

V2067

REPORT NO. TRC-93-N14

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

FORD MOTOR CO. INC. FOR NISSAN MOTOR CO., LTD.

1994 NISSAN QUEST

VAN

NHTSA NO. MR5200

TRC TEST NO. 940520

PREPARED BY:

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

EAST LIBERTY, OHIO 43319



JUNE 15, 1994

FINAL REPORT

PREPARED FOR:

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OFFICE OF MARKET INCENTIVES

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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1994 Nissan Quest van, NHTSA No. MR5200, at Transportation Research Center Inc. on May 20, 1994. 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 558 millimeters. The ambient temperature was 23° C. The driver's Head Injury Criteria (HIC) was 688. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.9 g. The driver's chest maximum deflection was 37 millimeters. The driver's left and right femur maximum axial forces were 5334 N and 5186 N, respectively. The passenger's HIC was 735. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.4 g. The passenger's left and right femur maximum axial forces were 5338 N and 2316 N, respectively.			
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures				Approximate Conversions from Metric Measures			
Symbol	When You Know	Multiply by	To Find	Symbol	When You Know	Multiply by	To Find
in ft yd mi	inches	2.5	centimeters	mm	millimeters	0.04	inches
	feet	30	centimeters	cm	centimeters	0.4	inches
	yards	0.9	meters	m	meters	3.3	feet
	miles	1.6	kilometers	km	kilometers	1.1	yards
in ² ft ² yd ² mi ²	square inches	6.5	square centimeters				
	square feet	0.09	square meters	cm ²	square centimeters	0.16	square inches
	square yards	0.8	square meters	m ²	square meters	1.2	square yards
	square miles	2.6	square kilometers	km ²	square kilometers	0.4	square miles
				ha	hectares (10,000 m ²)	2.5	acres
oz lb	ounces	28	grams				
	pounds	0.45	kilograms	g	grams	0.035	ounces
	short tons (2000 lb)	0.9	tonnes	kg	kilograms	2.2	pounds
				t	tonnes (1000 kg)	1.1	short tons
tsp Tbsp fl oz c pt qt gal fl ³ yd ³	teaspoons	5	milliliters	ml	milliliters	0.03	fluid ounces
	tablespoons	15	milliliters	l	liters	2.1	pints
	fluid ounces	30	milliliters	l	liters	1.06	quarts
	cups	0.24	liters	l	liters	0.26	gallons
	pints	0.47	liters	m ³	cubic meters	35	cubic feet
	quarts	0.95	liters	m ³	cubic meters	1.3	cubic yards
	gallons	3.8	liters				
	cubic feet	0.03	cubic meters				

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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 1994 Nissan Quest van, NHTSA No. MR5200, 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. 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) 50th percentile adult male anthropomorphic test devices (dummies). One (1) Part 572E dummy was positioned in the left front outboard designated seating position. One (1) Part 572B dummy was seated in the right front outboard designated seating position. The dummies were positioned according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the first use of the driver dummy and the passenger dummy.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. The 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 seventy-six (76) 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 May 20, 1994.

The test vehicle, a 1994 Nissan Quest van, NHTSA No. MR5200, was equipped with a 3.0-liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1999 KG. The vehicle's impact speed was 56.3 kph. The vehicle sustained 558 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 688. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.9 g. The driver's chest maximum deflection was 37 mm. The driver's left and right femur maximum axial forces were 5334 N and 5186 N, respectively.

The passenger's HIC was 735. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.4 g. The passenger's left and right femur maximum axial forces were 5338 N and 2316 N, respectively.

There was loss of windshield periphery retention from 45 to 225 millimeters along the lower edge measured from the lower right 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.

DATA ACQUISITION EXPLANATIONS

The right front passenger's head X-axis accelerometer, HEDXG2, recorded questionable data from 45 to 49 milliseconds. The right front passenger's head X-, Y-, and Z-axis accelerometers, HEDXG2, HEDYG2, and HEDZG2, recorded questionable data spikes at 169 and 179 milliseconds. The questionable data and data spikes affected the right front passenger's head resultant acceleration calculation, HEDRG2.

The left rear seat X-axis accelerometer, TLRXG1, did not return to zero following the impact event. The left rear seat redundant X-axis acceleration, TLRXGA, was used for velocity and displacement calculations.

The passenger's shoulder belt force load cell, SHBF2, recorded questionable data spikes at 168 and 202 milliseconds.

The right rear seat redundant X-axis accelerometer, TRRXGA, did not return to zero following the impact event.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MR5200 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 05/20/94 TEST TIME: 1354 AMBIENT TEMP.: 23° C

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Nissan/Quest/van

VEHICLE TEST WEIGHT (KG): 1999

IMPACT ANGLE (DEG)¹: 0

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

MAXIMUM STATIC CRUSH (MM): 558

AVERAGE REBOUND (MM): 613

DUMMIES: Driver #142 Passenger #713

TYPE: Part 572 E Part 572 B

LOCATION: Left front Right front

RESTRAINT: Airbag, two-point Two-point passive
passive belt and lap belt belt and lap belt

NUMBER OF DATA CHANNELS: 76

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: Ford Motor Co. in USA for Nissan Motor Co., Ltd.

MAKE/MODEL: Nissan/Quest VIN: 4N2DN11W1RD825690

BODY STYLE: Van MODEL YEAR: 1994

NHTSA NO.: MR0502 COLOR: Red

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

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

DATE VEHICLE RECEIVED: 05/13/94 ODOMETER READING: 181

DEALER'S NAME AND ADDRESS: Torrance Nissan
20710 Hawthorne Blvd.
Torrance, CA 90503

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	No	TILTING STEERING WHEEL	Yes
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER	None		

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Ford Motor Co. in USA for Nissan Motor Co., Ltd.

DATE OF MANUFACTURE: 01/94 VIN: 4N2DN11W1RD825690

GVWR: 2469 kg

GAWR: FRONT: 1231 kg, REAR: 1270 kg

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): General, Radial ST, P205/75R15

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

SPARE TIRE (MFR., SIZE): General Temporary T125/90D16

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually adjustable

MAXIMUM WIDTH: 1872 MM

WHEELBASE: 2850 MM

LOCATION OF LABEL STATING TIRE DATA:

The label was located in the glove box.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P205/75R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 35 psi ; REAR: 35 psi

DESIGNATED SEATING CAPACITY: 2 FRONT 2 MID 3 REAR
7 TOTAL

VEHICLE CAPACITY WEIGHT: 1290 lb

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE: LF 783; RF 785; LR 790; RR 798

PRE-TEST ATTITUDE: LF 766; RF 781; LR 758; RR 769

POST-TEST ATTITUDE: LF 780; RF 840; LR 851; RR 844

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	512 KG	RIGHT REAR	360 KG
LEFT FRONT	517 KG	LEFT REAR	359 KG
TOTAL FRONT WEIGHT	1029 KG	(58.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	719 KG	(41.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1748 KG		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW¹ = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (1748 KG)

VCW = VEHICLE CAPACITY WEIGHT (585 KG)

DSC = DESIGNATED SEATING CAPACITY (7)

RCLW¹ = VCW - 68 (DSC) = 109 KG

TARGET TEST WEIGHT=UDW + RCLW¹ + (NO. OF HYBRID III DUMMIES X 76 KG/DUMMY)+
(NO. OF HYBRID II DUMMIES X 74 KG/DUMMY)

TARGET TEST WEIGHT = 1748 + 109 + 76 + 74

TARGET TEST WEIGHT = 2007 KG

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 101 KG OF CARGO WEIGHT:

RIGHT FRONT	540 KG	RIGHT REAR	440 KG
LEFT FRONT	573 KG	LEFT REAR	446 KG
TOTAL FRONT WEIGHT	1113 KG	(55.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	886 KG	(44.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	1999 KG	(0.4% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 0 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 1263 MM REARWARD OF FRONT WHEEL CENTERLINE

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

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 940520 NHTSA NO.: MR5200
TEST DATE: 05/20/94 TEST TIME: 1354
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 4646; C 4819; R 4649

POST-TEST: L 4134; C 4265; R 4164

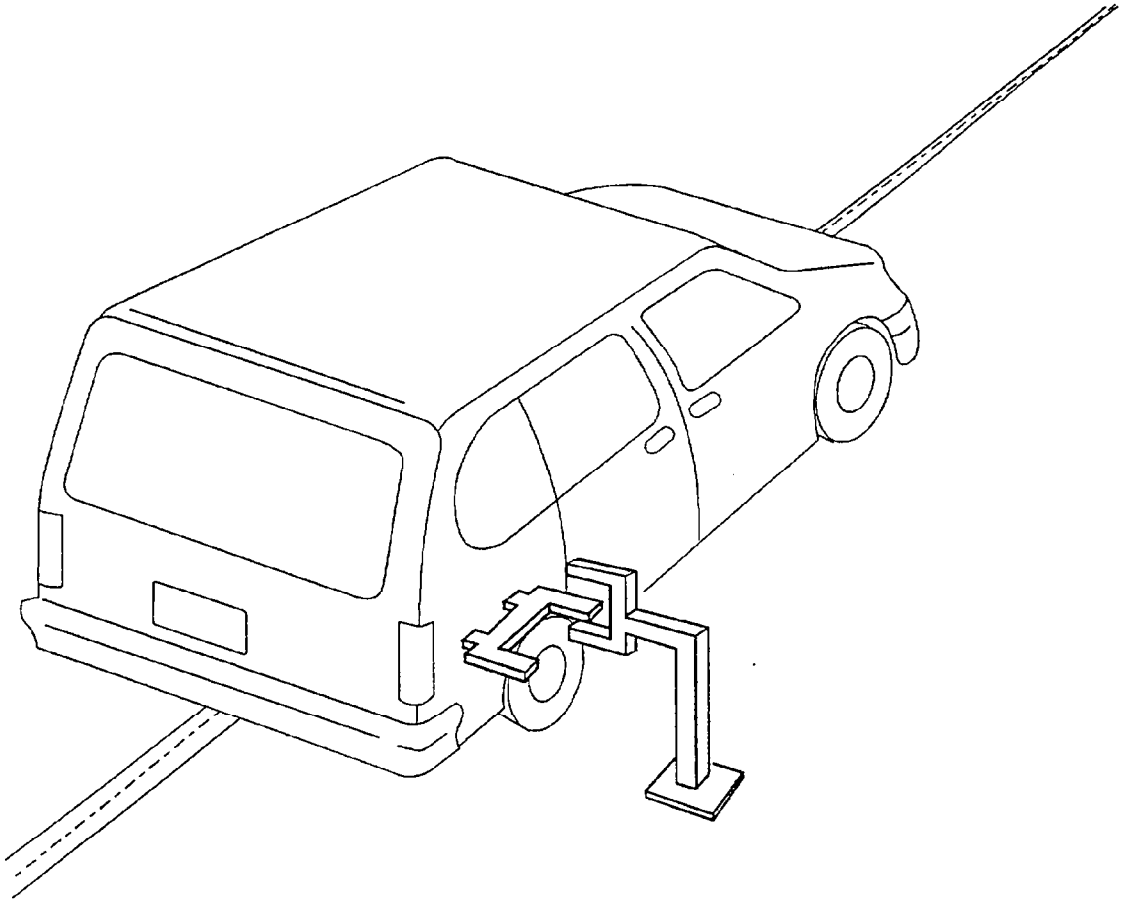
TOTAL CRUSH: L 512; C 554; R 485

AVERAGE CRUSH: 517

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 648; C 541; R 651; AVG. 613

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: Nissan/Quest/van

VEHICLE NHTSA NO.: MR5200; VIN: 4N2DN11W1RD825690

MODEL YEAR: 1994; BUILD DATE: 01/94; TEST DATE: 05/20/94

VEHICLE SIZE CATEGORY: Van; TEST WEIGHT: 1999 KG

VEHICLE WHEELBASE: 2850 MM

MAXIMUM WIDTH: 1872 MM

FRONT OVERHANG: 1013 MM

COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH
MEASUREMENTS:

C1 =	<u>512</u>	MM
C2 =	<u>519</u>	MM
C3 =	<u>532</u>	MM
C4 =	<u>558</u>	MM
C5 =	<u>531</u>	MM
C6 =	<u>485</u>	MM

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE
(LONGITUDINAL)

LENGTH OF DAMAGED
REGION: L = 1524 MM

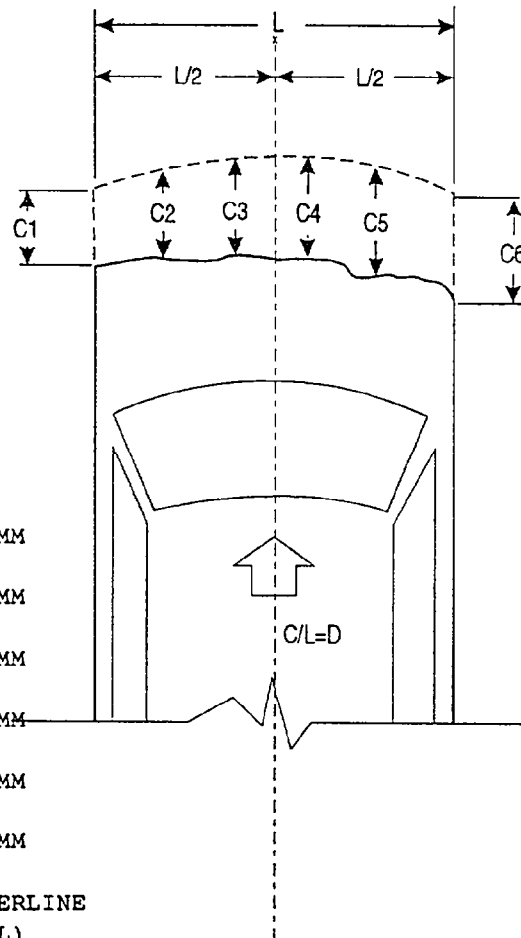


FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT

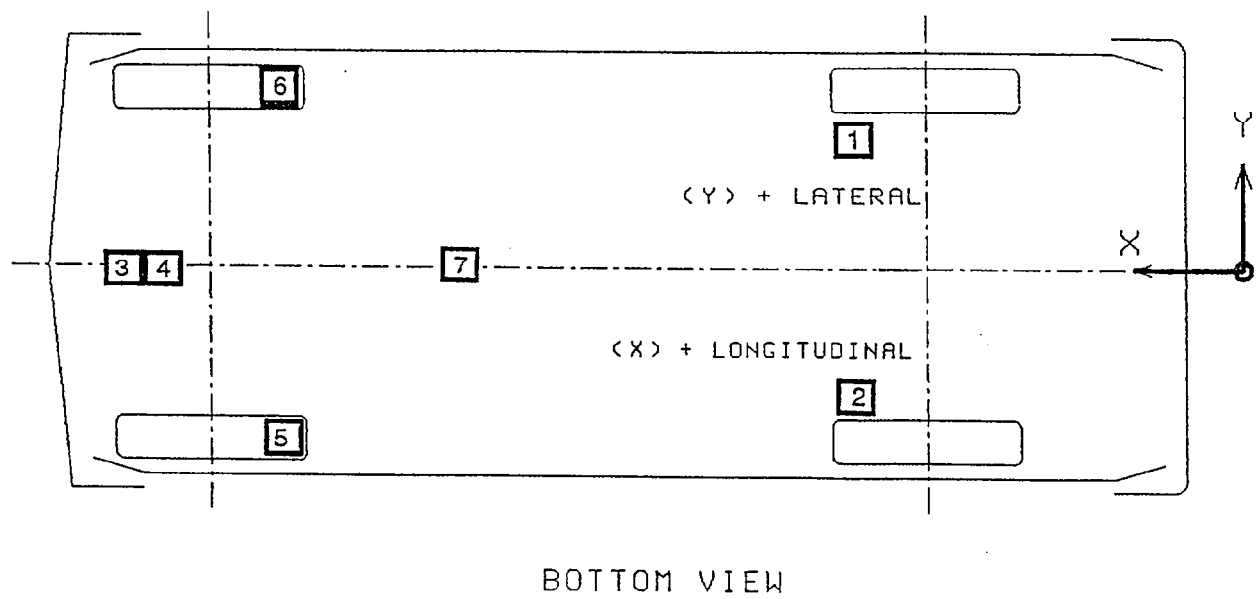
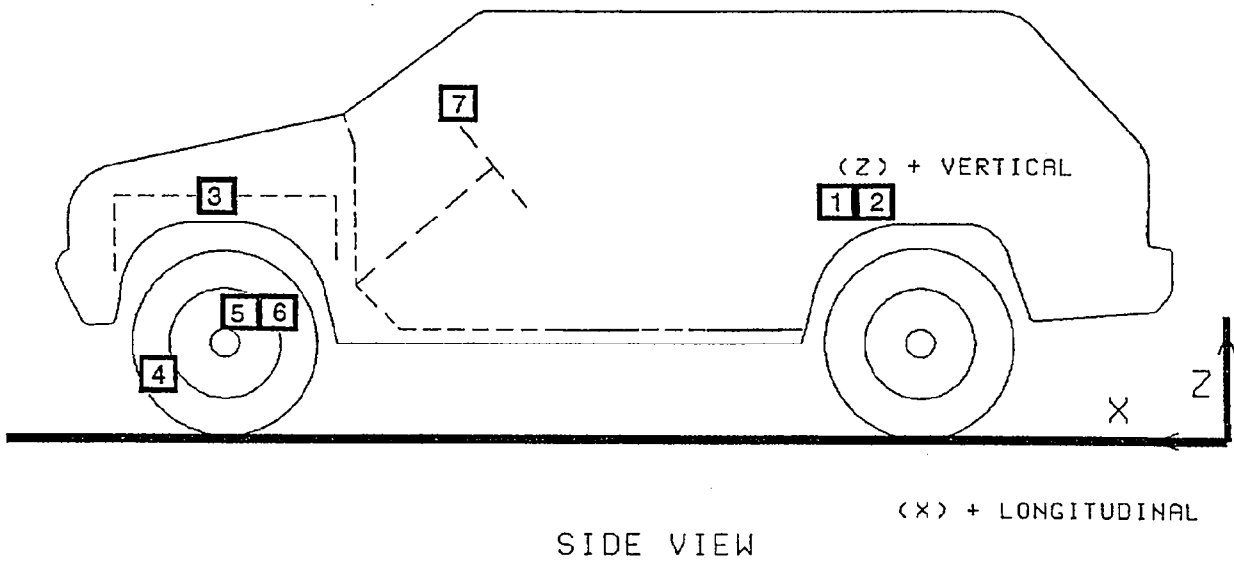


TABLE 4 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No. LOCATION	TEST NUMBER: 940520			POSITIVE DIRECTION		NEGATIVE DIRECTION	
	X	Y	Z				
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL ¹ REDUNDANT	3242 mm	1050 mm	433 mm	46.9 g 2.6 g	@ 202.3 ms @ 24.1 ms	117.0 g 47.5 g	@ 15.2 ms @ 40.6 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT ¹	3210 mm	-1050 mm	444 mm	3.4 g 14.4 g	@ 146.9 ms @ 136.8 ms	48.7 g 38.8 g	@ 41.8 ms @ 41.7 ms
3 ENGINE TOP LONGITUDINAL	591 mm	-25 mm	757 mm	25.6 g	@ 41.9 ms	156.0 g	@ 27.8 ms
4 ENGINE BOTTOM LONGITUDINAL	819 mm	-268 mm	155 mm	57.3 g	@ 41.1 ms	149.8 g	@ 31.0 ms
5 RIGHT BRAKE CALIPER LONGITUDINAL	909 mm	-733 mm	335 mm	35.9 g	@ 66.7 ms	91.9 g	@ 47.8 ms
6 LEFT BRAKE CALIPER LONGITUDINAL	909 mm	733 mm	351 mm	41.9 g	@ 64.6 ms	117.0 g	@ 41.0 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1375 mm	0 mm	1094 mm	5.8 g	@ 111.4 ms	51.1 g	@ 53.8 ms

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS. X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER.

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

¹ See DATA ACQUISITION EXPLANATIONS

TABLE 5 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #142	PASSENGER #713
HEAD	<u>Airbag</u> <u>and head restraint</u>	<u>Chest, head restraint,</u> <u>and seat back</u>
CHEST	<u>Airbag</u>	<u>None</u>
ABDOMEN	<u>None</u>	<u>None</u>
LEFT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>
RIGHT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

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

SEAT MOVEMENT:

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

GLAZING DAMAGE:

The entire windshield cracked on impact.

OTHER NOTABLE IMPACT EFFECTS:

None

TABLE 6 FMVSS 208 DATA SUMMARY

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Nissan/Quest/van

VEHICLE NHTSA NO.: MR5200; TEST DATE: 05/20/94

	DRIVER DUMMY #142	PASSENGER DUMMY #713
<u>MAXIMUM ACCELERATIONS (G):</u>		
HEAD X-AXIS ³	-74.7	-119.4
HEAD Y-AXIS ³	7.2	-30.6
HEAD Z-AXIS ³	-20.8	-70.4
HEAD RESULTANT ³	76.4	119.4
CHEST X-AXIS	-53.6	-63.7
CHEST Y-AXIS	-5.0	15.7
CHEST Z-AXIS	12.4	-13.6
CHEST RESULTANT ¹	51.9	55.4
CHEST RESULTANT TIME INTERVAL (SEC.) ¹	.003	.003
<u>HEAD INJURY CRITERIA (HIC) VALUES:</u>		
HIC ²	688	735
HIC STARTING TIME (SEC.)	.056	.071
HIC ENDING TIME (SEC.)	.082	.107
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	58.8	53.0
<u>MAXIMUM CHEST DEFLECTIONS (MM):</u>		
CHEST X-AXIS ³	37	NA
MAXIMUM CHEST DEFLECTION TIME (SEC)	.070	
<u>MAXIMUM COMPRESSIVE FEMUR FORCES (N):</u>		
LEFT FEMUR	5334	5338
RIGHT FEMUR	5186	2316
<u>MAXIMUM SEAT BELT FORCES (N):</u>		
LAP BELT	3588	6960
SHOULDER BELT ³	9083	11036

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

¹ 0.003 SEC. MINIMUM DURATION.

² THE MAXIMUM HIC TIME INTERVAL IS 36 MILLISECONDS.

³ See DATA ACQUISITION EXPLANATIONS

TABLE 7 HYBRID III NECK DATA SUMMARY

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Nissan/Quest/van

VEHICLE NHTSA NO.: MR5200; TEST DATE: 05/20/94

<u>MAXIMUM VALUES:</u>	<u>DRIVER DUMMY #142</u>	<u>PASSENGER DUMMY #713</u>
NECK X-AXIS FORCE (N)	313	NA
NECK Y-AXIS FORCE (N)	-125	NA
NECK Z-AXIS FORCE (N)	2404	NA
NECK MOMENT ABOUT X AXIS (N-M)	-7	NA
NECK MOMENT ABOUT Y AXIS (N-M)	-45	NA
NECK MOMENT ABOUT Z AXIS (N-M)	6	NA

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 airbag, two-point passive belt, and lap belt. The dummy rebounded rearward into the seat back as the dummy's head rotated slightly rearward contacting the head restraint. The driver dummy came to rest in the driver's seat, restrained by the two-point passive belt and lap belt.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated downward impacting the dummy's chest. The right front passenger dummy was restrained by the two-point passive belt and lap belt. The dummy rebounded rearward and slightly to the right into the seat back as the dummy's head rotated rearward contacting the head restraint and seat back. The right front passenger dummy came to rest in the right front passenger's seat, leaning slightly to the right, restrained by the two-point passive belt and lap belt.

TABLE 8 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

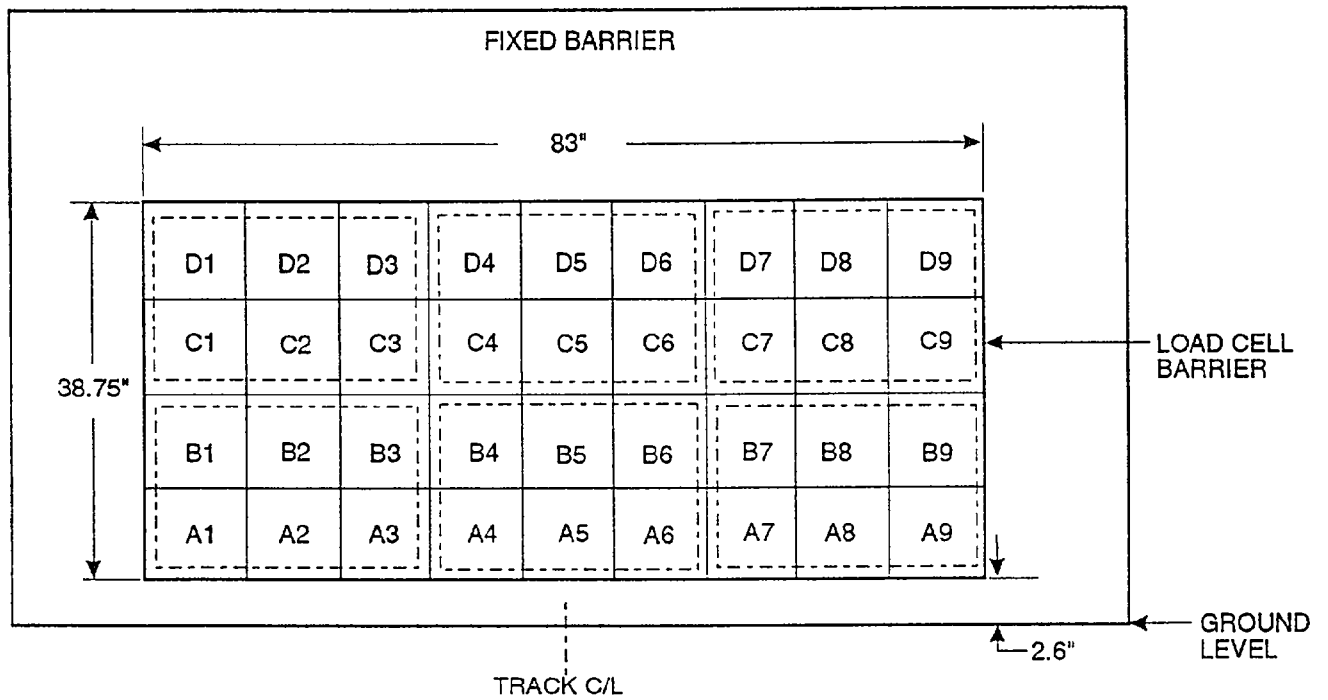
	<u>DRIVER</u>	<u>PASSENGER</u>
<u>BELT LENGTH DATA:</u>		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	NA	NA
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	1180	1180
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	870	855
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	25	30
AS DETERMINED MECHANICALLY	30	37
AS DETERMINED ELECTRONICALLY	40	60
<u>BELT STRETCH LENGTH (MM/M):</u>		
AS MEASURED MECHANICALLY	4	5
AS MEASURED ELECTRONICALLY	0	56
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	56	60

ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

¹ No seatbelt instrumentation was installed as a result of the vehicle being equipped with seat belt pretensioning devices.

FIGURE 4 LOAD CELL BARRIER CONFIGURATION

36 LOAD CELLS
4 ROWS
9 COLUMNS
FRONT VIEW



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

TABLE 9 LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER: 940520

LOCATION	POSITIVE DIRECTION	NEGATIVE DIRECTION
TOTAL GROUP 1	1.7 kN @ 3.0 ms	124.9 kN @ 15.7
TOTAL GROUP 2	1.3 kN @ 190.4 ms	299.4 kN @ 50.6
TOTAL GROUP 3	1.4 kN @ 291.0 ms	124.8 kN @ 15.2
TOTAL GROUP 4	1.1 kN @ 290.7 ms	51.8 kN @ 37.0
TOTAL GROUP 5	2.1 kN @ 2.2 ms	74.4 kN @ 52.8
TOTAL GROUP 6	1.0 kN @ 157.1 ms	77.2 kN @ 31.2
TOTAL LOAD CELL FORCE	6.0 kN @ 290.6 ms	665.4 kN @ 51.1

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.:

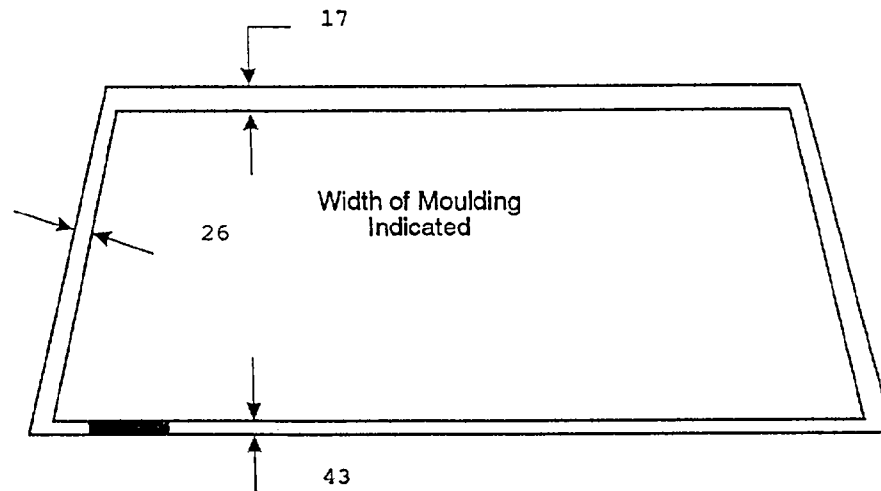
Plastic trim around outer perimeter, adhesive around inner perimeter.

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:

	<u>PRE-TEST</u>	<u>POST-TEST</u>	<u>PERCENT RETENTION</u>
RIGHT SIDE	2270	2090	92.1
LEFT SIDE	2270	2270	100.0
TOTAL	4540	4360	96.0

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 20° C



FRONT VIEW OF WINDSHIELD¹

LOSS OF WINDSHIELD RETENTION LENGTHS: Windshield retention loss occurred along the lower edge from 45 to 225 millimeters measured from the lower right corner.

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

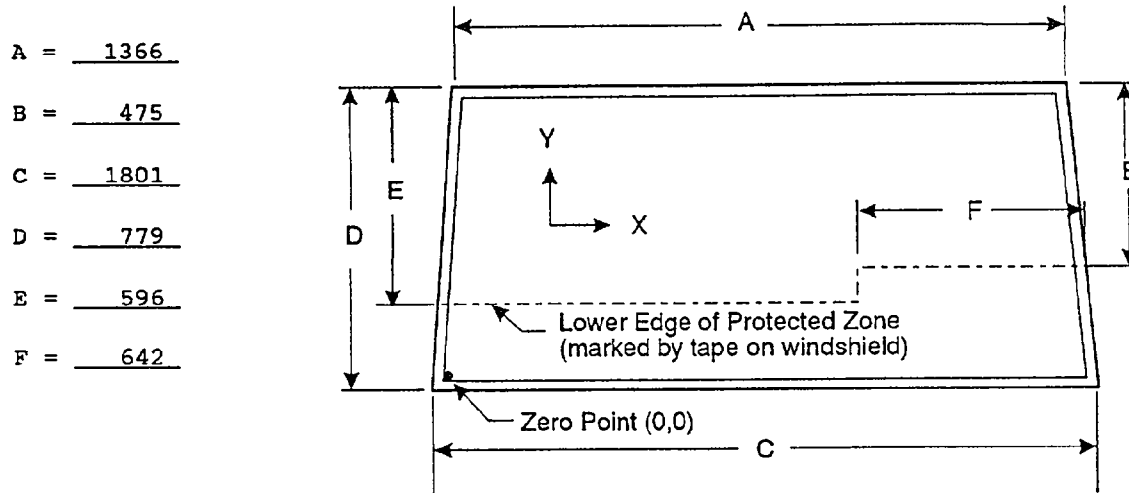
¹ INDICATE AREAS OF LOSS OF RETENTION, IF ANY, ON WINDSHIELD DIAGRAM.

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:



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: Nissan/Quest

NHTSA NO.: MR5200

FUEL SYSTEM CAPACITY: 75.7 LITERS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 75.7 LITERS (FURNISHED BY COTR)

TEST VOLUME RANGE: 69.6 LITERS TO 71.2 LITERS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 70.4 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 front of the rear axle. The fuel filler neck is located on the left side. The fuel lines run along the left side to the front.

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

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

TABLE 11 FMVSS 301 POST-IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: MR5200; TEST DATE: 05/20/94

VEHICLE MAKE/MODEL/BODY STYLE: Nissan/Quest/van

TEST REQUIREMENTS:

Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

 X FRONTAL (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:

	<u>TEST</u> <u>RESULTS</u>	<u>MAXIMUM</u> <u>ALLOWABLE</u>
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

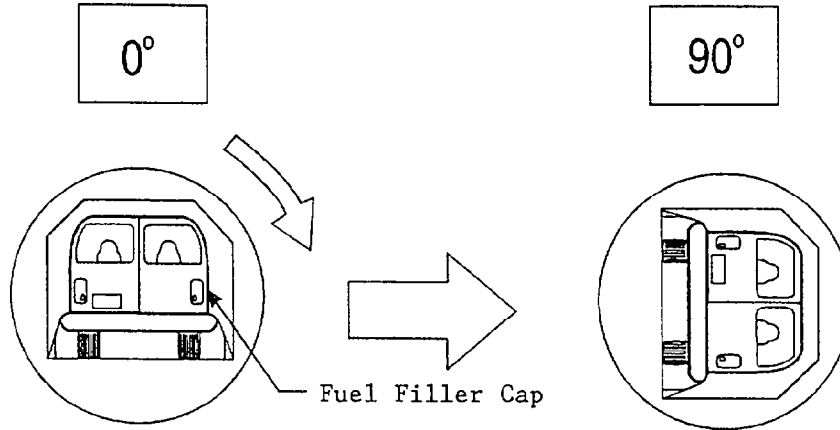
FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: MR5200

TEST PHASE



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

TIME REQUIRED 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:

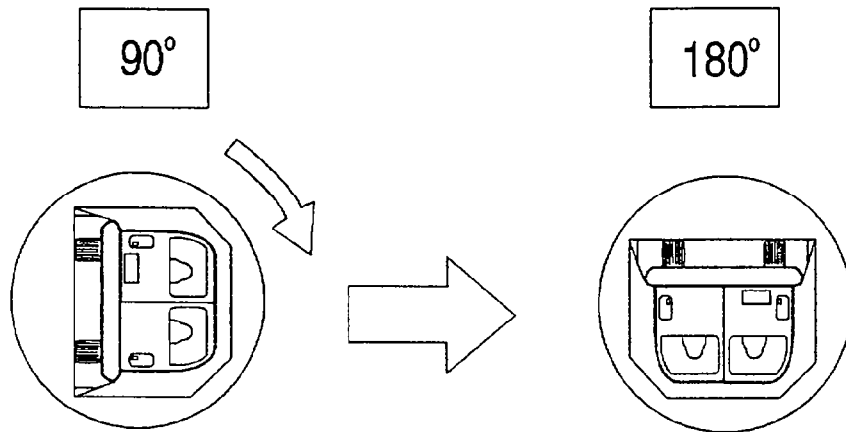
<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR5200
TEST PHASE



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

TIME REQUIRED 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:

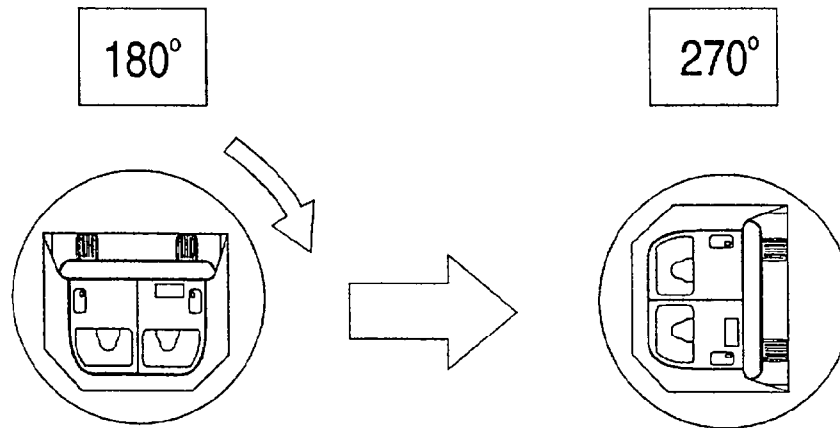
<u>90° TO 180° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR5200
TEST PHASE



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

TIME REQUIRED 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:

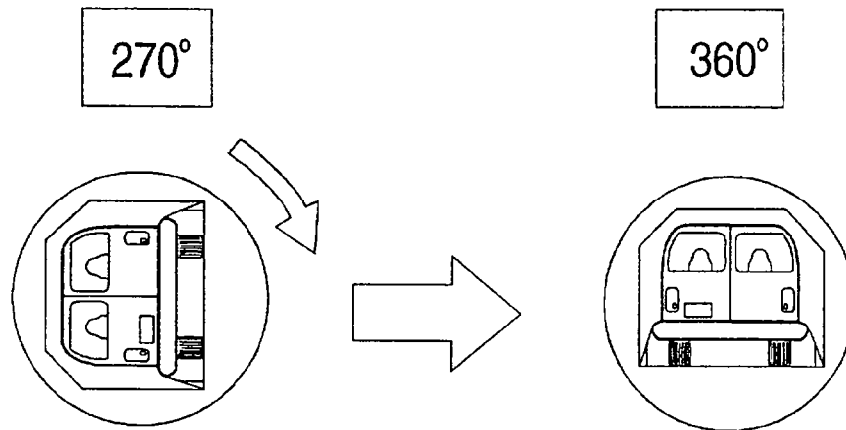
<u>180° TO 270° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR5200
TEST PHASE



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

TIME REQUIRED 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

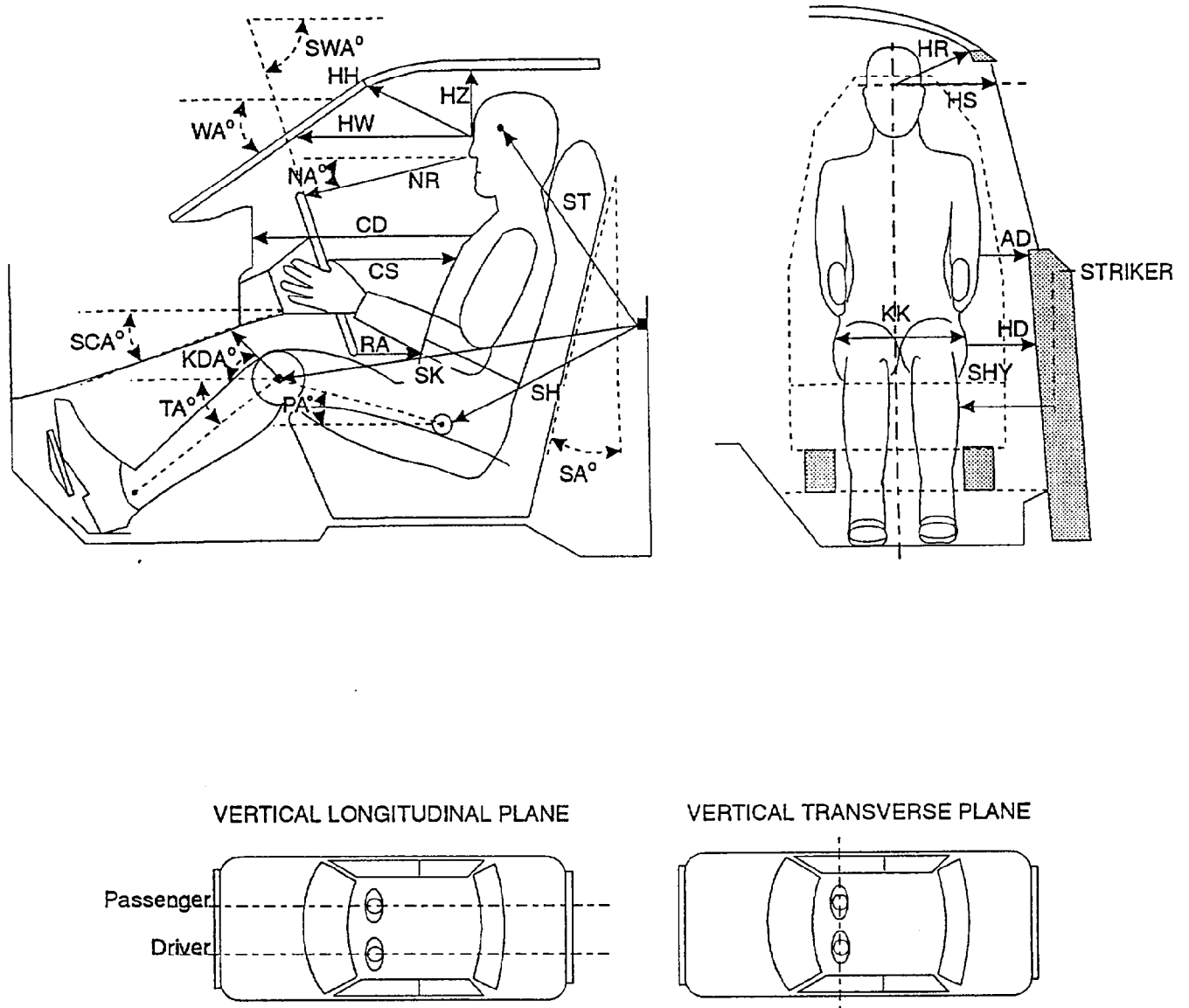


TABLE 12 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #142)	PASSENGER (SERIAL #713)
WA°	WINDSHIELD ANGLE	32	NA
SWA°	STEERING WHEEL ANGLE	29	NA
SCA°	STEERING COLUMN ANGLE	63	NA
SA°	SEAT BACK ANGLE ¹	24	24
HZ	HEAD TO ROOF	219	196
HH	HEAD TO HEADER	395	463
HW	HEAD TO WINDSHIELD	678	666
HR	HEAD TO SIDE HEADER	227	178
NR	NOSE TO RIM	386	NA
NA	NOSE TO RIM ANGLE	9	NA
CD	CHEST TO DASH	550	631
CS	STEERING WHEEL TO CHEST	287	NA
RA	RIM TO ABDOMEN	167	NA
KDL	LEFT KNEE TO DASH	185	224
KDR	RIGHT KNEE TO DASH	132	233
KDA	OUTBOARD KNEE TO DASH ANGLE	41	34
PA°	PELVIC ANGLE	23	11
TA°	TIBIAL ANGLE	48	41
KK	KNEE TO KNEE	304	290
ST	STRIKER TO HEAD	619	622
	STRIKER TO HEAD ANGLE	-72	-81
SK	STRIKER TO KNEE	716	668
	STRIKER TO KNEE ANGLE	-4	-4
SH	STRIKER TO H-POINT	318	266
	STRIKER TO H-POINT ANGLE	7	5
SHY	STRIKER TO H-POINT (Y DIR.)	277	261
HS	HEAD TO SIDE WINDOW	341	307
HD	H-POINT TO DOOR	175	180
AD	ARM TO DOOR	138	128

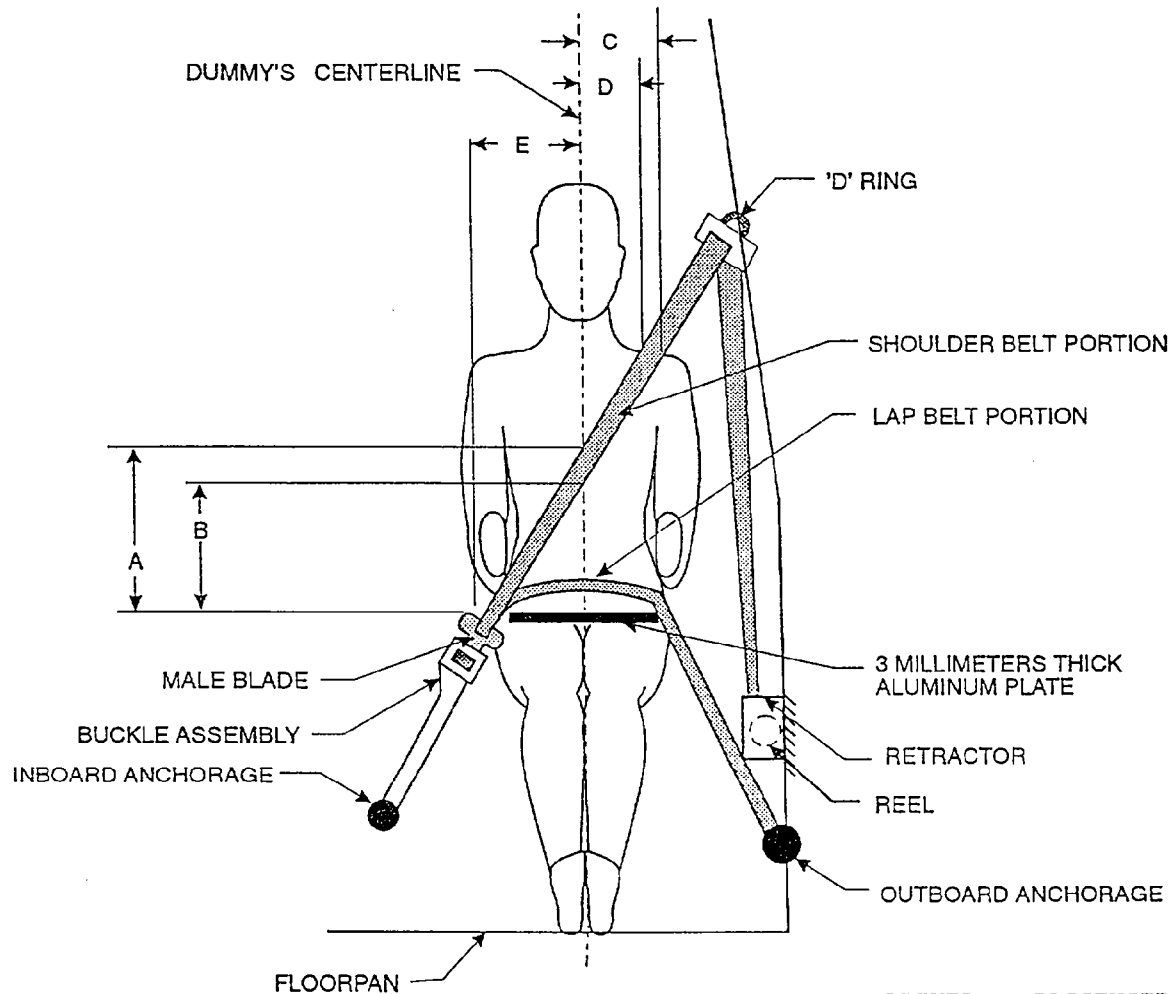
THE SEAT BACK ANGLE (SA°) IS MEASURED RELATIVE TO VERTICAL, ALL OTHER ANGLES ARE MEASURED RELATIVE TO HORIZONTAL.

ALL ANGLE MEASUREMENTS ARE IN DEGREES.

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

¹Angle measured from head restraint support.

FIGURE 9 SEAT BELT POSITIONING DATA



	DRIVER	PASSENGER
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	342	386
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	268	316
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	116	141
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	60	75
LAPBELT TENSION (N)	13	13
SHOULDER BELT TENSION (N)	18	13
ADJUSTABLE SEAT BELT ANCHORAGE POSITION	NA	NA

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 10 CAMERA POSITIONS

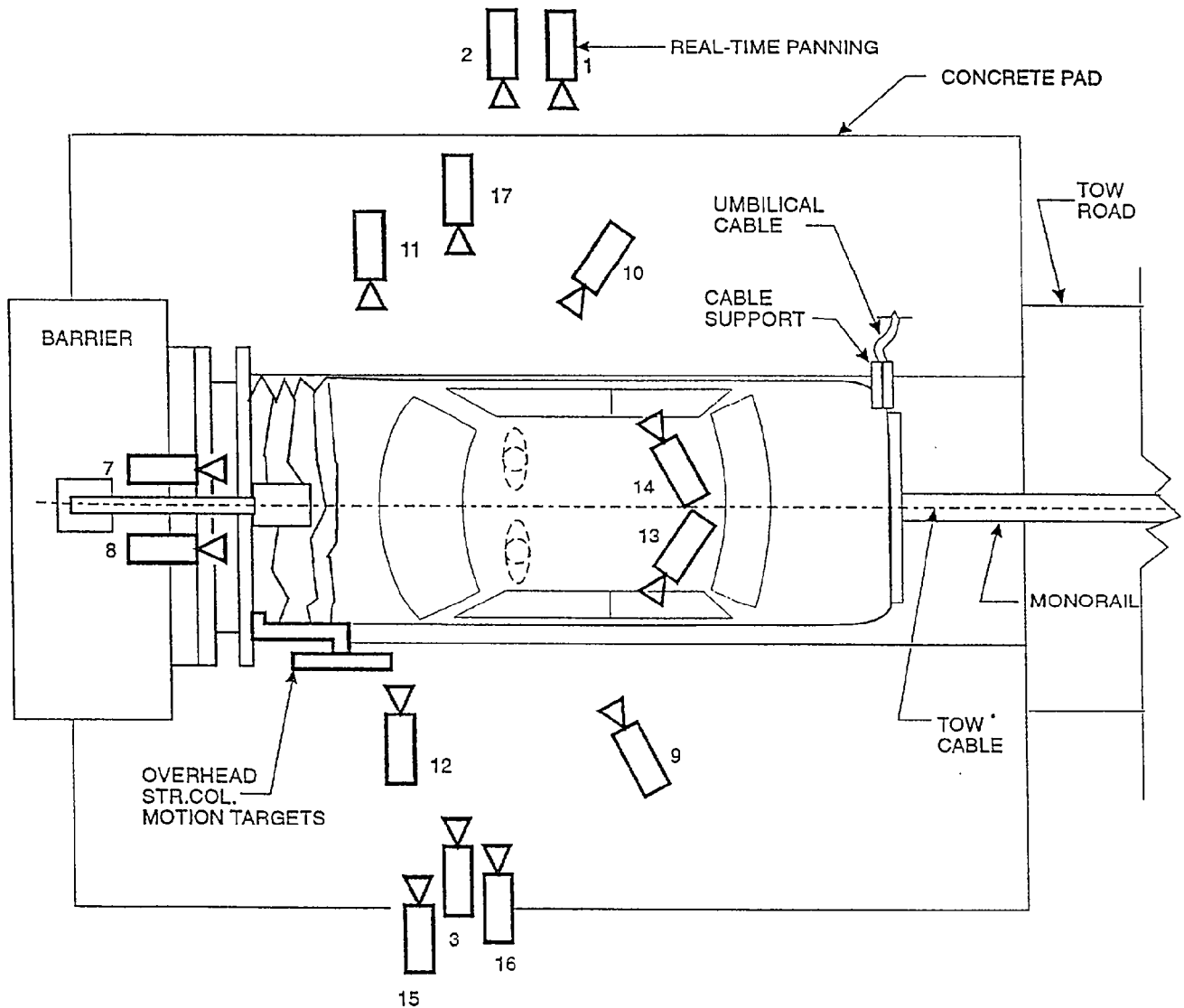


FIGURE 10 CAMERA POSITIONS, CONT'D.

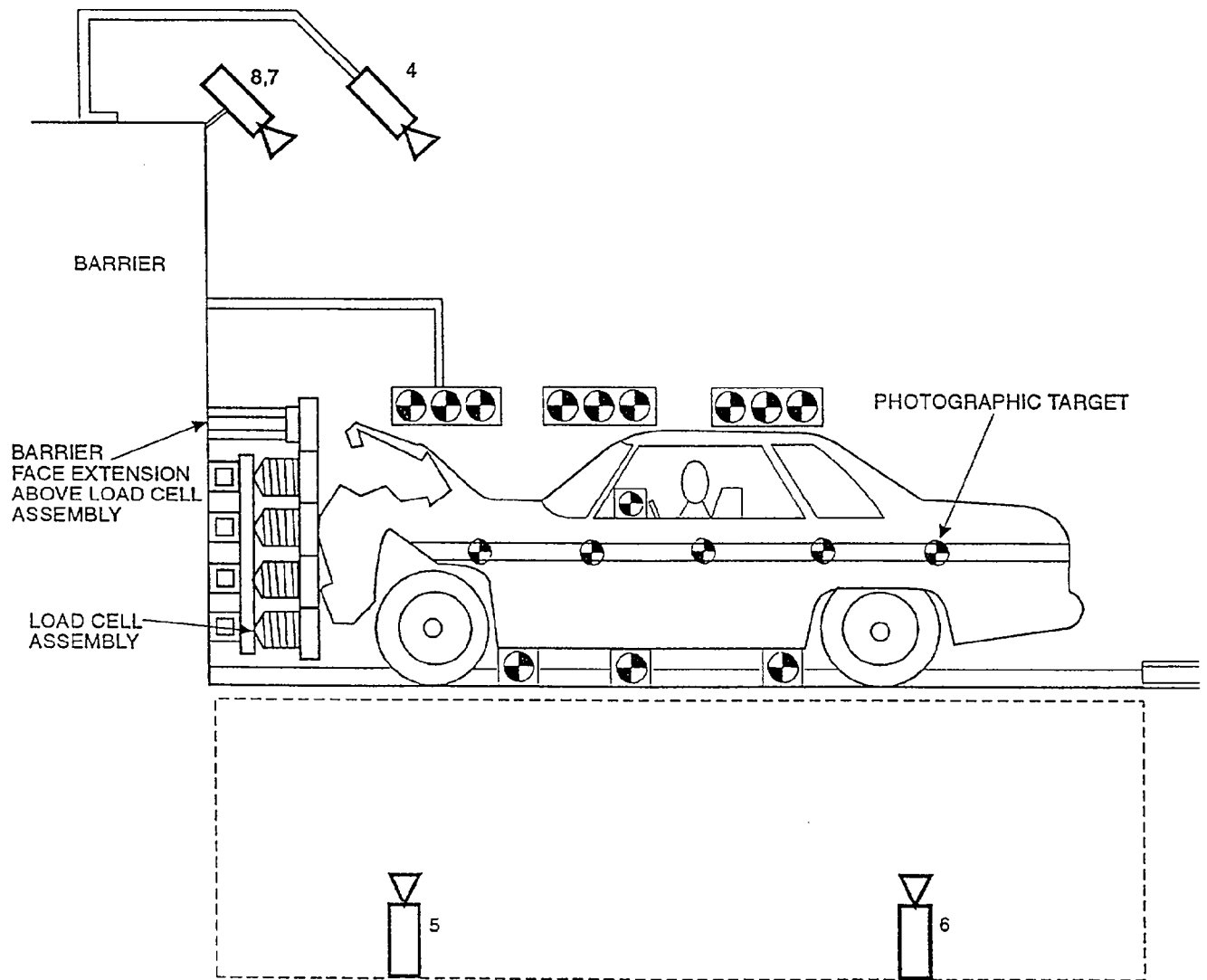


TABLE 13 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 940520		VEHICLE: 1994 Nissan Quest		CAMERA POSITIONS (MM) ¹			ANGLE ² (DEG)	FILM PLANE TO HEAD		FILM SPEED (FPS)
CAMERA NO.	VIEW	X	Y	Z	TARGET (MM)	LENS (MM)				
1	Real-time panning	-3607	-12802	1549	NA	NA	16	24		
2	Vehicle crush	-2065	-6767	942	-2	NA	13	495		
3	Dummy kinematics	-1054	7493	1118	-12	5563	25	1002		
4	Windshield damage	-925	0	2489	-40	NA	13	505		
5	Crush & fluid spillage	-1283	0	-2347	90	NA	13	1002		
6	Fluid spillage	-2522	0	-2515	90	NA	13	1018		
7	Passenger kinematics	-114	-351	2159	-40	NA	17	498		
8	Driver kinematics	-173	368	2159	-41	NA	17	518		
9	Driver kinematics	-4572	1854	2591	-27	2515	25	498		
10	Passenger kinematics	-4674	-1880	2540	-26	2362	25	495		
11	Windshield intrusion	-968	-7775	1118	0	NA	50	500		
12	Windshield intrusion	-1346	7859	1074	0	NA	50	500		
13	Driver seat belt movement	NA	NA	NA	NA	NA	13	500		
14	Passenger seat belt movement	NA	NA	NA	NA	NA	13	498		
15	Column movement	-2769	7264	2616	-14	NA	25	505		
16	Column movement	-2769	7264	1908	-9	NA	25	506		
17	Passenger kinematics	-986	-5354	1151	7	5436	25	1022		

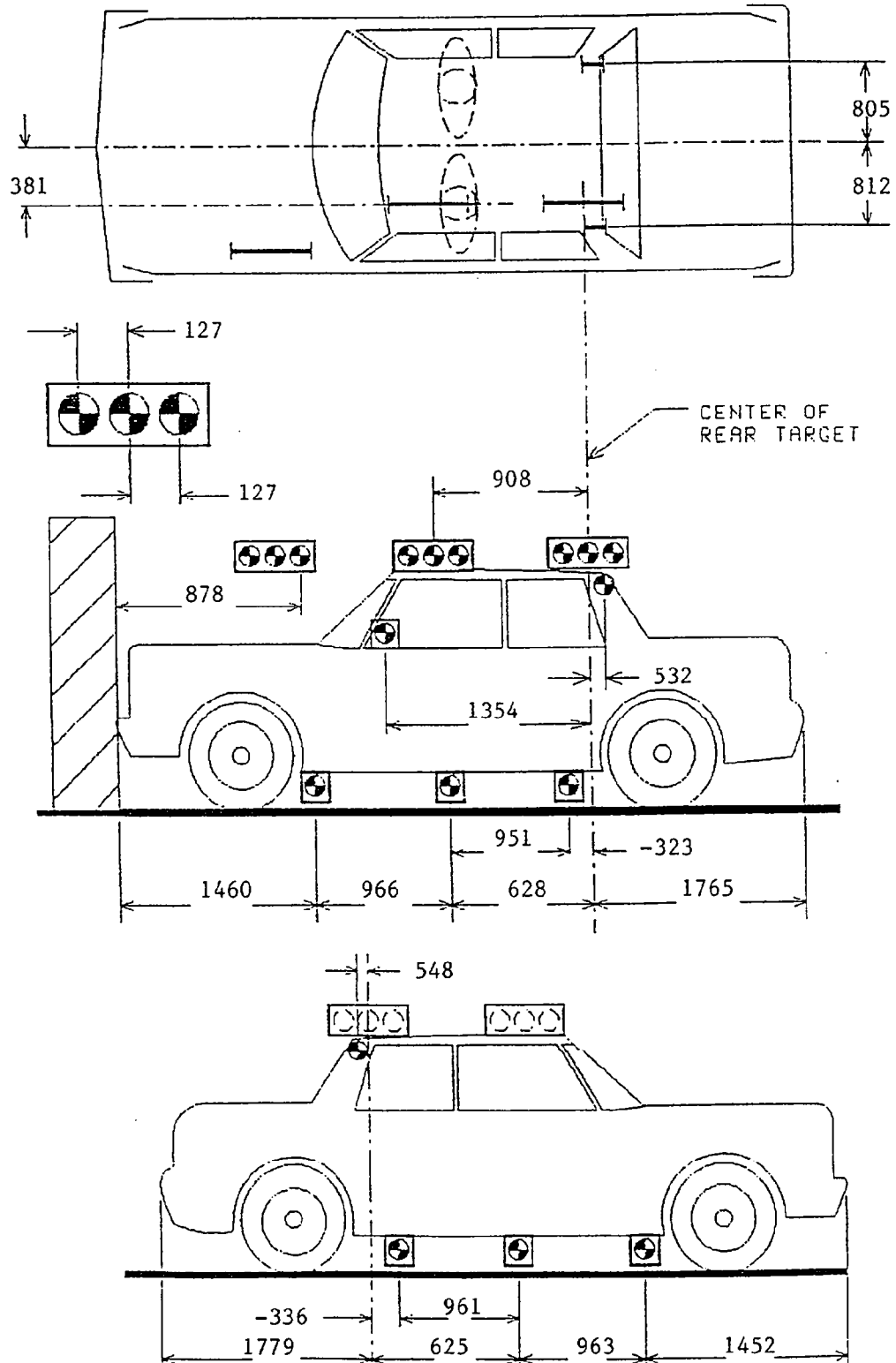
¹ +X = Film plane forward of barrier face

+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



All measurements are in millimeters.

FIGURE 12 PRE-TEST AND POST-TEST MEASUREMENT POINTS

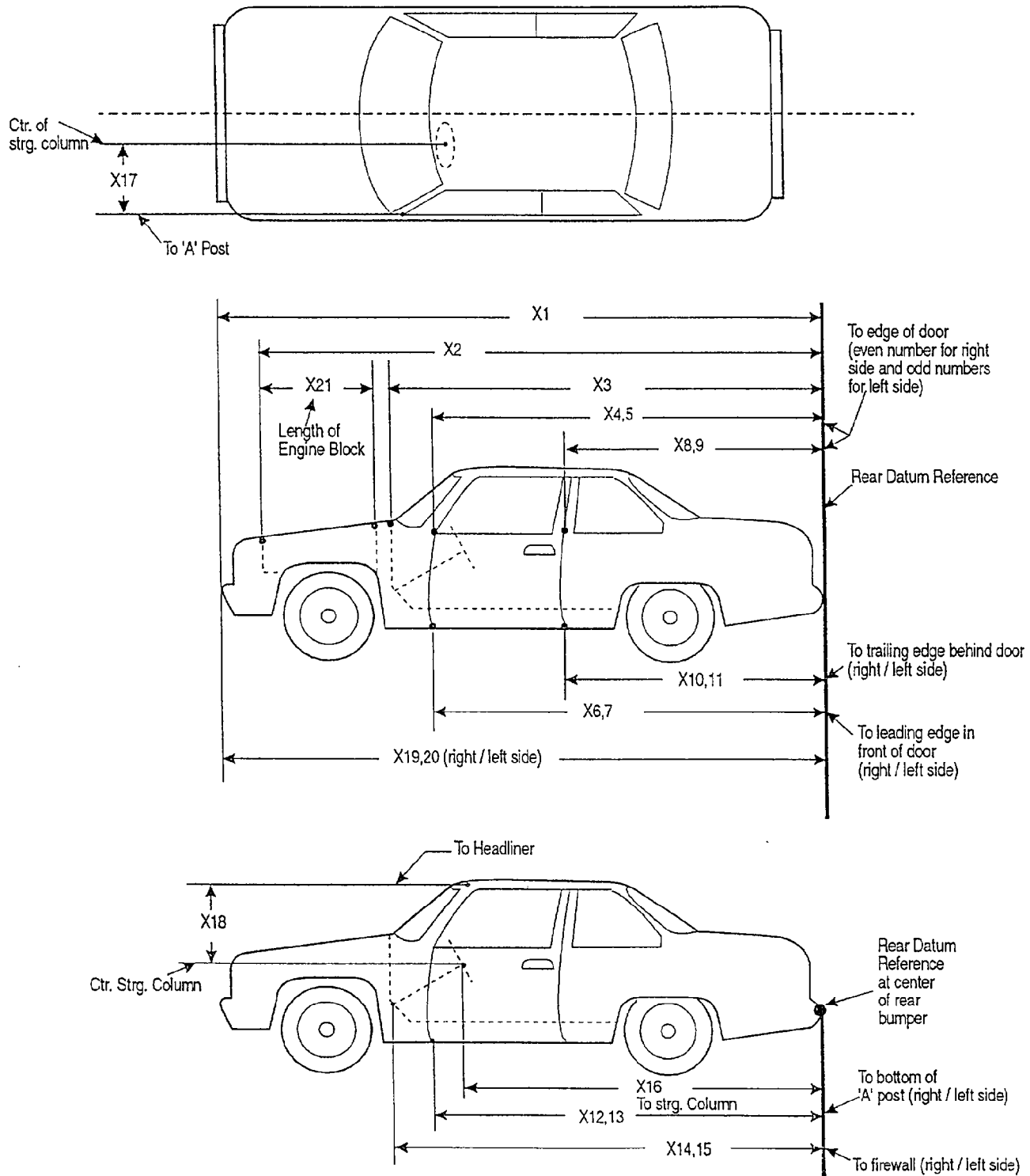


TABLE 14 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Nissan/Quest TEST NUMBER: 940520

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4819	4265	554
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	4309	4036	273
X3	REAR SURFACE OF VEHICLE TO FIREWALL	3891	3802	89
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3450	3458	-8
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3450	3455	-5
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3373	3357	16
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3370	3354	16
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2238	2244	-6
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2235	2238	-3
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2260	2245	15
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2265	2256	9
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3373	3369	4
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3366	3371	-5
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	3778	3699	79
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3785	3720	65
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	2930	2902	28
X17	CENTER OF STEERING COLUMN TO "A" POST	295	265	30
X18	CENTER OF STEERING COLUMN TO HEADLINER	397	320	77
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4649	4164	485
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4646	4134	512
X21	LENGTH OF ENGINE BLOCK	360	360	0

All measurements are in millimeters.

