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REPORT NOS. 208-TRC-93-016
212-TRC-93-016
301-TRC-93-016

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

VOLKSWAGEN AG

1993 VOLKSWAGEN EUROVAN

VAN

NHTSA NO. CP5803

TRC TEST NO. 930407

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

APRIL 23, 1993

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE (NEF-31)
400 SEVENTH STREET, S.W., ROOM NO. 6111
WASHINGTON, DC 20590

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FINAL REPORT OF FMVSS NOS. 208, 212, 219 (PARTIAL), AND 301 COMPLIANCE TESTING OF A 1993 VOLKSWAGEN EUROVAN VAN, NHTSA NO. CP5803	APRIL 23, 1993
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15. Supplementary Notes

16. Abstract

A 30 mph flat frontal barrier impact test was conducted on a 1993 Volkswagen EuroVan van, NHTSA No. CP5803, at Transportation Research Center Inc. on April 7, 1993. 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 14.3 inches. The ambient temperature was 70° F.

The driver's head injury criteria (HIC) was 613 (See DATA ACQUISITION EXPLANATIONS). The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.3 g. The driver's left and right femur maximum axial forces were 219 pounds and 179 pounds, respectively.

The passenger's head injury criteria (HIC) was 413. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.1 g. The passenger's left and right femur maximum axial forces were 226 pounds and 157 pounds, respectively.

The vehicle appears to comply with the applicable requirements of FMVSS 208, 212, 219 (partial), and 301.

17. Key Words	18. Distribution Statement
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"	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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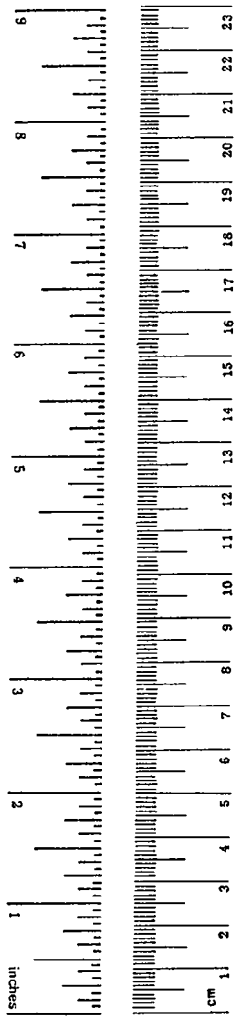
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

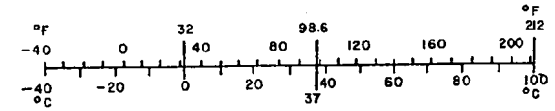
Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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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 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 Volkswagen EuroVan van, NHTSA No. CP5803, 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 April 7, 1993.

The test vehicle, a 1993 Volkswagen EuroVan van, NHTSA No. CP5803, 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 2.5-liter, transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 4446 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 14.3 inches.

The driver's head injury criteria (HIC) was 613 (See DATA ACQUISITION EXPLANATIONS). The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.3 g. The driver's left and right femur maximum axial forces were 219 pounds and 179 pounds, respectively.

The right front passenger's HIC was 413. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.1 g. The right front passenger's left and right femur maximum axial forces were 226 pounds and 157 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 Y-axis accelerometer, HEDYG1, recorded questionable data from 7 milliseconds and after. The questionable data affected the driver's Head Injury Criteria and resultant acceleration calculation. The data acquisition circuit was checked after the test and appeared normal. The dummy's head passed the post-test head drop calibration test. The cause of the questionable data could not be found.

The engine bottom X-axis accelerometer, ENGXG1, lost data fron 32 to 42 milliseconds as a result of the accelerometer's cable being pinched by the vehicle's crush on impact.

The left rear seat X-axis accelerometer, TLRXG1, recorded questionable data spikes from 8 to 32 milliseconds and did not return to zero following the impact event. The data acquisition circuit was checked and the accelerometer was recalibrated after the test. The cause of the data not returning to zero could not be found.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: CP5803 TEST TYPE: Frontal Barrier Impact

TEST DATE: 04/07/93 TEST TIME: 1356 AMBIENT TEMP. (°F): 70

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1993/Volkswagen/EuroVan/van

VEHICLE TEST WEIGHT (LBS): 4446

IMPACT ANGLE (DEG)*: 0

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

MAXIMUM STATIC CRUSH (IN): 14.3

AVERAGE REBOUND (IN): 48.6

DUMMIES:	Driver #354	Passenger #1173
TYPE:	Part 572 B	Part 572 B
LOCATION:	Left front	Right front
RESTRAINT:	3-point unibelt	3-point unibelt

NUMBER OF DATA CHANNELS: 23

NUMBER OF CAMERAS: HIGH-SPEED 14 REAL-TIME 2

*With respect to tow track centerline.
**Speed trap measurement (± .05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagen AG Germany

MAKE/MODEL: Volkswagen/EuroVan VIN: WV2HC0704PH062398

BODY STYLE: Van MODEL YEAR: 1993

NHTSA NO.: CP5803 COLOR: Gray

ENGINE DATA: TYPE: transverse CYLINDERS: 5 DISPLACEMENT: 2.5-liter

TRANSMISSION DATA: _4_SPEED, ___MANUAL, _X_AUTOMATIC, _X_FWD, ___RWD,___4WD

DATE VEHICLE RECEIVED: 02/25/93 ODOMETER READING: 50

DEALER'S NAME AND ADDRESS: Midwestern Auto Group
5016 Post Road
Dublin, OH 43017

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	No
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: Volkswagen AG Germany

DATE OF MANUFACTURE: 12/92 VIN: WV2HC0704PH062398

GVWR: 5578 LBS

GAWR: FRONT: 2976 LBS., REAR: 2646 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear, G64, 195/75R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 55 PSI
REAR: 55 PSI

SPARE TIRE (MFR., LINE, SIZE): Goodyear, G64, 195/75R15

TYPE OF SEATS: FRONT: Bucket
SECOND ROW: Bench
THIRD ROW: Bench

TYPE OF FRONT SEAT BACKS: Manually-adjustable

MAXIMUM WIDTH: 72.4 INCHES

WHEELBASE: 115.0 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the driver's side B-pillar.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: 195/70R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 43 PSI; REAR: 48 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	27.8;	RF	28.0;	LR	28.8;	RR	29.2
FULLY LOADED ATTITUDE:	LF	27.2;	RF	27.4;	LR	27.9;	RR	28.1
PRE-TEST ATTITUDE:	LF	27.5;	RF	27.5;	LR	28.2;	RR	28.2
POST-TEST ATTITUDE:	LF	26.9;	RF	26.3;	LR	28.0;	RR	27.4

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	1226 LBS.	RIGHT REAR	678 LBS.
LEFT FRONT	1222 LBS.	LEFT REAR	711 LBS.
TOTAL FRONT WEIGHT	2448 LBS.	(63.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1389 LBS.	(36.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	3837 LBS.		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

GVWR = GROSS VEHICLE WEIGHT RATING (5578 LBS)

UDW = UNLOADED DELIVERED WEIGHT (3837 LBS)

VCW = VEHICLE CAPACITY WEIGHT = GVWR - UDW = 5578 - 3837 = 1741 LBS.

DSC = DESIGNATED SEATING CAPACITY (7)**

RCLW*= VCW - 150 (DSC) = 5578 - 3837 - 150 (7) = 691 LBS.

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

TARGET TEST WEIGHT = 3837 + 300 + 328

TARGET TEST WEIGHT = 4465 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 281 LBS. OF CARGO WEIGHT:

RIGHT FRONT	1391 LBS.	RIGHT REAR	832 LBS.
LEFT FRONT	1260 LBS.	LEFT REAR	963 LBS.
TOTAL FRONT WEIGHT	2651 LBS.	(59.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1795 LBS.	(40.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	4446 LBS.	(0.4% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 215 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 46.4 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.

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

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 930407 NHTSA NO.: CP5803

TEST DATE: 04/07/93 TEST TIME: 1356

TEST TYPE: Frontal Barrier Impact IMPACT ANGLE: 0

AMBIENT TEMPERATURE AT IMPACT AREA: 70° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 71° 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 = 15.0 IN.

EXITING VELOCITY TRAP = 2.0 IN.

TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN INCHES):

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 178.6; C 186.8; R 179.0

POST-TEST: L 171.9; C 173.5; R 170.8

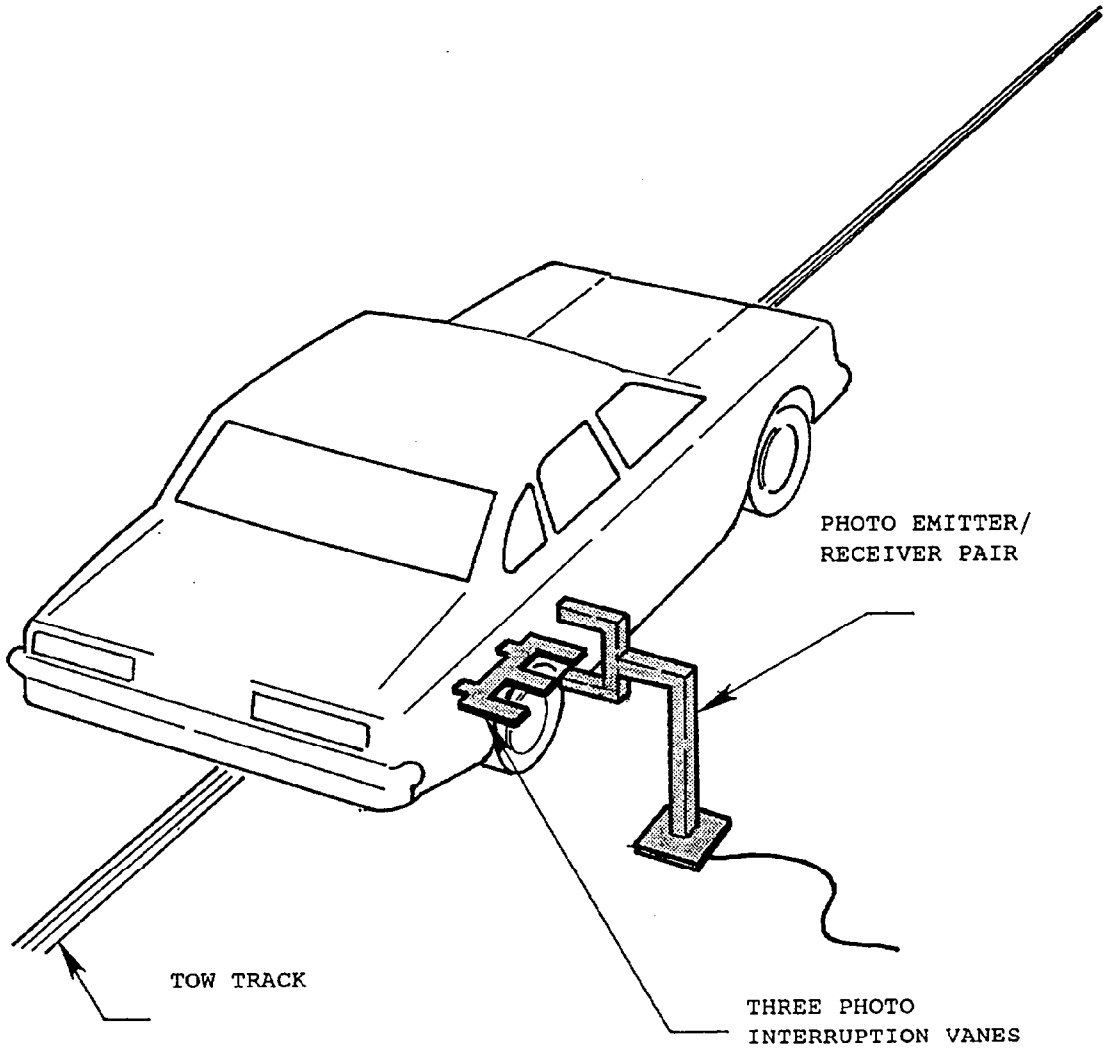
TOTAL CRUSH: L 6.7; C 13.3; R 8.2

AVERAGE CRUSH: 9.4

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 48.0; C 46.1; R 51.8; AVG. 48.6

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: Volkswagen/EuroVan/van

VEHICLE NHTSA NO.: CP5803 ; VIN: WV2HC0704PH062398

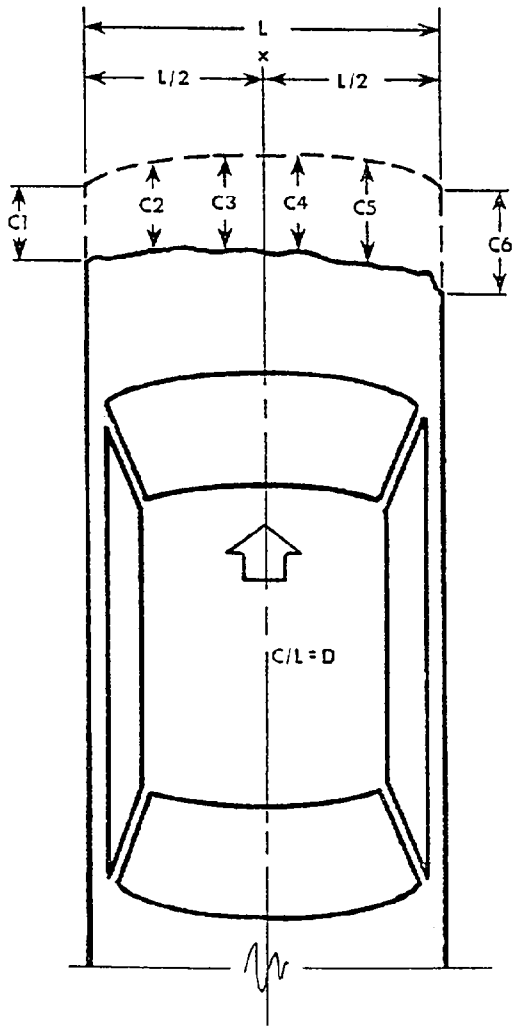
MODEL YEAR: 1993 ; BUILD DATE: 12/92 ; TEST DATE: 04/07/93

VEHICLE SIZE CATEGORY: Van ; TEST WEIGHT: 4446 LBS.

VEHICLE WHEELBASE: 115.0 INCHES

MAXIMUM WIDTH: 72.4 INCHES

FRONT OVERHANG: 37.5 INCHES



COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH MEASUREMENTS:

C1 = 6.7 INCHES

C2 = 11.1 INCHES

C3 = 13.2 INCHES

C4 = 14.3 INCHES

C5 = 12.3 INCHES

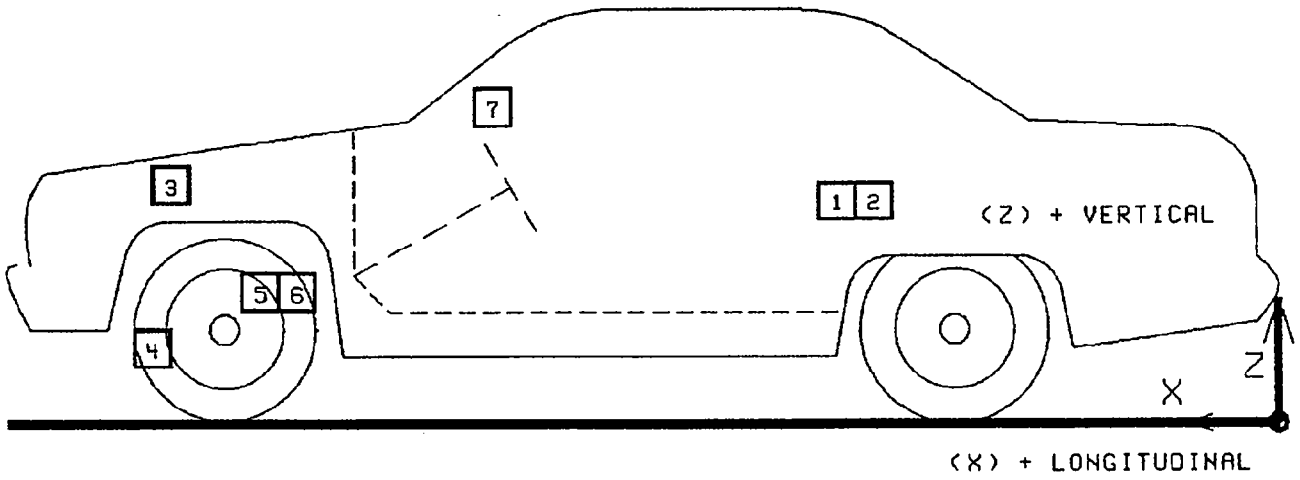
C6 = 8.2 INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE (LONGITUDINAL)

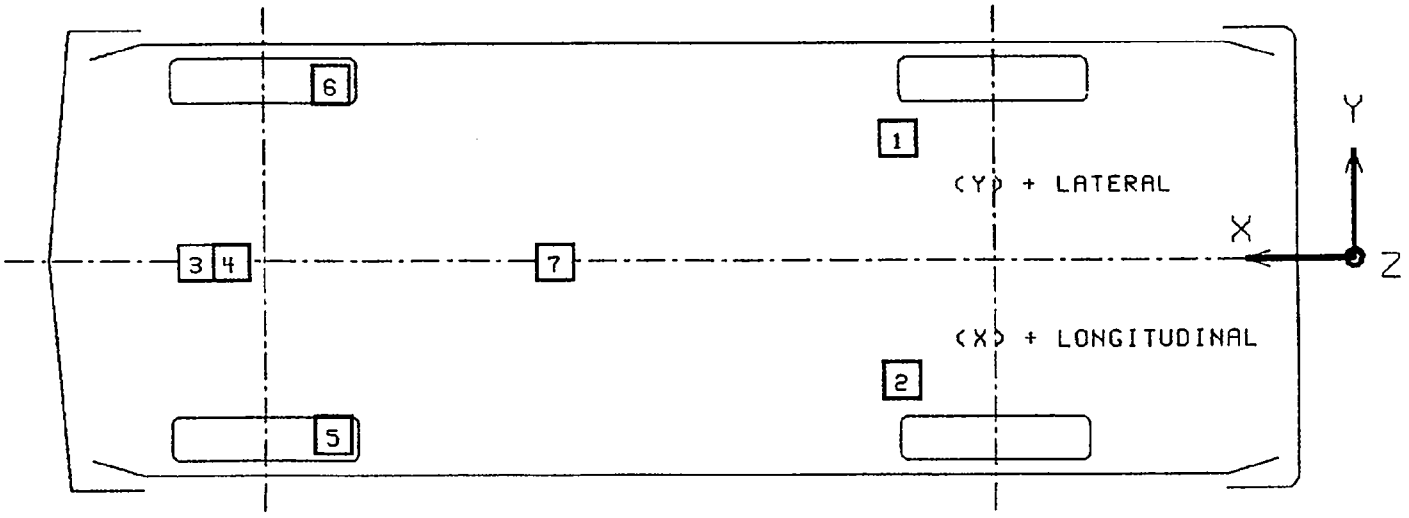
LENGTH OF DAMAGED REGION: L = 66.0 INCHES

FIGURE 3

VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930407

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	60.4	23.0	18.2				
		POST	60.4	23.0	18.0	---	---Y	---	---Y
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	62.5	-24.5	18.1				
		POST	62.5	-24.5	18.2	3.3	93.6	31.8	37.5
3	ENGINE TOP LONGITUDINAL	PRE	165.2	-1.5	37.0				
		POST	159.8	-2.5	38.2	12.9	50.5	87.5	31.3
4	ENGINE BOTTOM LONGITUDINAL	PRE	156.0	-10.2	7.2				
		POST	150.5	-10.2	7.0	---	---Y	---	---Y
5	RIGHT BRAKE CALIPER LONGITUDINAL	PRE	154.2	-26.4	12.3				
		POST	150.1	-26.0	12.4	10.9	63.9	85.3	35.0

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 930407

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
6	LEFT BRAKE CALIPER	PRE	154.0	26.2	12.1				
		POST	149.4	26.5	11.6				
	LONGITUDINAL					14.5	66.1	48.6	47.5
7	INSTRUMENT PANEL CENTER	PRE	146.0	-2.4	42.1				
		POST	147.1	-2.4	52.1				
	LONGITUDINAL					5.3	115.5	42.0	48.0

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

ϒ See DATA ACQUISITION EXPLANATIONS

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT NO.: DTNH22-90-C-21003
FROM: Transporation 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.: CP5803
MAKE/MODEL/BODY STYLE: Volkswagen/EuroVan/van
MODEL YEAR: 1993 BODY COLOR: Gray
VIN: WV2HC0704PH062398
ODOMETER (ARRIVAL): 50 DATE: 02/25/93
ODOMETER (COMPLETION): 55 DATE: 04/07/93
COST: $19,005.67

X AIR CONDITIONER	___ CONSOLE	BRAKES: X POWER
X TINTED GLASS	___ TACHOMETER	FRONT: Disc
X POWER STEERING	___ SPEED CONTROL	REAR: Drum
___ POWER WINDOWS	X REAR WINDOW DEF.	
___ POWER DOOR LOCKS	___ SUN/MOON ROOF	FRONT SEATS: ___ POWER
X RADIO	___ T-TOP	SEAT TYPE: Bucket
X CLOCK	___ TILT STEERING WHEEL	NO. OF SEATS: 7
___ ROOF RACK	___ OTHER OPTIONS:	

ENGINE: 5 CYLINDERS; 2.5 LITERS
TRANSMISSION: automatic; DRIVE TYPE: Front wheel drive
TIRE SIZE: 195/75R15
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	-40.5	30.8 ϒ	-52.6	128.1 ϒ	-42.7	16.1	-14.5
PASSENGER	-18.9	-20.8	-47.4	48.4	-36.7	-15.8	-11.4

MAXIMUM FEMUR COMPRESSIVE FORCE (LBS)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	219	179
PASSENGER	226	157

HEAD INJURY CRITERIA*

	HIC	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	613 ϒ	69.6	105.6
PASSENGER	413	63.5	99.5

CHEST MAXIMUM RESULTANT ACCELERATION**

	ACCEL. (G)	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	43.3	61.0	64.0
PASSENGER	38.1	58.2	61.2

*As defined in FMVSS No. 208

**Defined as equal to or exceeding 0.003 sec. duration

ϒ See DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #353	PASSENGER #354
HEAD	Steering wheel hub and chest	Chest
CHEST	Steering wheel	None
ABDOMEN	None	None
LEFT KNEE	Instrument panel	Instrument panel
RIGHT KNEE	Instrument panel	Instrument panel

DOOR OPENING:

	LEFT	RIGHT
FRONT	Easy	Easy
REAR	NA	Easy

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	None	None
REAR	NA	NA

GLAZING DAMAGE:

None

OTHER NOTABLE IMPACT EFFECTS:

None

DUMMY KINEMATIC SUMMARY

Driver Dummy

Upon impact, the driver dummy translated forward on the seat with the dummy's upper torso rotating slightly to the left, impacting both knees into the instrument panel. The dummy's upper torso rotated slightly forward with the dummy's chest impacting the lower steering wheel rim as the dummy's head rotated downward impacting the steering wheel hub and the dummy's chest. The driver dummy was restrained by the three-point unibelt. The dummy rebounded rearward and slightly to the right into the seat as the dummy's head rotated rearward into the head restraint. The driver dummy came to rest in the driver's seat, rotated slightly to the left and leaning slightly to the right, restrained by the three-point unibelt.

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 downward impacting the dummy's chest as the dummy's upper torso rotated slightly downward and to the right. The right front passenger dummy was restrained by the three-point unibelt. The dummy rebounded rearward, still rotated to the right, into the seat back as the dummy's head rotated rearward into the head restraint. The right front passenger dummy came to rest, rotated slightly to the right, in the right front passenger's seat, restrained by the three-point unibelt.

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

MAKE/MODEL: Volkswagen/EuroVan VIN: WV2HC0704PH062398

BODY STYLE: Van NHTSA NO.: CP5803

DATE OF MANUFACTURE: 12/92

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:

THE WEBBING TENSION - RELIEVING DEVICE IS CANCELLED WHEN

(check one): _____ The adjacent door is opened.

_____ The latch plate is released from the buckle.

_____ A manual means is activated on an open-body vehicle without doors.

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: __0.2__ POUNDS

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

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

MAKE/MODEL: Volkswagen/EuroVan VIN: WV2HC0704PH062398

BODY STYLE: Van NHTSA NO.: CP5803

DATE OF MANUFACTURE: 12/92

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__

OPEN-BODY VEHICLE (without doors): DOES THE SEAT BELT SYSTEM FULLY RETRACT WHEN THE WEBBING TENSION-RELIEVING DEVICE IS MANUALLY DEACTIVATED? _____ YES _____ NO

ACCESSIBILITY:

IS THE SEAT CUSHION REMOVABLE SO THE SEAT BACK SERVES A FUNCTION OTHER THAN SEATING? __NO__

IS THE SEAT REMOVABLE? __NO__

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.

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

MAKE/MODEL: Volkswagen/EuroVan VIN: WV2HC0704PH062398

BODY STYLE: Van NHTSA NO.: CP5803

DATE OF MANUFACTURE: 12/92

ACCESSIBILITY, CONT'D:

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 = 6 sec.

Duration of reminder light operation = 6 sec.

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

Duration of audible warning signal = 0 sec.

(NOTE: audible warning should not operate)

Duration of reminder light operation = 6 sec.

WORDING OF VISUAL WARNING:

_____ Fasten Seat Belt

_____ Fasten Belt

__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

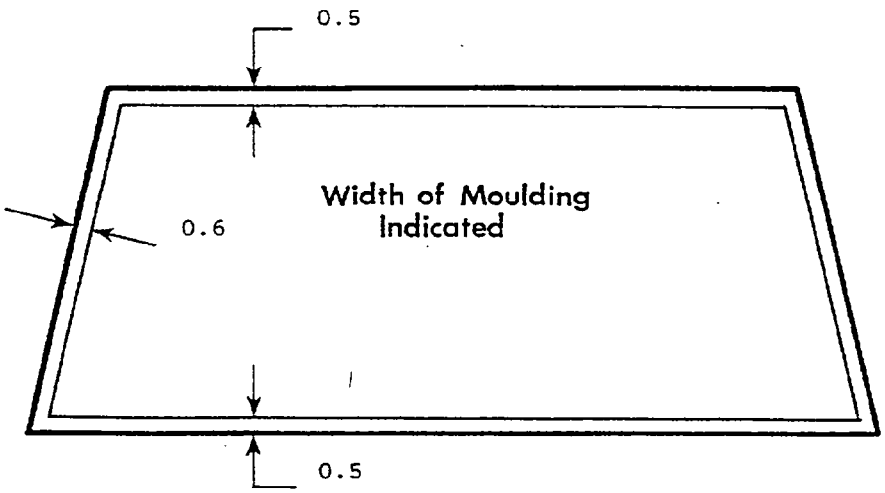
DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	90.0	90.0	100
LEFT SIDE	90.0	90.0	100
TOTAL	180.0	180.0	100

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 71° 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 = 56.5

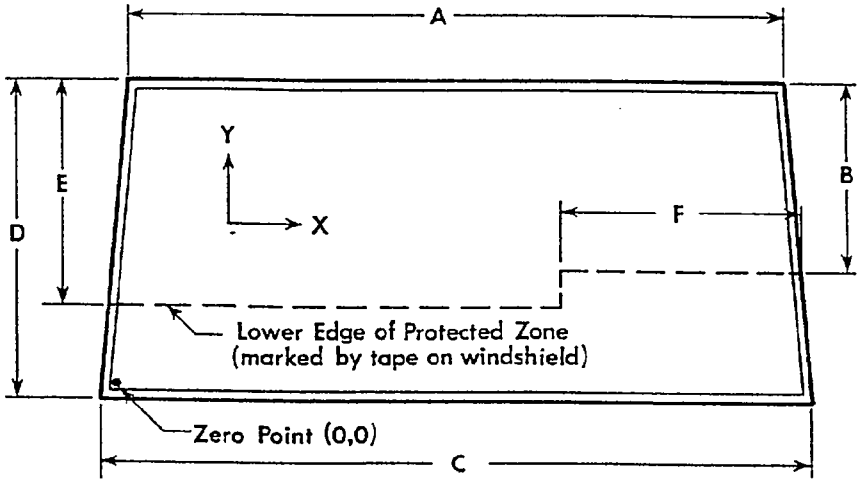
B = 18.0

C = 71.5

D = 29.0

E = 19.2

F = 13.2



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:	Volkswagen/EuroVan
NHTSA NO.:	CP5803
FUEL SYSTEM CAPACITY:	21.1 GALLONS (FROM OWNER'S MANUAL)
USABLE CAPACITY:	21.1 GALLONS (FURNISHED BY COTR)
TEST VOLUME RANGE:	19.4 GALLONS TO 19.8 GALLONS (92-94% OF USABLE)
ACTUAL TEST VOLUME:	19.6 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 filler is on the left. The fuel tank is in front of the rear axle. The fuel lines run along the left side 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.: CP5803 ; TEST DATE: 04/07/93

VEHICLE MAKE/MODEL/BODY STYLE: Volkswagen/EuroVan/van

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:

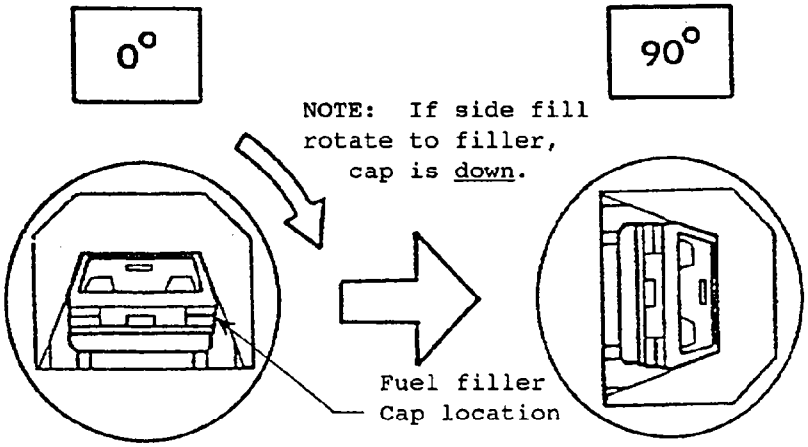
		TEST RESULTS	MAXIMUM ALLOWABLE
1.	FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 OZ.	1 OZ.
2.	5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 OZ.	5 OZ.
3.	NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - - -	0 OZ.	1 OZ./1 MIN.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: CP5803
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:

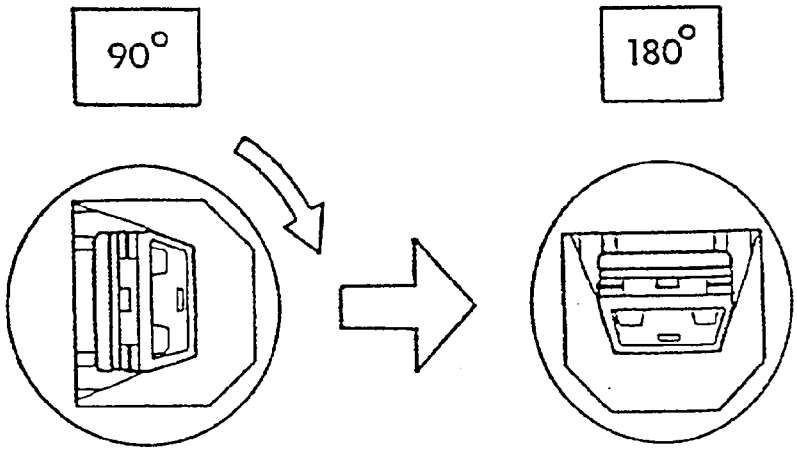
0° TO 90° ROTATION (FUEL FILLER CAP DOWN)	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CP5803
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:

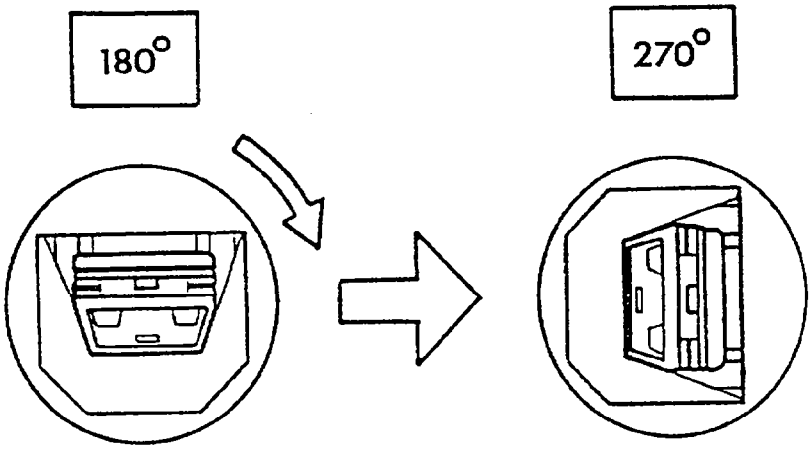
90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CP5803
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:

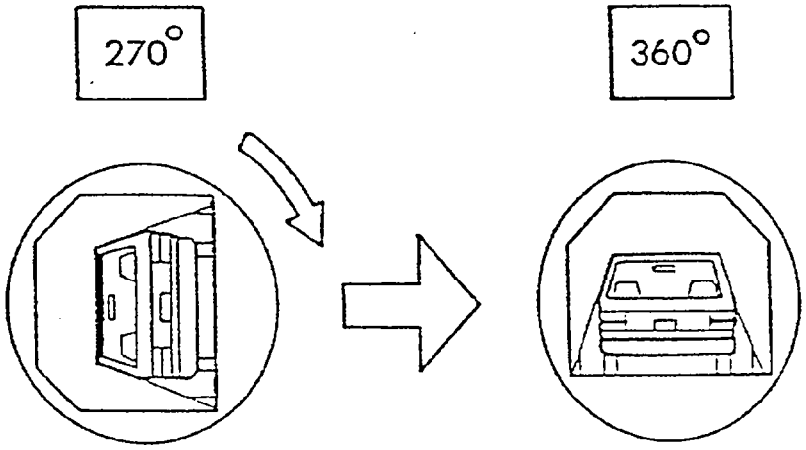
180° TO 270° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CP5803
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:

270° TO 360° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
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

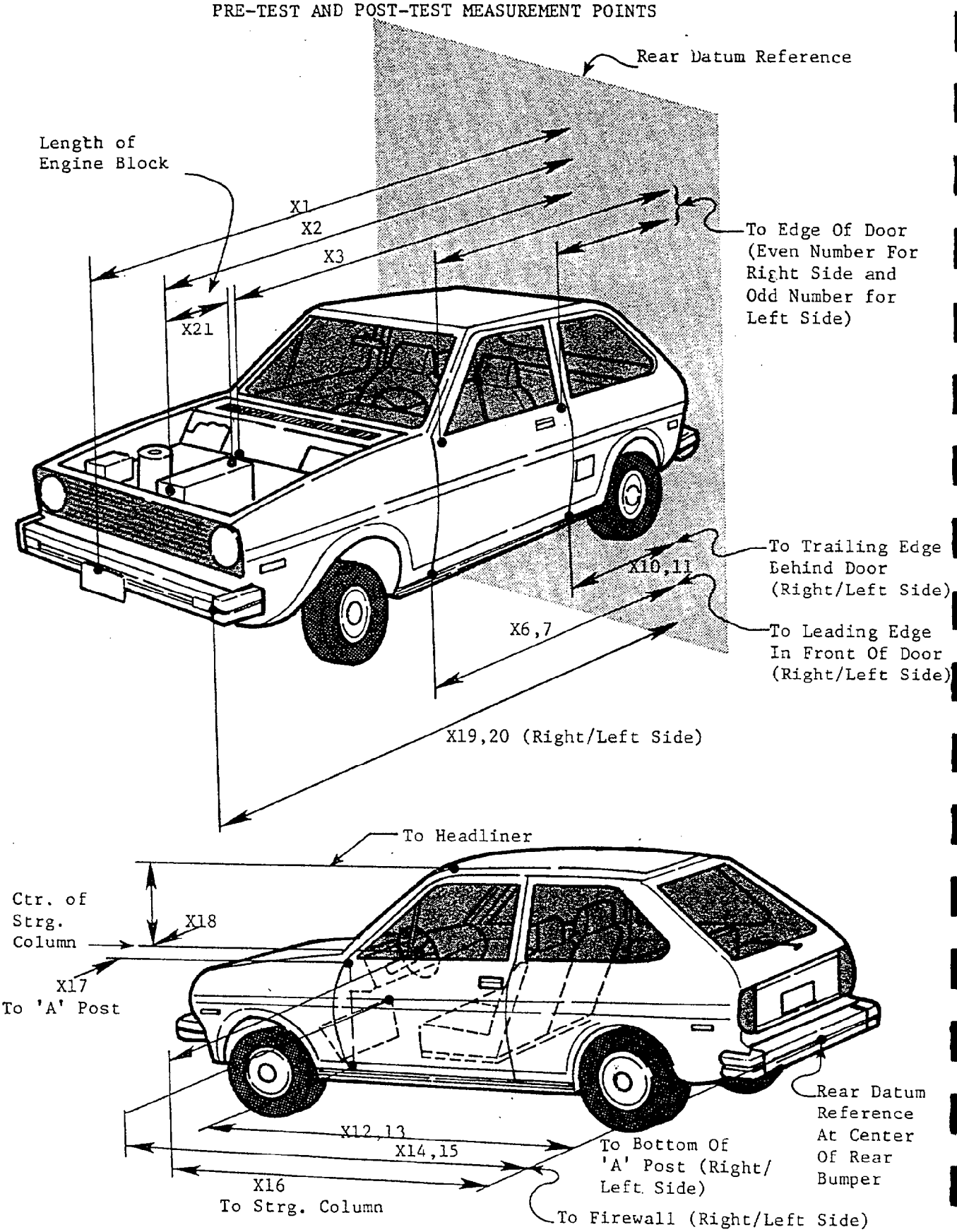


TABLE 13 IMPACTED VEHICLE MEASUREMENTS

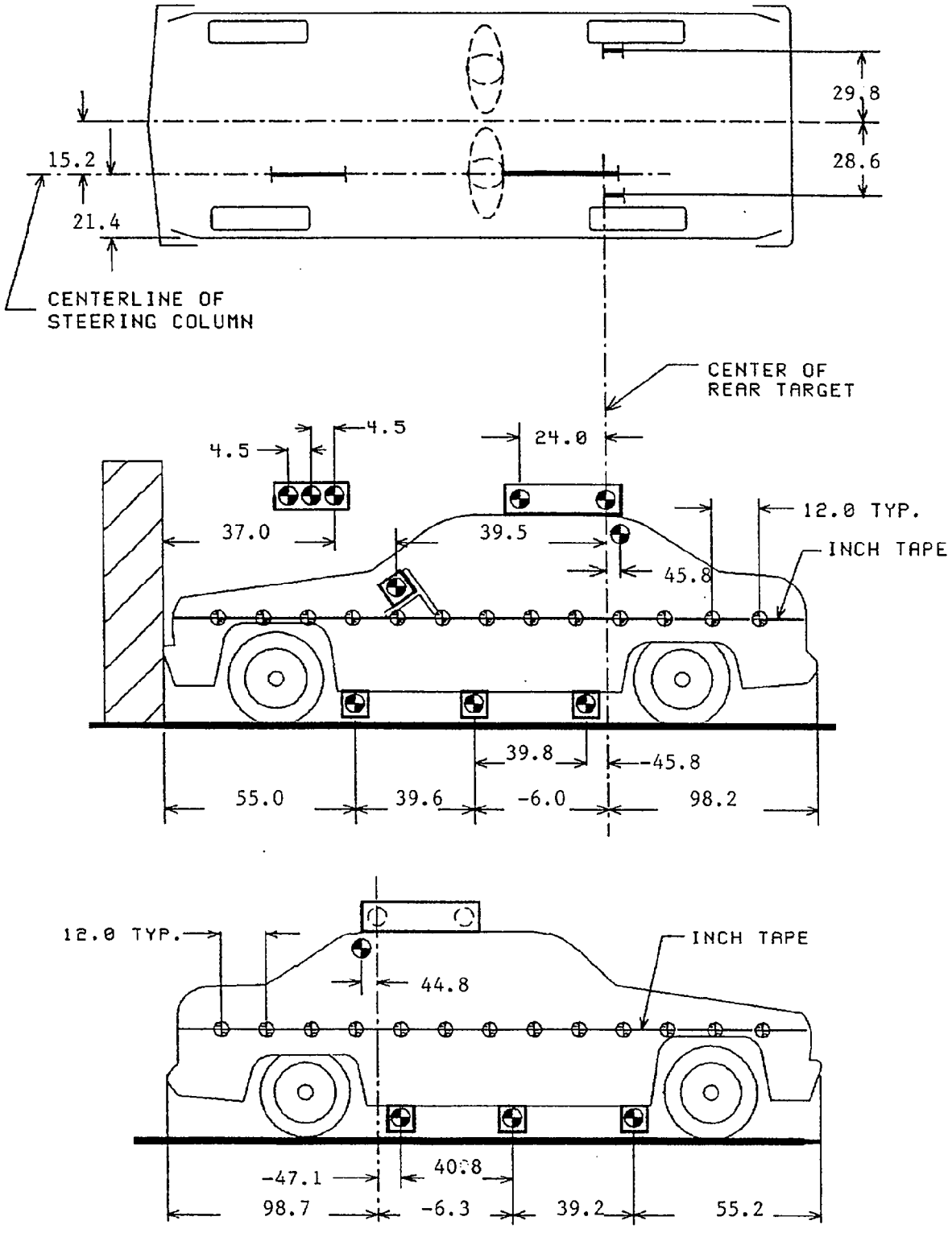
VEHICLE MAKE/MODEL: Volkswagen/EuroVan TEST NUMBER: 930407

