REPORT NOS. 208-TRC-94-002

212-TRC-94-002

301-TRC-94-002

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

SUZUKI MOTOR CORPORATION

1994 SUZUKI SWIFT

4-DOOR SEDAN

NHTSA NO. CR0500

TRC TEST NO. 931012

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

EAST LIBERTY, OHIO 43319

OCTOBER 28, 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. 6115

WASHINGTON, DC 20590

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16. Abstract

A 30 mph flat frontal barrier impact test was conducted on a 1994 Suzuki Swift 4-door sedan, NHTSA No. CR0500, at Transportation Research Center Inc. on October 12, 1993. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards: FMVSS 208, "Occupant Crash Protection"; 212, "Windshield Mounting"; 219 (partial), "Windshield Zone Intrusion"; and 301 "Fuel System Integrity." The barrier impact velocity was 29.3 mph. The vehicle's maximum static crush was 16.0 inches. The ambient temperature was 71° F.

The driver's head injury criteria (HIC) was 629. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 47.7 g. The driver's chest maximum deflection was 2.3 inches. The driver's left and right femur maximum axial forces were 1684 pounds and 547 pounds, respectively.

The passenger's HIC was 572. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 39.1 g. The passenger's chest maximum deflection was 2.4 inches. The passenger's left and right femur maximum axial forces were 500 pounds and 573 pounds, respectively.

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

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Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219 (partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"	Available from: NHTSA Technical Reference Division Room 5108, (NAD-52) 400 Seventh Street, S.W. Washington, DC 20590 Attn: Mr. Robert Hornickle

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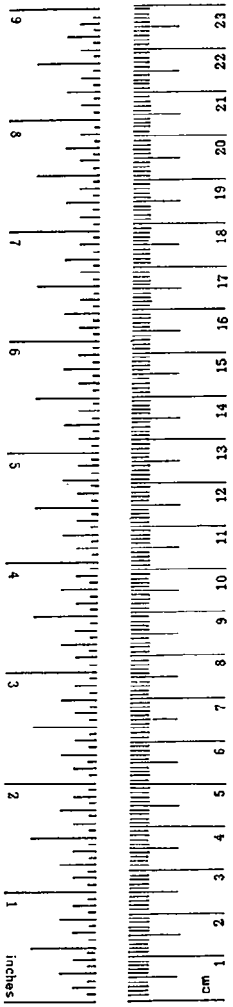
METRIC CONVERSION FACTORS

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

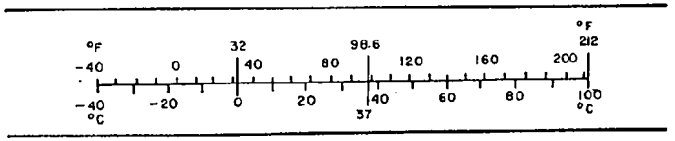


TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS, CONT'D.

SECTION 1.0

PURPOSE & TEST PROCEDURE

PURPOSE

This 30 mph flat frontal barrier impact test is part of the Federal Motor Vehicle Safety Standards (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-D-22121. The purpose of this test was to determine if the subject vehicle, a 1994 Suzuki Swift 4-door sedan, NHTSA No. CR0500, 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 and one (1) accelerometer to measure vertical axis acceleration. 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 E 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 Appendix B and Optional Appendix 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. Each Part 572 E dummy was instrumented with a chest potentiometer to measure longitudinal deflection and neck load cells to measure longitudinal, lateral, and vertical forces and moments.

The thirty-eight (38) data channels were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 12,500 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 October 12, 1993.

The test vehicle, a 1994 Suzuki Swift 4-door sedan, NHTSA No. CR0500, 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 E 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 door mounted automatic 3-point passive safety belt at both the driver and right front outboard passenger positions. The vehicle's test weight was 2278 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 16.0 inches.

The driver's HIC was 629. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 47.7 g. The driver's chest maximum deflection was 2.3 inches. The driver's left and right femur maximum axial forces were 1684 pounds and 547 pounds, respectively.

The right front passenger's HIC was 572. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 39.1 g. The passenger's chest maximum deflection was 2.4 inches. The right front passenger's left and right femur maximum axial forces were 500 pounds and 573 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 right front passenger's chest Z-axis accelerometer, CSTZG2, recorded a questionable data spike at 18 milliseconds. The data acquisition circuit was checked after the test. No cause for the data spike was found.

The right front passenger's 6-axis neck load cell X-, Y-, and Z-axis force and moment channels all lost data. The cause for the questionable data during the impact event appears to be a damaged data acquisition system multiplexing cable. The neck Z-axis axial force channel, NEKZF1, was malfunctioning before the test. The neck Z-axis axial force channel functioned correctly during the post-test calibration. The neck load cell was checked after the test and functioned correctly. No cause for the neck Z-axis axial force channel malfunctioning was found. The load cell was returned to and checked by its manufacturer and no cause for the malfunctioning was found.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.:	CR0500	
TEST TYPE:	Frontal Barrier Impact	
TEST DATE:	10/12/93	
TEST TIME:	1549	
AMBIENT TEMPERATURE AT IMPACT AREA:	71° F	
VEHICLE YEAR/MAKE/ MODEL/BODY STYLE:	1994/Suzuki/Swift/4-door sedan	
VEHICLE TEST WEIGHT:	2278 LBS.	
IMPACT ANGLE[1]:	0°	
IMPACT VELOCITY[2]:		
PRIMARY:	29.3 MPH	
SECONDARY:	29.6 MPH	
MAXIMUM STATIC CRUSH:	16.0	
AVERAGE REBOUND:	27.9	
NUMBER OF CAMERAS:		
Real-time:	2	
High-speed:	14	
FRONT DOOR OPENING DATA:		
LEFT:	Difficult, required tools	
RIGHT:	Easy	
DUMMIES:	Driver #229	Passenger #230
TYPE:	Part 572 E	Part 572 E
LOCATION:	Left front	Right front
RESTRAINT:	Three-point passive	Three-point passive
NUMBER OF DATA CHANNELS:	15	15
FRONT SEAT DATA:		
SEAT TRACK FAILURE:	None	None
SEAT BACK FAILURE:	None	None
VISIBLE DUMMY CONTACT POINTS:		
HEAD:	Upper steering wheel rim & hub	Chest
CHEST:	Lower steering wheel rim	None
ABDOMEN:	None	None
LEFT KNEE:	Instrument panel	Instrument panel
RIGHT KNEE:	Instrument panel	Instrument panel

All distance measurements are in inches.
[1]With respect to tow track centerline.
[2]Speed trap measurement (± .05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE YEAR/MAKE/ MODEL\BODY STYLE:	1994/Suzuki/Swift/4-door sedan
COLOR:	White
VIN:	JS2AE35S0R5100283
NHTSA NO.:	CR0500

ENGINE DATA:

PLACEMENT:	_____ LONGITUDINAL/INLINE __X__ TRANSVERSE/LATERAL
CYLINDERS:	4
DISPLACEMENT:	1.3 liters
TRANSMISSION DATA:	_5_ SPEED, _X_ MANUAL, ___AUTOMATIC, ___OVERDRIVE
FINAL DRIVE:	_X_ FWD, ___RWD, ___4WD

DATE VEHICLE RECEIVED:	09/13/93
ODOMETER READING:	190
DEALER'S NAME AND ADDRESS:	A. Merry Suzuki P. O. Box 67 Norton, OH 44203

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	No
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
POWER DOOR LOCKS	No	OTHER	None

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY:	Suzuki Motor Corp.
DATE OF MANUFACTURE:	06/93
VIN:	JS2AE35S0R5100283
GVWR:	2625 LBS.
GAWR: FRONT:	1390 LBS.
REAR:	1370 LBS.

TABLE 2 TEST VEHICLE INFORMATION, CONT'D.

SIZE OF TIRES ON VEHICLE:		P155/70R13
TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD:	FRONT:	35 PSI
	REAR:	35 PSI
SPARE TIRE:		__X__SPACE SAVER _____STANDARD
TYPE OF SEATS:	FRONT:	Bucket
	REAR:	Bench

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE:	P155/70R13
RECOMMENDED COLD TIRE PRESSURE:	FRONT: 29 PSI; REAR: 29 PSI
DESIGNATED SEATING CAPACITY:	2 FRONT 2 REAR 4 TOTAL
VEHICLE CAPACITY WEIGHT:	688 LBS.

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

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

TEST VEHICLE ATTITUDES:

DELIVERED ATTITUDE:	LF:	24.6;	RF:	24.7;	LR:	25.0;	RR:	24.4
FULLY LOADED ATTITUDE:	LF:	23.8;	RF:	23.8;	LR:	22.1;	RR:	22.1
PRE-TEST ATTITUDE:	LF:	23.6;	RF:	24.0;	LR:	22.4;	RR:	22.6
POST-TEST ATTITUDE:	LF:	23.5;	RF:	22.9;	LR:	23.2;	RR:	22.0

All distance measurements are in inches.

TABLE 2 TEST VEHICLE INFORMATION, CONT'D.

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

RIGHT FRONT	515	LBS.	RIGHT REAR	406	LBS.
LEFT FRONT	542	LBS.	LEFT REAR	404	LBS.
TOTAL FRONT WEIGHT	1057	LBS.	(56.6% OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	810	LBS.	(43.4% OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1867	LBS.			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW[1] = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (1867 LBS)

VCW = VEHICLE CAPACITY WEIGHT (688 LBS.)

DSC = DESIGNATED SEATING CAPACITY (4)

RCLW[1] = VCW - 150 (DSC) = 88

TARGET TEST WEIGHT = UDW + RCLW[1] + (NUMBER OF HYBRID III DUMMIES X 167 LBS. PER DUMMY)

TARGET TEST WEIGHT = 1867 + 88 + 334 = 2289 LBS.

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 77 LBS. OF CARGO WEIGHT:

RIGHT FRONT	579	LBS.	RIGHT REAR	538	LBS.
LEFT FRONT	611	LBS.	LEFT REAR	550	LBS.
TOTAL FRONT WEIGHT	1190	LBS.	(52.2% OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1088	LBS.	(47.8% OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2278	LBS.	(0.5% UNDER TARGET TEST WEIGHT)		

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

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Bumper, rear door glass and trim, rear seat belts, muffler

CG: 44.5 INCHES REARWARD OF FRONT WHEEL CENTERLINE

WHEELBASE: 93.1 INCHES

[1]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:	931012
NHTSA NO.:	CR0500
TEST DATE:	10/12/93
TEST TIME:	1549
TEST TYPE:	Frontal Barrier Impact
IMPACT ANGLE:	0°
AMBIENT TEMPERATURE AT IMPACT AREA:	71° F
TEMPERATURE IN OCCUPANT COMPARTMENT:	70° F
IMPACT VELOCITY:	
PRIMARY:	29.3 MPH
SECONDARY	29.6 MPH
SPECIFIED RANGE:	28.9 TO 29.9 MPH

DISTANCE FROM VEHICLE TO BARRIER:

ENTERING VELOCITY TRAP: 15.0

EXITING VELOCITY TRAP: 2.0

TEST VEHICLE STATIC CRUSH:

OVERALL LENGTH OF TEST VEHICLE:

PRE-TEST:	L: 156.8;	C: 160.5;	R: 157.0		
POST-TEST:	L: 142.5;	C: 144.5;	R: 143.6		
TOTAL CRUSH:	L: 14.3;	C: 16.0;	R: 13.4		
AVERAGE CRUSH:	14.6				

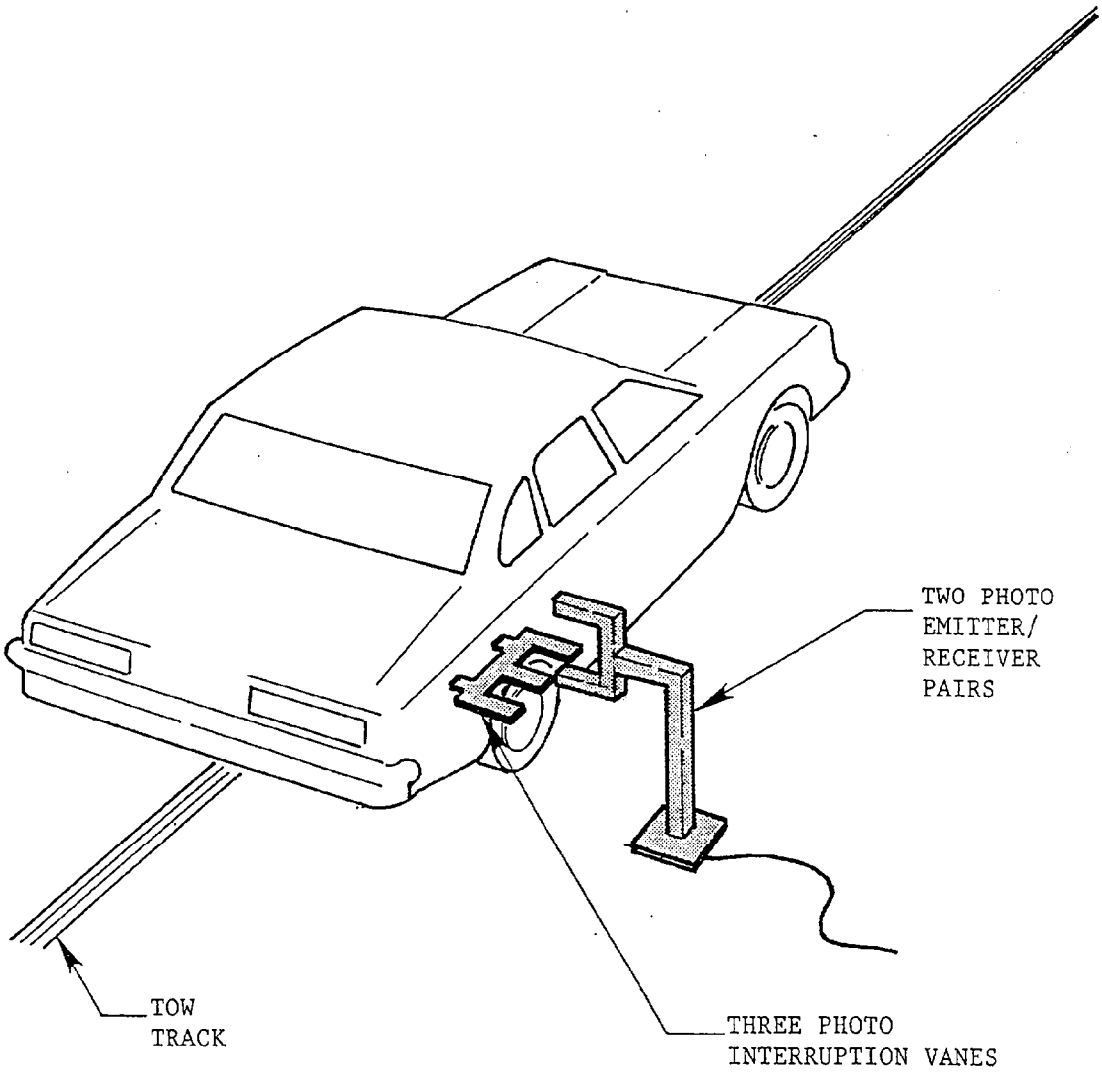
TEST VEHICLE REBOUND FROM FLAT BARRIER:

DISTANCE FROM TEST VEHICLE TO BARRIER:

L: 27.8;	C: 27.4;	R: 28.5	
AVG.: 27.9			

All distance measurements are in inches.

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



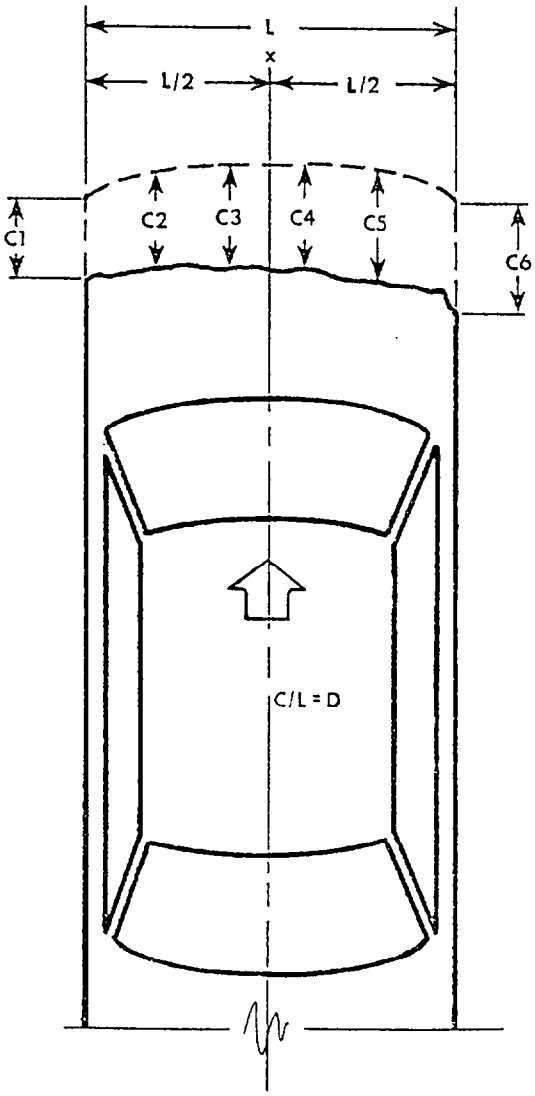
The final vane clears emitter/receiver two inches before impact.

The vanes have one-foot spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA

FOR 30 MPH FRONTAL BARRIER IMPACT

NHTSA NO.:	CR0500
TEST DATE:	10/12/93
VEHICLE YEAR/MAKE/ MODEL/BODY STYLE:	1994/Suzuki/Swift/4-door sedan
VEHICLE SIZE CATEGORY:	Subcompact
VIN:	JS2AE35S0R5100283
BUILD DATE:	06/93
TEST WEIGHT:	2278 LBS.
VEHICLE WHEELBASE:	93.1
MAXIMUM WIDTH:	62.6
FRONT OVERHANG:	29.5



COLLISION DEFORMATION

CLASSIFICATION (CDC) CODE: 12FDEW2

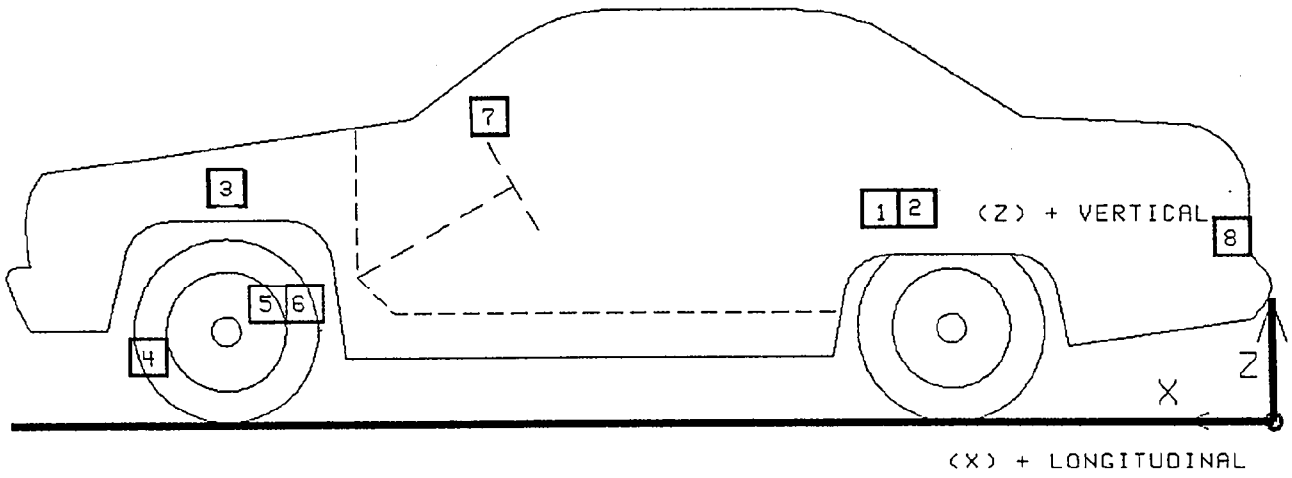
CRUSH DEPTH MEASUREMENTS:	C1:	14.3
	C2:	15.9
	C3:	15.8
	C4:	15.4
	C5:	15.0
	C6:	13.4

MIDPOINT OF DAMAGE: D: Vehicle Longitudinal Centerline

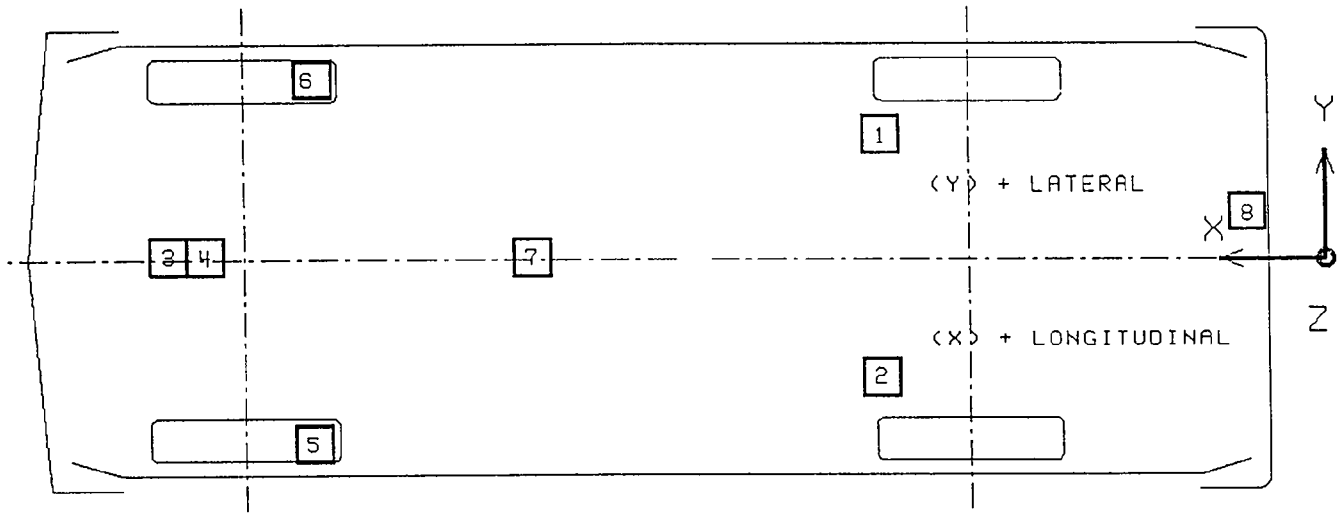
LENGTH OF DAMAGED REGION: L: 52.0

All distance measurements are in inches.

FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 931012

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	61.6	23.3	11.7				
		POST	61.5	23.3	13.8	1.0	184.5	48.9	40.0
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE	60.4	-23.4	11.9				
		POST	61.0	-23.4	13.6	0.8	197.0	37.2	40.8
3	ENGINE TOP LONGITUDINAL	PRE	141.6	-5.0	27.9				
		POST	133.2	-5.1	28.5	72.9	40.1	162.3	32.2
4	ENGINE BOTTOM LONGITUDINAL	PRE	132.9	-9.8	8.0				
		POST	126.2	-10.2	9.1	57.2	43.8	127.0	34.2

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 931012

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
5	RIGHT BRAKE CALIPER	PRE	134.4	-26.2	11.2				
		POST	133.0	-25.6	13.7				
	LONGITUDINAL					13.0	64.7	66.6	46.5
6	LEFT BRAKE CALIPER	PRE	134.4	26.2	11.4				
		POST	132.1	25.5	12.2				
	LONGITUDINAL					27.1	69.4	79.9	42.7
7	INSTRUMENT PANEL CENTER	PRE	108.9	-0.5	32.9				
		POST	109.6	-0.2	35.1				
	LONGITUDINAL					68.2	67.3	50.5	72.4
8	VEHICLE REAR CENTER	PRE	5.9	0.0	20.2				
		POST	5.9	0.0	20.2				
	VERTICAL					2.5	43.4	2.7	26.8

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT NO.: DTNH22-90-D-22121
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.: CR0500

VEHICLE YEAR/MAKE/
MODEL/BODY STYLE: 1994/Suzuki/Swift/4-door sedan

BODY COLOR: White

VIN: JS2AE35S0R5100283

ODOMETER (ARRIVAL): 190 DATE: 09/13/93

ODOMETER (COMPLETION): 193 DATE: 10/12/93

COST: $8,373.51

AIR CONDITIONER	No	CONSOLE	No	BRAKES	POWER
TINTED GLASS	Yes	TACHOMETER	No	FRONT	Disc
POWER STEERING	No	SPEED CONTROL	No	REAR	Drum
POWER WINDOWS	No	REAR WINDOW DEF.	Yes	FRONT SEATS	Manual
POWER DOOR LOCKS	No	SUN/MOON ROOF	No	SEAT TYPE	Front-bucket
RADIO	No	T-TOP	No		Rear-bench
CLOCK	No	TILT STEERING WHEEL	No	NO. OF SEATS	4
ROOF RACK	No	OTHER OPTIONS:	None		

ENGINE: 4 CYLINDERS
LITERS: 1.3
TRANSMISSION: 5-speed manual
DRIVE TYPE: Front-wheel drive
TIRE SIZE: P155/70R13
GASOLINE TYPE: Unleaded

EQUIPMENT THAT IS NO LONGER ON THE VEHICLE AS NOTED ABOVE: Rear bumper spare tire, rear door glass and trim, rear seat belts, muffler

EXPLANATION: Equipment removed to allow installation of data acquisition system.

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING, CONT'D.

VEHICLE CONDITION: Vehicle was subjected to a 30 mph crash test. There is severe structural damage. Various interior and exterior portions of the vehicle have been painted and have had holes drilled to facilitate attachment of instrumentation. Various trim and body parts have been removed including the rear seats. Stoddard solvent replaced the fuel in the fuel system and engine. THE VEHICLE IS FOR SALVAGE ONLY AND IS NOT TO BE REPAIRED FOR HIGHWAY USE.

SECTION 3.0

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

TABLE 5 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION (G)

	HEAD				CHEST		
	X	Y	Z	R	X	Y	Z
DRIVER	-125.9	13.8	-35.2	127.6	-50.5	4.3	-9.8
PASSENGER	-44.4	-8.5	-49.9	57.8	-39.5	8.1	13.3

MAXIMUM FEMUR COMPRESSIVE FORCE (LBS.)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	1684	547
PASSENGER	500	573

HEAD INJURY CRITERIA[1]

	HIC	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	629	69.8	105.8
PASSENGER	572	78.0	114.0

CHEST MAXIMUM RESULTANT ACCELERATION[2]

	ACCEL. (G)	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	47.7	75.0	78.0
PASSENGER	39.1	75.6	78.6

MAXIMUM CHEST DEFLECTION (IN.)

DRIVER	2.3
PASSENGER	2.4

[1]As defined in FMVSS No. 208

[2]Defined as equal to or exceeding 0.003 sec. duration

DUMMY KINEMATIC SUMMARY

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated slightly forward impacting the upper steering wheel rim and hub. The driver dummy was restrained by the three-point passive belt. The dummy rebounded rearward into the seat back. The dummy's head rotated rearward into the head restraint. The driver dummy came to rest in the driver's seat restrained by the three-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 head rotated downward and contacted the dummy's chest. The right front passenger dummy was restrained by the three-point passive belt. The dummy rebounded rearward into the seat back. The dummy's head rotated rearward into the head restraint. The right front passenger dummy came to rest in the right front passenger's seat restrained by the three-point passive belt.

TABLE 6 FMVSS 208 COMFORT & CONVENIENCE DATA FOR AUTOMATIC SEAT BELTS

MAKE/MODEL/BODY STYLE: Suzuki/Swift/4-door sedan

NHTSA NO.: CR0500

VIN: JS2AE35S0R5100283

DATE OF MANUFACTURE: 06/93

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 a 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 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 = __CONTINUOUS__

Duration of reminder light operation = __CONTINUOUS__

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 = ___0___ sec.

WORDING OF VISUAL WARNING:

_____ Fasten Seat Belt

_____ Fasten Belt

__X__ Symbol from Table 2 of FMVSS 101

_____ Other: _____

TABLE 8 FMVSS 208 LABELING AND DRIVER'S MANUAL DATA

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

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

TABLE 9 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

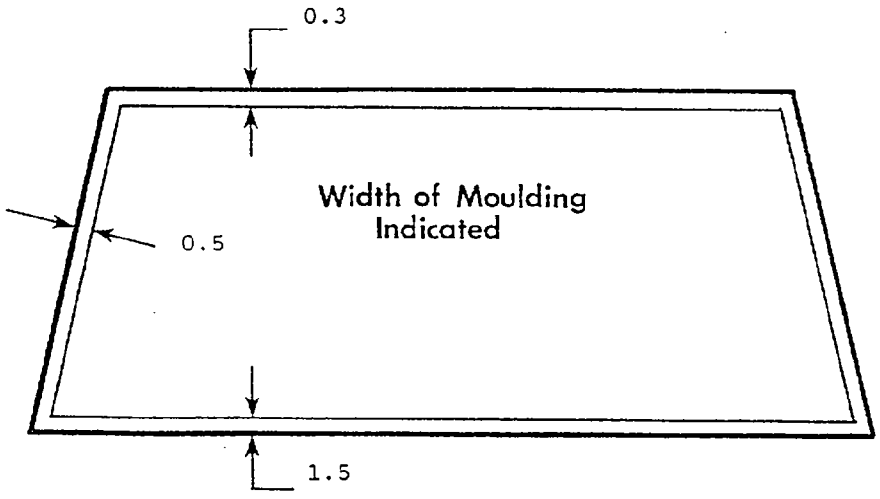
DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	77.5	77.5	100
LEFT SIDE	77.5	77.5	100
TOTAL	155.0	155.0	100

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 68° F



FRONT VIEW OF WINDSHIELD[1]

LOSS OF WINDSHIELD RETENTION LENGTHS: None

All distance measurements are in inches.
[1]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: 41.0

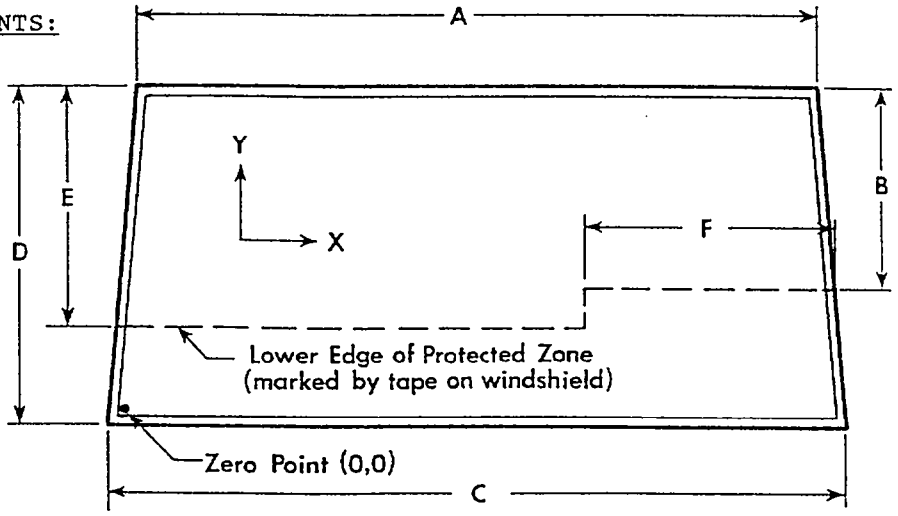
B: 21.4

C: 54.1

D: 33.2

E: 23.8

F: 21.6



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 10 FUEL SYSTEM DATA

MAKE/MODEL:	Suzuki/Swift
NHTSA NO.:	CR0500
FUEL SYSTEM CAPACITY:	10.6 GALLONS (FROM OWNER'S MANUAL)
USABLE CAPACITY:	10.6 GALLONS (FURNISHED BY COTR)
TEST VOLUME RANGE:	9.8 GALLONS TO 10.0 GALLONS (92-94% OF USABLE)
ACTUAL TEST VOLUME:	9.9 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 located in front of the rear axle. The fuel filler is on the left side. 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 11 FMVSS 301 POST-IMPACT TEST DATA

NHTSA NO.: CR0500

TEST DATE: 10/12/93

VEHICLE YEAR/MAKE/
MODEL/BODY STYLE: 1994/Suzuki/Swift/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:

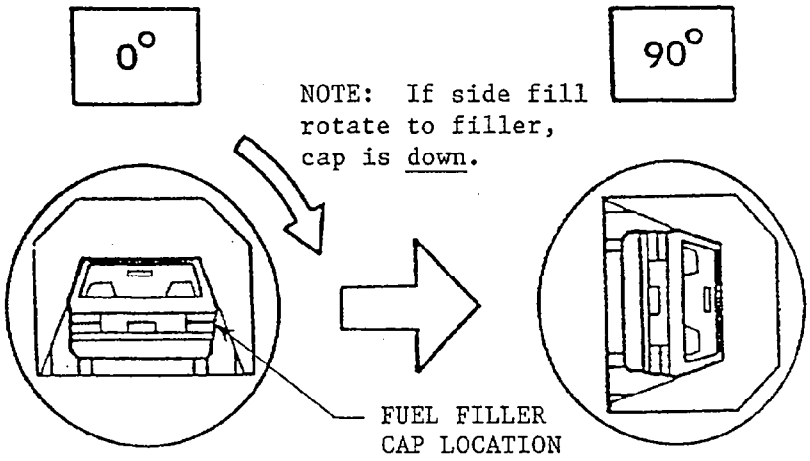
		TEST RESULTS	MAXIMUM ALLOWABLE
1.	FROM IMPACT UNTIL VEHICLE MOTION CEASES	0 OZ.	1 OZ.
2.	5-MINUTE PERIOD AFTER VEHICLE MOTION CEASES	0 OZ.	5 OZ.
3.	NEXT 25 MINUTES AFTER 5 MINUTE PERIOD	0 OZ.	1 OZ./1 MIN.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: CR0500
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:

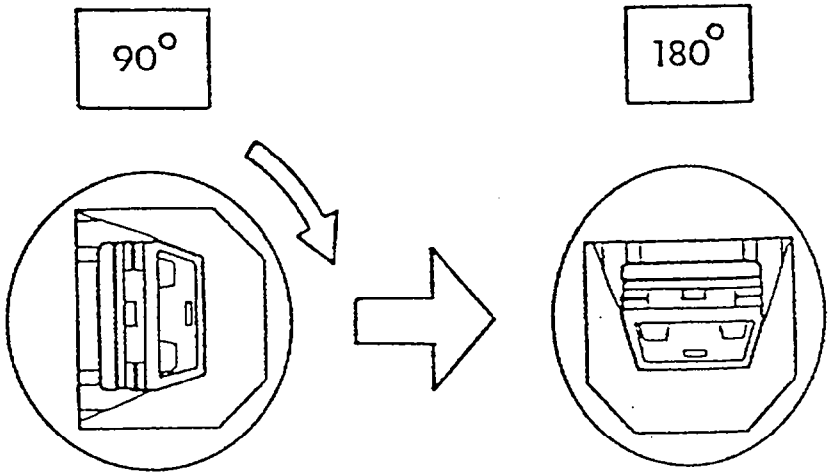
0° TO 90° ROTATION (FUEL FILLER CAP DOWN)	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CR0500
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:

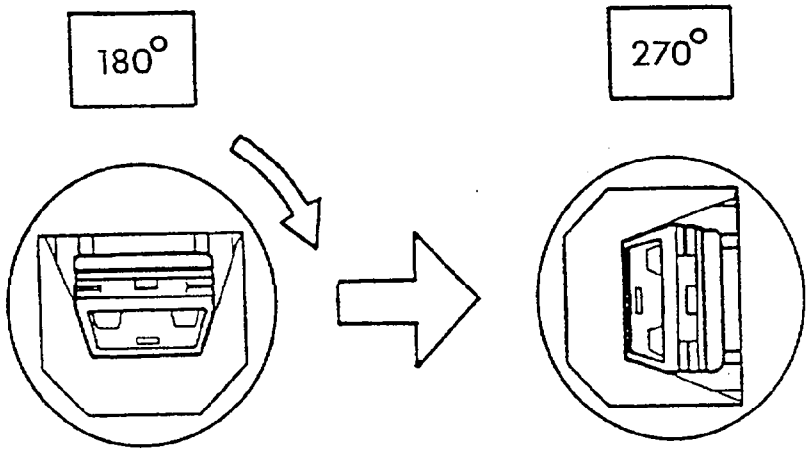
90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CR0500
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:

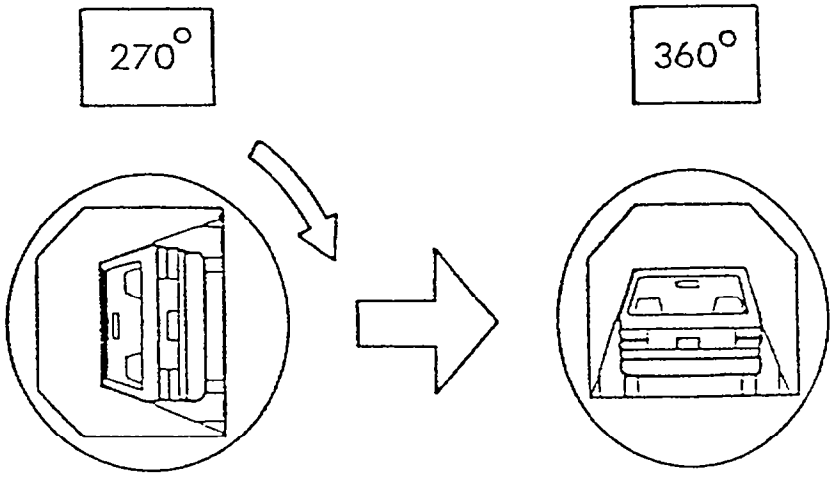
180° TO 270° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: CR0500
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.

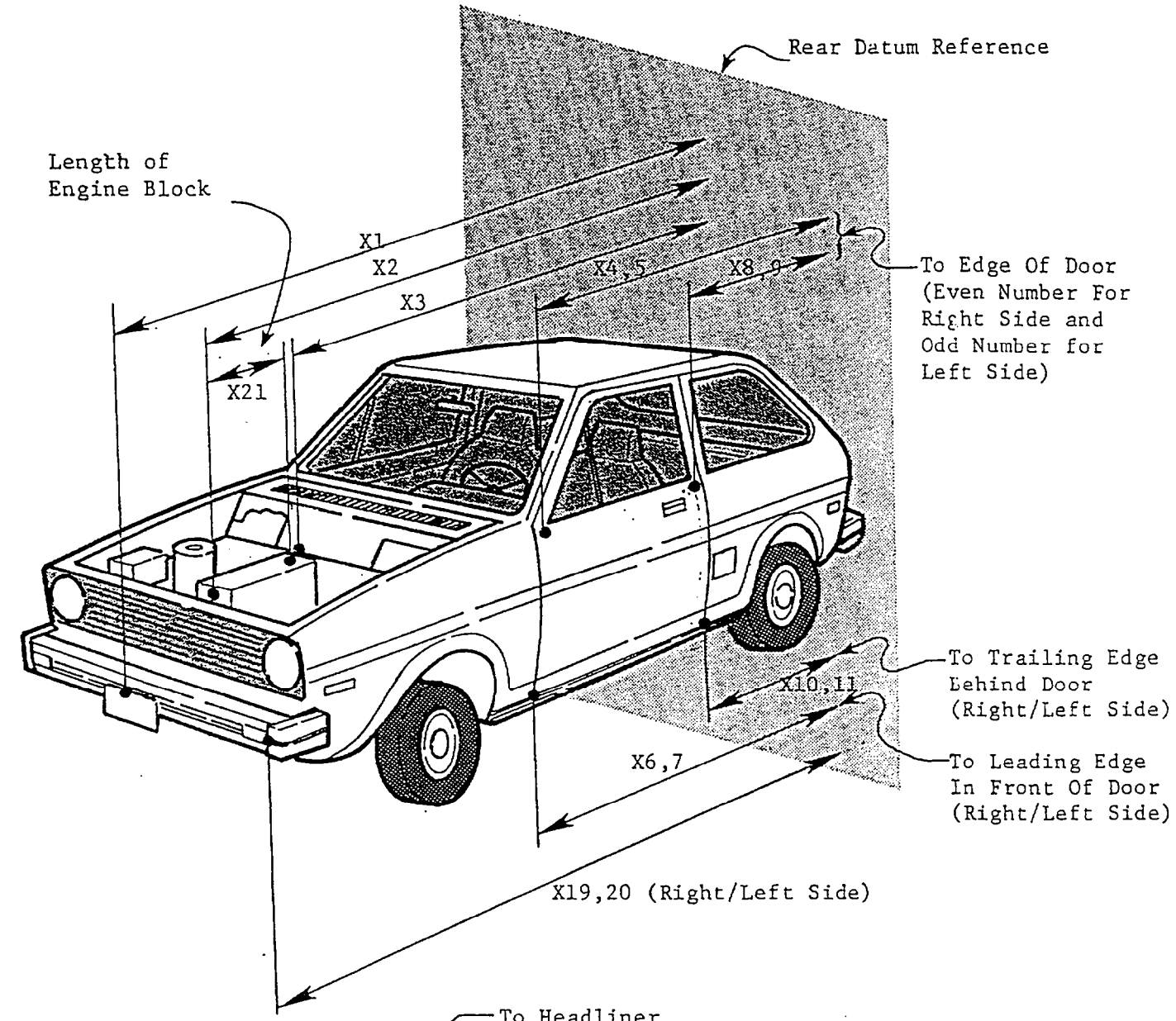
FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

SECTION 4.0

VEHICLE, OCCUPANT, AND CAMERA MEASUREMENTS

FIGURE 7 PRE-TEST AND POST-TEST MEASUREMENT POINTS



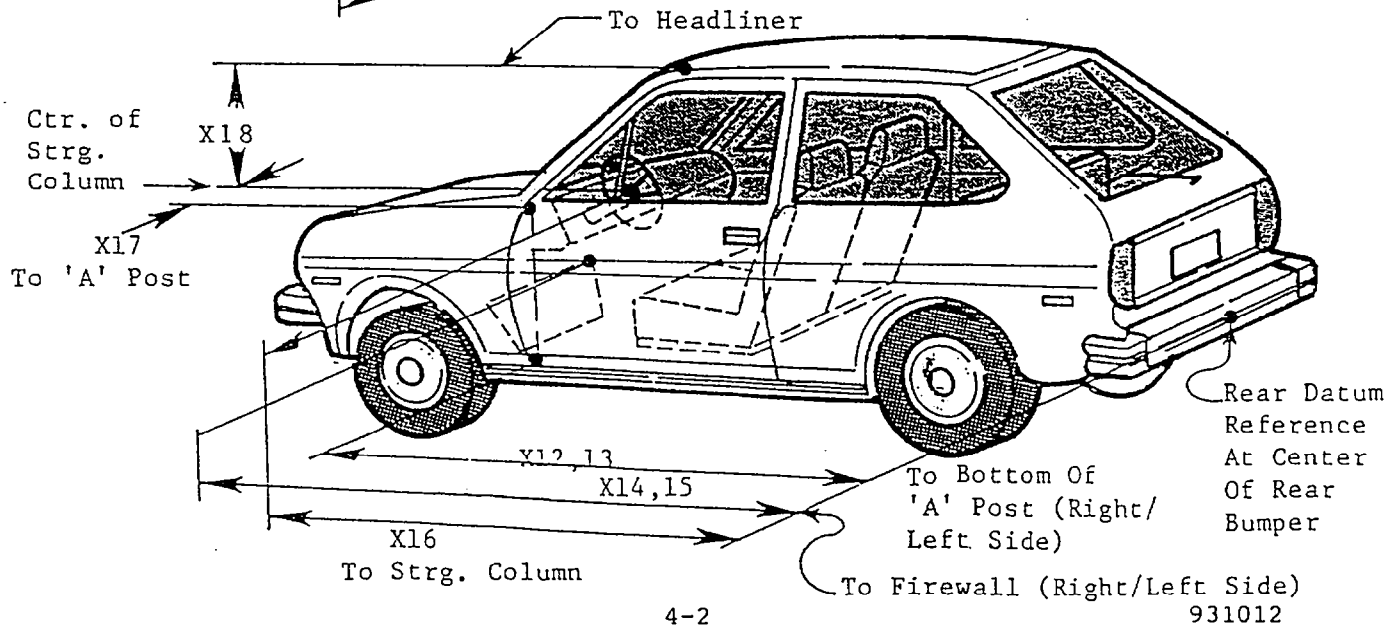


TABLE 12 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Suzuki/Swift TEST NUMBER: 931012

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	160.5	144.5	16.0
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	143.5	136.8	6.7
X3	REAR SURFACE OF VEHICLE TO FIREWALL	125.0	123.8	1.2
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	113.8	114.2	-0.4
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	113.8	112.2	1.6
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	113.2	113.2	0.0
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	113.0	113.8	-0.8
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	72.8	73.2	-0.4
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	72.6	72.8	-0.2
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	73.2	72.8	0.4
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	73.1	72.4	0.7
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	113.0	112.8	0.2
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	113.0	111.9	1.1
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	123.6	122.1	1.5
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	123.7	122.5	1.2
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	97.6	96.1	1.5
X17	CENTER OF STEERING COLUMN TO "A" POST	10.8	8.9	1.9
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.4	16.9	1.5
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	157.0	143.6	13.4
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	156.8	142.5	14.3
X21	LENGTH OF ENGINE BLOCK	14.8	14.8	0.0

All distance measurements are in inches.