APPENDIX A

PHOTOGRAPHS

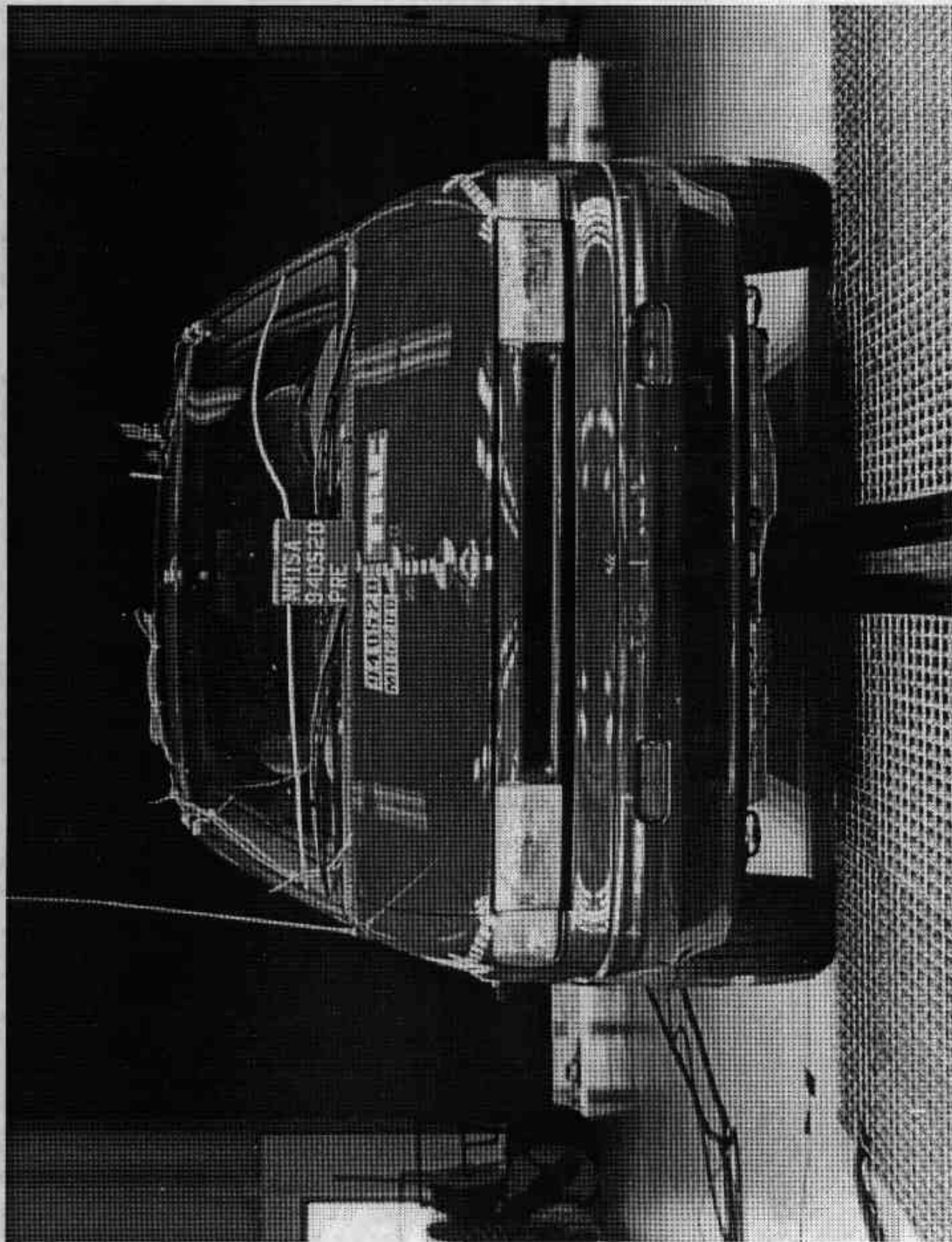


Figure A-1. PRE-TEST FRONT VIEW
A-2

940520

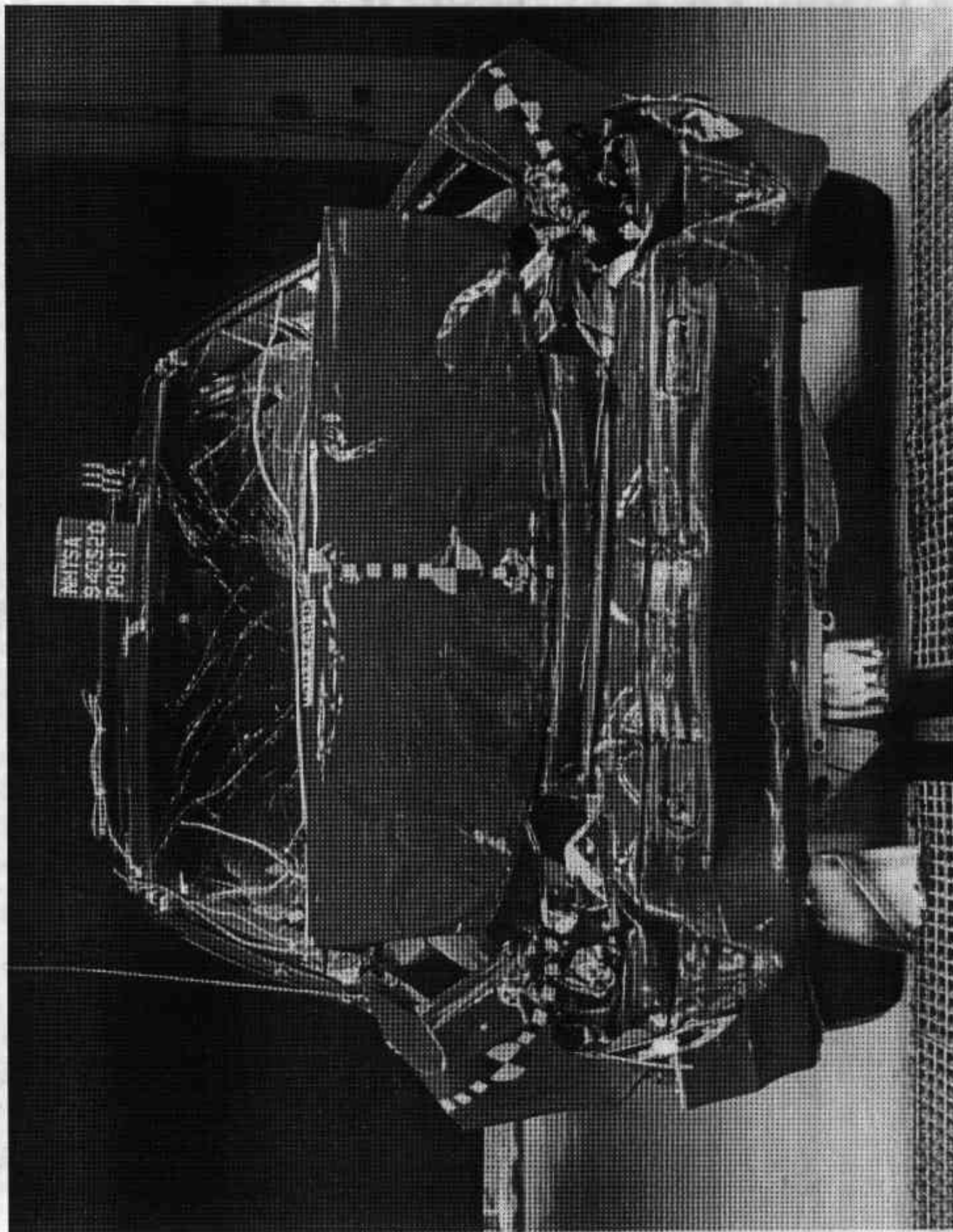


Figure A-2. POST-TEST FRONT VIEW
A-3

940520

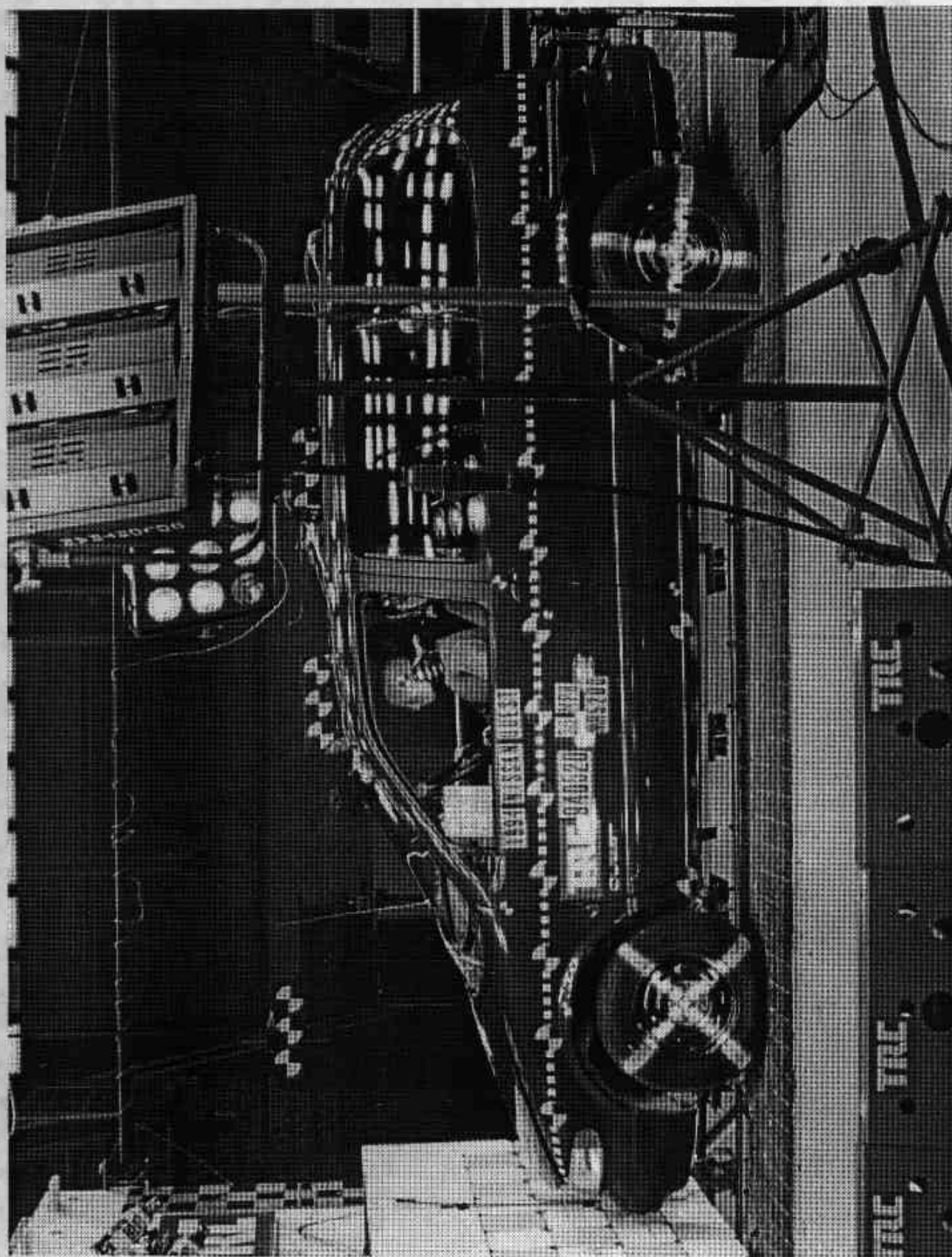


Figure A-3. PRE-TEST LEFT SIDE VIEW

A-4

940520

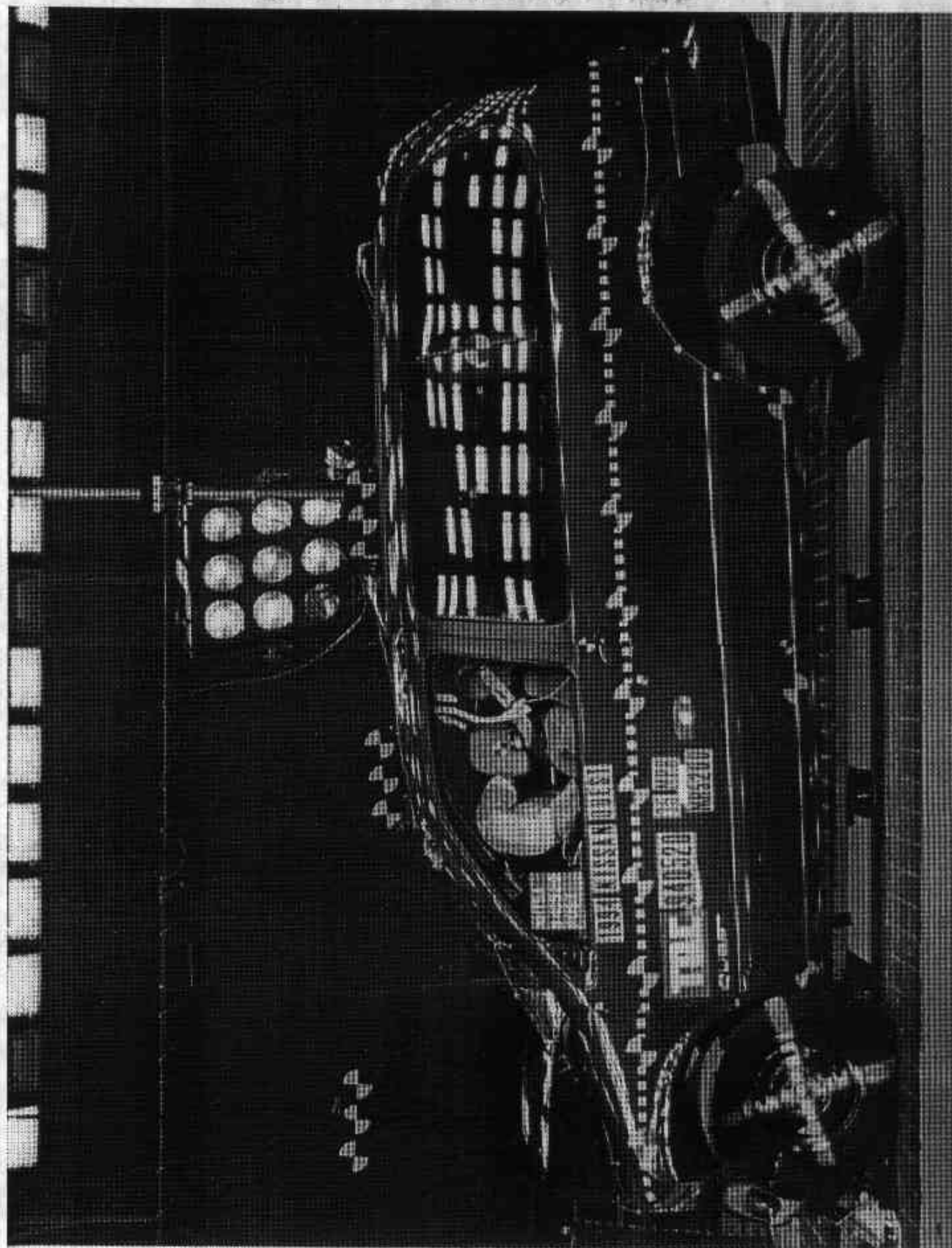


Figure A-4. POST-TEST LEFT SIDE VIEW
A-5

940520



Figure A-5. PRE-TEST REAR VIEW
A-6

940520

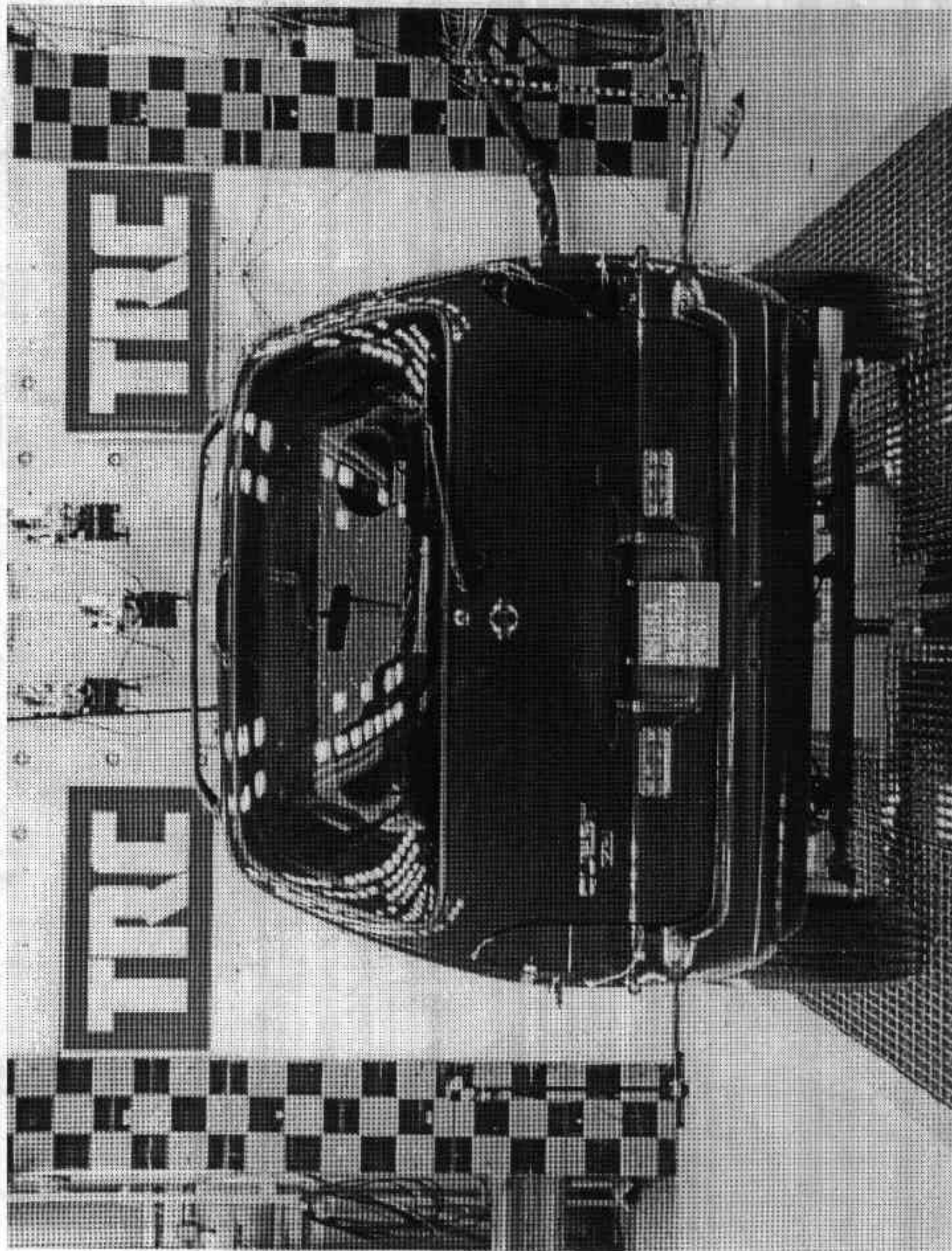


Figure A-6. POST-TEST REAR VIEW
A-7

940520

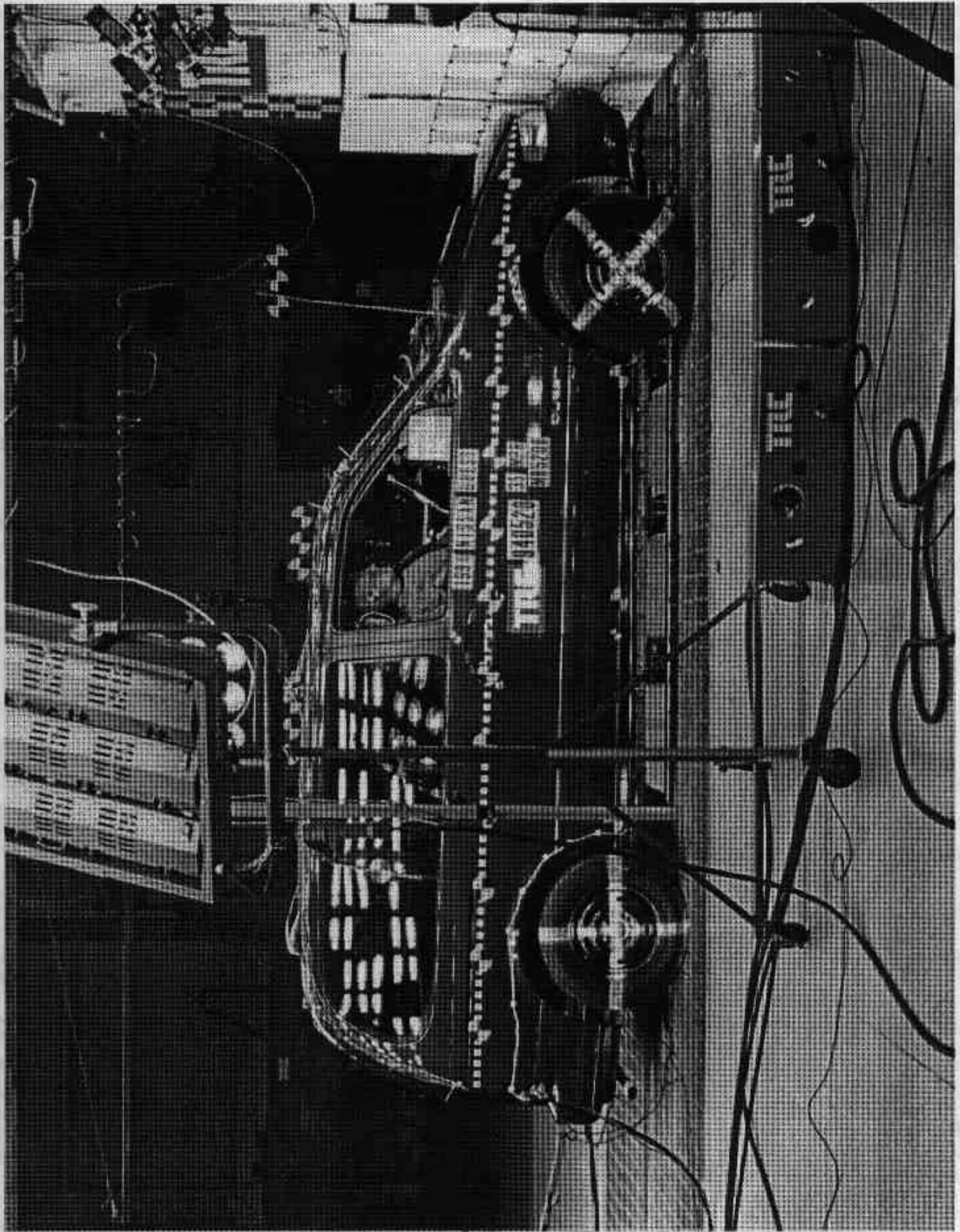


Figure A-7. PRE-TEST RIGHT SIDE VIEW
A-8

940520

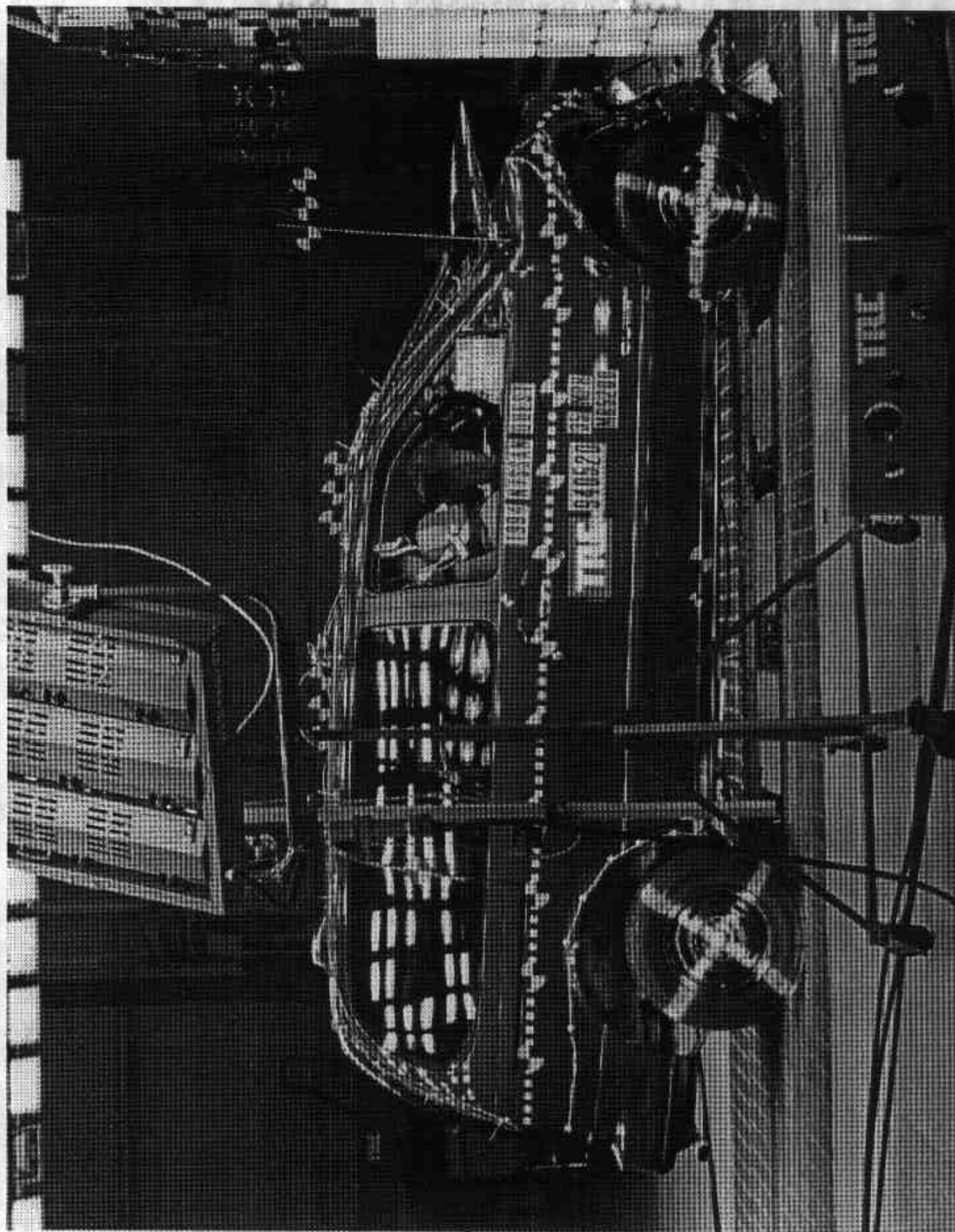


Figure A-8. POST-TEST RIGHT SIDE VIEW

A-9

940520



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

A-10

940520

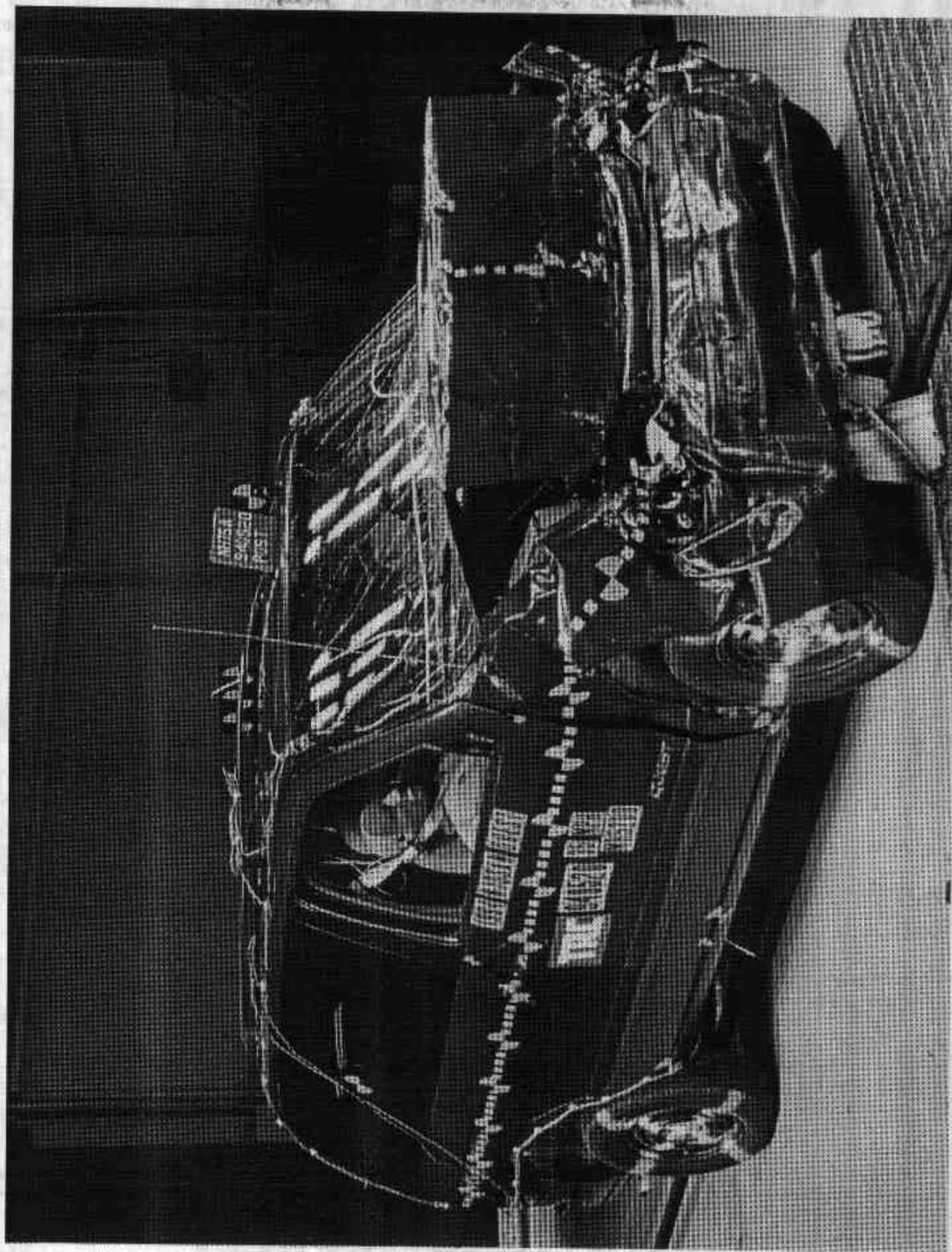


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

940520

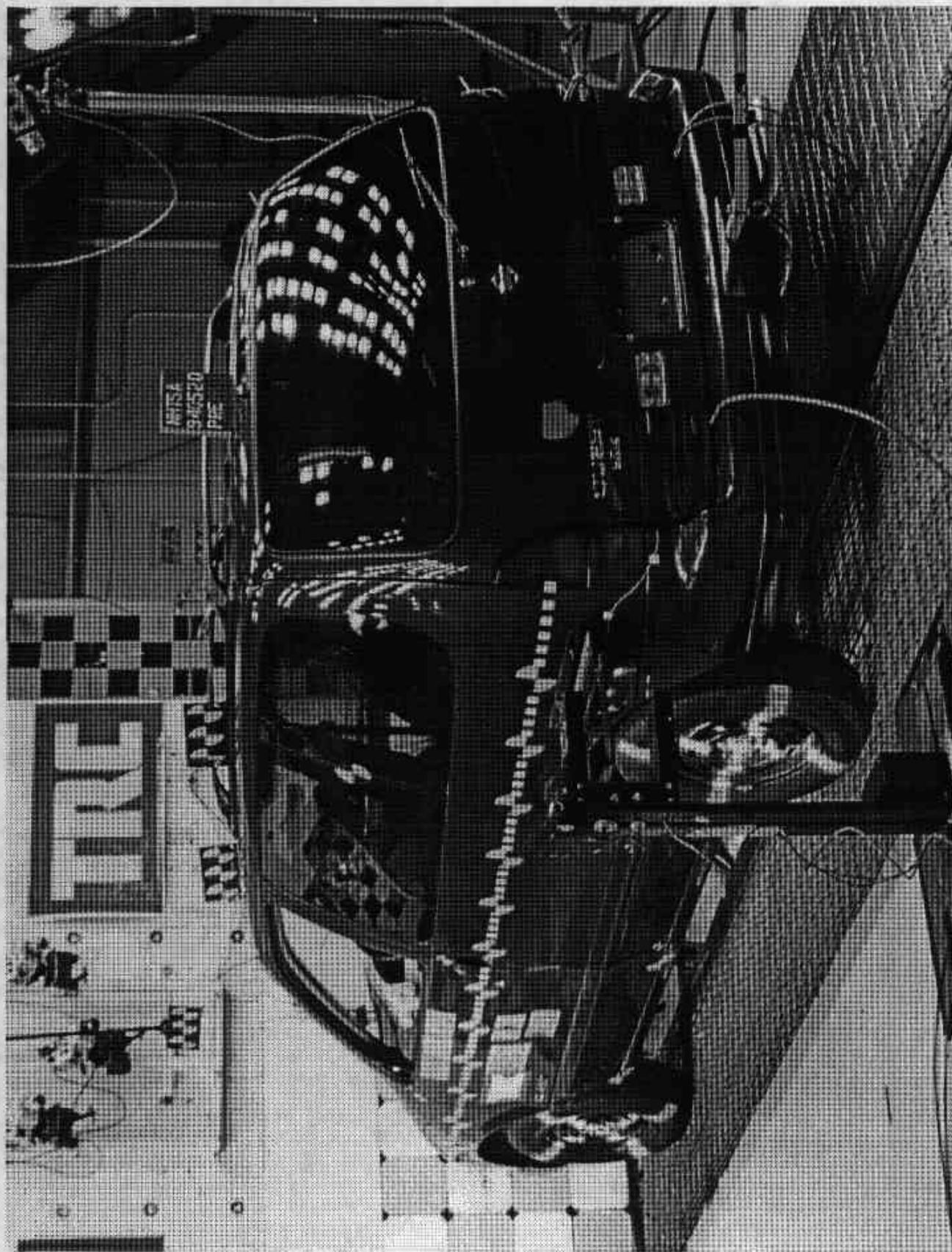


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

940520

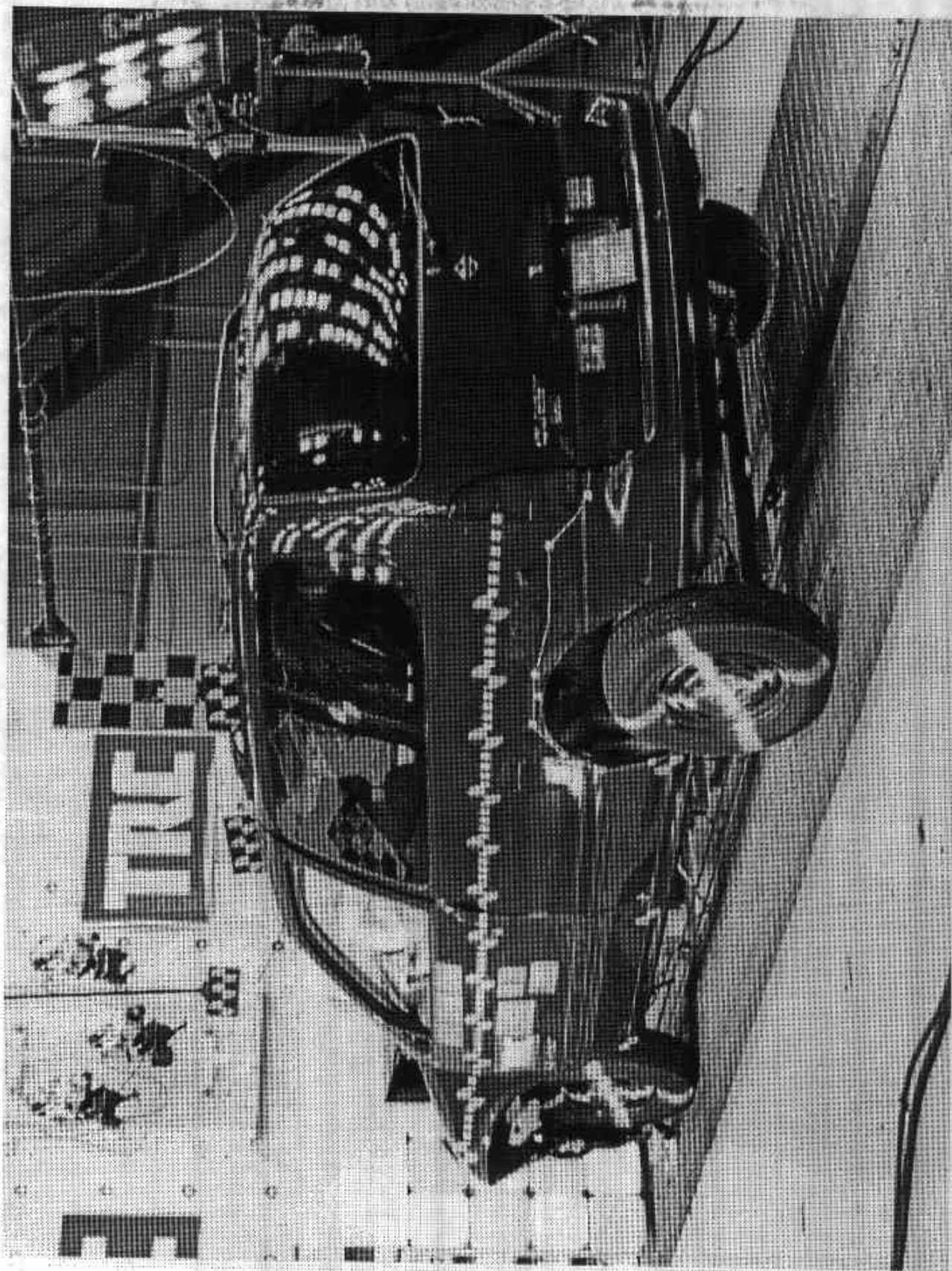


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

940520

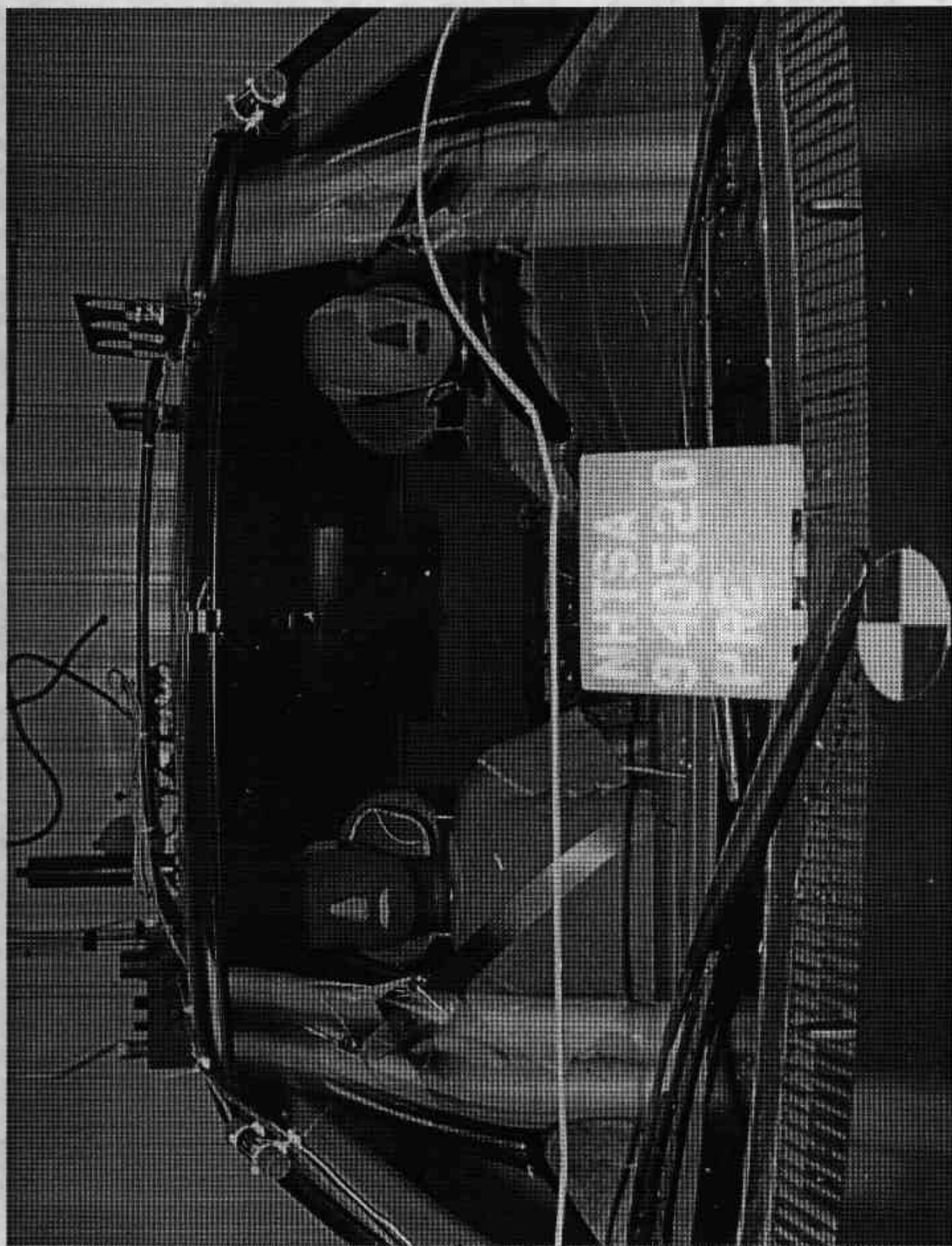


Figure A-13. PRE-TEST WINDSHIELD VIEW
A-14

940520



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

940520

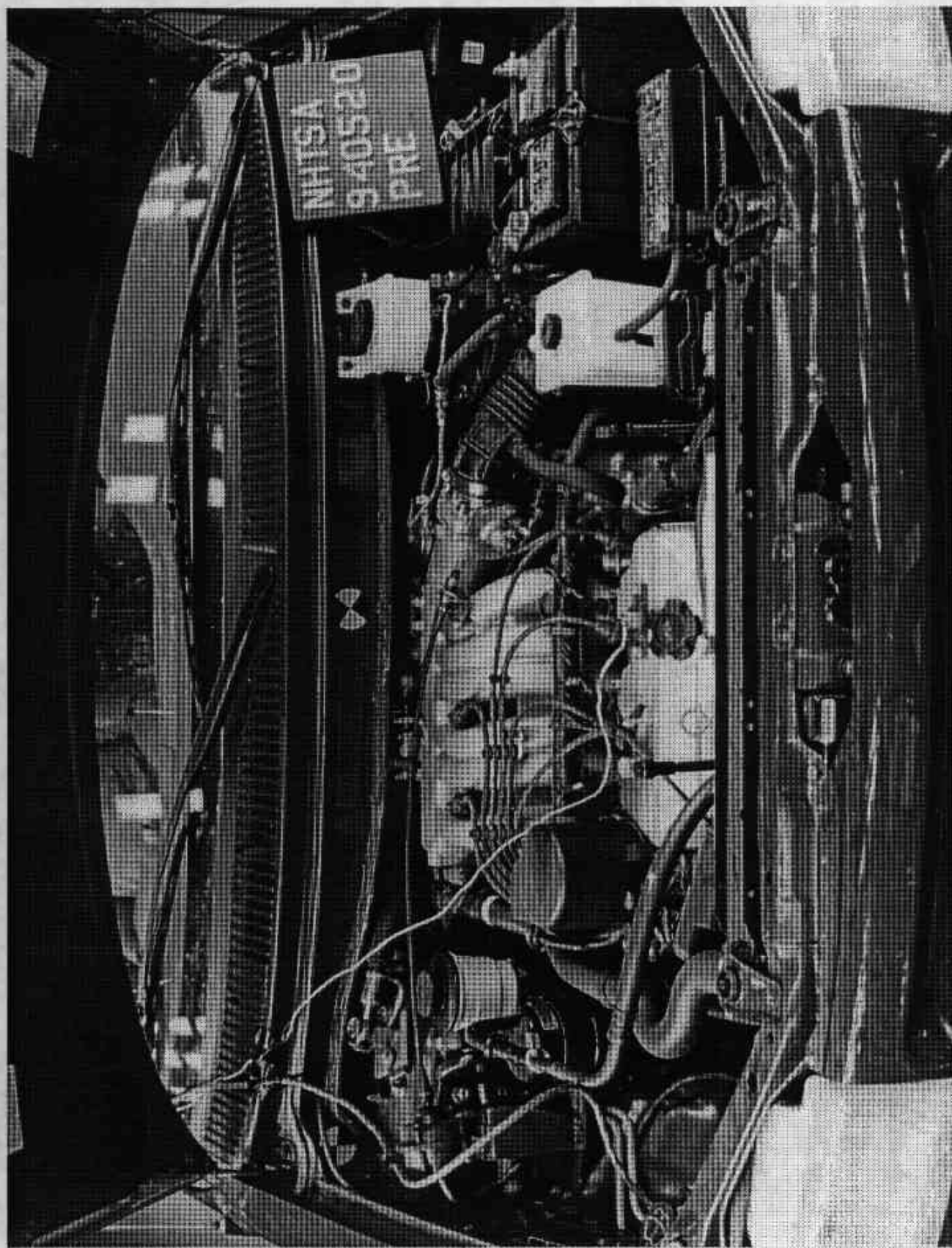


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

940520

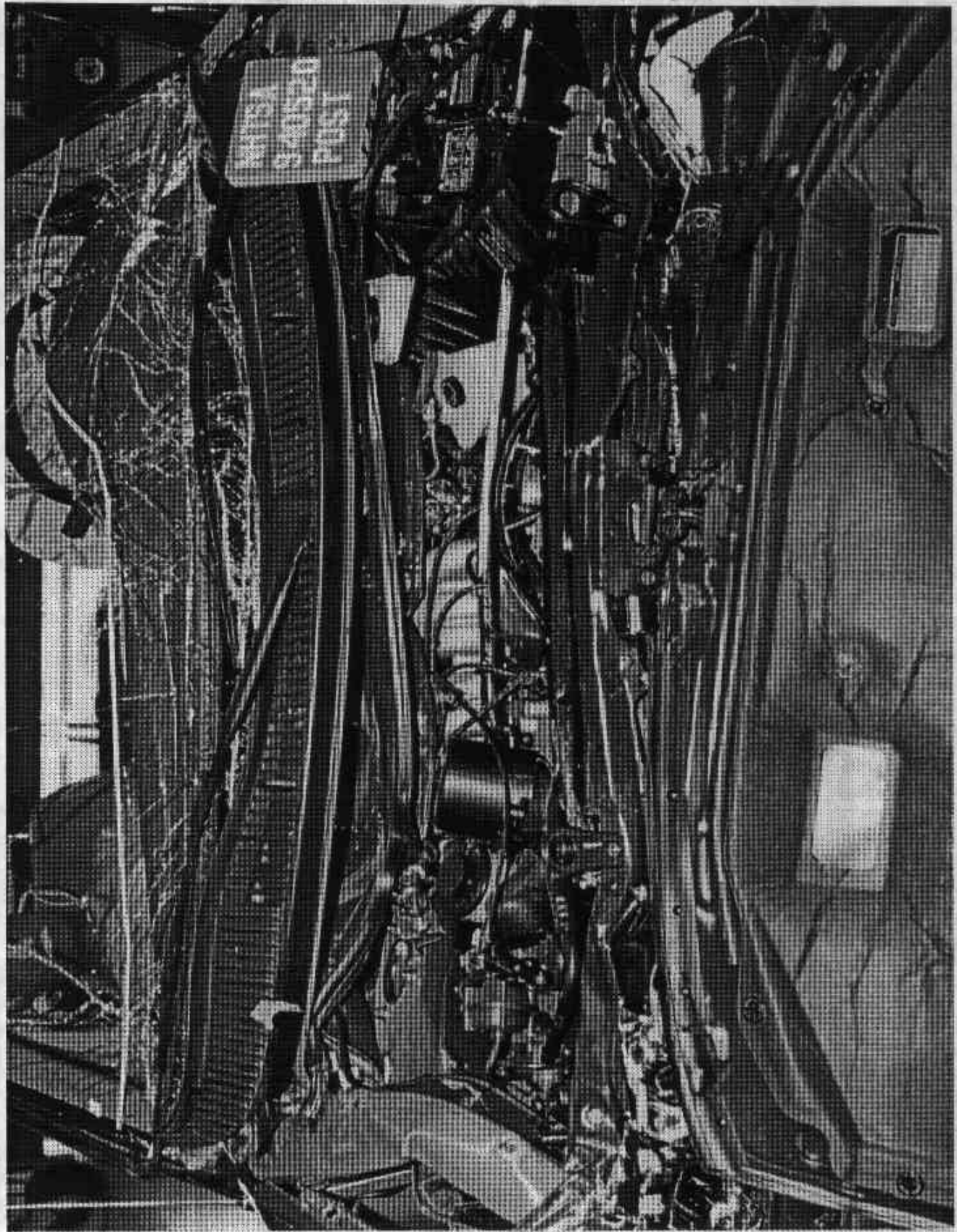


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW
A-17

940520



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

940520

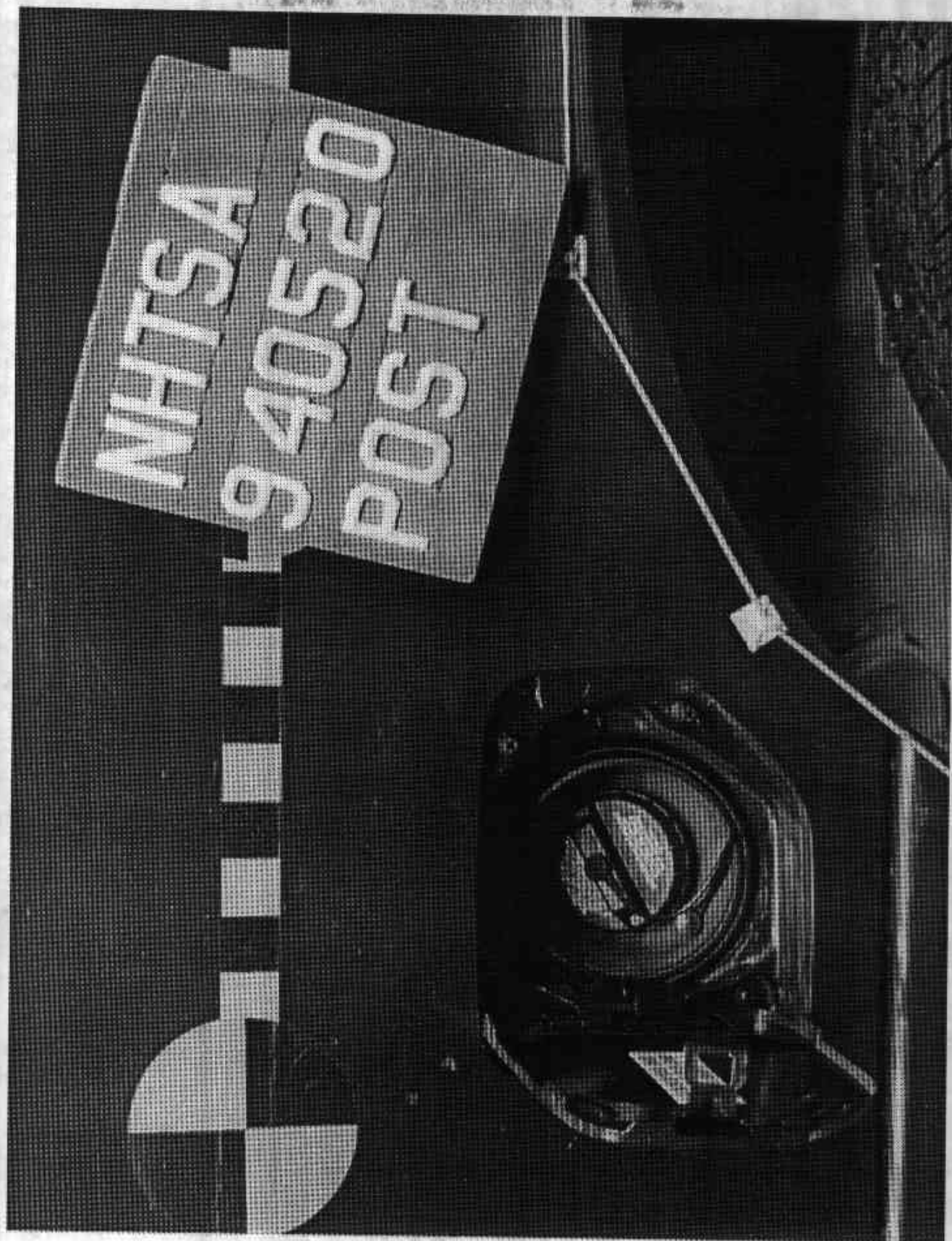


Figure A-18. POST-TEST FUEL FILLER CAP VIEW

A-19

940520



Figure A-19. PRE-TEST FUEL FILLER NECK VIEW
A-20

940520

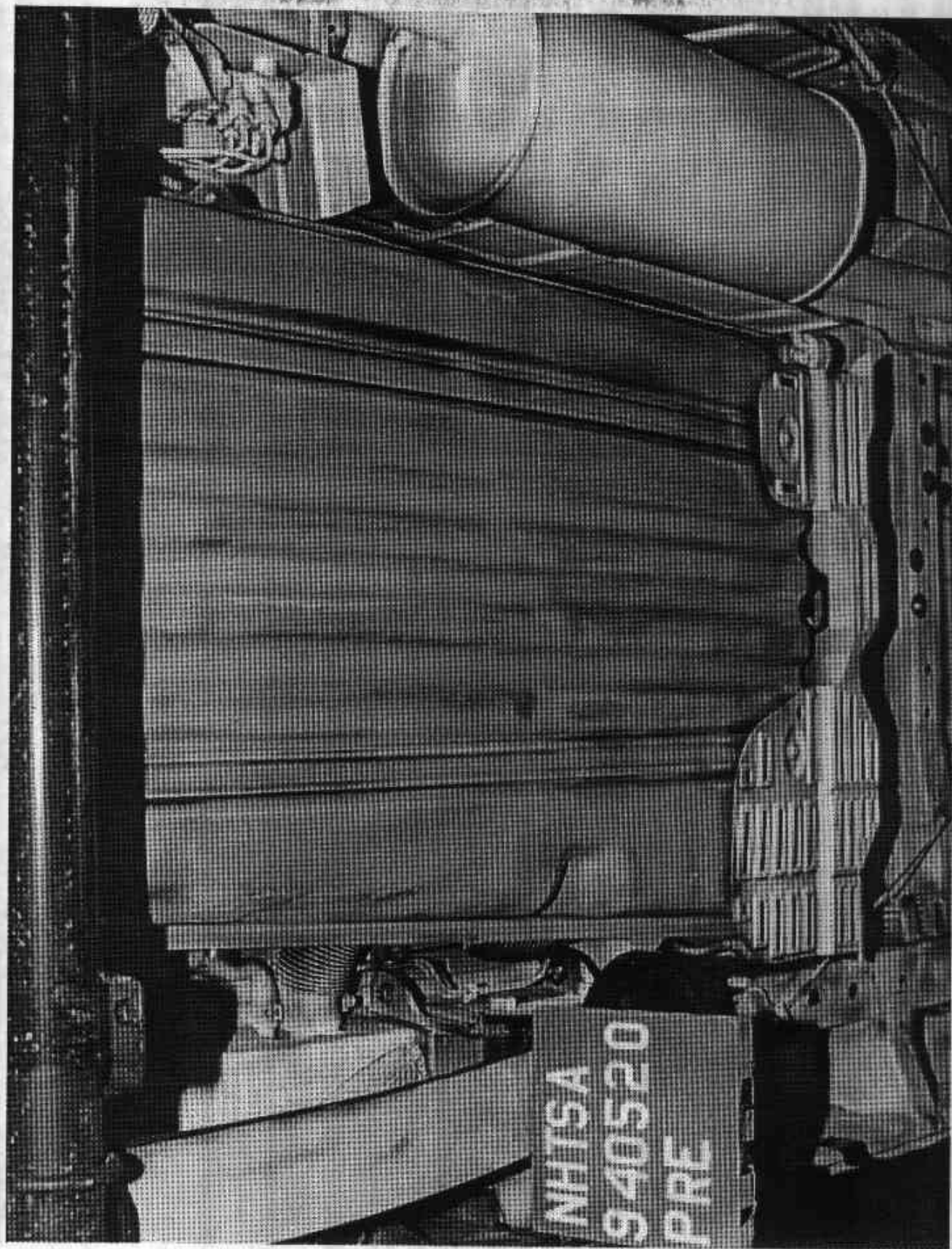


Figure A-20. PRE-TEST FUEL FILLER NECK AND TANK VIEW

A-21

940520

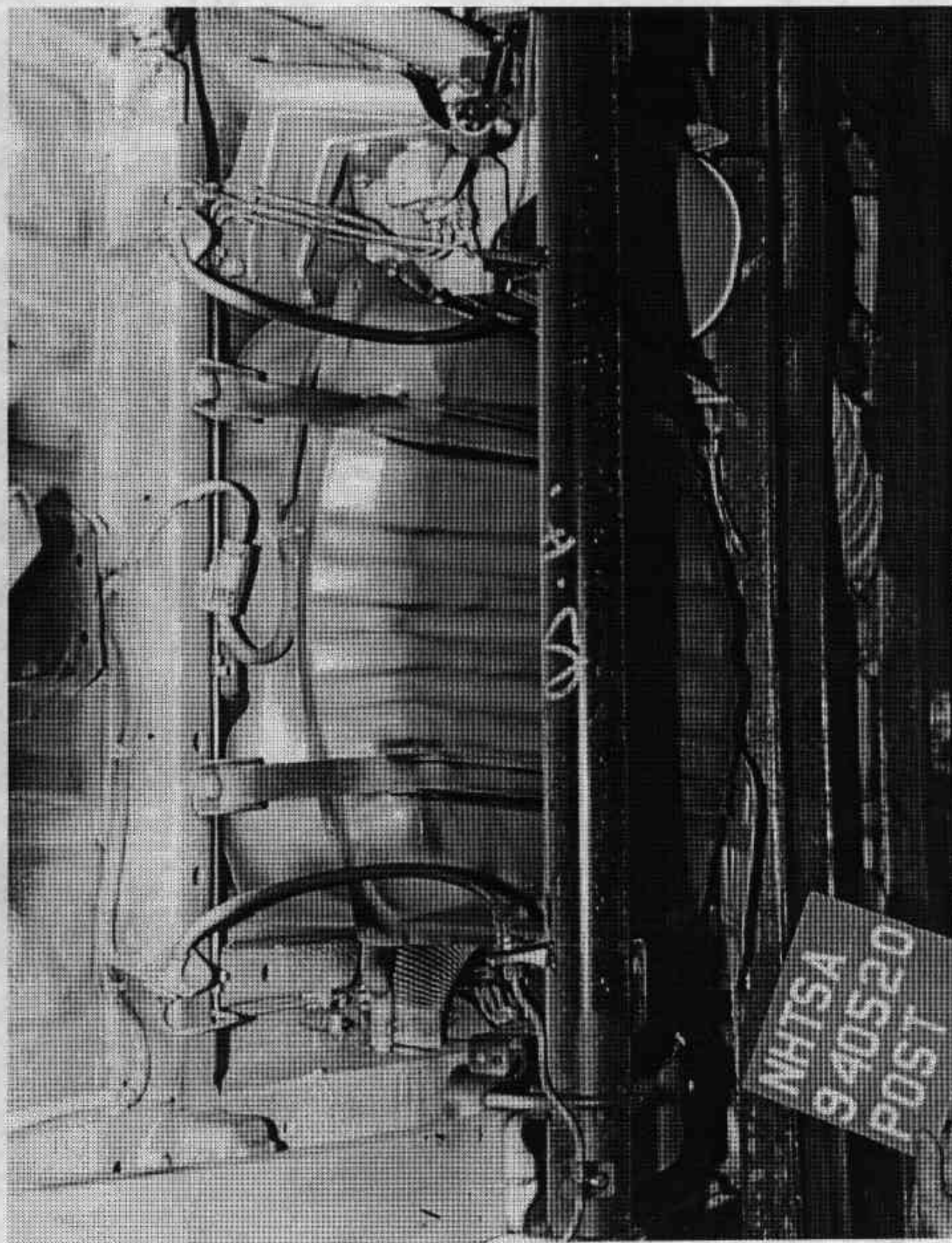


Figure A-21. POST-TEST FUEL FILLER NECK AND TANK VIEW

A-22

940520

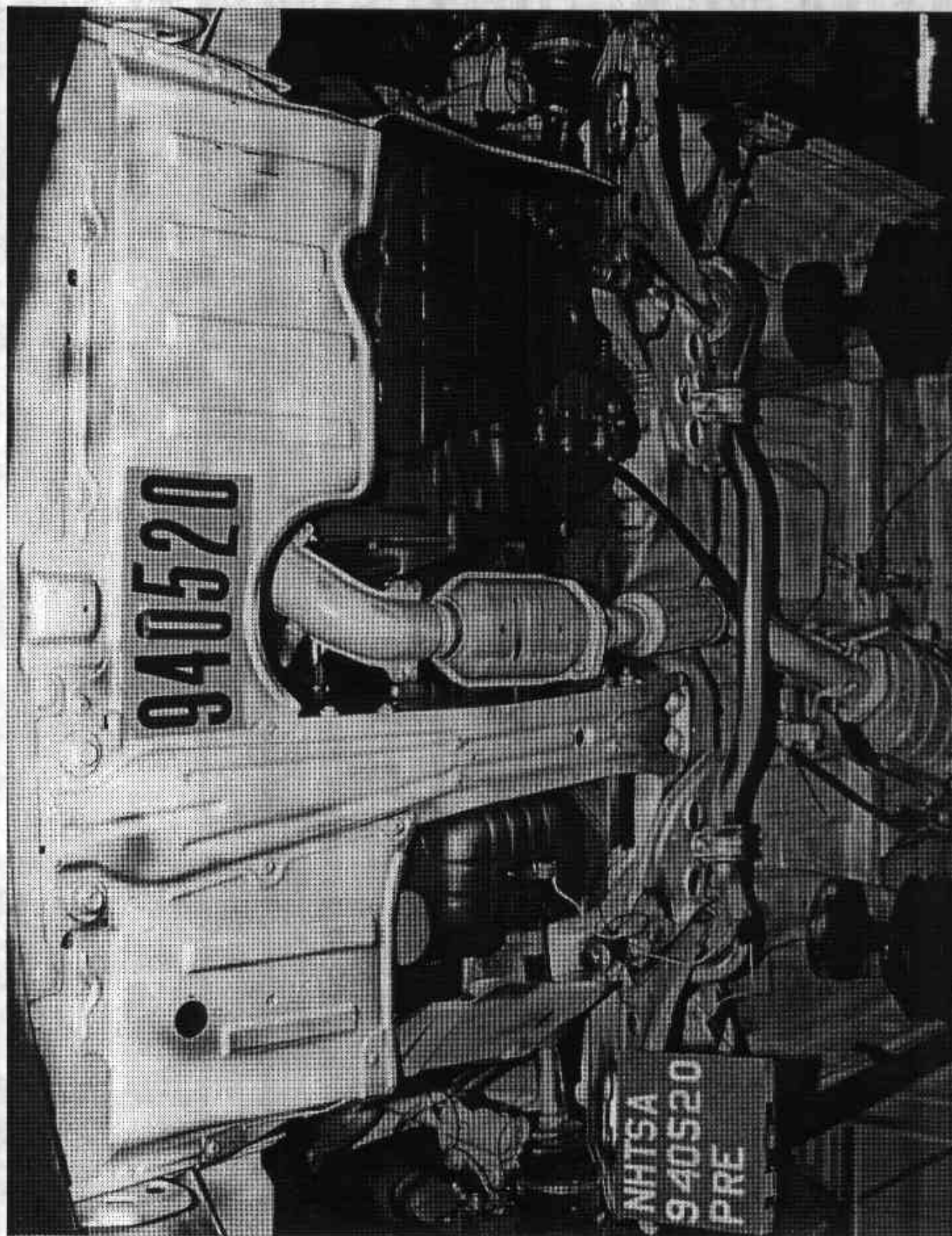


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW
A-23

940520

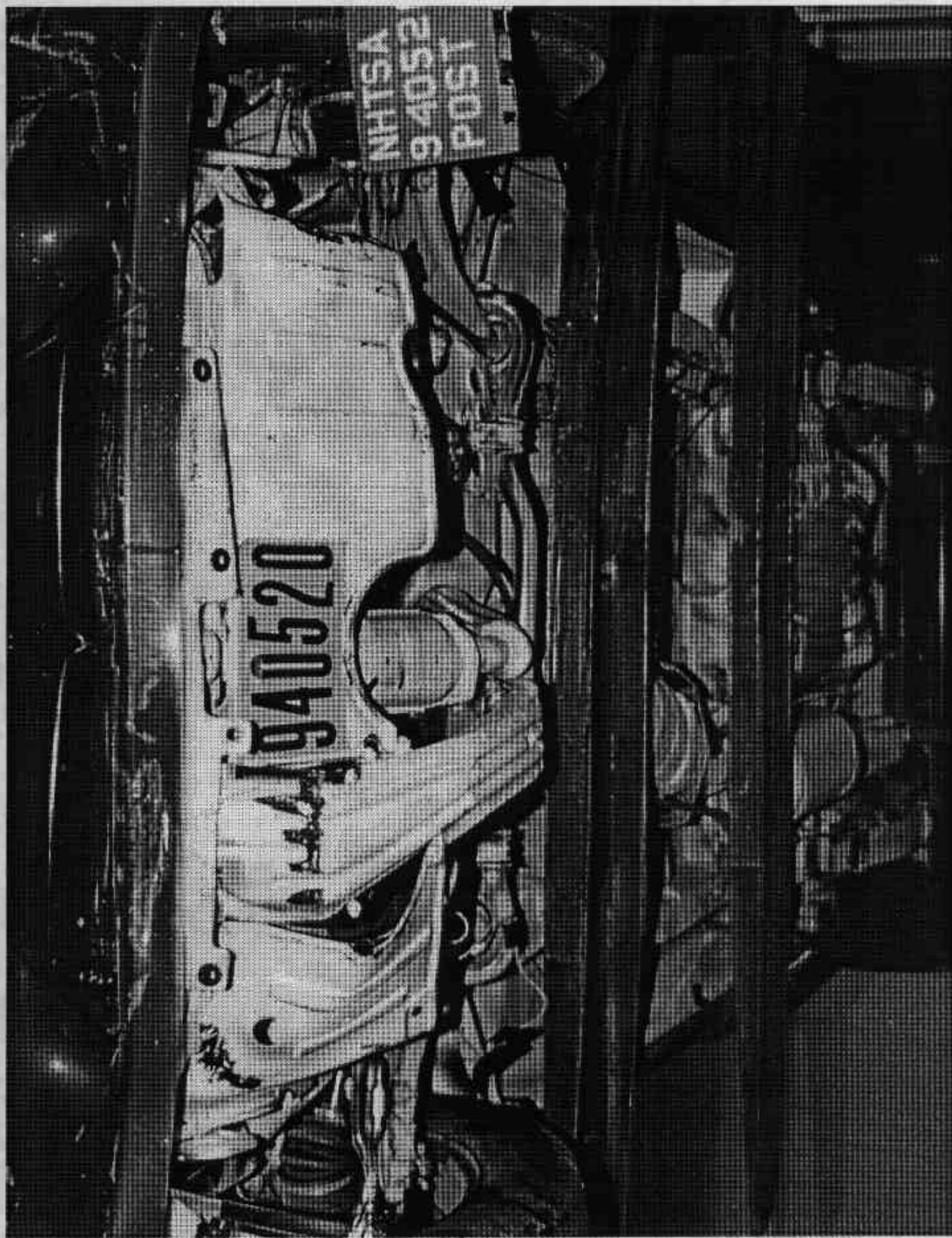


Figure A-23. POST-TEST FRONT UNDERBODY VIEW

A-24

940520

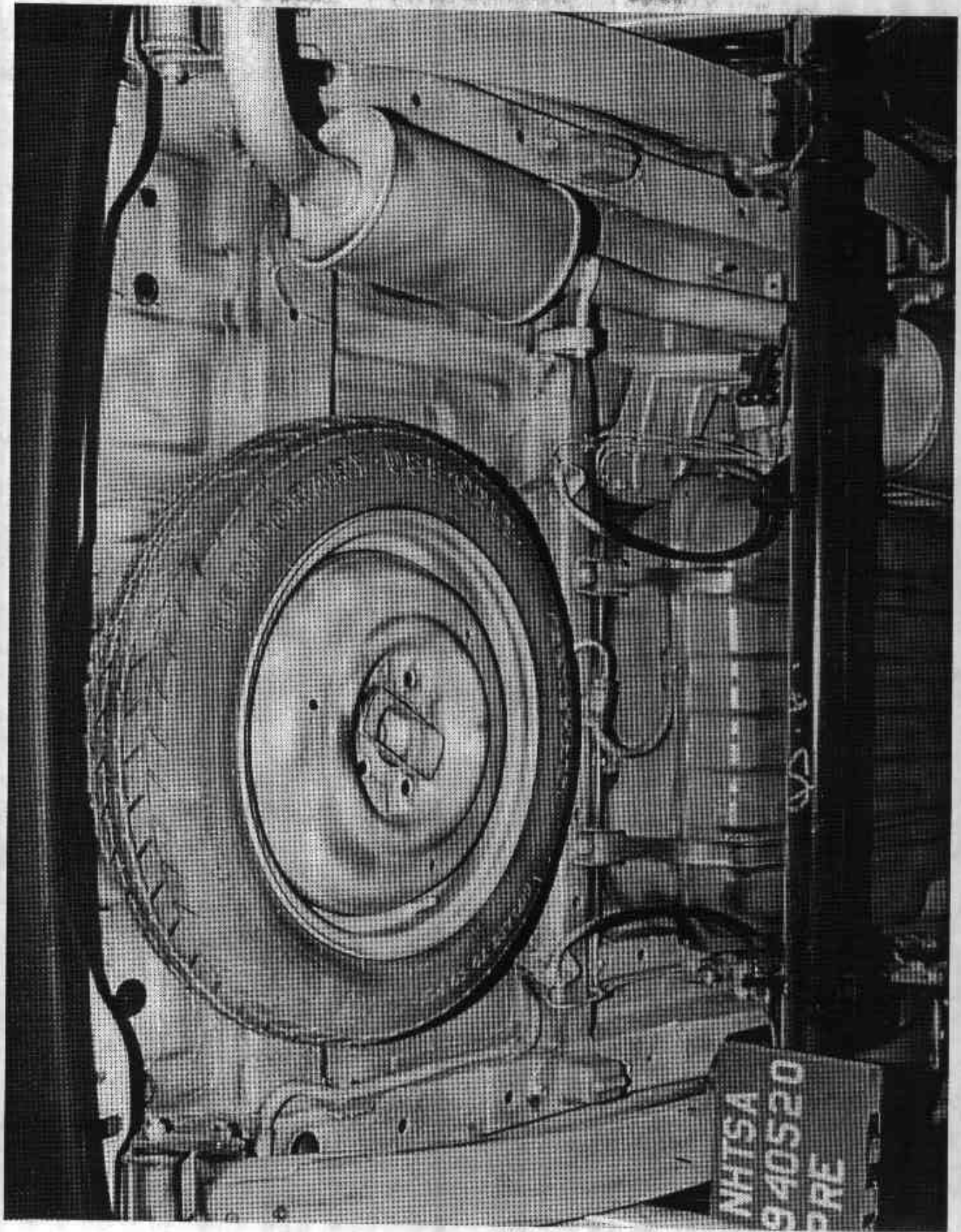


Figure A-24. PRE-TEST REAR UNDERBODY VIEW
A-25

940520

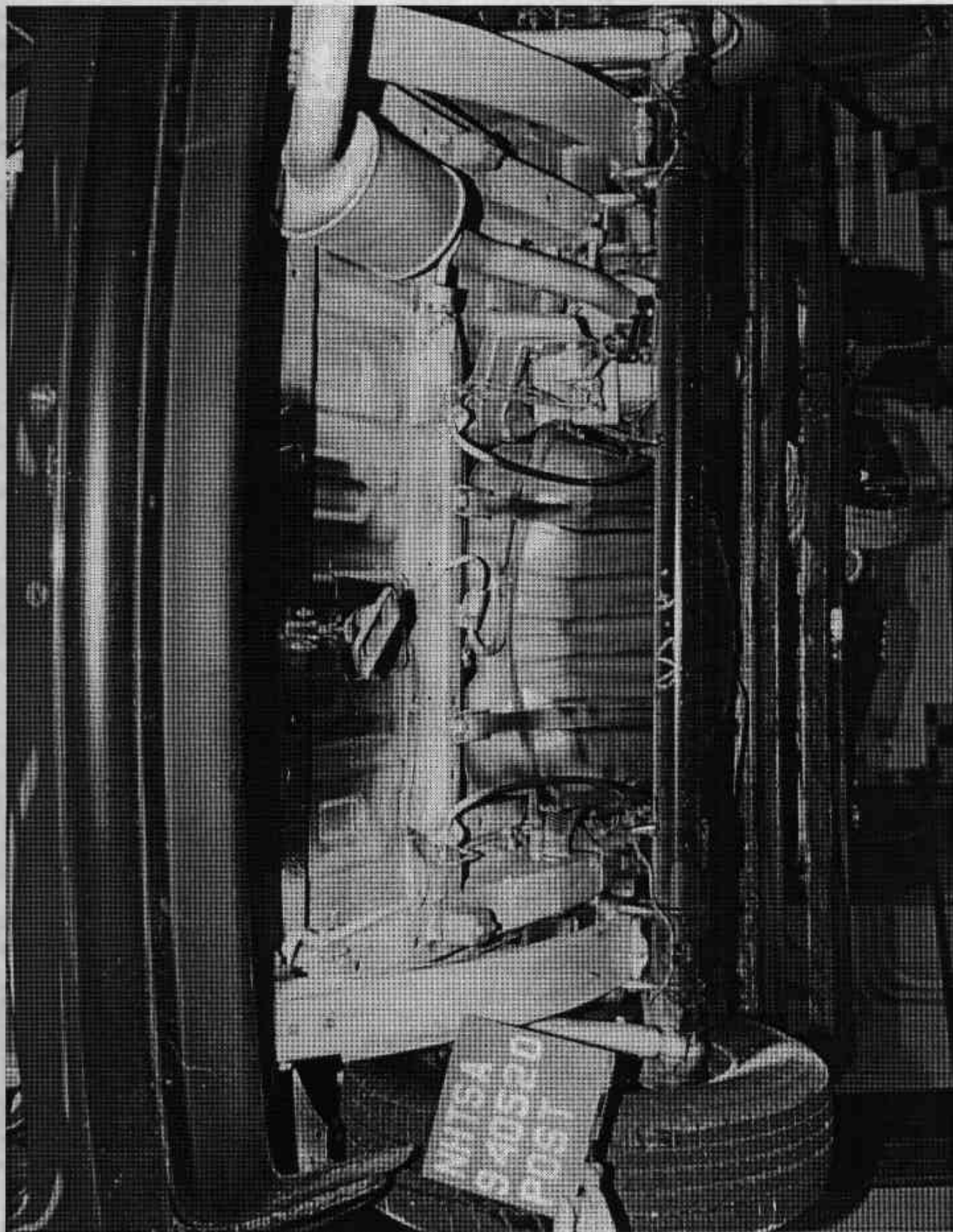


Figure A-25. POST-TEST REAR UNDERBODY VIEW
A-26

940520



Figure A-26. PRE-TEST DRIVER DUMMY POSITION VIEW
A-27

940520

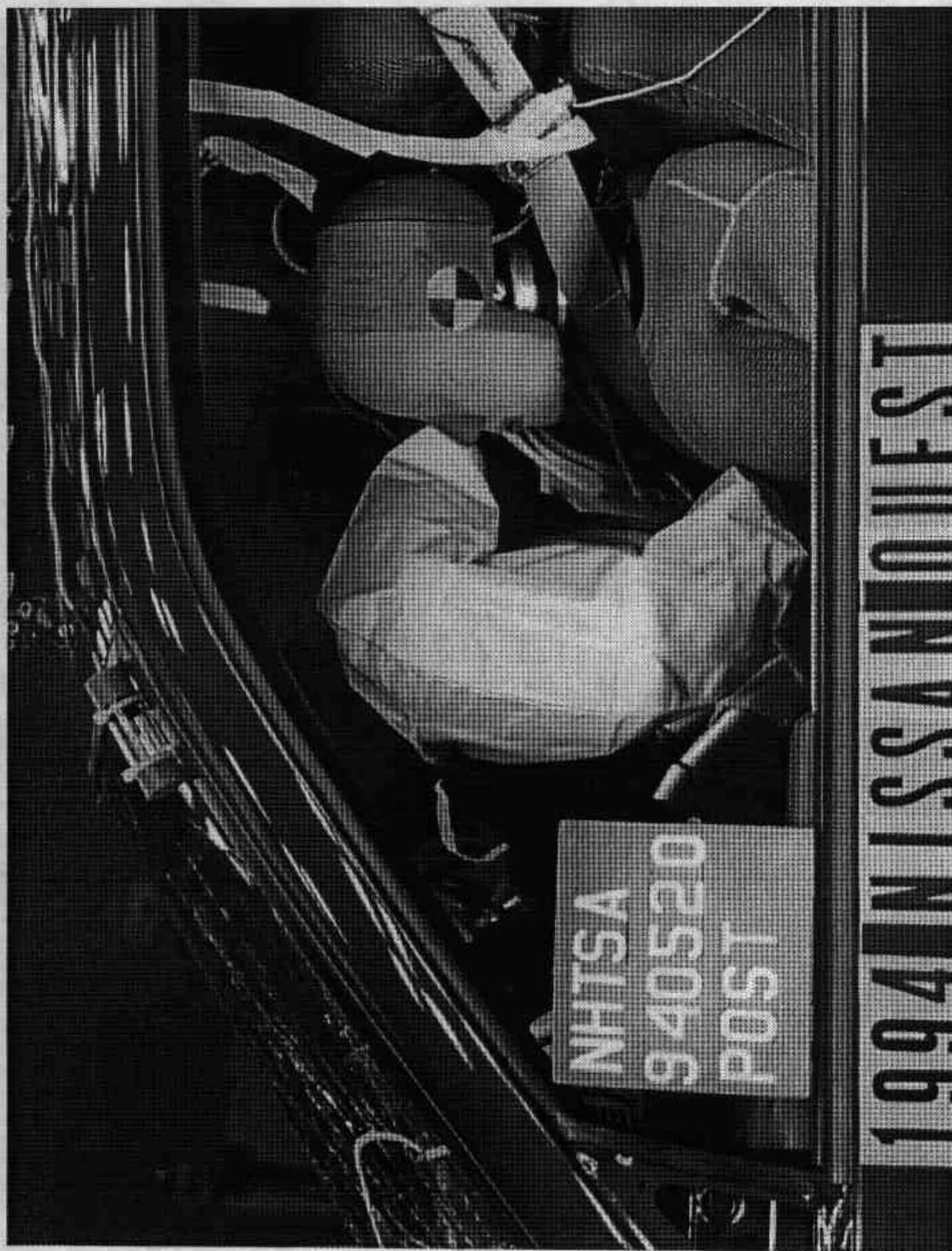


Figure A-27. POST-TEST DRIVER DUMMY POSITION VIEW

A-28

940520

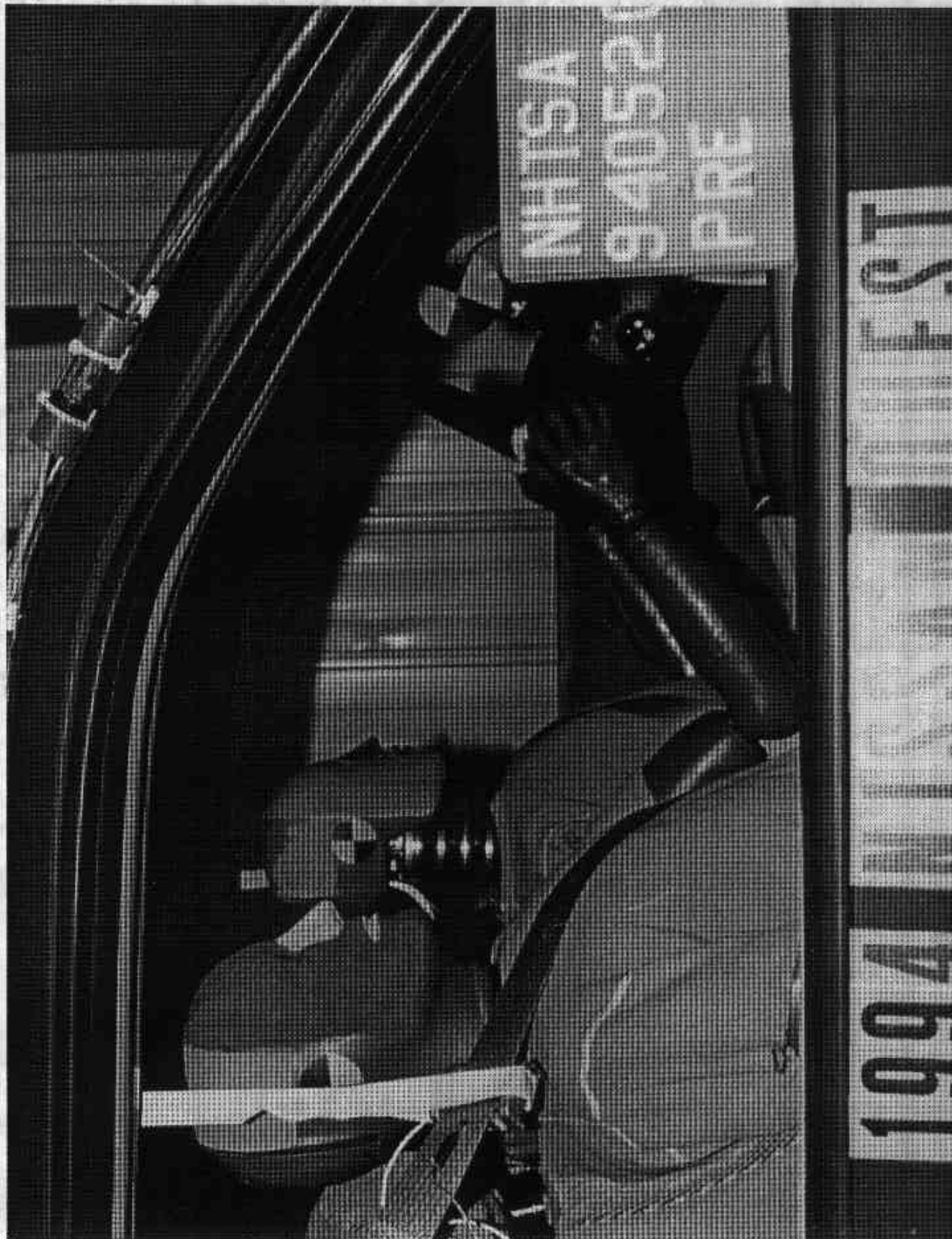


Figure A-28. PRE-TEST PASSENGER DUMMY POSITION VIEW

A-29

940520



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

A-30

940520

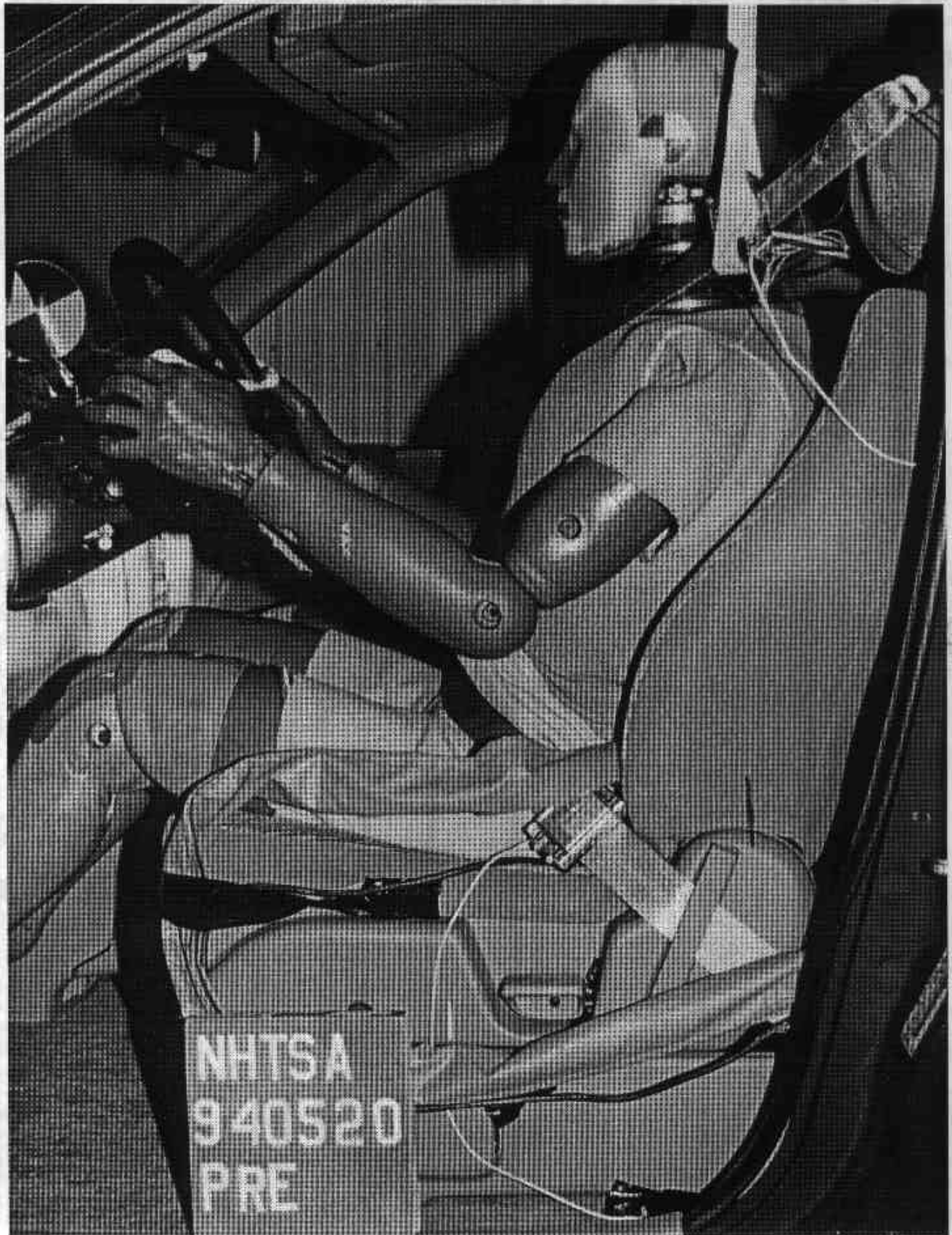


Figure A-30. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-31 940520



Figure A-31. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-32 940520



Figure A-32. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-33 940520



Figure A-33. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-34 940520



Figure A-34. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-35 940520

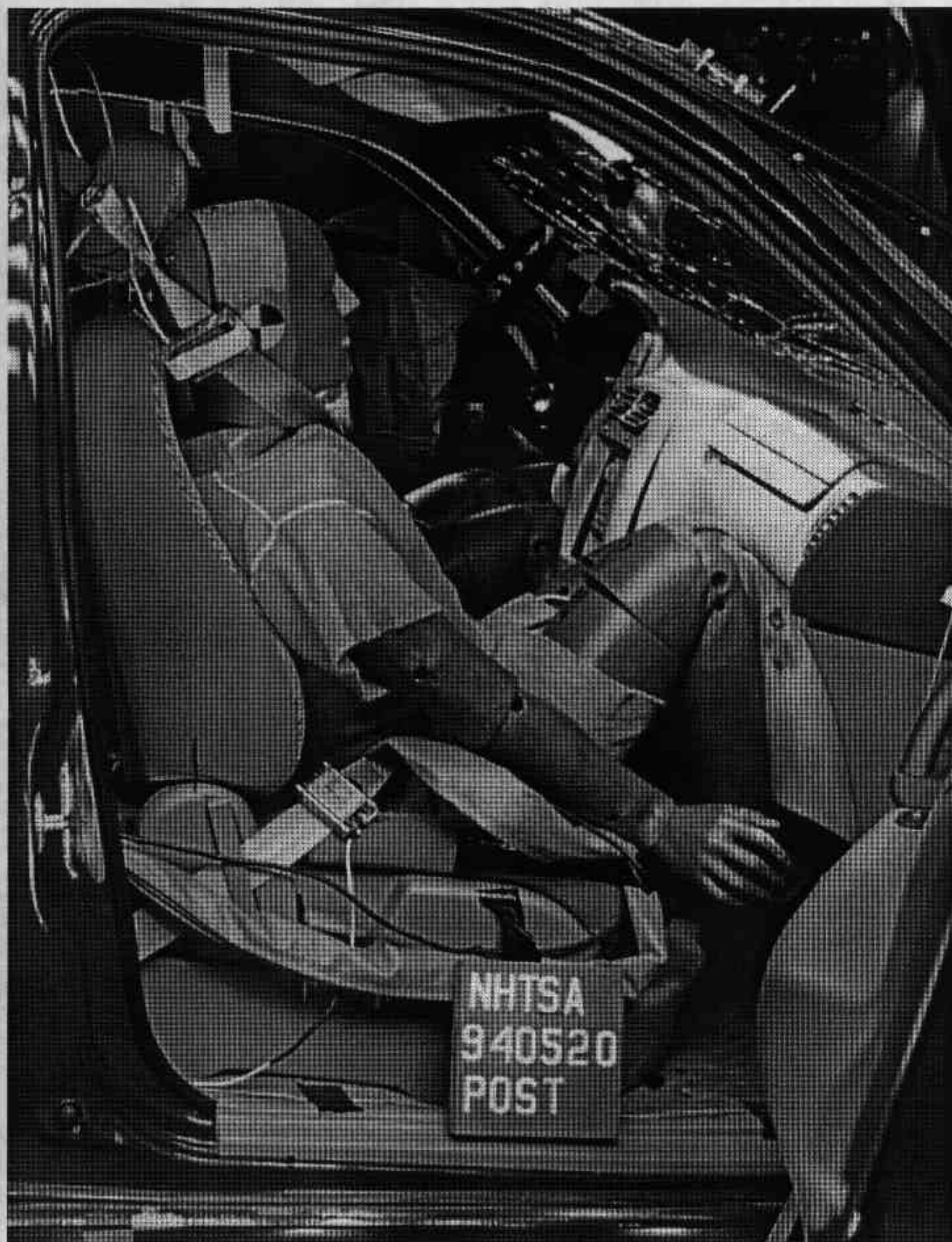


Figure A-35. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-36 940520

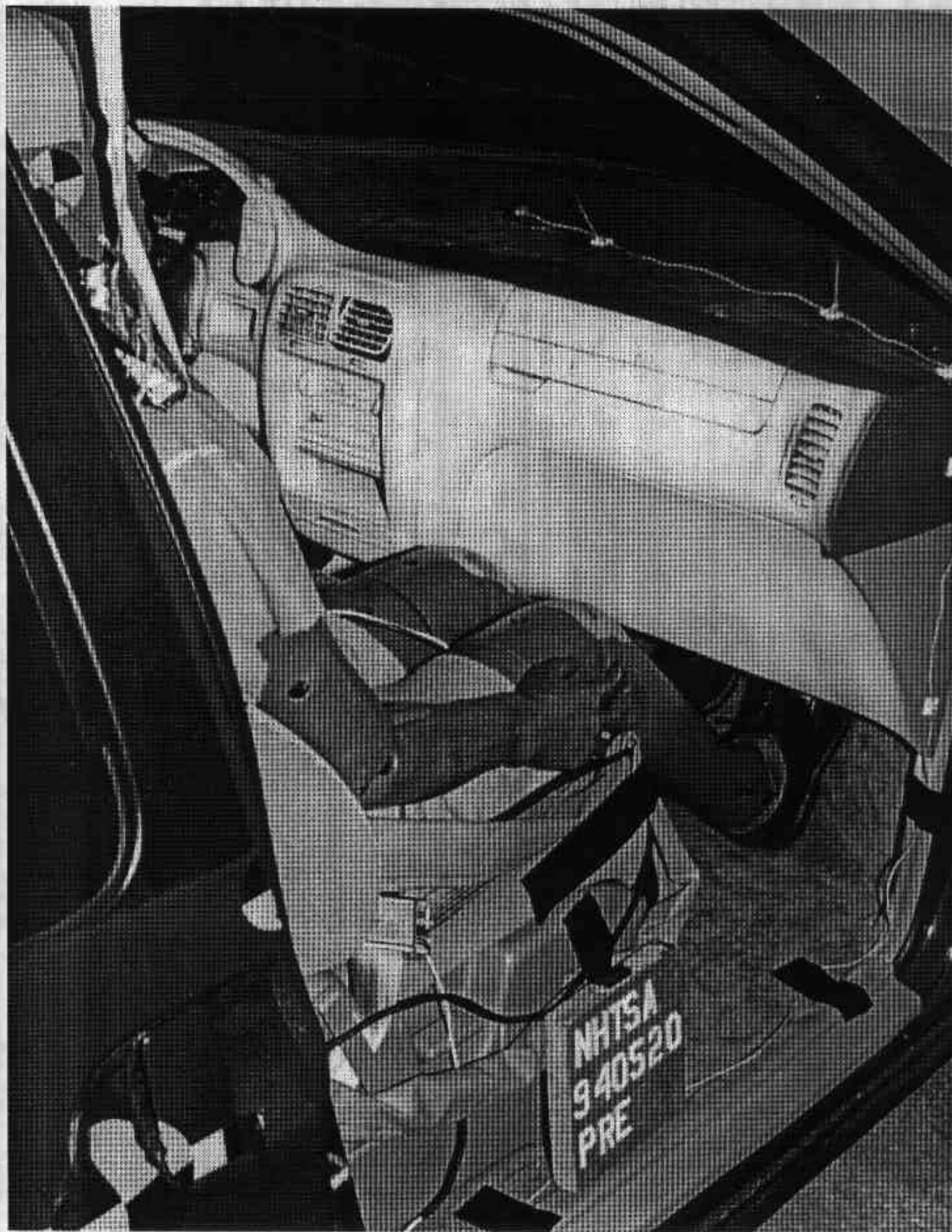


Figure A-36. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-37 940520



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

A-38

940520



Figure A-38. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

A-39

940520



Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2
A-40 940520



Figure A-40. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-41

940520

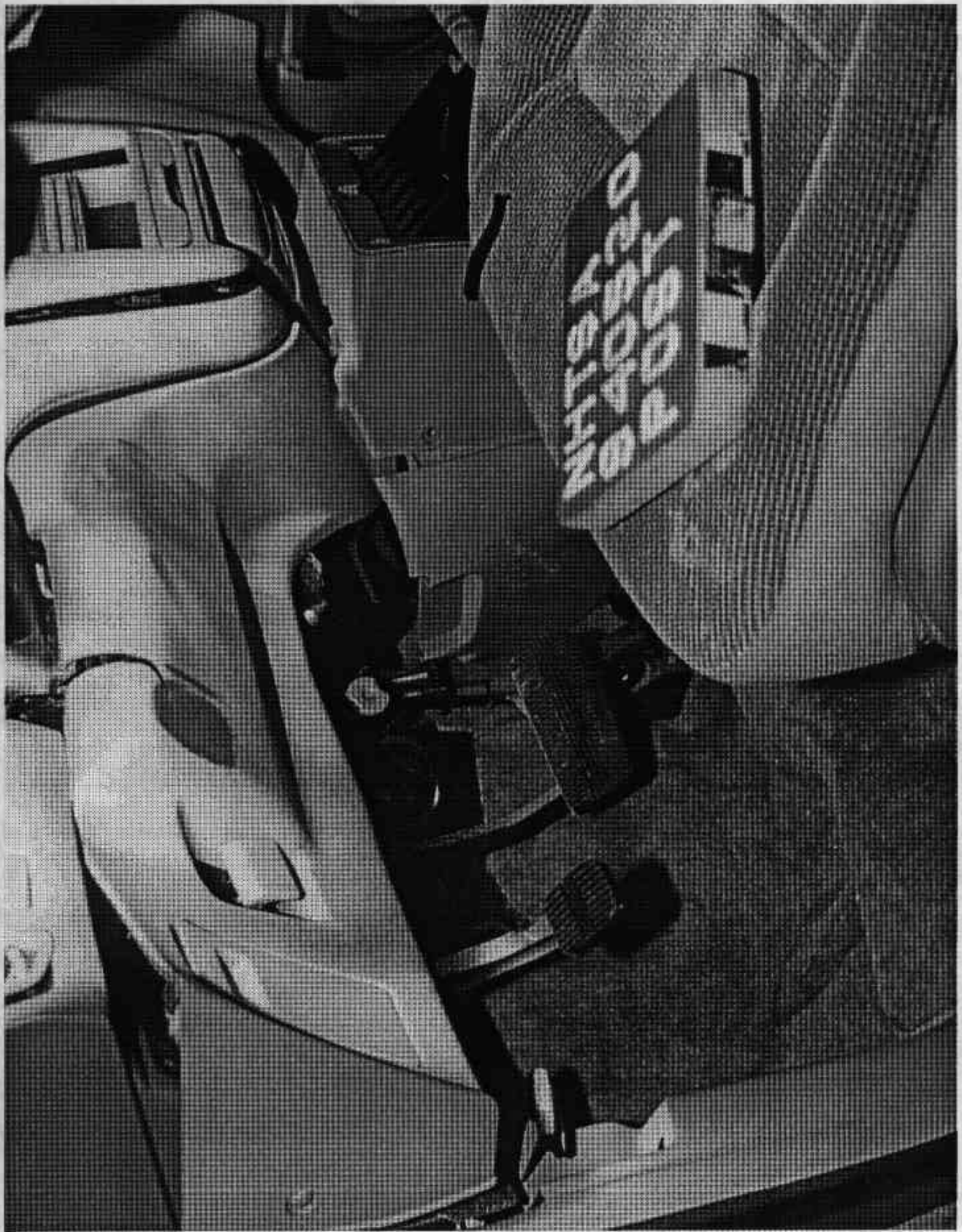


Figure A-41. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

A-42

940520

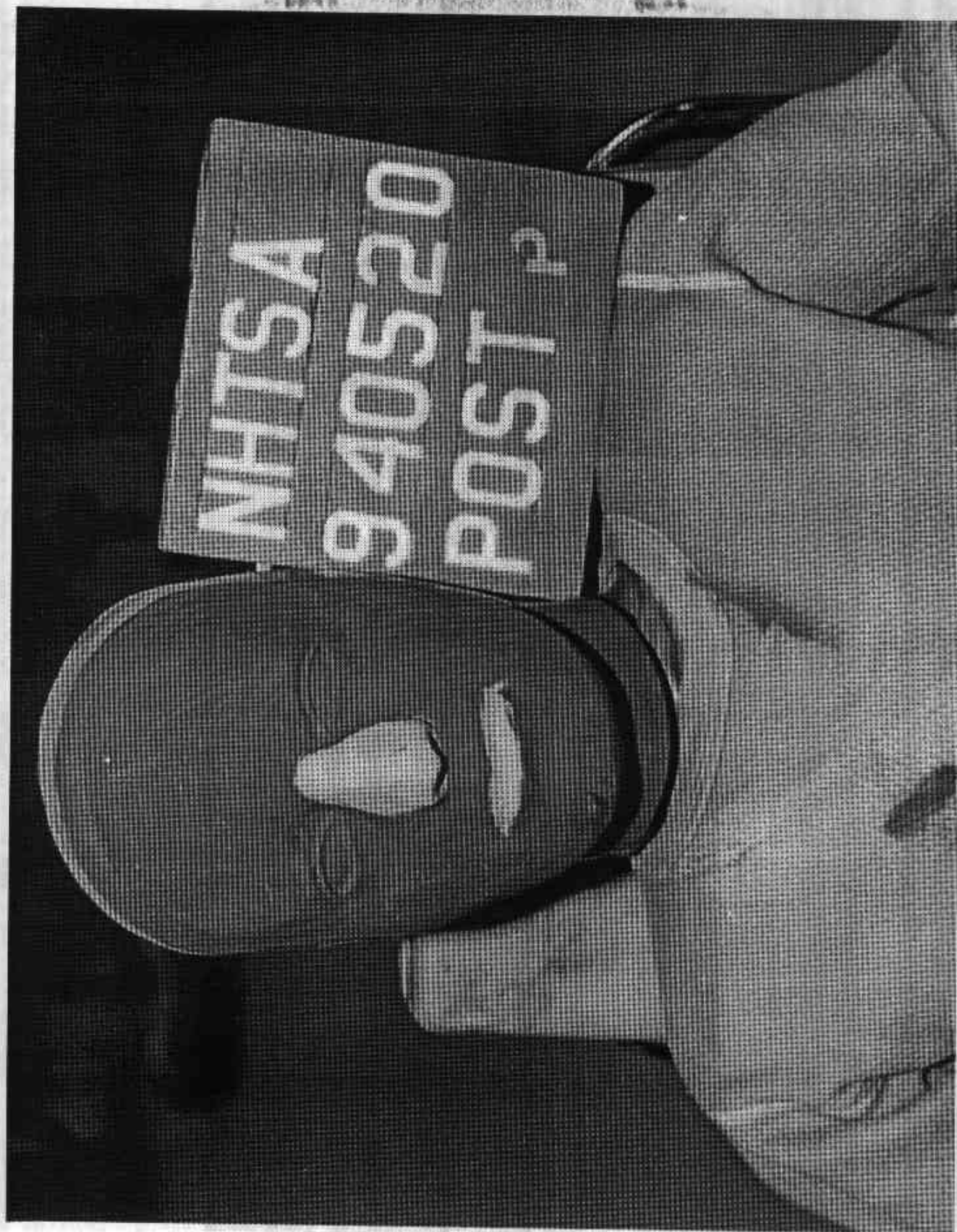


Figure A-42. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW
A-43 940520



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

A-44

940520

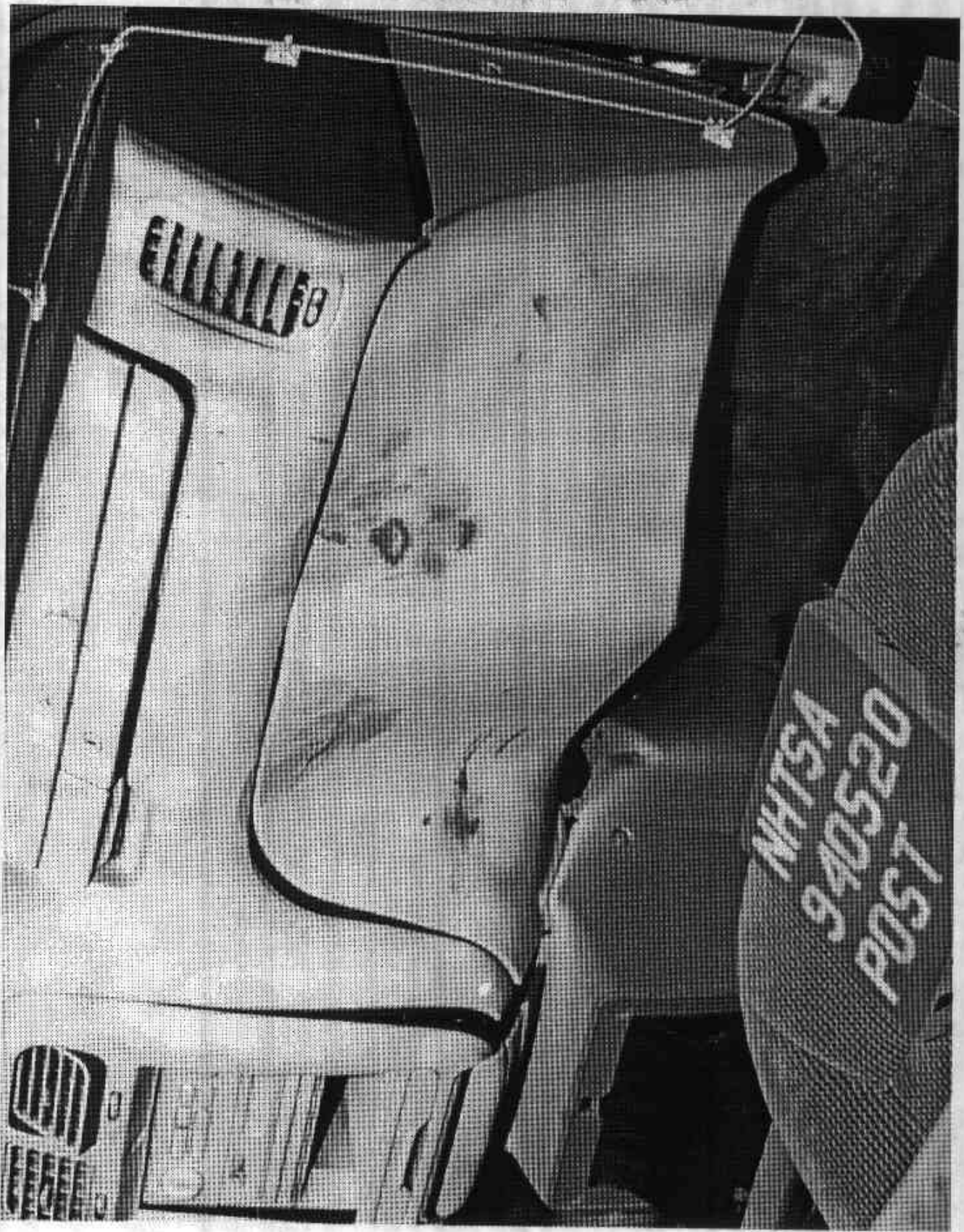


Figure A-44. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2
A-45 940520

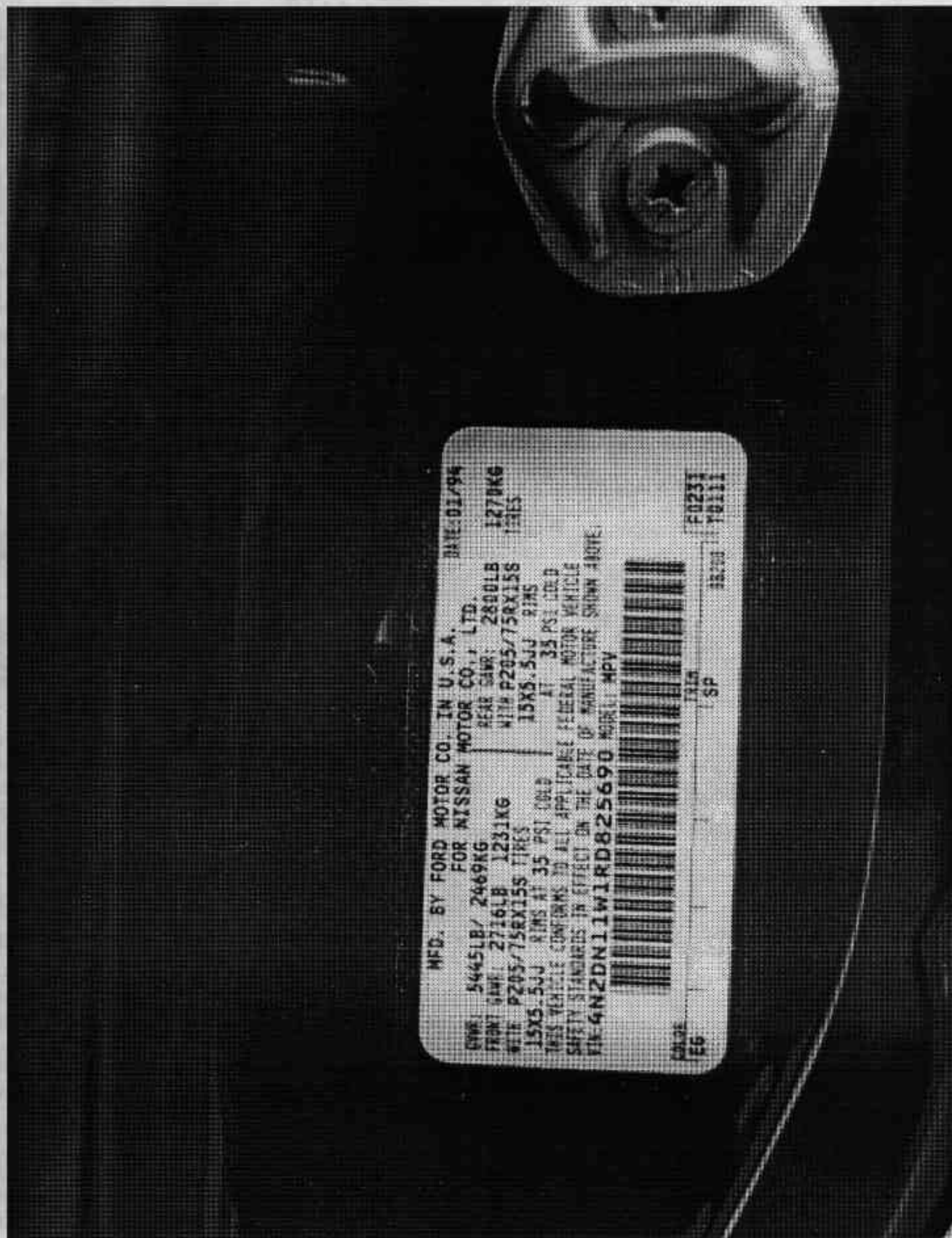


Figure A-45. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

RECOMMENDED COLD TIRE INFLATION PRESSURE PRESSEIONS DE GONFLAGE RECOMMANDÉES (A FROID)					TEMPERATURE TEMPERATURE	FRONT PSI AVANT (PSI)	REAR PSI ARRIÈRE (PSI)
TIRE SIZE DIMENSIONS DES PNEUS	FRONT PSI AVANT (PSI)	REAR PSI ARRIÈRE (PSI)			DO NOT USE IN EXCESS OF 30 mph. 48 km/h. SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION. NE PAS UTILISER À UNE VITESSE DÉPASSANT DE 48 km/h. VOIR PLUS DÉTAILS DE SÉLECTION AU MANUEL DE L'USAGER		
3.5x14	30 (240)	30 (240)					
6.5x15	30 (240)	30 (240)					
VEHICLE CAPACITY (WEIGHT) CAPACITÉ PORTUSE DU VÉHICULE		TOTAL OCCUPANTS		SEATING CAPACITY / PLACES ASSIÈGES			
		NUMBER TOTAL OCCUPANTS		1st SEAT 2nd SEAT 3rd SEAT 4th SEAT			
(300 lb / 136 kg)		5		2 3 N/A N/D			
		7		2 3			

Figure A-46. PRE-TEST RECOMMENDED TIRE PRESSURE LABEL VIEW
A-47
940520

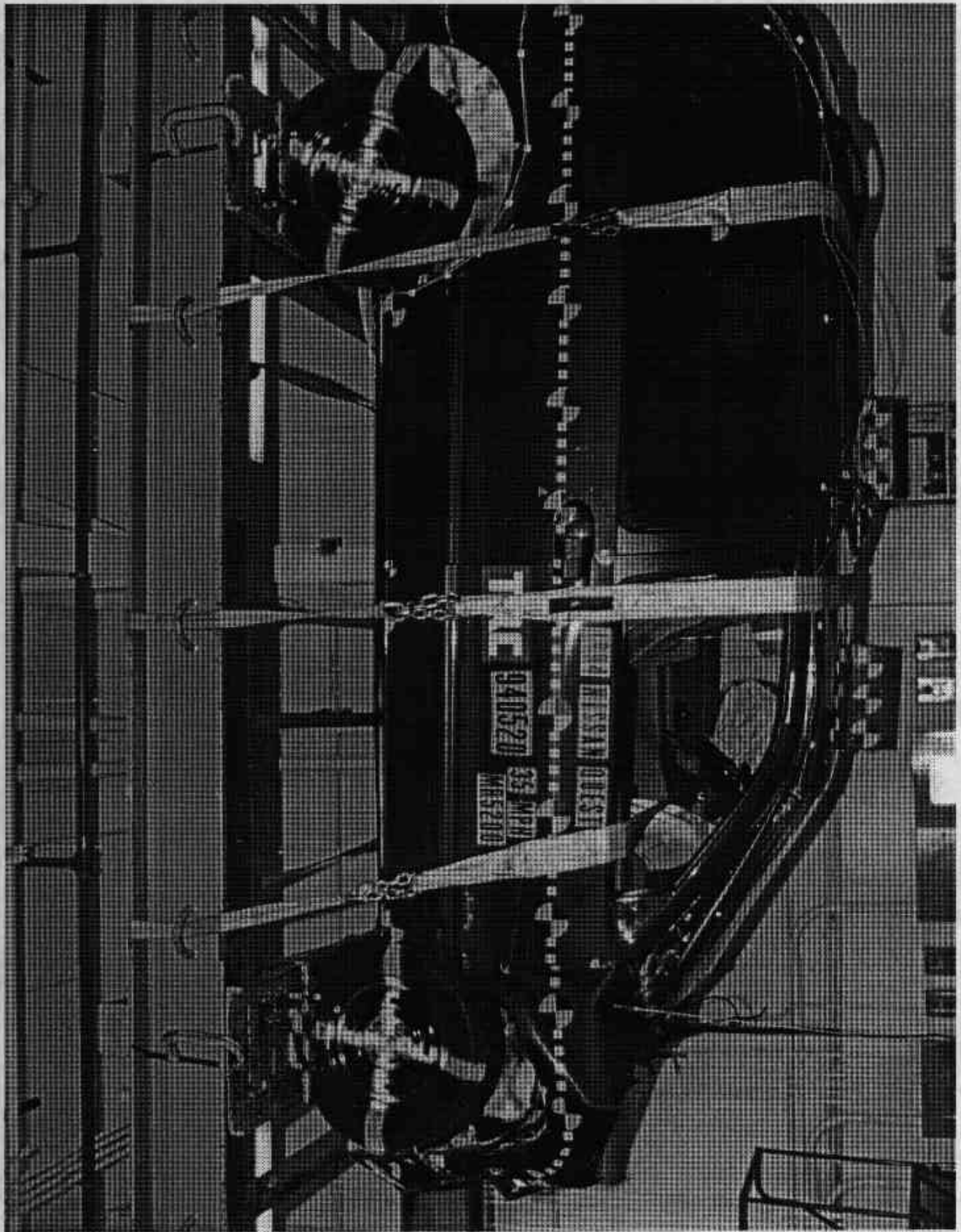


Figure A-47. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

A-48

940520



Figure A-48. POST-TEST LOSS OF WINDSHIELD RETENTION VIEW

A-49

940520

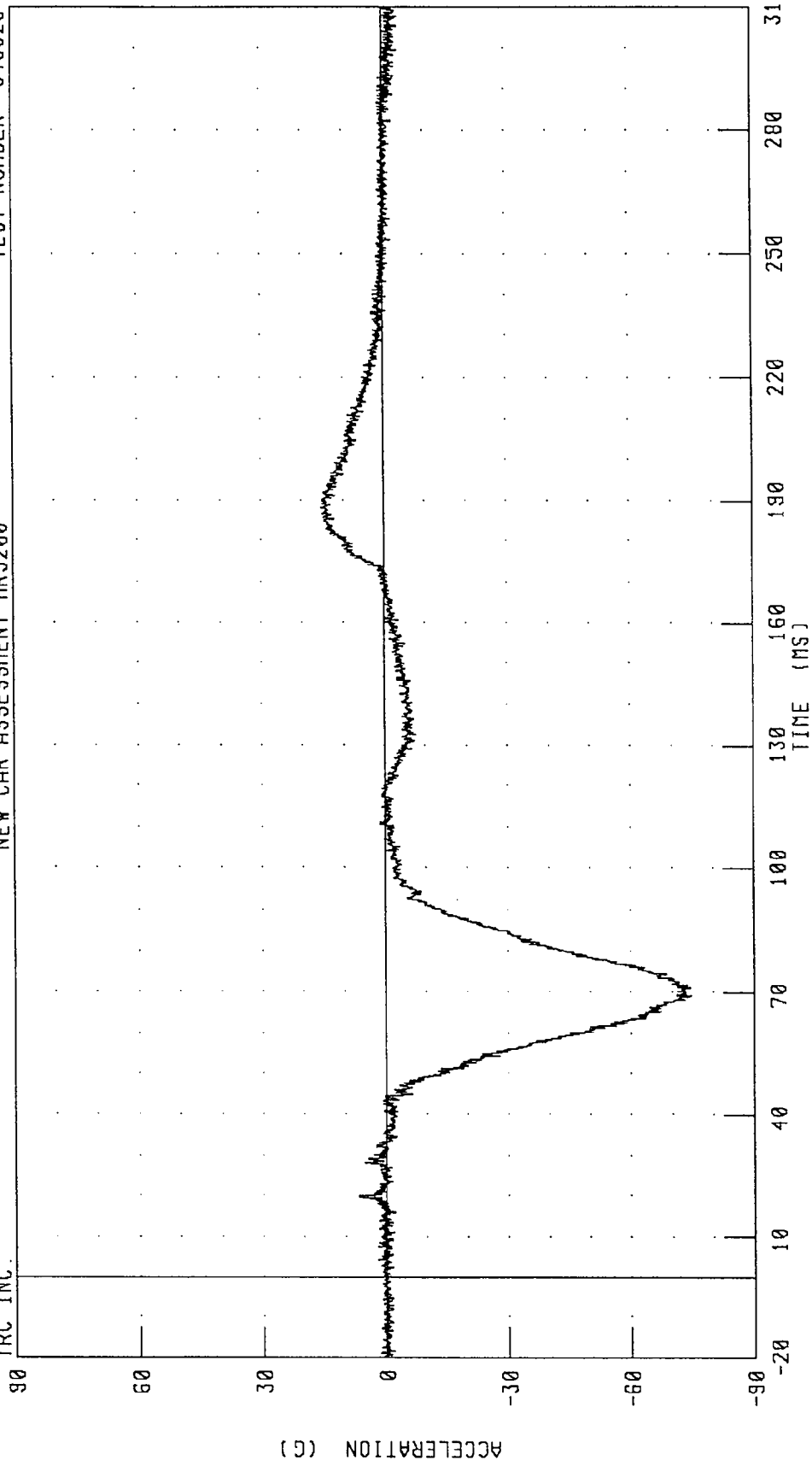
APPENDIX B

DATA PLOTS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



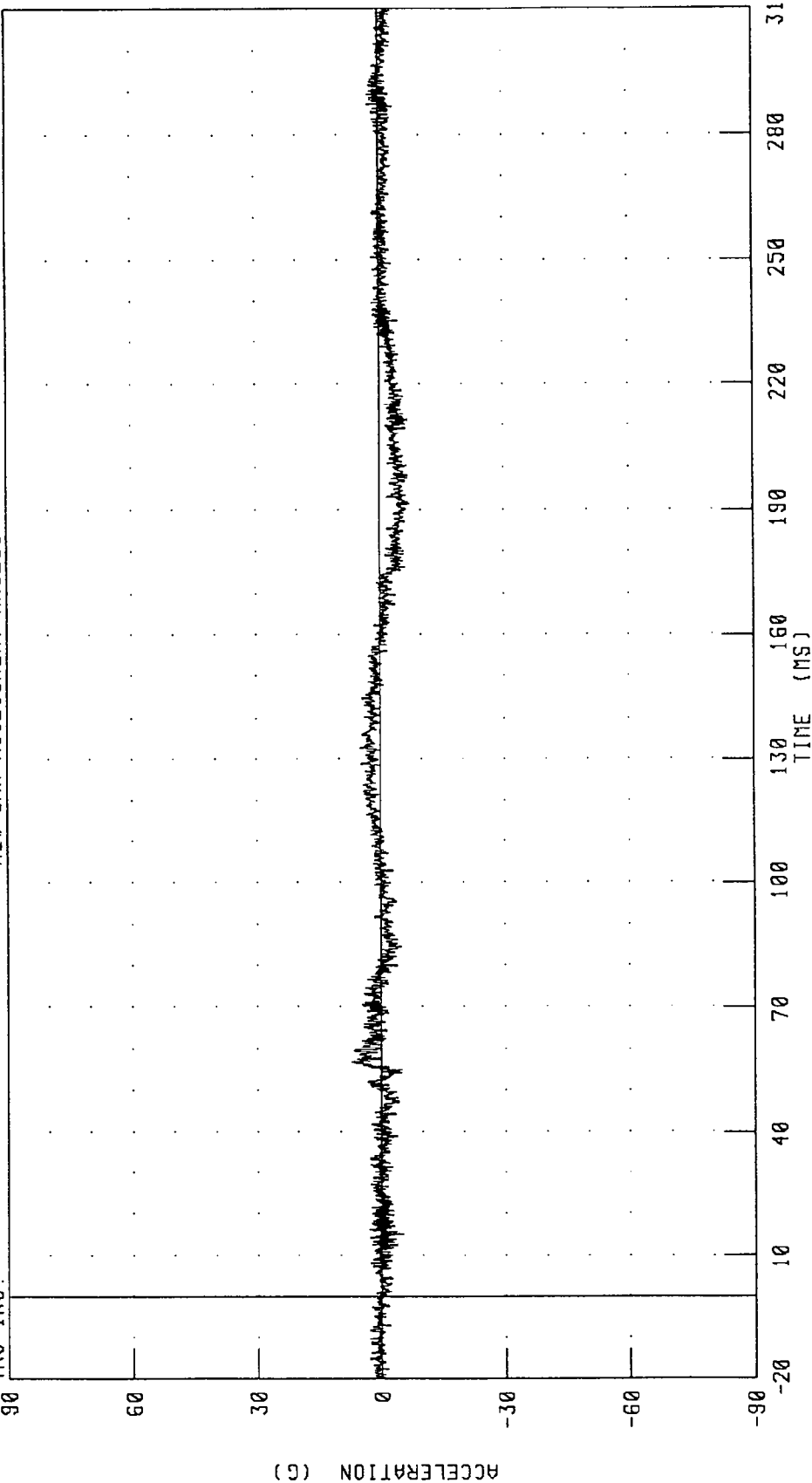
CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 15.33 G @ 188.32 MS; -74.72 G @ 69.12 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



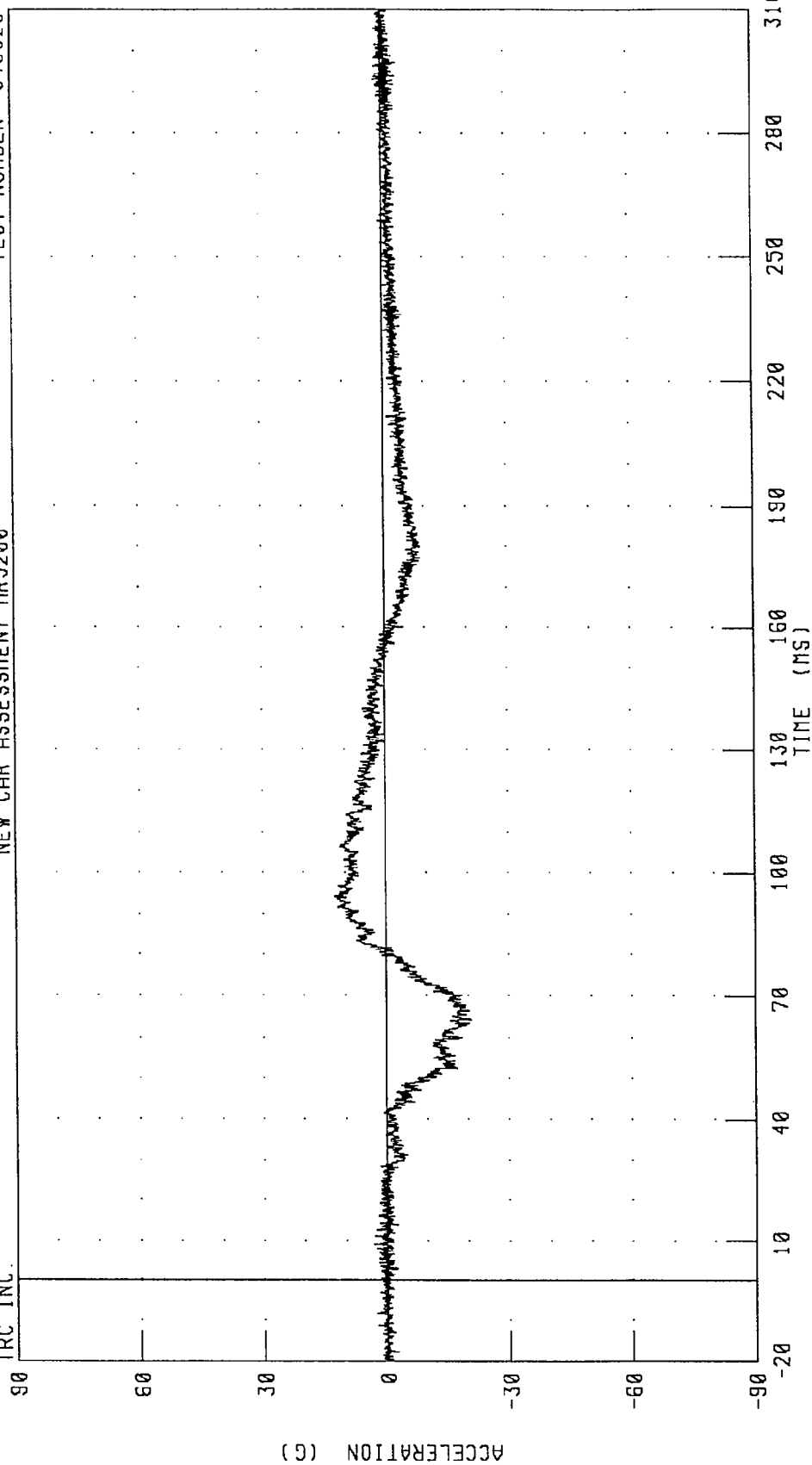
PEAK DATA: 7.17 G @ 56.80 MS; -7.30 G @ 191.60 MS

CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



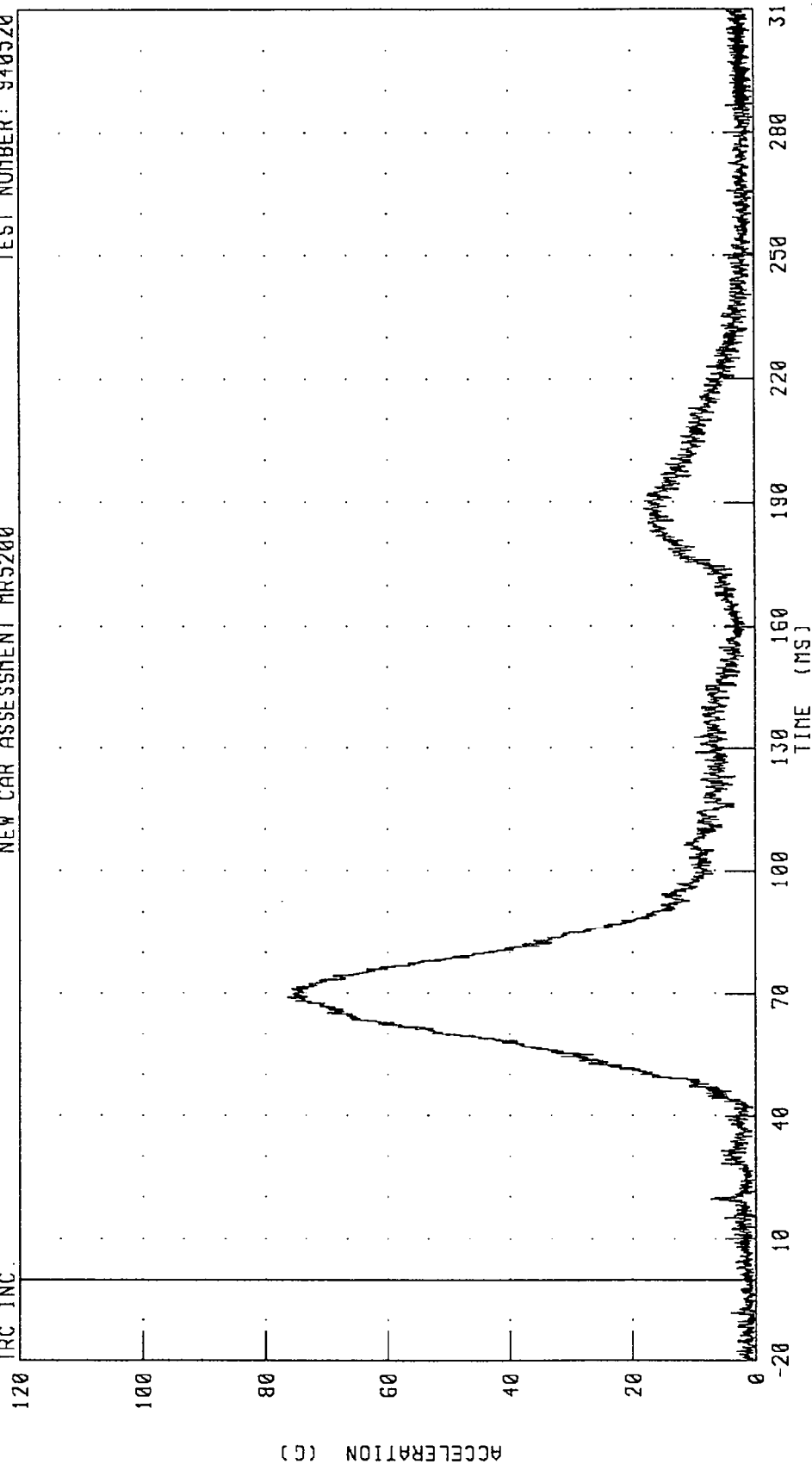
CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 12.49 G @ 94.24 MS; -20.85 G @ 64.40 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



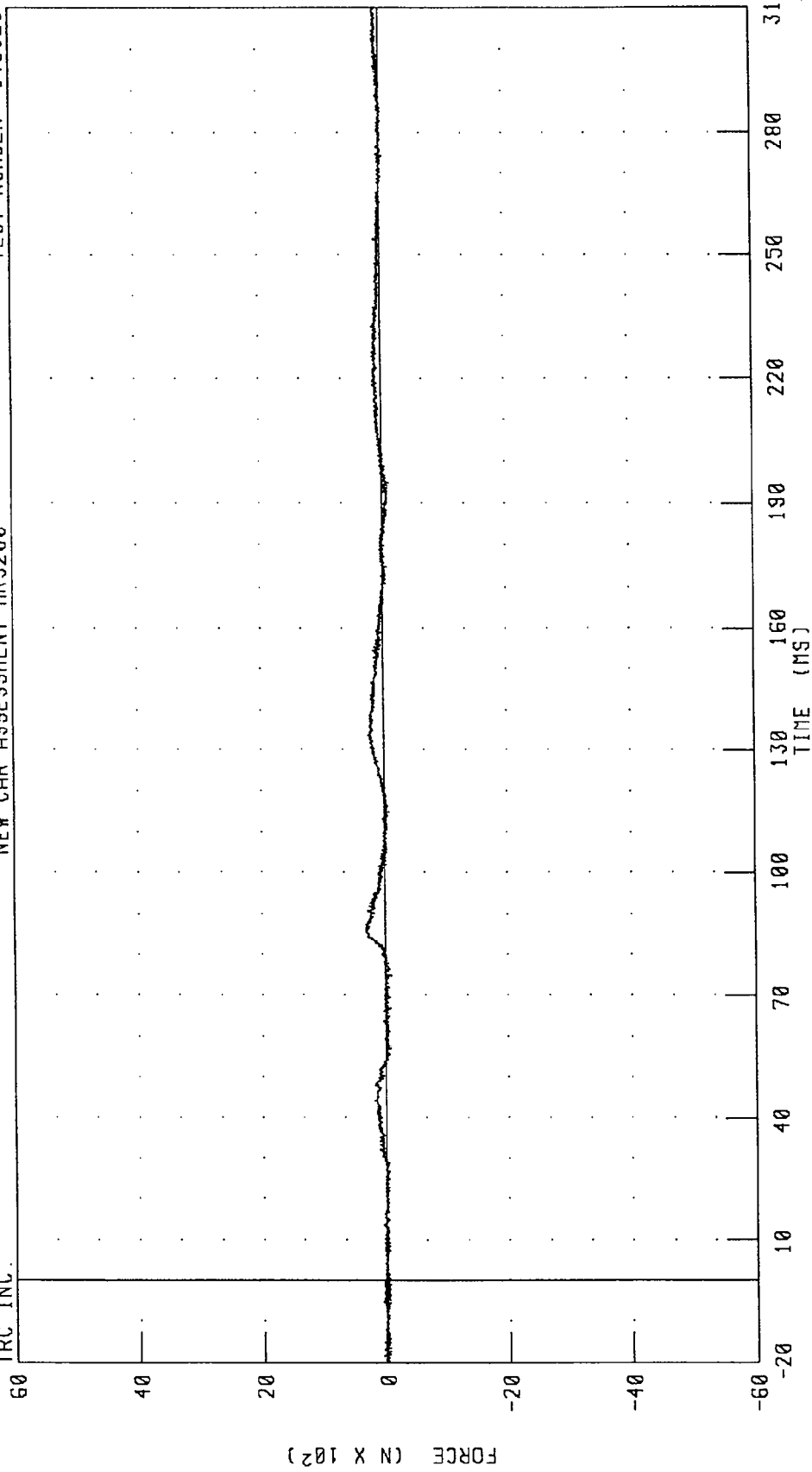
PEAK DATA: 76.44 G @ 69.12 MS; 0.20 G @ 265.44 MS

CHANNEL: HEDG1 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 312.82 N @ 85.60 MS; -114.04 N @ 194.88 MS

CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

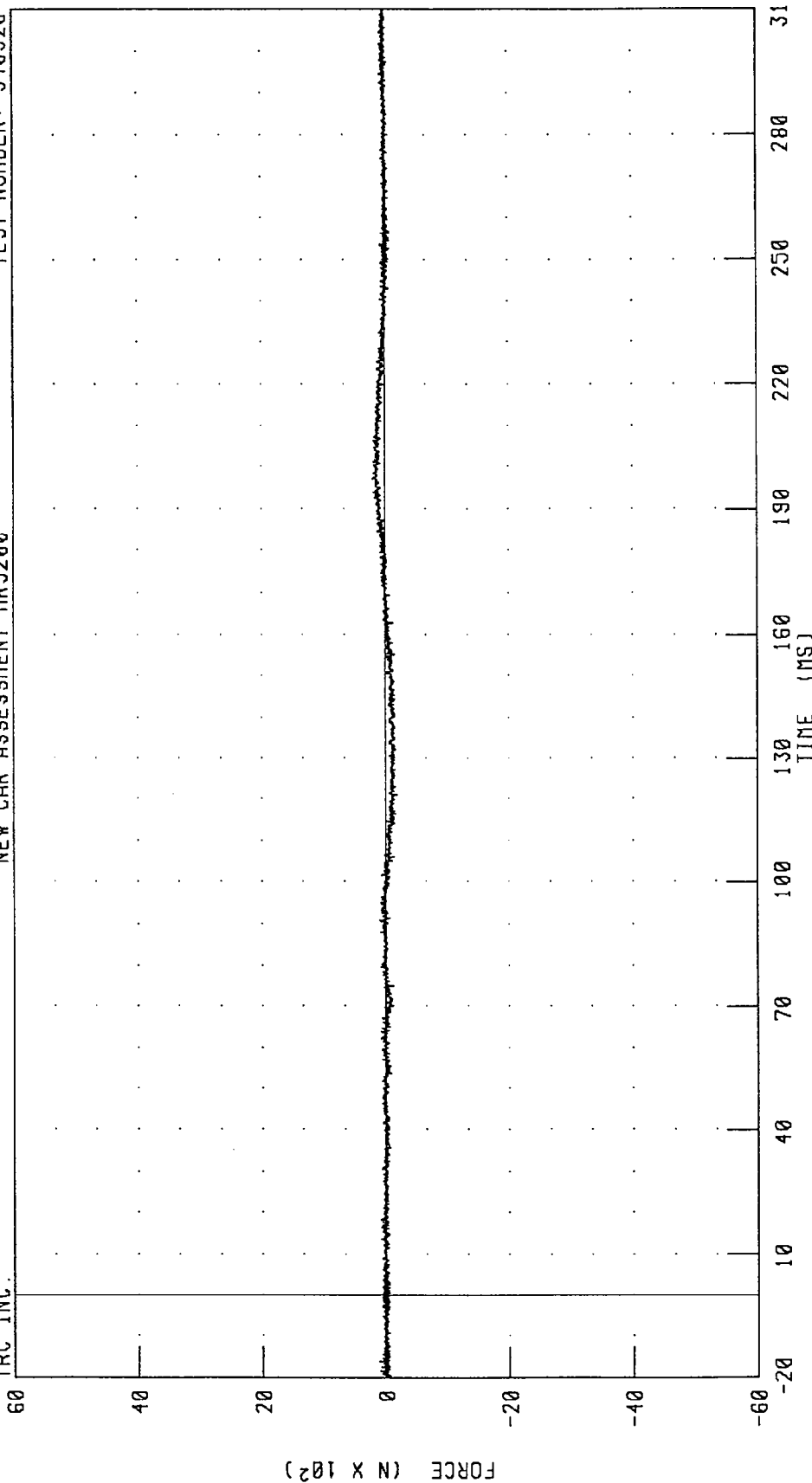
FORCE (N X 10²)

TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Y-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



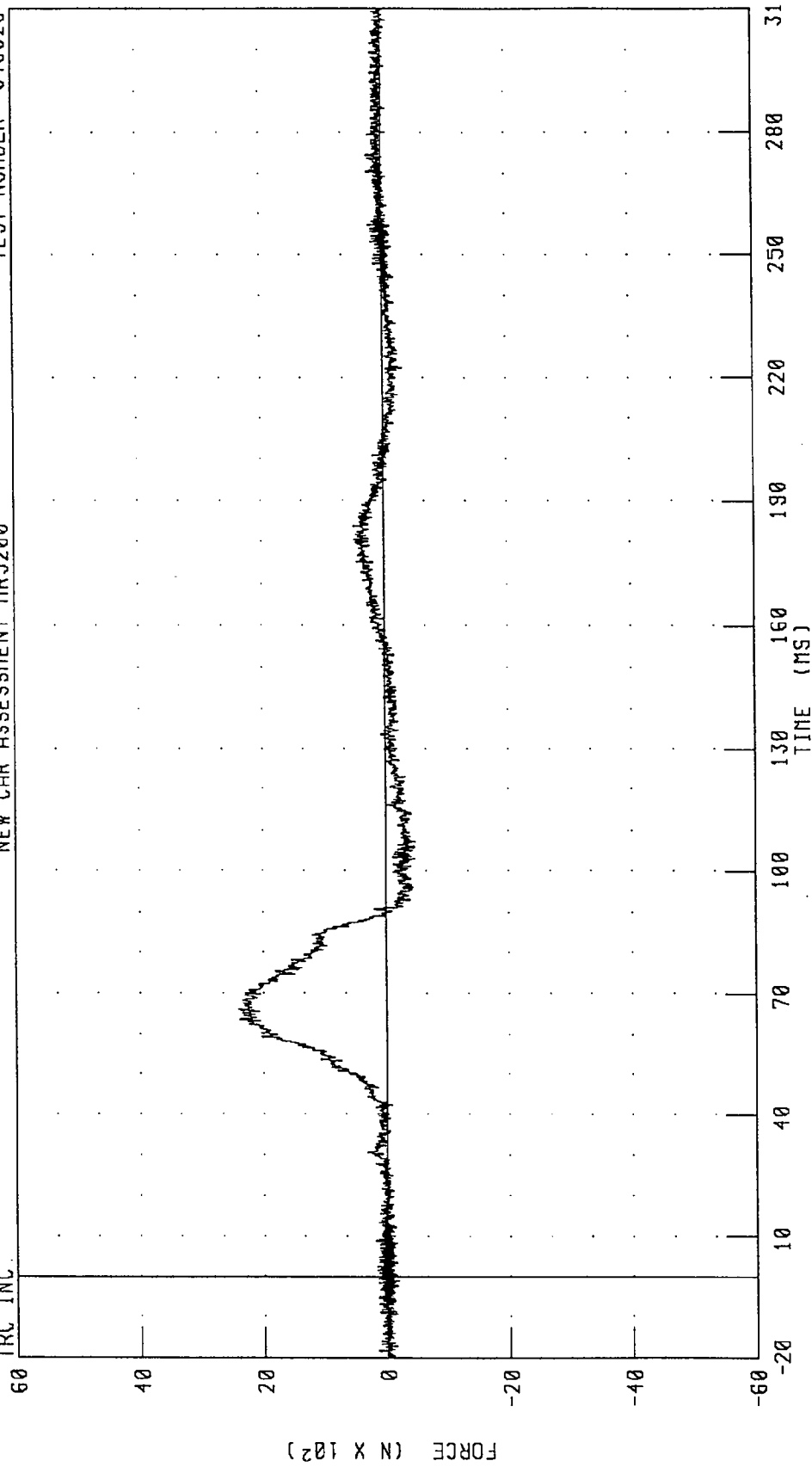
PEAK DATA: 197.90 N @ 197.28 MS; -178.10 N @ 120.96 MS

CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Z-AXIS AXIAL FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



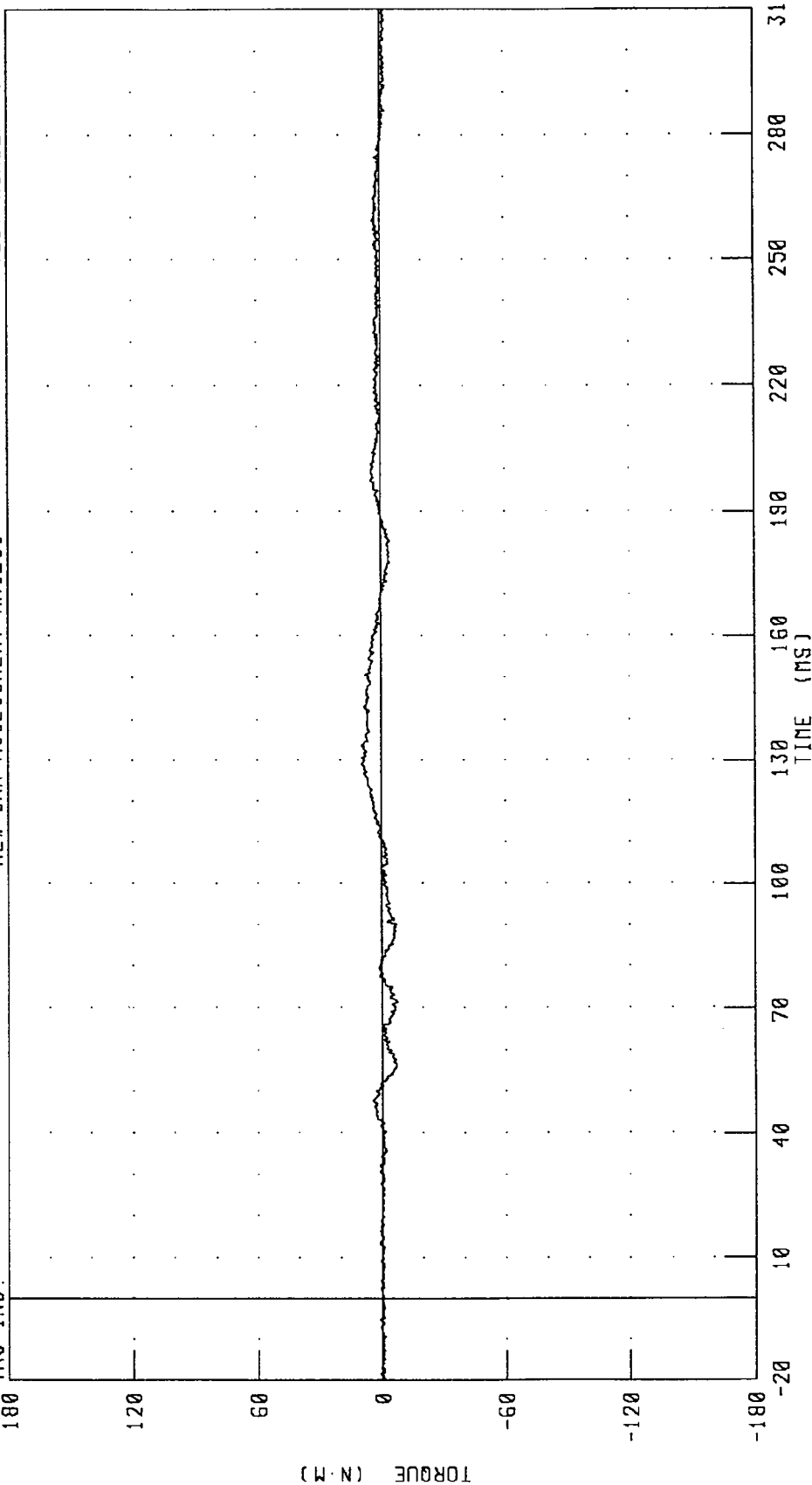
PEAK DATA: 2404.50 N @ 66.08 MS; -488.53 N @ 107.04 MS

CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT X AXIS
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



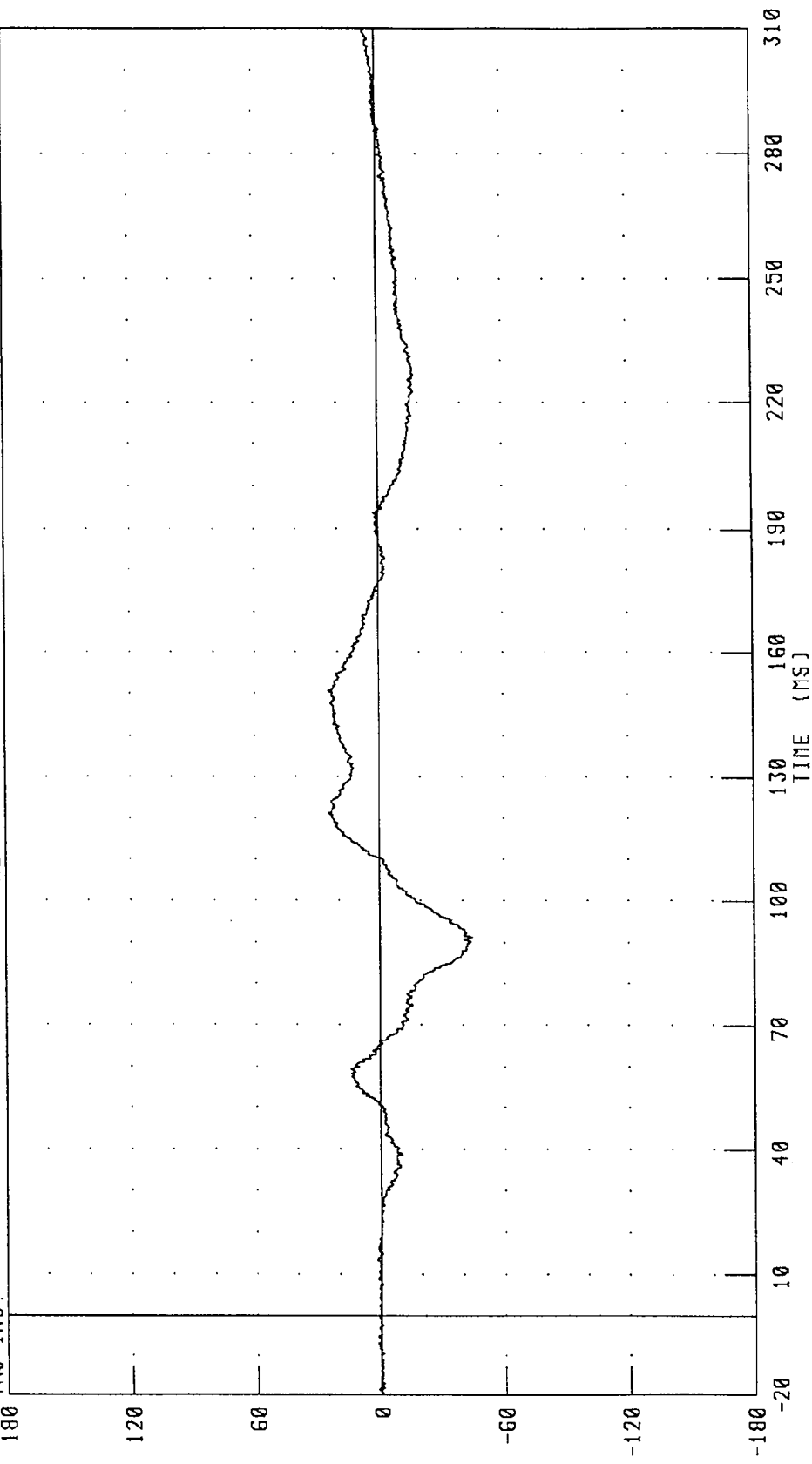
PEAK DATA: 9.38 N.M @ 129.12 MS; -7.39 N.M @ 71.44 MS

CHANNEL: NEKXM1 FILTER: CH. CLASS 600

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 24.47 N.M @ 121.28 MS; -44.64 N.M @ 91.28 MS

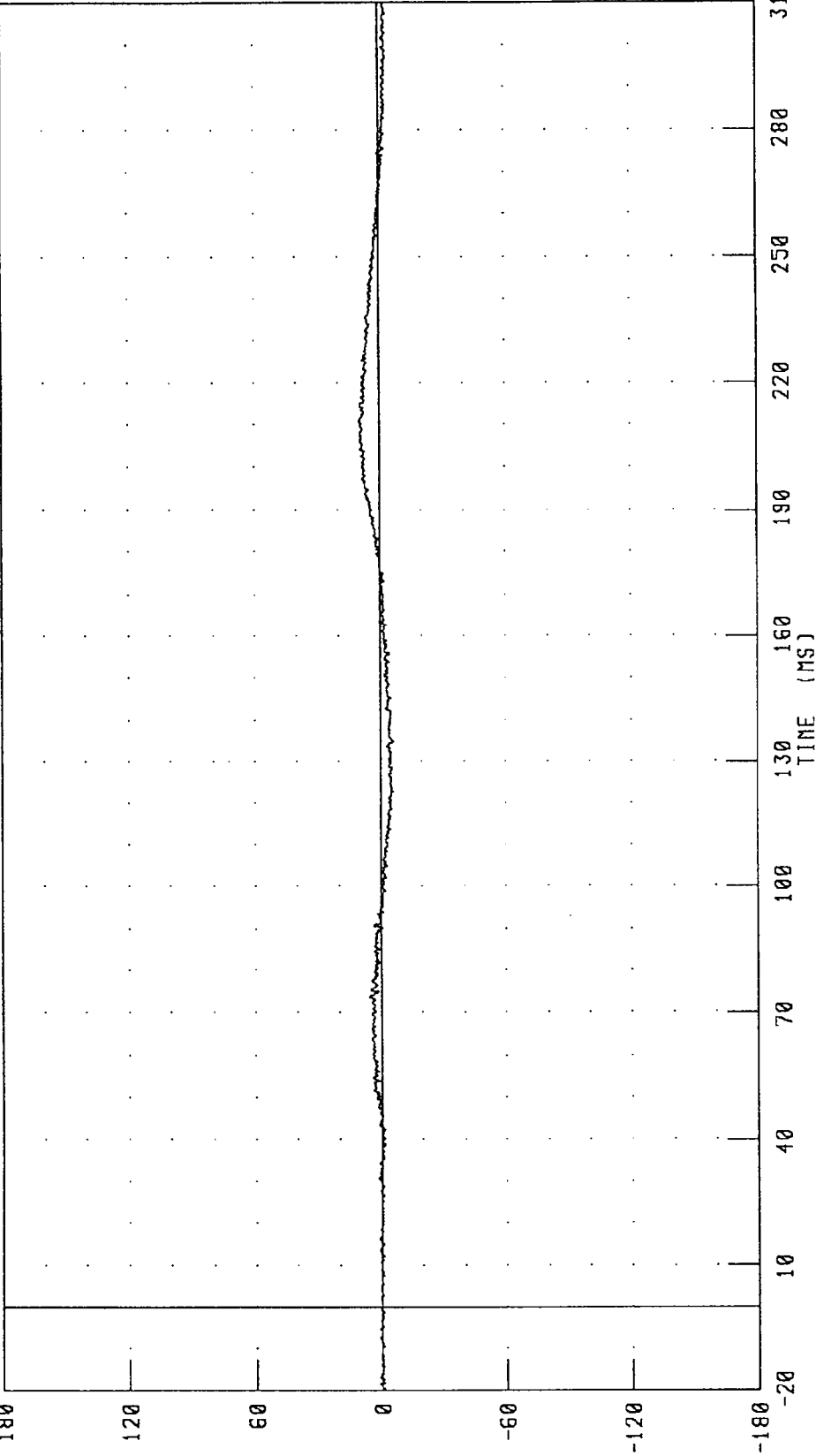
CHANNEL: NEKYM1 FILTER: CH. CLASS 600

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



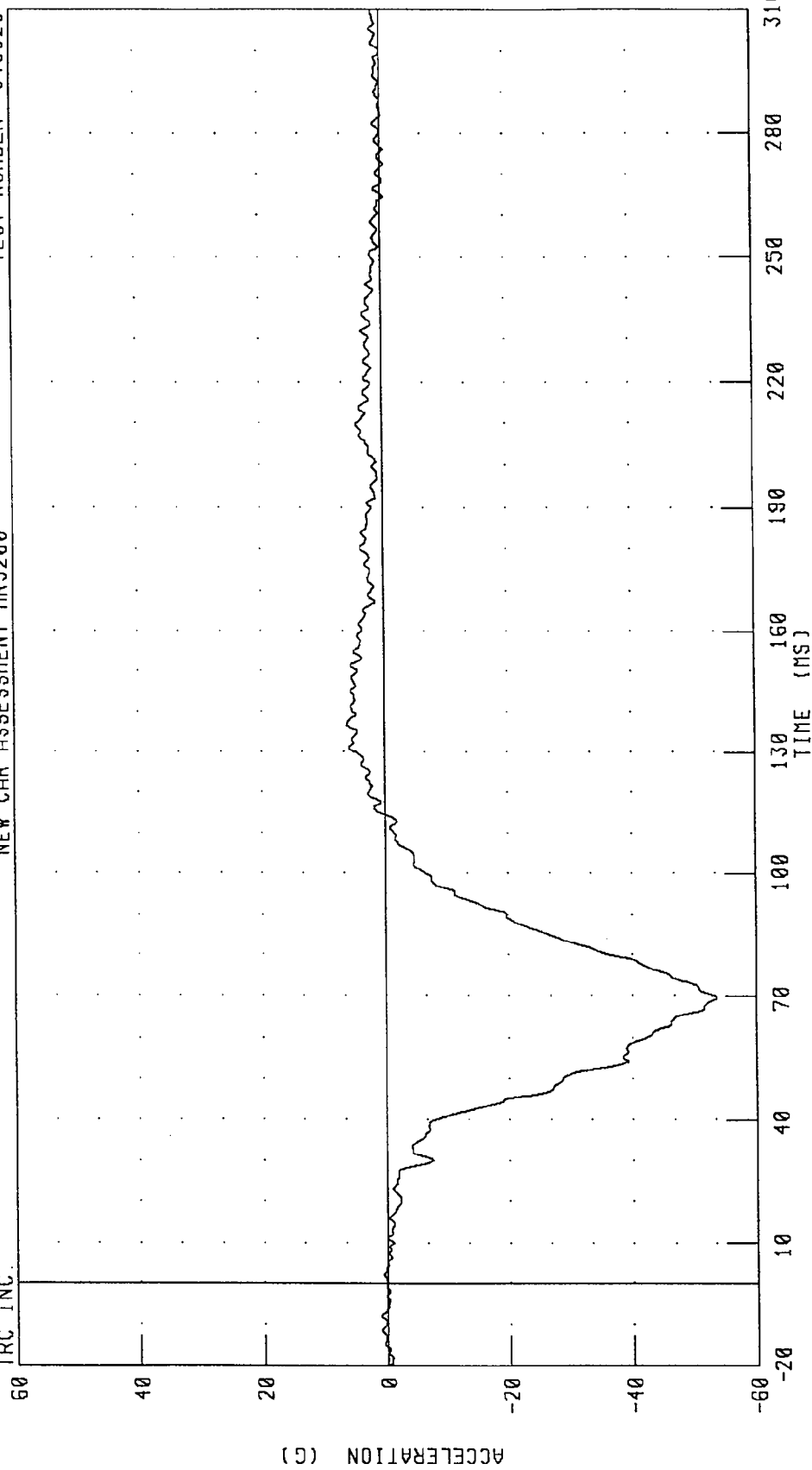
CHANNEL: NEKZM1 FILTER: CH. CLASS 600

PEAK DATA: 9.80 N·M @ 210.72 MS; -6.33 N·M @ 134.80 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



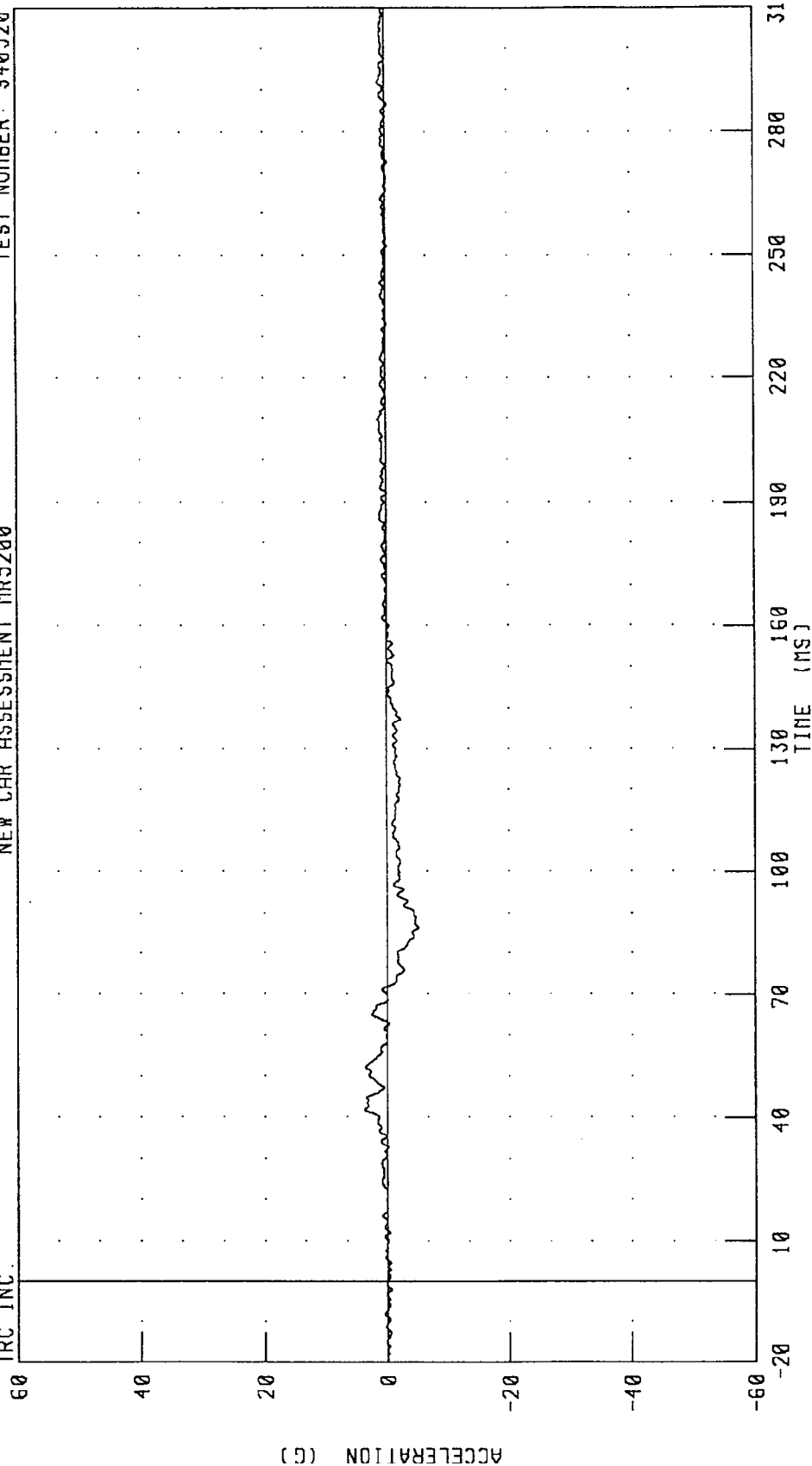
PEAK DATA: 6.10 G @ 136.88 MS; -53.58 G @ 69.60 MS

CHANNEL: CSTXG1 FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

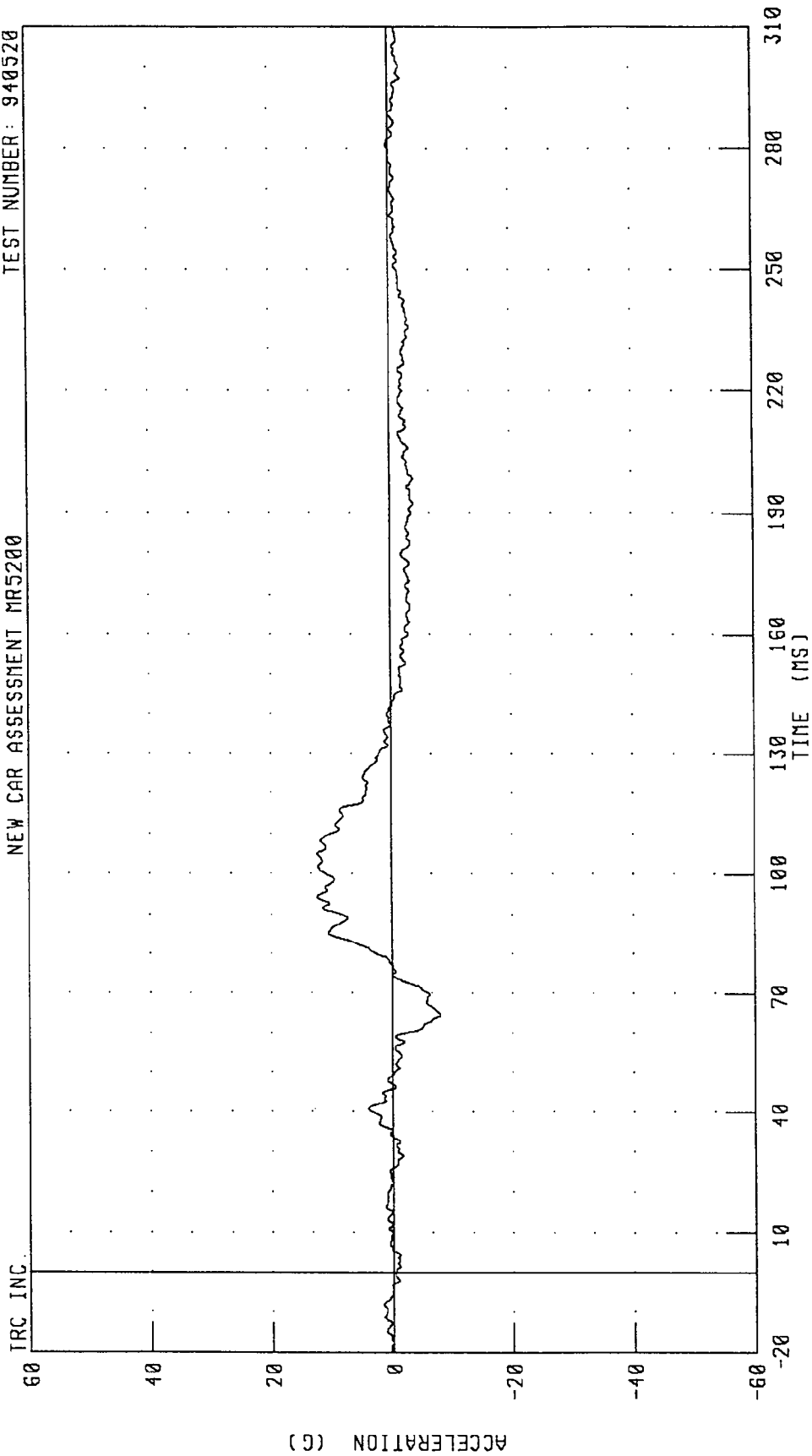


CHANNEL: CSTYGI FILTER: CH. CLASS 180

PEAK DATA: 3.69 G @ 41.92 MS; -5.04 G @ 86.40 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 12.36 G @ 94.40 MS; -8.01 G @ 64.48 MS

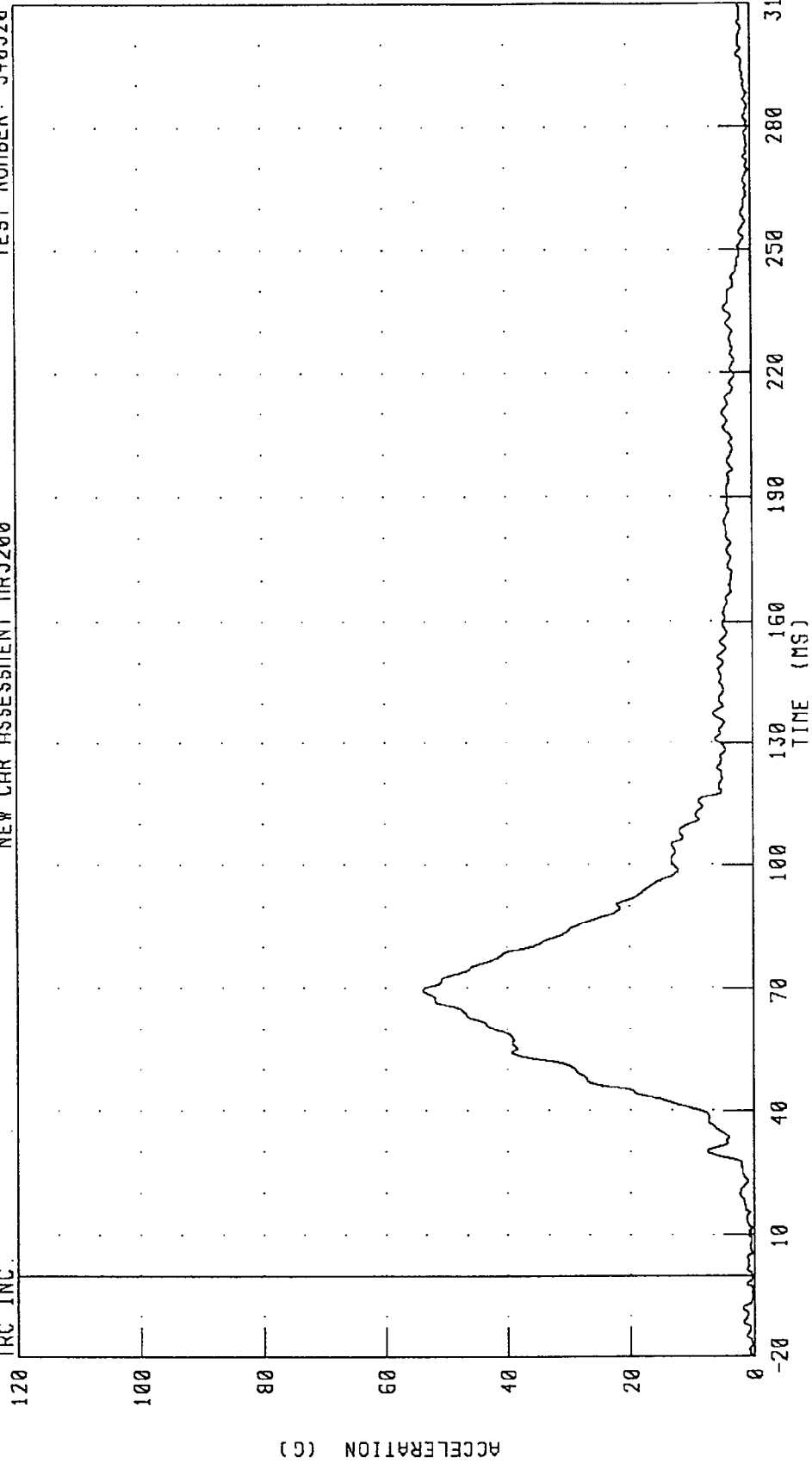
CHANNEL: CSTZG1 FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.

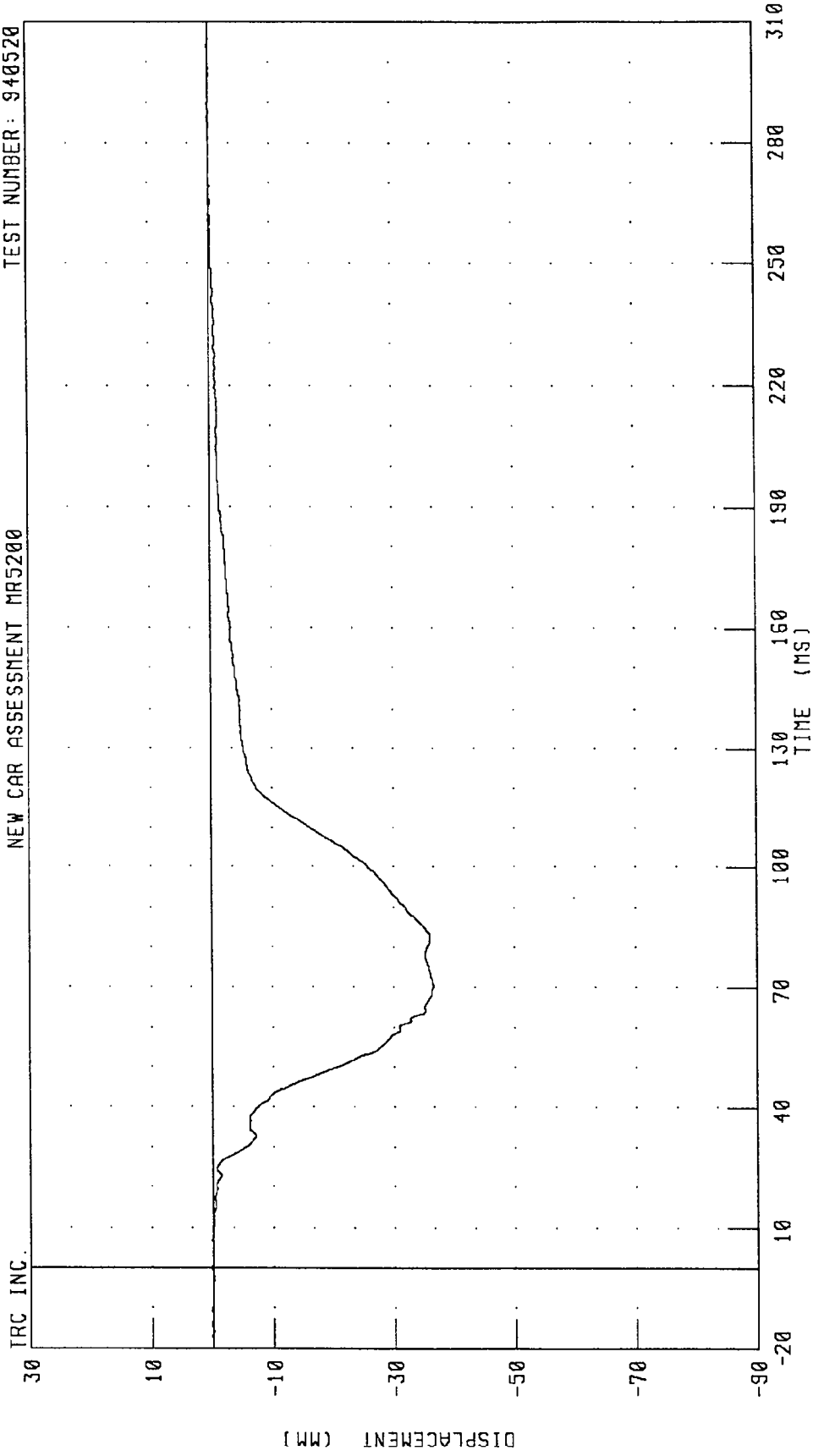


PEAK DATA: 53.94 G @ 69.60 MS; 0.12 G @ -20.00 MS

CHANNEL: CSTRG1 FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT MR5200

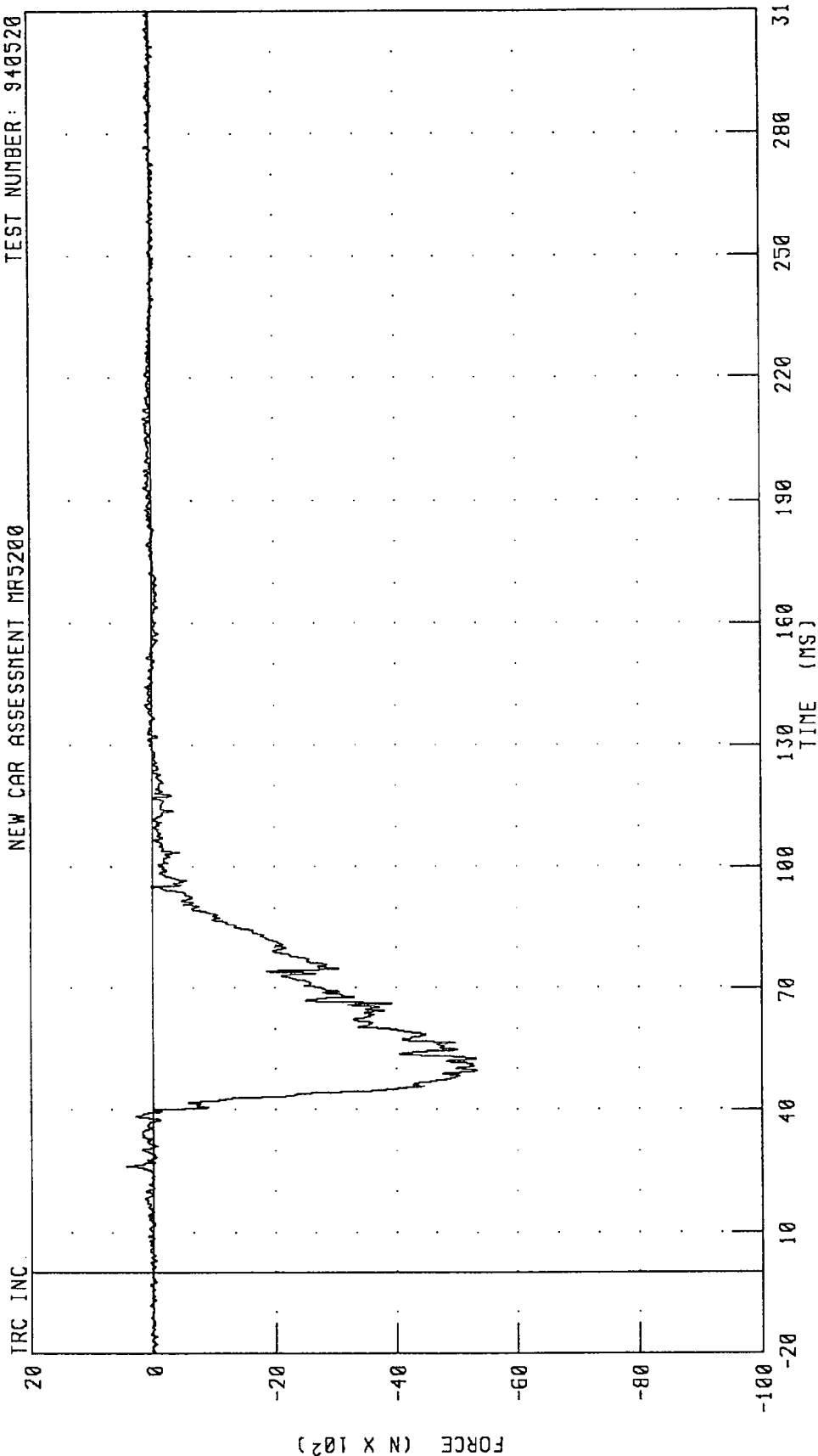
TEST NUMBER: 940520



CHANNEL: CSTX01 FILTER: CH. CLASS 180
PEAK DATA: 0.20 MM @ -13.92 MS; -36.55 MM @ 70.24 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

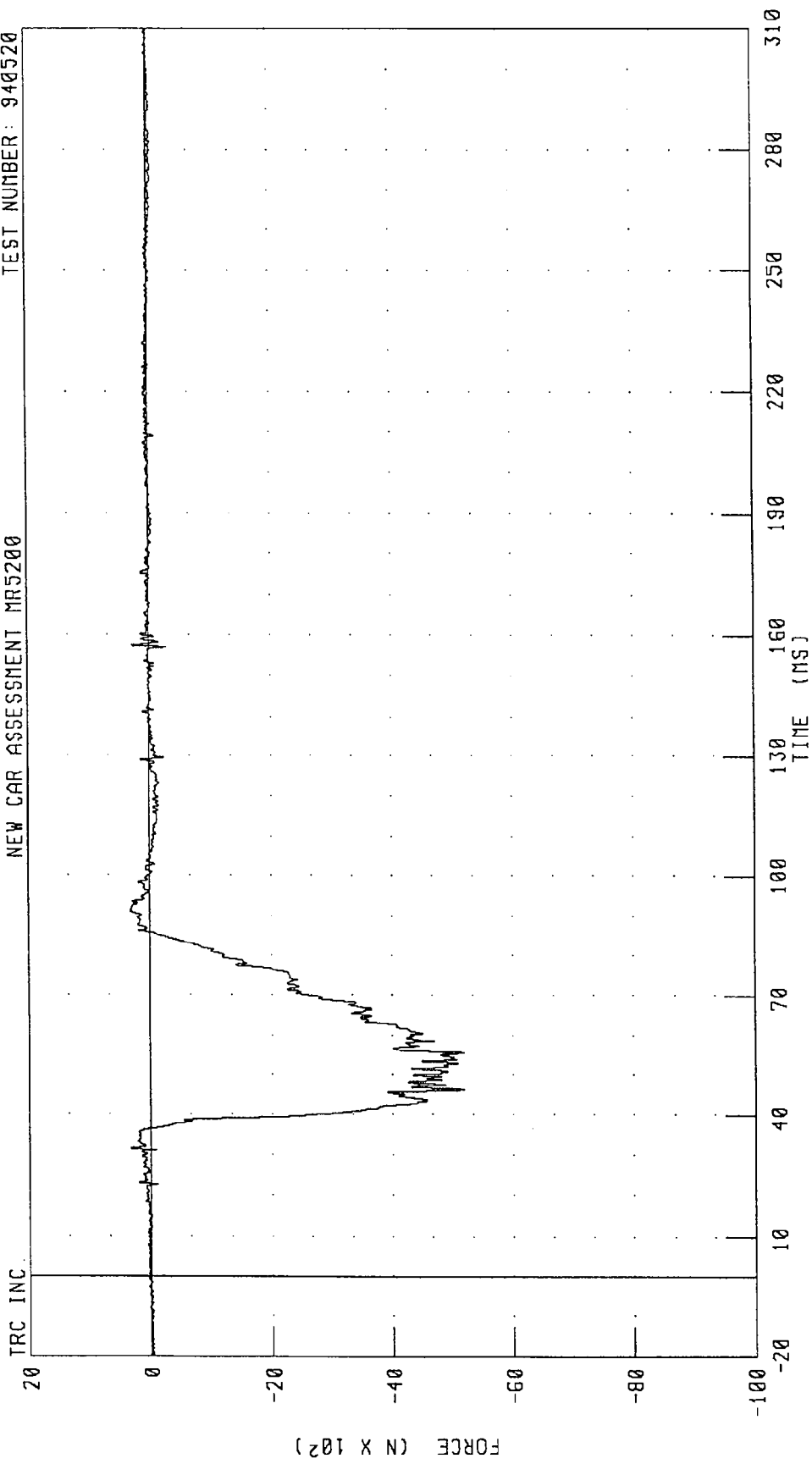


PEAK DATA: 433.94 N @ 26.24 MS; -5333.90 N @ 49.68 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



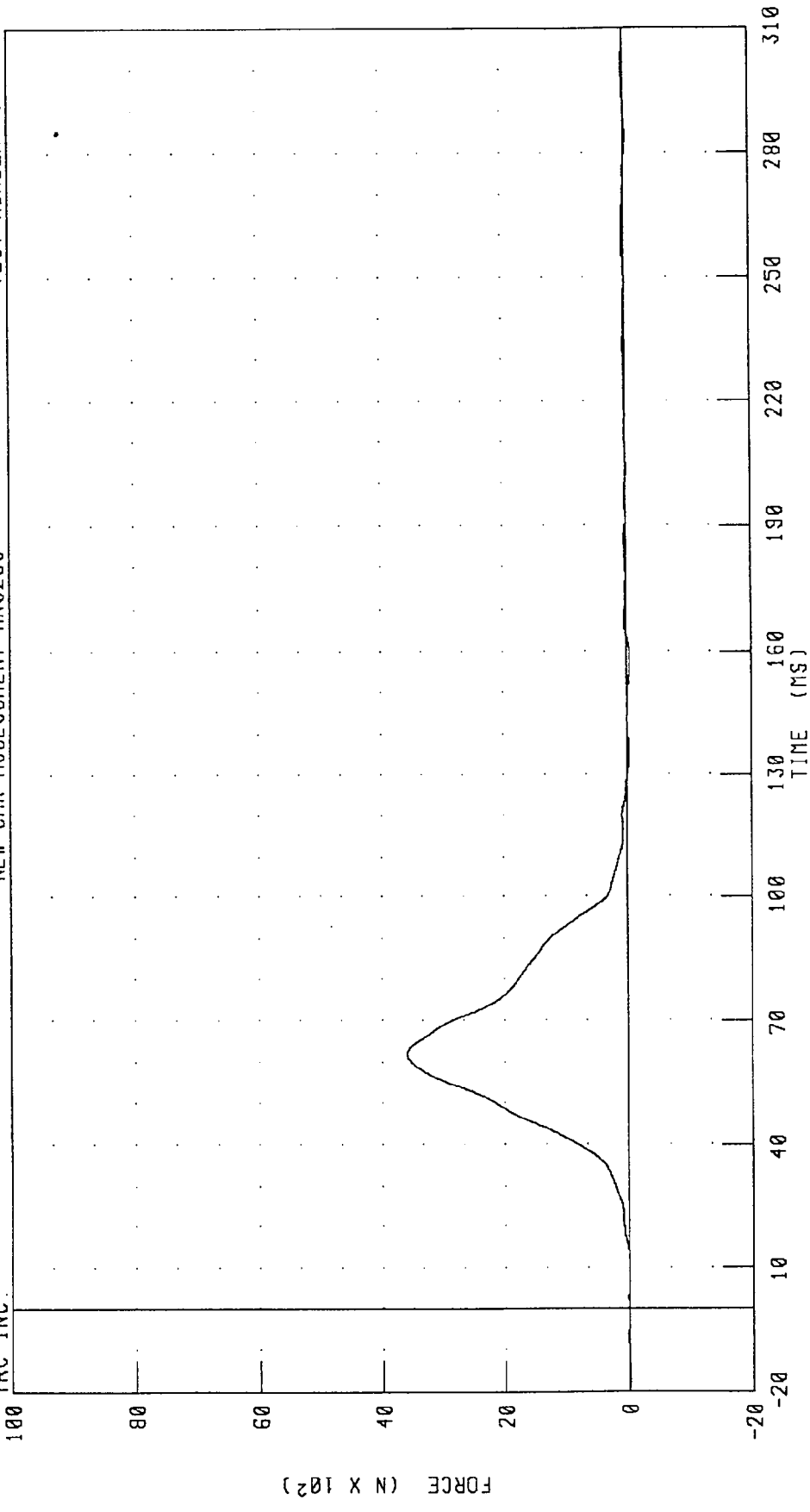
CHANNEL: RFMF1 FILTER: CH. CLASS 600

PEAK DATA: 326.08 N @ 31.76 MS; -5185.74 N @ 55.52 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



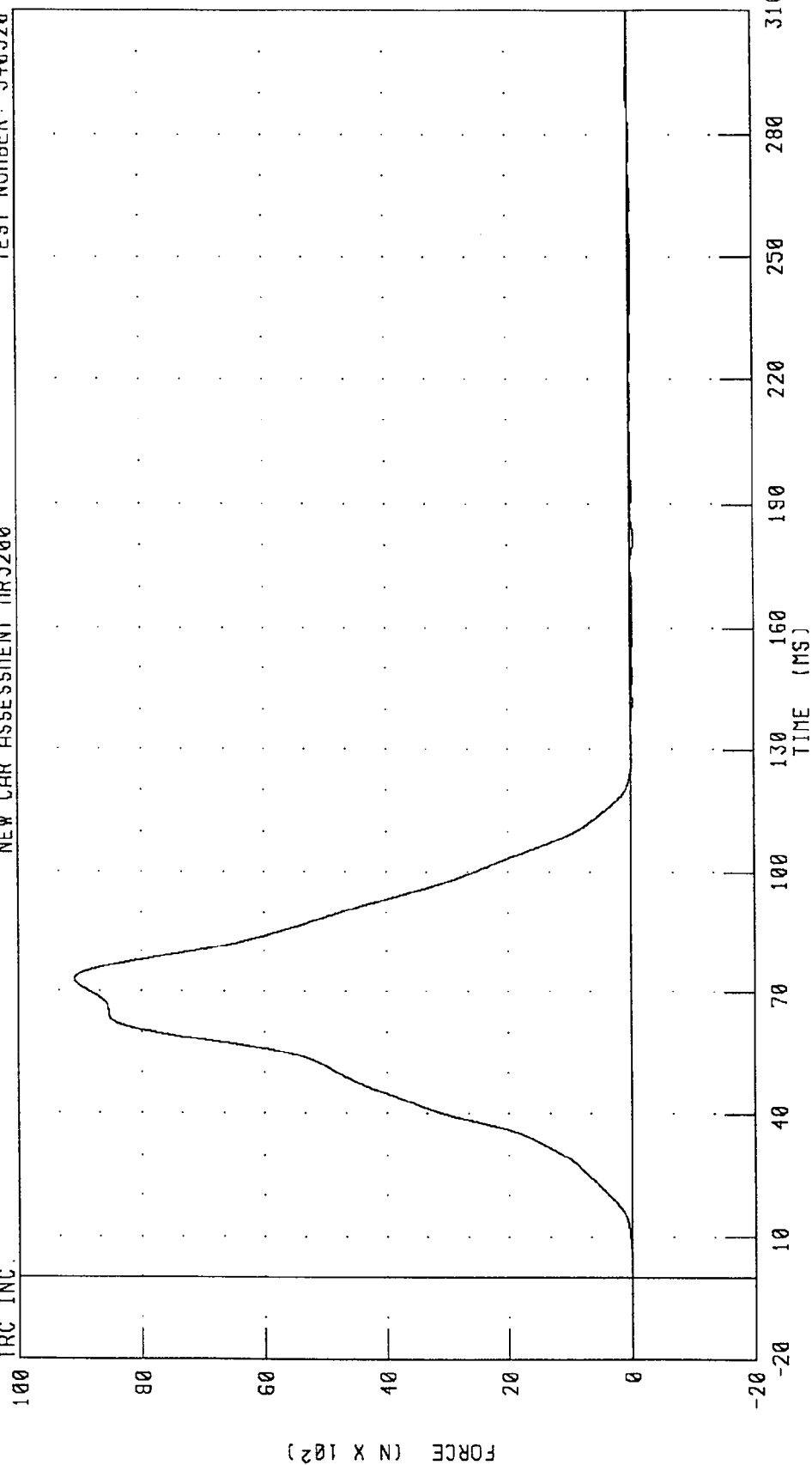
PEAK DATA: 3588.32 N @ 61.92 MS; -52.11 N @ 157.36 MS

CHANNEL: LBOFI FILTER: CH CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 9083.10 N @ 73.04 MS; -49.64 N @ 181.76 MS

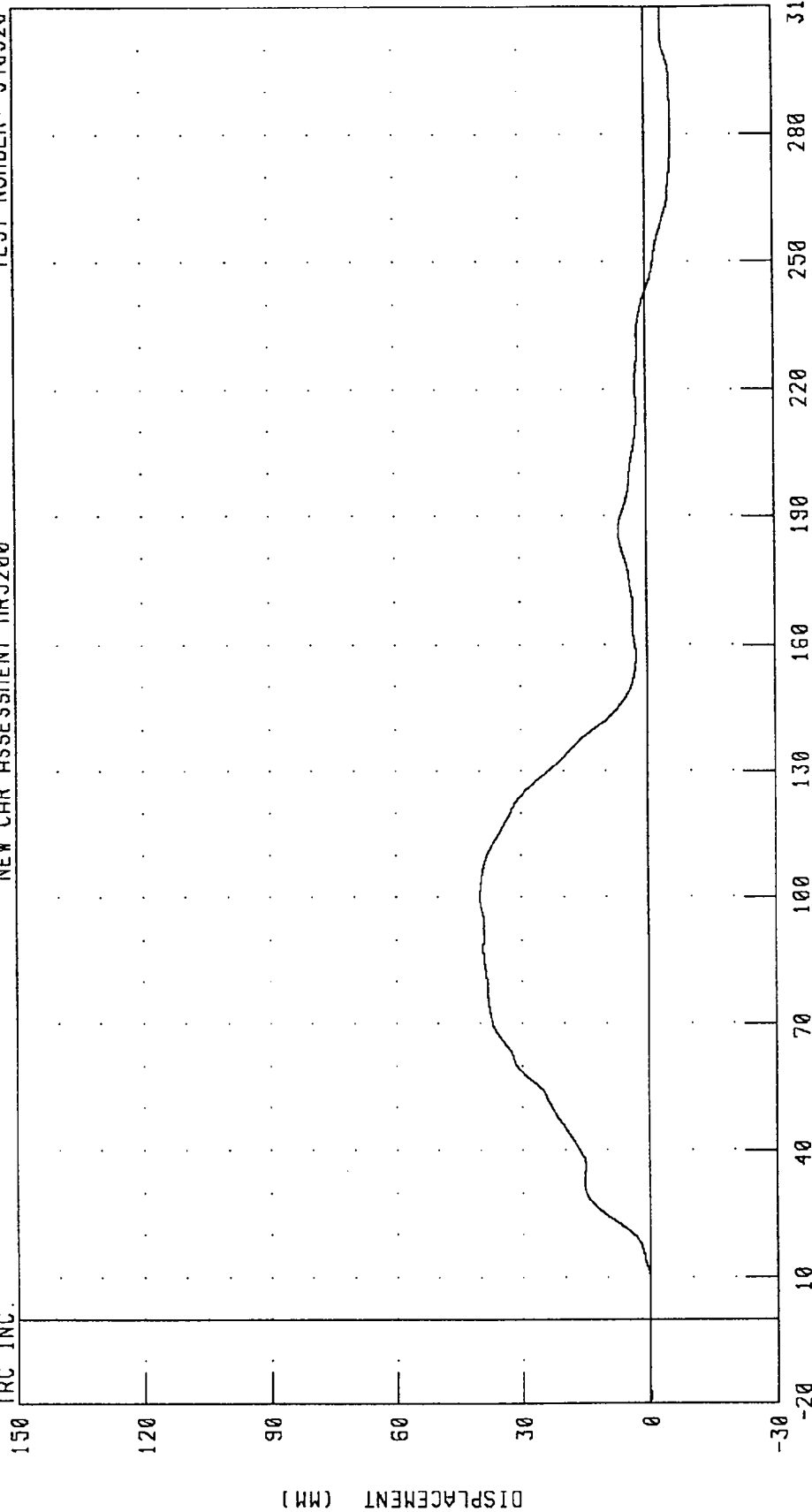
CHANNEL: SHBF1 FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.

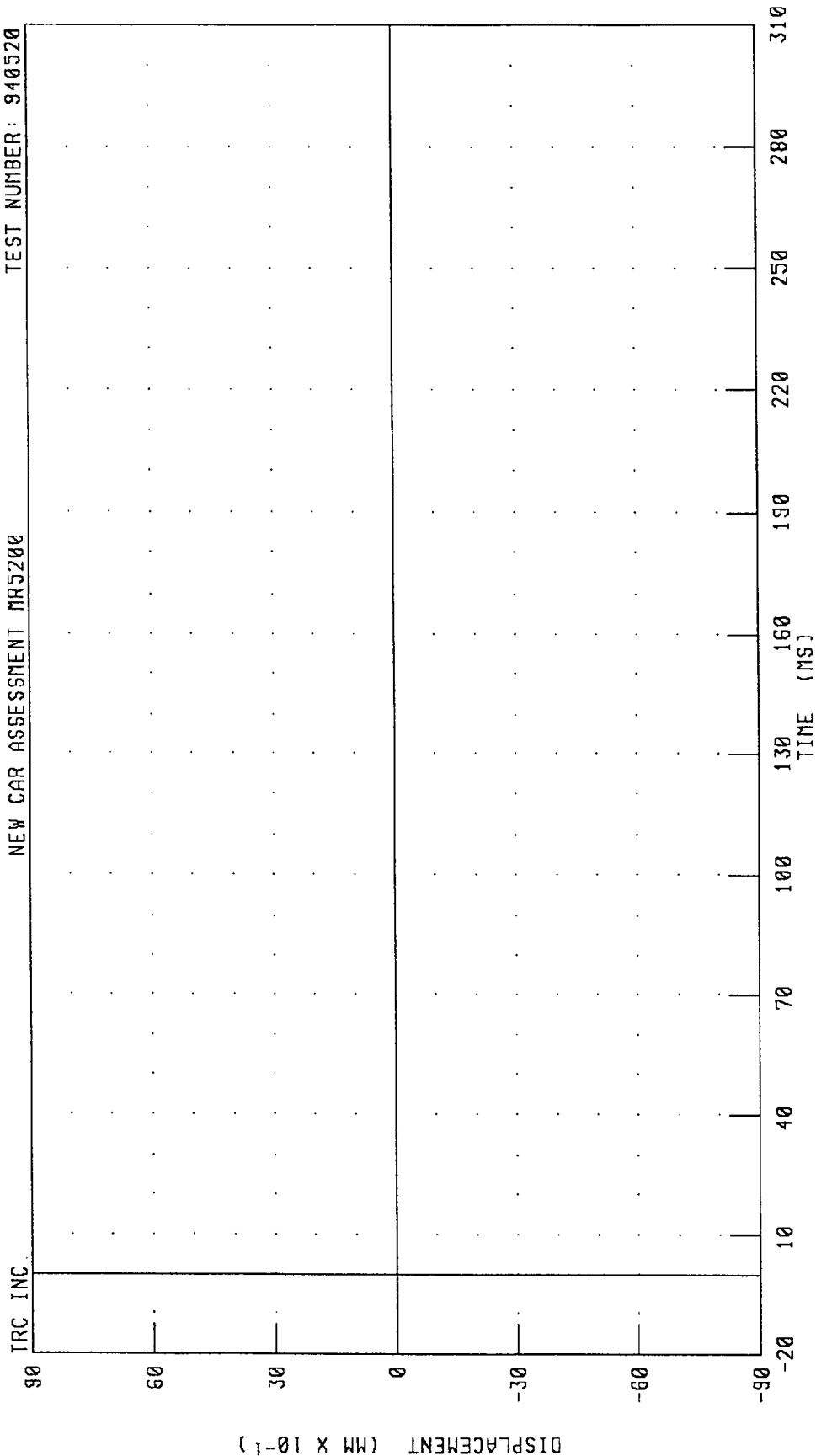


PEAK DATA: 39.91 MM @ 100.24 MS; -6.05 MM @ 278.16 MS

CHANNEL: SHB01 FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 DRIVER SEAT BELT EXTENSION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



CHANNEL: SBED1 FILTER: CH. CLASS 60

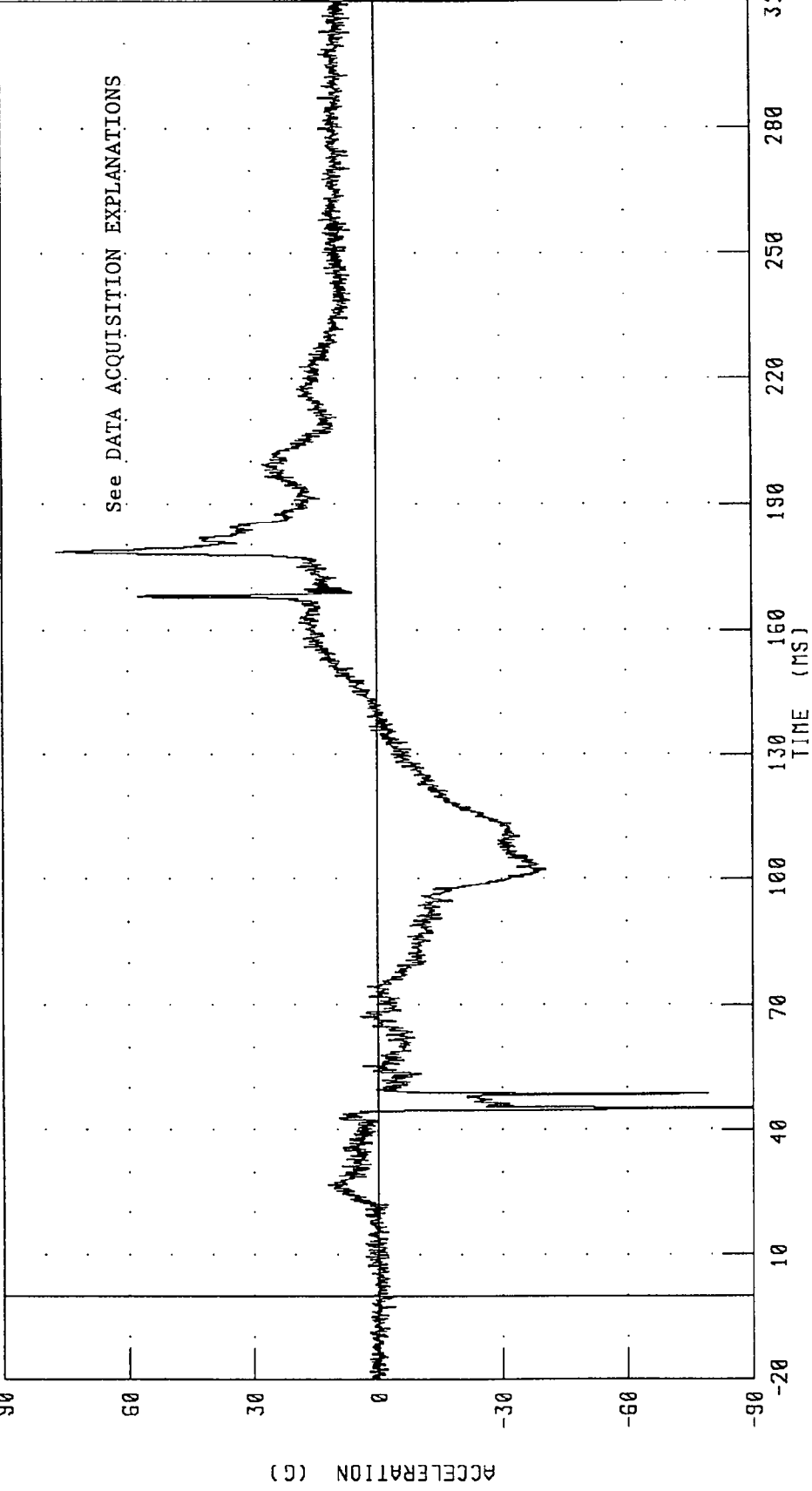
PEAK DATA: 0.01 MM @ 220.64 MS; 0.00 NM @ 45.52 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.

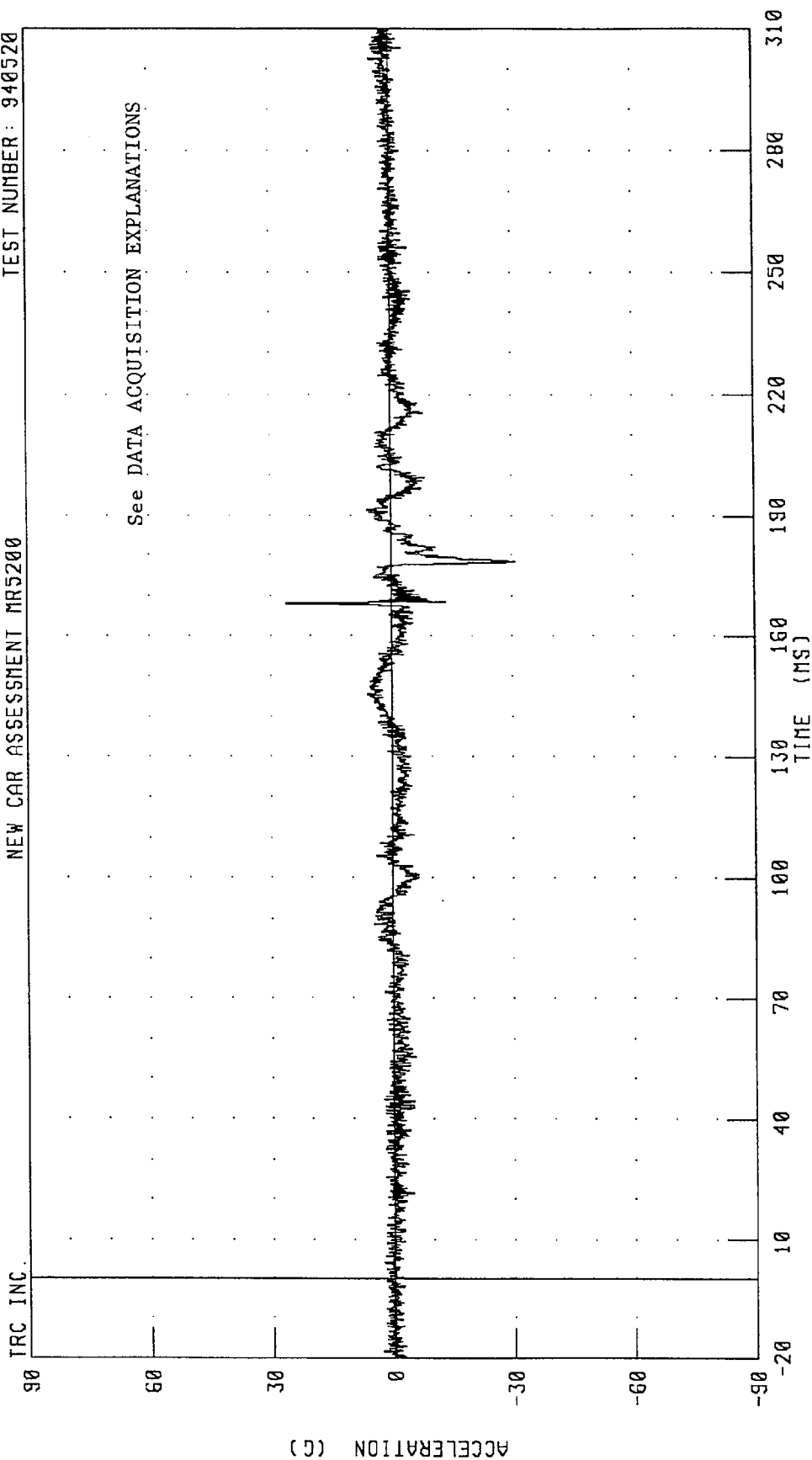


PEAK DATA: 76.93 G @ 178.48 MS; -119.37 G @ 45.20 MS

CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA: 26.08 G @ 168.16 MS; -30.63 G @ 178.48 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

90

See DATA ACQUISITION EXPLANATIONS

60

30

ACCELERATION (G)

0

-30

-60

-90

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

PEAK DATA: 3.18 G @ -0.32 MS; -70.37 G @ 84.88 MS

CHANNEL: HDZG2 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION

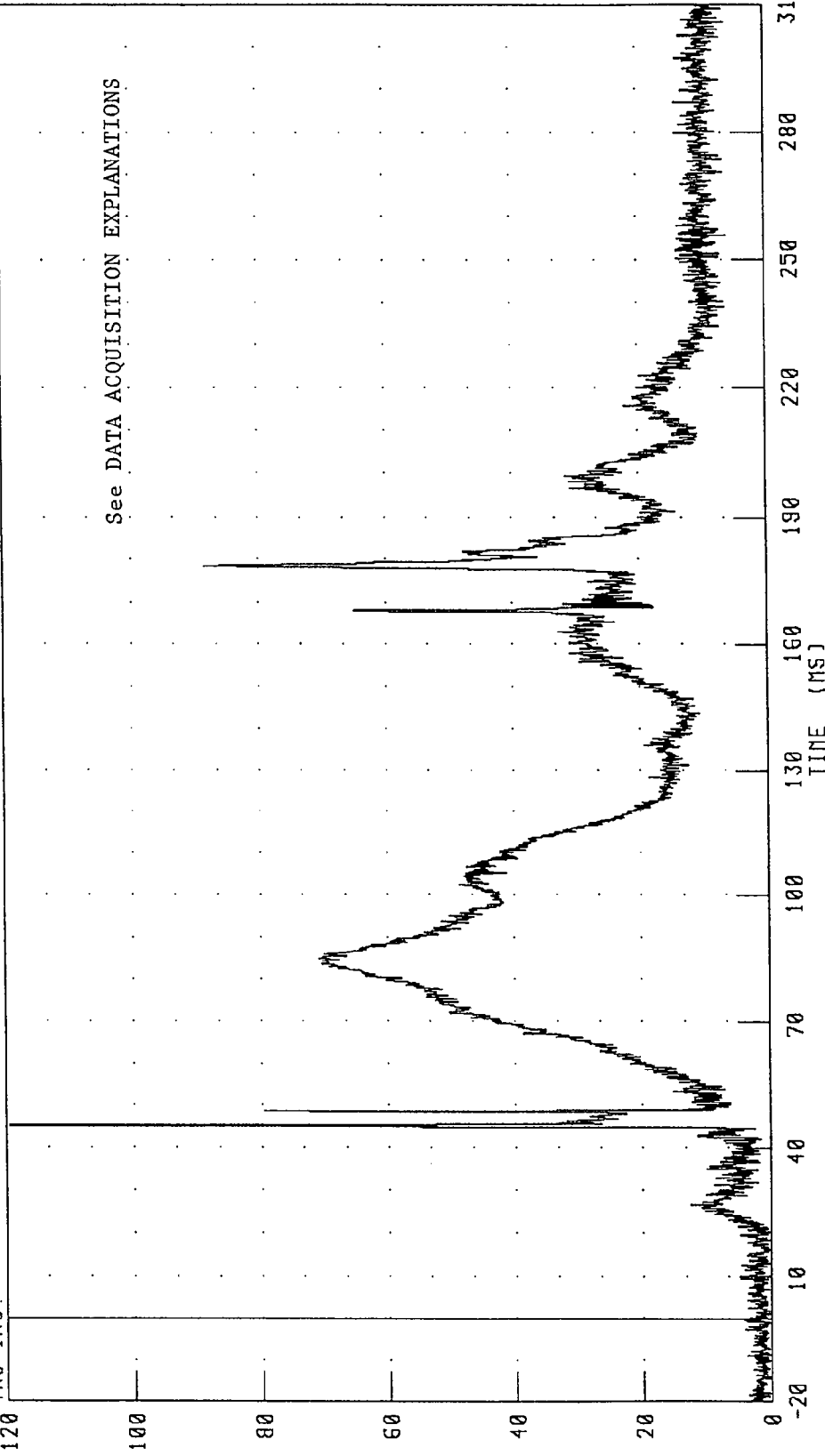
TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.

See DATA ACQUISITION EXPLANATIONS

ACCELERATION (G)



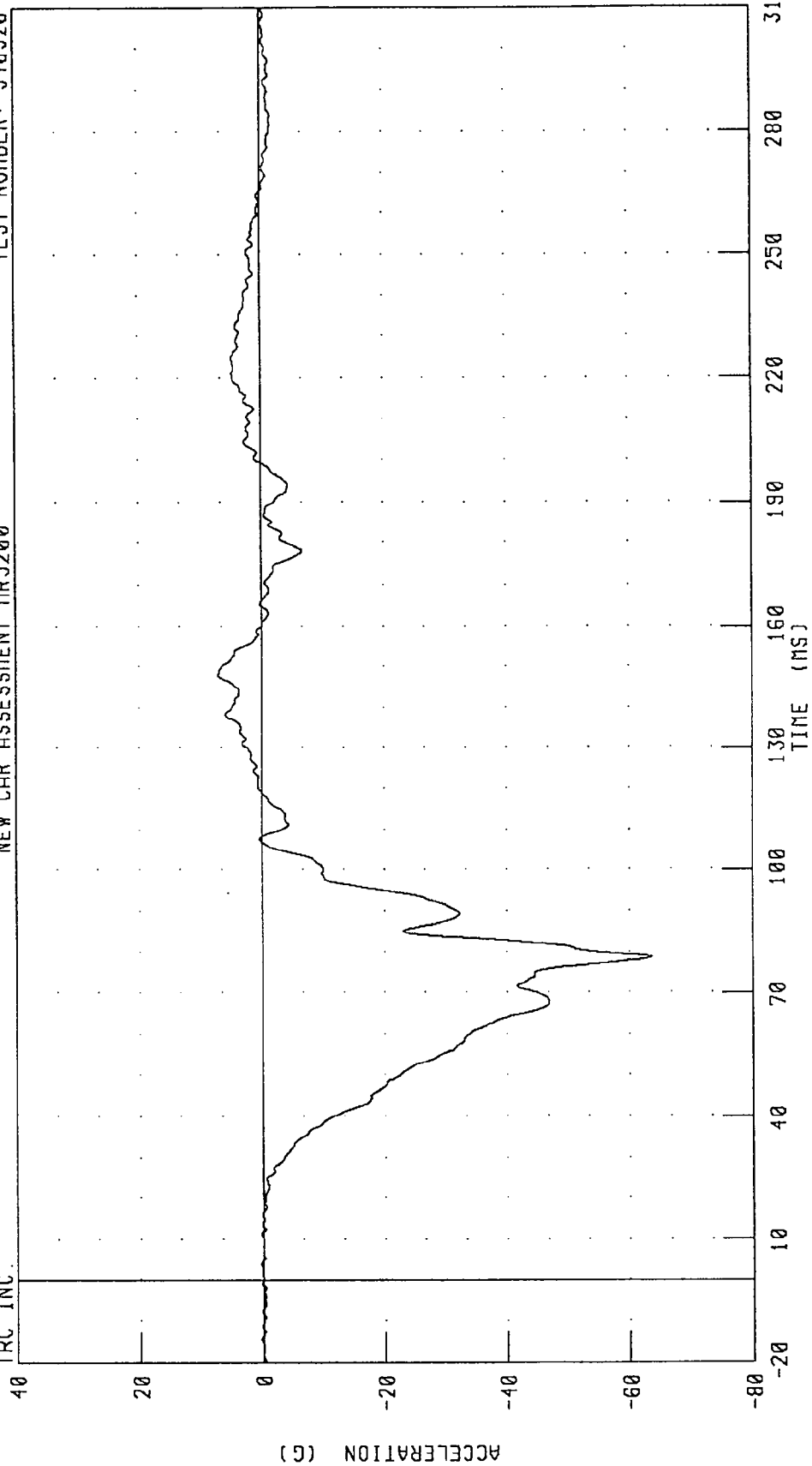
PEAK DATA: 119.41 G @ 45.20 MS; 0.22 G @ -14.16 MS

CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT NR5200

TEST NUMBER: 940520

TRC INC.

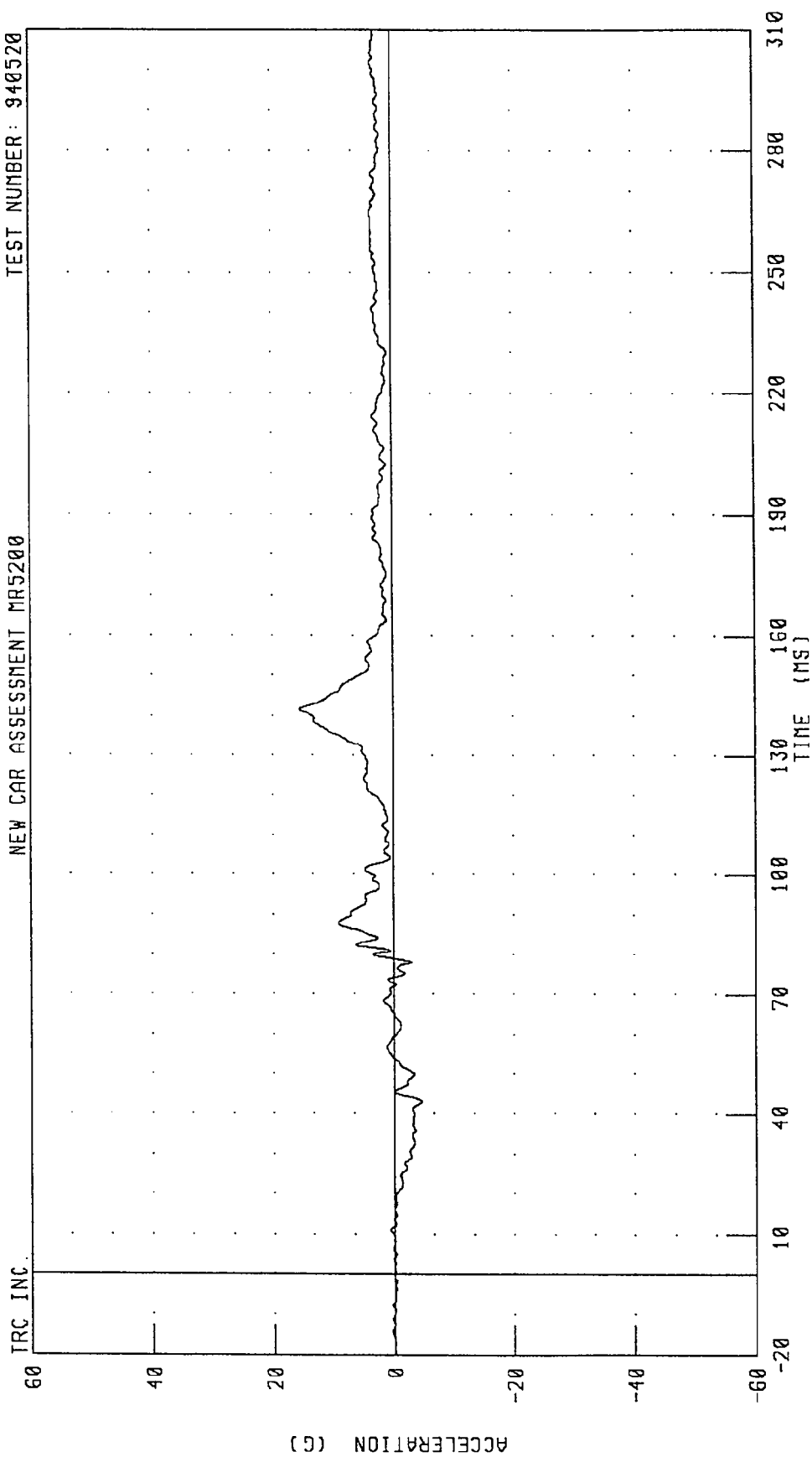


CHANNEL: CSTXG2 FILTER: CH. CLASS 180

PEAK DATA: 7.05 G @ 147.92 MS; -63.69 G @ 78.64 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



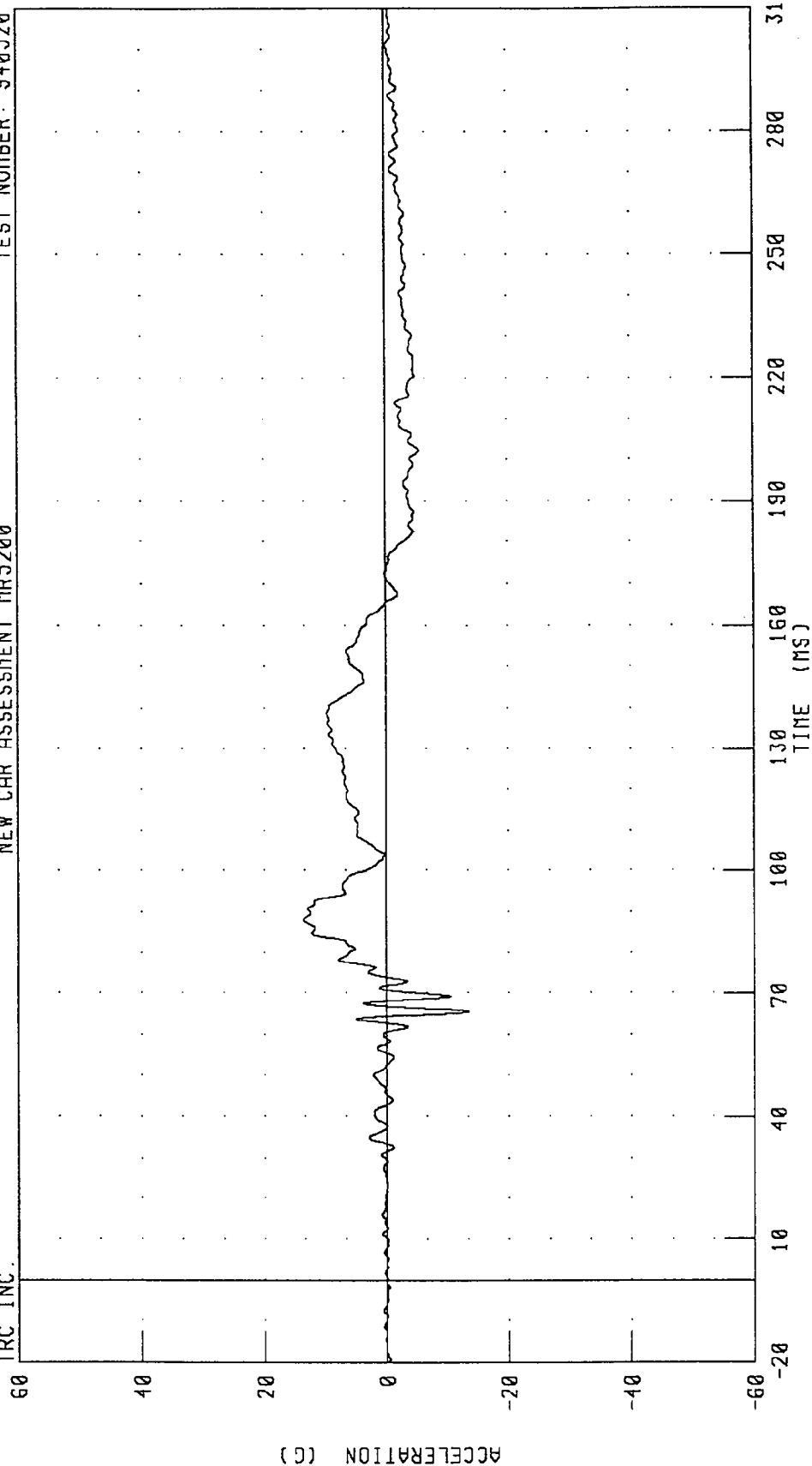
CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 15.66 G @ 141.76 MS; -4.65 G @ 43.12 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

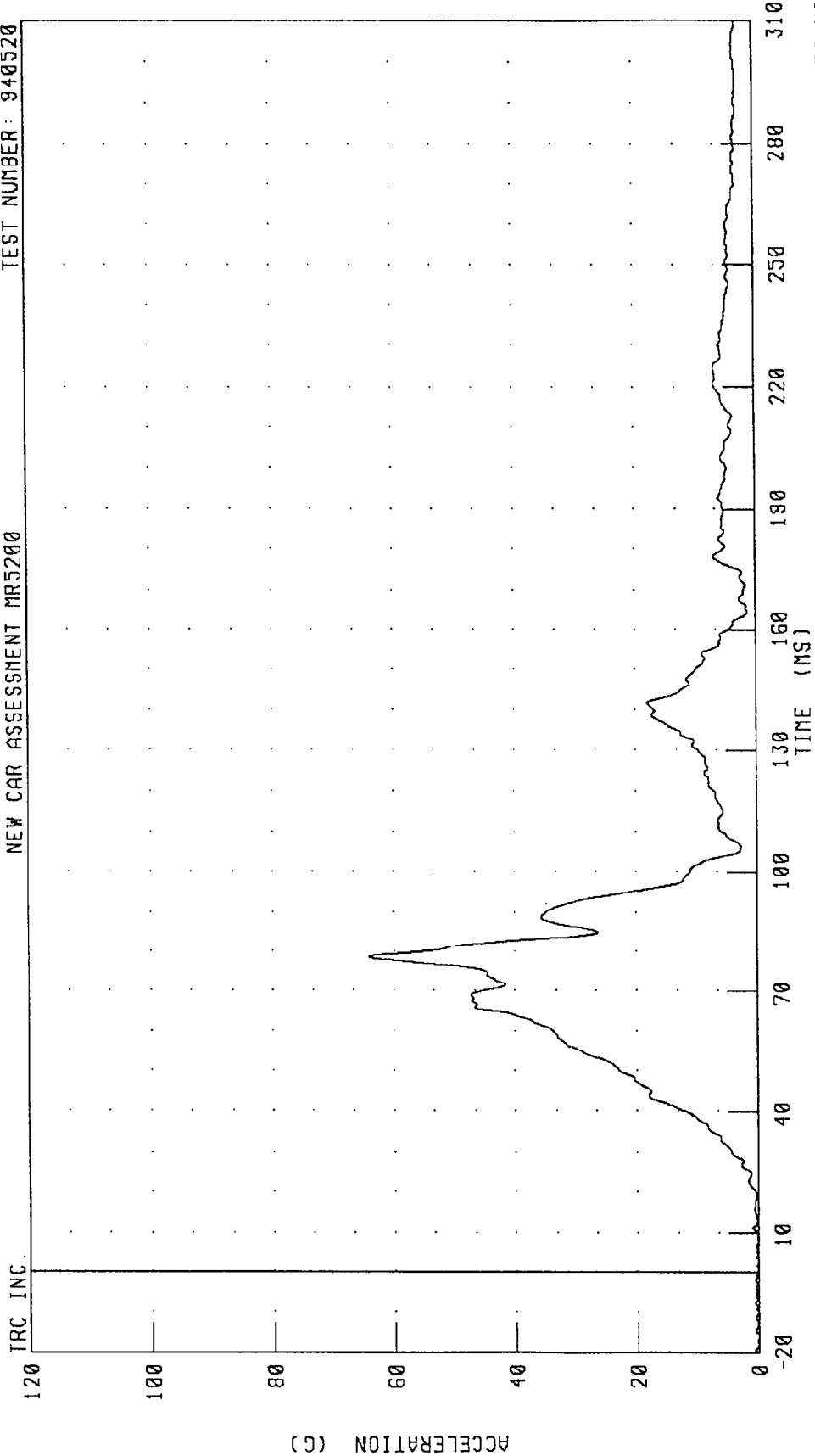


PEAK DATA: 13.56 G @ 88.08 MS; -13.61 G @ 65.52 MS

CHANNEL: CSTZG2 FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

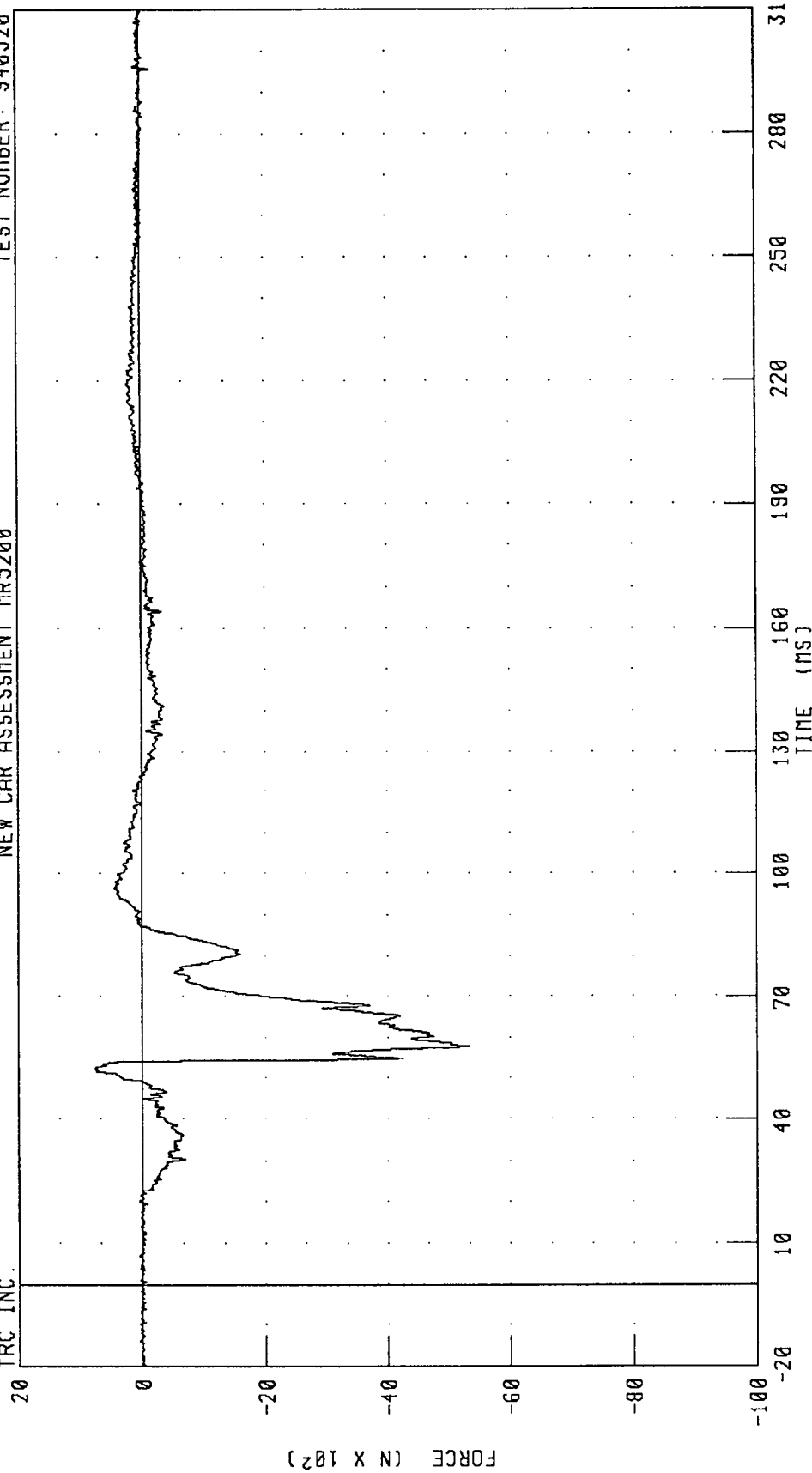


CHANNEL: CSTRG2 FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

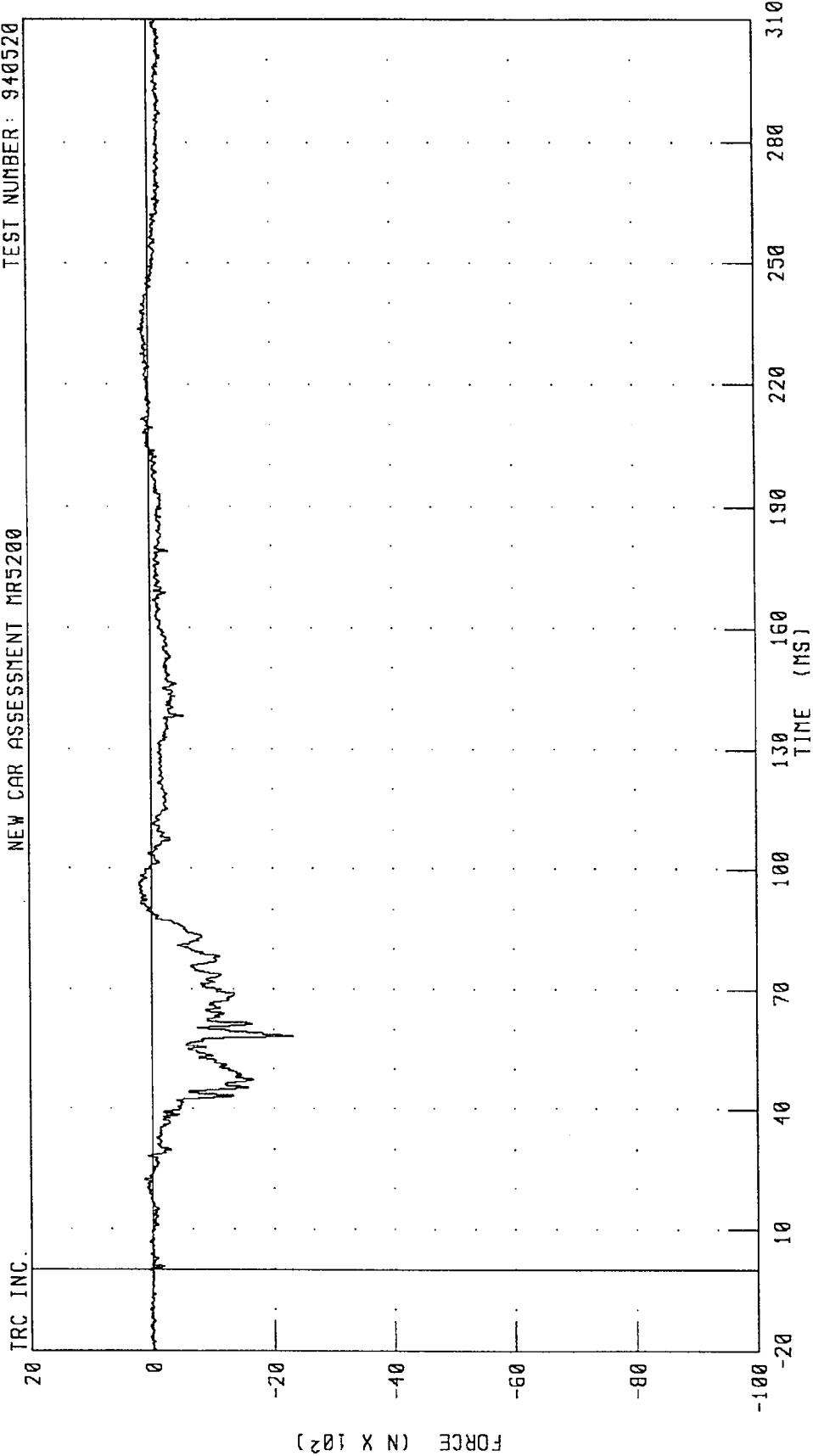


CHANNEL: LFMF2 FILTER: CH. CLASS 600

PEAK DATA: 753.32 N @ 52.32 MS; -5337.92 N @ 57.92 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 PASSENGER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



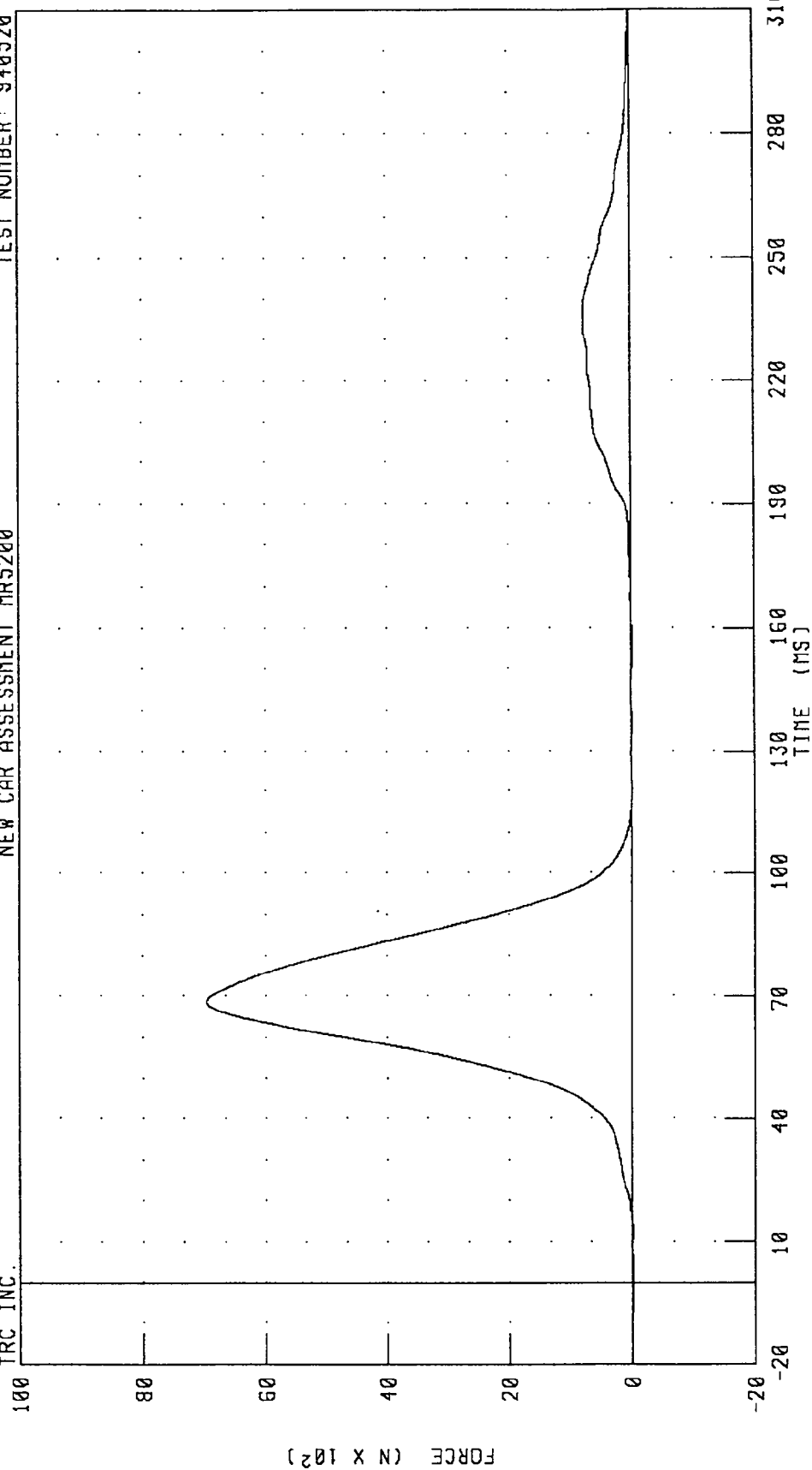
PEAK DATA: 198.30 N @ 96.00 MS; -2316.49 N @ 58.40 MS