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	186.8	173.5	13.3
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	168.2	163.5	4.7
X3	REAR SURFACE OF VEHICLE TO FIREWALL	158.8	158.0	0.8
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	144.6	144.1	0.5
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	144.4	145.0	-0.6
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	144.5	143.5	1.0
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	144.2	144.5	-0.3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	104.5	104.0	0.5
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	104.1	104.8	-0.7
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	104.1	106.1	-2.0
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	107.0	107.2	-0.2
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	142.9	141.9	1.0
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	143.0	142.8	0.2
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	154.5	155.1	-0.6
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	156.0	156.4	-0.4
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	130.5	130.5	0.0
X17	CENTER OF STEERING COLUMN TO "A" POST	13.5	13.2	0.3
X18	CENTER OF STEERING COLUMN TO HEADLINER	20.2	18.8	1.4
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	179.0	170.8	8.2
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	178.6	171.9	6.7
X21	LENGTH OF ENGINE BLOCK	15.0	15.0	0.0

FIGURE 8

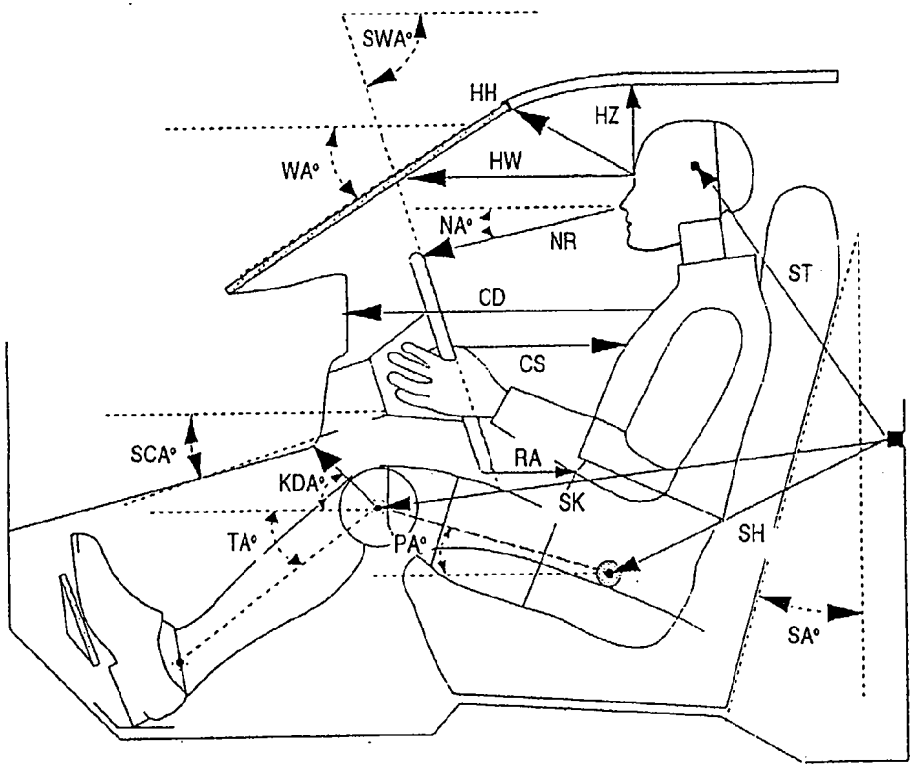
VEHICLE TARGET LOCATIONS

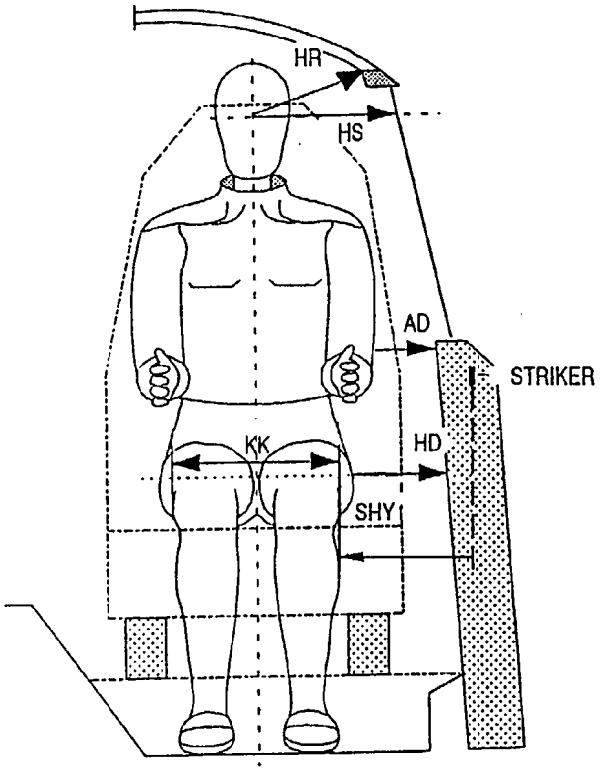


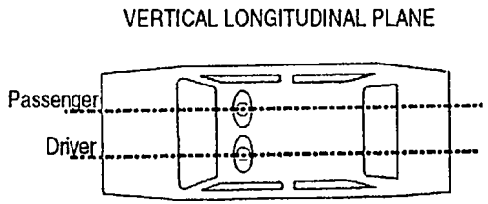
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS







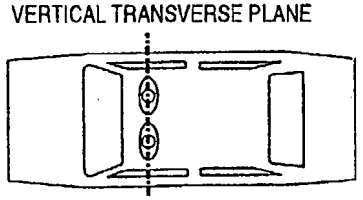


TABLE 14 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #354)	PASSENGER (SERIAL #1173)
WA	WINDSHIELD ANGLE	39	NA
SWA	STEERING WHEEL ANGLE	45	NA
SCA	STEERING COLUMN ANGLE	46	NA
SA	SEAT BACK ANGLE	11	11
HZ	HEAD TO ROOF	7.2	6.7
HH	HEAD TO HEADER	18.4	19.7
HW	HEAD TO WINDSHIELD	24.2	24.7
HR	HEAD TO SIDE HEADER	11.0	10.8
NR	NOSE TO RIM	22.0	NA
NA	NOSE TO RIM ANGLE	20	NA
CD	CHEST TO DASH	25.8	24.7
CS	STEERING WHEEL TO CHEST	14.5	NA
RA	RIM TO ABDOMEN	8.7	NA
KDL	LEFT KNEE TO DASH	8.6	4.6
KDR	RIGHT KNEE TO DASH	7.9	5.5
KDA	OUTBOARD KNEE TO DASH ANGLE	1	15
PA	PELVIC ANGLE	6	4
TA	TIBIAL ANGLE	45	46
KK	KNEE TO KNEE	13.5	10.6
ST*	STRIKER TO HEAD	22.5	21.7
	STRIKER TO HEAD ANGLE	-78	-83
SK*	STRIKER TO KNEE	23.6	25.5
	STRIKER TO KNEE ANGLE	5	5
SH*	STRIKER TO H-POINT	8.1	9.0
	STRIKER TO H-POINT ANGLE	32	23
SHY	STRIKER TO H-POINT (Y DIR.)	10.2	10.5
HS	HEAD TO SIDE WINDOW	14.0	13.8
HD	H-POINT TO DOOR	7.4	6.9
AD	ARM TO DOOR	5.0	5.4

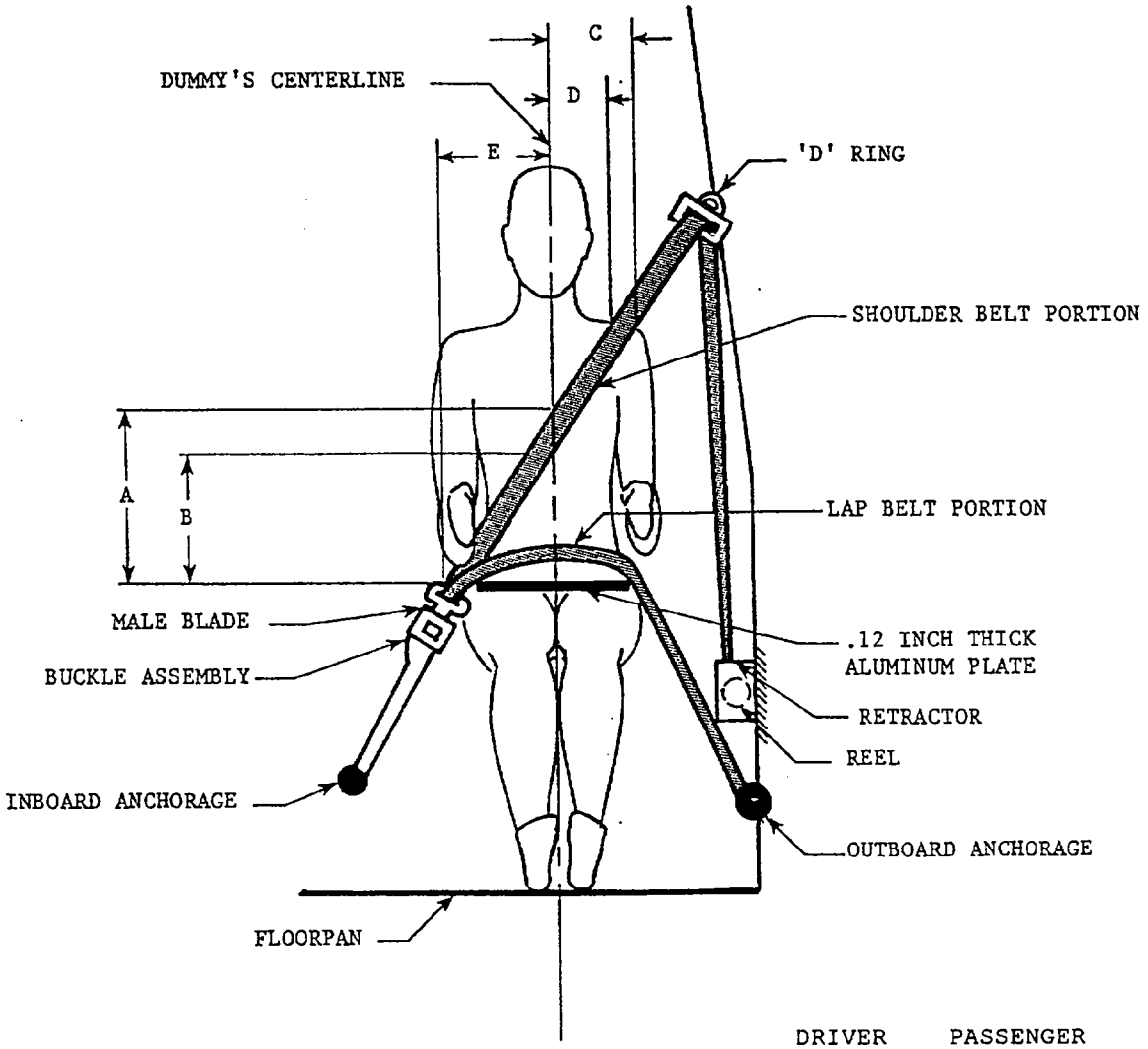
THE SEAT BACK ANGLE (SA°) IS MEASURED RELATIVE TO VERTICAL, ALL OTHER ANGLES ARE MEASURED RELATIVE TO HORIZONTAL.

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

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

ALL ANGLE MEASUREMENTS ARE IN DEGREES.

FIGURE 10 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUM. PLATE TO BELT UPPER EDGE	13.5	14.6
B - TOP SURFACE OF ALUM. PLATE TO BELT LOWER EDGE	10.5	11.5
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	8.4	7.2
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	5.5	4.8
E - DUMMY CENTERLINE TO INTERSECTION OF UPPER TORSO BELT AND LAP BELT	12.2	13.4

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 11 CAMERA POSITIONS

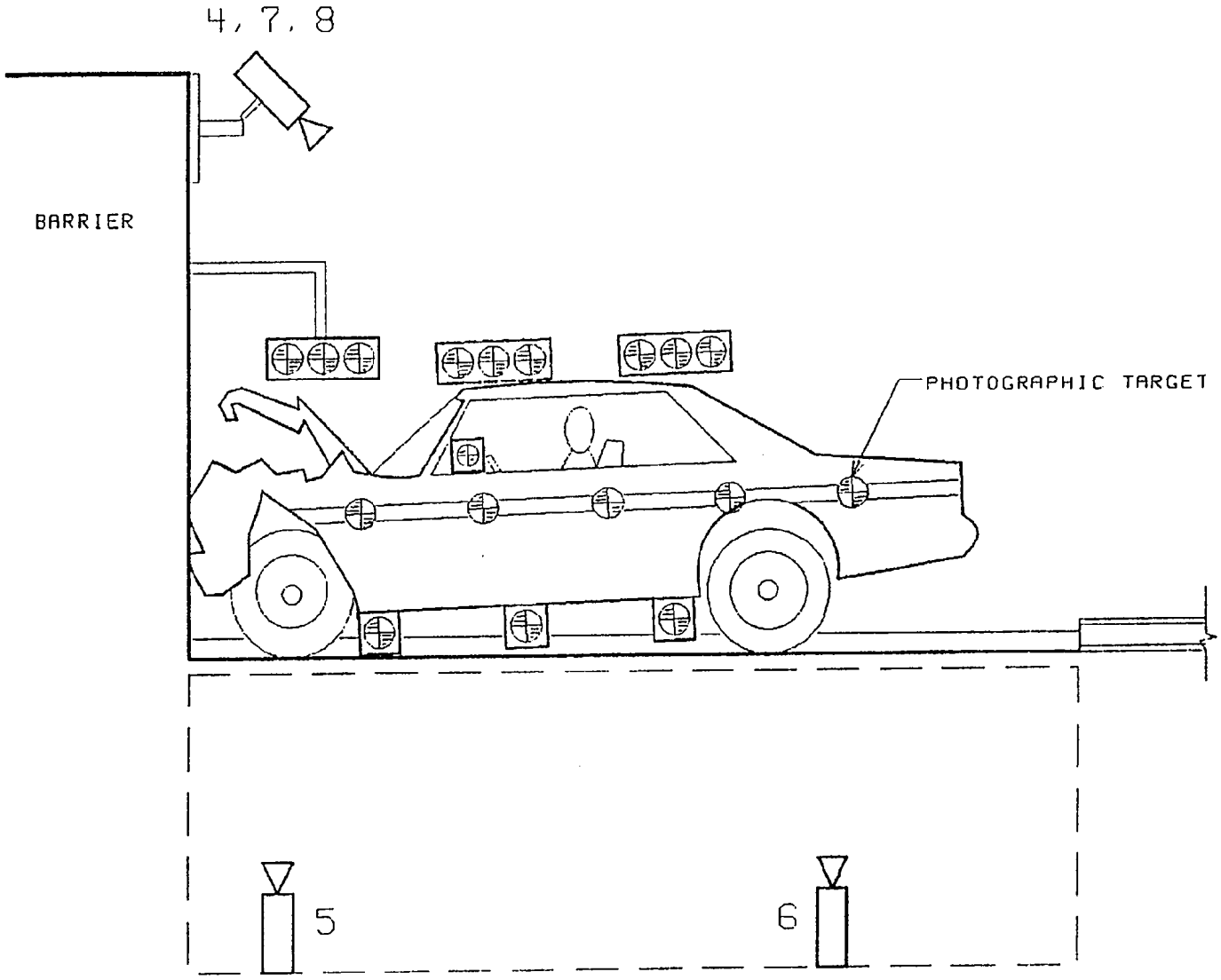


FIGURE 11 CAMERA POSITIONS, CONT'D.

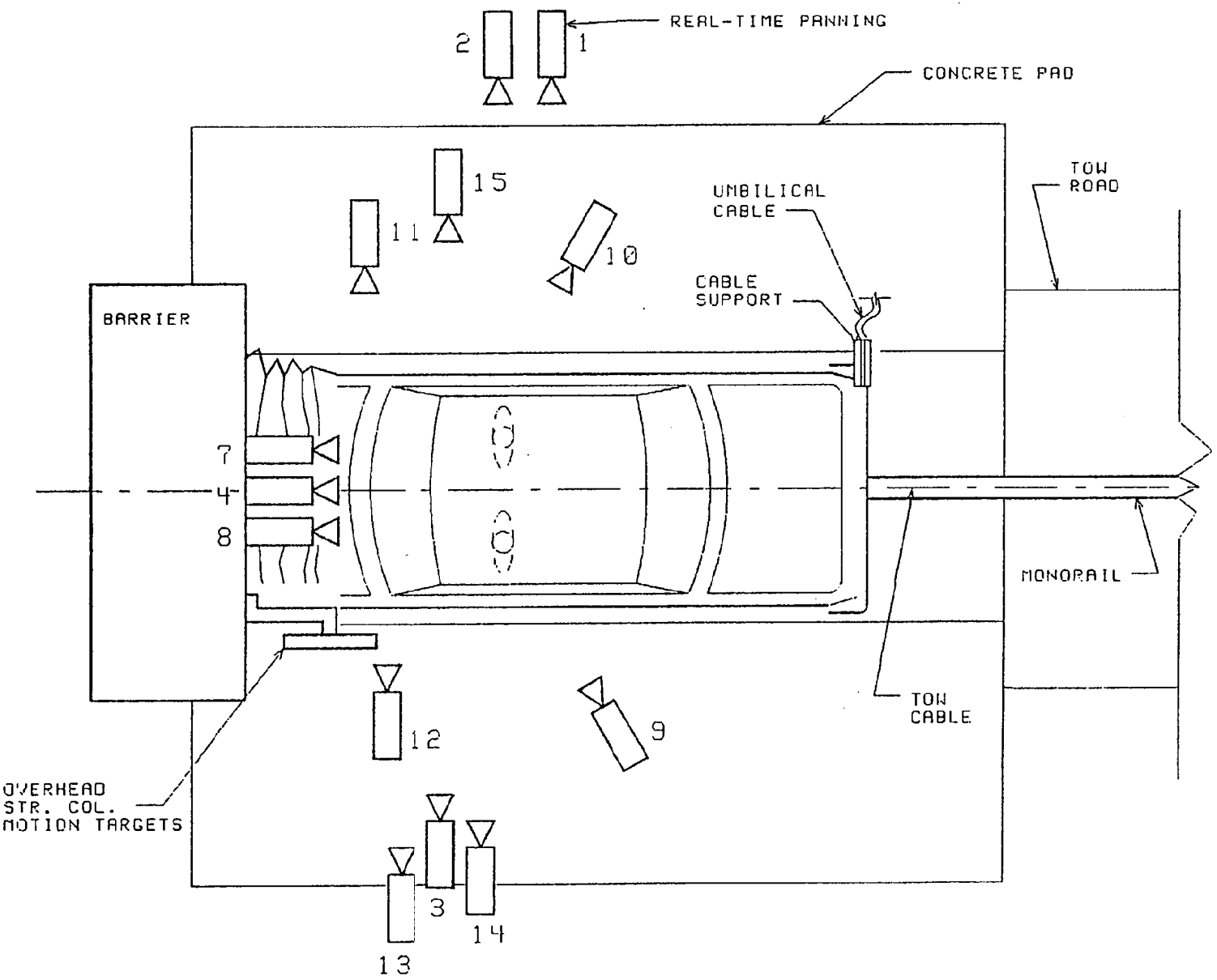


TABLE 15 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 930407 VEHICLE: Volkswagen EuroVan van

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)* X	Y	Z	ANGLE** (DEG)	FILM PLANE TO HEAD TARGET(IN)	LENS (MM)	FILM SPEED (FPS)
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	498
3	Left vehicle crush	-41.5	295.0	44.0	-4	231.0	25	1025
4	Windshield front view	-6.0	0.0	84.0	-40	NA	13	495
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	1000
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	82.0	25	498
10	Passenger kinematics	-152.1	-116.0	87.0	-26	77.0	25	510
11	Right windshield intrusion	-38.1	-306.1	44.0	0	NA	50	500
12	Left windshield instrusion	-53.0	309.4	42.3	0	NA	50	505
13	Steering column motion	-93.0	285.0	103.0	-14	NA	25	505
14	Steering column motion	-93.0	285.0	75.1	-9	NA	25	498
15	Passenger kinematics	-38.8	-293.0	45.3	-4	220.0	25	1008
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

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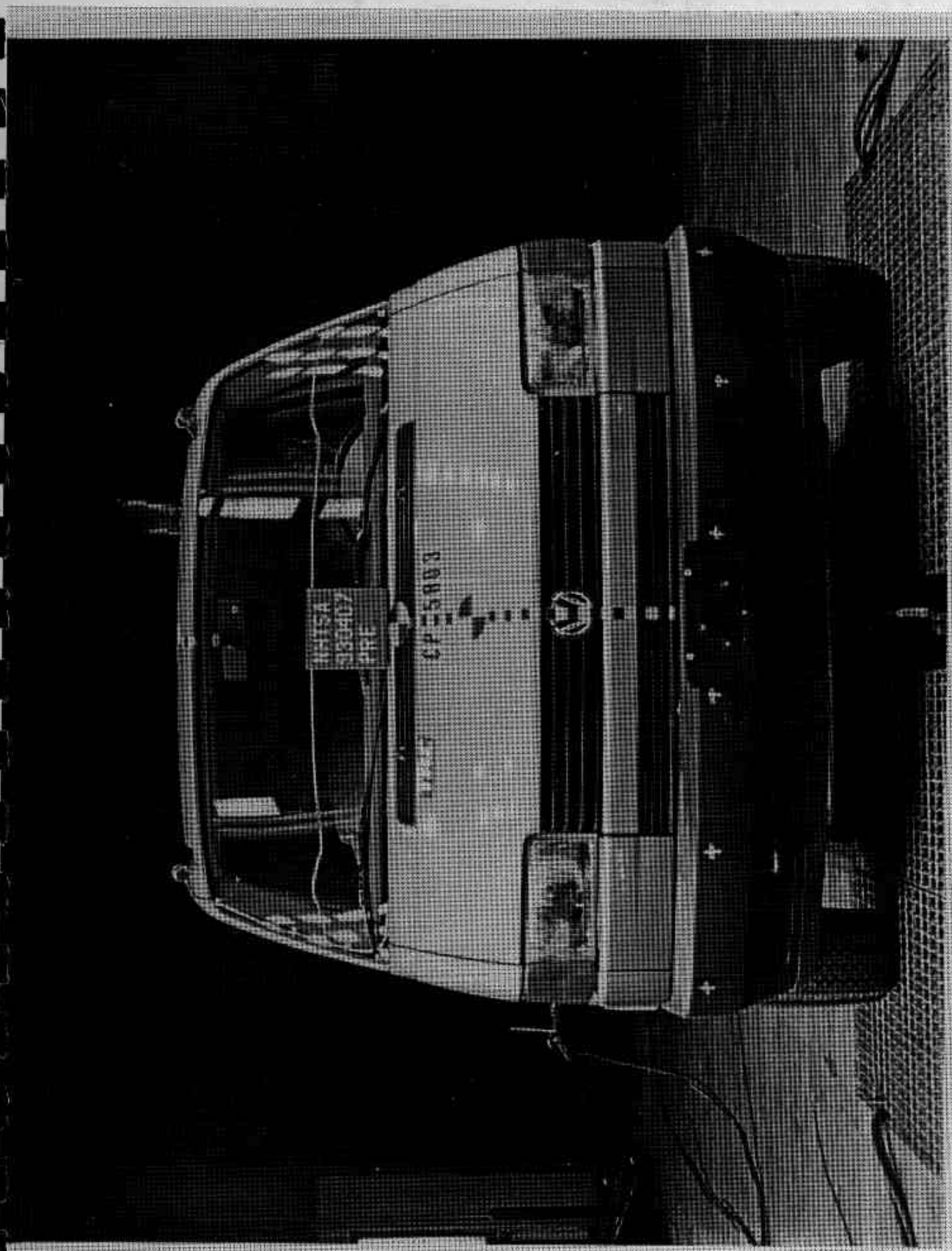

