

REPORT NO. TRC-93-N04

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

TOYOTA MOTOR CORPORATION

1993 LEXUS GS300

4-DOOR SEDAN

NHTSA NO. MP5108

TRC TEST NO. 931027

PREPARED BY:

TRANSPORTATION RESEARCH CENTER INC.

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NOVEMBER 19, 1993

FINAL REPORT

PREPARED FOR:

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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1993 Lexus GS300, NHTSA No. MP5108, at Transportation Research Center Inc. on October 27, 1993. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.3 kph. The vehicle's maximum static crush was 563 millimeters. The ambient temperature was 23° C. The driver's Head Injury Criteria (HIC) was 622. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 59.0 g. The driver's chest maximum deflection was 41 millimeters. The driver's left and right femur maximum axial forces were 3252 N and 3774 N, respectively. The passenger's HIC was 370. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 60.8 g. The passenger's chest maximum deflection was 47 millimeters. The passenger's left and right femur maximum axial forces were 3690 N and 5311 N, respectively.					
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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	meters	m
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 Mon., Publ. 286, Units of Length and Masses, 1955, Price \$2.25, SD Catalog No. C13.10.286.

Approximate Conversions from Metric Measures

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

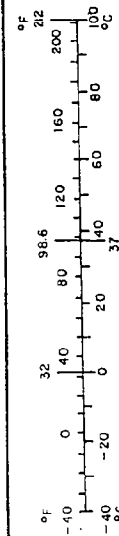


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SECTION 1.0

PURPOSE AND TEST PROCEDURE

PURPOSE

This 56 kph (35 mph) frontal barrier impact test is part of the New Car Assessment Program (NCAP) conducted for the National Highway Traffic Safety Administration's (NHTSA) Office of Market Incentives by Transportation Research Center Inc. (TRC) under Contract No. DTNH22-90-D-22121.

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1993 Lexus GS300 4-door sedan, NHTSA No. MP5108, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Laboratory Indicant Test Procedure, New Car Assessment Program, dated January 1, 1990. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap belt tension and shoulder belt tension, two (2) string potentiometers to measure shoulder belt displacement, and two (2) linear potentiometers to measure shoulder belt stretch. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells. The vehicle's specified impact velocity range was 55.5 to 57.1 kph.

The test vehicle contained two (2) Part 572E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant 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 572E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection and a six-axis neck load cell to measure longitudinal, lateral, and vertical forces and moments.

The eighty-three (83) data channels were multiplexed and recorded on two (2) 14-track tape drives. The data was digitally sampled at 12,500 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and sixteen (16) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle, occupant, and load cell barrier data are presented in Section 2.0. The occupant, camera, and vehicle measurements are presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the dummy, vehicle, and load cell barrier data plots. Appendix C contains the dummy certification data. Appendix D contains miscellaneous test information. Appendix E contains the restraint system instructions from the owner's manual.

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This frontal load cell barrier test was conducted at TRC on October 27, 1993.

The test vehicle, a 1993 Lexus GS300 4-door sedan, NHTSA No. MP5108, was equipped with a 3.0-liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1925 KG. The vehicle's impact speed was 56.3 kph. The vehicle sustained 563 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 622. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 59.0 g. The driver's chest maximum deflection was 41 mm. The driver's left and right femur maximum axial forces were 3252 N and 3774 N, respectively.

The passenger's HIC was 370. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 60.8 g. The passenger's chest maximum deflection was 47 mm. The passenger's left and right femur maximum axial forces were 3690 N and 5311 N, respectively.

Loss of windshield periphery retention was from 263 mm to 590 mm and from 902 to 975 mm along the lower edge of the windshield measured from the lower left corner.

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.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MP5108 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 10/27/93 TEST TIME: 1441 AMBIENT TEMP.: 23° C

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1993/Lexus/GS300/4-door sedan

VEHICLE TEST WEIGHT (KG): 1925

IMPACT ANGLE (DEG)¹: 0

IMPACT VELOCITY (KPH)²: PRIMARY = 56.3 SECONDARY = 56.3

MAXIMUM STATIC CRUSH (MM): 563

AVERAGE REBOUND (MM): 557

DUMMIES:	Driver #192	Passenger #142
TYPE:	Part 572 E	Part 572 E
LOCATION:	Left front	Right front
RESTRAINT:	3-point unbelt and airbag	3-point unbelt and airbag

NUMBER OF DATA CHANNELS: 83

NUMBER OF CAMERAS: HIGH-SPEED 16 REAL-TIME 2

¹With respect to tow track centerline.

²Speed trap measurement ($\pm$.08 kph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Toyota Motor Corporation

MAKE/MODEL: Lexus/GS300

VIN: JT8JS47E2P0032772

BODY STYLE: 4-door sedan

MODEL YEAR: 1993

NHTSA NO.: MP5108

COLOR: Green

ENGINE DATA: TYPE: inline CYLINDERS: 6 DISPLACEMENT: 3.0-liter

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

DATE VEHICLE RECEIVED: 09/22/93

ODOMETER READING: 75.0

DEALER'S NAME AND ADDRESS: Lexus of Columbus
3885 W. Dublin-Granville Rd.
Columbus, OH 43017

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	Yes	TILTING STEERING WHEEL	Yes
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	Yes
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	Yes
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	Sunroof		

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: Toyota Motor Corporation

DATE OF MANUFACTURE: 02/93

VIN: JT8JS47E2P0032772

GVWR: 4675 LB

GAWR: FRONT: 2690 LB, REAR: 2690 LB

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Good Year Invicta GA, P215/60R16

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 300 kPa
REAR: 300 kPa

SPARE TIRE (MFR., SIZE): Good Year Invicta GA, P215/60R16

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: electronically adjustable

MAXIMUM WIDTH: 1795 MM

WHEELBASE: 2780

LOCATION OF LABEL STATING TIRE DATA:

The label was located in the glove compartment.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P215/60R16

RECOMMENDED COLD TIRE PRESSURE: FRONT: 210 kPa; REAR: 210 kPa

DESIGNATED SEATING CAPACITY: 2 FRONT 3 REAR
5 TOTAL

VEHICLE CAPACITY WEIGHT: 410 KG

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE: LF 725; RF 719; LR 727; RR 733

PRE-TEST ATTITUDE: LF 717; RF 721; LR 707; RR 709

POST-TEST ATTITUDE: LF 718; RF 714; LR 697; RR 693

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	448 KG	RIGHT REAR	390 KG
LEFT FRONT	471 KG	LEFT REAR	399 KG
TOTAL FRONT WEIGHT	919 KG	(53.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	789 KG	(46.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1708 KG		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW¹ = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (1708 KG)

VCW = VEHICLE CAPACITY WEIGHT (410)

DSC = DESIGNATED SEATING CAPACITY (5)

RCLW¹ = VCW - 68 (DSC) = 70 KG

TARGET TEST WEIGHT=UDW + RCLW¹ + (NO. OF HYBRID III DUMMIES X 76 KG/DUMMY)

TARGET TEST WEIGHT = 1708 + 70 + 152

TARGET TEST WEIGHT = 1930 KG

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 65 KG OF CARGO WEIGHT:

RIGHT FRONT	490 KG	RIGHT REAR	470 KG
LEFT FRONT	493 KG	LEFT REAR	472 KG
TOTAL FRONT WEIGHT	983 KG	(51.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	942 KG	(48.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	1925 KG	(0.3% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 0 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: rear hatch, rear bumper, taillights, mufflers, and antenna

CG = 1361 MM REARWARD OF FRONT WHEEL CENTERLINE

¹Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 136 KG, whichever is less.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 931027 NHTSA NO.: MP5108
TEST DATE: 10/27/93 TEST TIME: 1441
TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°
AMBIENT TEMPERATURE AT IMPACT AREA: 23° C
TEMPERATURE IN OCCUPANT COMPARTMENT: 20° C
IMPACT VELOCITY: PRIMARY = 56.3 KPH SECONDARY = 56.3 KPH

(SPECIFIED RANGE = 55.5 TO 57.1 KPH)

DISTANCE FROM VEHICLE TO BARRIER: ENTERING VELOCITY TRAP = 356 MM

EXITING VELOCITY TRAP = 51 MM

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

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 4810; C 4936; R 4781

POST-TEST: L 4386; C 4375; R 4340

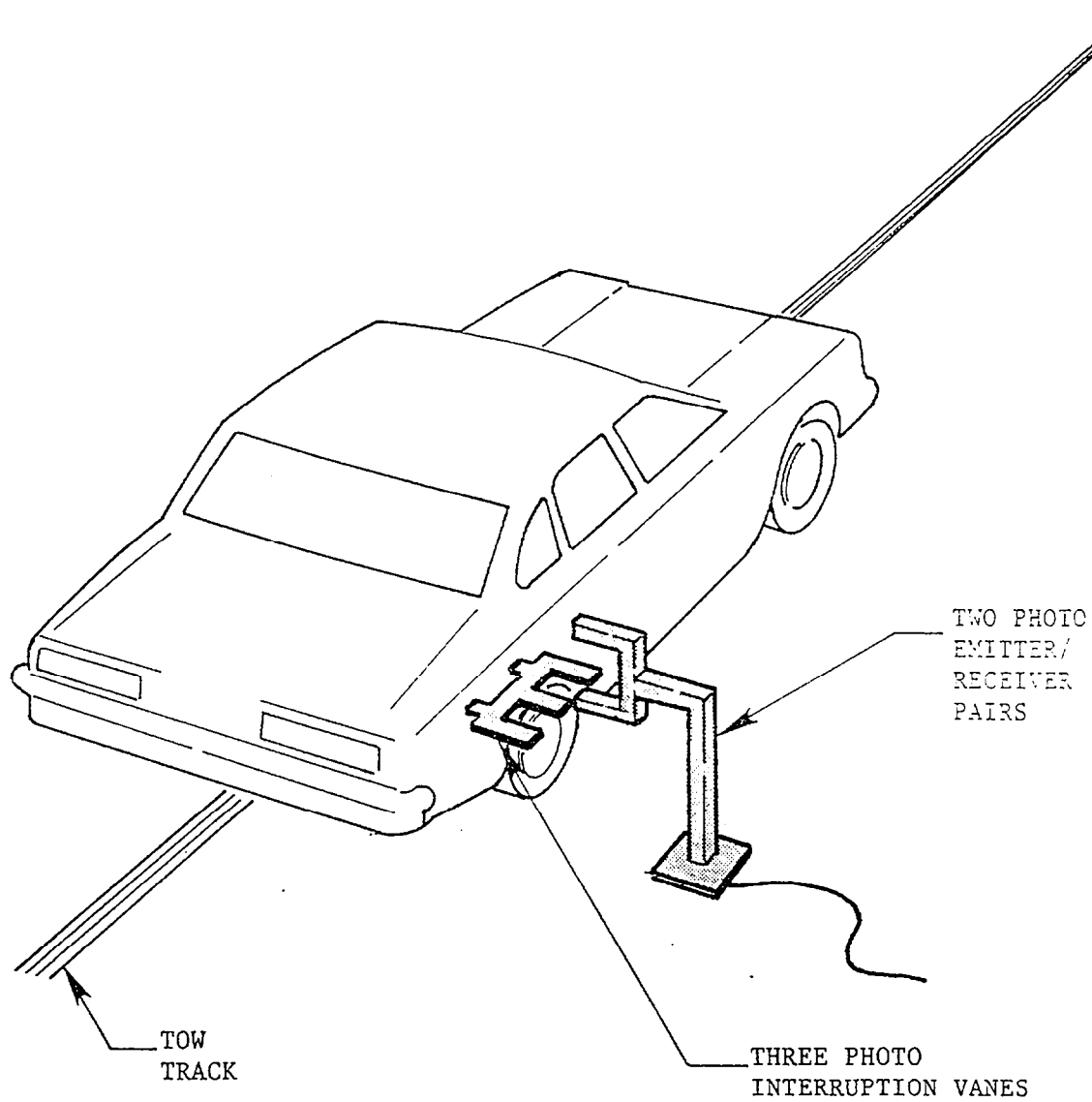
TOTAL CRUSH: L 424; C 561; R 441

AVERAGE CRUSH: 475

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 547; C 550; R 575; AVG. 557

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver 51 millimeters before impact.

The vanes have 305-millimeter spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 56 KPH (35 MPH) FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Lexus/GS300/4-door sedan

VEHICLE NHTSA NO.: MP5108; VIN: JT8JS47E2P0032772

MODEL YEAR: 1993; BUILD DATE: 02/93; TEST DATE: 10/27/93

VEHICLE SIZE CATEGORY: 4-door sedan; TEST WEIGHT: 1925 KG

VEHICLE WHEELBASE: 2780 MM

MAXIMUM WIDTH: 1795 MM

FRONT OVERHANG: 950 MM

COLLISION DEFORMATION

CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH

MEASUREMENTS: C1 = 424 MM
 C2 = 476 MM
 C3 = 531 MM
 C4 = 563 MM
 C5 = 494 MM
 C6 = 441 MM

VEHICLE CENTERLINE

MIDPOINT OF DAMAGE: D = (LONGITUDINAL)

LENGTH OF DAMAGED

REGION: L = 1436 MM

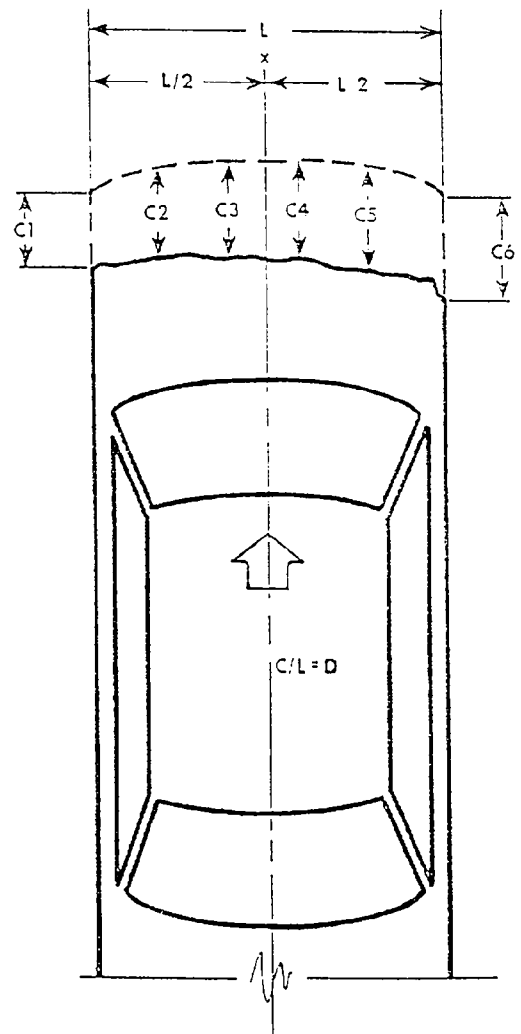
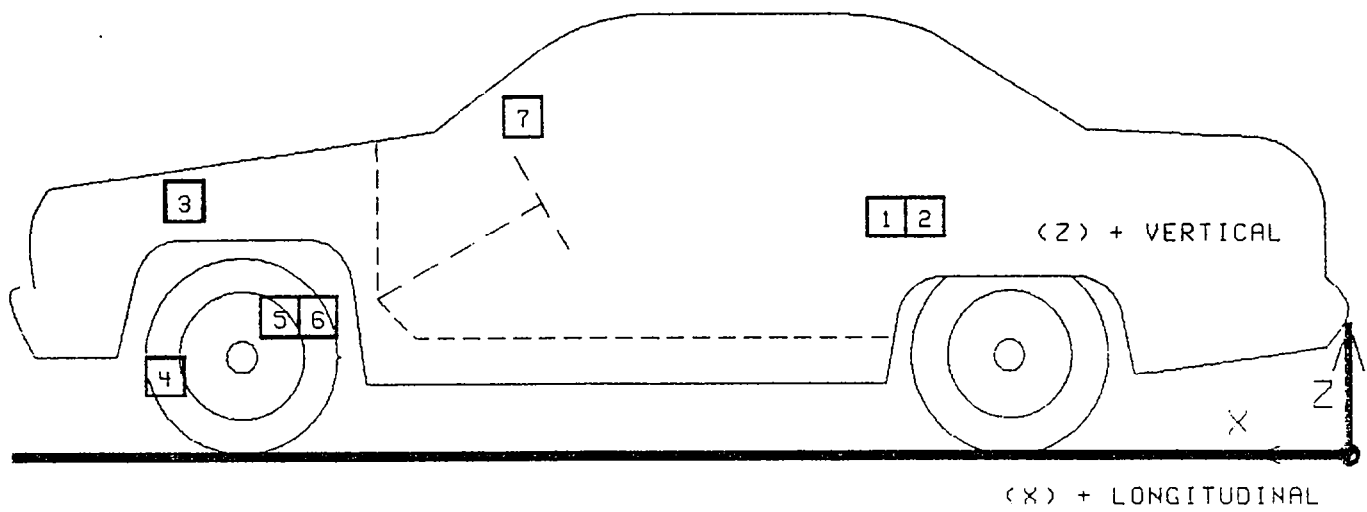
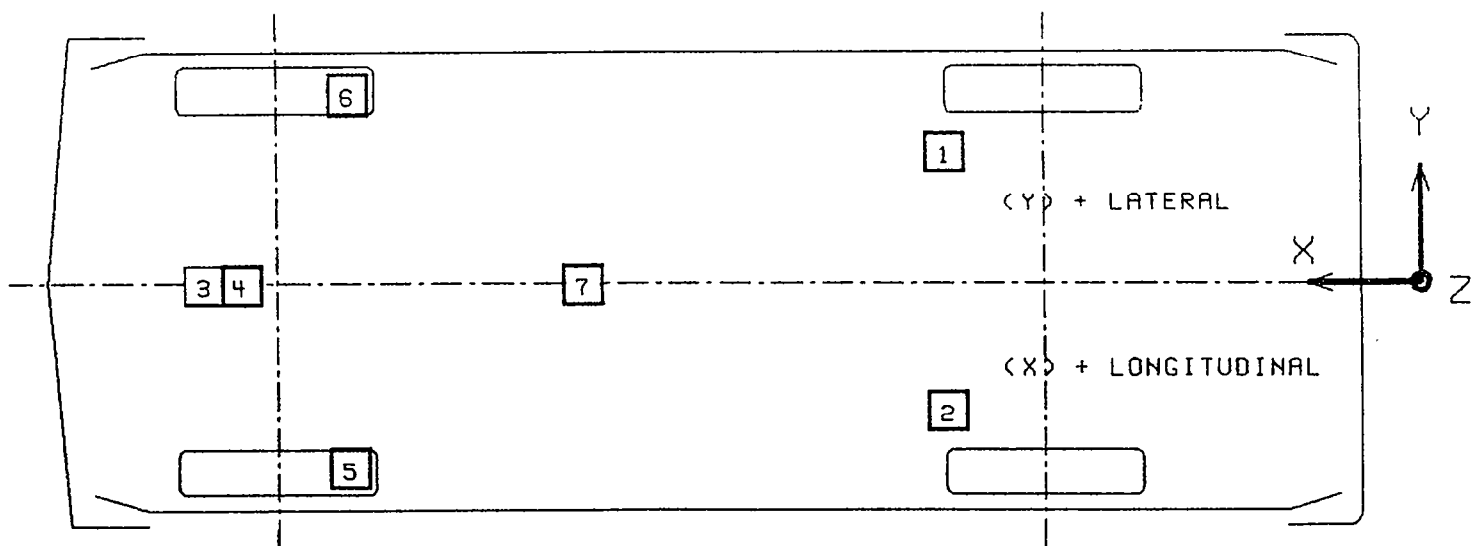


FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 931027

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
				MAX G	MSEC	MAX G	MSEC
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3031	386	335	2.1 2.3	123.4 123.6	58.9 59.7	52.2 52.3
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3033	-383	329	2.3 2.2	121.9 122.5	60.6 60.1	53.1 53.2
3 ENGINE TOP LONGITUDINAL	825	76	811	7.6	56.4	103.6	33.5
4 ENGINE BOTTOM LONGITUDINAL	821	-36	190	9.1	47.6	85.1	32.8
5 RIGHT BRAKE CALIPER LONGITUDINAL	1076	-672	324	38.9	64.2	91.4	49.1

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 931027

No. LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE	
				DIRECTION	MAX G MSEC	DIRECTION	MAX G MSEC
6 LEFT BRAKE CALIPER LONGITUDINAL	1076	672	342	18.8	61.1	64.6	41.9
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1640	4	994	11.4	111.3	74.6	49.8

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS.

REFERENCE: X: + FORWARD ACCELERATION
Y: + LEFT FROM VEHICLE CENTERLINE
Z: + UP FROM GROUND LEVEL

TABLE 5 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #192	PASSENGER #142
HEAD	<u>Airbag</u>	<u>Airbag</u>
CHEST	<u>Airbag</u>	<u>Airbag</u>
ABDOMEN	<u>None</u>	<u>None</u>
LEFT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>
RIGHT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
FRONT	<u>Easy</u>	<u>Easy</u>
REAR	<u>Easy</u>	<u>Easy</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	<u>None</u>	<u>None</u>
REAR	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

The entire windshield cracked on impact.

OTHER NOTABLE IMPACT EFFECTS:

TABLE 6 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1993/Lexus/GS300/4-door sedanVEH. NHTSA NO.: MP5108; TEST DATE: 10/27/93

	DRIVER DUMMY #192	PASSENGER DUMMY #142
<u>MAXIMUM ACCELERATIONS (G):</u>		
HEAD X-AXIS	-61.0	-48.6
HEAD Y-AXIS	-7.2	27.2
HEAD Z-AXIS	31.9	-35.4
HEAD RESULTANT	64.2	54.7
CHEST X-AXIS	-58.2	-63.5
CHEST Y-AXIS	-12.4	7.8
CHEST Z-AXIS	19.5	22.1
CHEST RESULTANT ¹	59.0	60.8
CHEST RESULTANT TIME INTERVAL (SEC.) ¹	.003	.003
<u>HEAD INJURY CRITERIA (HIC) VALUES:</u>		
HIC ²	622	370
HIC STARTING TIME (SEC.)	.060	.057
HIC ENDING TIME (SEC.)	.096	.093
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	49.5	40.2
<u>MAXIMUM CHEST DEFLECTIONS (MM):</u>		
CHEST X-AXIS	41	47
MAXIMUM CHEST DEFLECTION TIME (SEC)	.075	.069
<u>MAXIMUM COMPRESSIVE FEMUR FORCES (N):</u>		
LEFT FEMUR	3252	3690
RIGHT FEMUR	3774	5311
<u>MAXIMUM SEAT BELT FORCES (N):</u>		
LAP BELT	8708	7156
SHOULDER BELT	7207	6206

NOTE: ALL VALUES LISTED MUST BE OCCURRING DURING PRIMARY IMPACT EVENT.
(HEAD ACCELERATIONS LISTED MUST BE DURING HIC TIME INTERVAL.)

¹0.003 SEC. MINIMUM DURATION.

²THE MAXIMUM HIC TIME INTERVAL IS 36 MILLISECONDS.

TABLE 7 HYBRID III NECK DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1993/Lexus/GS300/4-door sedan

VEHICLE NHTSA NO.: MP5108; TEST DATE: 10/27/93

<u>MAXIMUM VALUES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
	<u>DUMMY #192</u>	<u>DUMMY #142</u>
NECK X-AXIS FORCE (N)	294	-634
NECK Y-AXIS FORCE (N)	321	201
NECK Z-AXIS FORCE (N)	2605	2134
NECK MOMENT ABOUT X AXIS (N-M)	13	30
NECK MOMENT ABOUT Y AXIS (N-M)	-46	-57
NECK MOMENT ABOUT Z AXIS (N-M)	14	21

NOTE: ALL VALUES LISTED MUST BE OCCURRING DURING PRIMARY IMPACT EVENT.

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 and chest impacted the airbag. The driver dummy was restrained by the three-point unbelt and airbag. The dummy rebounded rearward into the seat back with the dummy's head contacting the head restraint. The driver dummy came to rest in the driver's seat restrained by the three-point unbelt.

RIGHT FRONT PASSENGER DUMMY

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

TABLE 8 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

	<u>DRIVER</u>	<u>PASSENGER</u>
<u>BELT LENGTH DATA:</u>		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	2565	2569
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	971	950
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	787	790
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	NA	NA
AS DETERMINED MECHANICALLY	NA	NA
AS DETERMINED ELECTRONICALLY	110	108
<u>BELT STRETCH LENGTH (MM/M):</u>		
AS MEASURED MECHANICALLY	NA	8
AS MEASURED ELECTRONICALLY	56	0
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	NA	NA

¹ The driver's and passenger's 3-point unibelts were equipped with belt pre-tensioning devices. The belt webbing retracts during the impact making mechanical and film determinations of belt spool-off impossible. The electronic spool-off measurement is questionable.

² The driver's seat belt stretch indication string pulled out of the belt on impact.

ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

FIGURE 4

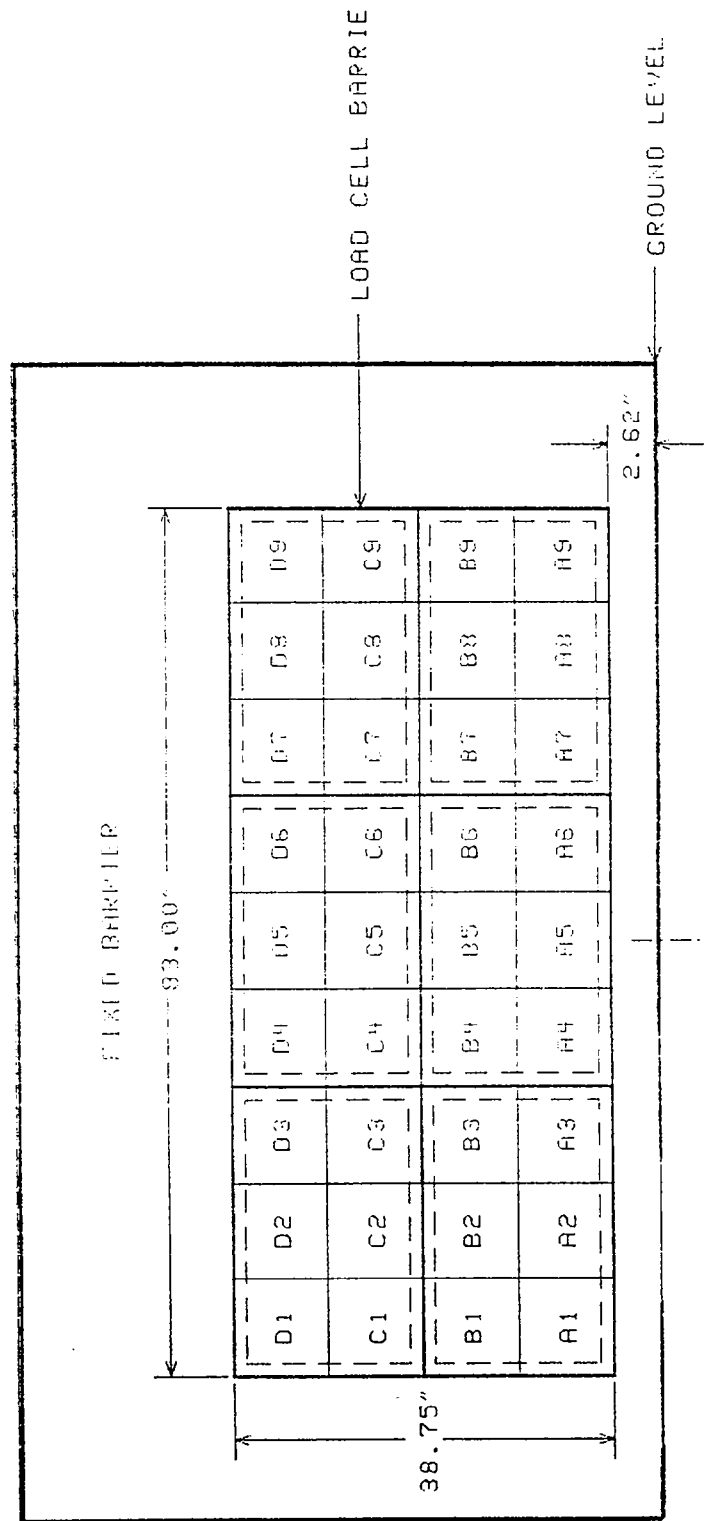
LOAD CELL BARRIER CONFIGURATION

FRONT VIEW

36 LOAD CELLS

4 ROWS

9 COLUMNS



- GROUP 1: A1 THRU B3
- GROUP 2: A4 THRU B6
- GROUP 3: A7 THRU B9
- GROUP 4: C1 THRU D3
- GROUP 5: C4 THRU D6
- GROUP 6: C7 THRU D9

TABLE 9

LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER 931027

LOCATION	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	KN	MSEC	KN	MSEC
TOTAL GROUP 1	1.7	148.8	112.1	27.2
TOTAL GROUP 2	0.8	268.2	291.1	36.2
TOTAL GROUP 3	1.7	1.2	130.3	36.0
TOTAL GROUP 4	1.0	3.3	58.3	31.8
TOTAL GROUP 5	1.1	259.2	107.0	34.4
TOTAL GROUP 6	1.7	207.6	30.3	41.0

TABLE 9

LOAD CELL BARRIER DATA SUMMARY CONTINUED

TEST NUMBER 931027

LOCATION	POSITIVE		NEGATIVE	
	KN	DIRECTION MSEC	KN	DIRECTION MSEC
TOTAL LOAD CELL FORCE	5.2	259.5	677.5	35.5

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

FMVSS 212, 219 (PARTIAL), AND 301 DATA

FIGURE 5 FMVSS 212 TEST DATA

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

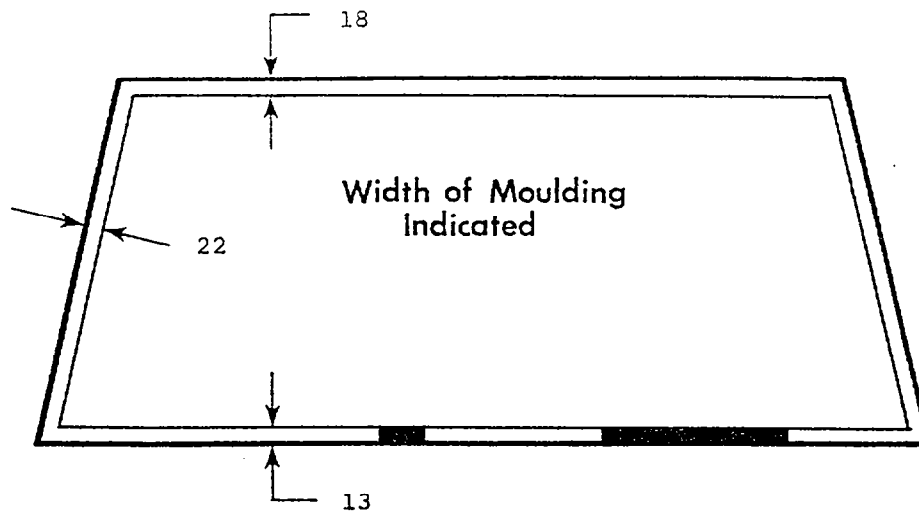
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	2069	1742	84.2
LEFT SIDE	2069	1996	96.5
TOTAL	4138	3738	90.3

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 20° C



FRONT VIEW OF WINDSHIELD¹

LOSS OF WINDSHIELD RETENTION LENGTHS:

Loss of windshield periphery retention was from 263 to 590 mm and from 902 to 975 mm along the lower edge of the windshield measured from the lower left corner.

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

¹INDICATE AREAS OF LOSS OF RETENTION, IF ANY, ON WINDSHIELD DIAGRAM.

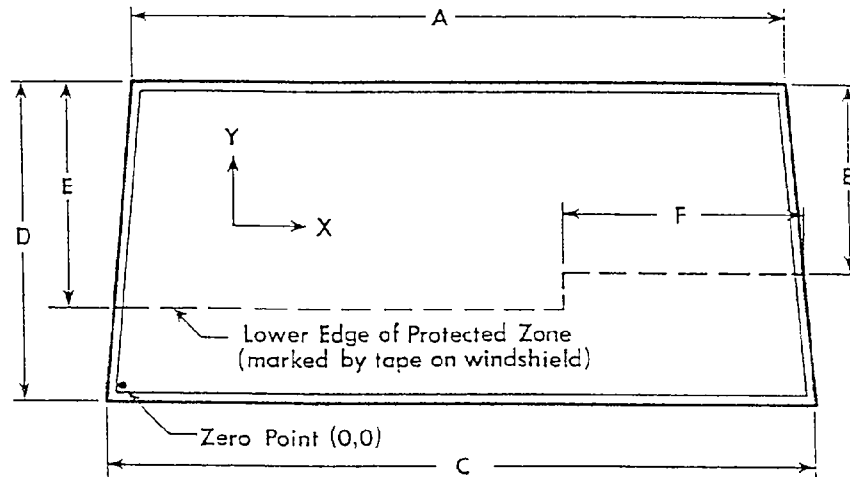
FIGURE 6 FMVSS 219 TEST DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165-millimeter diameter rigid sphere weighing 6.8 kg 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 13 millimeters 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 = 1190
B = 395
C = 1590
D = 780
E = 475
F = 905



FRONT VIEW

METHOD OF ADHERING PROTECTED ZONE TEMPLATE TO WINDSHIELD: NA

AREAS OF WINDSHIELD TEMPLATE PENETRATION

GREATER THAN 6.0 MM: 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 MILLIMETERS.

TABLE 10 FUEL SYSTEM DATA

MAKE/MODEL: Lexus/GS300

NHTSA NO.: MP5108

FUEL SYSTEM CAPACITY: 80.0 LITERS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 80.0 LITERS (FURNISHED BY COTR)

TEST VOLUME RANGE: 73.6 LITERS TO 75.2 LITERS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 74.4 LITERS (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 the trunk directly
behind the rear seat. The fuel filler is on the left. 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

TEST VEHICLE NHTSA NO.: MP5108; TEST DATE: 10/27/93

VEHICLE MAKE/MODEL/BODY STYLE: Lexus/GS300/4-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 (56 KPH)
 OBLIQUE (48 KPH) WITH ° BARRIER FACE
FIRST CONTACTING (DRIVER/PASS.) SIDE.
 REAR MOVING BARRIER (48 KPH)
 LATERAL MOVING BARRIER (32 KPH)

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

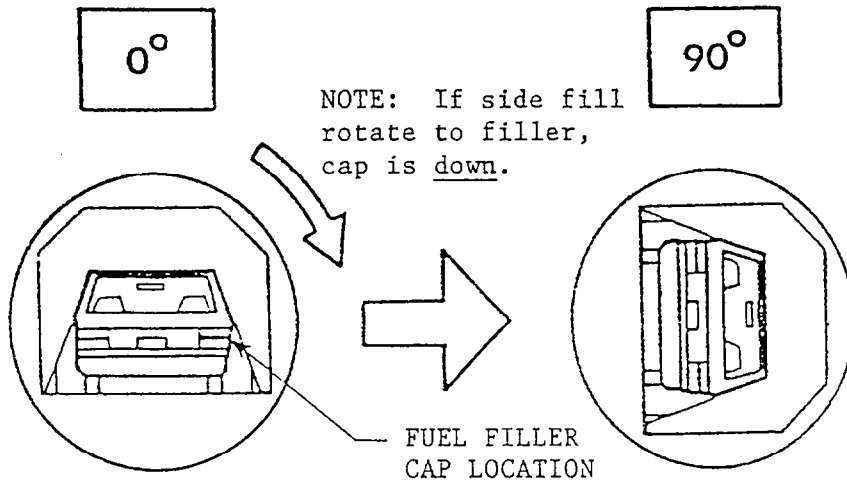
	TEST RESULTS	MAXIMUM ALLOWABLE
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 G	28 G
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 G	142 G
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - -	0 G	28 G/MN

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: MP5108
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 7 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

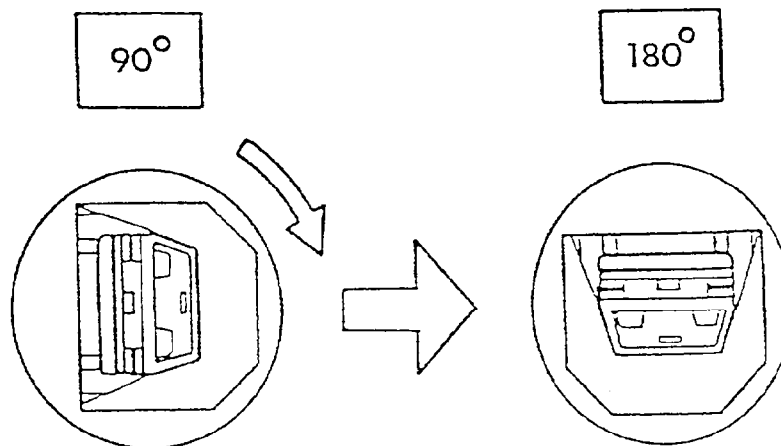
FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: MP5108

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 14 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

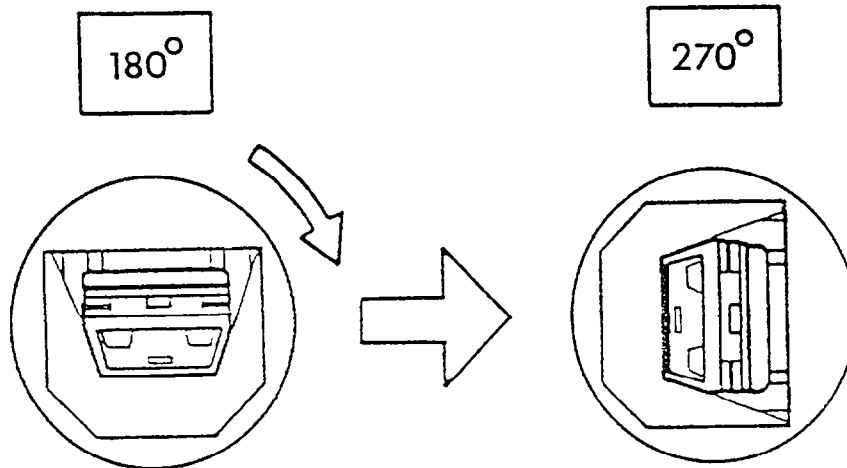
<u>90° TO 180° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: MP5108
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 21 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

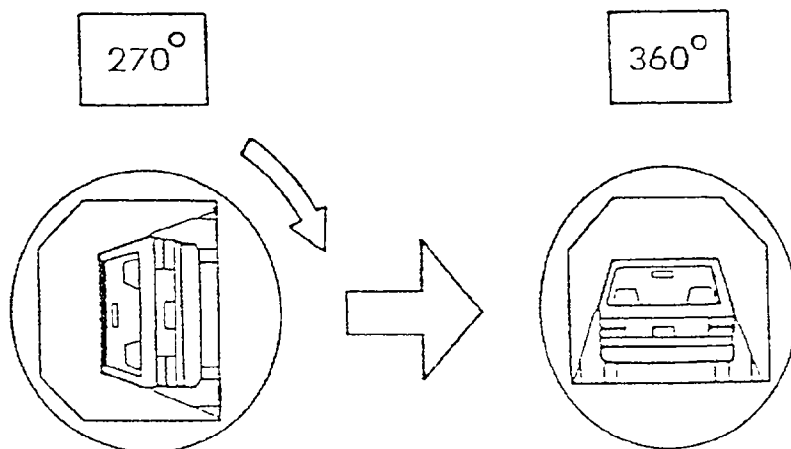
<u>180° TO 270° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: MP5108
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds
FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds
TOTAL - - - - - = 7 minutes, 00 seconds
NEXT WHOLE MINUTE INTERVAL - - - - = 28 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

<u>270° TO 360° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

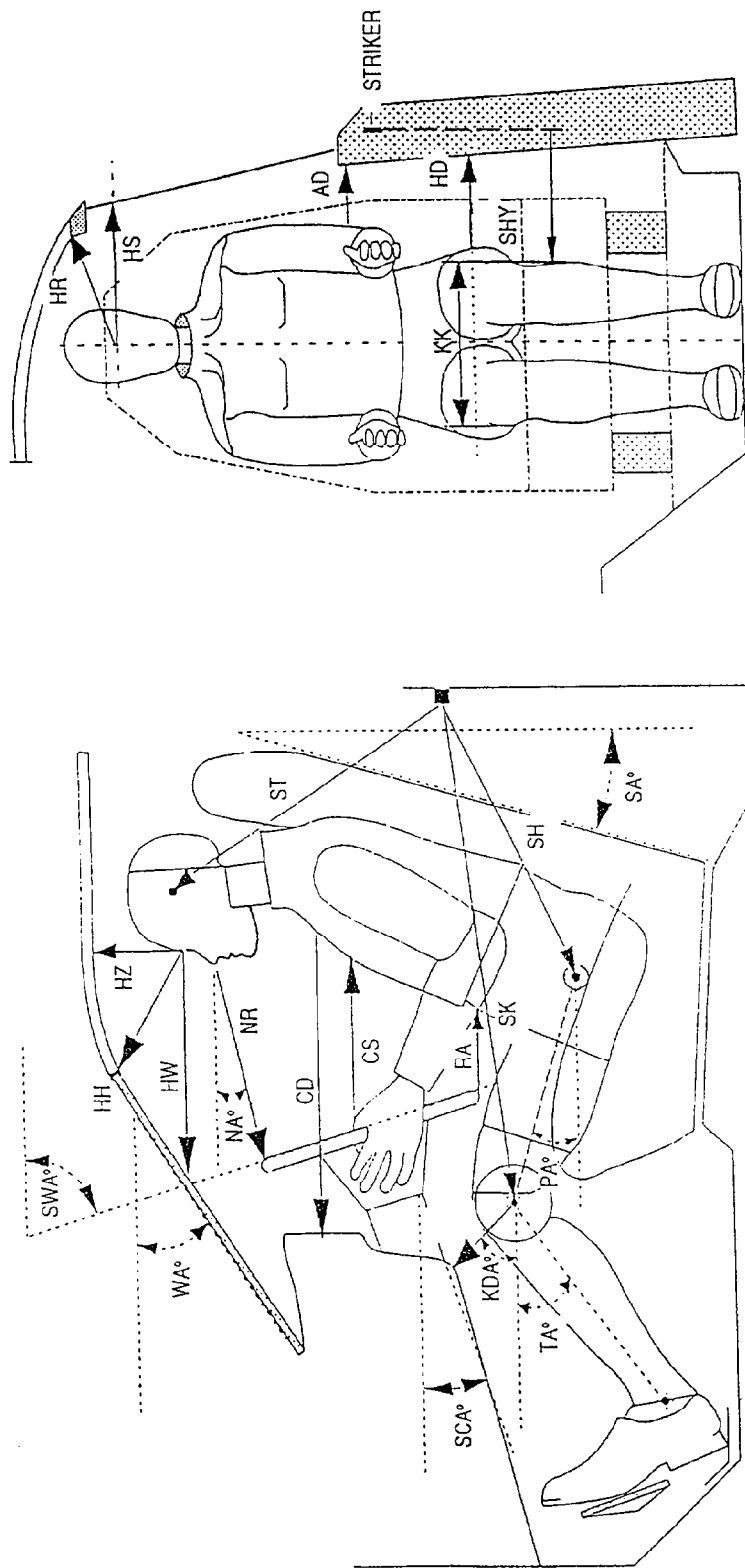
None

SECTION 4.0

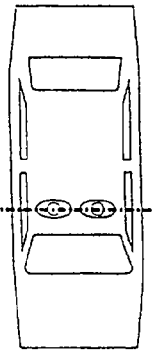
VEHICLE, OCCUPANT, AND CAMERA INFORMATION

FIGURE 8

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS



VERTICAL TRANSVERSE PLANE



VERTICAL LONGITUDINAL PLANE

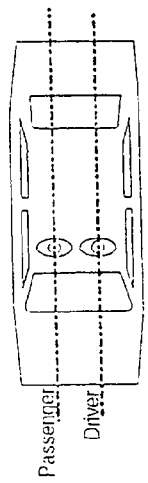
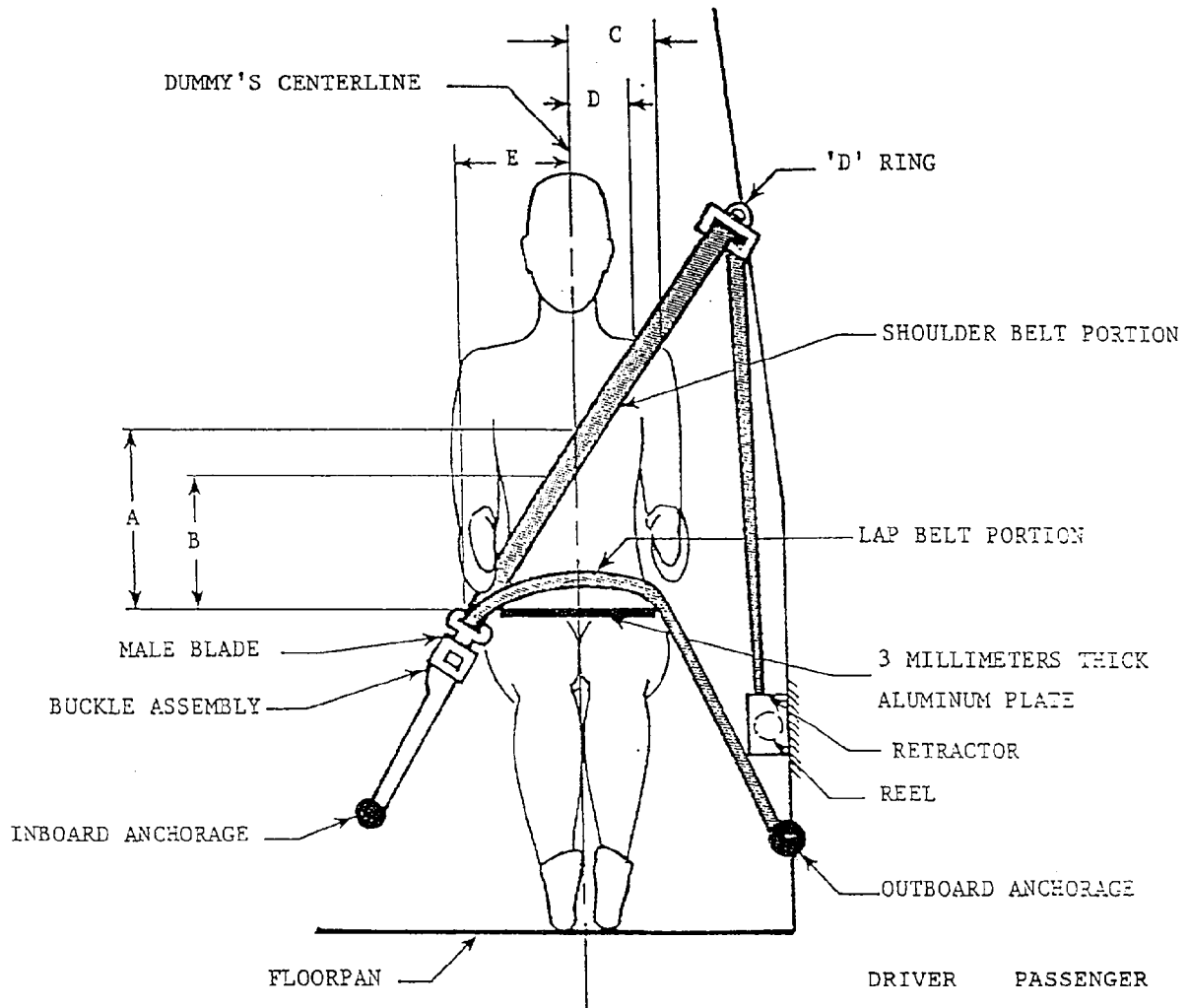


TABLE 12 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #192)	PASSENGER (SERIAL #142)
WA°	WINDSHIELD ANGLE	28	NA
SWA°	STEERING WHEEL ANGLE	65	NA
SCA°	STEERING COLUMN ANGLE	25	NA
SA°	SEAT BACK ANGLE	16	16
HZ	HEAD TO ROOF	145	147
HH	HEAD TO HEADER	343	340
HW	HEAD TO WINDSHIELD	567	569
HR	HEAD TO SIDE HEADER	195	185
NR	NOSE TO RIM	422	NA
NA	NOSE TO RIM ANGLE	12	NA
CD	CHEST TO DASH	556	578
CS	STEERING WHEEL TO CHEST	327	NA
RA	RIM TO ABDOMEN	218	NA
KDL	LEFT KNEE TO DASH	210	215
KDR	RIGHT KNEE TO DASH	208	182
KDA	OUTBOARD KNEE TO DASH ANGLE	24	34
PA°	PELVIC ANGLE	26	26
TA°	TIBIAL ANGLE	31	40
KK	KNEE TO KNEE	340	277
ST	STRIKER TO HEAD	451	450
	STRIKER TO HEAD ANGLE	-75	-75
SK	STRIKER TO KNEE	642	630
	STRIKER TO KNEE ANGLE	15	12
SH	STRIKER TO H-POINT	318	318
	STRIKER TO H-POINT ANGLE	51	31
SHY	STRIKER TO H-POINT (Y DIR.)	210	205
HS	HEAD TO SIDE WINDOW	295	294
HD	H-POINT TO DOOR	144	124
AD	ARM TO DOOR	111	100

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 MILLIMETERS.

FIGURE 9 SEAT BELT POSITIONING DATA



	DRIVER	PASSENGER
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	393	345
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	313	255
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	100	125
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	36	62
LAPBELT TENSION (N)	18	13
SHOULDER BELT TENSION (N)	9	18
SEAT BELT ANCHORAGE POSITION	ONE POSITION DOWN FROM UPPERMOST	ONE POSITION DOWN FROM UPPERMOST

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 10
CAMERA POSITIONS

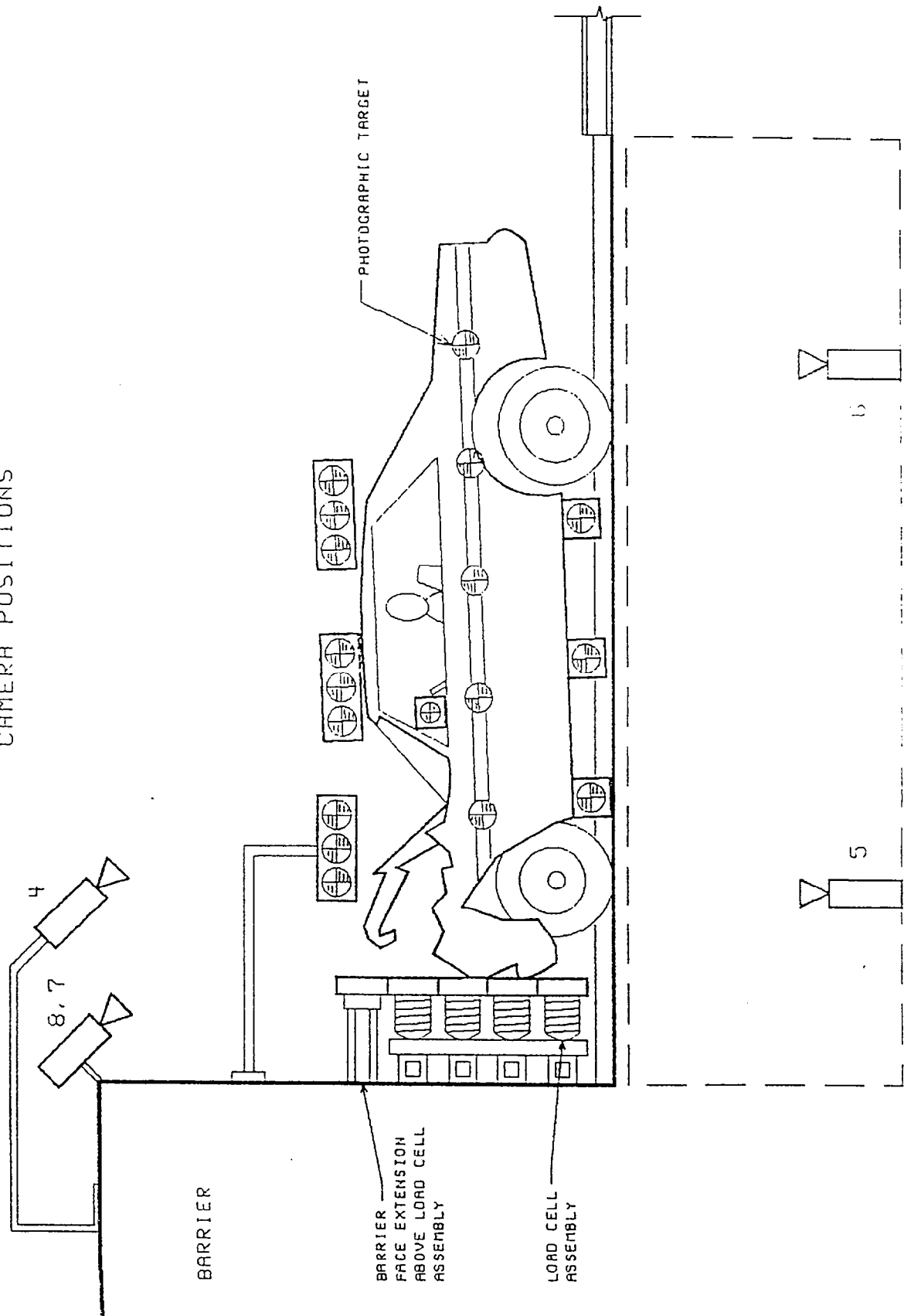


FIGURE 10
CAMERA POSITIONS, CONTINUED

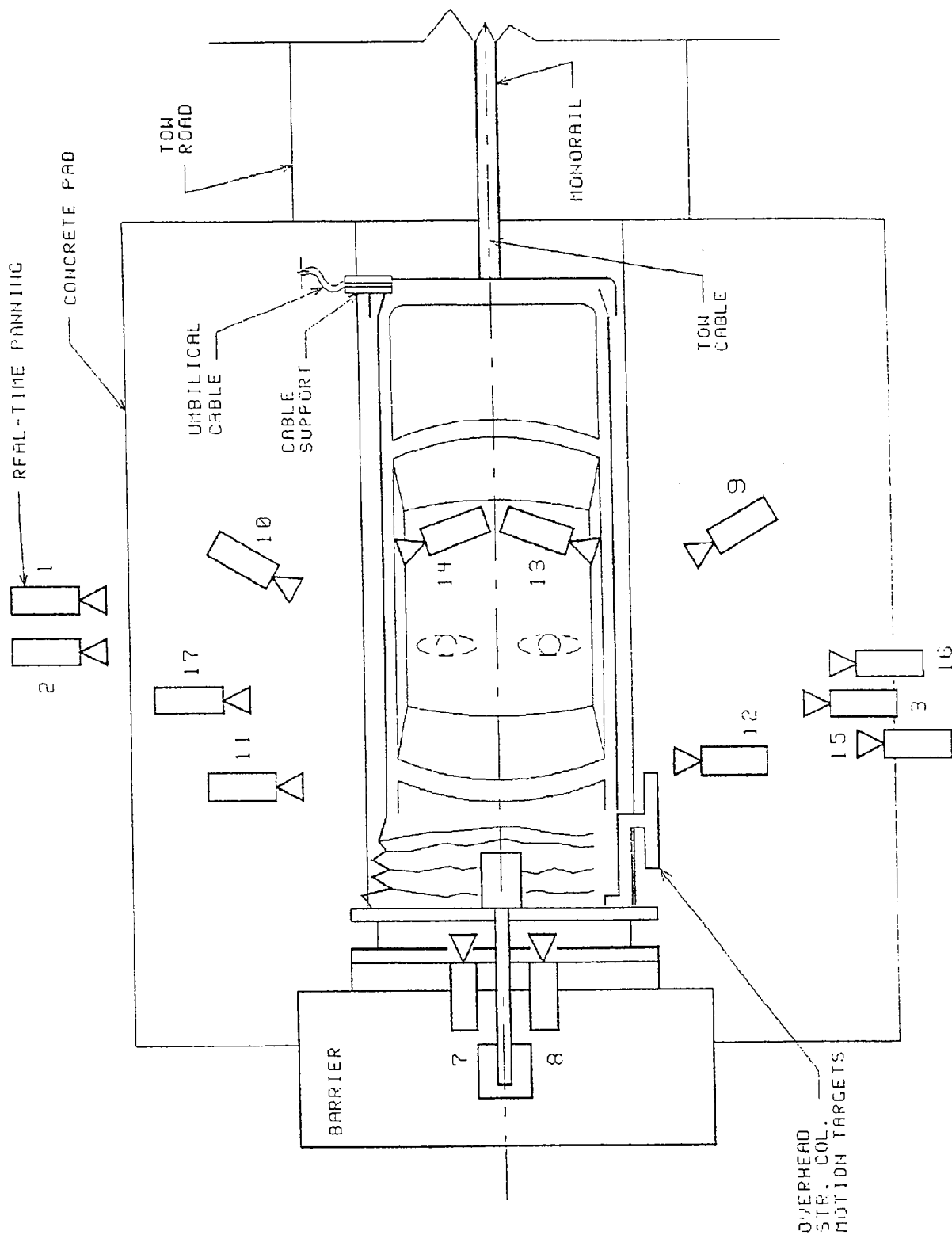


TABLE 13 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 931013		VEHICLE: 1993 Lexus GS300 4-door sedan		CAMERA POSITIONS (MM) ¹			ANGLE ² (DEG)		FILM PLANE TO HEAD TARGET (MM)		FILM SPEED (FPS)	
CAMERA NO.	VIEW	X	Y	Z								
1	Real-time panning	-3607	-12802	1549		NA			NA	16	24	
2	Vehicle crush	-2065	-6767	942		-2			NA	13	493	
3	Dummy kinematics	-1054	7493	1118		-12			5842	25	998	
4	Windshield damage	-925	0	2489		-40			NA	13	498	
5	Crush & fluid spillage	-1283	0	-2347		90			NA	13	1008	
6	Fluid spillage	-2522	0	-2515		90			NA	13	998	
7	Passenger kinematics	-114	-351	2159		-40			NA	17	505	
8	Driver kinematics	-173	368	2159		-41			NA	17	500	
9	Driver kinematics	-4572	1854	2591		-27			3200	25	500	
10	Passenger kinematics	-4674	-1880	2540		-26			3099	25	490	
11	Windshield intrusion	-968	-7775	1118		0			NA	50	505	
12	Windshield intrusion	-1346	7859	1074		0			NA	50	502	
13	Driver seat belt movement	NA	NA	NA		NA			NA	13	498	
14	Passenger seat belt movement	NA	NA	NA		NA			NA	13	500	
15	Column movement	-2515	7264	2616		-14			NA	25	473	
16	Column movement	-2515	7264	1908		-9			NA	25	508	
17	Passenger kinematics	-986	-5354	1151		7			6121	25	1025	

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

FIGURE 11 VEHICLE TARGET LOCATIONS

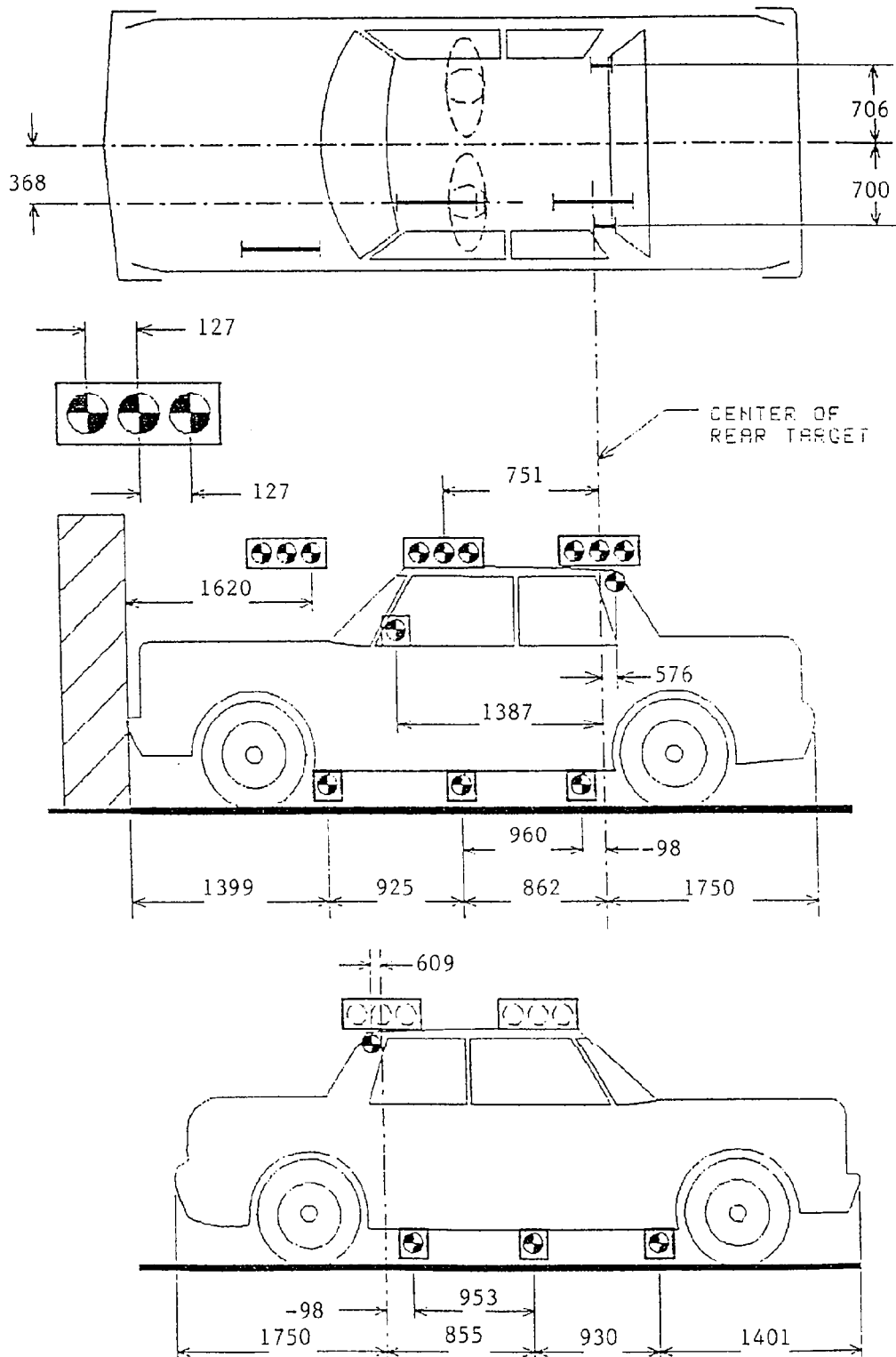


FIGURE 12 PRE-TEST AND POST-TEST MEASUREMENT POINTS

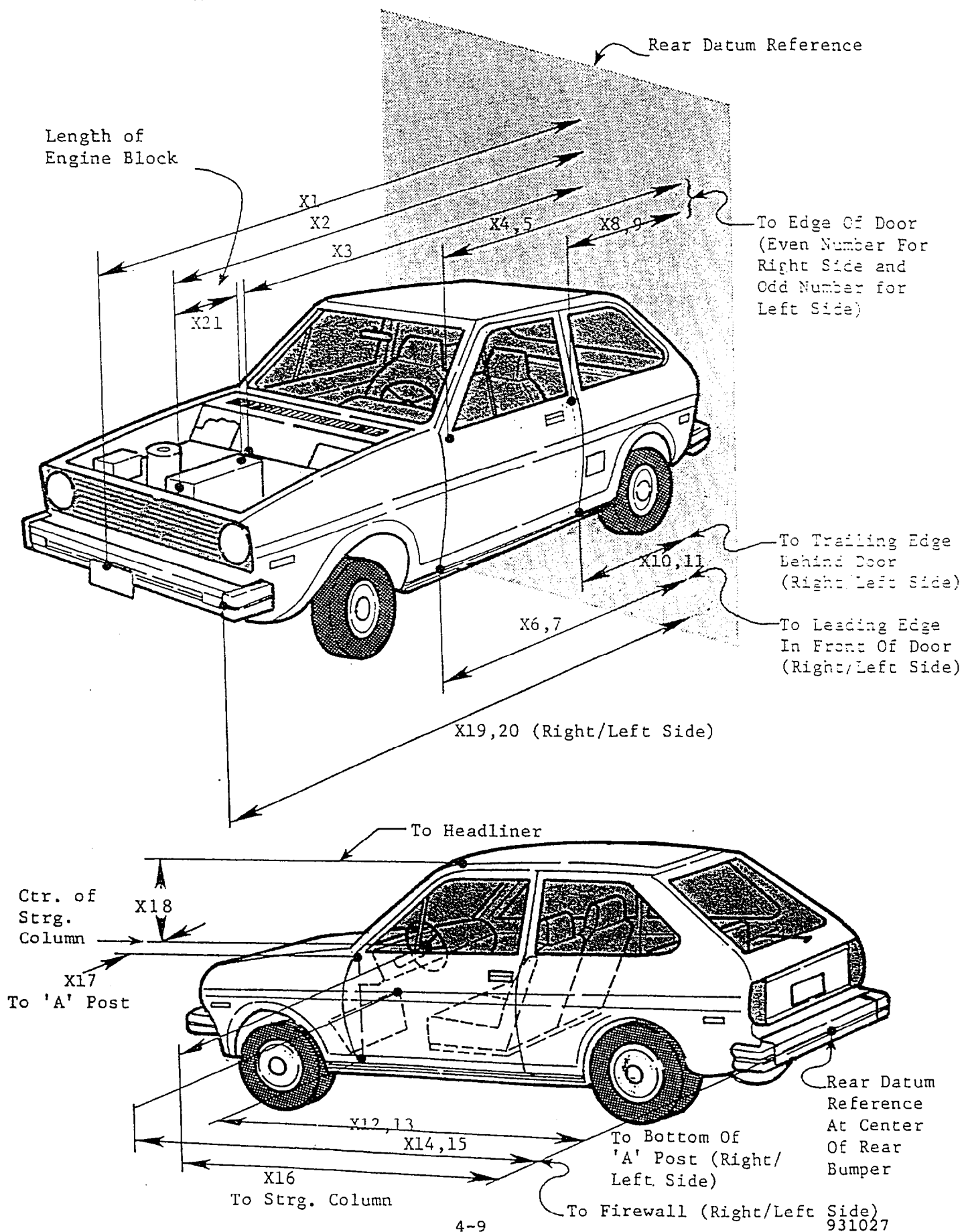


TABLE 14 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Lexus/GS300 TEST NUMBER: 931027

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4936	4935	561
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	4306	4035	271
X3	REAR SURFACE OF VEHICLE TO FIREWALL	3656	3391	265
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3395	3407	-12
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3398	3411	-13
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3375	3331	44
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3380	3345	35
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2280	2290	-10
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2280	2290	-10
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2278	2245	33
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2288	2253	35
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3357	3332	25
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3361	3346	15
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	3654	3515	139
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3620	3554	66
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	2947	2860	87
X17	CENTER OF STEERING COLUMN TO "A" POST	252	245	7
X18	CENTER OF STEERING COLUMN TO HEADLINER	413	400	13
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4781	4340	441
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4810	4386	424
X21	LENGTH OF ENGINE BLOCK	635	635	0

All measurements are in millimeters.

APPENDIX A

PHOTOGRAPHS

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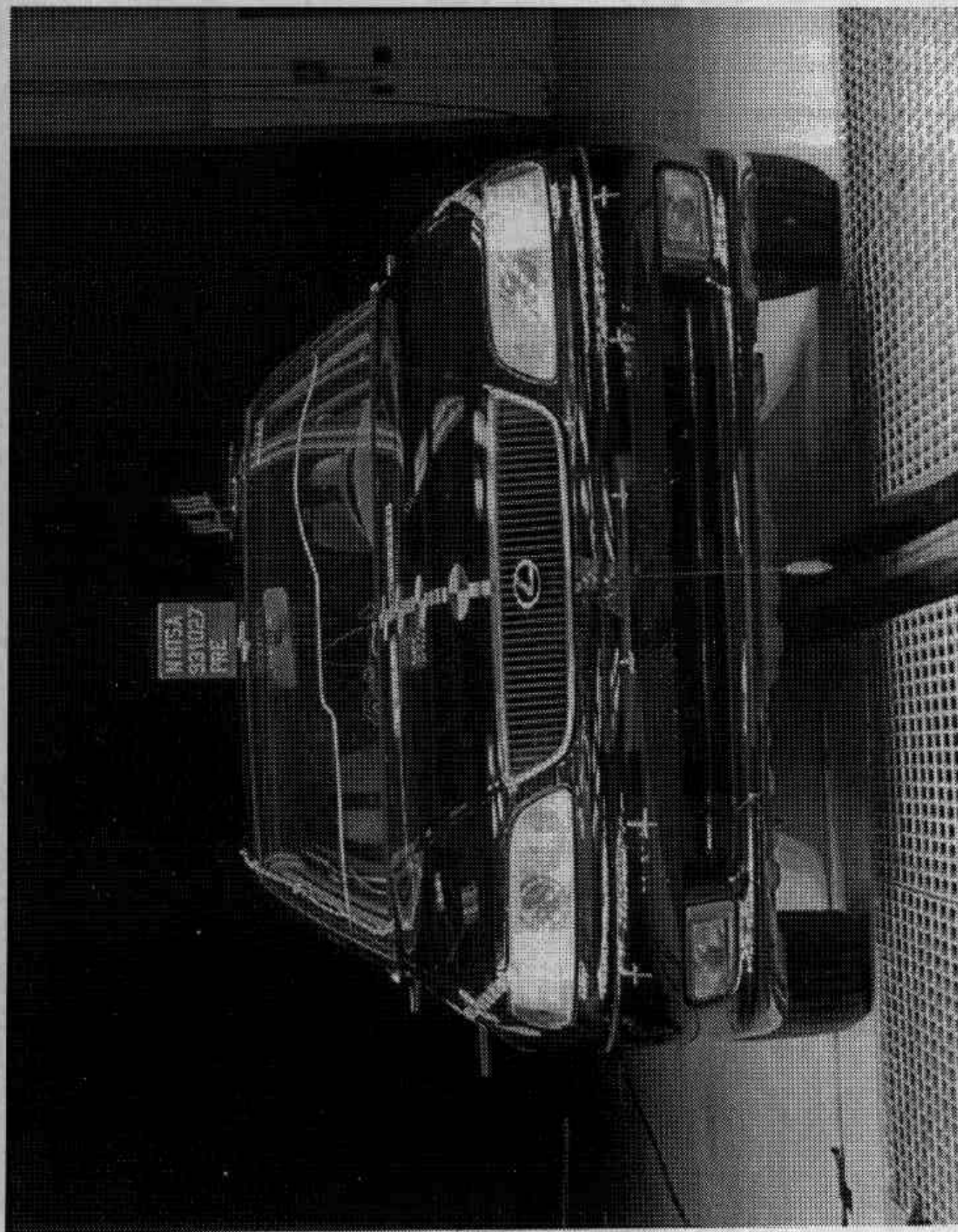