CHANNEL: RFMF2 FILTER: CH. CLASS 600

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 PASSENGER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



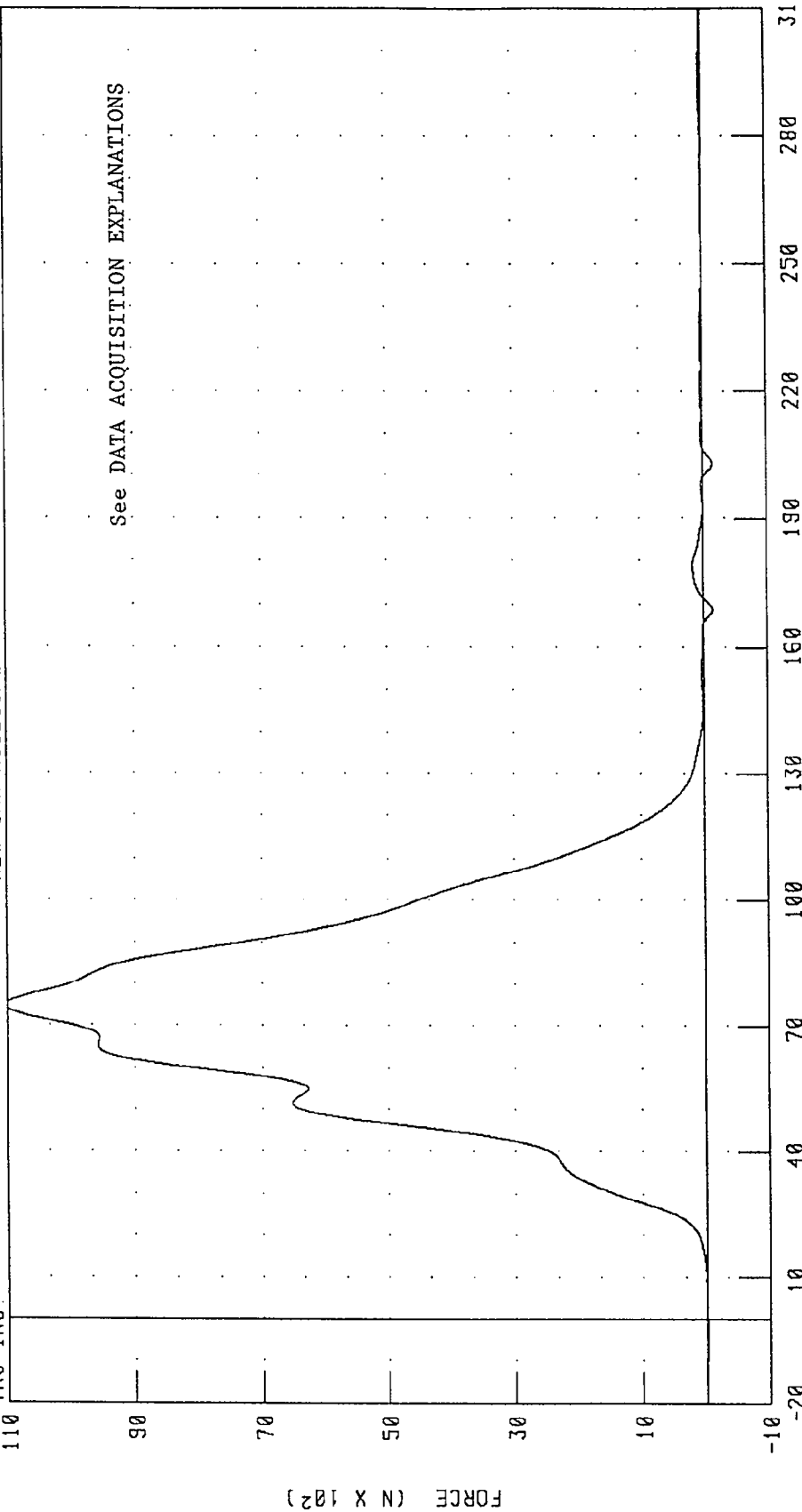
CHANNEL: LBOF2 FILTER: CH. CLASS 60

PEAK DATA: 6959.97 N @ 68.64 MS; -12.46 N @ 136.96 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



See DATA ACQUISITION EXPLANATIONS

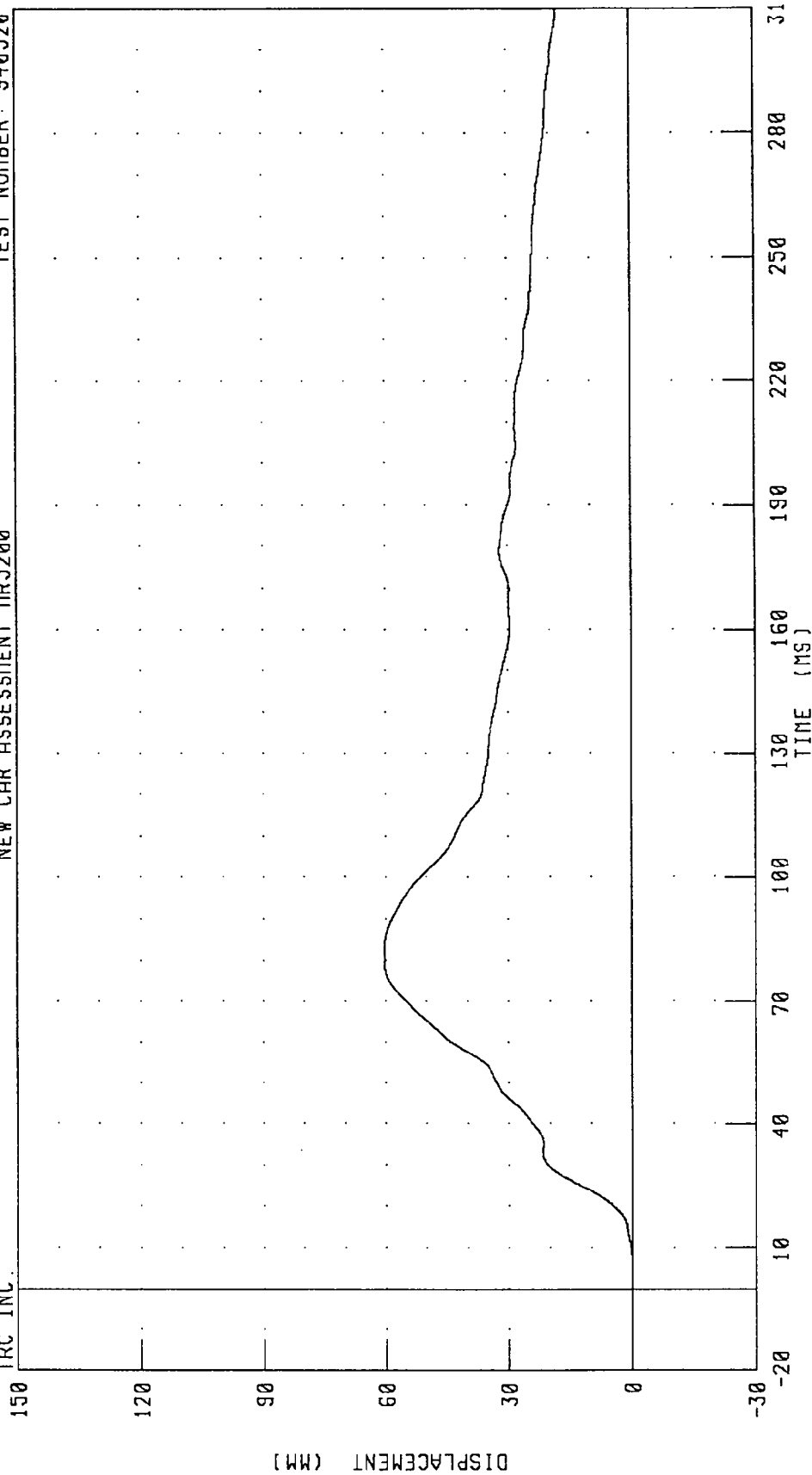
CHANNEL: SHBF2 FILTER: CH. CLASS 60

PEAK DATA: 11036.35 N @ 74.72 MS; -152.18 N @ 202.64 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

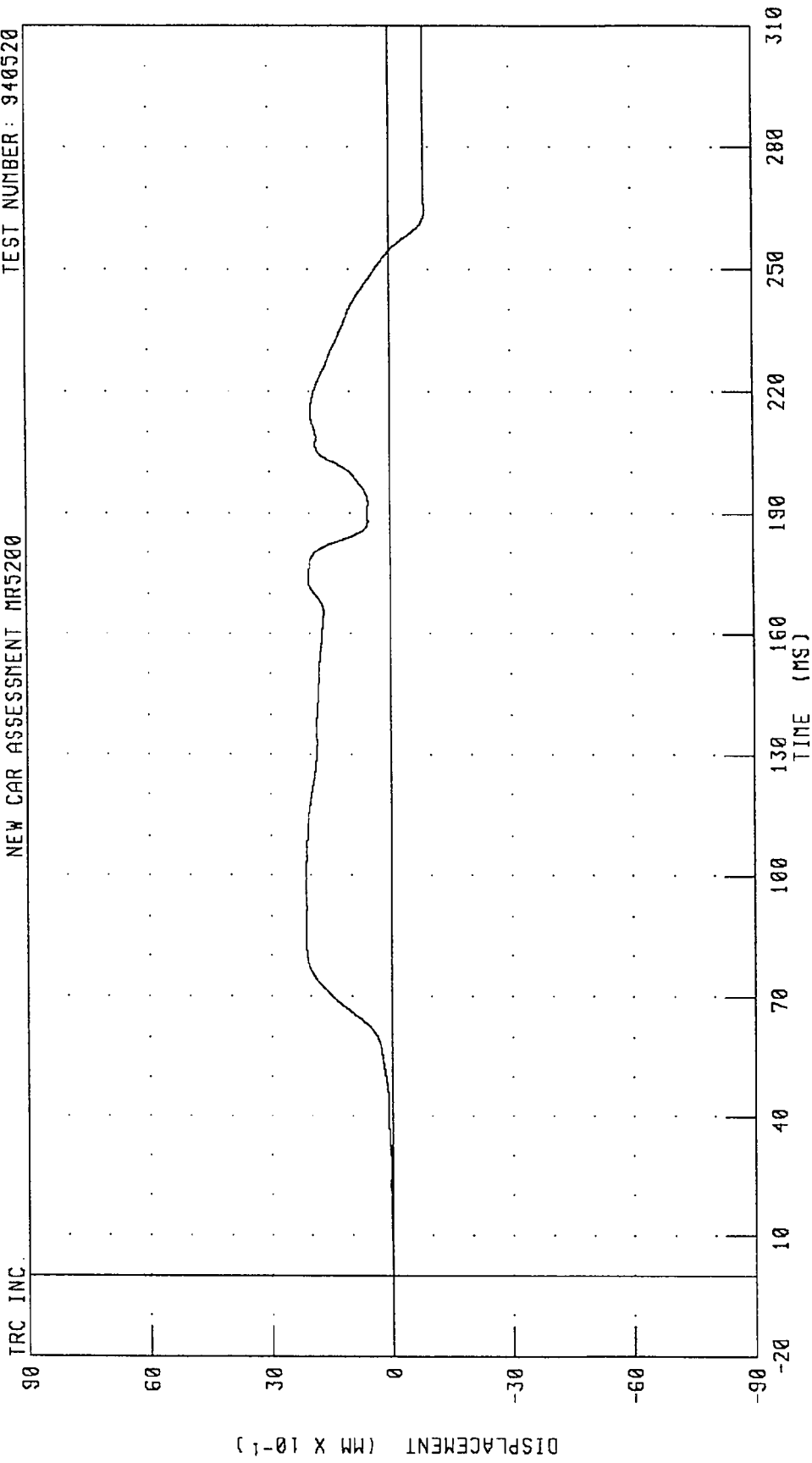


PEAK DATA: 60.35 MM @ 82.88 MS; 0.03 MM @ 4.72 MS

CHANNEL: SHBD2 FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



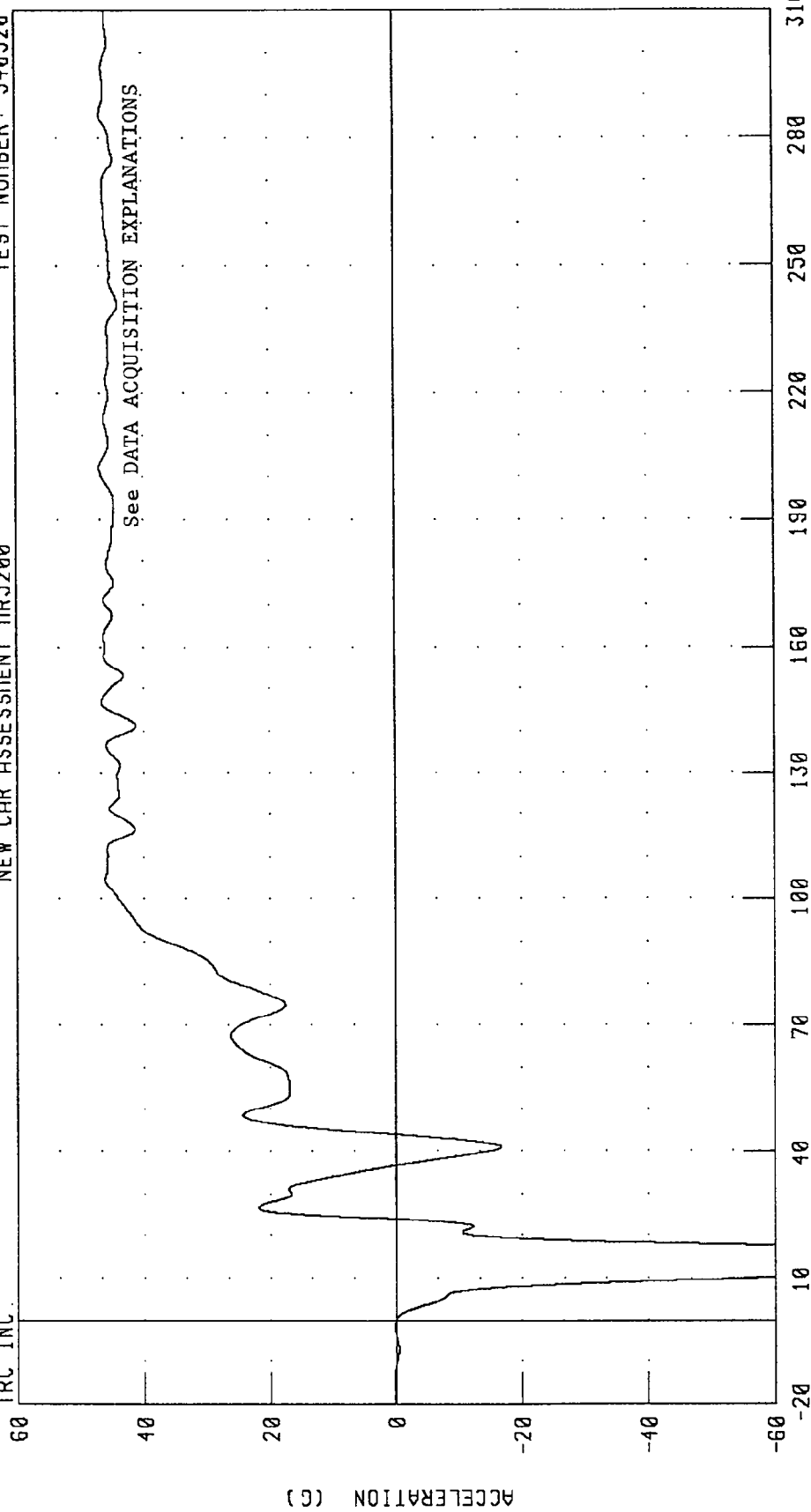
CHANNEL: SBED2 FILTER: CH. CLASS 60

PEAK DATA: 2.14 MM @ 85.68 MS; -0.88 MM @ 264.24 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

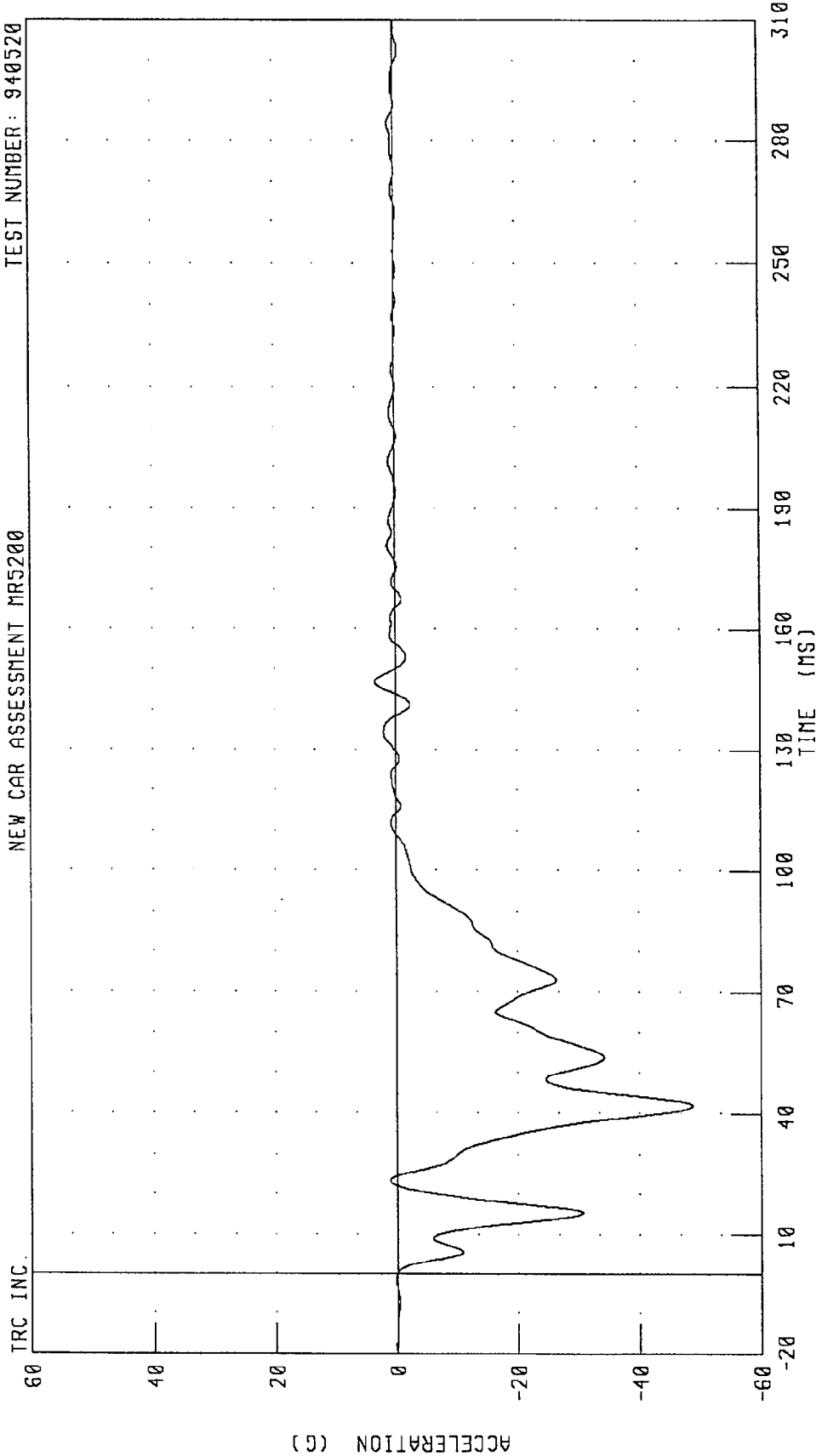


CHANNEL: TLRXG1 FILTER: CH. CLASS 60

PEAK DATA: 46.88 G @ 202.32 MS; -116.98 G @ 15.20 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

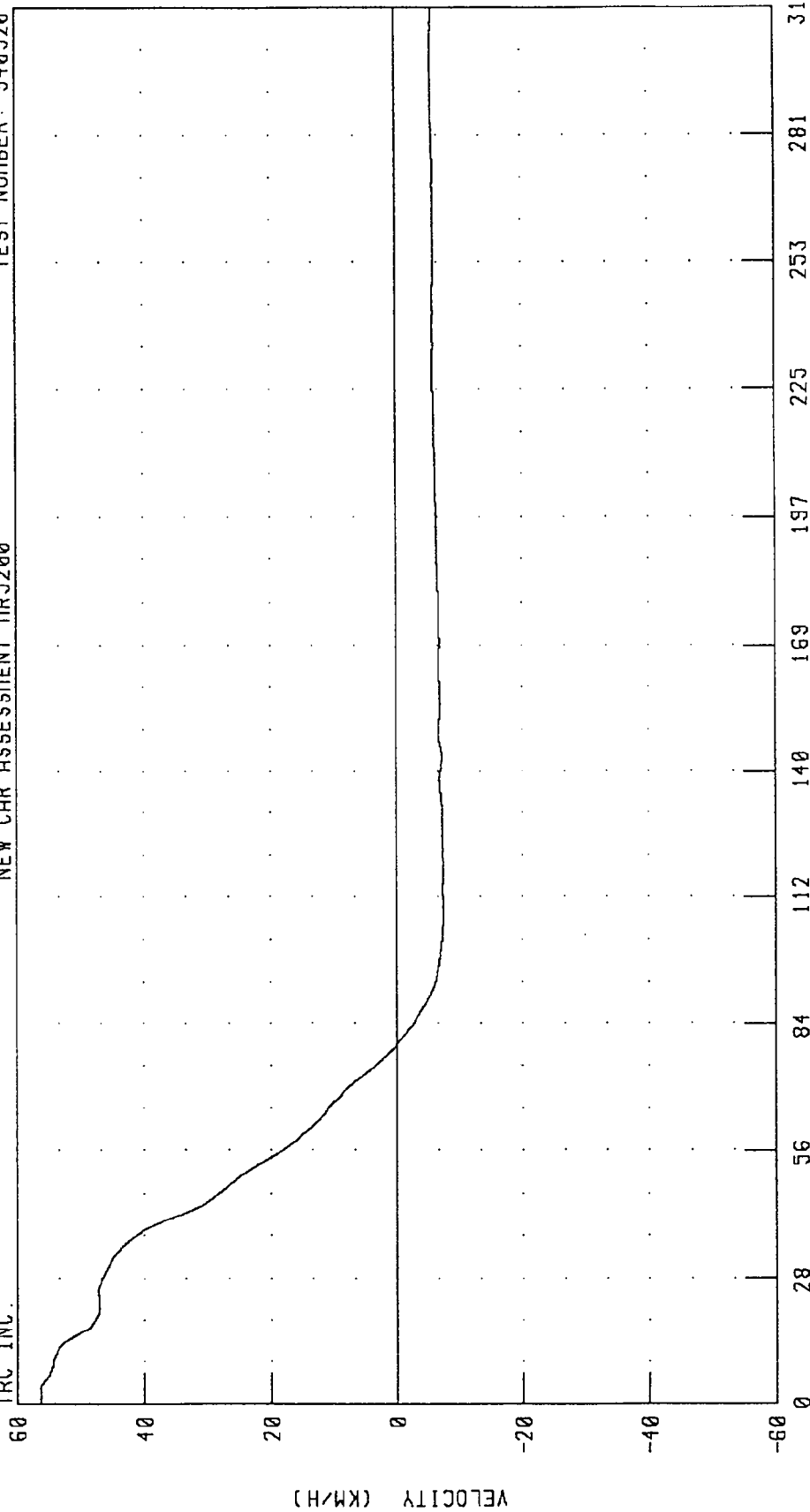


CHANNEL: TRRXG1 FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



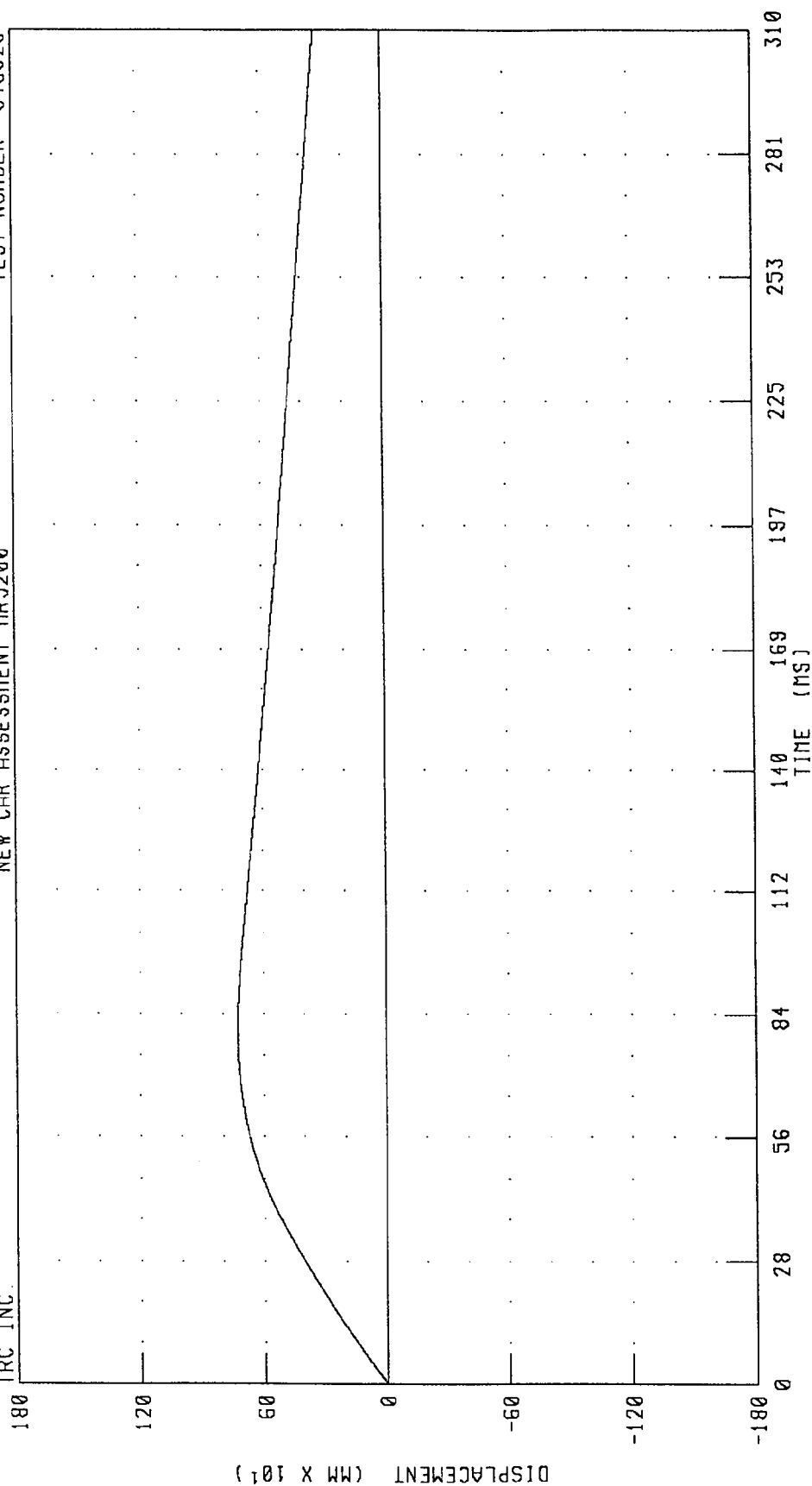
TIME (MS)

PEAK DATA: 56.30 KM/H @ 0 00 MS; -7.45 KM/H @ 109.52 MS

CHANNEL: TRRXV1 FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT

TRC INC. NEW CAR ASSESSMENT MR5200 TEST NUMBER: 940520

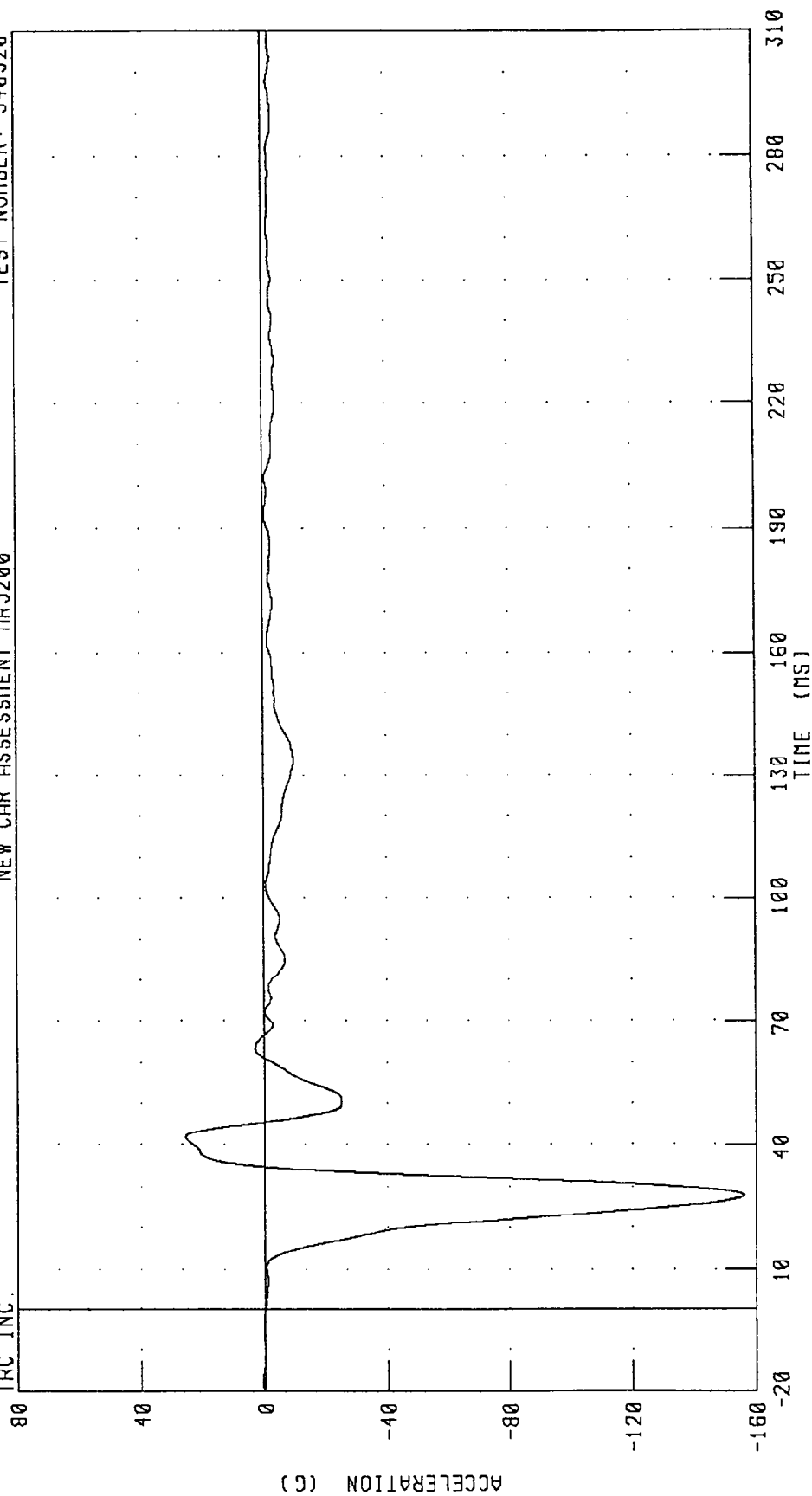


CHANNEL: TRRXD1 FILTER: CH. CLASS 180
PEAK DATA: 728.16 MM @ 79.84 MS; 0.00 MM @ 0.00 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

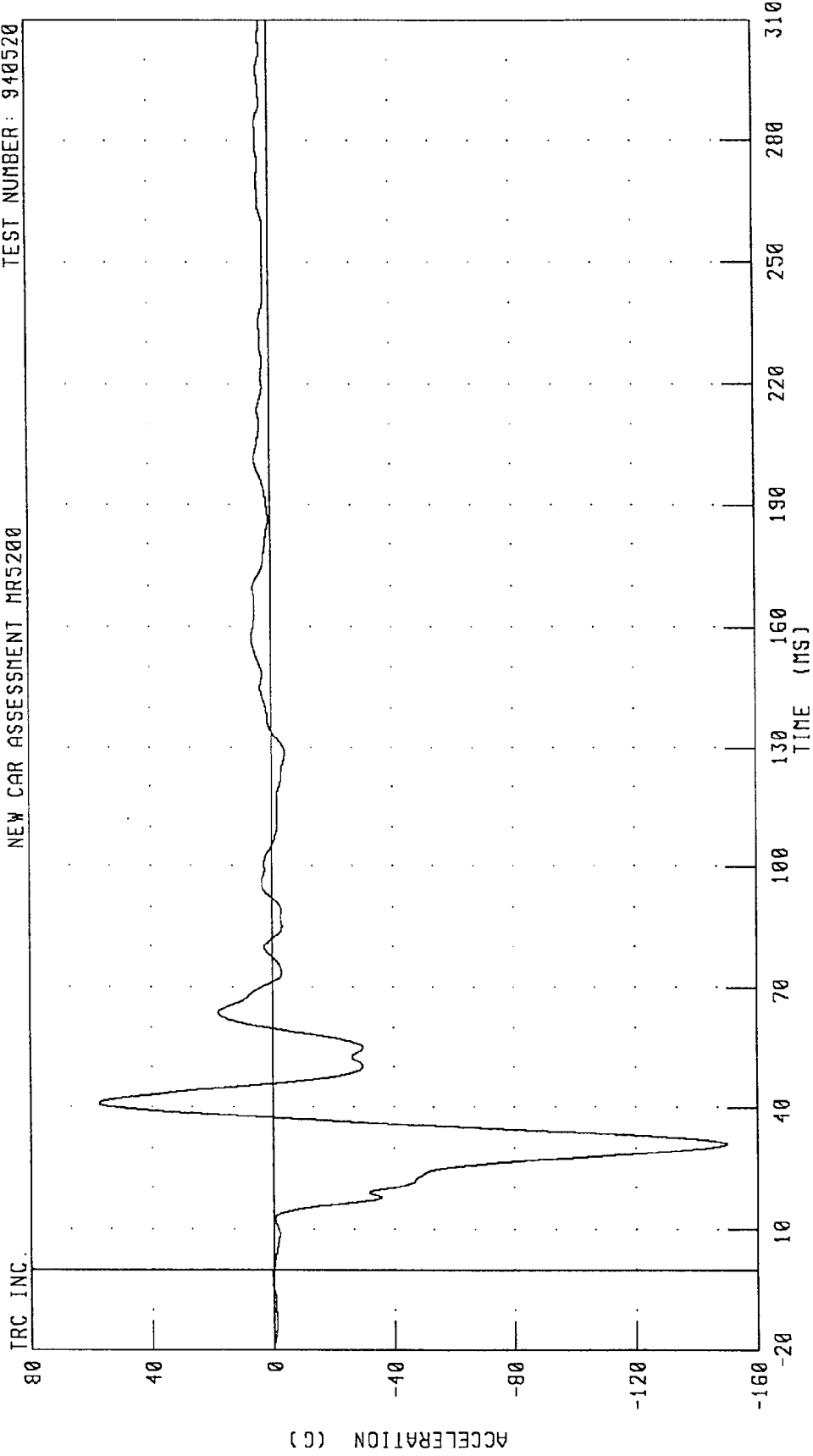


CHANNEL: ENGXC1 FILTER: CH. CLASS 60

PEAK DATA: 25.57 G @ 41.92 MS; -155.97 G @ 27.76 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

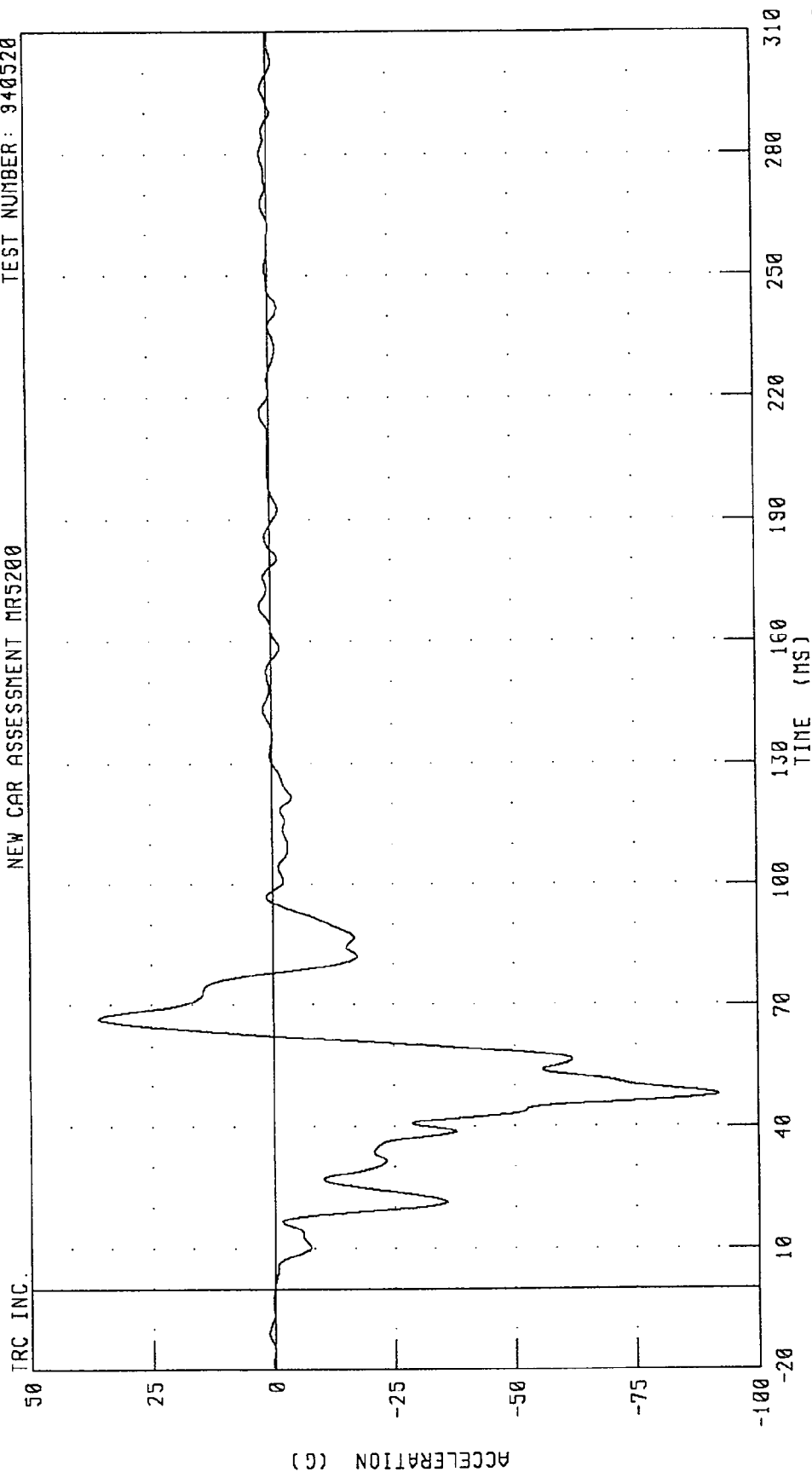


CHANNEL: ENGXC2 FILTER: CH. CLASS 60

PEAK DATA: 57.33 G @ 41.12 MS; -149.76 G @ 31.04 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT NR5200

TEST NUMBER: 340520

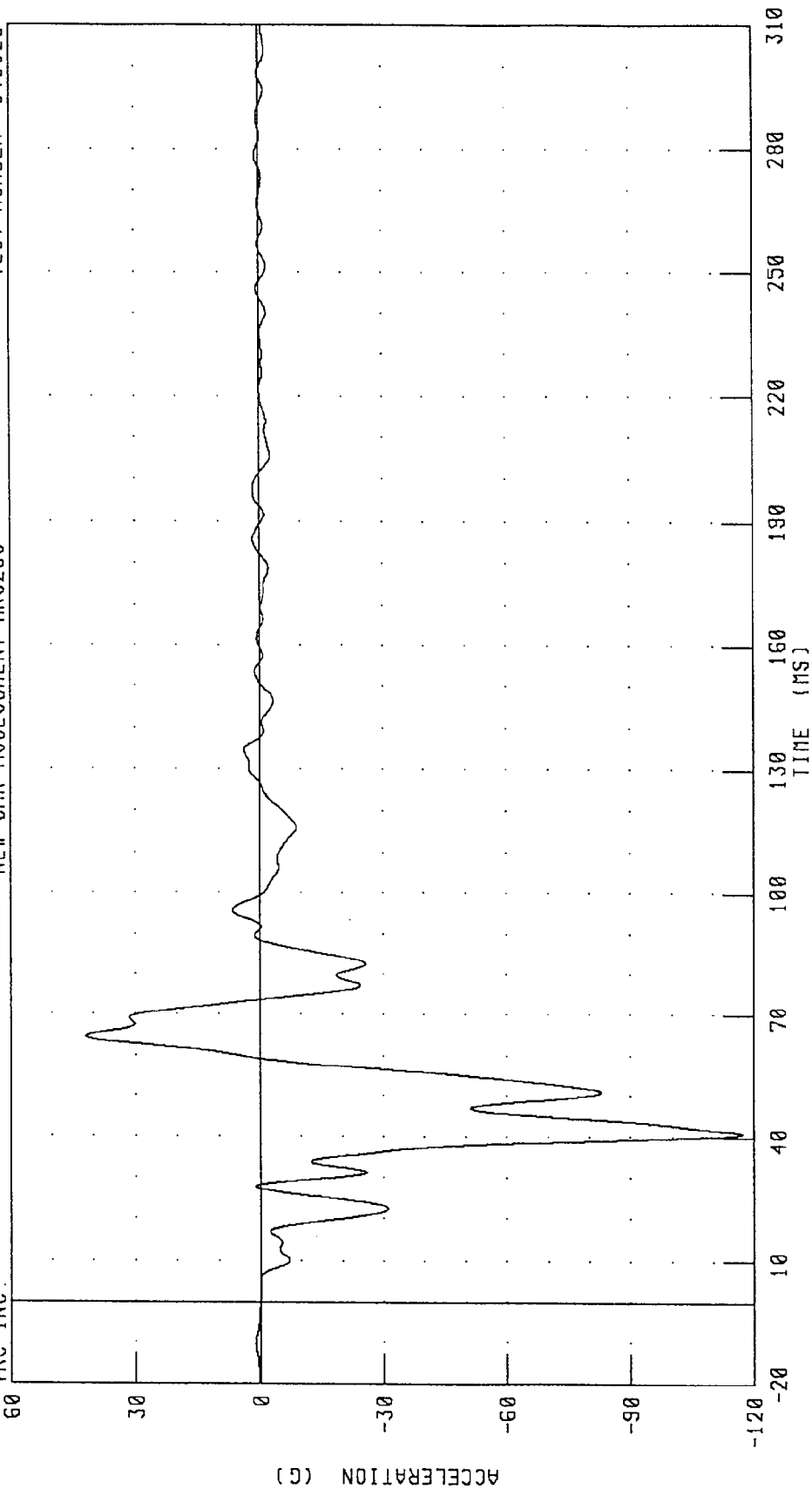


CHANNEL: BCRXG1 FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



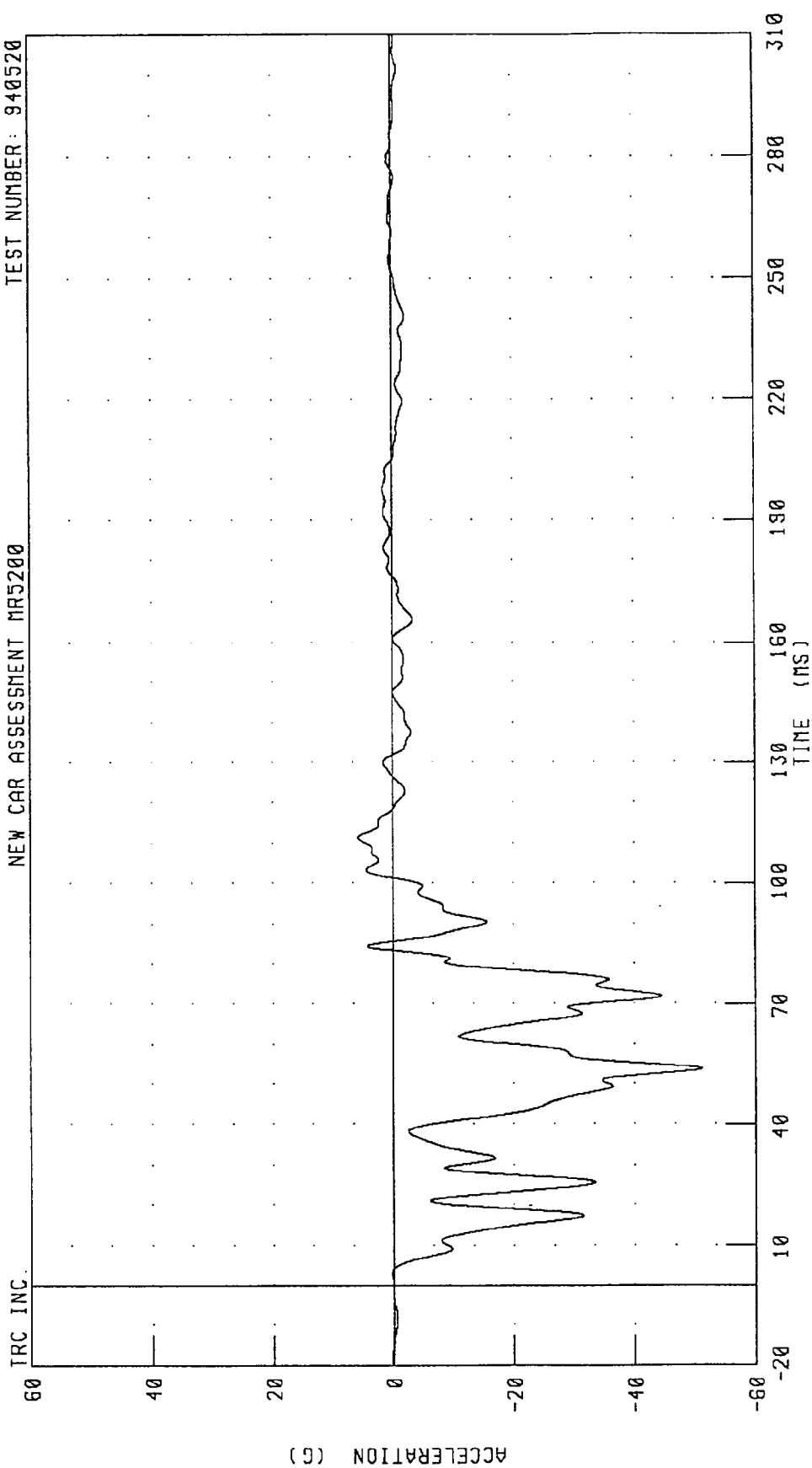
CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 41.89 G @ 64.56 MS, -116.98 G @ 40.96 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



CHANNEL: DPCXG1 FILTER: CH. CLASS 60

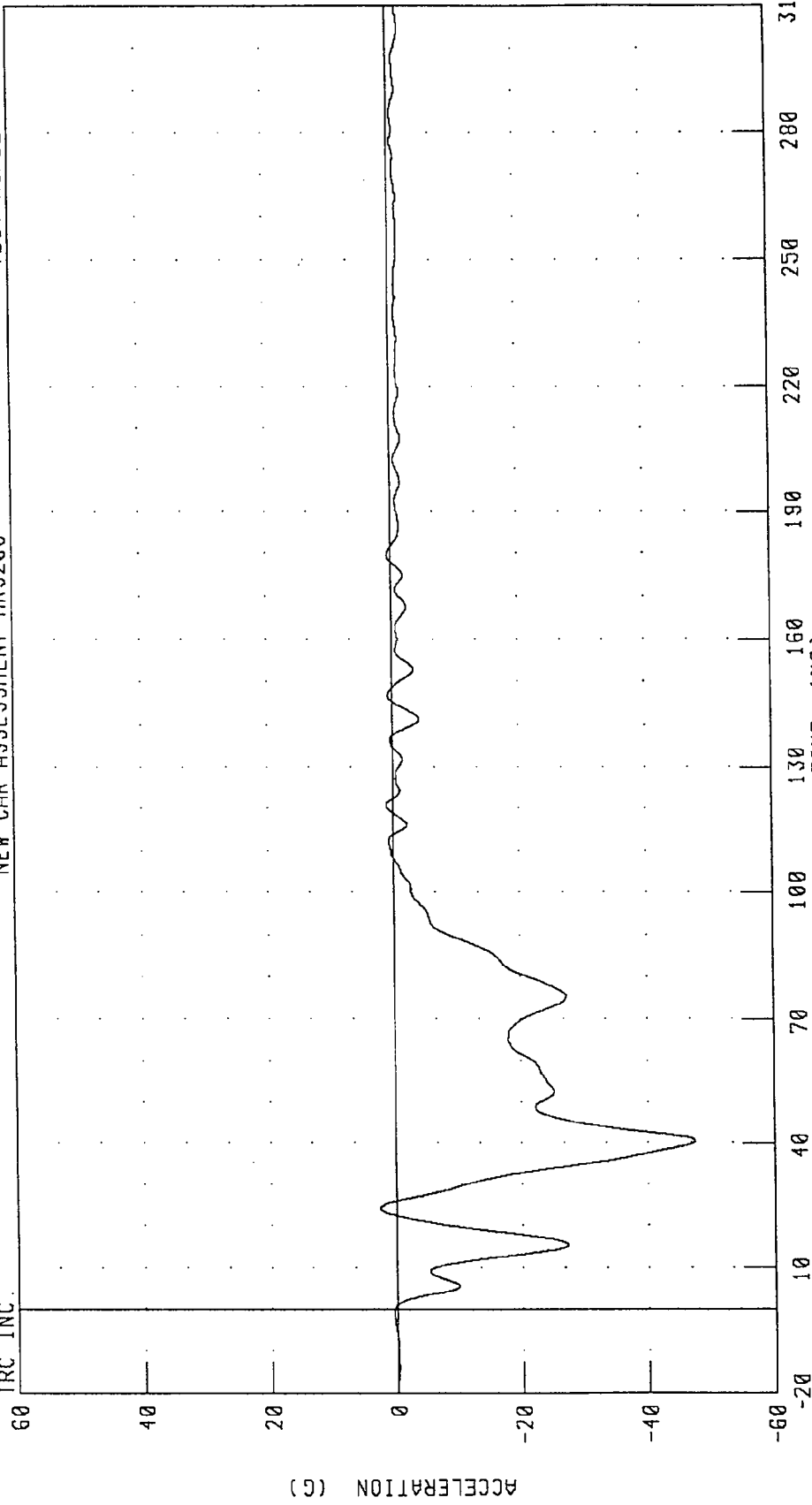
PEAK DATA: 5.78 G @ 111.36 MS; -51.11 G @ 53.76 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



PEAK DATA: 2.57 G @ 24.08 MS; -47.47 G @ 40.56 MS

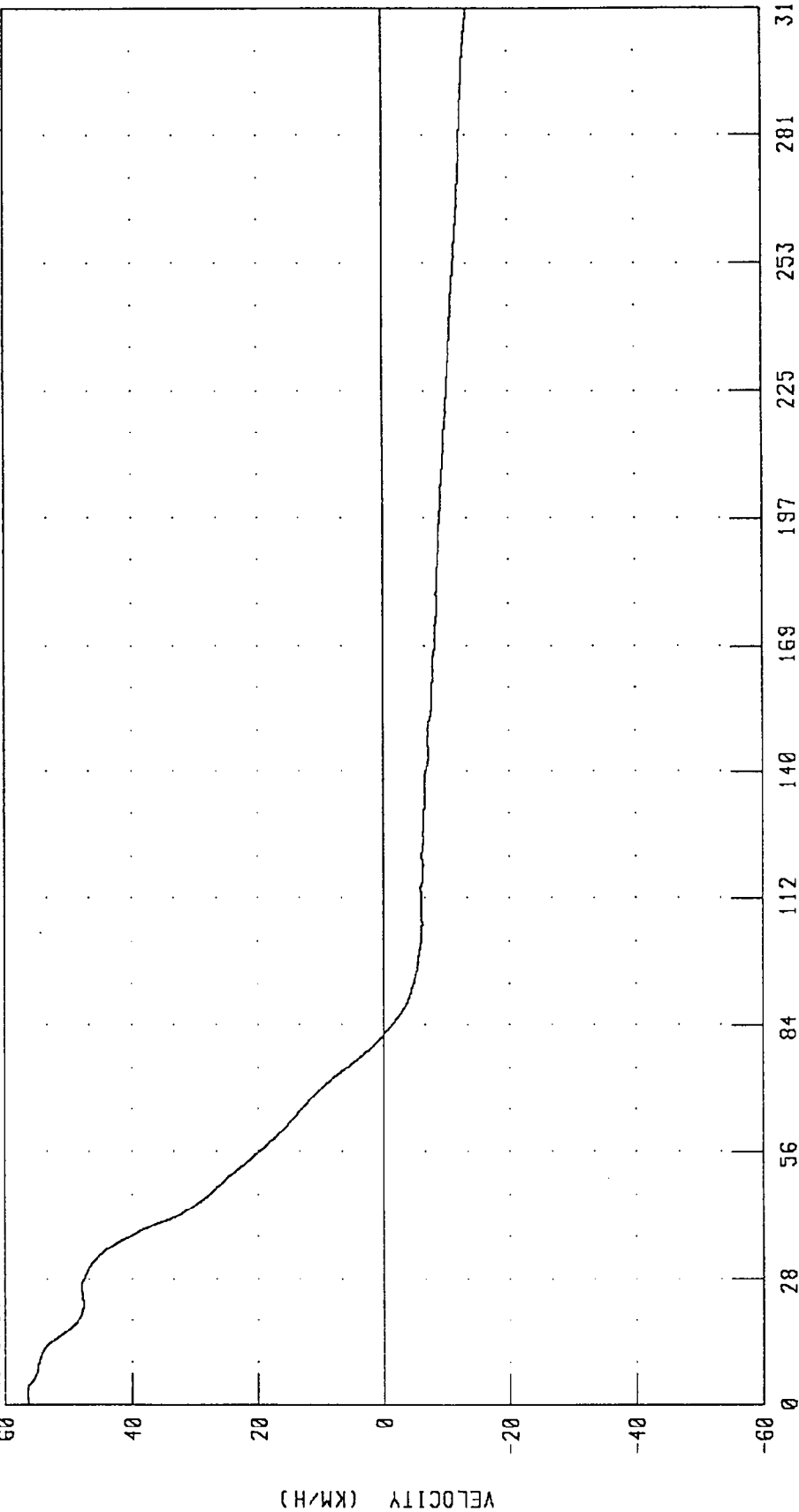
CHANNEL: TLRXGA FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS VELOCITY

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



PEAK DATA: 56.34 KM/H @ 3.04 MS; -13.55 KM/H @ 310.00 MS

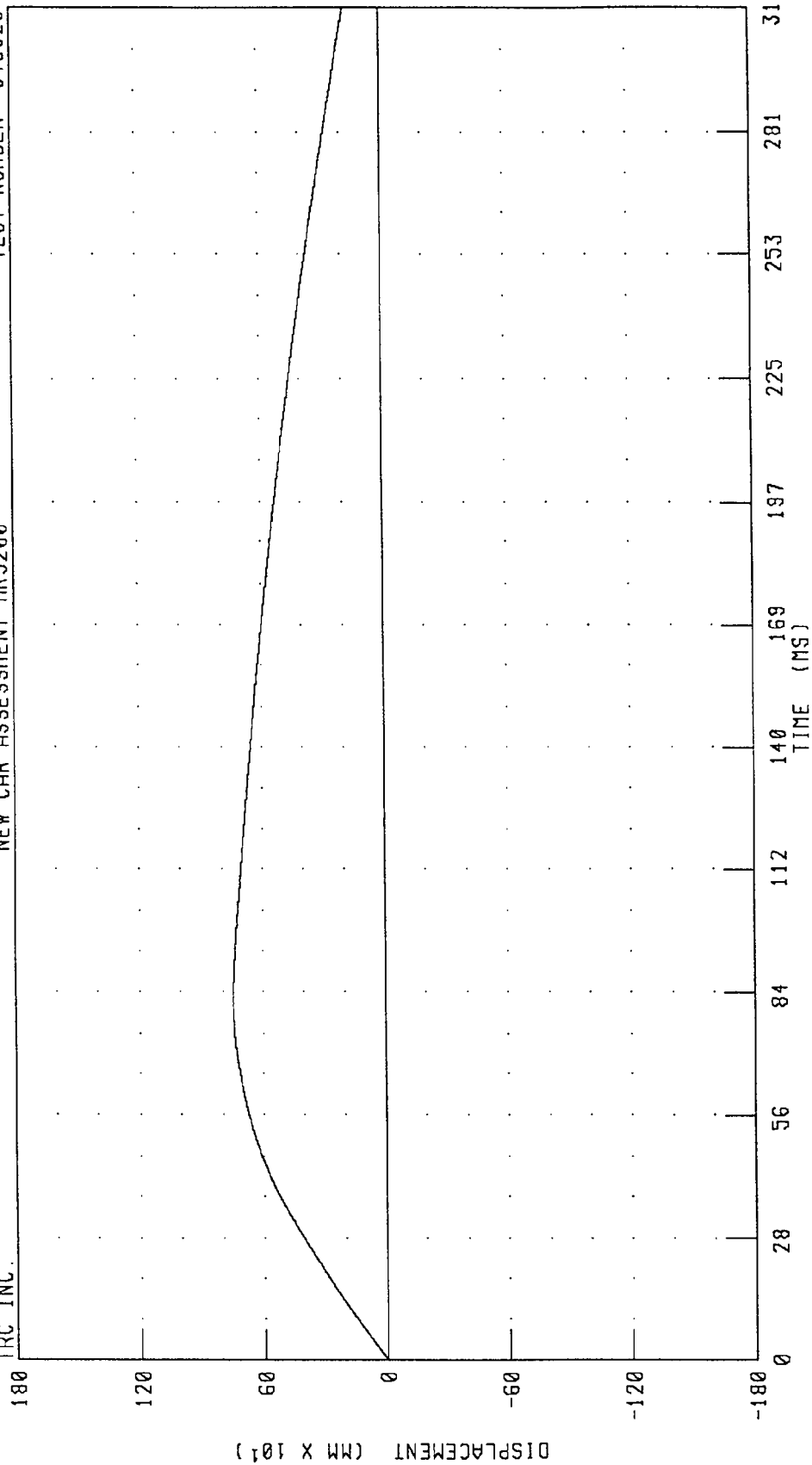
CHANNEL: TLRXVA FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS DISPLACEMENT

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



PEAK DATA: 746.23 MM @ 82.40 MS; 0.00 MM @ 0.00 MS

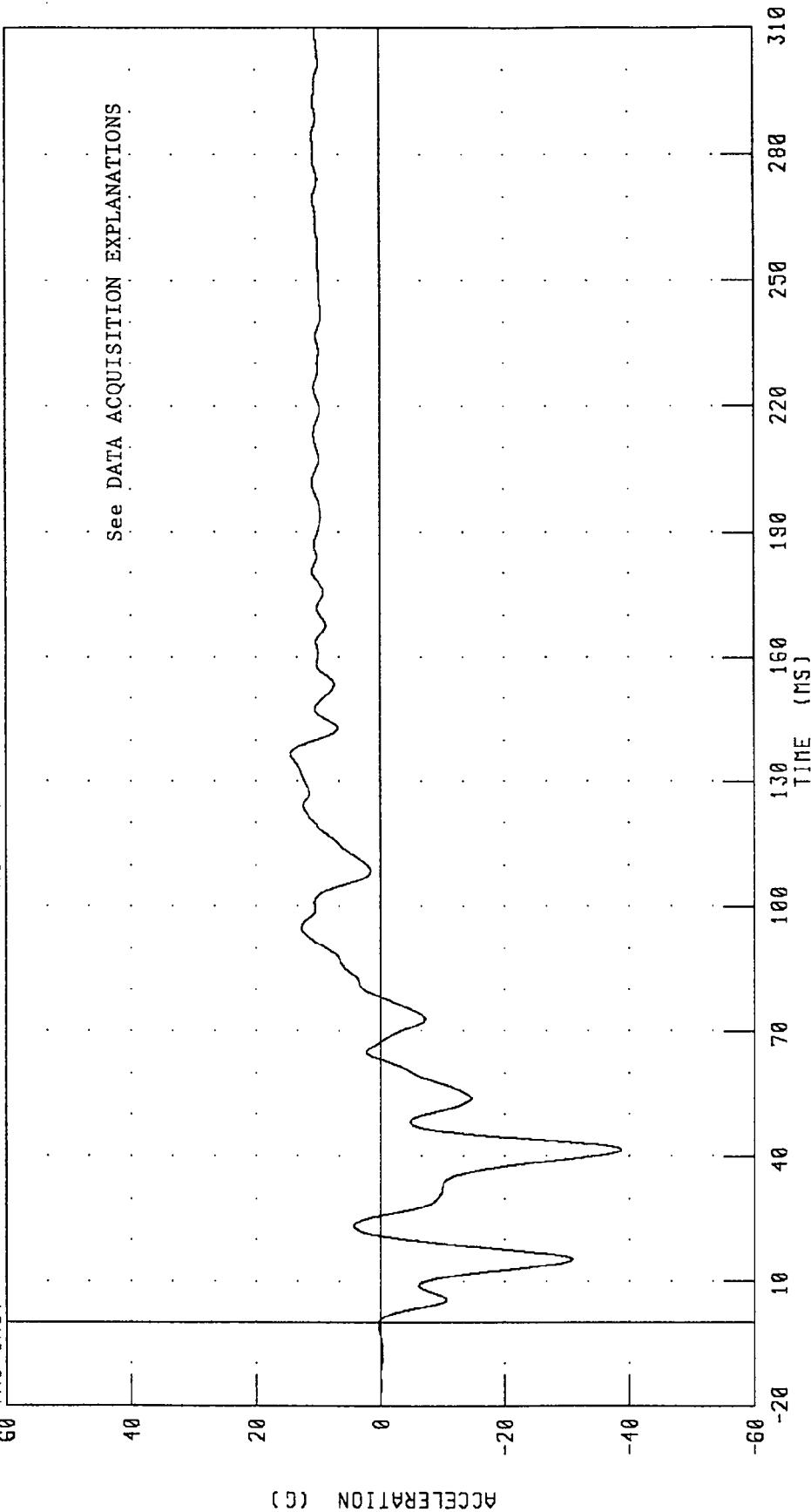
CHANNEL: TLRXDA FILTER: CH. CLASS 180

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



CHANNEL: TRRXGA FILTER: CH. CLASS 60

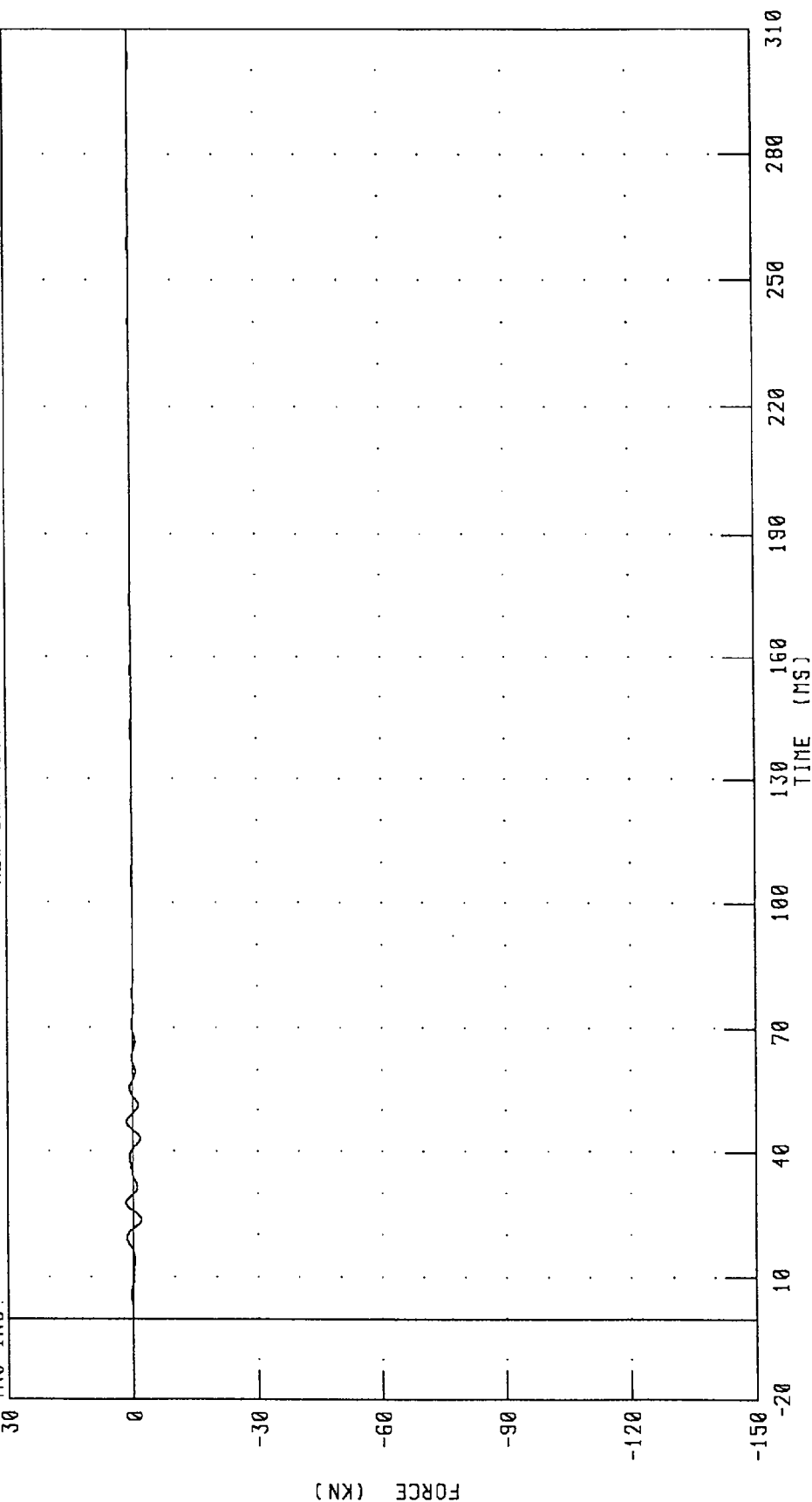
PEAK DATA: 14.40 G @ 136.80 MS; -38.80 G @ 41.68 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



PEAK DATA: 1.64 KN @ 27.60 MS; -2.05 KN @ 23.60 MS

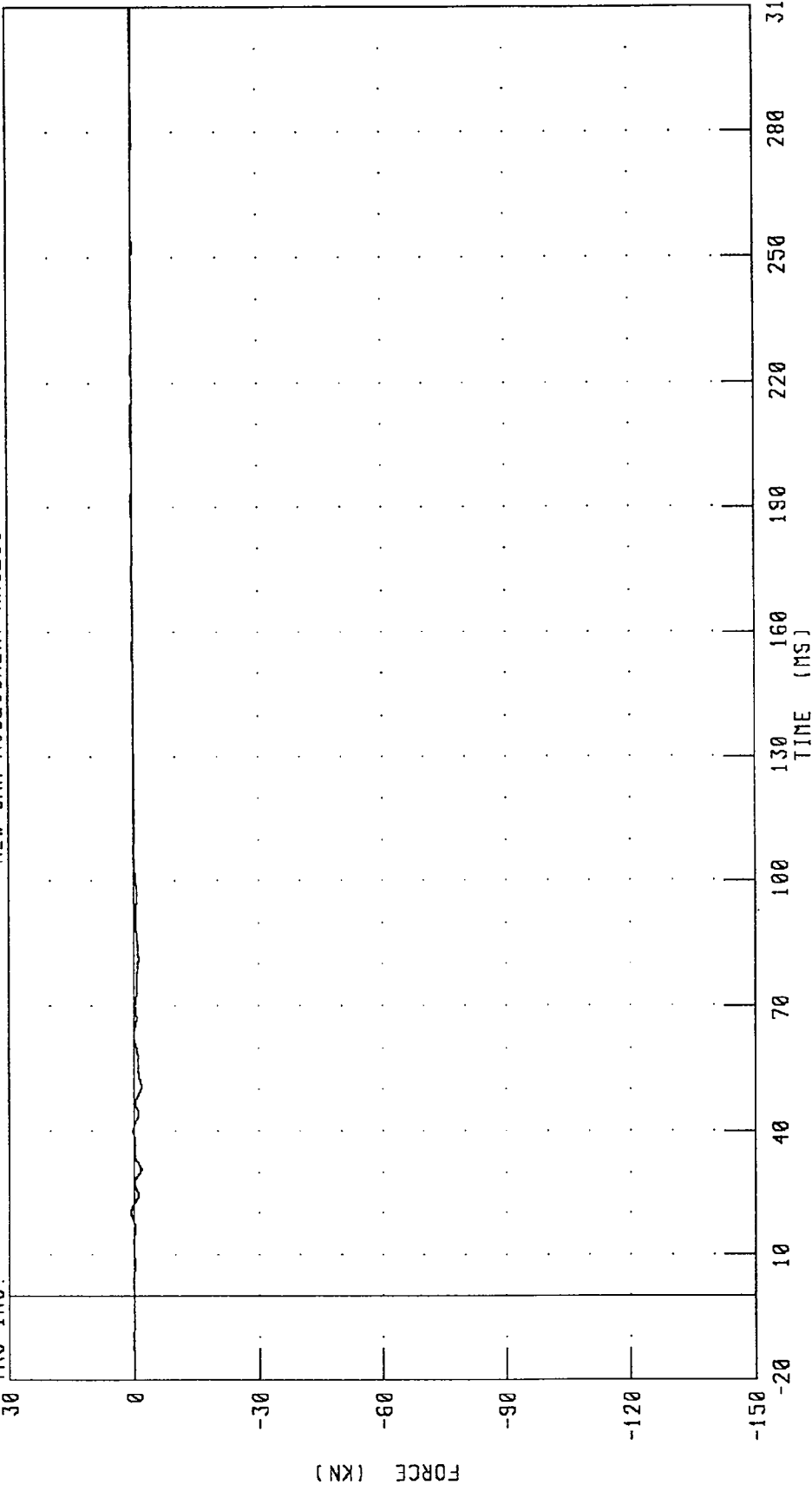
CHANNEL: BAIF FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.

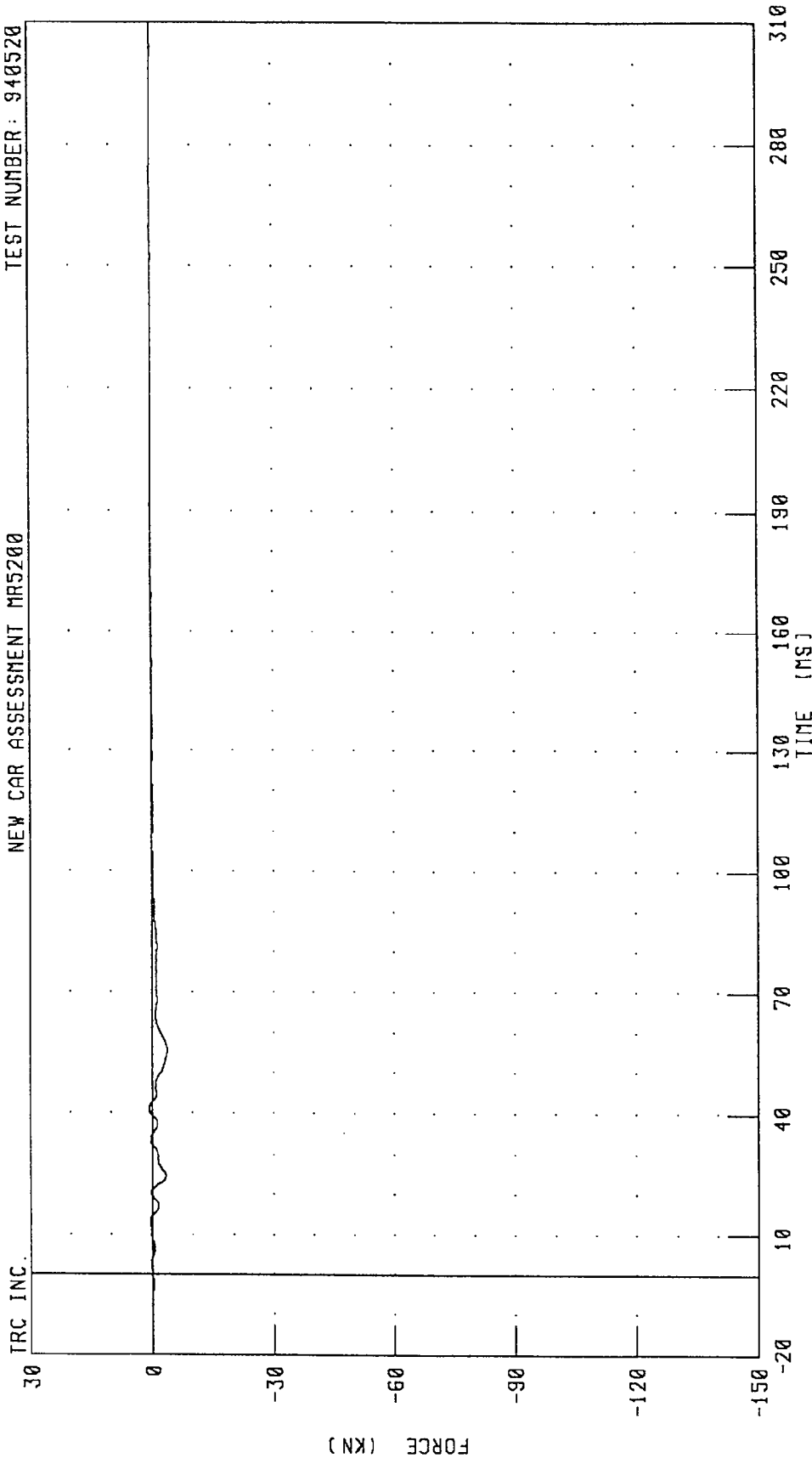


PEAK DATA: 0.73 KN @ 20.16 MS; -1.73 KN @ 50.80 MS

CHANNEL: BA2F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A3 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 0.77 KN @ 41.20 MS; -3.83 KN @ 55.52 MS

FILTER: CH. CLASS 60

CHANNEL: BA3F

FORCE (KN)

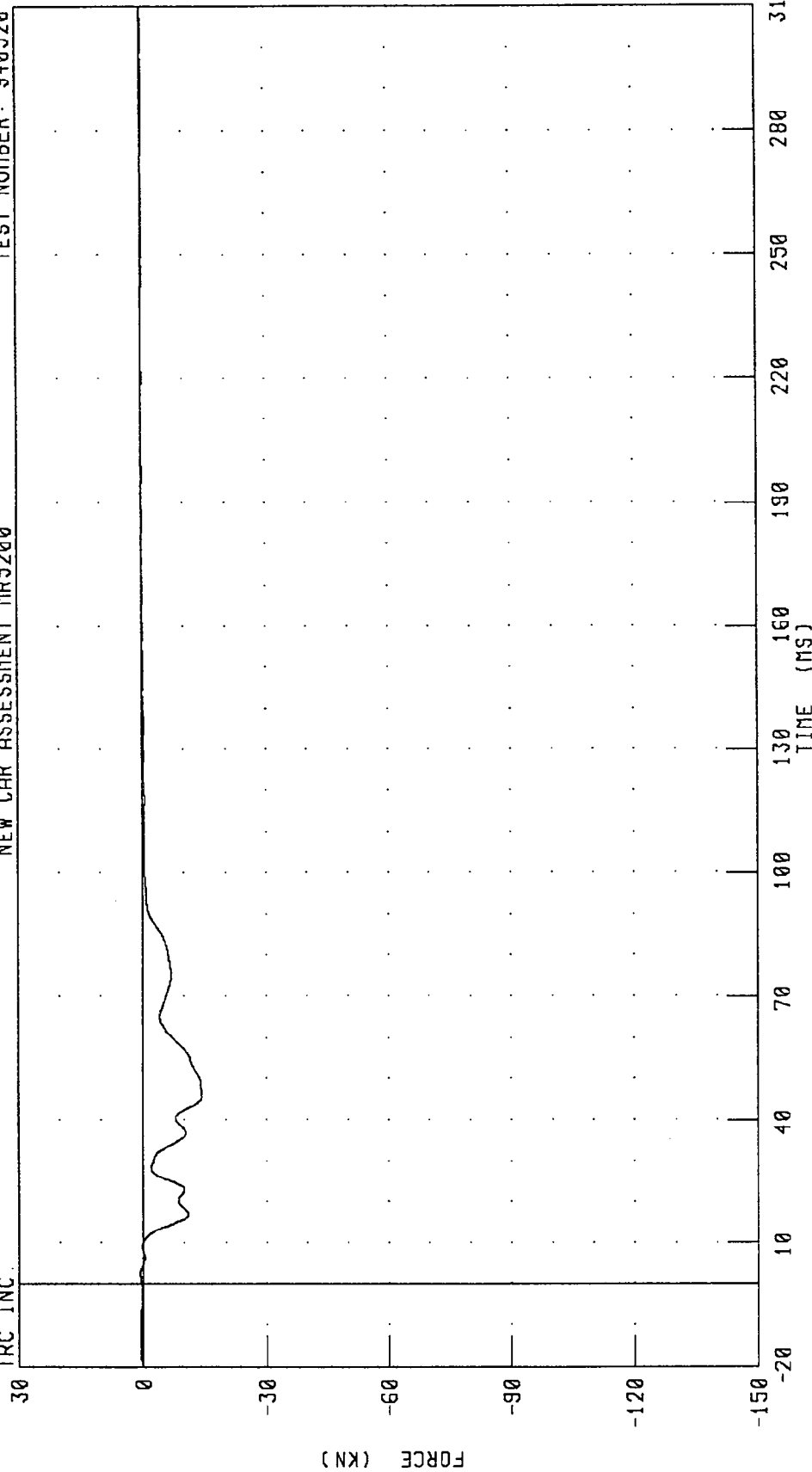
TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



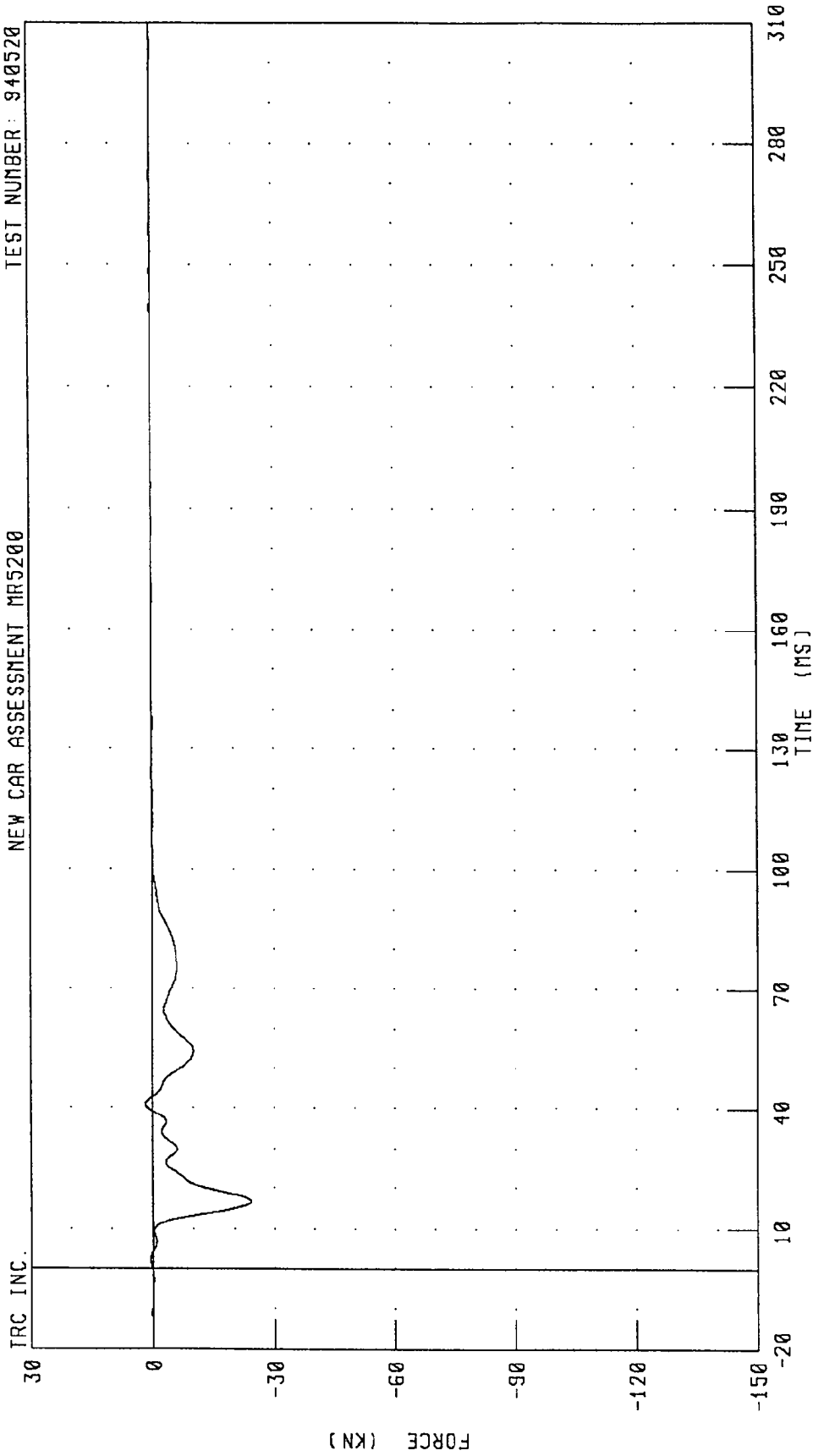
PEAK DATA: 0.66 KN @ 2.32 MS; -14.39 KN @ 46.08 MS

FILTER: CH. CLASS 60

CHANNEL: BA4F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A5 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



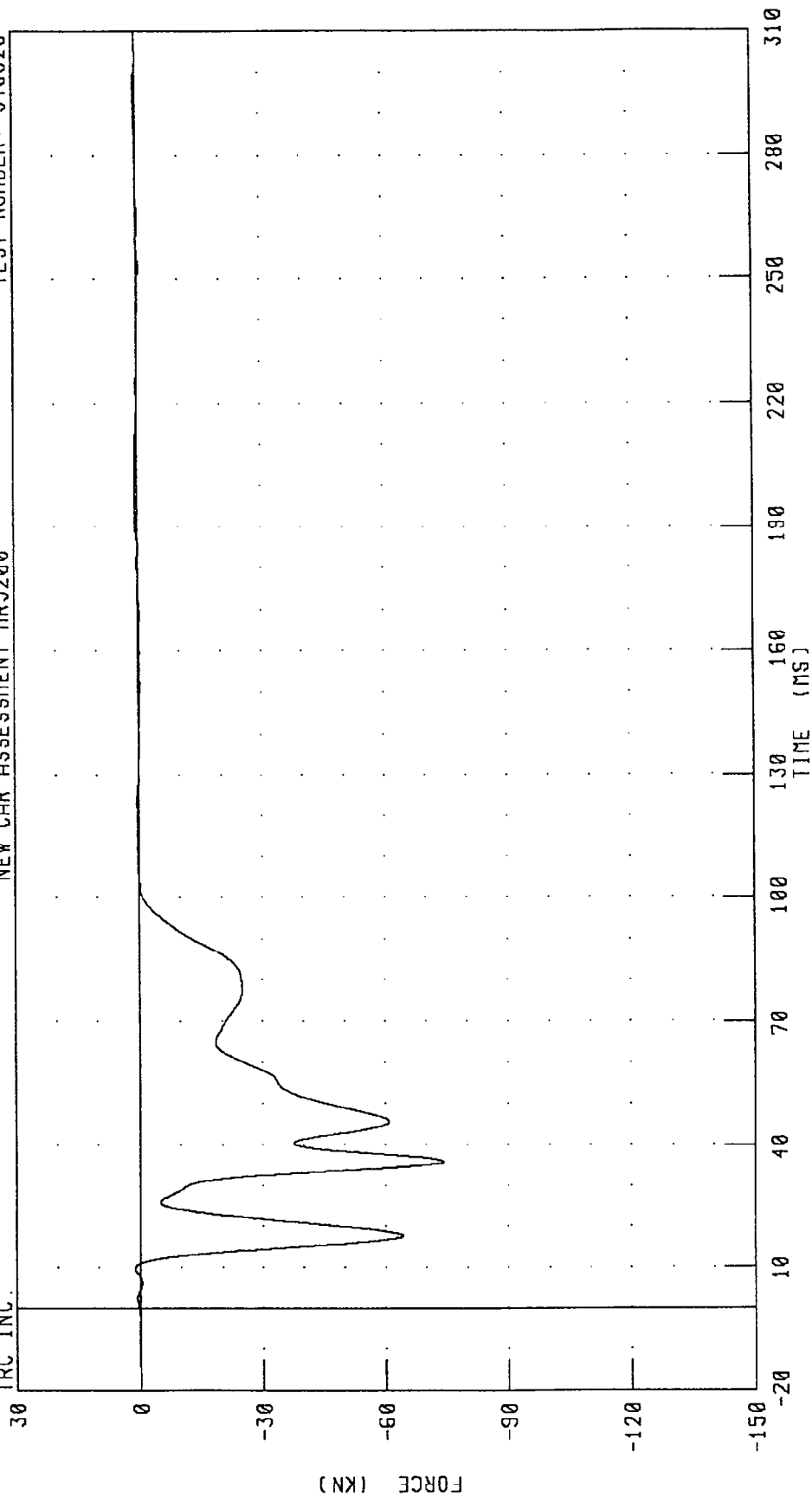
PEAK DATA: 1.83 KN @ 40.96 MS; -24.29 KN @ 16.72 MS

CHANNEL: BASF FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION AG FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



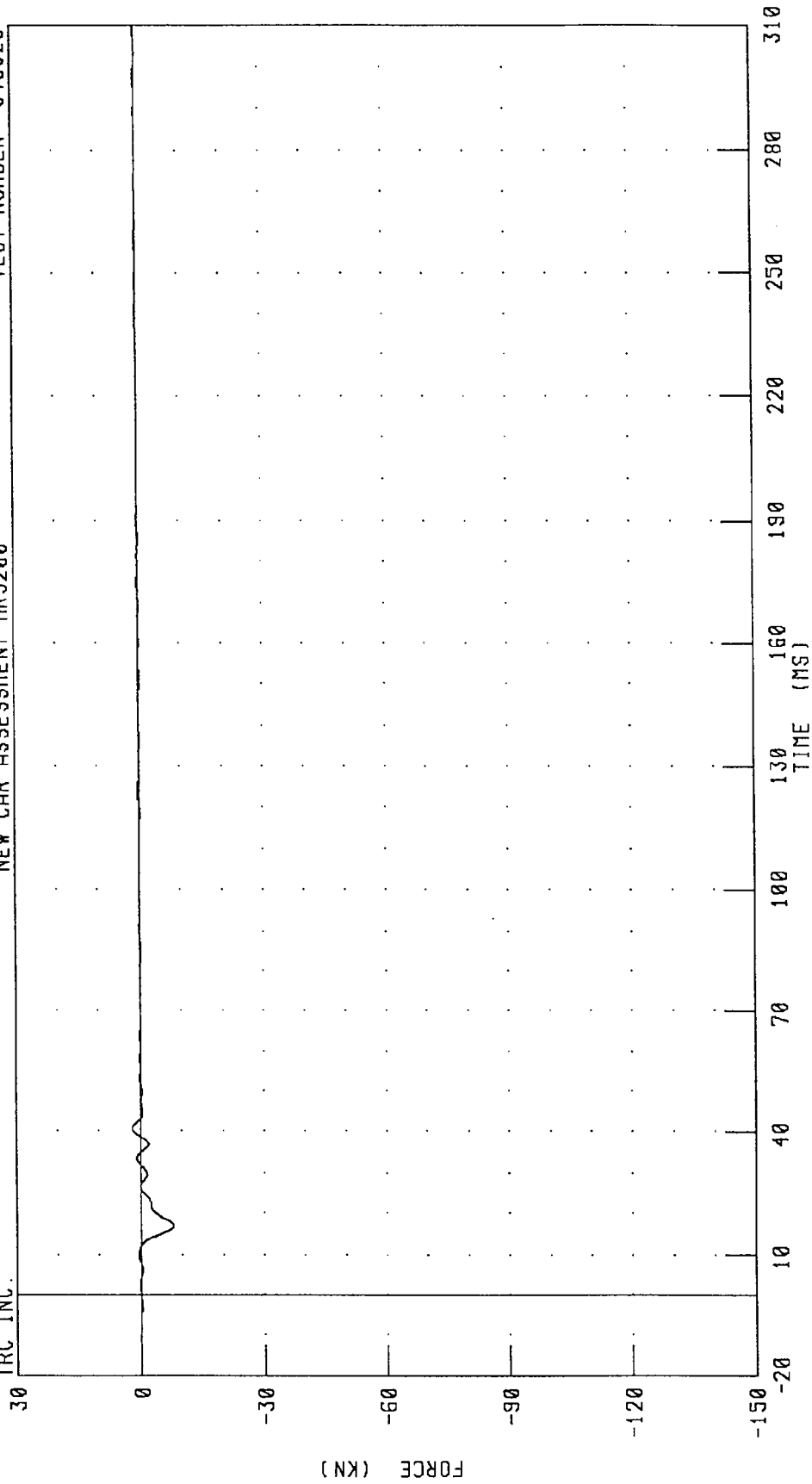
PEAK DATA: 1.21 KN @ 9.68 MS; -74.12 KN @ 36.00 MS

CHANNEL: BAGE FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A7 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 2.03 KN @ 40.72 MS; -7.87 KN @ 16.96 MS

CHANNEL: BA7F FILTER: CH. CLASS 60

FORCE (KN)

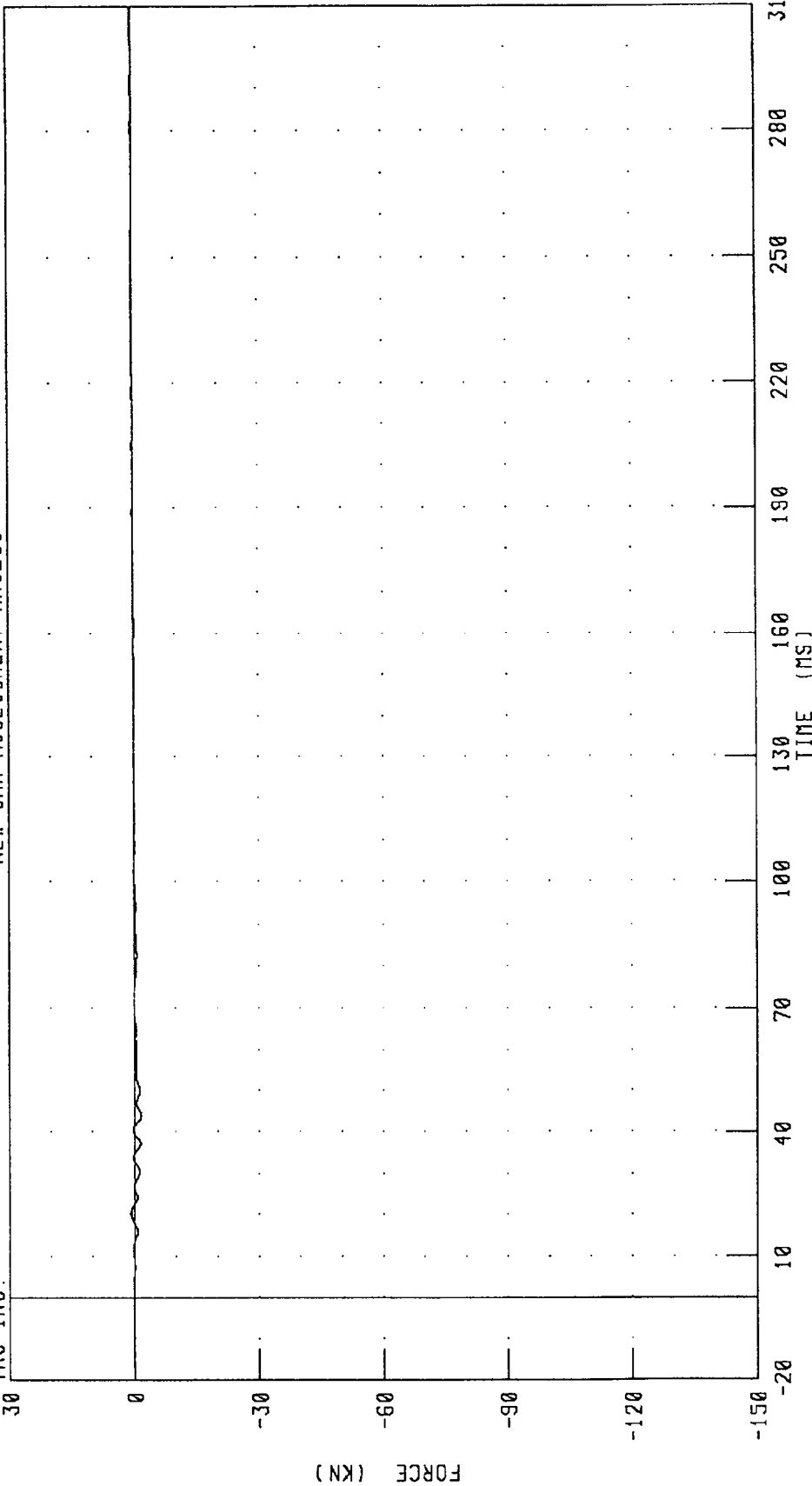
TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 48 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



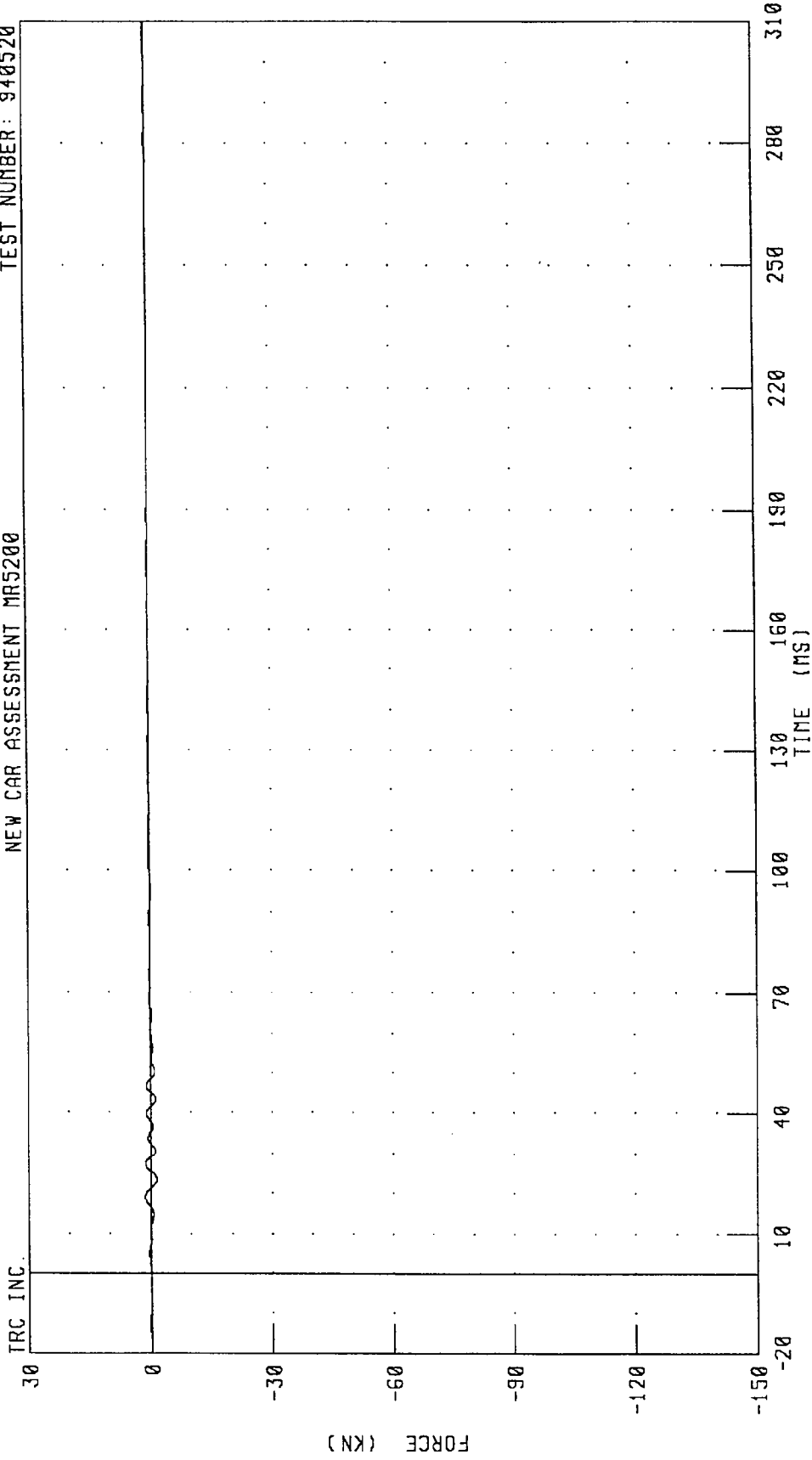
PEAK DATA: 0.85 KN @ 20.40 MS; -1.66 KN @ 43.92 MS

FILTER: CH. CLASS 60

CHANNEL: BA8F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A9 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 1.39 KN @ 19.04 MS; -1.61 KN @ 23.44 MS

CHANNEL: BASF FILTER: CH. CLASS 60

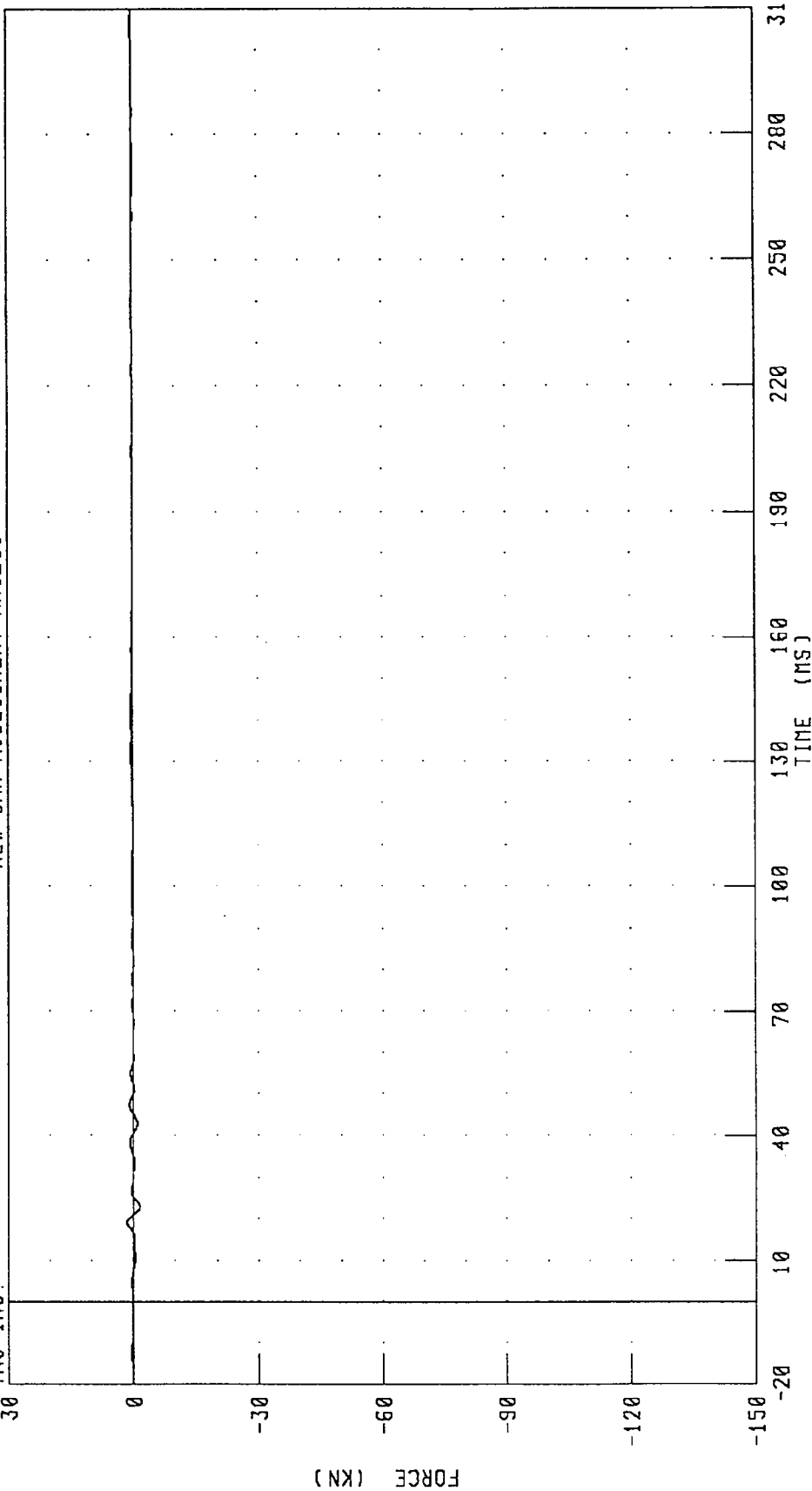
FORCE (KN)

TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B1 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 340520

TRC INC.