Figure A-1. PRE-TEST FRONT VIEW

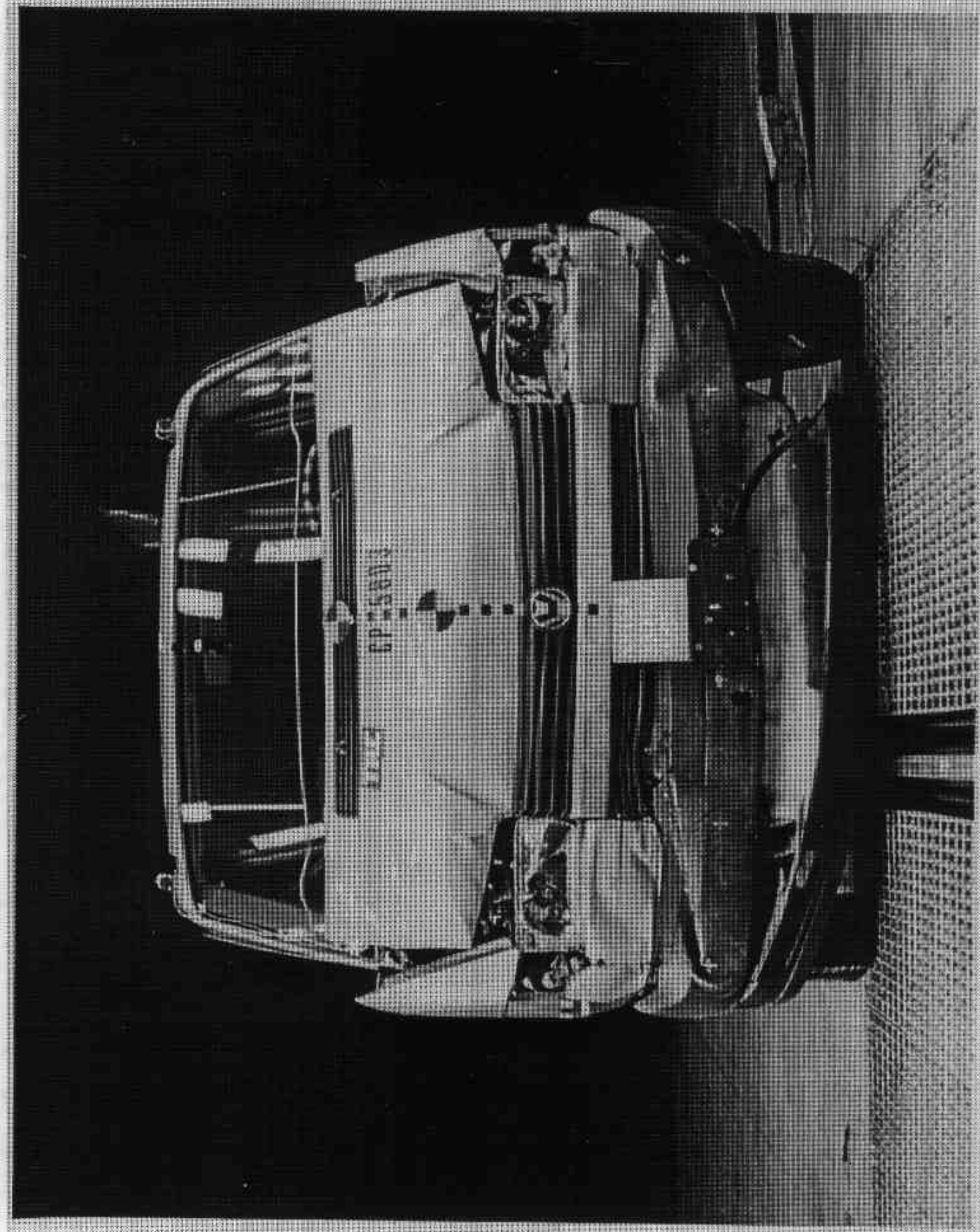

Figure A-2. POST-TEST FRONT VIEW

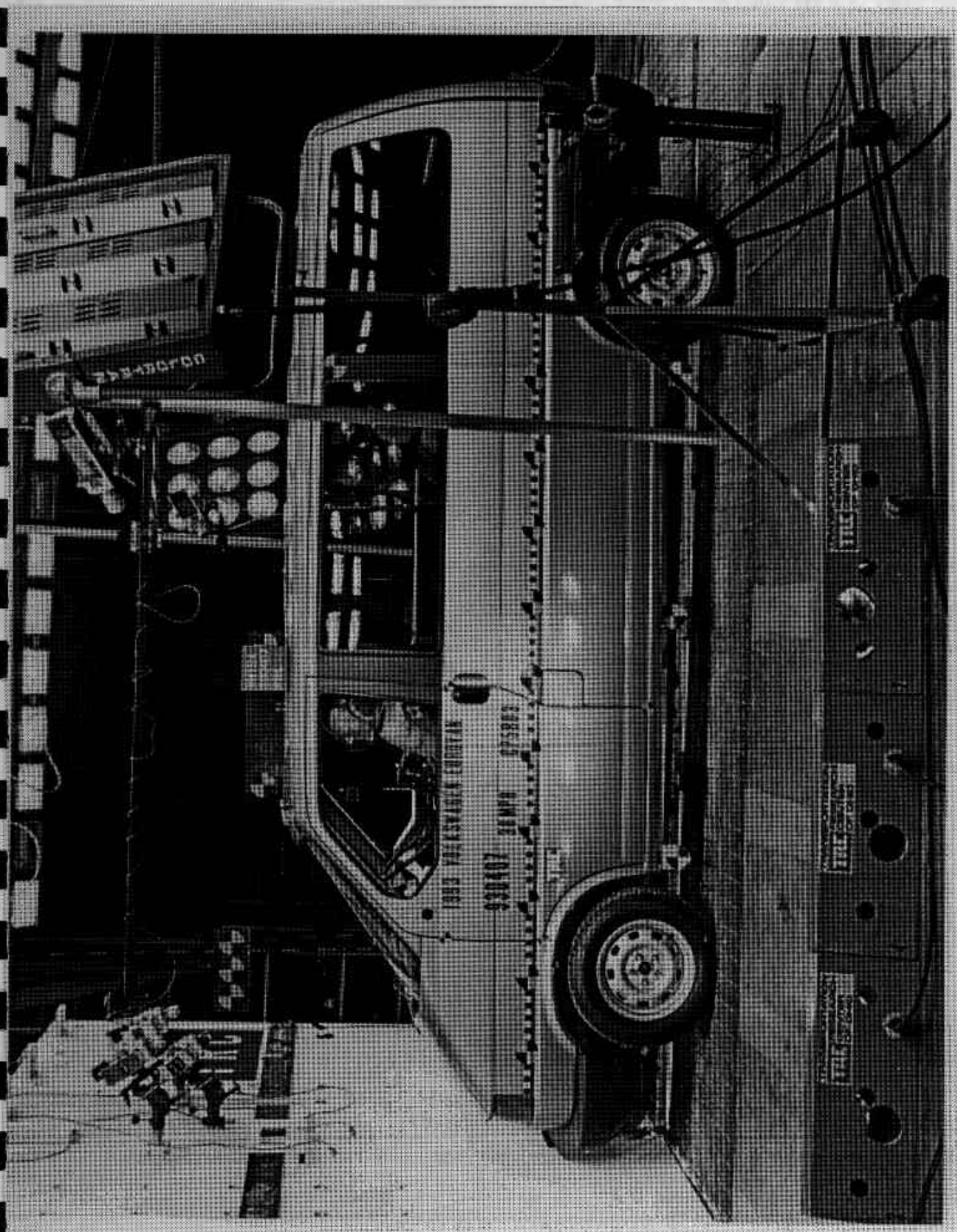

Figure A-3. PRE-TEST LEFT SIDE VIEW

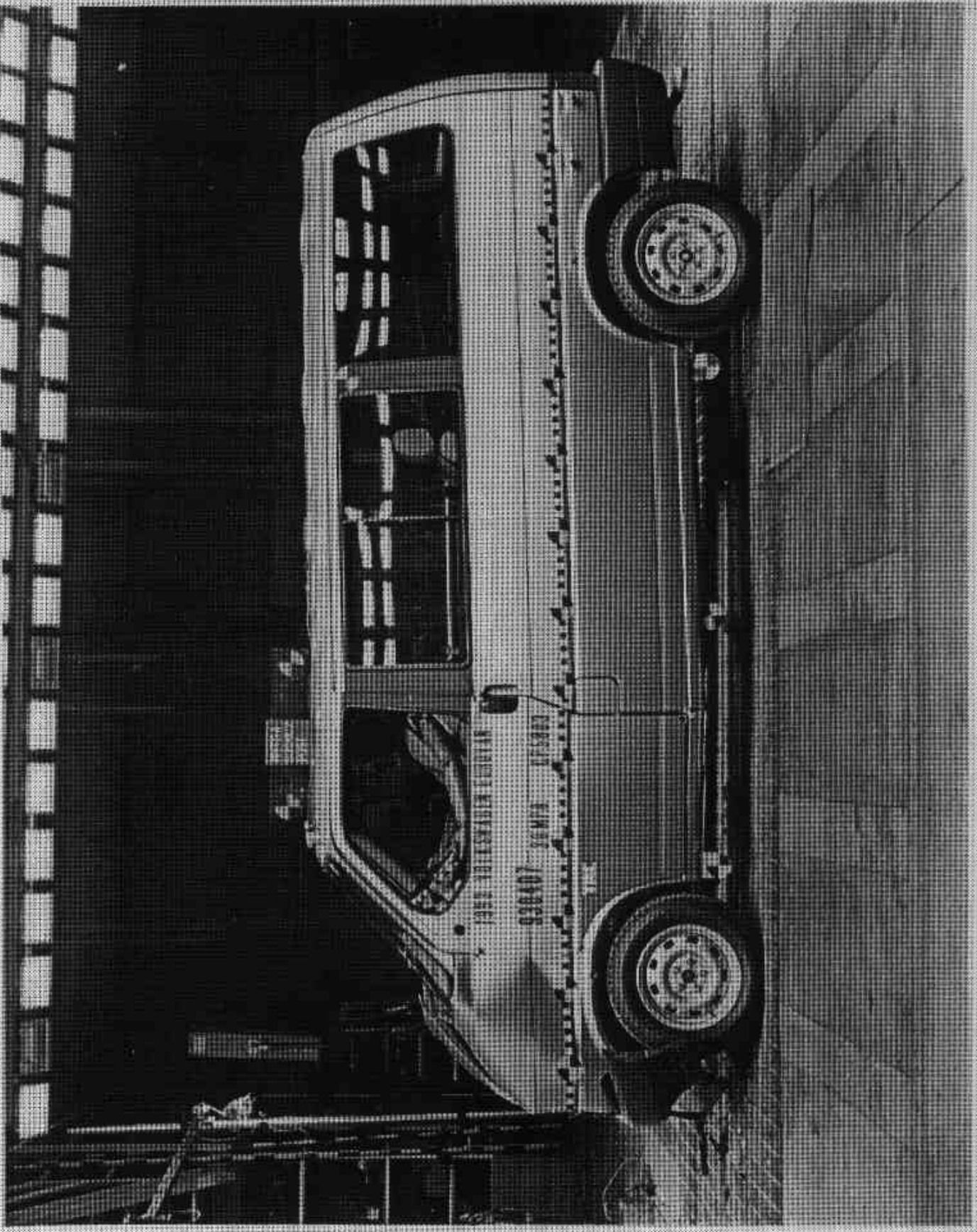

Figure A-4. POST-TEST LEFT SIDE VIEW

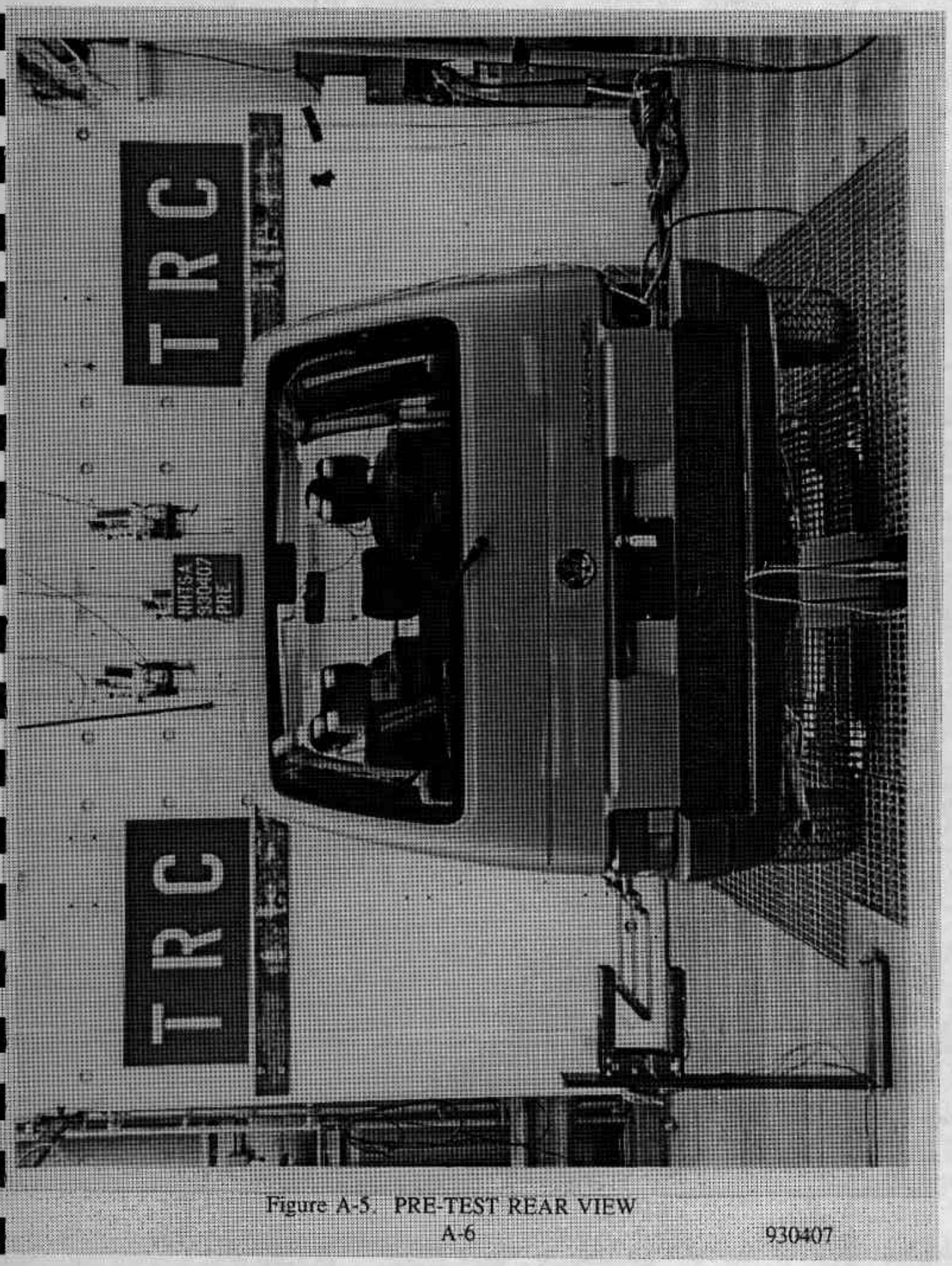

Figure A-5 PRE-TEST REAR VIEW

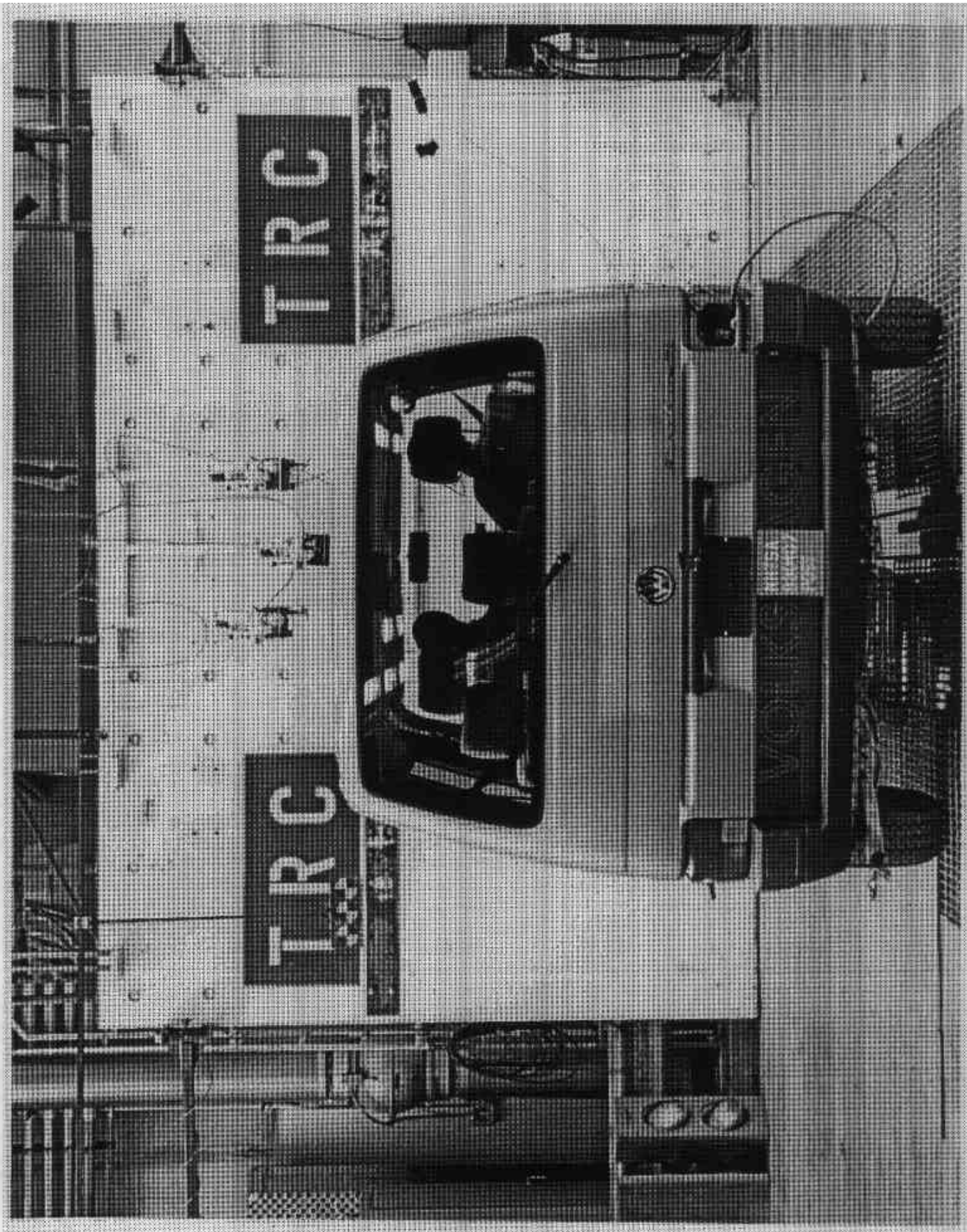

Figure A-6. POST-TEST REAR VIEW

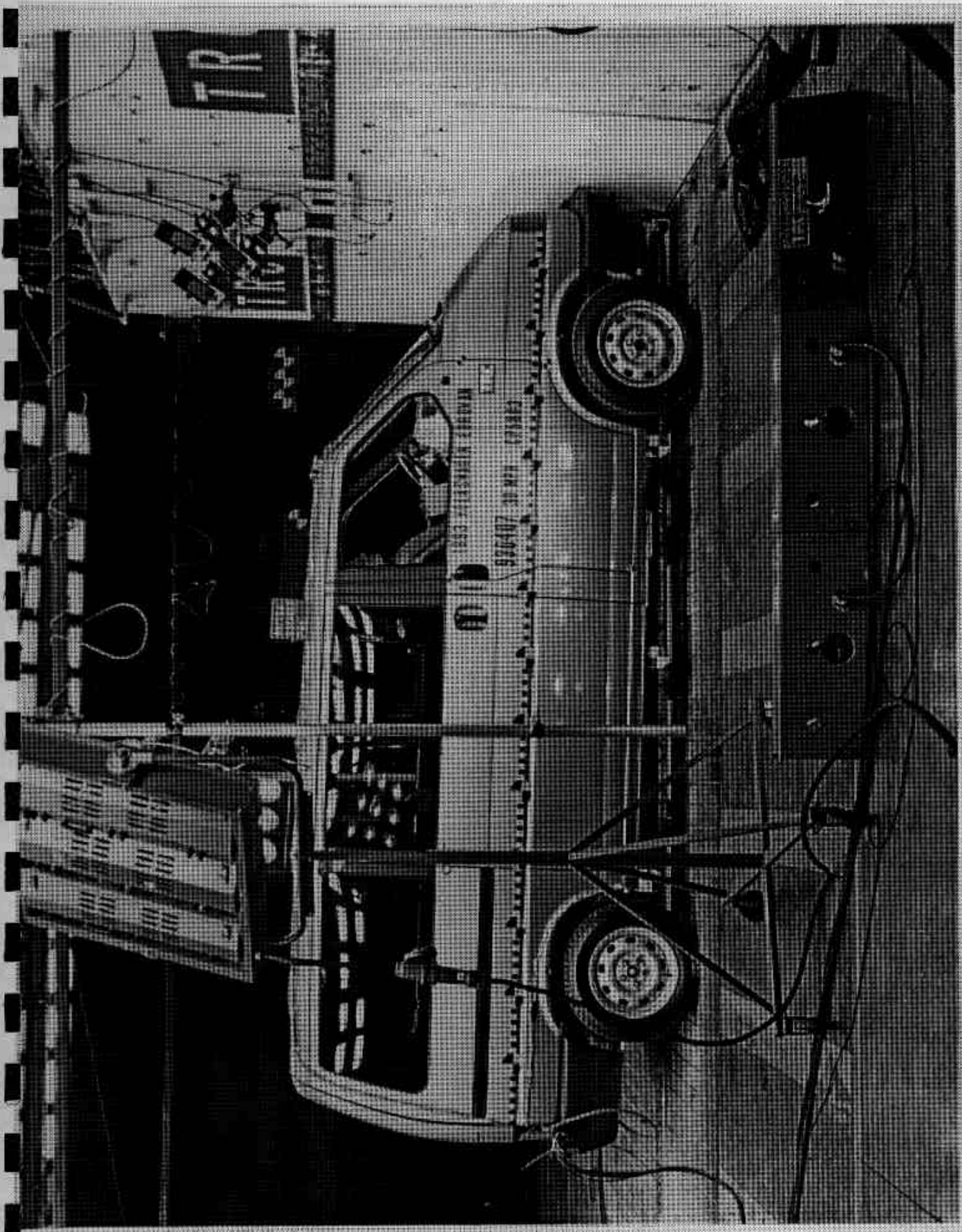

Figure A-7. PRE-TEST RIGHT SIDE VIEW

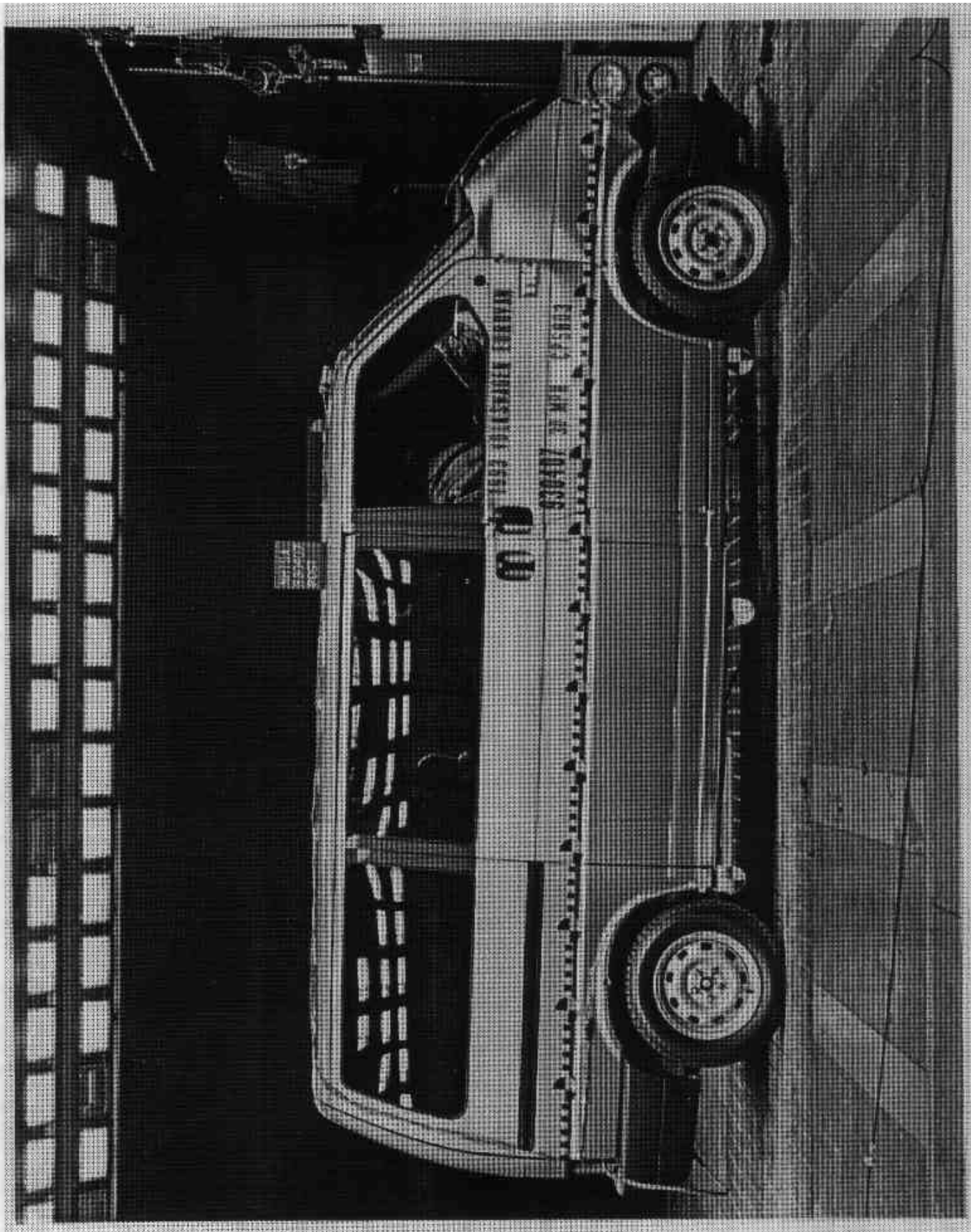

Figure A-8. POST-TEST RIGHT SIDE VIEW

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

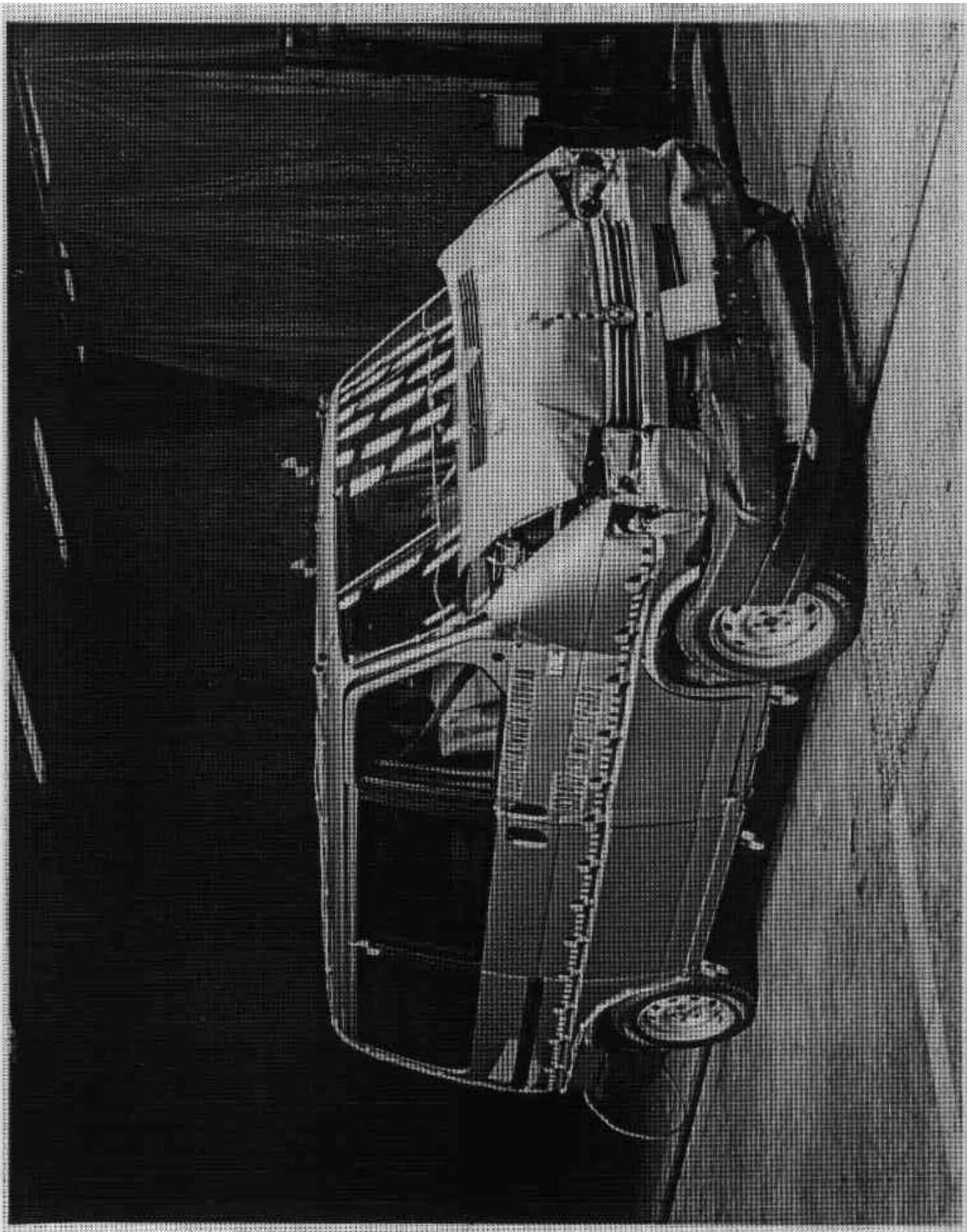

Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

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

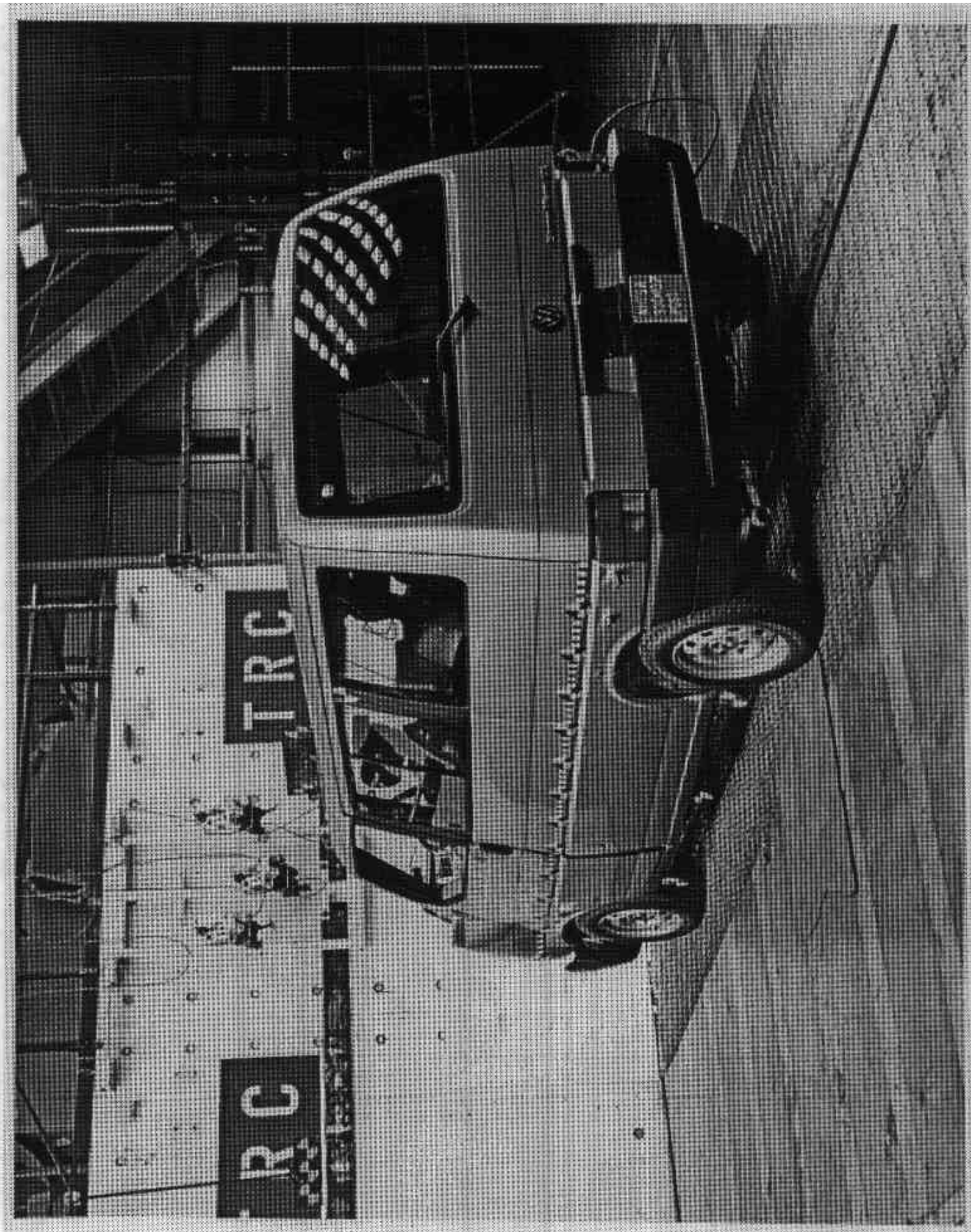

Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

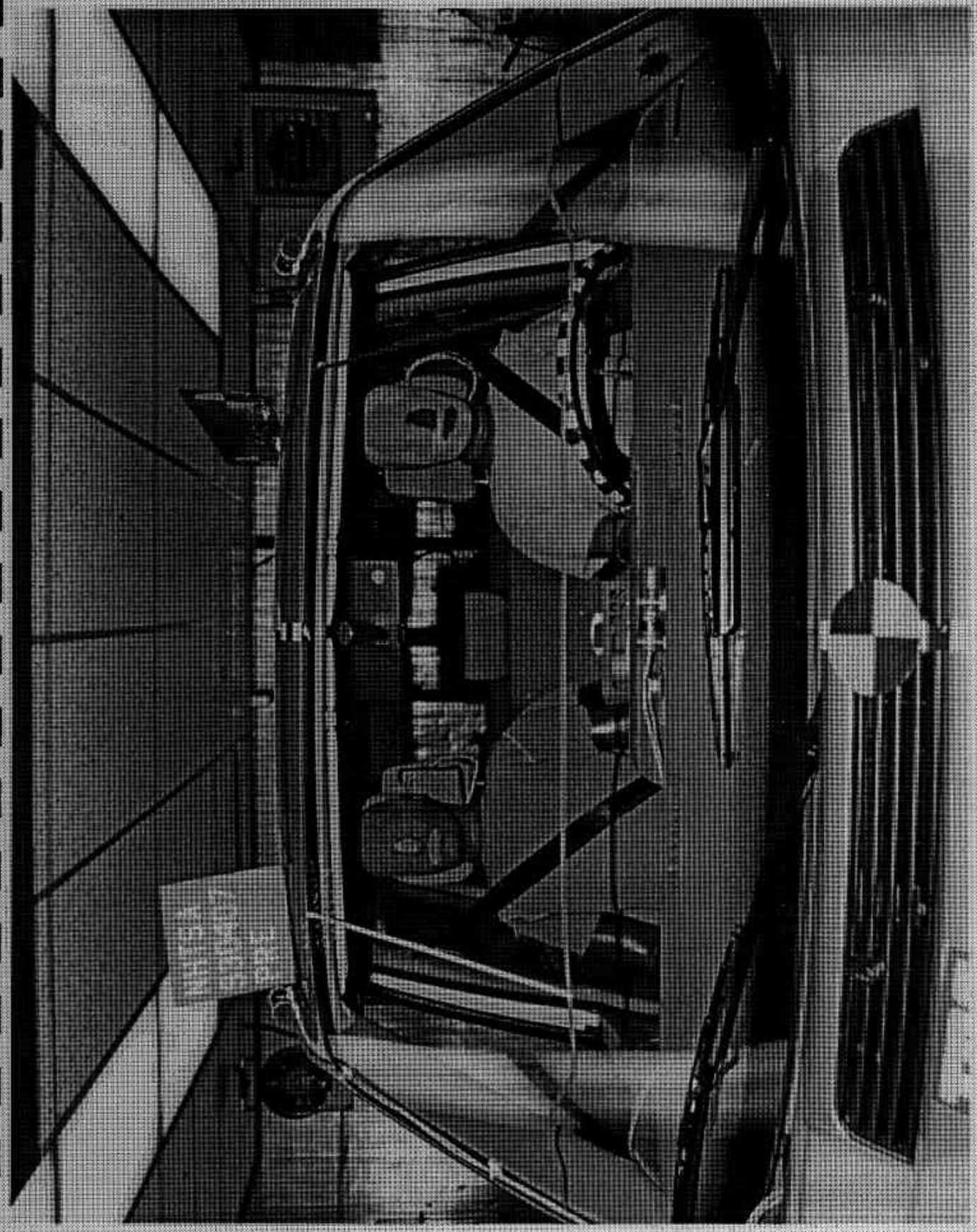

Figure A-13. PRE-TEST WINDSHIELD VIEW

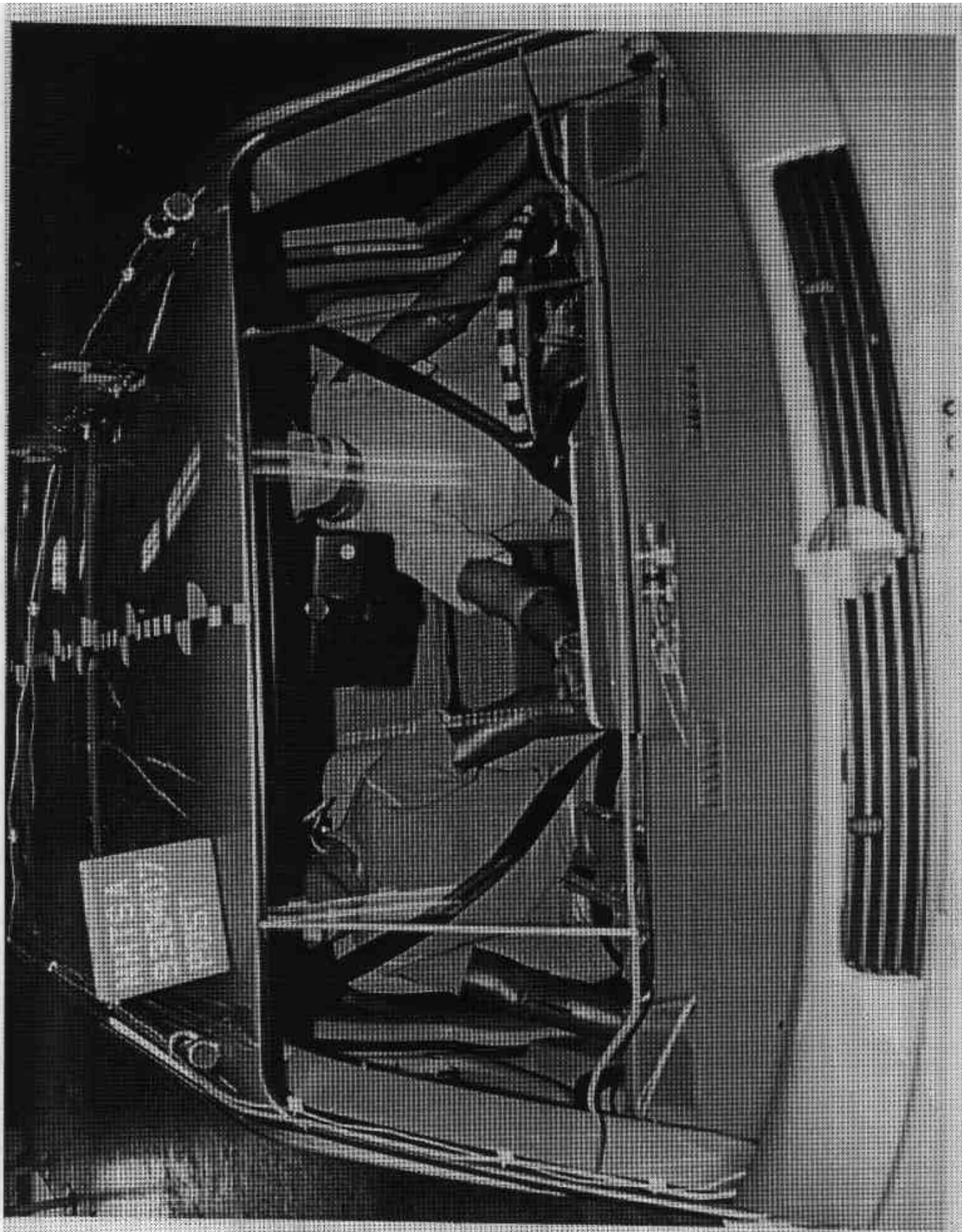

Figure A-14. POST-TEST WINDSHIELD VIEW

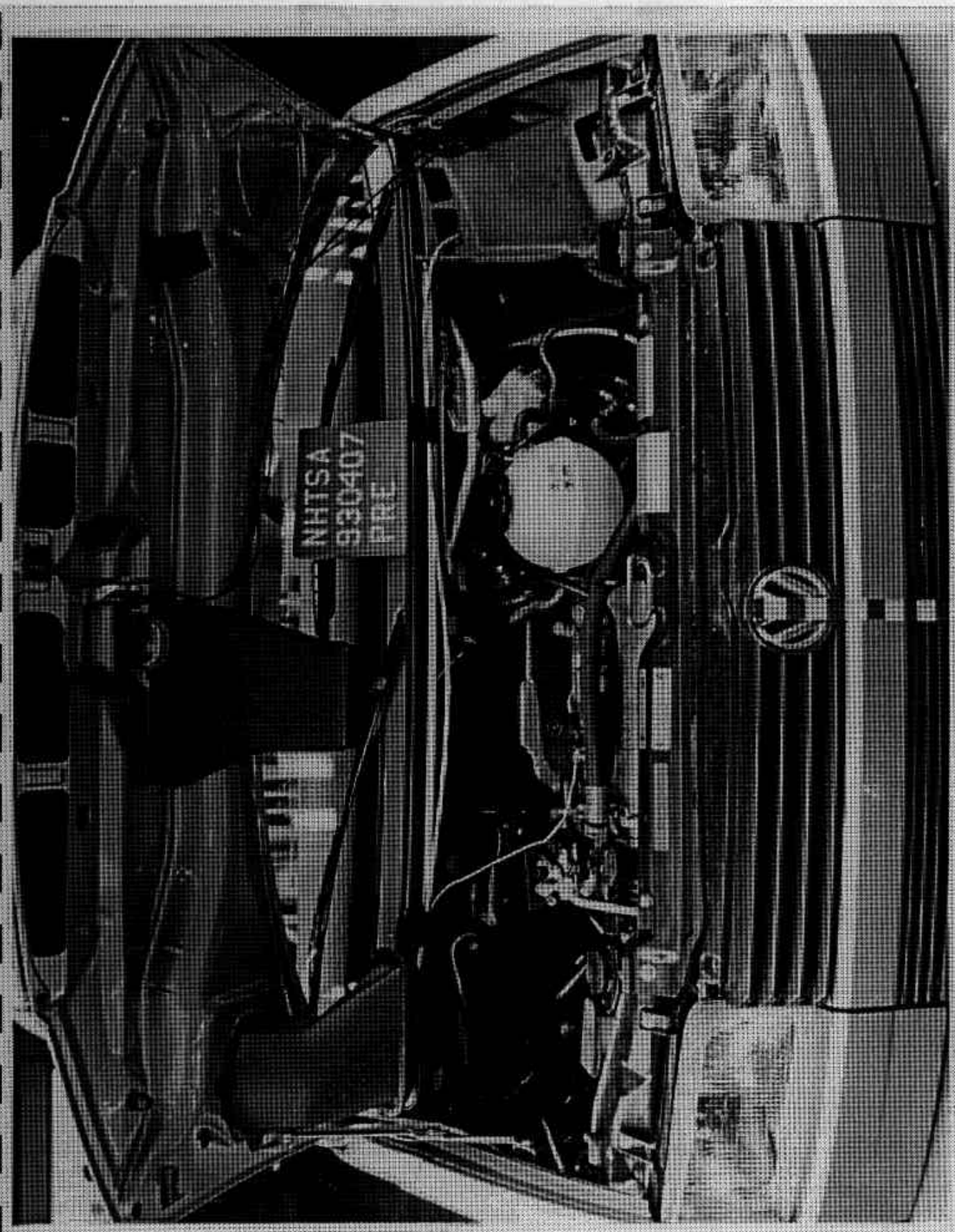

Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

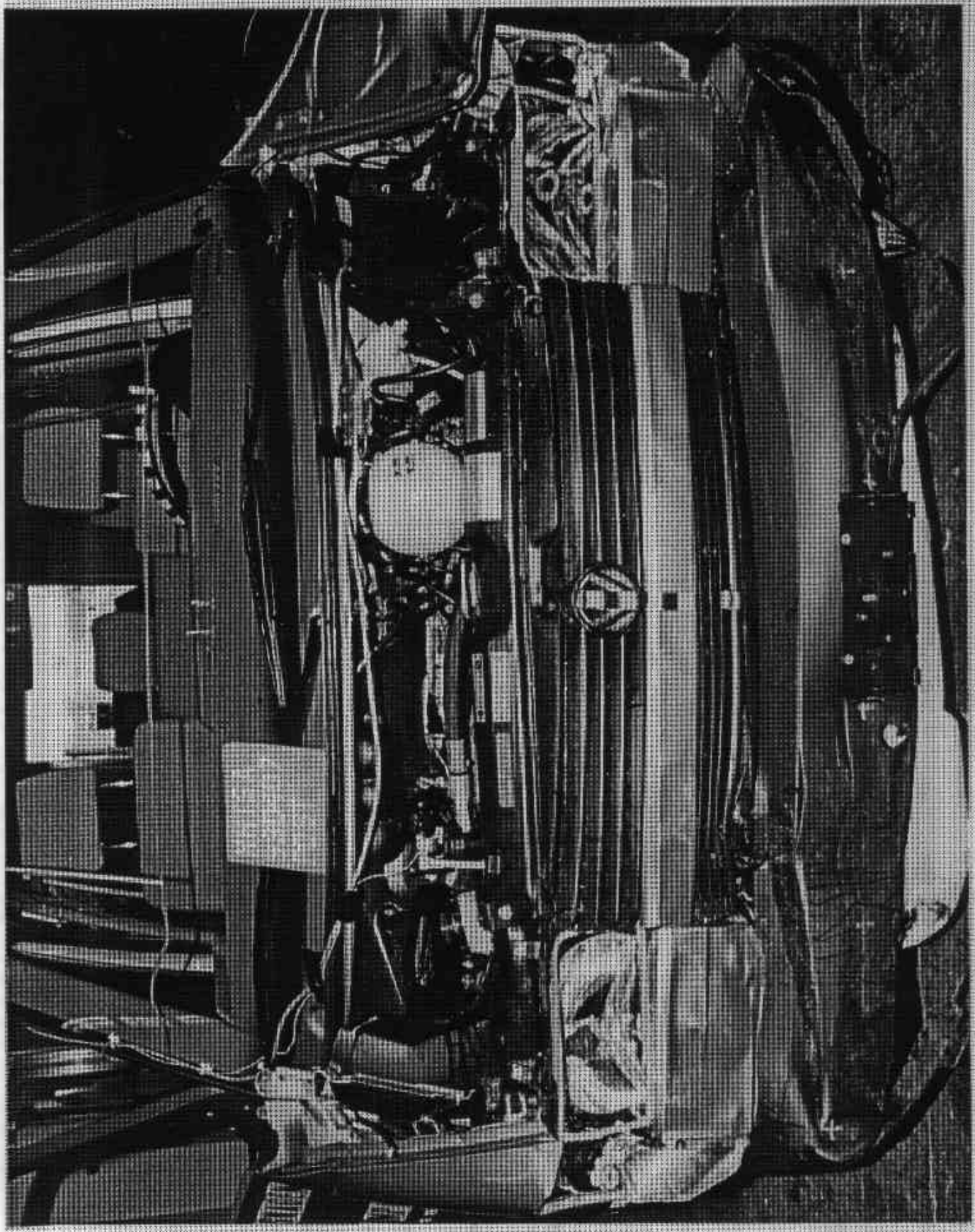

Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

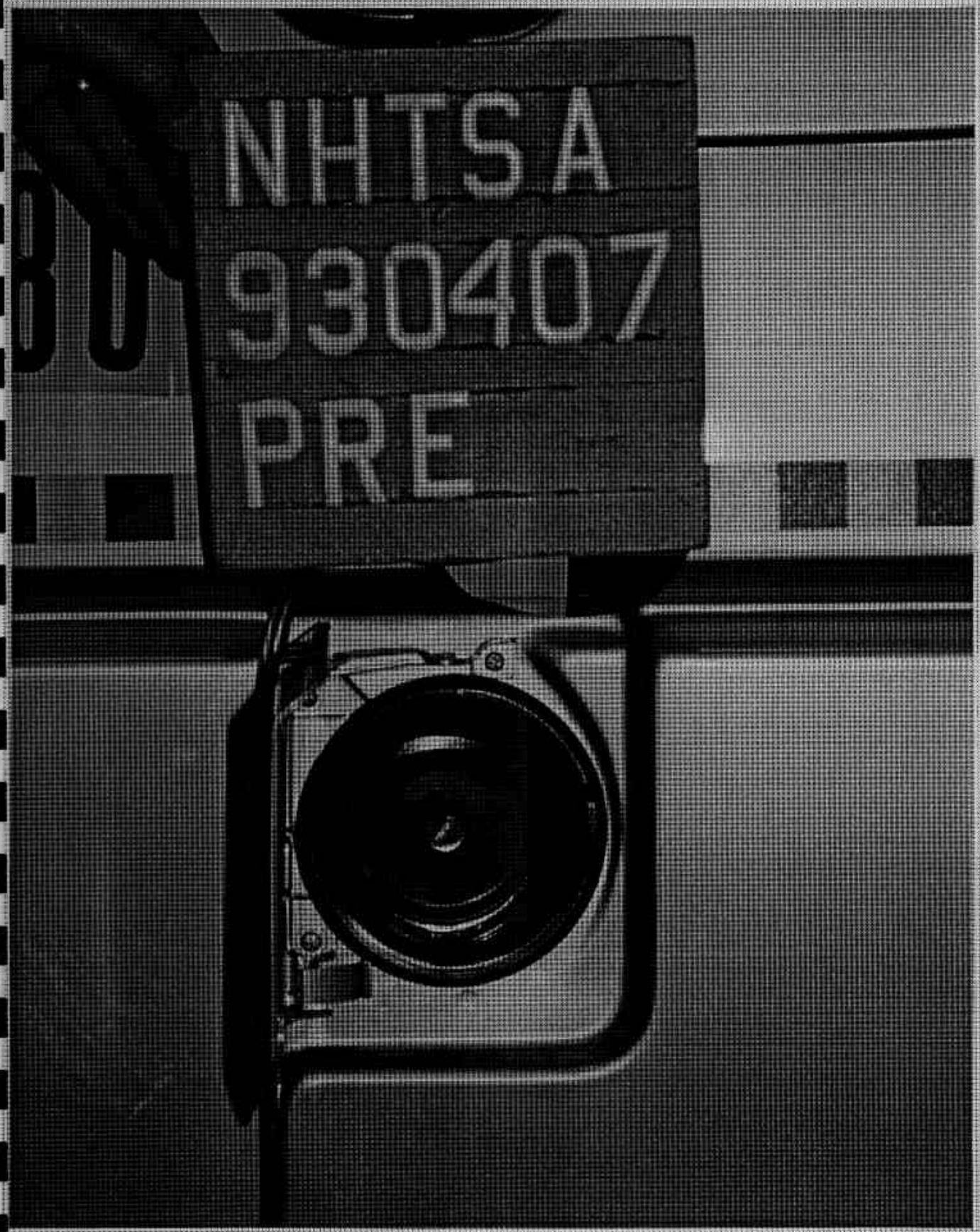

Figure A-17. PRE-TEST FUEL FILLER CAP VIEW

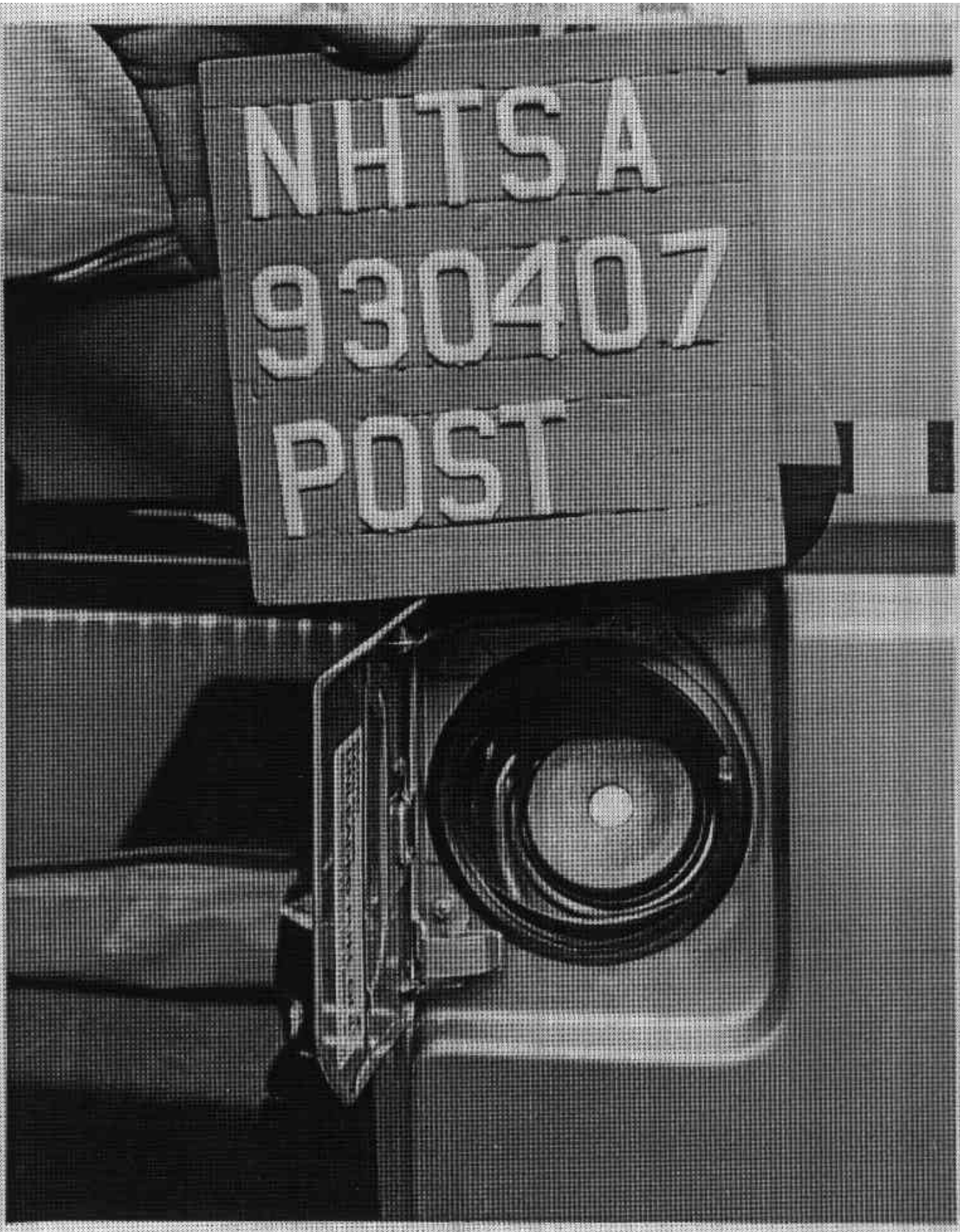

