

V1795

REPORT NOS. 208-TRC-93-005

212-TRC-93-005

301-TRC-93-005

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

MITSUBISHI MOTORS CORPORATION

1993 MITSUBISHI MIRAGE

4-DOOR SEDAN

NHTSA NO. CP5600

TRC TEST NO. 921117

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

EAST LIBERTY, OHIO 43319



DECEMBER 3, 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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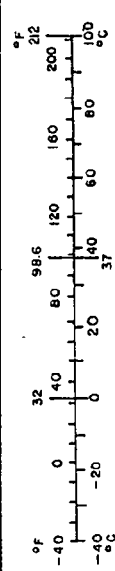
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16. Abstract A 30 mph flat frontal barrier impact test was conducted on a 1993 Mitsubishi Mirage 4-door sedan, NHTSA No. CP5600, at the Transportation Research Center Inc. on November 17, 1992. This test was conducted to determine compliance with Federal 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 18.4 inches. The ambient temperature was 70° F. The driver's head injury criteria (HIC) was 356. (See DATA ACQUISITION EXPLANATIONS.) The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.8 g. The driver's left and right femur maximum axial forces were 911 pounds and 1661 pounds, respectively. The passenger's head injury criteria (HIC) was 452. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.6 g. The passenger's left and right femur maximum axial forces were 558 pounds and 1558 pounds, respectively. The vehicle appears to comply with the applicable requirements of FMVSS 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 219P, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"			18. Distribution Statement Available from: NHTSA Technical Reference Division Room 5108, (NAD-52) 400 Seventh Street, SW Washington, DC 20590 Attn: Mr. Robert Hornickle		
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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	mm	millimeters	0.04	inches	in
ft	feet	30	centimeters	cm	centimeters	0.4	inches	in
yd	yards	0.9	meters	m	meters	3.3	feet	ft
mi	miles	1.6	kilometers	km	kilometers	1.1	yards	yd
						0.6	miles	mi
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	km ²	square kilometers	0.4	square miles	mi ²
mi ²	square miles	2.6	square kilometers	ha	hectares (10,000 m ²)	2.5	acres	
	acres	0.4	hectares					
MASS (weight)								
oz	ounces	28	grams	g	grams	0.035	ounces	oz
lb	pounds (2000 lb)	0.45	kilograms	kg	kilograms	2.2	pounds	lb
		0.9	tonnes	t	tonnes (1000 kg)	1.1	short tons	
VOLUME								
tsp	teaspoons	5	milliliters	ml	milliliters	0.03	fluid ounces	fl oz
Tbsp	tablespoons	15	milliliters	l	liters	2.1	pints	pt
fl oz	fluid ounces	30	milliliters	ml	milliliters	1.06	quarts	qt
c	cups	0.24	liters	l	liters	0.26	gallons	gal
pt	pints	0.47	liters	m ³	cubic meters	35	cubic feet	ft ³
qt	quarts	0.95	liters	m ³	cubic meters	1.3	cubic yards	yd ³
gal	gallons	3.8	liters					
ft ³	cubic feet	0.03	cubic meters					
yd ³	cubic yards	0.76	cubic meters					
TEMPERATURE (exact)								
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



* 1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weight and Measures, Price \$2.25, SO Catalog No. C13.10-286.

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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 Inc. (TRC) under Contract No. DTNH22-90-C-21003. The purpose of this test was to determine if the subject vehicle, a 1993 Mitsubishi Mirage 4-door sedan, NHTSA No. CP5600, 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 November 17, 1992.

The test vehicle, a 1993 Mitsubishi Mirage 4-door sedan, NHTSA No. CP5600, 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 1.5 liter, transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 2637 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 18.4 inches.

The driver's head injury criteria (HIC) was 356. (See DATA ACQUISITION EXPLANATIONS.) The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.8 g. The driver's left and right femur maximum axial forces were 911 pounds and 1661 pounds, respectively.

The right front passenger's HIC was 452. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.6 g. The right front passenger's left and right femur maximum axial forces were 558 pounds and 1558 pounds, respectively.

There was no loss of windshield periphery retention.

There was no penetration through the windshield.

Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

DATA ACQUISITION EXPLANATIONS

The driver's head X-, Y-, and Z-axis accelerometers, HEDXG1, HEDYG1, and HEDZG1, recorded data spikes at 100 and 106 milliseconds. Contact between the dummy's head and the steering wheel rim and between the dummy's head and chest took place during the same time frame in which the data spikes occurred. The contact and the timing of the contact was verified using the high-speed motion picture film. These data spikes affected the driver's head injury criteria and head resultant acceleration calculations. The data acquisition circuits were checked immediately after the test and appeared normal. The dummy's head passed the post-test calibration head drop test.

The driver's chest X-, Y-, and Z-axis accelerometers CSTXG1, CSTYG1, and CSTZG1, recorded a questionable data spike at 110 milliseconds. This data spike occurred after the chest maximum resultant acceleration over a duration equal to or greater than three milliseconds. The data spike did affect the driver's chest resultant acceleration calculation. The data acquisition circuits were checked immediately after the test and appeared normal. The cause of the spikes could not be identified. The data spikes are not discernible on the SAEJ211 OCT88 filtered data plots included in Appendix B.

The engine bottom X-axis accelerometer, ENGXG1, lost data at 52 milliseconds resulting from the accelerometer being damaged by the vehicle's crush on impact.

The dash panel center X-axis accelerometer, DPCXG1, did not return to zero after the impact event resulting from the vehicle's rear view mirror falling and striking the accelerometer on impact.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: CP5600 TEST TYPE: Frontal Barrier Impact

TEST DATE: 11/17/92 TEST TIME: 1400 AMBIENT TEMP. (°F): 70

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1993/Mitsubishi/Mirage/4-door sedan

VEHICLE TEST WEIGHT (LBS): 2637

IMPACT ANGLE (DEG)*: 0

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

MAXIMUM STATIC CRUSH (IN): 18.4

AVERAGE REBOUND (IN): 29.2

DUMMIES: Driver #1173 Passenger #353

TYPE: Part 572 B Part 572 B

LOCATION: Left front Right front

RESTRAINT: Passive 2-point belt Passive 2-point belt

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: Mitsubishi Motors Corporation

MAKE/MODEL: Mitsubishi/Mirage

VIN: JA3CA26A3PU003580

BODY STYLE: 4-door sedan

MODEL YEAR: 1993

NHTSA NO.: CP5600

COLOR: Silver

ENGINE DATA: TYPE: transverse CYLINDERS: 4 DISPLACEMENT: 1.5 liter

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

DATE VEHICLE RECEIVED: 09/24/92

ODOMETER READING: 75

DEALER'S NAME AND ADDRESS: Ricart Ford, Inc.
4255 South Hamilton Rd.
Columbus, OH 43227

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	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	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: Mitsubishi Motors Corporation

DATE OF MANUFACTURE: 06/92

VIN: JA3CA26A3PU003580

GVWR: 3417 LBS

GAWR: FRONT: 1830 LBS., REAR: 1742 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Michelin, XW4, P155/80R13

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

SPARE TIRE (MFR., LINE, SIZE): Toyo, Temporary spare, T105/70R14

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually adjustable

MAXIMUM WIDTH: 66.5 INCHES

WHEELBASE: 98.2 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the driver's door.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P155/80R13

RECOMMENDED COLD TIRE PRESSURE: FRONT: 31 PSI; REAR: 31 PSI

DESIGNATED SEATING CAPACITY: 2 FRONT 3 REAR 5 TOTAL

VEHICLE CAPACITY WEIGHT: 827 LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 26.1; RF 26.1; LR 25.0; RR 24.8

FULLY LOADED ATTITUDE*: LF NA ; RF NA ; LR NA ; RR NA

PRE-TEST ATTITUDE: LF 25.2; RF 25.2; LR 23.6; RR 23.4

POST-TEST ATTITUDE: LF 24.2; RF 24.2; LR 23.0; RR 22.9

*Fully loaded attitudes were not recorded.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	694 LBS.	RIGHT REAR	433 LBS.
LEFT FRONT	700 LBS.	LEFT REAR	424 LBS.
TOTAL FRONT WEIGHT	1394 LBS.	(61.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	857 LBS.	(38.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 2251 LBS.			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

UDW = UNLOADED DELIVERED WEIGHT (2251 LBS)

VCW = VEHICLE CAPACITY WEIGHT (827 LBS)

DSC = DESIGNATED SEATING CAPACITY (5)

$RCLW* = VCW - 150 (DSC) = 77$

TARGET TEST WEIGHT = $UDW + RCLW* + (NO. OF HYBRID II DUMMIES \times 164 \text{ LBS/DUMMY})$

TARGET TEST WEIGHT = $2251 + 77 + 328$

TARGET TEST WEIGHT = 2656 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 58 LBS. OF CARGO WEIGHT:

RIGHT FRONT	759 LBS.	RIGHT REAR	560 LBS.
LEFT FRONT	763 LBS.	LEFT REAR	555 LBS.
TOTAL FRONT WEIGHT	1522 LBS.	(57.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1115 LBS.	(42.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2637 LBS.	(0.7% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 0 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Rear bumper, rear seat belts, trunk lid

CG = 41.5 INCHES REARWARD OF FRONT WHEEL CENTERLINE

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

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 921117 NHTSA NO.: CP5600
TEST DATE: 11/17/92 TEST TIME: 1400
TEST TYPE: Frontal Barrier Impact IMPACT ANGLE: 0
AMBIENT TEMPERATURE AT IMPACT AREA: 70° F
TEMPERATURE IN OCCUPANT COMPARTMENT: 66° F
IMPACT VELOCITY: PRIMARY = 29.3 MPH SECONDARY = 29.3 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 162.4; C 168.4; R 162.8

POST-TEST: L 147.1; C 150.0; R 147.8

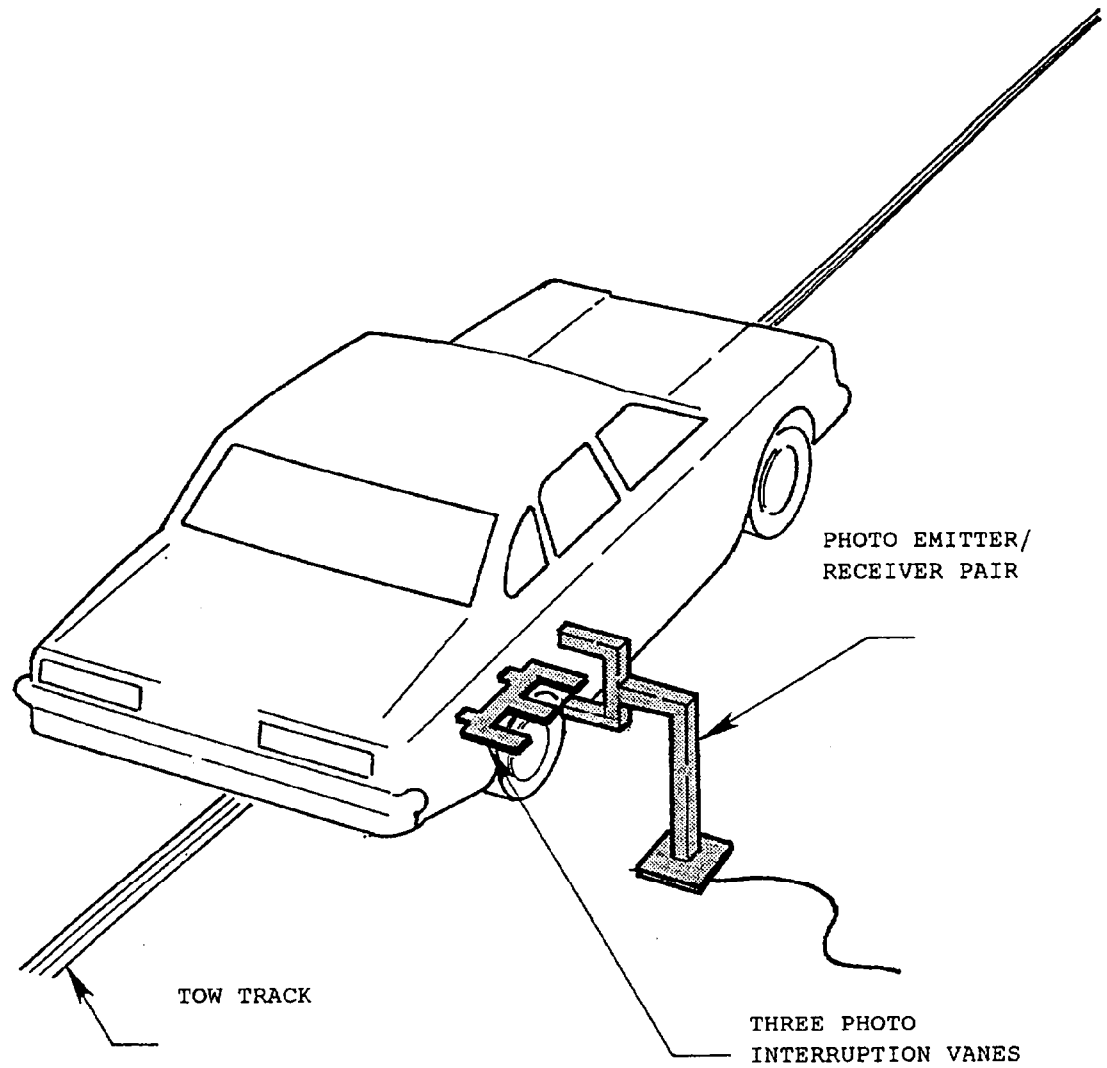
TOTAL CRUSH: L 15.3; C 18.4; R 15.0

AVERAGE CRUSH: 16.2

TEST VEHICLE REBOUND FROM FLAT BARRIER (ALL MEASUREMENTS ARE IN INCHES):

DISTANCE FROM TEST VEHICLE TO BARRIER: L 29.2; C 27.8; R 30.5; AVG. 29.2

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears the final emitter/receiver pair 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: Mitsubishi/Mirage/4-door sedan

VEHICLE NHTSA NO.: CP5600; VIN: JA3CA26A3PU003580

MODEL YEAR: 1993; BUILD DATE: 06/92; TEST DATE: 11/17/92

VEHICLE SIZE CATEGORY: Compact; TEST WEIGHT: 2637 LBS.

VEHICLE WHEELBASE: 98.2 INCHES

MAXIMUM WIDTH: 66.5 INCHES

FRONT OVERHANG: 36.4 INCHES

COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW2

CRUSH DEPTH
MEASUREMENTS:

C1 =	<u>15.3</u>	INCHES
C2 =	<u>16.2</u>	INCHES
C3 =	<u>18.2</u>	INCHES
C4 =	<u>18.3</u>	INCHES
C5 =	<u>16.6</u>	INCHES
C6 =	<u>15.0</u>	INCHES

VEHICLE CENTERLINE
MIDPOINT OF DAMAGE: D = (LONGITUDINAL)

LENGTH OF DAMAGED
REGION: L = 54.5 INCHES

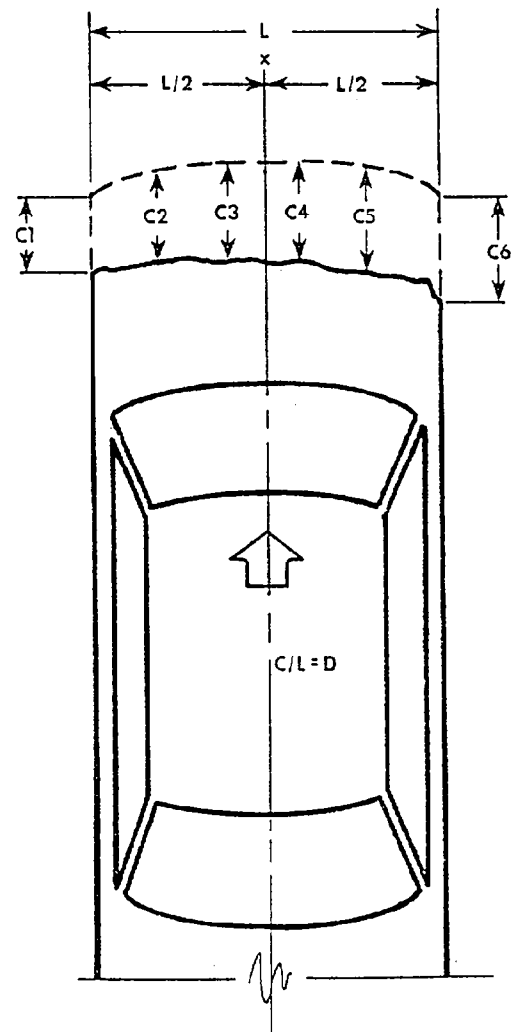
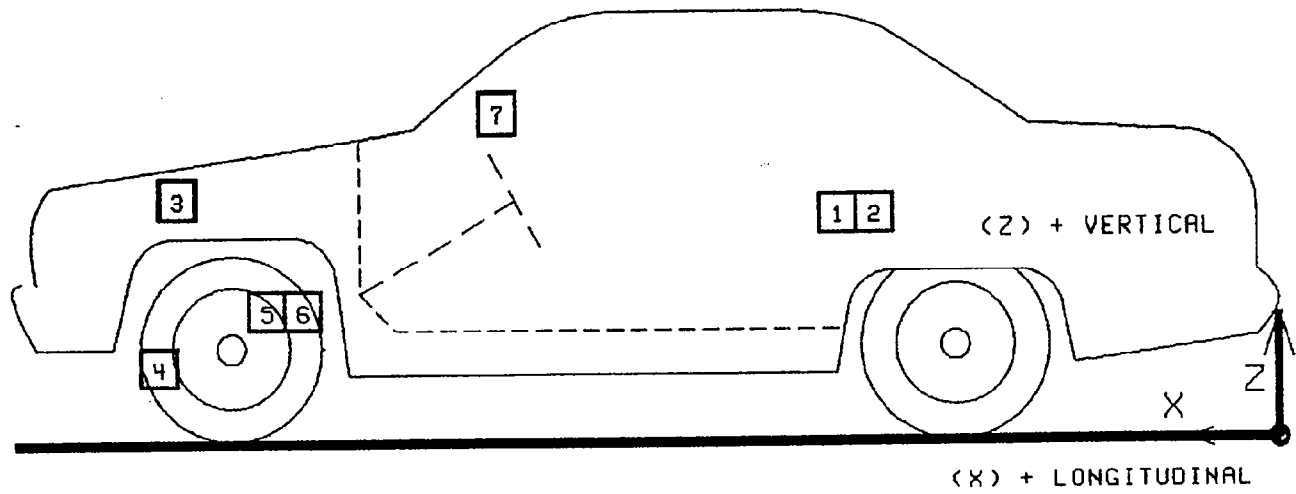
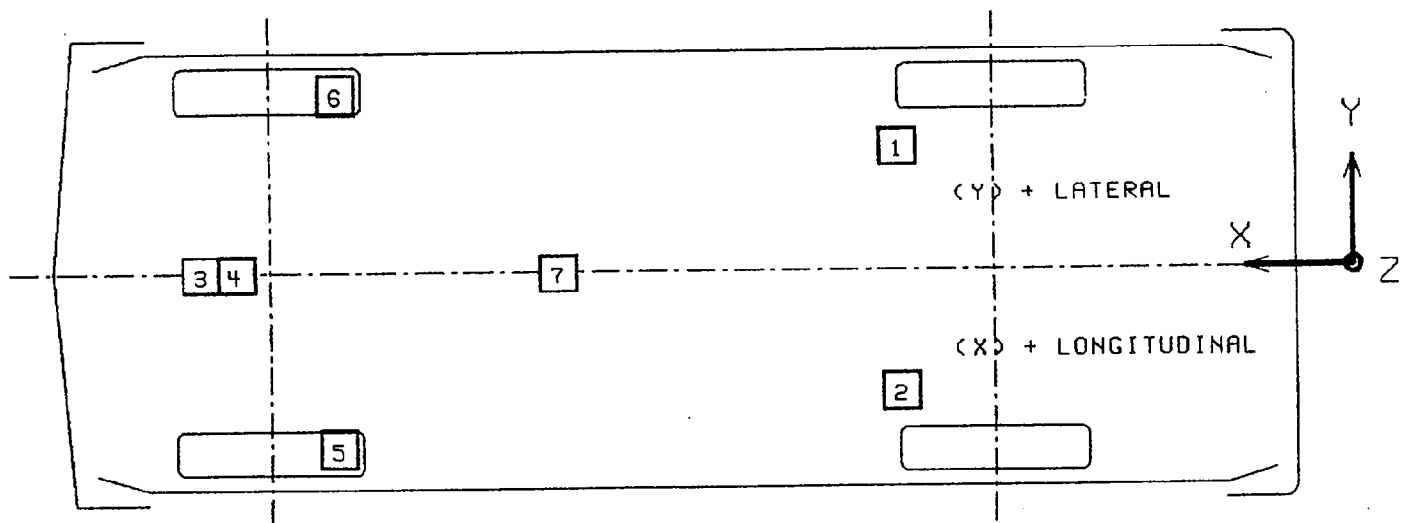


FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 921117

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
						MAX & MSEC		MAX & MSEC	
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	61.2	11.2	15.0				
		POST	61.2	11.2	16.0				
						4.5	132.0	35.4	67.0
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	61.1	-10.9	14.8				
		POST	61.1	-10.9	15.6				
						4.9	132.1	33.9	57.4
3	ENGINE TOP LONGITUDINAL	PRE	143.1	4.6	28.6				
		POST	136.8	2.8	28.6				
						41.4	49.0	91.6	35.4
4	ENGINE BOTTOM LONGITUDINAL	PRE	144.2	13.4	9.9				
		POST	139.5	11.2	9.8				
						---	---Y	117.9	33.9Y
5	RIGHT BRAKE CALIPER LONGITUDINAL	PRE	142.2	-25.2	9.8				
		POST	139.5	-25.6	9.8				
						33.6	65.5	105.6	44.5
6	LEFT BRAKE CALIPER LONGITUDINAL	PRE	142.1	25.2	10.0				
		POST	140.5	25.6	10.4				
						28.1	73.8	77.3	54.9
7	INSTRUMENT PANEL CENTER LONGITUDINAL	PRE	108.4	0.0	35.9				
		POST	108.4	0.0	37.0				
						25.5	29.2Y	61.0	51.0Y

* 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.: CP5600
MAKE/MODEL/BODY STYLE: Mitsubishi/Mirage/4-door sedan
MODEL YEAR: 1993 BODY COLOR: Silver
VIN: JA3CA26A3PU003580
ODOMETER (ARRIVAL): 75 DATE: 09/24/92
ODOMETER (COMPLETION): 78 DATE: 11/17/92
COST: \$11,168.27

☒ 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: Bucket
☒ CLOCK	☐ TILT STEERING WHEEL	NO. OF SEATS: 5
☐ ROOF RACK	☐ OTHER OPTIONS: _____	

ENGINE: 4 CYLINDERS; 1.5 LITERS
TRANSMISSION: automatic; DRIVE TYPE: Front wheel drive
TIRE SIZE: P155/80R13
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.

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
DRIVER	-40.0 ^Y	24.9 ^Y	-50.1 ^Y	68.7 ^Y	-38.8 ^Y	11.0 ^Y	6.6 ^Y
PASSENGER	-25.5	-25.3	-52.3	55.7	-41.0	-21.3	15.1

MAXIMUM FEMUR COMPRESSIVE FORCE (LBS)		
	LEFT FEMUR	RIGHT FEMUR
DRIVER	911	1661
PASSENGER	558	1558

HEAD INJURY CRITERIA**			
	HIC	TIME t ₁ (MSEC) ¹	TIME t ₂ (MSEC) ²
DRIVER	356 ^Y	72.0	108.0
PASSENGER	452	66.1	102.1

CHEST MAXIMUM RESULTANT ACCELERATION*			
	ACCEL. (G)	TIME t ₁ (MSEC) ¹	TIME t ₂ (MSEC) ²
DRIVER	38.8	72.5	75.6
PASSENGER	38.6	67.9	71.0

*Defined as equal to or 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 #1173	PASSENGER #353
HEAD	<u>Steering wheel upper rim and chest</u>	<u>Chest</u>
CHEST	<u>Steering wheel lower rim</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 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 upper torso rotated slightly to the left as the dummy's head rotated downward contacting the dummy's chest and upper steering wheel rim. The driver dummy was restrained by the two-point passive belt. The dummy, while still rotated slightly to the left, rebounded rearward into the seat back. The driver dummy's head rotated rearward. The driver dummy came to rest in the driver's seat leaning to the right and rotated slightly to the left restrained by the two-point passive belt.

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 upper torso rotated slightly to the right as the dummy's head rotated downward into the dummy's chest. The right front passenger dummy was restrained by the two-point passive belt. The dummy, while still rotated slightly to the right, rebounded rearward into the seat back as the dummy's head rotated rearward. The right front passenger came to rest in the right front passenger's seat rotated slightly to the right restrained by the two-point passive belt.

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

MAKE/MODEL: Mitsubishi/Mirage

VIN: JA3CA26A3PU003580

BODY STYLE: 4-door sedan

NHTSA NO.: CP5600

DATE OF MANUFACTURE: 06/92

CONVENIENCE HOOKS:

DEVICE TO STOW SEAT BELT WEBBING TO FACILITATE ENTERING OR EXITING THE VEHICLE AUTOMATICALLY RELEASES THE WEBBING WHEN THE IGNITION IS TURNED TO THE "ON" OR "START" POSITION.

WEBBING TENSION - RELIEVING DEVICE:

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

IF YES:

MAXIMUM SLACK RECOMMENDED IN OWNER'S MANUAL: _____ INCHES

DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER BELT? YES NO

IF NO, EXPLAIN:

IS THE WEBBING TENSION - RELIEVING DEVICE CANCELLED EACH TIME THE ADJACENT DOOR IS OPENED? YES NO

OPEN-BODY VEHICLE (without doors): DOES THE MANUAL MEANS TO CANCEL THE WEBBING TENSION - RELIEVING DEVICE OPERATE PROPERLY? YES
NO

IF NO, EXPLAIN:

BELT CONTACT FORCE:

BELT CONTACT FORCE ON CHEST OF TEST DUMMY: 0.1 POUNDS

NOT APPLICABLE, THE VEHICLE'S SEAT BELT SYSTEM INCLUDED A WEBBING TENSION-RELIEVING DEVICE.

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 = continuous 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 = continuous 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.:

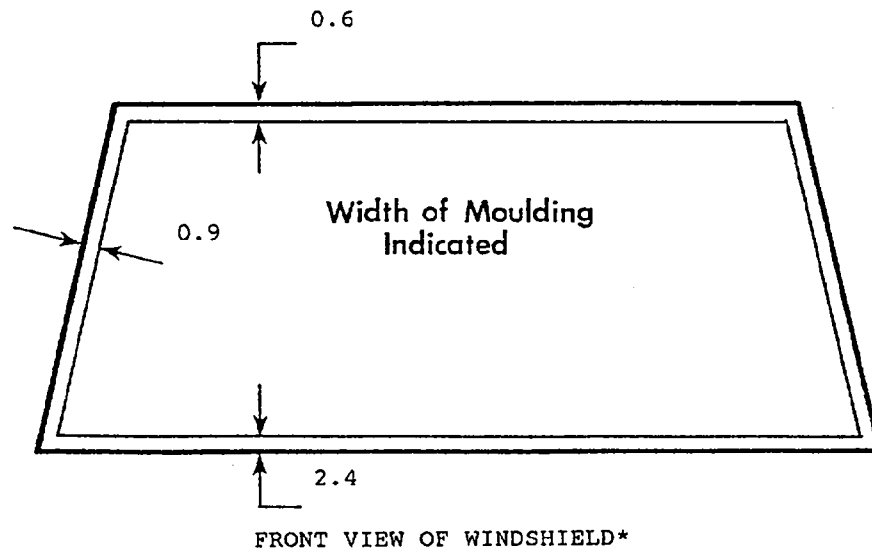
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	74.2	74.2	100
LEFT SIDE	74.2	74.2	100
TOTAL	148.4	148.4	100

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 66° F



LOSS OF WINDSHIELD RETENTION LENGTHS: None

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

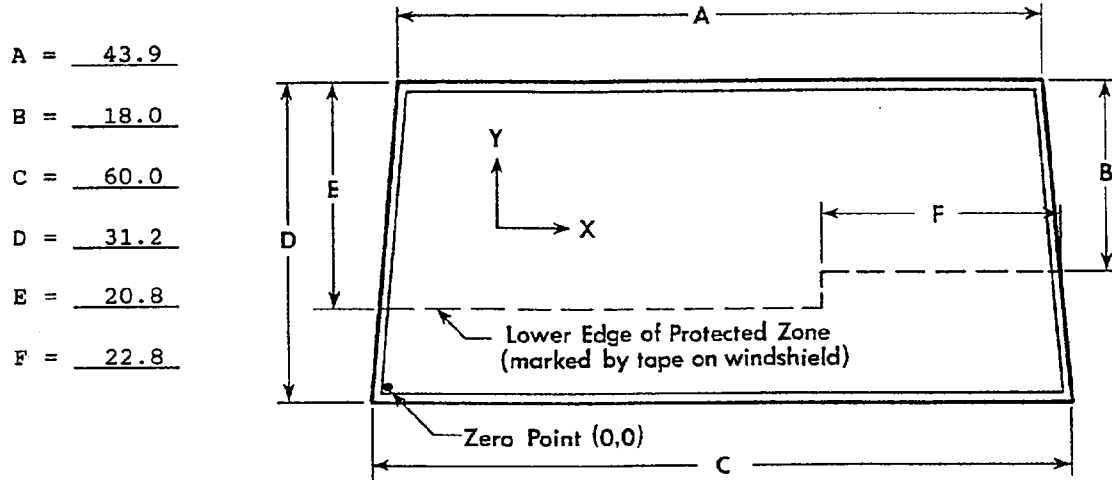
*INDICATE AREAS OF LOSS OF RETENTION, IF ANY, ON WINDSHIELD DIAGRAM.

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:



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: Mitsubishi/Mirage

NHTSA NO.: CP5600

FUEL SYSTEM CAPACITY: 13.2 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 12.5 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 11.5 GALLONS TO 11.8 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 11.6 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 is in front of the rear axle.

The fuel lines run along the right side to the front. The fuel filler
is located on the right side.