PEAK DATA: 1.44 KN @ 19.20 MS; -1.67 KN @ 22.88 MS

FILTER: CH. CLASS 60

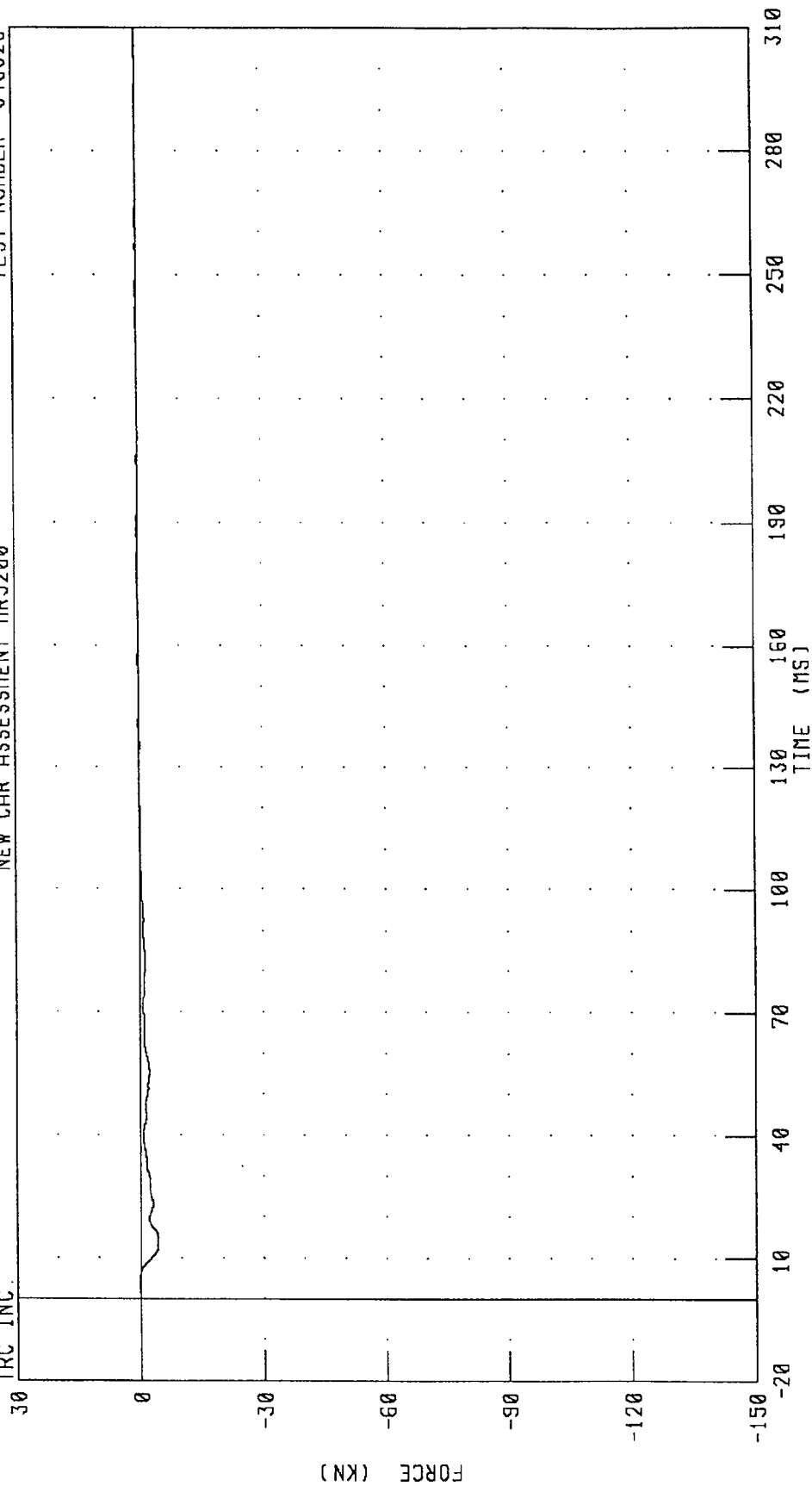
CHANNEL: BB1F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE

NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 0.32 KN @ 291.68 MS; -4.21 KN @ 14.72 MS

FILTER: CH. CLASS 60

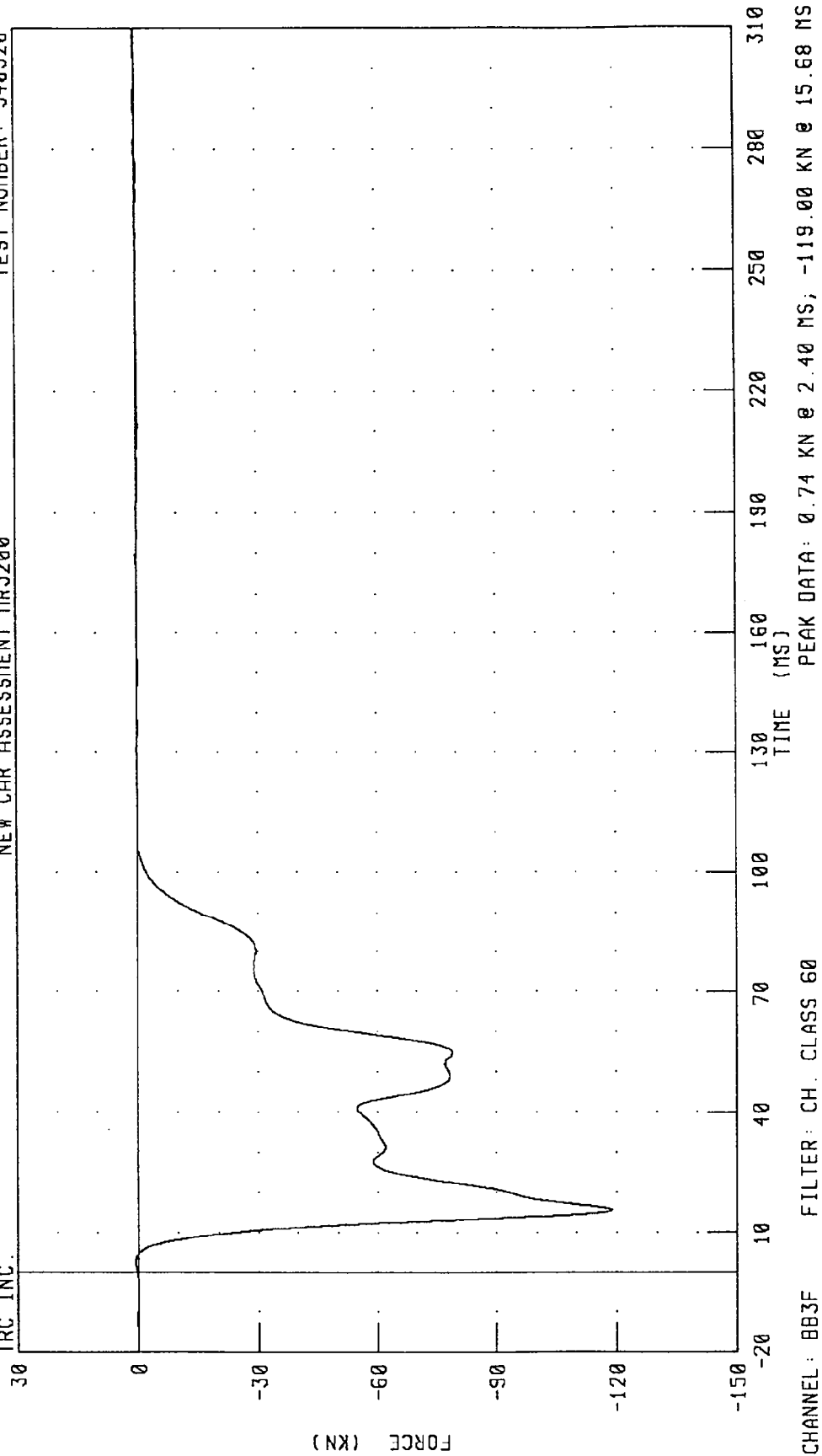
CHANNEL: BB2F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



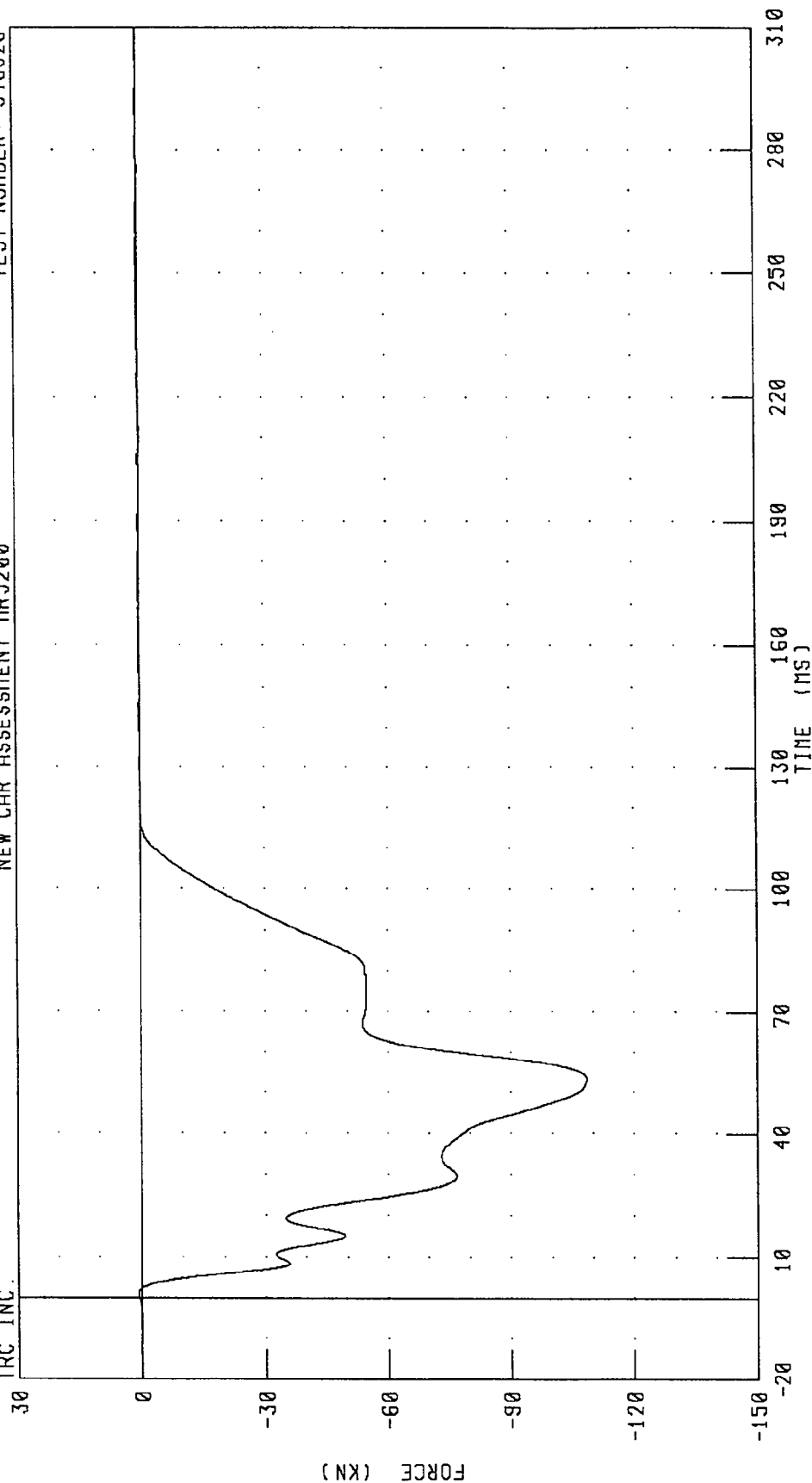
CHANNEL: BB3F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



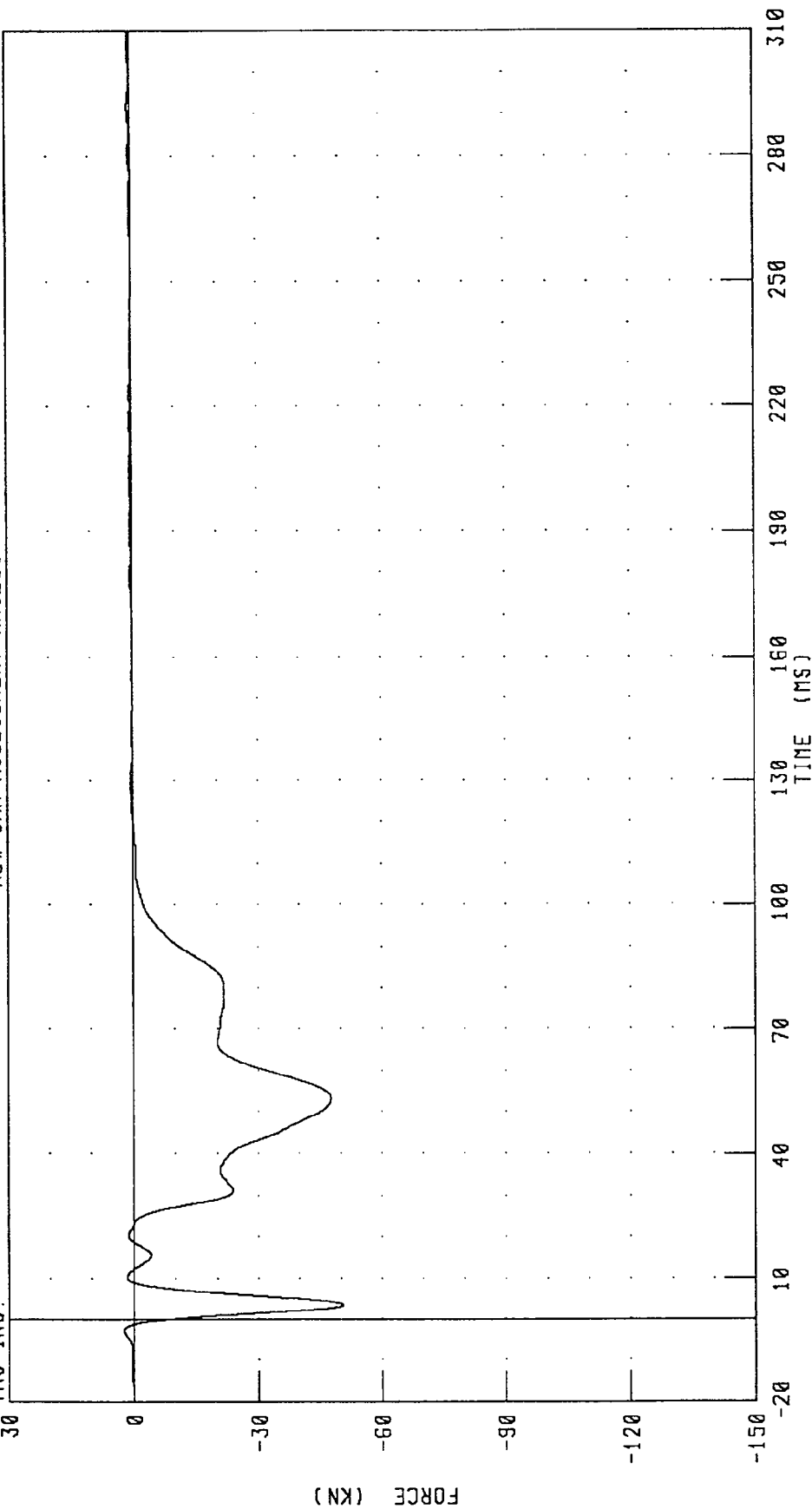
PEAK DATA: 0.84 KN @ 0.80 MS; -108.43 KN @ 53.28 MS

CHANNEL: BB4F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B5 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



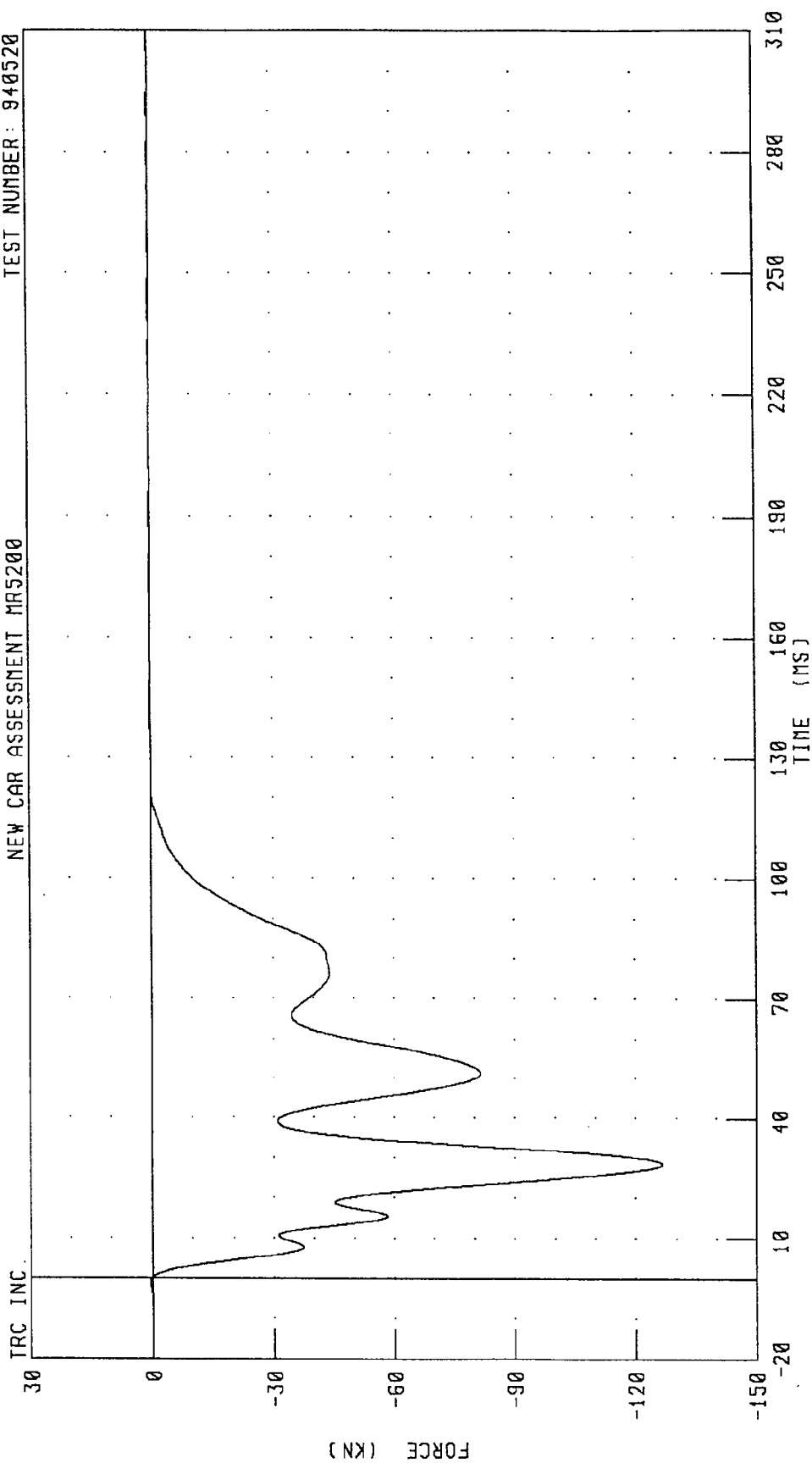
PEAK DATA: 2.31 KN @ -2.88 MS; -50.70 KN @ 3.44 MS

FILTER: CH. CLASS 60

CHANNEL: BB5F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B6 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 0.51 KN @ -1.28 MS; -126.62 KN @ 28.48 MS

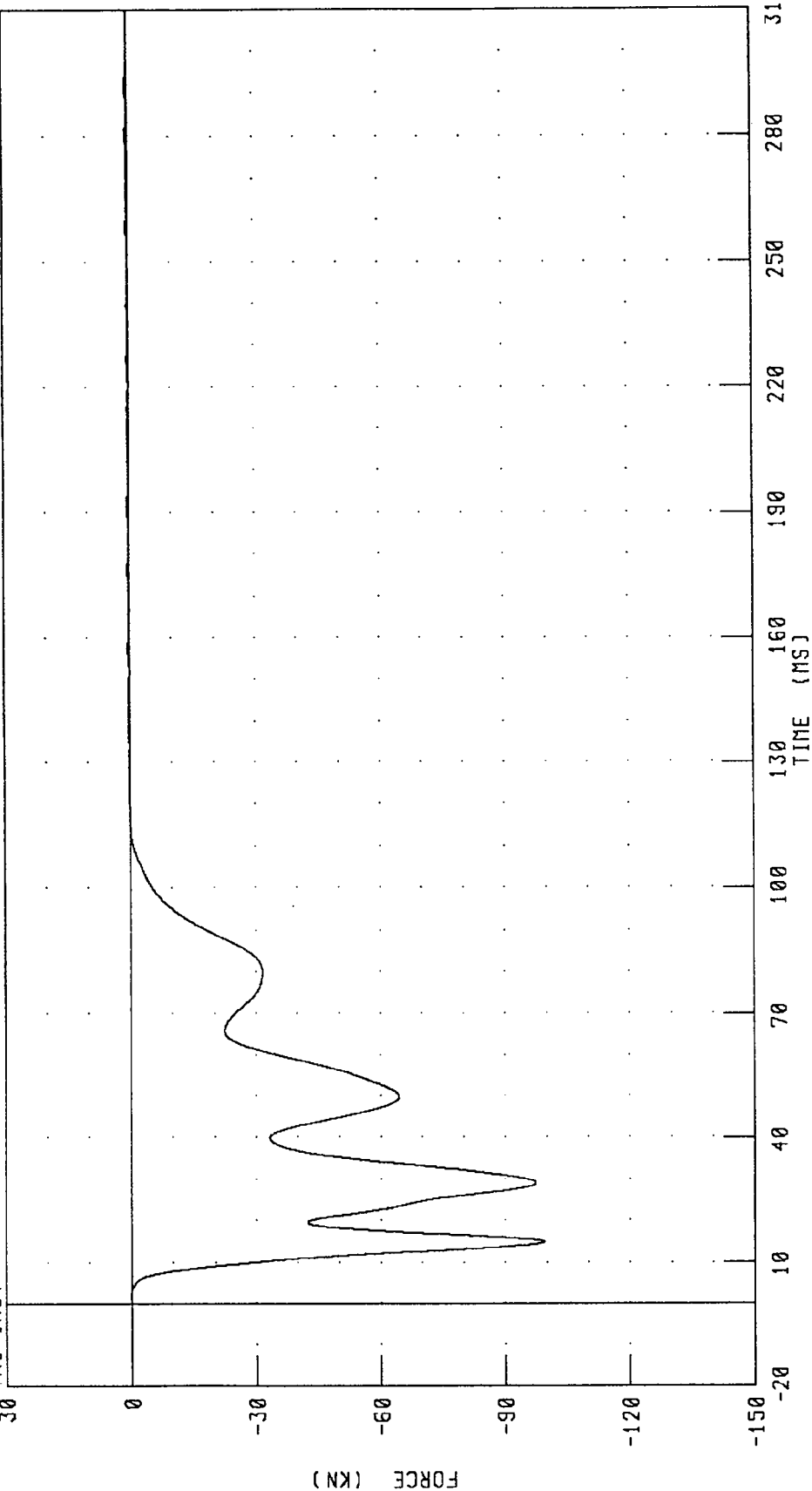
CHANNEL: BB6F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



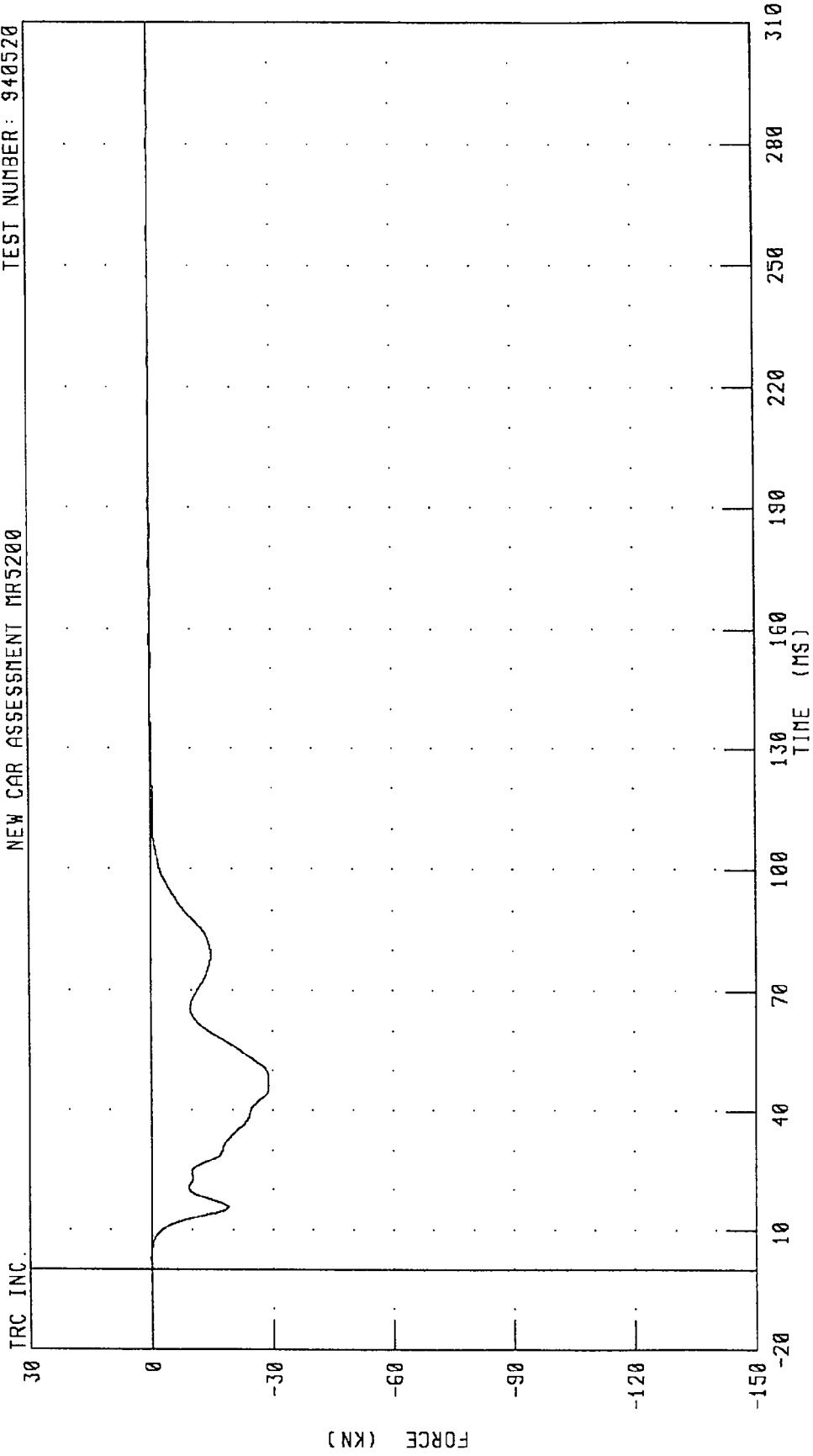
PEAK DATA: 0.46 KN @ 291.28 MS; -99.33 KN @ 14.88 MS

FILTER: CH. CLASS 60

CHANNEL: BB7F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



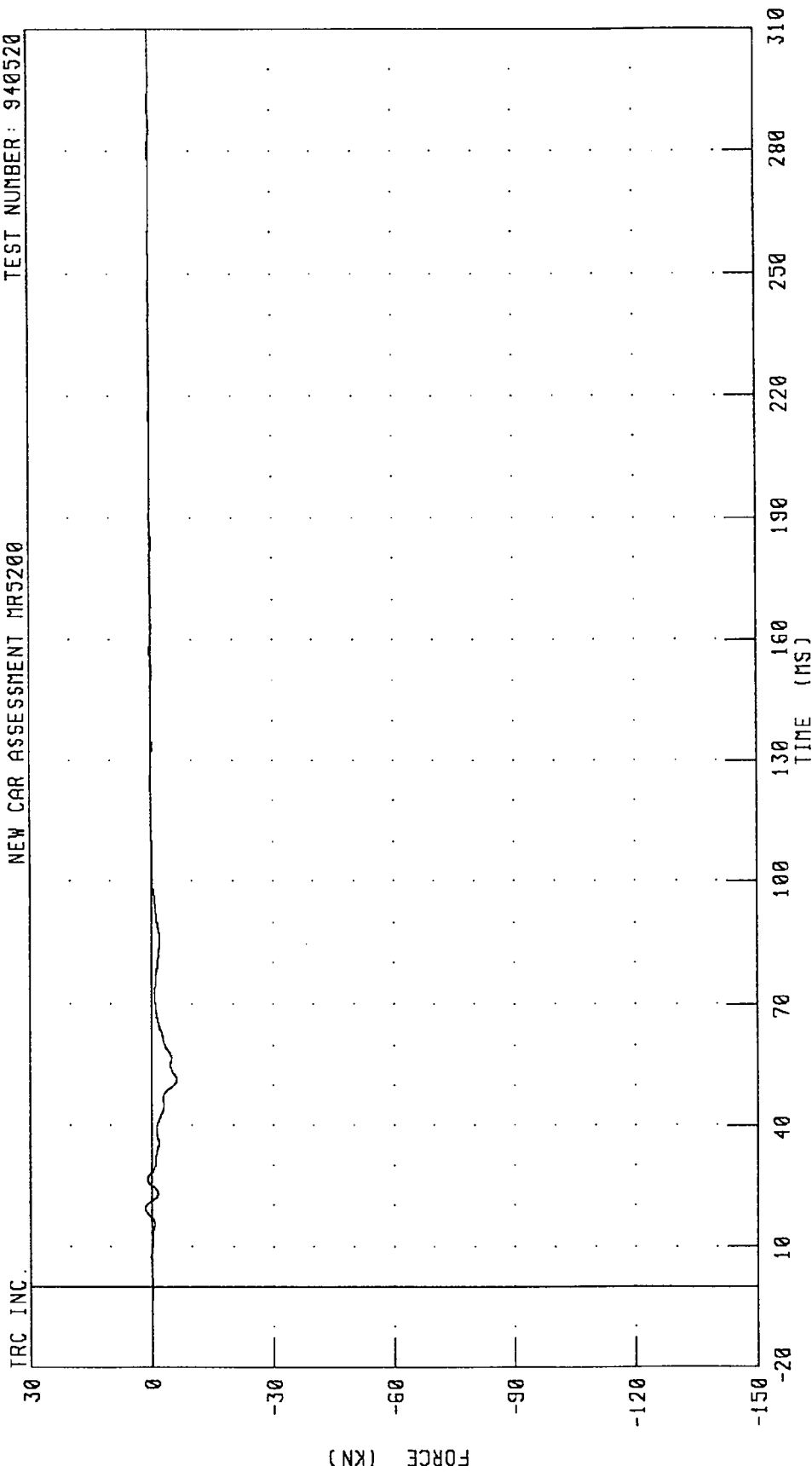
PEAK DATA: 0.18 KN @ 291.20 MS; -29.11 KN @ 45.84 MS

CHANNEL: BB8F FILTER: CH. CLASS 60

940520

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

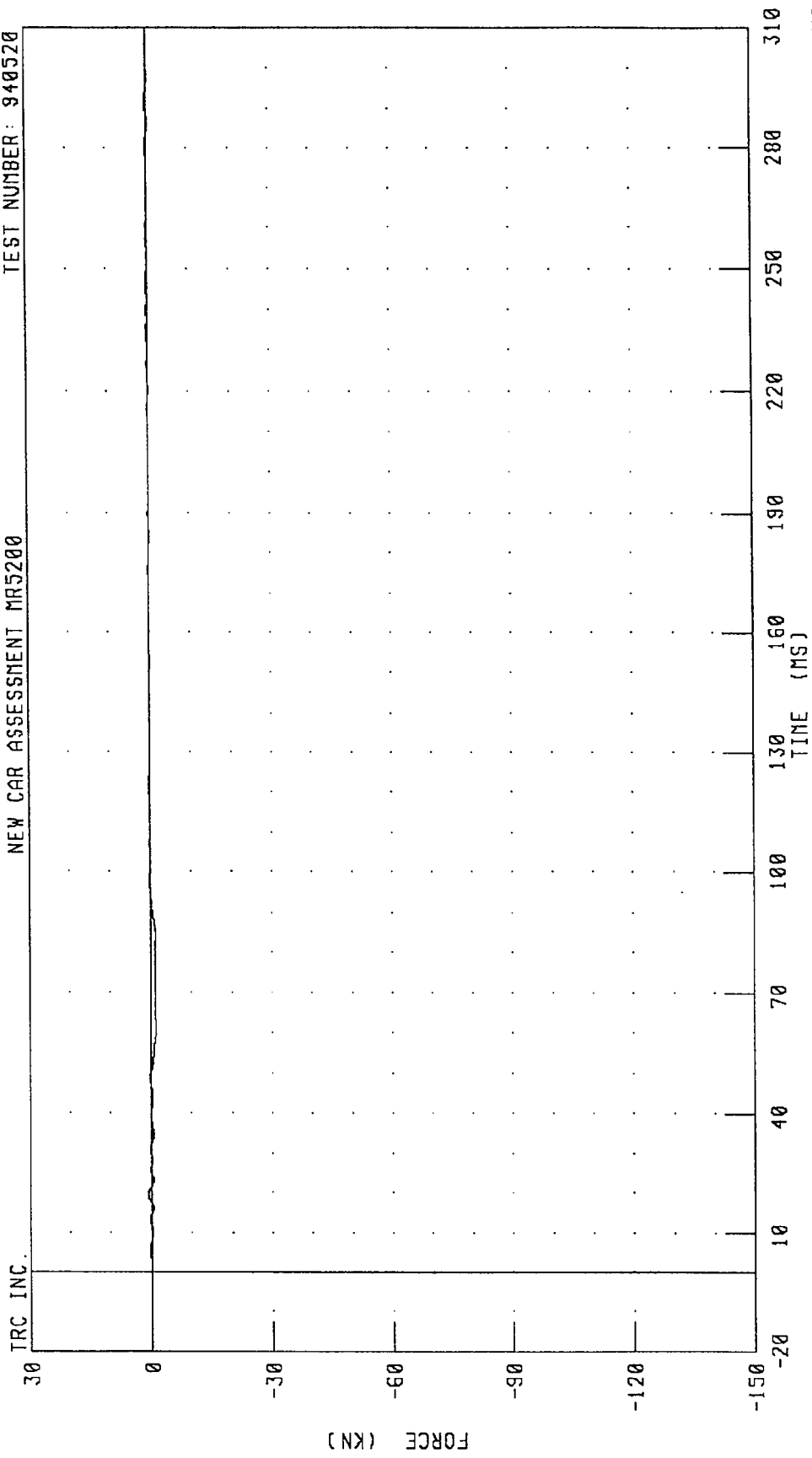


PEAK DATA: 1.52 KN @ 19.28 MS; -6.25 KN @ 51.44 MS

CHANNEL: BB9F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C1 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 0.85 KN @ 19.52 MS; -1.39 KN @ 61.04 MS

CHANNEL: BC1F FILTER: CH. CLASS 60

FORCE (KN)

TIME (MS)

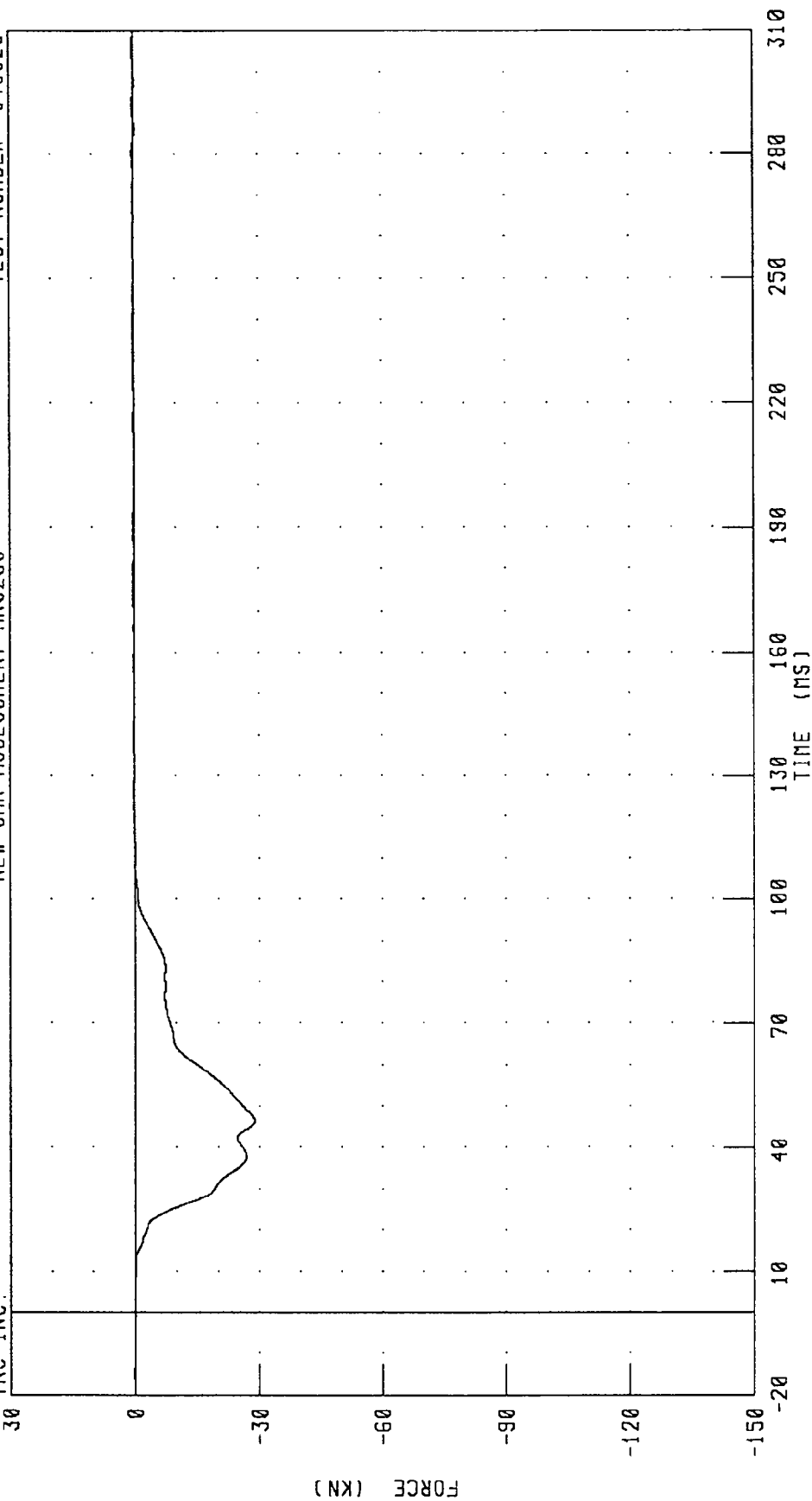
TRC INC.

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



PEAK DATA: 0.35 KN @ 280.16 MS; -29.06 KN @ 46.56 MS

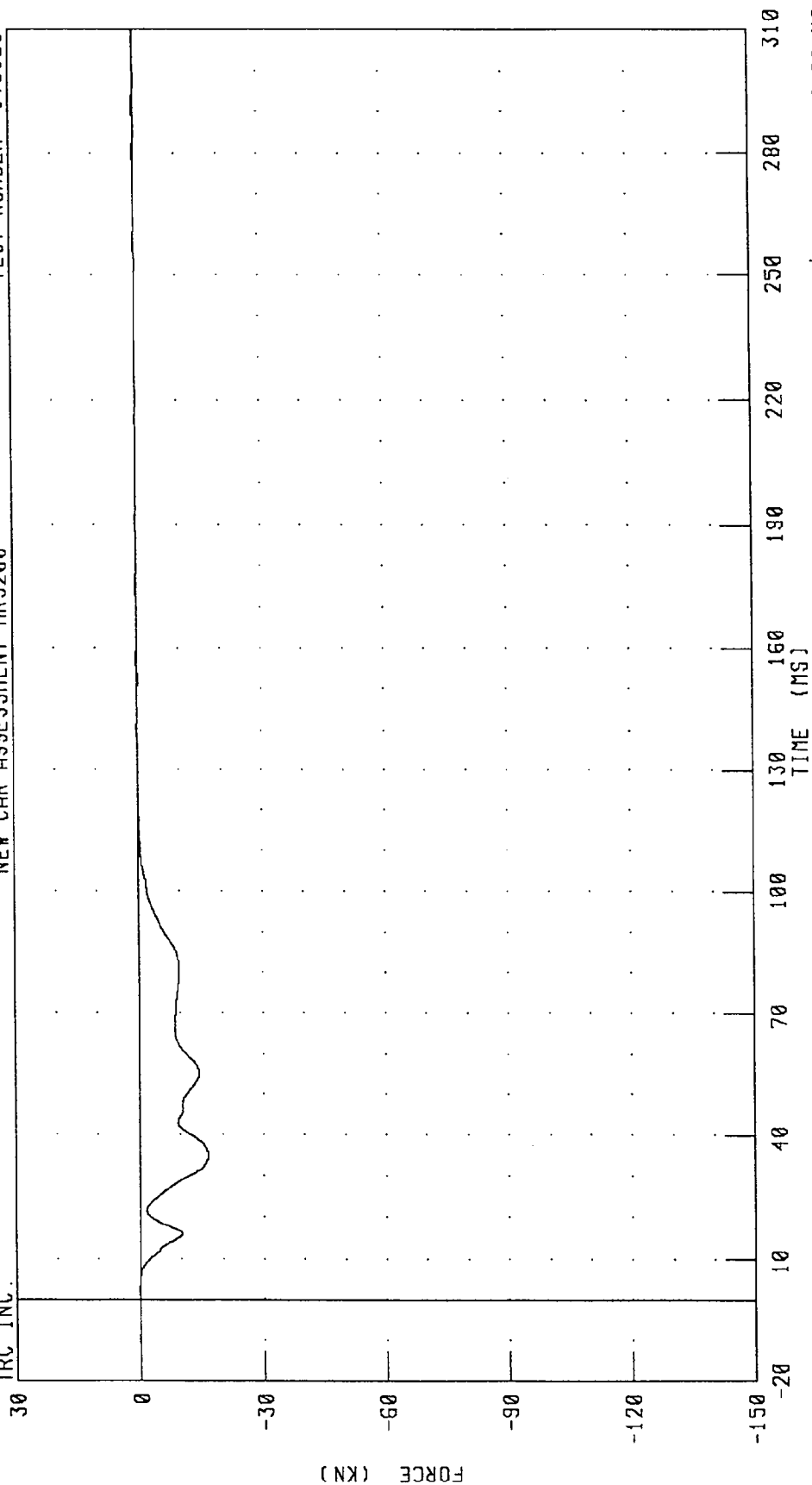
FILTER: CH. CLASS 60

CHANNEL: BC2F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C3 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



CHANNEL: BC3F

FILTER: CH. CLASS 60

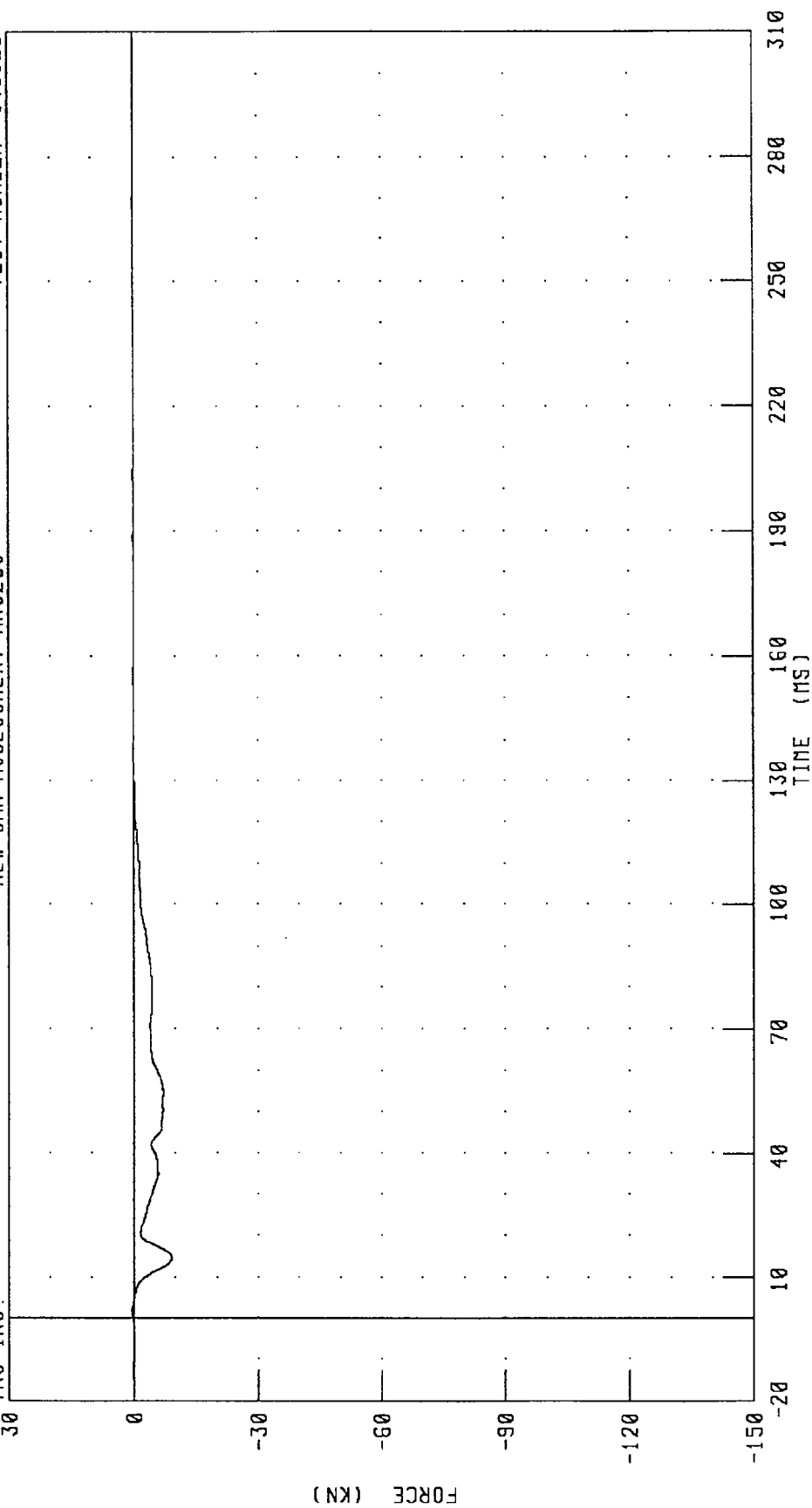
PEAK DATA: 0.29 KN @ 291.36 MS; -16.57 KN @ 35.28 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



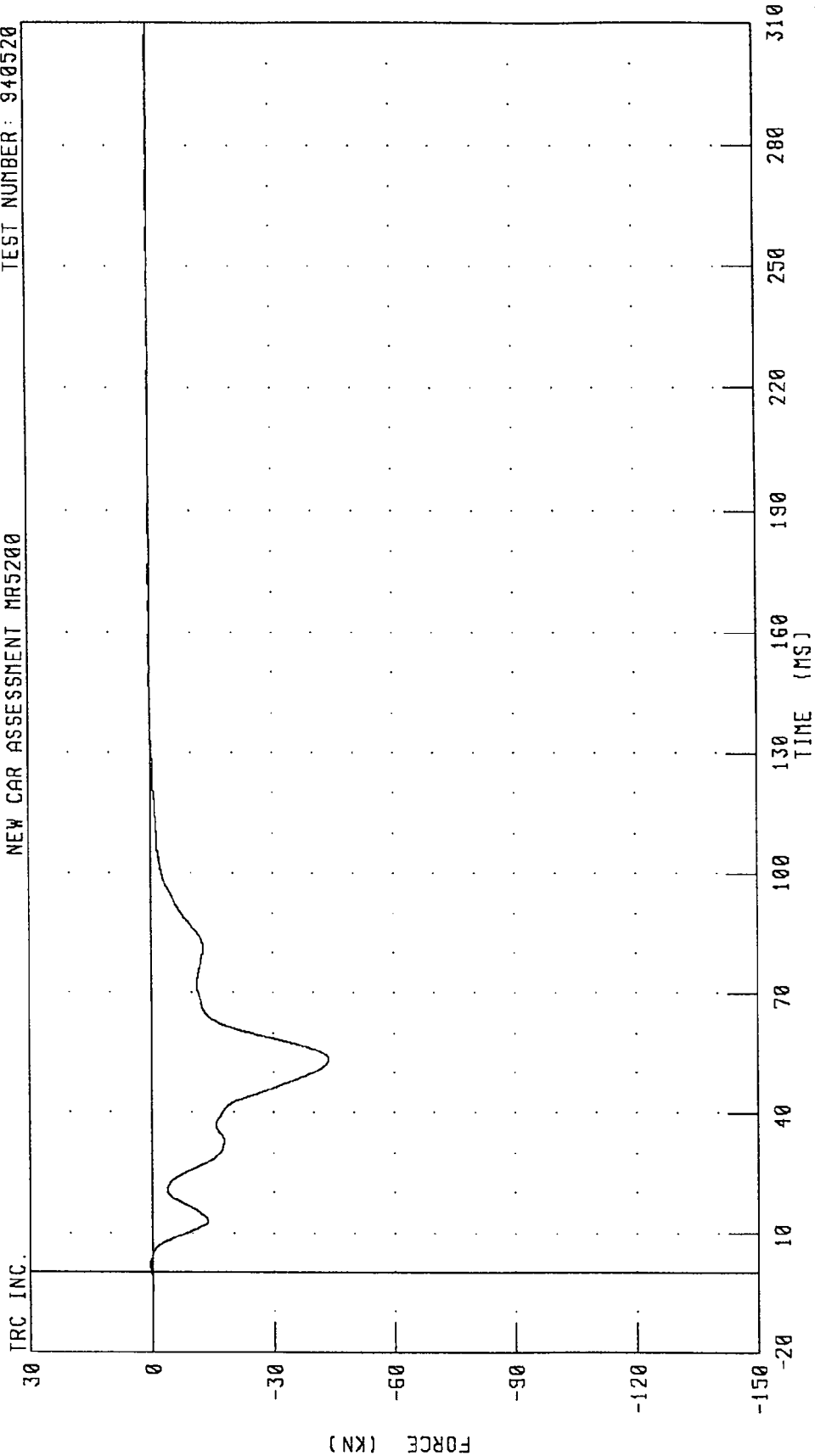
PEAK DATA: 0.48 KN @ 1.84 MS; -9.20 KN @ 14.56 MS

FILTER: CH. CLASS 60

CHANNEL: BC4F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



CHANNEL: BC5F FILTER: CH. CLASS 60

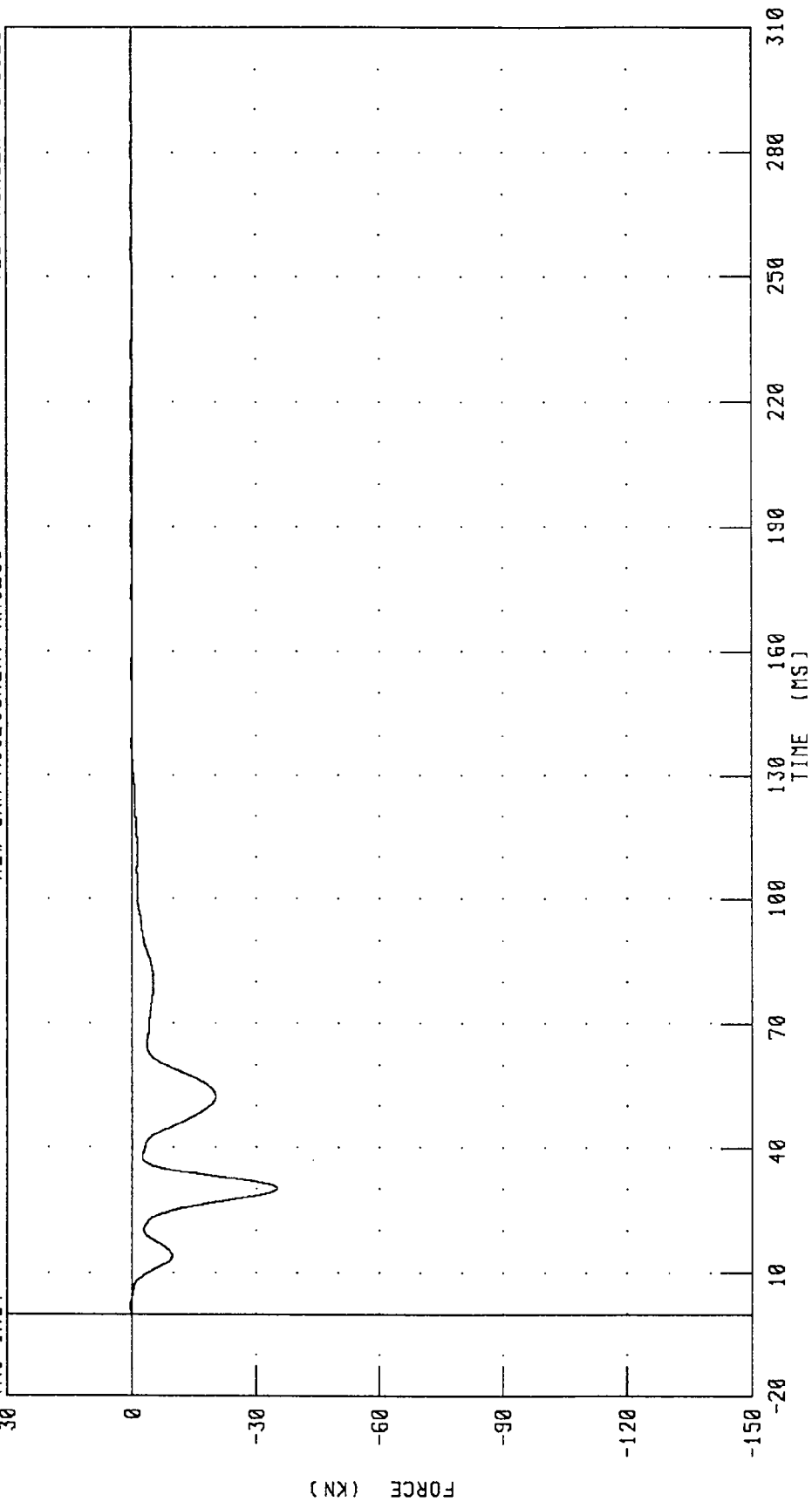
FORCE (KN)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



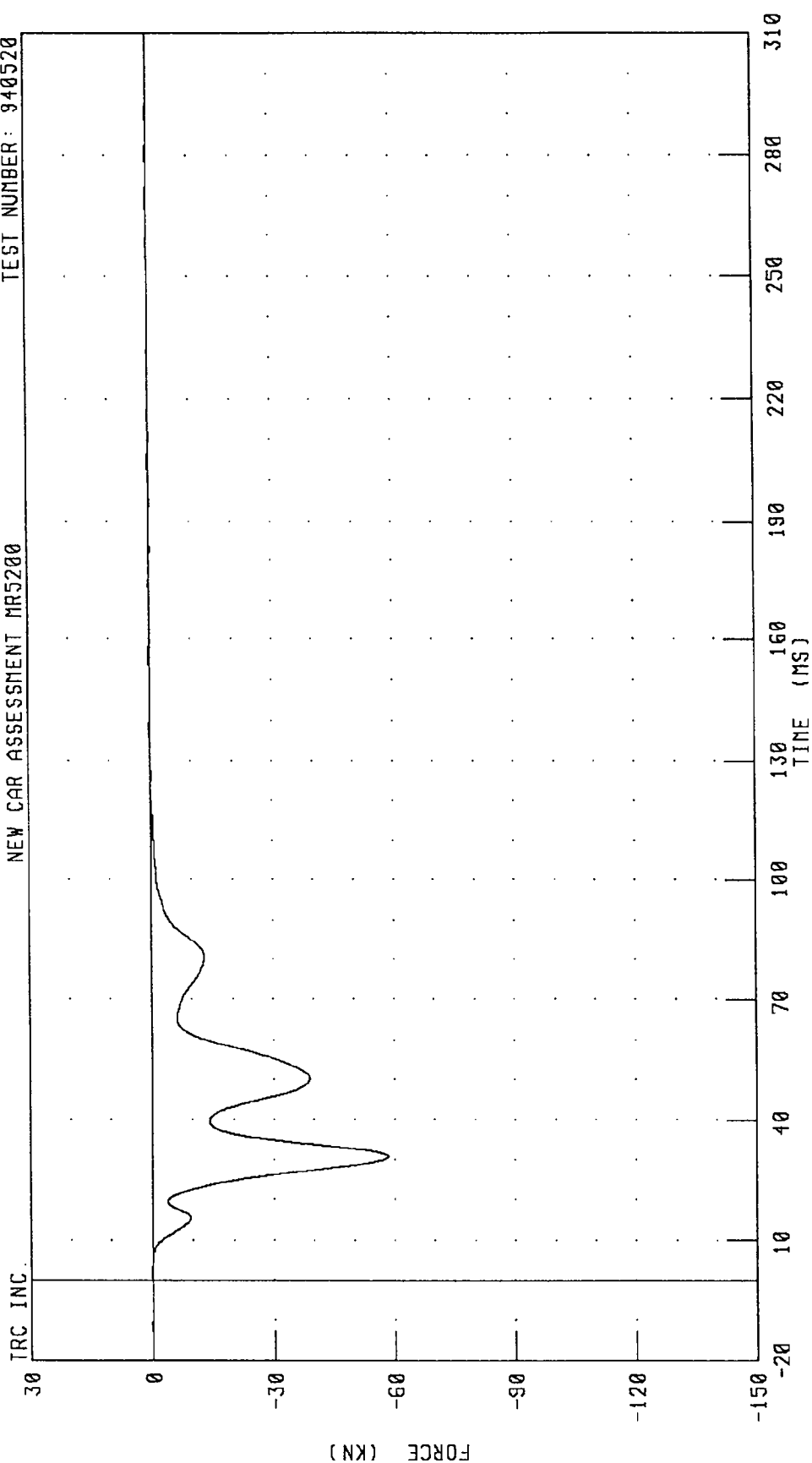
PEAK DATA: 0.46 KN @ 1.84 MS; -35.18 KN @ 30.24 MS

FILTER: CH. CLASS 60

CHANNEL: BC6F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



CHANNEL: BC7F FILTER: CH. CLASS 60

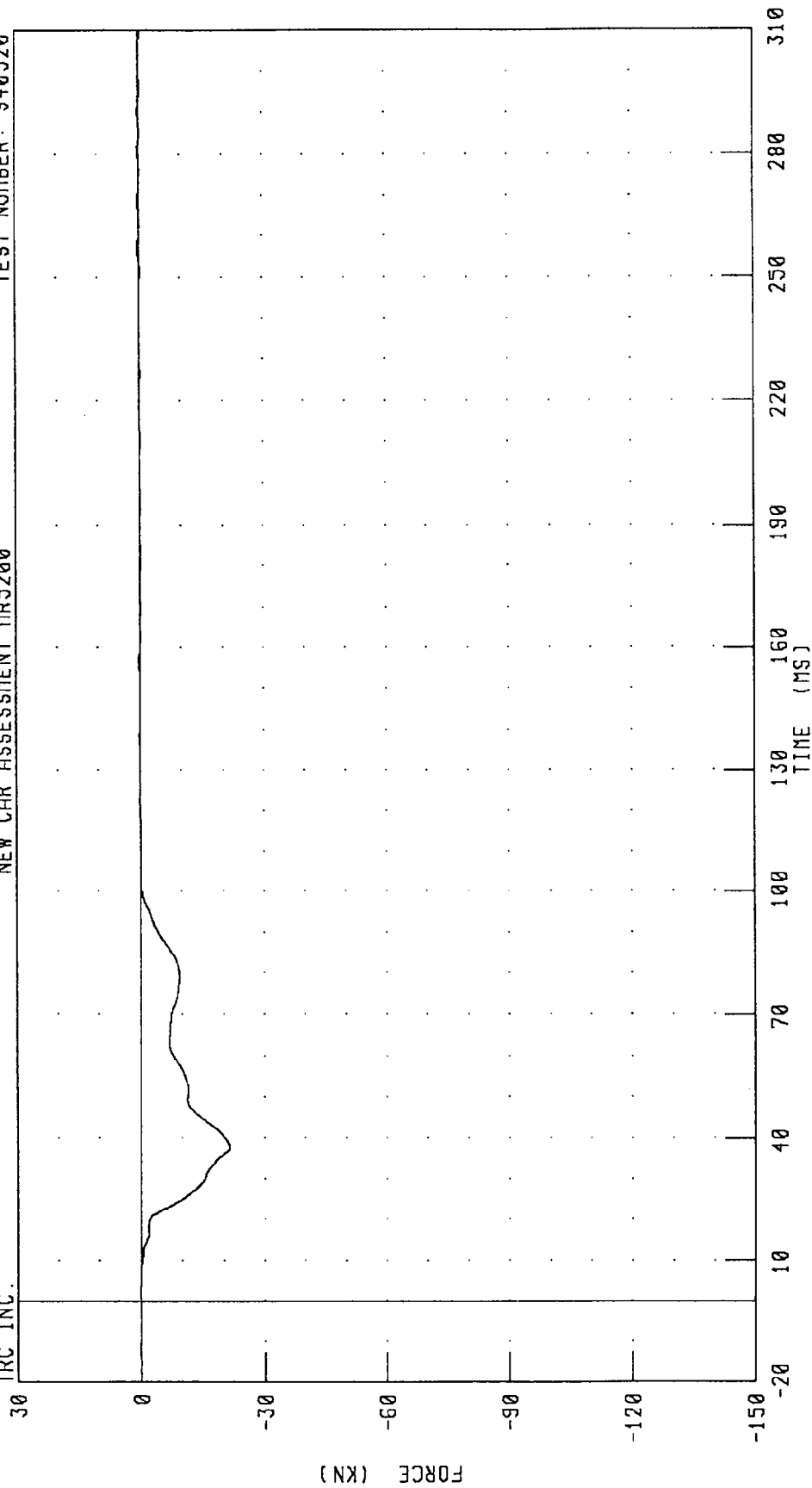
PEAK DATA: 0.26 KN @ 2.08 MS; -58.44 KN @ 30.88 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 0.21 KN @ 2.40 MS; -21.47 KN @ 38.00 MS

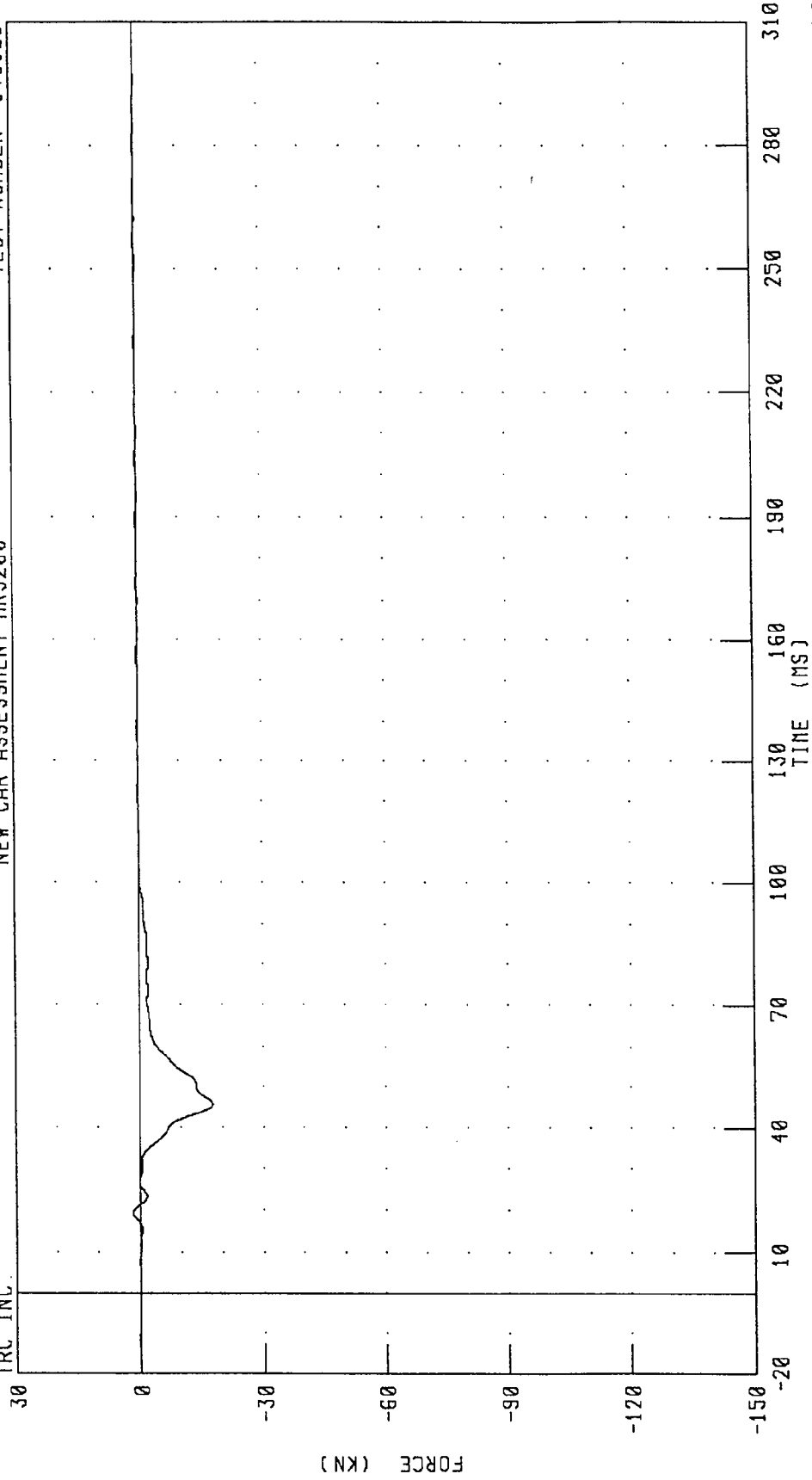
FILTER: CH. CLASS 60

CHANNEL: BC8F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 1.74 KN @ 19.28 MS; -17.73 KN @ 45.76 MS

FILTER: CH. CLASS 60

CHANNEL: BC9F

FORCE (KN)

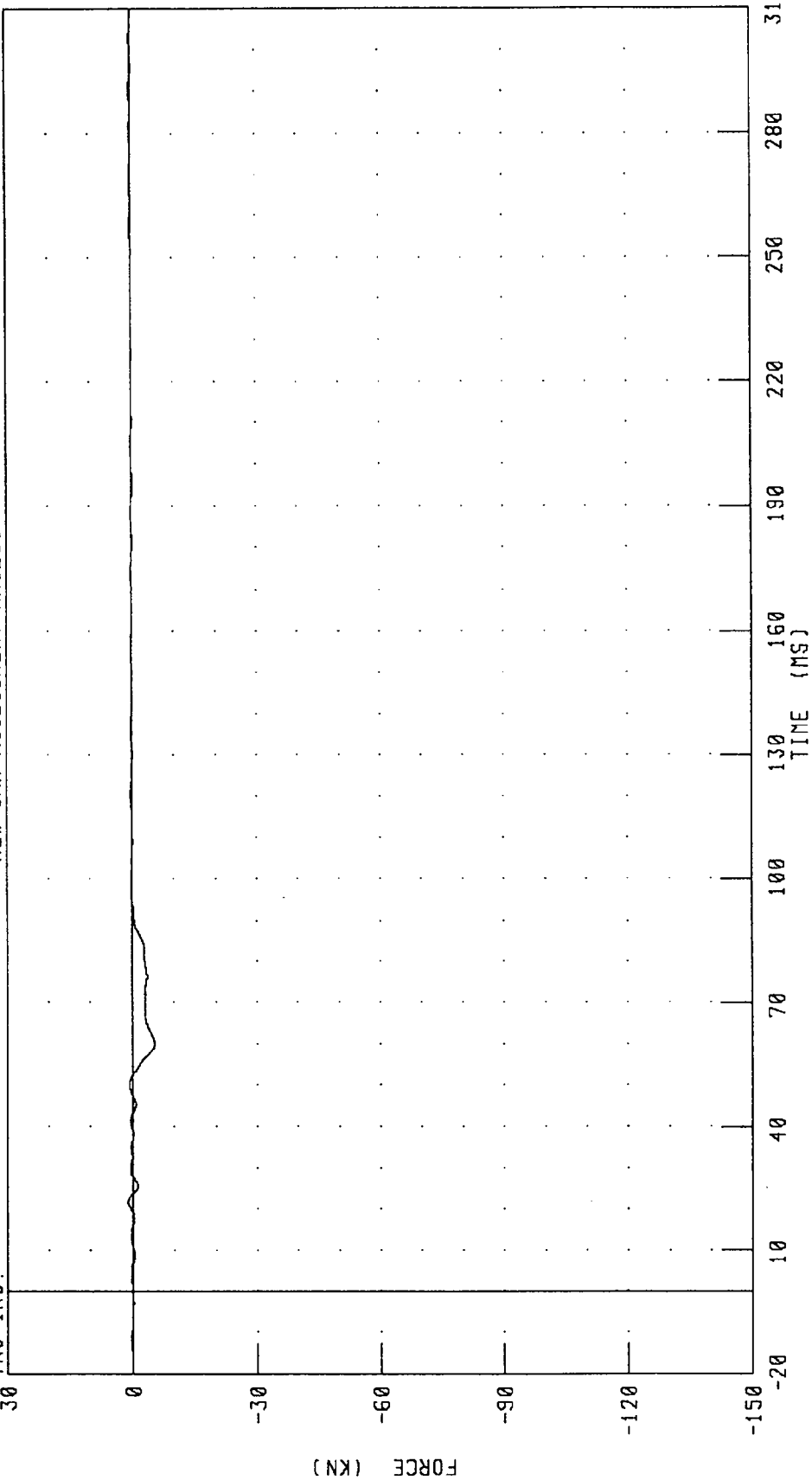
TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT NR5200

TRC INC.



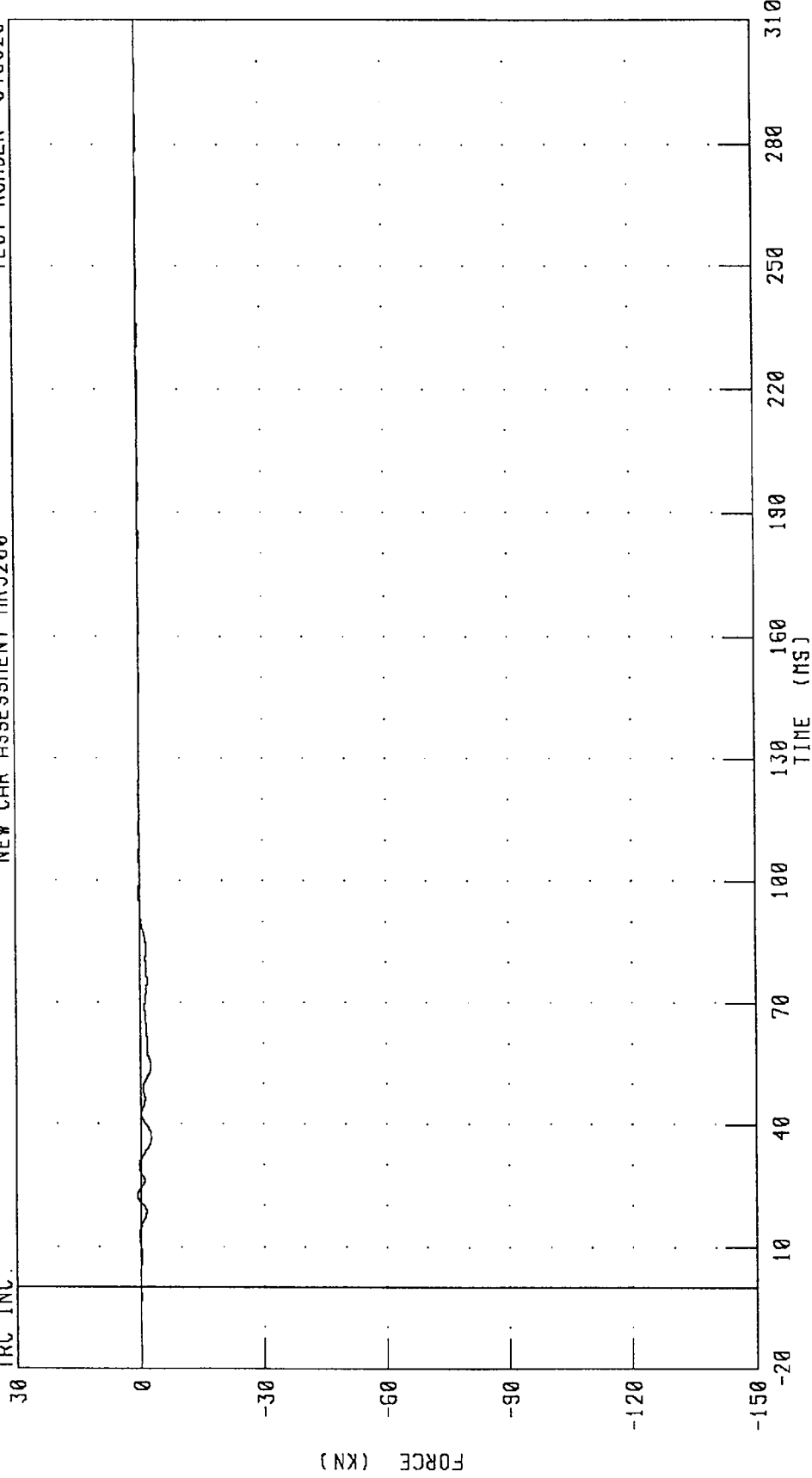
PEAK DATA: 1.15 KN @ 21.84 MS; -5.37 KN @ 60.08 MS

CHANNEL: 801F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D2 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



PEAK DATA: 0.77 KN @ 22.40 MS; -2.71 KN @ 36.80 MS

FILTER: CH. CLASS 60

CHANNEL: BD2F

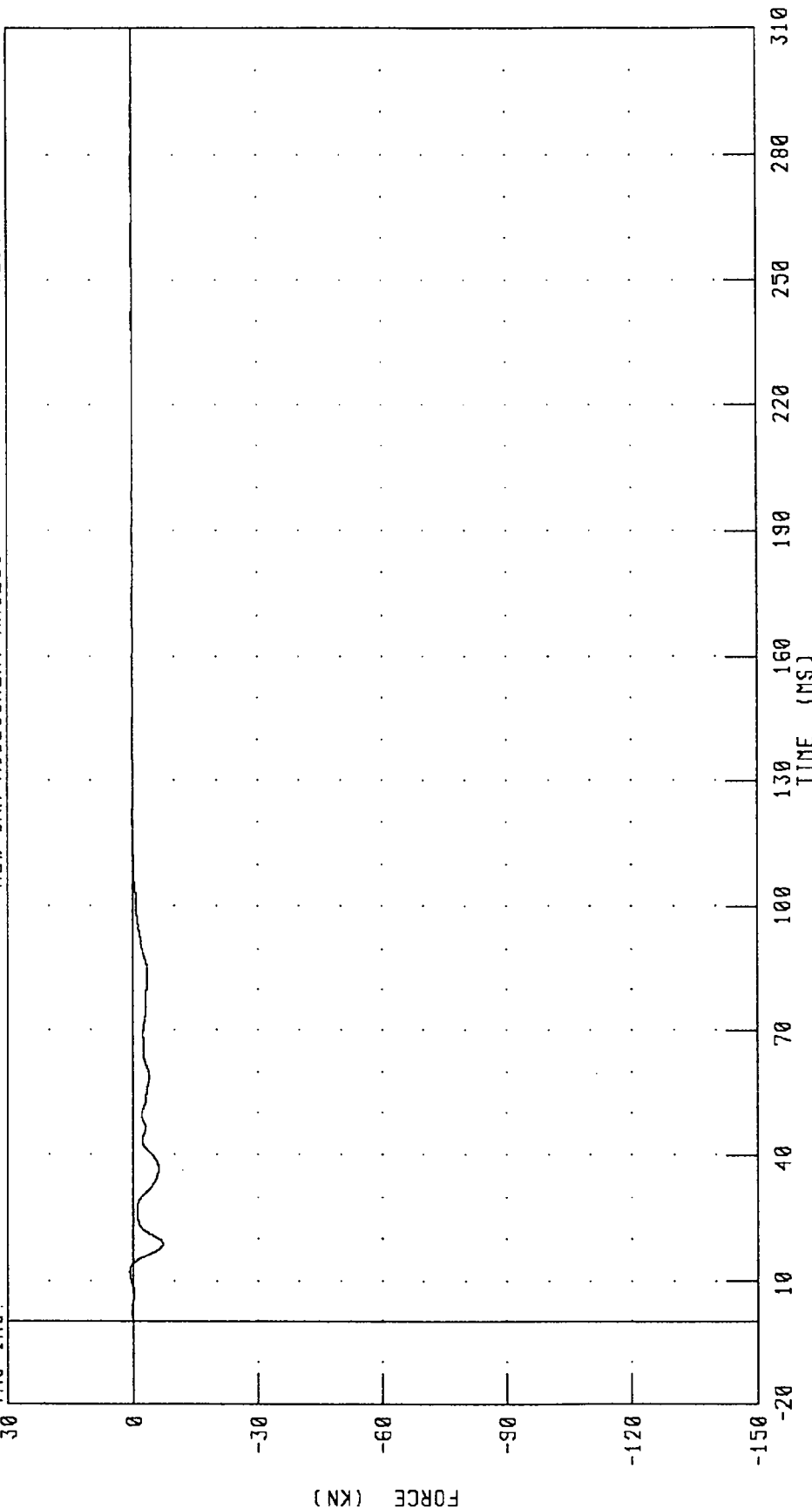
FORCE (KN)

TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

IRC INC.



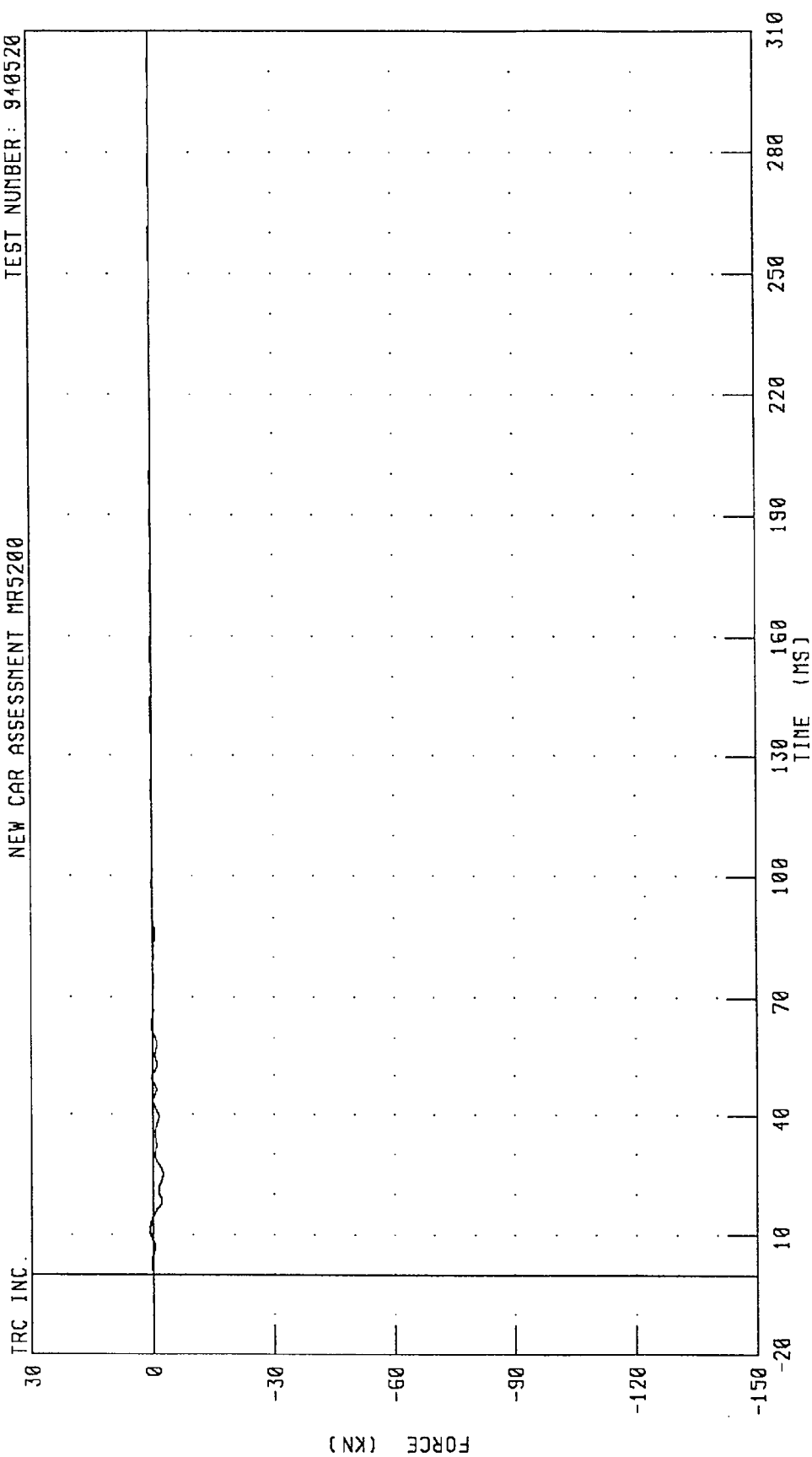
PEAK DATA: 0.85 KN @ 12.08 MS; -7.19 KN @ 18.80 MS

FILTER: CH. CLASS 60

CHANNEL: BD3F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D4 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 0.65 KN @ 11.12 MS; -2.50 KN @ 24.96 MS

CHANNEL: BD4F FILTER: CH. CLASS 60

FORCE (KN)

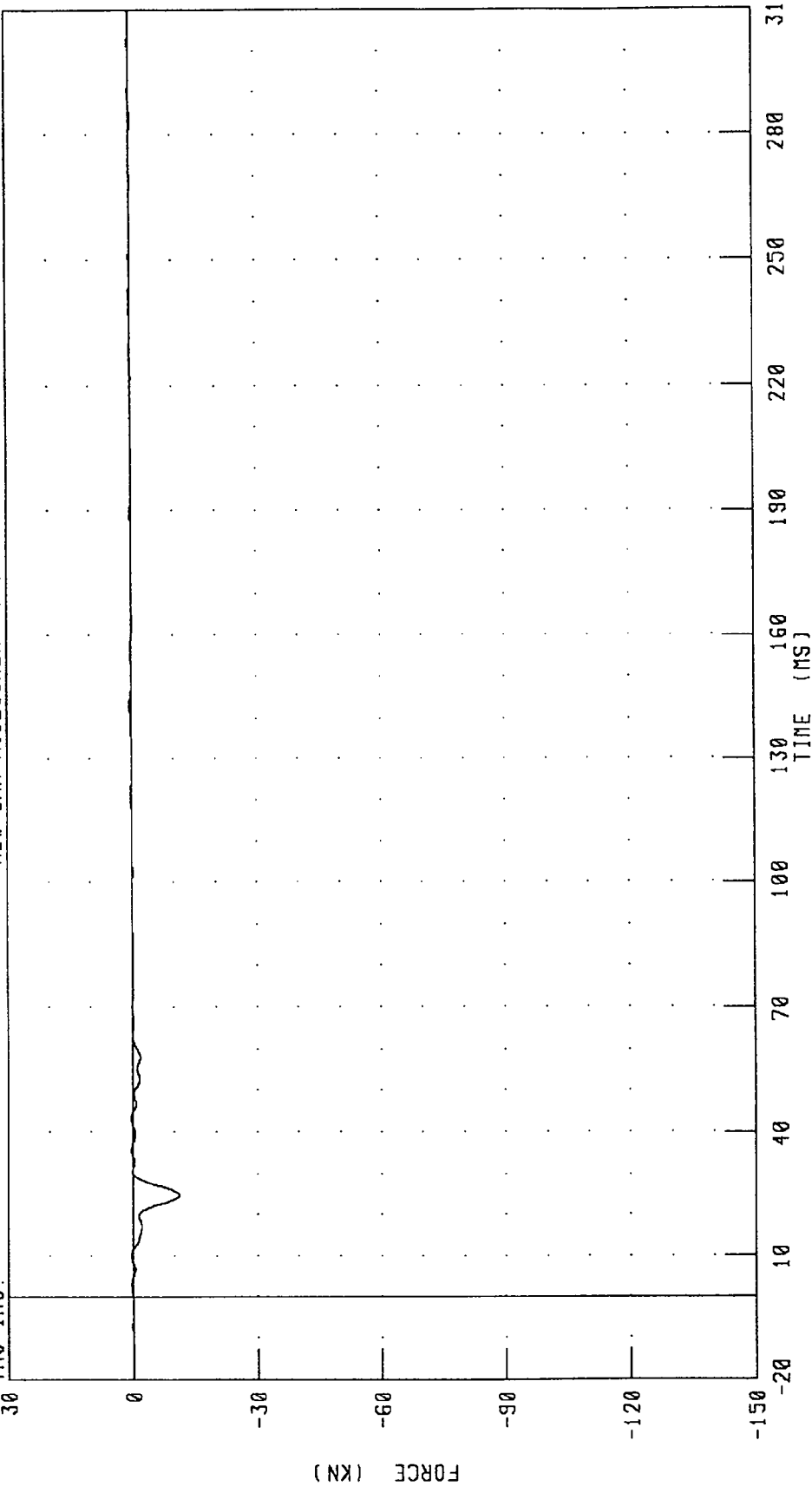
TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT NR5200

TRC INC.



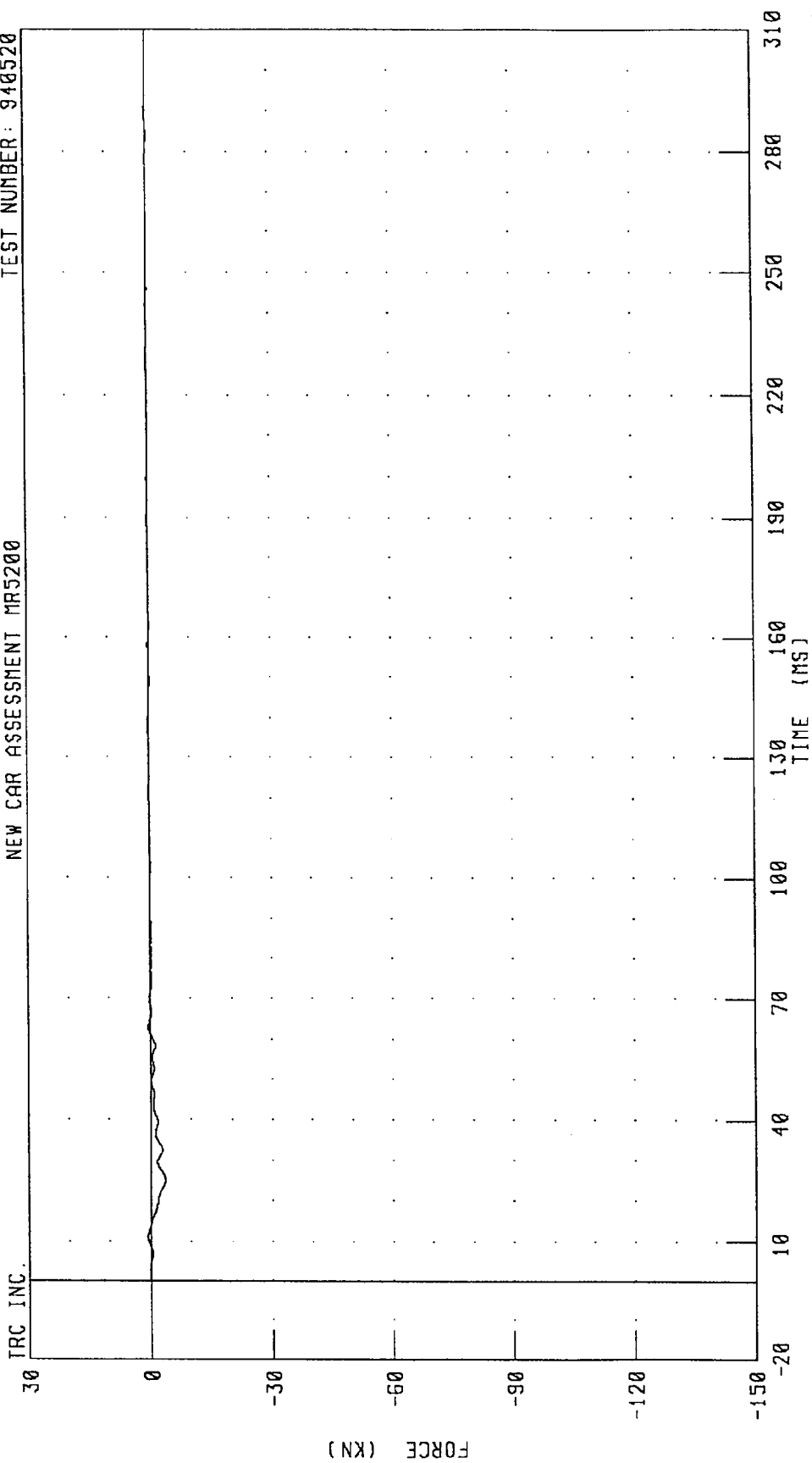
PEAK DATA: 0.49 KN @ 43.28 MS; -11.16 KN @ 24.80 MS

FILTER: CH. CLASS 60

CHANNEL: BD5F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D6 FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 0.68 KN @ 10.96 MS; -3.70 KN @ 25.20 MS

CHANNEL: BD6F FILTER: CH. CLASS 60

FORCE (KN)

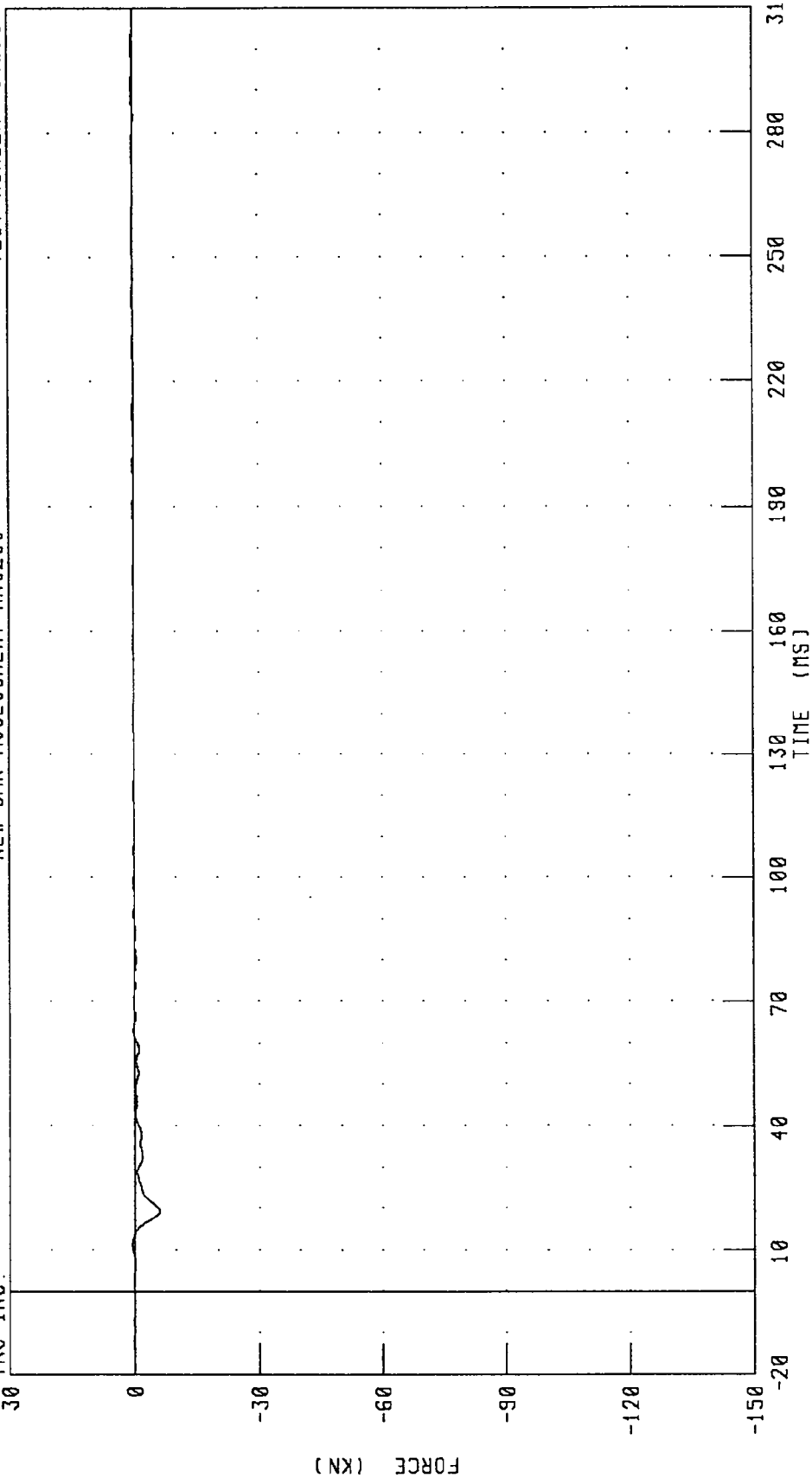
TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



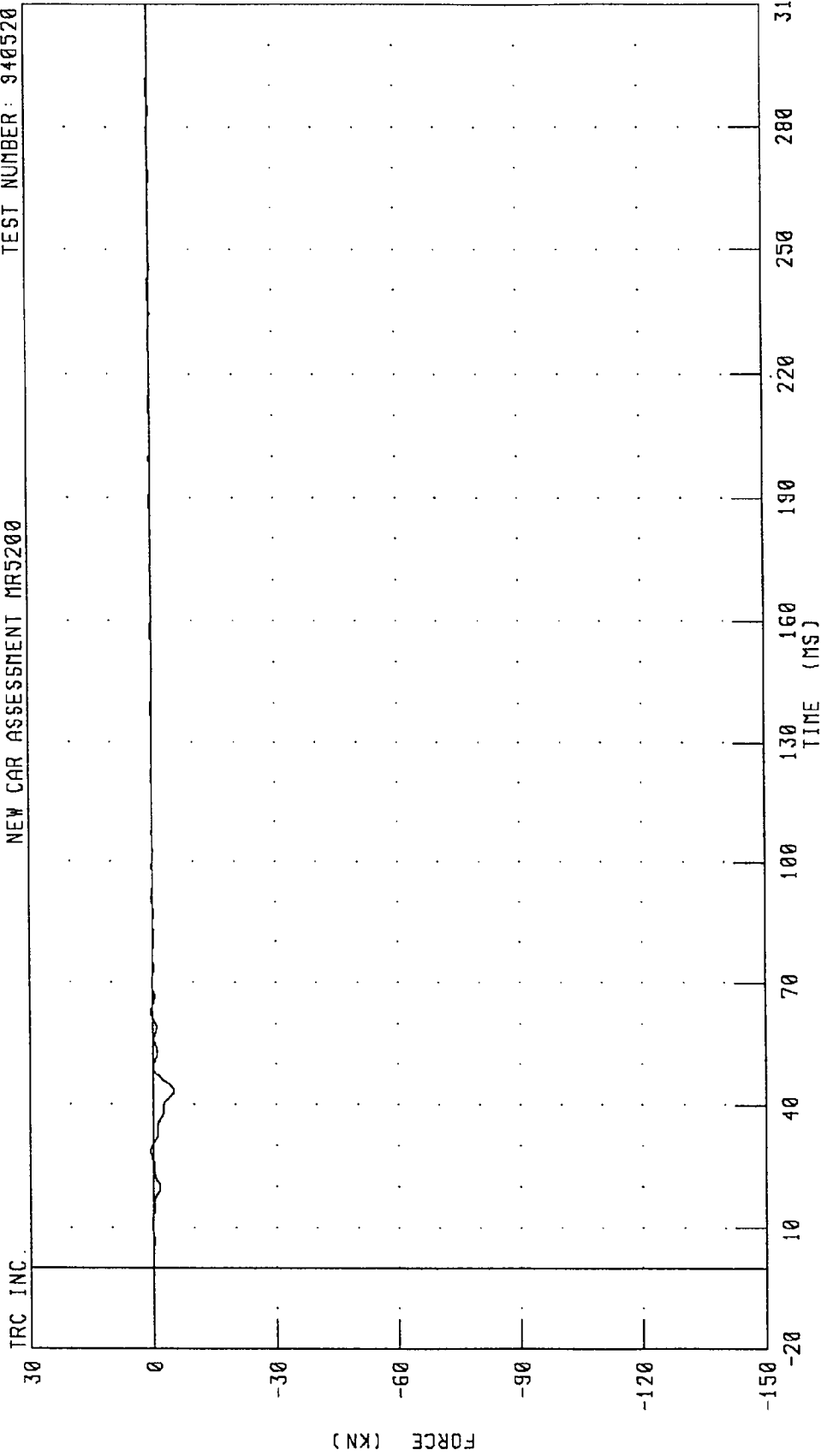
PEAK DATA: 0.61 KN @ 11.28 MS; -5.99 KN @ 19.28 MS

FILTER: CH. CLASS 60

CHANNEL: B07F

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

NEW CAR ASSESSMENT MR5200 TEST NUMBER: 940520



PEAK DATA: 0.65 KN @ 28.48 MS; -5.16 KN @ 43.44 MS

FILTER: CH. CLASS 60

CHANNEL: BD8F

FORCE (KN)

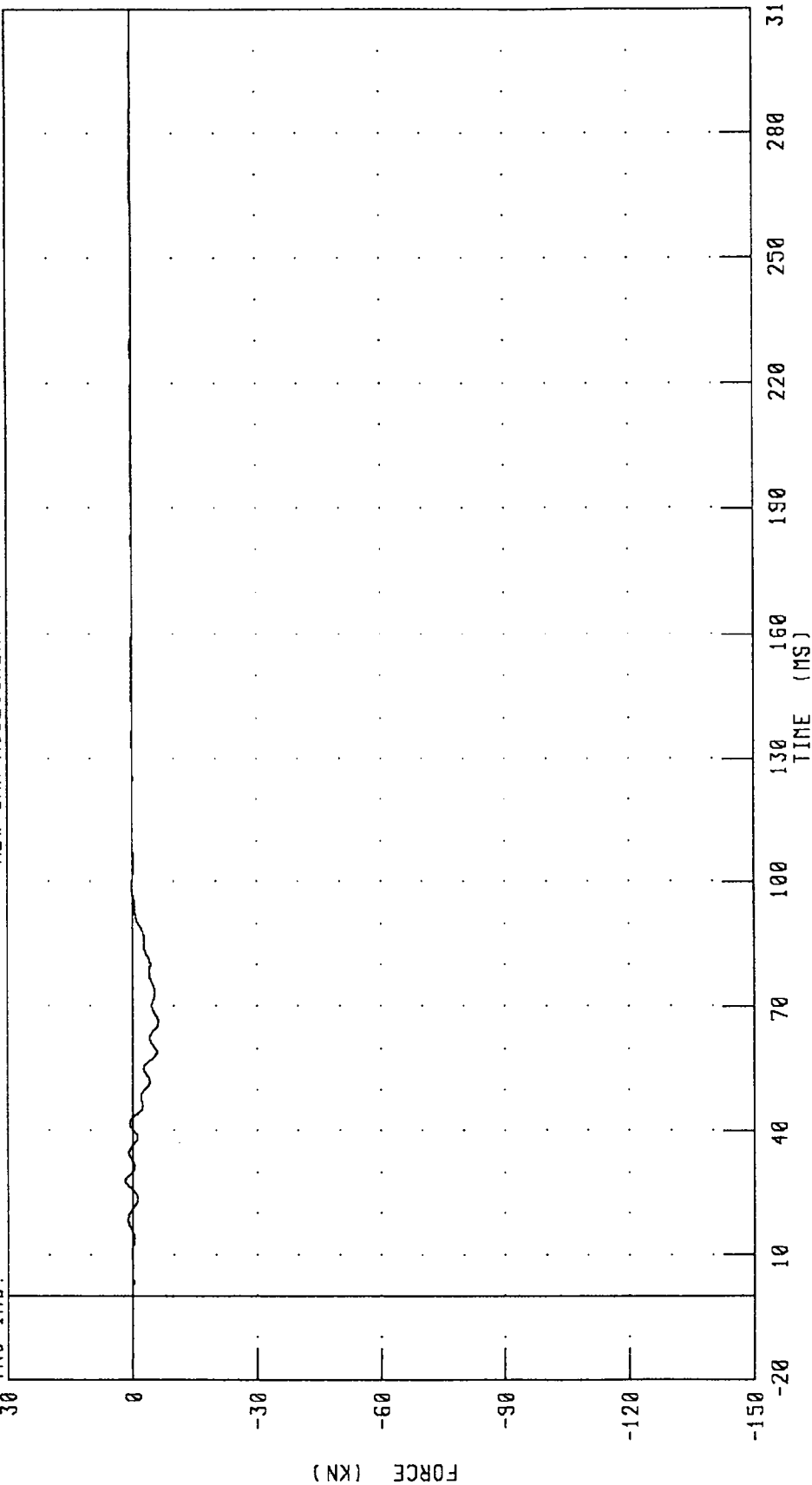
TIME (MS)

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



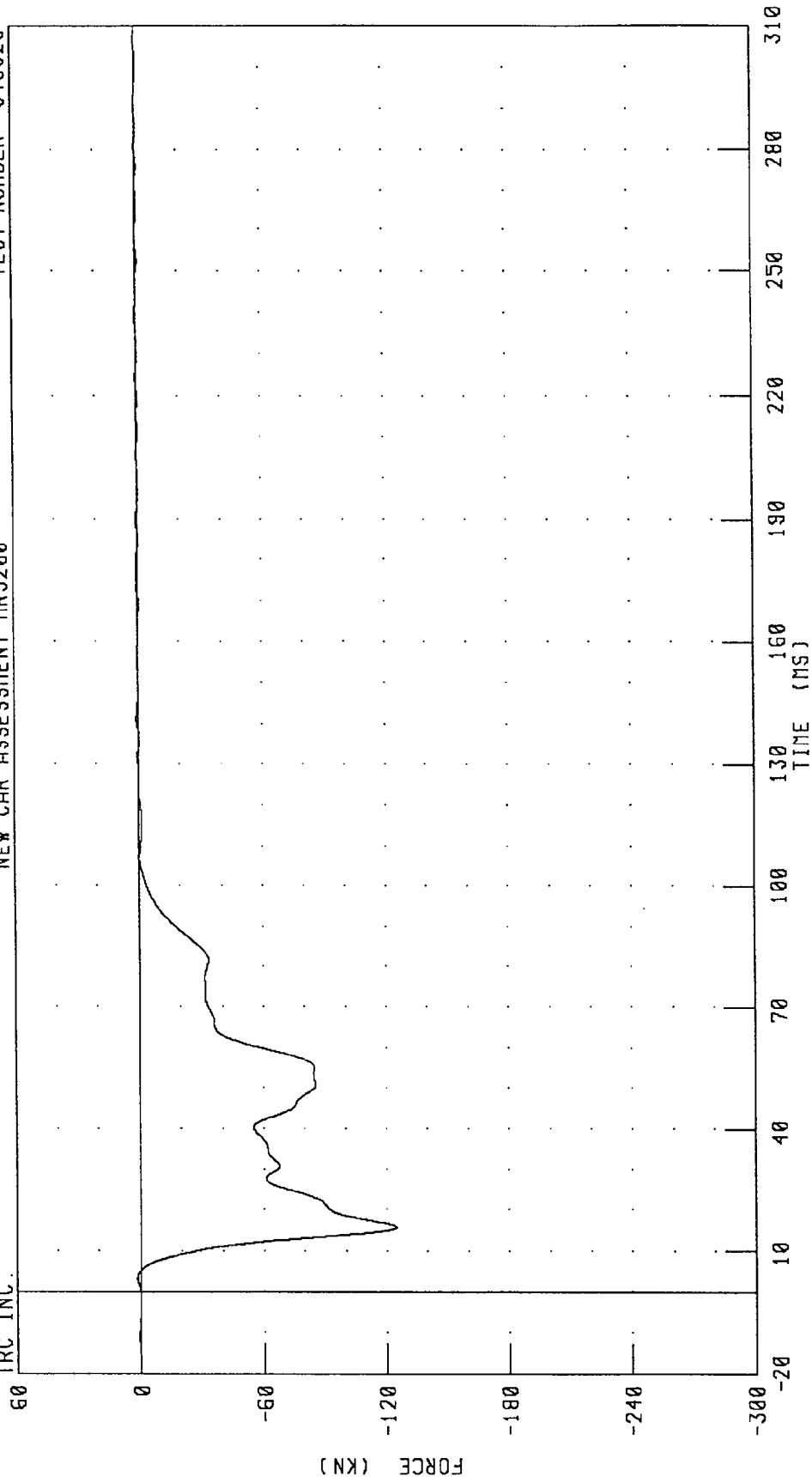
CHANNEL: B09F FILTER: CH. CLASS 60

940520

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

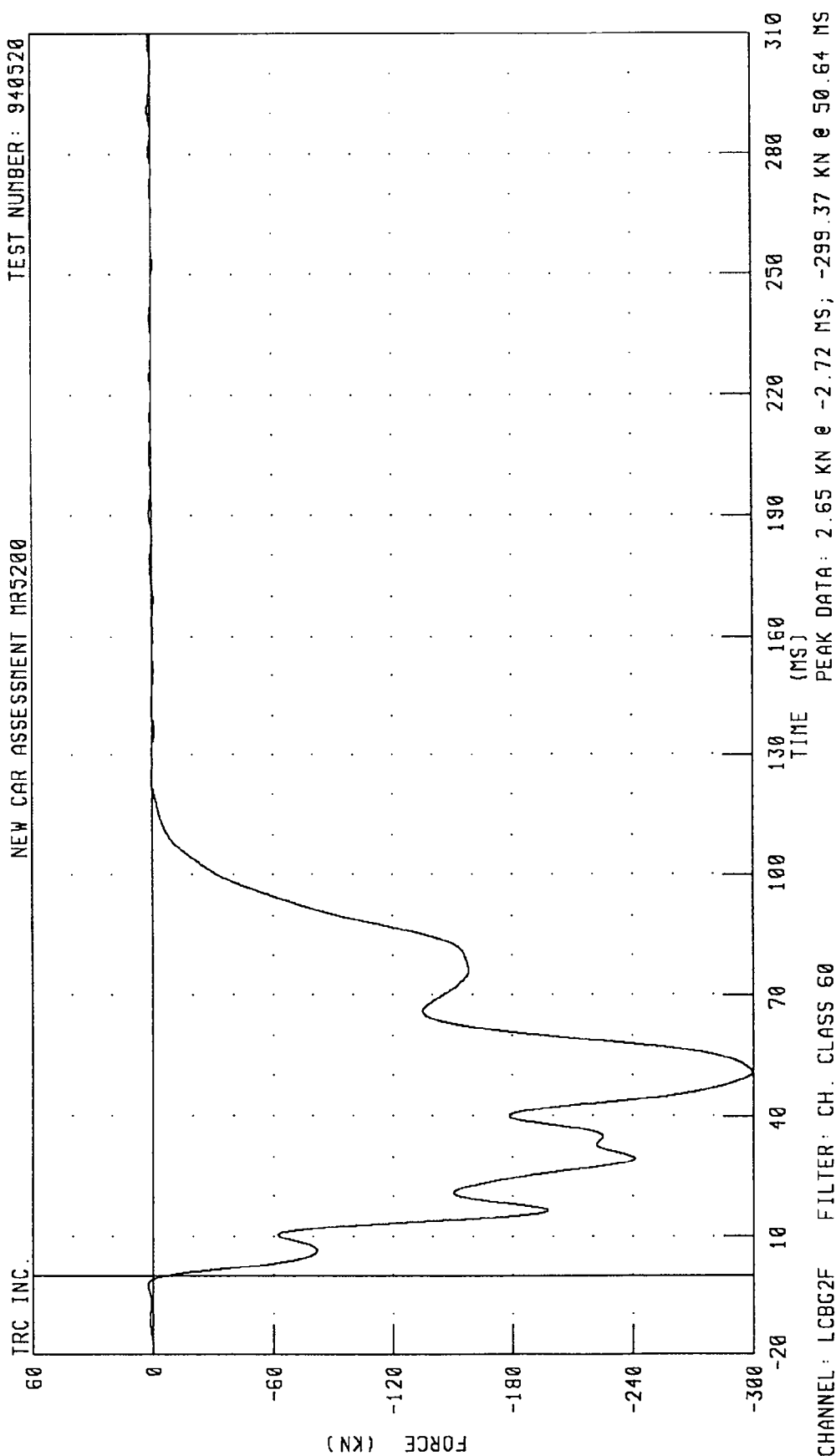


PEAK DATA: 1.70 KN @ 3.04 MS, -124.92 KN @ 15.68 MS

CHANNEL: LCBG1F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
NEW CAR ASSESSMENT MR5200

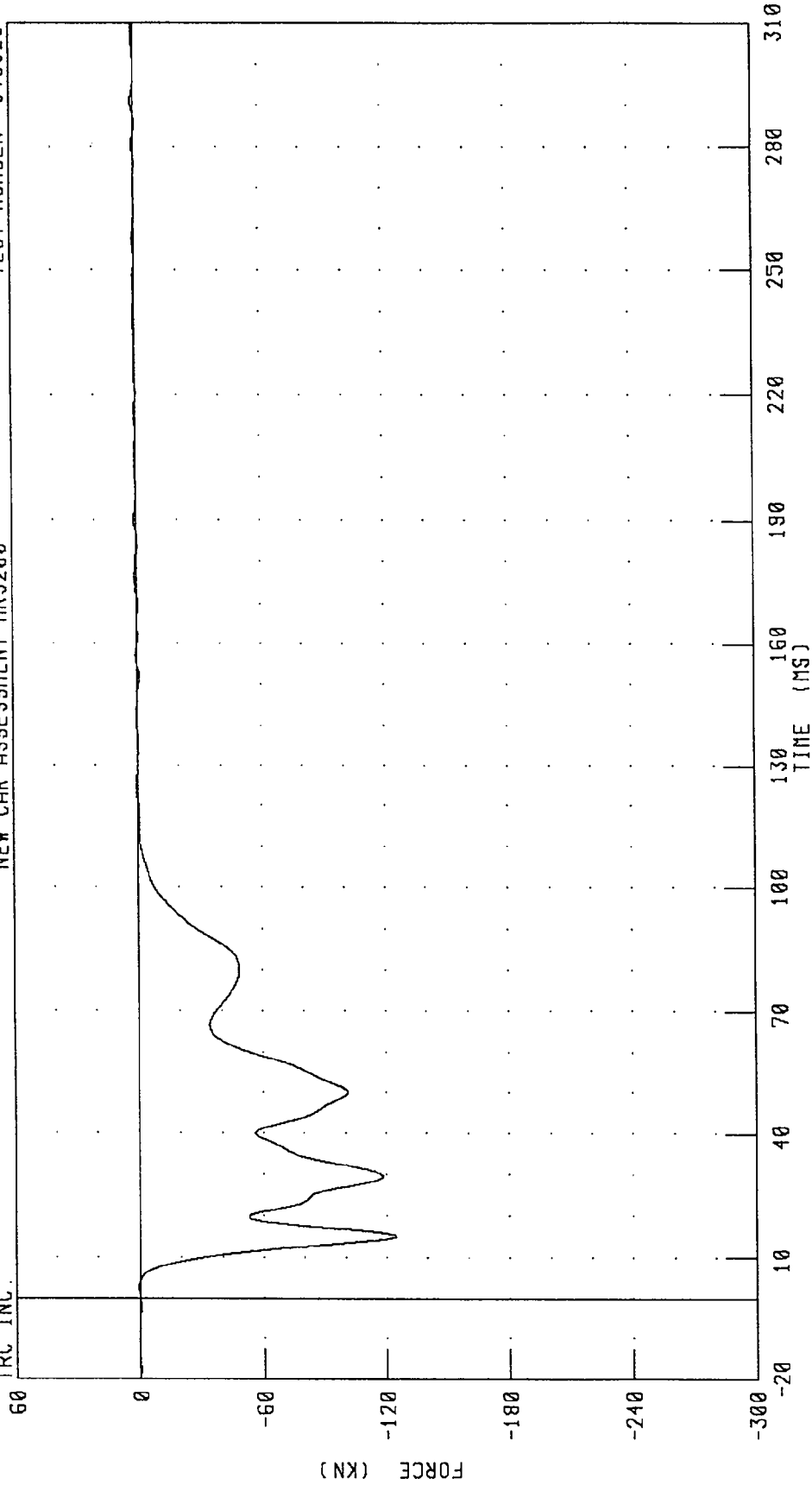
TEST NUMBER: 940520



1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.



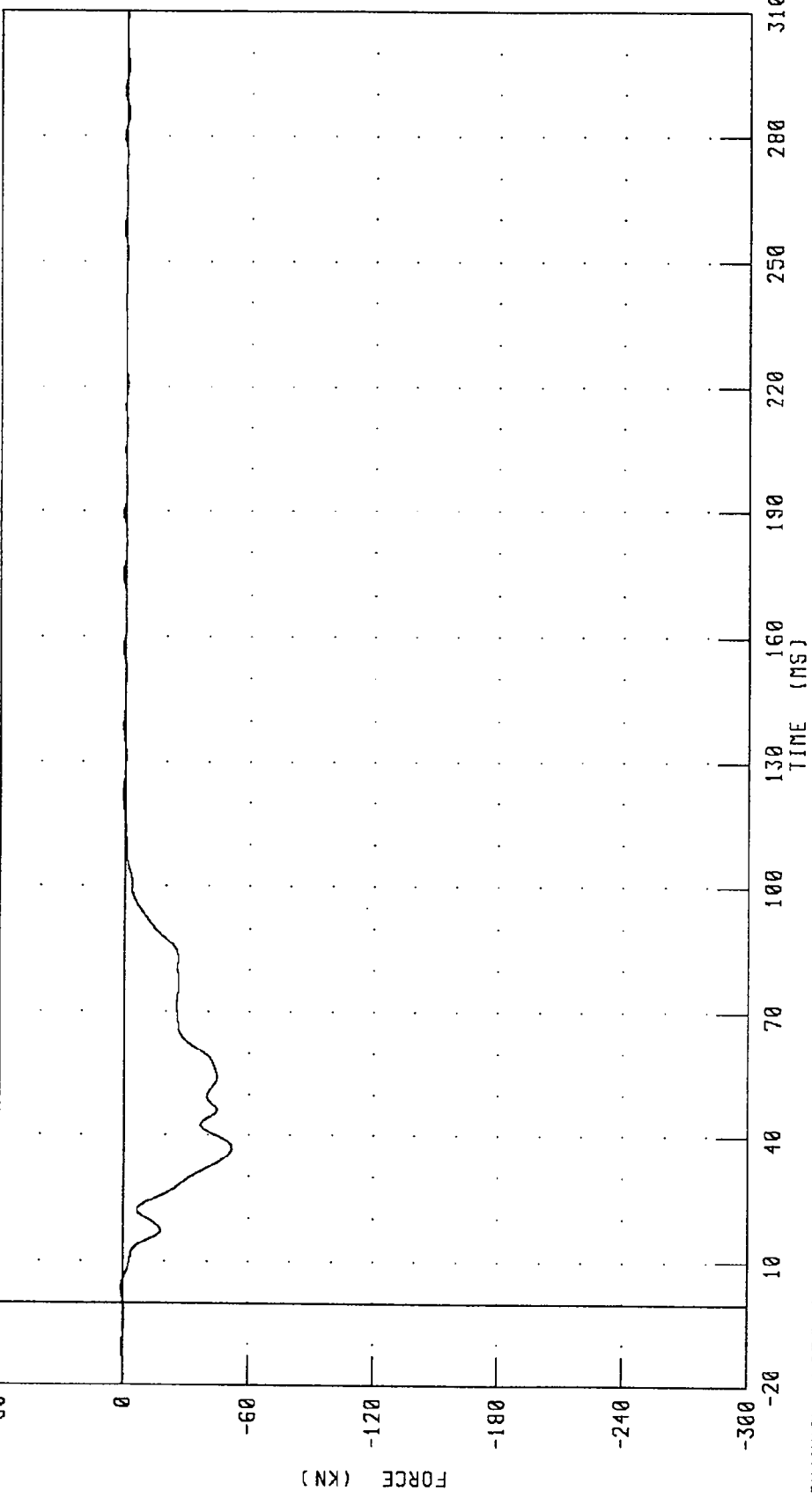
CHANNEL: LCBG3F FILTER: CH. CLASS 60

PEAK DATA: 1.36 KN @ 290.96 MS; -124.77 KN @ 15.20 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

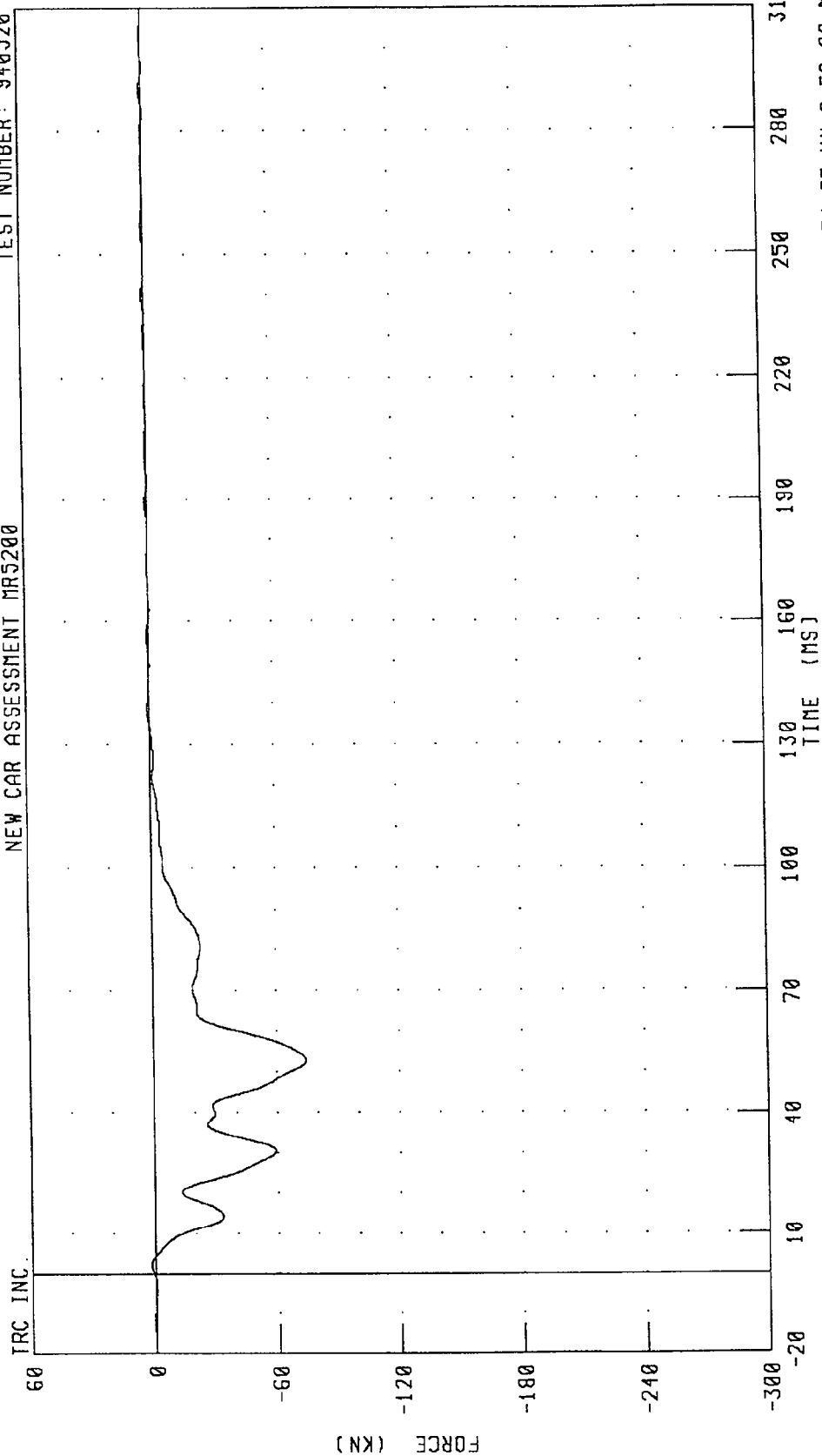


CHANNEL: LCBG4F FILTER: CH. CLASS 60

PEAK DATA: 1.28 KN @ 290.72 MS; -51.75 KN @ 36.96 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 2.12 KN @ 2.16 MS; -74.35 KN @ 52.80 MS

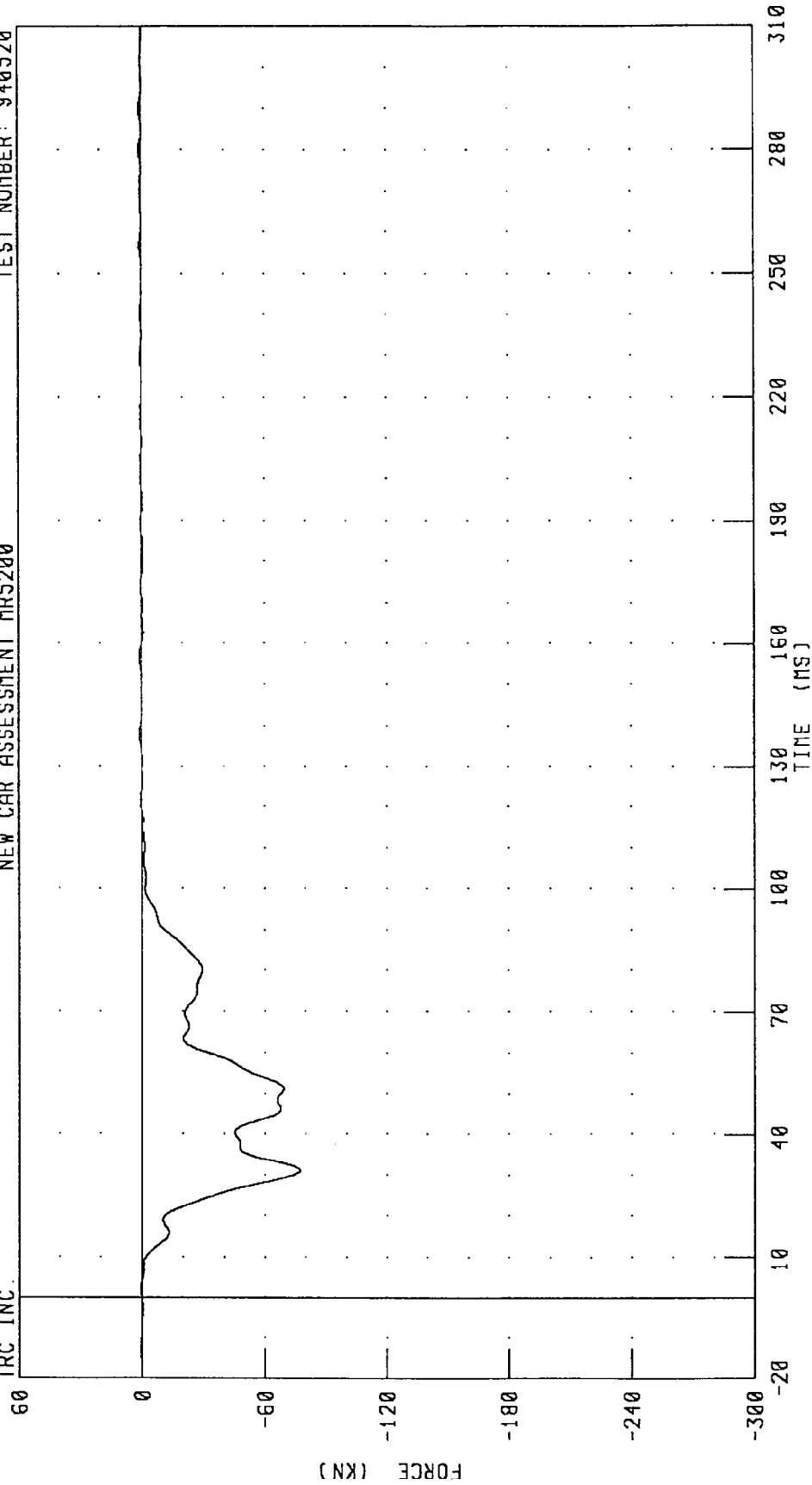
CHANNEL: LCBG5F FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520

TRC INC.

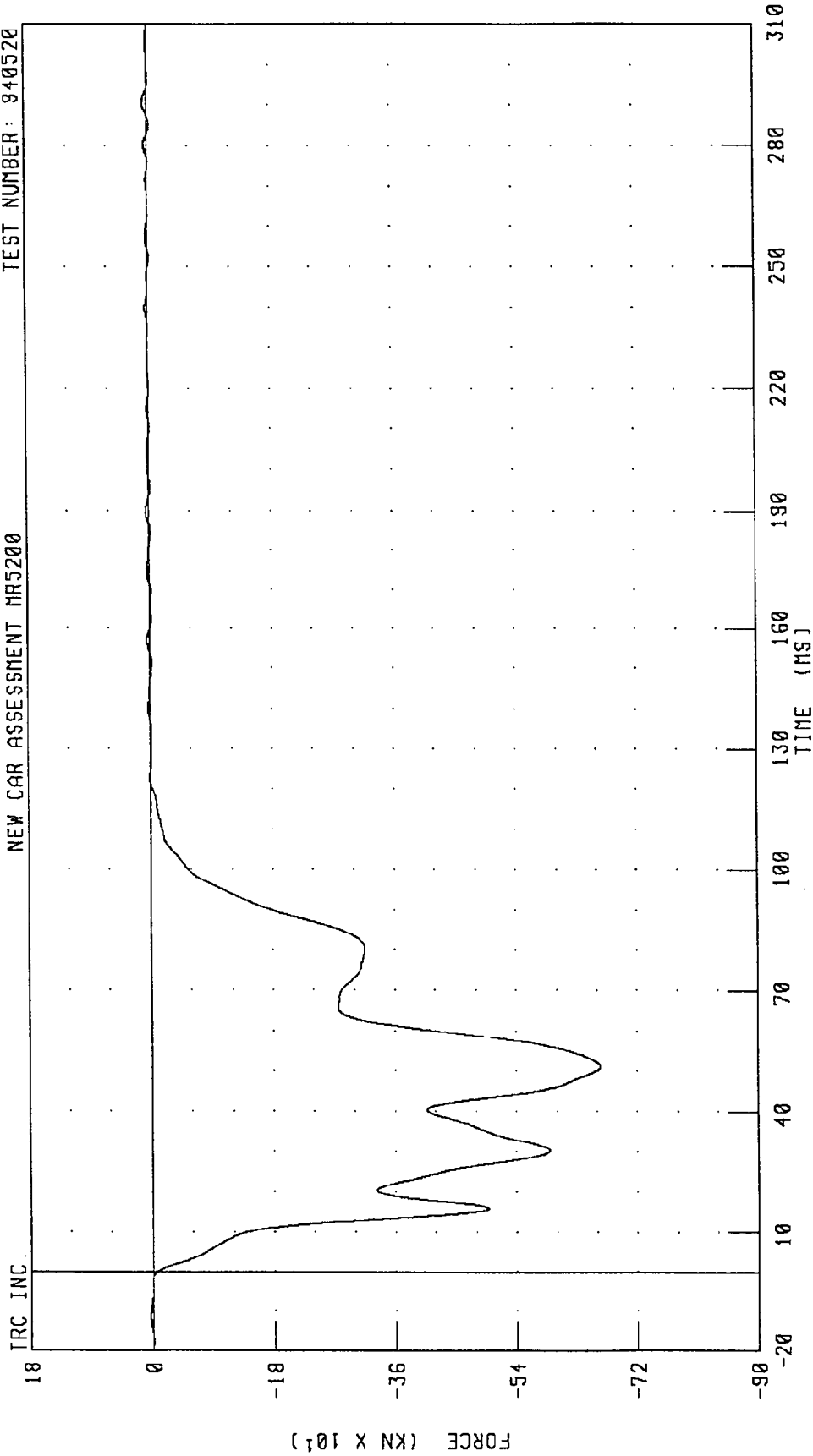


CHANNEL: LCBG6F FILTER: CH. CLASS 60

PEAK DATA: 1.00 KN @ 157.12 MS; -77.24 KN @ 31.20 MS

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT MR5200

TEST NUMBER: 940520



PEAK DATA: 6.02 KN @ 290.56 MS; -665.36 KN @ 51.12 MS

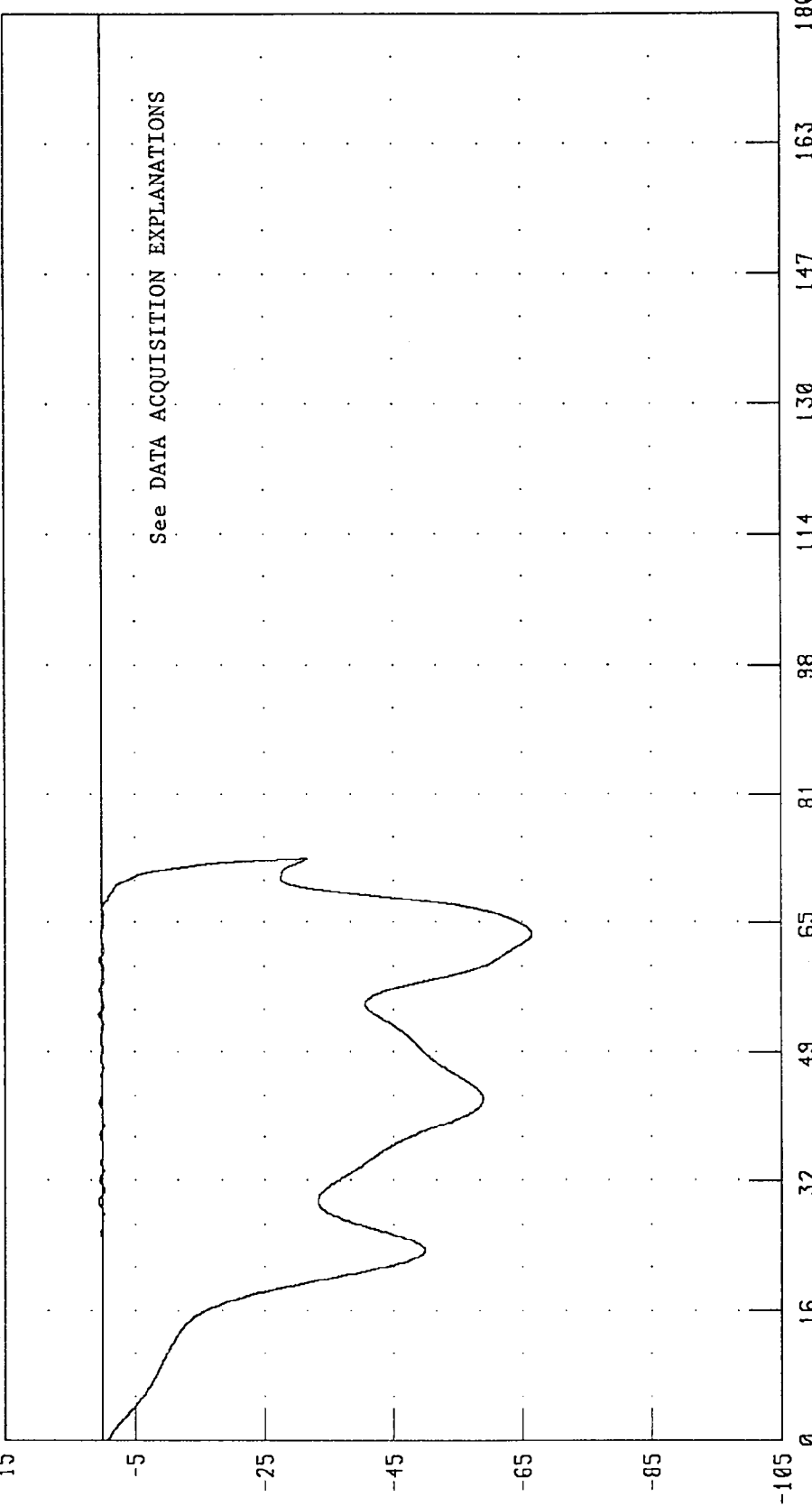
CHANNEL: LCBGT FILTER: CH. CLASS 60

1994 NISSAN QUEST INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TEST NUMBER: 940520

NEW CAR ASSESSMENT MR5200

TRC INC.



CHANNEL: OTHXD FILTER: CH. CLASS 180
 LCBGT CH. CLASS 60
 DISPLACEMENT (MM X 10¹)
 PEAK DATA: 737.07 MM @ 81.20 MS, 0.00 MM @ 0.00 MS
 6.02 KN @ 290.56 MS, -665.36 KN @ 51.12 MS

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
142 HUMANOID

19-MAY-94

TRC INC. TEST NO: 142C22ED1 572E SN142 EXT.DIMENSION CAL22

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

DUMMY MEETS SPECIFICATIONS
TECHNICIAN

John R. Clauwidge

RUN NUMBER: 051994.1259

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

19-MAY-94

TRC INC.

TEST NO: 142C22HD1

572E SN142 HEAD DROP CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	53.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	256.51 G
PEAK LATERAL ACCELERATION	15 G MAX	2.60 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

John K. Clauwge

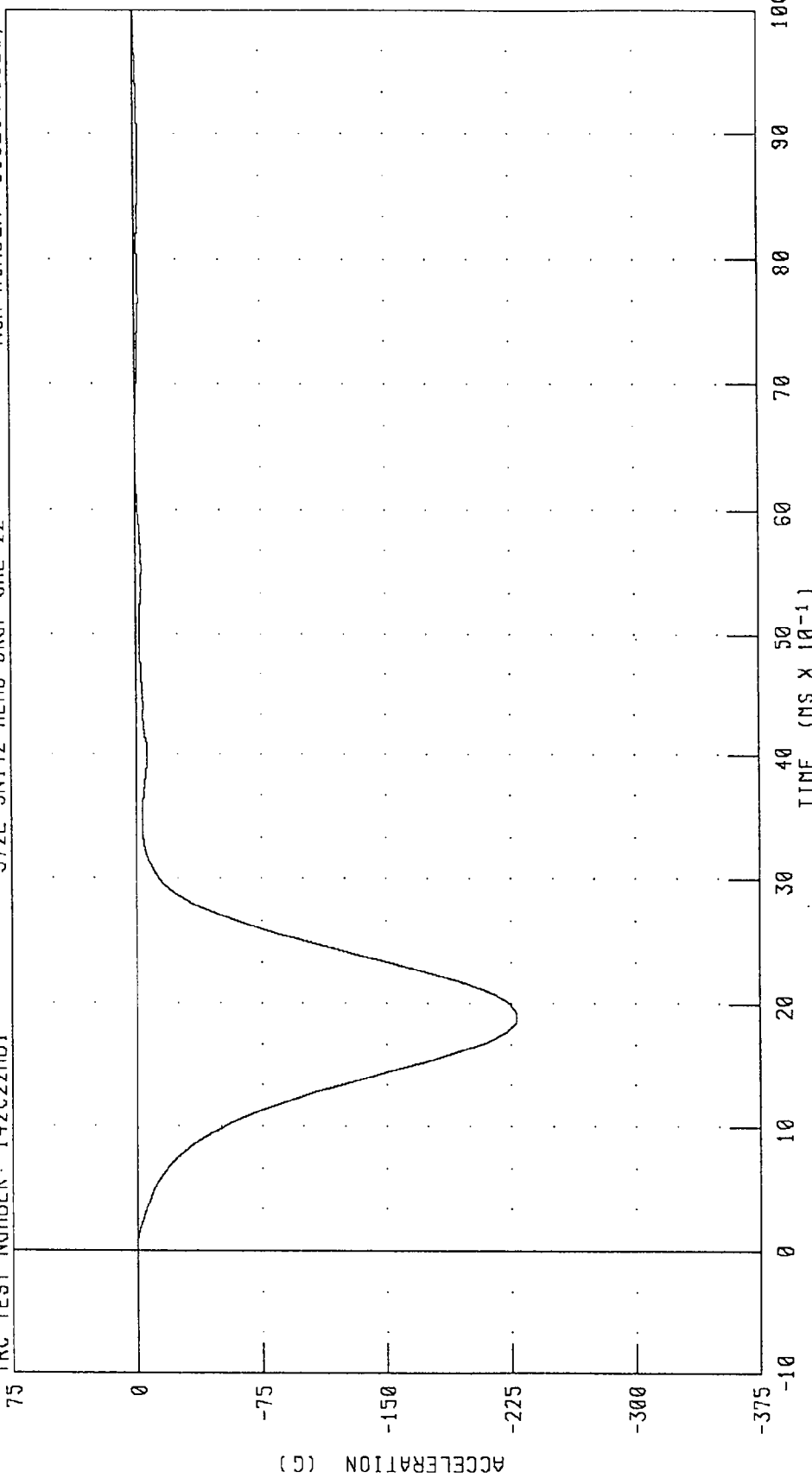
RUN NUMBER: 051994.0917;4

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

TRC TEST NUMBER: 142C22HD1

572E SN142 HEAD DROP CAL 22

RUN NUMBER: 060294.1323,4



PEAK DATA: 0.13 G @ 6.48 MS; -228.02 G @ 1.92 MS

CHANNEL: HEDXC FILTER: CH. CLASS 1000

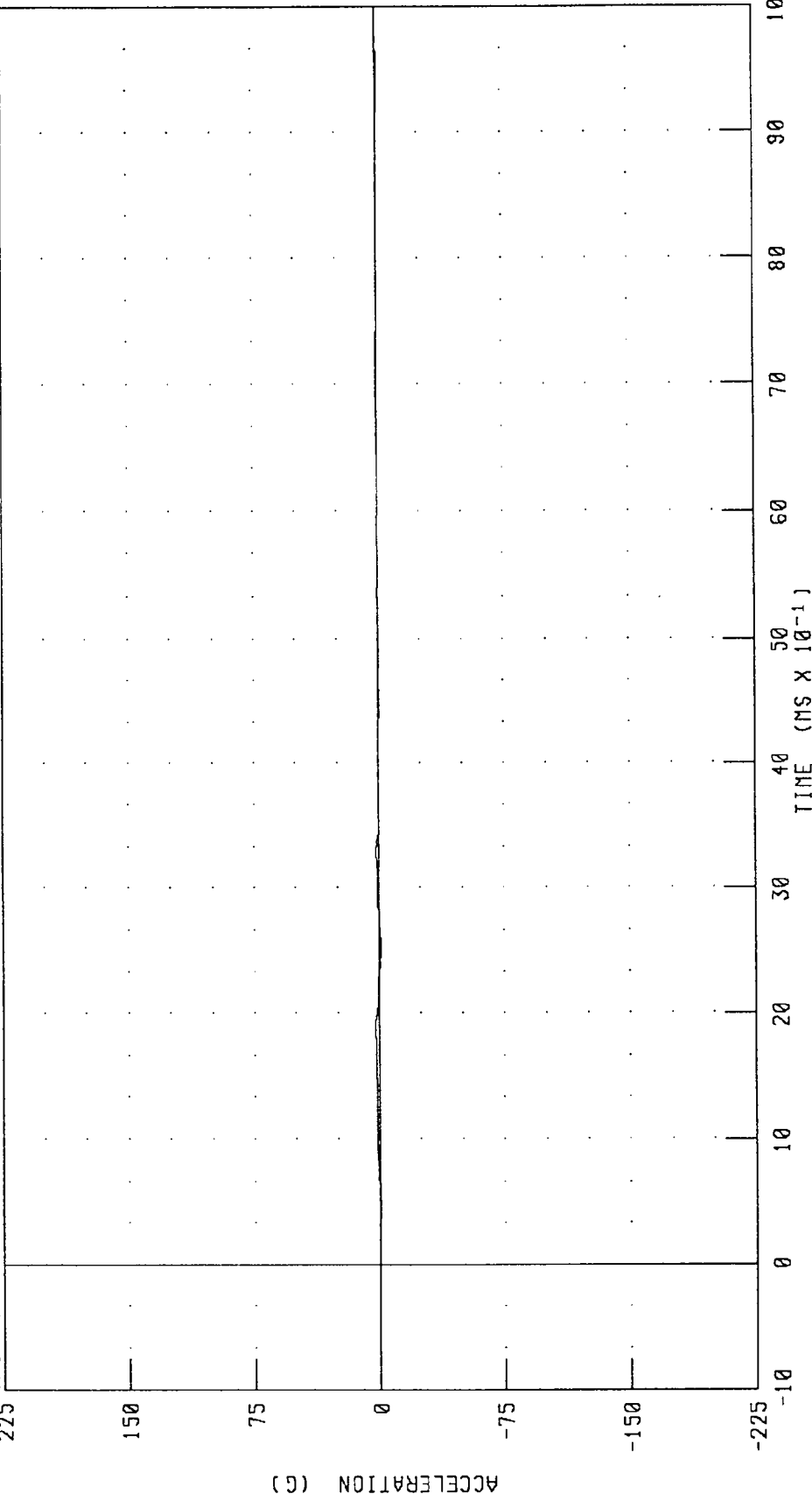
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

572E SN142 HEAD DROP CAL 22

RUN NUMBER: 060294.1323,4

TRC TEST NUMBER: 142C22HD1



PEAK DATA: 2.61 G @ 1.84 MS; -1.41 G @ 2.48 MS

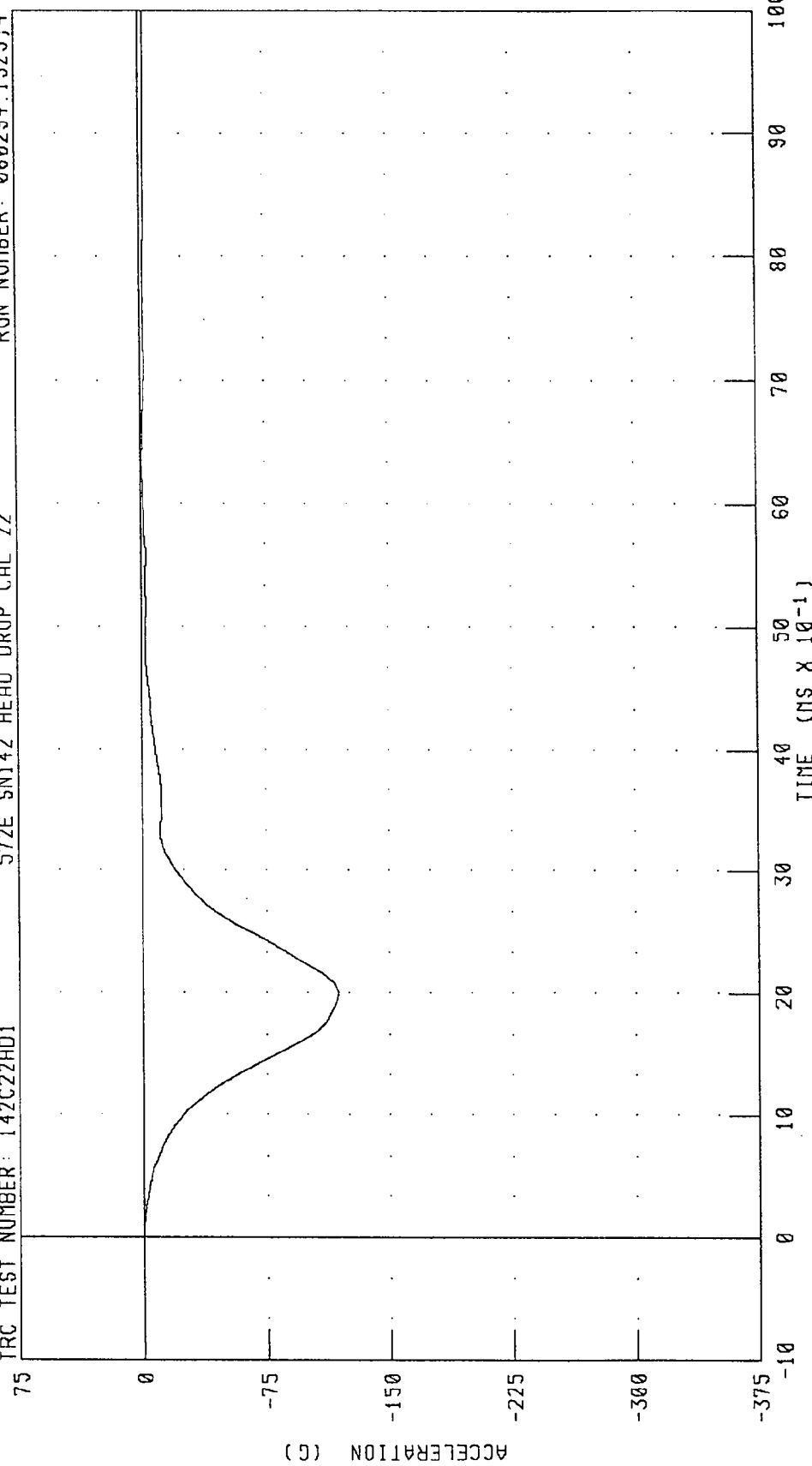
CHANNEL: HEDYC FILTER: CH. CLASS 1000

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

RUN NUMBER: 060294.1323;4

572E SN142 HEAD DROP CAL 22

TRC TEST NUMBER: 142C22HD1



PEAK DATA: 0.05 G @ 0.00 MS; -118.98 G @ 2.00 MS

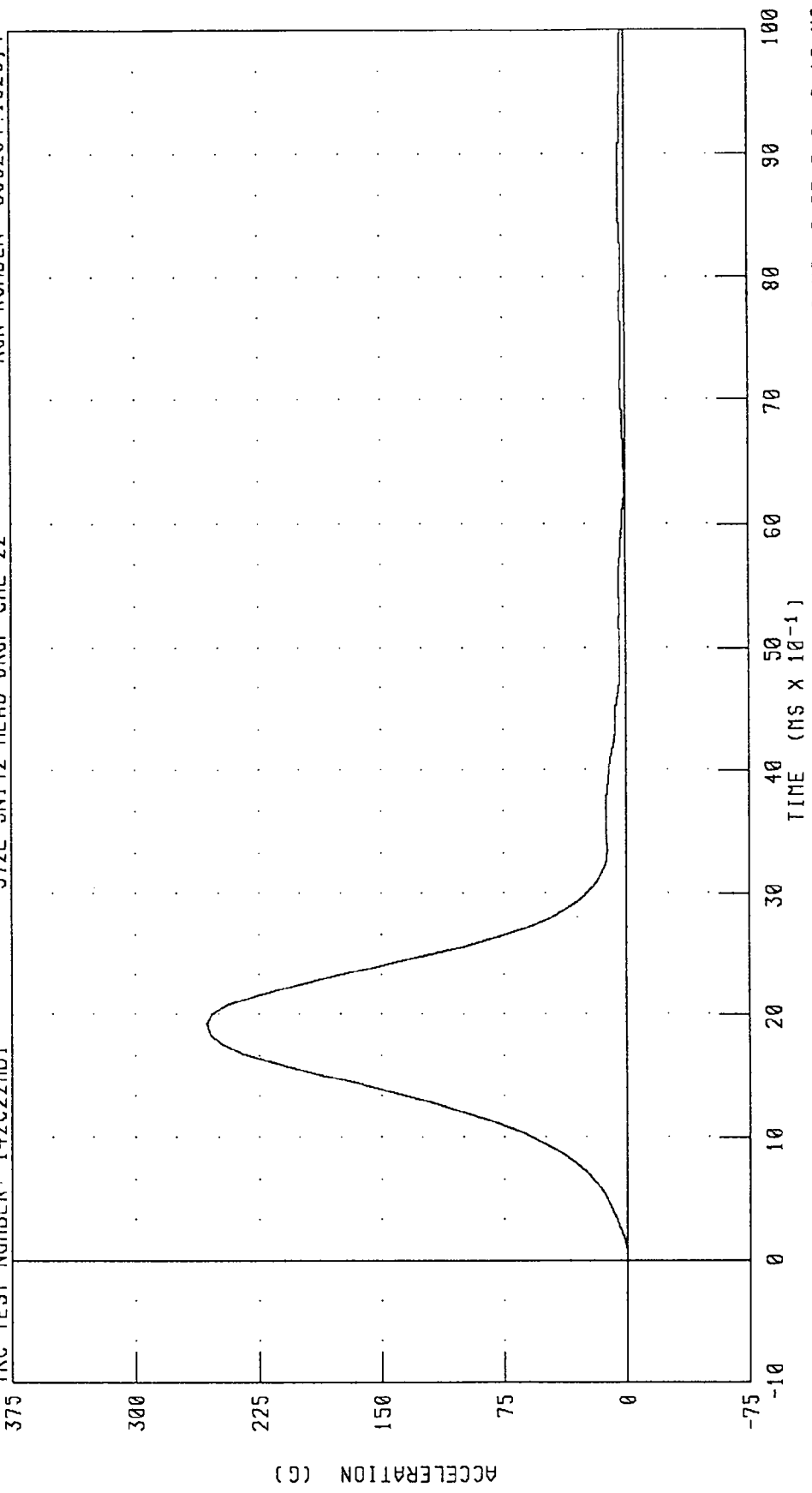
FILTER: CH. CLASS 1000

CHANNEL: HEDZG

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD RESULTANT ACCELERATION
 572E SN142 HEAD DROP CAL 22

IRC TEST NUMBER: 142C22HD1

RUN NUMBER: 060294.1323,4



PEAK DATA: 256.51 G @ 1.92 MS; 0.03 G @ -0.16 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

19-MAY-94

TRC INC. TEST NO: 142C22NF1 572E SN142 NECK FLEXION CAL22

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	53.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.70 G
	20 MS	17.60 - 22.60 G	19.75 G
	30 MS	12.50 - 18.50 G	15.46 G
MAX PENDULUM G		29 G MAX	24.67 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.41 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	39.44 MS
D PLANE	MAX	64 - 78 DEG.	73.77 DEG.
ROTATION	TIME	57 - 64 MS	59.60 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	93.14 NM
	TIME	47 - 58 MS	53.28 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.76 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	104.72 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

John K. Clavidge

RUN NUMBER: 051994.1034;1

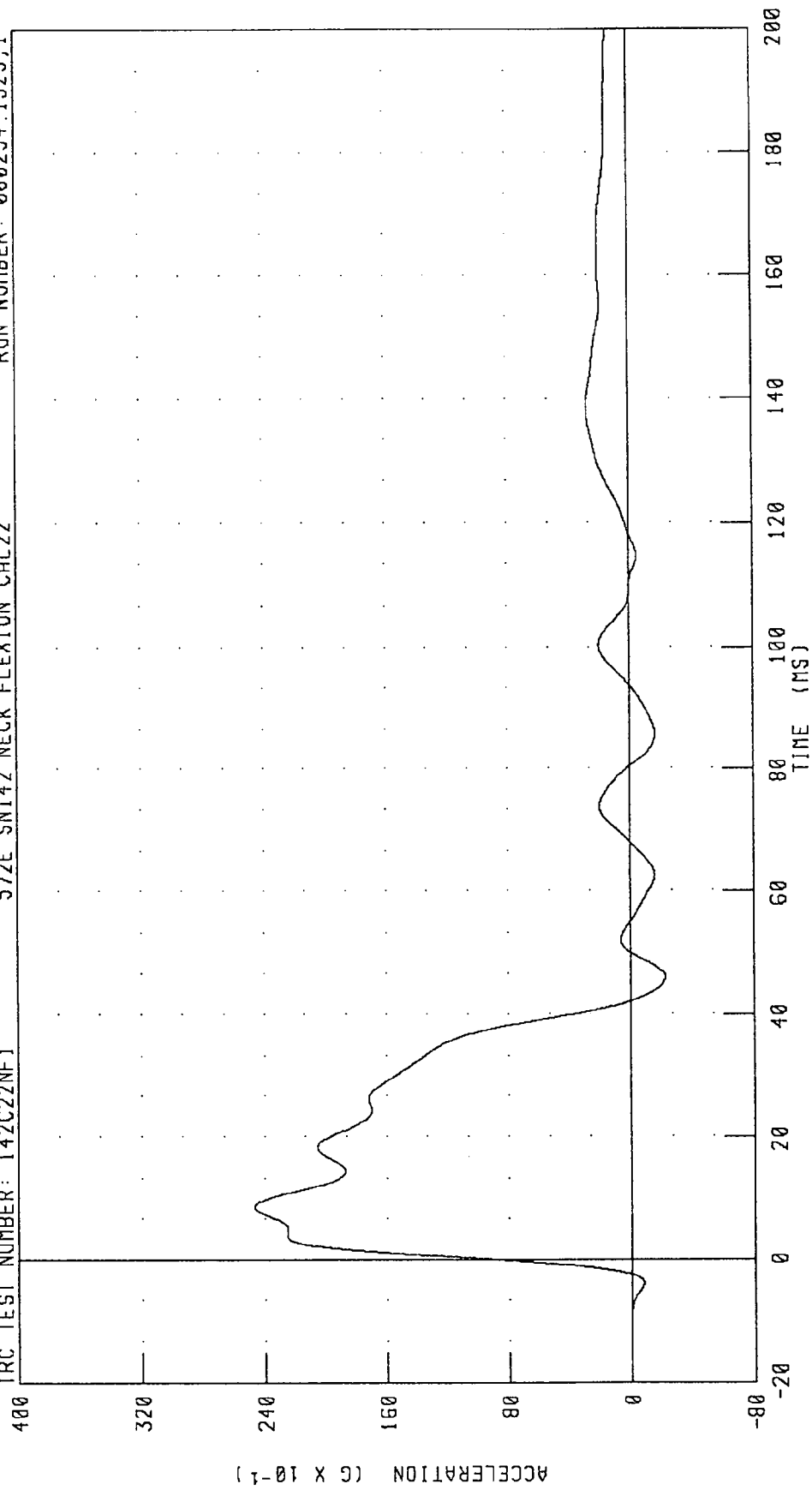
PART 572-E HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 060294.1323;1



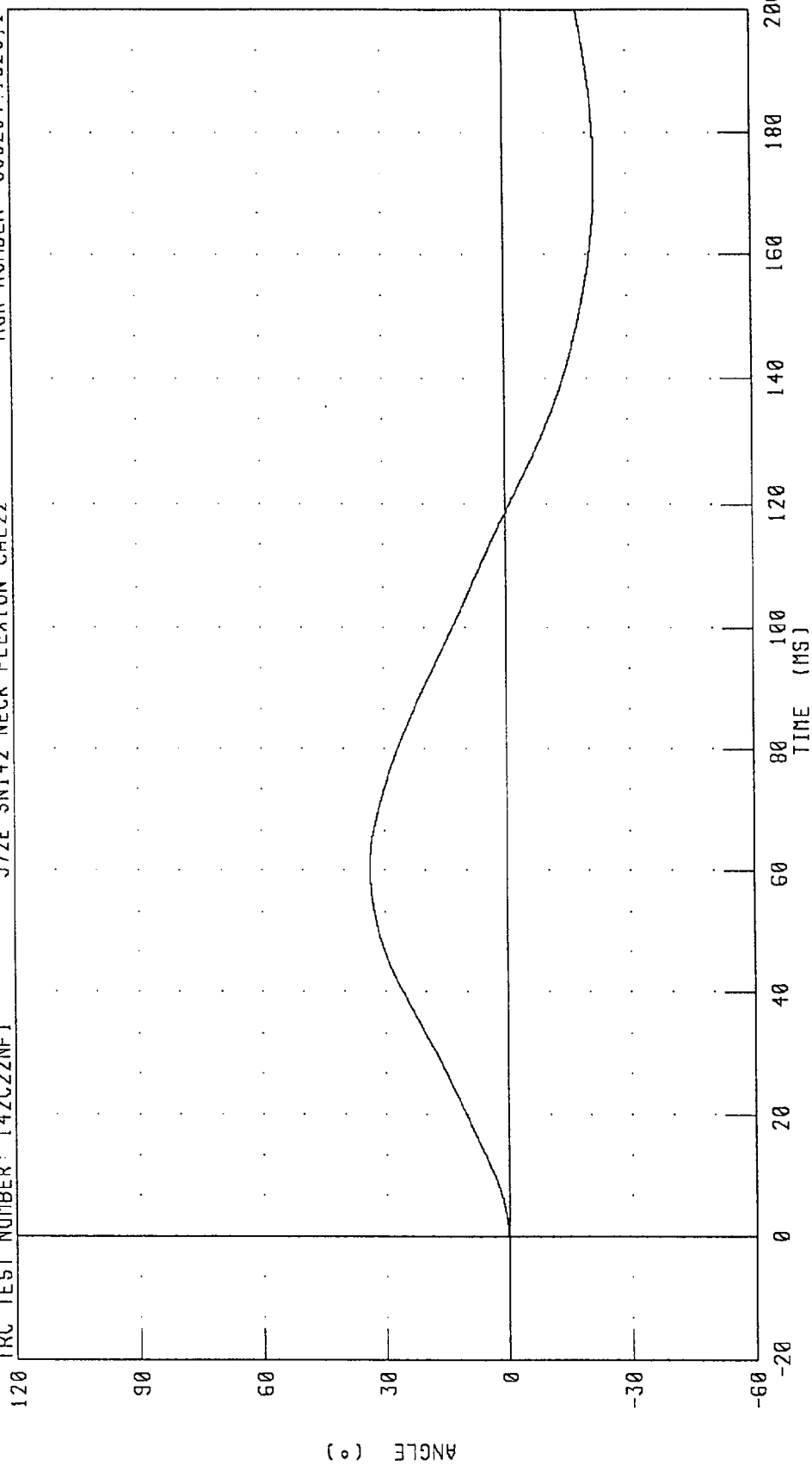
PEAK DATA: 24.67 G @ 8.56 MS; -2.23 G @ 46.00 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C22NF1 RUN NUMBER: 060294.1323;1

572E SN142 NECK FLEXION CAL22



PEAK DATA: 33.55 ° @ 60.32 MS; -22.15 ° @ 171.12 MS

CHANNEL: BETA FILTER: CH. CLASS 60

ANGLE (°)

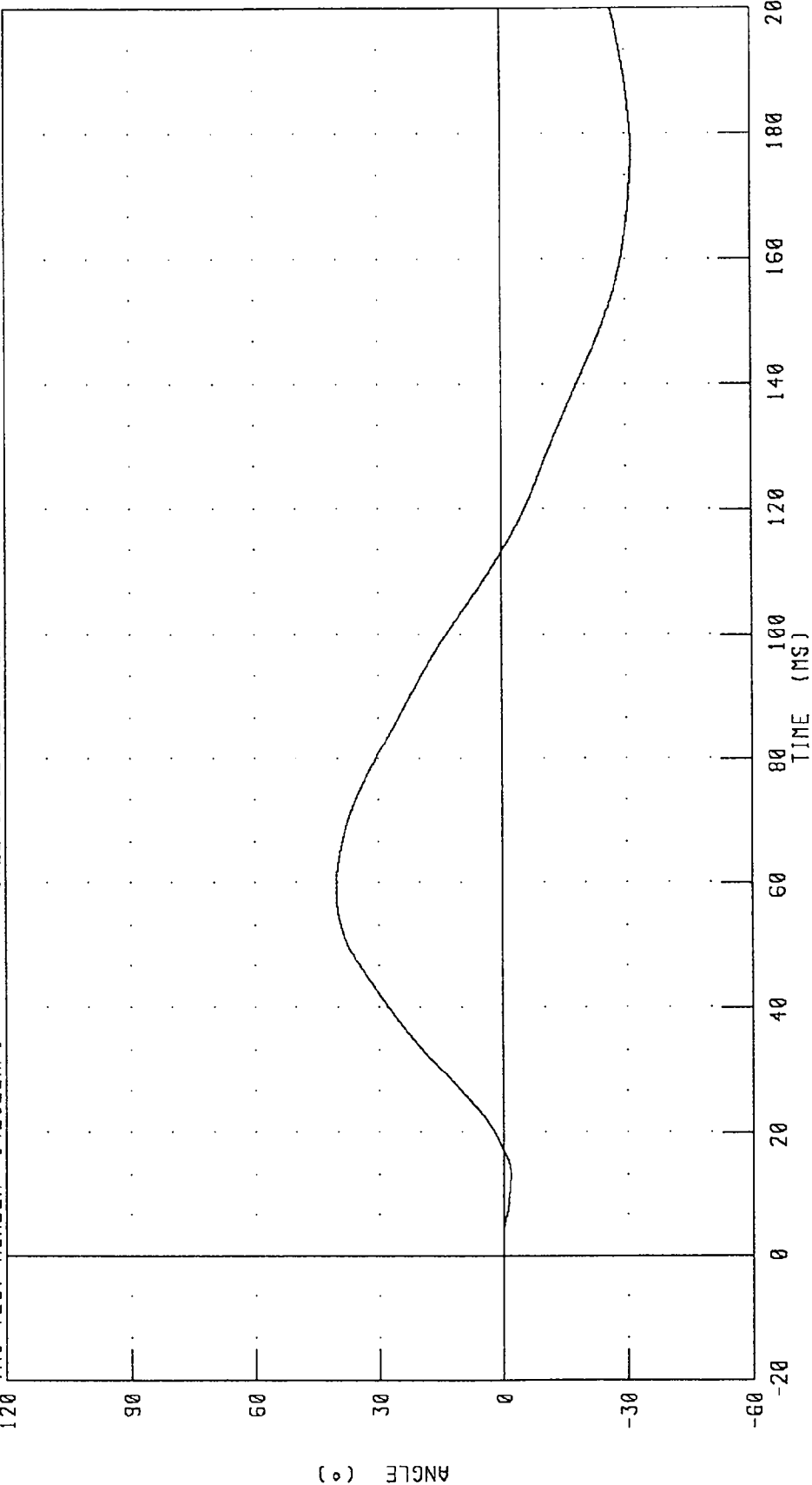
TIME (MS)

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

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 060294.1323;1



PEAK DATA: 40.25 ° @ 58.96 MS; -31.48 ° @ 177.36 MS

CHANNEL: THETA FILTER: CH. CLASS 60

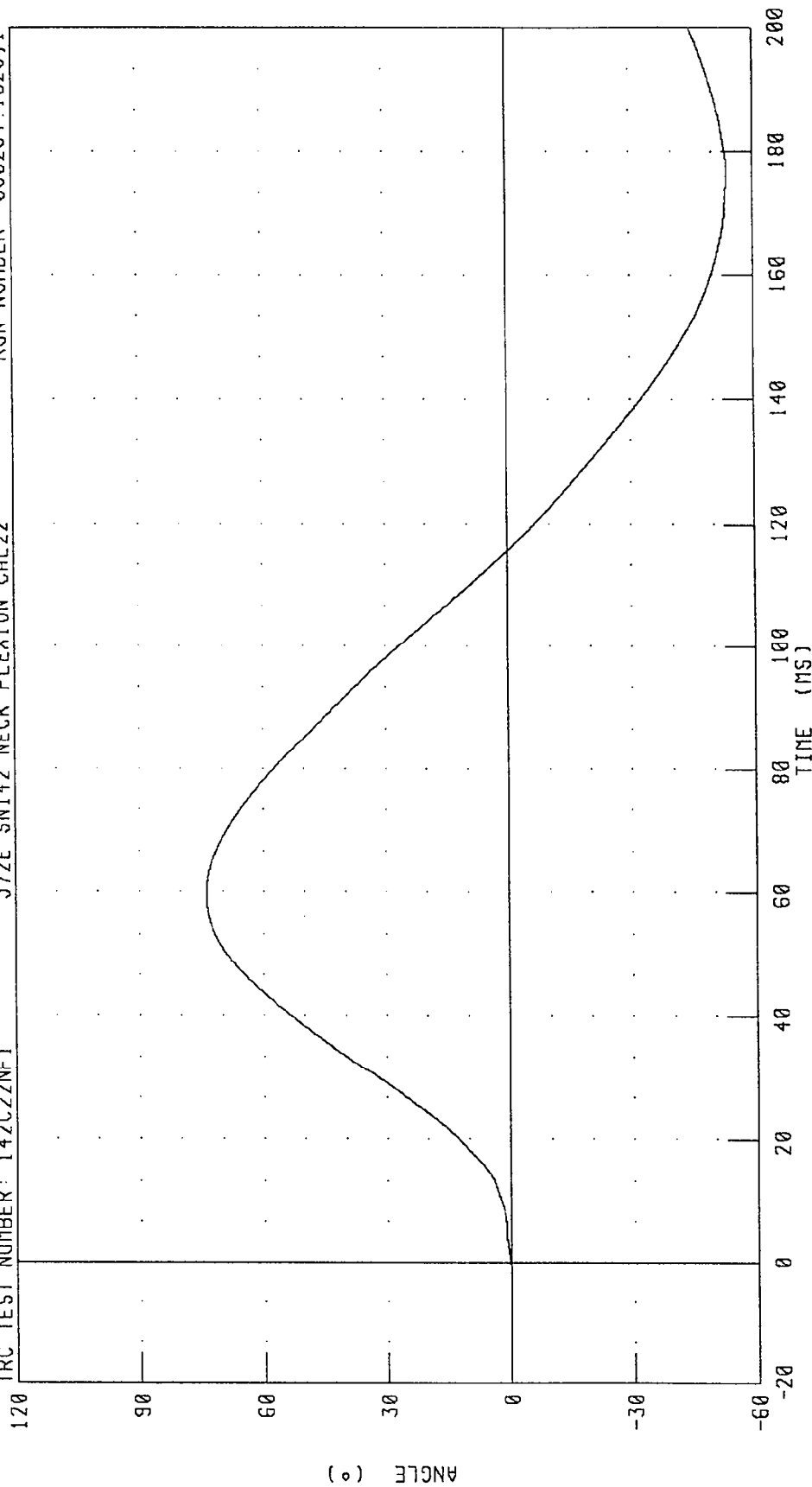
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 060294.1323,1



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 73.77 ° @ 59.60 MS; -53.58 ° @ 176.64 MS

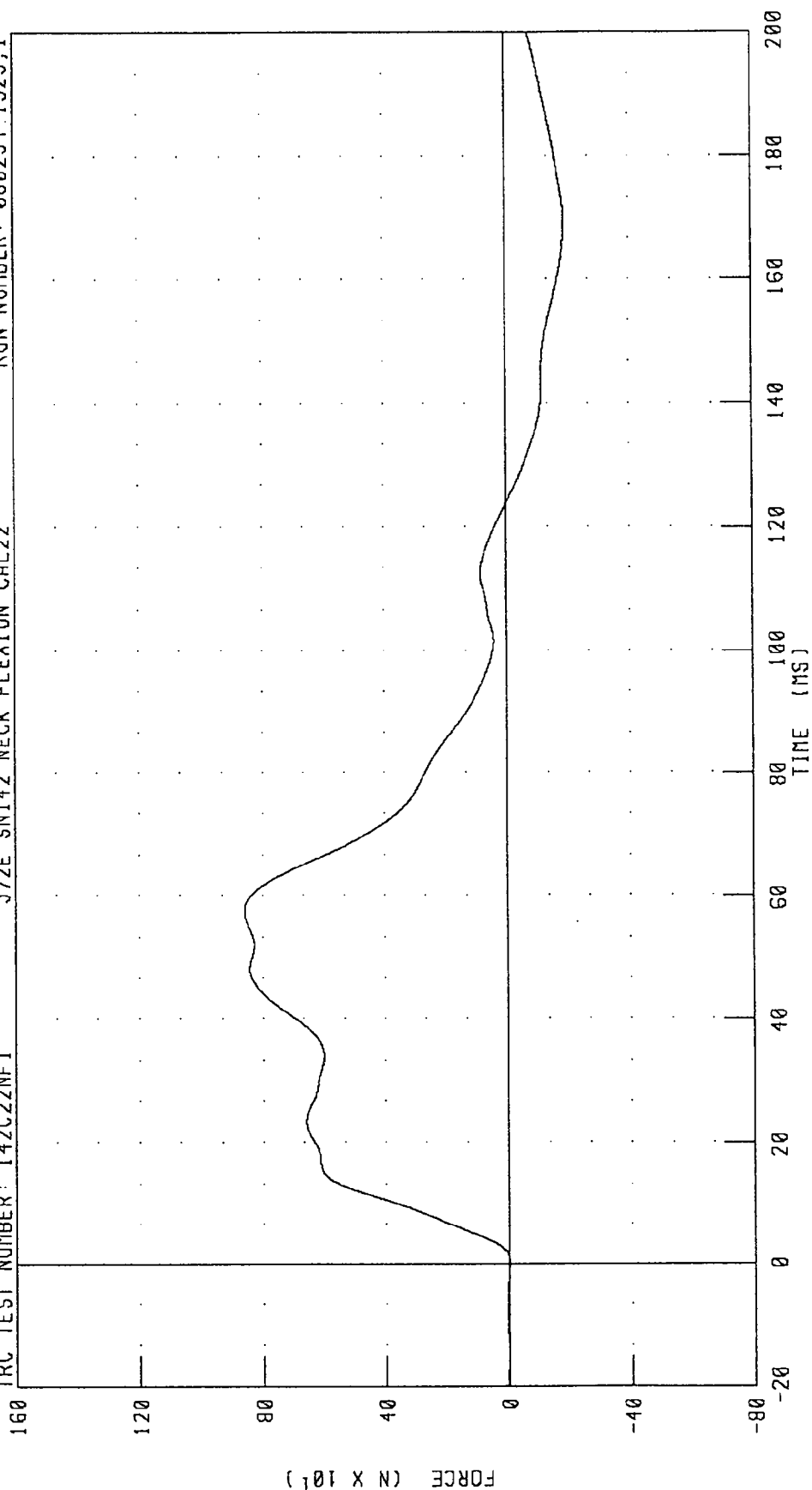
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 060294.1323;1

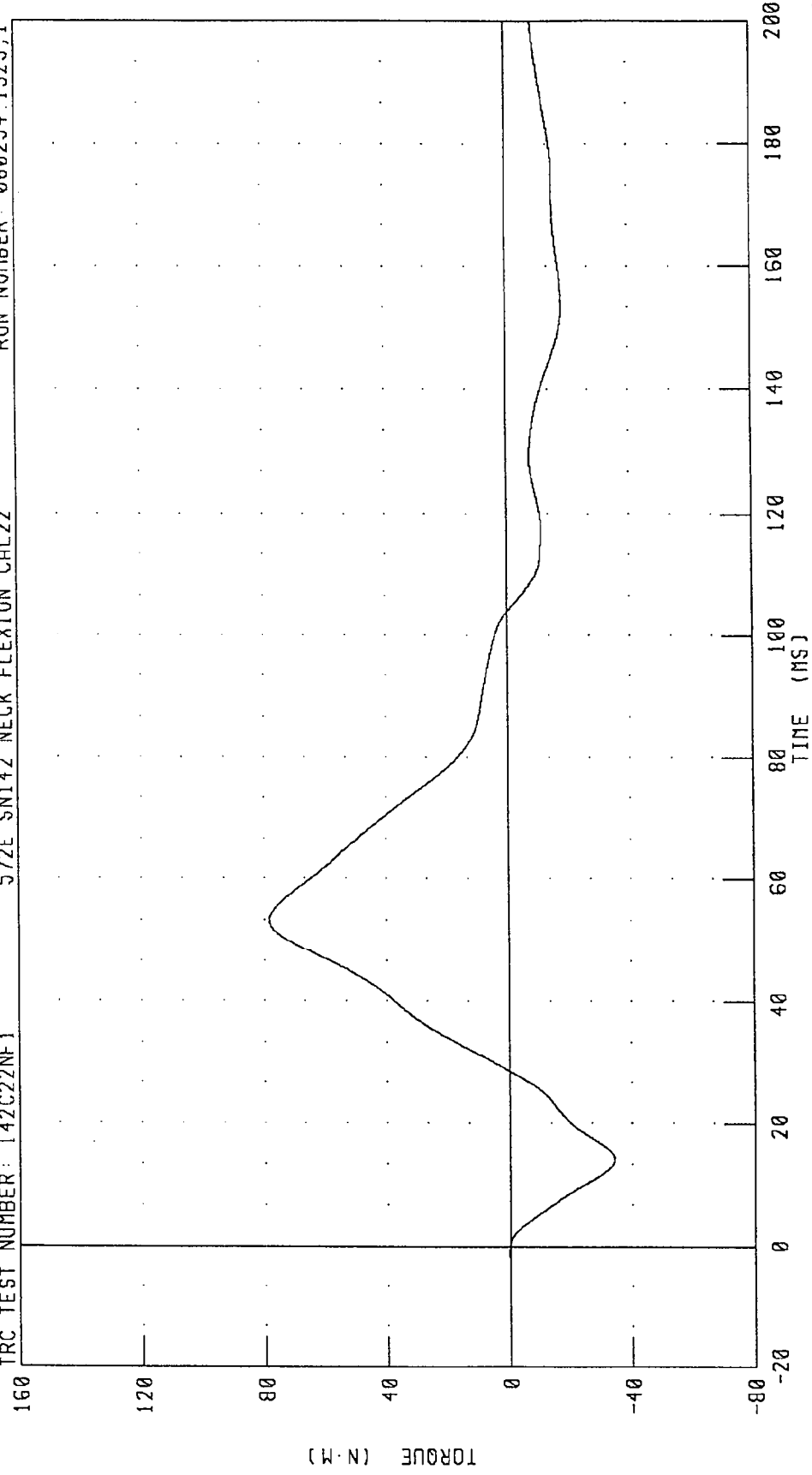


PEAK DATA: 859.02 N @ 57.44 MS; -189.53 N @ 169.20 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C22NF1 572E SN142 NECK FLEXION CAL22 RUN NUMBER: 060294.1323;1



PEAK DATA: 78.35 N·M @ 53.20 MS; -34.22 N·M @ 14.16 MS

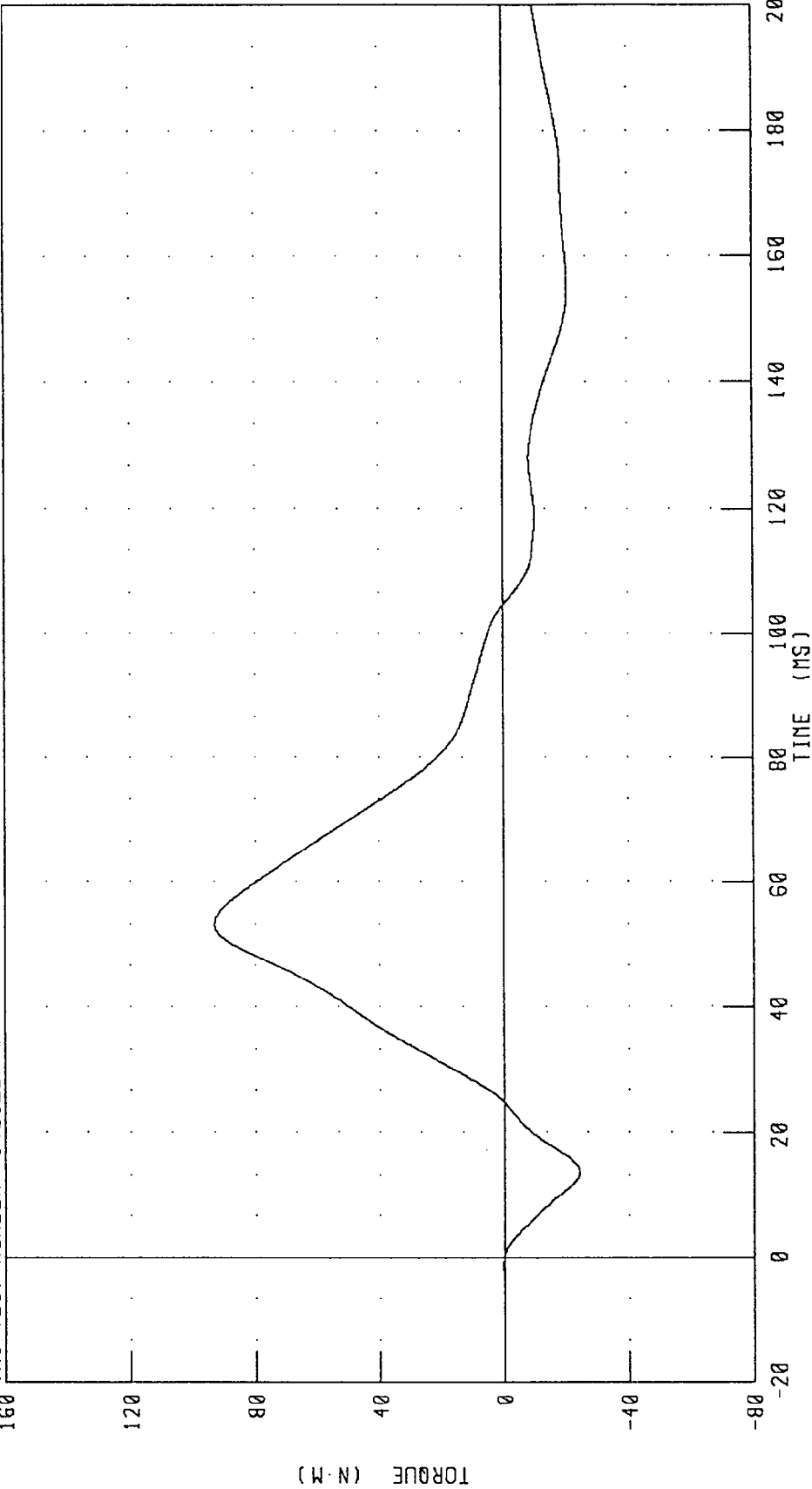
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 060294.1323;1



PEAK DATA: 93.14 N.M @ 53.28 MS; -23.99 N.M @ 13.76 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

19-MAY-94

TRC INC. TEST NO: 142C22NE1 572E SN142 NECK EXT. CAL22

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	54.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.02 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.48 G
	20 MS	14.00 - 19.00 G	17.05 G
	30 MS	11.00 - 16.00 G	13.82 G
MAX PENDULUM G		22 G MAX	20.19 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.81 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.28 MS
D PLANE	MAX	81 - 106 DEG.	98.17 DEG.
ROTATION	TIME	72 - 82 MS	73.12 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-76.12 NM
	TIME	65 - 79 MS	69.60 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	150.96 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.40 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

John K. Clawidge

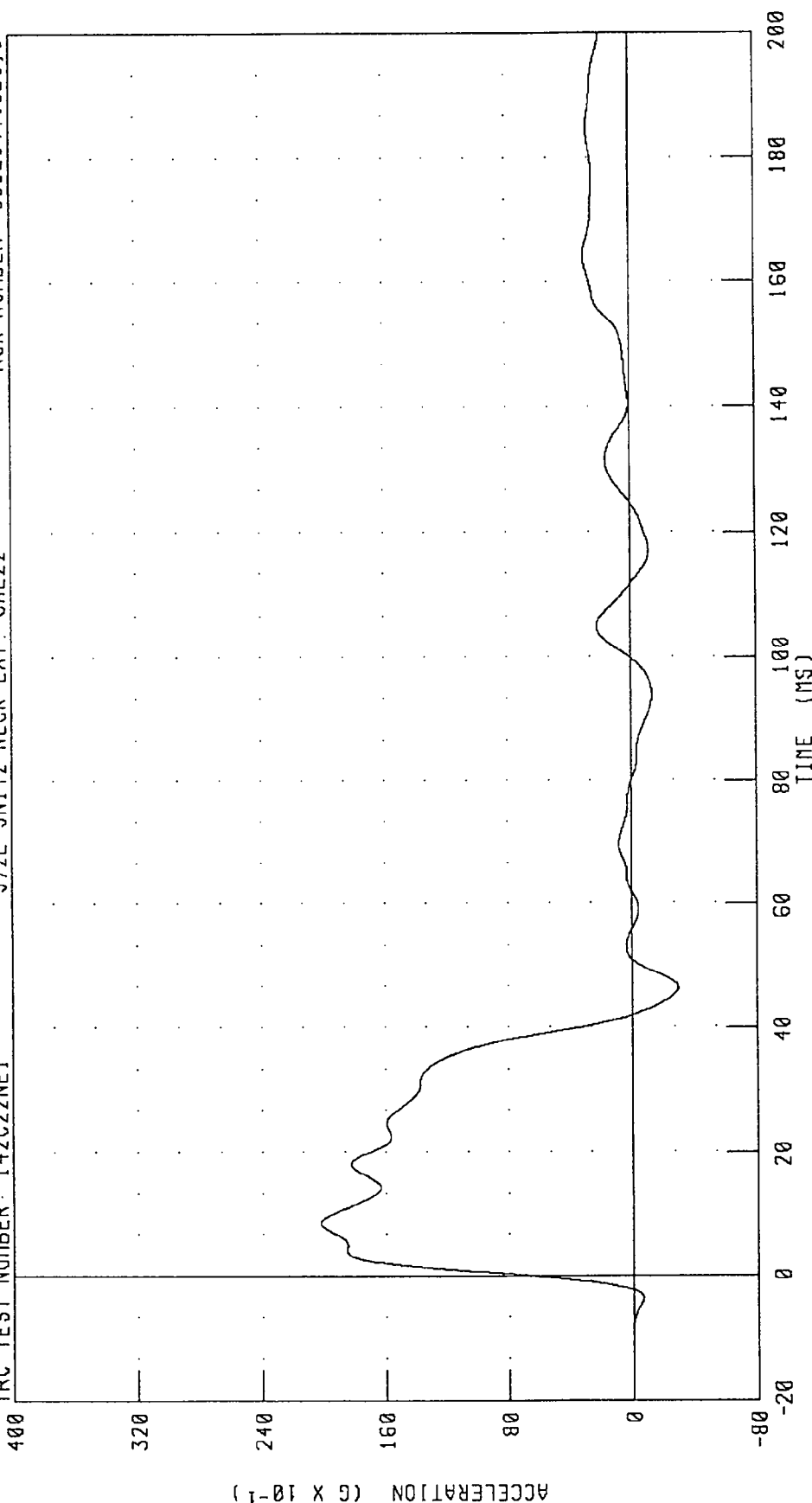
RUN NUMBER: 051994.1044;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 060294.1323;1



PEAK DATA: 20.20 G @ 8.48 MS; -2.93 G @ 46.24 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

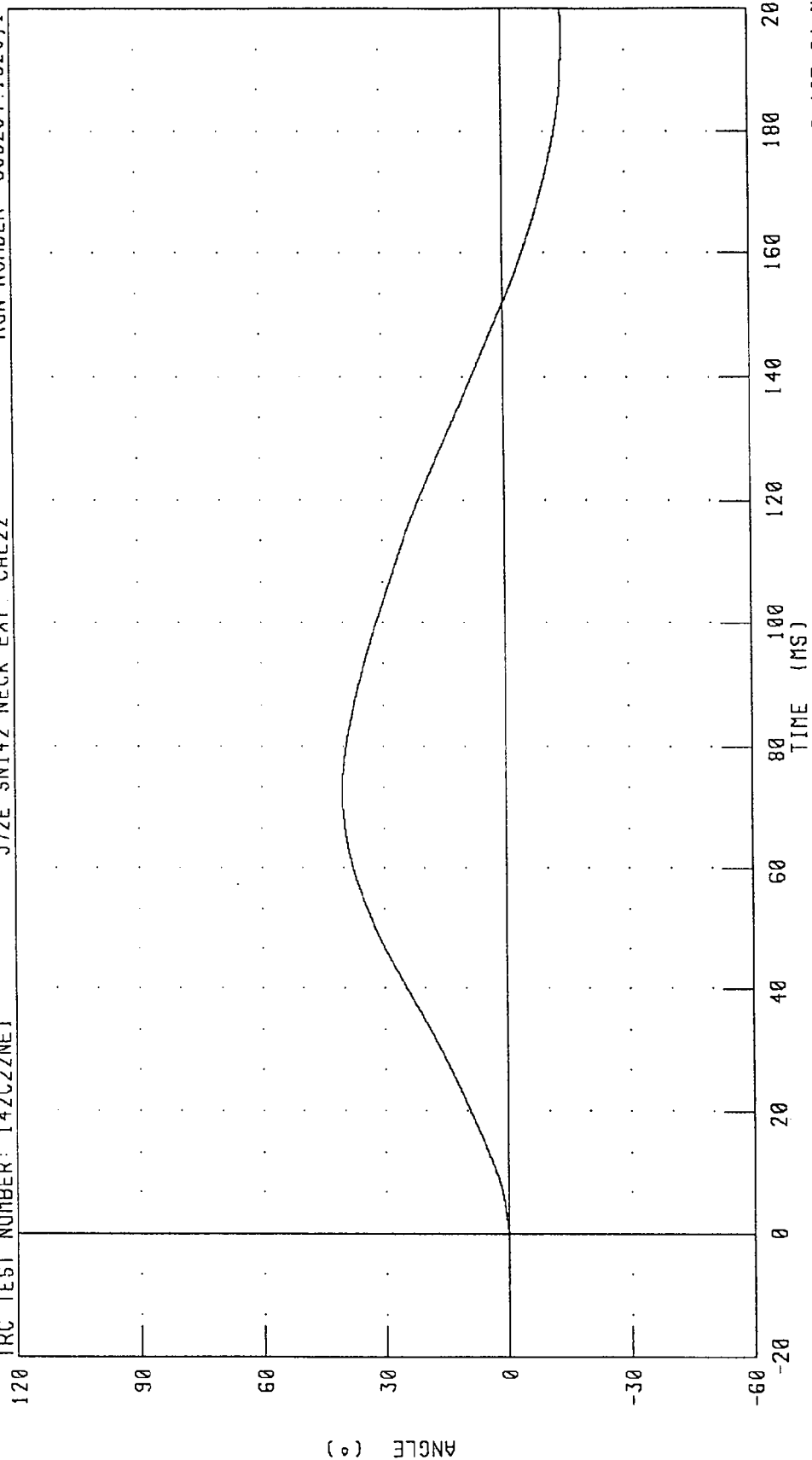
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT BASE OF NECK

572E SN142 NECK EXT CAL22

572E SN142 NECK EXT CAL22

IRC TEST NUMBER: 142C22NE1

RUN NUMBER: 060294.1323,1



PEAK DATA: 40.24 ° @ 72.56 MS; -14.64 ° @ 195.84 MS

CHANNEL: BETA FILTER: CH. CLASS 60

ANGLE (°)

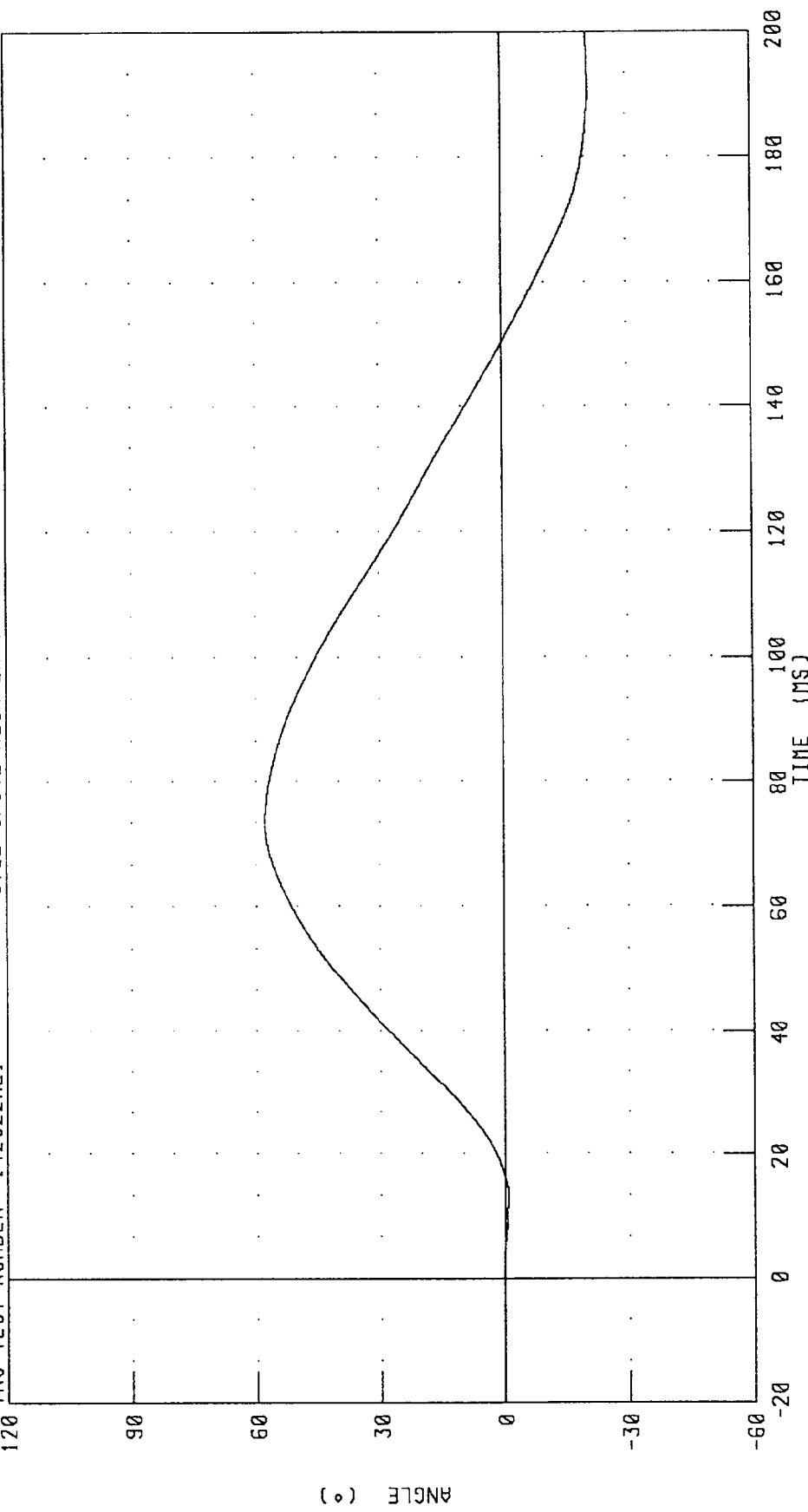
TIME (MS)

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

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 060294.1323;1



PEAK DATA: 57.94 ° @ 73.36 MS; -21.05 ° @ 190.88 MS

CHANNEL: THETA FILTER: CH. CLASS 60

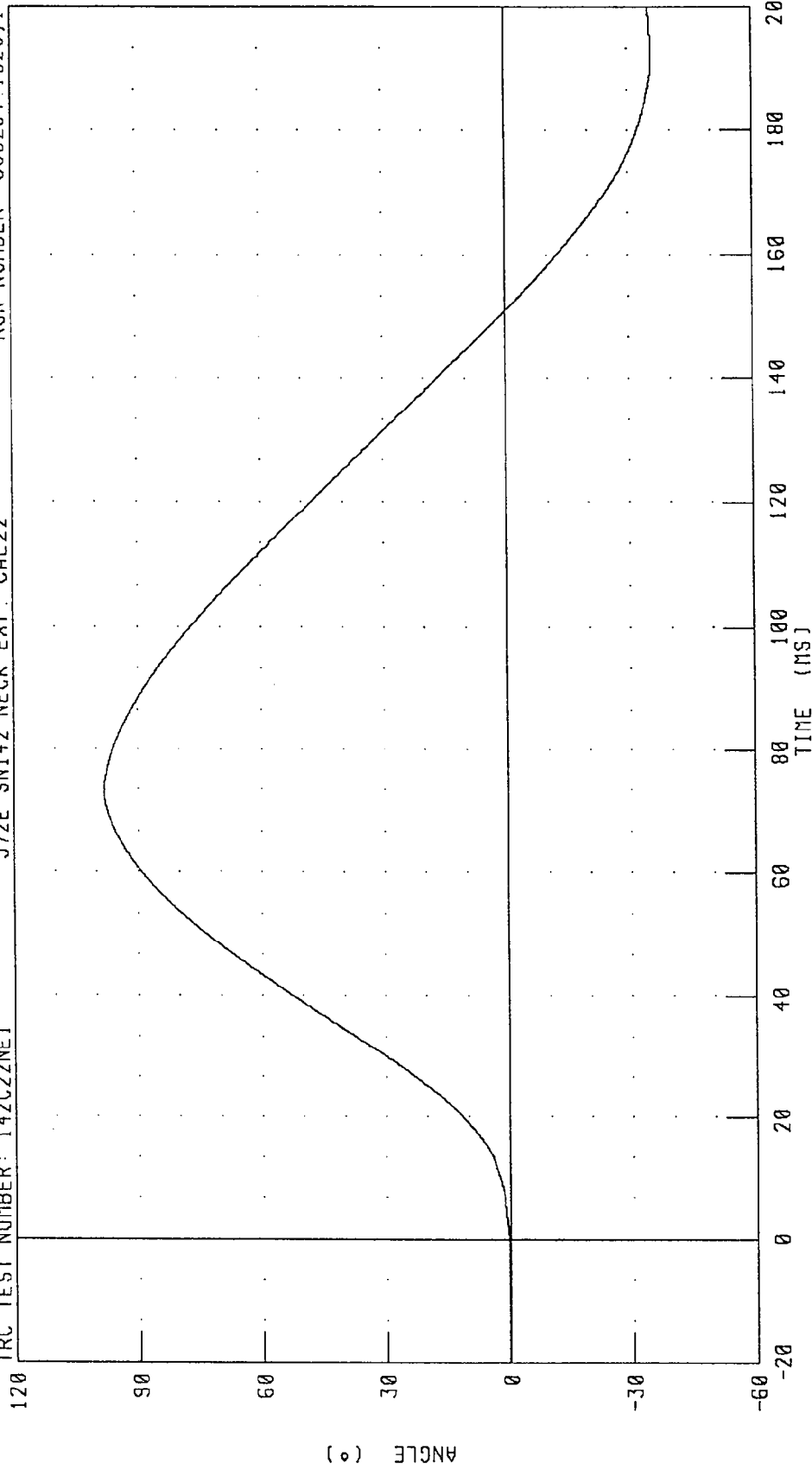
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 060284.1323.1



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 98.18 ° @ 73.12 MS; -35.59 ° @ 191.36 MS

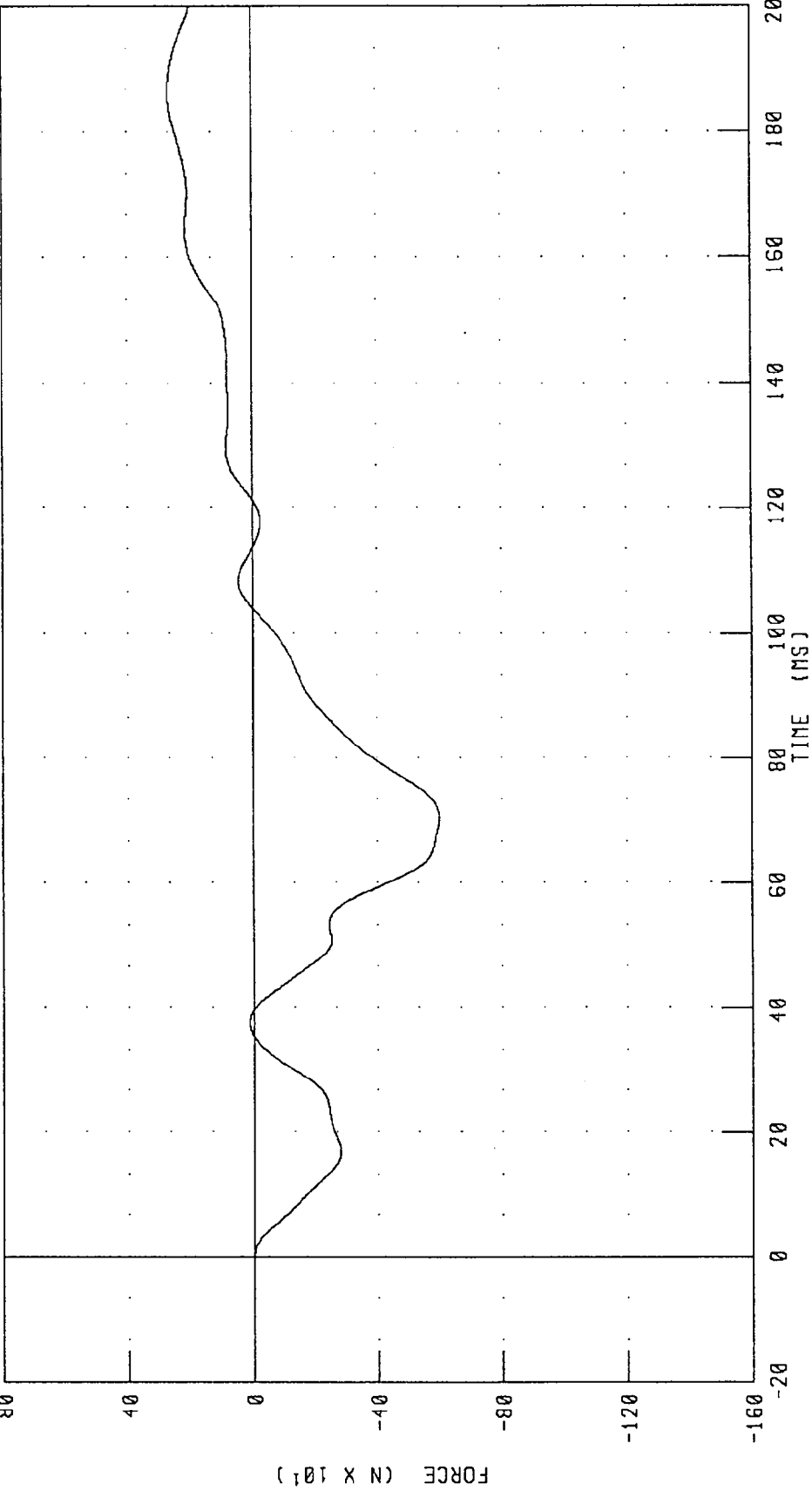
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 060294.1323;1

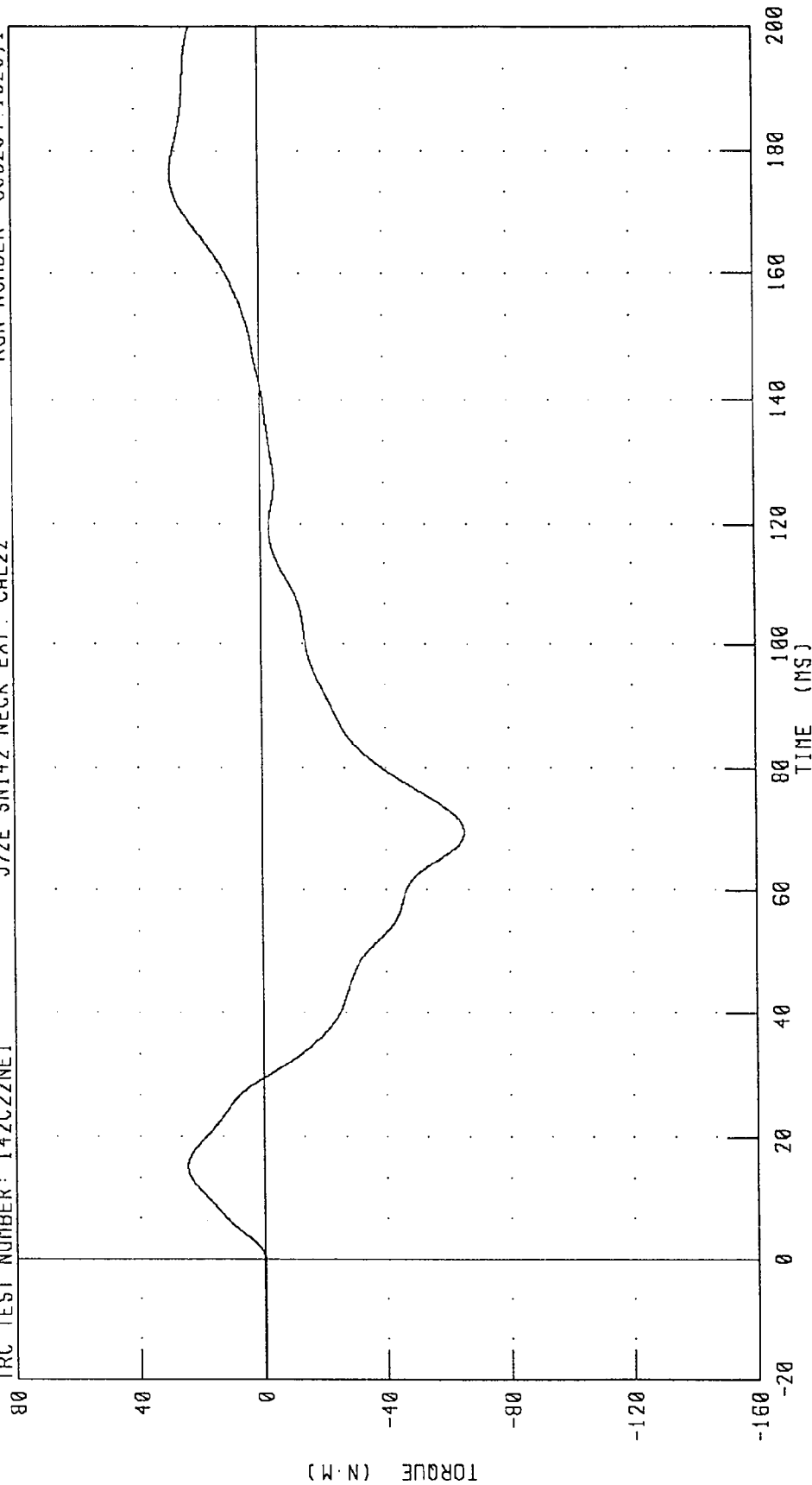


PEAK DATA: 267.39 N @ 186.32 MS; -599.78 N @ 70.32 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C22NE1 572E SN142 NECK EXT. CAL22 RUN NUMBER: 060294.1323.1



PEAK DATA: 28.44 N·M @ 176.48 MS; -65.48 N·M @ 69.60 MS

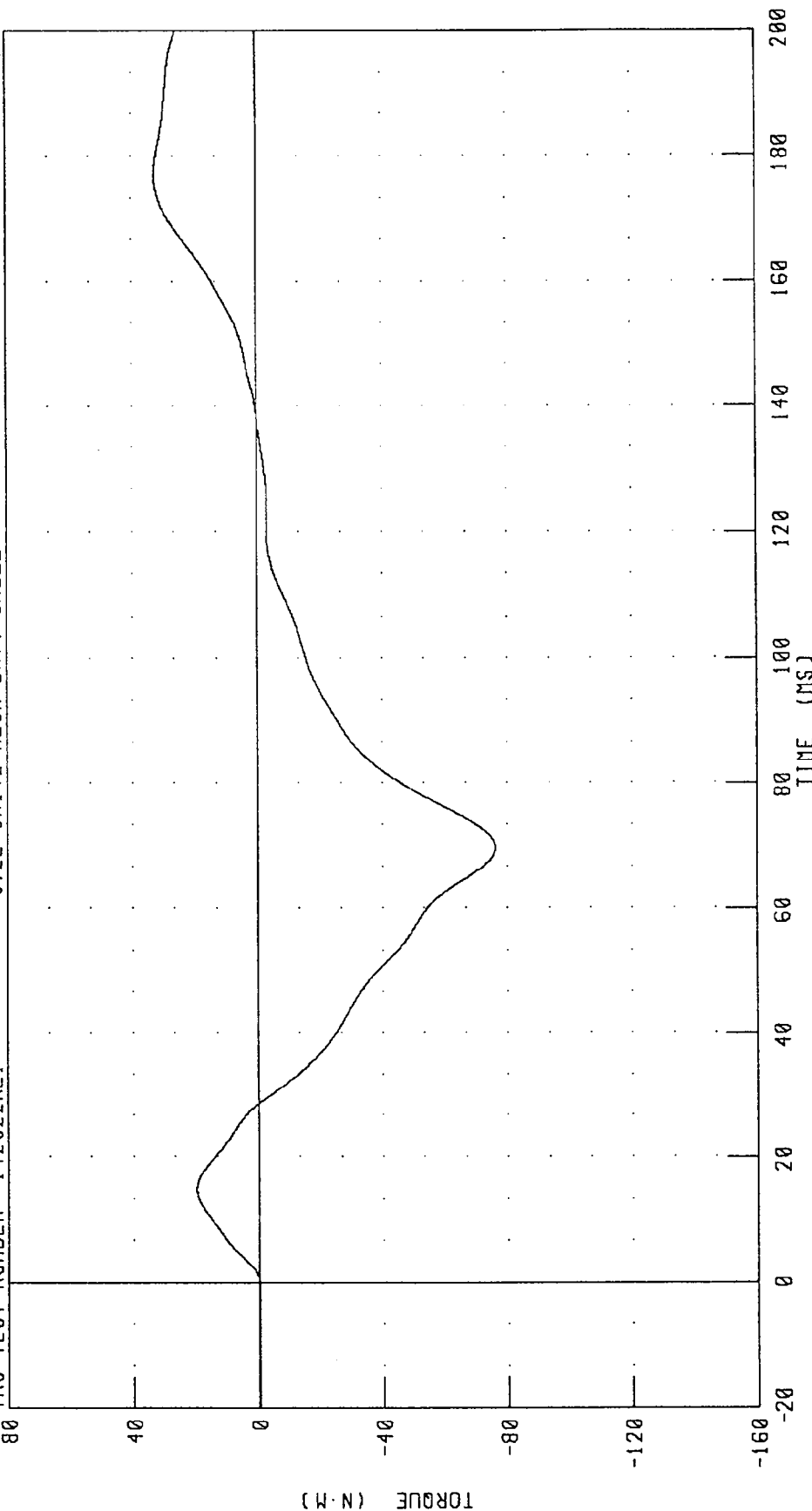
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 060294.1323,1



PEAK DATA: 32.48 N.M @ 177.04 MS; -76.12 N.M @ 69.60 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

19-MAY-94

TRC INC.

TEST NO: 142C22TH1

572E SN142 H.S.THORAX CAL22

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	53.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	71.5 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5413. N
INTERNAL HYSTERESIS	69% - 85%	72.7%

TEST MEETS SPECIFICATIONS

TECHNICIAN

John K. Clavidge

RUN NUMBER: 051994.1214;1

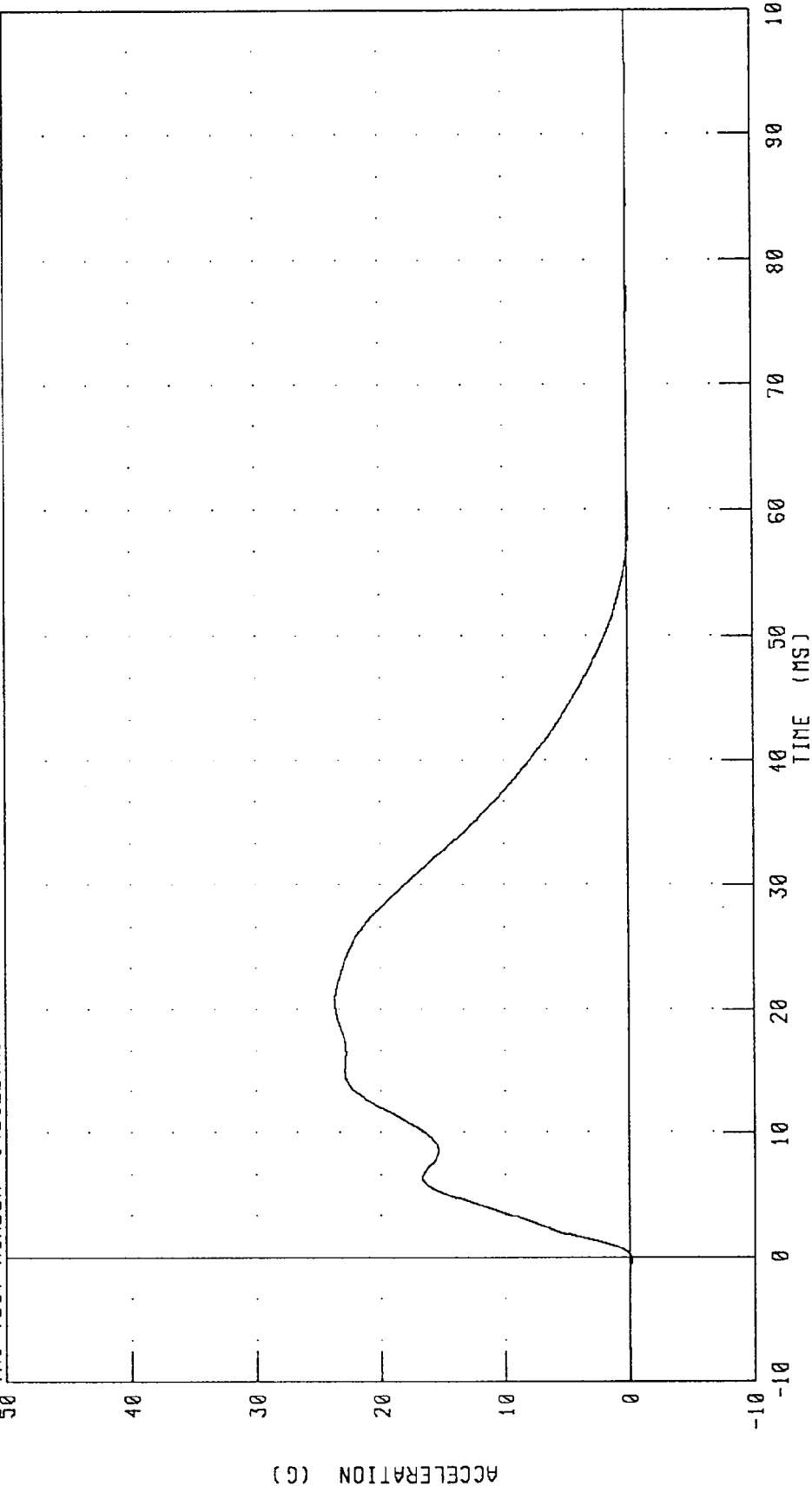
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C22TH1

572E SN142 H.S. THORAX CAL22

RUN NUMBER: 060294.1323,1

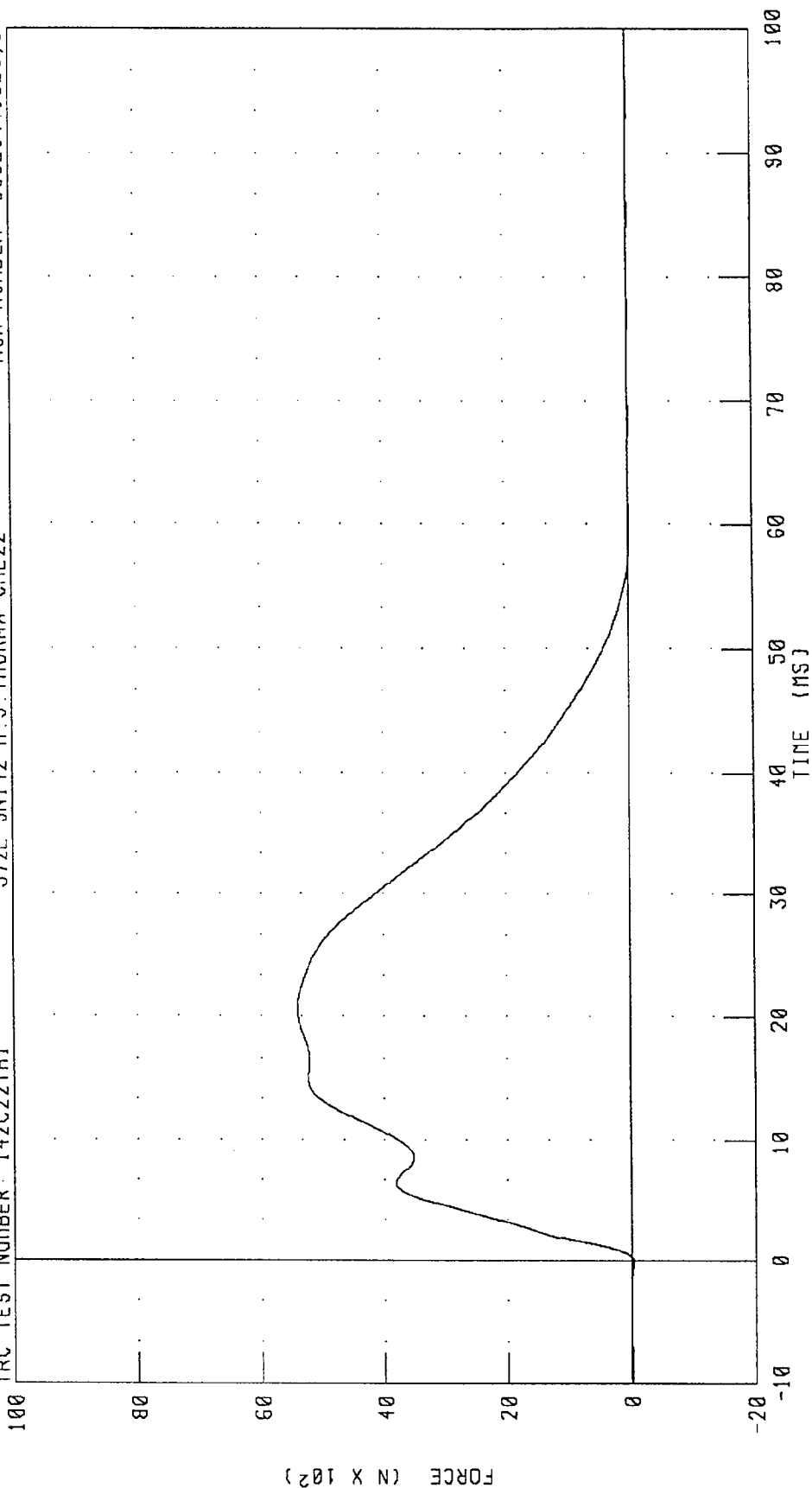


PEAK DATA: 23.63 G @ 20.64 MS; -0.13 G @ -0.16 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM FORCE

TRC TEST NUMBER: 142C22TH1 572E SNI42 H.S. THORAX CAL22 RUN NUMBER: 060294.1323,1



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5413.11 N @ 20.64 MS; -29.83 N @ -0.16 MS

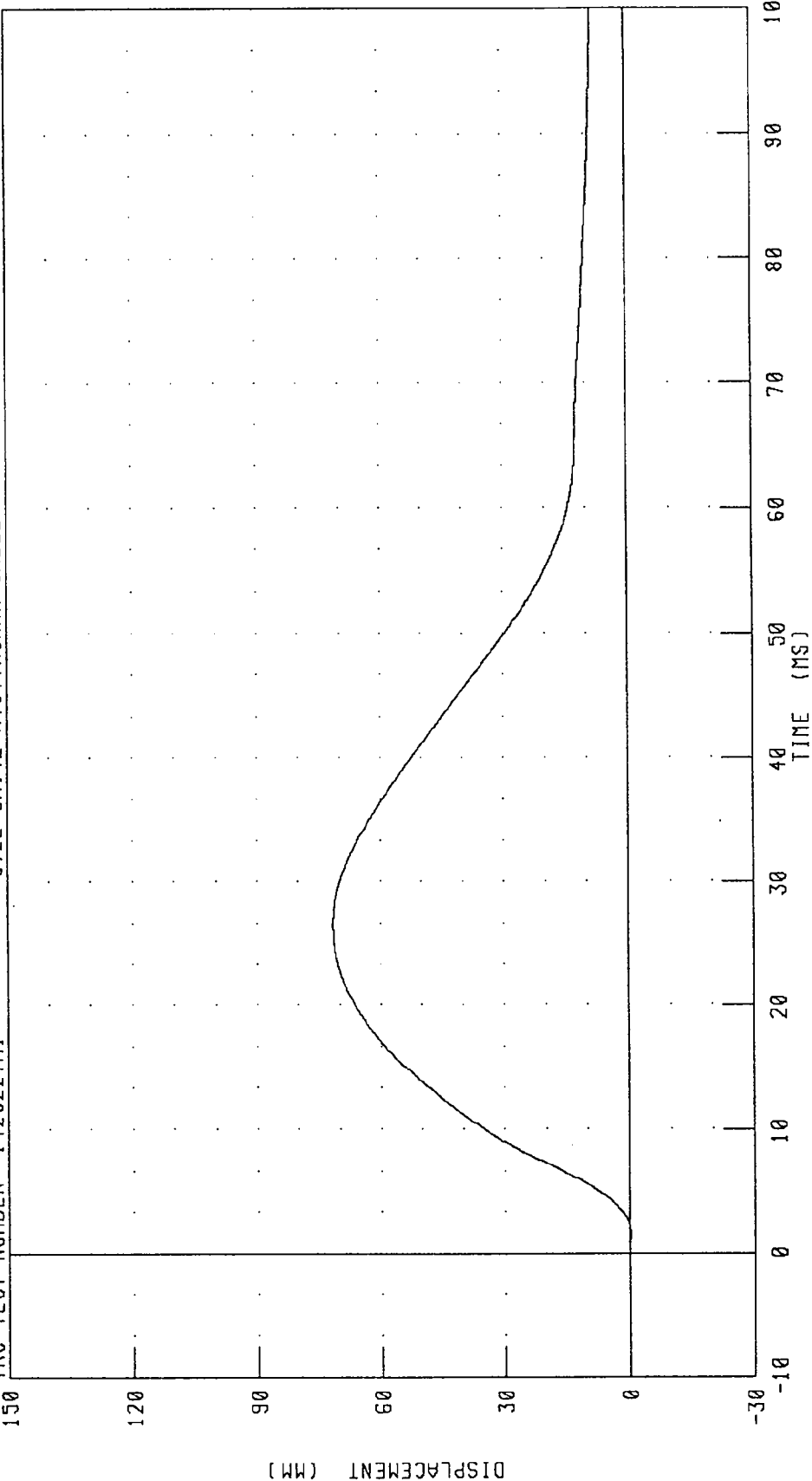
PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

TRC TEST NUMBER: 142C22TH1

572E SN142 H.S. THORAX CAL22

RUN NUMBER: 060294.1323;1



PEAK DATA: 71.59 MM @ 26.64 MS; -0.08 MM @ 1.60 MS

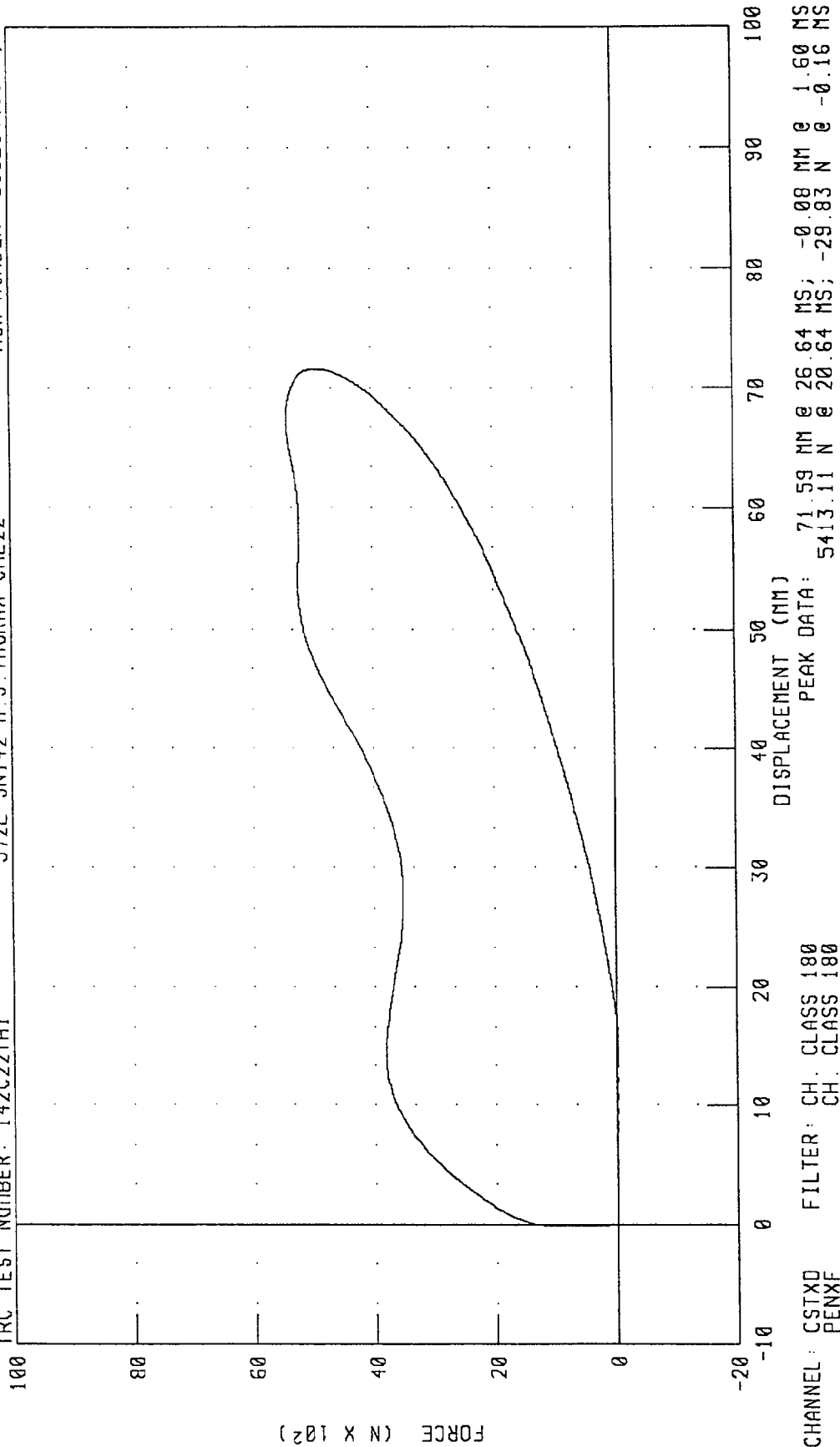
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 142C22TH1

572E SN142 H.S. THORAX CAL22

RUN NUMBER: 060294.1323;1



TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

19-MAY-94

TRC INC.

TEST NO: 142C22RK1

572E SN142 RIGHT KNEE CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	53.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5382.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

John K. Clawidge

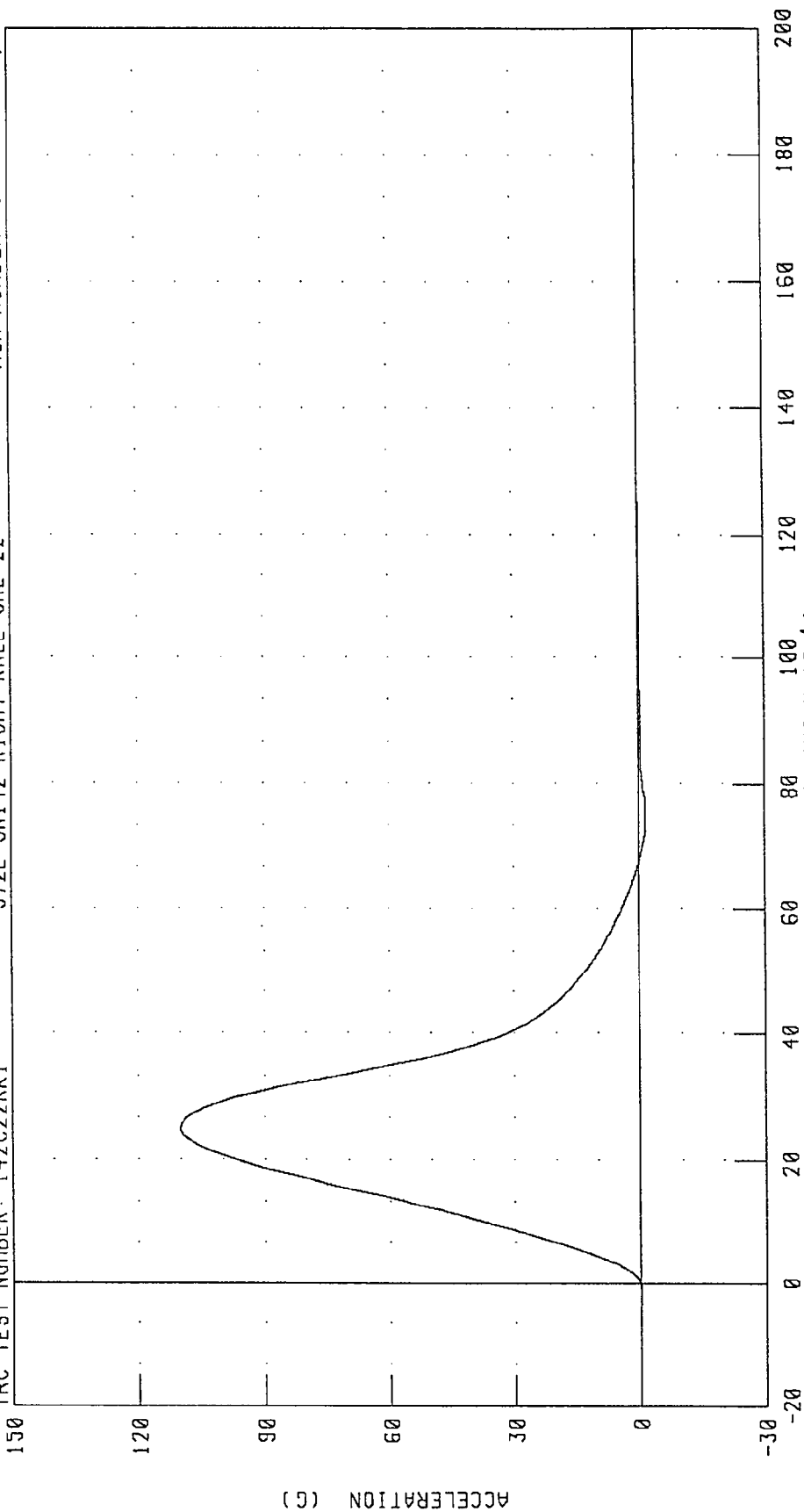
RUN NUMBER: 051994.1039;2

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

TRC TEST NUMBER: 142C22RK1

572E SN142 RIGHT KNEE CAL 22

RUN NUMBER: 060294.1323;2



PEAK DATA: 110.02 G @ 2.48 MS; -1.56 G @ 7.44 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

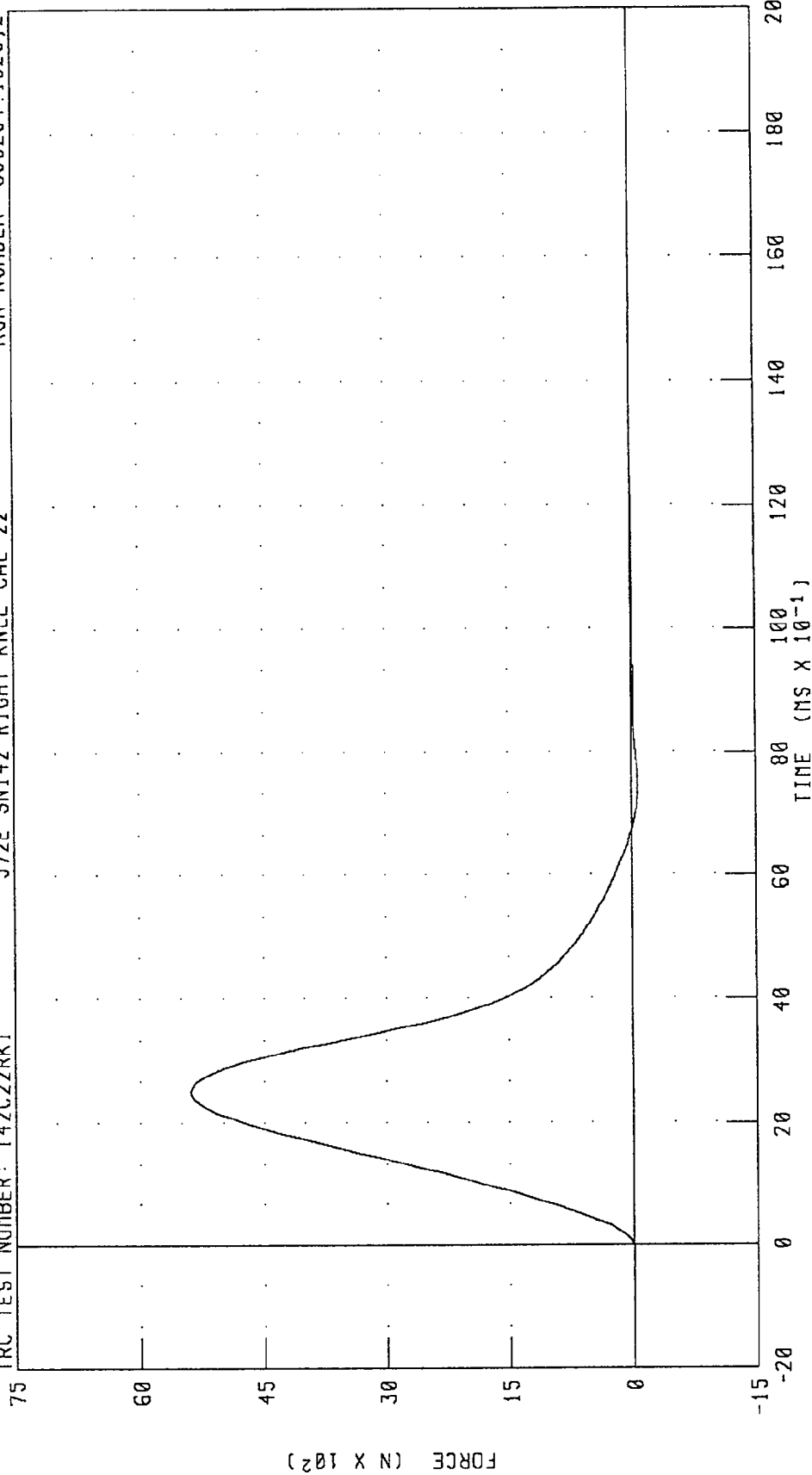
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN142 RIGHT KNEE CAL 22

RUN NUMBER: 060294.1323.2

TRC TEST NUMBER: 142C22RK1



PEAK DATA: 5383.00 N @ 2.48 MS; -76.21 N @ 7.44 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

19-MAY-94

TRC INC.

TEST NO: 142C22LK1

572E SN142 LEFT KNEE CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	53.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5156.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

John K. Clauidge

RUN NUMBER: 051994.0924;1

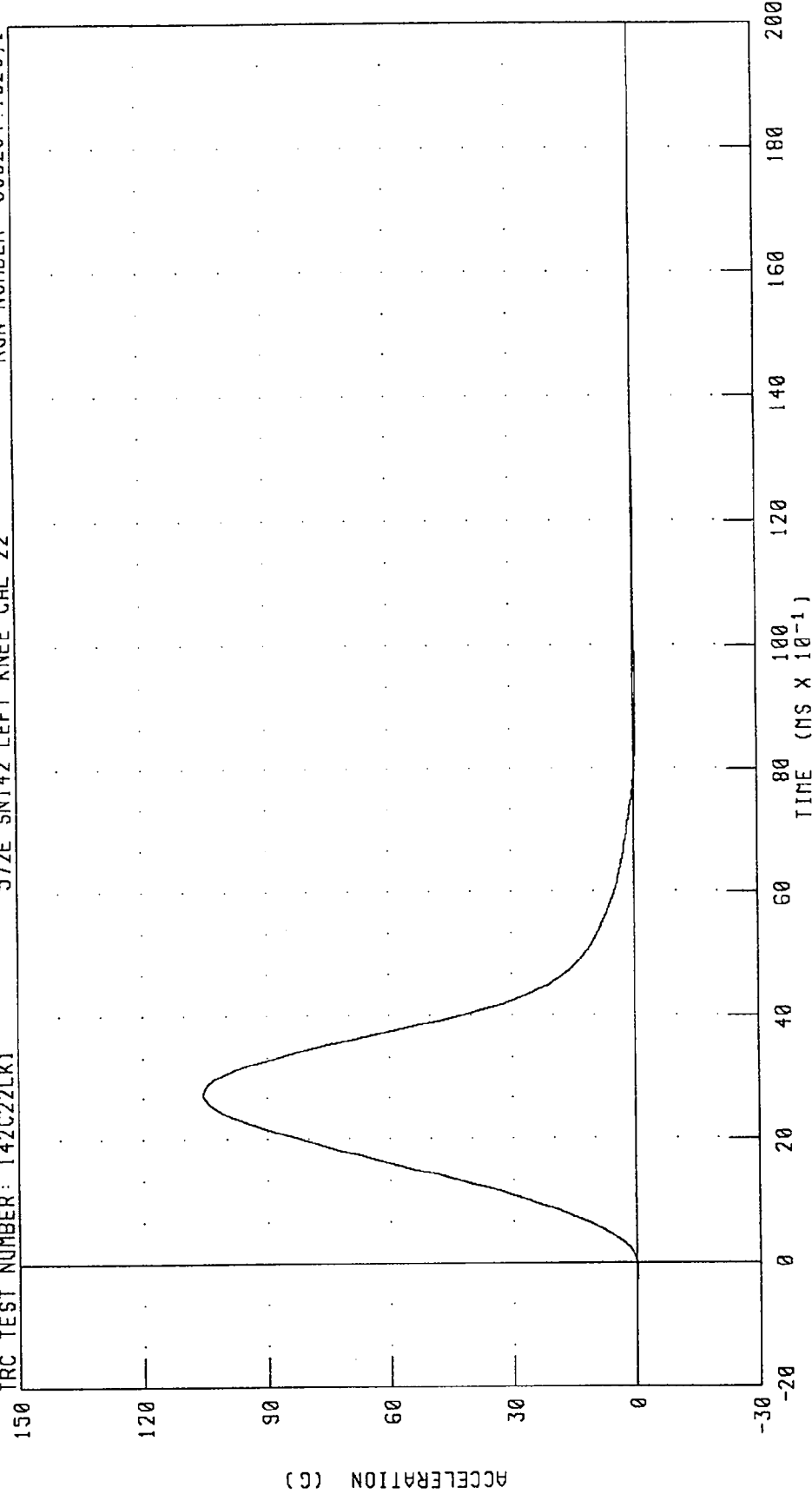
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM DECELERATION (5 KC PEND.)

RUN NUMBER: 060294.1323;1

IRC TEST NUMBER: 142C22LK1

572E SN142 LEFT KNEE CAL 22



CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 105.40 G @ 2.72 MS; -0.46 G @ 9.04 MS

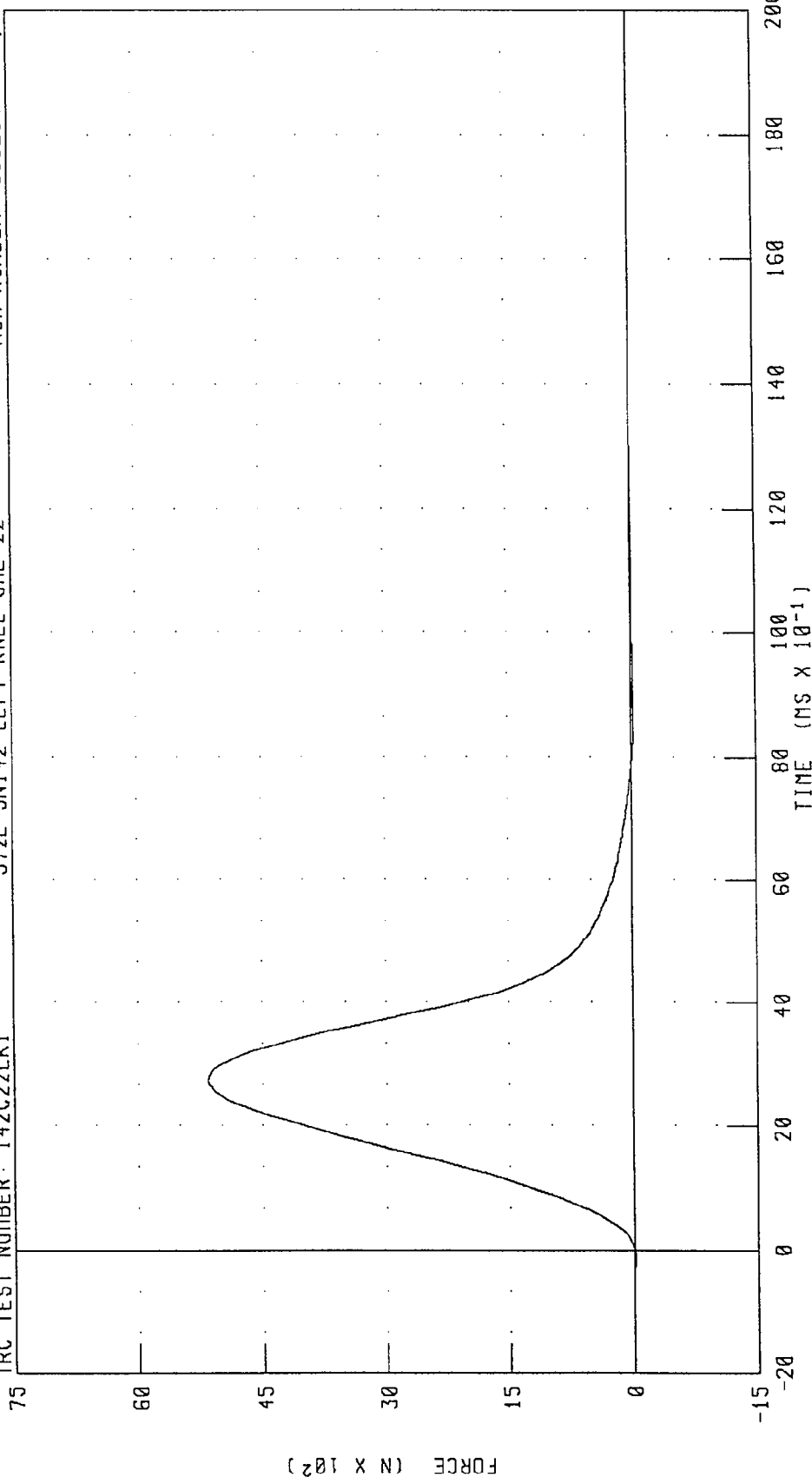
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN142 LEFT KNEE CAL 22

TRC TEST NUMBER: 142C22LK1

RUN NUMBER: 060294.1323,1



PEAK DATA: 5156.95 N @ 2.72 MS; -22.53 N @ 9.04 MS

FILTER: CH. CLASS 600

CHANNEL: PENXF

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER INC.
PART 572B EXTERNAL DIMENSIONS
SN 713 HUMANOID

02-MAY-94

TRC INC. TEST NO: ED71309 572B SN713 EXT.DIMENSION CAL09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
SITTING HEIGHT	904 - 909 MM	904. MM
SHOULDER PIVOT HEIGHT	553 - 569 MM	561. MM
HIP PIVOT HEIGHT	99 MM	REFERENCE
HIP PIVOT FROM BACKLINE	122 MM	REFERENCE
KNEE PIVOT FROM BACKLINE	511 - 526 MM	521. MM
REAR OF HEAD FROM BACKLINE	43 MM	REFERENCE
CHEST DEPTH	231 - 241 MM	239. MM
SHOULDER WIDTH	452 - 467 MM	455. MM
CHEST CIRCUMFERENCE OVER NIPPLES	935 - 965 MM	958. MM
WAIST CIRCUMFERENCE AT MIN. GIRTH	798 - 828 MM	818. MM
HIP WIDTH	356 - 391 MM	378. MM
KNEE PIVOT FROM FLOOR	490 - 506 MM	498. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

John K. Clawidge

RUN NUMBER: 050294.1029

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B

27-APR-94

TRC INC.

TEST NO: HD71309

572B SN 713 HEAD DROP CAL 09

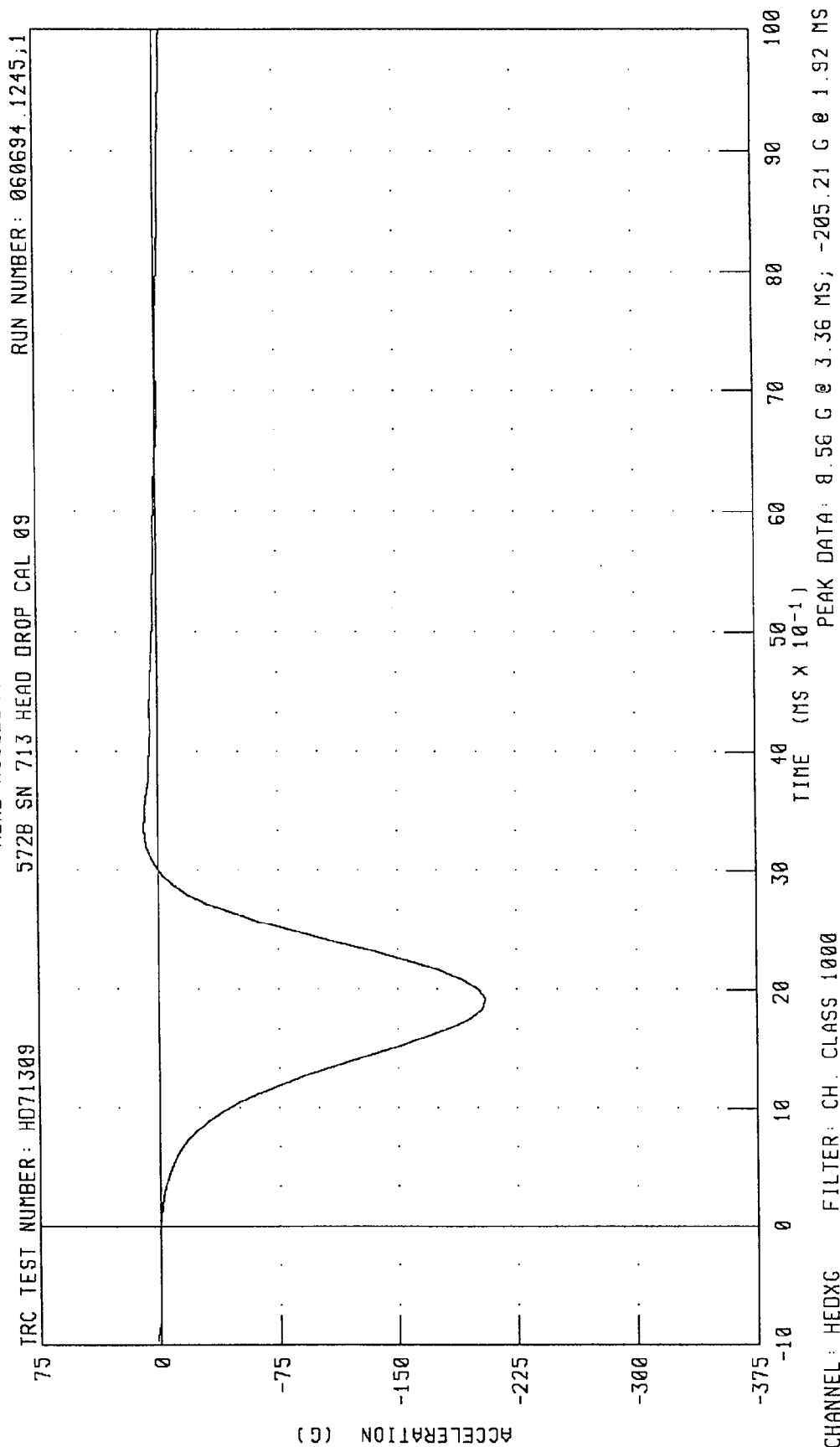
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	57 %
PEAK RESULTANT ACCELERATION	210 - 260 G	244.46 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.25 MS
PEAK LATERAL ACCELERATION	10 G MAX	-2.12 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN John K. Clawidge

RUN NUMBER: 042794.1059;1

PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD ACCELERATION X AXIS



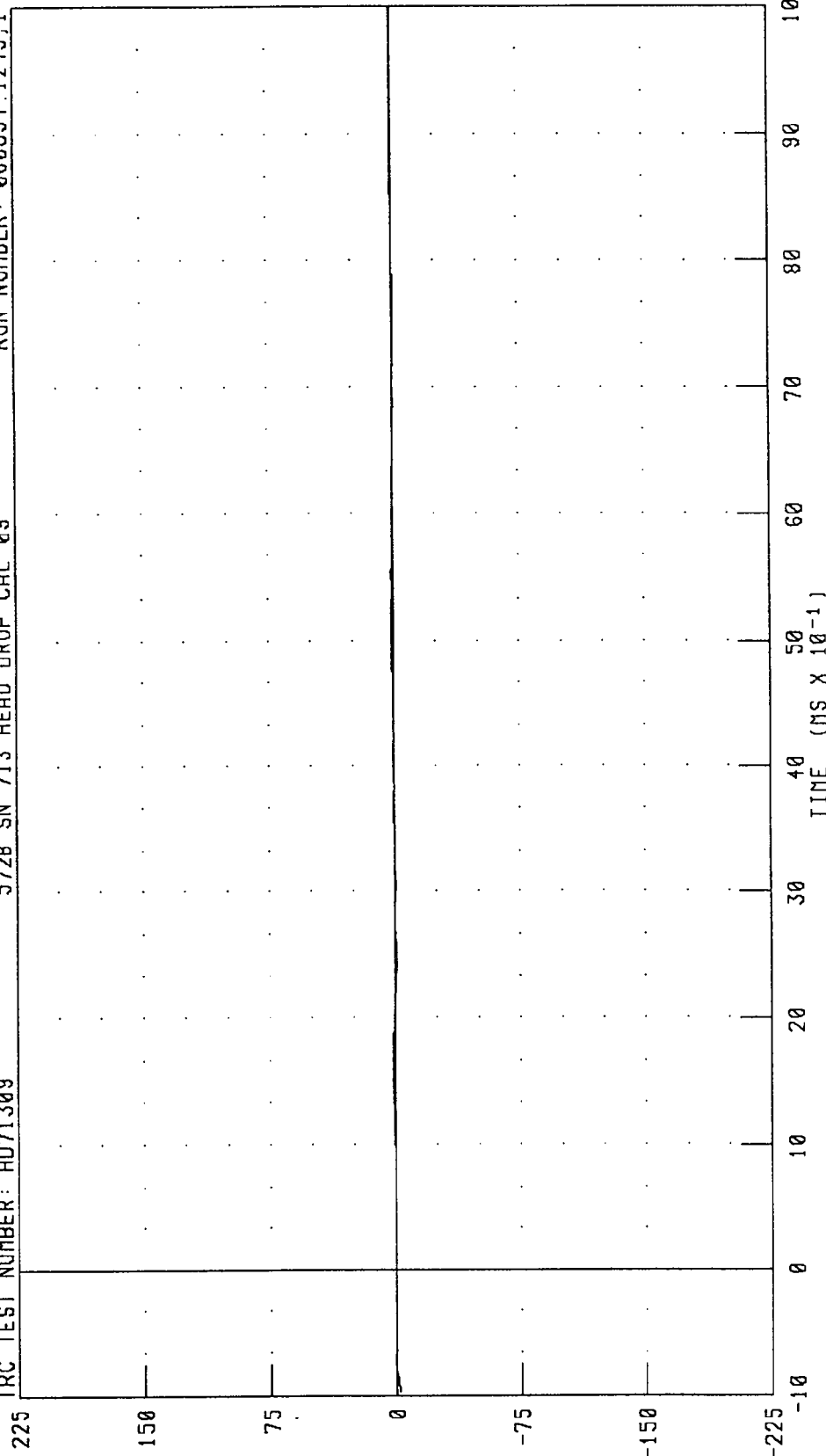
PART 572-8 HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HD71309

5728 SN 713 HEAD DROP CAL 08

RUN NUMBER: 060694.1245.1



PEAK DATA: 1.34 G @ 1.60 MS; -2.12 G @ -0.96 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

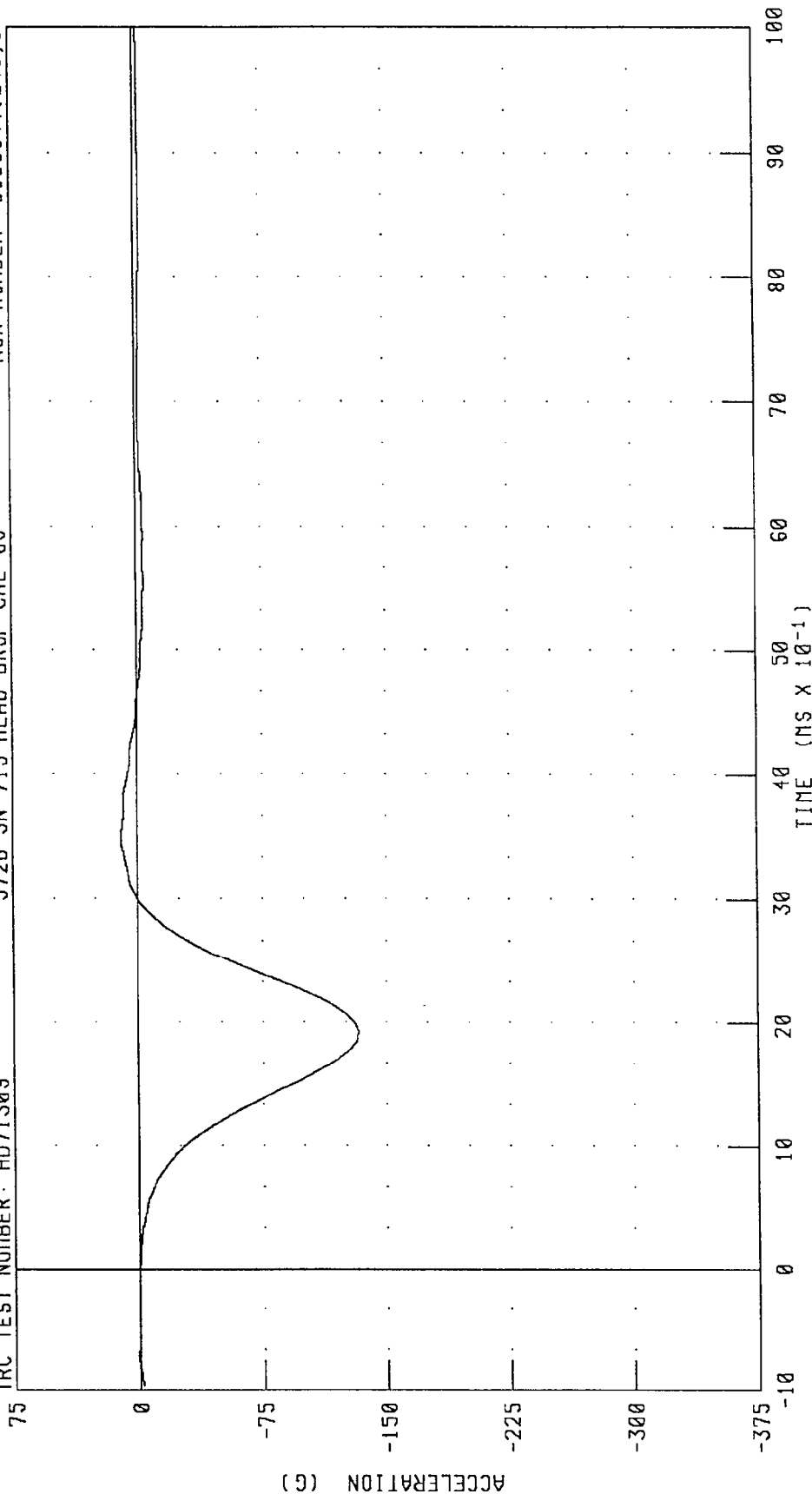
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HD71309

572B SN 713 HEAD DROP CAL 09

RUN NUMBER: 060694.1245;1



CHANNEL: HEDZG FILTER: CH. CLASS 1000

PEAK DATA: 9.63 G @ 3.52 MS; -132.84 G @ 1.92 MS

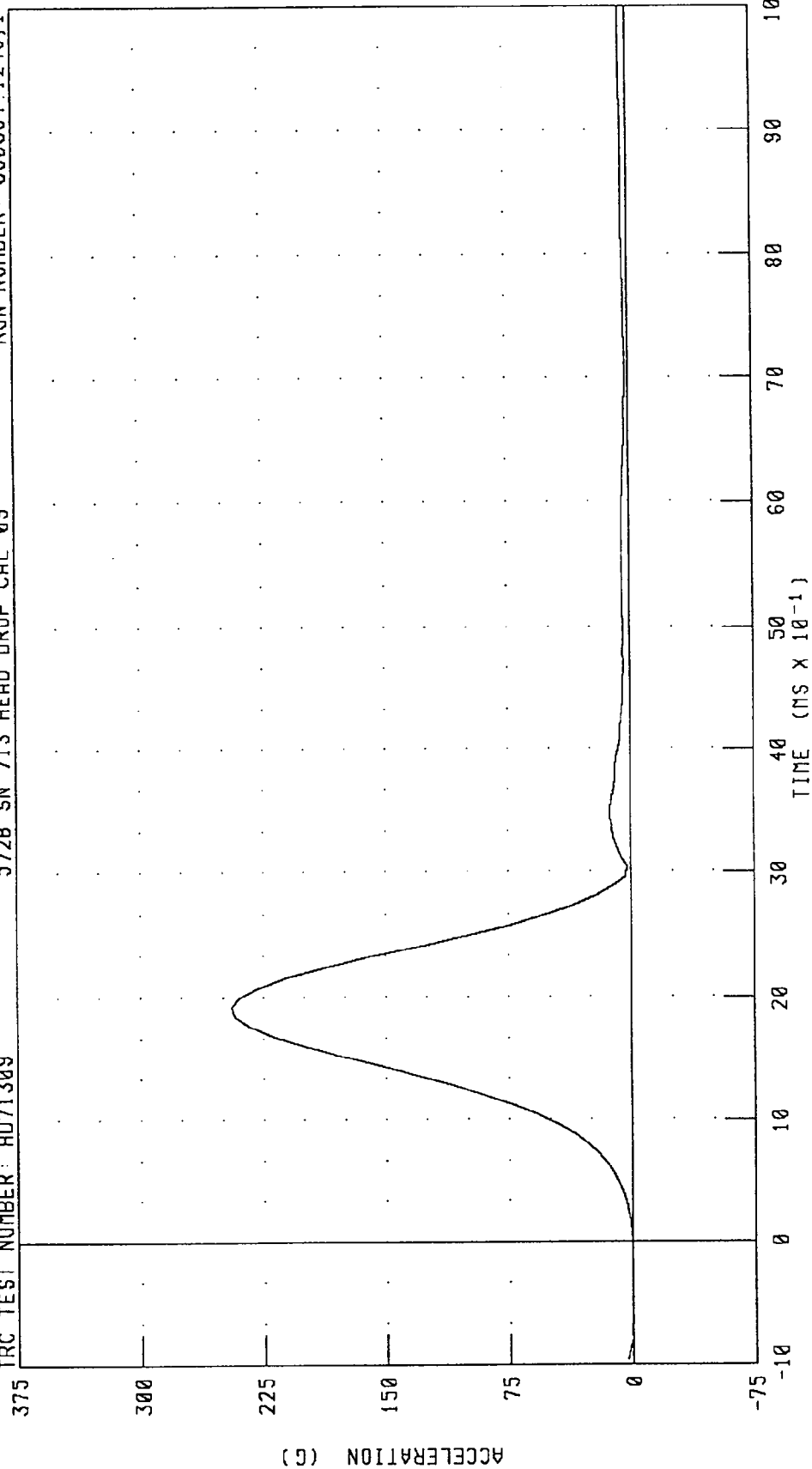
PART 572-B HYBRID II HEAD DROP CALIBRATION

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HD71309

572B SN 713 HEAD DROP CAL 09

RUN NUMBER: 060694.1245,1



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 244.46 G @ 1.92 MS; 0.04 G @ -0.32 MS

TRANSPORTATION RESEARCH CENTER INC.
NECK PENDULUM TEST
PART 572B

27-APR-94

TRC INC. TEST NO: HN71309 572B SN 713 HEAD/NECK CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	57 %
PENDULUM VELOCITY	6.55 - 7.77 M/S	7.33 M/S
PENDULUM DECELERATION:		
T1 - T2 TIME (5 - 20 G)	3 MS MAX	1.86 MS
T2 - T3 TIME (20 - 20 G)	25 - 30 MS	28.25 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	4.01 MS
AVG. G LEVEL T2 - T3	20 - 24 G	23.66 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG.	68.27 DEG.
PEAK HEAD RESULTANT ACCEL	26 G MAX	22.48 G
PENDULUM REVERSAL TIME AFTER NECK RETURN TIME	> 0 MS	16.42 MS

TEST PARAMETER	SPECIFICATION		TEST RESULTS	
ROTATION ANGLE (DEGREES)	TIME (MS)	CHORDAL DISP. (MM)	TIME (MS)	CHORDAL DISP. (MM)
0	-2.0 - +2.0	-12.7 - +12.7	1.12	0.06
30	25.6 - 34.4	53.3 - 78.7	30.14	62.74
60	40.3 - 51.7	109.2 - 134.6	46.20	120.70
MAX	53.2 - 66.8	127.0 - 152.4	60.80	139.50
60	67.0 - 83.0	109.2 - 134.6	75.67	123.98
30	85.4 - 104.6	53.3 - 78.7	95.74	59.96
0	101.0 - 123.0	-12.7 - +12.7	110.02	3.04

DUMMY MEETS SPECIFICATIONS

SND: 151.13 MM

TECHNICIAN

John K. Clauwidge

RUN NUMBER: 042794.1234;1

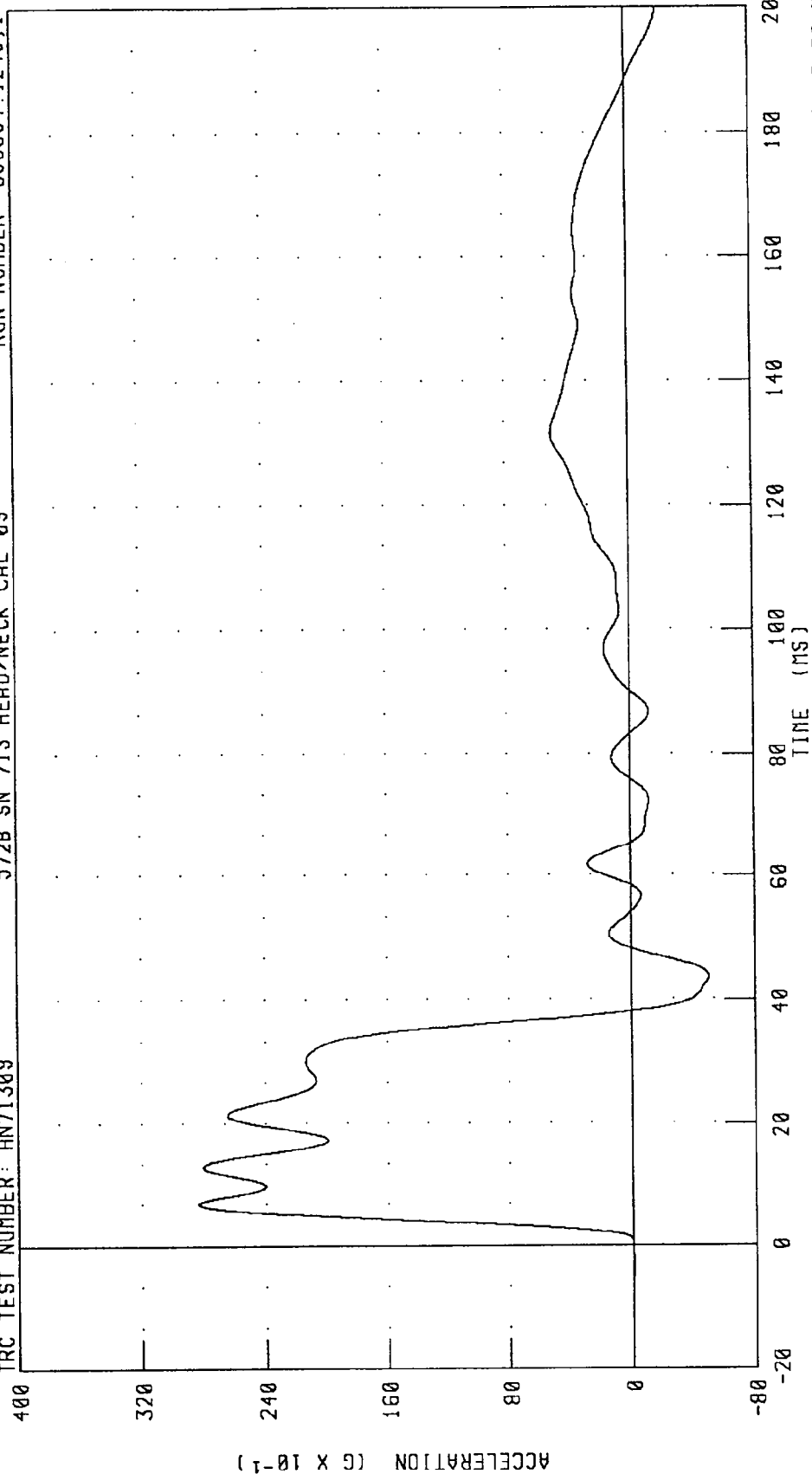
PART 572-B HYBRID II HEAD/NECK CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: HN71389

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245.1



PEAK DATA: 28.35 G @ 6.72 MS; -4.99 G @ 43.68 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

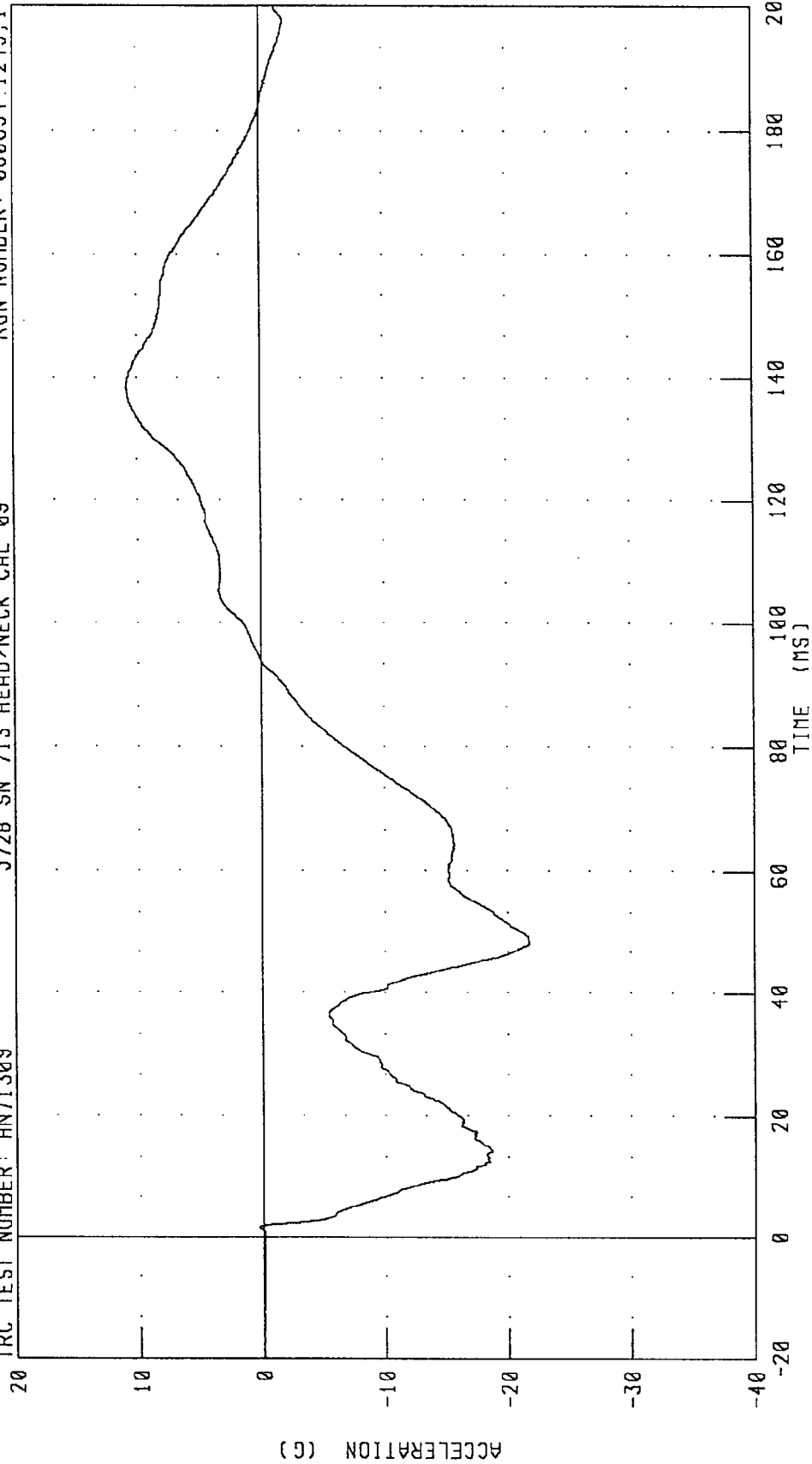
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HN71309

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245;1



PEAK DATA: 10.87 G @ 139.04 MS, -21.80 G @ 48.48 MS

CHANNEL: HEDXC FILTER: CH. CLASS 1000

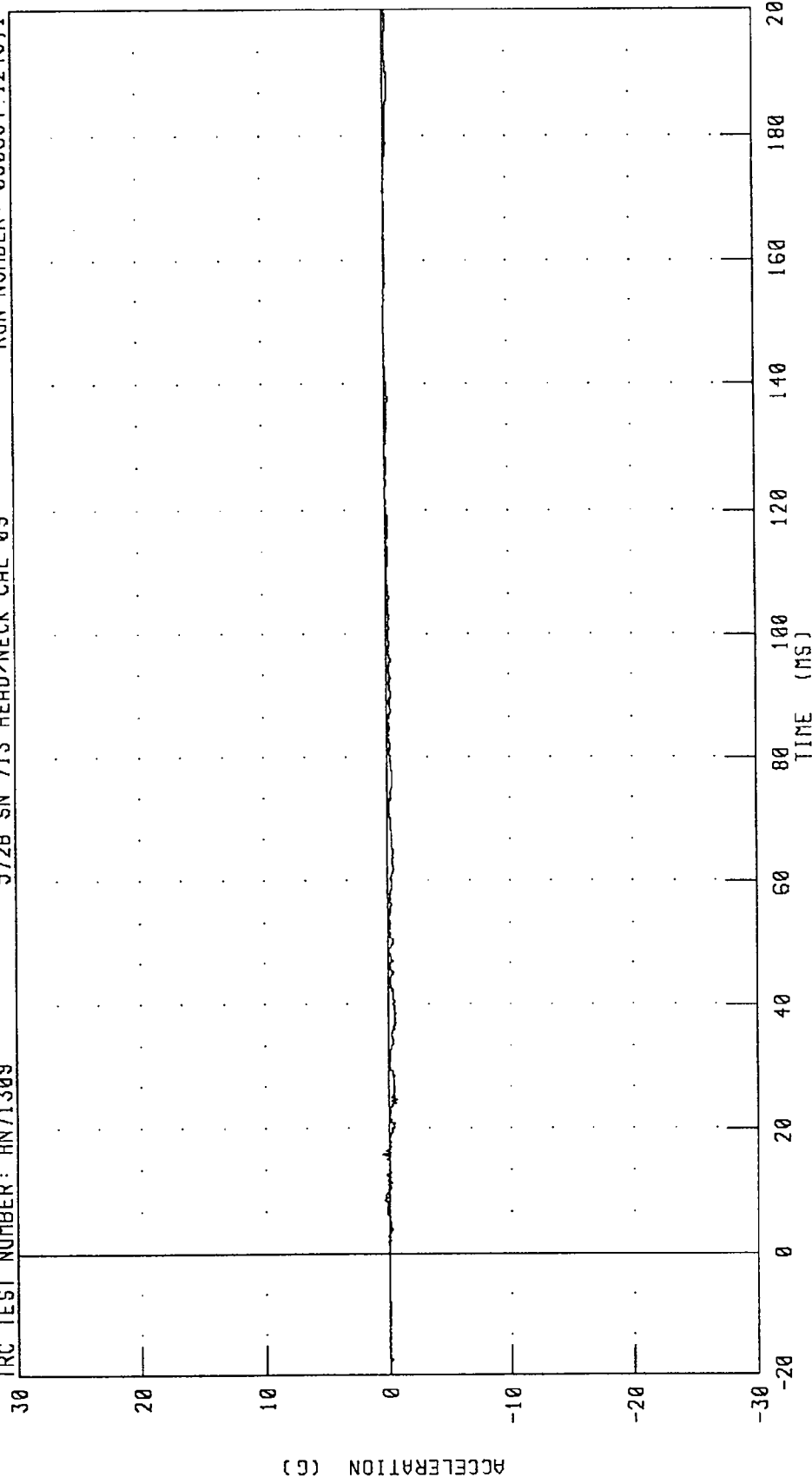
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HN71309

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245.1



PEAK DATA: 0.47 G @ 15.76 MS; -0.66 G @ 24.72 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

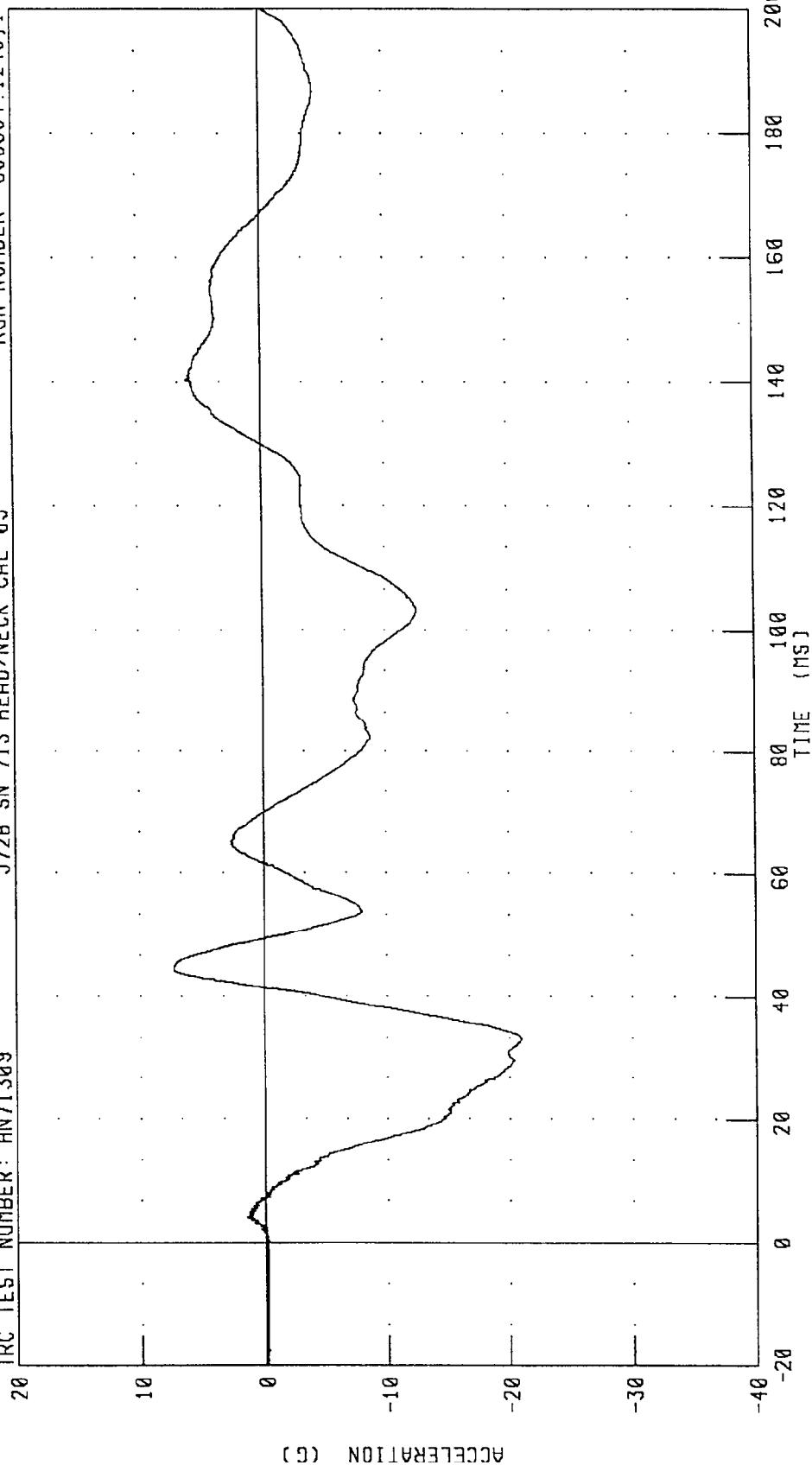
PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION Z AXIS

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245;1

TRC TEST NUMBER: HN71309



PEAK DATA: 7.28 G @ 44.64 MS; -20.98 G @ 33.12 MS

CHANNEL: HEOZG FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD RESULTANT ACCELERATION

572B SN 713 HEAD/NECK CAL 09 RUN NUMBER: 060694.1245,1

TRC TEST NUMBER: HN71309

50

40

30

20

10

0

-10

ACCELERATION (G)

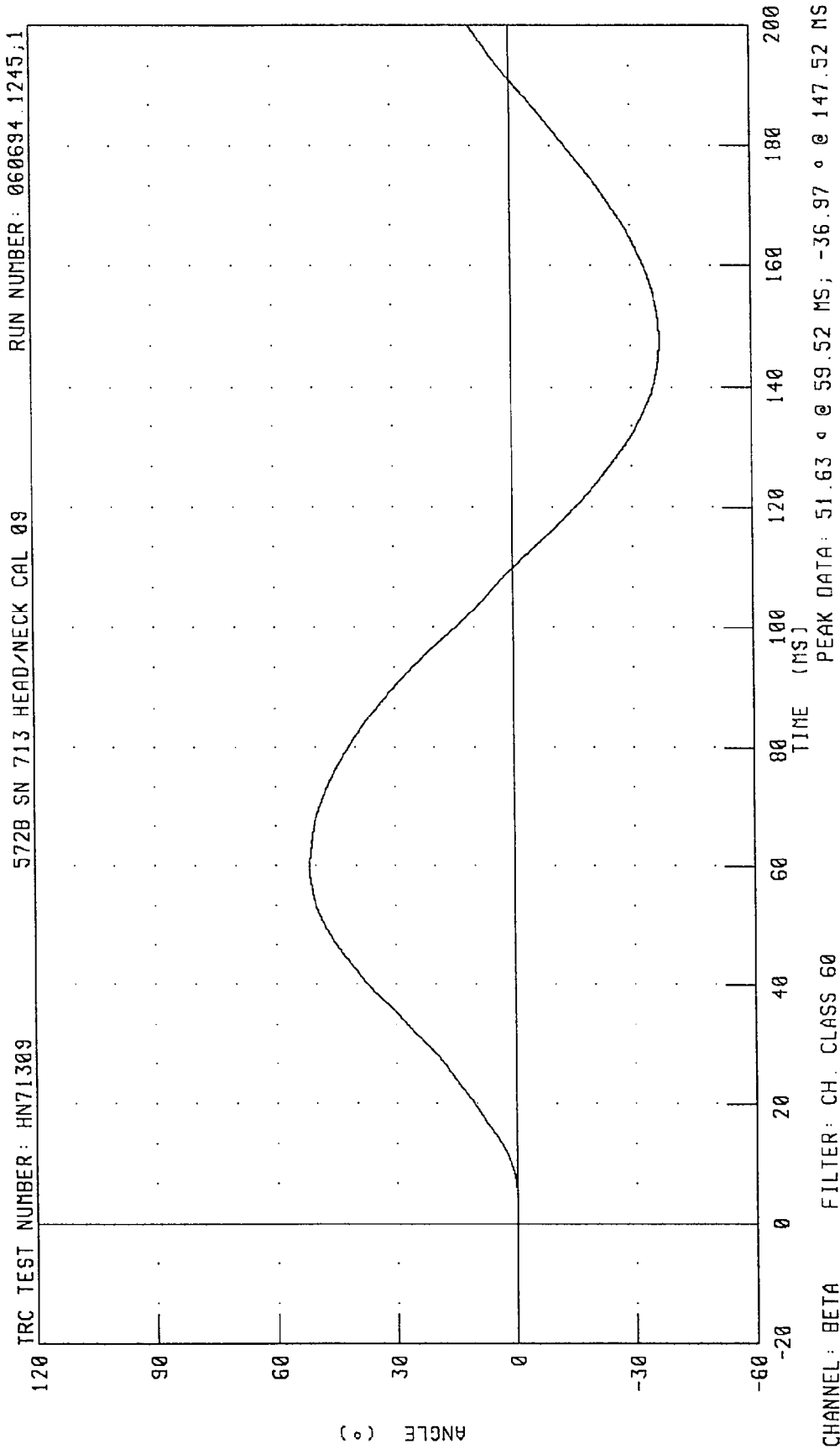
TIME (MS)

0 20 40 60 80 100 120 140 160 180 200

PEAK DATA: 22.48 G @ 29.36 MS, 0.09 G @ -17.12 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

PART 572-B HYBRID II HEAD/NECK CALIBRATION
 ROTATION ABOUT THE BASE OF THE NECK



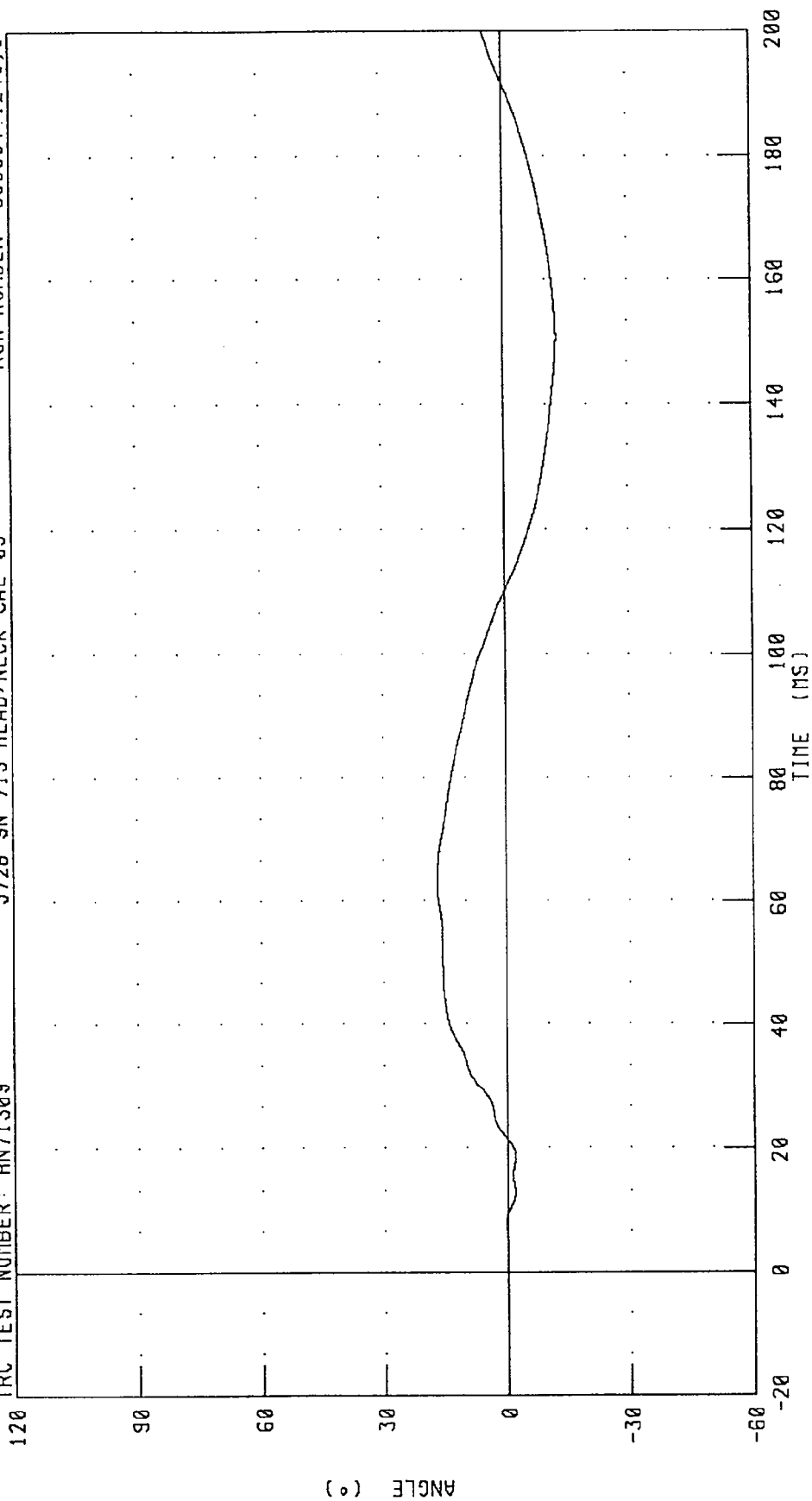
PART 572-B HYBRID II HEAD/NECK CALIBRATION

ROTATION ABOUT THE HEAD C.G.

TRC TEST NUMBER: HN71309

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245.1



CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 16.81 ° @ 62.40 MS; -12.79 ° @ 150.56 MS

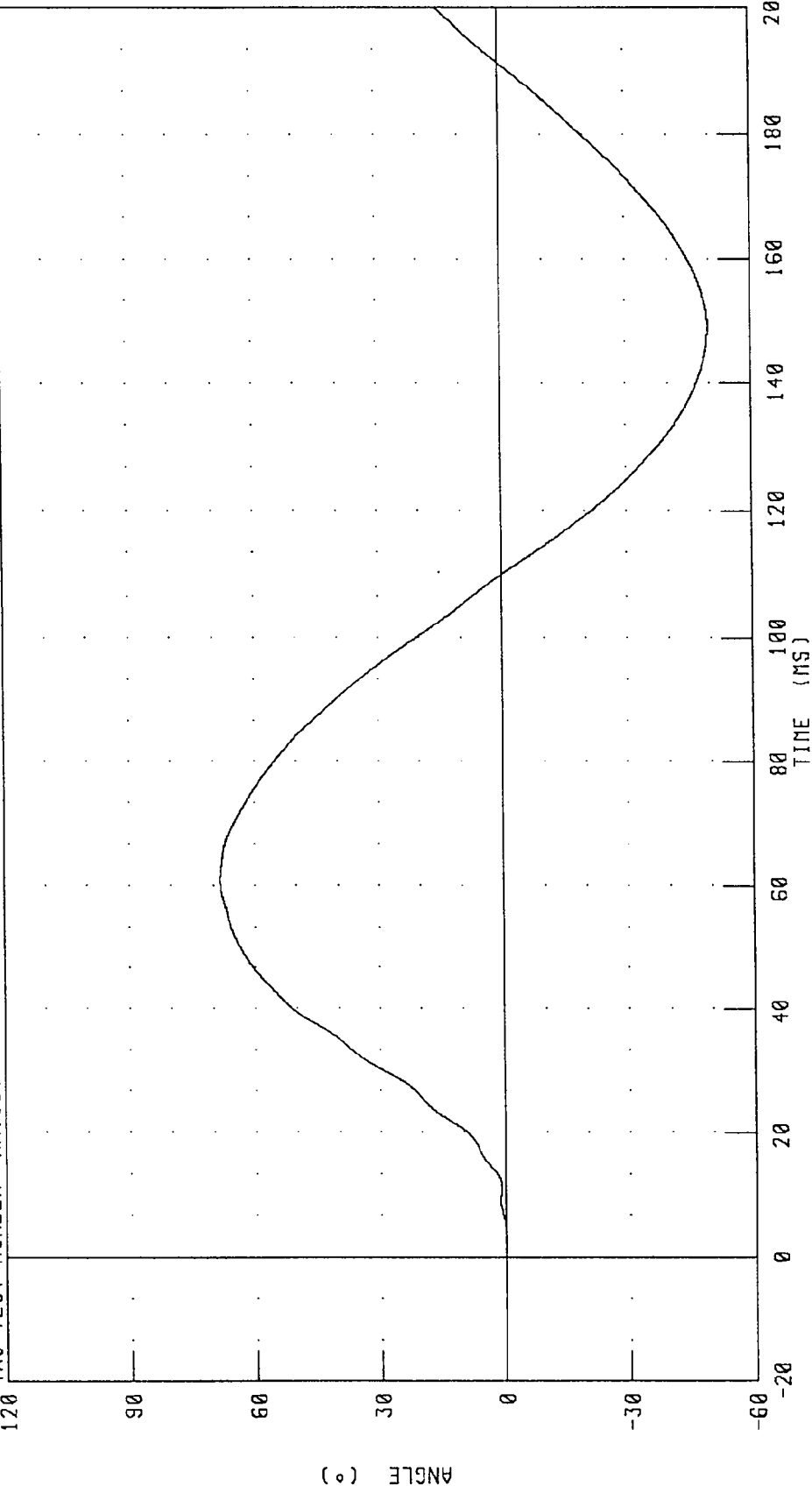
PART 572-B HYBRID II HEAD/NECK CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: HN71309

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245;1



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 68.27 ° @ 60.80 MS; -49.67 ° @ 149.04 MS

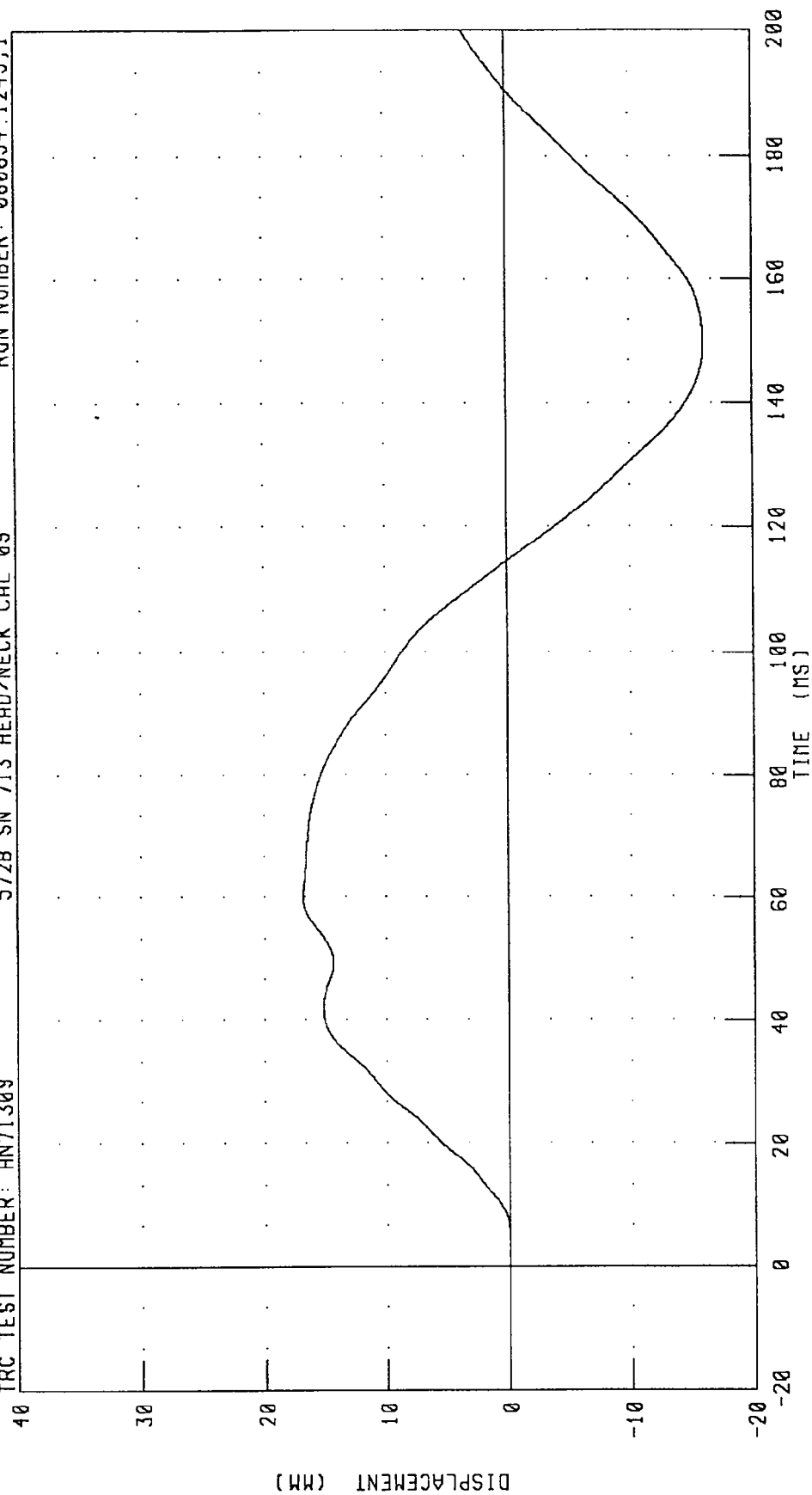
PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK DISPLACEMENT Z AXIS

TRC TEST NUMBER: HN71309

572B SN 713 HEAD/NECK CAL 09

RUN NUMBER: 060694.1245.1



PEAK DATA: 16.86 MM @ 59.92 MS; -16.03 MM @ 149.44 MS

CHANNEL: NEKZD FILTER: CH. CLASS 60

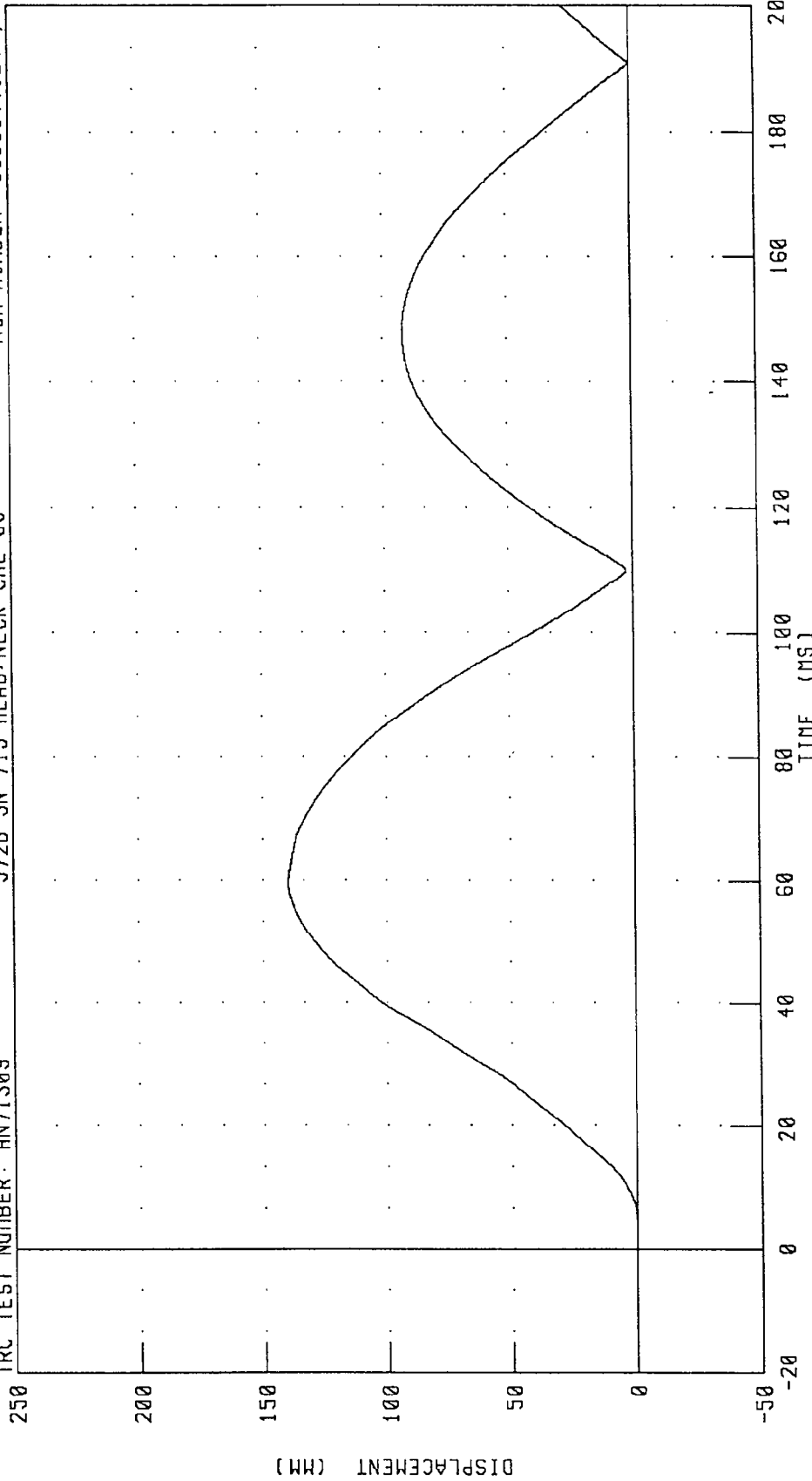
PART 572-B HYBRID II HEAD/NECK CALIBRATION

NECK CHORDAL DISPLACEMENT

TRC TEST NUMBER: HN71309

572B SN 713 HEAD/NECK CAL 09

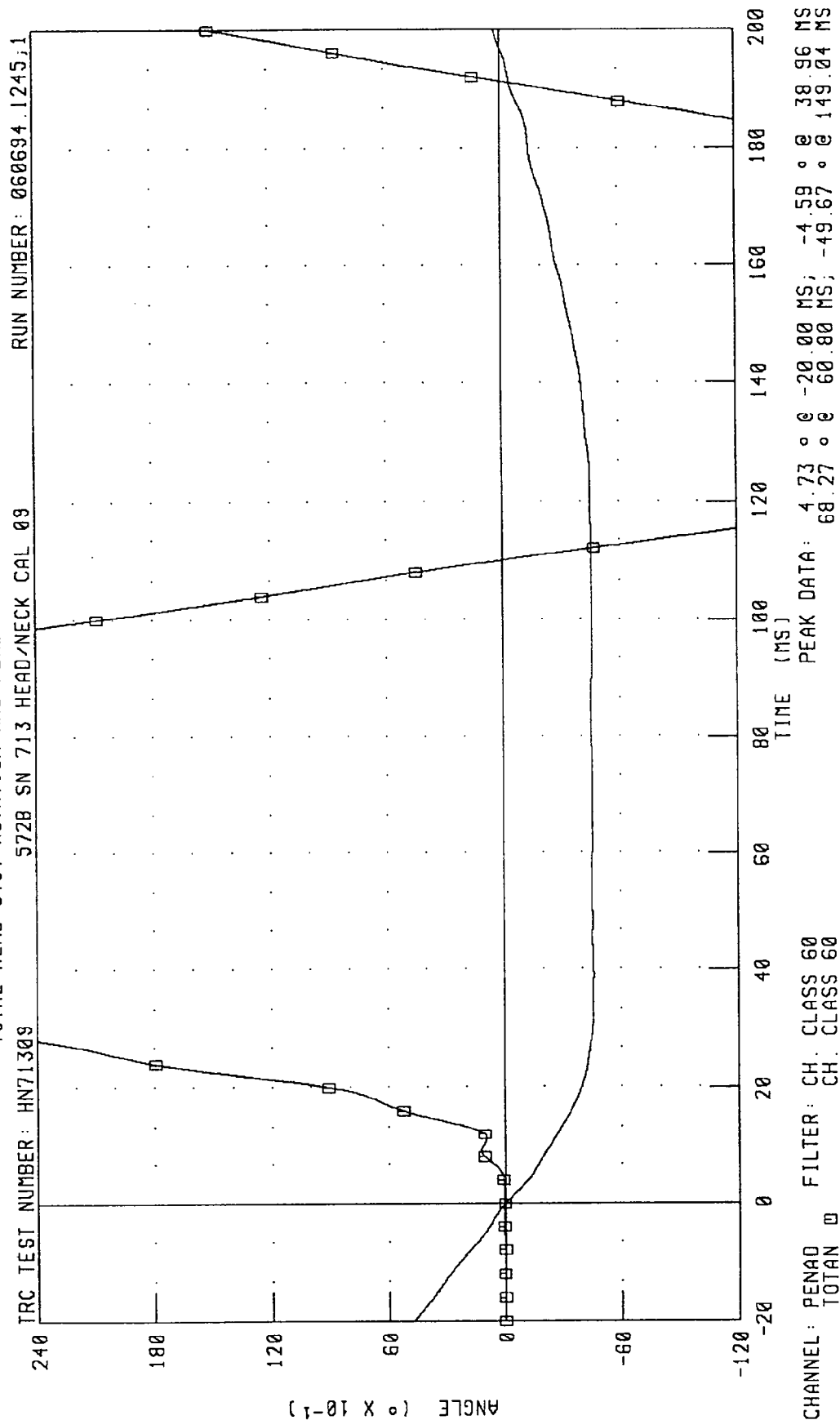
RUN NUMBER: 060694.1245.1



PEAK DATA: 139.72 MM @ 59.52 MS; 0.00 MM @ -20.00 MS

CHANNEL: NEKCD FILTER: CH. CLASS 60

PART 572-B HYBRID II HEAD/NECK CALIBRATION TOTAL HEAD C.C. ROTATION AND PENDULUM ANGULAR DISPLACEMENT



TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

02-MAY-94

TRC INC.

TEST NO: TL71309

572B SN 713 L.S.THORAX CAL 09

TEST PARAMETER	LOW SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	4.22 - 4.31 M/S	4.30 M/S
PEAK STERNUM DEFLECTION	28 MM MAX.	21.78 MM
PEAK RESISTIVE FORCE	6450. N MAX.	5881. N
INTERNAL HYSTERESIS	50 - 70 %	61.3 %

SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

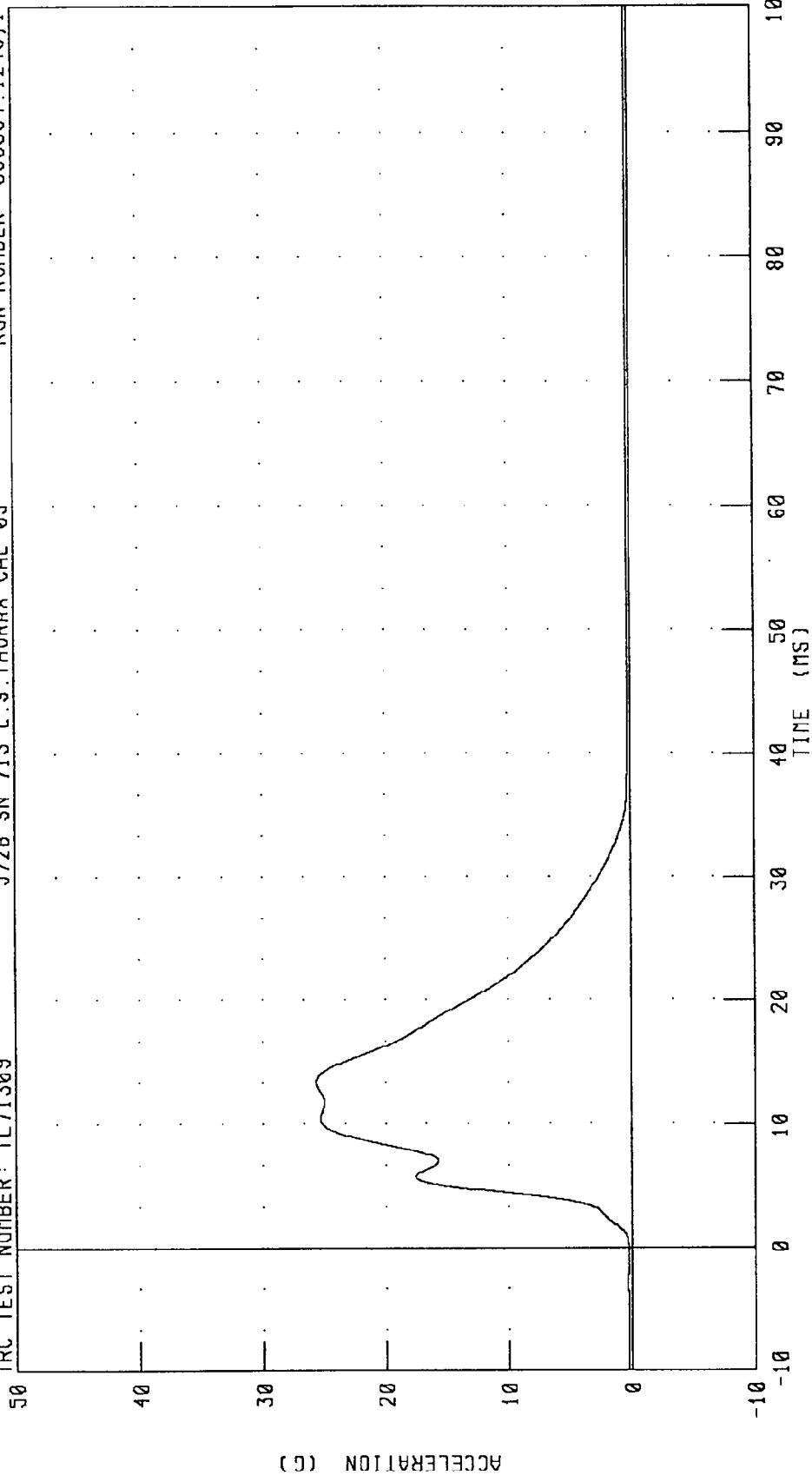
John K. Claidge

RUN NUMBER: 050294.0833;1

PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)

PENDULUM DECELERATION

TRC TEST NUMBER: TL71309 572B SN 713 L.S. THORAX CAL 09 RUN NUMBER: 060694.1245;1



PEAK DATA: 25.67 G @ 13.36 MS; 0.24 G @ 50.72 MS

CHANNEL: PENXC FILTER: CH. CLASS 180

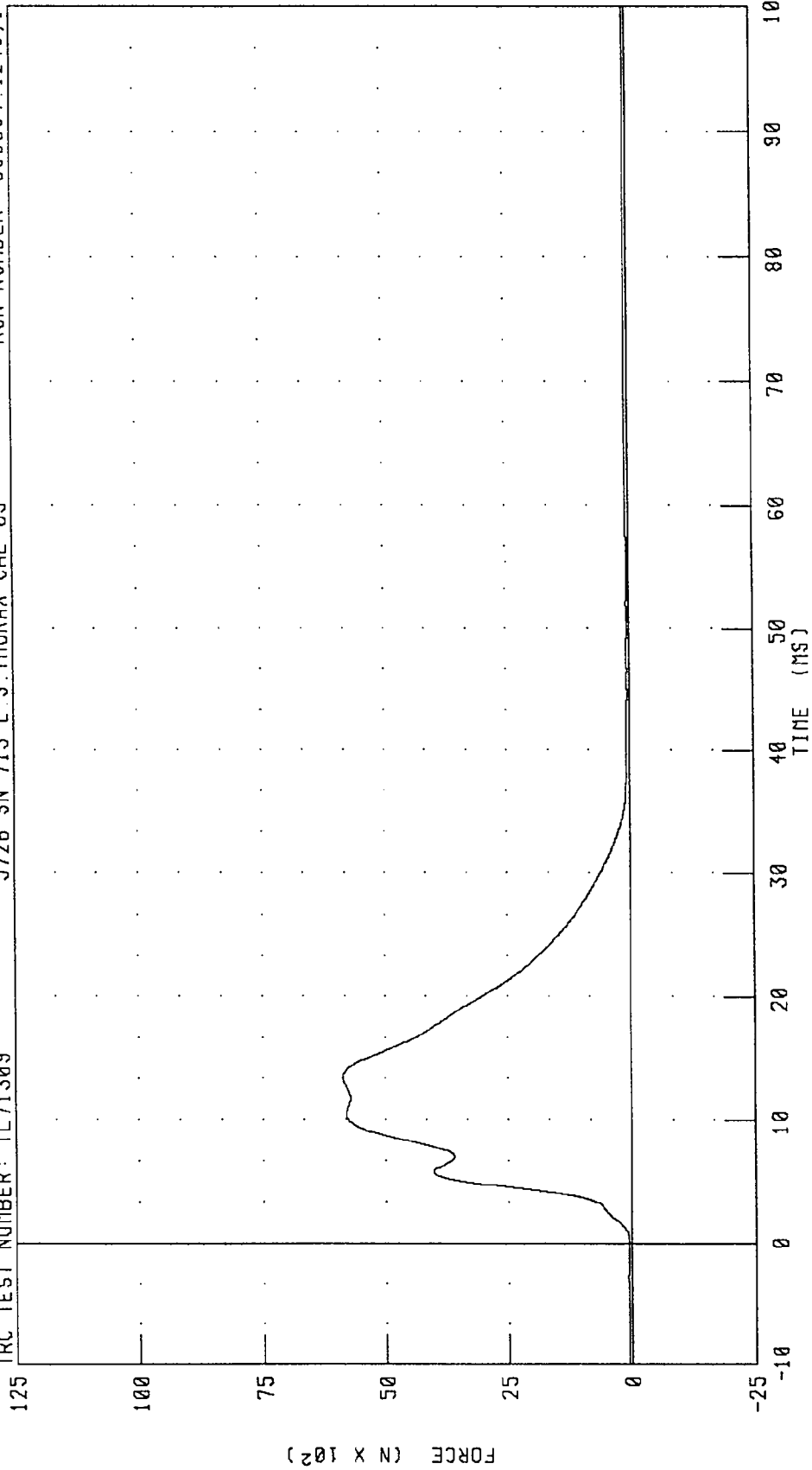
PART 572-B HYBRID II THORAX CALIBRATION (4.3 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: TL71309

572B SN 713 L S THORAX CAL 09

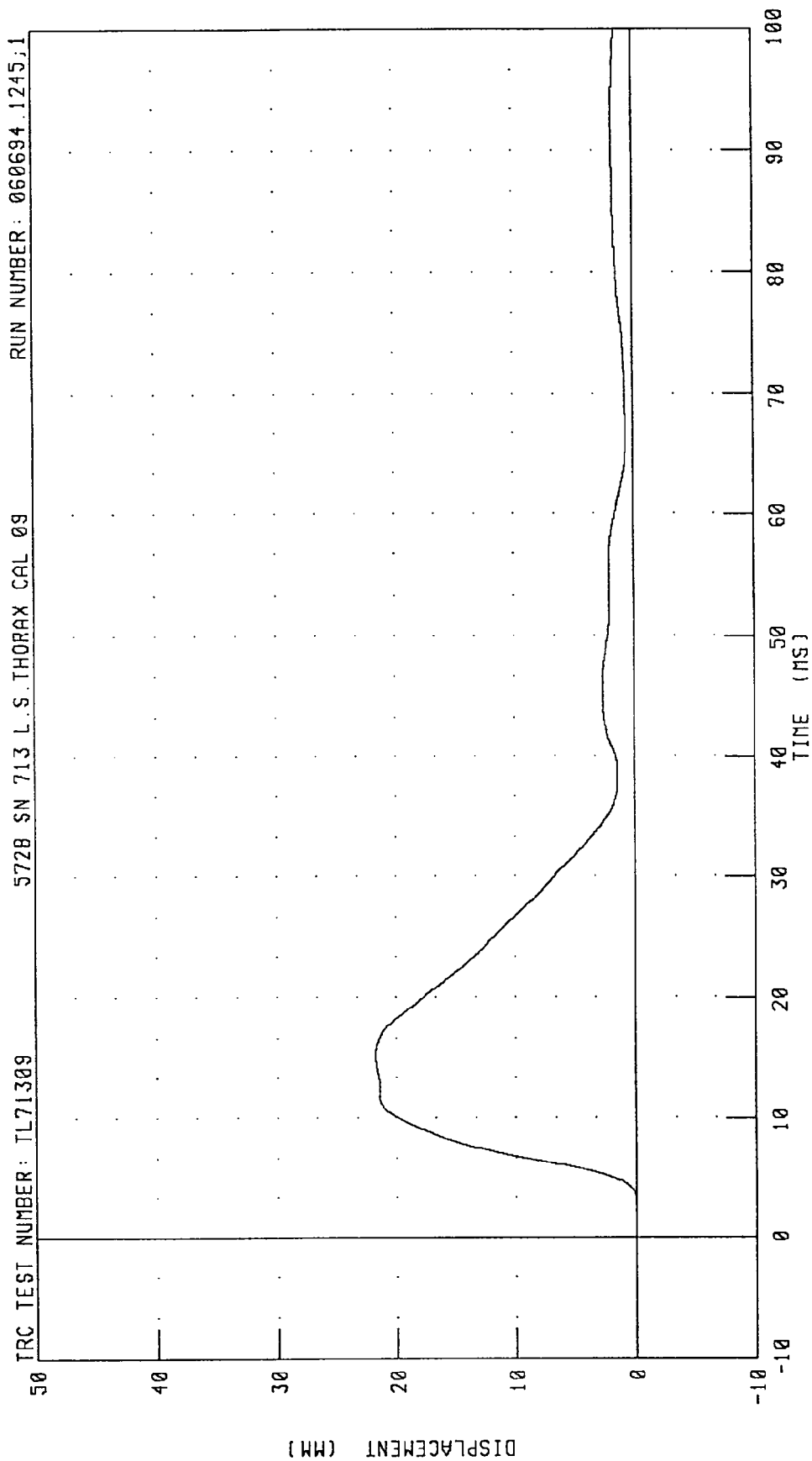
RUN NUMBER: 060694.1245;1



CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5880.89 N @ 13.36 MS; 55.29 N @ 50.72 MS

PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)
STERNUM DISPLACEMENT



PEAK DATA: 21.78 MM @ 15.12 MS; -0.01 MM @ -2.96 MS

CHANNEL: CSTXD FILTER: CH. CLASS 180

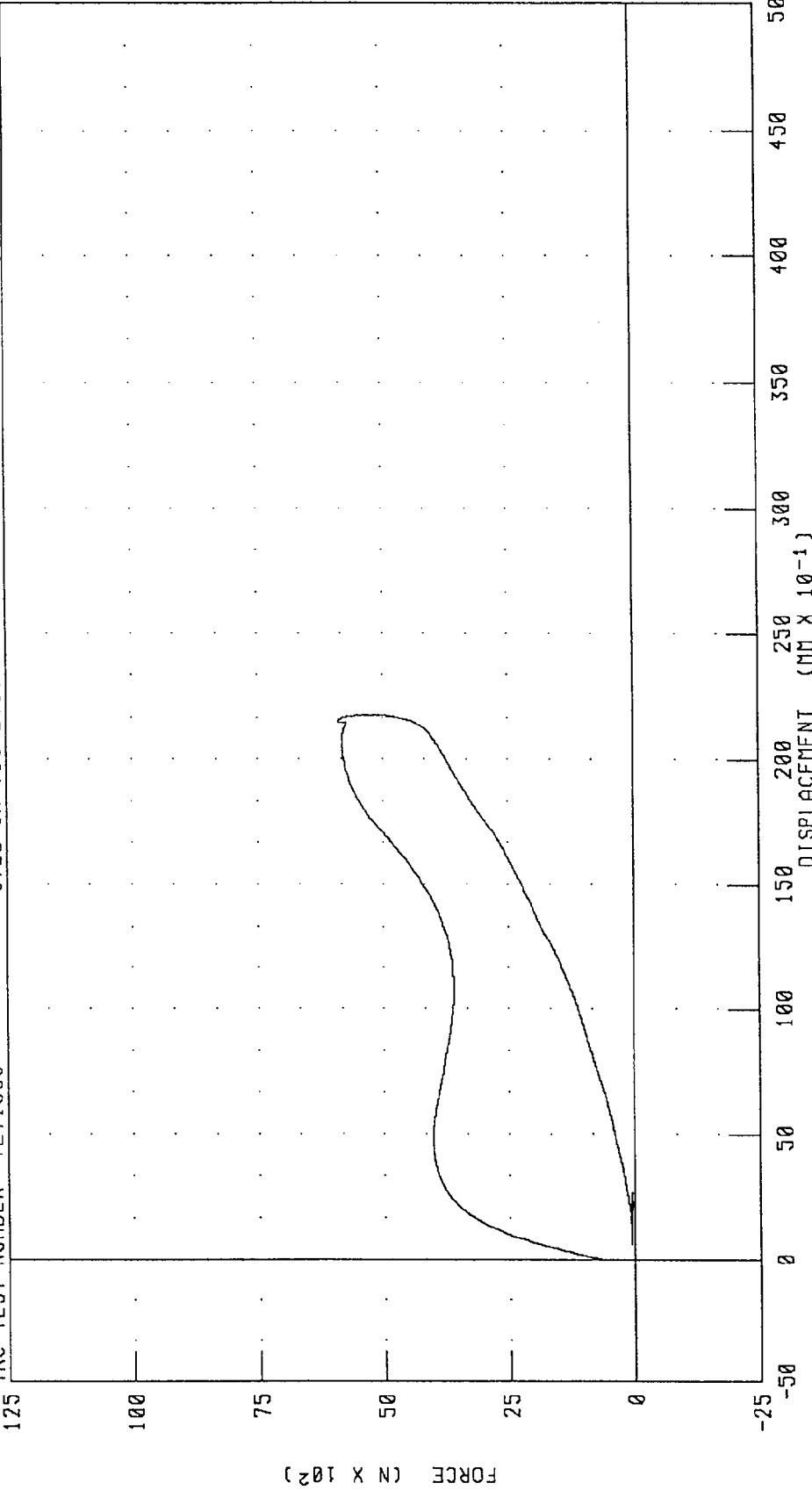
PART 572-B HYBRID II THORAX CALIBRATION (4.3 N/SEC)

CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: TL71309

572B SN 713 L.S. THORAX CAL 09

RUN NUMBER: 060694.1245,1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA: 21.78 MM @ 15.12 MS;
5880.89 N @ 13.36 MS;

-0.01 MM @ -2.96 MS
55.29 N @ 50.72 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B

02-MAY-94

TRC INC.

TEST NO: TH71309

572B SN 713 H.S.THORAX CAL 09

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	6.64 - 6.77 M/S	6.68 M/S
PEAK STERNUM DEFLECTION	43 MM MAX.	36.46 MM
PEAK RESISTIVE FORCE	10009. N MAX.	9021. N
INTERNAL HYSTERESIS	50 - 70 %	63.3 %

SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

John K. Clawidge

RUN NUMBER: 050294.0913;1

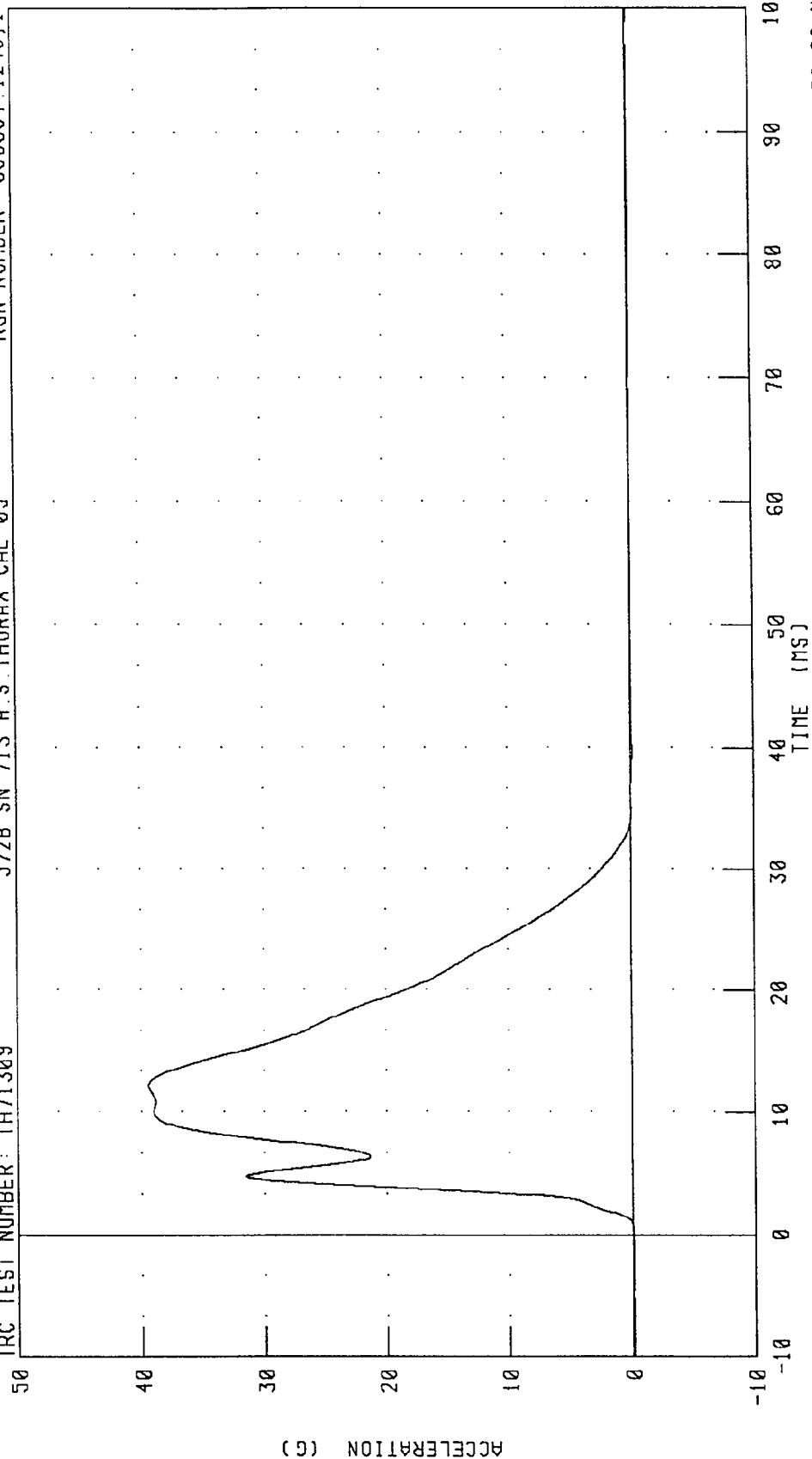
PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)

PENDULUM DECELERATION

RUN NUMBER: 060694.1245;1

572B SN 713 H.S. THORAX CAL 09

TRC TEST NUMBER: TH71309



PEAK DATA: 39.38 G @ 12.08 MS; -0.11 G @ 39.60 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

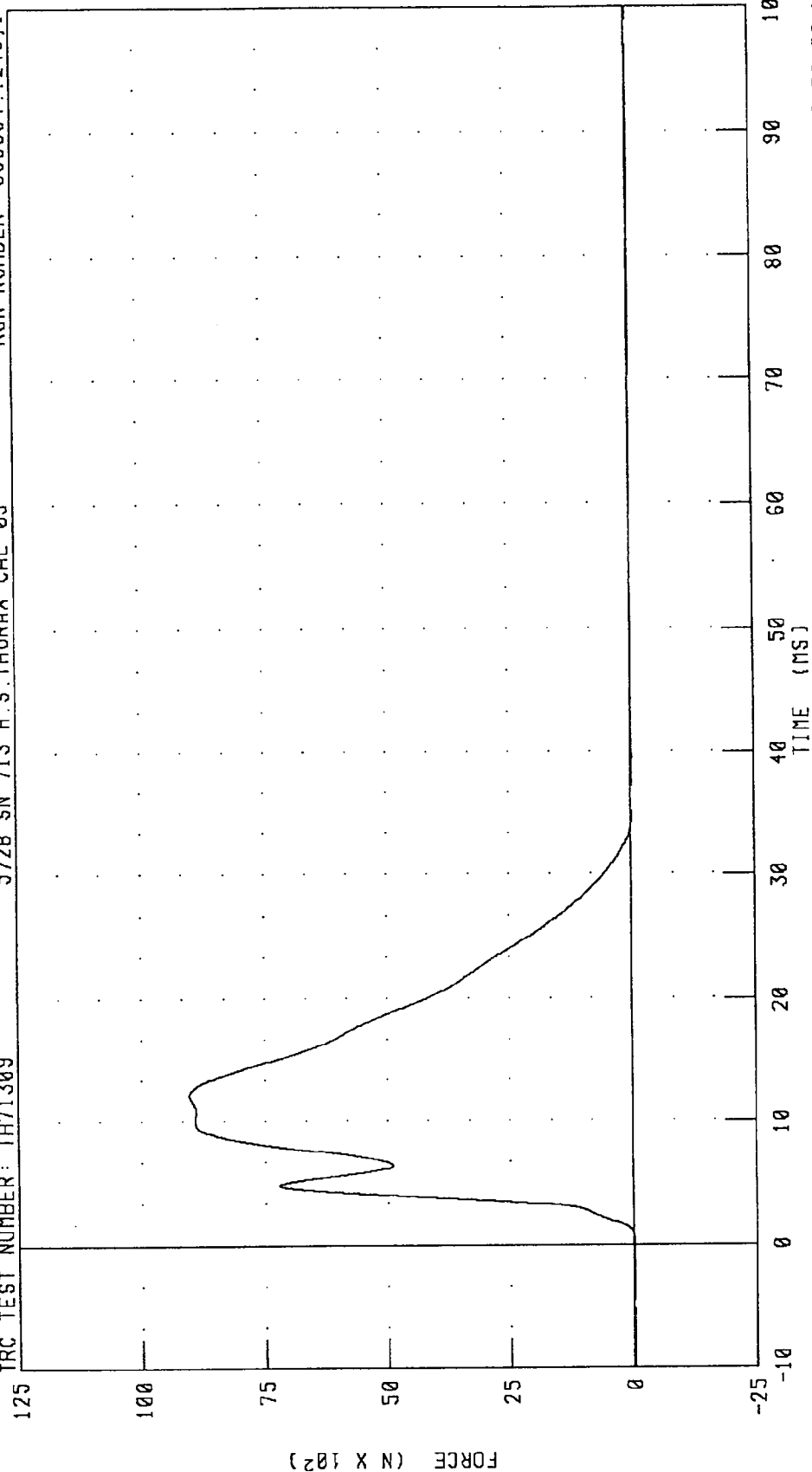
PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

PENDULUM FORCE

TRC TEST NUMBER: TH71309

572B SN 713 H.S. THORAX CAL 08

RUN NUMBER: 060694.1245.1



PEAK DATA: 9021.08 N @ 12.08 MS; -25.72 N @ 39.60 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

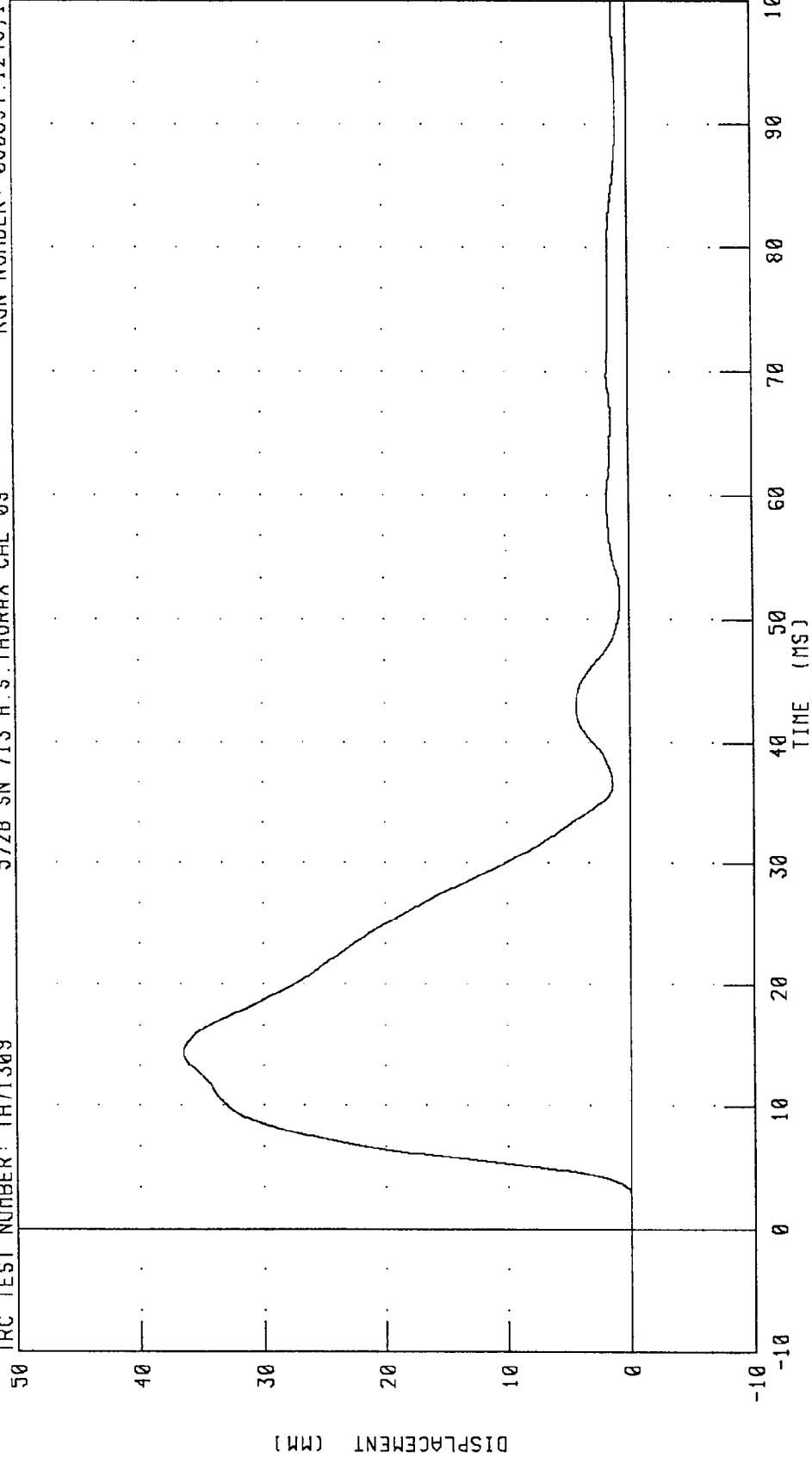
PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)

STERNUM DISPLACEMENT

TRC TEST NUMBER: TH71309

572B SN 713 H.S. THORAX CAL 09

RUN NUMBER: 060694.1245;1



CHANNEL: CSTXD FILTER: CH. CLASS 180

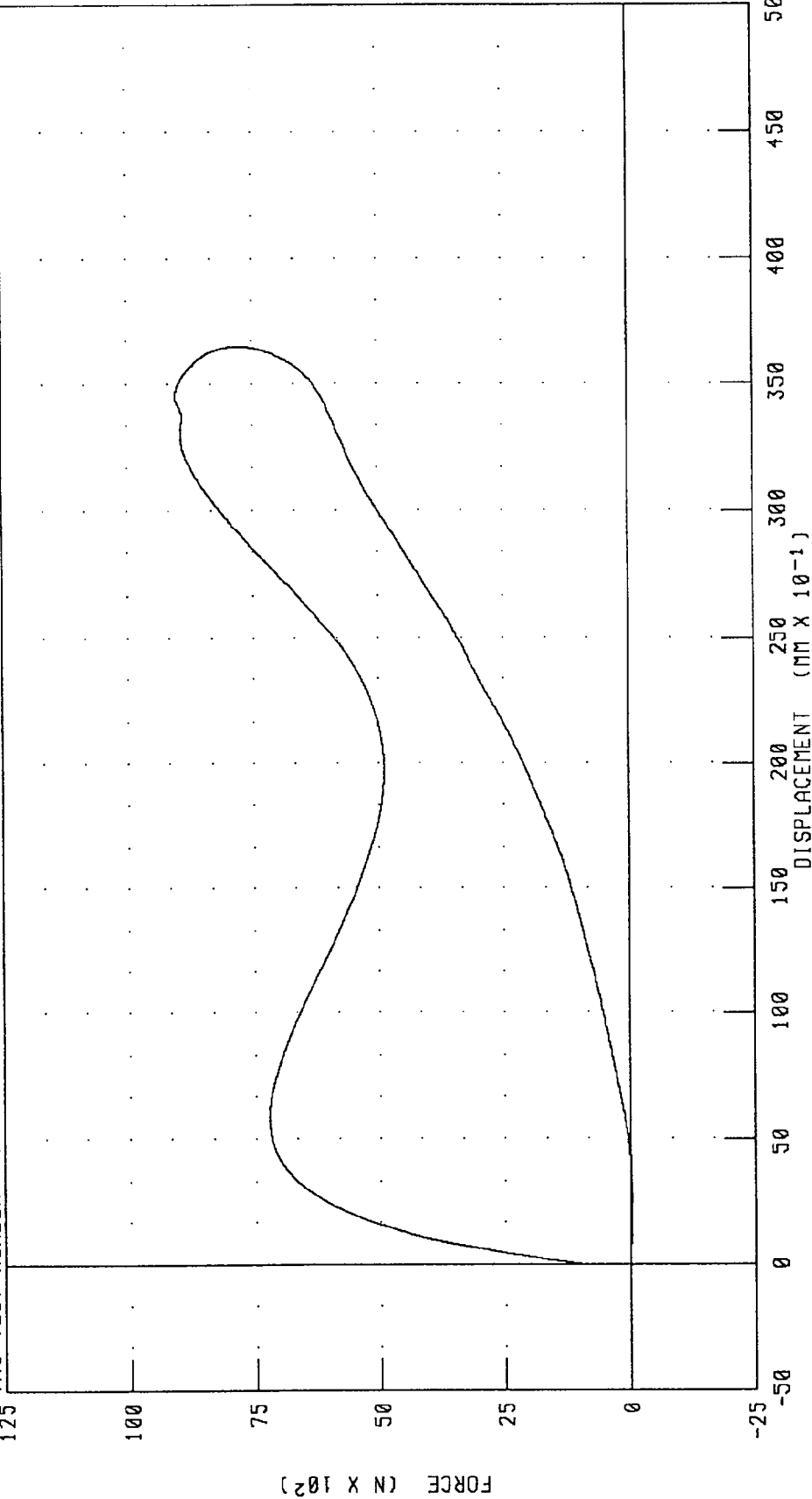
PART 572-B HYBRID II THORAX CALIBRATION (6.7 N/SEC)

CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: TH71309

5728 SN 713 H.S. THORAX CAL 09

RUN NUMBER: 060694.1245;1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

DISPLACEMENT (MM X 10⁻¹)

PEAK DATA: 36.46 MM @ 14.40 MS; -0.02 MM @ 0.32 MS
9021.08 N @ 12.08 MS; -25.72 N @ 39.60 MS

TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B

27-APR-94

TRC INC.

TEST NO: AB71309

572B SN 713 ABDOM COMPR CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	57 %
DEFLECTION RATE	6.4 - 8.9 MM/S	7.74 MM/S
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	117.84 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	171.51 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	237.85 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	343.60 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

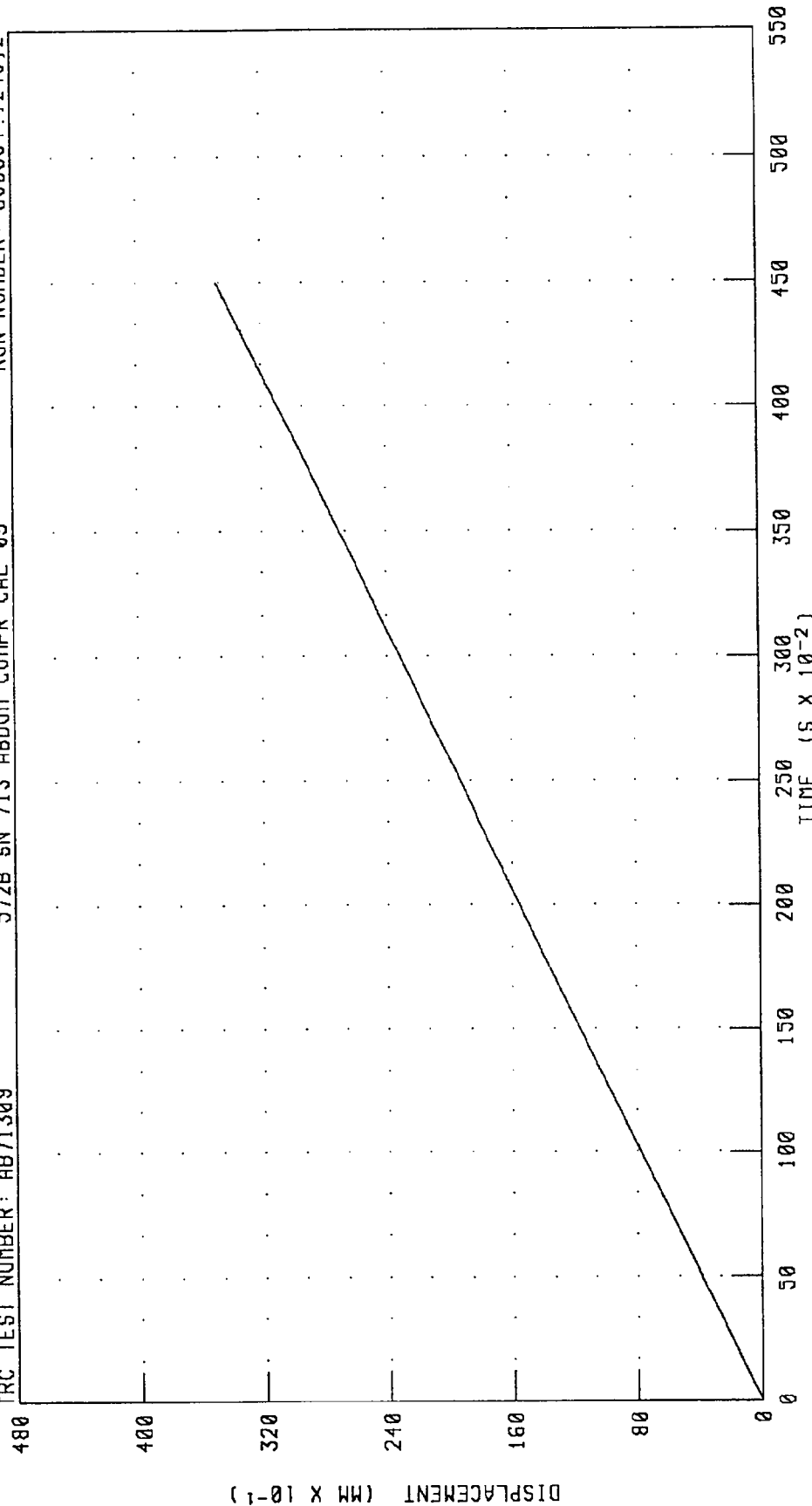
John K. Clawdgo

RUN NUMBER: 042794.1241;2

PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN DISPLACEMENT

TRC TEST NUMBER: AB71309 572B SN 713 ABDOM COMPR CAL 09 RUN NUMBER: 060694.1245.2



PEAK DATA: 34.85 MM @ 4.50 S; -0.01 MM @ 0.00 S

CHANNEL: ABXD FILTER: CH. CLASS 1000

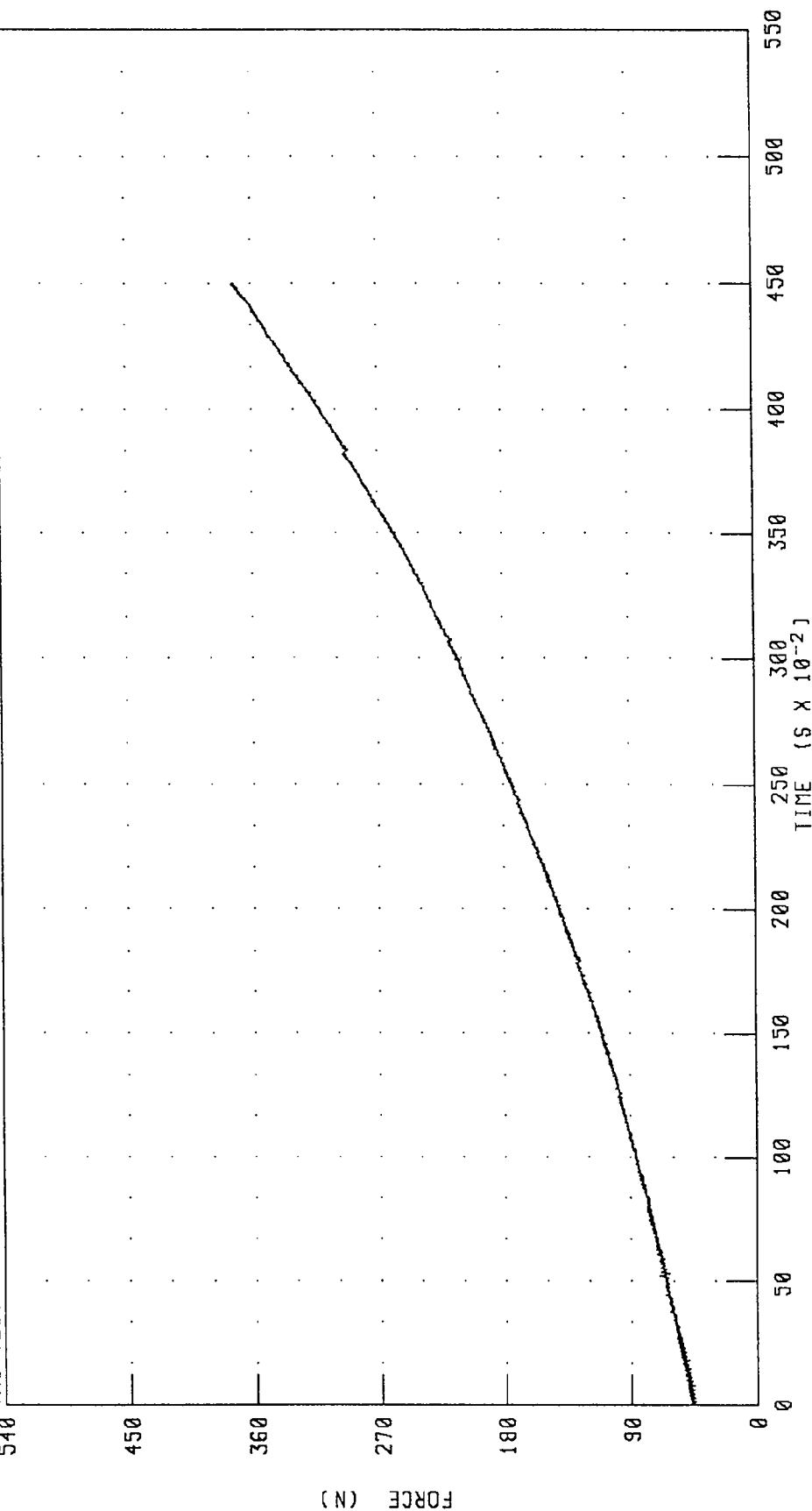
PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN FORCE

TRC TEST NUMBER: AB71309

572B SN 713 ABDOM COMPR CAL 09

RUN NUMBER: 060694.1245;2



PEAK DATA: 373.71 N @ 4.50 S; 43.58 N @ 0.00 S

CHANNEL: ABXF FILTER: CH. CLASS 1000

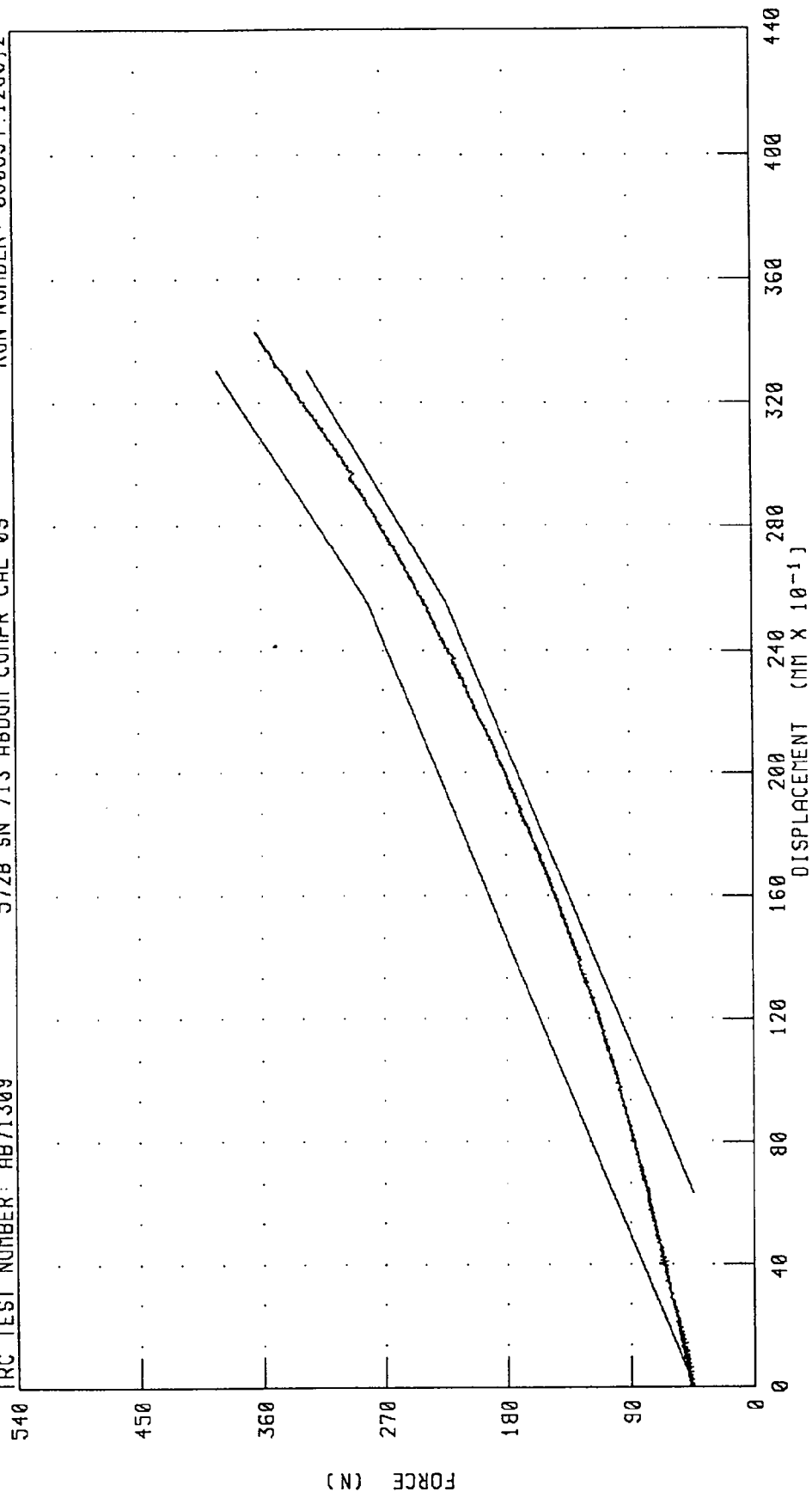
PART 572-B HYBRID II ABDOMEN CALIBRATION

ABDOMEN FORCE VS DISPLACEMENT

572B SN 713 ABDOM COMPR CAL 09

RUN NUMBER: 060694.1250.2

TRC TEST NUMBER: AB71309



PEAK DATA: 34.29 MM @ 4.43 S; -0.01 MM @ 0.00 S
363.21 N @ 4.43 S; 43.58 N @ 0.00 S

CHANNEL: ABXD FILTER: CH. CLASS 1000
ABXF CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B

02-MAY-94

TRC INC.

TEST NO: LF71309

572B SN713 LUMBAR FLEX CAL09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
FORCE AT 0 DEG. FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG. FLEXION	97.86 - 151.24 N	124.54 N
FORCE AT 30 DEG. FLEXION	151.24 - 204.62 N	160.13 N
FORCE AT 40 DEG. FLEXION	204.62 - 258.00 N	213.50 N
NET RETURN ANGLE	< 12 DEG.	0.72 DEG.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

John K. Clauidez

RUN NUMBER: 050294.1031

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B

02-MAY-94

TRC INC.

TEST NO: RK71309

572B SN 713 R.KNEE IMP CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.13 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	10467.85 N
DURATION ABOVE 4448 N	≥ 1.7 MS	1.80 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

John K. Clawdige

RUN NUMBER: 050294.1006;1

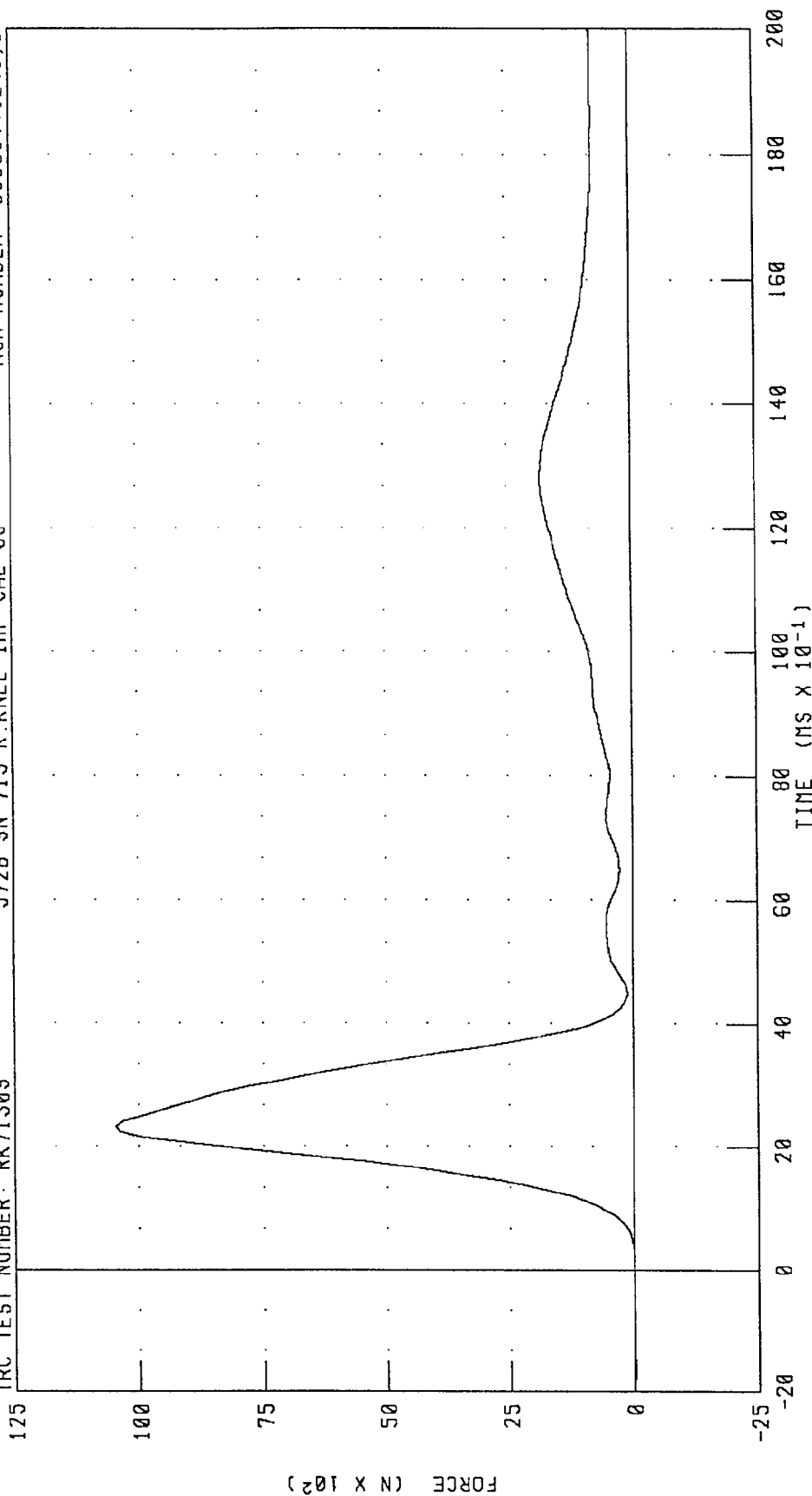
PART 572-B HYBRID II RIGHT KNEE CALIBRATION

RIGHT FEMUR FORCE

TRC TEST NUMBER: RK71309

572B SN 713 R.KNEE IMP CAL 09

RUN NUMBER: 060694 1245.1



PEAK DATA: 10467.85 N @ 2.32 MS; -5.09 N @ -1.68 MS

CHANNEL: RFMF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B

02-MAY-94

TRC INC.

TEST NO: LK71309

572B SN 713 L.KNEE IMP CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.15 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	9631.56 N
DURATION ABOVE 4448 N	>=1.7 MS	1.85 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

John K. Clauwidge

RUN NUMBER: 050294.1002;3

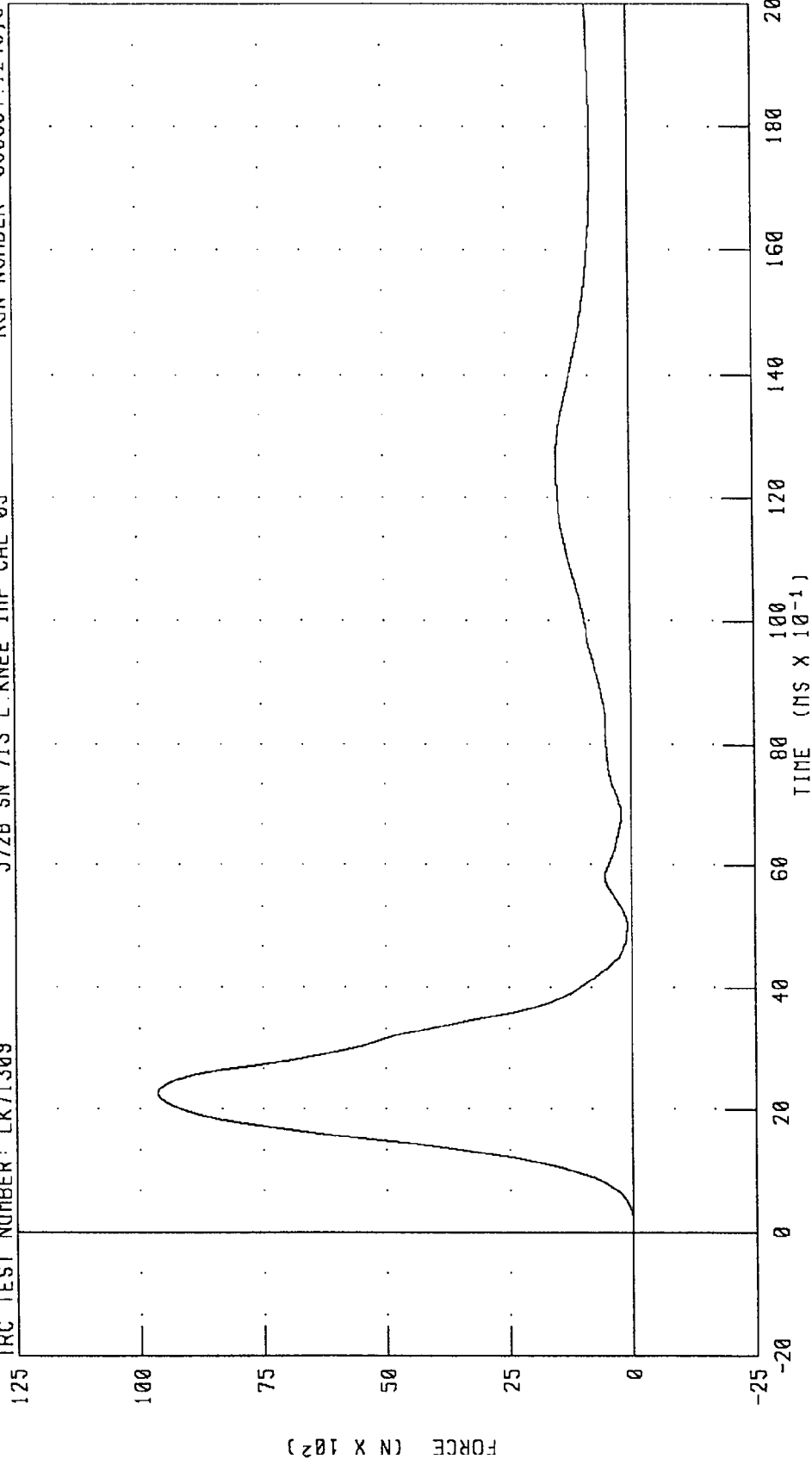
PART 572-B HYBRID II LEFT KNEE CALIBRATION

LEFT FEMUR FORCE

TRC TEST NUMBER: LK71309

572B SN 713 L KNEE IMP CAL 08

RUN NUMBER: 060694.1245,3



PEAK DATA: 9631.56 N @ 2.24 MS; -1.81 N @ -1.04 MS

FILTER: CH. CLASS 600

CHANNEL: LFMF

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #142

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCELEROMETER	FH25J	7264	ENDEVCO	03/28/94	09/28/94
Y-AXIS ACCELEROMETER	CY32H	7264	ENDEVCO	03/28/94	09/28/94
Z-AXIS ACCELEROMETER	DB81H	7264	ENDEVCO	03/28/94	09/28/94
CHEST X-AXIS ACCELEROMETER	DR49J7	7264	ENDEVCO	03/28/94	09/28/94
Y-AXIS ACCELEROMETER	AC8W6	7264	ENDEVCO	03/28/94	09/28/94
Z-AXIS ACCELEROMETER	CW42H	7264	ENDEVCO	03/28/94	09/28/94
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	03/25/94	09/25/94
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	03/25/94	09/25/94
*NECK X-AXIS FORCE LOAD CELL	0280	1716	DENTON	03/28/94	09/28/94
Y-AXIS FORCE LOAD CELL	0280	1716	DENTON	03/28/94	09/28/94
Z-AXIS FORCE LOAD CELL	0280	1716	DENTON	03/28/94	09/28/94
*NECK MOMENT ABOUT X-AXIS LOAD CELL	0280	1716	DENTON	03/28/94	09/28/94
MOMENT ABOUT Y-AXIS LOAD CELL	0280	1716	DENTON	03/28/94	09/28/94
MOMENT ABOUT Z-AXIS LOAD CELL	0280	1716	DENTON	03/28/94	09/28/94
*CHEST DEFLECTION POTENTIOMETER	90320-B	81422A	VERNITECH	03/28/94	09/28/94
LAP BELT FORCE LOAD CELL	674	3419	LEBOW	02/22/94	08/22/94
SHOULDER BELT FORCE LOAD CELL	616	3419	LEBOW	02/22/94	08/22/94

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

RIGHT FRONT PASSENGER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCEL.	CT44H	7264	ENDEVCO	04/22/94	10/22/94
Y-AXIS ACCEL.	AAMT5	7264	ENDEVCO	04/22/94	10/22/94
Z-AXIS ACCEL.	ACCM9	7264	ENDEVCO	04/22/94	10/22/94
CHEST X-AXIS ACCEL.	AAMJ5	7264	ENDEVCO	04/22/94	10/22/94
Y-AXIS ACCEL.	AC8B8	7264	ENDEVCO	04/22/94	10/22/94
Z-AXIS ACCEL.	CR63H	7264	ENDEVCO	04/22/94	10/22/94
LEFT FEMUR FORCE LOAD CELL	964	2430	GSE	04/27/94	10/27/94
RIGHT FEMUR FORCE LOAD CELL	982	2430	GSE	04/27/94	10/27/94
*NECK X-AXIS FORCE LOAD CELL					
Y-AXIS FORCE LOAD CELL					
X-AXIS FORCE LOAD CELL					
*NECK MOMENT ABOUT X-AXIS LOAD CELL					
MOMENT ABOUT Y-AXIS LOAD CELL					
MOMENT ABOUT Z-AXIS LOAD CELL					
*CHEST DEFLECTION POTENTIOMETER					
LAP BELT FORCE LOAD CELL	612	3419	LEBOW	02/22/94	08/22/94
SHOULDER BELT FORCE LOAD CELL	127	3419	LEBOW	02/22/94	08/22/94
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A12889	PT-101-40A	CELESCO	02/22/94	02/22/94
SHOULDER BELT STRETCH POTENTIOMETER	1291	2051414101	BOURNES	02/22/94	02/22/94

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NUMBER	MODEL NUMBER	MFR.	LAST	CALIBRATION DATE DUE
LEFT REAR SEAT CROSSMEMBER X-AXIS	AGRG8	7264	ENDEVCO	02/10/94	08/10/94
LEFT REAR SEAT CROSSMEMBER X-AXIS REDUNDANT	AGRG5	7264	ENDEVCO	03/07/94	09/07/94
RIGHT REAR SEAT CROSSMEMBER X-AXIS	CR26H	7264	ENDEVCO	12/30/93	06/30/94
RIGHT REAR SEAT CROSSMEMBER X-AXIS REDUNDANT	CK32H	7264	ENDEVCO	03/07/94	09/07/94
ENGINE TOP X-AXIS	CC71H	7264	ENDEVCO	02/09/94	08/09/94
ENGINE BOTTOM X-AXIS	AC861	7264	ENDEVCO	04/28/94	10/28/94
RIGHT BRAKE CALIPER X-AXIS	CL98H	7264	ENDEVCO	03/28/94	09/28/94
LEFT BRAKE CALIPER X-AXIS	CL60H	7264	ENDEVCO	01/14/94	07/14/94
INSTRUMENT PANEL CENTER X-AXIS	DR87J	7264	ENDEVCO	01/24/94	07/24/94

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NUMBER	MODEL NUMBER	MFR.	LAST	CALIBRATION DATE DUE
NECK BENDING PENDULUM ACCELEROMETER	CB27	7232	ENDEVCO	04/04/94	10/04/94
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	04/05/94	10/05/94
THORAX/HYBRID II FEMUR PENDULUM ACCELEROMETER	CC64	7232	ENDEVCO	04/04/94	10/04/94
LUMBAR FLEXION FORCE GAUGE	NA	DPPH-50	CHATILLON	05/03/89	REPAIRED
LUMBAR FLEXION ROTATION GAUGE	CP17-0601-1	7020	HUMPHREY	MFR. SPECIFICATION	
ABDOMEN COMPRESSION DISPLACEMENT GAUGE	4075-175	80294-2051941504	BOURNES	04/05/94	10/05/94
ABDOMEN COMPRESSION FORCE GAUGE	3443	3167	LEEBO	04/05/94	10/05/94
HYBRID III FEMUR PENDULUM ACCELEROMETER	CG83	7232	ENDEVCO	04/04/94	10/04/94

NHTSA DATA TAPE REFERENCE GUIDE

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

```
+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)
```

```
+FEMUR FORCE:      TENSION
+SEAT BELT FORCE:  TENSION
+BARRIER FORCE:   TENSION
```

```
+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
```

```

+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

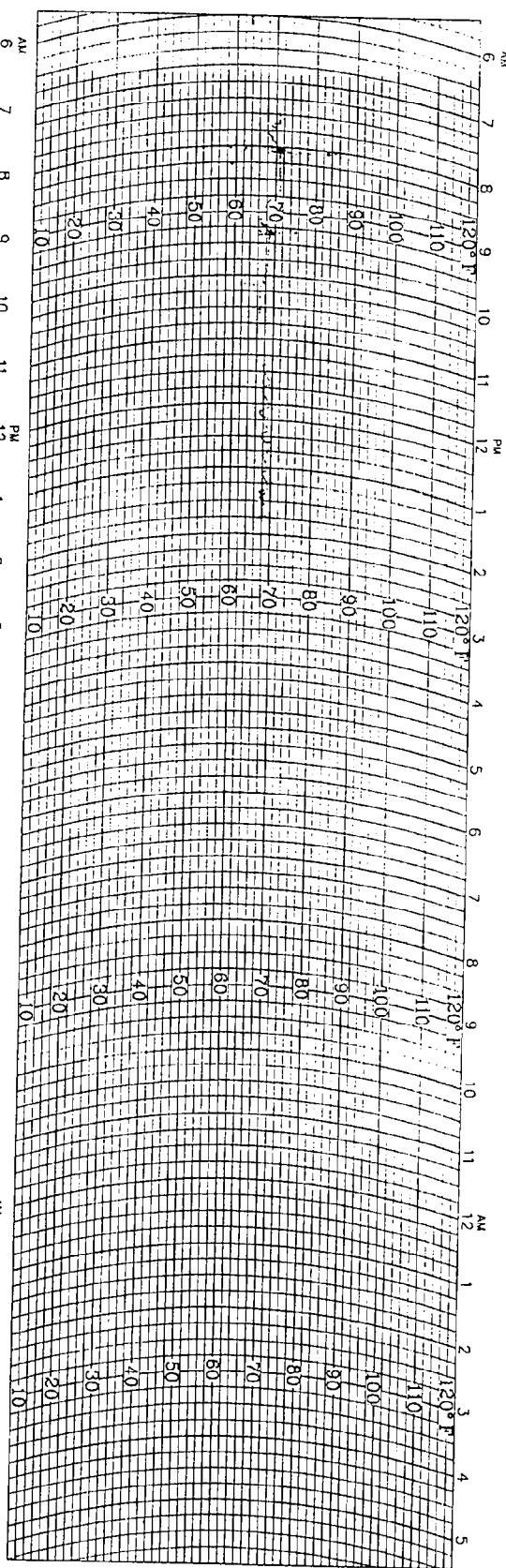
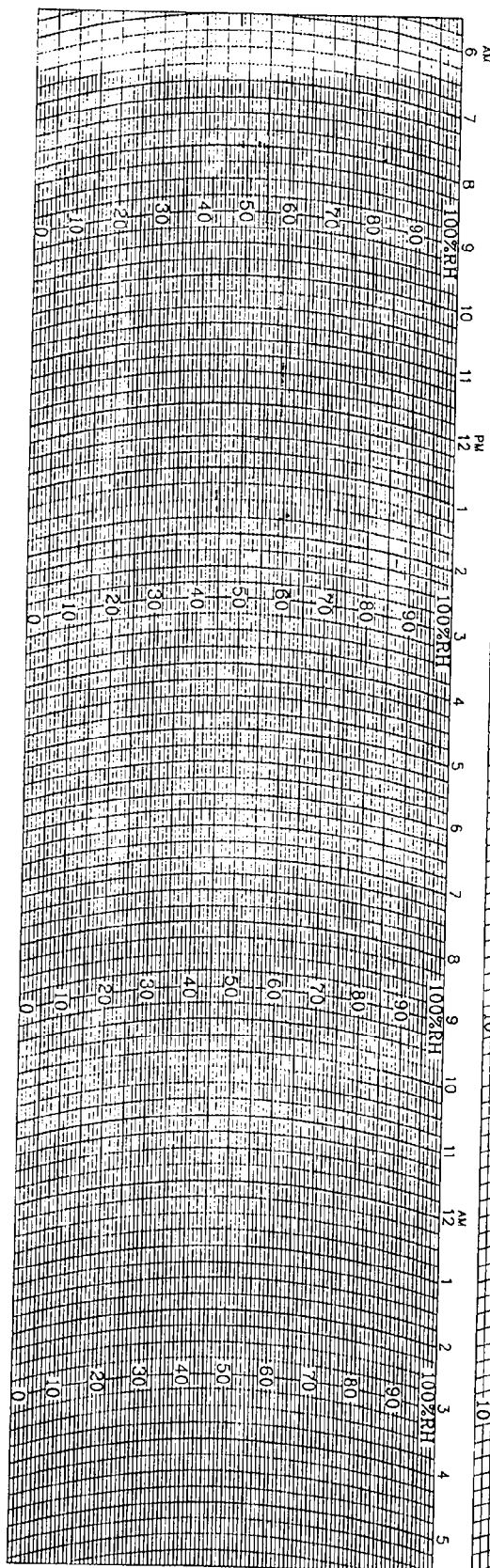
SAE J211 OCT88

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 QUALONETRICS, 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

SUPPLEMENTAL RESTRAINT SYSTEM (MINIVAN AIR BAG)

- : This Supplemental Restraint System description contains important information concerning the special driver supplemental minivan air bag. The Supplemental Restraint System Air Bag can help reduce impact force to the driver in certain frontal collisions. The driver's supplemental air bag is designed to **supplement** the crash protection provided by the seat belts and is **not** a **substitute** for the seat belts. The seat belts should always be correctly worn and the driver seated a suitable distance from the steering wheel. (See "Seat belts" for instructions and precautions on seat belt usage.)

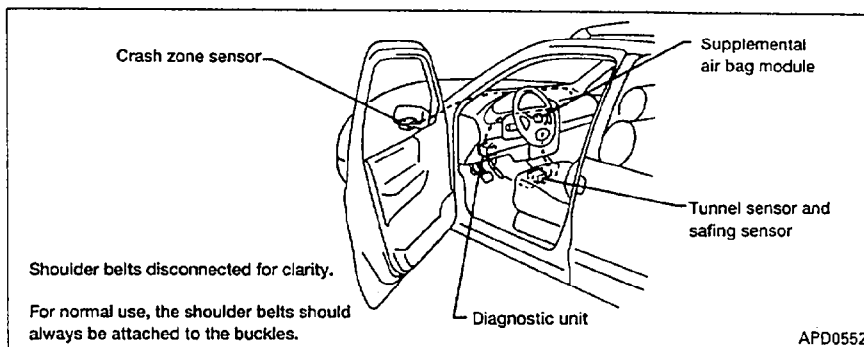
The supplemental air bag will operate only when the ignition switch is in the "ON" or "START" position.

WARNING:

The supplemental air bag ordinarily will not inflate in the event of a side impact, rear impact, roll over, or lower severity frontal collision; so always wear your seat belts to help reduce the risk or severity of injury in various kinds of accidents.

WARNING:

The seat belts and the supplemental air bag are most effective when you are sitting back and upright in the seat. Supplemental air bags inflate with great force. If you are unrestrained, leaning forward, sitting sideways or out of position in any way, you are at greater risk of injury or death in a crash and may also receive serious or fatal injuries from the supplemental air bag if you are up against it when it inflates.

**Supplemental air bag system**

The supplemental driver air bag is located in the center of the steering wheel. There is no air bag for the passenger seat. The supplemental air bag system is designed to inflate in higher severity frontal collisions, although it may inflate if the forces in another type of collision are similar to those of a higher severity frontal impact. When the supplemental air bag inflates, a fairly loud noise may be heard, followed by release of smoke. This smoke is not harmful and does not indicate a fire, but care should be taken not to intentionally inhale it, as it may cause

irritation and choking. The supplemental air bag, along with the use of seat belts, helps to cushion the impact force on the face and chest of the occupant.

The seat belts should be correctly worn and the driver seated upright as far as practical away from the steering wheel. Since the supplemental air bag inflates quickly in order to help protect the occupant, the force of the supplemental air bag inflating can increase the risk of injury if the occupant is too close to or is against the supplemental air bag module during inflation. The supple-

2-40

mental air bag will deflate quickly after the collision is over.

The supplemental air bag will operate only when the Ignition switch is in the "ON" or "START" position.

WARNING:

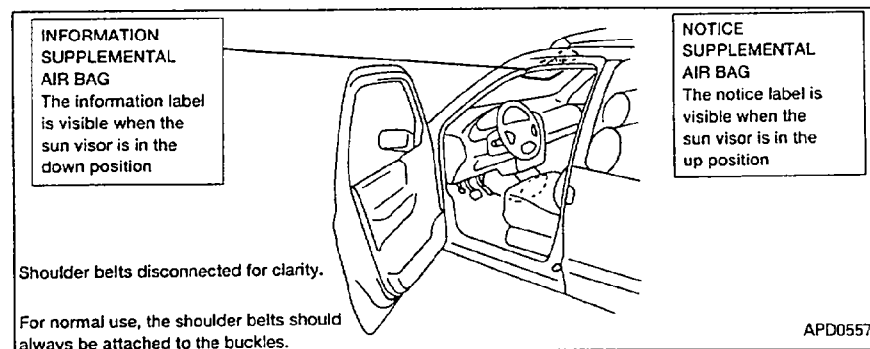
- Right after inflation, several supplemental air bag system components will be hot. Do not touch them; you may severely burn yourself.
- No unauthorized changes should be made to any components or wiring of the supplemental air bag system. This is to prevent accidental inflation of the supplemental air bag or damage to the supplemental air bag system.
- Tampering with the supplemental air bag system may result in serious personal injury. Tampering includes changes to the steering wheel by placing material over the steering wheel pad or by installing additional trim material around the supplemental air bag system.
- Do not attach any objects to the steering wheel pad. Objects attached to the

steering wheel pad may become dangerous projectiles and cause injury if the supplemental air bag inflates.

- Work around and on the supplemental air bag system should be done by an authorized NISSAN dealer. Installation of electrical equipment should also be done by an authorized NISSAN dealer. The yellow SRS wiring should not be modified or disconnected. Unauthorized electrical test equipment and probing devices should not be used on the supplemental air bag system.

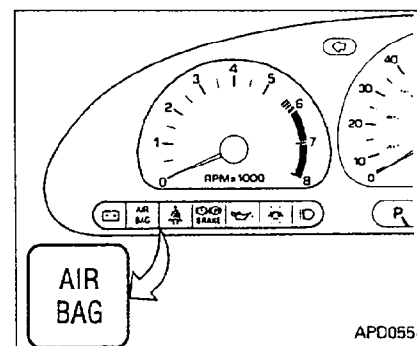
2-41

INFORMATION, WARNING AND NOTICE LABELS



Information, warning and notice labels about the supplemental air bag system are placed in the vehicle.

SUPPLEMENTAL AIR BAG WARNING LIGHT



The supplemental air bag light, displaying "AIR BAG" in the instrument panel, monitors the circuits of the supplemental air bag. The circuits monitored by the supplemental air bag light are the crash zone sensor, tunnel sensor, safing sensor and all related wiring.

When the ignition key is in the "ON" or "START" position, the supplemental air bag light will illuminate for about 7 seconds and then turn off. This means the system is operational.

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If any of the following conditions occurs, the supplemental air bag needs servicing and should be taken to your nearest authorized NISSAN dealer:

1. The supplemental air bag light does not come on for 7 seconds and then go off as described above.
2. The supplemental air bag light flashes intermittently or remains on.
3. The supplemental air bag light does not come on at all.

Under these conditions, the Supplemental Restraint System Air Bag will not operate properly. It must be checked and repaired.

Repair and replacement procedure

The supplemental air bag system is designed to inflate on a one-time-only basis. As a reminder, unless it is damaged, the supplemental air bag light will remain illuminated after inflation has occurred. Repair and replacement of the supplemental air bag system should be done only by authorized NISSAN dealers. To ensure long-term functioning, the system must be inspected 10 years after the date of manufacture as noted on the certifica-

tion label located on the driver side front pillar.

When maintenance work is required on the vehicle, the supplemental air bag system and related parts should be pointed out to the person conducting the maintenance. The ignition key should always be in the "LOCK" position when working under the hood or inside the vehicle.

WARNING:

- Once the supplemental air bag inflates, the supplemental air bag module will not function again and must be replaced. The supplemental air bag module cannot be repaired.
- The supplemental air bag system should be inspected by an authorized NISSAN dealer if there is any damage to the front end portion of the vehicle or replaced if the supplemental air bag has inflated.
- When selling your vehicle, we request that you inform the buyer about the supplemental air bag system and guide the buyer to the appropriate sections in this Owner's Manual.

- If you need to dispose of a supplemental air bag or scrap the vehicle, contact an authorized NISSAN dealer. Correct supplemental air bag disposal procedures are set forth in the appropriate NISSAN Service Manual. Incorrect disposal procedures could cause personal injury.

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SEAT BELTS

PRECAUTIONS ON SEAT BELT USAGE

Your chances of being injured or killed in an accident and/or the severity of injury may be greatly reduced if you are wearing your seat belt and it is properly adjusted. NISSAN strongly encourages you and all of your passengers to buckle up every time you drive, even if your seating position includes an air bag.

Some states, provinces or territories require that seat belts be worn at all times when a vehicle is being driven.

WARNING:

- Every person who drives or rides in this vehicle should wear a seat belt at all times. Children should be in appropriate child restraints.
- The belts should be adjusted to a snug fit. Failure to do so will reduce the effectiveness of the entire restraint system.
- Do not wear the belts inside out or twisted.
- Do not allow more than one person to use the same seat belt.

- All seat belt assemblies, including retractors and attaching hardware, should be inspected at your NISSAN dealer after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Seat belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

WARNING:

- Never carry more people in the vehicle than there are seat belts.
- If the seat belt warning light glows continuously while the ignition is turned "ON" with all doors closed and all seat belts fastened, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.
- Be sure to observe the following precautions when using seat belts. Failure to do so could increase the

chance and/or severity of injury in an accident.

- Always route the shoulder belt over your shoulder and across your chest. Never run the belt under your arm. Serious injury can occur if a seat belt is not worn properly.
- Position the lap belt as low as possible **AROUND THE HIPS, NOT THE WAIST.**

Infant or small child

NISSAN recommends that infants or small children be placed in child restraint systems that comply with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. You should choose a child restraint system that fits your vehicle and always follow the manufacturer's instructions for installation and use.

Children

Children who are too large for child restraint systems should be seated and restrained by the seat belts which are provided.

NISSAN recommends that children sit in a rear seat if possible. According to accident statistics, children are safer when properly

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restrained in a rear seat than in a front seat.

If the child's seating position has a shoulder belt that fits close to the face or neck, the use of a booster seat (commercially available) may help overcome this. The booster seat should raise the child so that the shoulder belt is centered across the top, middle portion of the shoulder and the lap belt is low on the hips. The booster seat should fit the vehicle seat and have a label certifying that it complies with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. Once the child has grown enough so the shoulder belt is no longer on or near the face and neck, use the shoulder belt without the booster seat.

Never let a child stand or kneel on any seat and do not allow a child in the cargo areas while the vehicle is moving.

Pregnant women

NISSAN recommends that pregnant women use seat belts. Contact your doctor for specific recommendations. The lap belt should be worn snug and positioned as low as possible around the hips, not the waist.

Injured persons

NISSAN recommends that injured persons use seat belts, depending on the injury. Check with your doctor for specific recommendations.

2-POINT AUTOMATIC SEAT BELT SYSTEM

The Automatic Seat Belt system consists of a 2-point shoulder belt for the driver and front passenger seat positions. The shoulder belts automatically adjust to the body and seating positions when the door is closed and the ignition key is turned "ON". A manual lap belt for the driver and front passenger seat positions is also provided for increased protection in many types of accidents.

WARNING:

- For most effective protection, always wear the manual lap belt in addition to the automatic shoulder belt.
- If you do not wear your lap belt, you may increase your chance of being injured or increase the severity of injury. The shoulder belt alone may not

fully restrain you in some types of accidents.

- To properly operate the automatic seat belt system, the shoulder belt tongue should always remain inserted in the shoulder belt buckle, located in the rail of the door opening.

NISSAN recommends that children be seated in the rear seats. See "Precautions on seat belt usage" earlier in this section.

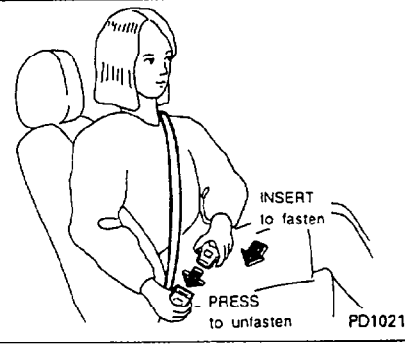
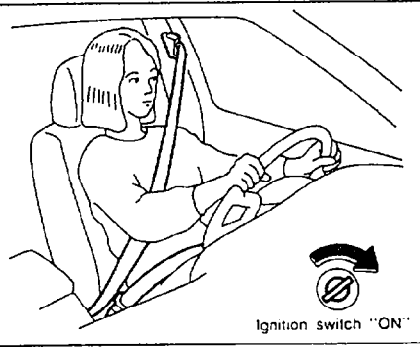
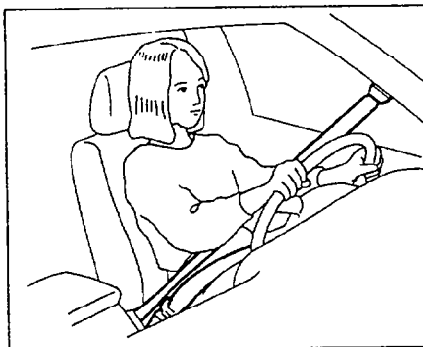
System malfunction

If, while the ignition switch is turned "ON" with either front door open, the seat belt warning light illuminates and remains illuminated and the chime sounds faster than usual for about 6 seconds, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.

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Fastening the belts

1. Open the door and make sure that the shoulder buckle is in the forward position. Then, get into the vehicle and close the door.

When the ignition switch is in the "ON" position and the door is closed, the shoulder buckle will move to the rear position.

2. Adjust the seat.

WARNING:

The seatback should not be in a reclining

position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat. If the seat is reclined, the risk of sliding under the lap belt and being injured is increased.

3. Turn the ignition switch to "ON". The shoulder buckle will move to the rear position and will fit across your chest. Pull the shoulder belt toward the retractor to take up extra slack.

- Do not touch the door guide rail while the shoulder buckle is moving.

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- Do not wear the shoulder belt across the neck or under your outer arm. The shoulder belt should be positioned midway over the shoulder for the most effective protection.

4. Slowly pull the lap belt out of the retractor and insert the tongue into the lap buckle until it snaps. Position the lap belt low on the hips and pull the belt toward the retractor to take up extra slack.

- Do not wear the lap belt across the shoulder belt.
- The retractors are designed to lock

during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.

The front seat passenger side lap belt has a cinching mechanism for child seat installation. It is referred to as the automatic locking mode. When the cinching mechanism is activated the seat belt cannot be withdrawn again until the seat belt tongue is detached from the buckle and fully retracted. Refer to "Child restraints for infants and small children" later in this section for more information.

WARNING:

- The automatic locking mode should be used only for child seat installation. During normal seat belt use by a passenger, the locking mode should not be activated. If it is activated it may cause uncomfortable seat belt tension.

Unfastening the belts

1. To unfasten the lap belt, press the button on the lap buckle. The seat belt will automatically retract.

2. Open the door. The shoulder belt buckle will move to the forward position and the shoulder belt will move away from your chest.

- Do not touch the door guide rail while the shoulder buckle is moving and do not place any body part or other objects in the path of the moving shoulder buckle.

- Do not unfasten the shoulder belt tongue from the buckle except in an emergency. See "Operation in an accident" later in this section.

How the automatic shoulder belt works

While the ignition switch is "ON":

The shoulder buckle will move to the forward position when the door is opened, and it will move to the rear position when the door is closed.

While the ignition switch is "OFF":

The shoulder buckle will remain in or move to the front position when the door is opened, and it will remain in the front position when the door is closed until the ignition switch is turned "ON".

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If the shoulder buckle operates abnormally, have the system checked by your NISSAN dealer.

Seat belt warning light "⚡" and warning chime

When the ignition switch is turned "ON" with the door open (the shoulder buckle is at the front position):

The chime will sound for about 6 seconds, and the warning light will illuminate. The warning light will go off when the door is closed and the shoulder buckle reaches the rear position.

When the ignition switch is turned "ON" with the door closed:

The chime will sound and the warning light will illuminate until the shoulder buckle reaches the rear position.

If the shoulder belt tongue is disconnected from the buckle:

When the ignition switch is turned "ON" and the shoulder buckle reaches the rear position, the warning light will continue to illuminate and the chime will sound for about 6 seconds until the shoulder belt is connected to the shoulder buckle. Insert the shoulder

belt tongue into the shoulder buckle before driving.

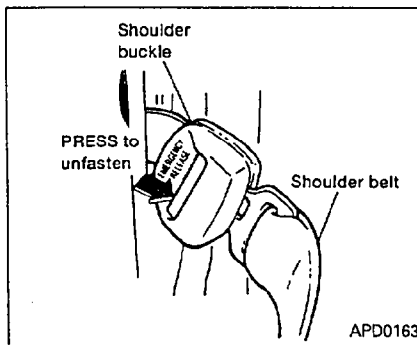
If the driver side lap belt is not fastened:

When the ignition switch is turned "ON" and the shoulder buckle reaches the rear position, the chime will sound for about 6 seconds and the warning light will continue to illuminate until the lap belt is fastened. Fasten the lap belt before driving.

WARNING:

If the seat belt warning light glows continuously while the ignition is turned "ON" with both doors closed and all seat belts fastened, it may indicate a malfunction in the system. Have the system checked by your NISSAN dealer.

If the vehicle is stopped quickly, the belt retractor may lock. Be sure to check if the shoulder belt is free before opening the door.



Operation in an accident

Emergency release

If you need to release the shoulder belt from the shoulder belt buckle in an emergency, press the red button marked with "EMERGENCY RELEASE". Use this feature only when the shoulder belt keeps you from leaving the vehicle in an accident.

For normal vehicle operation, the shoulder belt should always be connected to the buckle (see "Precautions on seat belt usage" in this section).

When the automatic shoulder belts do not move after an accident

This vehicle is equipped with an inertia fuel shut-off switch which also controls the automatic seat belt system circuit. The switch operates when the vehicle is involved in a collision and stops the automatic belts' motors from moving the belts and shuts off the fuel pump. Once the inertia fuel shut-off switch is activated, it must be reset before the vehicle will start and the automatic belts will operate.

For instructions on how to reset the inertia fuel shut-off switch, refer to "After an accident" in the "In case of emergency" section. Before resetting the switch, always check under the vehicle for fuel leaks.

WARNING:

If you see or smell fuel, do not reset the inertia fuel shut-off switch or try to start the vehicle. Have all the passengers get out of the vehicle and call the local fire department or a towing service. Failure to follow these instructions could result in injuries.

The belts may move suddenly when the inertia fuel shut-off switch reset button is

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pressed. Stay clear of the shoulder belt assemblies to avoid contact when motors engage.

IF EITHER SHOULDER BELT BUCKLE DOES NOT OPERATE

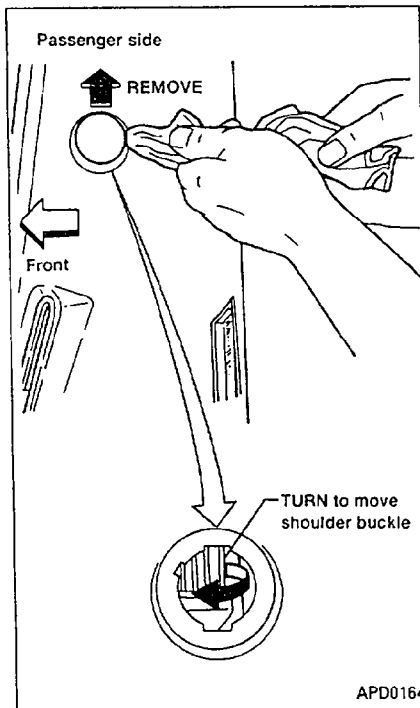
1. Slide the seat forward as far as possible.
2. Remove the blind cap in the lower portion of the center pillar with a screwdriver.

You will see the override thumbwheel.

You can also use a key (wrapped in a cloth to protect the cap) to remove the blind cap.

3. Use your thumb to move the thumbwheel toward the front of the vehicle for the passenger shoulder belt and toward the rear of the vehicle for the driver shoulder belt. You will see the shoulder belt buckle move toward the back of the door guide rail. Keep turning the thumbwheel until the buckle reaches the back of the door guide rail.

Have the automatic seat belt system checked and repaired by your NISSAN dealer.



Checking seat belt retractor operation (automatic seat belt)

Your seat belt retractors are designed to lock belt movement **only** when the vehicle slows down rapidly. Pulling on the belt will not cause the retractor to lock, no matter how fast you pull.

If you wish to have the locking operation of your seat belts checked for you, or if you have any questions about belt operation, see your NISSAN dealer.

**AUTOMATIC LOCKING MODE
(FOR USE IN CHILD SEAT
INSTALLATION)**

The front seat passenger lap belt and rear 3-point seat belts have a cinching mechanism for child seat installation. It is referred to as the automatic locking mode.

When the cinching mechanism is activated the seat belt cannot be withdrawn again until the seat belt tongue is detached from the buckle and fully retracted. Refer to "Child restraints for infants and small children" later in this section for more information.

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WARNING:

- The automatic locking mode should be used only for child seat installation. During normal seat belt use by a passenger, the locking mode should not be activated. If it is activated it may cause uncomfortable seat belt tension.

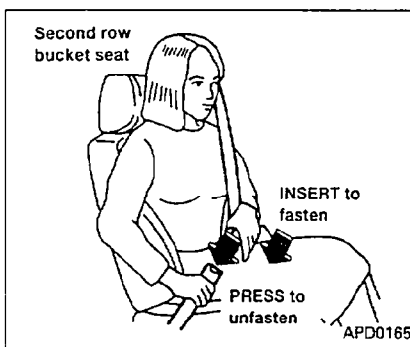
Unfastening the belts

To unfasten the belt, press the button on the buckle. The seat belt will automatically retract.

**Checking seat belt operation
(2-point type with retractor)**

Your seat belt retractors are designed to lock belt movement when the vehicle slows down rapidly.

If the retractor does not lock during this check or if you have any questions about belt operation, see your NISSAN dealer.



**3-POINT TYPE SEAT BELT WITH
RETRACTOR FOR SECOND
ROW BUCKET SEATS**

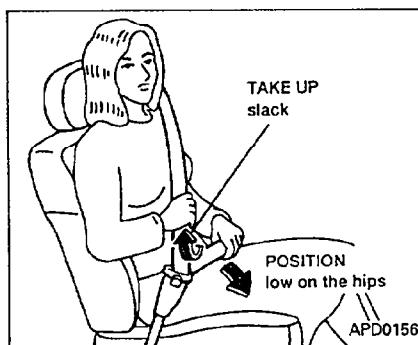
Every person who drives or rides in this vehicle should wear a seat belt at all times.

Fastening the belts

1. Adjust the seat.

The seatback should not be in a reclining position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat.

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3. Position the lap belt portion low on the hips as shown.

4. Pull the shoulder belt portion toward the retractor to take up extra slack.

**Two buckle seat belt system for the
second row bench seat**

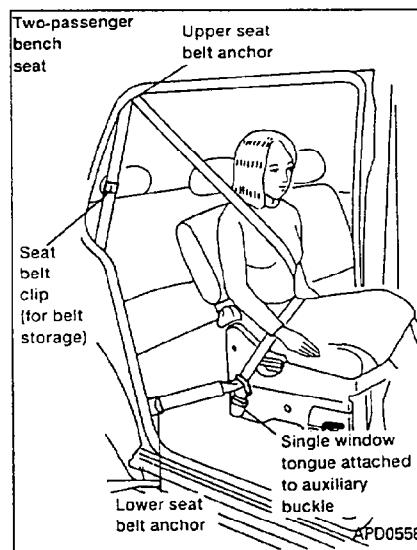
There is a two buckle seat belt system for the seating position of the second row bench seat next to the sliding door.

WARNING:

It is very important that you follow the instructions in this section before any-

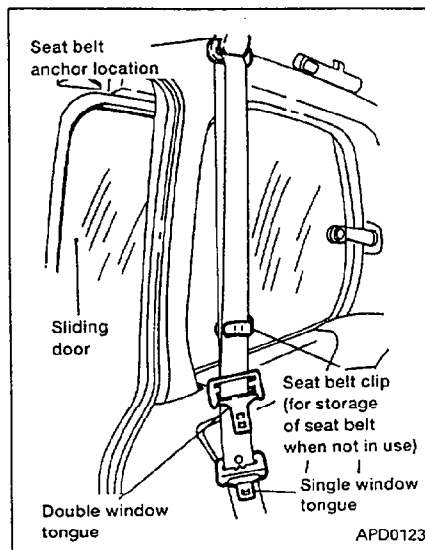
one rides in this seating position of the two-passenger bench seat.

Failure to do so may result in improper positioning of seat belt which could lead to increased likelihood or severity of injury in a sudden stop or collision.



The two-passenger bench seat in the second row has a seat belt system made up of two buckles and two tongues. There are two body attaching points (one upper and one lower) that attach each end of the seat belt webbing.

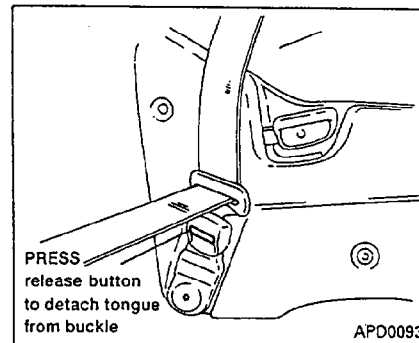
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One of the seat belt tongues has two "windows" (or holes) and the other has only one "window". The seat belt tongue with one window attaches to the buckle mounted to the side of the seat. The seat belt tongue with two windows should be positioned

properly and fastened to the buckle mounted in the location in the middle of the seat.

When the two buckle seat belt system is not in use, the webbing can be secured with the seat belt clip. The seat belt clip should not be used with a child seat or during seat belt usage. The seat belt clip opening should face the front of the vehicle.



A twisted belt may prevent the retractor from working properly. If the two buckle seat belt system is twisted, disengage the single window tongue from the buckle on the side of the seat, remove the twist and reinstall the tongue into the buckle until you hear a snap and feel the latch engage.

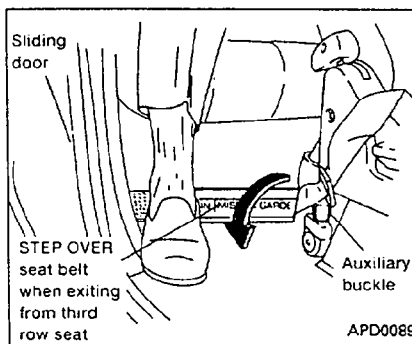
Both tongues must be attached to their appropriate buckles whenever someone is riding in that seating position. If the tongue is released to allow a third row passenger to enter or exit, the tongue must be reattached.

When the two-passenger bench seat is re-

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moved from the vehicle, you must detach the single window tongue from the auxiliary buckle.

If the three-passenger bench seat is moved up to the second row position, the outside passenger (near the sliding door) only needs to use the double window tongue and the standard buckle. Because the third row seat is so much wider and is closer to the sliding door, the single window tongue and the auxiliary buckle are not necessary.



WARNING:

Third row passengers must be very careful when exiting, because of the auxiliary seat belt. It is important to step over the seat belt guide and belt webbing to avoid tripping.

Unfastening the belts

To unfasten the belt, press the button on the buckle. The seat belt will automatically retract.

Checking seat belt operation (3-point type with retractor)

The second and third row seat belt retractors are designed to lock belt movement using two separate methods:

- 1) when the belt is pulled quickly from the retractor
- 2) when the vehicle slows down rapidly

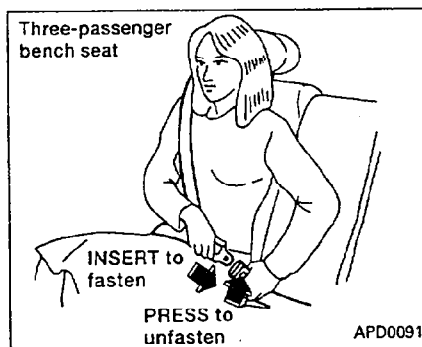
To increase your confidence in the belts, check their operation. Grasp the shoulder belt and pull quickly forward. The retractor should lock and restrict further belt movement.

If the retractor does not lock during this check or if you have any questions about belt operation, see your NISSAN dealer.

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THREE-PASSENGER BENCH SEAT

Fastening the seat belts

1. Adjust the seat.

The seatback should not be in a reclining position any more than needed for comfort. Seat belts are most effective when the passenger sits well back and straight up in the seat.

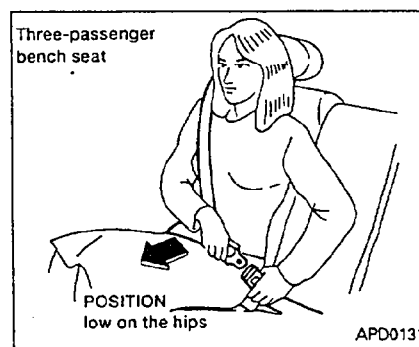
Third row passengers should be aware that their shoulder belt is located slightly behind the third row seating position. Never try to

use the seat belts for the second row passengers which are in front of the three-passenger bench seat.

WARNING:

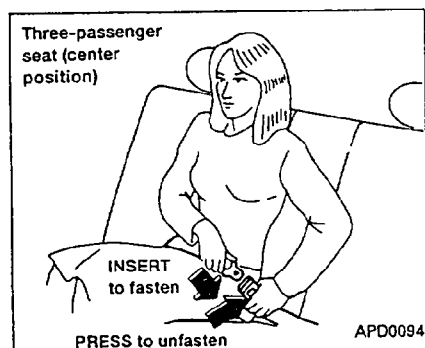
- Use of the second row 3-point seat belts by third row passengers could increase injury in a sudden stop or an accident.
2. Slowly pull the seat belt out of the retractor and insert the tongue into the buckle until it snaps.

The retractor is designed to lock during a sudden stop or on impact. A slow pulling motion will permit the belt to move, and allow you some freedom of movement in the seat.



3. Position the lap belt portion low on the hips as shown.
4. Pull the shoulder belt portion toward the retractor to take up extra slack.

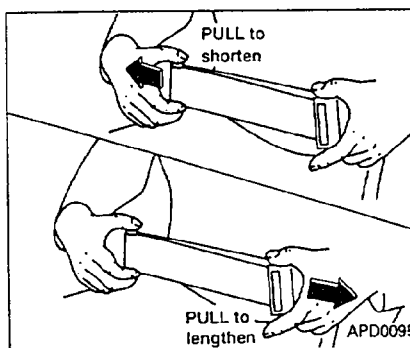
2-54



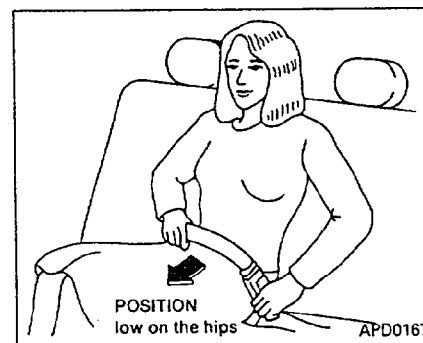
2-POINT TYPE WITHOUT RETRACTOR (Center of three-passenger bench seat)

Fastening the belts

1. Insert the tongue into the buckle until it snaps.



2. To lengthen, hold the tongue at a right angle to the belt and pull on the belt. To shorten, pull the free end of the belt away from the tongue.

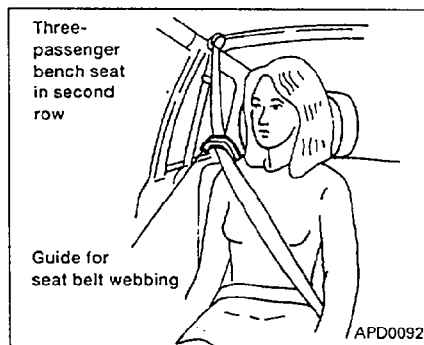


3. Position the lap belt low on the hips as illustrated.

Unfastening the belts

To unfasten the belt, press the button on the buckle.

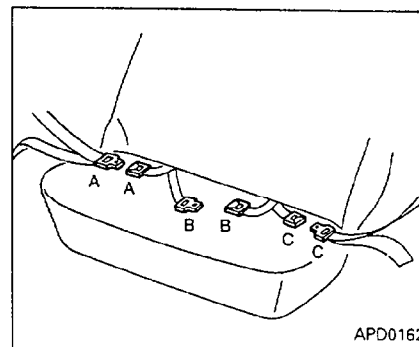
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THREE-PASSENGER BENCH SEAT (IN SECOND ROW)

A seat belt guide is provided **only** on the head restraint of the passenger side of the three-passenger bench seat in vehicles equipped with the second row bench seat or in five passenger vehicles. **The guide is designed for the comfort of the passenger when the three-passenger bench seat is moved up to the second row position.** If the shoulder belt fits close to the passenger's face or neck, the belt webbing should be positioned under the seat belt guide. If the shoulder belt fits comfortably over the passenger's shoulder and across

the chest, it is not necessary to use the guide.



Selecting correct set of belts

The seat belt tongues must be fastened into the seat belt buckles as illustrated above.

WARNING:

- Any rear seat belt tongue will connect to any seat belt buckle, therefore it is important to follow the illustration above. Failure to do so could increase the chance and/or severity of injury in an accident.