Figure A-18. POST-TEST FUEL FILLER CAP VIEW

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

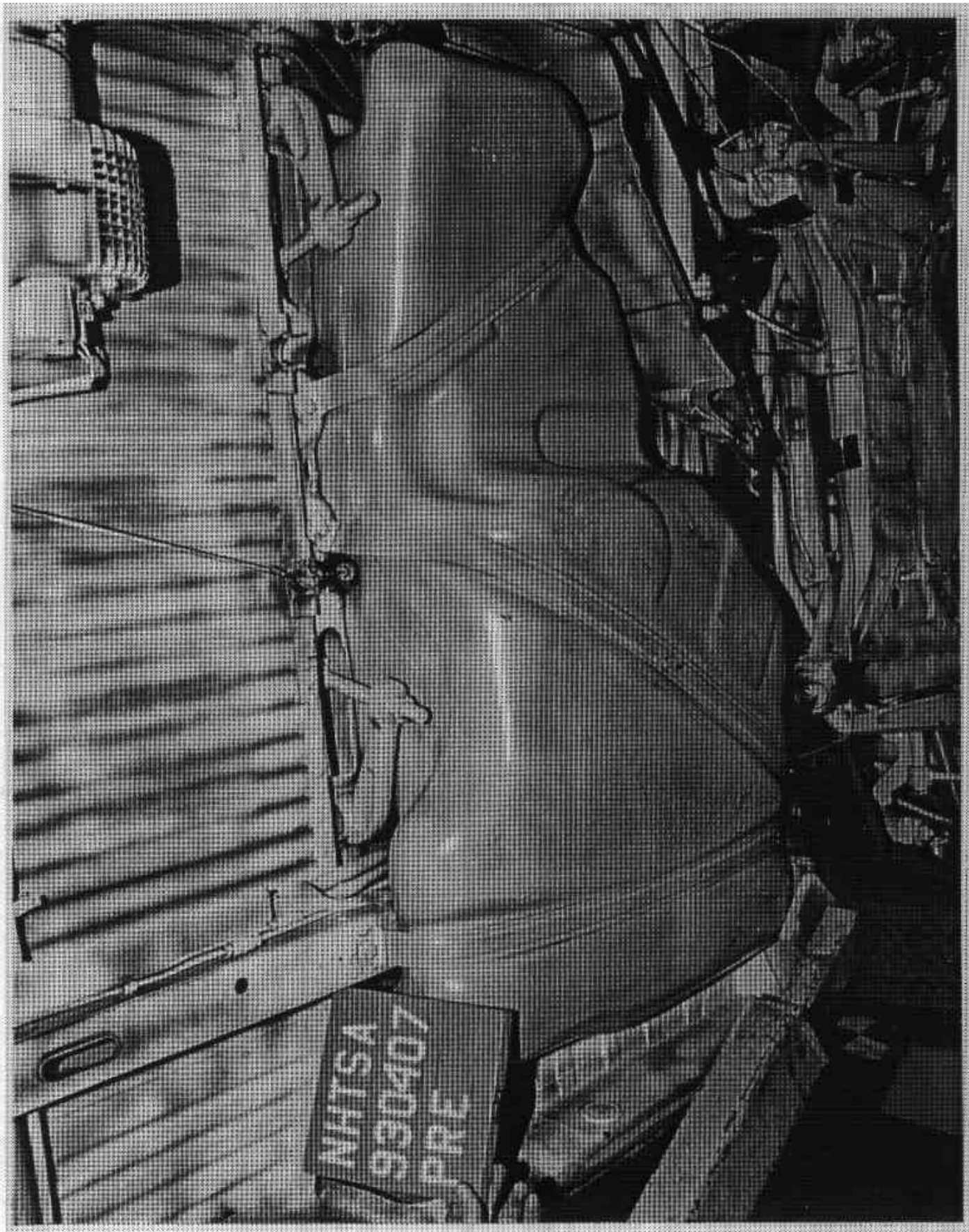

Figure A-20. PRE-TEST FUEL TANK VIEW

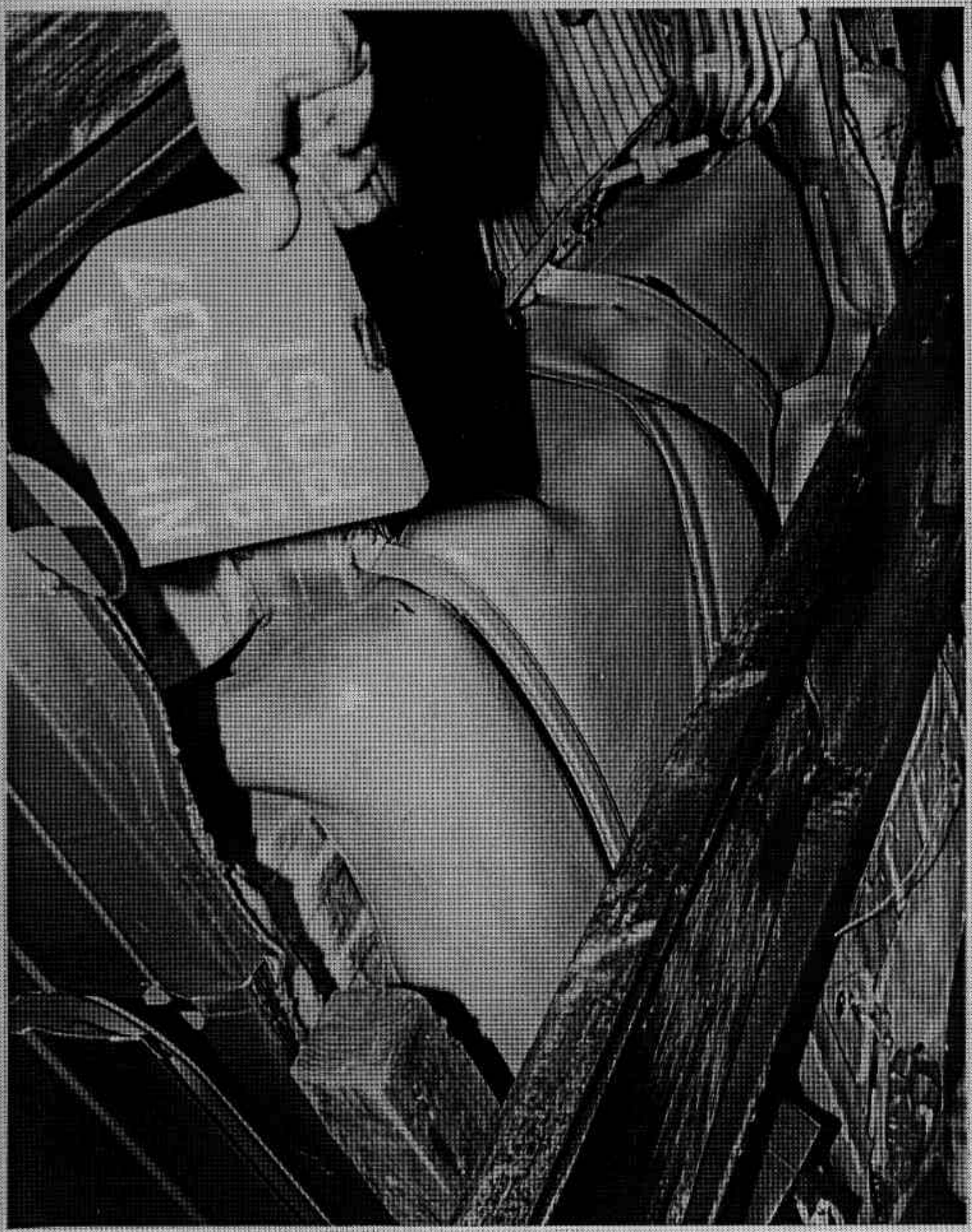

Figure A-21. POST-TEST FUEL FILLER NECK & FUEL TANK VIEW

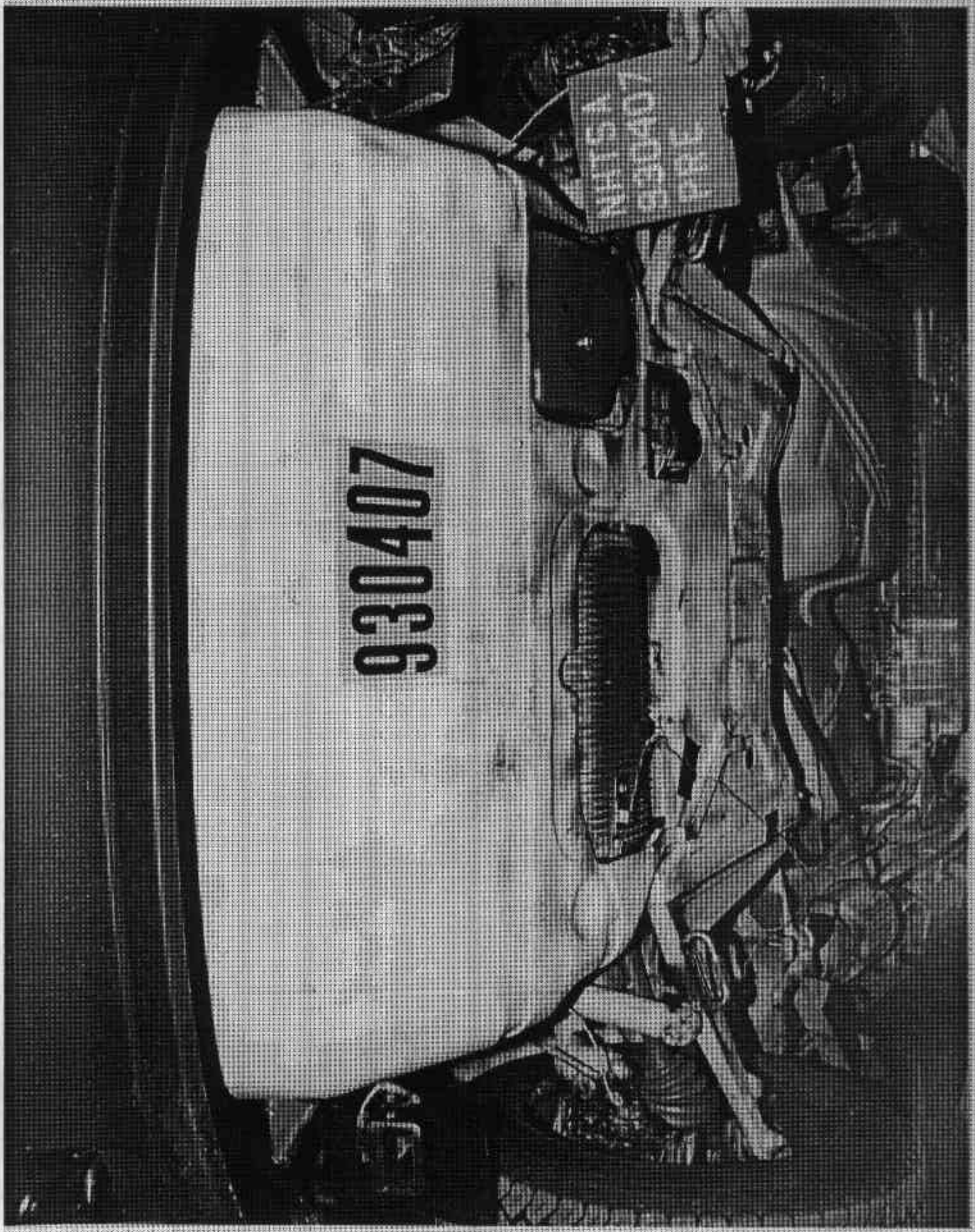

Figure A-22. PRE-TEST FRONT UNDERBODY VIEW

Figure A-23. POST-TEST FRONT UNDERBODY VIEW

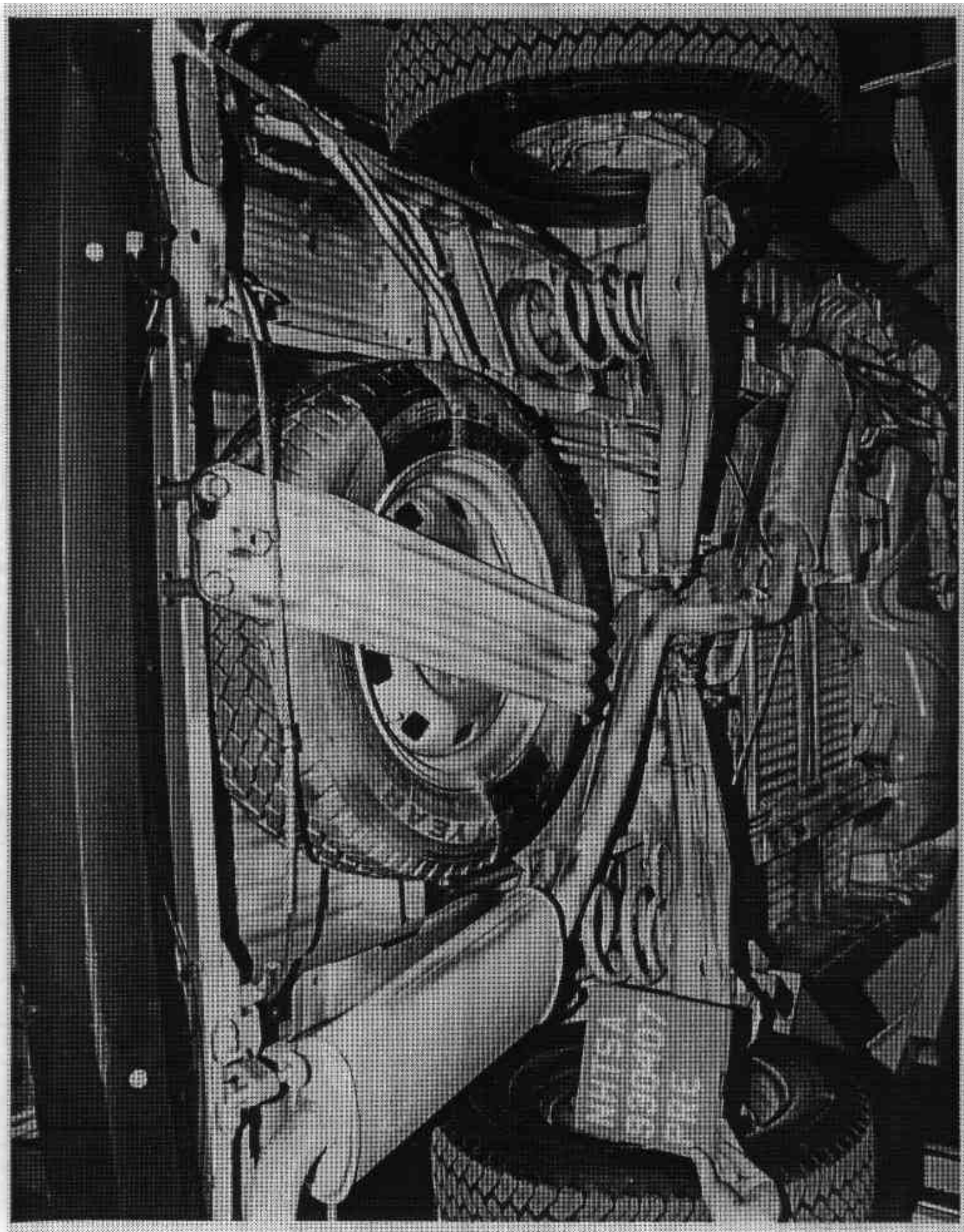

Figure A-24. PRE-TEST REAR UNDERBODY VIEW

Figure A-25. POST-TEST REAR UNDERBODY VIEW

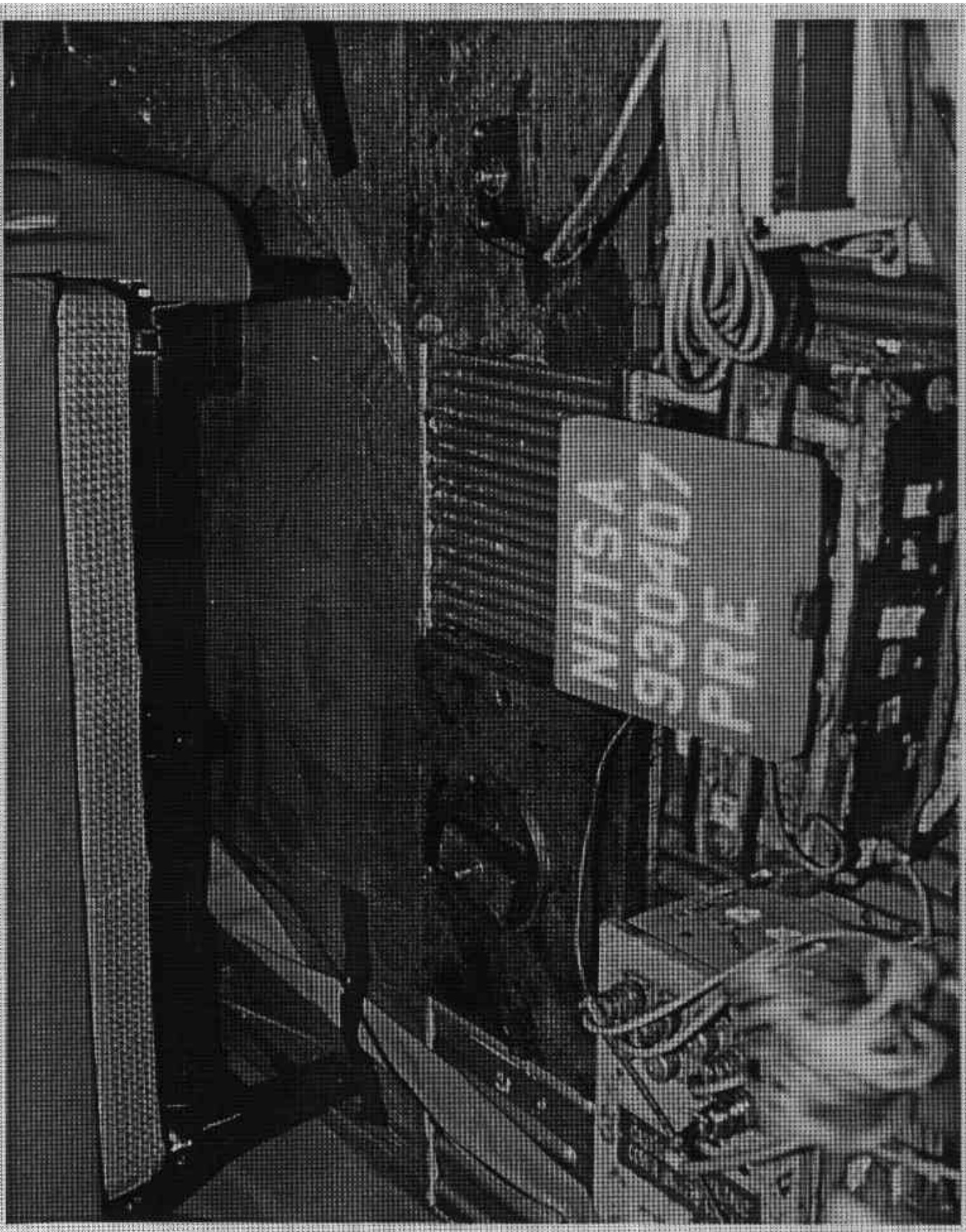

Figure A-26. PRE-TEST BALLAST LOCATION VIEW

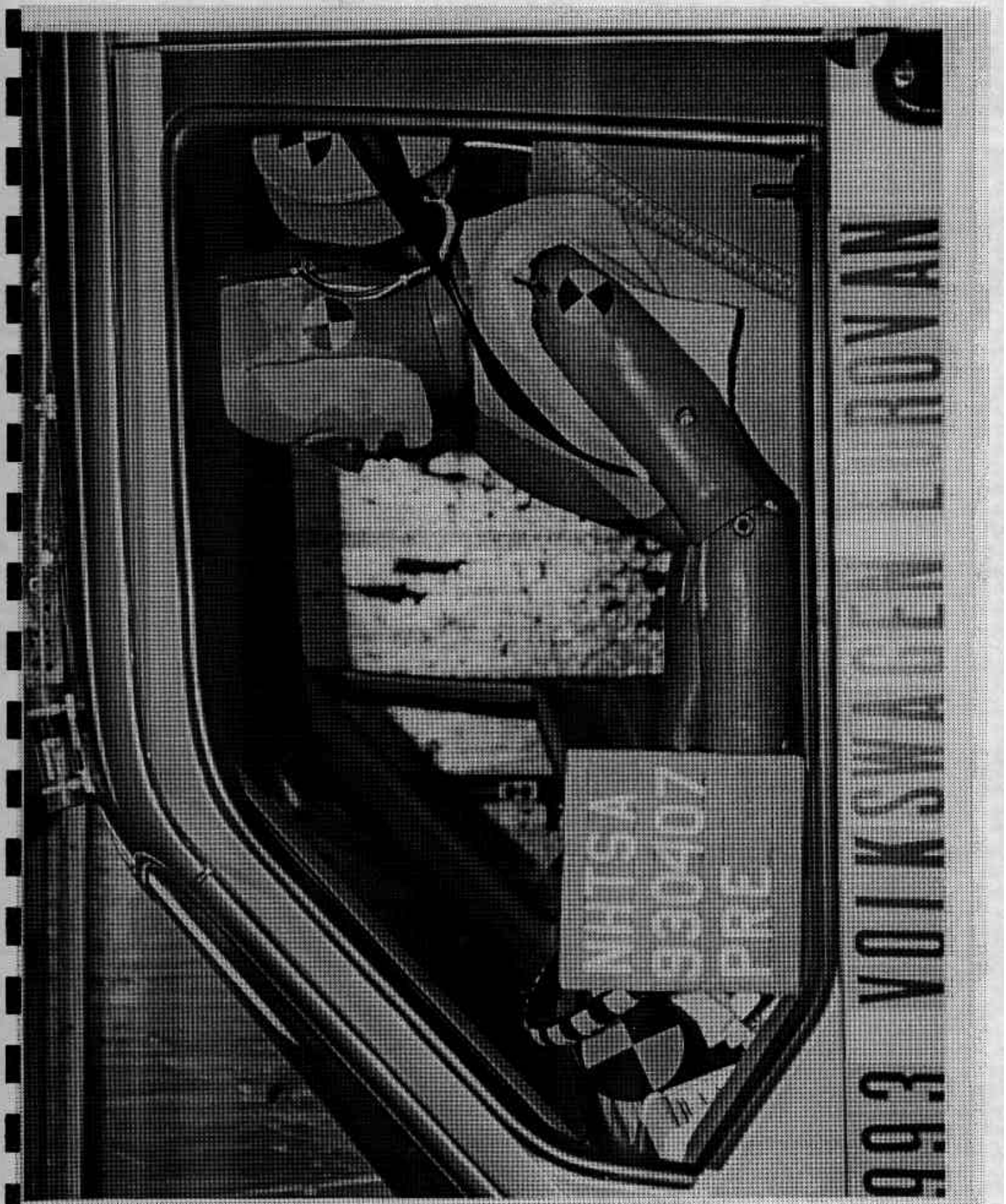

Figure A-27. PRE-TEST DRIVER DUMMY POSITION VIEW

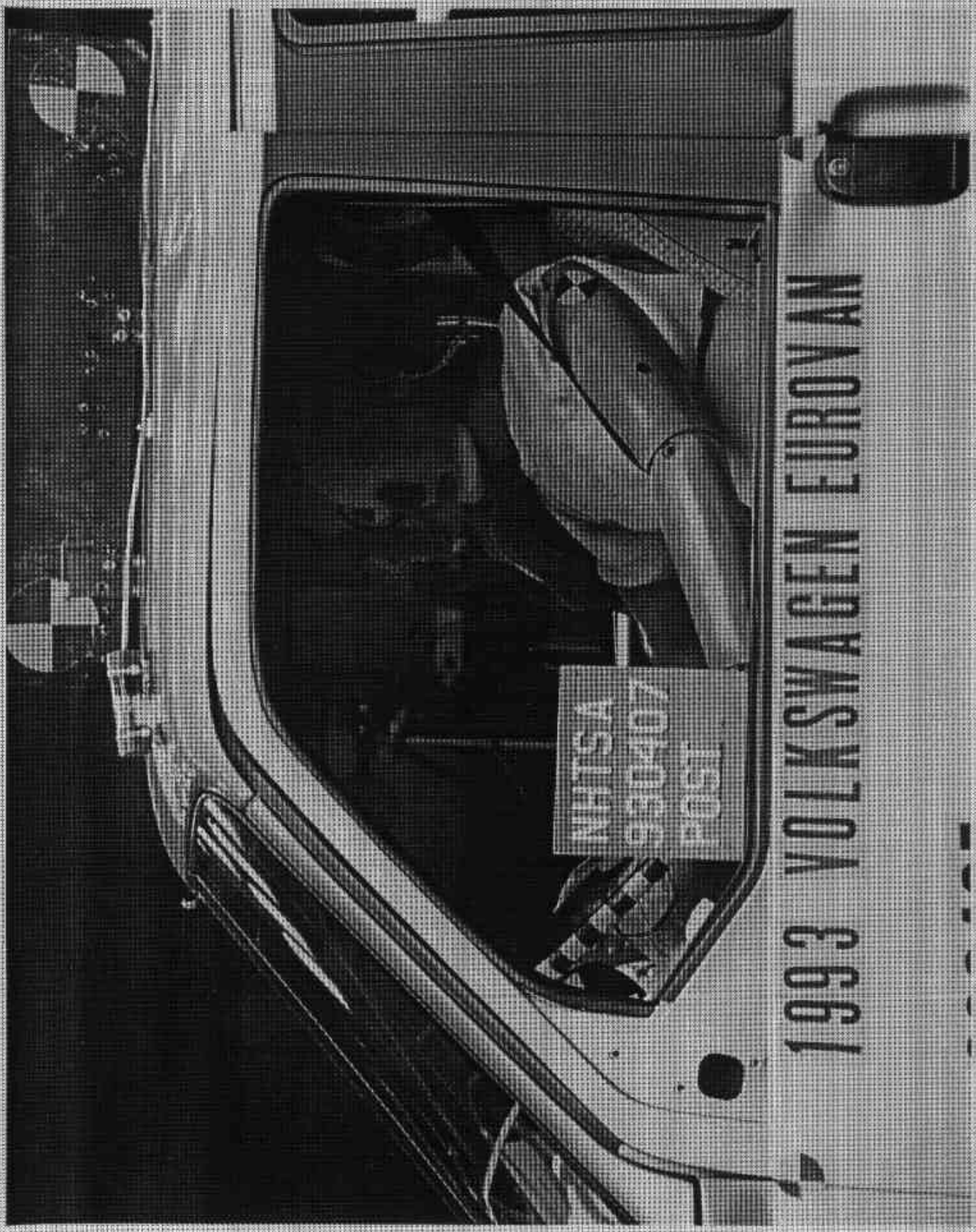

Figure A-28. POST-TEST DRIVER DUMMY POSITION VIEW

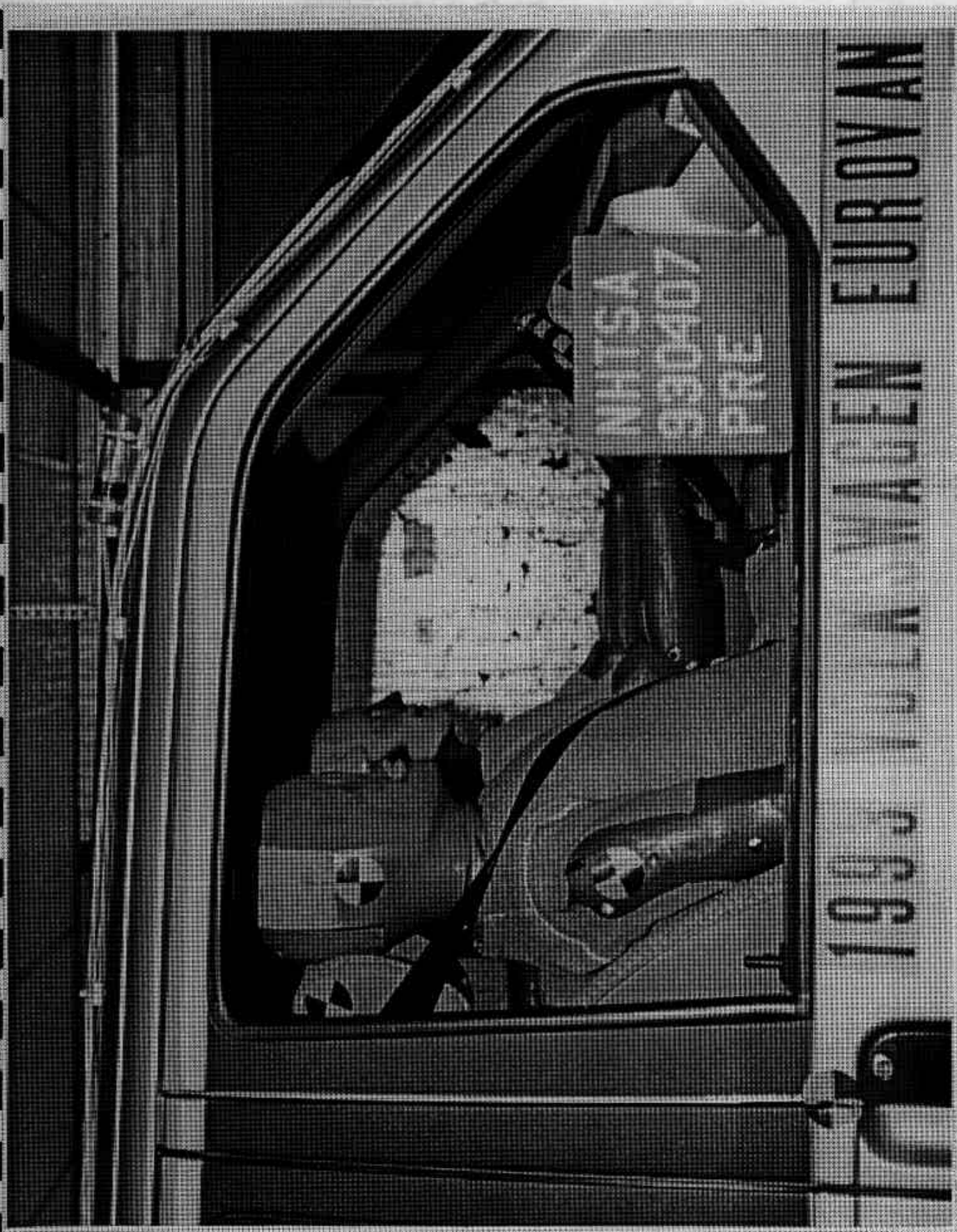

Figure A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW

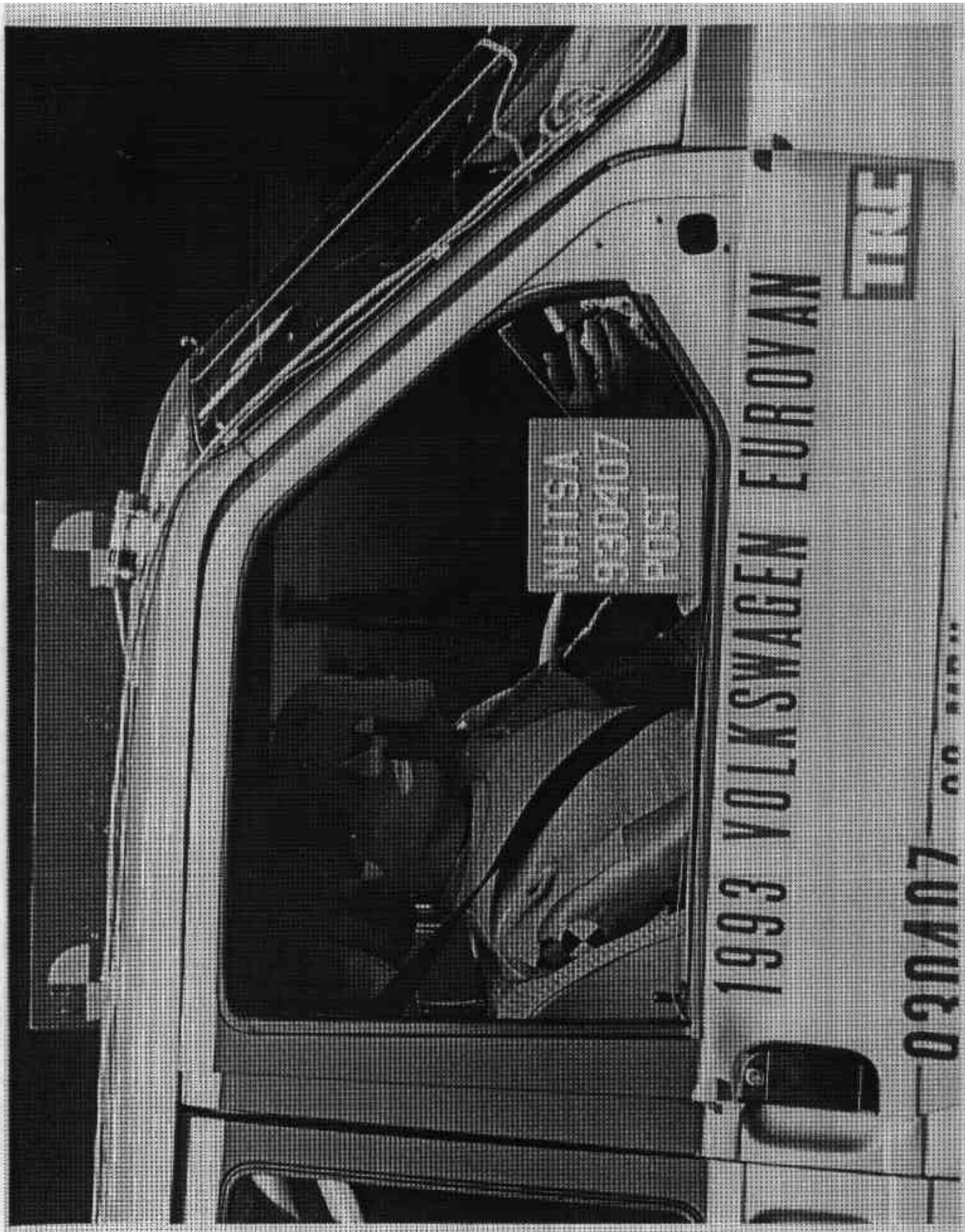

Figure A-30. POST-TEST PASSENGER DUMMY POSITION VIEW

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

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

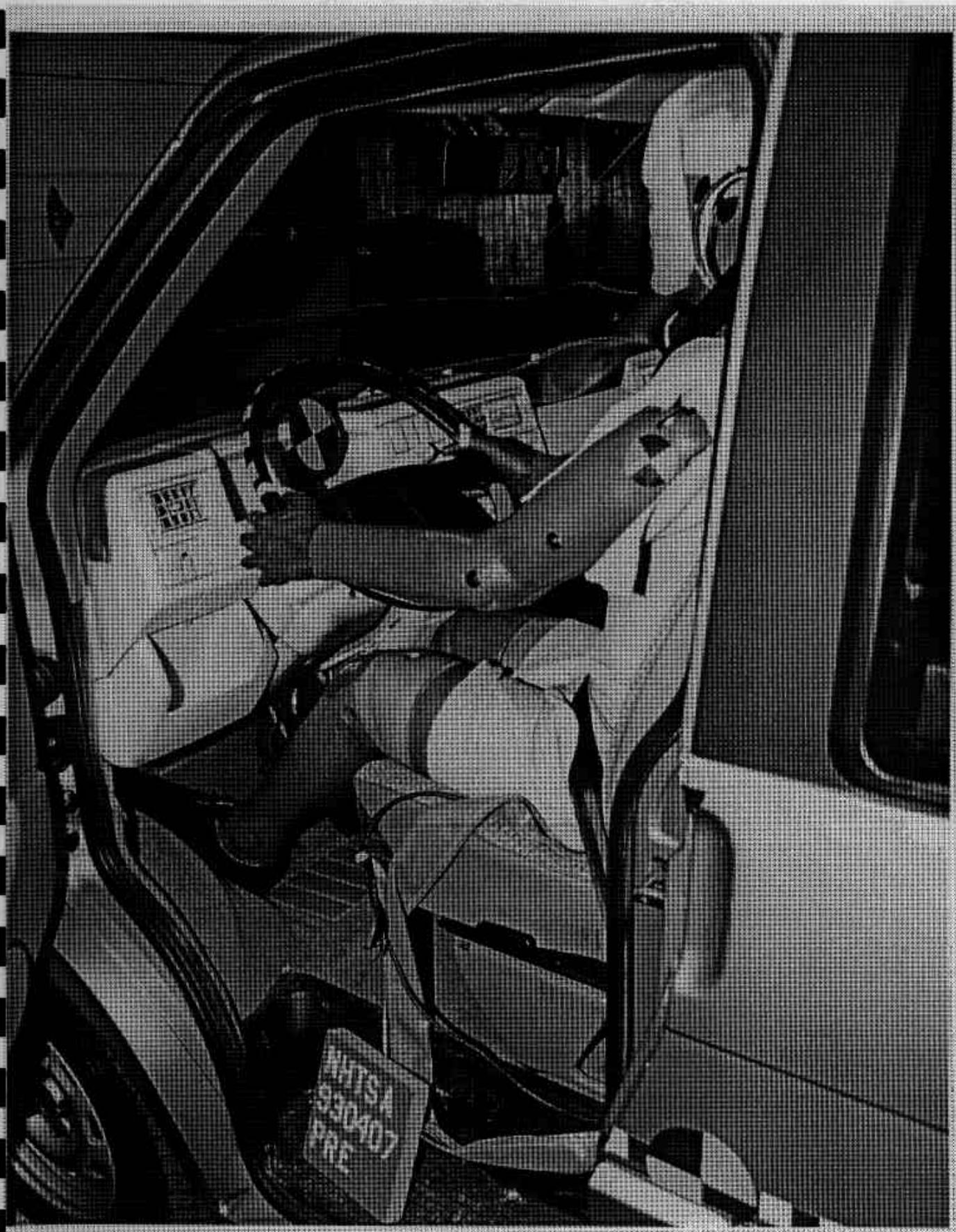

Figure A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

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

Figure A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

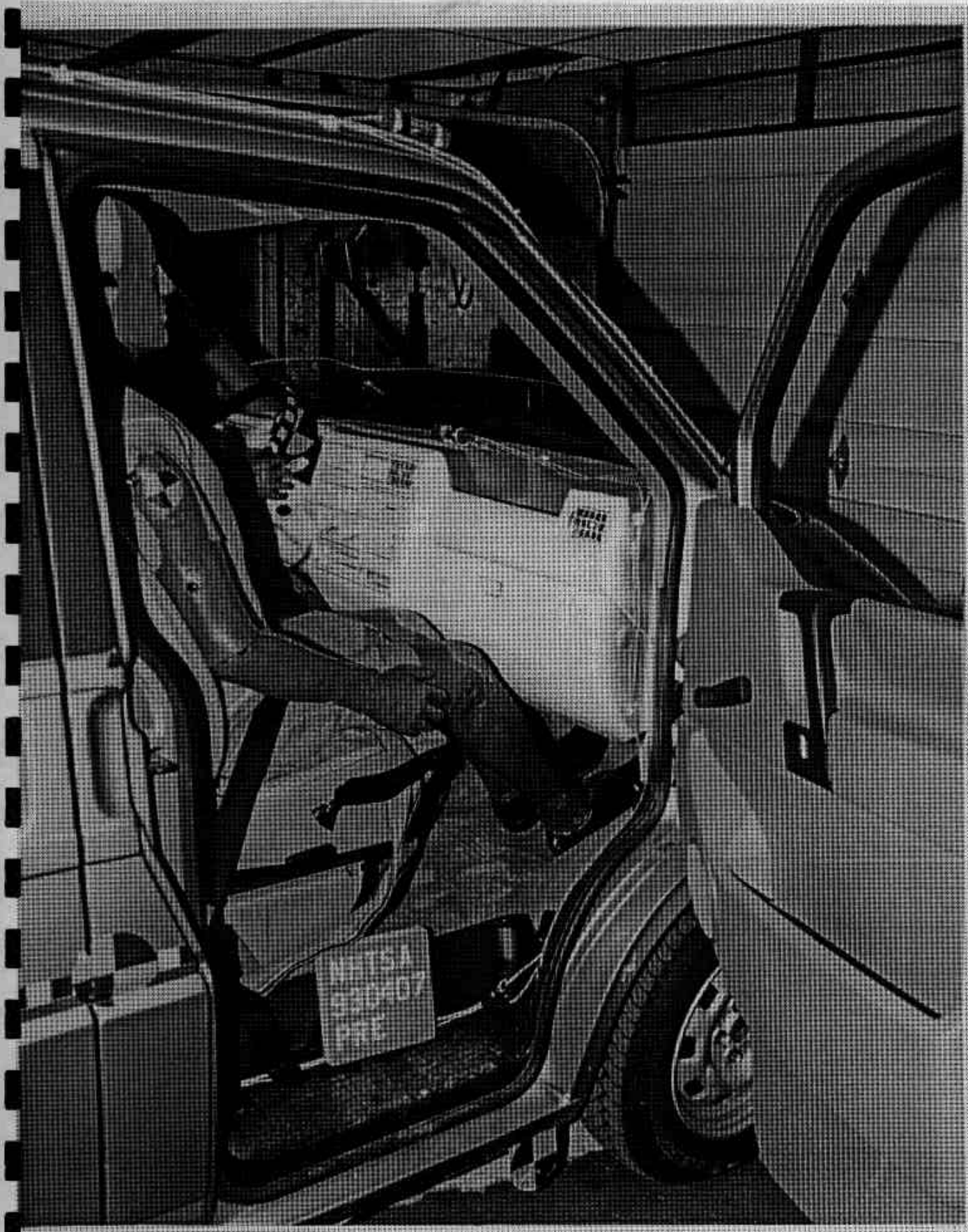