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.: CP5600; TEST DATE: 11/17/92
VEHICLE MAKE/MODEL/BODY STYLE: Mitsubishi/Mirage/4-door sedan

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:

 X 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:

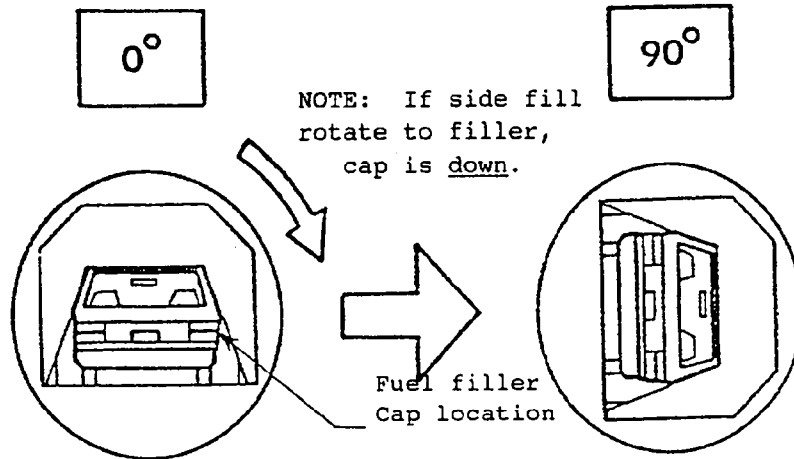
	TEST RESULTS	MAXIMUM ALLOWABLE
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 OZ.	1 OZ.
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 OZ.	5 OZ.
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - - -	0 OZ.	1 OZ./1 MIN.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: CP5600
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:

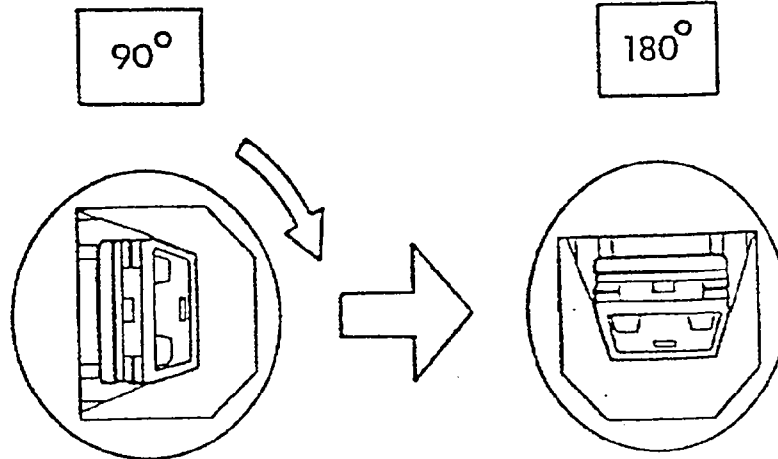
<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CP5600
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:

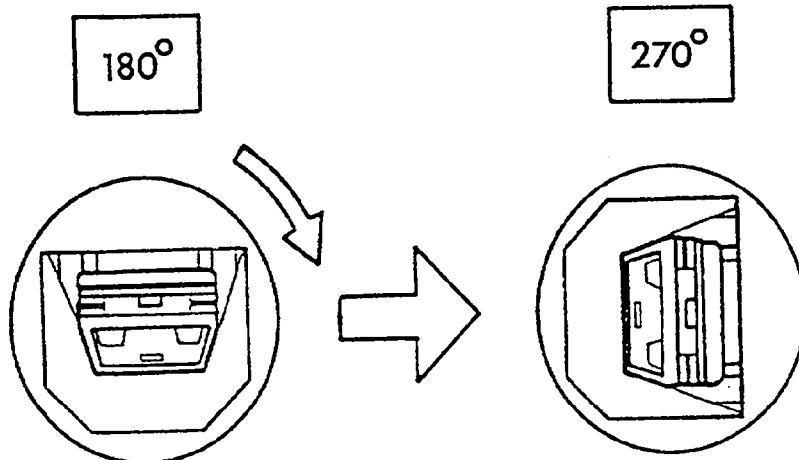
<u>90° TO 180° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CP5600
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:

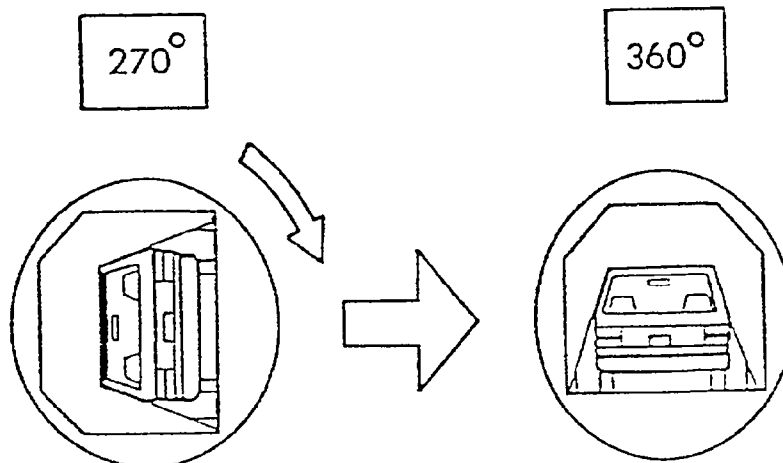
<u>180° TO 270° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CP5600
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

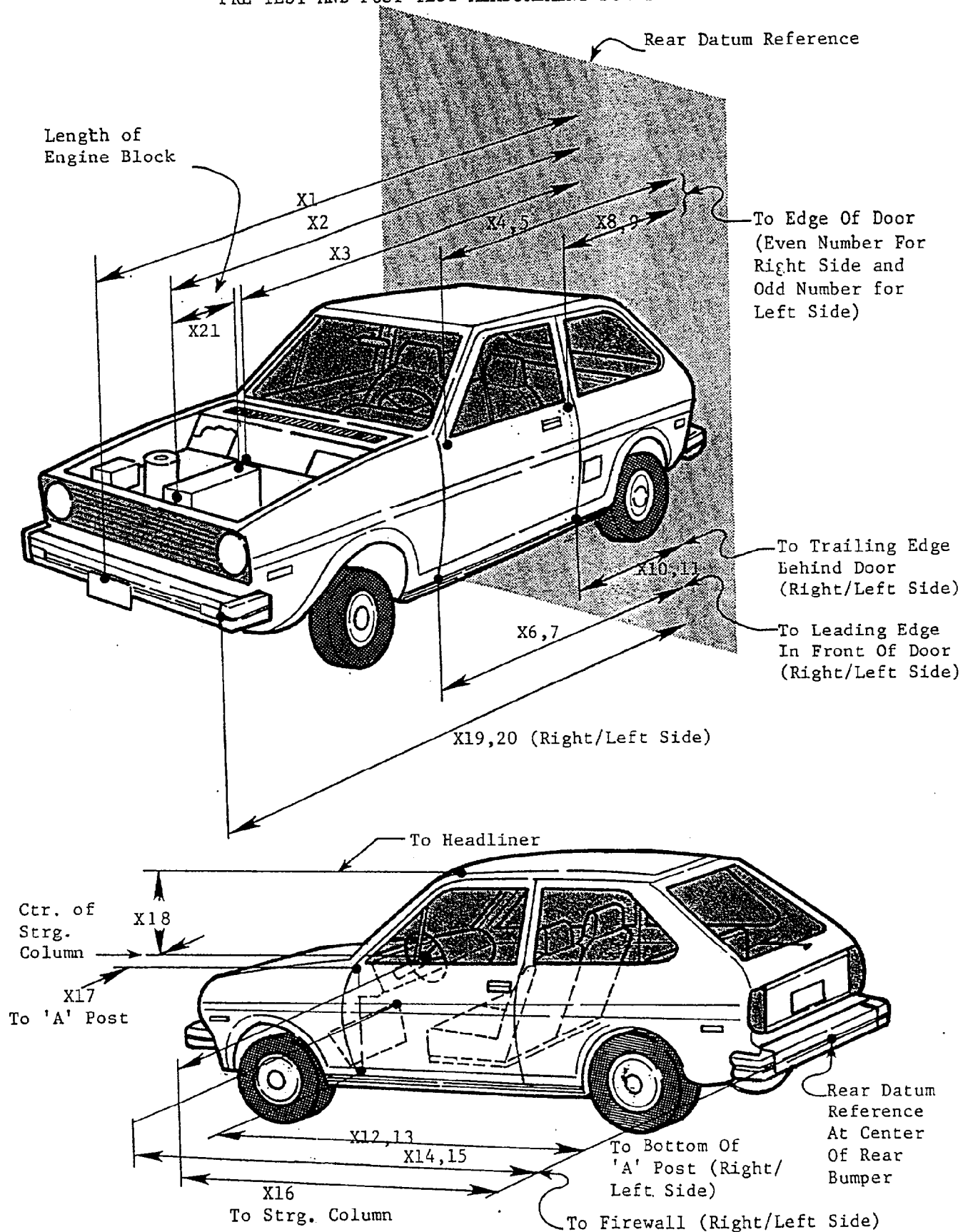
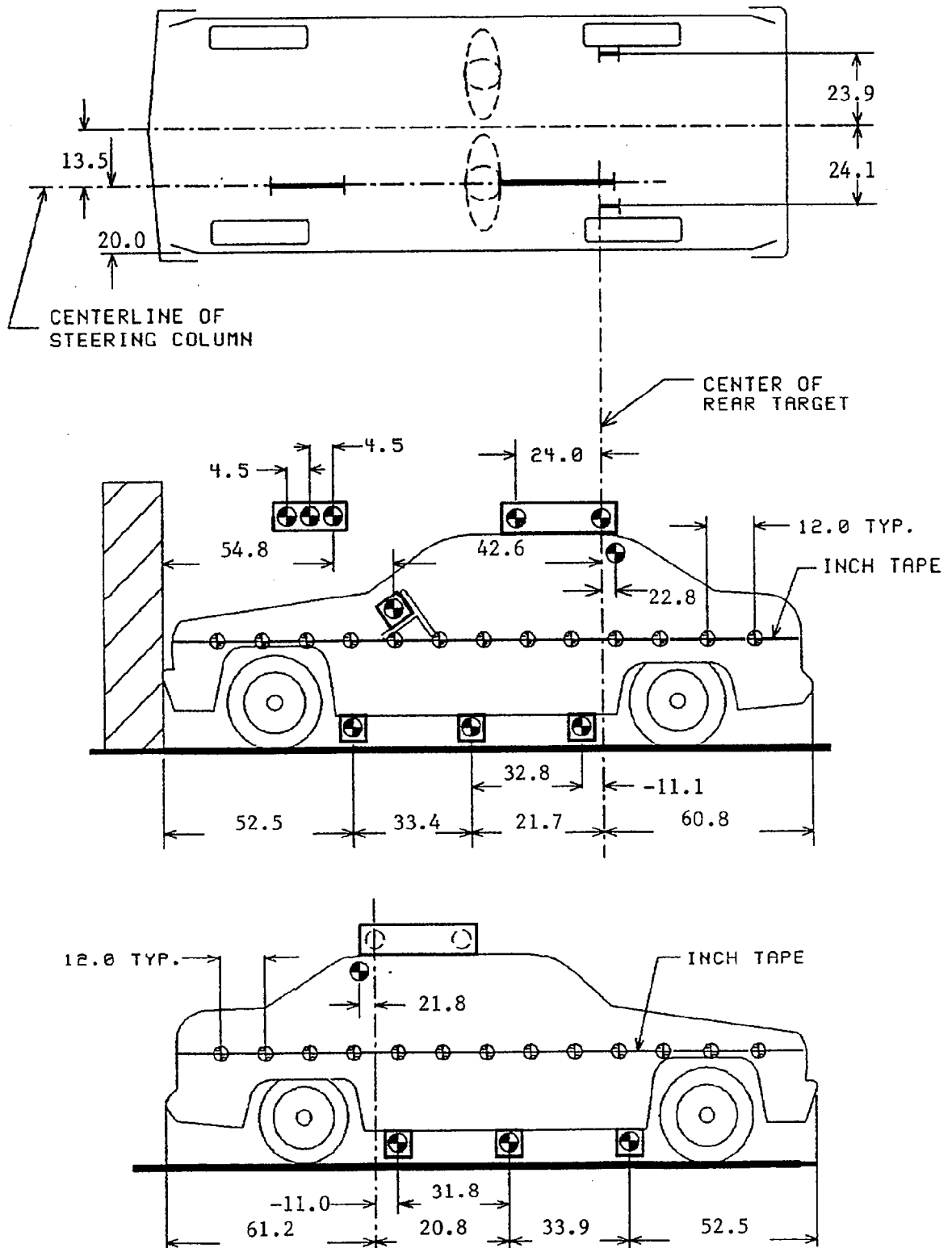


TABLE 13 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Mitsubishi/Mirage		TEST NUMBER: 921117		ALL MEASUREMENTS ARE IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.		
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	168.4	150.0	18.4		
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	145.4	141.0	4.4		
X3	REAR SURFACE OF VEHICLE TO FIREWALL	125.8	123.0	2.8		
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	115.0	115.2	-0.2		
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	113.8	114.2	-0.4		
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	114.2	114.0	0.2		
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	114.5	114.0	0.5		
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	72.2	72.5	-0.3		
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	72.2	72.9	-0.7		
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	72.3	71.5	0.8		
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	72.4	71.6	0.8		
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	113.6	113.0	0.6		
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	113.5	112.6	0.9		
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	123.8	122.8	1.0		
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	123.3	122.3	1.0		
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	97.1	96.9	0.2		
X17	CENTER OF STEERING COLUMN TO "A" POST	11.5	10.4	1.1		
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.3	17.5	-0.2		
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	162.8	147.8	15.0		
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	162.4	147.1	15.3		
X21	LENGTH OF ENGINE BLOCK	16.0	16.0	0.0		

FIGURE 8

VEHICLE TARGET LOCATIONS



ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9

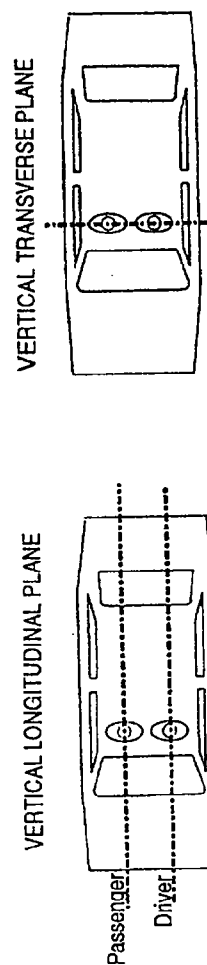


TABLE 14 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

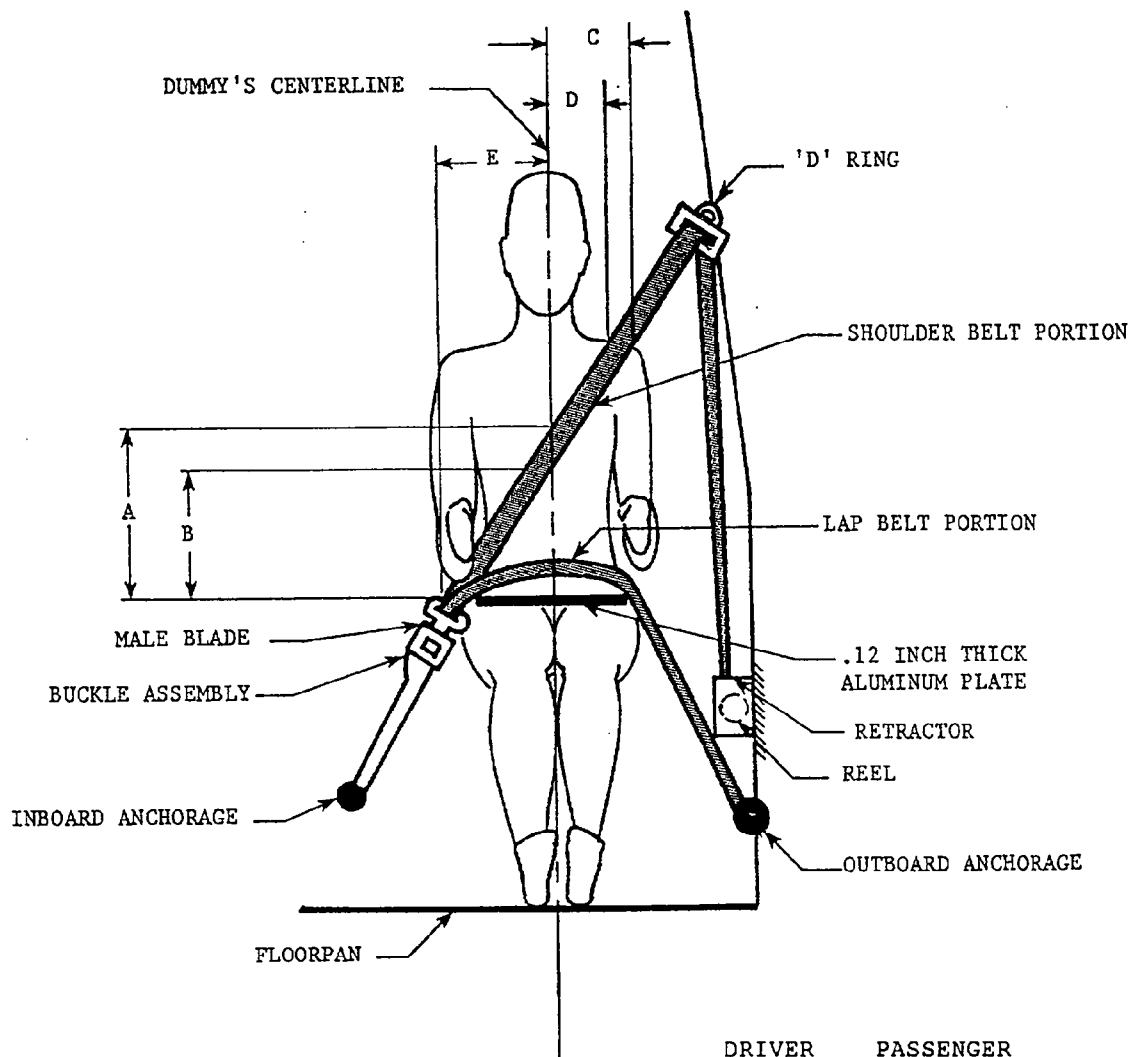
DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #1173)	PASSENGER (SERIAL #353)
WA°	WINDSHIELD ANGLE	31°	NA
SWA°	STEERING WHEEL ANGLE	66°	NA
SCA°	STEERING COLUMN ANGLE	24°	NA
SA°	SEAT BACK ANGLE	26°	26°
HZ	HEAD TO ROOF	6.4	6.4
HH	HEAD TO HEADER	15.0	14.1
HW	HEAD TO WINDSHIELD	22.1	21.4
HR	HEAD TO SIDE HEADER	7.5	6.4
NR	NOSE TO RIM	18.3	NA
NA	NOSE TO RIM ANGLE	15°	NA
CD	CHEST TO DASH	22.6	24.2
CS	STEERING WHEEL TO CHEST	15.9	NA
RA	RIM TO ABDOMEN	8.2	NA
KDL	LEFT KNEE TO DASH	8.2	7.4
KDR	RIGHT KNEE TO DASH	7.3	8.6
KDA	OUTBOARD KNEE TO DASH ANGLE	25°	29°
PA°	PELVIC ANGLE	13°	15°
TA°	TIBIAL ANGLE	31°	31°
KK	KNEE TO KNEE	12.4	9.5
ST*	STRIKER TO HEAD	20.8	21.0
	STRIKER TO HEAD ANGLE	-92°	92°
SK*	STRIKER TO KNEE	23.1	23.0
	STRIKER TO KNEE ANGLE	5°	9°
SH*	STRIKER TO H-POINT	8.0	8.5
	STRIKER TO H-POINT ANGLE	36°	48°
SHY	STRIKER TO H-POINT (Y DIR.)	8.6	9.5
HS	HEAD TO SIDE WINDOW	12.9	12.1
HD	H-POINT TO DOOR	6.5	6.6
AD	ARM TO DOOR	4.5	4.2

THE SEAT BACK ANGLE (SA°) IS MEASURED RELATIVE TO VERTICAL, ALL OTHER ANGLES ARE MEASURED RELATIVE TO HORIZONTAL.

*A negative angle indicates the measurement point was located above the striker.

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 10 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUM. PLATE TO BELT UPPER EDGE	14.2	14.4
B - TOP SURFACE OF ALUM. PLATE TO BELT LOWER EDGE	11.0	11.2
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	7.8	7.0
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	5.0	1.2

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

4, 7, 8

FIGURE 11

CAMERA POSITIONS

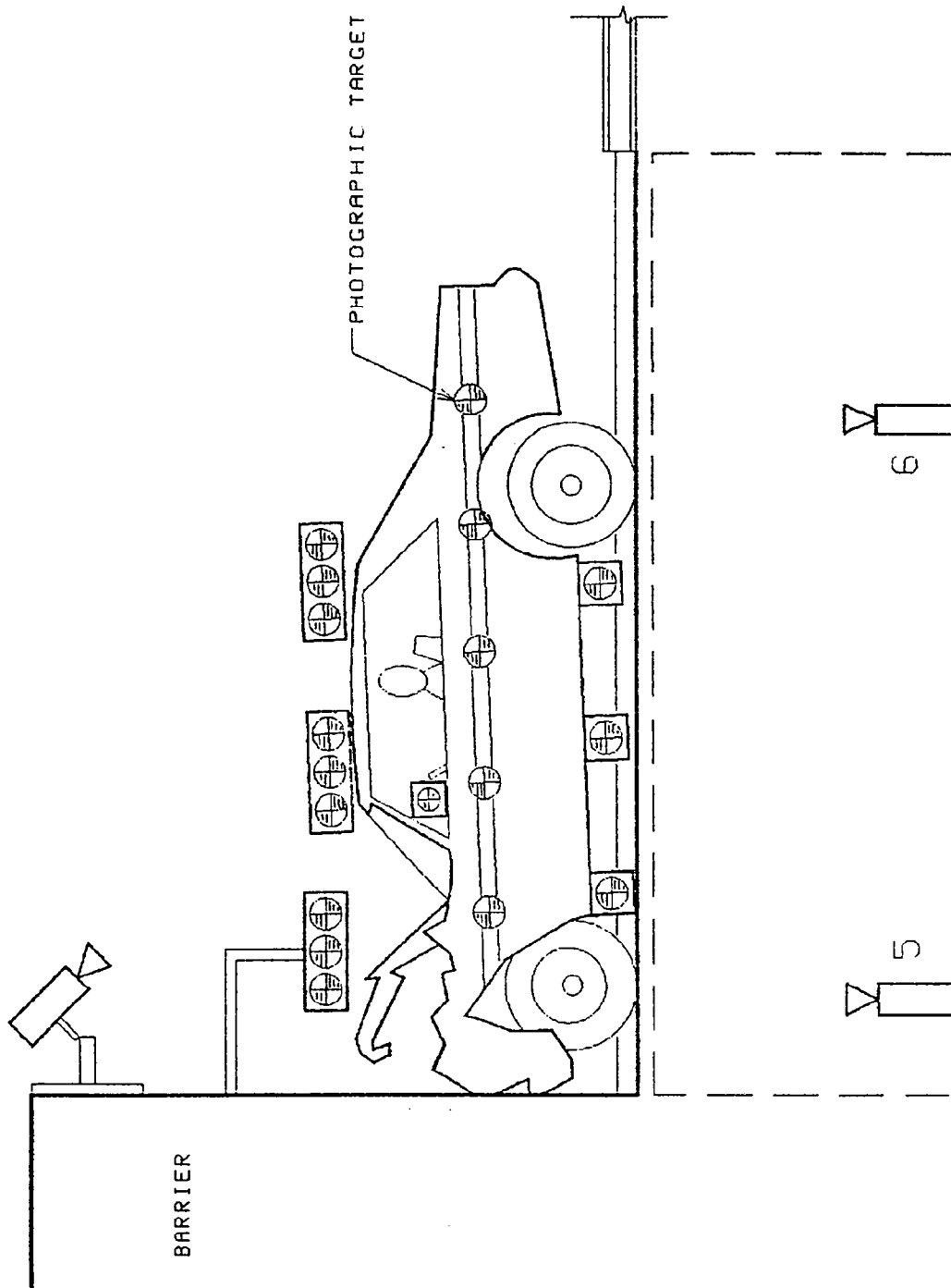


FIGURE 11
CAMERA POSITIONS, CONTINUED

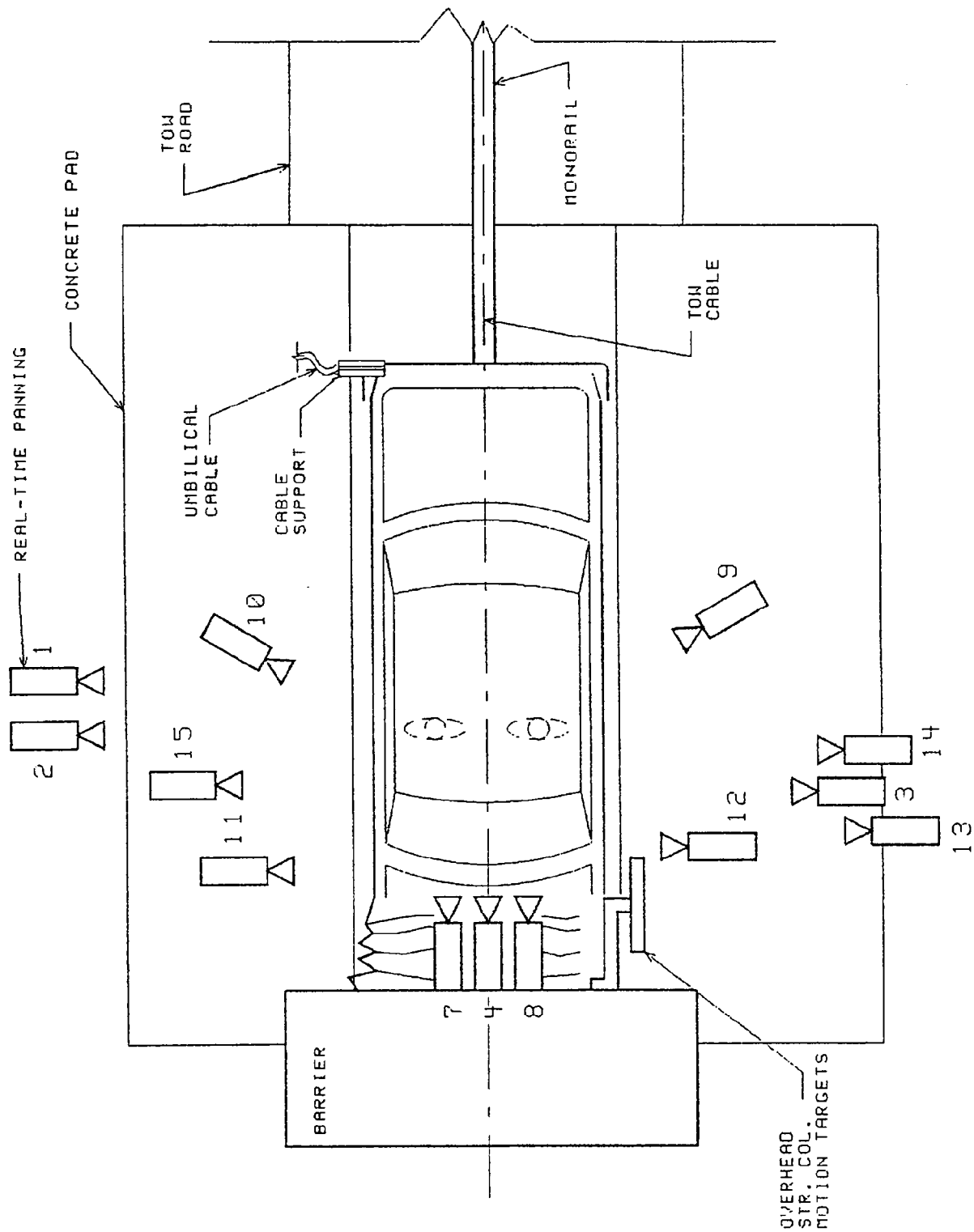


TABLE 15 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 921117		VEHICLE: Mitsubishi Mirage 4-door sedan									
CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	FILM PLANE		FILM SPEED (FPS)			
		X	Y	Z		TO HEAD TARGET(IN)	LENS (MM)				
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	224.0	25	1025			
4	Windshield front view	-6.0	0.0	84.0	-40	NA	13	505			
5	Pit-left subframe sidemember	-8.0	29.0	-16.0	90	NA	13	998			
6	Pit-right subframe sidemember	-7.0	30.0	-12.0	90	NA	13	1002			
7	Passenger front view	-4.5	-13.8	93.0	-50	NA	17	508			
8	Driver front view	-6.8	14.5	93.0	-50	NA	17	505			
9	Driver kinematics	-157.3	116.0	87.0	-27	106.0	25	500			
10	Passenger kinematics	-152.1	-116.0	87.0	-26	94.0	25	498			
11	Right windshield intrusion	-38.1	-306.1	44.0	0	NA	50	498			
12	Left windshield intrusion	-53.0	309.4	42.3	0	NA	50	459			
13	Steering column motion	-108.0	285.0	103.0	-14	NA	25	505			
14	Steering column motion	-108.0	285.0	75.1	-9	NA	25	498			
15	Passenger kinematics	-38.8	-293.0	45.3	-4	216.0	25	1025			
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