Figure A-1. PRE-TEST FRONT VIEW
A-2

931027

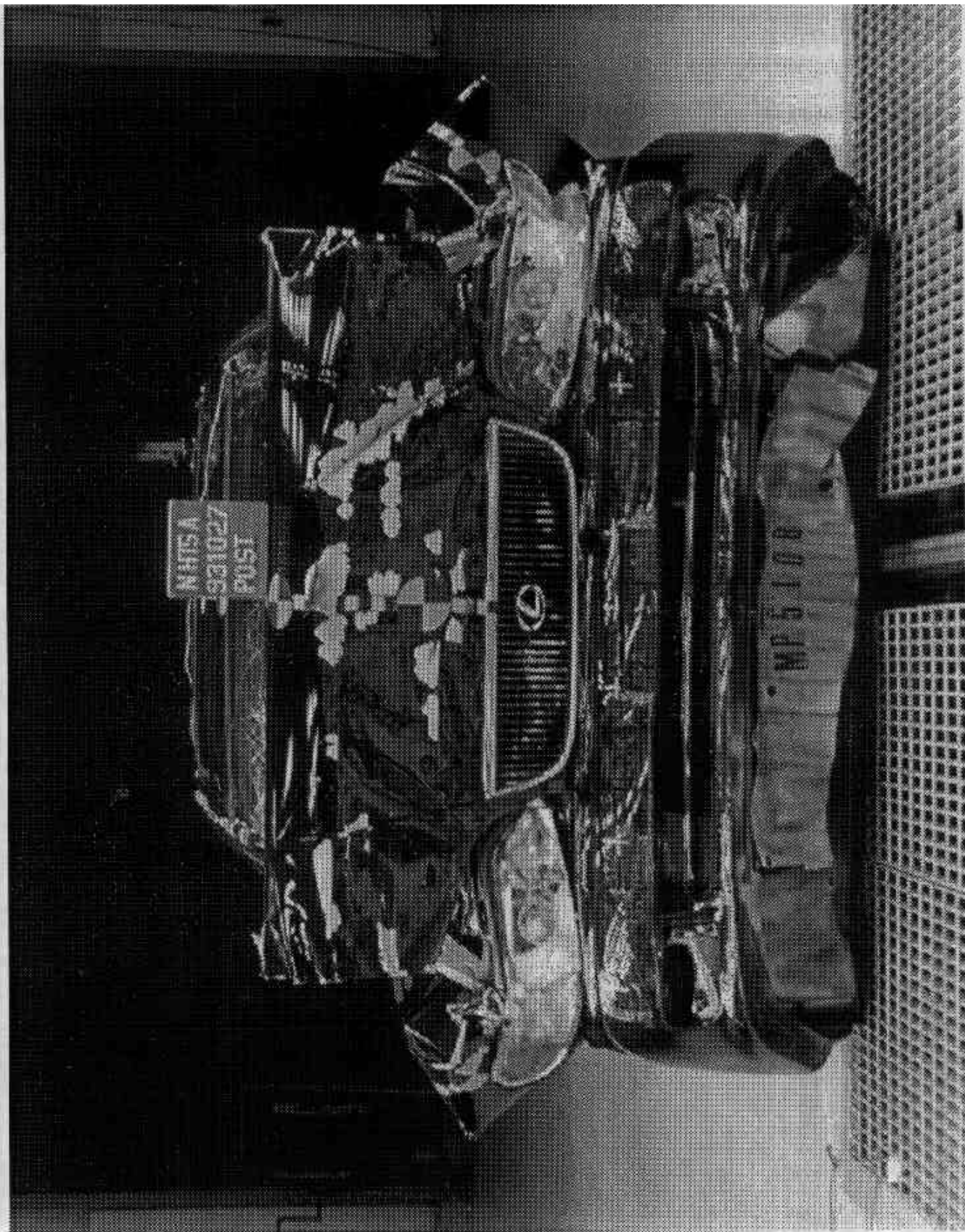


Figure A-2. POST-TEST FRONT VIEW

A-3

931027

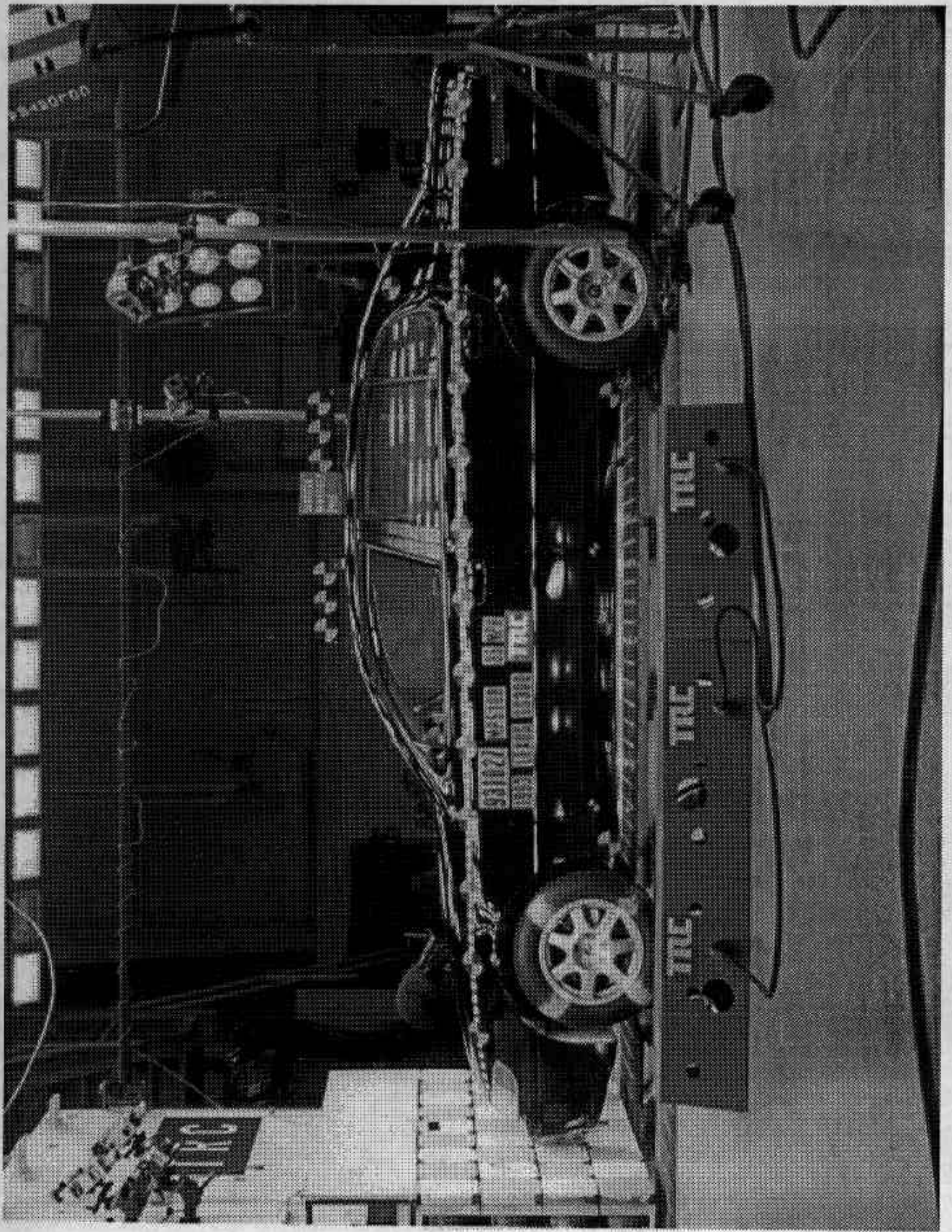


Figure A-3. PRE-TEST LEFT SIDE VIEW

A-4

931027

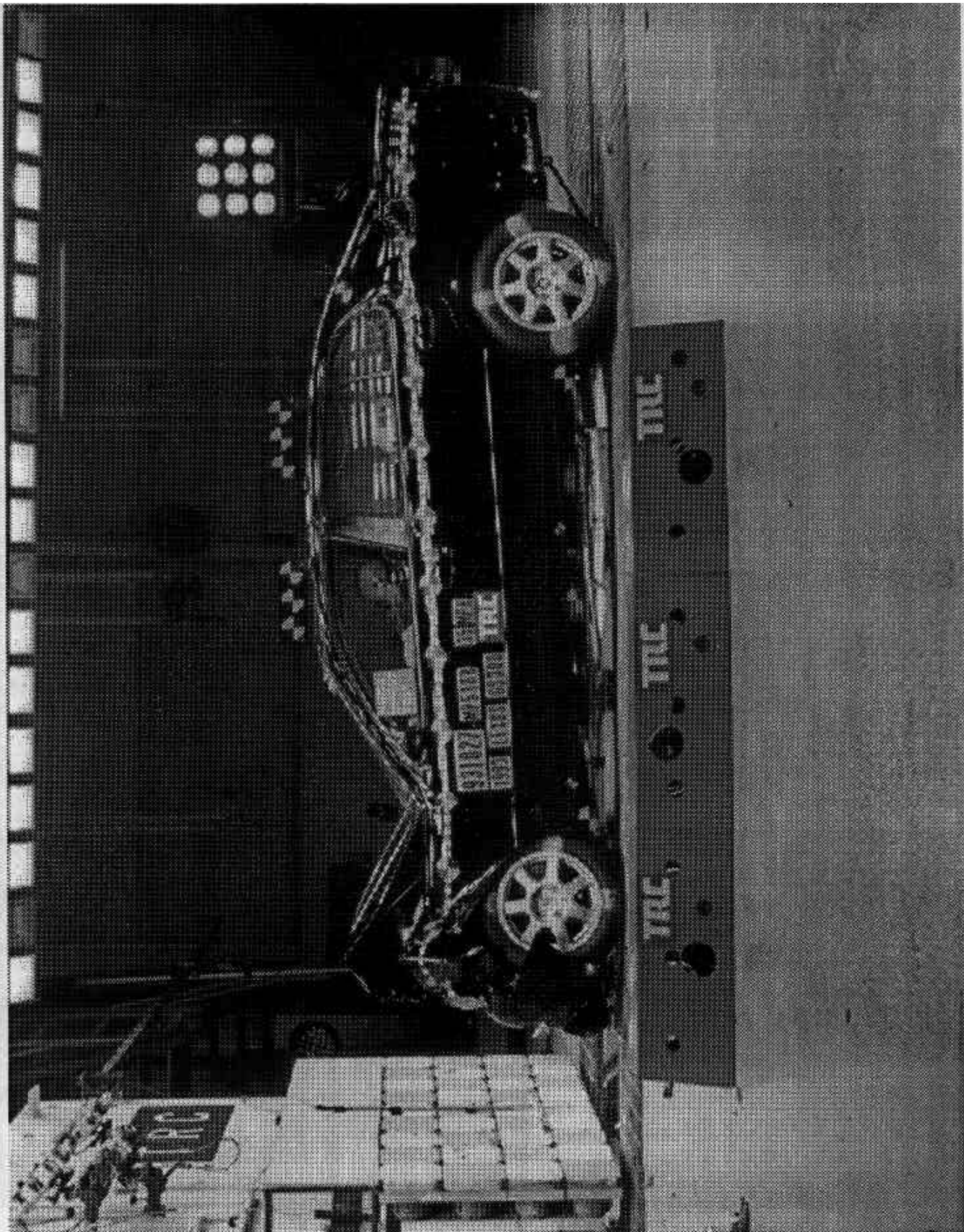


Figure A-4. POST-TEST LEFT SIDE VIEW
A-5

931027

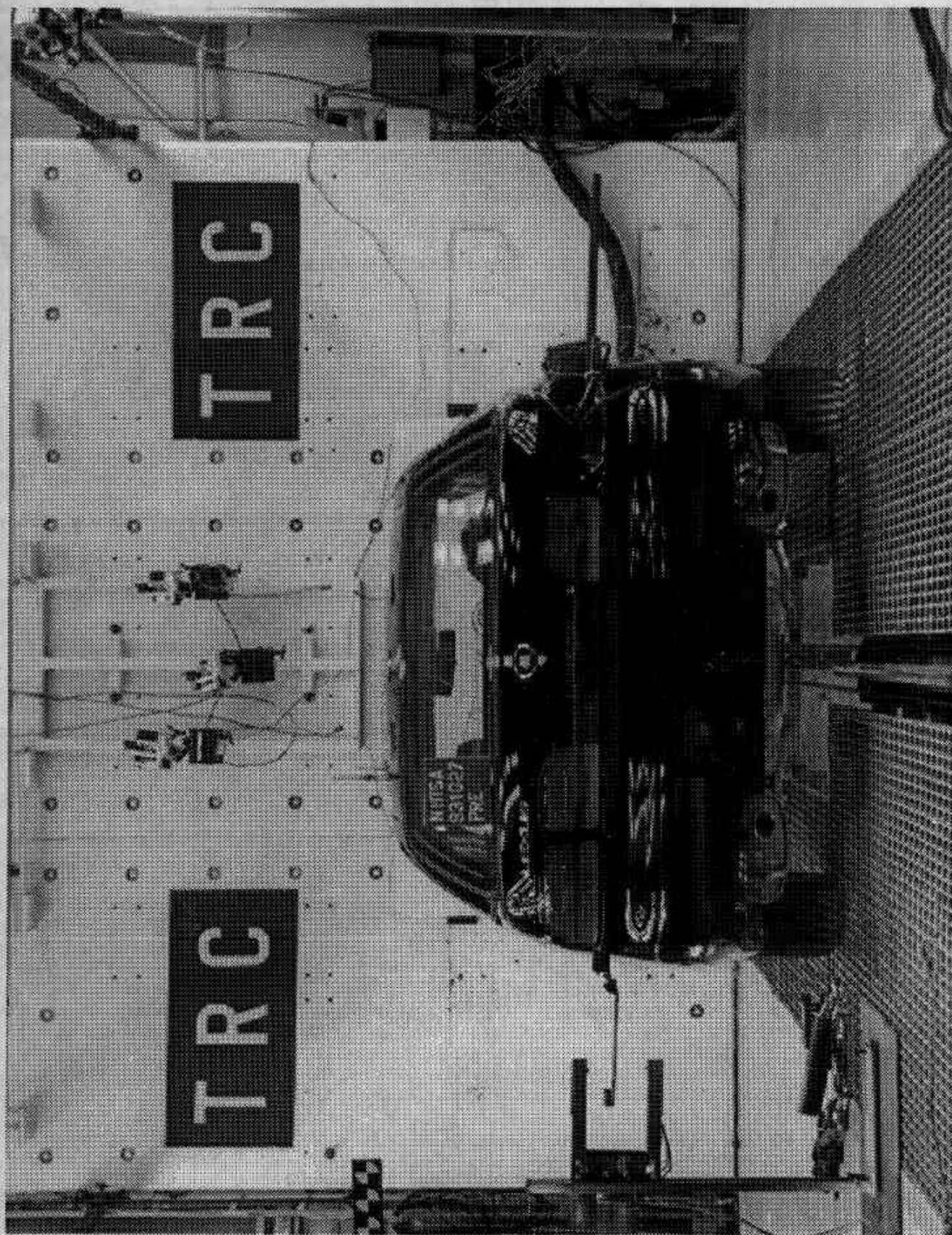


Figure A-5. PRE-TEST REAR VIEW

A-6

931027

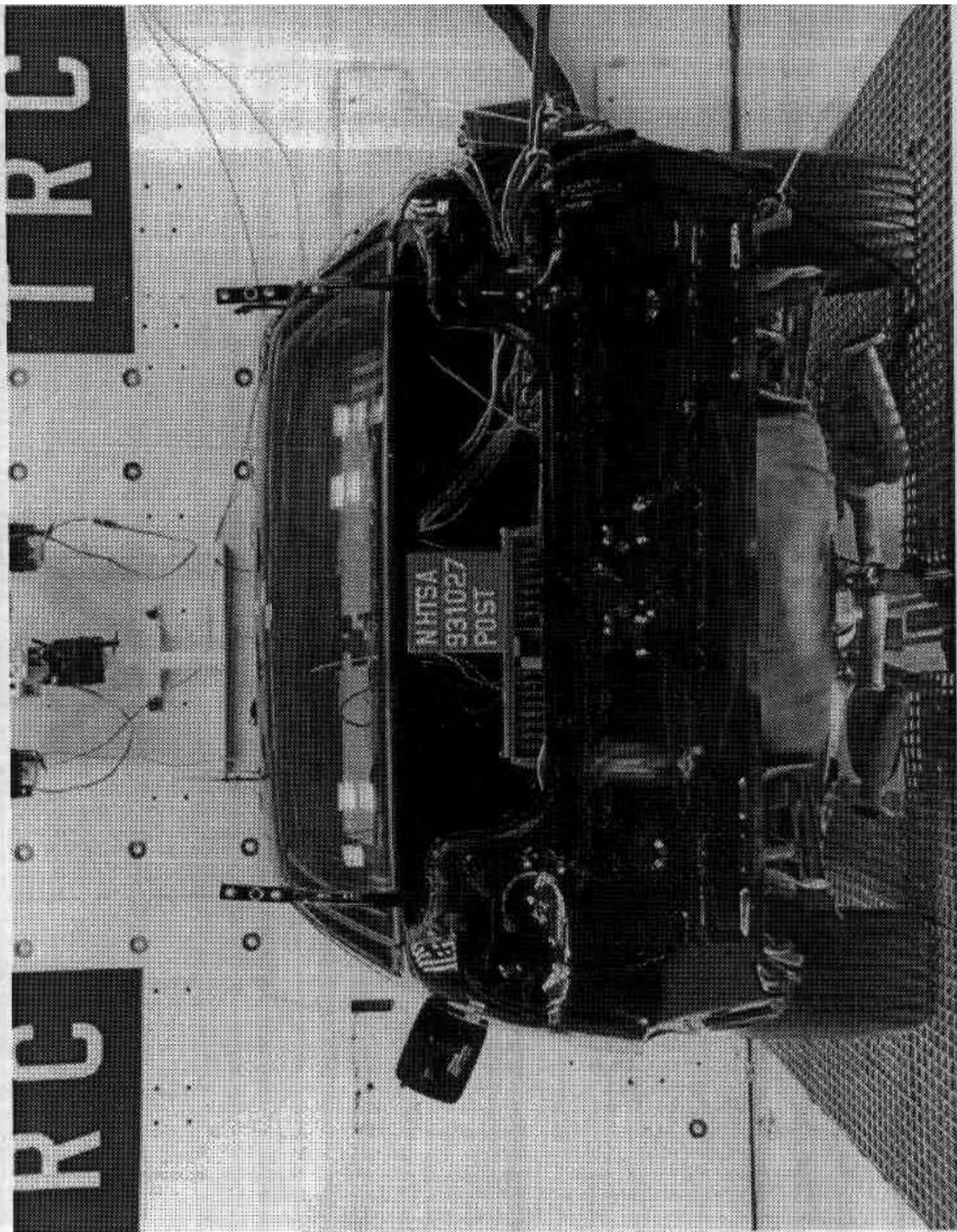


Figure A-6. POST-TEST REAR VIEW

A-7

931027

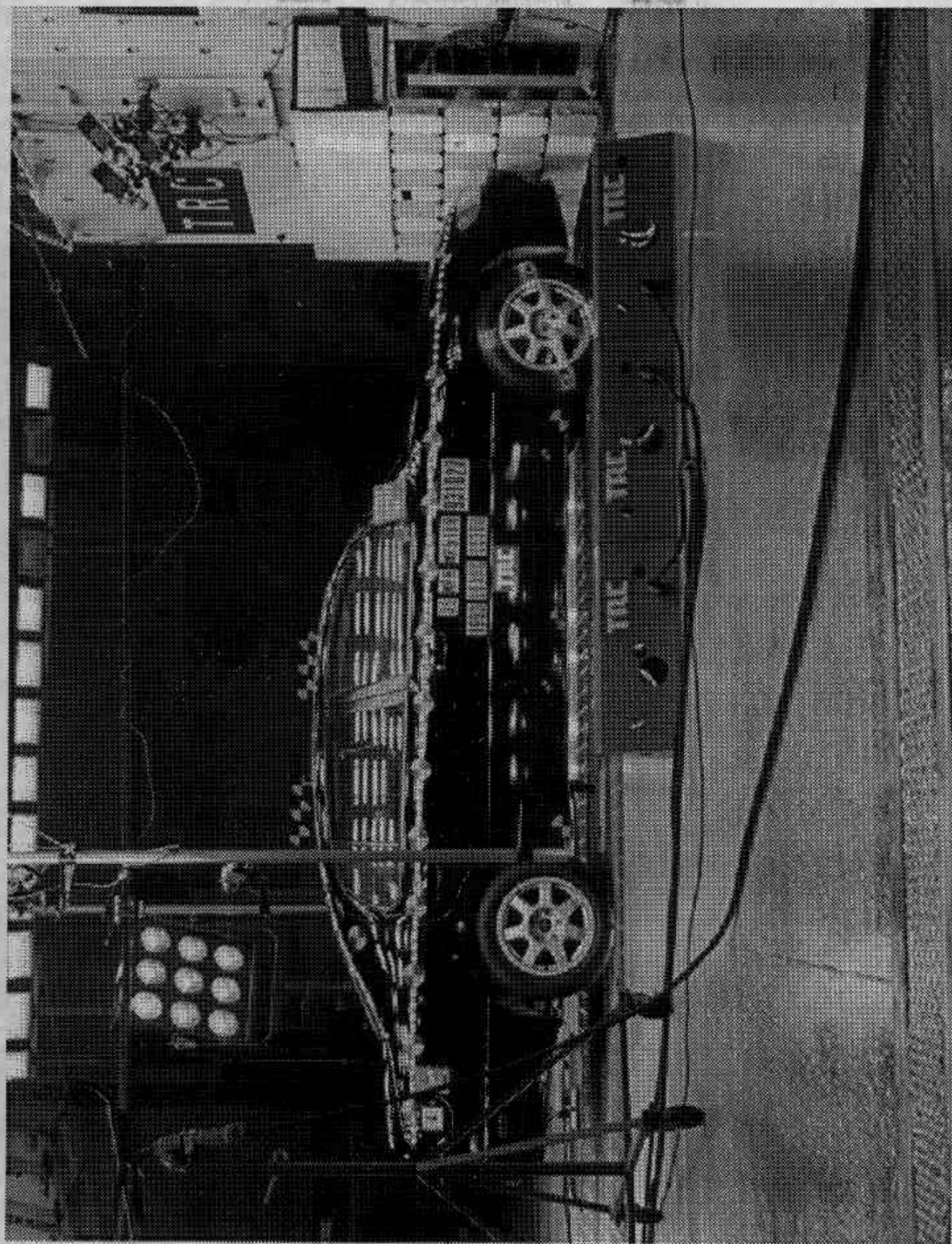


Figure A-7. PRE-TEST RIGHT SIDE VIEW

A-8

931027

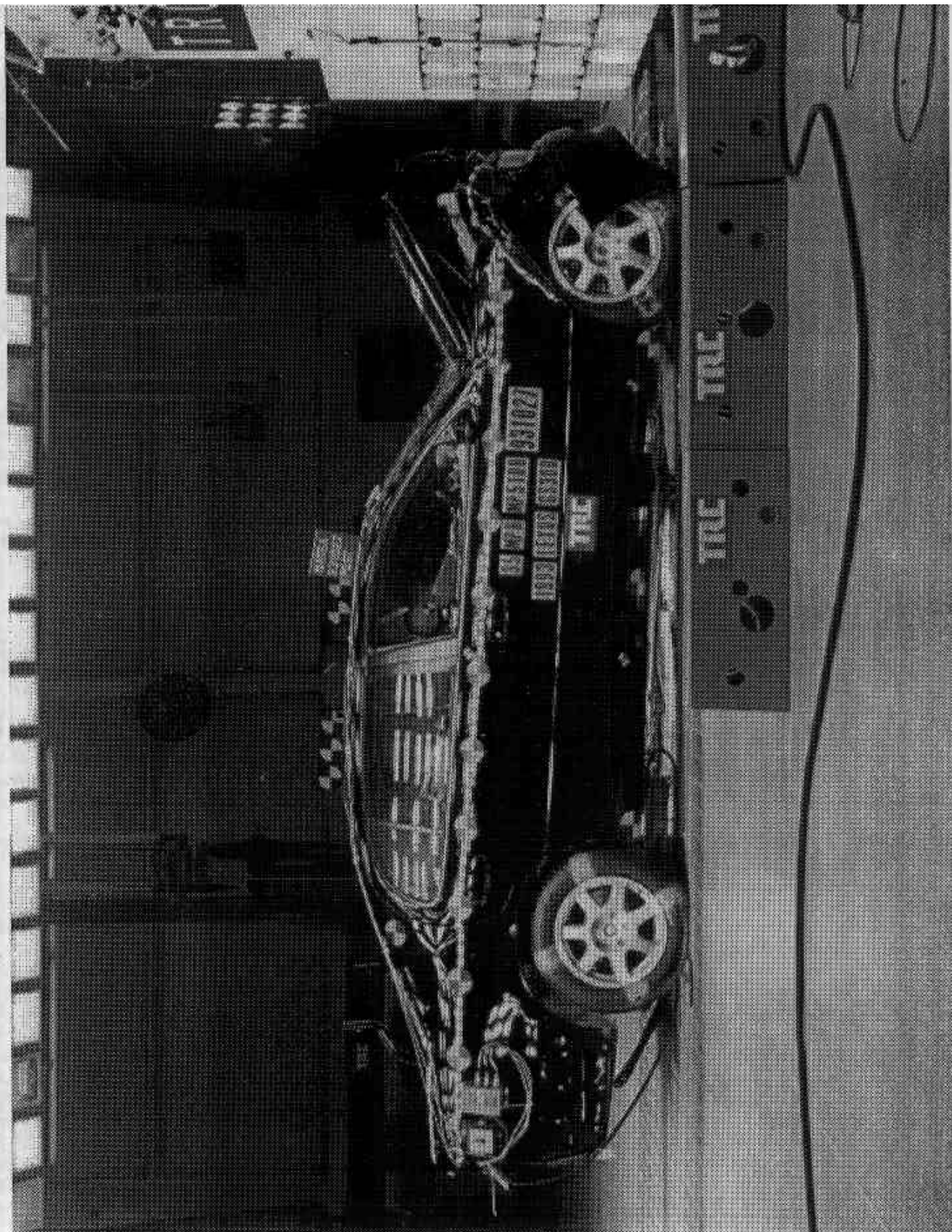


Figure A-8. POST-TEST RIGHT SIDE VIEW
A-9

931027

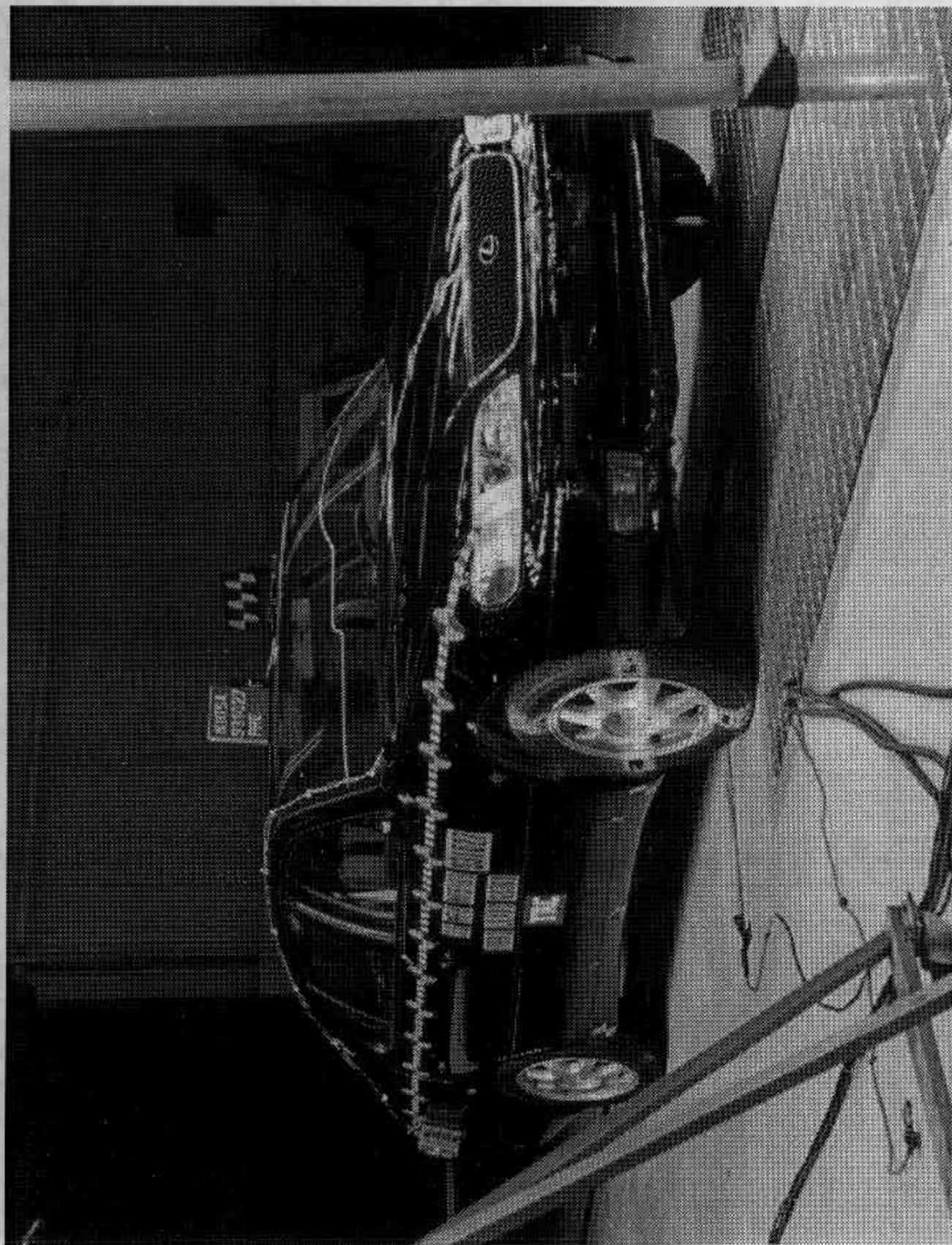


Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

931027

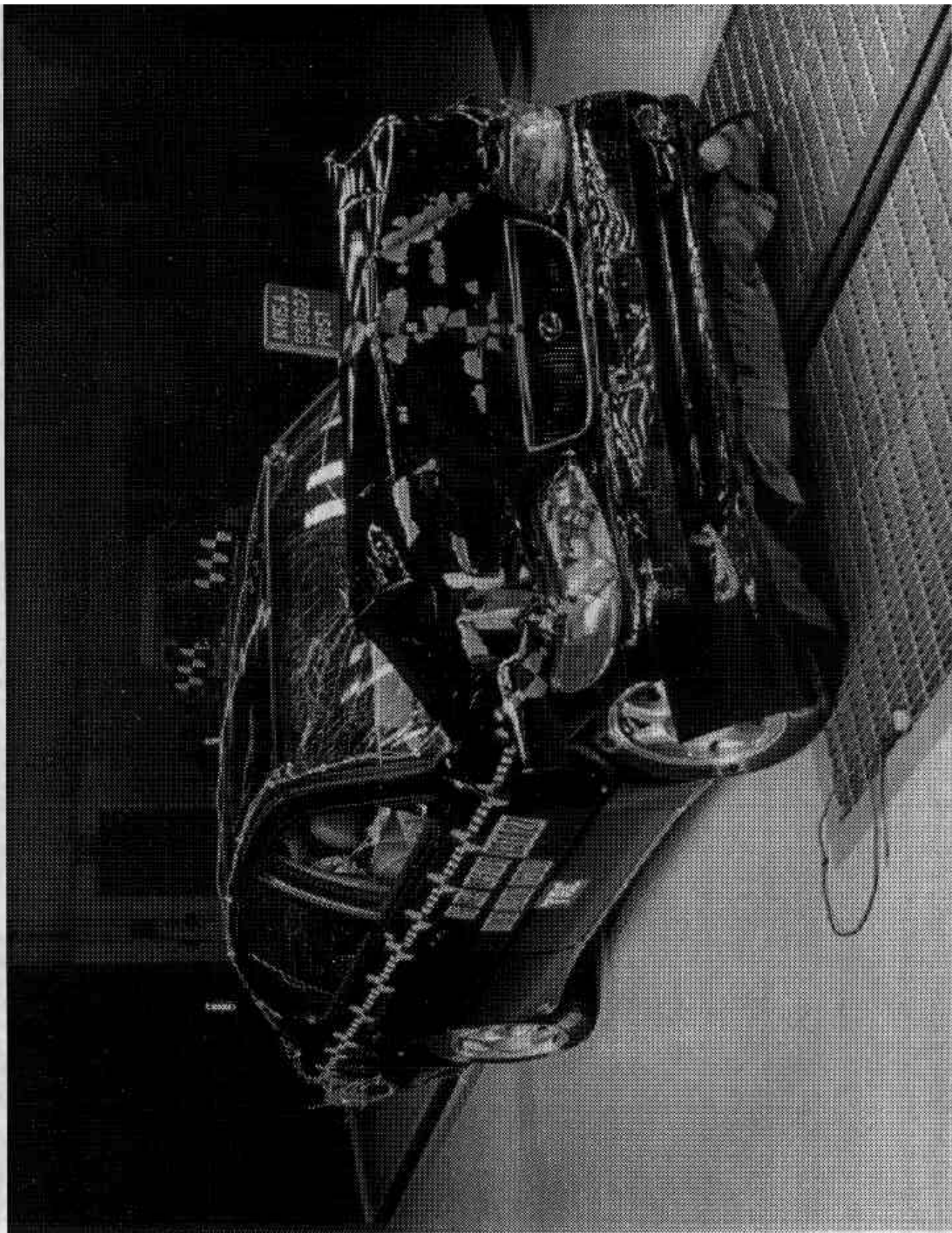


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

931027

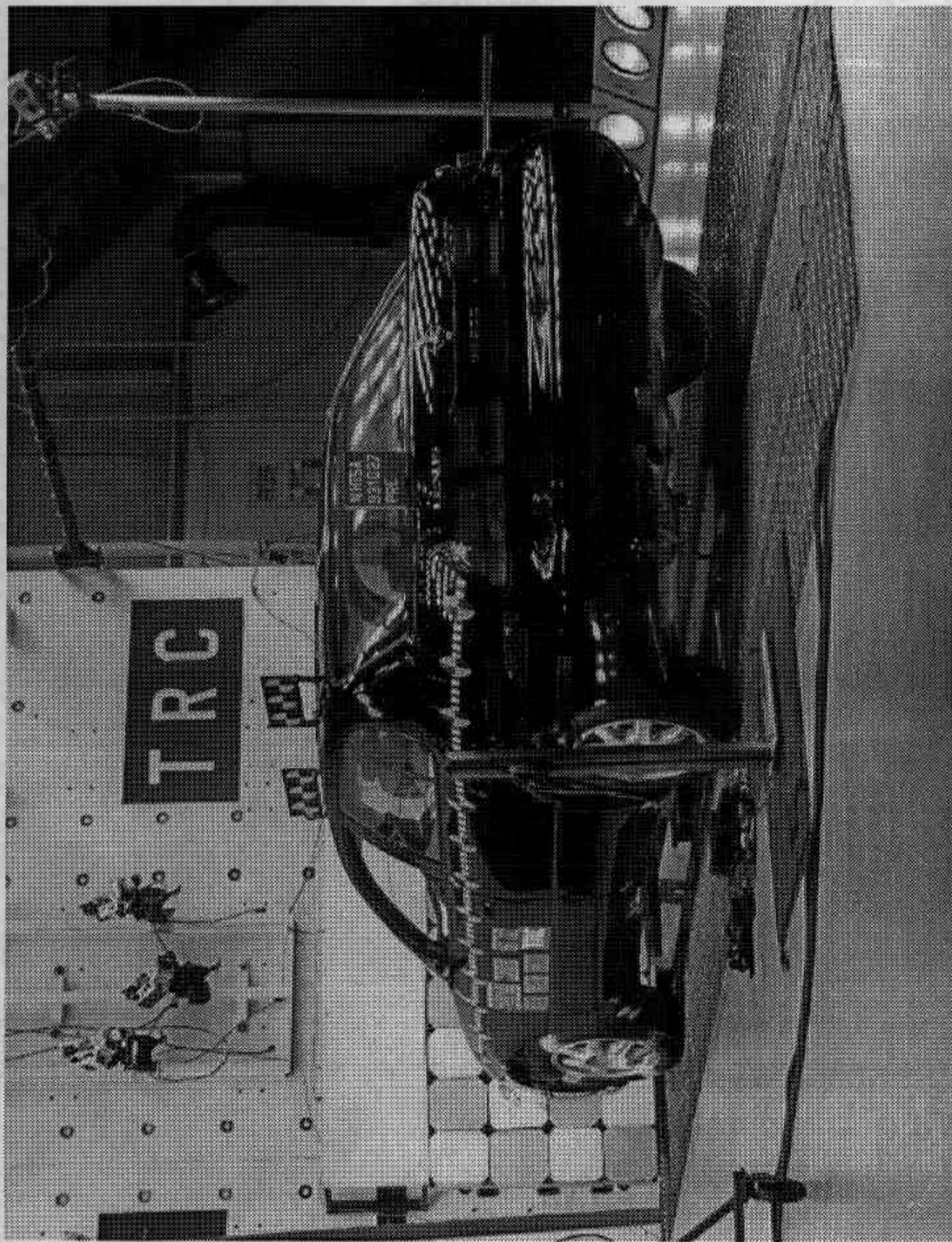


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

931027

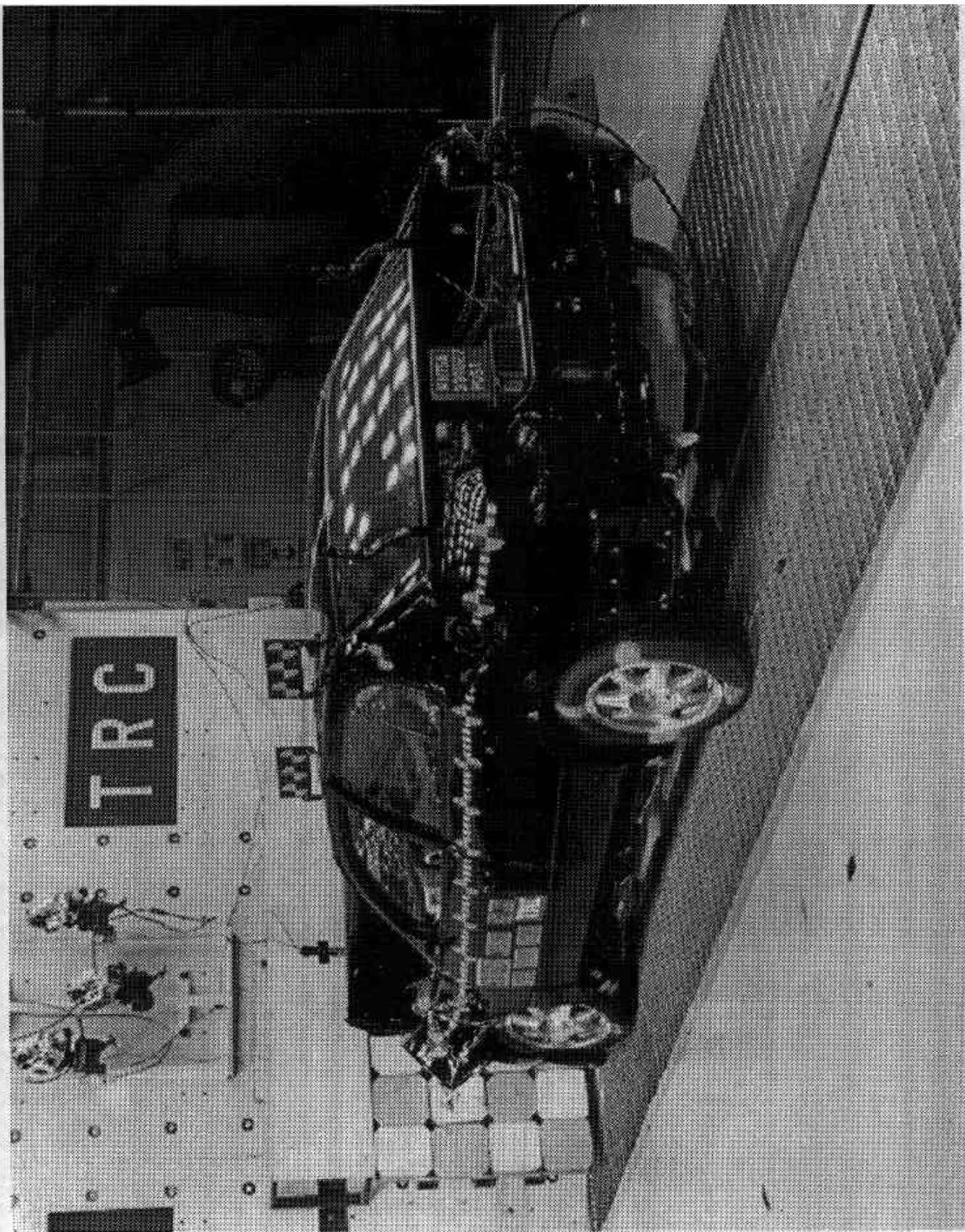


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

931027

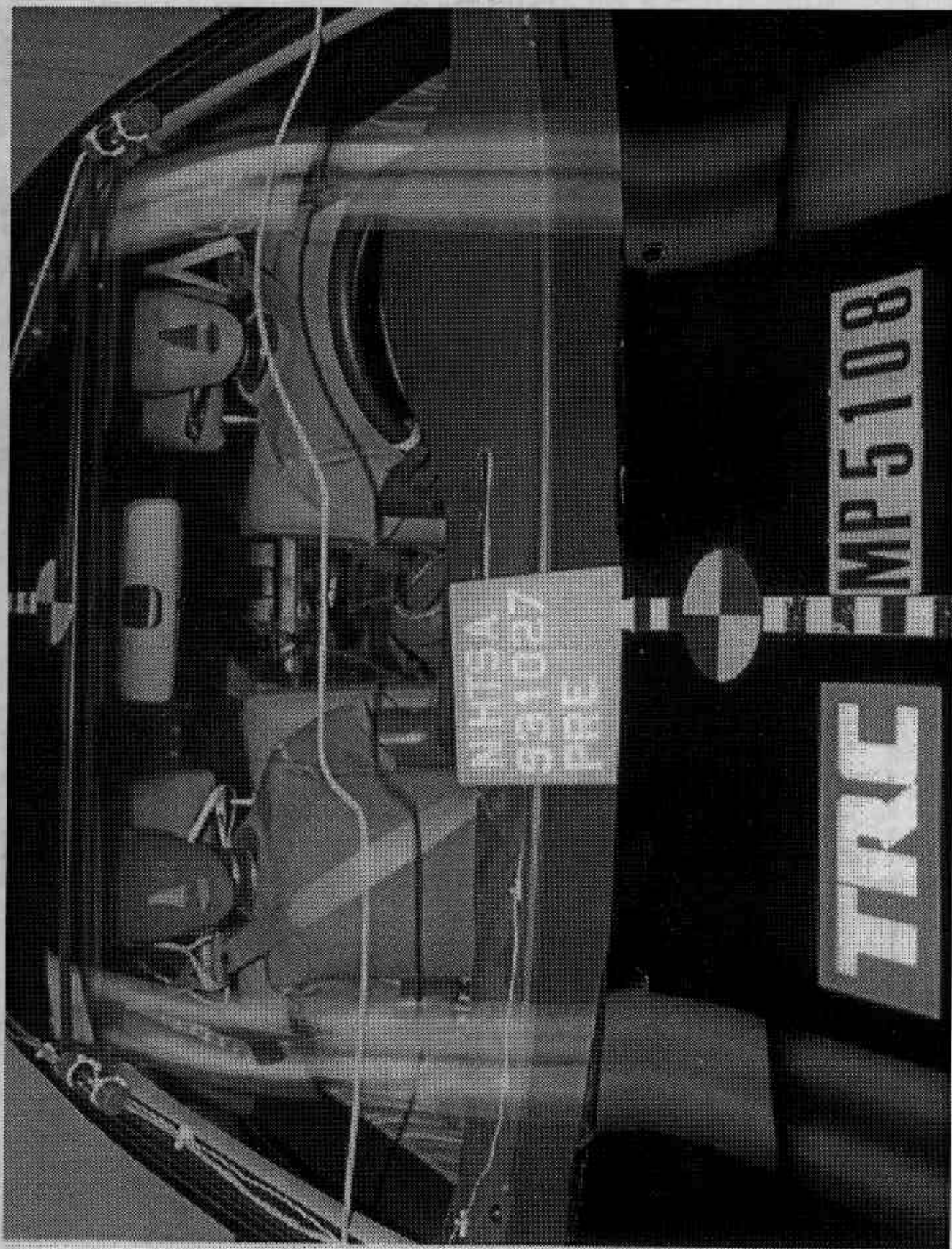


Figure A-13. PRE-TEST WINDSHIELD VIEW

A-14

931027

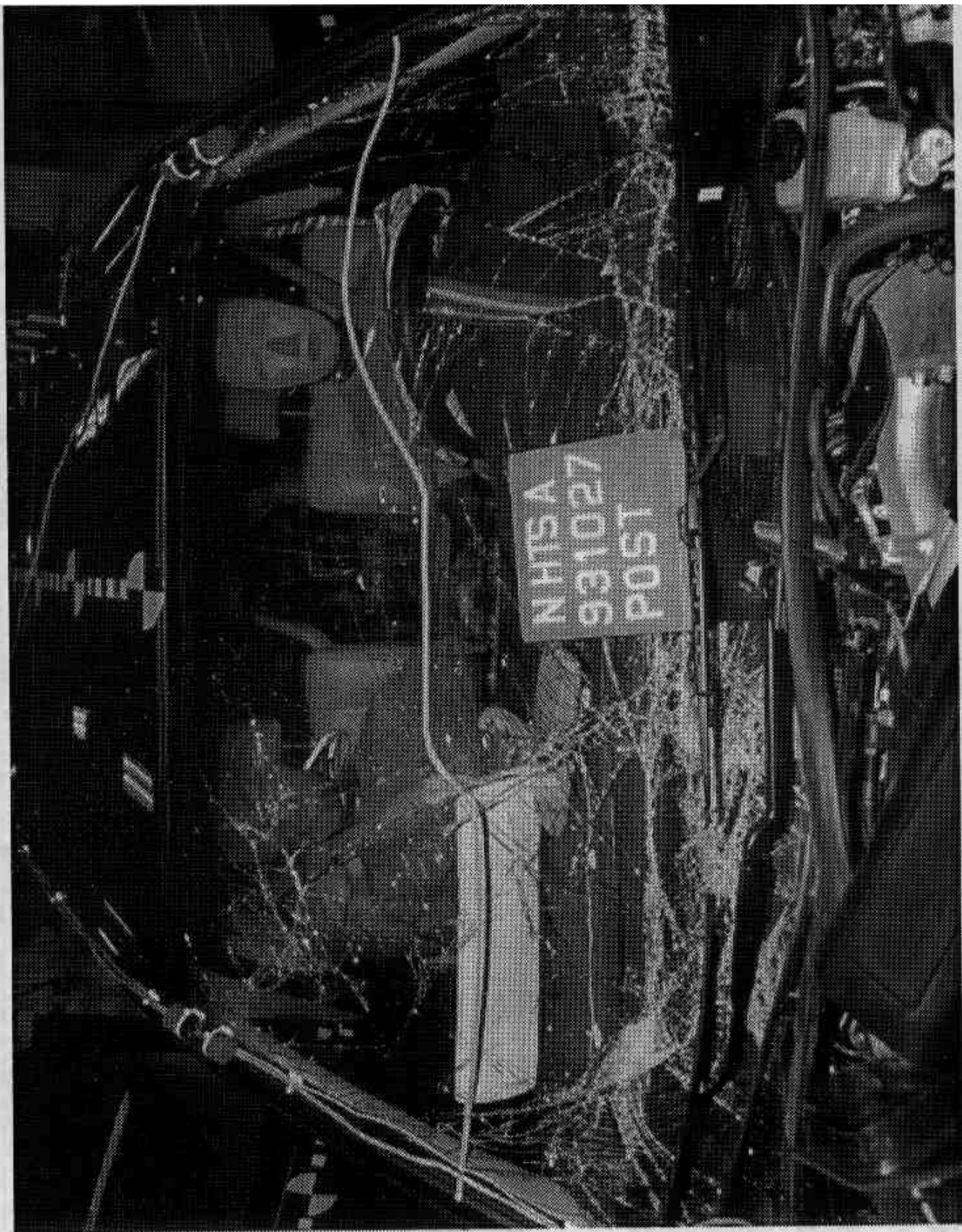


Figure A-14. POST-TEST WINDSHIELD VIEW
A-15

931027

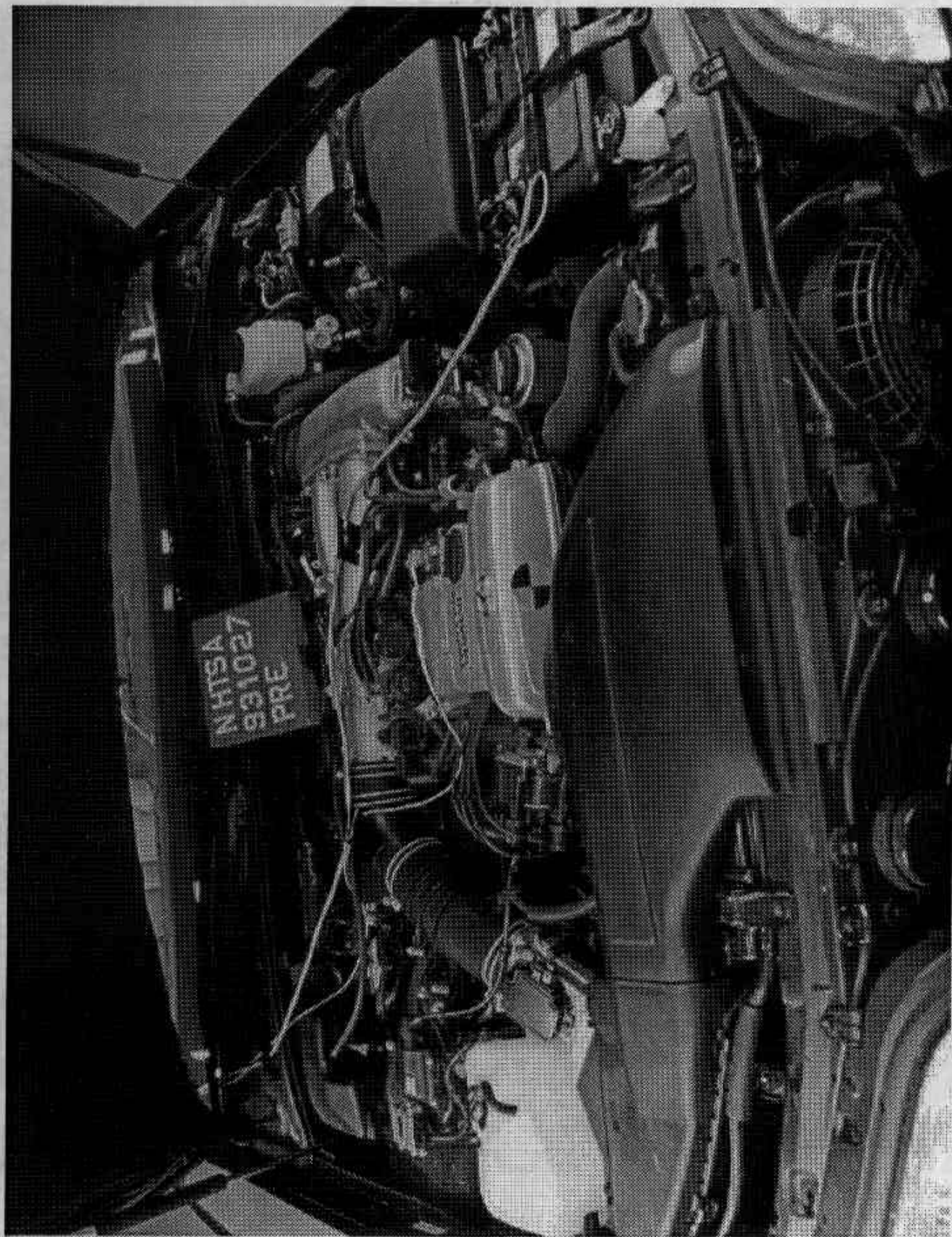


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

931027

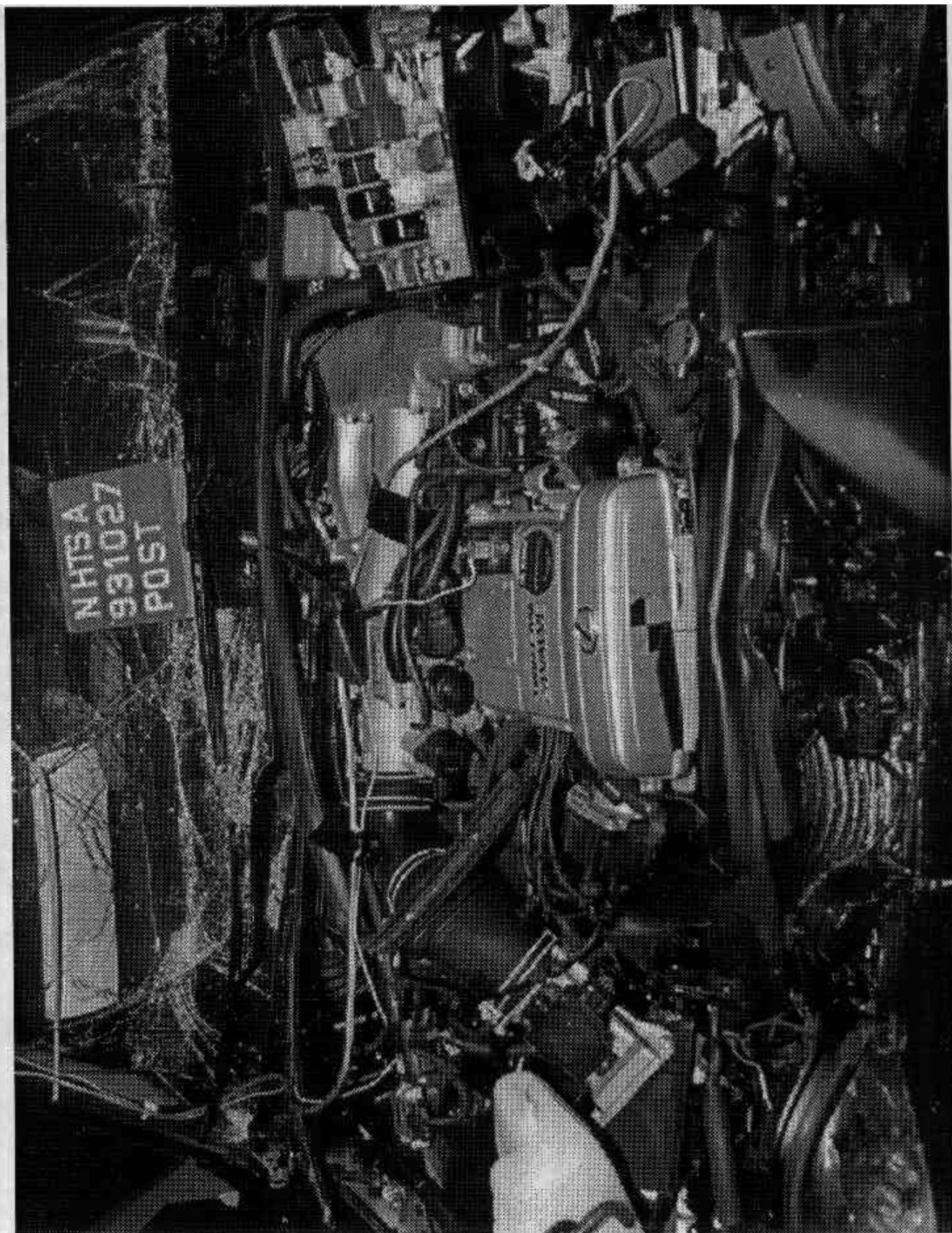


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW
A-17

931027

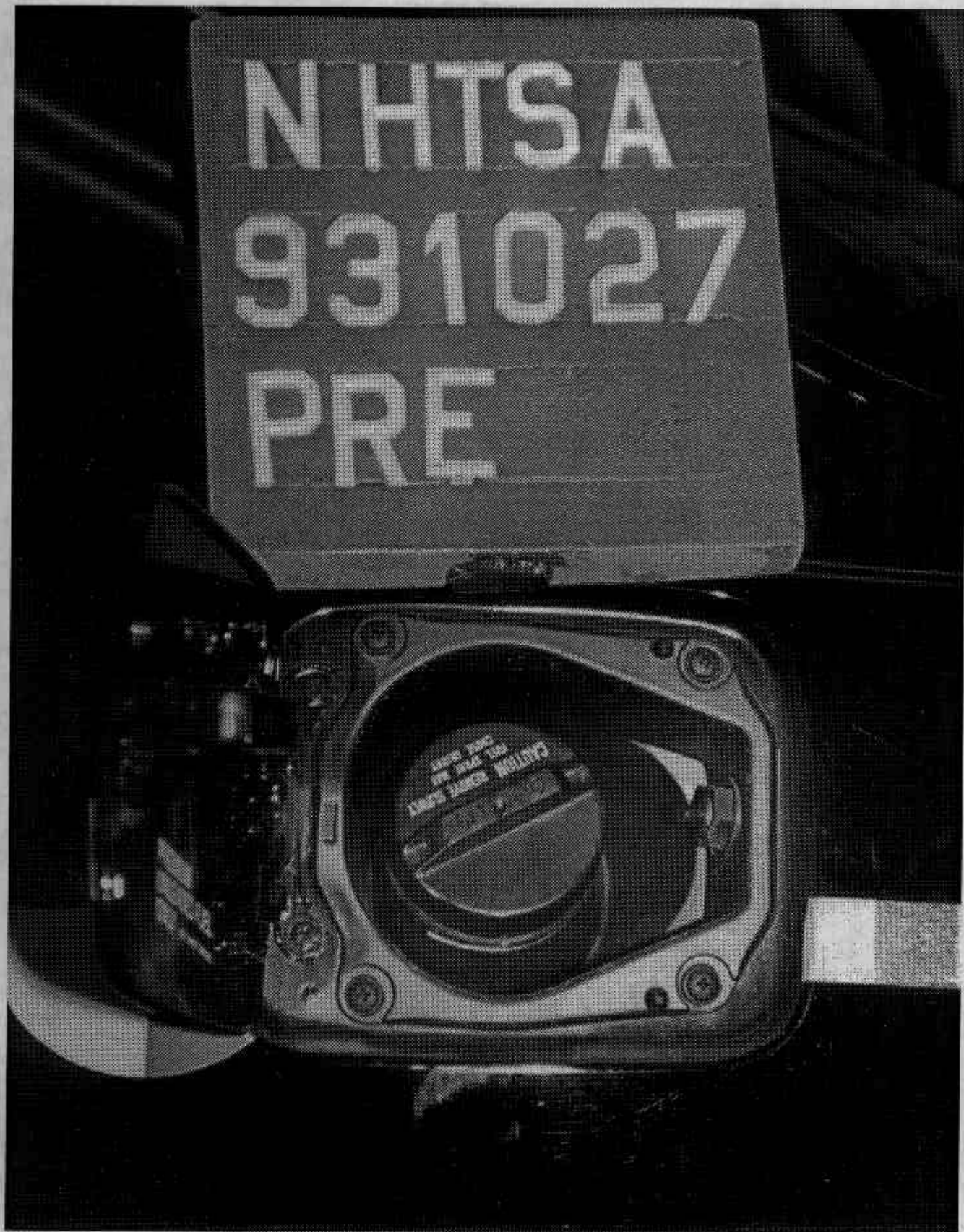


Figure A-17. PRE-TEST FUEL FILLER CAP VIEW
A-18

931027

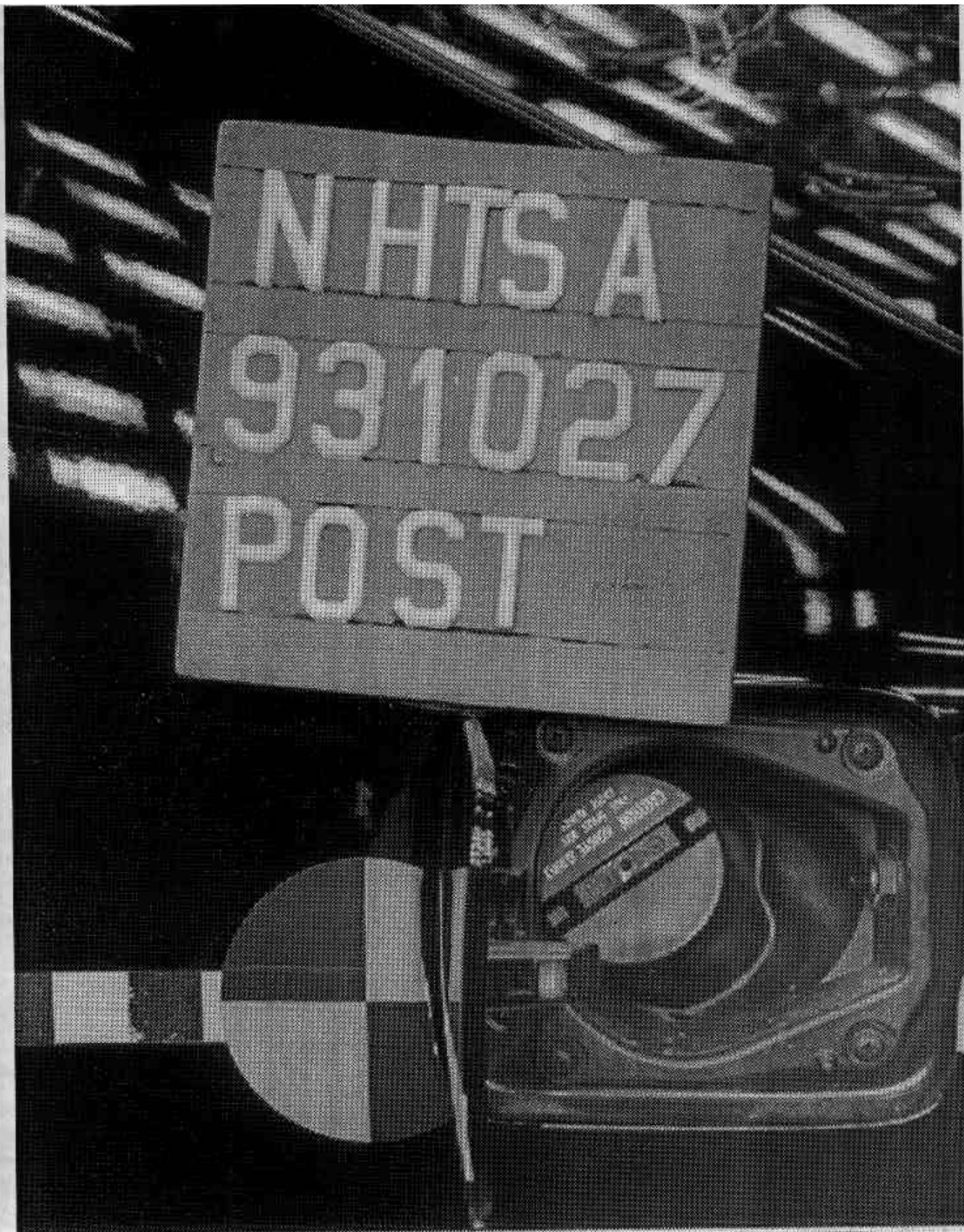


Figure A-18. POST-TEST FUEL FILLER CAP VIEW

A-19

931027



Figure A-19. POST-TEST FUEL FILLER NECK AND FUEL TANK VIEW
A-20 931027

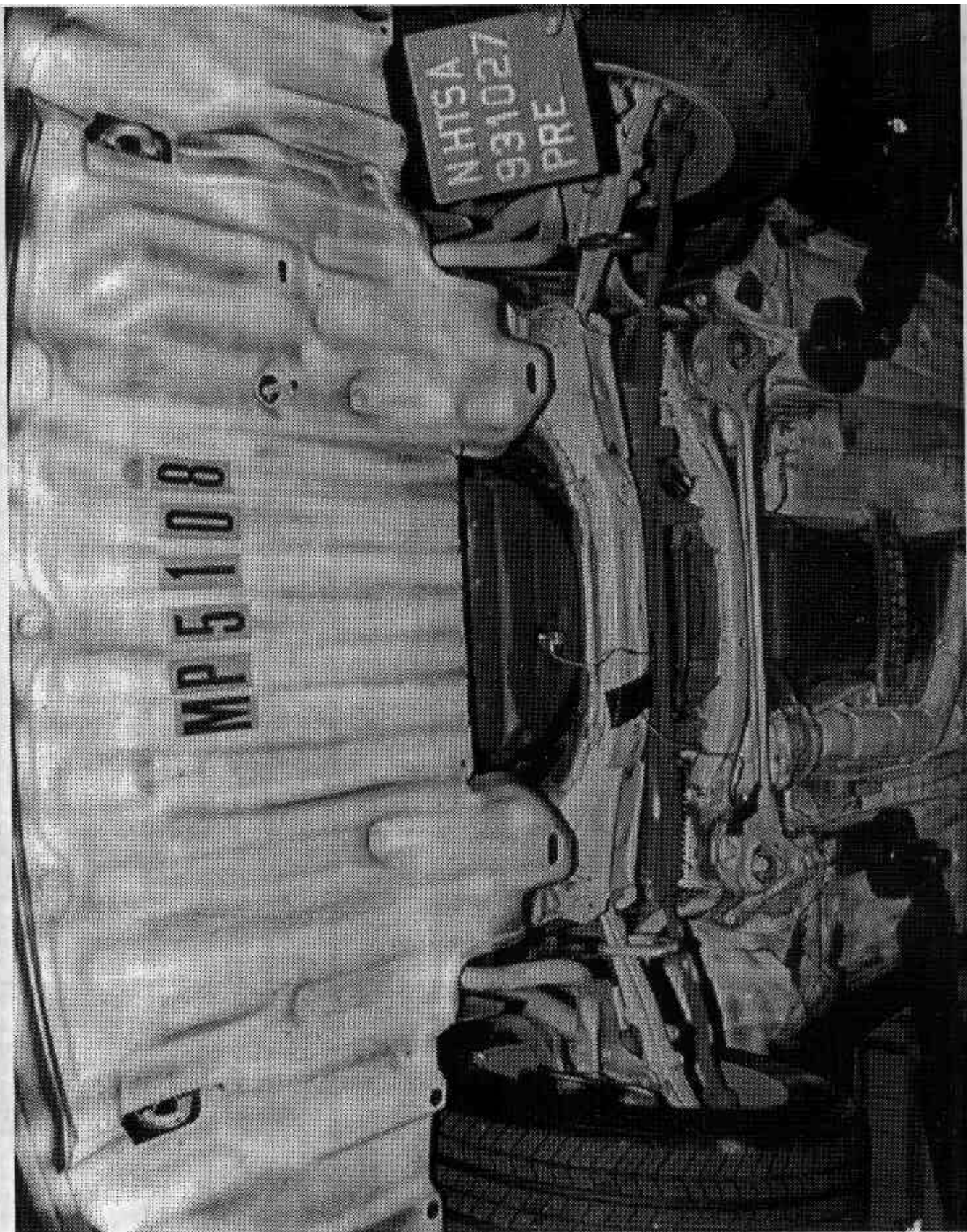


Figure A-20. PRE-TEST FRONT UNDERBODY VIEW

A-21

931027

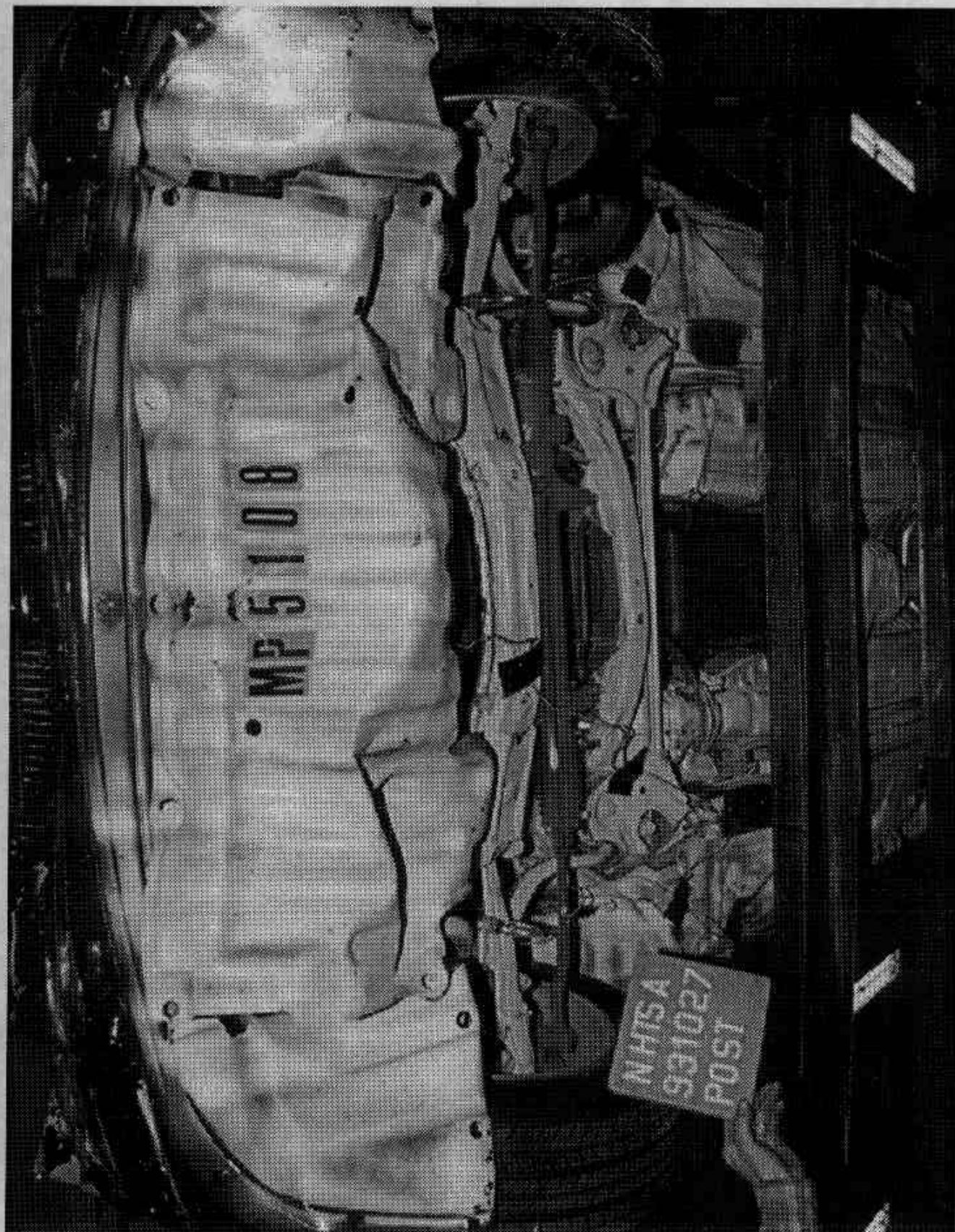


Figure A-21. POST-TEST FRONT UNDERBODY VIEW

A-22

931027

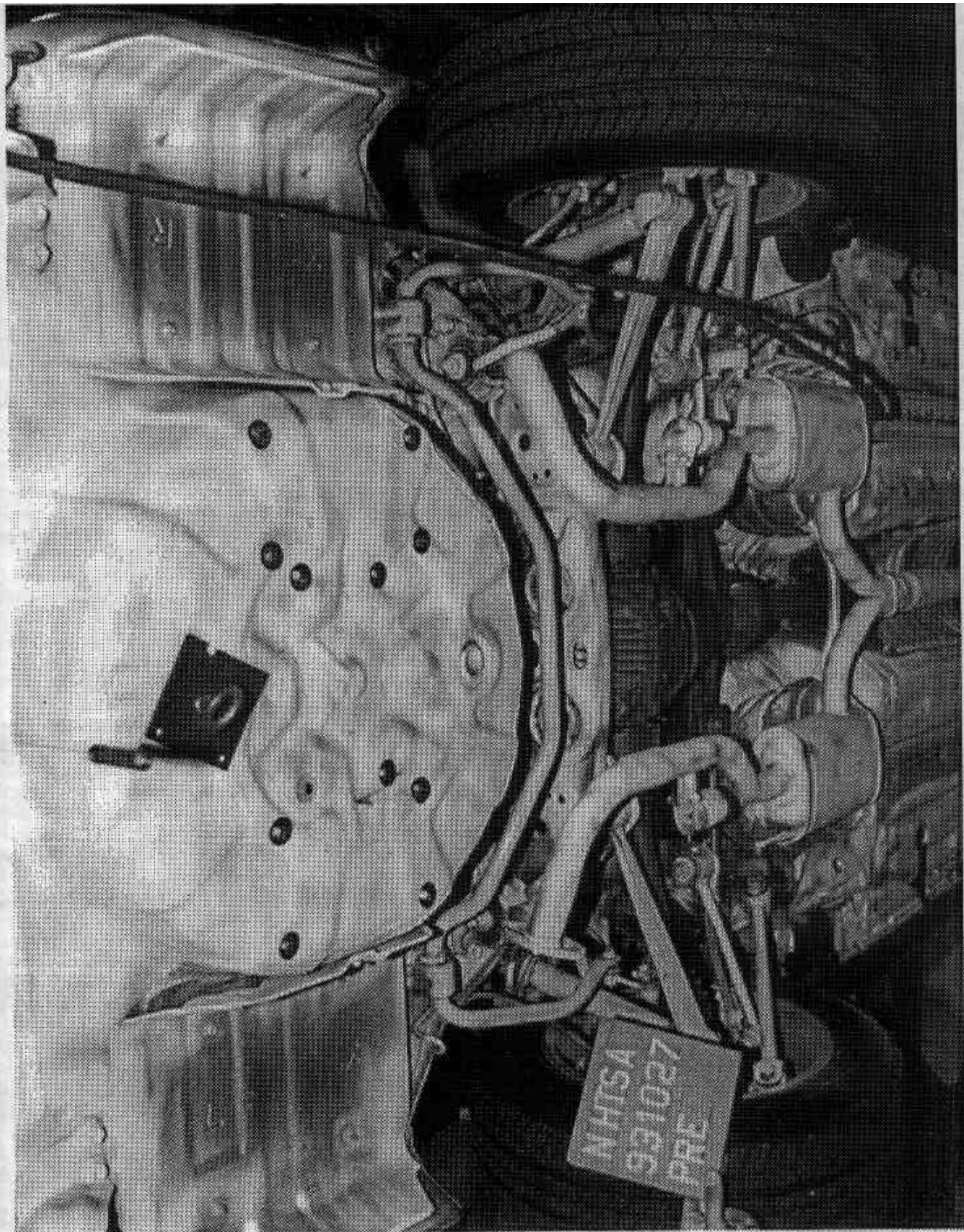


Figure A-22. PRE-TEST REAR UNDERBODY VIEW

A-23

931027

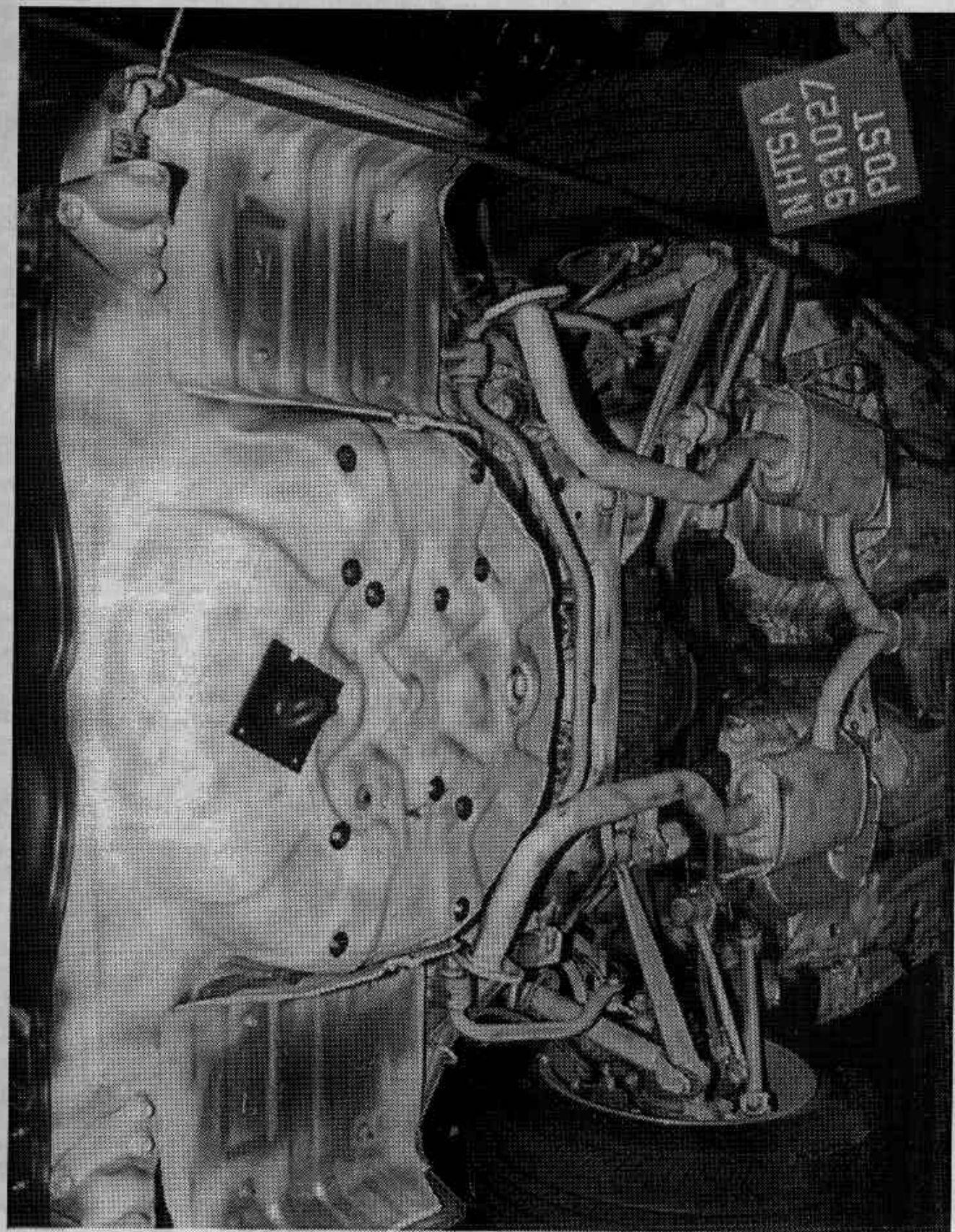


Figure A-23. POST-TEST REAR UNDERBODY VIEW

A-24

931027

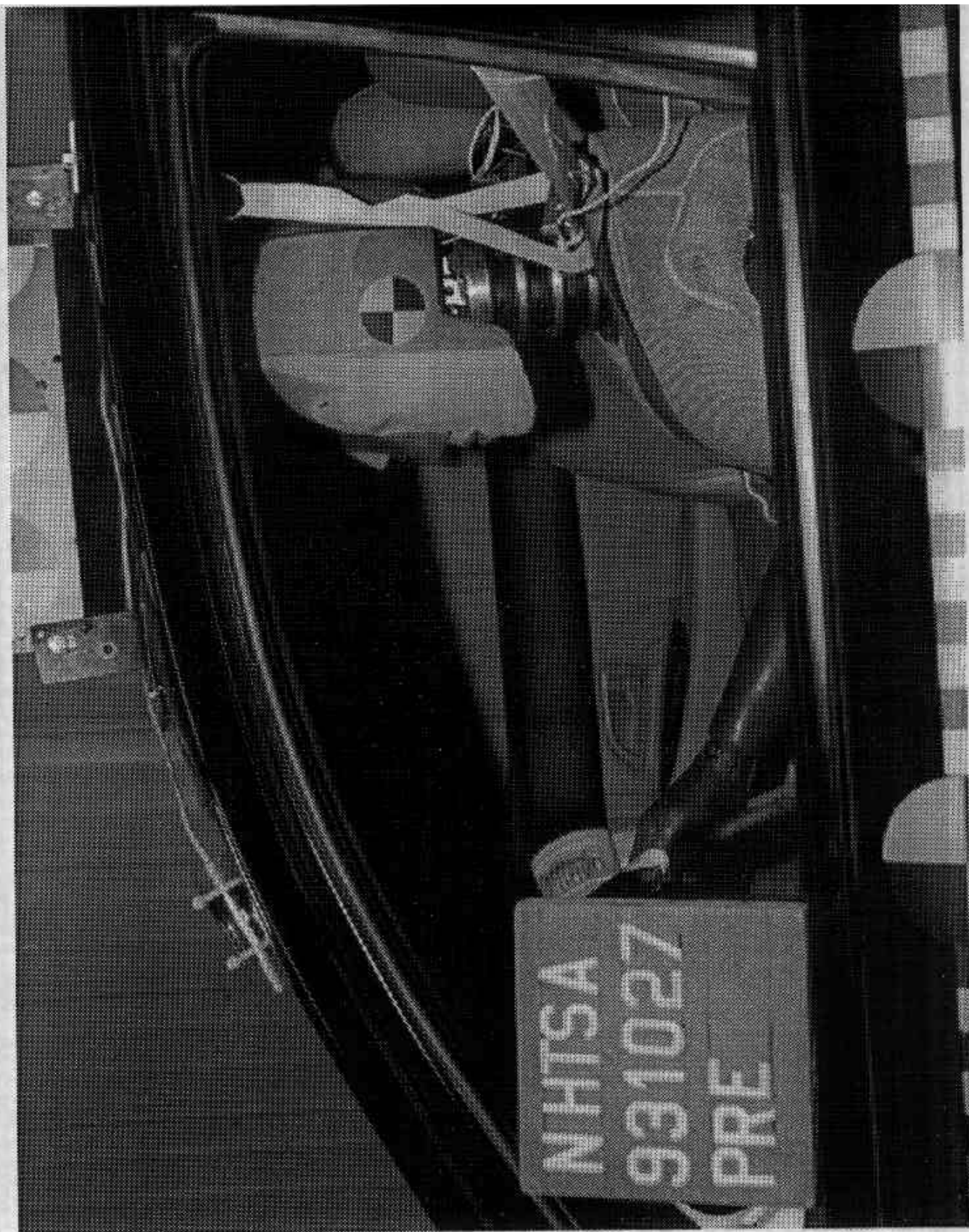


Figure A-24. PRE-TEST DRIVER DUMMY POSITION VIEW

A-25

931027

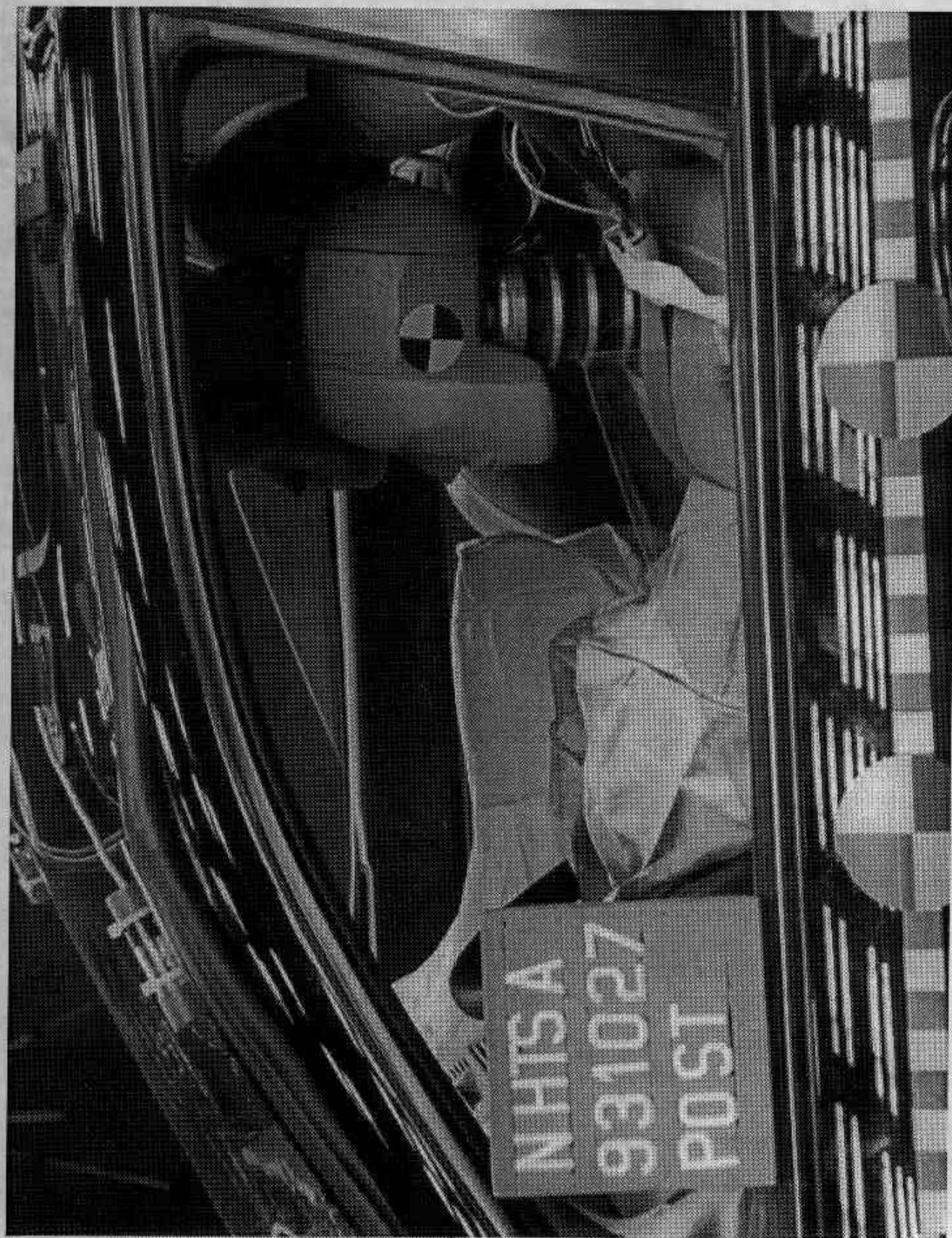


Figure A-25. POST-TEST DRIVER DUMMY POSITION VIEW

A-26

931027



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

A-27

931027

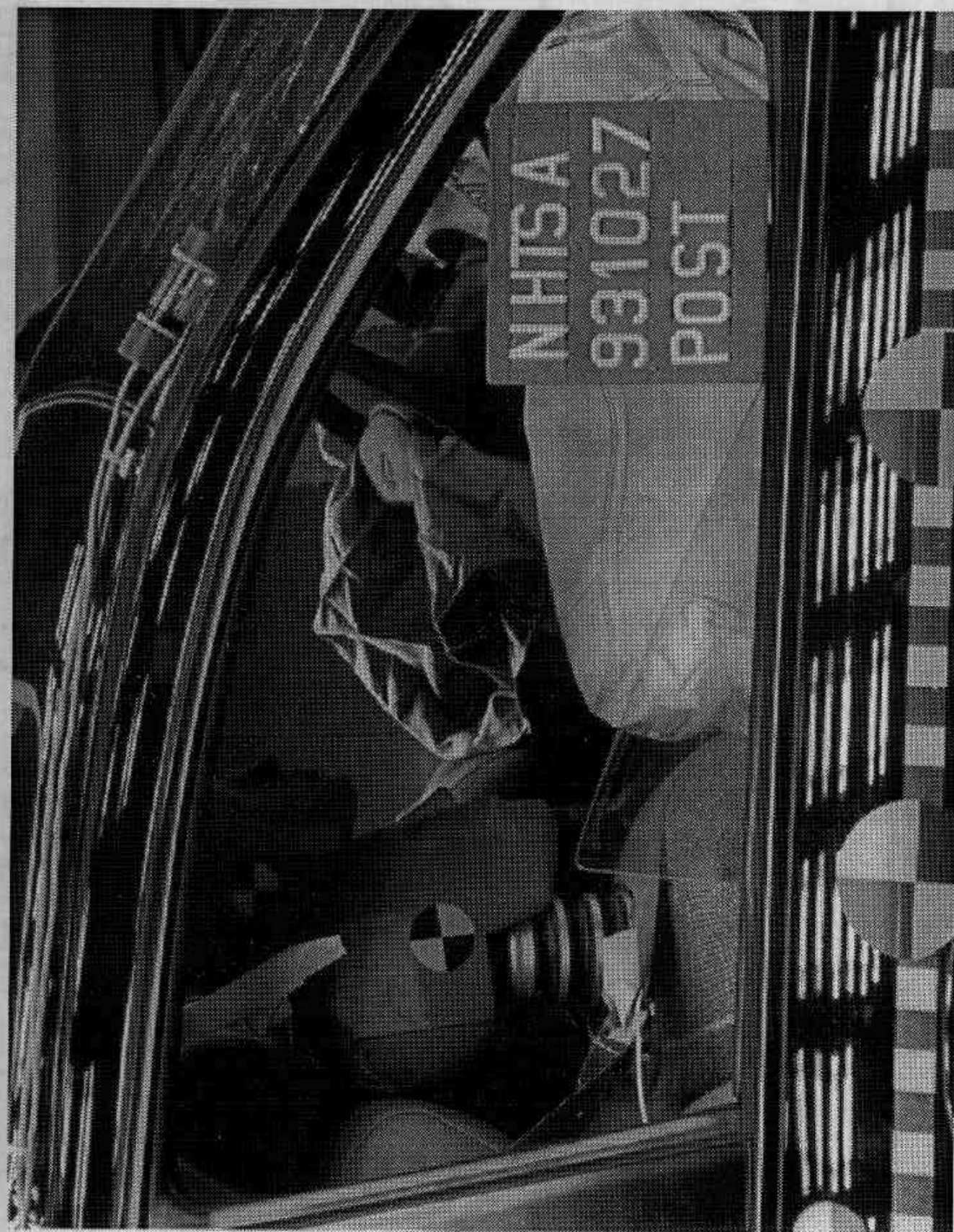


Figure A-27. POST-TEST PASSENGER DUMMY POSITION VIEW

A-28

931027

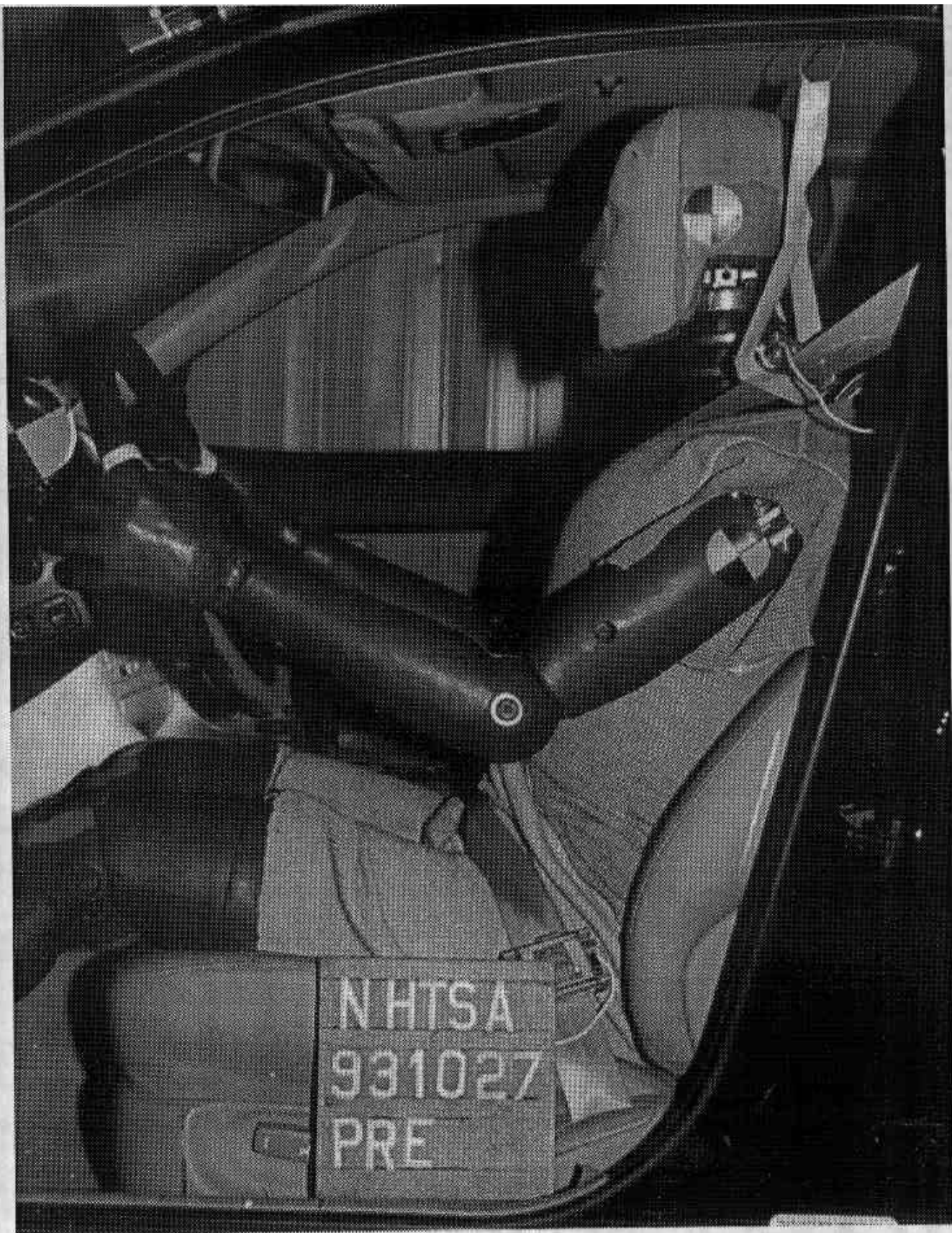


Figure A-28. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-29 931027



Figure A-29. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-30 931027

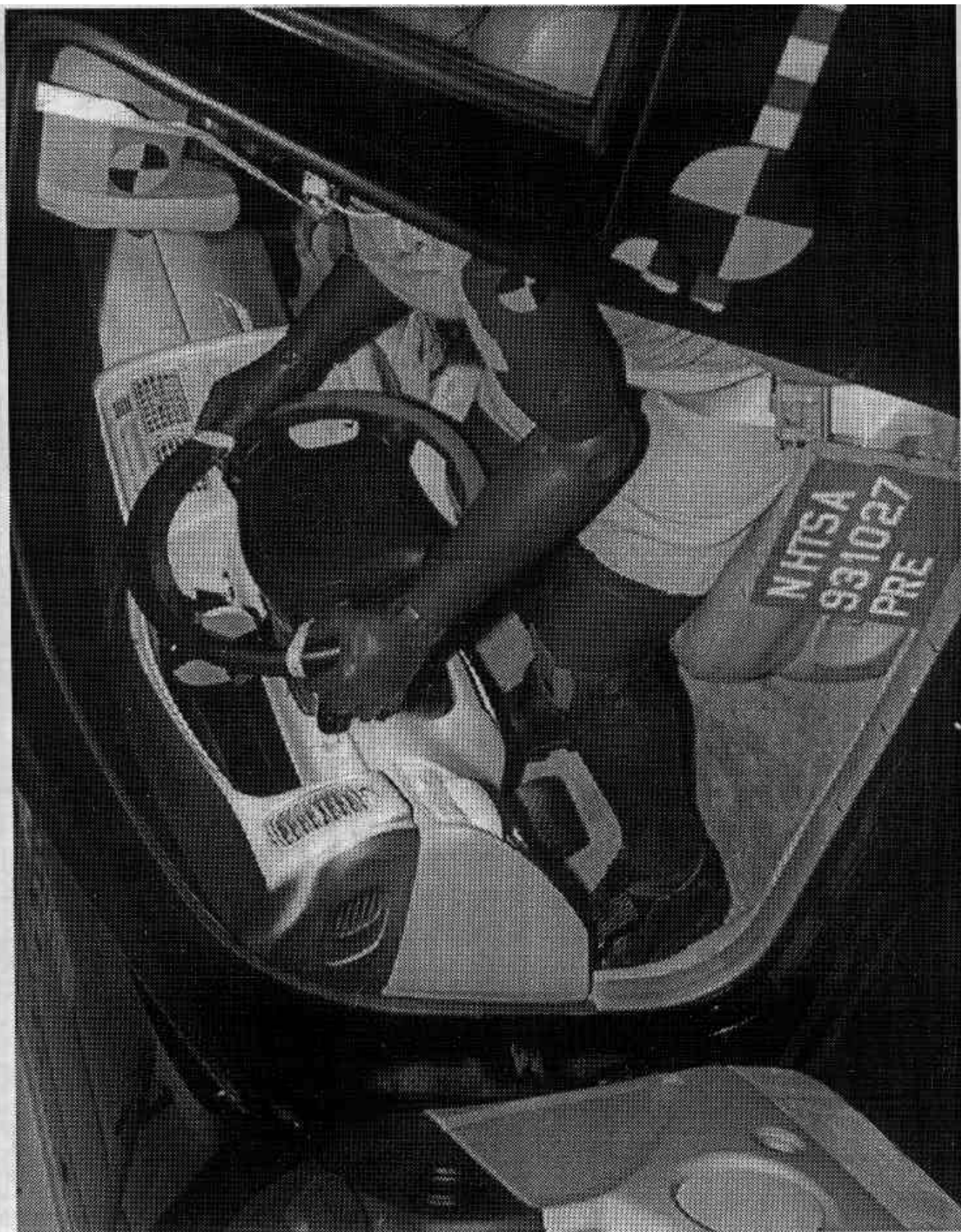


Figure A-30. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-31 931027



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

A-32

931027



Figure A-32. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-33 931027

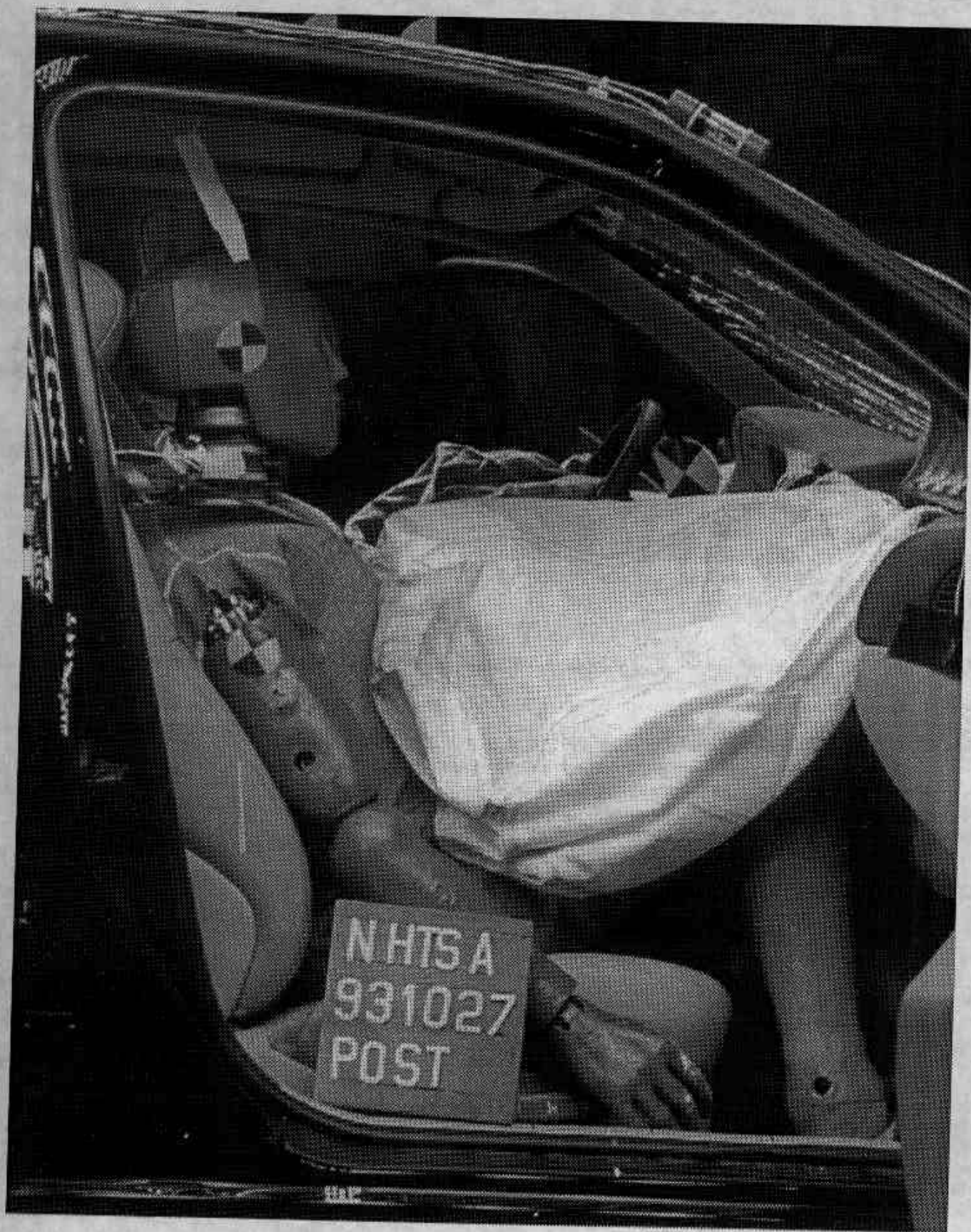


Figure A-33. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-34 931027

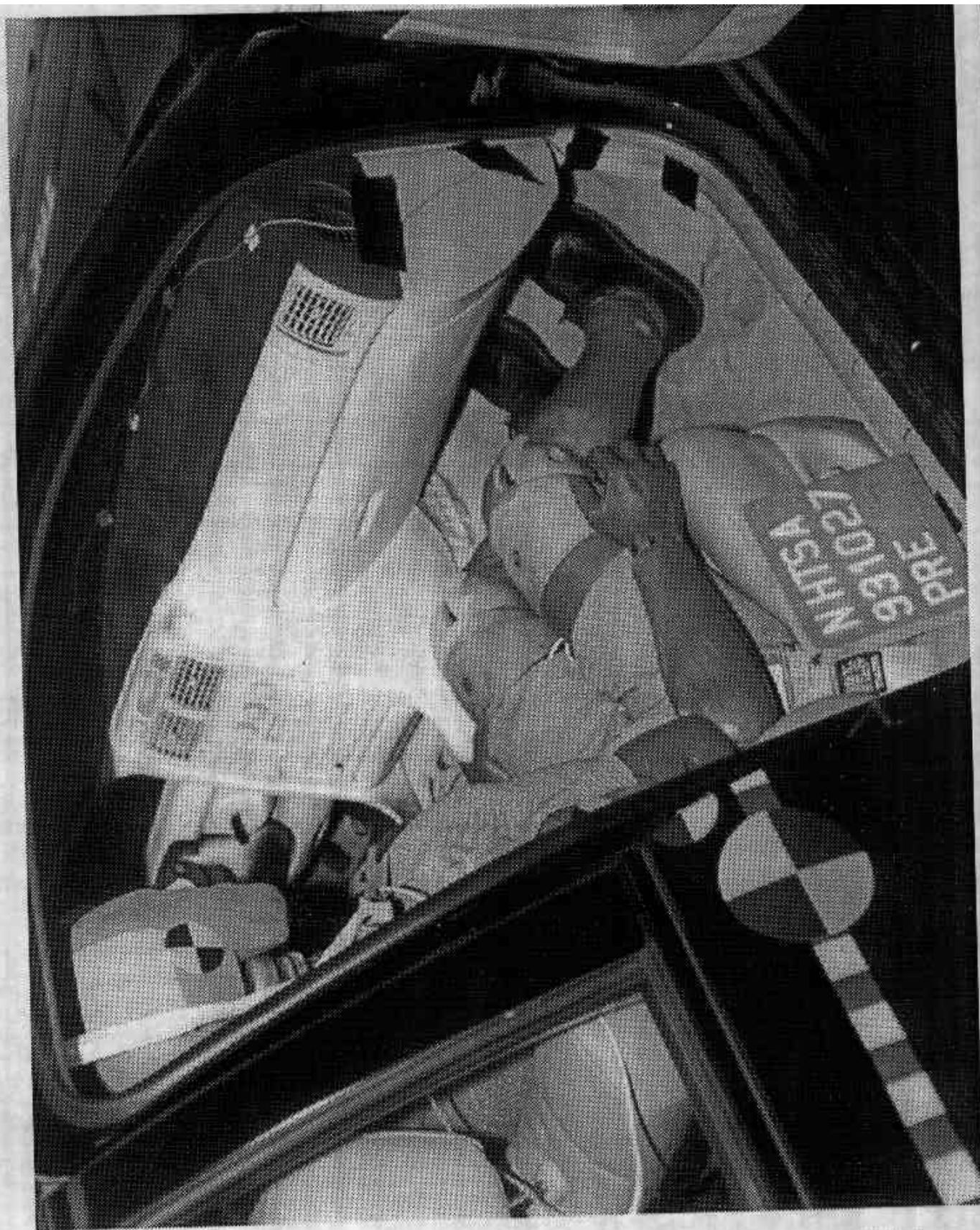


Figure A-34. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-35 931027

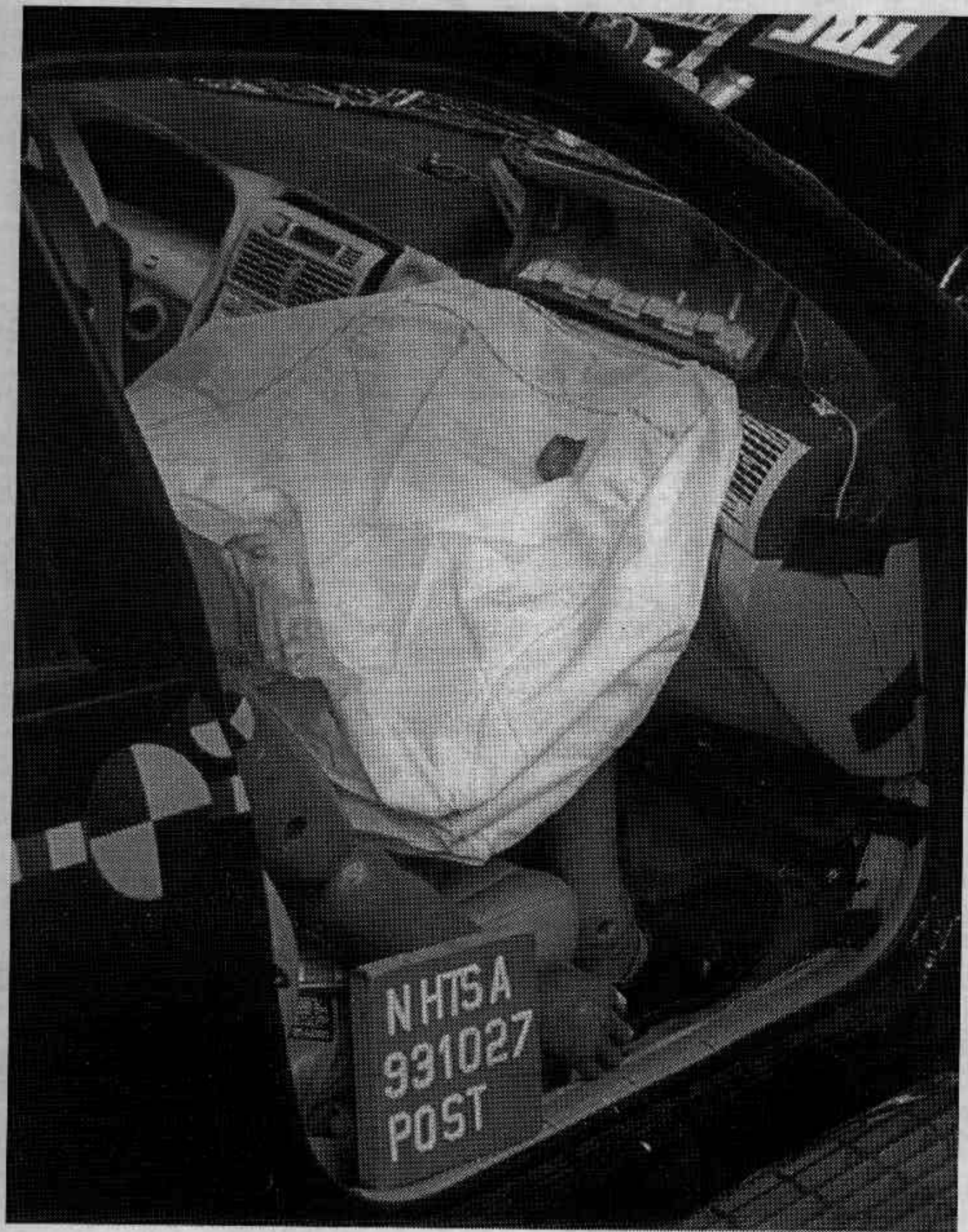


Figure A-35. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-36

931027

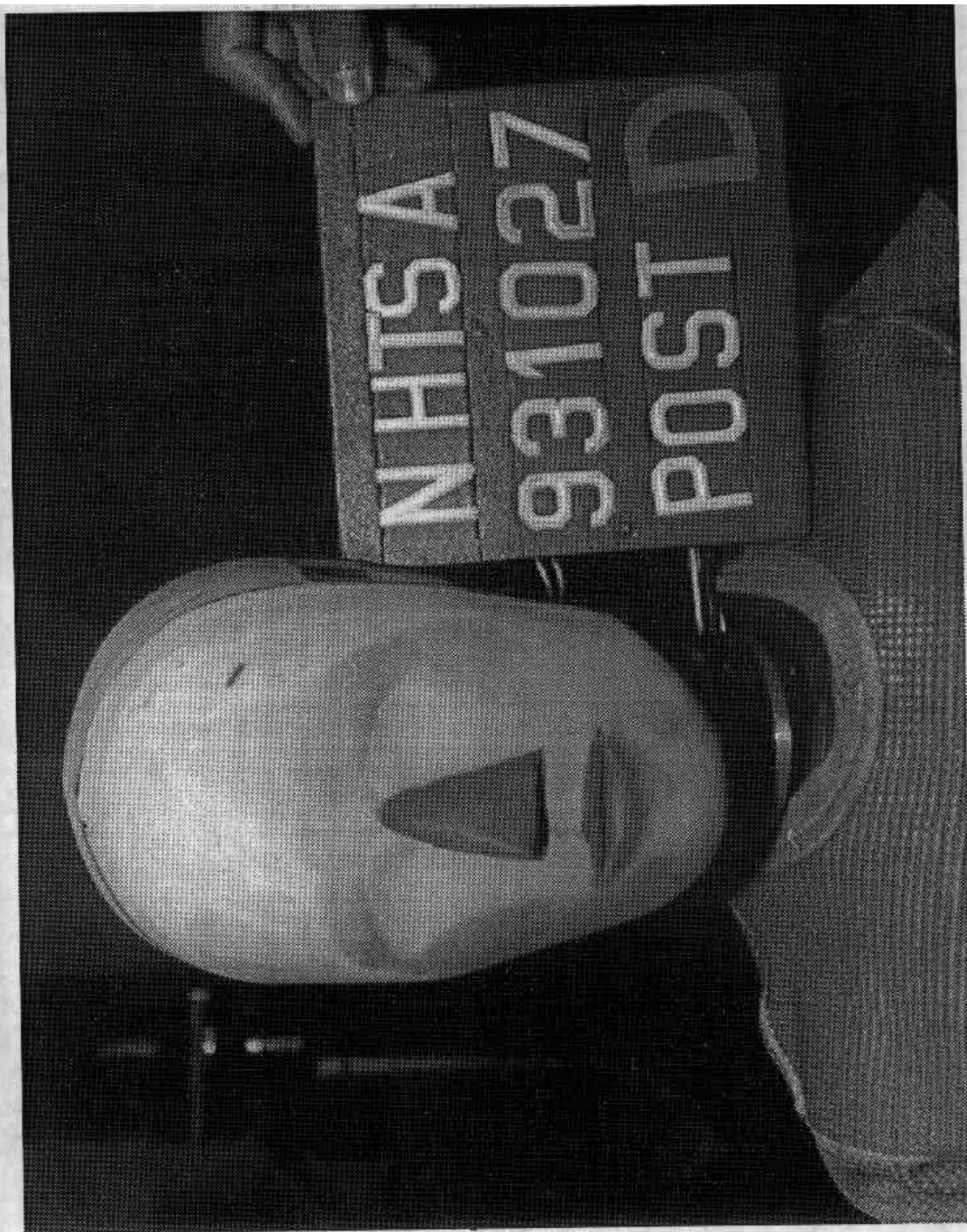


Figure A-36. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1
A-37 931027



Figure A-37. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2
A-38 931027

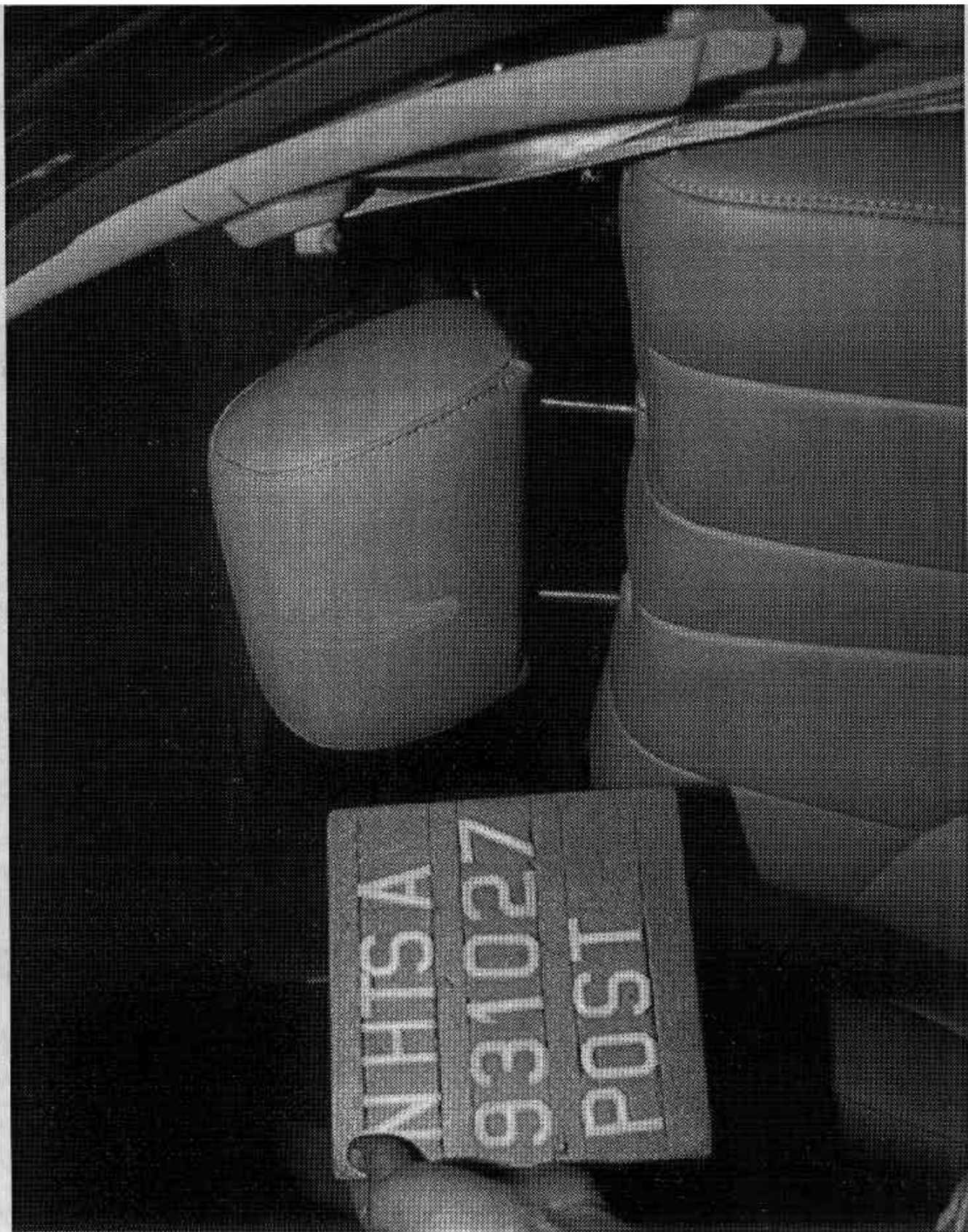


Figure A-38. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 3
A-39 931027

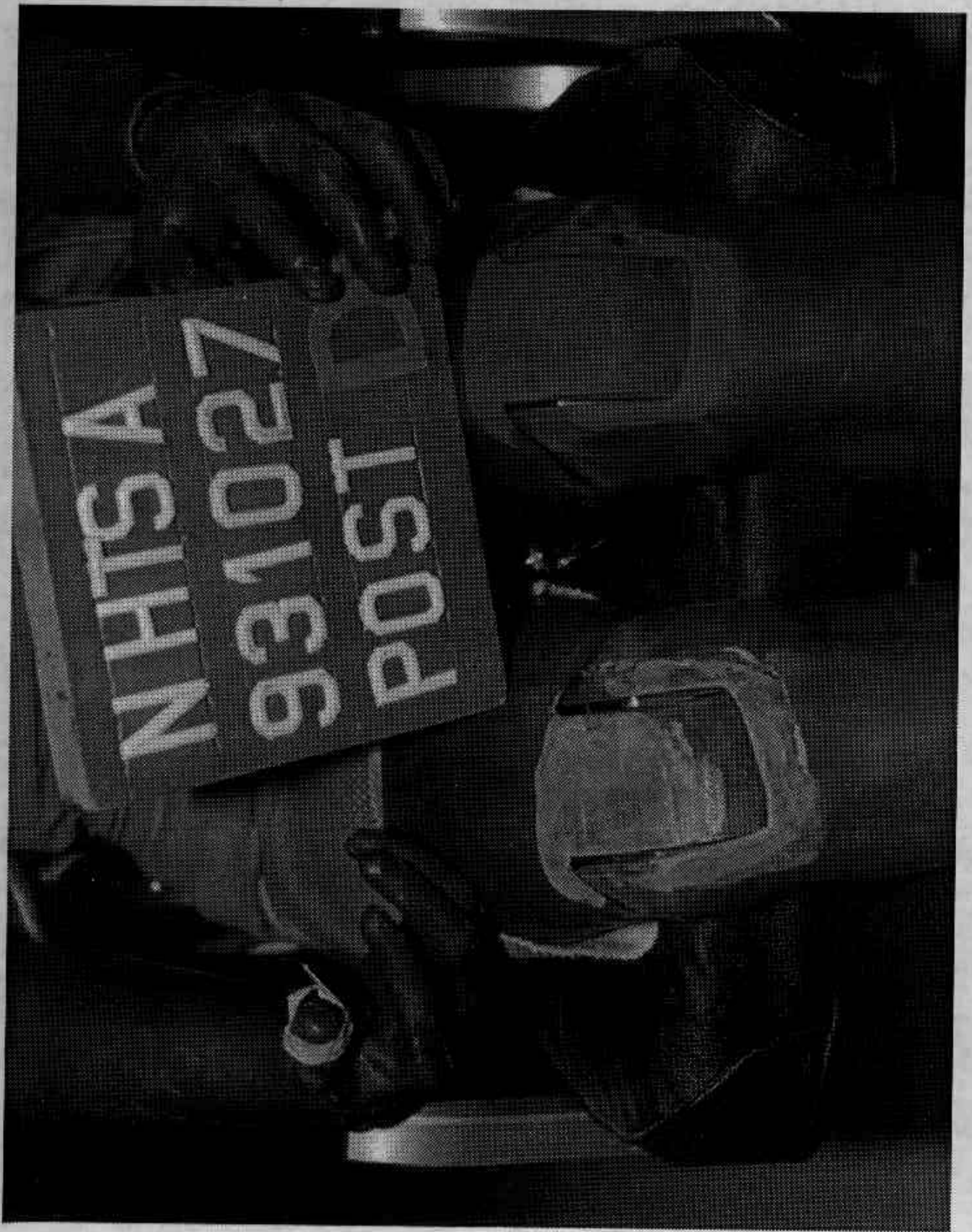


Figure A-39. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-40

931027

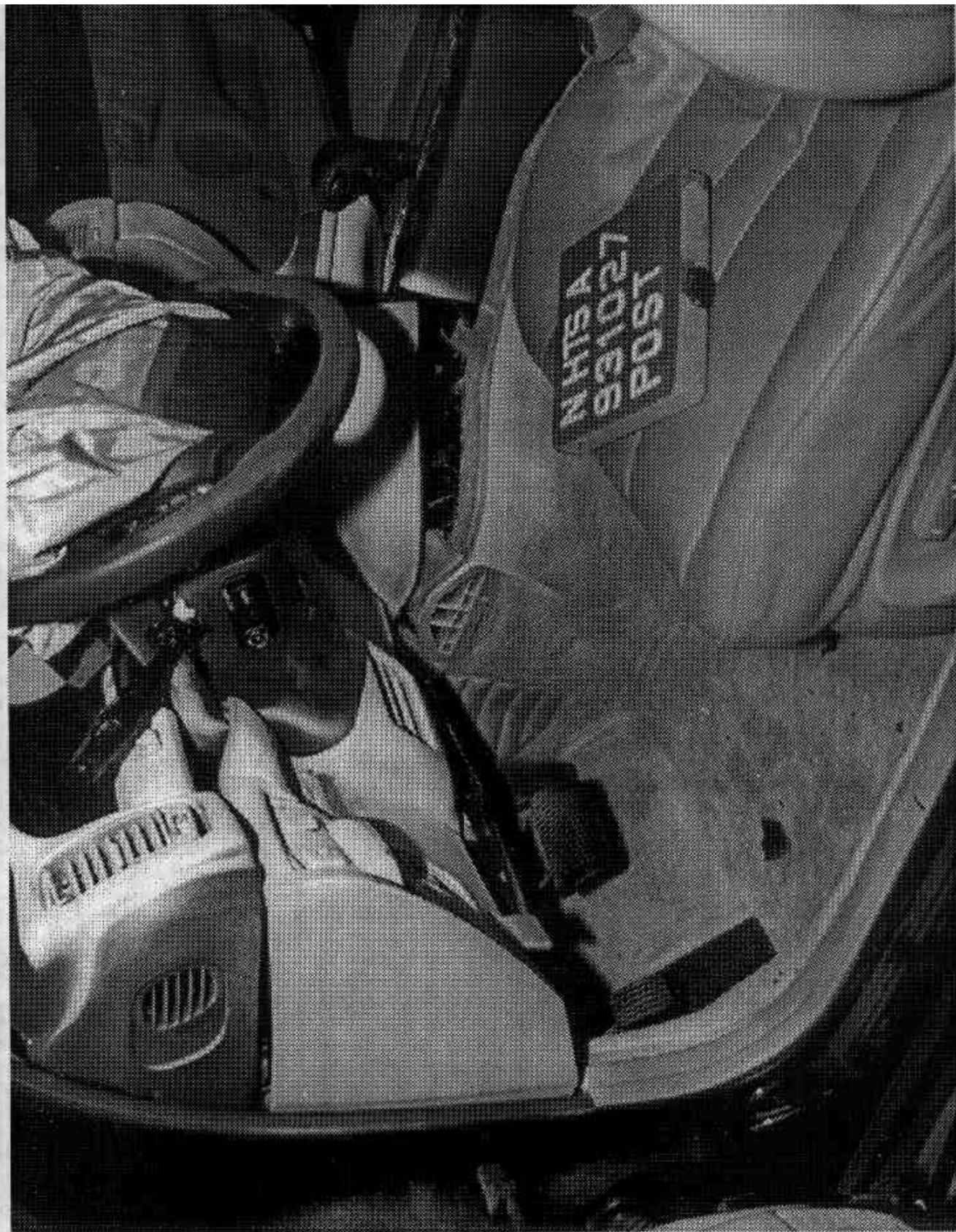


Figure A-40. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

A-41

931027

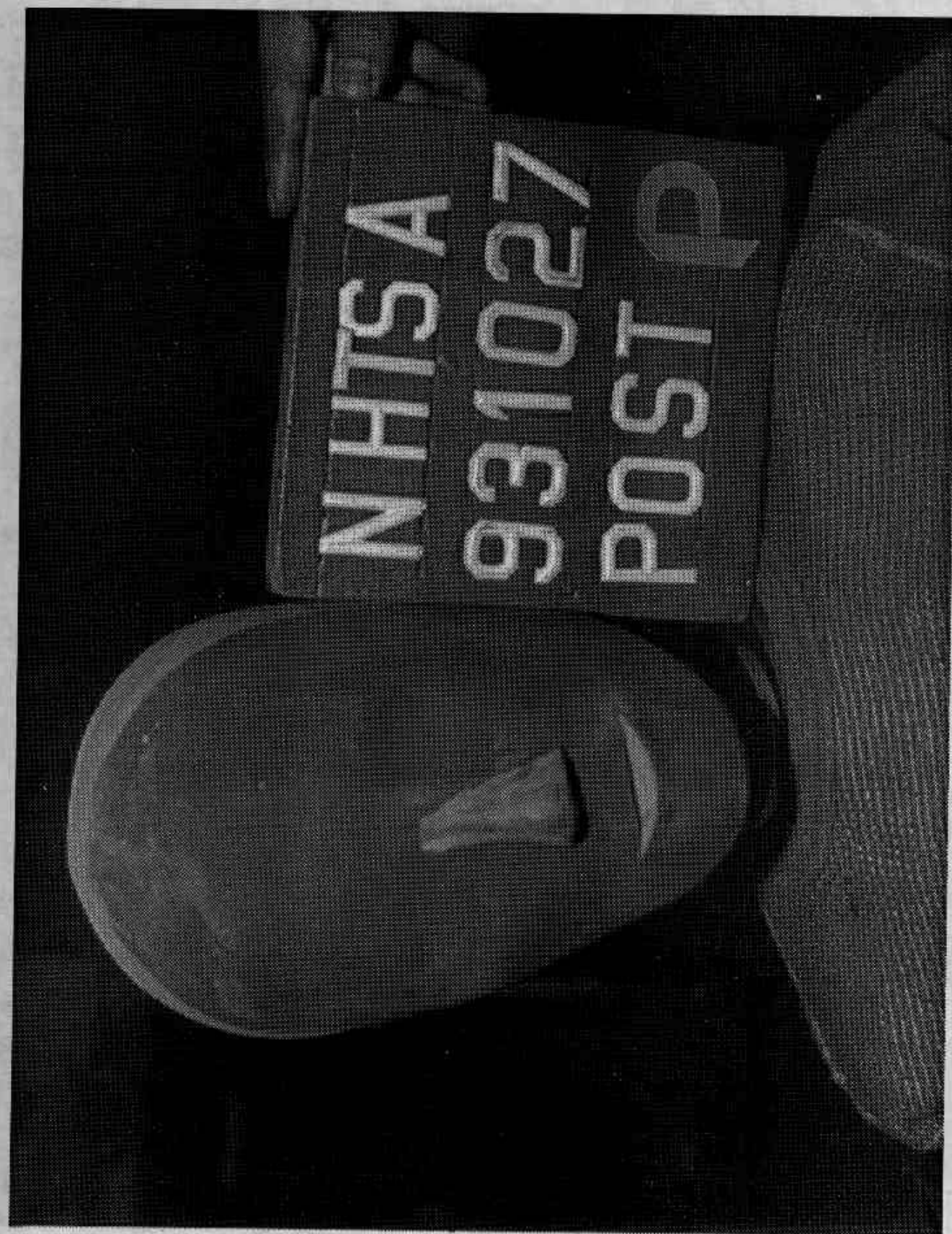


Figure A-41. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 1
A-42 931027



Figure A-42. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 2
A-43 931027

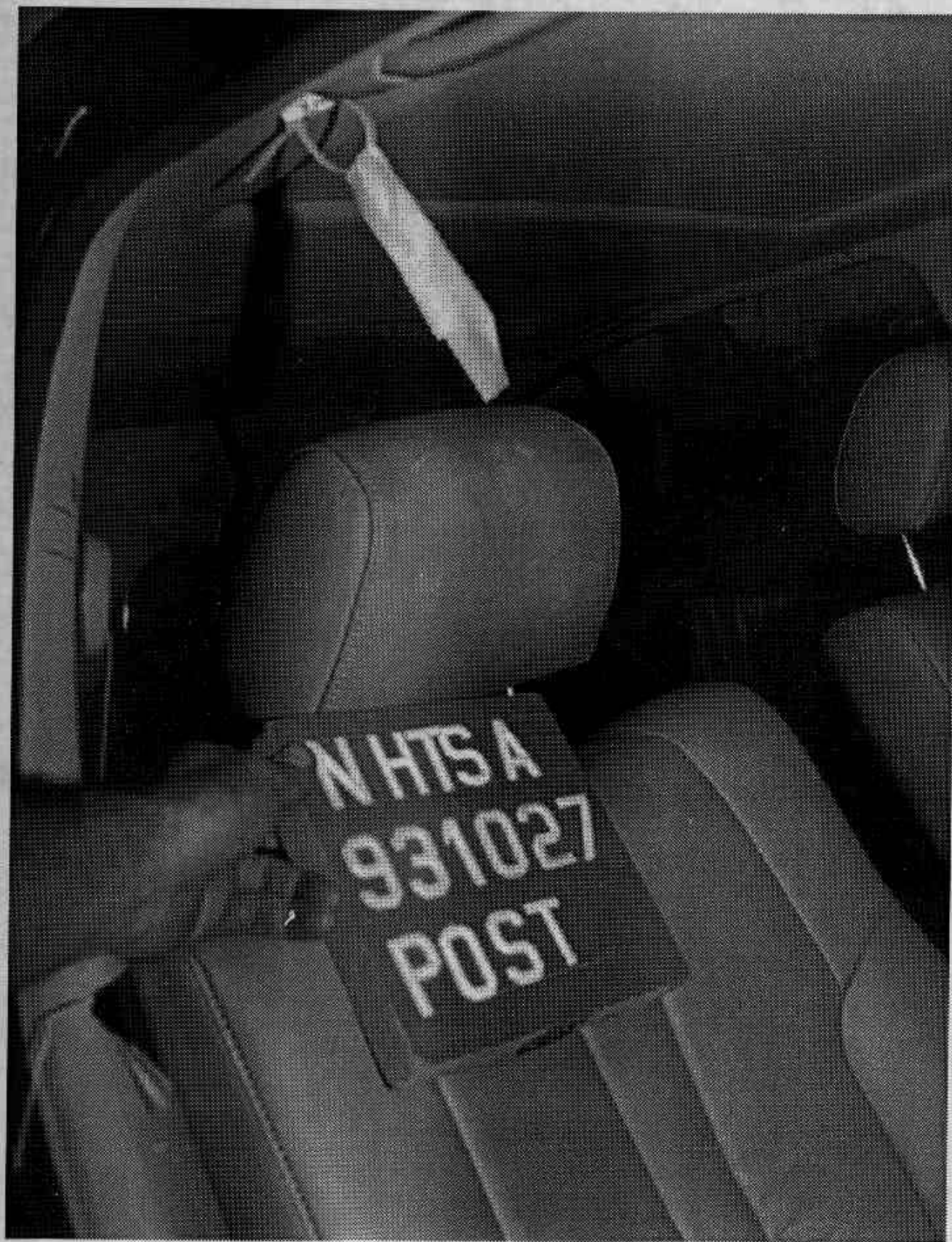


Figure A-43. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 3

A-44

931027

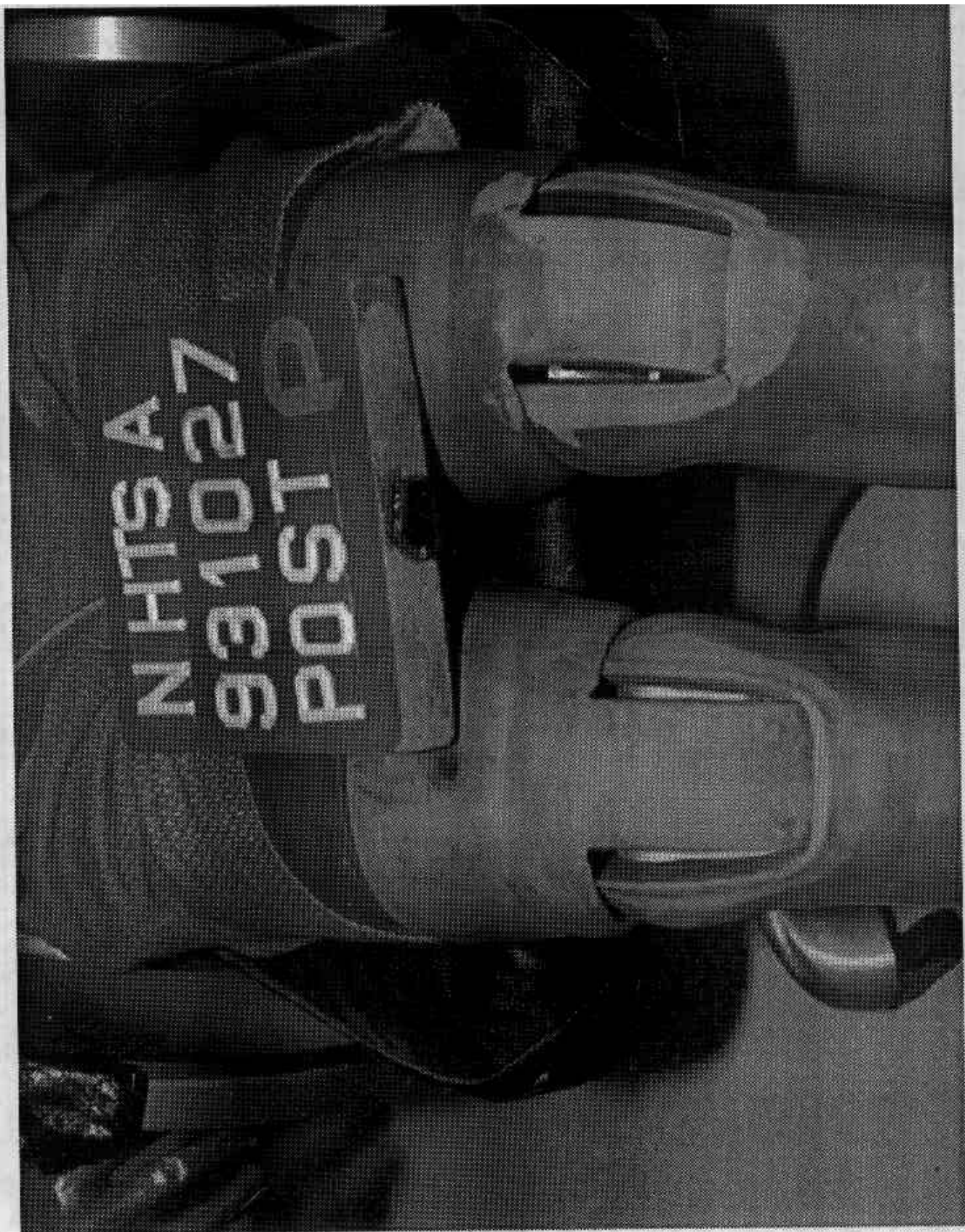


Figure A-44. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1
A-45 931027

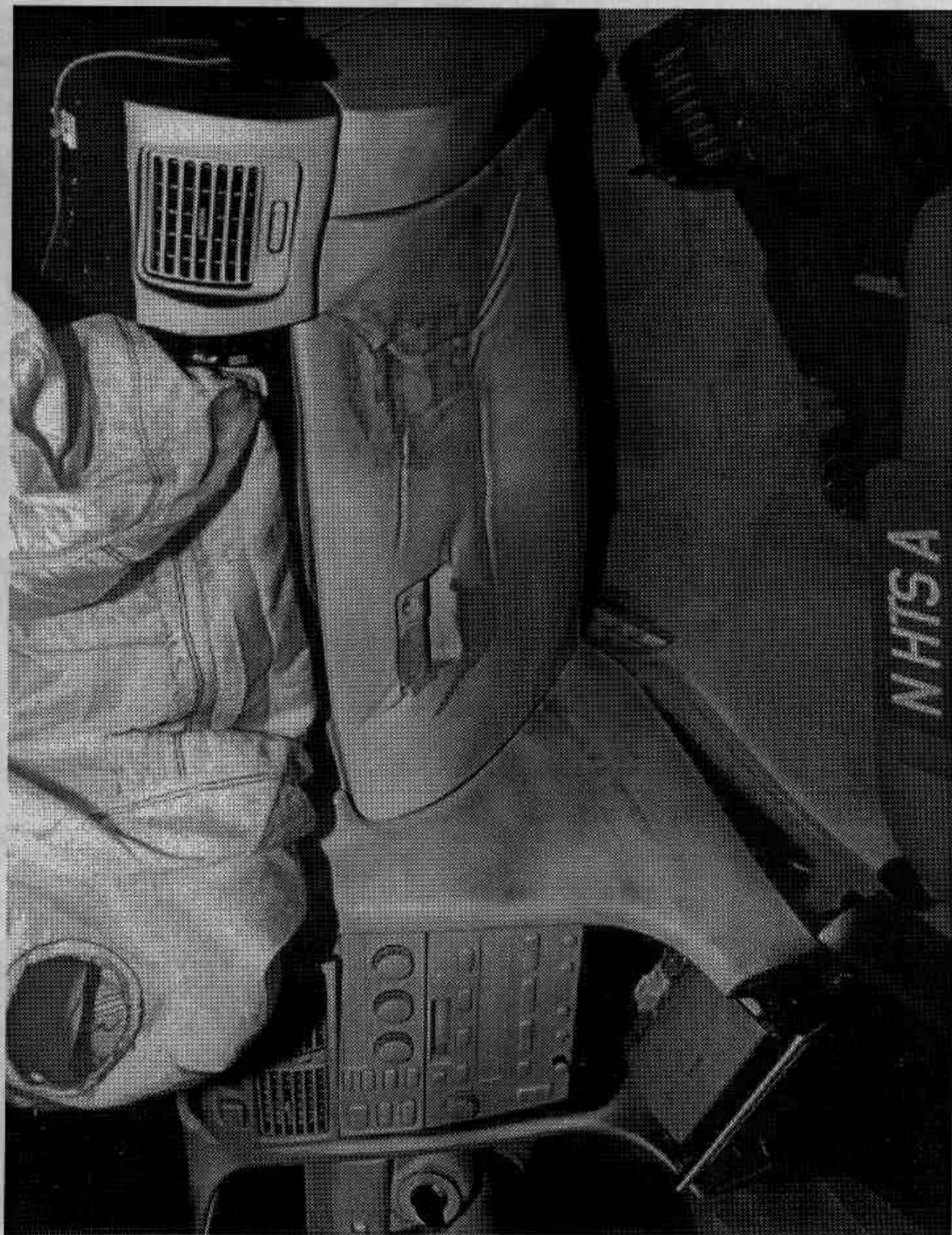


Figure A-45. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2
A-46 931027

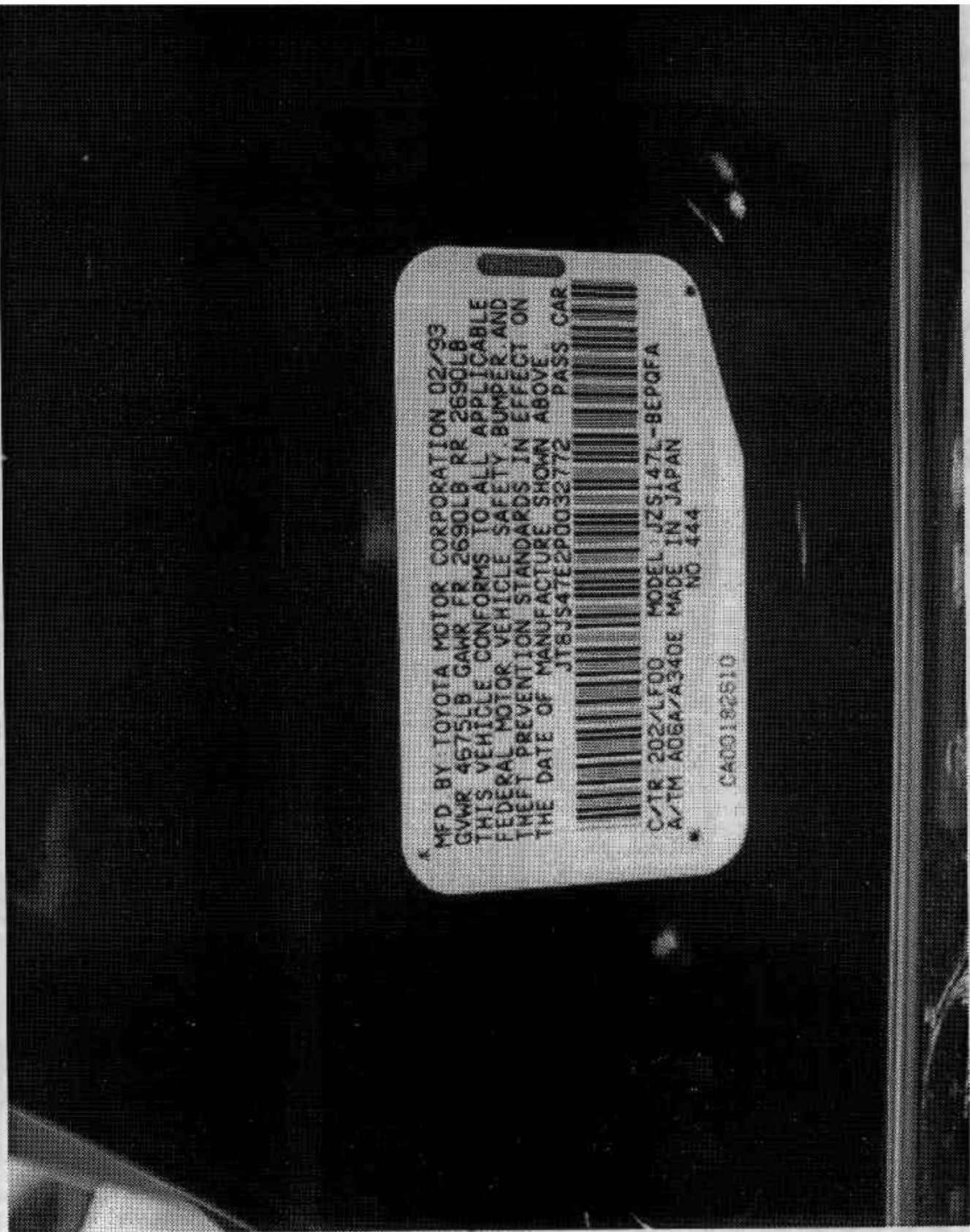


Figure A-46. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

A-47

931027

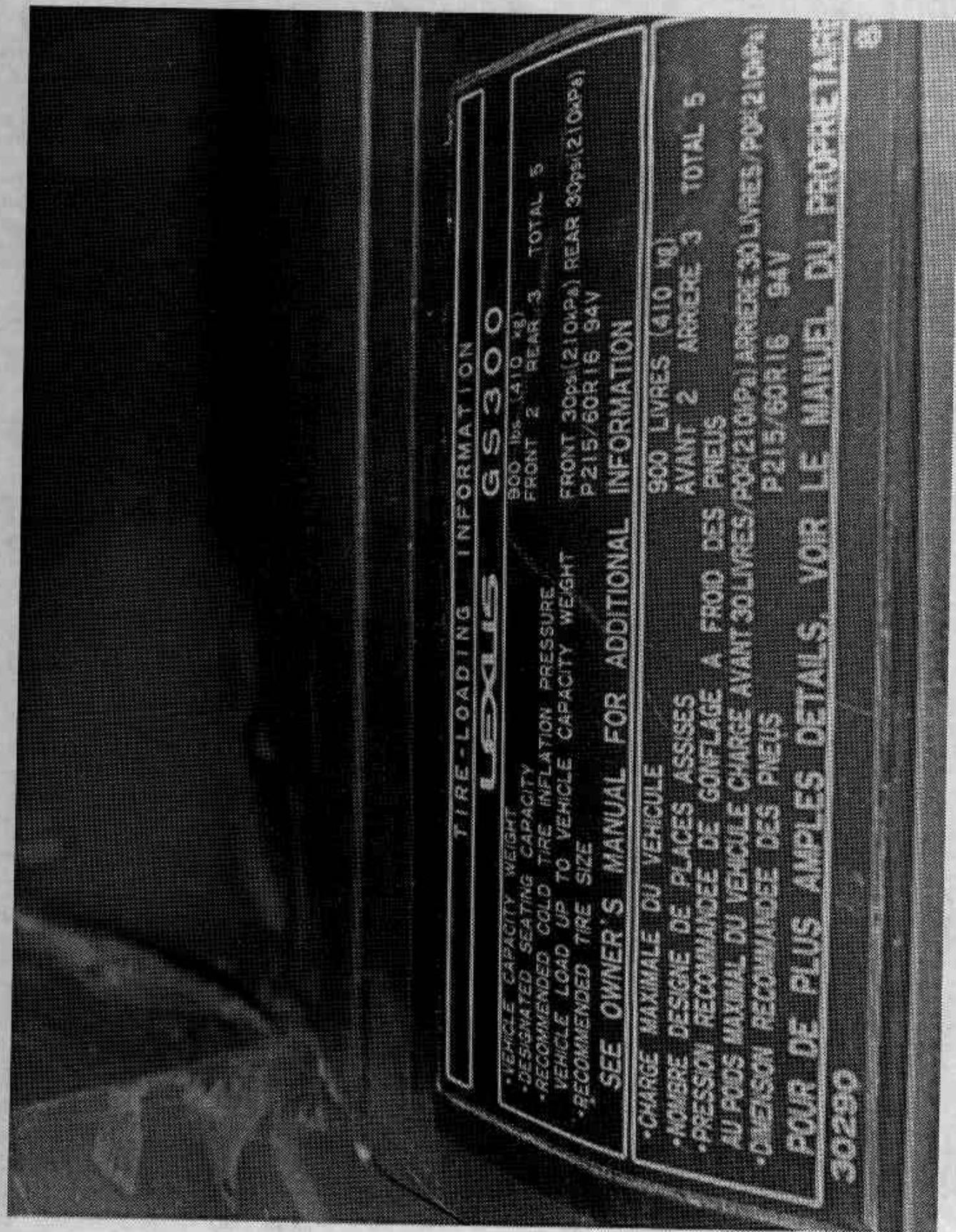


Figure A-47. PRE-TEST RECOMMENDED TIRE PRESSURE LABEL VIEW

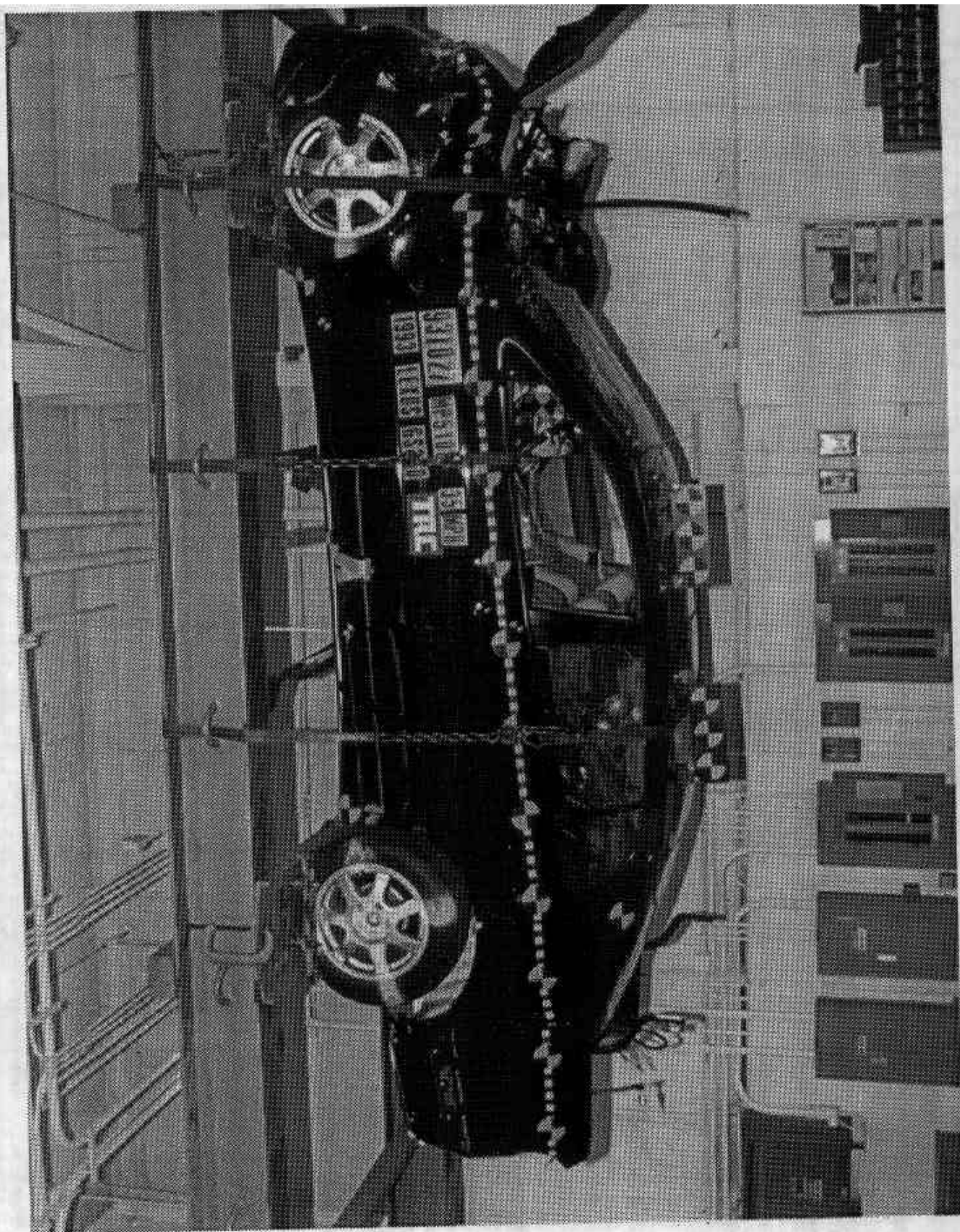


Figure A-48. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW
A-49 931027

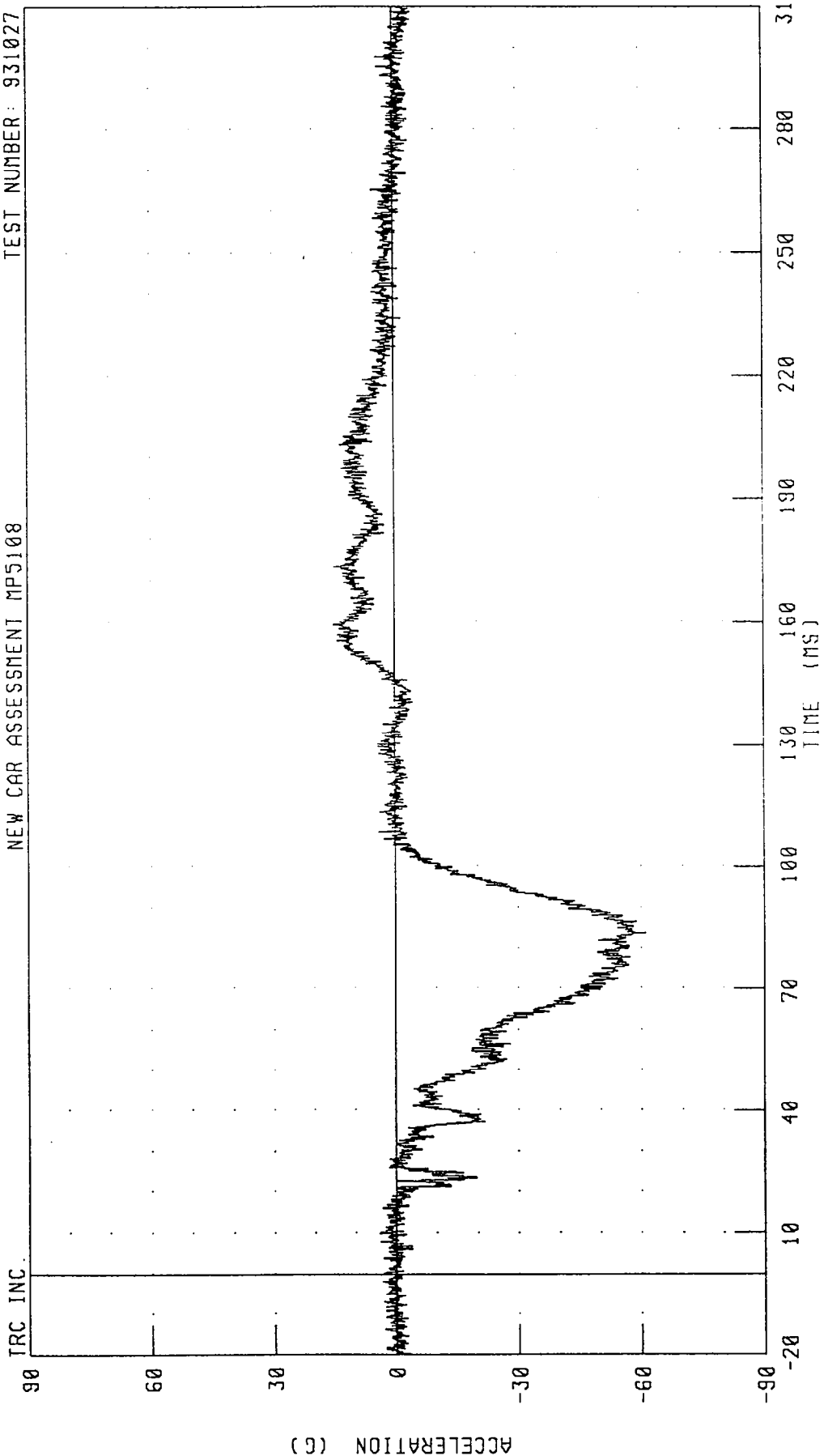
APPENDIX B

DATA PLOTS

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1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MP5108