Figure A-37. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

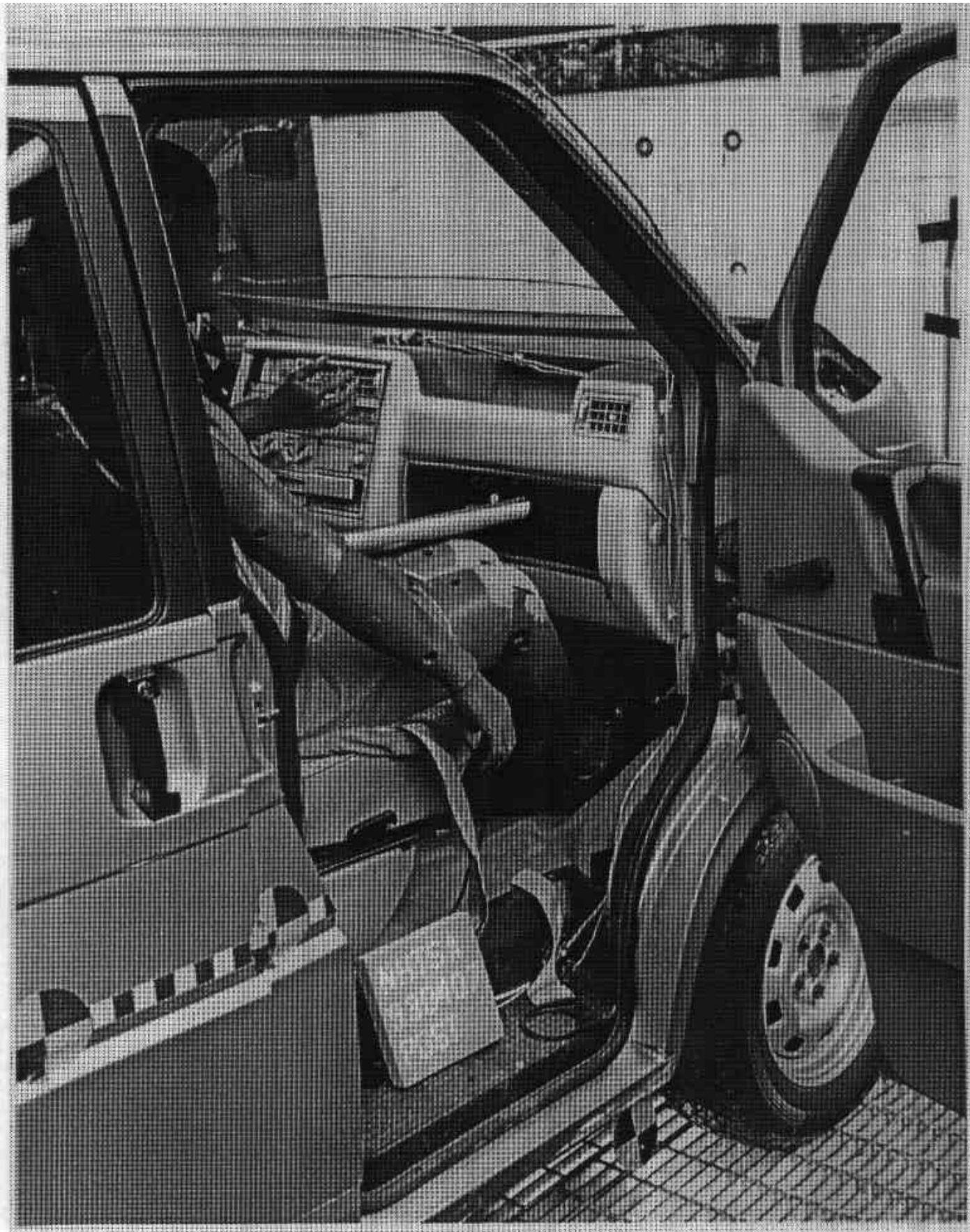

Figure A-38. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

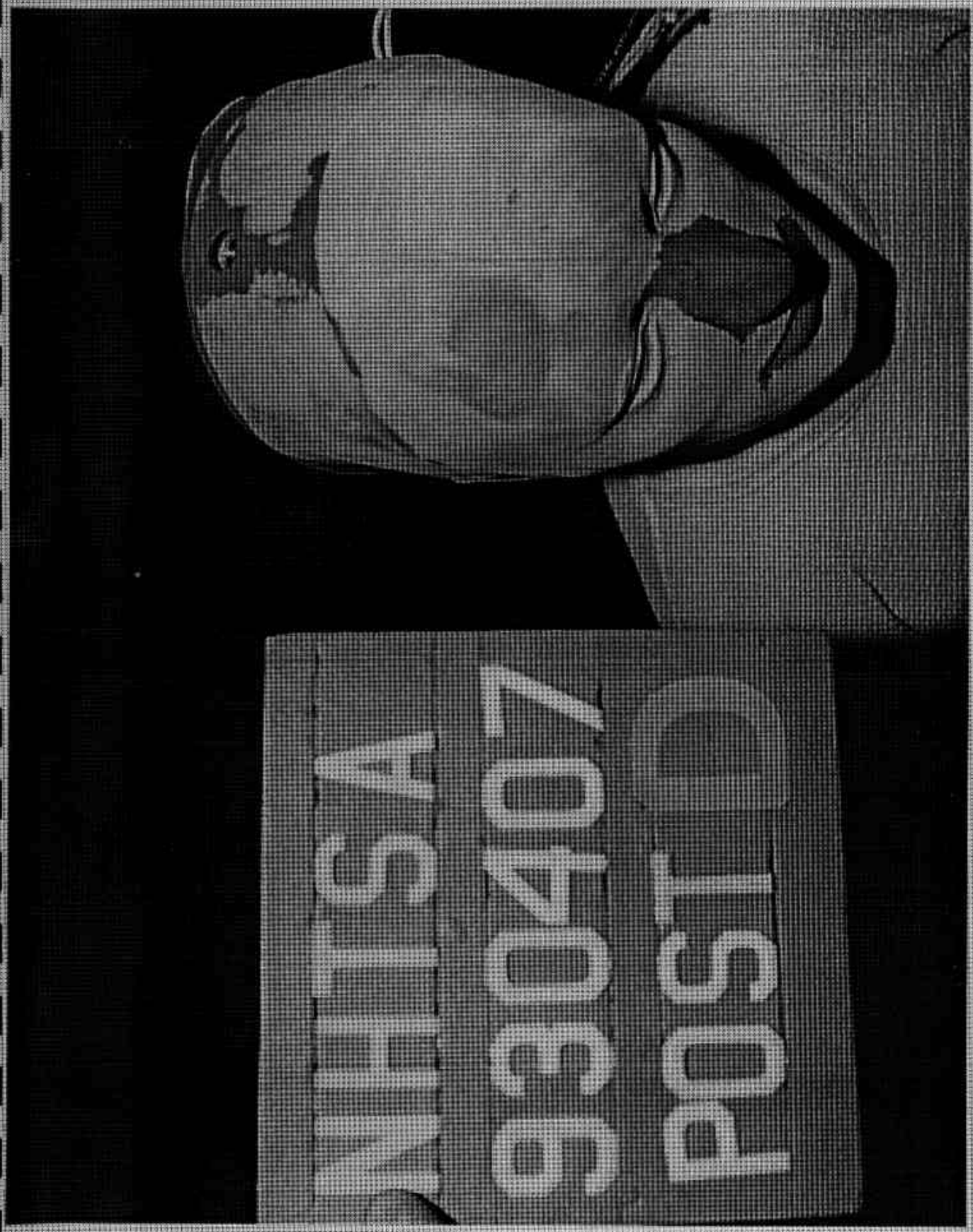

Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW

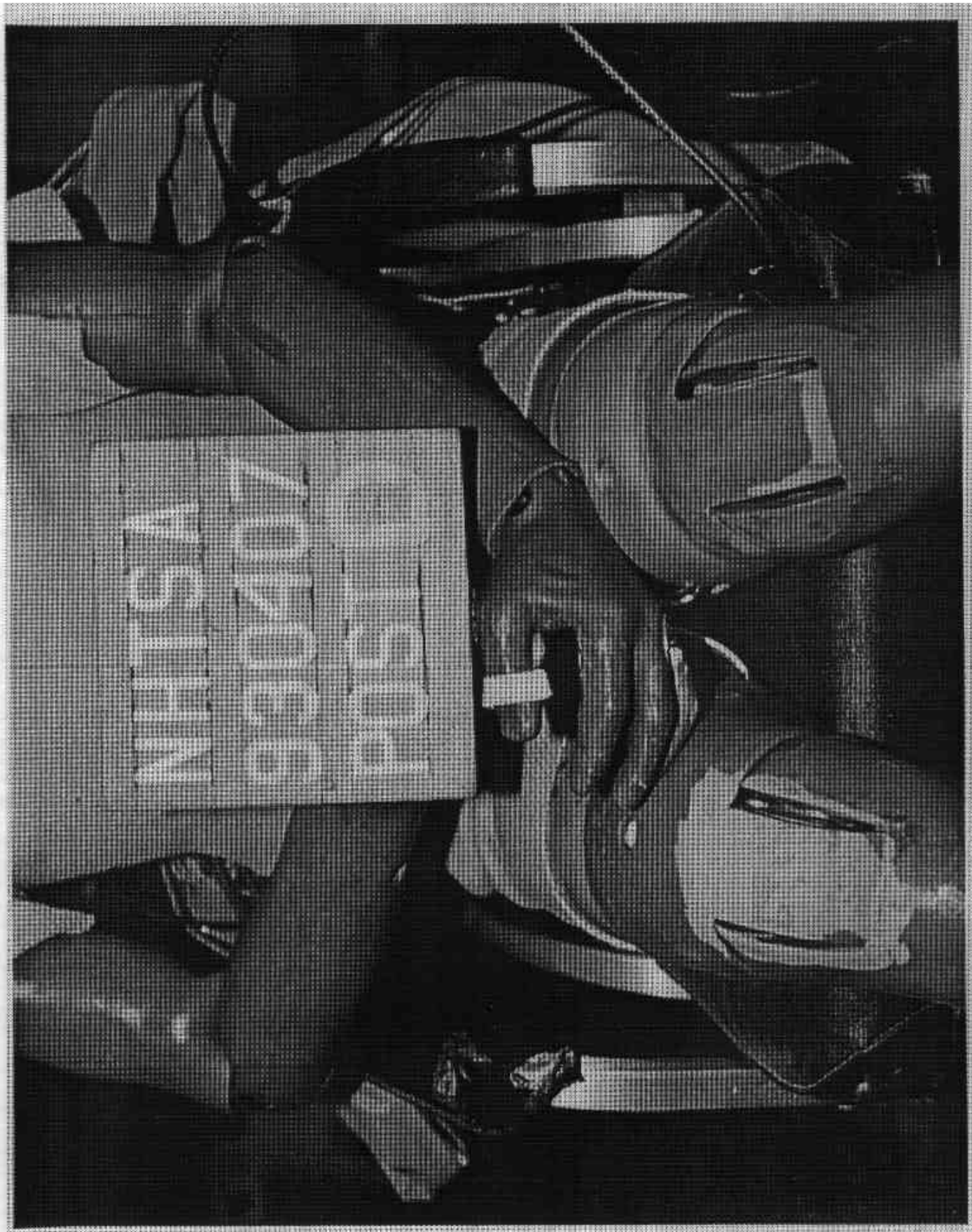

Figure A-40. POST-TEST DRIVER DUMMY KNEE CONTACT VIEW

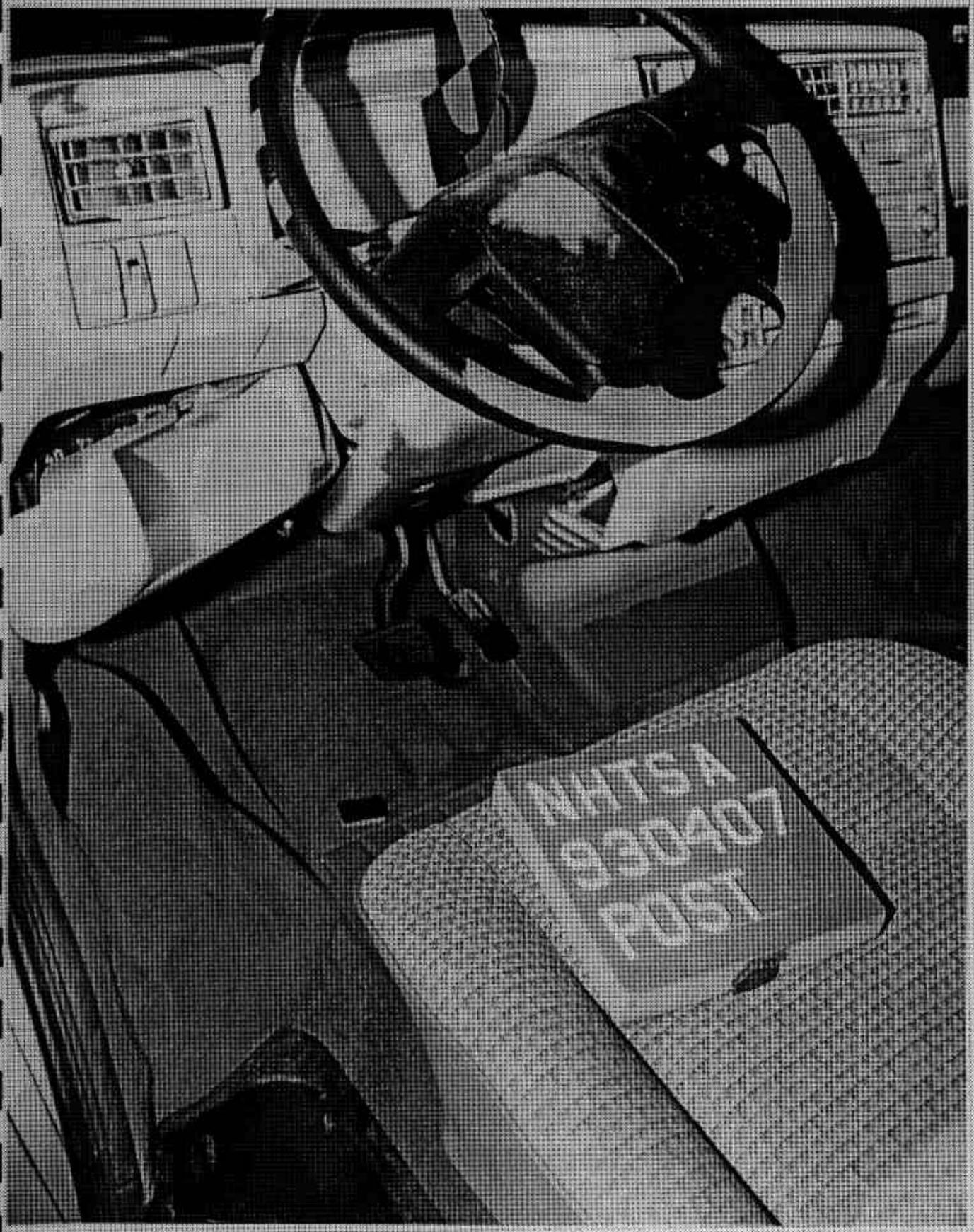

Figure A-41. POST-TEST DRIVER HEAD, CHEST, & KNEE CONTACT- VIEW 1

Figure A-42. POST-TEST DRIVER HEAD, CHEST, & KNEE CONTACT - VIEW 2

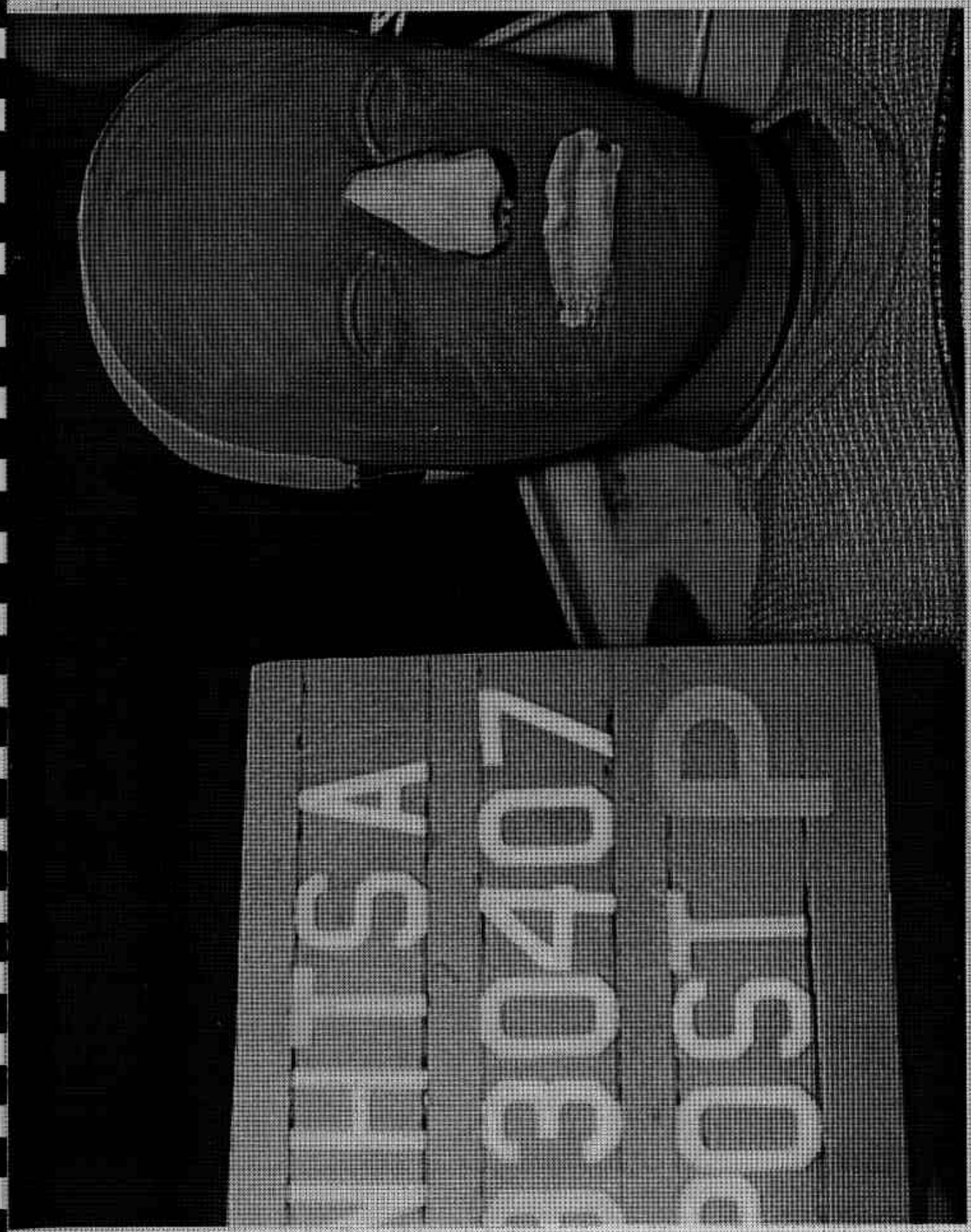

Figure A-43. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

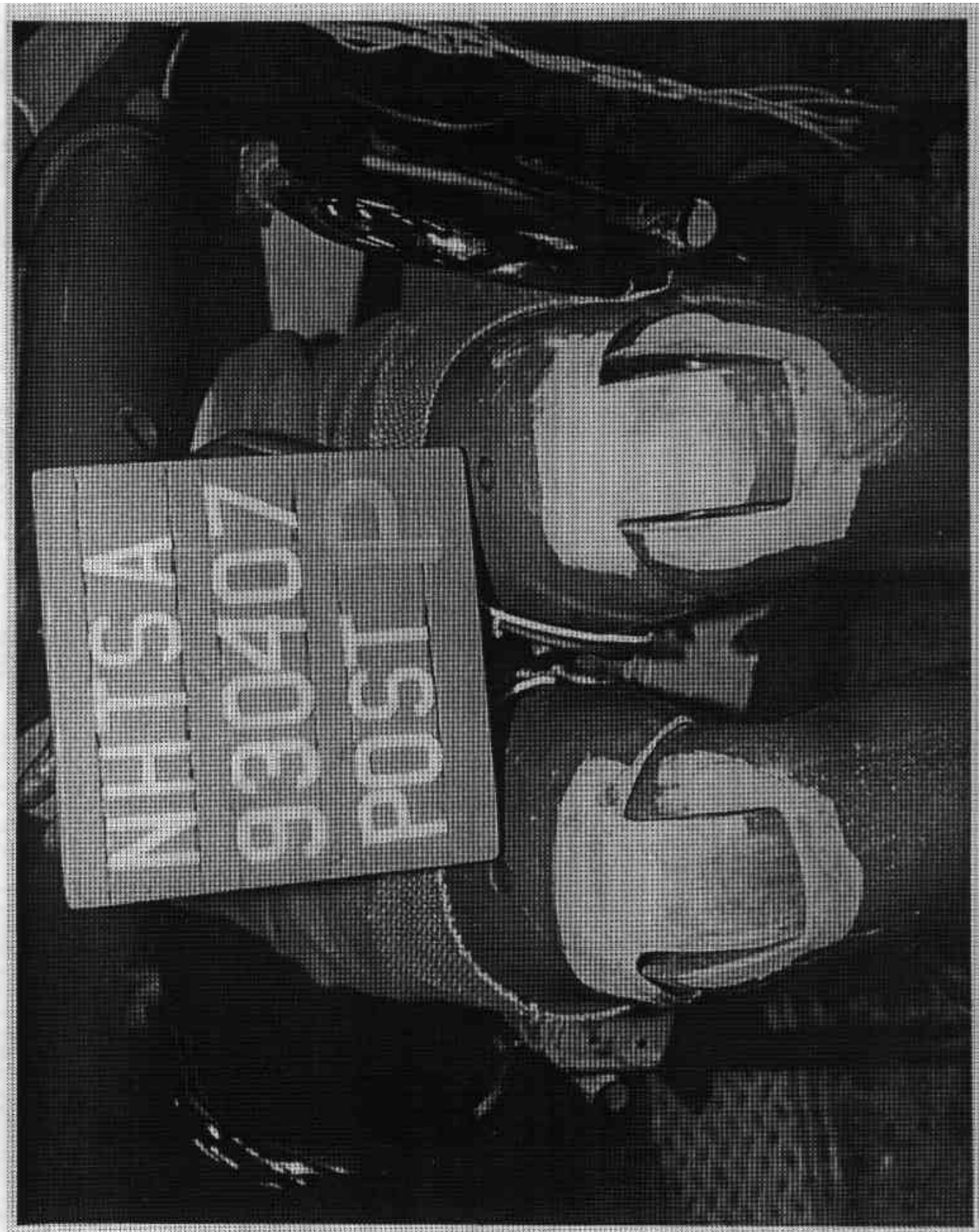

Figure A-44. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

Figure A-45. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

Figure A-46. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 3

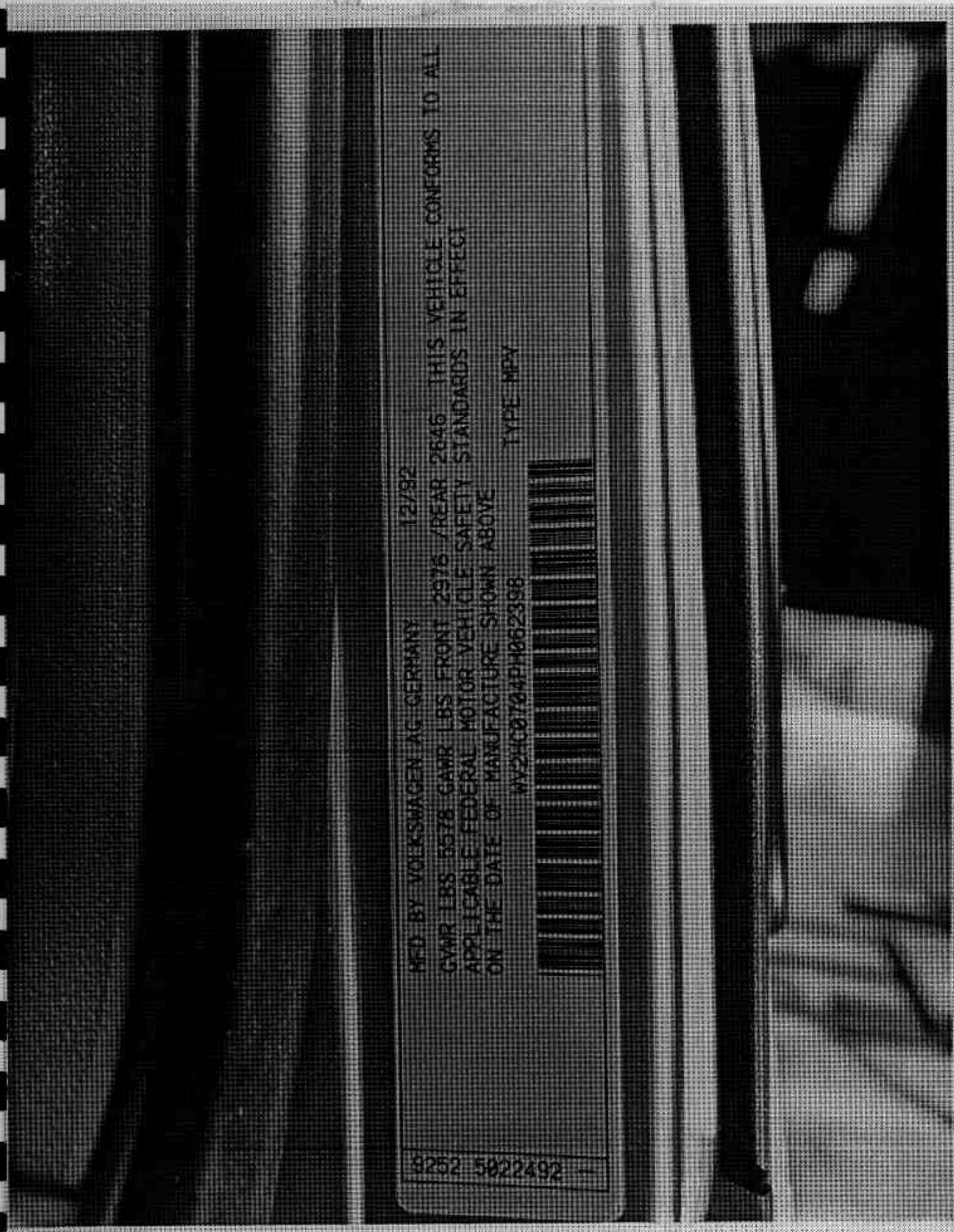

Figure A-47. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

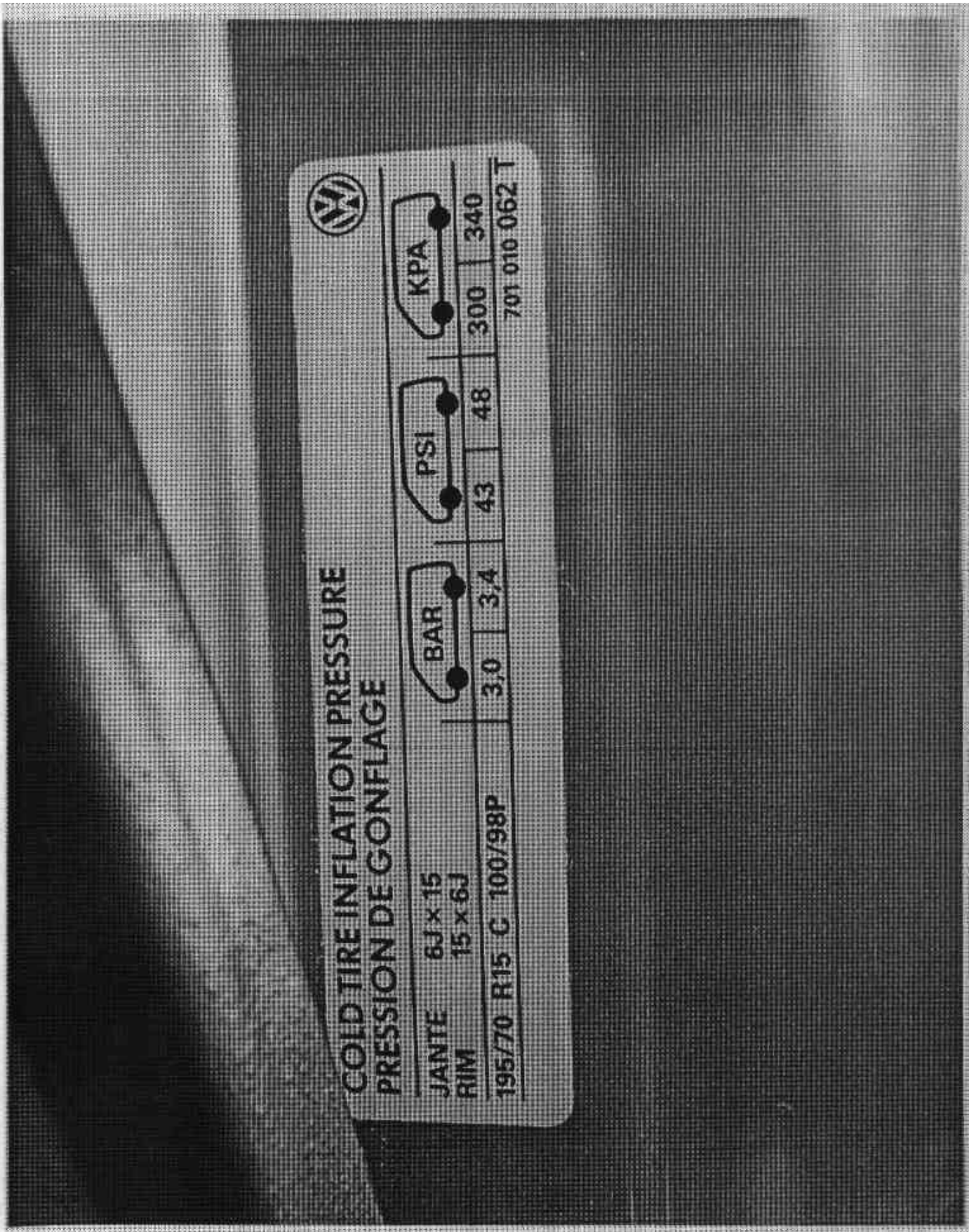

Fig. A-48. PRE-TEST VEHICLE RECOMMENDED TIRE PRESSURE LABEL VIEW

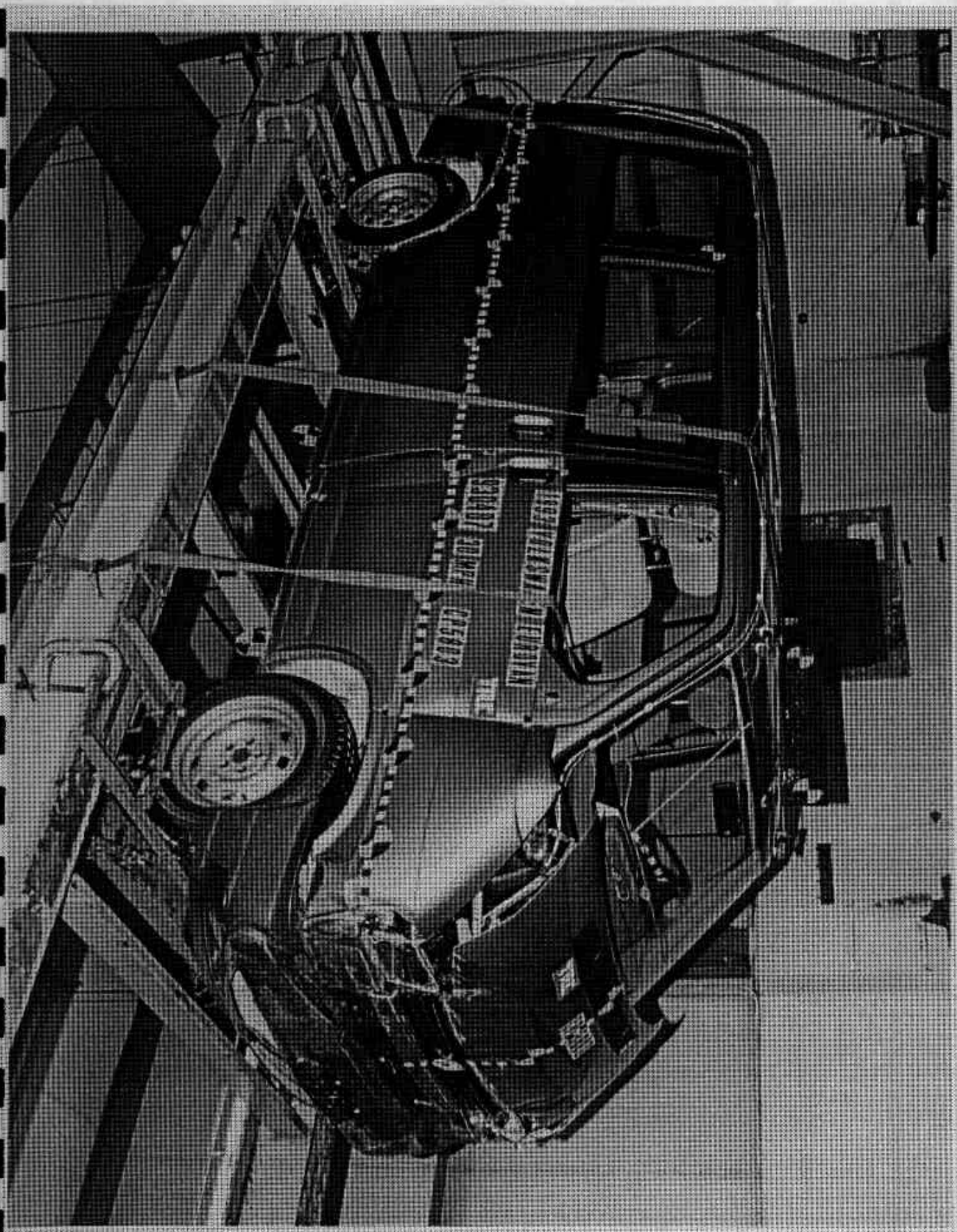

Figure A-49. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

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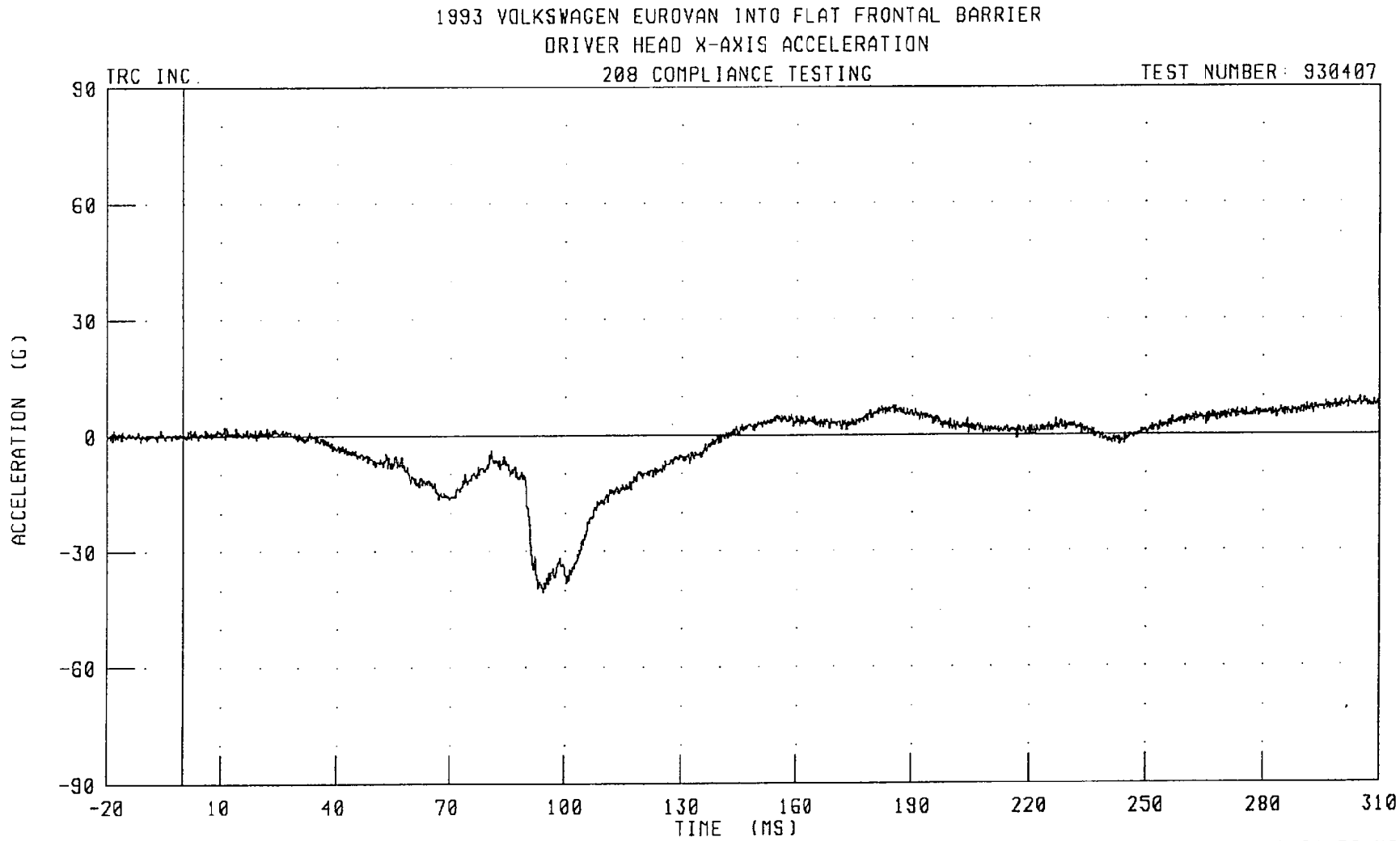
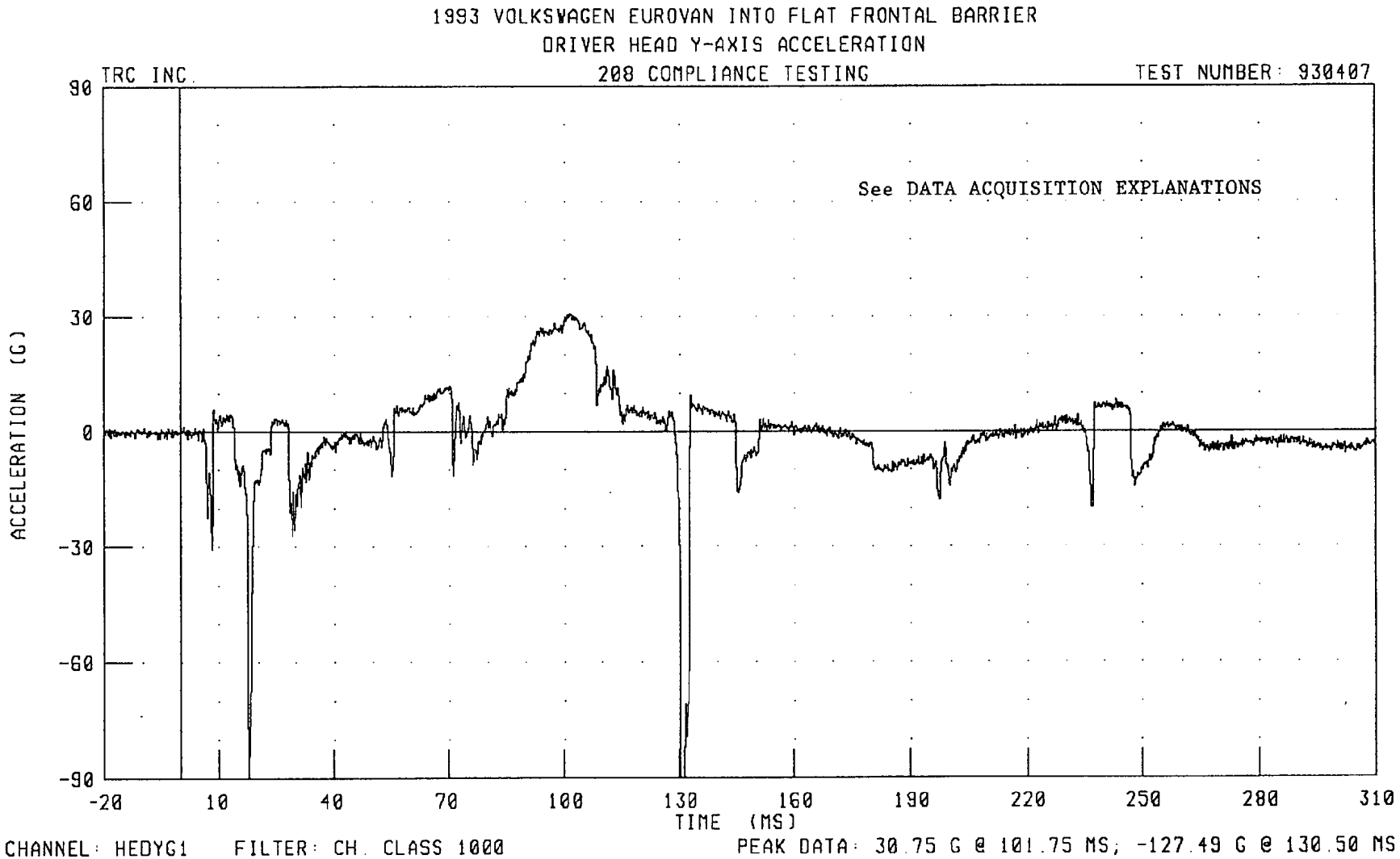
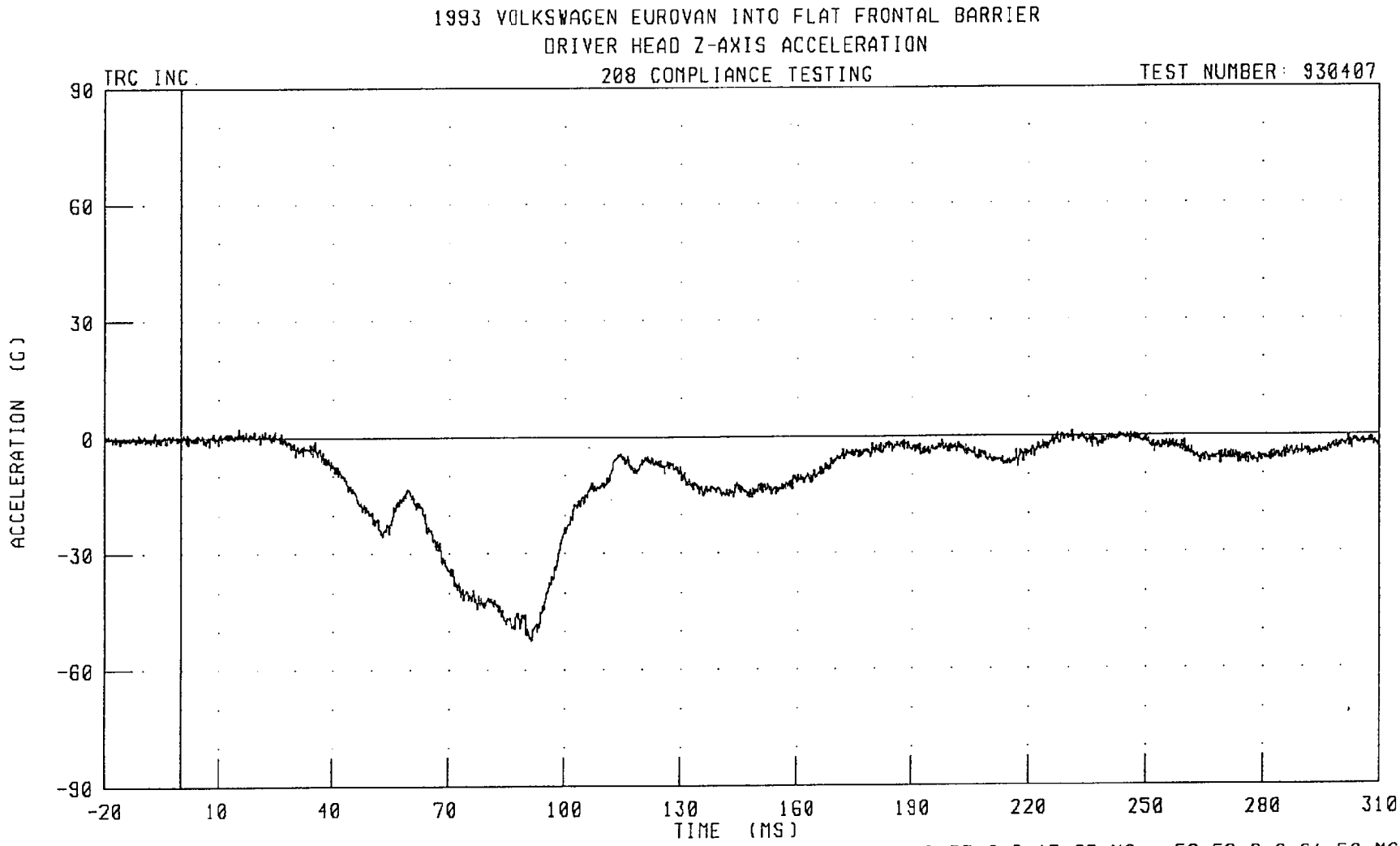
APPENDIX B

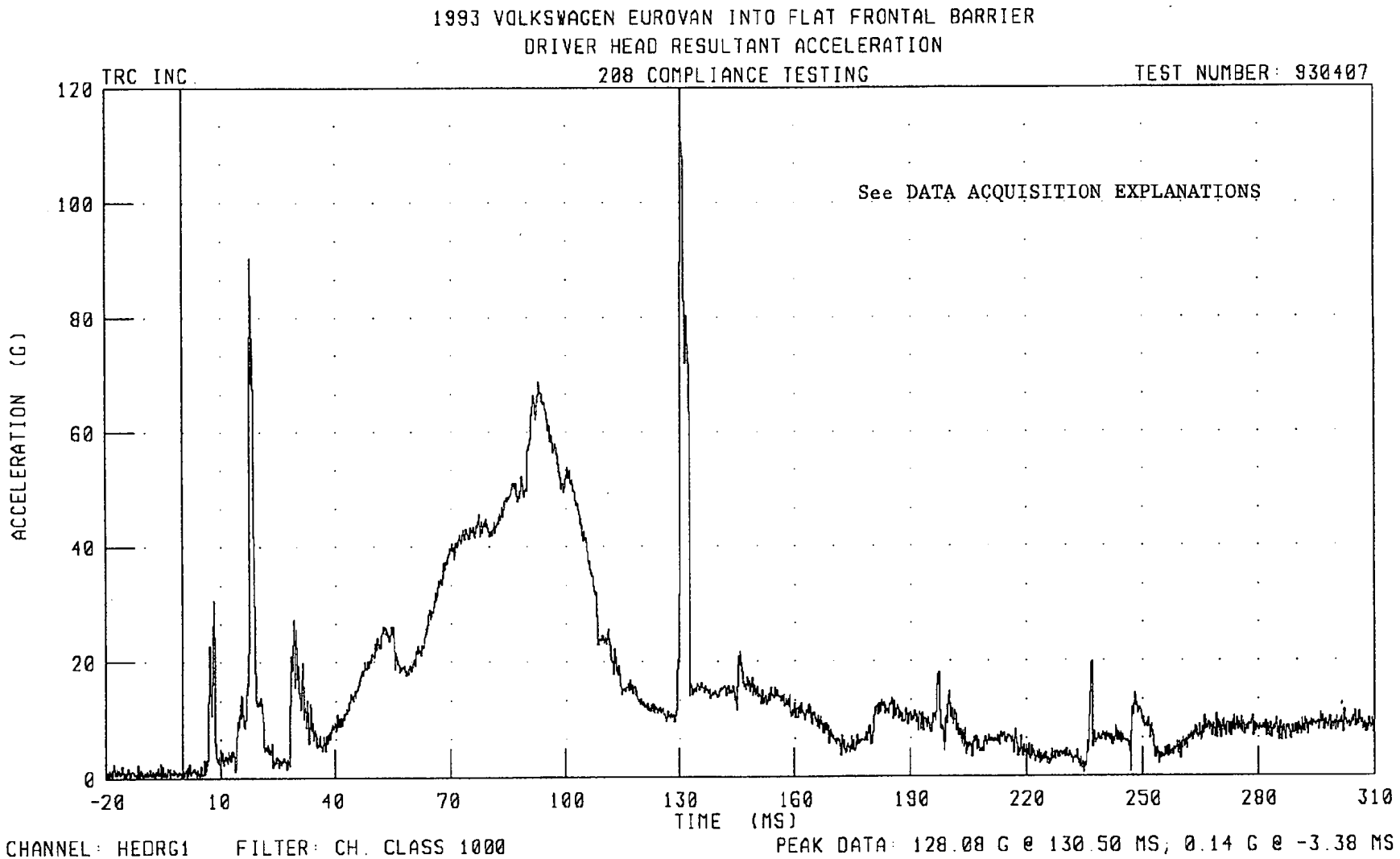
DATA PLOTS


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG1
FILTER: CH. CLASS 1000
PEAK DATA: 9.62 G @ 305.00 MS; -40.54 G @ 94.50 MS

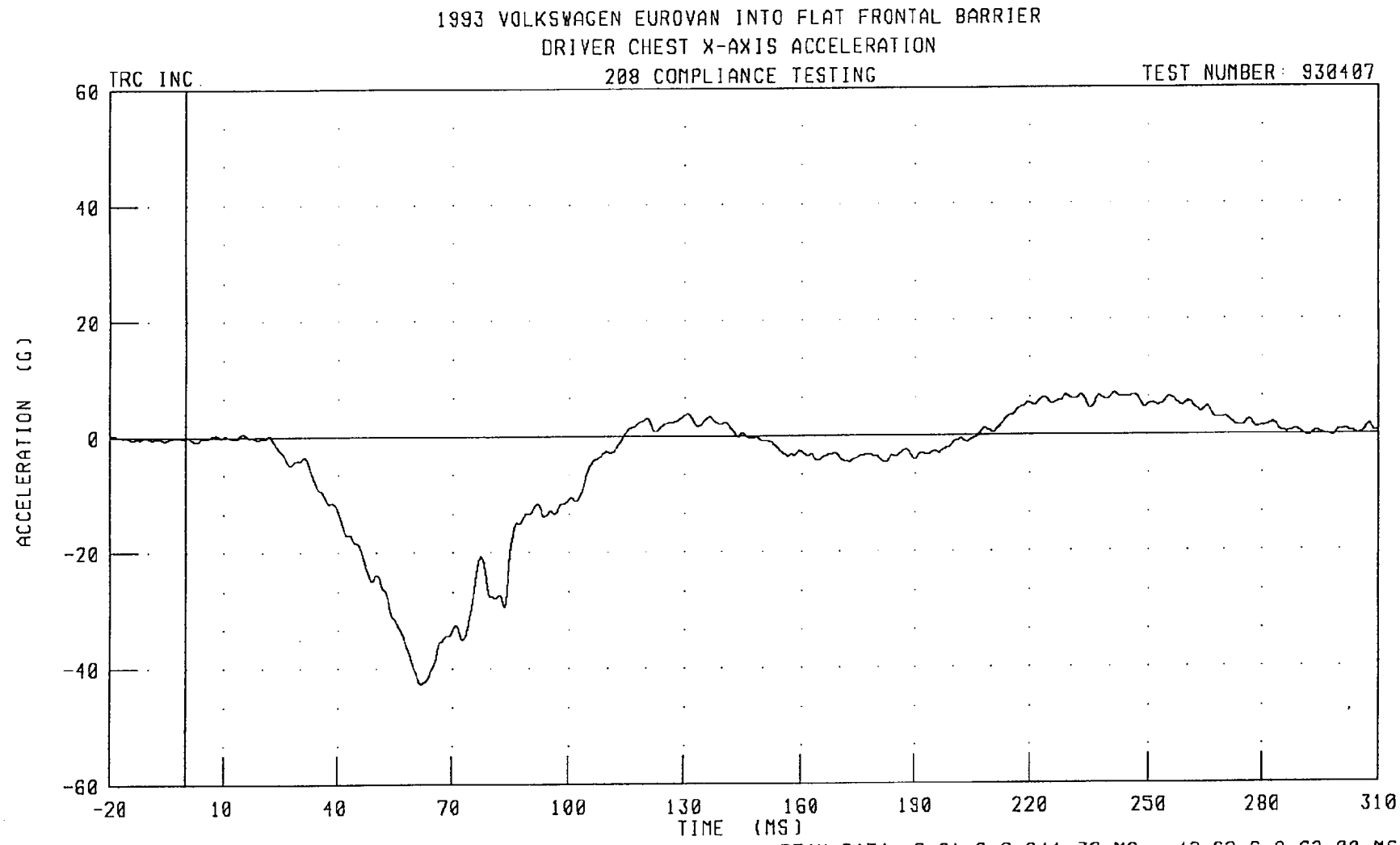

1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
See DATA ACQUISITION EXPLANATIONS
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG1
FILTER: CH. CLASS 1000
PEAK DATA: 30.75 G @ 101.75 MS; -127.49 G @ 130.50 MS


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG1
FILTER: CH. CLASS 1000
PEAK DATA: 2.33 G @ 15.25 MS; -52.59 G @ 91.50 MS

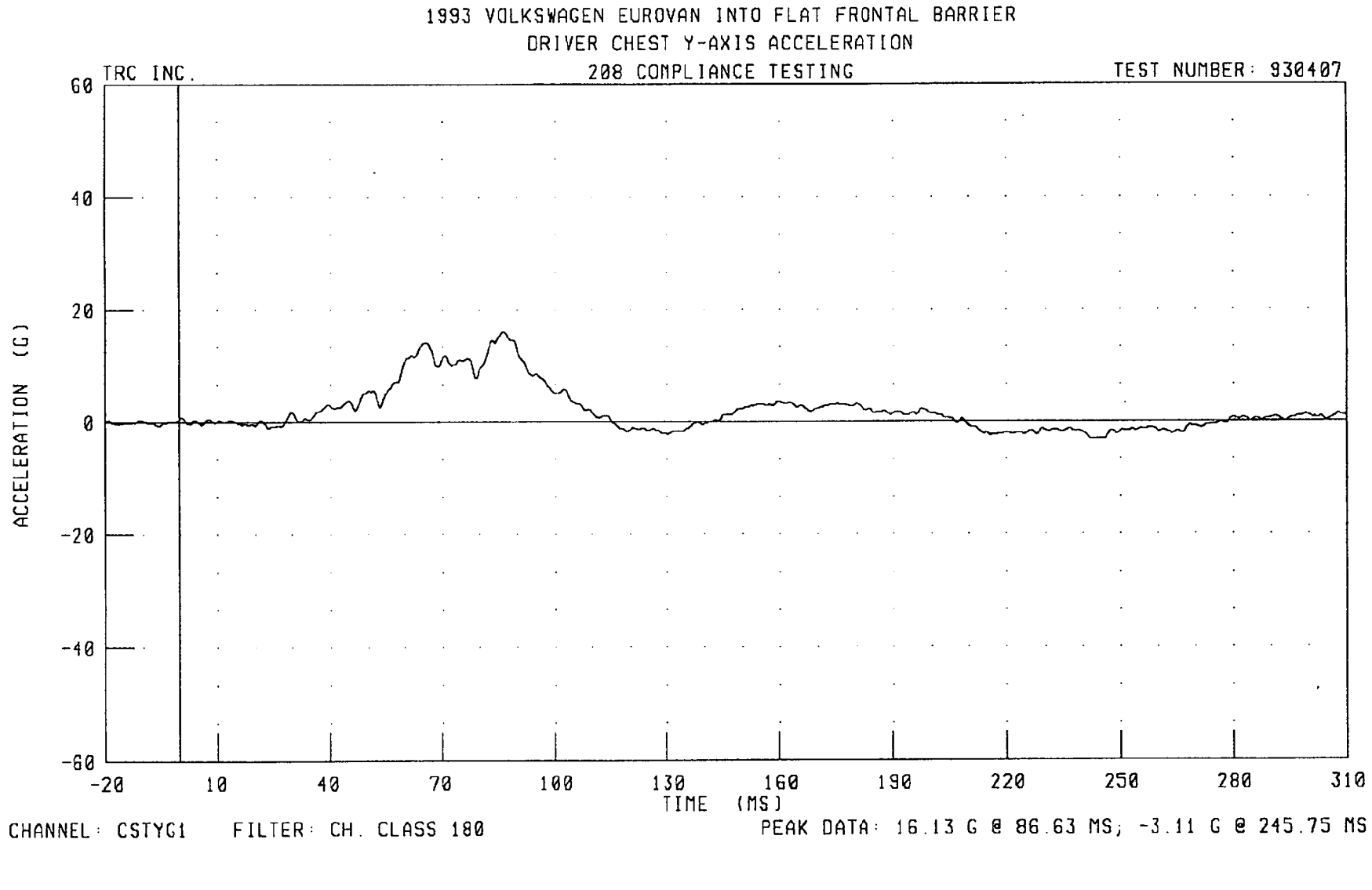
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
TRC INC
208 COMPLIANCE TESTING
TEST NUMBER: 930407
See DATA ACQUISITION EXPLANATIONS
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDRG1
FILTER: CH. CLASS 1000
PEAK DATA: 128.08 G @ 130.50 MS, 0.14 G @ -3.38 MS

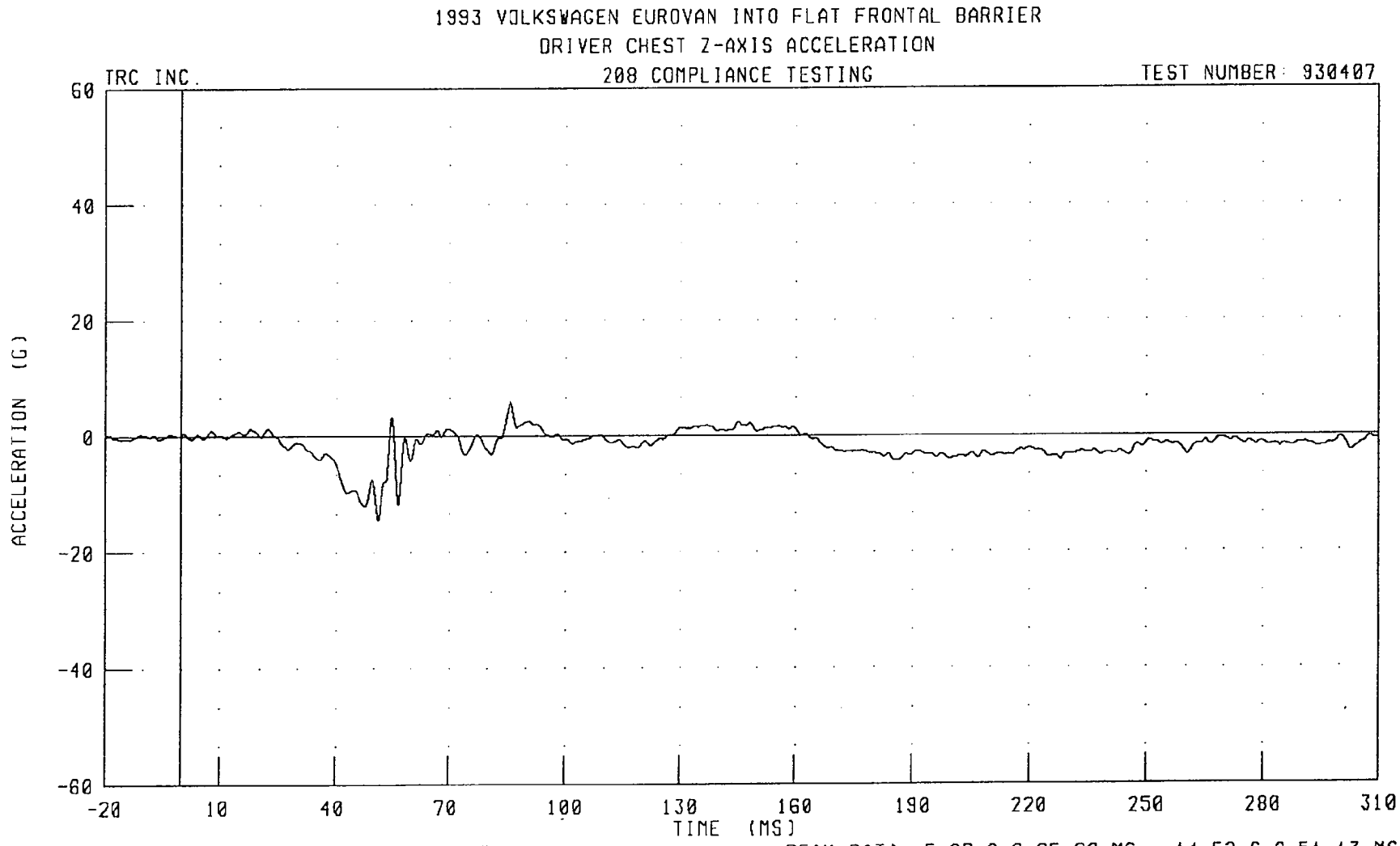
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
TRC INC
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG1
FILTER: CH. CLASS 180
PEAK DATA: 7.21 G @ 241.38 MS; -42.69 G @ 62.00 MS

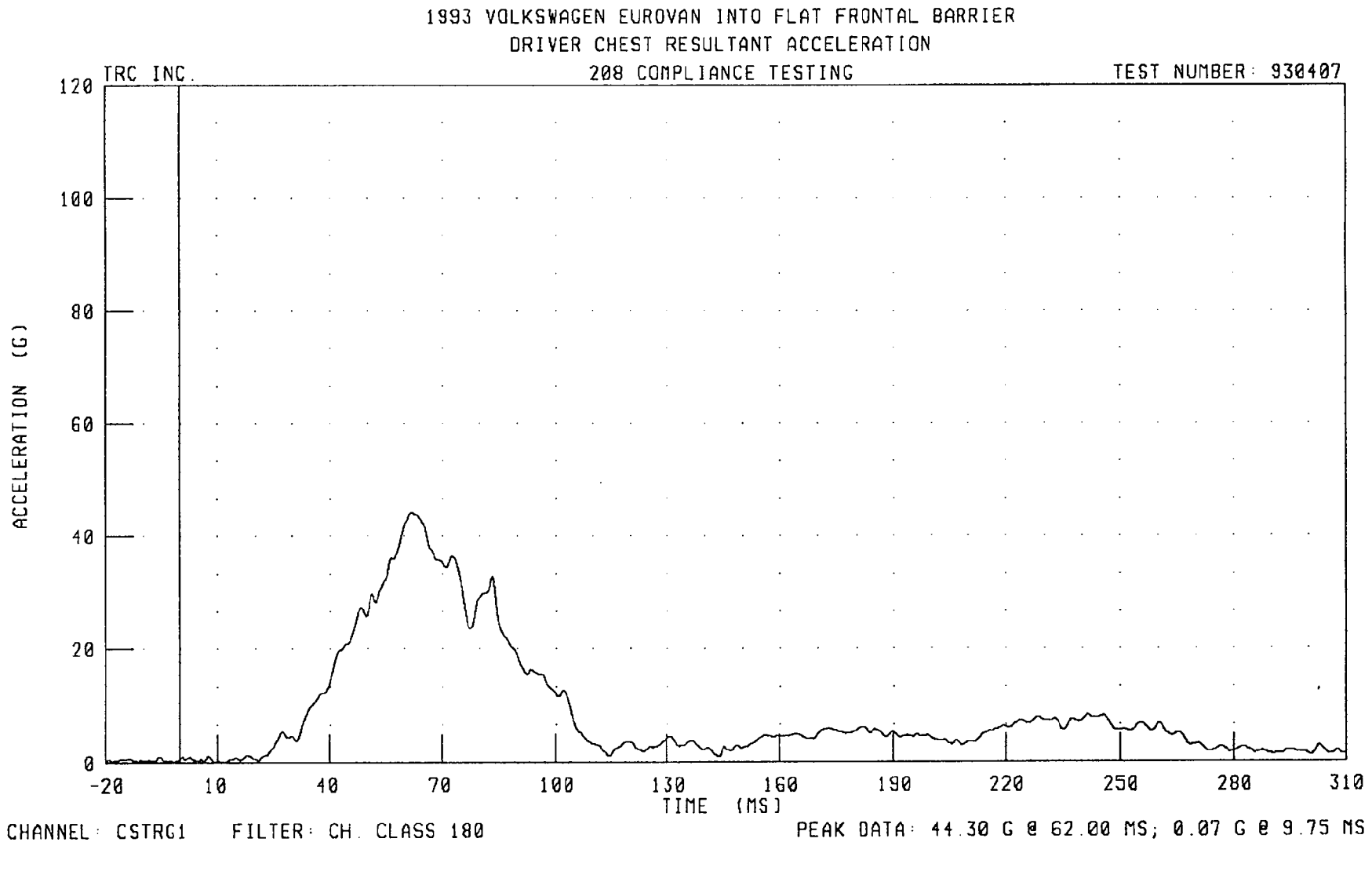
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTYG1
FILTER: CH. CLASS 180
PEAK DATA: 16.13 G @ 86.63 MS; -3.11 G @ 245.75 MS

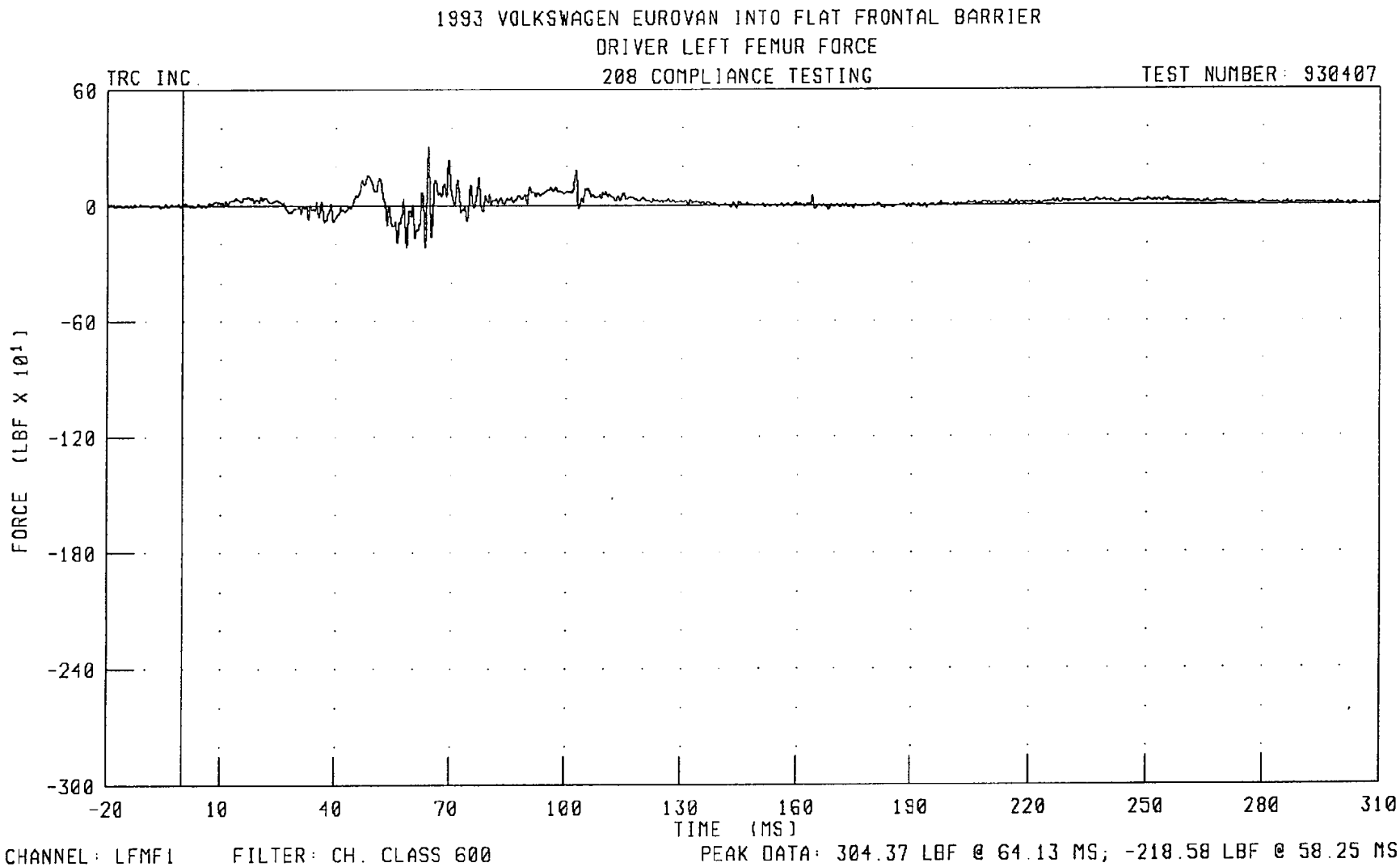
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG1
FILTER: CH. CLASS 180
PEAK DATA: 5.87 G @ 85.88 MS; -14.52 G @ 51.13 MS

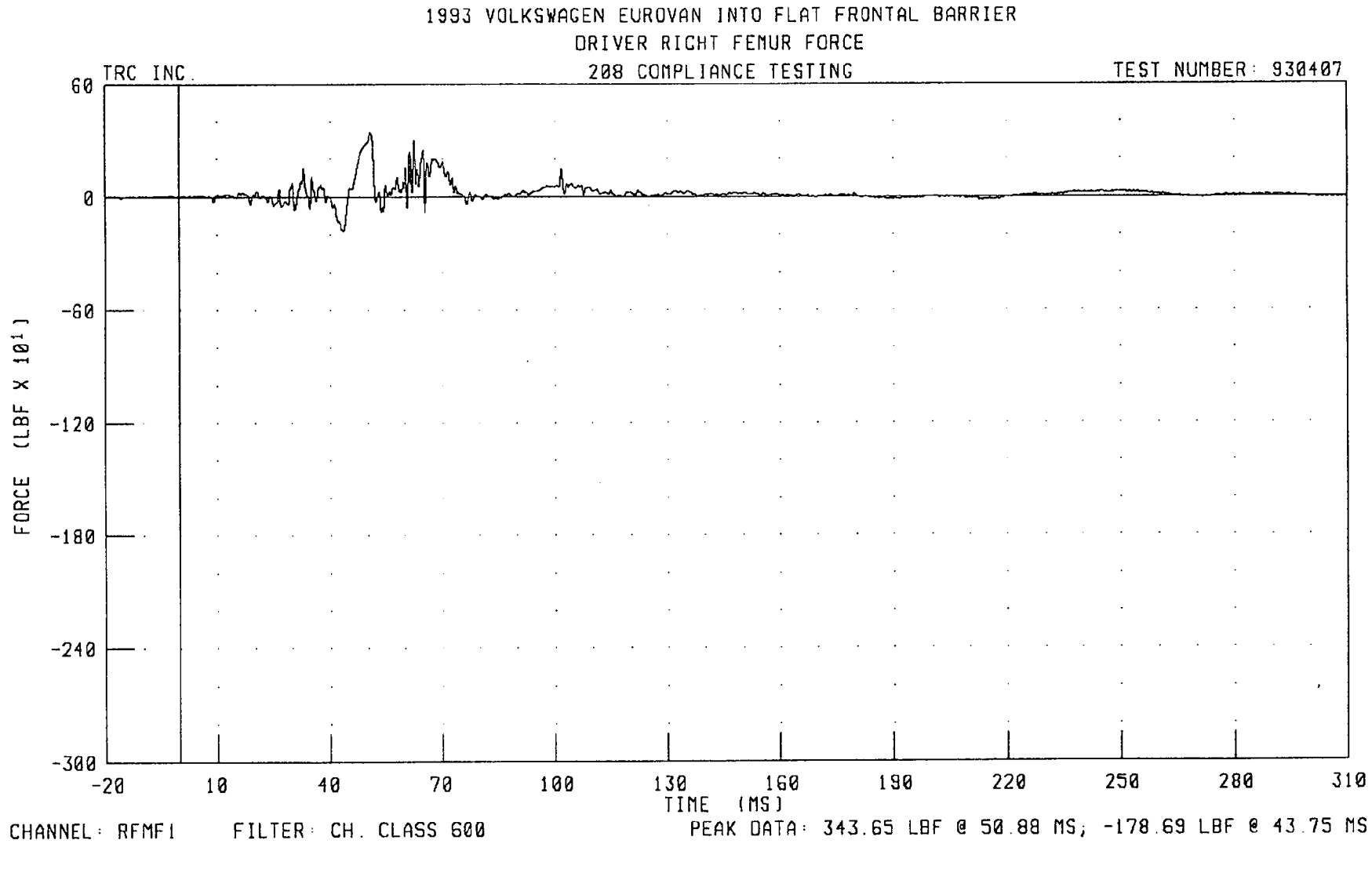
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG1
FILTER: CH. CLASS 180
PEAK DATA: 44.30 G @ 62.00 MS; 0.07 G @ 9.75 MS

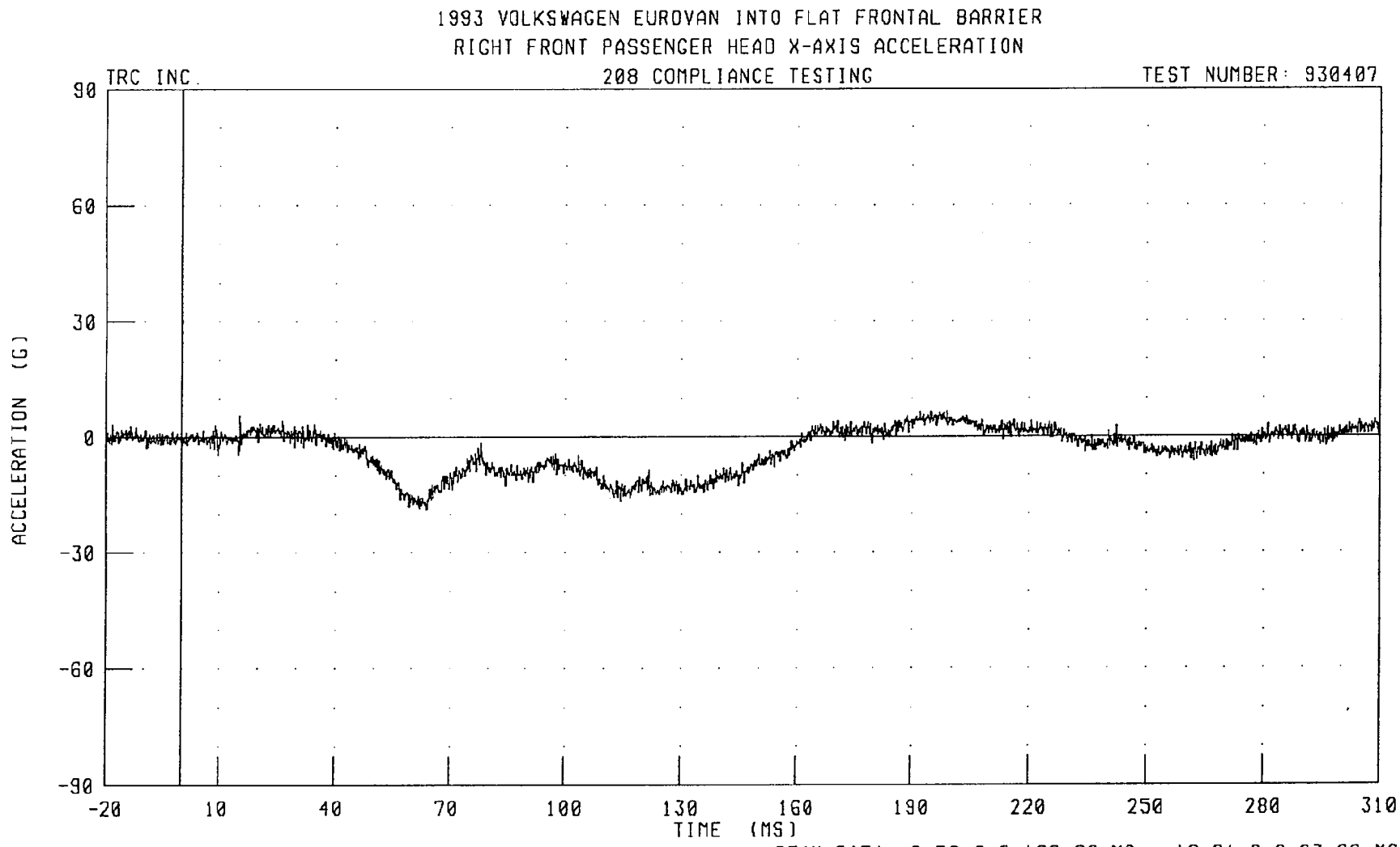
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
0
-60
-120
-180
-240
-300
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LFMF1
FILTER: CH. CLASS 600
PEAK DATA: 304.37 LBF @ 64.13 MS; -218.58 LBF @ 58.25 MS

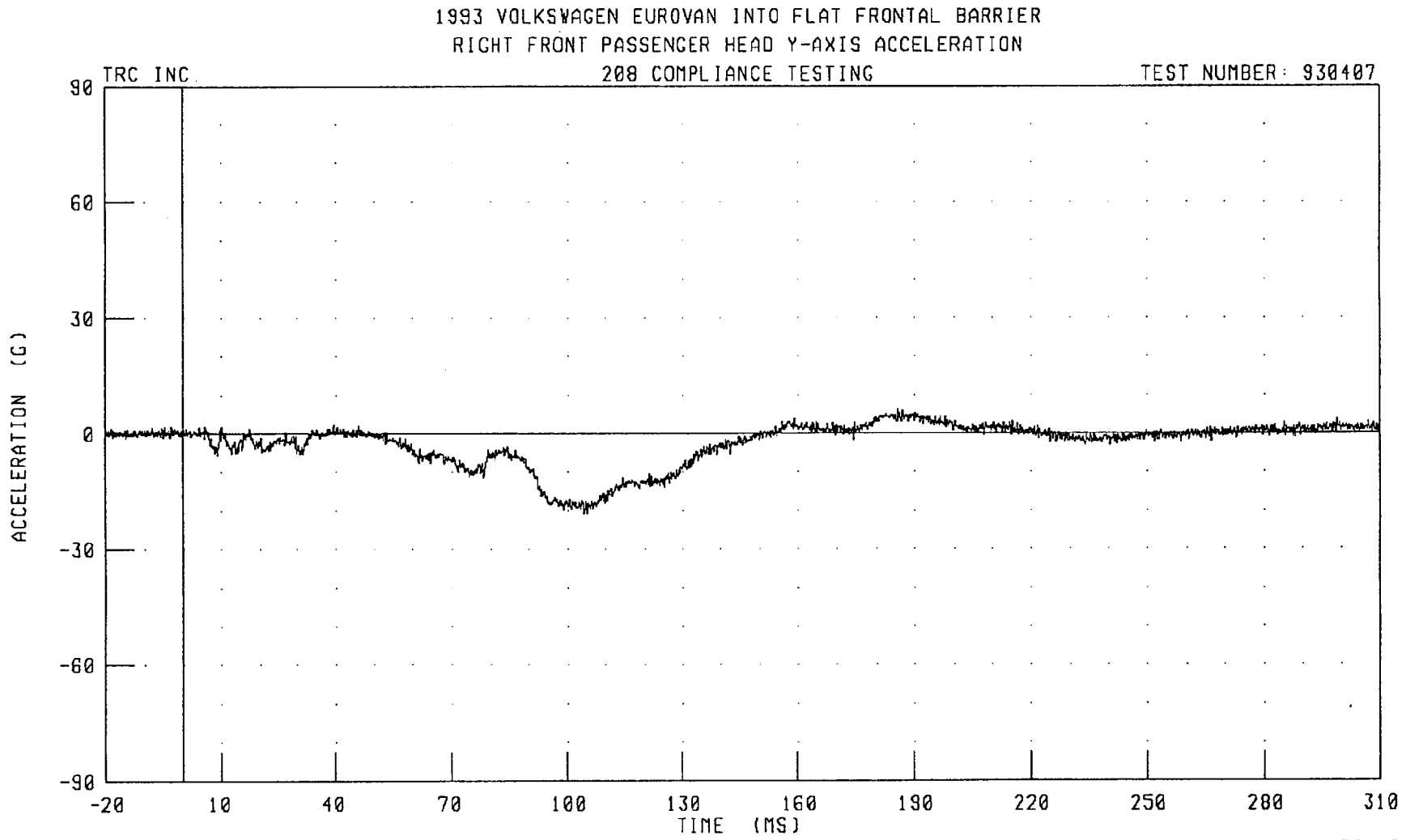
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
0
-60
-120
-180
-240
-300
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMF1
FILTER: CH. CLASS 600
PEAK DATA: 343.65 LBF @ 50.88 MS; -178.69 LBF @ 43.75 MS

930407

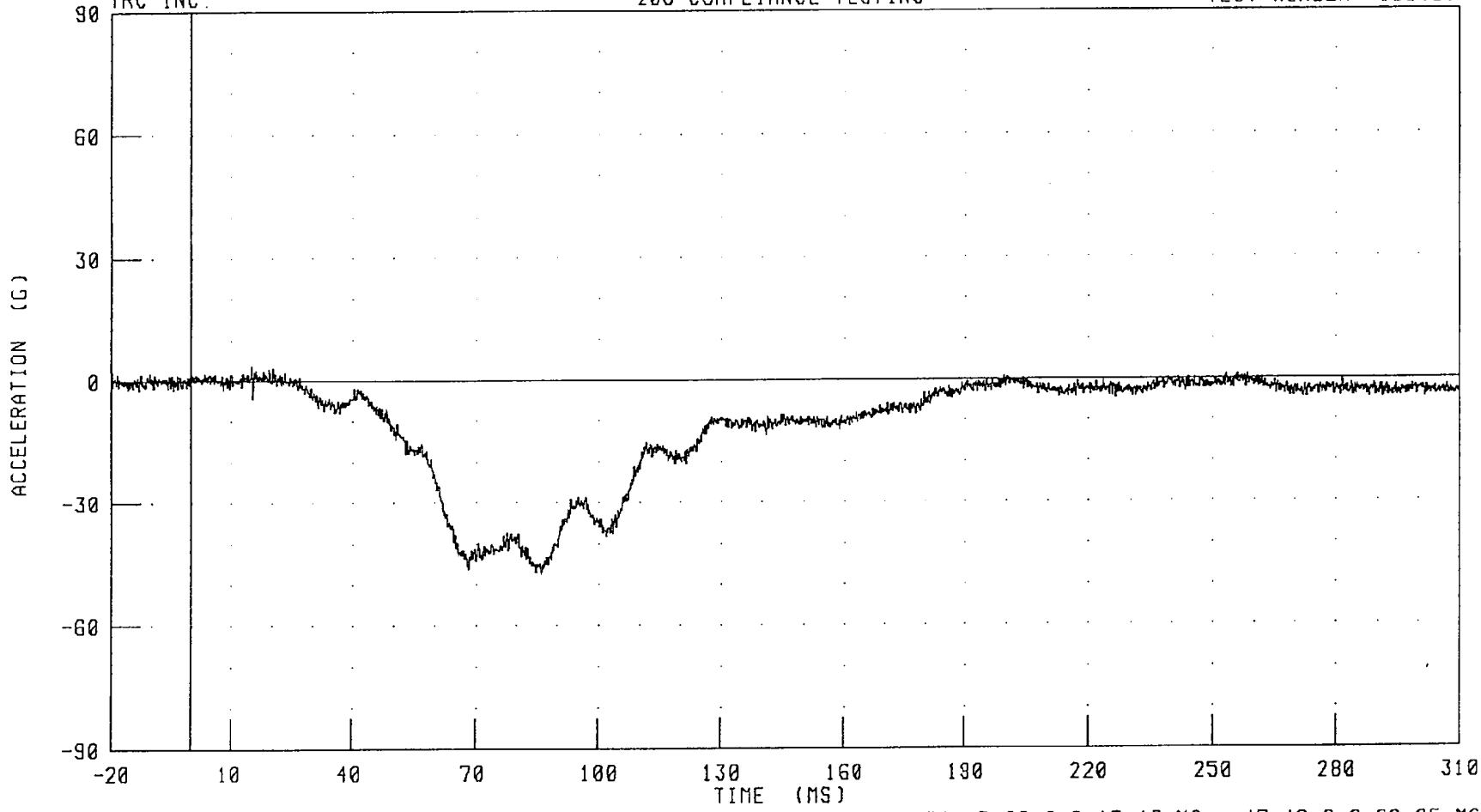

1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG2
FILTER: CH. CLASS 1000
PEAK DATA: 6.58 G @ 199.00 MS; -18.91 G @ 63.88 MS

930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION
TRC INC
208 COMPLIANCE TESTING
TEST NUMBER: 930407
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG2
FILTER: CH. CLASS 1000
PEAK DATA: 6.27 G @ 185.75 MS; -20.81 G @ 104.50 MS

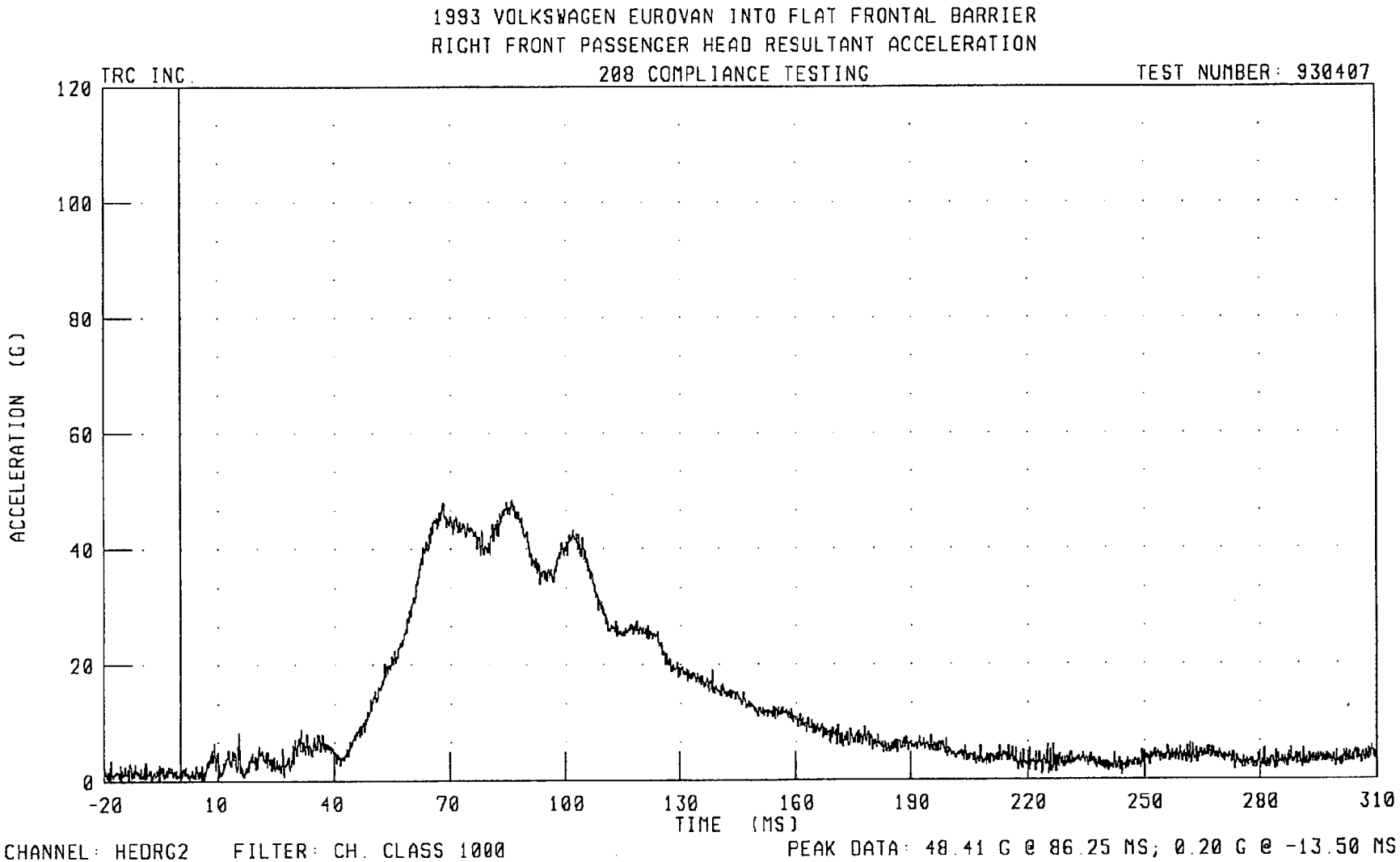
1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TRC INC. 208 COMPLIANCE TESTING TEST NUMBER: 930407



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000 PEAK DATA: 3.60 G @ 15.13 MS; -47.40 G @ 86.25 MS

930407

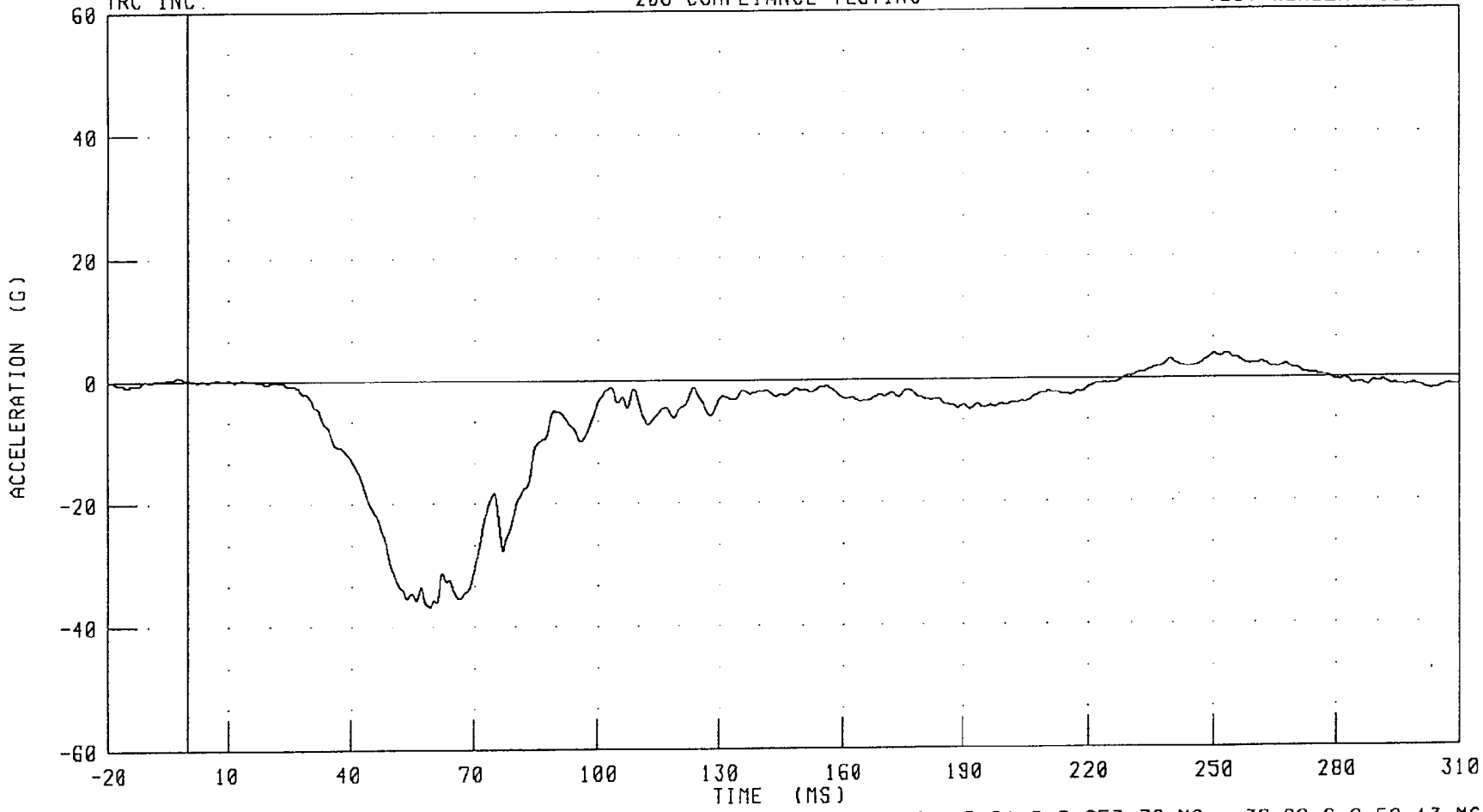

1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDRG2
FILTER: CH. CLASS 1000
PEAK DATA: 48.41 G @ 86.25 MS; 0.20 G @ -13.50 MS

930407

1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TRC INC.

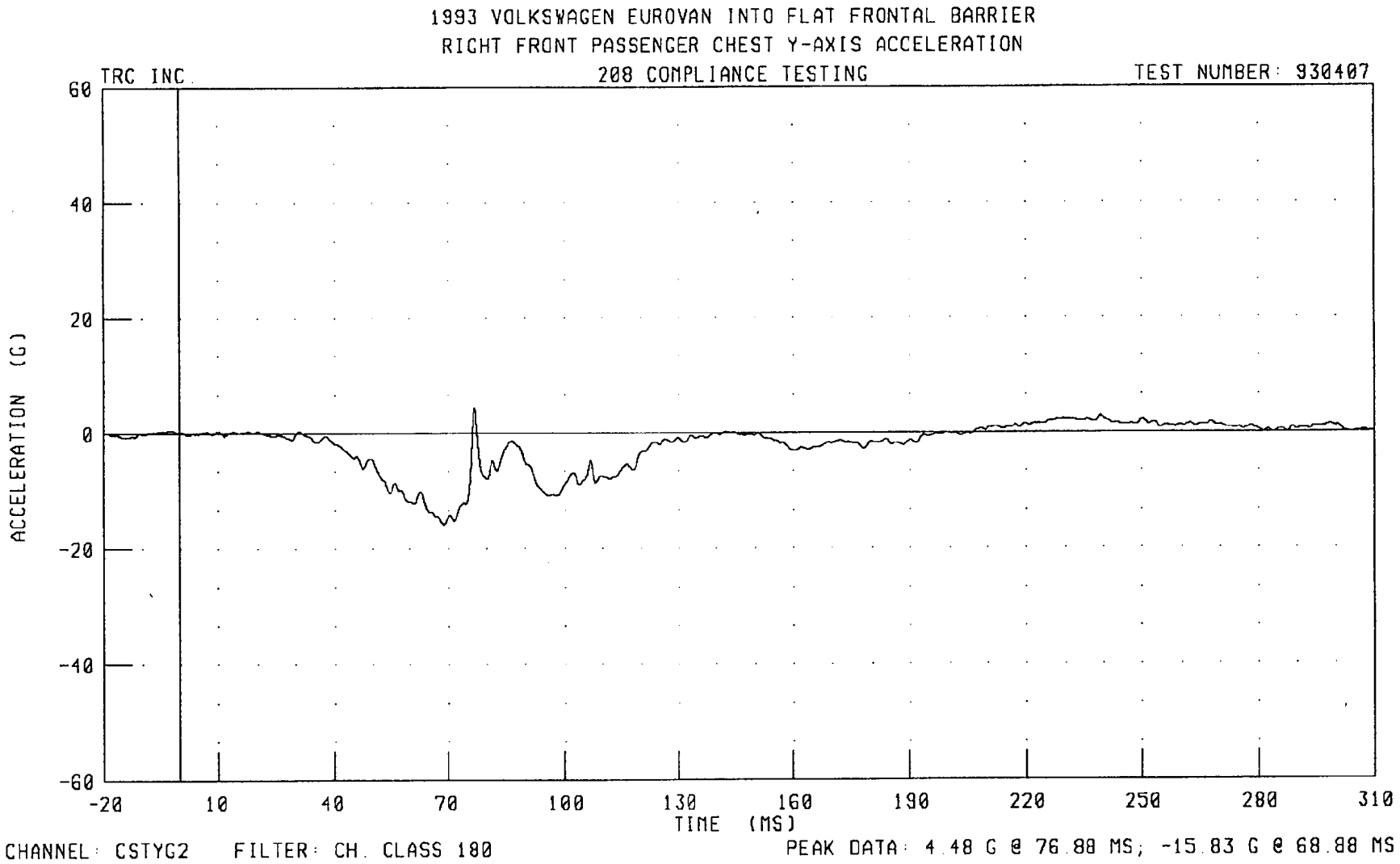
TEST NUMBER: 930407

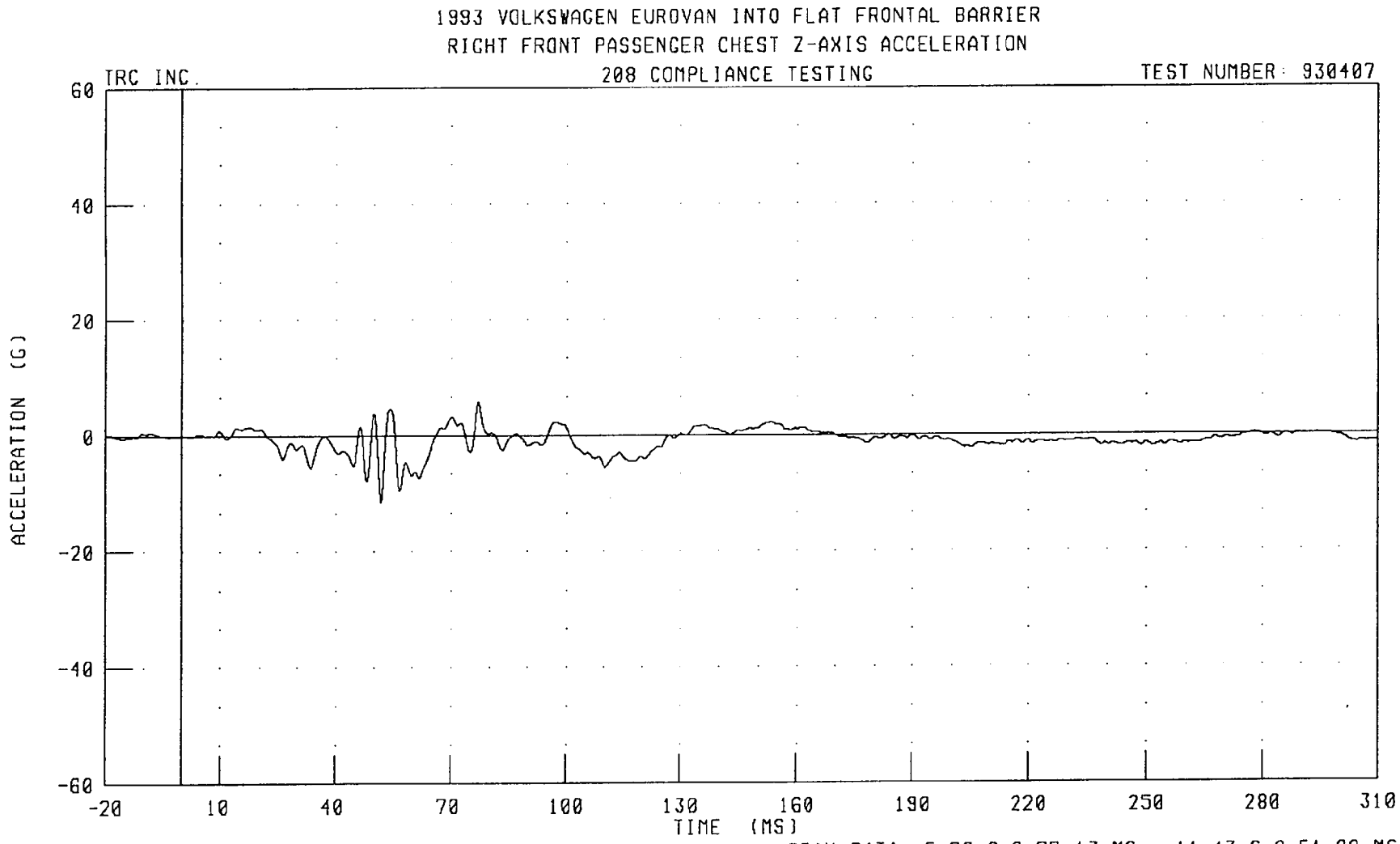


CHANNEL: CSTXG2 FILTER: CH. CLASS 180

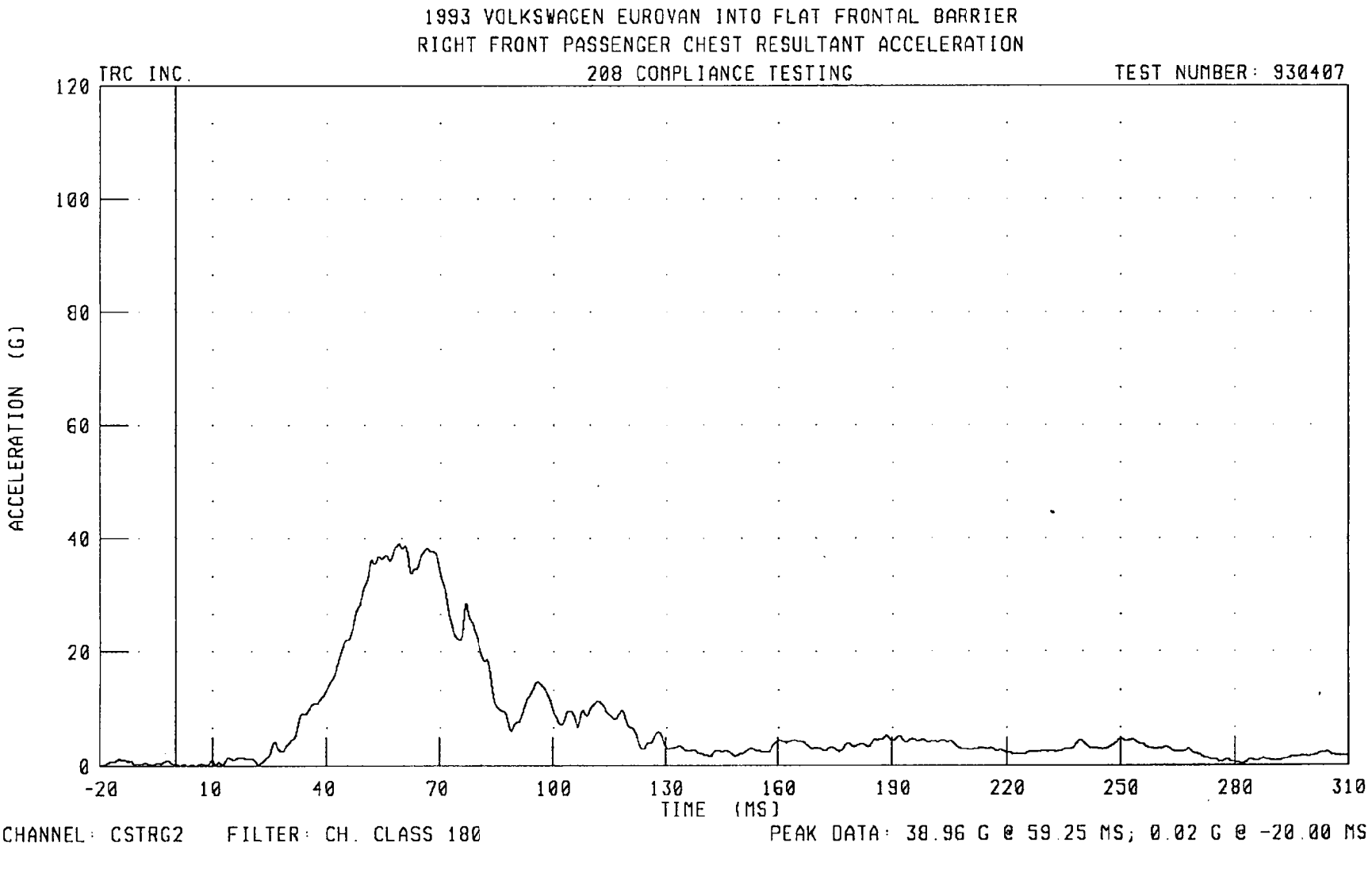
PEAK DATA: 3.94 G @ 253.38 MS; -36.68 G @ 59.13 MS

930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION
TRC INC
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTYG2
FILTER: CH. CLASS 180
PEAK DATA: 4.48 G @ 76.88 MS; -15.83 G @ 68.88 MS

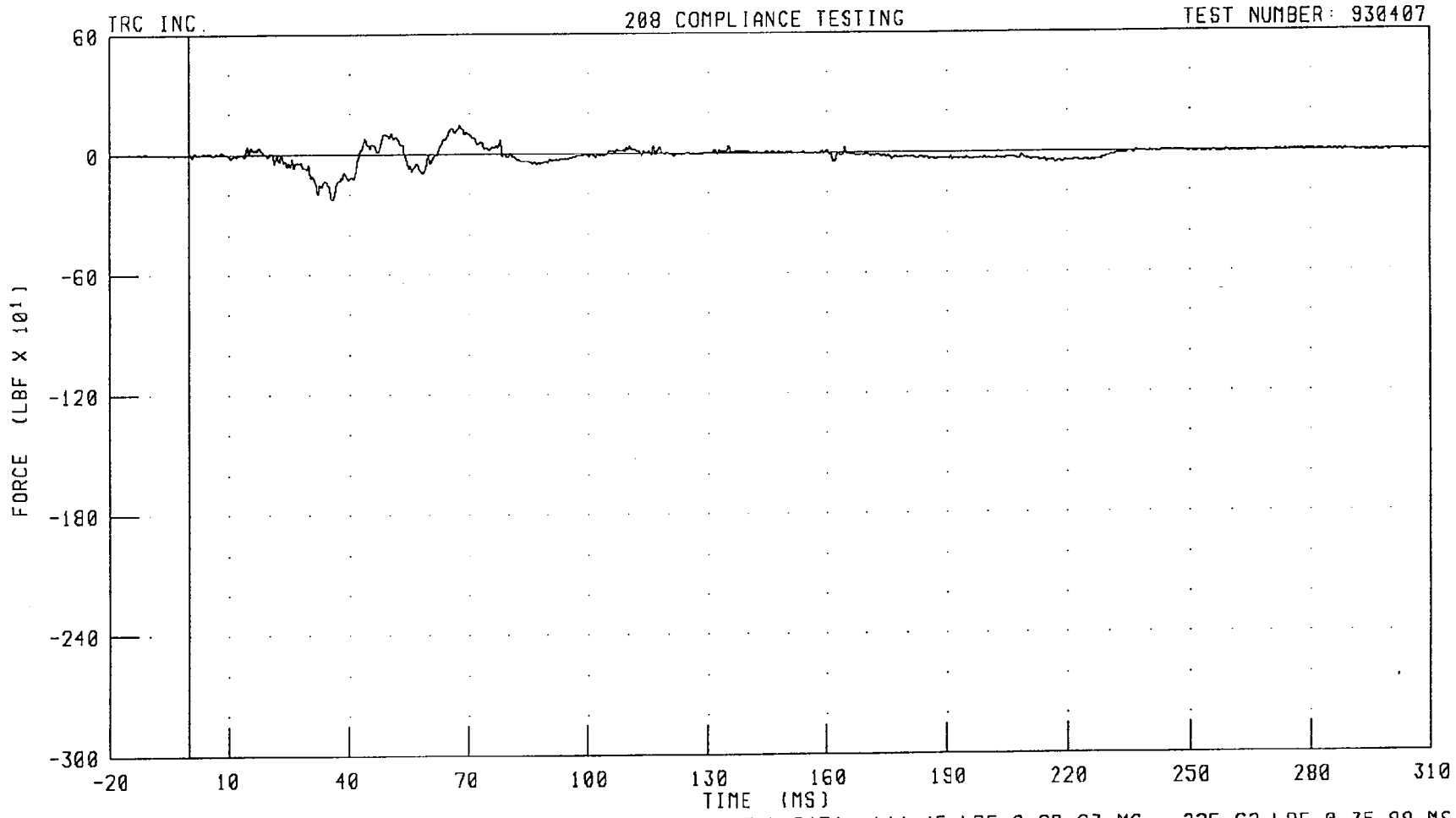

1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG2
FILTER: CH. CLASS 180
PEAK DATA: 5.79 G @ 77.13 MS; -11.43 G @ 51.88 MS

930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG2
FILTER: CH. CLASS 180
PEAK DATA: 38.96 G @ 59.25 MS; 0.02 G @ -20.00 MS

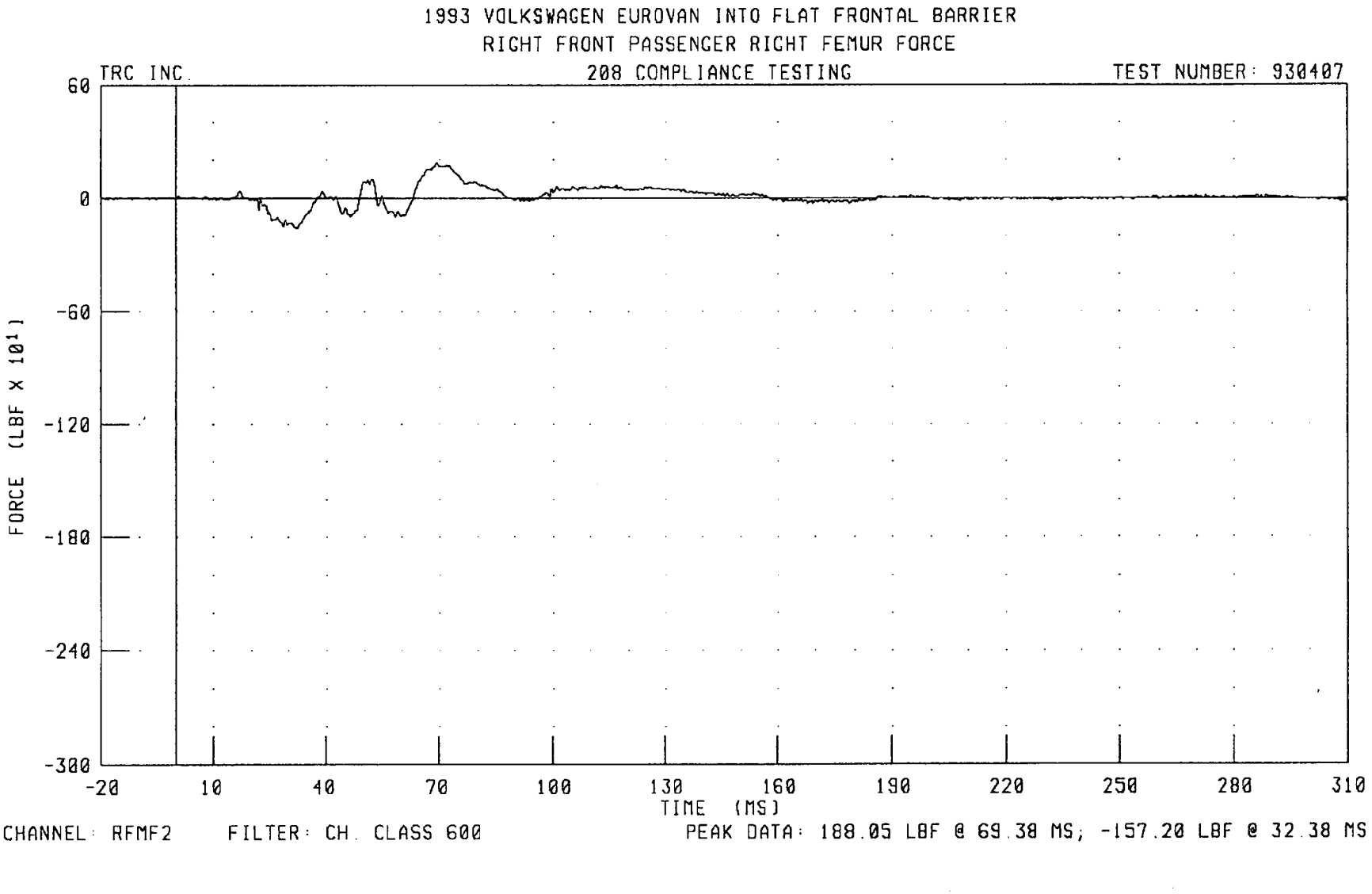
930407

1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE
208 COMPLIANCE TESTING

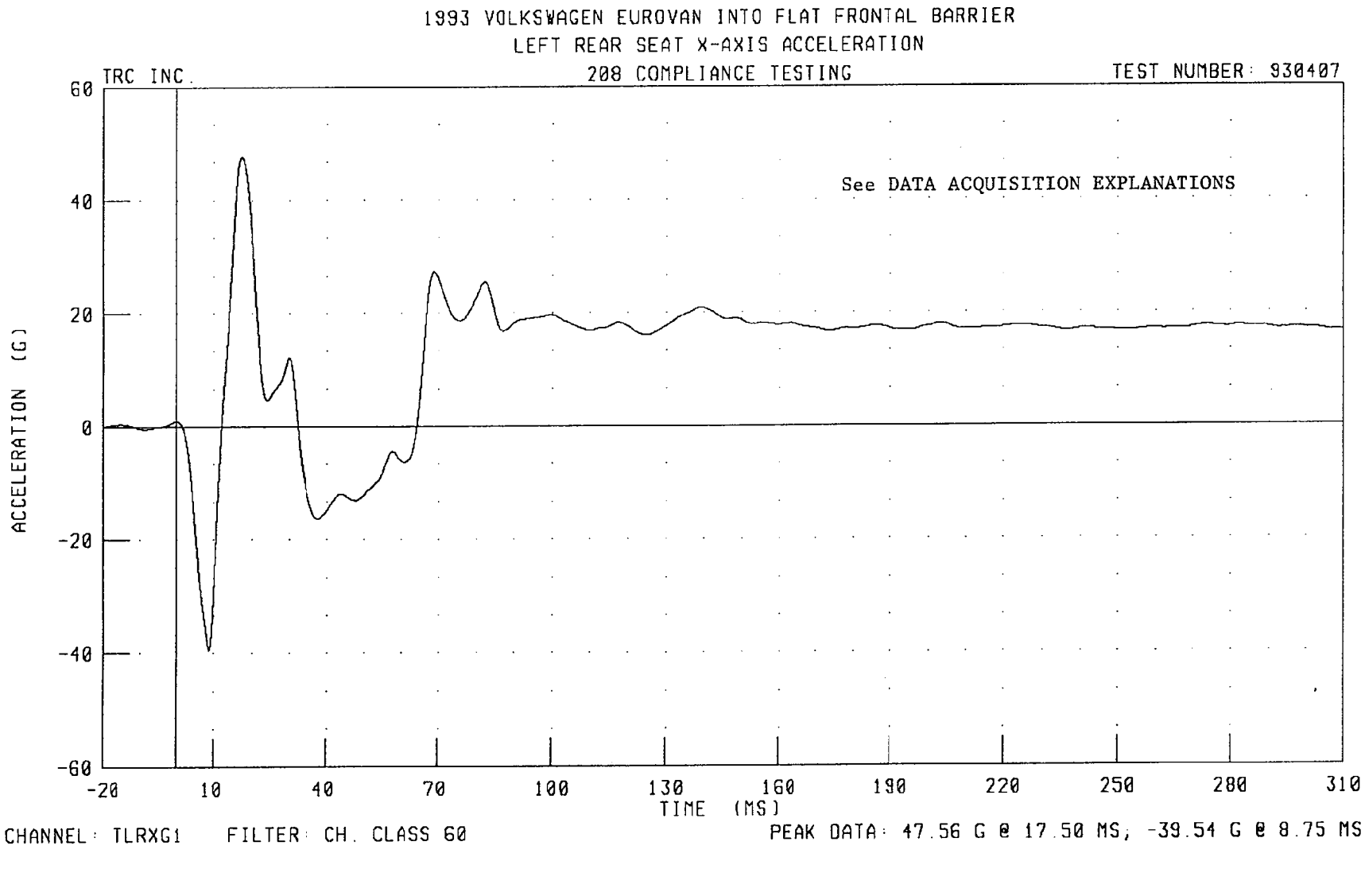


CHANNEL: LFMF2 FILTER: CH. CLASS 600
PEAK DATA: 144.45 LBF @ 67.63 MS; -225.62 LBF @ 35.88 MS

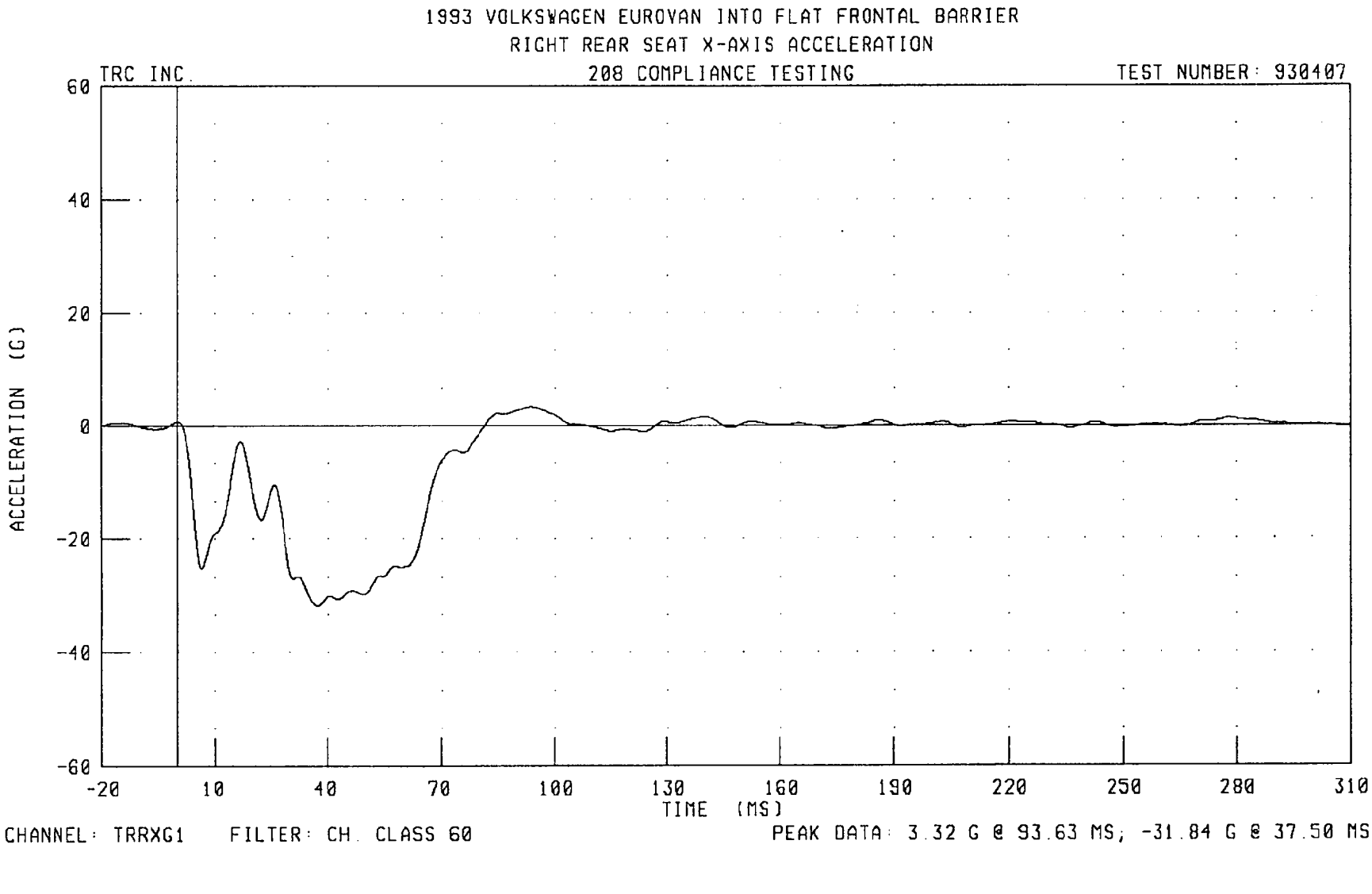
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
0
-60
-120
-180
-240
-300
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMF2
FILTER: CH. CLASS 600
PEAK DATA: 188.05 LBF @ 69.38 MS; -157.20 LBF @ 32.38 MS

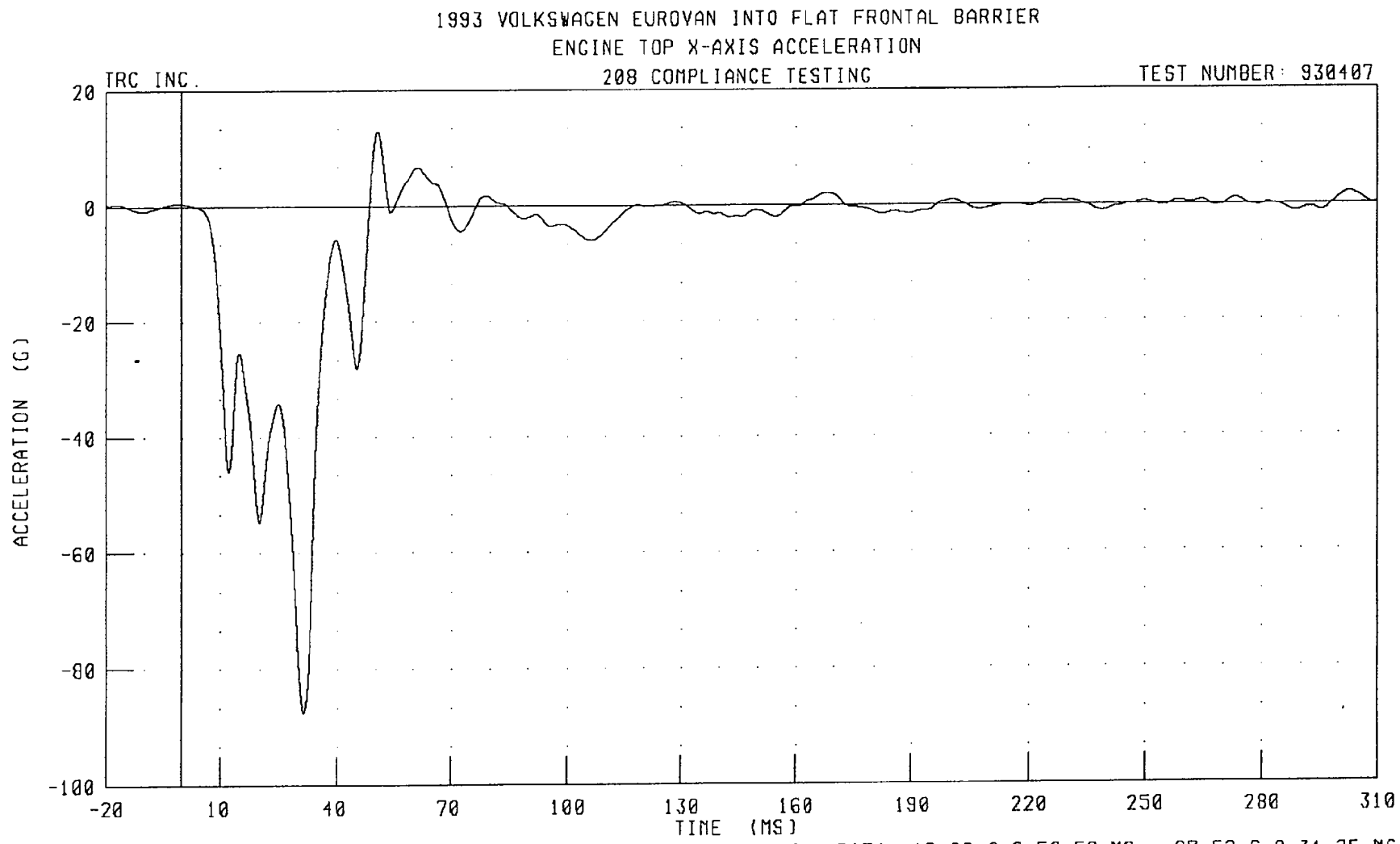
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
208 COMPLIANCE TESTING
TRC INC.
TEST NUMBER: 930407
See DATA ACQUISITION EXPLANATIONS
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TLRXG1
FILTER: CH. CLASS 60
PEAK DATA: 47.56 G @ 17.50 MS, -39.54 G @ 8.75 MS

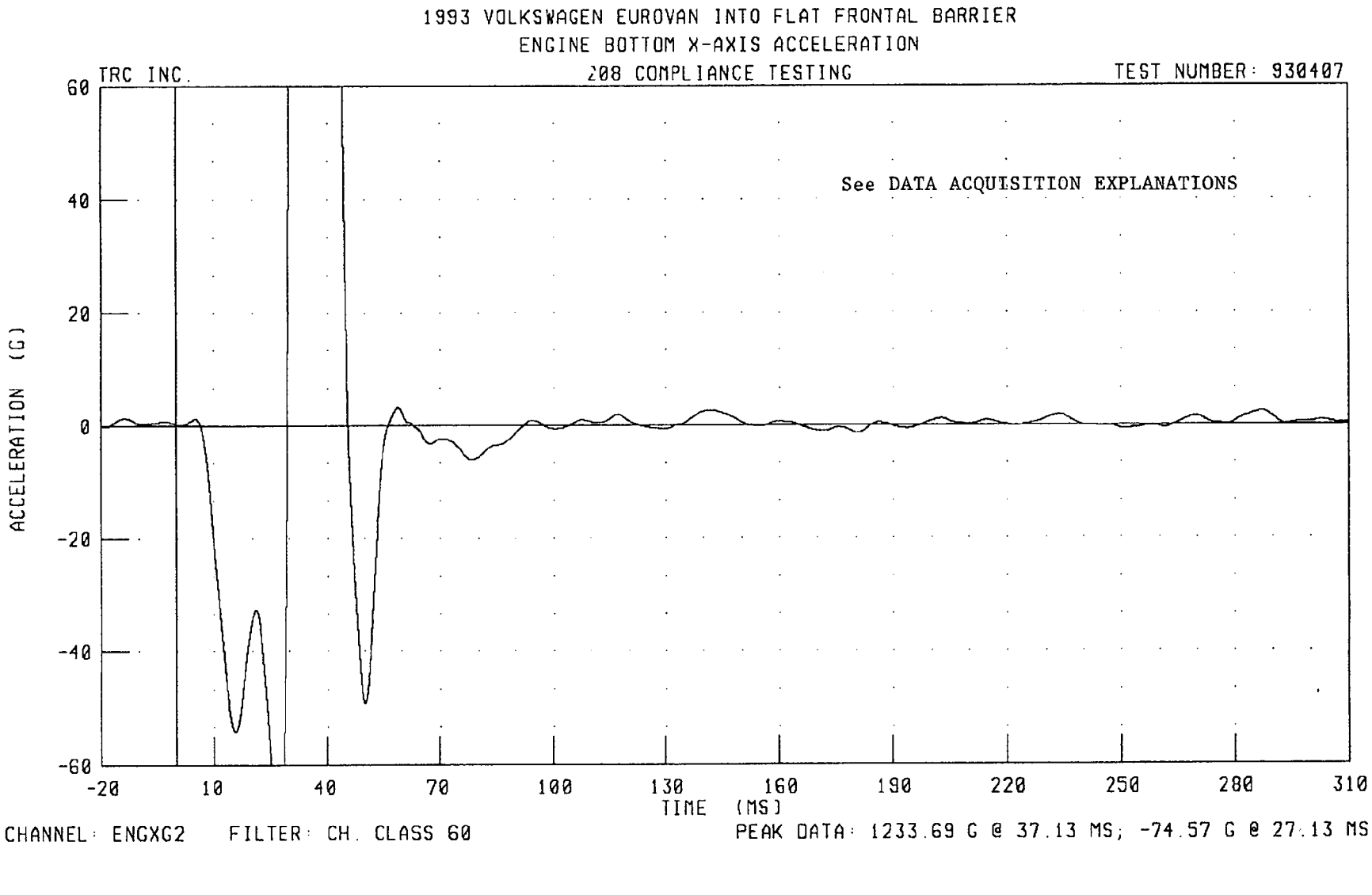
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TRRXG1
FILTER: CH. CLASS 60
PEAK DATA: 3.32 G @ 93.63 MS; -31.84 G @ 37.50 MS

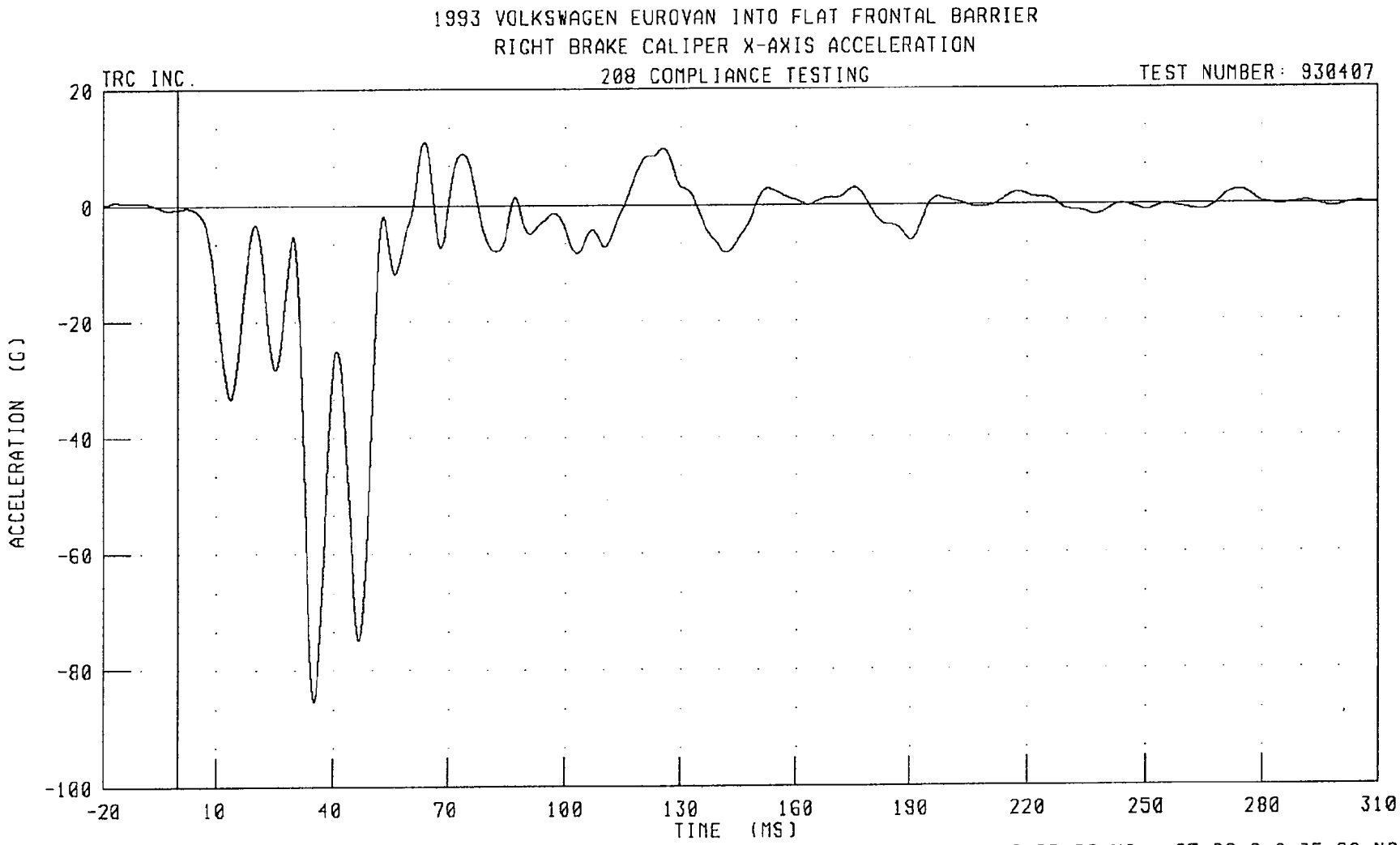
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
ENGINE TOP X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
20
0
-20
-40
-60
-80
-100
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG1
FILTER: CH. CLASS 60
PEAK DATA: 12.89 G @ 50.50 MS; -87.52 G @ 31.25 MS

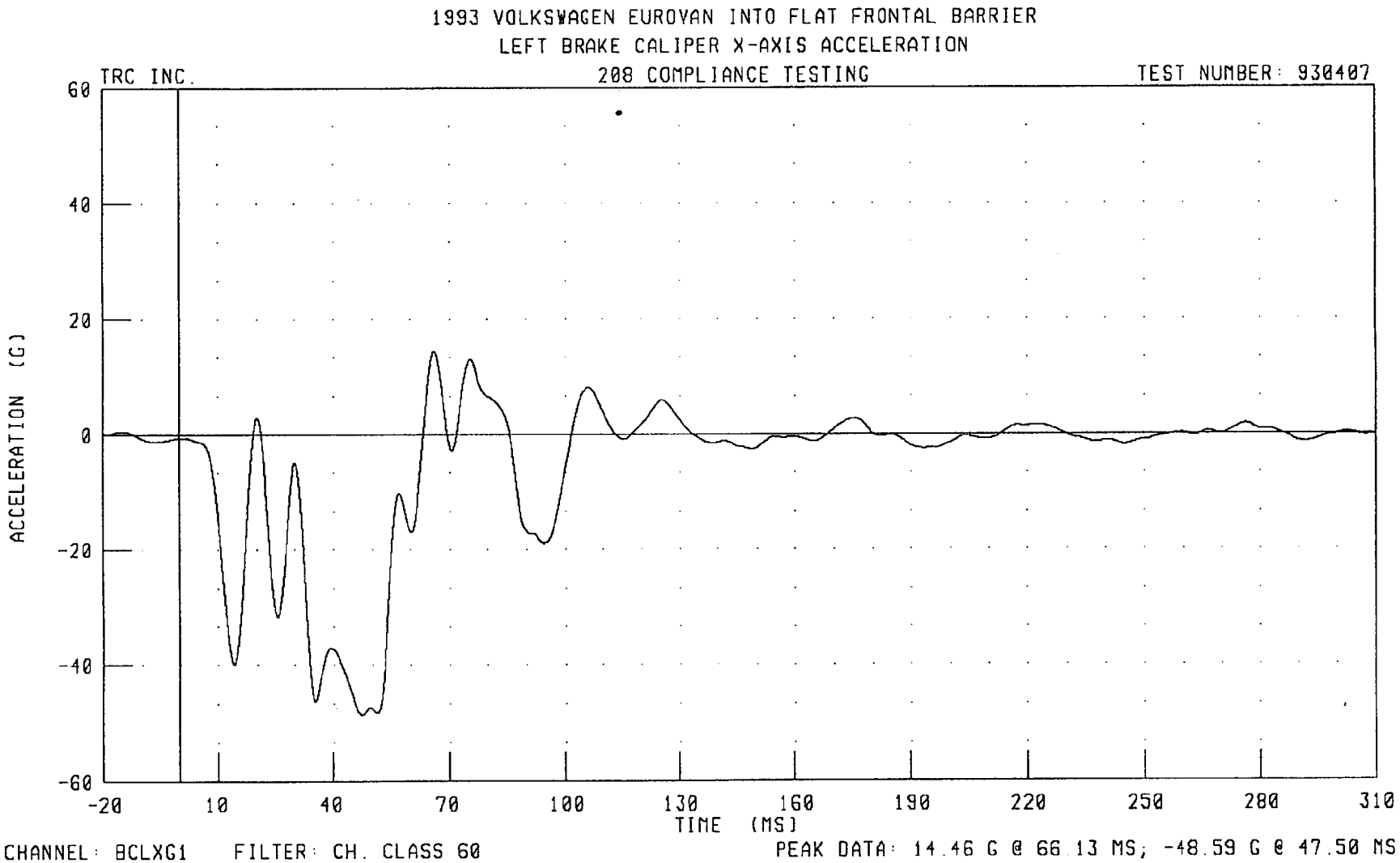
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
See DATA ACQUISITION EXPLANATIONS
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG2
FILTER: CH. CLASS 60
PEAK DATA: 1233.69 G @ 37.13 MS; -74.57 G @ 27.13 MS

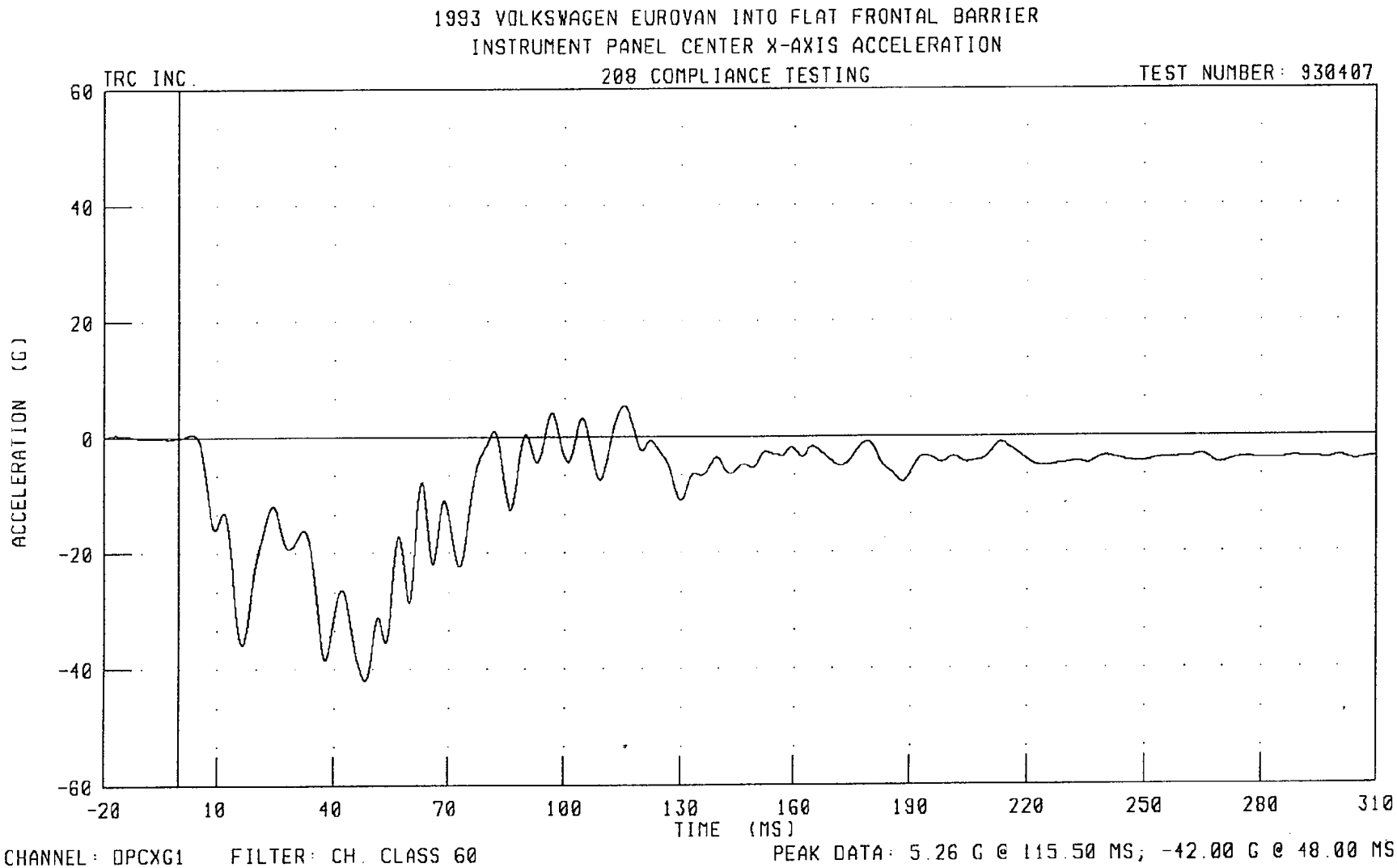
930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
20
0
-20
-40
-60
-80
-100
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCRXG1
FILTER: CH. CLASS 60
PEAK DATA: 10.90 G @ 63.88 MS; -85.29 G @ 35.00 MS

930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCLXG1
FILTER: CH. CLASS 60
PEAK DATA: 14.46 G @ 66.13 MS; -48.59 G @ 47.50 MS

930407


1993 VOLKSWAGEN EUROVAN INTO FLAT FRONTAL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TESTING
TEST NUMBER: 930407
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: DPCXG1
FILTER: CH. CLASS 60
PEAK DATA: 5.26 G @ 115.50 MS; -42.00 G @ 48.00 MS

930407