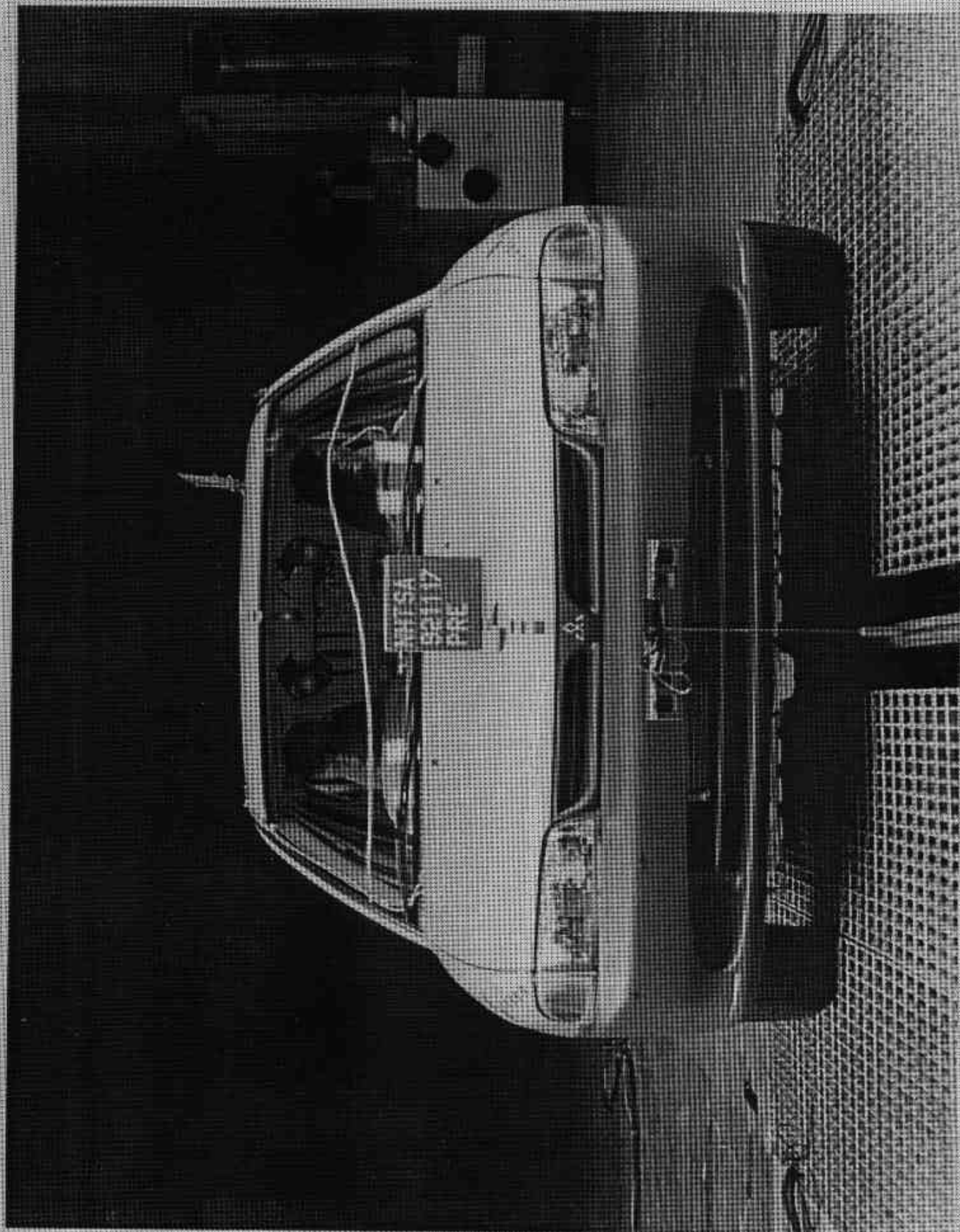


FIGURE A-1. PRE-TEST FRONT VIEW

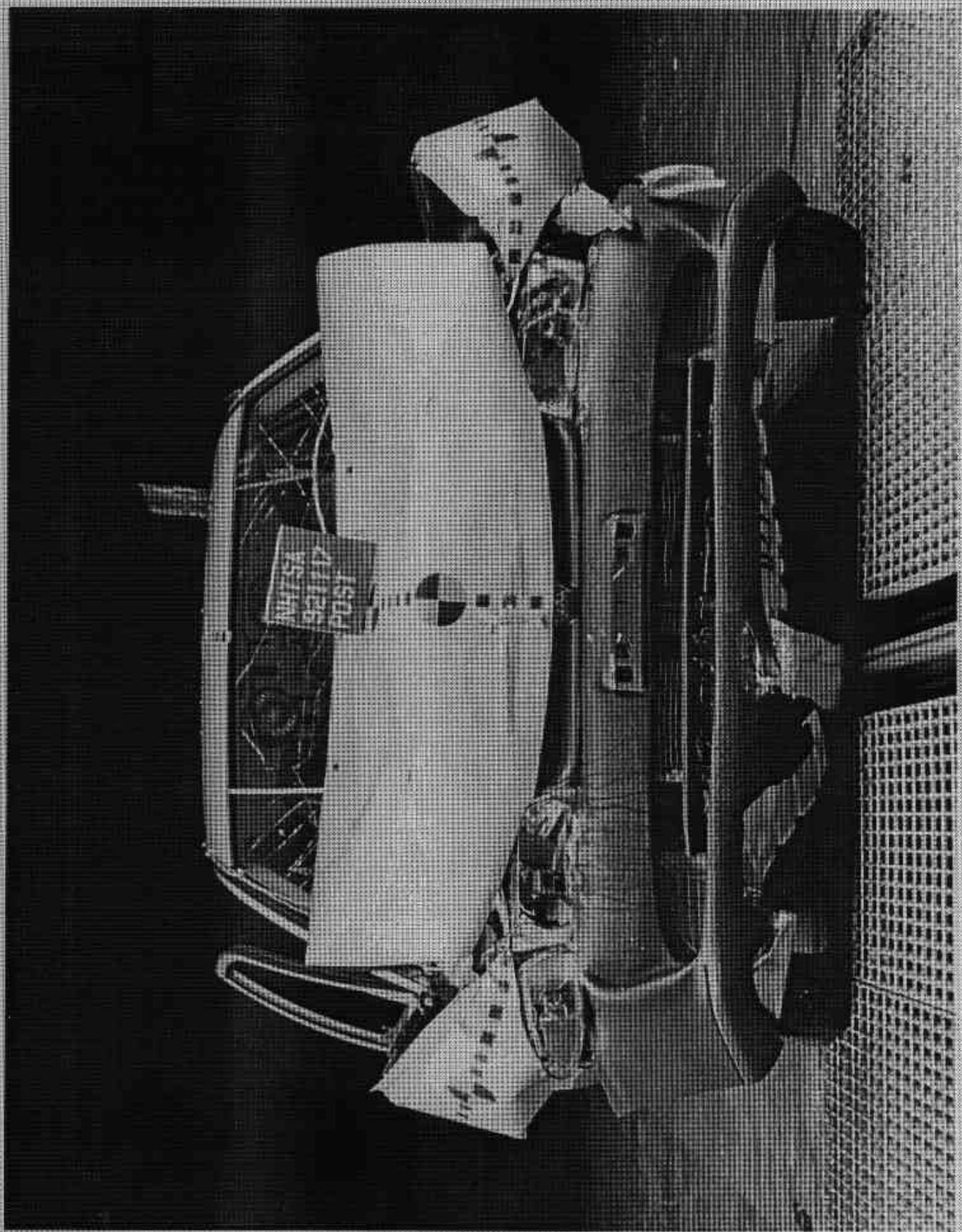


FIGURE A-2. POST-TEST FRONT VIEW

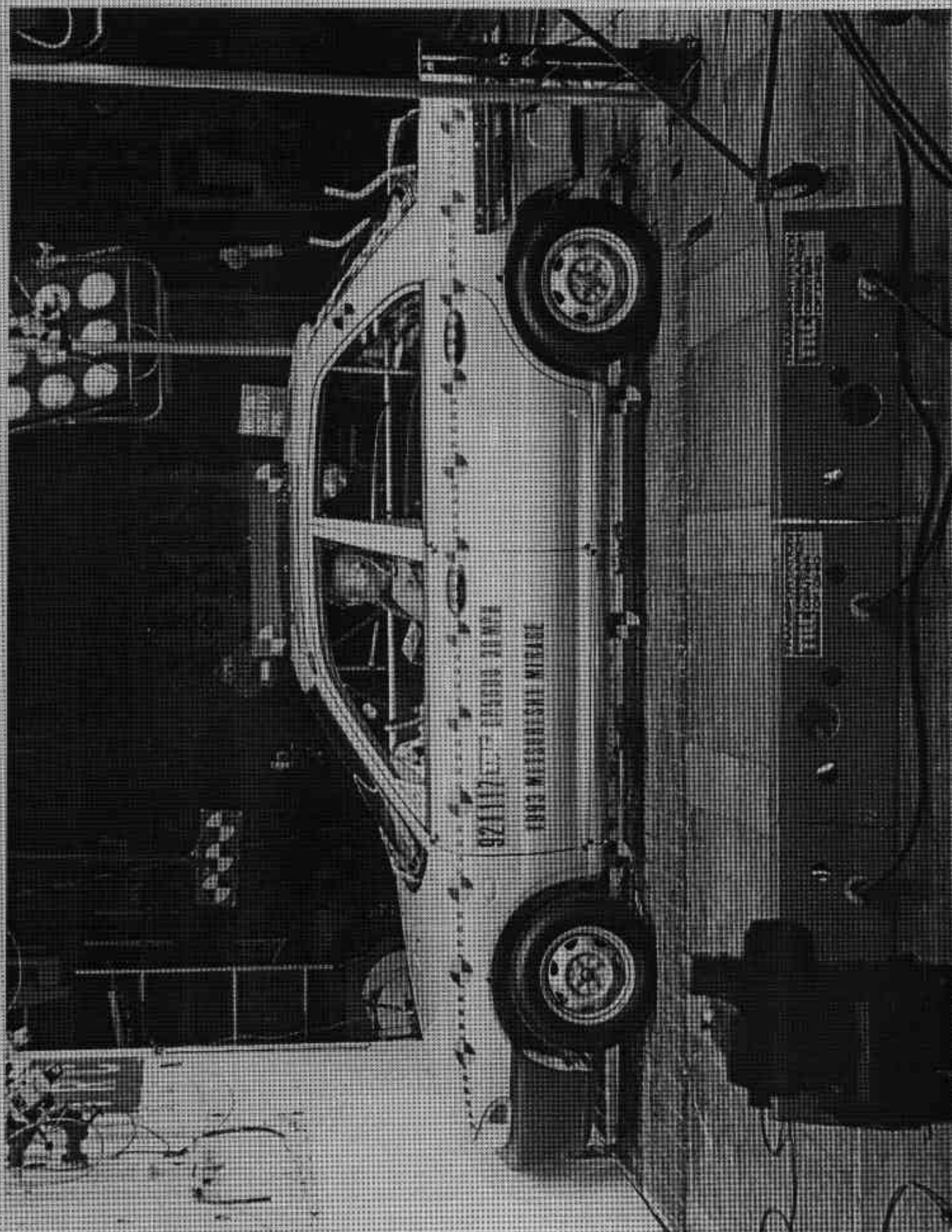


FIGURE A-3. PRE-TEST LEFT SIDE VIEW

A-4

921117

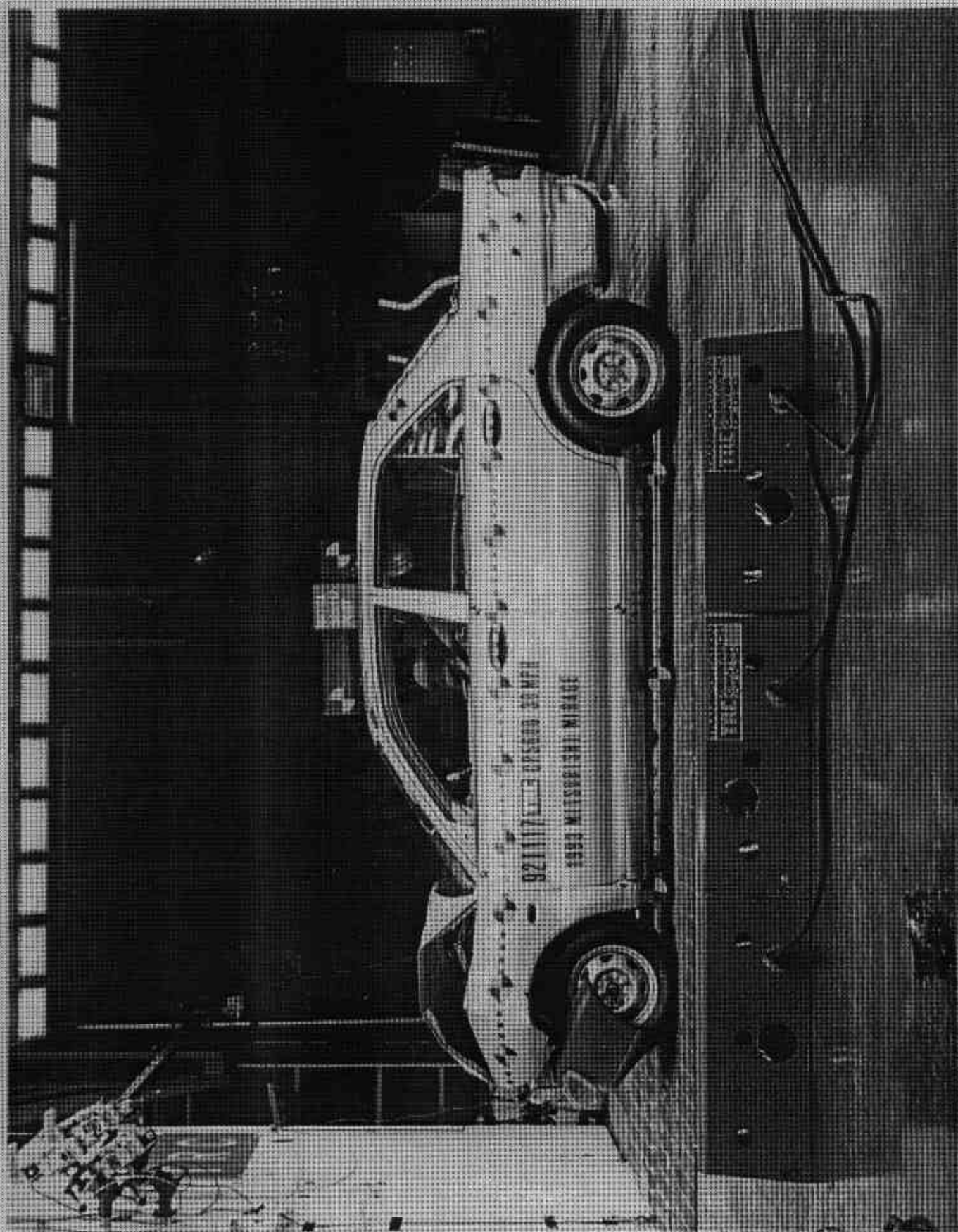


FIGURE A-4. POST-TEST LEFT SIDE VIEW
A-5

921117

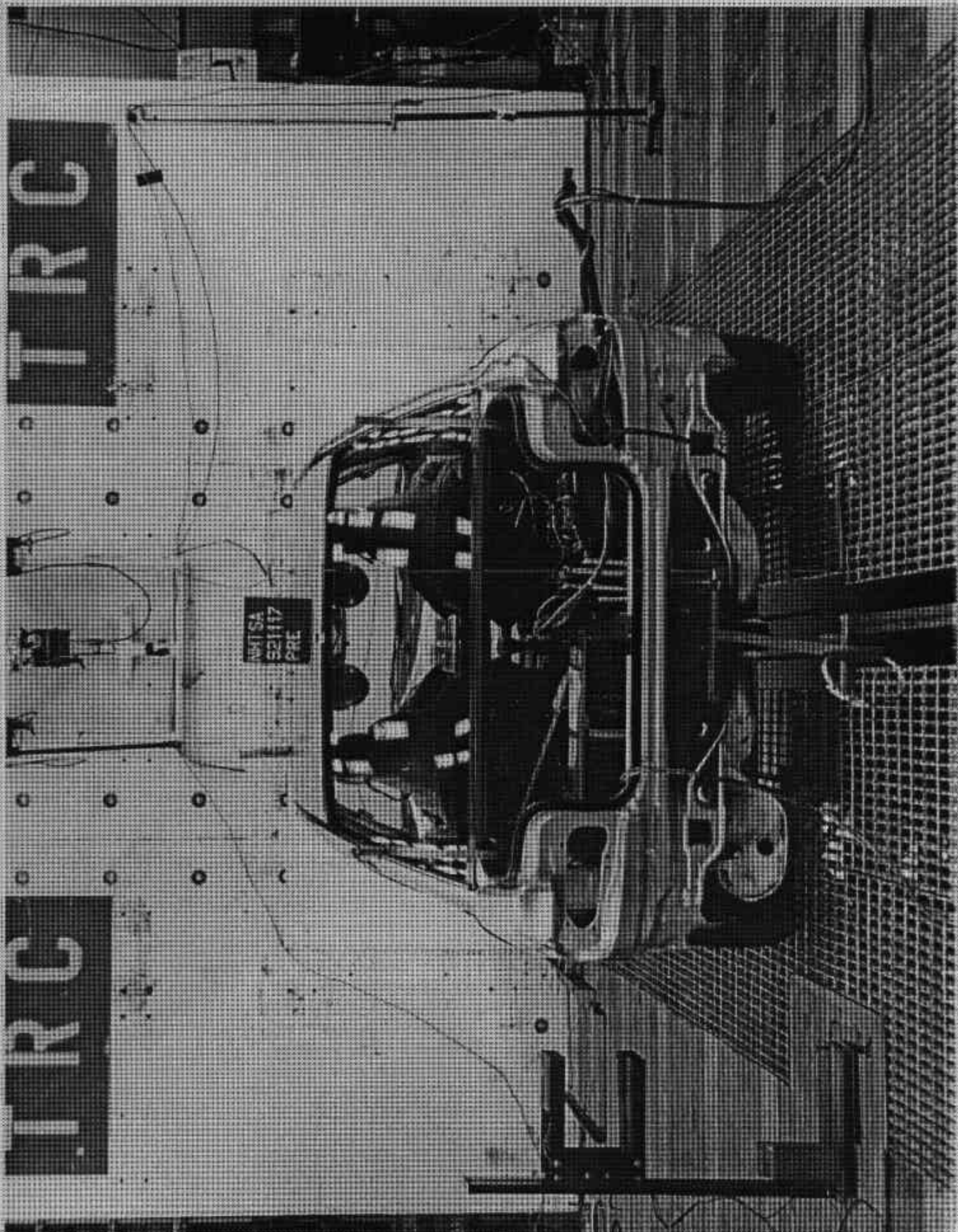


FIGURE A-5. PRE-TEST REAR VIEW

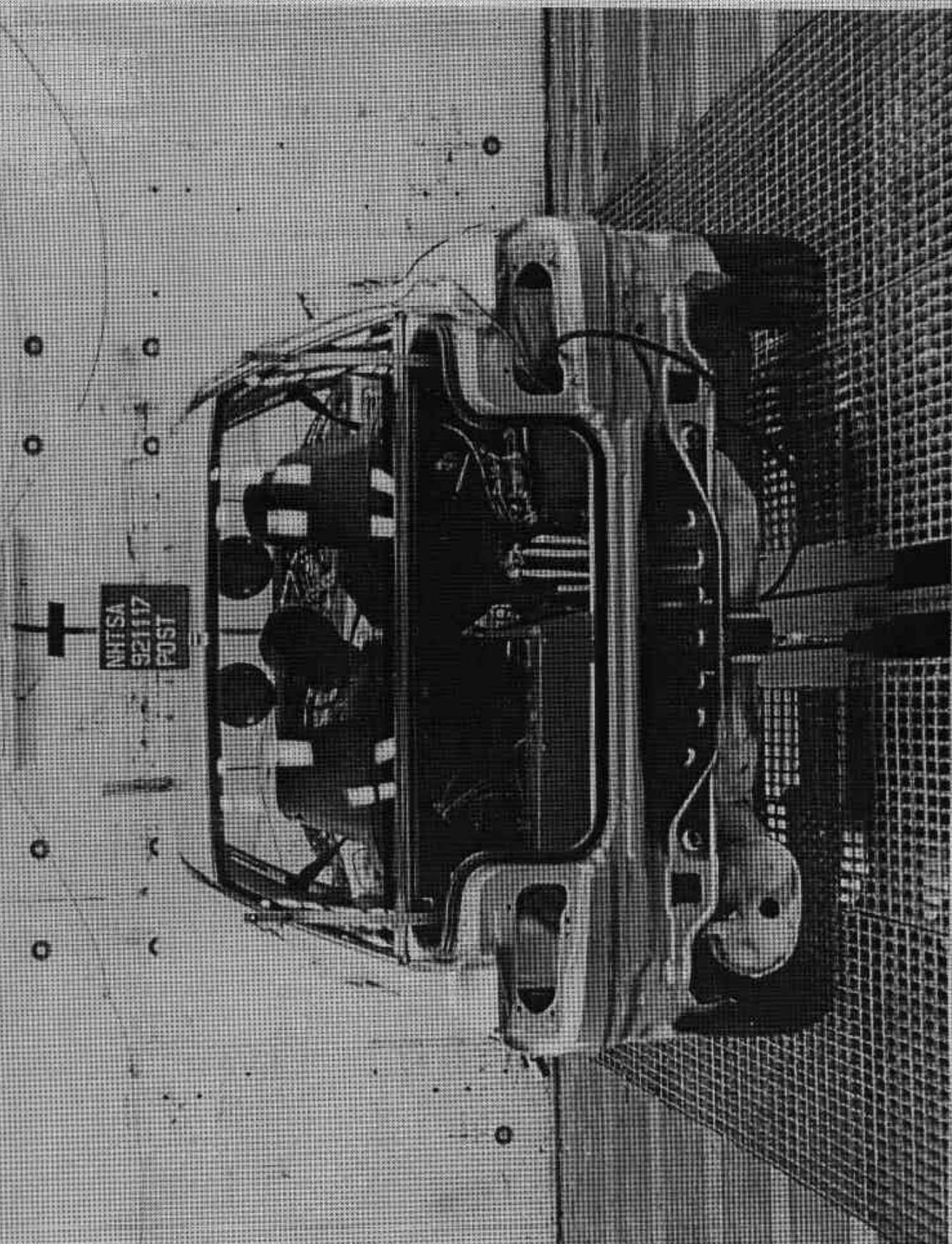


FIGURE A-6. POST-TEST REAR VIEW

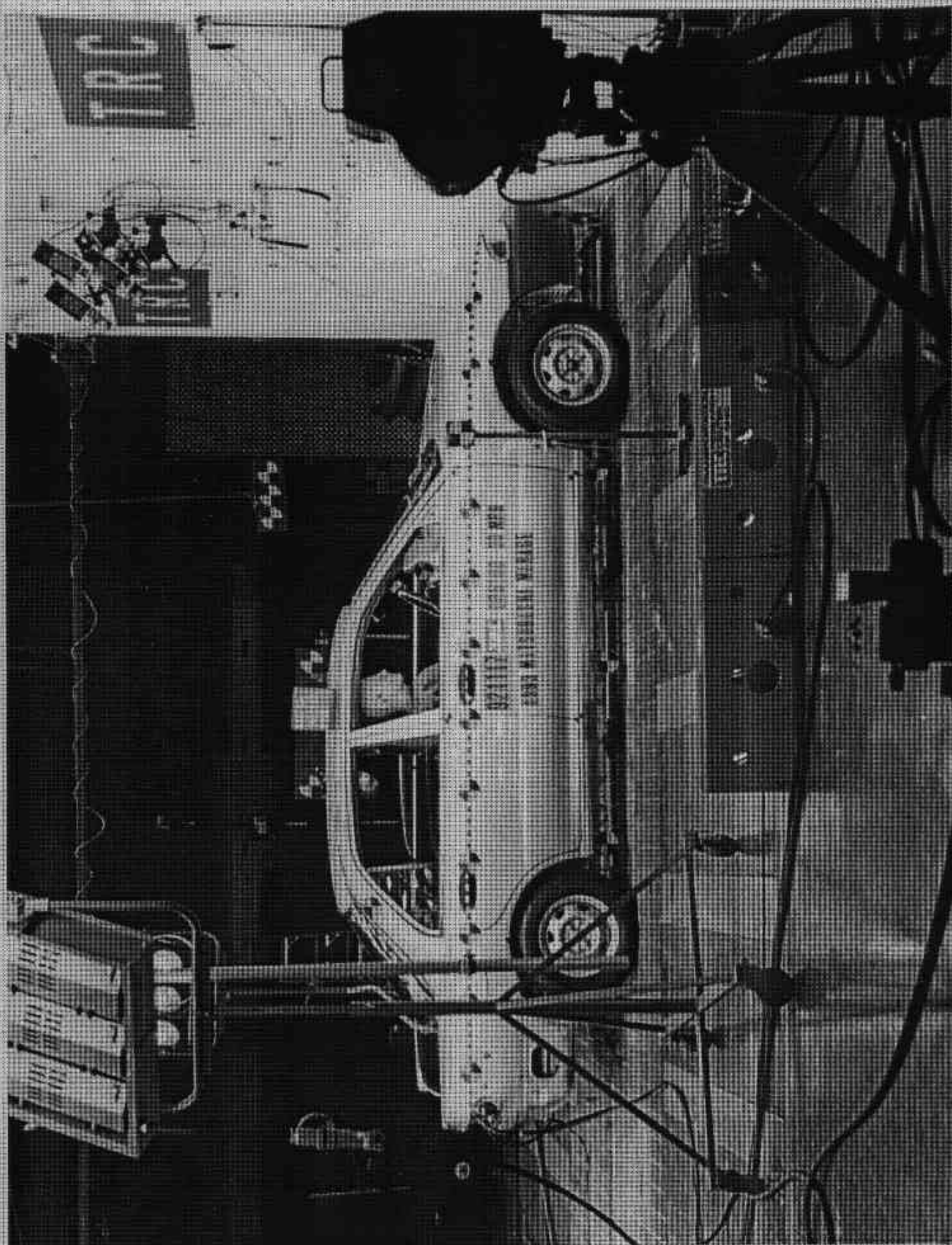


FIGURE A-7. PRE-TEST RIGHT SIDE VIEW

A-8

921117



FIGURE A-8. POST-TEST RIGHT SIDE VIEW

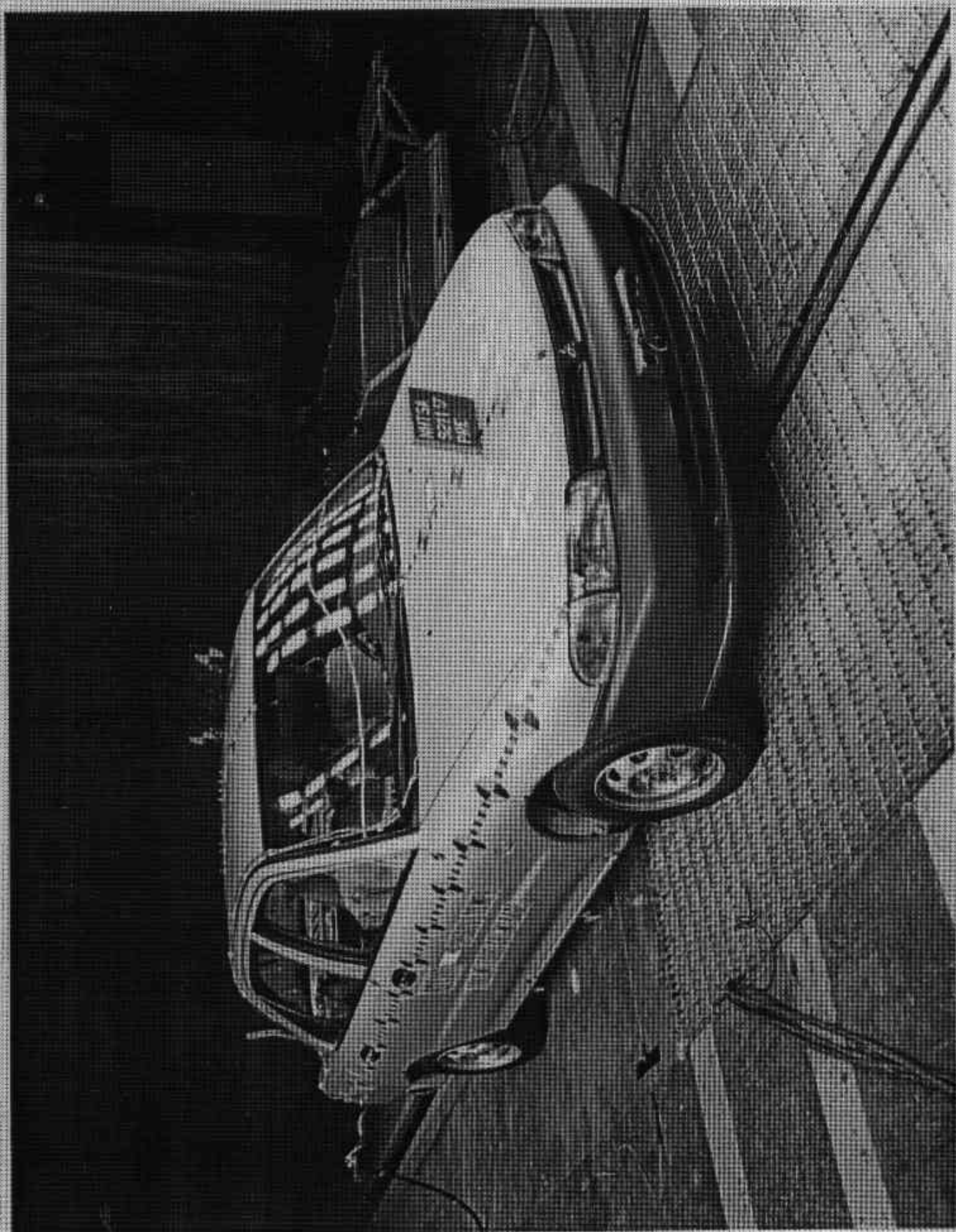


FIGURE A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

921117

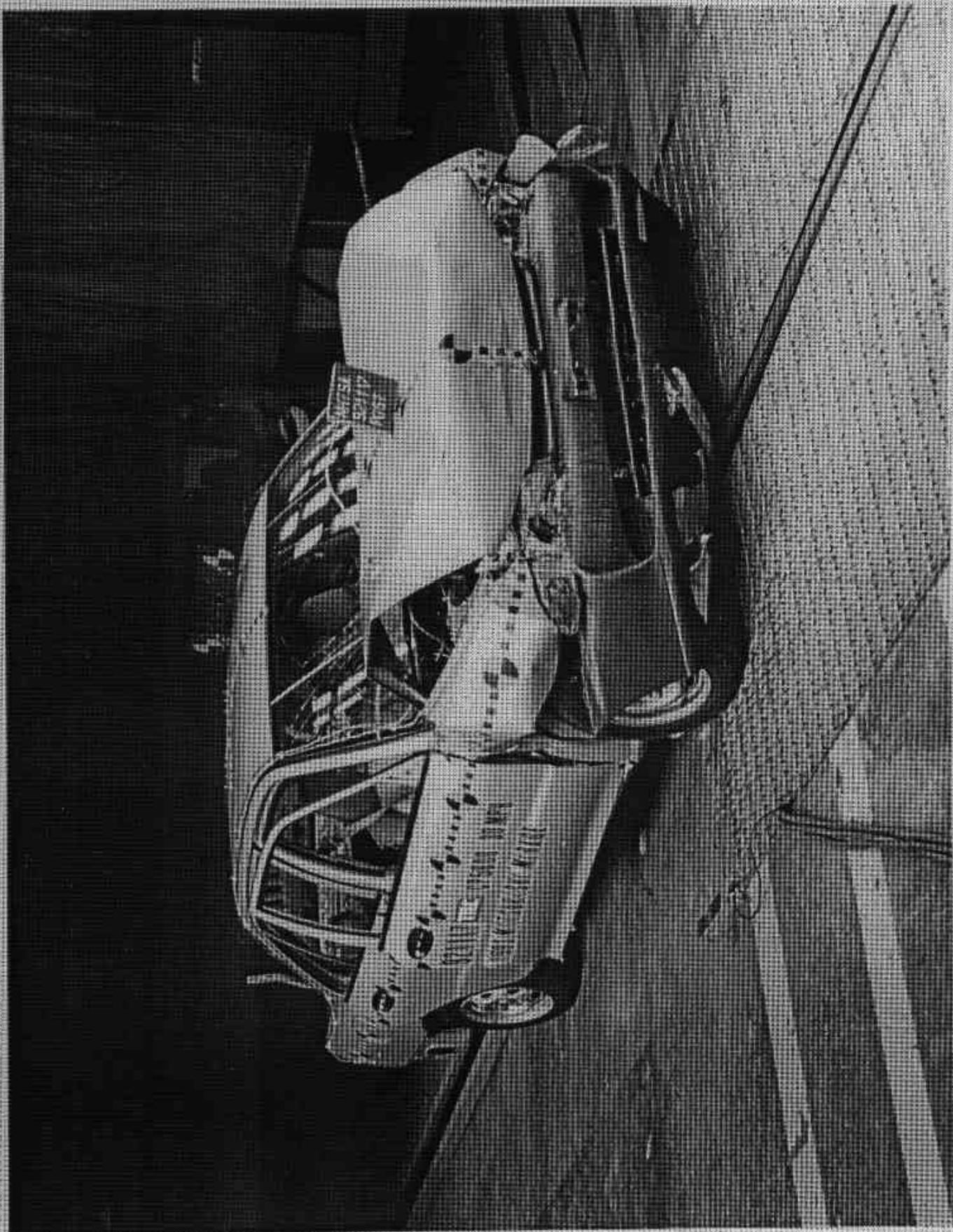


FIGURE A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

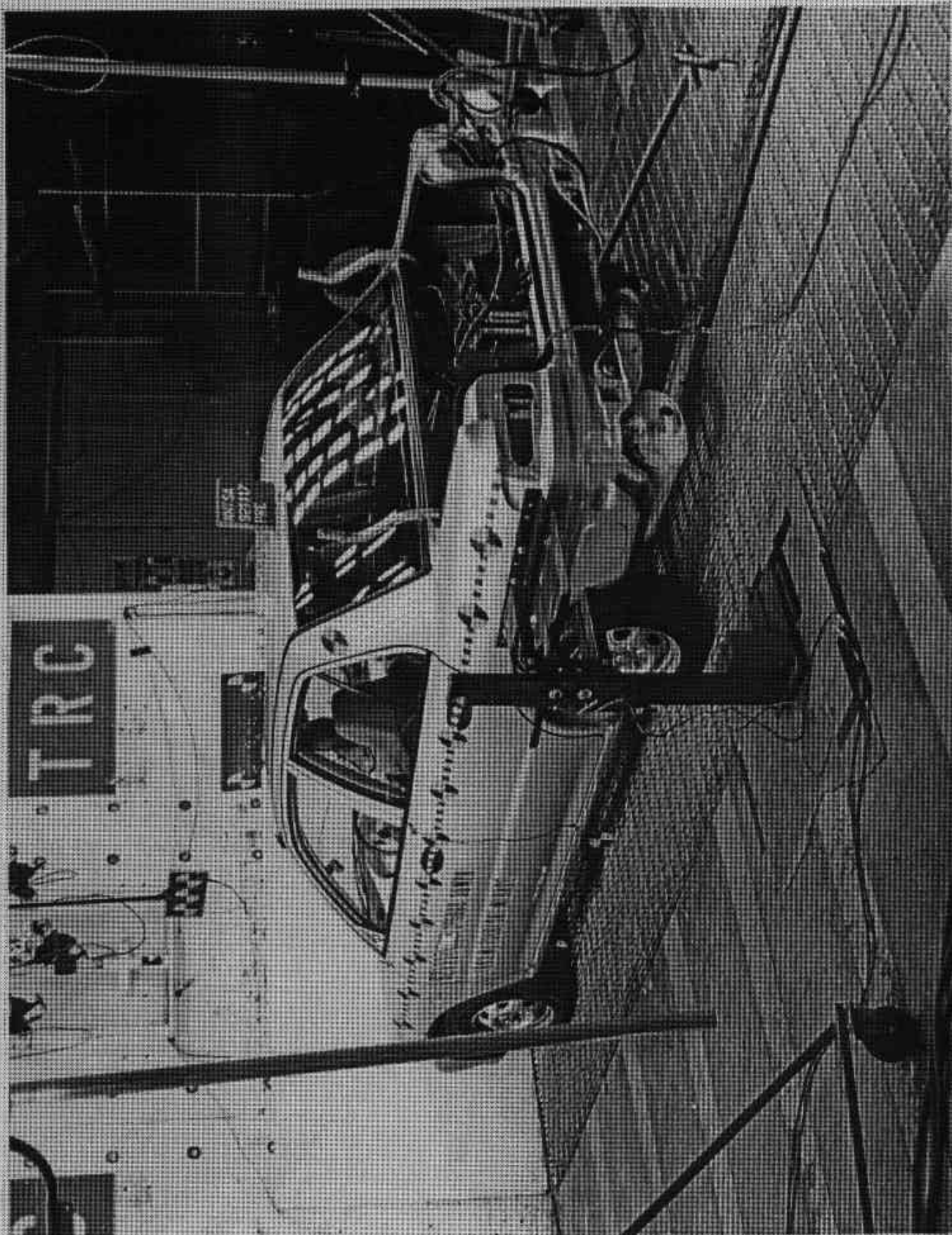


FIGURE A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

921117



FIGURE A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW
A-13

921117

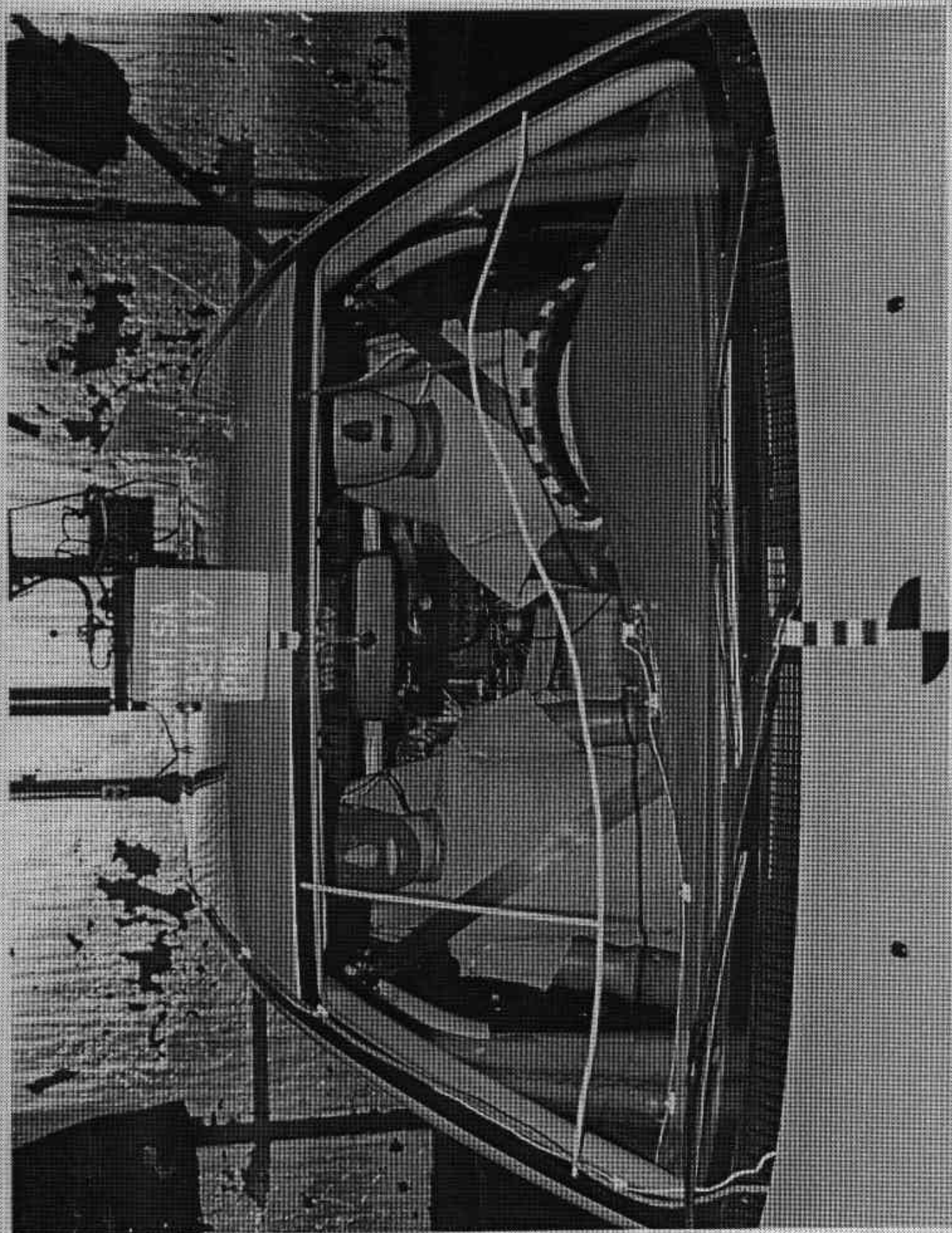


FIGURE A-13. PRE-TEST WINDSHIELD VIEW
A-14

921117

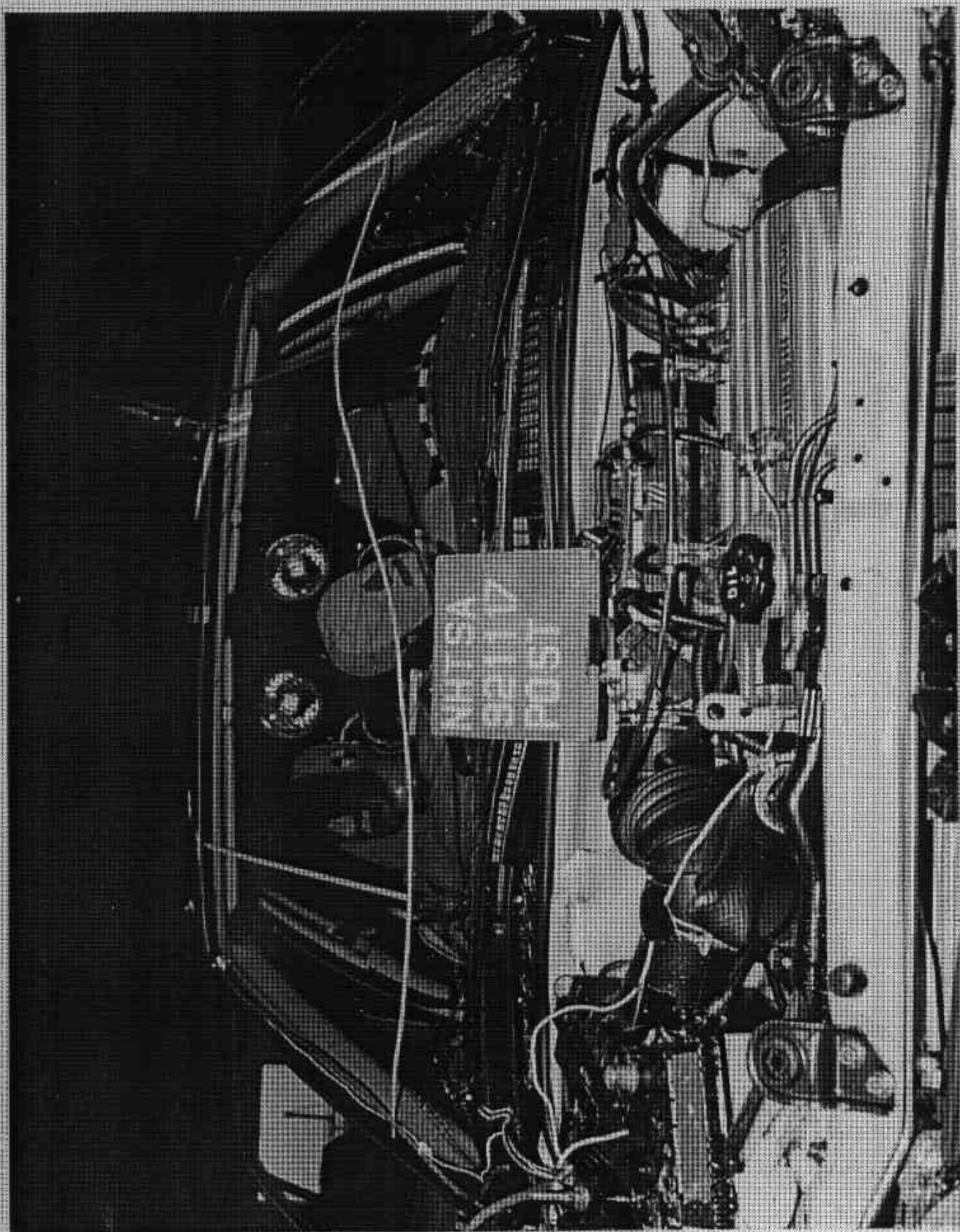


FIGURE A-14. POST-TEST WINDSHIELD VIEW
A-15

921117

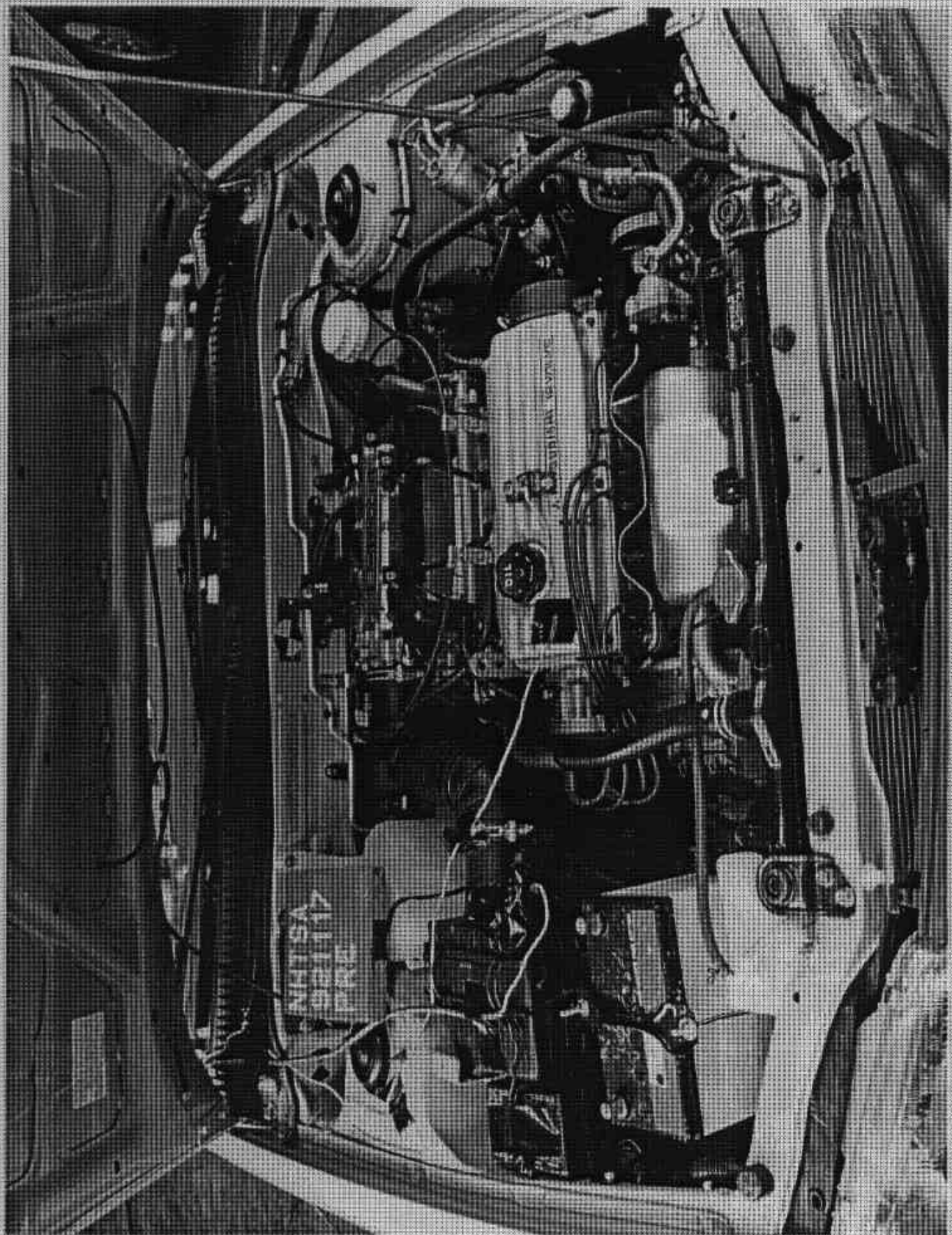


FIGURE A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

921117

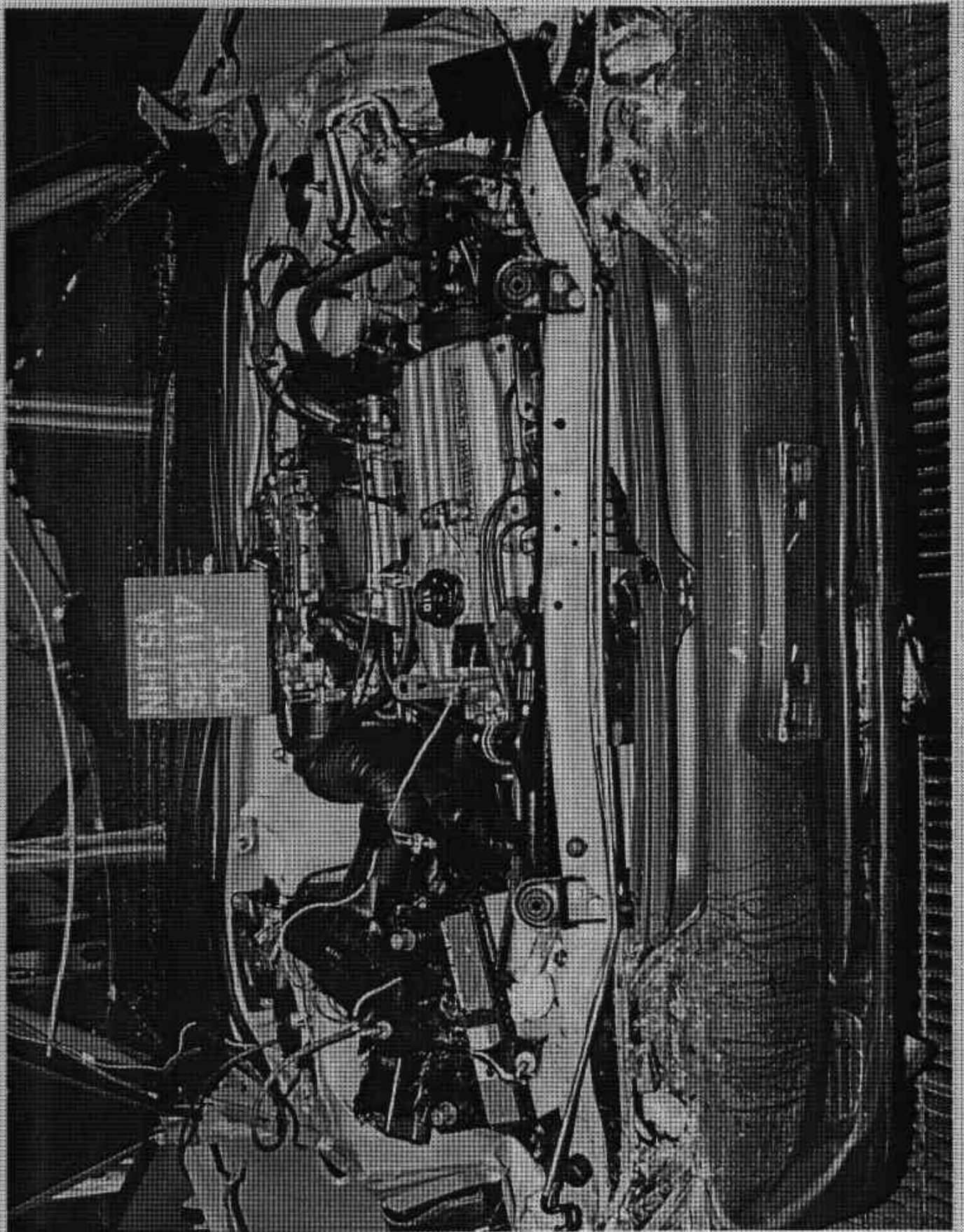


FIGURE A-16. POST-TEST ENGINE COMPARTMENT VIEW

A-17

921117



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

921117



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

A-19

921117



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