FIGURE 8 VEHICLE TARGET LOCATIONS

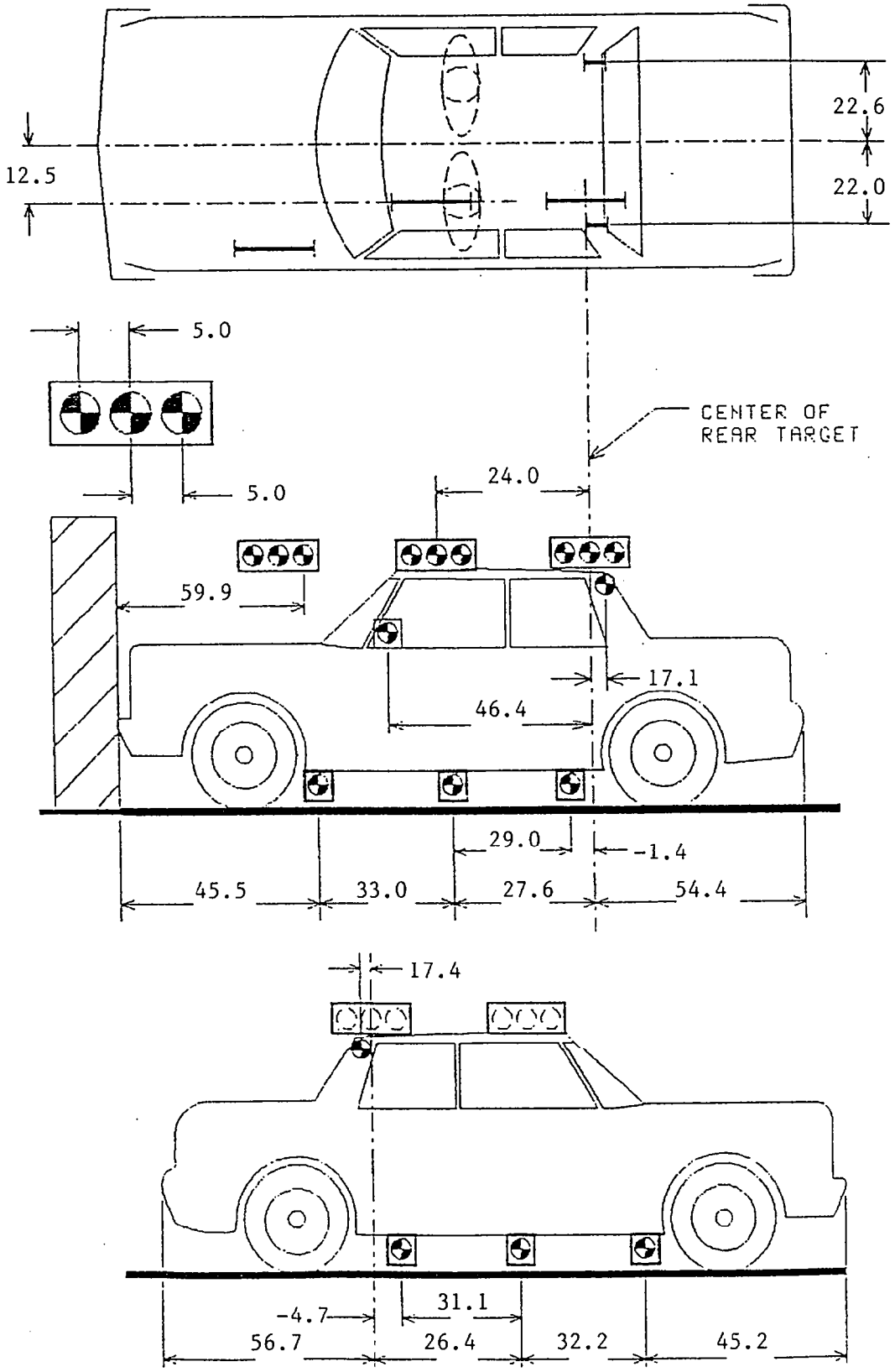
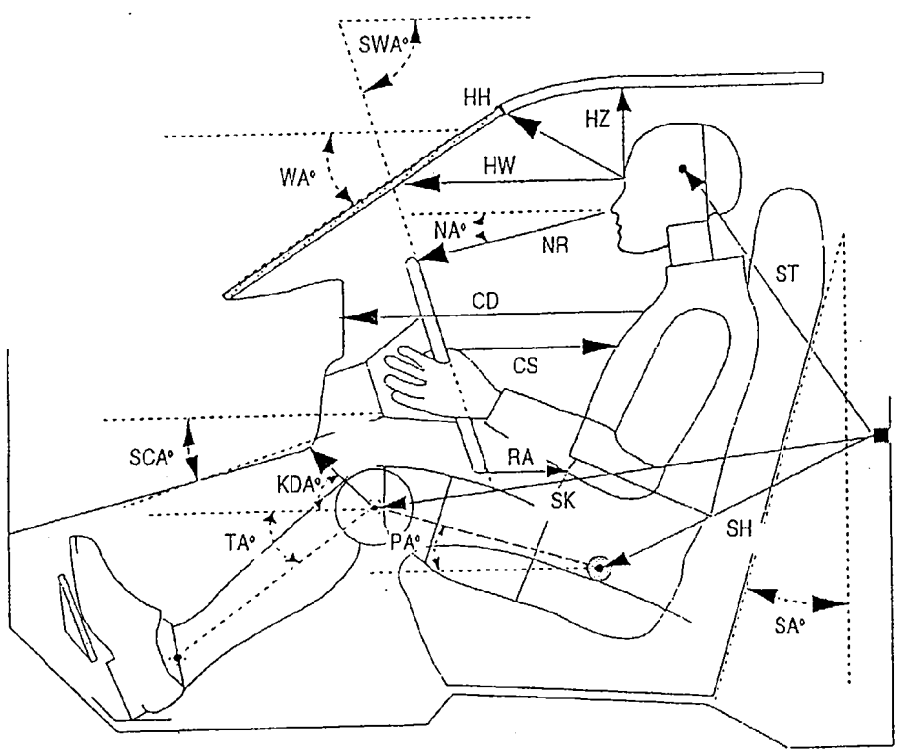
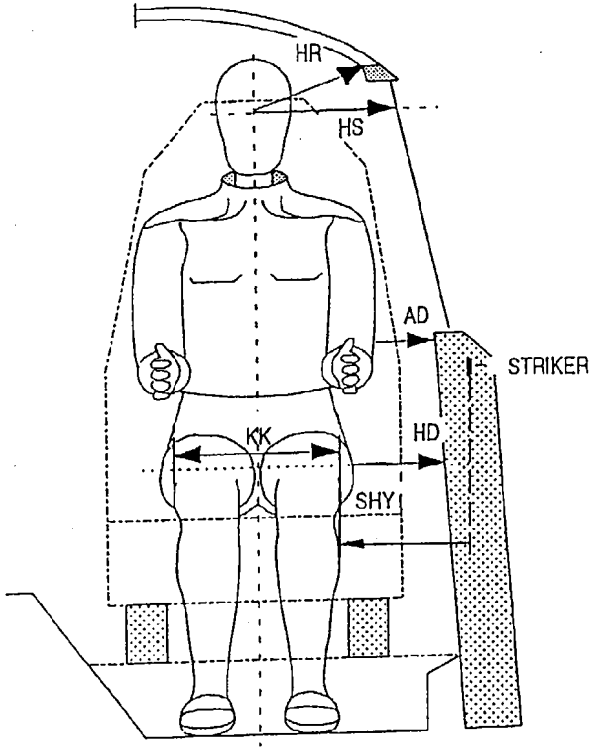
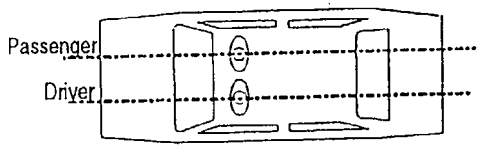


FIGURE 9

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS







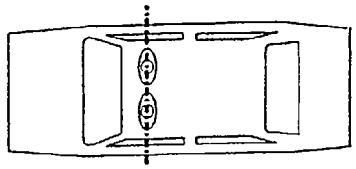
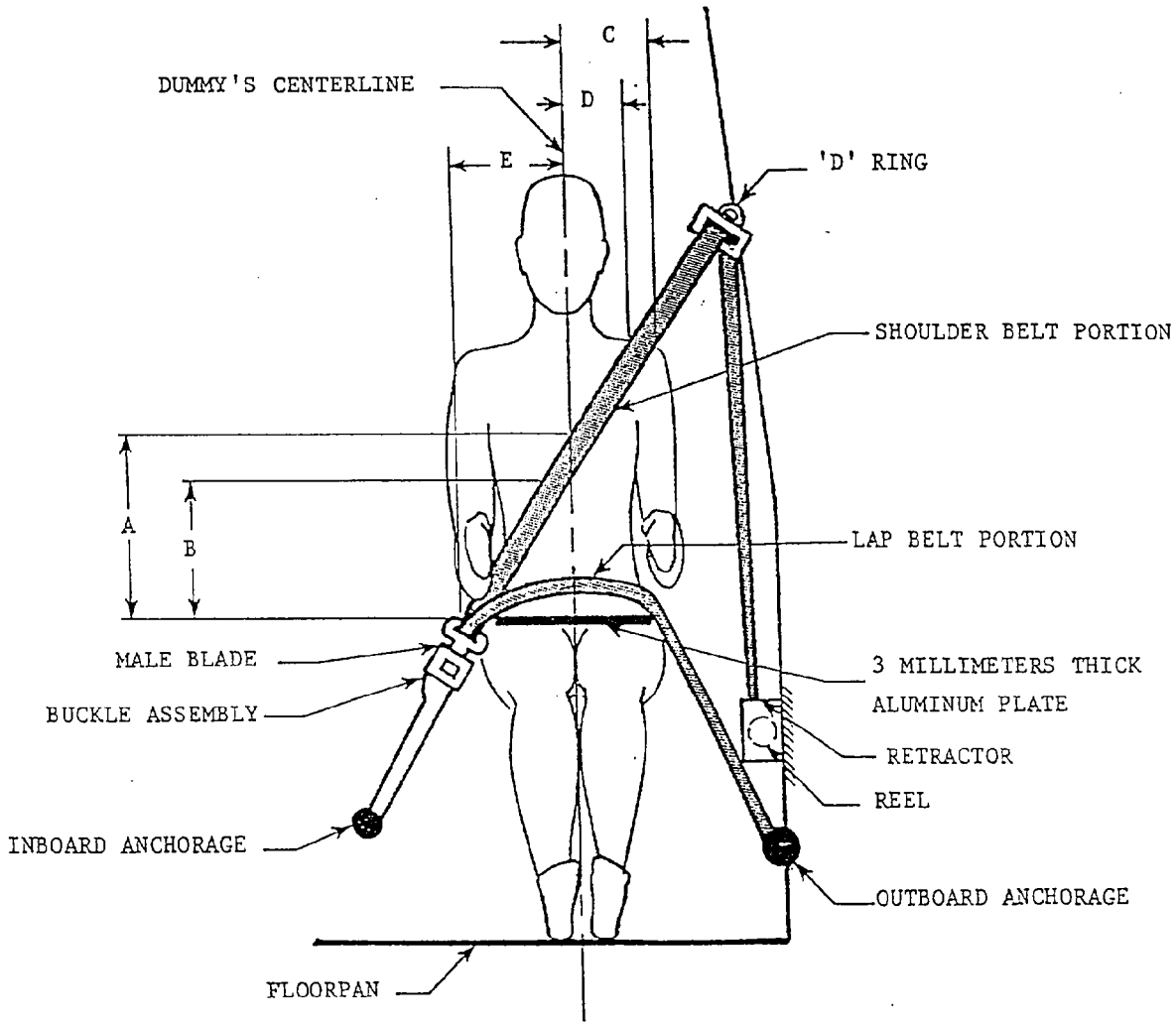


TABLE 13 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #229)	PASSENGER (SERIAL #230)
WA	WINDSHIELD ANGLE	29	29
SWA	STEERING WHEEL ANGLE	22	NA
SCA	STEERING COLUMN ANGLE	66	NA
SA	SEAT BACK ANGLE	24	25
HZ	HEAD TO ROOF	7.4	6.9
HH	HEAD TO HEADER	12.0	11.7
HW	HEAD TO WINDSHIELD	20.5	20.3
HR	HEAD TO SIDE HEADER	7.6	7.2
NR	NOSE TO RIM	16.8	NA
NA	NOSE TO RIM ANGLE	11	NA
CD	CHEST TO DASH	20.9	22.4
CS	STEERING WHEEL TO CHEST	14.1	NA
RA	RIM TO ABDOMEN	7.7	NA
KDL	LEFT KNEE TO DASH	7.6	7.9
KDR	RIGHT KNEE TO DASH	8.0	7.5
KDA	OUTBOARD KNEE TO DASH ANGLE	20	28
PA	PELVIC ANGLE	23	21
TA	TIBIAL ANGLE	40	40
KK	KNEE TO KNEE	10.8	10.6
ST	STRIKER TO HEAD	20.6	20.4
	STRIKER TO HEAD ANGLE	-86	-85
SK	STRIKER TO KNEE	23.1	22.6
	STRIKER TO KNEE ANGLE	-3	-2
SH	STRIKER TO H-POINT	9.0	8.5
	STRIKER TO H-POINT ANGLE	-30	-36
SHY	STRIKER TO H-POINT (Y DIR.)	7.0	7.2
HS	HEAD TO SIDE WINDOW	11.8	11.7
HD	H-POINT TO DOOR	3.4	3.2
AD	ARM TO DOOR	2.3	2.7

The seat back angle (SA°) is measured relative to vertical, all other angles are measured relative to horizontal.
All angle measurements are in degrees.
All distance measurements are in inches.

FIGURE 10 SEAT BELT POSITIONING DATA



		DRIVER	PASSENGER
A	- TOP SURFACE OF ALUM. PLATE TO BELT UPPER EDGE	13.5	12.5
B	- TOP SURFACE OF ALUM. PLATE TO BELT LOWER EDGE	10.7	9.2
C	- DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	5.0	6.2
D	- DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	2.6	3.7
E	- DUMMY CENTERLINE TO INTERSECTION OF UPPER TORSO BELT AND LAP BELT	11.0	10.5

All distance measurements are in inches.

FIGURE 10 CAMERA POSITIONS

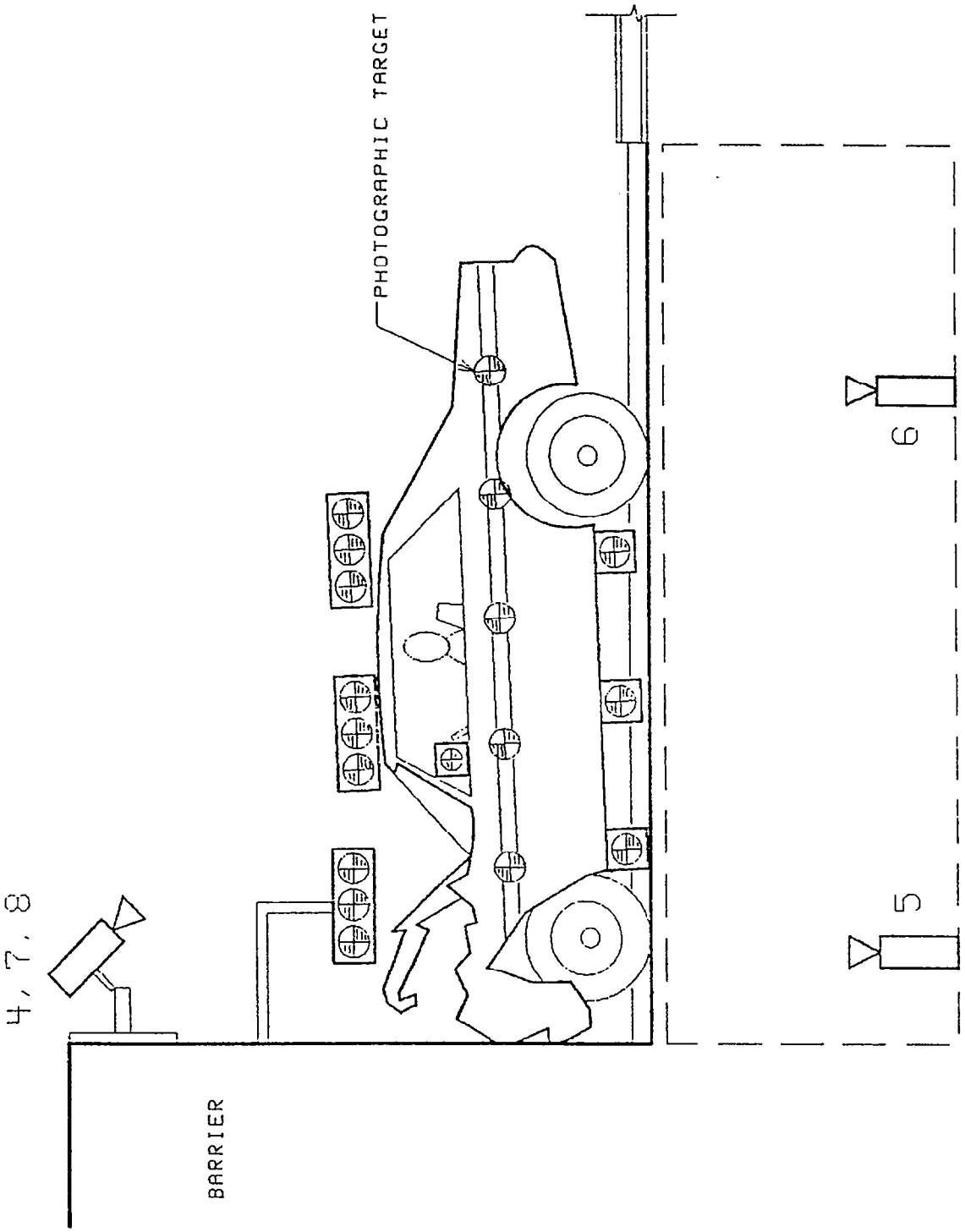


FIGURE 10 CAMERA POSITIONS, CONT'D.

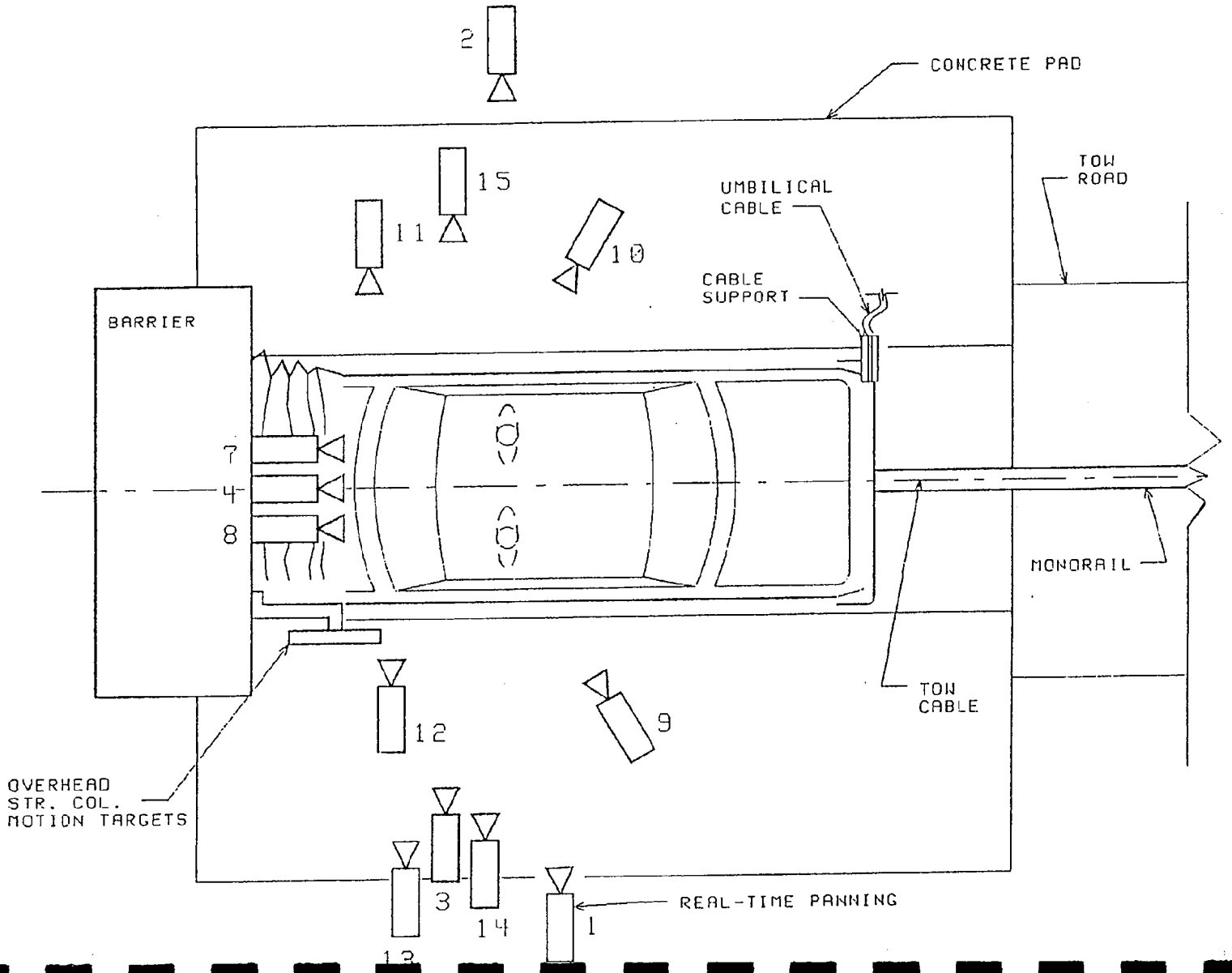


TABLE 14 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 931012 VEHICLE: 1994 Suzuki Swift 4-door sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (IN.)[1] X	Y	Z	ANGLE[2] (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	993
3	Left vehicle crush	-41.5	295.0	44.0	-4	215.0	25	1002
4	Windshield front view	-6.0	0.0	84.0	-40	NA	13	1000
5	Pit - front position	-50.5	0.0	-92.4	90	NA	13	1018
6	Pit - rear position	-99.3	0.0	-99.0	90	NA	13	1000
7	Passenger - front view	-4.5	-13.8	93.0	-50	NA	17	998
8	Driver - front view	-6.8	14.5	93.0	-50	NA	17	1005
9	Driver kinematics	-157.3	116.0	87.0	-27	110.0	25	995
10	Passenger kinematics	-152.1	-116.0	87.0	-26	94.0	25	983
11	Right windshield intrusion	-38.1	-306.1	44.0	0	NA	50	1015
12	Left windshield intrusion	-53.0	309.4	42.3	0	NA	50	1005
13	Steering column motion	-86.0	286.0	103.0	-14	NA	25	998
14	Steering column motion	-86.0	286.0	75.1	-9	NA	25	1005
15	Passenger kinematics	-38.8	-293.0	45.3	-4	217.0	25	1022
16	Real-time documentation	NA	NA	NA	NA	NA	12-120	24

[1] +X: Film plane forward of barrier face
+Y: Film plane to left of monorail centerline
+Z: Film plane above ground level

