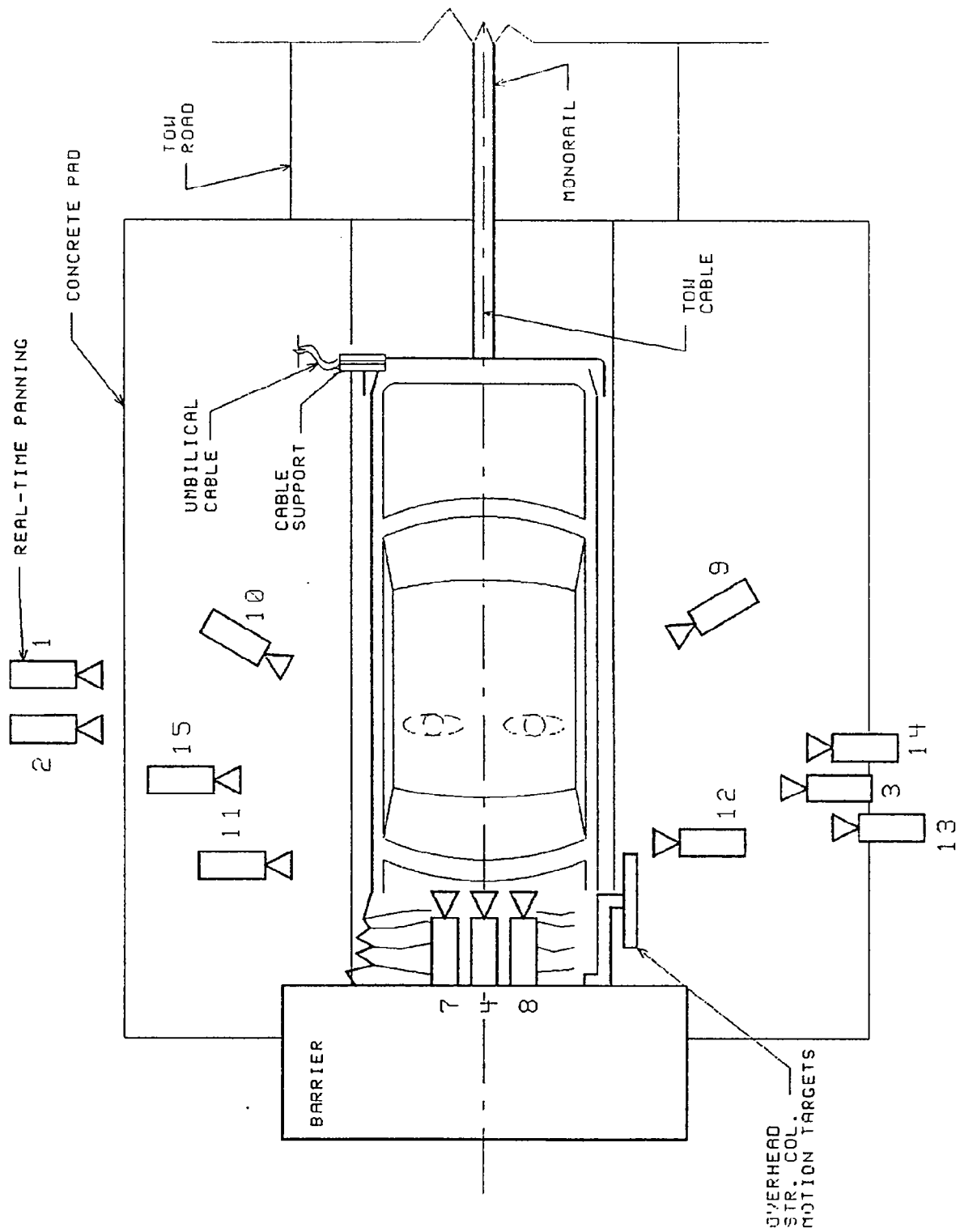


TABLE 13 HIGH SPEED CAMERA LOCATIONS

TEST NO.: 900308		VEHICLE: 1990 Dodge Dynasty 4-door sedan						
CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	FILM PLANE		SPEED (FPS)
		X	Y	Z		TO HEAD TARGET	LENS (MM)	
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	500
3	Dummy kinematics	-41.5	295.0	44.0	-4	227.0	25	498
4	Windshield damage	-6.0	0.0	96.0	-40	NA	13	500
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	995
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	500
8	Driver kinematics	-6.8	14.5	93.0	-50	NA	17	502
9	Driver kinematics	-157.3	116.0	87.0	-27	88.0	25	498
10	Passenger kinematics	-152.1	-116.0	87.0	-26	91.0	25	505
11	Windshield intrusion	-38.1	-306.1	44.0	0	NA	50	498
12	Windshield intrusion	-53.0	309.4	42.3	0	NA	50	500
13	Column movement	-129.0	256.0	103.0	-14	NA	25	505
14	Column movement	-129.0	256.0	75.1	-9	NA	25	500
15	Passenger kinematics	-38.8	-293.0	45.3	-4	236.0	25	507

* +X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

** +Angle = Film plane angled upward from horizontal plane

APPENDIX A

PHOTOGRAPHS



Figure A-1. PRE-TEST FRONT VIEW

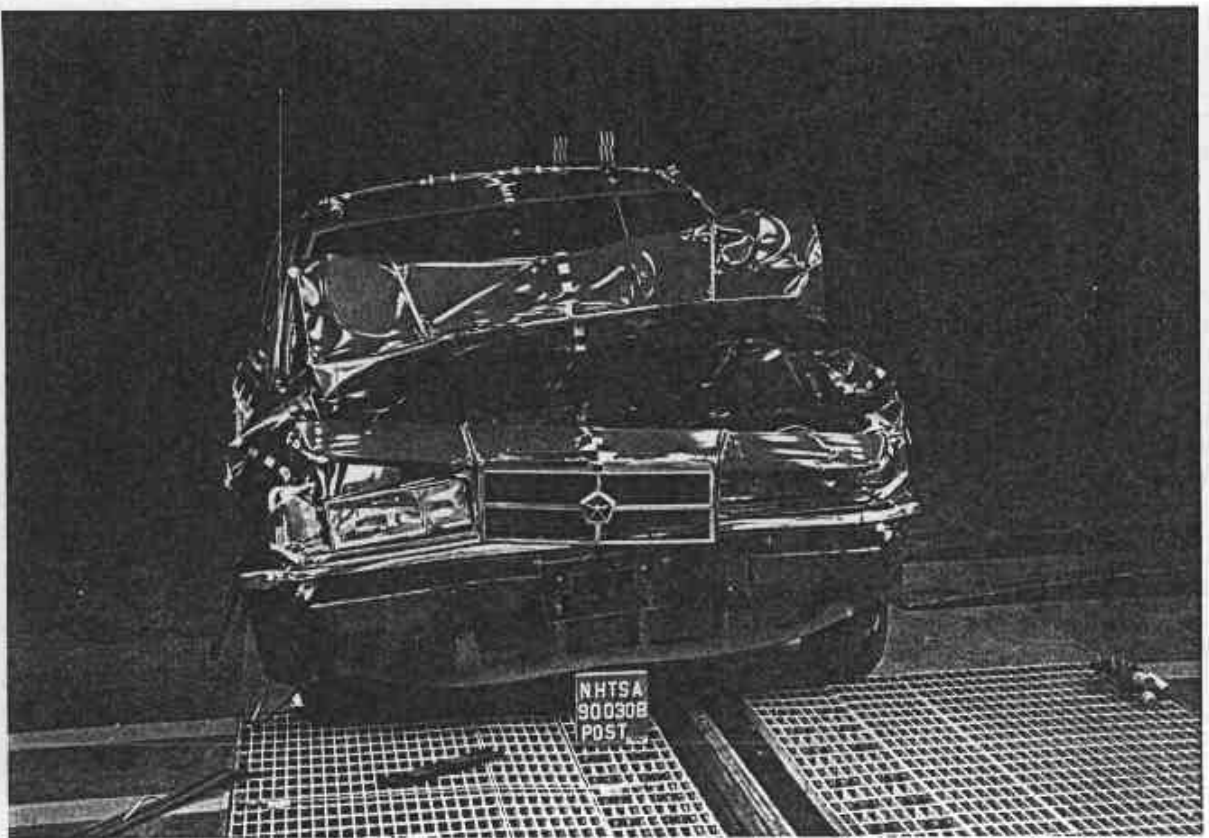


Figure A-2. POST-TEST FRONT VIEW

A-2

900308

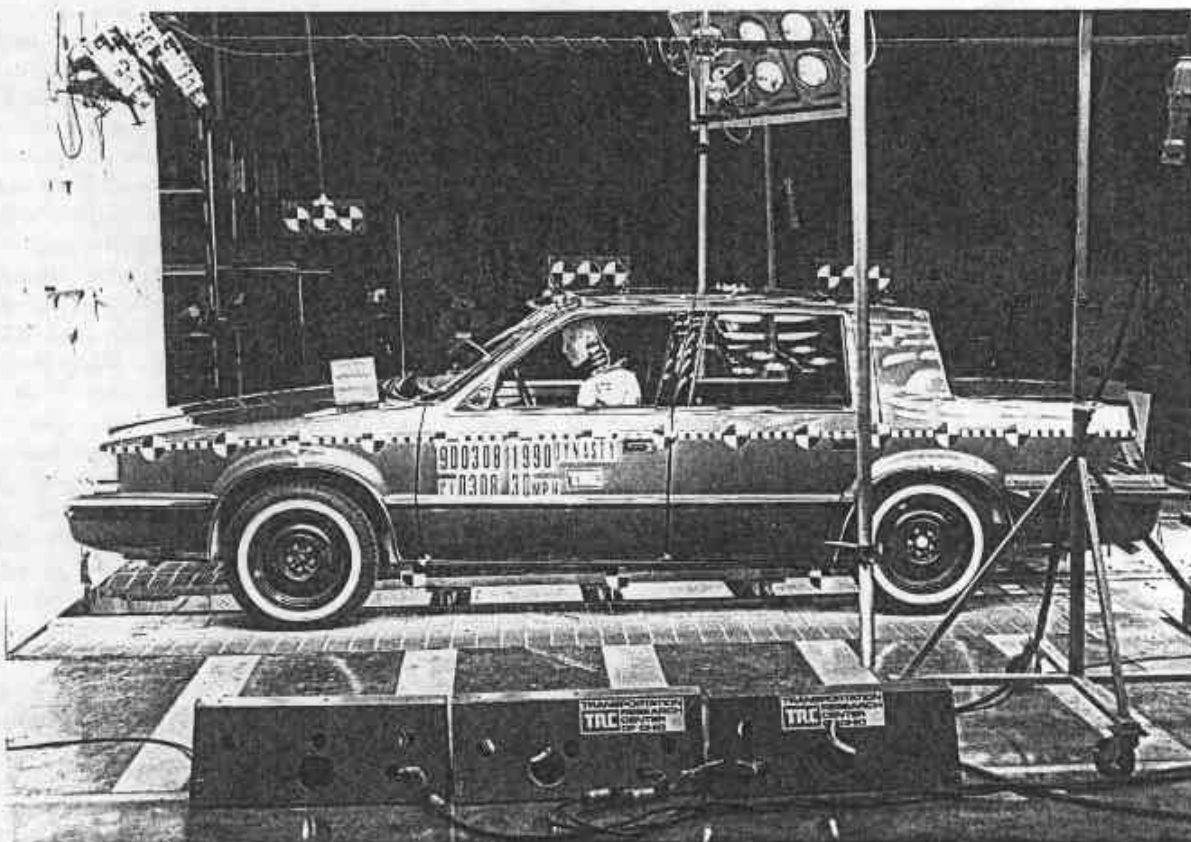


Figure A-3. PRE-TEST LEFT SIDE VIEW

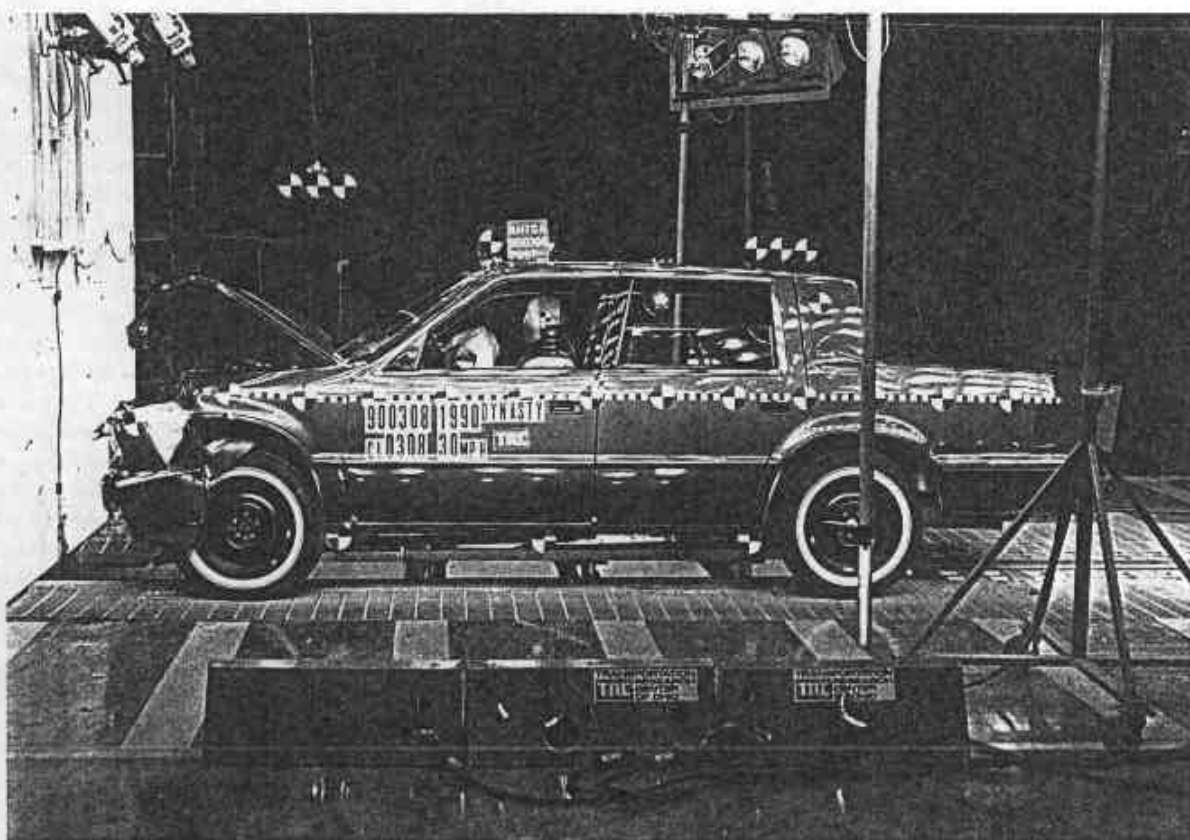


Figure A-4. POST-TEST LEFT SIDE VIEW

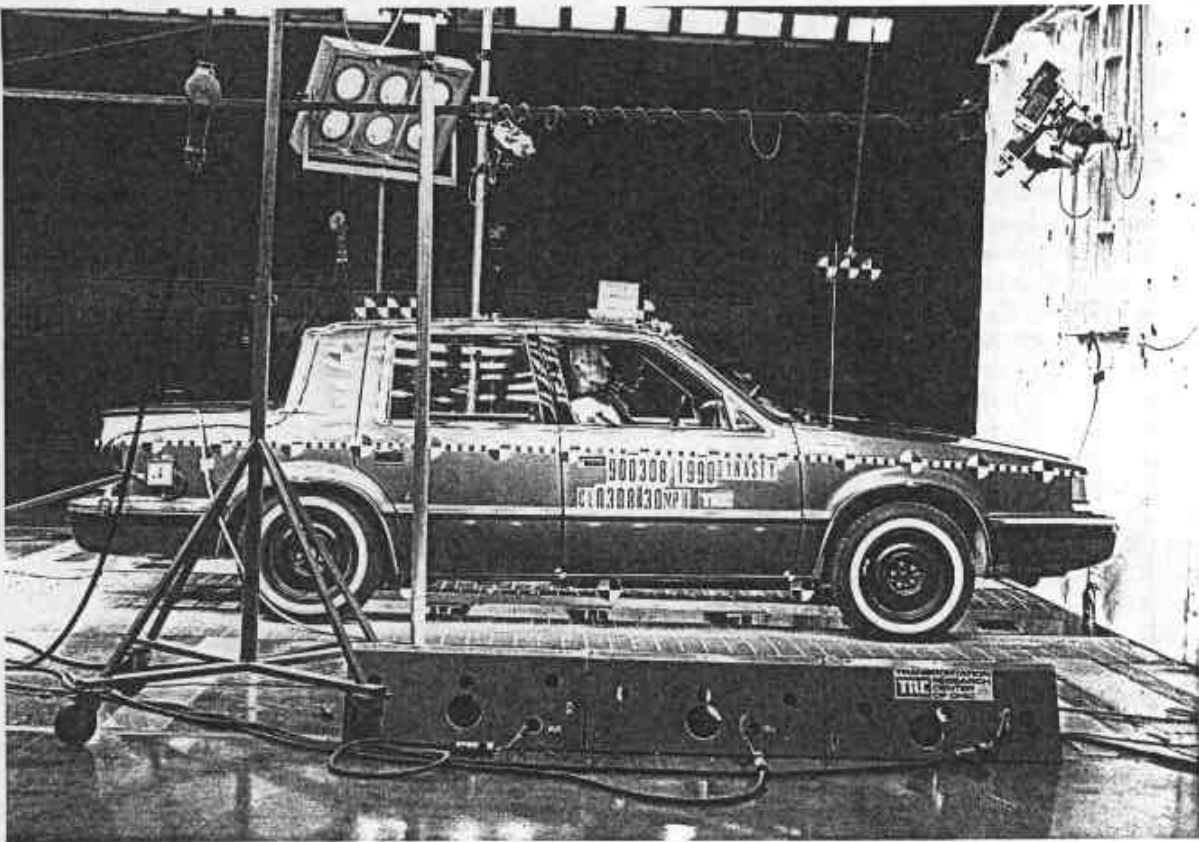


Figure A-5. PRE-TEST RIGHT SIDE VIEW

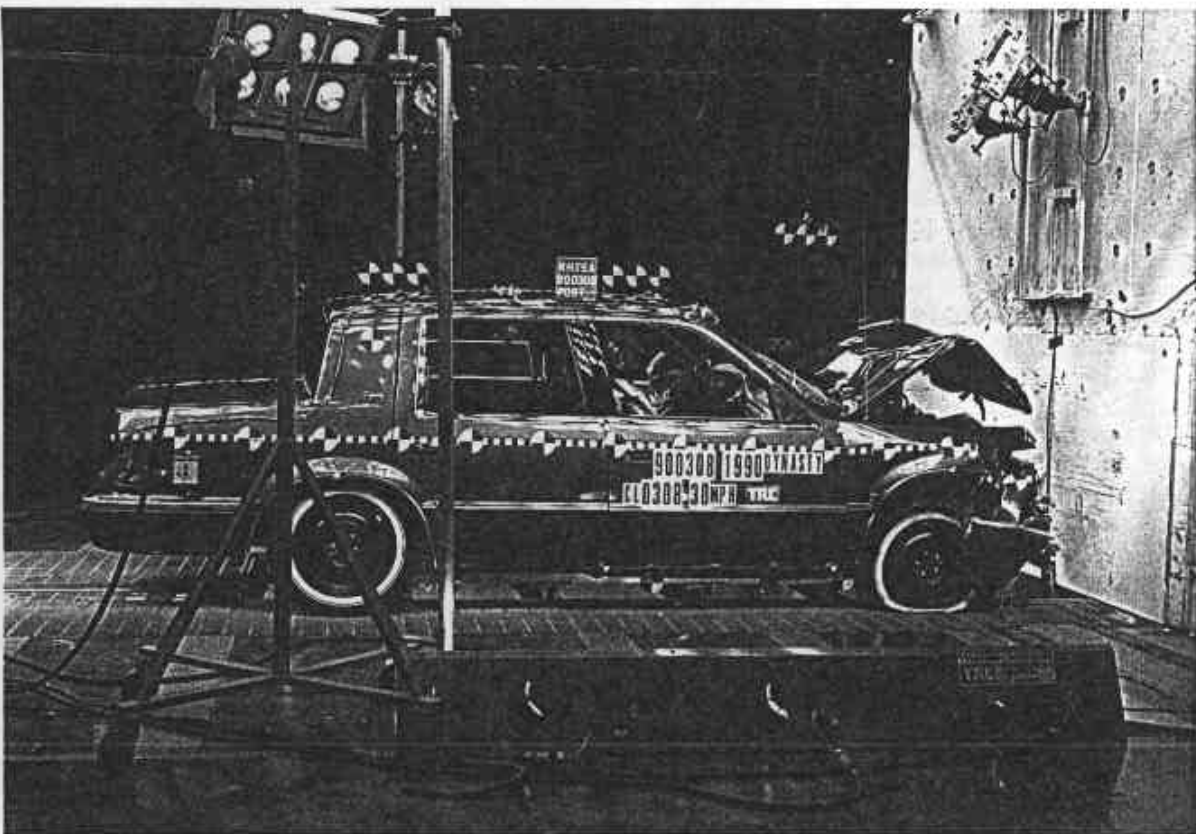


Figure A-6. POST-TEST RIGHT SIDE VIEW

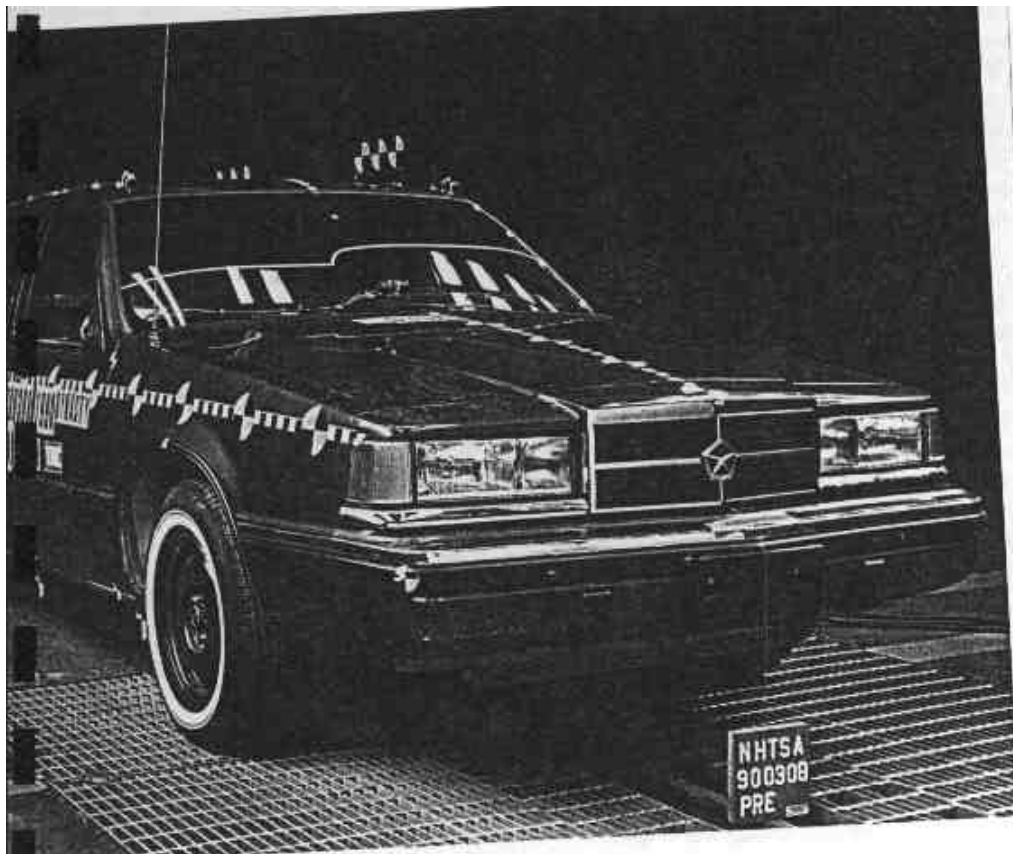


Figure A-7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

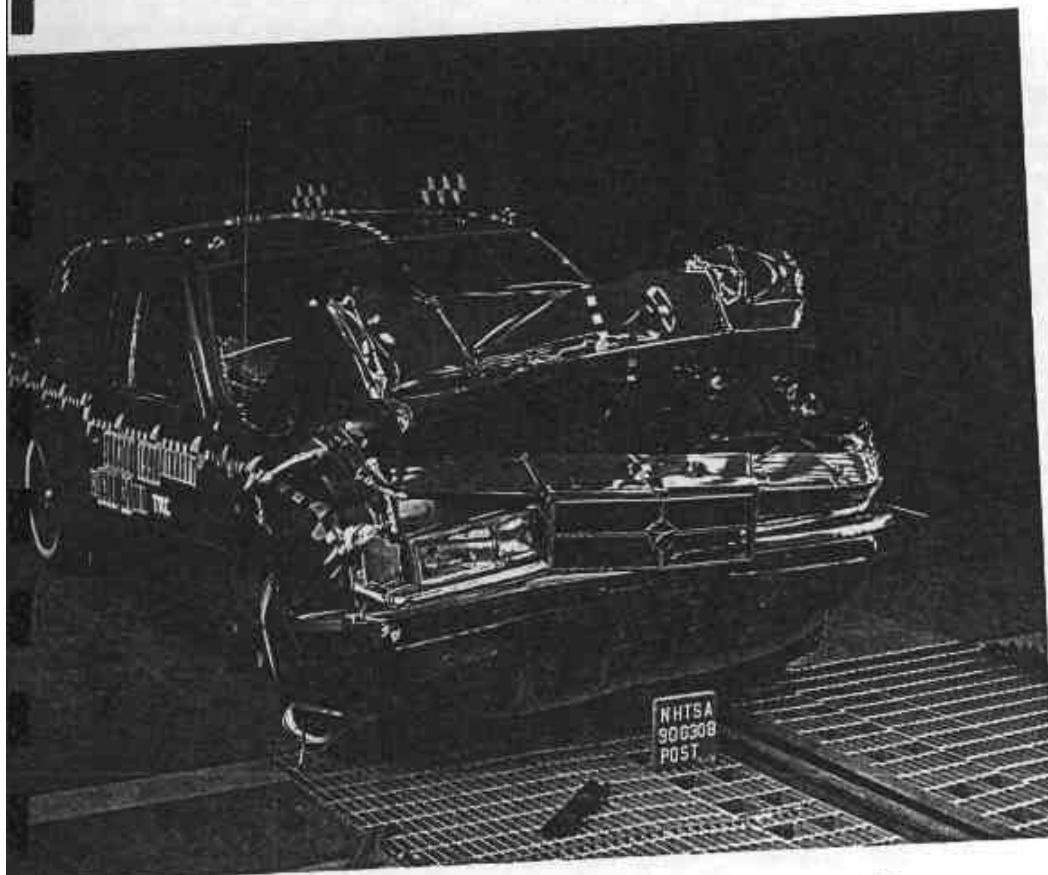


Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
A-5 900308



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

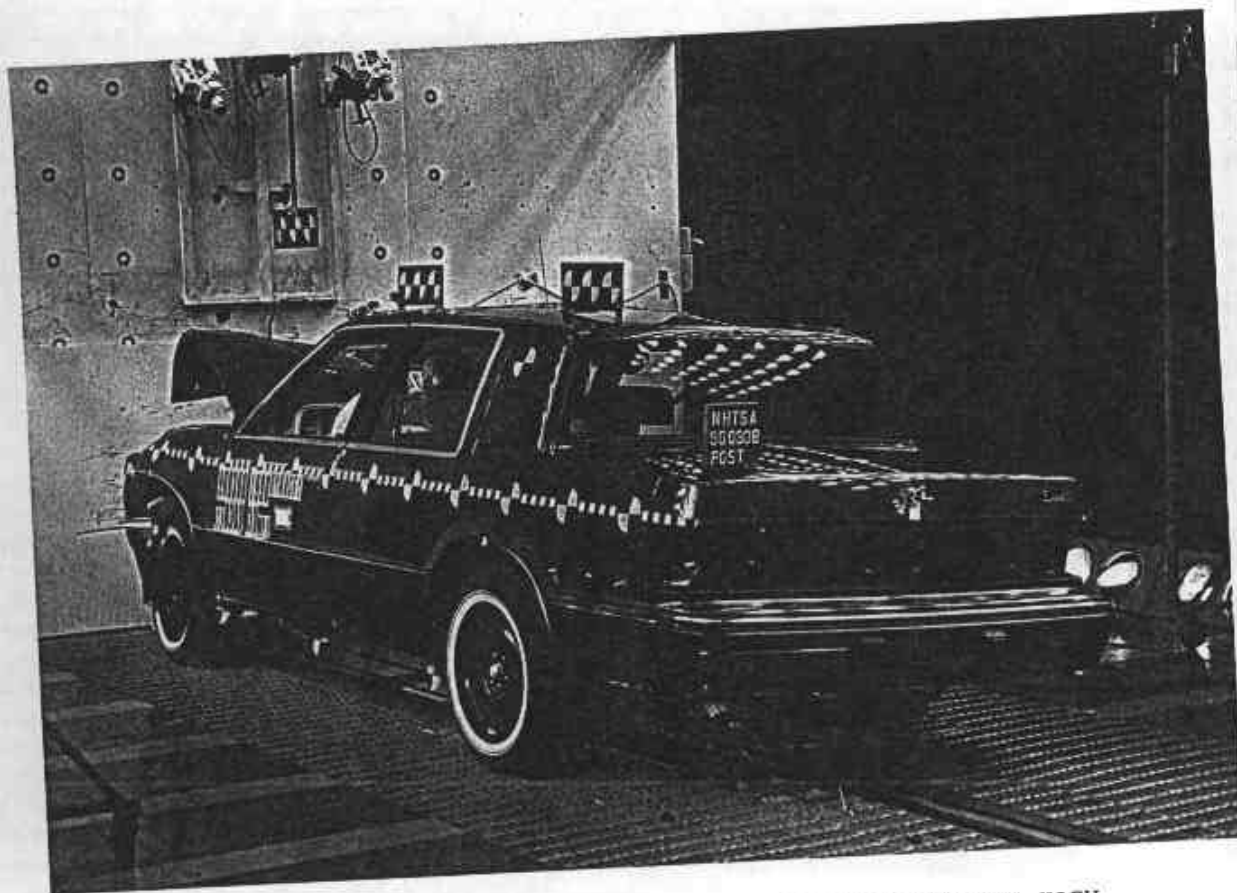


Figure A-10. POST-TEST LEFT REAR THREE-QUARTER VIEW
A-6 900308



Figure A-11. PRE-TEST REAR VIEW

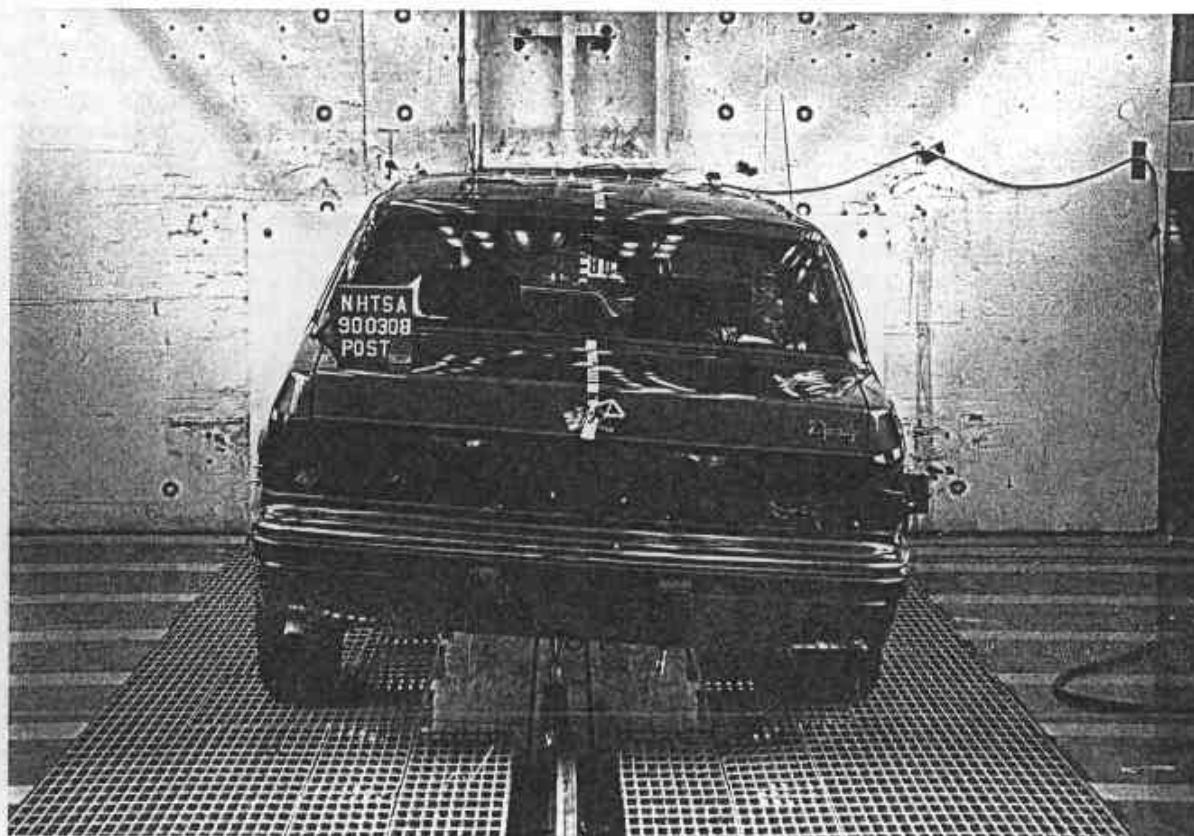


Figure A-12. POST-TEST REAR VIEW
A-7

900308

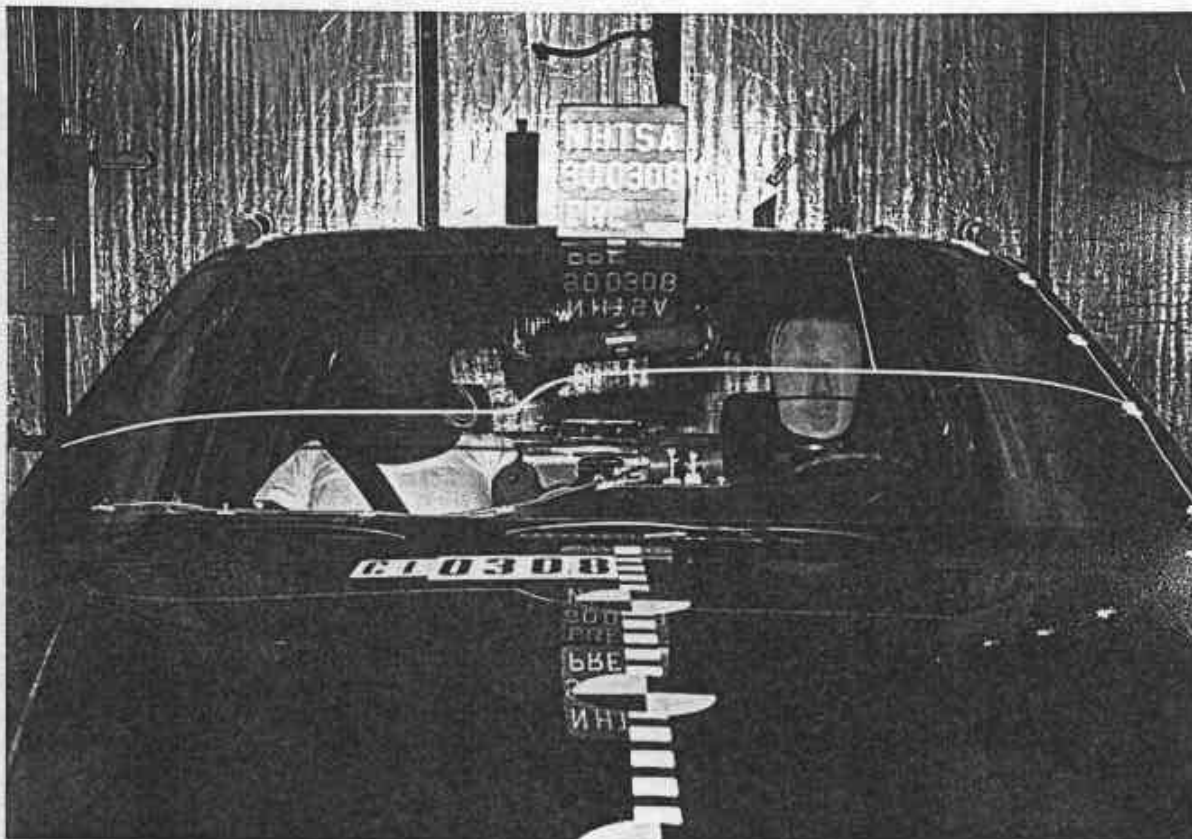


Figure A-13. PRE-TEST WINDSHIELD VIEW

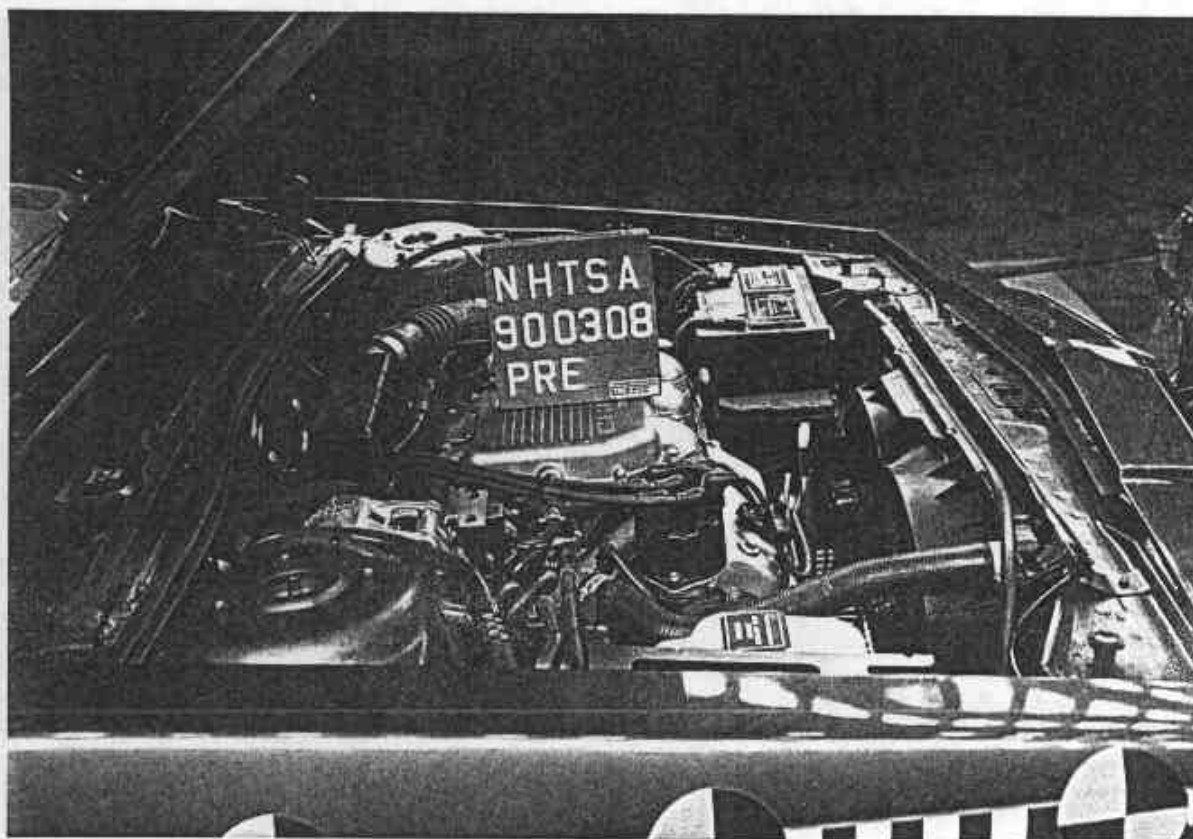


Figure A-14. PRE-TEST ENGINE COMPARTMENT VIEW

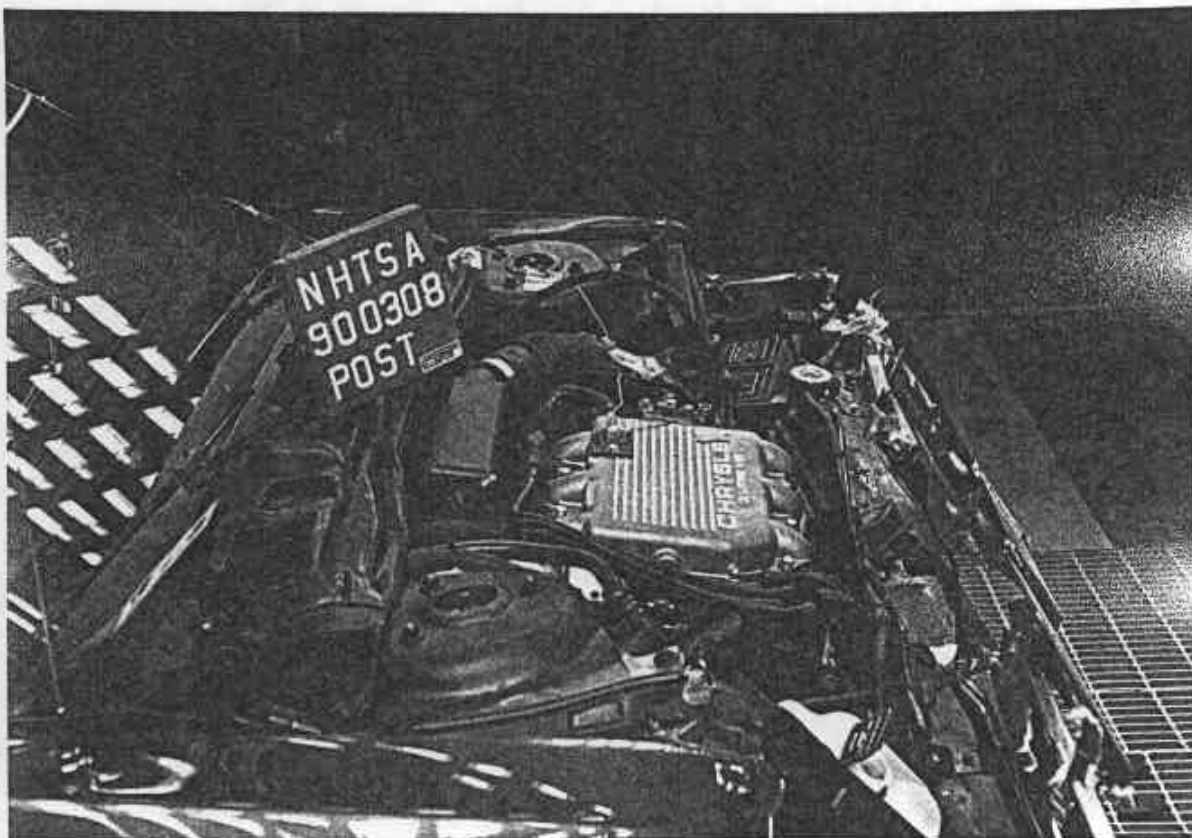


Figure A-15. POST-TEST ENGINE COMPARTMENT VIEW

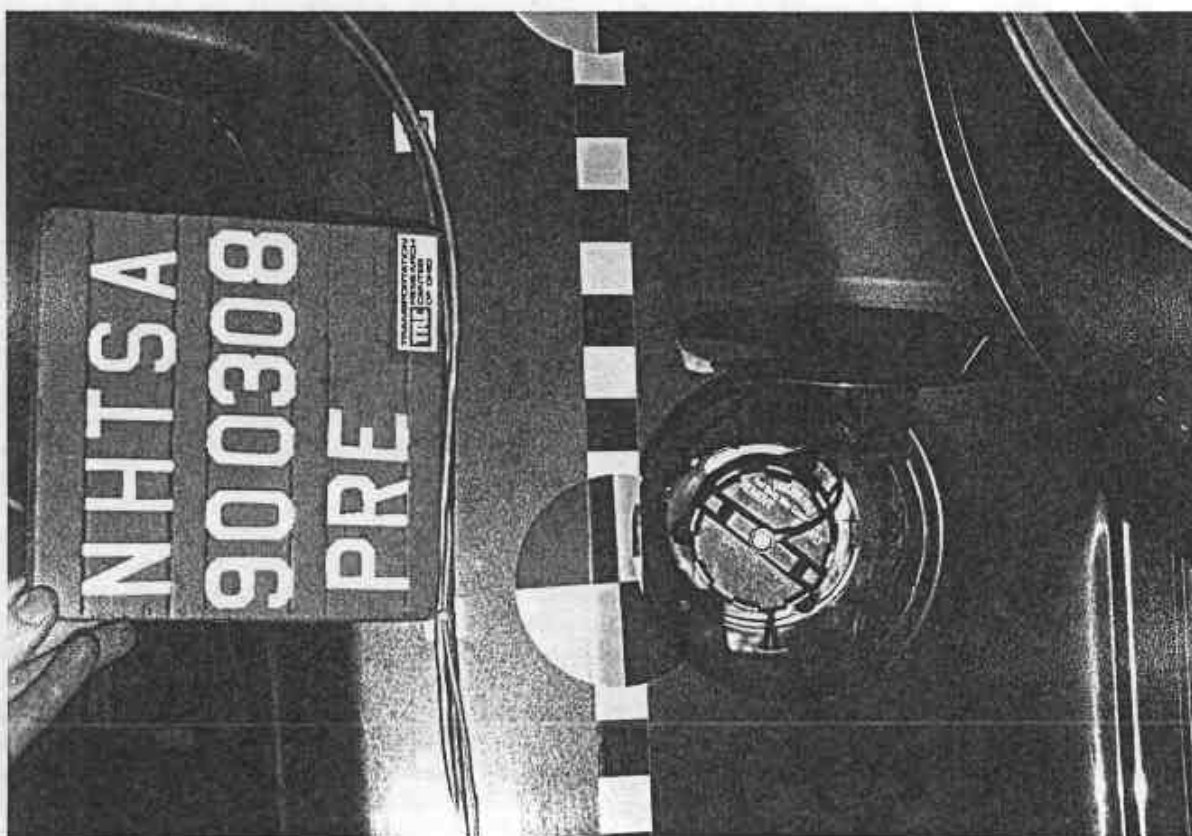


Figure A-16. PRE-TEST FUEL FILLER CAP VIEW

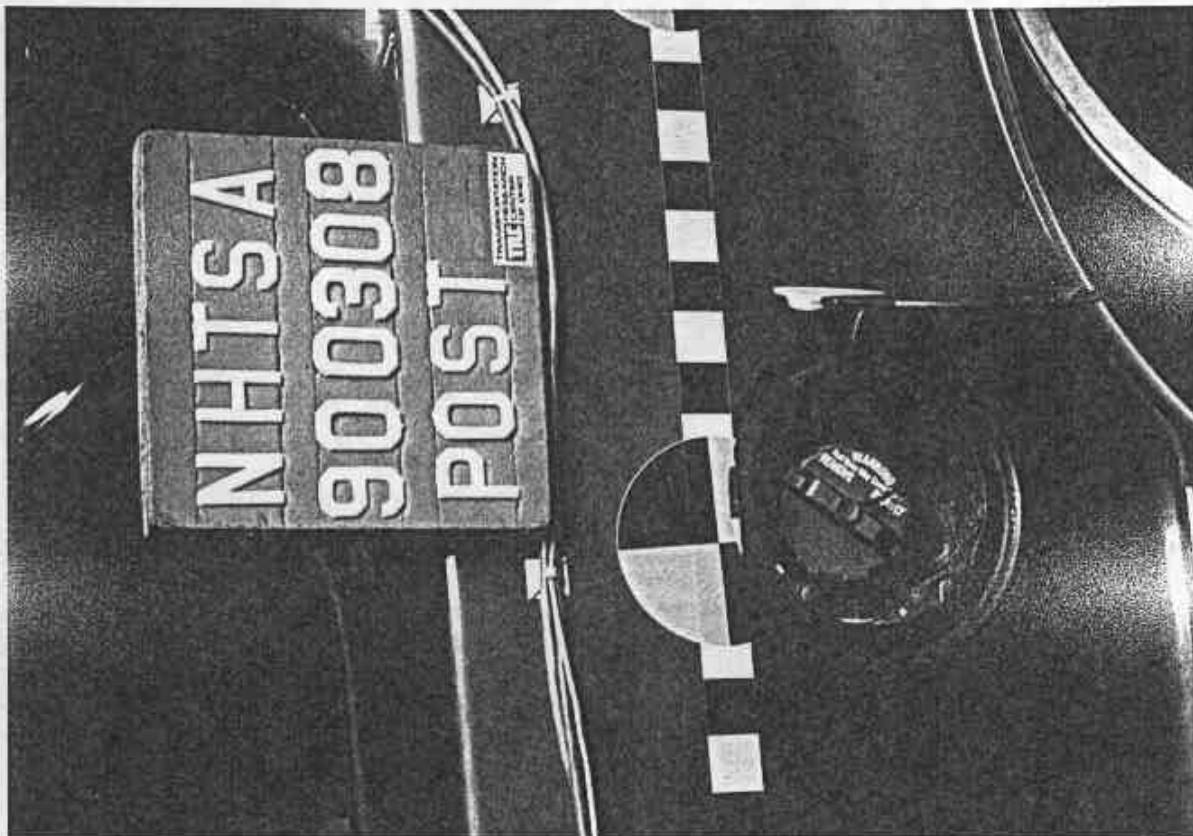


Figure A-17. POST-TEST FUEL FILLER CAP VIEW

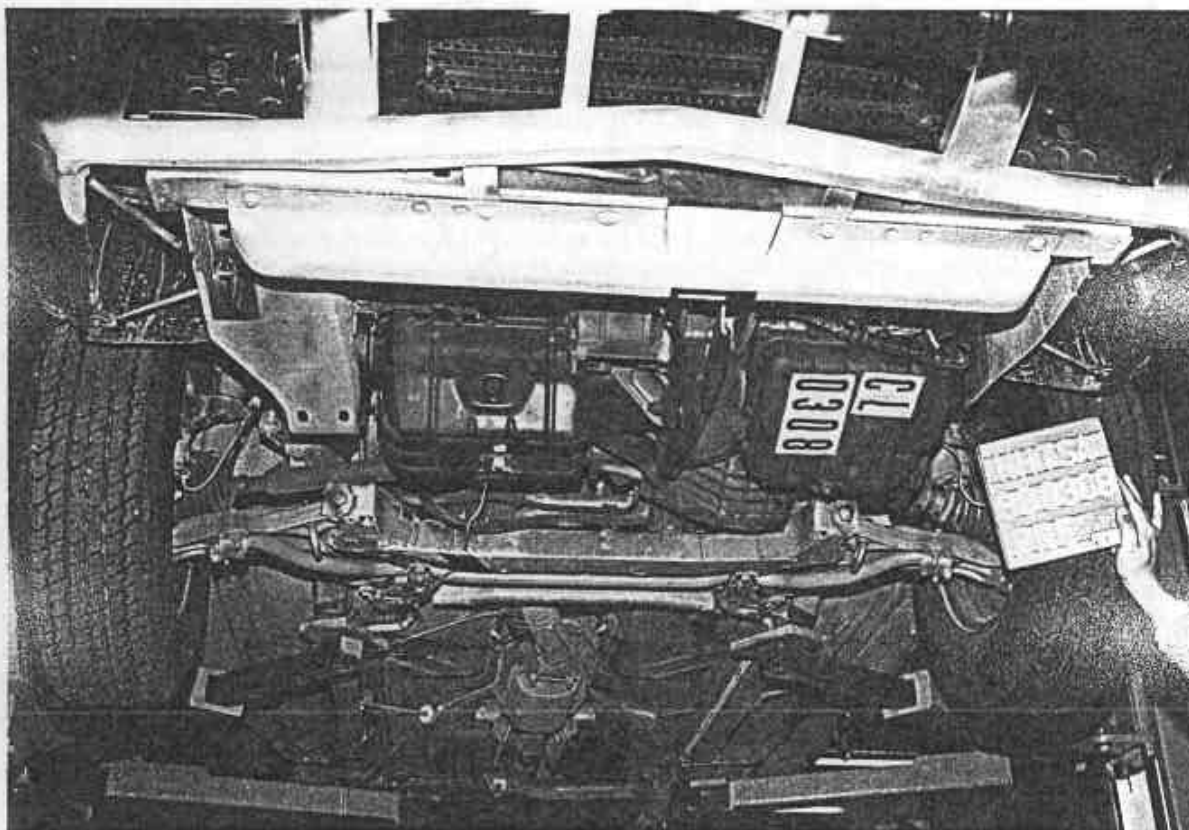


Figure A-16. PRE-TEST FRONT UNDERBODY VIEW

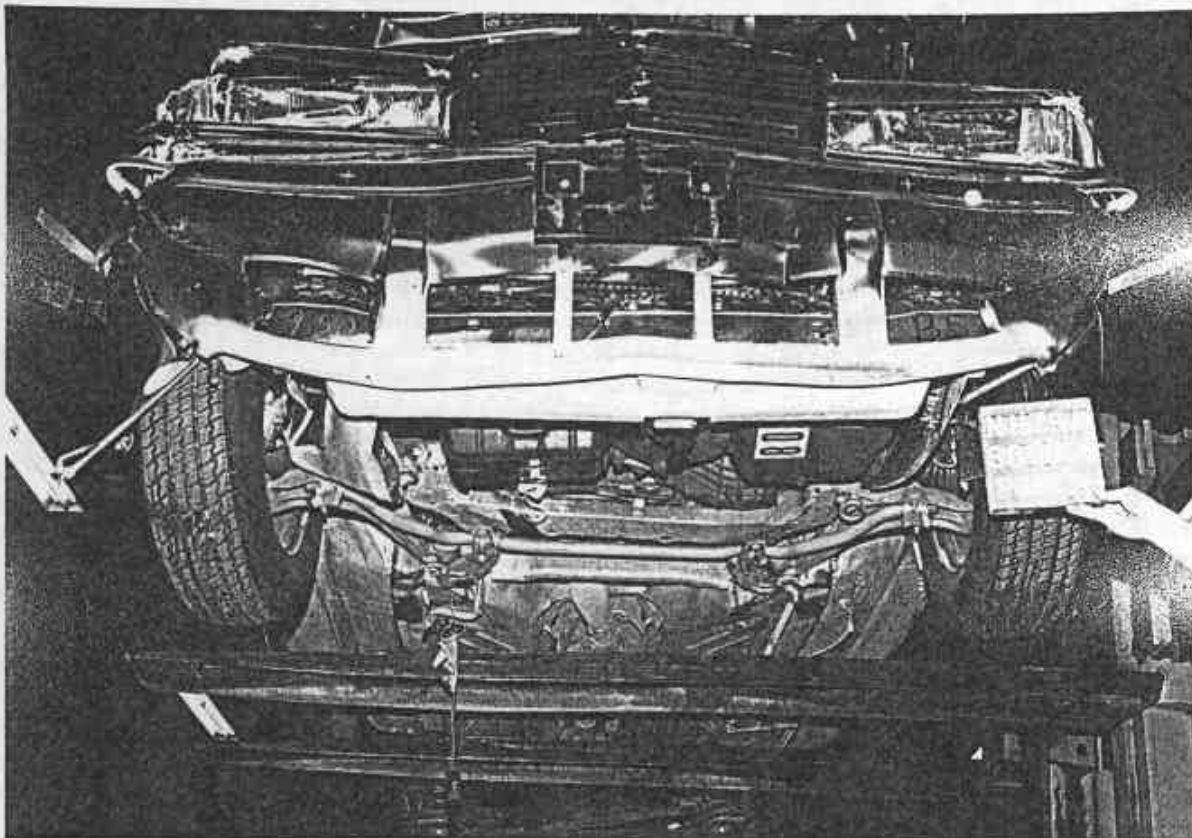


Figure A-19. POST-TEST FRONT UNDERBODY VIEW

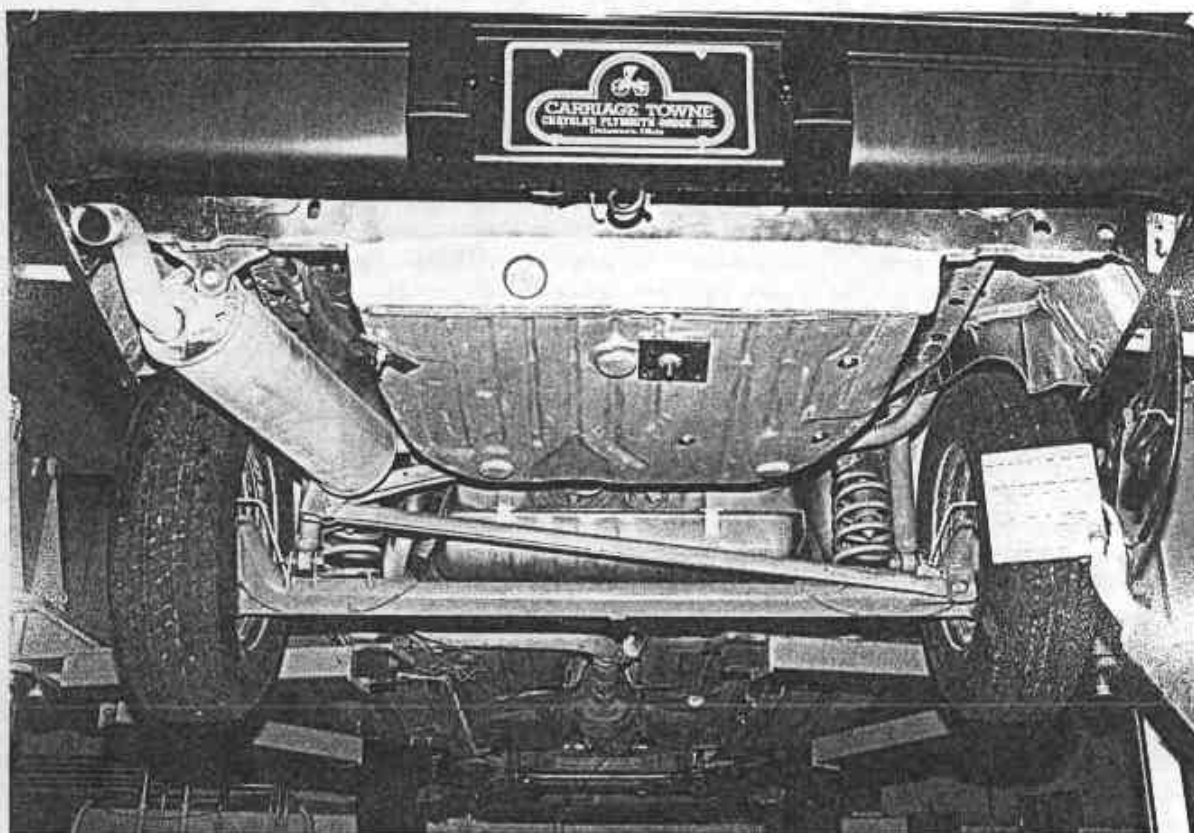


Figure A-20. PRE-TEST REAR UNDERBODY VIEW

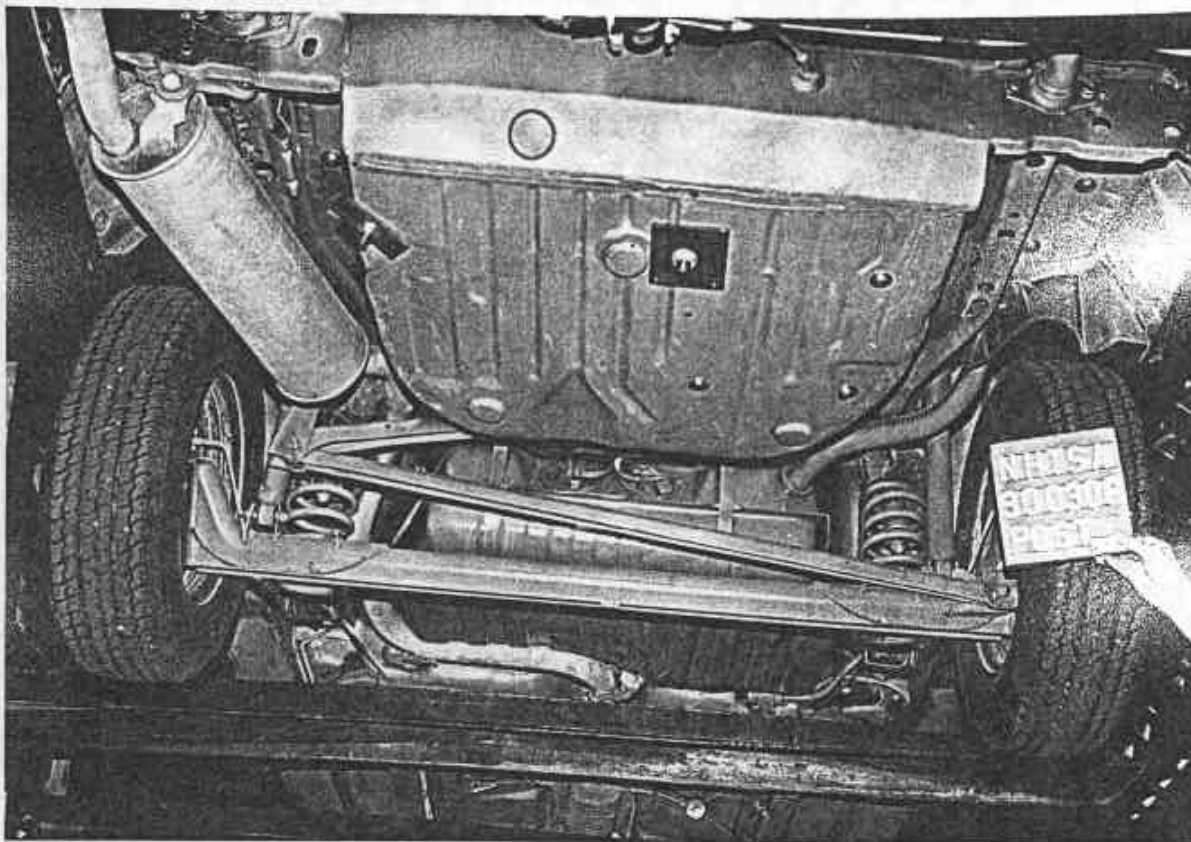


Figure A-21. POST-TEST REAR UNDERBODY VIEW



Figure A-22. PRE-TEST FUEL FILLER NECK VIEW



Figure A-23. PRE-TEST BALLAST LOCATION VIEW

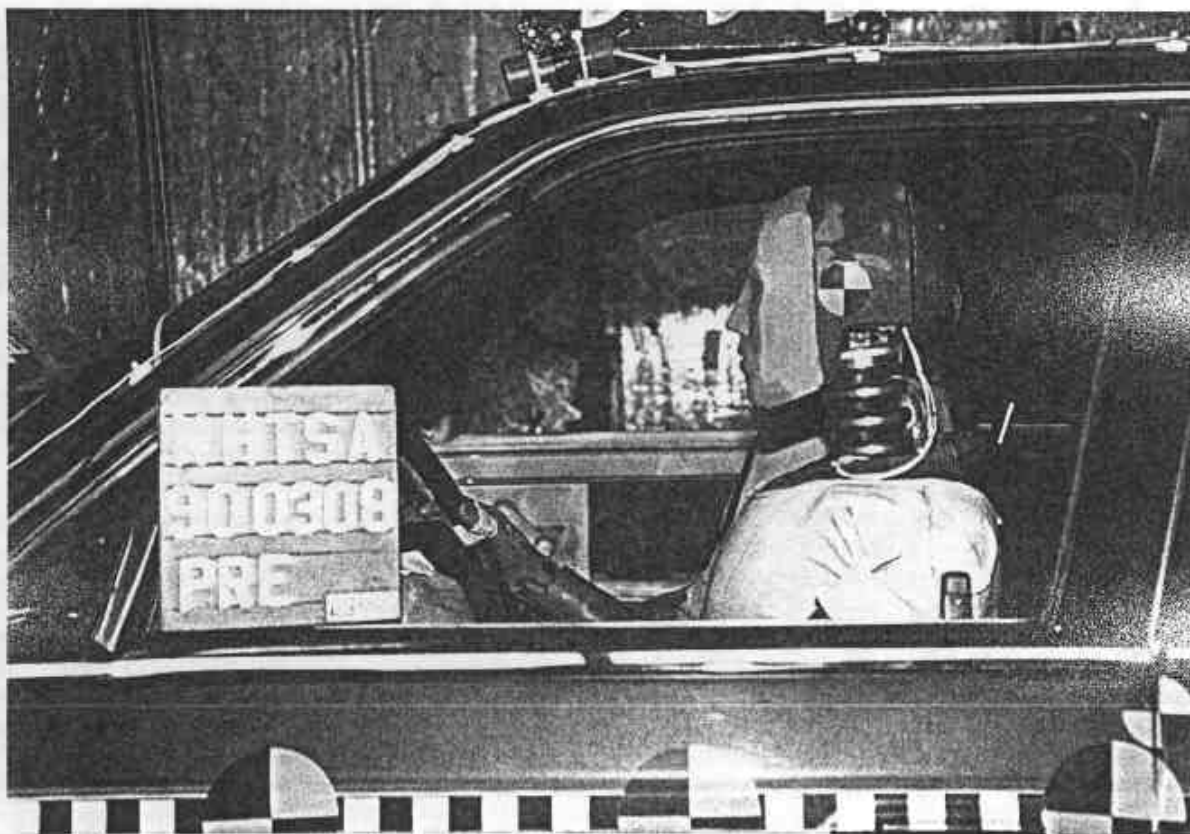


Figure A-24. PRE-TEST DRIVER DUMMY POSITION VIEW



Figure A-25. POST-TEST DRIVER DUMMY POSITION VIEW



Figure A-26. PRE-TEST PASSENGER DUMMY POSITION VIEW



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



Figure A-28. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

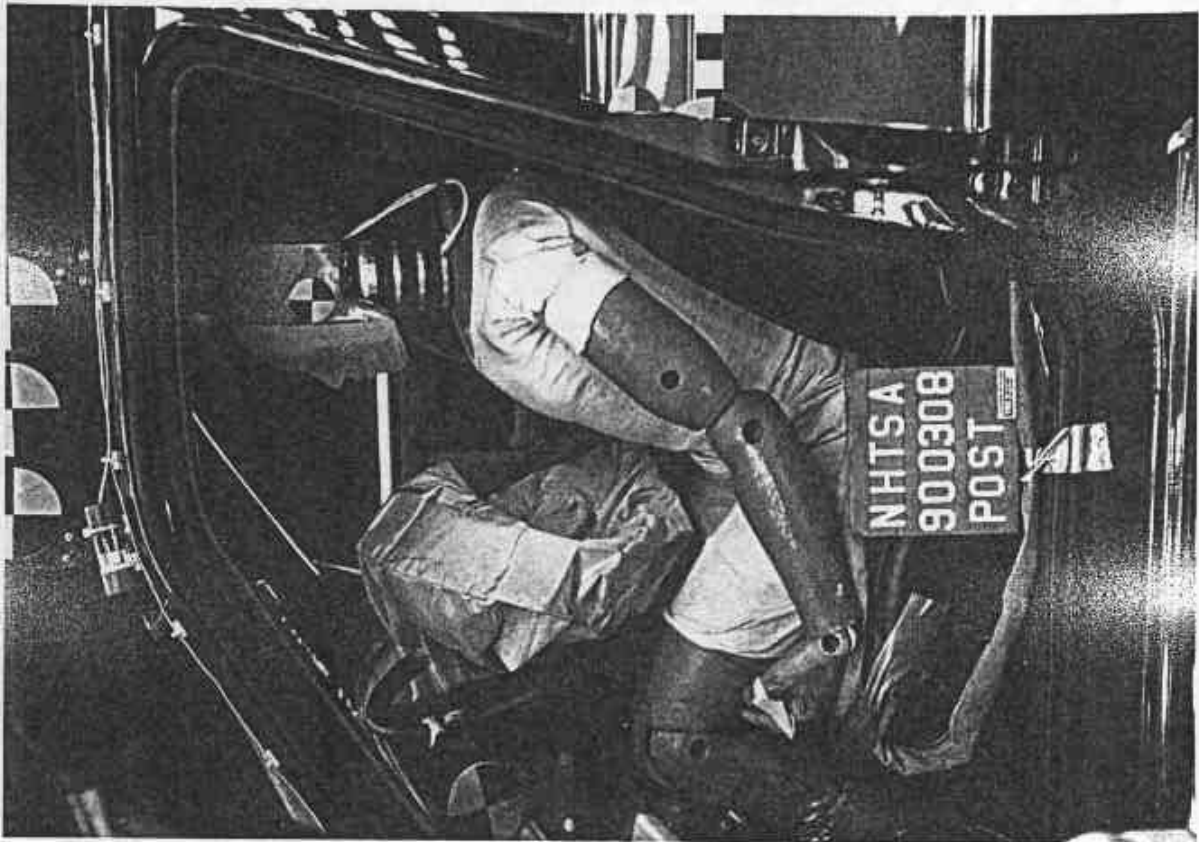


Figure A-29. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

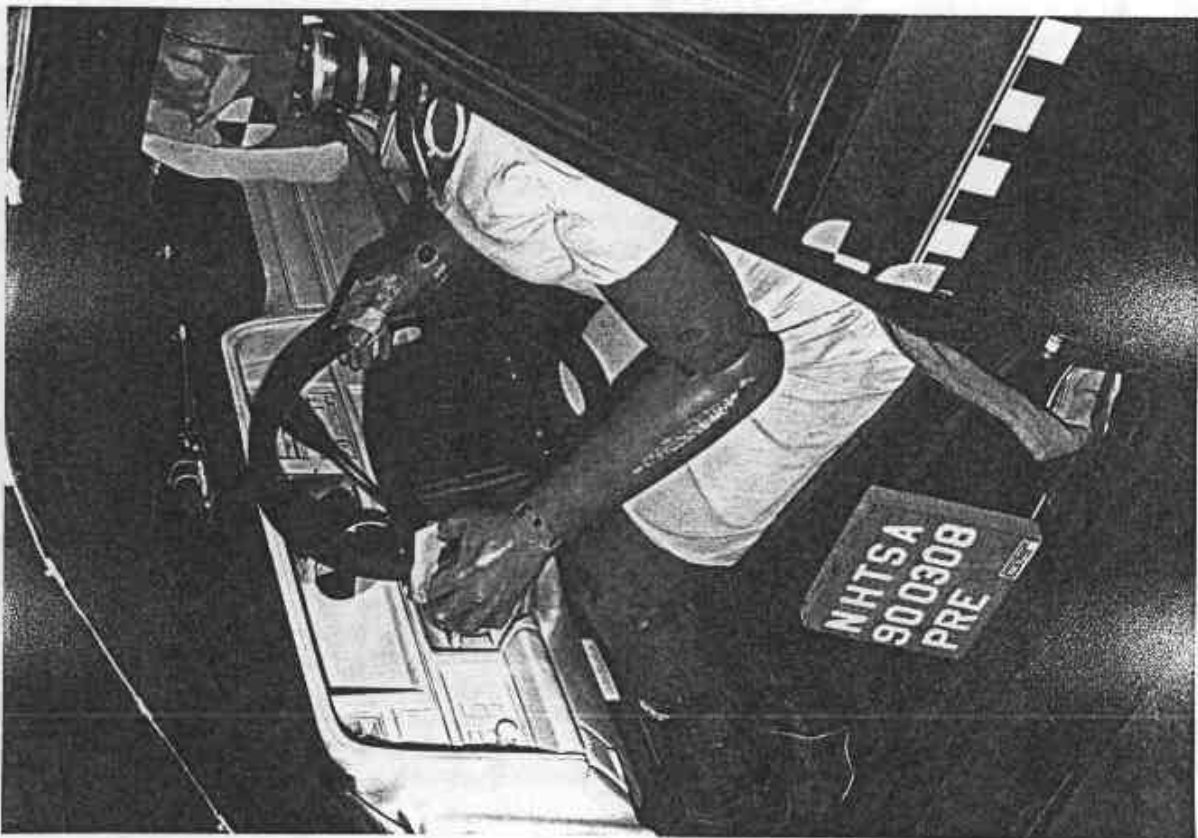


Figure A-30. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

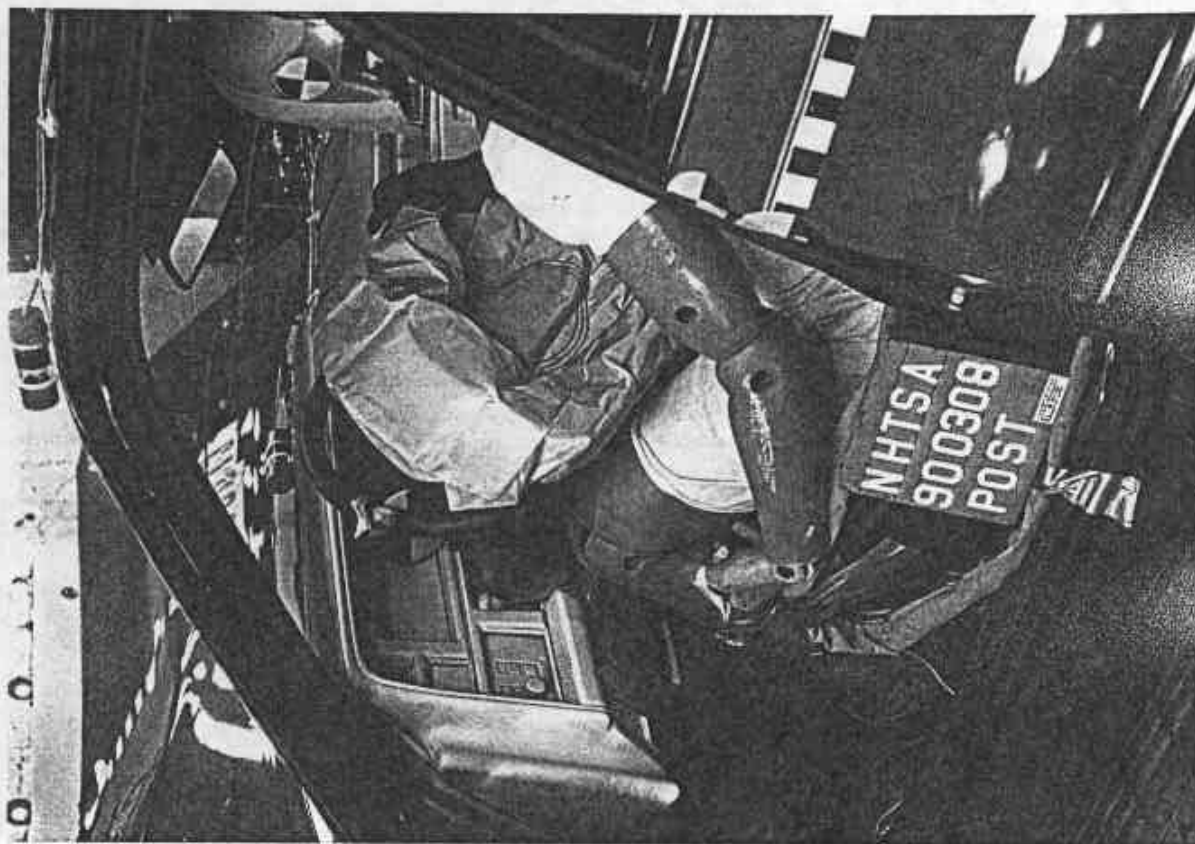


Figure A-31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-32. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

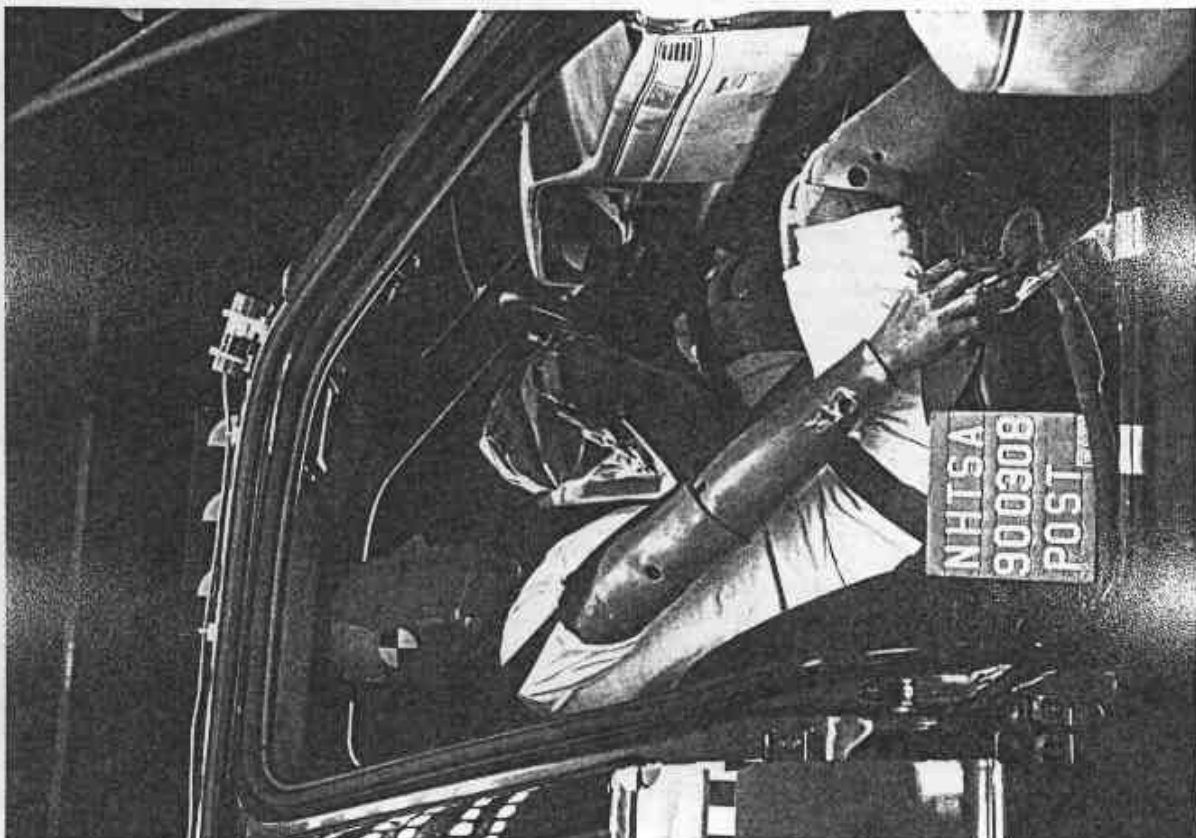


Figure A-33. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure A-34. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

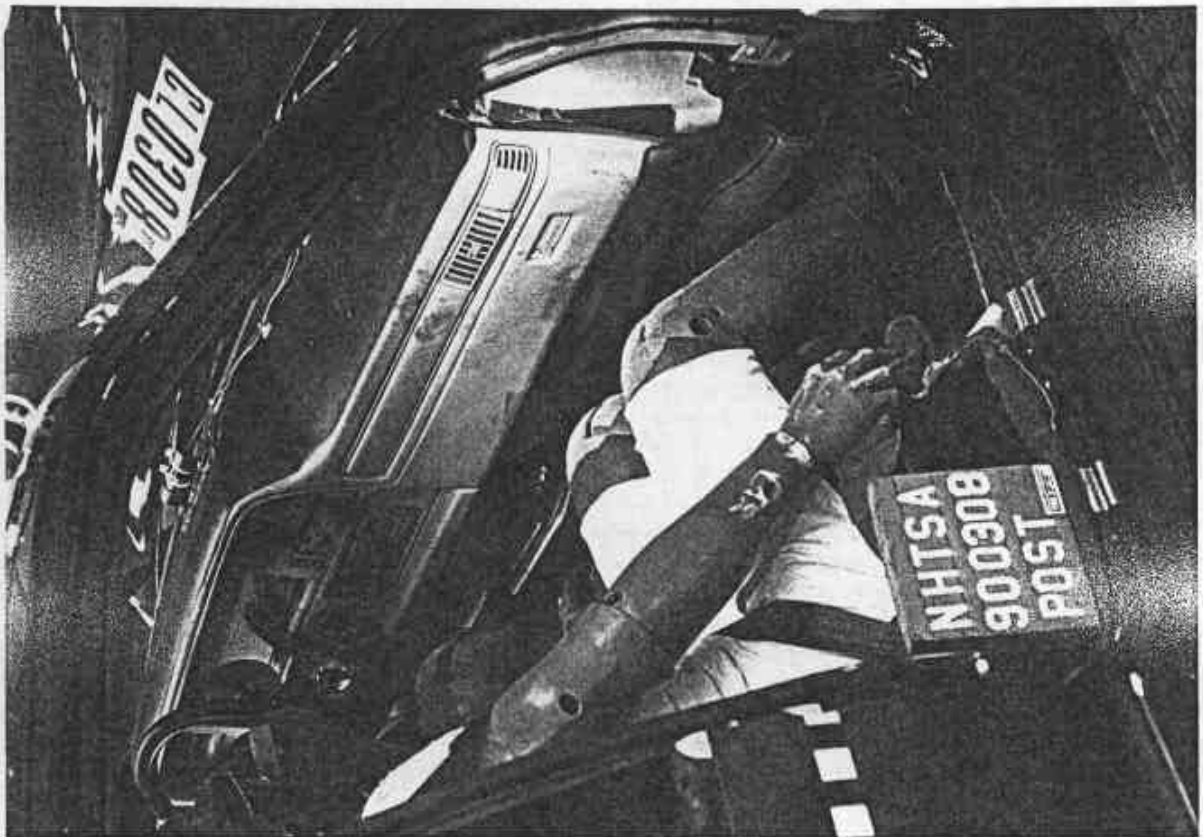


Figure A-35. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2



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

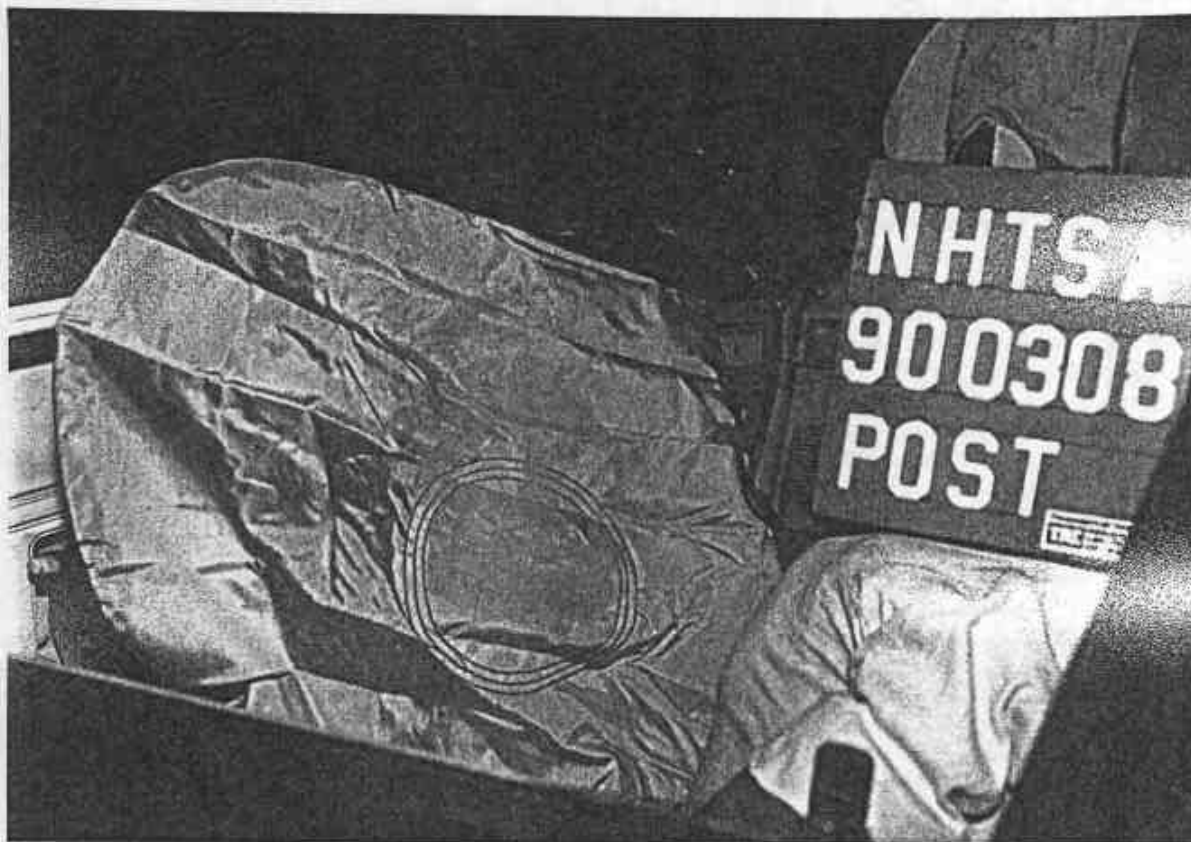


Figure A-37. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2



Figure A-38. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

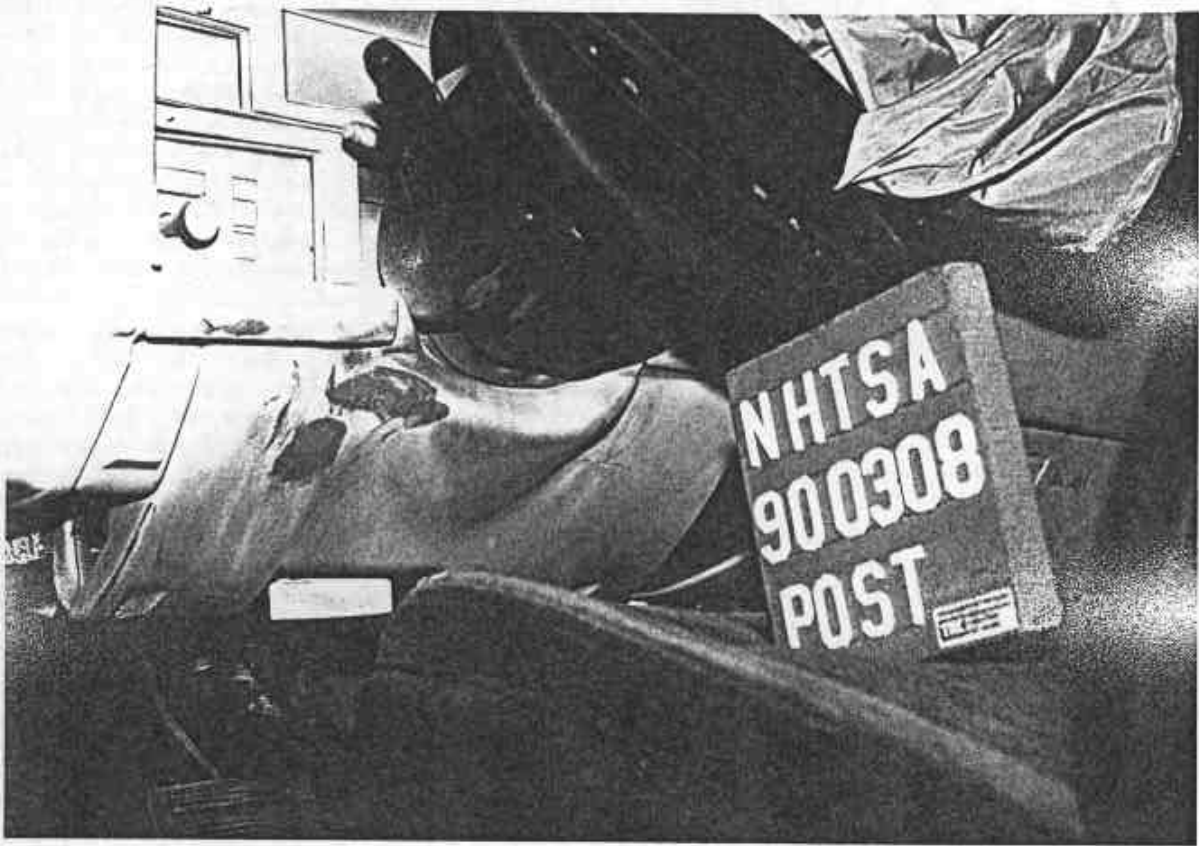


Figure A-39. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2



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



Figure A-41. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1



Figure A-42. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

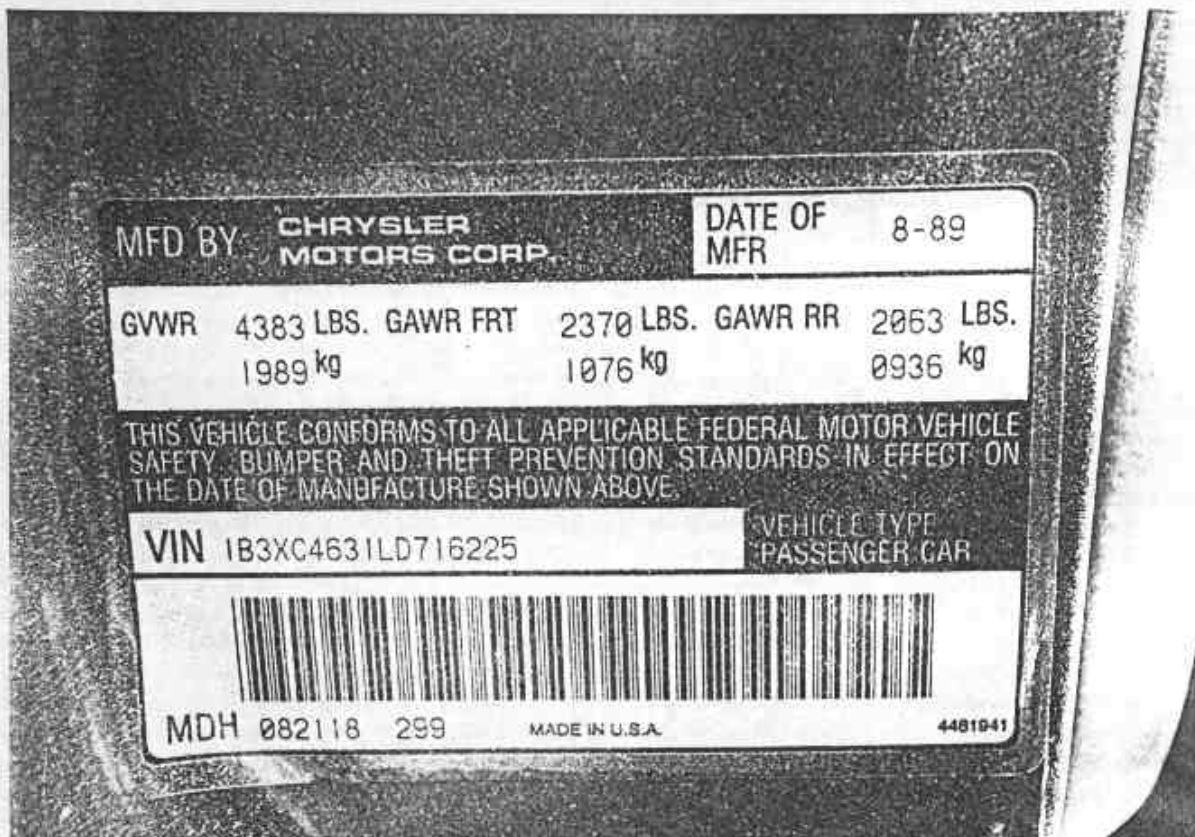


Figure A-43. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

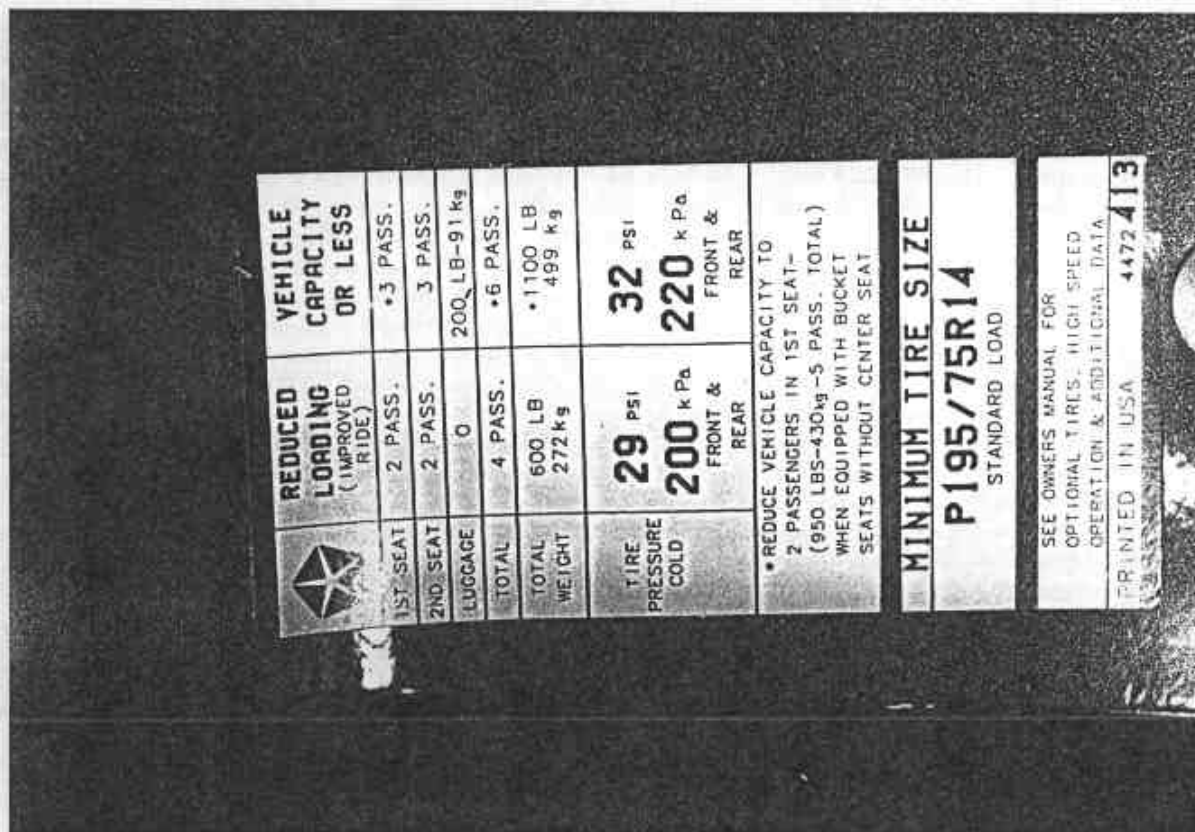


Figure A-44. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW

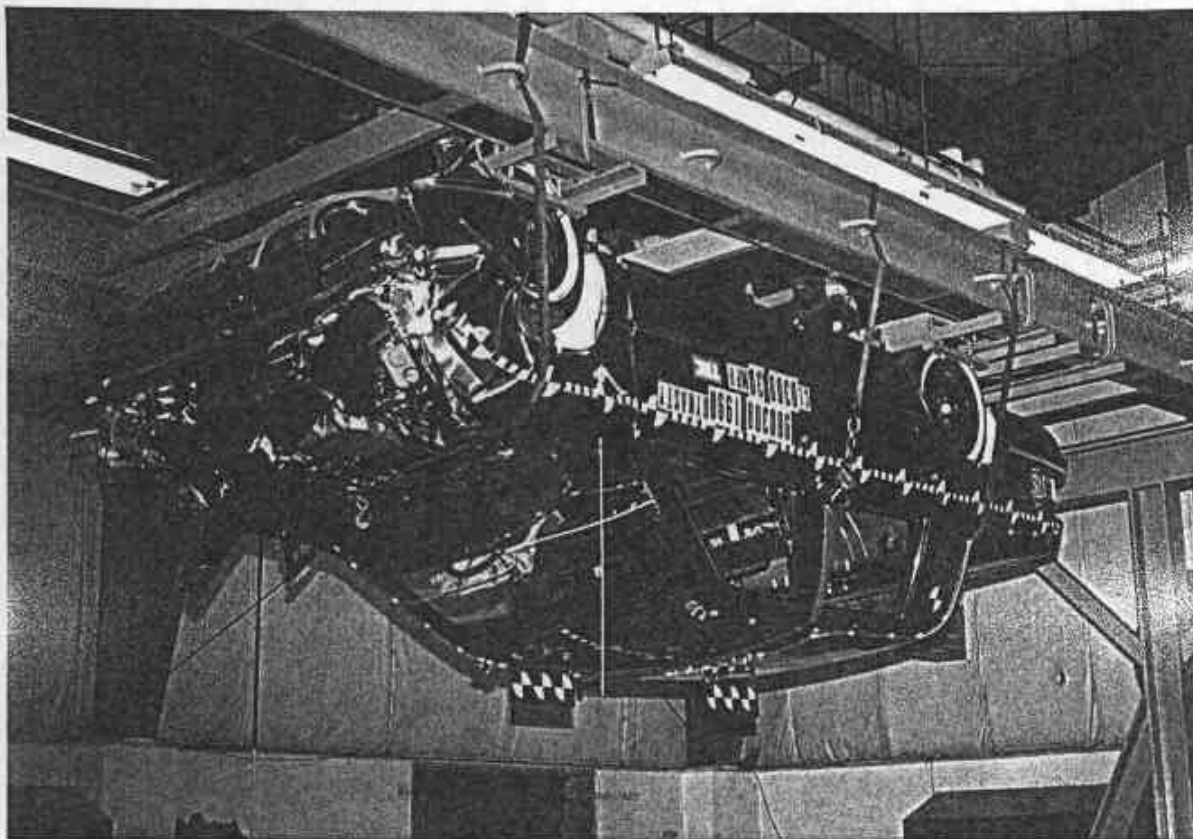


Figure A-45. POST-TEST VEHICLE ON ROLLOVER MACHINE VIEW

APPENDIX B

DATA PLOTS

DUMMY AND VEHICLE AXES: X: FRONT/REAR

Y: LEFT/RIGHT

Z: UP/DOWN

TRC 900308

208 COMPLIANCE

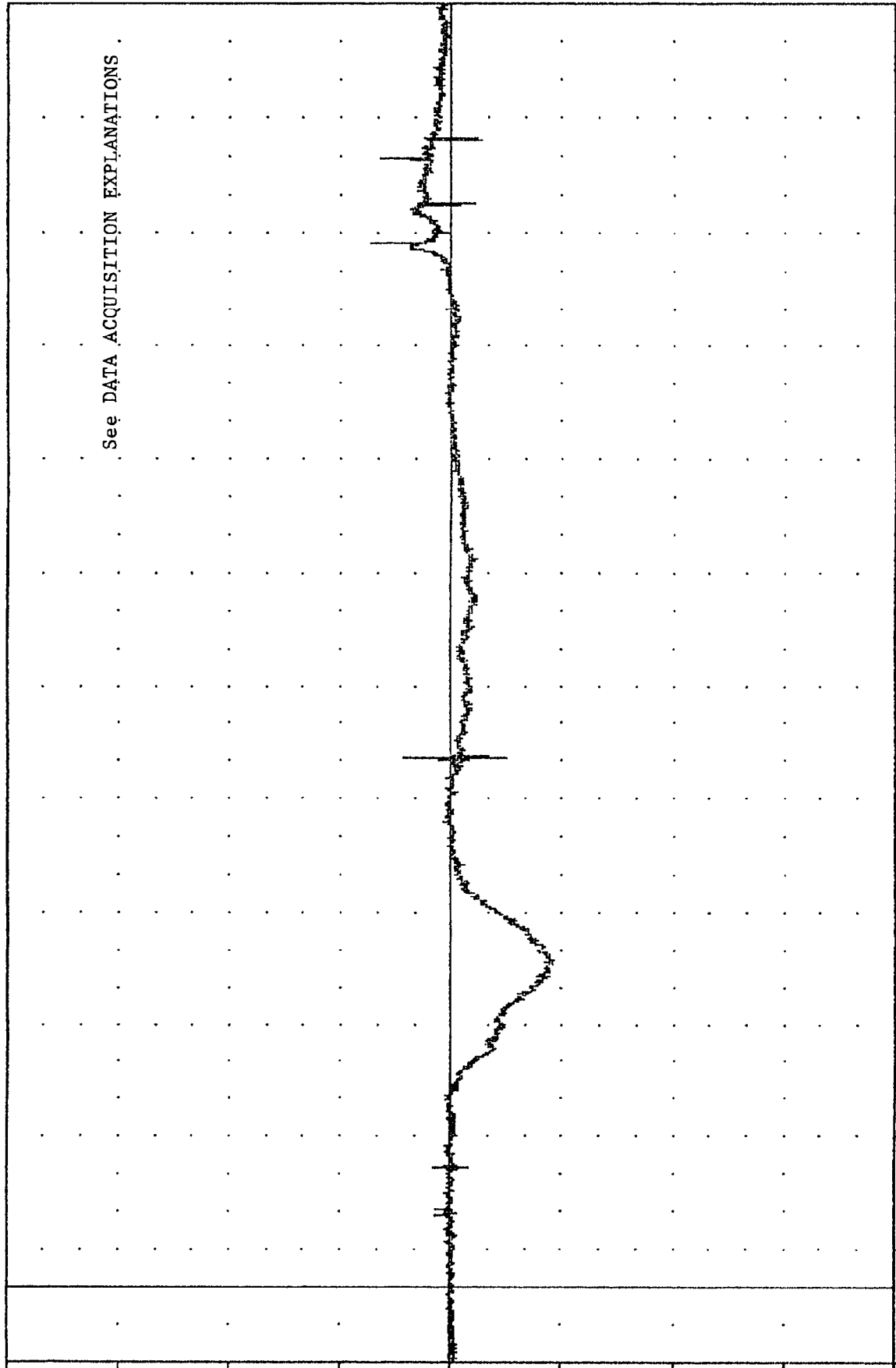
90067

HEDXG1

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -55.60 e 87.38 , 43.79 e 277.25

803006
B-2
ACCELERATION (G)
-240.00 -180.00 -120.00 -60.00 0.00 60.00 120.00 180.00 240.00



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
DRIVER HEAD X AXIS ACCELERATION

TRC 900308

208 COMPLIANCE

90067

HEDYG1

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -43.60 277.38 48.53 304.38

240.00

180.00

120.00

60.00

0.00

-60.00

-120.00

-180.00

-240.00

ACCELERATION (G)

B-3

803008

.See DATA ACQUISITION EXPLANATIONS

-20.00 10.00 40.00 70.00 100.00 130.00 150.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

DODGE DYNASTY INTO FLAT FRONTAL BARRIER

DRIVER HEAD Y AXIS ACCELERATION

TRC 900308

208 COMPLIANCE

90067

HEADZG1

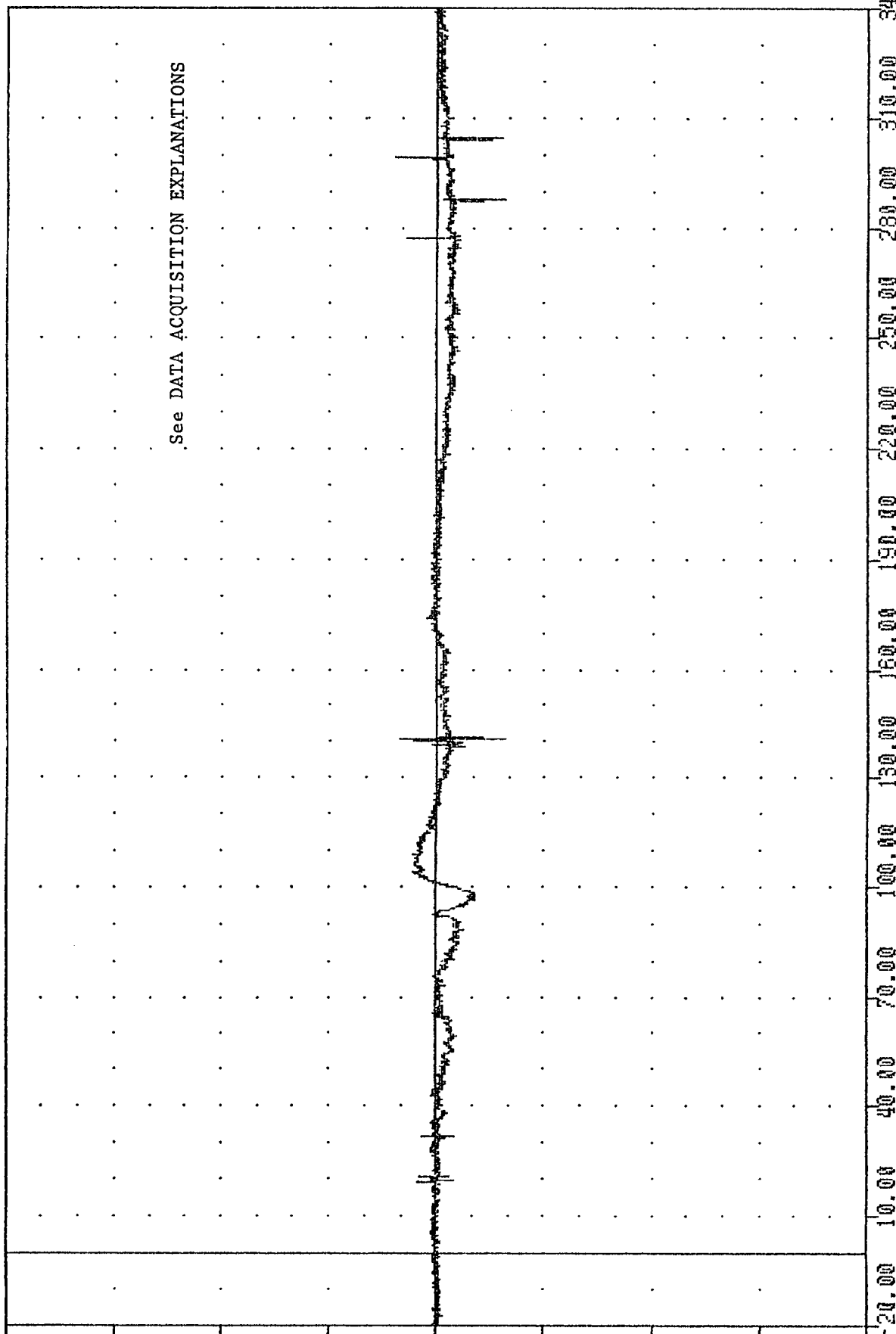
FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -38.03e 287.63, 23.74 e 299.38

ACCELERATION [G]

B-4

900308



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
DRIVER HEAD Z AXIS ACCELERATION

TRC 900308

208 COMPLIANCE

90067

HEADG1

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.27 e

2.63. 62.28 e 140.75

210.00

180.00

150.00

120.00

90.00

60.00

30.00

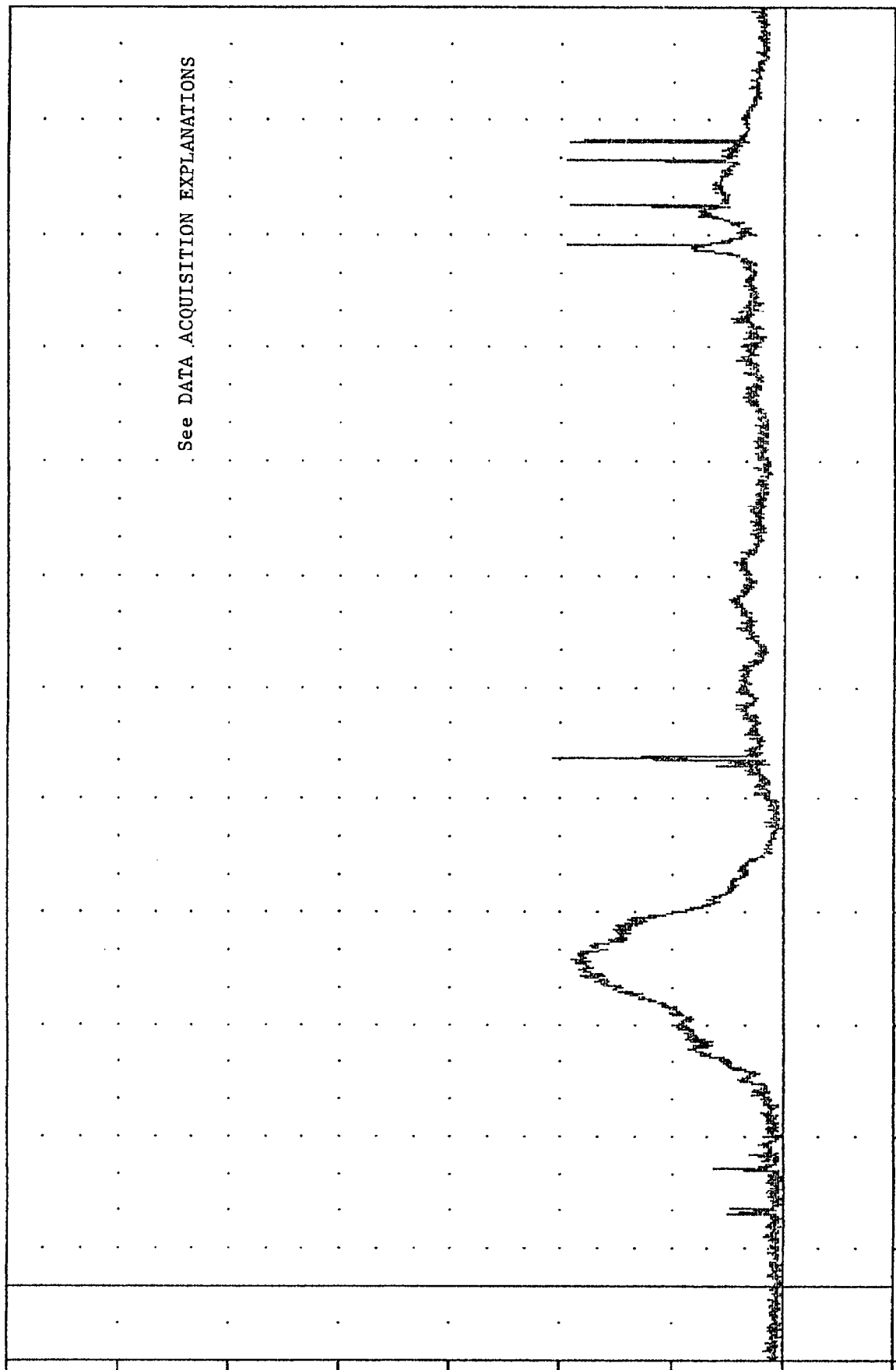
0.00

-30.00

ACCELERATION (G)

B-5

900308



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (msec)

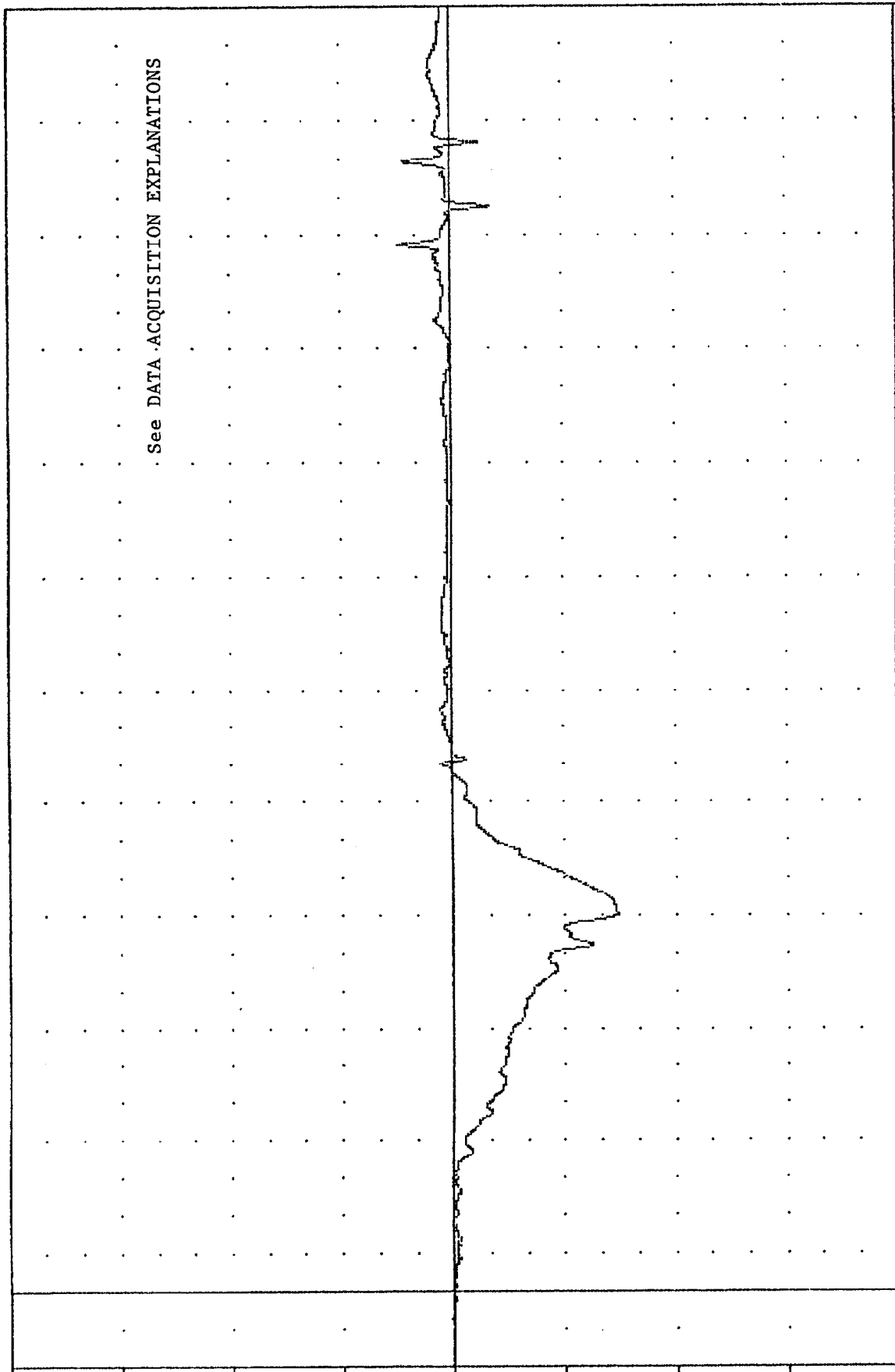
DODGE DYNASTY INTO FLAT FRONTAL BARRIER

DRIVER HEAD RESULTANT ACCELERATION

TRC 900308
 208 COMPLIANCE
 90067
 CSTXG1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -44.238 100.38, 14.11 @ 277.38

ACCELERATION (G)



See DATA ACQUISITION EXPLANATIONS

900308

B-6

DODGE DYNASTY INTO FLAT FRONTAL BARRIER
 OUTPUT CURVE Y AXIS ACCELERATION

TRC 900308

208 COMPLIANCE

90067

CSTY61

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -8.92e 304.50, 9.23 e 299.25

120.00

90.00

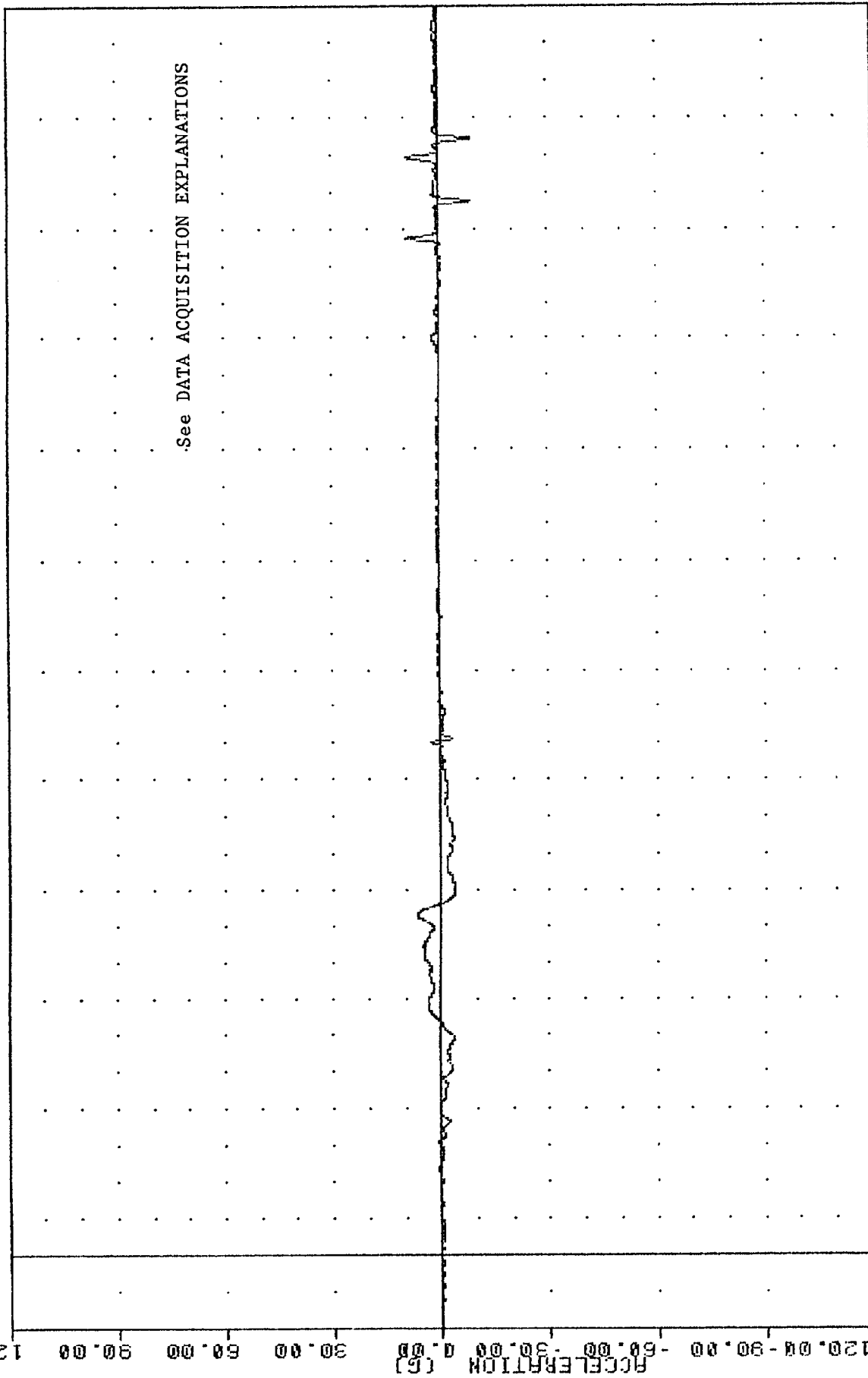
60.00

30.00

0.00

B-7

900308



-20.00 10.00 40.00 70.00 100.00 150.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

DODGE DYNASTY INTO FLAT FRONTAL BARRIER

NOTED CRASH Y AXIS ACCELERATION

TFC , 900308

208 COMPLIANCE

90067

CST2G1

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -12.58 104.00, 6.94 277.38

120.00

90.00

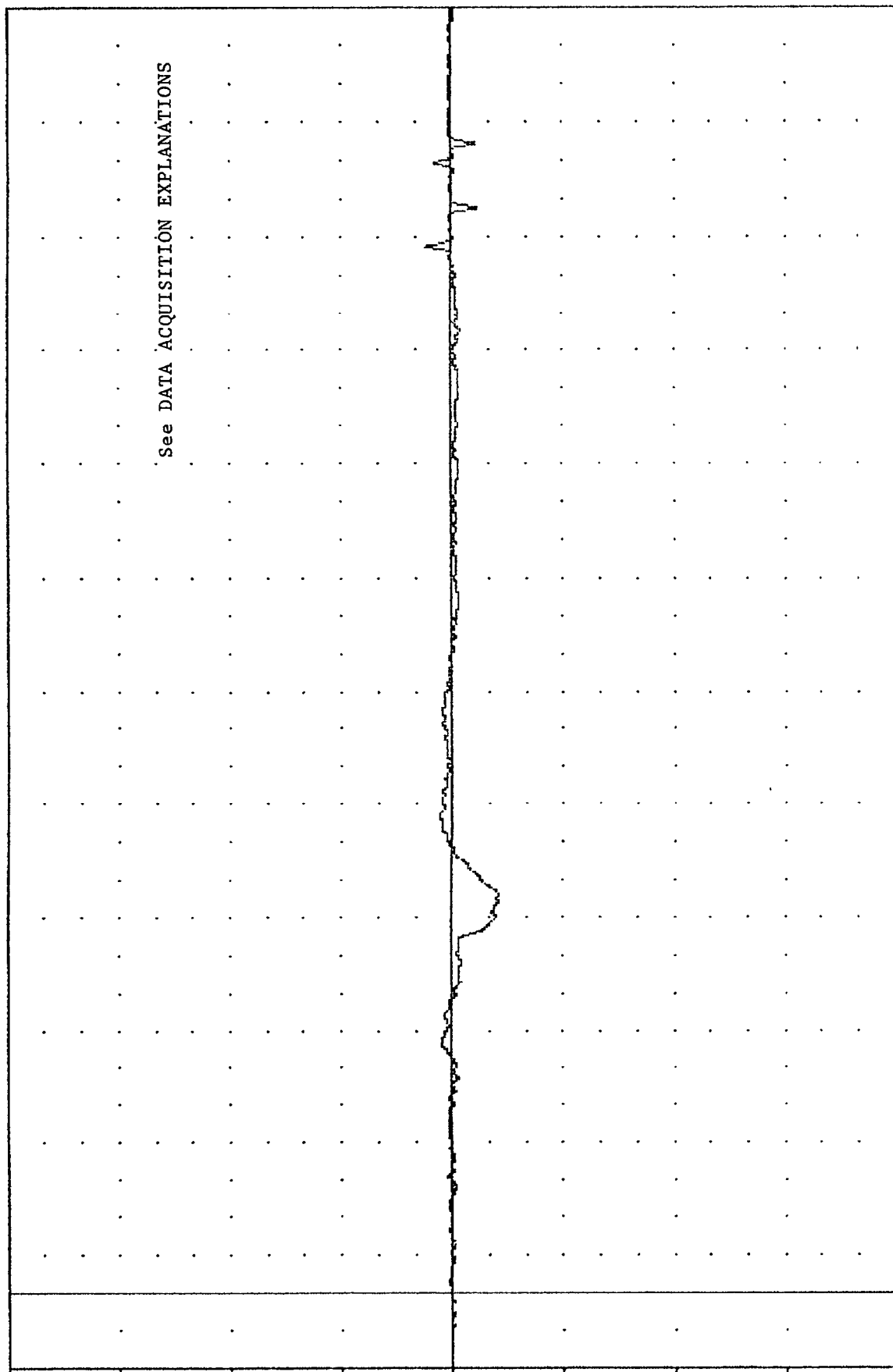
60.00

30.00

0.00

B-8

900308



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

DODGE DYNASTY INTO FLAT FRONTAL BARRIER

NOTED SHEET 7 OF 10 ACCELERATION

TRC , 900308

208 COMPLIANCE

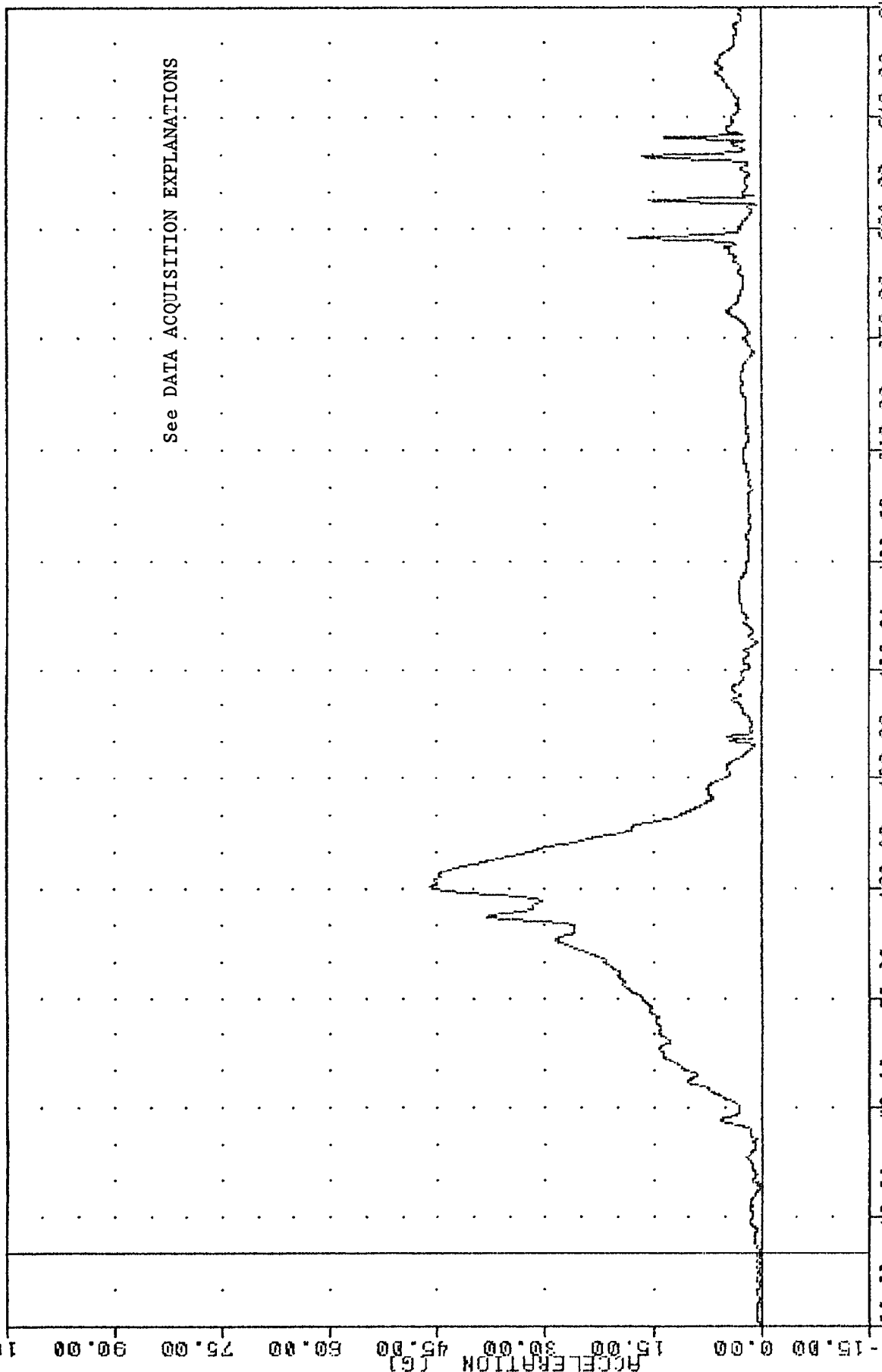
90067

CSTRG1

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = 0.05e -20.00 , 45.88 e 100.38

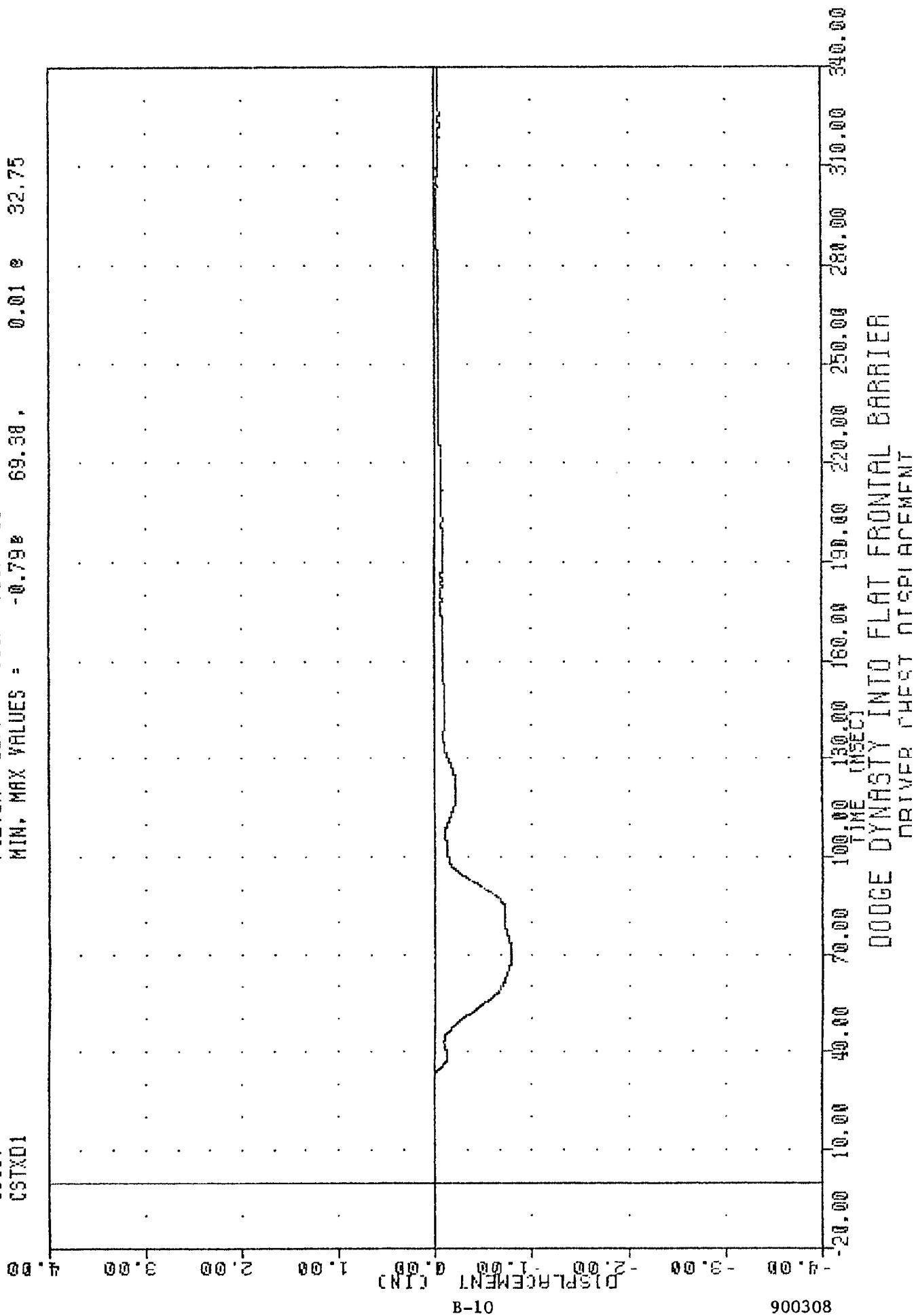
105.00



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
NOTED CRASH DECEASED OFFICE BOTTOM

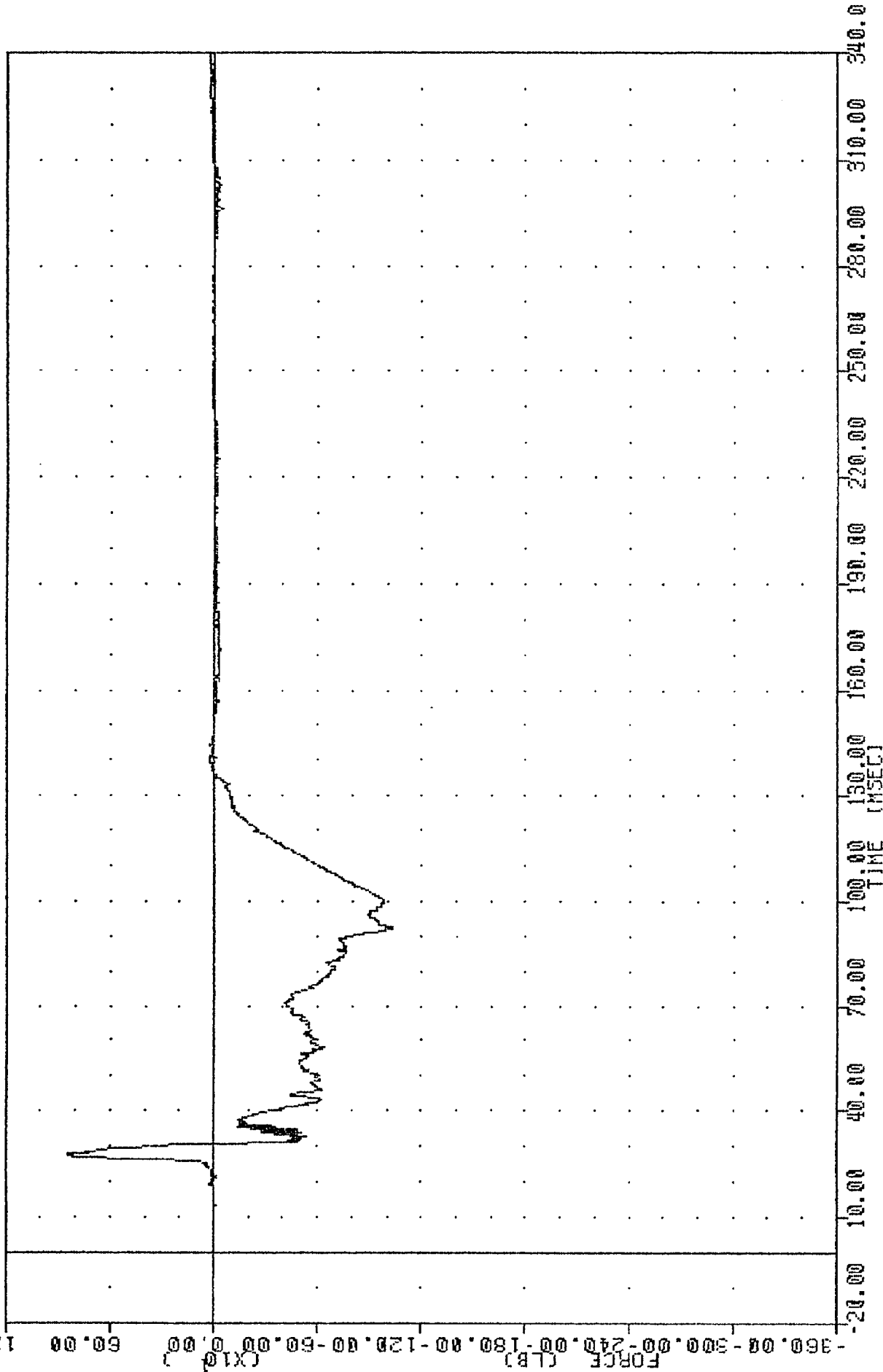
TRC , 900308
208 COMPLIANCE
90067
CSTXD1

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -0.79% 69.38, 0.01 @ 32.75



TRC
208 COMPLIANCE
90067
LFMF1

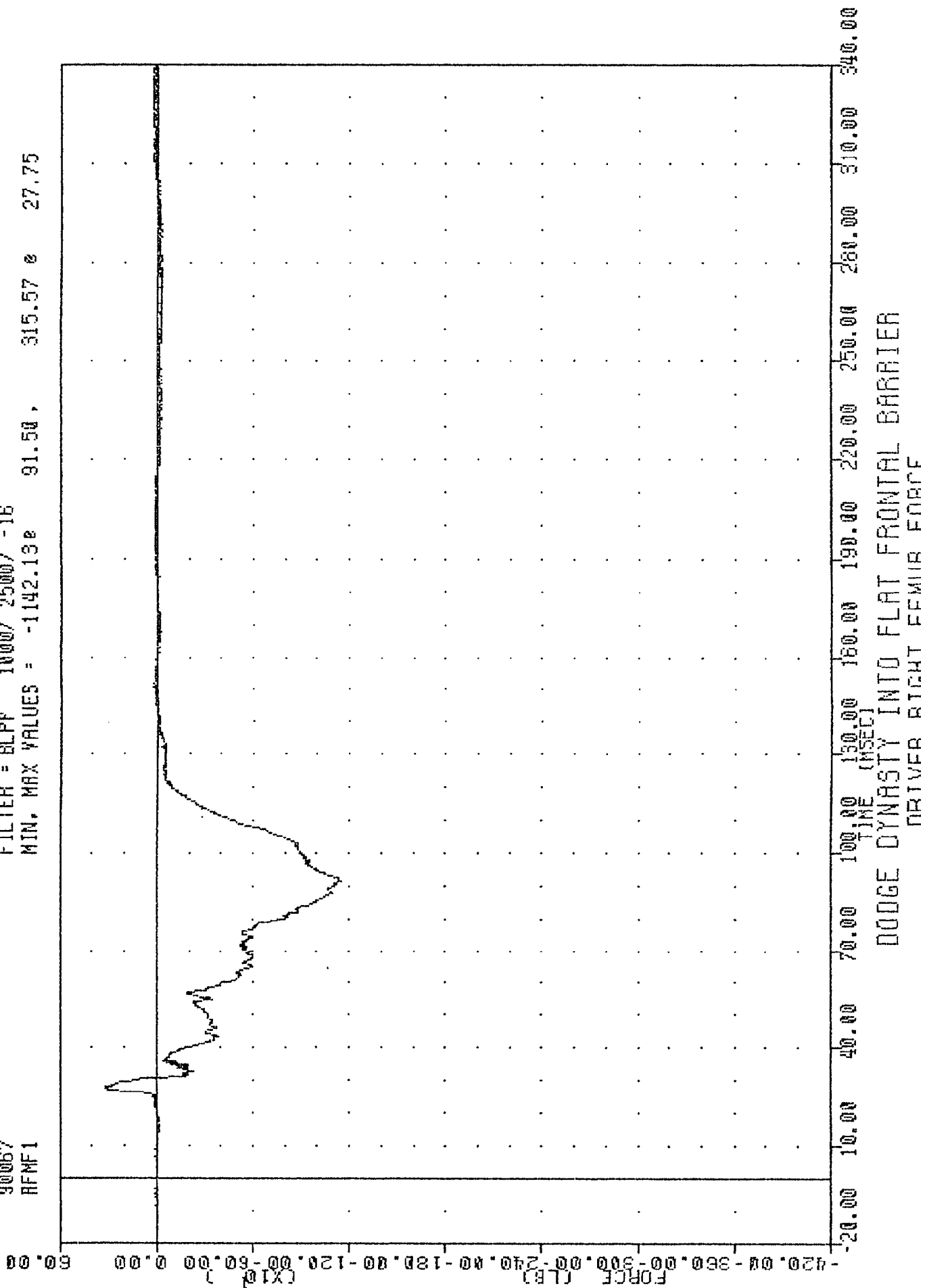
FILTER = BLFF 1000/ 2500/ -16
MIN, MAX VALUES = -1027.43 92.25, 834.19 27.75



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE

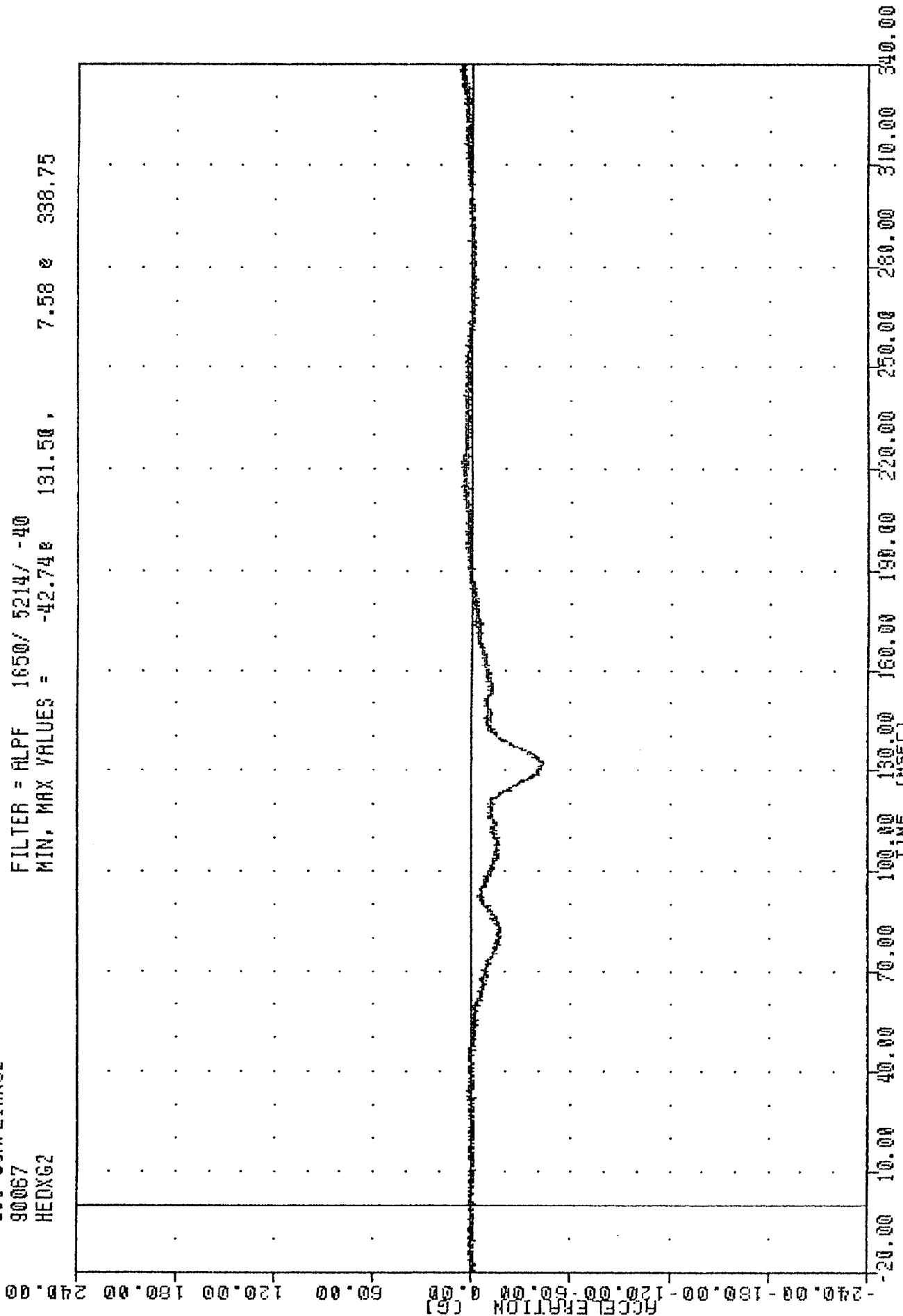
TRC , 900308
 308 COMPLIANCE
 90067
 RFMF1

FILTER = BLPF 1000/ 2500/ -16
 MIN. MAX VALUES = -1142.13e 91.50, 315.57 e 27.75



TRC
208 COMPLIANCE
90067
HEDXG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -42.748 131.50 7.58 338.75



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X AXIS ACCELERATION

TRC , 900308

208 COMPLIANCE

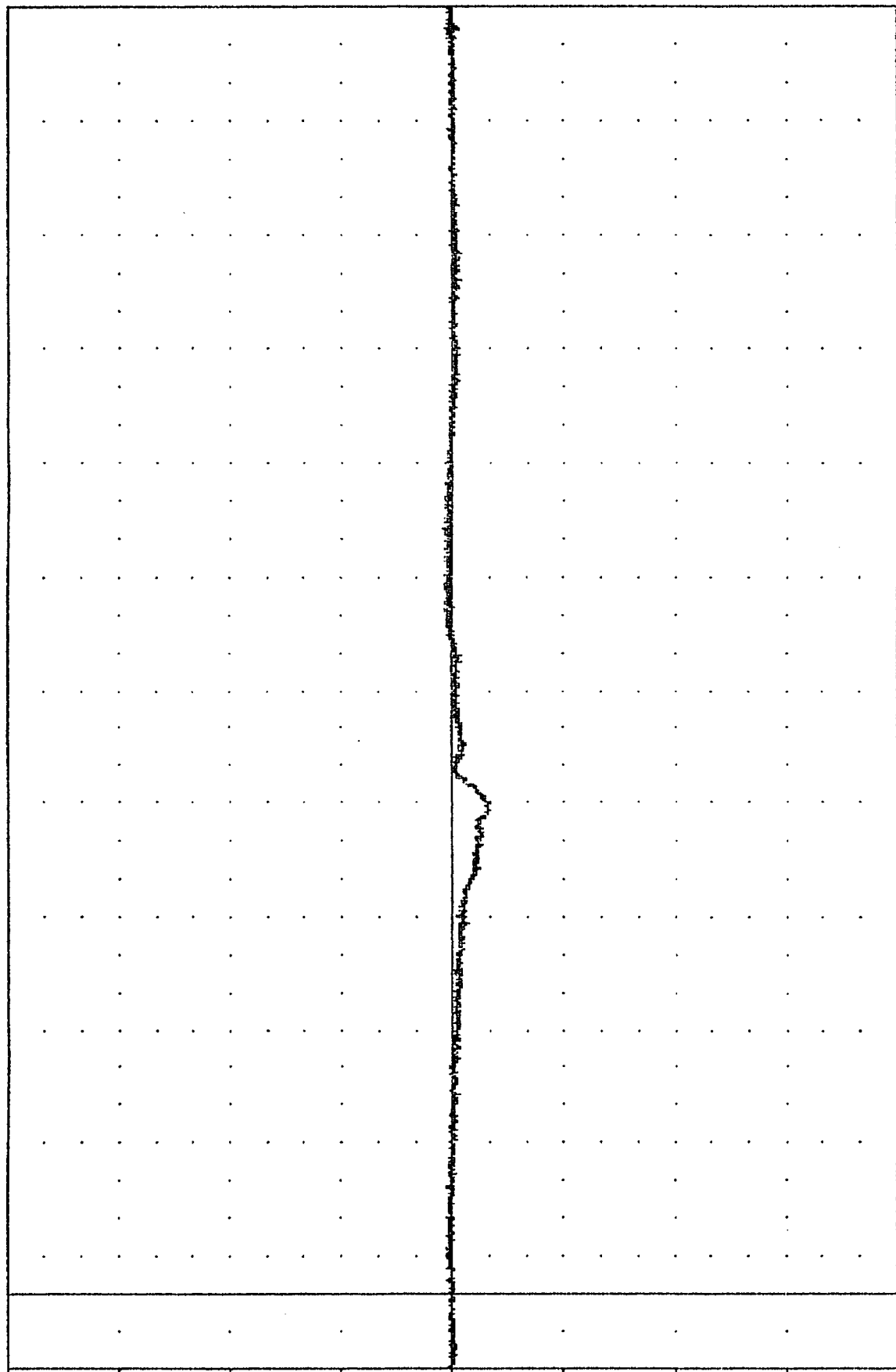
90067

HEDYG2

FILTER = ALPF 1050/ 5214/ -40

MIN. MAX VALUES = -20.66 129.50 , 4.80 202.38

ACCELERATION (G)



B-14

900308

DODGE DYNASTY INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y AXIS ACCELERATION

TRC . 900308

200 COMPLIANCE

90067

HEDZG2

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = -37.69 86.13,

3.45 3.88

ACCELERATION (G)

240.00

180.00

120.00

60.00

0.00

-60.00

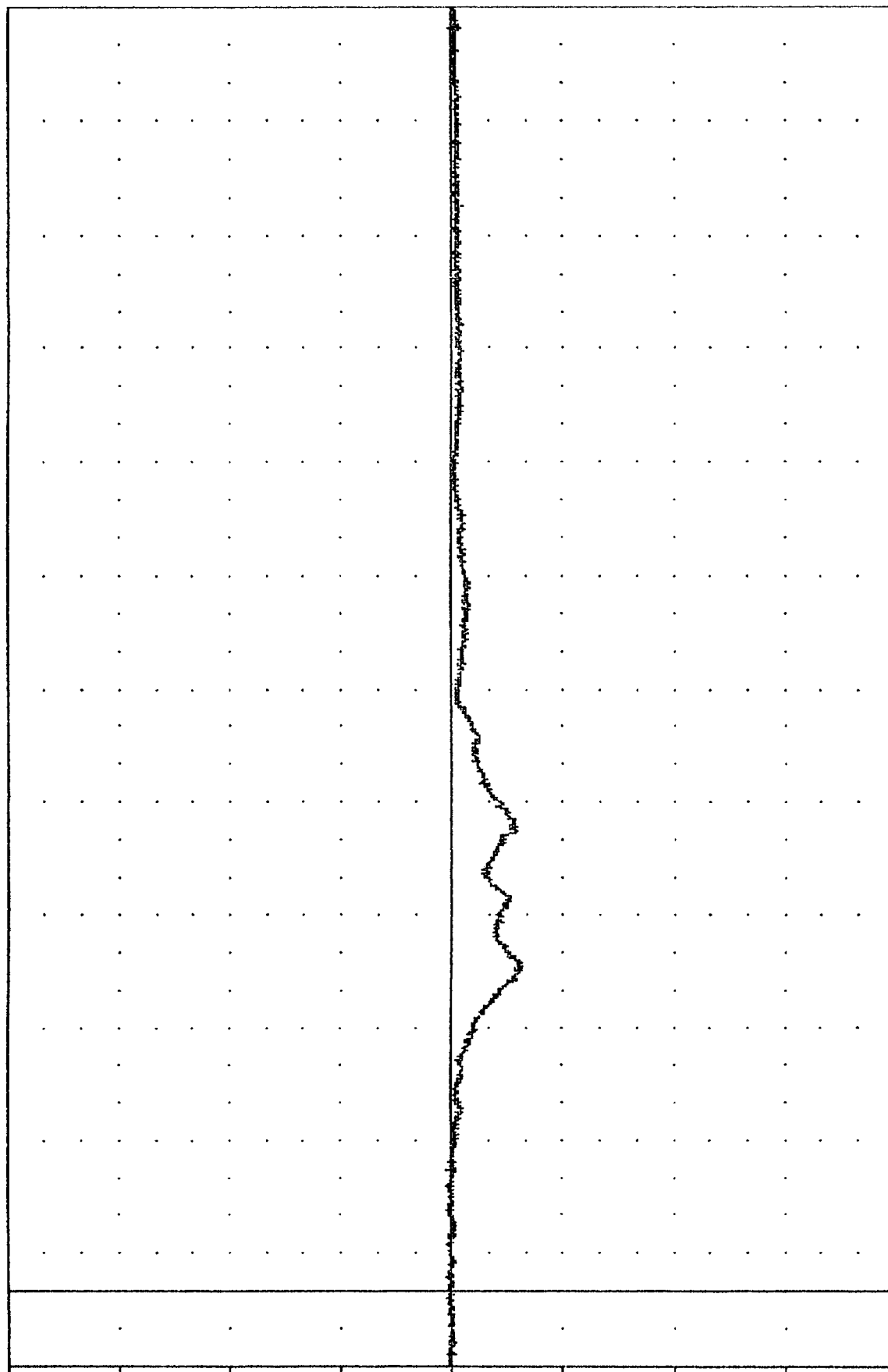
-120.00

-180.00

-240.00

B-15

900308

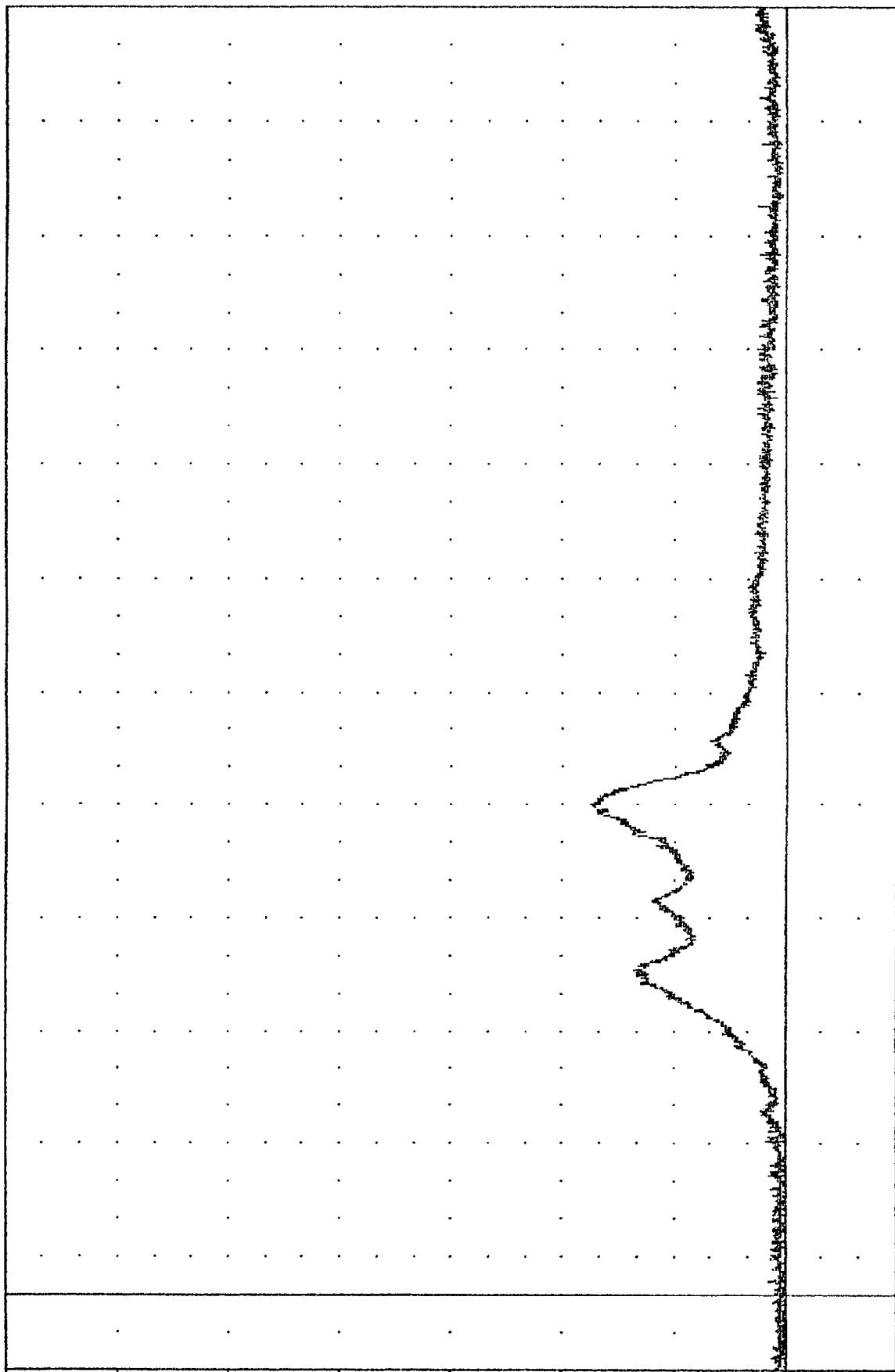


DODGE DYNASTY INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD 7 AXIS ACCELERATION

TRC , 900308
 208 COMPLIANCE
 90067
 HEDRG2

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.14e -10.00, 52.53 e 129.88

ACCELERATION (G)
 30.00
 15.00
 0.00
 -15.00
 -30.00



900308

B-16

DODGE DYNASTY INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER HEAD RESISTANT ACCELERATION

TRC 900308

208 COMPLIANCE

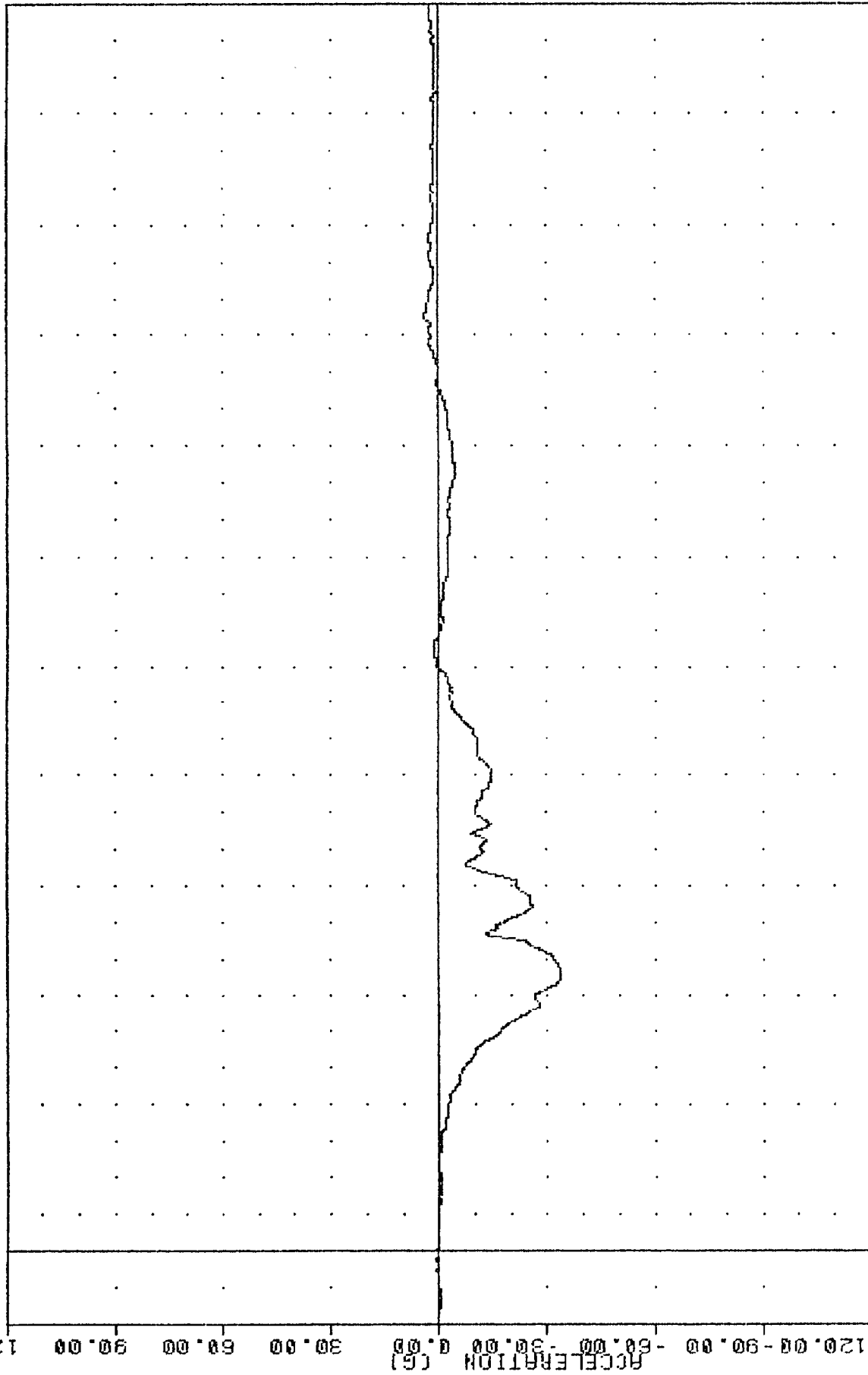
90067

CSTX62

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = -99.828 76.50, 4.26 255.00

120.00



B-17

900308

DODGE DYNASTY INTO FLAT FRONTAL BARRIER

RIGHT FRONT PASSENGER CHEST V AVIS ACCELERATION

TRC 900308

200 COMPLIANCE

90067

CSTYG2

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -15.33 113.50, 6.03 277.38

120.00

90.00

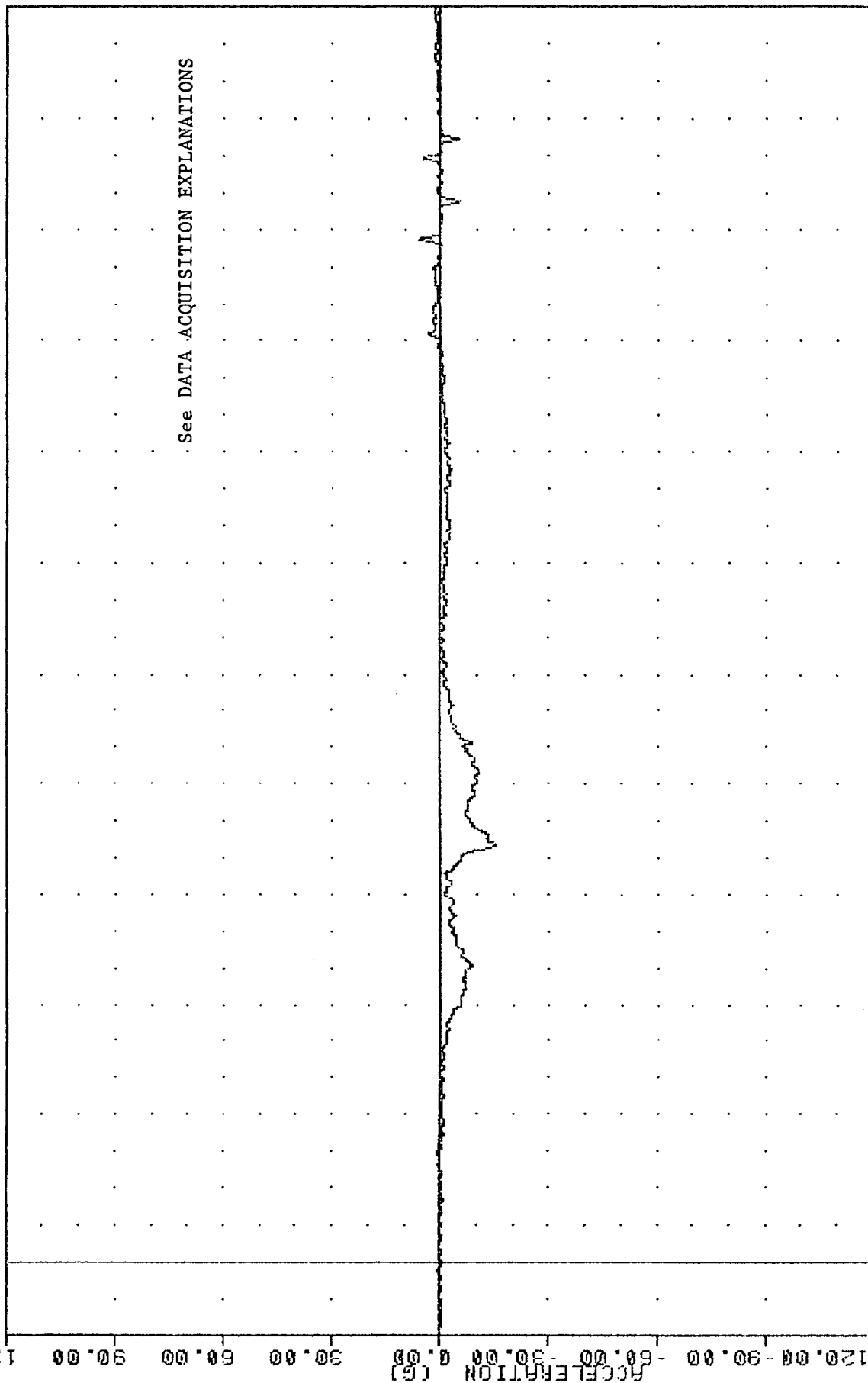
60.00

30.00

0.00

B-18

900308



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)
DODGE DYNASTY INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y AXIS ACCELERATION

TRC , 900308

200 COMPLIANCE

90067

CSTZG2

FILTER = BLPP 300/ 750/ -16

MIN. MAX VALUES = -8.01e 81.50, 7.66 e 117.63

120.00

90.00

60.00

30.00

0.00

-30.00

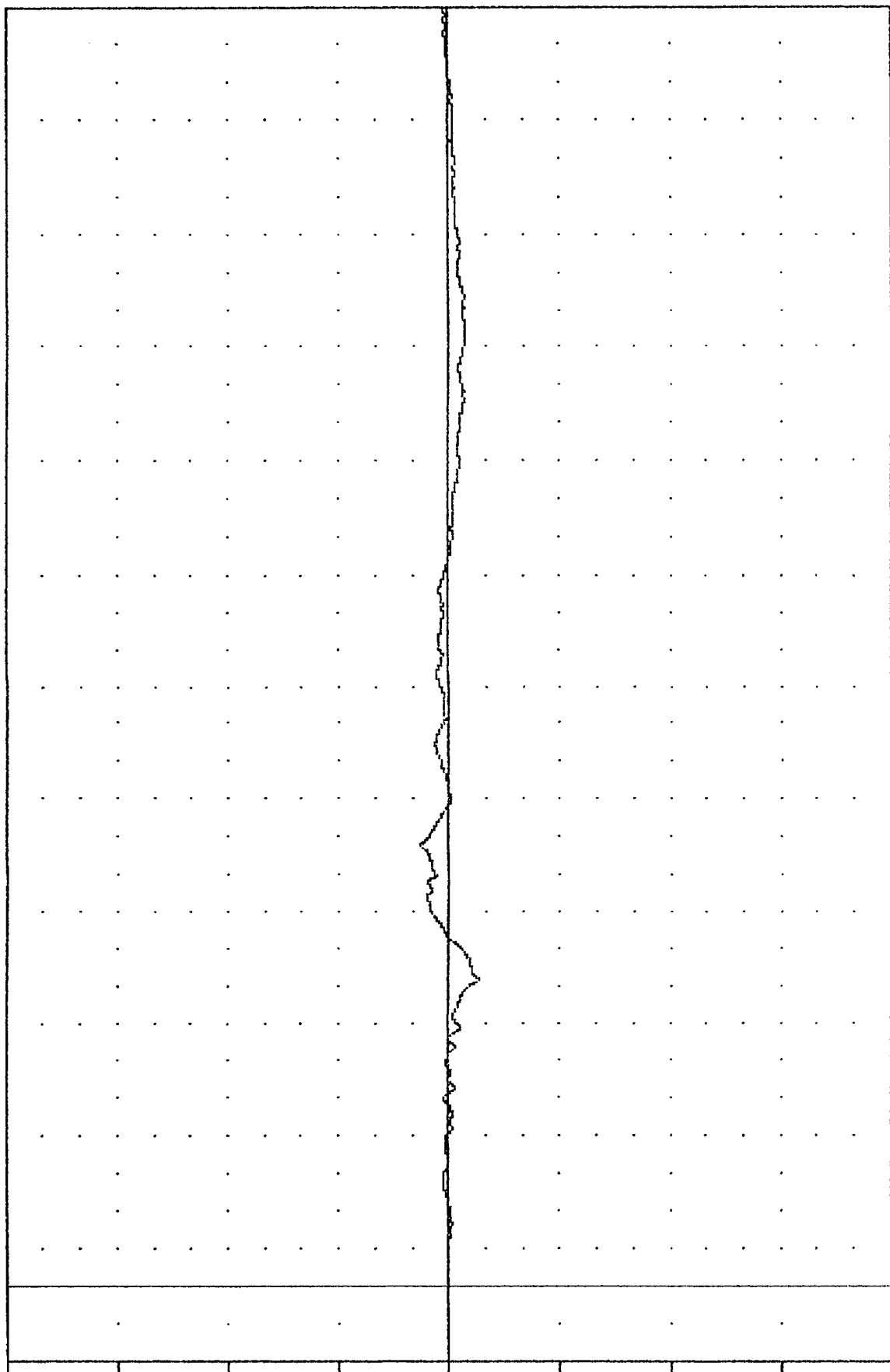
-60.00

-90.00

-120.00

B-19

900308



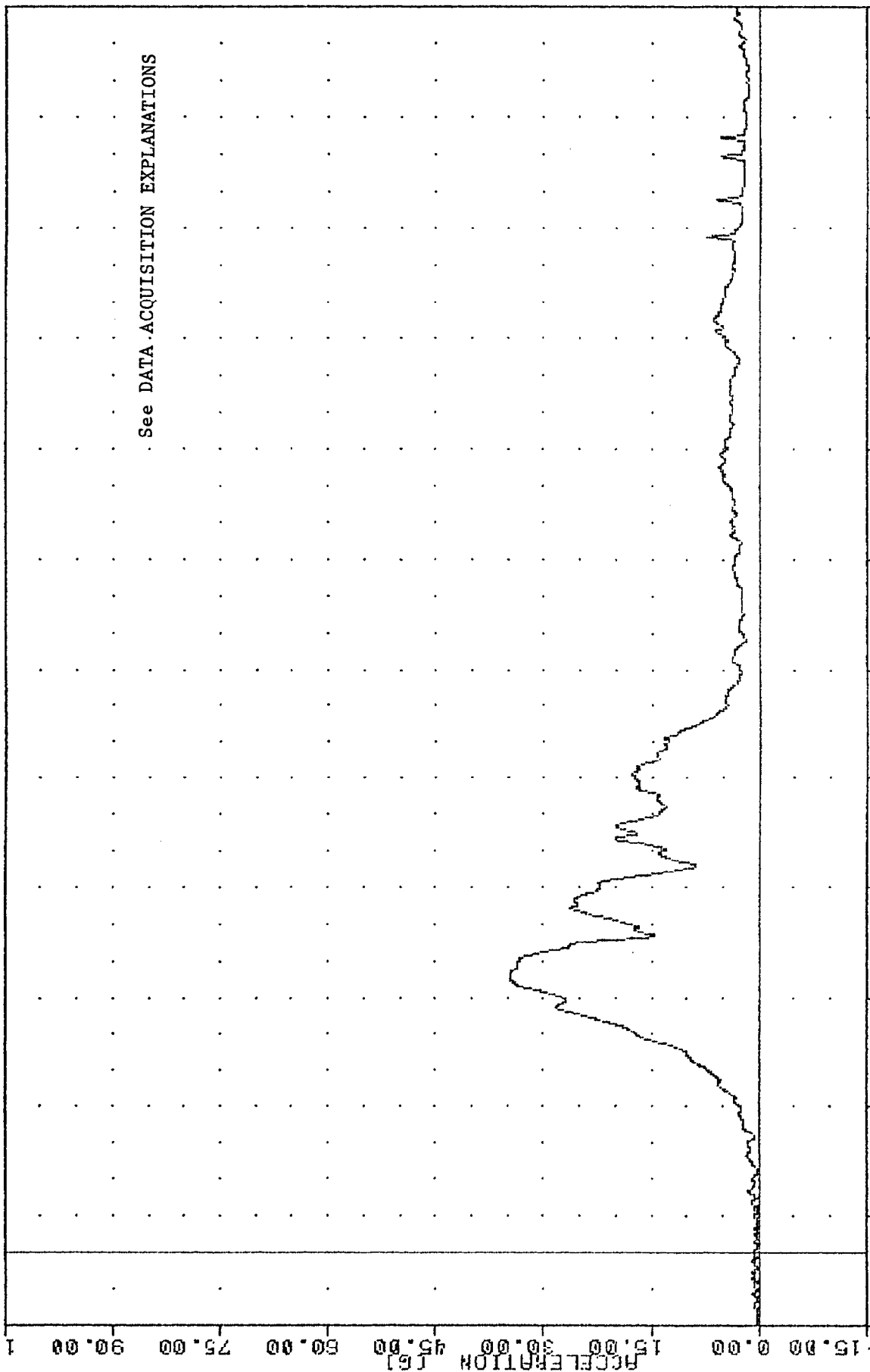
DODGE DYNASTY INTO FLAT FRONTAL BARRIER

PICUT FRONT DEFORMER CUCT 7 DIVE ACCELERATION

TRC 900308
 208 COMPLIANCE
 90067
 CSTRG2

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.06e 7.75, 34.57 e 75.00

105.00



B-20

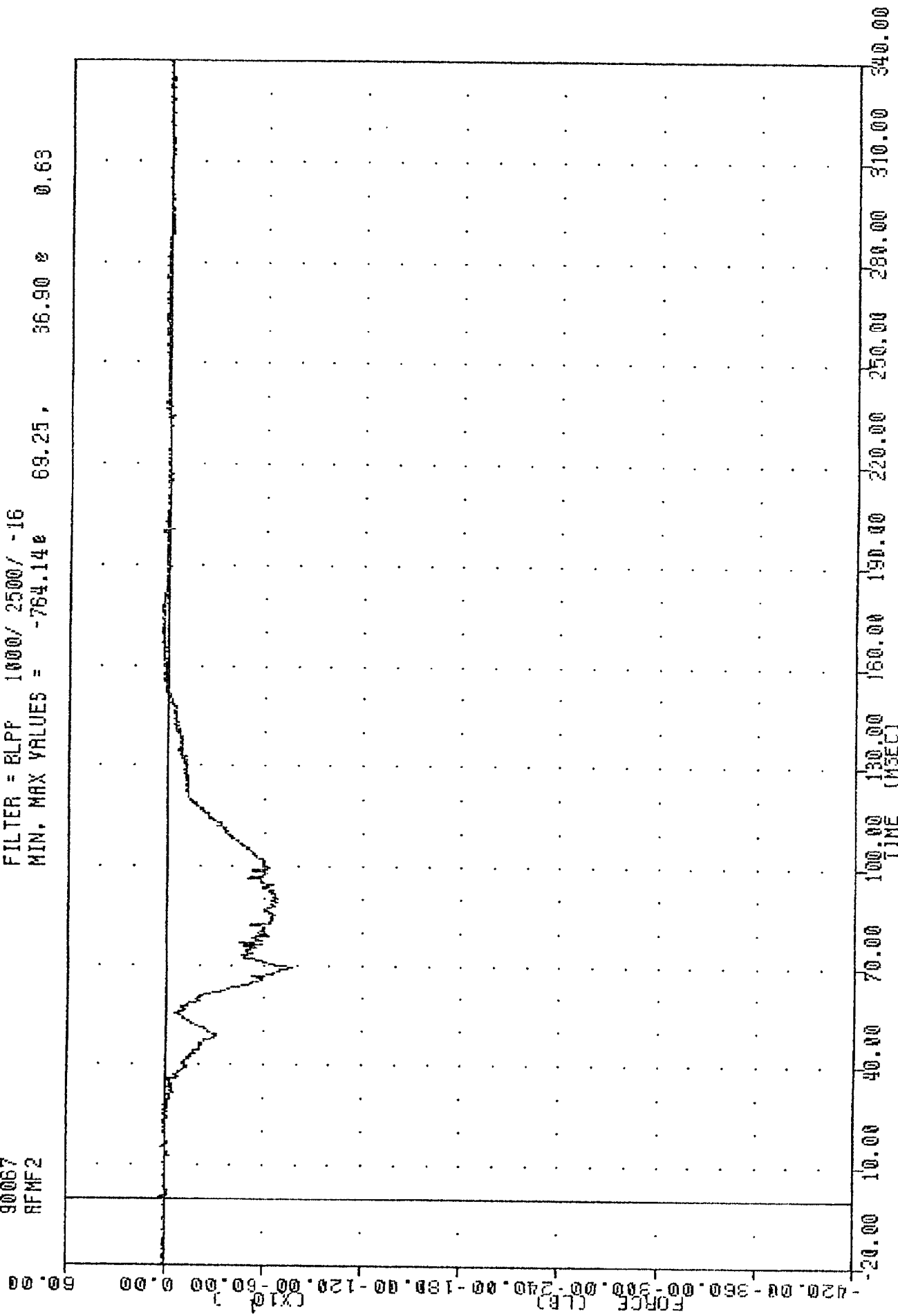
900308

-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

DODGE DYNASTY INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST RESISTANT DECELERATION

TAC
208 COMPLIANCE
900308

90067
RFMF2
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -764.14e 69.25, 36.90 e 0.63



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

TRC 900308

208 COMPLIANCE

90067

TLRX61

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -26.18e 51.88e

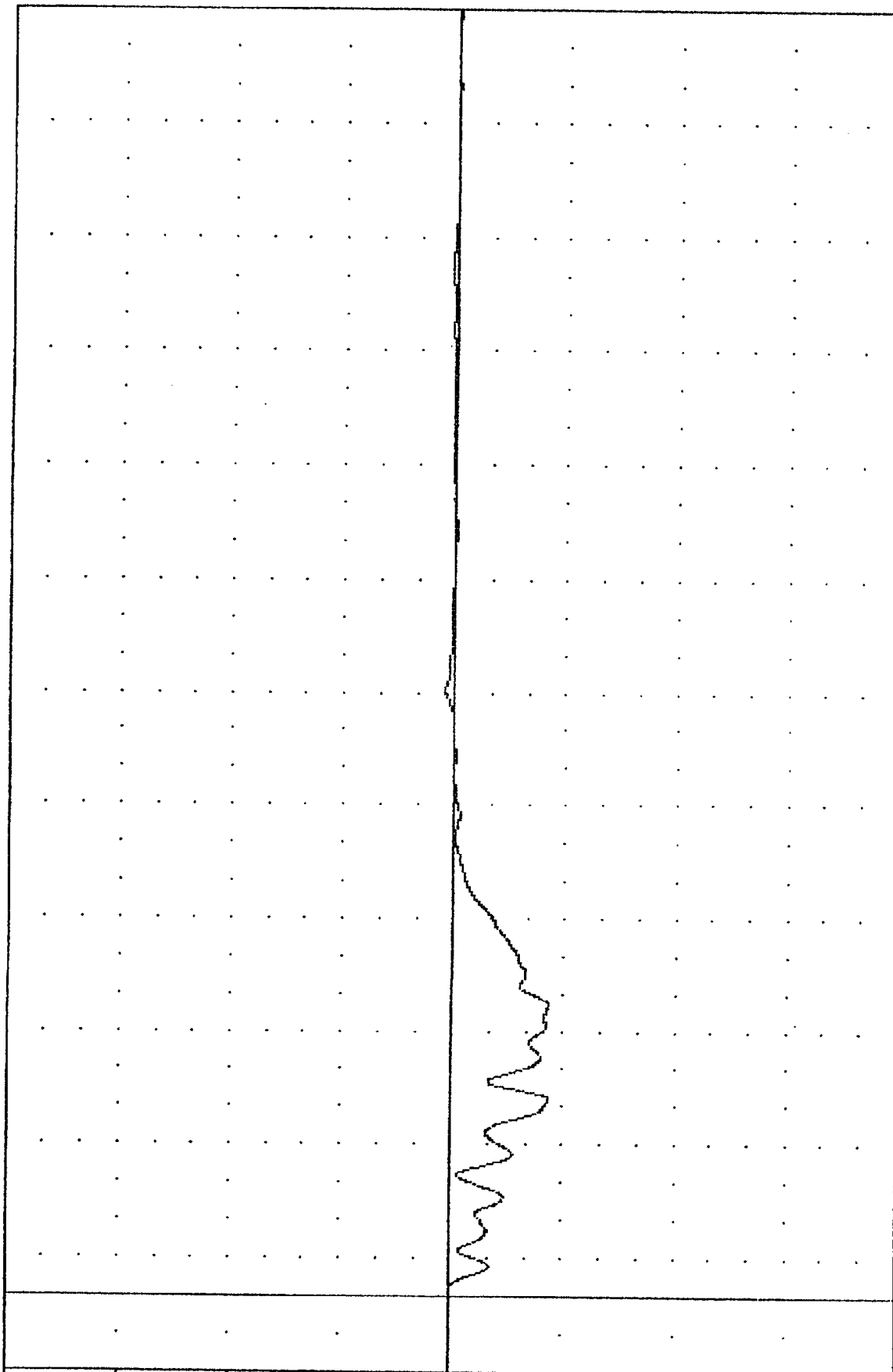
2.50 e 160.75

120.00
90.00
60.00
30.00
0.00
-30.00
-60.00
-90.00
-120.00

ACCELERATION [G]

B-23

900308



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

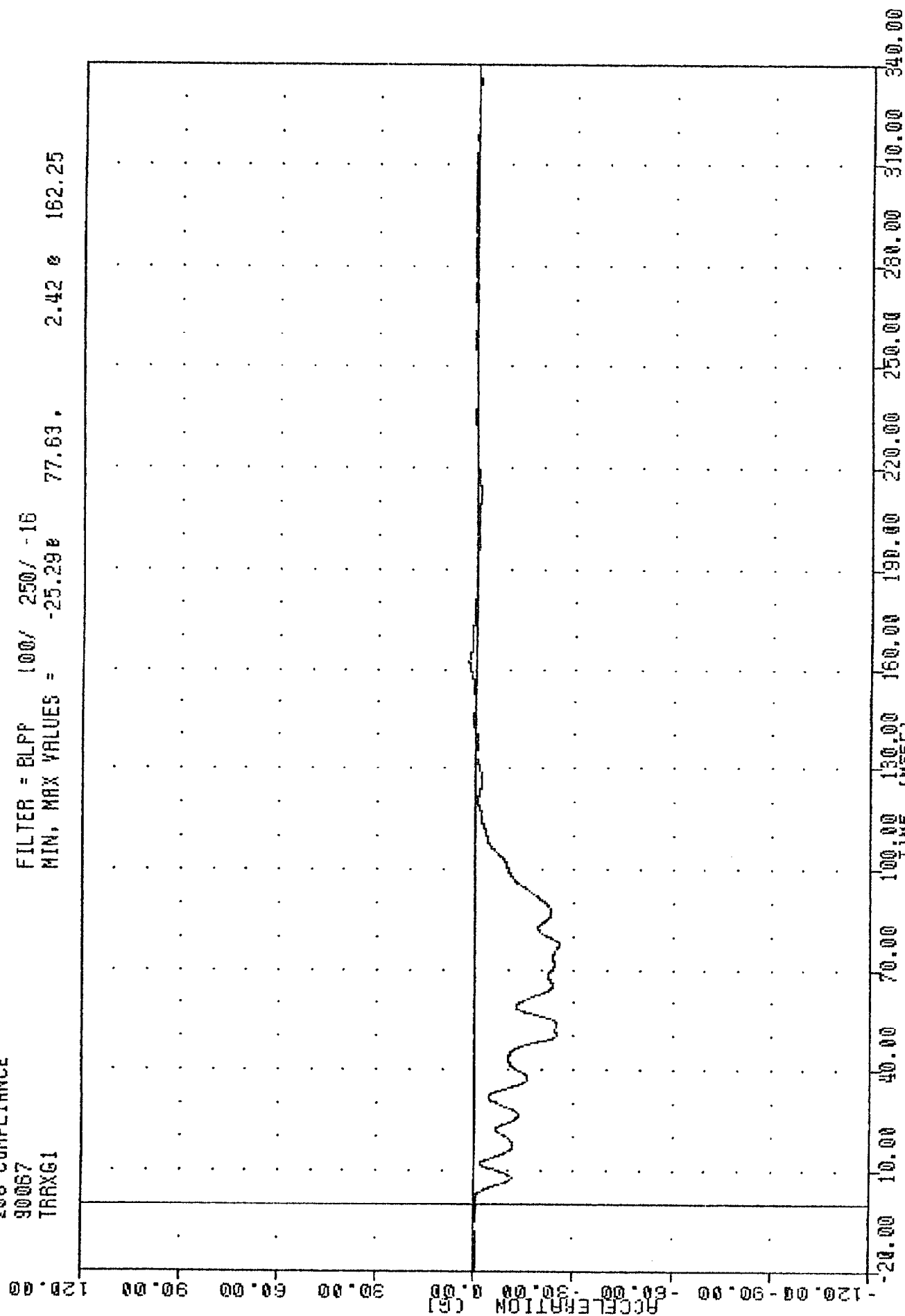
TIME (MSEC)

DODGE DYNASTY INTO FLAT FRONTAL BARRIER

LEFT REAR SEAT X AXIS ACCELERATION

TRC 900308
208 COMPLIANCE
90067
TRXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -25.29 77.63, 2.42 0 162.25



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X AXIS ACCELERATION

TRC 900308

208 COMPLIANCE

90067

ENGXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -79.028 44.00, 35.08 61.63

120.00

90.00

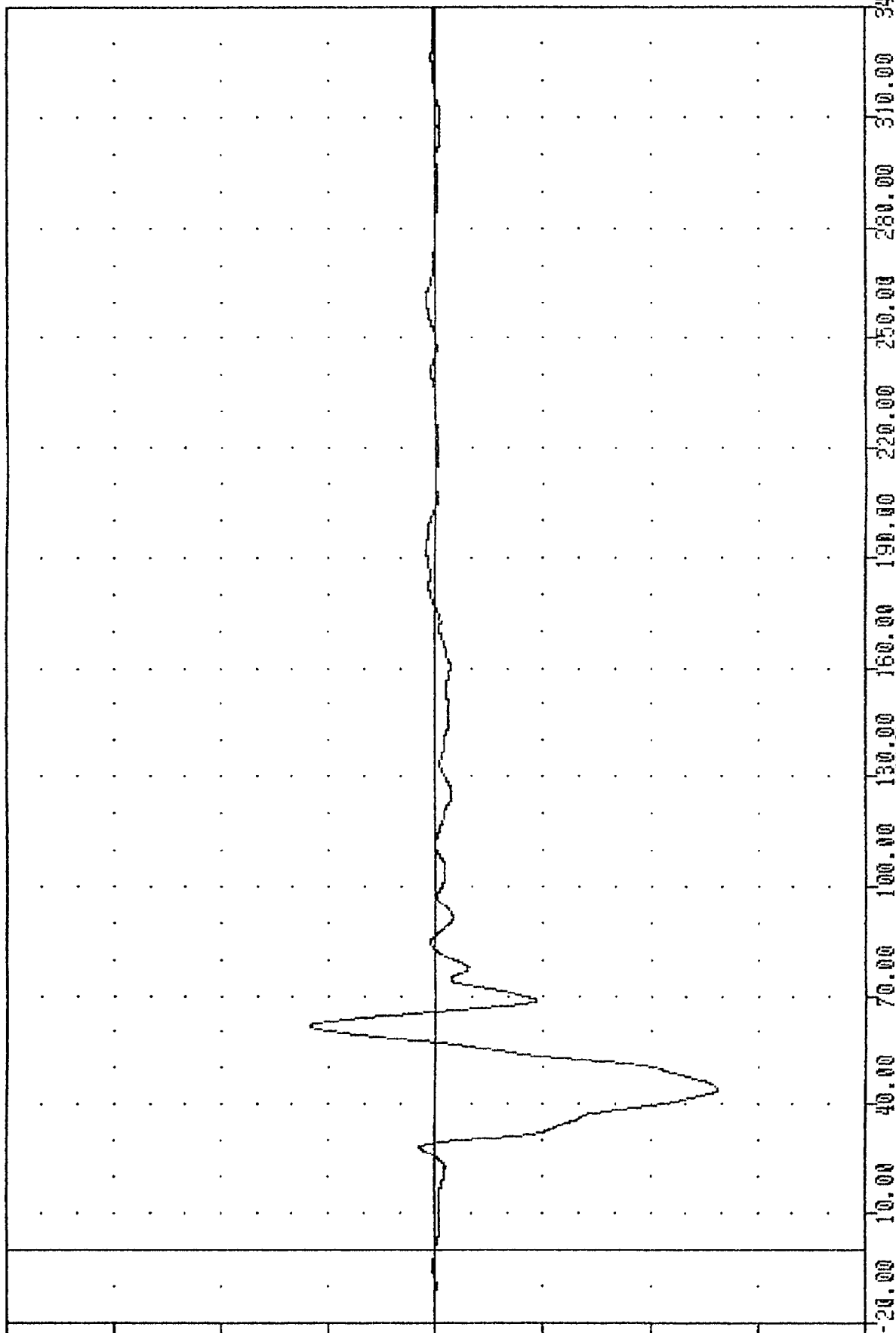
60.00

30.00

0.00

B-25

900308



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
ENGINE UPPER RIRCK Y AXIS ACCELERATION

TRC , 900308

200 COMPLIANCE

90057

ENGXG2

FILTER = BLPP 100/ 250/ :16

MIN, MAX VALUES = -106.690 45.75, 54.06 0 55.13

120.00

90.00

60.00

30.00

0.00

-30.00

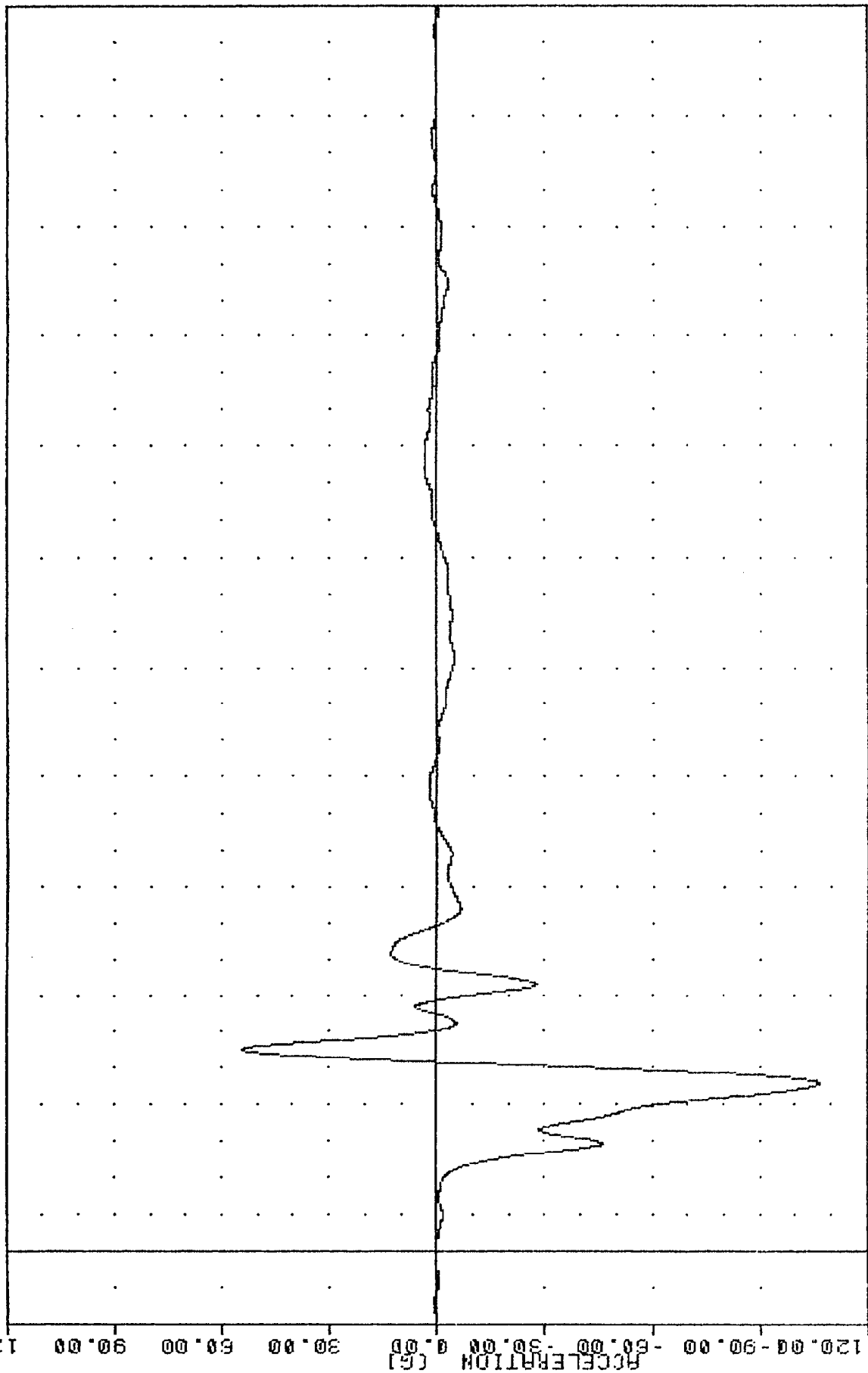
-60.00

-90.00

-120.00

B-26

900308



TIME (MSEC)

DODGE DYNASTY INTO FLAT FRONTAL BARRIER

ENGINE BOTTOM PLATE V OYTE ACCELERATION

TRC , 900308

208 COMPLIANCE

90067

BCRXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -110.11e 68.00, 40.53 e 84.00

120.00

90.00

60.00

30.00

0.00

-30.00

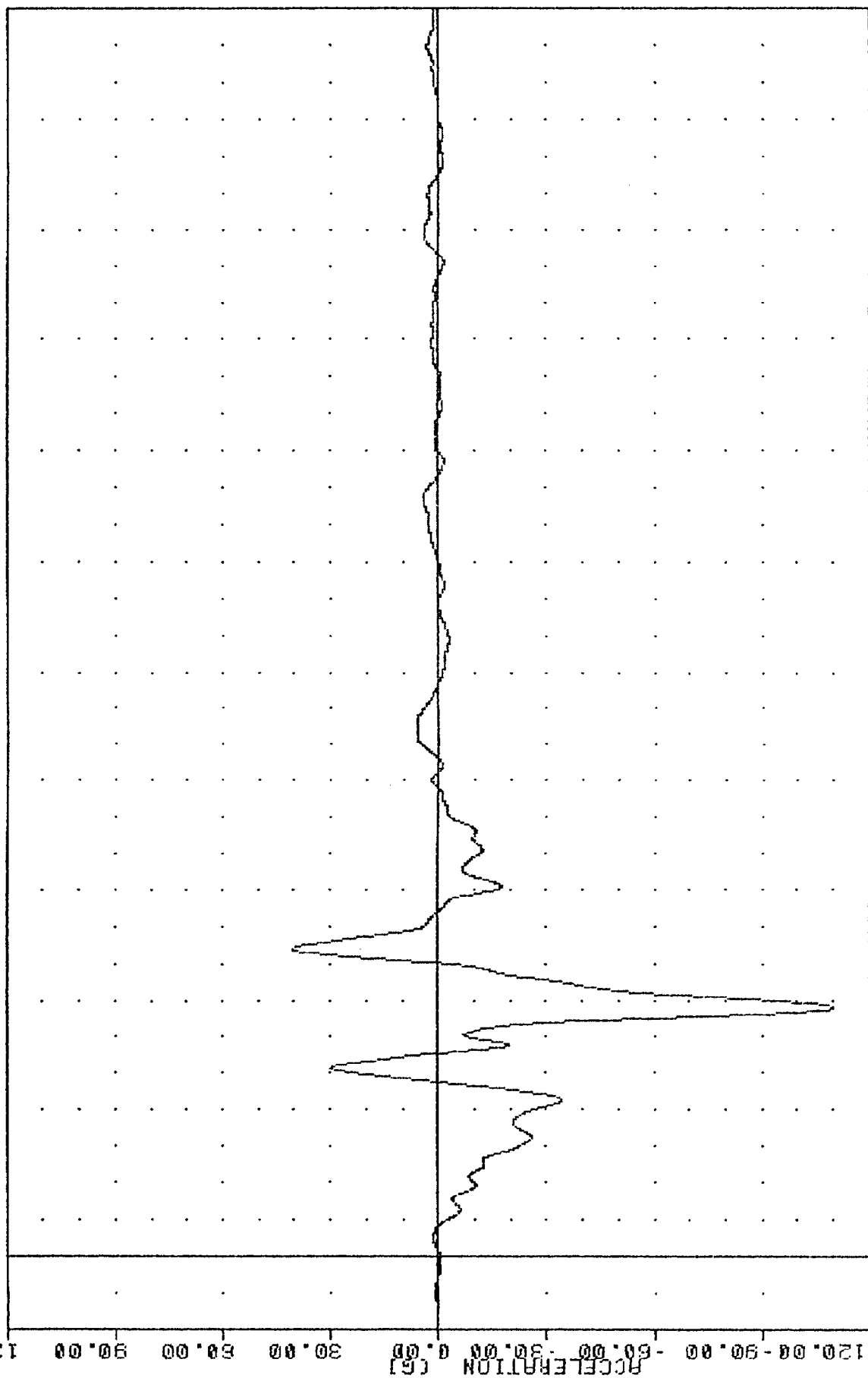
-60.00

-90.00

-120.00

B-27

900308



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
OUTPUT ABOVE CONTAINS V AND A ACCELERATION

TRC , 900308

208 COMPLIANCE

90067

BCLXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -1057.43 107.63 , 0.47 2 -5.50

120.00

90.00

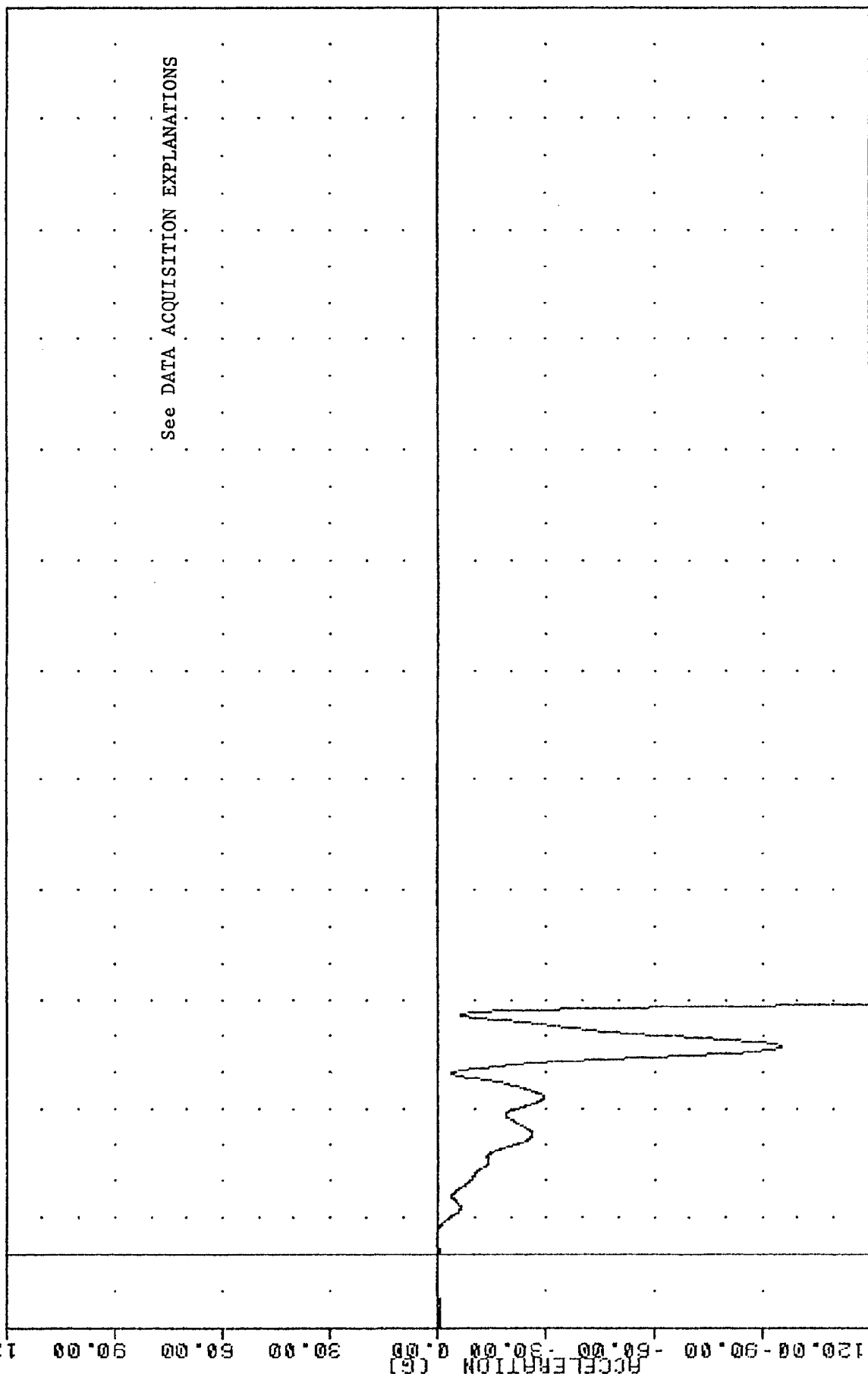
60.00

30.00

0.00

B-28

900308



DODGE DYNASTY INTO FLAT FRONTAL BARRIER
LEFT SIDE COLLISION DATA ACQUISITION

TAC , 900308

208 COMPLIANCE

90067

DPCXG1

FILTER = BLPP 100/ 250/ -16

MIN, MAX VALUES = -59.01e 60.25, 24.33 e 109.75

120.00

90.00

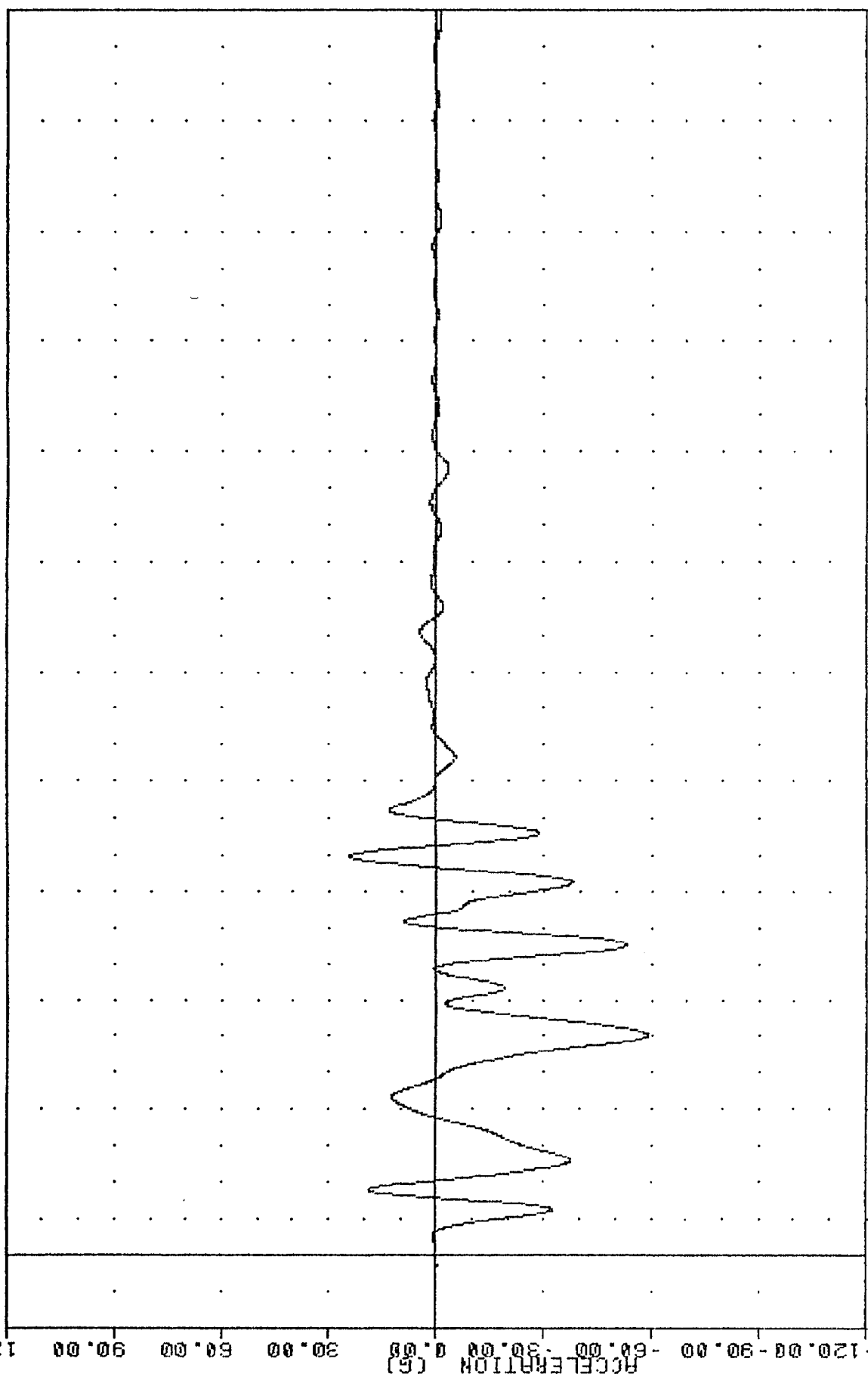
60.00

30.00

0.00

B-29

900308



DODGE DYNASTY INTO FLAT FRONTAL BARRIER

NOISE DONE! CENTERED V DIVE ACCCELERATION