A-20

921117



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

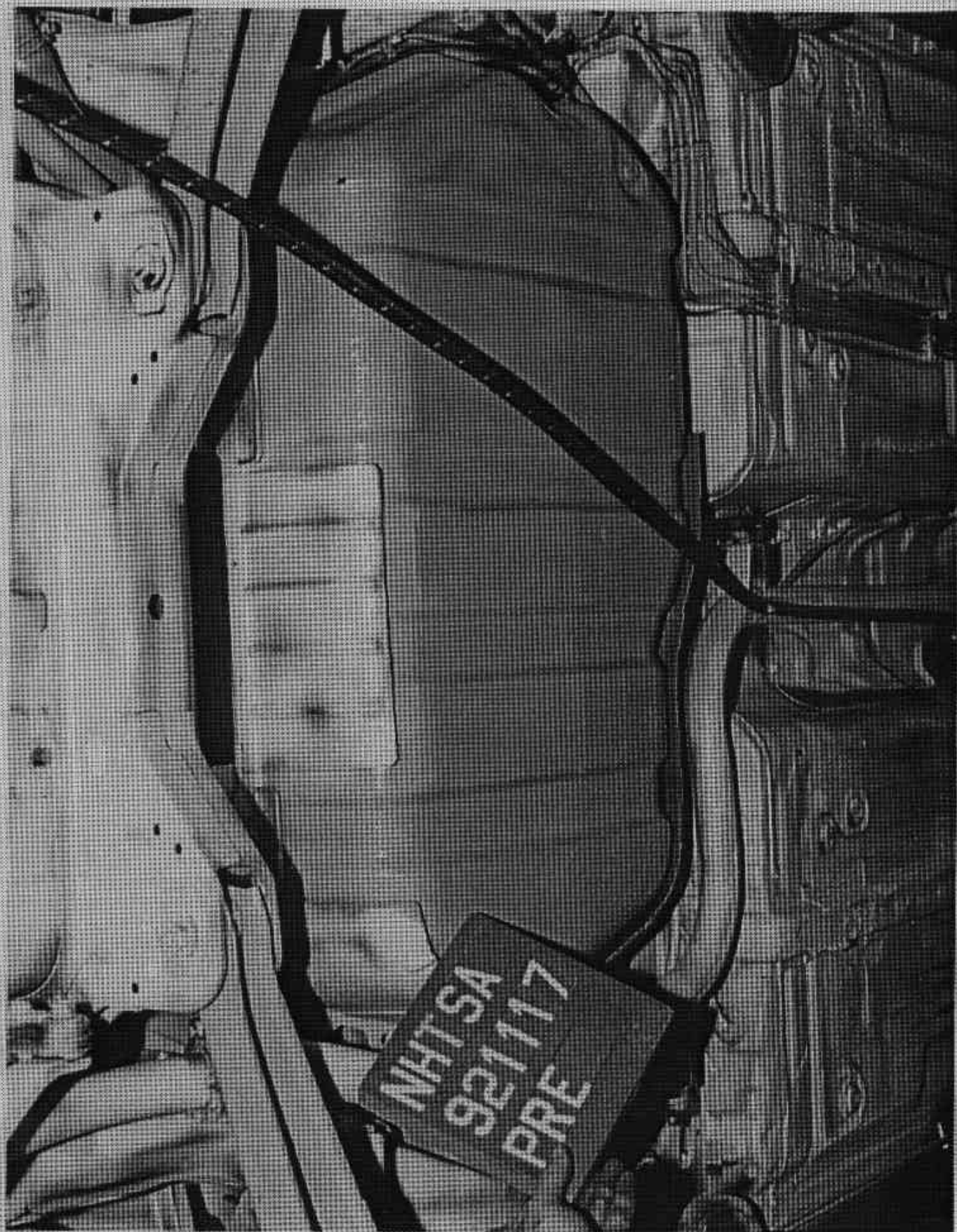


FIGURE A-21. PRE-TEST FUEL TANK VIEW
A-22

921117



FIGURE A-22. POST-TEST FUEL TANK VIEW

A-23

921117

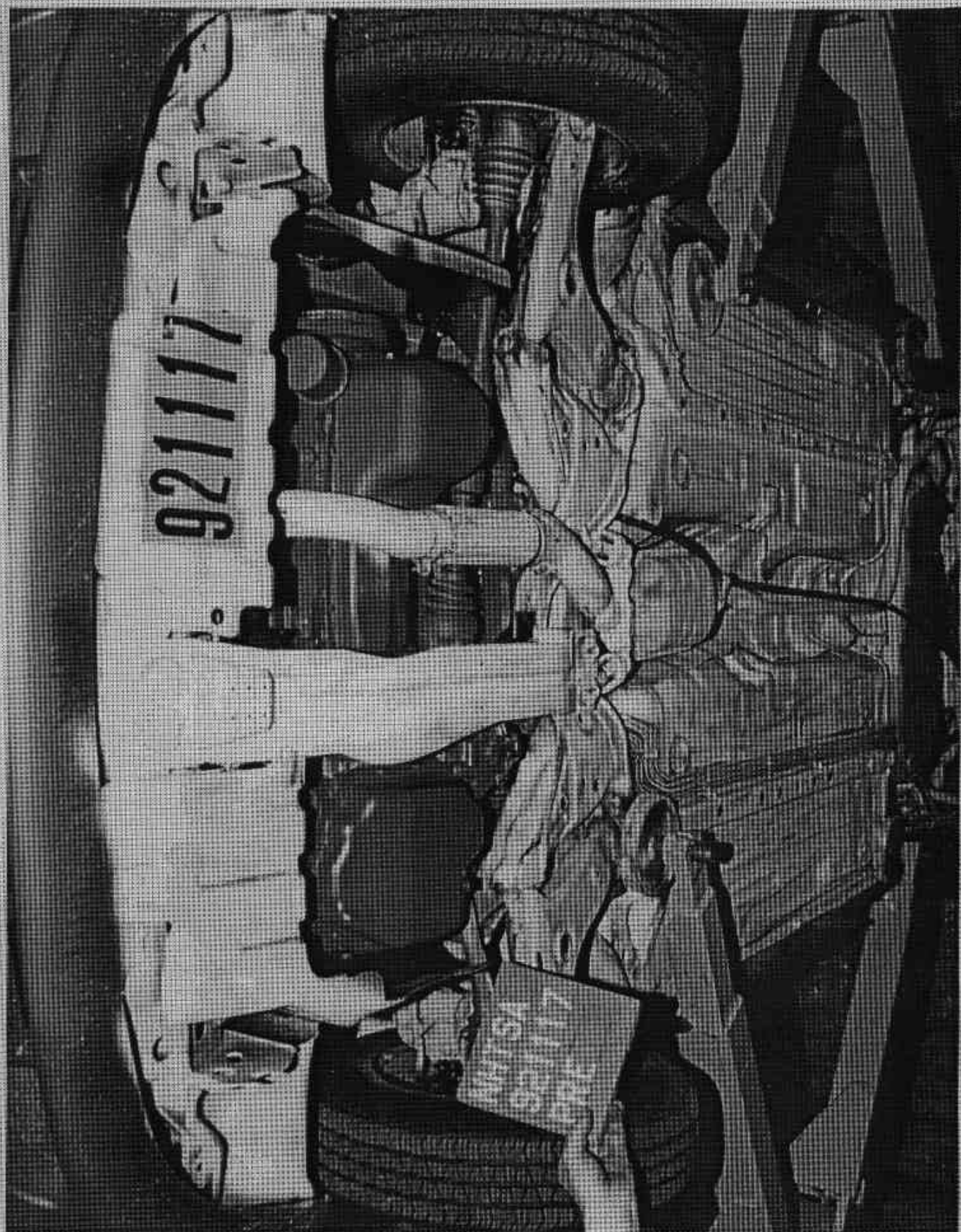


FIGURE A-23. PRE-TEST FRONT UNDERBODY VIEW

A-24

921117



FIGURE A-24. POST-TEST FRONT UNDERBODY VIEW

A-25

921117

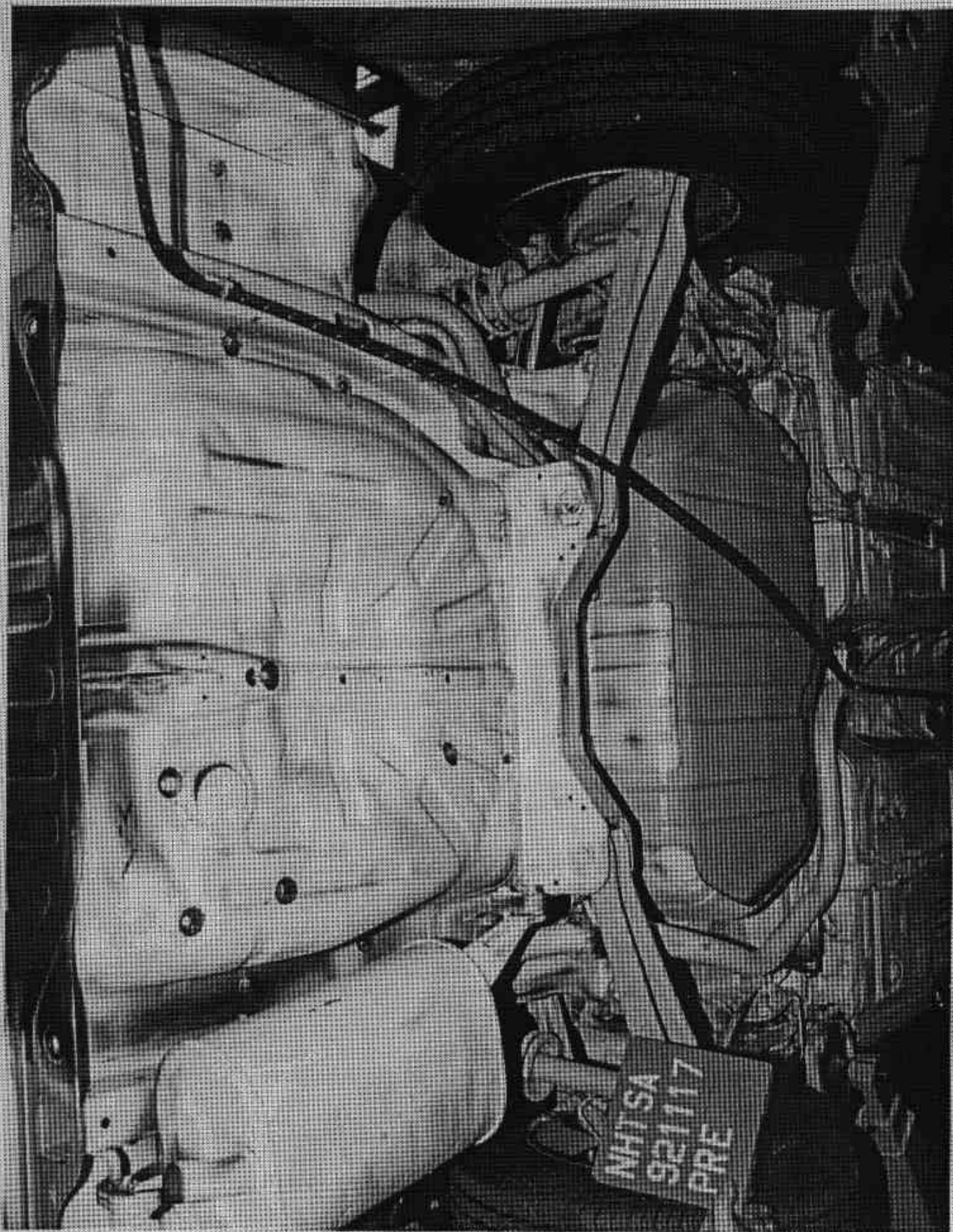


FIGURE A-25. PRE-TEST REAR UNDERBODY VIEW
A-26

921117

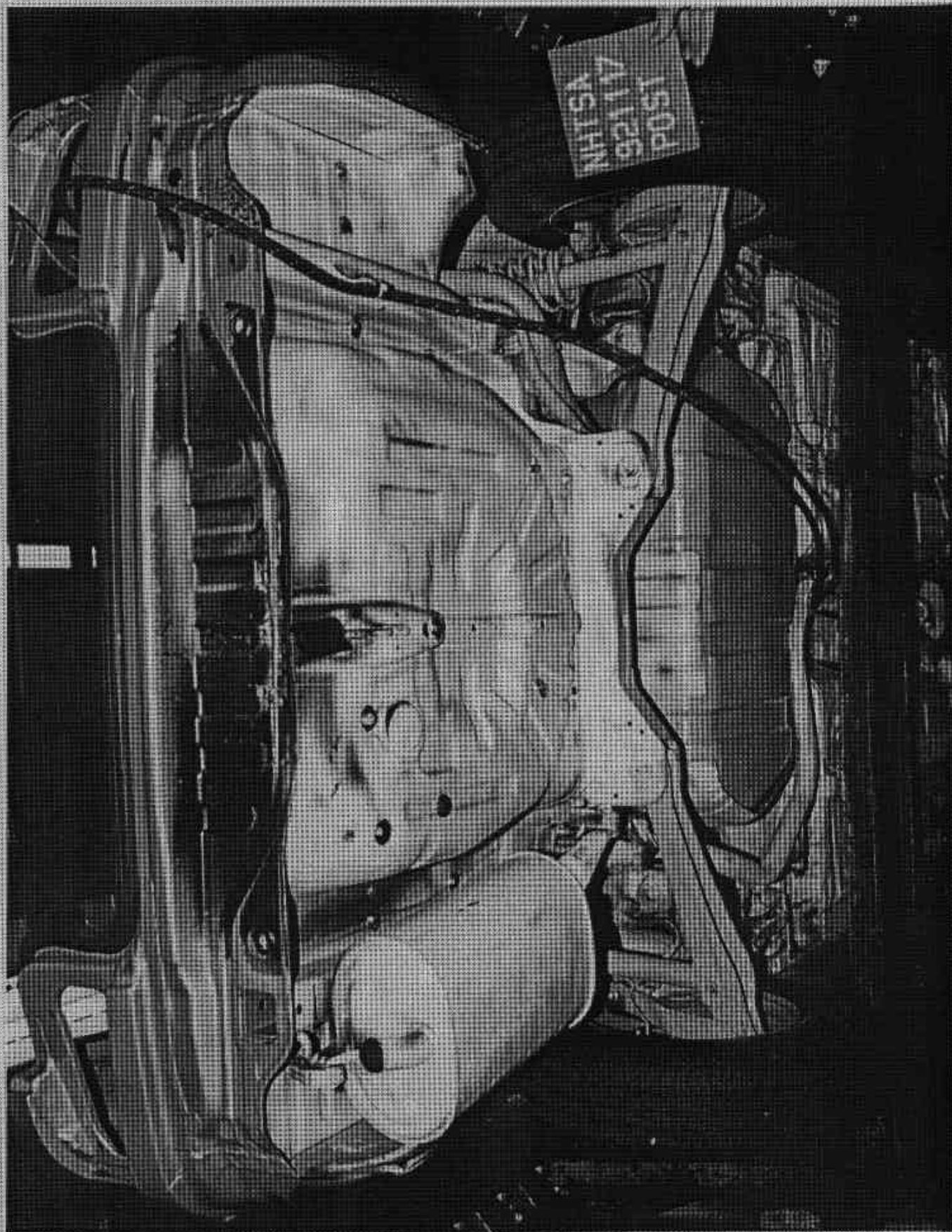


FIGURE A-26. POST-TEST REAR UNDERBODY VIEW

A-27

921117

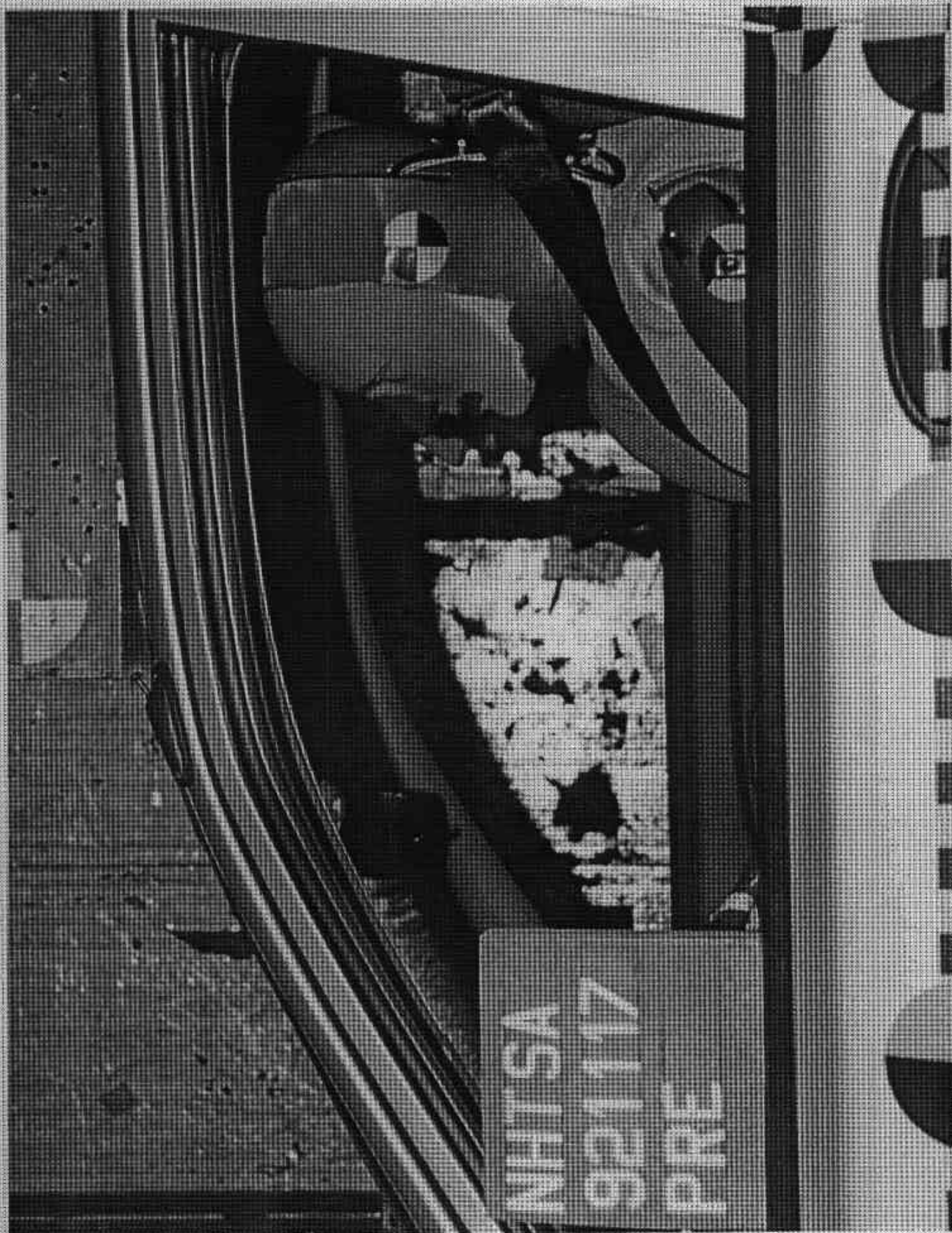


FIGURE A-27. PRE-TEST DRIVER DUMMY POSITION VIEW

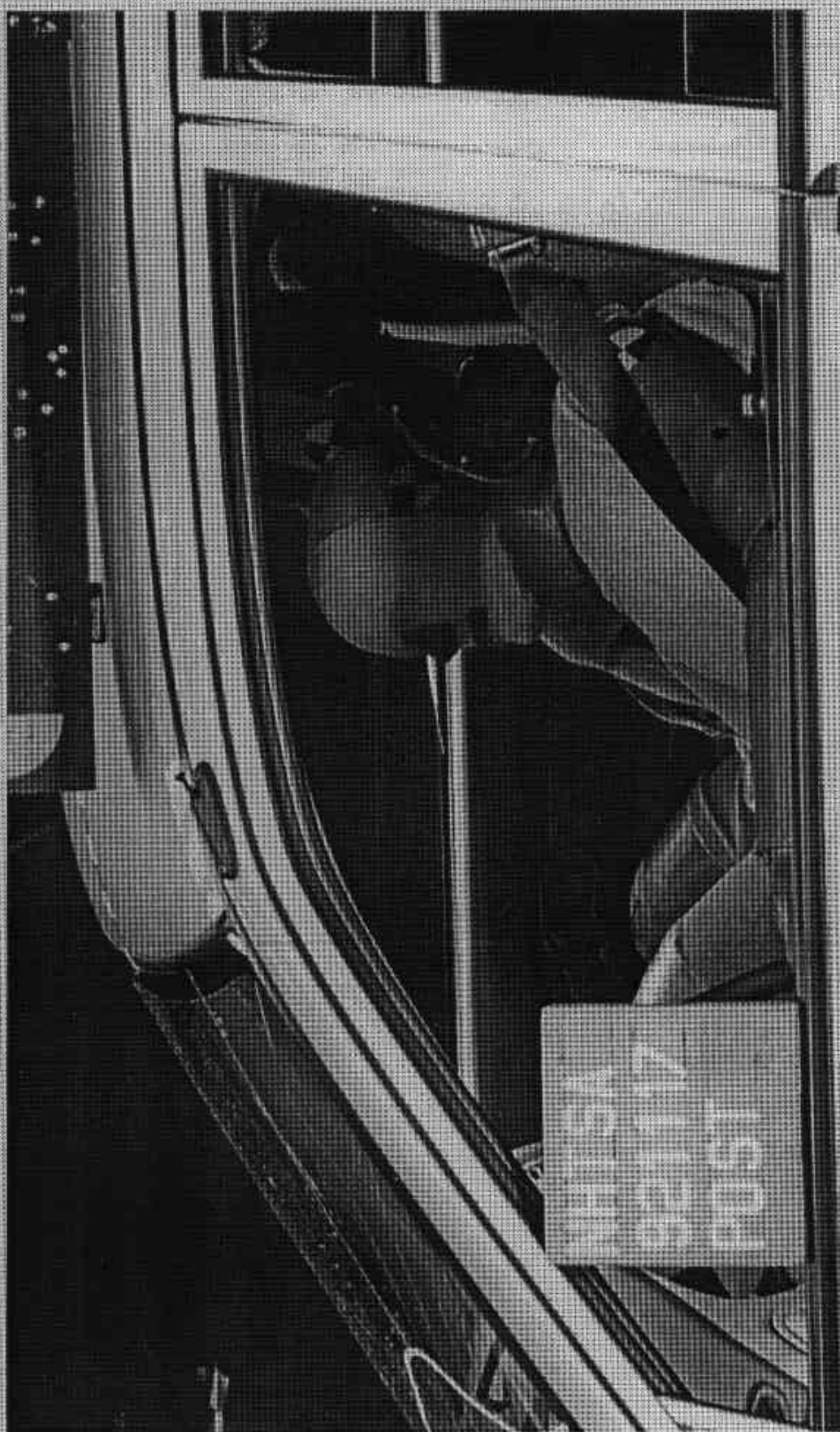


FIGURE A-28. POST-TEST DRIVER DUMMY POSITION VIEW

A-29

921117

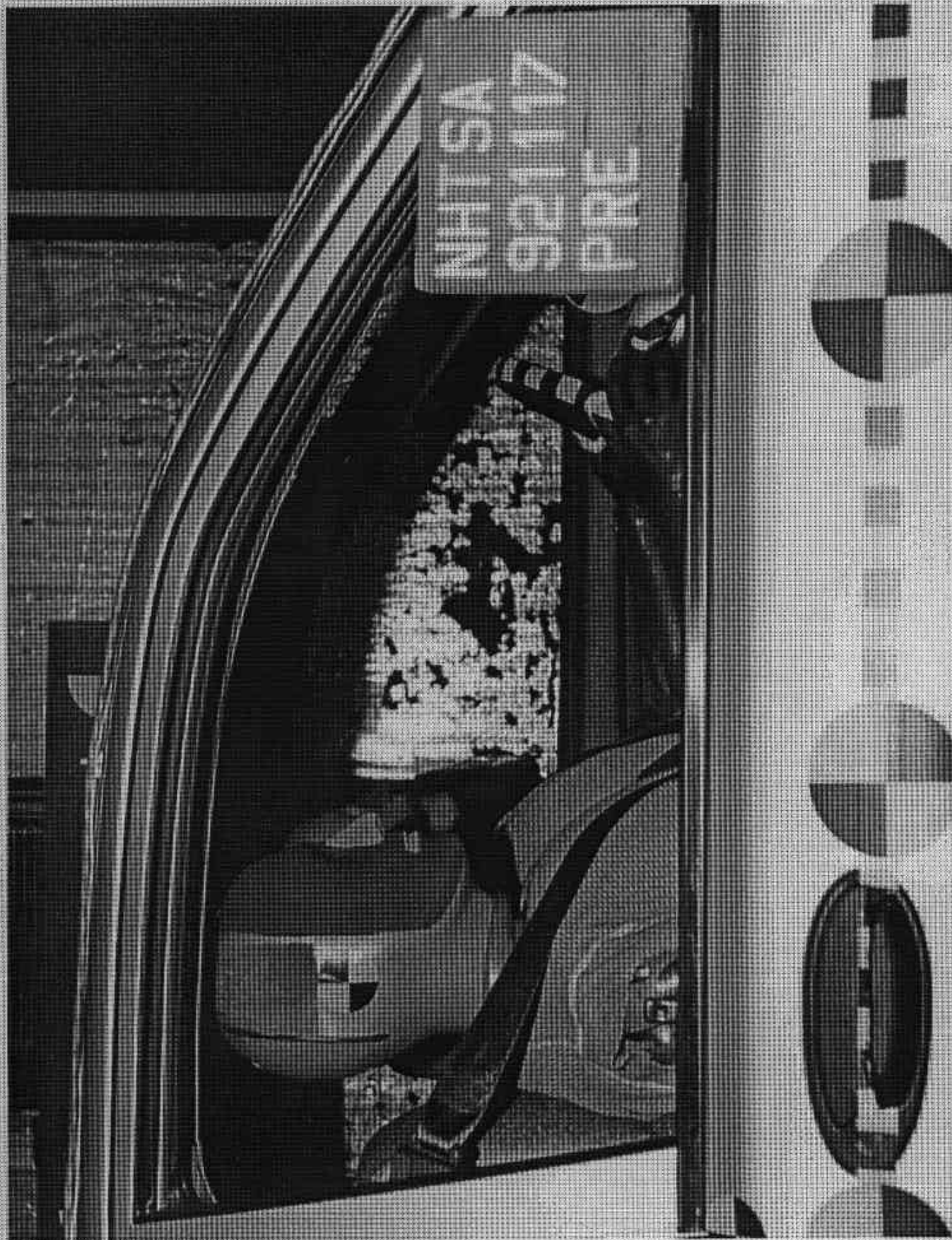


FIGURE A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW
A-30

921117

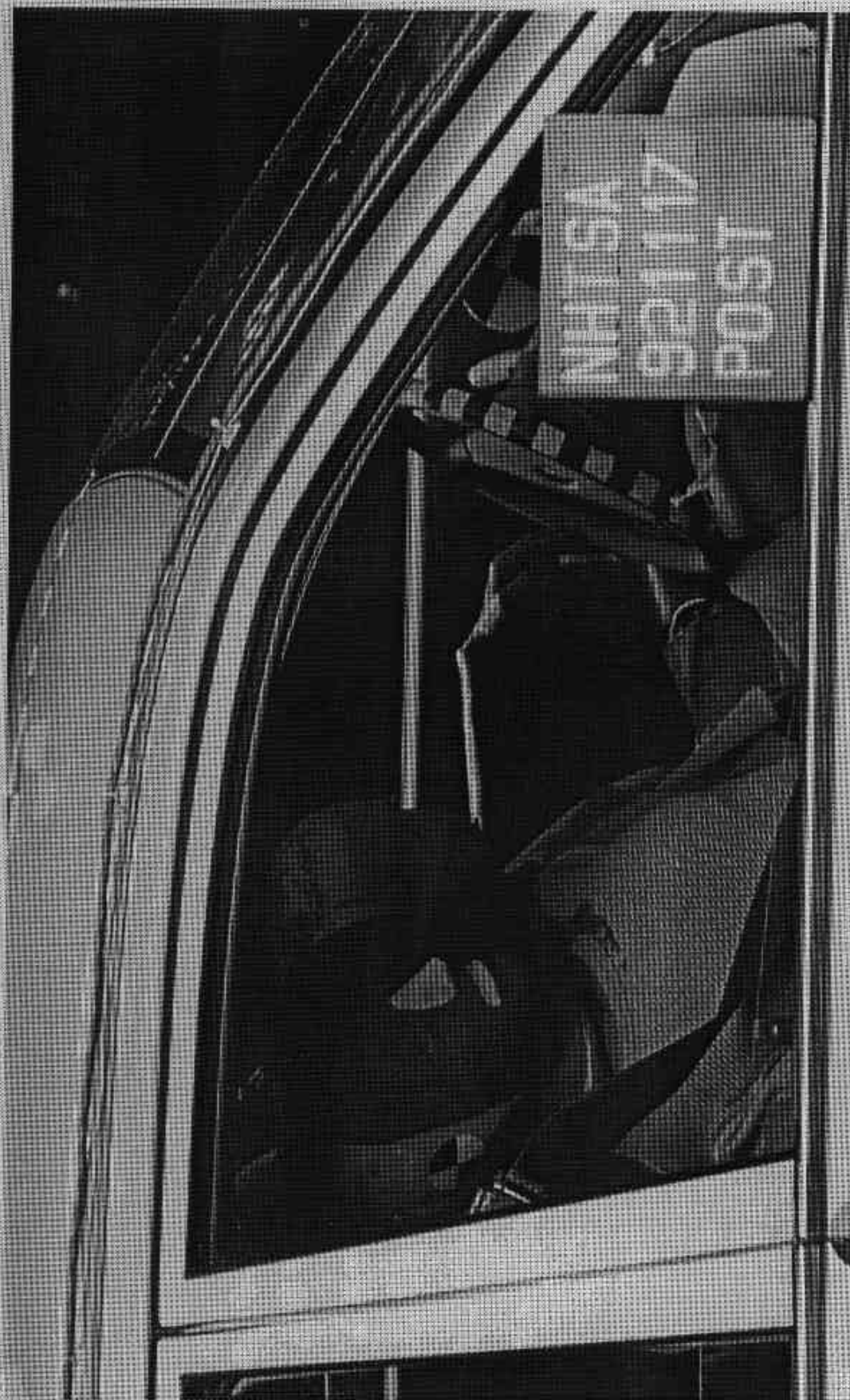


FIGURE A-30. POST-TEST PASSENGER DUMMY POSITION VIEW

A-31

921117



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



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

A-33

921117



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

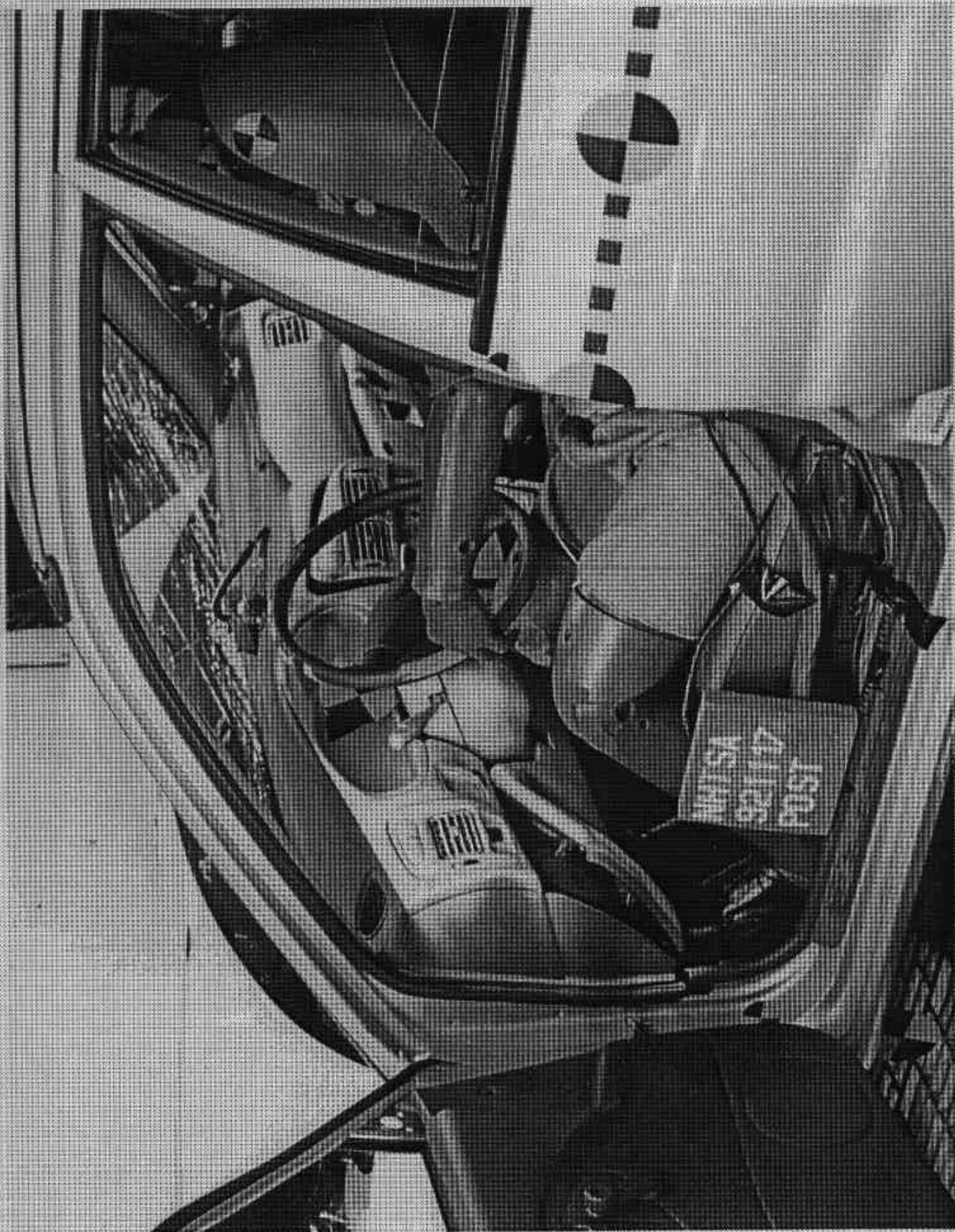


FIGURE A-34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-35

921117



FIGURE A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-36 921117



FIGURE A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-37 921117



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

A-38

921117



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