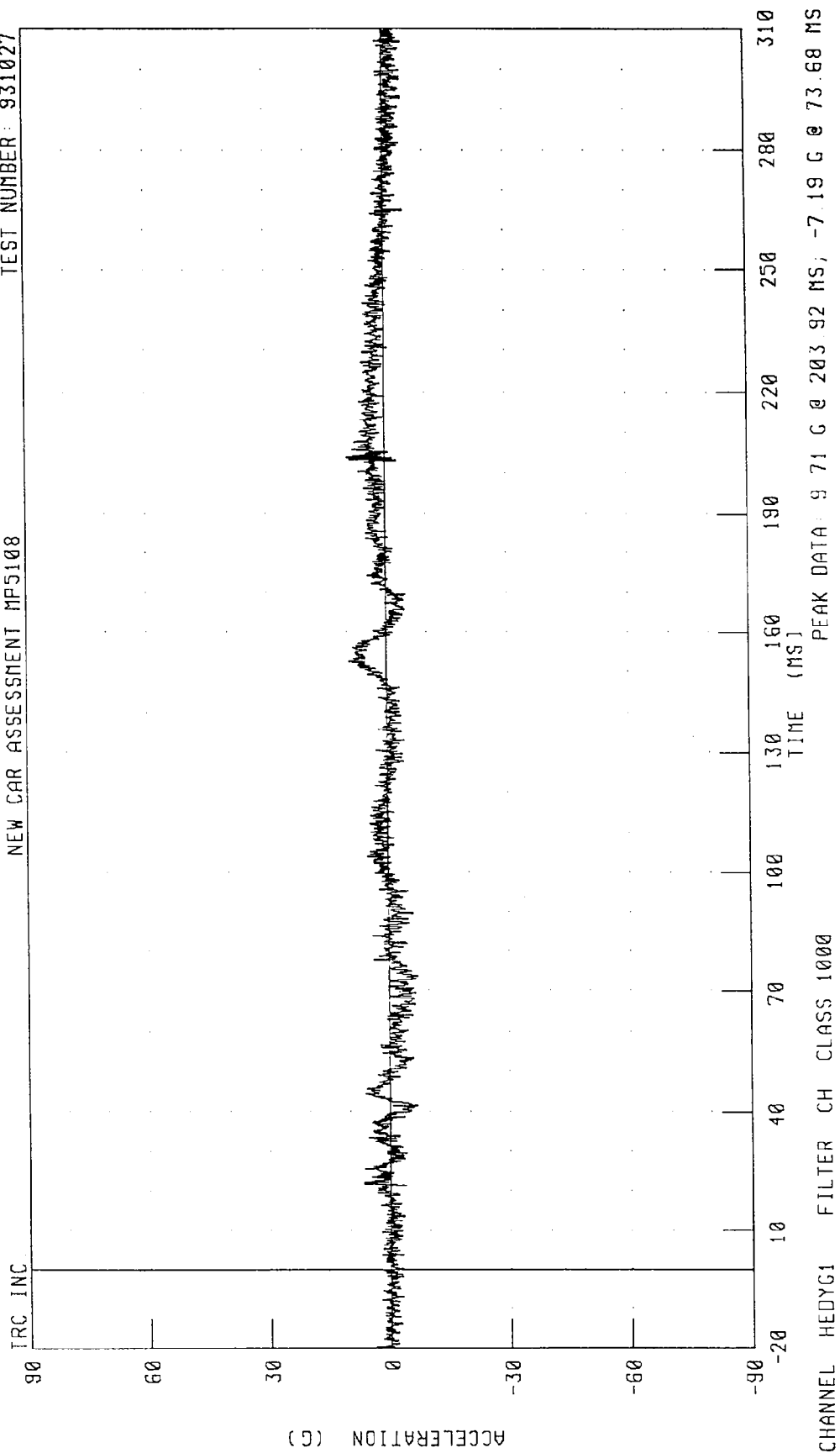
TEST NUMBER: 931027



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000 PEAK UNIT: 15.71 G @ 159.28 MS, -60.96 G @ 83.68 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MF5108

TEST NUMBER: 931027

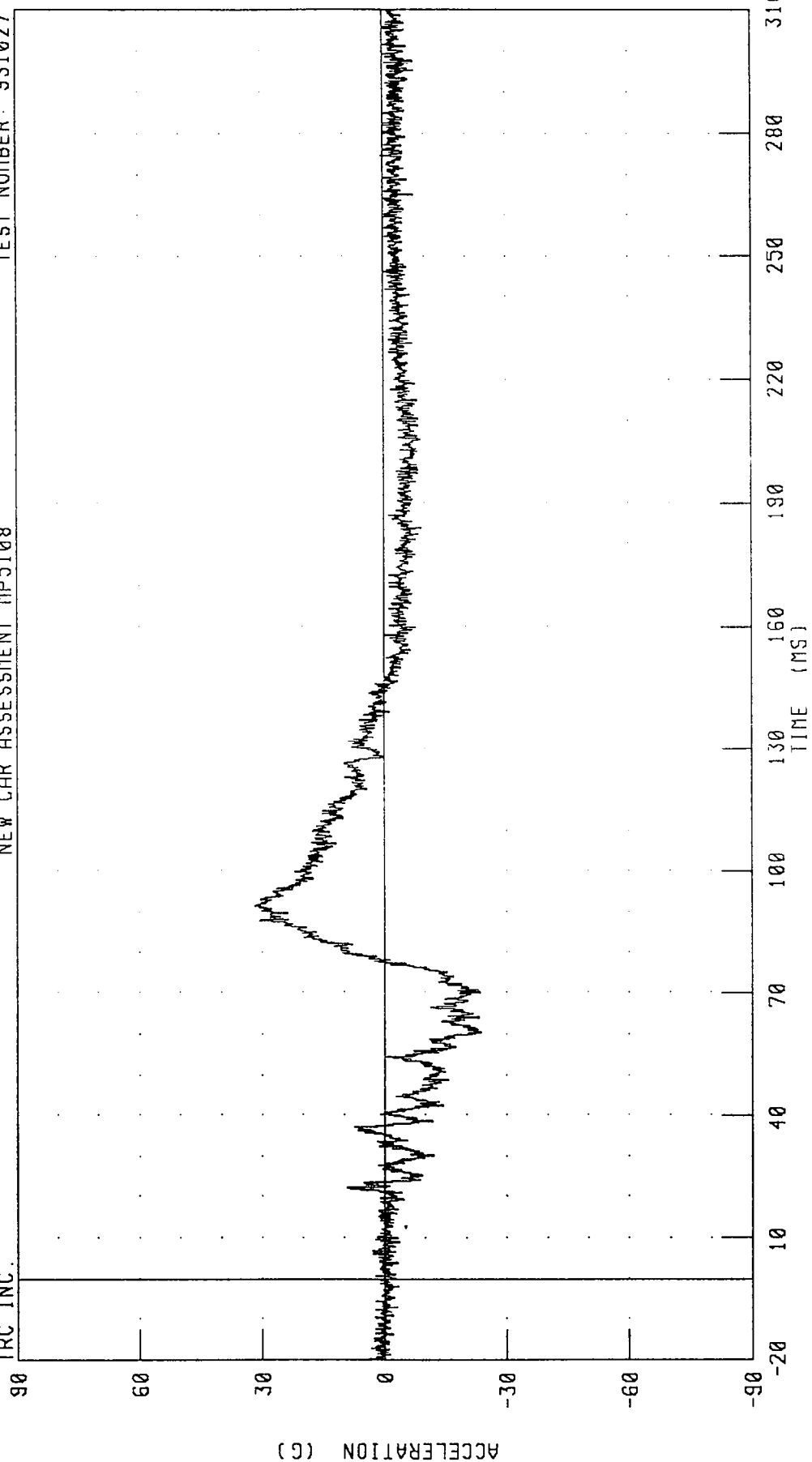


1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION

TEST NUMBER 931027

NEW CAR ASSESSMENT MP5108

TRC INC.

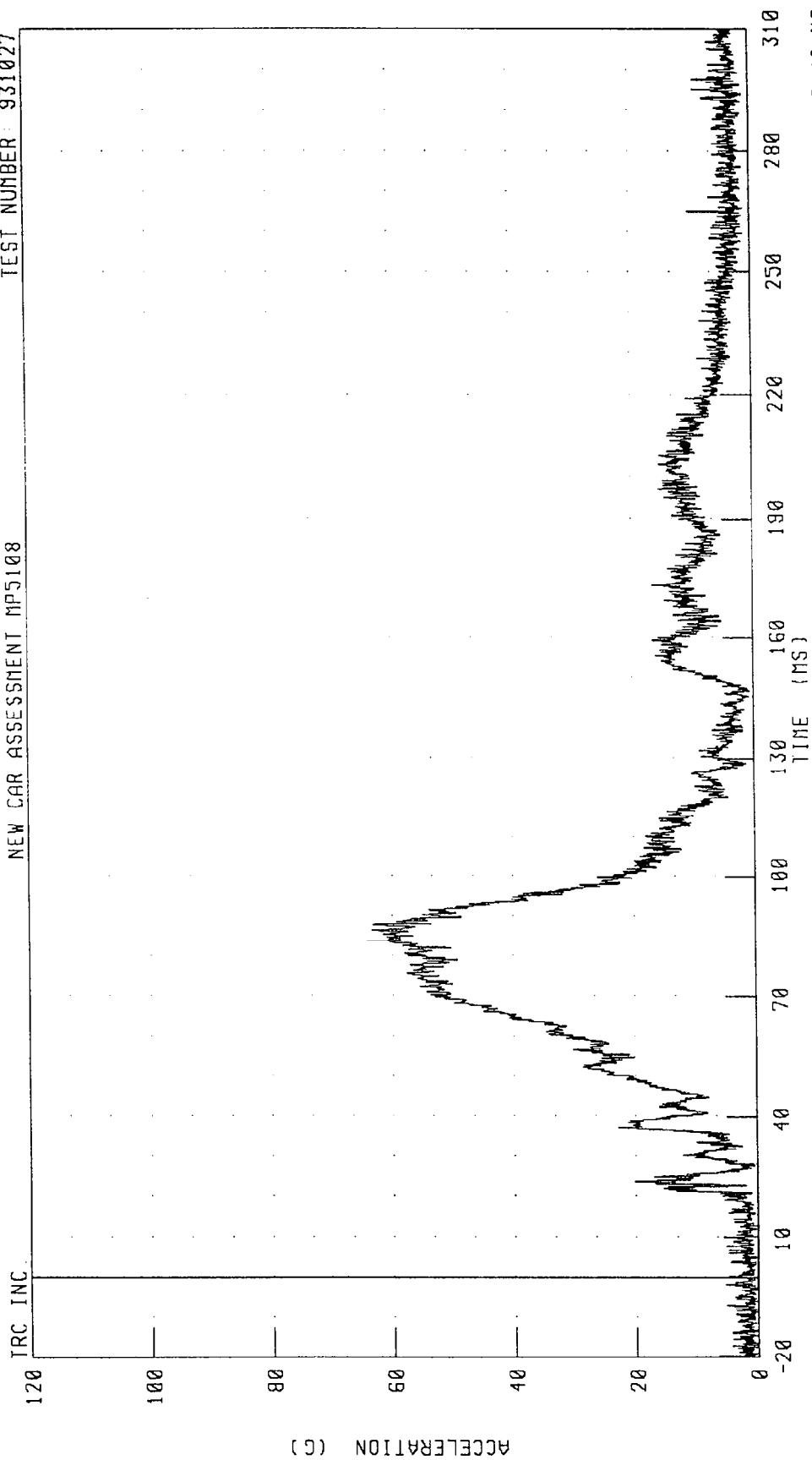


CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA 31 86 G @ 91 44 MS, -23.56 G @ 60.48 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



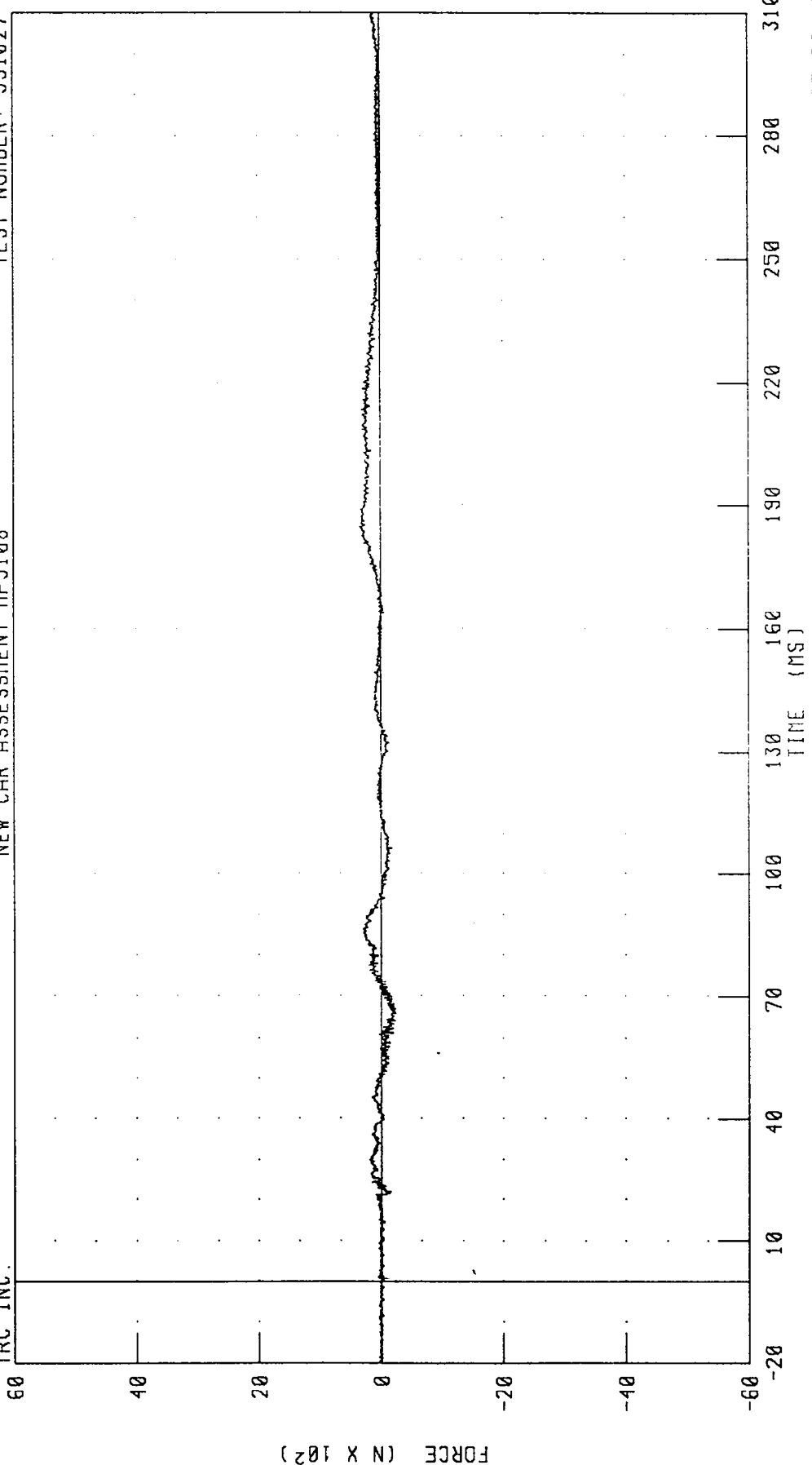
PEAK DATA 64 23 G @ 83 68 MS, 0.14 G @ -8 48 MS

CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

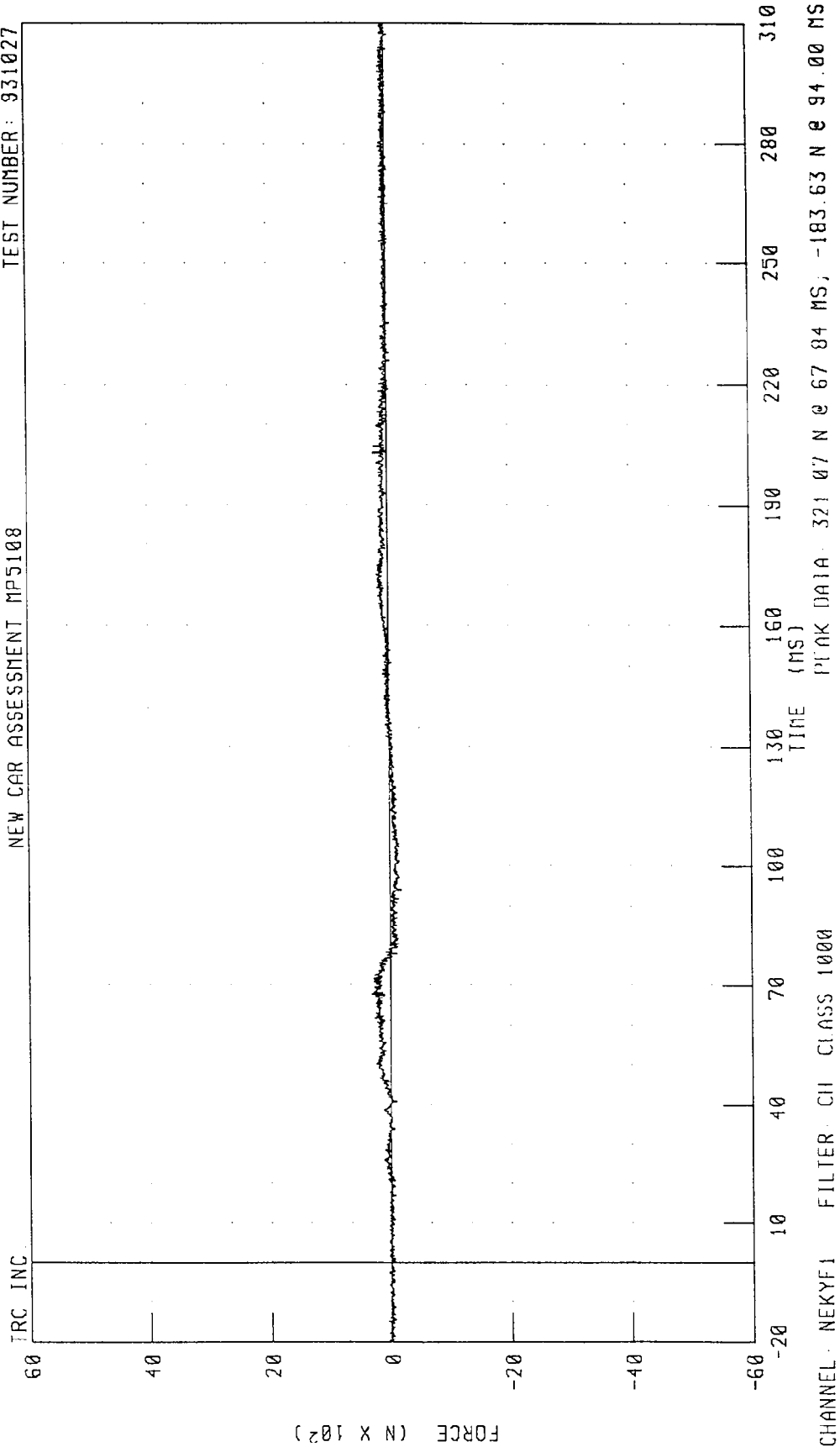
TRC INC.



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000
 PEAK DATA 332.45 N @ 184.72 MS, -241.02 N @ 65.92 MS

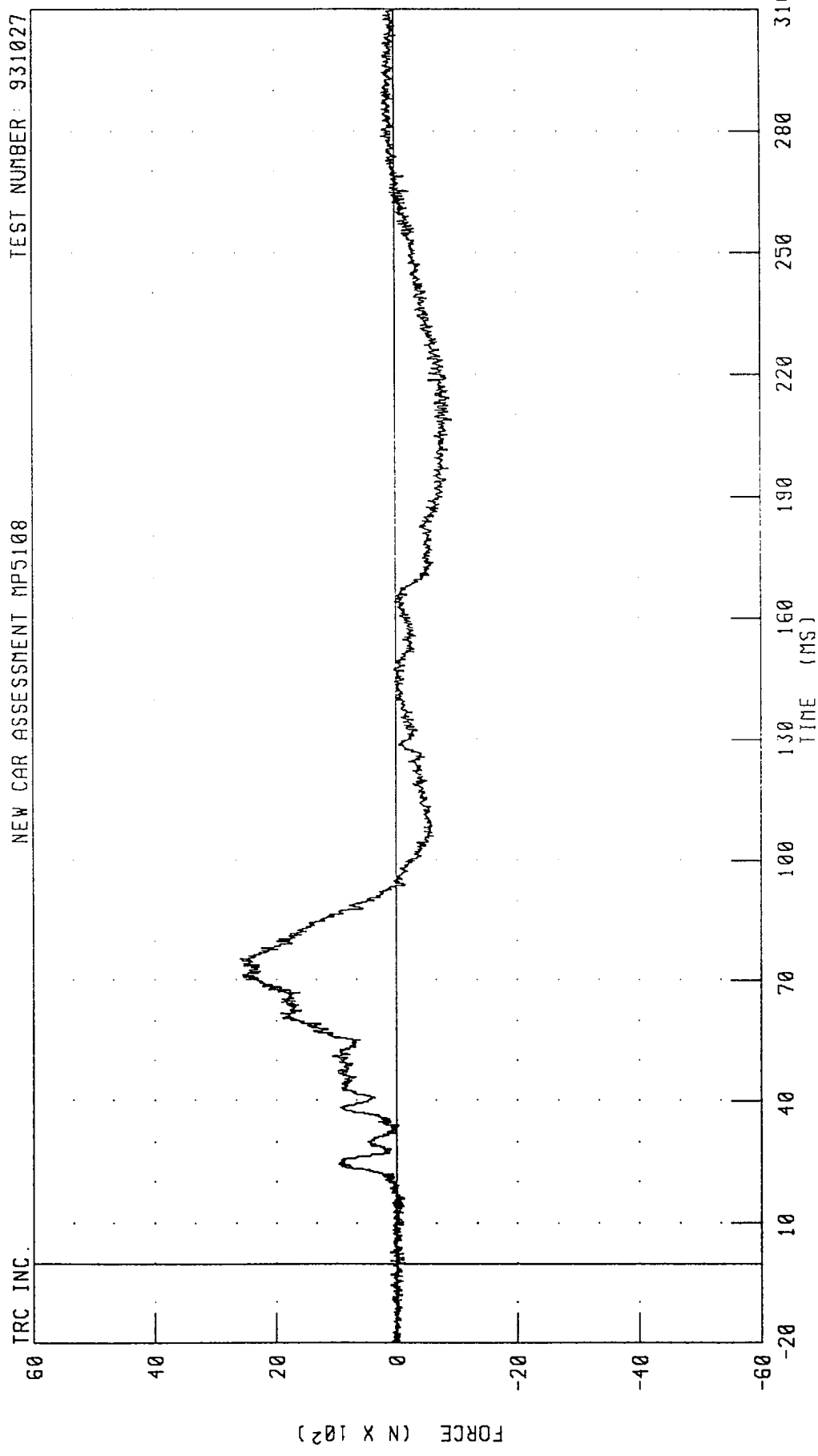
1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Y-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT MP5108

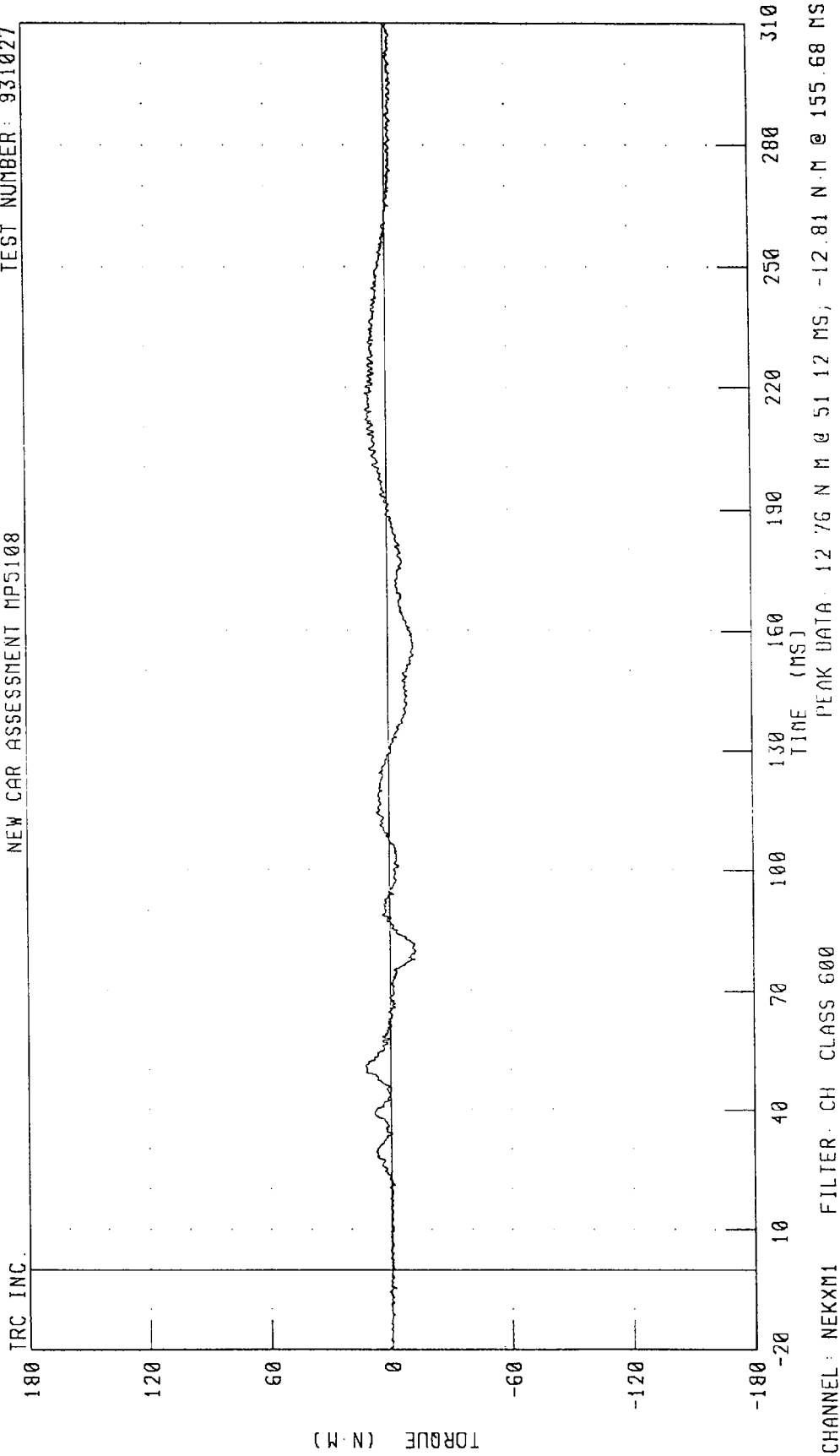
TEST NUMBER: 931027



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

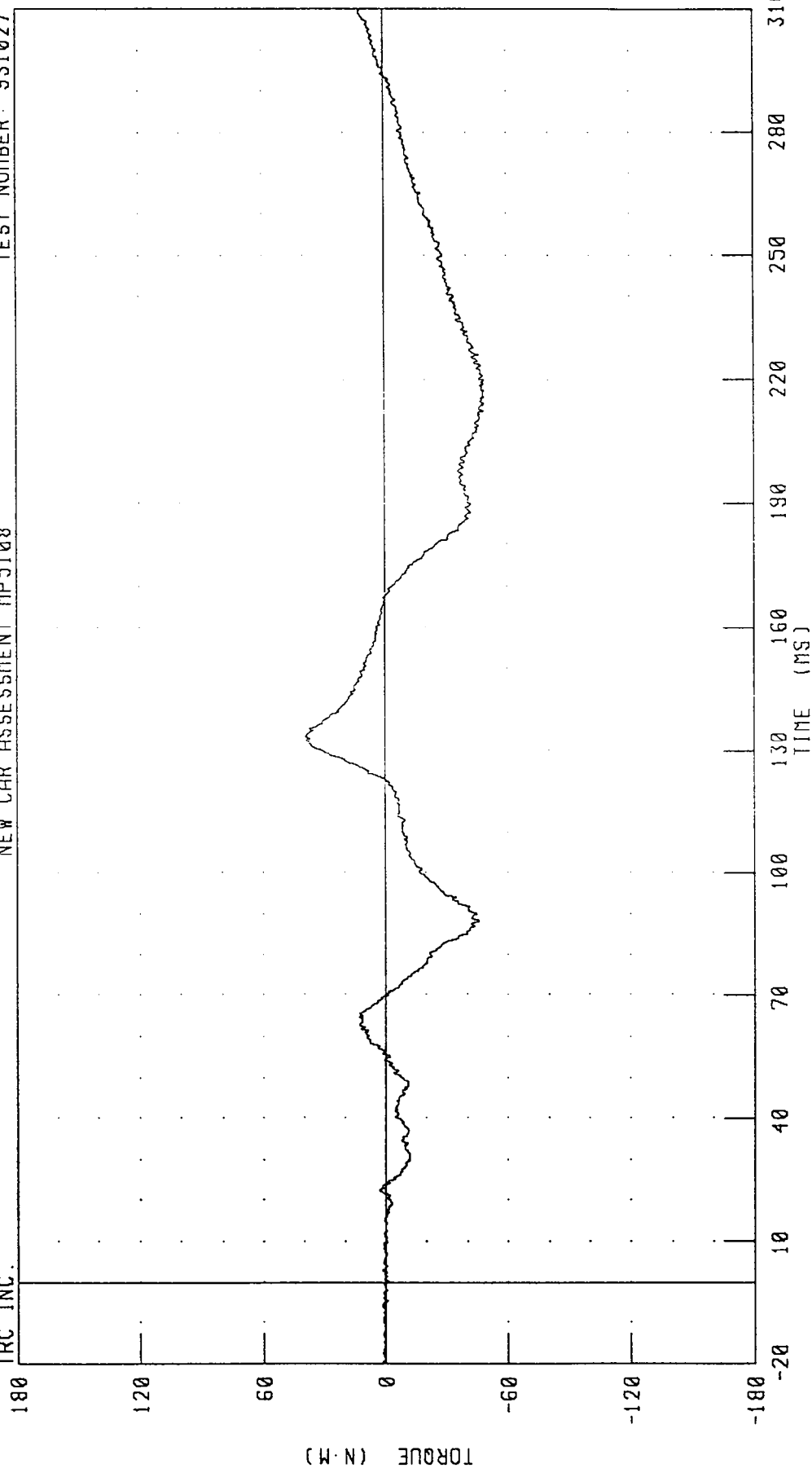


1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.

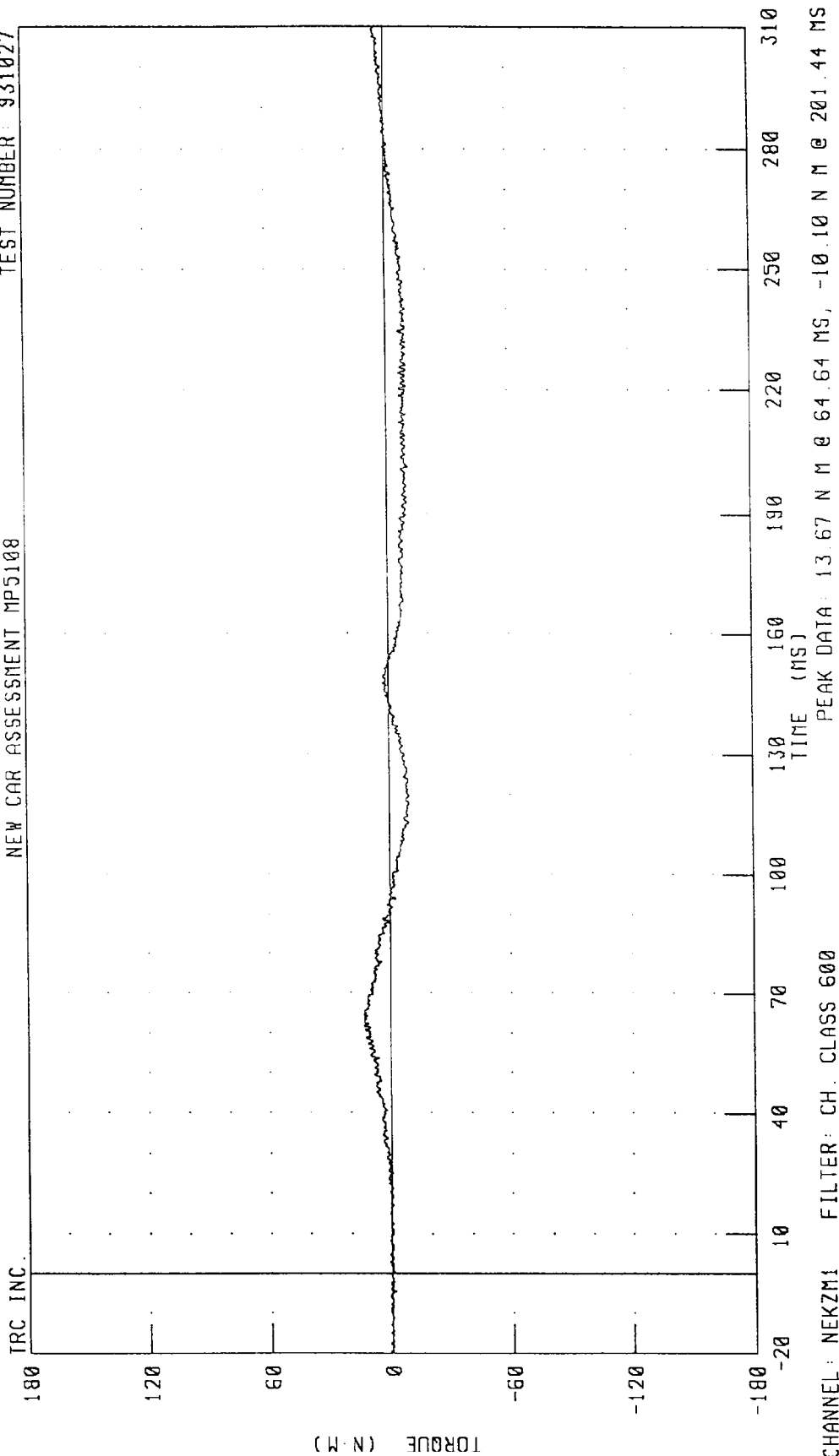


CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA 39 49 N M @ 133 76 MS, -48 89 N M @ 219 12 MS

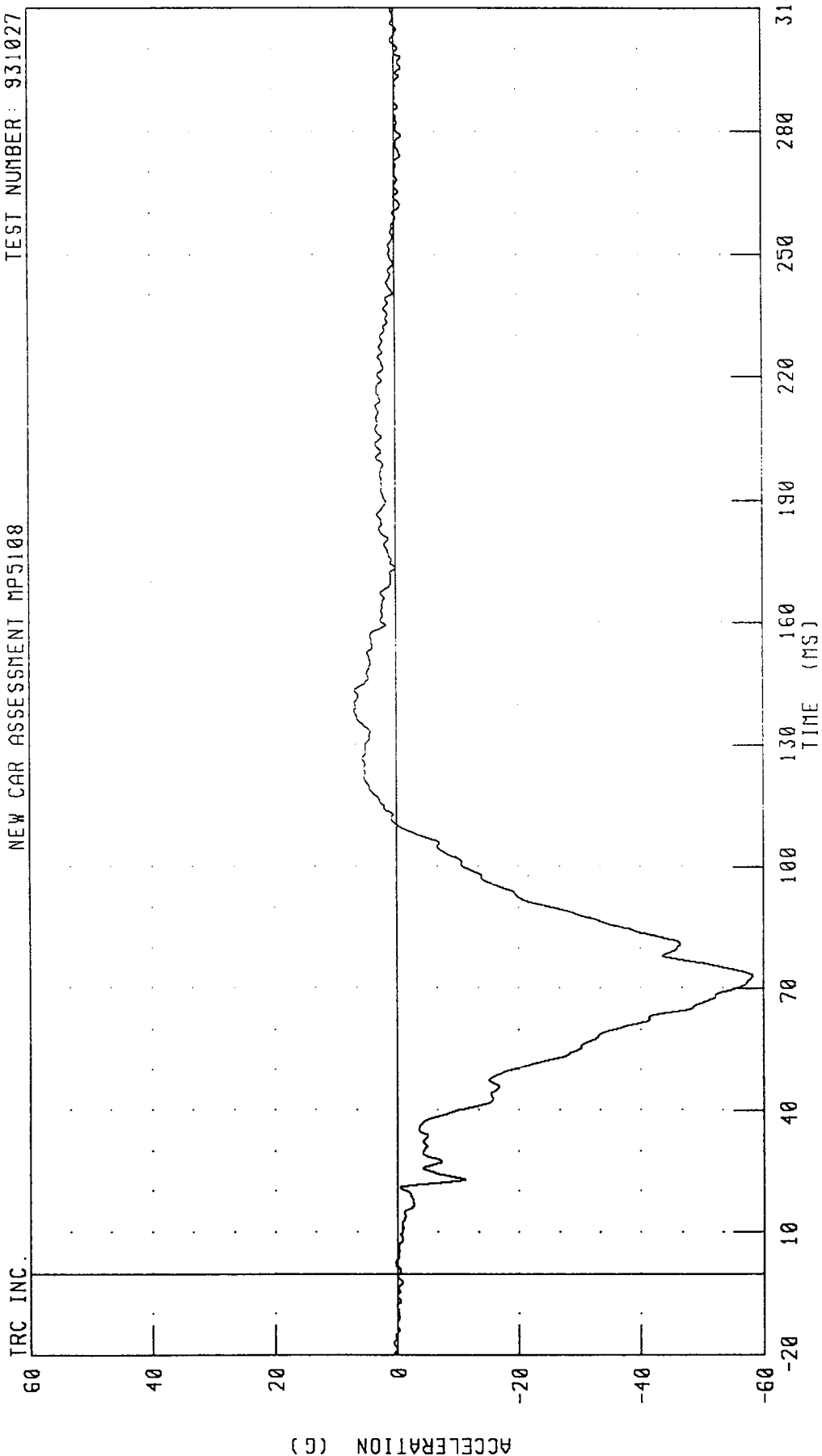
1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT Z AXIS
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

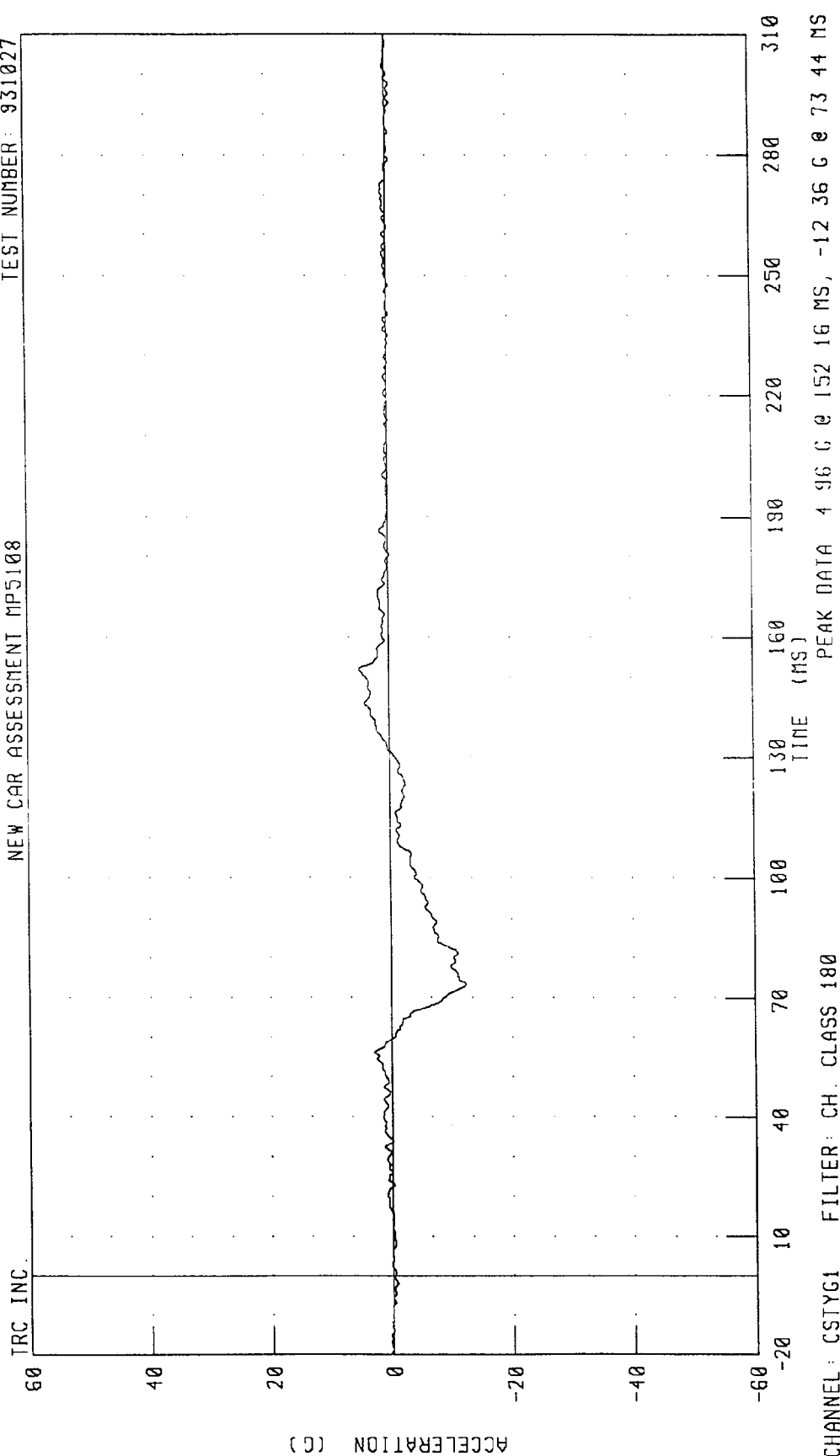


CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA 6.91 G @ 138.48 MS, -58.16 G @ 73.04 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

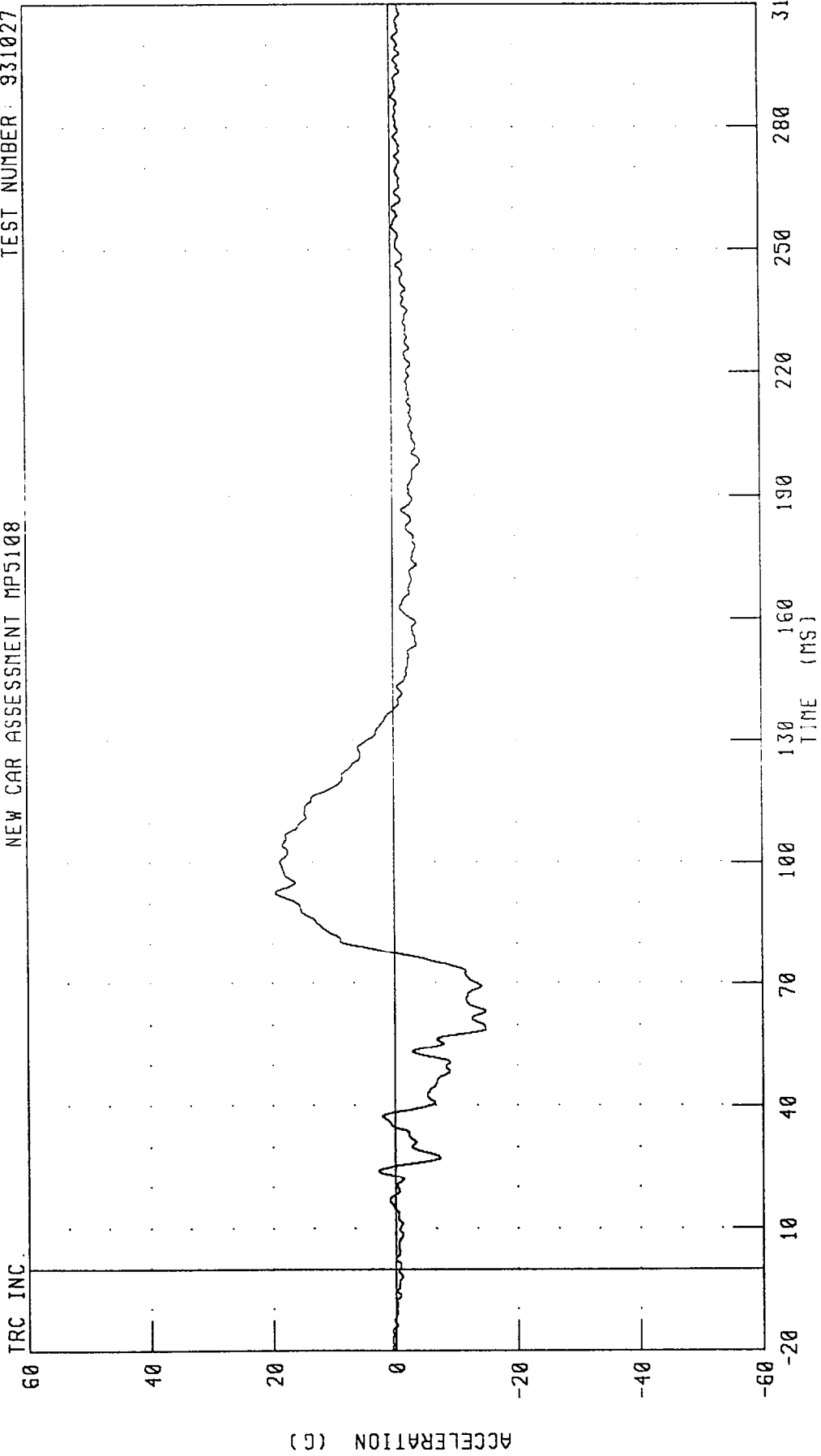


CHANNEL: CSTYG1 FILTER: CH. CLASS 180

PEAK DATA 4 96 G @ 152 16 MS, -12 36 G @ 73 44 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

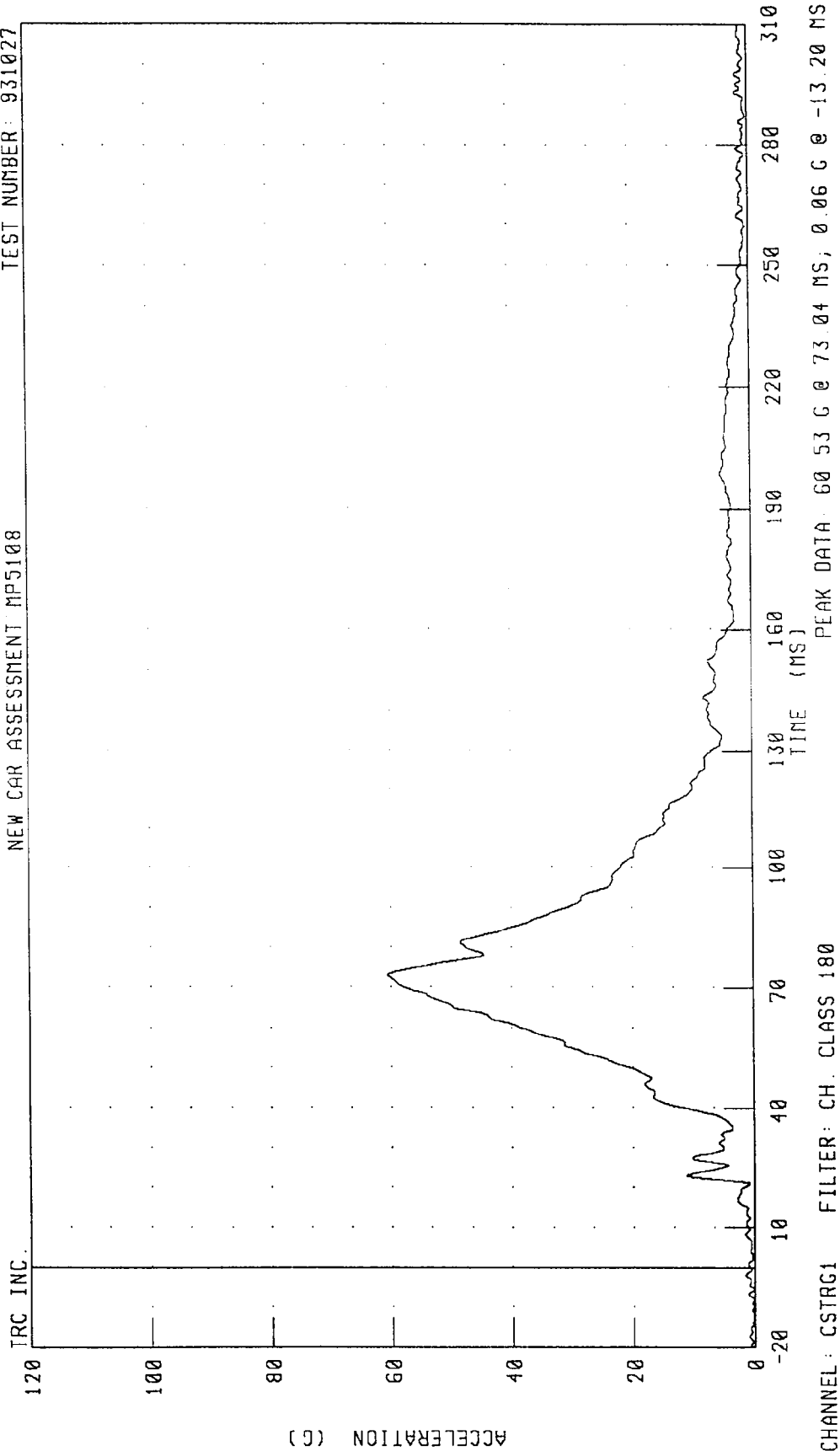


CHANNEL: CST2G1 FILTER: CH. CLASS 180

PEAK DATA 19.48 G @ 92.64 MS, -14.79 G @ 63.28 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MP5108

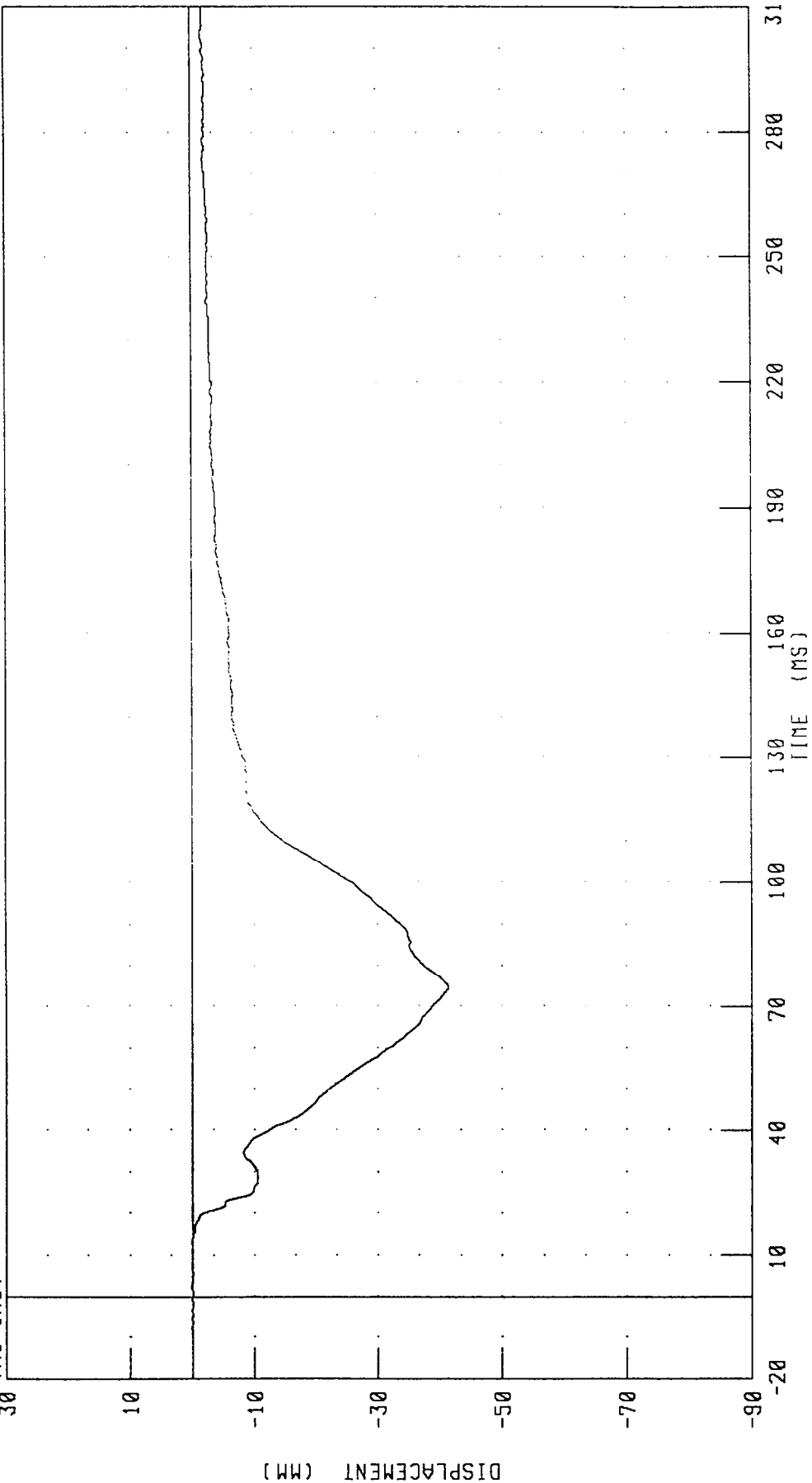
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST DEFLECTION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

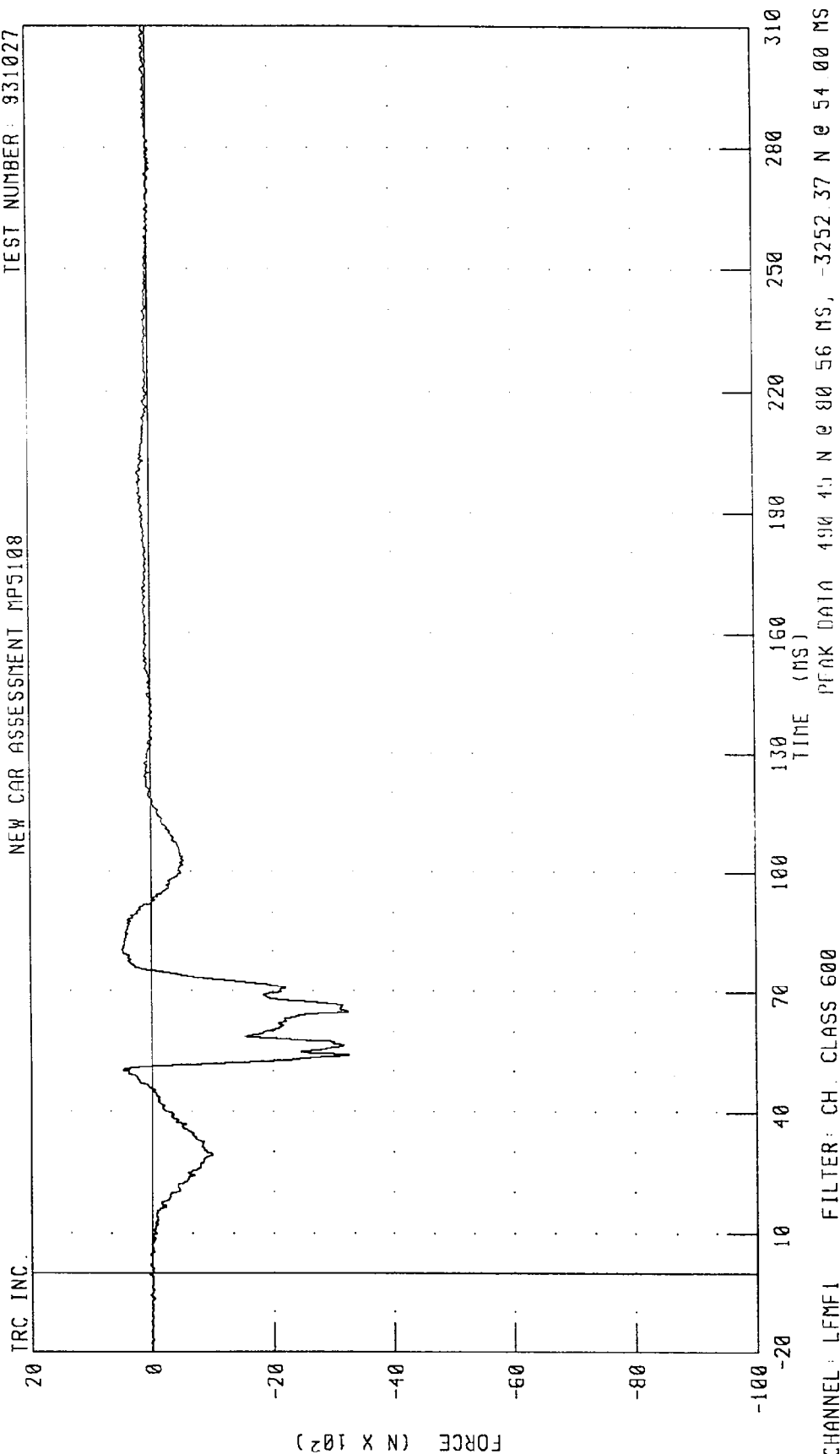
TRC INC.



CHANNEL: CSTXD1 FILTER: CH. CLASS 180 PFAK DATA 0 11 MM @ 56 MS, -41.31 MM @ 74.64 MS

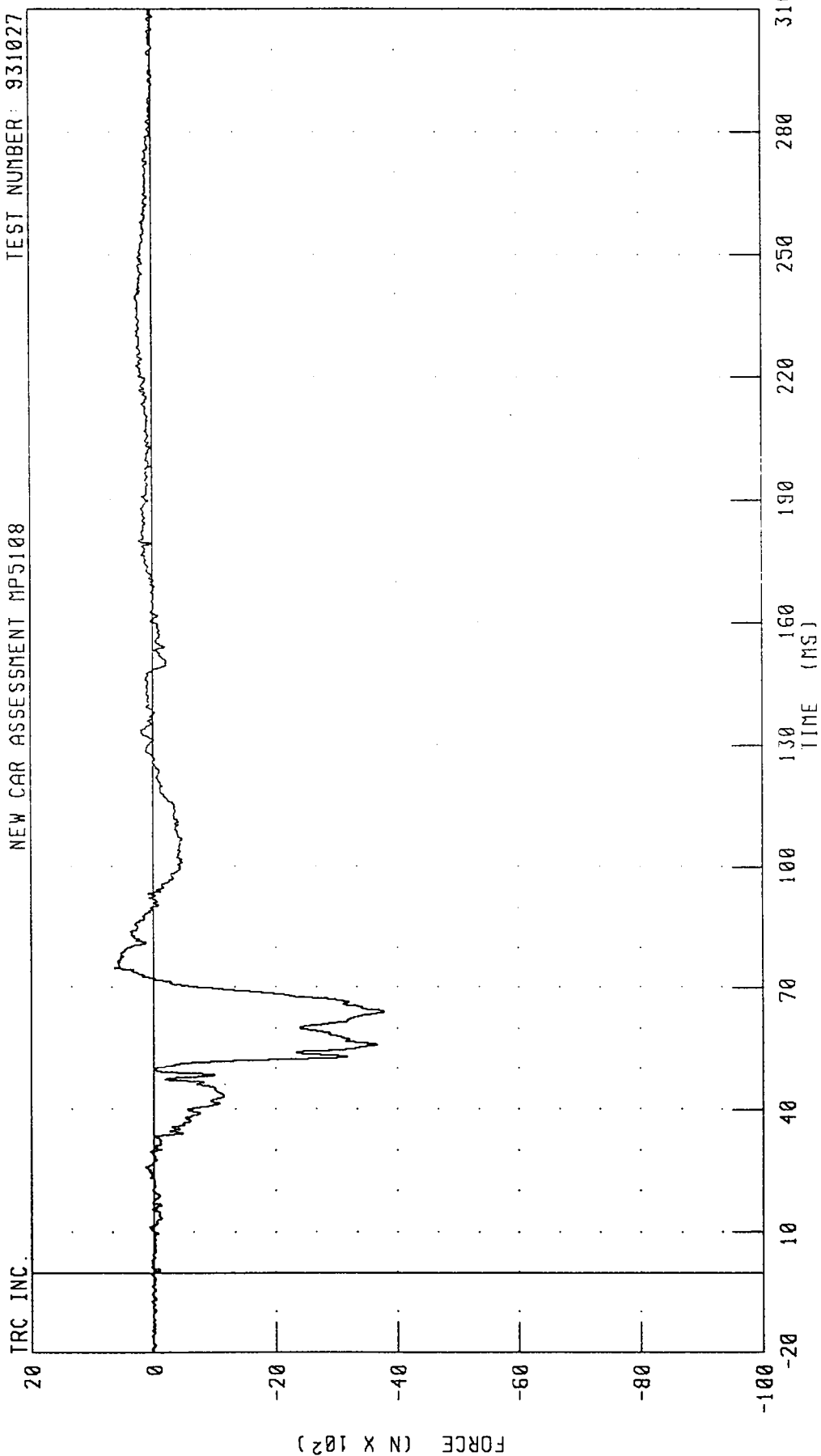
1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT FEMUR FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

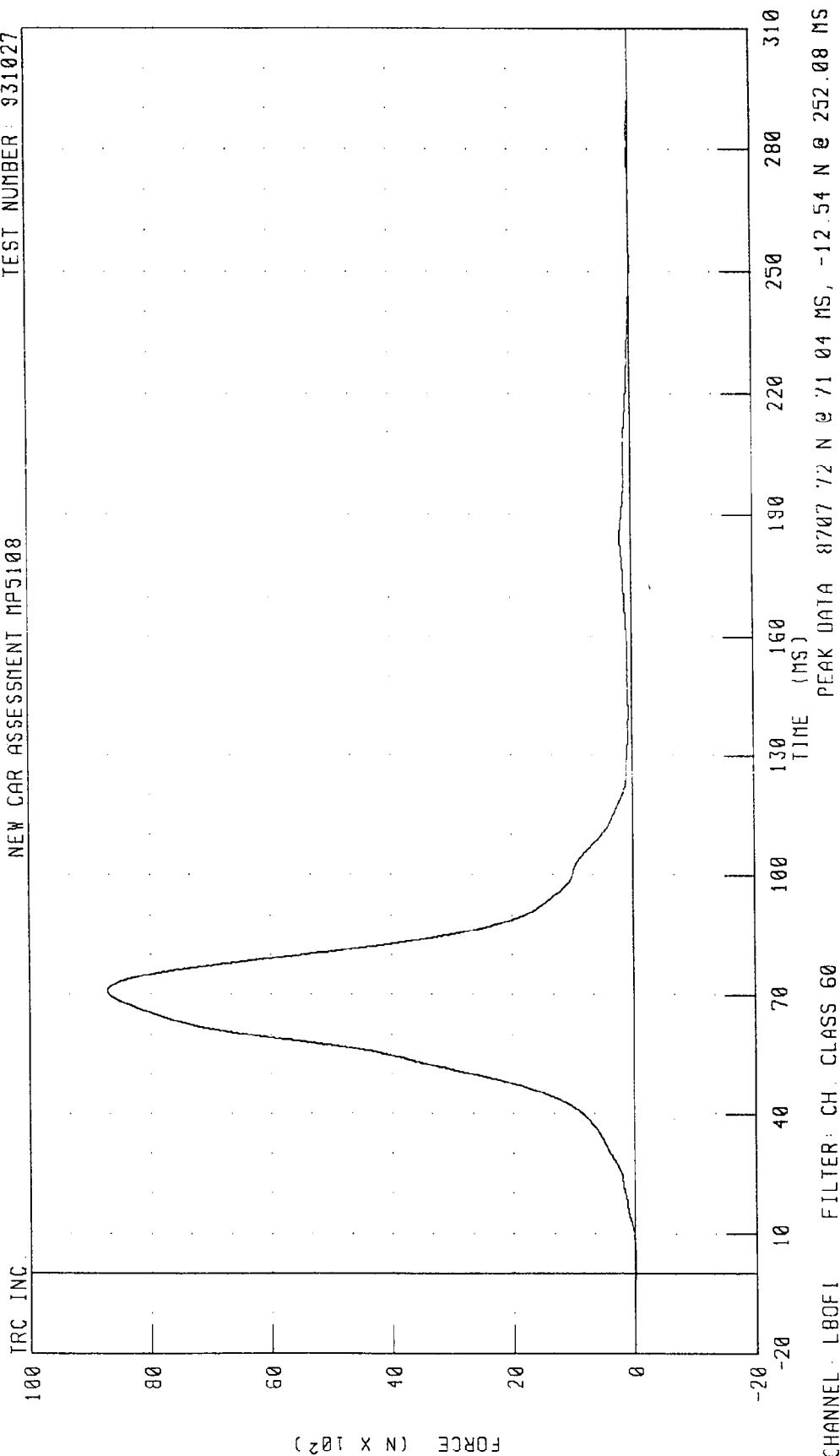


CHANNEL: RFMF1 FILTER: CH. CLASS 600

P10K 0010 644 87 N @ 74 88 MS, -3774 27 N @ 64 16 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



CHANNEL: LBOFI FILTER: CH. CLASS 60

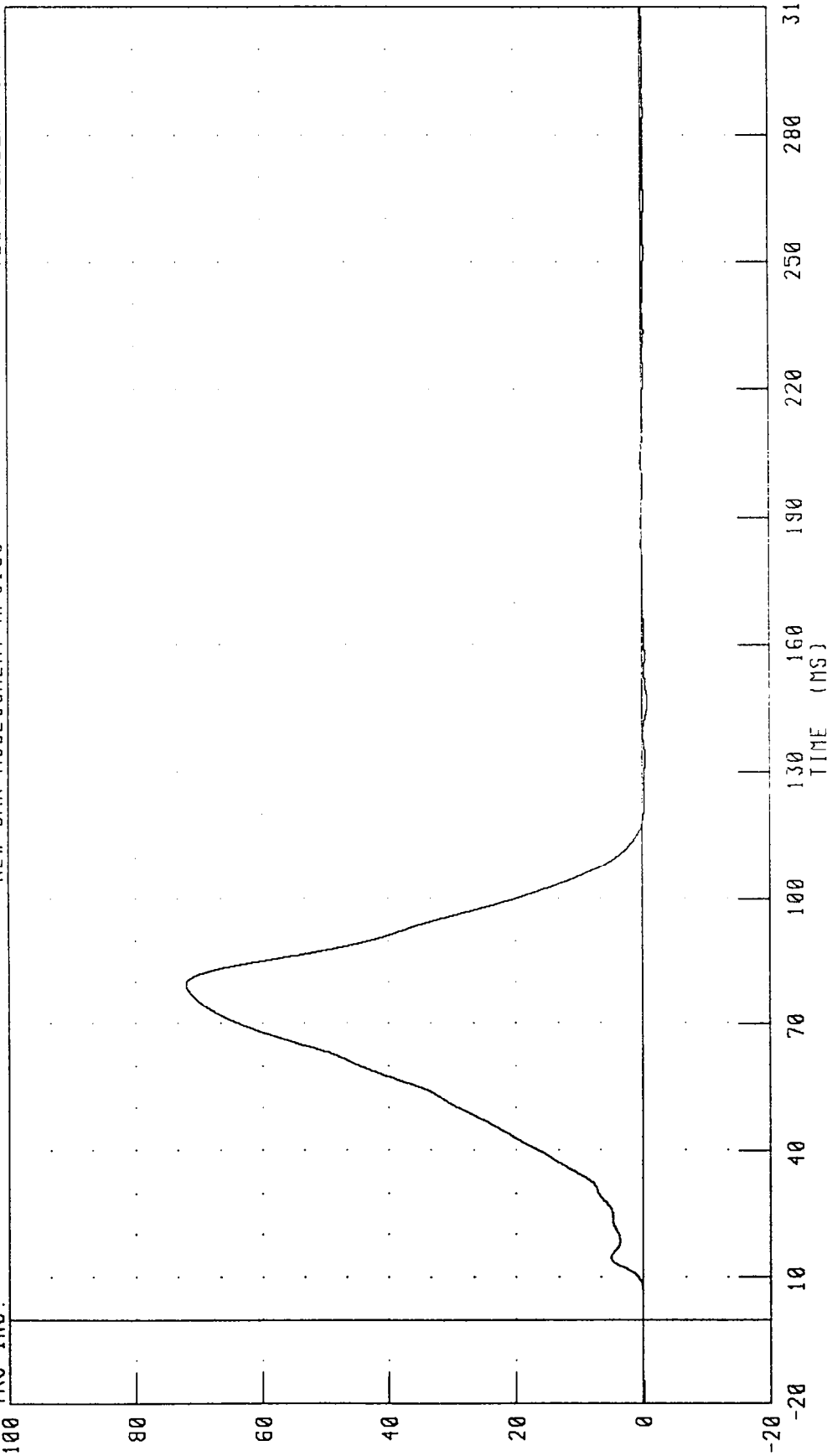
PEAK DATA 8707 1/2 N @ 71 04 MS, -12.54 N @ 252.08 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

TRC INC.

FORCE (N X 10²)



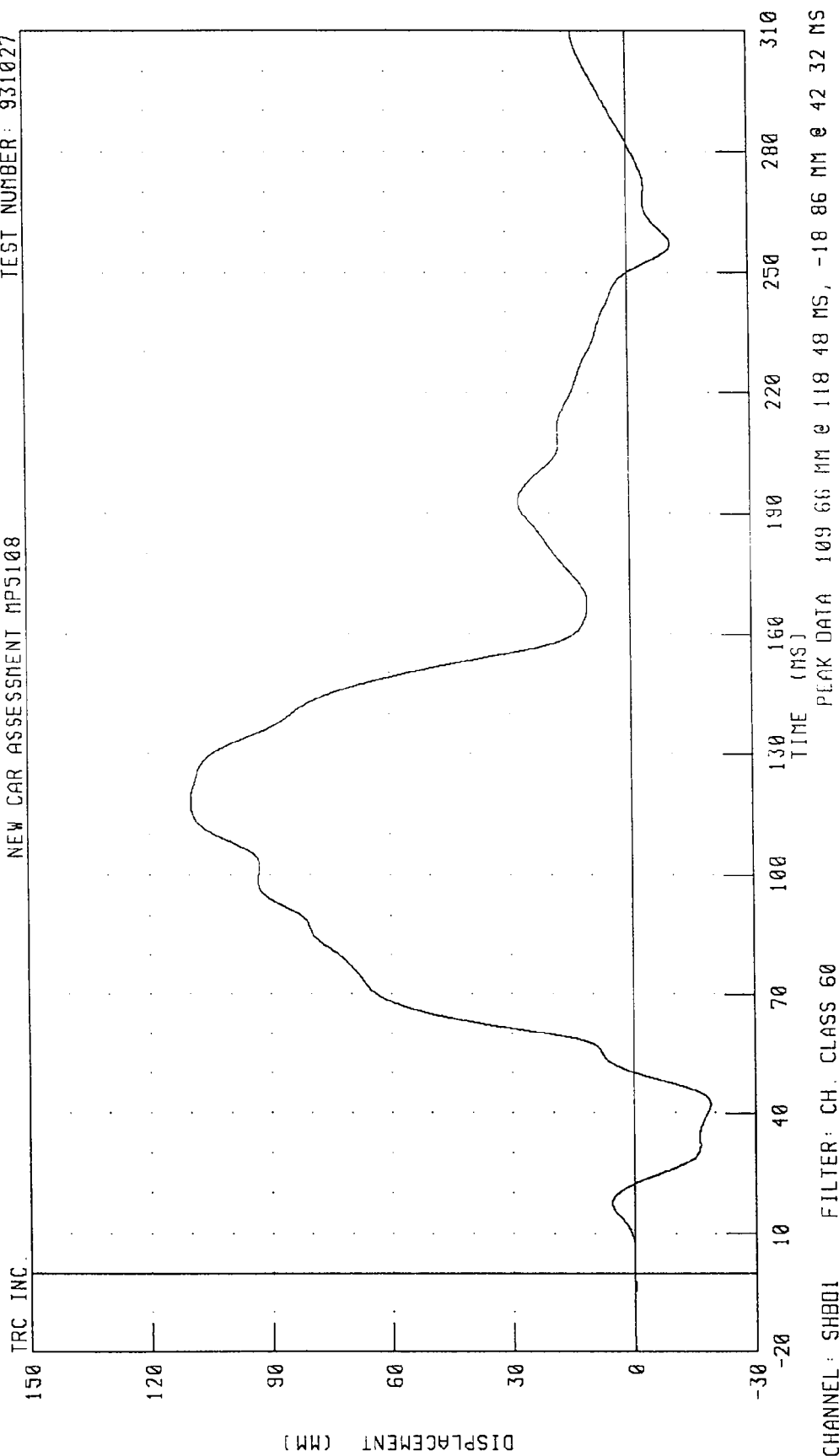
CHANNEL: SHBF1 FILTER: CH. CLASS 60

PEAK DATA

7207 31 N @ 79 44 MS, -83 77 N @ 146 40 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

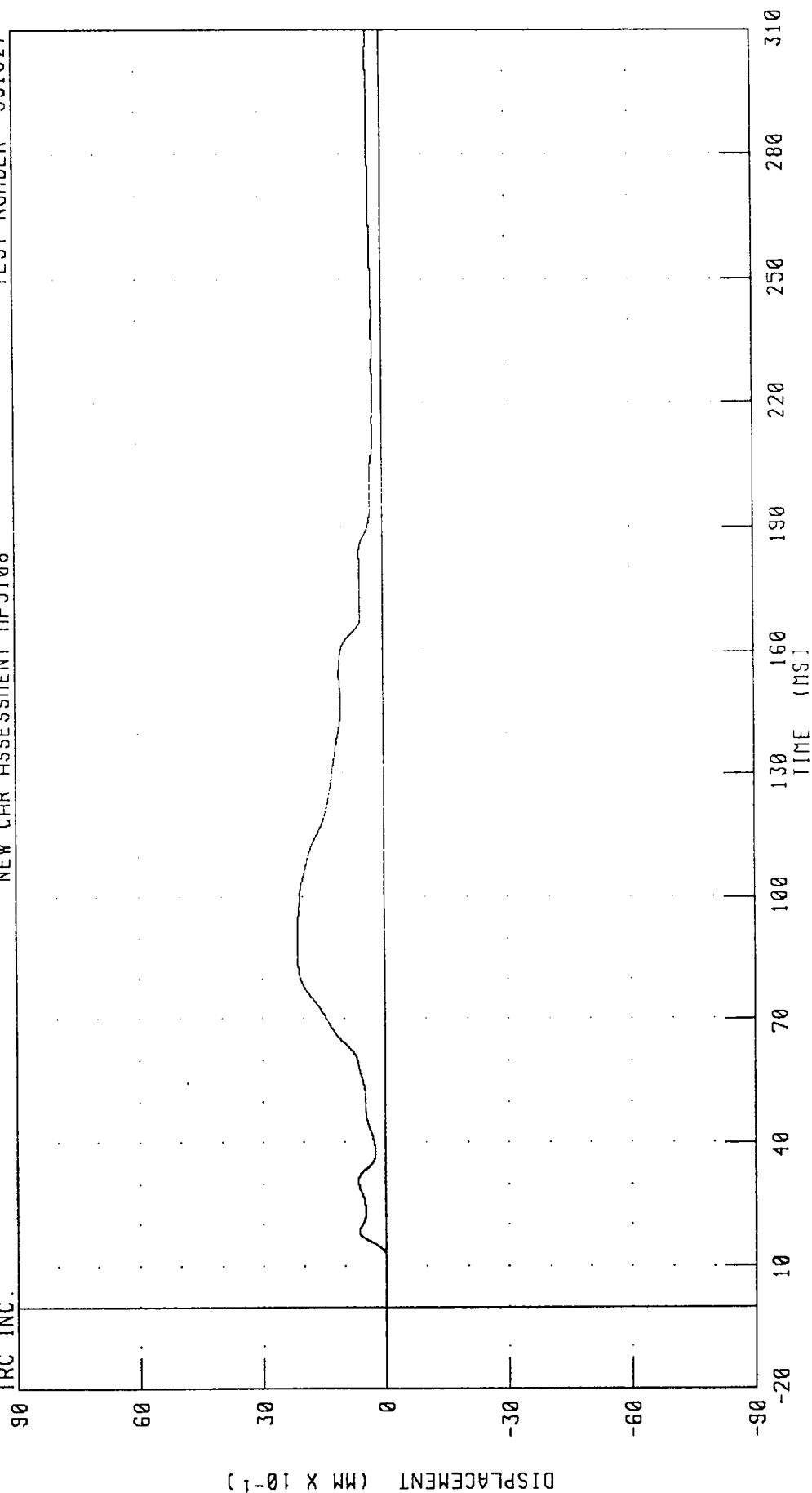


CHANNEL: SHBD1 FILTER: CH. CLASS 60
 PEAK DATA 109 66 MM @ 118 48 MS, -18 86 MM @ 42 32 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

TRC INC.

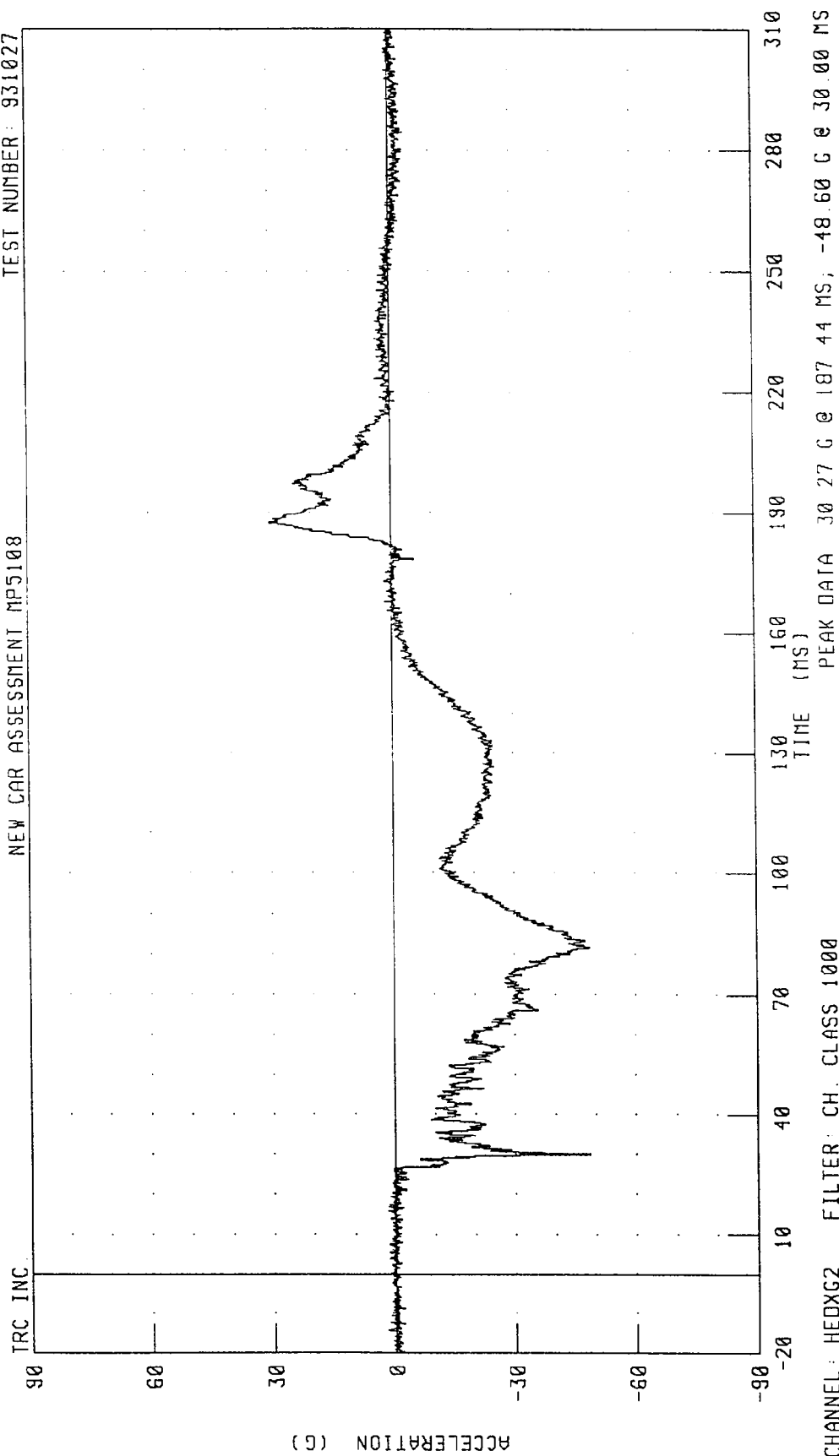


CHANNEL: SBED1 FILTER: CH. CLASS 60

PEAK DATA 2 13 MM @ 92 24 MS, -0 02 MM @ 11 60 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

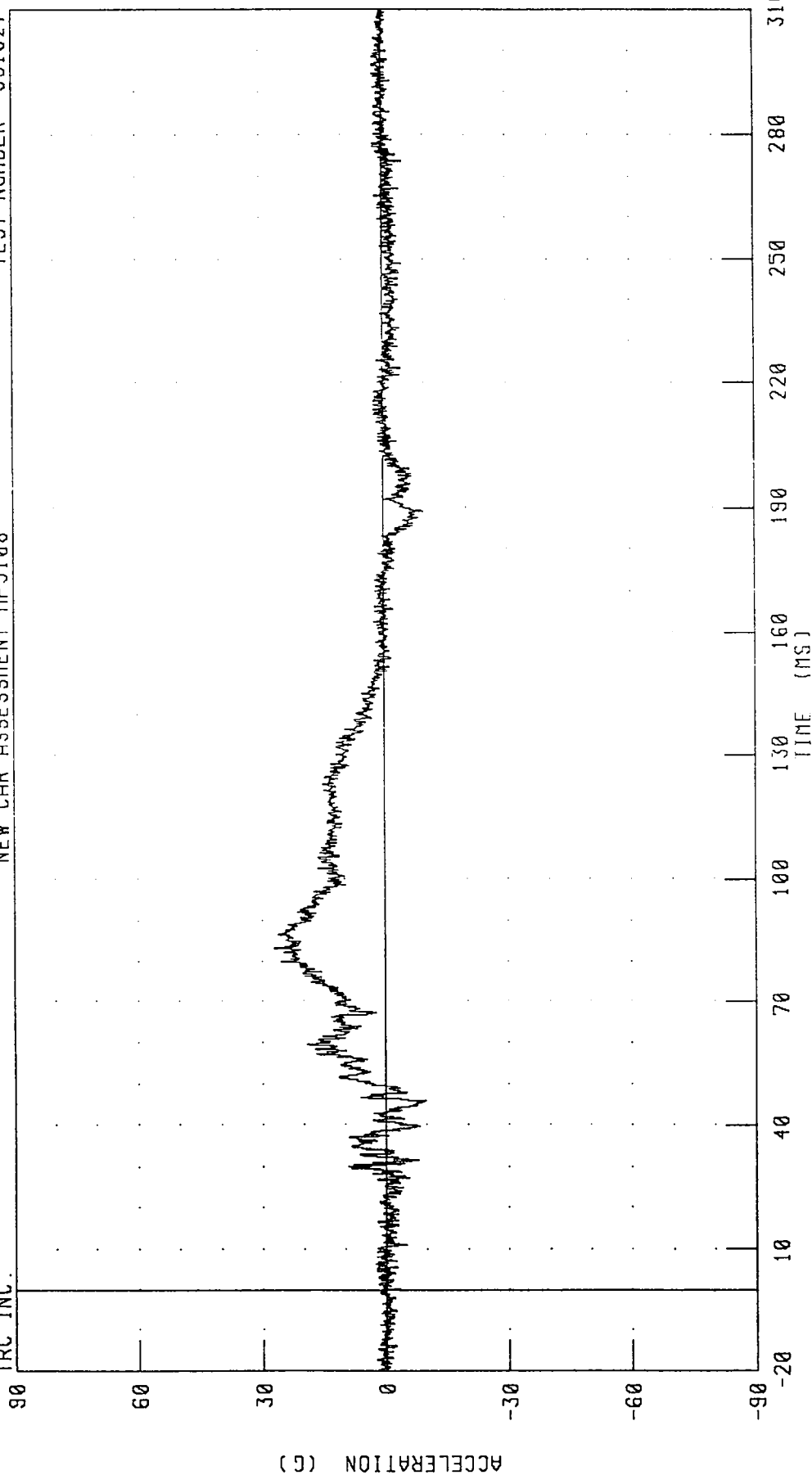


1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.