[2] +Angle: Film plane angled upward from horizontal plane

APPENDIX A

PHOTOGRAPHS

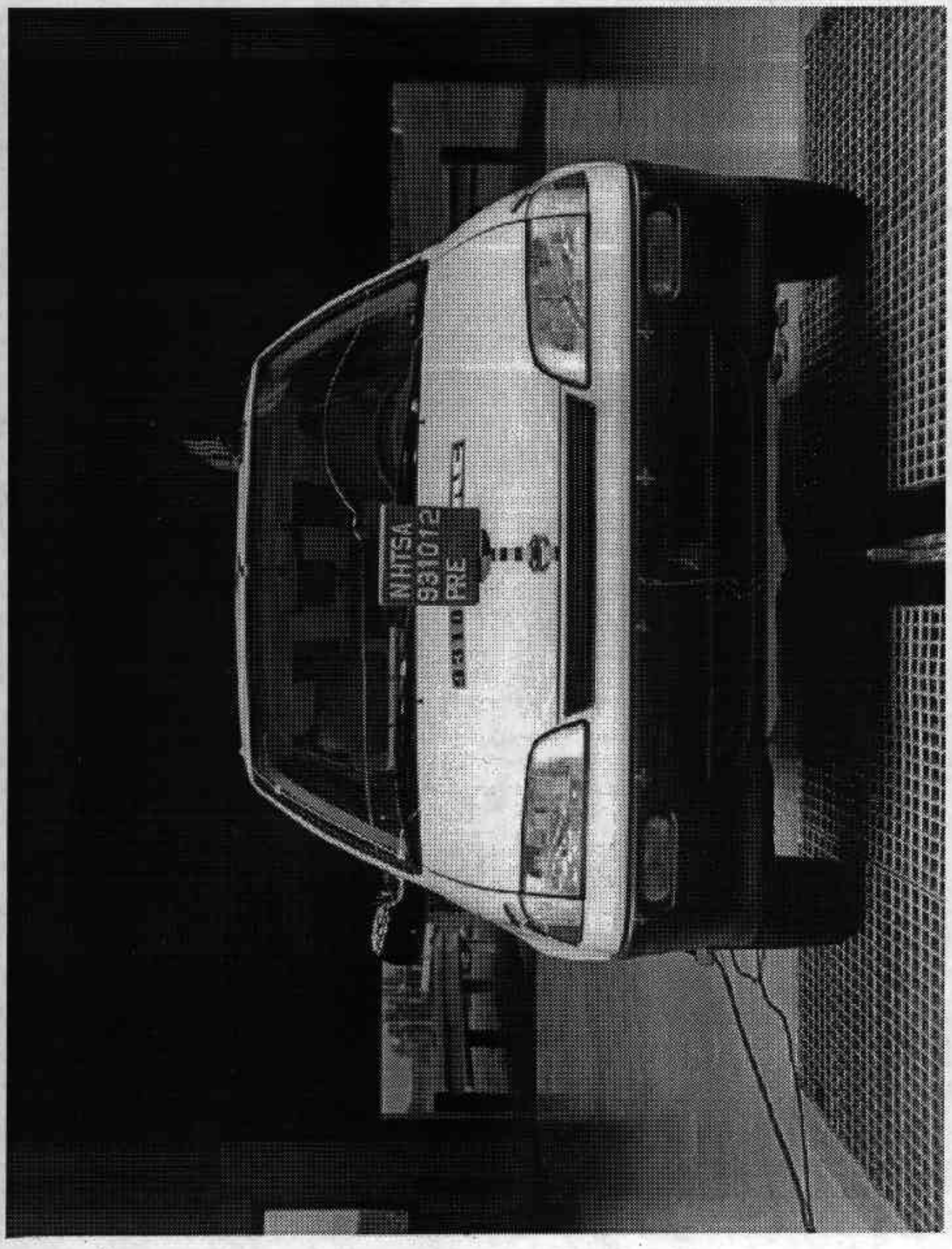


Figure A-1. PRE-TEST FRONT VIEW

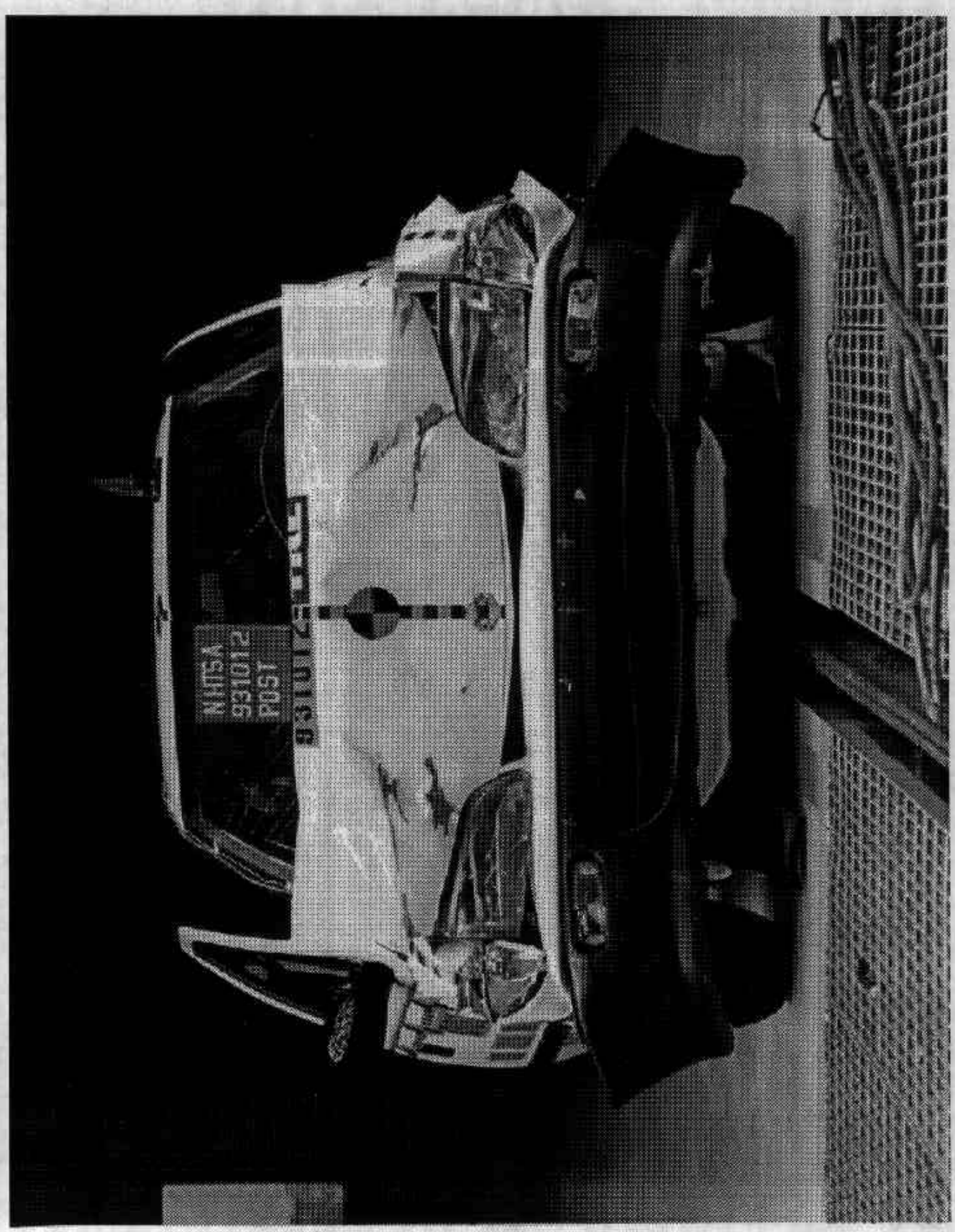


Figure A-2. POST-TEST FRONT VIEW

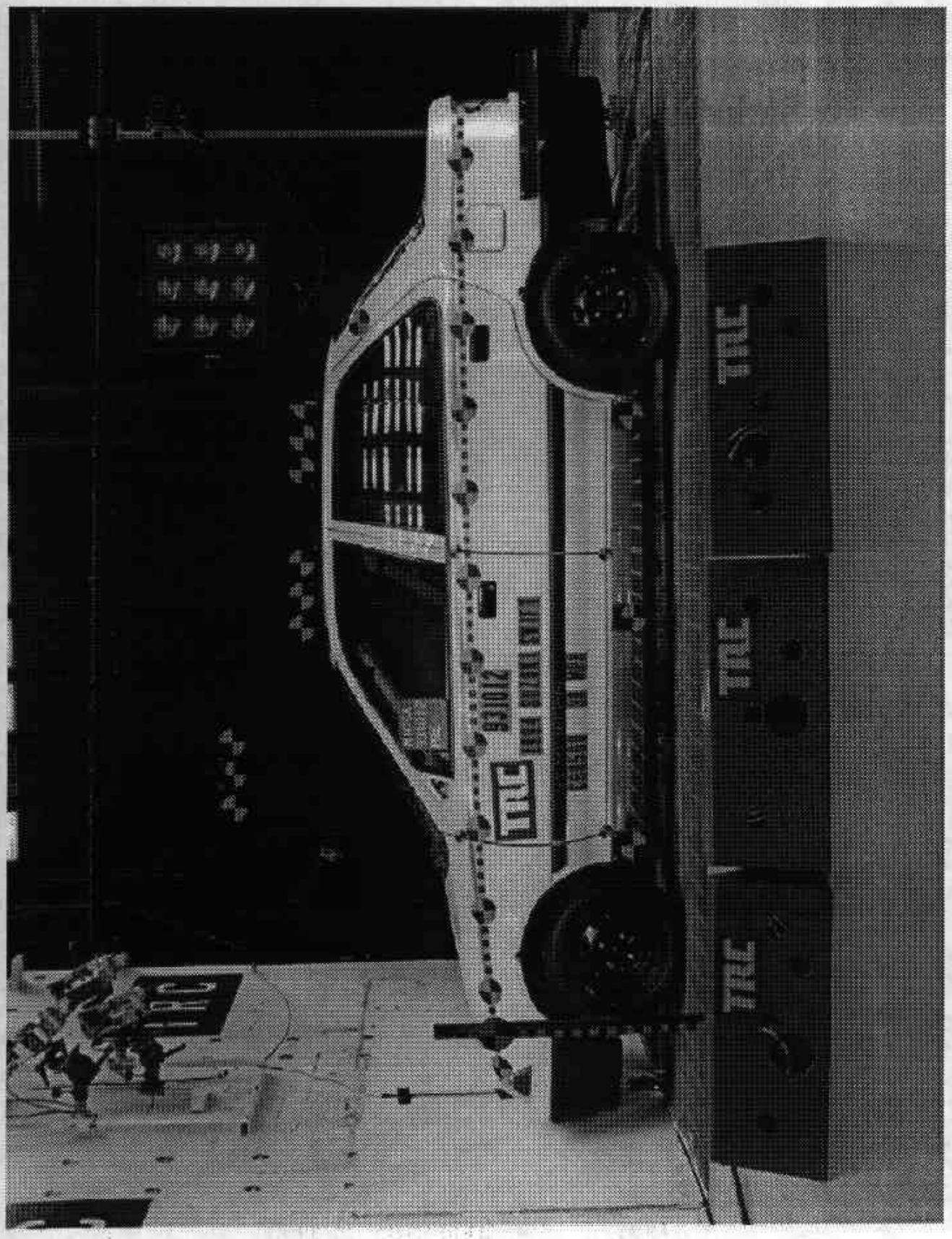


Figure A-3. PRE-TEST LEFT SIDE VIEW

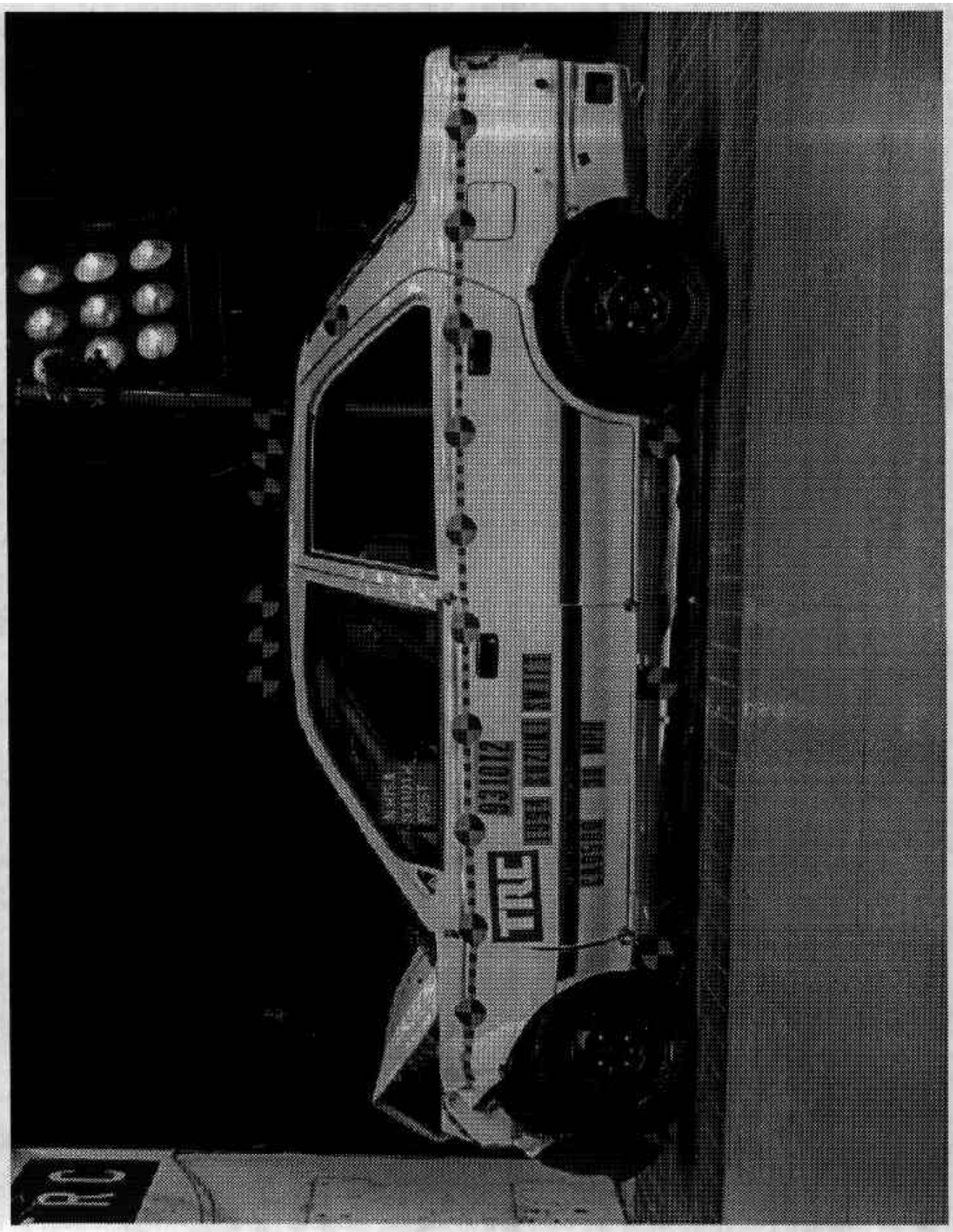


Figure A-4. POST-TEST LEFT SIDE VIEW

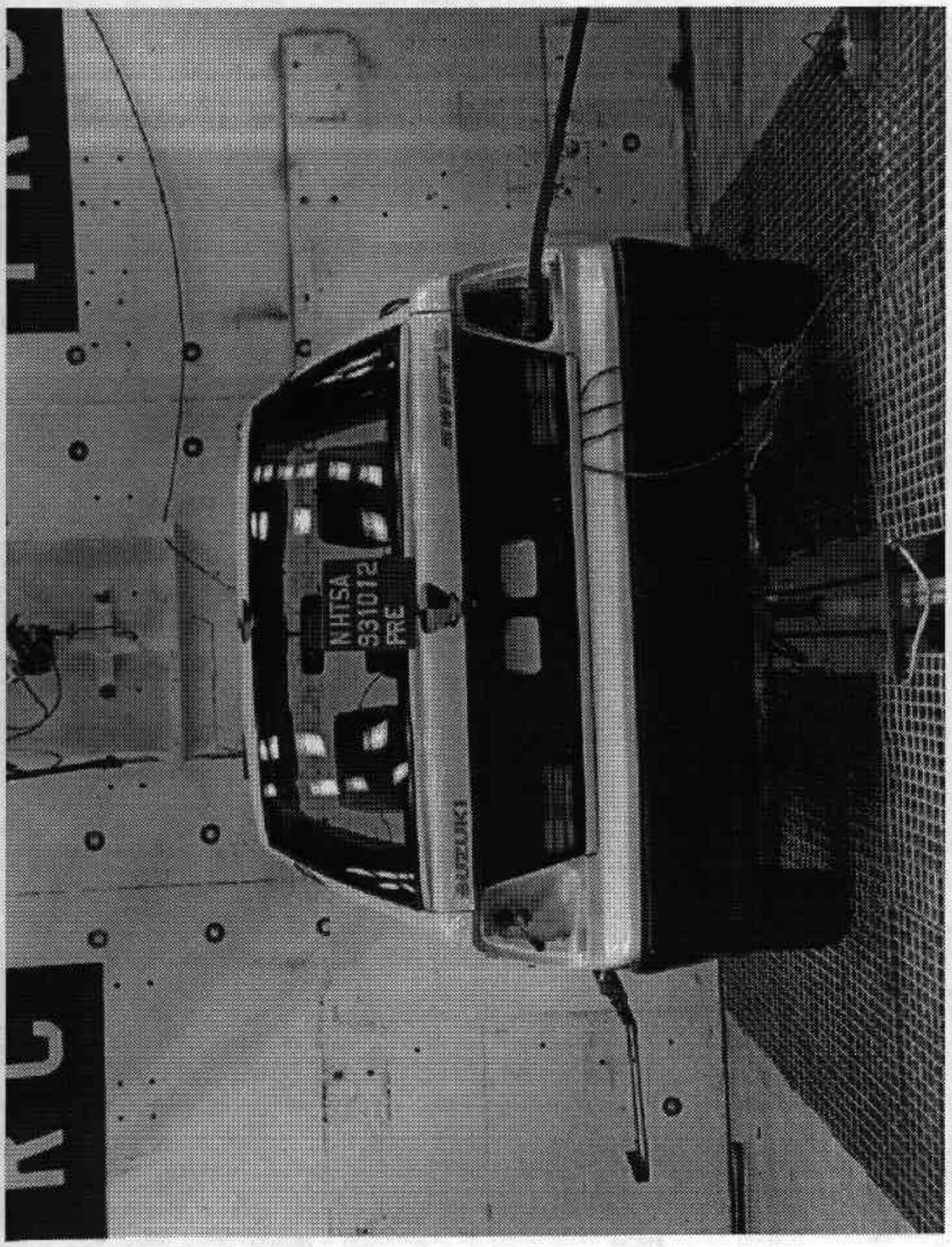


Figure A-5. PRE-TEST REAR VIEW

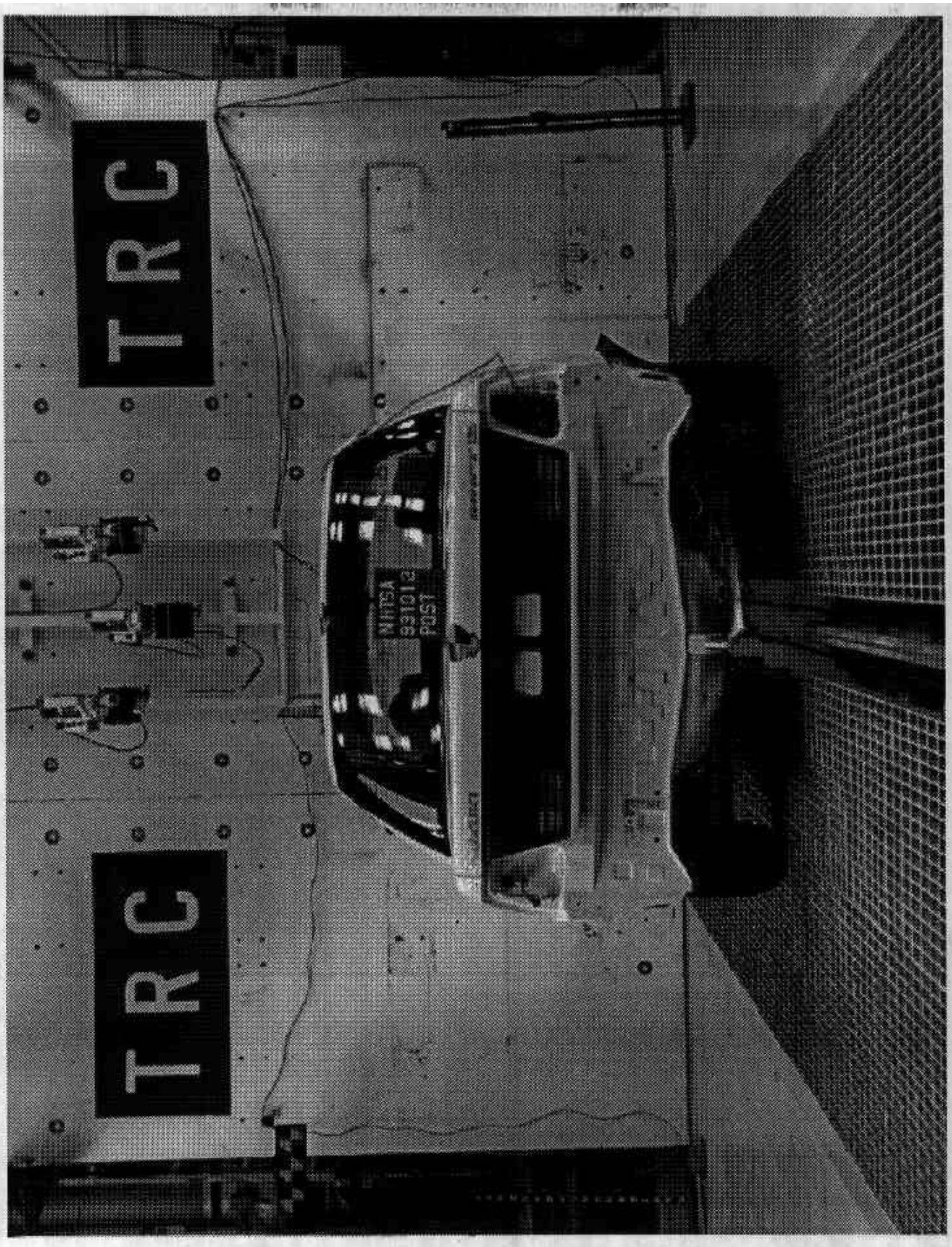


Figure A-6. POST-TEST REAR VIEW

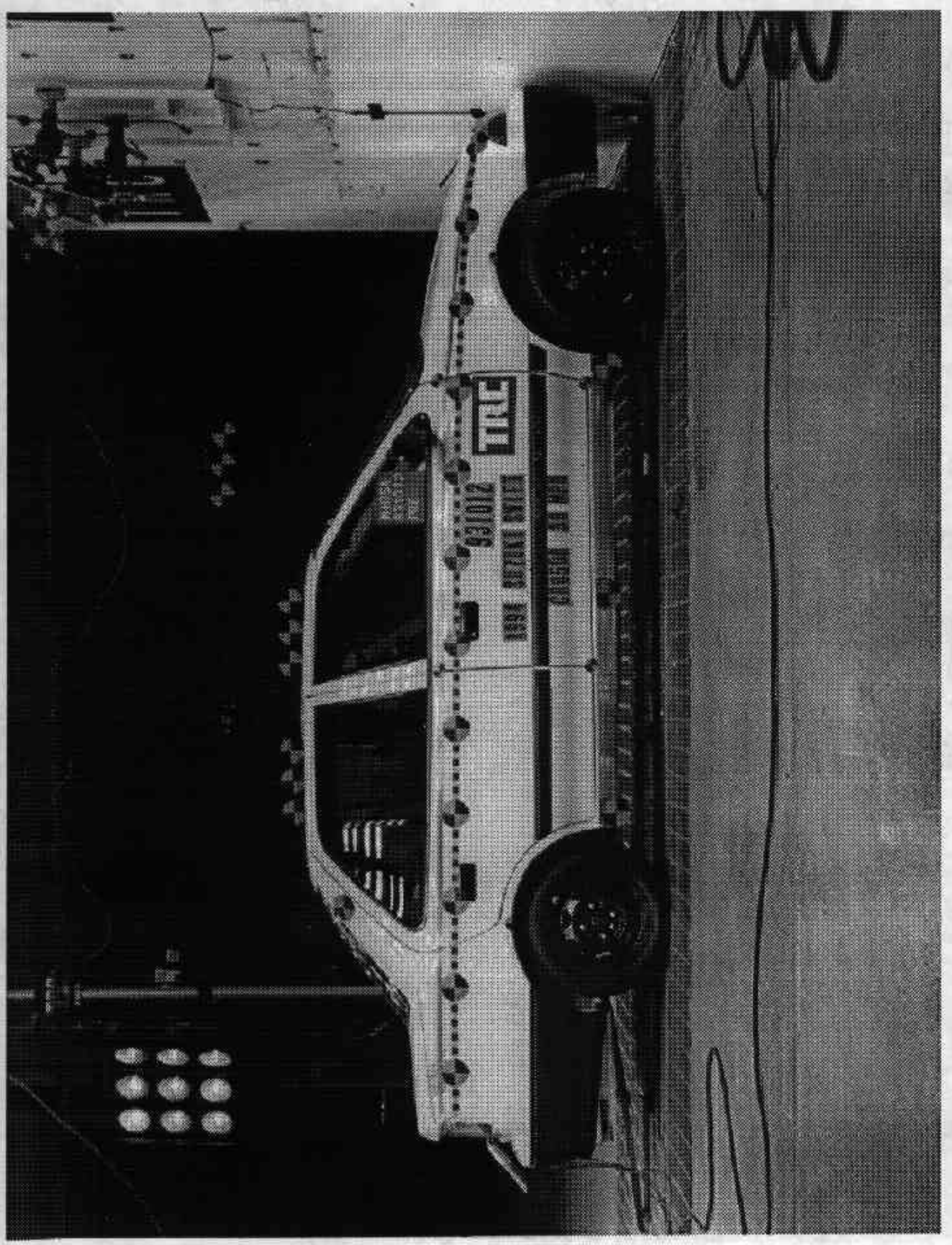


Figure A-7. PRE-TEST RIGHT SIDE VIEW

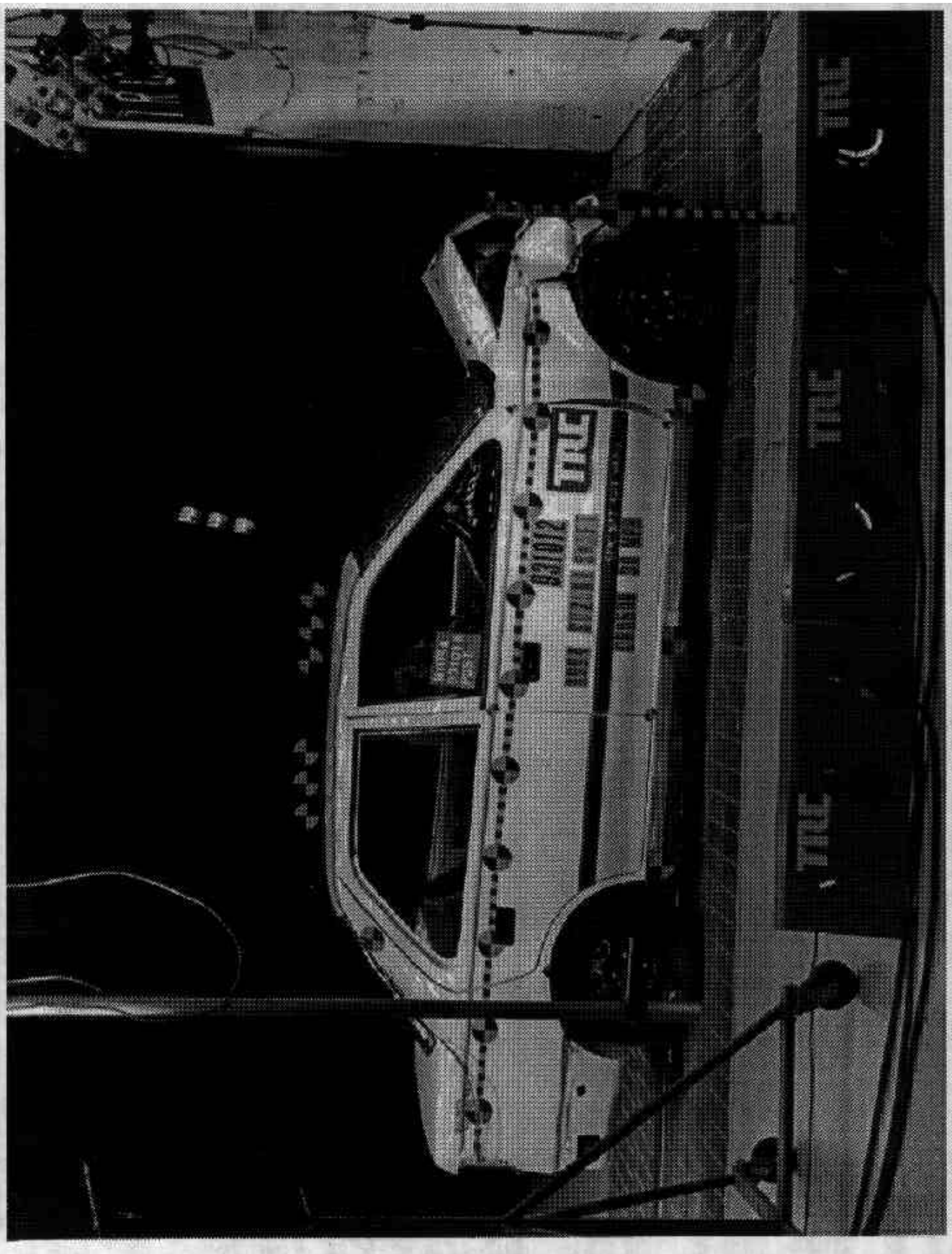


Figure A-8. POST-TEST RIGHT SIDE VIEW

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

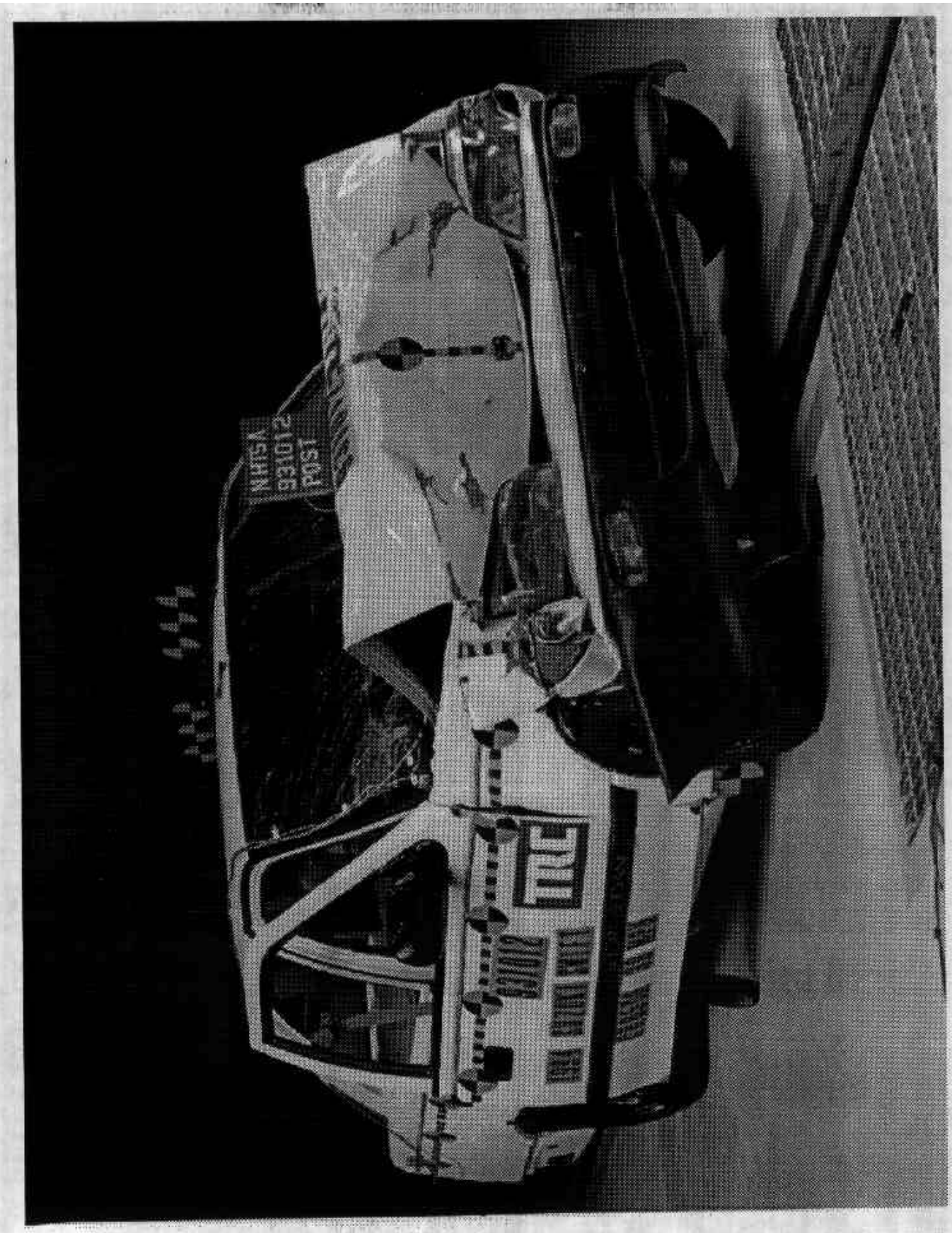


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

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

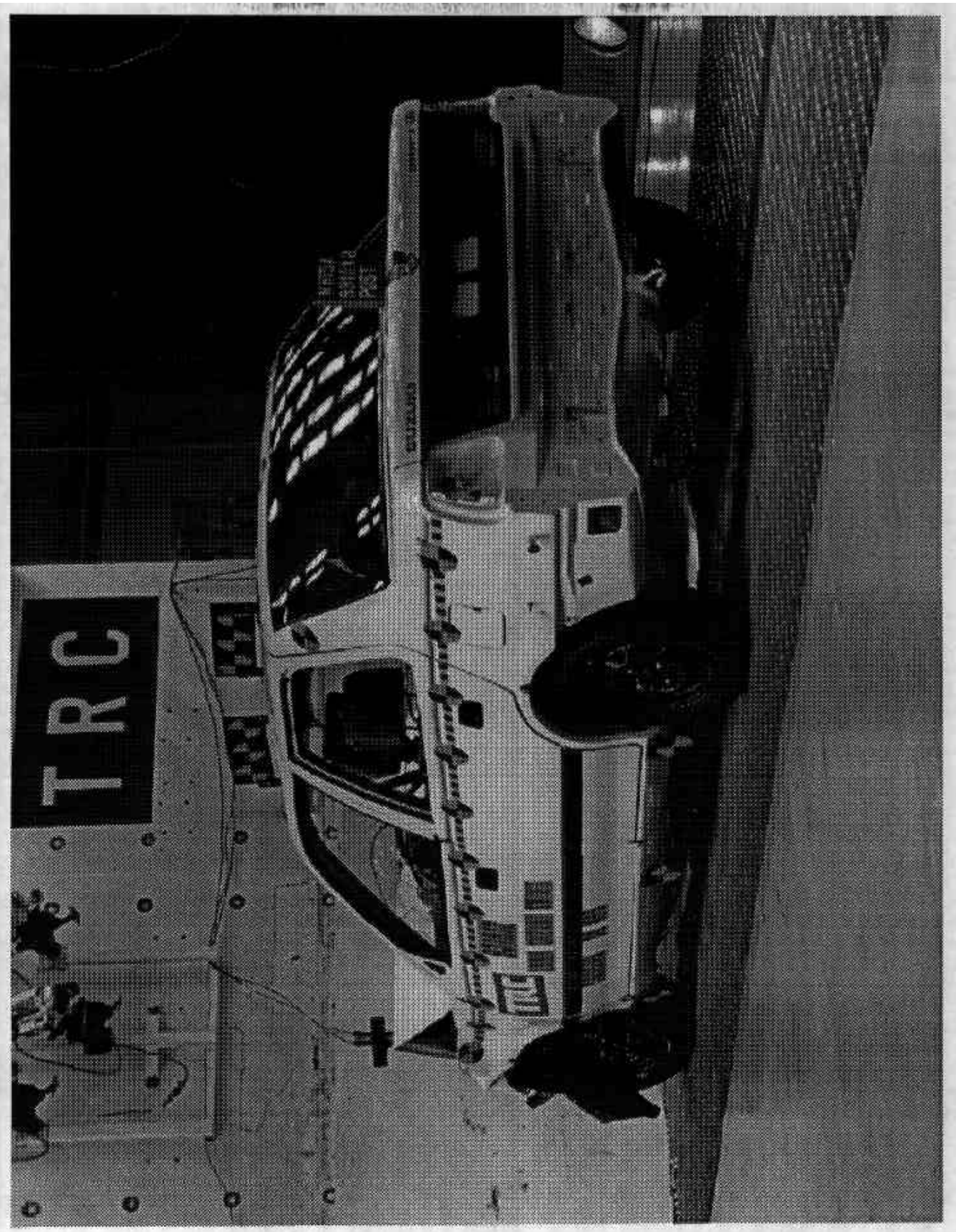


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

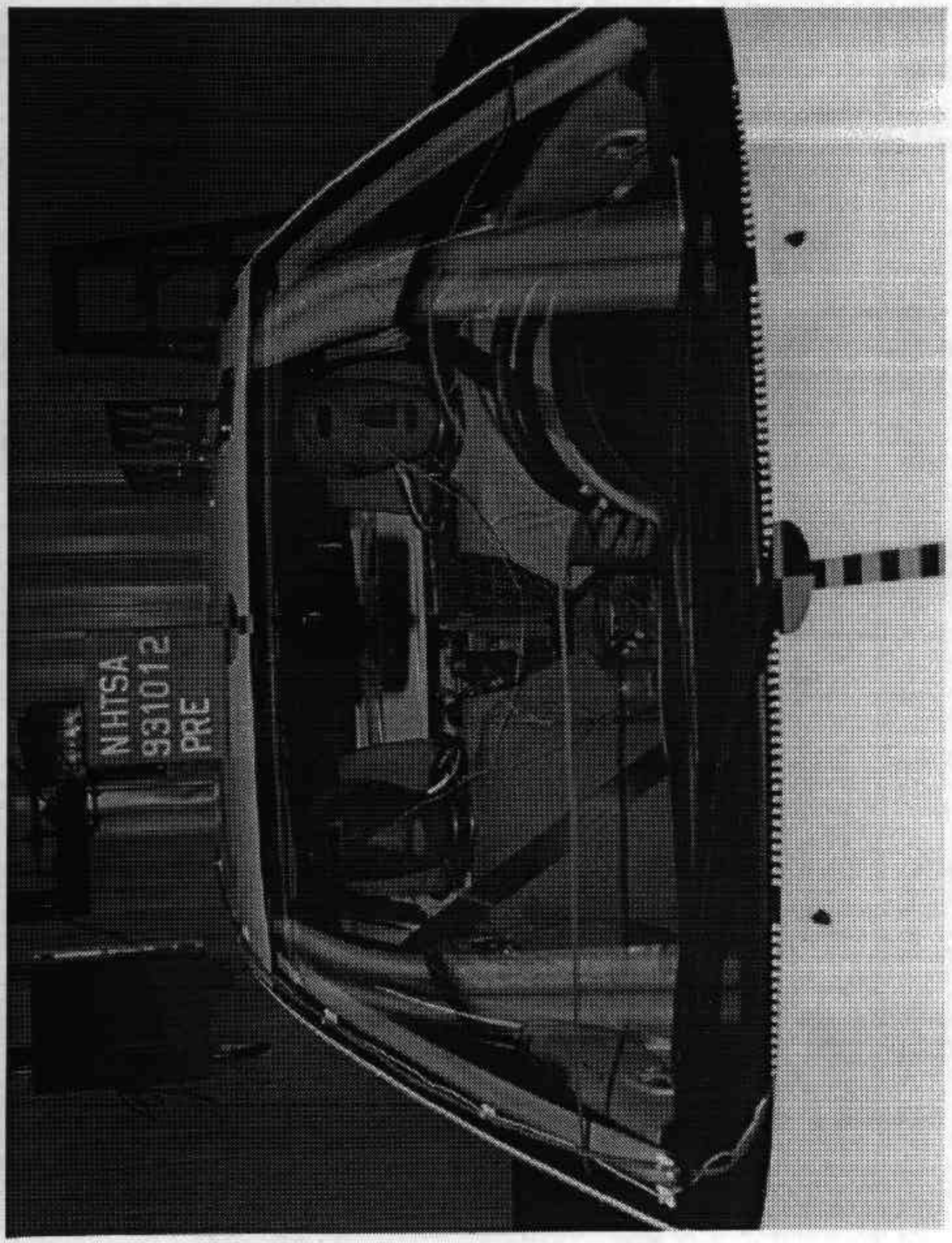


Figure A-13. PRE-TEST WINDSHIELD VIEW

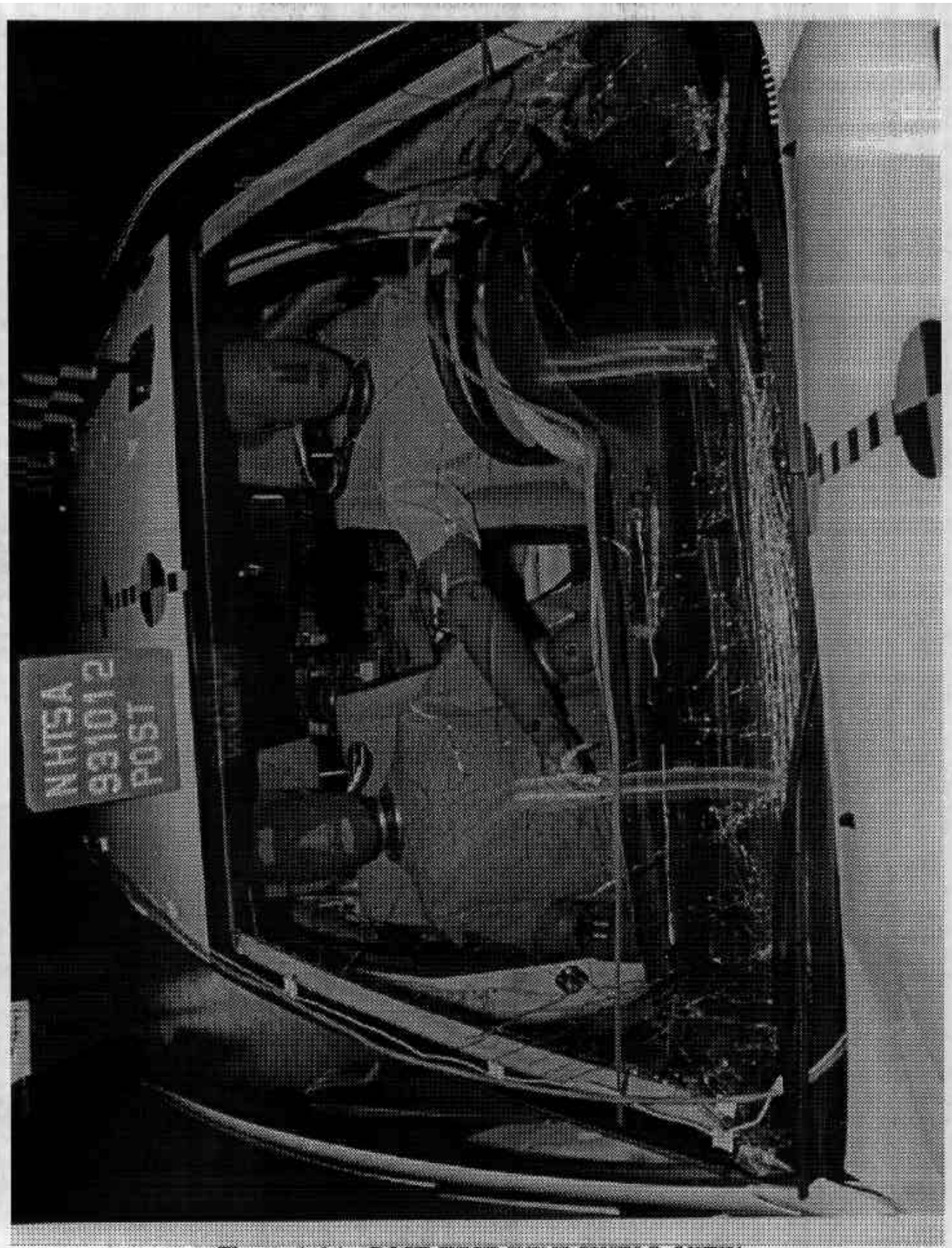


Figure A-14. POST-TEST WINDSHIELD VIEW

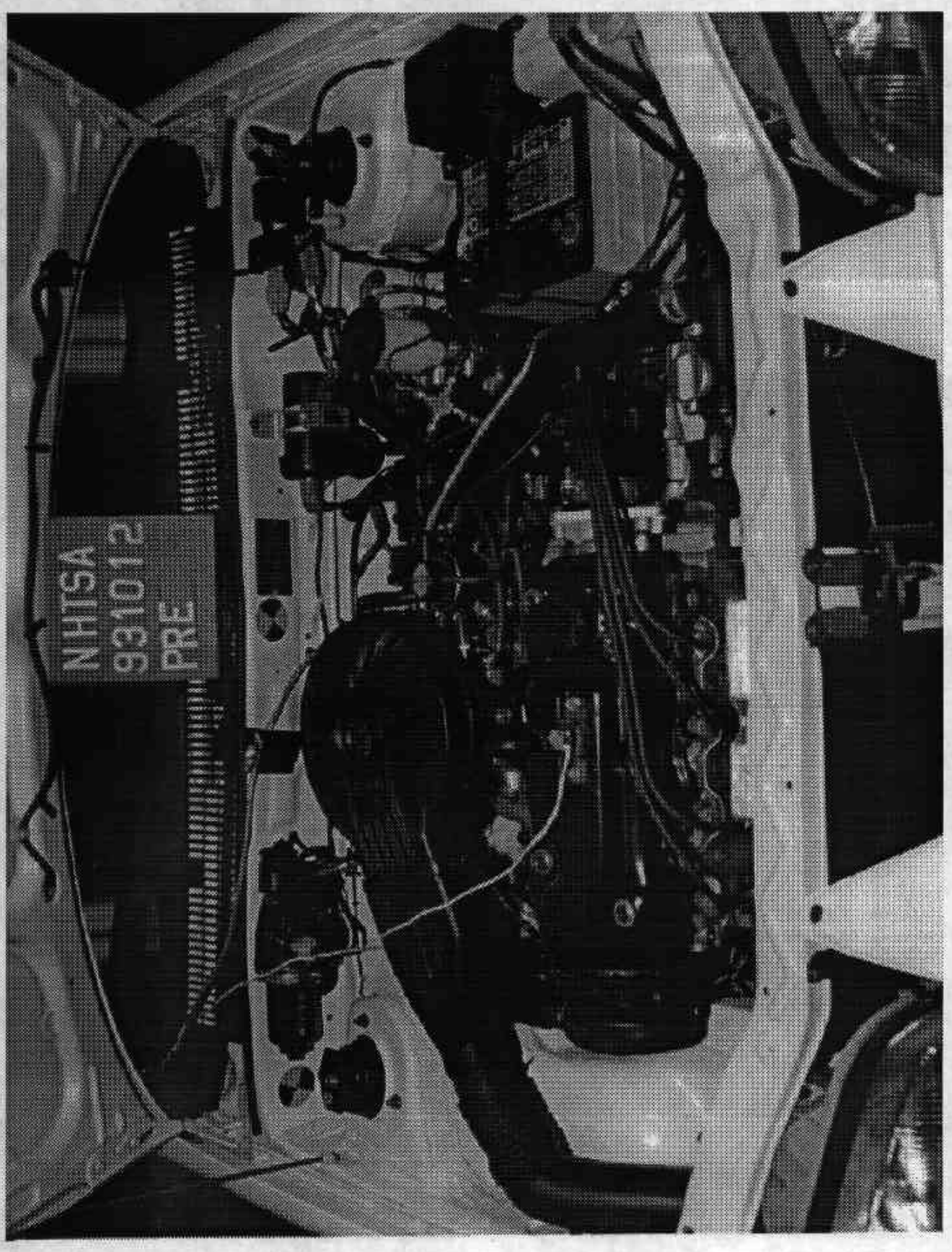


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

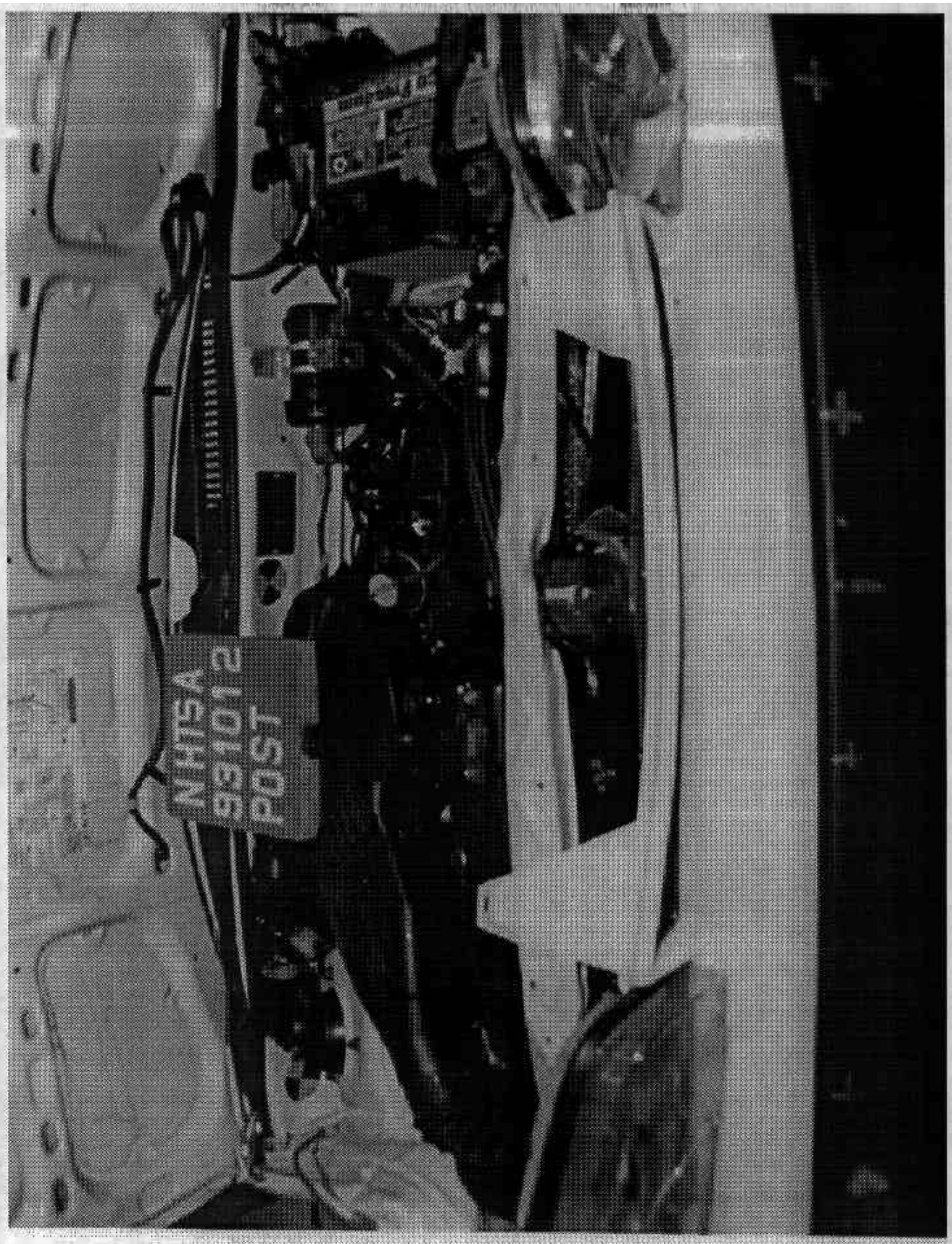


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

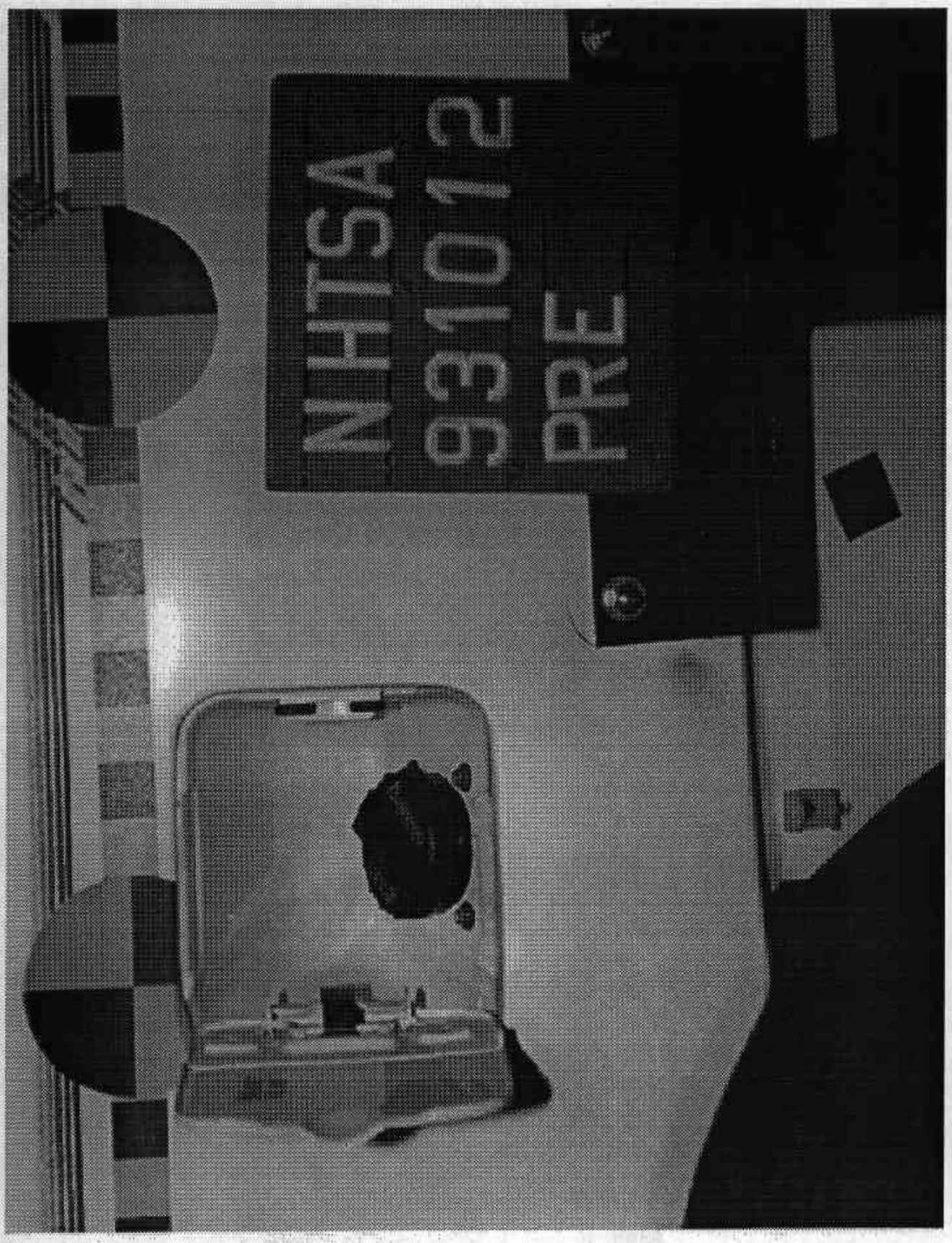


Figure A-17. PRE-TEST FUEL FILLER CAP VIEW

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

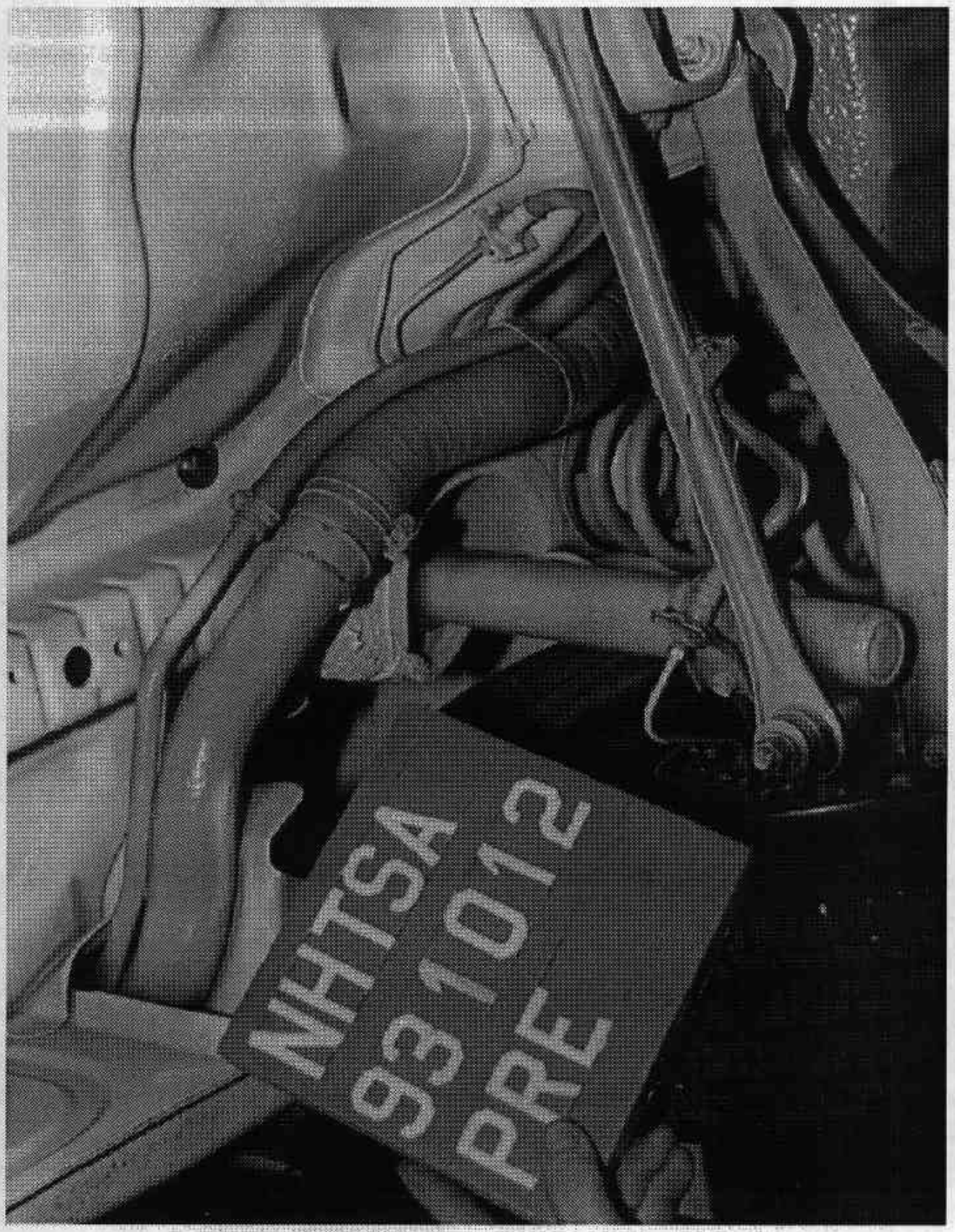


Figure A-19. PRE-TEST FUEL FILLER NECK VIEW

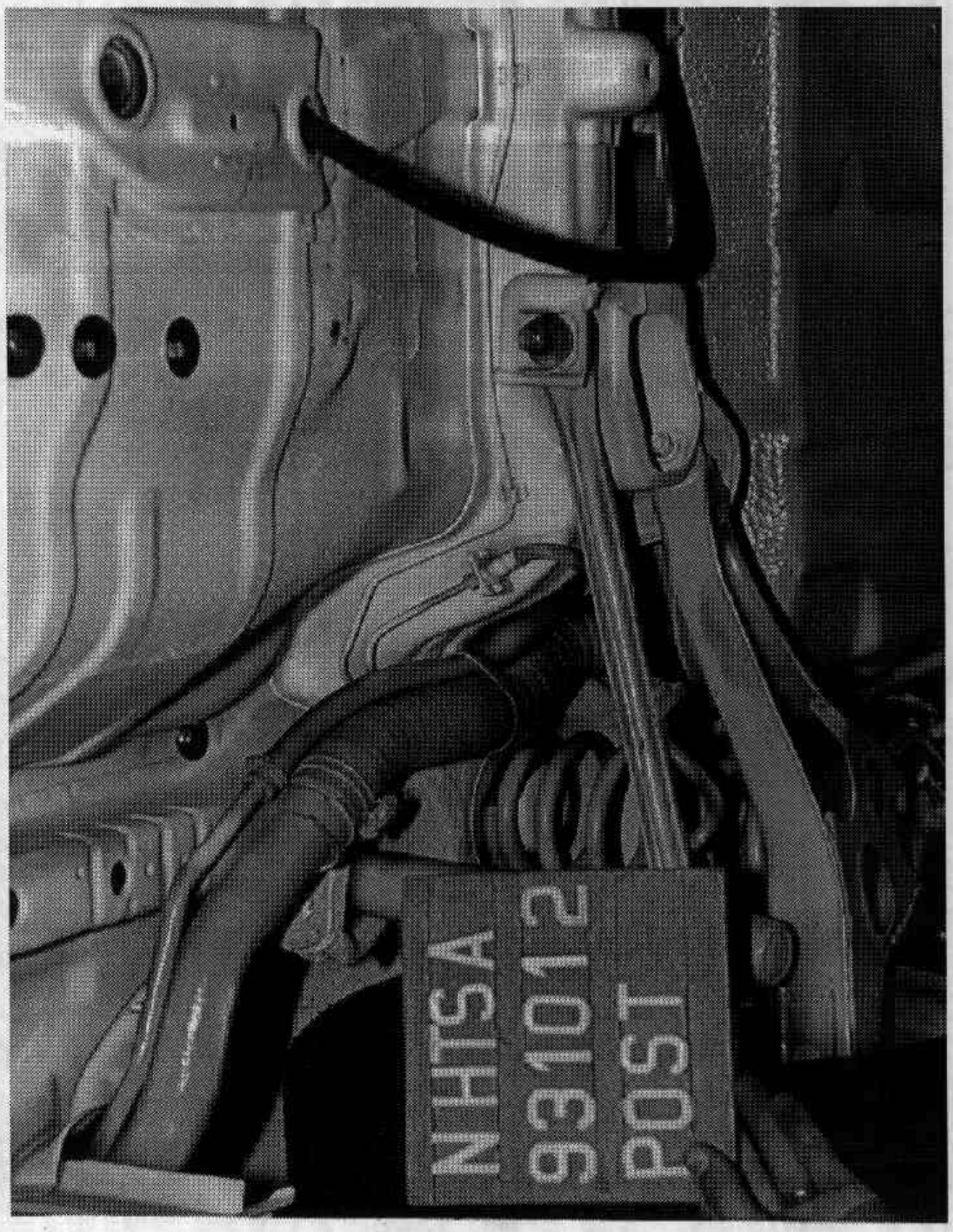


Figure A-20. POST-TEST FUEL FILLER NECK VIEW

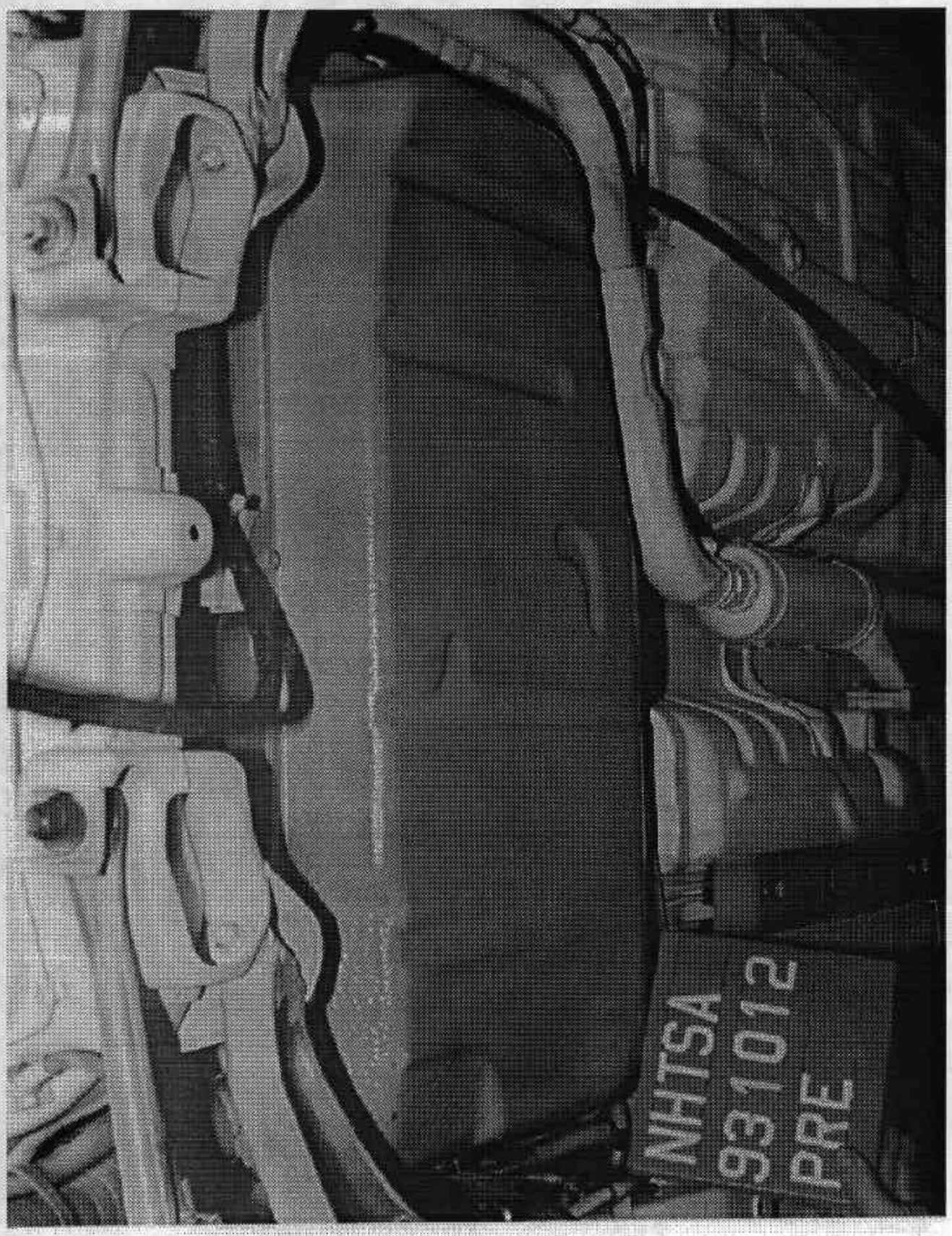


Figure A-21. PRE-TEST FUEL TANK VIEW

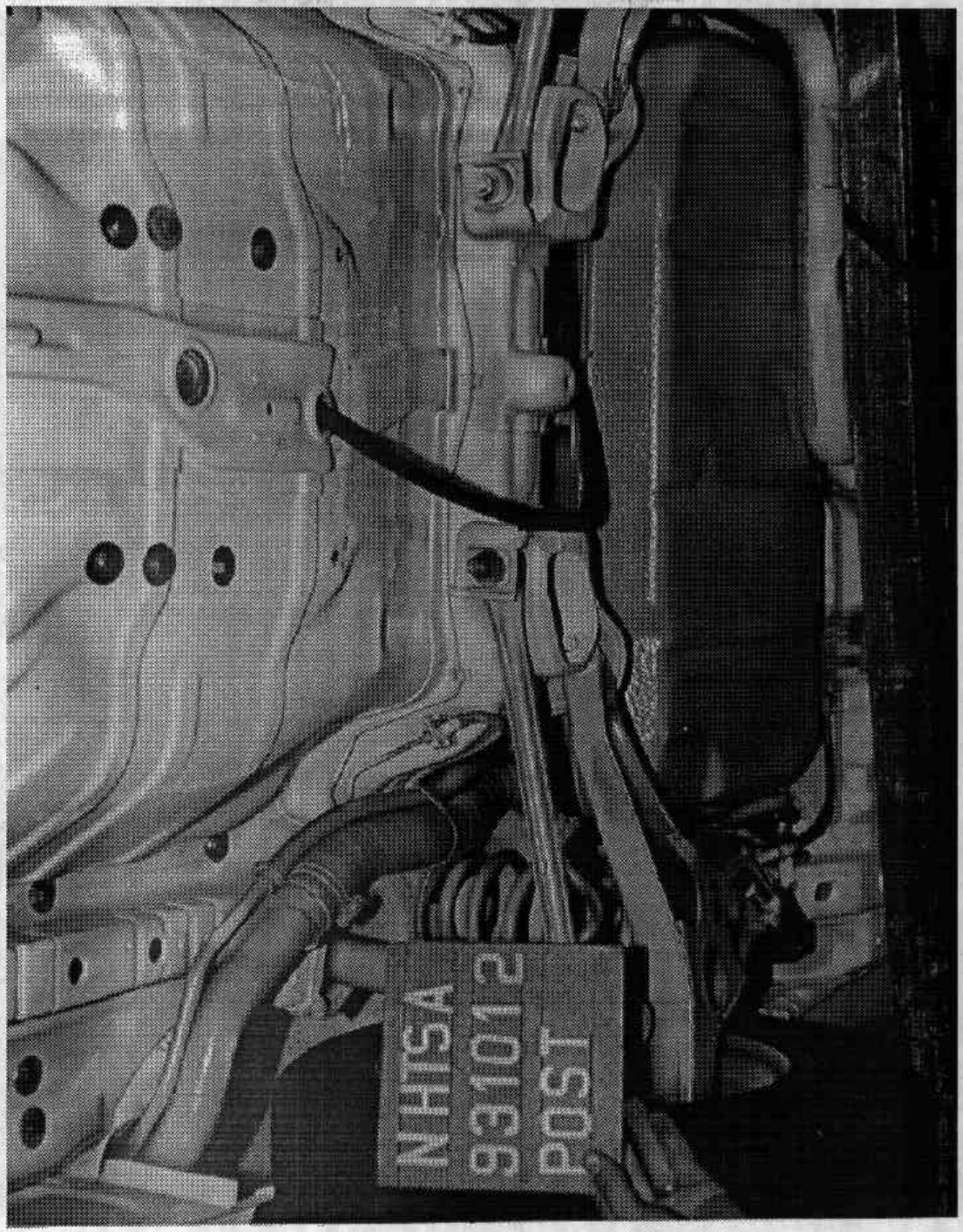


Figure A-22. POST-TEST FUEL TANK AND FUEL FILLER NECK VIEW

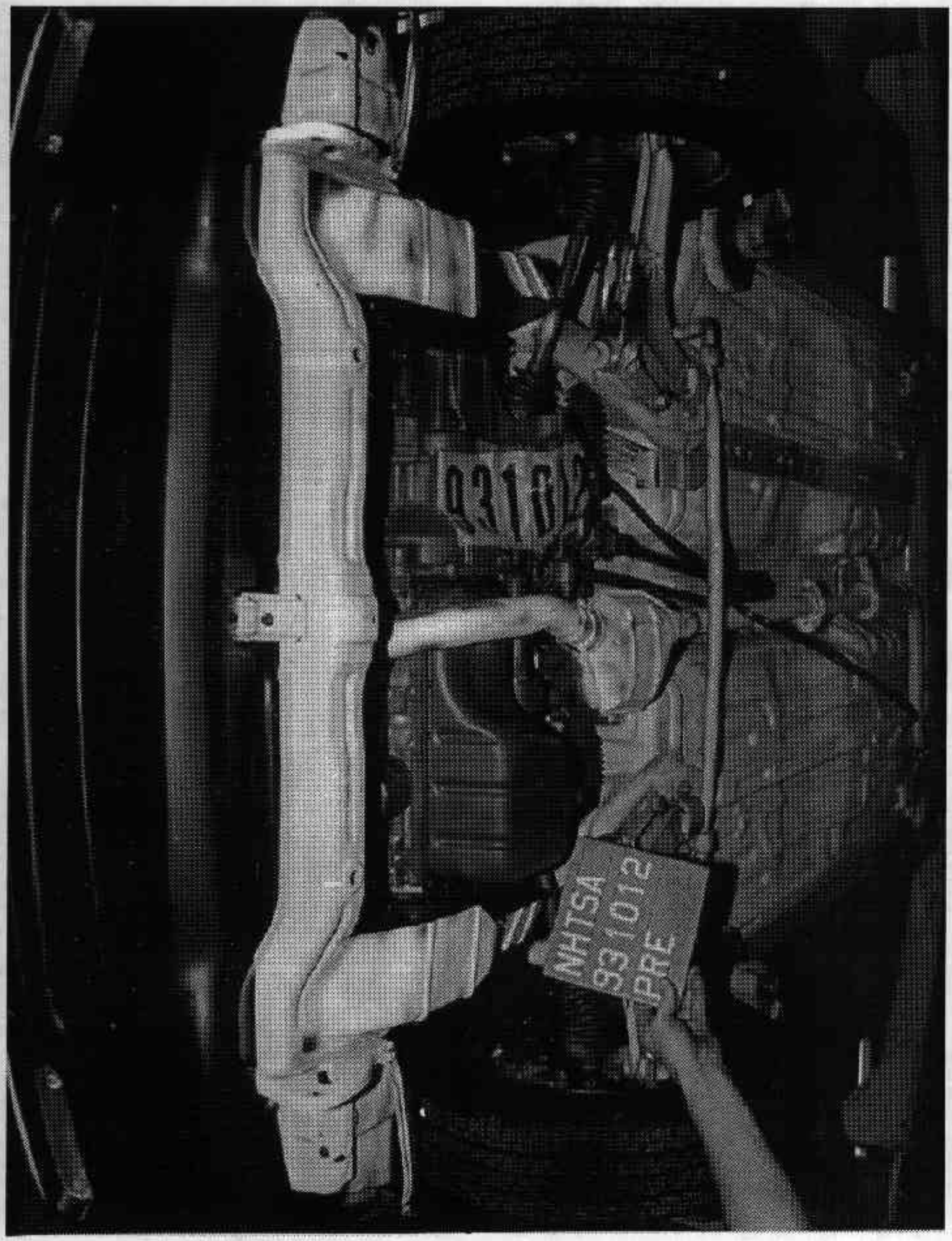


Figure A-23. PRE-TEST FRONT UNDERBODY VIEW

Figure A-24. POST-TEST FRONT UNDERBODY VIEW

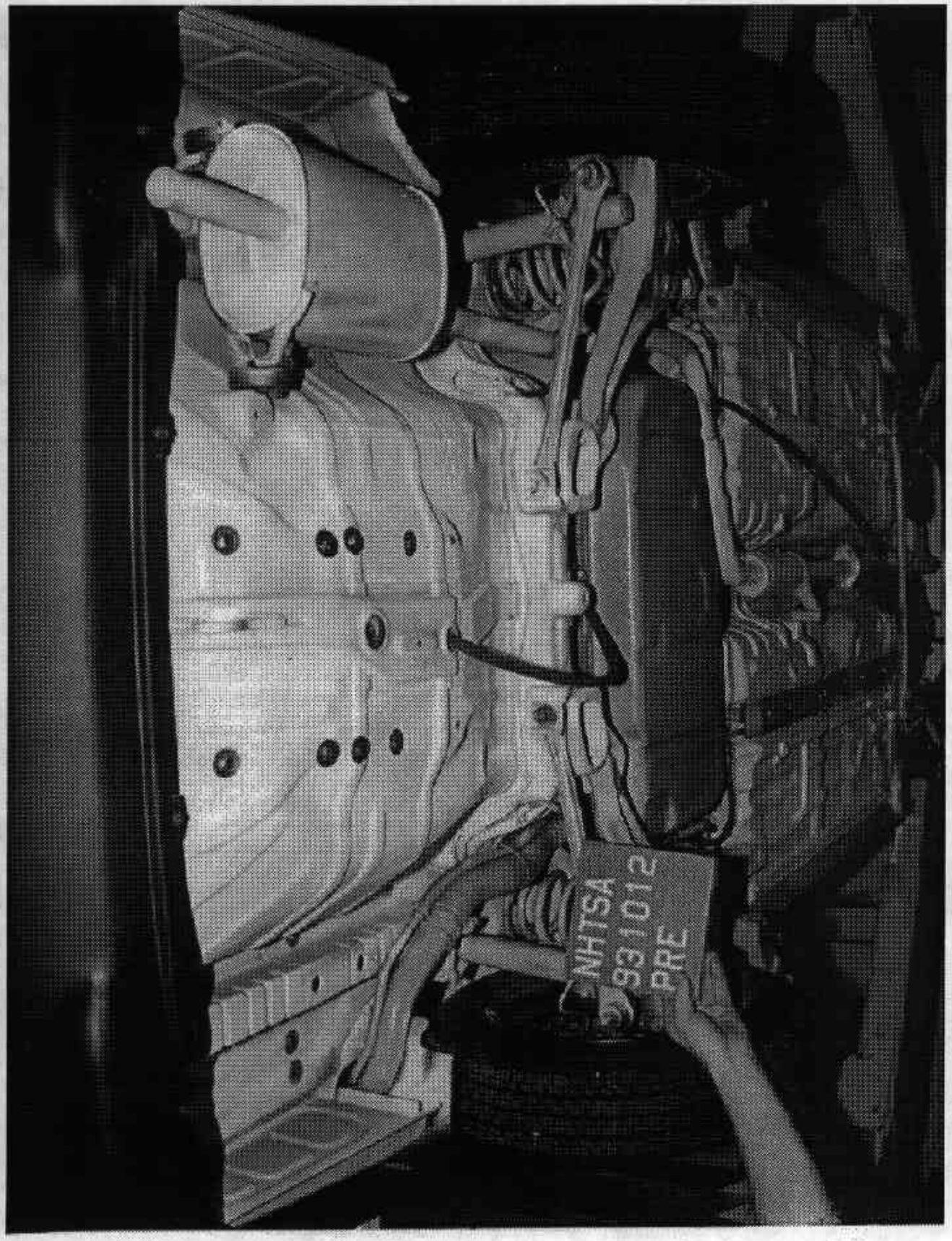


Figure A-25. PRE-TEST REAR UNDERBODY VIEW

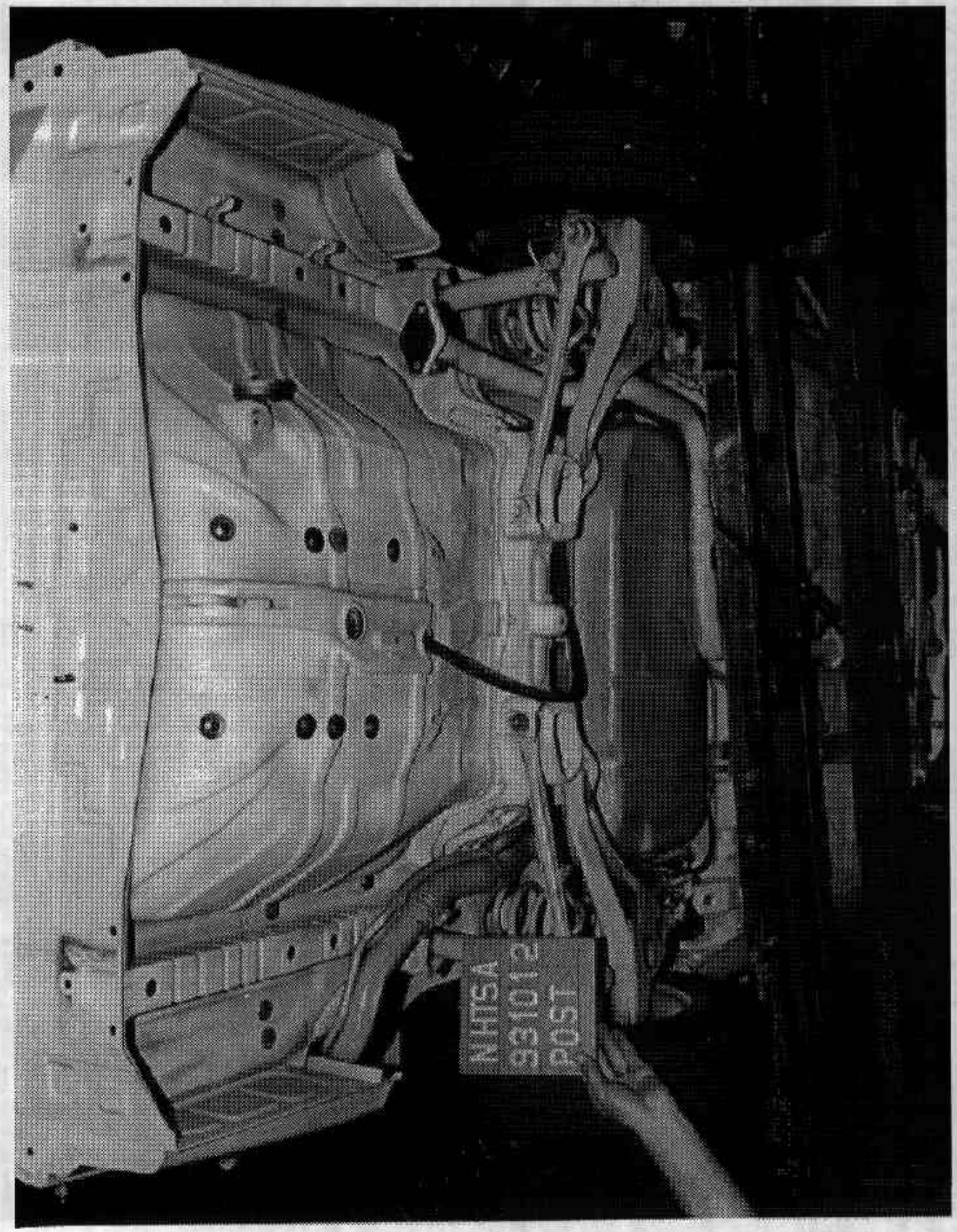


Figure A-26. POST-TEST REAR UNDERBODY VIEW

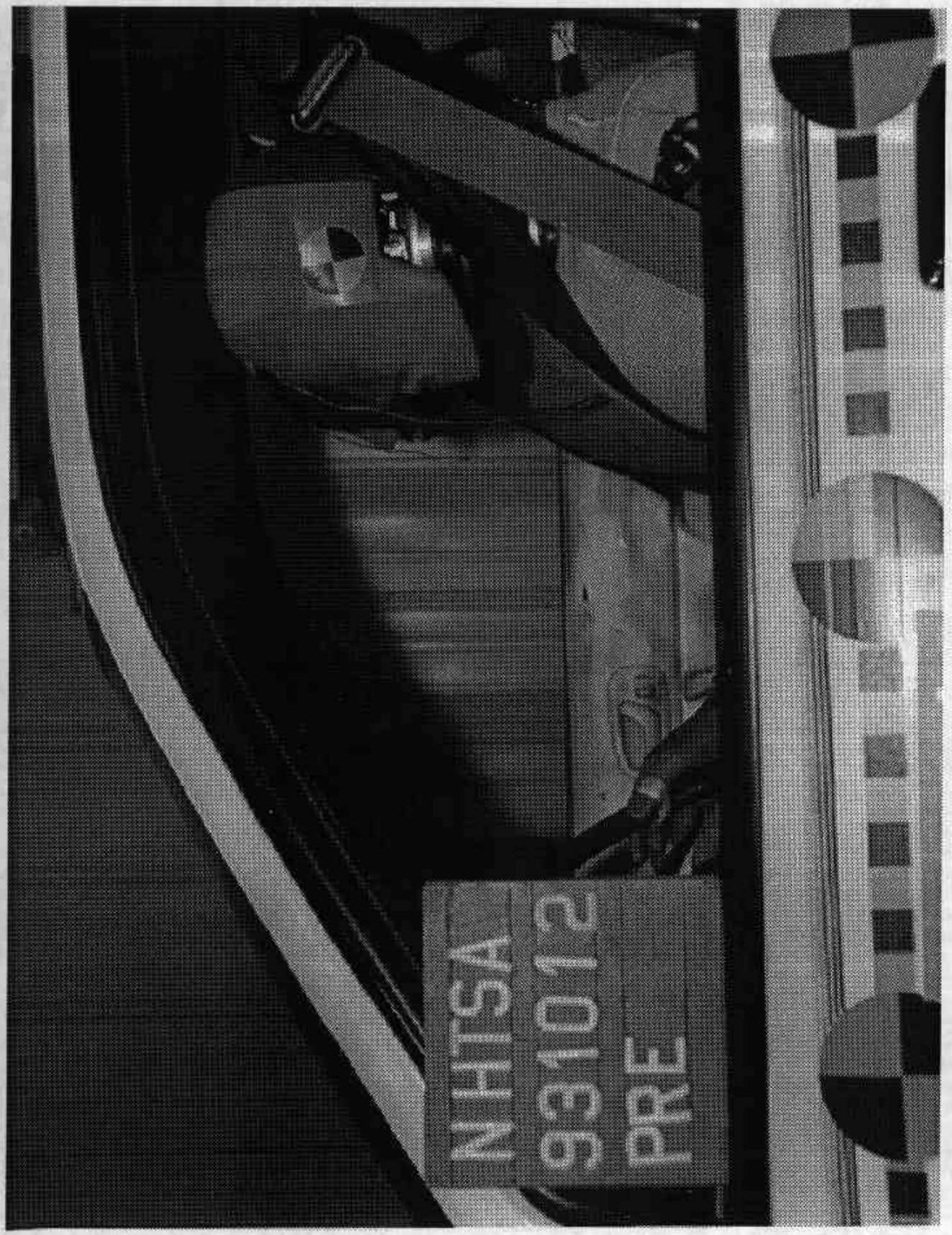


Figure A-27. PRE-TEST DRIVER DUMMY POSITION VIEW

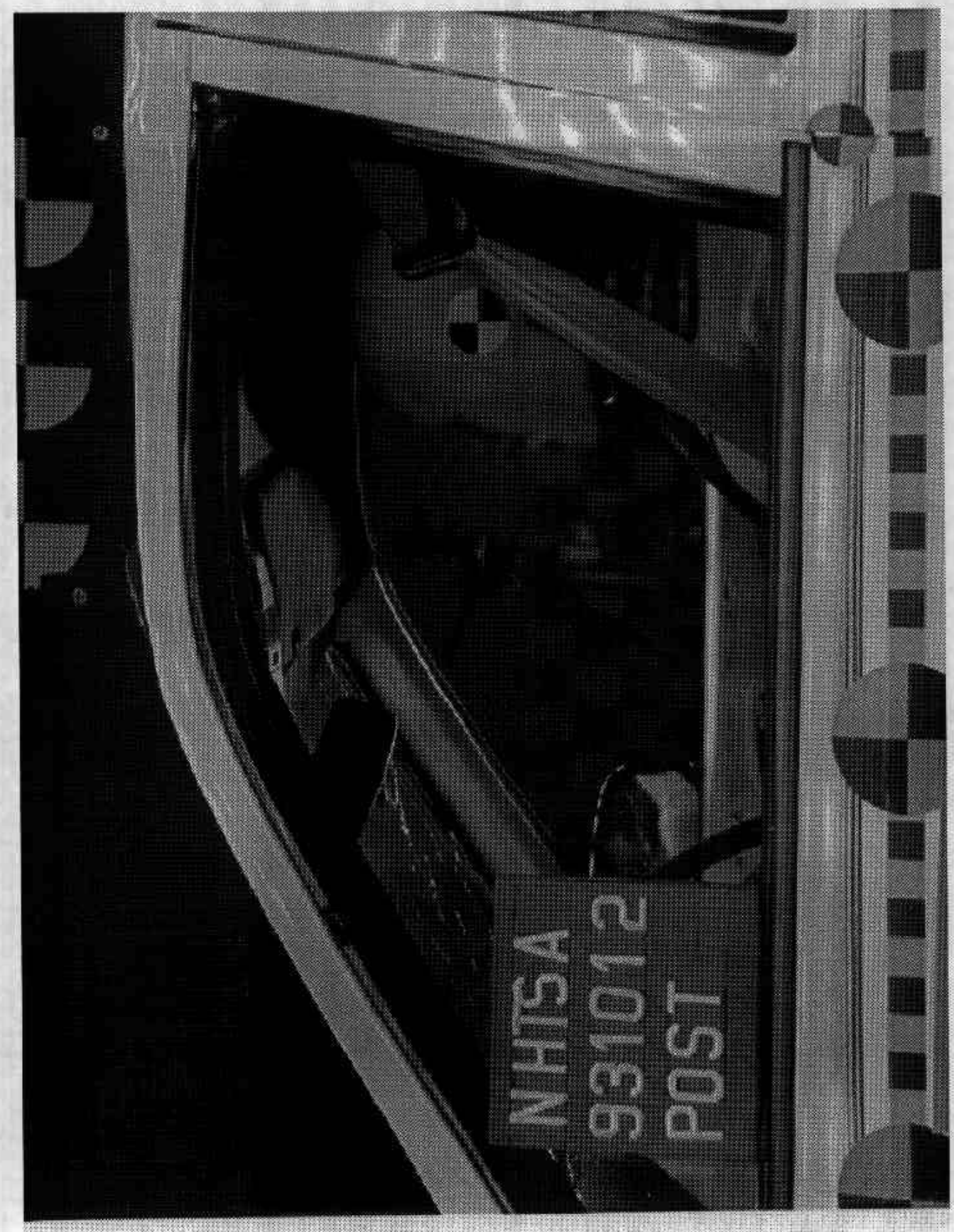


Figure A-28. POST-TEST DRIVER DUMMY POSITION VIEW

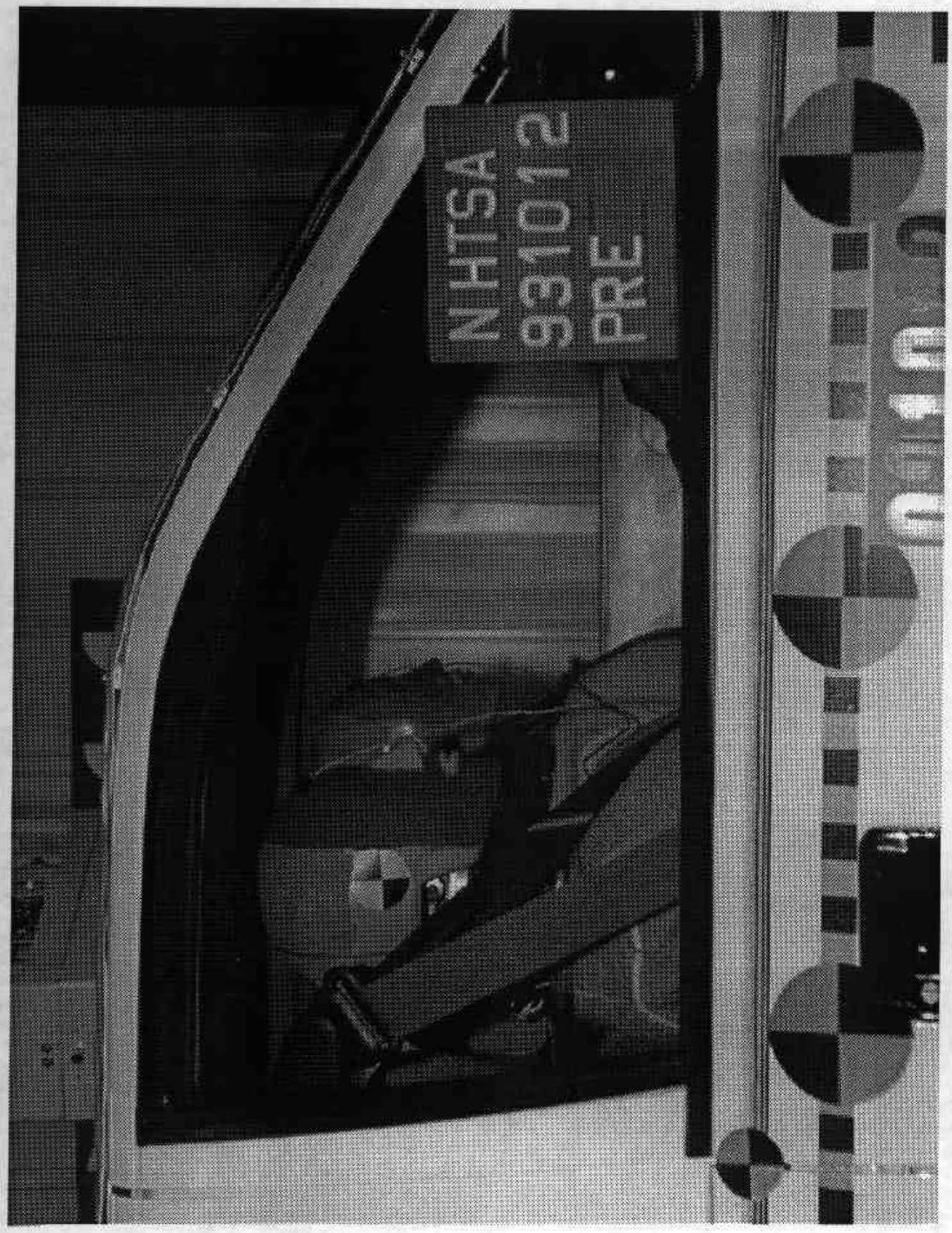


Figure A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW

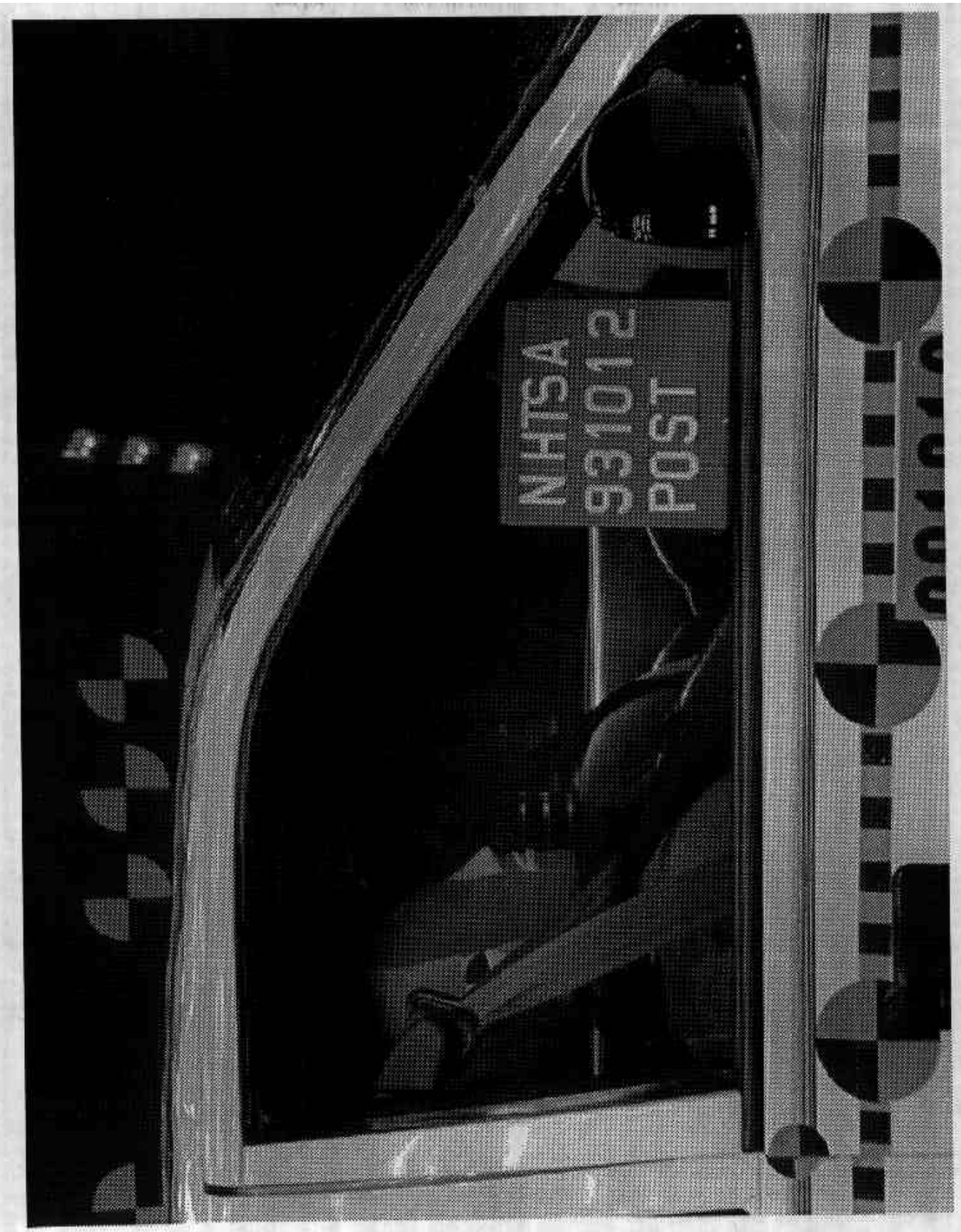


Figure A-30. POST-TEST PASSENGER DUMMY POSITION VIEW

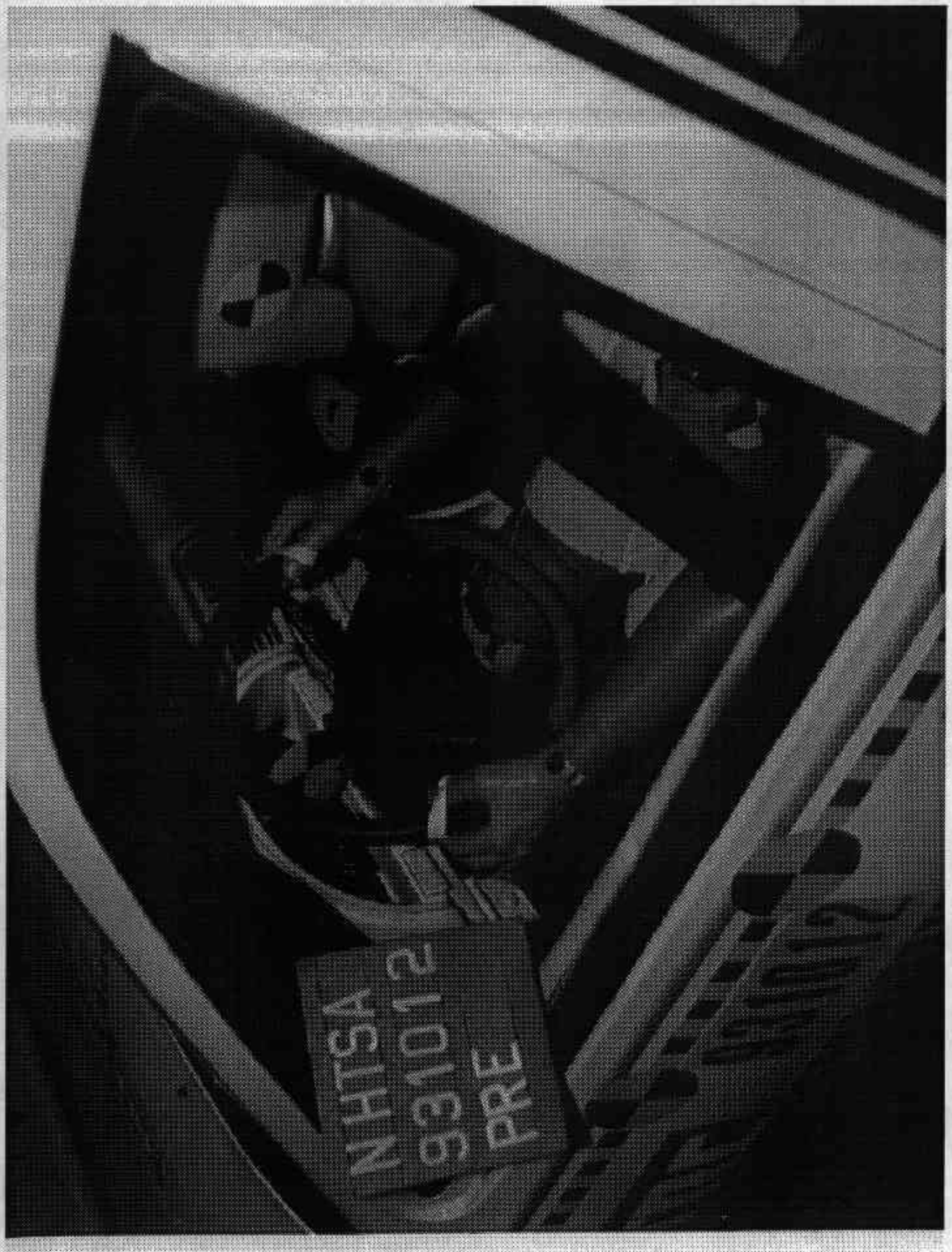


Figure A-31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW

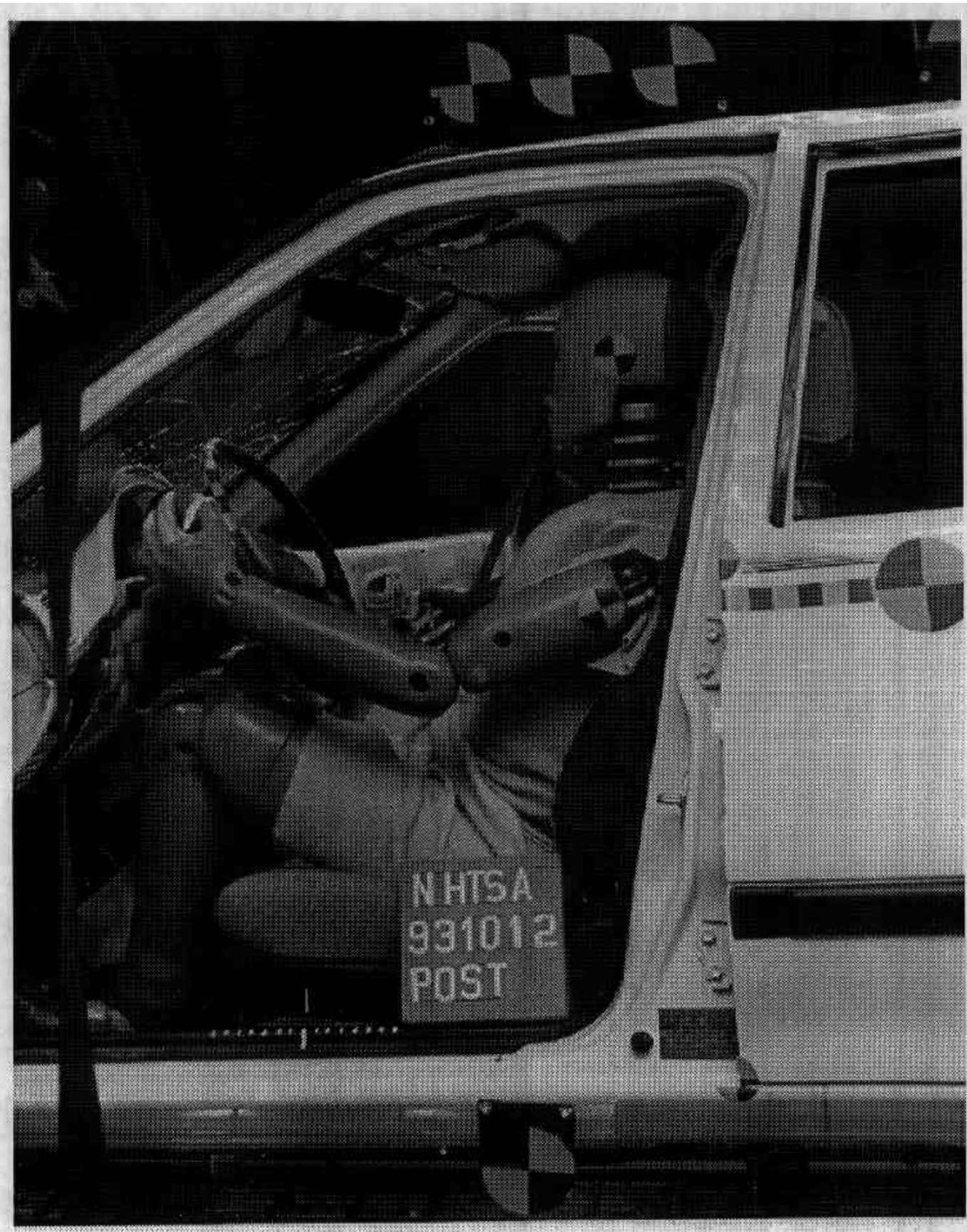


Figure A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

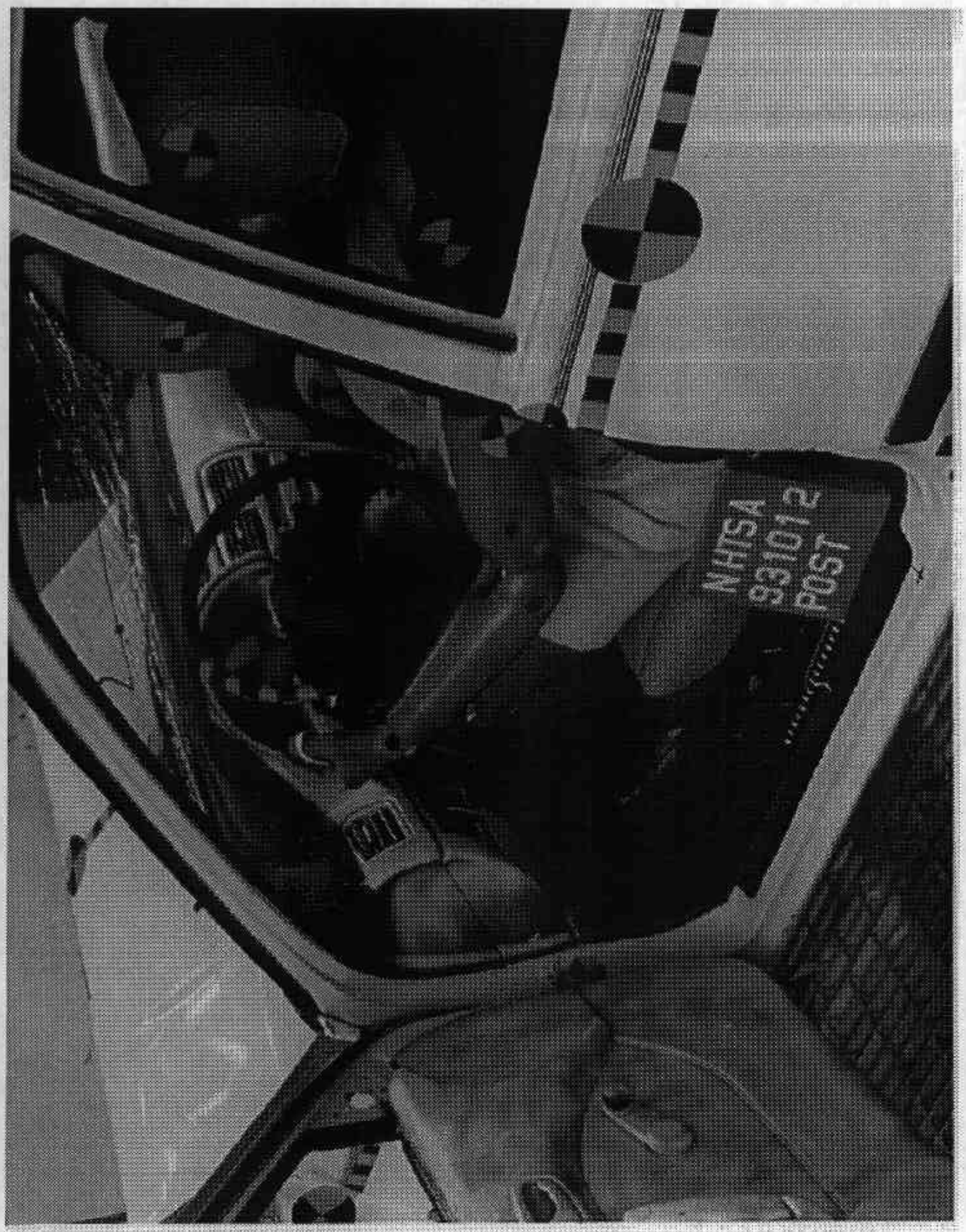


Figure A-33. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

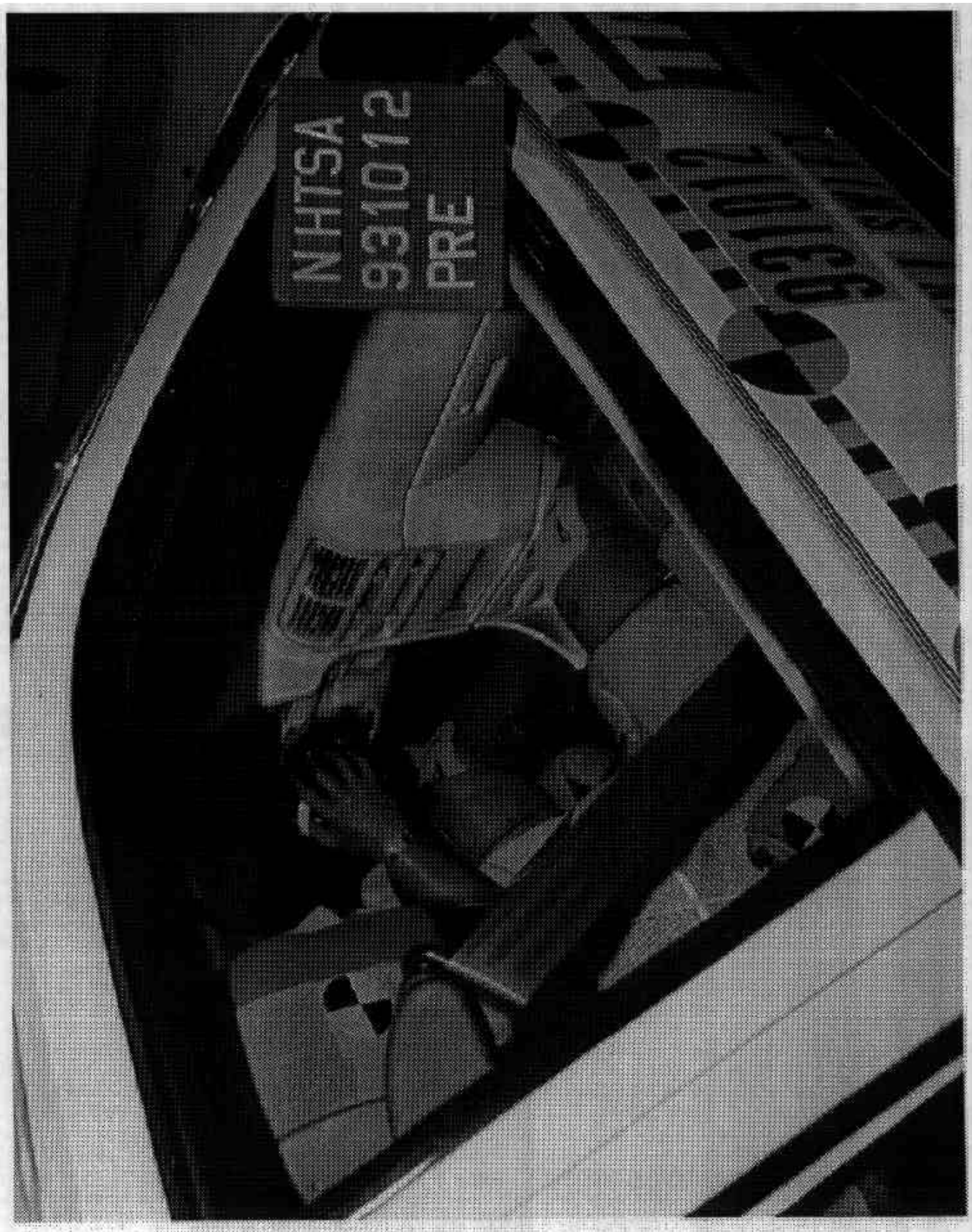


Figure A-34. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR VIEW

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

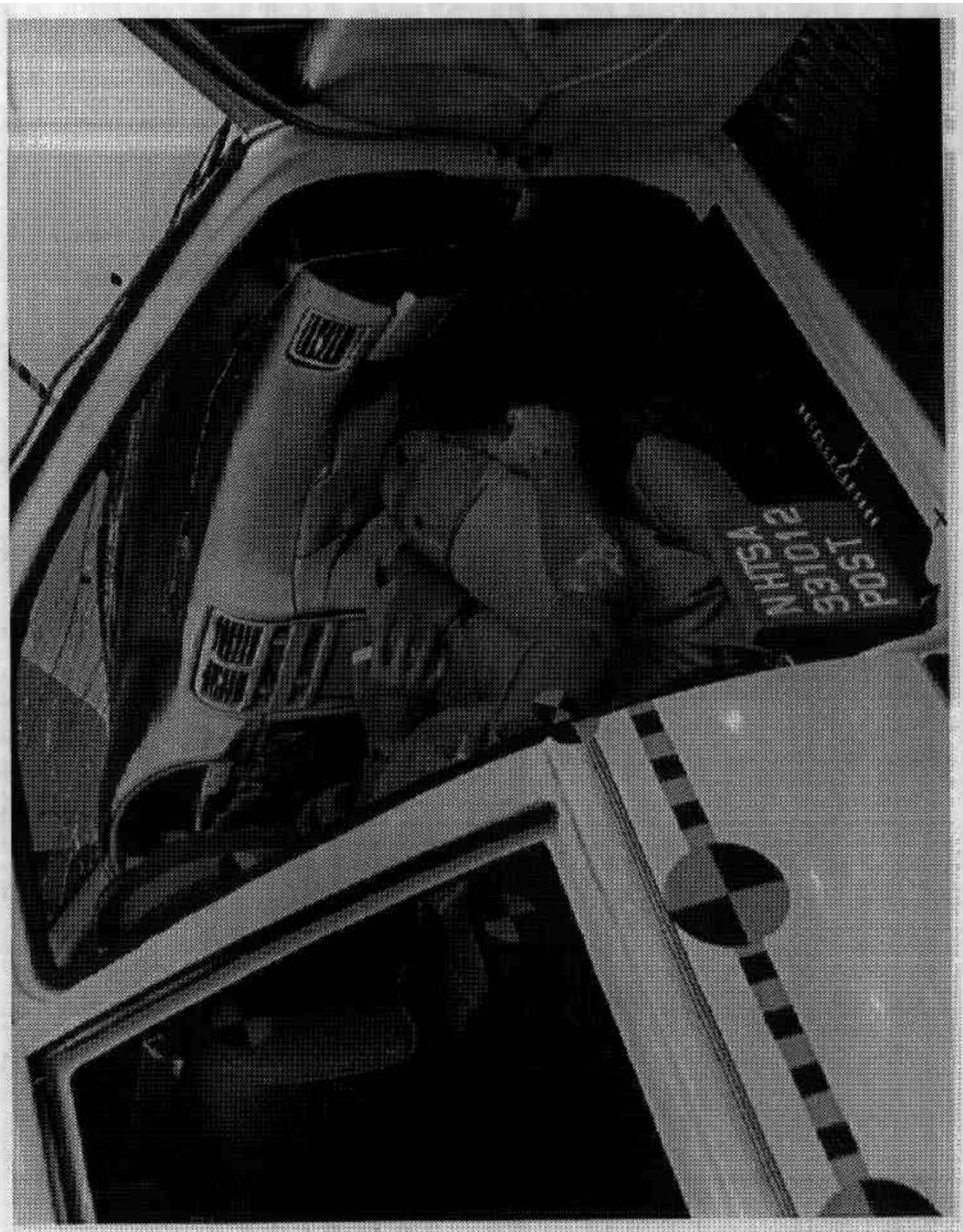


Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

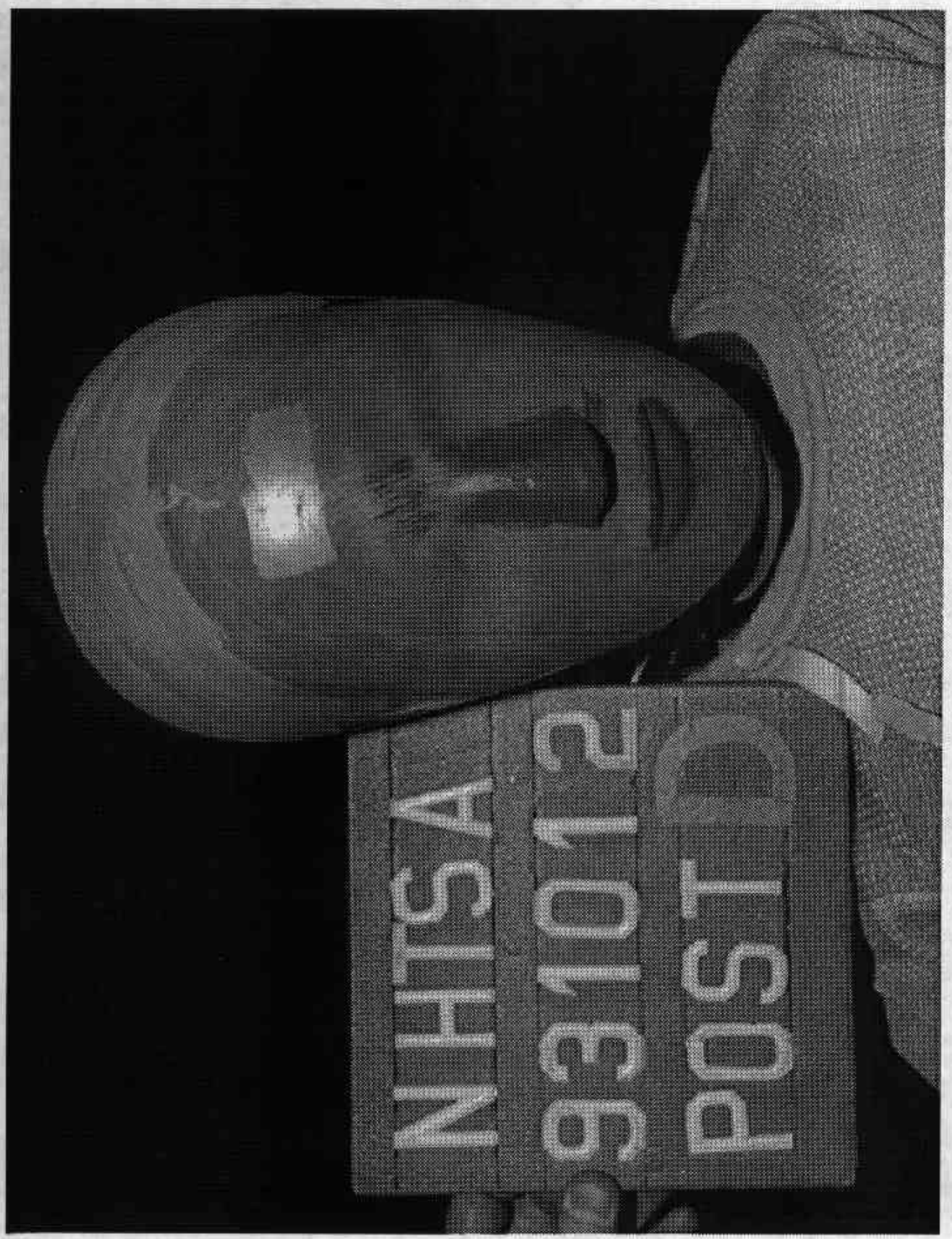


Figure A-37. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

Figure A-38. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

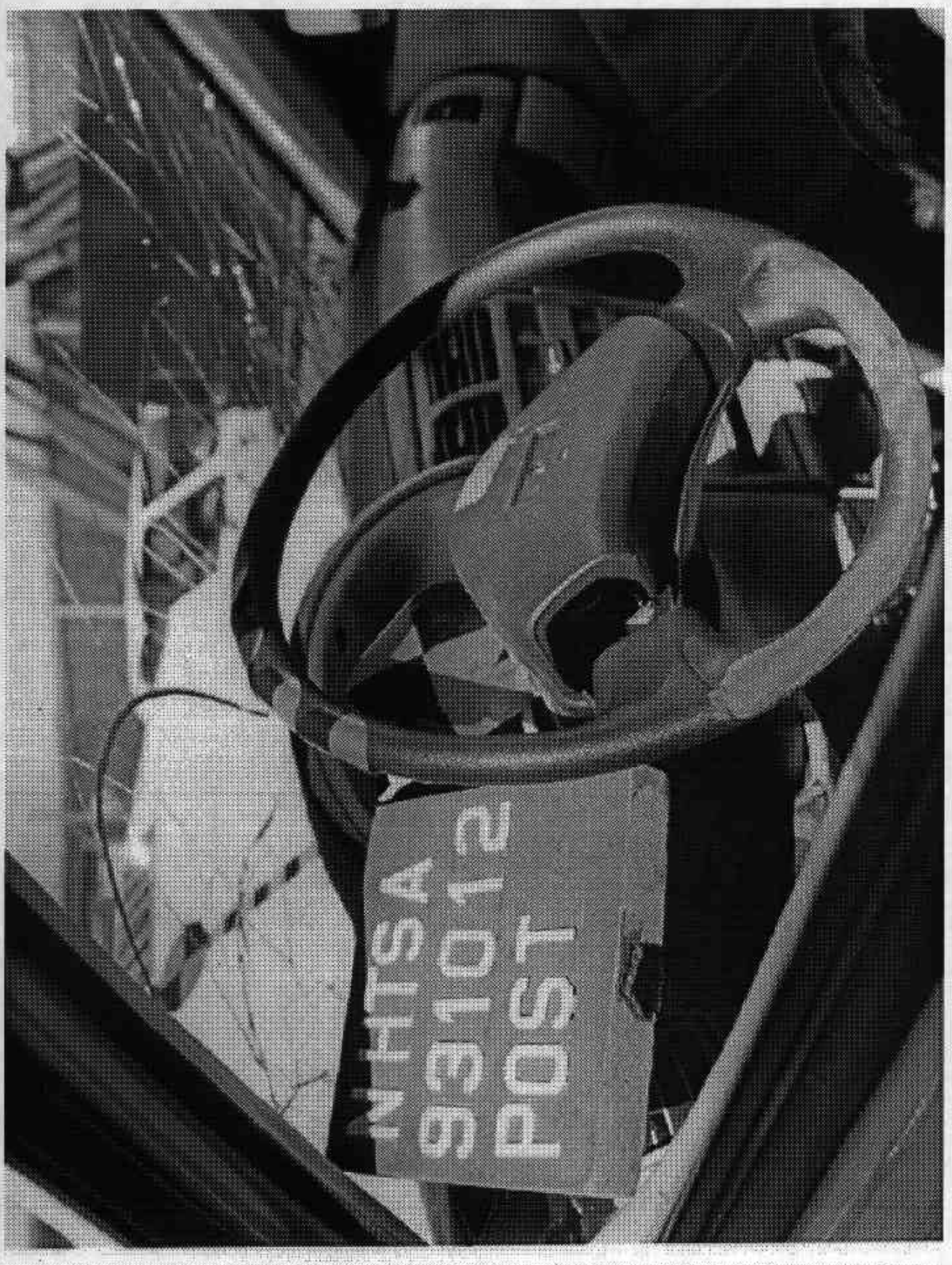


Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 3

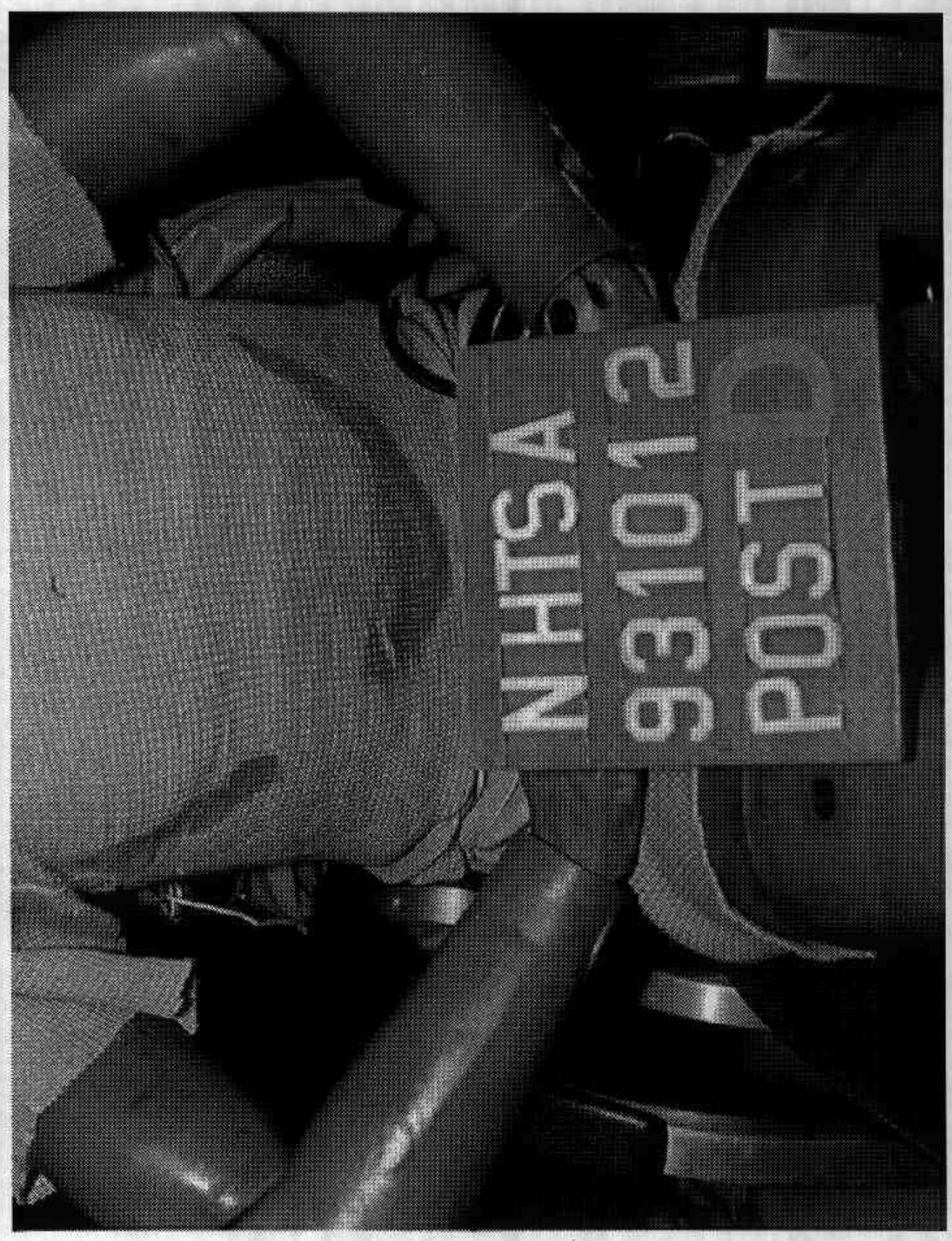


Figure A-40. POST-TEST DRIVER DUMMY CHEST CONTACT

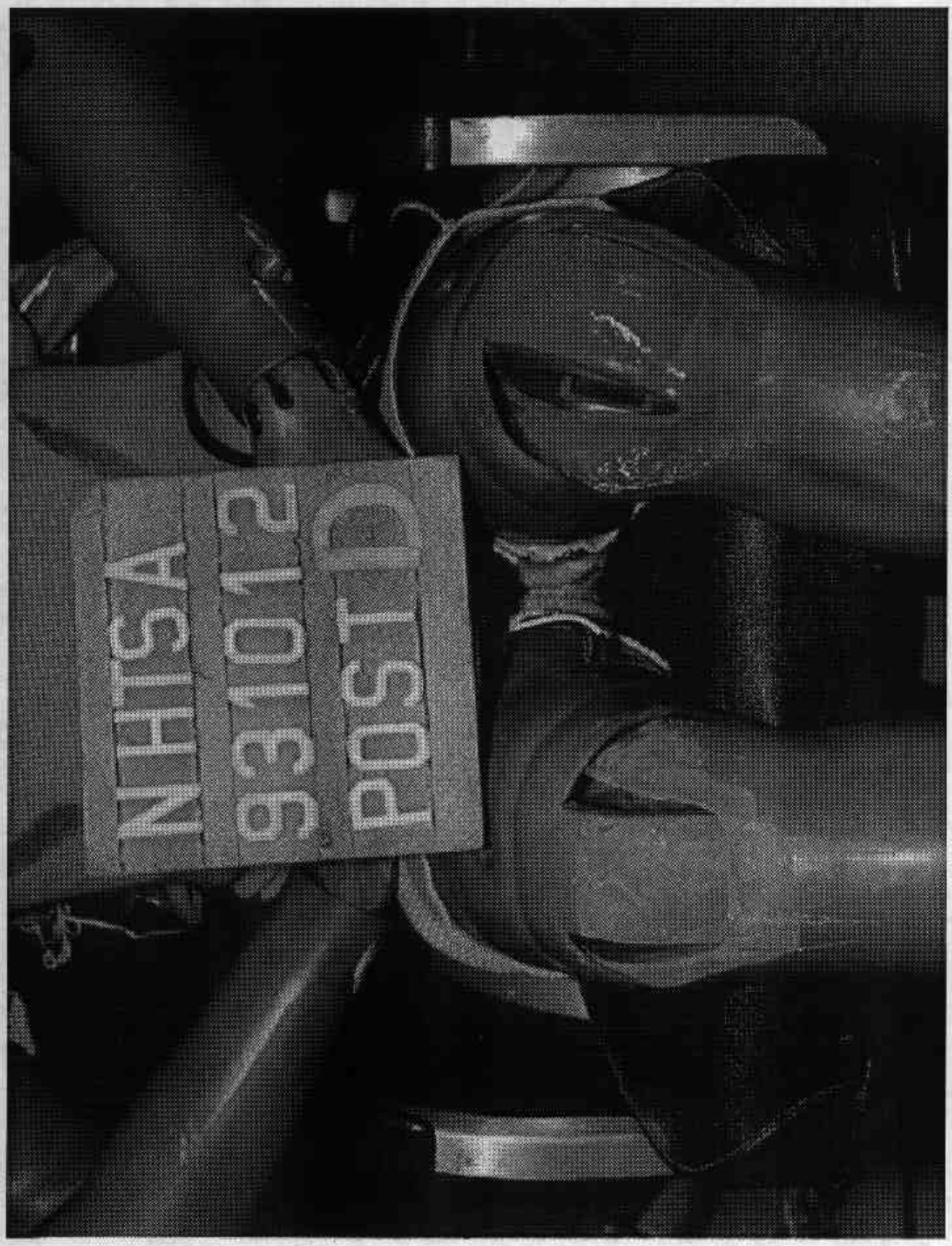


Figure A-41. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

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

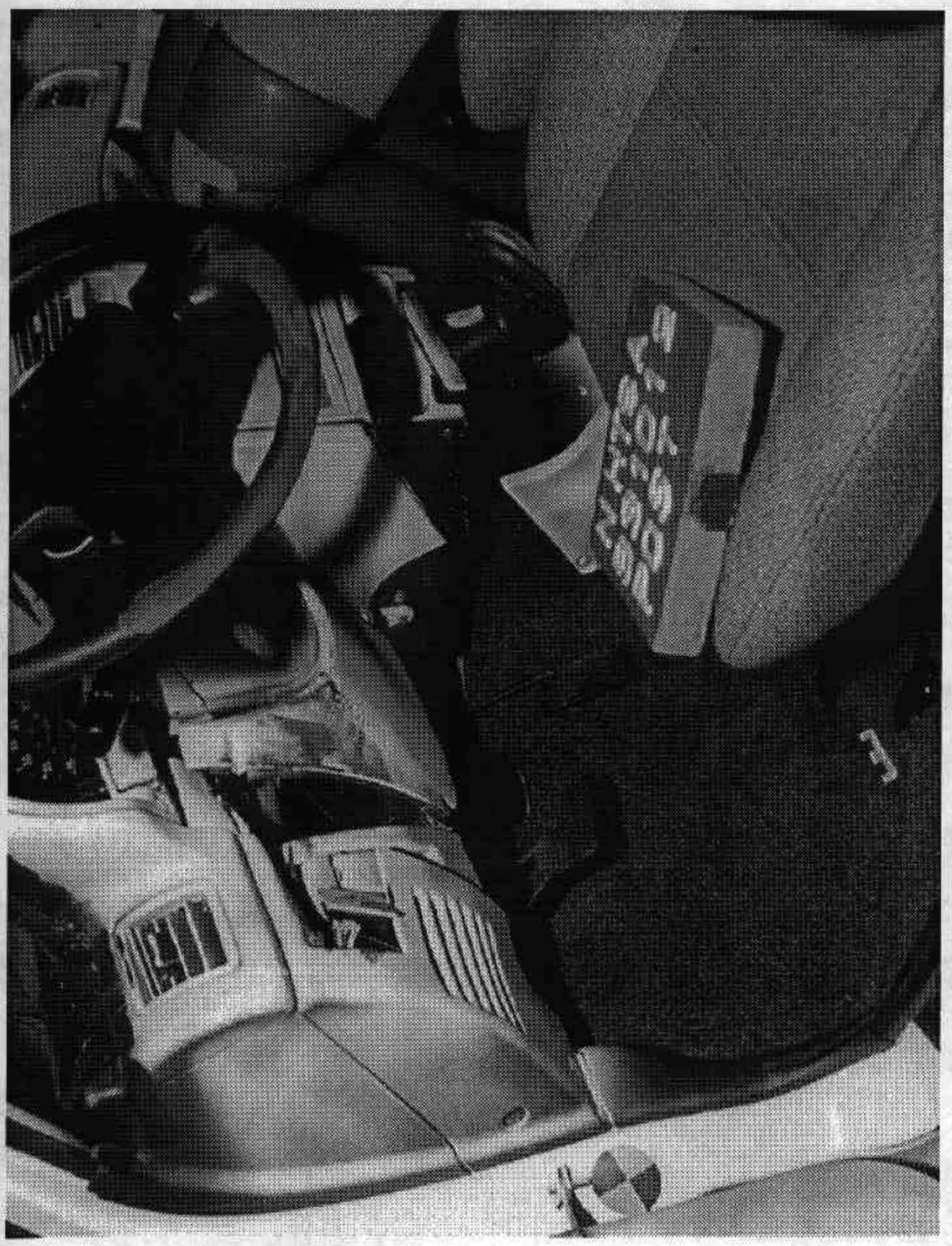


Figure A-43. POST-TEST DRIVER DUMMY CHEST AND KNEE CONTACT VIEW

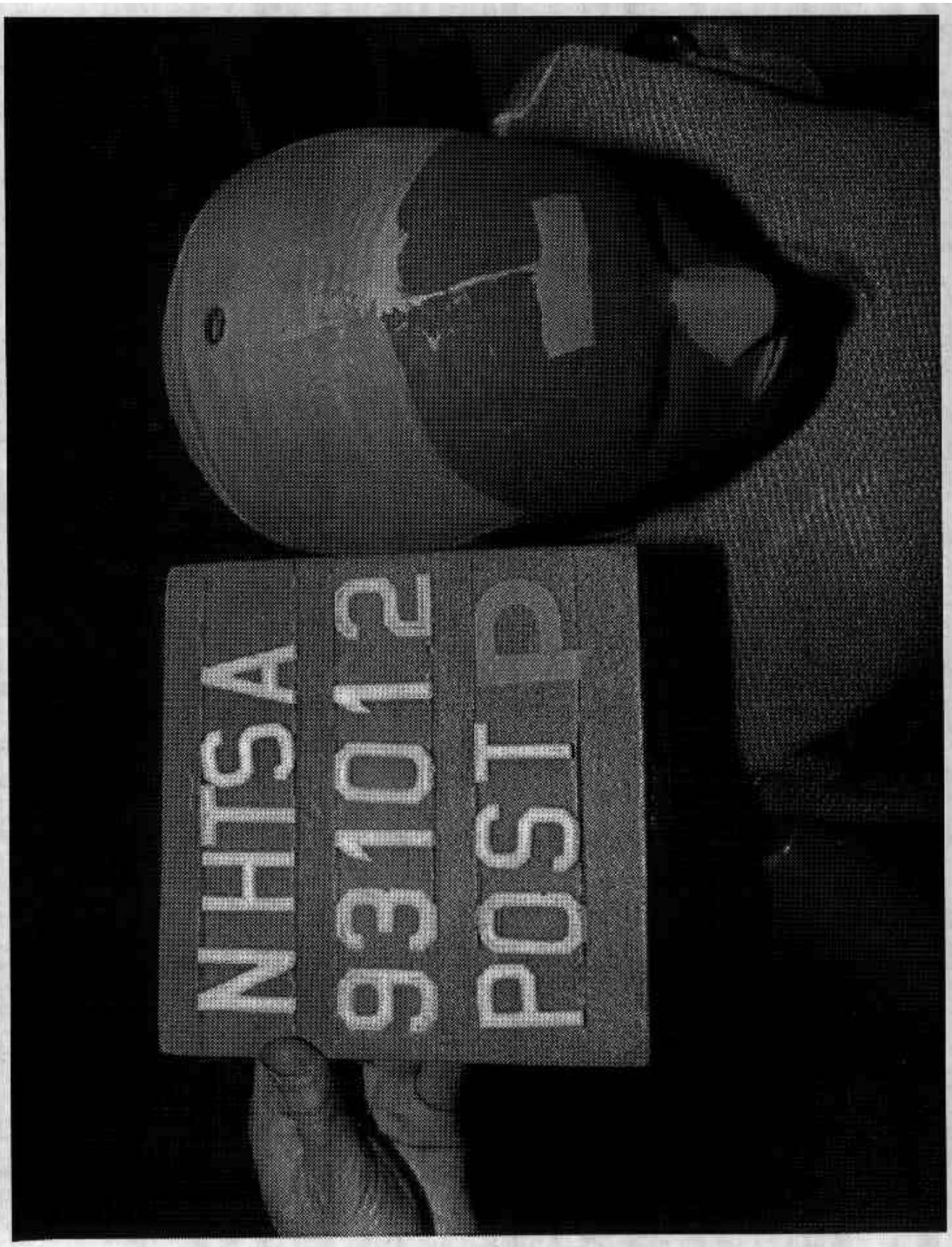


Figure A-44. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 1

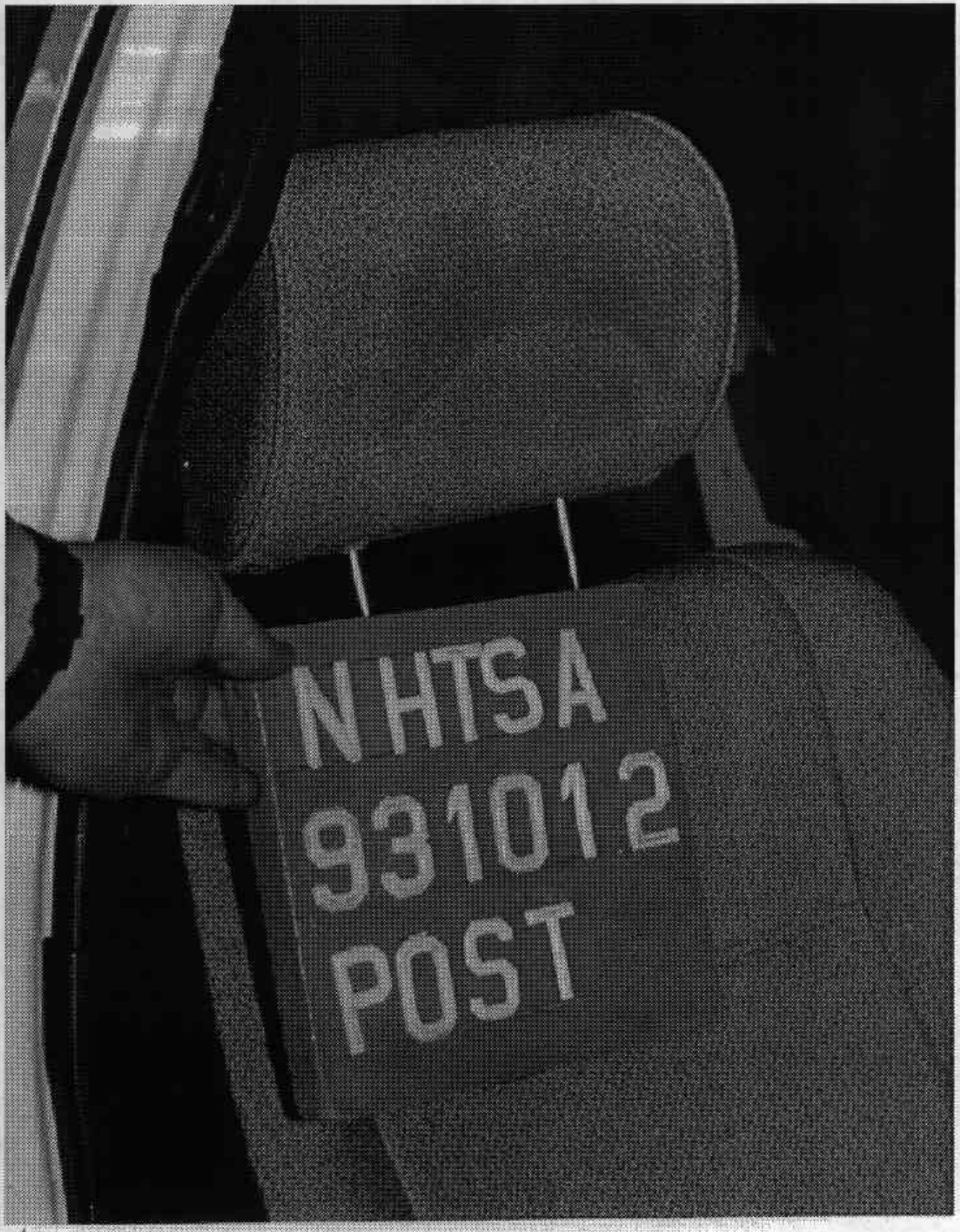


Figure A-45. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 2

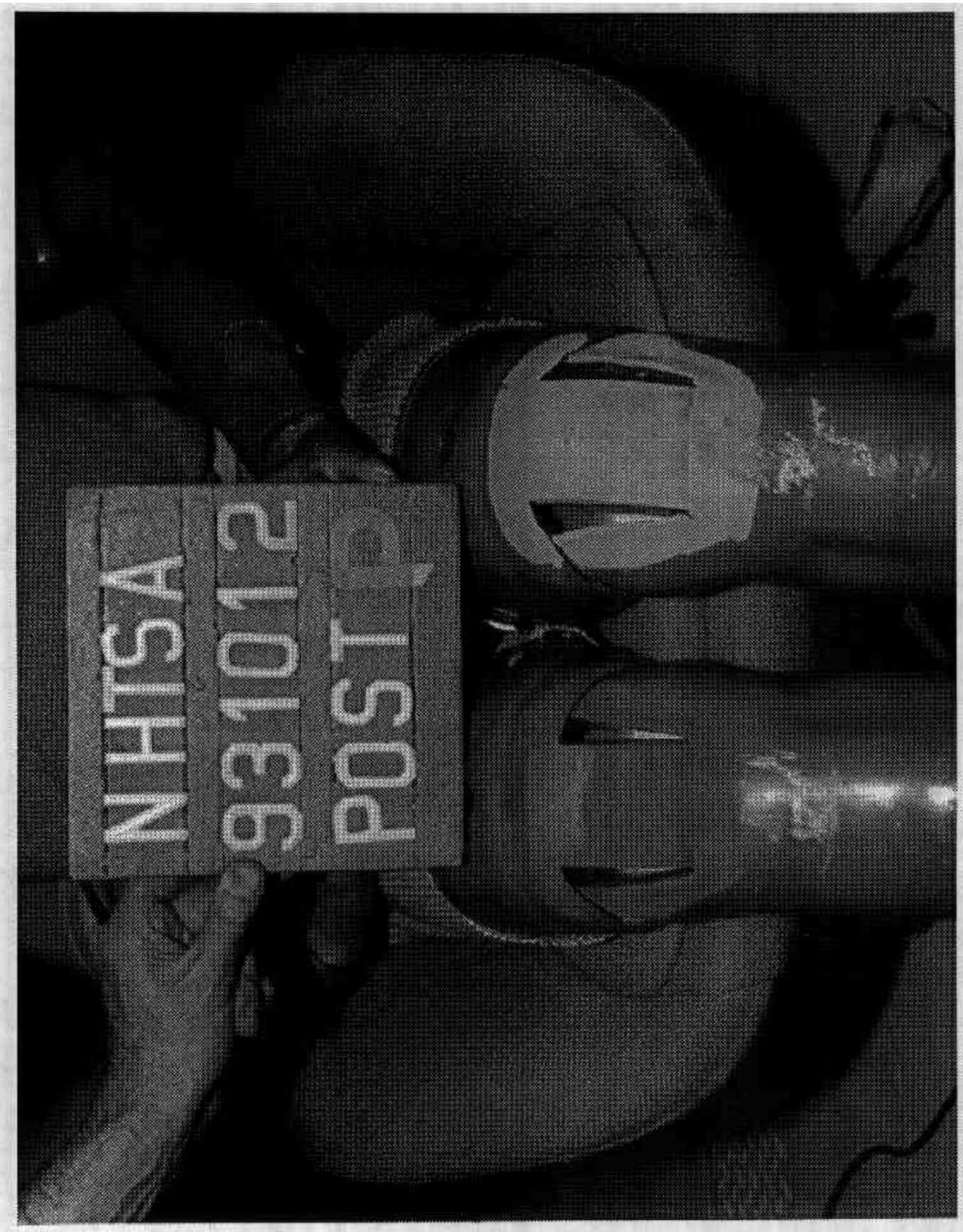


Figure A-46. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

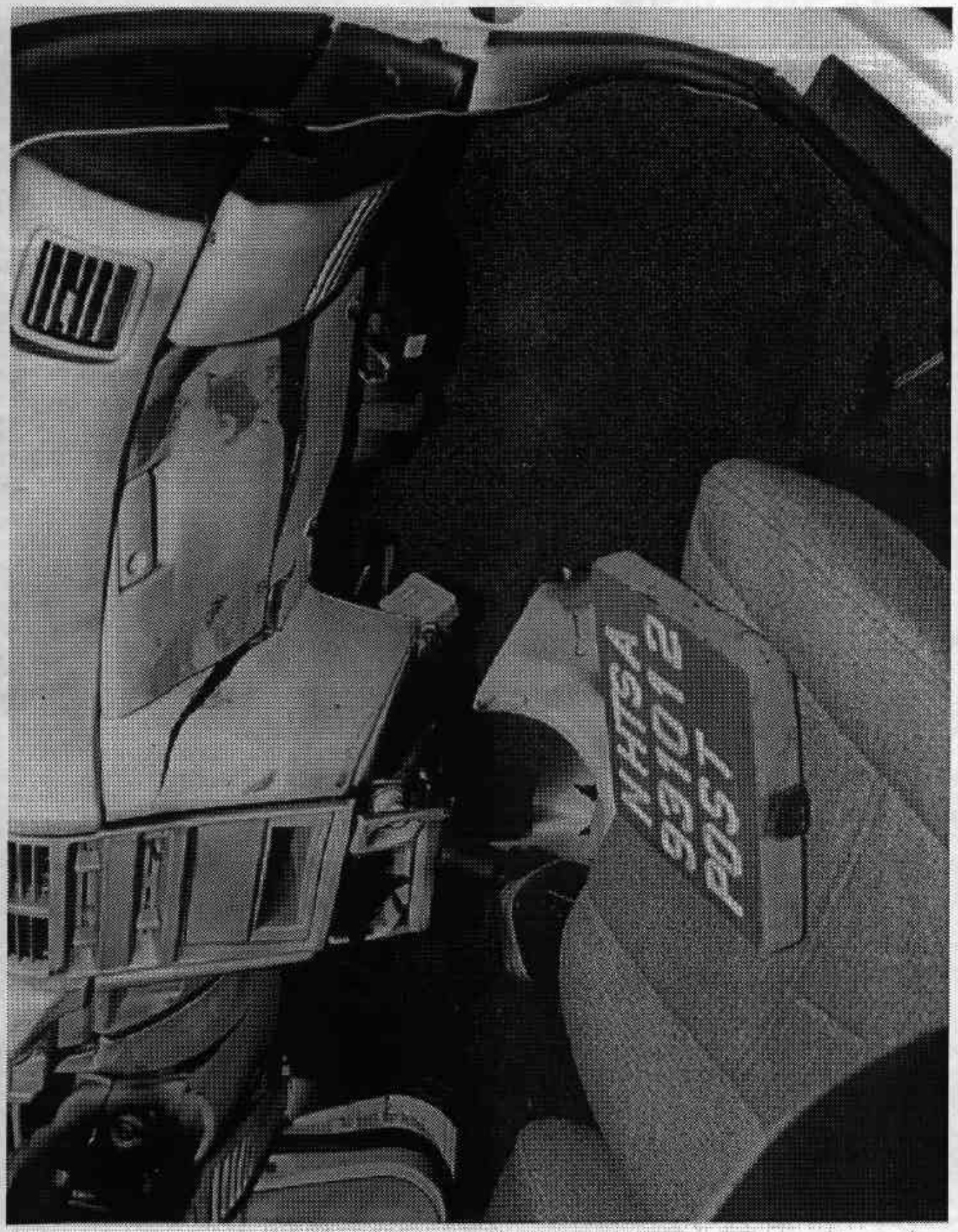


Figure A-47. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

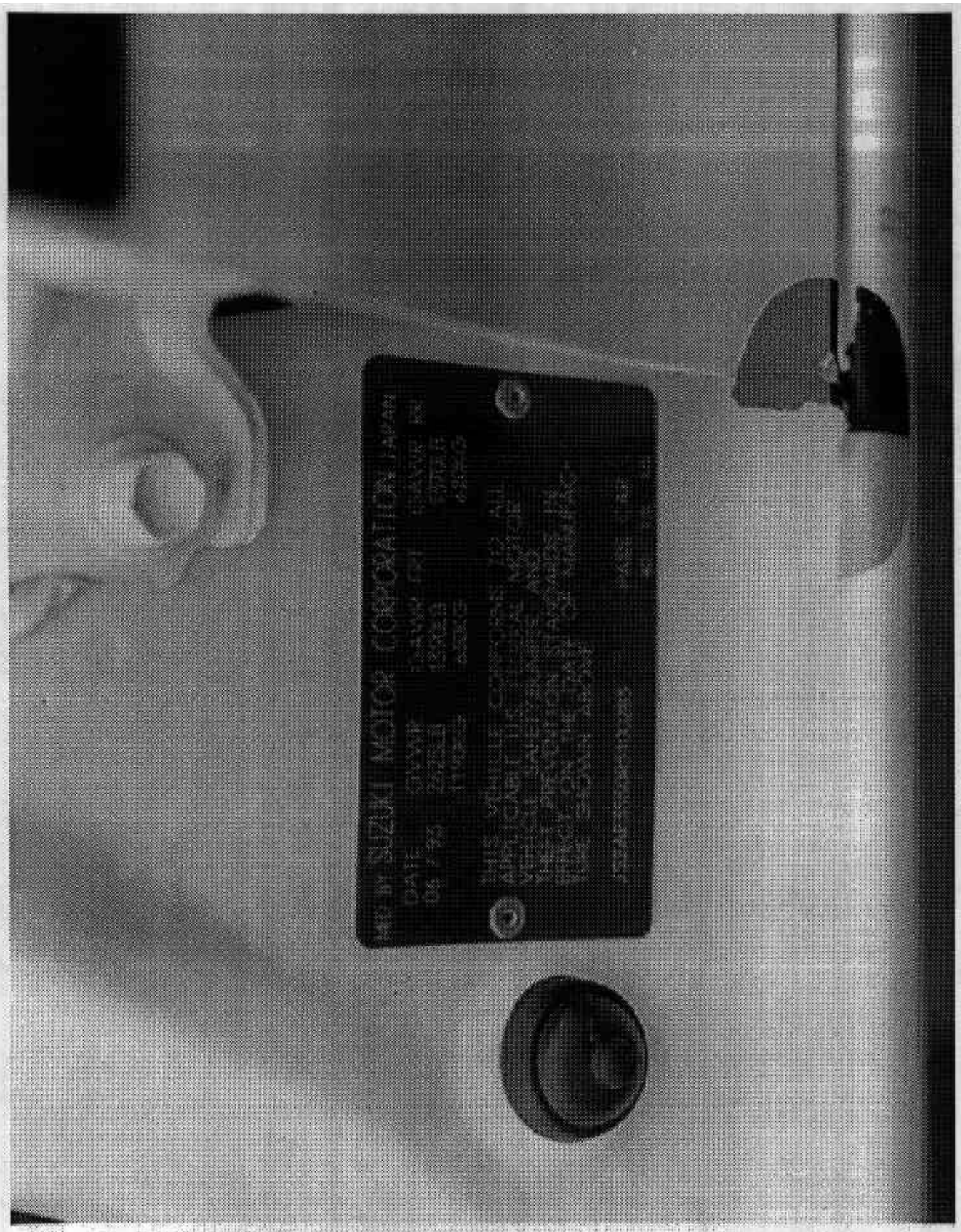


Figure A-48. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

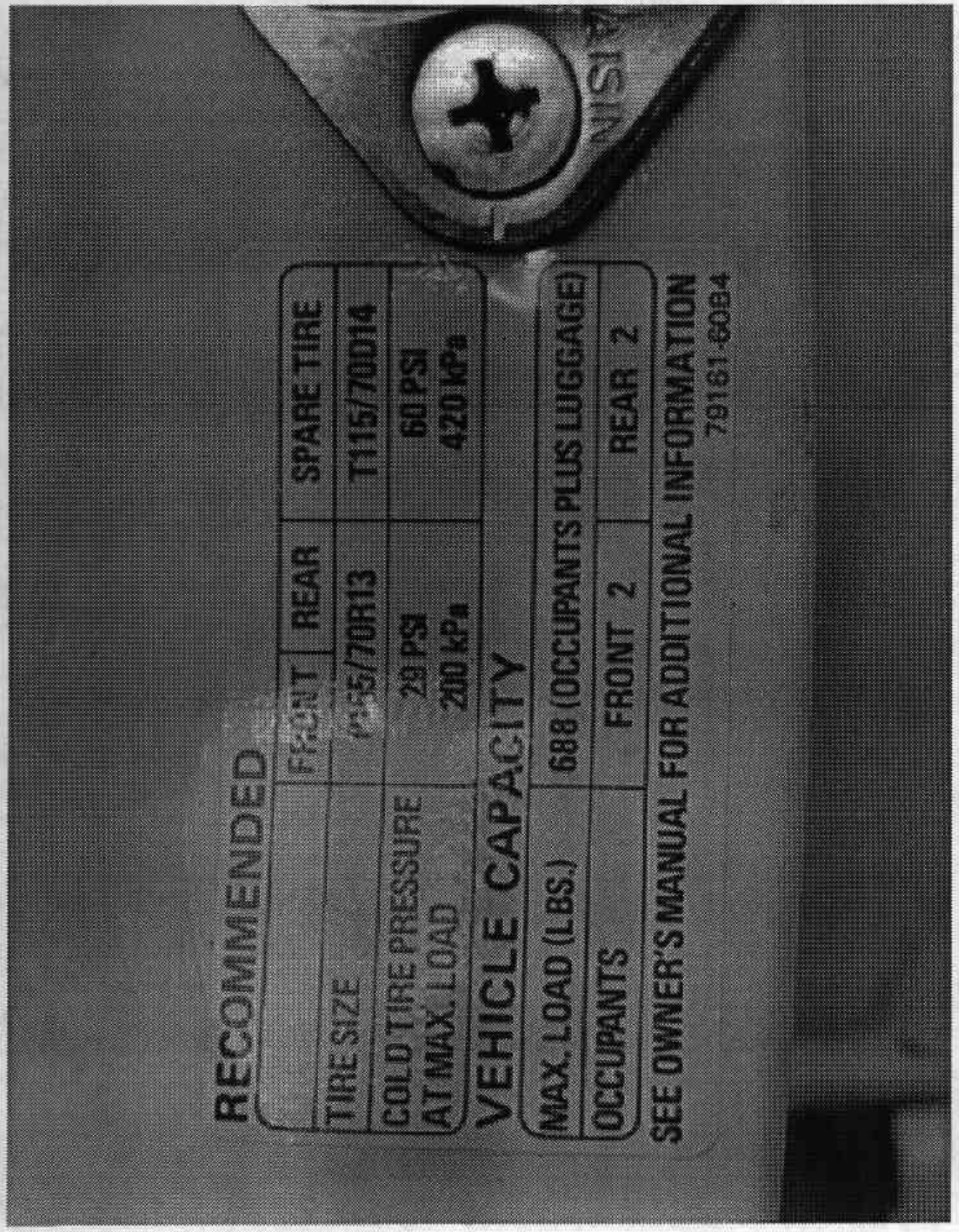


Fig. A-49. PRE-TEST VEHICLE RECOMMENDED TIRE PRESSURE LABEL VIEW

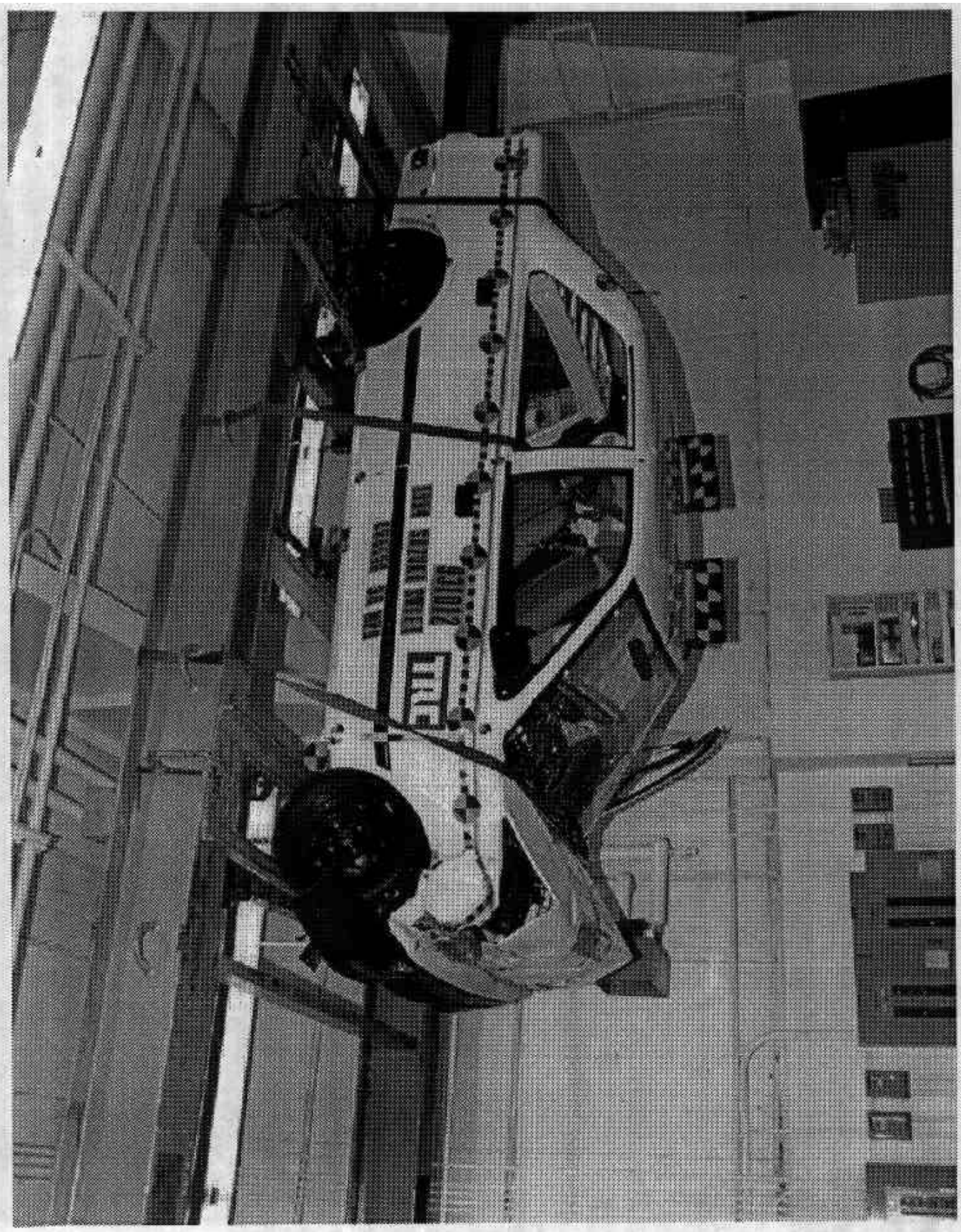


Figure A-50. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

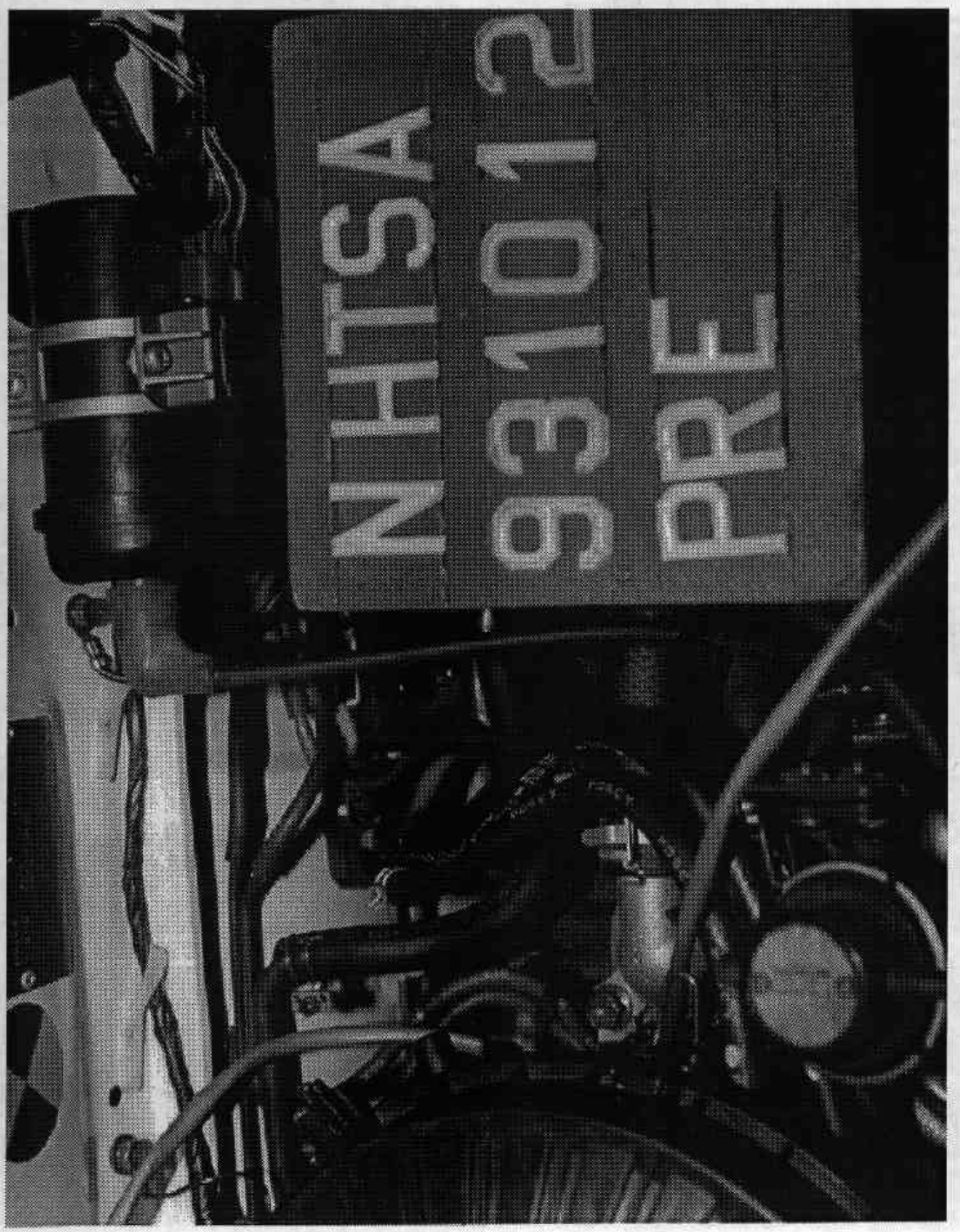


Figure A-51. PRE-TEST FUEL LINES VIEW

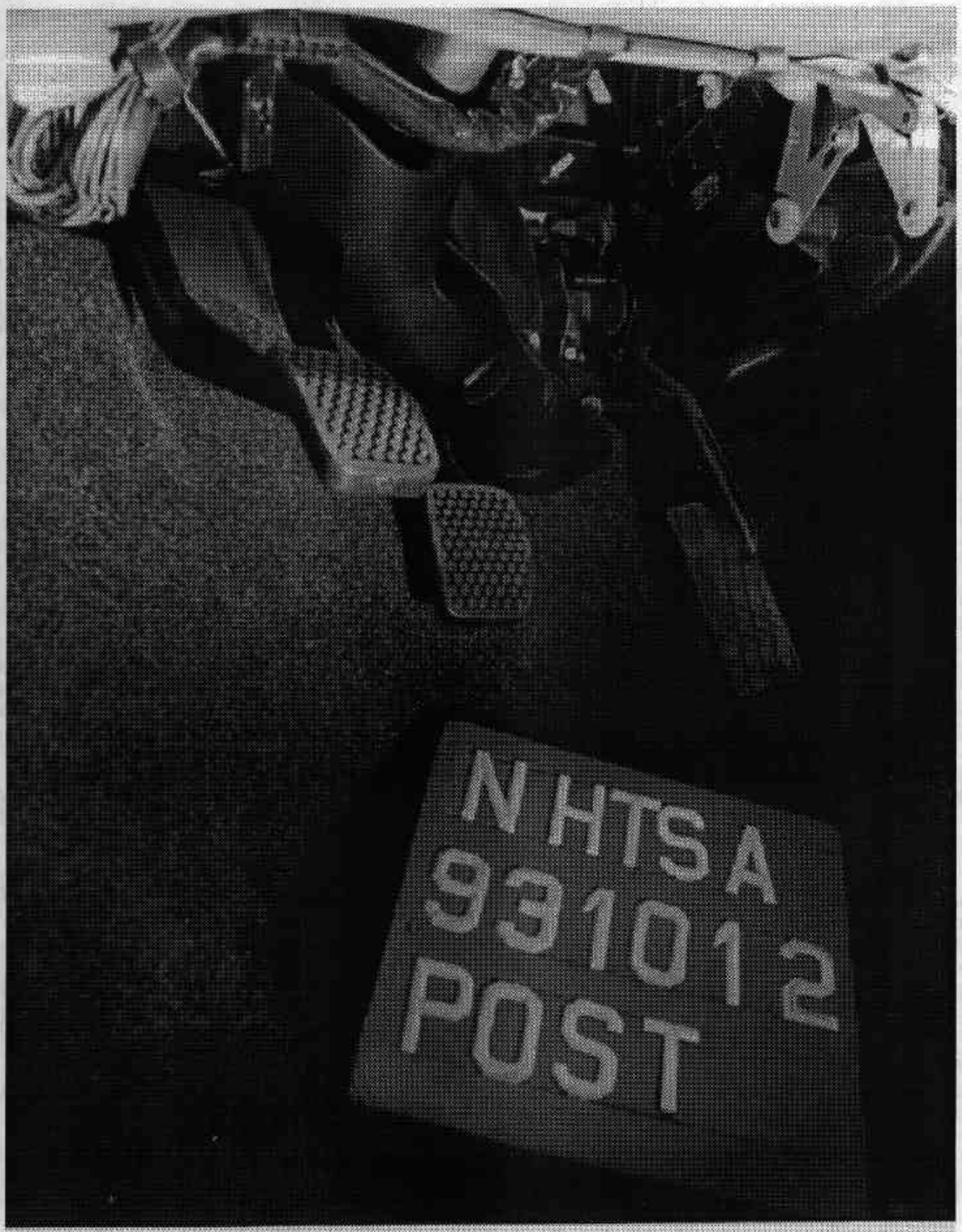
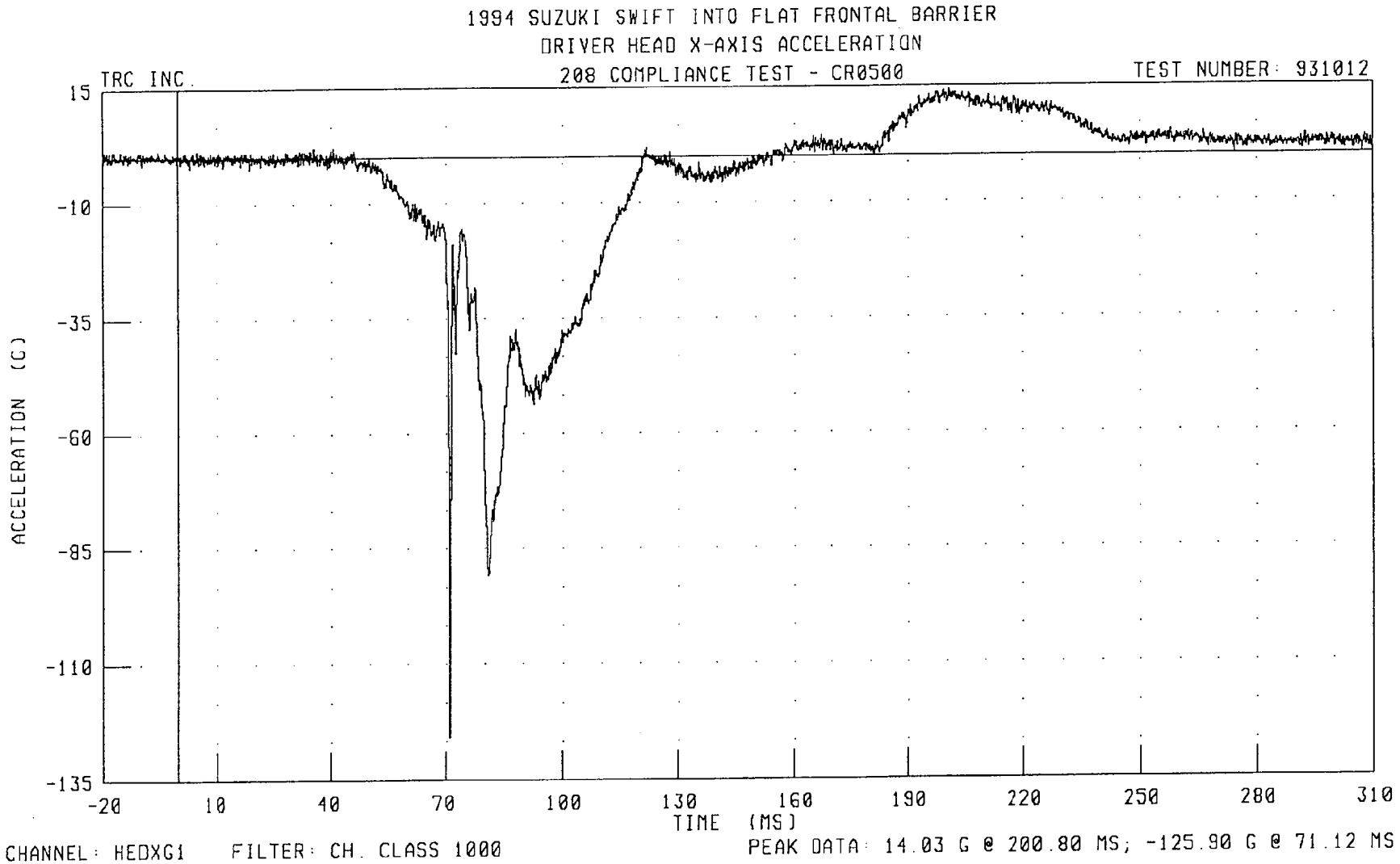


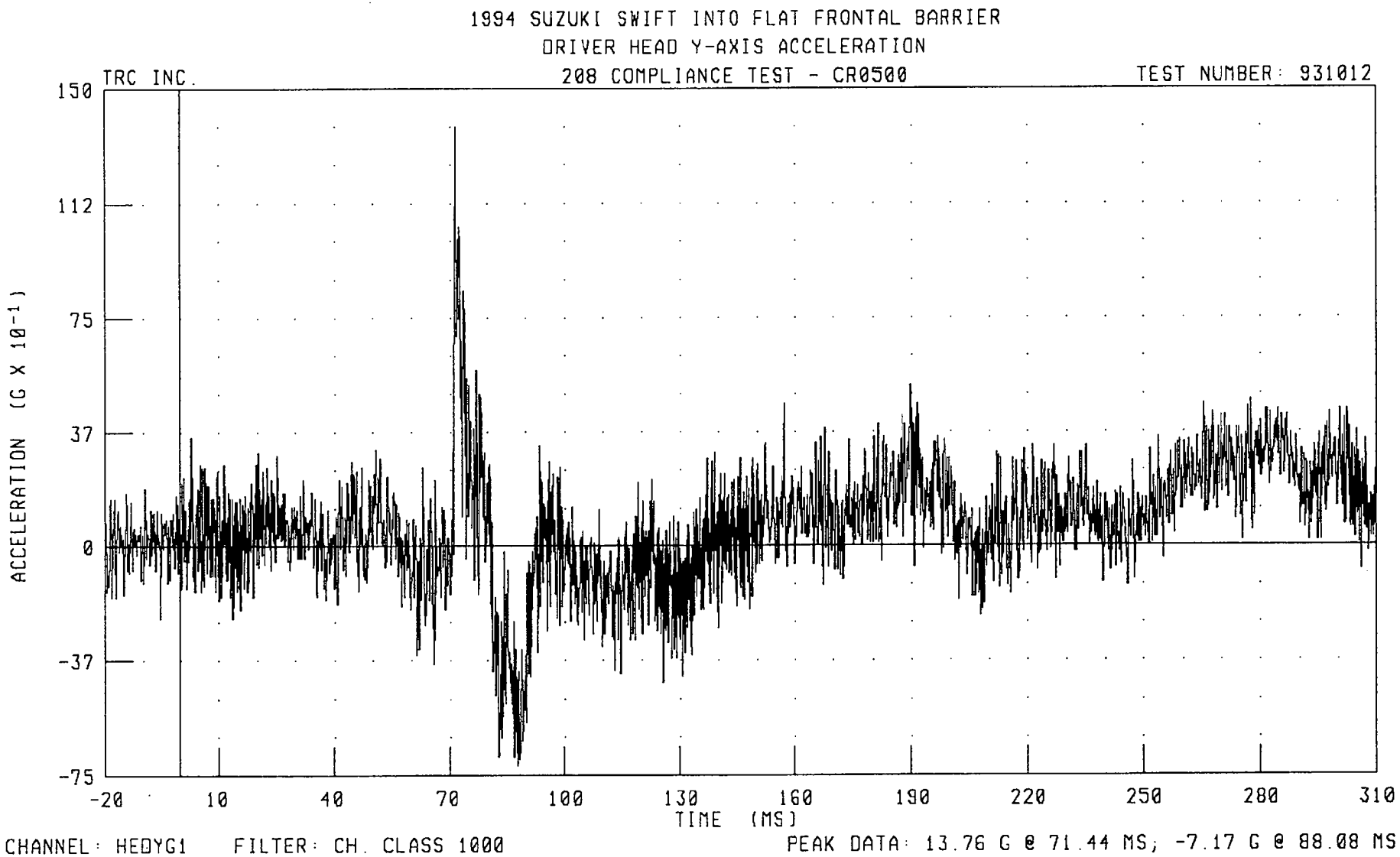
Figure A-53. POST-TEST STEERING COLUMN AT FIREWALL VIEW

Intentionally Left Blank

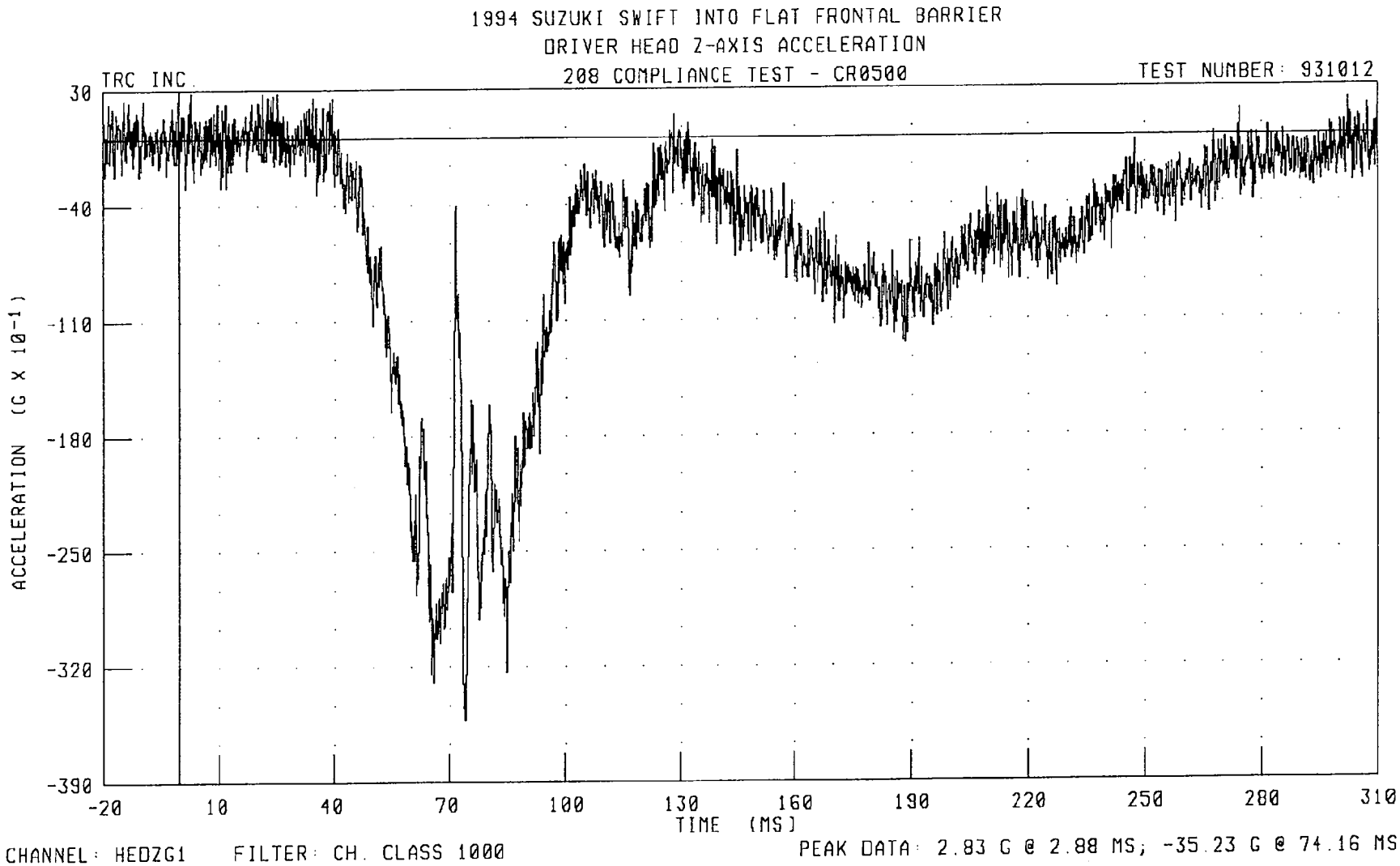
APPENDIX B

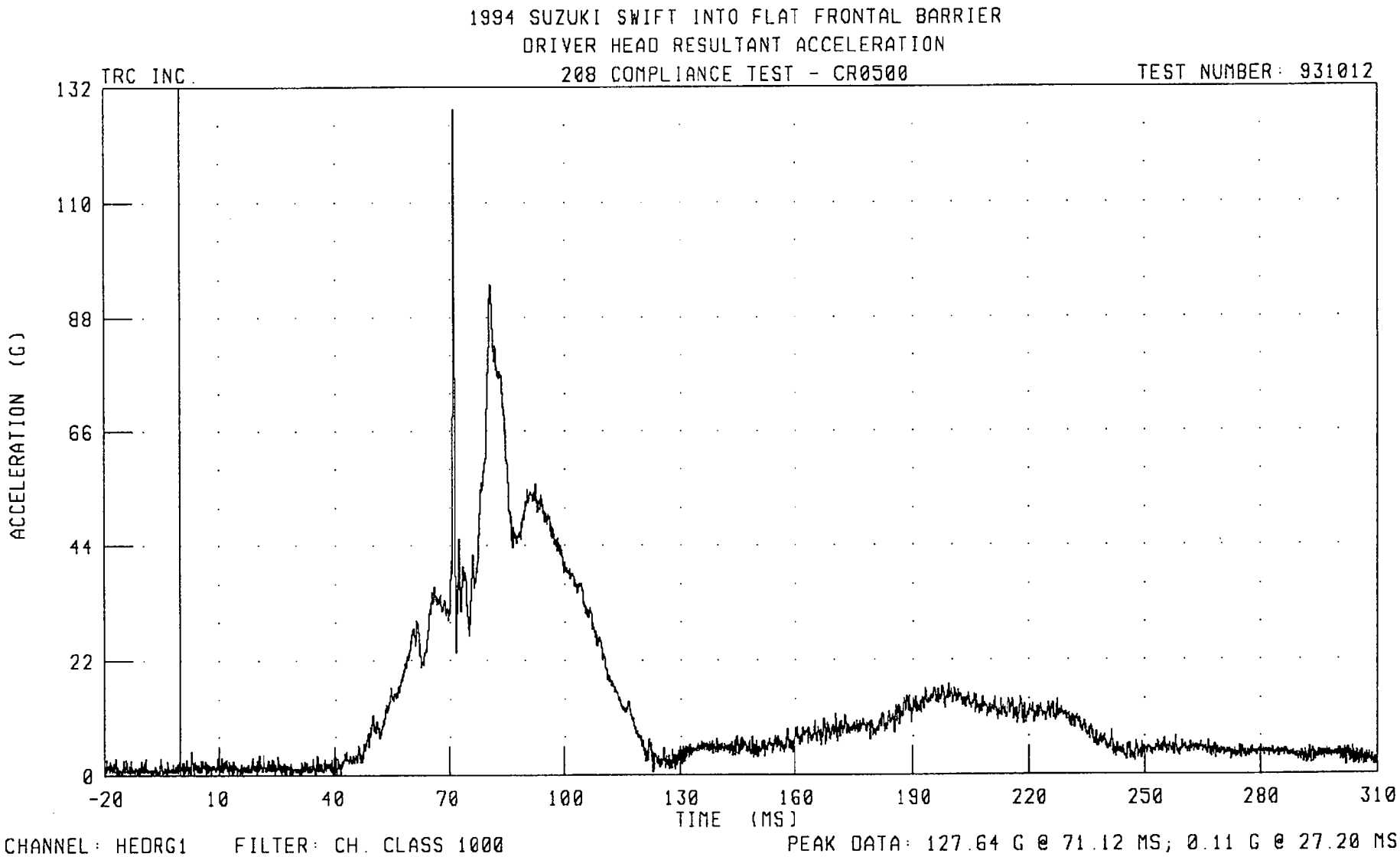
DATA PLOTS


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
15
-10
-35
-60
-85
-110
-135
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG1
FILTER: CH. CLASS 1000
PEAK DATA: 14.03 G @ 200.80 MS; -125.90 G @ 71.12 MS

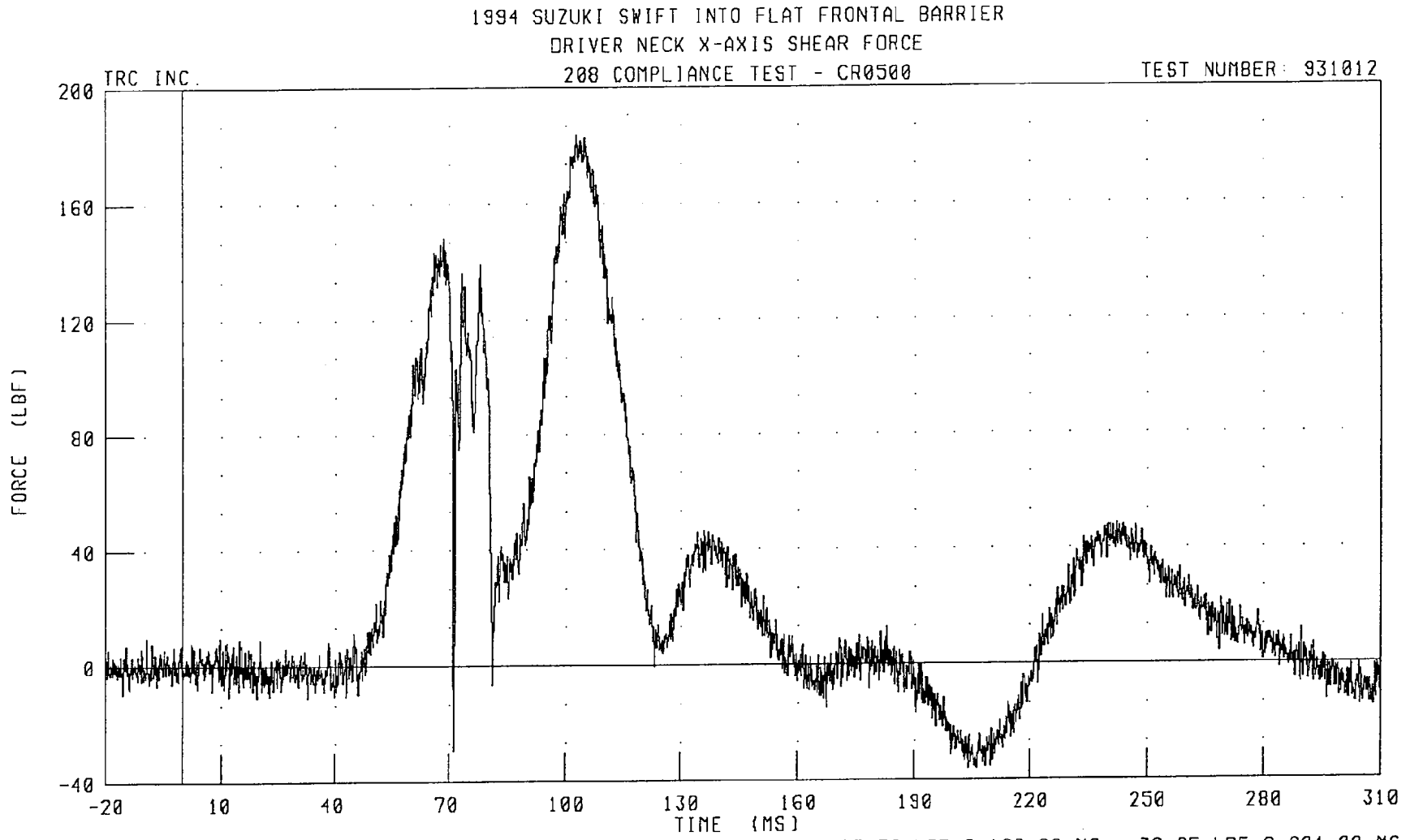

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
150
112
75
37
0
-37
-75
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG1
FILTER: CH. CLASS 1000
PEAK DATA: 13.76 G @ 71.44 MS; -7.17 G @ 88.08 MS

931012

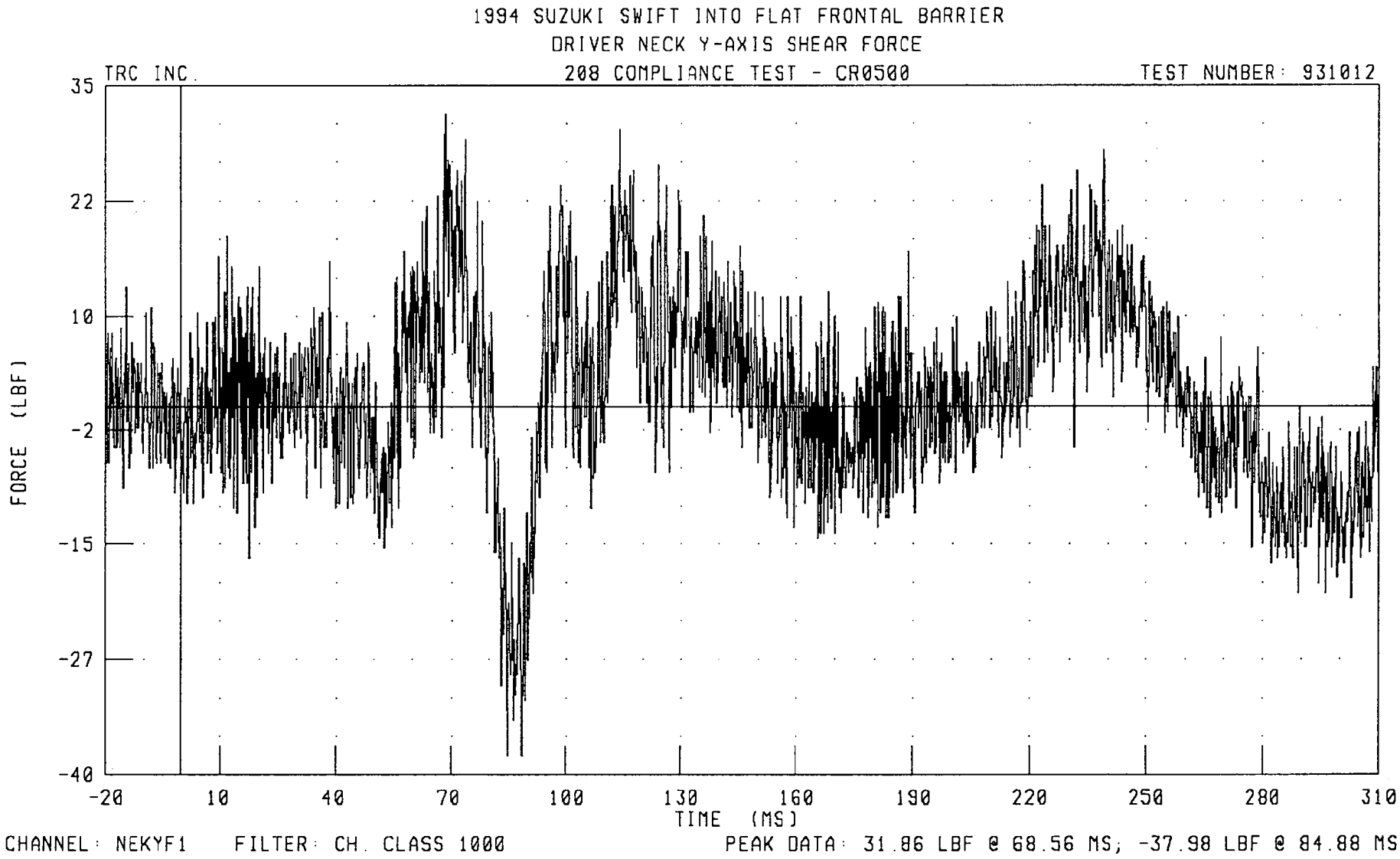

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
30
-40
-110
-180
-250
-320
-390
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG1
FILTER: CH. CLASS 1000
PEAK DATA: 2.83 G @ 2.88 MS; -35.23 G @ 74.16 MS


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
ACCELERATION (G)
132
110
88
66
44
22
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDRG1
FILTER: CH. CLASS 1000
PEAK DATA: 127.64 G @ 71.12 MS; 0.11 G @ 27.20 MS

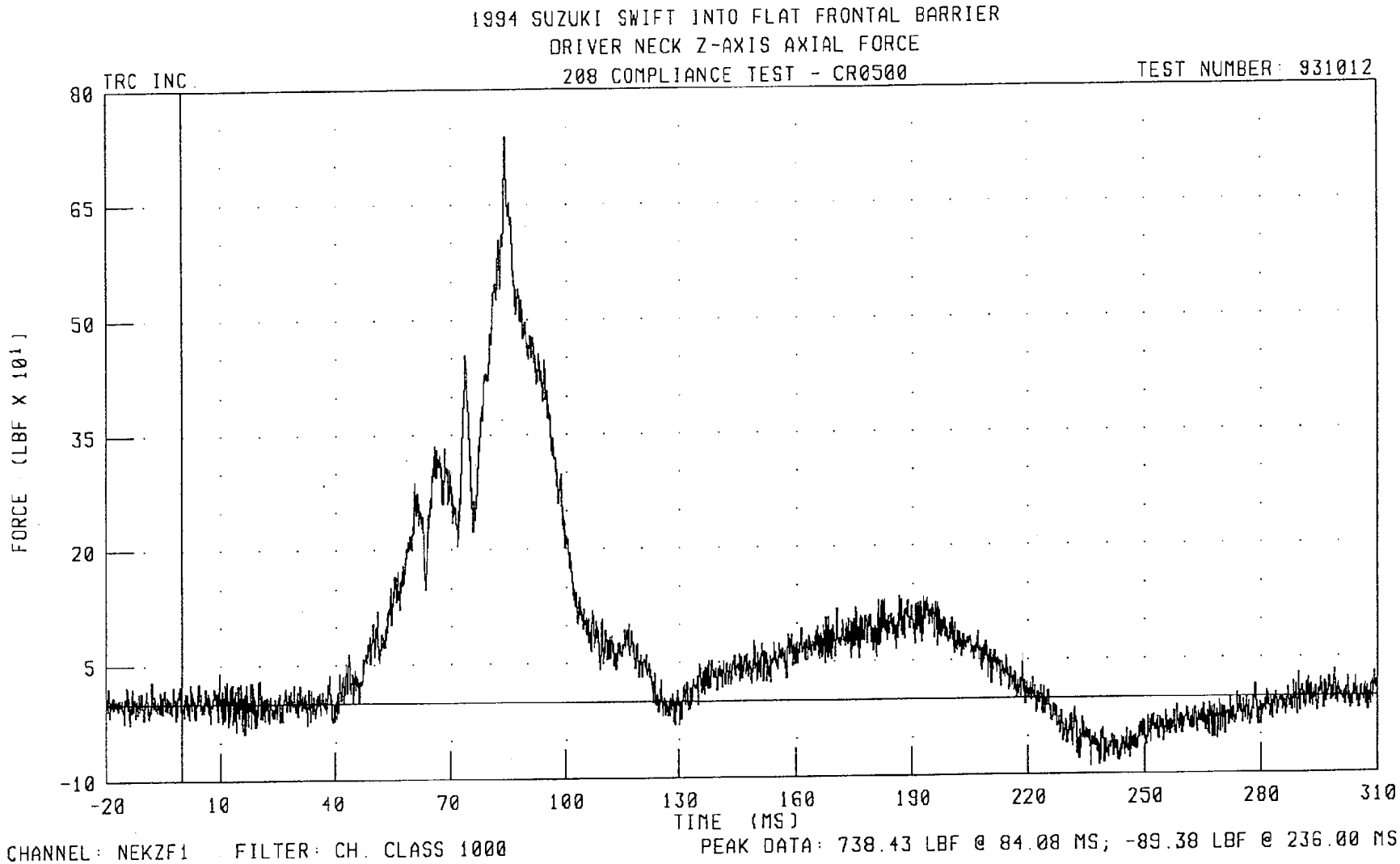
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER NECK X-AXIS SHEAR FORCE
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
FORCE (LBF)
200
160
120
80
40
0
-40
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXF1
FILTER: CH. CLASS 1000
PEAK DATA: 183.56 LBF @ 102.80 MS; -36.05 LBF @ 204.00 MS

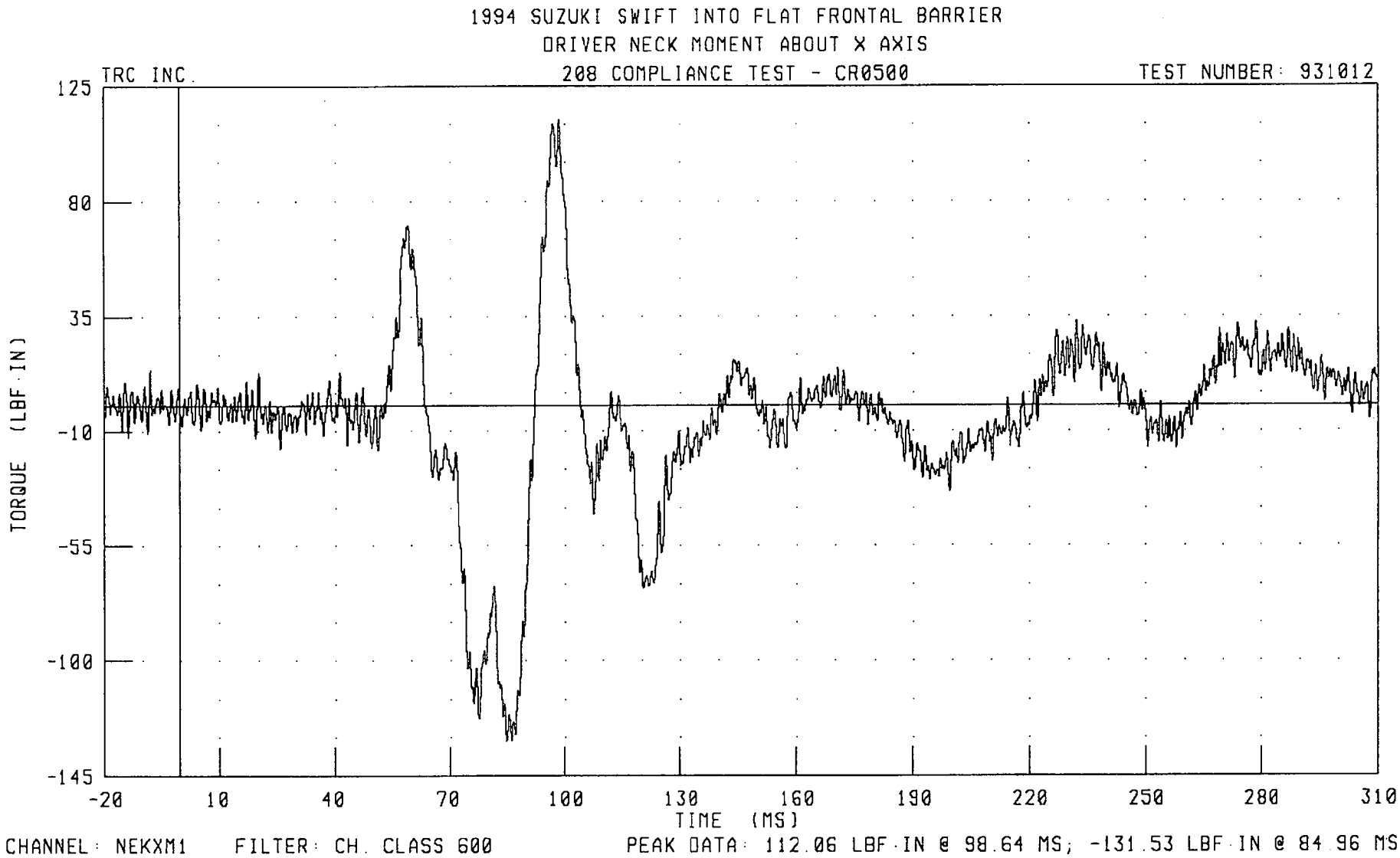
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER NECK Y-AXIS SHEAR FORCE
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
35
22
10
-2
-15
-27
-40
FORCE (LBF)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYF1
FILTER: CH. CLASS 1000
PEAK DATA: 31.86 LBF @ 68.56 MS; -37.98 LBF @ 84.88 MS

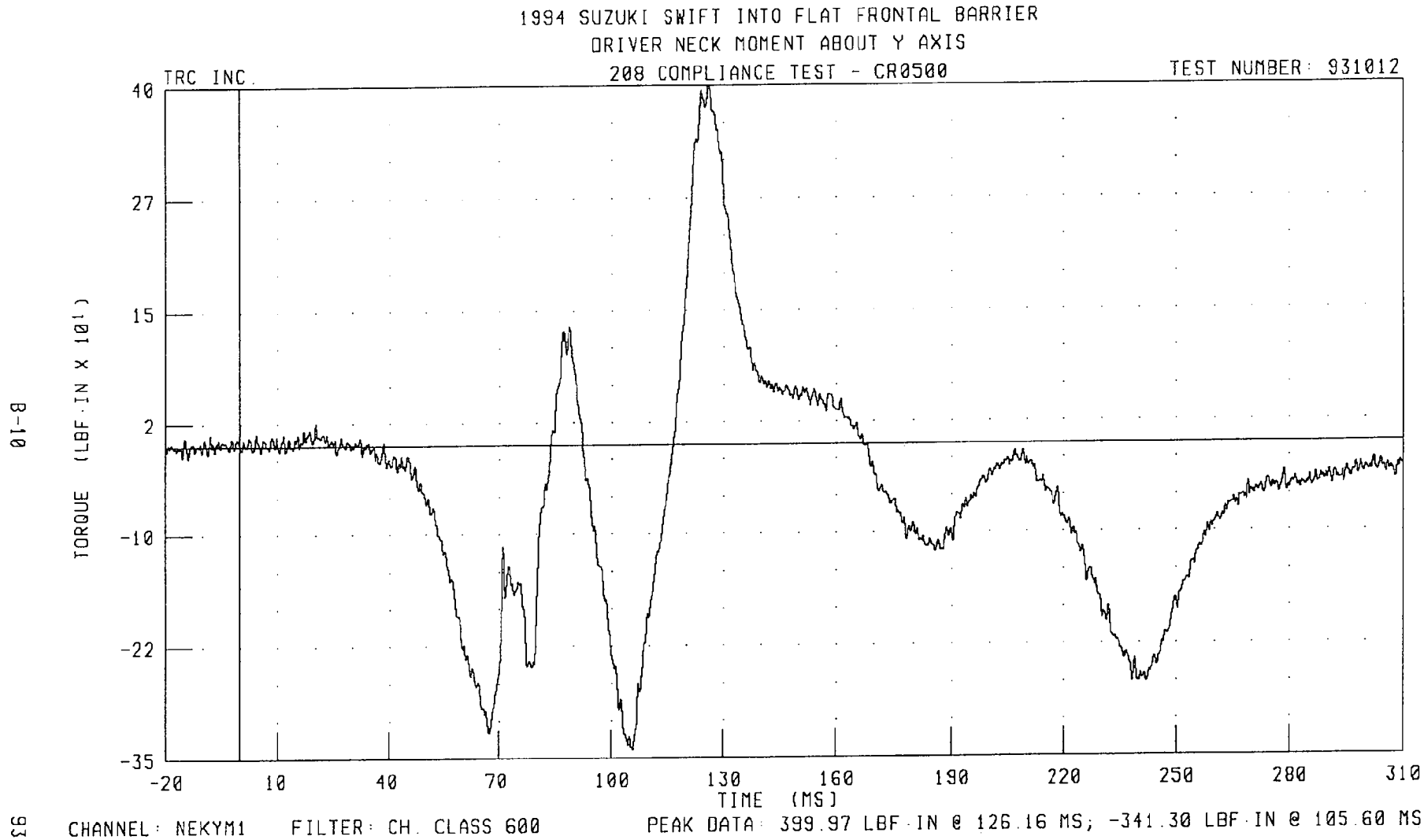
931012

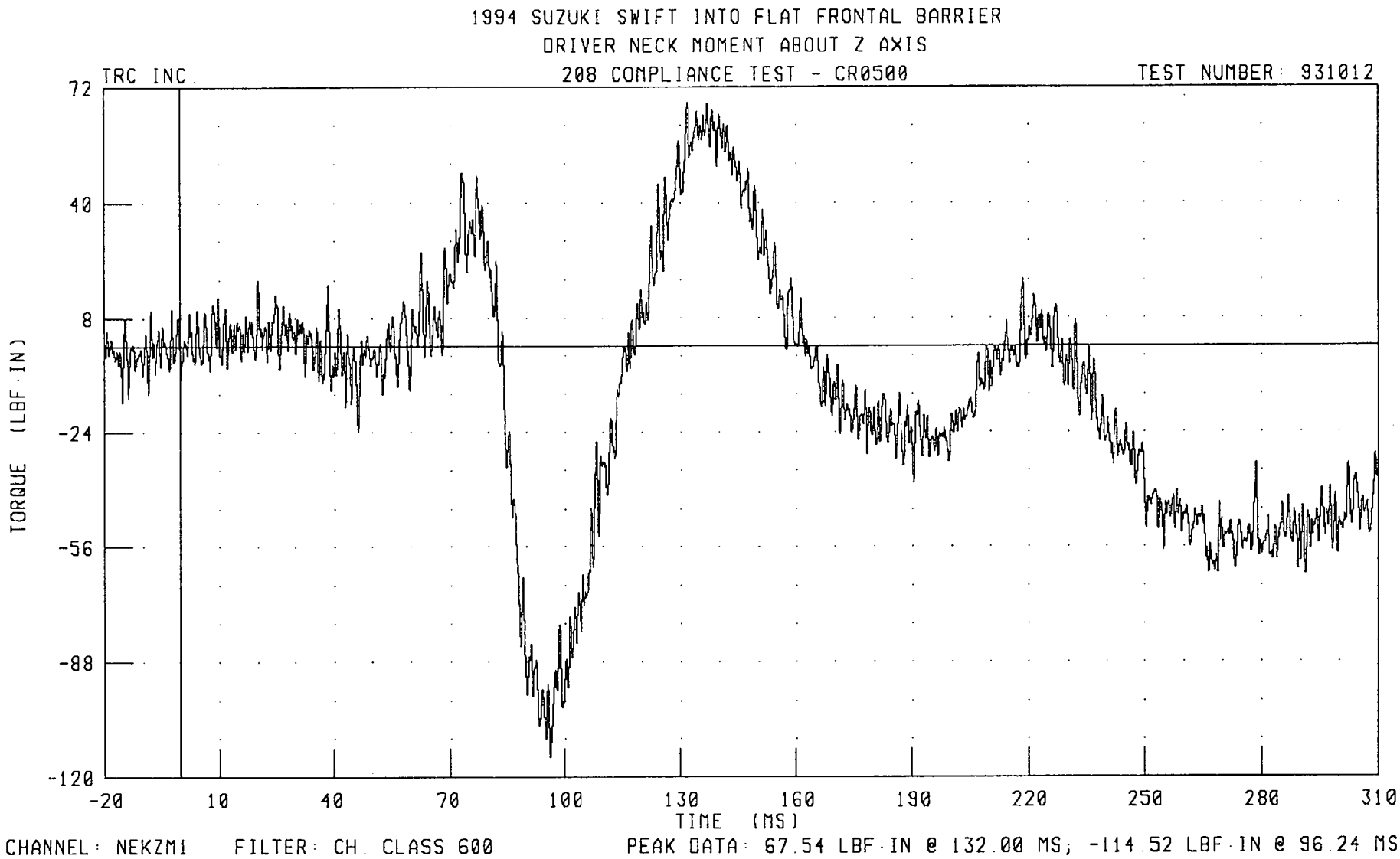

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
80
65
50
35
20
5
-10
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZF1
FILTER: CH. CLASS 1000
PEAK DATA: 738.43 LBF @ 84.08 MS; -89.38 LBF @ 236.00 MS

931012

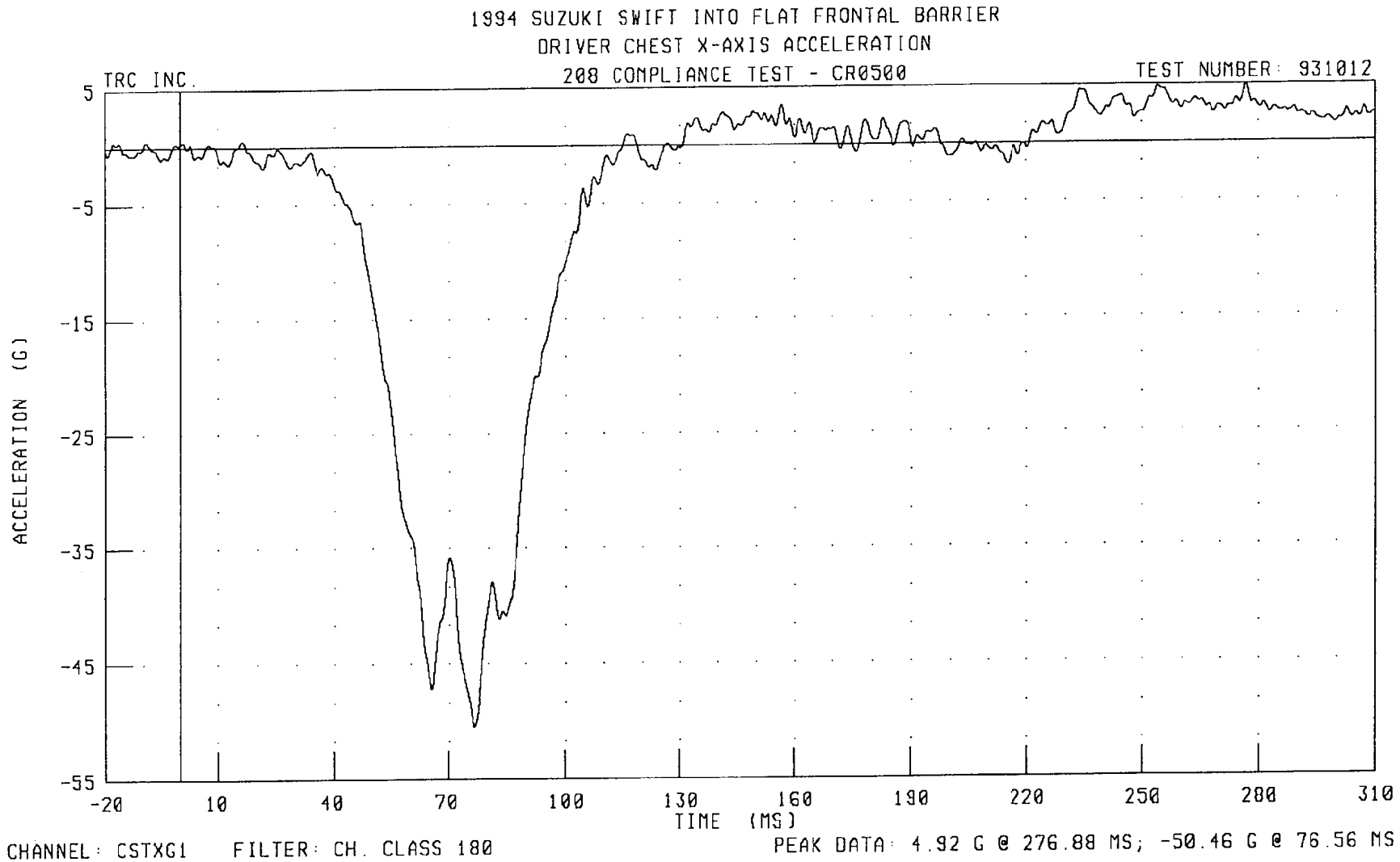

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
125
80
35
-10
-55
-100
-145
TORQUE (LBF-IN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXM1
FILTER: CH. CLASS 600
PEAK DATA: 112.06 LBF-IN @ 98.64 MS; -131.53 LBF-IN @ 84.96 MS

931012

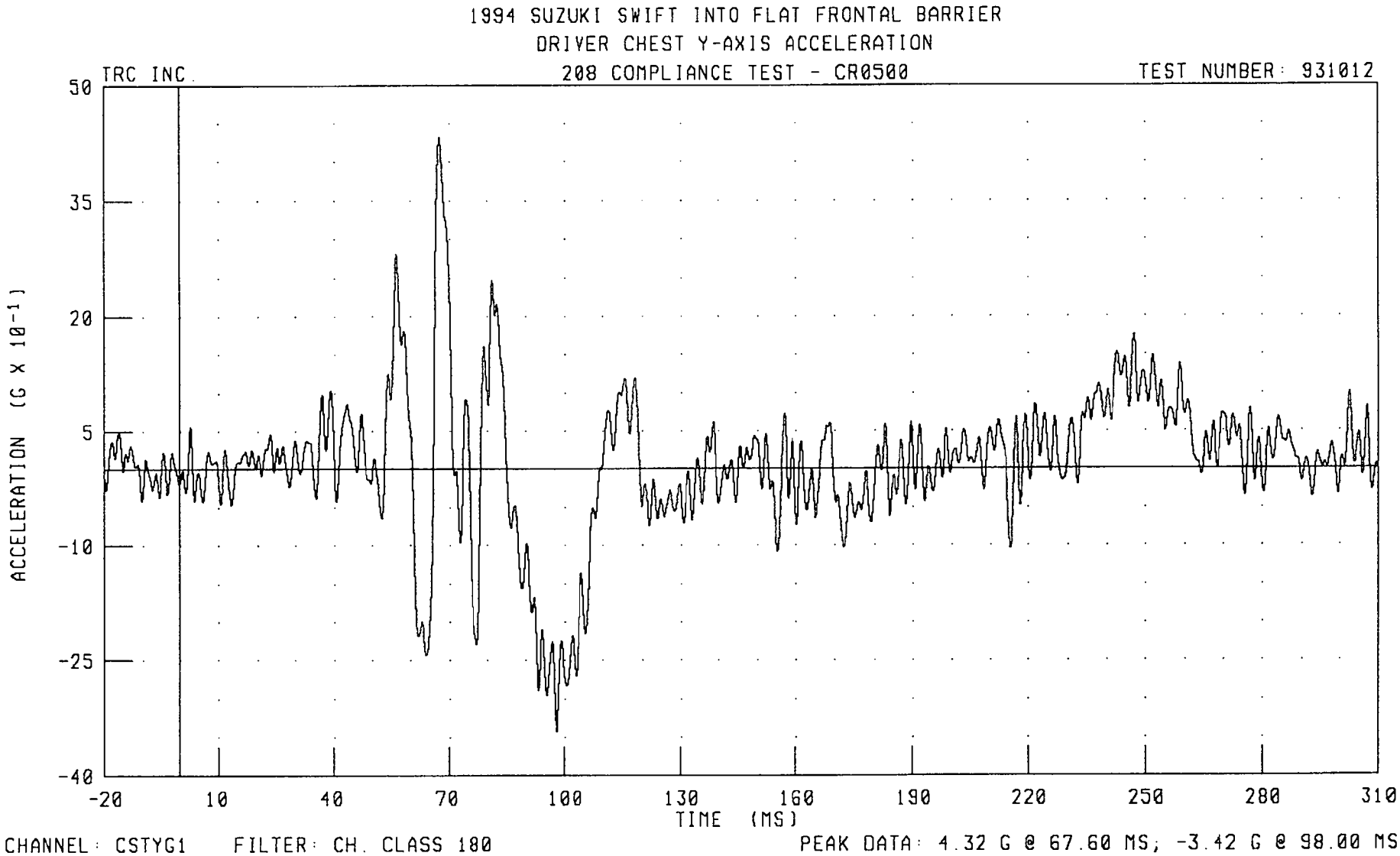

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
TORQUE (LBF-IN X 10¹)
40
27
15
2
-10
-22
-35
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYM1
FILTER: CH. CLASS 600
PEAK DATA: 399.97 LBF-IN @ 126.16 MS; -341.30 LBF-IN @ 105.60 MS

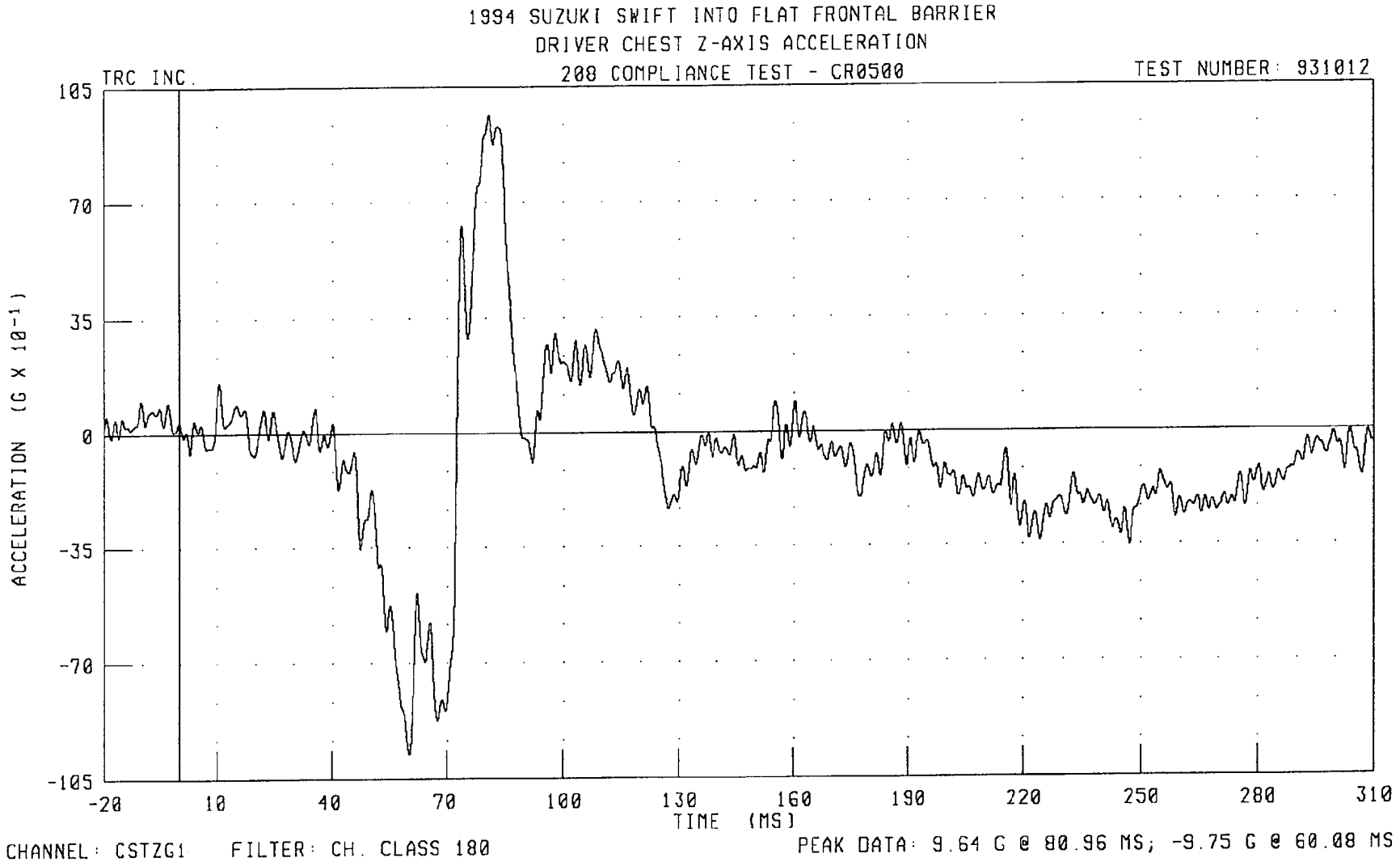

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
72
40
8
-24
-56
-88
-120
TORQUE (LBF-IN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZM1
FILTER: CH. CLASS 600
PEAK DATA: 67.54 LBF-IN @ 132.00 MS; -114.52 LBF-IN @ 96.24 MS

931012

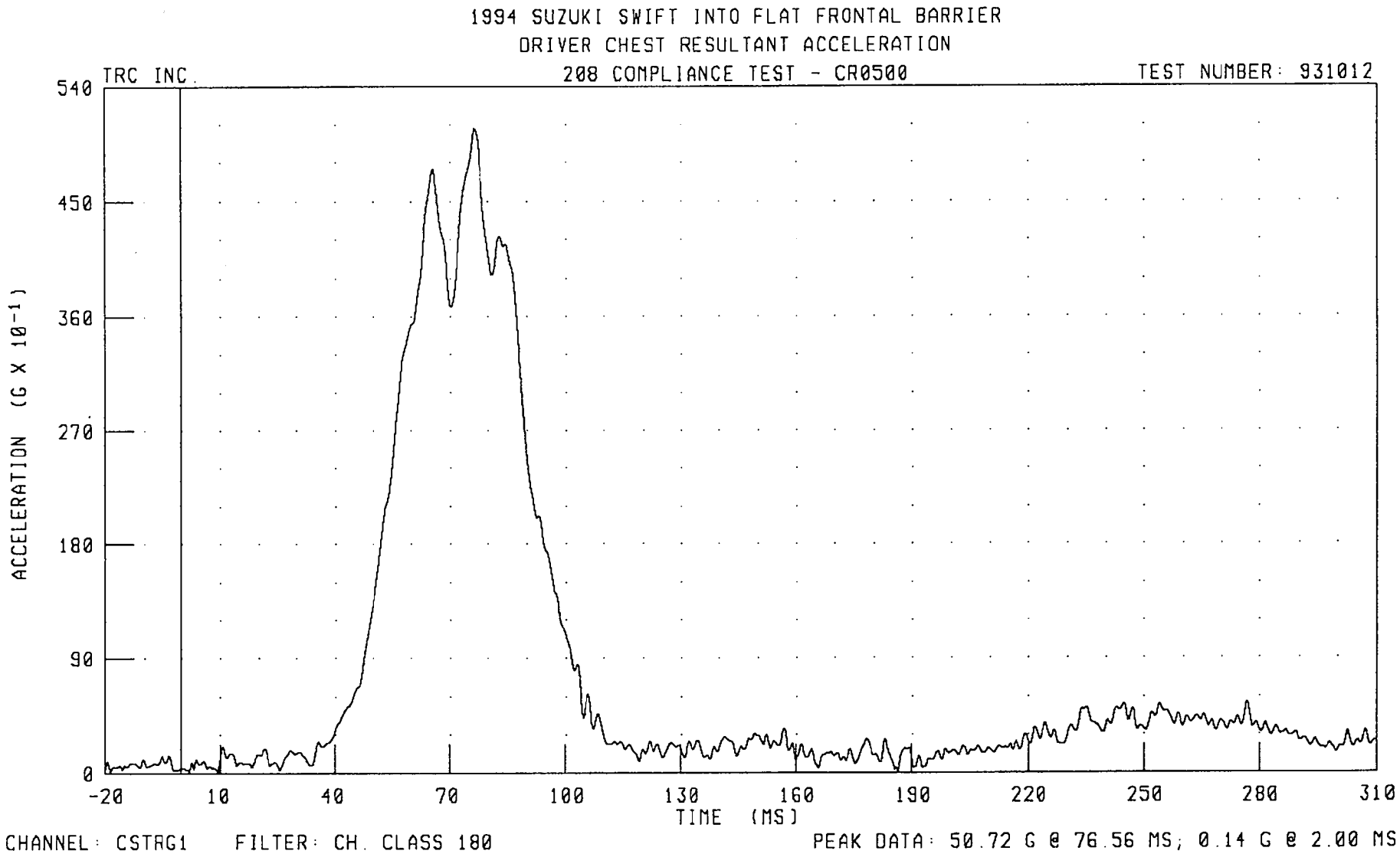

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
ACCELERATION (G)
5
-5
-15
-25
-35
-45
-55
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG1
FILTER: CH. CLASS 180
PEAK DATA: 4.92 G @ 276.88 MS; -50.46 G @ 76.56 MS

931012

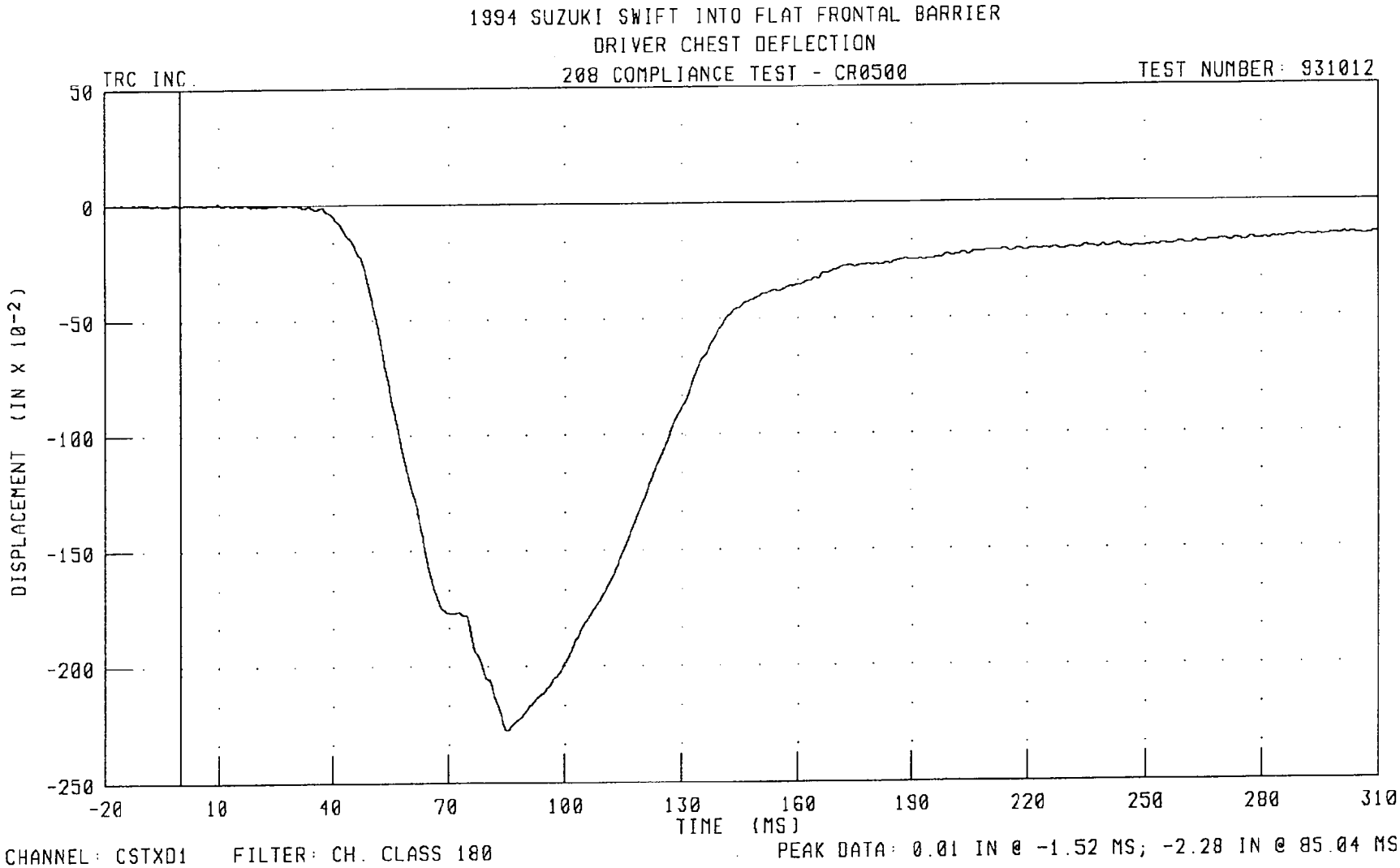

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
50
35
20
5
-10
-25
-40
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTYG1
FILTER: CH. CLASS 180
PEAK DATA: 4.32 G @ 67.60 MS; -3.42 G @ 98.00 MS

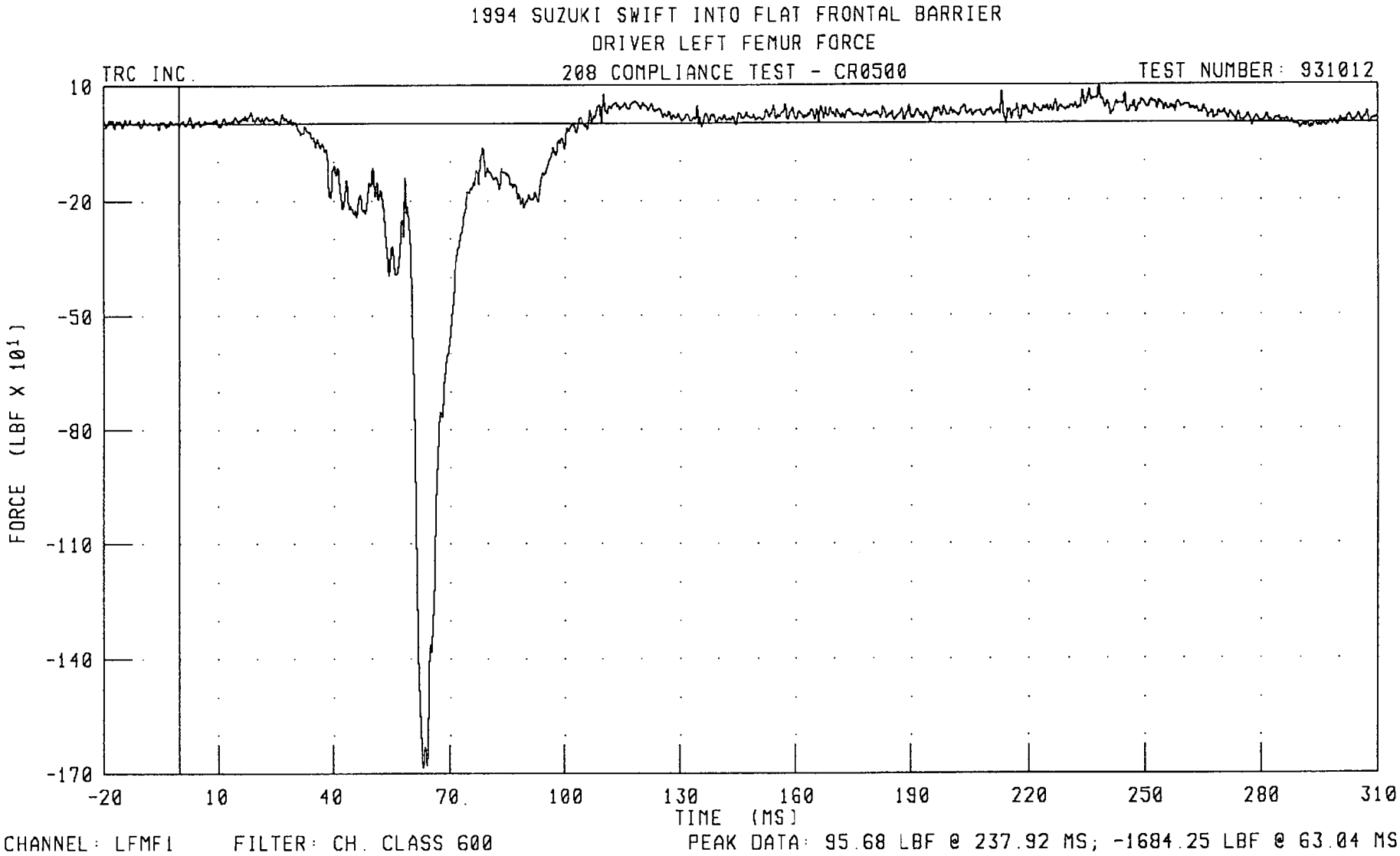

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
105
70
35
0
-35
-70
-105
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG1
FILTER: CH. CLASS 180
PEAK DATA: 9.64 G @ 80.96 MS; -9.75 G @ 60.08 MS

931012

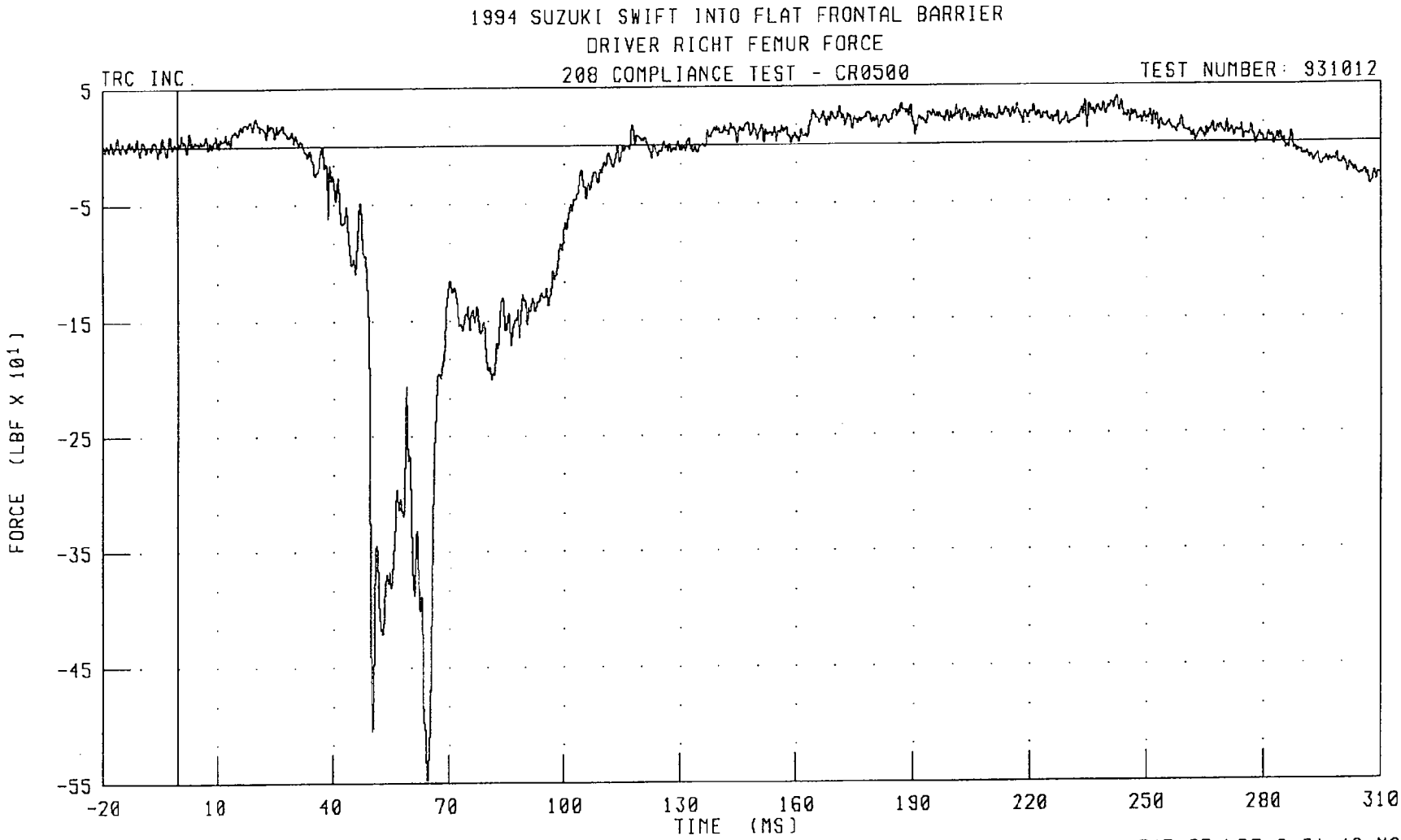

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
540
450
360
270
180
90
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG1
FILTER: CH. CLASS 180
PEAK DATA: 50.72 G @ 76.56 MS; 0.14 G @ 2.00 MS

931012

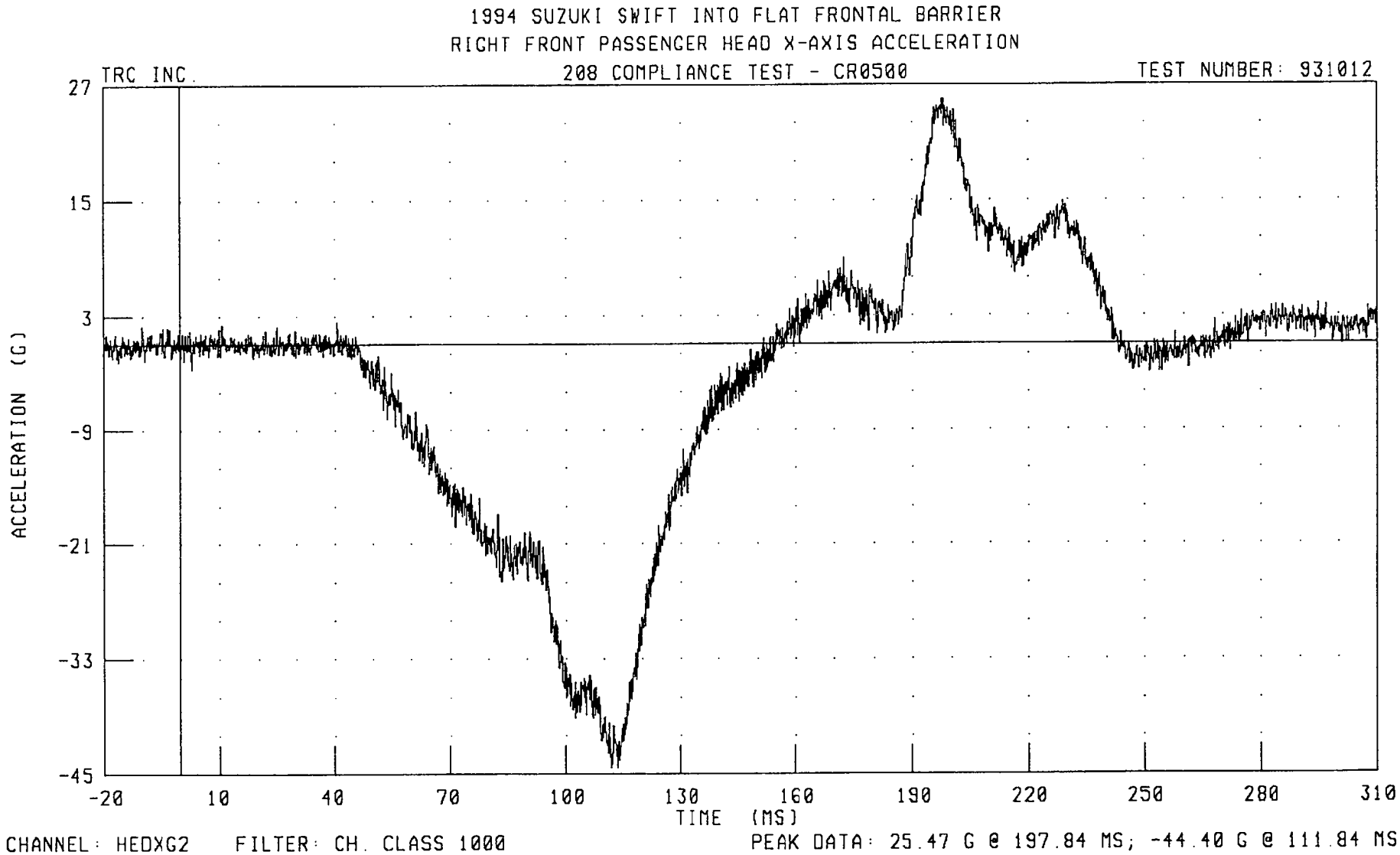

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER CHEST DEFLECTION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
DISPLACEMENT (IN X 10-2)
50
0
-50
-100
-150
-200
-250
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXD1
FILTER: CH. CLASS 180
PEAK DATA: 0.01 IN @ -1.52 MS; -2.28 IN @ 85.04 MS


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
10
-20
-50
-80
-110
-140
-170
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LFMFI
FILTER: CH. CLASS 600
PEAK DATA: 95.68 LBF @ 237.92 MS; -1684.25 LBF @ 63.04 MS

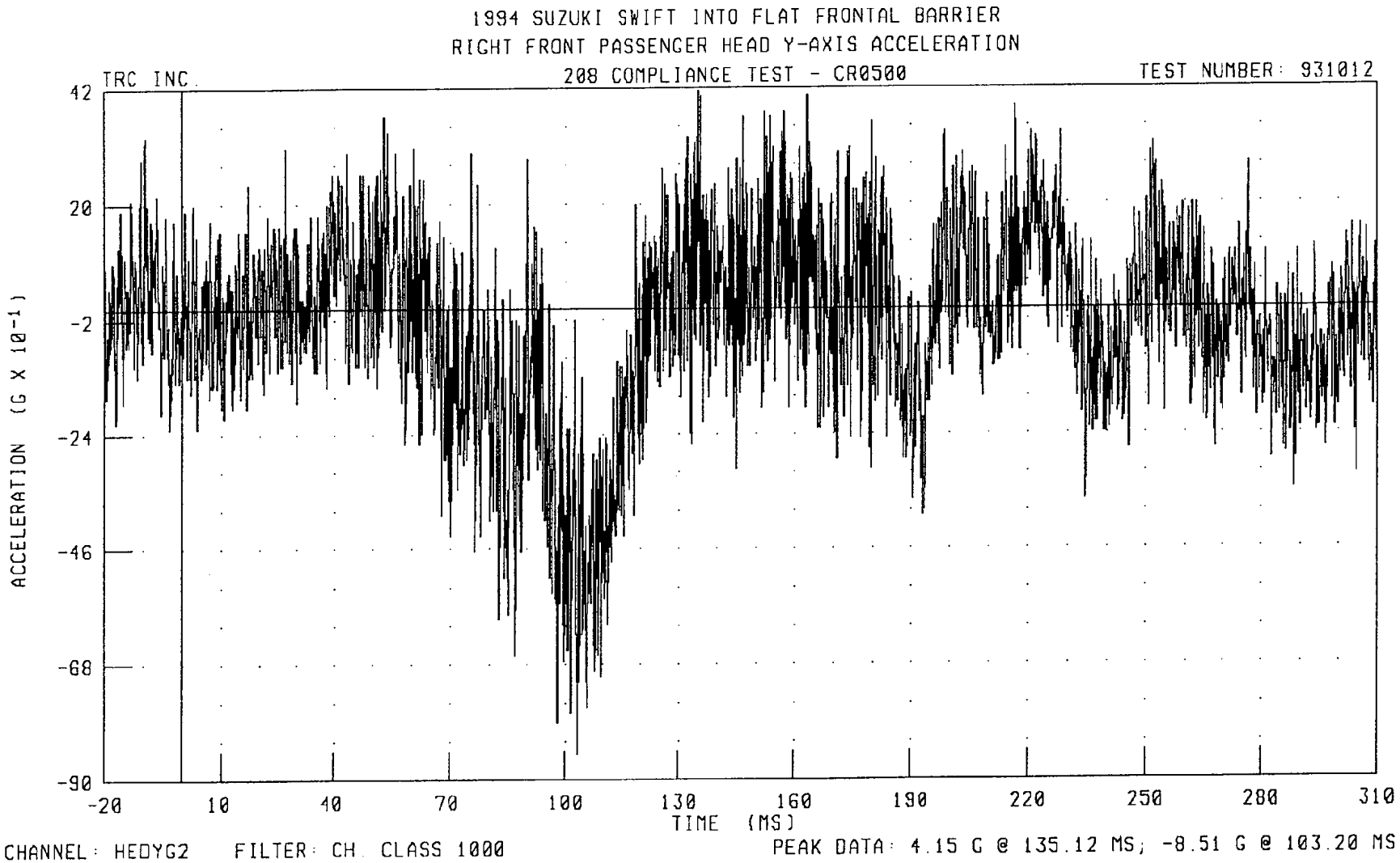
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
FORCE (LBF X 10¹)
5
-5
-15
-25
-35
-45
-55
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMF1
FILTER: CH. CLASS 600
PEAK DATA: 39.56 LBF @ 242.40 MS; -547.25 LBF @ 64.48 MS

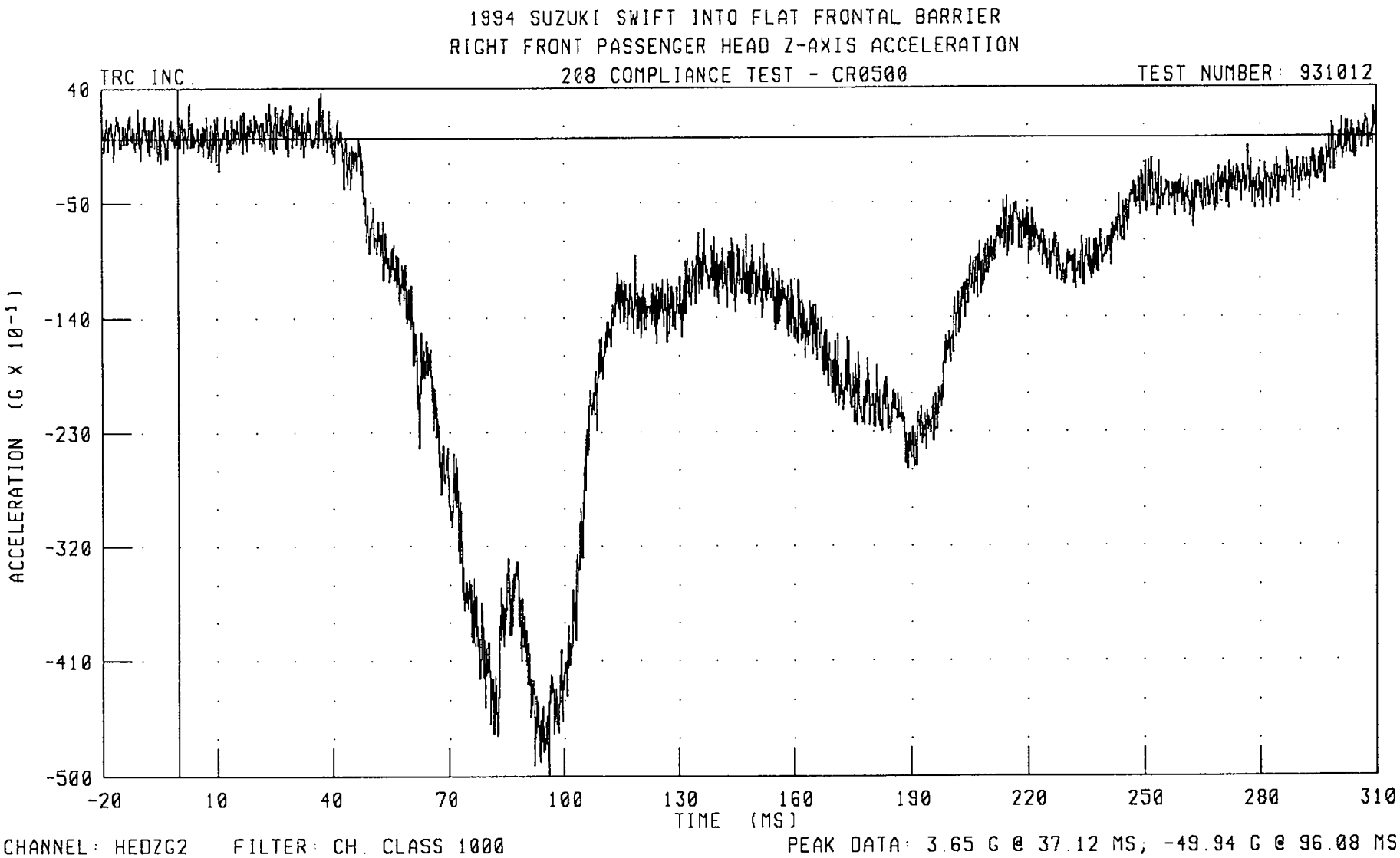
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
27
15
3
-9
-21
-33
-45
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG2
FILTER: CH. CLASS 1000
PEAK DATA: 25.47 G @ 197.84 MS; -44.40 G @ 111.84 MS

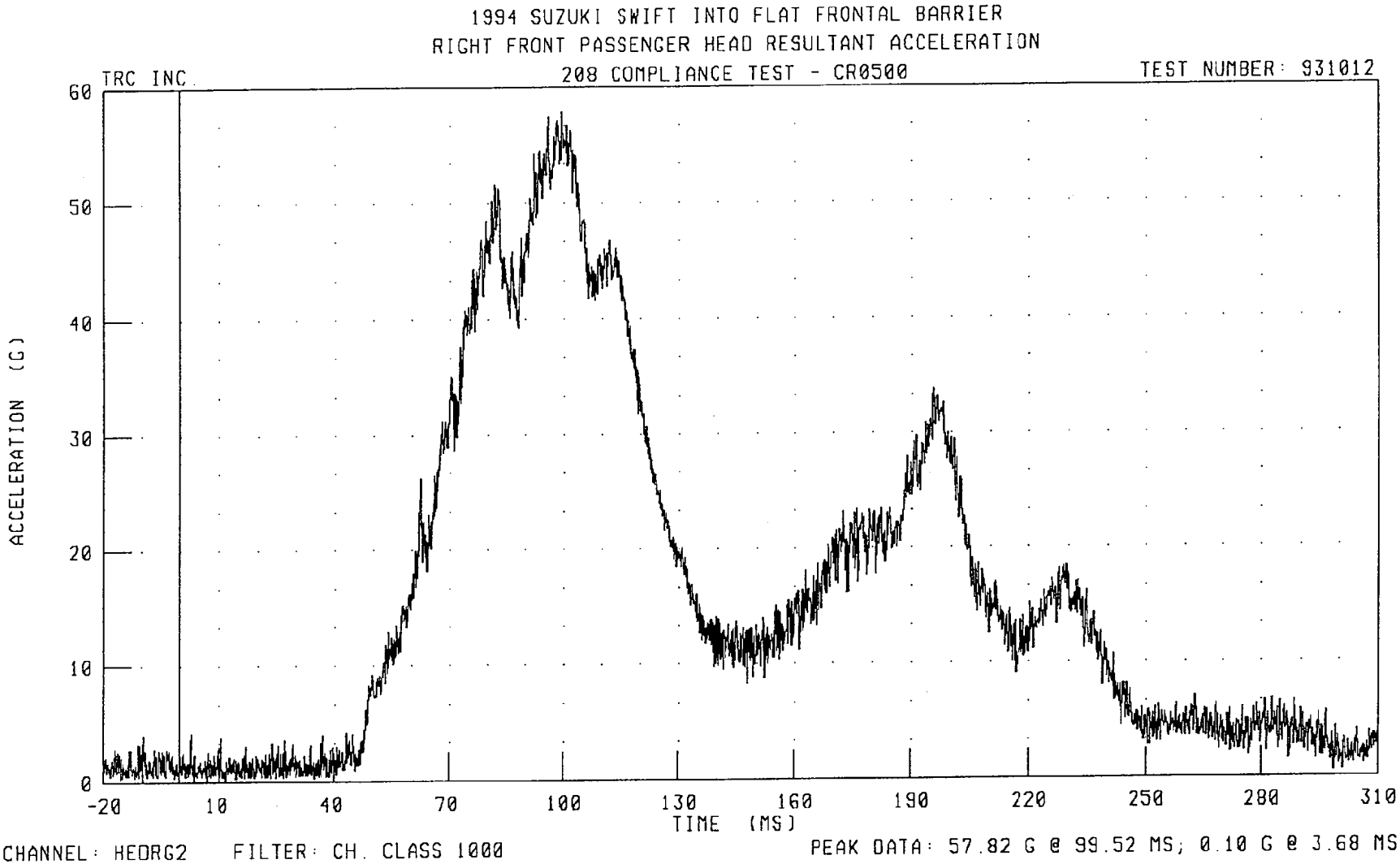
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
42
20
-2
-24
-46
-68
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG2
FILTER: CH. CLASS 1000
PEAK DATA: 4.15 G @ 135.12 MS; -8.51 G @ 103.20 MS

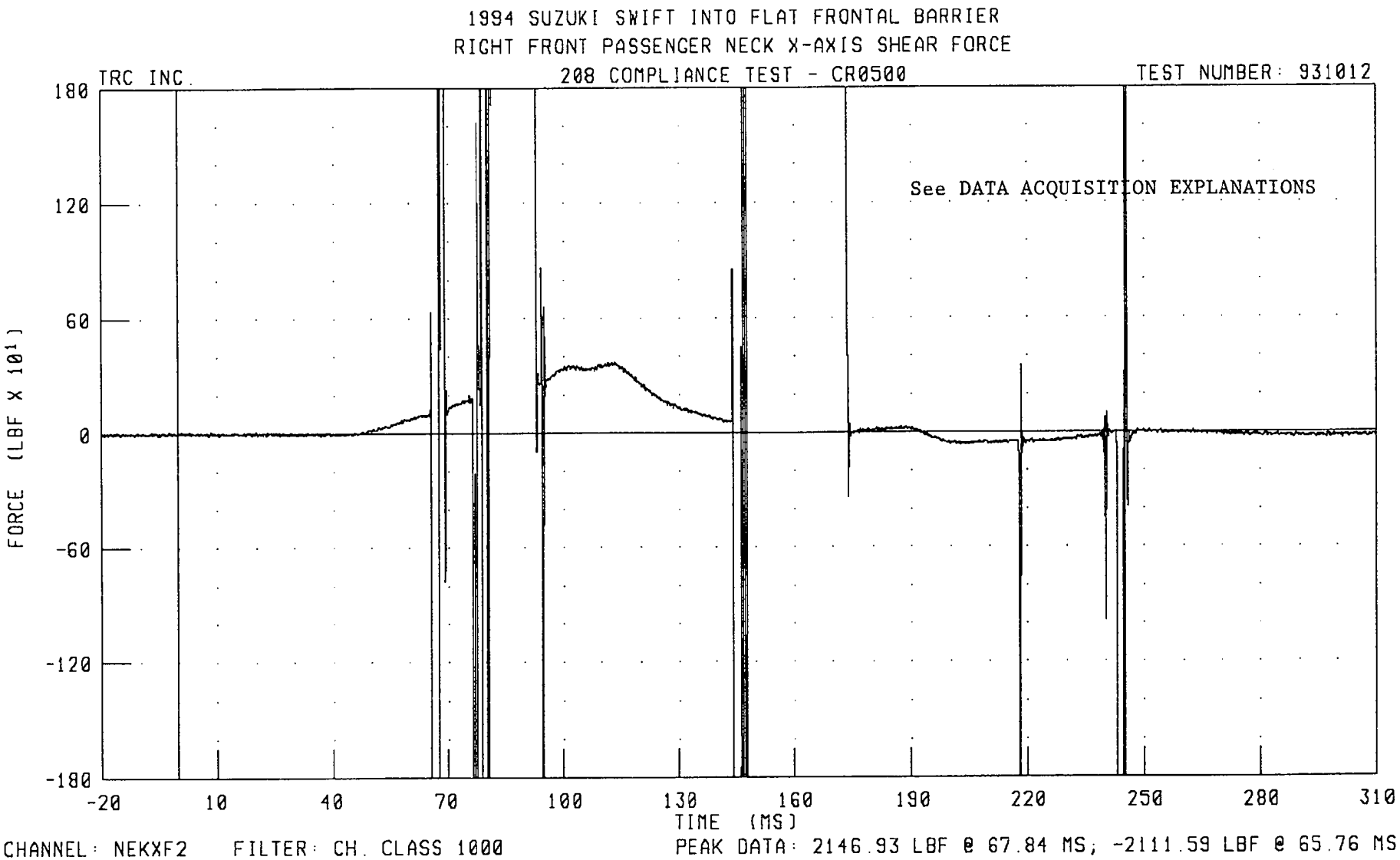
931012

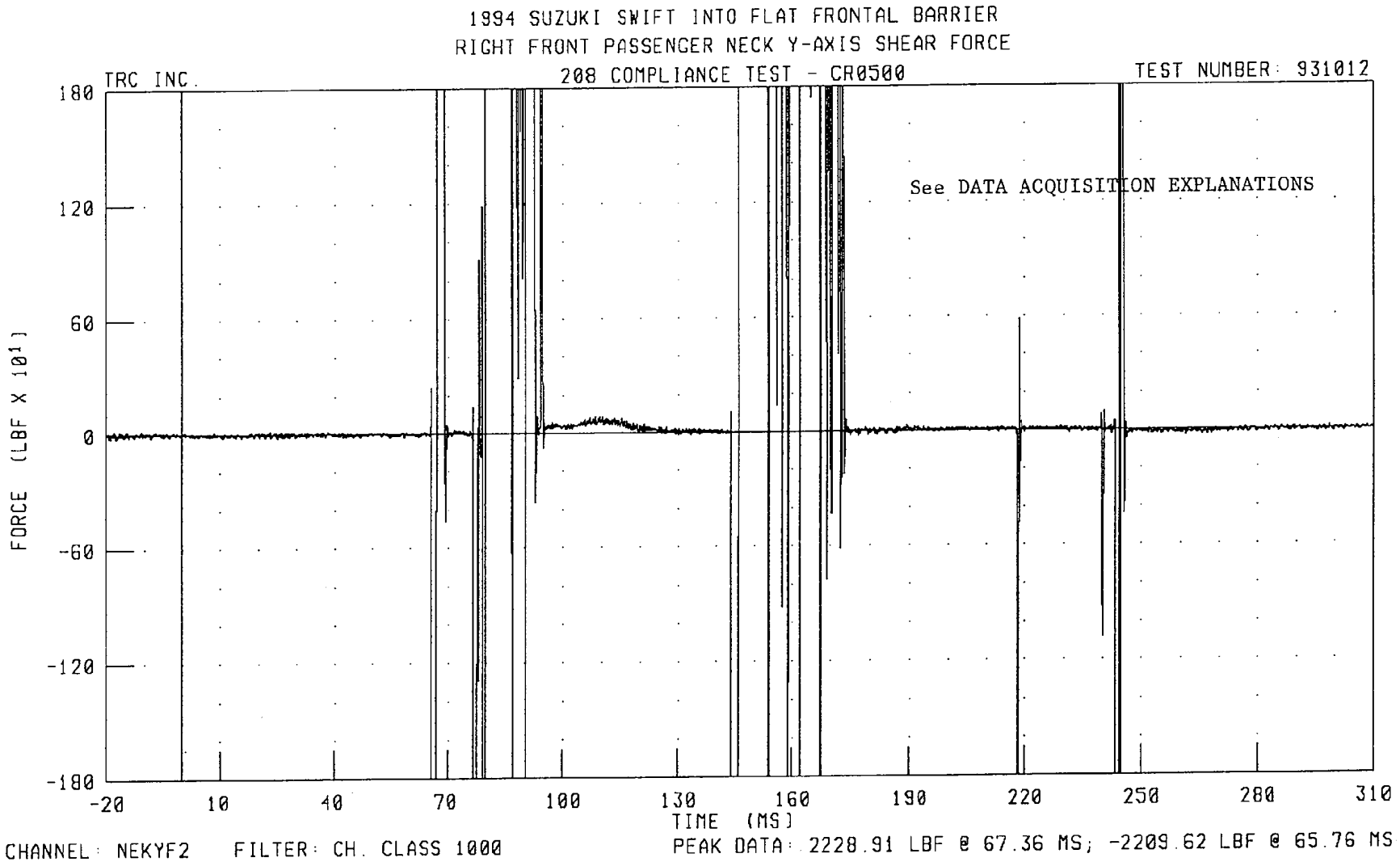

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
40
-50
-140
-230
-320
-410
-500
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG2
FILTER: CH. CLASS 1000
PEAK DATA: 3.65 G @ 37.12 MS; -49.94 G @ 96.08 MS

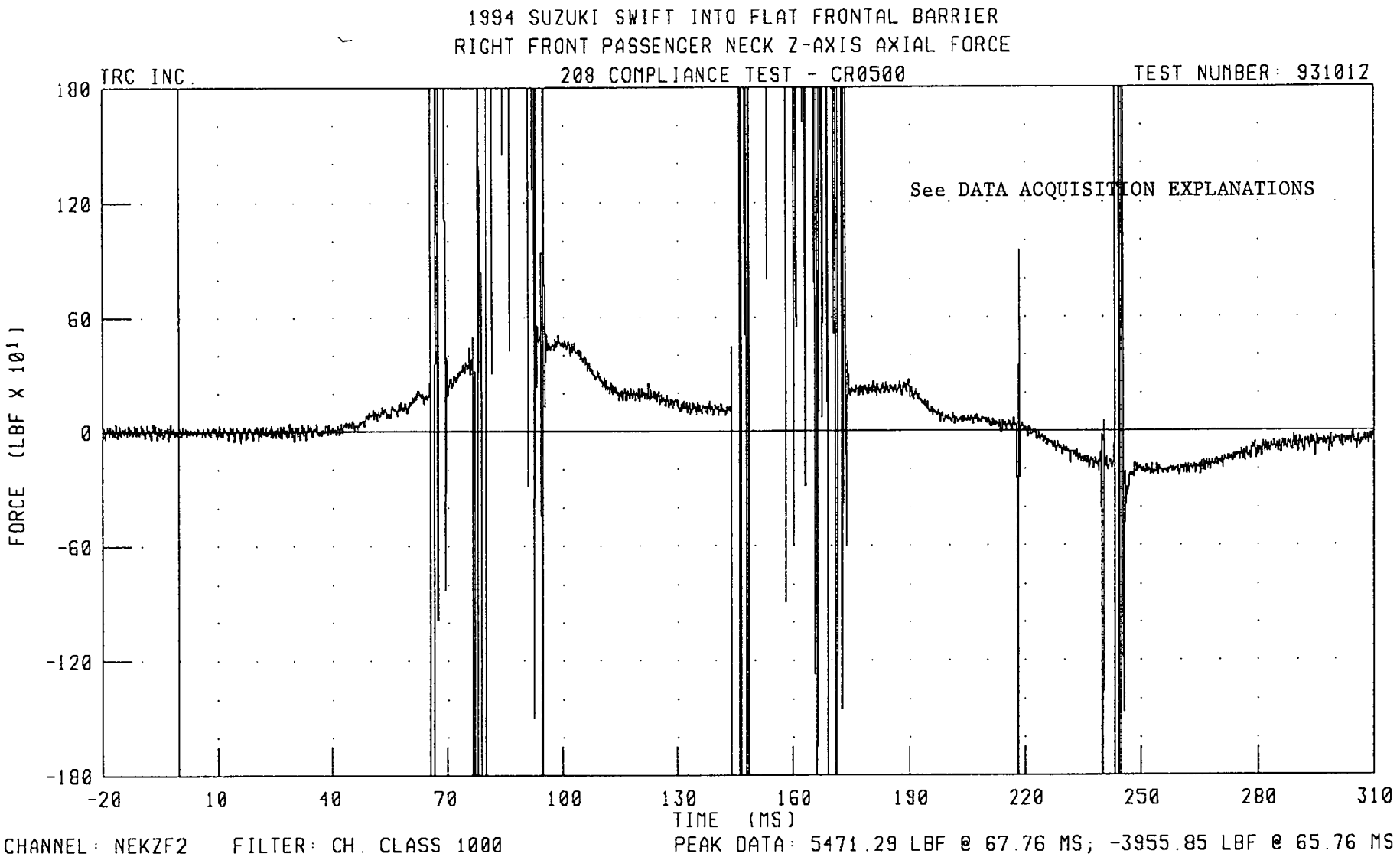
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
ACCELERATION (G)
60
50
40
30
20
10
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEORG2
FILTER: CH. CLASS 1000
PEAK DATA: 57.82 G @ 99.52 MS; 0.10 G @ 3.68 MS

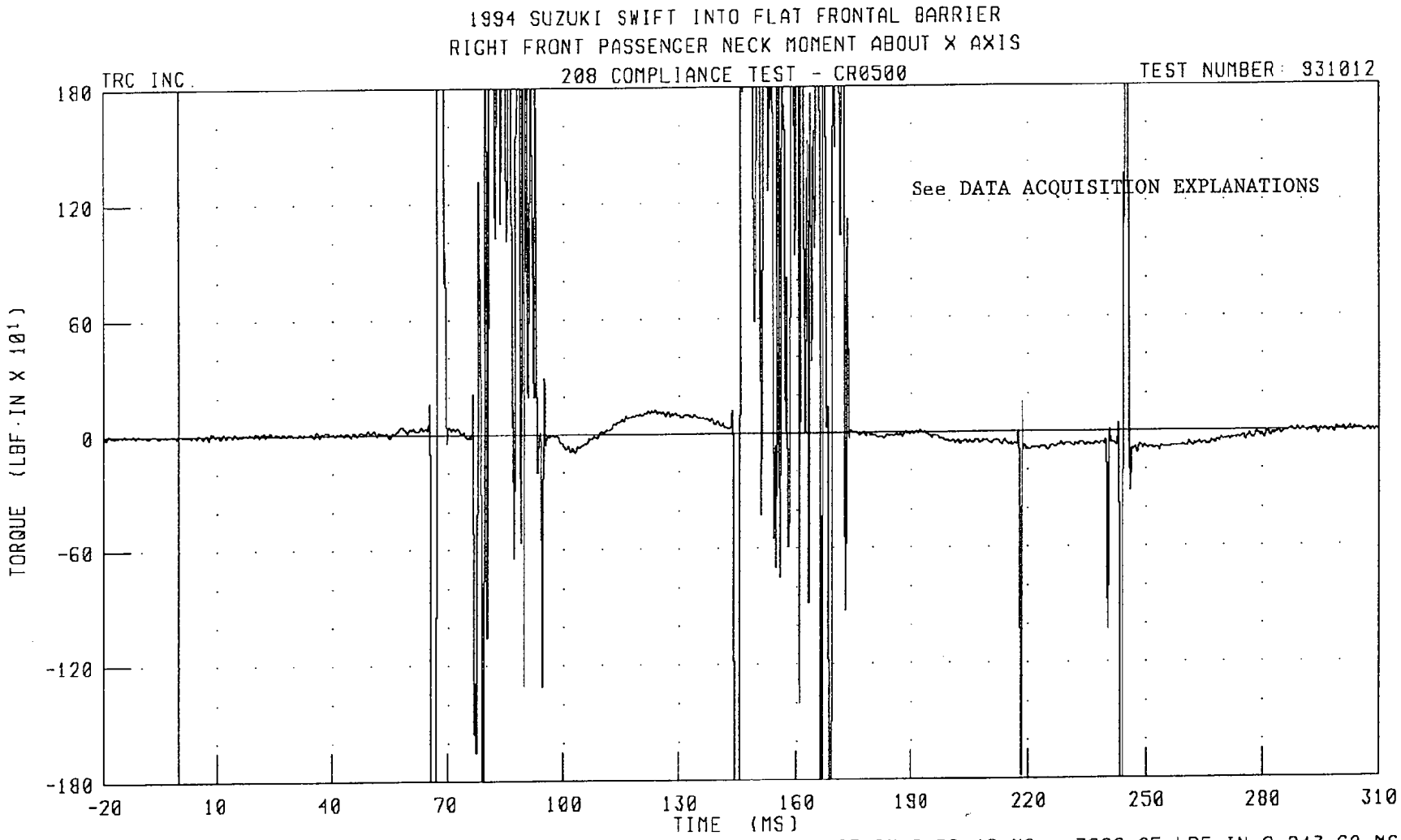
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
FORCE (LBF X 10¹)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXF2
FILTER: CH. CLASS 1000
PEAK DATA: 2146.93 LBF @ 67.84 MS; -2111.59 LBF @ 65.76 MS

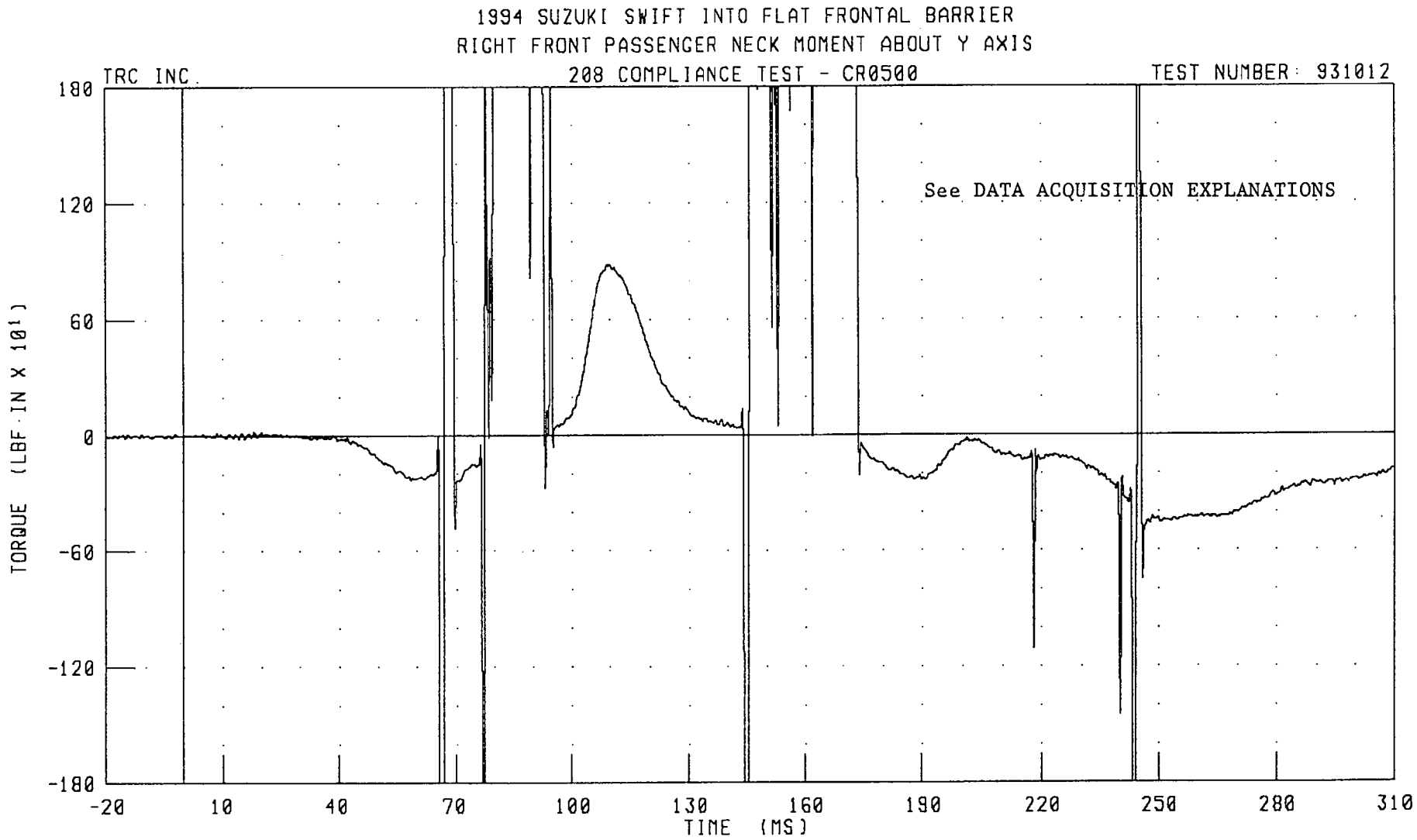

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
FORCE (LBF X 10¹)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYF2
FILTER: CH. CLASS 1000
PEAK DATA: 2228.91 LBF @ 67.36 MS; -2209.62 LBF @ 65.76 MS

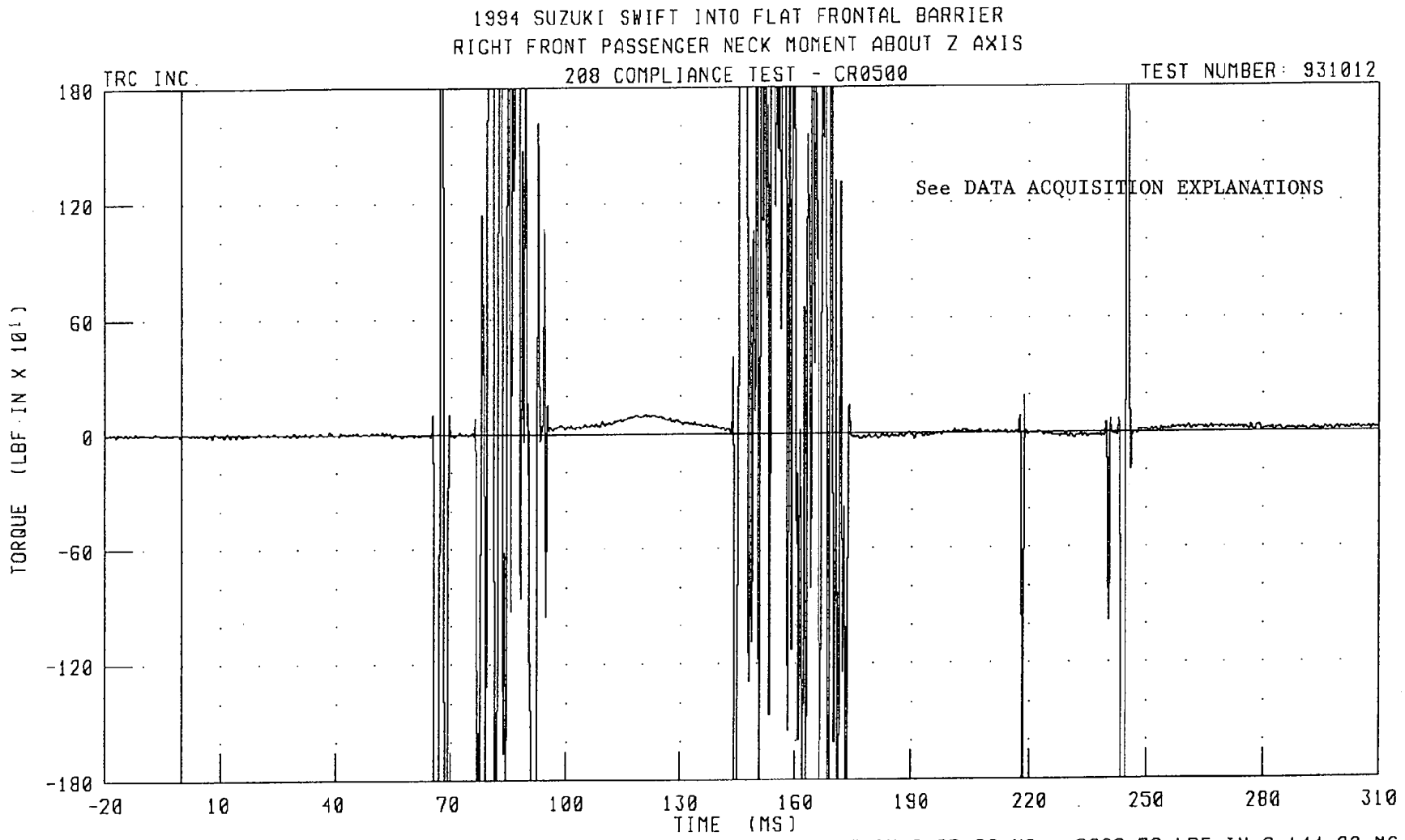

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
FORCE (LBF X 10¹)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZF2
FILTER: CH. CLASS 1000
PEAK DATA: 5471.29 LBF @ 67.76 MS; -3955.85 LBF @ 65.76 MS

931012

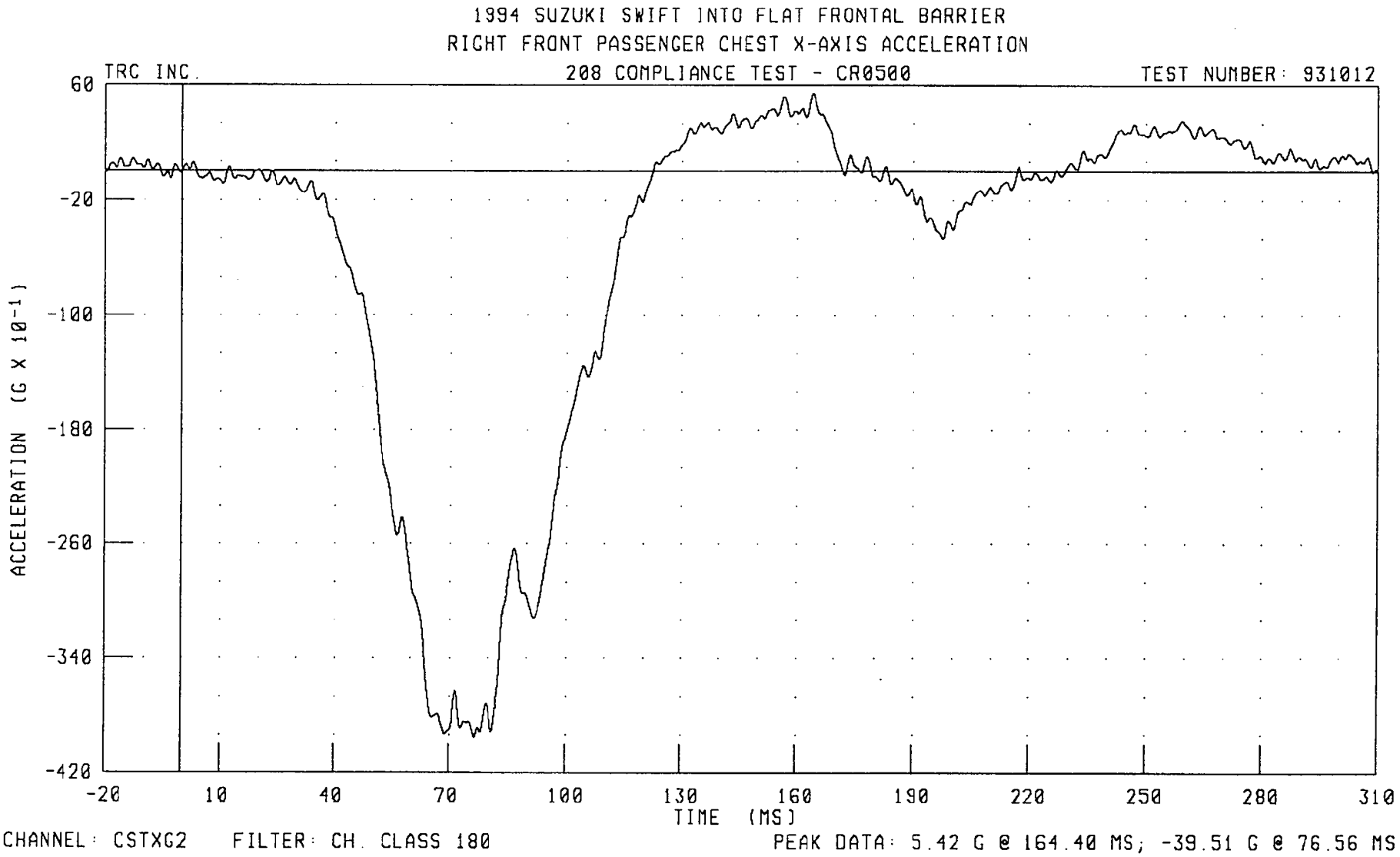

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
TORQUE (LBF-IN X 10¹)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXM2
FILTER: CH. CLASS 600
PEAK DATA: 2968.27 LBF-IN @ 90.48 MS; -3069.85 LBF-IN @ 243.60 MS

931012

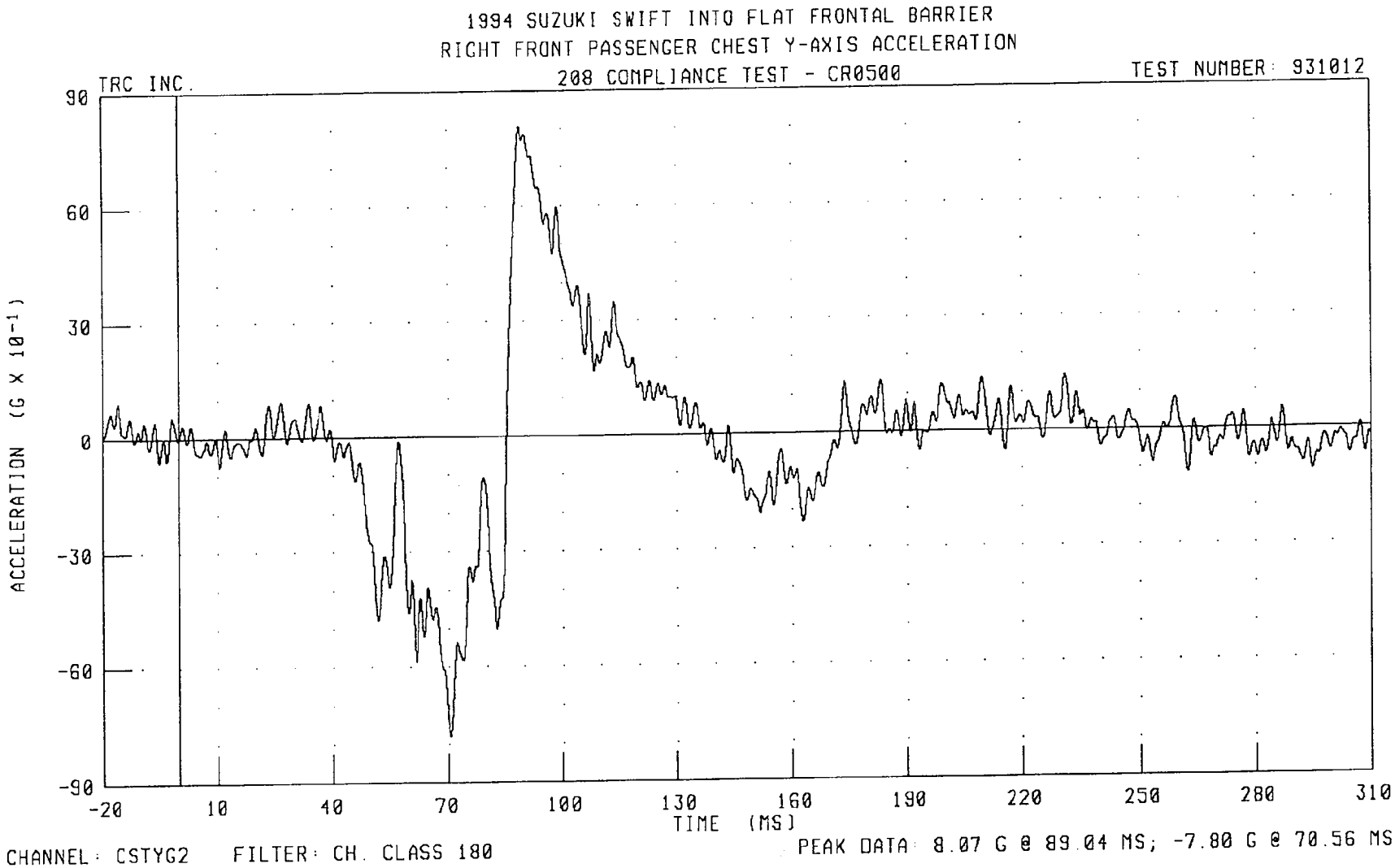

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
TORQUE (LBF-IN X 10¹)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYM2
FILTER: CH. CLASS 600
PEAK DATA: 2983.23 LBF-IN @ 245.12 MS; -2932.26 LBF-IN @ 145.04 MS

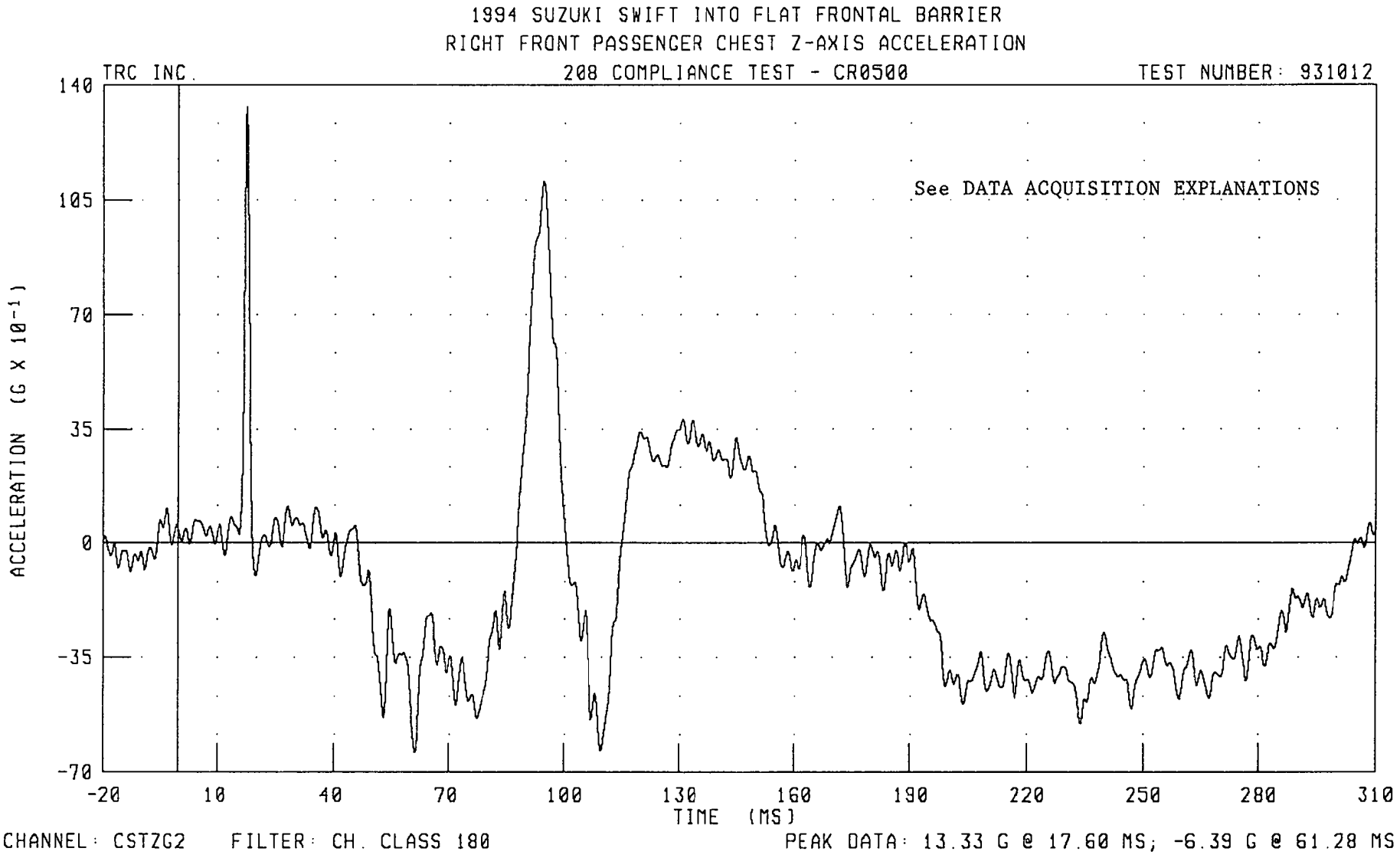

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
TORQUE (LBF-IN X 10¹)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZM2
FILTER: CH. CLASS 600
PEAK DATA: 2831.56 LBF-IN @ 67.60 MS; -2822.76 LBF-IN @ 144.80 MS

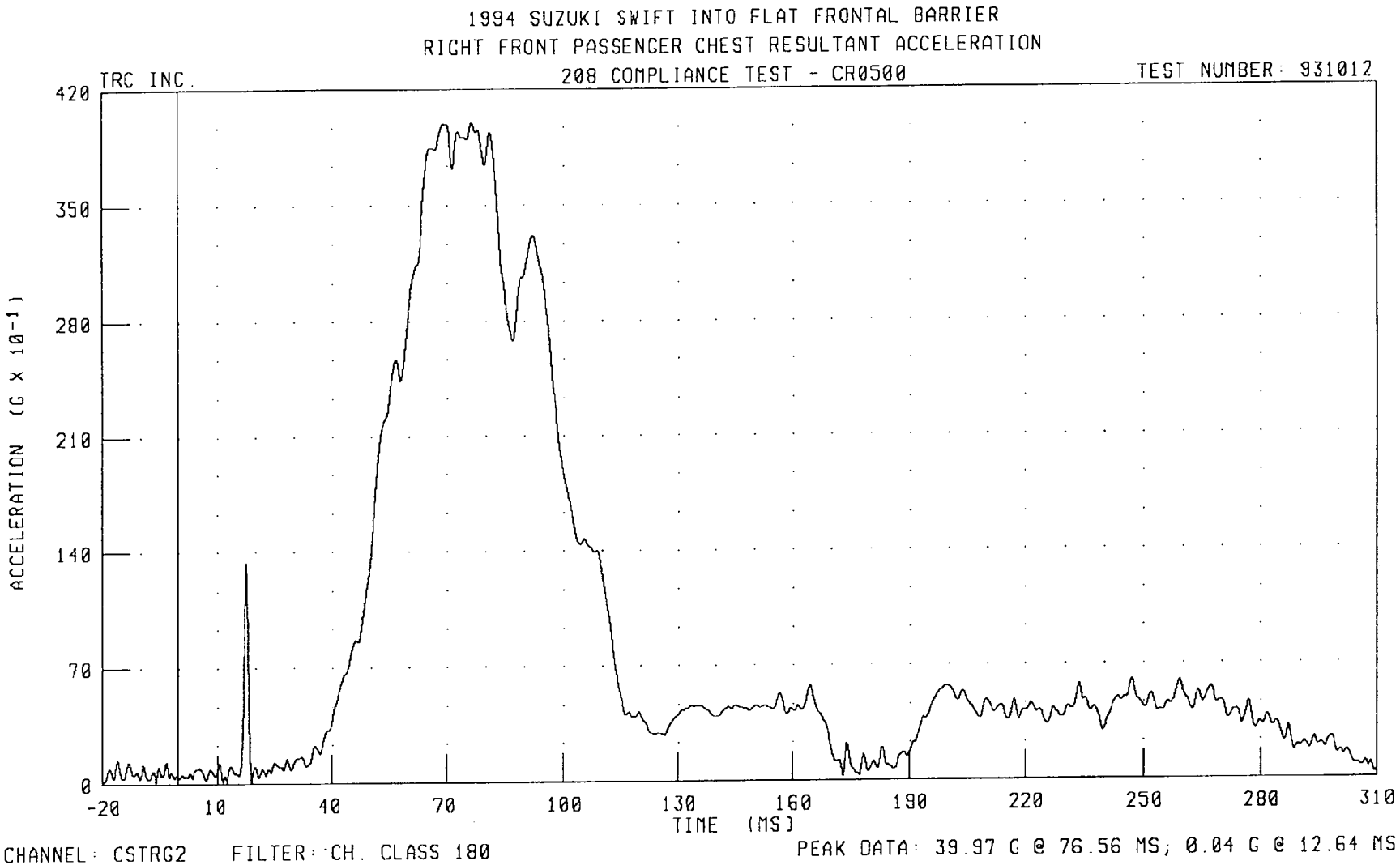
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
60
-20
-100
-180
-260
-340
-420
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG2
FILTER: CH. CLASS 180
PEAK DATA: 5.42 G @ 164.40 MS; -39.51 G @ 76.56 MS

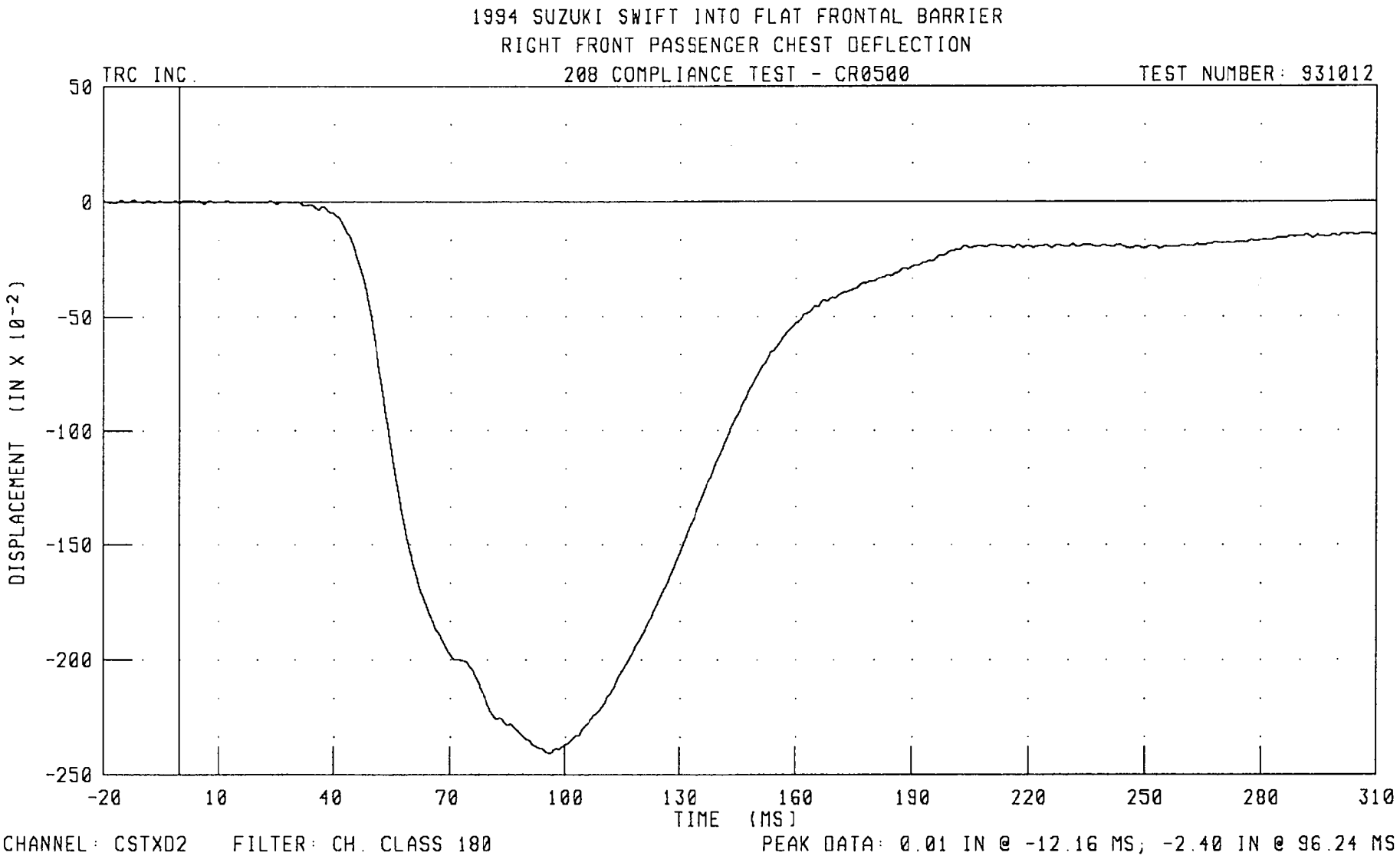
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTYG2
FILTER: CH. CLASS 180
PEAK DATA: 8.07 G @ 89.04 MS; -7.80 G @ 70.56 MS

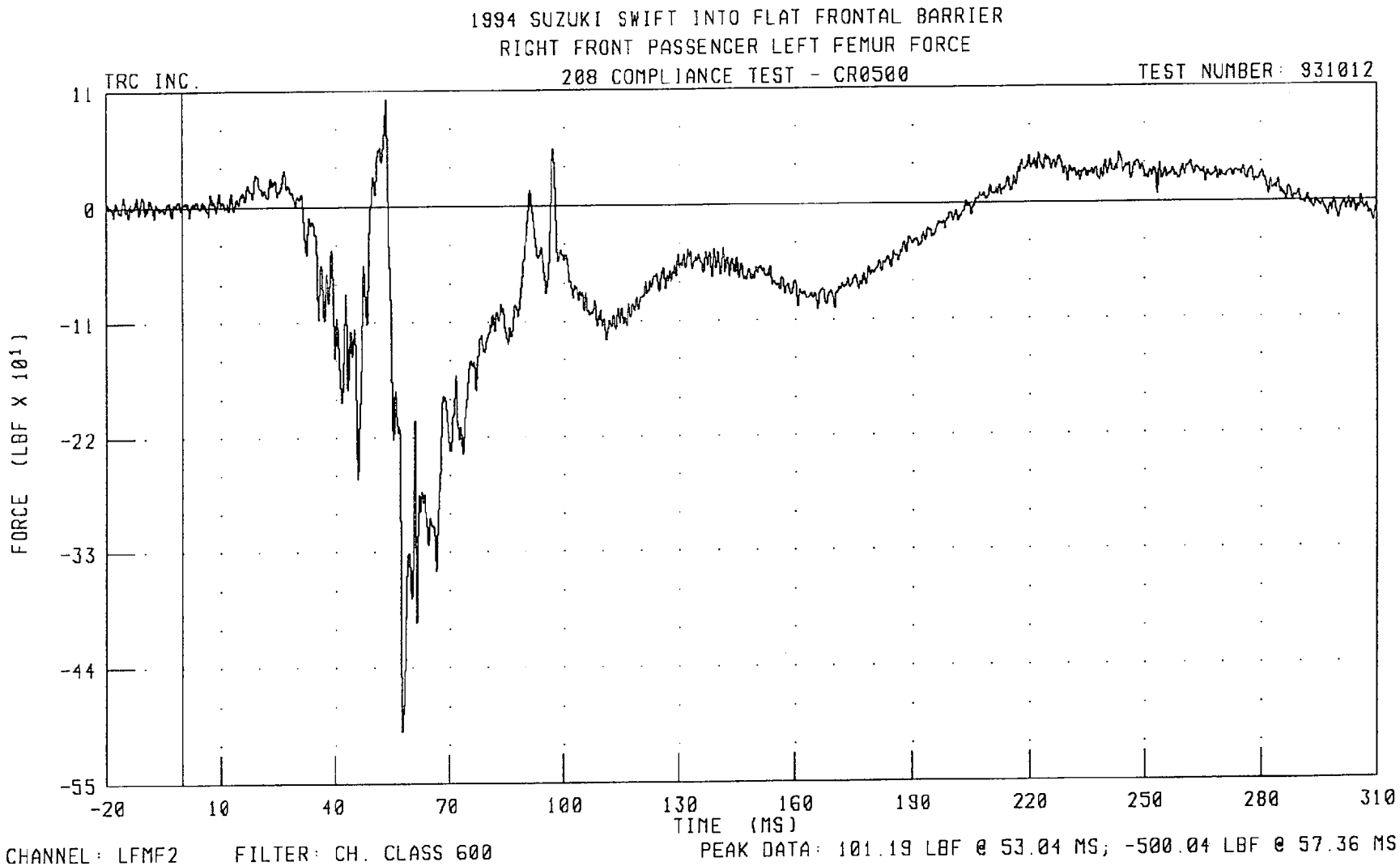

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
See DATA ACQUISITION EXPLANATIONS
ACCELERATION (G X 10-1)
140
105
70
35
0
-35
-70
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG2
FILTER: CH. CLASS 180
PEAK DATA: 13.33 G @ 17.60 MS; -6.39 G @ 61.28 MS


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
420
350
280
210
140
70
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG2
FILTER: CH. CLASS 180
PEAK DATA: 39.97 G @ 76.56 MS; 0.04 G @ 12.64 MS

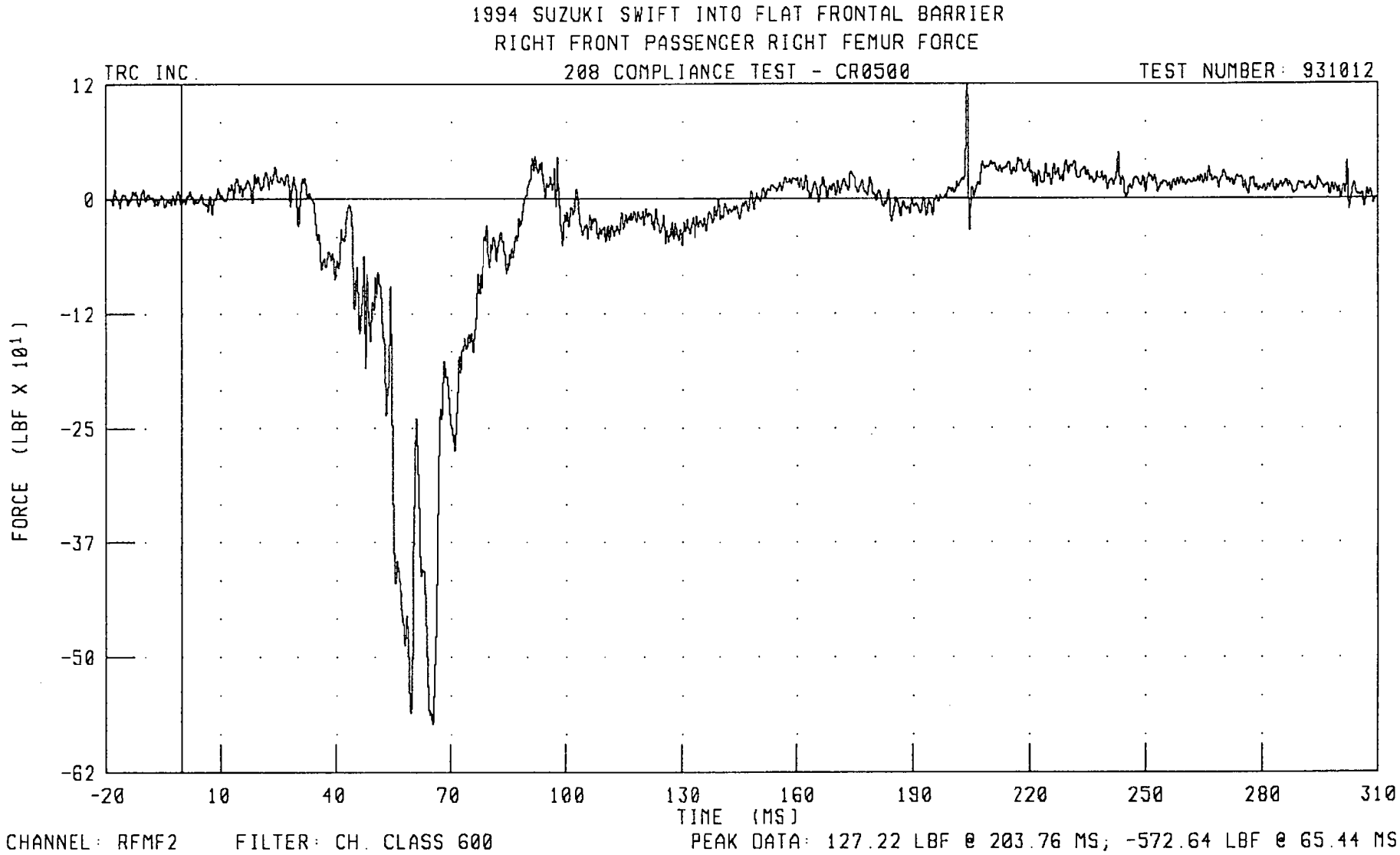
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST DEFLECTION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
50
0
-50
-100
-150
-200
-250
DISPLACEMENT (IN X 10-2)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXD2
FILTER: CH. CLASS 180
PEAK DATA: 0.01 IN @ -12.16 MS; -2.40 IN @ 96.24 MS

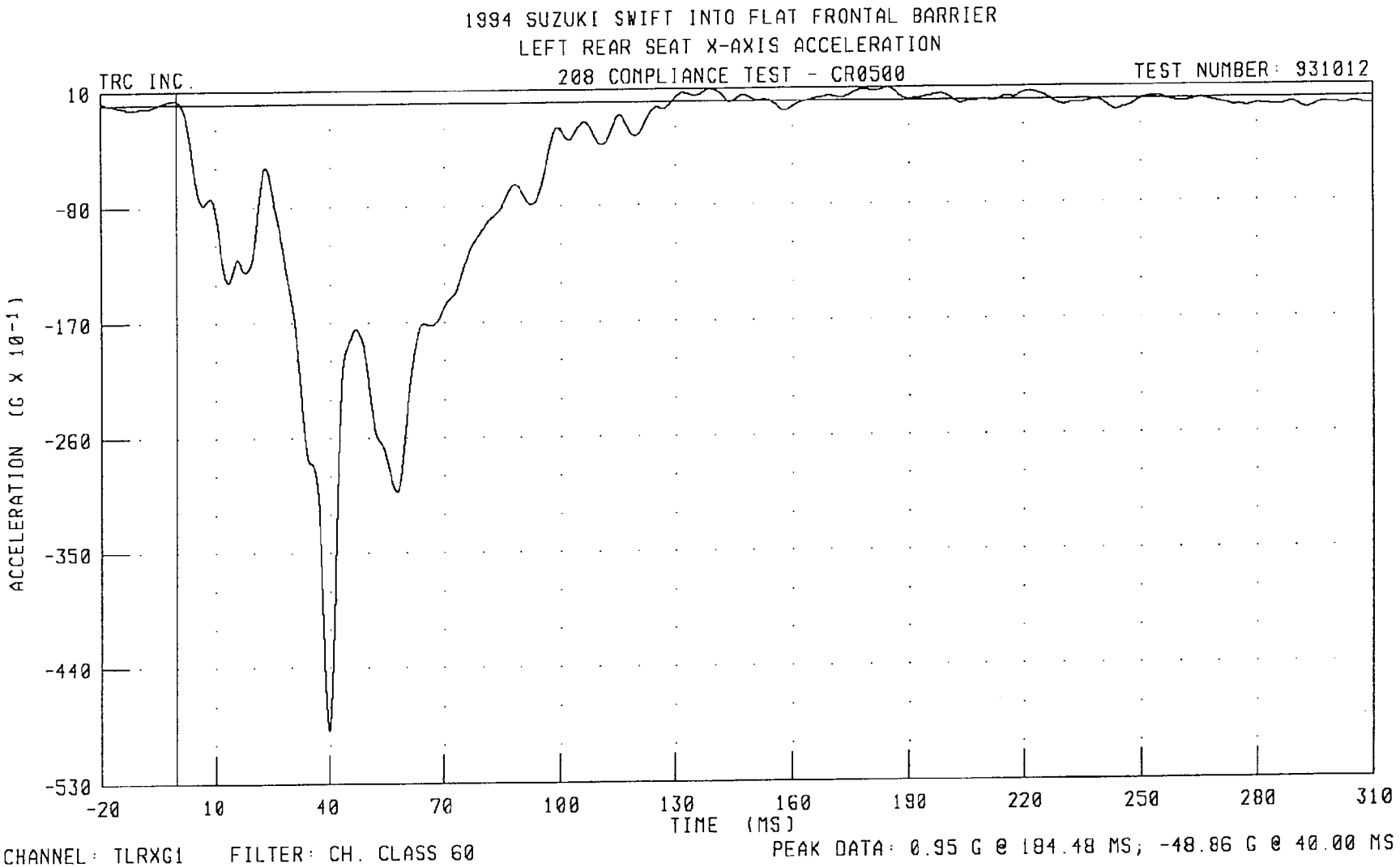
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
11
0
-11
-22
-33
-44
-55
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LFMF2
FILTER: CH. CLASS 600
PEAK DATA: 101.19 LBF @ 53.04 MS; -500.04 LBF @ 57.36 MS

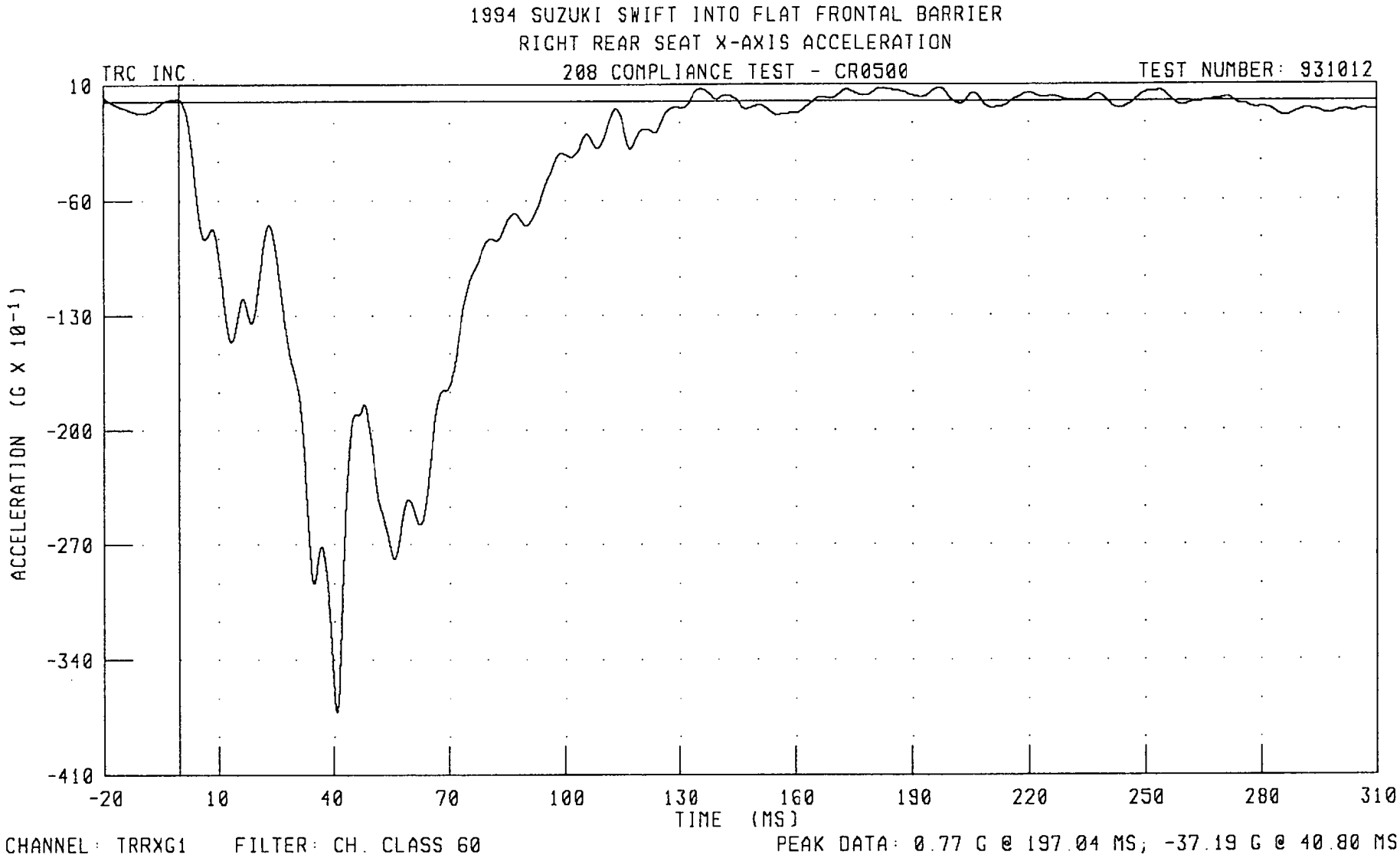
931012

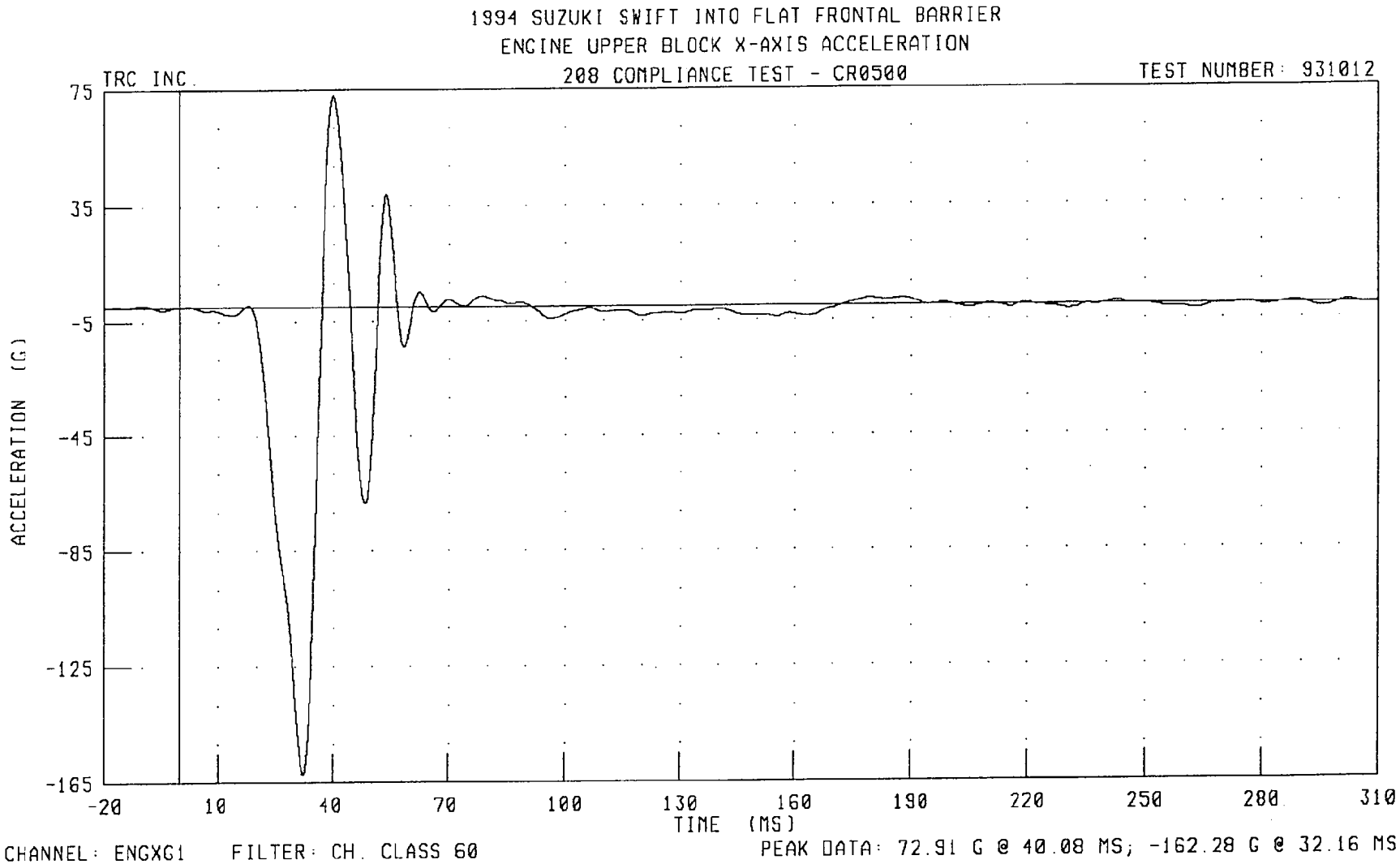

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
12
0
-12
-25
-37
-50
-62
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMF2
FILTER: CH. CLASS 600
PEAK DATA: 127.22 LBF @ 203.76 MS; -572.64 LBF @ 65.44 MS

931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
10
-80
-170
-260
-350
-440
-530
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TLRXG1
FILTER: CH. CLASS 60
PEAK DATA: 0.95 G @ 184.48 MS; -48.86 G @ 40.00 MS

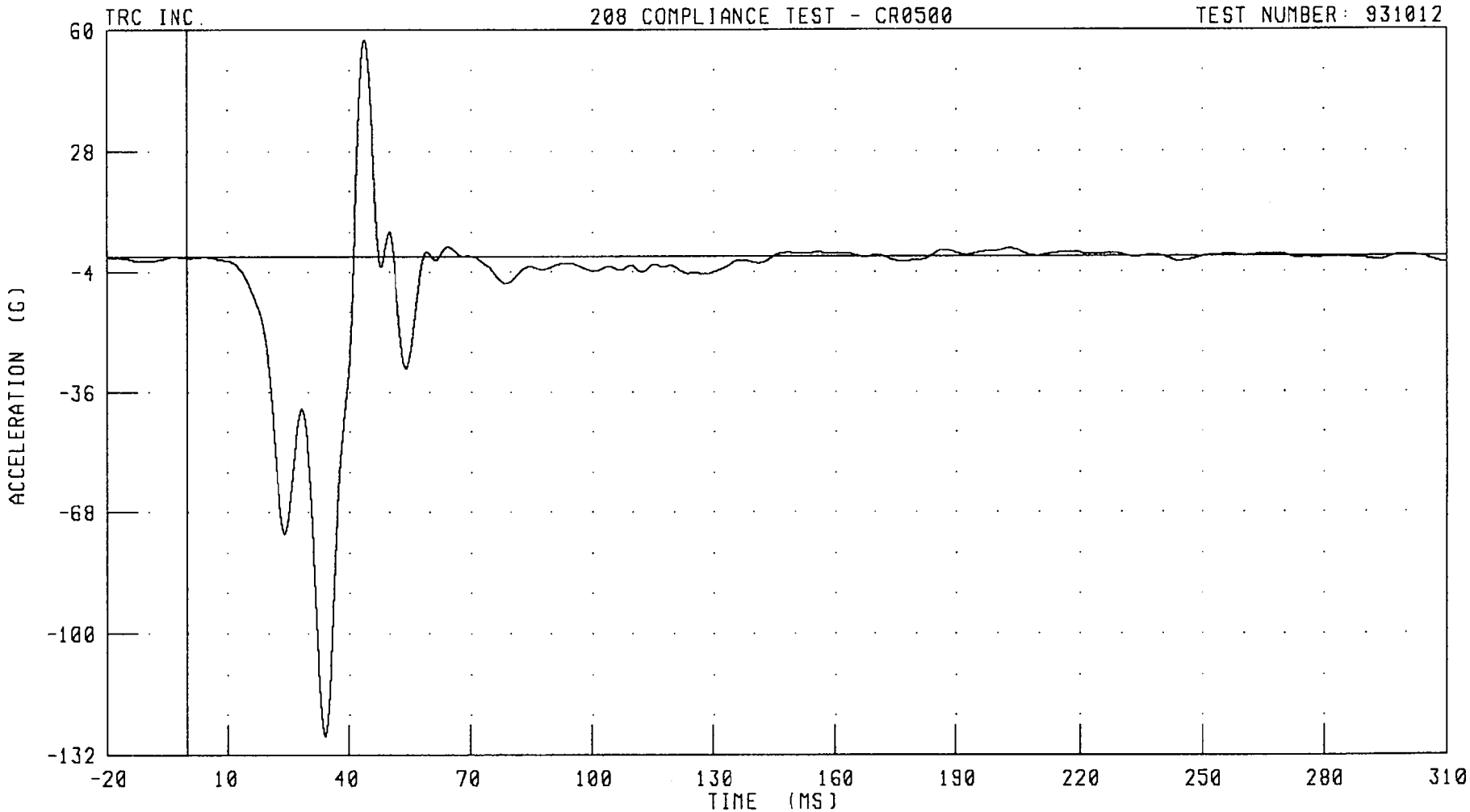
931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
10
-60
-130
-200
-270
-340
-410
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TRRXG1
FILTER: CH. CLASS 60
PEAK DATA: 0.77 G @ 197.04 MS; -37.19 G @ 40.80 MS

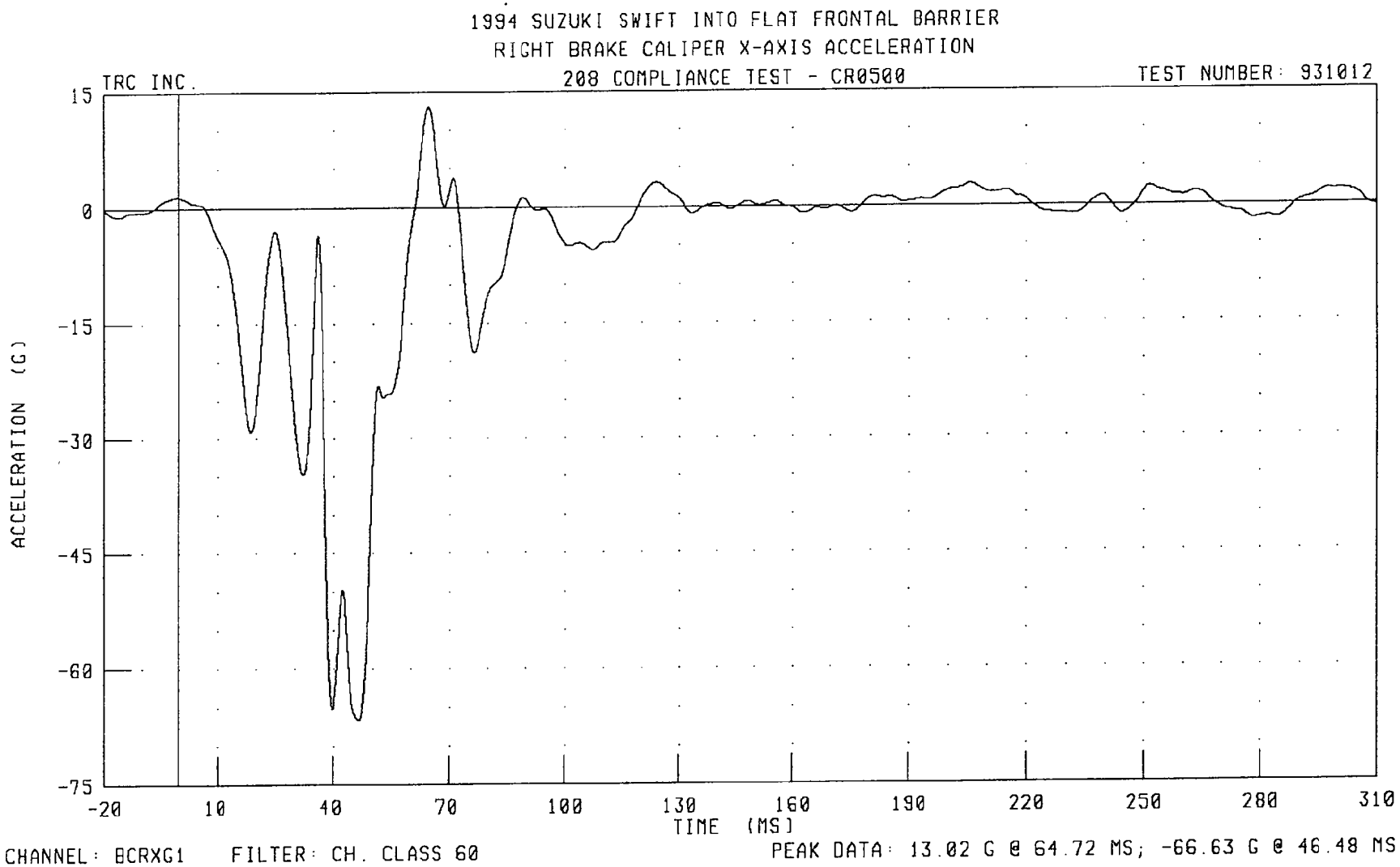

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
ENGINE UPPER BLOCK X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
75
35
-5
-45
-85
-125
-165
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG1
FILTER: CH. CLASS 60
PEAK DATA: 72.91 G @ 40.08 MS; -162.28 G @ 32.16 MS

931012

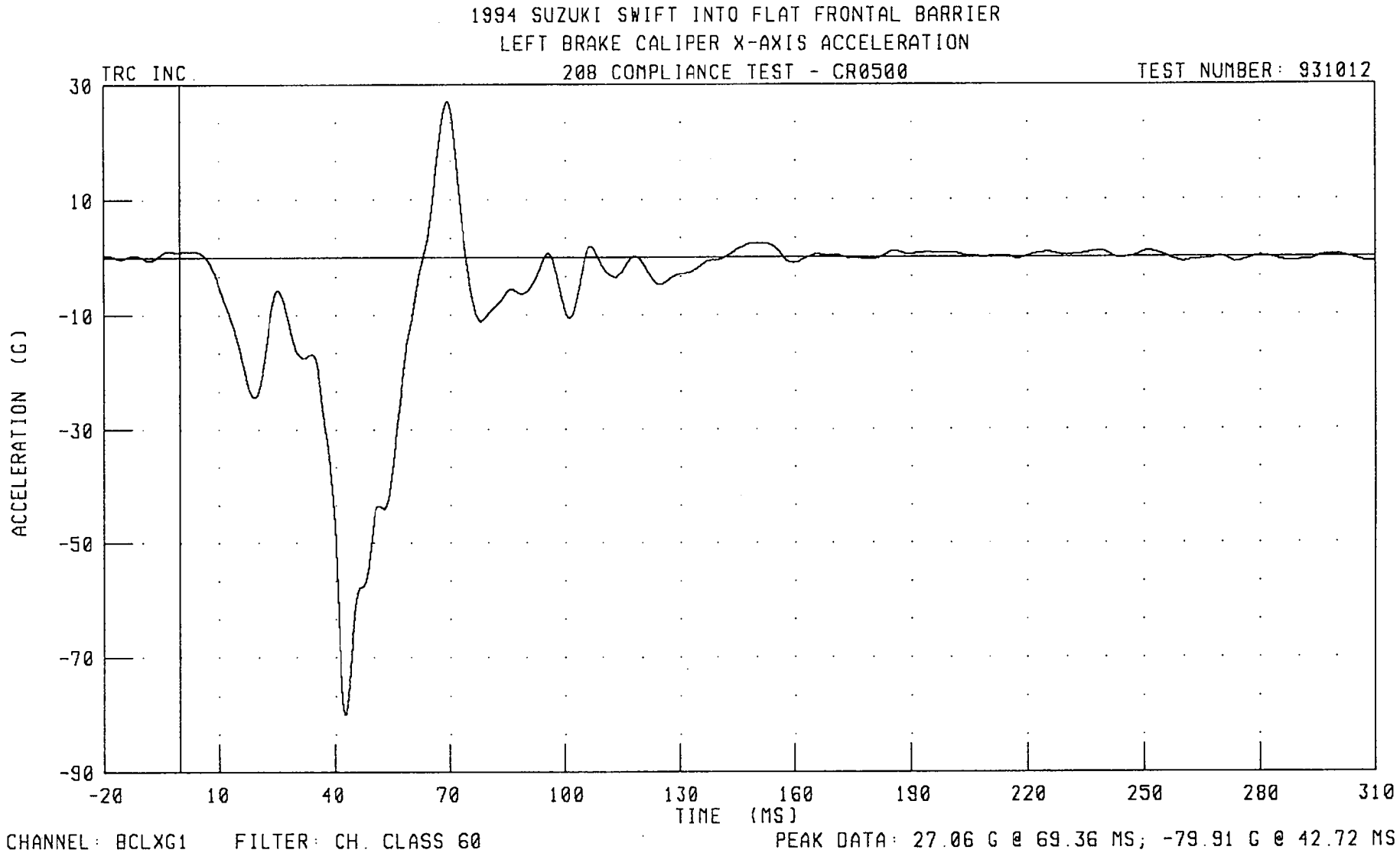
1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM BLOCK X-AXIS ACCELERATION

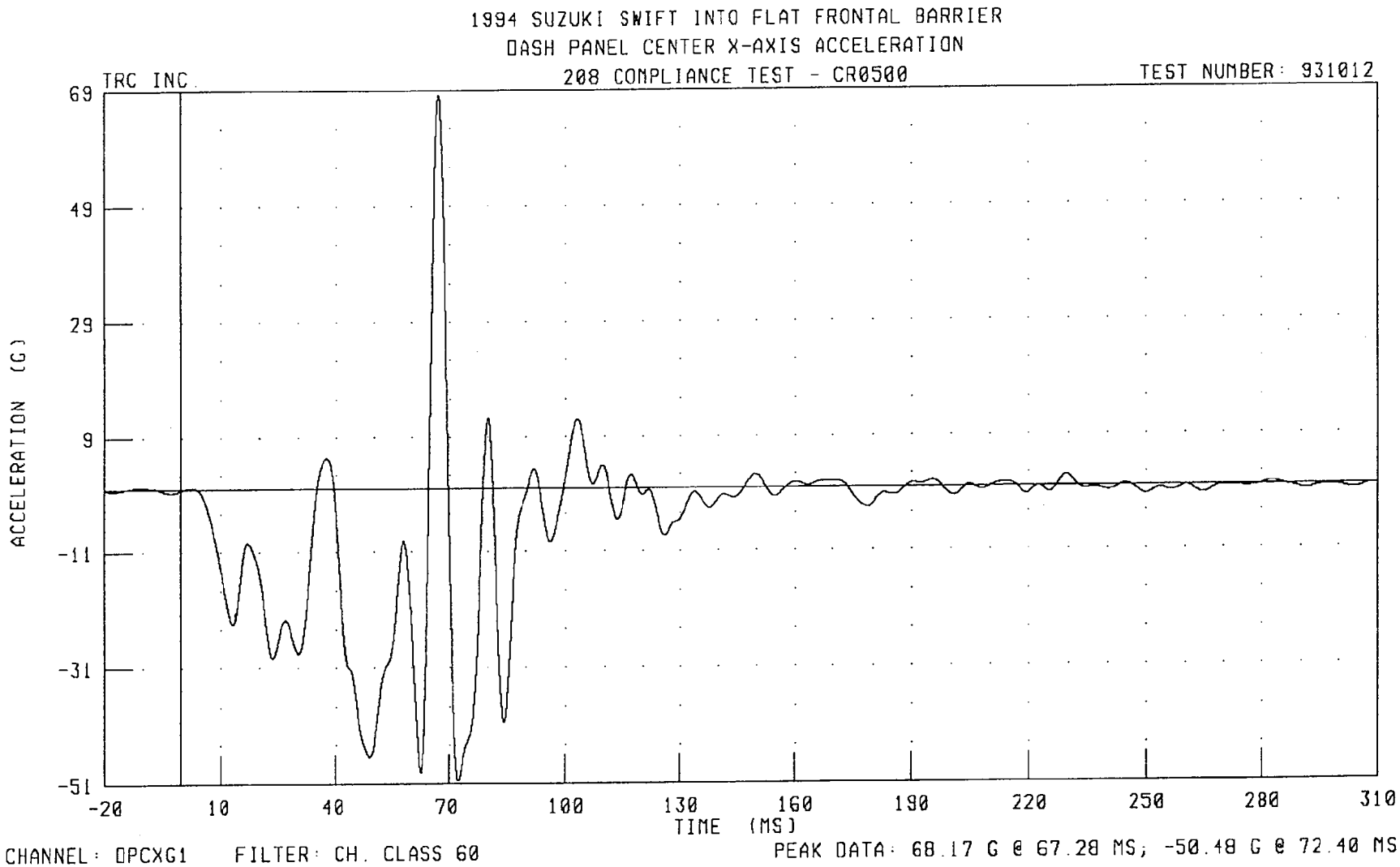


CHANNEL: ENGXG2 FILTER: CH. CLASS 60 PEAK DATA: 57.23 G @ 43.84 MS; -127.02 G @ 34.24 MS

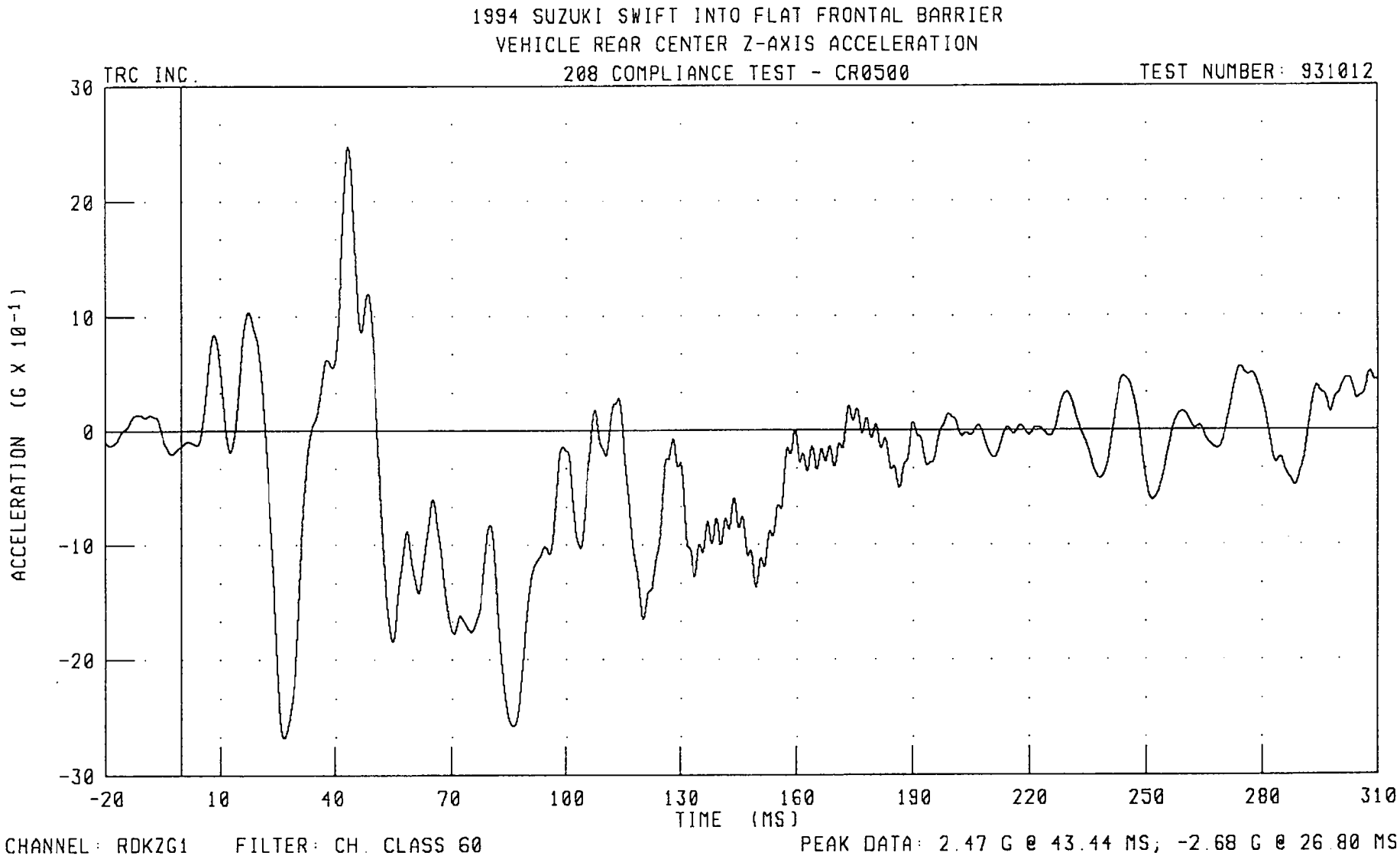

1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC.
TEST NUMBER: 931012
15
0
-15
-30
-45
-60
-75
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCRXG1
FILTER: CH. CLASS 60
PEAK DATA: 13.02 G @ 64.72 MS; -66.63 G @ 46.48 MS

931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
30
10
-10
-30
-50
-70
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCLXG1
FILTER: CH. CLASS 60
PEAK DATA: 27.06 G @ 69.36 MS; -79.91 G @ 42.72 MS


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
DASH PANEL CENTER X-AXIS ACCELERATION
208 COMPLIANCE TEST - CR0500
TRC INC
TEST NUMBER: 931012
69
49
29
9
-11
-31
-51
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: DPCXG1
FILTER: CH. CLASS 60
PEAK DATA: 68.17 G @ 67.28 MS; -50.48 G @ 72.40 MS

931012


1994 SUZUKI SWIFT INTO FLAT FRONTAL BARRIER
VEHICLE REAR CENTER Z-AXIS ACCELERATION
TRC INC.
208 COMPLIANCE TEST - CR0500
TEST NUMBER: 931012
ACCELERATION (G X 10-1)
30
20
10
0
-10
-20
-30
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RDKZG1
FILTER: CH. CLASS 60
PEAK DATA: 2.47 G @ 43.44 MS; -2.68 G @ 26.80 MS

931012