A-39

921117

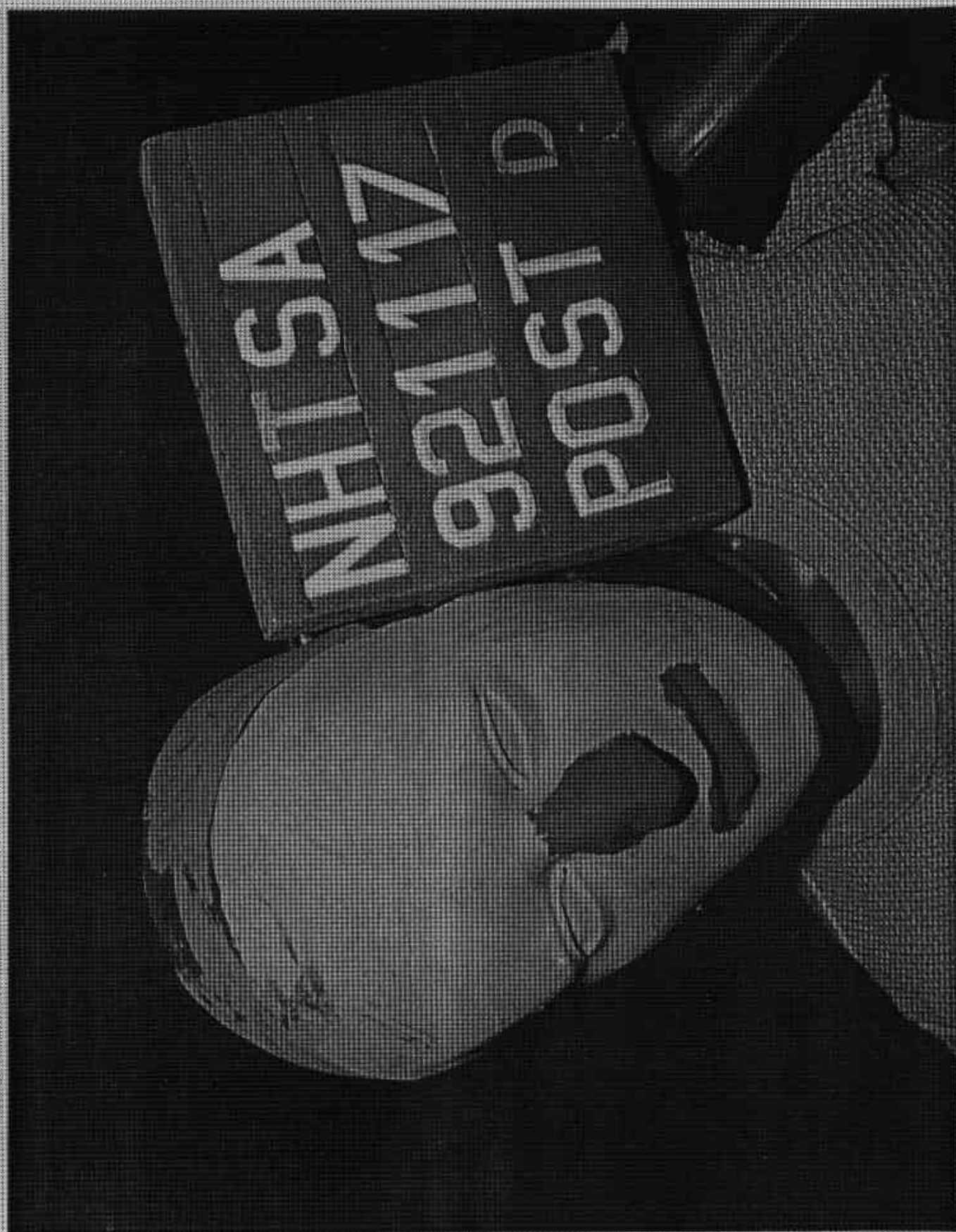


FIGURE A-39. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW

A-40

921117

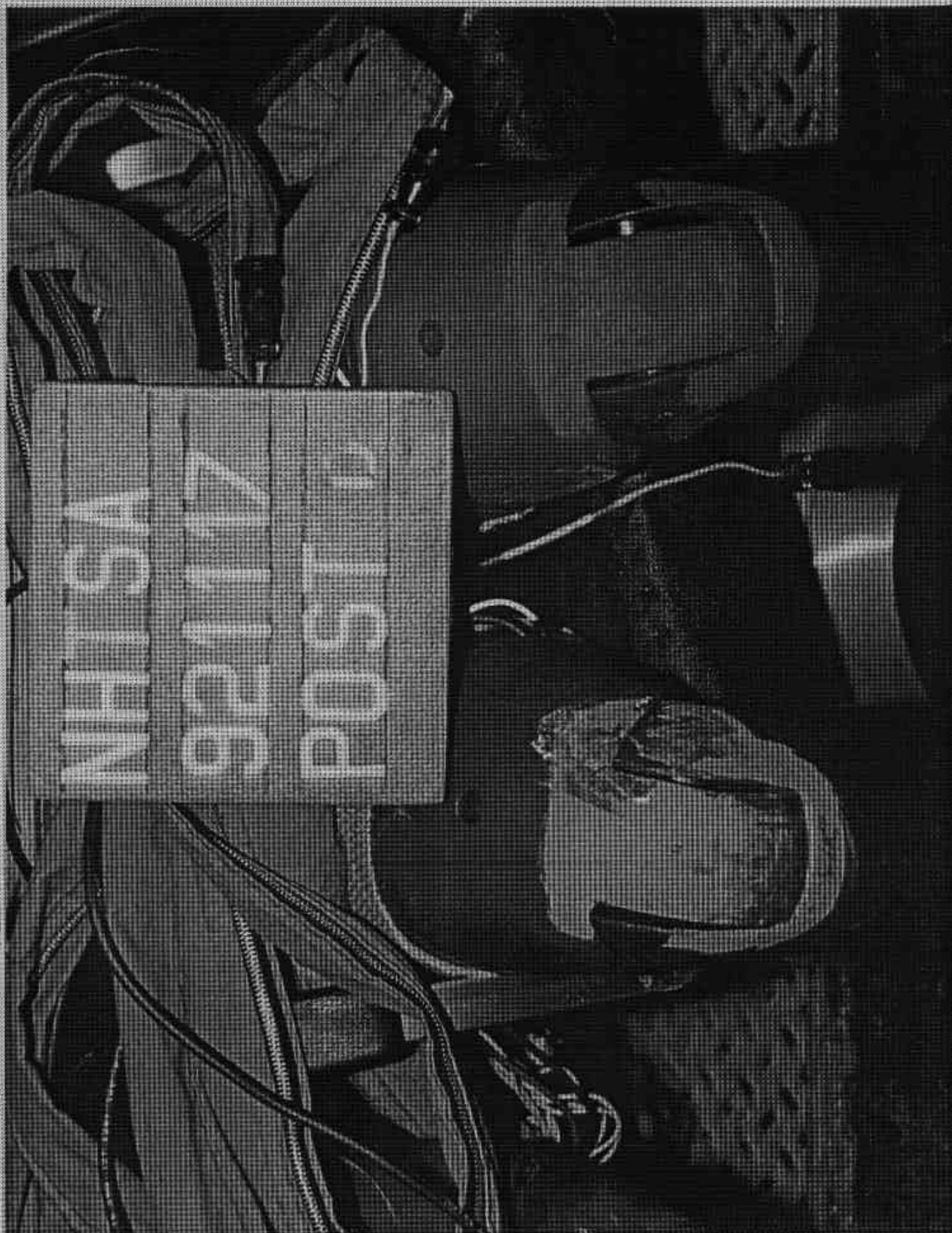


FIGURE A-40. POST-TEST DRIVER DUMMY KNEE CONTACT VIEW

A-41

921117

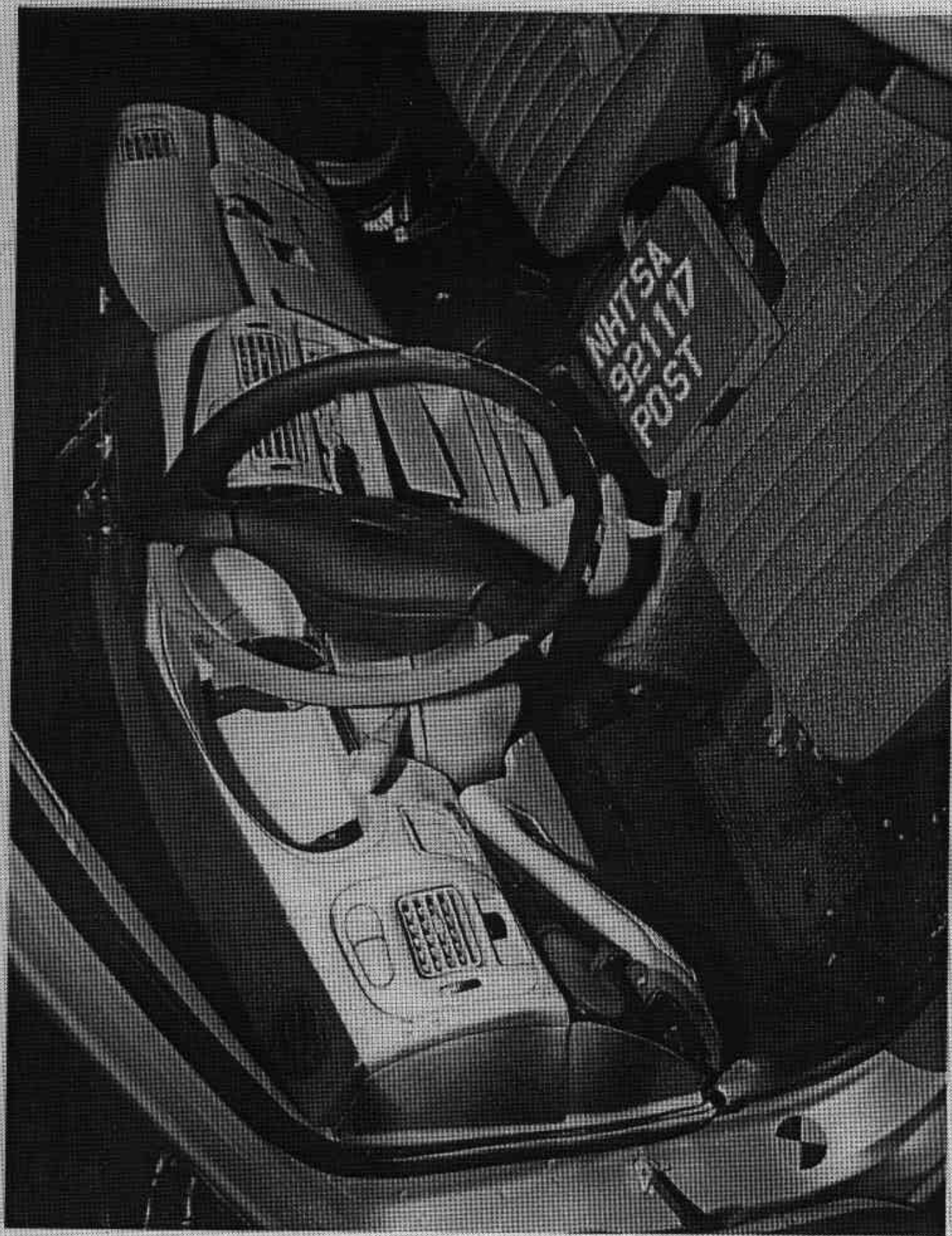


FIGURE A-41. POST-TEST DRIVER DUMMY HEAD, CHEST, & KNEE CONTACT VIEW

A-42

921117

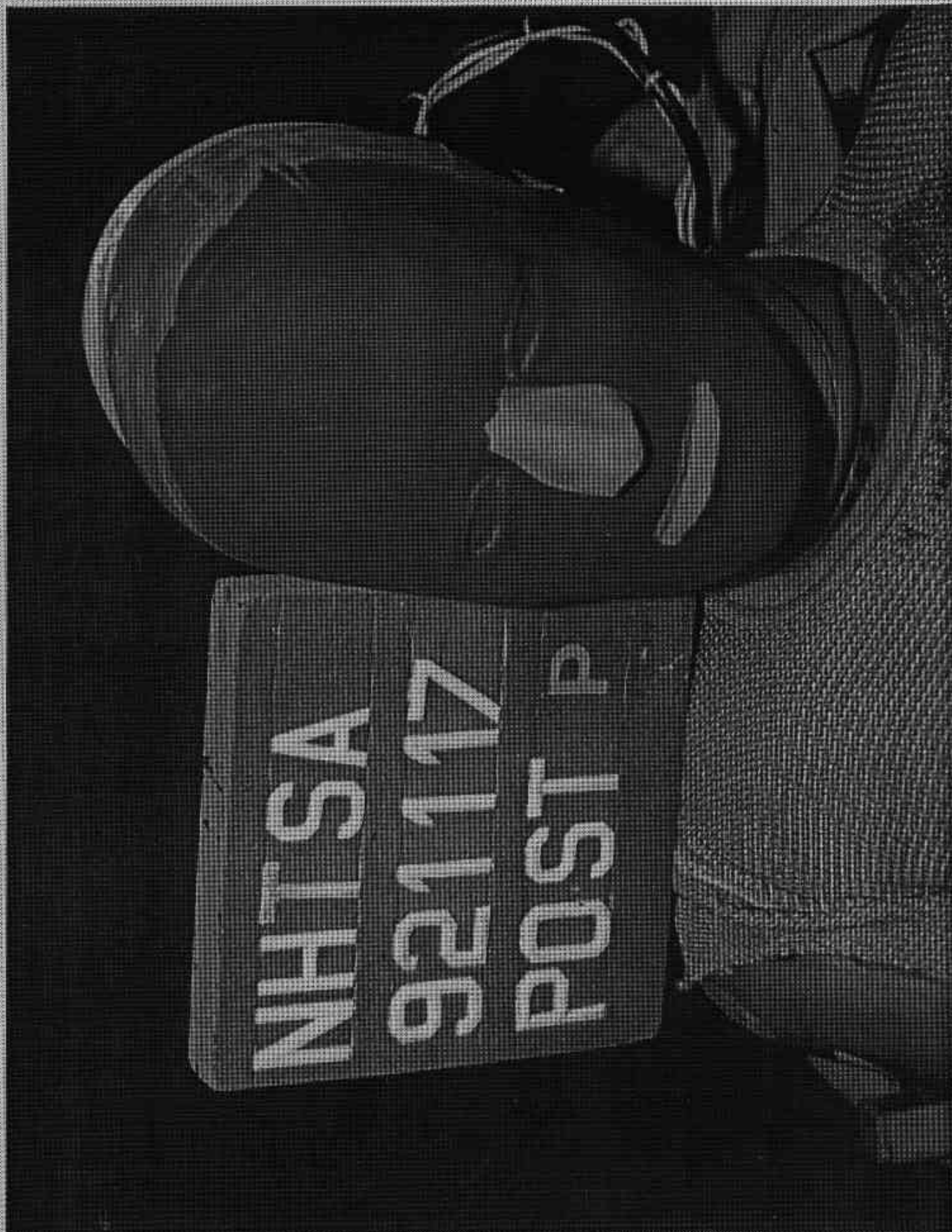


FIGURE A-42. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

A-43

921117



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

A-44

921117



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

A-45

921117

MFD. BY MITSUBISHI MOTORS CORPORATION

GVWR 3417LBS/ 1550KG
GAWR FR 1830LBS/ 830KG

JAPAN
JUN 1992

GAWR RR 1742LBS/ 790KG

THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.



JA3GA26A3PU003580

VEHICLE TYPE: PASSENGER CAR

MU900

147

FIGURE A-45. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

TIRE INFLATION PRESSURE (CHECK WITH TIRE COOL)	
STANDARD INFLATION PRESSURE FOR ALL LOAD	
1ST SEAT : 2 PASSENGERS	
2ND SEAT : 3 PASSENGERS	
TOTAL : 5 PASSENGERS	
LUGGAGE : 35kg (77lbs)	
TOTAL WEIGHT : 375kg (827lbs)	
TIRE SIZE	FRONT&REAR
P155/80R13	31PSI (210kPa)
TEMPORARY TIRE SIZE	
T105/70D14	
60PSI (420kPa)	
MR103098 A	

FIGURE A-46. PRE-TEST VEHICLE RECOMMENDED TIRE PRESSURE LABEL VIEW

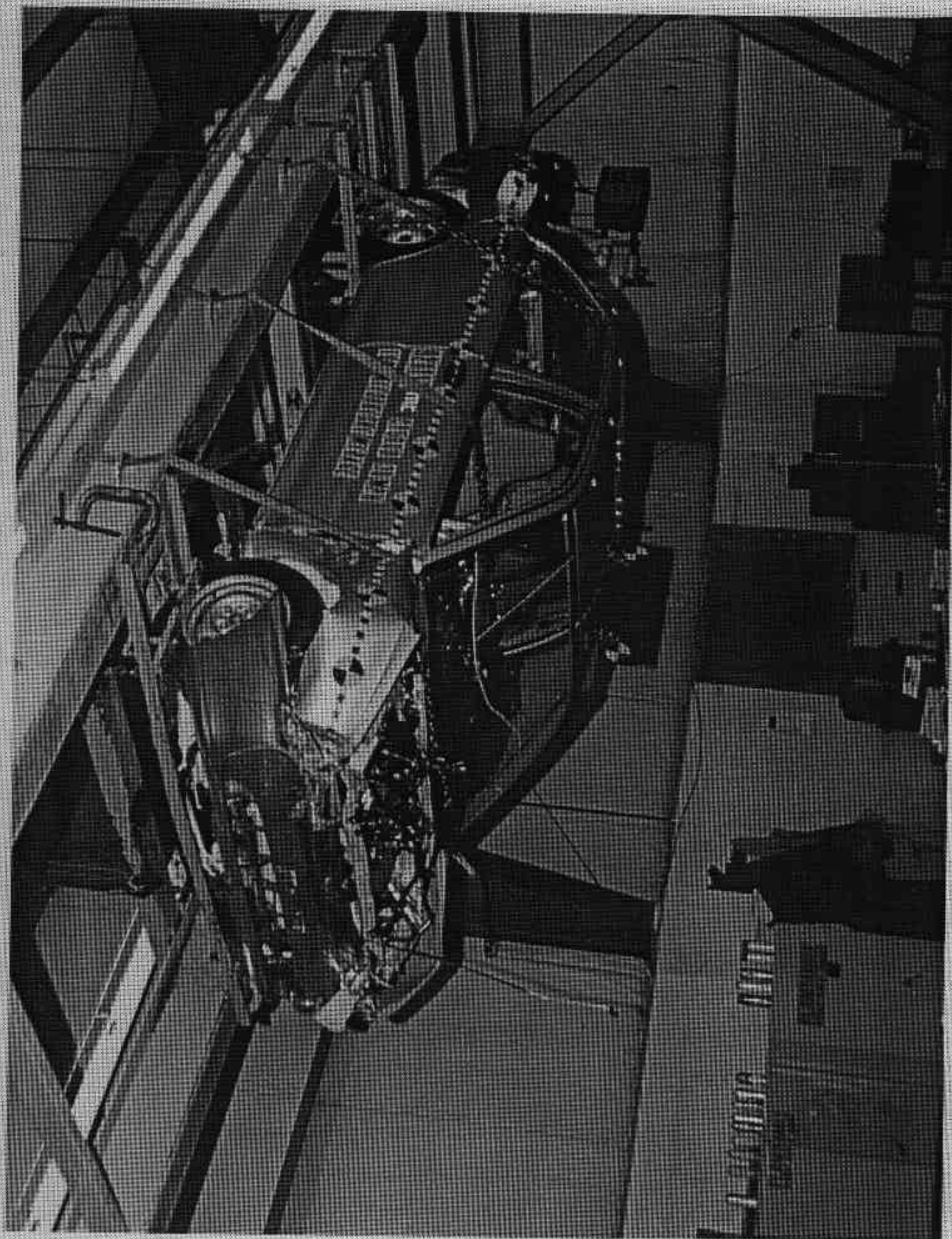


FIGURE A-47. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

APPENDIX B

DATA PLOTS

TRC . 921117
200 COMPLIANCE TESTING
92322
HEDXG1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -40.058 100.25. 11.26 e 307.63