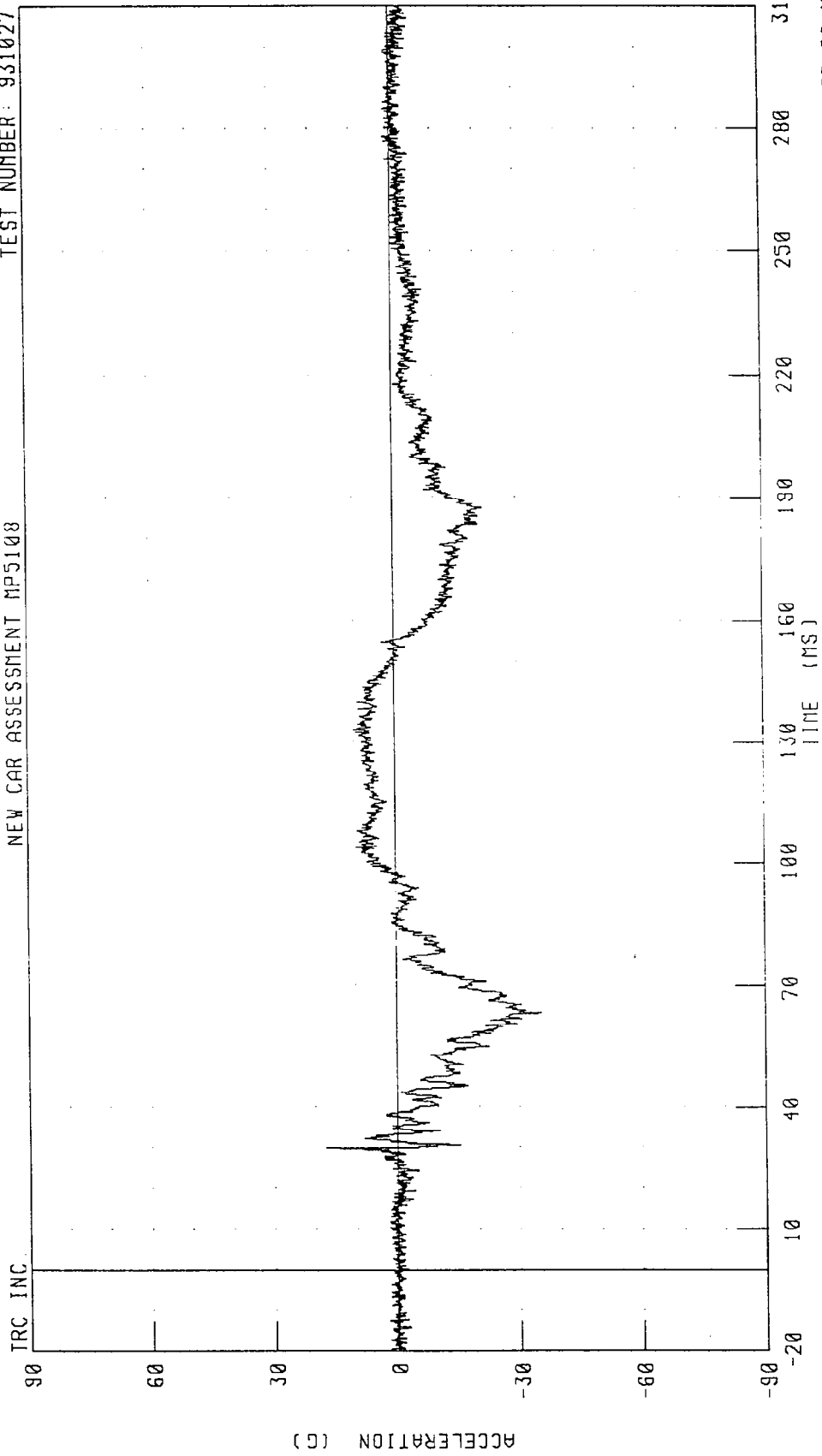


CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA 27 17 G @ 83 28 MS, -9.75 G @ 45 84 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

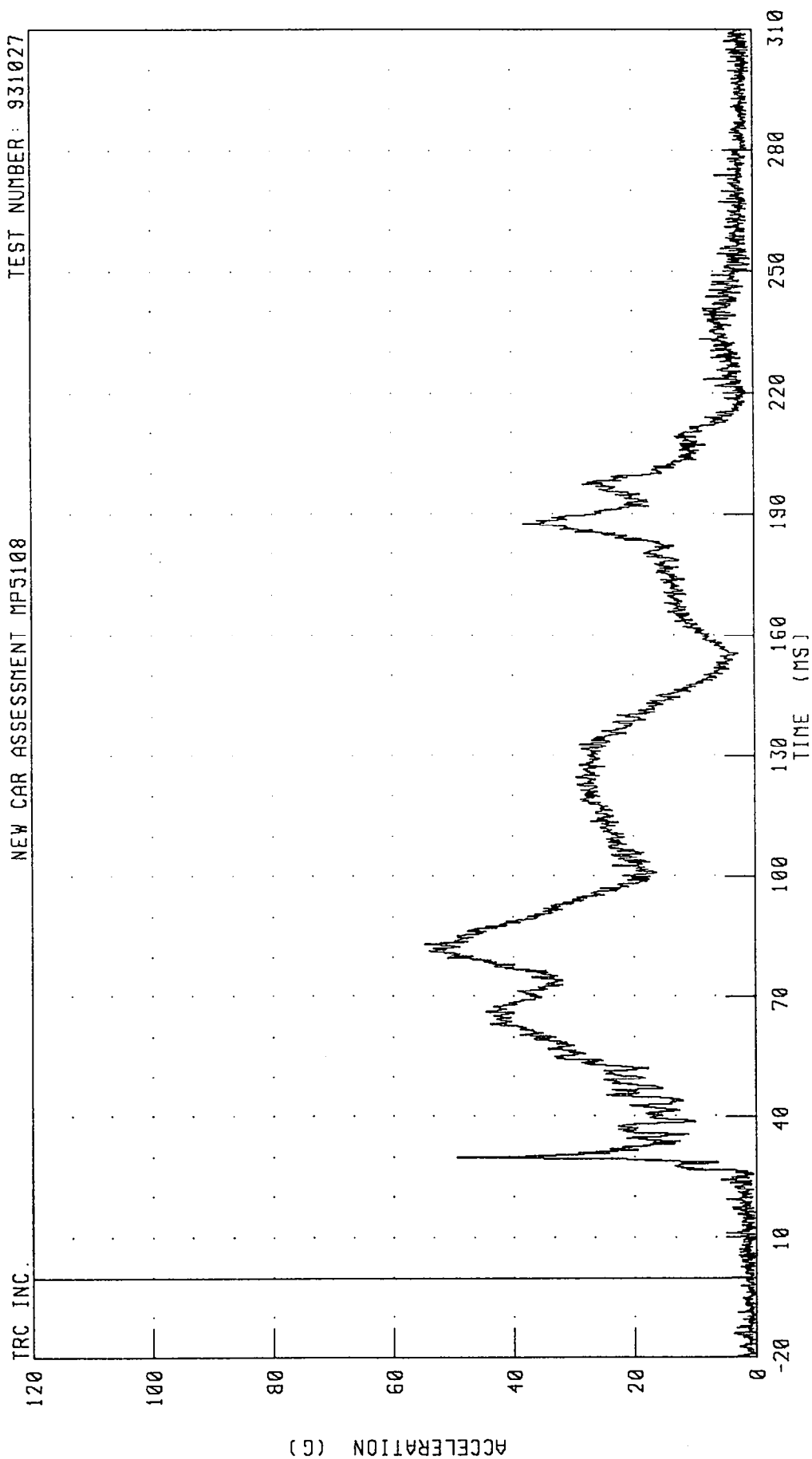


CHANNEL: HEDZG2 FILTER: CH CLASS 1000

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

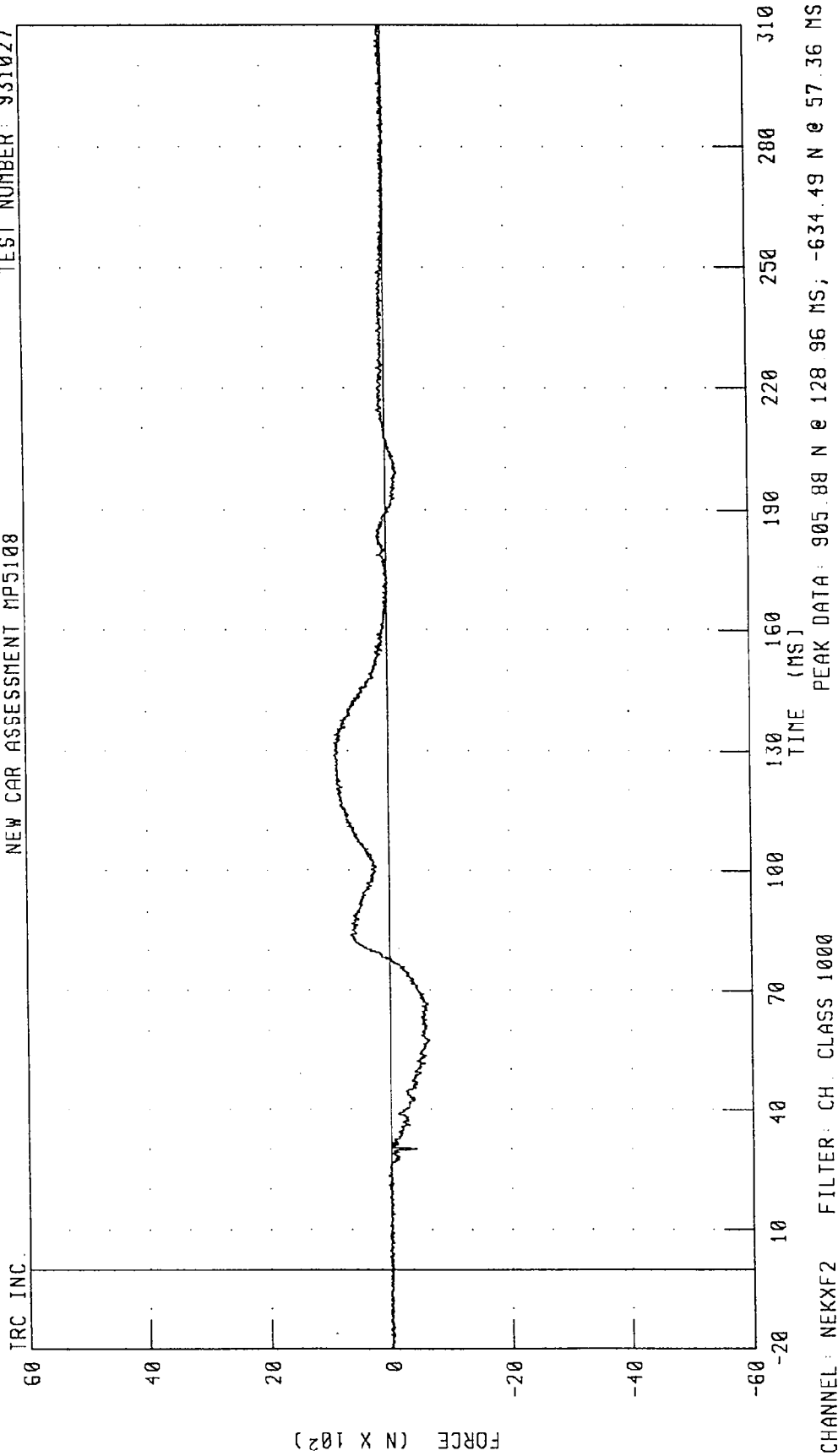


CHANNEL: HEDG2 FILTER: CH. CLASS 1000

PEAK DATA 54.72 G @ 83.28 MS, 0.10 G @ 16.16 MS

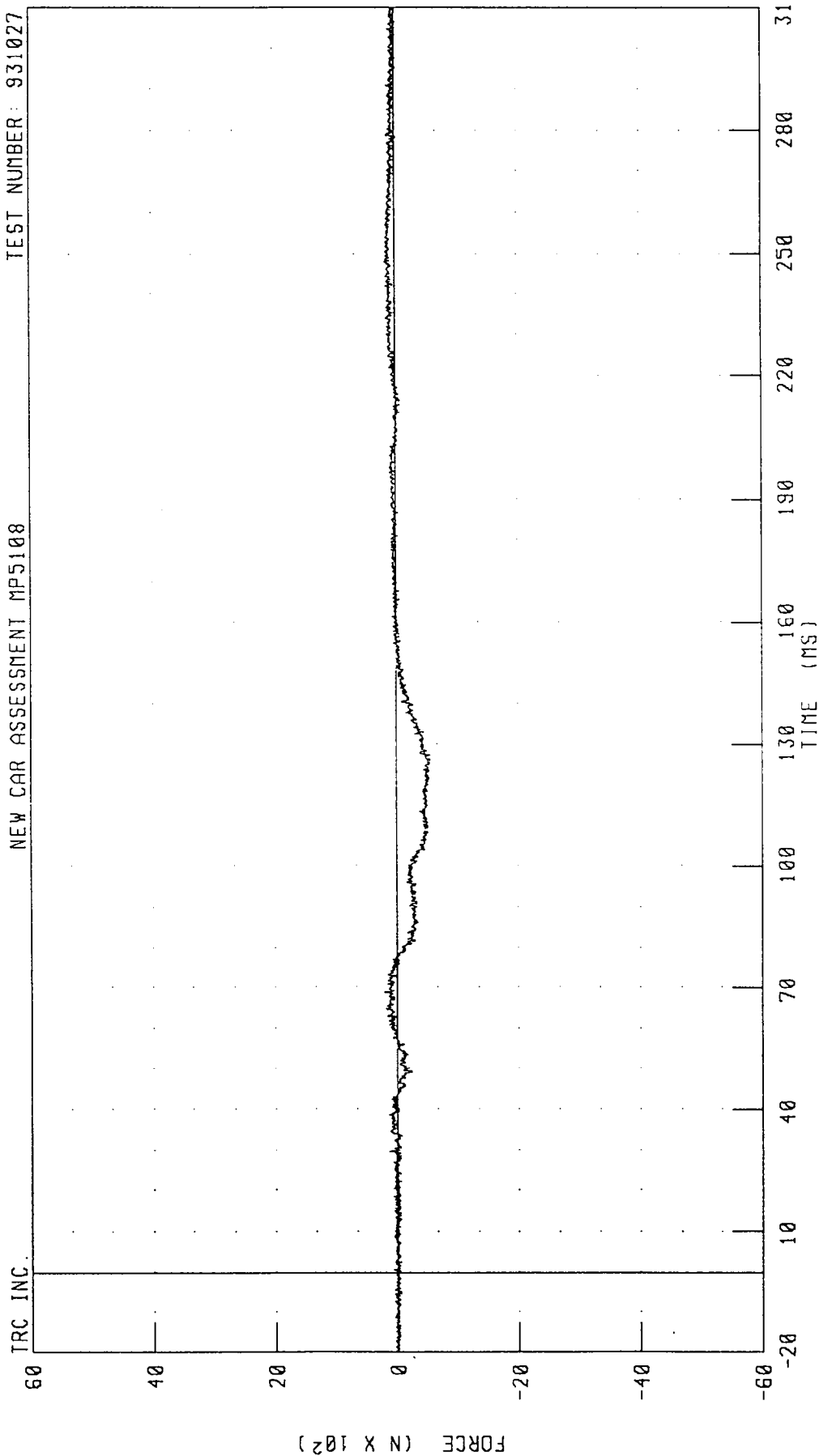
1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MP5108

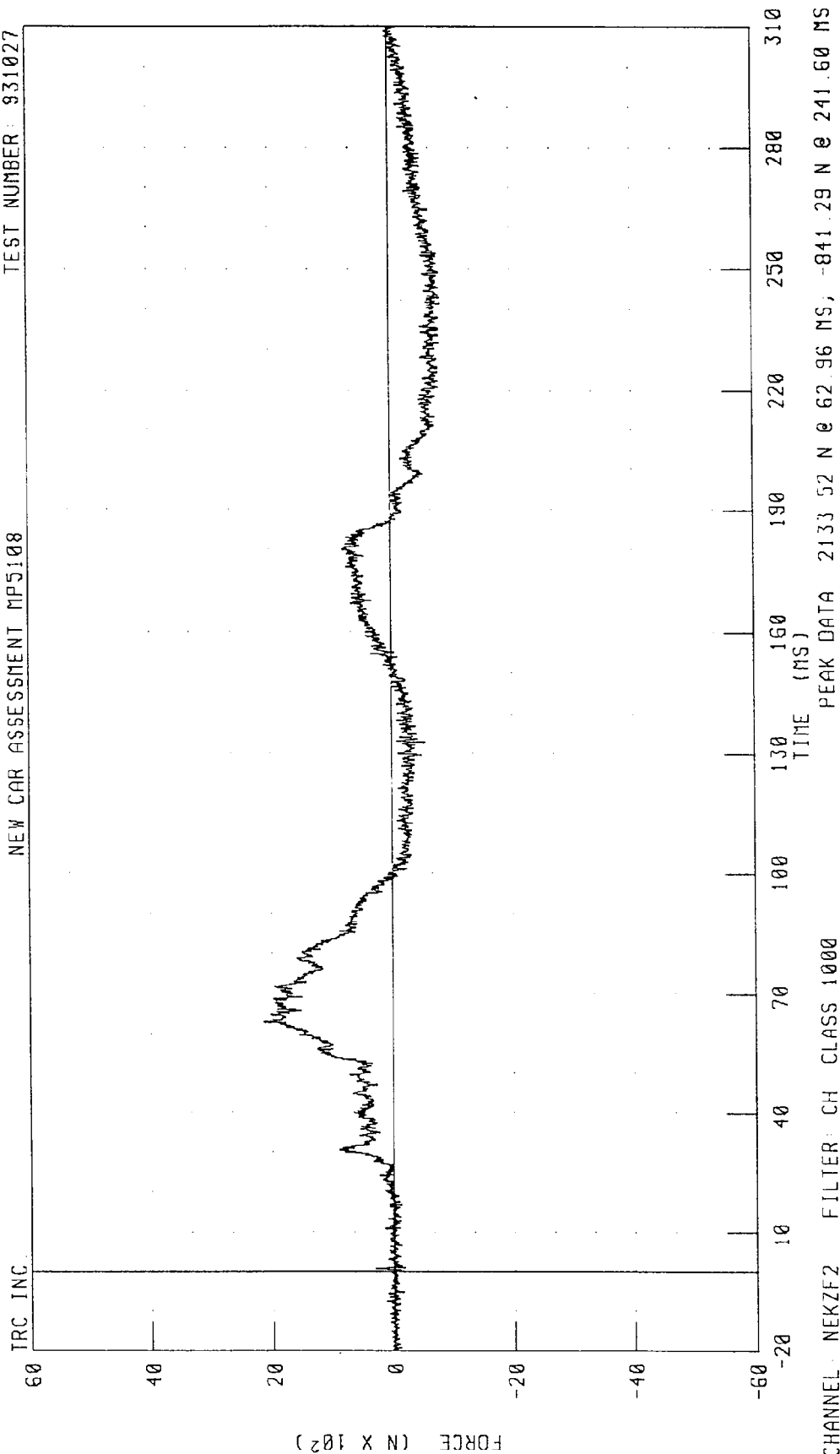
TEST NUMBER: 931027



CHANNEL: NEKYF2 FILTER: CH. CLASS 1000 PEAK DATA 200 95 N @ 68 80 MS, -540 88 N @ 126 24 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT MP5108

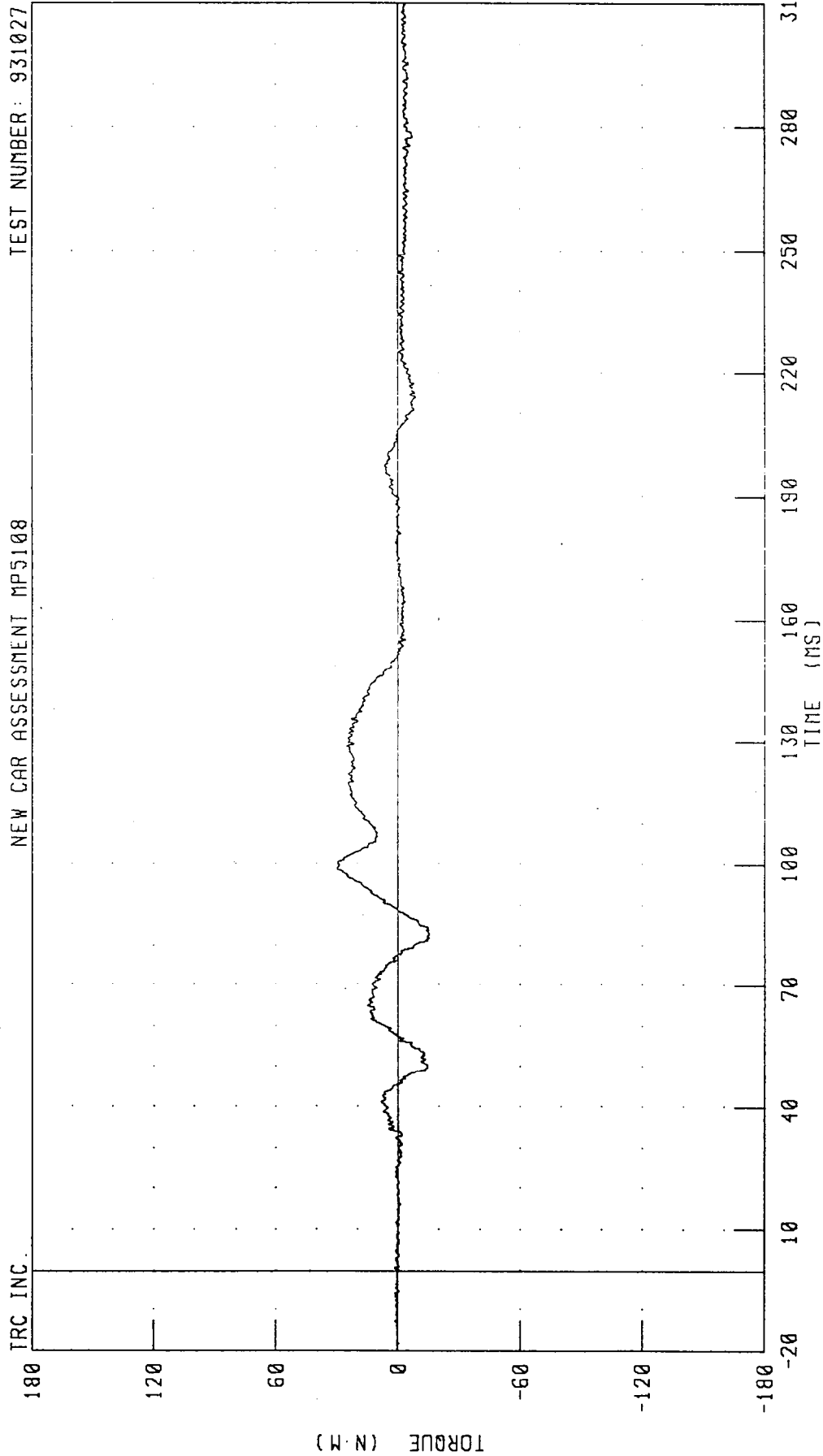
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

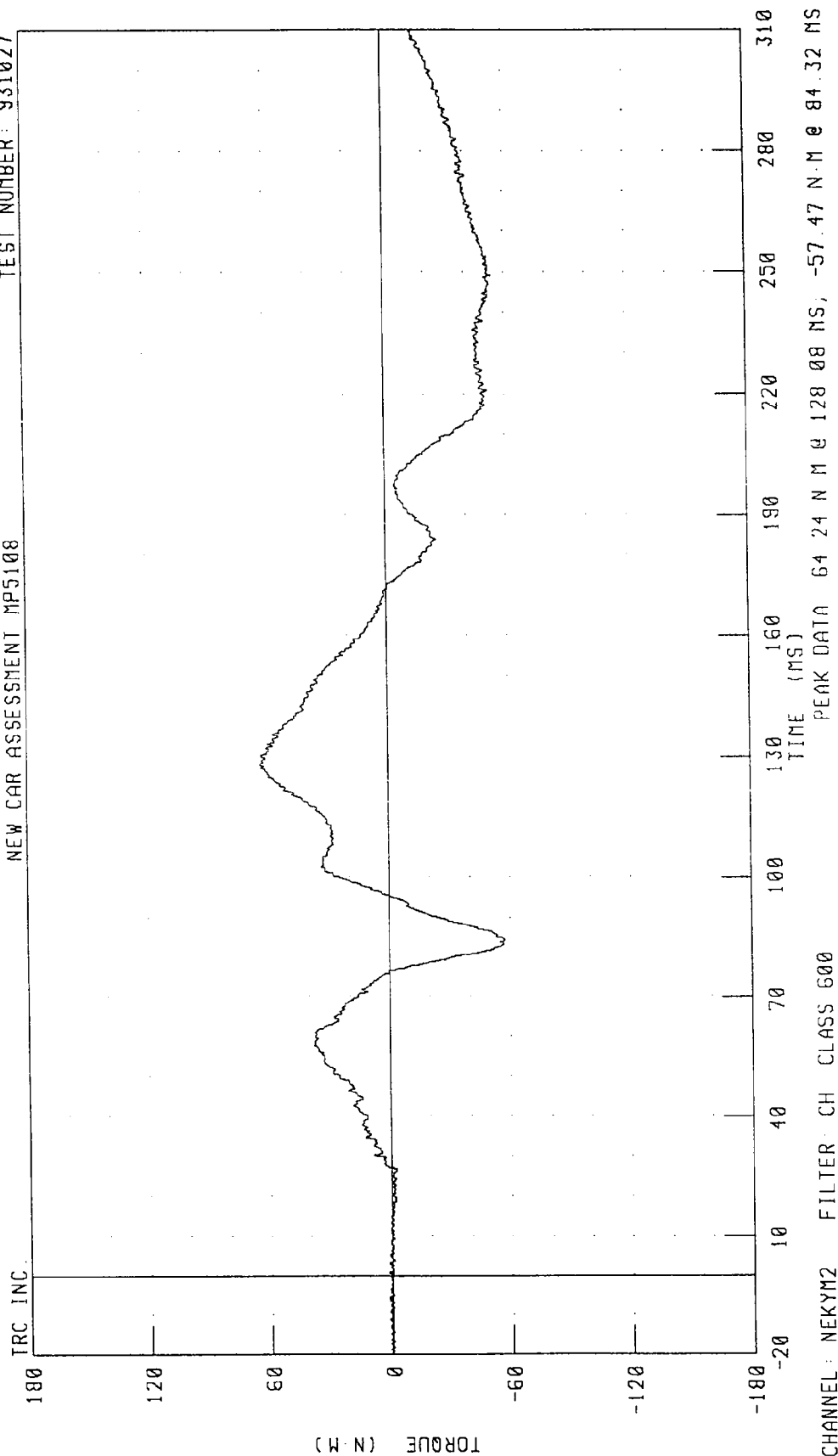


CHANNEL: NEKM2 FILTER: CH. CLASS 600

PEAK DATA 30 08 N M @ 98 96 MS, -15 05 N M @ 81 92 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

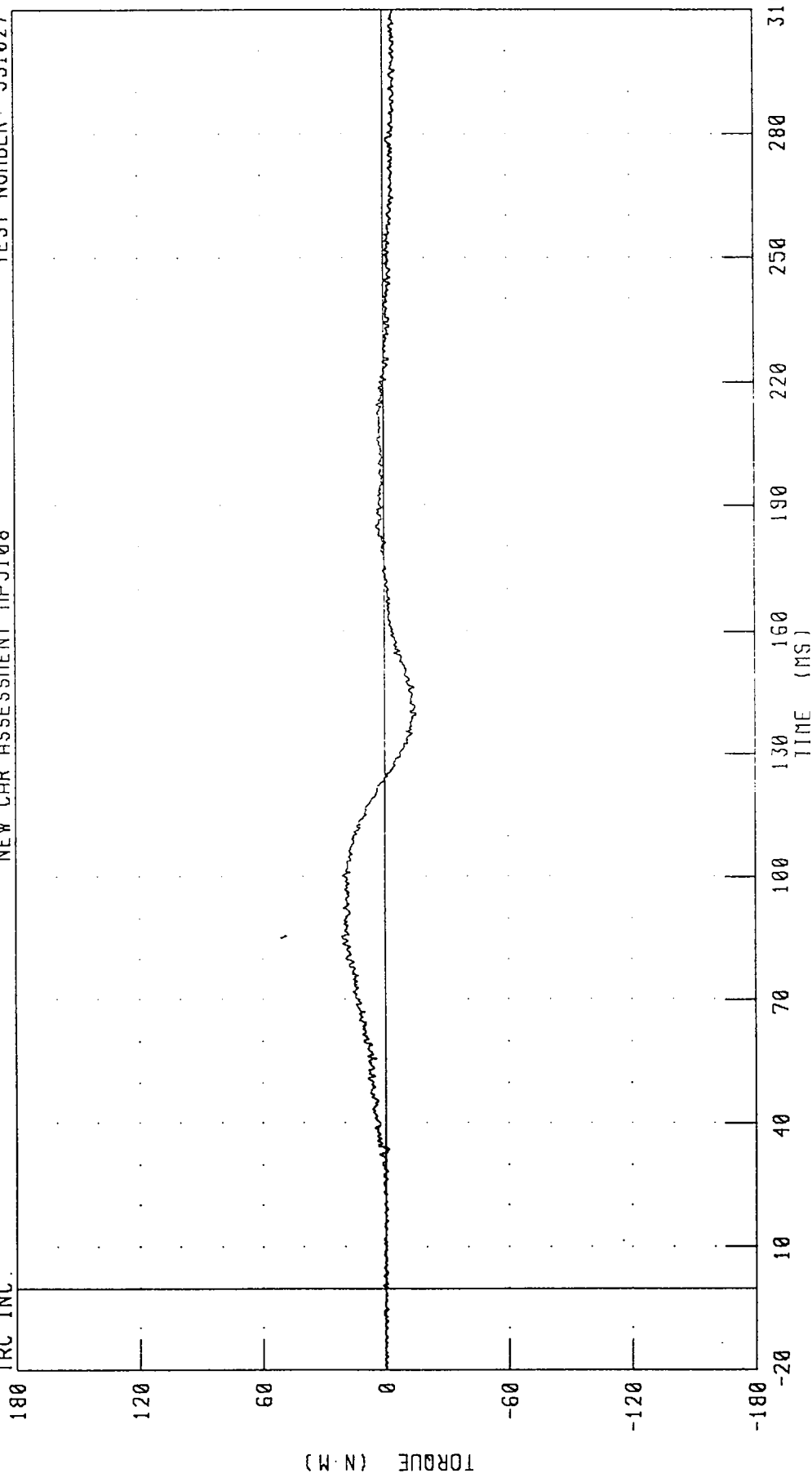


1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.

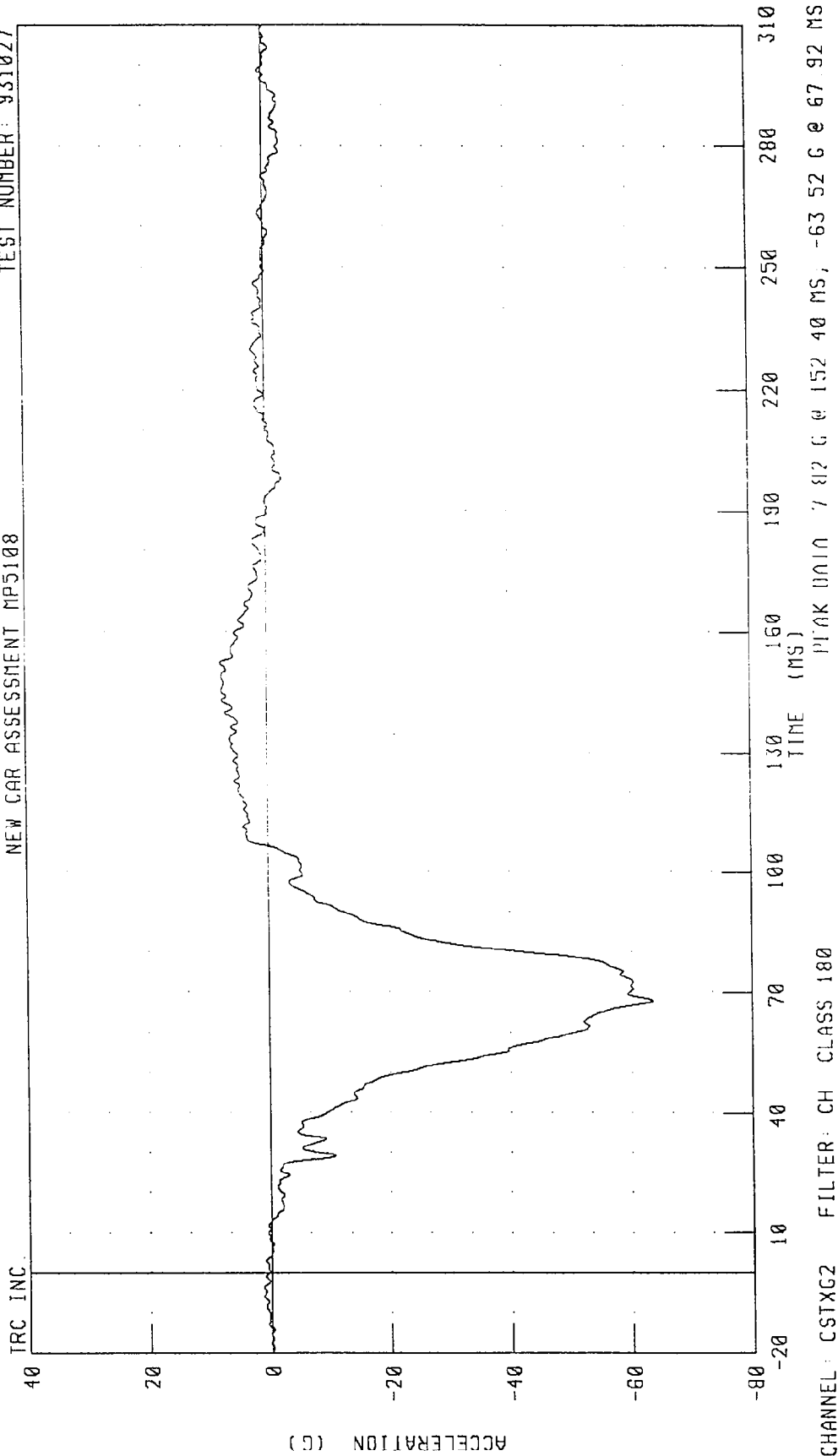


CHANNEL: NEKZM2 FILTER: CH. CLASS 600

PLAK DATA 21.58 N M @ 85.60 MS, -15.45 N M @ 139.84 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



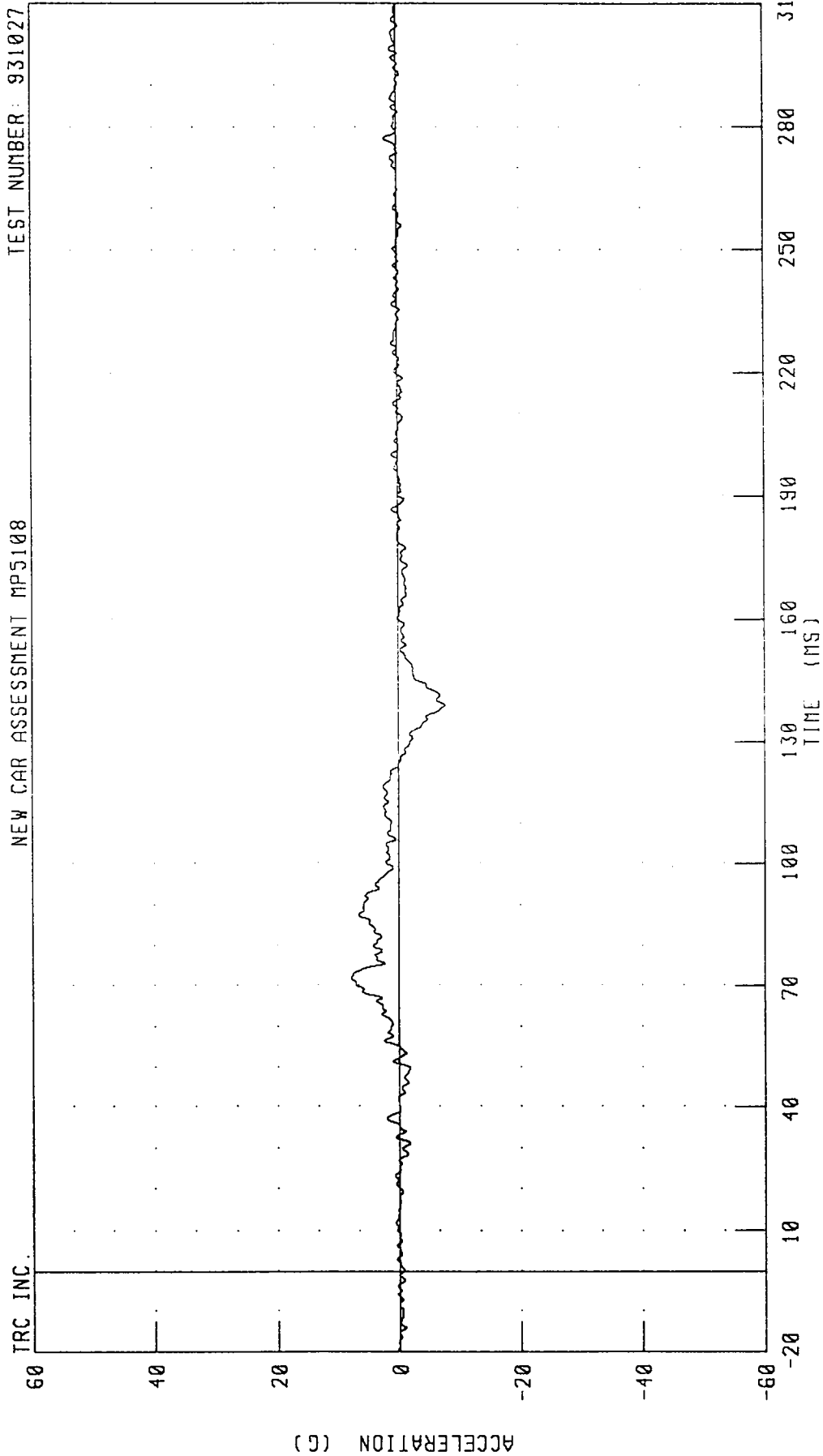
CHANNEL: CSTXG2 FILTER: CH CLASS 180

PIK DAIN 7 812 G @ 152 40 MS, -63 52 G @ 67 92 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

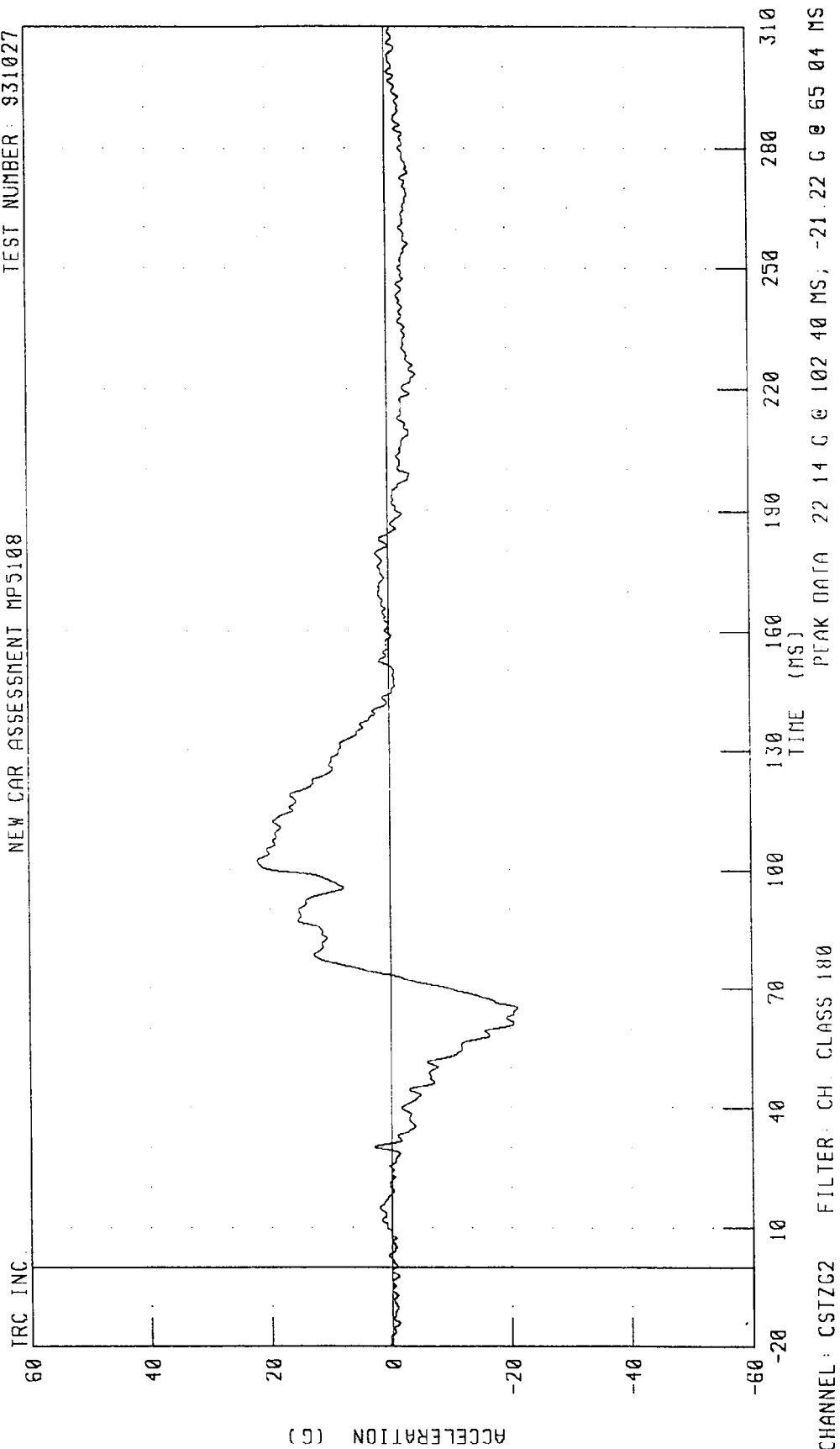


CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA 7 85 G @ 71 76 MS, -7.64 G @ 139 20 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MP5108

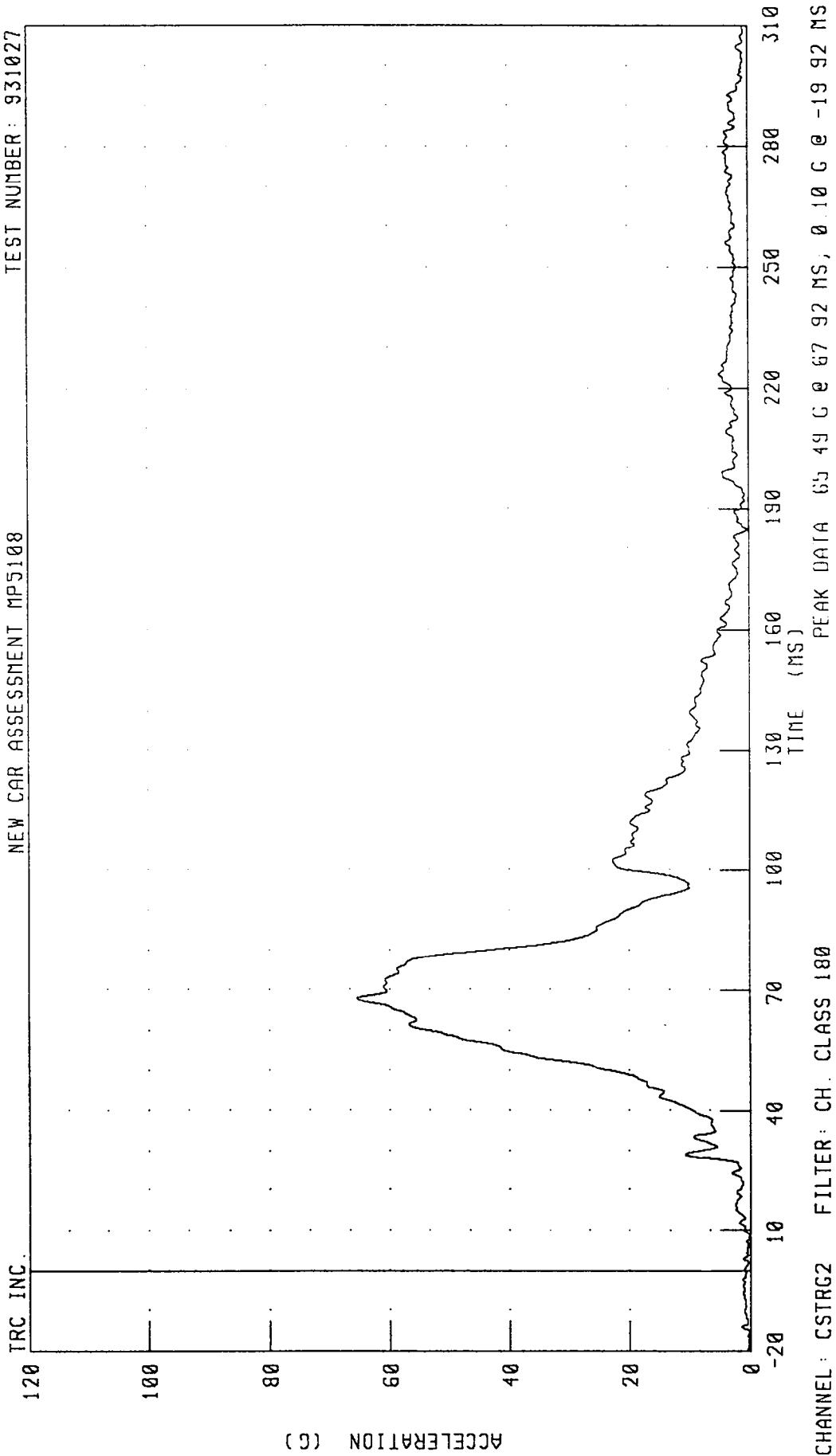
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION

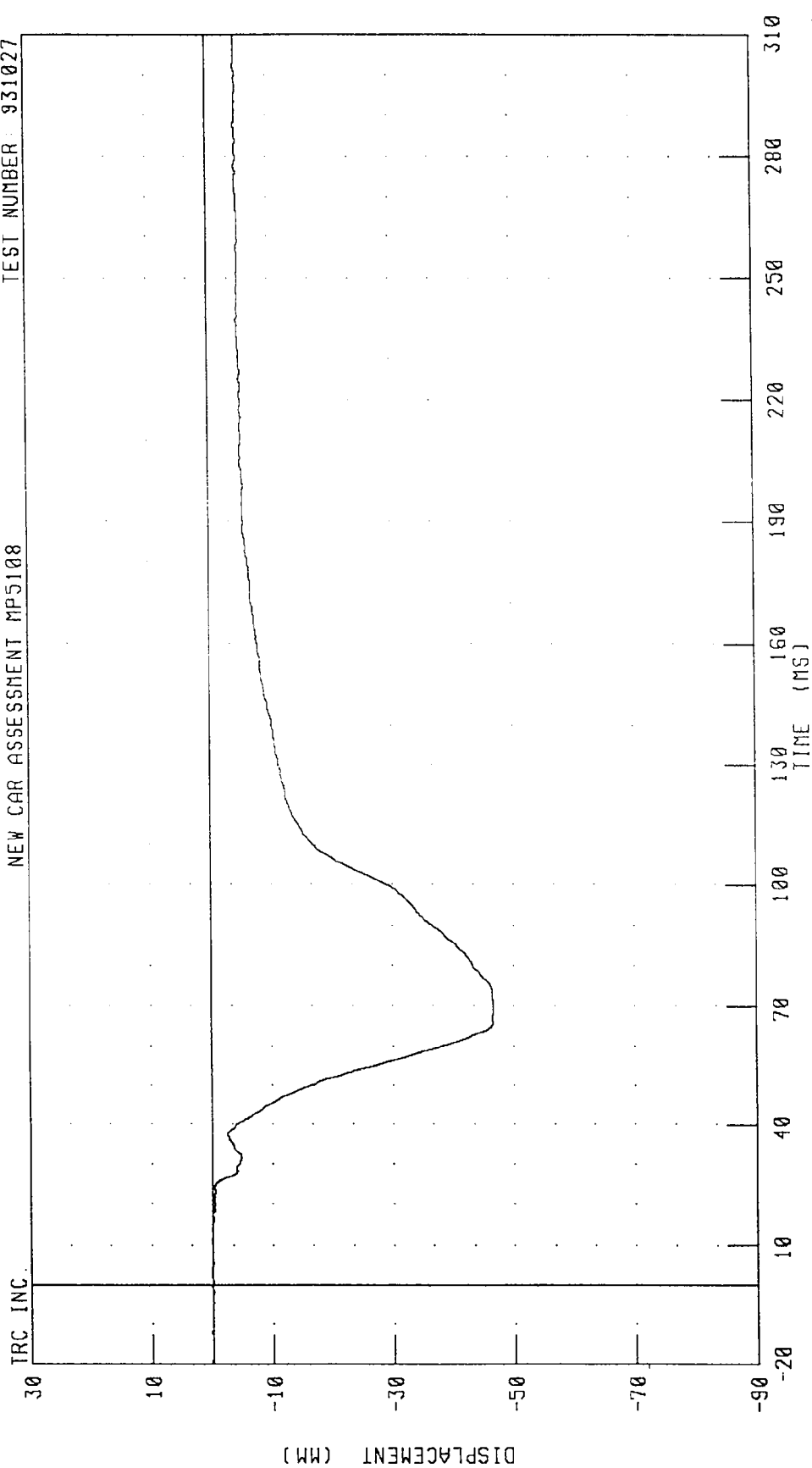
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST DEFLECTION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER 931027



CHANNEL: CSTXD2 FILTER: CH. CLASS 180

PEAK DATA: 0.11 MM @ 2.08 MS; -46.67 MM @ 68.72 MS

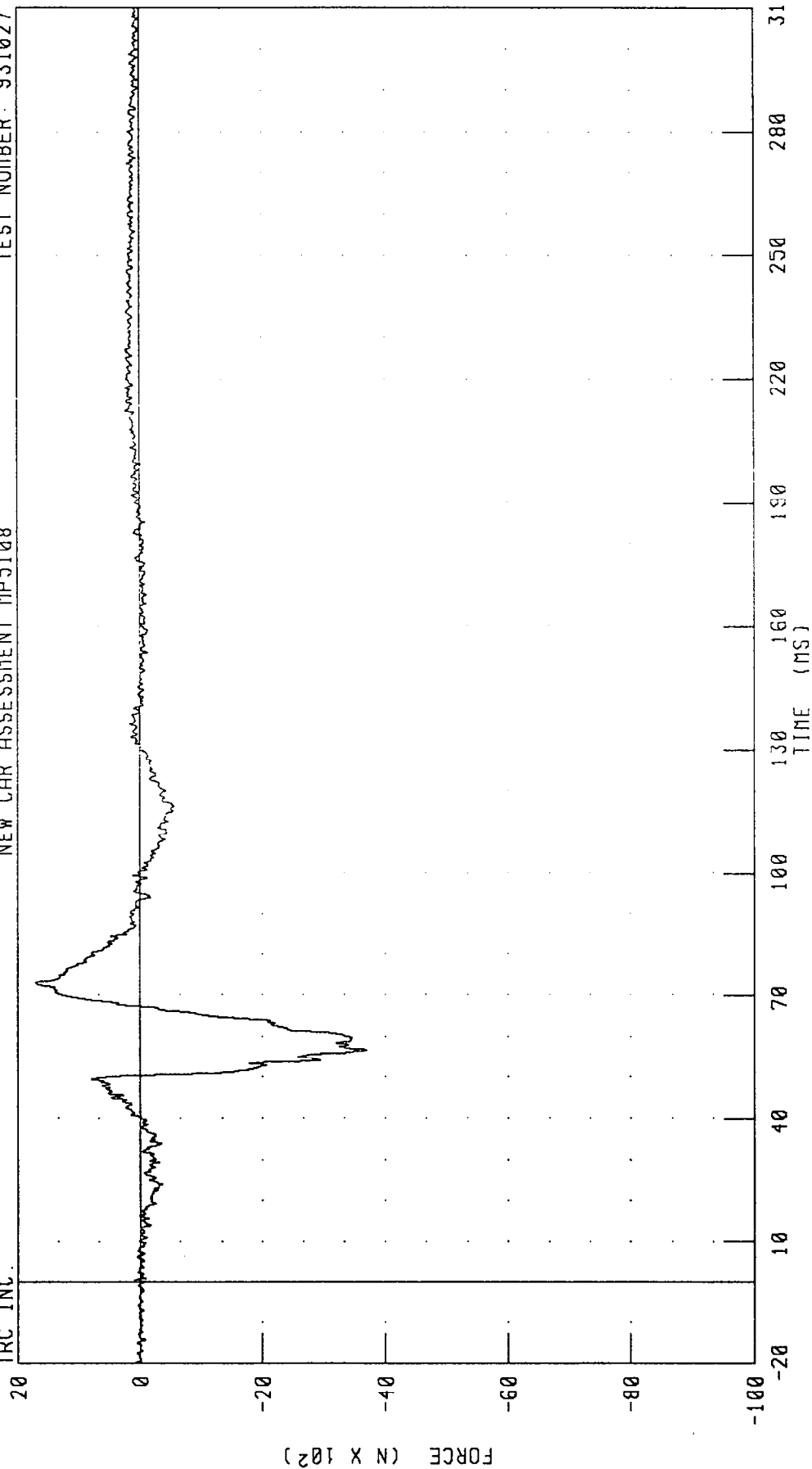
1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER

PASSENGER LEFT FEMUR FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

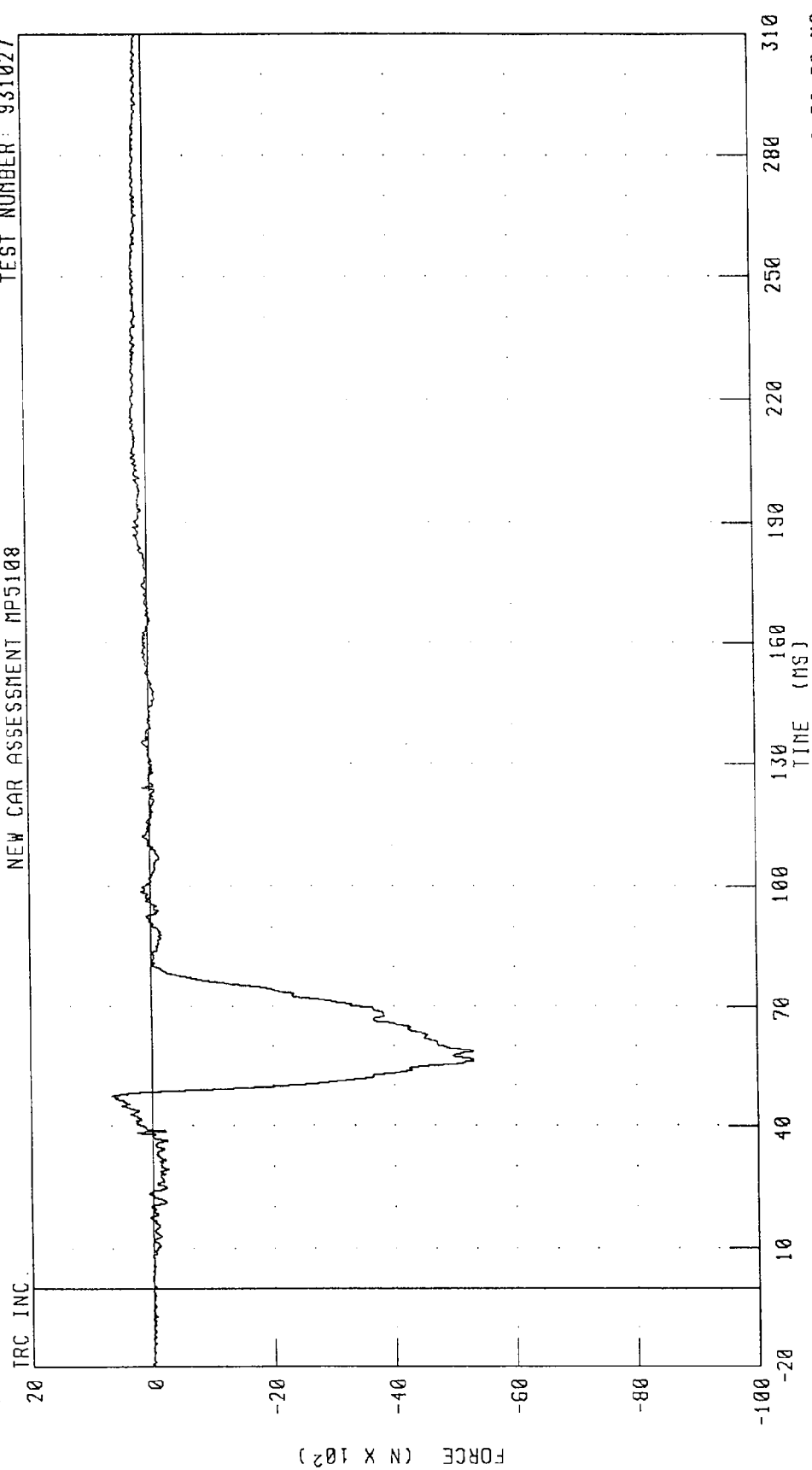
TRC INC.



CHANNEL: LFMF2 FILTER: CH. CLASS 600

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

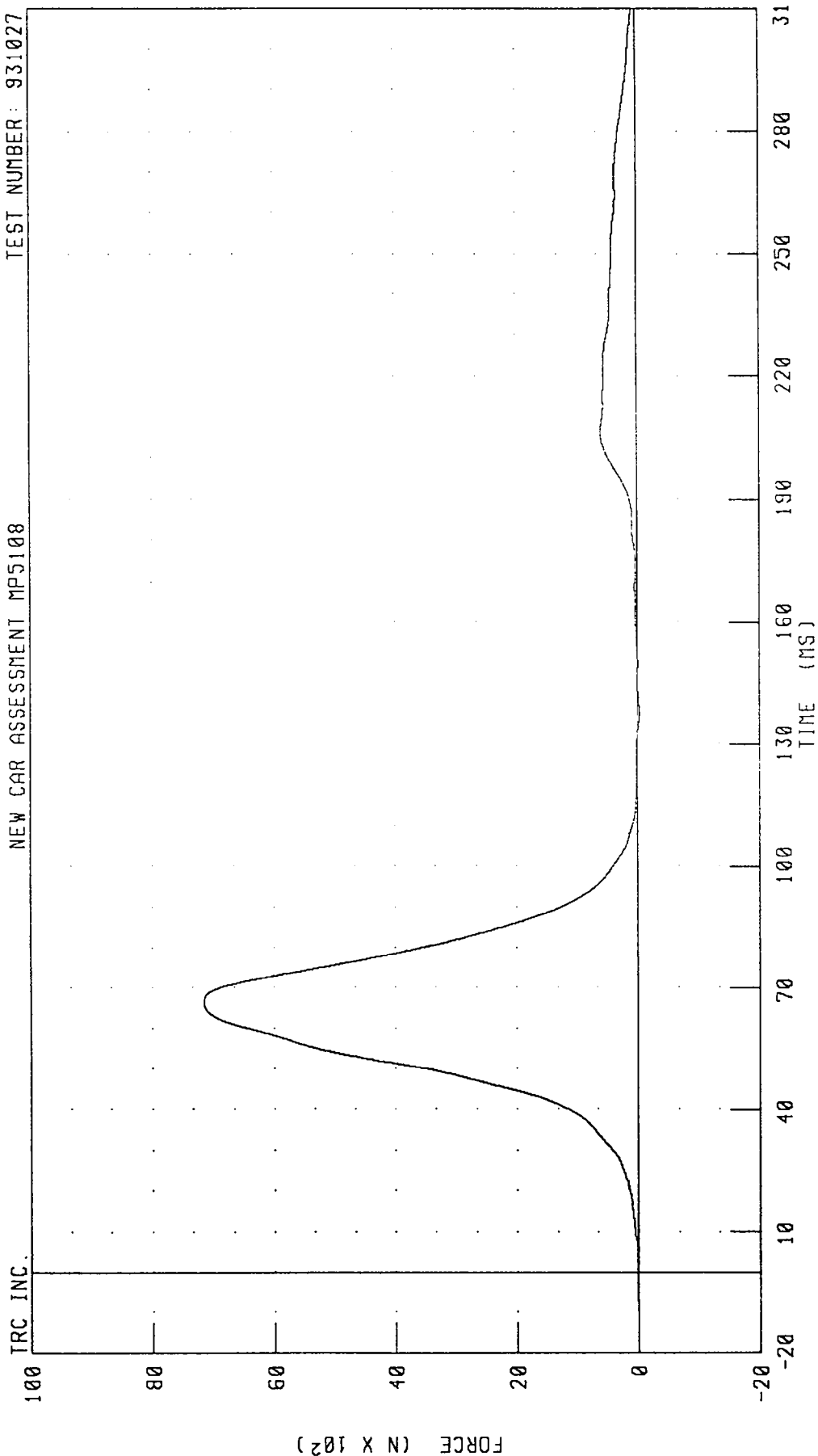


PEAK DATA: 671.63 N @ 47.44 MS; -5311.27 N @ 56.32 MS

CHANNEL: RFMF2 FILTER: CH. CLASS 600

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MP5108

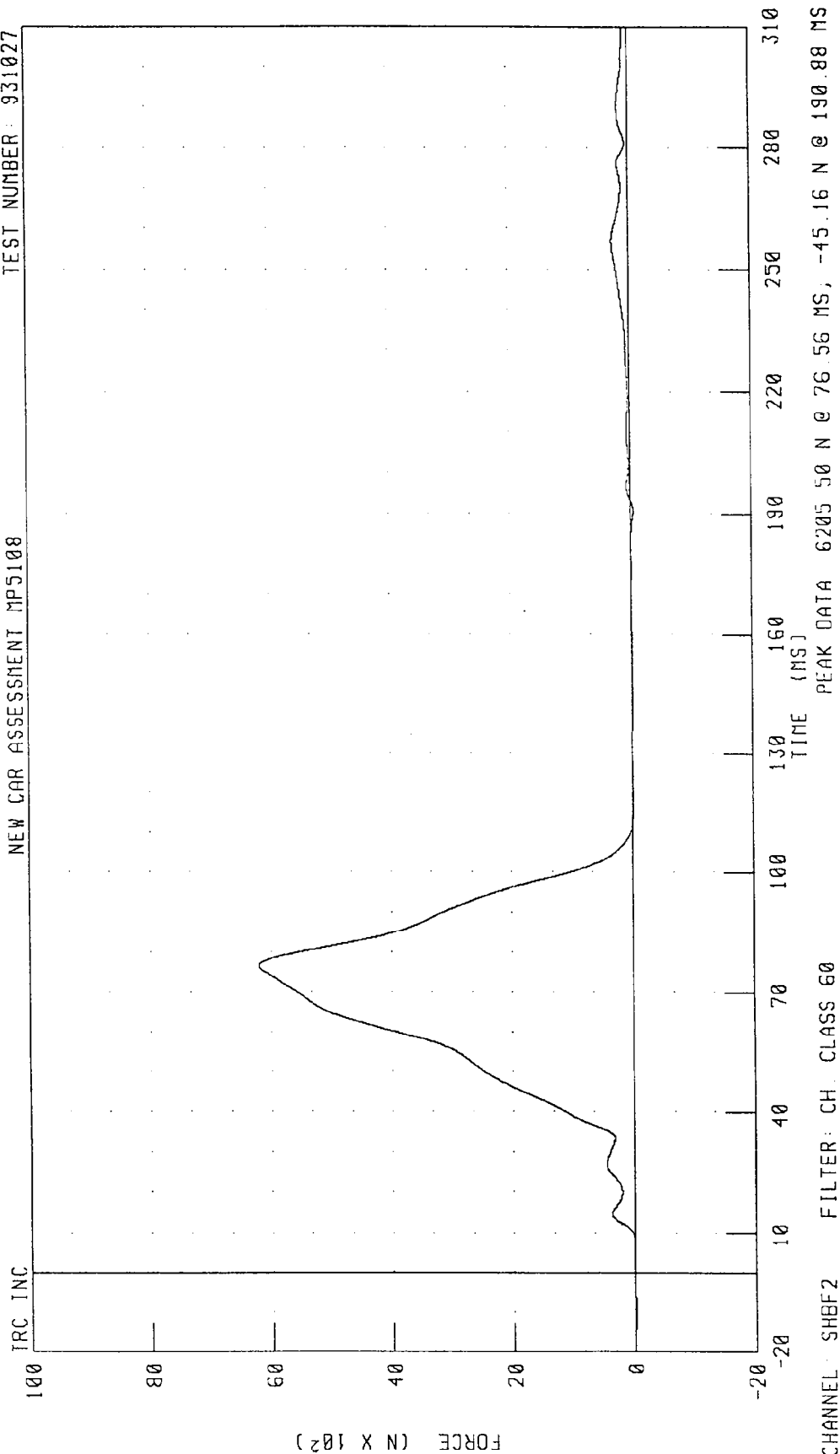
TEST NUMBER: 931027



CHANNEL: LBOF2 FILTER: CH. CLASS 60 PFAK DATA 7156 24 N @ 66 48 MS, -28 93 N @ 137 60 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



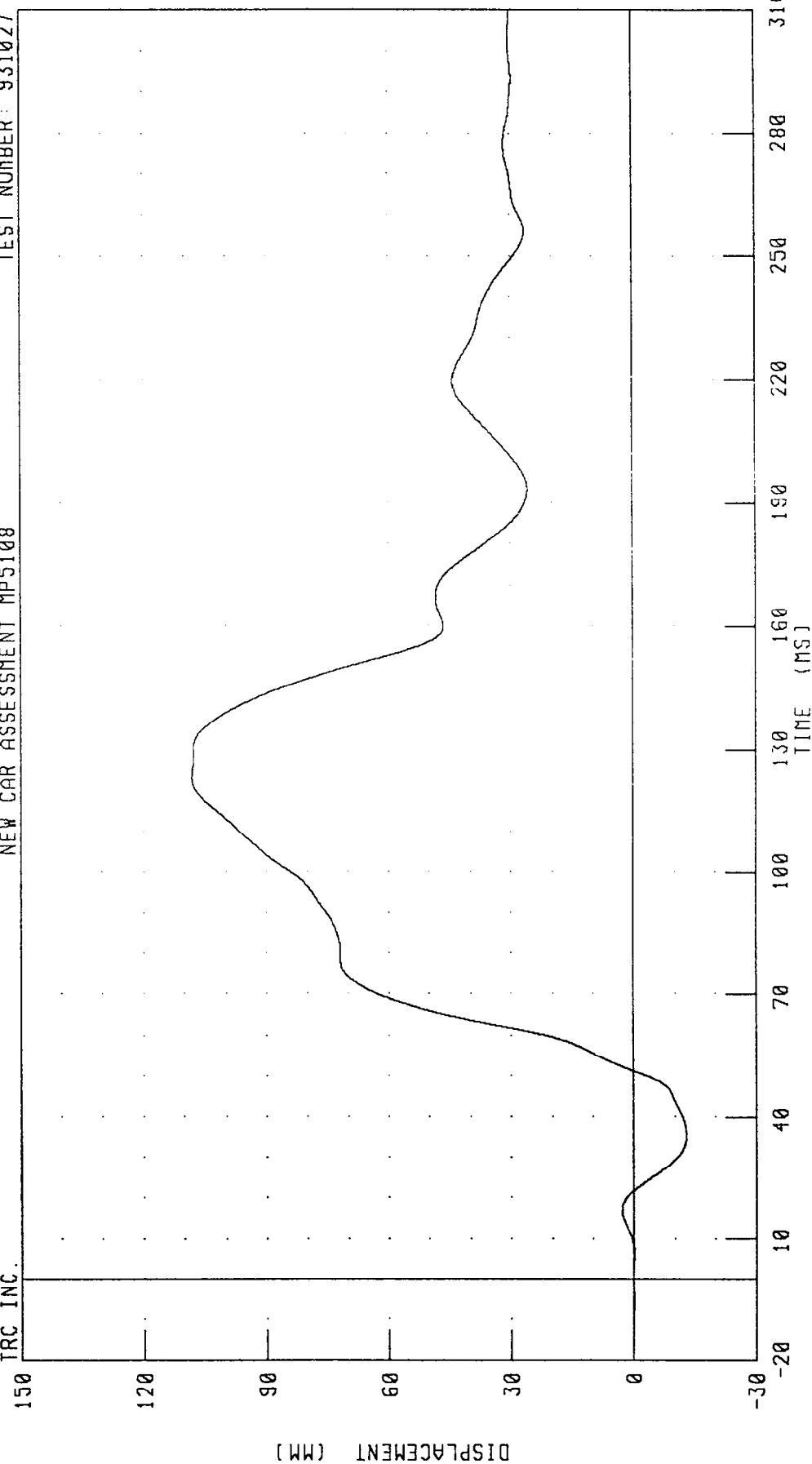
CHANNEL: SHBF2 FILTER: CH. CLASS 60

PEAK DATA 6205 50 N @ 76.56 MS, -45.16 N @ 190.88 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

TRC INC.



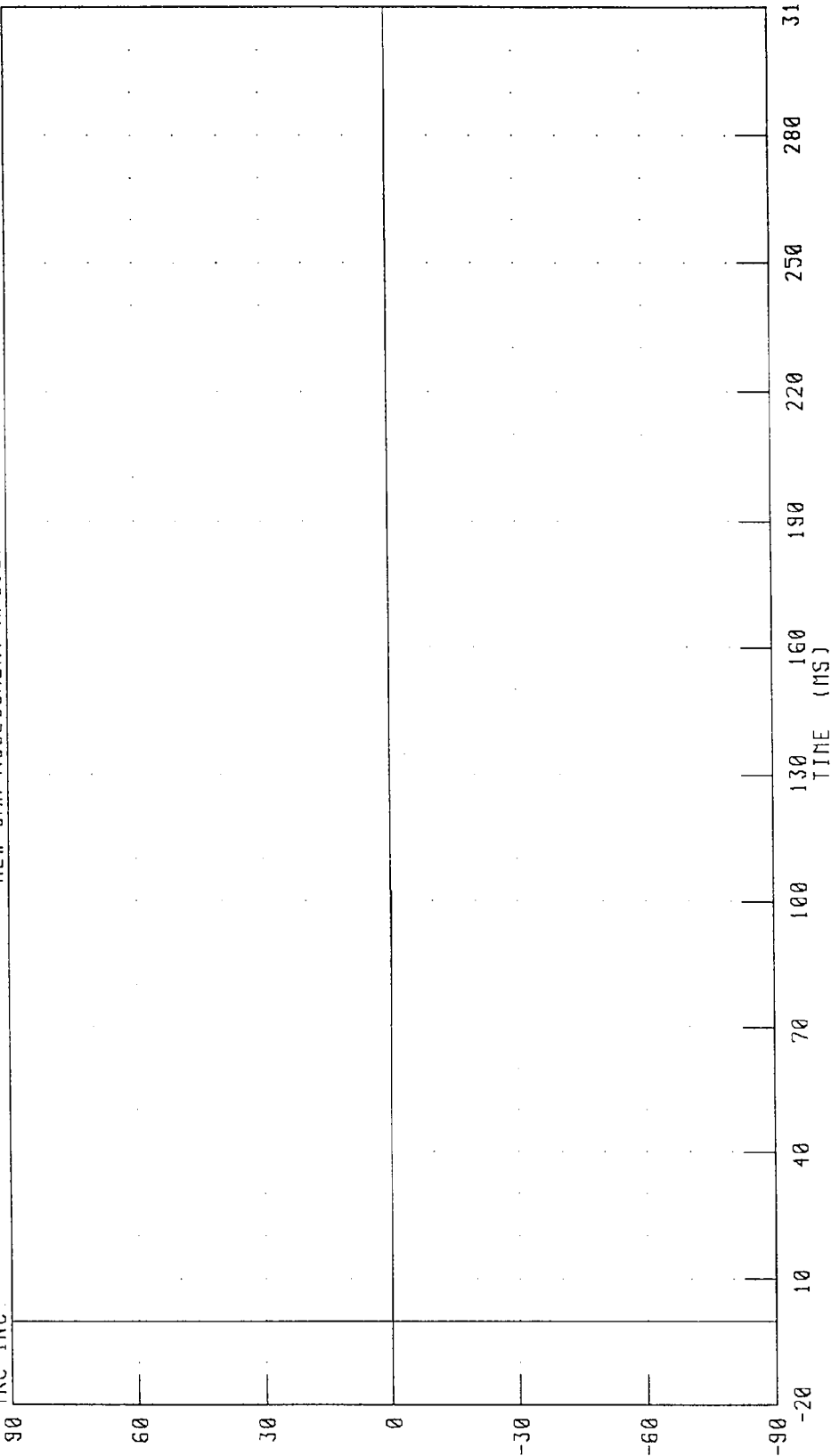
CHANNEL: SHB02 FILTER: CH. CLASS 60

PEAK DATA 108 16 MM @ 123 20 MS, -12 79 MM @ 35 12 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

TRC INC.



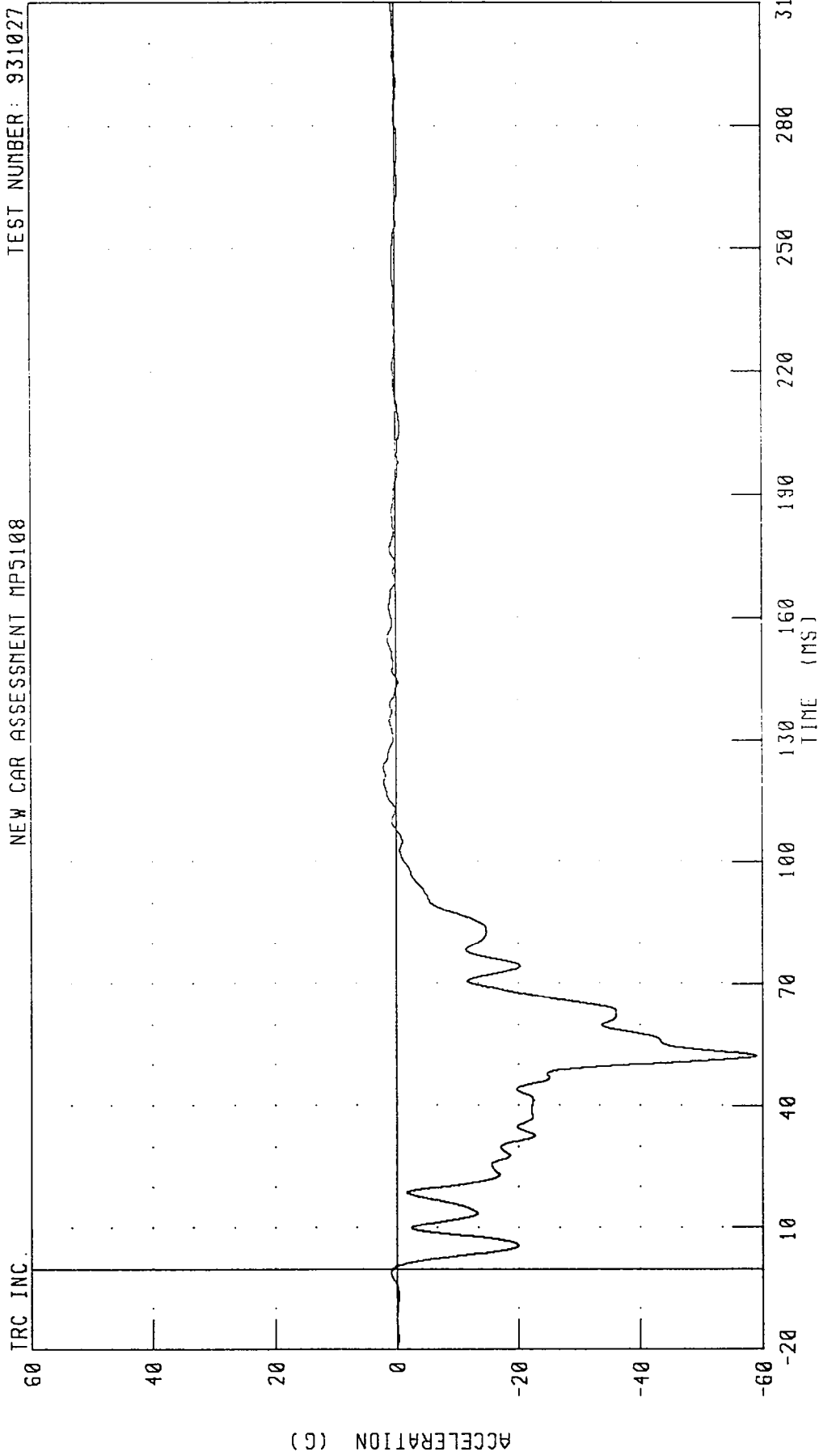
PEAK DATA 0 01 MM @ 63 84 MS; -0.03 MM @ 82.40 MS

CHANNEL SBED2 FILTER CH CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

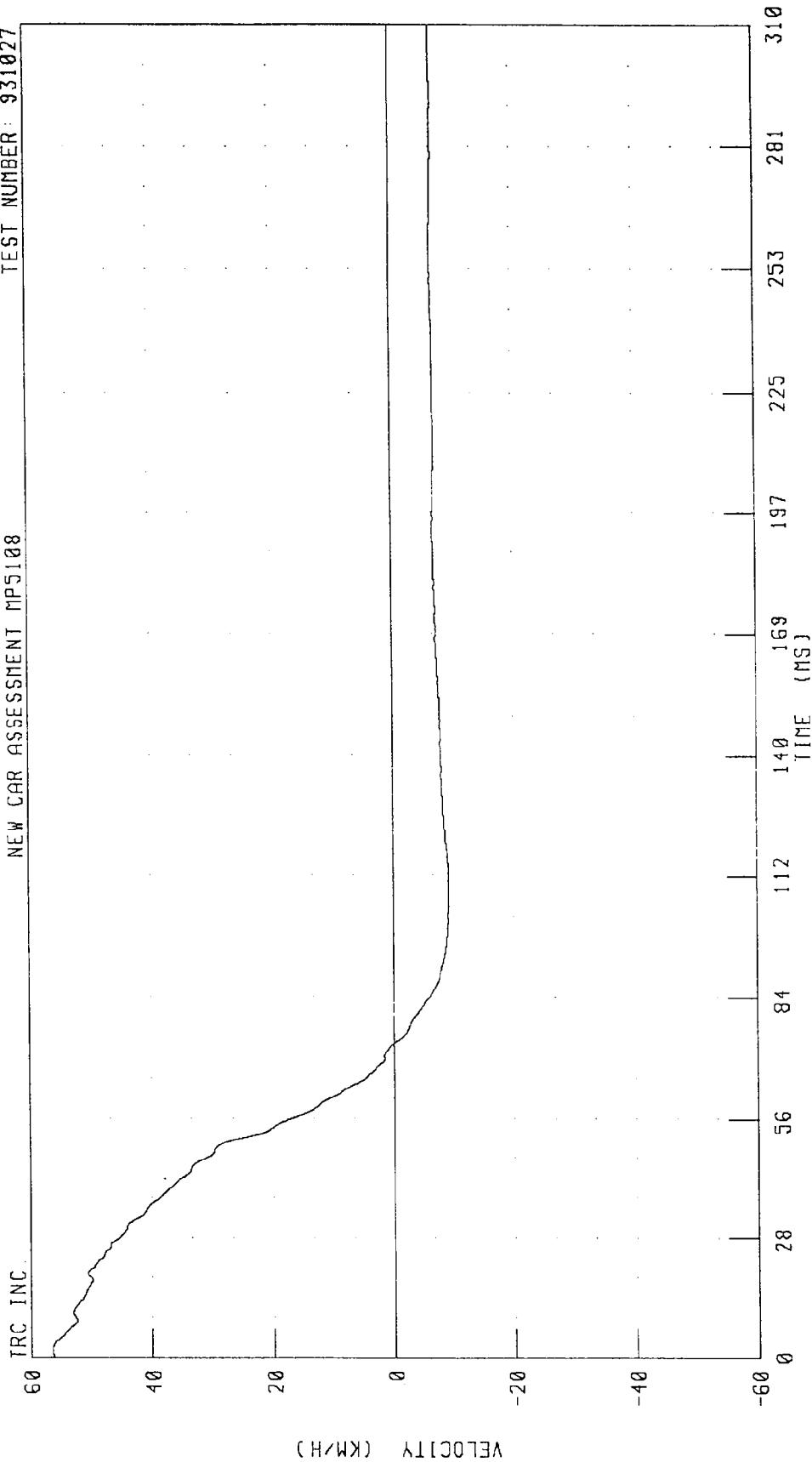


CHANNEL: TLRXG1 FILTER: CH. CLASS 60

PIAK DATA 2 15 G @ 123 36 MS, -58 89 G @ 52.24 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



CHANNEL: TLRXV1 FILTER: CH CLASS 180

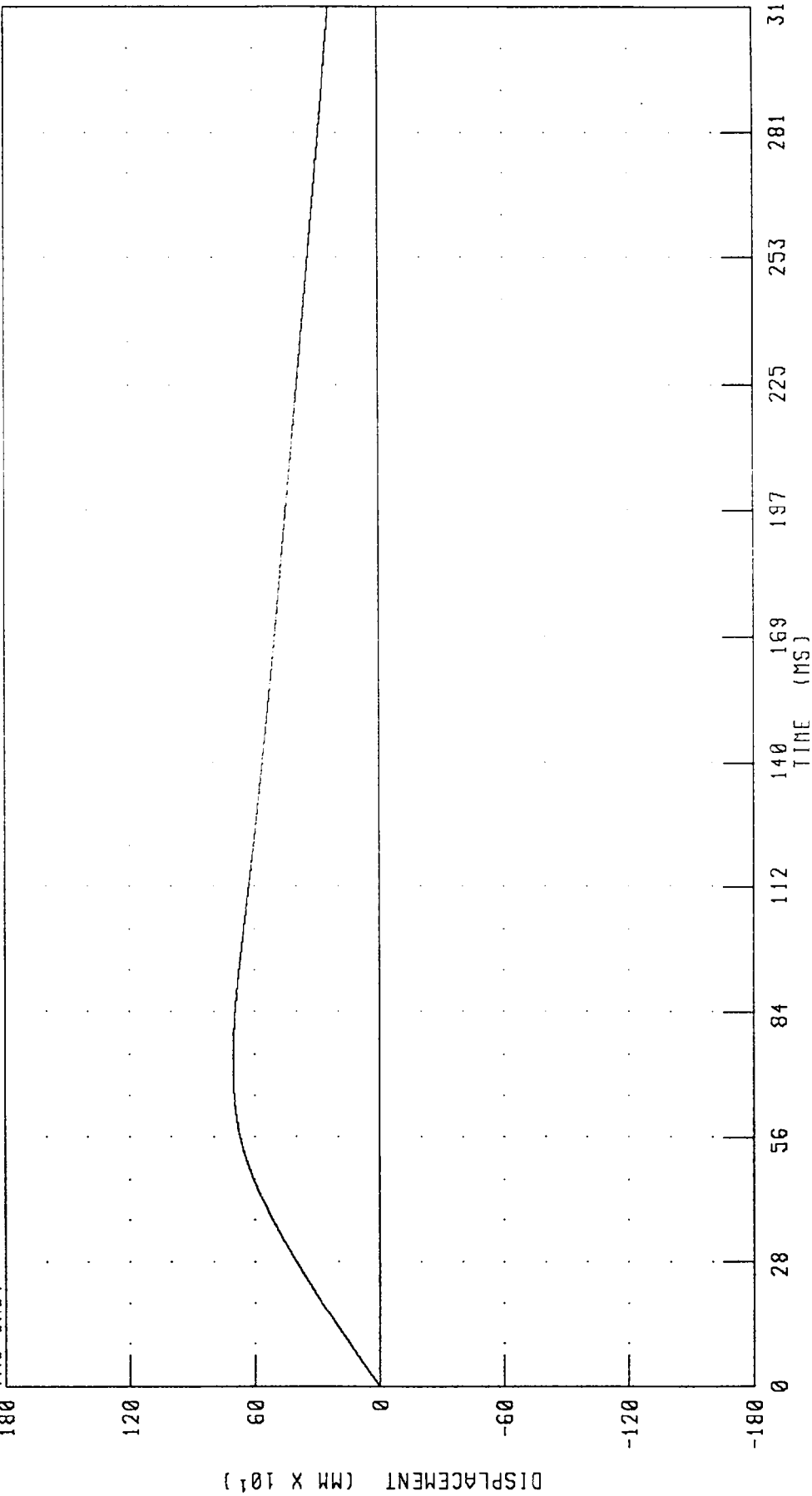
PEAK DATA 56.34 KM/H @ 2.16 MS; -9.20 KM/H @ 108.56 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.

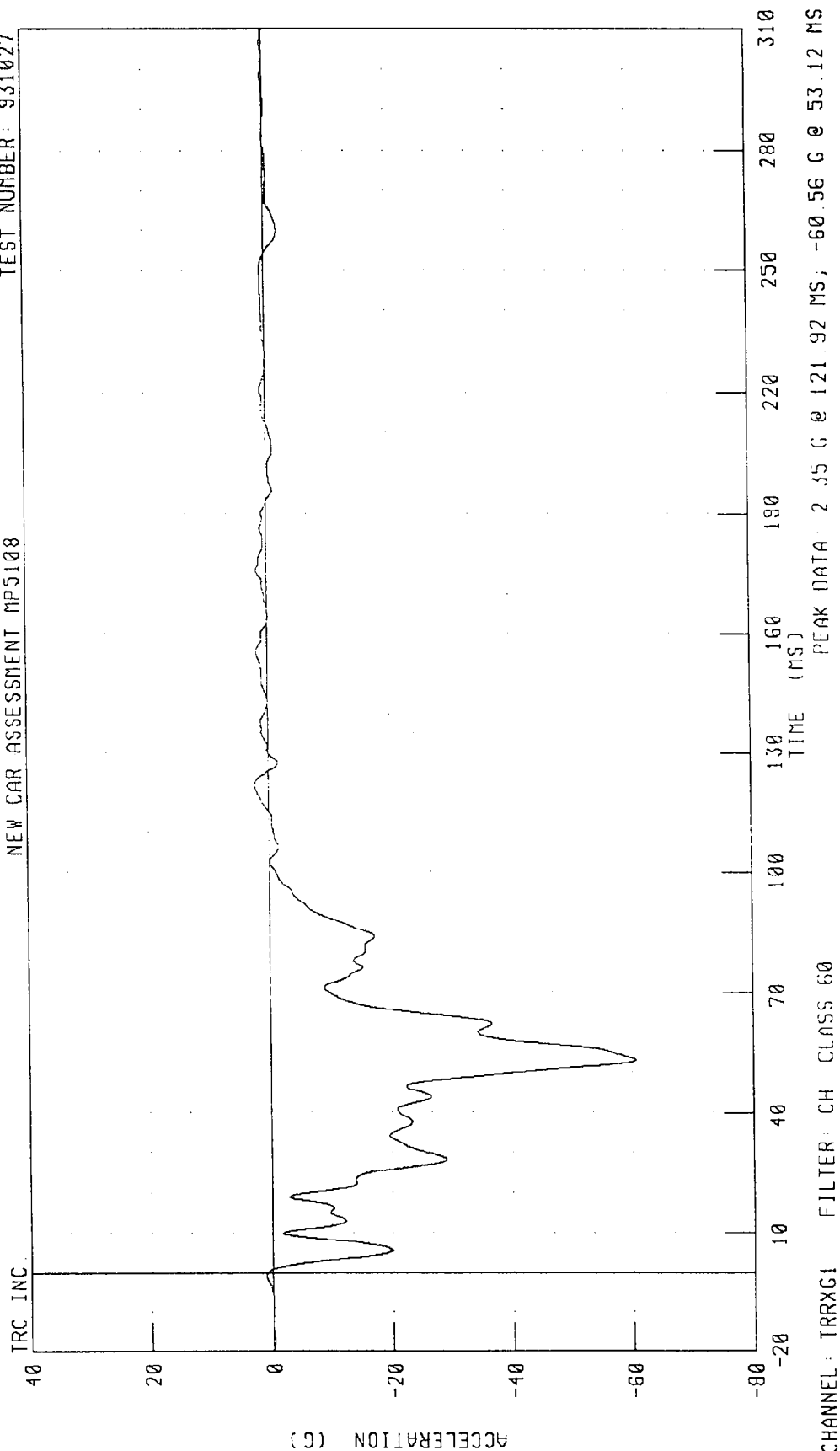


CHANNEL: TLRXD1 FILTER: CH. CLASS 180

PEAK DATA 702 86 MM @ 73 76 MS; 0 00 MM @ 0 00 MS

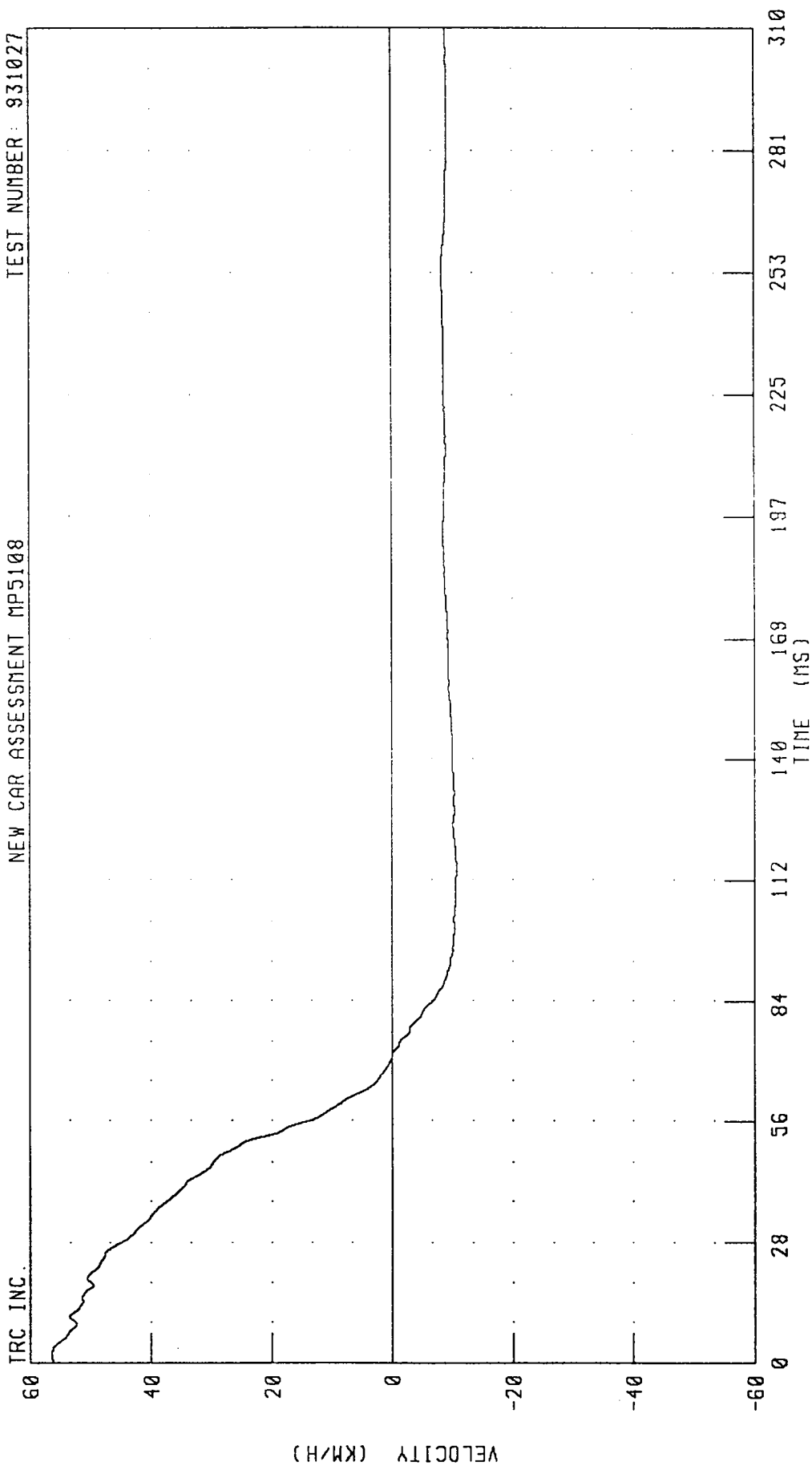
1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

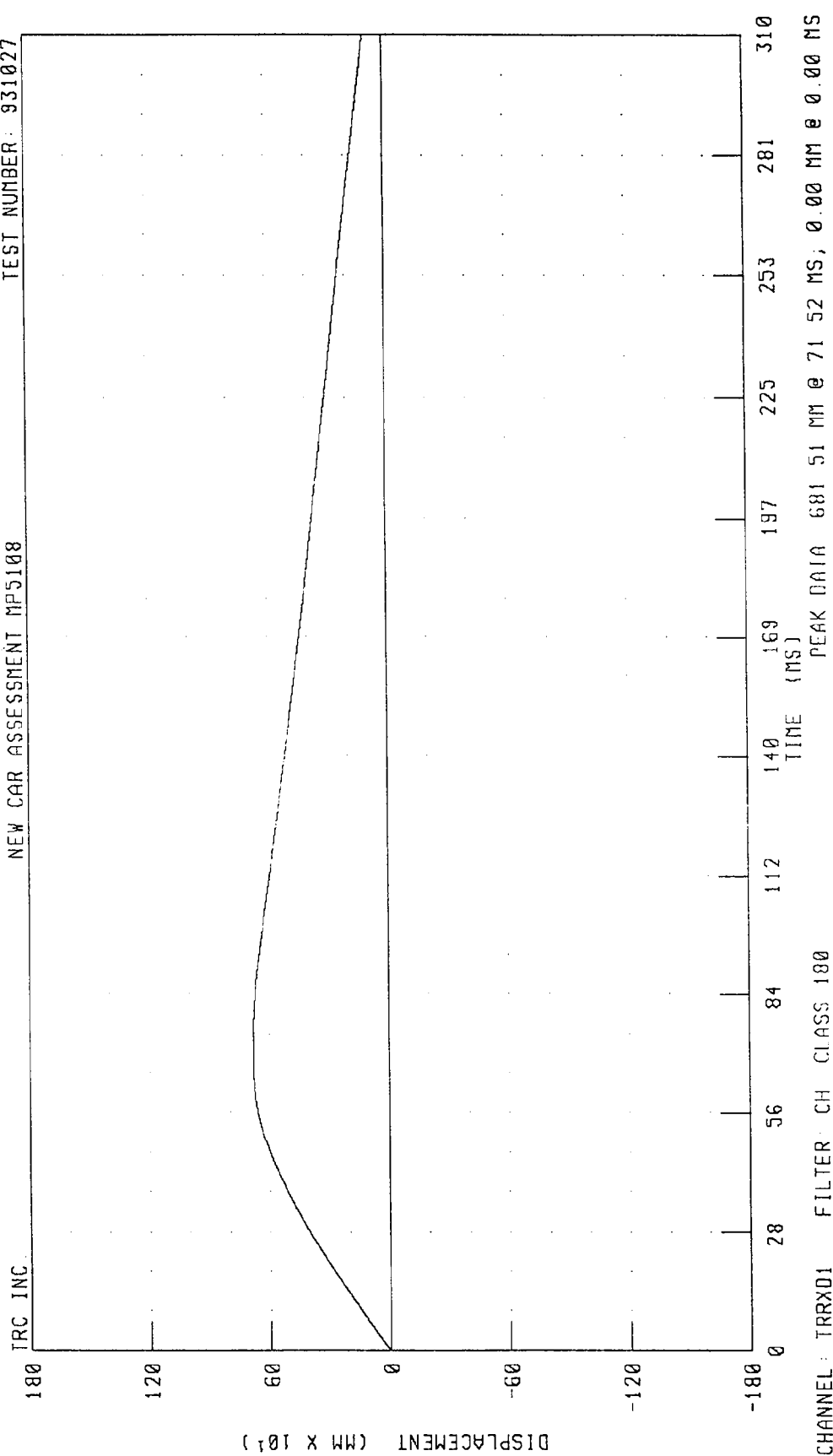


CHANNEL: TRRXV1 FILTER: CH. CLASS 180

PEAK DATA 56 35 KM/H @ 2 16 MS, -10 63 KM/H @ 115 76 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



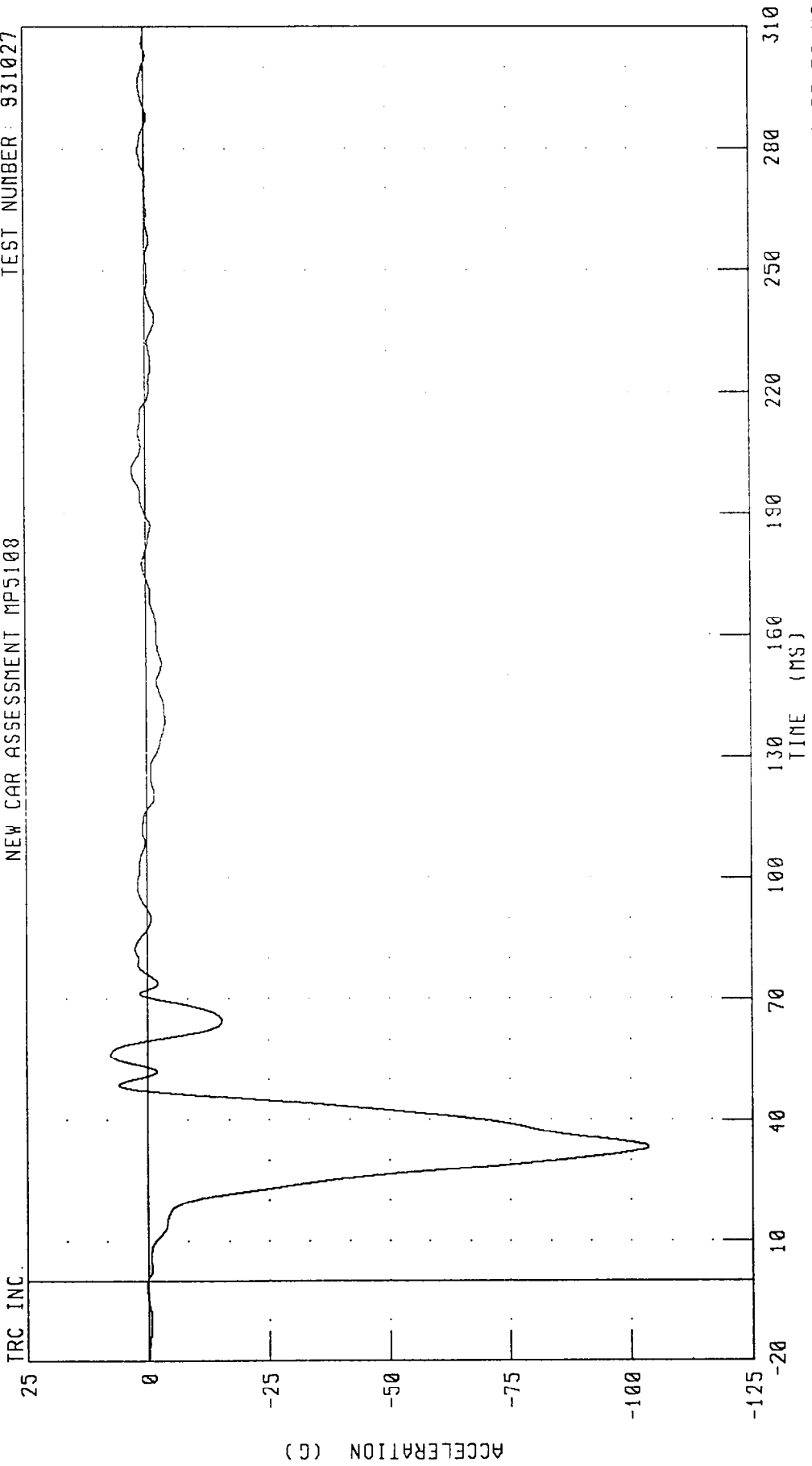
CHANNEL: TRRXD1 FILTER CH CLASS 180 PEAK DATA 681 51 MM @ 71 52 MS; 0.00 MM @ 0.00 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER

ENGINE 10P X-AXIS ACCELERATION

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

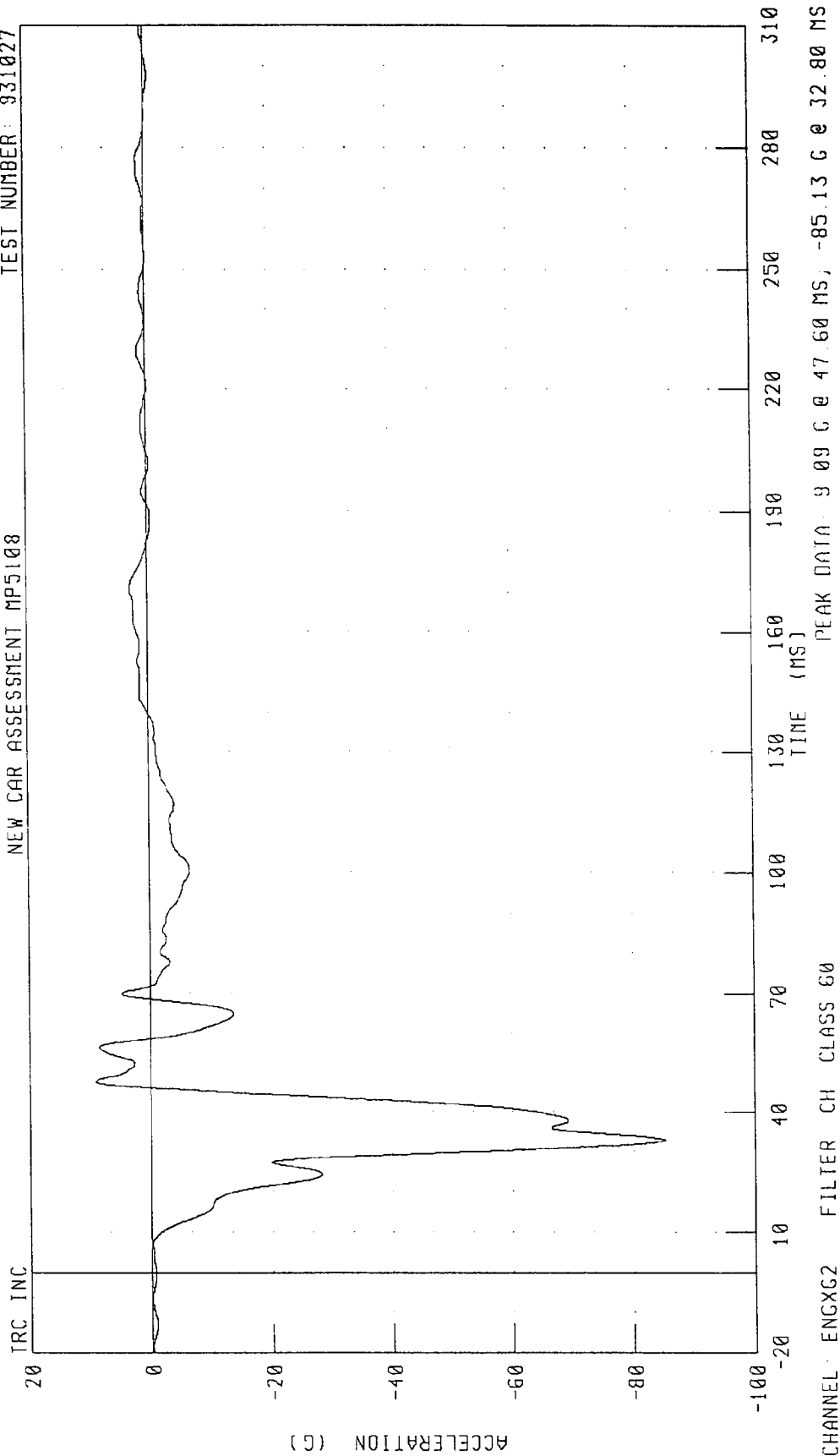


CHANNEL: ENGXC1 FILTER: CH. CLASS 60

PEAK DATA: 7.58 G @ 56.40 MS, -103.59 G @ 33.52 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT MP5108

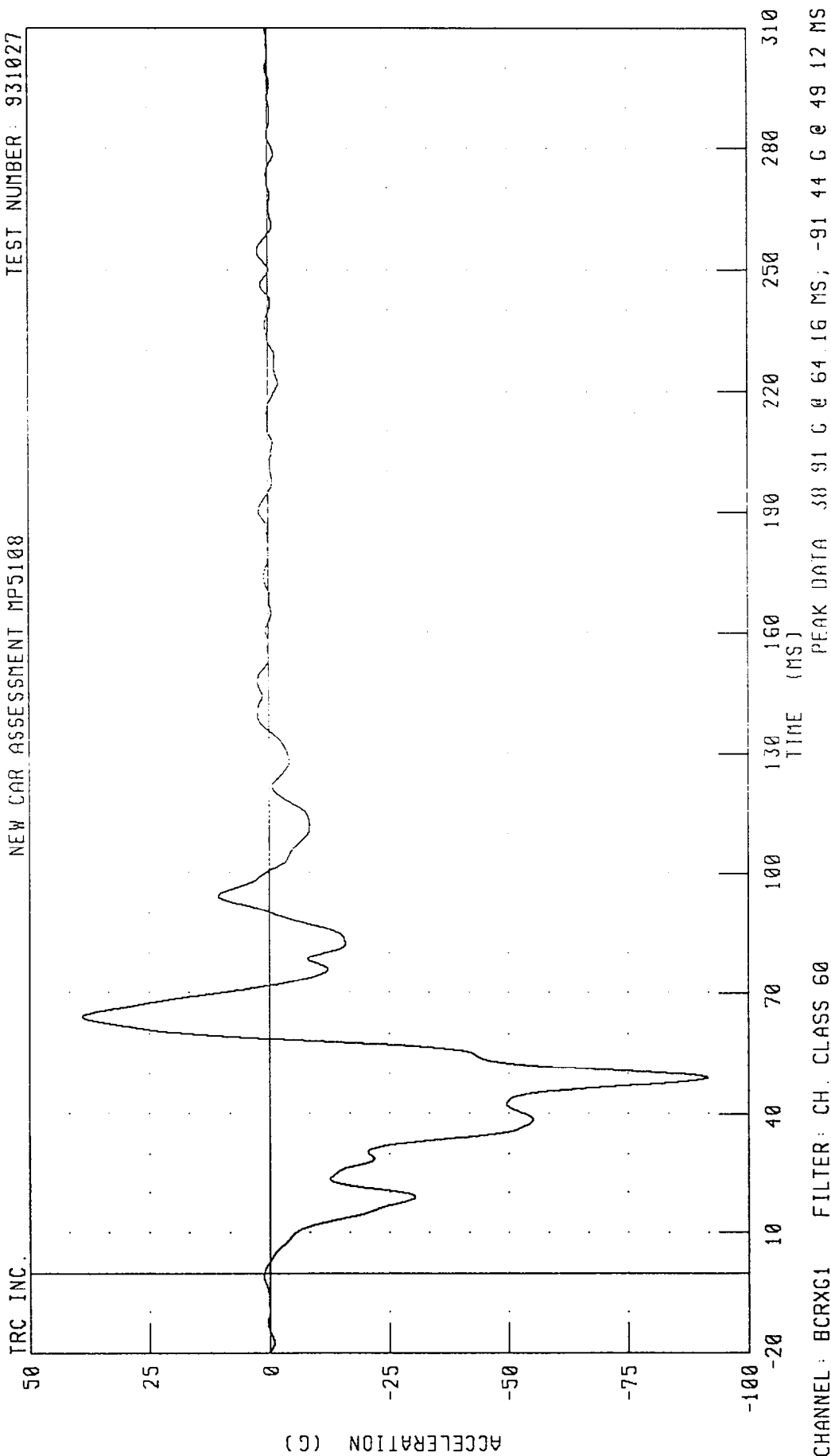
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

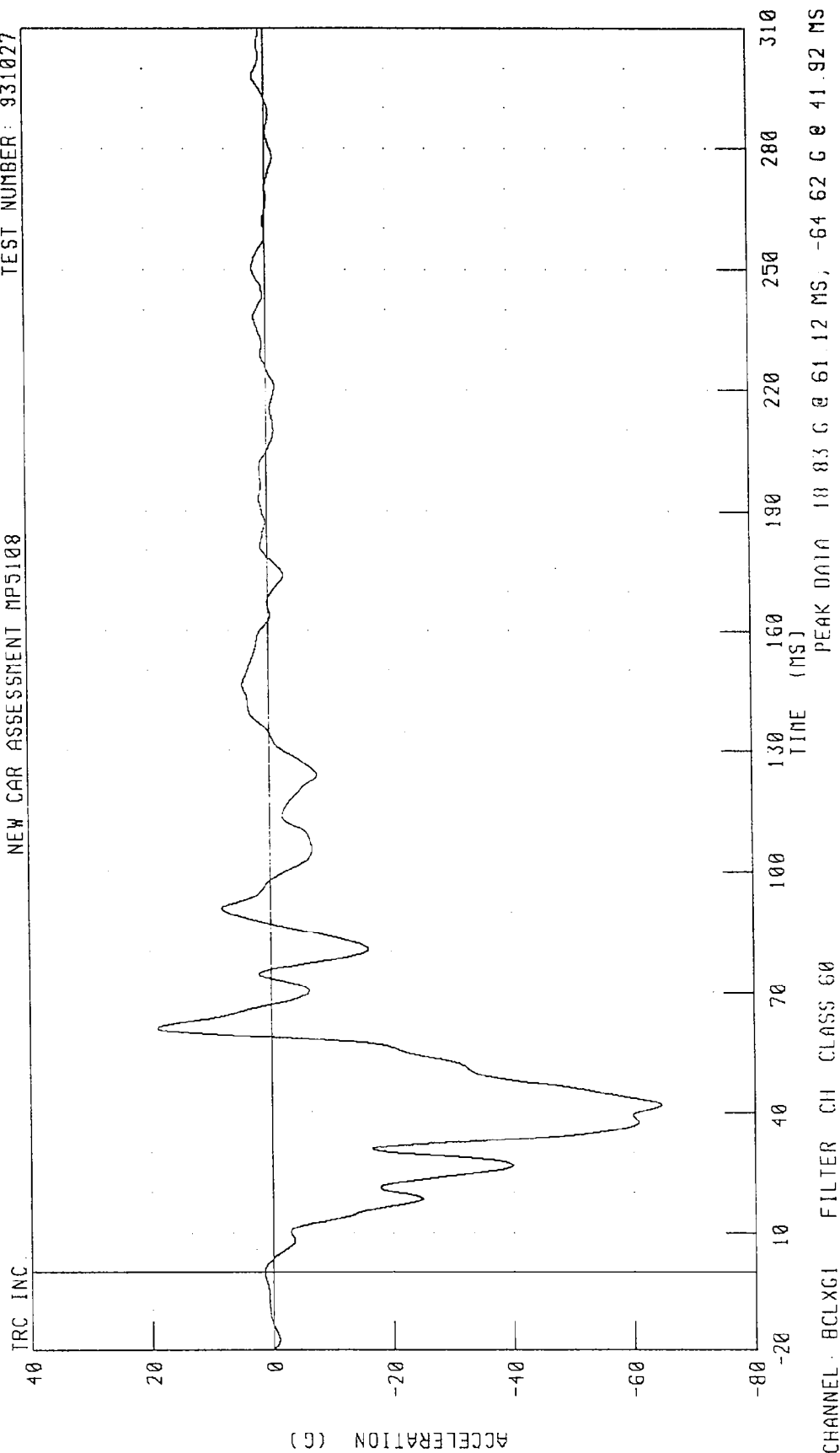
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MP5108

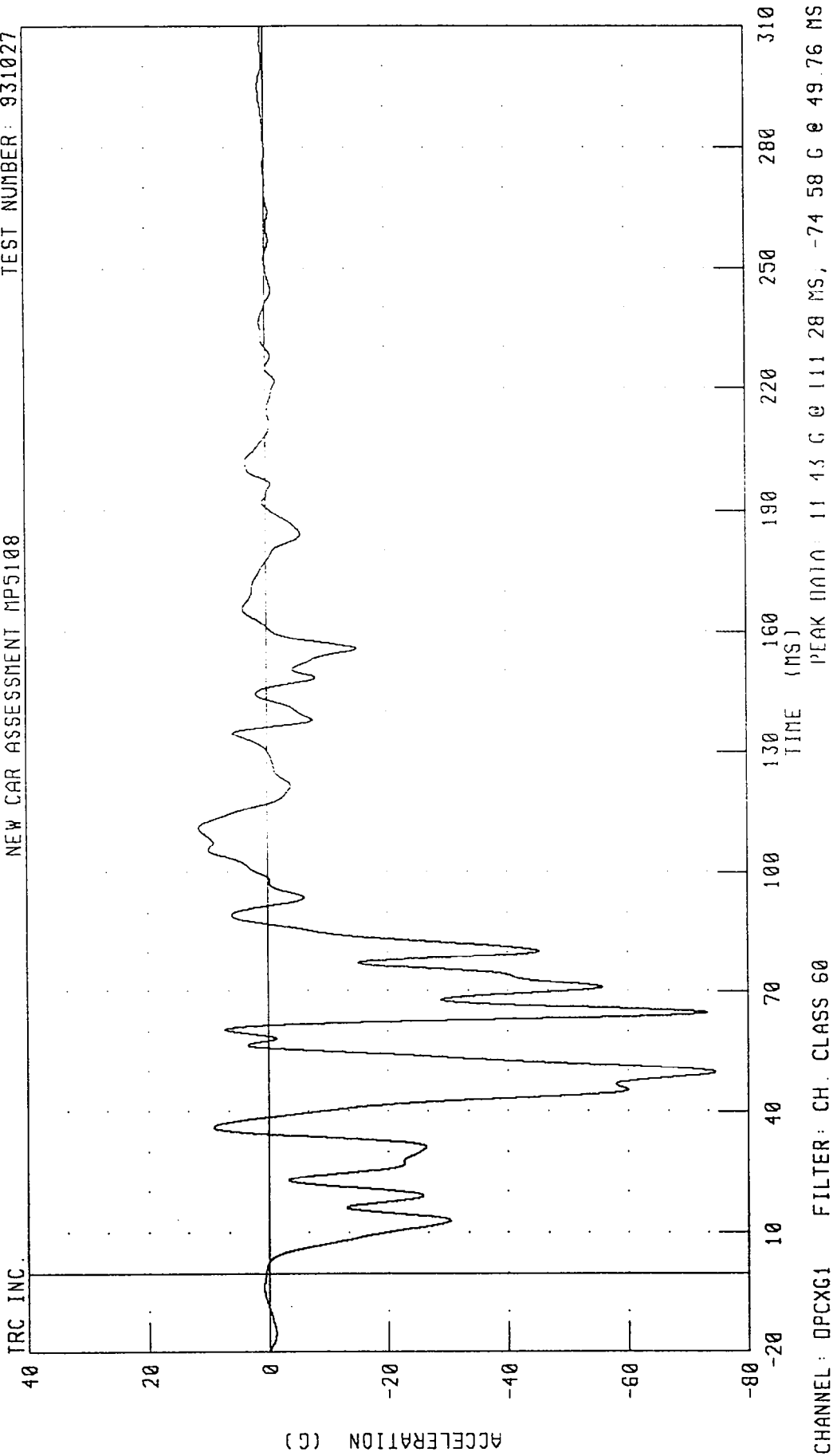
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

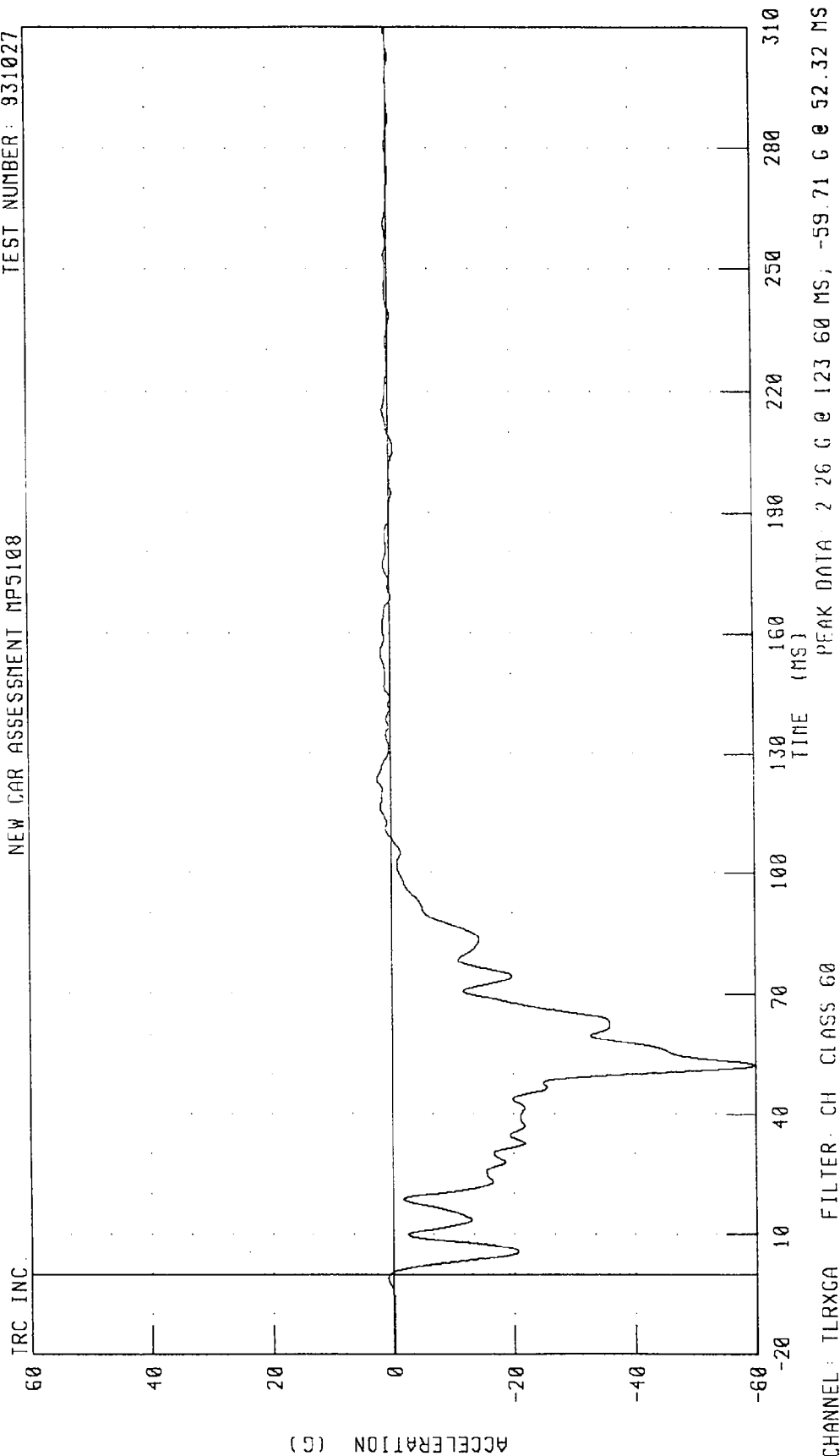
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MP5108

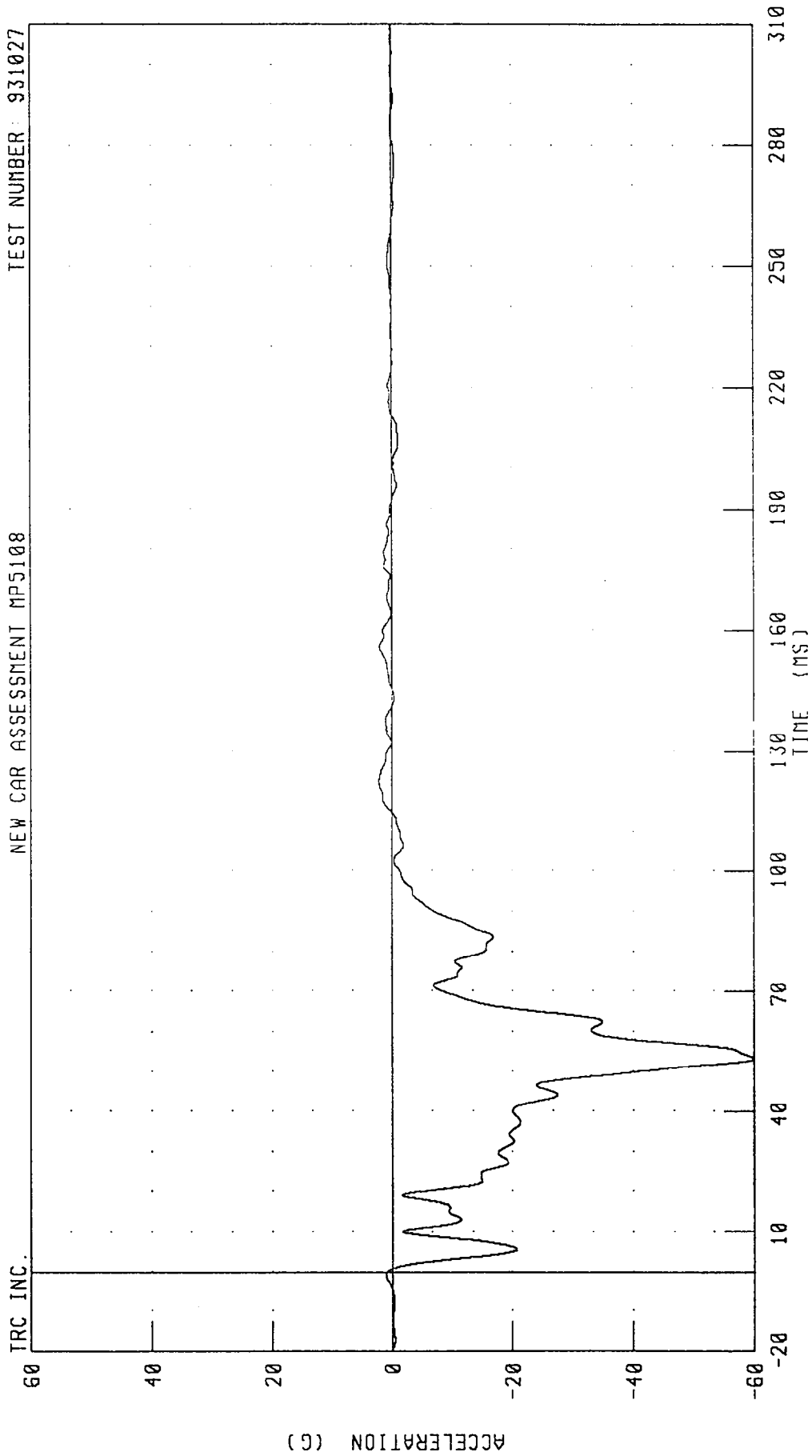
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

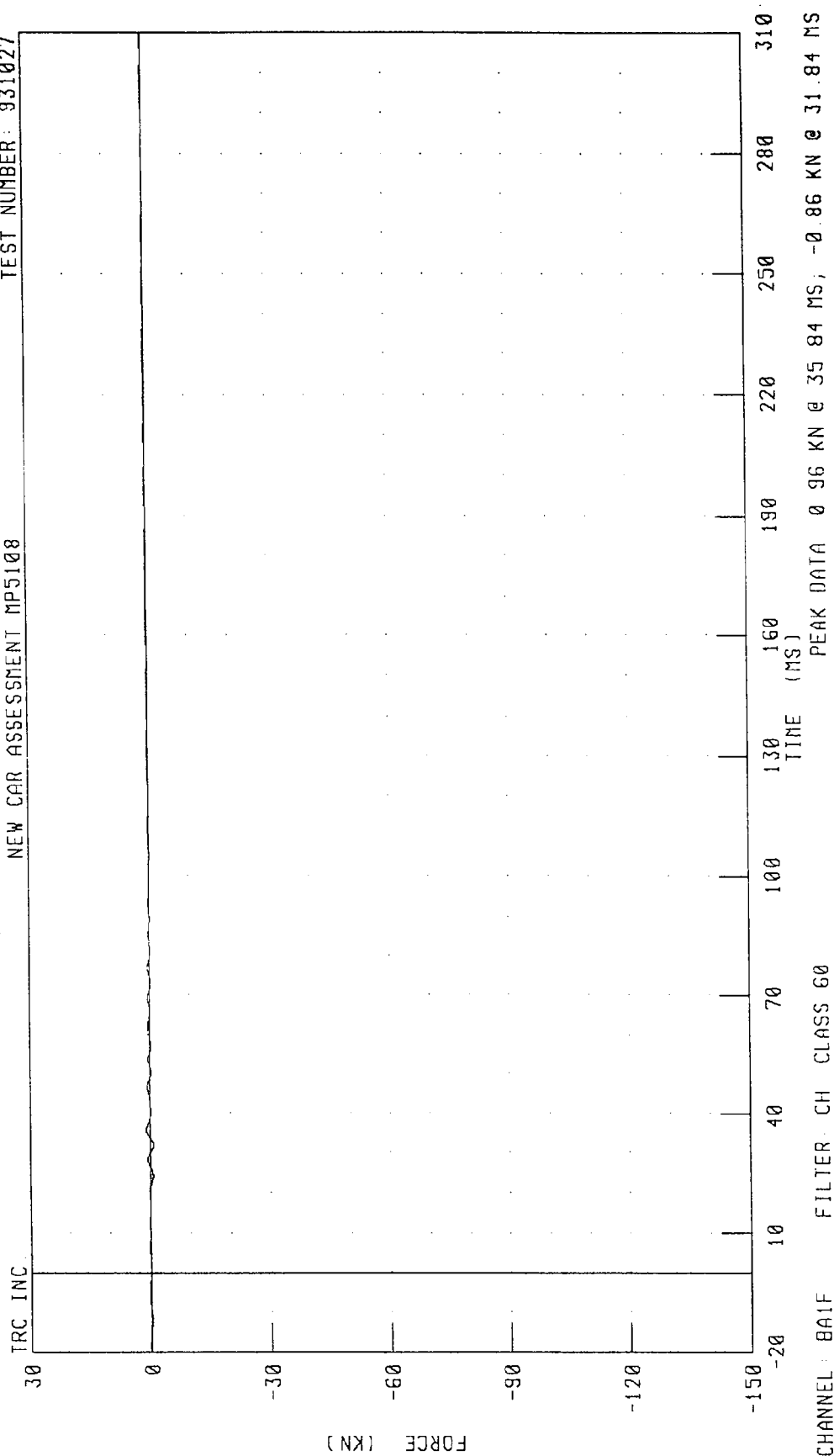


CHANNEL: TRRXGA FILTER: CH. CLASS 60

PEAK DATA 2 17 G @ 122 48 MS, -60 08 G @ 53 20 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A1 FORCE
 NEW CAR ASSESSMENT MP5108

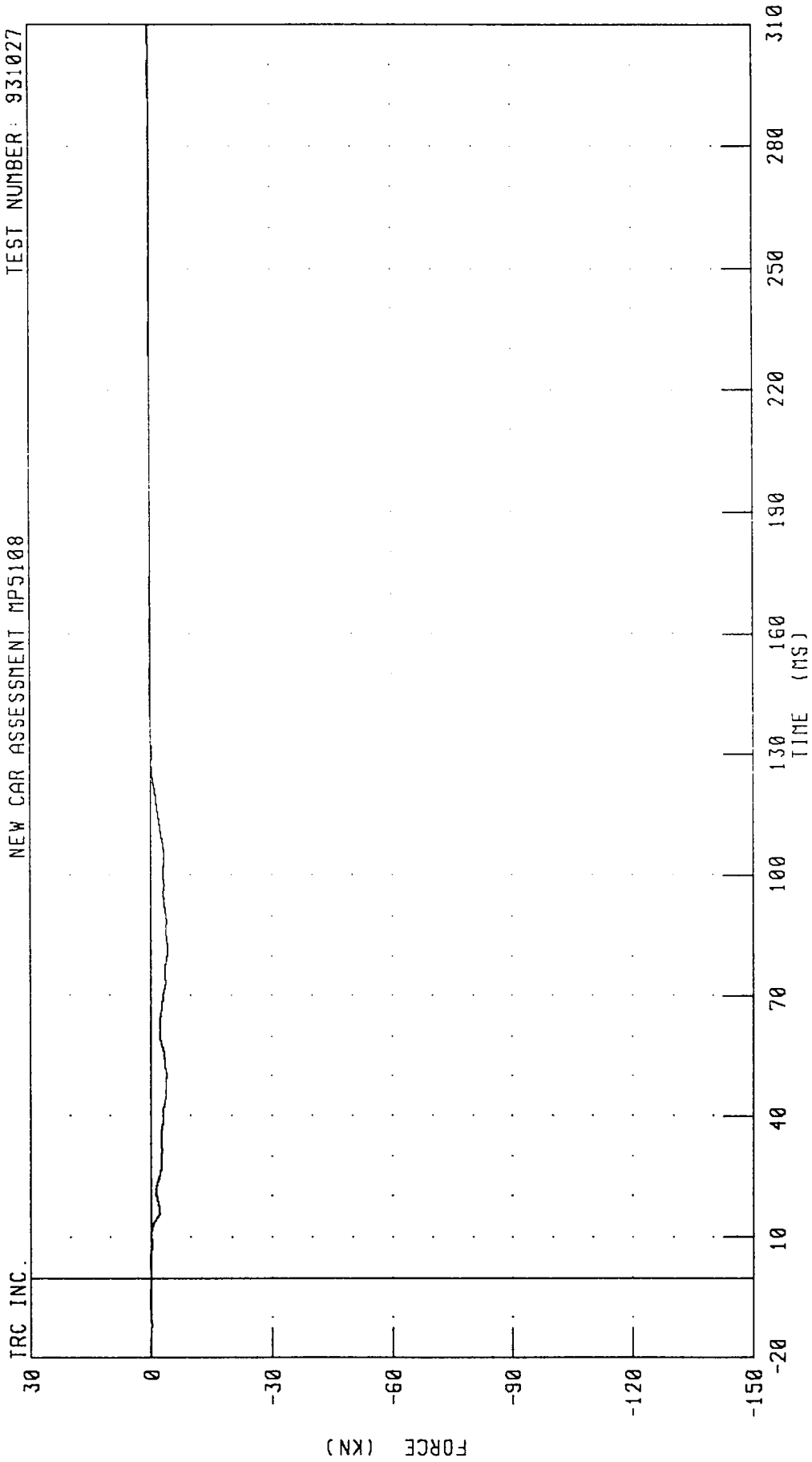
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE

NEW CAR ASSESSMENT MP5108

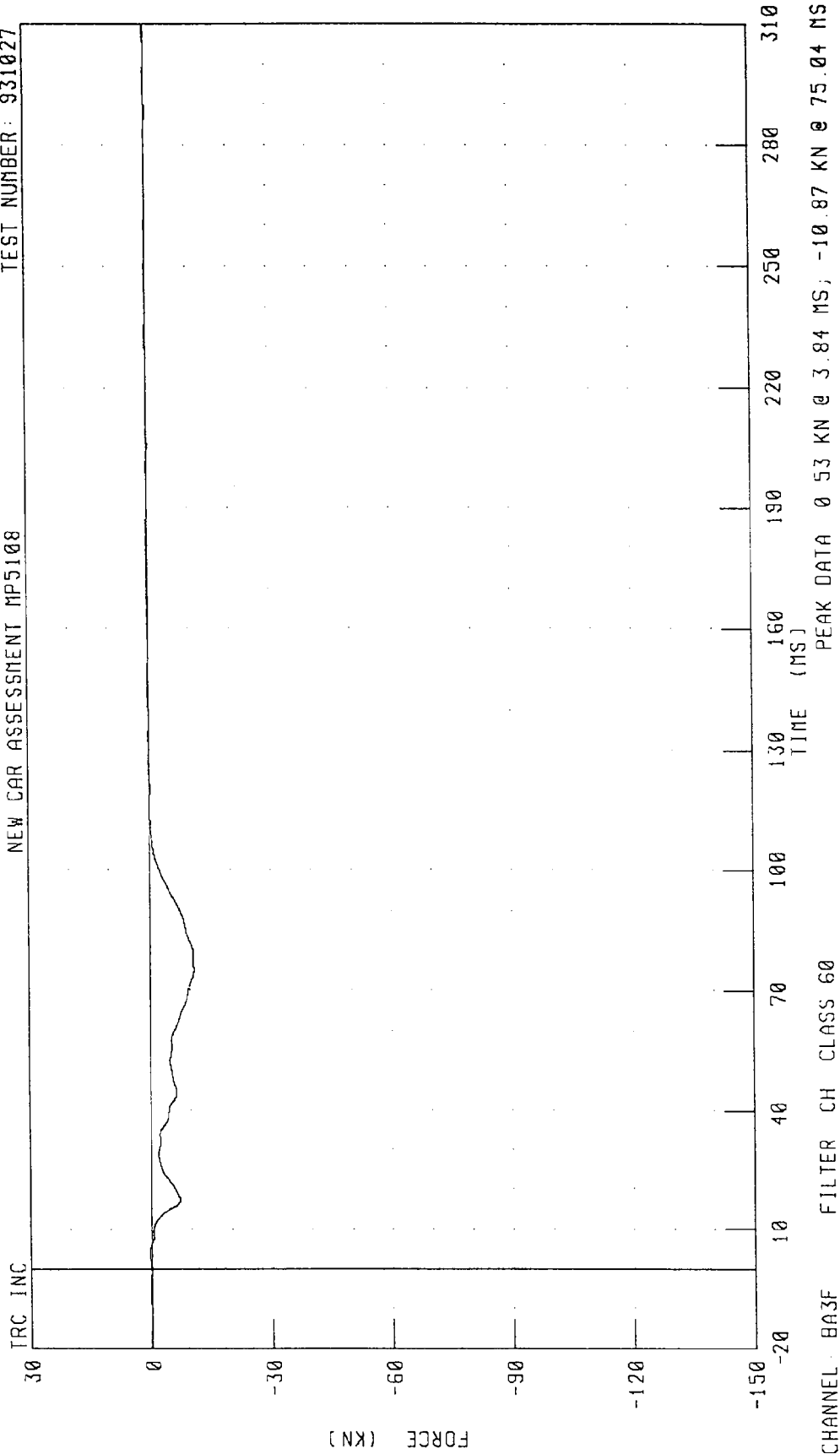
TEST NUMBER: 931027



CHANNEL: BA2F FILTER: CH. CLASS 60 PEAK DATA 0 28 KN @ 142.80 MS, -4.34 KN @ 81.60 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE
NEW CAR ASSESSMENT MP5108

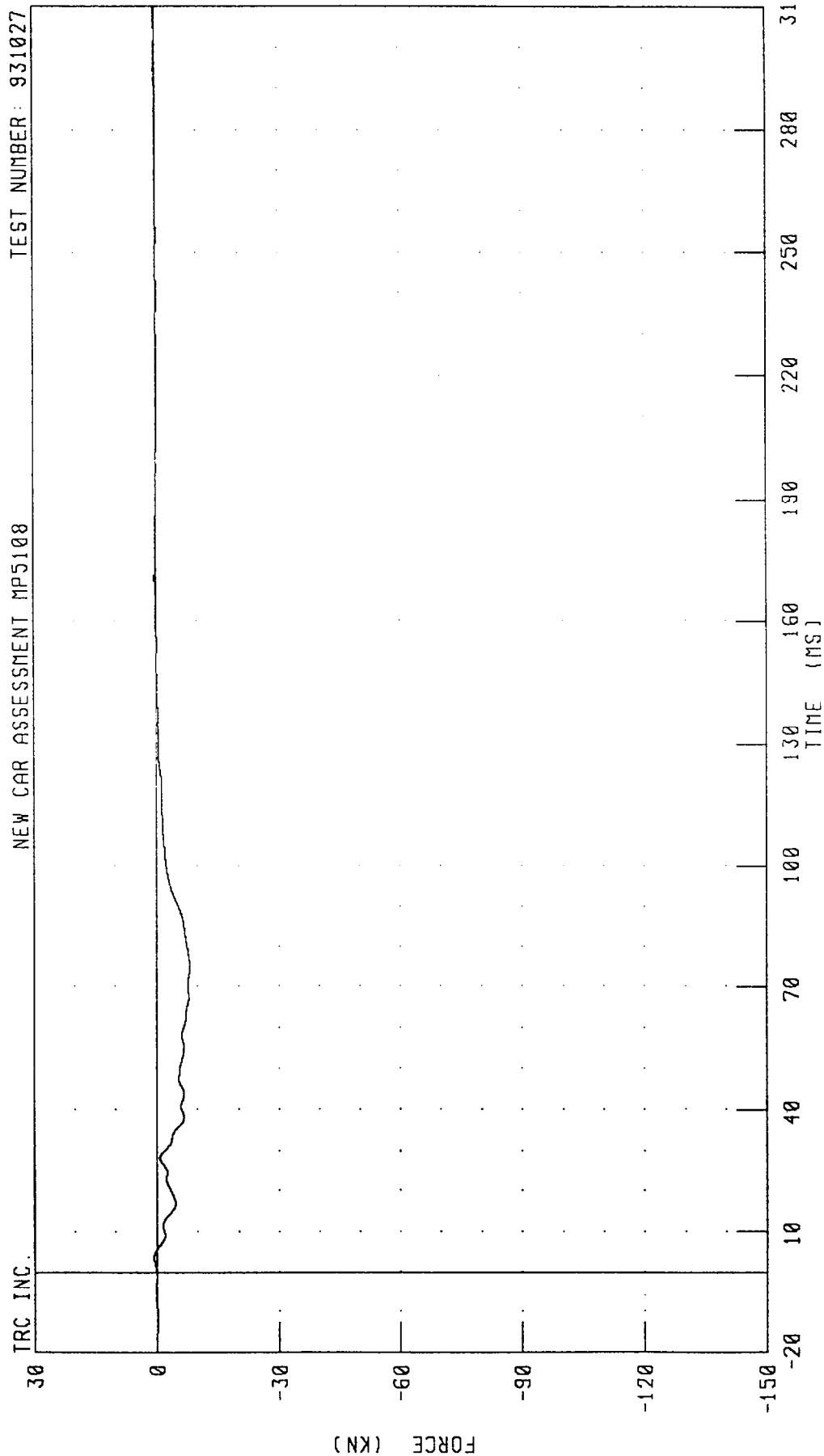
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE

NEW CAR ASSESSMENT MP5108

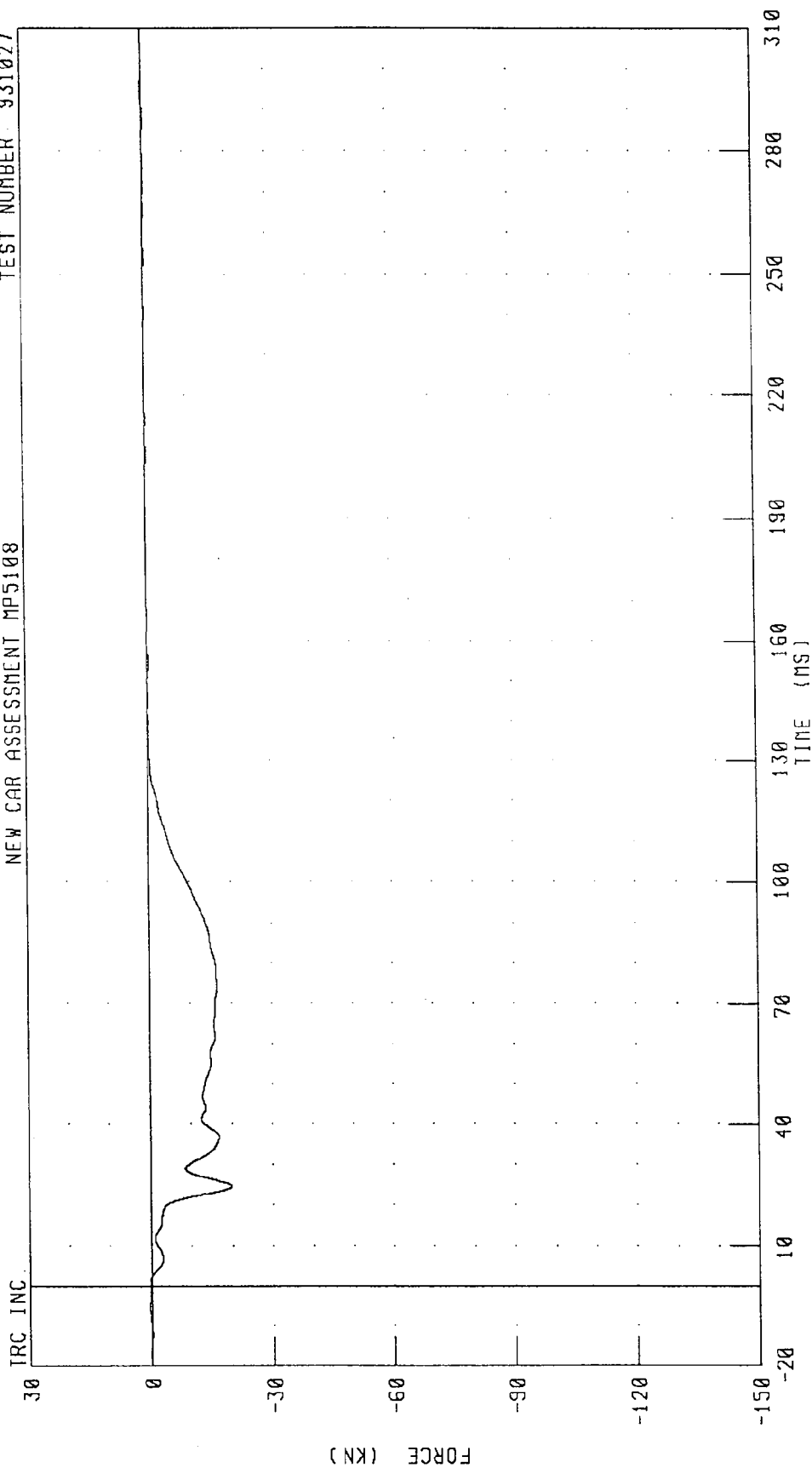
TEST NUMBER: 931027



CHANNEL: BA4F FILTER: CH. CLASS 60 PEAK DATA 0 60 KN @ 3 52 MS; -8 24 KN @ 74 64 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A5 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER 931027



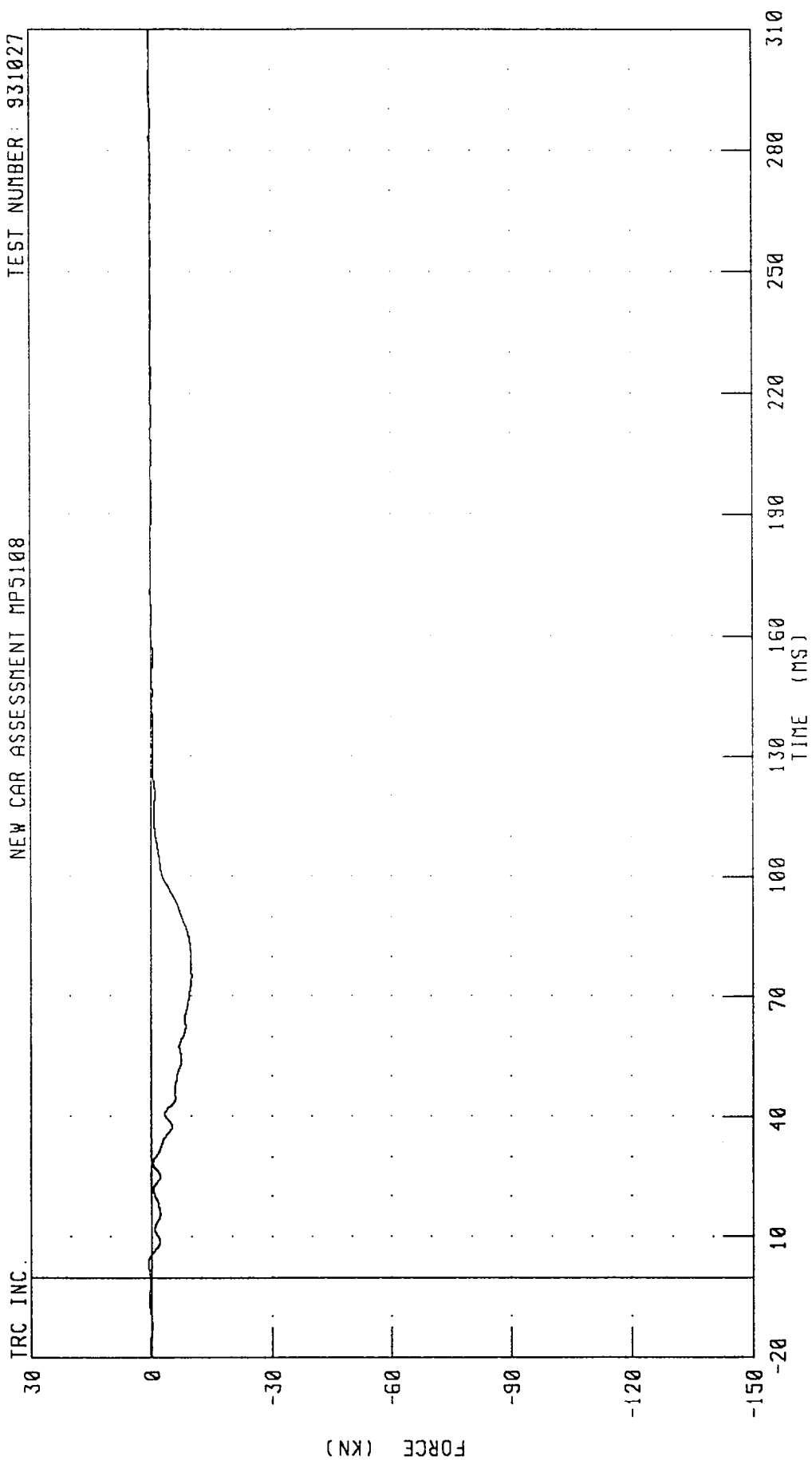
CHANNEL: BASF FILTER: CH. CLASS 60

PEAK DATA 0.37 KN @ -5.52 MS, -19.90 KN @ 24.64 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

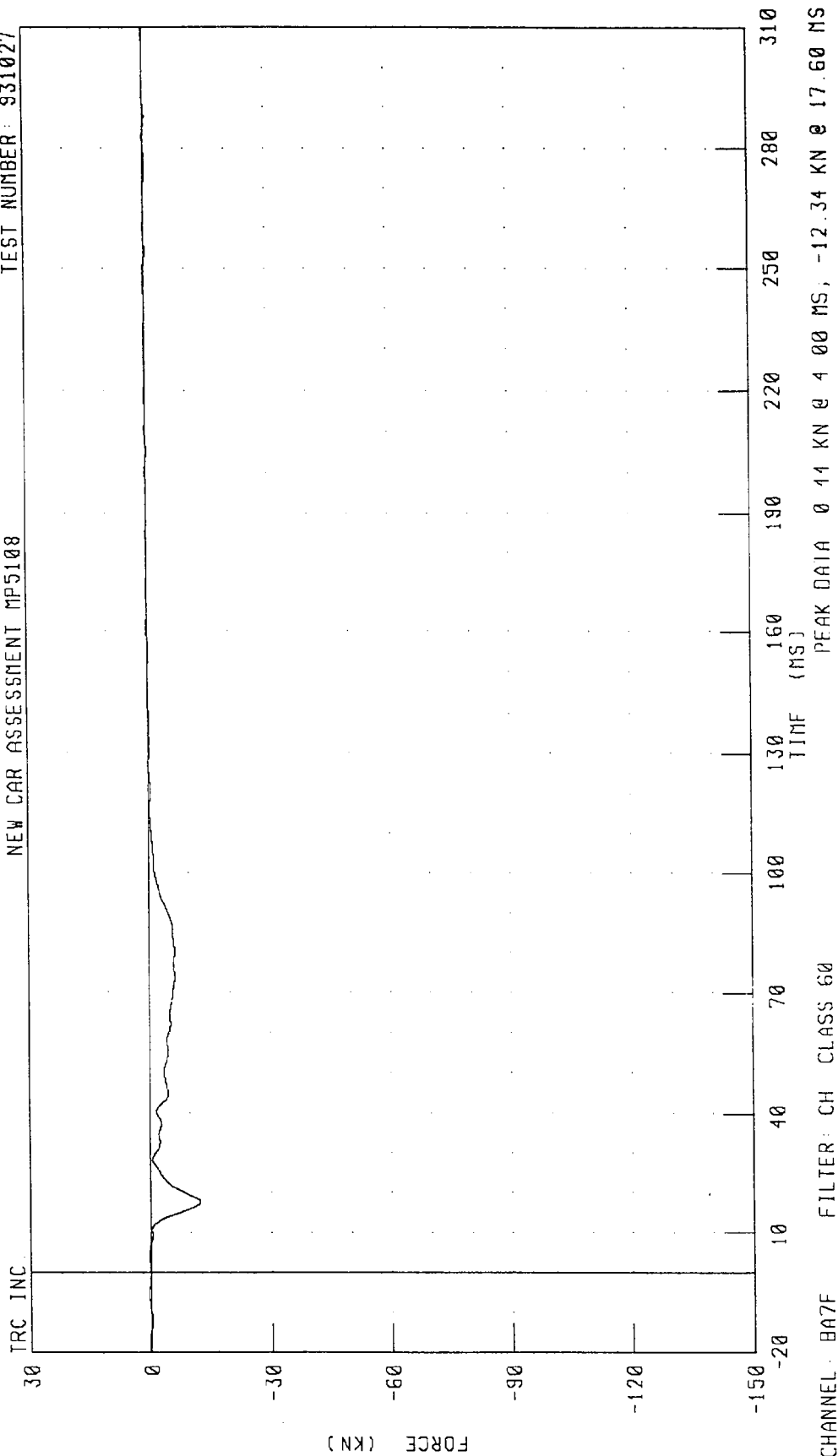


CHANNEL: B6F FILTER: CH. CLASS 60

PEAK DATA 0 812 KN @ 3 28 MS, -10 09 KN @ 75 20 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A7 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



PEAK DATA 0 11 KN @ 4 00 MS, -12.34 KN @ 17.60 MS

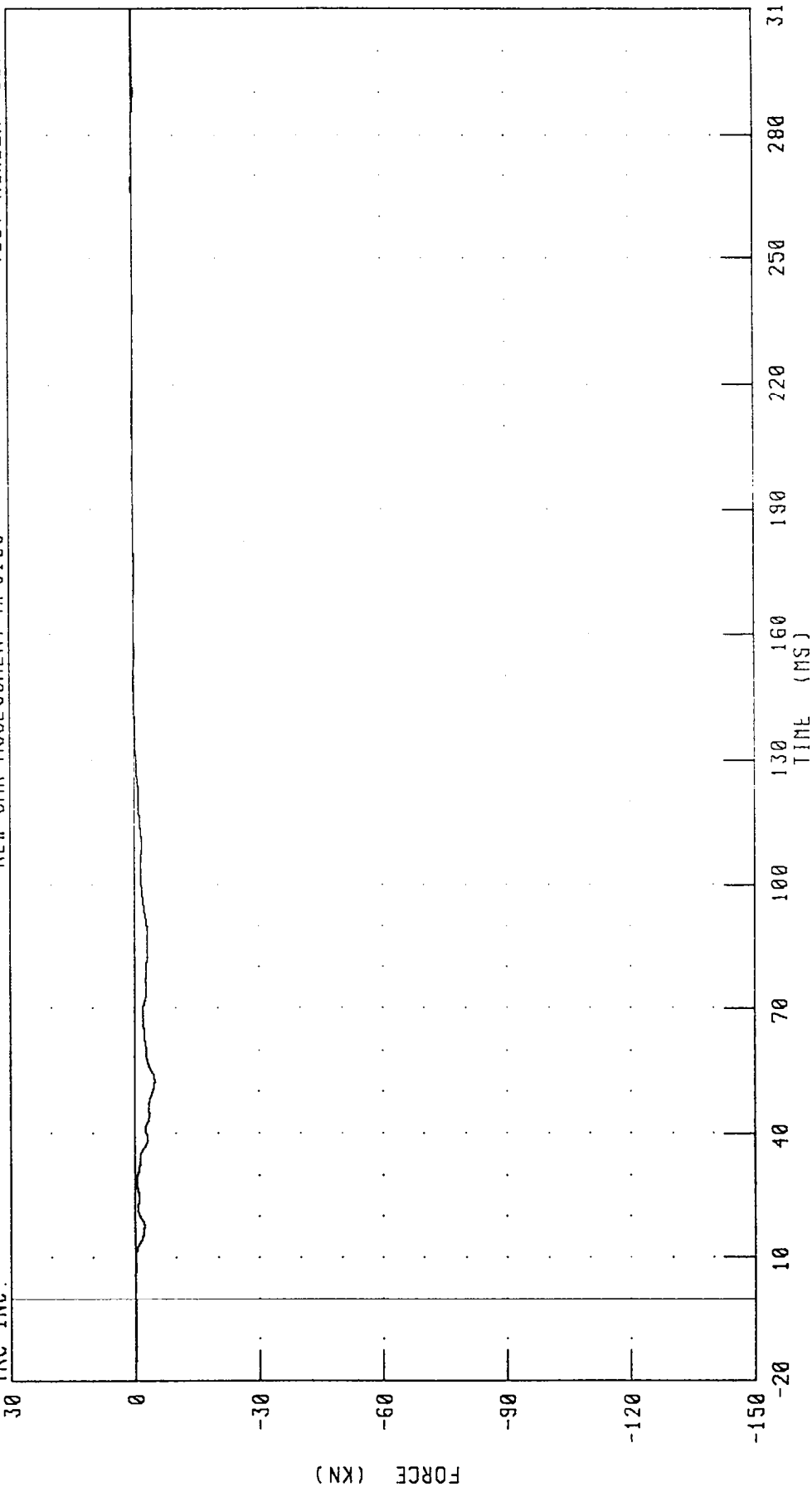
CHANNEL: BA7F FILTER: CH CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.



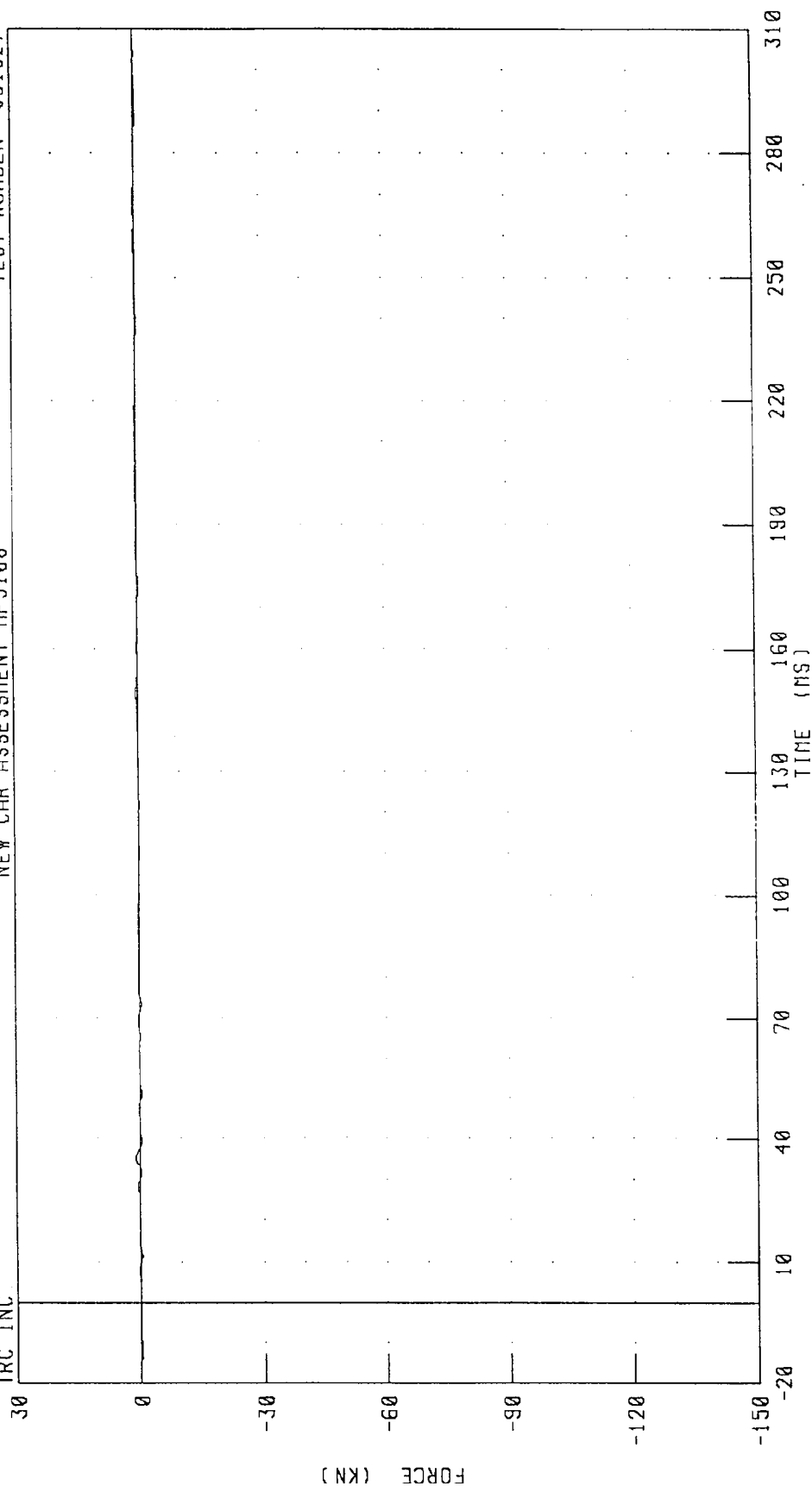
CHANNEL: B08F FILTER: CH. CLASS 60

PF0K 0010 0 2.5 KN @ 149.76 MS, -4.75 KN @ 52.56 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A9 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

TRC INC



CHANNEL: BASF

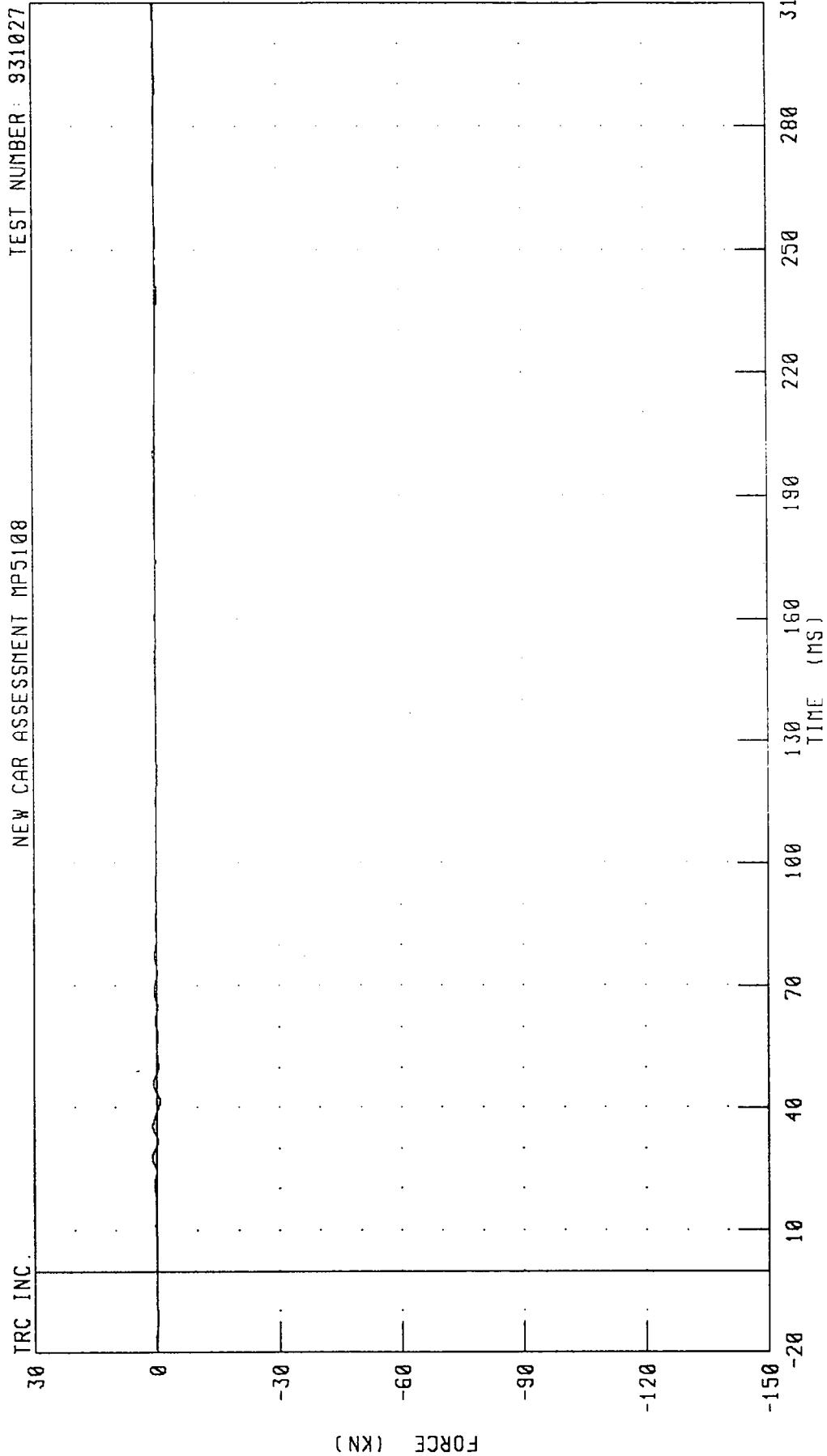
FILTER: CH CLASS 60

PEAK DATA 1 00 KN @ 35 36 MS, -0.53 KN @ 50.96 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE

TEST NUMBER: 931027

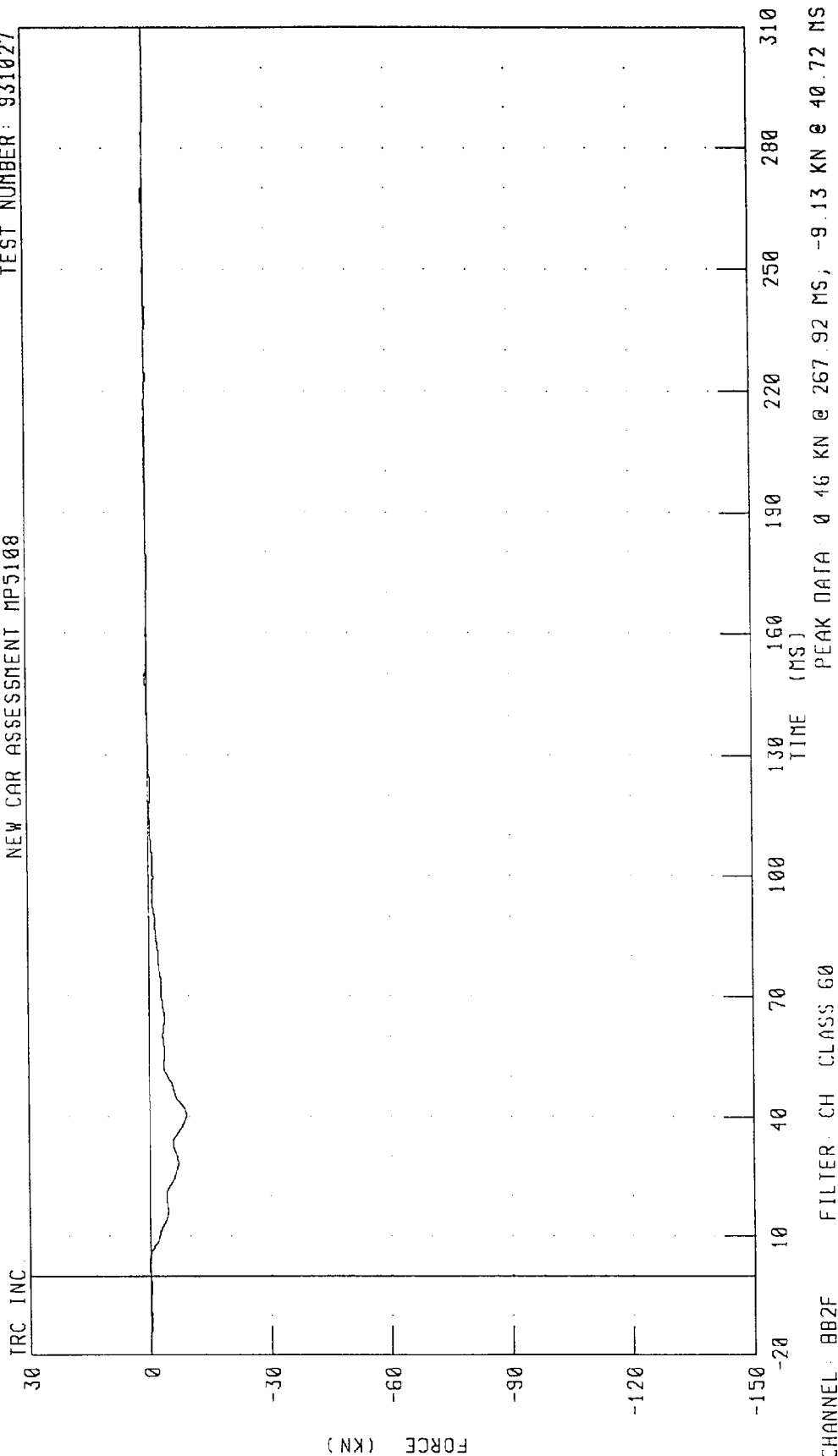
NEW CAR ASSESSMENT MP5108



CHANNEL: BB1F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B2 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

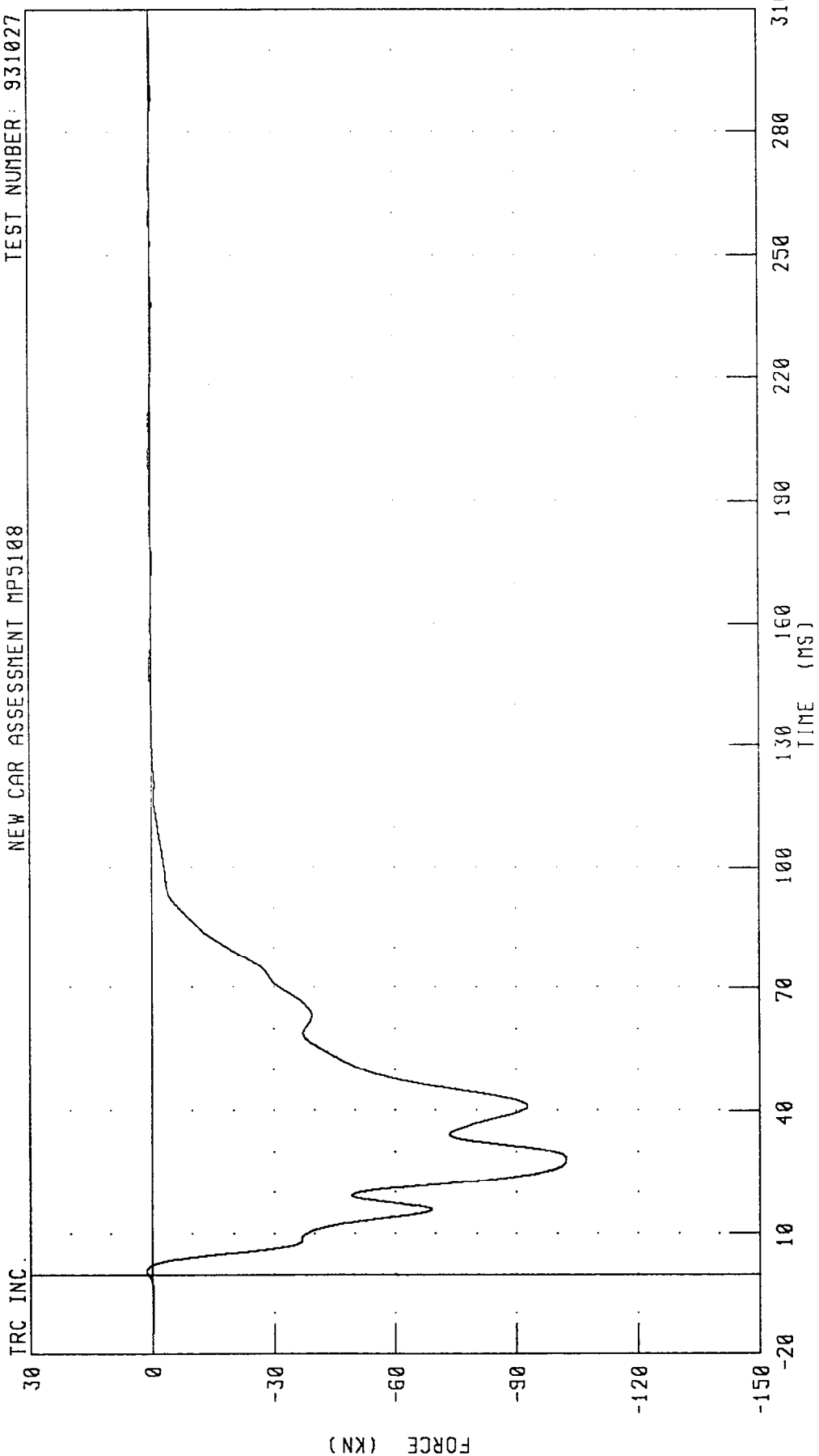


PEAK DATA 0 46 KN @ 267 92 MS, -9.13 KN @ 40.72 MS

CHANNEL: BB2F FILTER: CH CLASS: 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B3 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

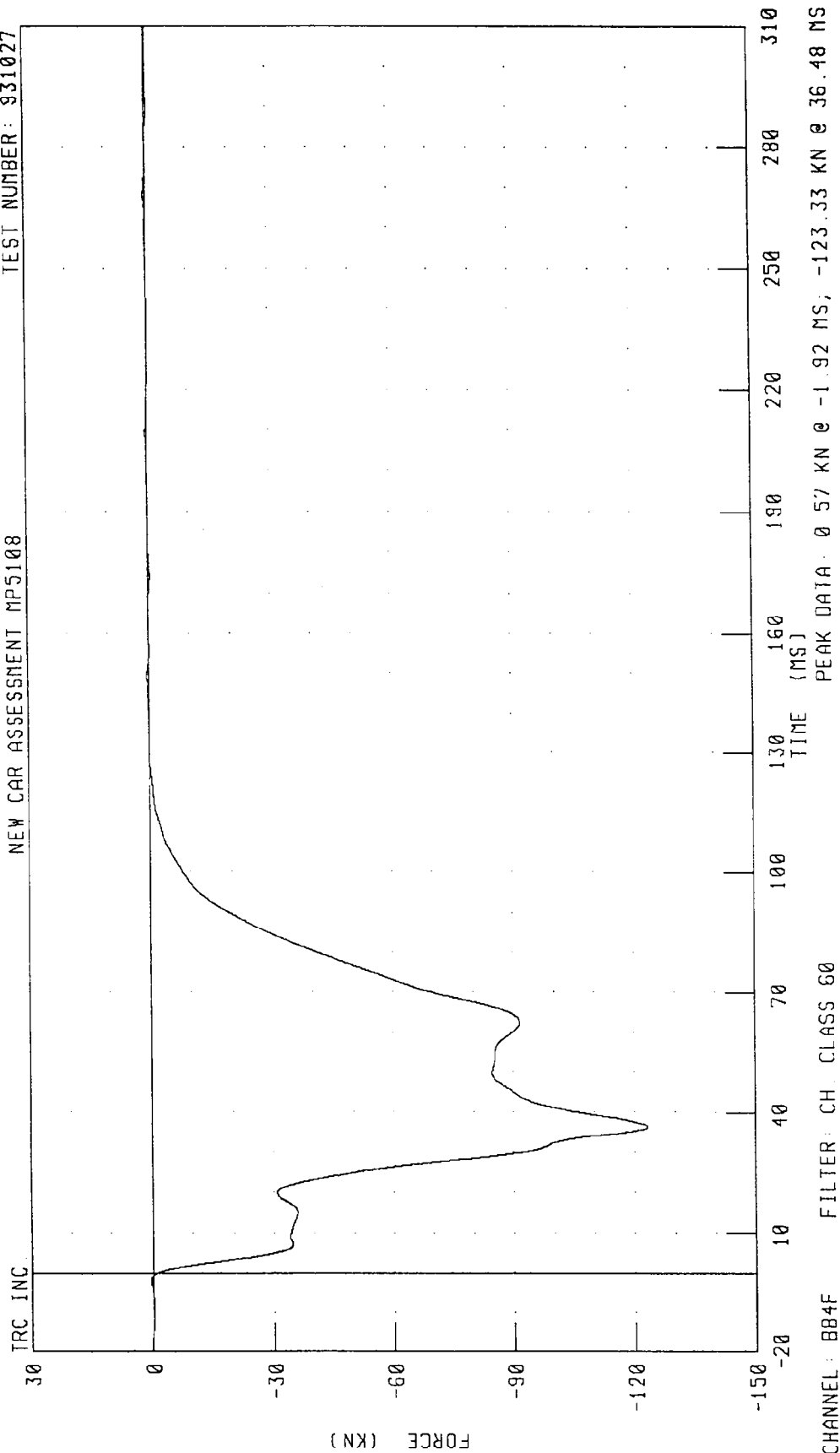


CHANNEL: 883F FILTER: CH. CLASS 60

PEAK DATA 1 26 KN @ 0.88 MS, -102.24 KN @ 28.32 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B4 FORCE
 NEW CAR ASSESSMENT MP5108

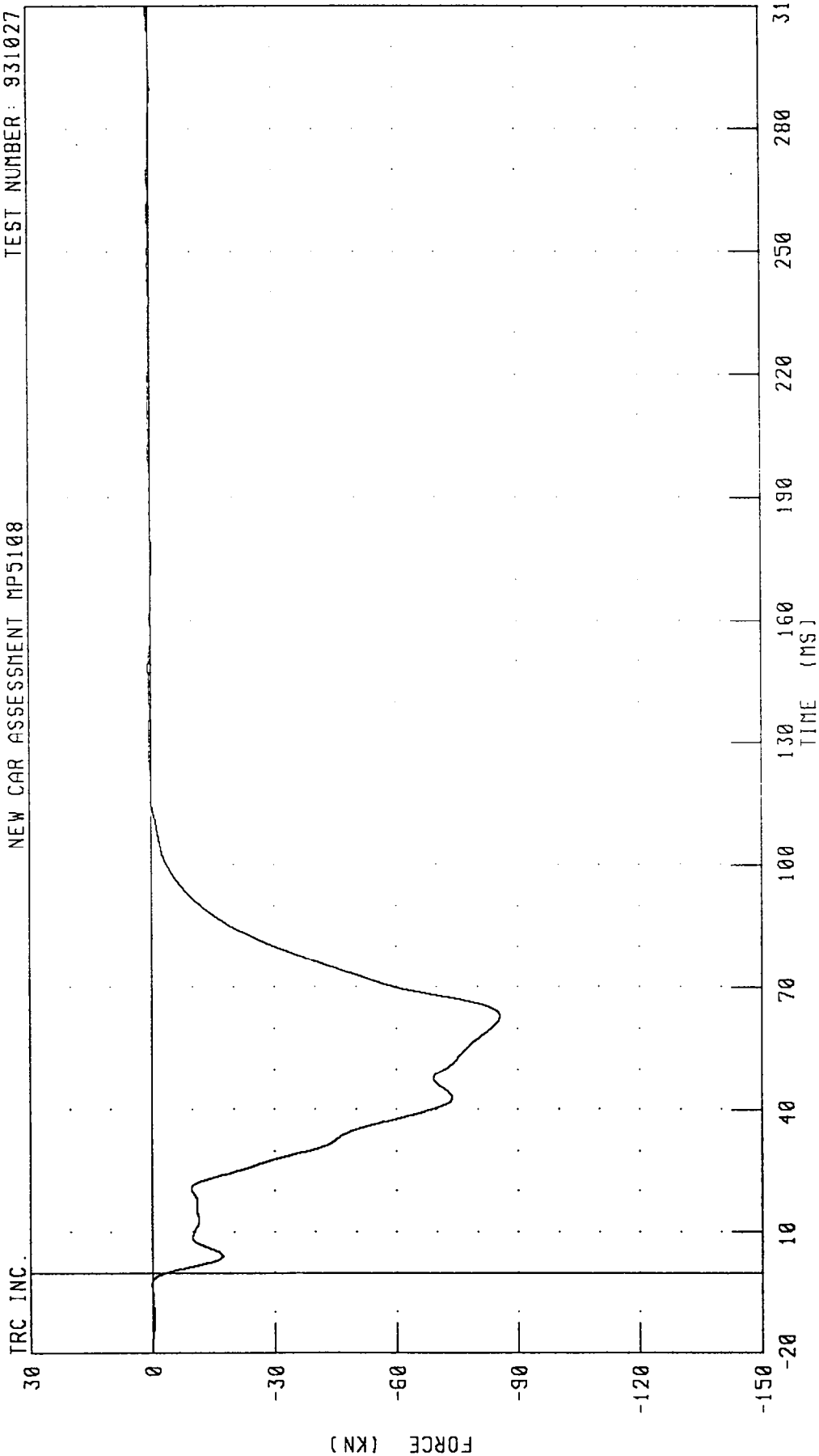
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

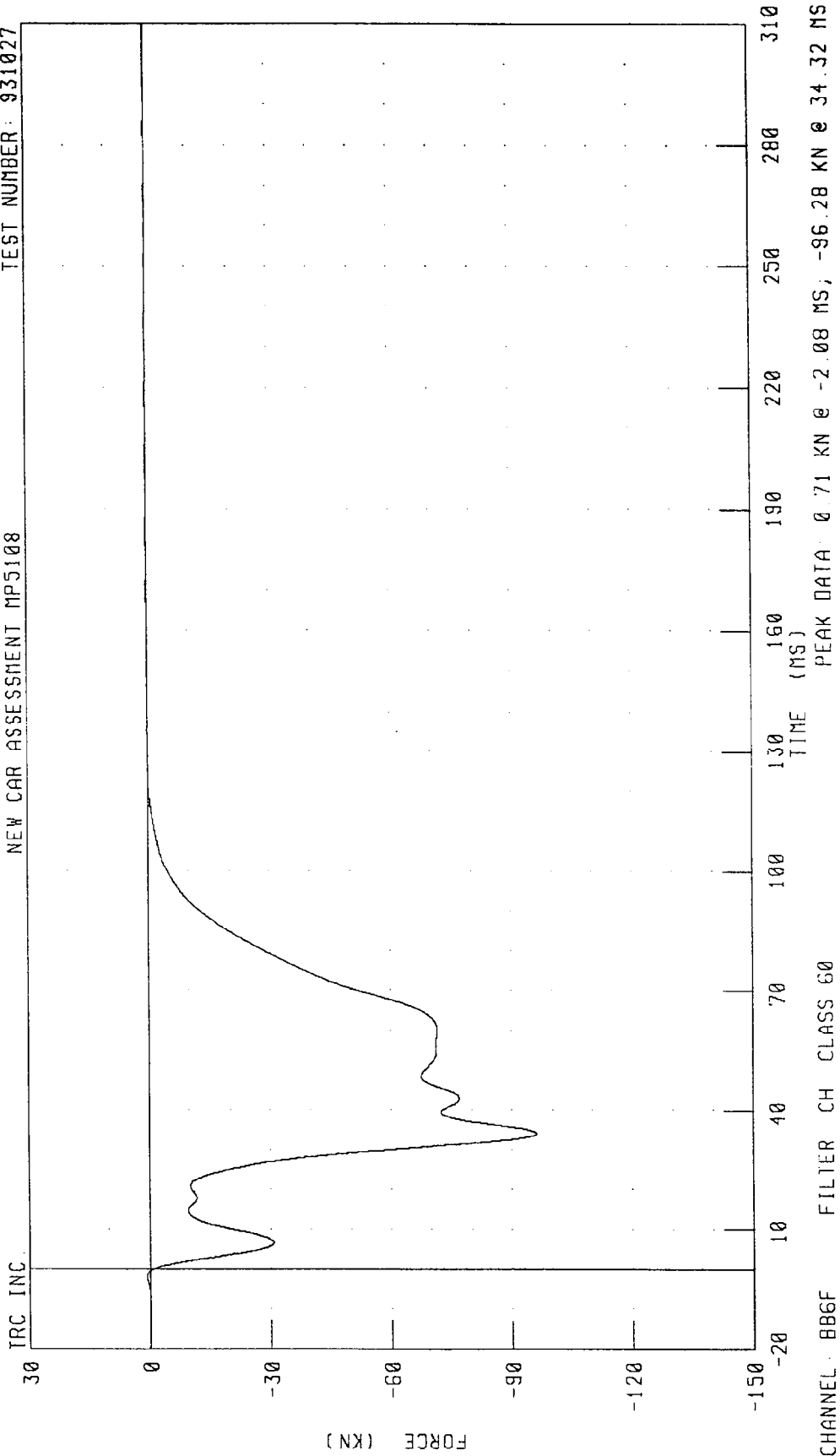


PEAK DATA 0 61 KN @ 148.40 MS; -85.56 KN @ 62.88 MS

CHANNEL: BB5F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B6 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



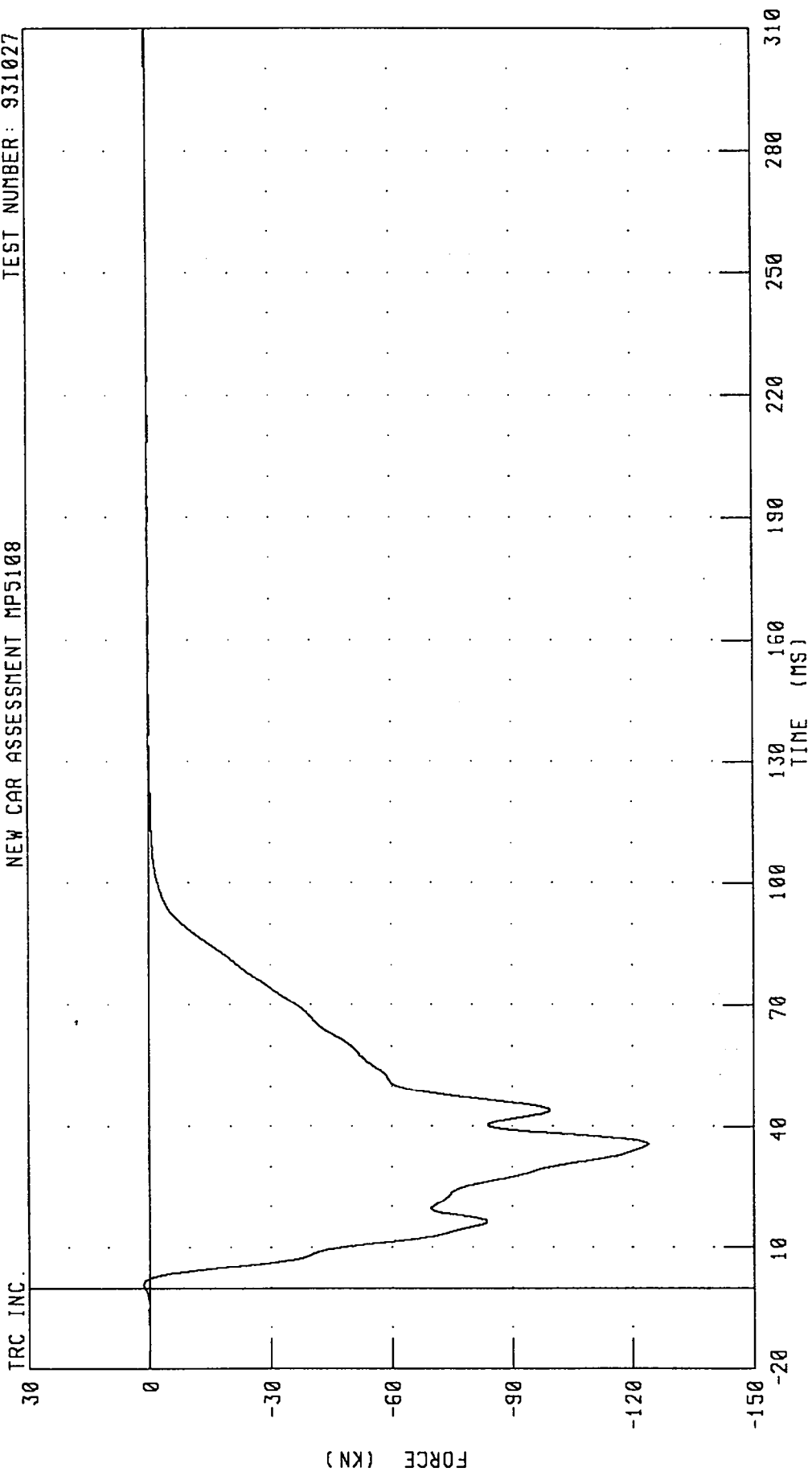
CHANNEL: BB6F FILTER: CH CLASS: 60

PEAK DATA: 0.71 KN @ -2.08 MS; -96.28 KN @ 34.32 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

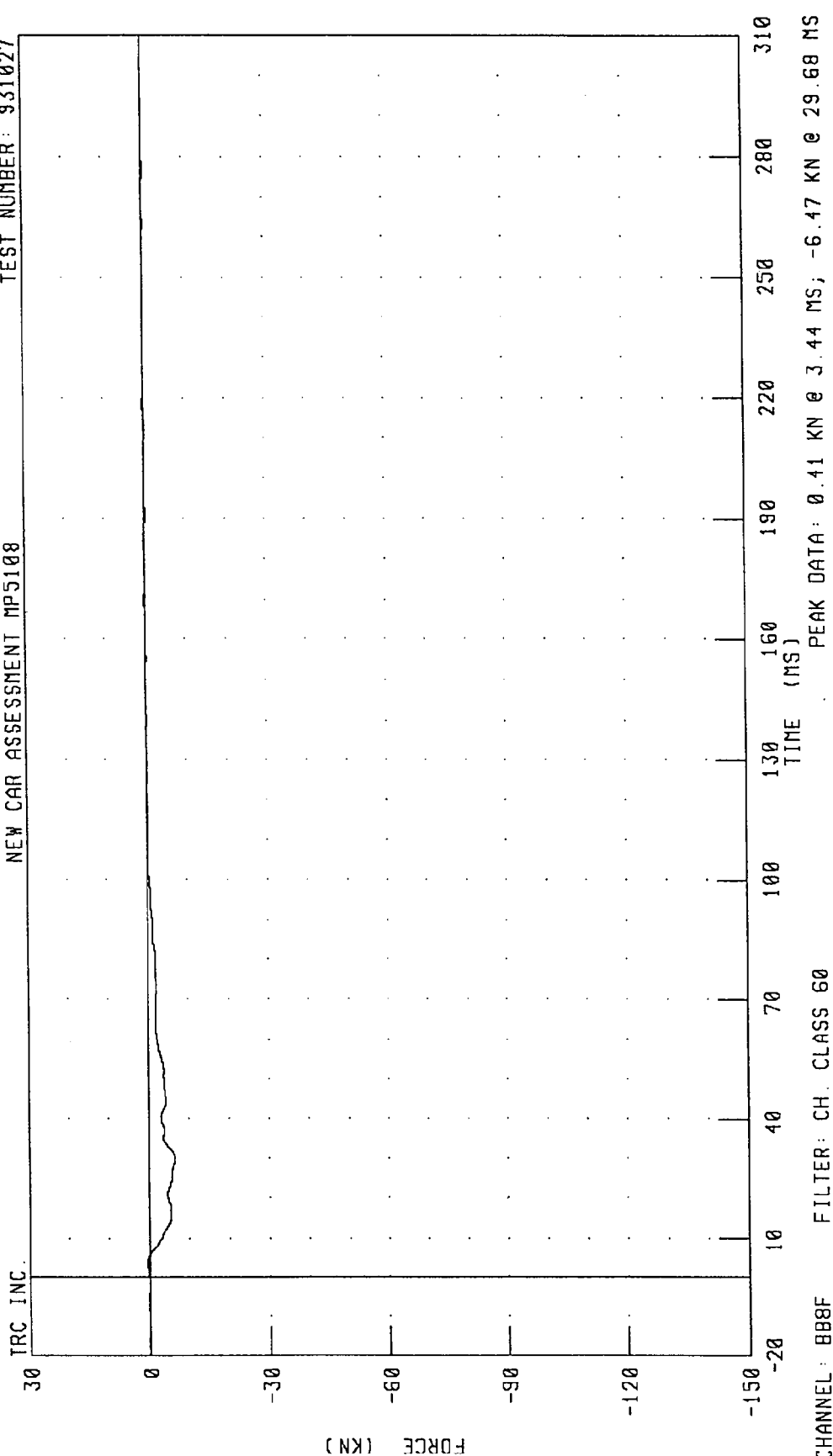


CHANNEL: BB7F FILTER: CH. CLASS 60

PEAK DATA: 1.43 KN @ 0.88 MS; -123.89 KN @ 35.68 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B8 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



PEAK DATA: 0.41 KN @ 3.44 MS; -6.47 KN @ 29.68 MS

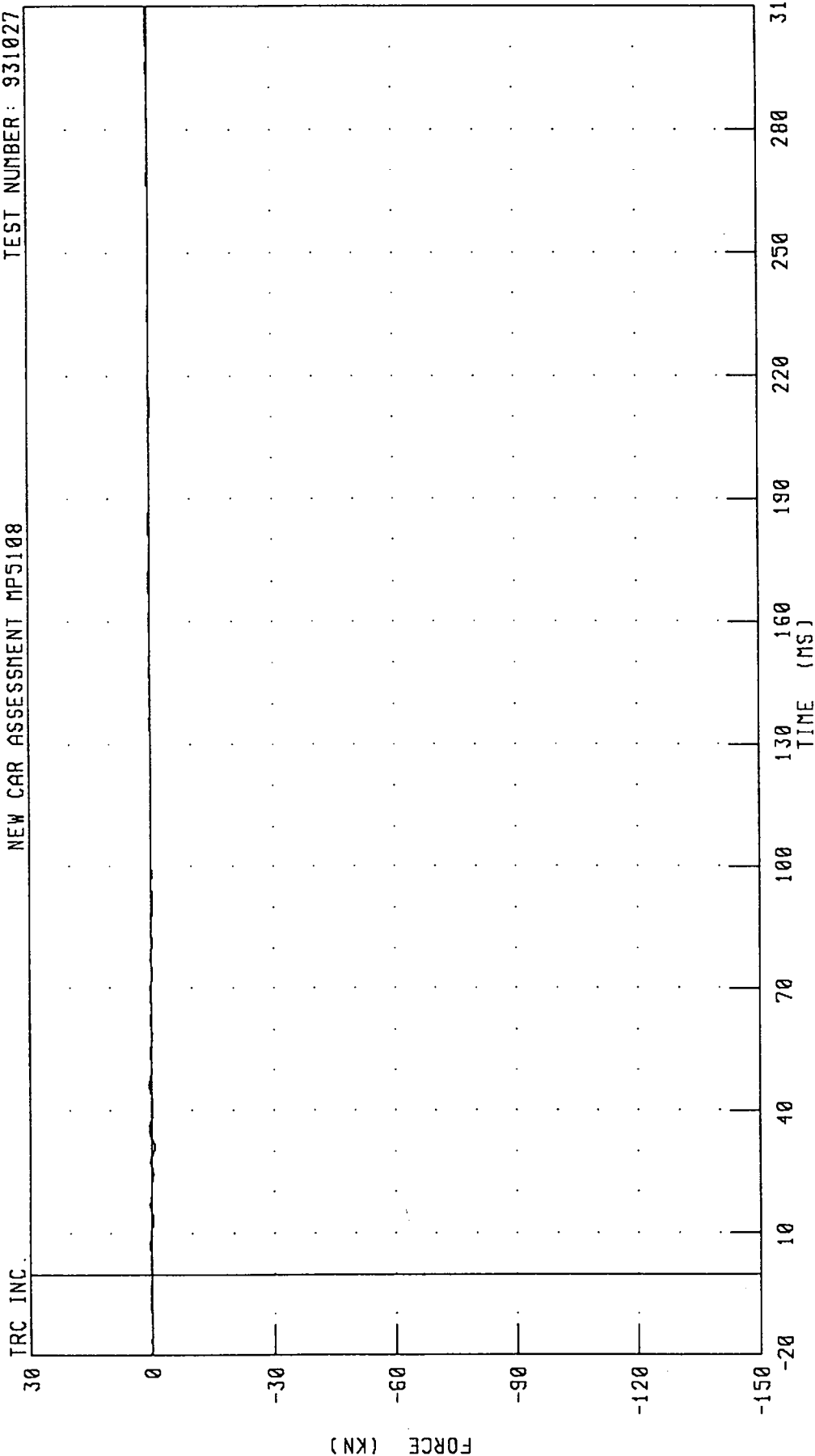
FILTER: CH. CLASS 60

CHANNEL: BB8F

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

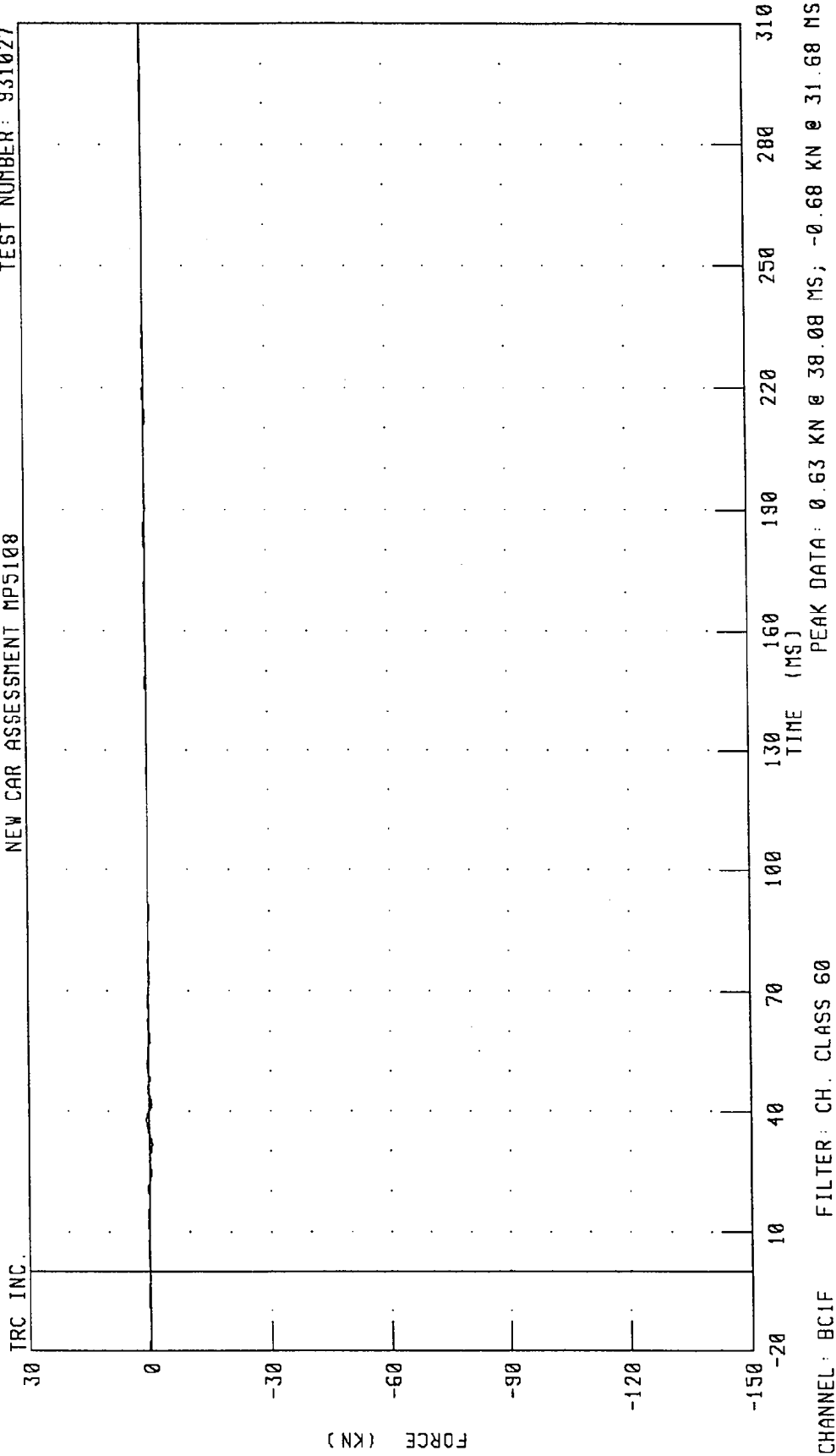


PEAK DATA: 0.44 KN @ 46.32 MS; -0.82 KN @ 31.20 MS

CHANNEL: BB9F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE
NEW CAR ASSESSMENT MP5108

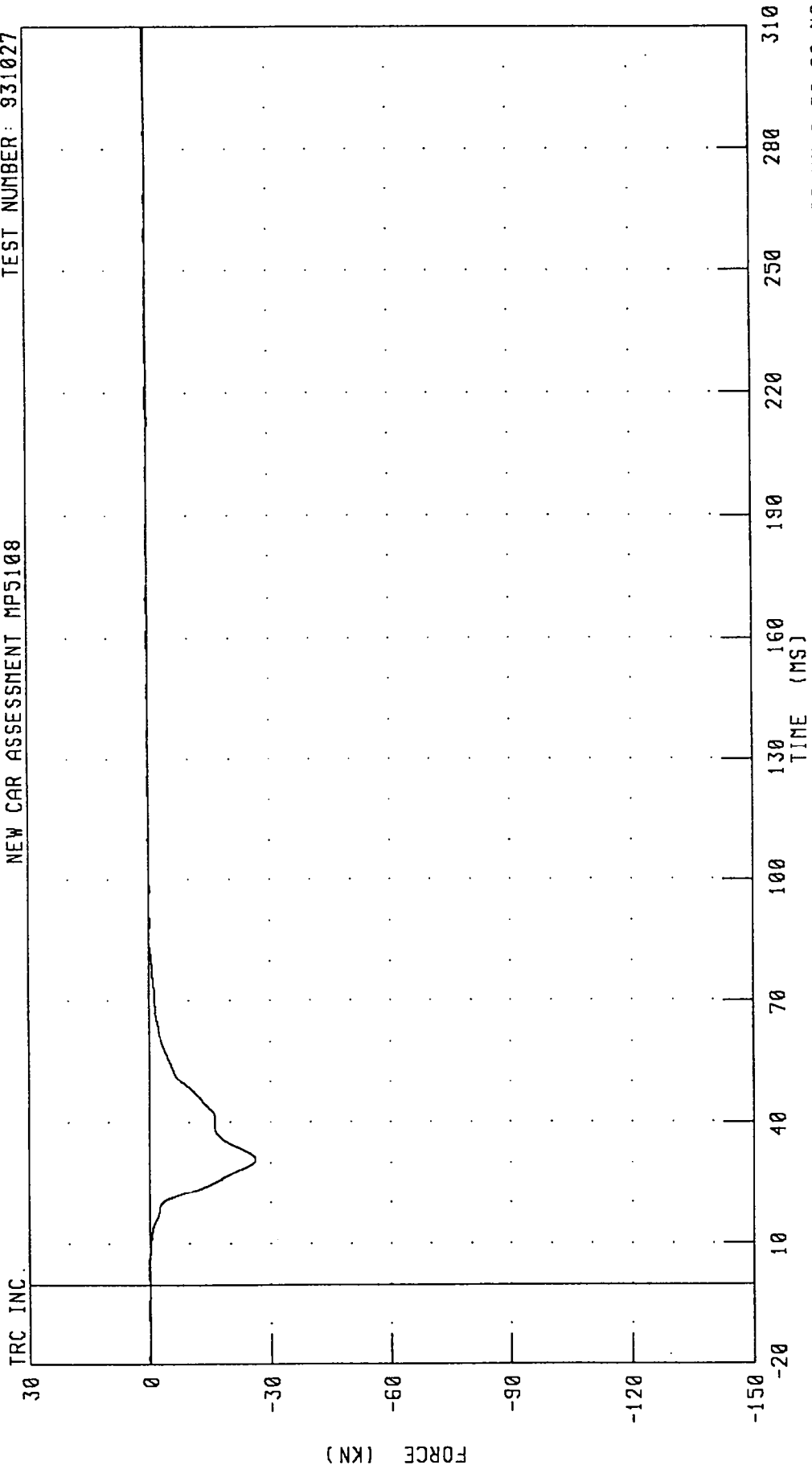
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

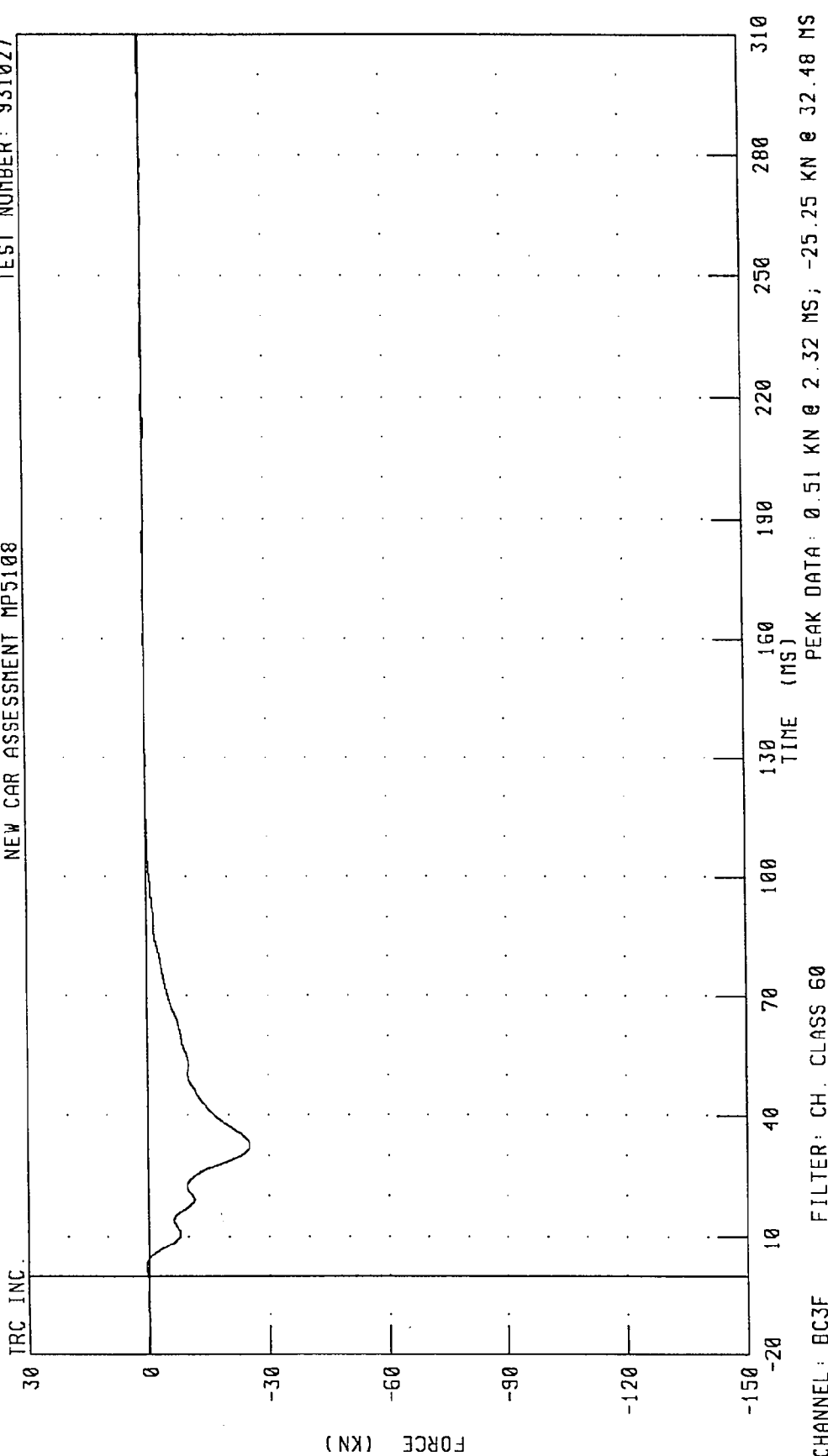


CHANNEL: BC2F FILTER: CH. CLASS 60

PEAK DATA: 0.34 KN @ 169.92 MS; -26.32 KN @ 30.96 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C3 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



PEAK DATA: 0.51 KN @ 2.32 MS; -25.25 KN @ 32.48 MS

FILTER: CH. CLASS 60

CHANNEL: BC3F

FORCE (KN)

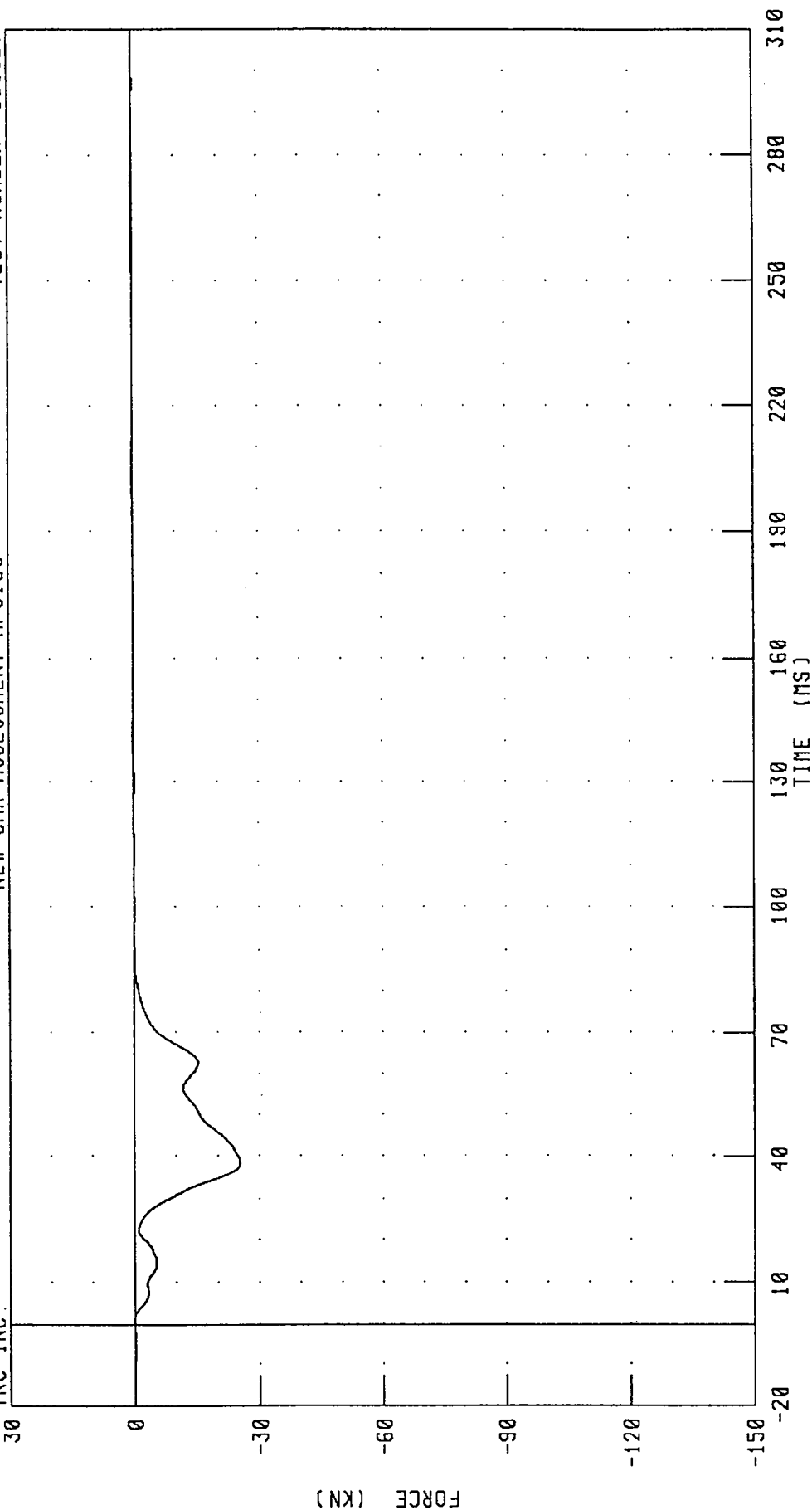
TIME (MS)

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.

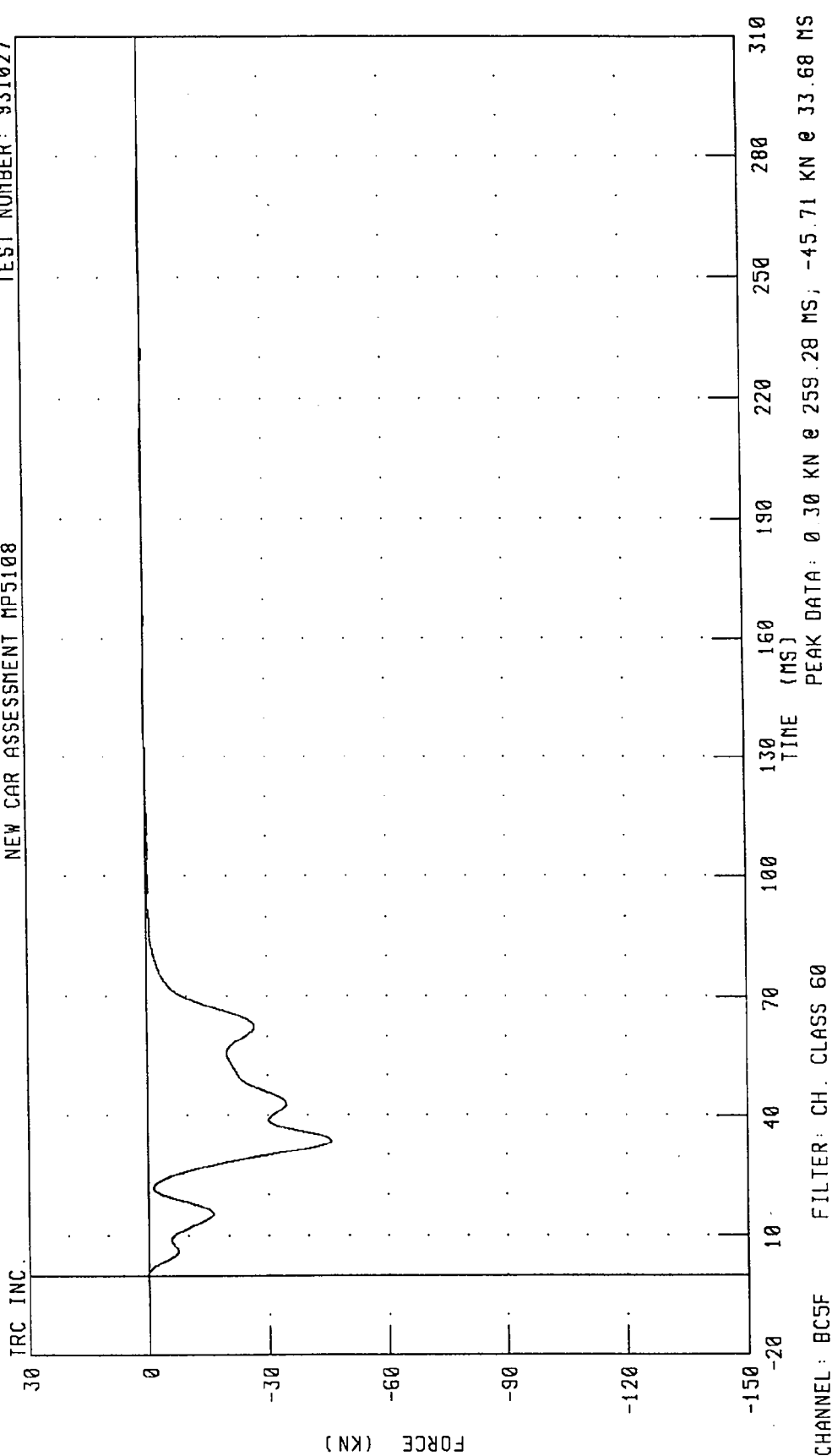


PEAK DATA: 0.25 KN @ 271.28 MS; -25.34 KN @ 38.56 MS

CHANNEL: BC4F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C5 FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



CHANNEL: BC5F

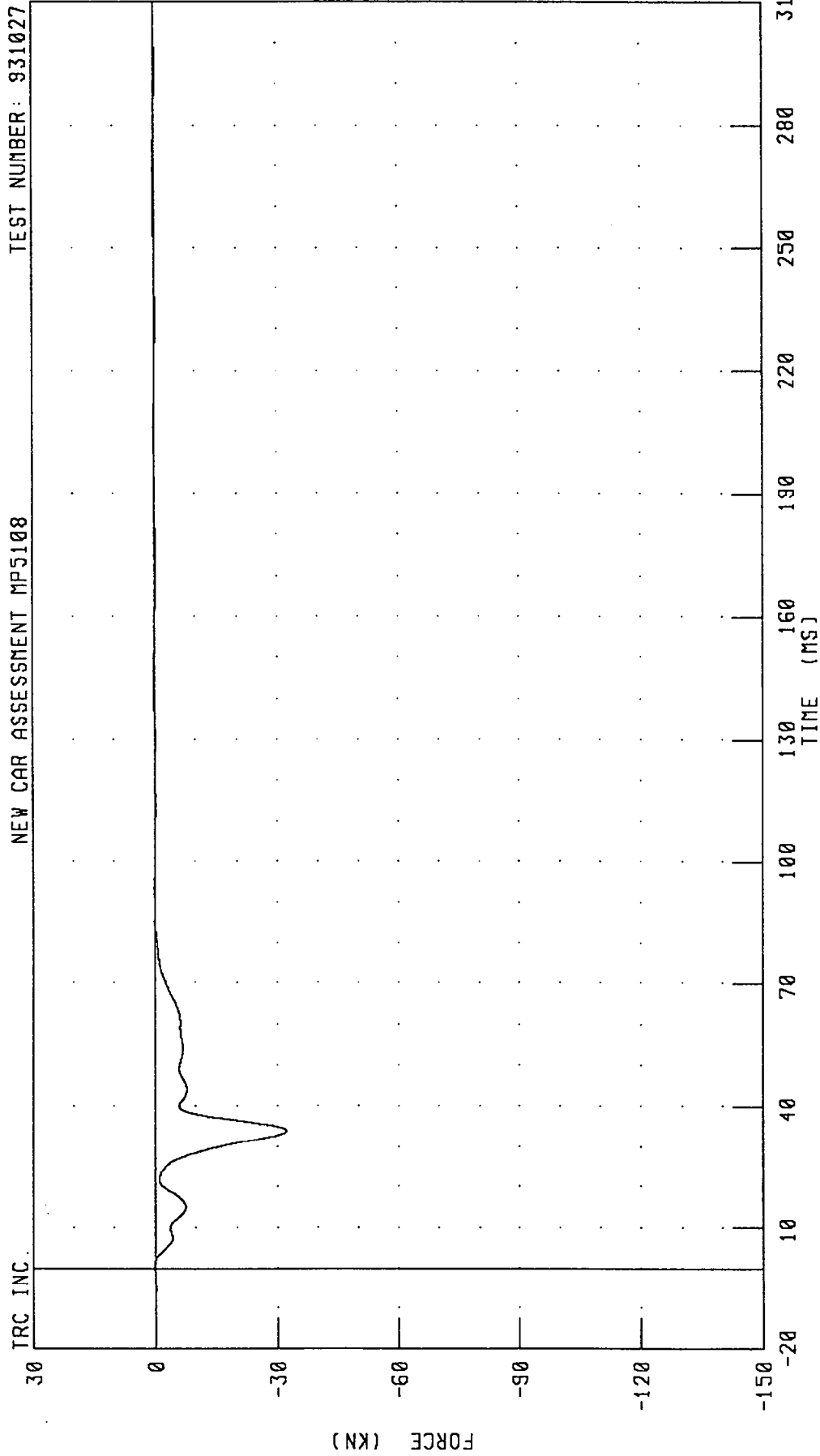
FILTER: CH. CLASS 60

PEAK DATA: 0 30 KN @ 259.28 MS; -45.71 KN @ 33.68 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

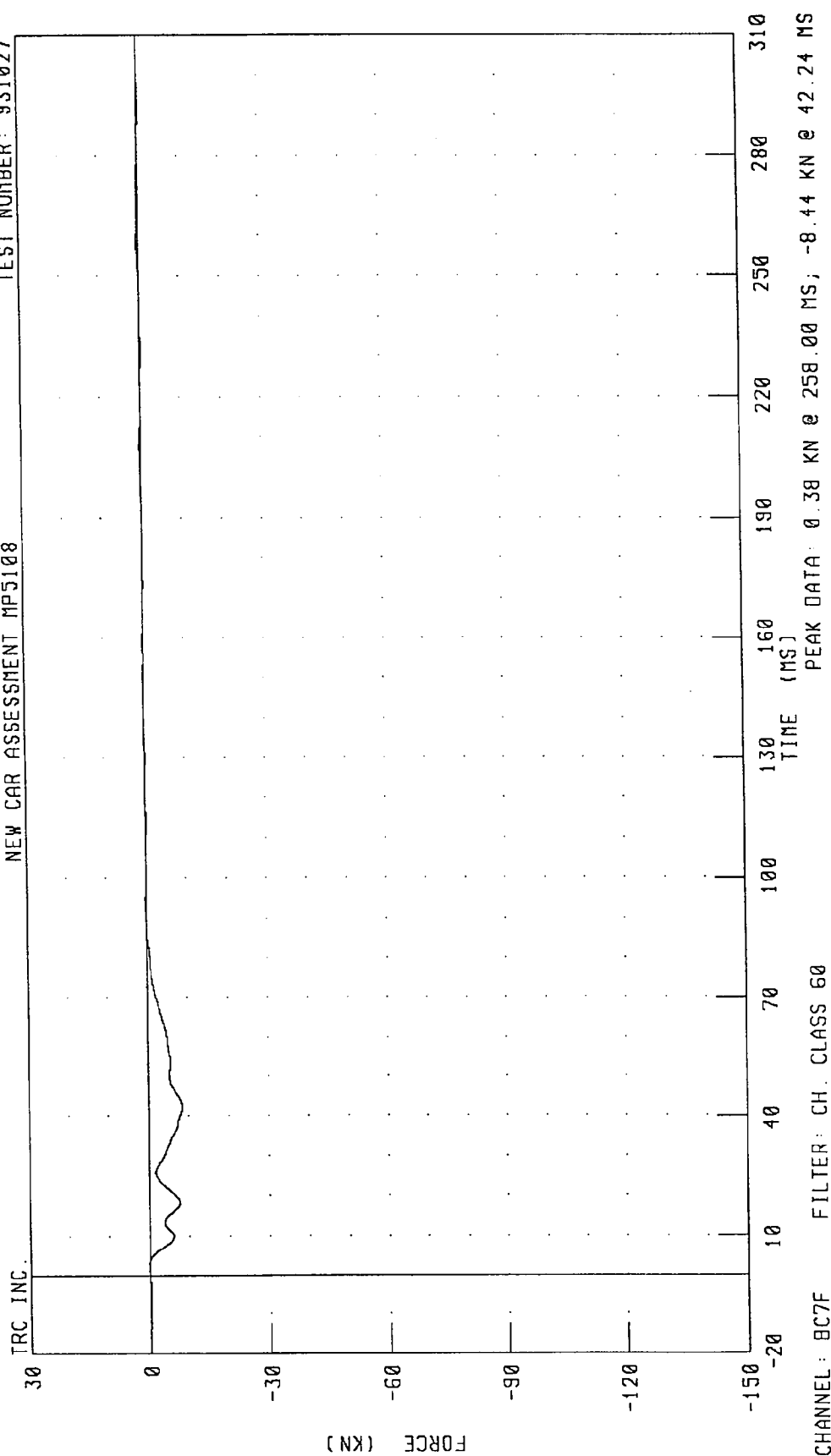


CHANNEL: BC6F FILTER: CH. CLASS 60

PEAK DATA: 0.30 KN @ 257.84 MS; -32.24 KN @ 34.08 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE
NEW CAR ASSESSMENT MP5108

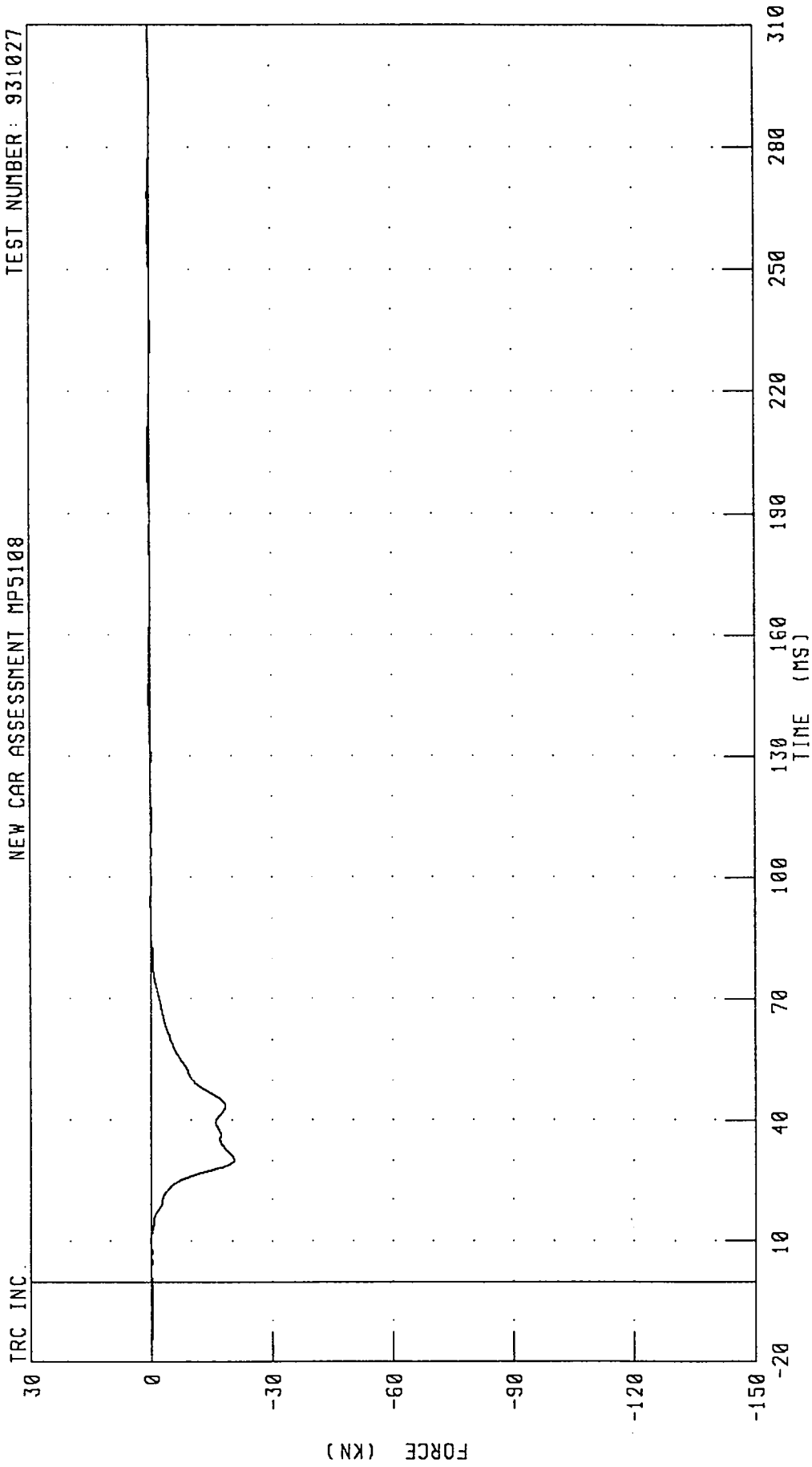
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

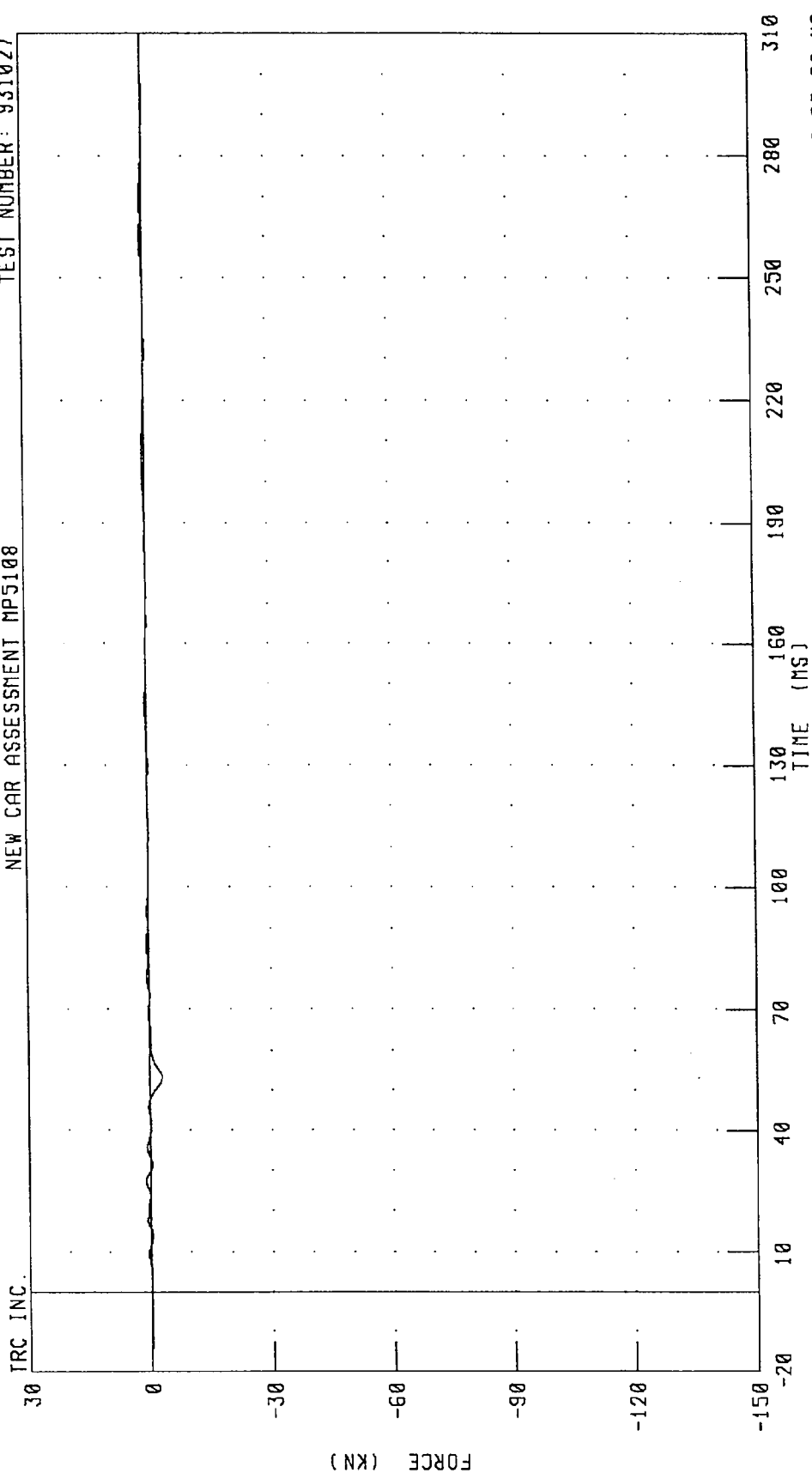


PEAK DATA: 0.46 KN @ 207.52 MS, -20.59 KN @ 30.32 MS

CHANNEL: BC8F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



CHANNEL: BC9F FILTER: CH. CLASS 60

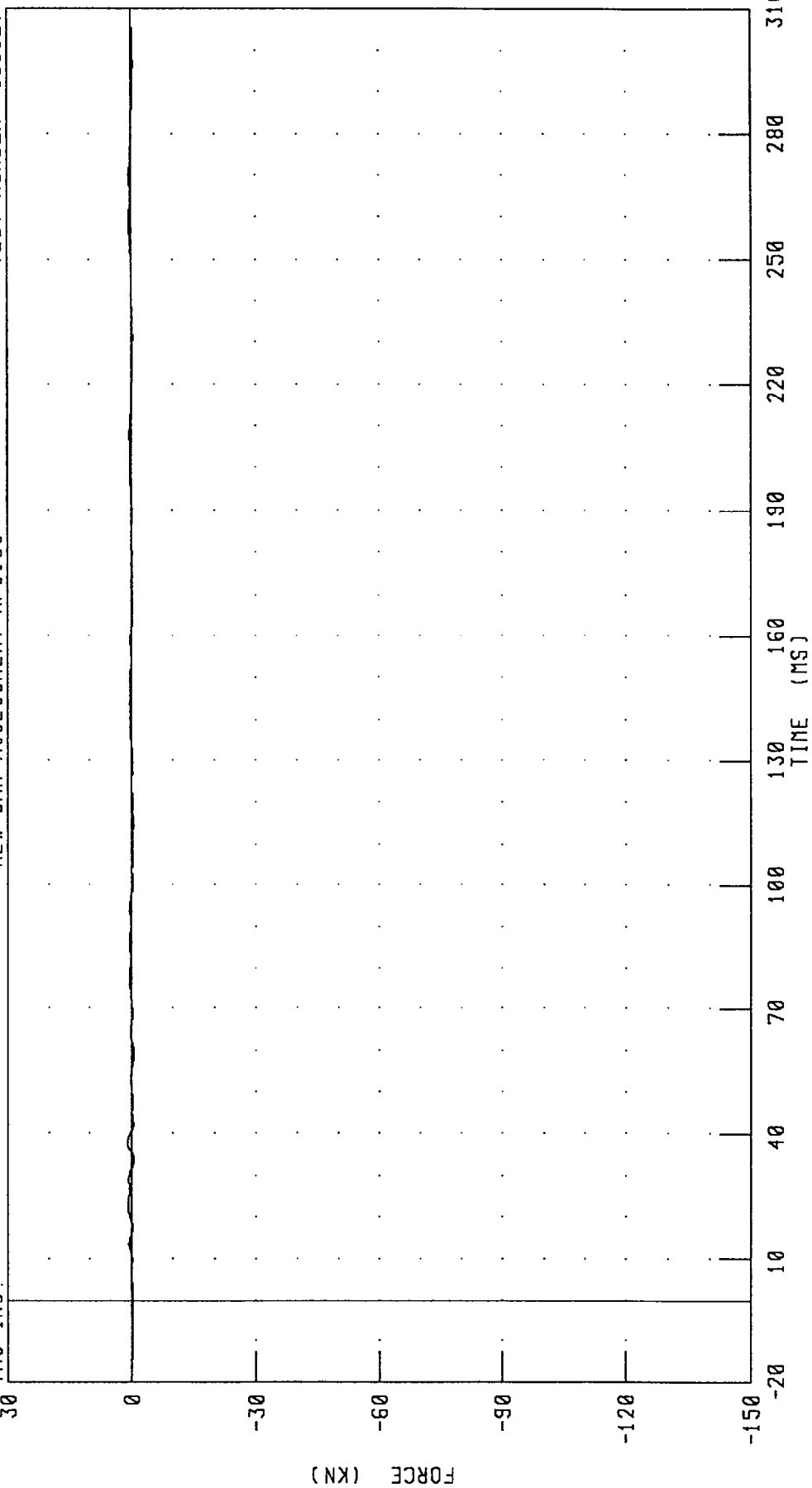
PEAK DATA: 1.06 KN @ 27.44 MS; -3.09 KN @ 53.28 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.



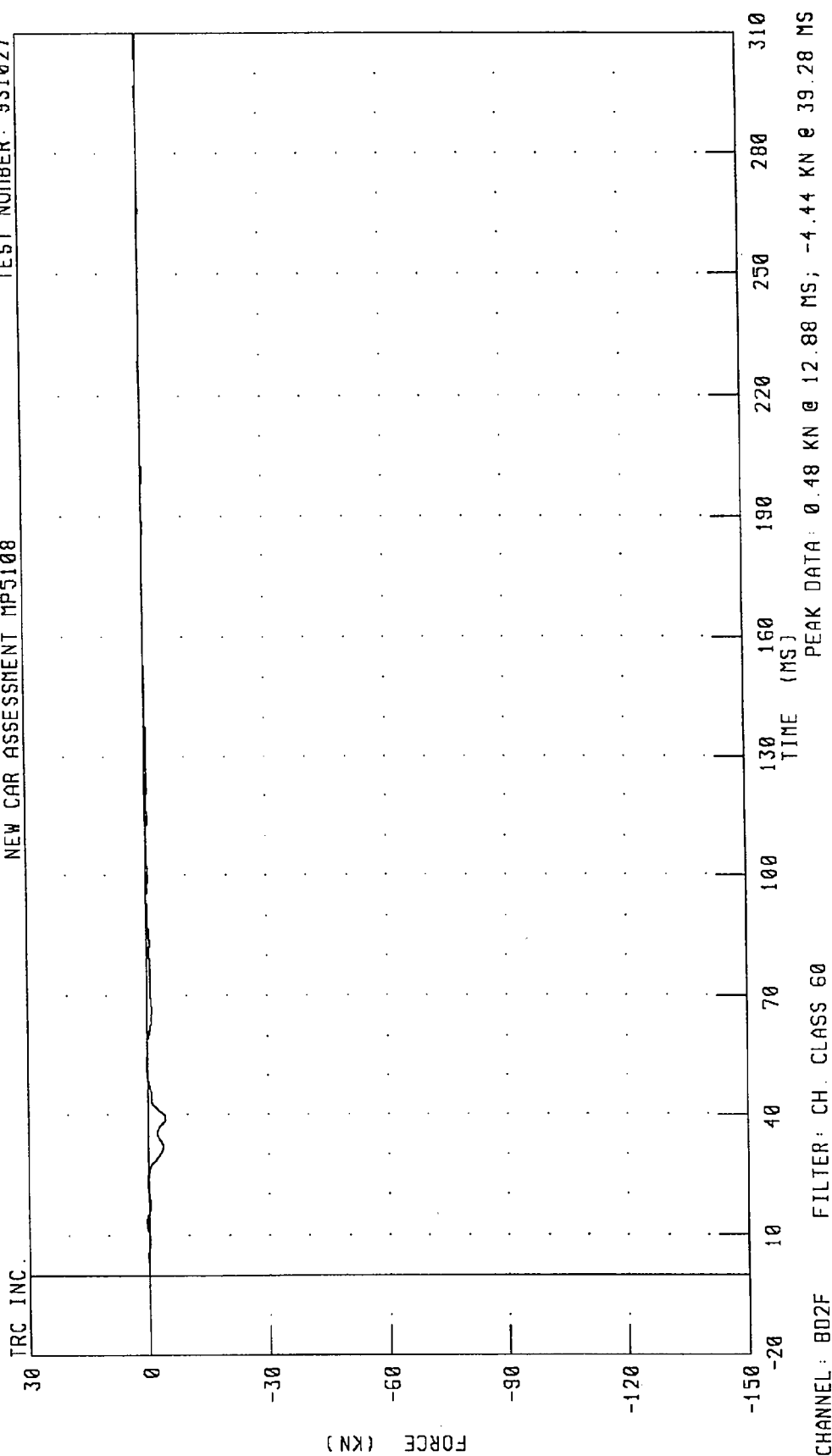
CHANNEL: BD1F FILTER: CH. CLASS 60

PEAK DATA:

1.03 KN @ 37.92 MS; -0.64 KN @ 33.84 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE
NEW CAR ASSESSMENT MP5108

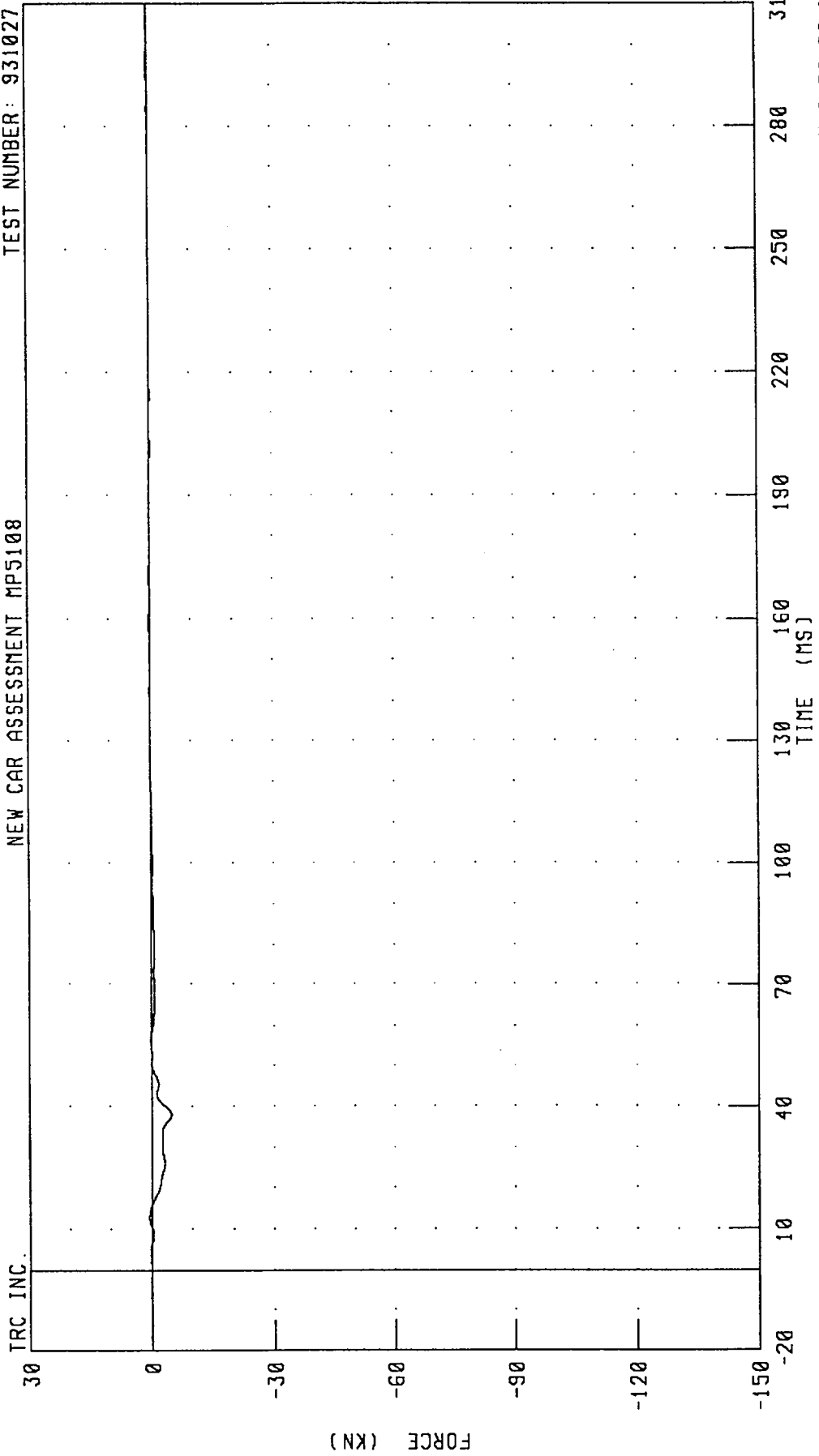
TEST NUMBER: 931027



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

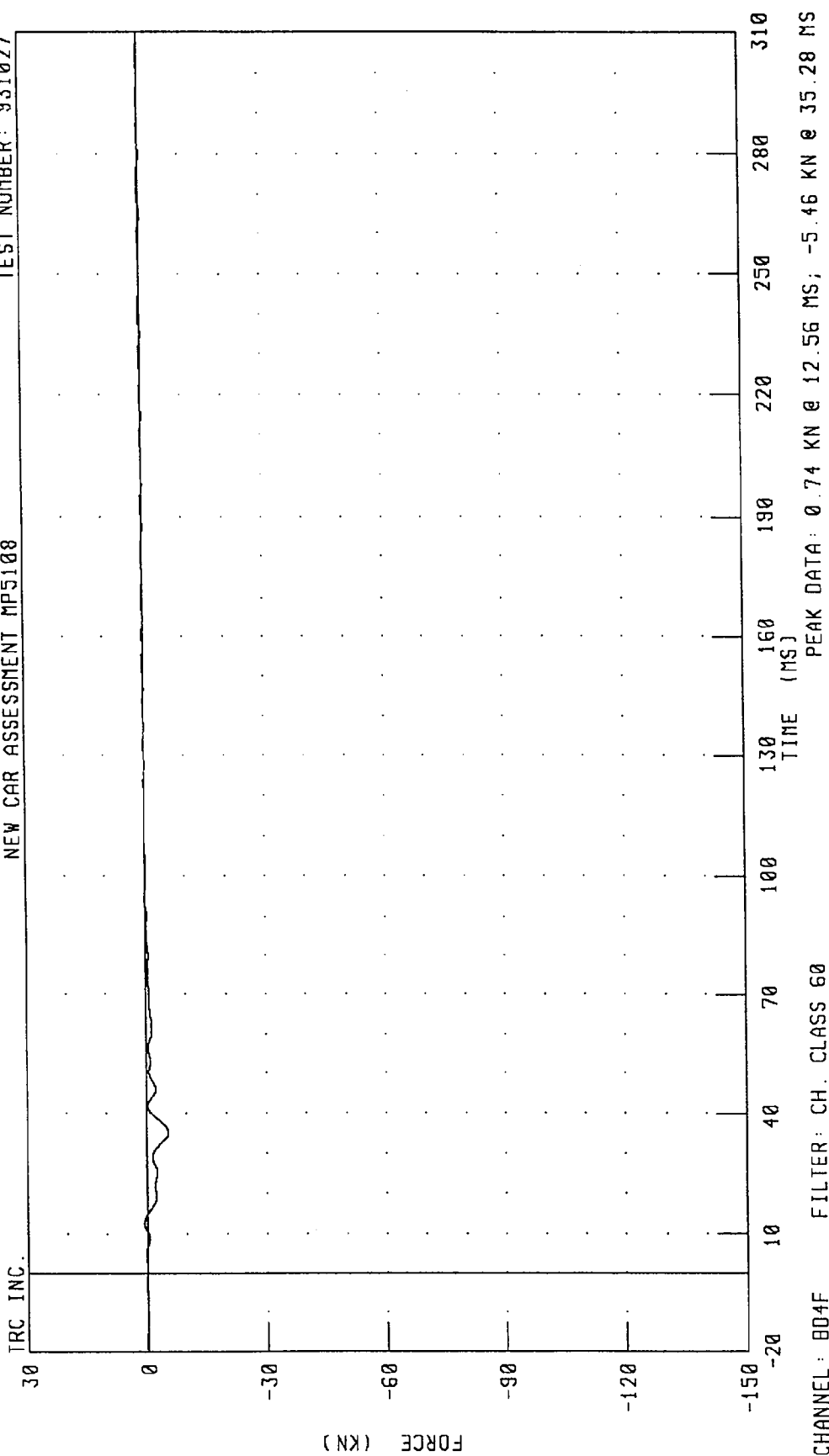


PEAK DATA: 0.63 KN @ 12.64 MS; -5.01 KN @ 38.08 MS

CHANNEL: BD3F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D4 FORCE
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

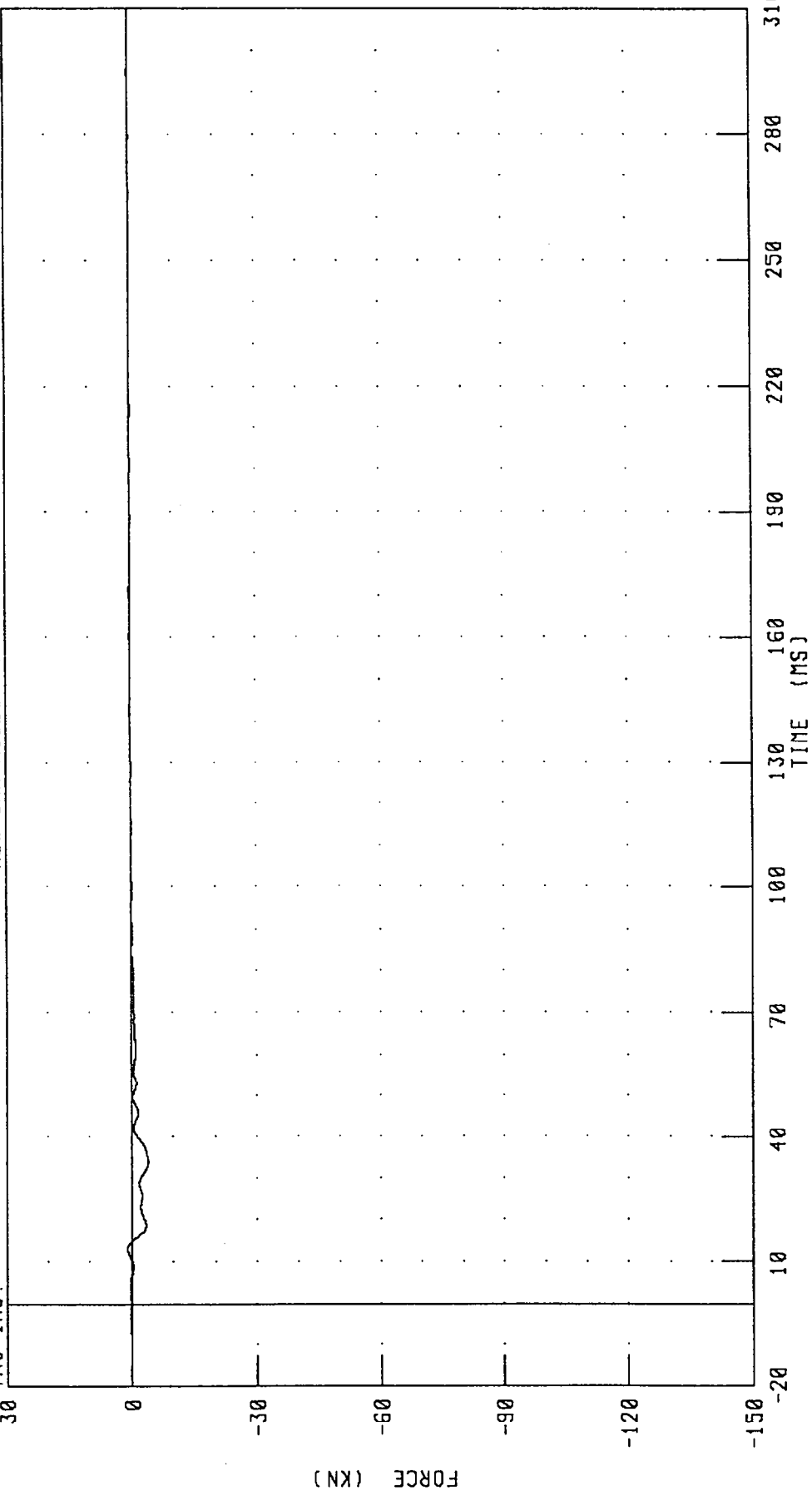


1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.



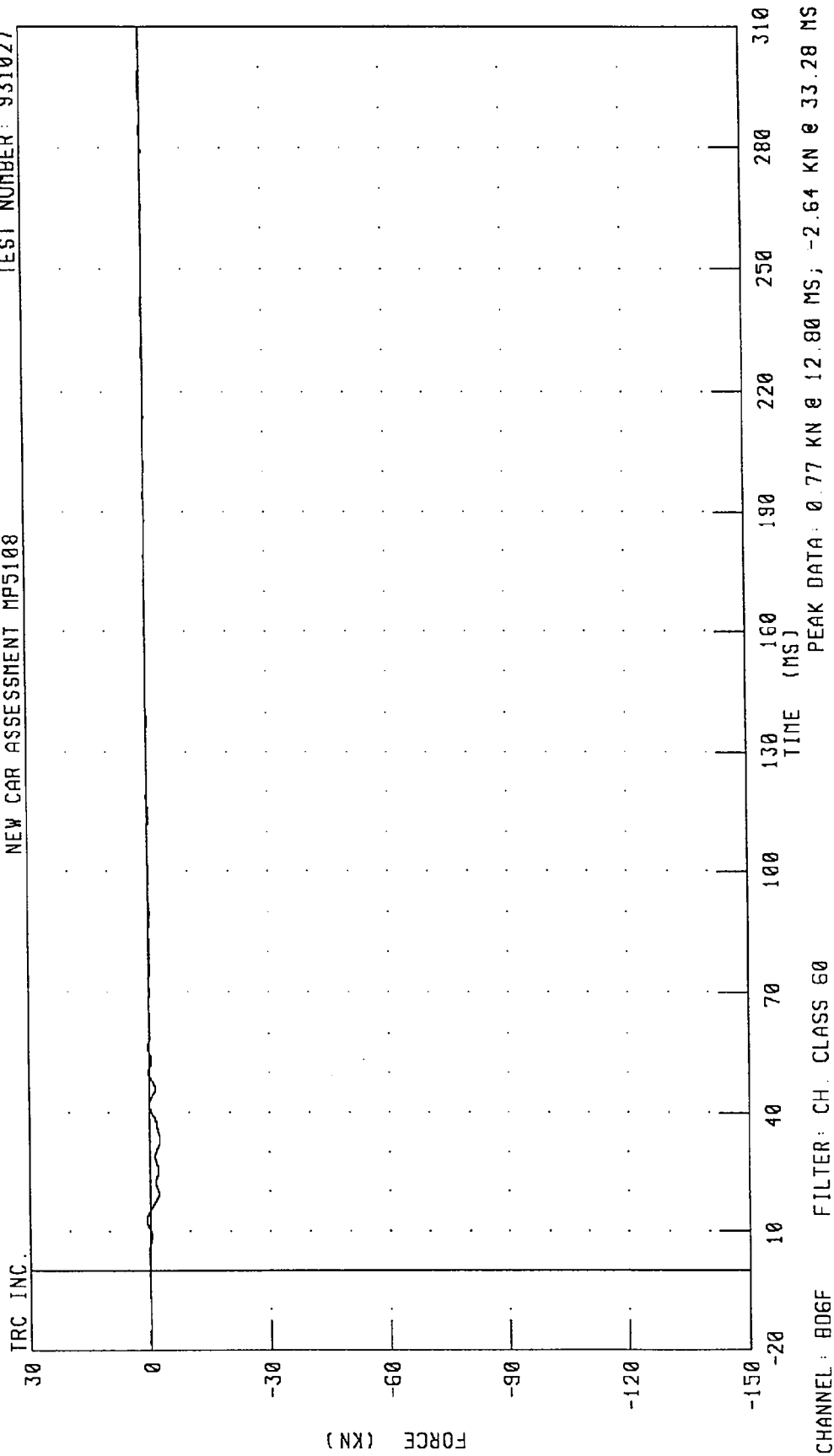
PEAK DATA: 0.96 KN @ 12.88 MS; -3.99 KN @ 33.92 MS

CHANNEL: B05F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

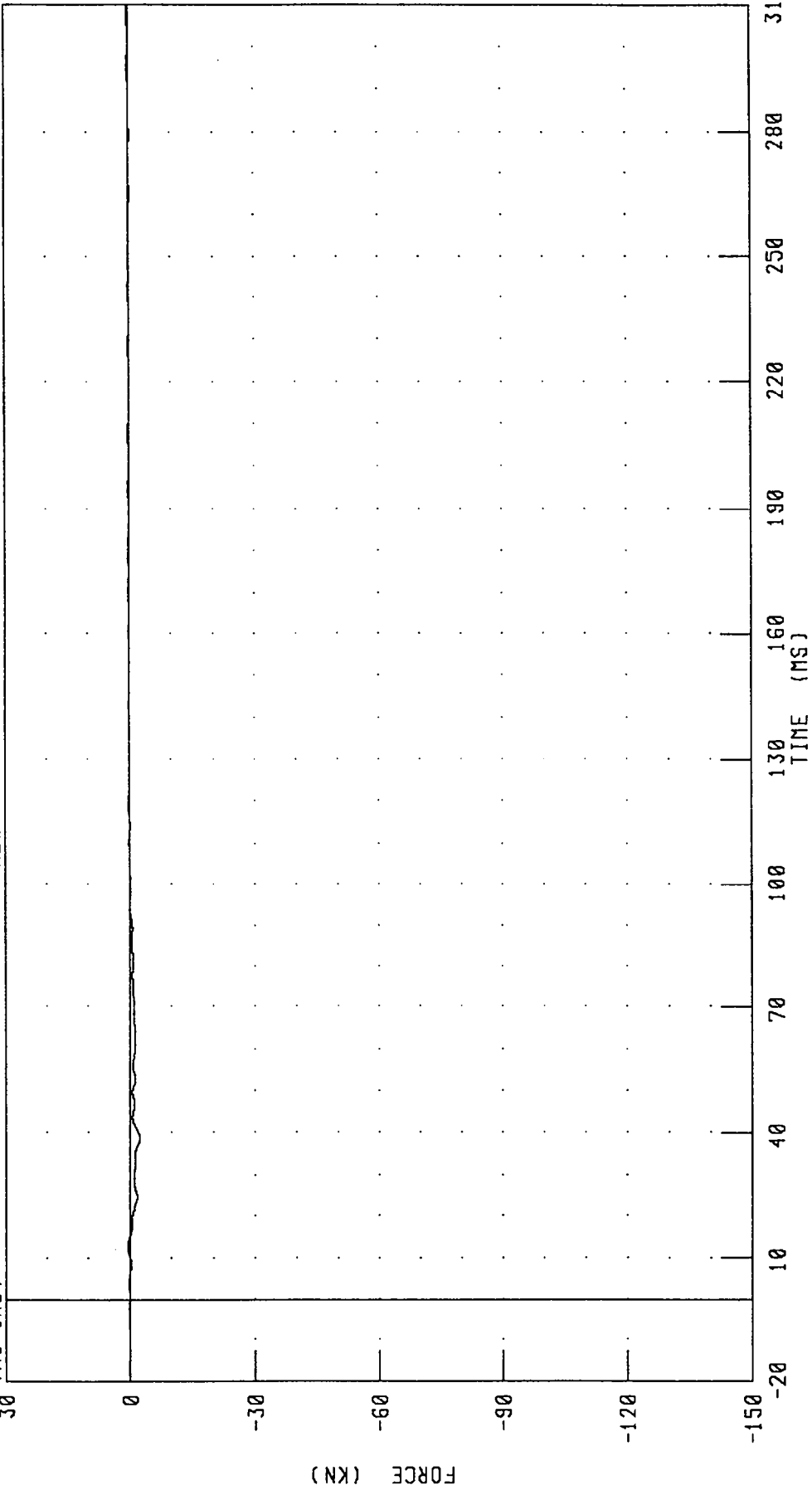


1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108

TRC INC.



PEAK DATA: 0.58 KN @ 12.56 MS; -2.38 KN @ 38.80 MS

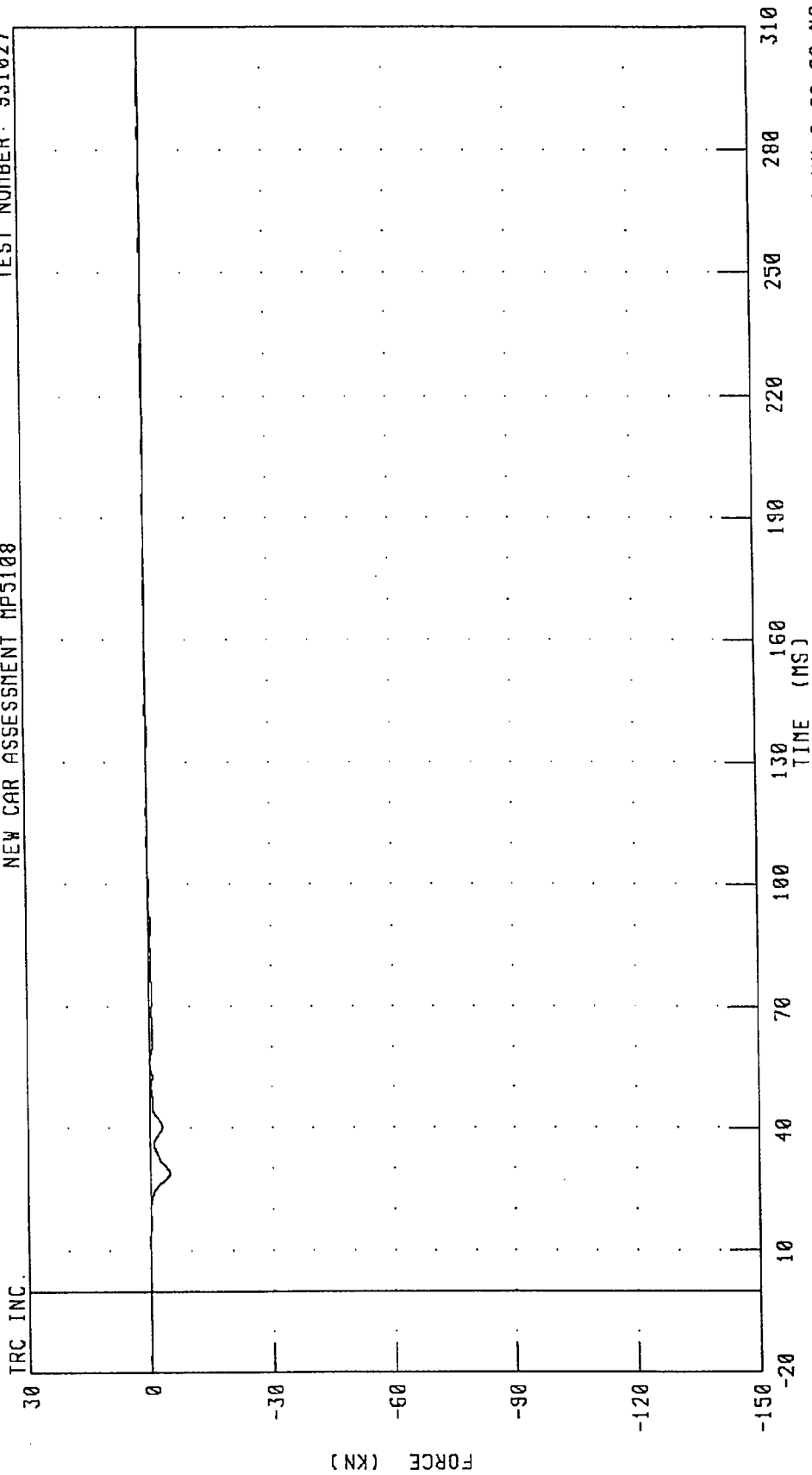
FILTER: CH. CLASS 60

CHANNEL: B07F

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

TEST NUMBER: 931027

NEW CAR ASSESSMENT MP5108



CHANNEL: BD8F

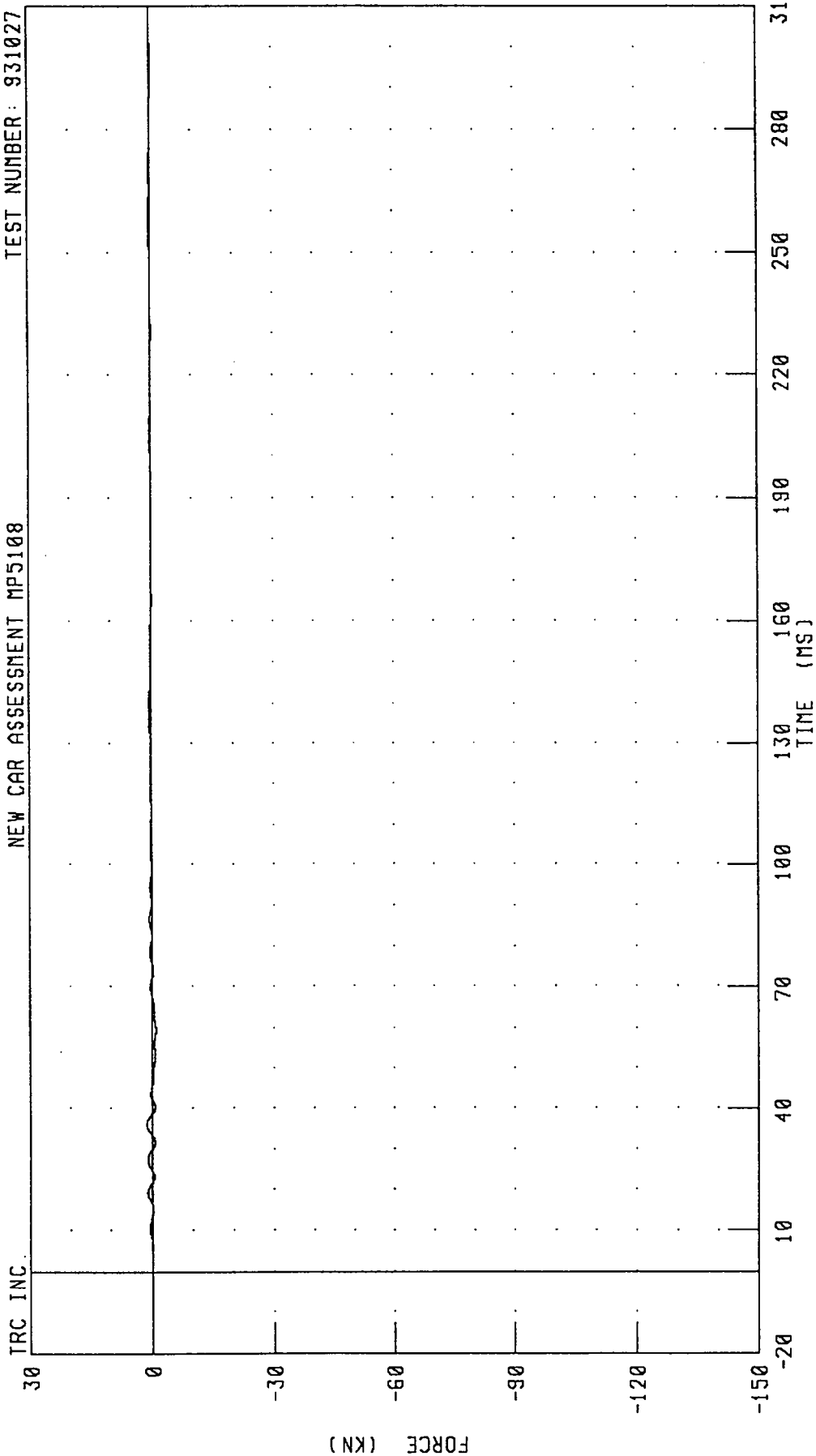
FILTER: CH. CLASS 60

PEAK DATA: 0.28 KN @ 294.88 MS; -4.89 KN @ 28.80 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



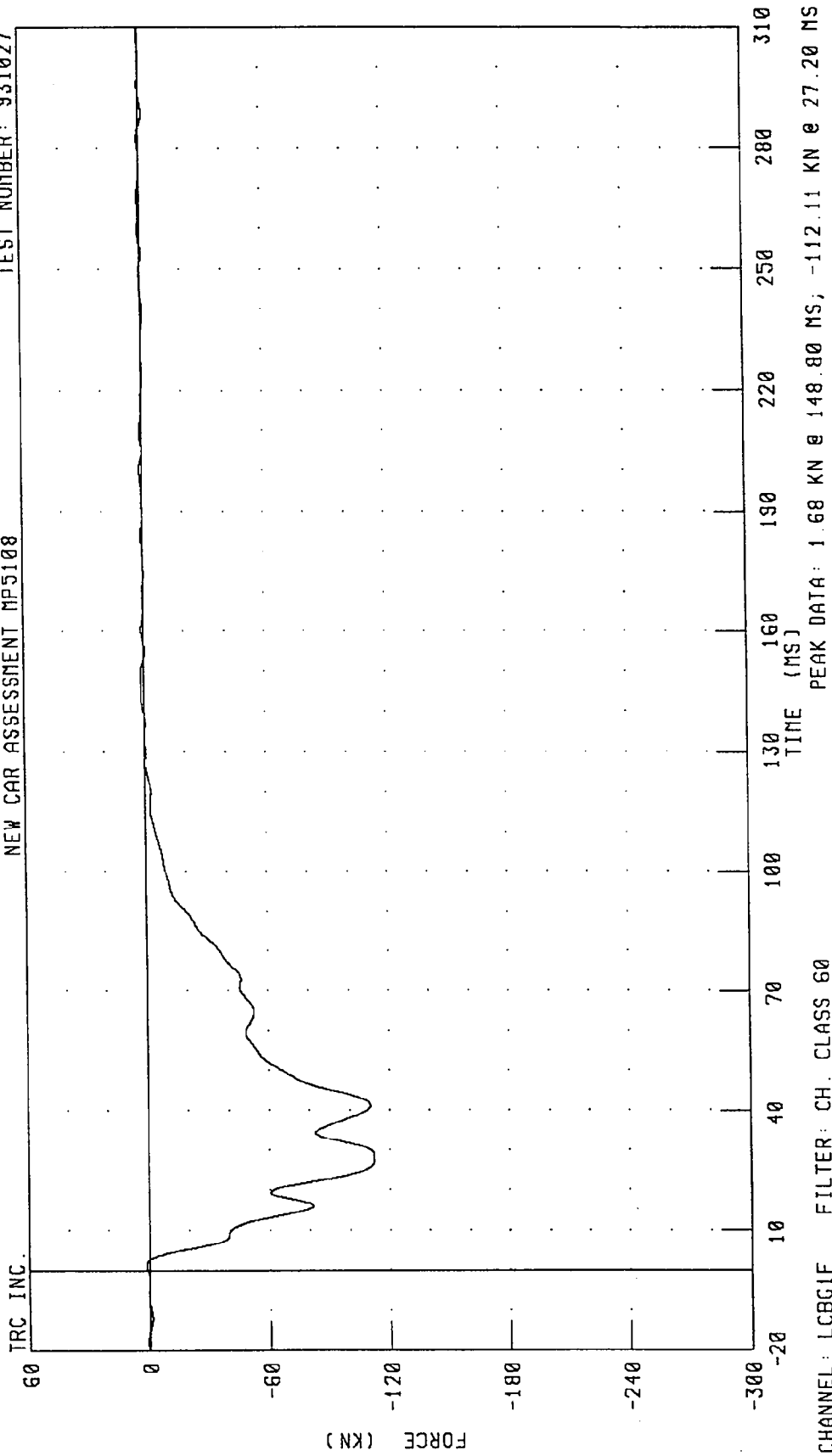
PEAK DATA: 1.30 KN @ 36.16 MS; -0.96 KN @ 59.52 MS

CHANNEL: BD9F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL

TEST NUMBER: 931027

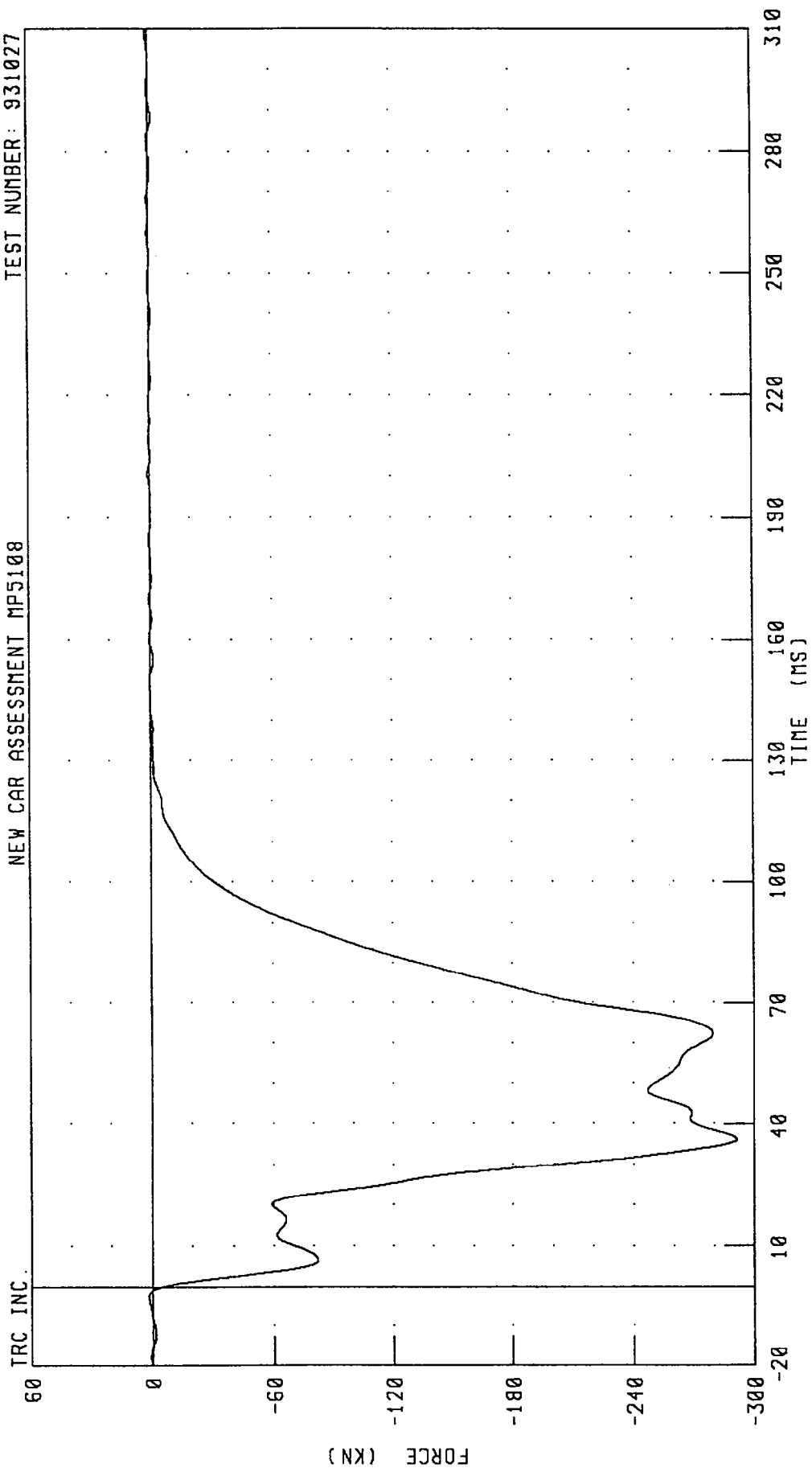
NEW CAR ASSESSMENT MP5108



1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL

NEW CAR ASSESSMENT MP5108

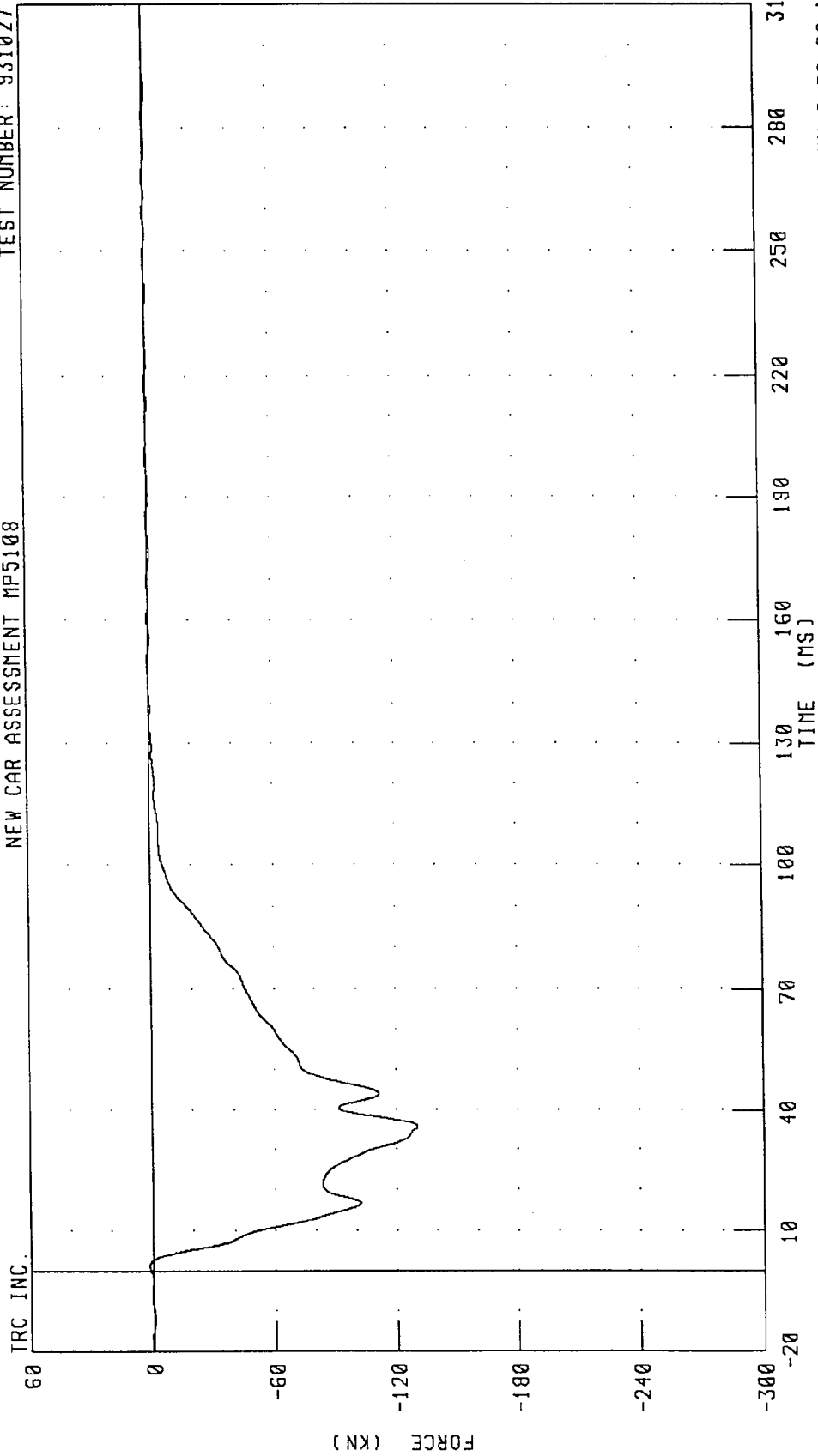
TEST NUMBER: 931027



CHANNEL: LCBG2F FILTER: CH. CLASS 60 PEAK DATA: 1.79 KN @ -2.56 MS; -291.06 KN @ 36.24 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



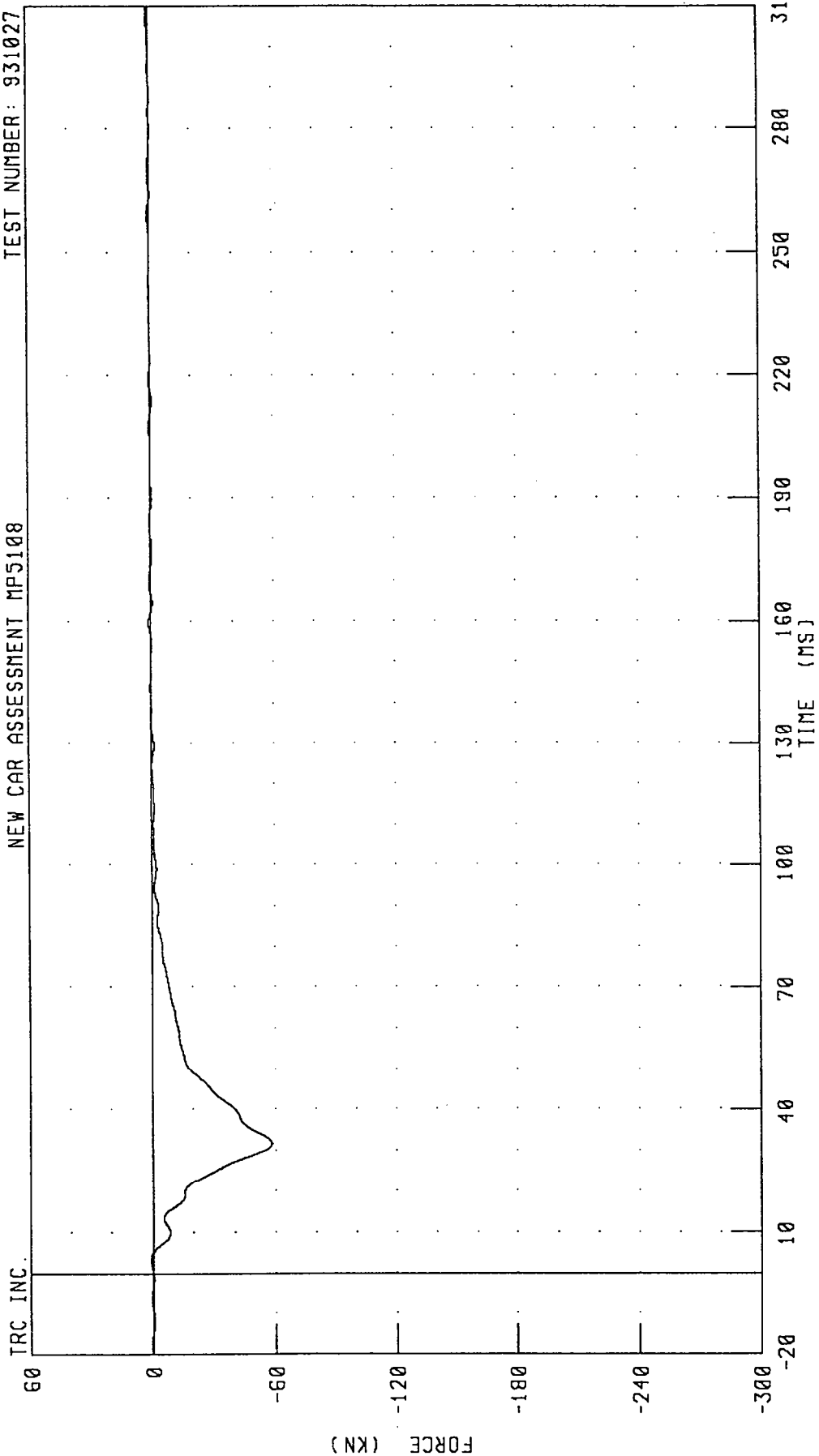
PEAK DATA: 1.73 KN @ 1.20 MS, -130.30 KN @ 36.00 MS

CHANNEL: LCBG3F FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL

NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



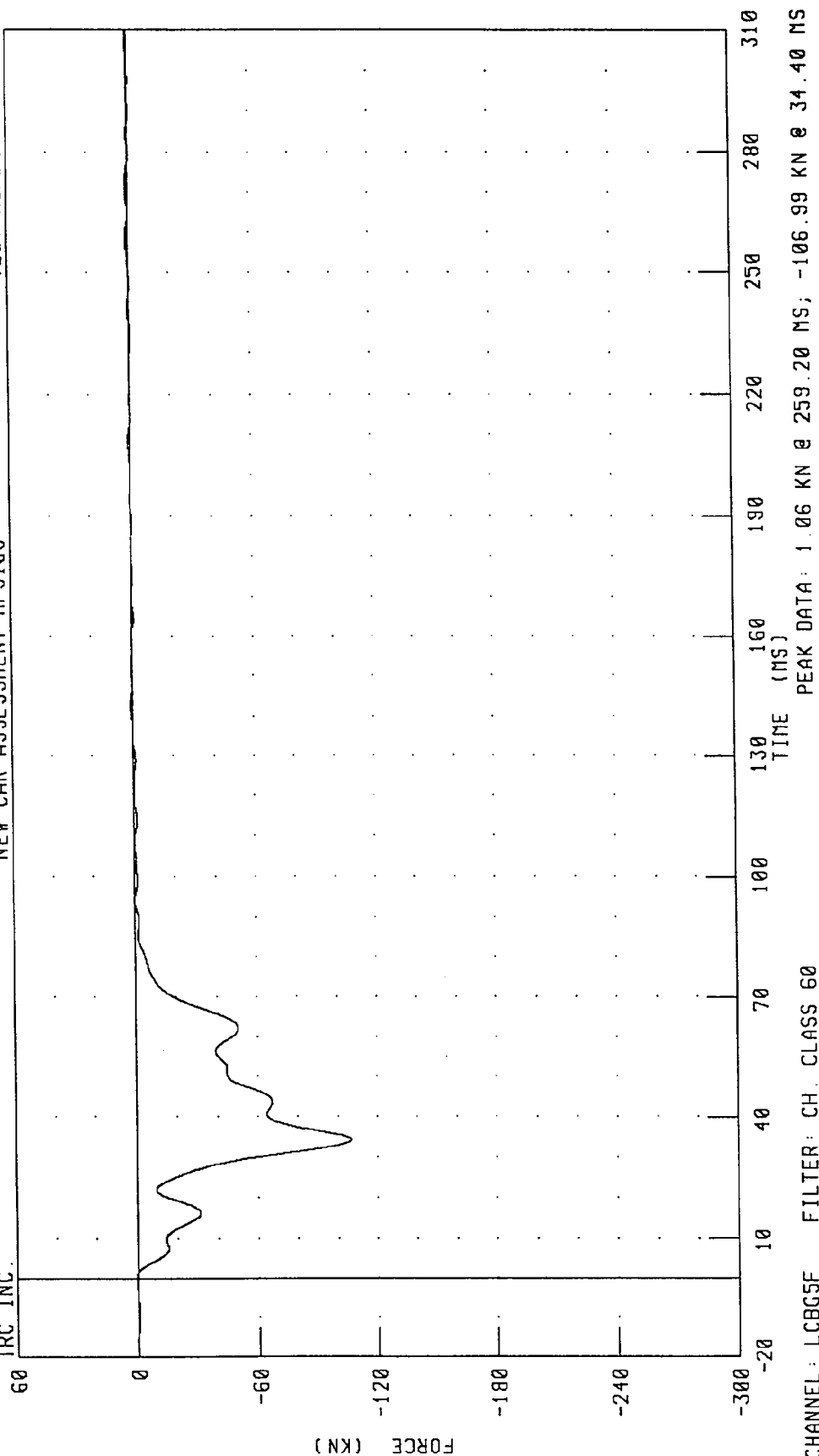
CHANNEL: LCBG4F FILTER: CH. CLASS 60

PEAK DATA: 1.02 KN @ 3.28 MS; -58.28 KN @ 31.84 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

TRC INC.



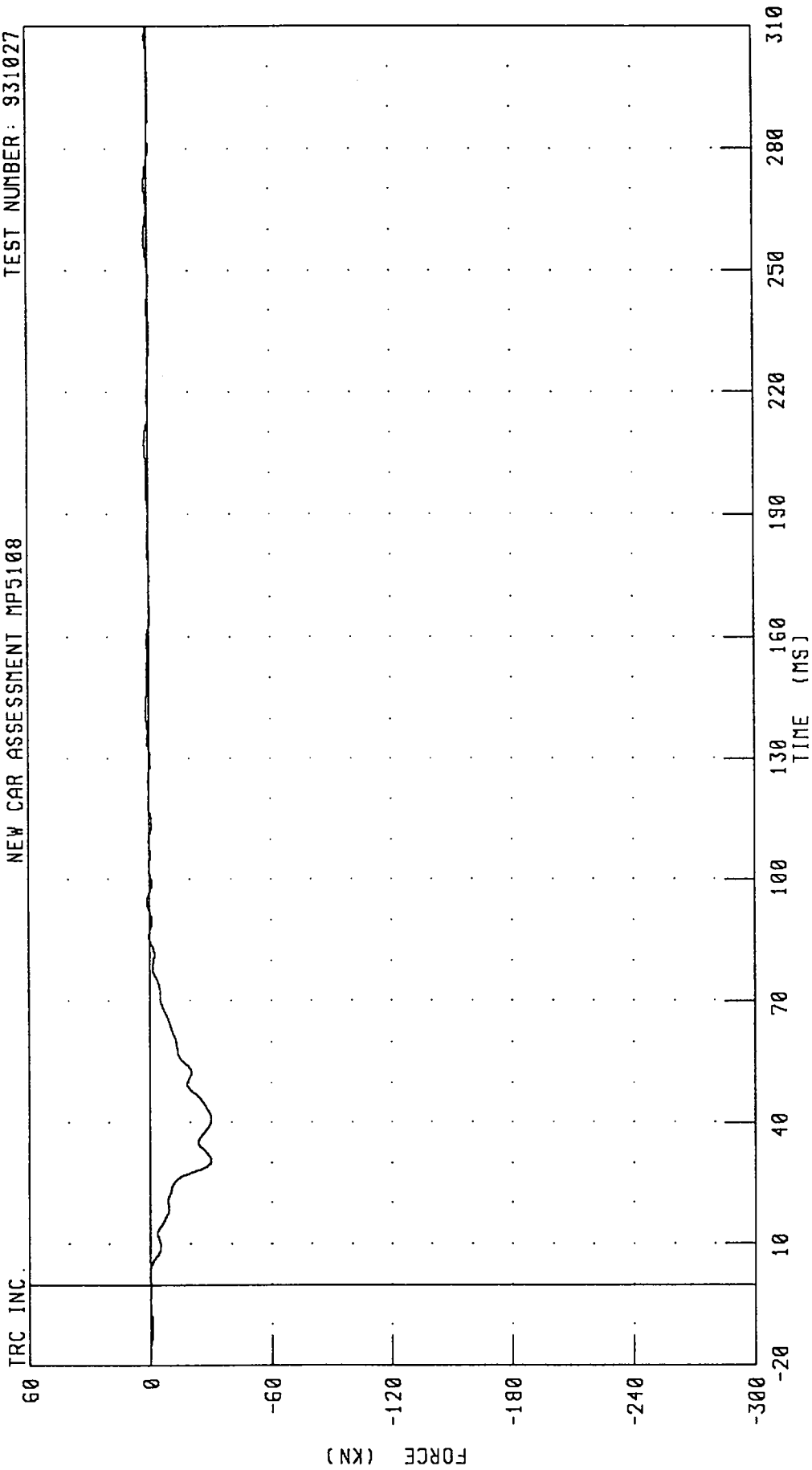
CHANNEL: LCBG5F FILTER: CH. CLASS 60

PEAK DATA: 1.06 KN @ 259.20 MS; -106.99 KN @ 34.40 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

NEW CAR ASSESSMENT MP5108

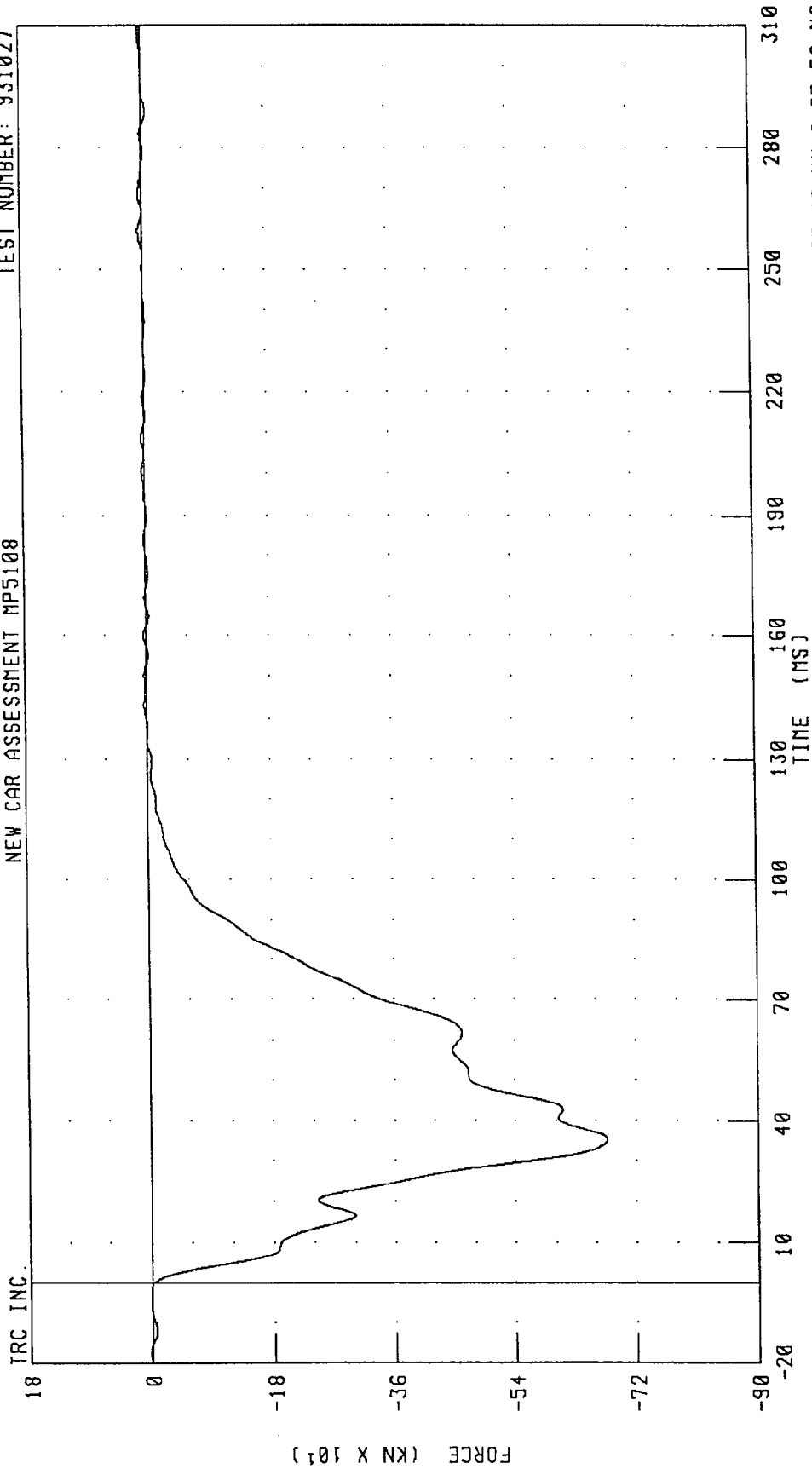
TEST NUMBER: 931027



CHANNEL: LCBG6F FILTER: CH. CLASS 60 PEAK DATA: 1.73 KN @ 207.60 MS; -30.29 KN @ 40.96 MS

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027

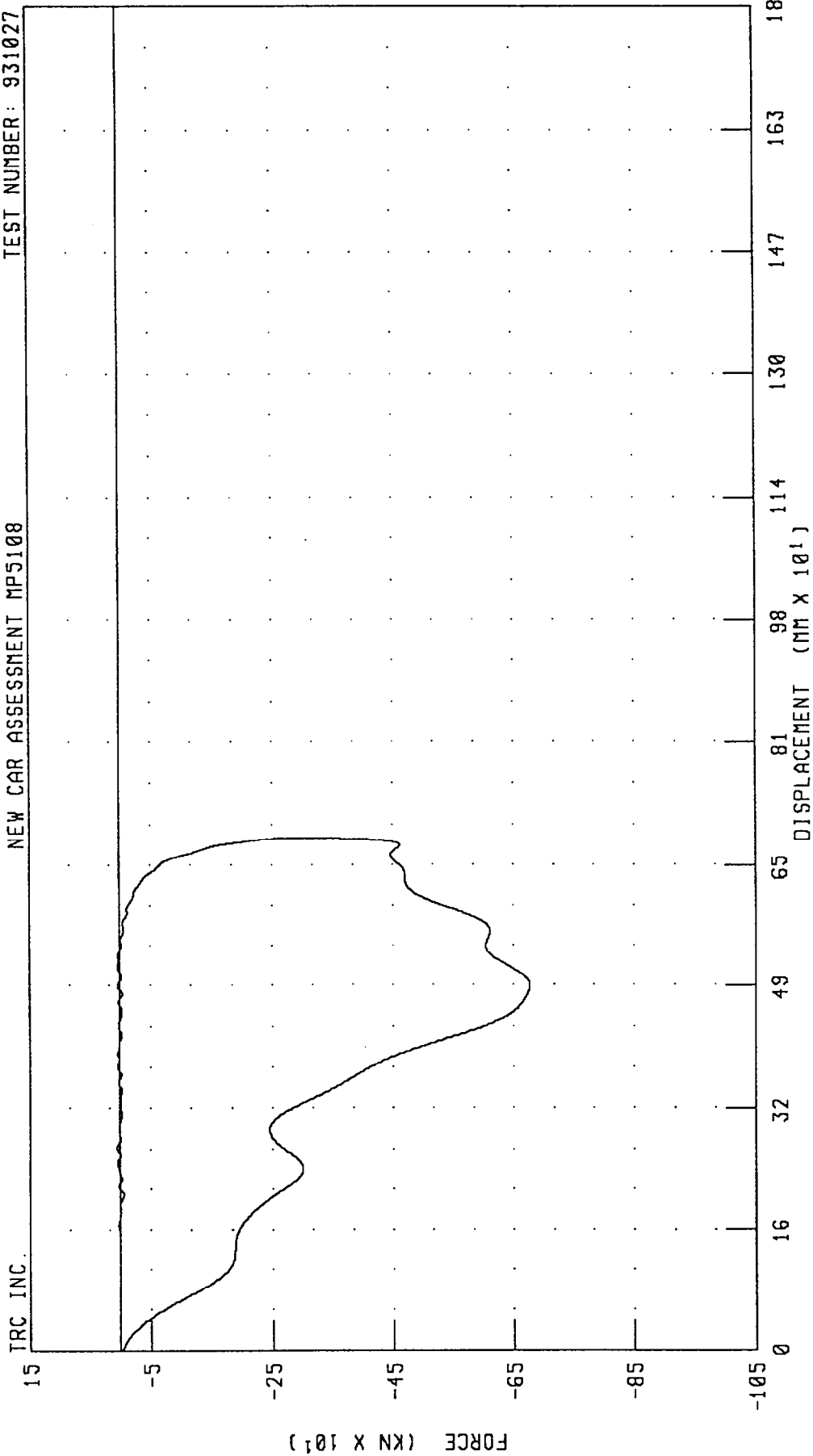


PEAK DATA: 5.21 KN @ 259.52 MS; -677.46 KN @ 35.52 MS

CHANNEL: LCBGT FILTER: CH. CLASS 60

1993 LEXUS GS300 INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MP5108

TEST NUMBER: 931027



CHANNEL: 0THXD
 LCBGT
 FILTER: CH. CLASS 180
 CH. CLASS 60
 DISPLACEMENT ($\text{MM} \times 10^1$)
 PEAK DATA: 692.14 MM @ 73.20 MS;
 5.21 KN @ 259.52 MS;
 0.00 MM @ 0.00 MS;
 -677.46 KN @ 35.52 MS

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 192

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
192 ARL

21-OCT-93

TRC 192C16ED1 572E SN192 EXT.DIMENSION CAL16

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE (AA)		429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)		226 - 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)		970 -1001 MM	980. MM
WAIST CIRCUMFERENCE (Z)		836 - 866 MM	848. MM
CHEST DEPTH (O)		213 - 229 MM	218. MM
H-POINT HEIGHT (C)		84 - 89 MM	84. MM
H-POINT FROM SEATBACK (D)		135 - 140 MM	136. MM
SKULL CAP TO BACKLINE (H)		41 - 46 MM	43. MM
TOTAL SITTING HEIGHT (A)		879 - 889 MM	884. MM
THIGH CLEARANCE (F)		140 - 155 MM	147. MM
BUTTOCK KNEE LENGTH (K)		579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH (N)		452 - 478 MM	472. MM
POPLITEAL HEIGHT (L)		429 - 455 MM	450. MM
KNEE PIVOT HEIGHT (M)		485 - 500 MM	493. MM
FOOT LENGTH (P)		252 - 267 MM	259. MM
FOOT BREADTH (W)		91 - 107 MM	102. MM
SHOULDER PIVOT FROM BACKLINE (E)		84 - 94 MM	91. MM
SHOULDER BREADTH (V)		422 - 437 MM	427. MM
SHOULDER PIVOT HEIGHT (B)		506 - 521 MM	513. MM
ELBOW REST HEIGHT (J)		191 - 211 MM	206. MM
SHOULDER-ELBOW LENGTH (I)		330 - 345 MM	340. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290 - 305 MM	295. MM

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foster

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

25-OCT-93

TRC INC. 192C16HD1

572E SN192 HEAD DROP CAL 16

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	32.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	228.45 G
PEAK LATERAL ACCELERATION	15 G MAX	-2.56 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

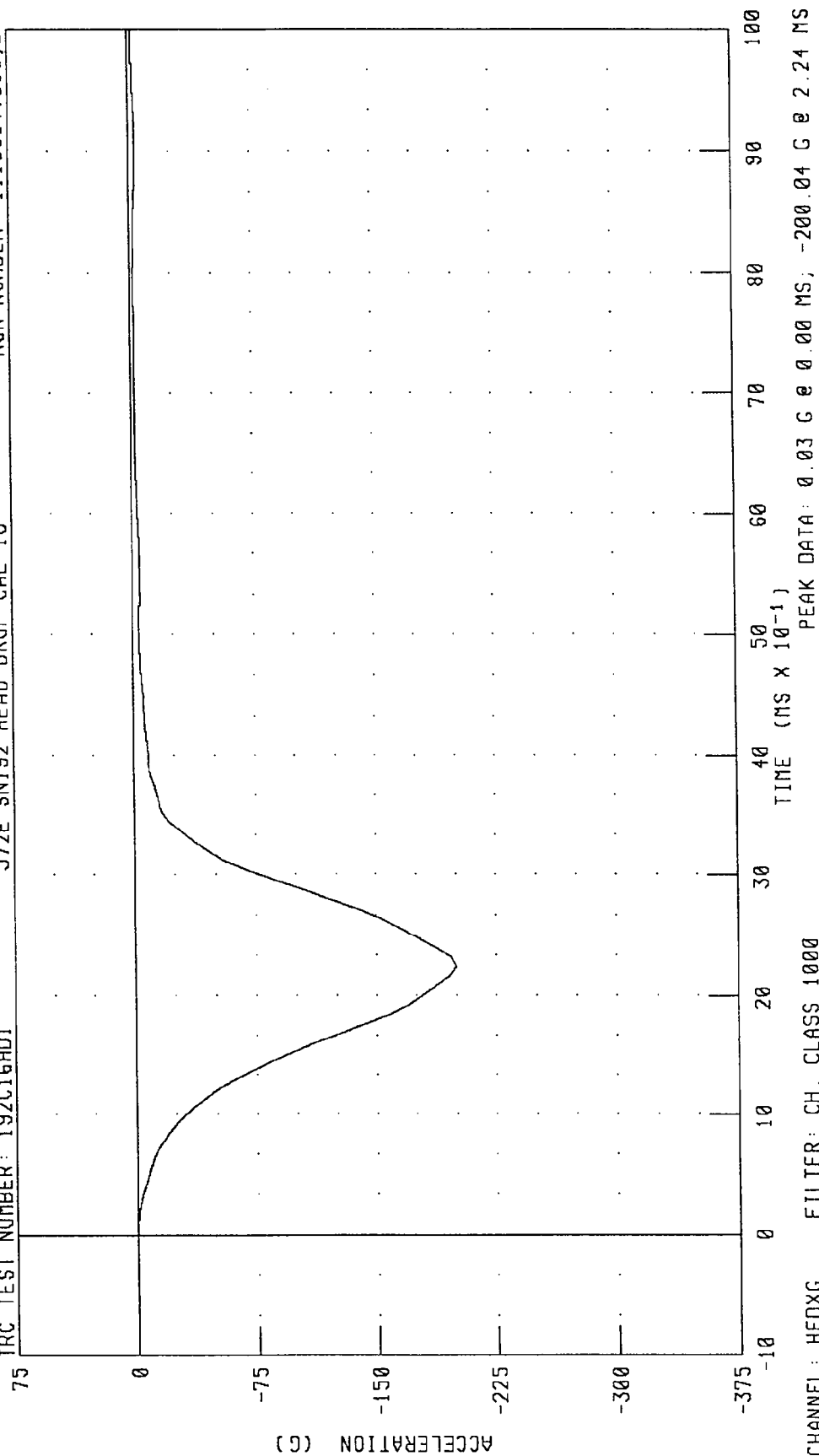
Pete Foster

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 192C16HD1

572E SN192 HEAD DRQP CAL 16

RUN NUMBER: 111593.1516,2



CHANNEL: HEDXC FILTER: CH. CLASS 1000

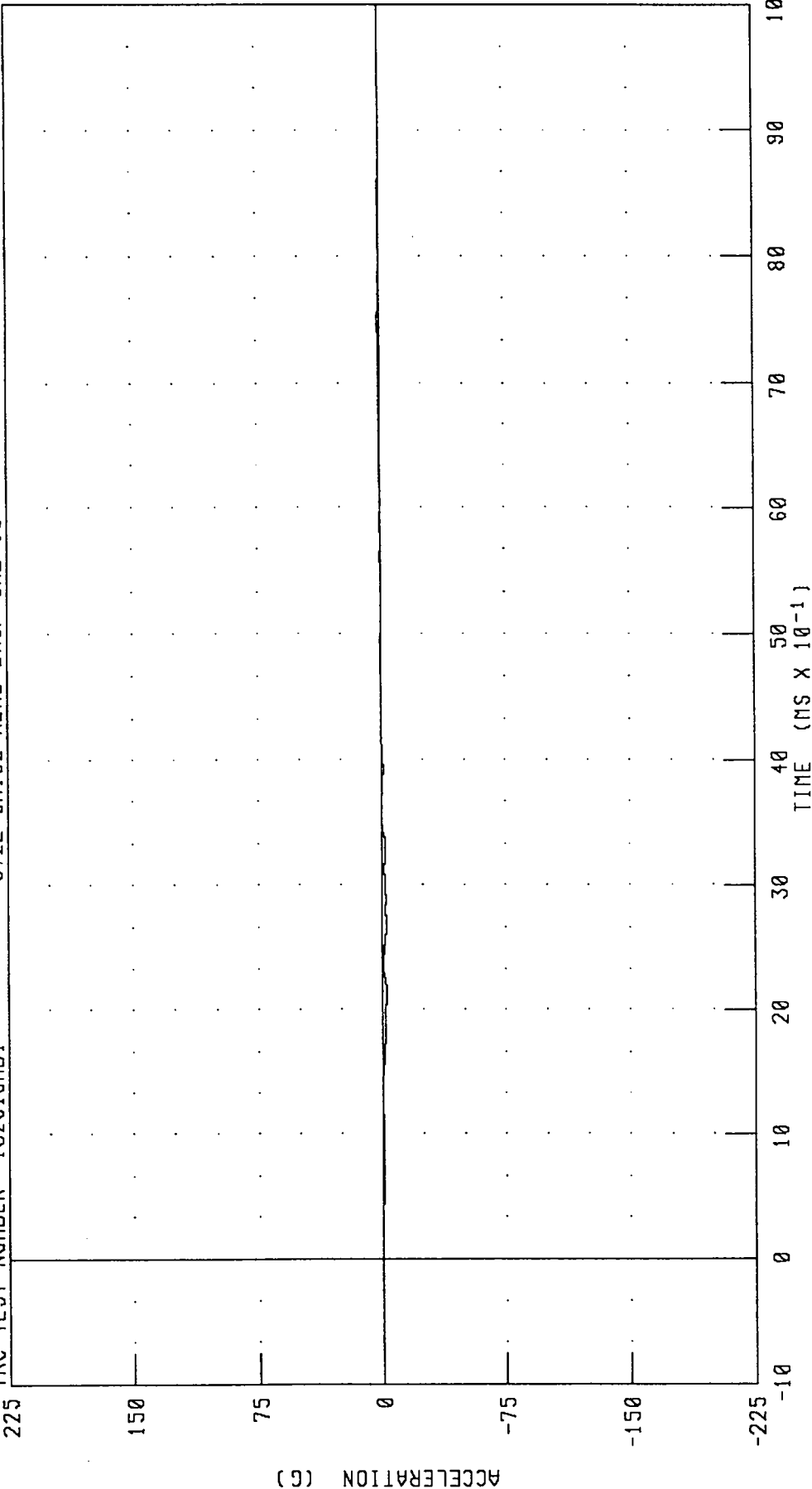
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 192C16HD1

572E SN192 HEAD DROP CAL 16

RUN NUMBER: 111593.1516;2

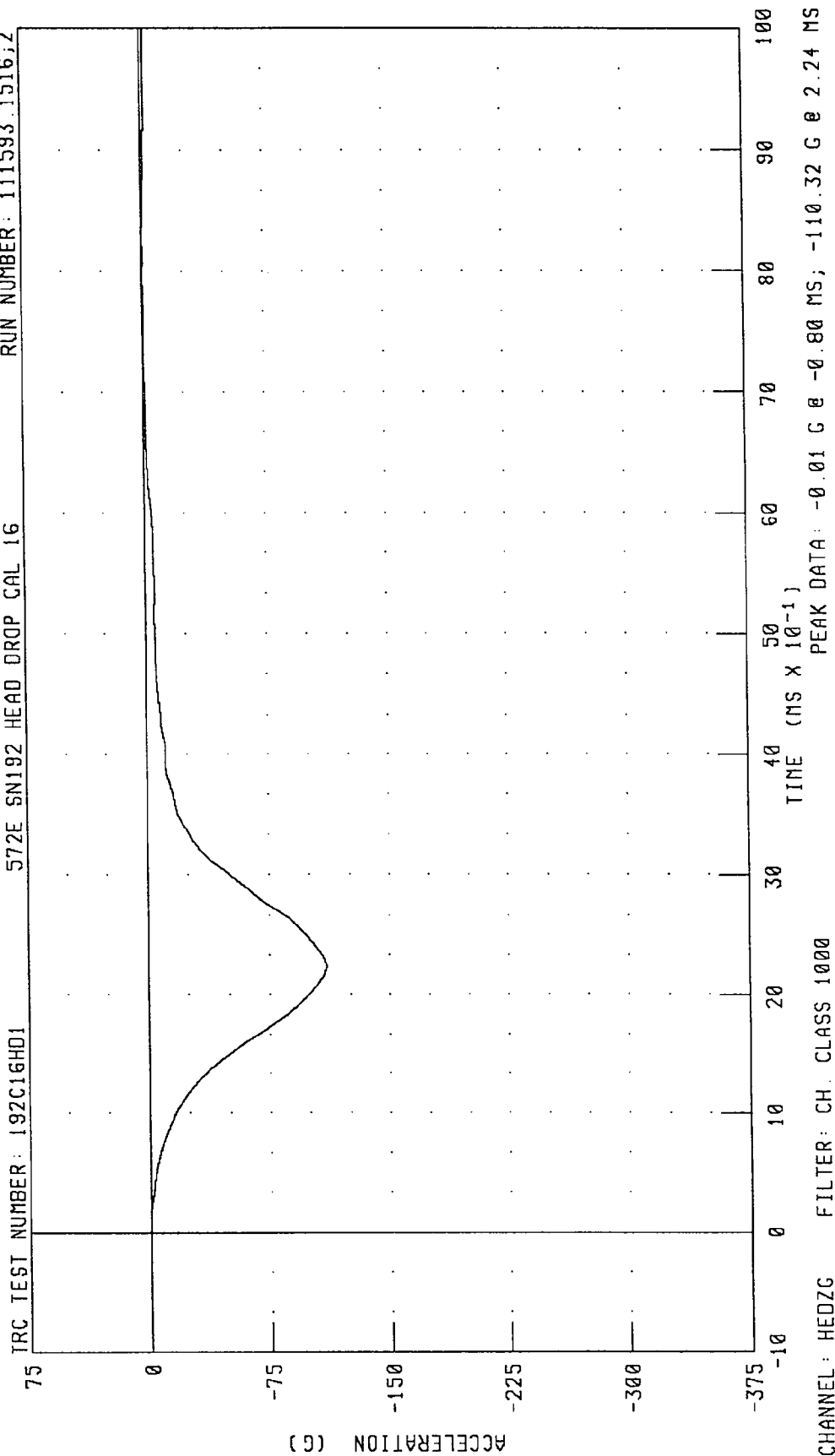


CHANNEL: HEDYG FILTER: CH. CLASS 1000

PEAK DATA: 1.03 G @ 7.52 MS; -2.56 G @ 2.08 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

572E SN192 HEAD DROP CAL 16 RUN NUMBER: 111593.1516;2



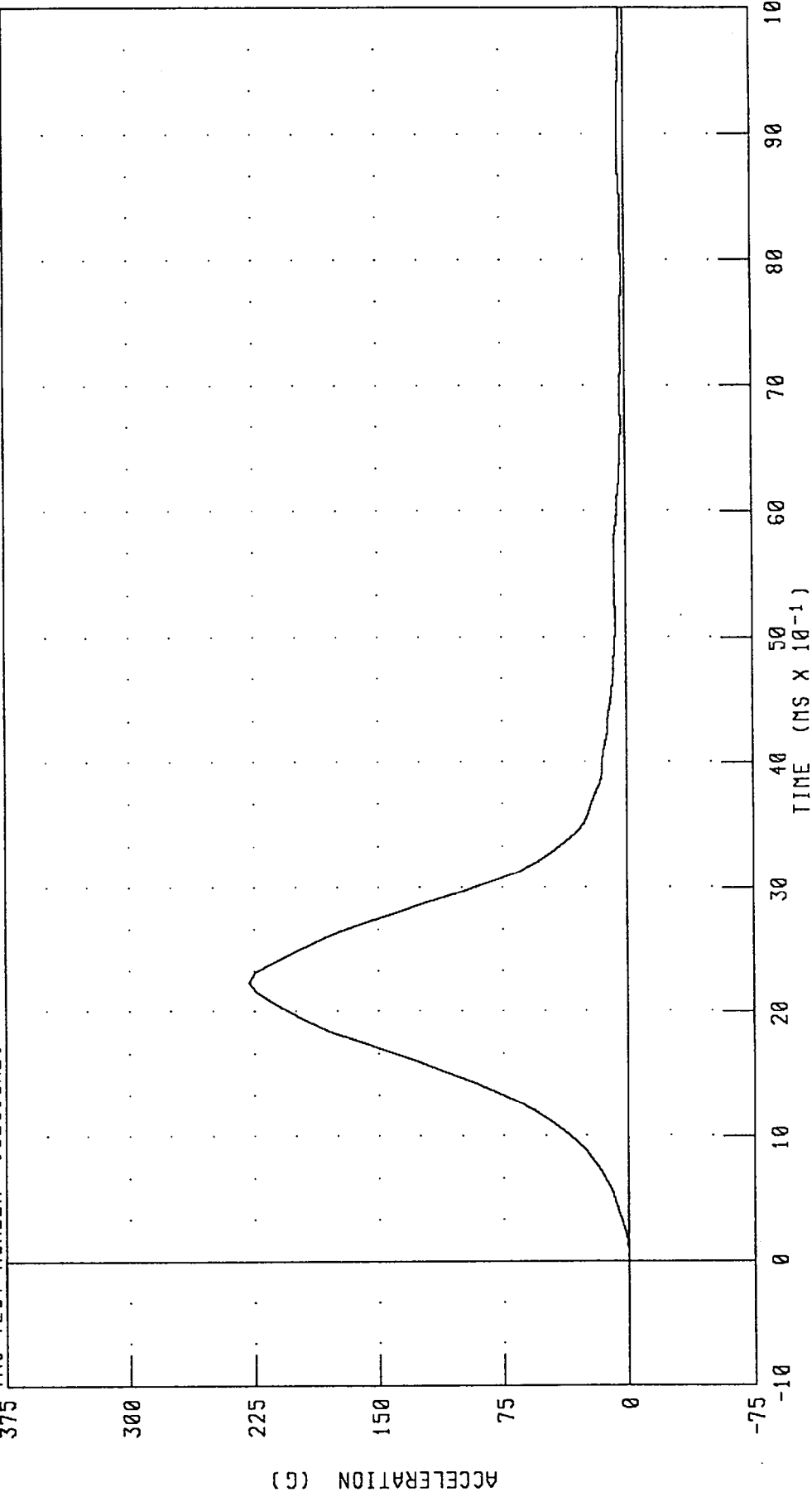
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SN192 HEAD DROP CAL 16

RUN NUMBER: 111593.1516,2

TRC TEST NUMBER: 192C16HD1



CHANNEL: HEDRG FILTER: CH CLASS 1000

PEAK DATA: 228.45 G @ 2.24 MS; 0.03 G @ -0.72 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST

HYBRID III

21-OCT-93

6 AXIS NECK TRANSDUCER
TRC 192C16NF1

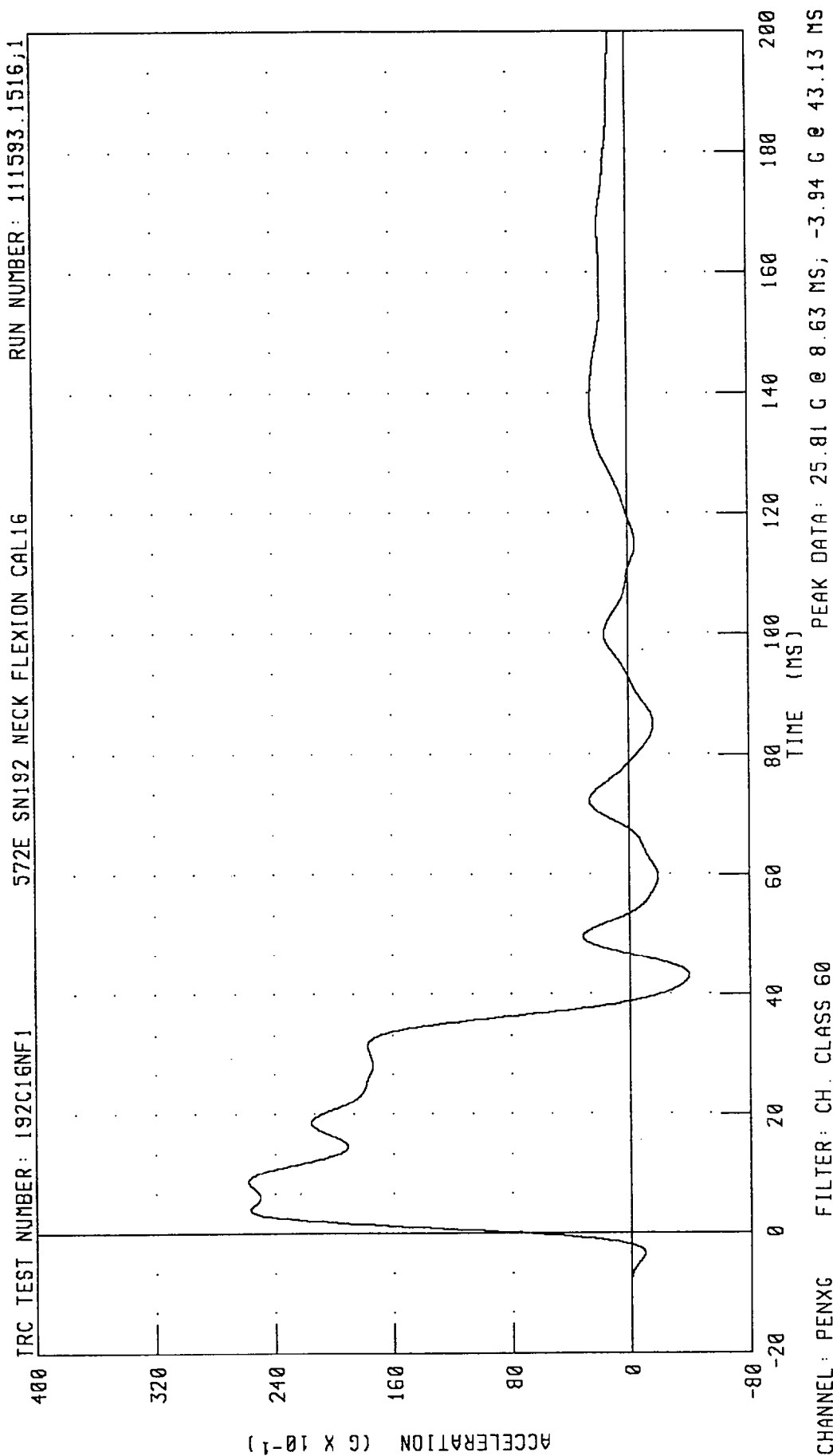
572E SN192 NECK FLEXION CAL16

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	51.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.03 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	25.12 G
	20 MS	17.60 - 22.60 G	20.89 G
	30 MS	12.50 - 18.50 G	17.50 G
MAX PENDULUM G		29 G MAX	25.80 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.68 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.13 MS
D PLANE	MAX	64 - 78 DEG.	68.83 DEG.
ROTATION	TIME	57 - 64 MS	58.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	89.01 NM
	TIME	47 - 58 MS	49.50 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	105.63 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Fox

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION



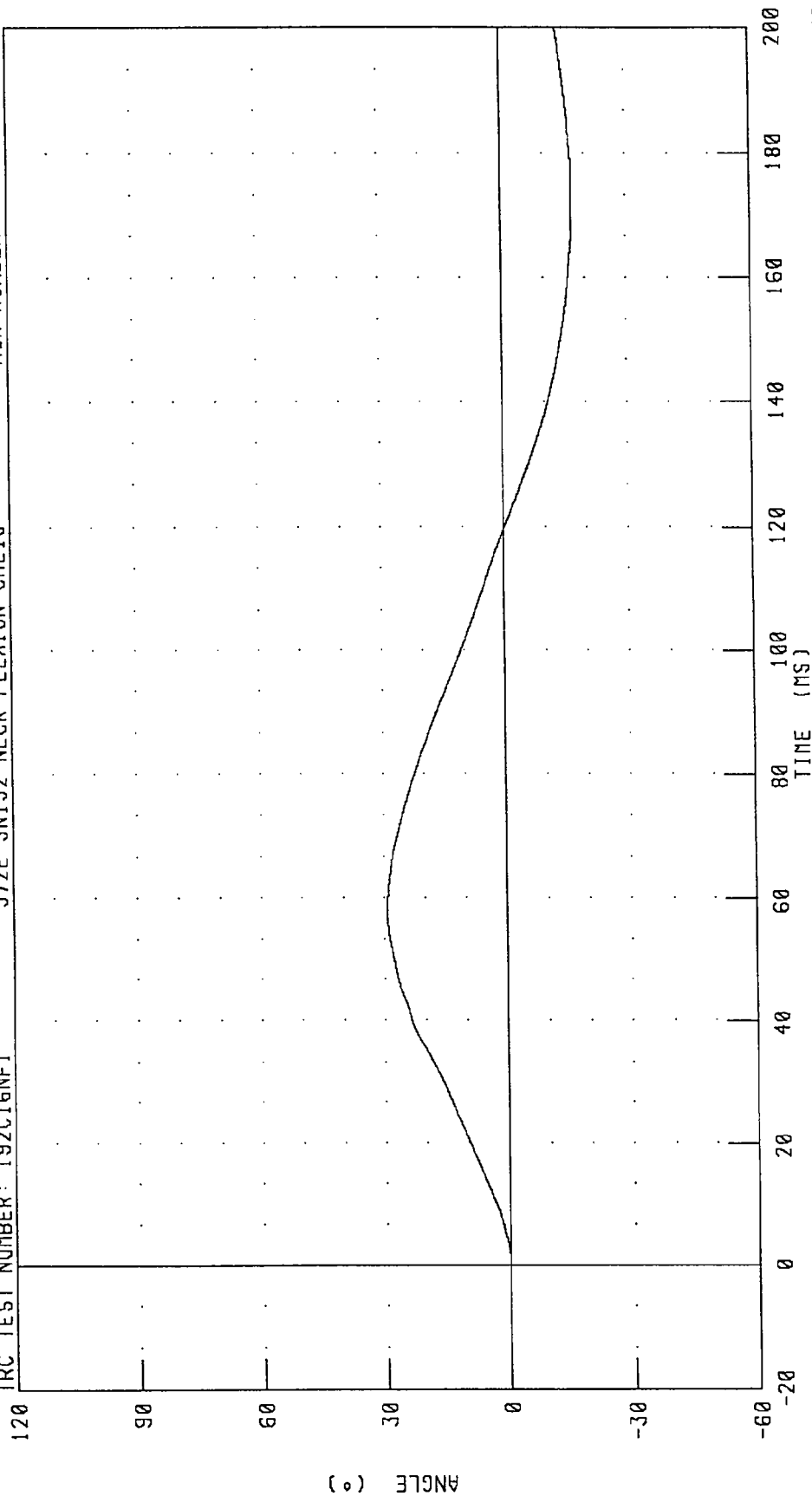
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN192 NECK FLEXION CAL16

IRC TEST NUMBER: 192C16NF1

RUN NUMBER: 111593 1516;1



PEAK DATA: 29.22 ° @ 57.63 MS; -16.96 ° @ 176.25 MS

FILTER: CH. CLASS 60

CHANNEL: BETA

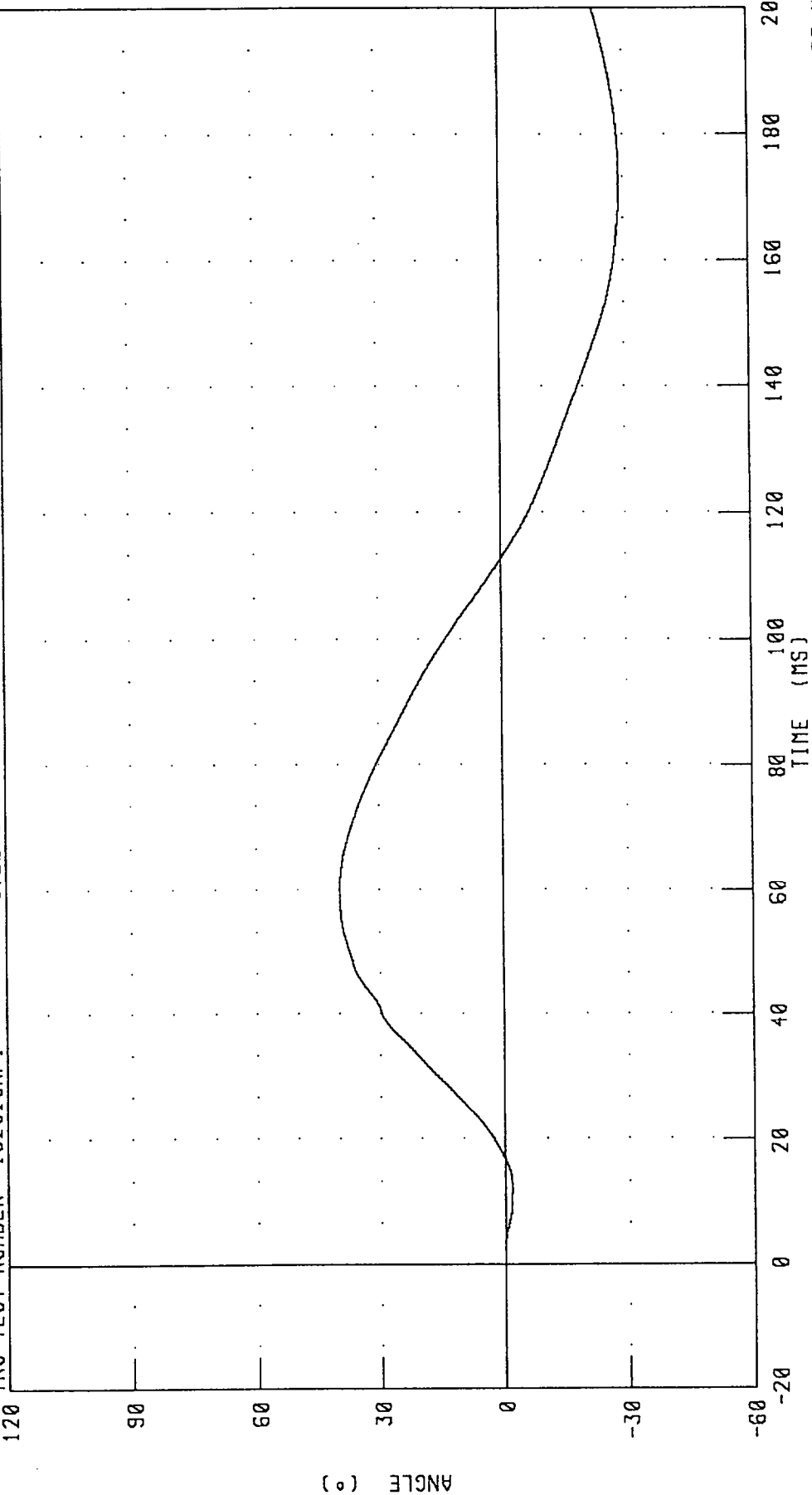
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

572E SN192 NECK FLEXION CAL16

IRC TEST NUMBER: 192C16NF1

RUN NUMBER: 111593.1516;1



CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 39.63 ° @ 59.50 MS; -28.83 ° @ 169.75 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

RUN NUMBER: 111593.1516;1

572E SN192 NECK FLEXION CAL16

TRC TEST NUMBER: 192C16NF1

120

90

60

30

0

-30

-60

ANGLE (°)

TIME (MS)

200

180

160

140

120

100

80

60

40

20

0

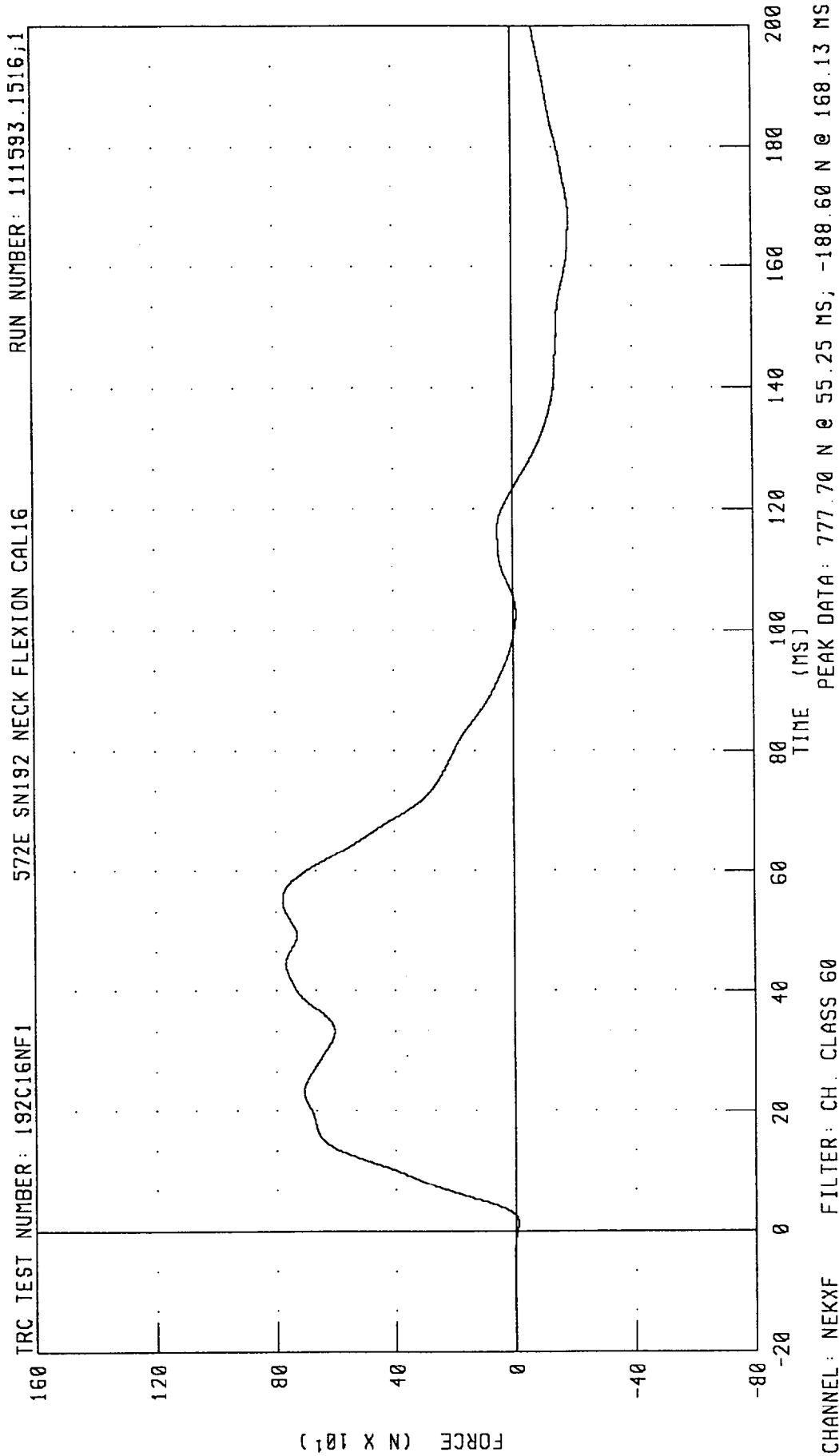
-20

PEAK DATA: 68.83 ° @ 58.38 MS; -45.78 ° @ 176.00 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS



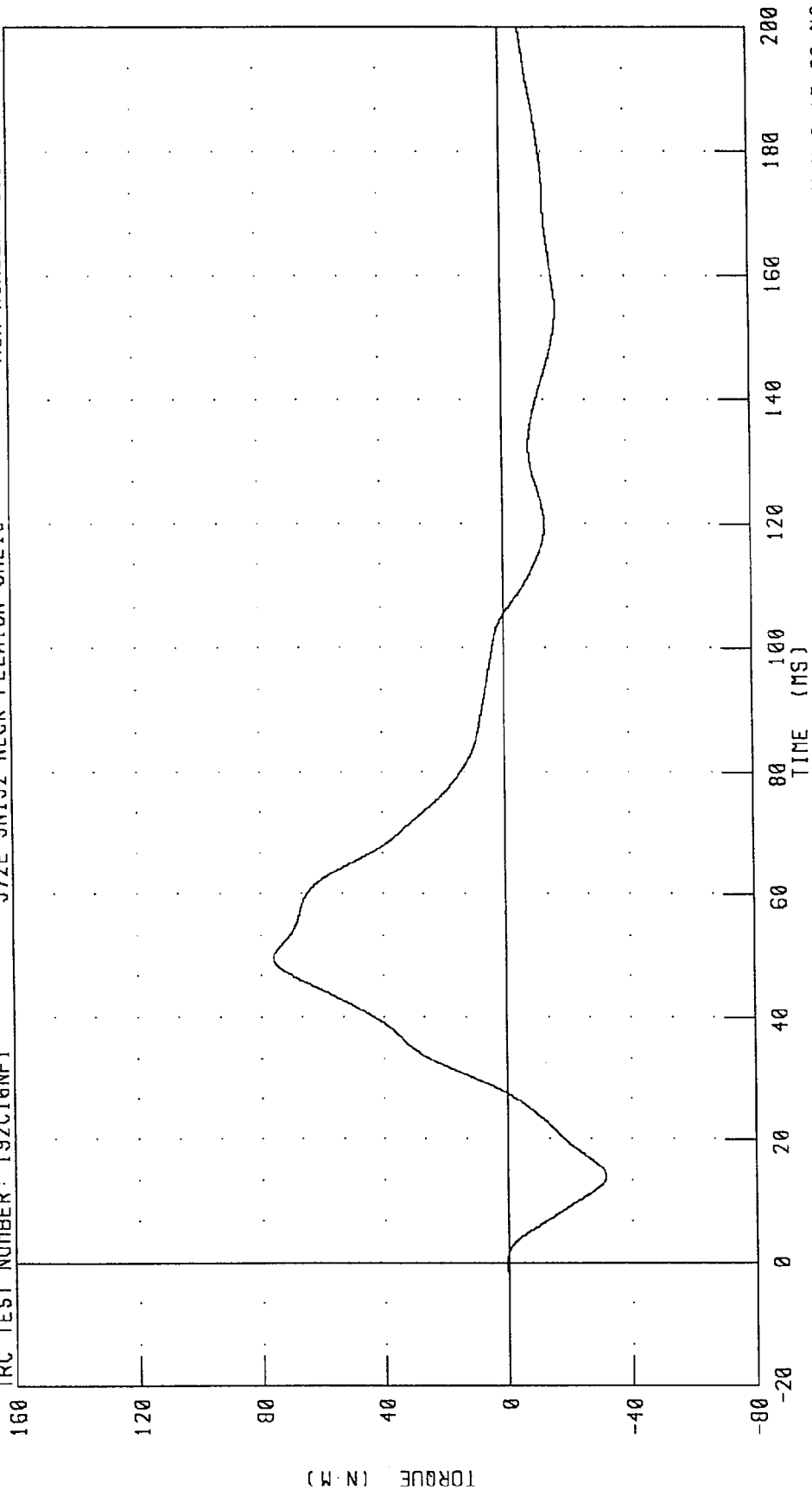
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C16NF1

572E SN192 NECK FLEXION CAL16

RUN NUMBER: 111593.1516;1

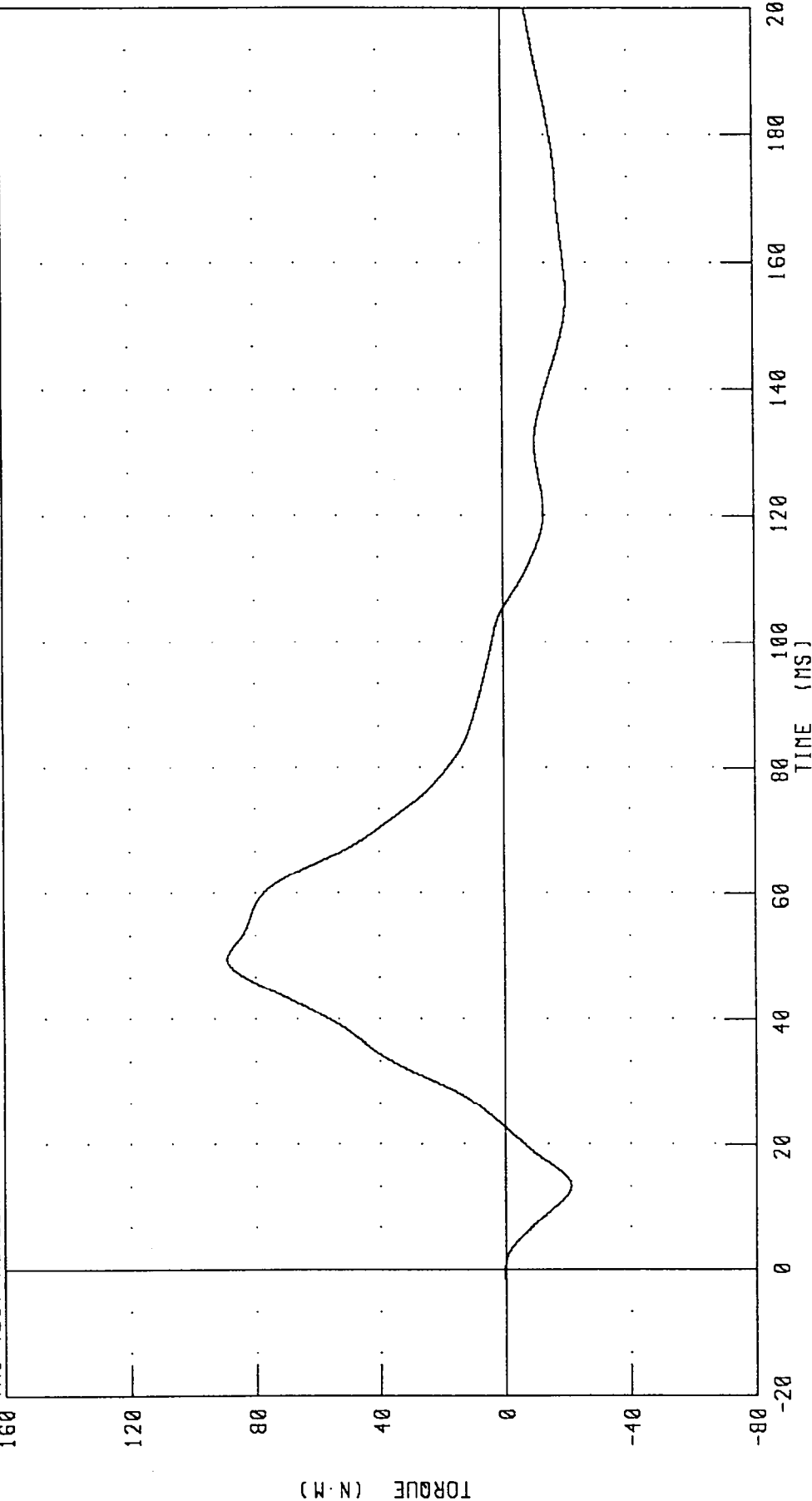


PEAK DATA: 76.01 N·M @ 49.50 MS; -31.50 N·M @ 13.88 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 192C16NF1 572E SN192 NECK FLEXION CAL16 RUN NUMBER: 111593.1516;1



PEAK DATA: 89.01 N·M @ 49.50 MS; -20.79 N·M @ 13.38 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST

HYBRID III

21-OCT-93

6 AXIS NECK TRANSDUCER
TRC 192C16NE1

572E SN192 NECK EXT. CAL16

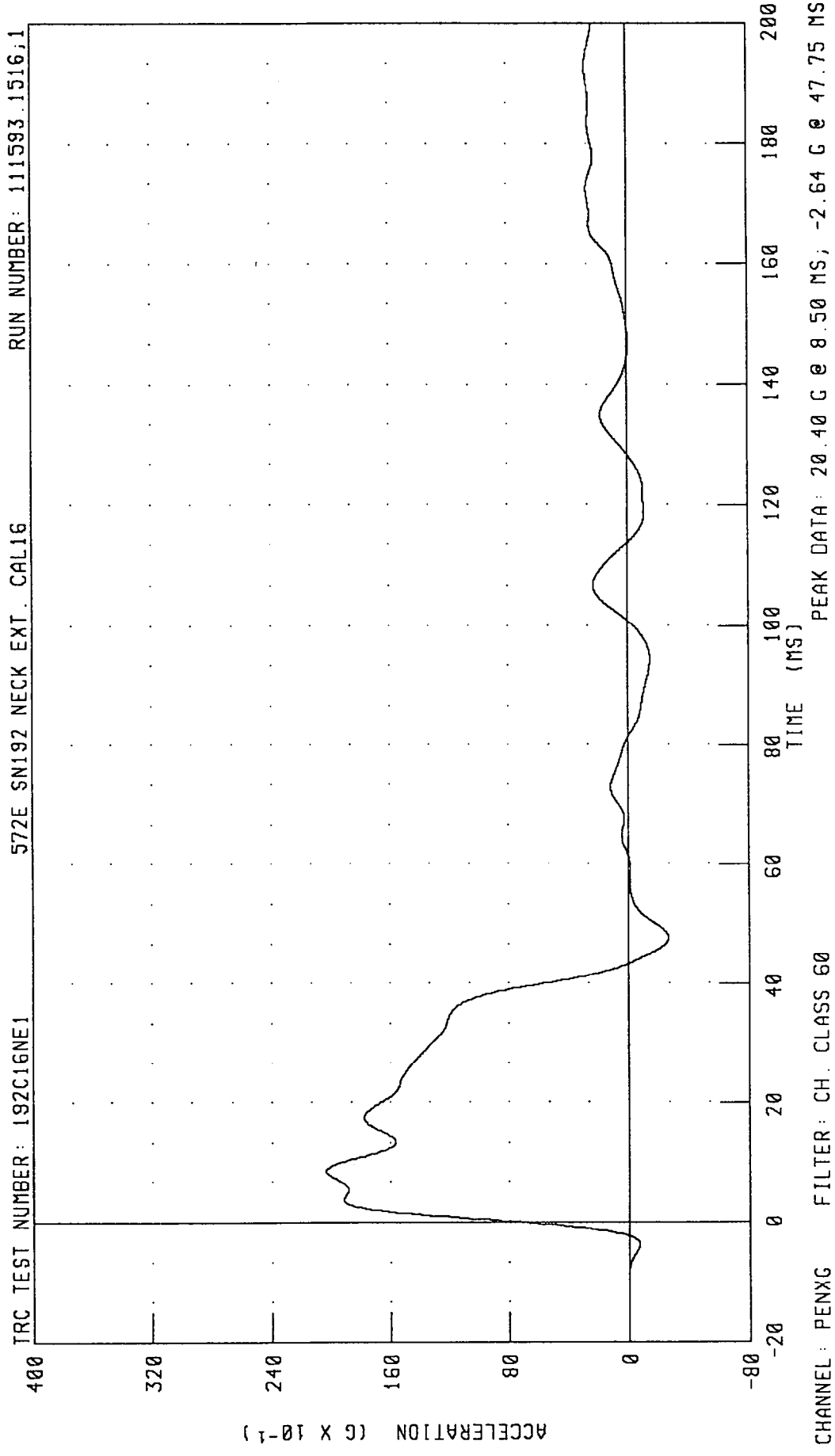
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	51.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.41 G
	20 MS	14.00 - 19.00 G	16.67 G
	30 MS	11.00 - 16.00 G	13.24 G
MAX PENDULUM G		22 G MAX	20.39 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.19 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.25 MS
D PLANE	MAX	81 - 106 DEG.	93.31 DEG.
ROTATION	TIME	72 - 82 MS	75.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-57.36 NM
	TIME	65 - 79 MS	71.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	157.88 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	141.38 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

Pete Foster

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION



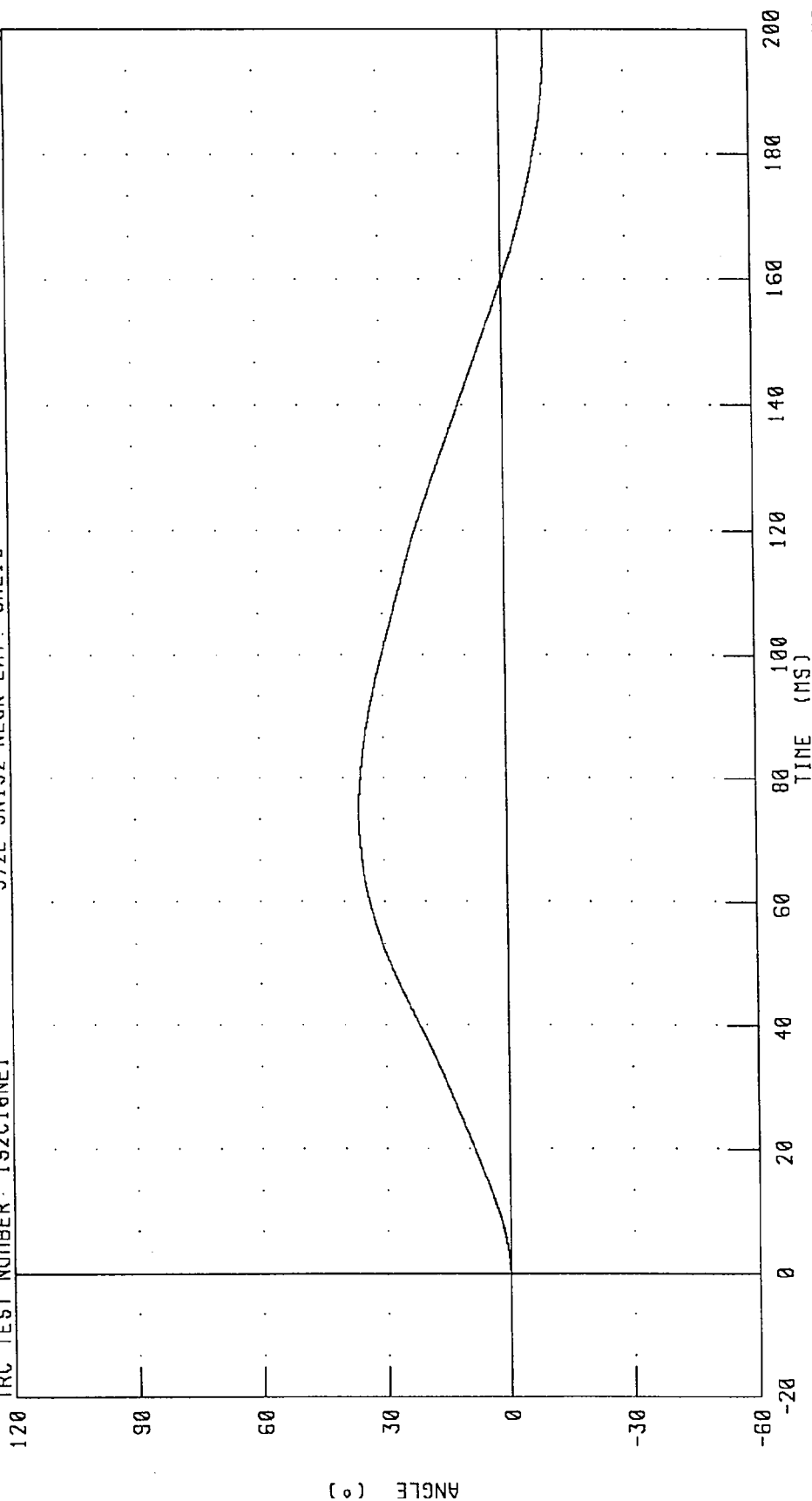
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 192C16NE1

572E SN192 NECK EXT. CAL16

RUN NUMBER: 111593.1516;1



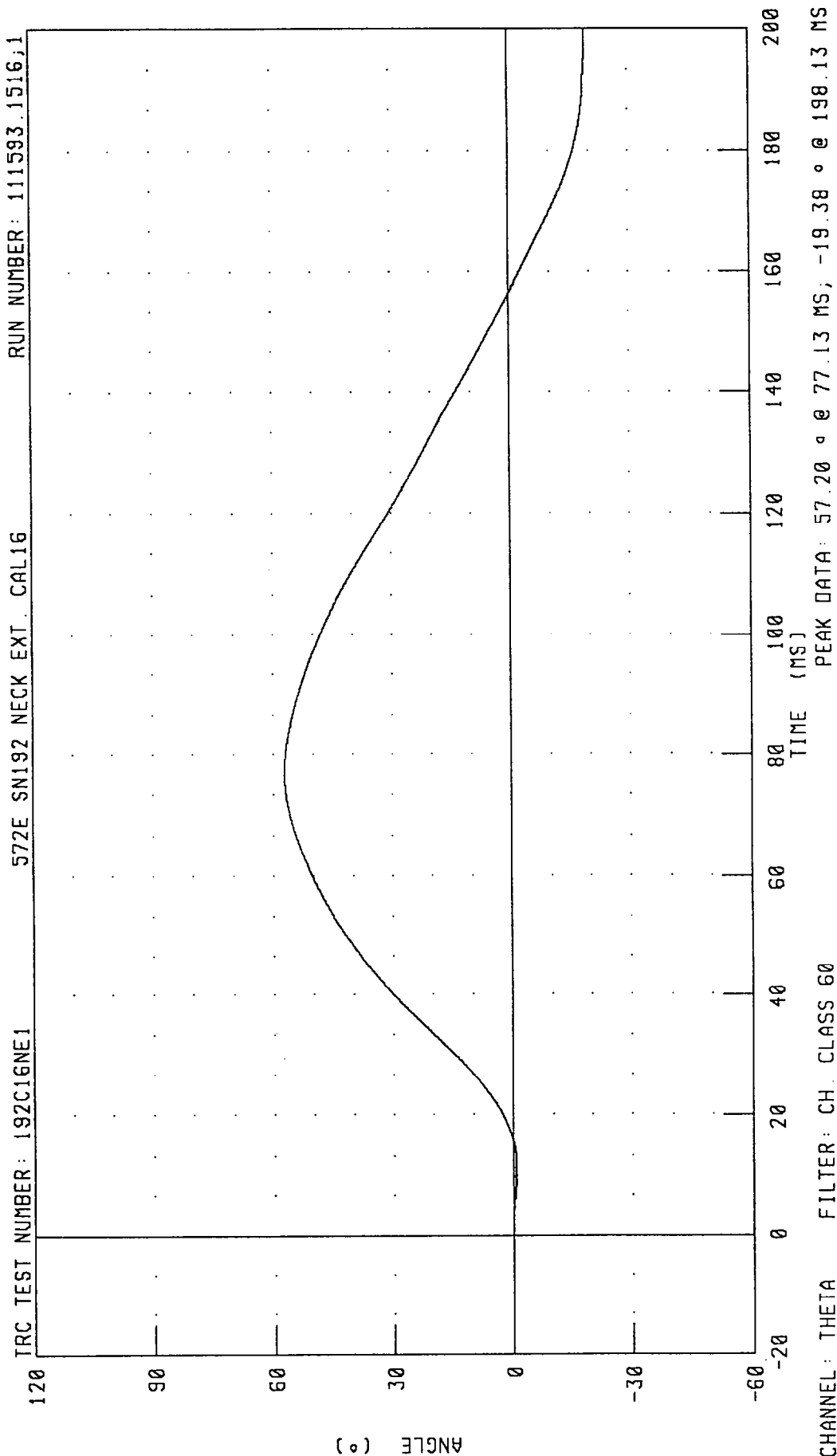
PEAK DATA: 36.22 ° @ 74.13 MS; -10.91 ° @ 198.25 MS

CHANNEL: BETA FILTER: CH. CLASS 60

ANGLE (°)

TIME (MS)

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE



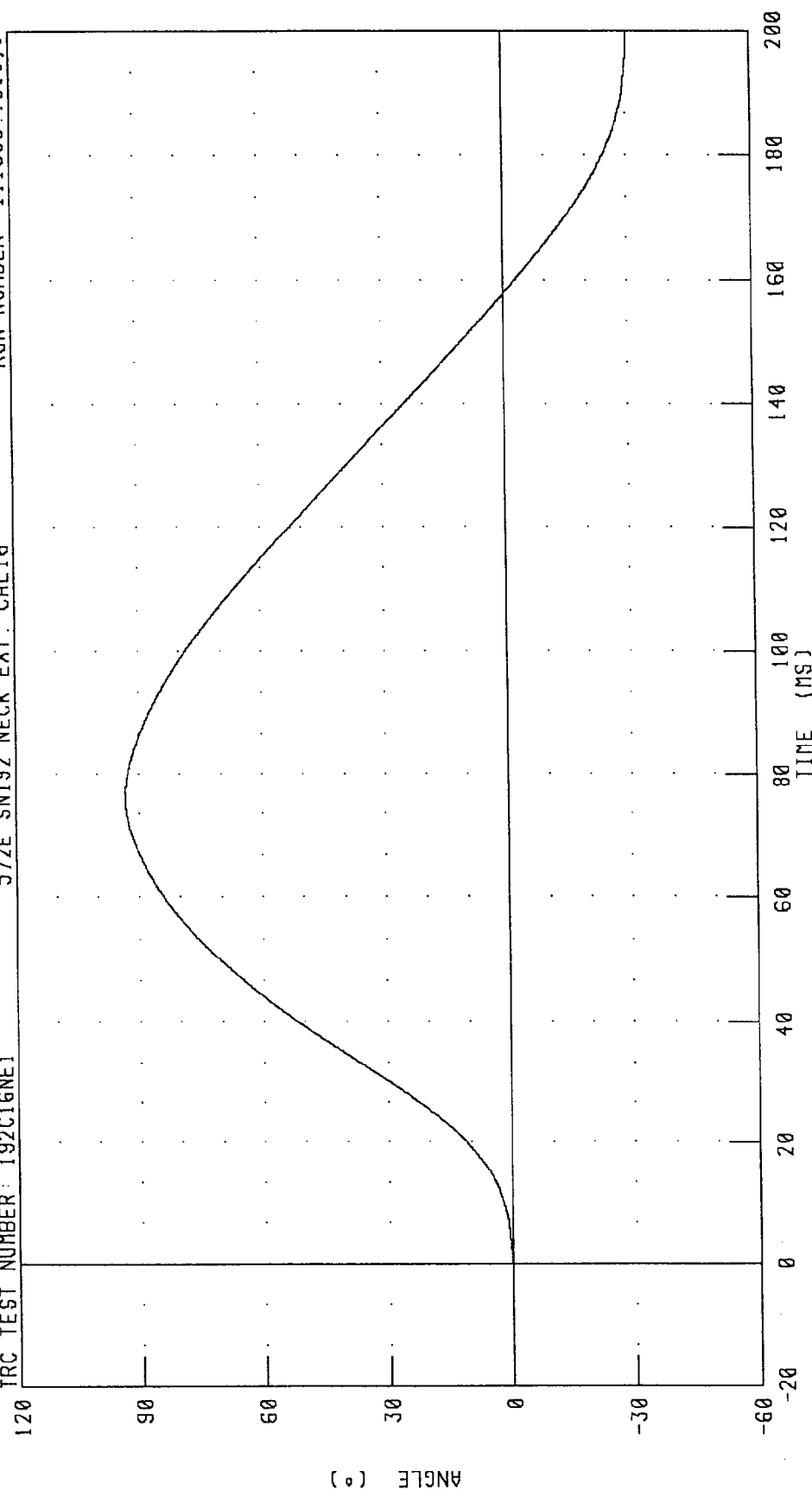
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C1GNE1

572E SN192 NECK EXT. CAL16

RUN NUMBER: 111593.1516,1



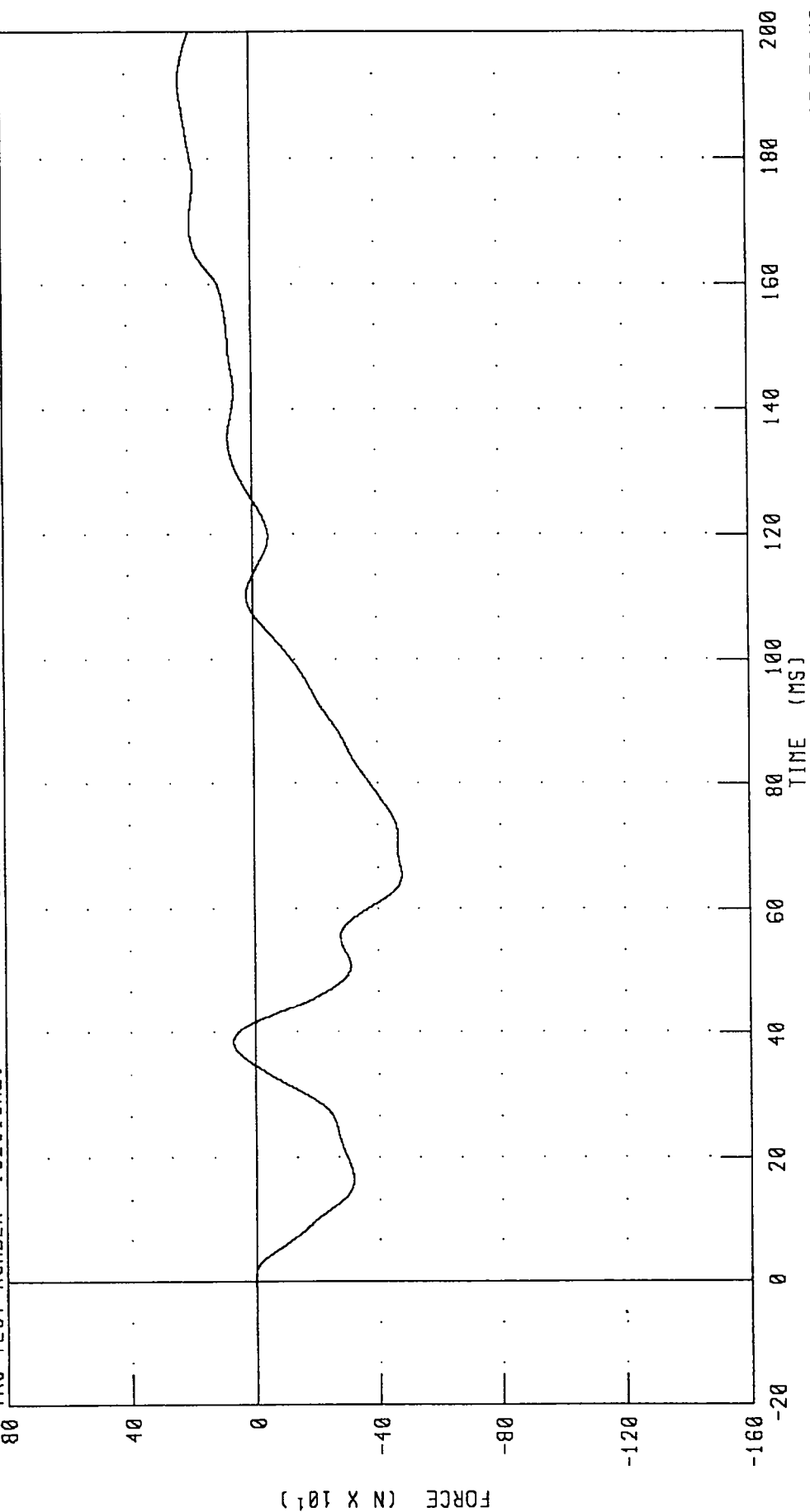
PEAK DATA: 93.31 ° @ 75.88 MS; -30.29 ° @ 198.13 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C16NE1 572E SN192 NECK EXT. CAL16 RUN NUMBER: 111593.1516.1



PEAK DATA: 227.48 N @ 192.00 MS; -476.44 N @ 65.50 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

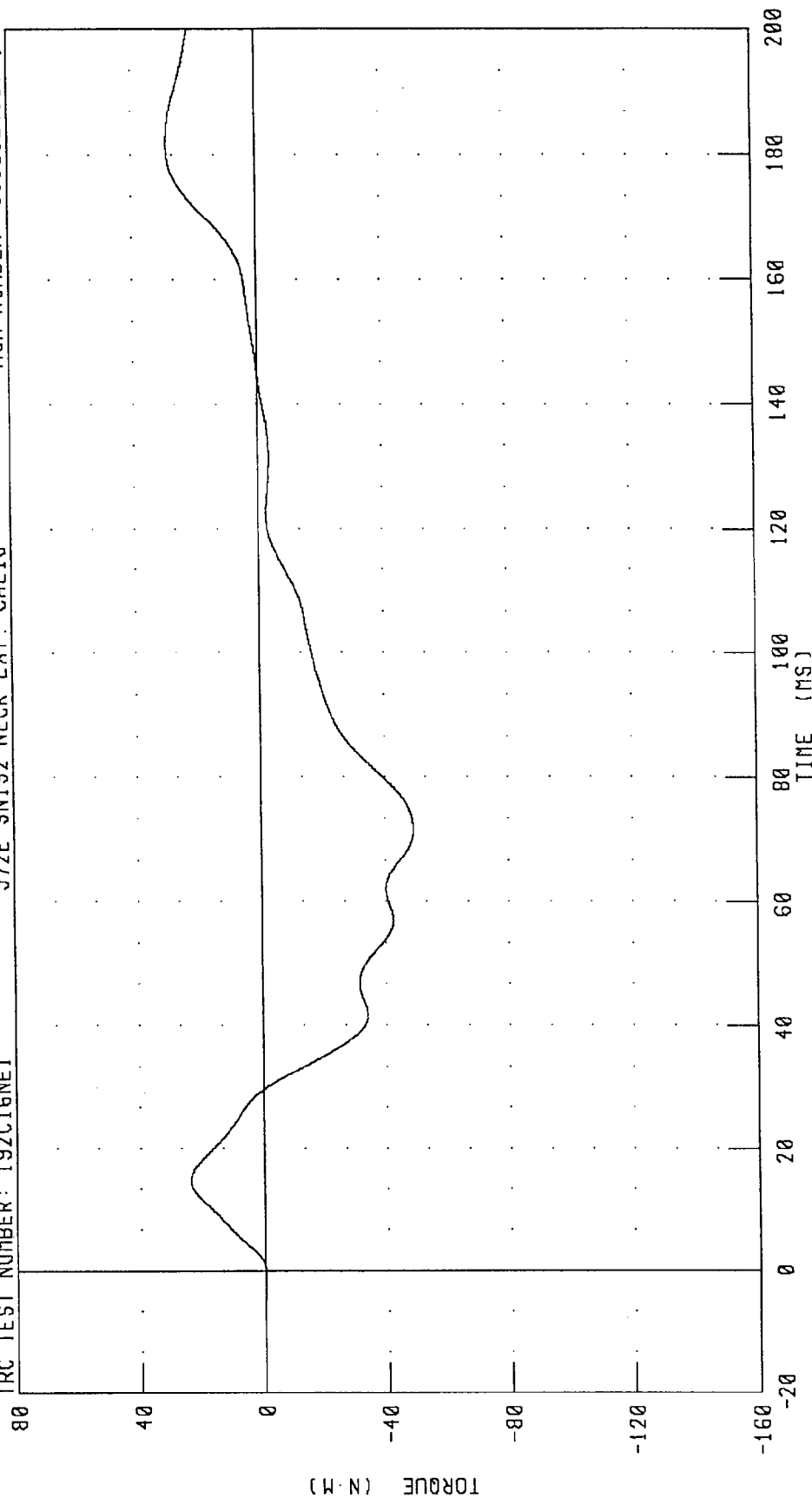
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C16NE1

572E SN192 NECK EXT. CAL16

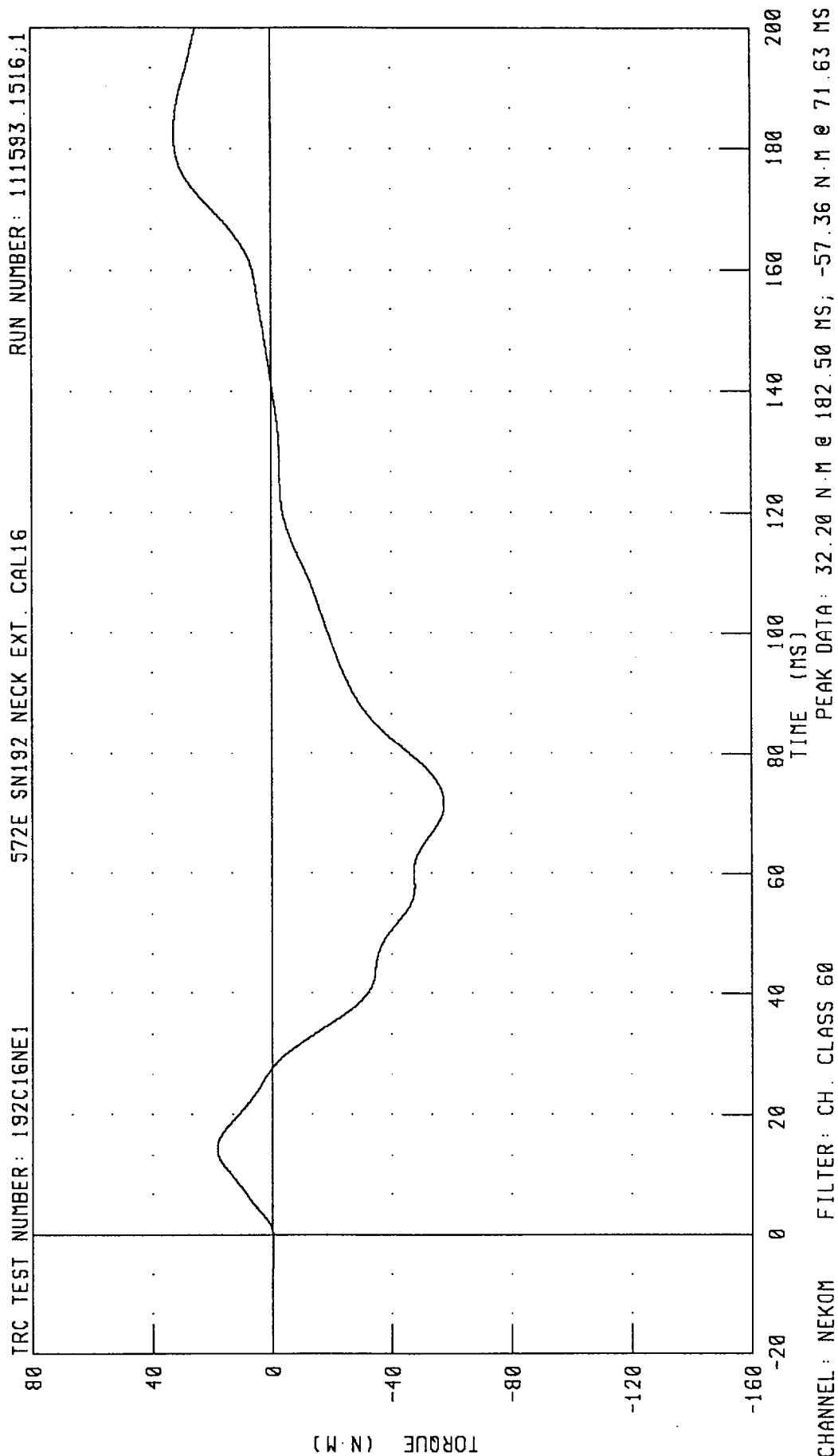
RUN NUMBER: 111593.1516.1



PEAK DATA: 28.65 N·M @ 181.75 MS; -49.09 N·M @ 71.63 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

25-OCT-93

TRC

192C16TH1

572E SN192 H.S.THORAX CAL16

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	47.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	71.0 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5443. N
INTERNAL HYSTERESIS	69% - 85%	72.4%

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Fount

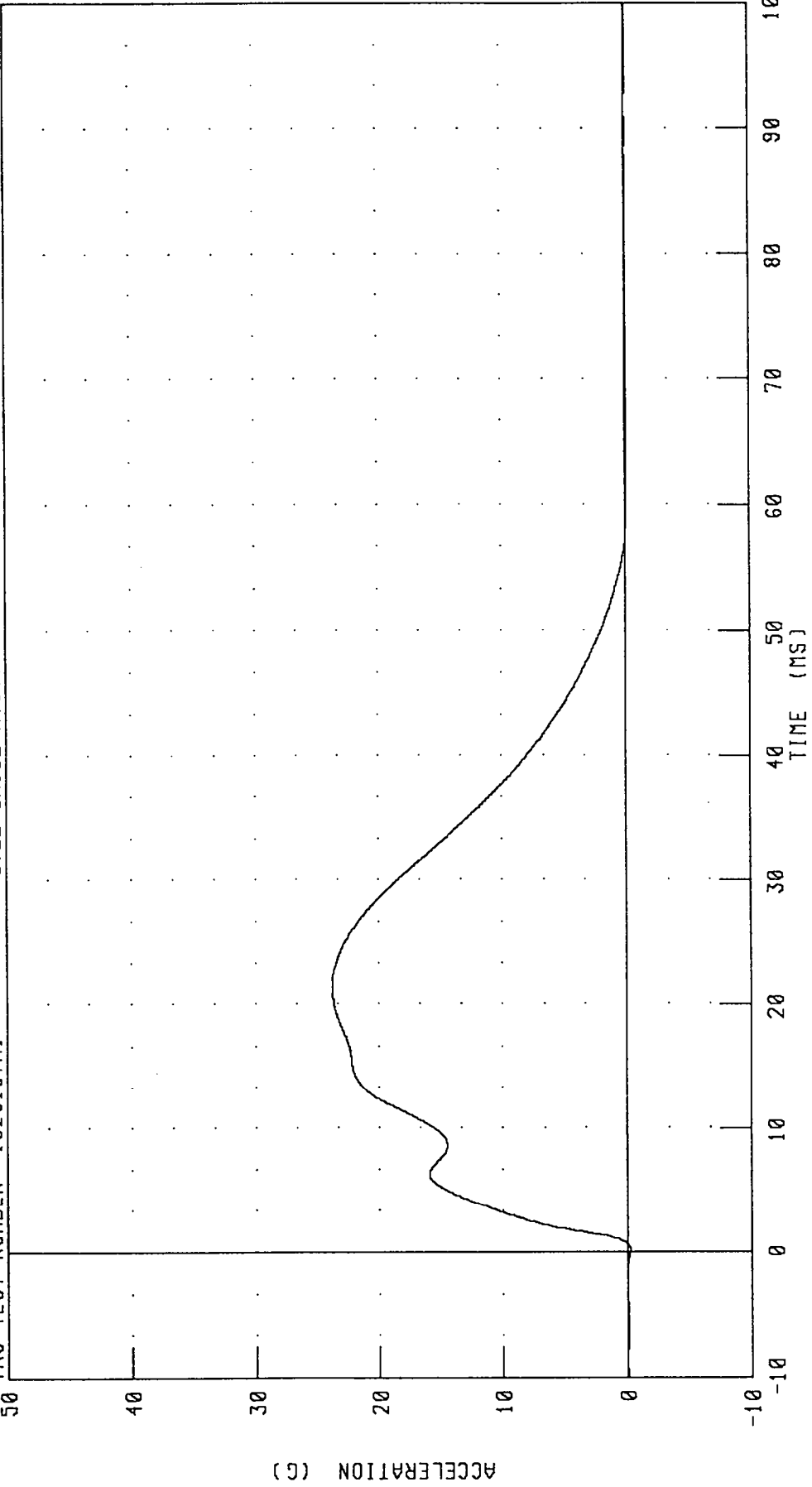
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 192C16TH1

572E SN192 H.S.THORAX CALI6

RUN NUMBER: 111593.1516;1



PEAK DATA: 23.76 G @ 21.50 MS; -0.20 G @ 0.13 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

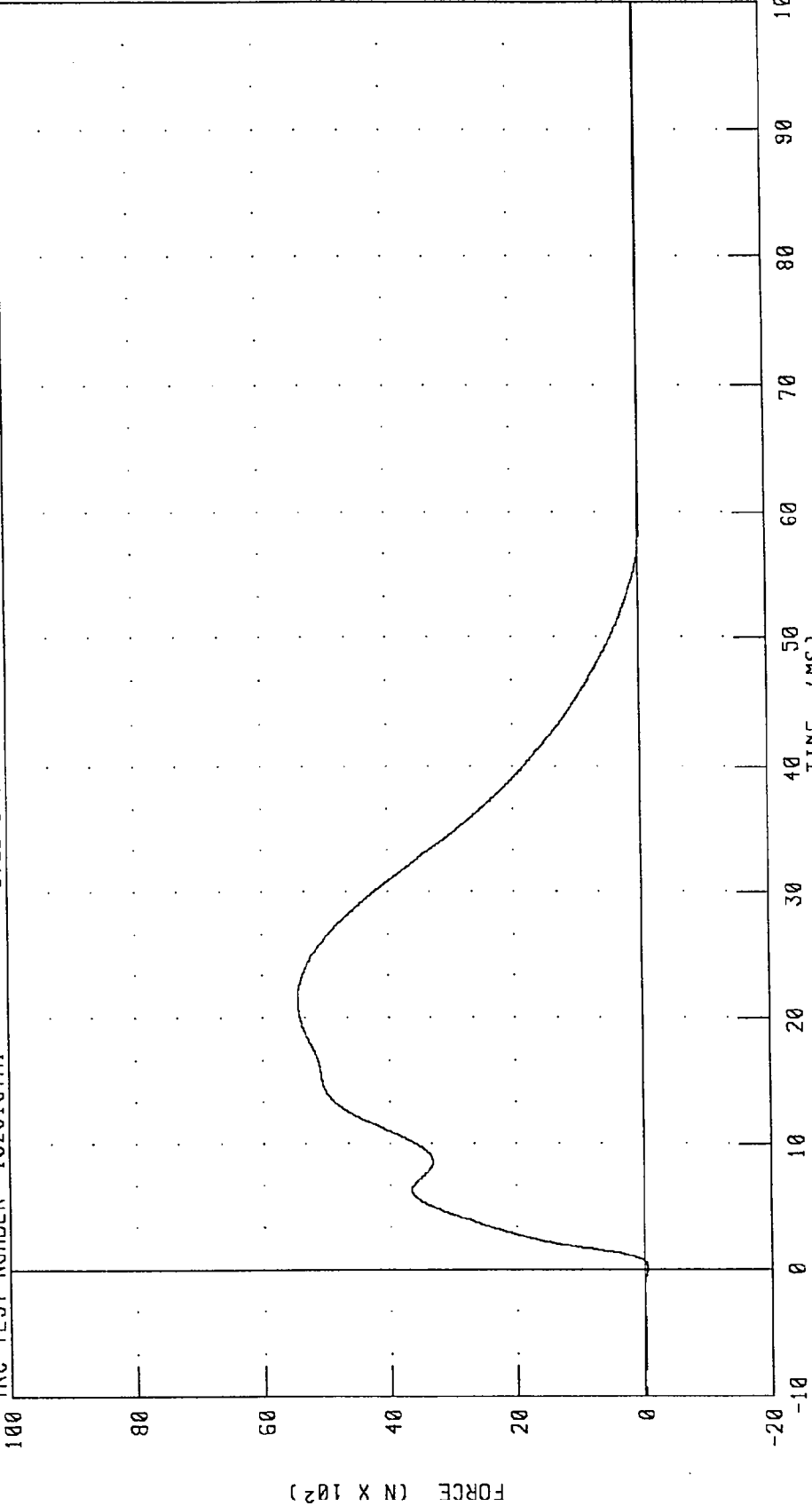
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 192C16TH1

572E SN192 H.S. THORAX CAL16

RUN NUMBER: 111593.1516;1



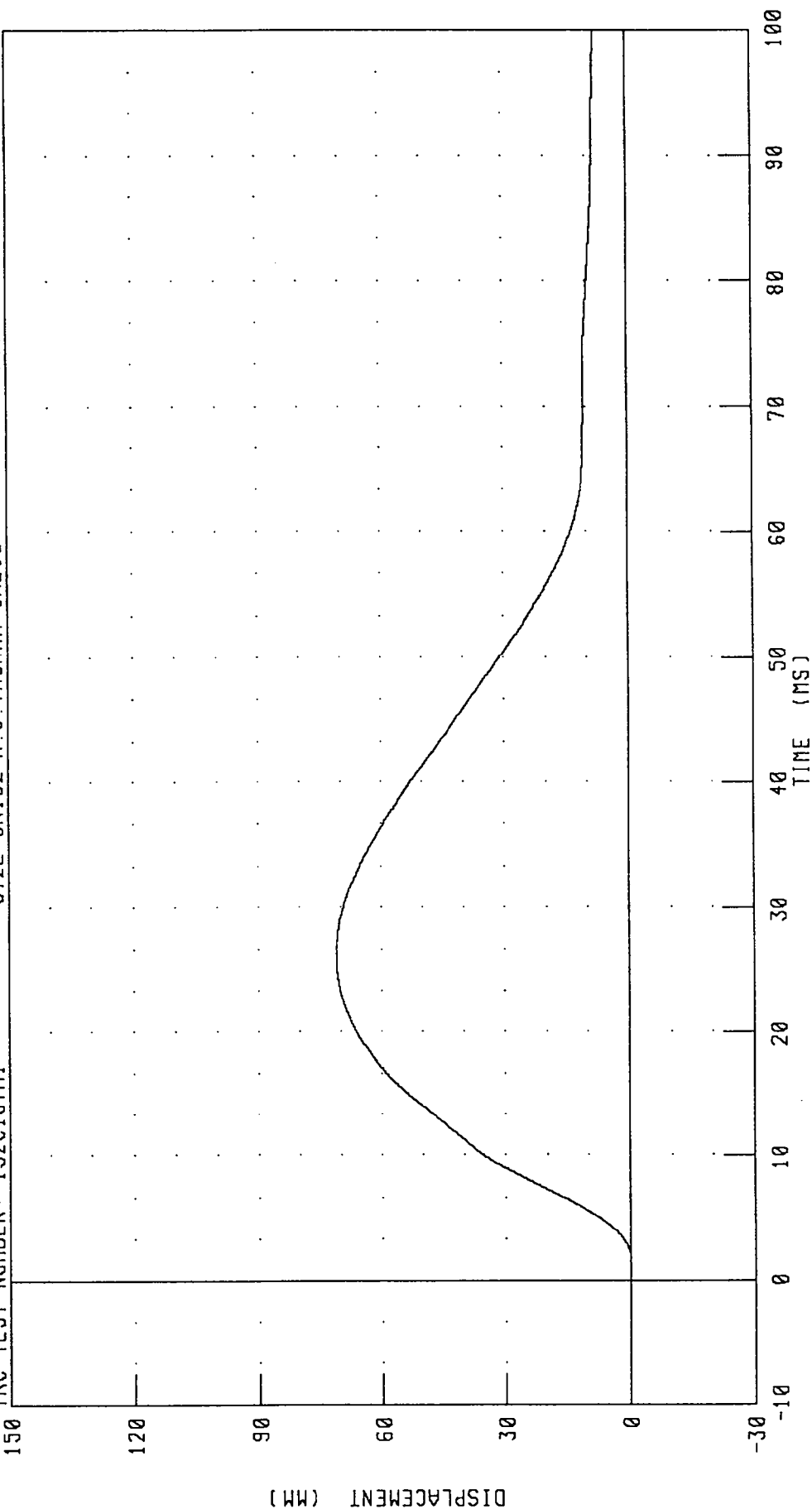
CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5443.23 N @ 21.50 MS; -45.31 N @ 0.13 MS

PART 572-E HYBRID III THORAX CALIBRATION

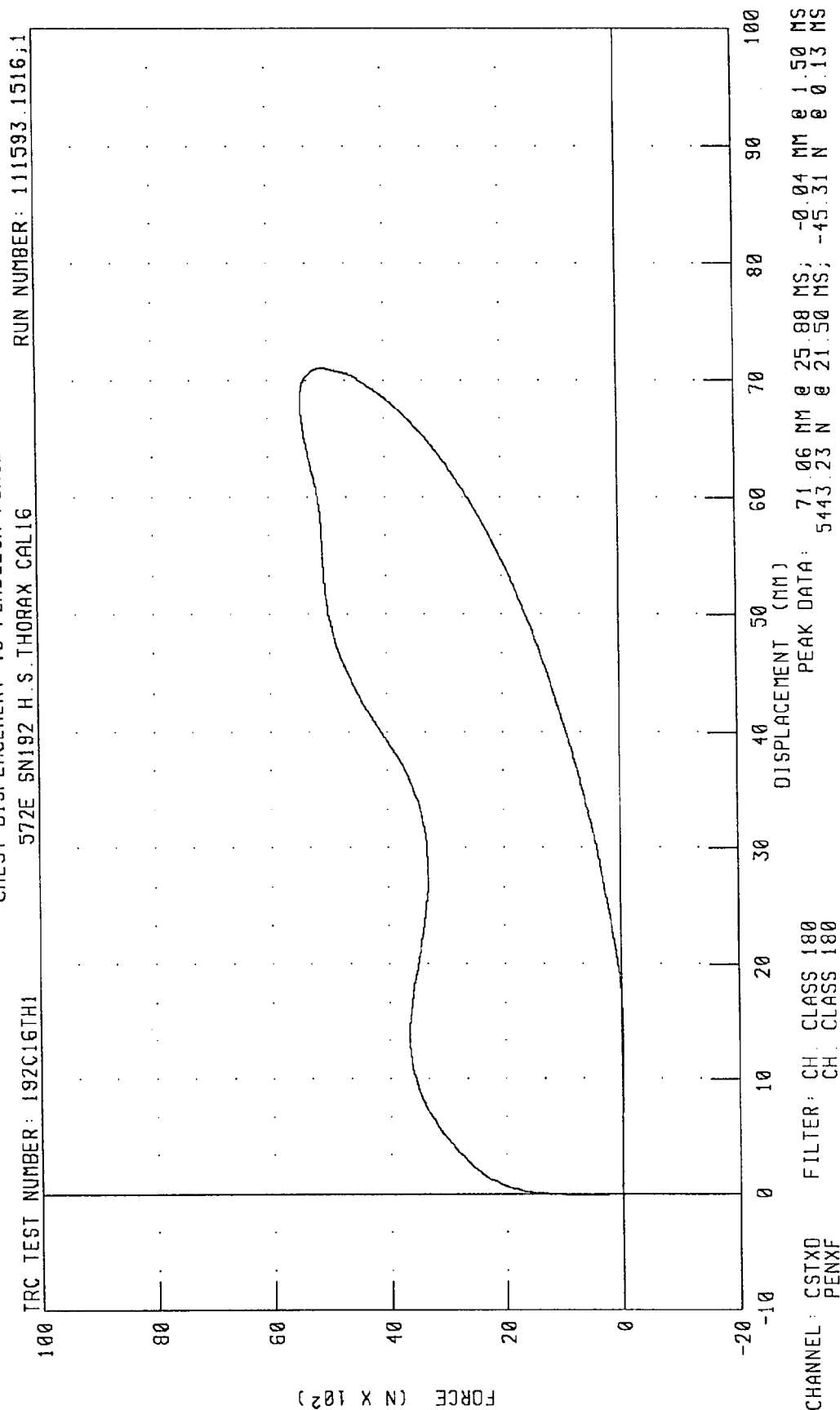
STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C16TH1 572E SN192 H.S. THORAX CAL16 RUN NUMBER: 111593.1516;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 71.06 MM @ 25.88 MS; -0.04 MM @ 1.50 MS

PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE



TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

25-OCT-93

TRC

192C16RK1

572E SN192 RIGHT KNEE CAL 16

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	45.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5513.5 N

TEST MEETS SPECIFICATIONS

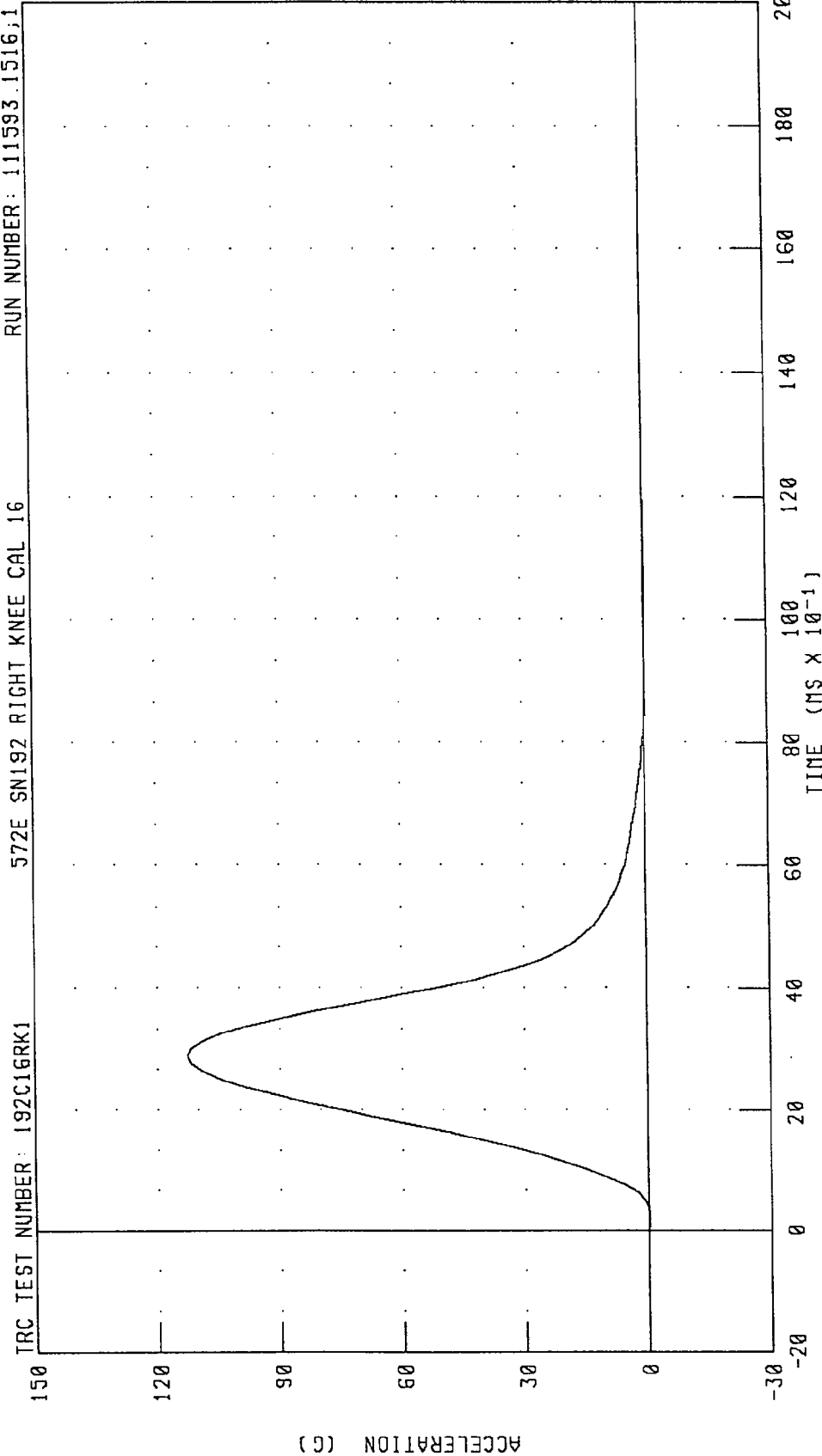
TECHNICIAN Pete Fort

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 192C16RK1

572E SN192 RIGHT KNEE CAL 16

RUN NUMBER: 111593.1516;1



PEAK DATA: 112.69 G @ 2.88 MS; -0.21 G @ 0.25 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

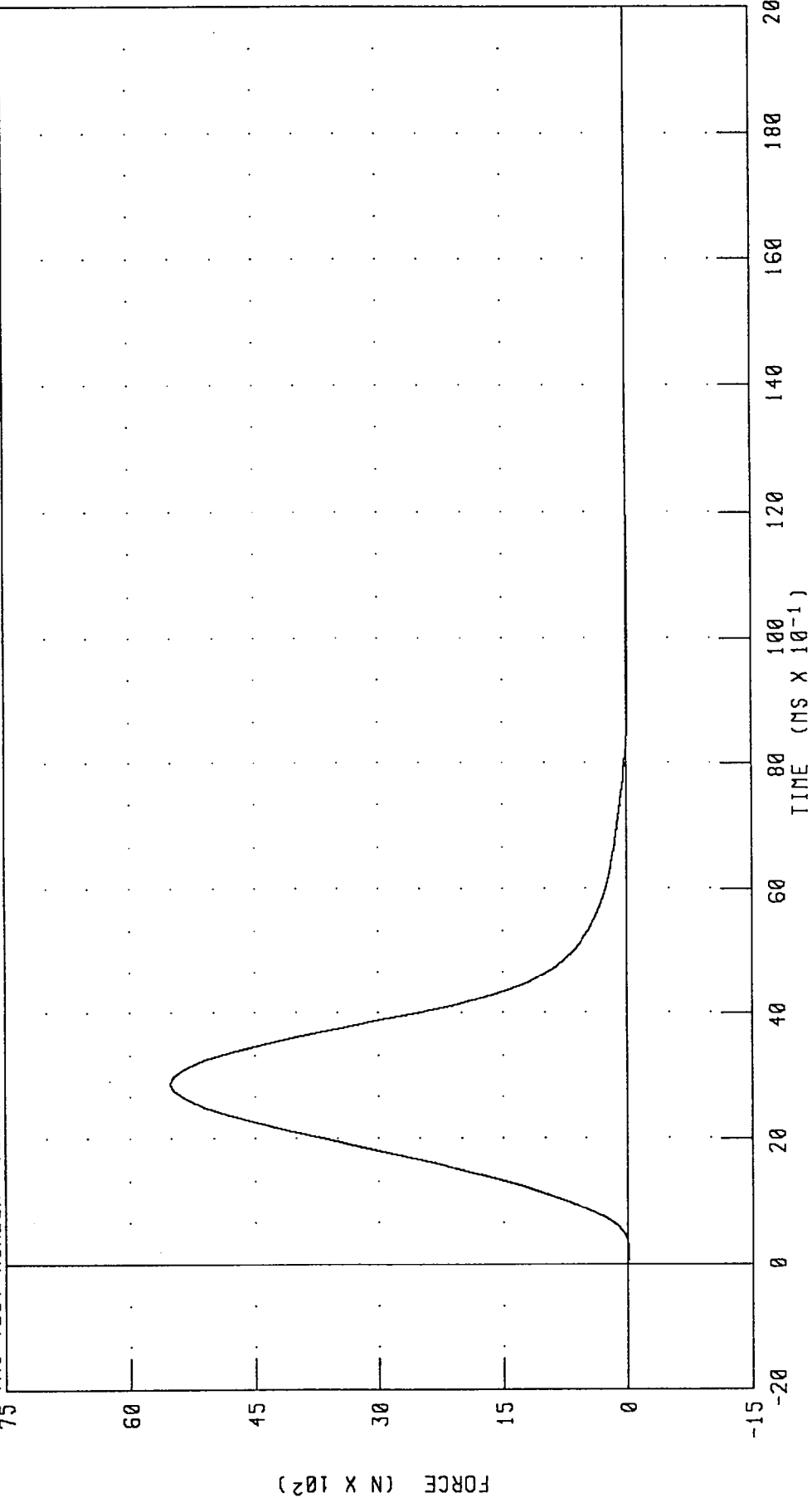
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C16RK1

572E SN192 RIGHT KNEE CAL 16

RUN NUMBER: 111593.1516;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5513.57 N @ 2.88 MS; -10.13 N @ 0.25 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

25-OCT-93

TRC

192C16LK1

572E SN192 LEFT KNEE CAL 16

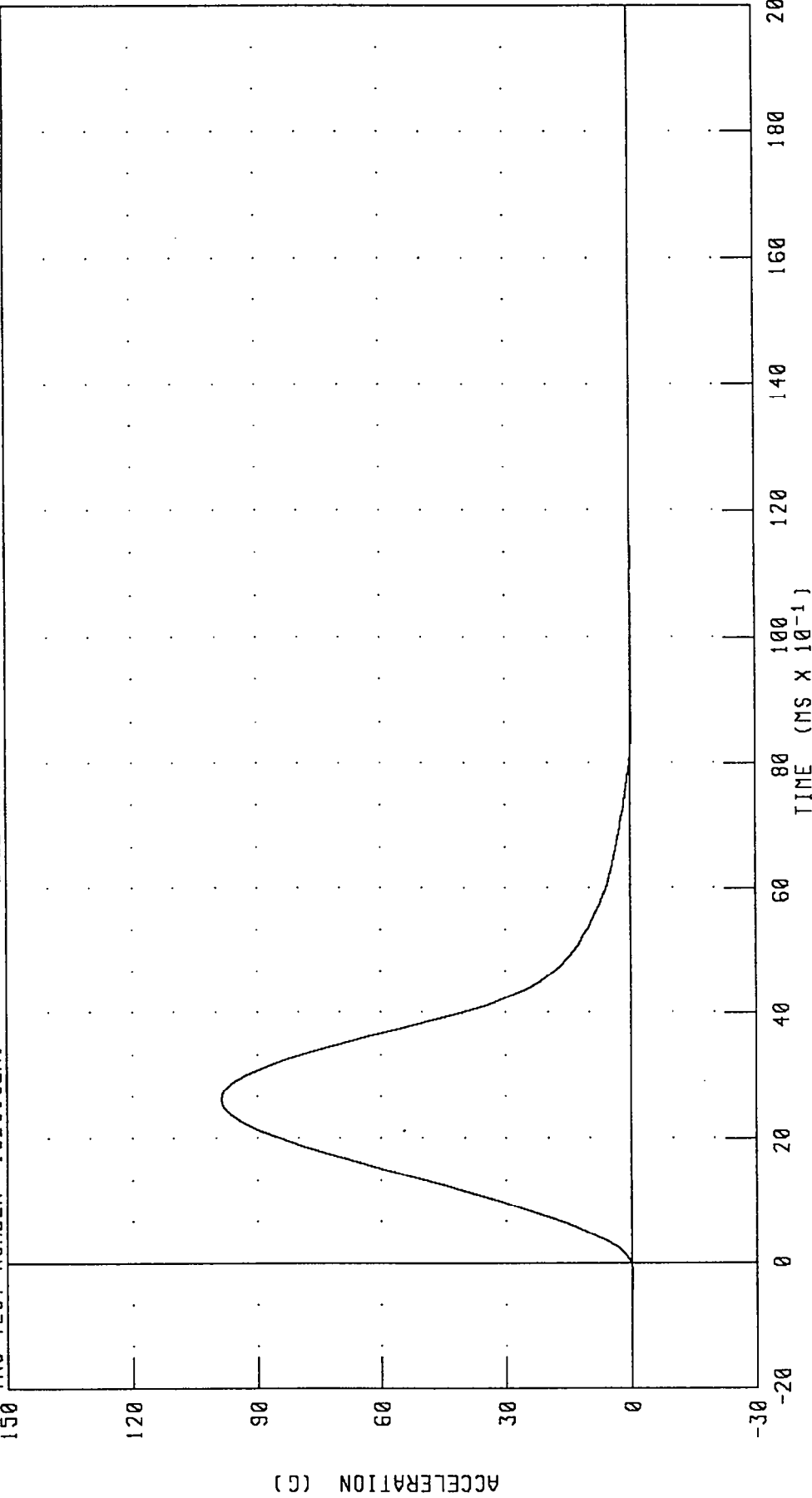
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	45.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	4831.5 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Rita Fort

PART 572-E HYBRID III LEFT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 192C16LK1 572E SN192 LEFT KNEE CAL 16 RUN NUMBER: 111593.1516.2



PEAK DATA: 98.75 G @ 2.63 MS; -0.24 G @ -0.13 MS

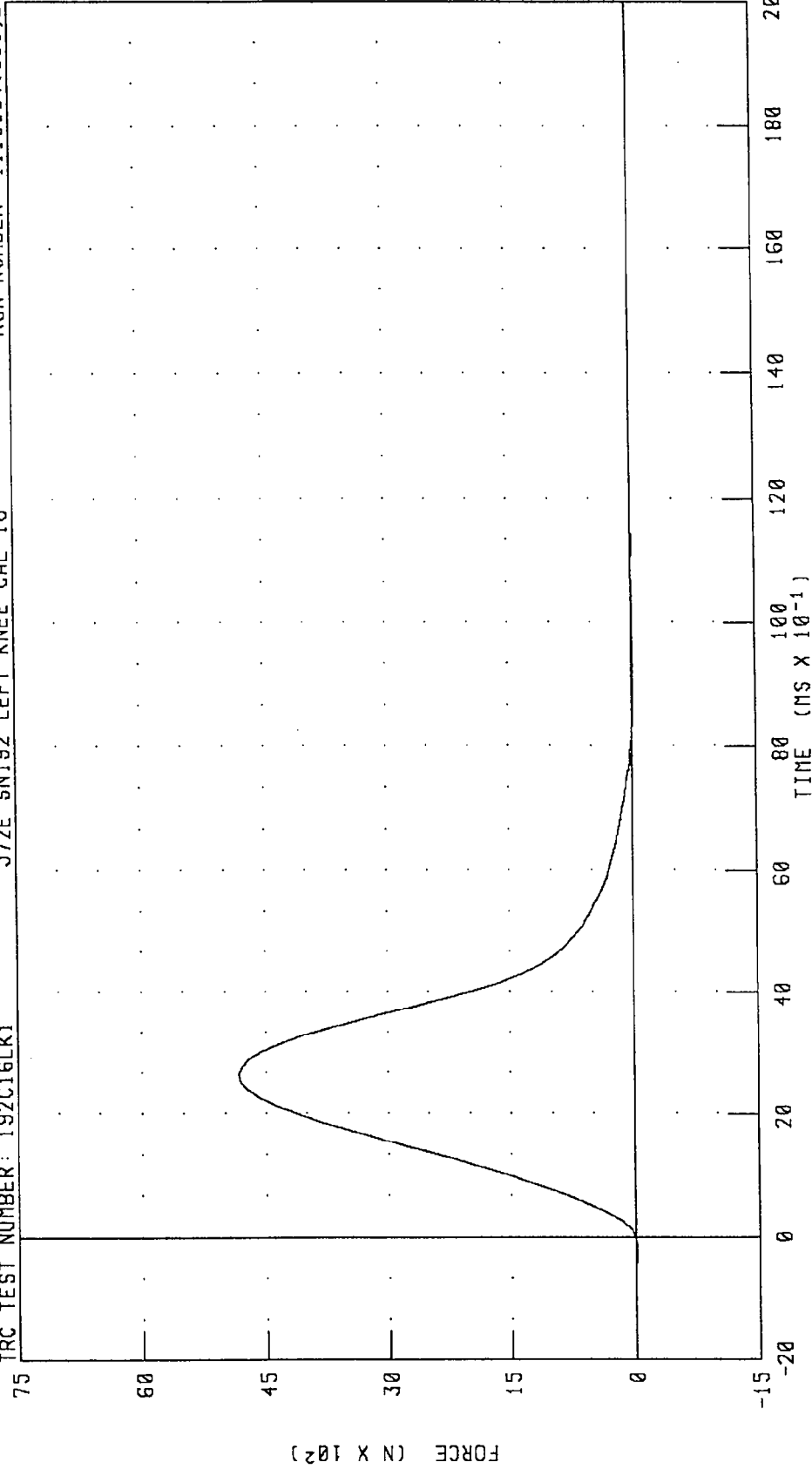
CHANNEL: PENXG FILTER: CH. CLASS 600

PART 572-E HYBRID III LEFT KNEE CALIBRATION
 PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C16LK1

572E SN192 LEFT KNEE CAL 16

RUN NUMBER: 111593.1516,2



PEAK DATA: 4831.55 N @ 2.63 MS; -11.75 N @ -0.13 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
142 HUMANOID

21-OCT-93

TRC 142C17ED1 572E SN142 EXT.DIMENSION CAL17

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE (AA)		429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)		226 - 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)		970 - 1001 MM	983. MM
WAIST CIRCUMFERENCE (Z)		836 - 866 MM	846. MM
CHEST DEPTH (O)		213 - 229 MM	218. MM
H-POINT HEIGHT (C)		84 - 89 MM	84. MM
H-POINT FROM SEATBACK (D)		135 - 140 MM	137. MM
SKULL CAP TO BACKLINE (H)		41 - 46 MM	43. MM
TOTAL SITTING HEIGHT (A)		879 - 889 MM	884. MM
THIGH CLEARANCE (F)		140 - 155 MM	145. MM
BUTTOCK KNEE LENGTH (K)		579 - 605 MM	597. MM
BUTTOCK POPLITEAL LENGTH (N)		452 - 478 MM	475. MM
POPLITEAL HEIGHT (L)		429 - 455 MM	452. MM
KNEE PIVOT HEIGHT (M)		485 - 500 MM	490. MM
FOOT LENGTH (P)		252 - 267 MM	257. MM
FOOT BREADTH (W)		91 - 107 MM	97. MM
SHOULDER PIVOT FROM BACKLINE (E)		84 - 94 MM	89. MM
SHOULDER BREADTH (V)		422 - 437 MM	427. MM
SHOULDER PIVOT HEIGHT (B)		506 - 521 MM	508. MM
ELBOW REST HEIGHT (J)		191 - 211 MM	208. MM
SHOULDER-ELBOW LENGTH (I)		330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290 - 305 MM	292. MM

TEST MEETS SPECIFICATIONS

TECHNICIAN *John R. Smith*

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

25-OCT-93

TRC

142C17HD1

572E SN142 HEAD DROP CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	45.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	257.63 G
PEAK LATERAL ACCELERATION	15 G MAX	1.14 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

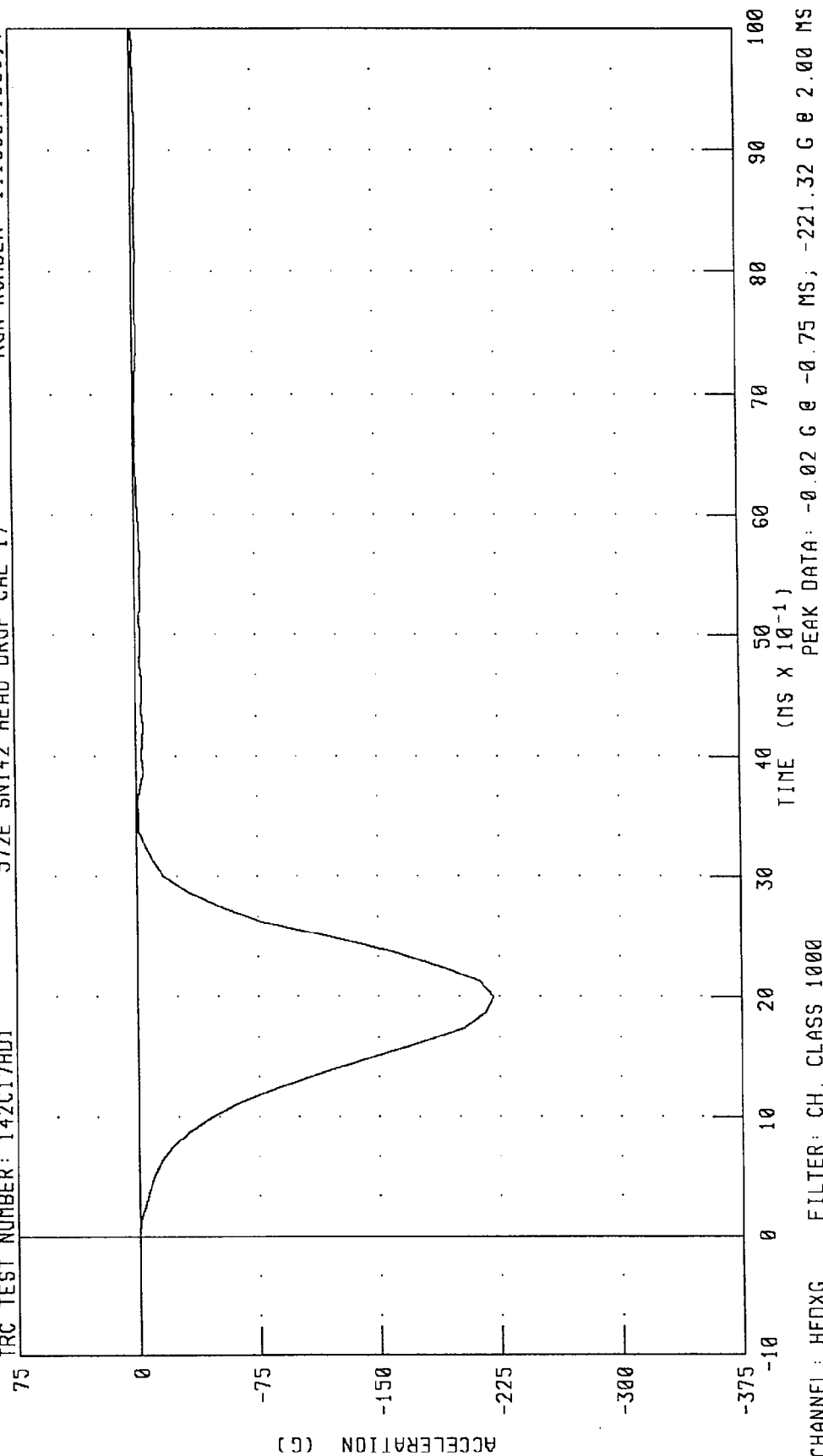
Pete Fount

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 142C17HD1

572E SN142 HEAD DROP CAL 17

RUN NUMBER: 111593.1533;4



CHANNEL: HEDXG FILTER: CH. CLASS 1000

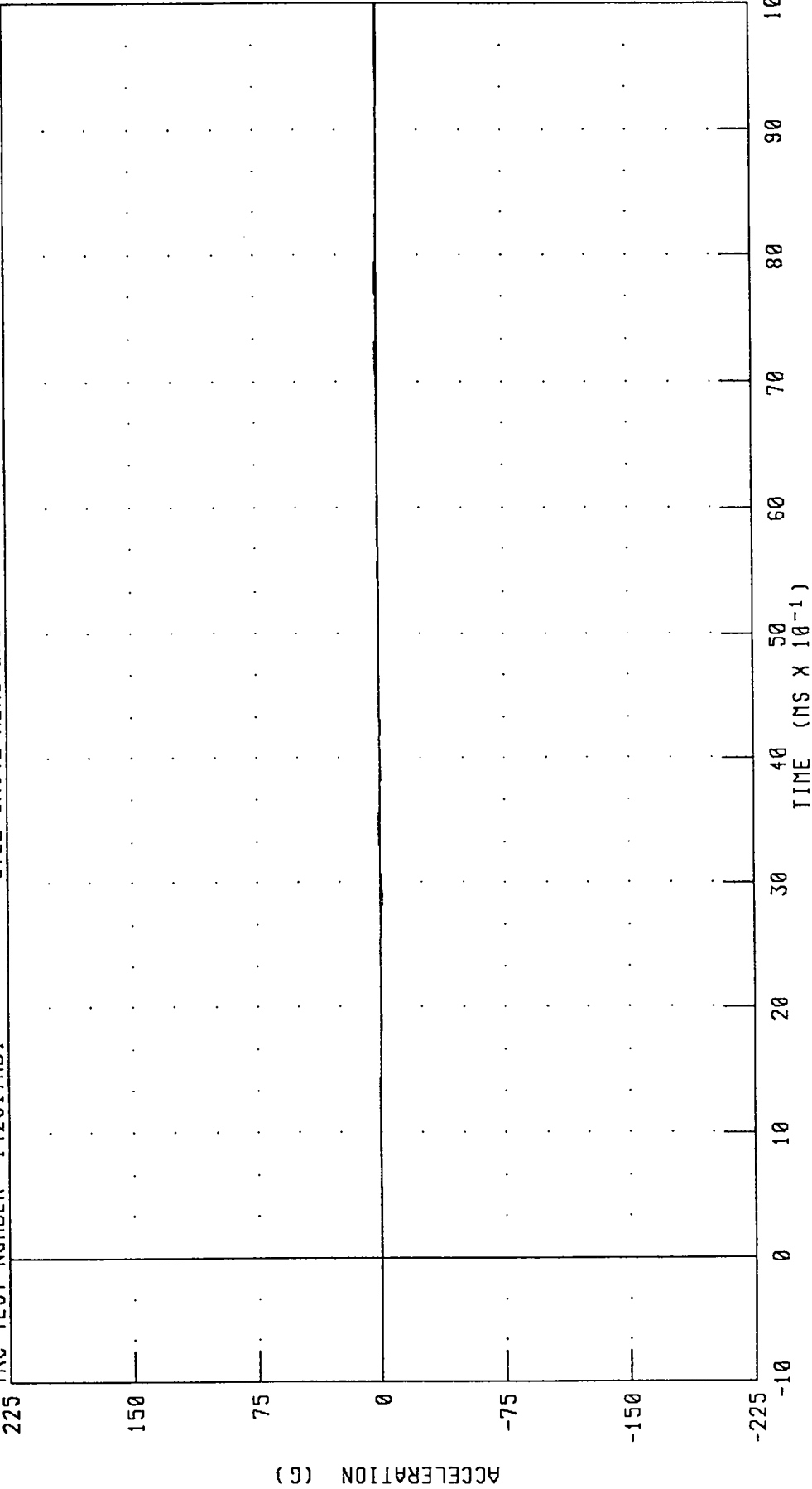
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 142C17HD1

572E SN142 HEAD DROP CAL 17

RUN NUMBER: 111593.1533;4

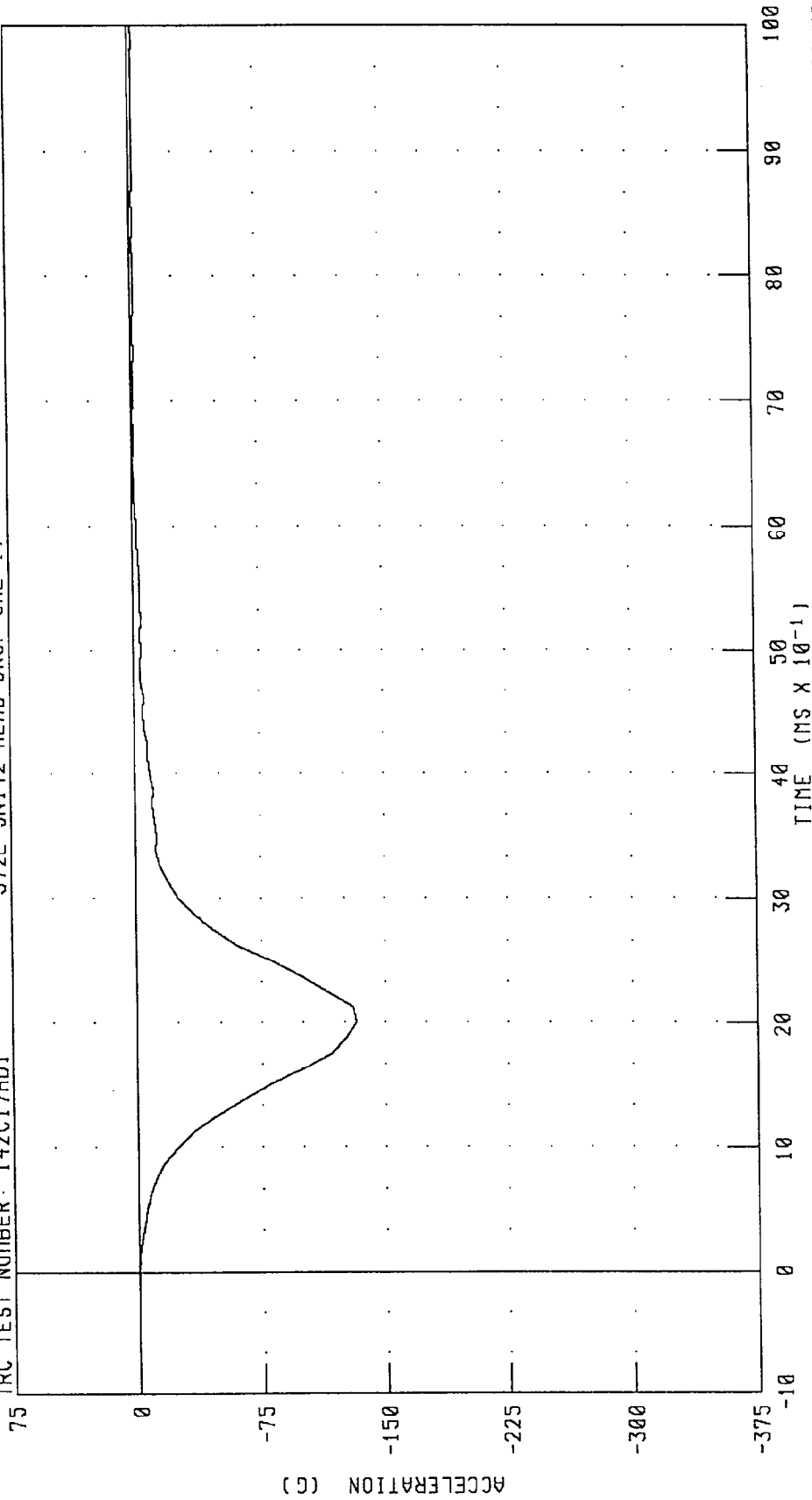


CHANNEL: HEDYG FILTER: CH. CLASS 1000

PEAK DATA: 1.14 G @ 7.25 MS; -1.01 G @ 2.88 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 142C17HD1 572E SN142 HEAD DROP CAL 17 RUN NUMBER: 111593.1533,4



PEAK DATA: 0.03 G @ 0.00 MS; -131.88 G @ 2.00 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

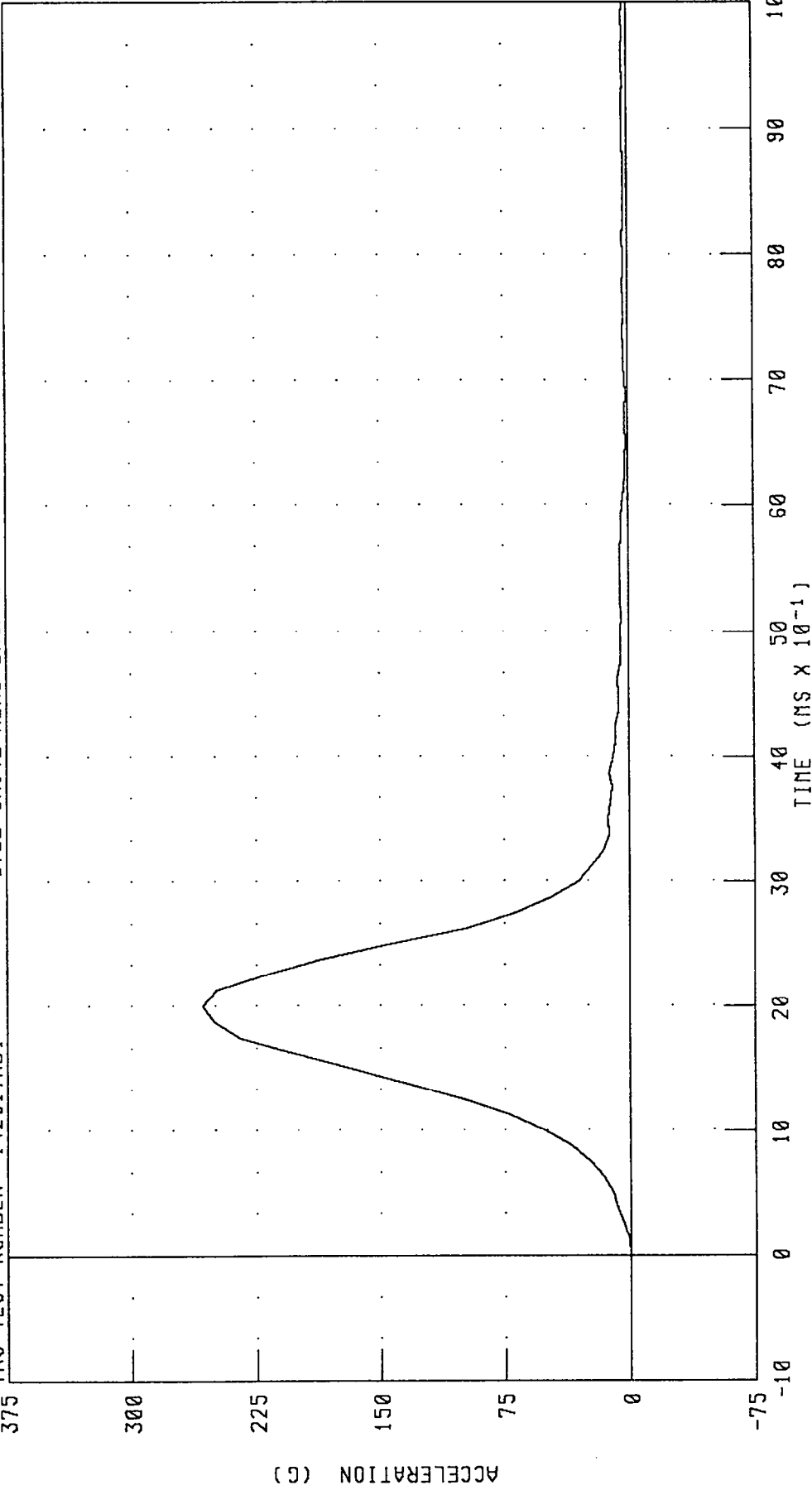
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 142C17HD1

572E SN142 HEAD DROP CAL 17

RUN NUMBER: 111593.1533;4



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 257.64 G @ 2.00 MS; 0.02 G @ -0.75 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST

HYBRID III

25-OCT-93

6 AXIS NECK TRANSDUCER
TRC 142C17NF1

572E SN142 NECK FLEXION CAL17

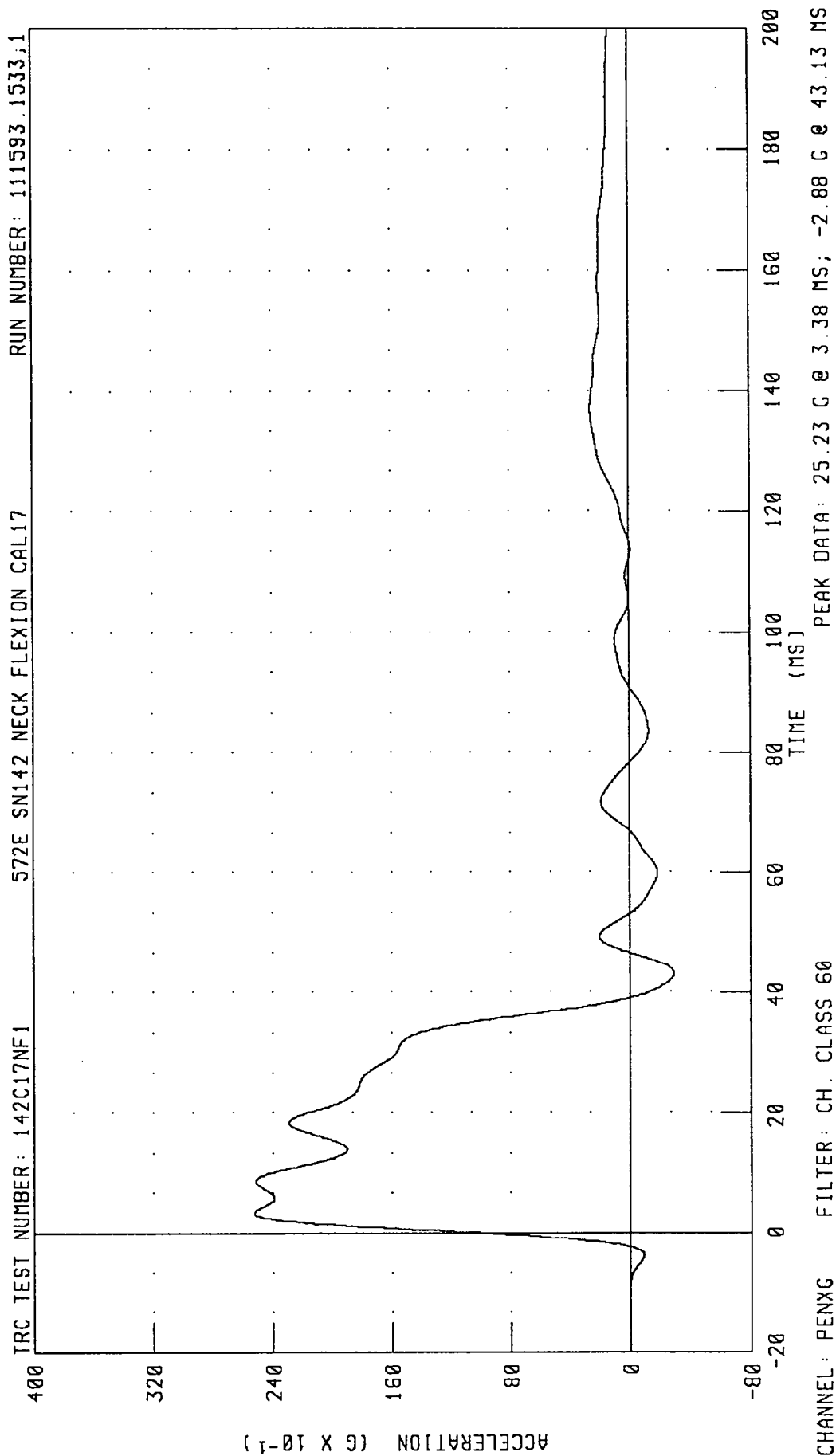
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	47.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.03 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	24.32 G
	20 MS	17.60 - 22.60 G	21.74 G
	30 MS	12.50 - 18.50 G	15.70 G
MAX PENDULUM G		29 G MAX	25.23 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.67 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.88 MS
D PLANE	MAX	64 - 78 DEG.	73.95 DEG.
ROTATION	TIME	57 - 64 MS	58.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	93.33 NM
	TIME	47 - 58 MS	50.50 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.25 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	102.75 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

Peto RS

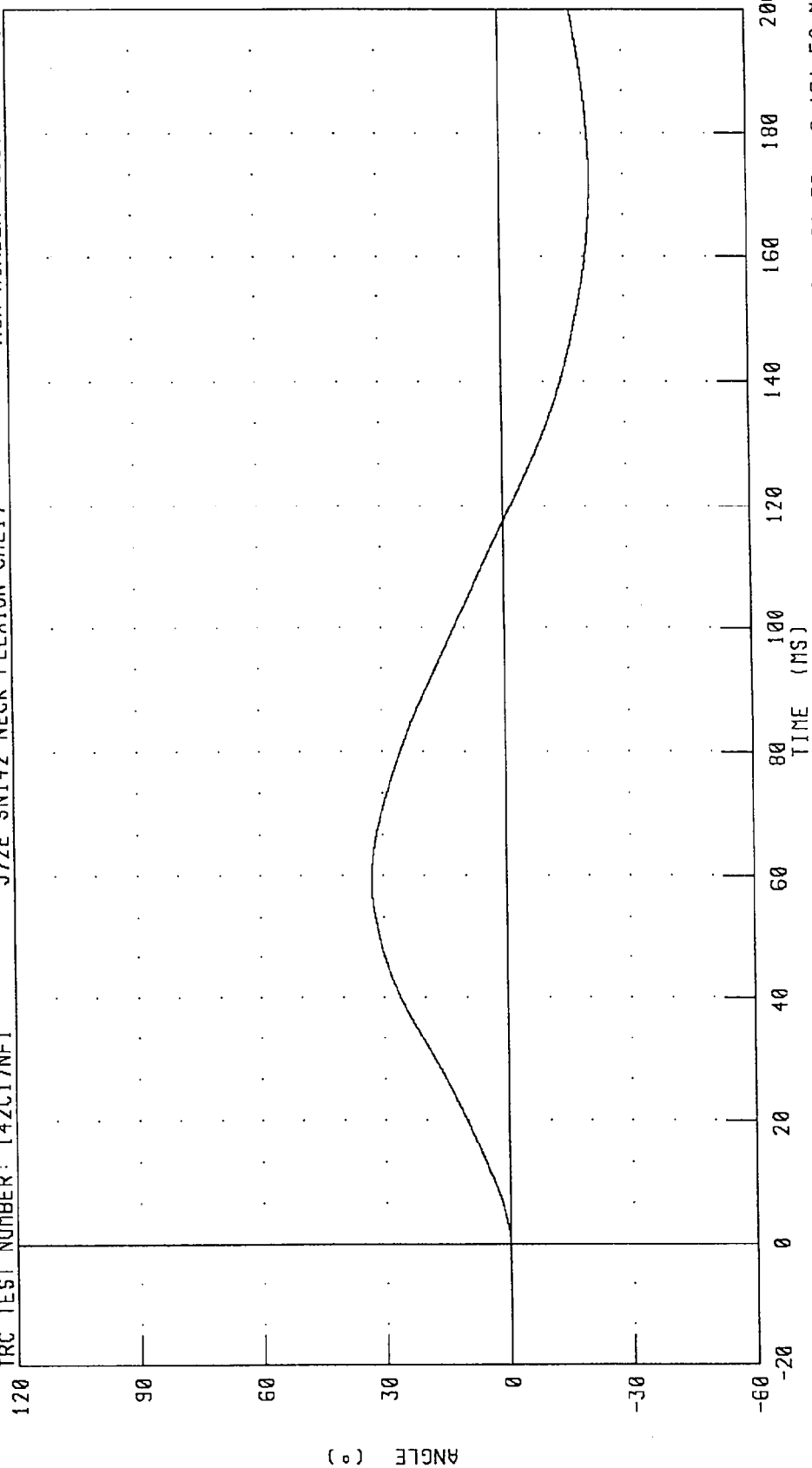
PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION



PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C17NF1 RUN NUMBER: 111593.1533,1

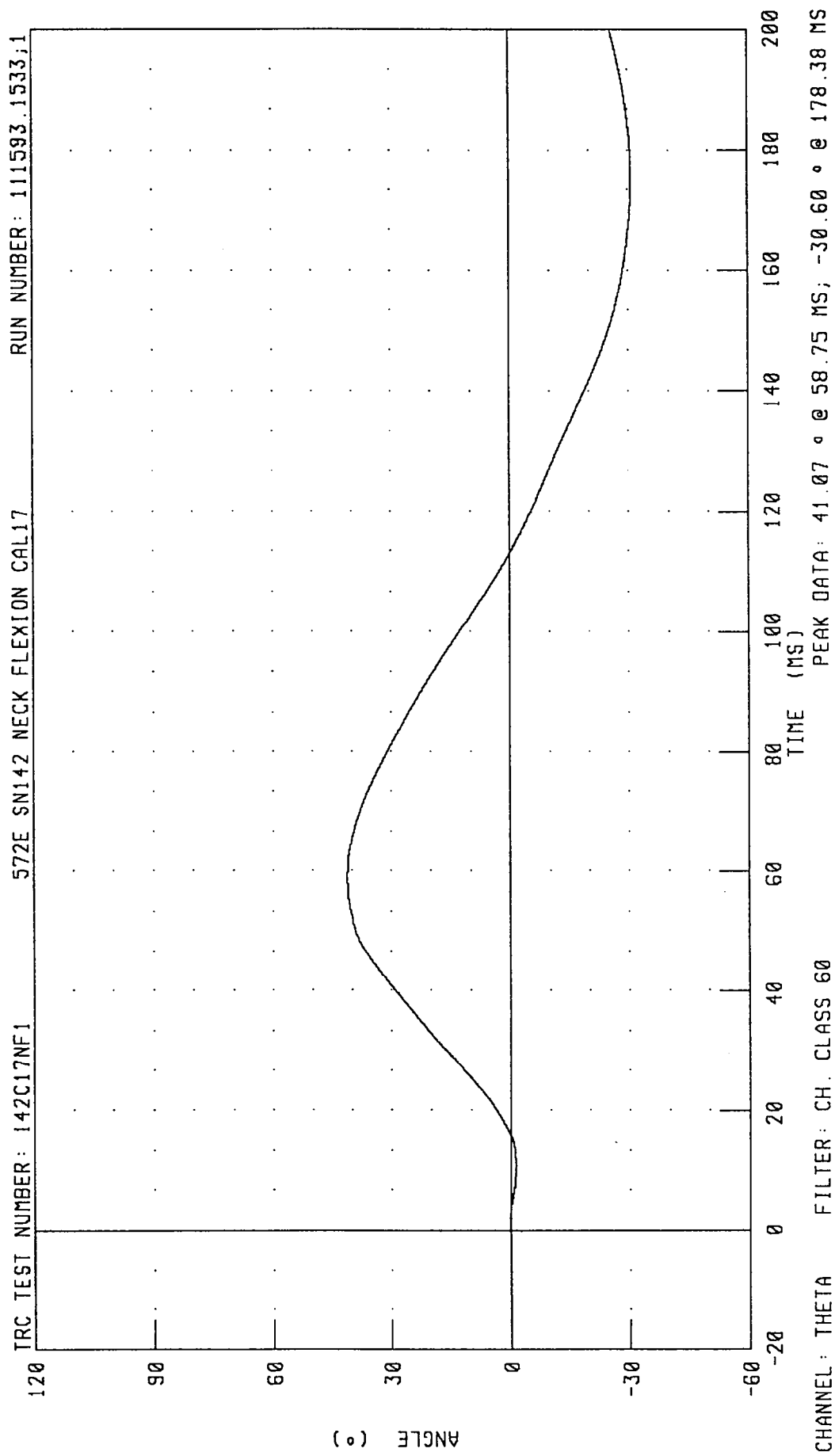
572E SN142 NECK FLEXION CAL17



CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 32.89 ° @ 58.88 MS; -21.70 ° @ 171.50 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE



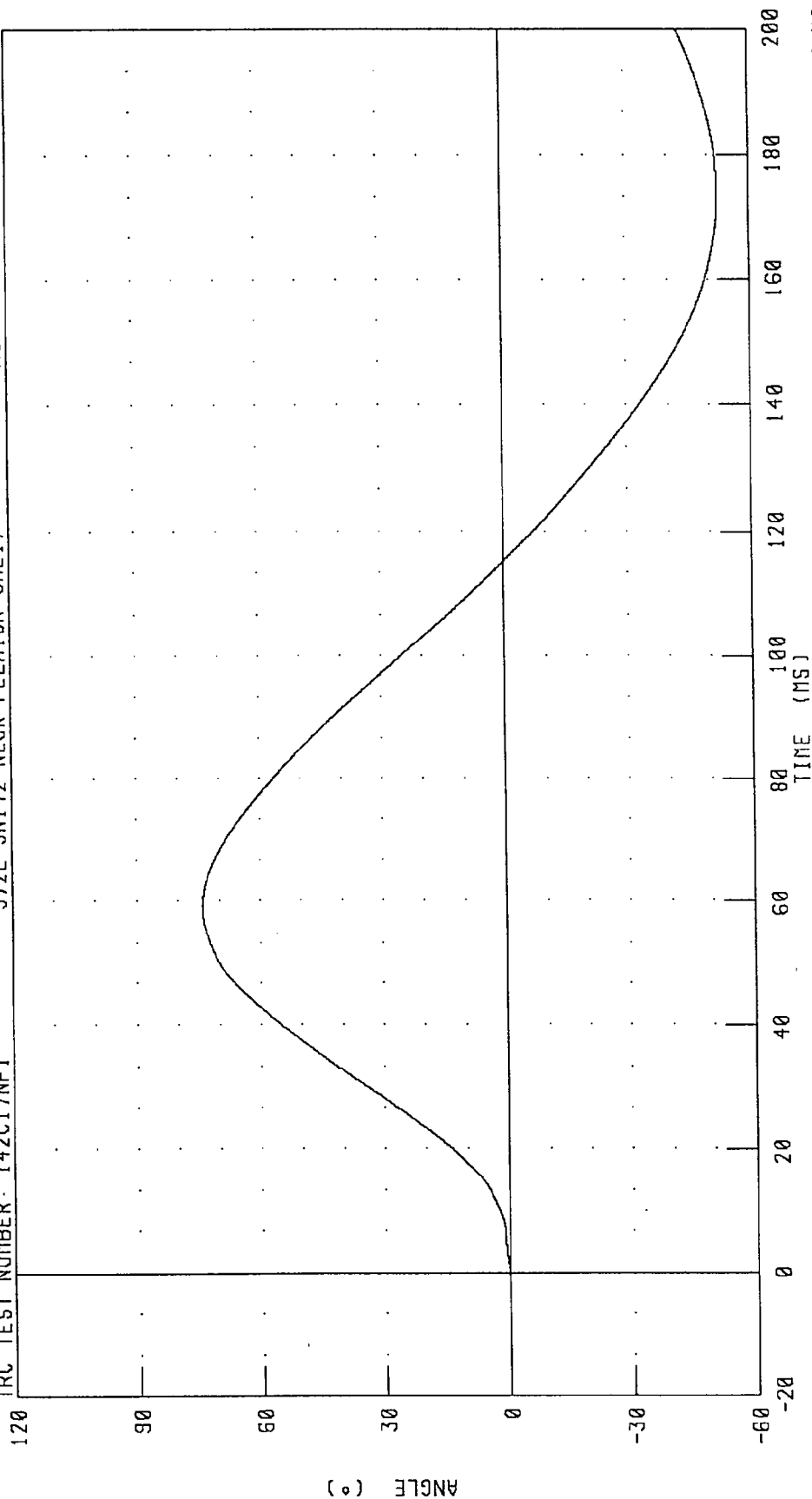
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C17NF1

572E SNI42 NECK FLEXION CAL17

RUN NUMBER: 111593.1533;1



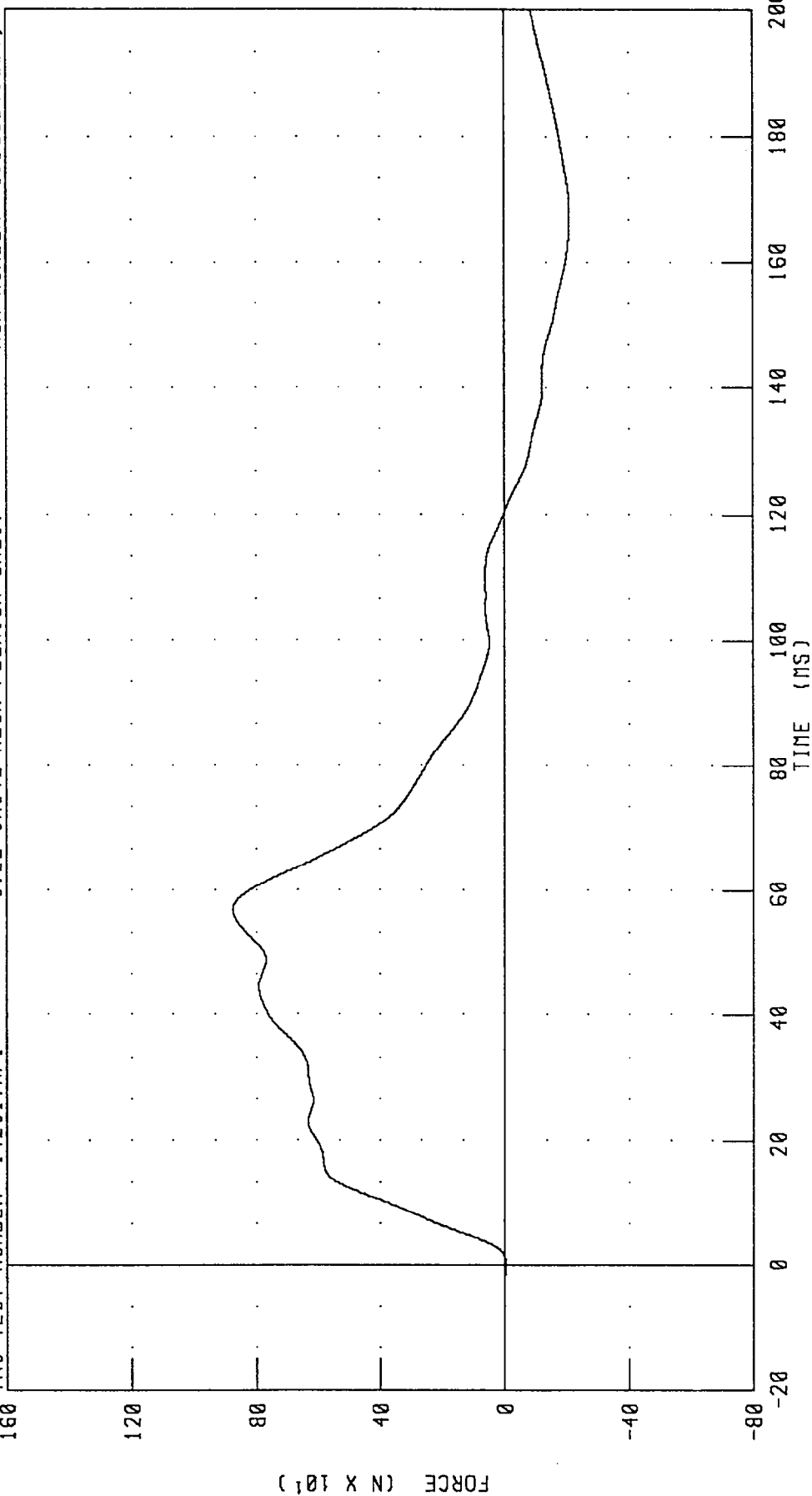
PEAK DATA: 73.96 ° @ 58.88 MS; -52.29 ° @ 172.25 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C17NF1 572E SN142 NECK FLEXION CAL17 RUN NUMBER: 111593.1533;1



PEAK DATA: 875.87 N @ 56.88 MS; -206.50 N @ 168.13 MS

FILTER: CH. CLASS 60

CHANNEL: NEKXF

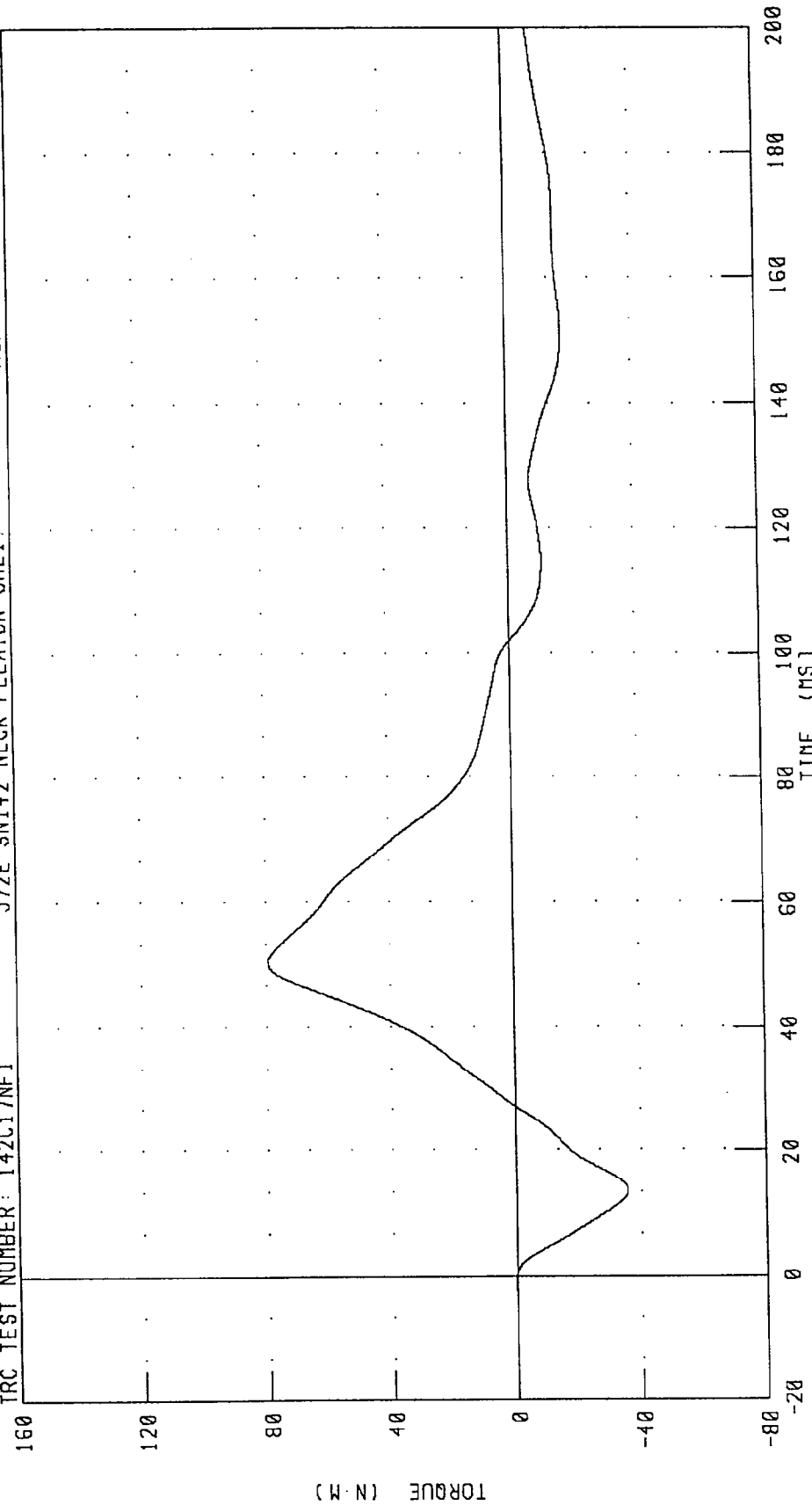
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

RUN NUMBER: 111593.1533;1

572E SN142 NECK FLEXION CAL17

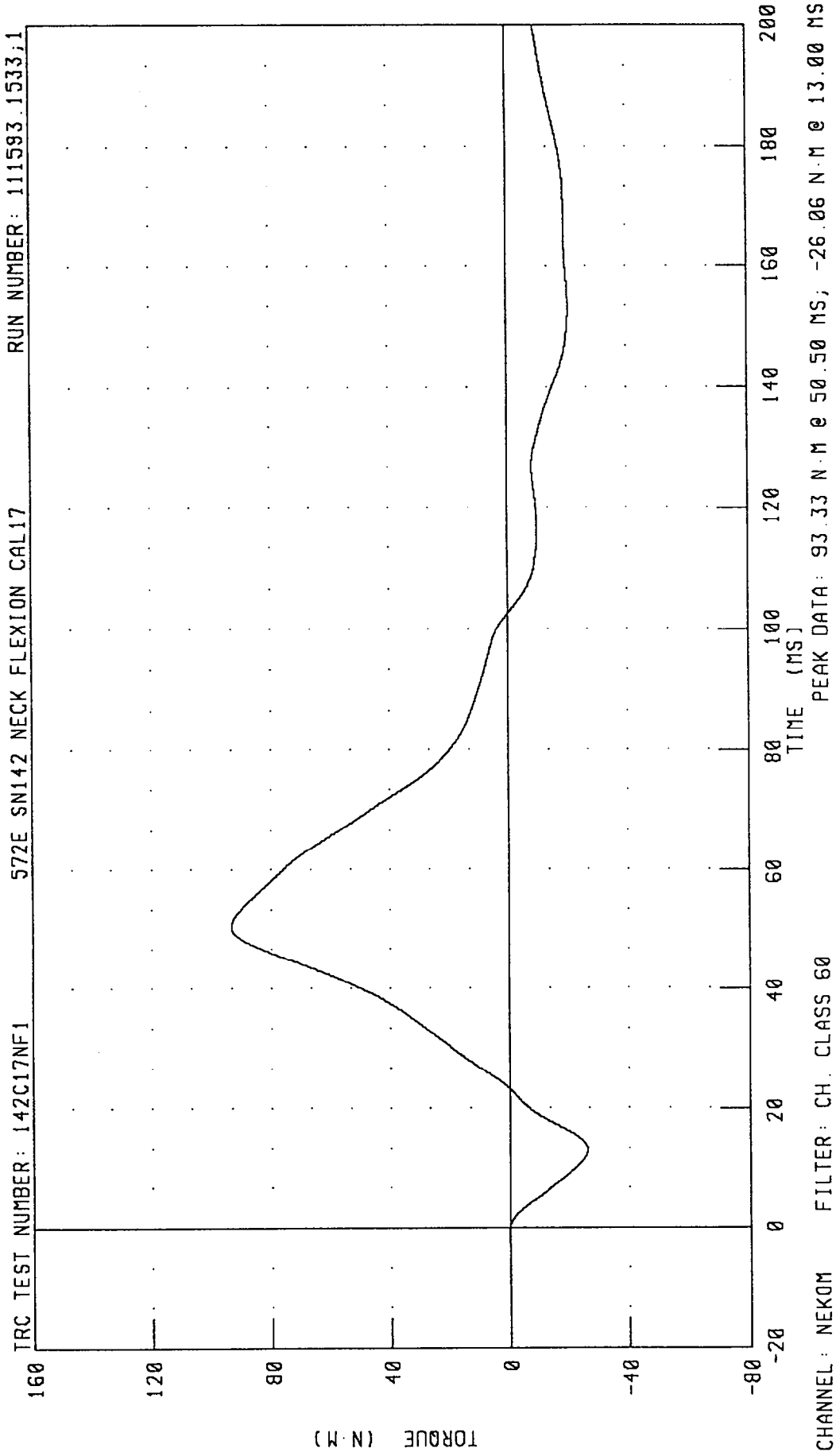
TRC TEST NUMBER: 142C17NF1



PEAK DATA: 79.46 N·M @ 50.25 MS; -35.60 N·M @ 13.38 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST

HYBRID III

25-OCT-93

6 AXIS NECK TRANSDUCER
TRC 142C17NE1

572E SN142 NECK EXT. CAL17

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	47.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.01 G
	20 MS	14.00 - 19.00 G	17.33 G
	30 MS	11.00 - 16.00 G	13.65 G
MAX PENDULUM G		22 G MAX	19.86 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.82 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.50 MS
D PLANE	MAX	81 - 106 DEG.	96.65 DEG.
ROTATION	TIME	72 - 82 MS	73.50 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-74.08 NM
	TIME	65 - 79 MS	69.25 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	151.38 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.75 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete F. A.

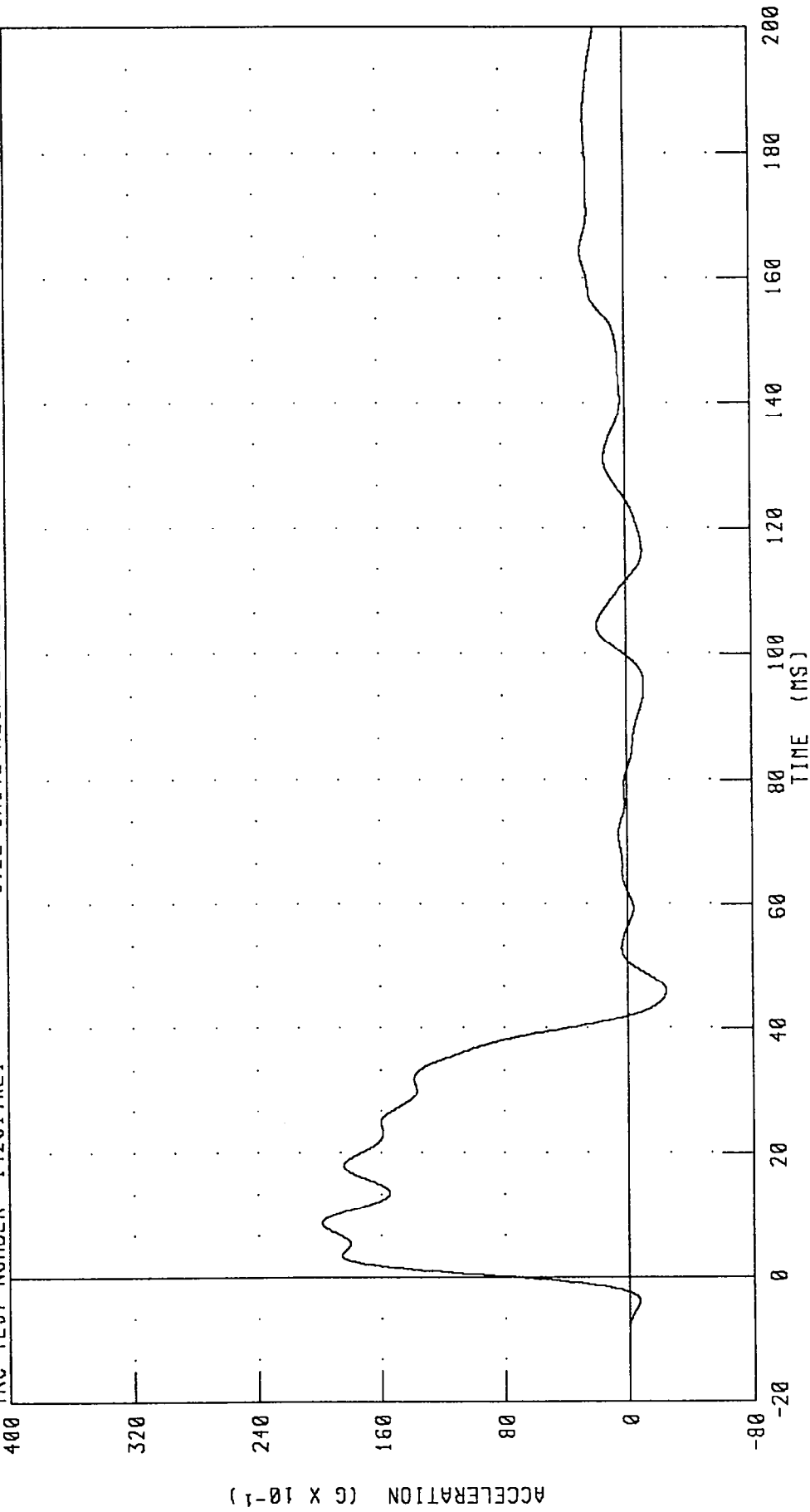
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



PEAK DATA: 19.87 G @ 8.63 MS; -2.44 G @ 45.88 MS

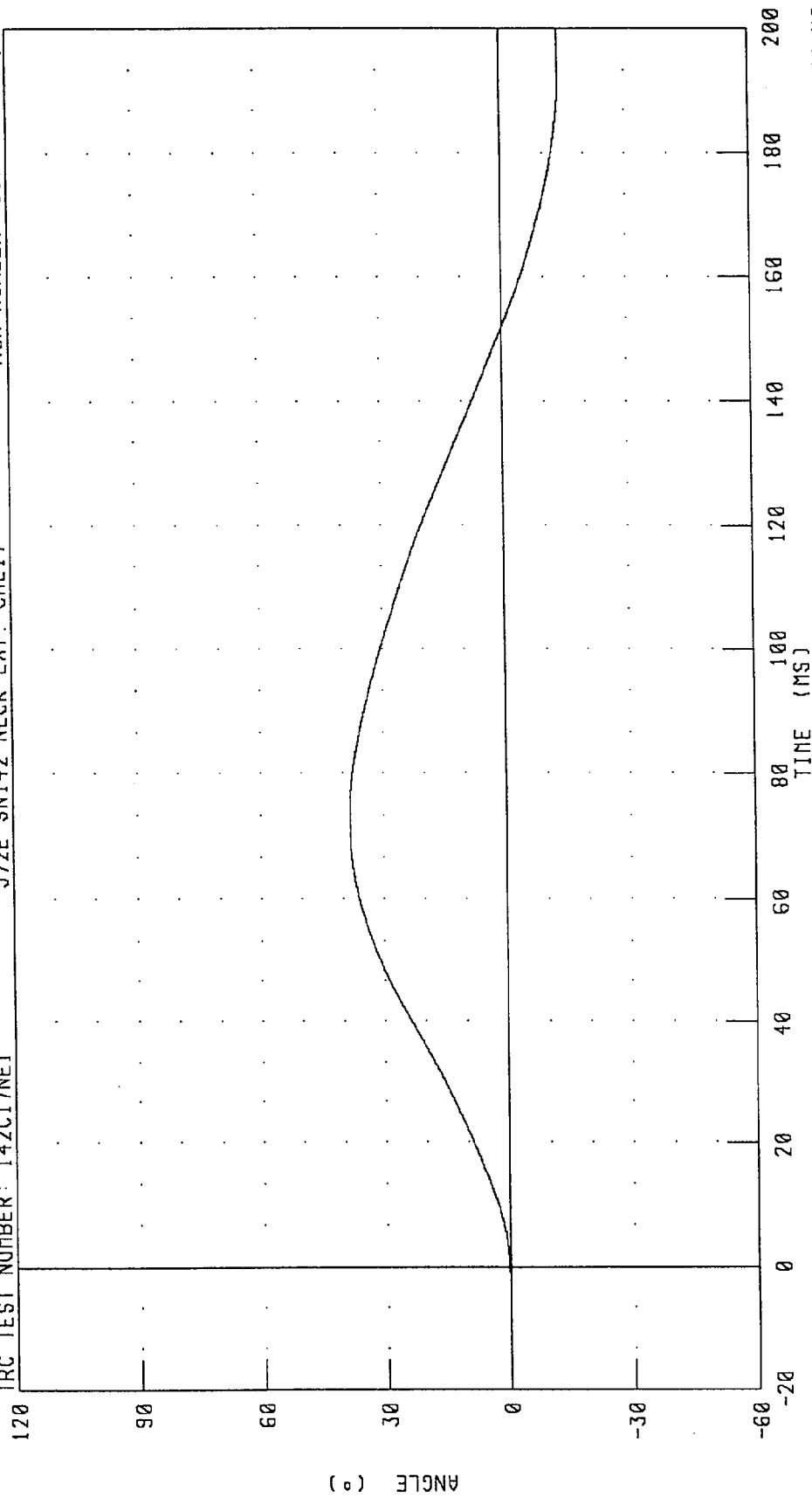
CHANNEL: PENXG FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



PEAK DATA: 38.26 ° @ 72.50 MS; -14.04 ° @ 195.00 MS

CHANNEL: BETA FILTER: CH. CLASS 60

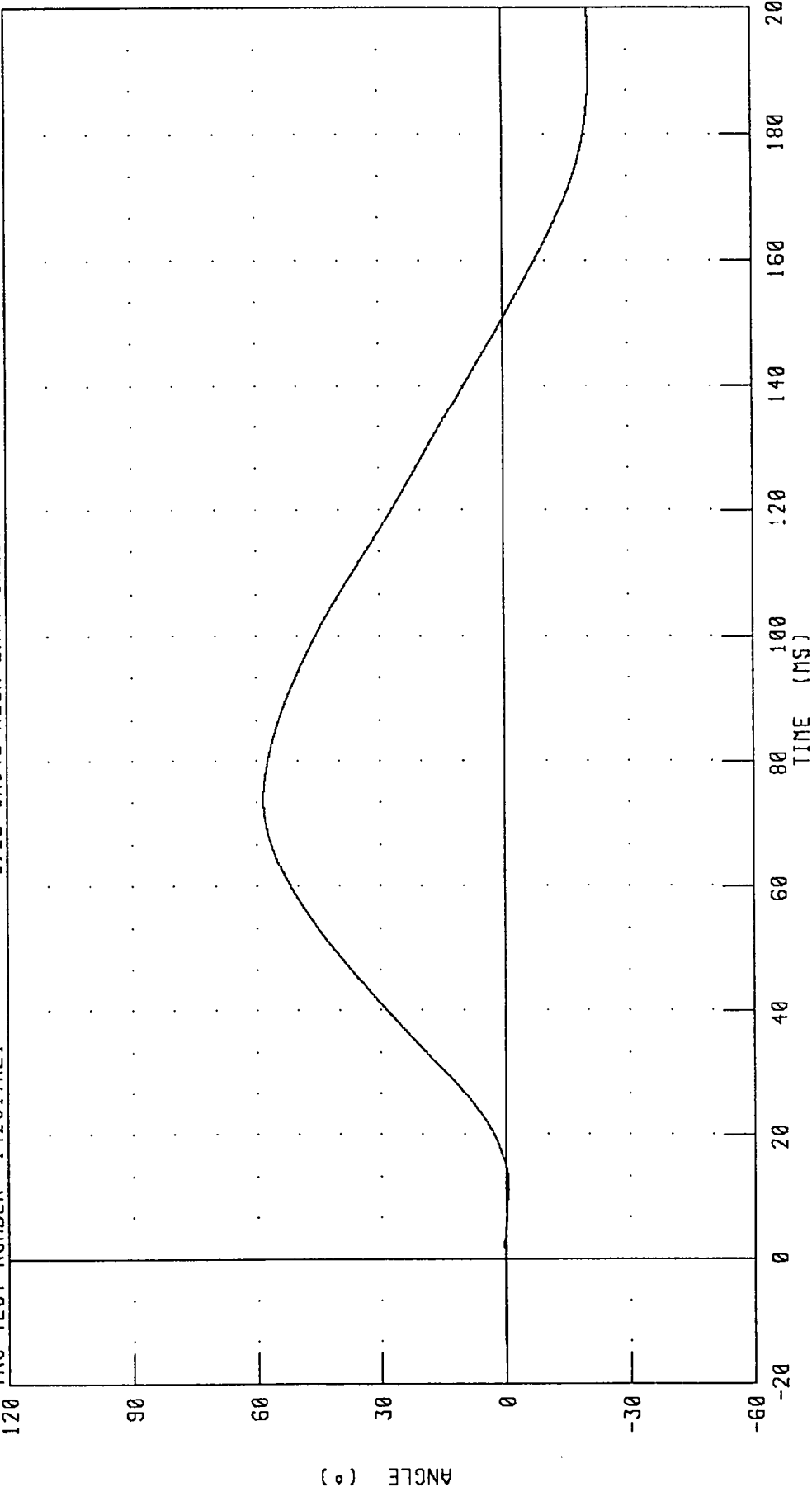
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 58.41 ° @ 73.88 MS; -20.76 ° @ 195.88 MS

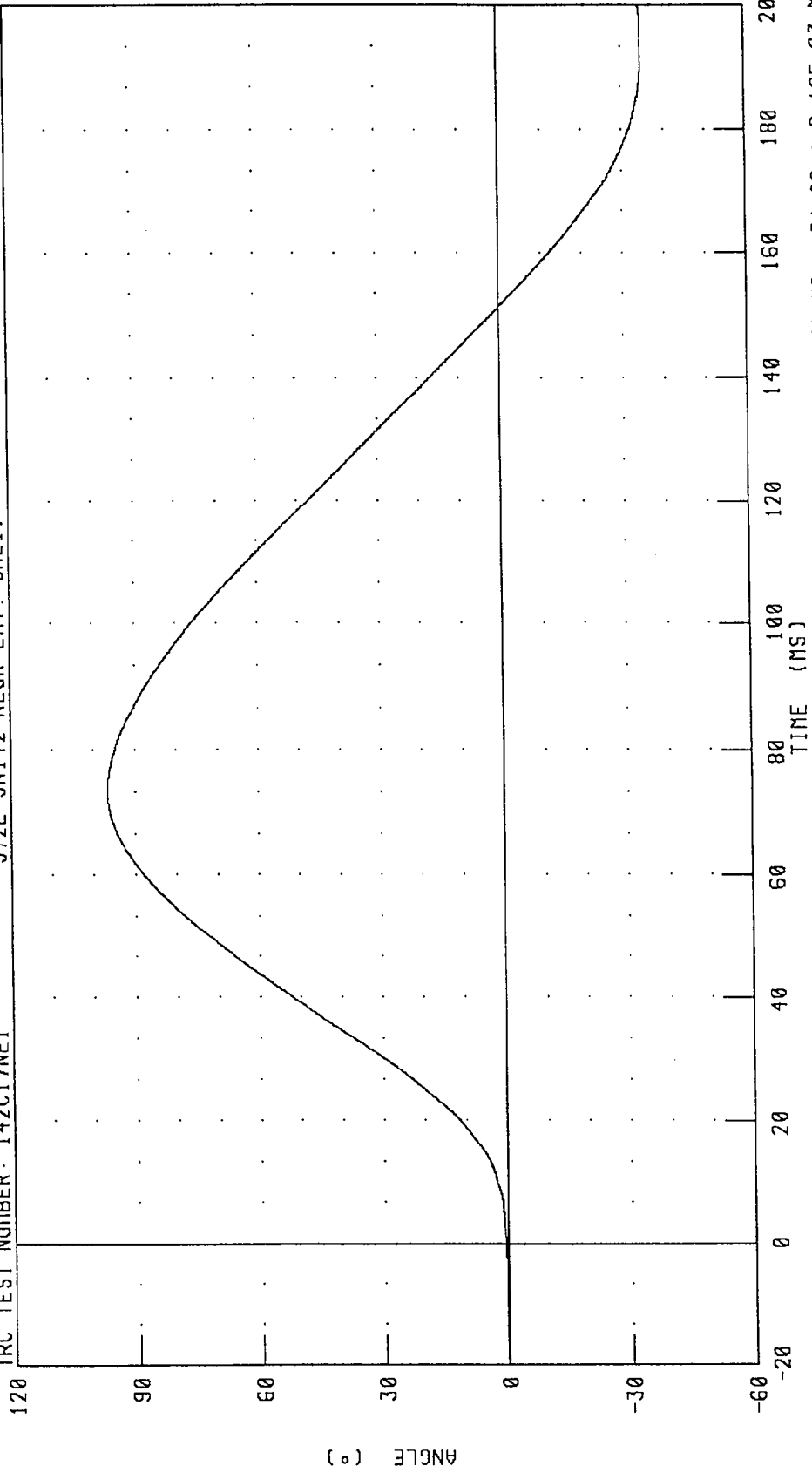
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



PEAK DATA: 96.65 ° @ 73.50 MS; -34.80 ° @ 195.63 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

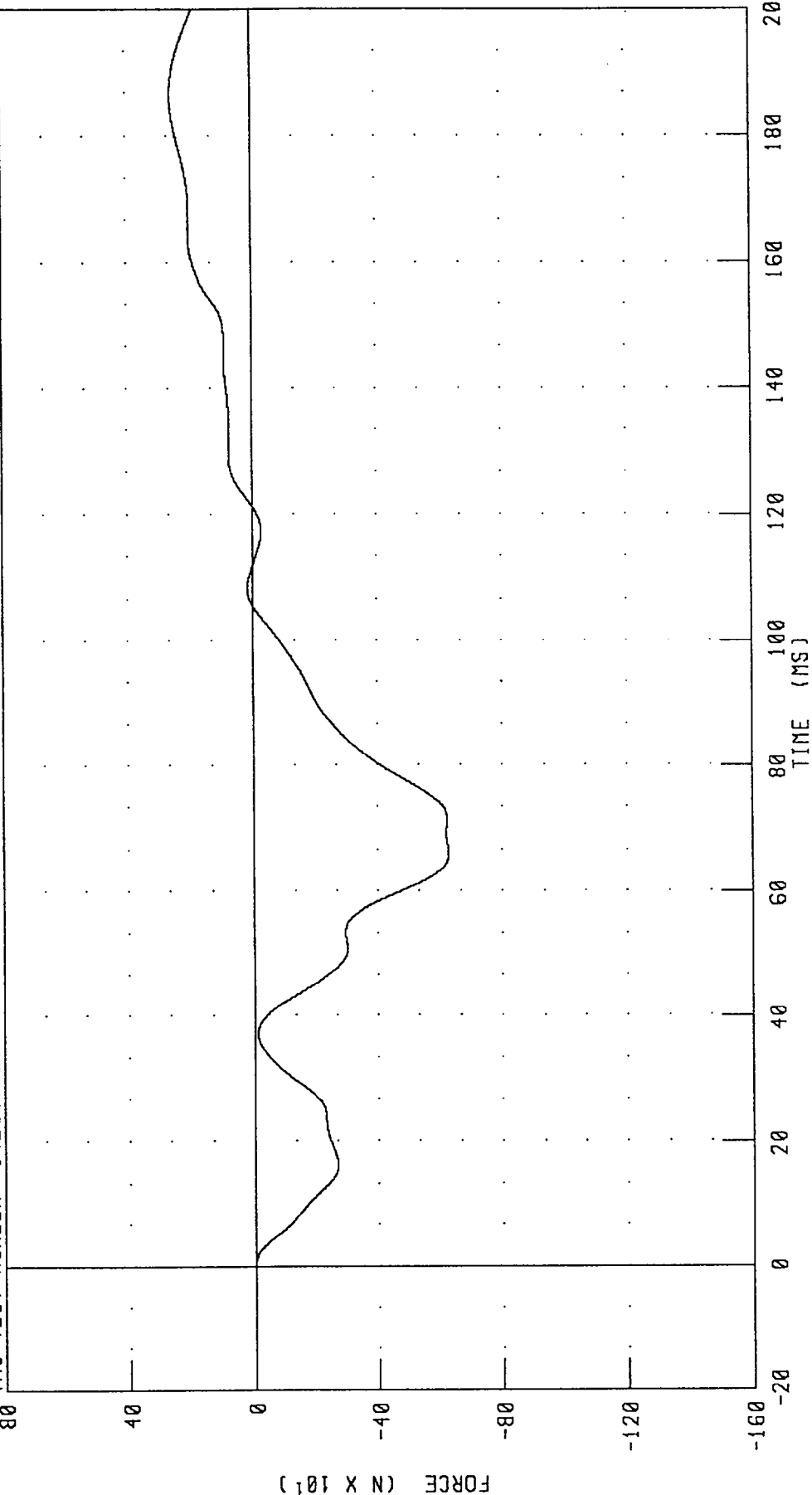
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 256.12 N @ 186.38 MS; -628.21 N @ 66.00 MS

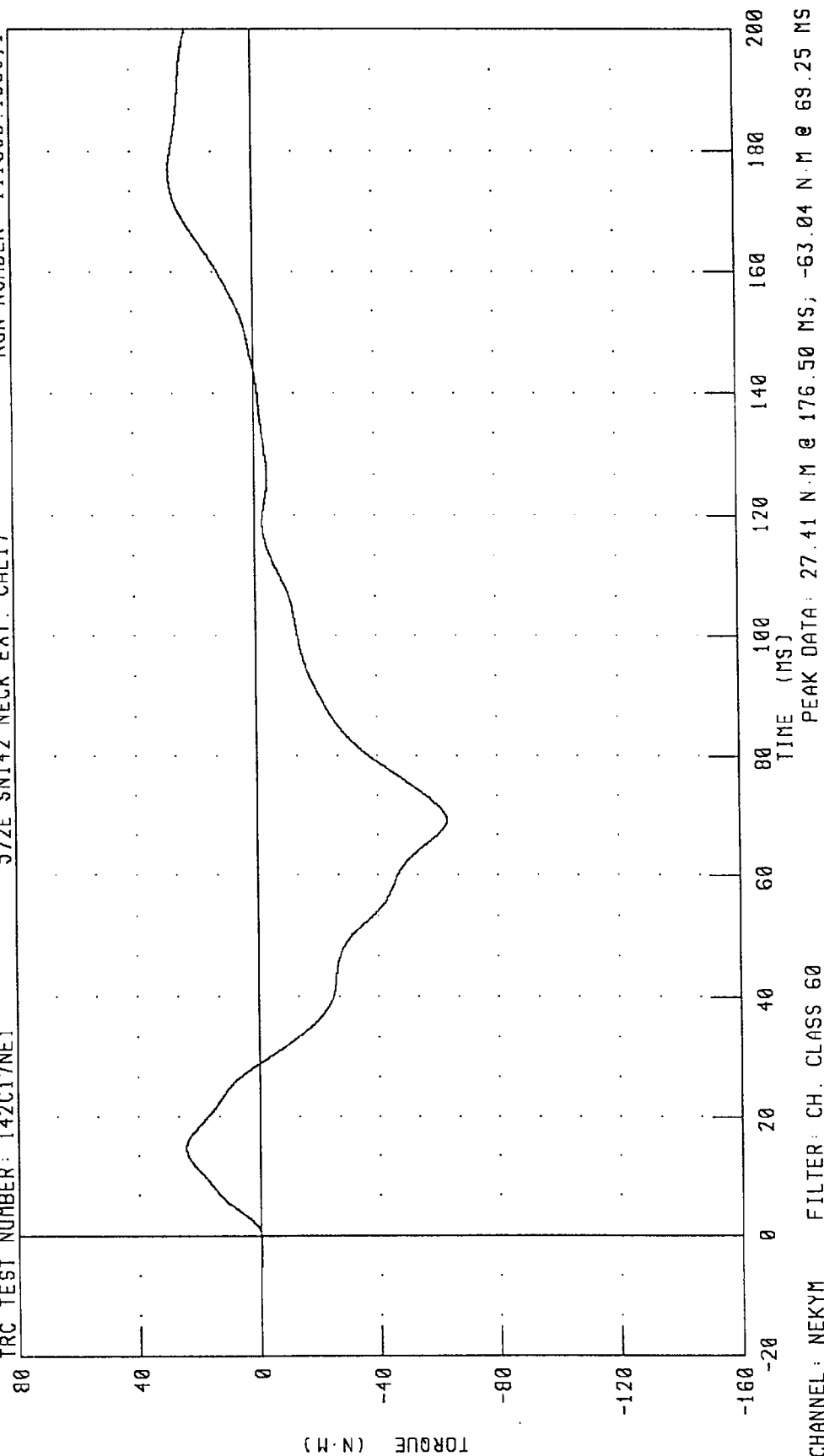
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



CHANNEL: NEKYM FILTER: CH. CLASS 60

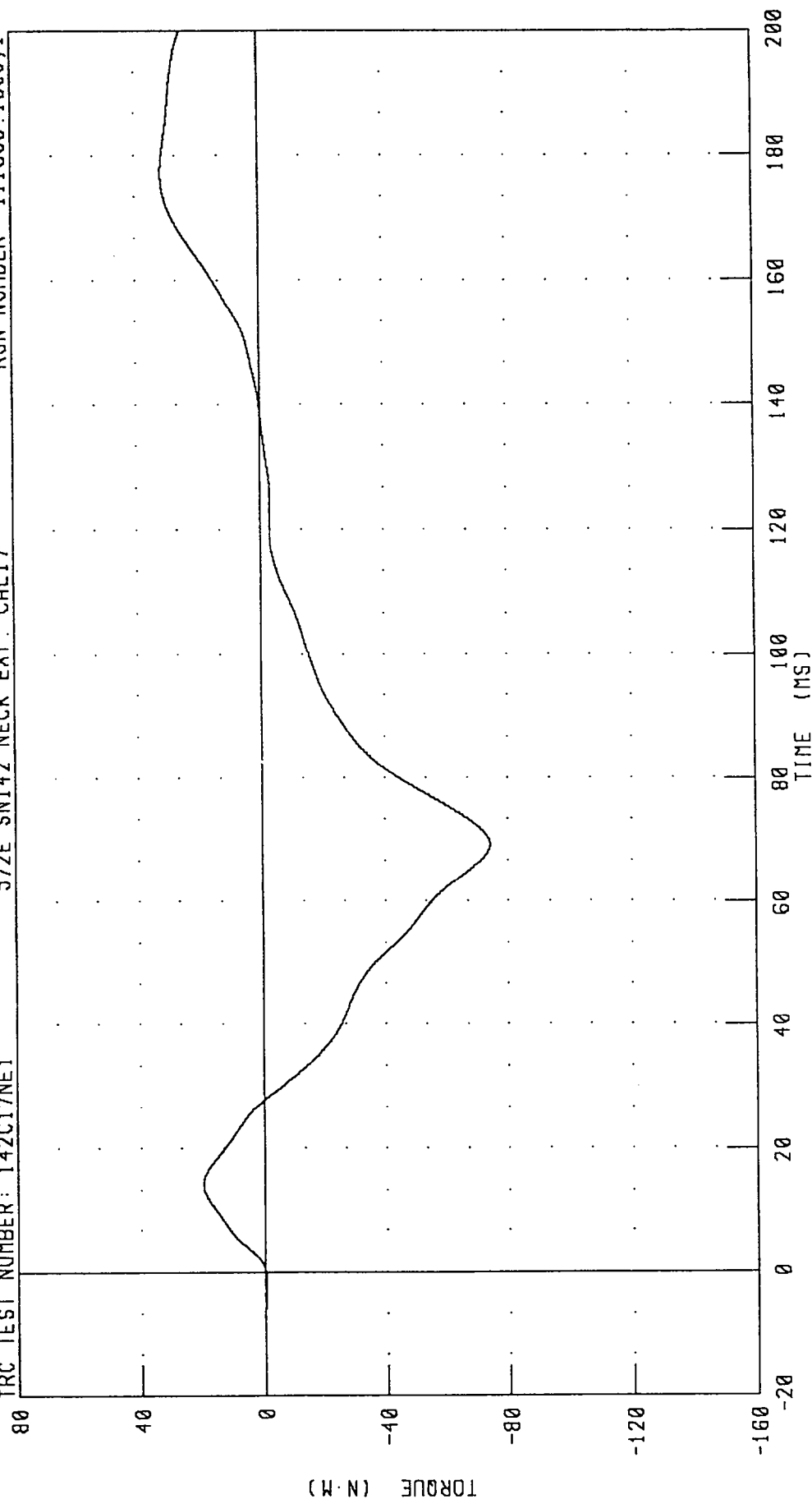
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C17NE1

572E SN142 NECK EXT. CAL17

RUN NUMBER: 111593.1533;1



PEAK DATA: 31.37 N·M @ 177.13 MS; -74.08 N·M @ 69.25 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

21-OCT-93

TRC

142C17TH1

572E SN142 H.S.THORAX CAL17

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	51.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	70.8 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5351. N
INTERNAL HYSTERESIS	69% - 85%	74.2%

TEST MEETS SPECIFICATIONS

TECHNICIAN *Ruth Fox*

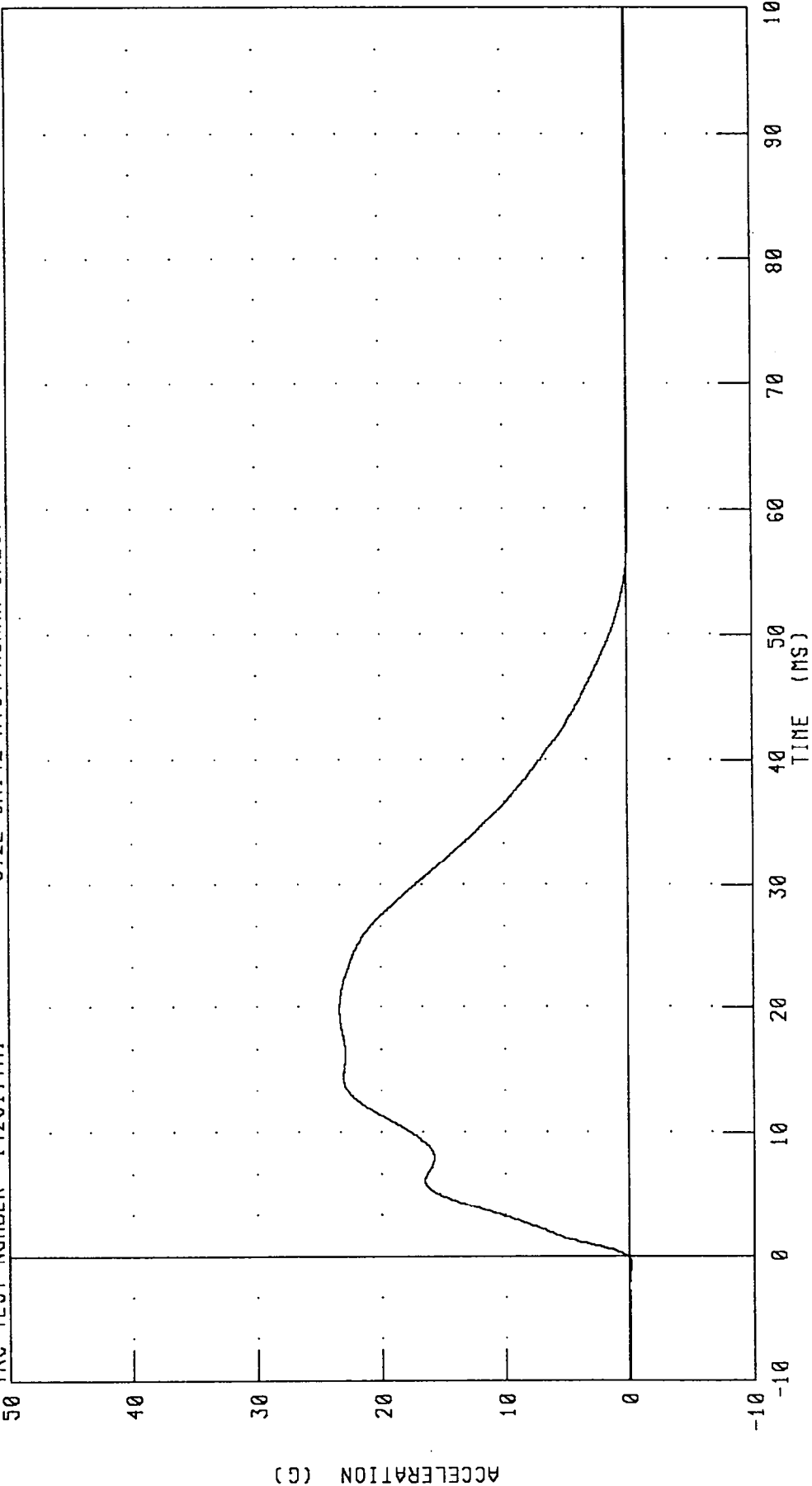
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C17TH1

572E SN142 H.S. THORAX CAL17

RUN NUMBER: 111593.1533;1



PEAK DATA: 23.36 G @ 19.75 MS; -0.17 G @ -0.63 MS

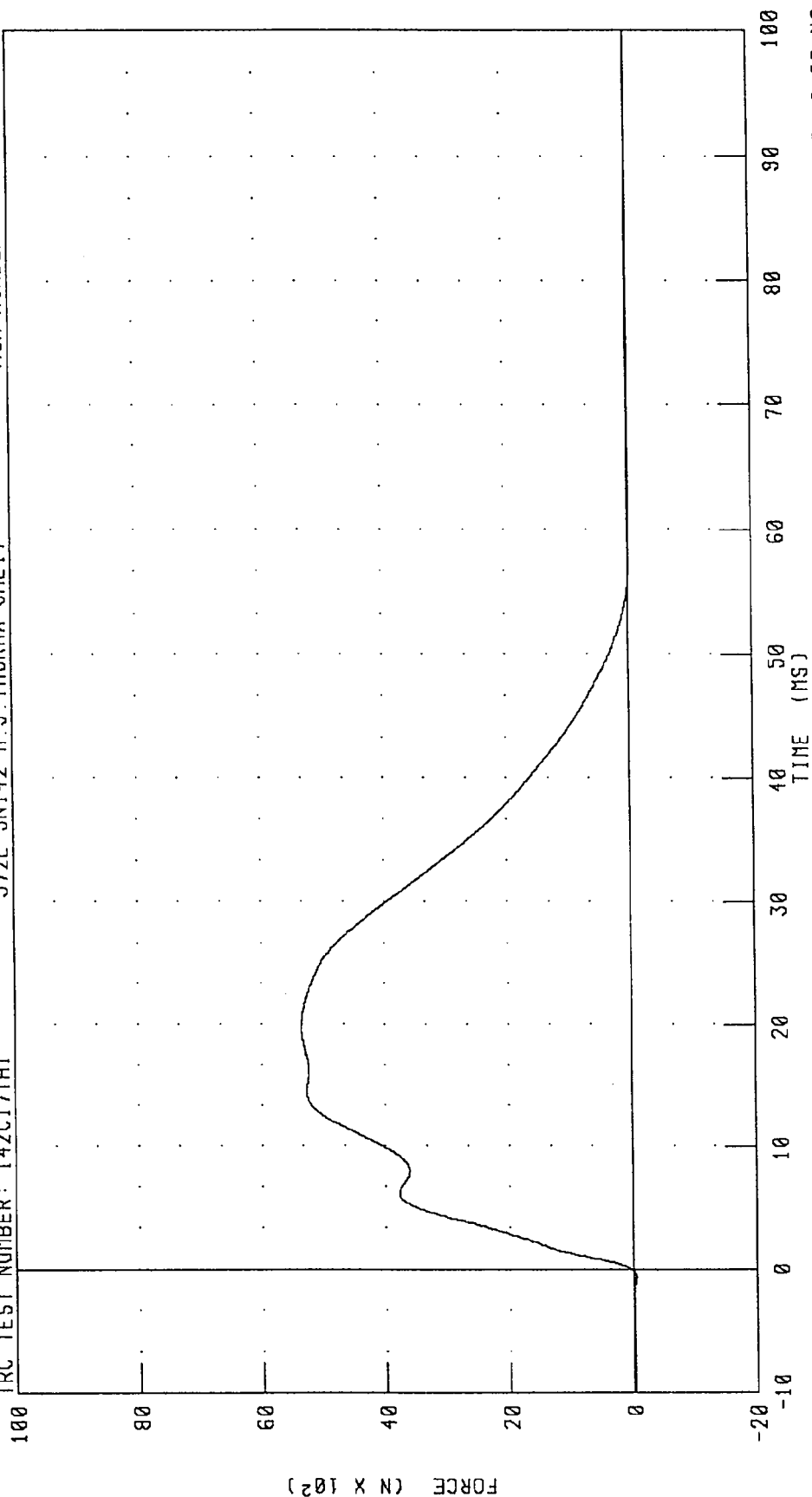
CHANNEL: PENXG FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 142C17TH1

572E SN142 H.S. THORAX CAL17

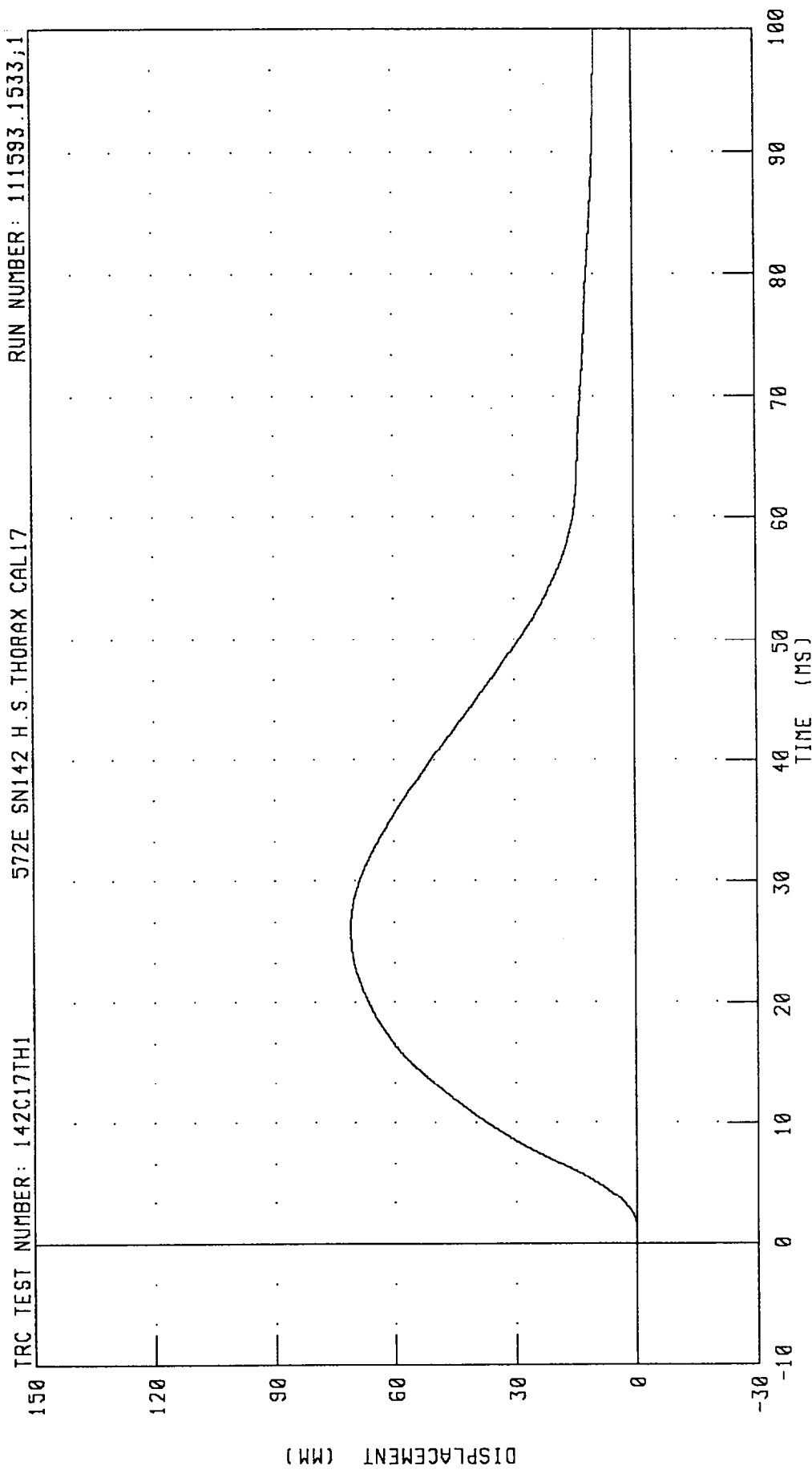
RUN NUMBER: 111593.1533;1



PEAK DATA: 5351.39 N @ 19.75 MS; -39.84 N @ -0.63 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
 STERNUM DISPLACEMENT



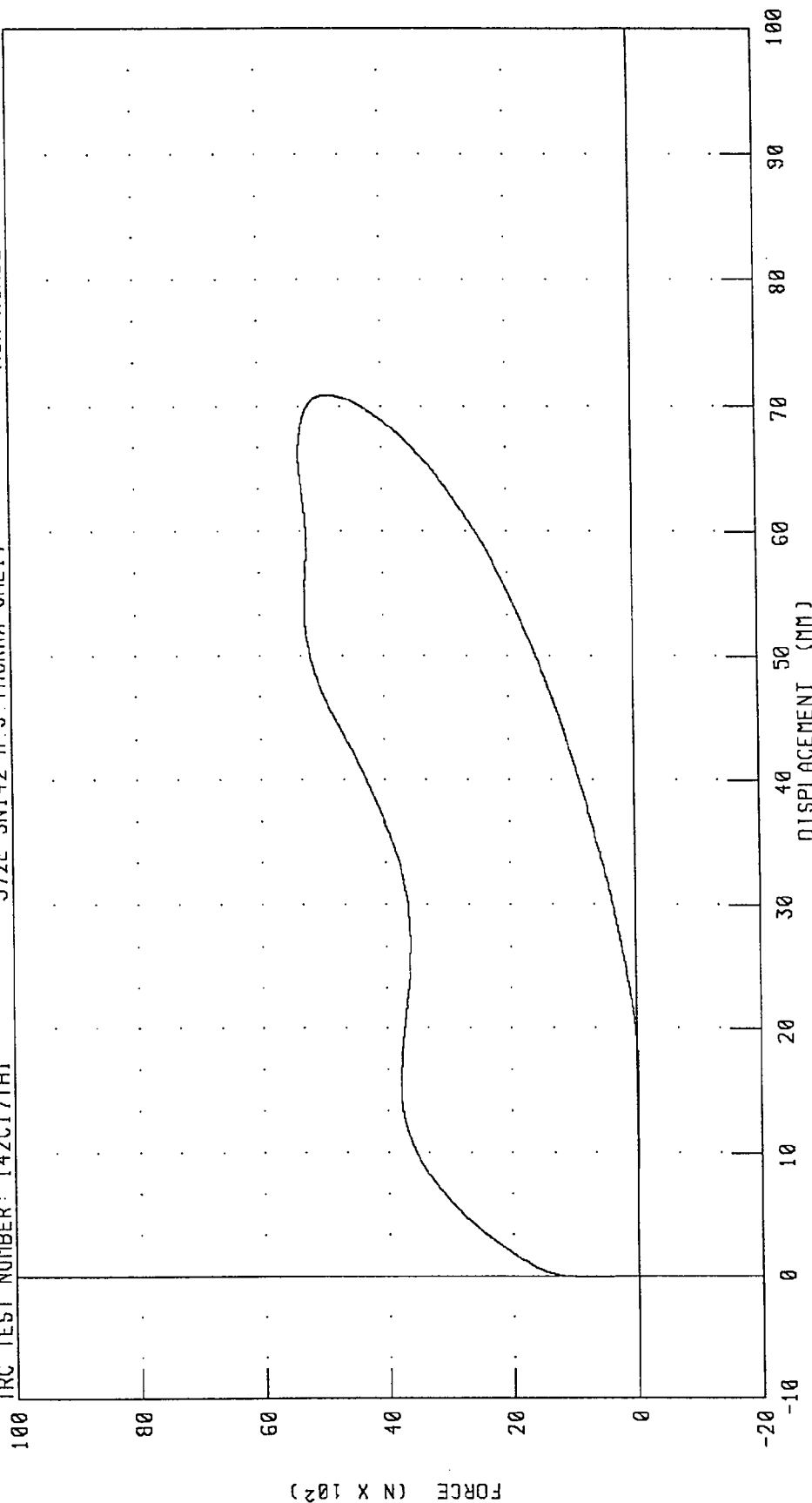
CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 70.89 MM @ 26.13 MS; -0.05 MM @ 1.00 MS

PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 142C17TH1

572E SN142 H.S. THORAX CAL17

RUN NUMBER: 111593.1533.1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA:

70.89 MM @ 26.13 MS; -0.05 MM @ 1.00 MS
5351.39 N @ 19.75 MS; -39.84 N @ -0.63 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

25-OCT-93

TRC

142C17RK1

572E SN142 RIGHT KNEE CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	45.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5482.0 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

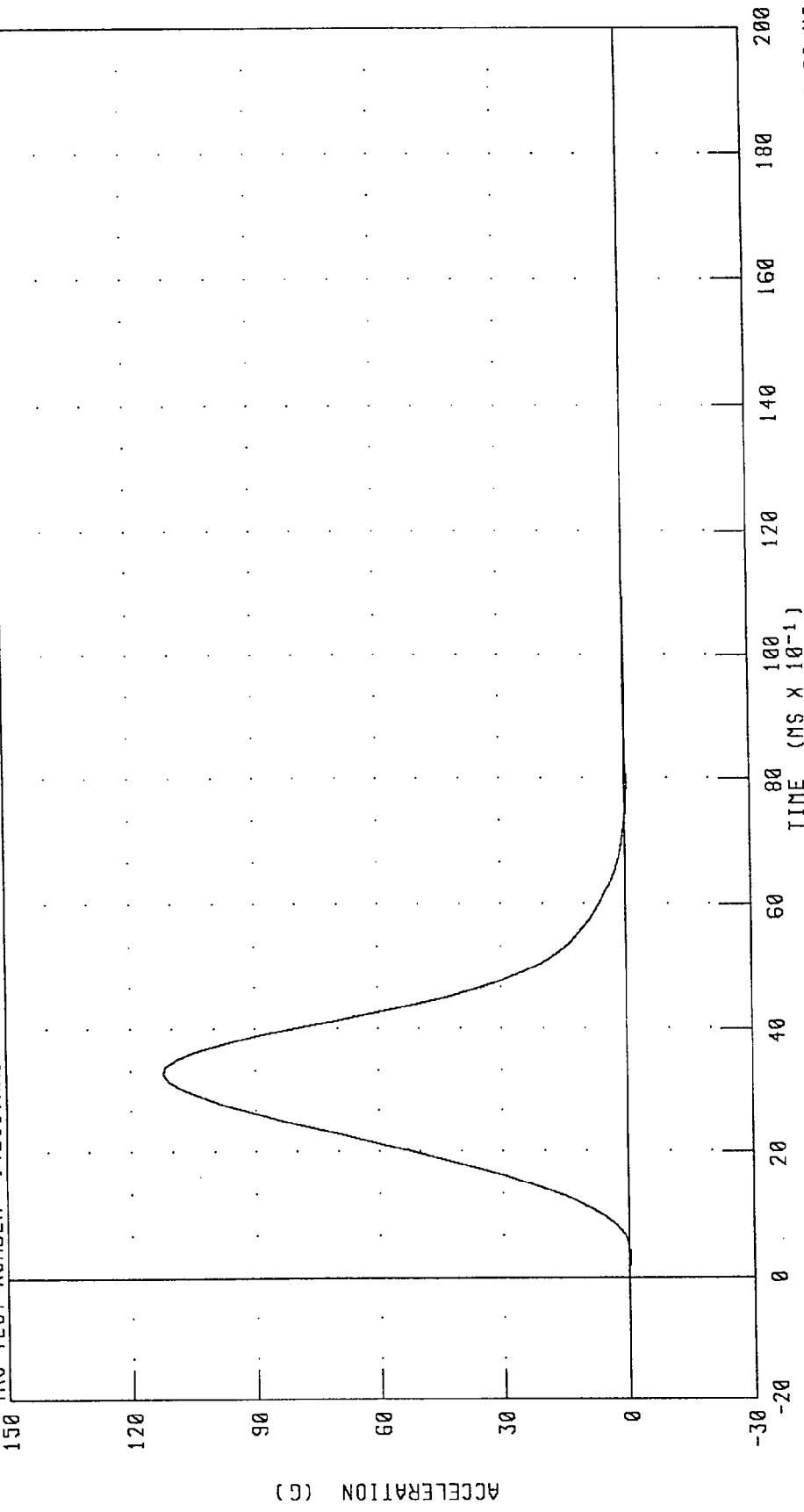
Pete Fort

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 142C17RK1

572E SN142 RIGHT KNEE CAL 17

RUN NUMBER: 111593.1533;1



PEAK DATA: 112.04 G @ 3.25 MS; -0.31 G @ 8.00 MS

CHANNEL: PENXC FILTER: CH. CLASS 600

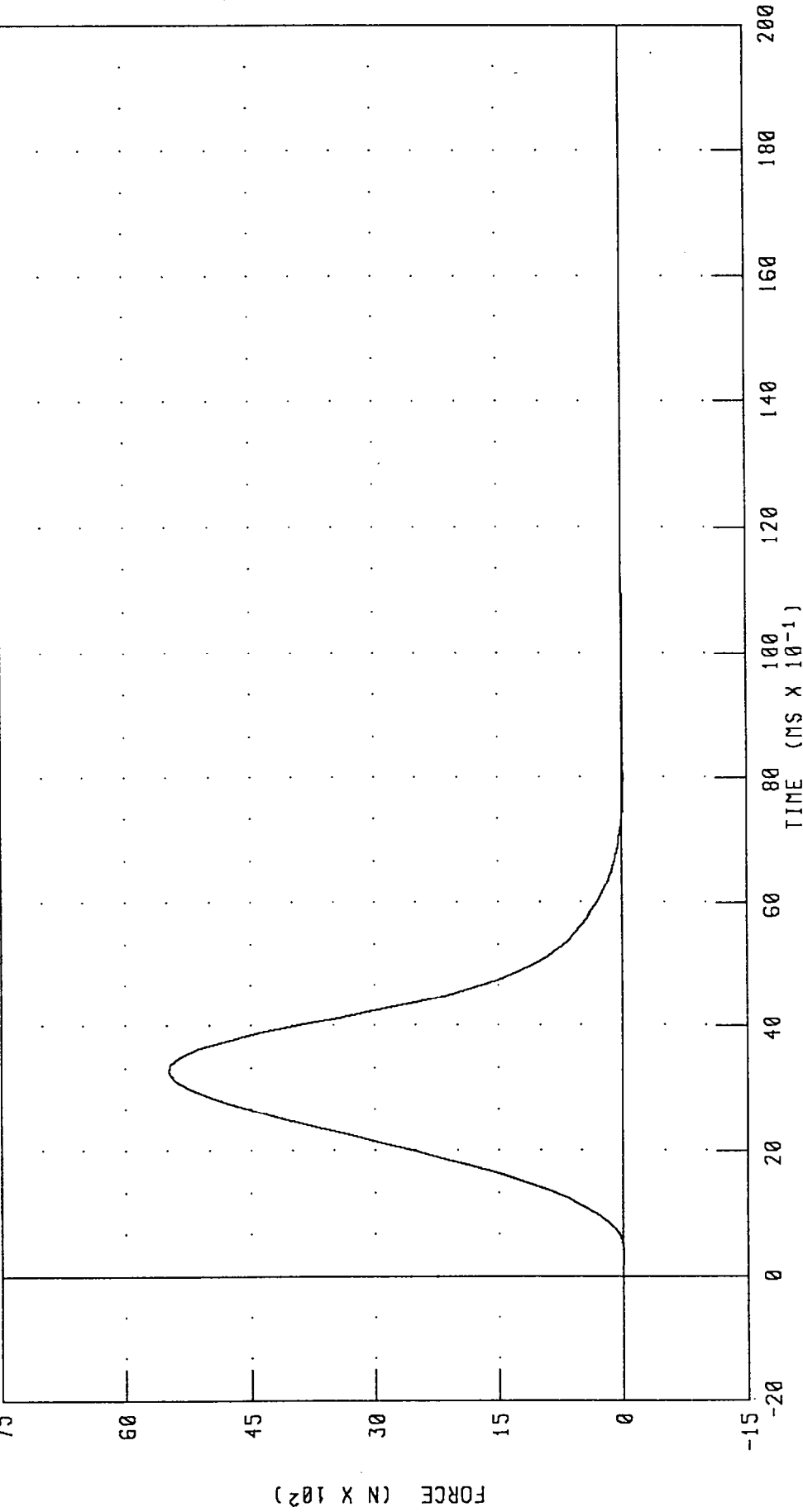
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C17RK1

572E SN142 RIGHT KNEE CAL 17

RUN NUMBER: 111593.1533;1



PEAK DATA: 5482.02 N @ 3.25 MS; -15.30 N @ 8.00 MS

FILTER: CH. CLASS 600

CHANNEL: PENXF

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

25-OCT-93

TRC

142C17LK1

572E SN142 LEFT KNEE CAL 17

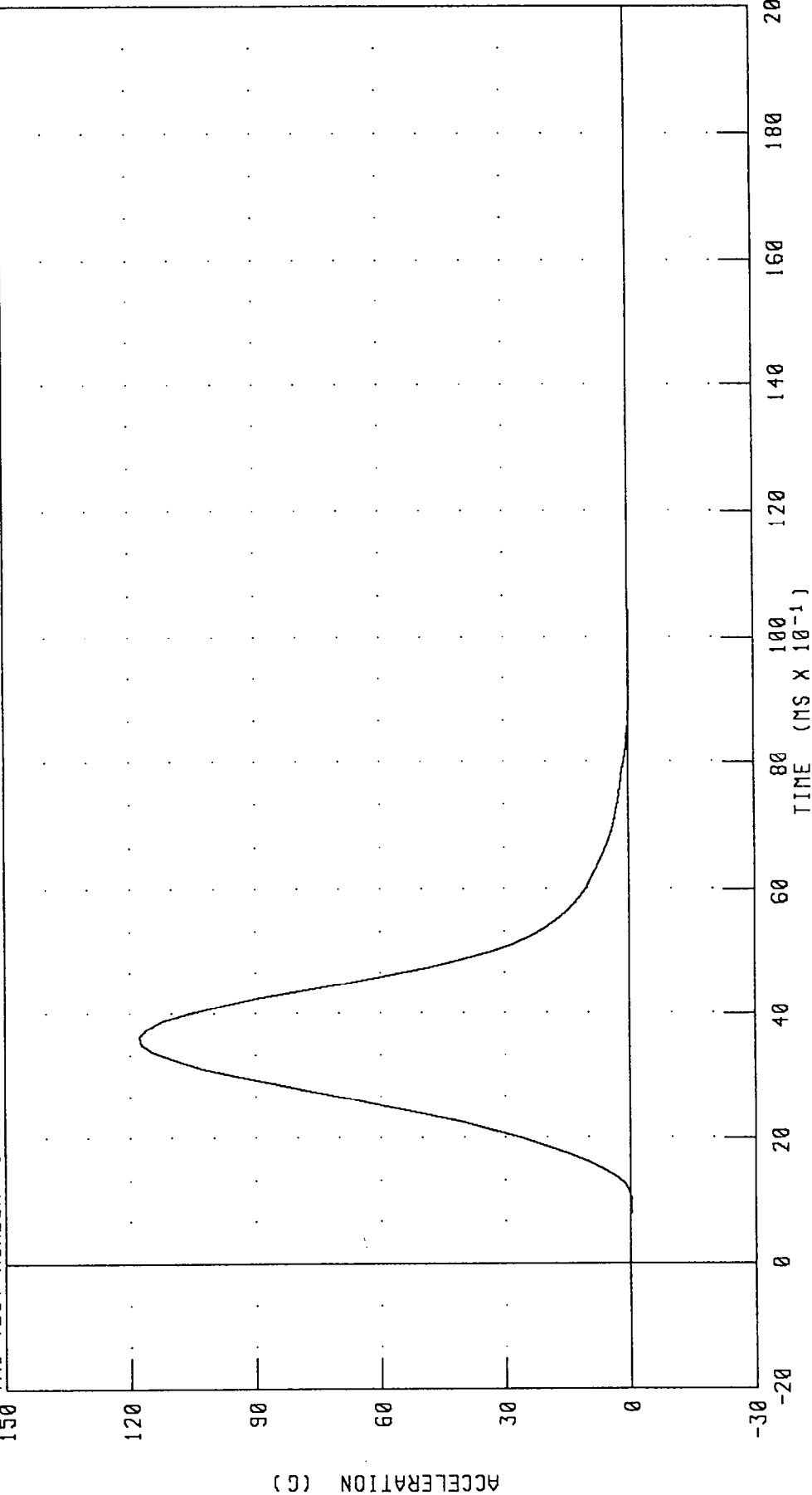
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	45.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5754.4 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete F. S.

PART 572-E HYBRID III LEFT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 142C17LK1 572E SN142 LEFT KNEE CAL 17 RUN NUMBER: 111593.1533;1



PEAK DATA: 117.61 G @ 3.63 MS; -0.19 G @ 1.00 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

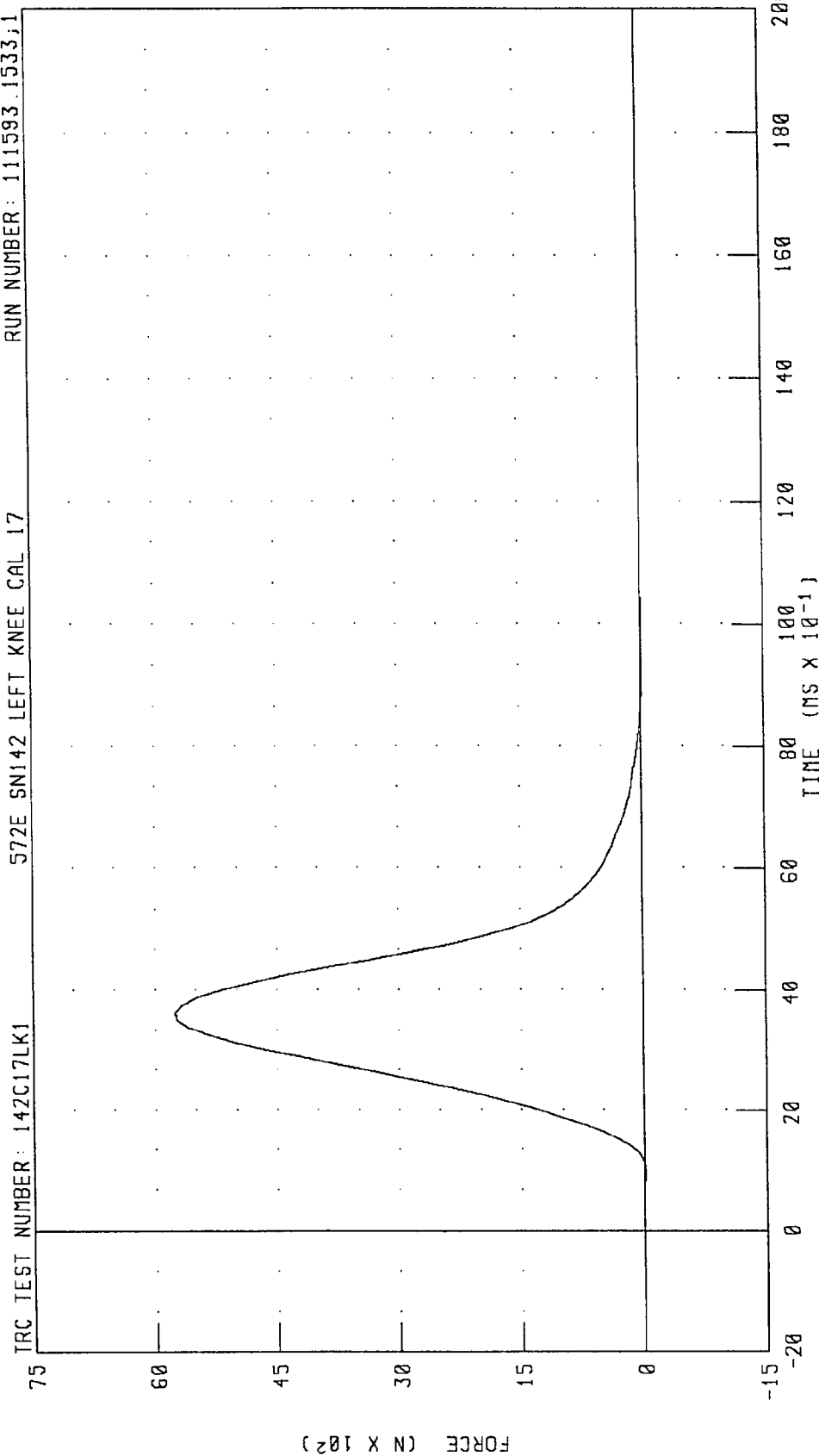
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C17LK1

572E SN142 LEFT KNEE CAL 17

RUN NUMBER: 111593.1533;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5754.48 N @ 3.63 MS; -9.14 N @ 1.00 MS

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #192

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	AAL82	7264	ENDEVCO	09/14/93	03/14/94
Y-AXIS ACCEL.	A84JJ	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	A62JJ	7264	ENDEVCO	09/14/93	03/14/94
CHEST X-AXIS ACCEL.	ACCJO	7264	ENDEVCO	09/14/93	03/14/94
Y-AXIS ACCEL.	AC708	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	CW59H	7264	ENDEVCO	09/14/93	03/14/94
LEFT FEMUR FORCE LOAD CELL	986	2430	GSE	09/23/93	03/23/94
RIGHT FEMUR FORCE LOAD CELL	987	2430	GSE	09/23/93	03/23/94
*NECK X-AXIS FORCE LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
Y-AXIS FORCE LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
X-AXIS FORCE LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
*NECK MOMENT ABOUT X-AXIS LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Y-AXIS LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Z-AXIS LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
*CHEST DEFLECTION POTENTIOMETER	87313-96	81422A	VERNITECH	09/24/93	03/24/94
LAP BELT FORCE LOAD CELL	616	3419	LEBOW	08/24/93	02/24/94
SHOULDER BELT FORCE LOAD CELL	610	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A51809	PT-101-40A	CELESCO	09/23/93	03/23/94
SHOULDER BELT STRETCH POTENTIOMETER	2690	2051414101	BOURNES	09/23/93	03/23/94

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

RIGHT FRONT PASSENGER DUMMY #142

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	FH25J	7264	ENDEVCO	09/24/93	03/24/94
Y-AXIS ACCEL.	CY32H	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	AC8K2	7264	ENDEVCO	09/14/93	03/14/94
CHEST X-AXIS ACCEL.	DR49J7	7264	ENDEVCO	09/14/93	03/14/94
Y-AXIS ACCEL.	AC8W6	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	CW42H	7264	ENDEVCO	09/14/93	03/14/94
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	09/23/93	03/23/94
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	09/23/93	03/23/94
*NECK X-AXIS FORCE LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
Y-AXIS FORCE LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
Z-AXIS FORCE LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
*NECK MOMENT ABOUT X-AXIS LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Y-AXIS LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Z-AXIS LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
*CHEST DEFLECTION POTENTIOMETER	90320B	81422A	VERNITECH	09/22/93	03/22/94
LAP BELT FORCE LOAD CELL	673	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT FORCE LOAD CELL	236	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A02465	PT-101-50A	CELESCO	09/23/93	03/23/94
SHOULDER BELT STRETCH POTENTIOMETER	1291	2051414101	BOURNES	09/23/93	03/23/94

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
LEFT REAR SEAT CROSSMEMBER X-AXIS	CW63H	7264	ENDEVCO	07/06/93	01/06/94
LEFT REAR SEAT CROSSMEMBER X-AXIS REDUN	CR26H	7264	ENDEVCO	09/01/93	03/01/94
RIGHT REAR SEAT CROSSMEMBER X-AXIS	BK96J	7264	ENDEVCO	07/06/93	01/06/94
RIGHT REAR SEAT CROSSMEMBER X-AXIS REDUN	BW77J	7264	ENDEVCO	07/22/93	01/22/94
ENGINE TOP X-AXIS	CM07H	7264	ENDEVCO	04/28/93	10/28/93
ENGINE BOTTOM X-AXIS	CK87H	7264	ENDEVCO	10/12/93	04/12/94
RIGHT BRAKE CALIPER X-AXIS	CF27H	7264	ENDEVCO	10/12/93	04/12/93
LEFT BRAKE CALIPER X-AXIS	CL83H	7264	ENDEVCO	10/12/93	04/12/94
INSTRUMENT PANEL CENTER X-AXIS	BM06J	7264	ENDEVCO	04/28/93	10/28/93

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
NECK BENDING PENDULUM ACCEL.	CB27	7232	ENDEVCO	10/04/93	04/04/94
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/06/93	04/06/94
THORAX/HYBRID II FEMUR PEND. ACCEL.	CC64	7232	ENDEVCO	10/06/93	04/06/94
LUMBAR FLEXION FORCE GAUGE	NA	DPH-50	CHATILLON	05/03/89	REPAIRED
LUMBAR FLEXION ROTATION GAUGE	CPI7-0601-1	7020	HUMPHREY	MFR. SPECIFICATION	
ABDOMEN COMPRESSION DISPL. GAUGE	4075-175	80294-2051941504	BOURNES	10/06/93	04/06/94
ABDOMEN COMPRESSION FORCE GAUGE	3443	3167	LEBOW	10/06/93	04/06/94
HYBRID III FEMUR PEND. ACCEL.	CG83	7232	ENDEVCO	10/06/93	04/06/94

— 2000 年 12 月 31 日 止 的 年 度 內 的 經 營 業 績 及 財 務 狀 況 。

ACCELEROMETERS: +X: FORWARD
 +Y: LEFTWARD
 +Z: UPWARD

<u>POTENTIOMETERS:</u>	+CHEST LONGITUDINAL DEFLECTION:	OUTWARD
	+CHEST LATERAL DEFLECTION:	LEFTWARD
	+SEAT BELT DISPLACEMENT:	OUTWARD
	+SEAT BELT EXTENSION:	ELONGATION
	+KNEE SLIDER DISPLACEMENT:	DISTANCE BETWEEN FEMUR
		AND TIBIA INCREASED
		(IN RELATION TO A
		SEATED DUMMY)

LOAD CELLS: +FEMUR FORCE: TENSION
+SEAT BELT FORCE: TENSION
+BARRIER FORCE: TENSION

NECK LOAD CELLS:

+X FORCE:	HEAD PUSHED FORWARD
+Y FORCE:	HEAD PUSHED LEFTWARD
+Z FORCE:	HEAD PULLED UPWARD (TENSION ON NECK)
+X MOMENT:	RIGHT EAR ROTATING TOWARD RIGHT SHOULDER
+Y MOMENT:	CHIN ROTATING TOWARD CHEST
+Z MOMENT:	CHIN ROTATING TOWARD LEFT SHOULDER

<u>TIBIA LOAD CELLS:</u>	+X FORCE:	TENSION
	+Y FORCE:	TENSION
	+Z FORCE:	TENSION
	+X MOMENT:	BOTTOM OF TIBIA MOVING LEFTWARD
	+Y MOMENT:	BOTTOM OF TIBIA MOVING REARWARD

FREQUENCY RESPONSE CLASSES

SAE J211 OCT88

TYPICAL TEST MEASUREMENTS

CHANNEL CLASS

Vehicle Structural Accelerations for use in:

Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180

Barrier Face Forces 60

Belt Restraint System Loads 60

Anthropomorphic Test Device

Head accelerations (linear and angular) 1000

Neck

Forces 1000

Moments 600

Thorax

Spine accelerations 180

Rib accelerations 1000

Sternum accelerations 1000

Deflections 180

Lumbar

Forces 1000

Moments 1000

Pelvis

Accelerations 1000

Forces 1000

Moments 1000

Femur/Knee/Tibia/Ankle

Forces 600

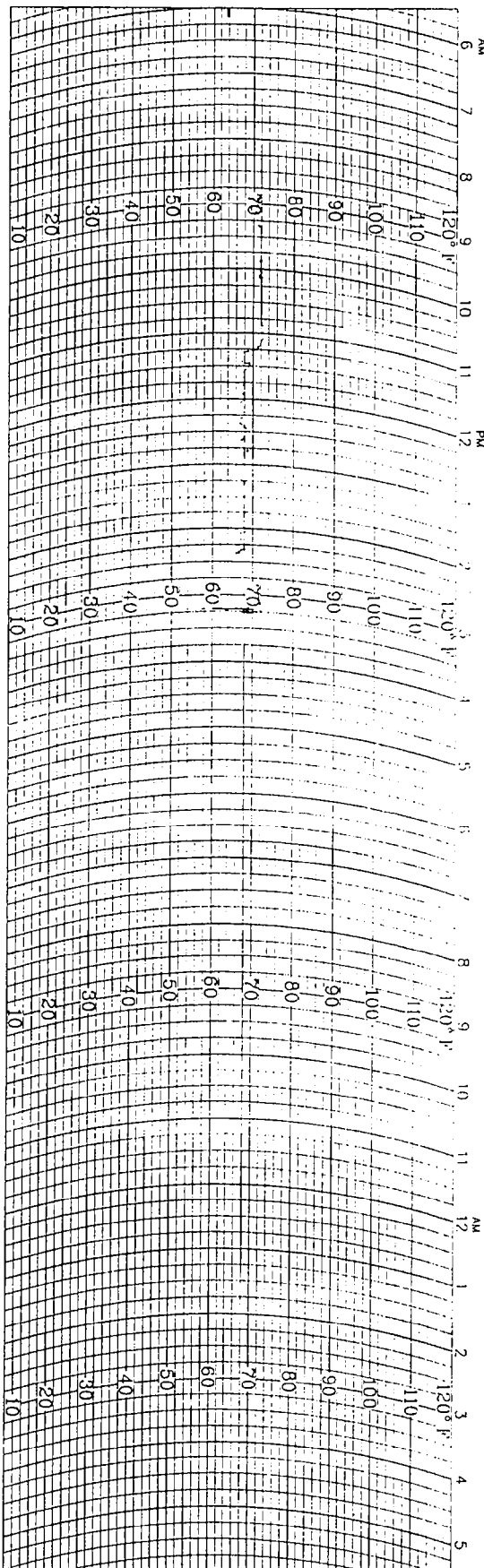
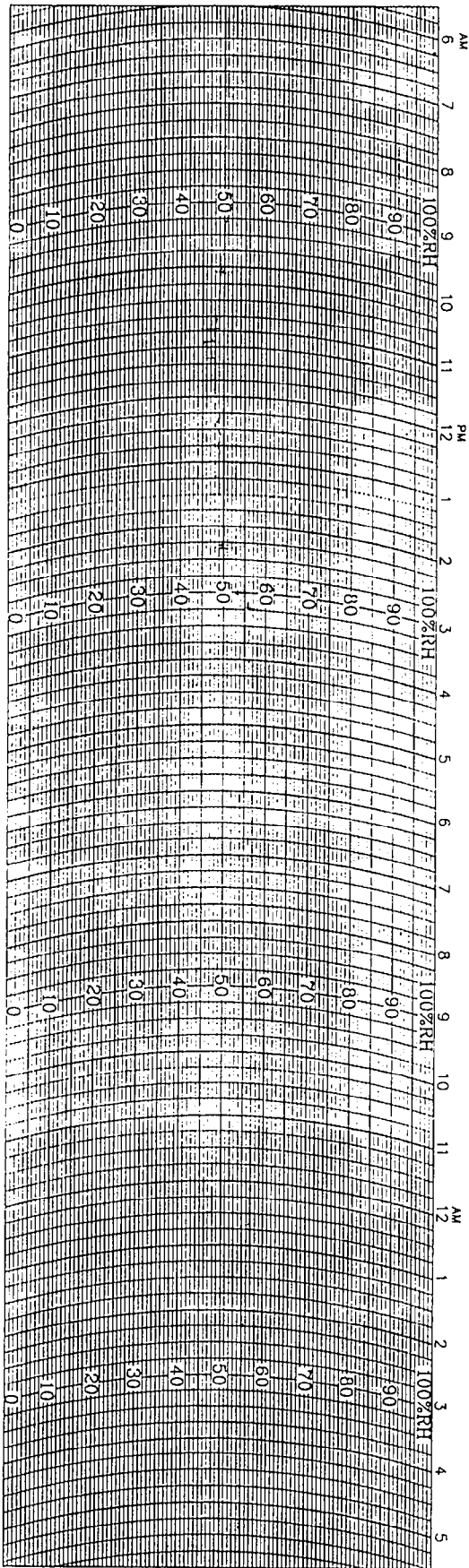
Moments 600

Displacements 180

Sled Accelerations 60

Steering Column Loads 600

Headform Accelerations 1000



WeatherMeasure
WEATHERtronics
 Division of QUALNETRICS, Inc.

P.O. BOX 41039
 SACRAMENTO, CA 95841
 PHONE: (916) 923-0055

HYGROTHERMOGRAPH
 1 DAY

CHART NO. M699123
 C311-D-HF
 ECN 2717
 6-9-87

STATION _____ DATE ON _____ DATE OFF _____

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

SEAT BELTS

Seat belt precautions

Lexus recommends that the driver and passengers in the vehicle be properly restrained at all times with the seat belts provided. Failure to do so could increase the chance of injury and/or the severity of injury in accidents.

Baby or small child. Use a child restraint system which fits your vehicle. See "Child restraint" for details.

Child. If a child is too large for a child restraint system, the child should sit in the rear seat and must be restrained using the vehicle's seat belts. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat. Do not allow the child to stand up or kneel on the seat. If the shoulder belt falls across the child's neck or face, move the child to the center position and use the center lap belt.

Pregnant woman. Lexus recommends the use of a seat belt. Ask your doctor for specific recommendations. The lap belt should be worn securely and as low as possible over the hips and not on the waist.

Injured person. Lexus recommends the use of a seat belt. Depending on the injury, however, first check with your doctor.

CAUTION:

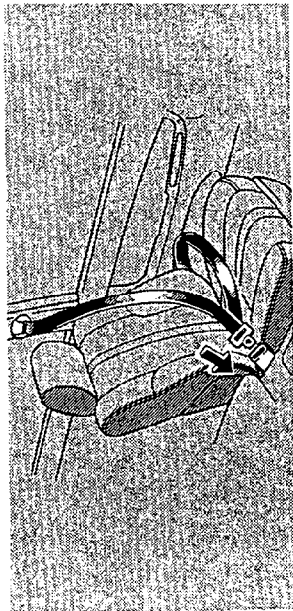
Persons should ride in their seats properly wearing their seat belts whenever the vehicle is moving. Otherwise, they are much more likely to suffer serious bodily injury in the event of sudden braking or a collision.

When using the seat belts, observe the following:

- Use the belt for only one person at a time. Do not use a single belt for two or more people – even children.
- Avoid reclining the seatbacks too much. The seat belts provide maximum protection when the seatbacks are in the upright position. (See "Adjusting seatback angle.")
- Be careful not to damage the belt webbing or hardware. Take care that they do not get caught or pinched in the seat or doors.
- Inspect the belt system periodically. Check for cuts, fraying, and loose parts. Damaged parts should be replaced. Do not disassemble or modify the system.
- Keep the belts clean and dry. If they need cleaning, use a mild soap solution or lukewarm water. Never use bleach, dye, or abrasive cleaners – they may severely weaken the belts.
- Replace the belt assembly if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.

COMFORT ADJUSTMENT

Front seat belts



Adjust the seat as needed and sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.

You will hear a click when the tab locks into the buckle.

The seat belt length automatically adjusts to your size and the seat position.

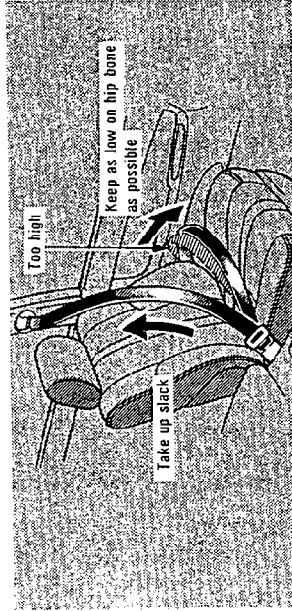
The retractor will lock the belt during a sudden stop or on impact. It also may lock if you lean forward too quickly. A slow, easy motion will allow the belt to extend, and you can move around freely.

When the passenger's shoulder belt is completely extended and is then retracted even slightly, the belt is locked in that position and cannot be extended. This feature is used to hold the child restraint system securely. (For details, see "Child restraint" on page 68.) To free the belt again, fully retract the belt and then pull the belt out once more.

If the seat belt cannot be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.

CAUTION:

After inserting the tab, make sure that the connection is secure and the belt is not twisted.



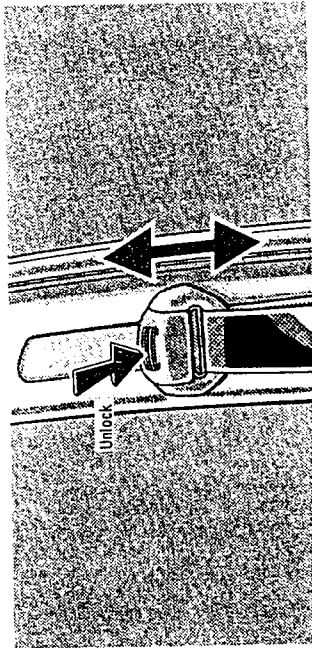
Adjust the position of the lap and shoulder belts.

Position the lap belt as low as possible on your hips – not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

CAUTION:

- High-positioned lap belts and loose-fitting shoulder belts both could increase the chance of injury due to sliding under the lap belt during an accident.
- For your safety, do not place the shoulder belt under your arm.

COMFORT ADJUSTMENT

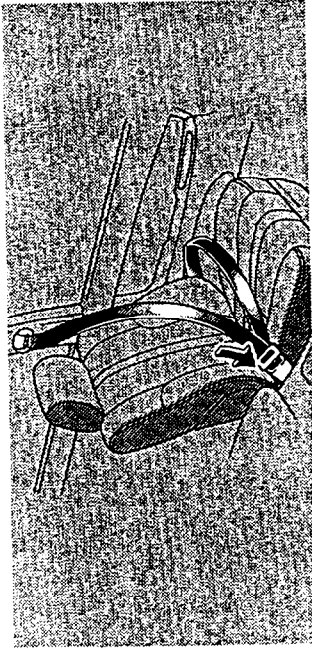


Adjust the shoulder anchor position to your size.

To raise the anchor position, push the anchor up. To lower the anchor position, push the lock release button and slide the anchor down. After the adjustment, make sure the anchor is locked in position.

CAUTION:

Always be sure that the belt is positioned across your shoulder, as close to your neck as possible; not on your upper arm or neck. Failure to do so could reduce the amount of protection in an accident and increase the chance of injury.

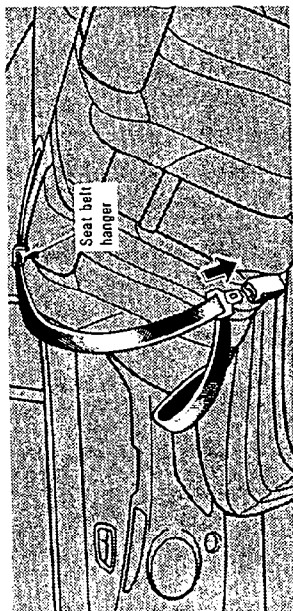


To release the belt, press the buckle release button and allow the belt to retract.

If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.

COMFORT ADJUSTMENT

Rear outside seat belts



Before you use the seat belt, make sure that it passes through the hanger. Sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.

You will hear a click when the tab locks into the buckle.

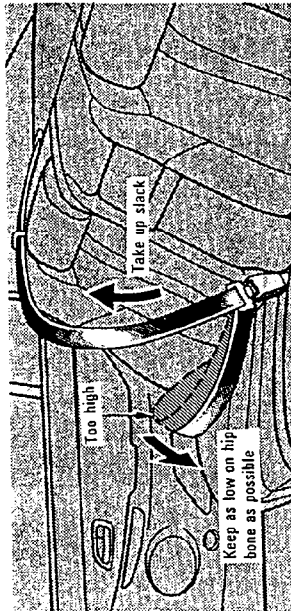
The seat belt length automatically adjusts to your size.

The retractor will lock the belt during a sudden stop or on impact. It also may lock if you lean forward too quickly. A slow, easy motion will allow the belt to extend, and you can move around freely. When the shoulder belt is completely extended and is then retracted even slightly, the belt is locked in that position and cannot be extended. This feature is used to hold the child restraint system securely. (For details, see "Child restraint" on page 68.)

To free the belt again, fully retract the belt and then pull the belt out once more.

If the seat belt cannot be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.

CAUTION:
After inserting the tab, make sure that the connection is secure and the belt is not twisted.



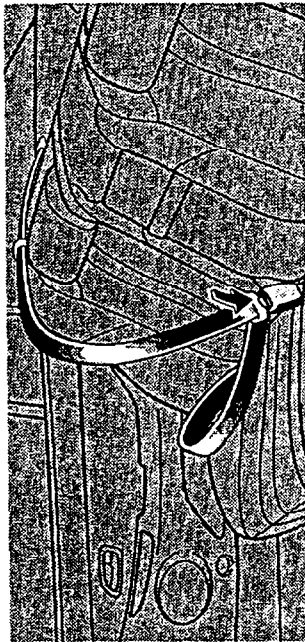
Adjust the position of the lap and shoulder belts.

Position the lap belt as low as possible on your hips – not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

COMFORT ADJUSTMENT

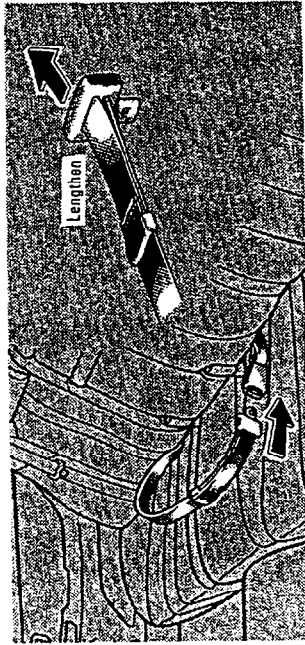
Rear center seat belt

- CAUTION:**
- High-positioned lap belts and loose-fitting shoulder belts both could increase the chance of injury due to sliding under the lap belt during an accident.
 - For your safety, do not place the shoulder belt under your arm.



To release the belt, press the buckle release button and allow the belt to retract.

If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure that it remains untwisted as it retracts.



Sit up straight and well back in the seat. To fasten your belt, insert the tab into the buckle.

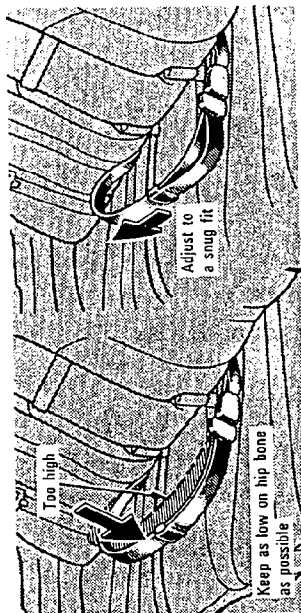
You will hear a click when the tab locks into the buckle.

If the belt is not long enough for you, hold the tab at a right angle to the belt and pull on the tab.

CAUTION:

After inserting the tab, make sure that the connection is secure and the belt is not twisted.

COMFORT ADJUSTMENT



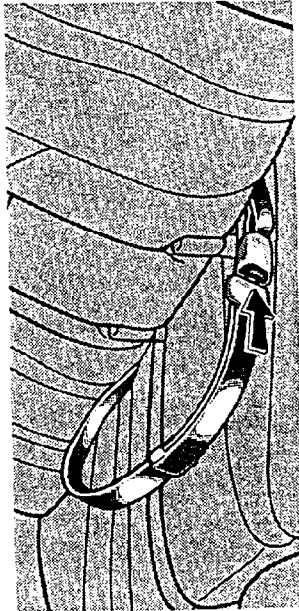
Remove excess length of the belt and adjust the belt position.

To shorten the belt, pull the free end of the belt.

Position the lap belt as low as possible on your hips – not on your waist, then adjust it to a snug fit.

CAUTION:

High-positioned lap belts could increase the chance of injury due to sliding under the lap belt during an accident.



To release the belt, press the buckle release button.

Seat belt extender

If your seat belt cannot be fastened securely because it is not long enough, a personalized seat belt extender is available from your Lexus dealer free of charge.

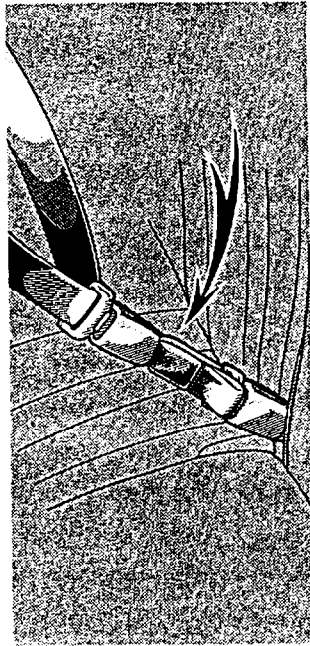
Please contact your local Lexus dealer so that the dealer can order the proper required length for the extender. Bring the heaviest coat you expect to wear for proper measurement and selection of length. Additional ordering information is available at your Lexus dealer.

CAUTION:

When using the seat belt extender, observe the following. Failure to follow these instructions could result in less effectiveness of the seat belt restraint system in case of vehicle accident, increasing the chance of personal injury.

COMFORT ADJUSTMENT

- Never use the seat belt extender if you can fasten the seat belt without it.
- Remember that the extender provided for you may not be safe when used on a different vehicle, or for another person or at a different seating position than the one originally intended for.



To connect the extender to the seat belt, insert the tab into the seat belt buckle so that the "PRESS" signs on the buckle release buttons of the extender and the seat belt are both facing outward as shown.

You will hear a click when the tab locks into the buckle.

When releasing the seat belt, press on the buckle release button on the extender, not on the seat belt. This helps prevent damage to the vehicle interior and extender itself.

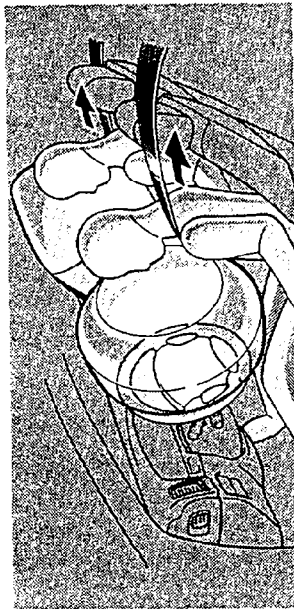
When not in use, remove the extender and store in the vehicle for future use.

CAUTION:
After inserting the tab, make sure that the connection is secure and the seat belt extender is not twisted.

COMFORT ADJUSTMENT

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Supplemental Restraint System (SRS) consists of Airbags and Seat Belt Pretensioners. The combination of these two systems provides maximum protection to the driver and front passenger in a severe collision.



Airbags:

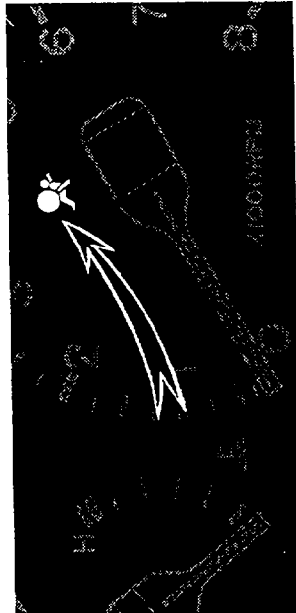
In response to a severe frontal impact, the airbags inflate and reduce the likelihood of the driver and passenger's heads from directly hitting the steering wheel and instrument panel.

Seat belt pretensioners:

In response to a severe frontal impact, the seat belts are quickly drawn back in by the retractors so that the belts snugly restrain the driver and front passenger.

The passenger airbag is activated together with the driver airbag, even with no passenger in the front seat.

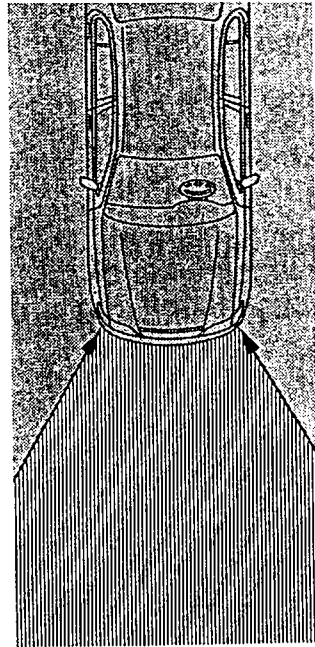
The seat belt pretensioners are activated together with the airbags, even with no passenger in the front seat.



This indicator comes on when the ignition key is turned to the "ACC" or "ON" position. It goes off after about 6 seconds. This means the SRS is operating properly.

The SRS warning light system monitors the front airbag sensors, center airbag sensor assembly, inflators, seat belt pretensioners, warning light, interconnecting wiring and power sources.

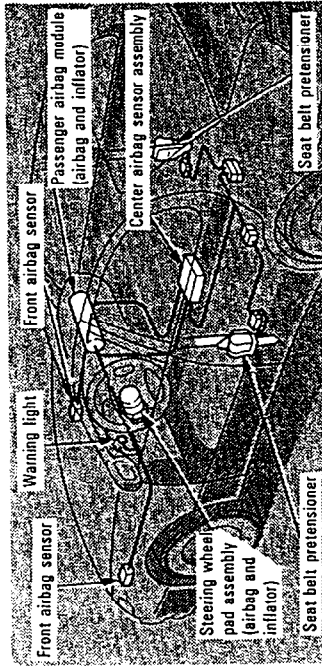
COMFORT ADJUSTMENT



The SRS is designed to activate in response to a severe frontal impact within the shaded area shown in the illustration.

The SRS does not work in the following cases.

- Impact from the side or rear
 - Vehicle overturn
 - Frontal collision at low speeds
- For your safety, be sure to always wear your seat belts.



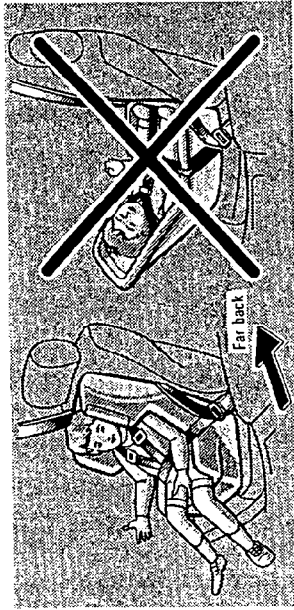
The center airbag sensor assembly consists of a safing sensor and center airbag sensor. In a severe frontal impact, a front airbag sensor and safing sensor, or center airbag sensor and safing sensor detect the shock, and the center airbag sensor assembly triggers the inflators and seat belt pretensioners. Then the inflators fill the airbags and the seat belts are quickly drawn back in by the retractors to help restrain forward motion of the occupants.

When the SRS operates, it produces an operating noise and releases a small amount of smoke-like gas. This gas is harmless and does not indicate a fire.

COMFORT ADJUSTMENT

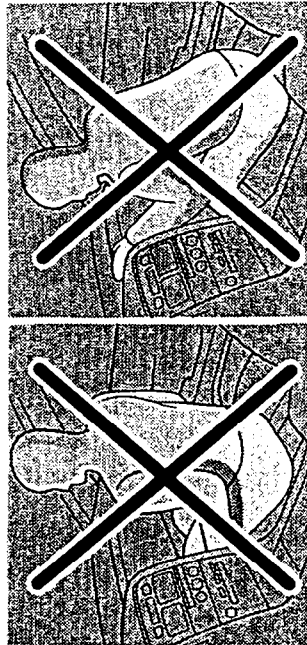
CAUTION:

- The SRS is designed only as a supplement to the conventional seat belt systems of the driver and front passenger. The front seat occupants are particularly susceptible to injury if they do not wear their seat belts; when sudden braking or a collision occurs, they may be thrown forward. To obtain maximum protection in an accident, the driver and all passengers in the vehicle should always wear their seat belts when driving. For instructions and precautions concerning the seat belt system, see "SEAT BELTS" on page 55.
- A baby or small child who is too small to use a seat belt should be properly secured in a rear seat using a child restraint system.

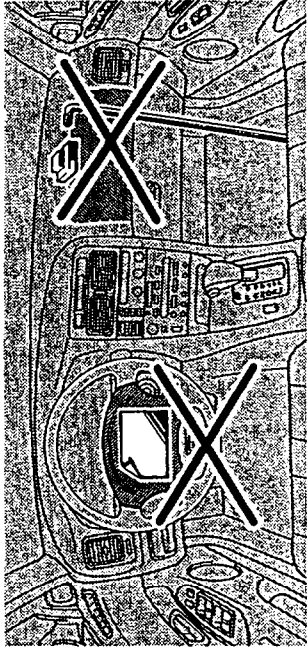


- Do not use a rear-facing child restraint system in the front seat because the force of the rapid inflation of the passenger airbag may cause severe injury to the child. When using a forward-facing child restraint system in the front seat, the seat must be moved as far back as possible. For instructions concerning the installation of a child restraint system, see "CHILD RESTRAINT" on page 68.

COMFORT ADJUSTMENT



- Do not sit on the edge of the seat or lean over the instrument panel when the vehicle is in use. The airbag inflates with considerable speed and force; you may be severely injured. Sit up straight and well back in the seat, and use your seat belt.



- Do not put objects on or in front of the instrument panel that houses the airbag system. They might restrict inflation or cause personal injury.
- Do not modify, remove or open any component or wiring, such as the steering wheel, column cover, front passenger airbag cover, front passenger airbag, center airbag sensor assembly, front airbag sensors, or seat belt assembly. Doing any of these may cause sudden SRS operation or disable the system, which could result in personal injury.

Failure to follow these instructions can result in severe injuries.

COMFORT ADJUSTMENT

NOTICE:

Do not perform any of the following changes without consulting your Lexus dealer. Such changes can interfere with proper operation of the SRS in some cases.

- Installation of electronic items such as a mobile two-way radio or cassette tape player.
- Modifications to the suspension system.
- Repairs made on or near the front fenders, front console, steering column, steering wheel or instrument panel near front passenger airbag or seat belt assembly.



This SRS has a warning light to indicate operating problems. If either of the following conditions occurs, this indicates a malfunction of the airbags and/or seat belt pretensioners. Even if the seat belt pretensioners should fail, the seat belt will operate conventionally. Contact your Lexus dealer as soon as possible to service the vehicle.

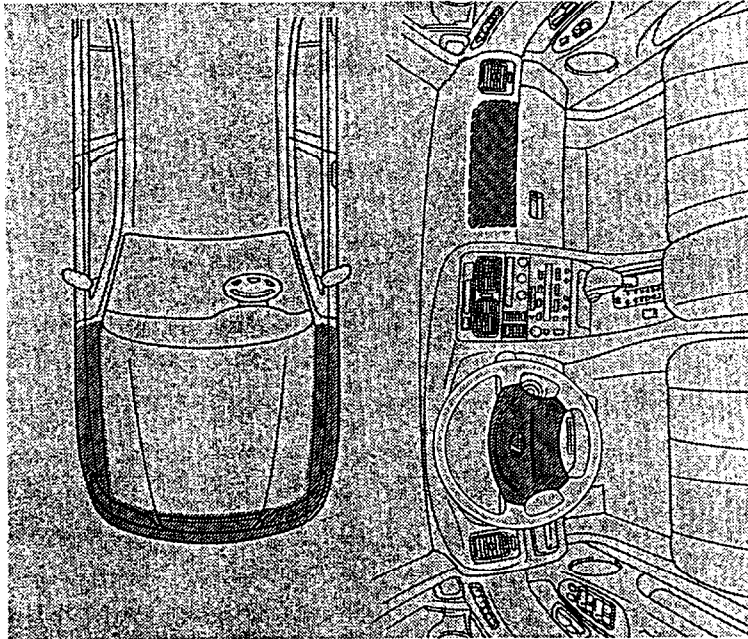
- The light does not come on when the ignition key is turned to the "ACC" or "ON" position, or remains on.
- The light comes on while driving.

COMFORT ADJUSTMENT

In the following cases, contact your Lexus dealer as soon as possible:

- The airbags have been inflated.
- The seat belt pretensioners have been activated.
- The front part of the vehicle (shaded in the illustration) was involved in an accident not of the extent to cause the SRS to inflate.
- The pad section of the steering wheel or front passenger airbag cover (shaded in the illustration) is scratched, cracked, or otherwise damaged.

NOTICE: Do not disconnect the battery cables before contacting your Lexus dealer.



COMFORT ADJUSTMENT

CHILD RESTRAINT

Child restraint precautions

Lexus strongly urges the use of child restraint system for children small enough to use it.

The laws of all fifty states in the U.S.A. and Canada now require the use of a child restraint system.

CAUTION:

For effective protection in automobile accidents and sudden stops, children must be properly restrained. Holding a child in your arms is not a substitute for a child restraint system. In an accident, the child can be crushed against the windshield, or between you and the vehicle's interior if you are unrestrained.

Child restraint system

A child restraint system for a small child or baby must itself be restrained on the seat with either the lap belt or the lap portion of the lap/shoulder belt.

The child restraint system should conform to the size of the child and properly fit the vehicle seat. For greater safety, the child restraint system should be installed in the rear seat. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat.

When installing a child restraint system, refer to the instructions provided by its manufacturer and follow the directions under the following illustrations.

CAUTION:

After installing the child restraint system, make sure it is secured in place. If it is not restrained securely, it may cause injury to the child in the event of a sudden stop or accident.

When not using the child restraint system, keep it secured with the seat belt or place it in the trunk or somewhere other than in the vehicle. This will prevent it injuring passengers in the event of a sudden stop or accident.

COMFORT ADJUSTMENT

Top strap anchors and locations



Your vehicle has anchors for securing the top strap of a child restraint system. Anchor nuts are welded beneath the sheet metal to permit installation of an anchor bracket for a child restraint system.

To install an anchor bracket, use an 8 mm X 30 mm X 1.25 mm coarse thread metric bolt and a 15 mm (0.6 in.) spacer. Note that the bolts accompanying many child restraint systems are not metric. You can damage the anchor nuts on your vehicle if you force bolts with different thread into the anchor nuts.

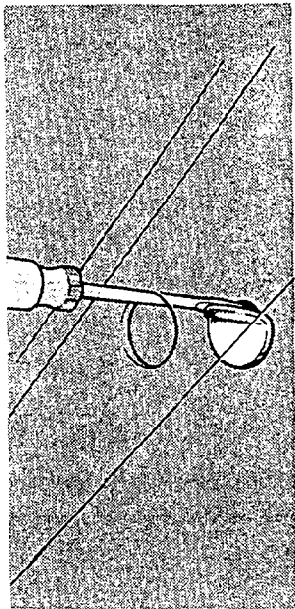
If your child restraint system does not provide any of the necessary parts, you can purchase the following items from your Lexus dealer.

- CRS installation kit (Part No. 04731-22012)
– contains 1 bolt, 3 types of spacer and 1 locking clip.
- Bolt (Part No. 91511-60830)

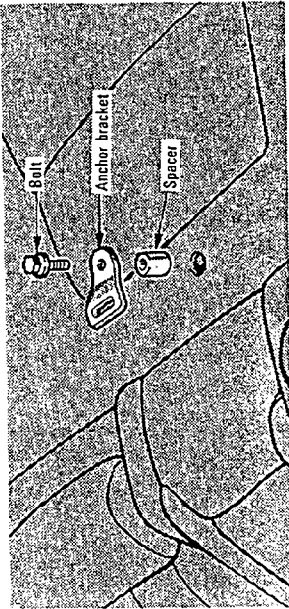


1. Run your fingers across the trim of the filler panel to locate the holes underneath it in the positions shown above.
2. Make a hole in the covering directly above the hole in the filler panel.

COMFORT ADJUSTMENT



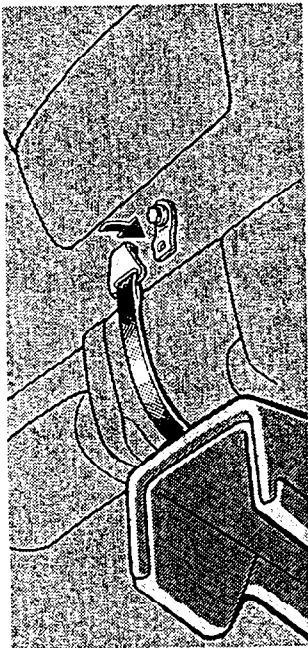
3. Remove the seals from the anchors using a screwdriver or the like.



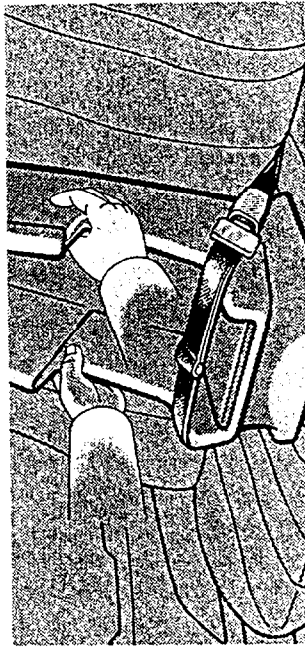
4. Insert a 15 mm (0.6 in.) spacer and tighten down the anchor bracket for your child restraint system with a bolt. Torque the bolt to 16.5 – 24.7 N.m (1.68 – 2.52 kgf m, 12.2 – 18.2 ft-lb).

To comply with Canada Motor Vehicle Safety Standards, vehicles sold in Canada are provided with a bracket set in the glovebox, designed for use with any of three anchor locations shown in the illustration.

COMFORT ADJUSTMENT

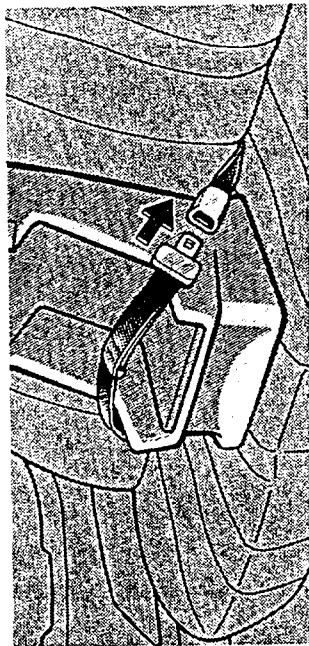


If your child restraint system requires the use of a top strap, latch the hook onto the anchor bracket and tighten the top strap.

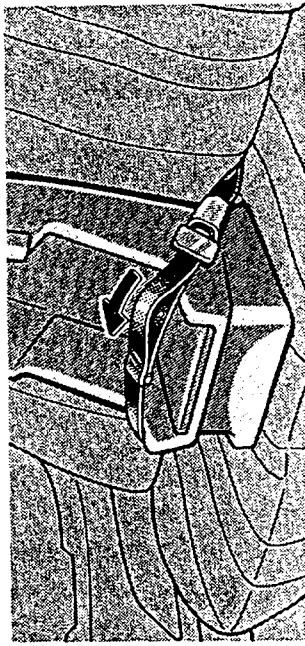


CAUTION:
Push and pull the child restraint system in different directions to be sure it is secure.

INSTALLATION ON CENTER REAR SEAT

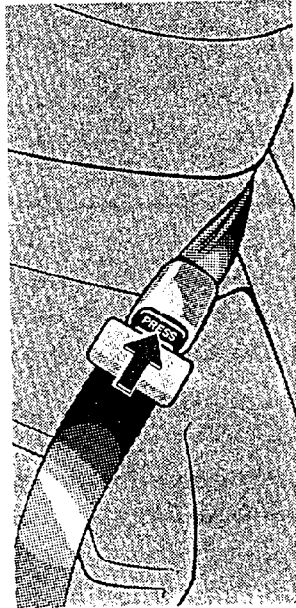


Fasten the center lap belt over the child restraint system following the instructions provided by its manufacturer.



Make sure the belt is tight by pulling its free end while you firmly push down the child restraint system.

COMFORT ADJUSTMENT

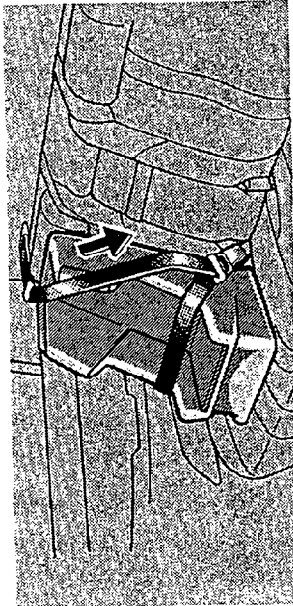


To remove the child restraint system, press the buckle release button and unhook the top strap.

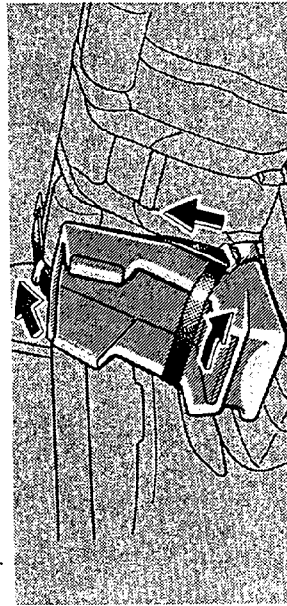
INSTALLATION ON OUTER REAR SEAT



Fasten the lap and shoulder belt over the child restraint system following the instructions provided by its manufacturer. Keep the lap portion of the belt tight.

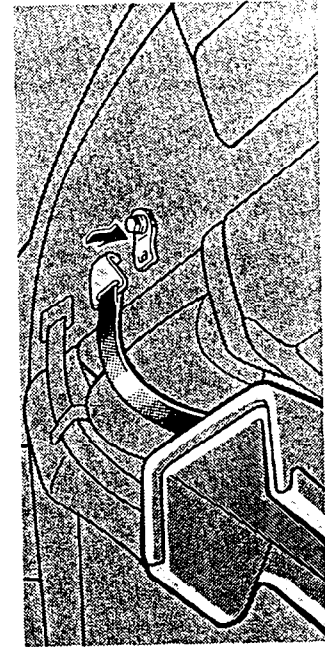


Fully extend the shoulder belt to put in the lock mode.

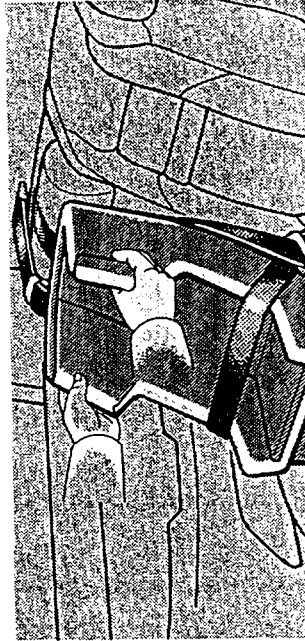


Place the shoulder belt between the vehicle seatback and the child restraint system and allow it to retract. To hold the child restraint system securely, let the shoulder belt retract as far as it will go while firmly pushing down the child restraint system.

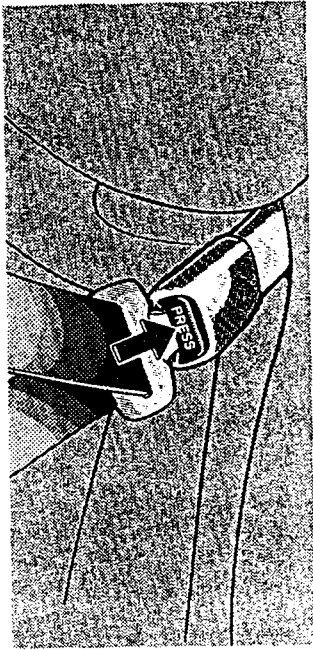
COMFORT ADJUSTMENT



If your child restraint system requires the use of a top strap, latch the hook onto the anchor bracket and tighten the top strap.



CAUTION: Make sure that the seat belt is securely locked, and the child restraint system is secure by pushing and pulling it in different directions.



To remove the child restraint system, press the buckle release button and allow the belt to retract. Unhook the top strap.

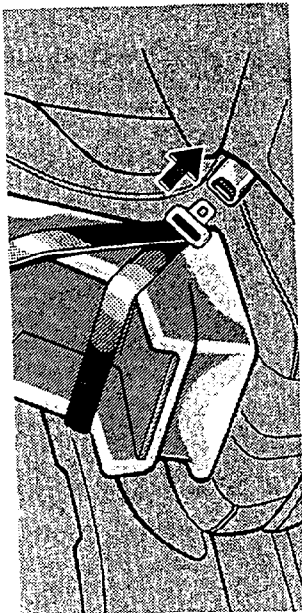
COMFORT ADJUSTMENT

INSTALLATION ON FRONT SEAT

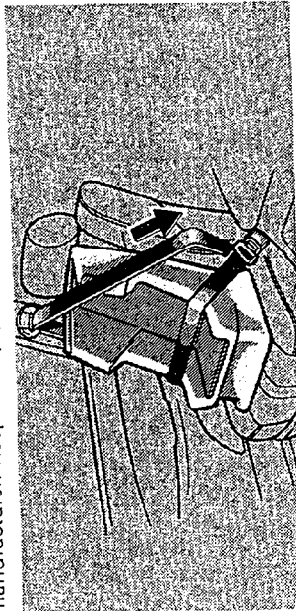


CAUTION:

Do not use a rear-facing child restraint system in the front seat because the force of the rapid inflation of the passenger airbag may cause severe injury to the child. When using a forward-facing child restraint system, move the seat as far back as possible.

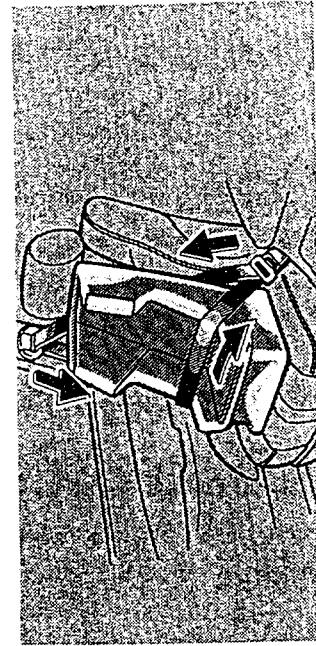


Fasten the lap and shoulder belt over the child restraint system following the instructions provided by its manufacturer. Keep the lap portion of the belt tight.

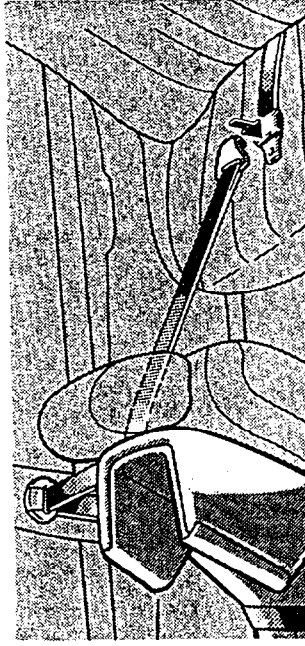


Fully extend the shoulder belt to put in the lock mode.

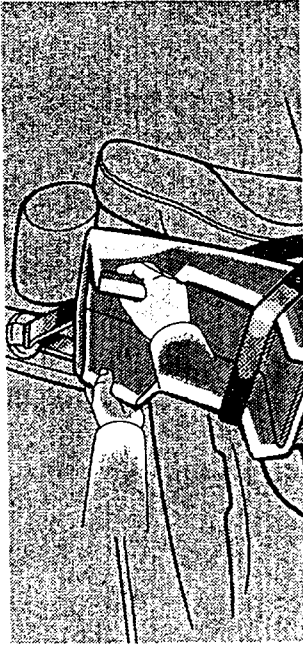
COMFORT ADJUSTMENT



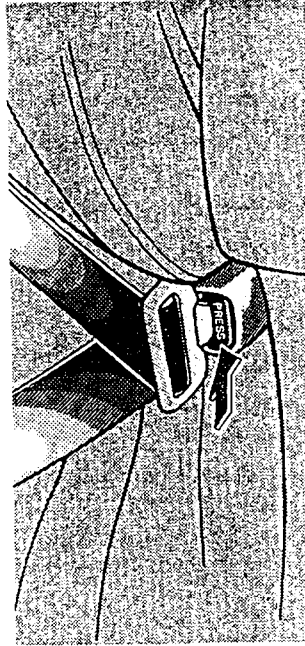
Place the shoulder belt between the vehicle seatback and child restraint system and allow it to retract. To hold the child restraint system securely, let the shoulder belt retract as far as it will go while firmly pushing down the child restraint system.



If your child restraint system requires the use of a top strap, latch the hook onto the tab of the rear center seat belt and tighten the top strap.



CAUTION:
Make sure that the seat belt is securely locked, and the child restraint system is secure by pushing and pulling it in different directions.



To remove the child restraint system, press the buckle release button and allow the belt to retract. Unhook the top strap.