

V1688

REPORT NOS. 208-TRC-92-009
212-TRC-92-009
301-TRC-92-009

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

FORD MOTOR COMPANY
1992 FORD EXPLORER
SPORT UTILITY VEHICLE
NHTSA NO. CN0209
TRC TEST NO. 920205

TRANSPORTATION RESEARCH CENTER INC.
10820 STATE ROUTE 347
EAST LIBERTY, OHIO 43319



FEBRUARY 21, 1992

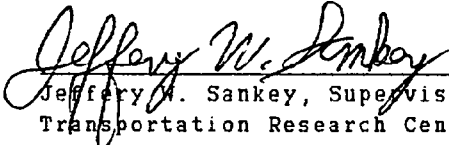
FINAL REPORT

PREPARED FOR:


U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE (NEF-31)
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This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-90-C-21003. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.


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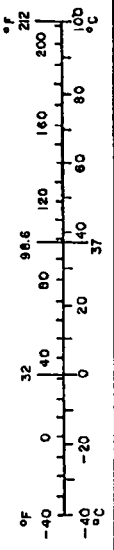
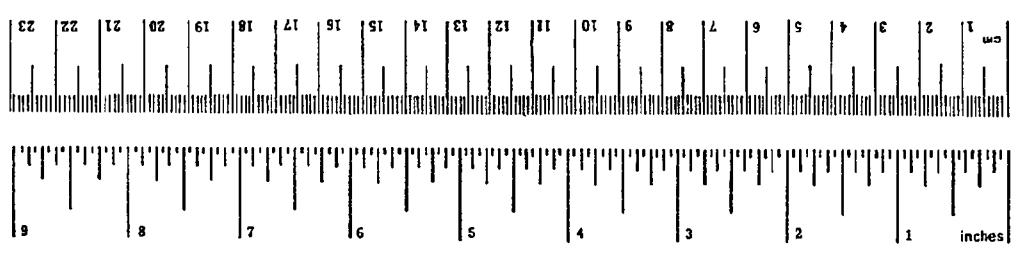
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NHTSA, Office of Vehicle Safety Compliance

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4. Title and Subtitle FINAL REPORT OF FMVSS NOS. 208, 212, 219 (PARTIAL), AND 301 COMPLIANCE TESTING OF A 1992 FORD EXPLORER SPORT UTILITY VEHICLE, NHTSA NO. CNO209				5. Report Date February 21, 1992	
7. Author(s) J. W. Sankey, Supervisor, Engineering				6. Performing Organization Code	
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, Ohio 43319				8. Performing Organization Report No. 208-TRC-92-009 212-TRC-92-009 301-TRC-92-009	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-31) 400 Seventh St., S.W., Washington, DC 20590				10. Work Unit No. (TRAIIS)	
15. Supplementary Notes				11. Contract or Grant No. DTNH22-90-C-21003	
16. Abstract <p>A 30 mph flat frontal barrier impact test was conducted on a 1992 Ford Explorer XL sport utility vehicle, NHTSA No. CNO209, at the Transportation Research Center Inc. on February 5, 1992. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards: FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; FMVSS 301, "Fuel System Integrity." The barrier impact velocity was 29.3 mph. The vehicle's maximum static crush was 13.5 inches. The ambient temperature was 68° F.</p> <p>The driver's head injury criteria (HIC) was 740. (See DATA ACQUISITION EXPLANATIONS.) The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.1 g. The driver's left and right femur maximum axial forces were 620 pounds and 427 pounds.</p> <p>The passenger's head injury criteria (HIC) was 437. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 36.3 g. The passenger's left and right femur maximum axial forces were 468 pounds and 297 pounds, respectively. (See DATA ACQUISITION EXPLANATIONS.)</p> <p>The vehicle appears to comply with the applicable requirements of FMVSS 208, 212, 219 (partial), and 301.</p>				13. Type of Report and Period Covered FINAL REPORT FEBRUARY 1992	
17. Key Words Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219P, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"				14. Sponsoring Agency Code NEF-30	
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures			Approximate Conversions from Metric Measures					
Symbol	When You Know	Multiply by	To Find	Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH								
in	inches	2.5	centimeters	cm	millimeters	0.04	inches	in
ft	feet	30	centimeters	cm	inches	0.4	inches	in
yd	yards	0.9	meters	m	feet	3.3	feet	ft
mi	miles	1.6	kilometers	km	yards	1.1	yards	yd
AREA								
in ²	square inches	6.5	square centimeters	cm ²	square centimeters	0.16	square inches	in ²
ft ²	square feet	0.09	square meters	m ²	square meters	1.2	square yards	yd ²
yd ²	square yards	0.8	square meters	m ²	square kilometers	0.4	square miles	mi ²
mi ²	square miles	2.6	square kilometers	km ²	hectares (10,000 m ²)	2.5	acres	ac
MASS (weight)								
oz	ounces	28	grams	g	grams	0.035	ounces	oz
lb	pounds (2000 lb)	0.46	kilograms	kg	pounds	2.2	pounds	lb
VOLUME								
tsp	teaspoons	5	milliliters	ml	milliliters	0.03	fluid ounces	fl oz
Tbsp	tablespoons	15	milliliters	ml	liters	2.1	pints	pt
fl oz	fluid ounces	30	milliliters	ml	liters	1.06	quarts	qt
c	cups	0.24	liters	l	liters	0.26	gallons	gal
pt	pints	0.47	liters	l	cubic meters	35	cubic feet	ft ³
qt	quarts	0.96	liters	l	cubic meters	1.3	cubic yards	yd ³
gal	gallons	3.8	liters	l	TEMPERATURE (exact)			
ft ³	cubic feet	0.03	cubic meters	m ³				
yd ³	cubic yards	0.76	cubic meters	m ³	°C	9/5 (then add 32)		°F



*1. N. P. 2.54 (exact). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C-1310286.

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1.0	PURPOSE AND TEST PROCEDURE	1-1
2.0	FRONTAL BARRIER IMPACT TEST SUMMARY	2-1
3.0	FMVSS 208, 212, 219 (PARTIAL) & 301 DATA	3-1
4.0	VEHICLE, OCCUPANT, & CAMERA MEASUREMENTS	4-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	DATA PLOTS	B-1

LIST OF TABLES

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1	CRASH TEST SUMMARY	2-4
2	TEST VEHICLE INFORMATION	2-5
3	POST-IMPACT DATA	2-8
4	VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY	2-12
5	DUMMY INJURY CRITERIA	3-2
6	POST-IMPACT DUMMY/VEHICLE DATA	3-3
7	FMVSS 208 COMFORT AND CONVENIENCE DATA FOR MANUAL SEAT BELTS	3-5
8	FMVSS 208 SEAT BELT WARNING SYSTEM DATA	3-7
9	FMVSS 208 LABELING AND DRIVER'S MANUAL DATA	3-8
10	FMVSS 208 READINESS INDICATOR DATA	3-9
11	FUEL SYSTEM DATA	3-12
12	FMVSS 301 POST-IMPACT TEST DATA	3-13
13	IMPACTED VEHICLE MEASUREMENTS	4-3
14	MOTION PICTURE CAMERA LOCATIONS	4-11

LIST OF FIGURES

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1	IMPACT VELOCITY MEASUREMENT SYSTEM	2-9
2	ACCIDENT INVESTIGATION DIVISION DATA FOR 30 MPH FRONTAL BARRIER IMPACT	2-10
3	VEHICLE ACCELEROMETER PLACEMENT	2-11
4	FMVSS 212 TEST DATA	3-10
5	FMVSS 219 TEST DATA	3-11
6	FMVSS 301 STATIC ROLLOVER TEST DATA	3-14
7	PRE-TEST AND POST-TEST MEASUREMENT POINTS	4-2
8	VEHICLE TARGET LOCATIONS	4-4
9	DUMMY AND SEAT POSITIONING DATA	4-5
10	DUMMY IN-VEHICLE POSITIONING DATA	4-6
11	SEAT BELT POSITIONING DATA	4-7
12	DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY DATA	4-8
13	CAMERA POSITIONS	4-9

LIST OF PHOTOGRAPHS

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
A-1.	PRE-TEST FRONT VIEW	A-2
A-2.	POST-TEST FRONT VIEW	A-3
A-3.	PRE-TEST LEFT SIDE VIEW	A-4
A-4.	POST-TEST LEFT SIDE VIEW	A-5
A-5.	PRE-TEST REAR VIEW	A-6
A-6.	POST-TEST REAR VIEW	A-7
A-7.	PRE-TEST RIGHT SIDE VIEW	A-8
A-8.	POST-TEST RIGHT SIDE VIEW	A-9
A-9.	PRE-TEST RIGHT FRONT THREE-QUARTER VIEW	A-10
A-10.	POST-TEST RIGHT FRONT THREE-QUARTER VIEW	A-11
A-11.	PRE-TEST LEFT REAR THREE-QUARTER VIEW	A-12
A-12.	POST-TEST LEFT REAR THREE-QUARTER VIEW	A-13
A-13.	PRE-TEST WINDSHIELD VIEW	A-14
A-14.	POST-TEST WINDSHIELD VIEW	A-15
A-15.	PRE-TEST ENGINE COMPARTMENT VIEW	A-16
A-16.	POST-TEST ENGINE COMPARTMENT VIEW	A-17
A-17.	PRE-TEST FUEL FILLER CAP VIEW	A-18
A-18.	POST-TEST FUEL FILLER CAP VIEW	A-19
A-19.	PRE-TEST FUEL FILLER NECK VIEW	A-20
A-20.	POST-TEST FUEL FILLER NECK VIEW	A-21
A-21.	PRE-TEST FUEL TANK VIEW	A-22
A-22.	POST-TEST FUEL TANK VIEW	A-23
A-23.	PRE-TEST FRONT UNDERBODY VIEW	A-24
A-24.	POST-TEST FRONT UNDERBODY VIEW	A-25
A-25.	PRE-TEST REAR UNDERBODY VIEW	A-26
A-26.	POST-TEST REAR UNDERBODY VIEW	A-27
A-27.	PRE-TEST DRIVER DUMMY POSITION VIEW	A-28
A-28.	POST-TEST DRIVER DUMMY POSITION VIEW	A-29
A-29.	PRE-TEST PASSENGER DUMMY POSITION VIEW	A-30
A-30.	POST-TEST PASSENGER DUMMY POSITION VIEW	A-31
A-31.	PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1	A-32
A-32.	POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1	A-33

LIST OF PHOTOGRAPHS, CONT'D.

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
A-33.	PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2	A-34
A-34.	POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2	A-35
A-35.	PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1	A-36
A-36.	POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1	A-37
A-37.	PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2	A-38
A-38.	POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2	A-39
A-39.	POST-TEST DRIVER DUMMY HEAD CONTACT VIEW	A-40
A-40.	POST-TEST DRIVER DUMMY HEAD AND CONTACT VIEW	A-41
A-41.	POST-TEST DRIVER DUMMY KNEE CONTACT VIEW	A-42
A-42.	POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW	A-43
A-43.	POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1	A-44
A-44.	POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2	A-45
A-45.	PRE-TEST VEHICLE CERTIFICATION LABEL AND RECOMMENDED TIRE PRESSURE LABEL VIEW	A-46
A-46.	POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW	A-47

SECTION 1.0

PURPOSE & TEST PROCEDURE

PURPOSE

This 30 mph flat 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. DTNH22-90-C-21003. The purpose of this test was to determine if the subject vehicle, a 1992 Ford Explorer sport utility vehicle, NHTSA No. CN0209, 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," in the flat frontal barrier impact mode.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-08. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations. The vehicle's specified impact velocity range was 28.9 to 29.9 mph. The vehicle impacted a flat frontal barrier.

The test vehicle contained two (2) Part 572 B 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendices B and C of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations; and with left and right femur load cells to measure axial forces.

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

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 208, 212, 219 (partial) and 301 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots.

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This flat frontal barrier test was conducted at TRC on February 5, 1992.

The test vehicle, a 1992 Ford Explorer sport utility vehicle, NHTSA No. CN0209, appeared to comply with the performance requirements of FMVSS 208, 212, 219 (partial), and 301 in the flat frontal barrier impact mode. The Head Injury Criteria (HIC) calculations were less than 1000, the chest resultant accelerations did not exceed 60 g's, and the axial forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 B dummies seated in the front outboard designated seating positions. The vehicle's restraint system met the applicable comfort and convenience requirements. The windshield periphery retention was 100 percent. There was no penetration into any portion of the windshield. No fluid spilled from the vehicle's fuel system following the impact or during the static rollover test.

The test vehicle was equipped with a 4.0 liter, inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 4690 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 13.5 inches.

The driver's head injury criteria (HIC) was 740. (See DATA ACQUISITION EXPLANATIONS.) The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.1 g. The driver's left and right femur maximum axial forces were 620 pounds and 427 pounds, respectively.

The right front passenger's HIC was 437. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 36.3 g. The right front passenger's left and right femur maximum axial forces were 468 pounds and 297 pounds, respectively. (See DATA ACQUISITION EXPLANATIONS.)

There was no loss of windshield periphery retention.

There was no intrusion through the windshield.

No fluid spilled from the vehicle's fuel system following the crash test event or during the static rollover test.

DATA ACQUISITION EXPLANATIONS

Questionable data spikes were recorded by the following data channels:

HEDXG1, driver's head X-axis acceleration, spike at 219 milliseconds

HEDYG1, driver's head Y-axis acceleration, spike at 96 milliseconds

HEDZG1, driver's head Z-axis acceleration, spikes at 87, 96, 99, 156,
and 219 milliseconds

HEDXG2, right front passenger's head X-axis acceleration, spikes at 20,
115, and 160 milliseconds

HEDYG2, right front passenger's head Y-axis acceleration, spikes at 156
and 219 milliseconds

HEDZG2, right front passenger's head Z-axis acceleration, spikes at 156
and 219 milliseconds

CSTXG2, right front passenger's chest X-axis acceleration, spikes at
156 and 219 milliseconds

CSTZG2, right front passenger's chest Z-axis acceleraton, spikes at 156
and 219 milliseconds

LFMF2, right front passenger's left femur force, spikes at 156 and 219
milliseconds

RFMF2, right front passenger's right femur force, spikes at 156 and 219
milliseconds

The driver's and right front passenger's head resultant acceleration, driver's Head Injury Criteria, and right front passenger's chest resultant acceleration calculations were affected by these data spikes.

The engine top X-axis accelerometer, ENGXG1, lost data after 12 milliseconds due to the vehicle's crush cutting the accelerometer cable.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: CN0209 TEST TYPE: Frontal Barrier Impact

TEST DATE: 02/05/92 TEST TIME: 1349 AMBIENT TEMP. (°F): 68

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1992/Ford/Explorer/Sport Utility Veh.

VEHICLE TEST WEIGHT (LBS): 4690

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 29.3 SECONDARY = 29.4

MAXIMUM STATIC CRUSH (IN): 13.5

AVERAGE REBOUND (IN): 12.1

DUMMIES: Driver #353 Passenger #354

TYPE: Part 572 B Part 572 B

LOCATION: Left front Right front

RESTRAINT: Three-point unbelt Three-point unbelt

NUMBER OF DATA CHANNELS: 23

NUMBER OF 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: Ford Motor Company

MAKE/MODEL: Ford/Explorer

VIN: 1FMDU34X8NUB65529

BODY STYLE: Sport Utility Vehicle

MODEL YEAR: 1992

NHTSA NO.: CN0209

COLOR: Green

ENGINE DATA: TYPE: inline CYLINDERS: 6 DISPLACEMENT: 4.0 liter

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

DATE VEHICLE RECEIVED: 01/30/92

ODOMETER READING: 79.0

DEALER'S NAME AND ADDRESS: Graham Ford
707 West Broad Street
Columbus, OH 43216

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
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

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Ford Motor Company

DATE OF MANUFACTURE: 12/91

VIN: 1FMDU34X8NUB65529

GVWR: 5280 LBS

GAWR: FRONT: 2540 LBS., REAR: 3000 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Firestone FR480 P225/70R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 35 PSI
REAR: 35 PSI

SPARE TIRE (MFR., LINE, SIZE): Firestone FR480 P225/70R15

TYPE OF SEATS: FRONT: Split Bench
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually Adjustable

MAXIMUM WIDTH: 70.9 INCHES

WHEELBASE: 112.0 INCHES

LOCATION OF LABEL STATING TIRE DATA: THE LABEL WAS LOCATED ON THE DRIVER'S DOOR

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P225/70R15SL

RECOMMENDED COLD TIRE PRESSURE: FRONT: 30 PSI; REAR: 35 PSI

DESIGNATED SEATING CAPACITY: NA FRONT NA REAR NA TOTAL *

VEHICLE CAPACITY WEIGHT: NA LBS *

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE:	LF	31.8;	RF	32.3;	LR	32.0;	RR	32.2
FULLY LOADED ATTITUDE:	LF	31.9;	RF	32.0;	LR	31.1;	RR	31.1
PRE-TEST ATTITUDE:	LF	32.0;	RF	32.1;	LR	30.8;	RR	30.8
POST-TEST ATTITUDE:	LF	31.4;	RF	29.6;	LR	31.2;	RR	30.5

*The vehicle did not contain a label stating capacity data.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	1161 LBS.	RIGHT REAR	956 LBS.
LEFT FRONT	1059 LBS.	LEFT REAR	976 LBS.
TOTAL FRONT WEIGHT	2220 LBS.	(53.5% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1932 LBS.	(46.5% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 4152 LBS.			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

CLW = RATED CARGO AND LUGGAGE WEIGHT*

GVWR = GROSS VEHICLE WEIGHT RATING (5280 LBS)

UDW = UNLOADED DELIVERED WEIGHT (4152 LBS)

VCW = VEHICLE CAPACITY WEIGHT = GVWR - UDW = 5280 - 4152 = 1128

DSC = DESIGNATED SEATING CAPACITY (6) **

CLW* = VCW - 150 (DSC) = 1128 - 150 (6) = 228 LBS.

TARGET TEST WEIGHT = UDW + CLW** (NO. OF HYBRID II DUMMIES X 164 LBS/DUMMY)

TARGET TEST WEIGHT = 4152 + 228 + 328

TARGET TEST WEIGHT = 4708 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 210 LBS. OF CARGO WEIGHT:

RIGHT FRONT	1138 LBS.	RIGHT REAR	1190 LBS.
LEFT FRONT	1179 LBS.	LEFT REAR	1183 LBS.
TOTAL FRONT WEIGHT	2317 LBS.	(49.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	2373 LBS.	(50.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	4690 LBS.	(0.4% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 150 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 56.7 INCHES REARWARD OF FRONT WHEEL CENTERLINE

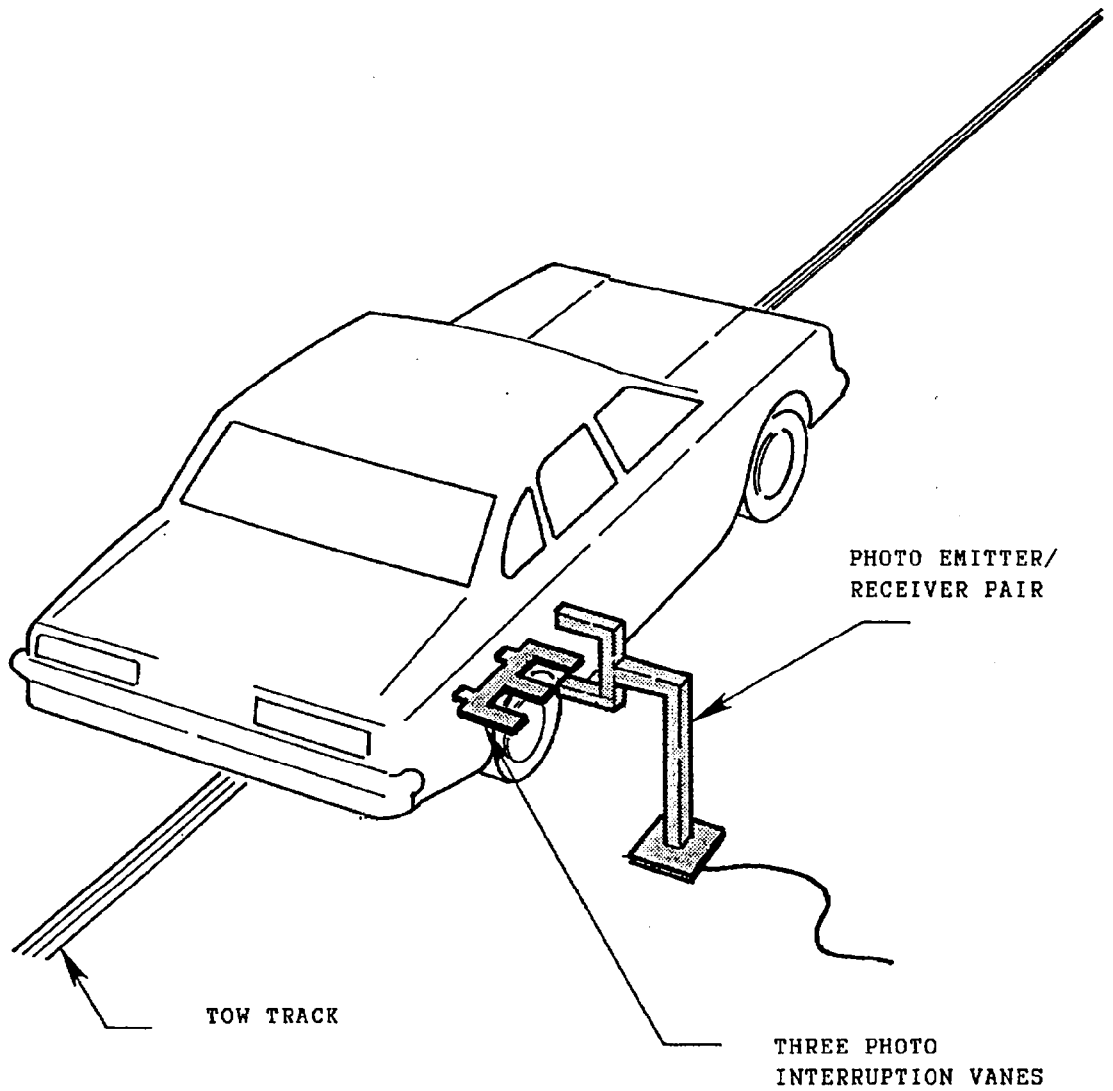
*Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 300 pounds, whichever is less.

**The designated seating capacity is determined by counting the number of seat belts installed in the vehicle.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 920205 NHTSA NO.: CN0209
TEST DATE: 02/05/92 TEST TIME: 1349
TEST TYPE: Frontal Barrier Impact IMPACT ANGLE: 0
AMBIENT TEMPERATURE AT IMPACT AREA: 68° F
TEMPERATURE IN OCCUPANT COMPARTMENT: 72° F
IMPACT VELOCITY: PRIMARY = 29.3 MPH SECONDARY = 29.4 MPH
(SPECIFIED RANGE = 28.9 TO 29.9 MPH)
DISTANCE FROM VEHICLE TO BARRIER: ENTERING VELOCITY TRAP = 26.0 IN.
EXITING VELOCITY TRAP = 2.0 IN.
TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN INCHES):
OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 182.9; C 184.8; R 182.9
POST-TEST: L 171.9; C 171.3; R 171.8
TOTAL CRUSH: L 11.0; C 13.5; R 11.1
AVERAGE CRUSH: 11.9
TEST VEHICLE REBOUND FROM FLAT BARRIER (ALL MEASUREMENTS ARE IN INCHES):
DISTANCE FROM TEST VEHICLE TO BARRIER: L 12.2; C 13.1; R 11.1; AVG. 12.1

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



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

The vanes have one foot spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Ford/Explorer/Sport Utility Vehicle
 VEHICLE NHTSA NO.: CN0209 ; VIN: 1FMDU34X8NUB65529
 MODEL YEAR: 1992 ; BUILD DATE: 12/91 ; TEST DATE: 02/05/92
 VEHICLE SIZE CATEGORY: Special Purpose ; TEST WEIGHT: 4690 LBS.
 VEHICLE WHEELBASE: 112.0 INCHES
 MAXIMUM WIDTH: 70.9 INCHES
 FRONT OVERHANG: 30.2 INCHES

COLLISION DEFORMATION
 CLASSIFICATION (CDC) CODE: 12FDEW2

CRUSH DEPTH
 MEASUREMENTS:

C1 =	<u>11.0</u>	INCHES
C2 =	<u>12.9</u>	INCHES
C3 =	<u>13.5</u>	INCHES
C4 =	<u>13.3</u>	INCHES
C5 =	<u>12.7</u>	INCHES
C6 =	<u>11.1</u>	INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE (LONGITUDINAL)

LENGTH OF DAMAGED
 REGION: L = 60.0 INCHES

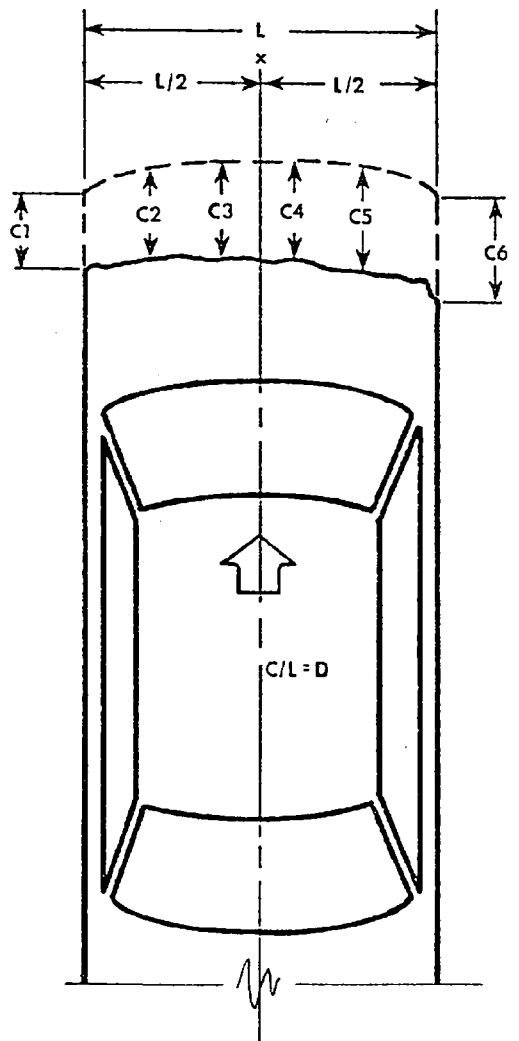
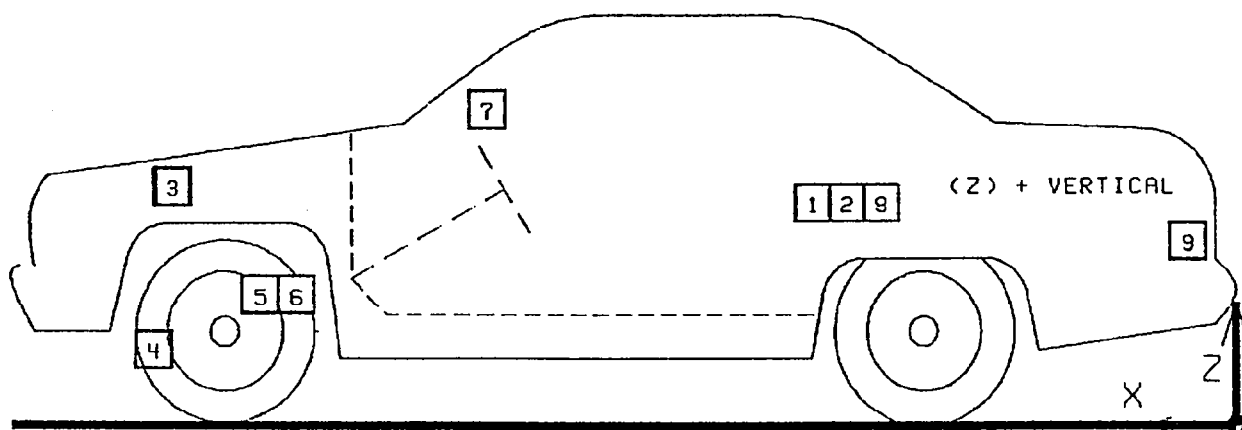


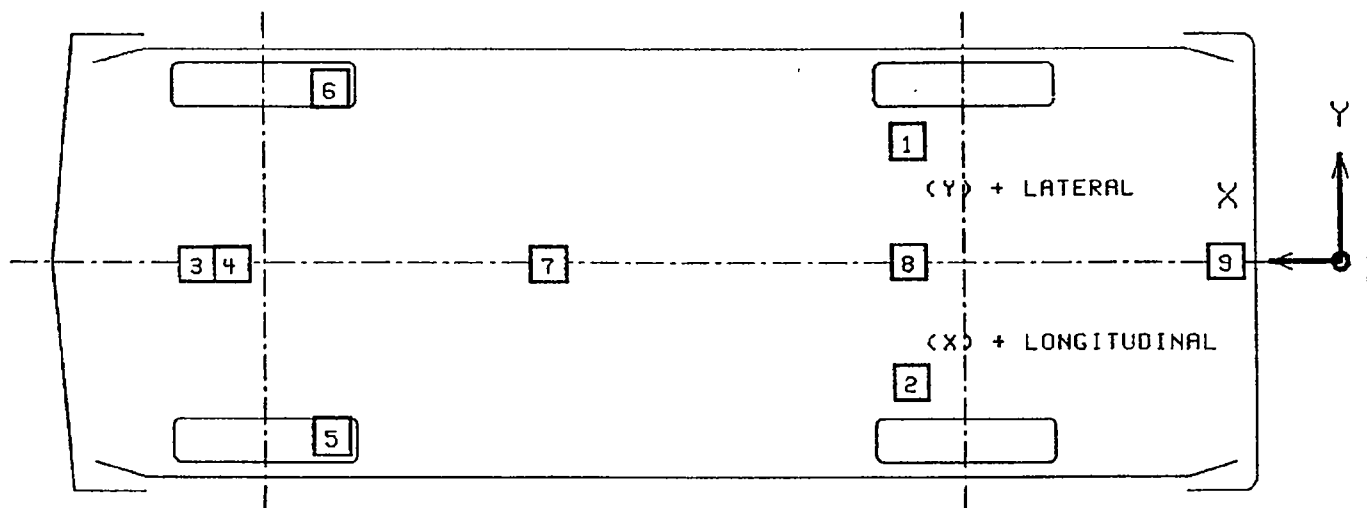
FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



(X) + LONGITUDINAL

SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 920205

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
						MAX G	MSEC	MAX G	MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	62.6	22.8	23.2				
		POST	63.1	22.8	23.9	1.4	110.0	37.8	11.4
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	61.6	-22.5	23.2				
		POST	62.1	-22.5	23.5	1.7	119.9	37.3	12.9
3	ENGINE TOP LONGITUDINAL	PRE	151.2	4.2	42.2				
		POST	146.1	5.0	43.0	---	---Y	---	---Y
4	ENGINE BOTTOM LONGITUDINAL	PRE	146.8	0.0	14.5				
		POST	148.2	0.5	15.0	3.8	161.8	53.0	27.9
5	RIGHT BRAKE CALIPER LONGITUDINAL	PRE	149.2	-24.0	13.3				
		POST	149.1	-24.4	12.5	12.8	72.0	58.9	13.9
6	LEFT BRAKE CALIPER LONGITUDINAL	PRE	149.5	24.0	12.9				
		POST	148.8	24.4	12.5	31.1	68.4	60.5	21.4
7	INSTRUMENT PANEL CENTER LONGITUDINAL	PRE	130.5	3.2	49.0				
		POST	130.7	3.2	47.1	16.9	107.1	71.8	21.0

* 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

REPORT OF VEHICLE CONDITION AT THE
COMPLETION OF TESTING

CONTRACT NO.: DTNH22-90-C-21003
FROM: Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319

TO: Mr. Charles Case
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.: CNO209
MAKE/MODEL/BODY STYLE: Ford/Explorer/Sport Utility Vehicle
MODEL YEAR: 1992 BODY COLOR: Green
VIN: 1FMDU34X8NUB65529
ODOMETER (ARRIVAL): 79 DATE: 01/30/92
ODOMETER (COMPLETION): 81 DATE: 02/05/92
COST: \$18,373.30

<input checked="" type="checkbox"/> AIR CONDITIONER	<input type="checkbox"/> CONSOLE	BRAKES: <input checked="" type="checkbox"/> POWER
<input checked="" type="checkbox"/> TINTED GLASS	<input type="checkbox"/> TACHOMETER	FRONT: Disc
<input checked="" type="checkbox"/> POWER STEERING	<input type="checkbox"/> SPEED CONTROL	REAR: Drum
<input type="checkbox"/> POWER WINDOWS	<input checked="" type="checkbox"/> REAR WINDOW DEF.	
<input type="checkbox"/> POWER DOOR LOCKS	<input type="checkbox"/> SUN/MOON ROOF	FRONT SEATS: <input type="checkbox"/> POWER
<input checked="" type="checkbox"/> RADIO	<input type="checkbox"/> T-TOP	SEAT TYPE: Split
<input checked="" type="checkbox"/> CLOCK	<input type="checkbox"/> TILT STEERING WHEEL	NO. OF SEATS: 2
<input type="checkbox"/> ROOF RACK	<input checked="" type="checkbox"/> OTHER OPTIONS: _____	

ENGINE: 6 CYLINDERS; 4.0 LITERS
TRANSMISSION: Automatic; DRIVE TYPE: 4 Wheel
TIRE SIZE: P225/70R15
GASOLINE TYPE: Unleaded

EQUIPMENT THAT IS NO LONGER ON THE VEHICLE AS NOTED ABOVE: None

EXPLANATION: NA

VEHICLE CONDITION: This vehicle has been subjected to a 30 mph frontal
barrier impact.

SECTION 3.0

FMVSS 208, 212, 219 (partial), & 301 DATA

TABLE 5 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION (G)

	HEAD				CHEST			
	X	Y	Z	R	X	Y	Z	R*
DRIVER	-88.7Y	21.8Y	-67.1Y	119.8Y	-47.5	5.3	-10.7	43.1
PASSENGER	-35.4Y	-8.8Y	-54.8Y	-57.7Y	-40.0Y	-11.0	10.3Y	36.3

MAXIMUM FEMUR COMPRESSIVE FORCE (LBS)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	620	427
PASSENGER	468Y	297Y

HEAD INJURY CRITERIA**

	HIC	TIME t ₁ (MSEC) ¹	TIME t ₂ (MSEC) ²
DRIVER	740Y	71.5	96.0
PASSENGER	437	69.2	105.2

*Defined as exceeding 0.003 sec. duration

**As defined in FMVSS No. 208

Y See DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #353	PASSENGER #354
HEAD	<u>Steering wheel upper rim and hub</u>	<u>Chest</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 entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

None

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 forward impacting the steering wheel's hub and upper rim. The dummy's torso was restrained by the three-point unbelt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated in the driver's seat, restrained by the three-point unbelt.

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 torso was restrained by the three-point unbelt. The dummy's head rotated rearward into the head restraint 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.

TABLE 7 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS

MAKE/MODEL: Ford/Explorer VIN: 1FMDU34X8NUB65529
BODY STYLE: Sport Utility Vehicle NHTSA NO.: CN0209
DATE OF MANUFACTURE: 12/91

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITION SEAT BELTS HAVE WEBBING TENSION - RELIEVING DEVICES?(check one): NO

BELT CONTACT FORCE:

BELT CONTACT FORCE ON CHEST OF TEST DUMMY: .1 POUNDS

LATCHPLATE ACCESS:

ARE THE SEAT BELT LATCHPLATES, IN THEIR NORMAL STOWED POSITION, WITHIN THE REACH ENVELOPE? YES

DOES THE CLEARANCE TEST BLOCK MOVE UNHINDERED TO THE LATCHPLATE OR BUCKLE? YES

RETRACTION:

SEAT BELT AUTOMATICALLY RETRACTS WHEN

(check one): _____ The adjacent vehicle door is open and the seat belt latchplate is released.

X The seat belt latchplate is released.

ARE THE STOWED SEAT BELT WEBBING AND HARDWARE PINCHED WHEN THE DOOR IS CLOSED? NO

ACCESSIBILITY:

IS THE SEAT CUSHION REMOVABLE SO THE SEAT BACK SERVES A FUNCTION OTHER THAN SEATING? NO

IS THE SEAT REMOVABLE? NO

TABLE 7 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS, CONT'D

MAKE/MODEL: Ford/Explorer VIN: 1FMDU34X8NUB65529
BODY STYLE: Sport Utility Vehicle NHTSA NO.: CN0209
DATE OF MANUFACTURE: 12/91

ACCESSIBILITY, CONT'D:

IS THE SEAT MOVABLE SO THE SPACE FORMERLY OCCUPIED BY THE SEAT CAN BE
USED FOR A SECONDARY FUNCTION? NO

NOTE: IF ANY OF THE ABOVE ANSWERS ARE "YES", THE ACCESSIBILITY
REQUIREMENTS DO NOT APPLY.

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?

Not Applicable, the webbing is not designed to pass through the seat
cushion or between the cushion and seat back.

ARE THE REMAINING TWO PARTS ACCESSIBLE UNDER NORMAL CONDITIONS?

Not Applicable, the webbing is not designed to pass through the seat
cushion or between the cushion and seat back.

DO THE LATCHPLATE AND BUCKLE PASS THROUGH THE GUIDES PROVIDED AND FALL
BEHIND THE SEAT WHEN THE BELT IS COMPLETELY RETRACTED (OR DETACHED IF
NOT RETRACTABLE); 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?

Not Applicable, the restraint system does not provide guides.

IS THE INBOARD RECEPTACLE END OF THE OUTBOARD SEATING POSITION'S SEAT
BELT ACCESSIBLE WITH THE CENTER ARM REST IN ANY POSITION TO WHICH IT CAN
BE ADJUSTED WITHOUT MOVING THE ARM REST FOR ACCESS?

Not Applicable, the vehicle does not contain a center arm rest.

TABLE 8 FMVSS 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 = 7 sec.

Duration of reminder light operation = 7 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

 X Symbol 101-80

 Other: _____

TABLE 9 FMVSS 208 LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER'S MAINTENANCE OR
REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTON SYSTEM:

Not Applicable, vehicle did not contain a crash-deployed occupant protection
system.

TABLE 10 FMVSS 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.

Not applicable, vehicle did not contain a crash-deployed occupant protection system.

FIGURE 4 FMVSS 212 TEST DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

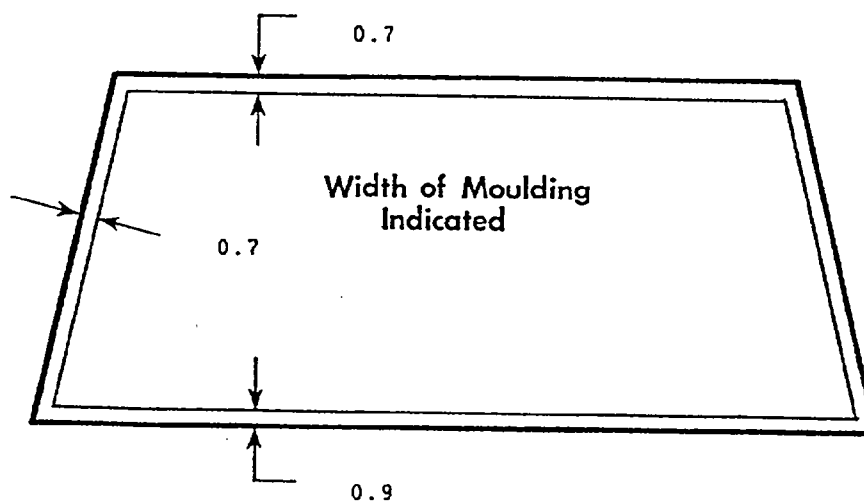
Plastic trim around outer perimeter, adhesive around inner perimeter.

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.

WINDSHIELD PERIPHERY MEASUREMENTS:

	PRE-TEST	POST-TEST	PERCENT RETENTION
RIGHT SIDE	80.8	80.8	100
LEFT SIDE	80.8	80.8	100
TOTAL	161.6	161.6	100

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 72° F



FRONT VIEW OF WINDSHIELD*

LOSS OF WINDSHIELD RETENTION LENGTHS: None

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

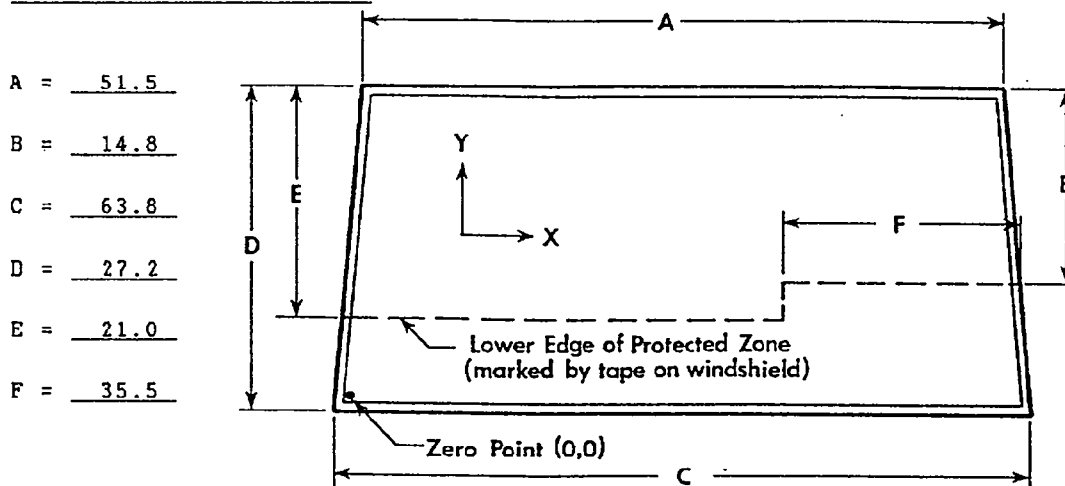
*INDICATE AREAS OF LOSS OF RETENTION, IF ANY, ON WINDSHIELD DIAGRAM.

FIGURE 5 FMVSS 219 TEST DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5 inch diameter 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 0.5 inch 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.

WINDSHIELD MEASUREMENTS:



- A = 51.5
- B = 14.8
- C = 63.8
- D = 27.2
- E = 21.0
- F = 35.5

FRONT VIEW

METHOD OF ADHERING PROTECTED ZONE TEMPLATE TO WINDSHIELD: NA

AREAS OF WINDSHIELD TEMPLATE PENETRATION GREATER THAN 0.25 IN.: NA

	COORDINATES	
	X	Y
1.		
2.		
3.		

AREAS OF WINDSHIELD PENETRATION, BELOW THE PROTECTED ZONE, THROUGH THE INNER SURFACE OF THE WINDSHIELD: None

- 1.
- 2.
- 3.

ALL MEASUREMENTS ARE IN INCHES.

TABLE 11 FUEL SYSTEM DATA

MAKE/MODEL: Ford/Explorer

NHTSA NO.: CN0209

FUEL SYSTEM CAPACITY: 19.3 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 19.3 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 17.8 GALLONS TO 18.1 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 18.0 GALLONS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

TEST FLUID COLOR: PURPLE

DETAILS OF FUEL SYSTEM: The fuel tank was located in front of the rear axle on the left side. The fuel filler neck was located on the left side and entered the rear of the tank. The fuel lines ran along the left frame rail to the front.

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

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

TABLE 12 FMVSS 301 POST-IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: CN0209; TEST DATE: 02/05/92
VEHICLE MAKE/MODEL/BODY STYLE: Ford/Explorer/Sport Utility Vehicle

TEST REQUIREMENTS:

Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable 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 SYSTEM FLUID SPILLAGE MEASUREMENTS:

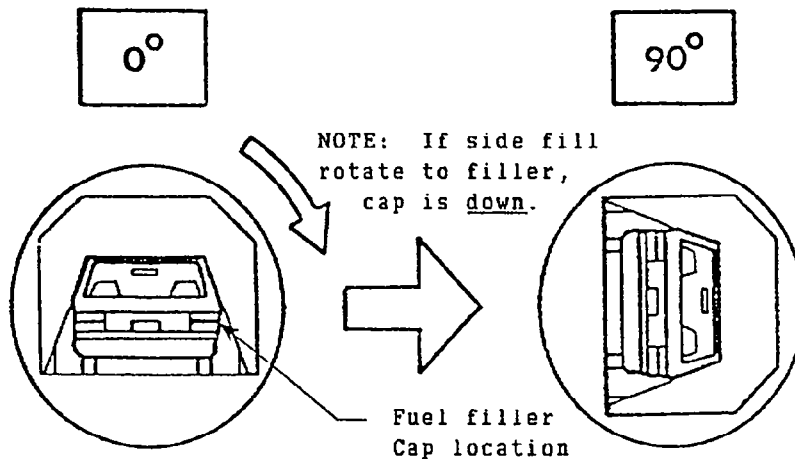
	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 OZ.	1 OZ.
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 OZ.	5 OZ.
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - -	0 OZ.	1 OZ./1 MIN.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: CN0209
 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

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

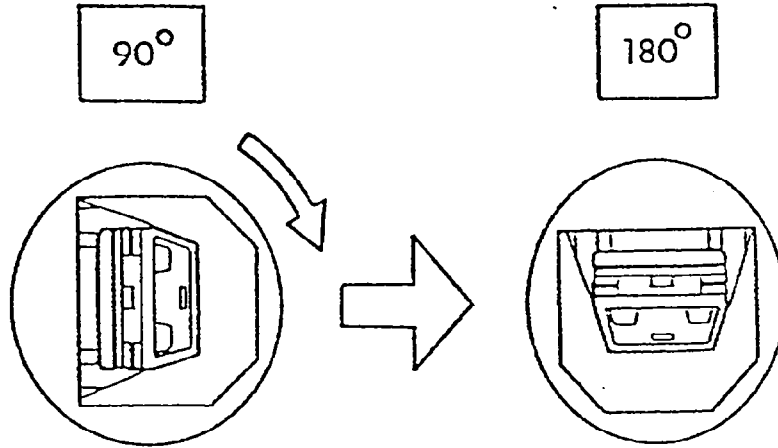
<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CN0209
 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

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

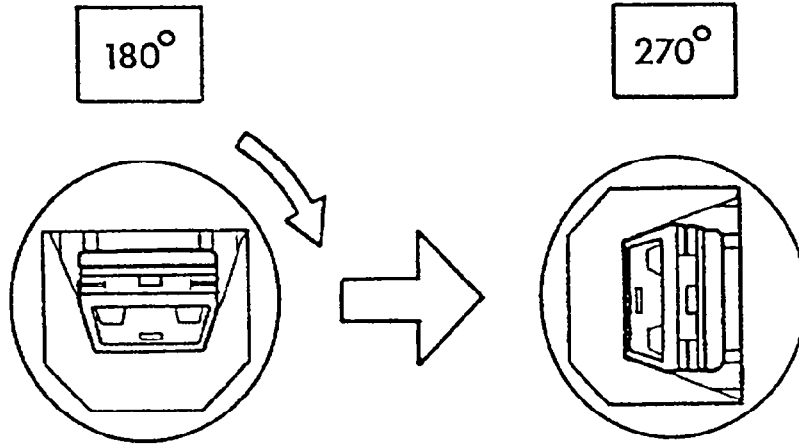
<u>90° TO 180° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CN0209
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

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

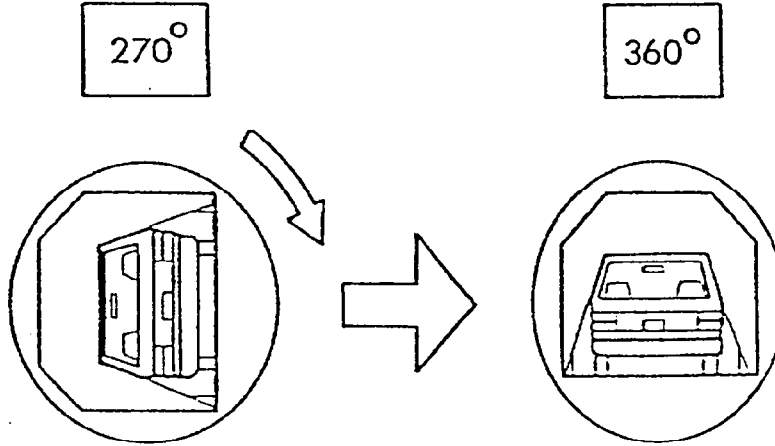
<u>180° TO 270° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CN0209
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

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

<u>270° TO 360° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

SECTION 4.0

VEHICLE, OCCUPANT, AND CAMERA MEASUREMENTS

FIGURE 7

PRE-TEST AND POST-TEST MEASUREMENT POINTS

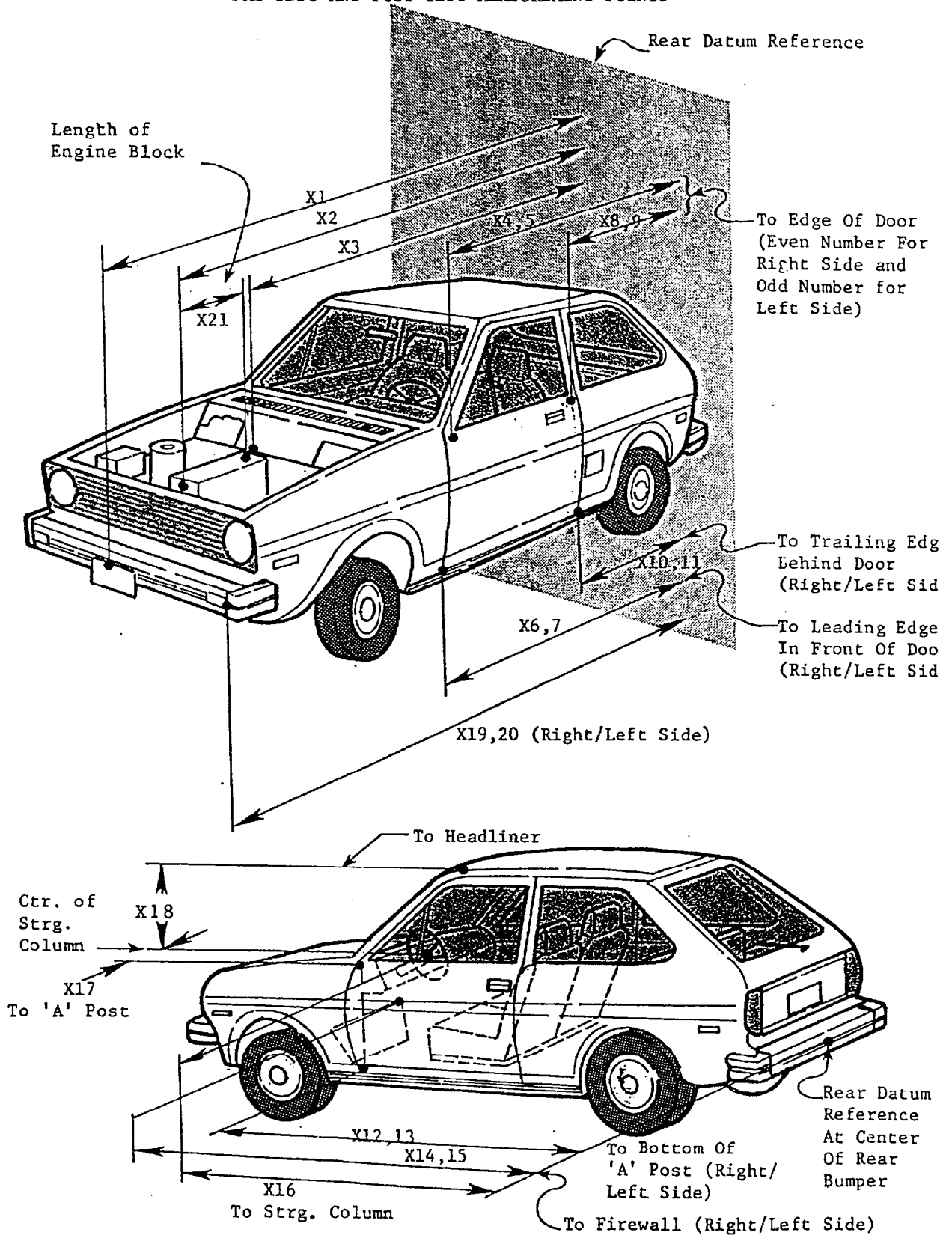


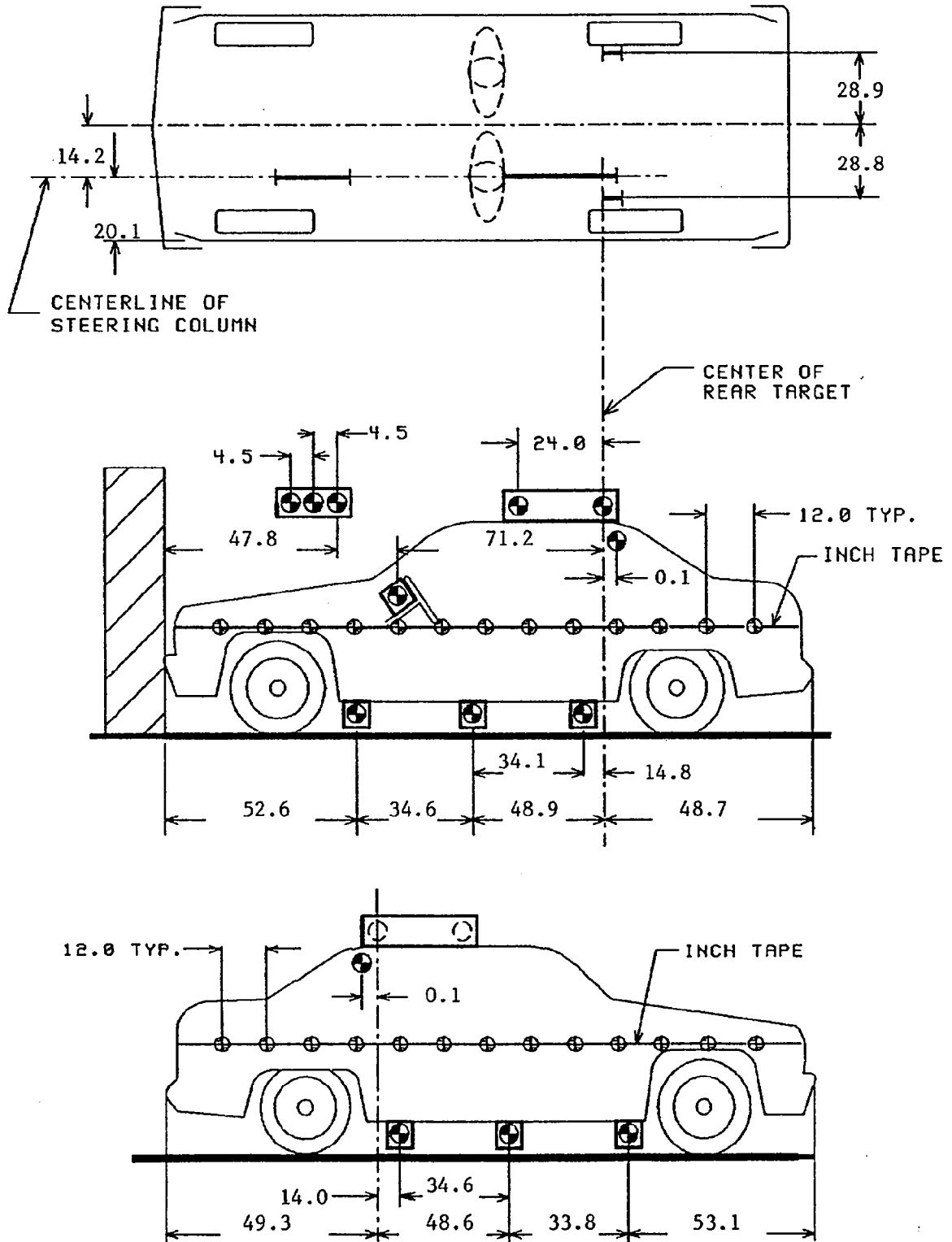
TABLE 13 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Ford/Explorer

TEST NUMBER: 920205

NO.	TYPE OF MEASUREMENT	ALL MEASUREMENTS ARE IN INCHES		
		PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	184.8	171.3	13.5
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	162.7	158.9	3.8
X3	REAR SURFACE OF VEHICLE TO FIREWALL	142.9	139.7	3.2
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	131.7	131.6	0.1
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	131.8	132.4	-0.6
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	129.5	130.1	-0.6
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	129.9	130.2	-0.3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	90.6	90.8	-0.2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	90.5	90.8	-0.3
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	90.9	91.4	-0.5
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	91.2	91.6	-0.4
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	129.5	129.4	0.1
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	129.6	129.8	-0.2
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	141.0	139.6	1.4
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	140.6	140.2	0.4
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	113.8	113.5	0.3
X17	CENTER OF STEERING COLUMN TO "A" POST	13.5	13.0	0.5
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.9	20.0	-2.1
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	182.9	171.8	11.1
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	182.9	171.9	11.0
X21	LENGTH OF ENGINE BLOCK	14.0	14.0	0.0

FIGURE 8
VEHICLE TARGET LOCATIONS



ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9 DUMMY AND SEAT POSITIONING DATA

PRE-IMPACT DATA:

MAKE/MODEL: Ford/Explorer
 BODY STYLE: Sport Utility Vehicle MODEL YEAR: 1992
 NHTSA NO.: CN0209 COLOR: Green

DATA FROM CERTIFICATION LABEL:

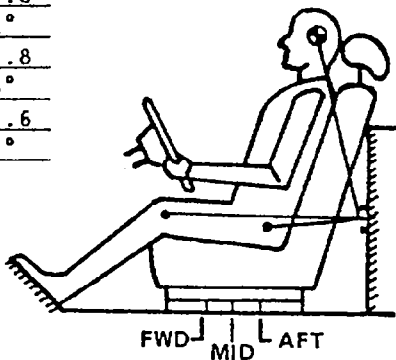
VEHICLE MANUFACTURER: Ford Motor Company
 DATE OF MANUFACTURE: 12/91 VIN: 1FMDU34X8NUB65529
 GVWR: 5280 LBS.; GAWR: FRONT = 2540 LBS.; REAR = 3000 LBS.

POST-IMPACT DATA:

DATE OF TEST: 02/05/92 TIME: 1349 TEMPERATURE: 68° F
 IMPACT VELOCITY: PRIMARY = 29.3 MPH SECONDARY = 29.4 MPH
 REQUIRED IMPACT VELOCITY RANGE: 28.9 TO 29.9 MPH
 SEAT TYPE: Split bench ADJUSTER TYPE: Manual
 FRONT SEAT BACK TYPE: Manually adjustable
 TECHNICIANS: B. Fishbaugh, P. Cummins, & R. Cribley

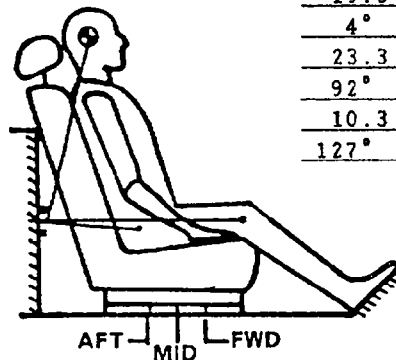
DRIVER DUMMY # 353 TYPE: HII

HEAD 20.8
 TARGET 2°
 KNEE 23.8
 JOINT 94°
 APPROX-
 IMATE 9.6
 "H"
 POINT 122°

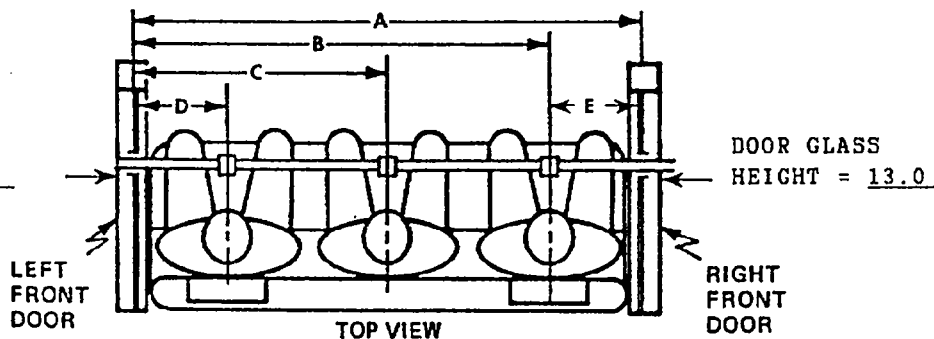


PASSENGER DUMMY # 354 TYPE: HII

HEAD 19.6 HEAD
 TARGET 4° TARGET
 KNEE 23.3 KNEE
 JOINT 92° JOINT
 APPROX-
 IMATE 10.3 APPROX-
 "H"
 POINT 127°



A = 57.2
 B = 43.4
 C = NA
 D = 15.4
 E = 13.8
 DOOR GLASS
 HEIGHT = 13.0



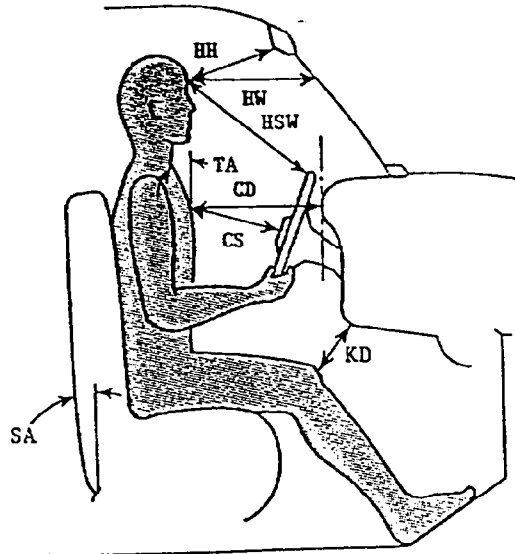
DRIVER
 DUMMY

PASSENGER
 DUMMY

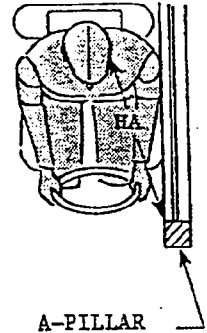
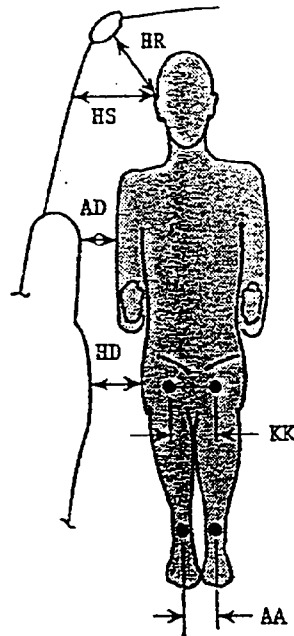
ALL ANGLES ARE RELATIVE TO VERTICAL PLANE THROUGH DOOR STRIKER.
 ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 10 DUMMY IN VEHICLE POSITIONING DATA

	DRIVER	PASSENGER
HH	19.5	19.4
HW	23.6	23.8
CD	24.1	24.2
CS	14.8	NA
KDL	7.8	7.9
KDR	8.2	7.6
TA	20°	20°
SA	21°	22°
HSW	21.1	NA



	DRIVER	PASSENGER
HR	8.6	8.6
HS	11.7	11.2
AD	5.3	4.9
HD	4.9	5.1
KK	10.0	8.1
AA	10.2	7.4
HA	23.4	23.9

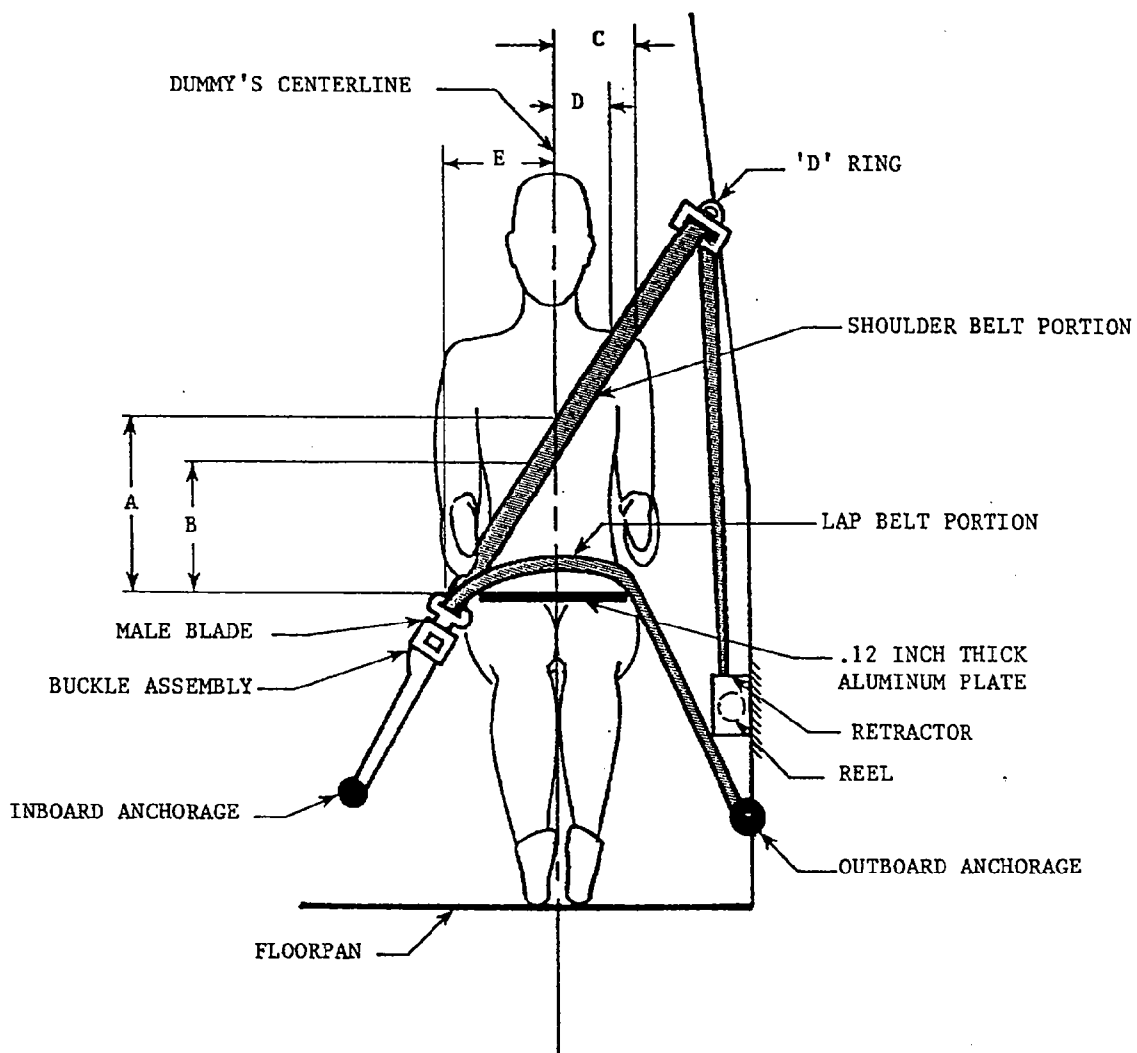


KNEE OUTER BOLT HEAD TO OUTER
BOLT HEAD SPACING:
DRIVER = 14.5
PASSENGER = 11.8

- | | |
|--------------------------------|---|
| HH = HEAD TO WINDSHIELD HEADER | HR = HEAD C.G. TARGET TO SIDE ROOF HEADER |
| HW = HEAD TO WINDSHIELD | HS = HEAD C.G. TARGET 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 C.G. TARGET TO A-PILLAR |
| HSW = HEAD TO STEERING WHEEL | |

TORSO AND SEAT BACK ANGLES ARE RELATIVE TO VERTICAL.
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

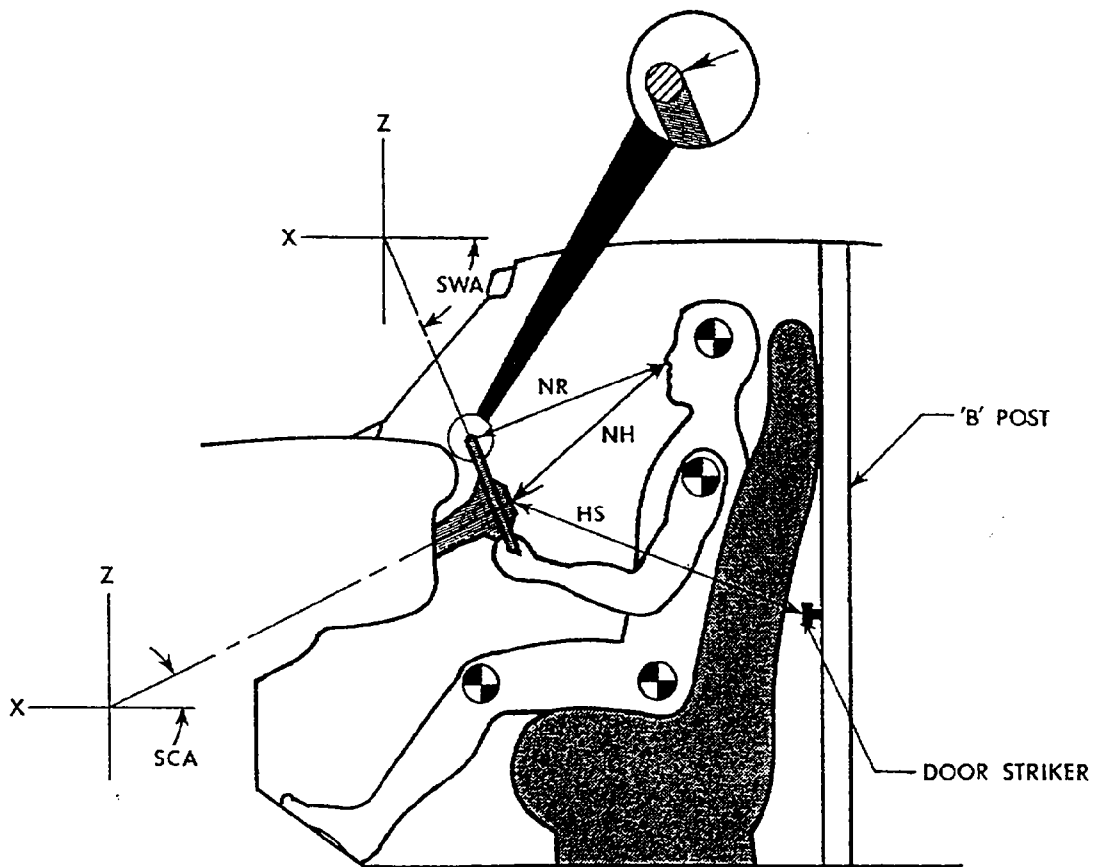
FIGURE 11 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	15.8	15.6
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	12.1	12.1
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	5.6	4.5
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	3.4	1.9
E - DUMMY CENTERLINE TO INTERSECTION OF UPPER TORSO BELT AND LAP BELT	9.0	8.8

ALL MEASUREMENTS ARE IN INCHES.

FIGURE 12 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY DATA



POSITION OF STEERING COLUMN TILTING AND TELESCOPING ADJUSTMENTS, IF ANY:
The steering column was not adjustable.

MEASUREMENTS

NR	- DISTANCE FROM TIP OF DUMMY'S NOSE TO TOP REAR SURFACE OF STEERING WHEEL RIM.	18.9
NH	- DISTANCE FROM TIP OF DUMMY'S NOSE TO CENTER OF STEERING COLUMN HUB.	19.2
HS	- DISTANCE FROM CENTER OF STEERING COLUMN HUB TO THE FORWARD SURFACE OF THE DOOR LOCK STRIKER PIN.	23.5
SCA	- ANGLE OF STEERING COLUMN RELATIVE TO THE HORIZONTAL X AXIS	25°
SWA	- ANGLE OF STEERING WHEEL RELATIVE TO THE HORIZONTAL X AXIS	65°

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

4, 7, 8
FIGURE 13
CAMERA POSITIONS

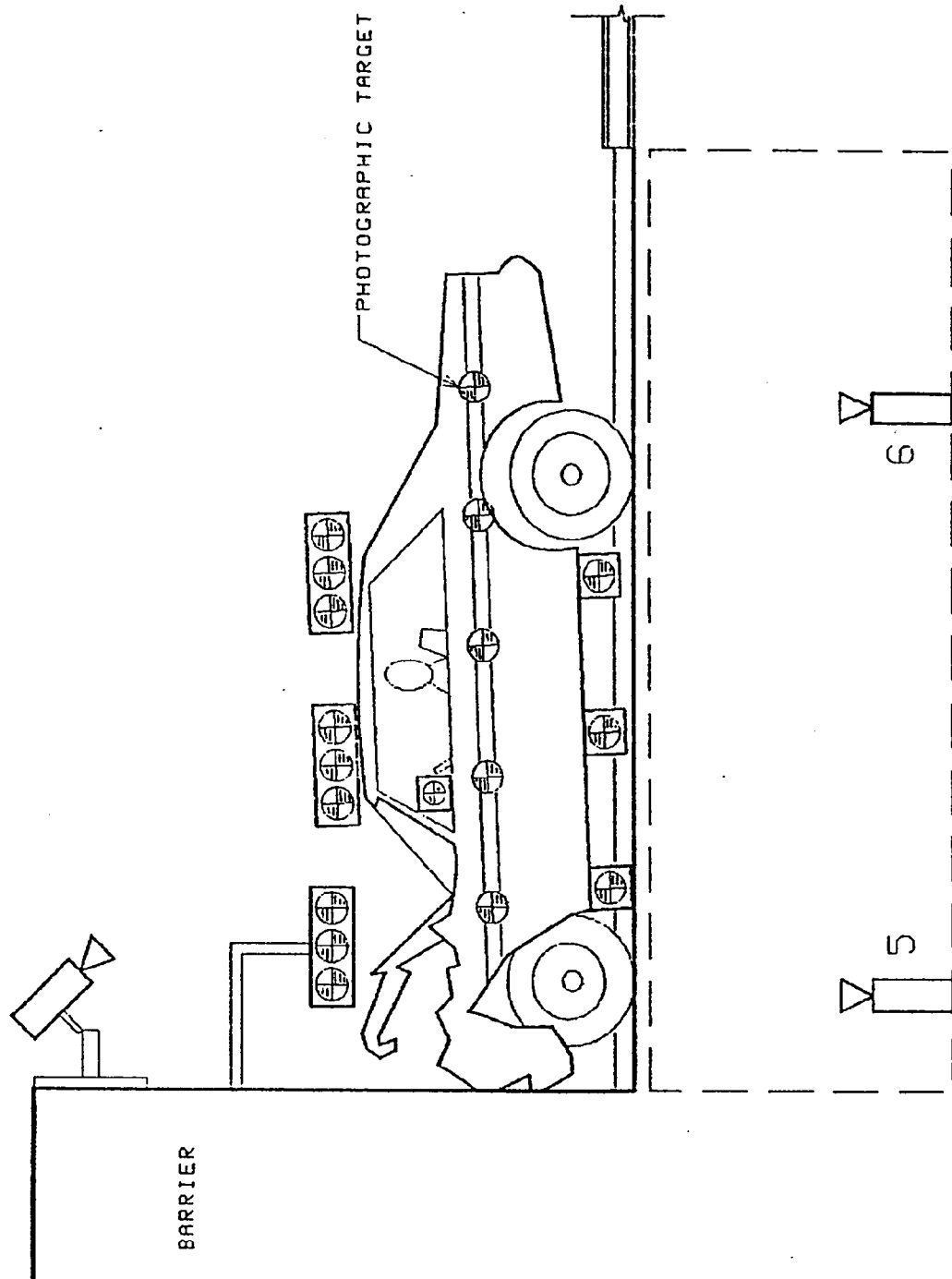


TABLE 14. MOTION PICTURE CAMERA LOCATIONS

TEST NO.:	CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	FILM PLANE		FILM SPEED (FPS)
			X	Y	Z		TO HEAD TARGET(IN)	LENS (MM)	
920205			VEHICLE: 1992 Ford Explorer						
	1	Real-time panning	-142.0	-504.0	61.0	NA	NA	16	24
	2	Right overall	-81.3	-266.4	37.1	-2	NA	13	500
	3	Left vehicle crush	-41.5	295.0	44.0	-4	215.0	25	502
	4	Windshield front view	-6.0	0.0	91.0	-40	NA	13	500
	5	Pit front position	-50.5	0.0	-92.4	90	NA	13	1000
	6	Pit rear position	-99.3	0.0	-99.0	90	NA	13	998
	7	Passenger front view	-4.5	-13.8	93.0	-50	NA	17	500
	8	Driver front view	-6.8	14.5	93.0	-50	NA	17	498
	9	Driver kinematics	-157.3	116.0	87.0	-27	75.0	25	500
	10	Passenger kinematics	-152.1	-116.0	87.0	-26	97.0	25	500
	11	Right windshield intrusion	-38.1	-306.1	44.0	0	NA	50	495
	12	Left windshield intrusion	-53.0	309.4	42.3	0	NA	50	498
	13	Steering column motion	-112.0	286.0	103.0	-14	NA	25	498
	14	Steering column motion	-112.0	286.0	75.1	-9	NA	25	500
	15	Passenger kinematics	-38.8	-293.0	45.3	-4	218.0	25	517
	16	Real-time documentation	NA	NA	NA	NA	NA	12-120	24

* +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

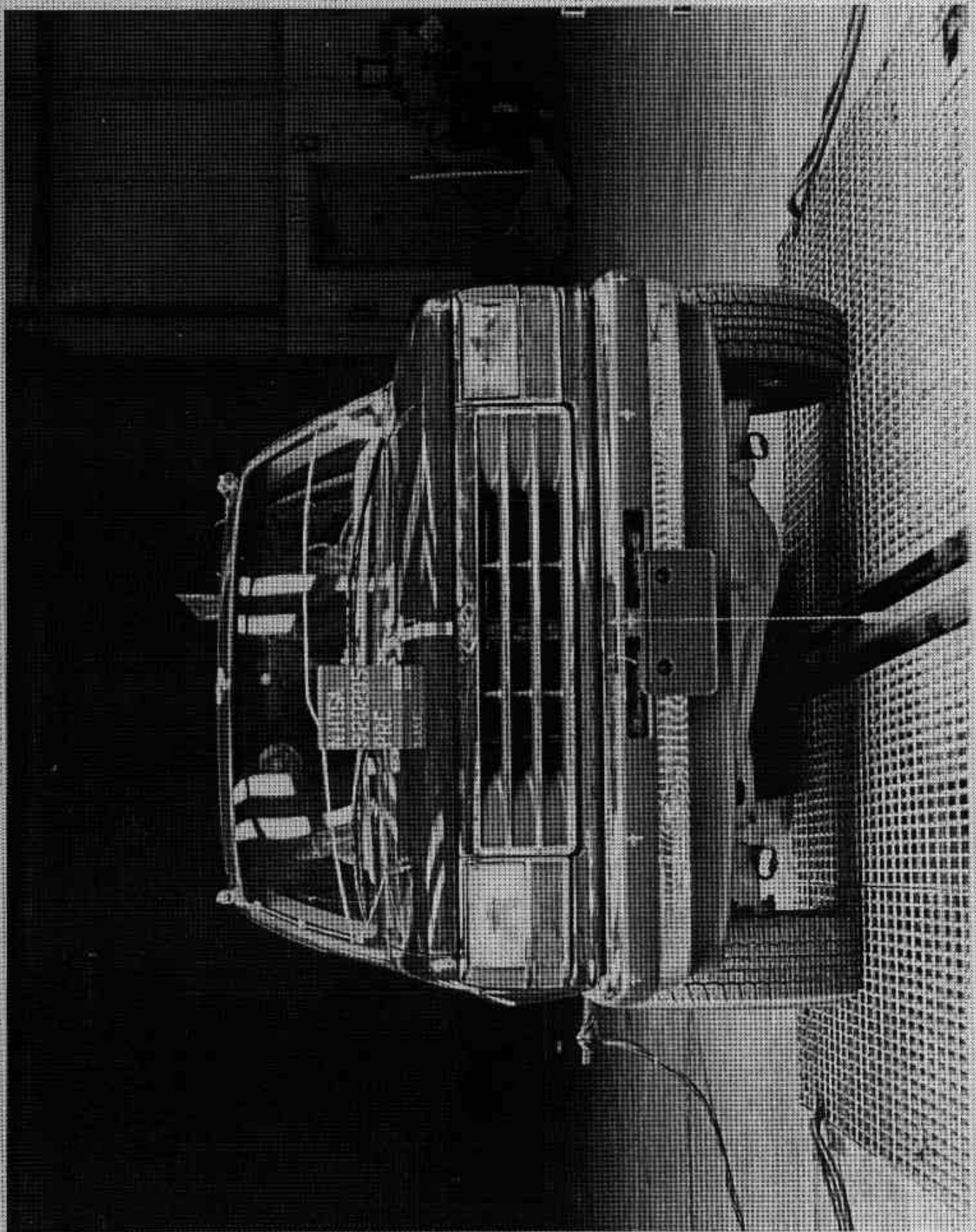


FIGURE A-1. PRE-TEST FRONT VIEW

A-2

920205

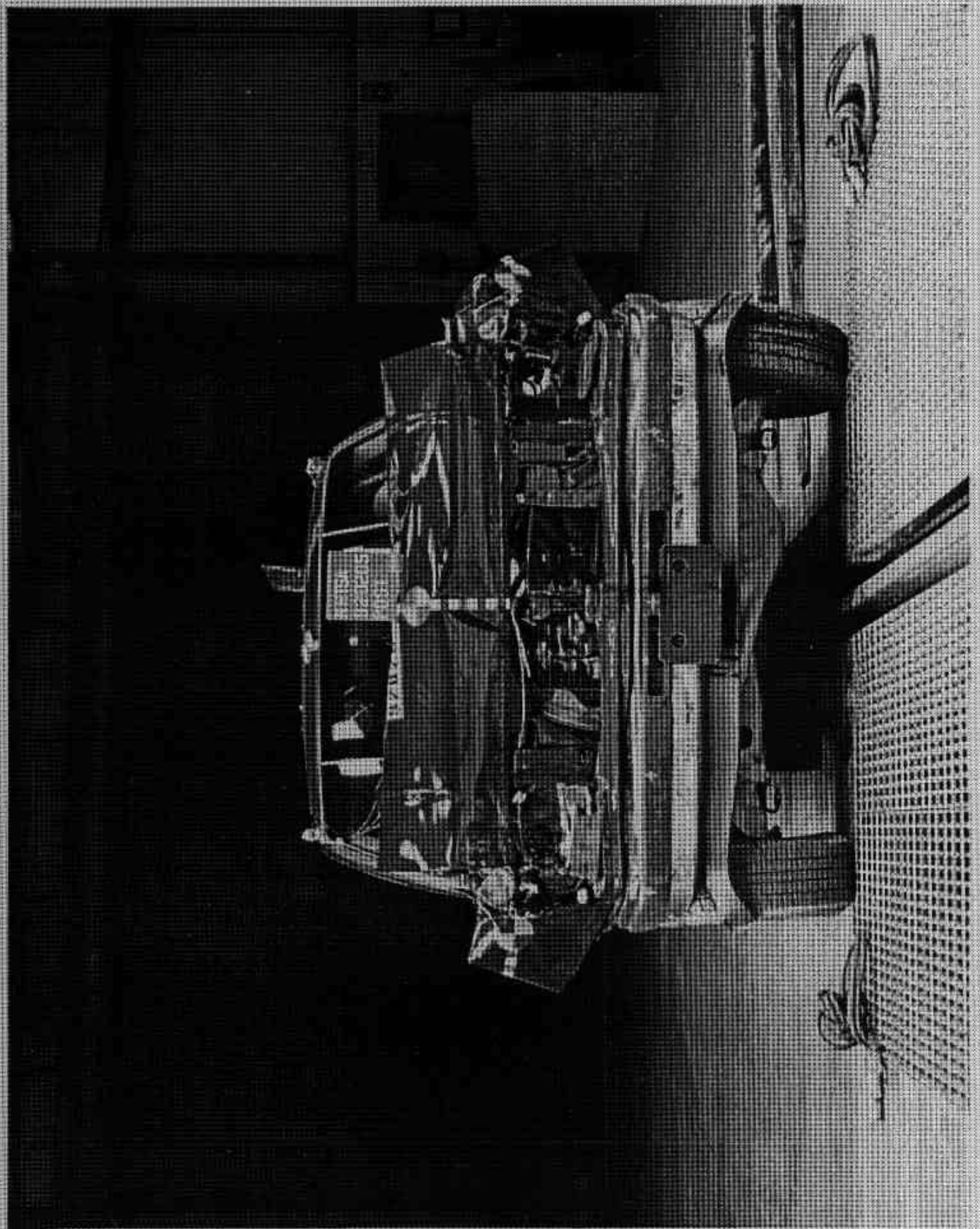


FIGURE A-2. POST-TEST FRONT VIEW

A-3

920205

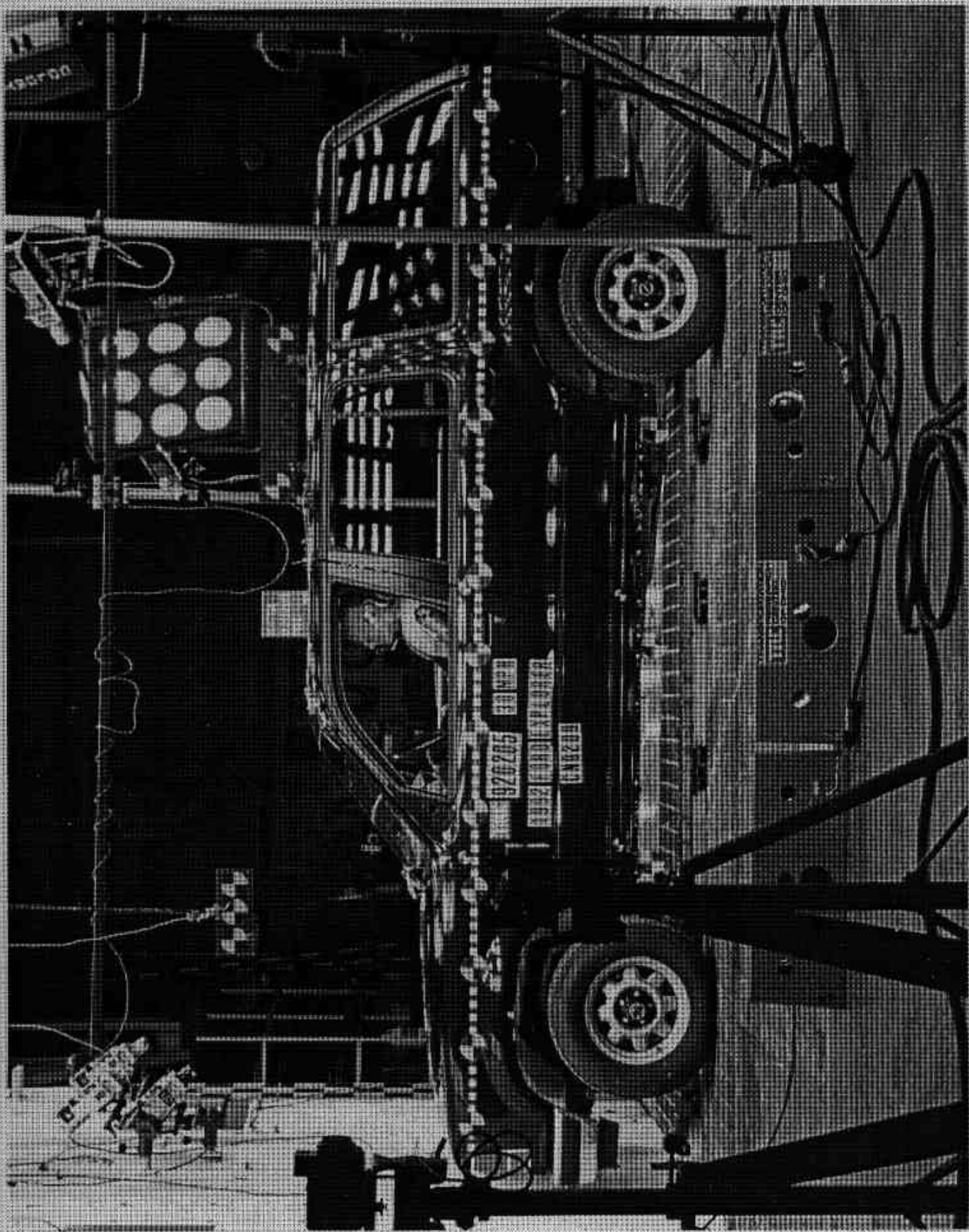


FIGURE A-3. PRE-TEST LEFT SIDE VIEW

A-4

920205

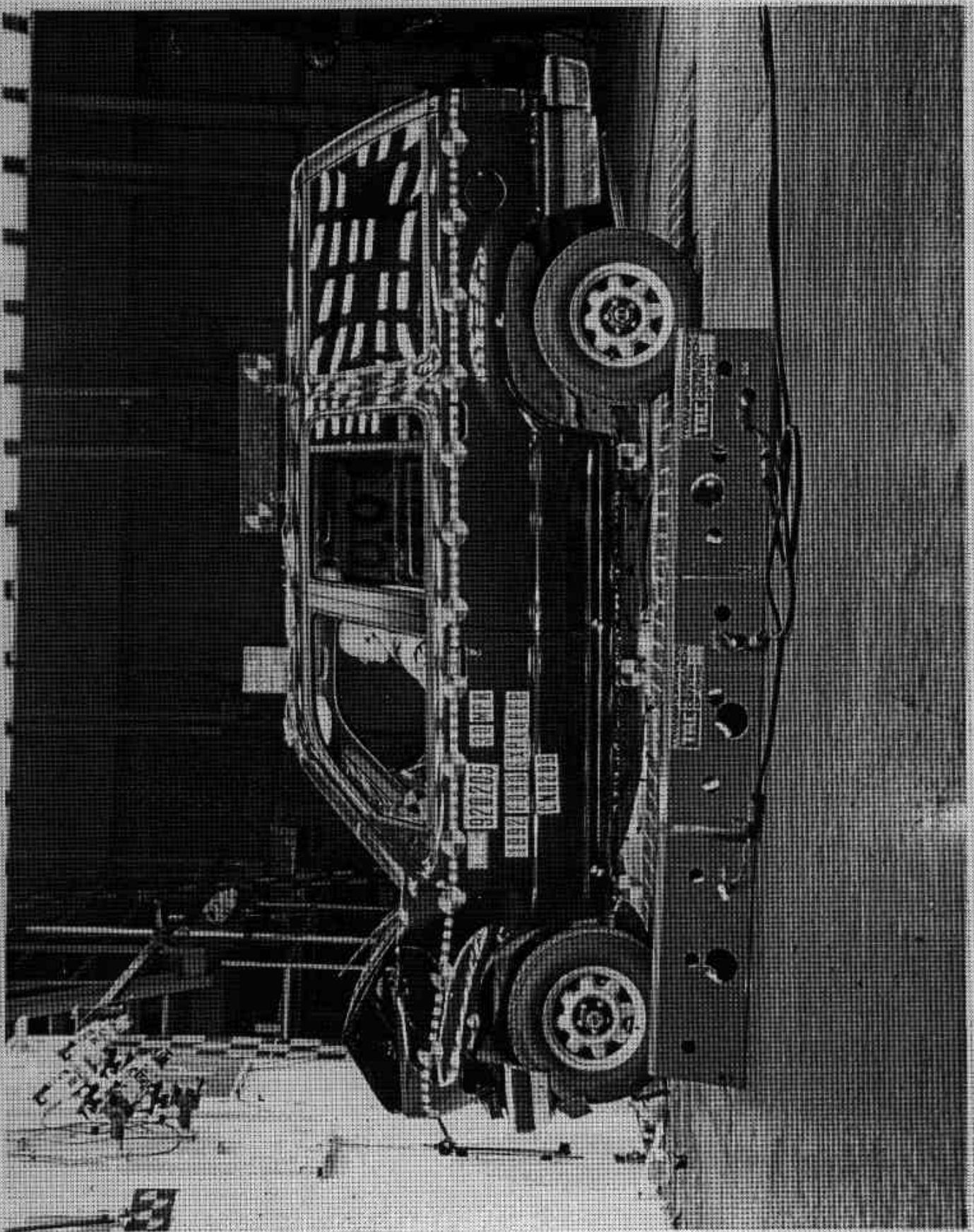


FIGURE A-4. POST-TEST LEFT SIDE VIEW
A-5

920205

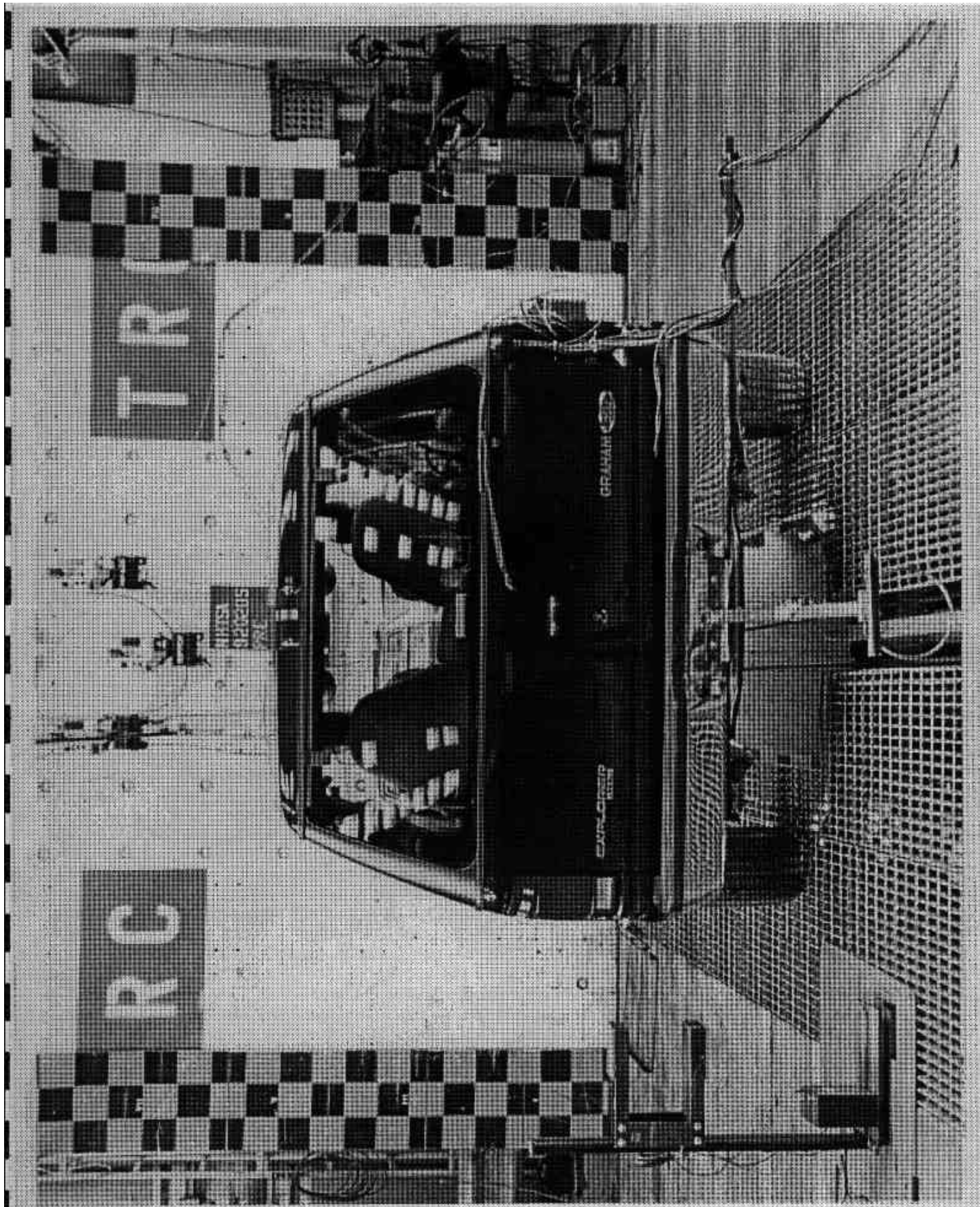


FIGURE A-5. PRE-TEST REAR VIEW

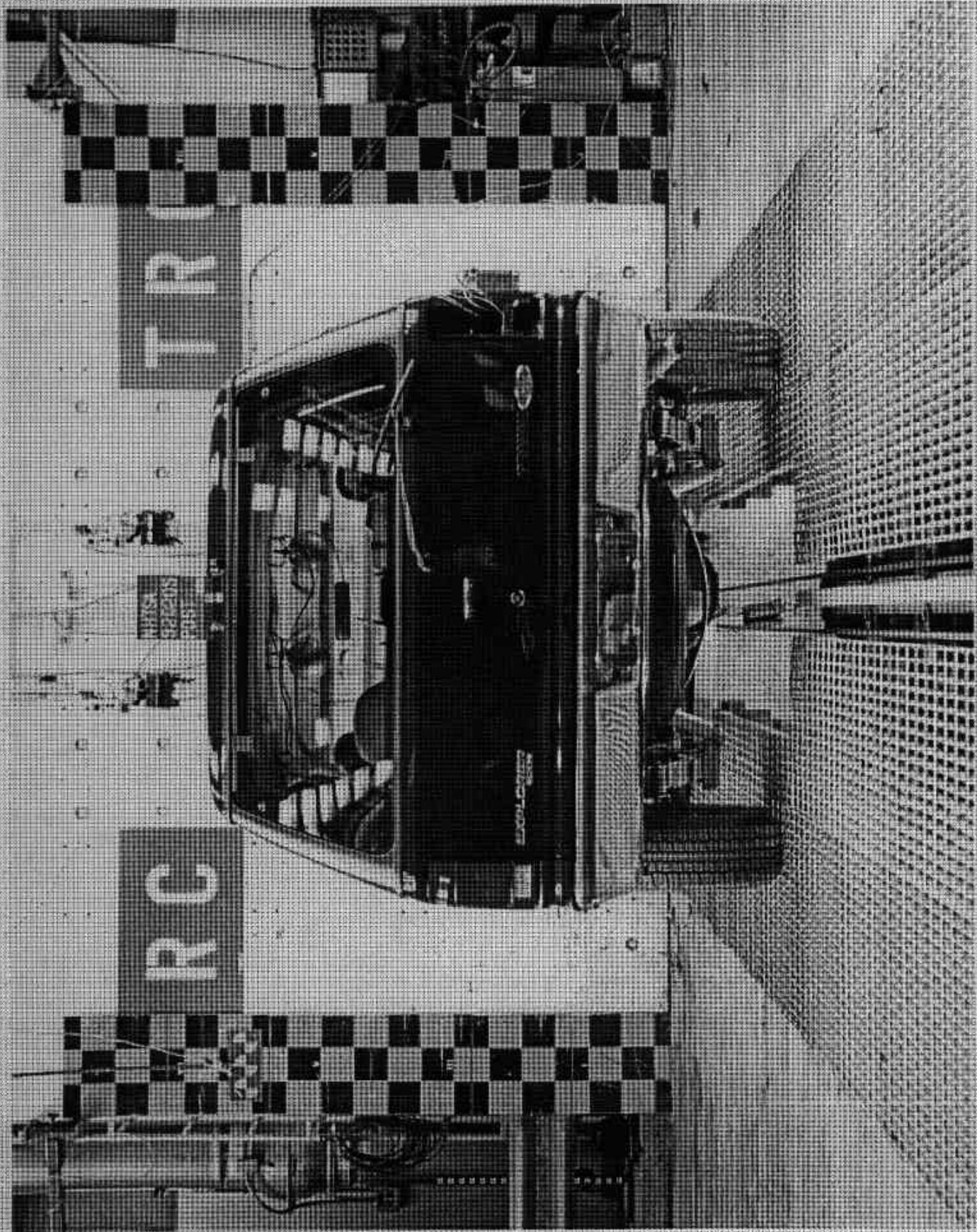


FIGURE A-6. POST-TEST REAR VIEW

A-7

920205

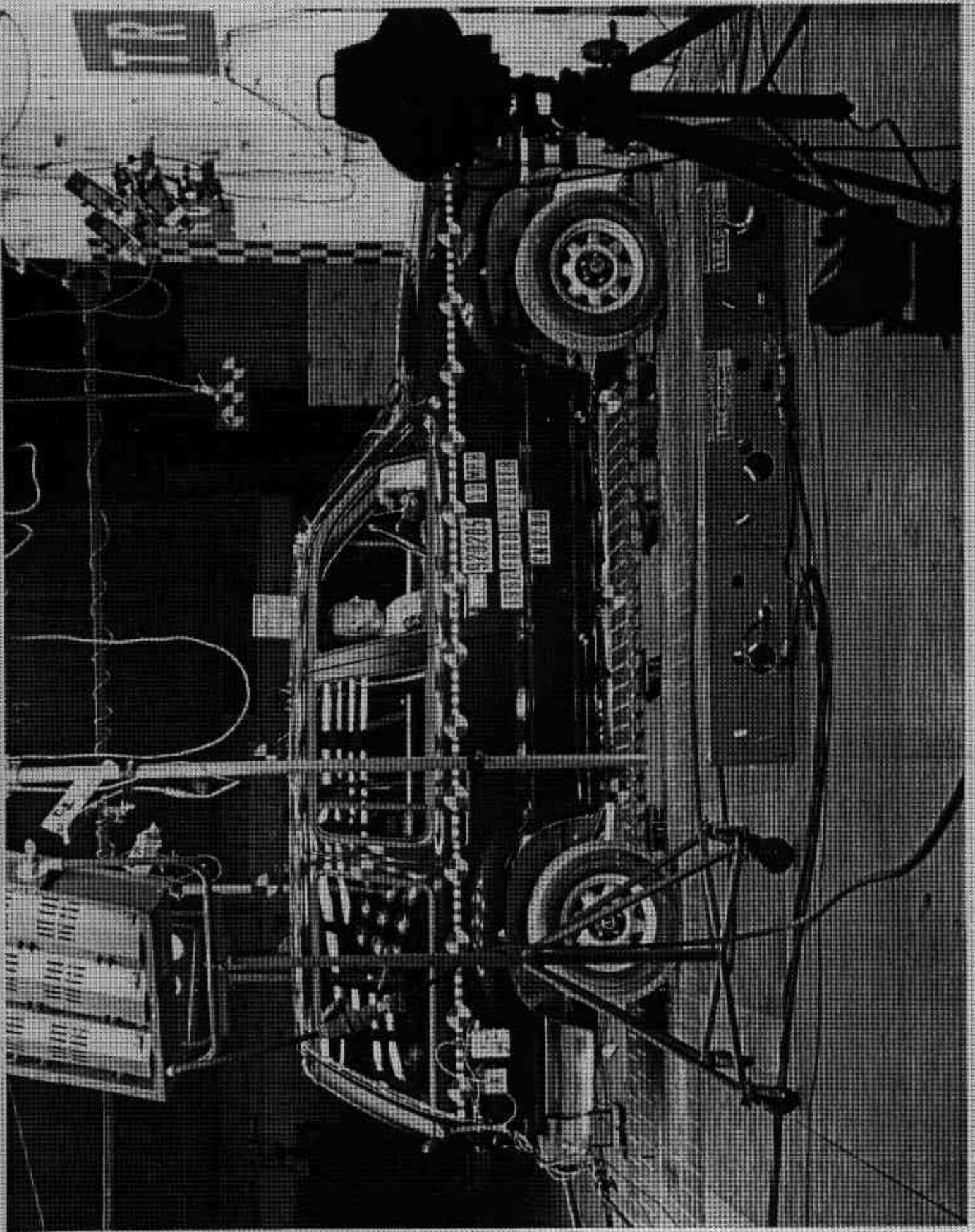


FIGURE A-7. PRE-TEST RIGHT SIDE VIEW
A-8

920205

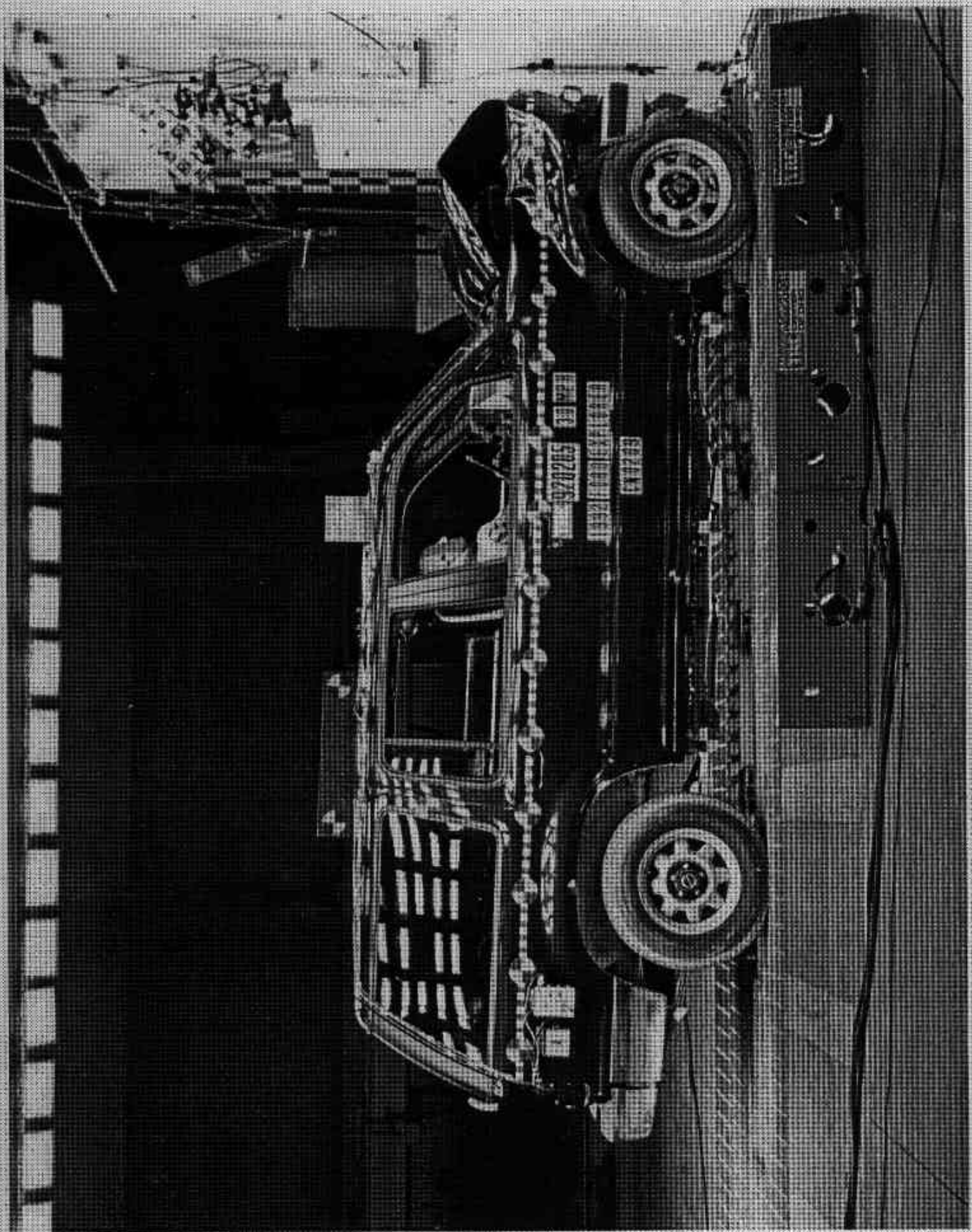


FIGURE A-8. POST-TEST RIGHT SIDE VIEW

A-9

920205

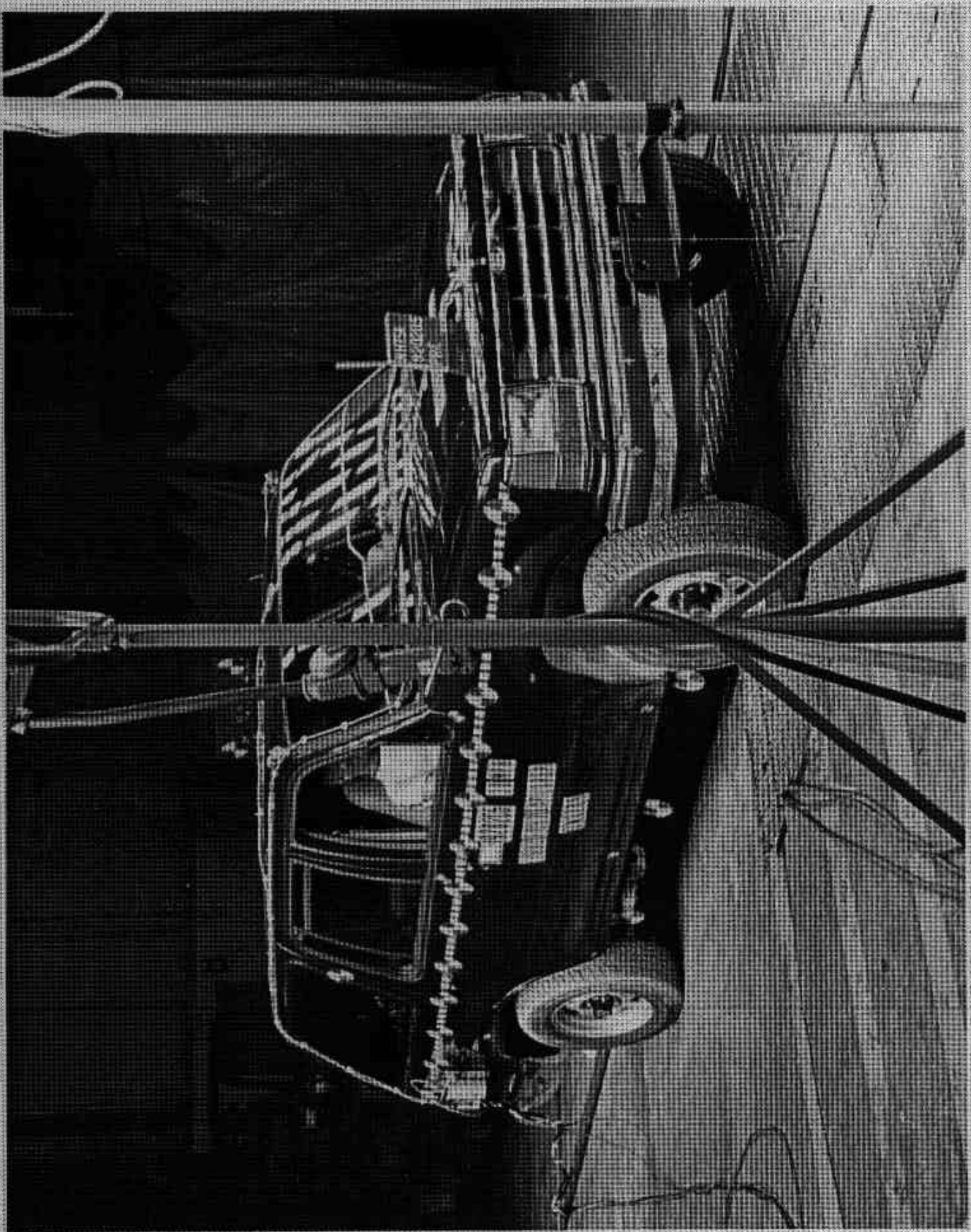


FIGURE A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

920205

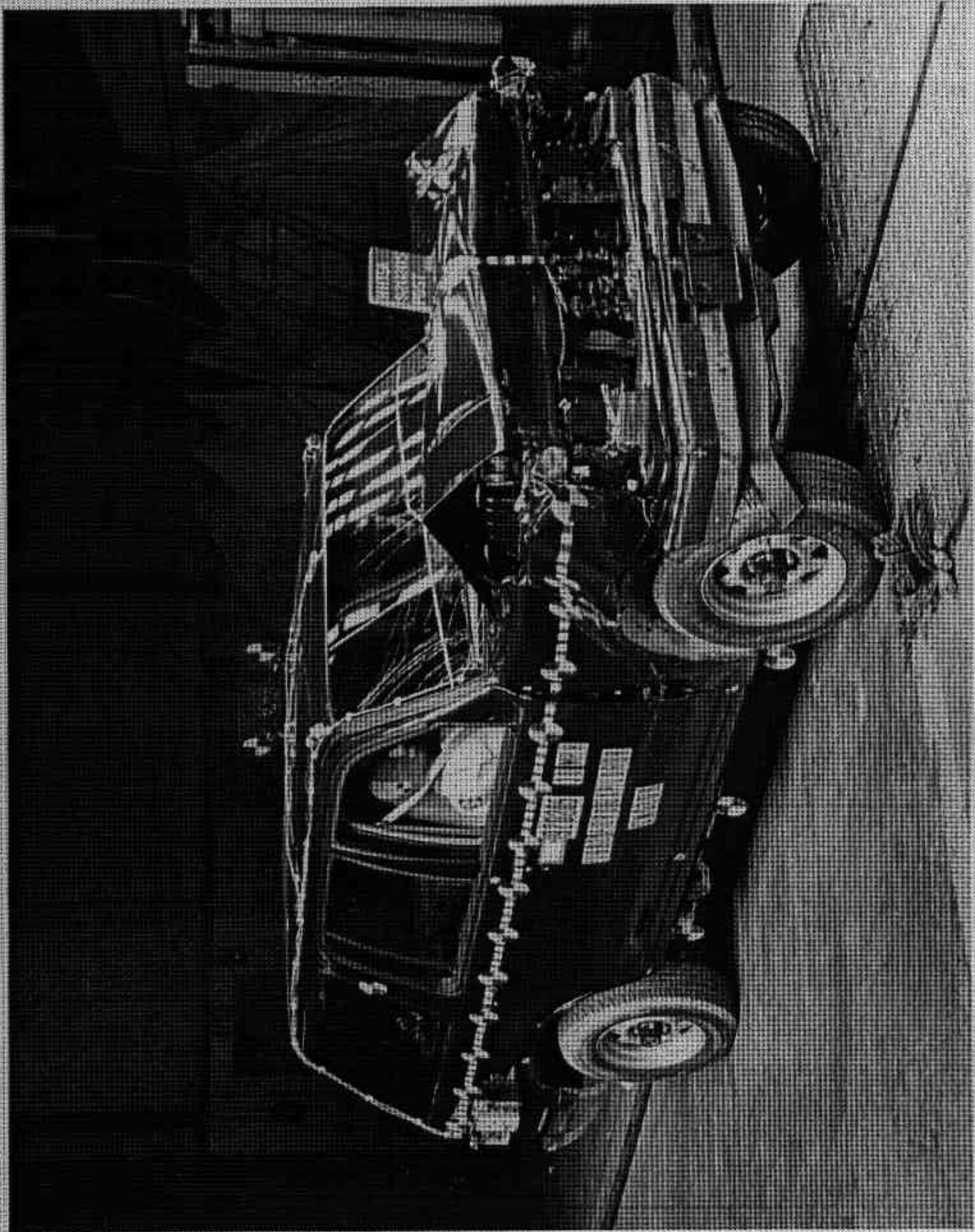


FIGURE A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

920205

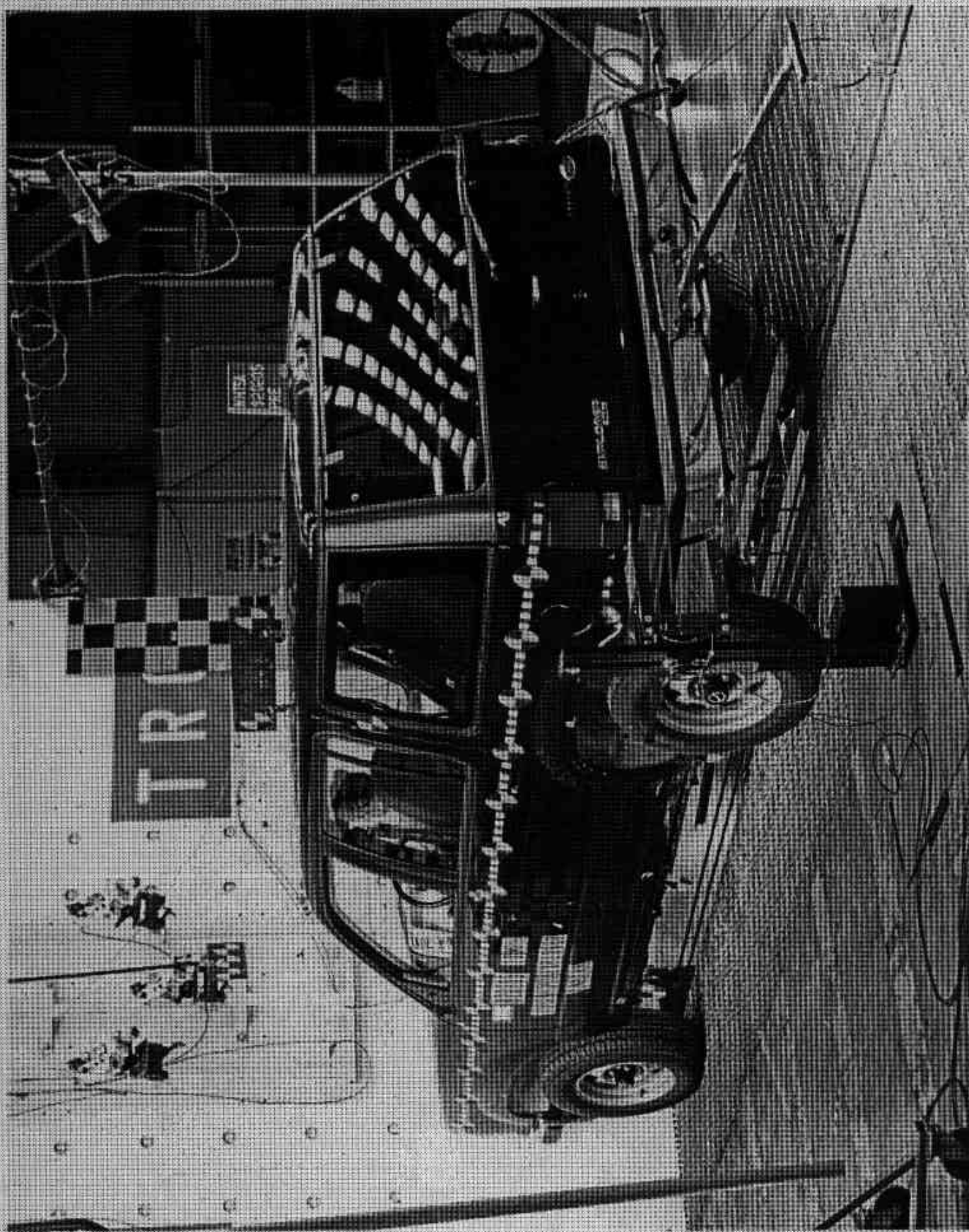


FIGURE A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW
A-12

920205

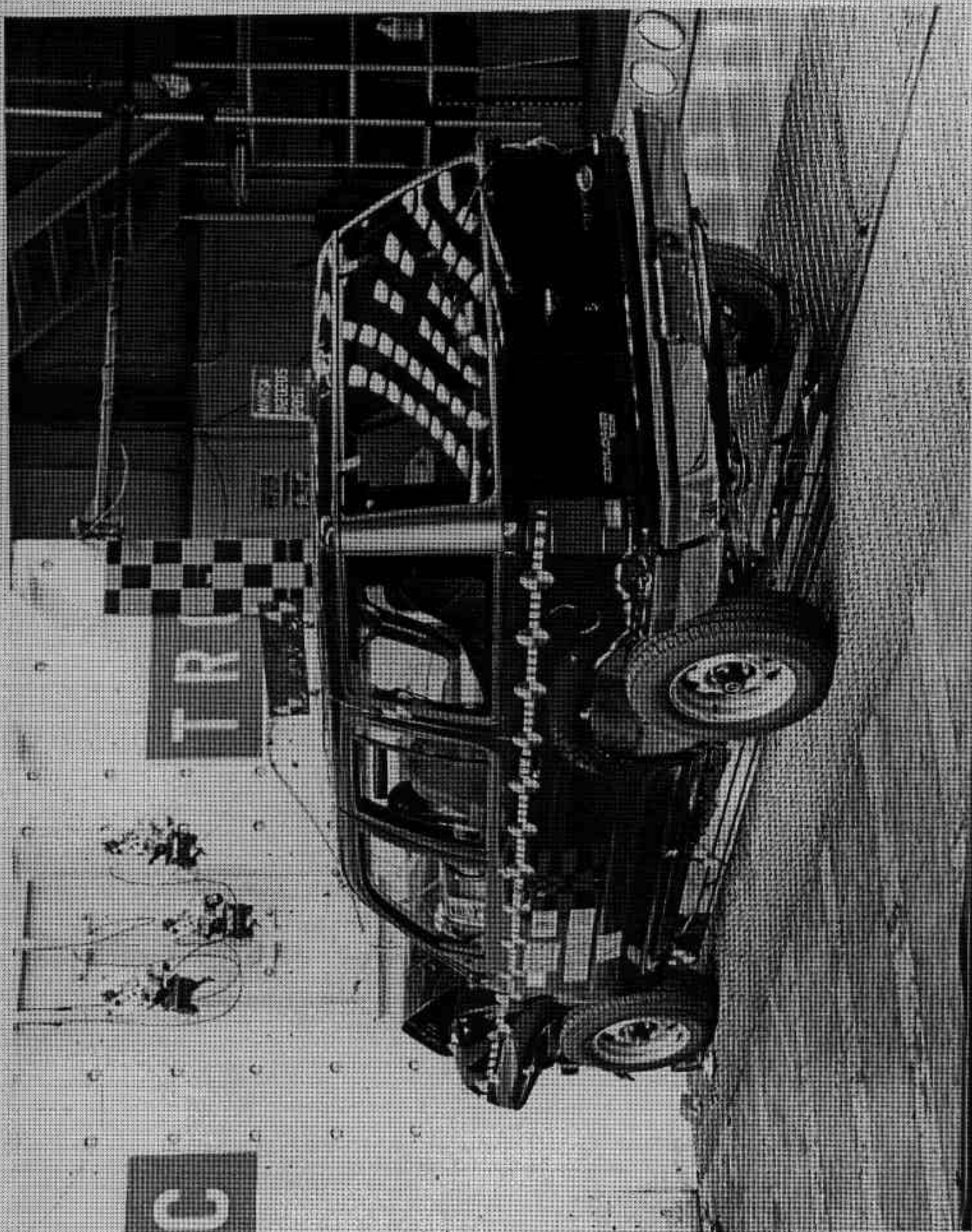


FIGURE A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

920205

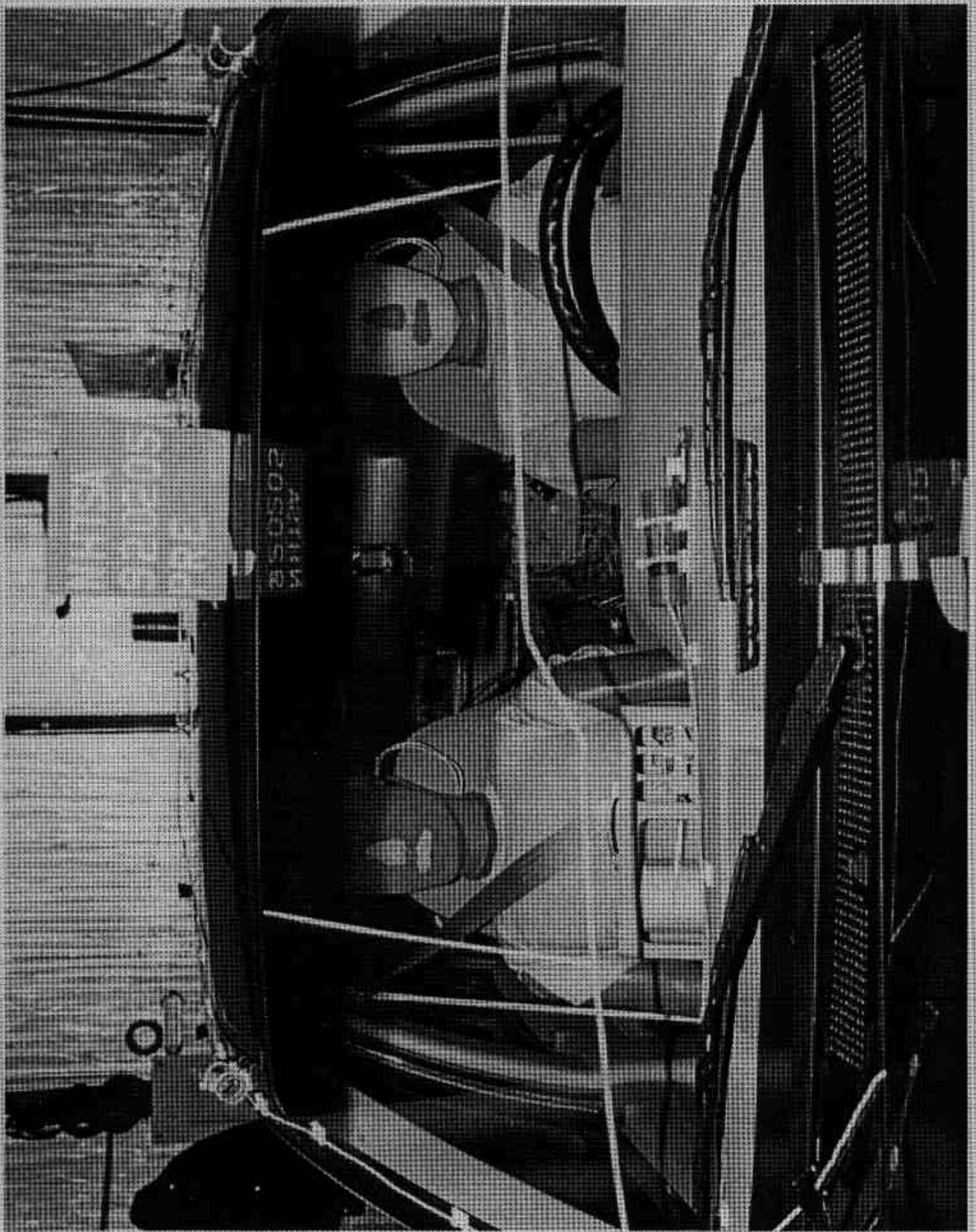


FIGURE A-13, PRE-TEST WINDSHIELD VIEW
A-14

920205

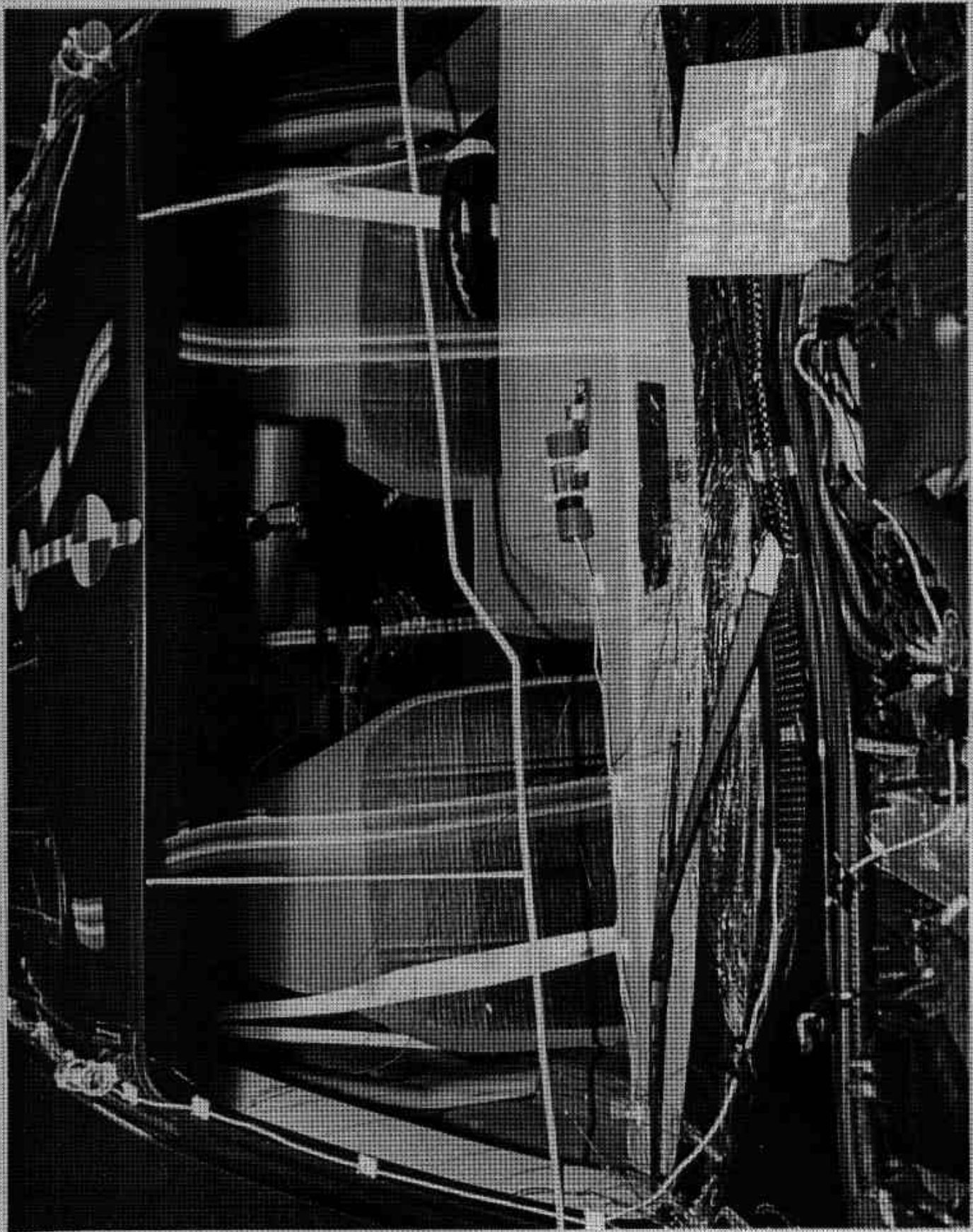


FIGURE A-14. POST-TEST WINDSHIELD VIEW
A-15

920205



FIGURE A-15, PRE-TEST ENGINE COMPARTMENT VIEW

A-16

920205

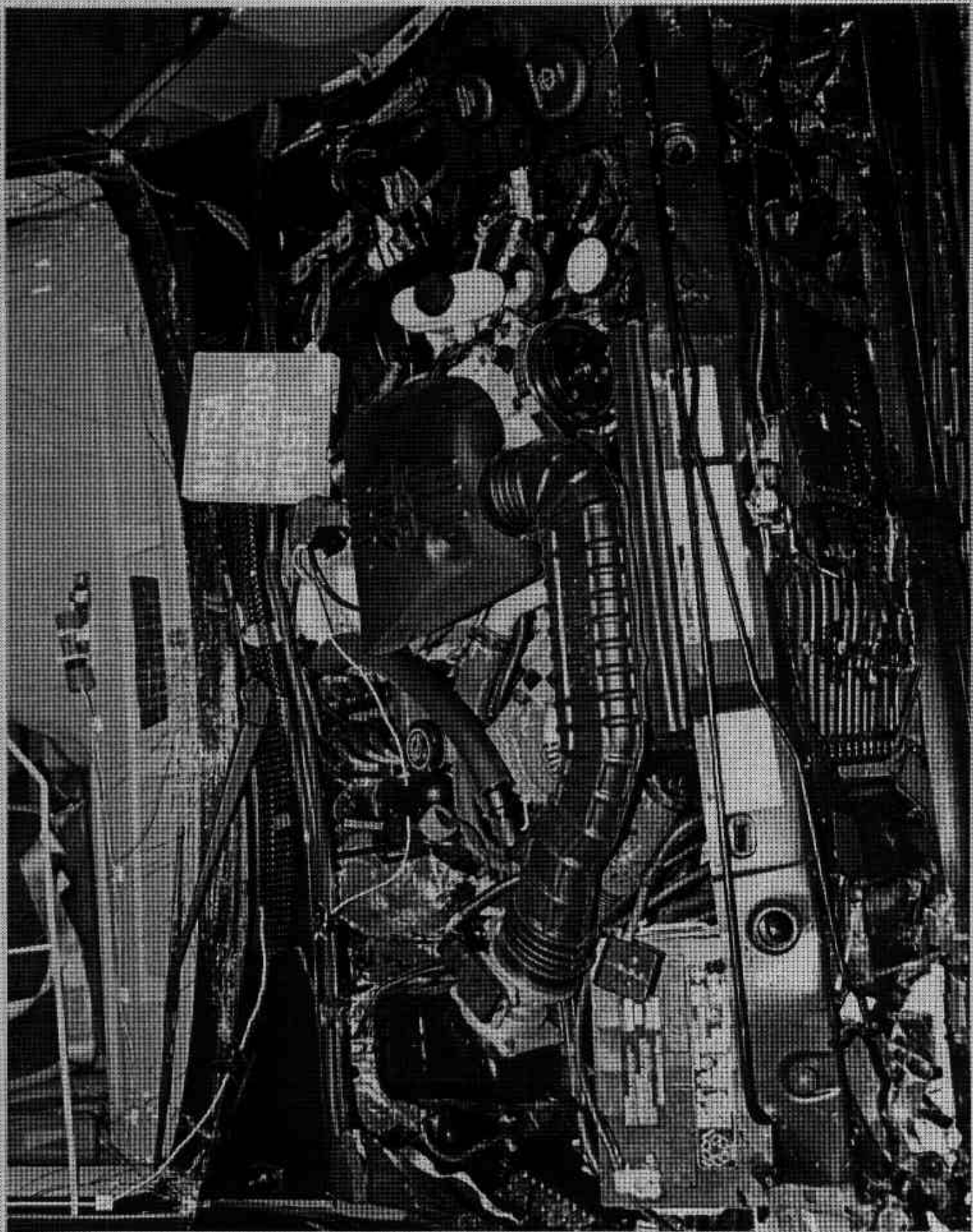


FIGURE A-16. POST-TEST ENGINE COMPARTMENT VIEW
A-17

920205

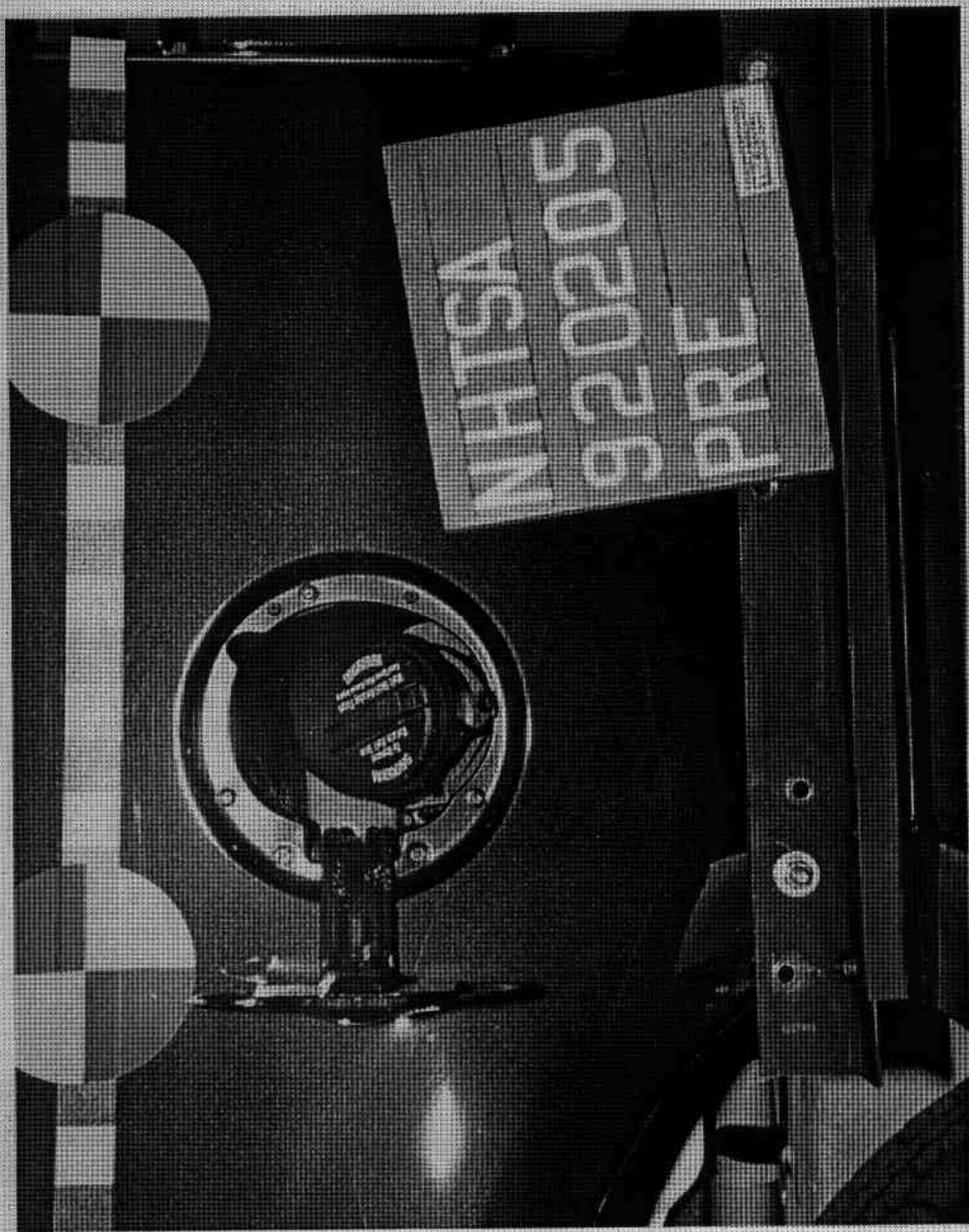


FIGURE A-17. PRE-TEST FUEL FILLER CAP VIEW
A-18

920205



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

A-19

920205

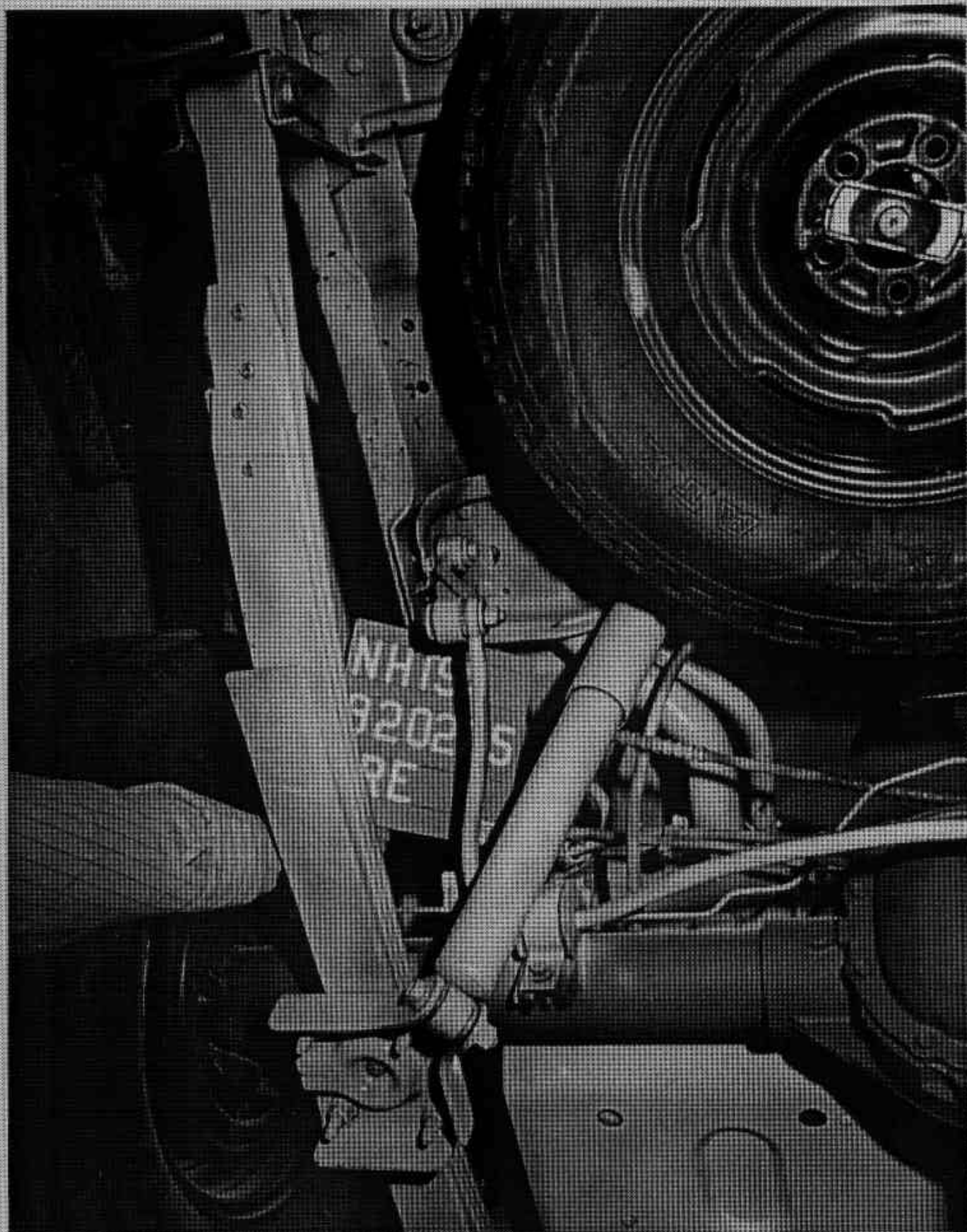


FIGURE A-19. PRE-TEST FUEL FILLER NECK VIEW

A-20

920205

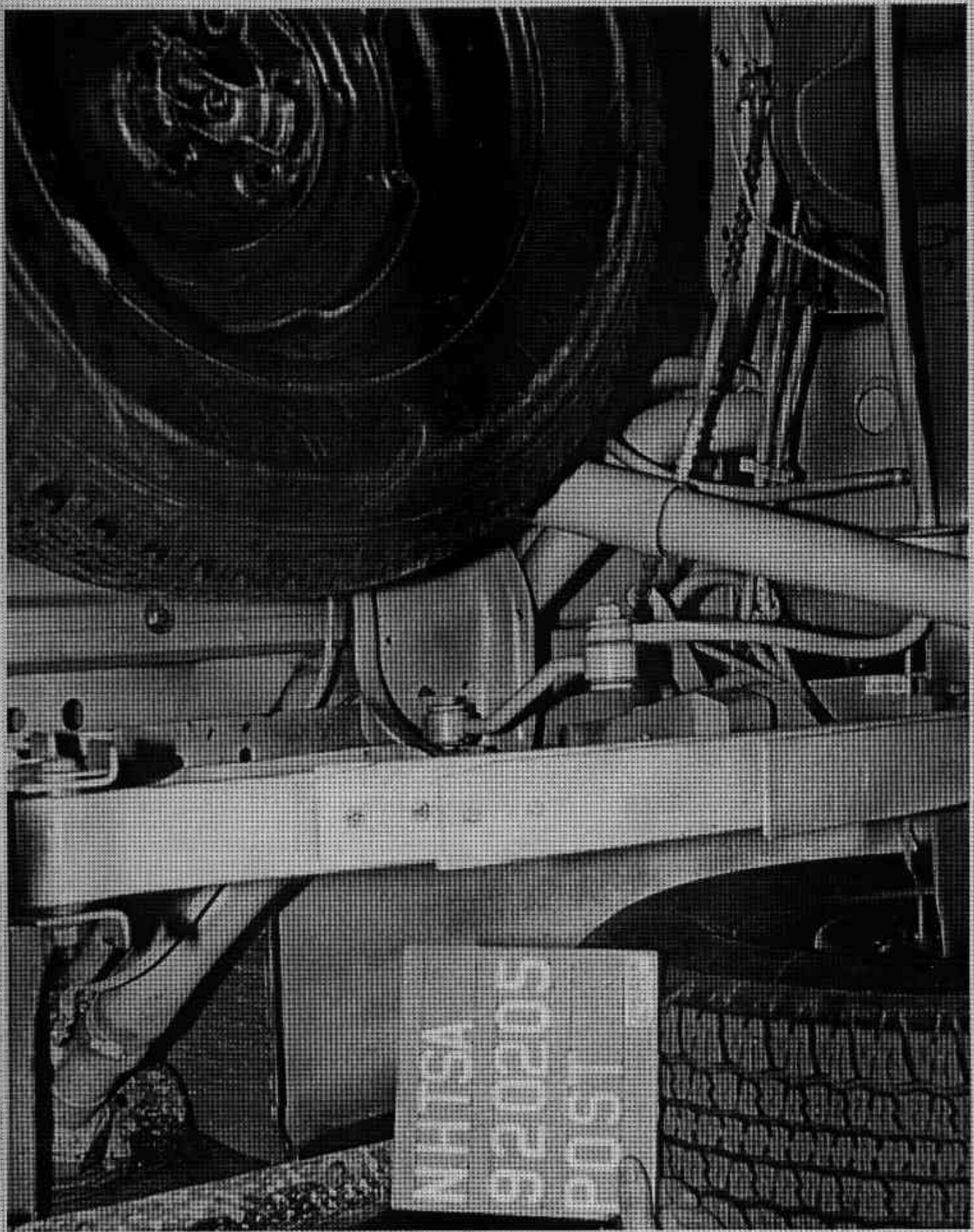


FIGURE A-20. POST-TEST FUEL FILLER NECK VIEW
A-21

920205

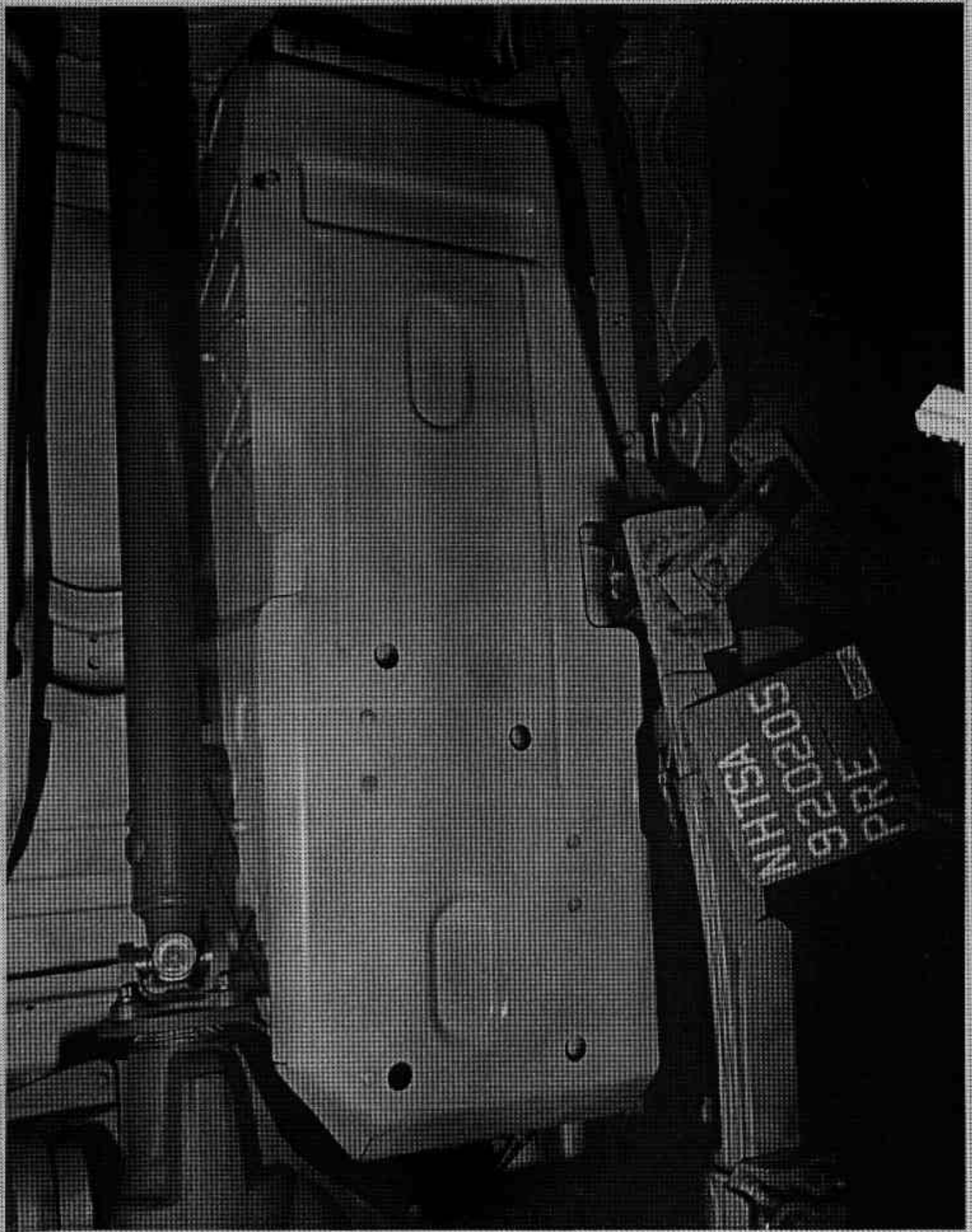


FIGURE A-21. PRE-TEST FUEL TANK VIEW
A-22

920205

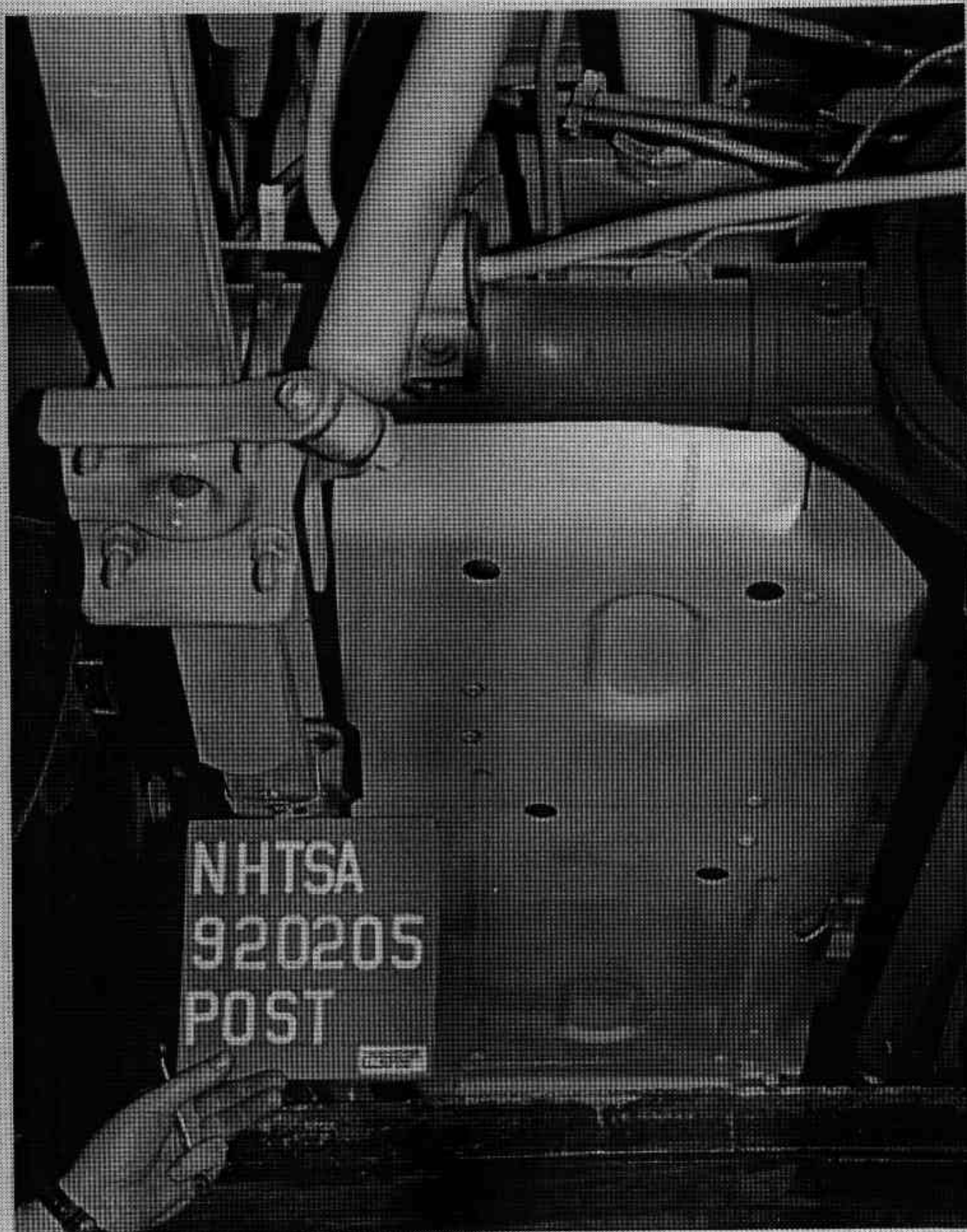


FIGURE A-22. POST-TEST FUEL TANK VIEW
A-23

920205

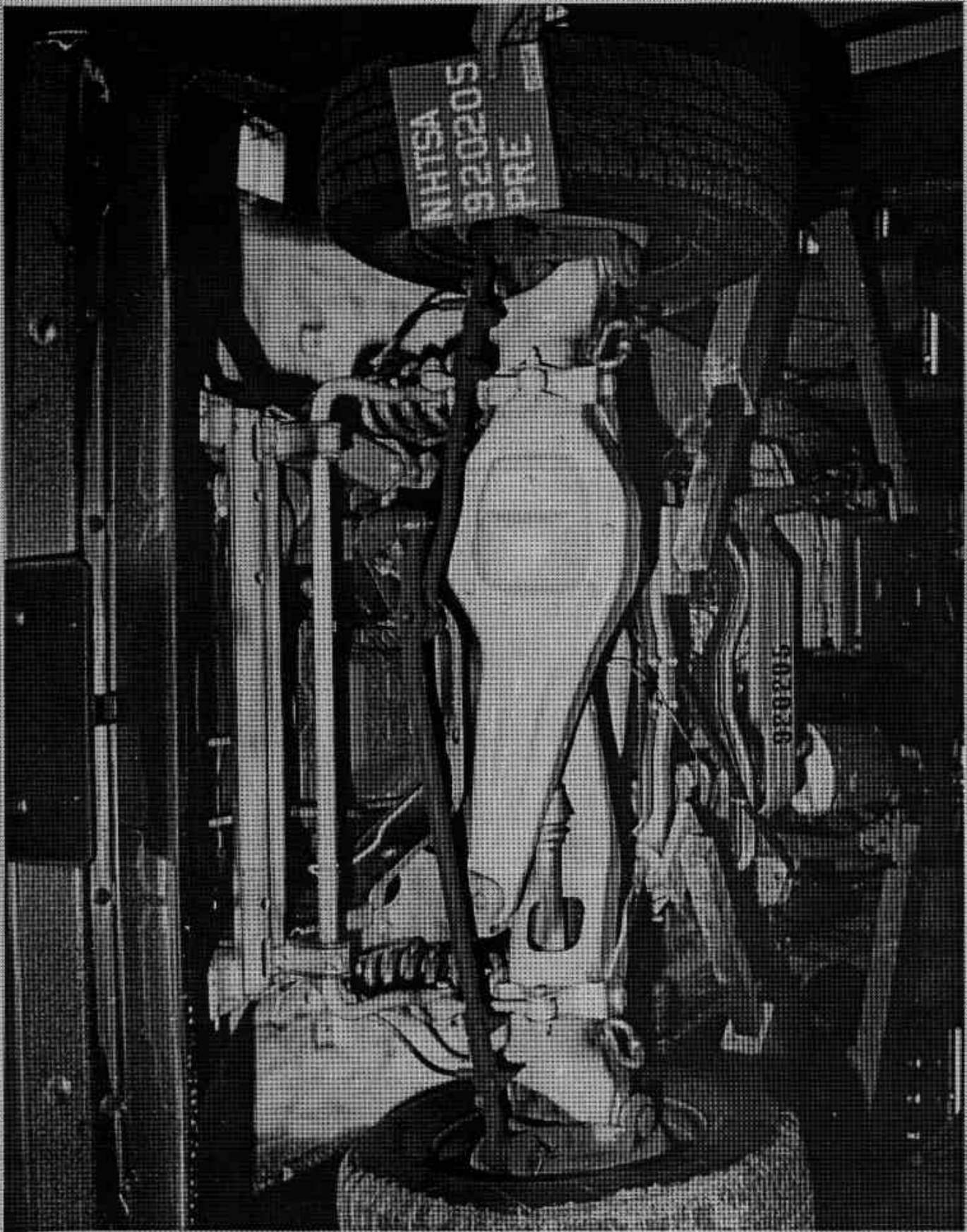


FIGURE A-23. PRE-TEST FRONT UNDERBODY VIEW

A-24

920205



FIGURE A-24. POST-TEST FRONT UNDERBODY VIEW

A-25

920205

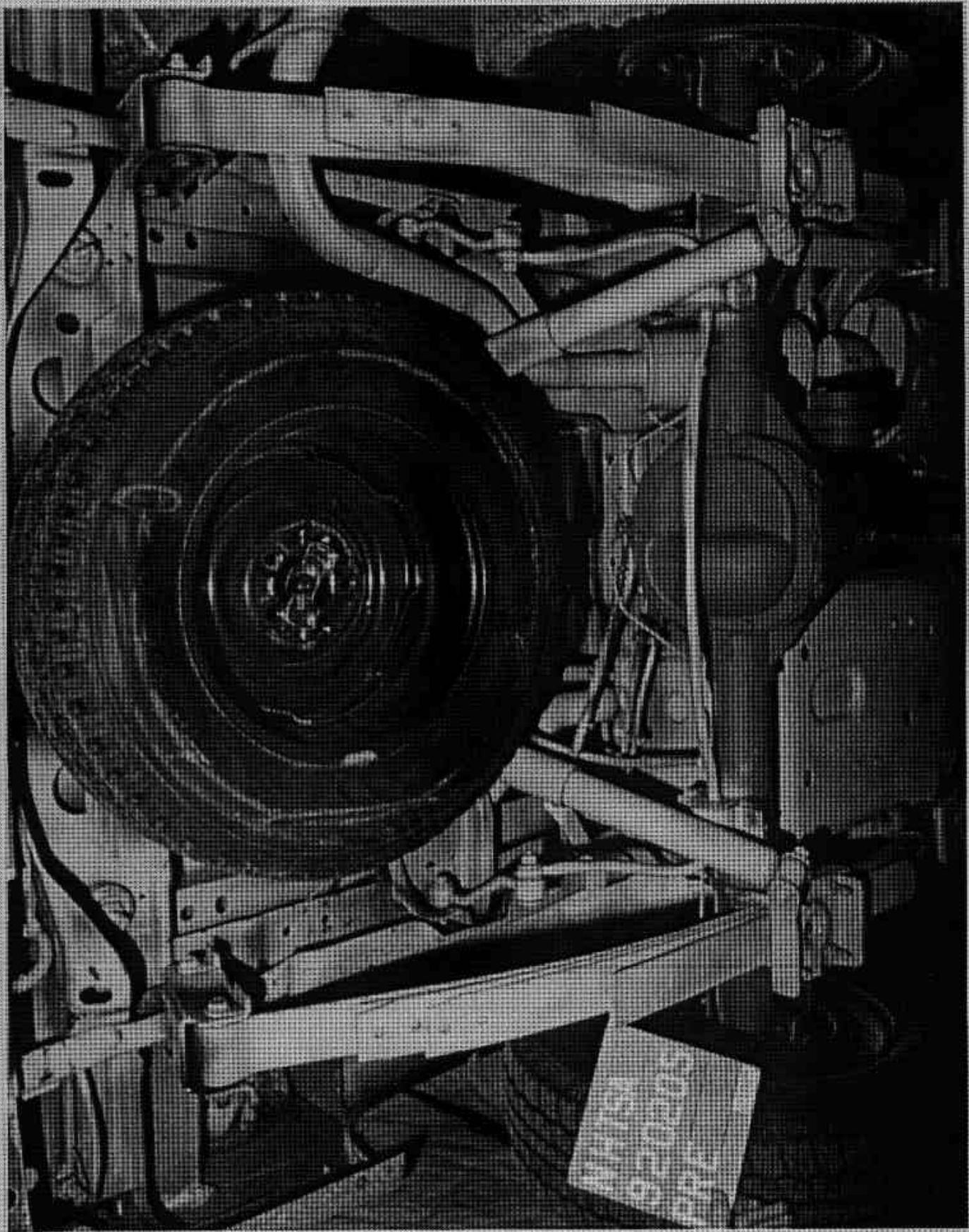


FIGURE A-25. PRE-TEST REAR UNDERBODY VIEW

A-26

920205

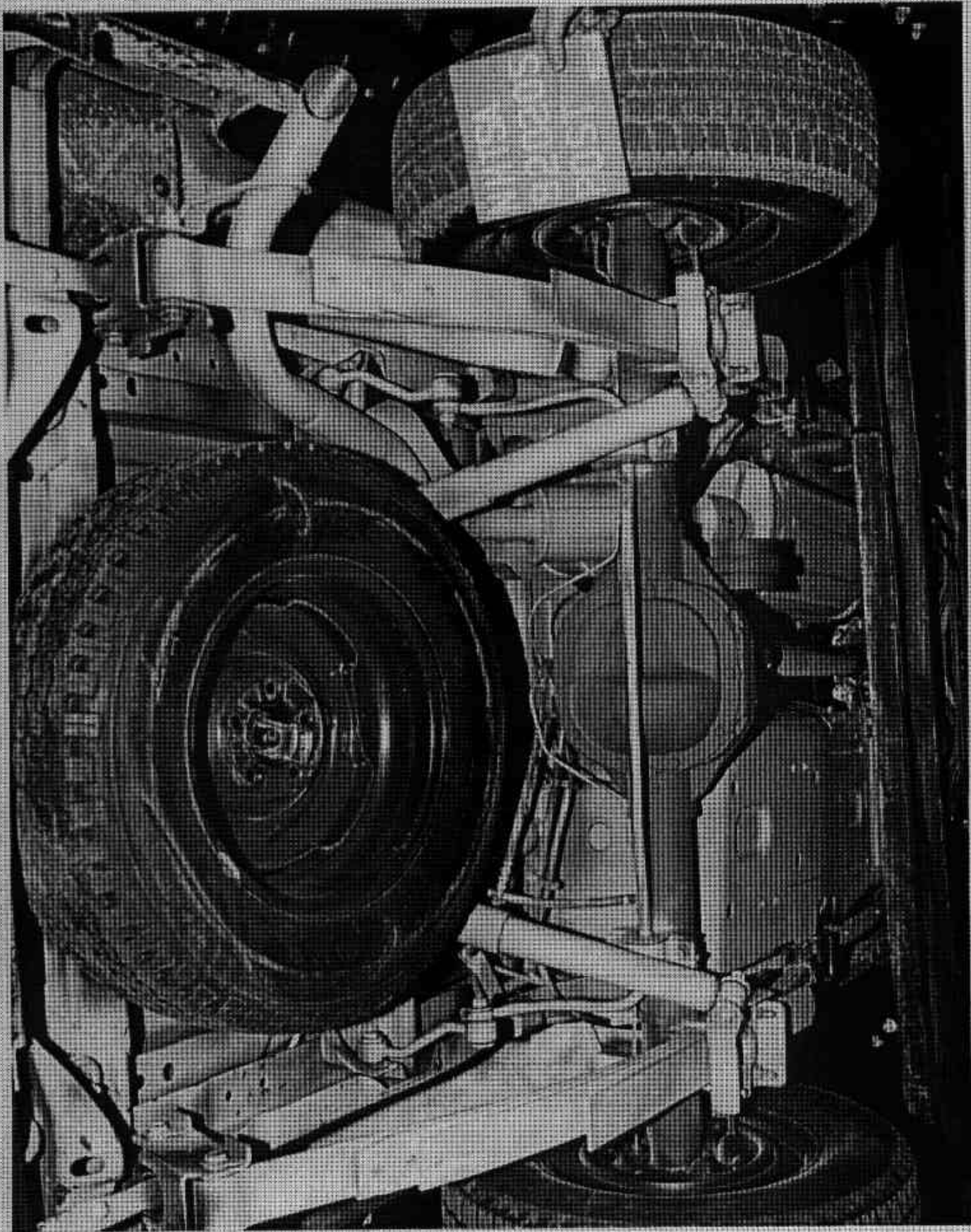


FIGURE A-26. POST-TEST REAR UNDERBODY VIEW

A-27

920205

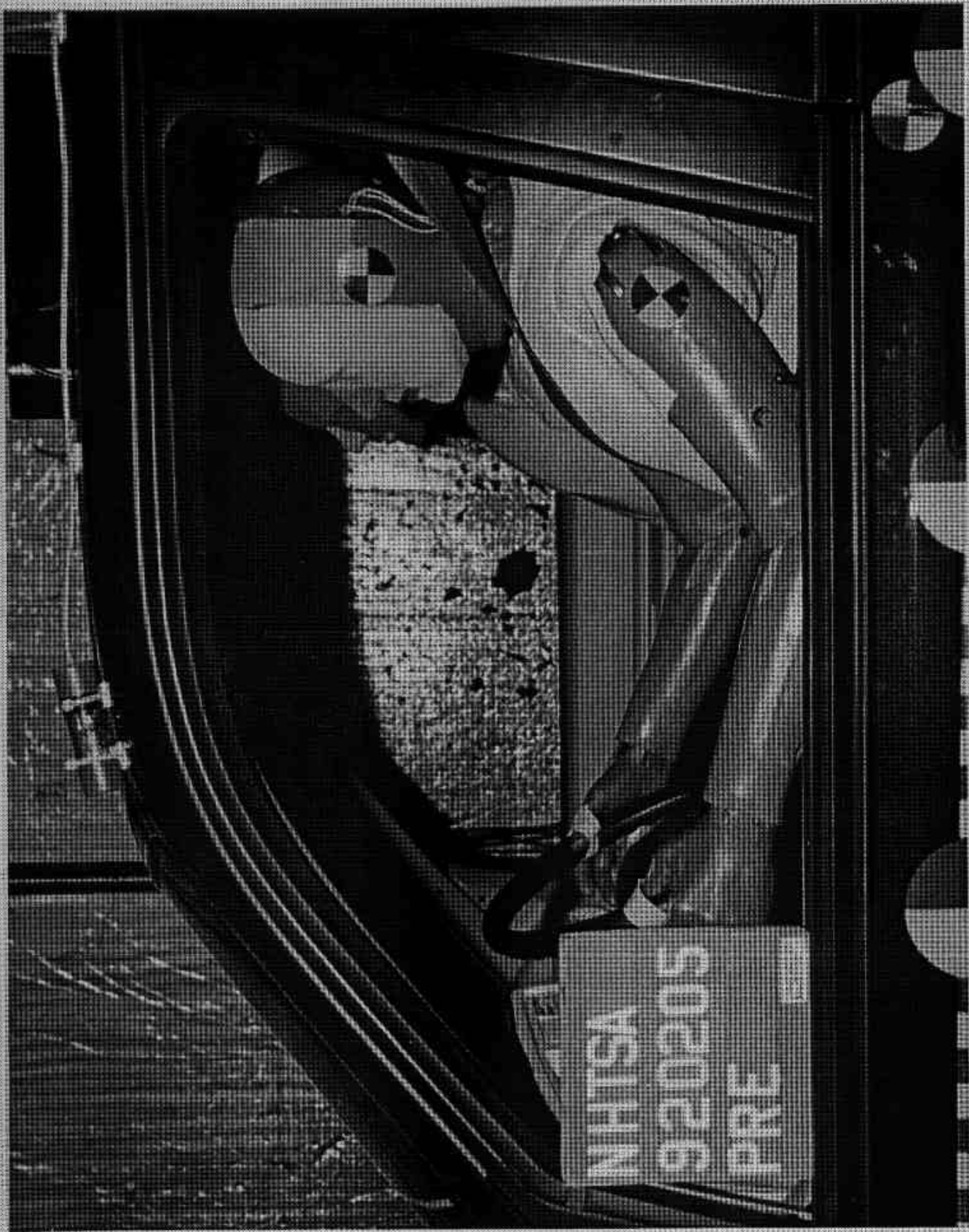


FIGURE A-27. PRE-TEST DRIVER DUMMY POSITION VIEW
A-28

920205

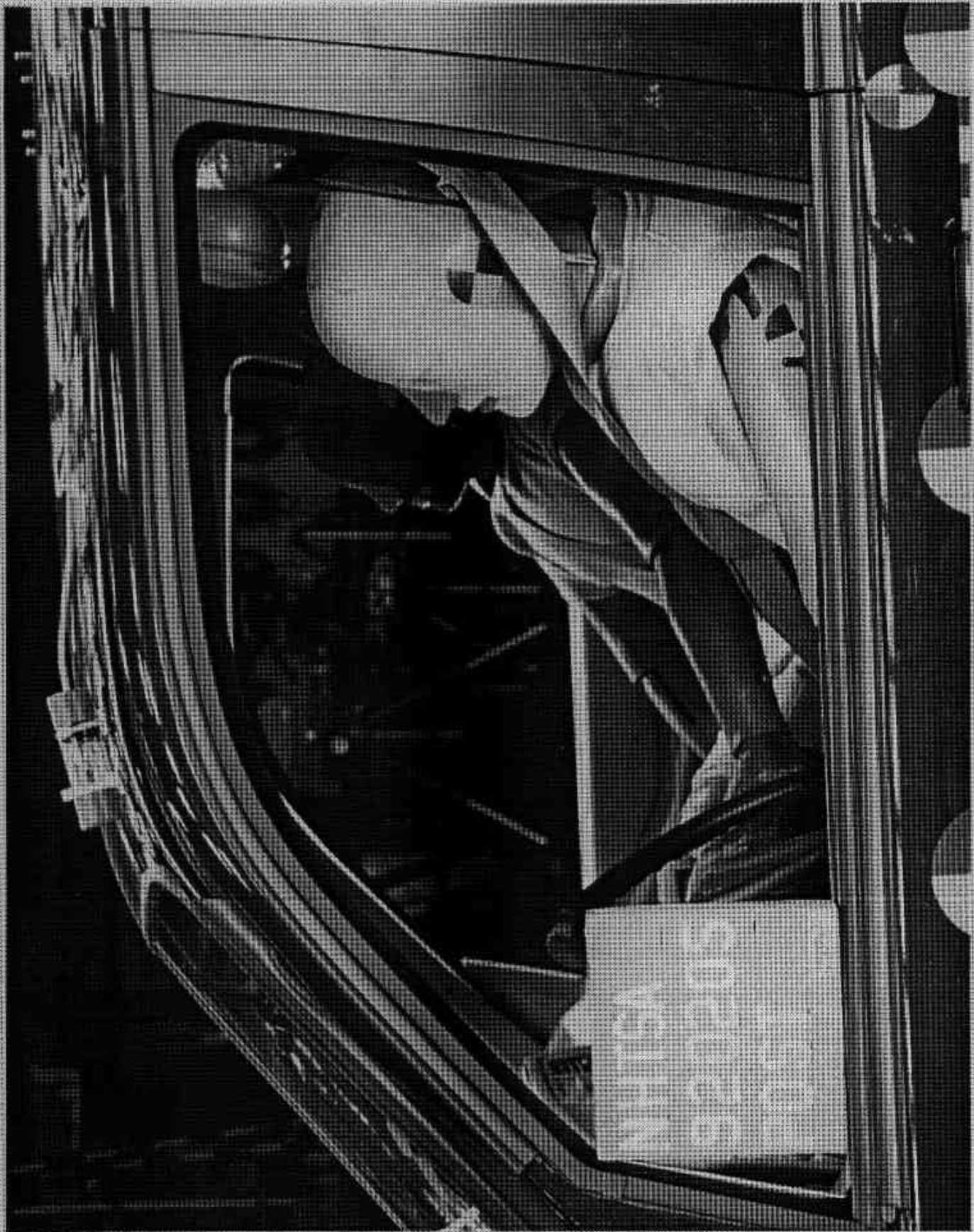


FIGURE A-28. POST-TEST DRIVER DUMMY POSITION VIEW

A-29

920205

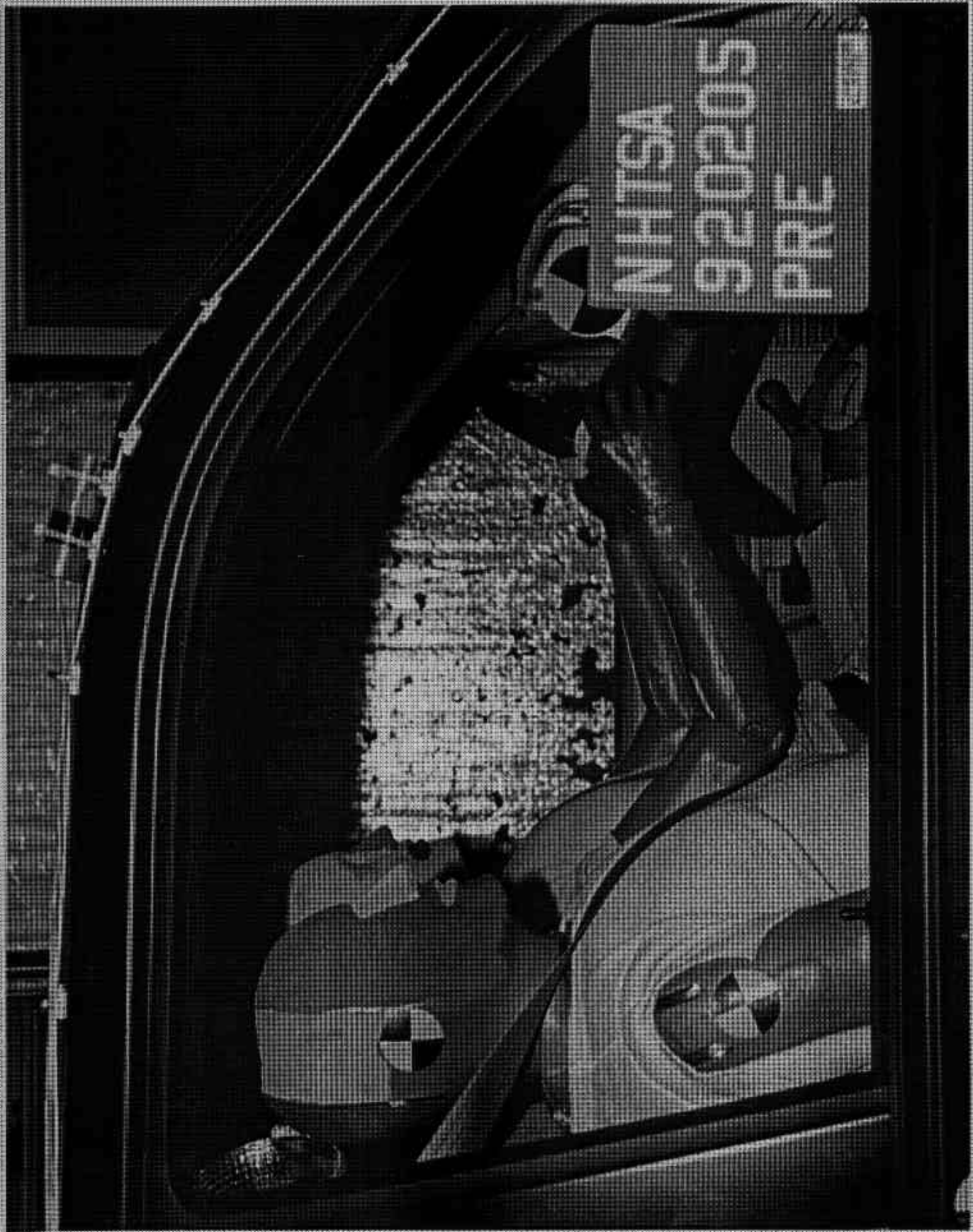


FIGURE A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW
A-30

920205

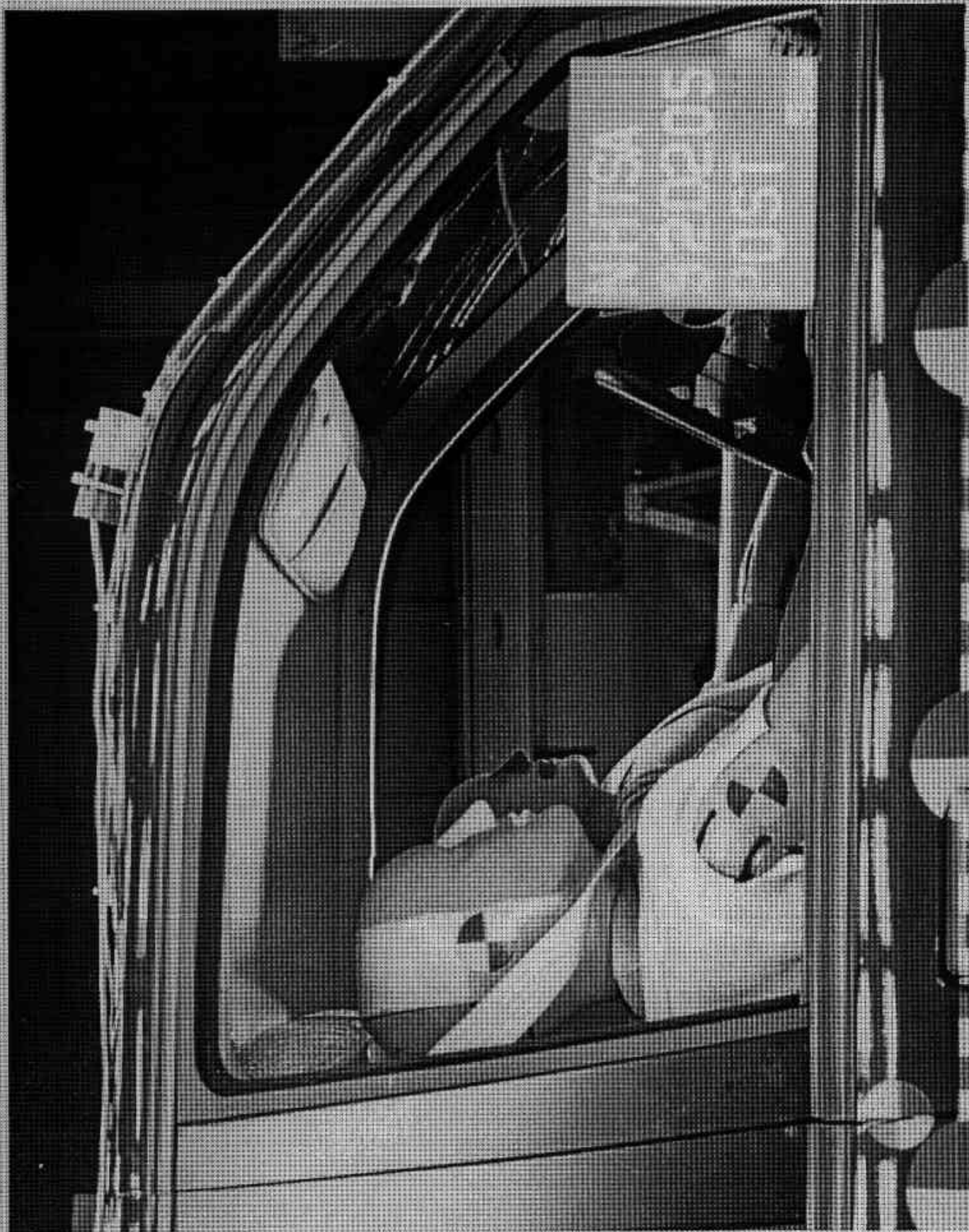


FIGURE A-30. POST-TEST PASSENGER DUMMY POSITION VIEW

A-31

920205

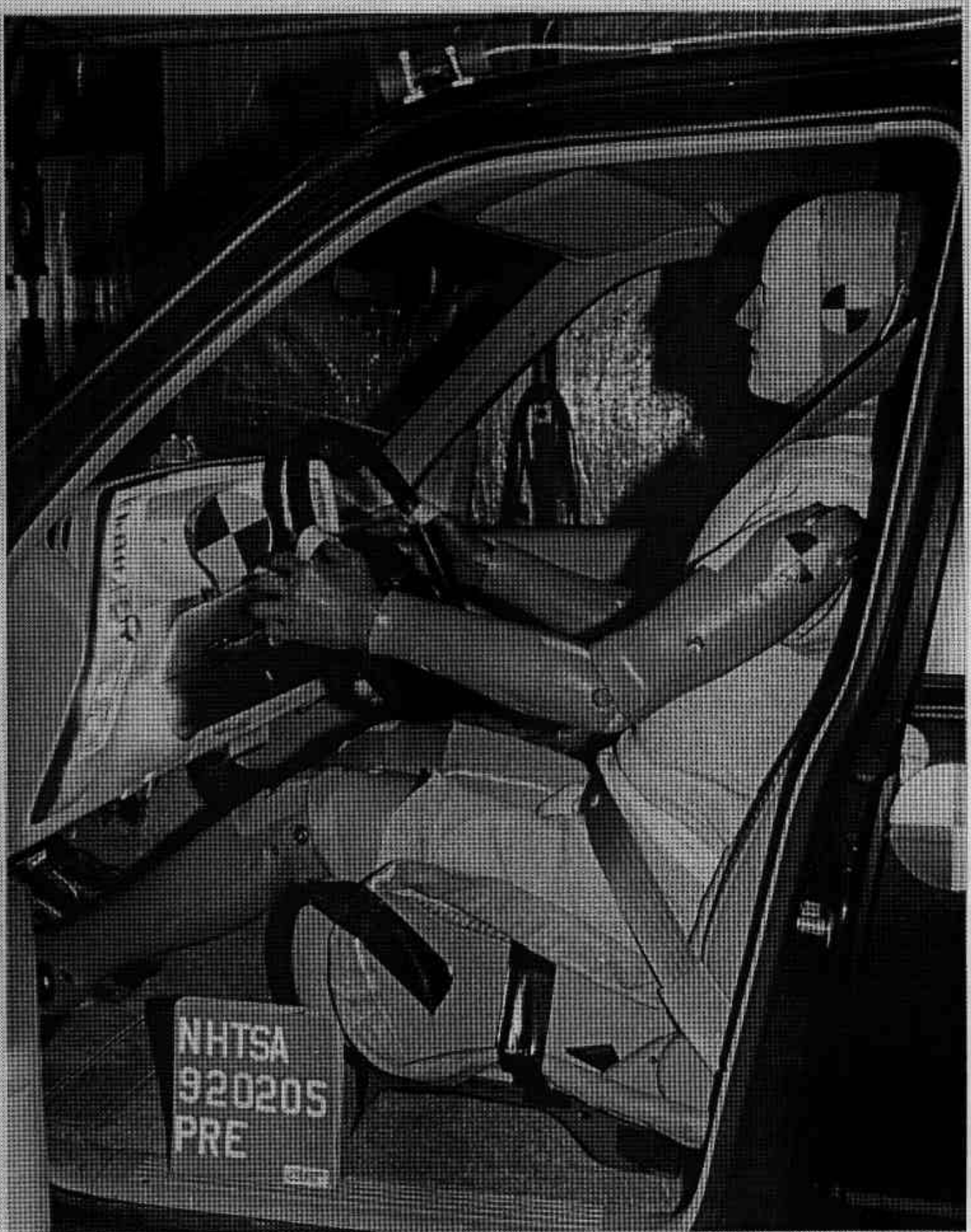


FIGURE A-31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-32

920205

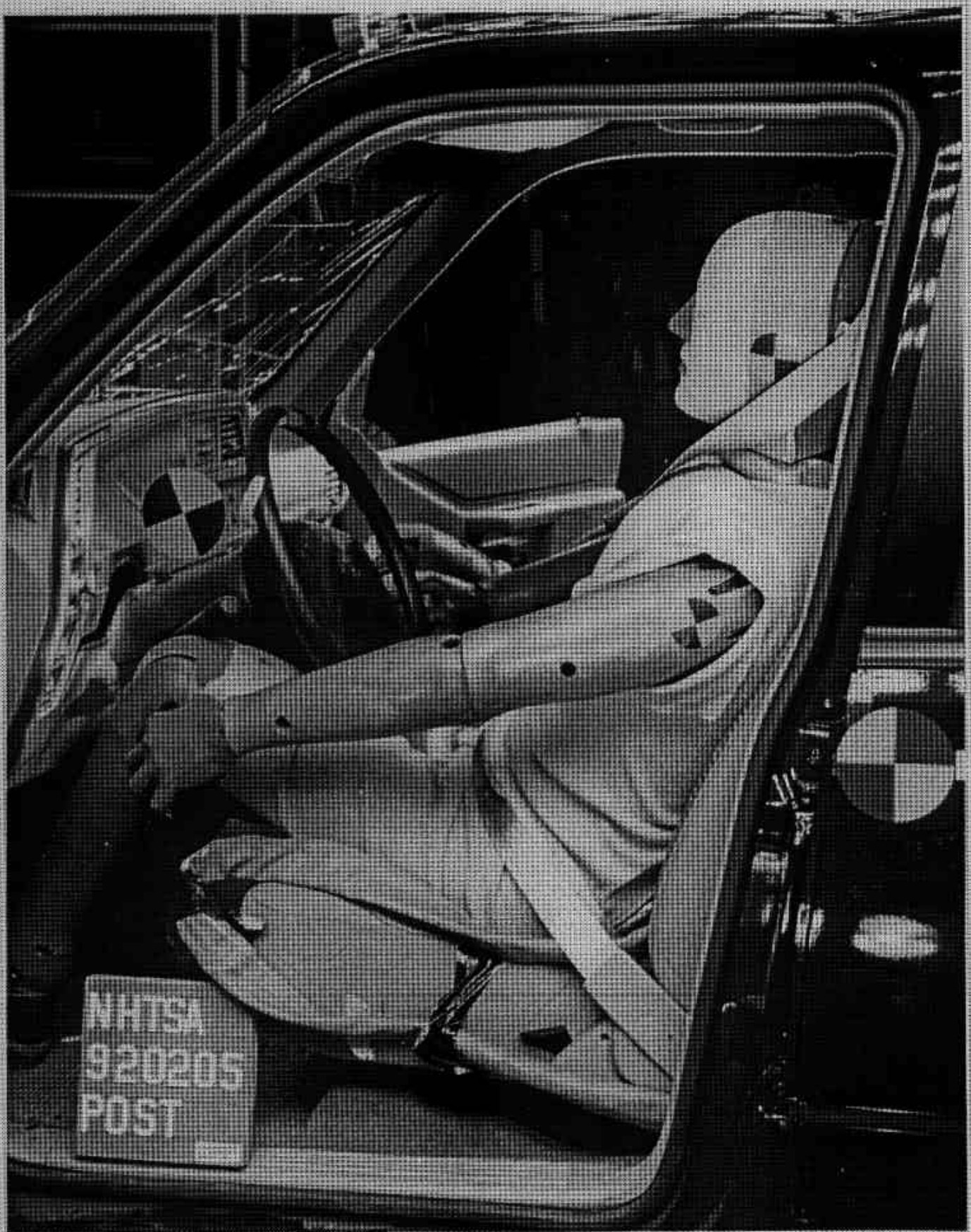


FIGURE A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-33

920205



FIGURE A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-34

920205

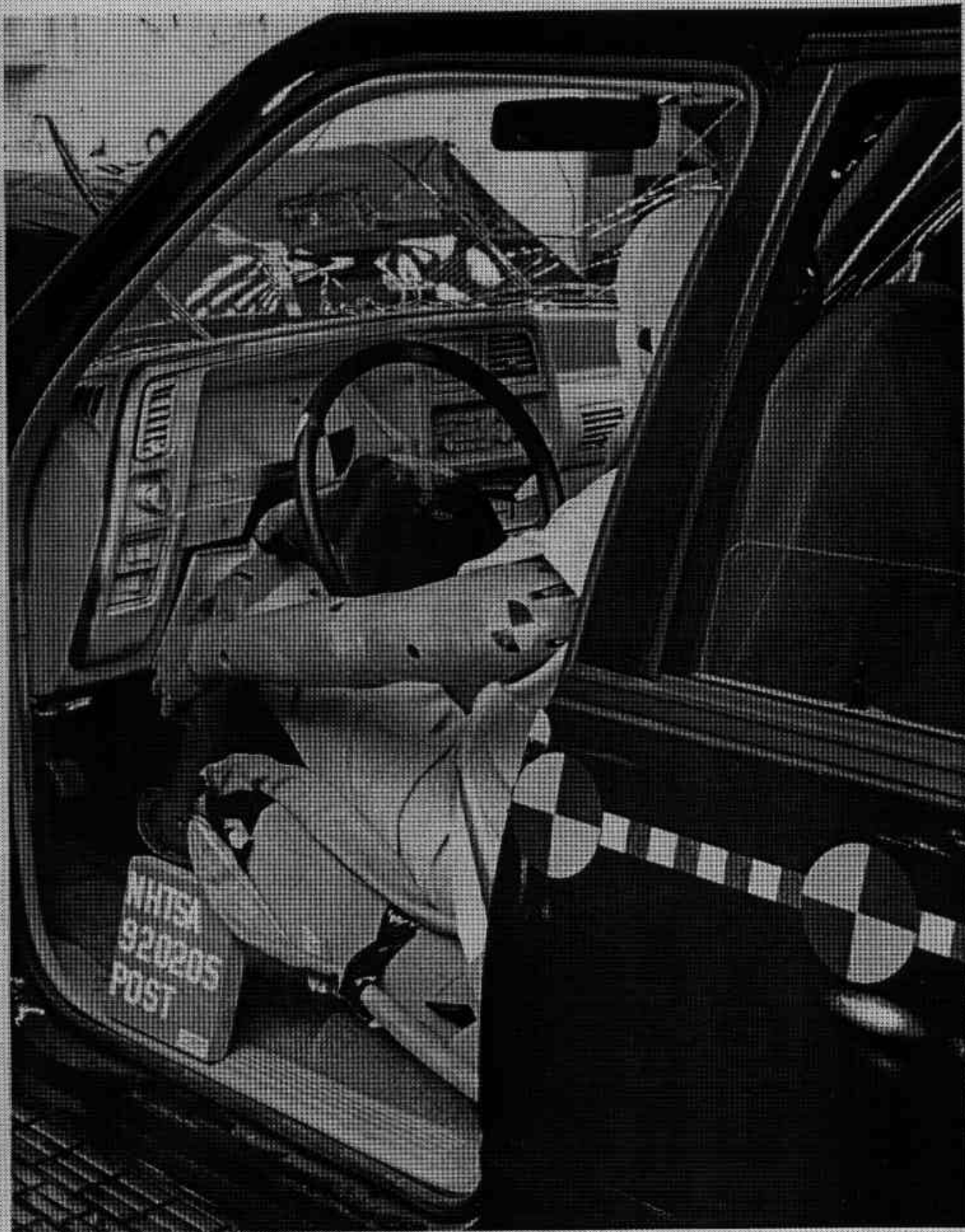


FIGURE A-34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-35

920205

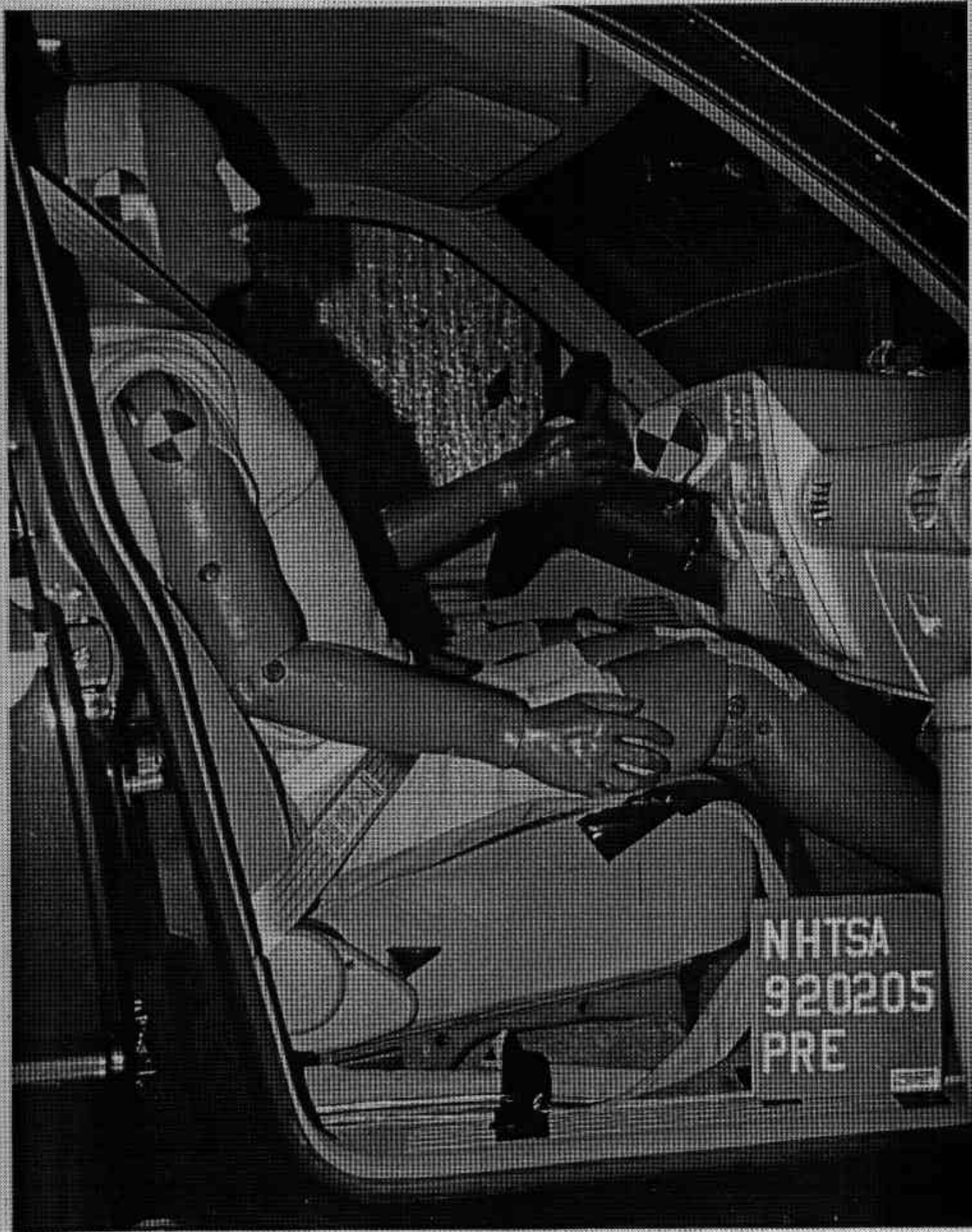


FIGURE A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-36 920205



FIGURE A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-37 920205

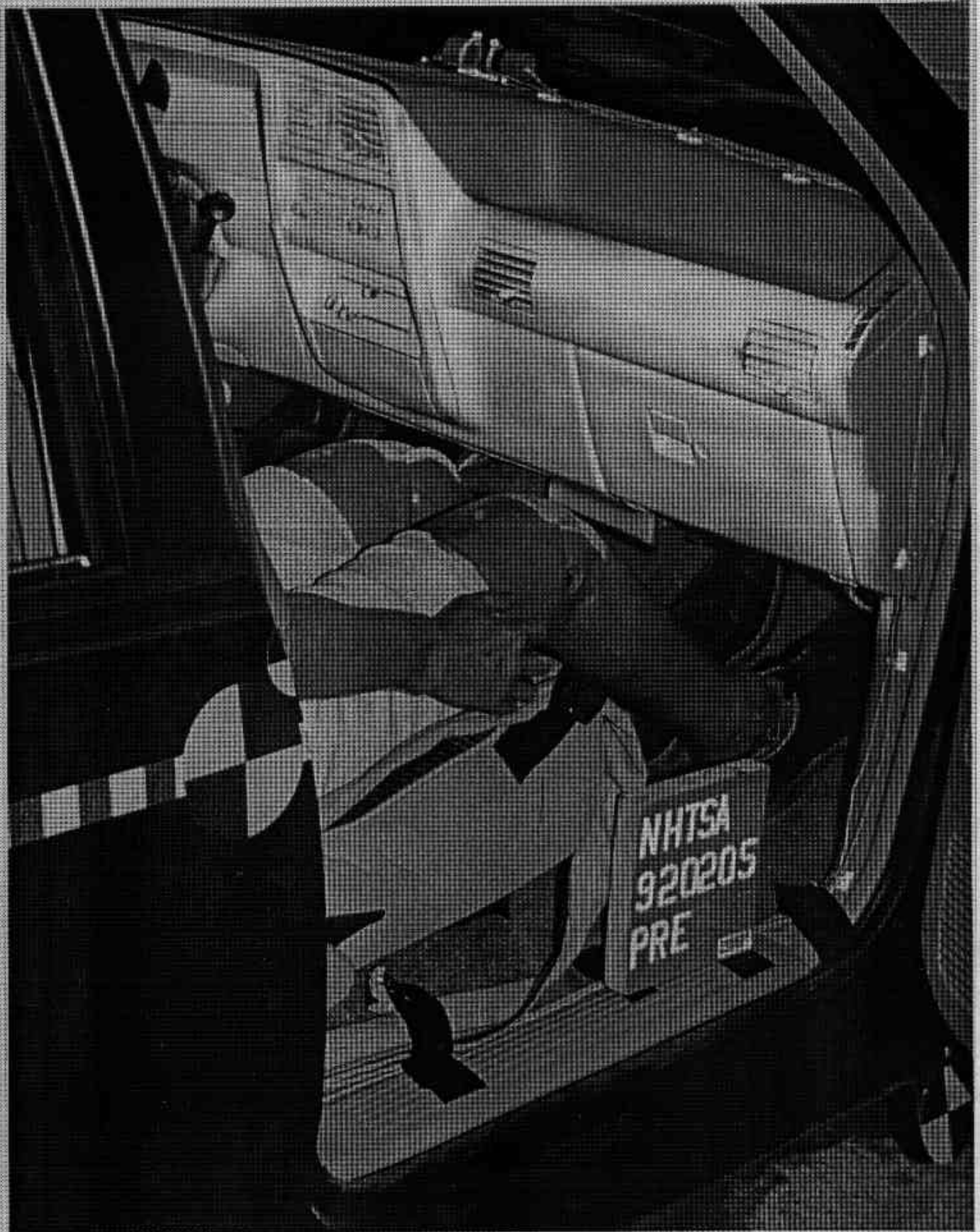


FIGURE A-37. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-38 920205

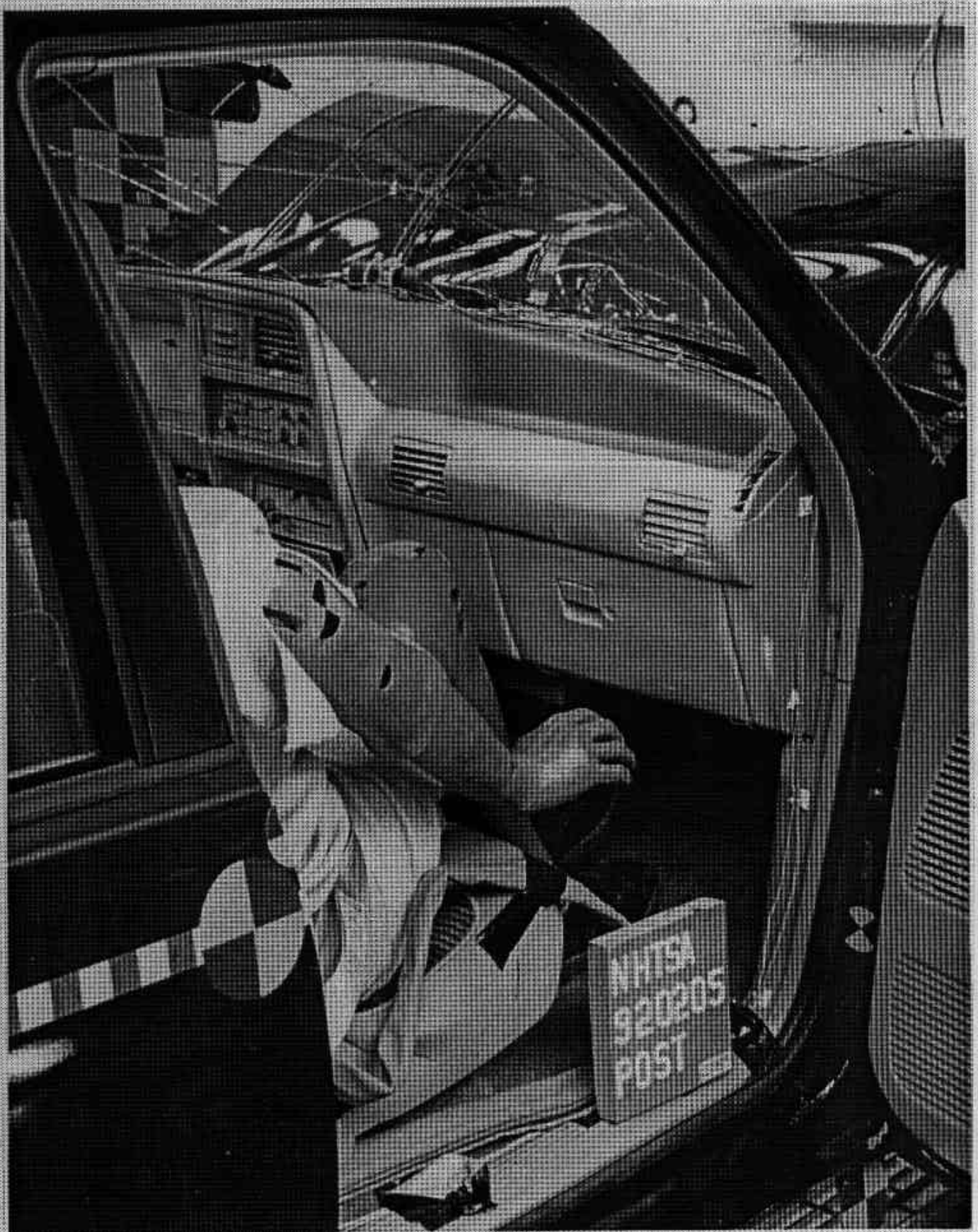


FIGURE A-38. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-39 920205

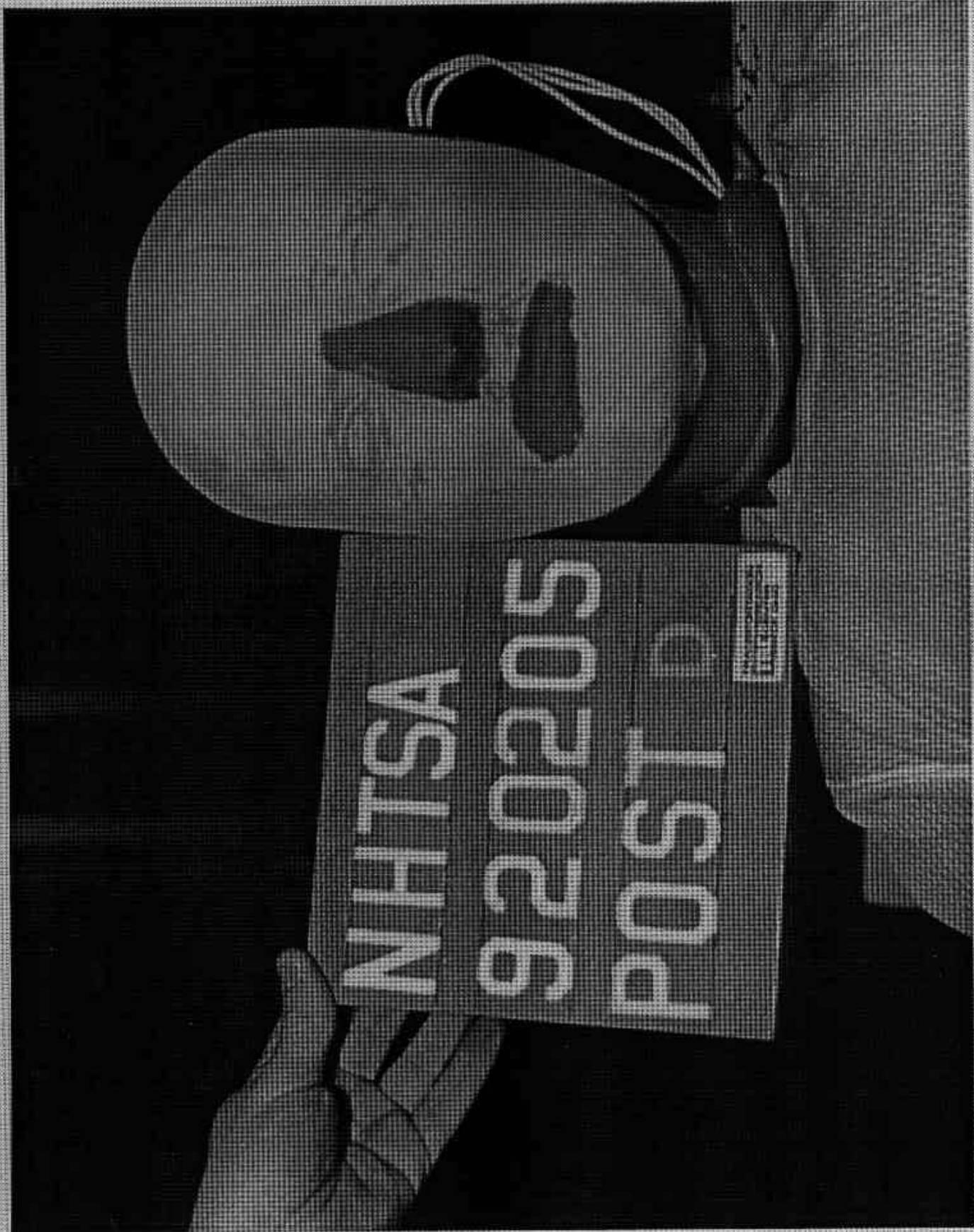


FIGURE A-39. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW



FIGURE A-40. POST-TEST DRIVER DUMMY HEAD AND KNEE CONTACT VIEW

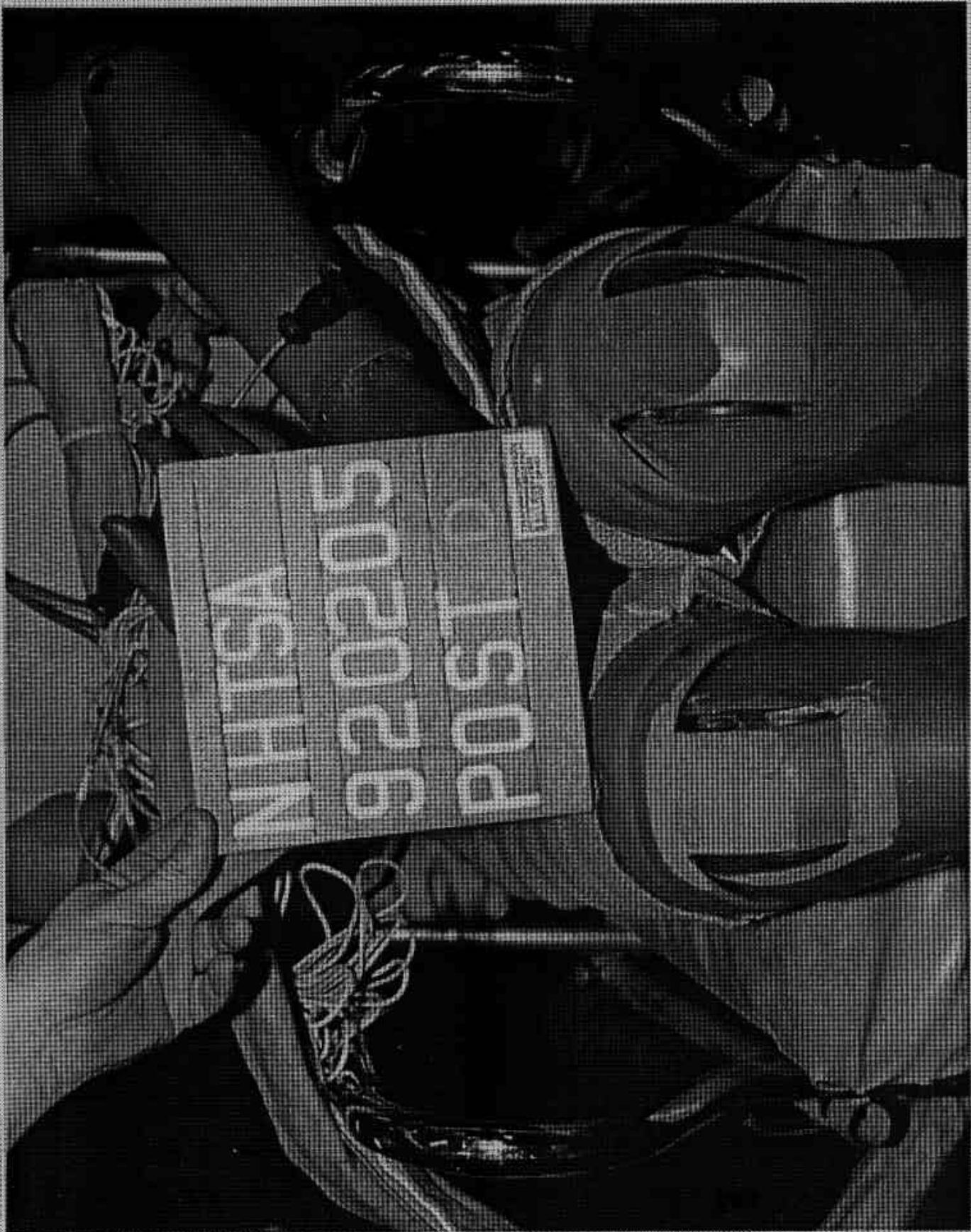


FIGURE A-41. POST-TEST DRIVER DUMMY KNEE CONTACT VIEW

A-42

920205

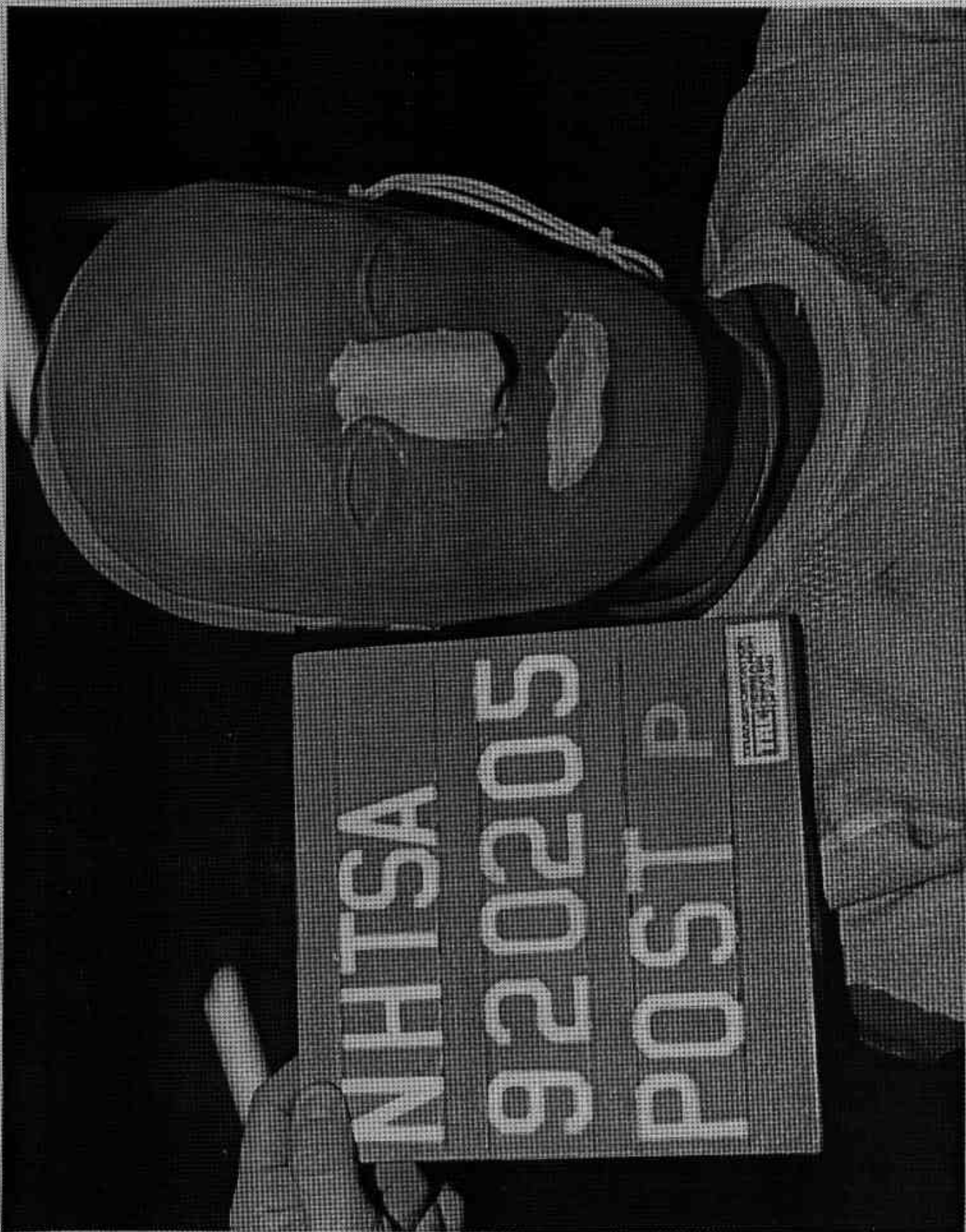


FIGURE A-42. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

A-43

920205



FIGURE A-43. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

A-44

920205

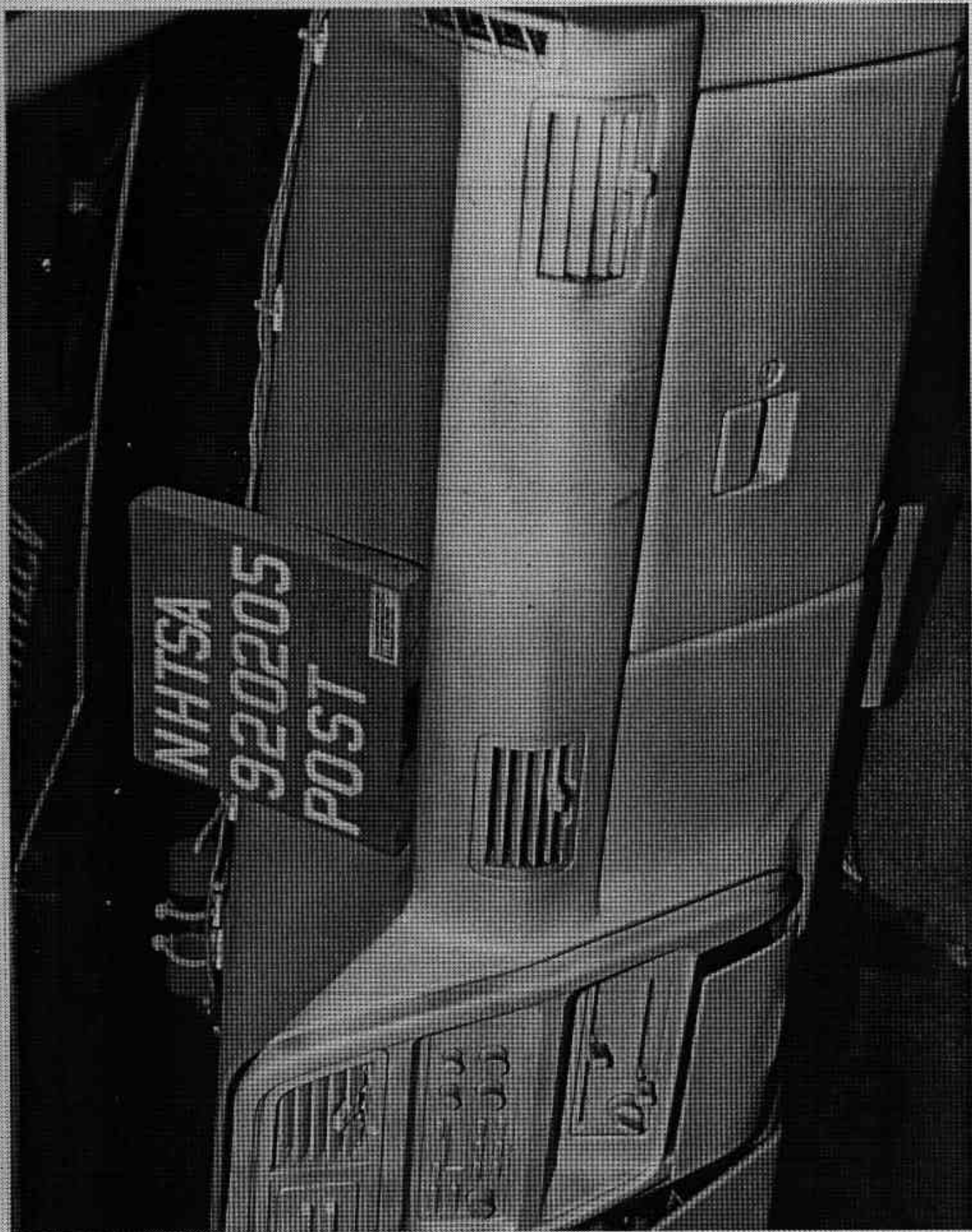


FIGURE A-44. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

A-45

920205

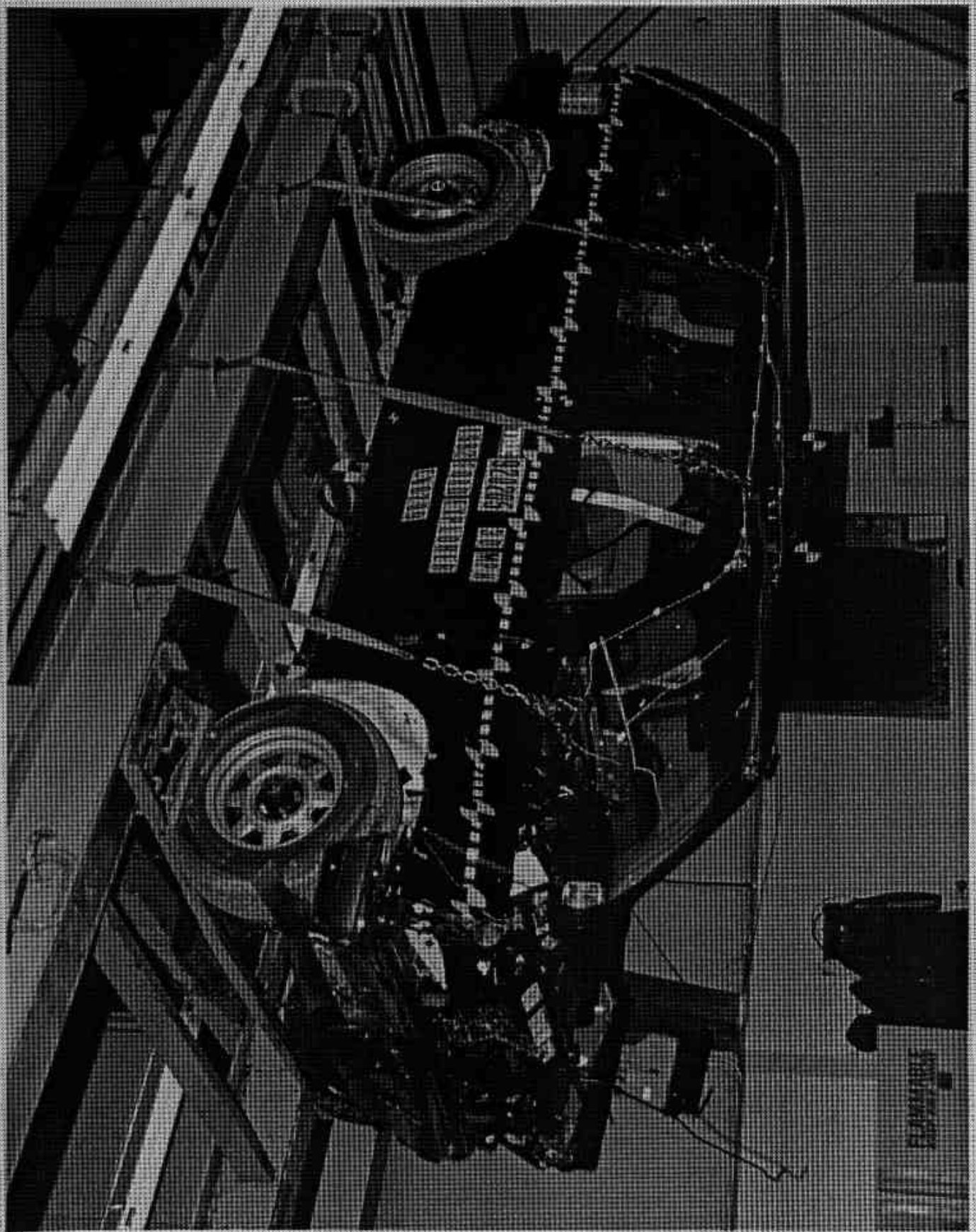


FIGURE A-46. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

A-47

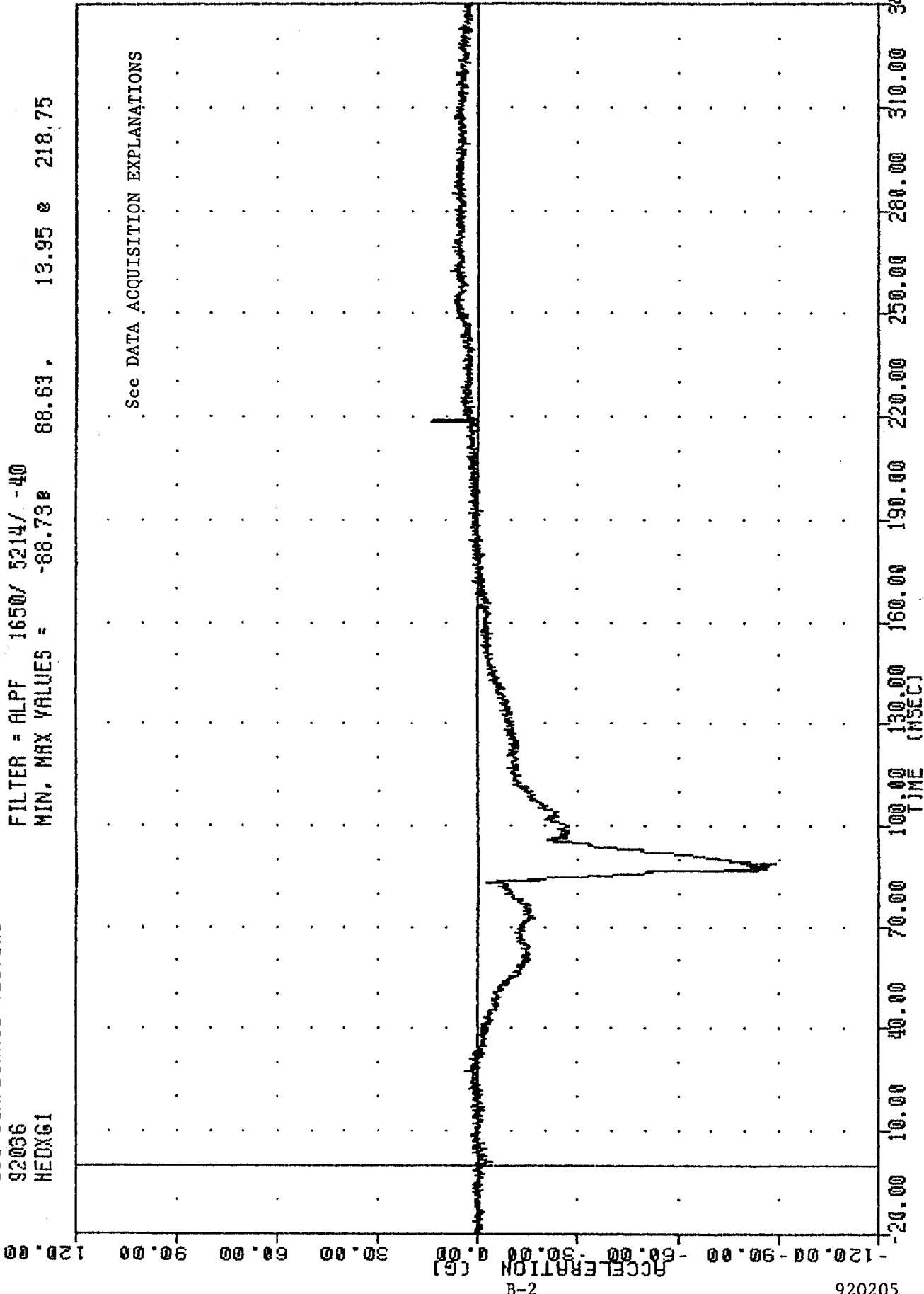
920205

APPENDIX B

DATA PLOTS

TAC , 920205
208 COMPLIANCE TESTING
92036
HEDX61

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -88.73 88.63 , 13.95 218.75

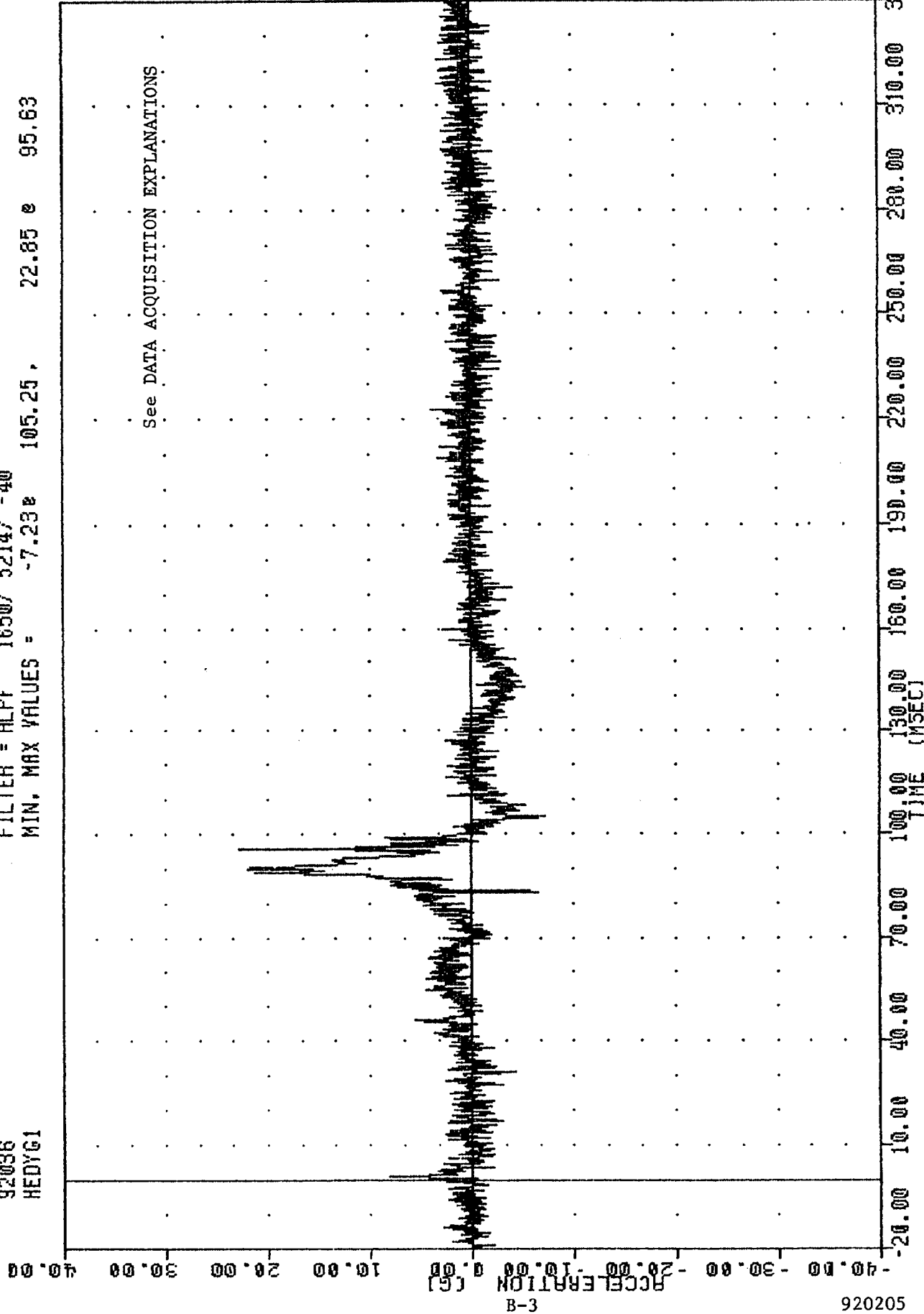


1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER HEAD X-AXIS ACCELERATION

TRC
208 COMPLIANCE TESTING
92036
HEDYG1

920205

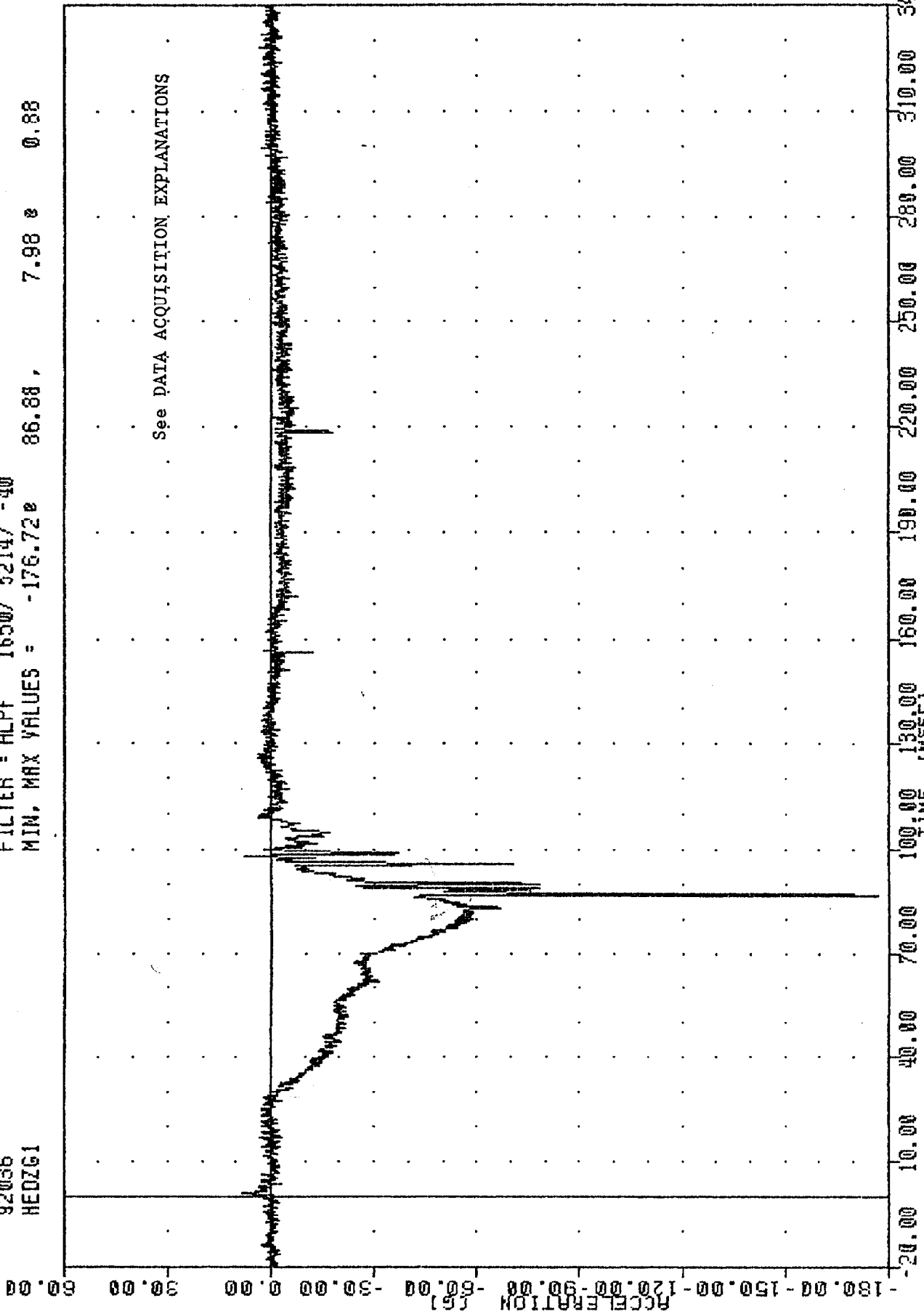
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -7.23e 22.85 e 95.63



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

TRC 920205
200 COMPLIANCE TESTING
92086
HE02G1

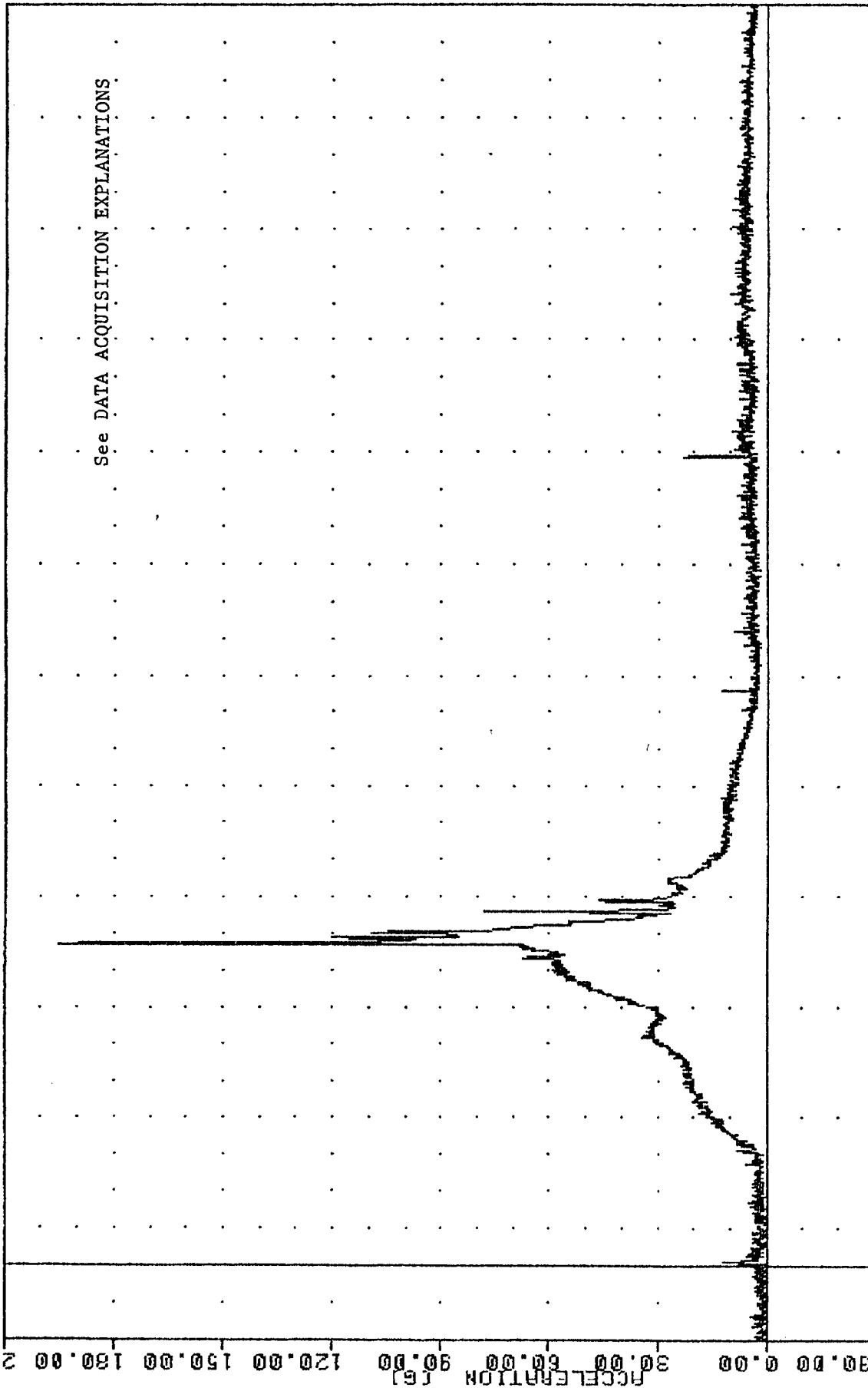
FILTER = ALPF 1650/ 5214/ -40
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1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION

TRC
 920205
 208 COMPLIANCE TESTING
 92056
 HECRG1

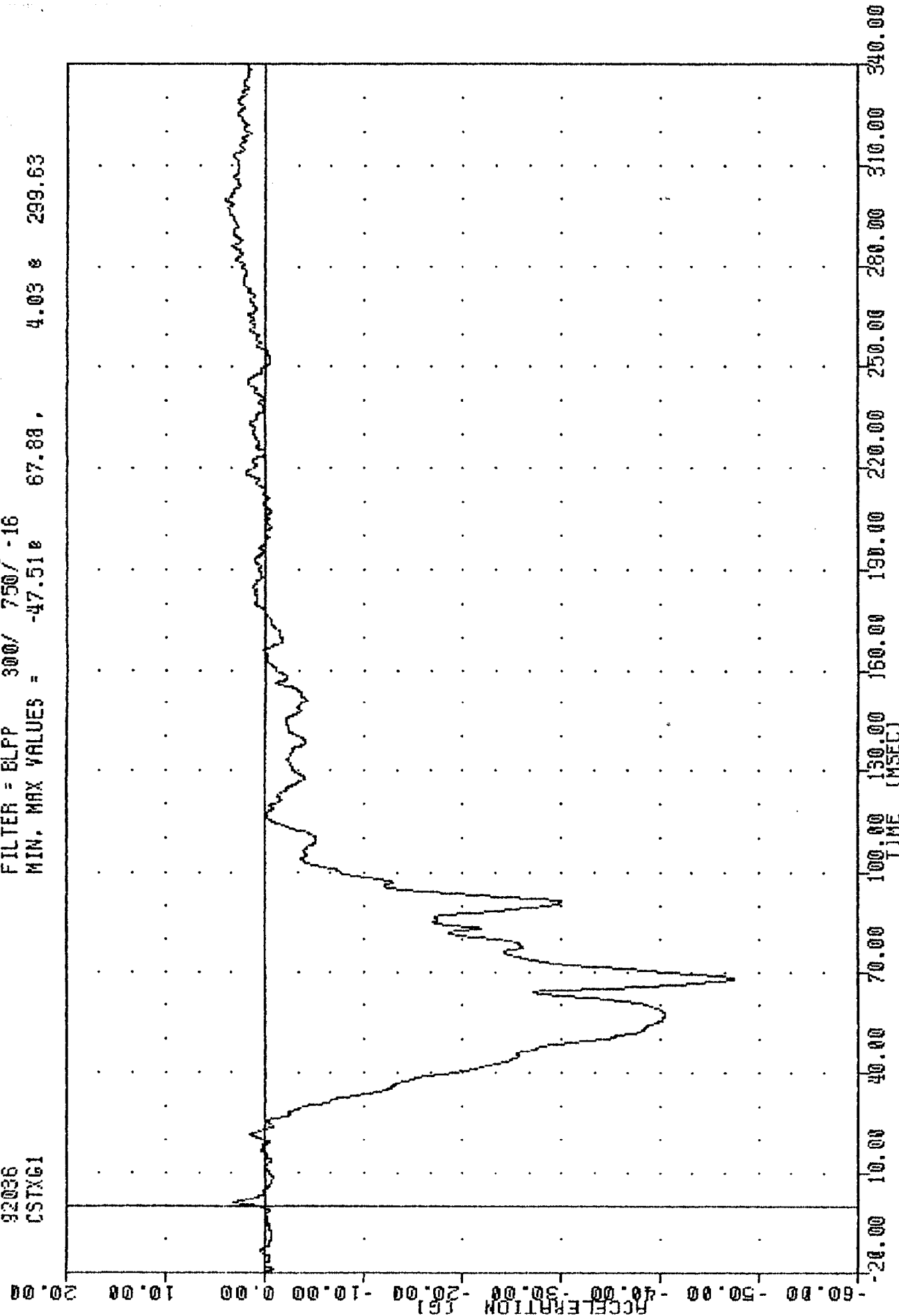
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 0.22g -1.13, 195.01 g 86.88



920205
 1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION

TRC 920205
208 COMPLIANCE TESTING
92036
CSTXG1

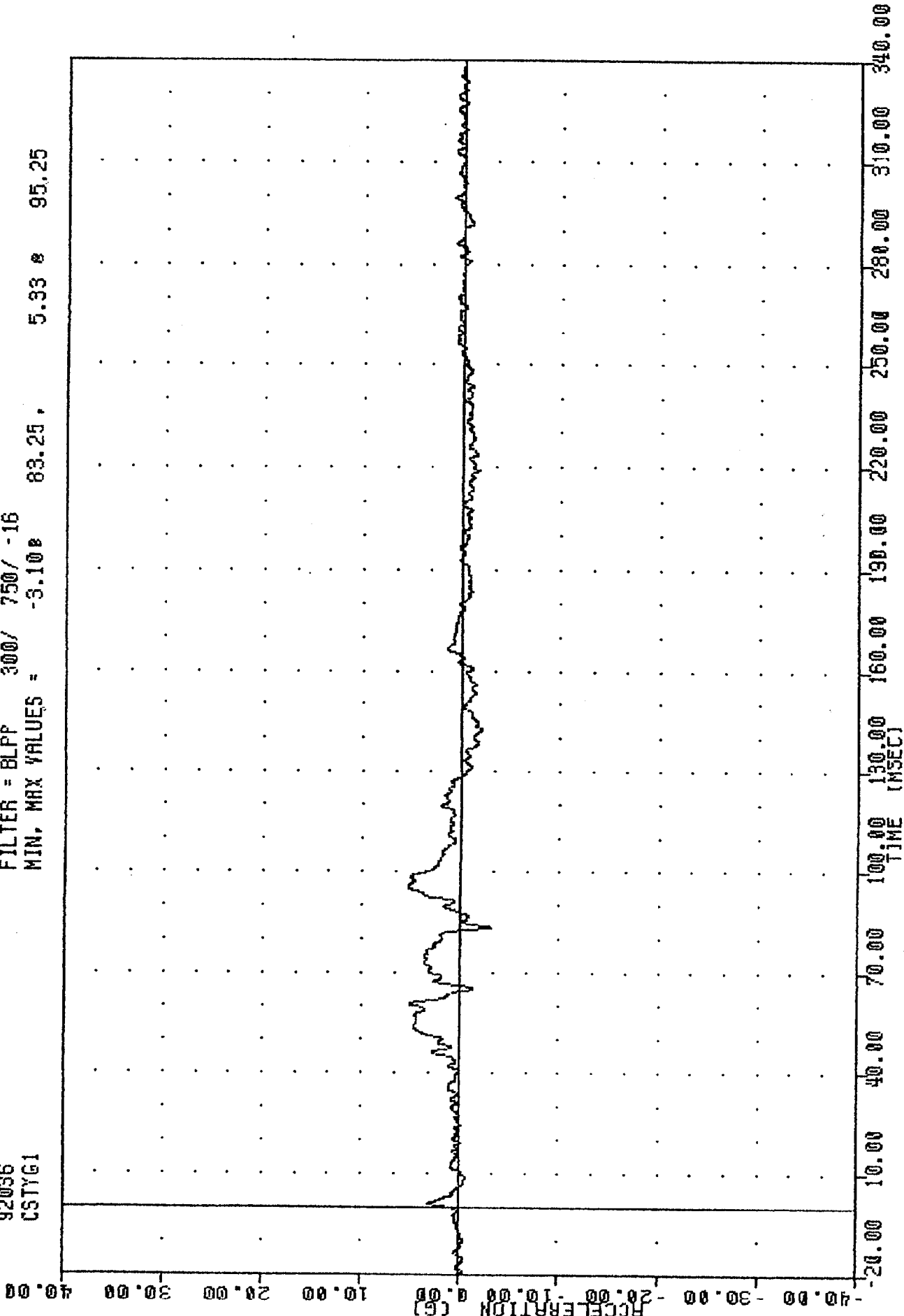
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -47.51e 67.88, 4.03 e 299.63



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER CHEST X-AXIS ACCELERATION

TAC , 920205
208 COMPLIANCE TESTING
92036
CSTYG1

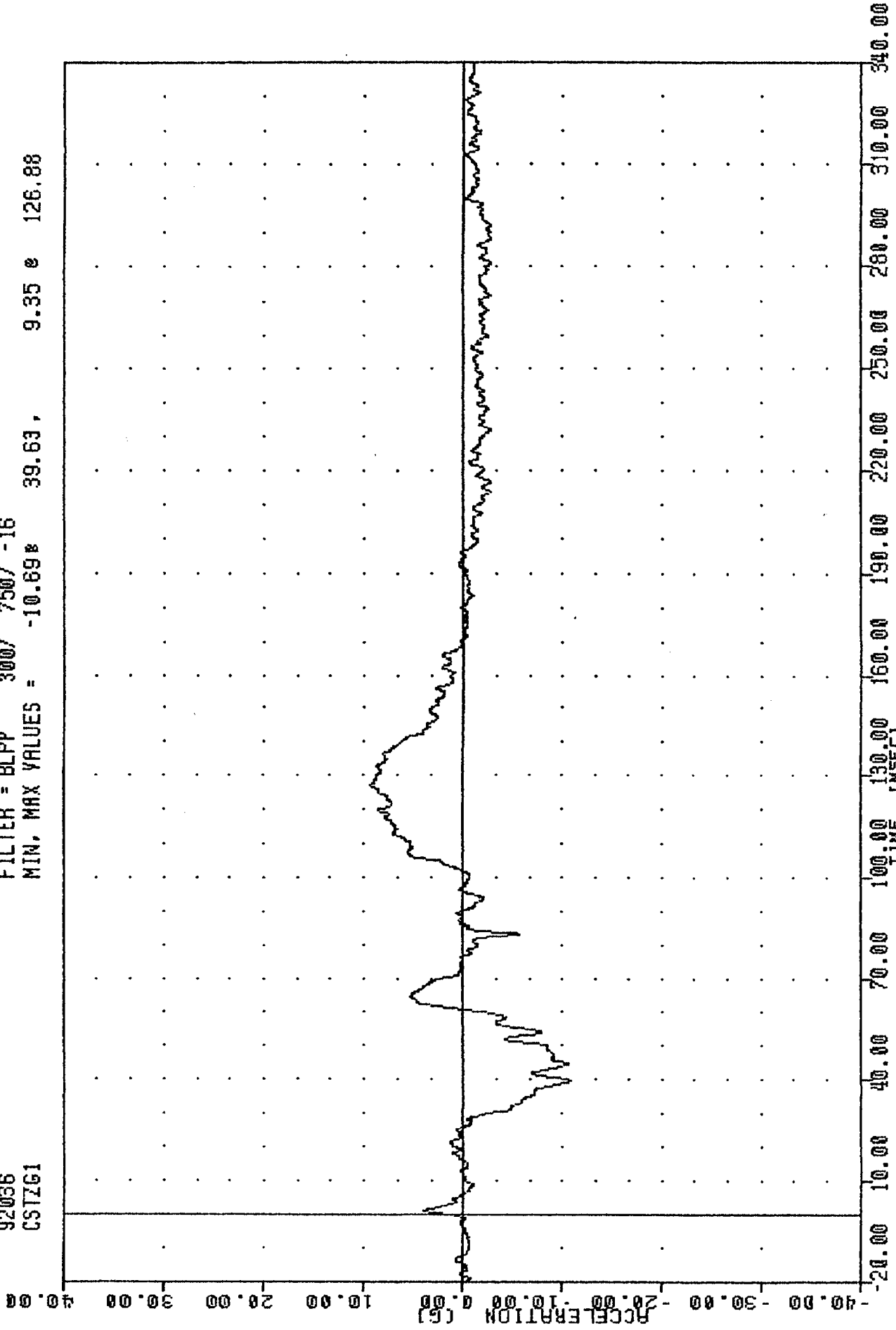
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -3.108 83.25, 5.33 95.25



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION

TRC 920205
208 COMPLIANCE TESTING
92036
CSTZG1

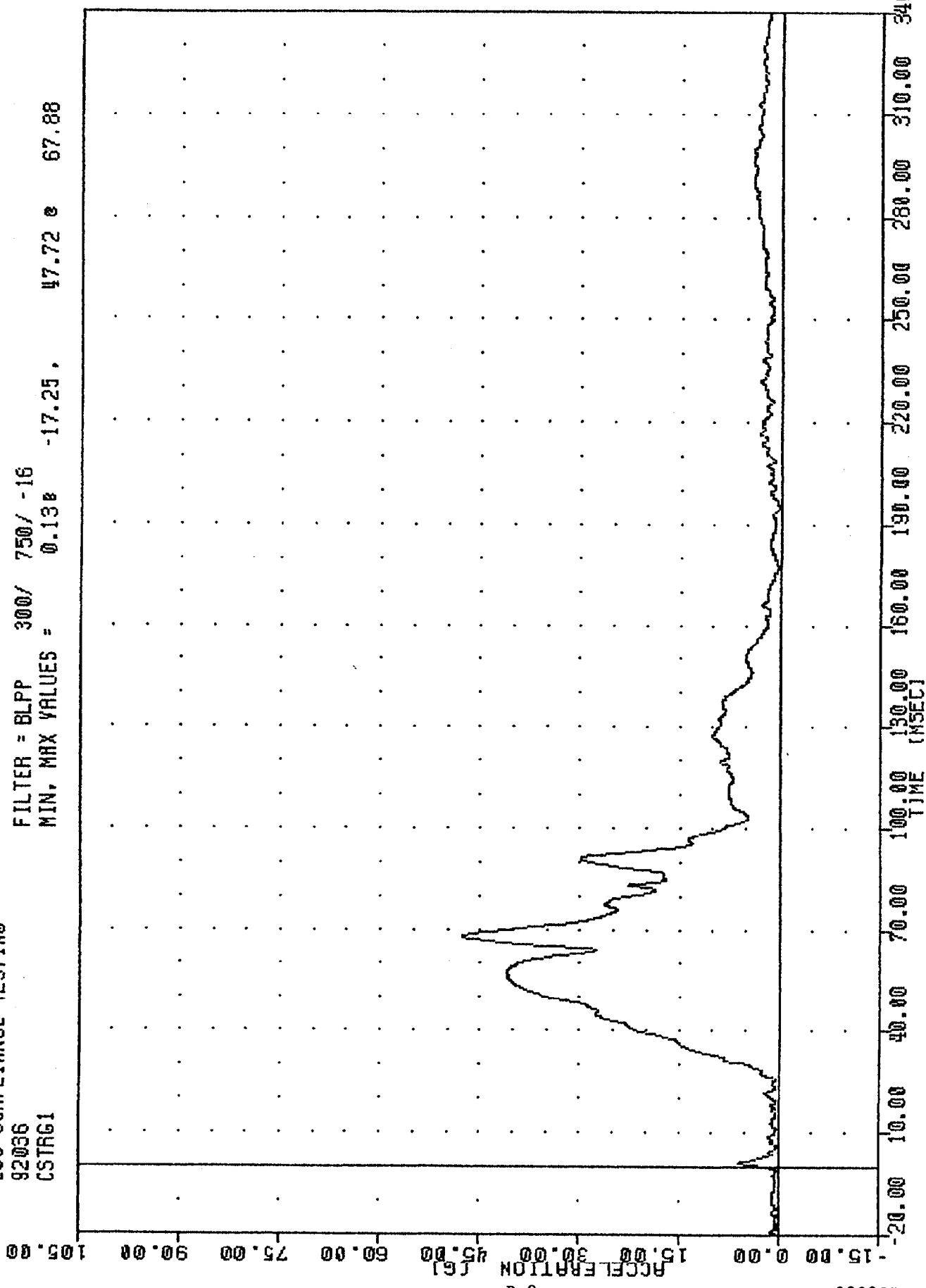
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -10.69% 39.63, 9.35 e 126.88



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION

TRC
920205
208 COMPLIANCE TESTING
92036
CSTRG1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = 0.138 -17.25, 47.72 e 67.88

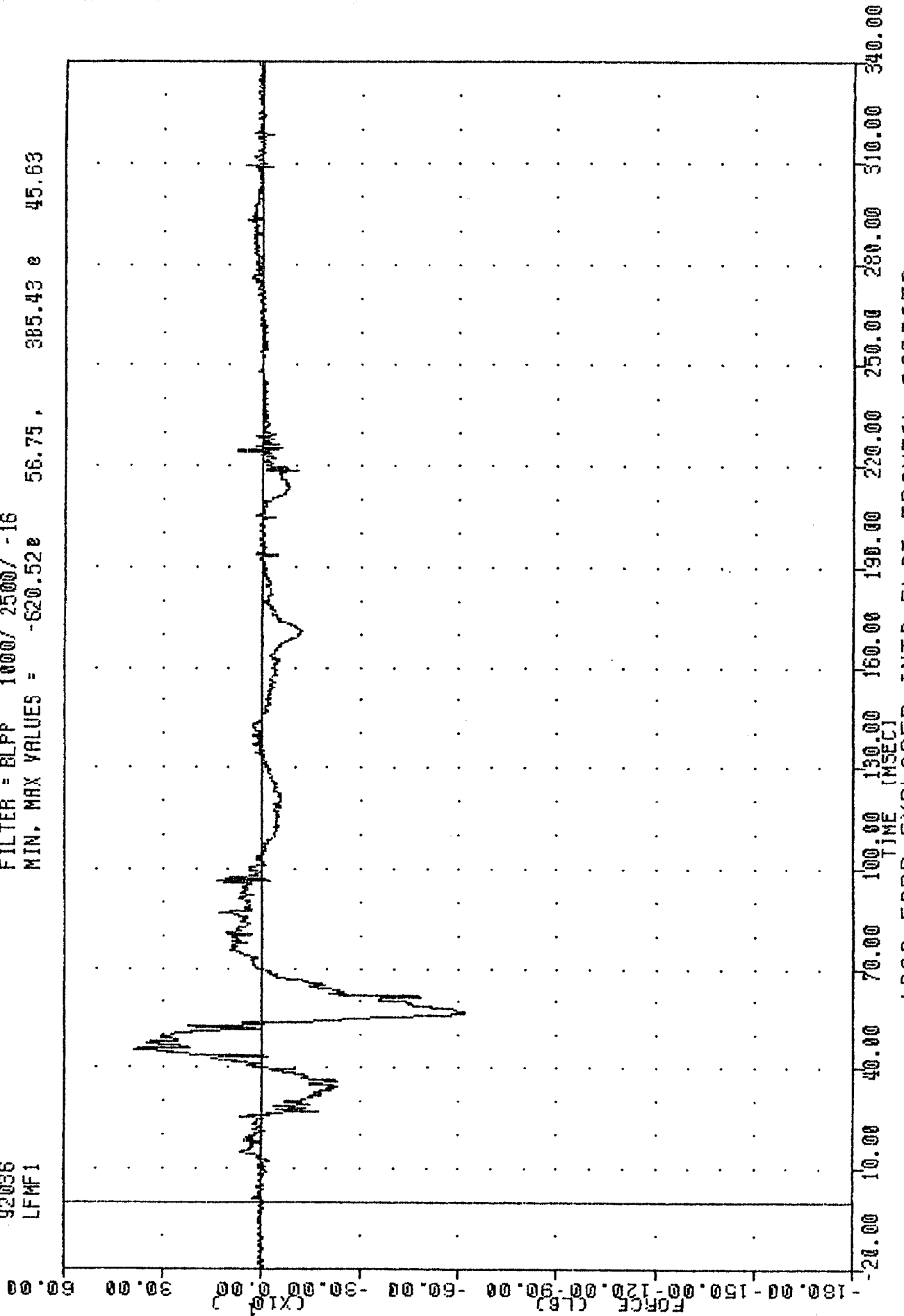


1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TRC , 920205
208 COMPLIANCE TESTING

92036
LFMF1

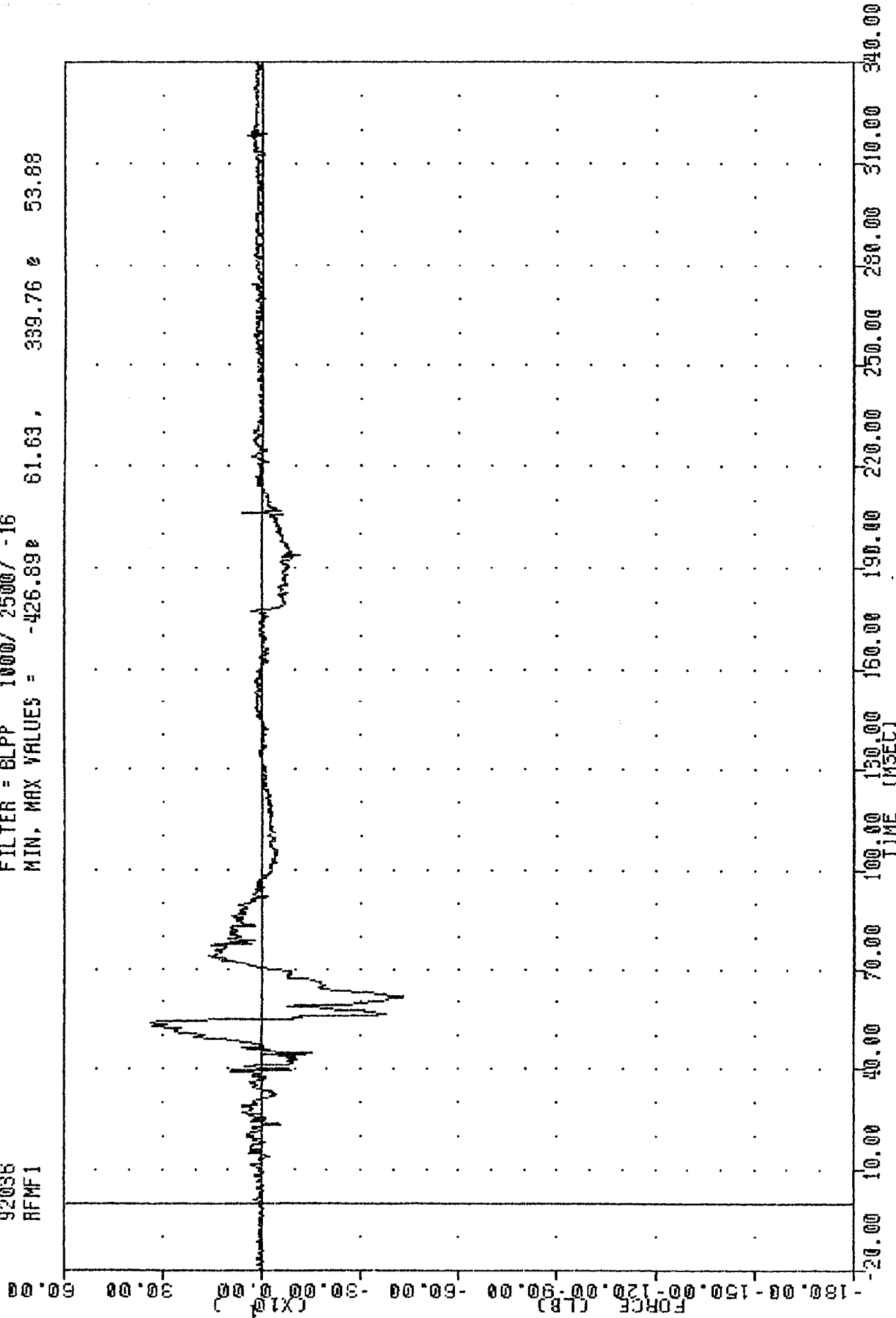
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -620.52e 385.43 e 45.63



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE

TRC , 920205
200 COMPLIANCE TESTING
92036
RFMF1

FILTER = 6LPP 1000/ 2500/ -16
MIN, MAX VALUES = -426.89e 61.63, 339.76 e 53.88

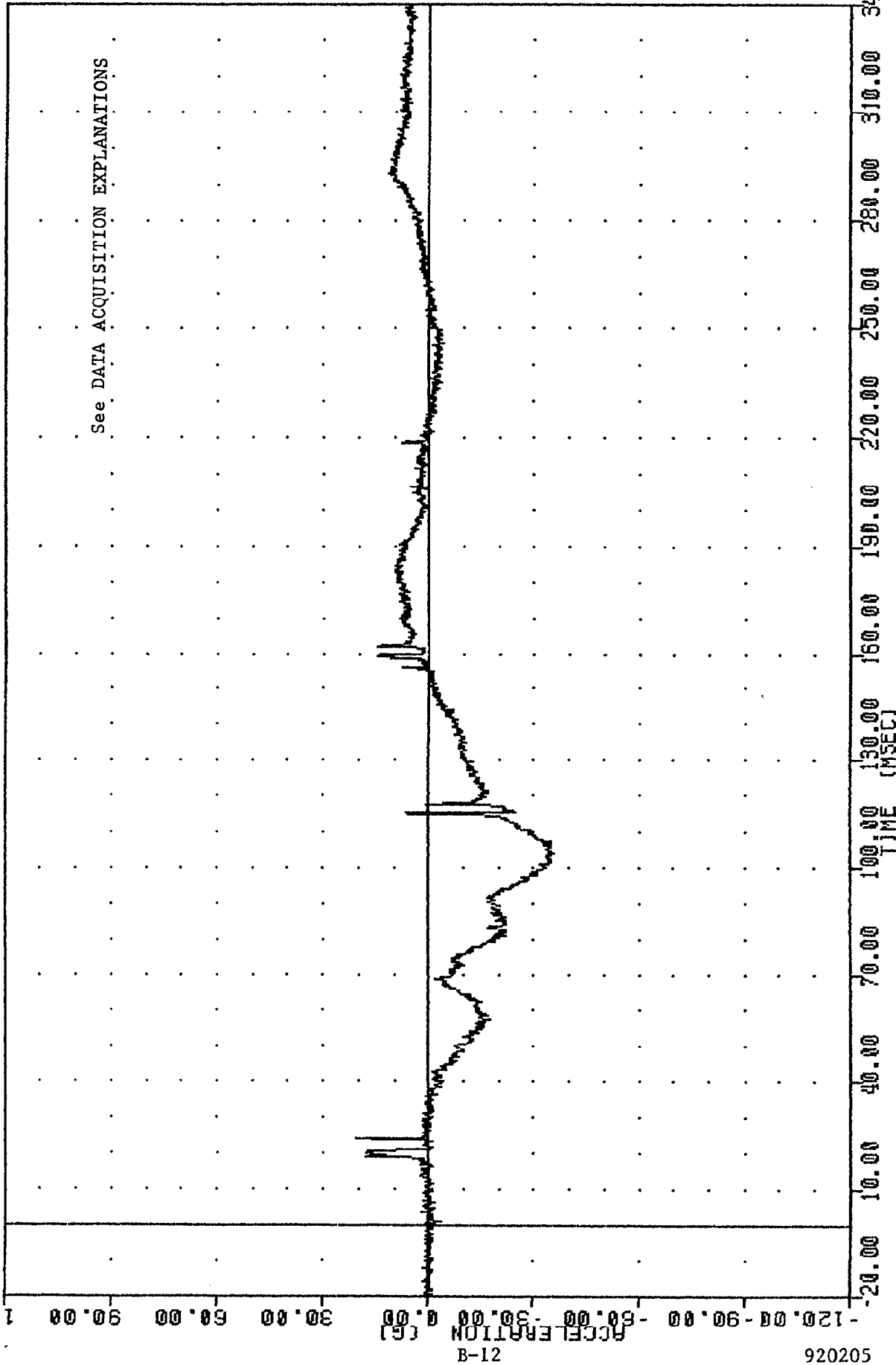


1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE

TRC , 920205
200 COMPLIANCE TESTING
92036
HEDXG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -35.38e 104.25, 20.30 e 24.13

See DATA ACQUISITION EXPLANATIONS



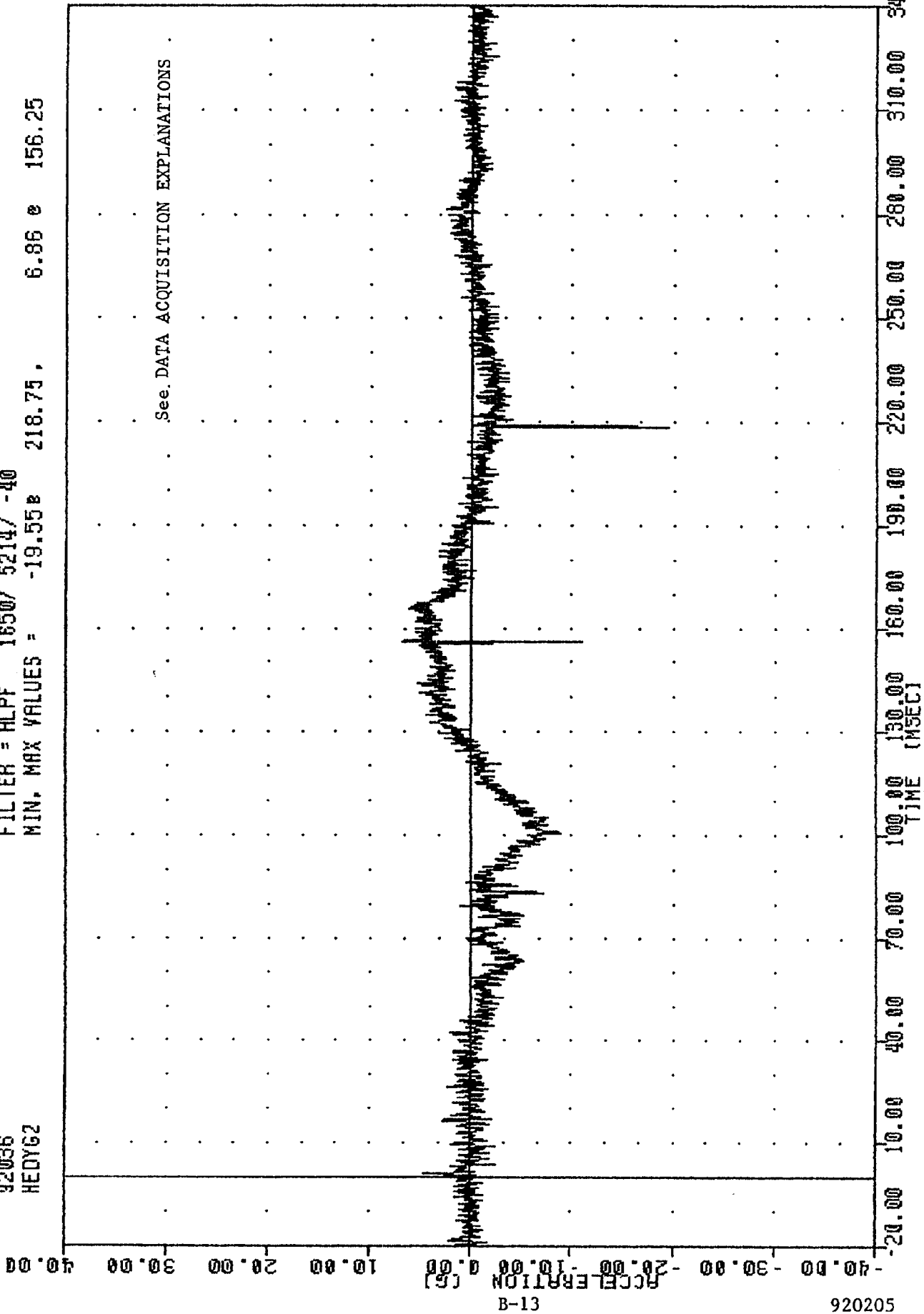
920205

B-12

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

TRC 920205
208 COMPLIANCE TESTING
92036
HEDYG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -19.55e 218.75 . 6.86 e 156.25



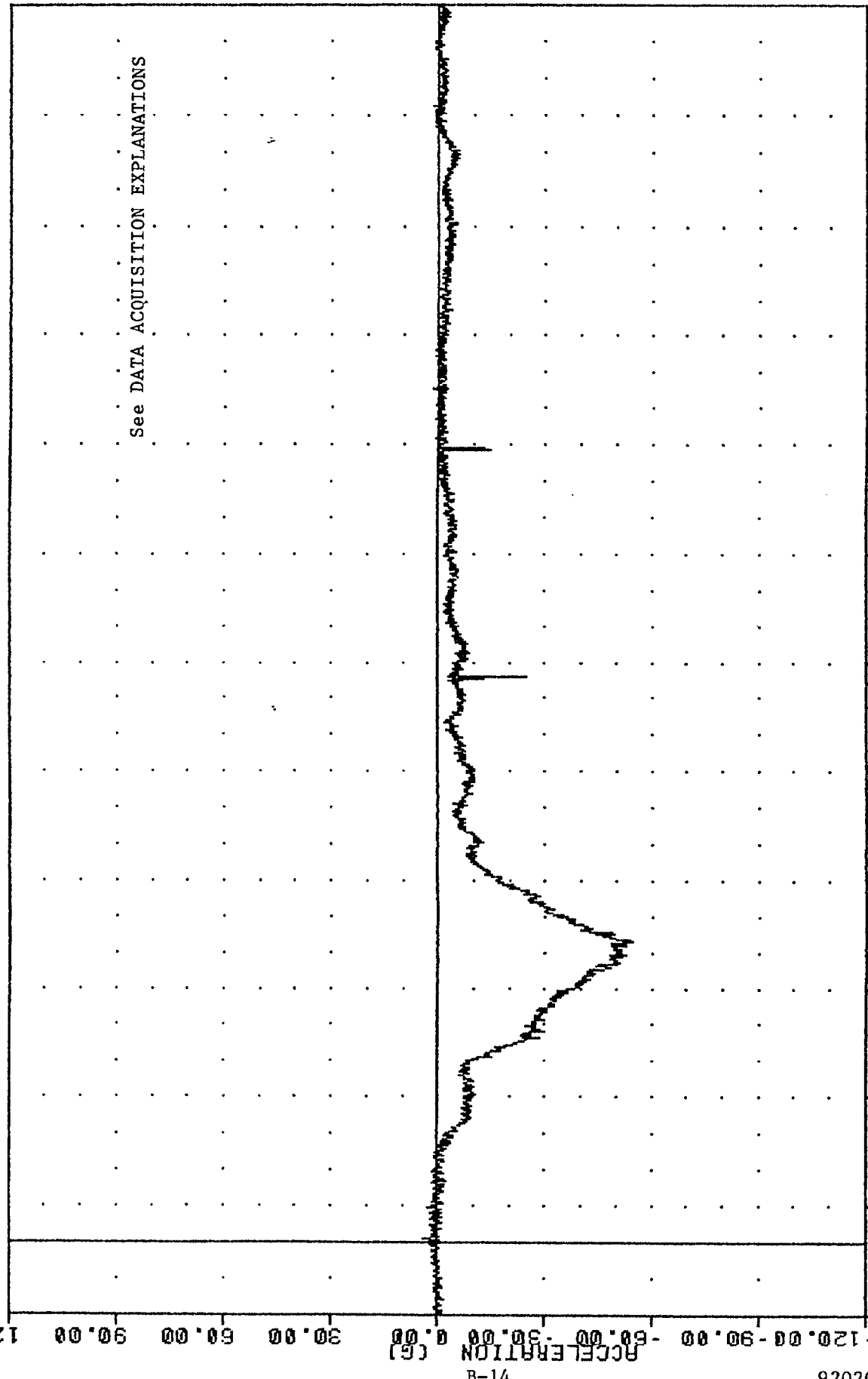
B-13

920205

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

TRC
920205
208 COMPLIANCE TESTING
92036
HEDZG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -54.76e 82.88, 4.29 e 0.88



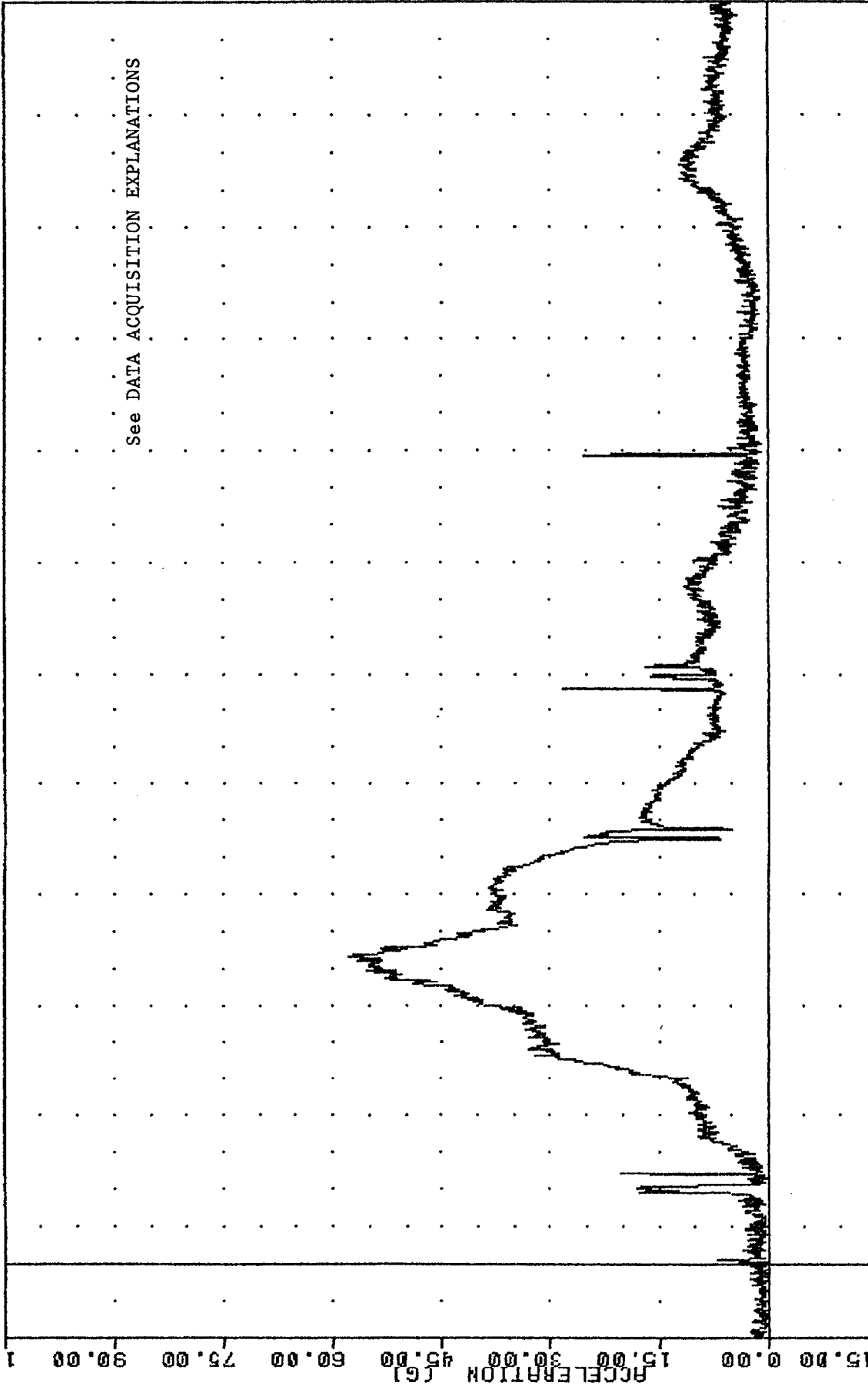
See DATA ACQUISITION EXPLANATIONS

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TRC , 920205
 208 COMPLIANCE TESTING
 92036
 HEADG2

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.38, 57.74 @ 82.88

105.00



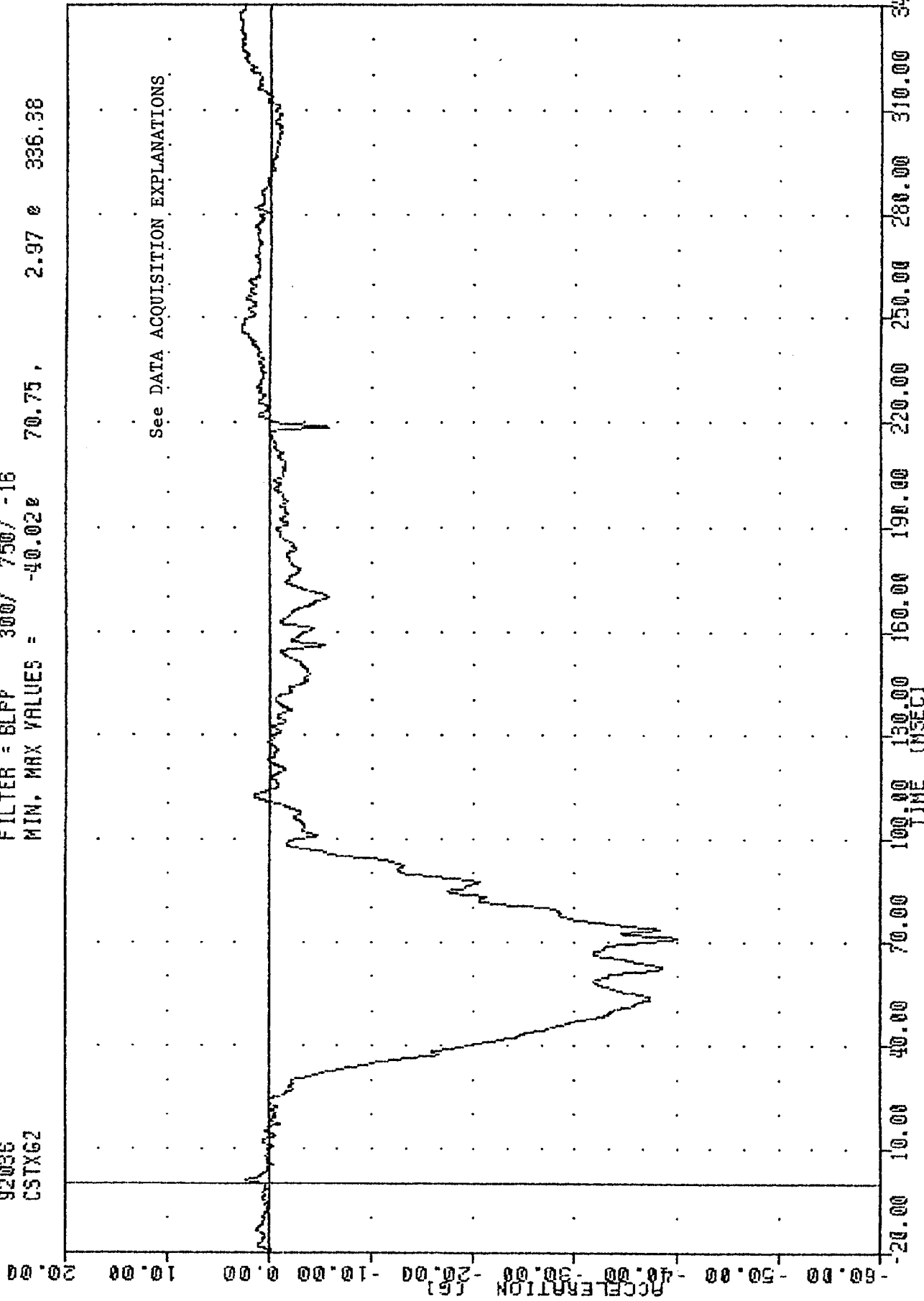
920205

B-15

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

TRC 920205
208 COMPLIANCE TESTING
92036
CSTXG2

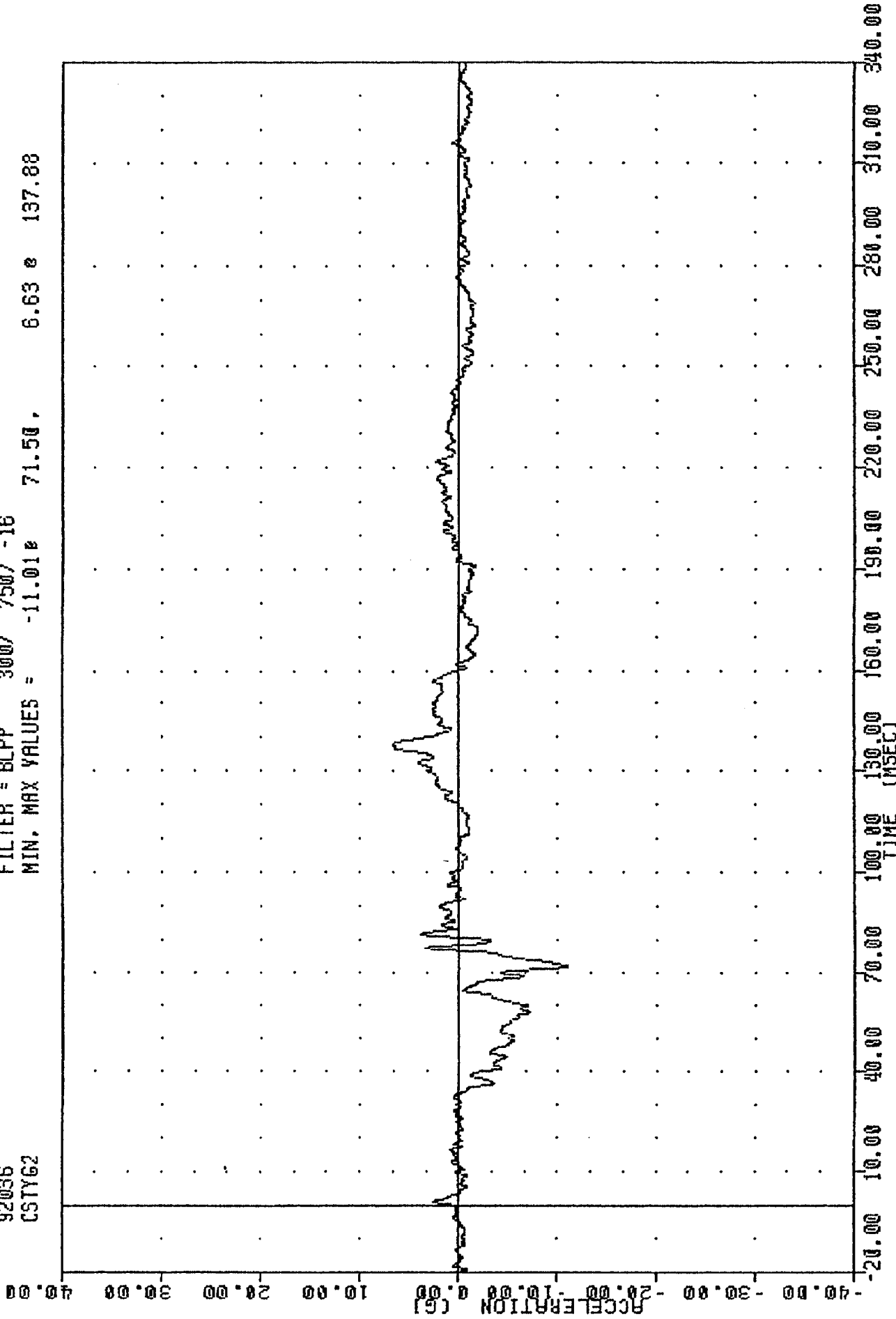
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -40.02e 70.75 , 2.97 e 336.38



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

TRC
920205
200 COMPLIANCE TESTING
92036
CSTY62

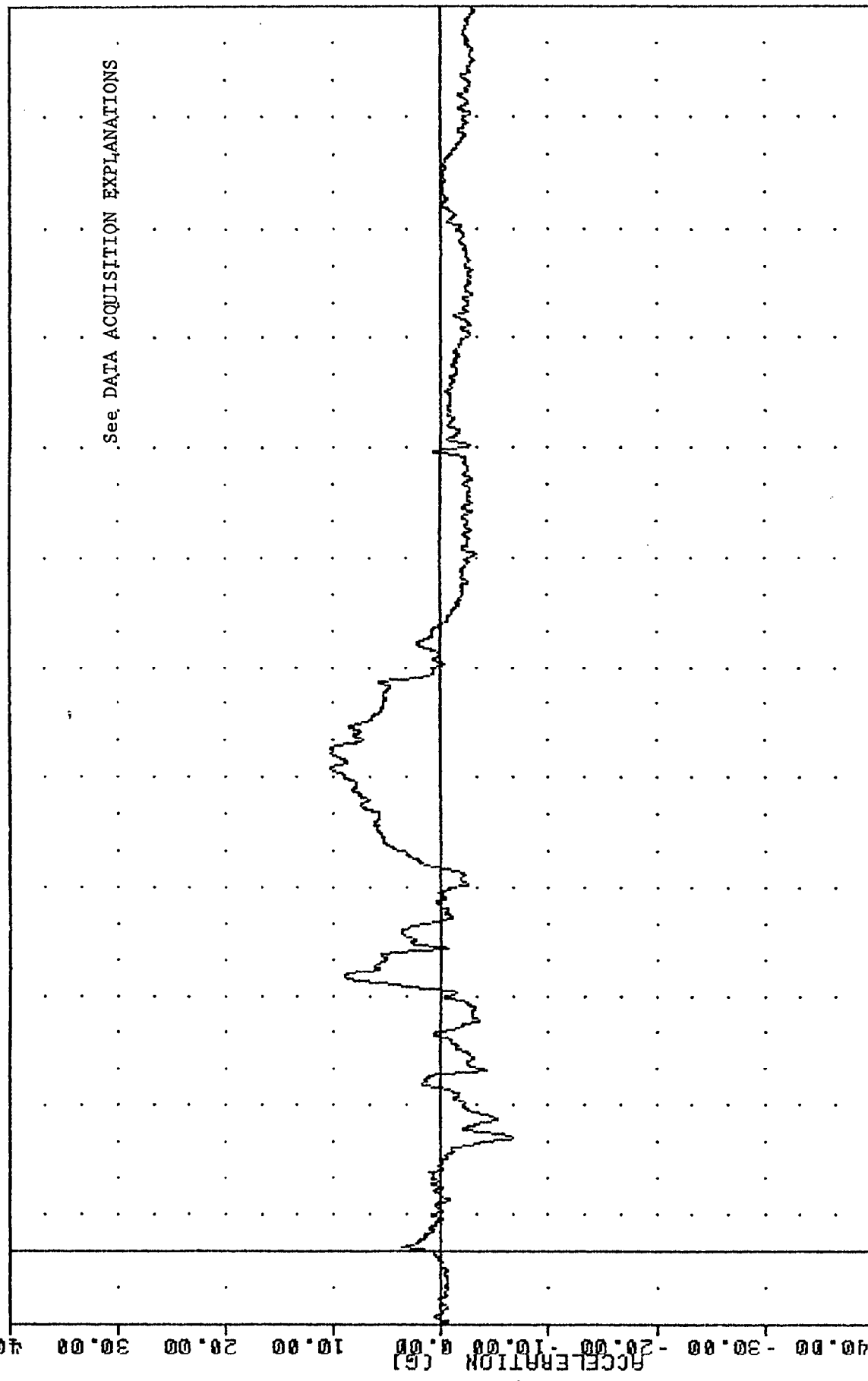
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -11.01e 71.50, 6.63 e 137.88



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

TRC 920205
 208 COMPLIANCE TESTING
 92096
 CSTZG2

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -6.76e 10.31 e 132.50

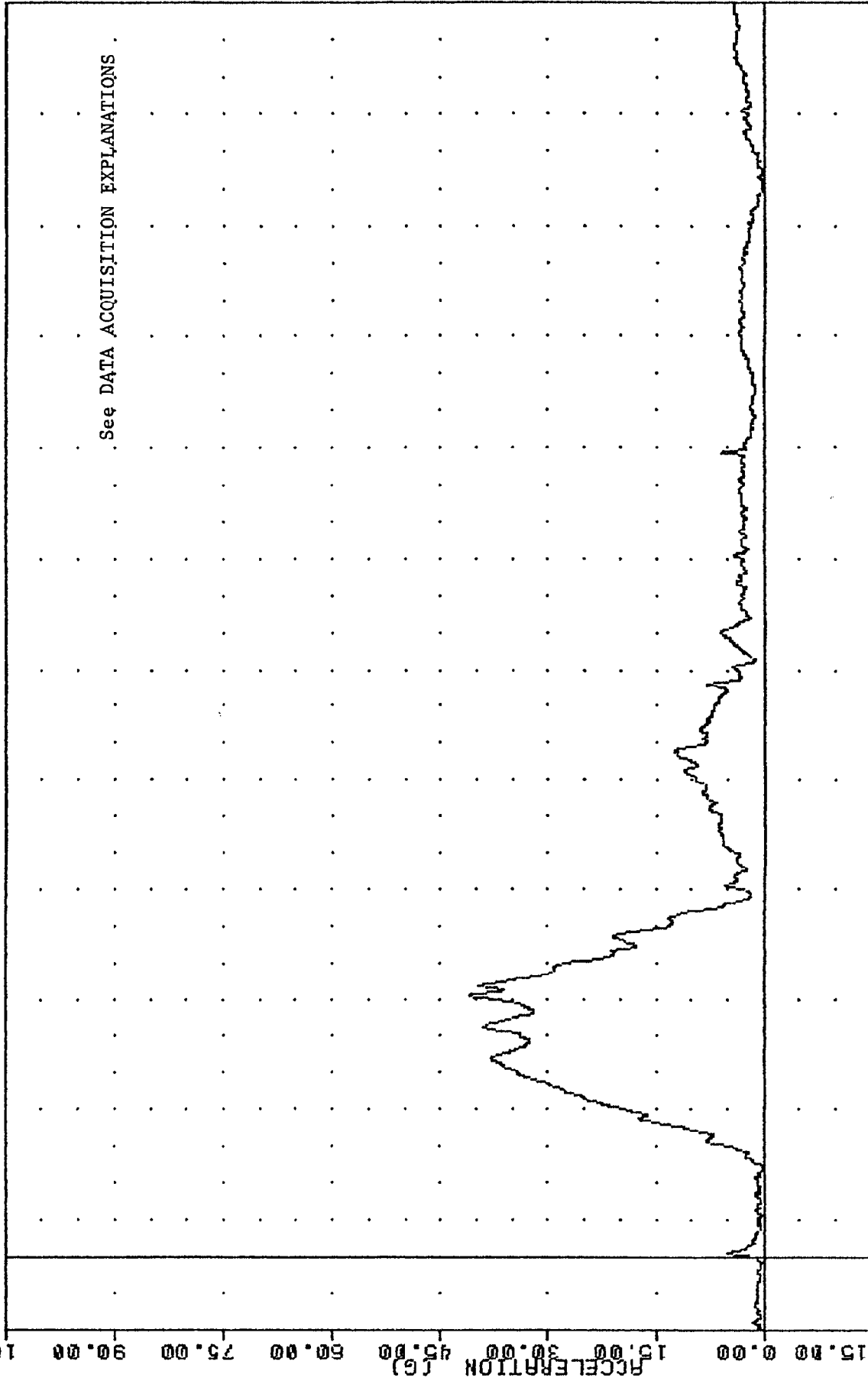


. See DATA ACQUISITION EXPLANATIONS .

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

TRC
 208 COMPLIANCE TESTING
 92036
 CSTR62

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = 0.118 291.88, 10.94 e 70.88

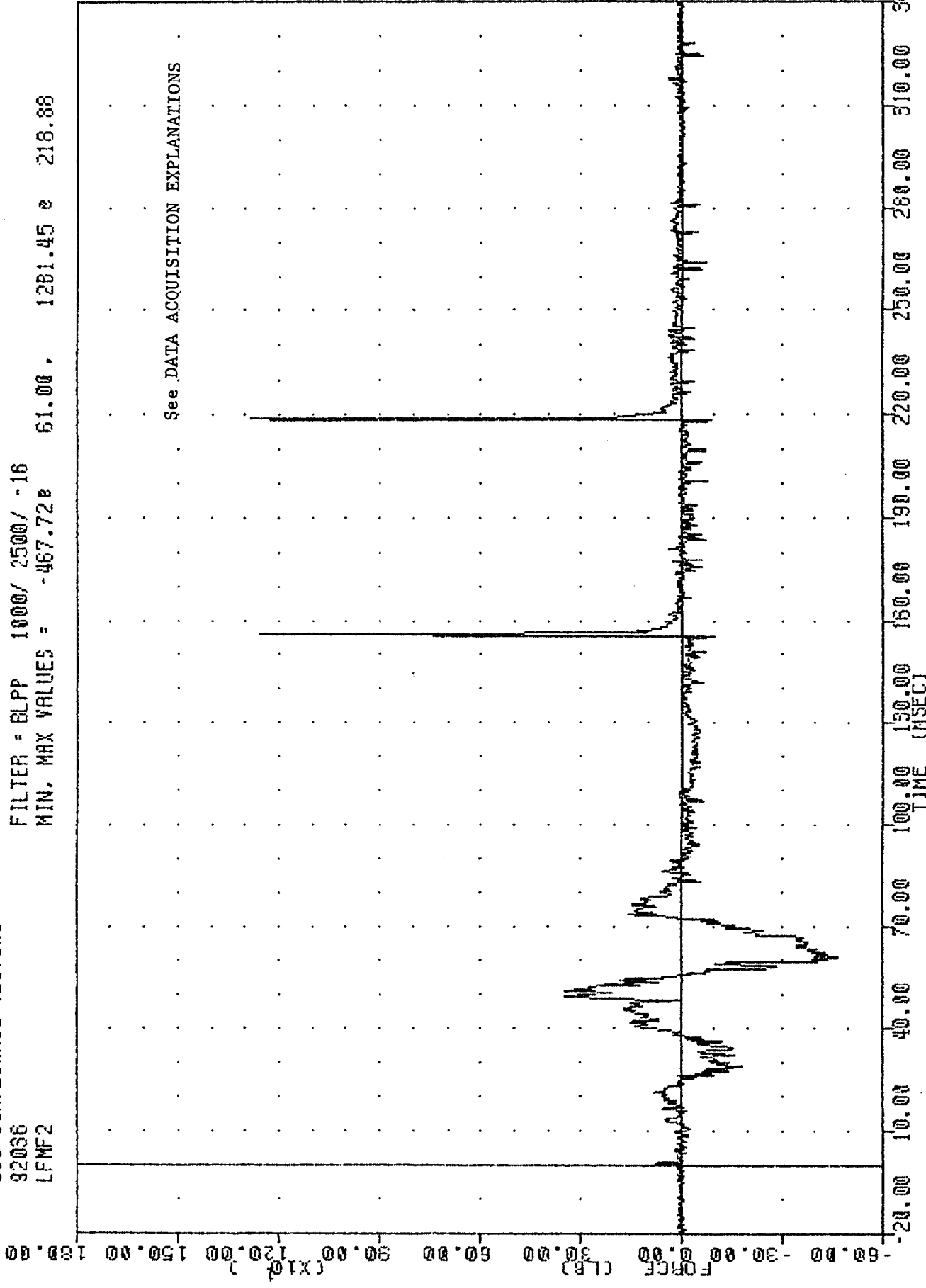


See DATA ACQUISITION EXPLANATIONS .

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

TRC
208 COMPLIANCE TESTING
92036
LFMF2

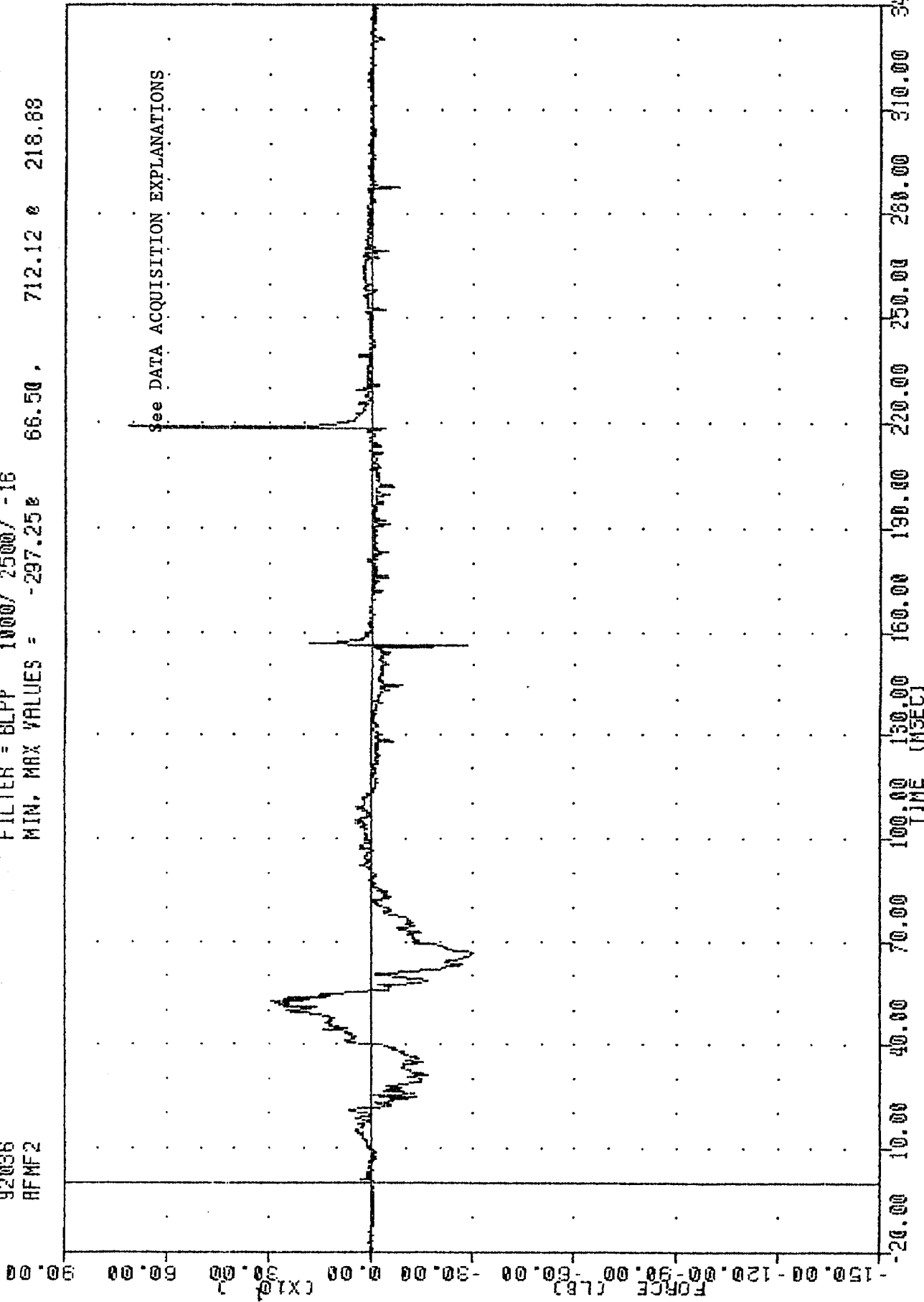
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -467.72 e 1281.45 e 218.88



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE

TRC
920205
308 COMPLIANCE TESTING
92036
RFMF2

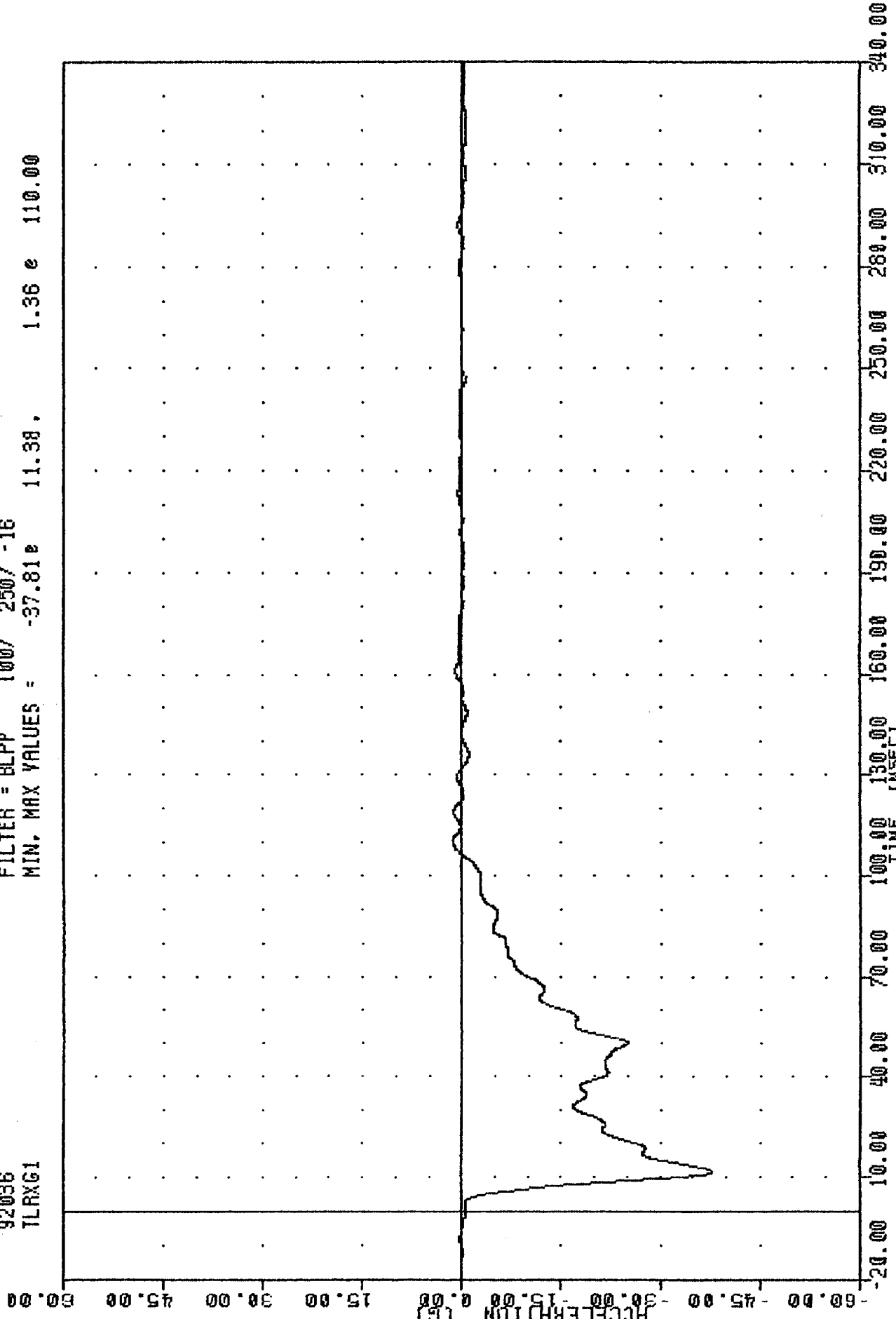
FILTER = BLPP 1000/ 2500/ -18
MIN. MAX VALUES = -297.250 66.50 , 712.12 0 218.68



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

TRC , 920205
208 COMPLIANCE TESTING
92036
TLRXG1

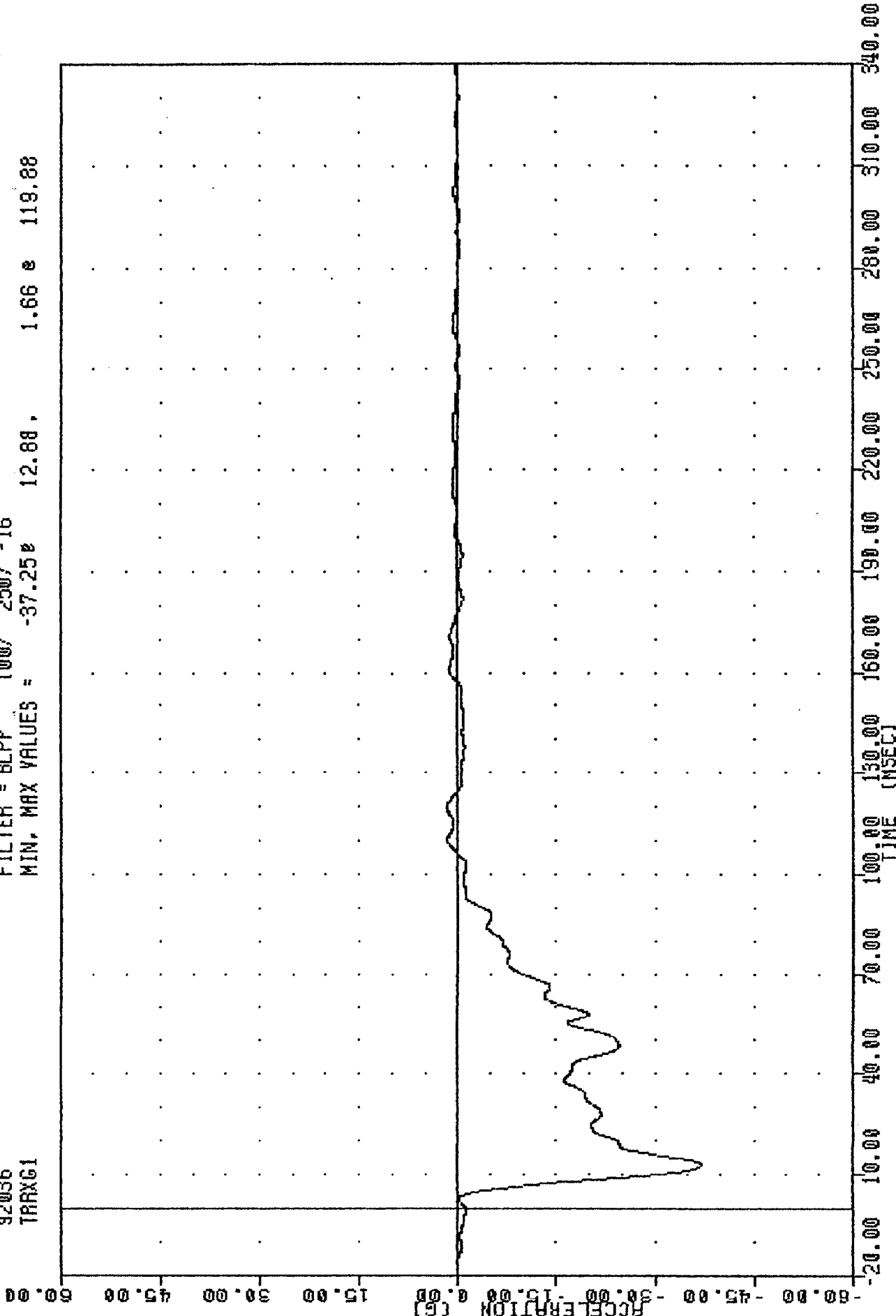
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -37.81e 11.38, 1.36 e 110.00



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION

TRC , 920205
208 COMPLIANCE TESTING
92036
TRRXG1

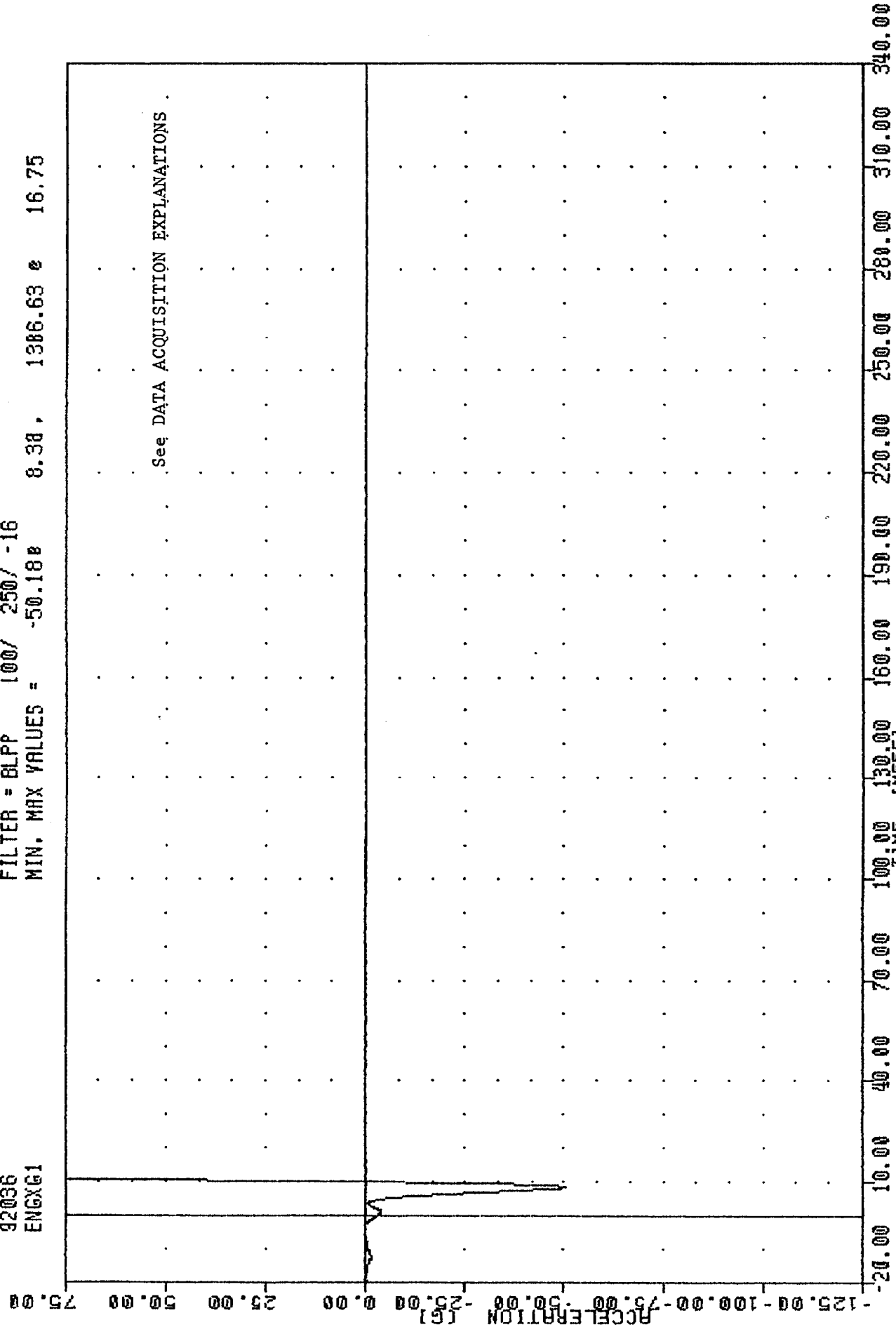
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -37.25% 12.88, 1.66 e 118.88



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

TRC 920205
 208 COMPLIANCE TESTING
 92036
 ENG161

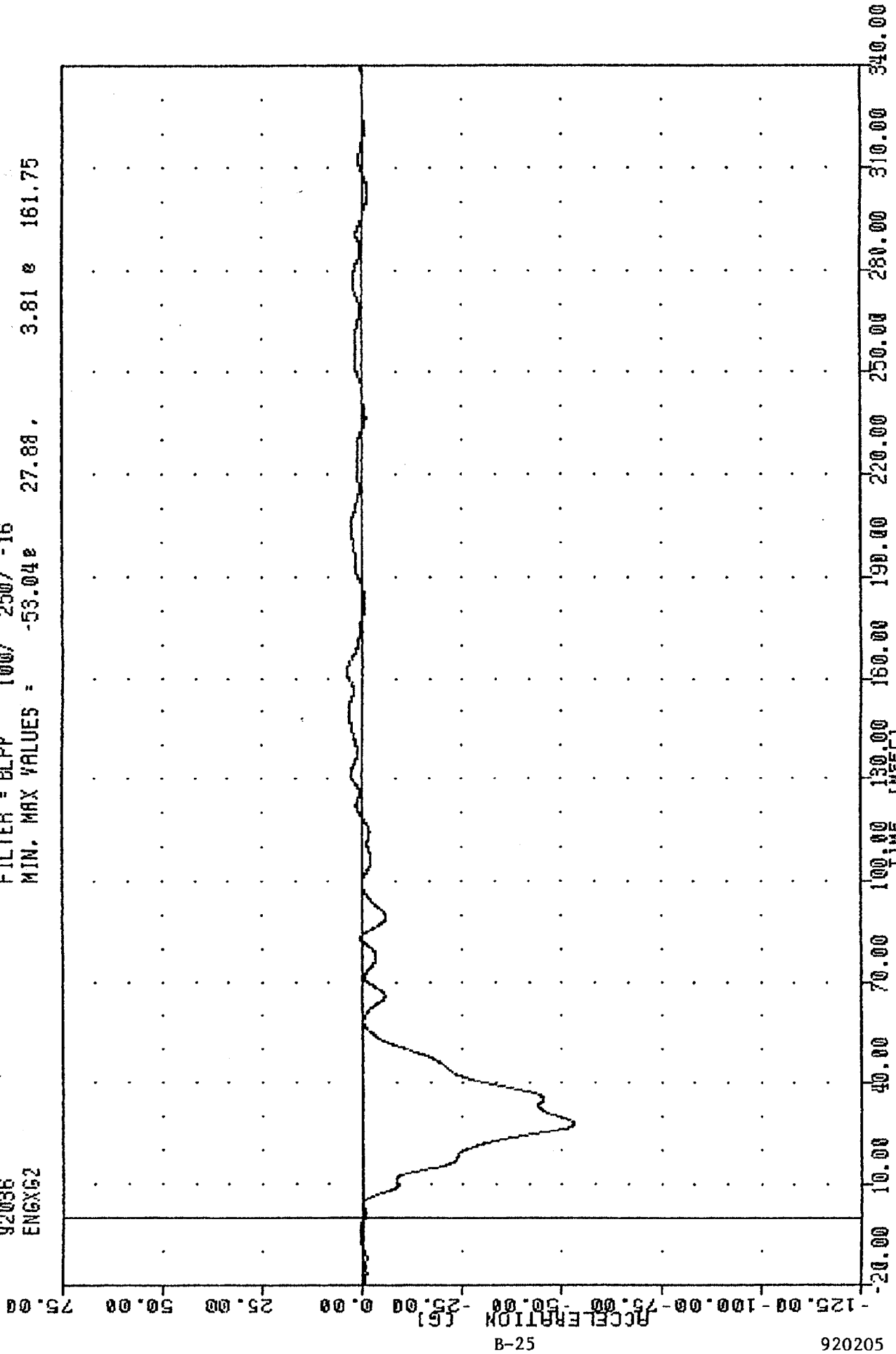
FILTER = 8LPP 100/ 250/ -16
 MIN. MAX VALUES = -50.18e 8.38 1386.63 e 16.75



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
 ENGINE TOP X-AXIS ACCELERATION

TRC 920205
208 COMPLIANCE TESTING
92036
ENGX62

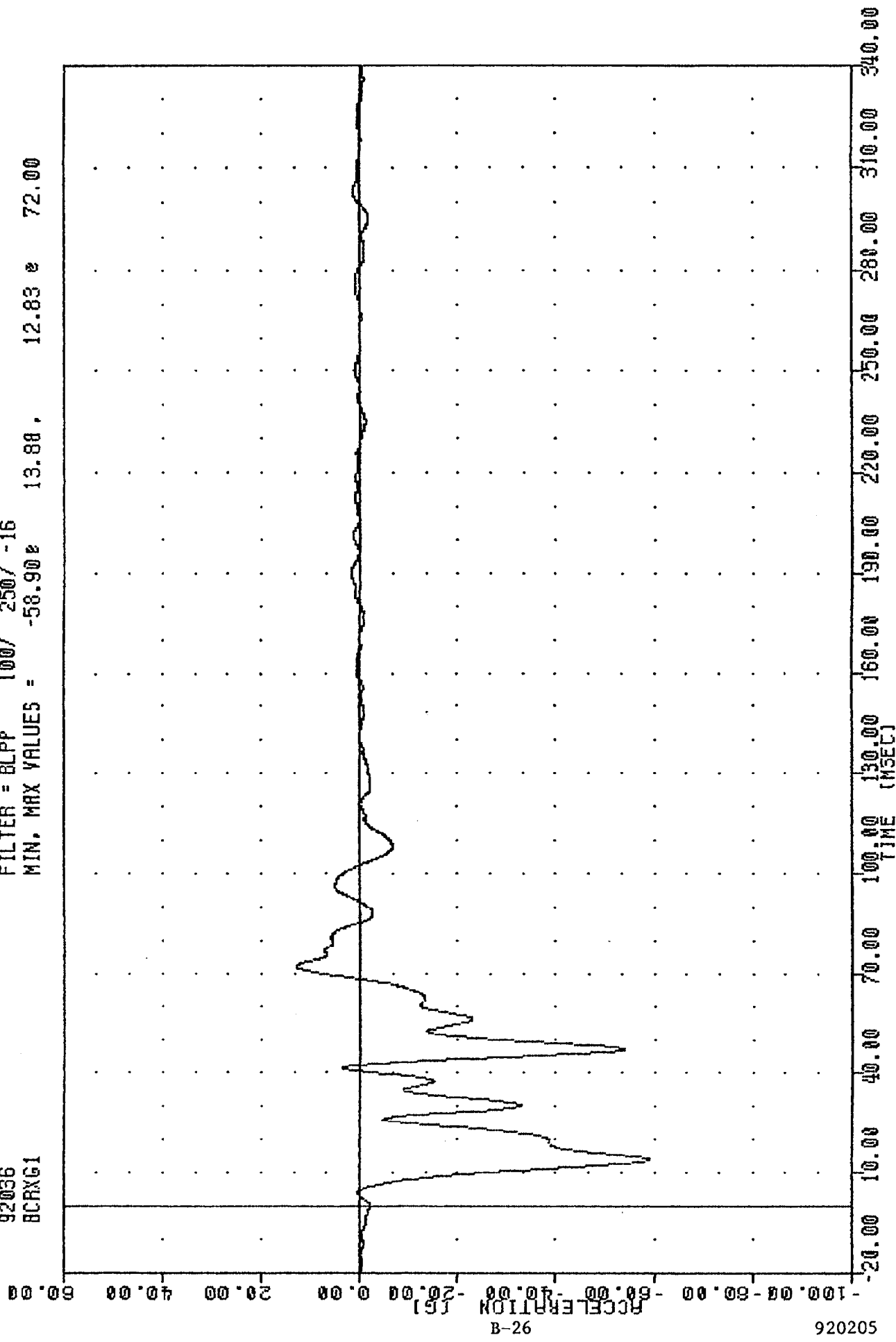
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -53.04e 27.88, 3.81 e 161.75



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION

TRC 920205
208 COMPLIANCE TESTING
92036
BCRXG1

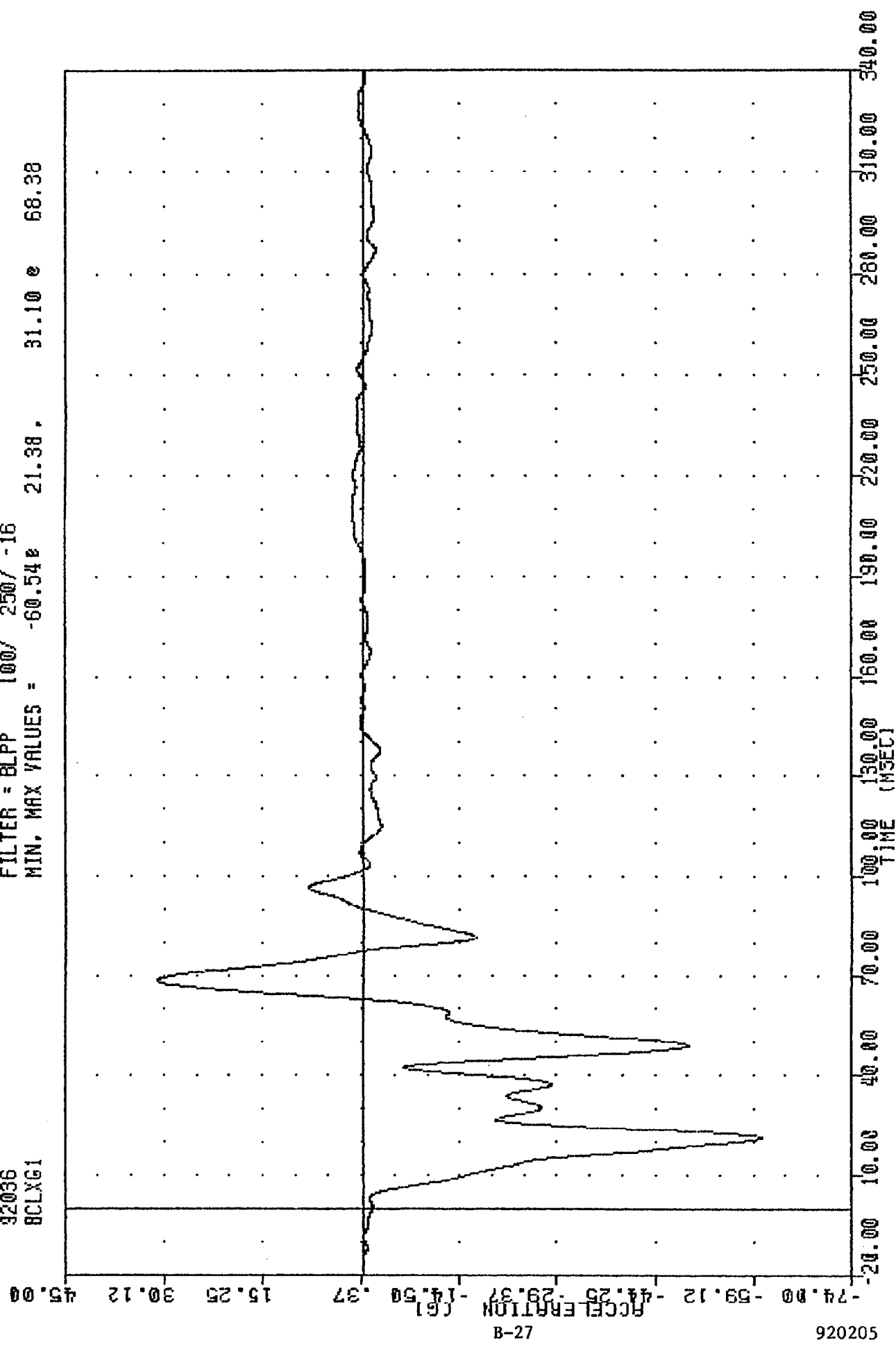
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -58.90% 13.88, 12.83 e 72.00



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 920205
308 COMPLIANCE TESTING
32036
8CLXG1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -60.54e 21.38, 31.10 e 68.38



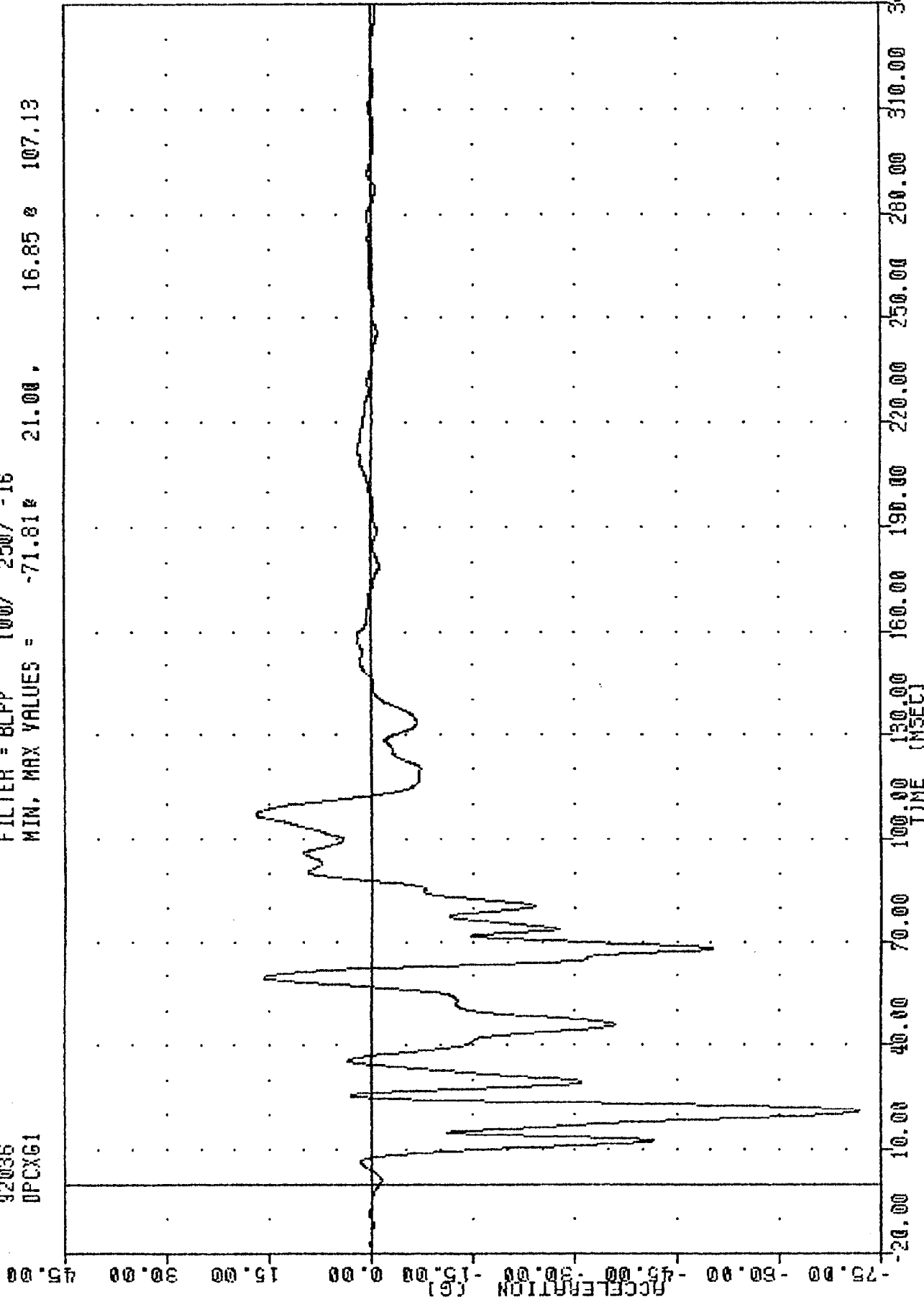
B-27

920205

1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 920205
208 COMPLIANCE TESTING
92036
DPCXG1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -71.81% 21.00 , 16.85 % 107.13



1992 FORD EXPLORER INTO FLAT FRONTAL BARRIER
INSTRUMENT PANFI CENTER X-AXIS ACCELERATION