120.00

90.00

60.00

30.00

0.00

B-2

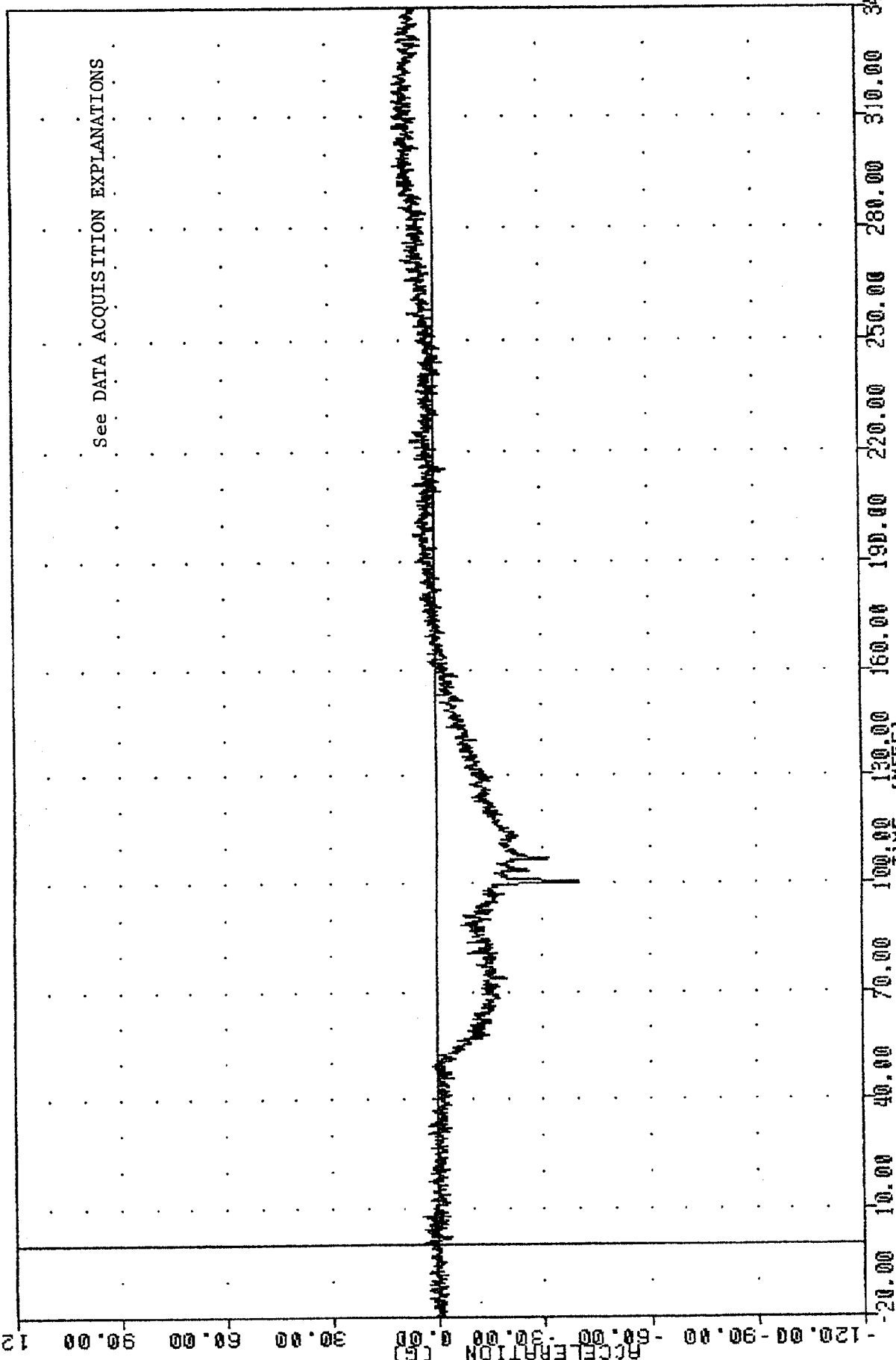
-30.00

-60.00

-90.00

-120.00

921117

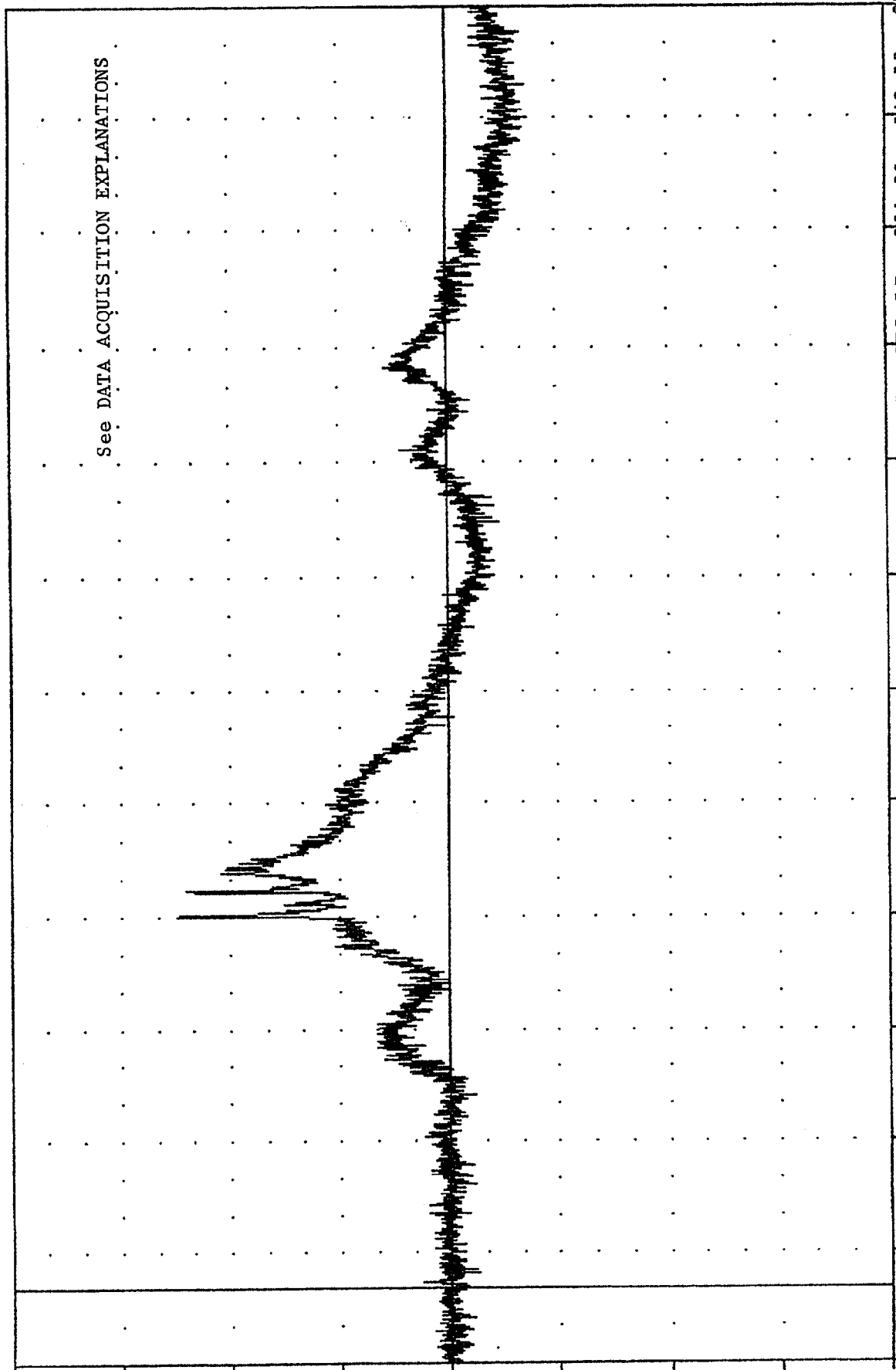


1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
DRIVER HEAD X-AXIS ACCELERATION

TRC , 921117
208 COMPLIANCE TESTING
92322
HEDY61

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -7.38e 309.88 , 24.91 e 100.13

ACCELERATION (G)



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

921117

B-3

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

TRC 921117
208 COMPLIANCE TESTING
92322
HEDZG1

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -50.07e 100.13, 3.57 e 29.25

120.00

90.00

60.00

30.00

0.00

-30.00

-60.00

-90.00

-120.00

ACCELERATION (G)

B-4

See DATA ACQUISITION EXPLANATIONS

-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)

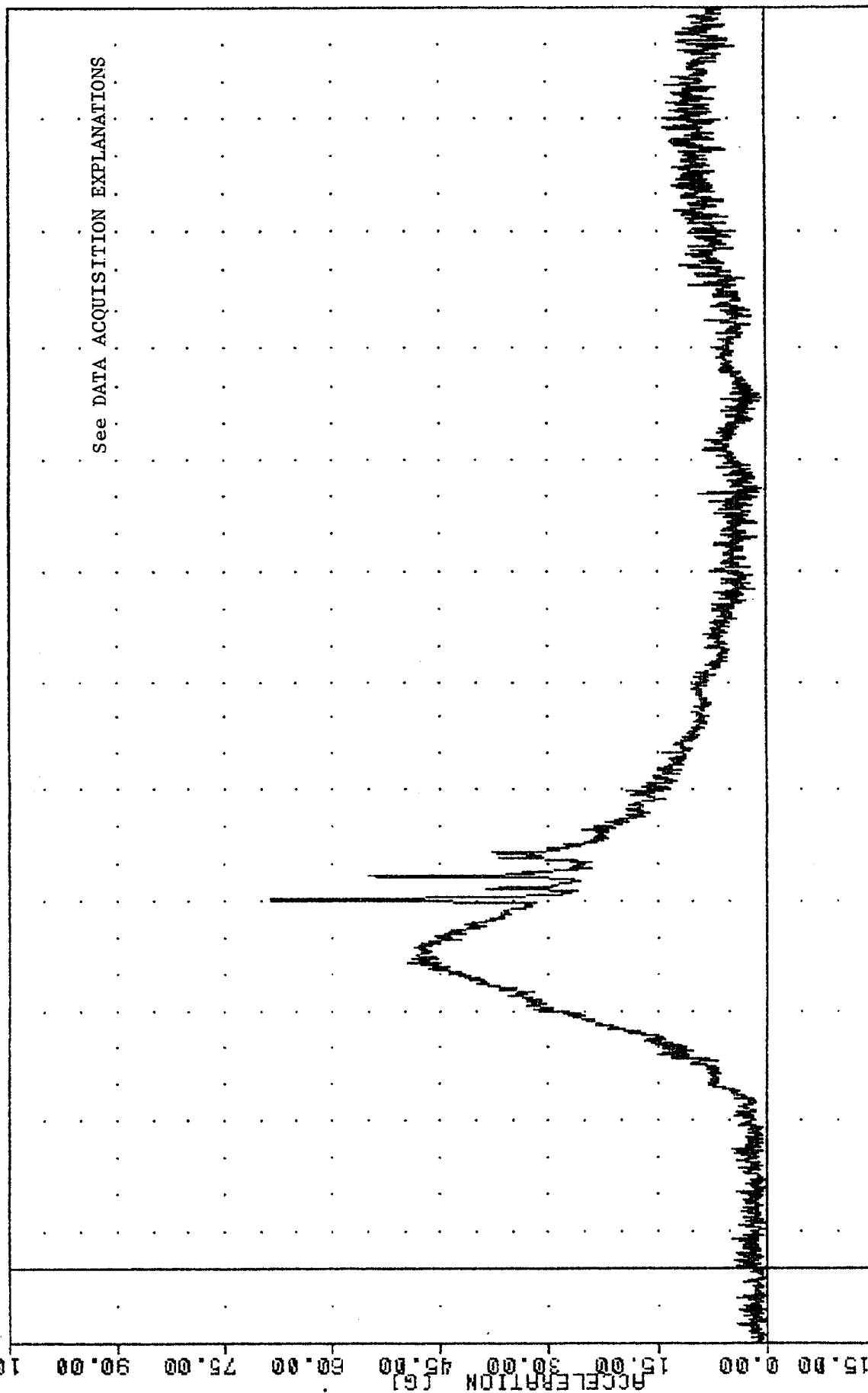
1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION

921117

TRC , 921117
 200 COMPLIANCE TESTING
 92322
 HEDRG1

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.11 21.38, 68.66 100.13

105.00



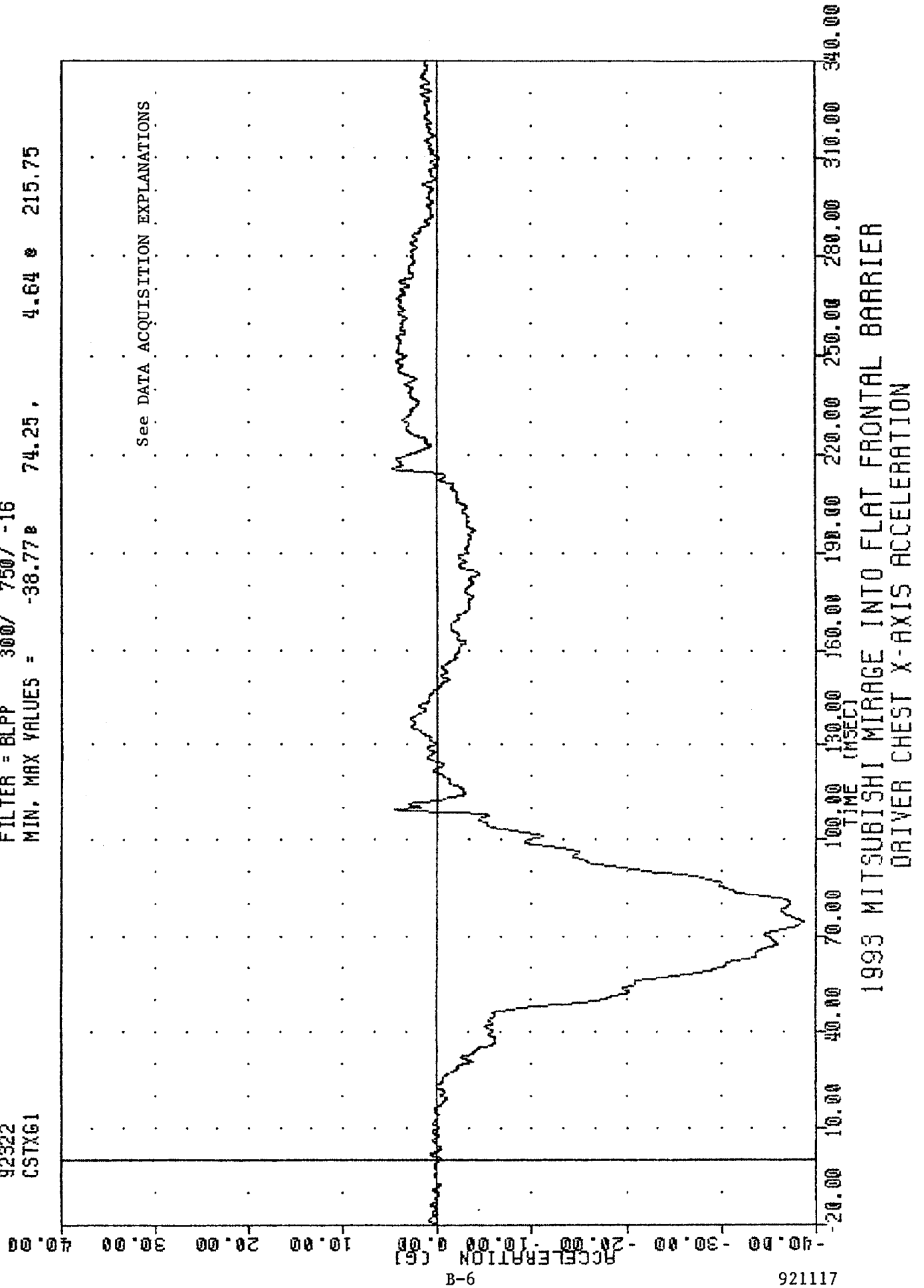
B-5

921117

-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)
 1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION

TRC 921117
 208 COMPLIANCE TESTING
 92322
 CSTXG1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -38.77 74.25, 4.64 215.75

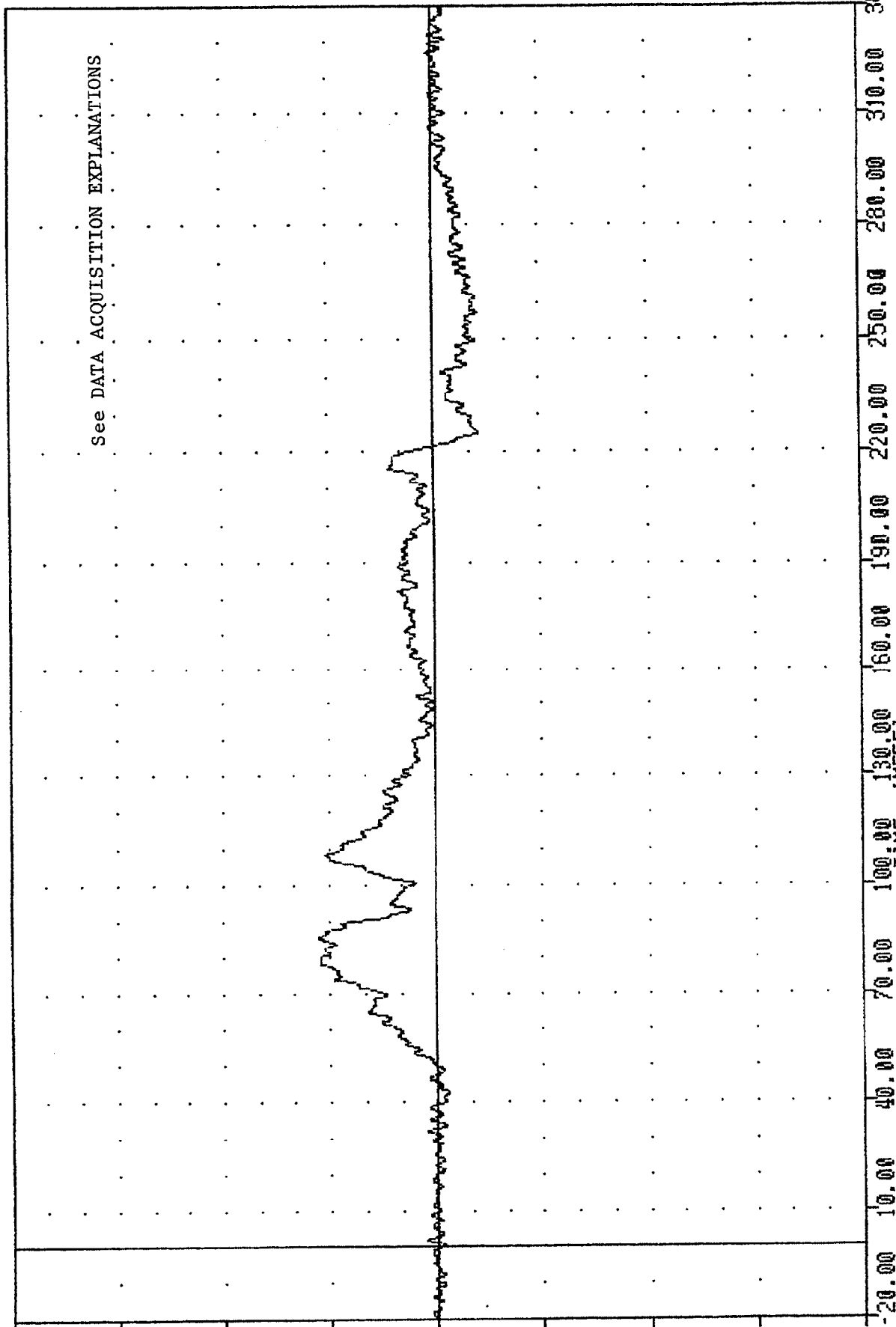


1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION

TRC . 921117
 208 COMPLIANCE TESTING
 92322
 CSTYG1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -4.238 225.13, 11.04 e 85.50

ACCELERATION [G]



B-7

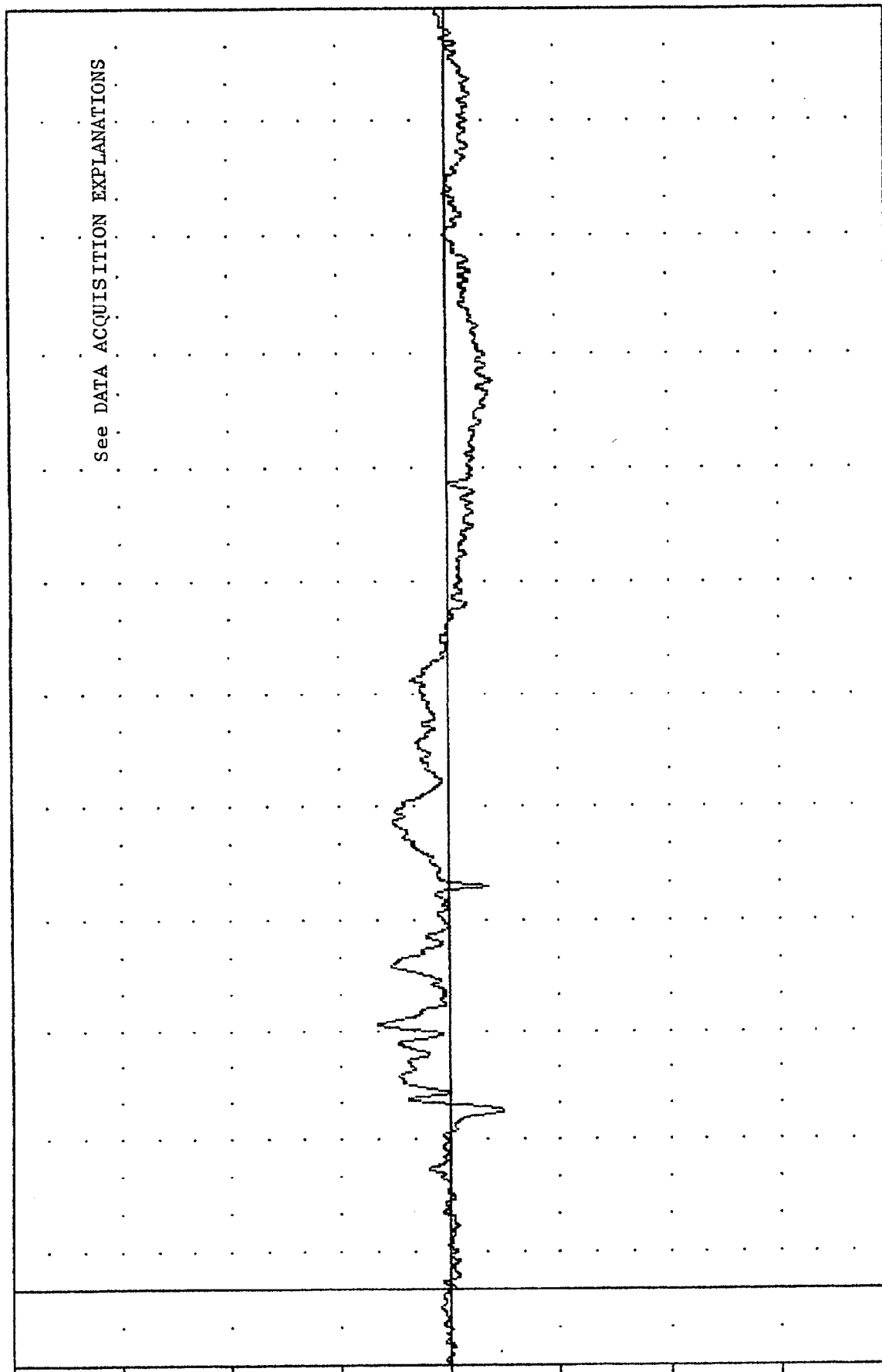
921117

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION

TRC
206 COMPLIANCE TESTING
92322
CSTZG1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -4.83 48.00 6.64 71.63

ACCELERATION (G)



B-8

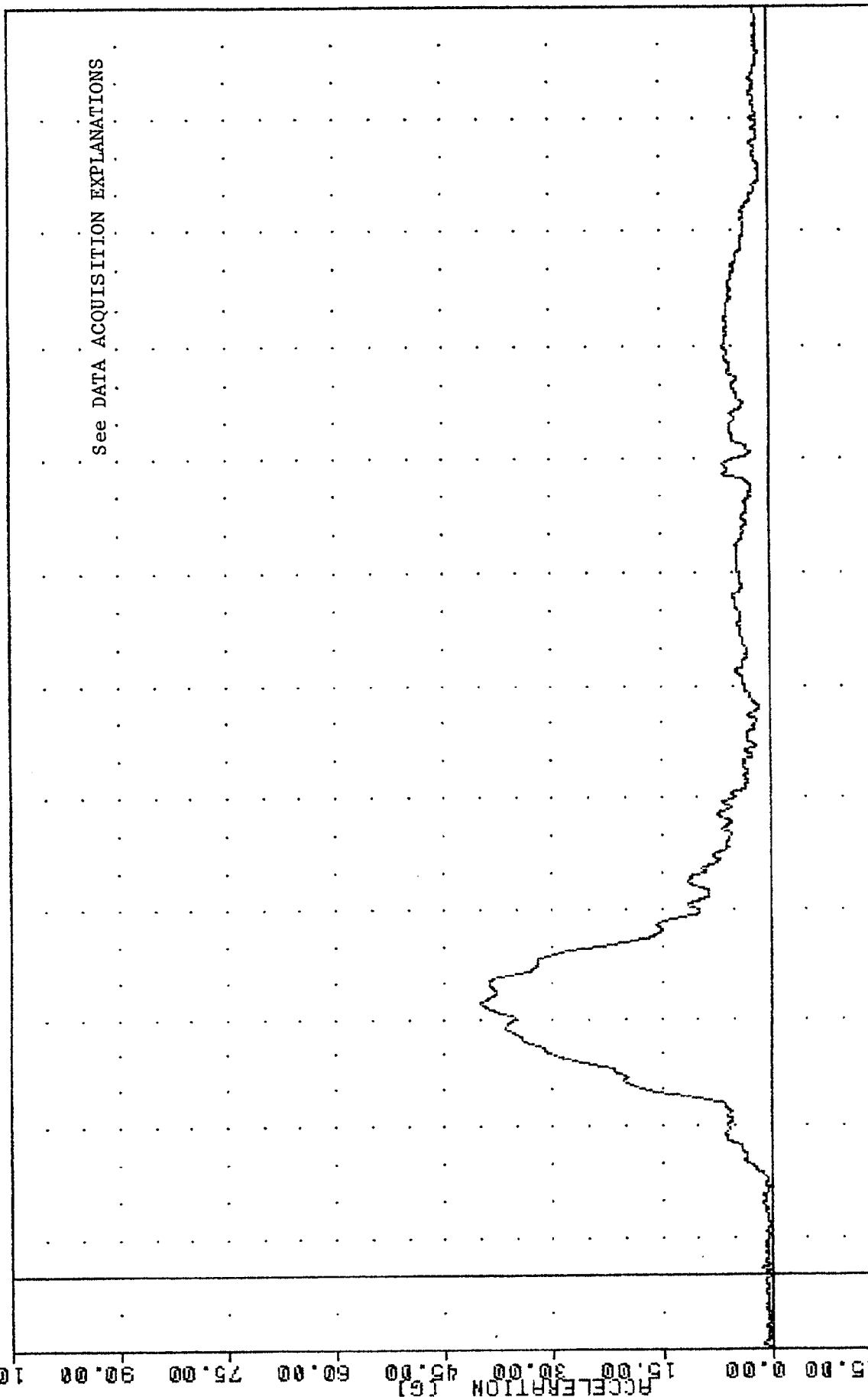
921117

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION

TRC , 921117
 208 COMPLIANCE TESTING
 92322
 CSTRG1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = 0.088 -20.00 , 39.96 8 74.13

105.00



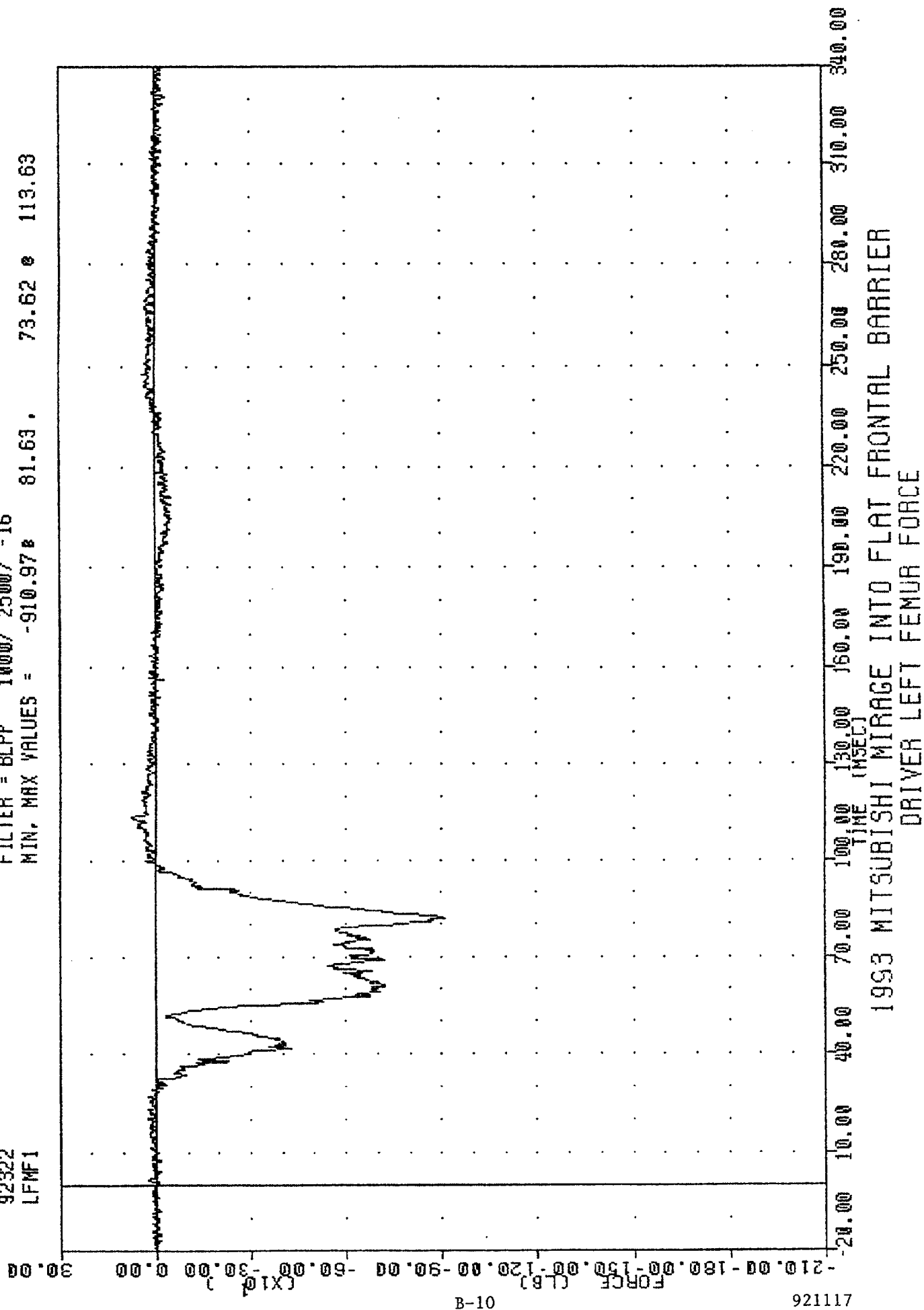
B-9

921117

-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)
 1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION

TRC
208 COMPLIANCE TESTING
92322
LFMF1

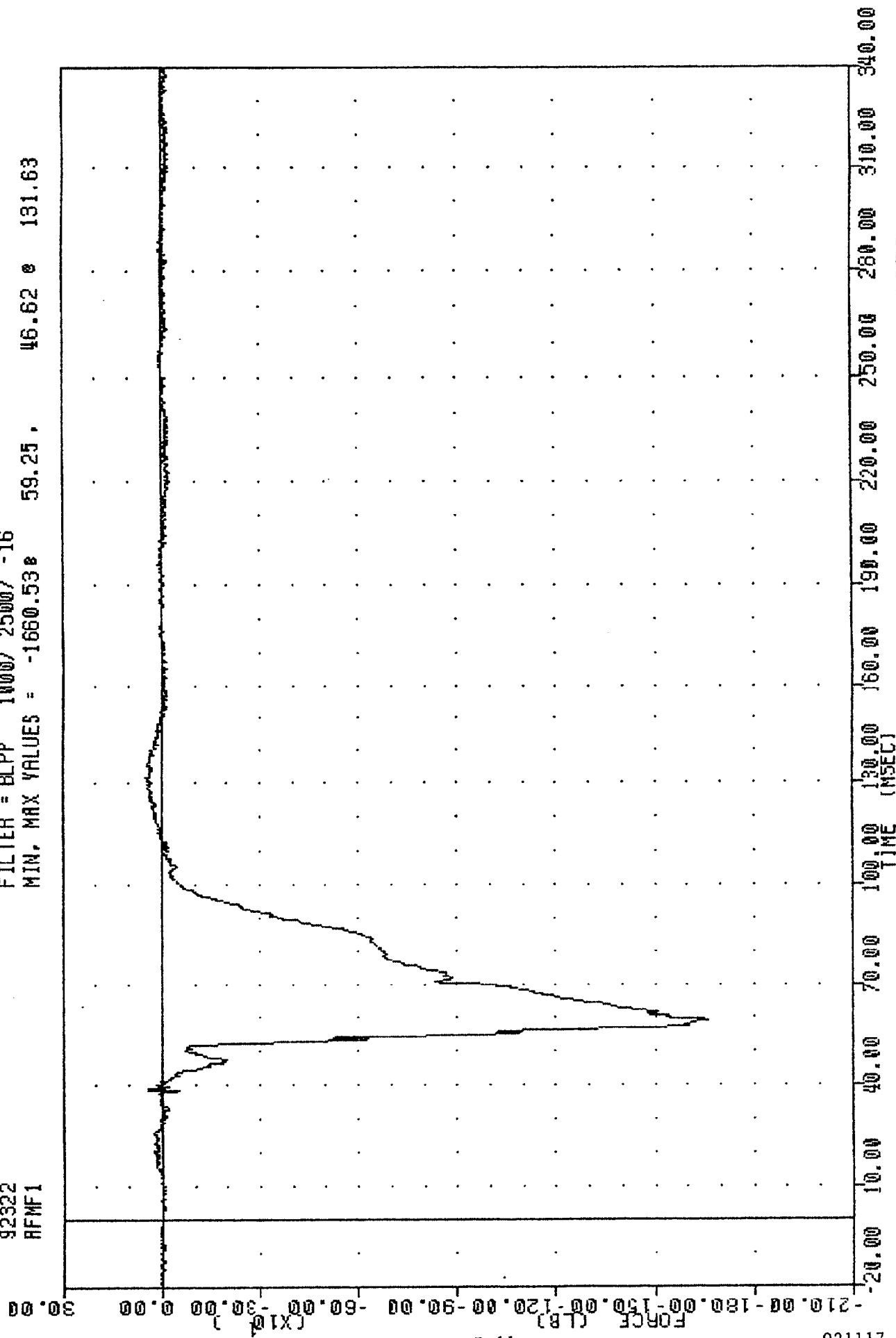
FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -910.97 81.63, 73.62 113.63



TRC
200 COMPLIANCE TESTING
92322
AFMF1

921117

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -1660.53 59.25 46.62 131.63



B-11

921117

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE

TRC 921117

200 COMPLIANCE TESTING

92322

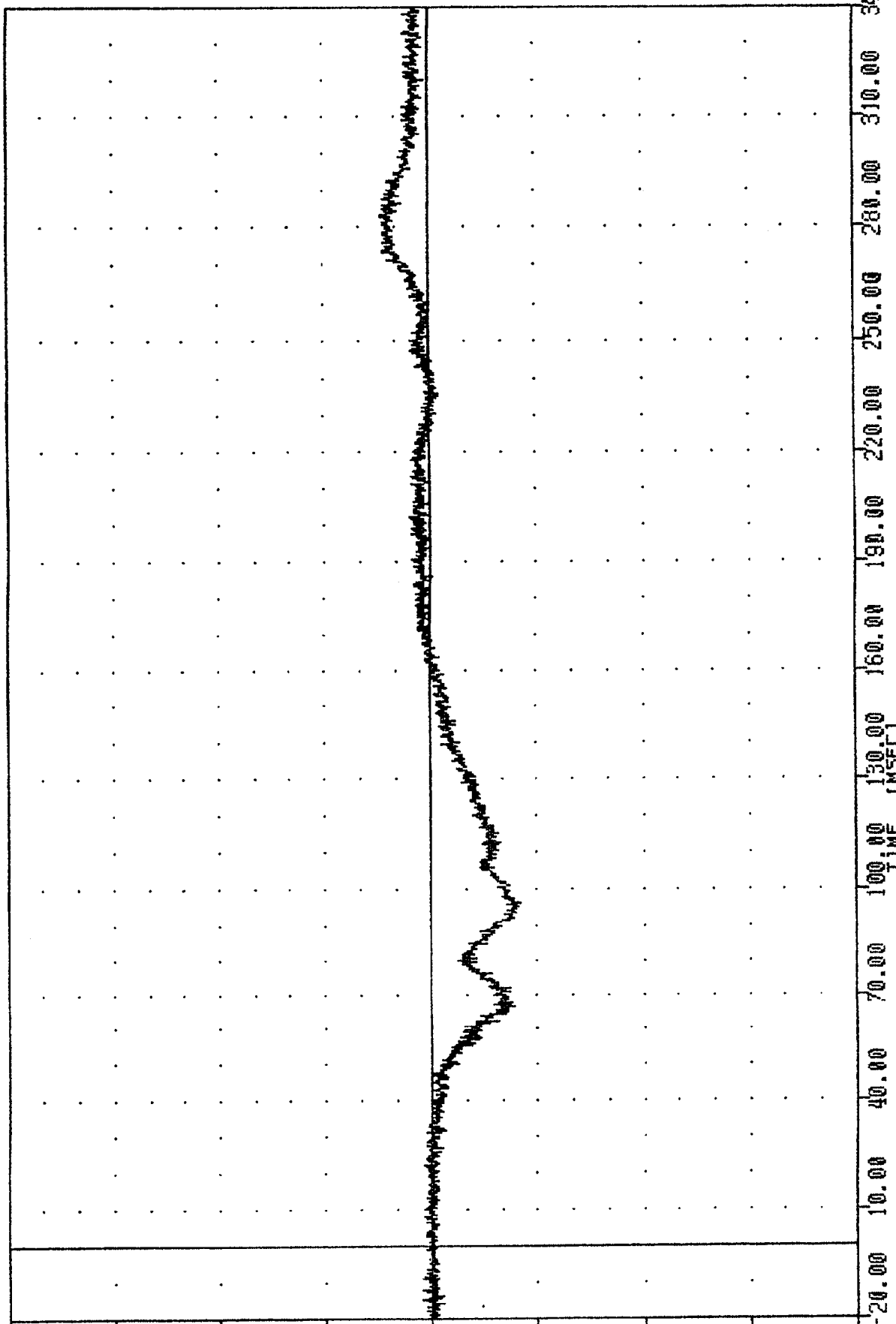
HEDX62

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -25.468

96.25, 13.60 e 282.75

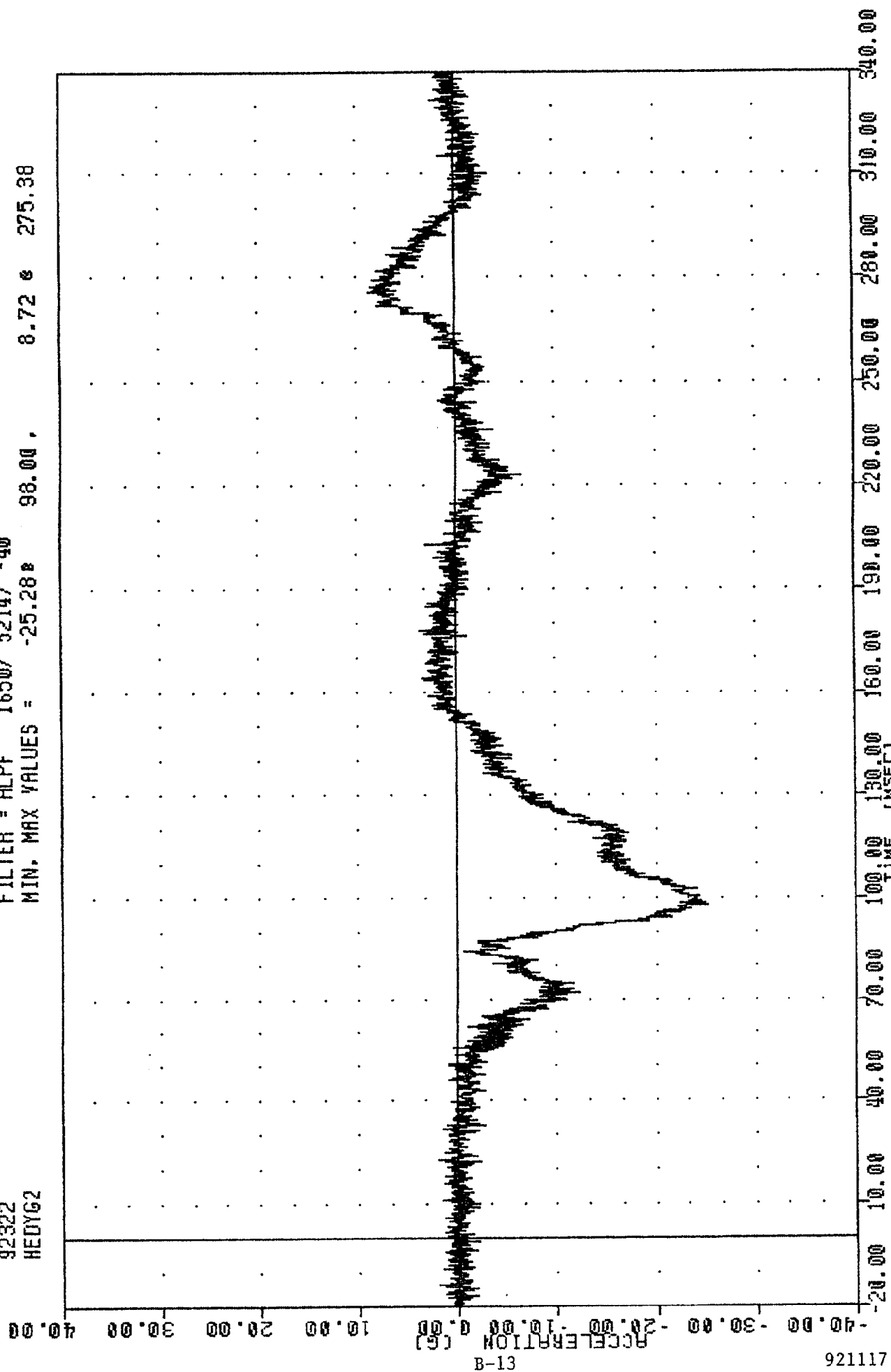
ACCELERATION (G)



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

TAC , 921117
200 COMPLIANCE TESTING
92322
HEDYG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -25.28 98.00 , 8.72 275.38



B-13

921117

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

TRC 921117

200 COMPLIANCE TESTING

92322

HEDZG2

FILTER = ALPF 1650/ 5214/ -40

MIN, MAX VALUES = -52.28

74.50

2.83

15.63

120.00

90.00

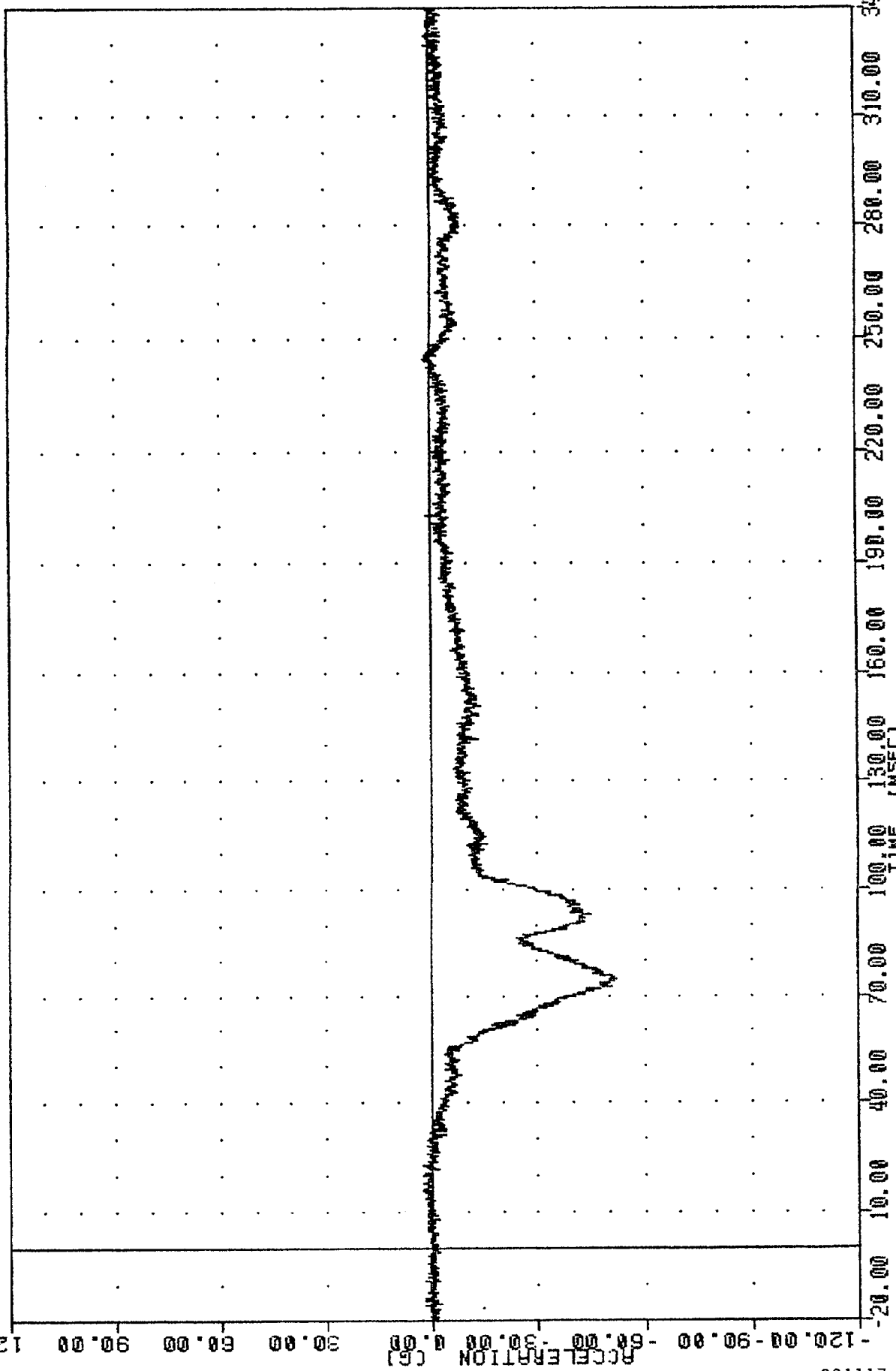
60.00

30.00

0.00

B-14

921117



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TRC , 921117

200 COMPLIANCE TESTING

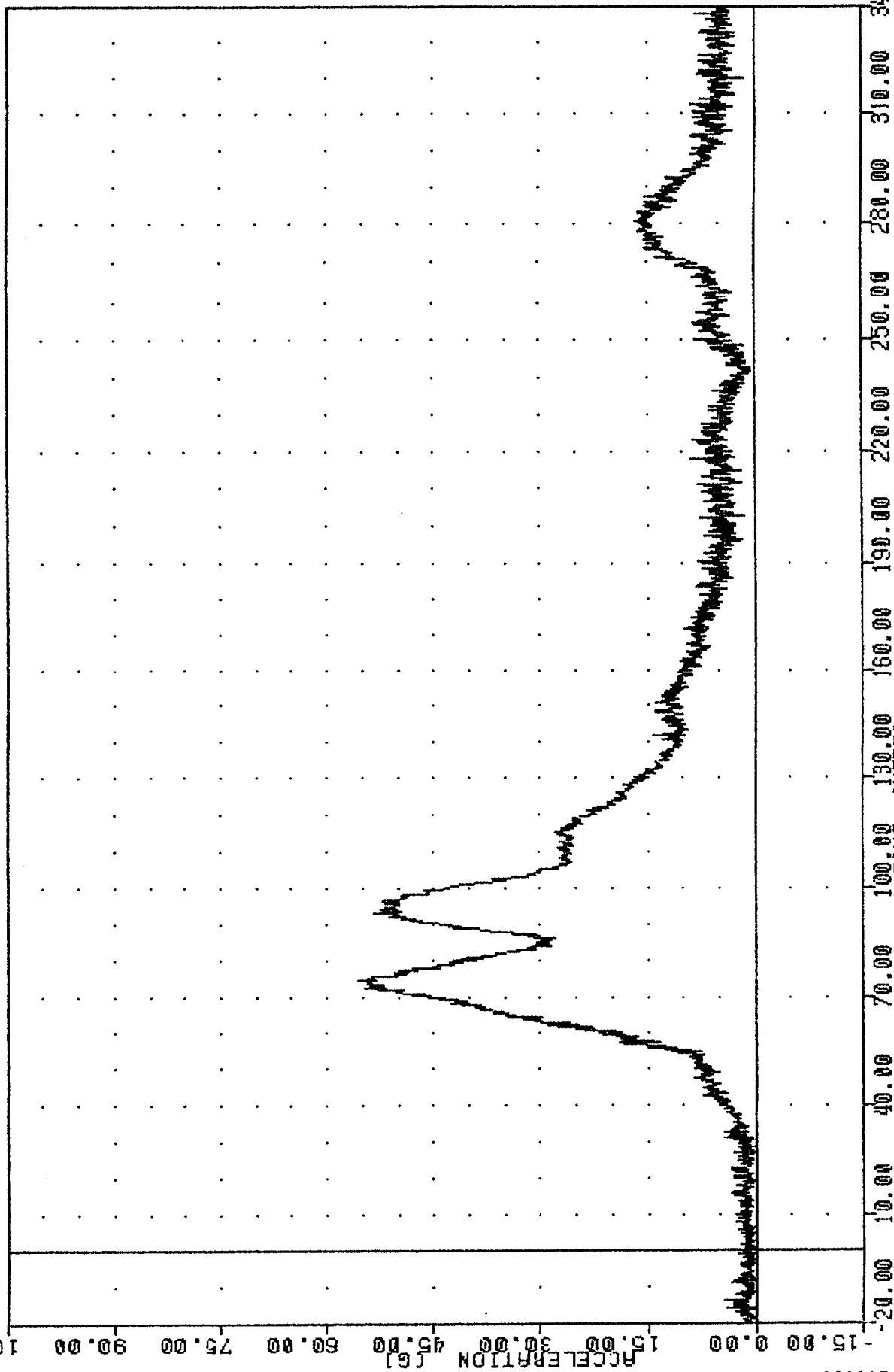
92322

HEDRG2

FILTER = ALPF 1650/ 5214/ -40

MIN. MAX VALUES = 0.15 -3.88 , 55.69 * 74.50

105.00



B-15

921117

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

TRC , 921117

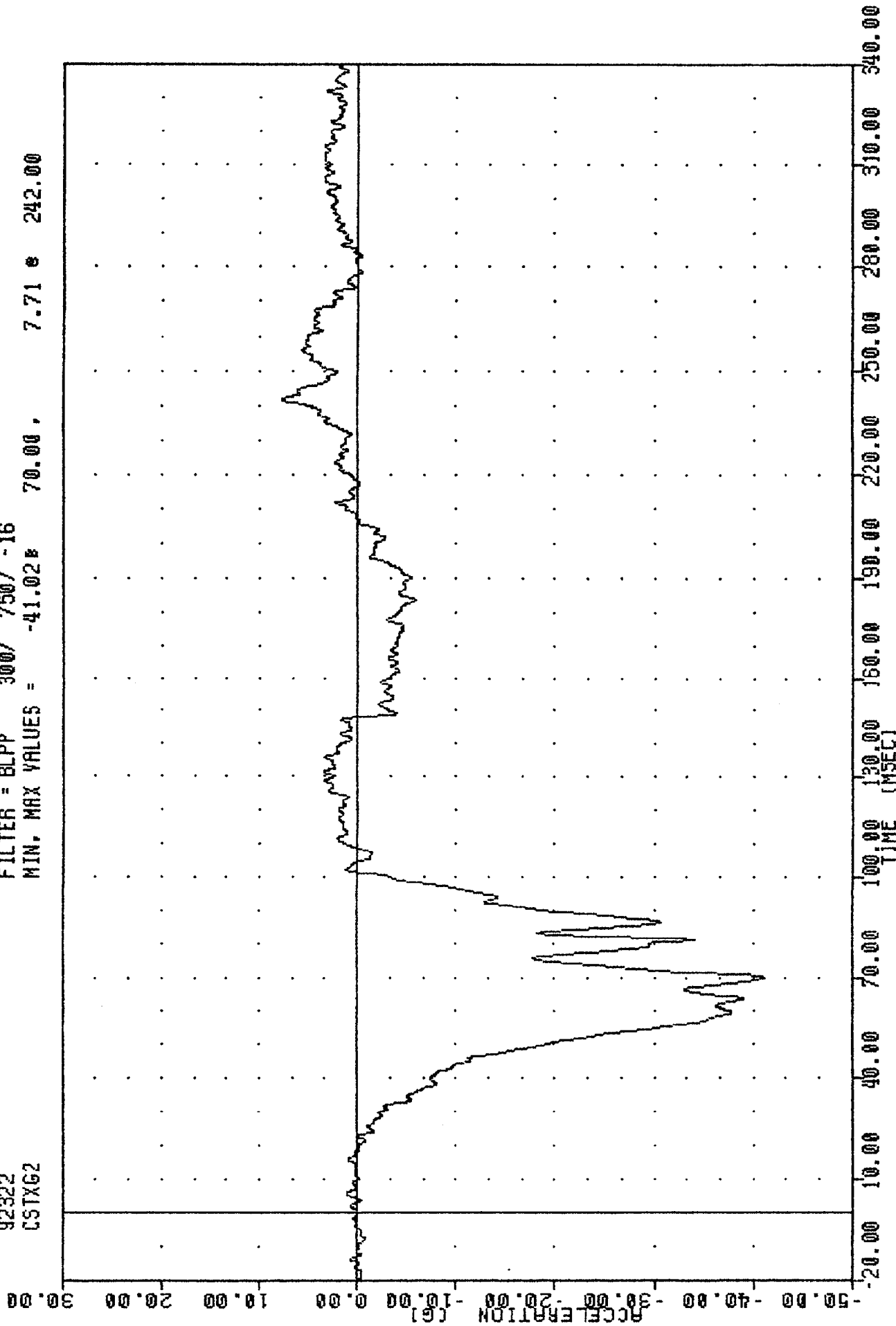
208 COMPLIANCE TESTING

92322

CSTXG2

FILTER = BLPP 300/ 750/ -16

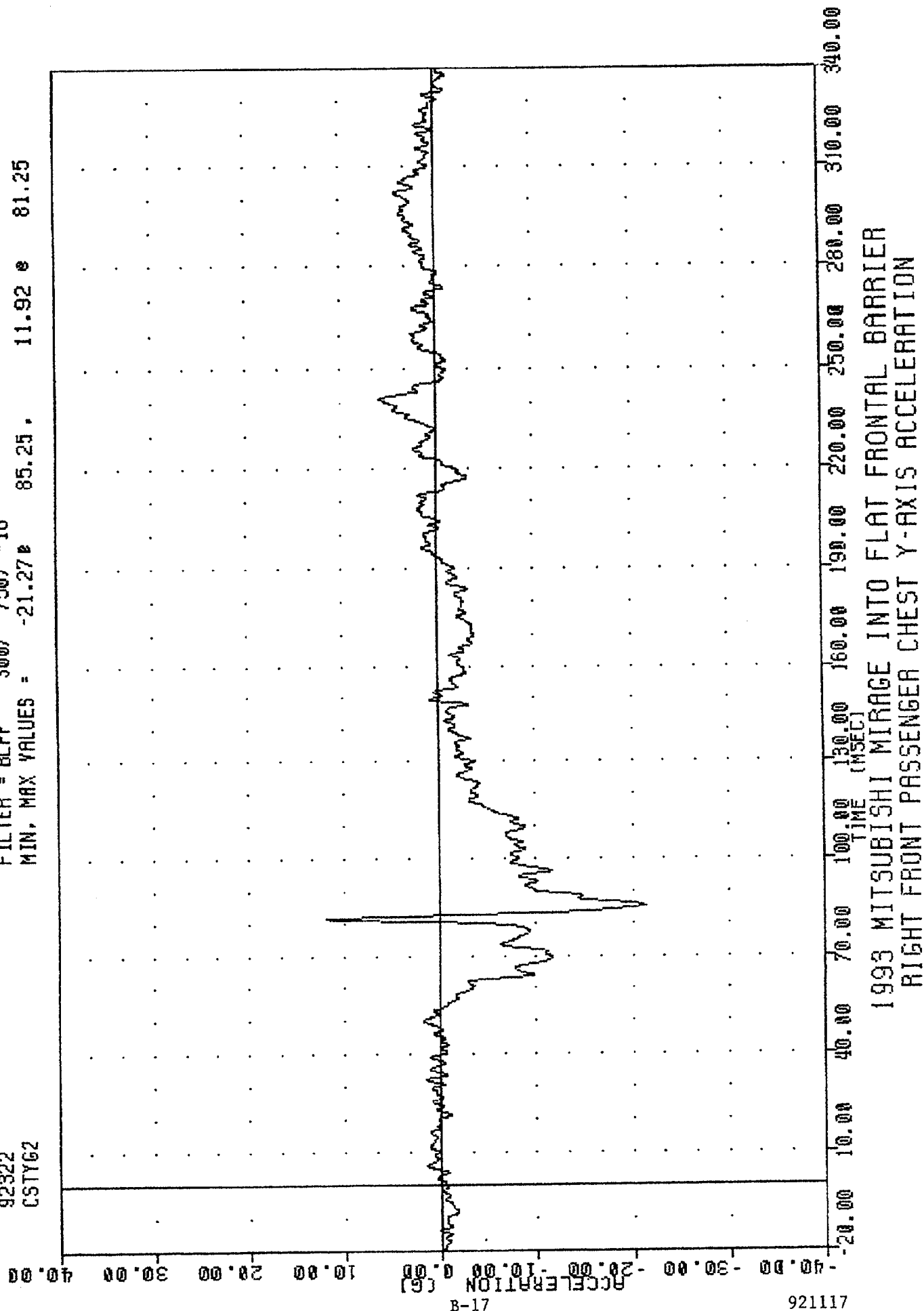
MIN, MAX VALUES = -41.02 70.00, 7.71 242.00



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

TRC , 921117
208 COMPLIANCE TESTING
92322
CSTYG2

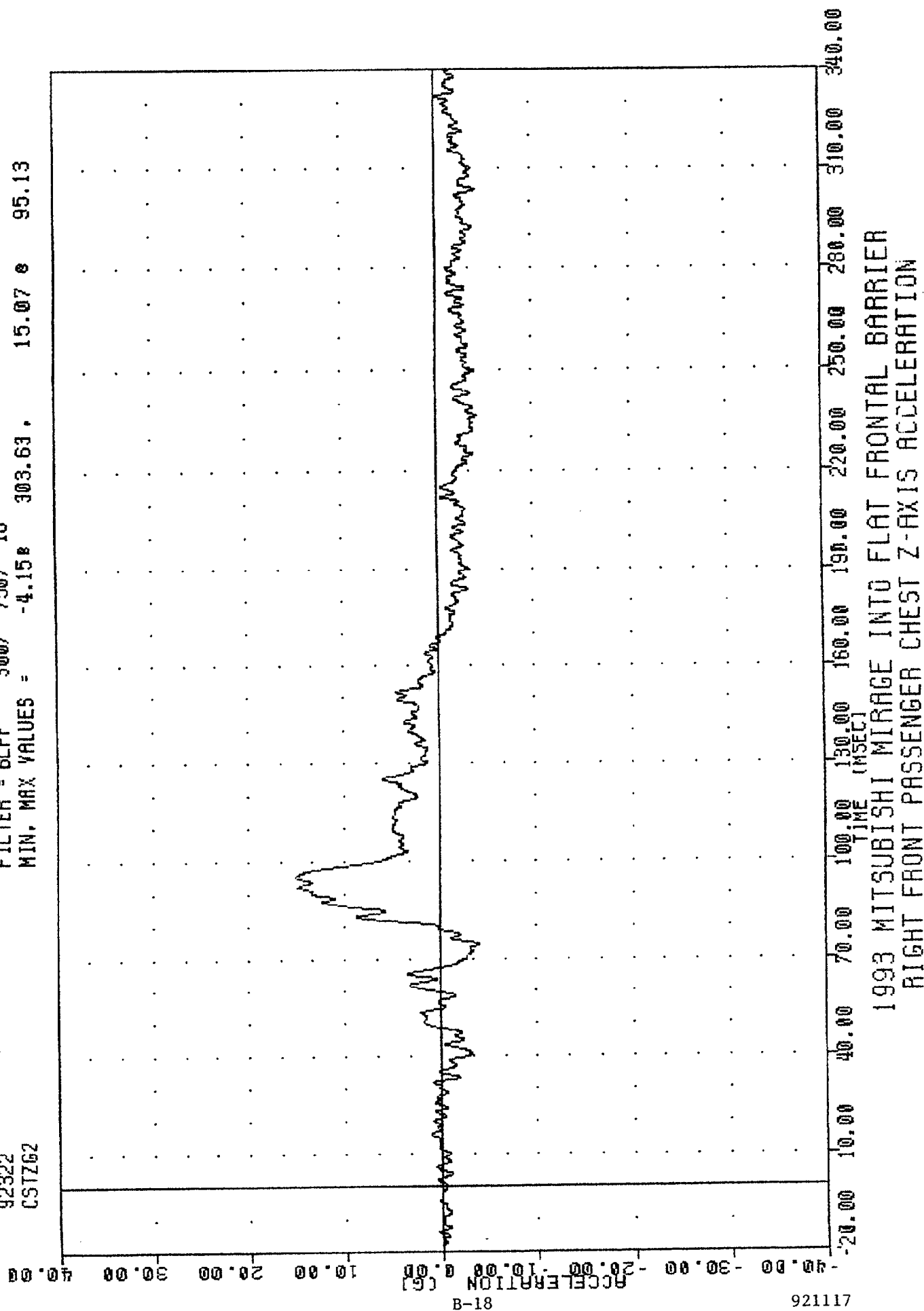
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -21.27 85.25 11.92 81.25



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

TRC , 921117
200 COMPLIANCE TESTING
92322
CSIZG2

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -4.15 303.63 15.07 95.13



TRC , 921117

208 COMPLIANCE TESTING

92322

CSTR62

FILTER = BLPP 300/ 750/ -16

MIN, MAX VALUES = 0.08 -20.00, 42.69 e 70.00

105.00

90.00

75.00

60.00

45.00

30.00

15.00

0.00

-15.00

-30.00

-45.00

-60.00

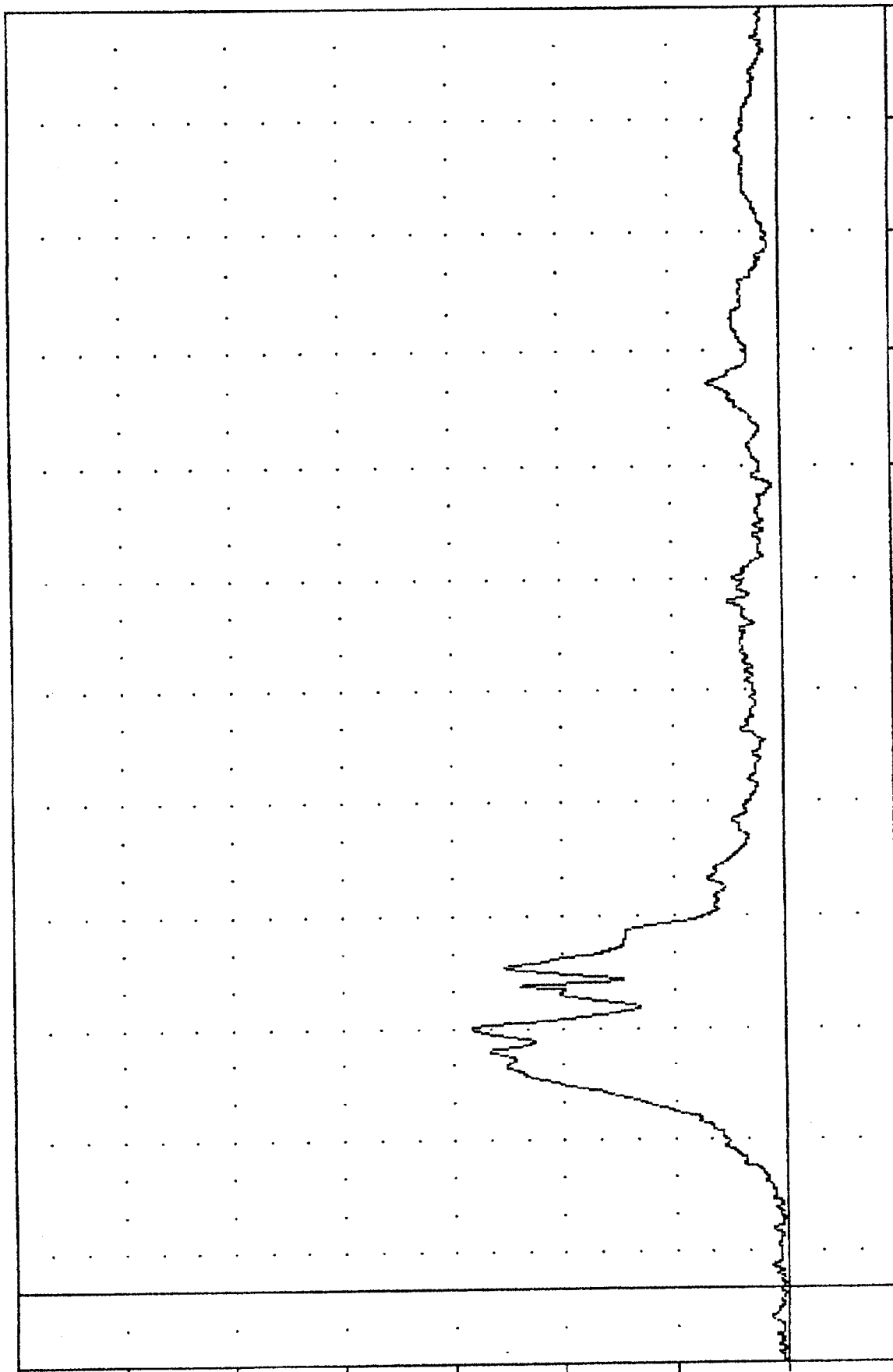
-75.00

-90.00

-105.00

ACCELERATION (G)

B-19



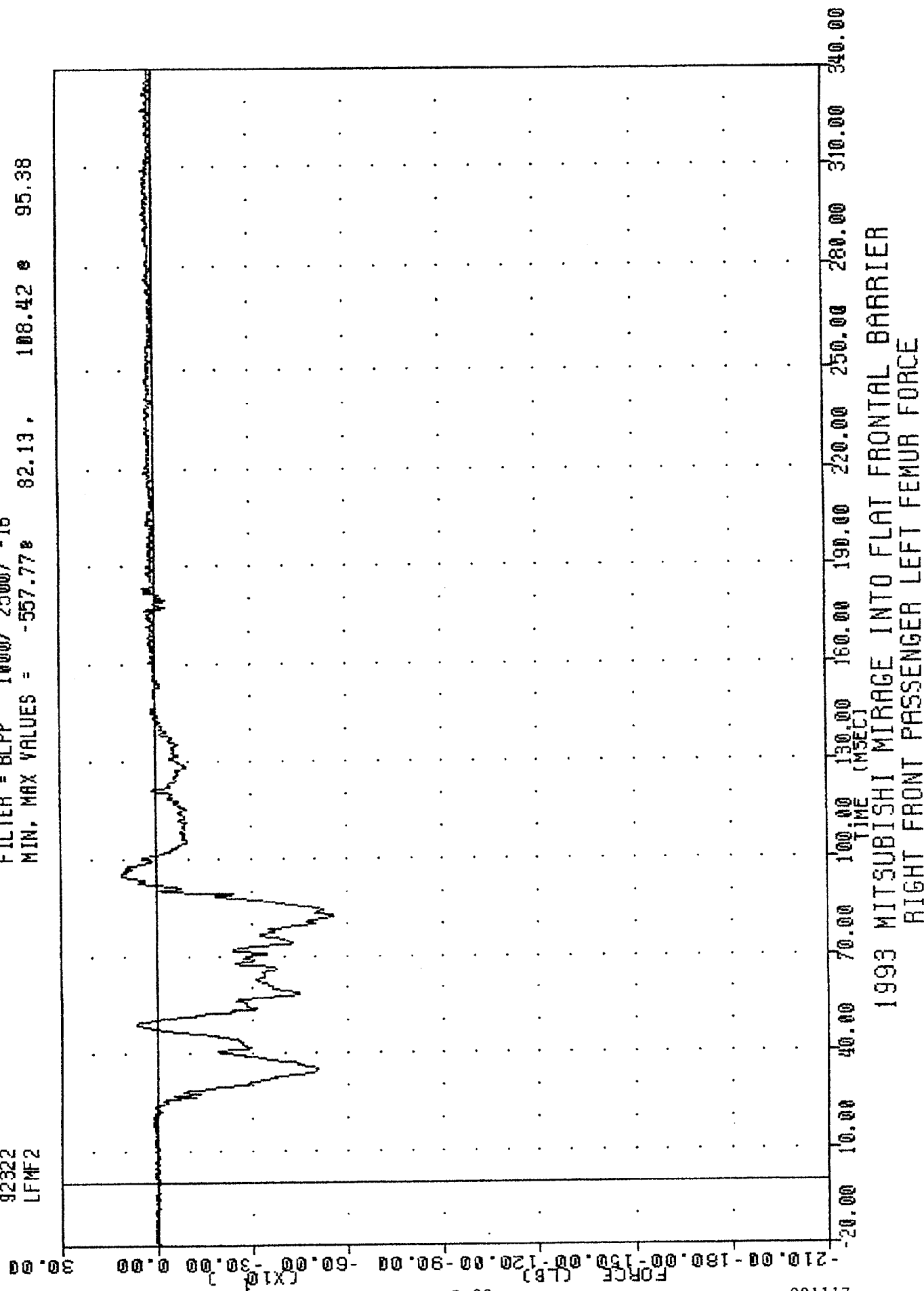
921117

-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

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

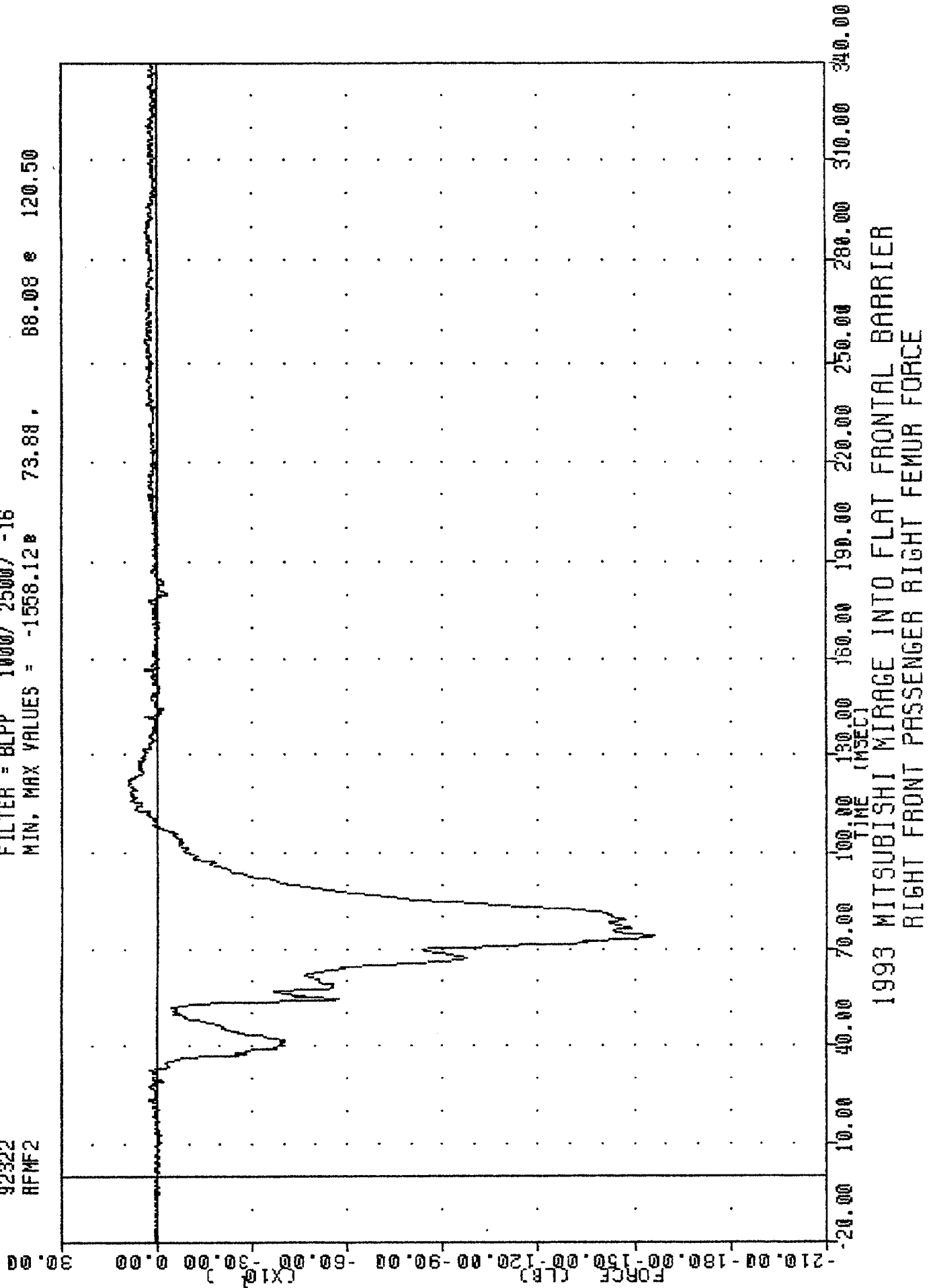
TRC , 921117
200 COMPLIANCE TESTING
92322
LFMF2

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -557.77 82.13, 108.42 95.38



TRC , 921117
208 COMPLIANCE TESTING
92322
RFMF2

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -1558.128 73.88 , 68.08 e 120.50



TRC 921117

200 COMPLIANCE TESTING

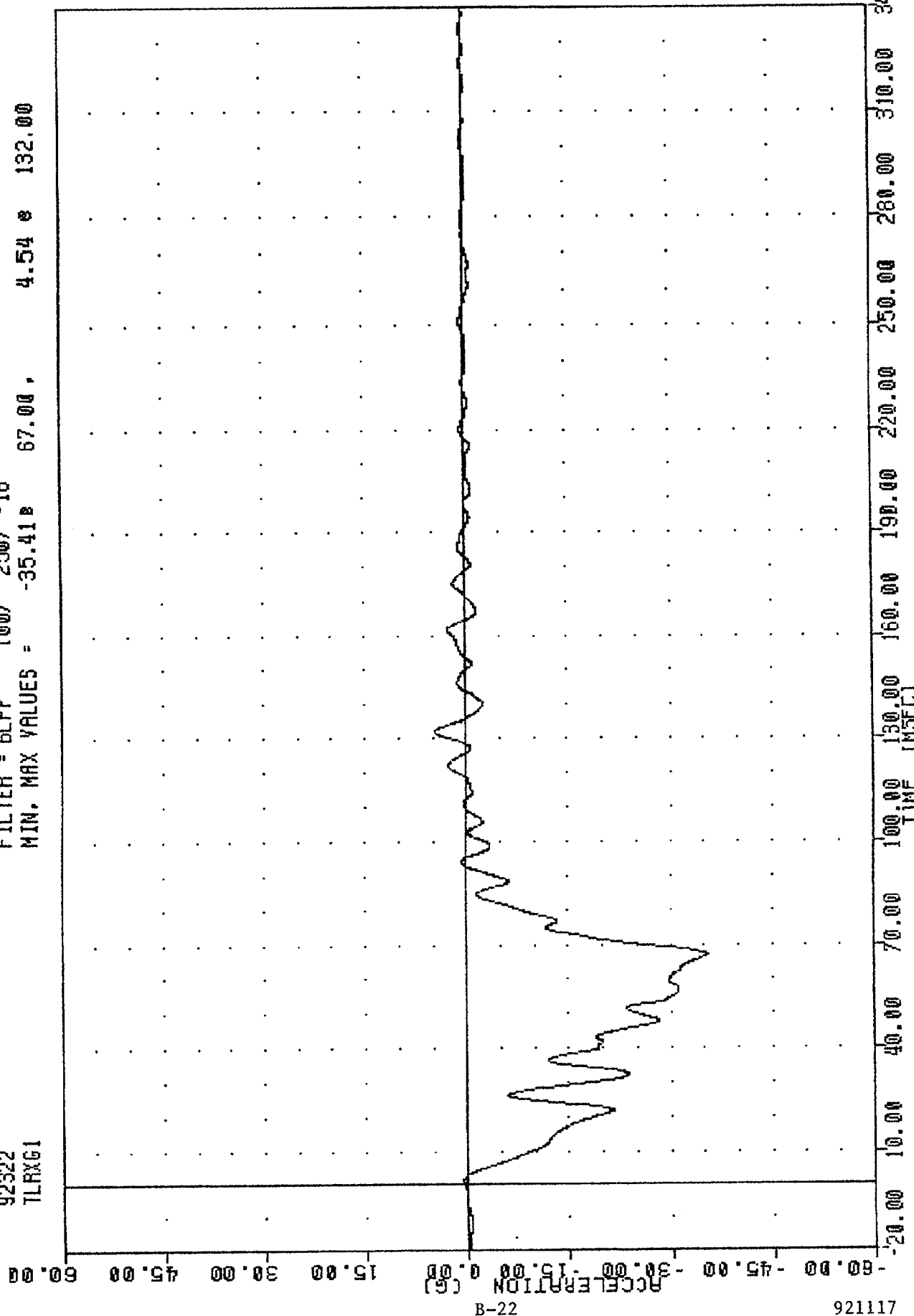
92322

TLRXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -35.41 67.00 ,

4.54 e 132.00



B-22

921117

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION

TRC 921117

200 COMPLIANCE TESTING

92322

TRAXG1

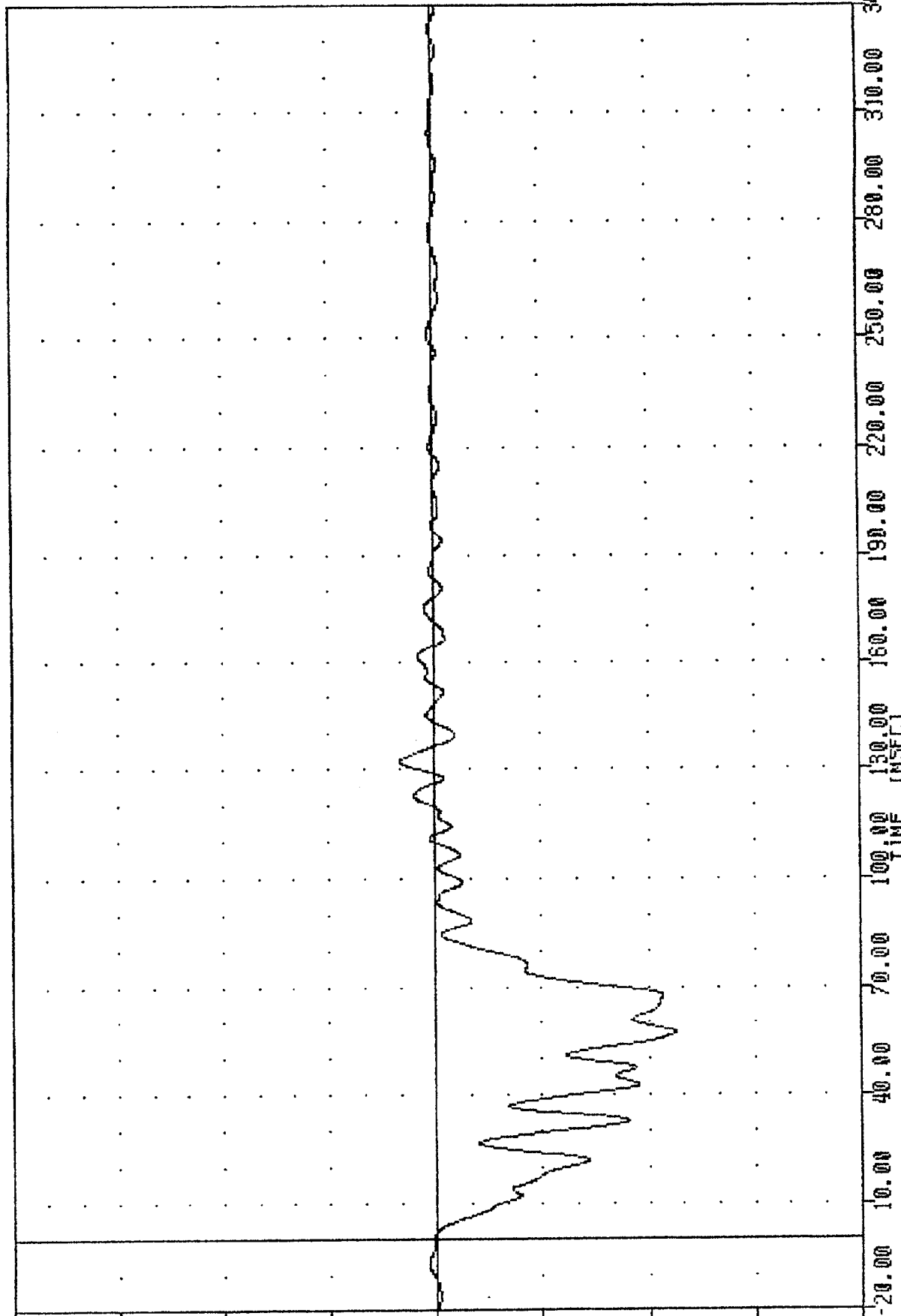
FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -33.86 57.38

4.89 132.13

ACCELERATION (G)

B-23



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

921117

TRC , 921117

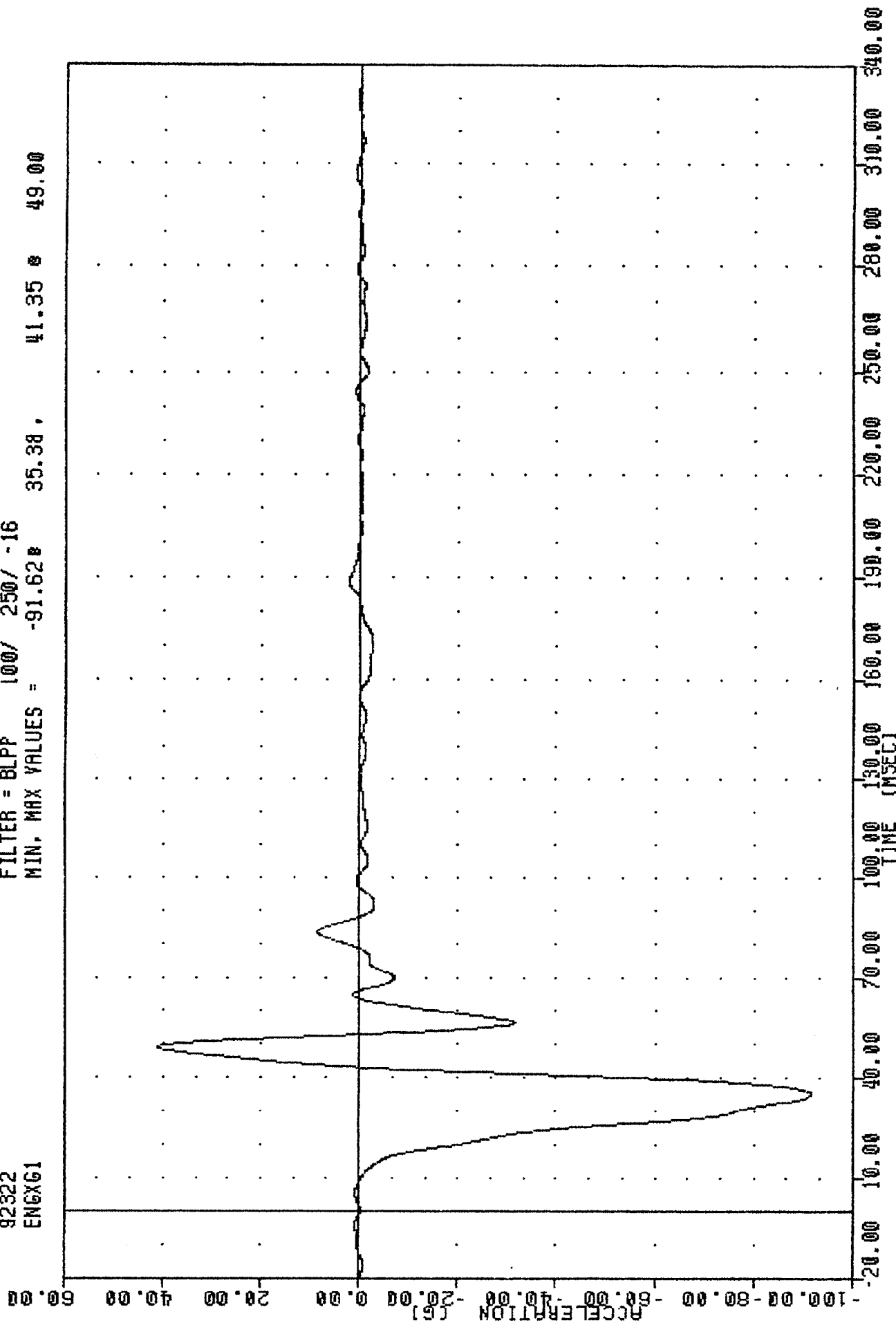
208 COMPLIANCE TESTING

92322

ENGXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -91.62 35.38 41.35 49.00

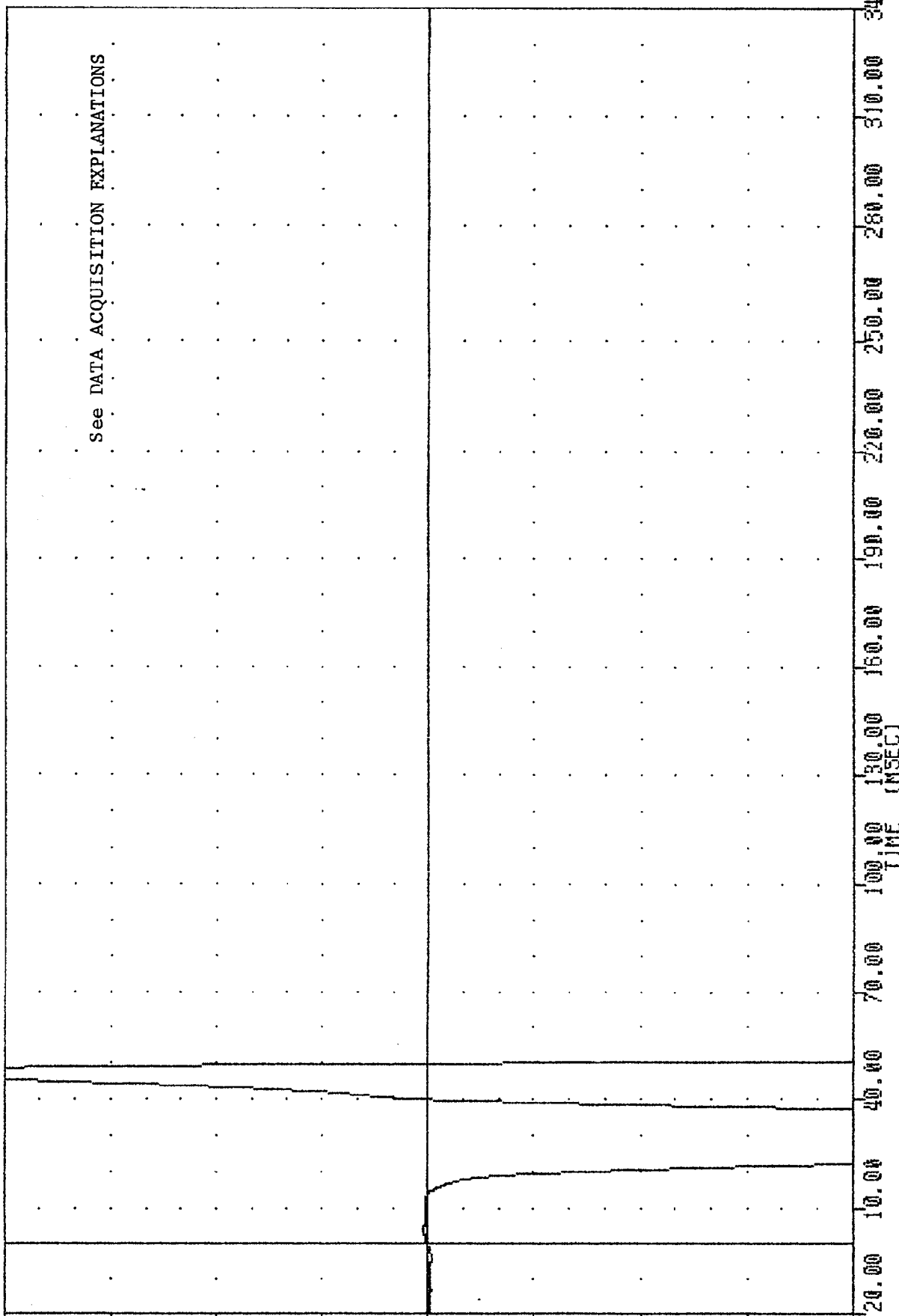


1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
ENGINE TOP X-AXIS ACCELERATION

TRC 921117
 209 COMPLIANCE TESTING
 92322
 ENG562

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -1154.29e 56.63, 77.85 e 47.50

ACCELERATION (G)
 60.00
 45.00
 30.00
 15.00
 0.00
 -15.00
 -30.00
 -45.00
 -60.00



921117

B-25

1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
 ENGINE BOTTOM X-AXIS ACCELERATION

921113

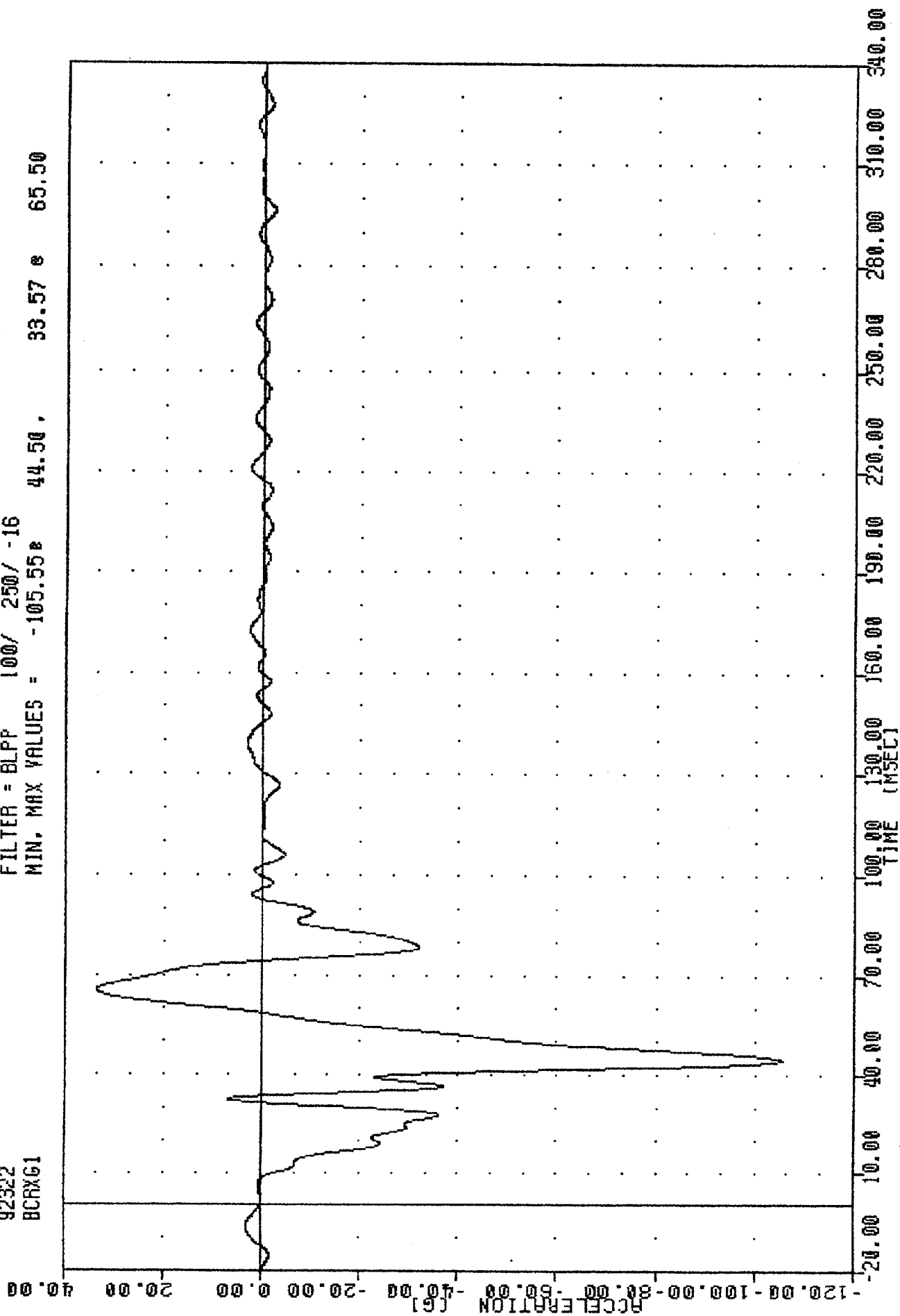
208 COMPLIANCE TESTING

92322

BCRXGI

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES =	-105.55	44.50	33.57	65.50
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1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

TRC 921117

208 COMPLIANCE TESTING

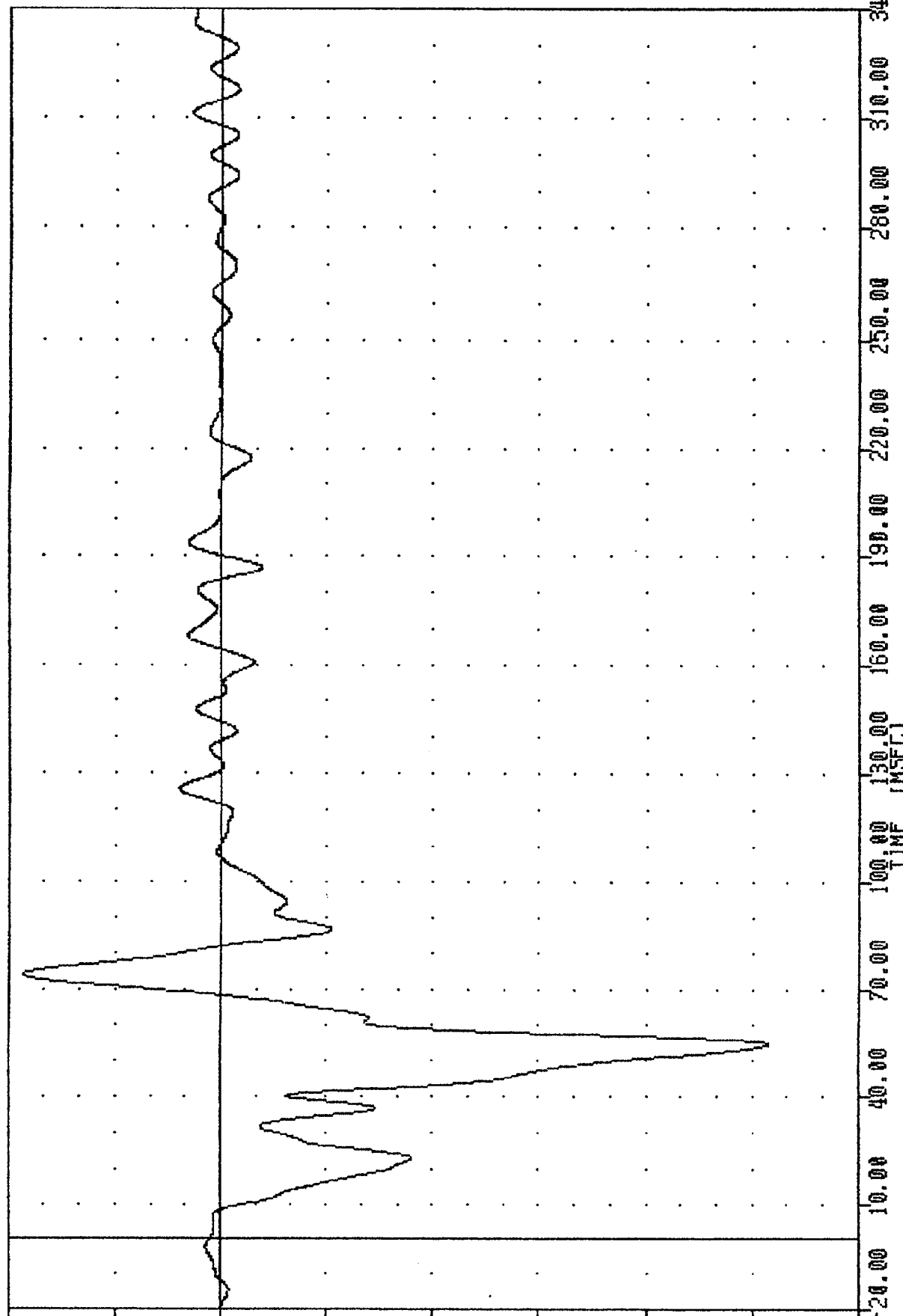
92322

BCLXG1

FILTER = BLPP 100/ 250/ -16

MIN. MAX VALUES = -77.32 54.88 28.14 73.75

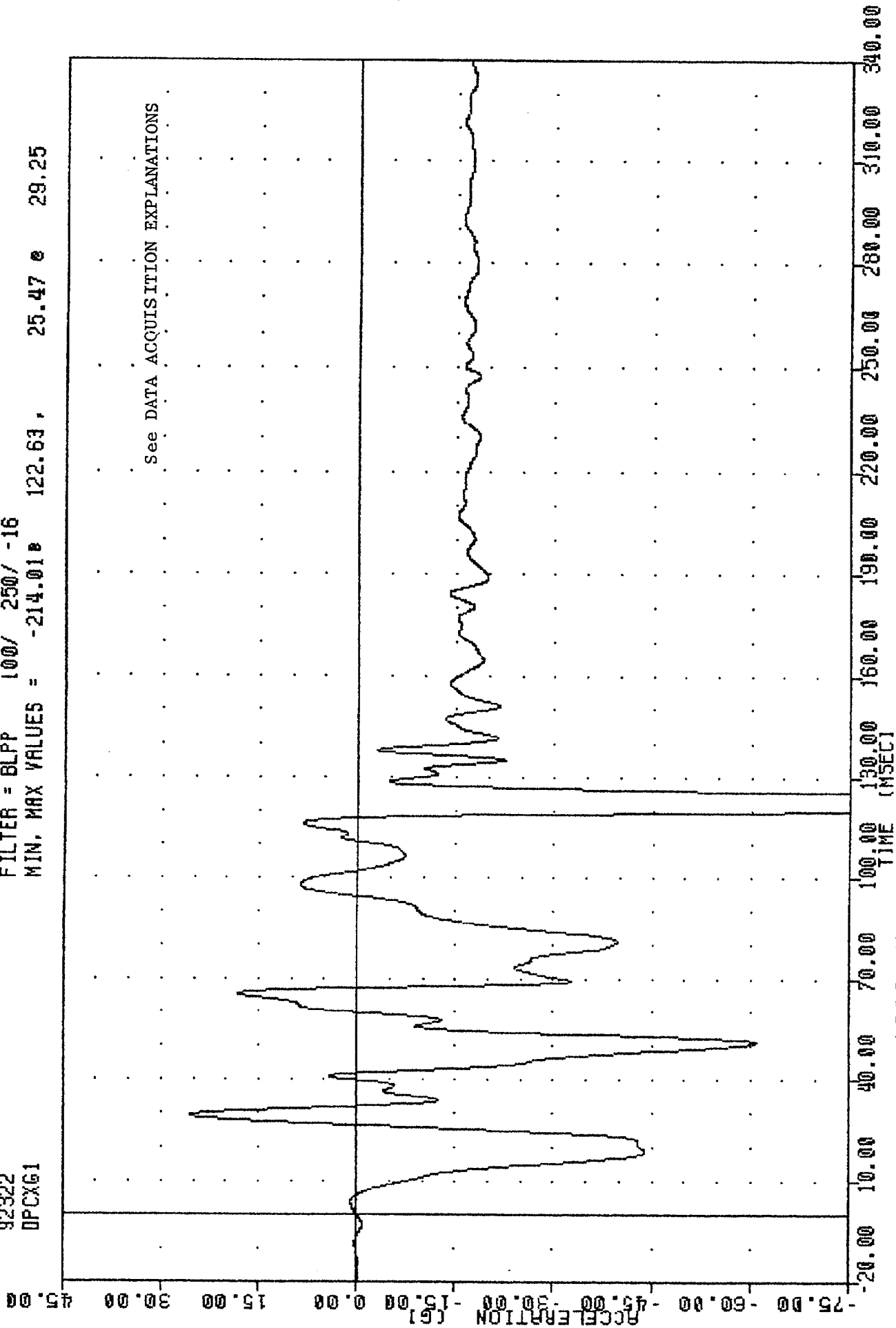
ACCELERATION (G)



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC 921117
200 COMPLIANCE TESTING
92322
DPCXG1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -214.01 122.63 25.47 29.25



1993 MITSUBISHI MIRAGE INTO FLAT FRONTAL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION