

2072

REPORT NO. TRC-93-N15

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION

1994 CHEVROLET CAPRICE

4-DOOR SEDAN

NHTSA NO. MR0103

TRC TEST NO. 940525

PREPARED BY:

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

EAST LIBERTY, OHIO 43319



JUNE 22, 1994

FINAL REPORT

PREPARED FOR:

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REPORT PREPARED BY:

Craig A. Markusic Date 7/11/94
Craig A. Markusic, Senior Project Engineer
Transportation Research Center Inc.

REPORT APPROVED BY:

Jeffery W. Sankay Date 7/11/94
Jeffery W. Sankay, Engineering Supervisor
Transportation Research Center Inc.

FINAL REPORT ACCEPTED BY:

[Signature] Date JUL 25 1994
Manager, New Car Assessment Program
NHTSA, Office of Market Incentives

Ann S. Chan Date JUL 25 1994
Contracting Officer's Technical Representative (COTR),
NHTSA, Office of Market Incentives

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7. Author(s) C. A. Markusic, Senior Project Engineer, TRC		8. Performing Organization Report No. TRC-93-N15	
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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1994 Chevrolet Caprice 4-door sedan, NHTSA No. MR0103, at Transportation Research Center Inc. on May 25, 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 56.5 kph. The vehicle's maximum static crush was 690 millimeters. The ambient temperature was 24° C. The driver's Head Injury Criteria (HIC) was 712 (See DATA ACQUISITION EXPLANATIONS). The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.2 g. The driver's chest maximum deflection was 45 millimeters. The driver's left and right femur maximum axial forces were 5386 N and 5296 N, respectively. The passenger's HIC was 1058. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 63.0 g. The passenger's chest maximum deflection was 47 millimeters. The passenger's left and right femur maximum axial forces were 4433 N and 4161 N, respectively.			
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
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LENGTH

in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km

AREA

in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha

MASS (weight)

oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	tonnes	t
	(2000 lb)			

VOLUME

tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³

TEMPERATURE (exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
--------	---------------	-------------	---------	--------

LENGTH

mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi

AREA

cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	

MASS (weight)

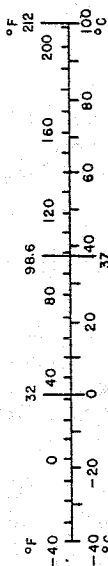
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	

VOLUME

ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³

TEMPERATURE (exact)

°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F
----	---------------------	-------------------	------------------------	----



* 1 m = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10.286.

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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 Chevrolet Caprice 4-door sedan, NHTSA No. MR0103, 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) Part 572E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the first use of the driver dummy and the second use of 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. Each Part 572E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection and a six-axis neck load cell to measure longitudinal, lateral, and vertical forces and moments.

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

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

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

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This frontal load cell barrier test was conducted at TRC on May 25, 1994.

The test vehicle, a 1994 Chevrolet Caprice 4-door sedan, NHTSA No. MR0103, was equipped with a 5.7-liter in-line engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 2133 KG. The vehicle's impact speed was 56.5 kph. The vehicle sustained 690 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 712 (See DATA ACQUISITION EXPLANATIONS). The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.2 g. The driver's chest maximum deflection was 45 mm. The driver's left and right femur maximum axial forces were 5386 N and 5296 N, respectively.

The passenger's HIC was 1058. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 63.0 g. The passenger's chest maximum deflection was 47 mm. The passenger's left and right femur maximum axial forces were 4433 N and 4161 N, respectively.

There was no loss of windshield periphery retention.

There was no penetration through the windshield.

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

DATA ACQUISITION EXPLANATIONS

The driver's head Z-axis accelerometer, HEDZG1, data contained noise. The HIC was calculated after removal of the noise from the data. The noise also affected the driver's head resultant acceleration calculation.

The left rear seat X-axis accelerometer, TLRXG1, recorded questionable data from 122 milliseconds and did not return to zero after the impact event. The left rear seat redundant accelerometer, TLRXGA, was used for left rear seat velocity and displacement calculations.

The following data channels lost data at approximately 113 milliseconds:

Driver's shoulder belt force load cell - SHBF1

Right front passenger neck X-axis shear force load cell - NEKXF2

Right front passenger neck Y-axis shear force load cell - NEKYF2

Right front passenger neck Z-axis axial force load cell - NEKZF2

Right front passenger moment about X-axis load cell - NEKXM2

Right front passenger moment about Y-axis load cell - NEKYM2

Right front passenger moment about Z-axis load cell - NEKZM2

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MRO103 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 05/25/94 TEST TIME: 1553 AMBIENT TEMP.: 24° C

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Chevrolet/Caprice/4-door sedan

VEHICLE TEST WEIGHT (KG): 2133

IMPACT ANGLE (DEG)¹: 0

IMPACT VELOCITY (KPH)²: PRIMARY = 56.5 SECONDARY = 56.5

MAXIMUM STATIC CRUSH (MM): 690

AVERAGE REBOUND (MM): 530

DUMMIES:	Driver #192	Passenger #142
TYPE:	Part 572 E	Part 572 E
LOCATION:	Left front	Right front
RESTRAINT:	Airbag and 3-point unbelt	Airbag and 3-point unbelt
NUMBER OF DATA CHANNELS:	83	
NUMBER OF CAMERAS:	HIGH-SPEED 16	REAL-TIME 2

¹ With respect to tow track centerline.

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

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: General Motors Corporation

MAKE/MODEL: Chevrolet Caprice VIN: 1G1BL52PORR106960

BODY STYLE: 4-door sedan MODEL YEAR: 1994

NHTSA NO.: MR0103 COLOR: Silver

ENGINE DATA: TYPE: Inline CYLINDERS: 8 DISPLACEMENT: 5.7-liter

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

DATE VEHICLE RECEIVED: 05/13/94 ODOMETER READING: 22

DEALER'S NAME AND ADDRESS: Clippinger Chevrolet
P.O. Box 1375
Covina, CA 91722

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	Driver only	TILTING STEERING WHEEL	Yes
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	Yes
CLOCK	Yes	REAR WINDOW DEFROSTER	Yes
OTHER			

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: General Motors Corporation

DATE OF MANUFACTURE: 09/93 VIN: 1G1BL52PORR106960

GVWR: 2420 kg

GAWR: FRONT: 1181 kg, REAR: 1239 kg

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear Eagle, P235/70R15

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

SPARE TIRE (MFR., SIZE): Goodyear, T145/80D62

TYPE OF SEATS: FRONT: Split bench
REAR: Bench

TYPE OF FRONT SEAT BACKS: Adjustable

MAXIMUM WIDTH: 1956 MM

WHEELBASE: 2935 MM

LOCATION OF LABEL STATING TIRE DATA:

The label was located on the driver's door.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P235/70R15

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

DESIGNATED SEATING CAPACITY: 3 FRONT 3 REAR
6 TOTAL

VEHICLE CAPACITY WEIGHT: 499 kg

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE: LF 762; RF 767; LR 707; RR 715

PRE-TEST ATTITUDE: LF 740; RF 745; LR 673; RR 663

POST-TEST ATTITUDE: LF 933; RF 904; LR 693; RR 657

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	527.0 KG	RIGHT REAR	414.0 KG
LEFT FRONT	520.0 KG	LEFT REAR	433.0 KG
TOTAL FRONT WEIGHT	1047.0 KG	(55.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	847.0 KG	(44.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1894.0 KG		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW¹ = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (1894 KG)

VCW = VEHICLE CAPACITY WEIGHT (499 KG)

DSC = DESIGNATED SEATING CAPACITY (6)

RCLW¹ = VCW - 68 (DSC) = 91 KG

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

TARGET TEST WEIGHT = 1894 + 91 + 152

TARGET TEST WEIGHT = 2137 KG

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 87 KG OF CARGO WEIGHT:

RIGHT FRONT	565.0 KG	RIGHT REAR	501.0 KG
LEFT FRONT	554.0 KG	LEFT REAR	513.0 KG
TOTAL FRONT WEIGHT	1119.0 KG	(52.5% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1014.0 KG	(47.5% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2133.0 KG	(0.2% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 0 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Rear bumper and trunk lid

CG = 1395 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: 940525 NHTSA NO.: MRO103
TEST DATE: 05/25/94 TEST TIME: 1553
TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°
AMBIENT TEMPERATURE AT IMPACT AREA: 24° C
TEMPERATURE IN OCCUPANT COMPARTMENT: 21° C
IMPACT VELOCITY: PRIMARY = 56.5 KPH SECONDARY = 56.5 KPH

(SPECIFIED RANGE = 55.5 TO 57.1 KPH)

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

EXITING VELOCITY TRAP = 51 MM

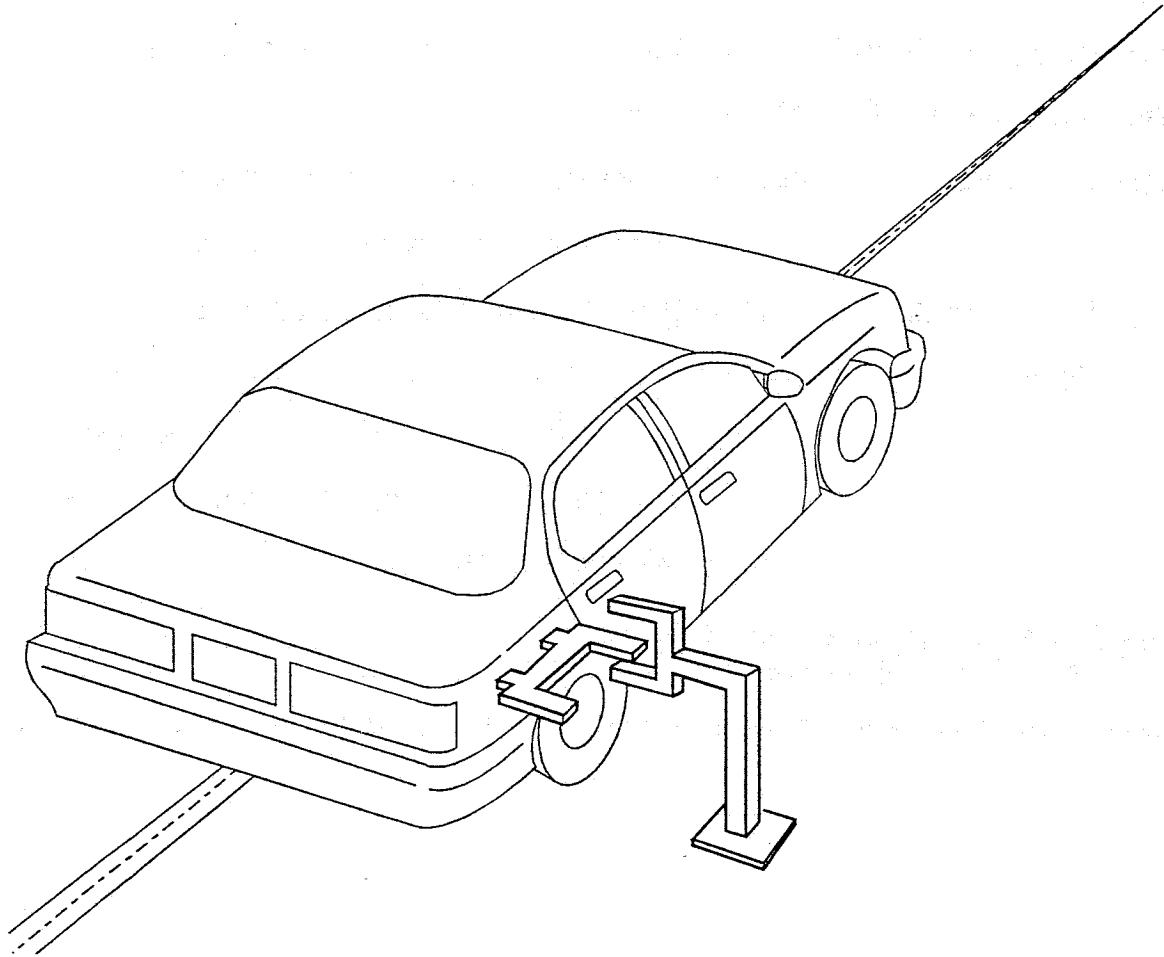
TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN MILLIMETERS):

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 5320; C 5430; R 5305
POST-TEST: L 4731; C 4740; R 4677
TOTAL CRUSH: L 589; C 690; R 628
AVERAGE CRUSH: 636

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 539; C 467; R 585; AVG. 530

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: Chevrolet/Caprice/4-door sedan

VEHICLE NHTSA NO.: MR0103; VIN: 1G1BL52PORR106960

MODEL YEAR: 1994; BUILD DATE: 09/93; TEST DATE: 05/25/94

VEHICLE SIZE CATEGORY: Large; TEST WEIGHT: 2133 KG

VEHICLE WHEELBASE: 2935 MM

MAXIMUM WIDTH: 1956 MM

FRONT OVERHANG: 1055 MM

COLLISION DEFORMATION

CLASSIFICATION (CDC) CODE: 12FDEW3

**CRUSH DEPTH
MEASUREMENTS:**

C1 = 589 MM

C2 = 632 MM

C3 = 651 MM

C4 = 678 MM

C5 = 690 MM

C6 = 628 MM

VEHICLE CENTERLINE

MIDPOINT OF DAMAGE: D = (LONGITUDINAL)

LENGTH OF DAMAGED

REGION: L = 1460 MM

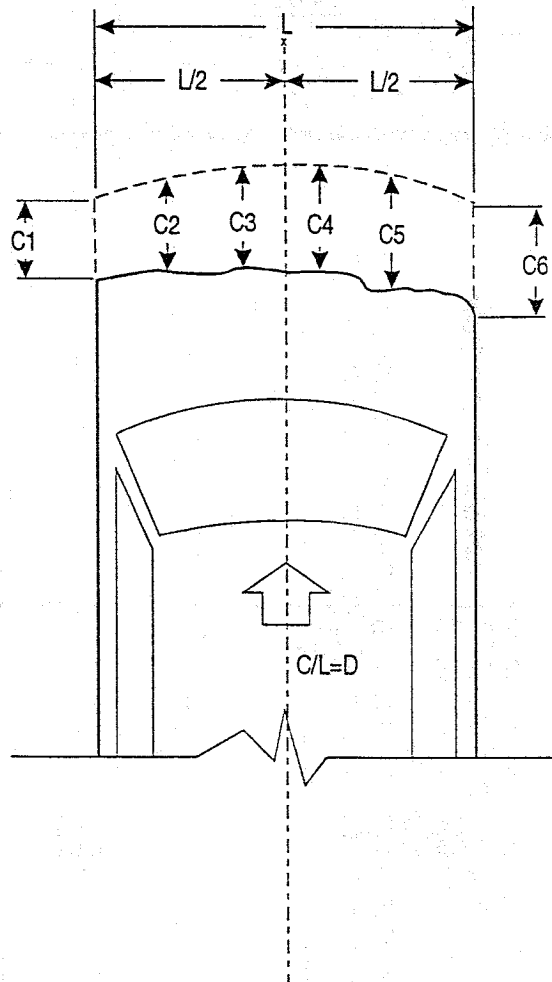
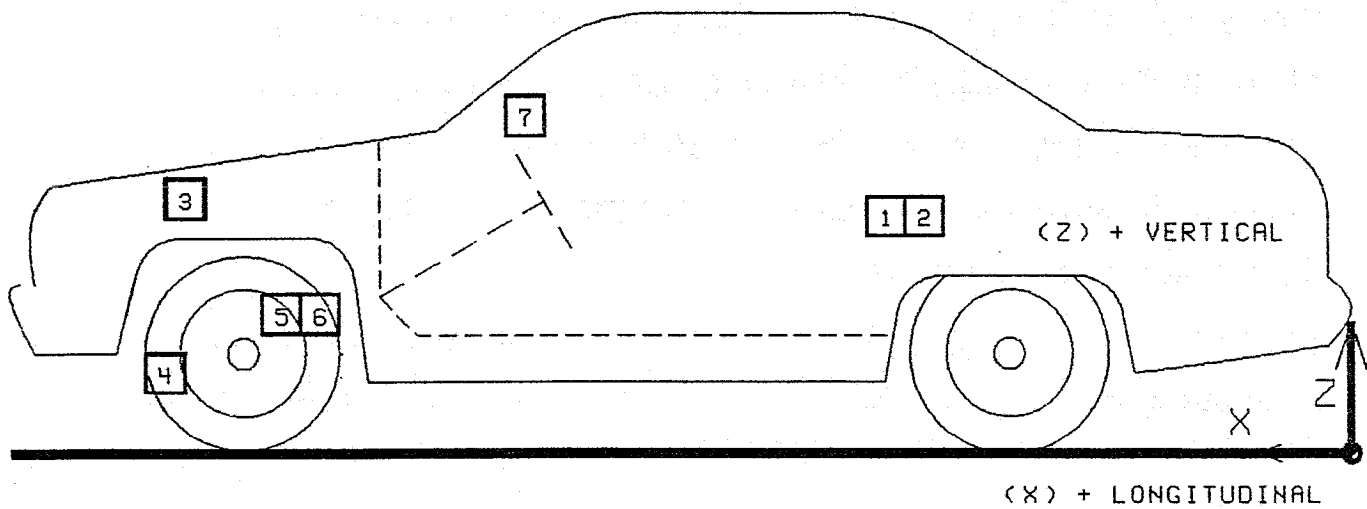
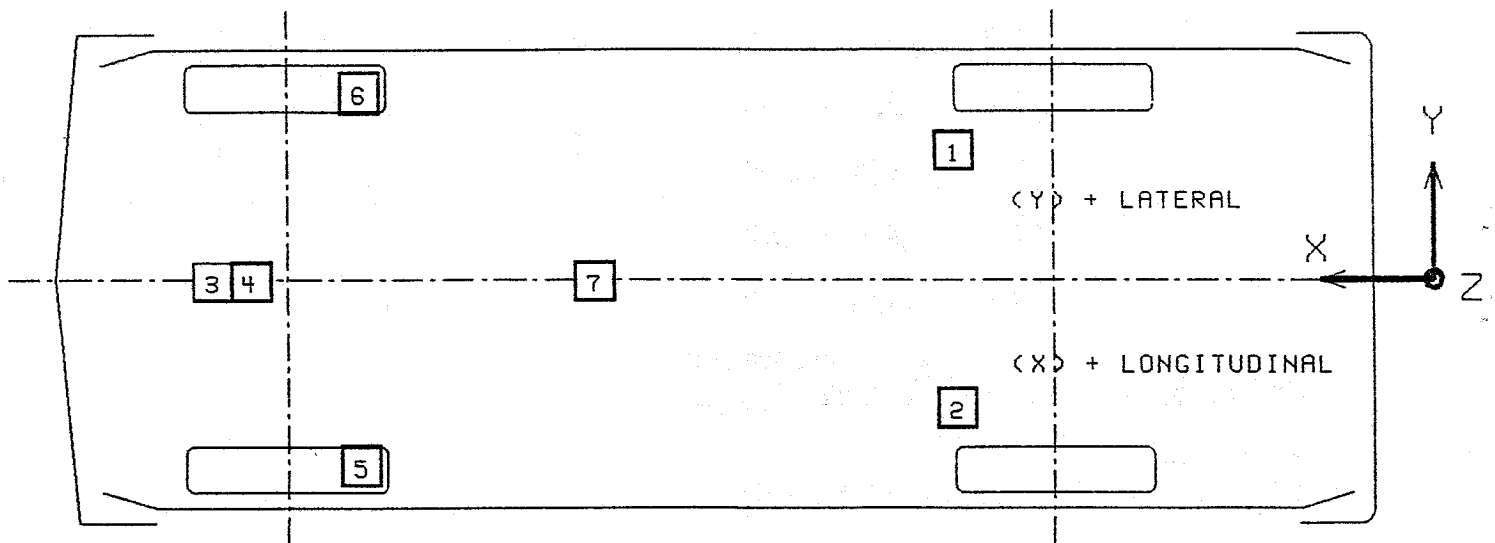


FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL ¹ REDUNDANT	3250 mm	440 mm	379 mm	5.6 g @ 111.1 ms 8.6 g @ 145.4 ms	248.8 g @ 150.7 ms 29.5 g @ 63.2 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3245 mm	-440 mm	379 mm	3.2 g @ 154.2 ms 0.1 g @ 2.0 ms	32.8 g @ 64.2 ms 38.8 g @ 64.2 ms
3 ENGINE TOP LONGITUDINAL	1117 mm	215 mm	760 mm	9.8 g @ 93.8 ms	67.3 g @ 48.9 ms
4 ENGINE BOTTOM LONGITUDINAL	1270 mm	-105 mm	236 mm	15.5 g @ 65.0 ms	60.3 g @ 51.4 ms
5 RIGHT BRAKE CALIPER LONGITUDINAL	1180 mm	-636 mm	371 mm	52.3 g @ 23.0 ms	77.2 g @ 56.0 ms
6 LEFT BRAKE CALIPER LONGITUDINAL	1180 mm	636 mm	352 mm	32.1 g @ 69.5 ms	63.5 g @ 23.3 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1795 mm	0 mm	1031 mm	42.7 g @ 49.9 ms	69.6 g @ 64.5 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 #192	PASSENGER #142
HEAD	<u>Airbag, seat back, head restraint</u>	<u>Airbag, seat back, head restraint</u>
CHEST	<u>Airbag</u>	<u>Airbag</u>
ABDOMEN	<u>None</u>	<u>None</u>
LEFT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>
RIGHT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

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

SEAT MOVEMENT:

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

GLAZING DAMAGE:

The entire windshield cracked on impact.

OTHER NOTABLE IMPACT EFFECTS:

None

TABLE 6 FMVSS 208 DATA SUMMARY

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Chevrolet/Caprice/4-door sedan

VEHICLE NHTSA NO.: MRO103; TEST DATE: 05/25/94

	DRIVER DUMMY #192	PASSENGER DUMMY #142
<u>MAXIMUM ACCELERATIONS (G):</u>		
HEAD X-AXIS	-62.8	-71.6
HEAD Y-AXIS	16.6	-11.7
HEAD Z-AXIS ³	NA	-47.4
HEAD RESULTANT ³	NA	80.8
CHEST X-AXIS	-49.2	-62.9
CHEST Y-AXIS	-6.5	-6.6
CHEST Z-AXIS	-21.2	-22.8
CHEST RESULTANT ¹	52.2	63.0
CHEST RESULTANT TIME INTERVAL (SEC.) ¹	.003	.003

HEAD INJURY CRITERIA (HIC) VALUES:

HIC ²³	712	1058
HIC STARTING TIME (SEC.)	.068	.070
HIC ENDING TIME (SEC.)	.104	.103
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	76.9	63.2

MAXIMUM CHEST DEFLECTIONS (MM):

CHEST X-AXIS	45	47
MAXIMUM CHEST DEFLECTION TIME (SEC)	.081	.088

MAXIMUM COMPRESSIVE FEMUR FORCES (N):

LEFT FEMUR	5386	4433
RIGHT FEMUR	5296	4161

MAXIMUM SEAT BELT FORCES (N):

LAP BELT	4131	6327
SHOULDER BELT ³	9180	8513

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/Chevrolet/Caprice/4-door sedan

VEHICLE NHTSA NO.: MR0103; TEST DATE: 05/25/94

<u>MAXIMUM VALUES:</u>	<u>DRIVER DUMMY #192</u>	<u>PASSENGER DUMMY #142</u>
NECK X-AXIS FORCE ³ (N)	316	-456
NECK Y-AXIS FORCE ³ (N)	348	174
NECK Z-AXIS FORCE ³ (N)	2842	2752
NECK MOMENT ABOUT X AXIS ³ (N-M)	26	-16
NECK MOMENT ABOUT Y AXIS ³ (N-M)	-21	38
NECK MOMENT ABOUT Z AXIS ³ (N-M)	25	-5

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 and the three-point unbelt. The dummy rebounded rearward and slightly to the left into the seat back with the dummy's head rotating rearward contacting the head restraint and seat back. The driver dummy came to rest in the driver's seat, restrained by the three-point unbelt.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated slightly forward with the dummy's head and chest impacting the airbag. The right front passenger dummy was restrained by the airbag and three-point unbelt. The dummy rebounded rearward into the seat back as the dummy's head contacted 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 three-point unbelt.

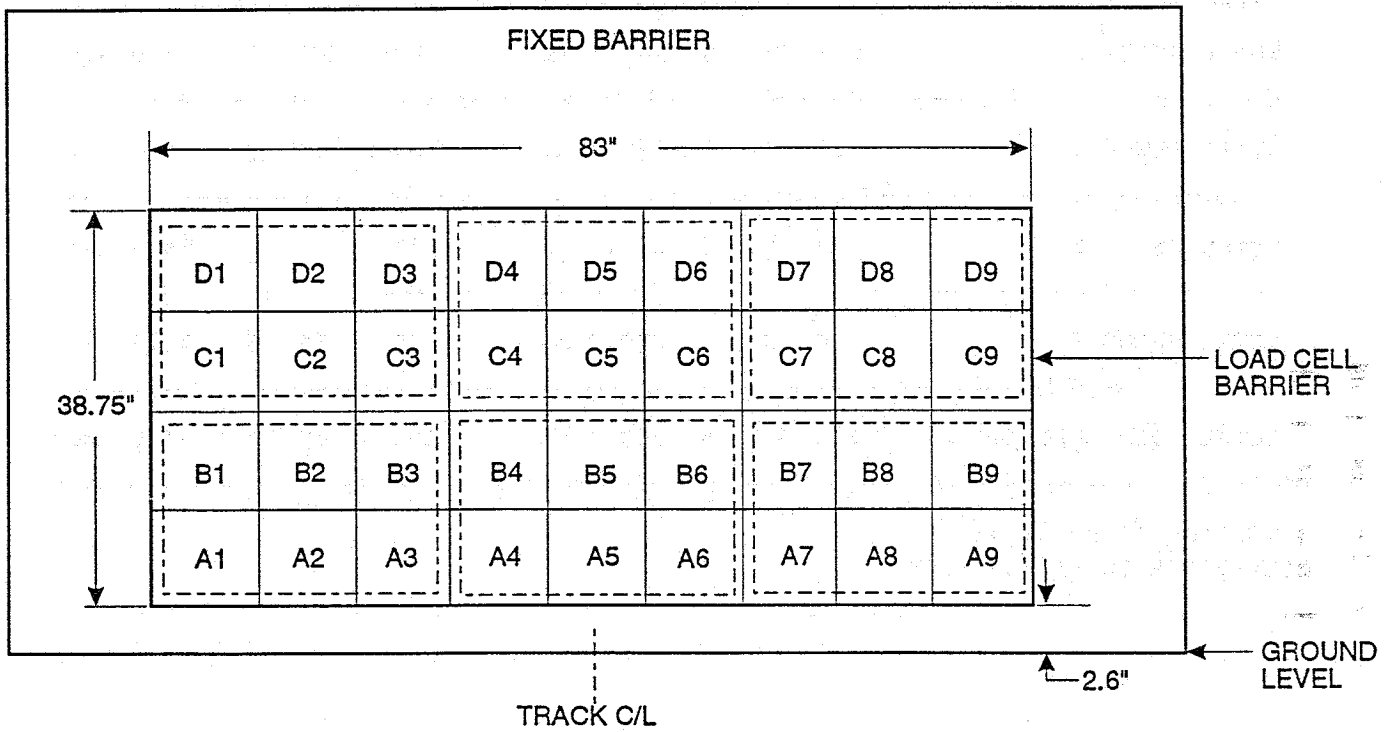
TABLE 8 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

	<u>DRIVER</u>	<u>PASSENGER</u>
<u>BELT LENGTH DATA:</u>		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	2480	2480
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	830	870
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	670	680
<u>SHOULDER BELT SPOOL-OFF LENGTH:</u>		
AS DETERMINED BY FILM ANALYSIS	46	71
AS DETERMINED MECHANICALLY	70	56
AS DETERMINED ELECTRONICALLY	75	83
<u>BELT STRETCH LENGTH (MM/M):</u>		
AS MEASURED MECHANICALLY	3	0
AS MEASURED ELECTRONICALLY	1	0
<u>RETRACTOR LOCK-UP TIME (MS):</u>		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	60	44

ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

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

LOCATION	POSITIVE DIRECTION	NEGATIVE DIRECTION
TOTAL GROUP 1	2.1 kN @ 296.9 ms	102.2 kN @ 44.9 ms
TOTAL GROUP 2	2.1 kN @ 297.0 ms	182.2 kN @ 86.6 ms
TOTAL GROUP 3	0.9 kN @ 246.0 ms	99.3 kN @ 48.1 ms
TOTAL GROUP 4	1.2 kN @ 229.4 ms	69.3 kN @ 27.0 ms
TOTAL GROUP 5	1.4 kN @ 229.5 ms	231.3 kN @ 54.4 ms
TOTAL GROUP 6	2.0 kN @ 229.8 ms	69.0 kN @ 30.4 ms
TOTAL LOAD CELL FORCE	8.5 kN @ 229.4 ms	671.2 kN @ 54.6 ms

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.:

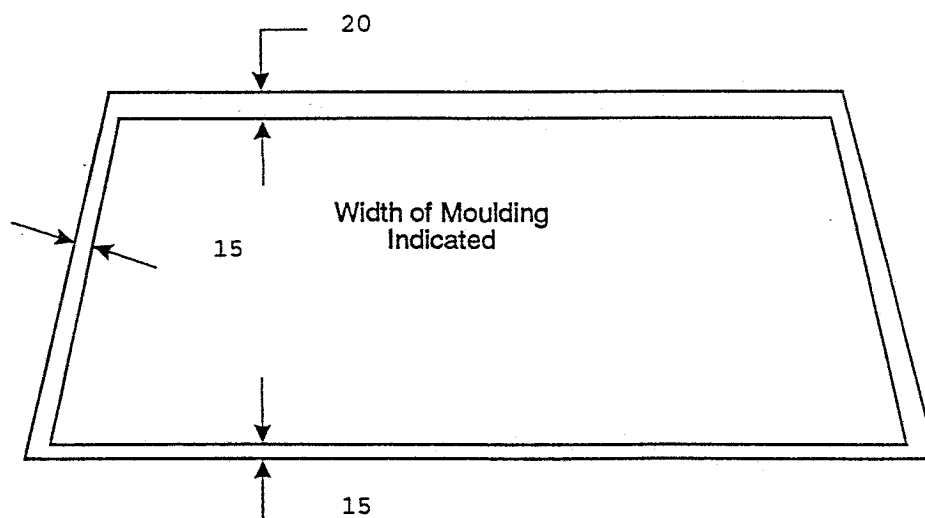
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	2400	2400	100.0
LEFT SIDE	2400	2400	100.0
TOTAL	4800	4800	100.0

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 21° C



FRONT VIEW OF WINDSHIELD¹

LOSS OF WINDSHIELD RETENTION LENGTHS: None

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

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

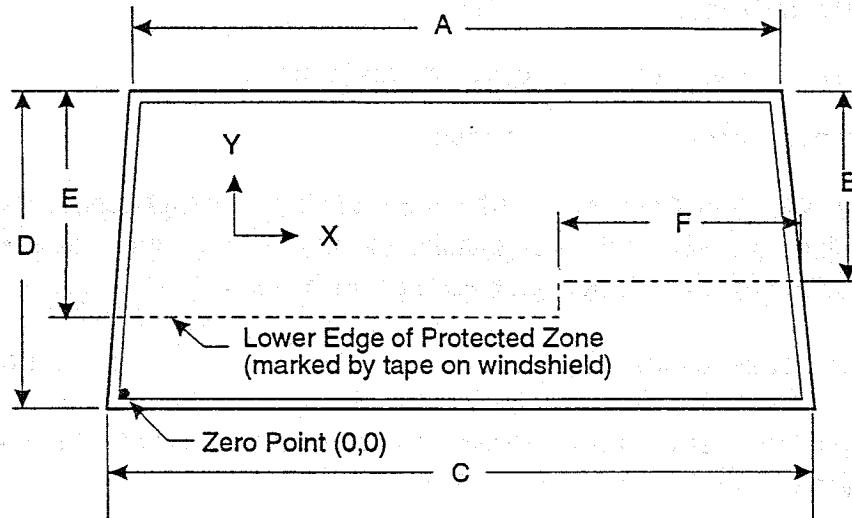
FIGURE 6 FMVSS 219 TEST DATA

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:

A = 1392
 B = 505
 C = 1797
 D = 843
 E = 538
 F = 613



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: Chevrolet/Caprice
NHTSA NO.: MR0103
FUEL SYSTEM CAPACITY: 87.4 LITERS (FROM OWNER'S MANUAL)
USABLE CAPACITY: 87.4 LITERS (FURNISHED BY COTR)
TEST VOLUME RANGE: 80.4 LITERS TO 82.2 LITERS (92-94% OF USABLE)
ACTUAL TEST VOLUME: 81.0 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 behind the rear axle.
The fuel filler neck is located at the rear center of the vehicle.
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.: MRO103; TEST DATE: 05/25/94

VEHICLE MAKE/MODEL/BODY STYLE: Chevrolet/Caprice/4-door sedan

TEST REQUIREMENTS:

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

TEST VEHICLE IMPACT TYPE:

- ☒ X FRONTAL (56 KPH)
☐ OBLIQUE (48 KPH) WITH ° BARRIER FACE
FIRST CONTACTING (DRIVER/PASS.) SIDE.
☐ REAR MOVING BARRIER (48 KPH)
☐ LATERAL MOVING BARRIER (32 KPH)

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

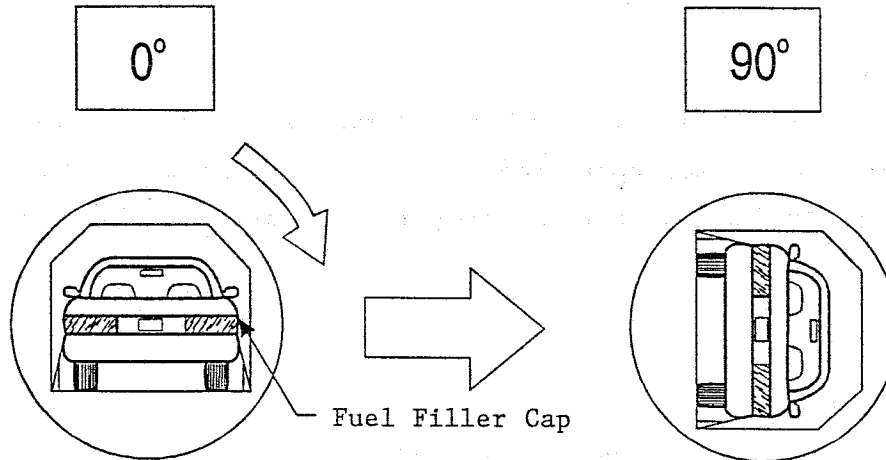
	TEST RESULTS	MAXIMUM ALLOWABLE
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 G	28 G
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 G	142 G
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - - -	0 G	28 G/MN

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: MR0103
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:

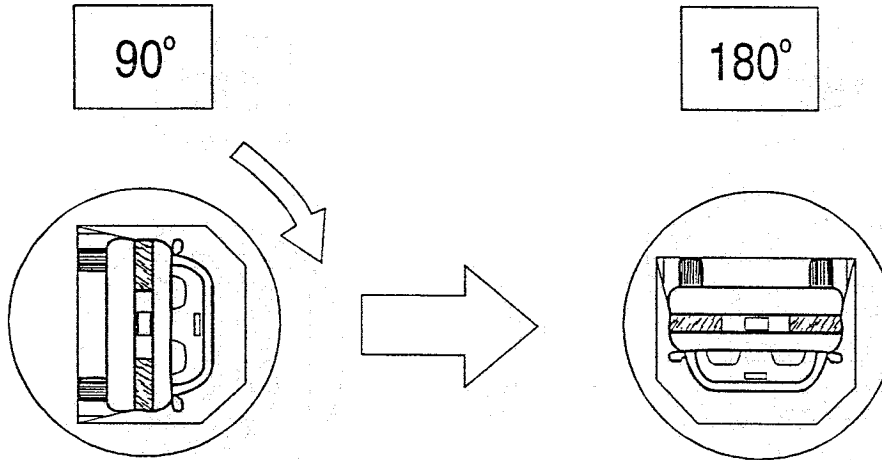
<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0103
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:

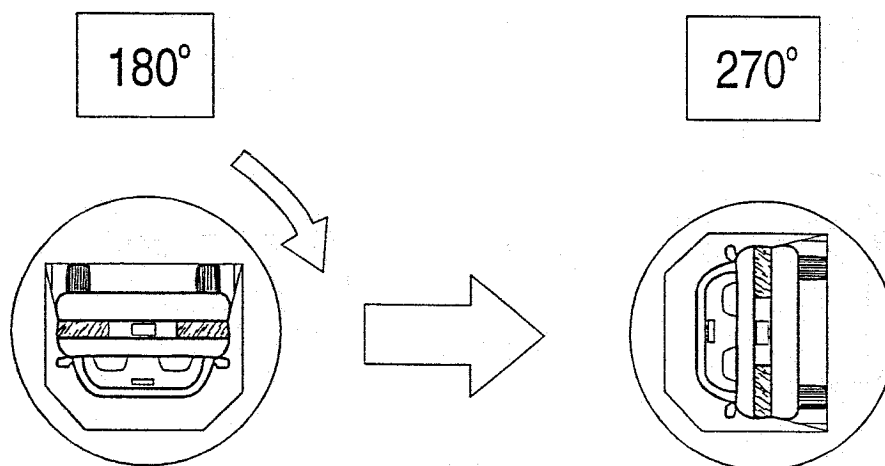
<u>90° TO 180° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0103
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:

180° TO 270° ROTATION

	<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

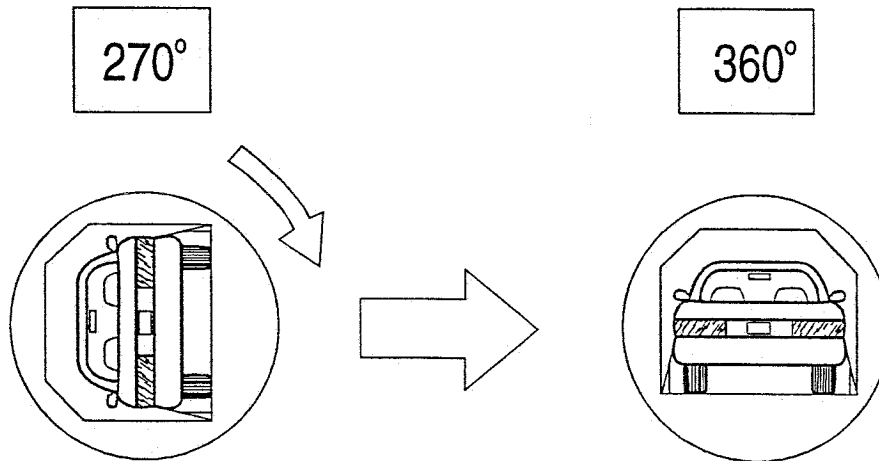
FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0103

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

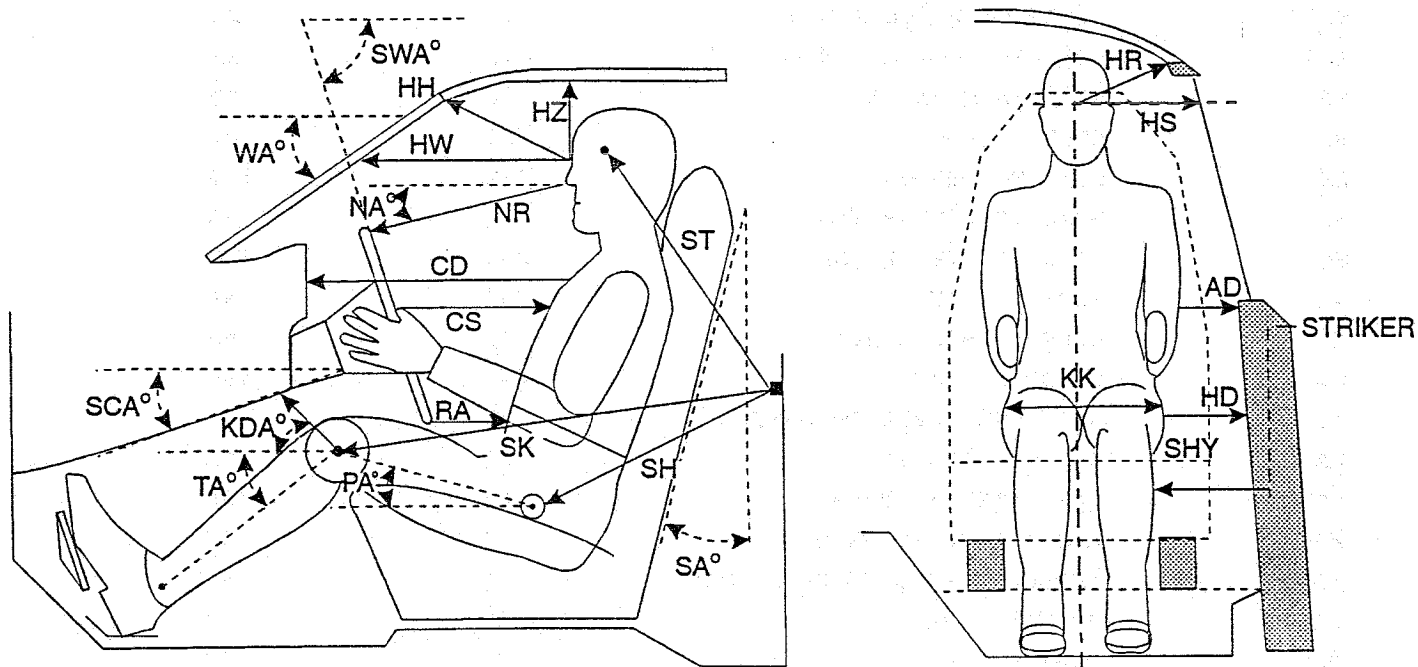
FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

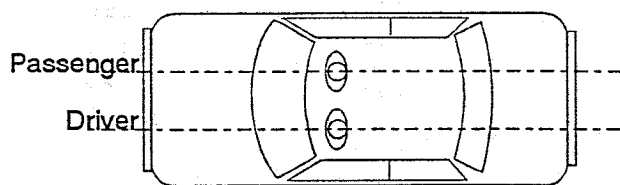
SECTION 4.0

VEHICLE, OCCUPANT, AND CAMERA INFORMATION

FIGURE 8 DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS



VERTICAL LONGITUDINAL PLANE



VERTICAL TRANSVERSE PLANE

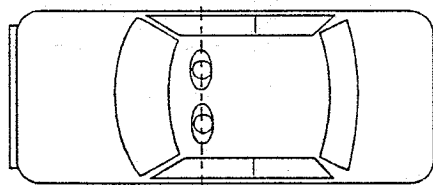


TABLE 12 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #192)	PASSENGER (SERIAL #142)
WA°	WINDSHIELD ANGLE	25	25
SWA°	STEERING WHEEL ANGLE	18	NA
SCA°	STEERING COLUMN ANGLE	72	NA
SA°	SEAT BACK ANGLE ¹	26	26
HZ	HEAD TO ROOF	211	207
HH	HEAD TO HEADER	322	324
HW	HEAD TO WINDSHIELD	686	696
HR	HEAD TO SIDE HEADER	233	241
NR	NOSE TO RIM	334	NA
NA	NOSE TO RIM ANGLE	12	NA
CD	CHEST TO DASH	495	491
CS	STEERING WHEEL TO CHEST	247	NA
RA	RIM TO ABDOMEN	157	NA
KDL	LEFT KNEE TO DASH	165	139
KDR	RIGHT KNEE TO DASH	171	155
KDA	OUTBOARD KNEE TO DASH ANGLE	36	44
PA°	PELVIC ANGLE	22	24
TA°	TIBIAL ANGLE	32	30
KK	KNEE TO KNEE	260	270
ST	STRIKER TO HEAD	535	540
	STRIKER TO HEAD ANGLE	-82	-80
SK	STRIKER TO KNEE	587	599
	STRIKER TO KNEE ANGLE	-3	-3
SH	STRIKER TO H-POINT	215	239
	STRIKER TO H-POINT ANGLE	23	16
SHY	STRIKER TO H-POINT (Y DIR.)	277	265
HS	HEAD TO SIDE WINDOW	275	299
HD	H-POINT TO DOOR	225	217
AD	ARM TO DOOR	152	153

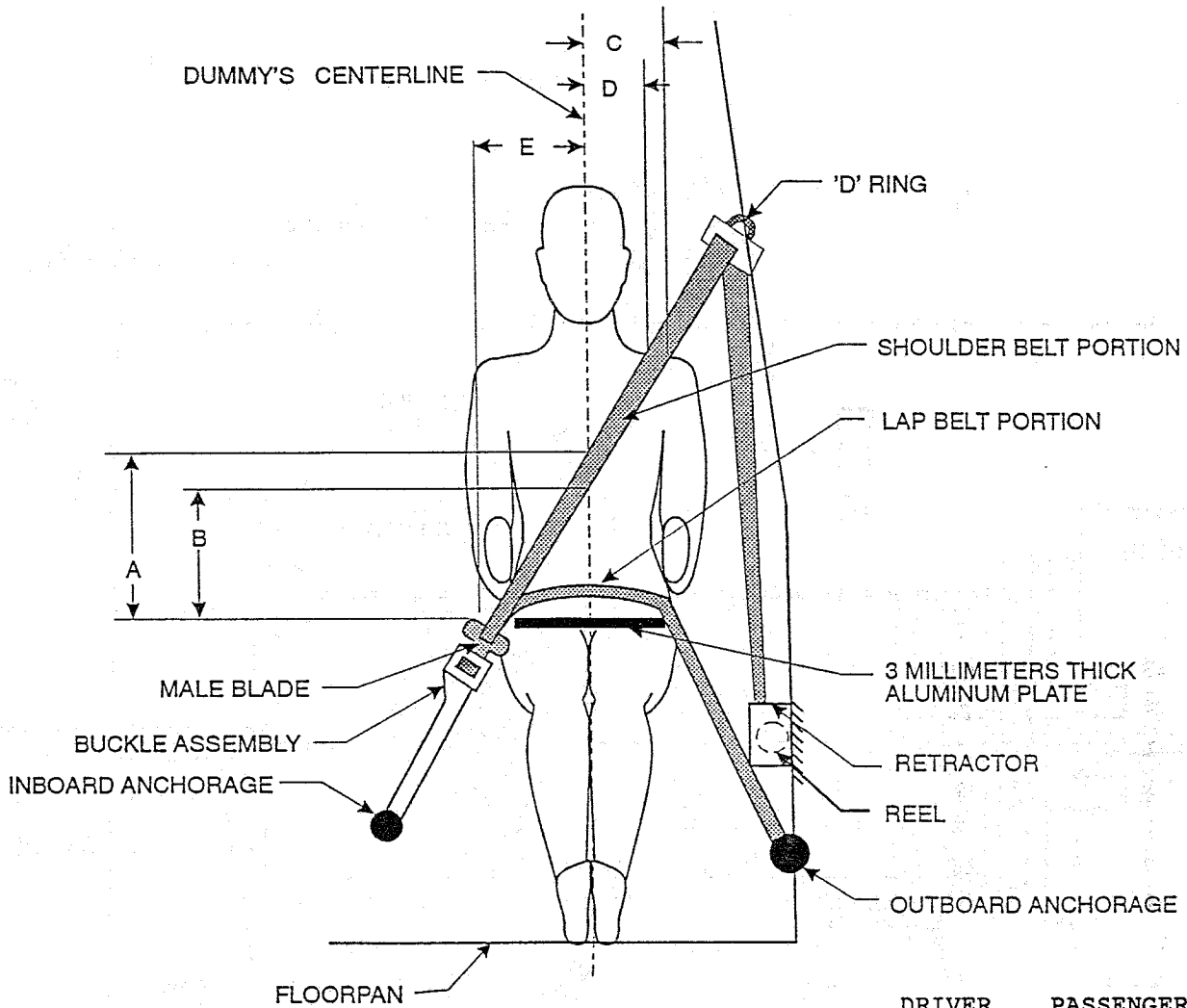
THE SEAT BACK ANGLE (SA°) IS MEASURED RELATIVE TO VERTICAL, ALL OTHER ANGLES ARE MEASURED RELATIVE TO HORIZONTAL.

ALL ANGLE MEASUREMENTS ARE IN DEGREES.

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

¹ Angle measured from head restraint support.

FIGURE 9 SEAT BELT POSITIONING DATA



	DRIVER	PASSENGER
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	343	335
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	271	247
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	129	129
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	60	57
LAP BELT TENSION (N)	13	18
SHOULDER BELT TENSION (N)	18	18
ADJUSTABLE SEAT BELT ANCHORAGE POSITION	NA	NA

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 10 CAMERA POSITIONS

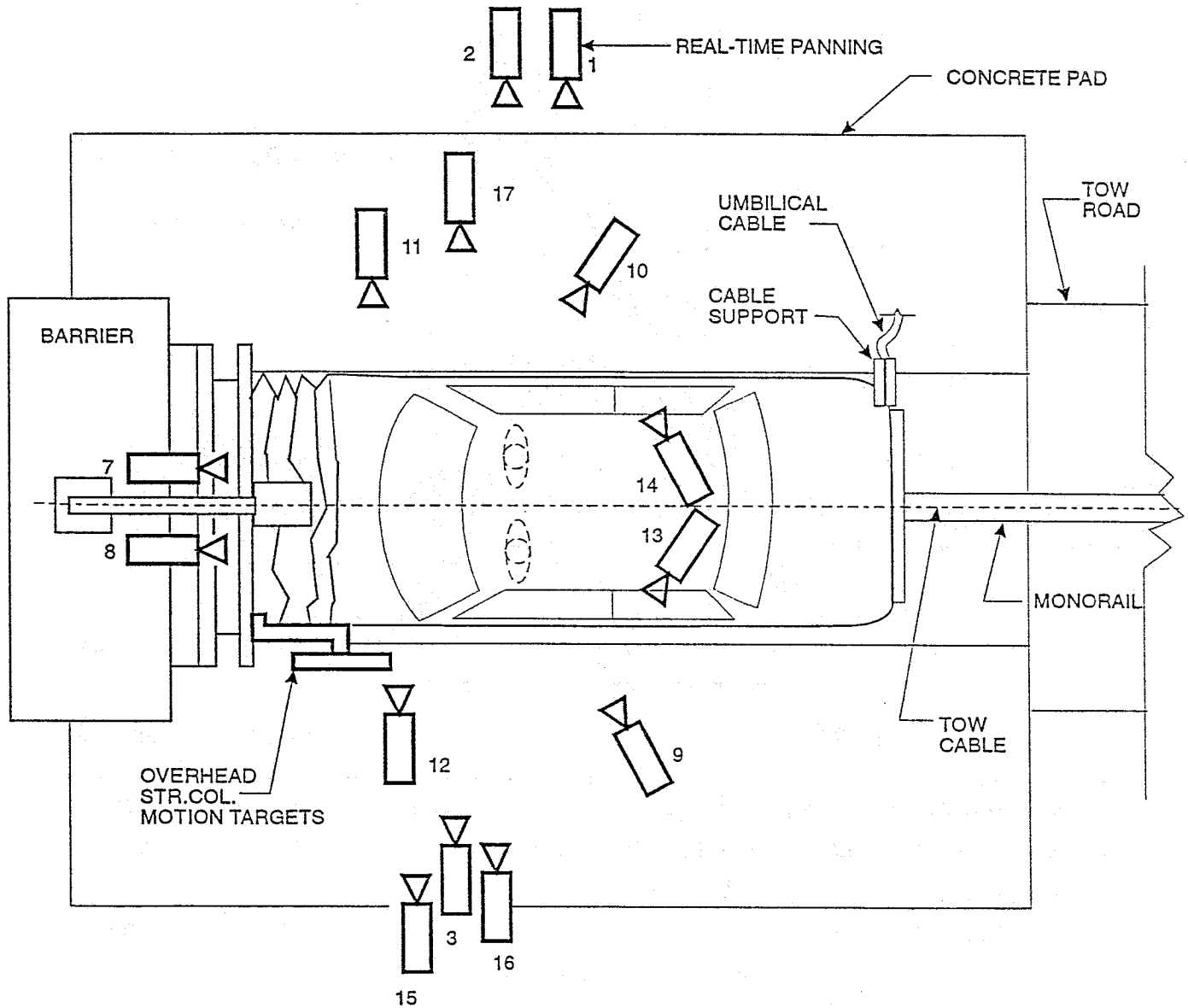


FIGURE 10 CAMERA POSITIONS, CONT'D.

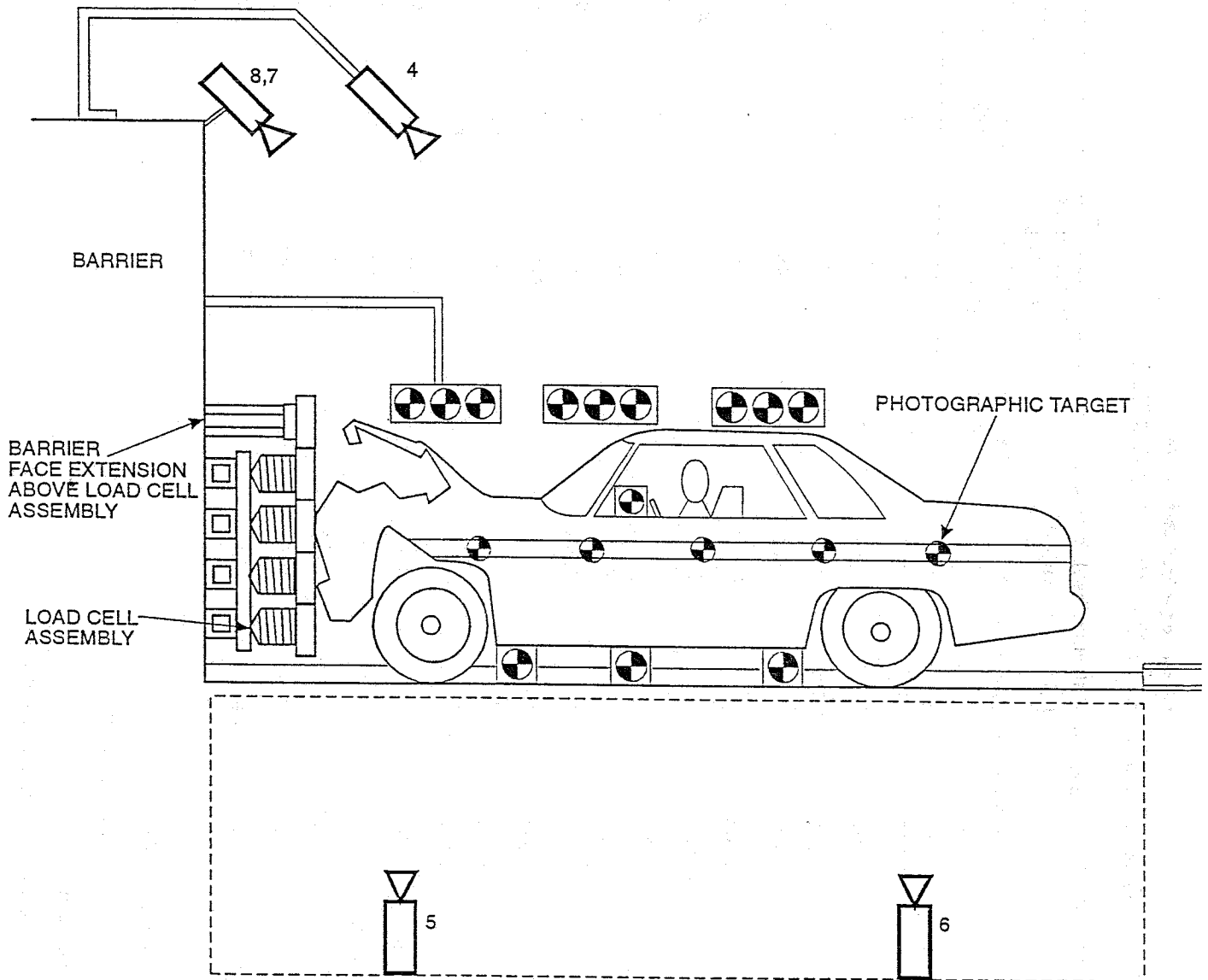


TABLE 13 MOTION PICTURE CAMERA LOCATIONS

CAMERA NO.	VIEW	CAMERA POSITIONS (MM) ¹			ANGLE ² (DEG)	FILM PLANE TO HEAD		FILM SPEED (FPS)
		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	520
3	Dummy kinematics	-1054	7493	1118	-12	5715	25	1010
4	Windshield damage	-925	0	2489	-40	NA	13	498
5	Crush & fluid spillage	-1283	0	-2347	90	NA	13	1000
6	Fluid spillage	-2522	0	-2515	90	NA	13	1015
7	Passenger kinematics	-114	-351	2159	-40	NA	17	498
8	Driver kinematics	-173	368	2159	-41	NA	17	500
9	Driver kinematics	-4572	1854	2591	-27	2667	25	500
10	Passenger kinematics	-4674	-1880	2540	-26	2845	25	495
11	Windshield intrusion	-968	-7775	1118	0	NA	50	505
12	Windshield intrusion	-1346	7859	1074	0	NA	50	502
13	Driver seat belt movement	NA	NA	NA	NA	NA	13	500
14	Passenger seat belt movement	NA	NA	NA	NA	NA	13	500
15	Column movement	-2438	7264	2616	-14	NA	25	510
16	Column movement	-2438	7264	1908	-9	NA	25	505
17	Passenger kinematics	-986	-5354	1151	7	6045	25	1025

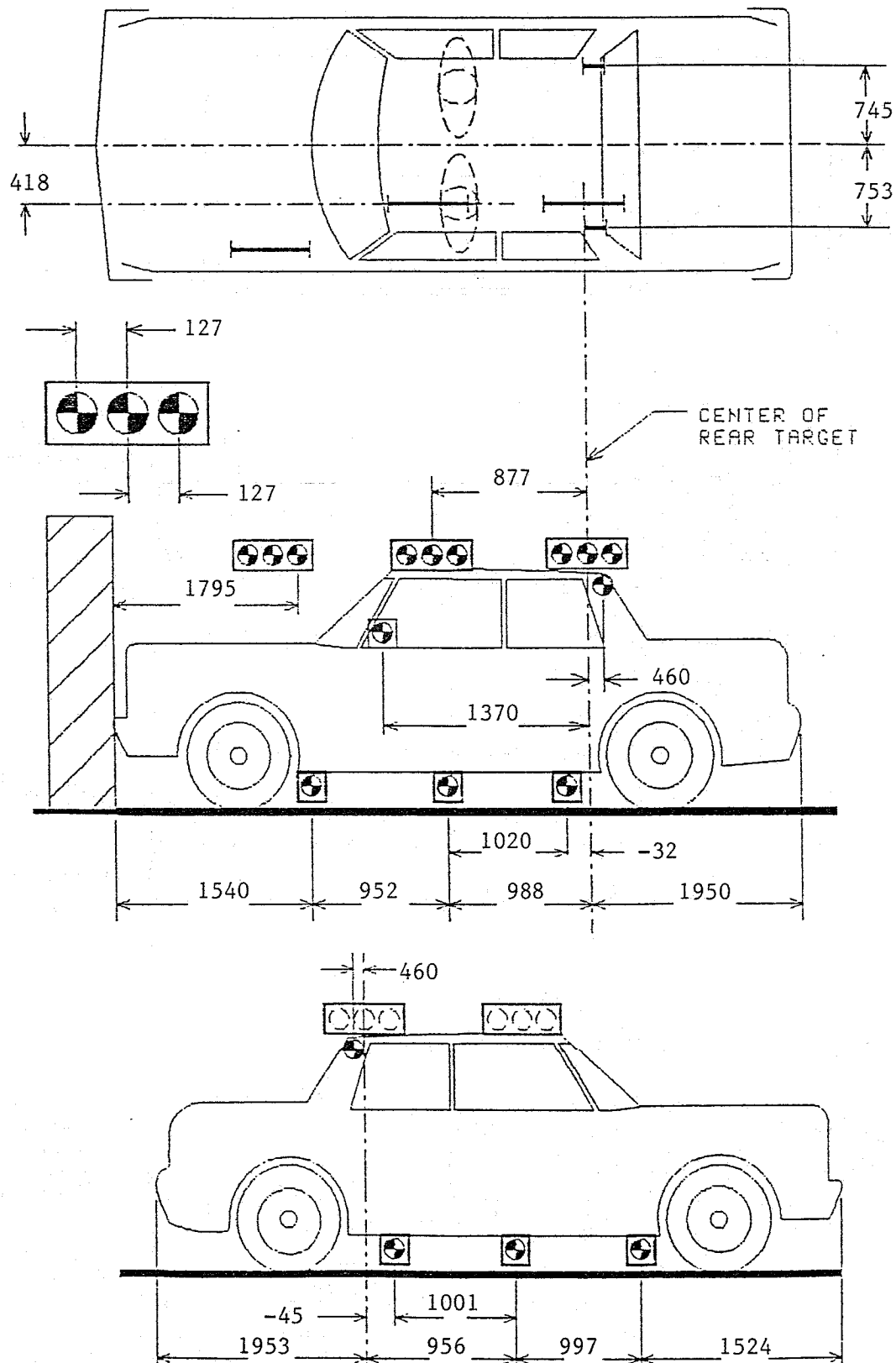
¹ +X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

² +Angle = Film plane angled upward from horizontal plane

FIGURE 11 VEHICLE TARGET LOCATIONS



All measurements are in millimeters.

FIGURE 12 PRE-TEST AND POST-TEST MEASUREMENT POINTS

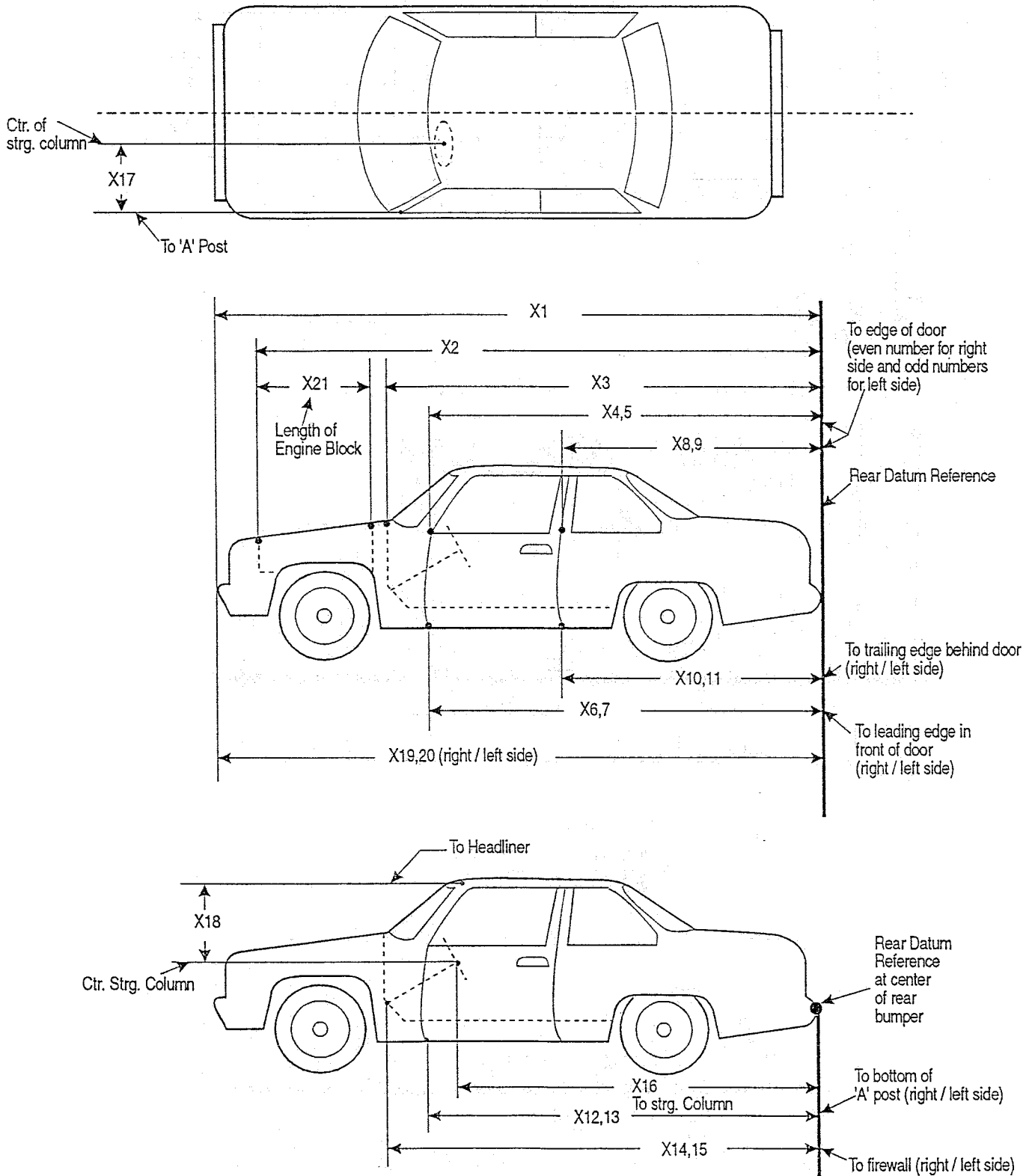


TABLE 14 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Chevrolet/Caprice TEST NUMBER: 940525

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	5430	4740	690
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	4630	4400	230
X3	REAR SURFACE OF VEHICLE TO FIREWALL	4130	4055	75
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3802	3789	13
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3803	3785	18
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3775	3759	16
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3781	3778	3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2587	2585	2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2586	2597	-11
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2603	2593	10
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2602	2604	-2
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3752	3746	6
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3757	3753	4
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	4055	4042	13
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	4050	4039	11
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	3165	3288	-123
X17	CENTER OF STEERING COLUMN TO "A" POST	344	360	-16
X18	CENTER OF STEERING COLUMN TO HEADLINER	410	375	35
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	5305	4677	628
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	5320	4731	589
X21	LENGTH OF ENGINE BLOCK	490	490	0

All measurements are in millimeters.

APPENDIX A

PHOTOGRAPHS

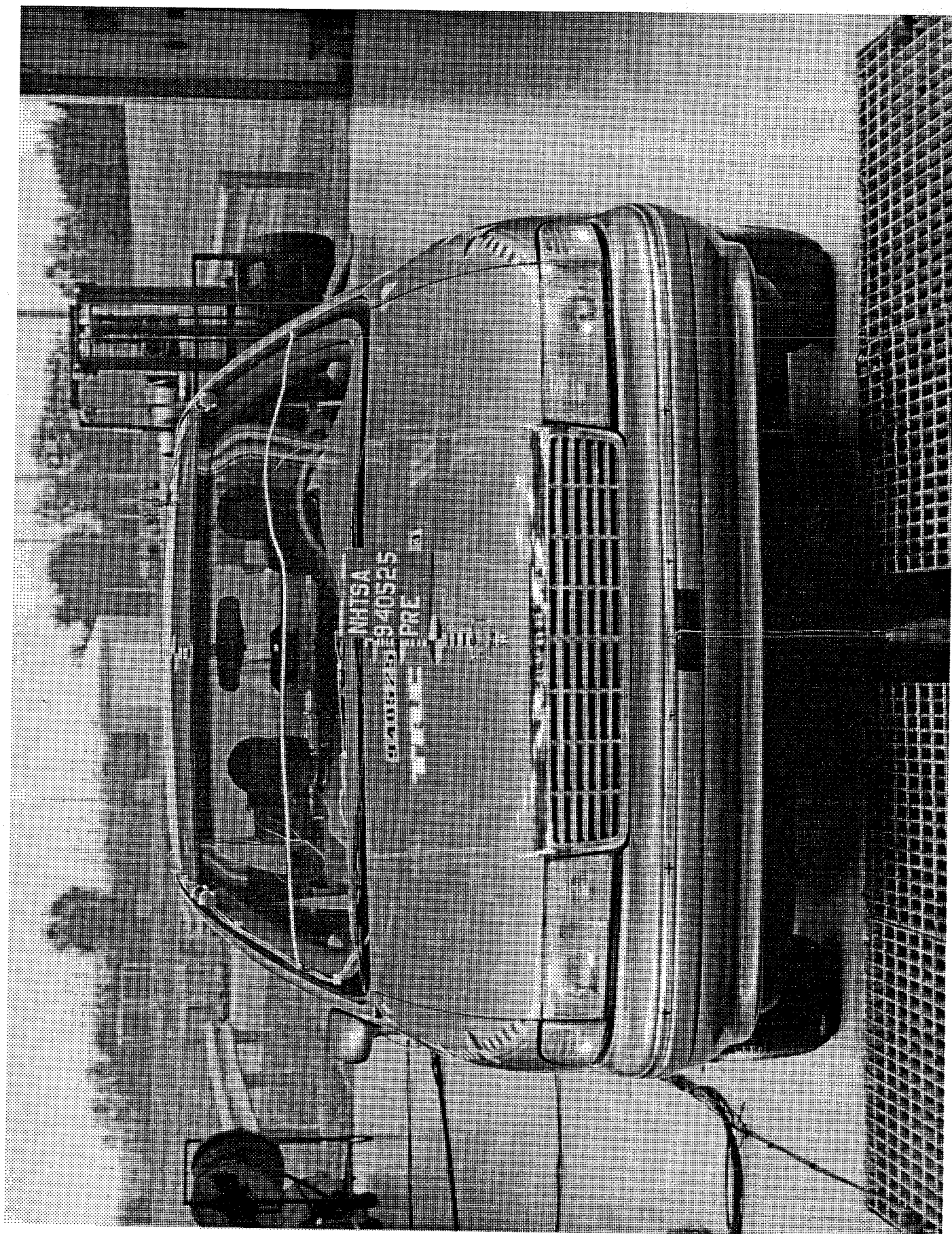


Figure A-1. PRE-TEST FRONT VIEW

A-2

940525



Figure A-2. POST-TEST FRONT VIEW

A-3

940525

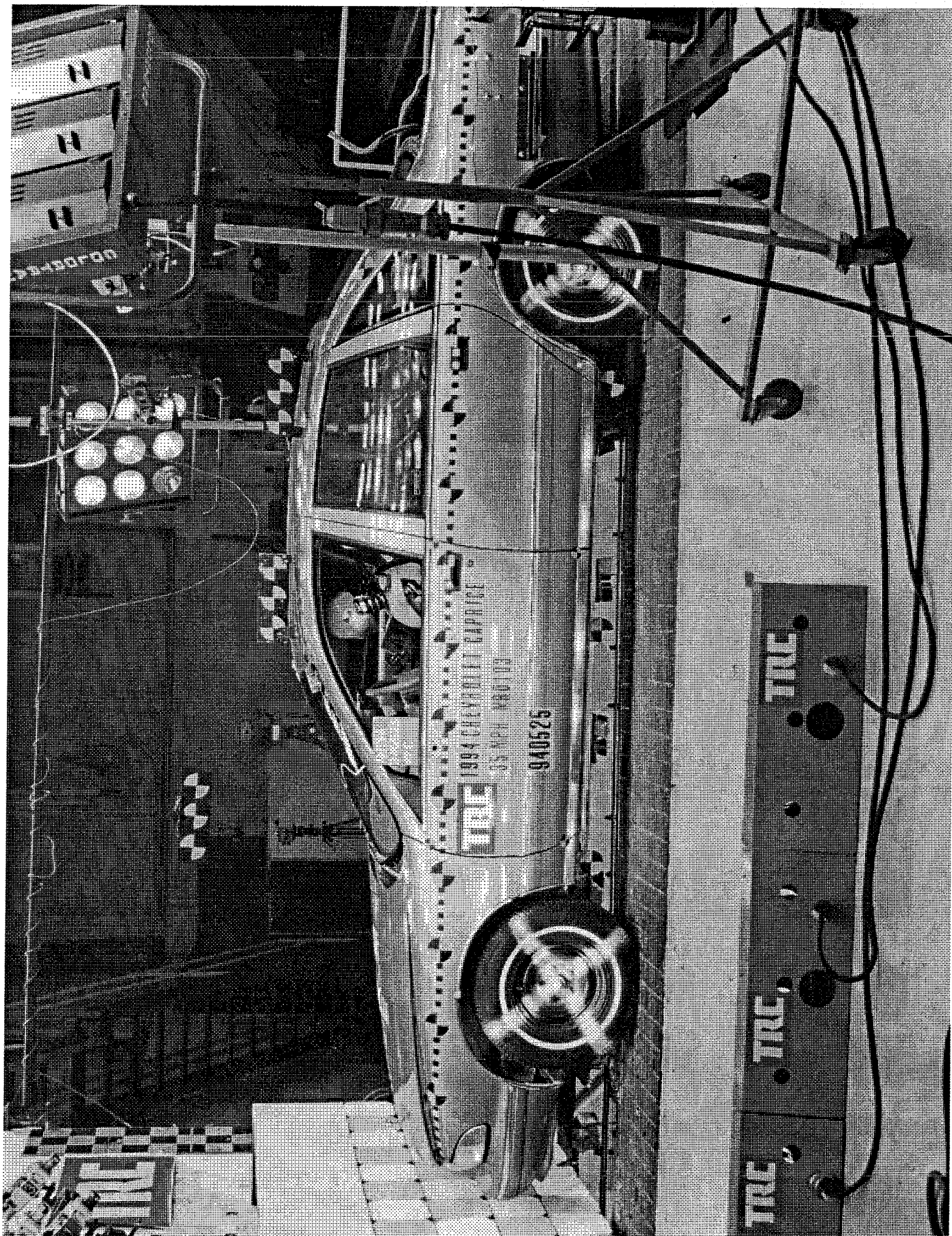


Figure A-3. PRE-TEST LEFT SIDE VIEW

A-4

940525

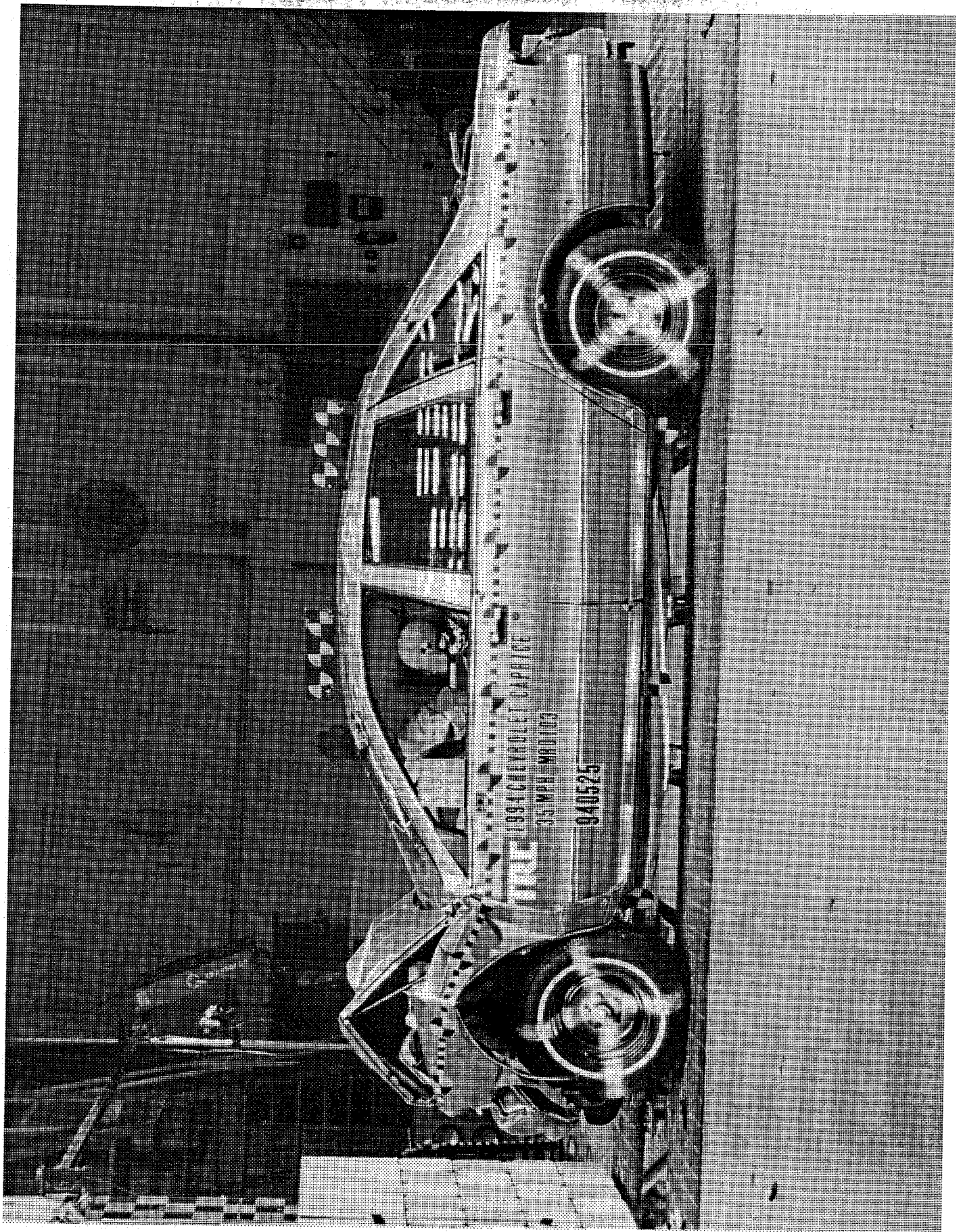


Figure A-4. POST-TEST LEFT SIDE VIEW

A-5

940525

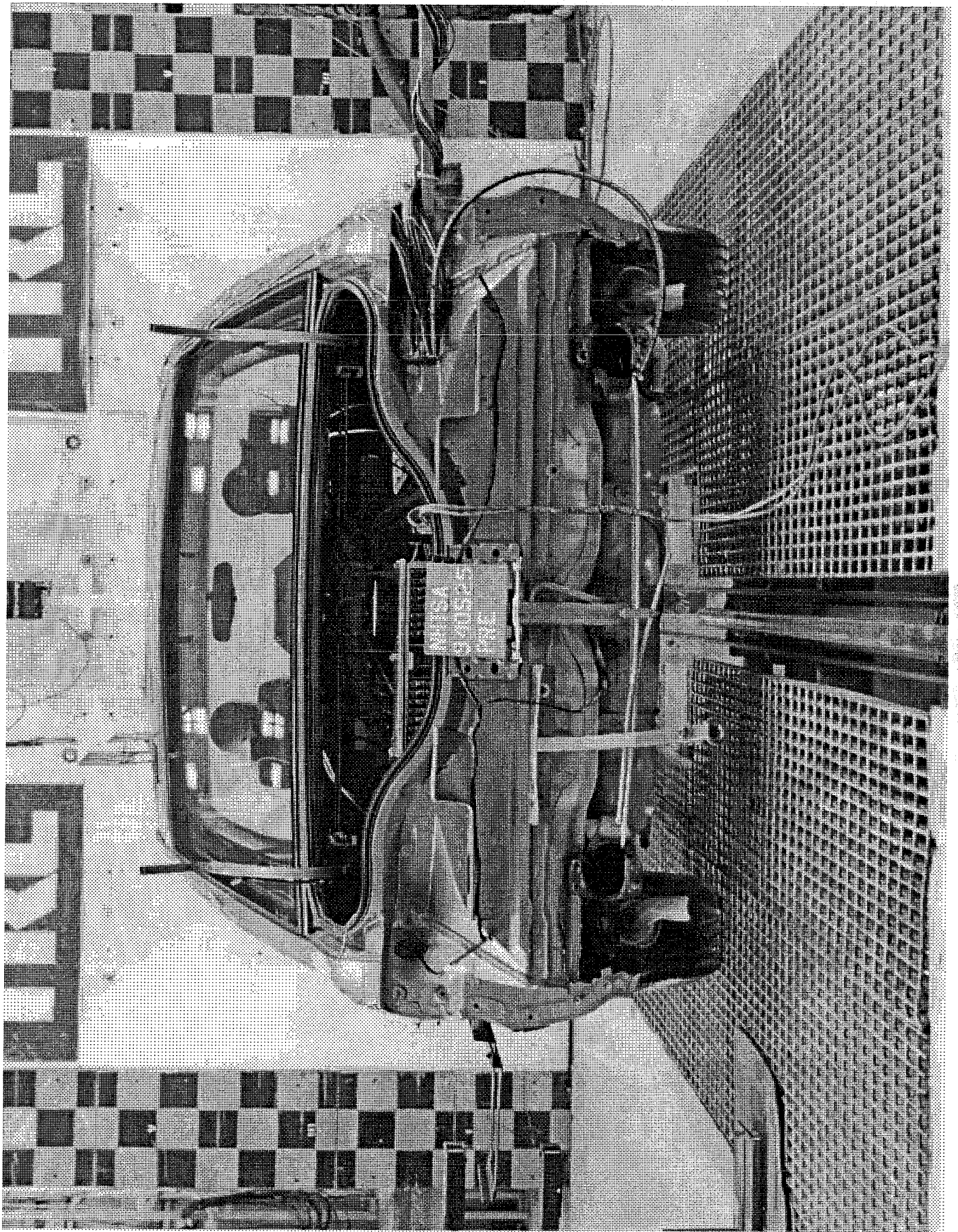


Figure A-5. PRE-TEST REAR VIEW
A-6

940525

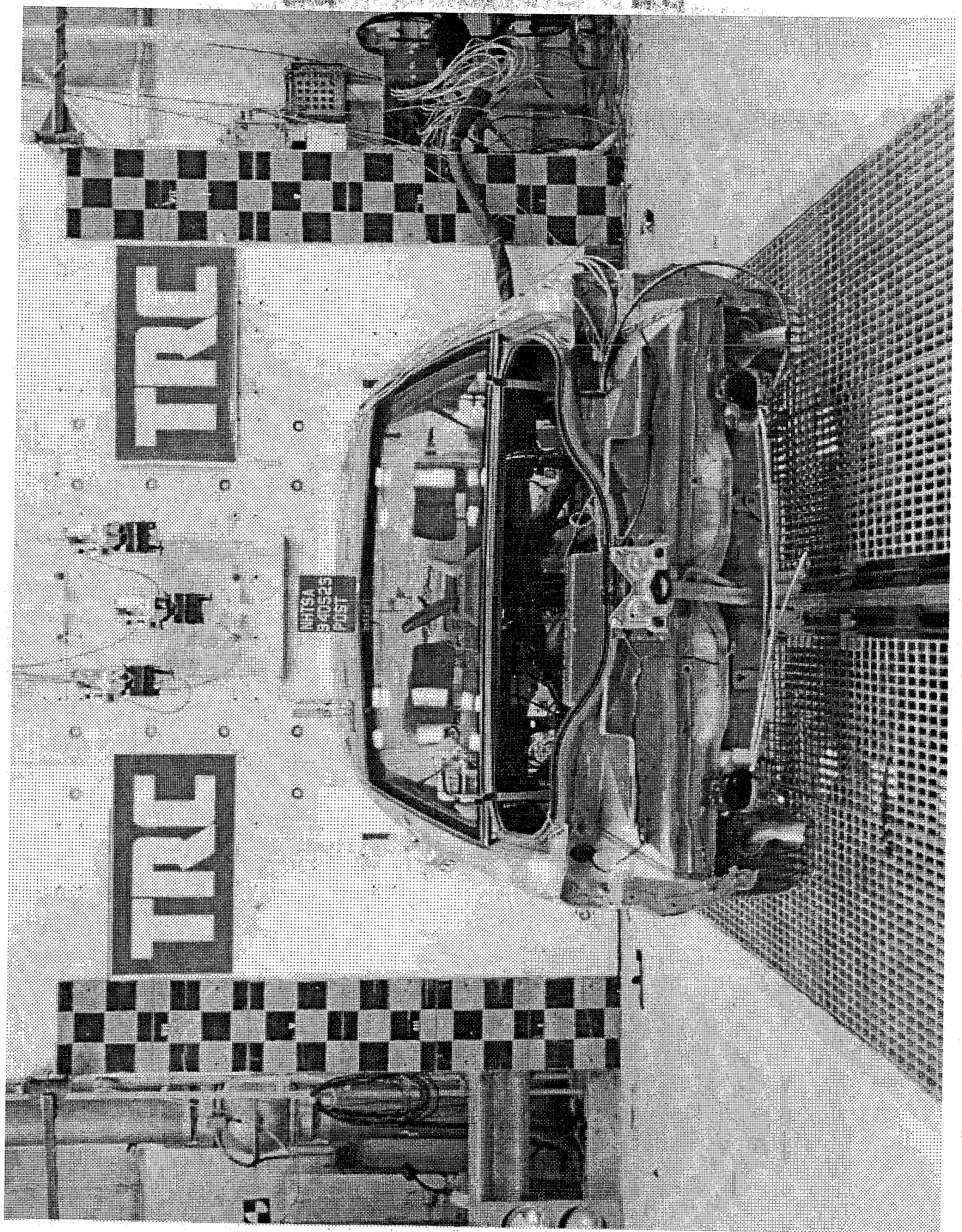


Figure A-6. POST-TEST REAR VIEW

A-7

940525

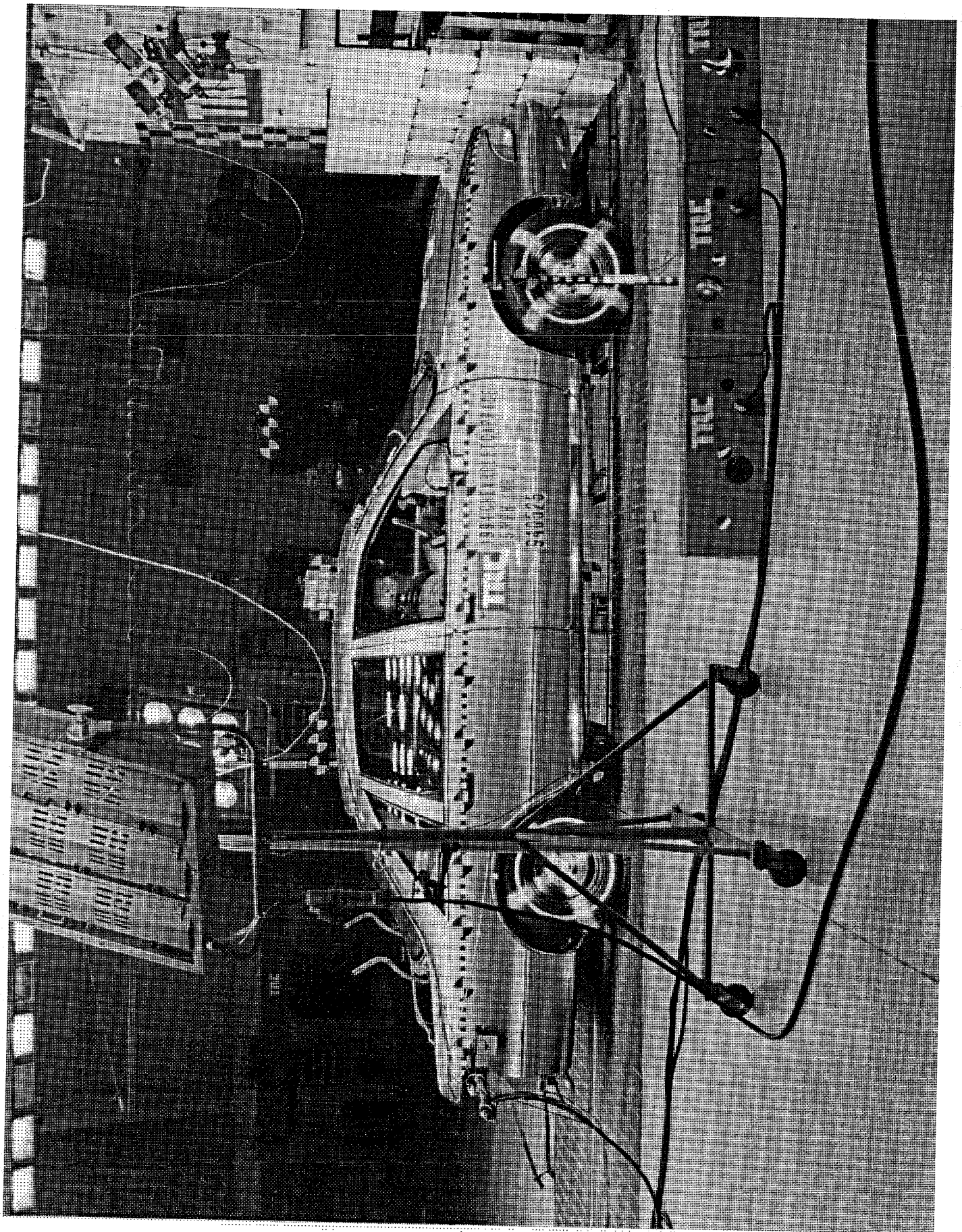


Figure A-7. PRE-TEST RIGHT SIDE VIEW

A-8

940525

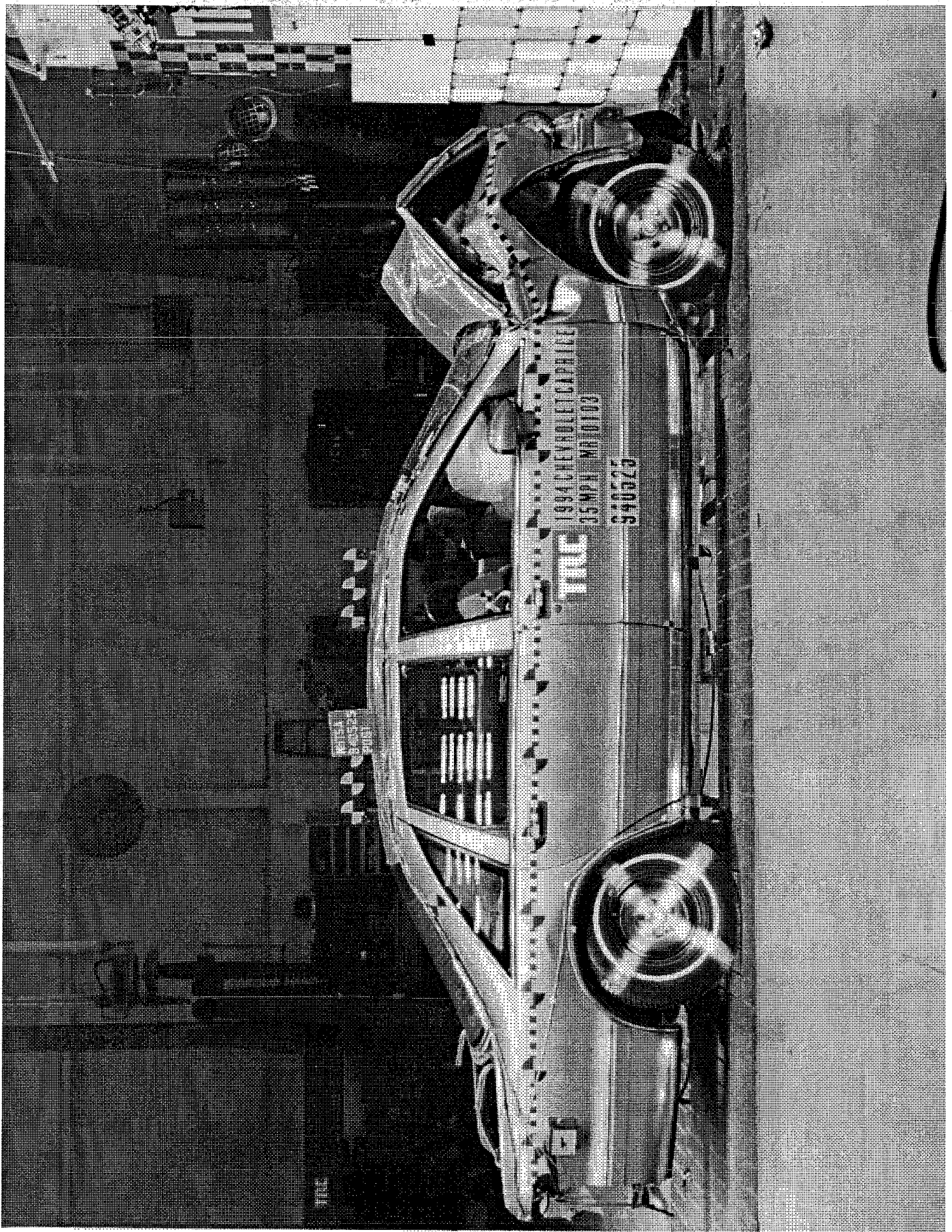


Figure A-8. POST-TEST RIGHT SIDE VIEW

A-9

940525

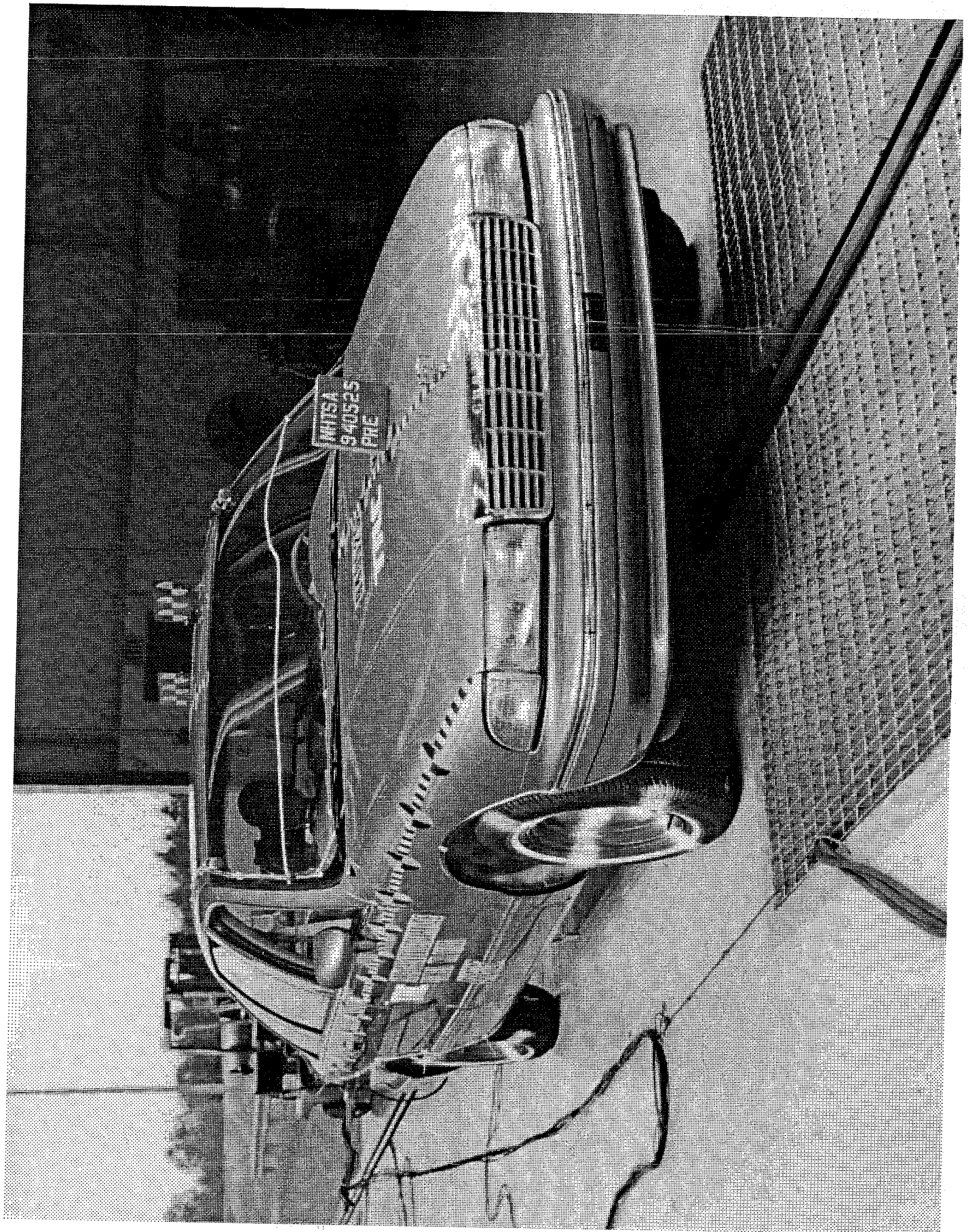


Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

940525

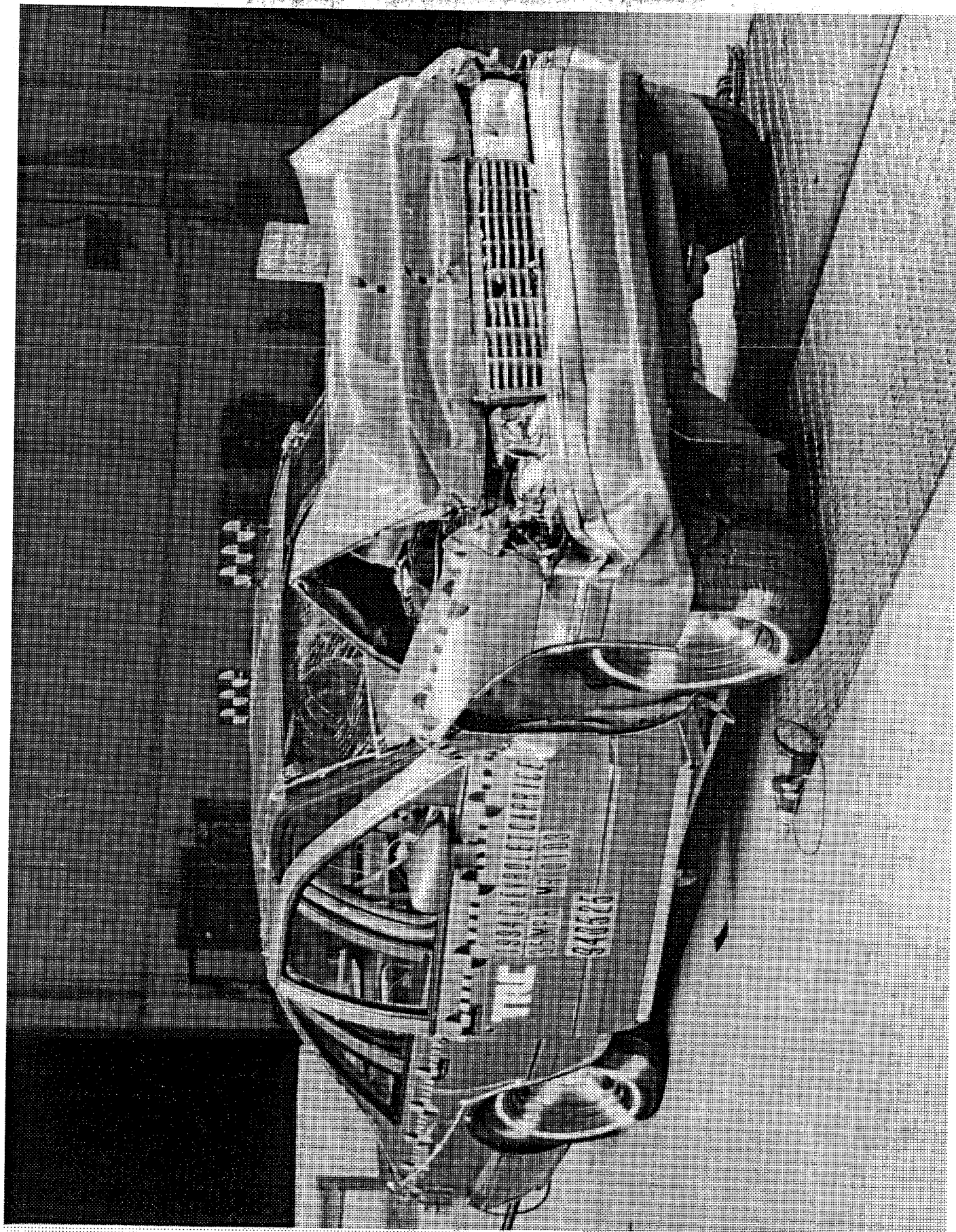


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

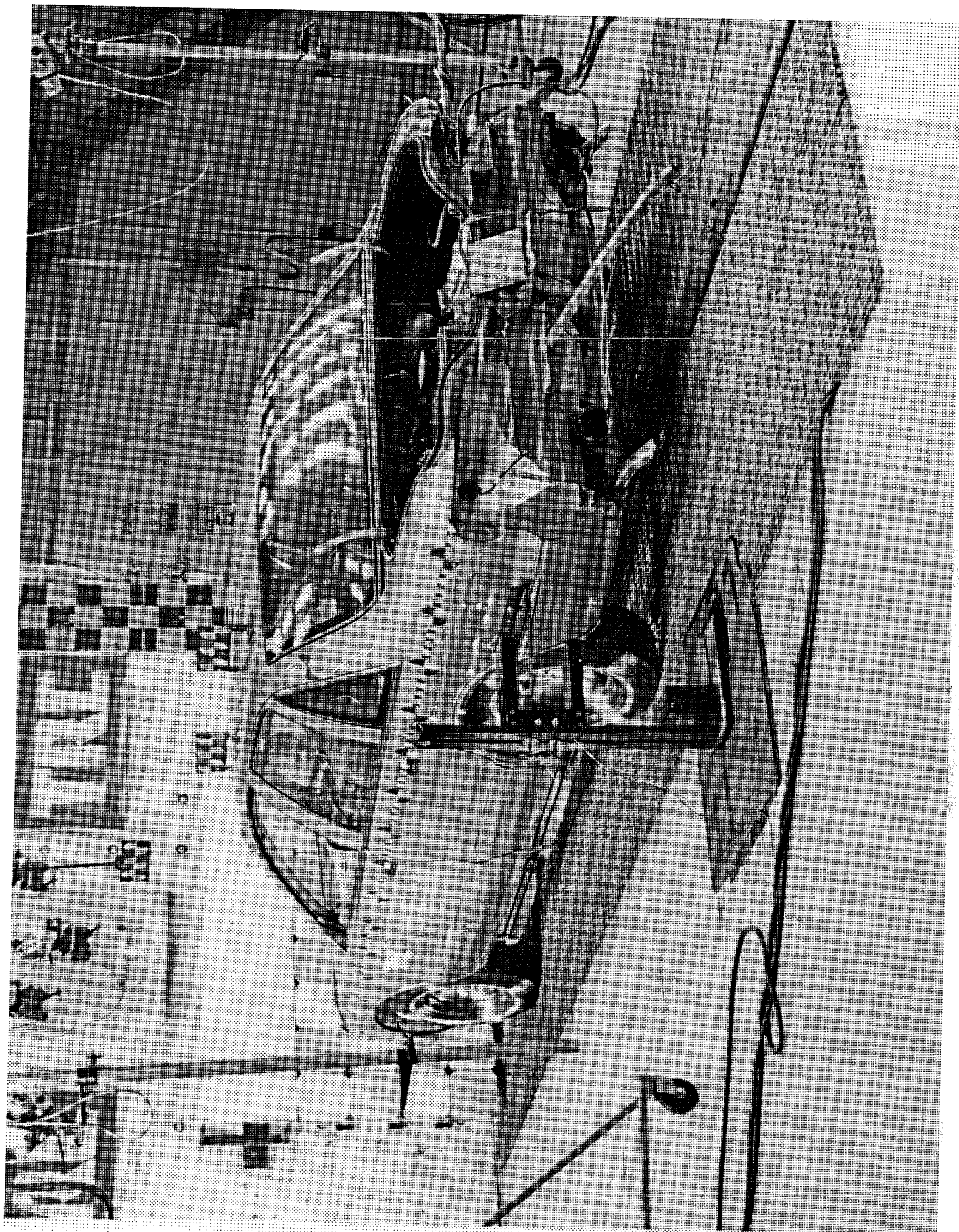


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

940525

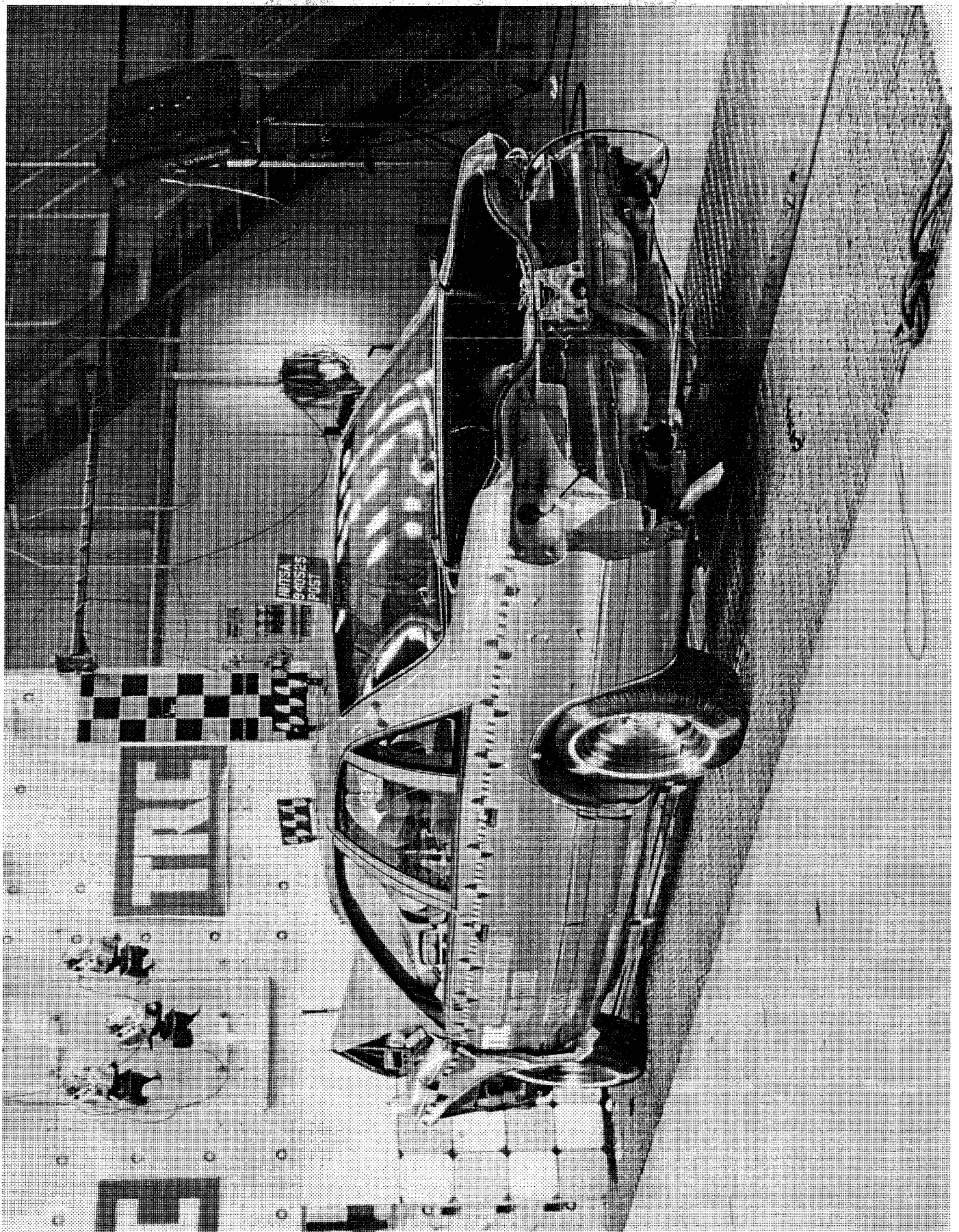


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

940525

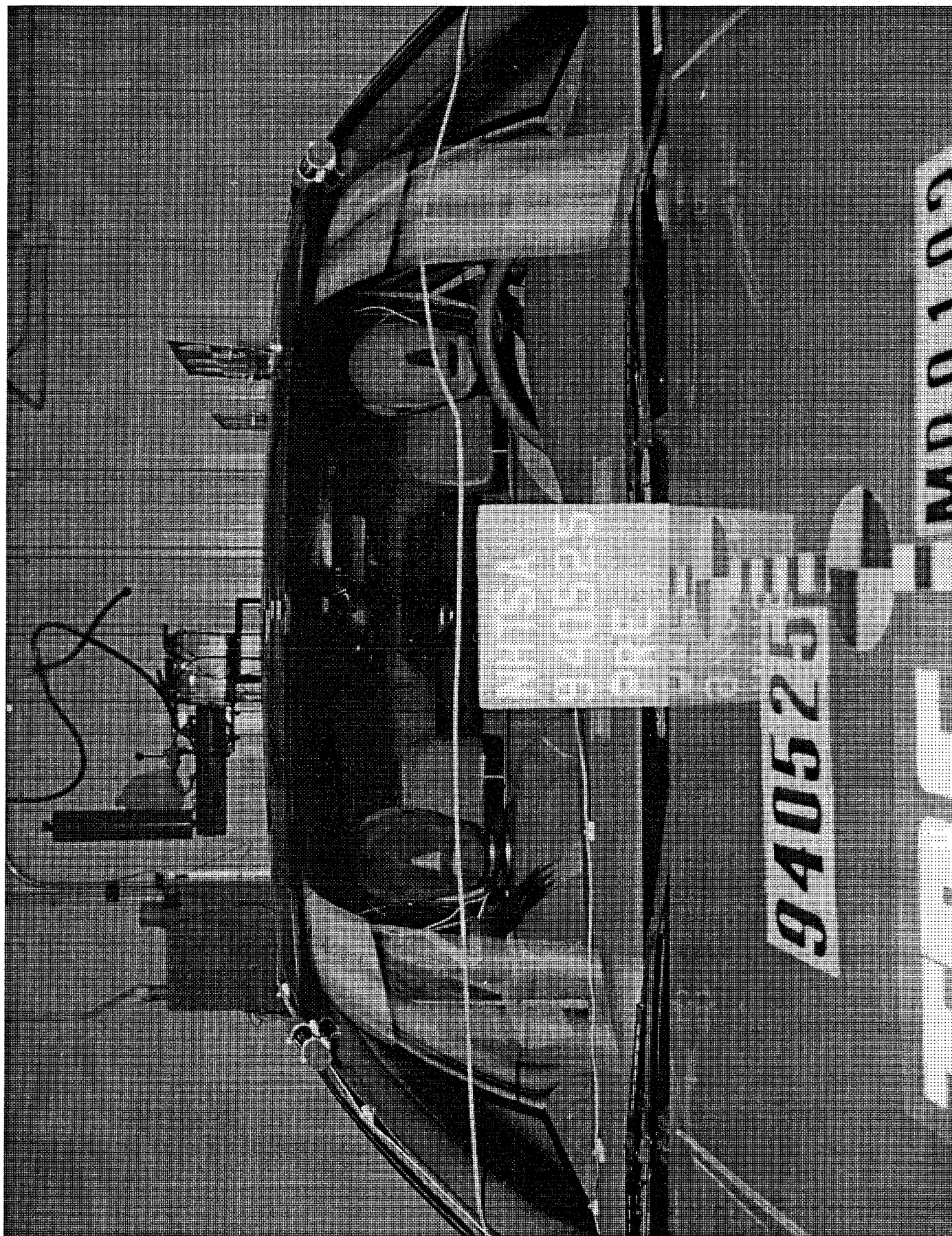


Figure A-13. PRE-TEST WINDSHIELD VIEW

A-14

940525

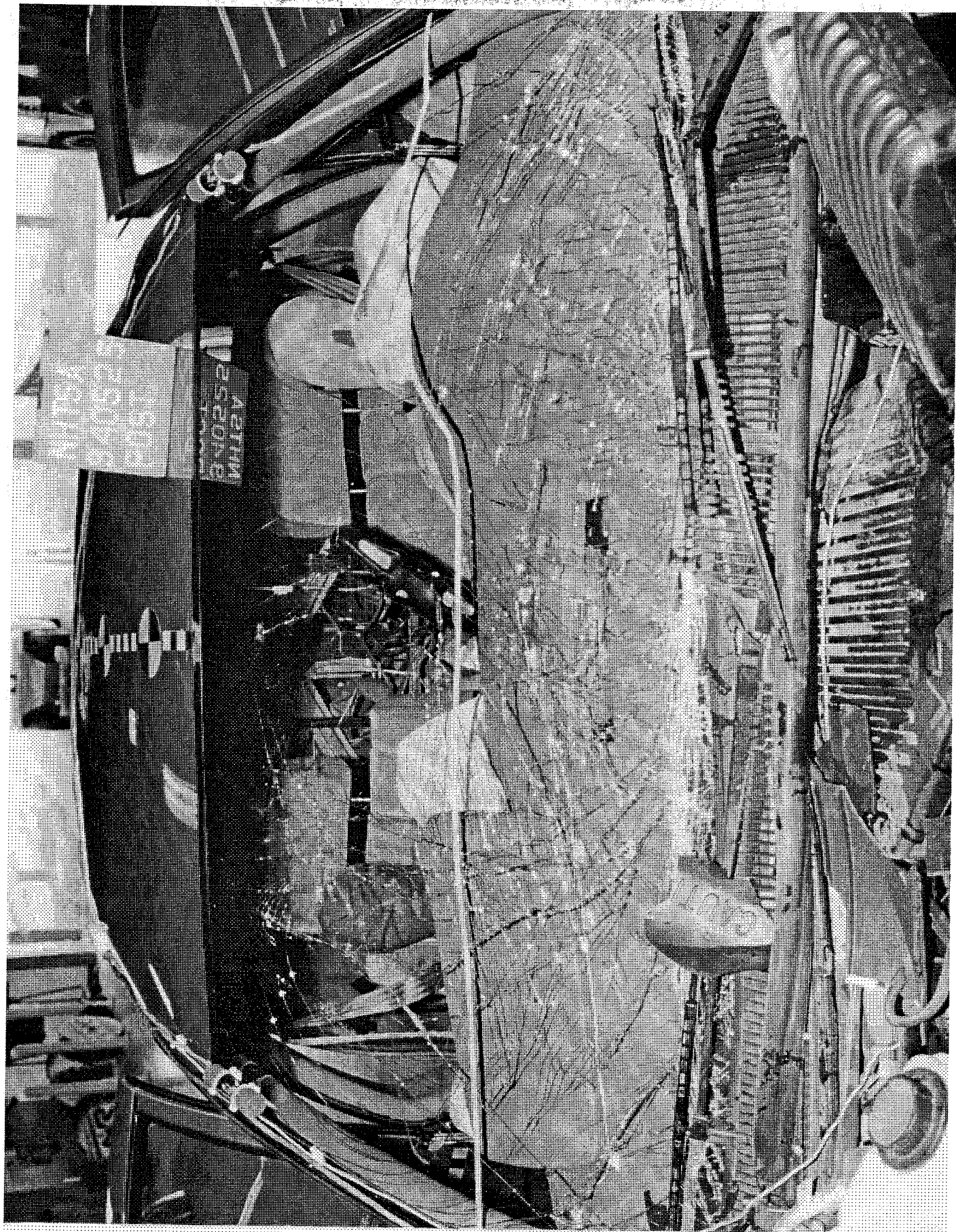


Figure A-14. POST-TEST WINDSHIELD VIEW
A-15

940525

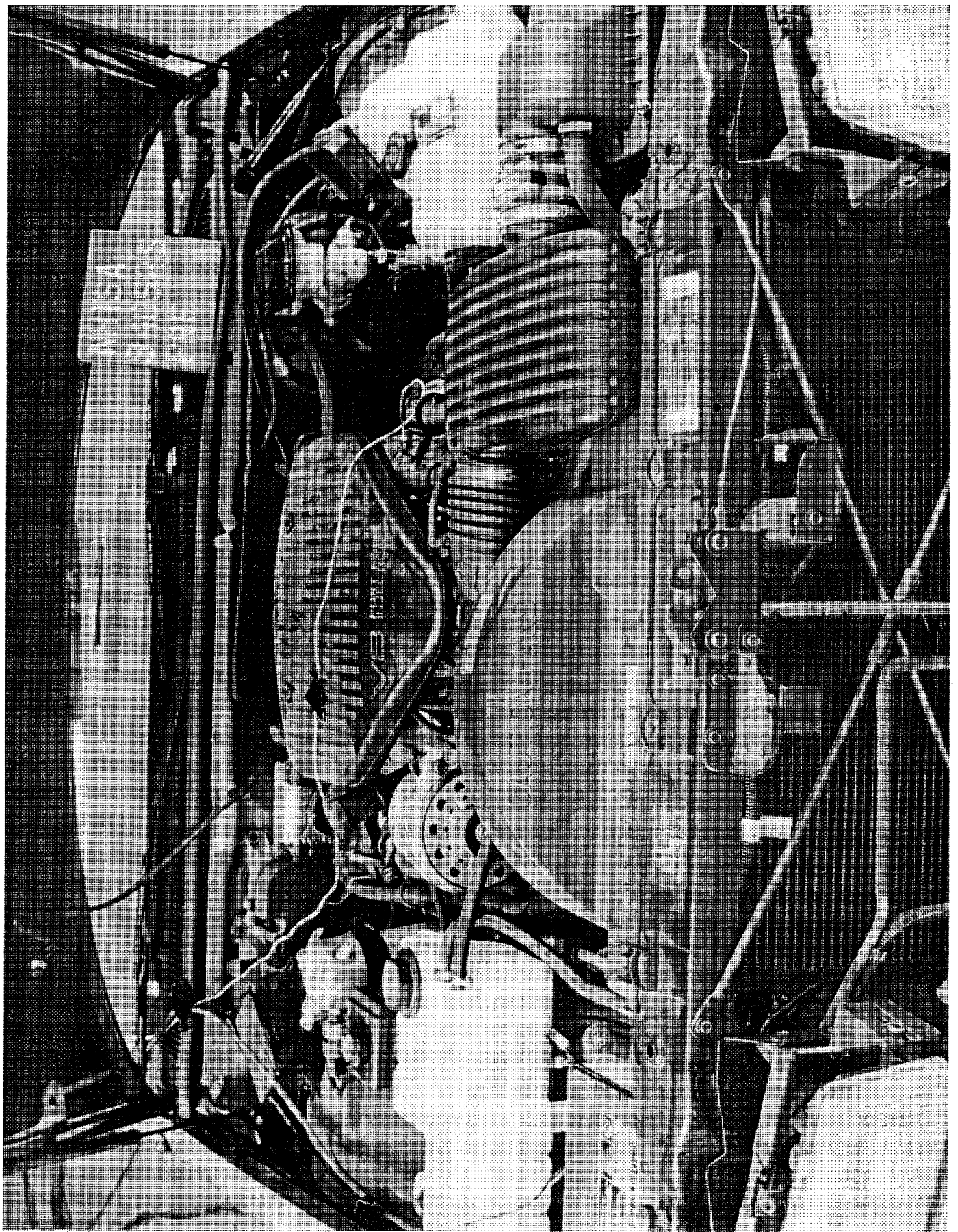


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

940525

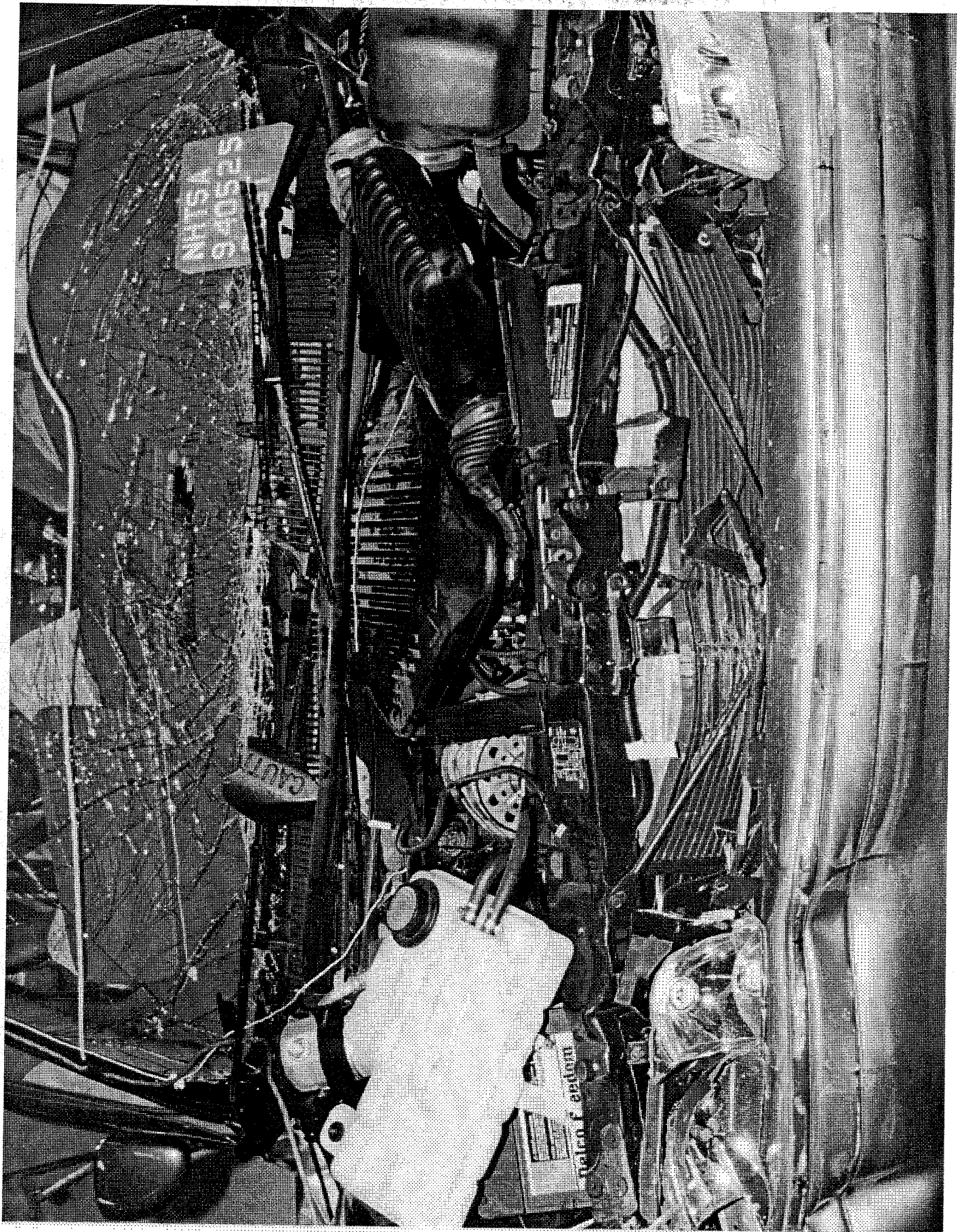


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

A-17

940525

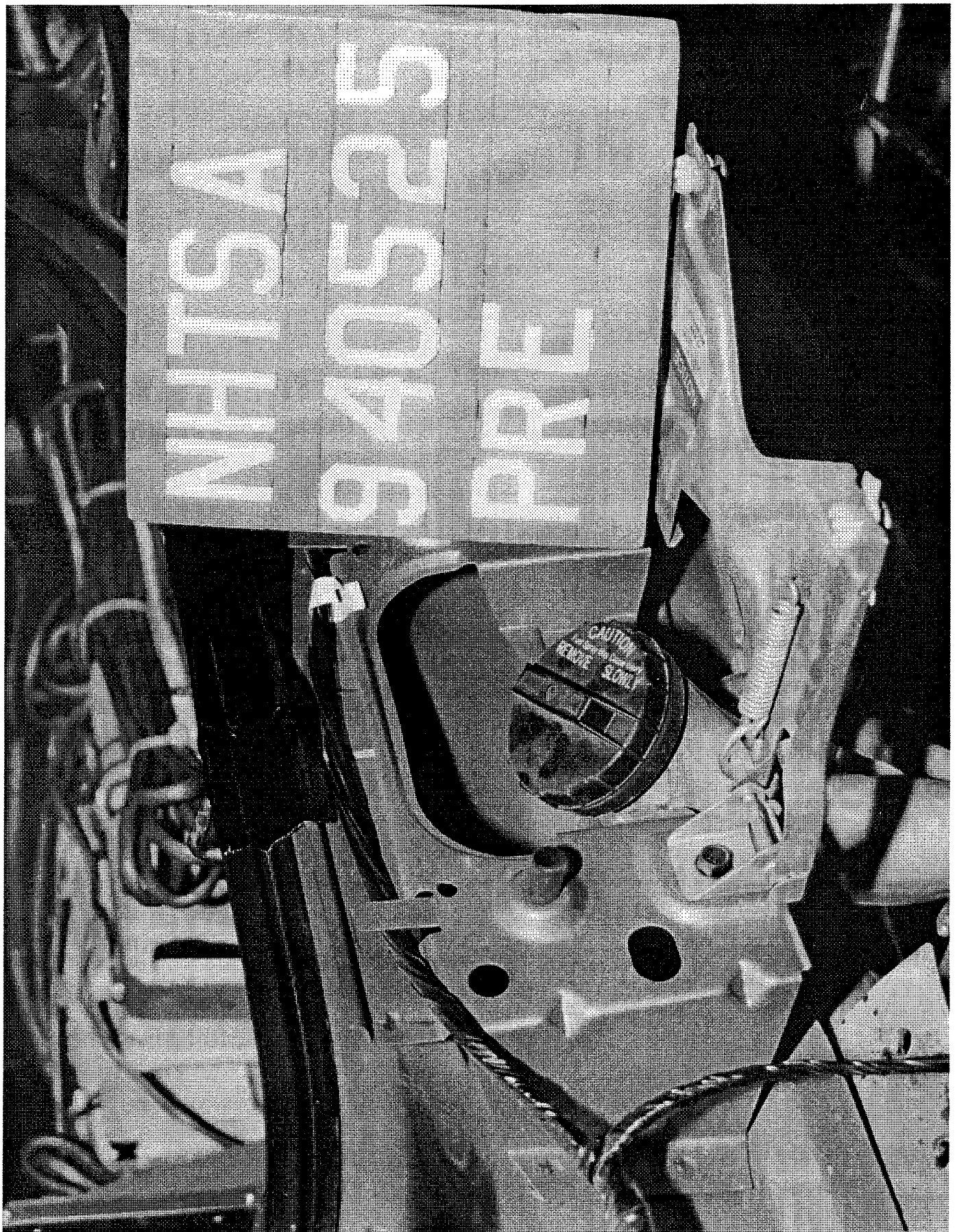


Figure A-17. PRE-TEST FUEL FILLER CAP VIEW
A-18

940525

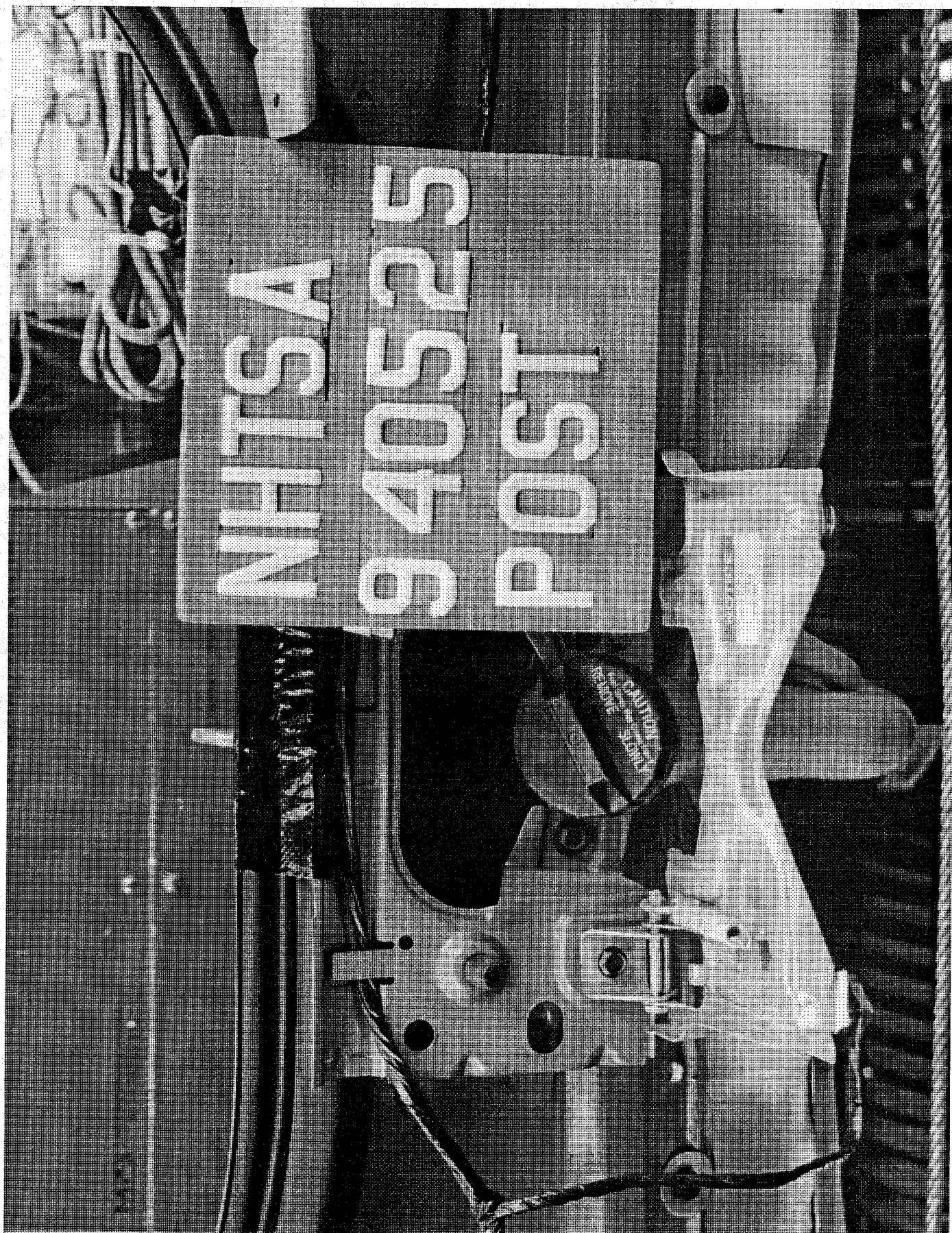


Figure A-18. POST-TEST FUEL FILLER CAP VIEW

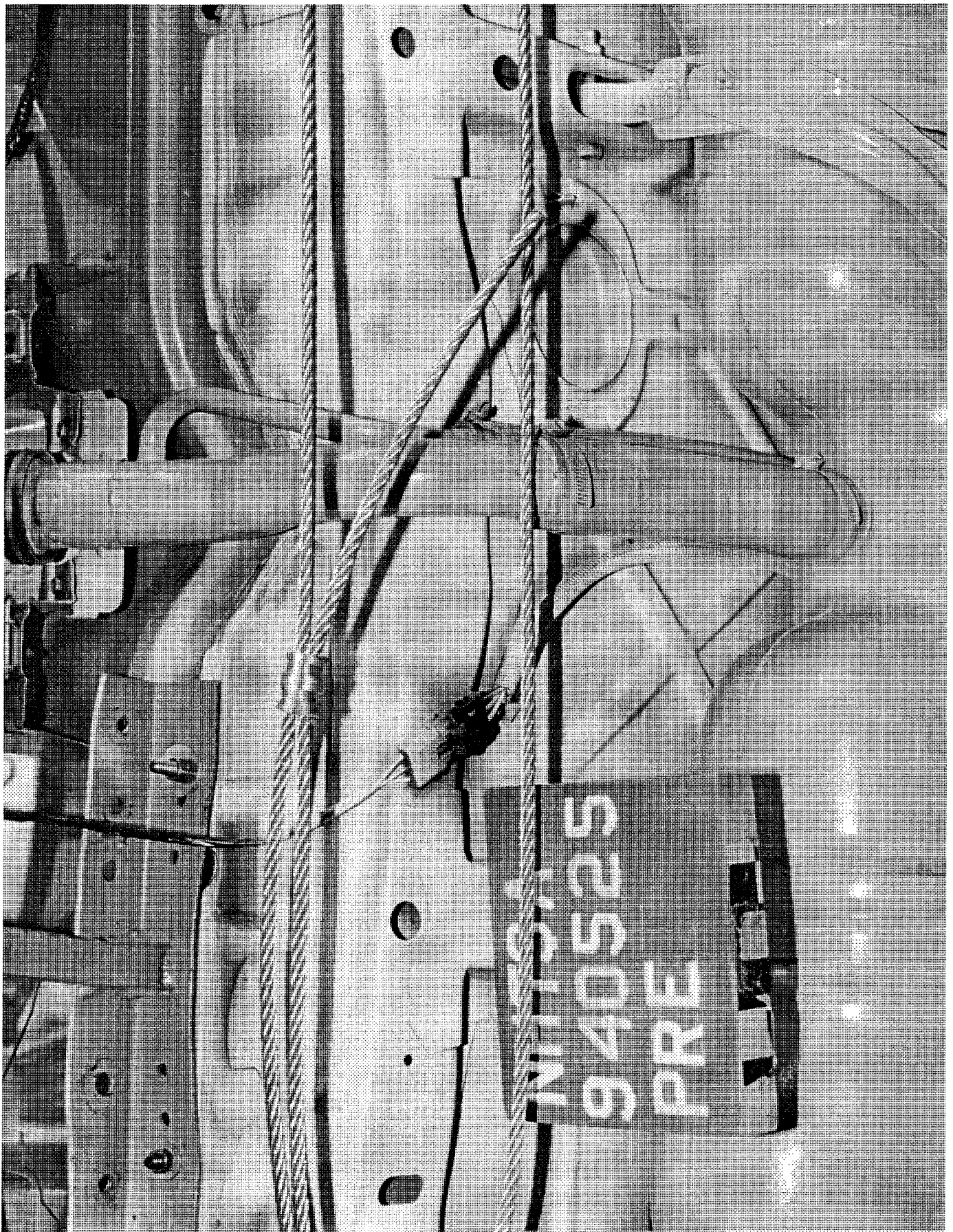


Figure A-19. PRE-TEST FUEL FILLER NECK VIEW

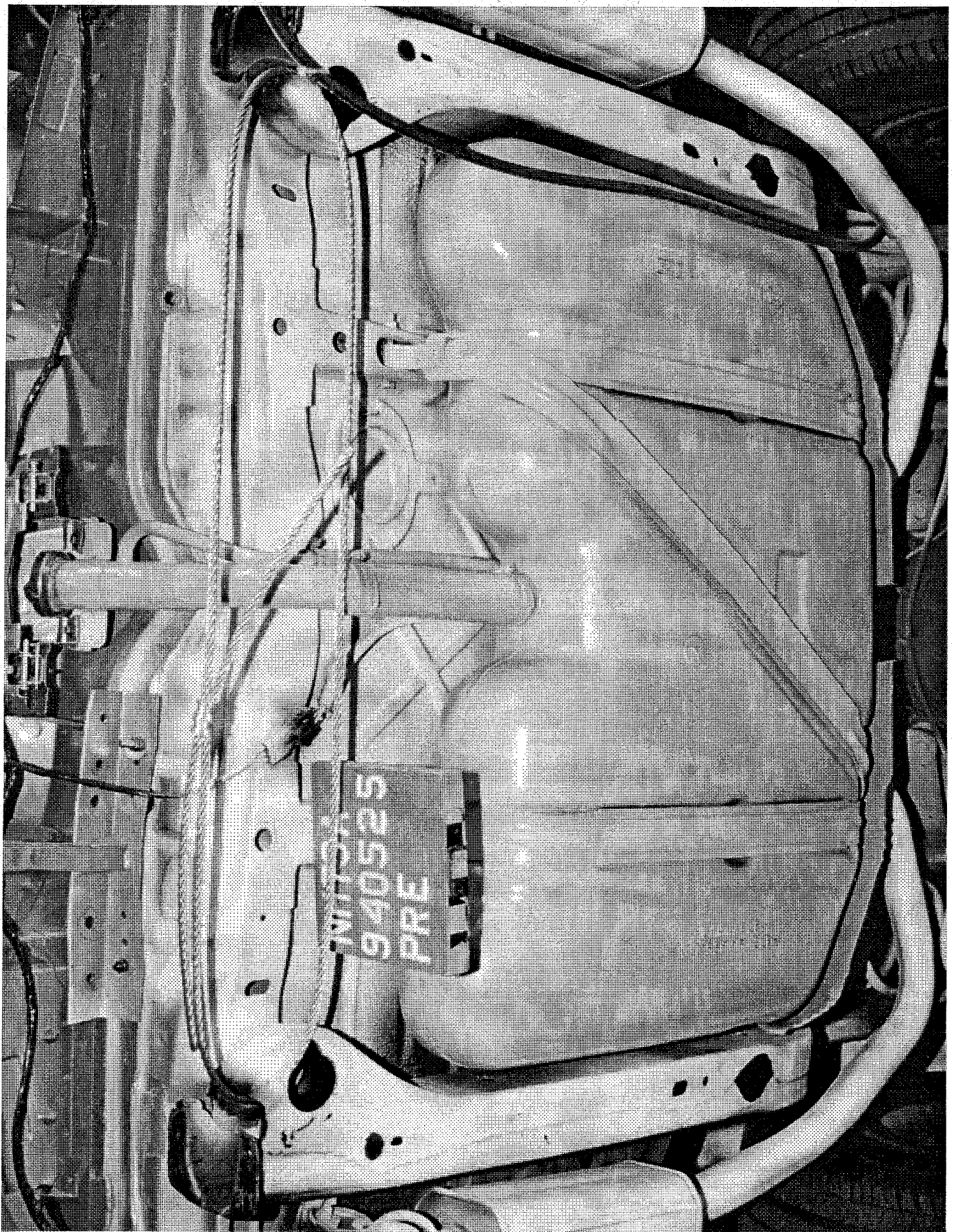


Figure A-20. PRE-TEST FUEL FILLER NECK AND FUEL TANK VIEW

A-21

940525

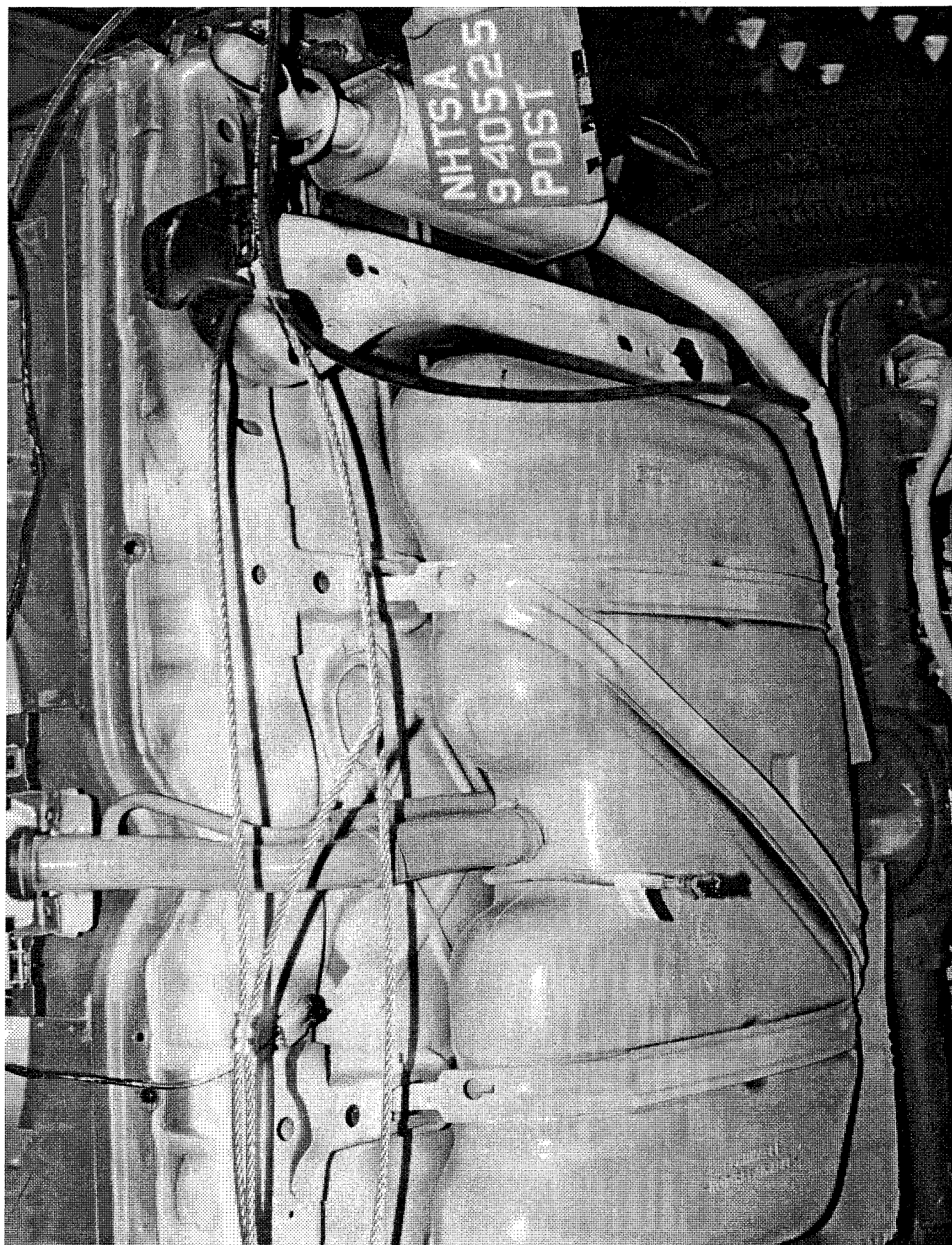


Figure A-21. POST-TEST FUEL FILLER NECK AND FUEL TANK VIEW

A-22

940525

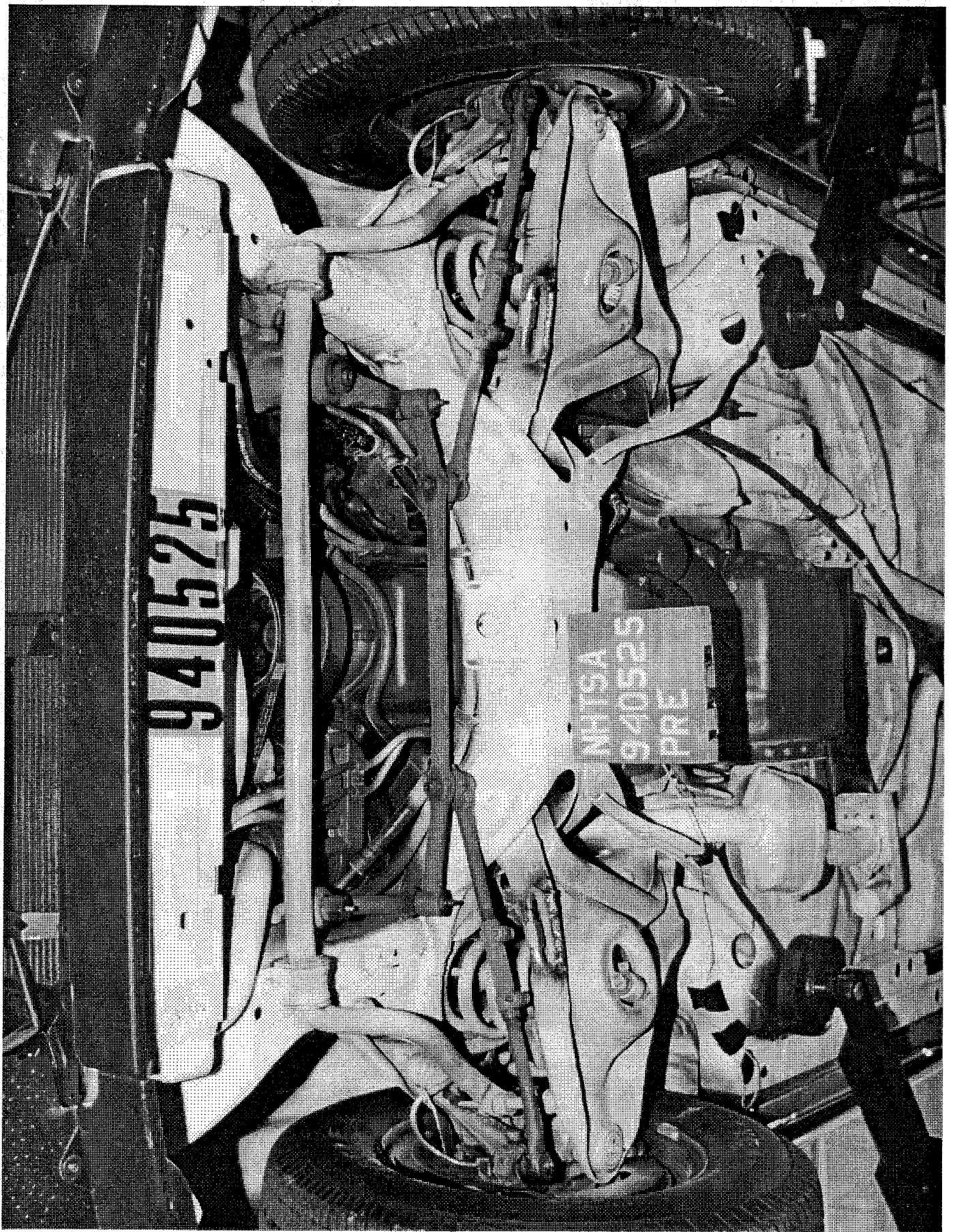


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW

A-23

940525



Figure A-23. POST-TEST FRONT UNDERBODY VIEW

A-24

940525

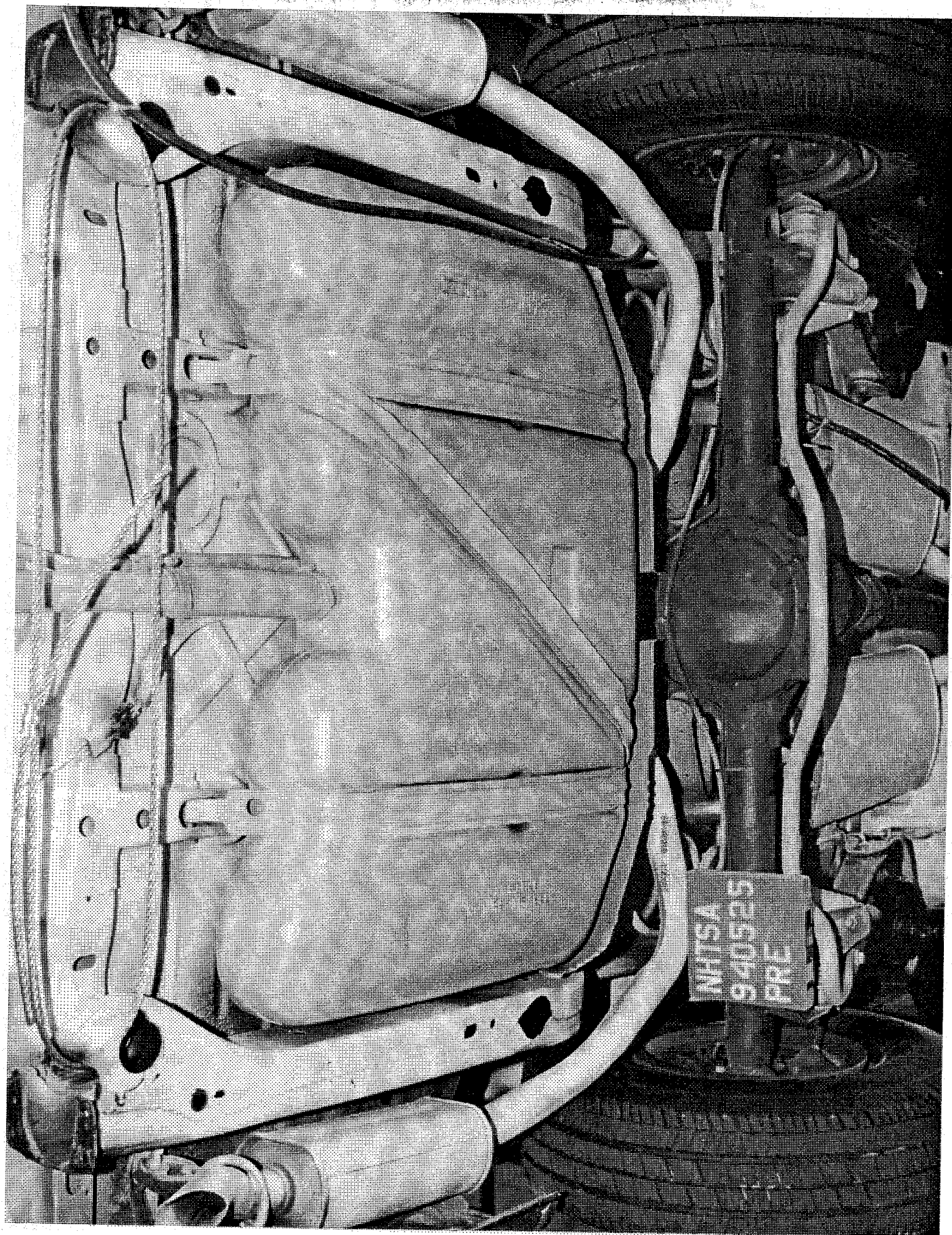


Figure A-24. PRE-TEST REAR UNDERBODY VIEW

A-25

940525

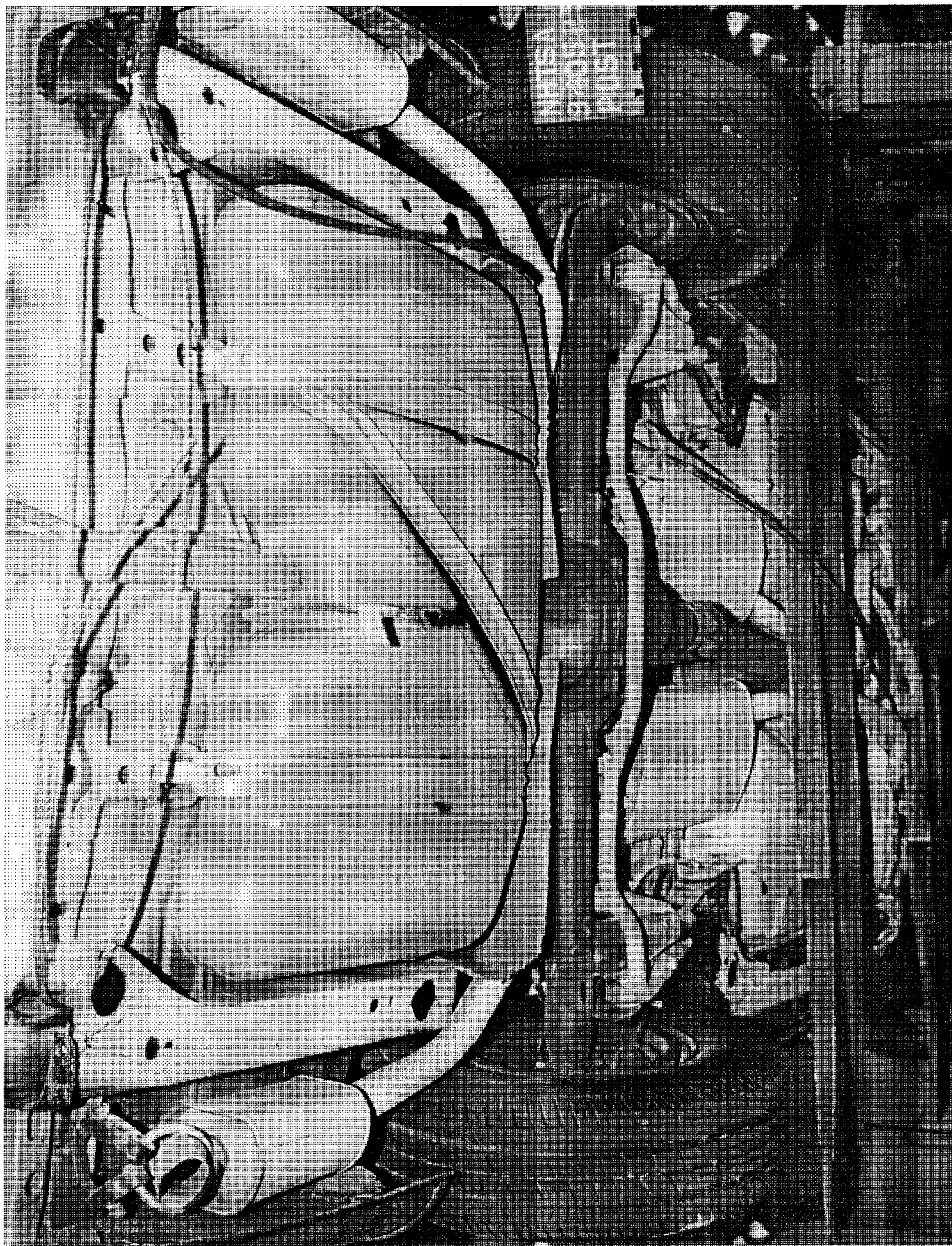


Figure A-25. POST-TEST REAR UNDERBODY VIEW

A-26

940525

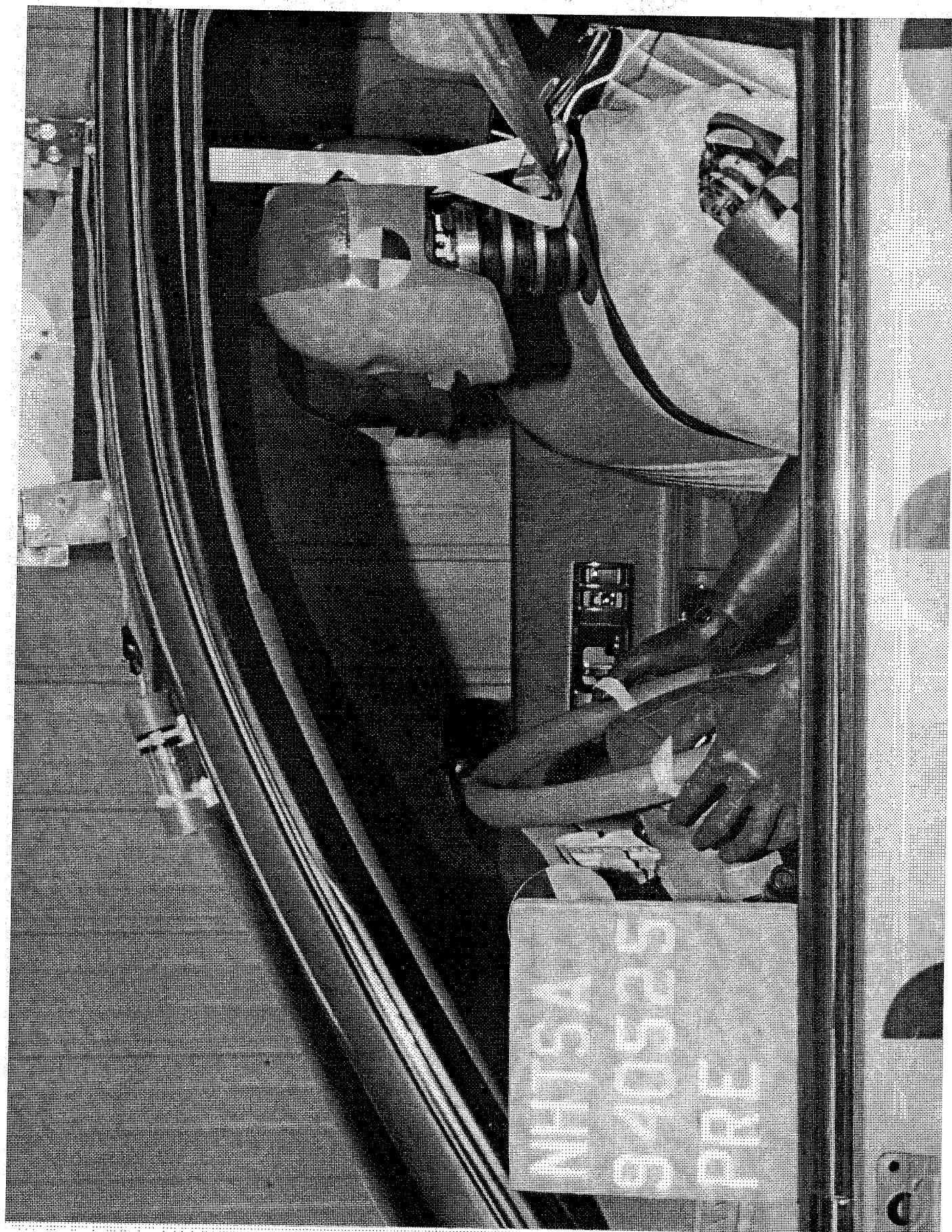


Figure A-26. PRE-TEST DRIVER DUMMY POSITION VIEW

A-27

940525

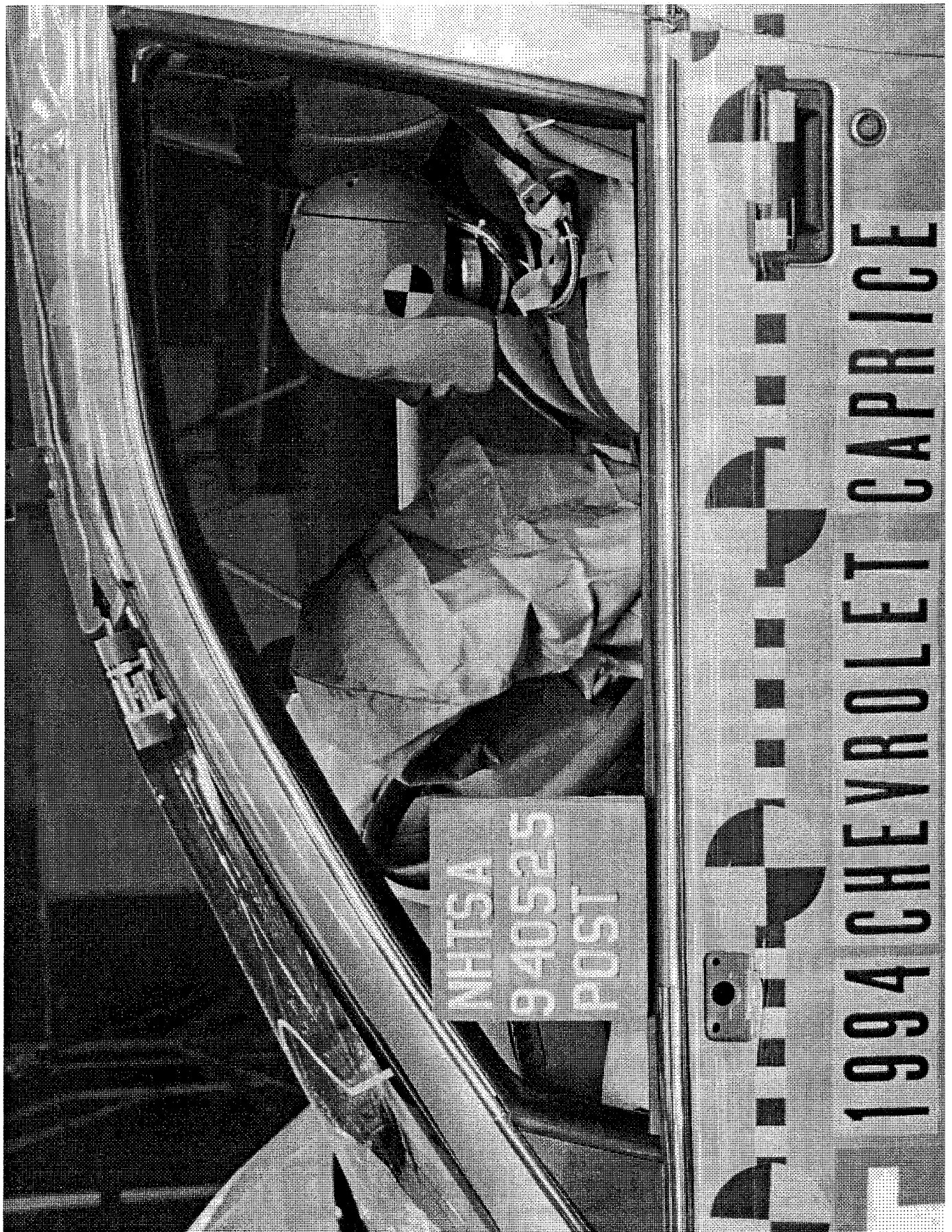


Figure A-27. POST-TEST DRIVER DUMMY POSITION VIEW

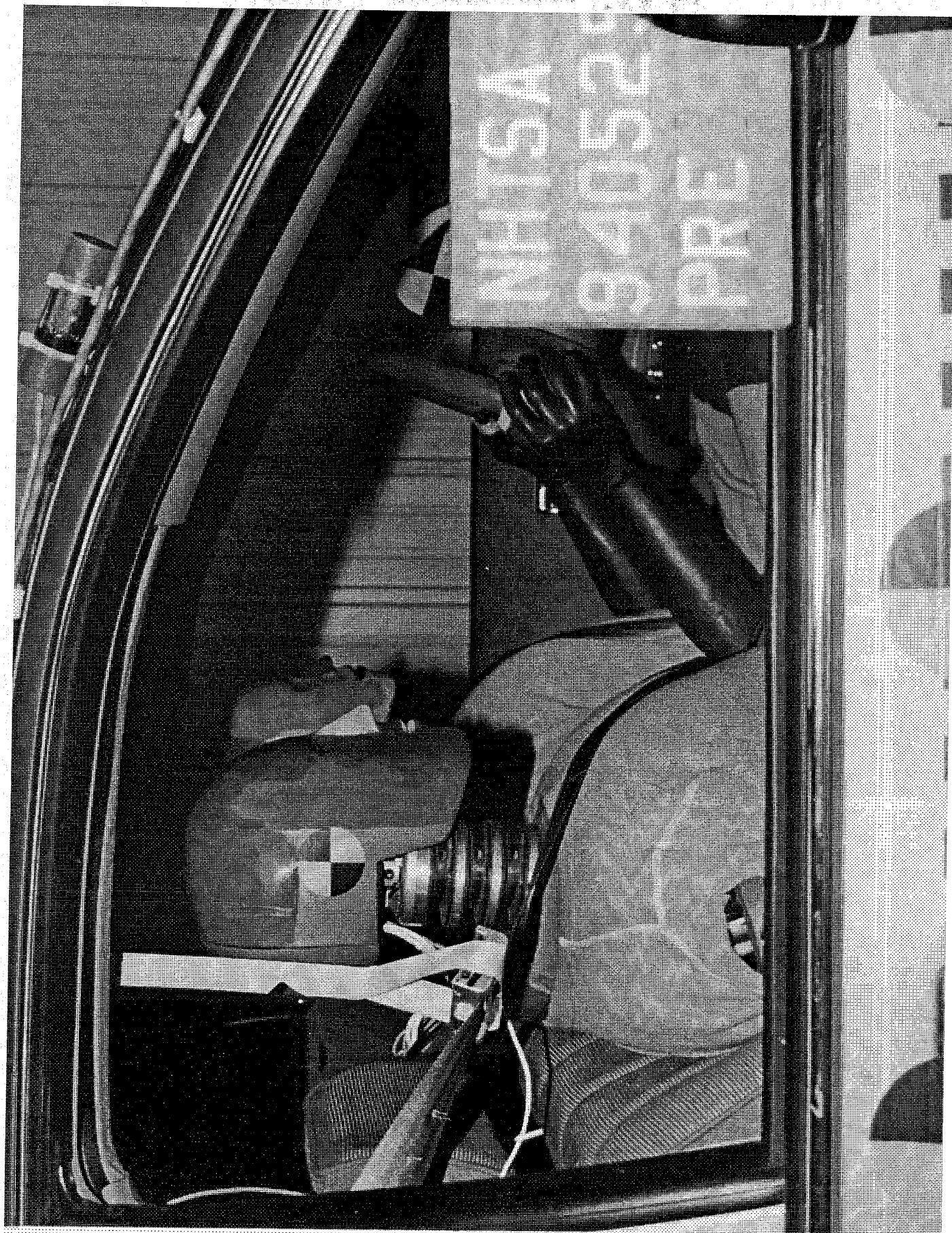


Figure A-28. PRE-TEST PASSENGER DUMMY POSITION VIEW

A-29

940525

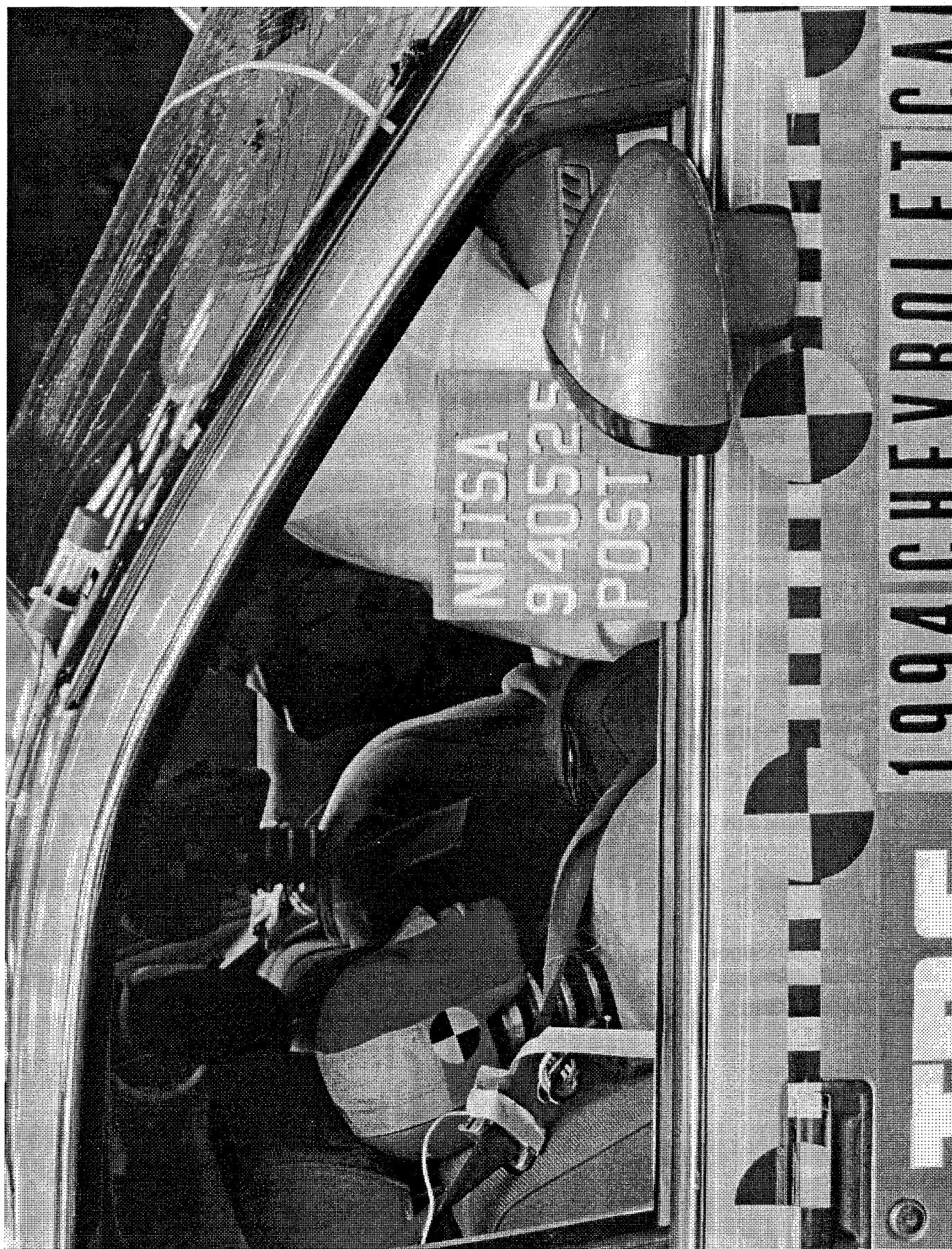


Figure A-29. POST-TEST PASSENGER DUMMY POSITION VIEW

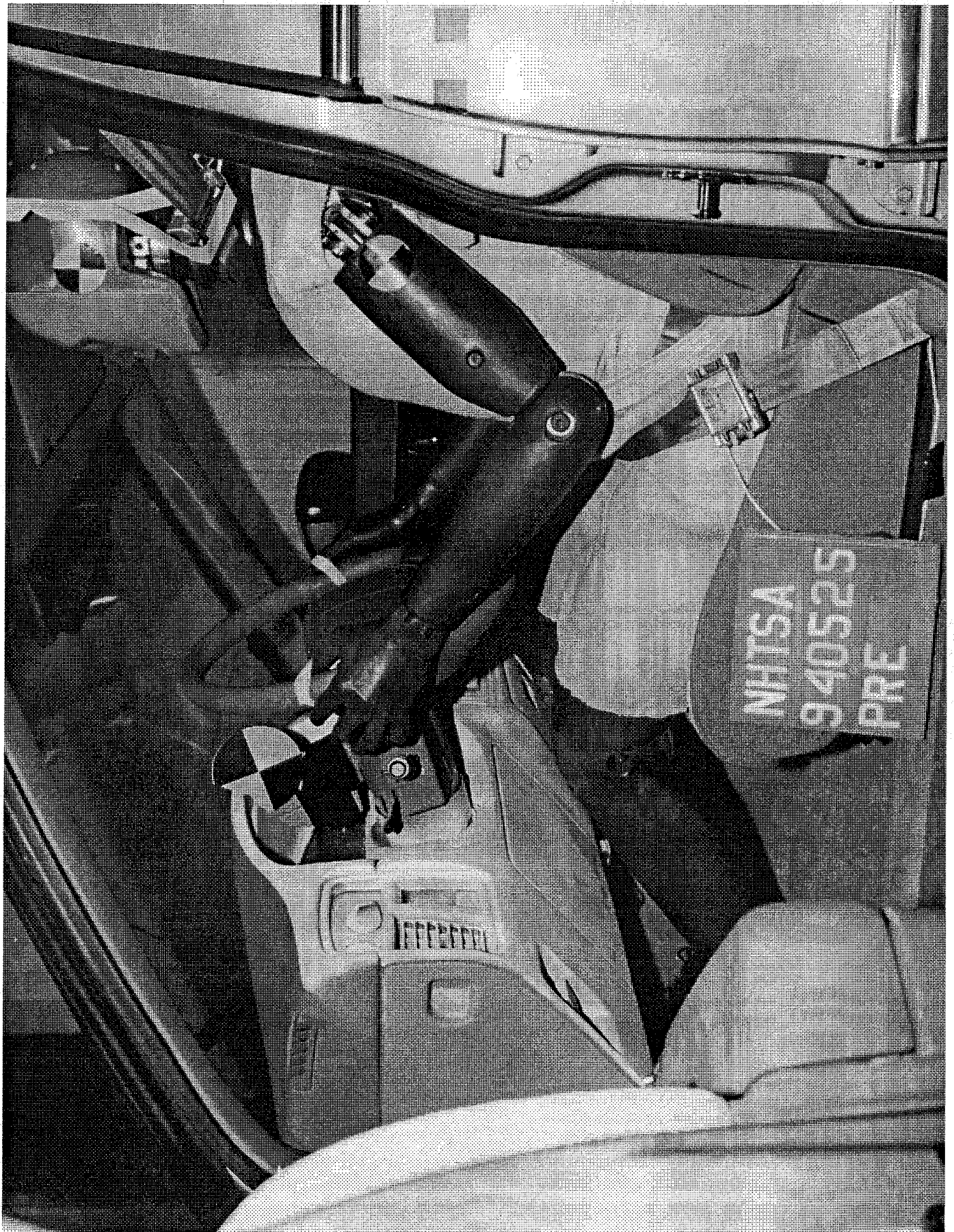


Figure A-30. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-31

940525



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

A-32

940525

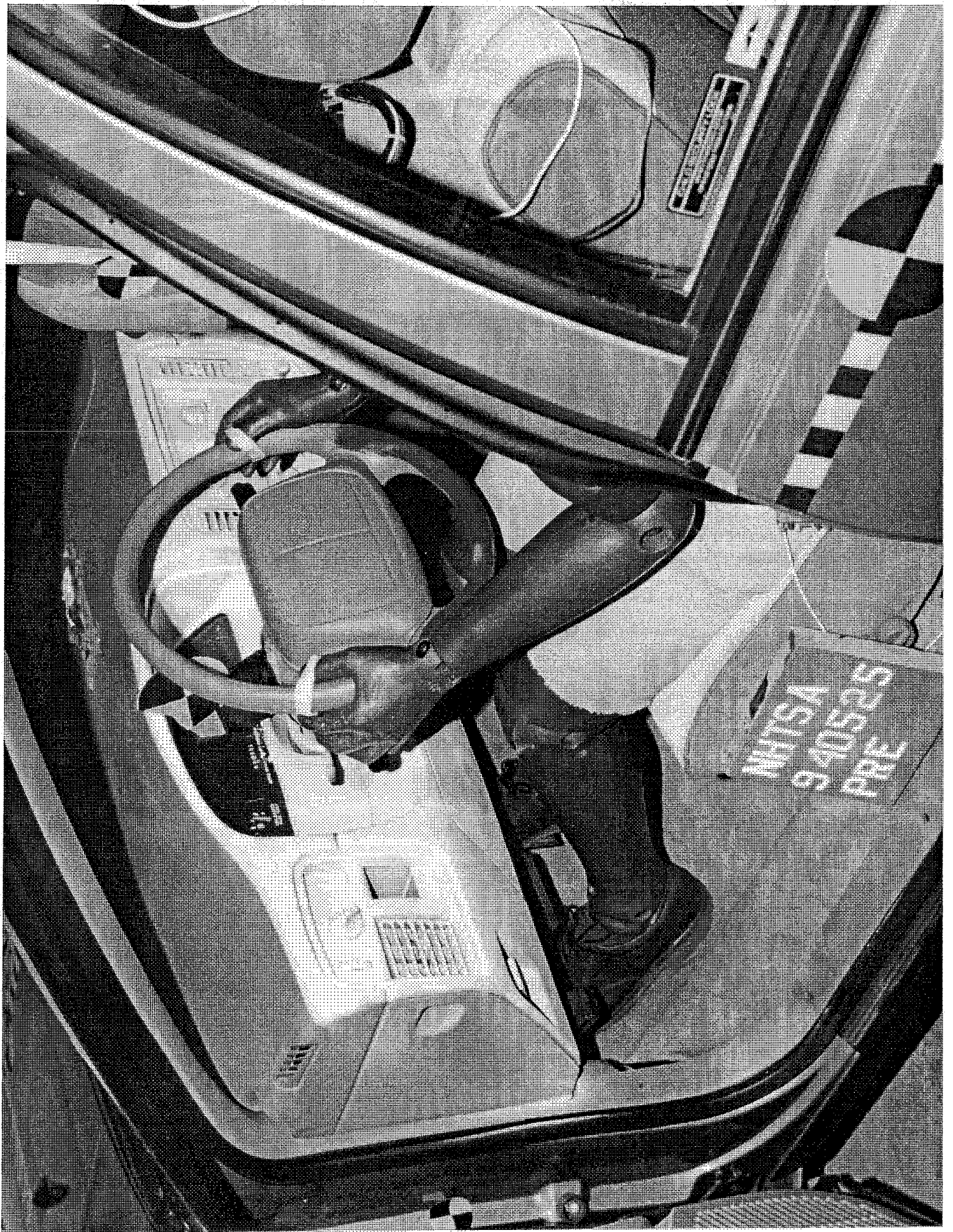


Figure A-32. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-33 940525



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

A-34

940525

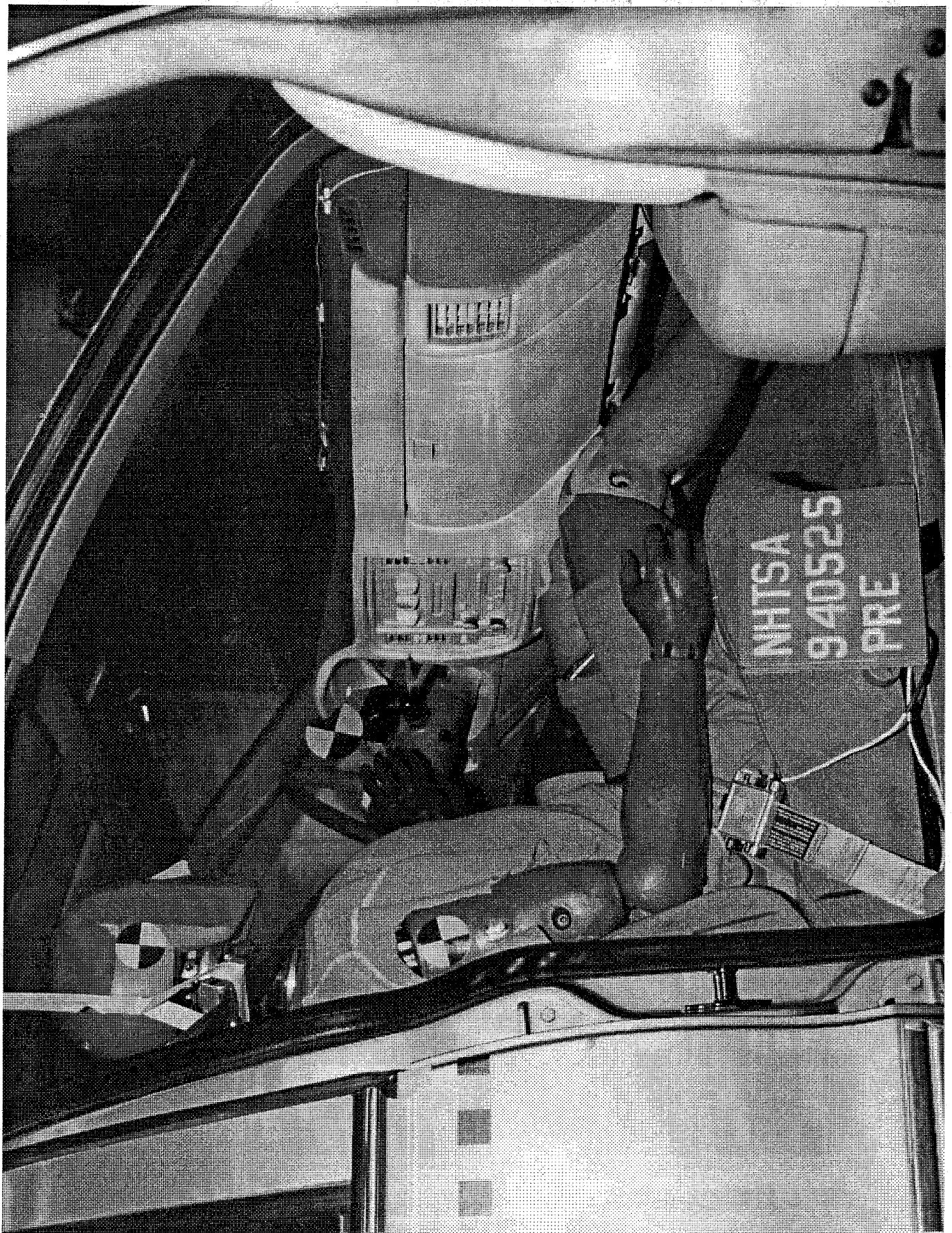


Figure A-34. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
A-35 940525



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

A-36

940525



Figure A-36. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-37 940525

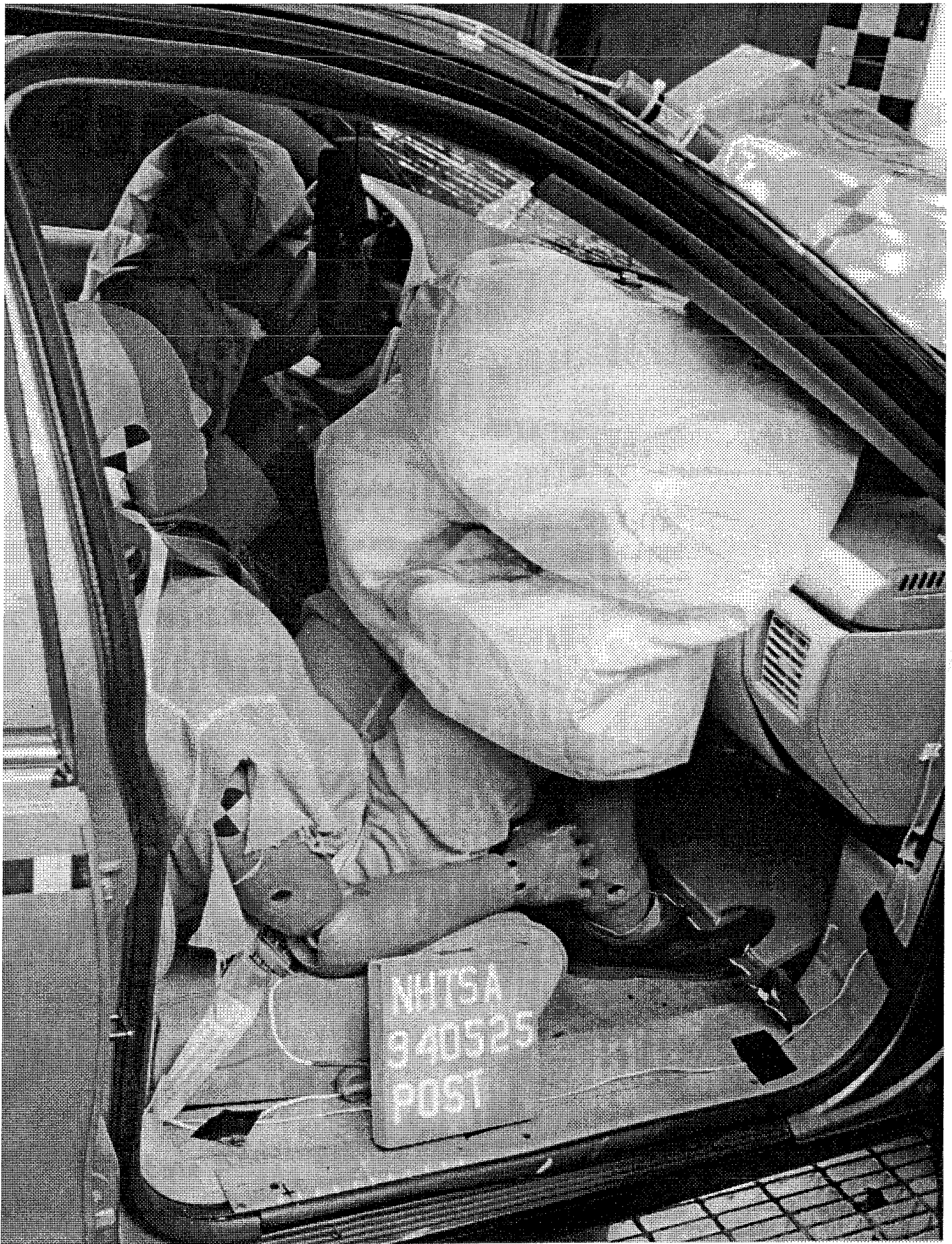


Figure A-37. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
A-38 940525

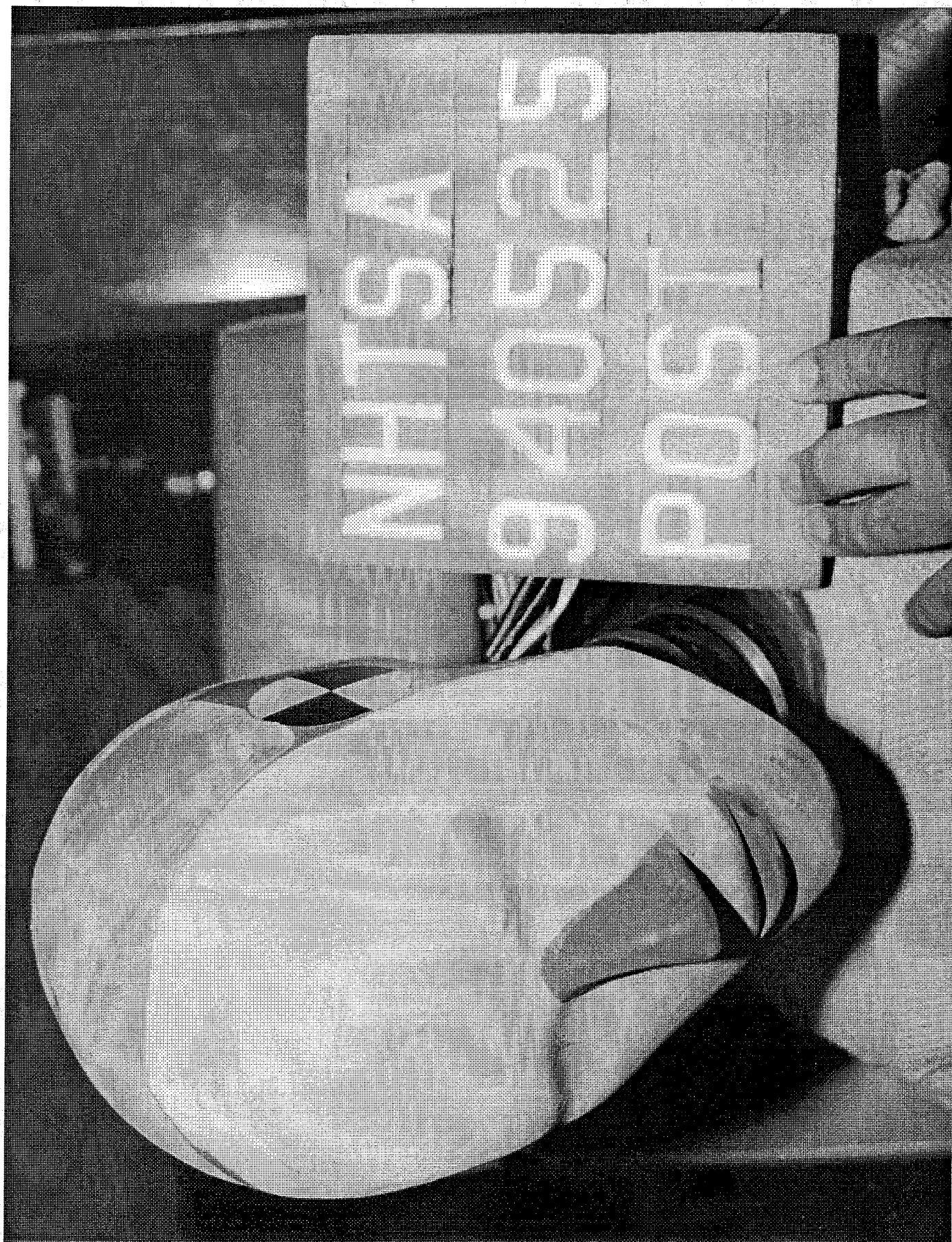


Figure A-38. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

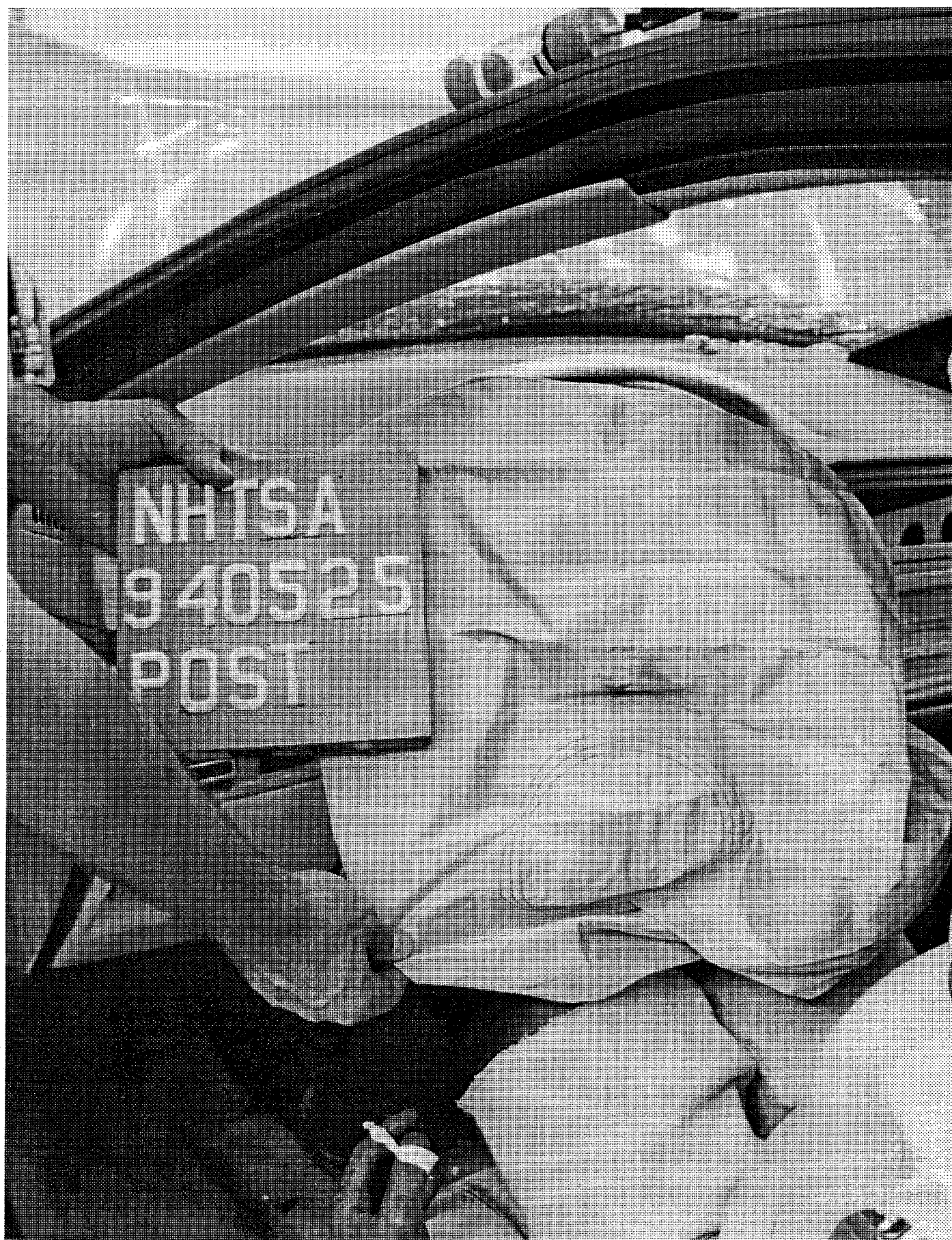


Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

A-40

940525

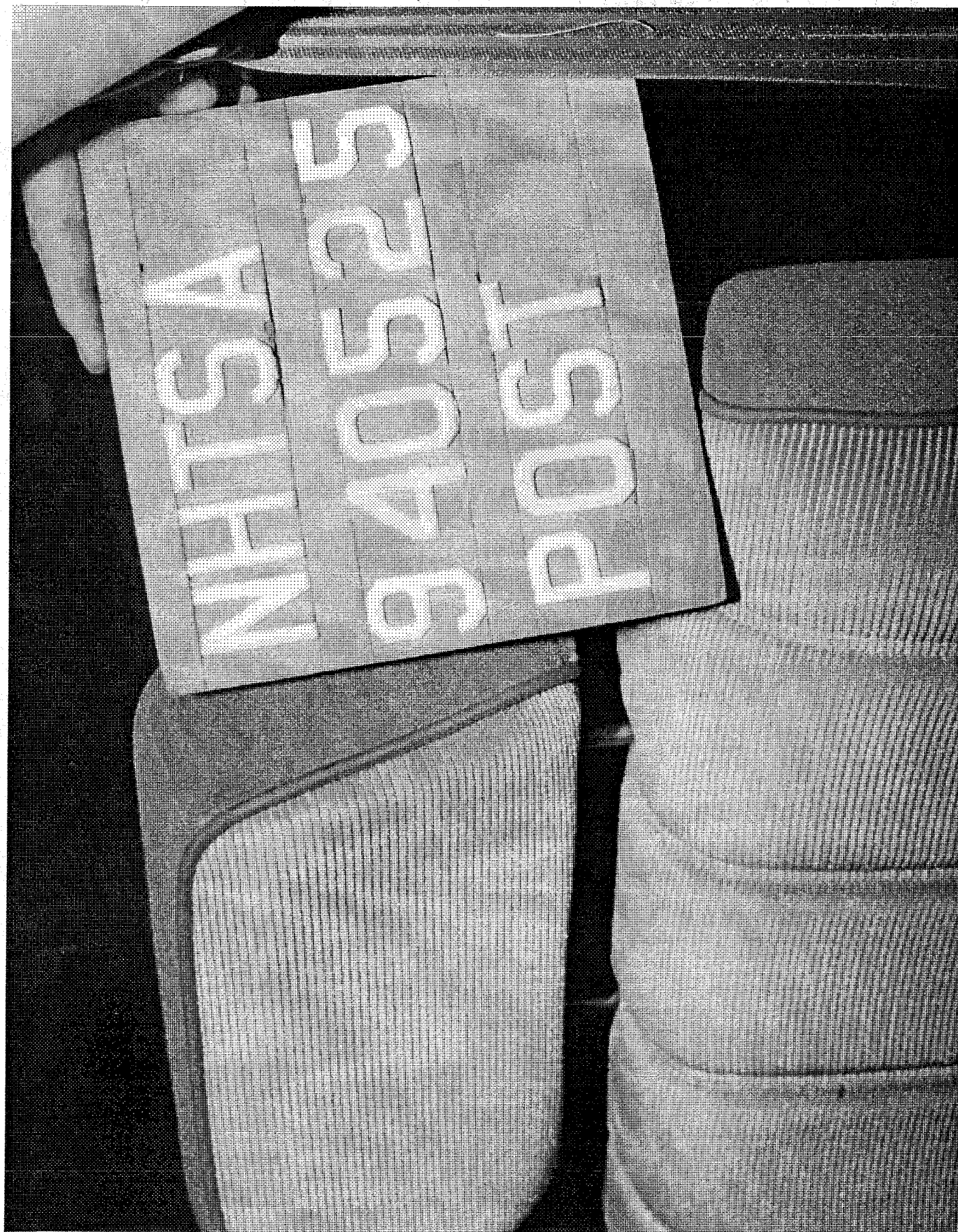


Figure A-40. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 3

A-41

940525

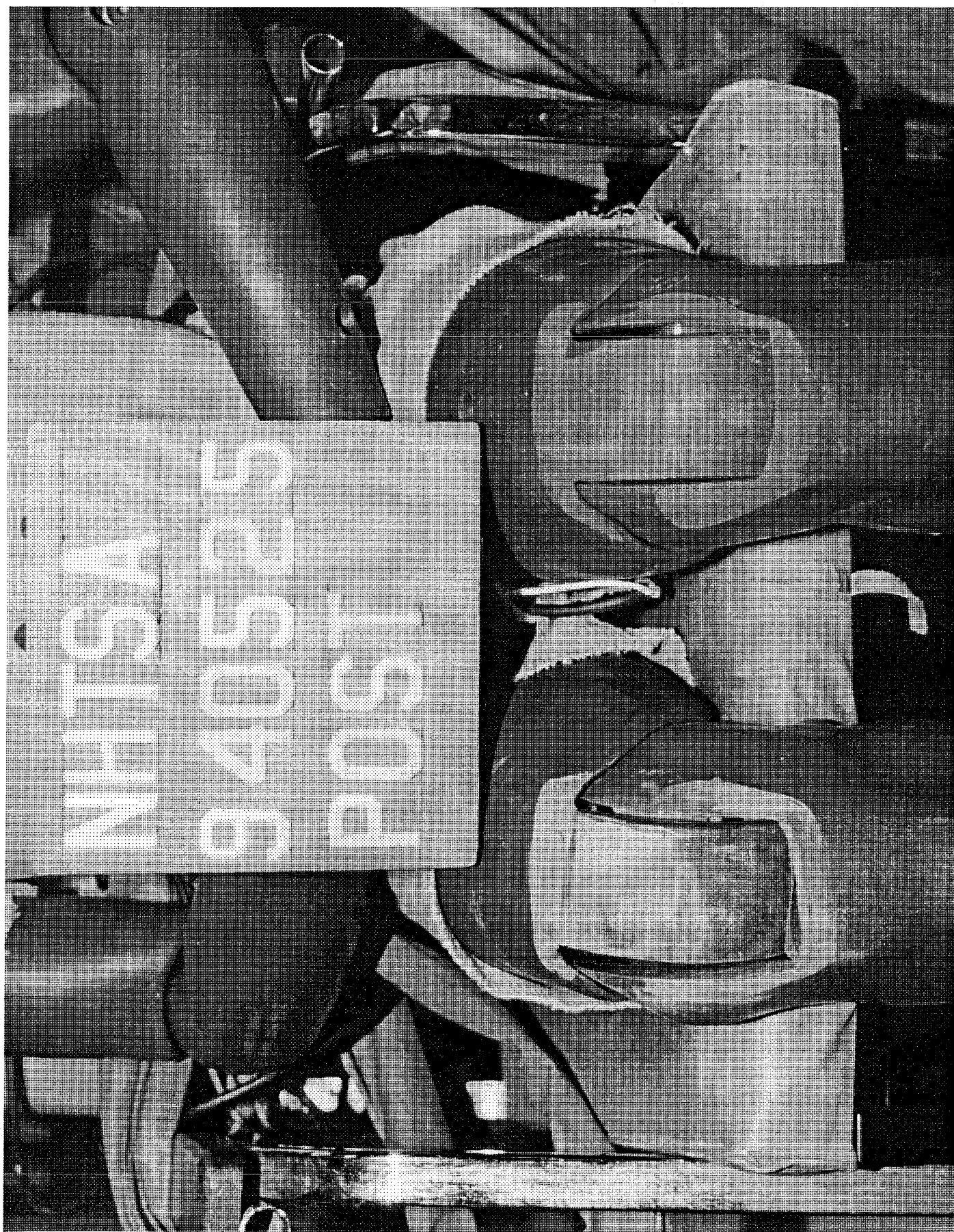


Figure A-41. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-42

940525



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

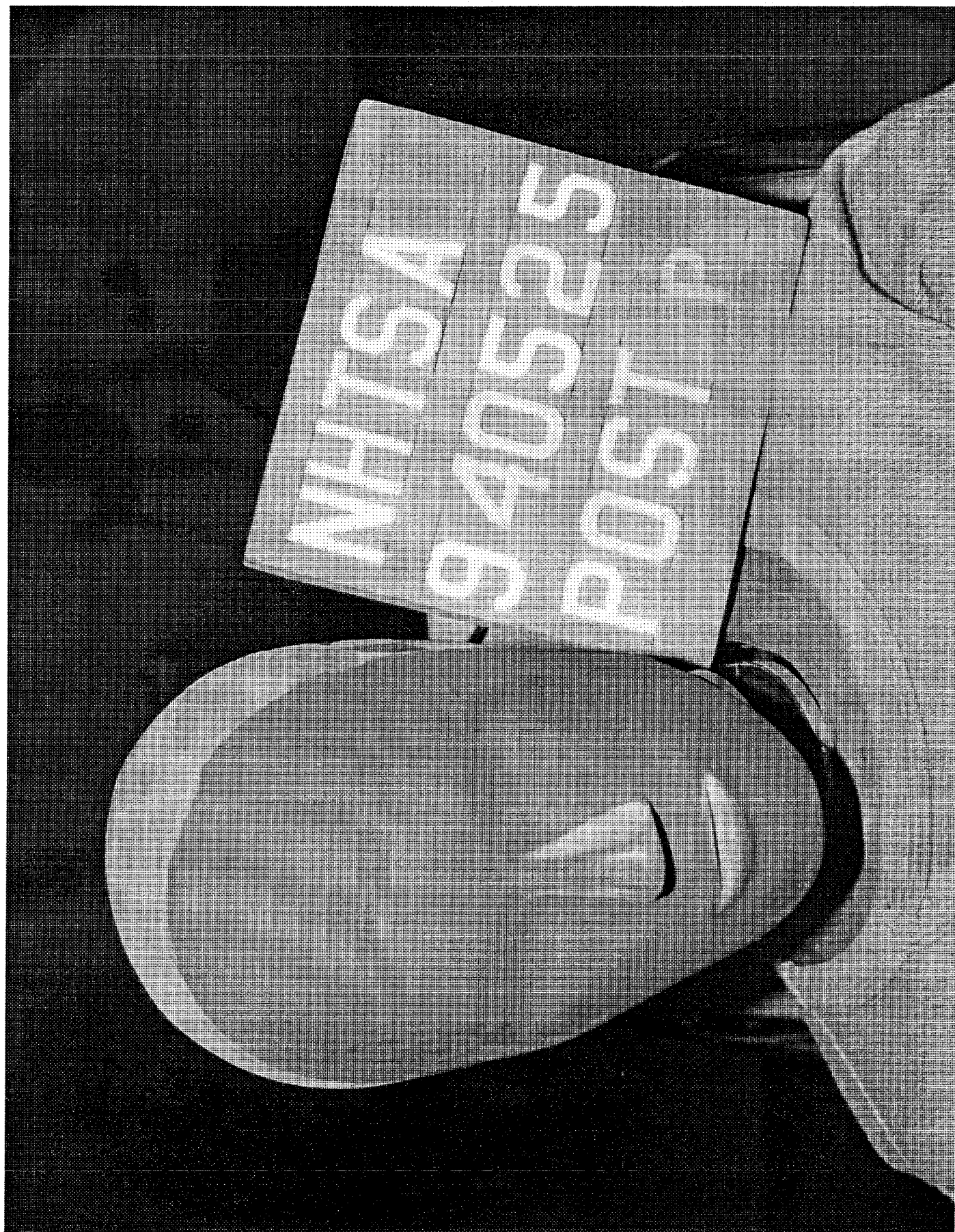


Figure A-43. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 1



Figure A-44. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW 2

A-45

940525

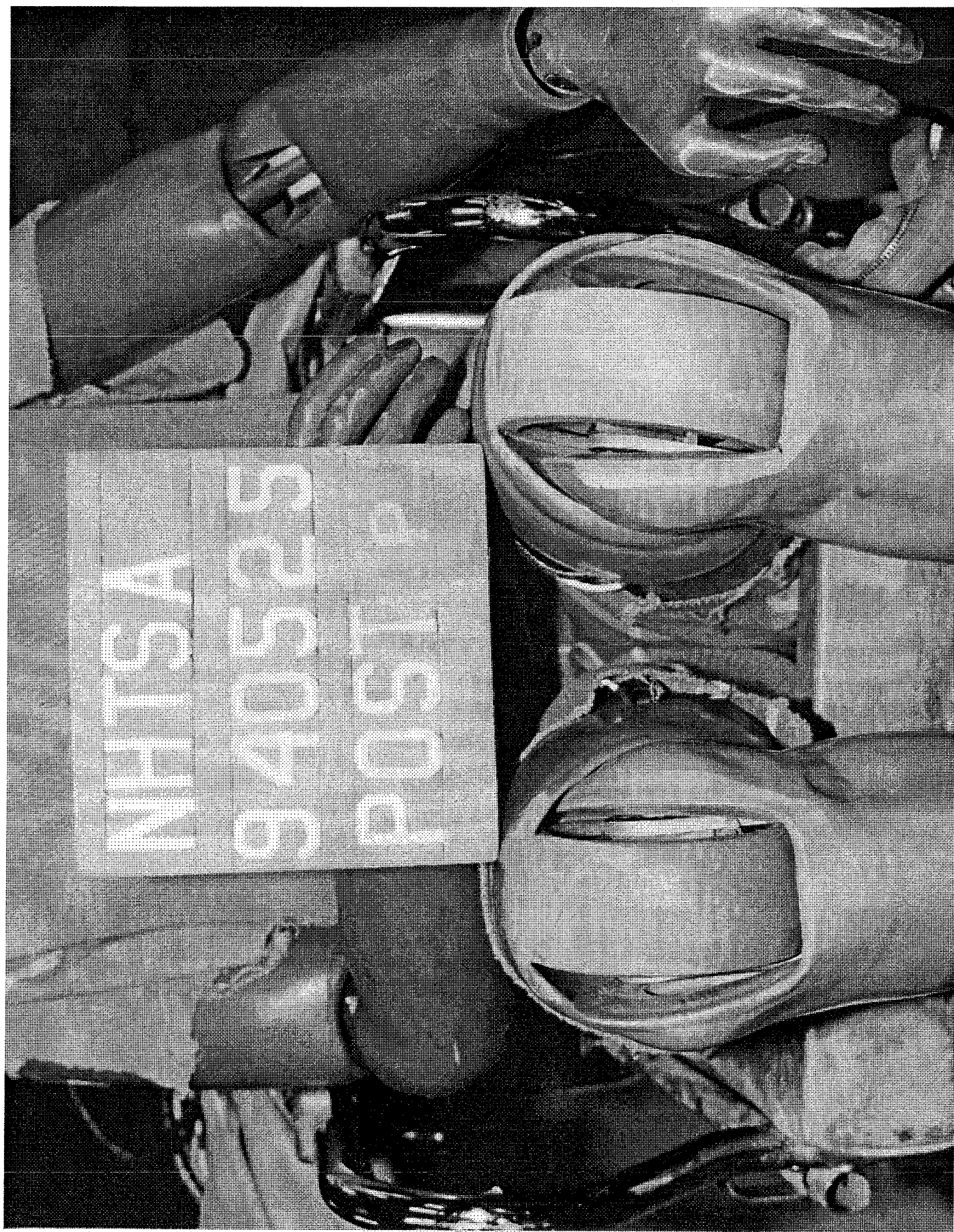


Figure A-45. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

A-46

940525



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

A-47

940525


 MKD BY GENERAL MOTORS CORP.
 DATE GVWR GAWR FRI GAWR RR
 09/93 5334LB 2604LB 2731LB
 2420KG 1181KG 1239KG
 THIS VEHICLE CONFORMS TO ALL APPLI-
 CABLE U.S. FEDERAL MOTOR VEHICLE
 SAFETY, BUMPER, AND THEFT PREVENTION
 STANDARDS IN EFFECT ON THE DATE OF
 MANUFACTURE SHOWN ABOVE.
 1G1BL52P0WR106960 PASS CAR



 TIRE-LOADING INFORMATION
 OCCUPANTS VEHICLE CAP. WT.
 FRT. CTR. RR. TOTAL LBS KG
 3 0 3 6 1100 499
 MAX. LOADING @ GVWR SAME AS VEHICLE
 CAPACITY WEIGHT. DBB COLD TIRE
 MODEL L19 SPEED PRESSURE
 TIRE SIZE RTG PSI/KPA
 FRT P235/70R15 S 30/210
 RR P235/70R15 S 30/210
 SPA 1145/80D16 M 60/420
 IF TIRES ARE HOT, ADD 4PSI/28KPA
 SEE OWNER'S MANUAL FOR ADDITIONAL
 INFORMATION


Fig A-47. PRE-TEST VEH. CERTIFICATION & RECOMMENDED TIRE PRESSURE

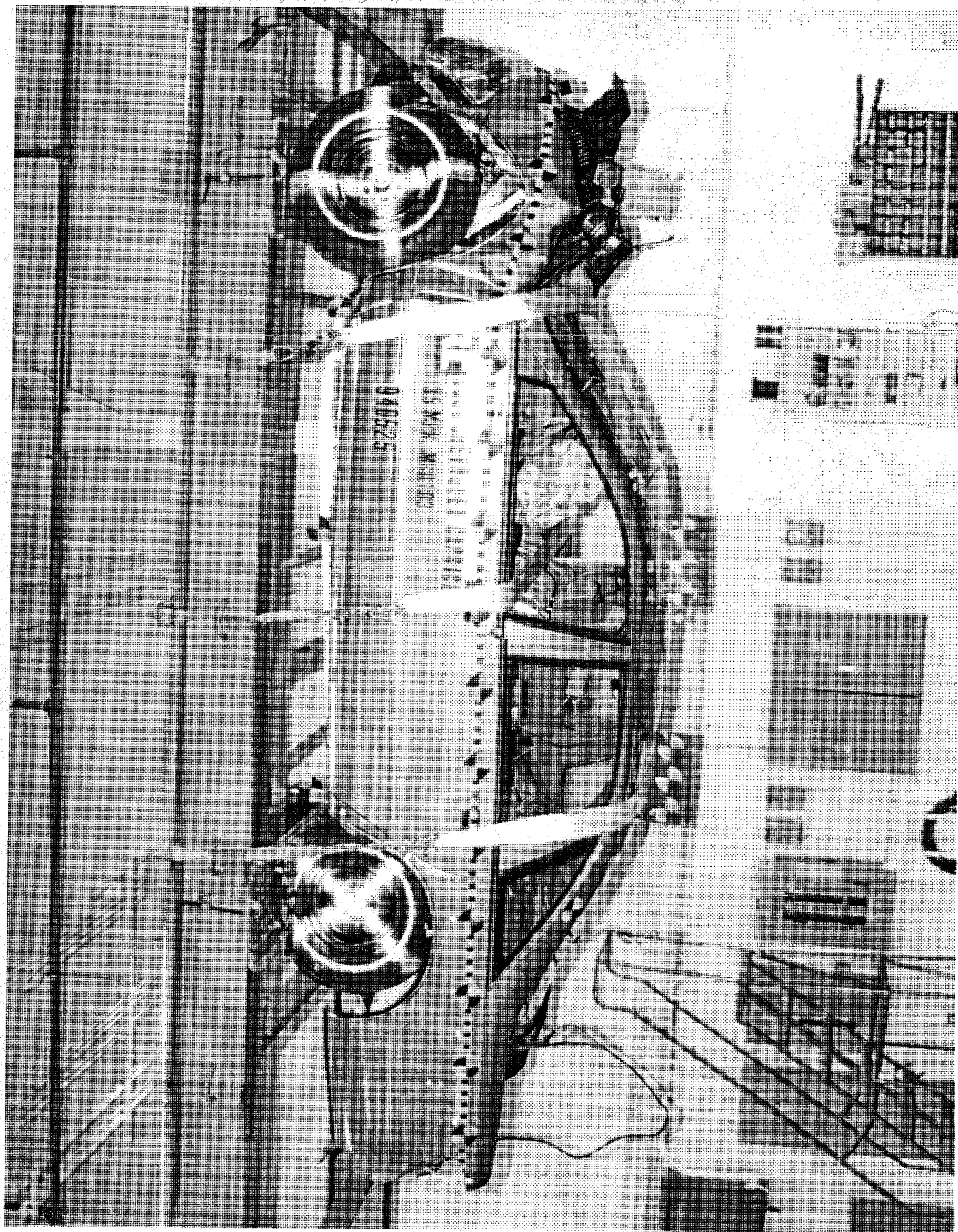


Figure A-48. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW
A-49 940525

APPENDIX B

DATA PLOTS

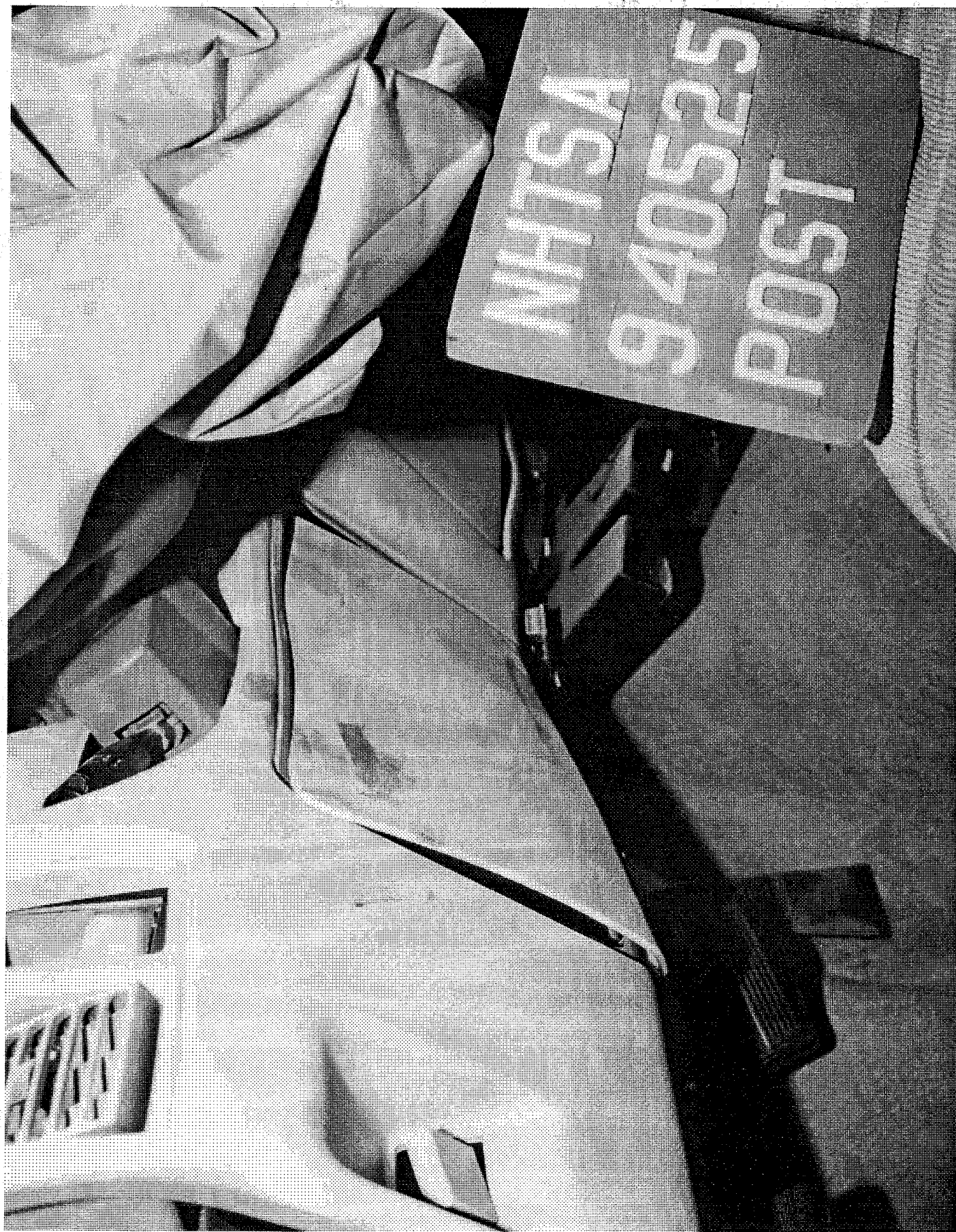


Figure A-42. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

A-43

940525

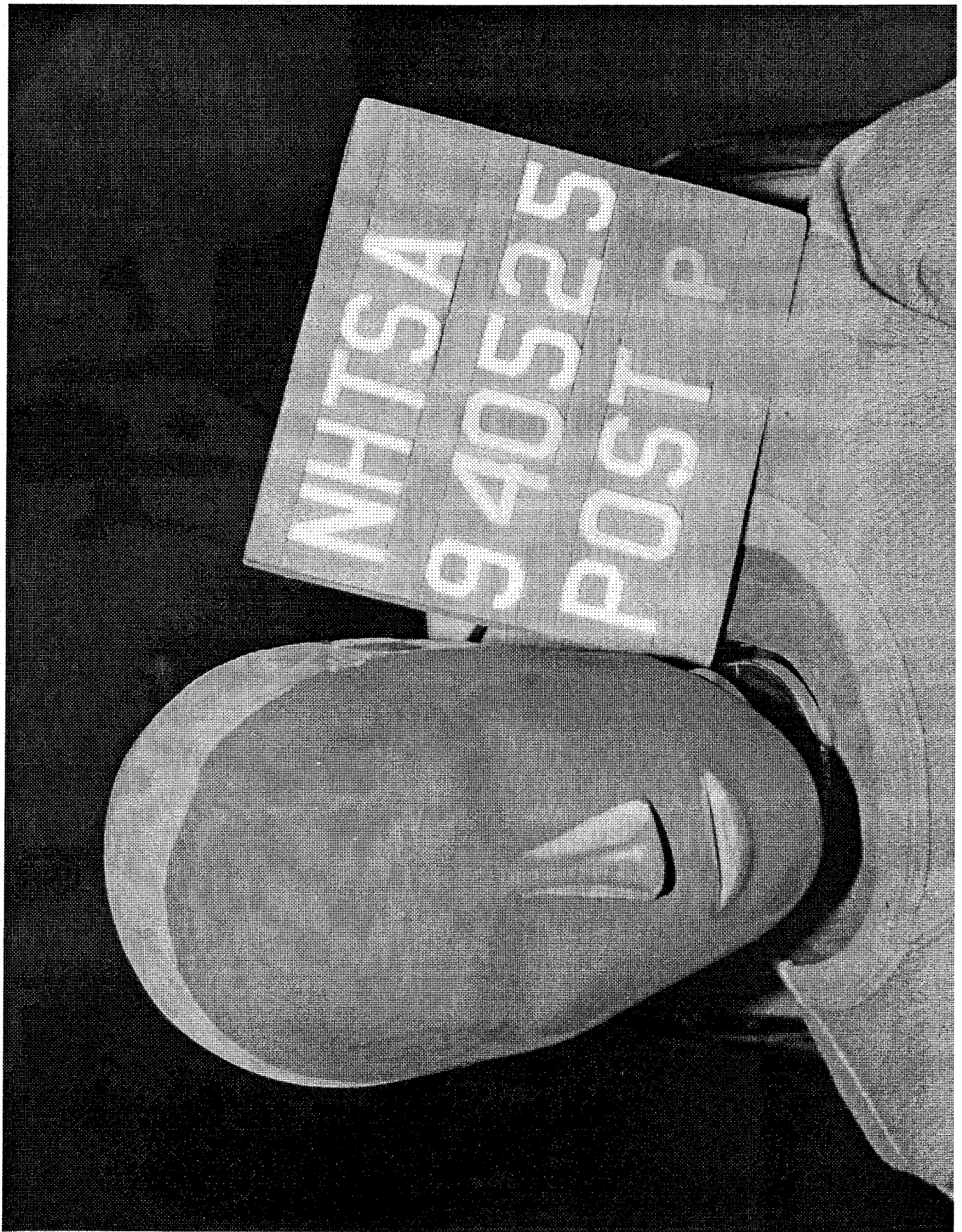


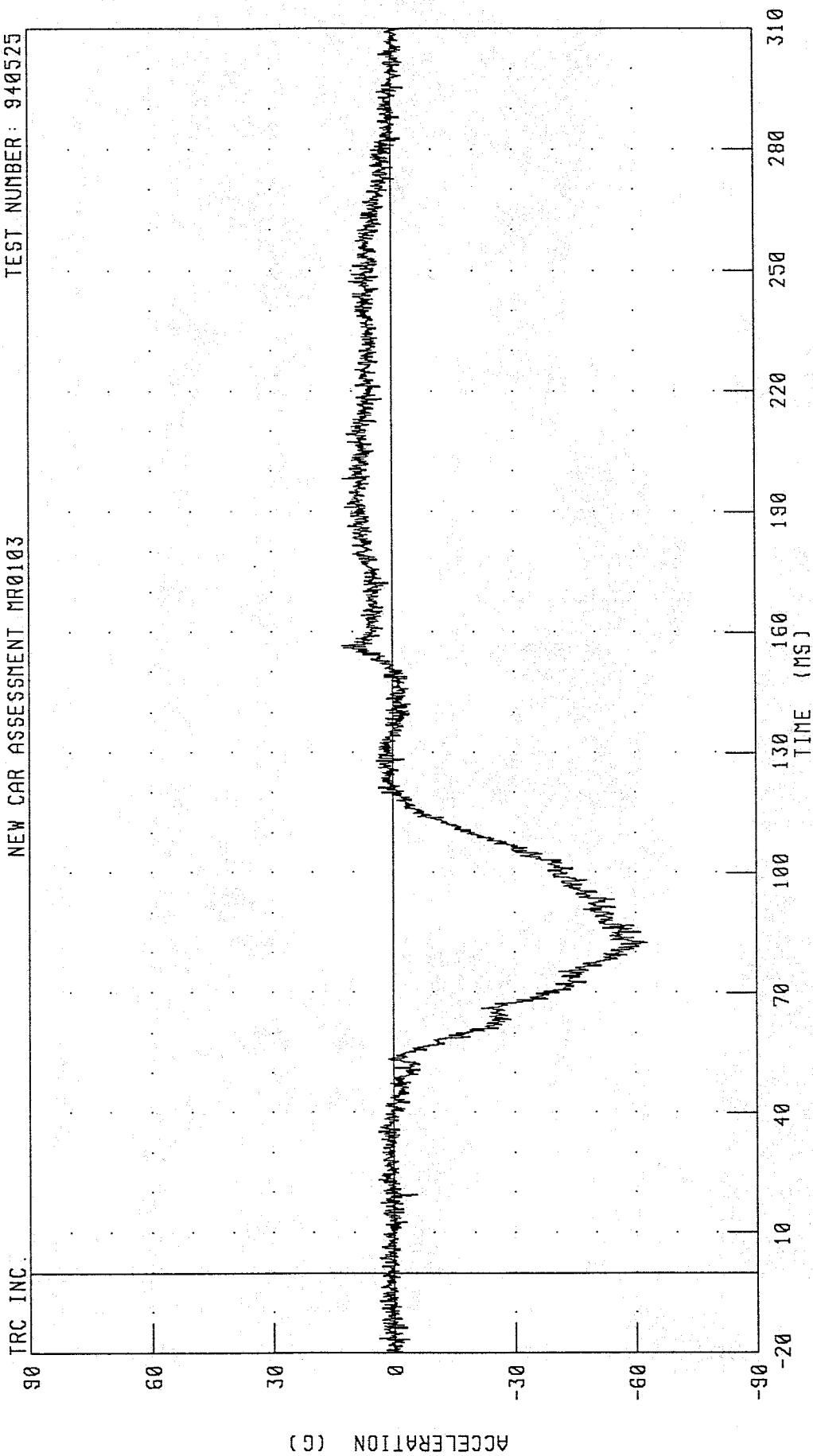
Figure A-43. POST-TEST PASSENGER DUMMY HEAD CONTACT - VIEW I
A-44 940525

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER HEAD X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 12.53 G @ 156.64 MS; -62.83 G @ 82.48 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

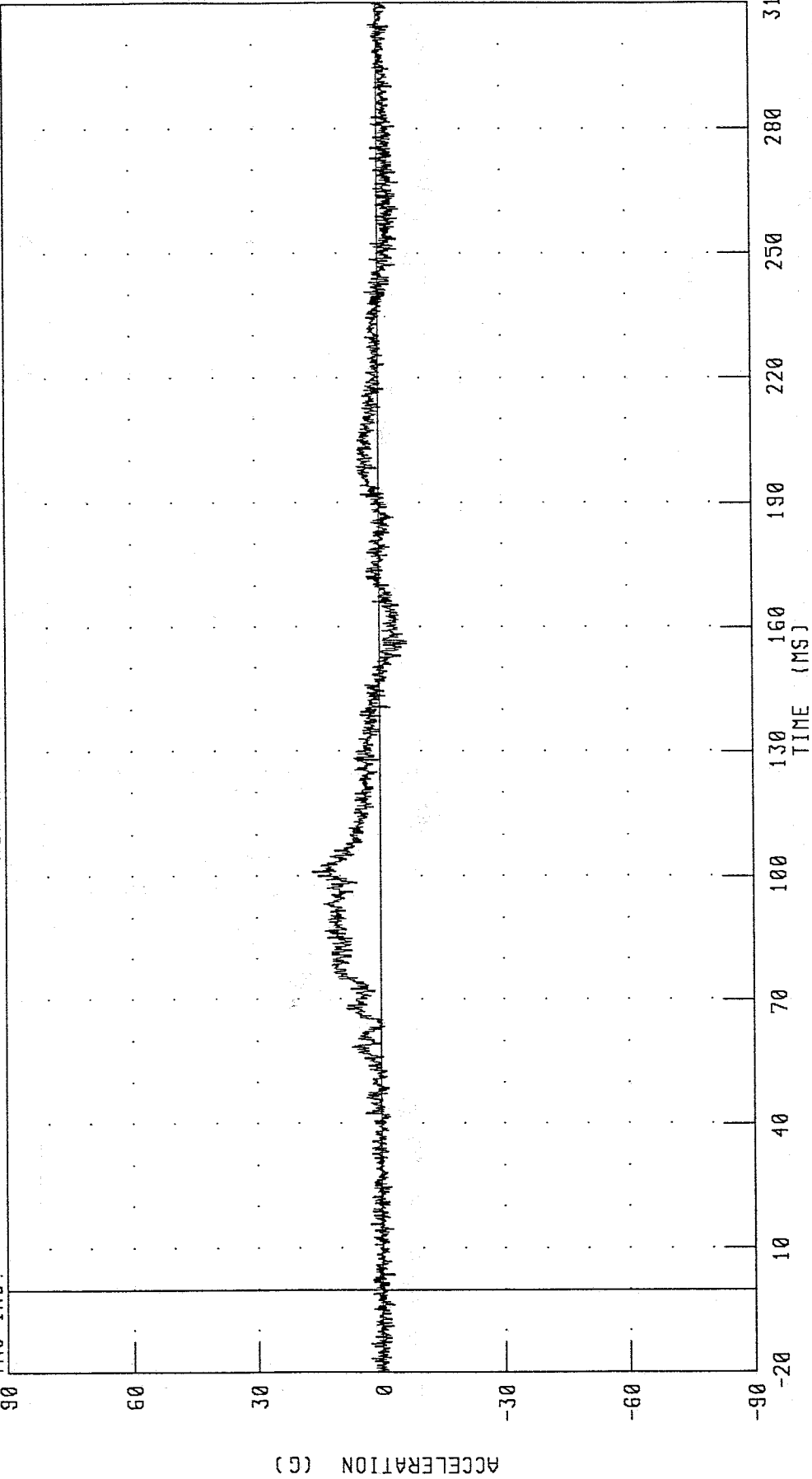
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER HEAD Y-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

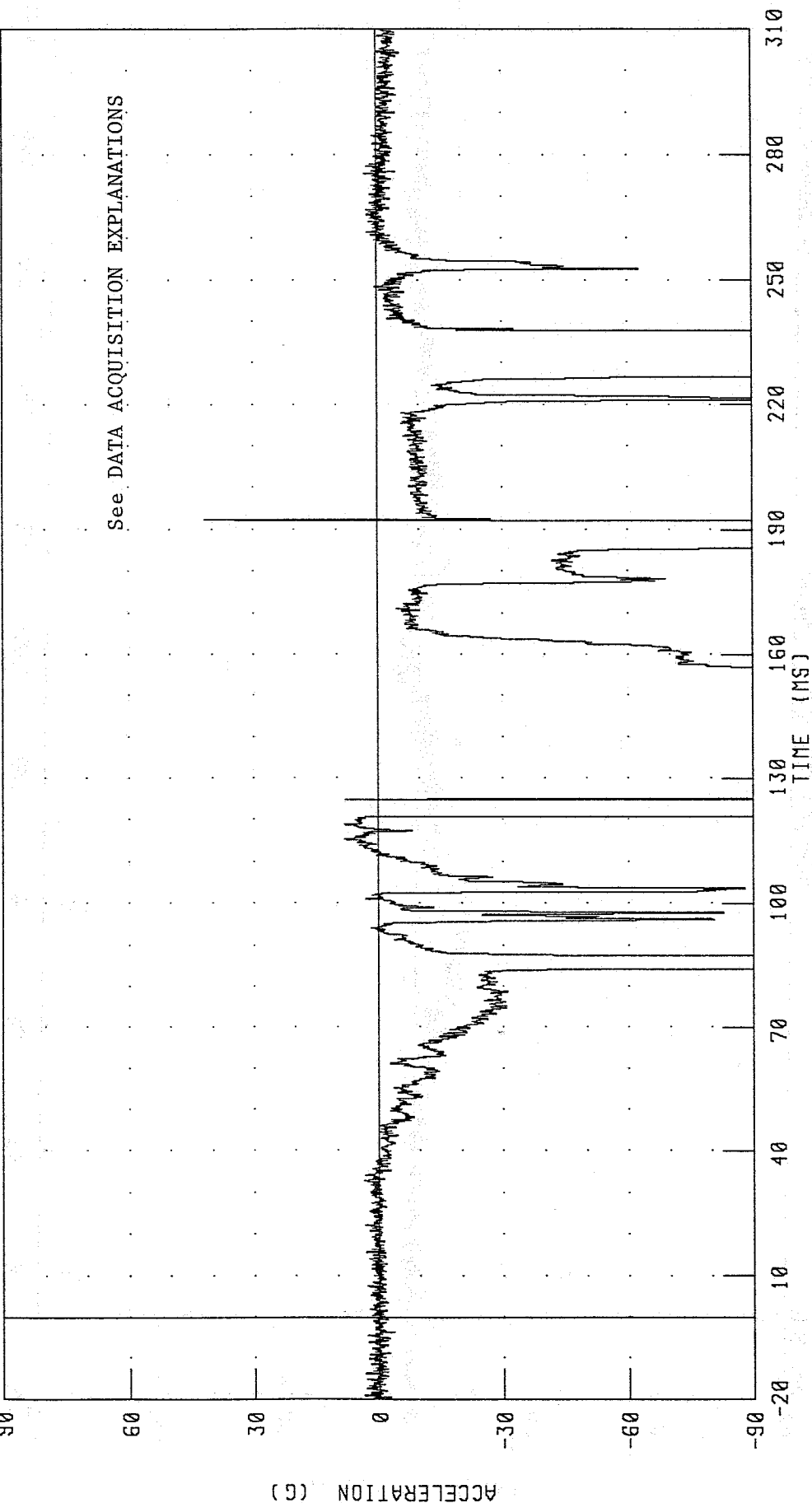
PEAK DATA: 16.64 G @ 101.04 MS, -6.58 G @ 156.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION

TRC INC.

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

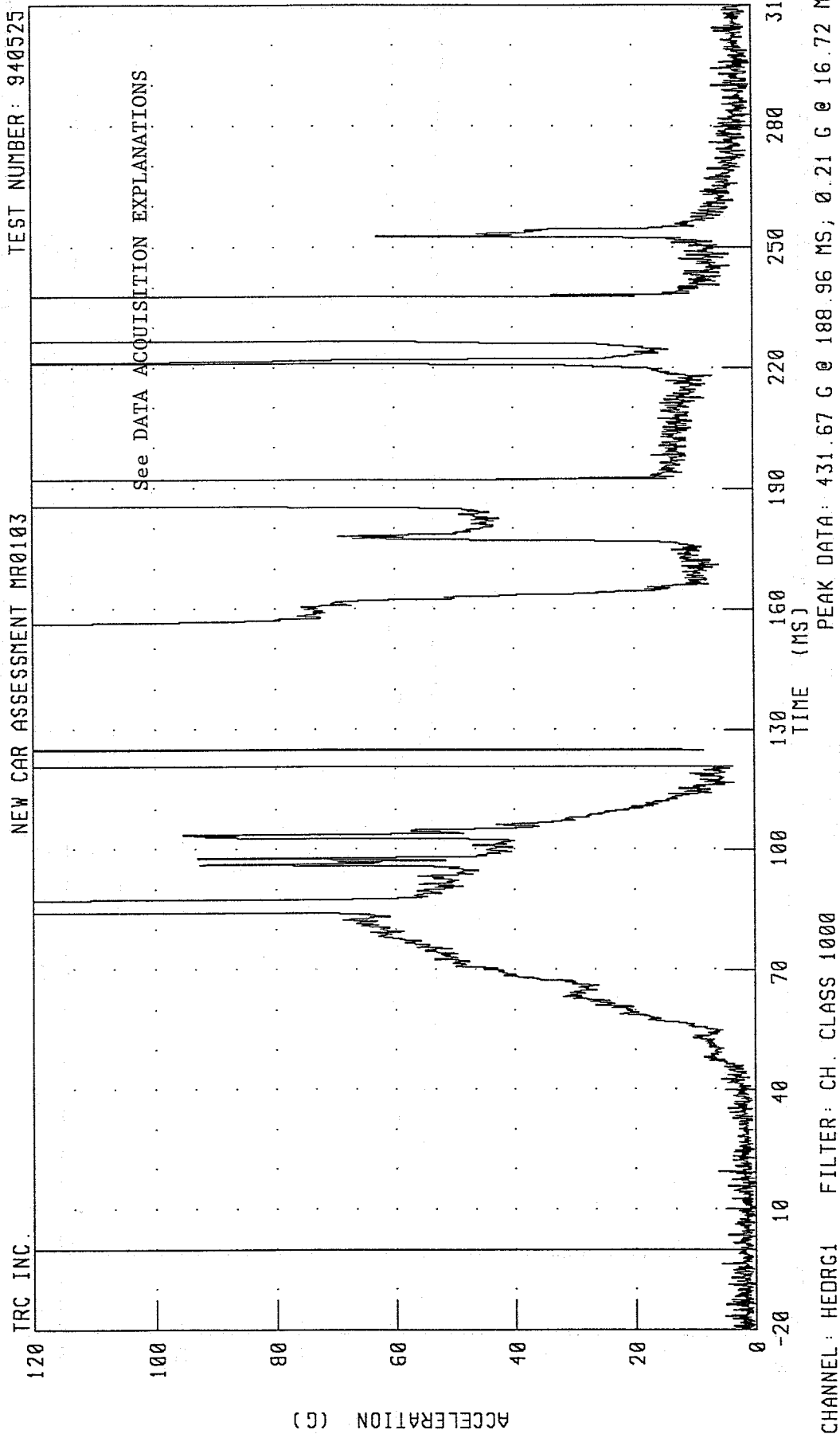


See DATA ACQUISITION EXPLANATIONS

CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 41.76 G @ 192.32 MS; -43.16 G @ 121.60 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION



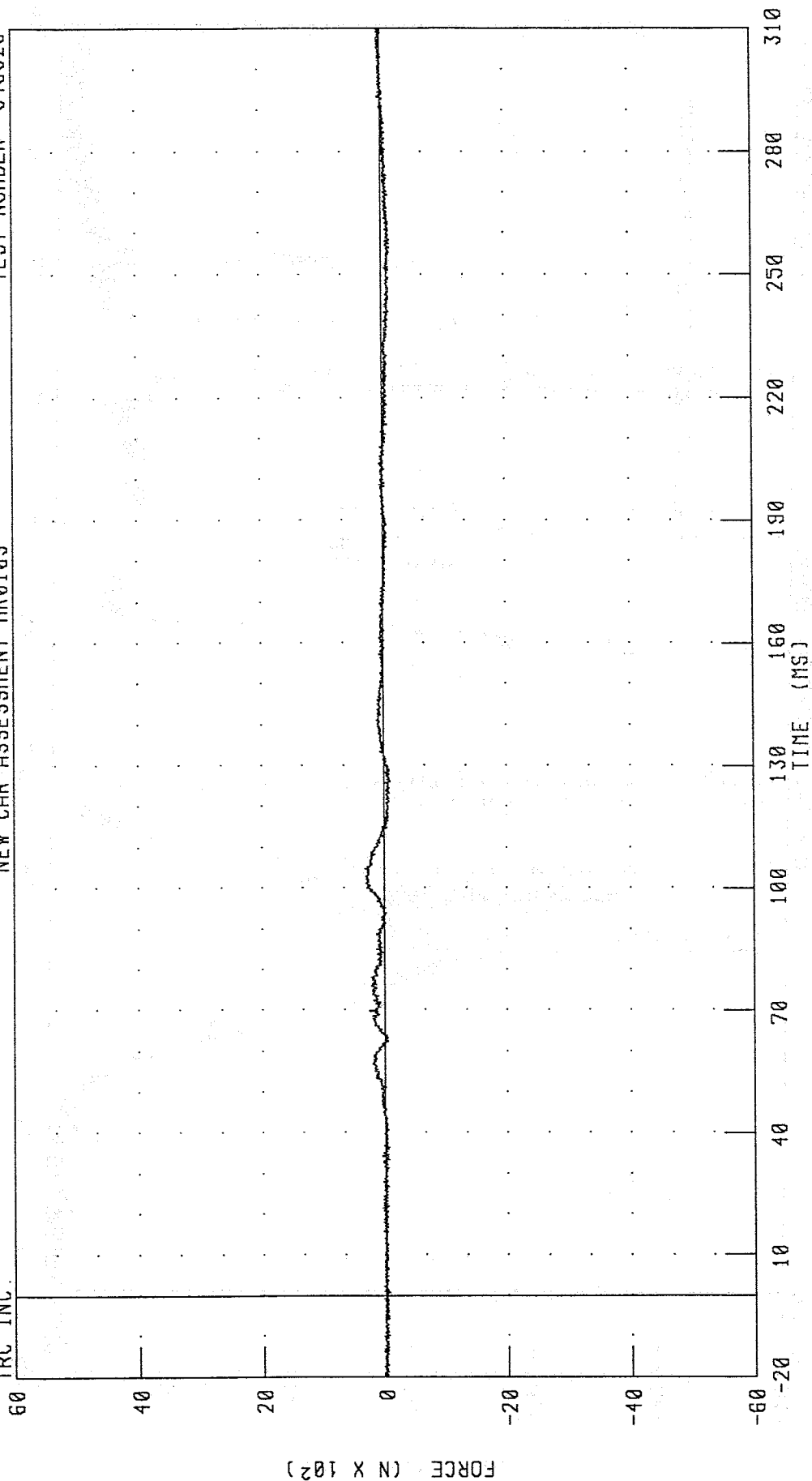
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK X-AXIS SHEAR FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



TIME (MS)

PEAK DATA: 315.62 N @ 104.72 MS; -135.06 N @ 258.48 MS

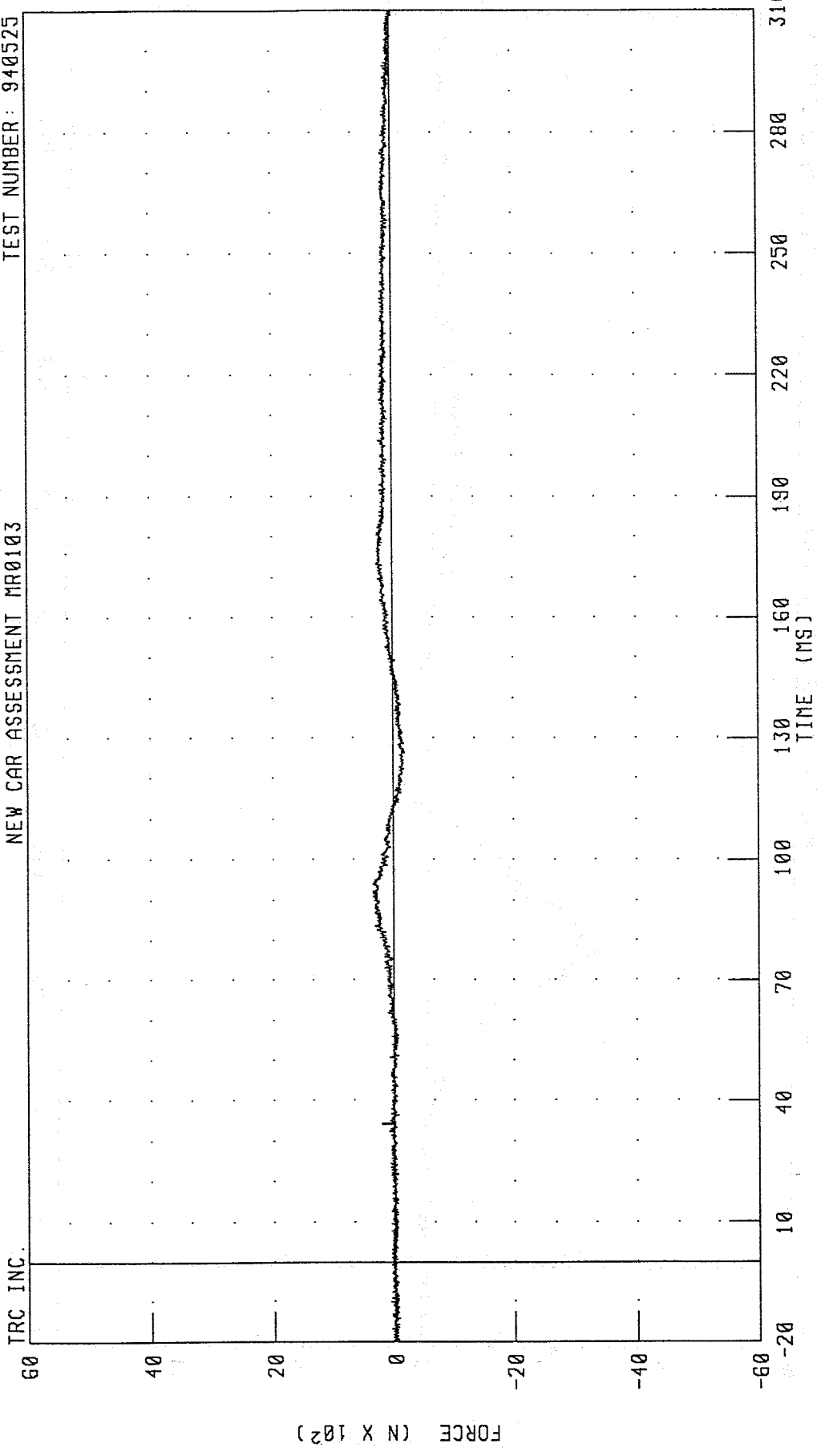
CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK Y-AXIS SHEAR FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 348.43 N @ 92.08 MS; -183.93 N @ 126.40 MS

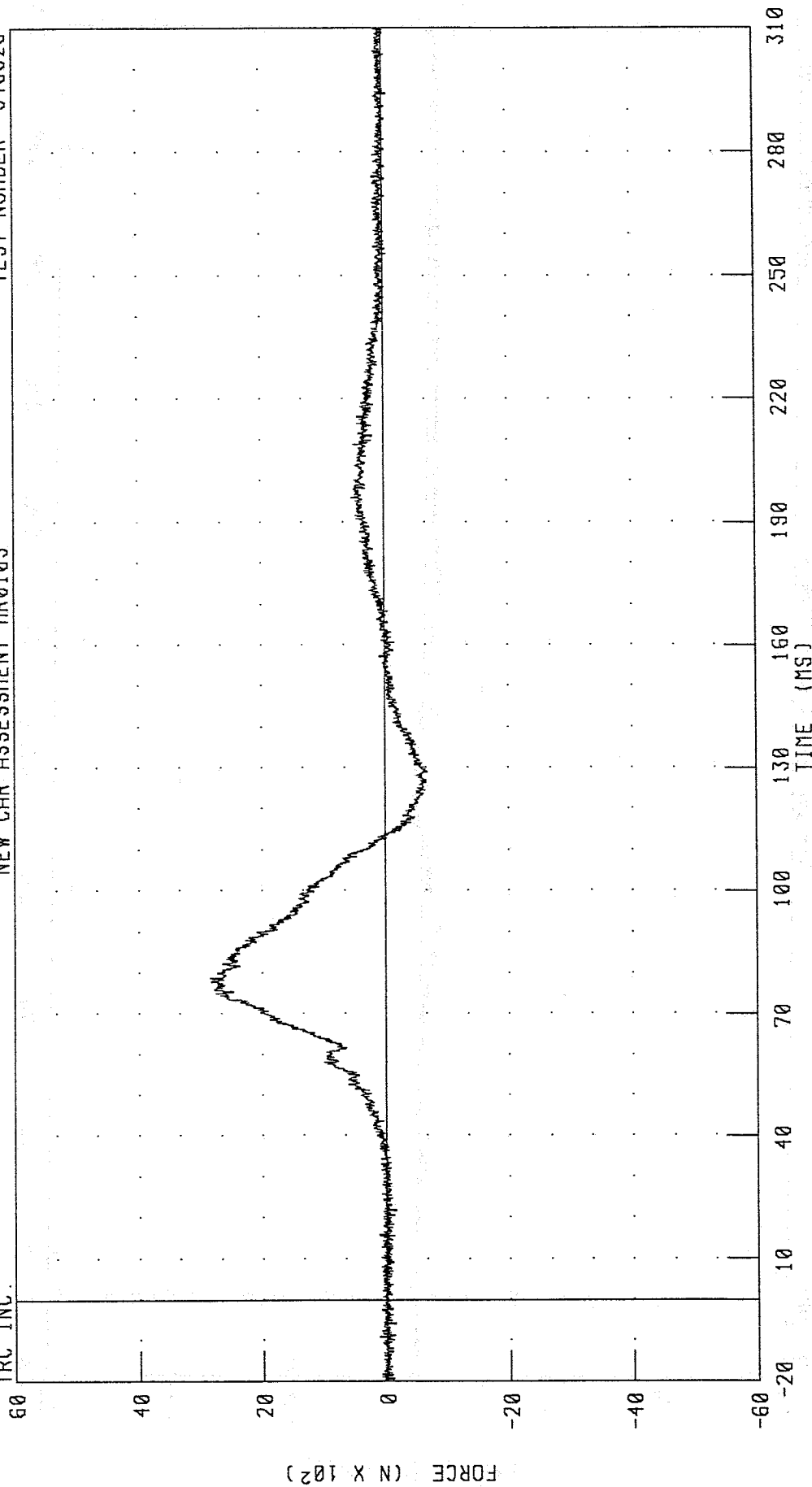
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK Z-AXIS AXIAL FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



PEAK DATA: 2842.06 N @ 78.80 MS; -680.76 N @ 129.04 MS

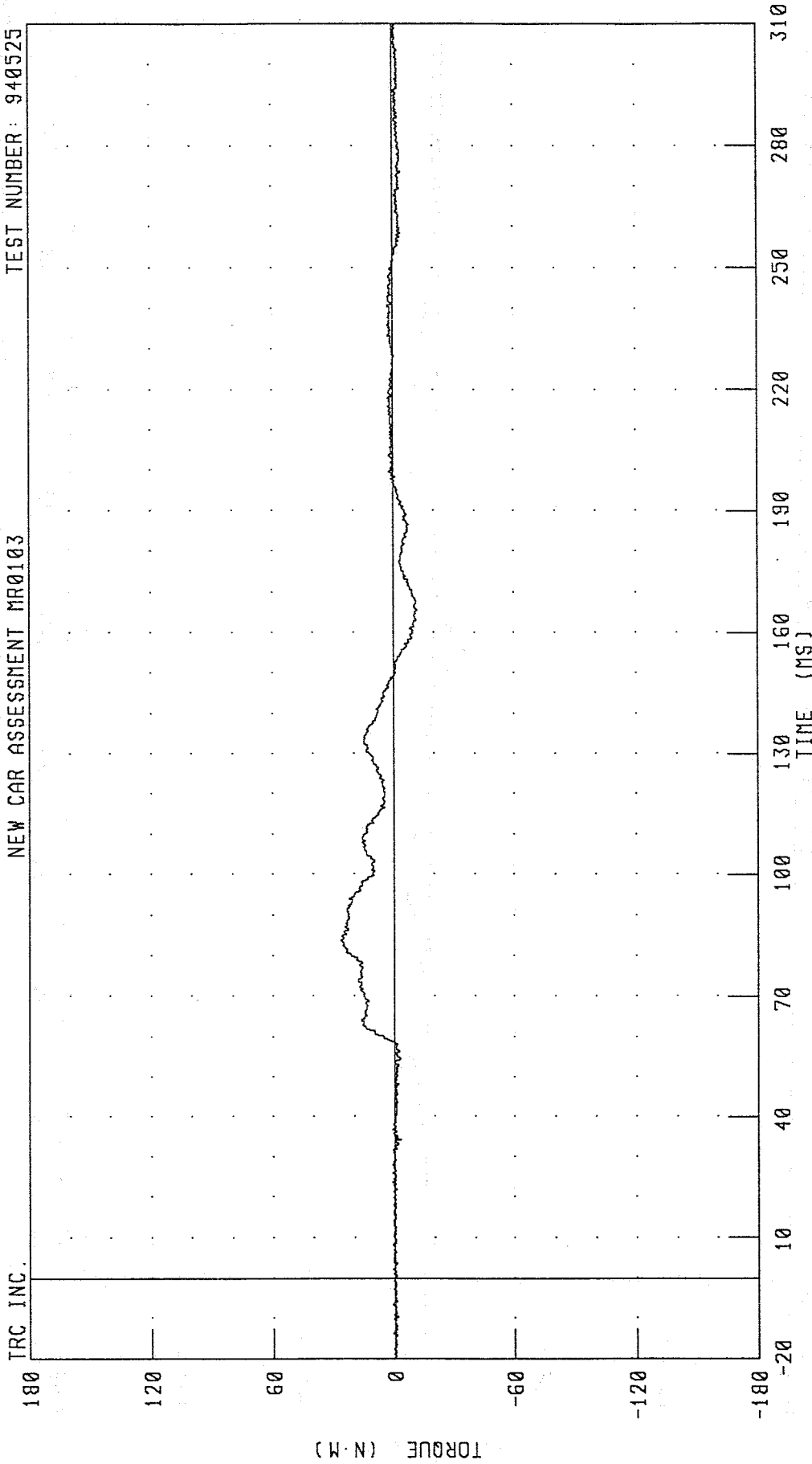
CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK MOMENT ABOUT X AXIS

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 26.45 N·M @ 83.84 MS; -11.79 N·M @ 165.52 MS

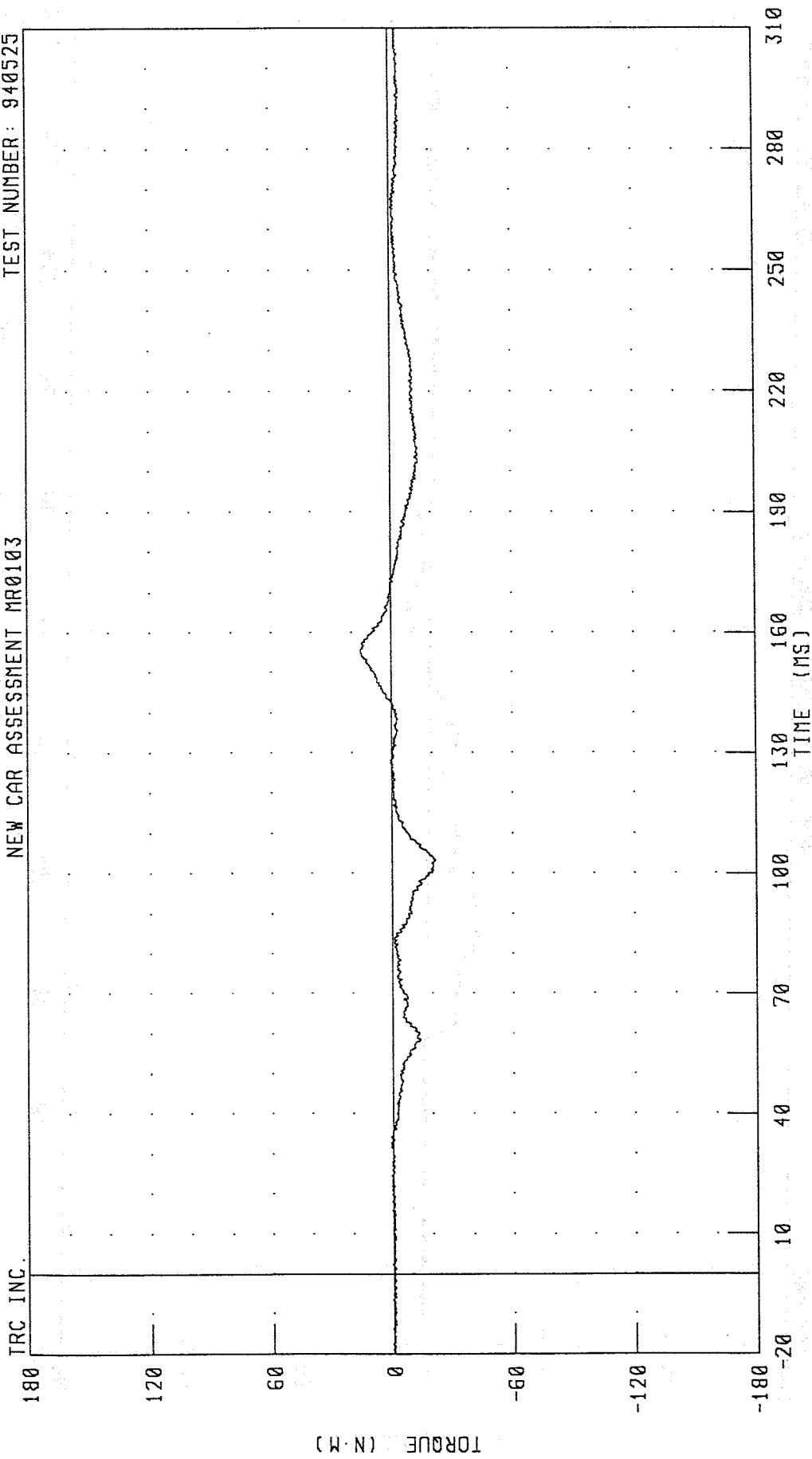
CHANNEL: NEKX01 FILTER: CH. CLASS 600

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 15.44 N-M @ 155.12 MS; -21.27 N-M @ 103.36 MS

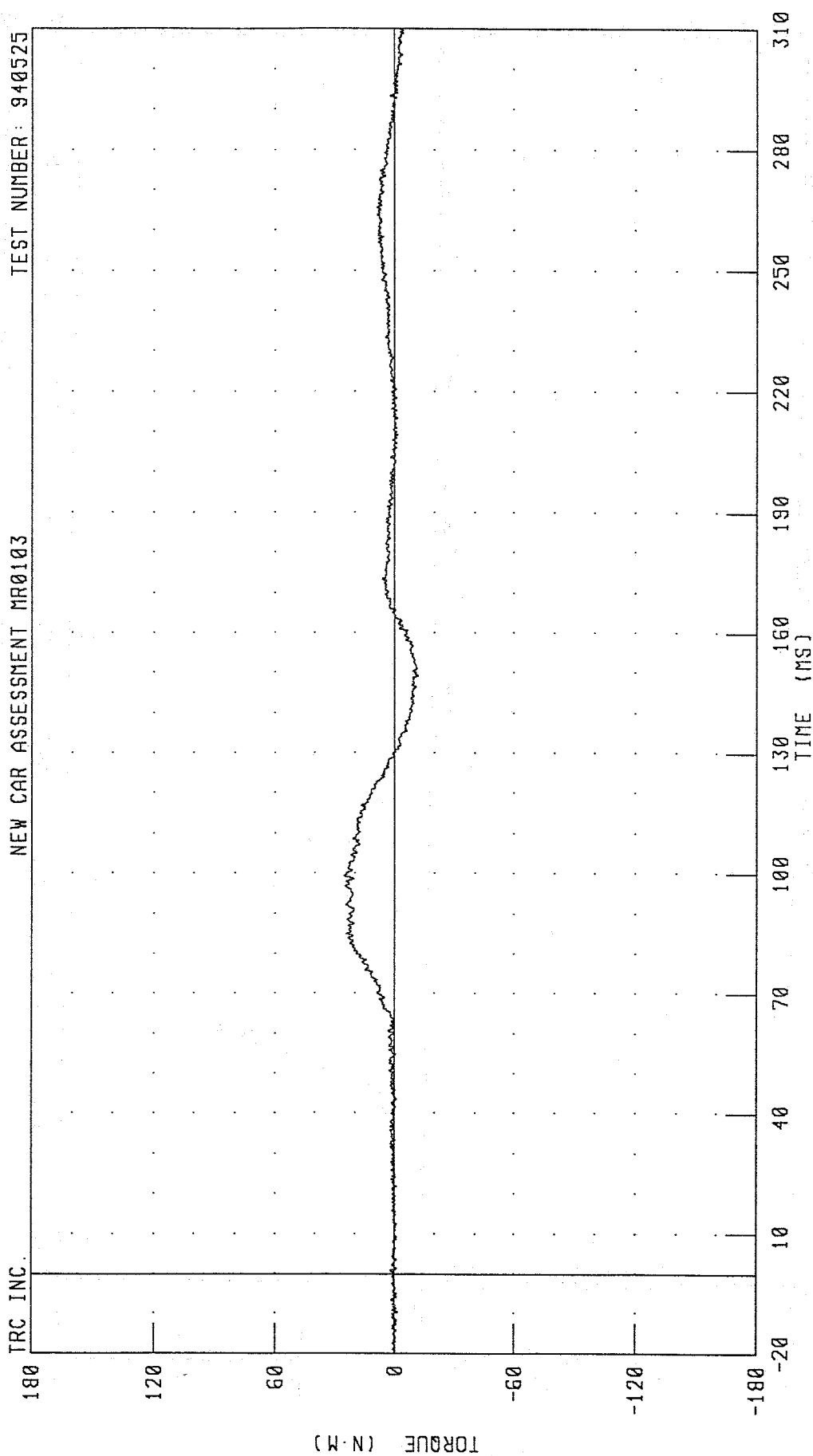
CHANNEL: NEKYM1 FILTER: CH. CLASS 600

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER NECK MOMENT ABOUT Z AXIS

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: NEKZM1 FILTER: CH. CLASS 600

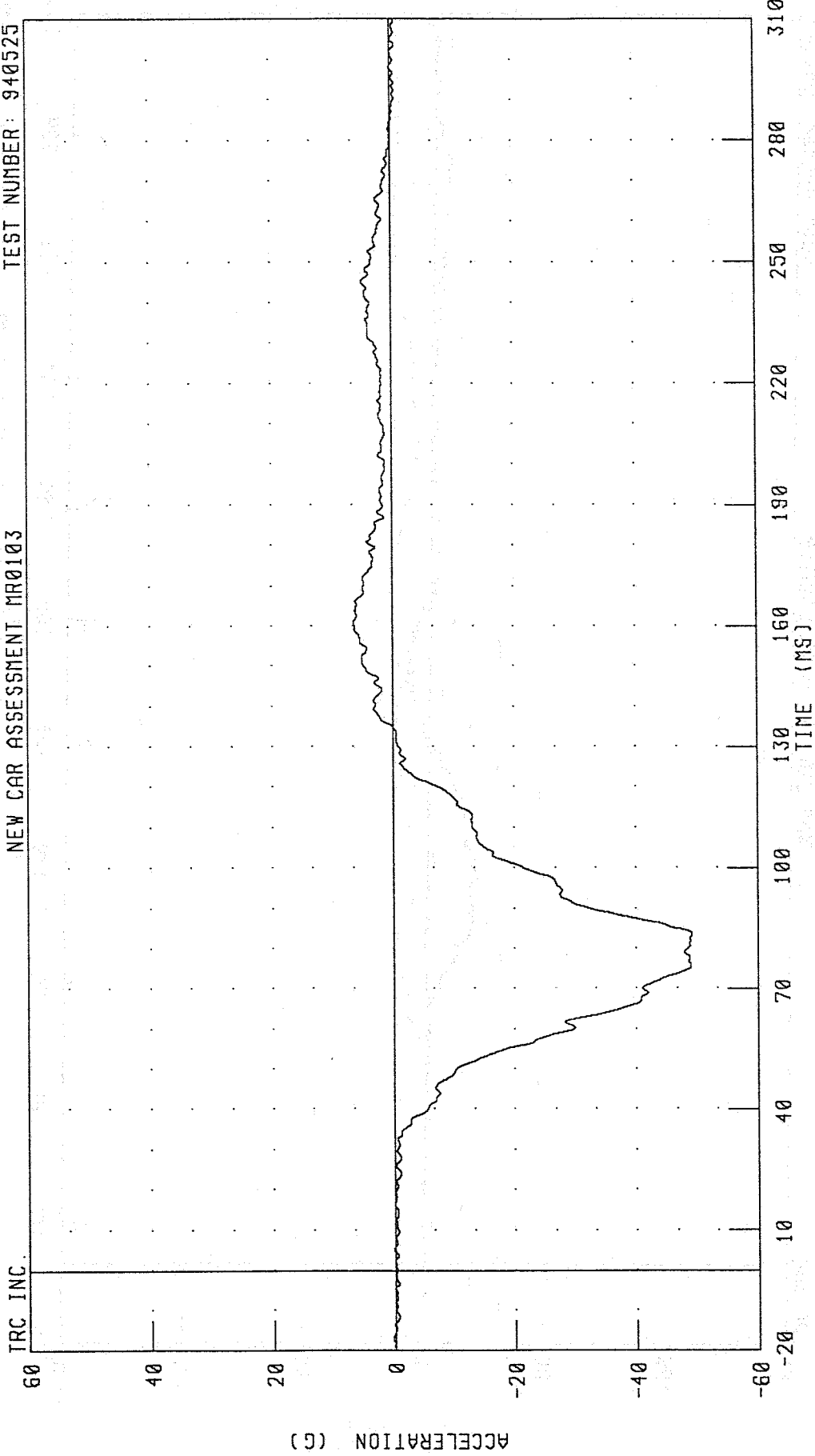
PEAK DATA: 25.24 N-M @ 99.36 MS; -11.81 N-M @ 149.36 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER CHEST X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

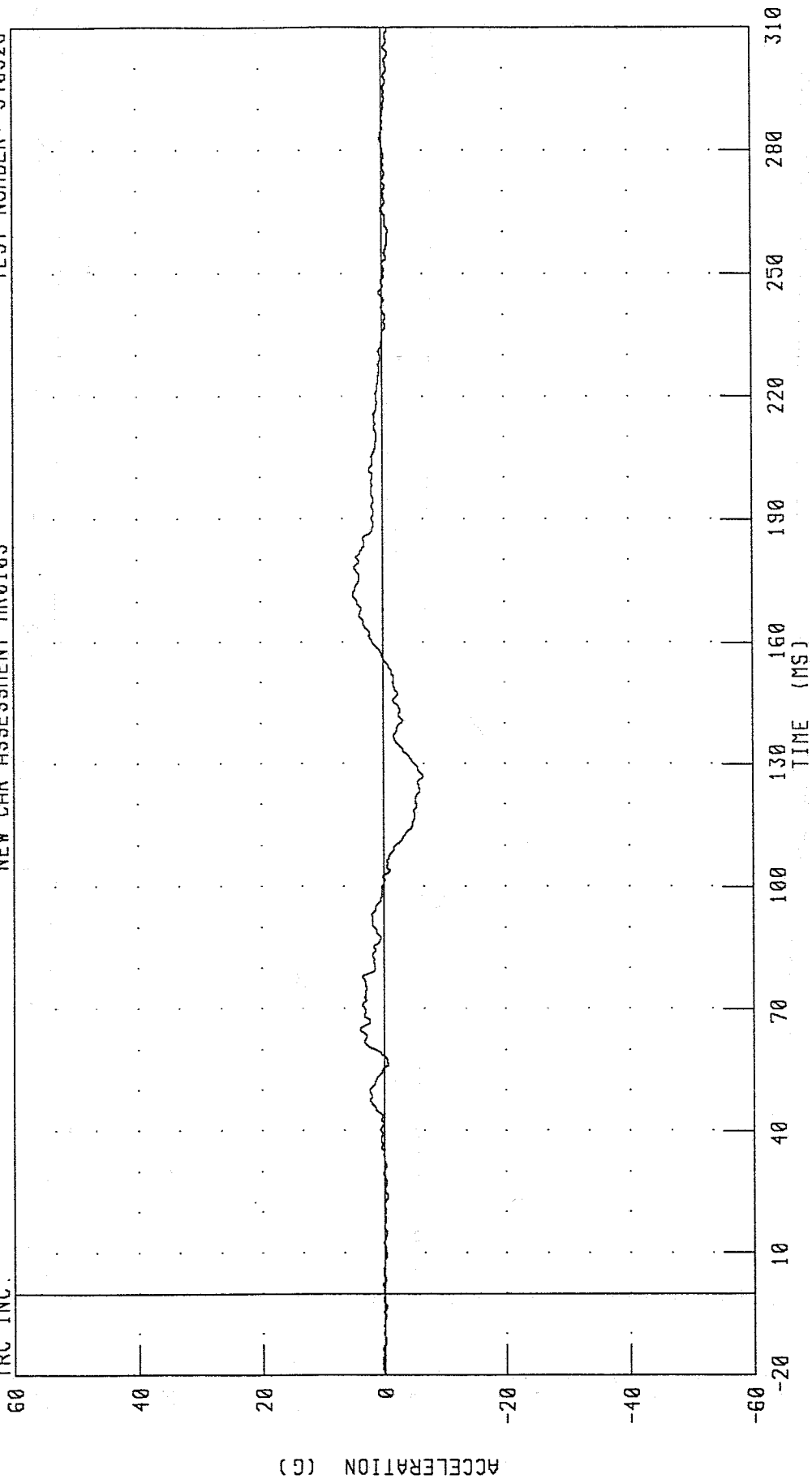


CHANNEL: CSTXG1 FILTER: CH. CLASS 180 PEAK DATA: 6.52 G @ 160.80 MS; -49.16 G @ 83.44 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



PEAK DATA: 4.98 G @ 171.76 MS; -6.50 G @ 126.96 MS

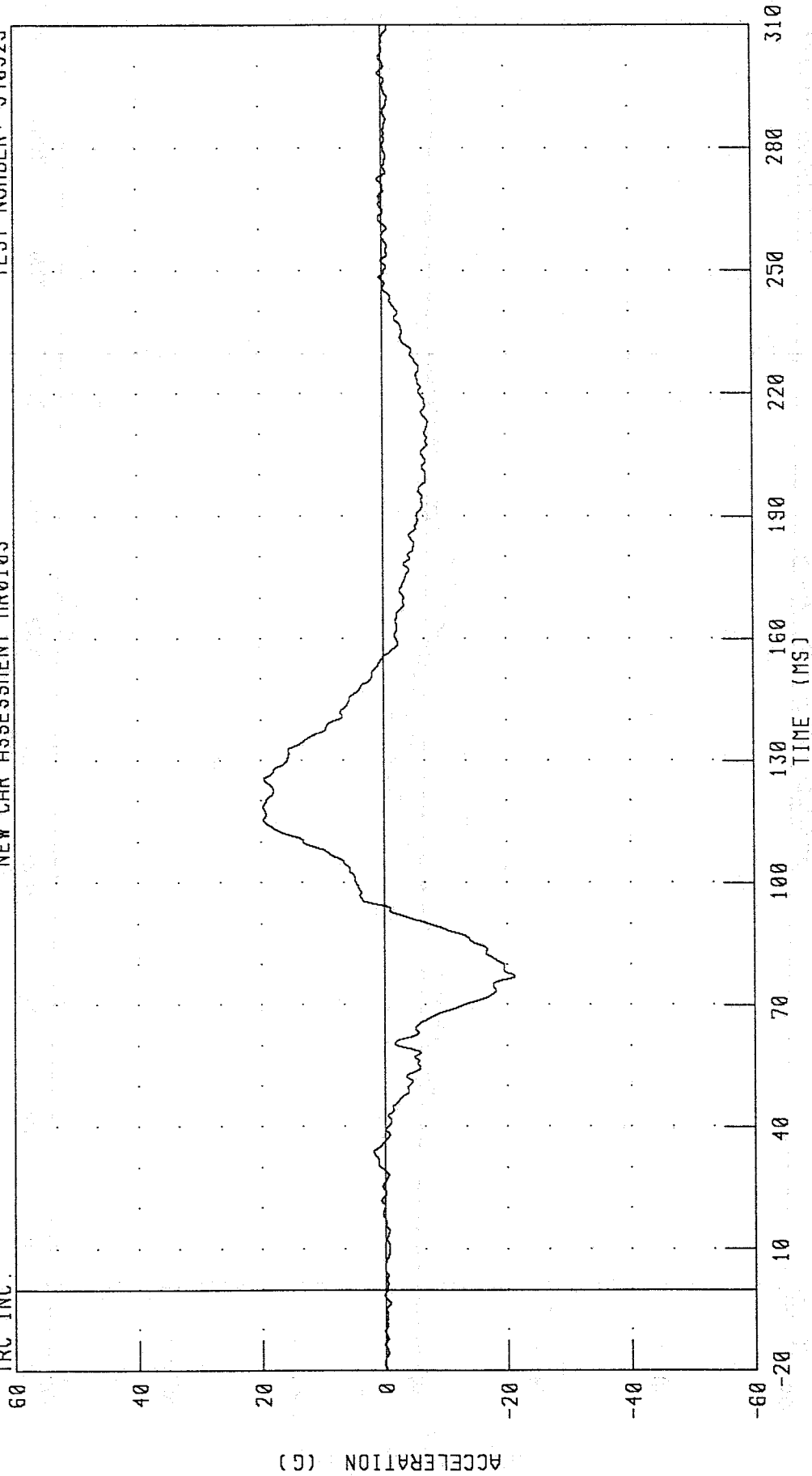
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER CHEST Z-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



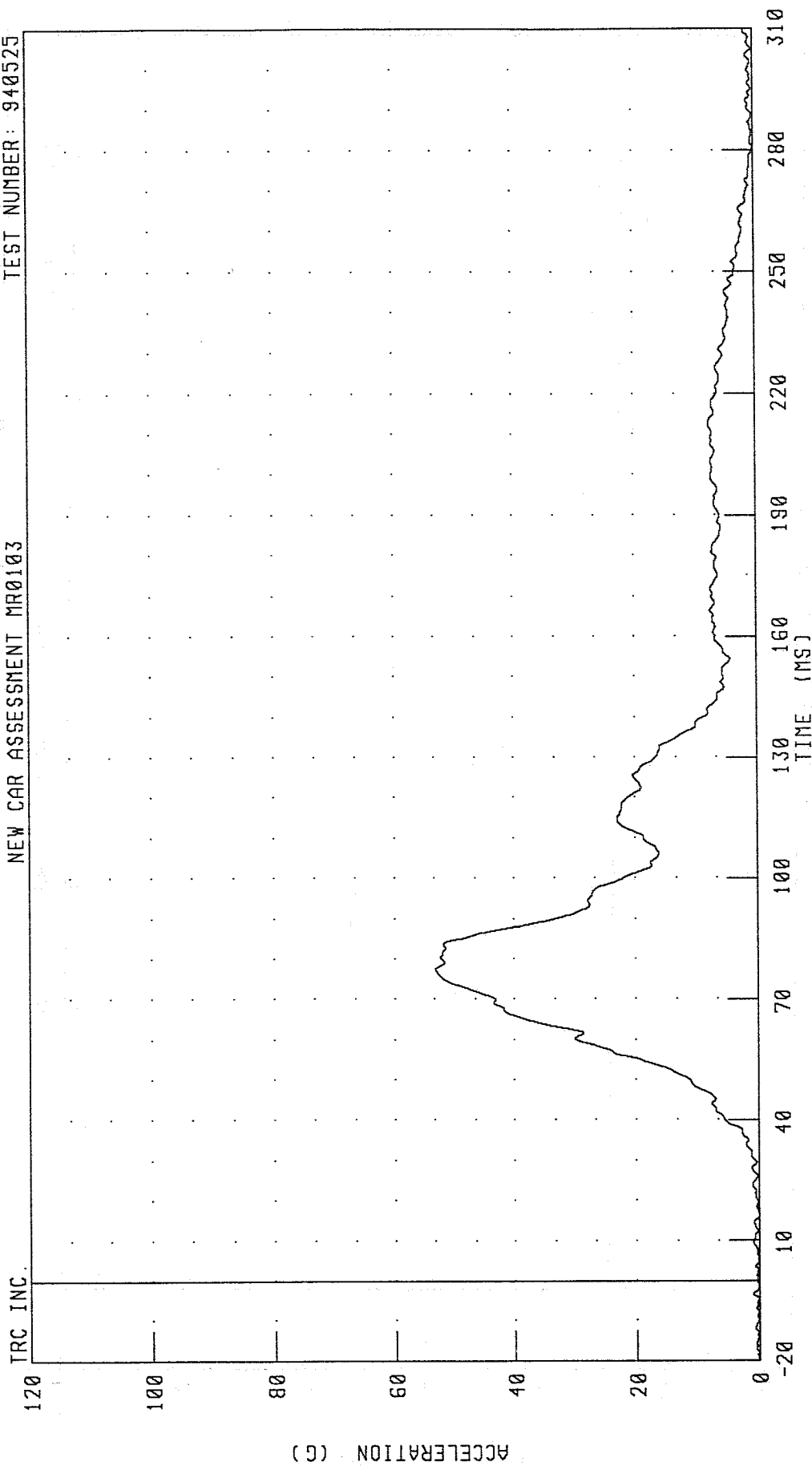
CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 19.69 G @ 118.64 MS; -21.22 G @ 77.20 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

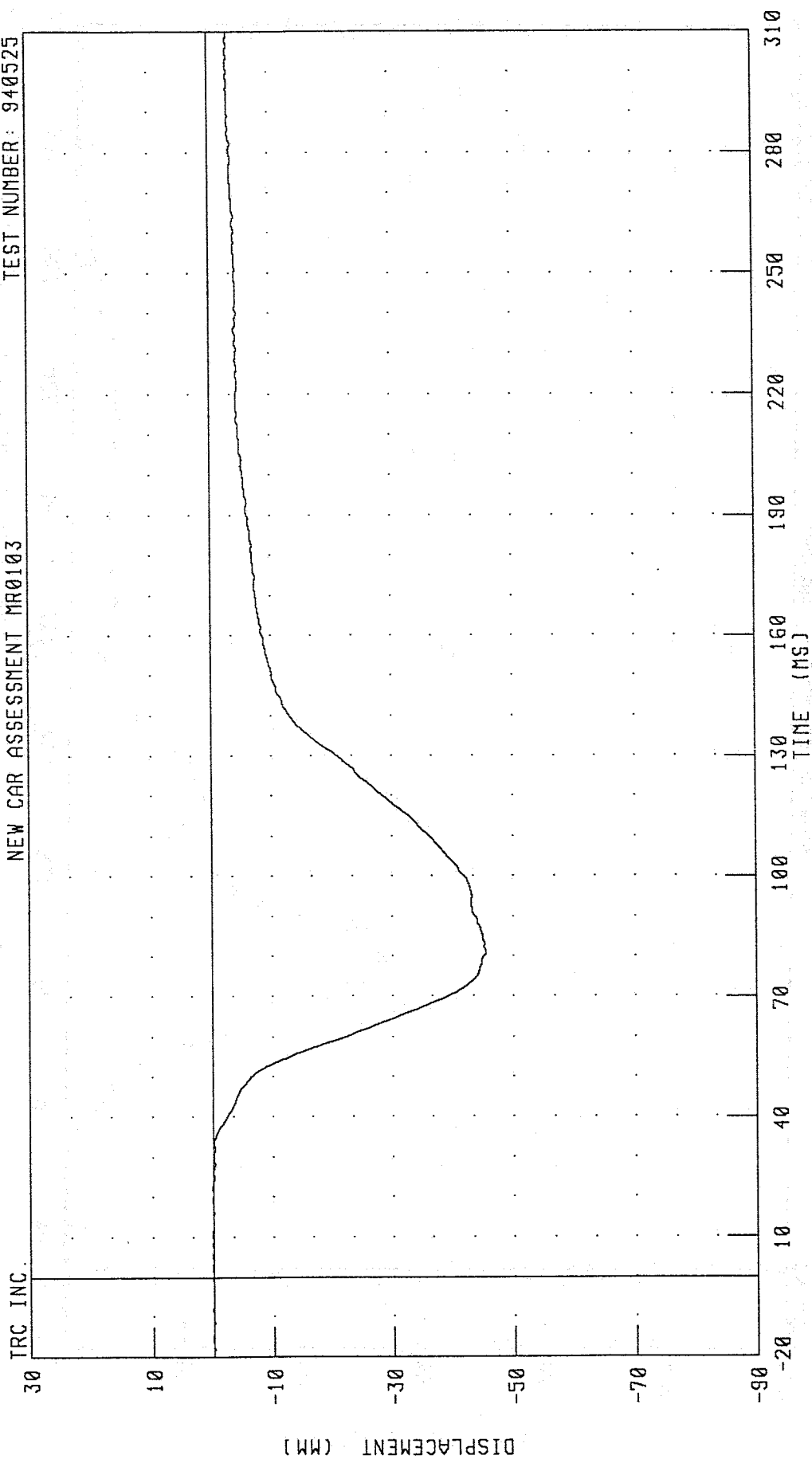
PEAK DATA: 53.23 G @ 77.28 MS; 0.05 G @ -20.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER CHEST DEFLECTION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: CSTXD1 FILTER: CH. CLASS 180

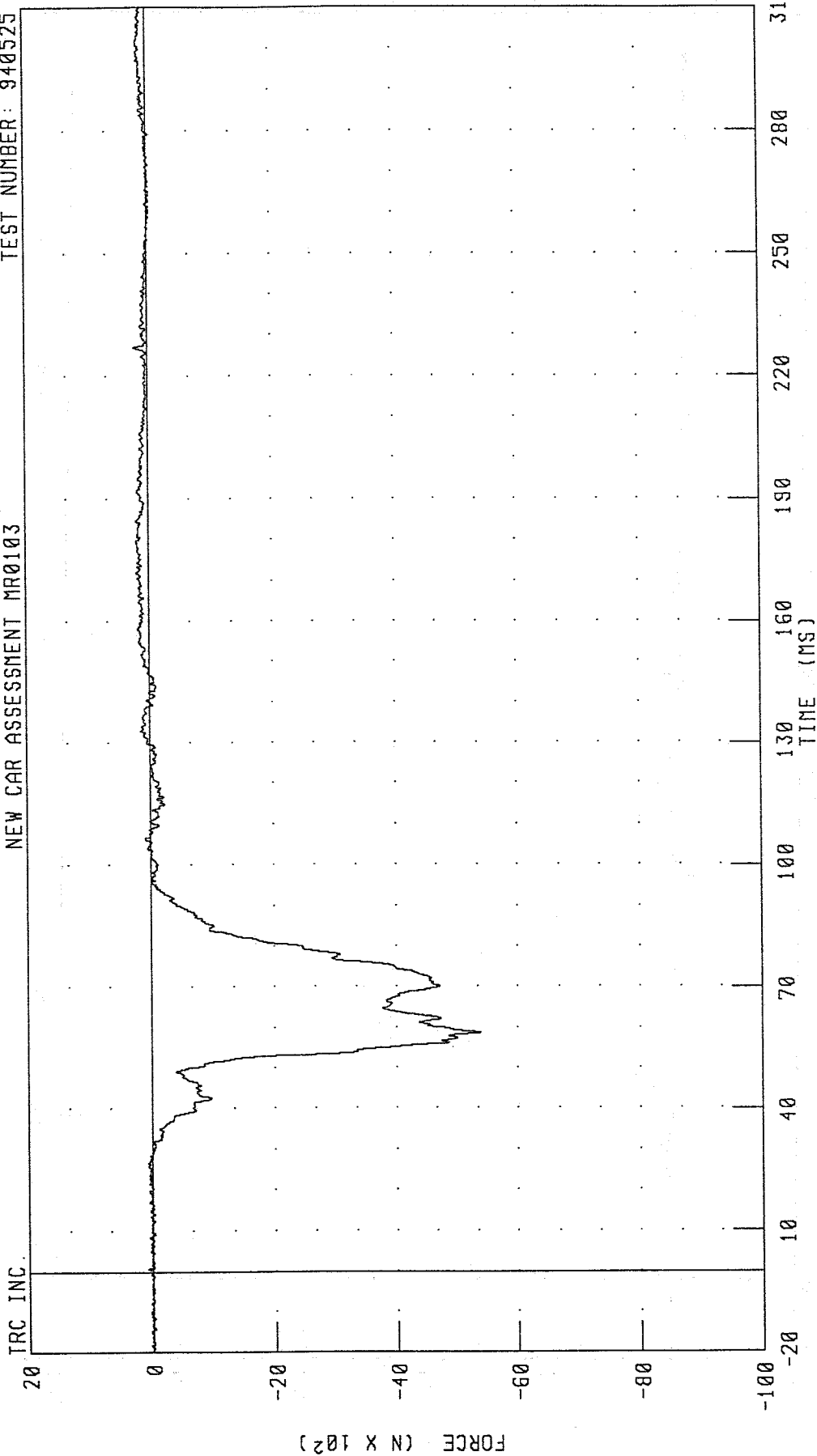
PEAK DATA: 0.20 MM @ 19.36 MS; -45.46 MM @ 80.88 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER LEFT FEMUR FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 218.29 N @ 227.04 MS; -5386.47 N @ 58.72 MS

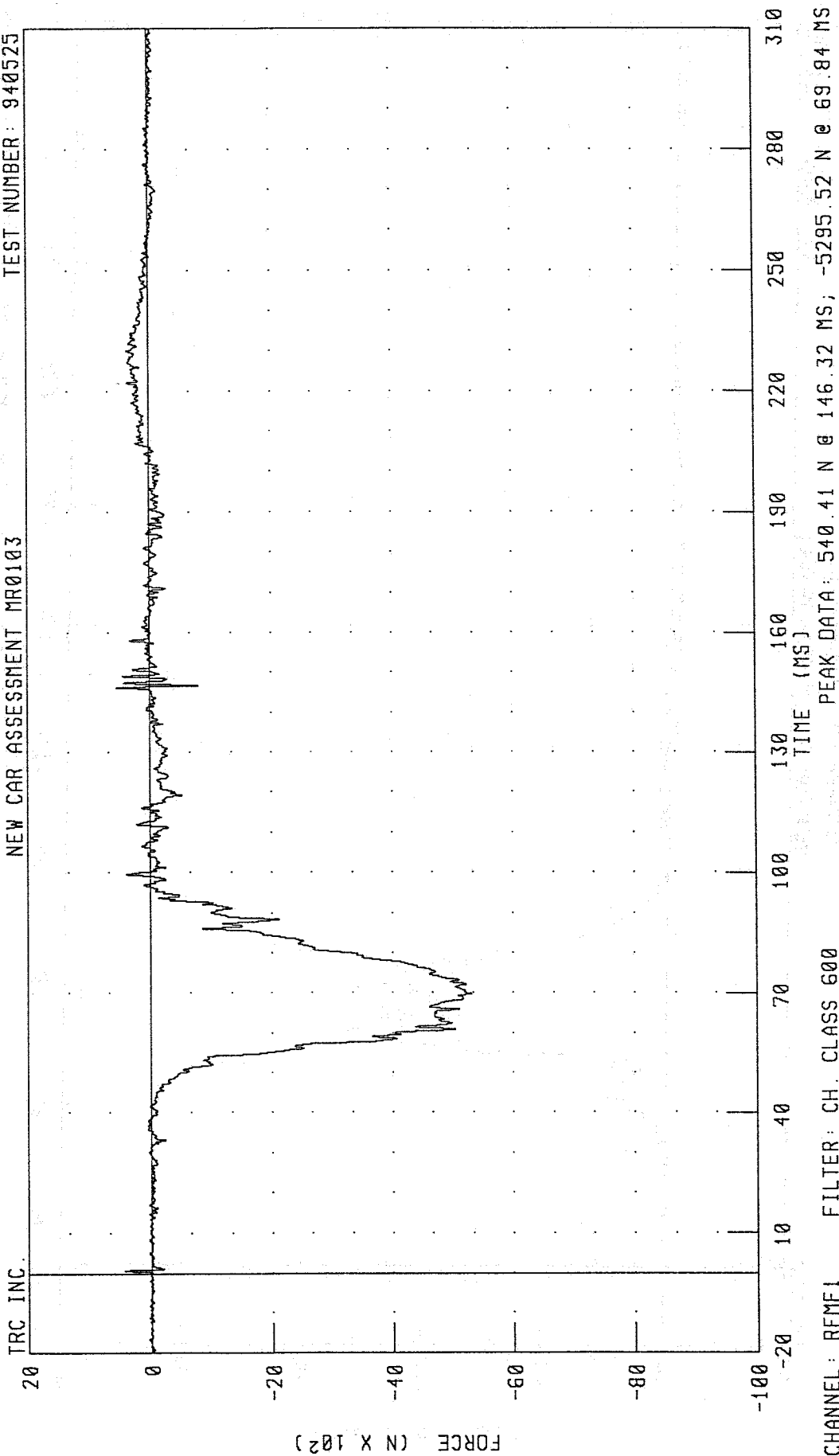
CHANNEL: LFMF1 FILTER: CH. CLASS 600

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER RIGHT FEMUR FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



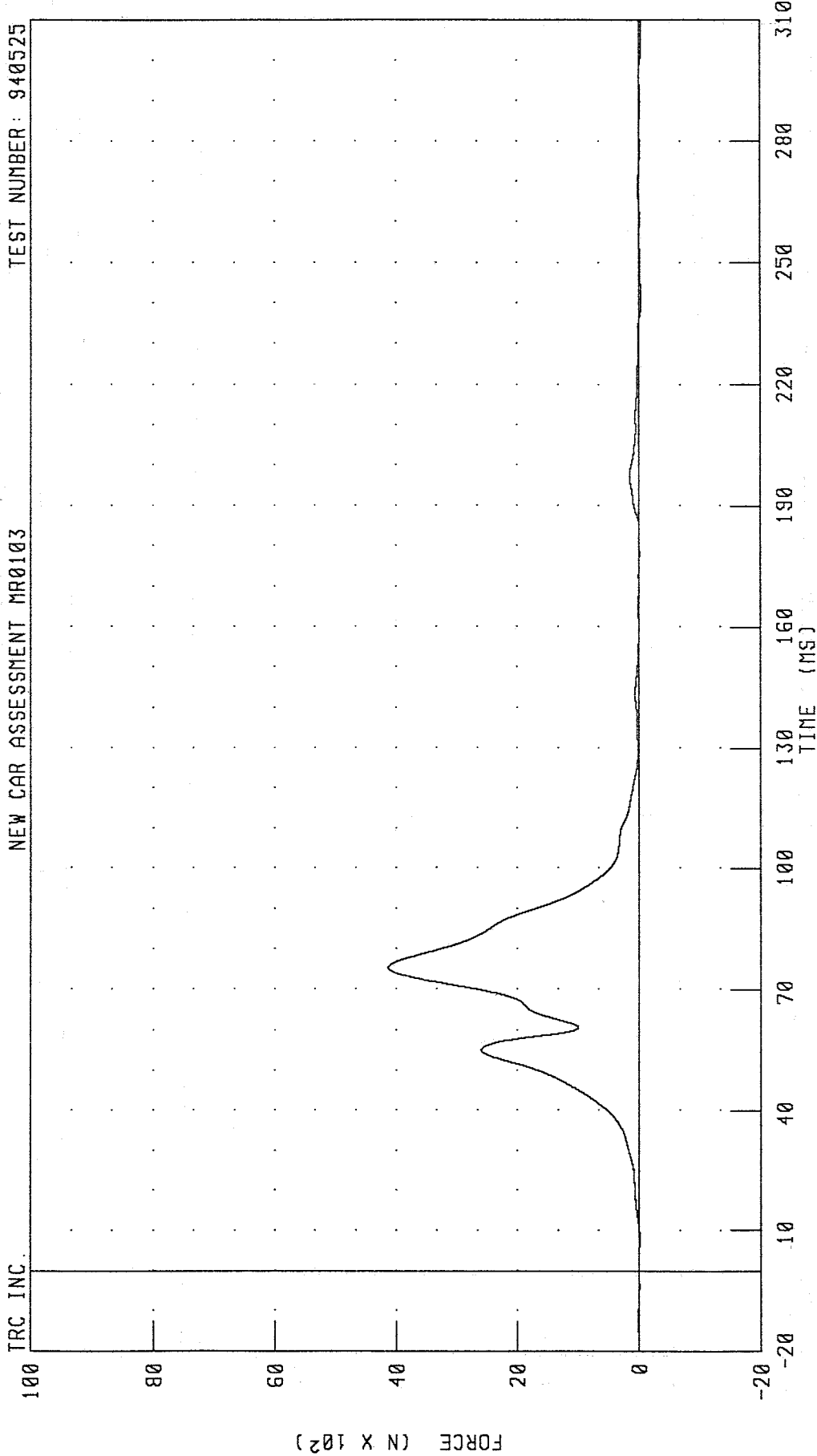
CHANNEL: RFMFI FILTER: CH. CLASS 600

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER LAP BELT OUTBOARD FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: LBOFI FILTER: CH. CLASS 60

PEAK DATA: 4130.68 N @ 75.36 MS; -37.09 N @ 240.80 MS

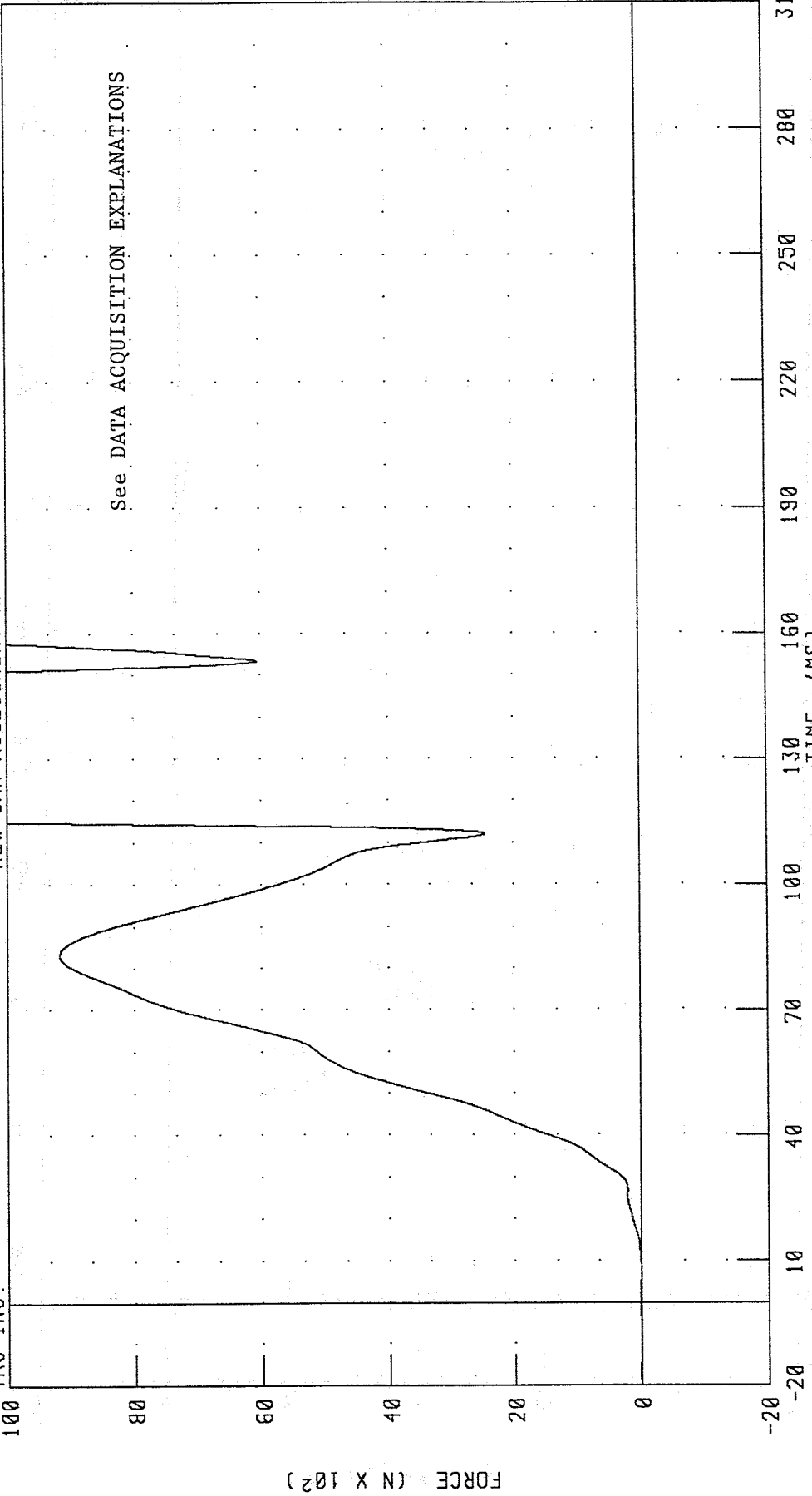
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER SHOULDER BELT FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.

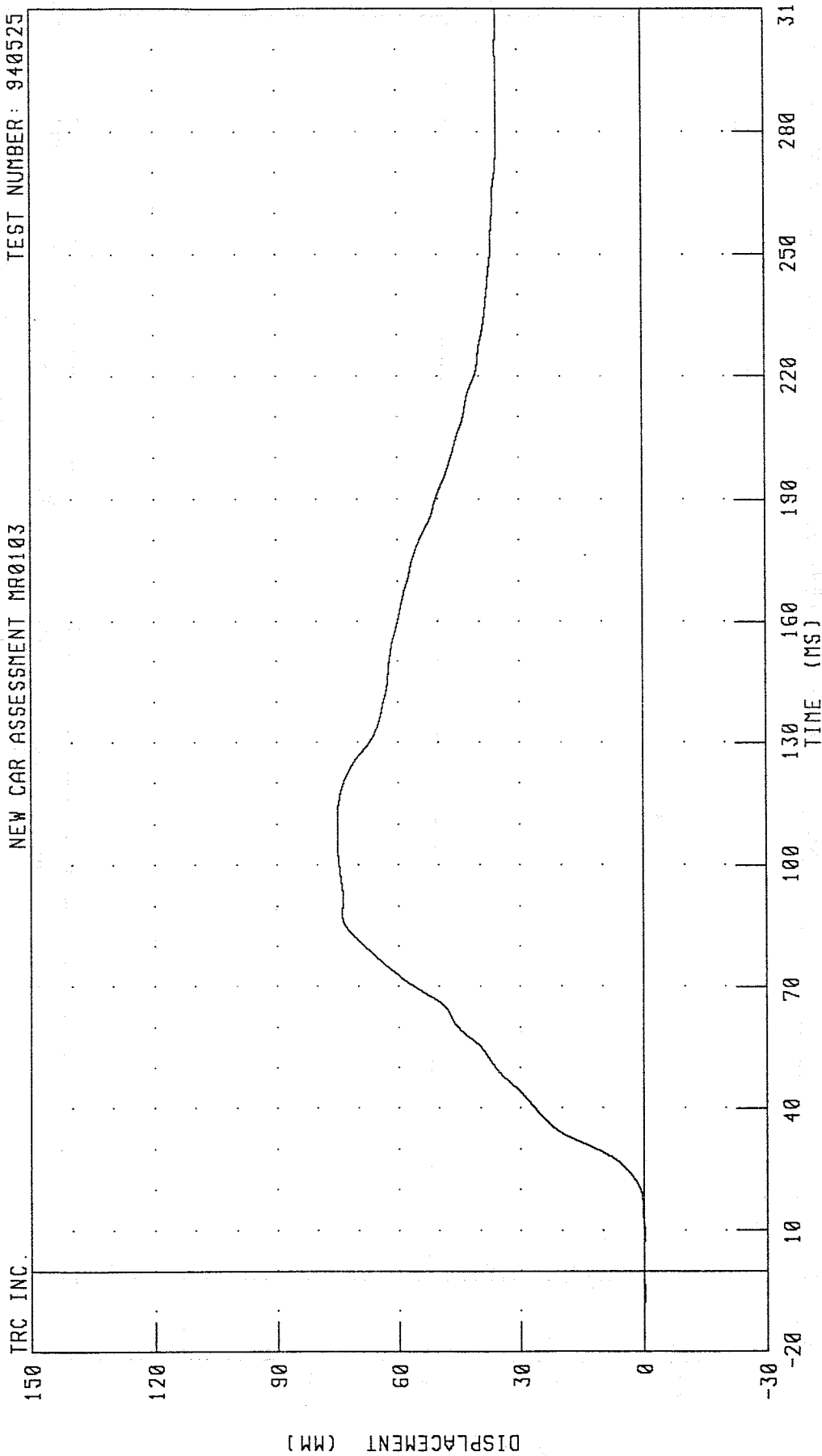


CHANNEL: SHBFI FILTER: CH. CLASS 60

PEAK DATA: 18699.49 N @ 168.24 MS; 4.59 N @ -20.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: SHBD1 FILTER: CH. CLASS 60 PEAK DATA: 74.95 MM @ 106.56 MS; -0.14 MM @ -5.60 MS

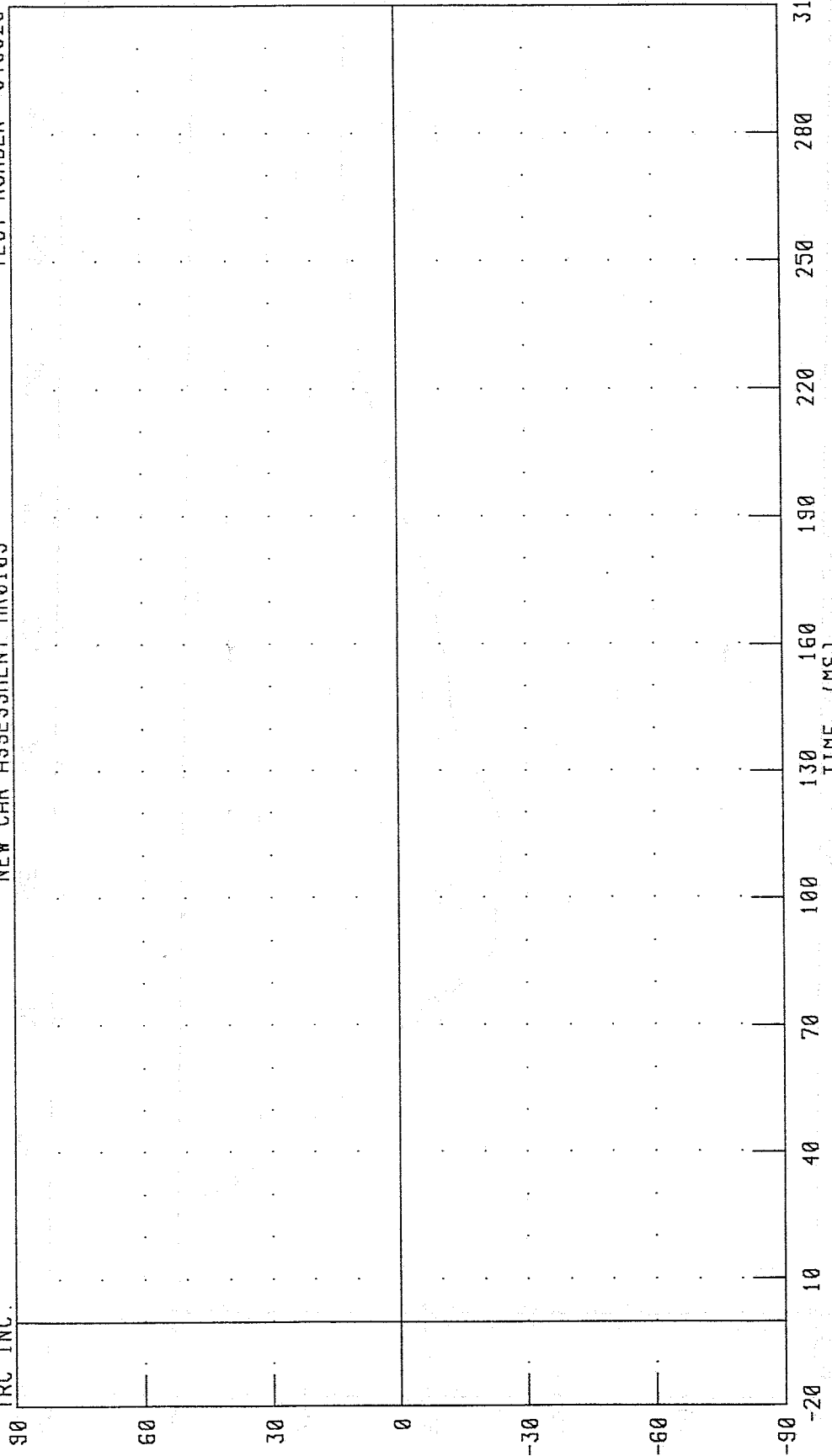
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

DRIVER SEAT BELT EXTENSION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: SBED1

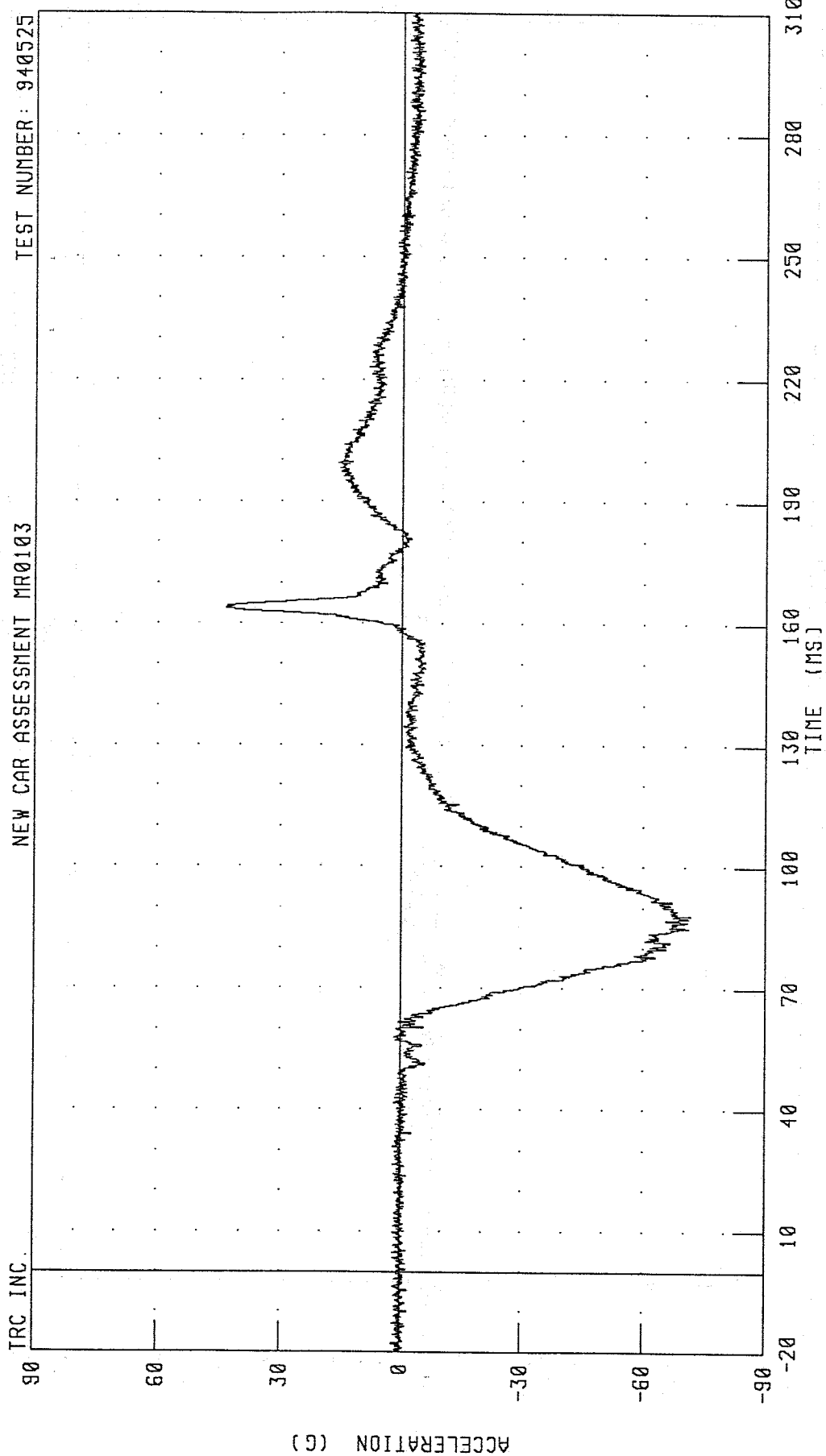
FILTER: CH. CLASS 60

PEAK DATA: 0.01 MM @ 33.92 MS, -0.01 MM @ 76.24 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



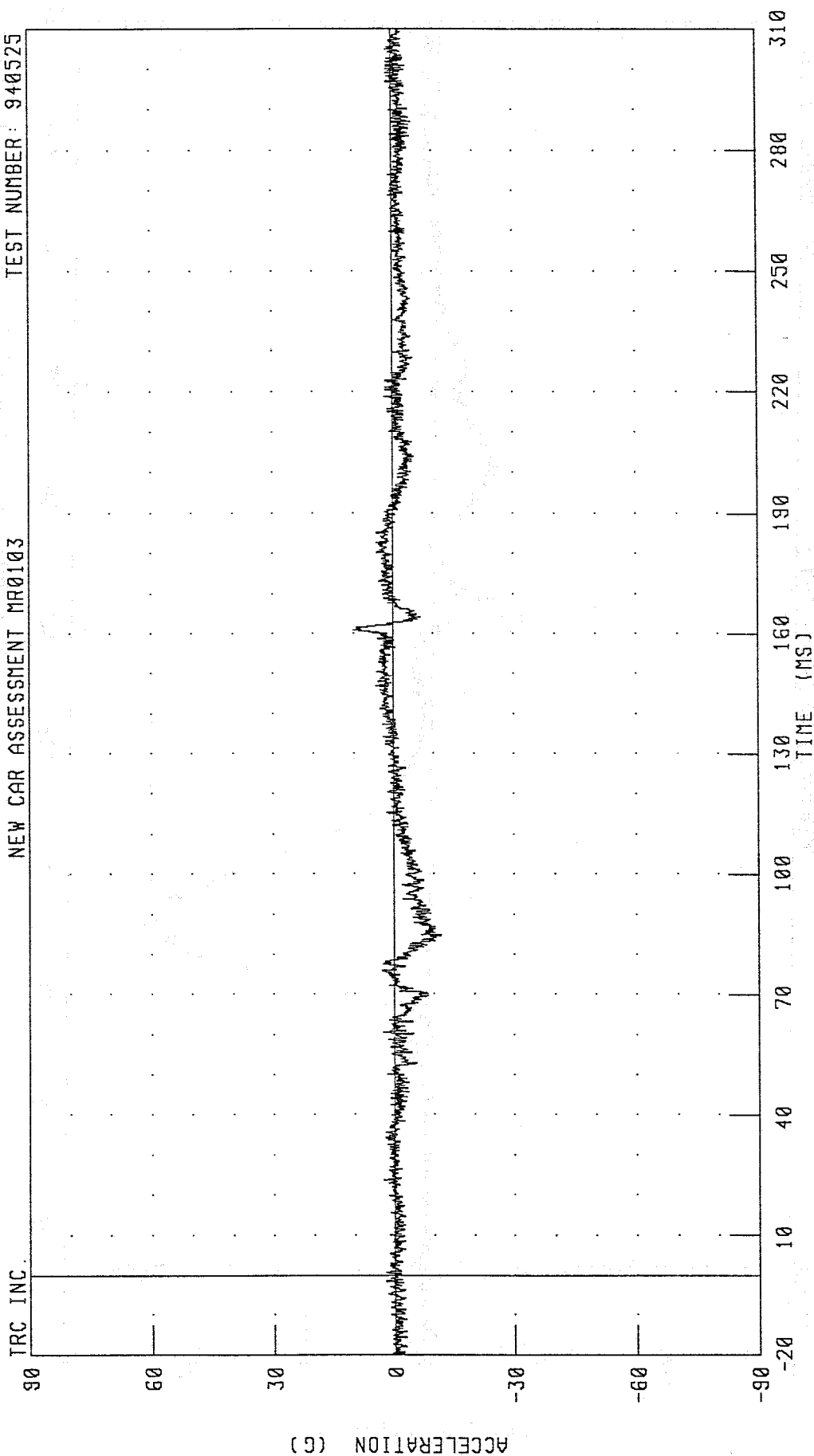
CHANNEL: HEDXG2 FILTER: CH. CLASS 1000
PEAK DATA: 43.43 G @ 163.84 MS; -71.64 G @ 88.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER HEAD Y-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

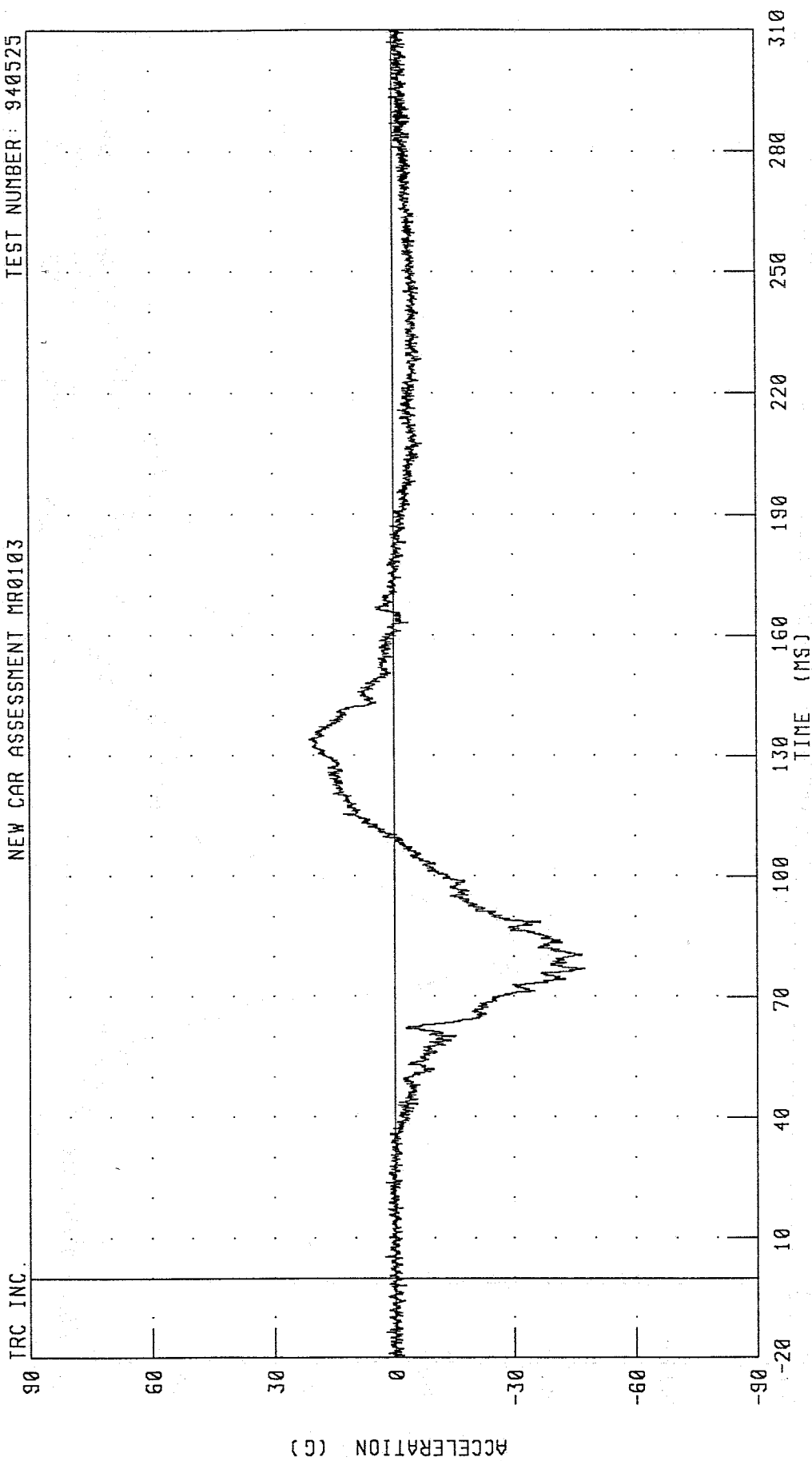
PEAK DATA: 9.99 G @ 160.96 MS; -11.72 G @ 84.80 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER HEAD Z-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

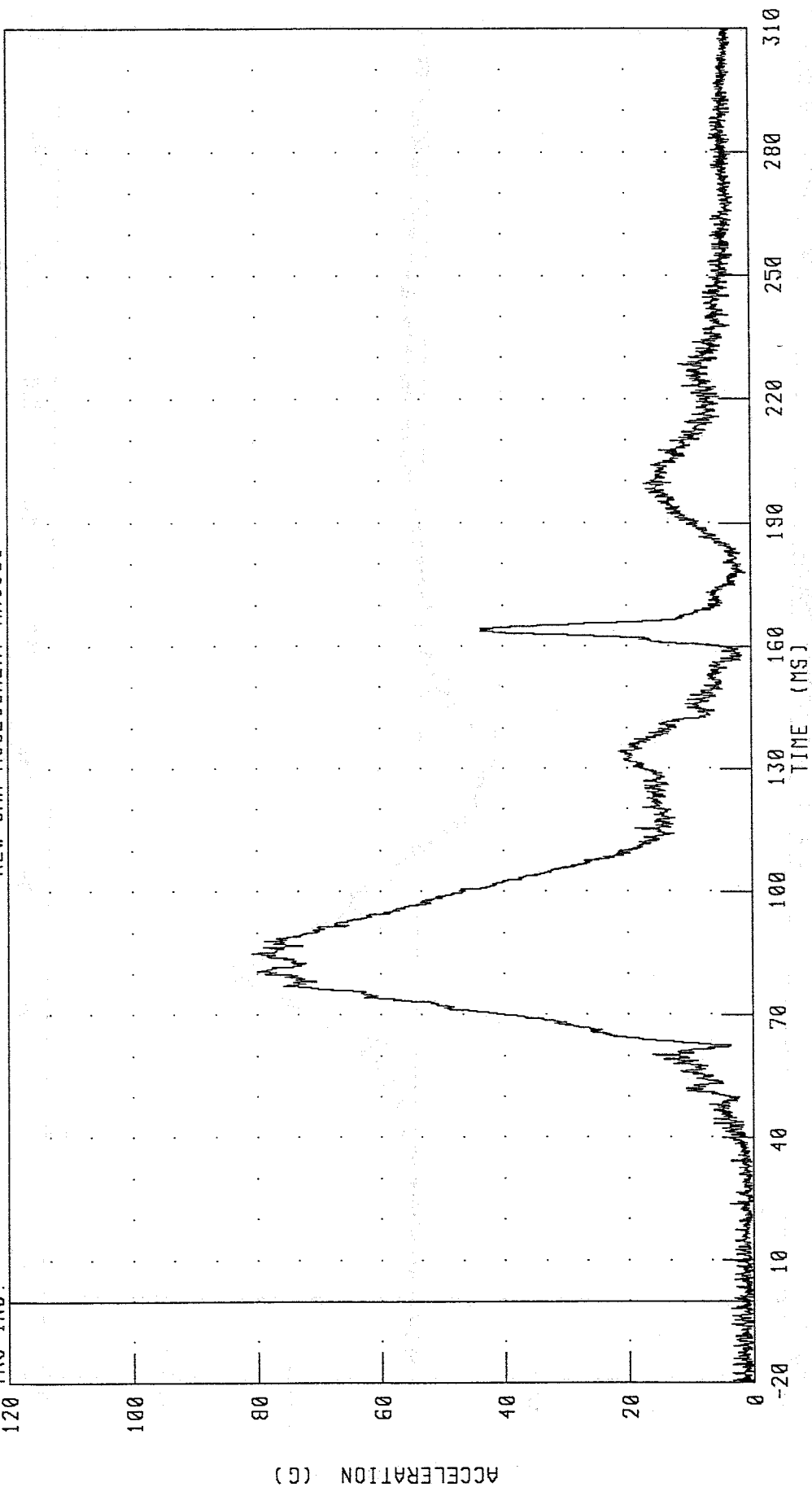
PEAK DATA: 20.98 G @ 134.00 MS; -47.40 G @ 77.12 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION

TRC INC.

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



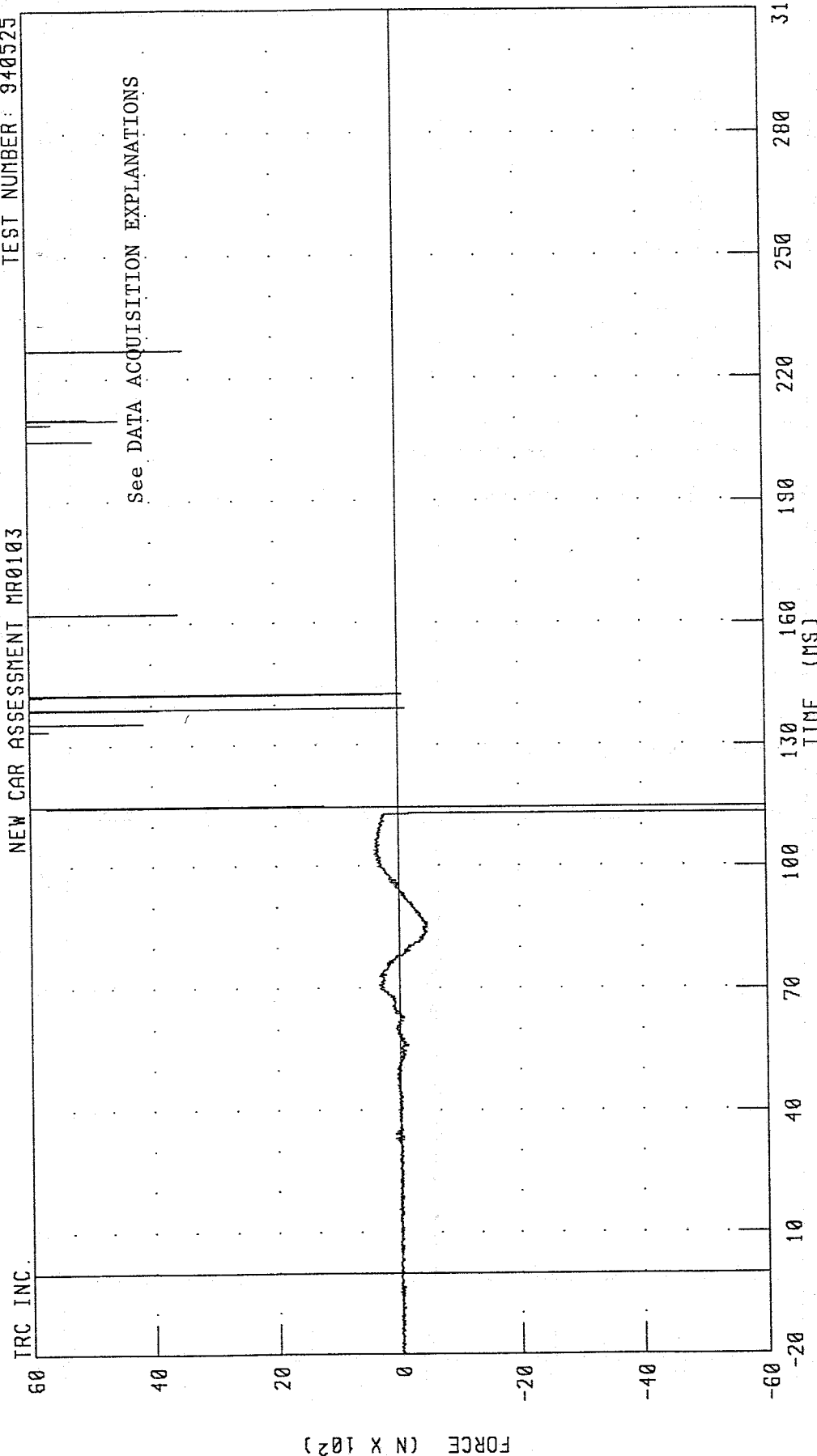
CHANNEL: HEDRC2 FILTER: CH. CLASS 1000

PEAK DATA: 80.83 G @ 85.04 MS; 0.09 G @ -3.12 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



PEAK DATA: 9356.38 N @ 310.00 MS, -9309.88 N @ 113.20 MS

CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

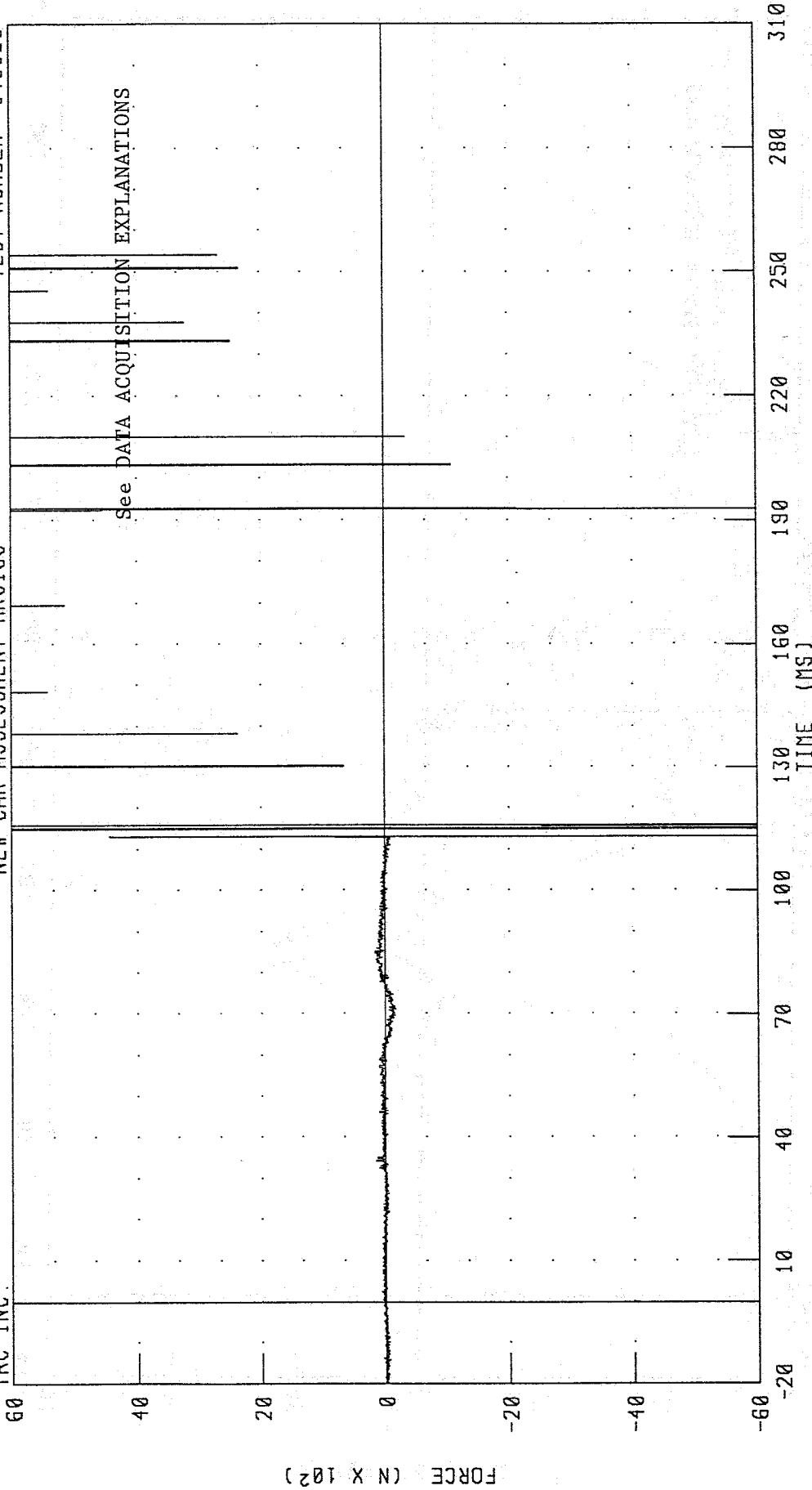
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER NECK Y-AXIS SHEAR FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

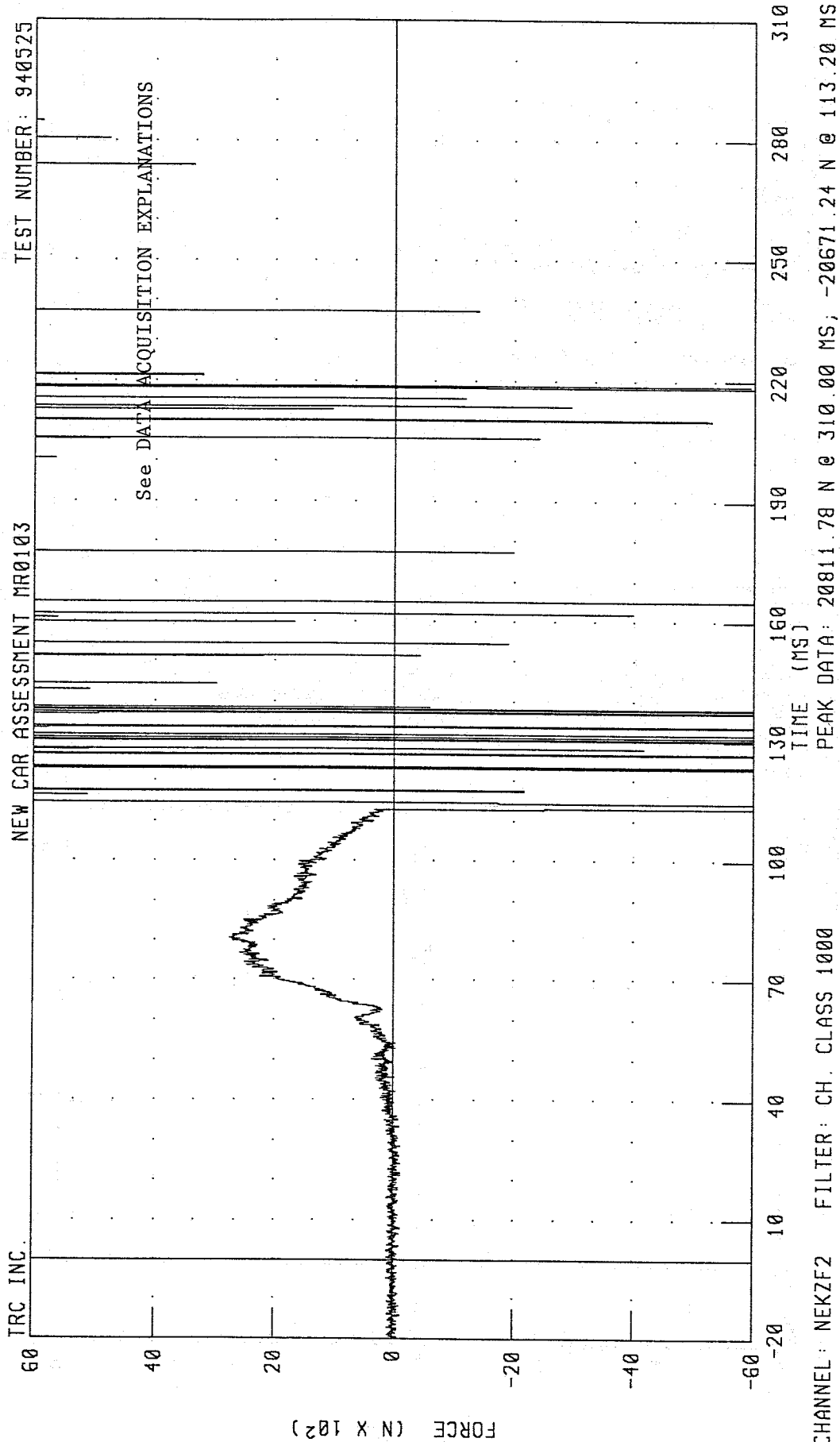
TRC INC.



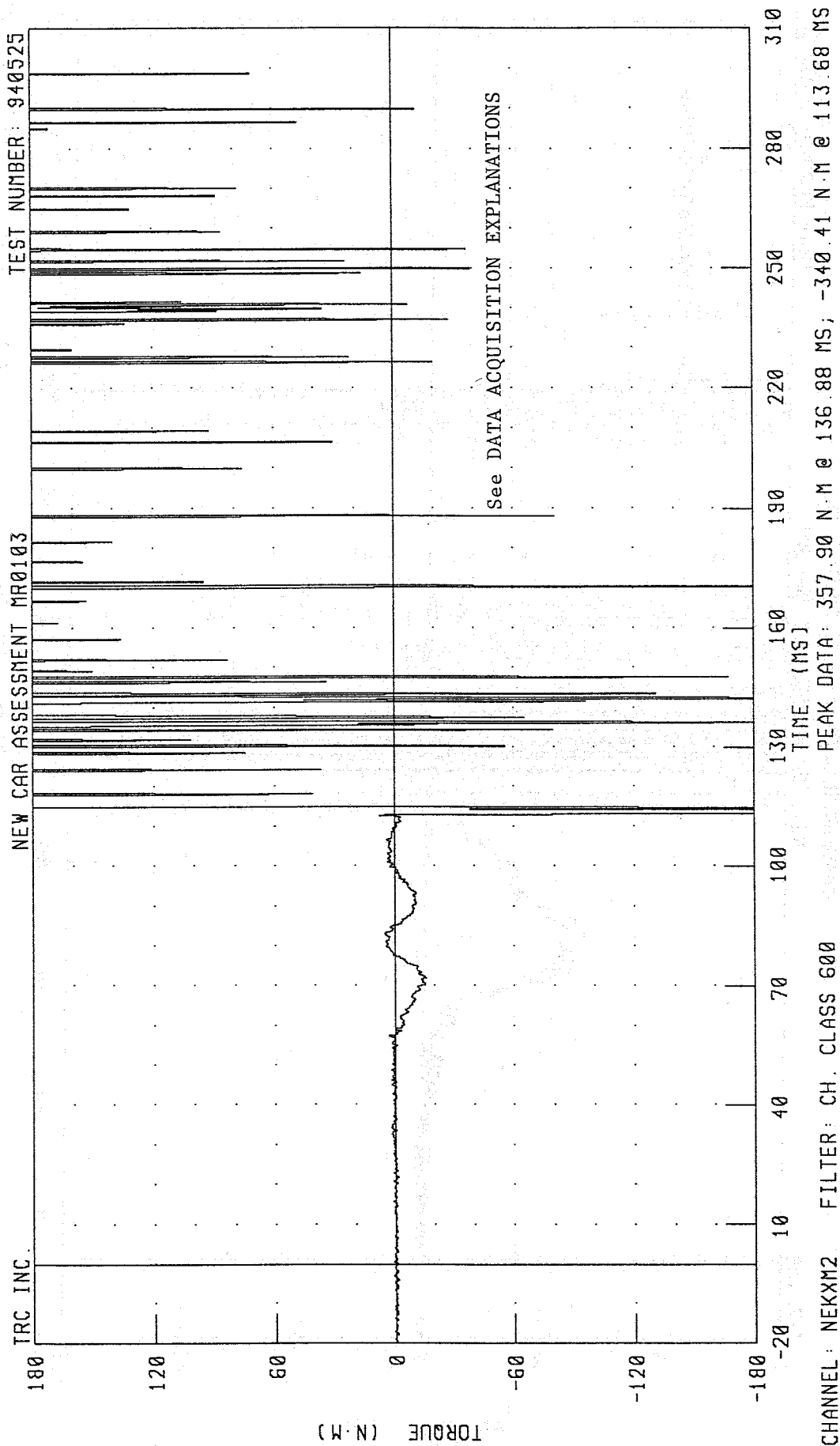
CHANNEL: NEKYF2 FILTER: CH CLASS 1000

PEAK DATA: 9895.31 N @ 310.00 MS; -9873.08 N @ 113.28 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE



1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS

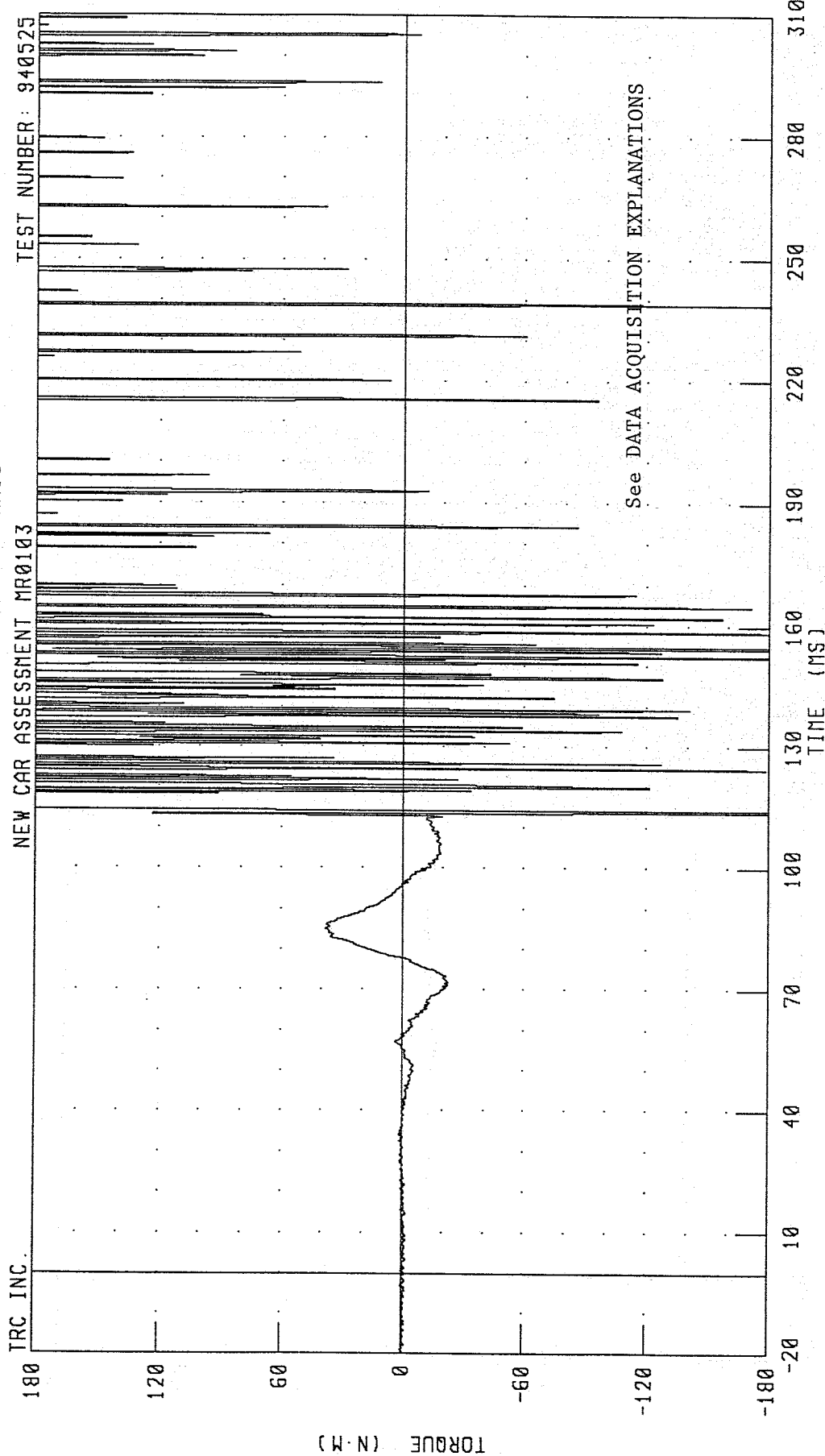


1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER NECK MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

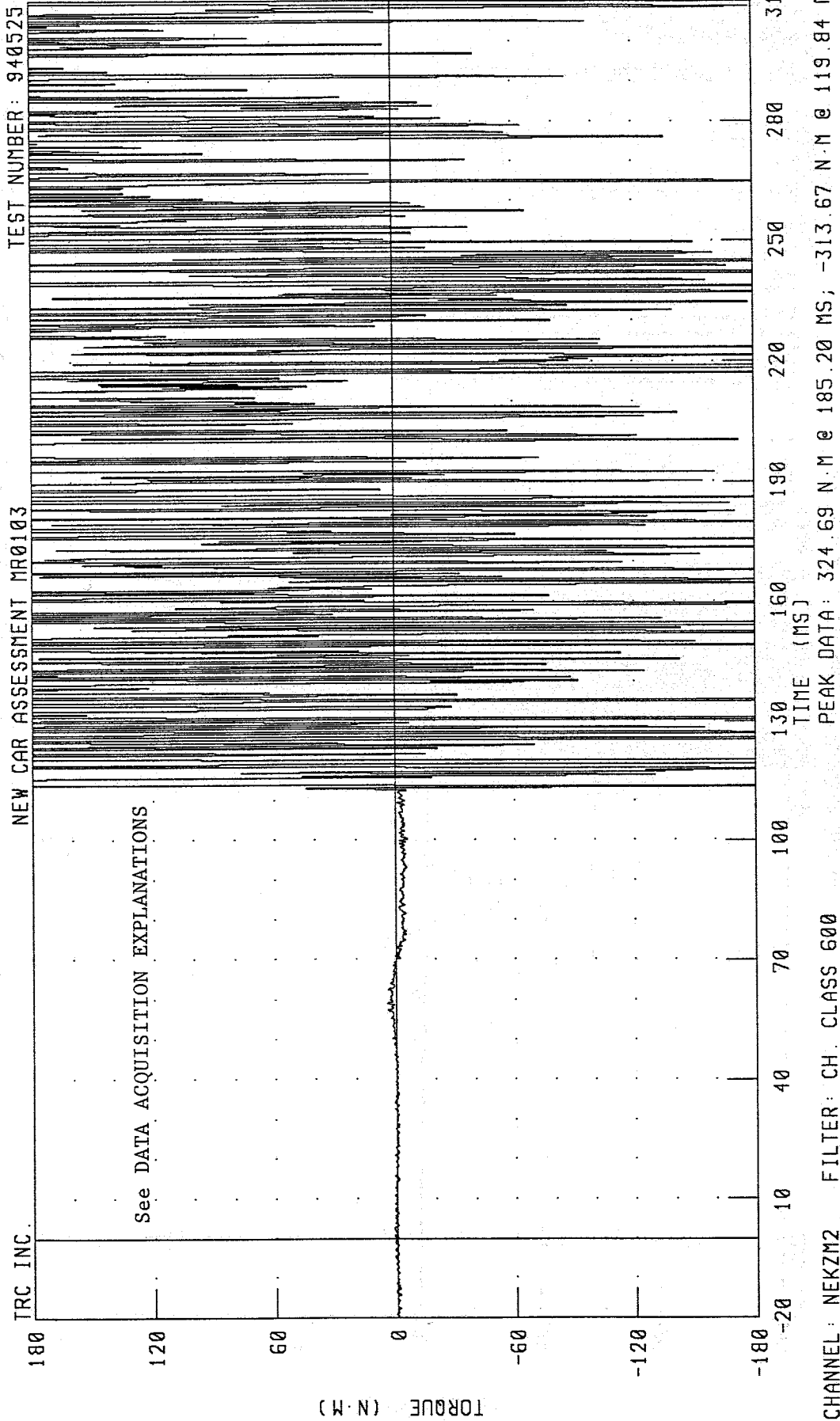


See DATA ACQUISITION EXPLANATIONS

CHANNEL: NEKYM2 FILTER: CH. CLASS 600

PEAK DATA: 339.74 N-M @ 157.84 MS; -273.42 N-M @ 154.64 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS



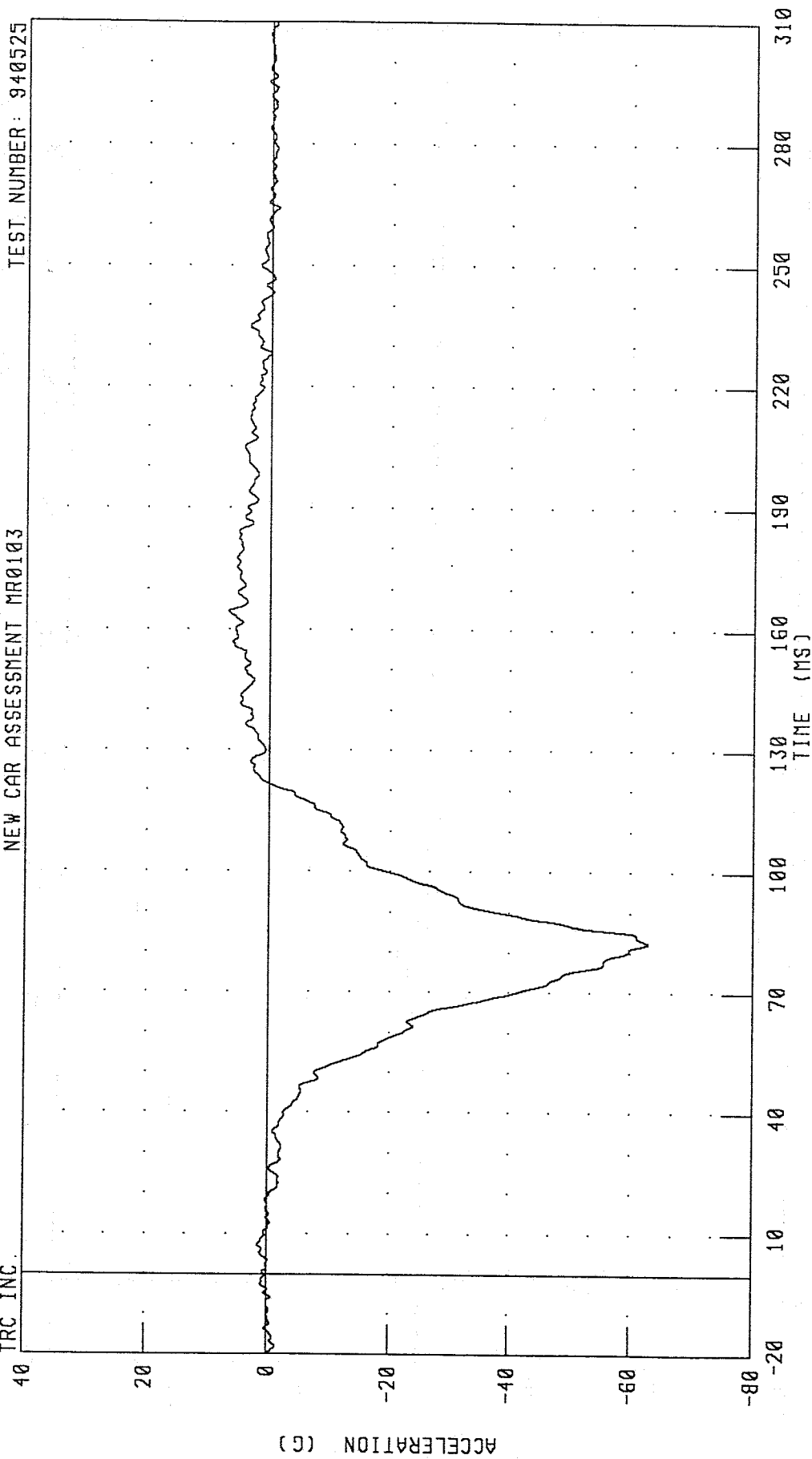
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER CHEST X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: CSTXG2 FILTER: CH. CLASS 180

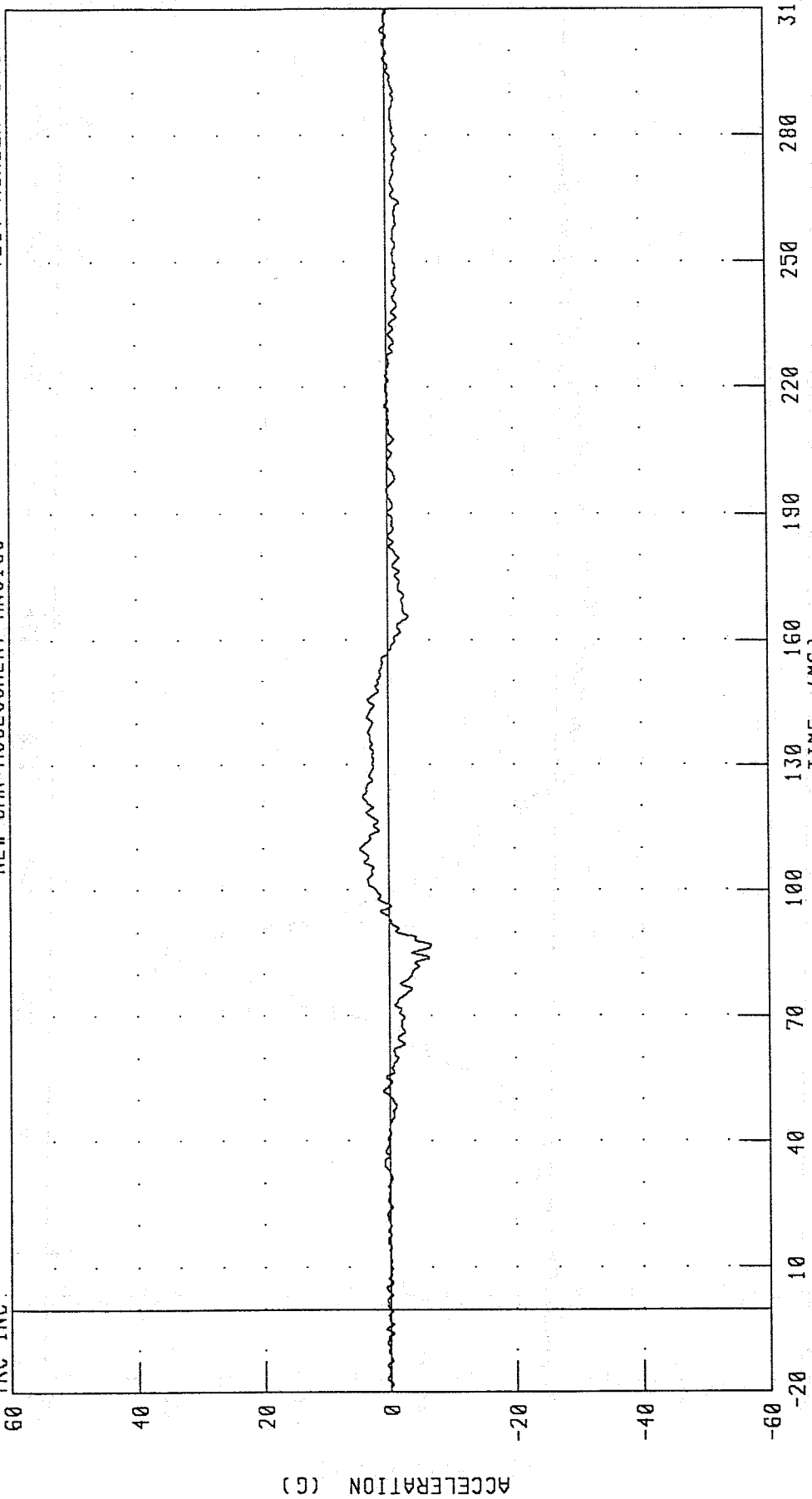
PEAK DATA: 6.69 G @ 164.48 MS; -62.88 G @ 82.40 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103

TRC INC.



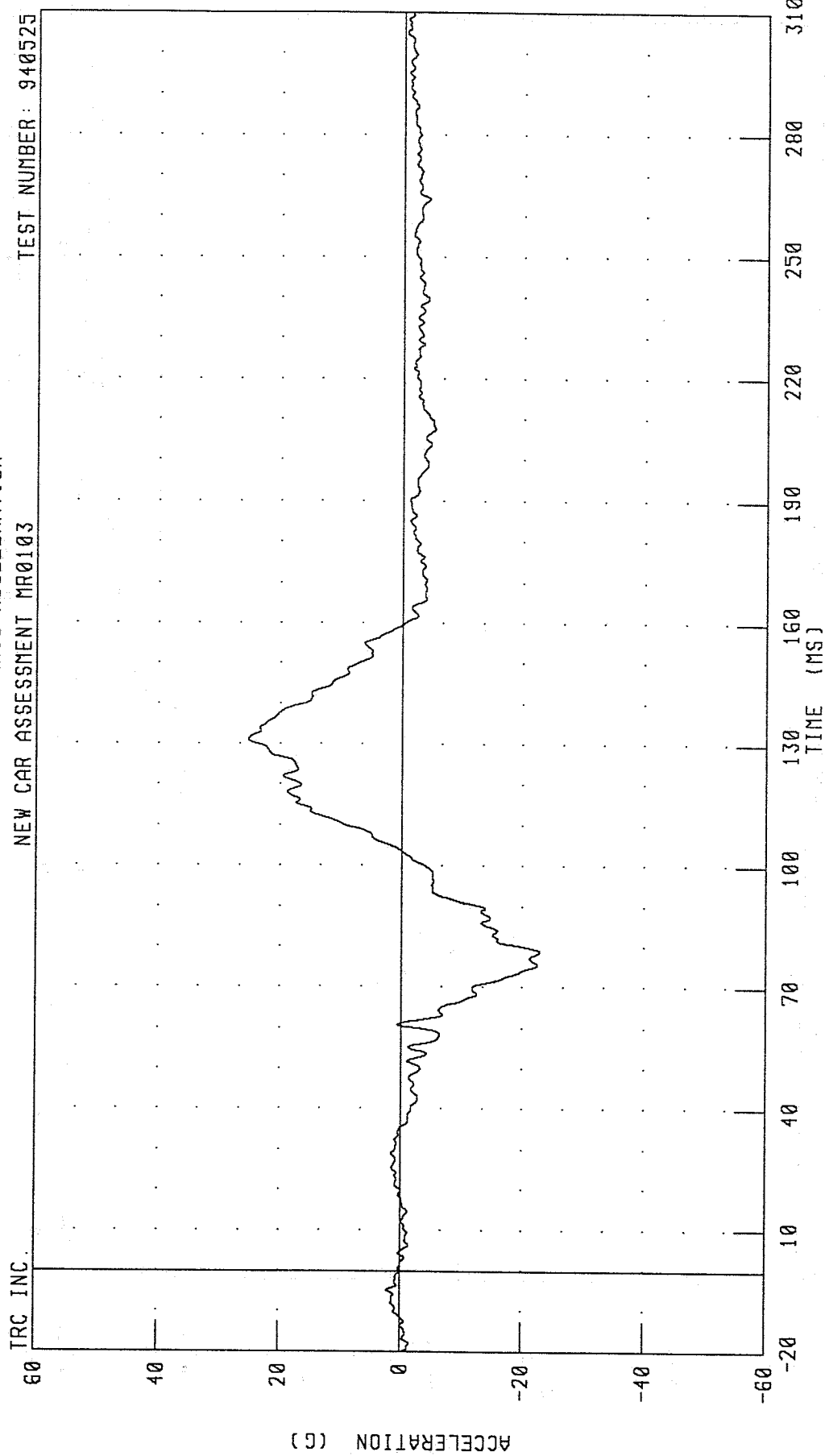
CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 4.63 G @ 109.84 MS; -6.63 G @ 86.96 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

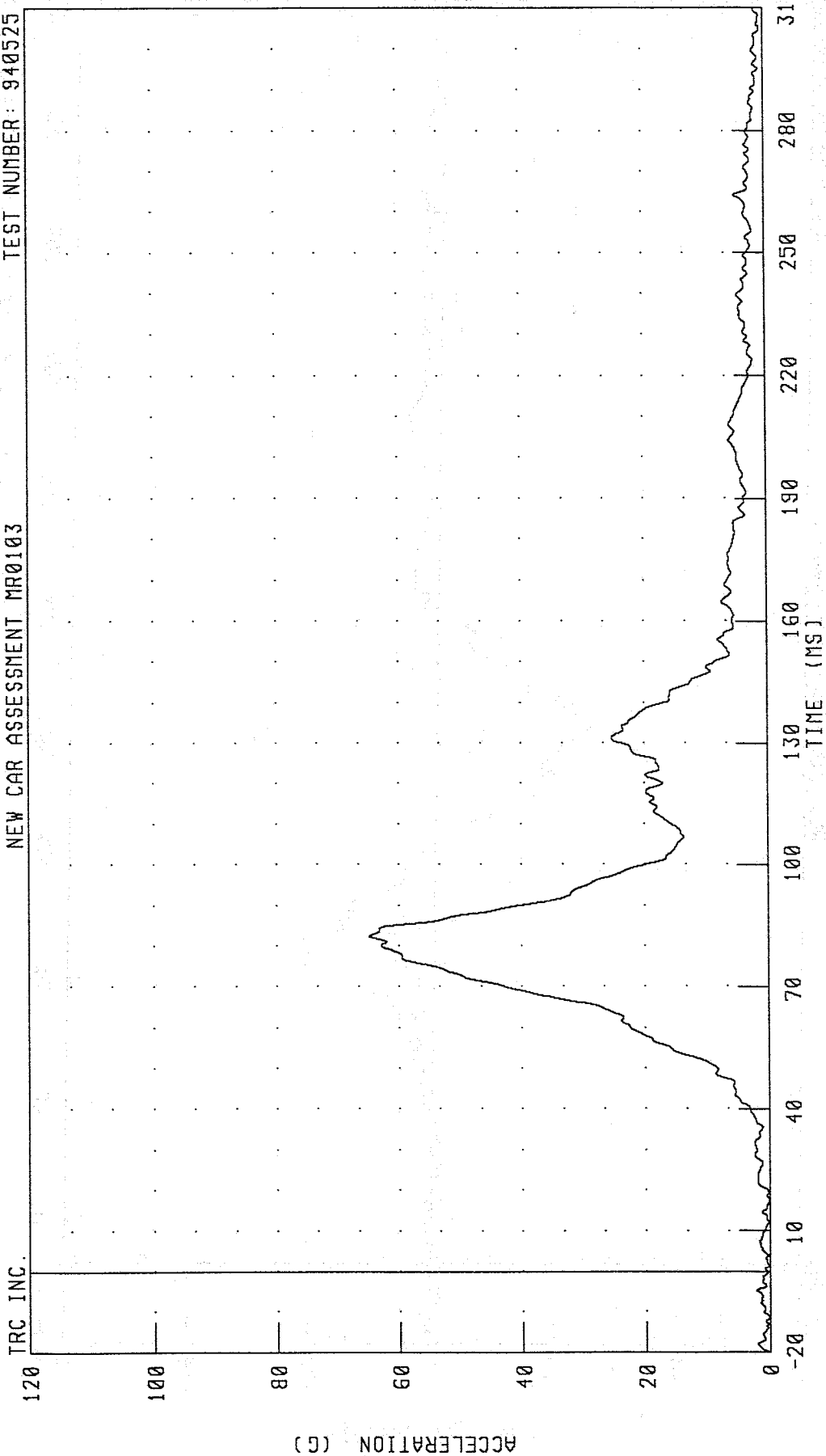
TEST NUMBER: 940525



CHANNEL: CSTZG2 FILTER: CH. CLASS 180

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 64.91 G @ 82.32 MS; 0.07 G @ -20.00 MS

CHANNEL: CSTRG2 FILTER: CH. CLASS 180

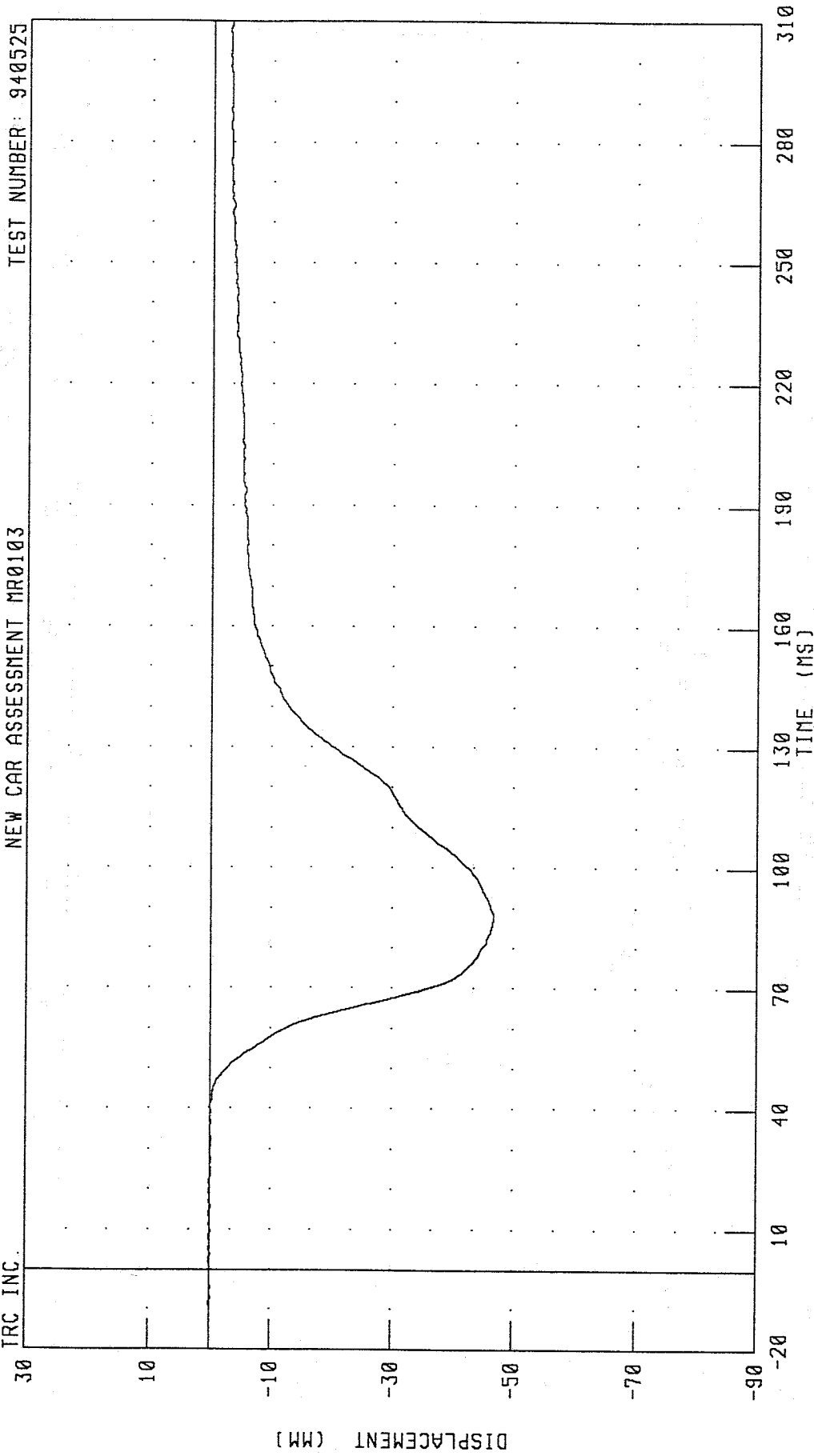
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER CHEST DEFLECTION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: CSTXD2 FILTER: CH. CLASS 180

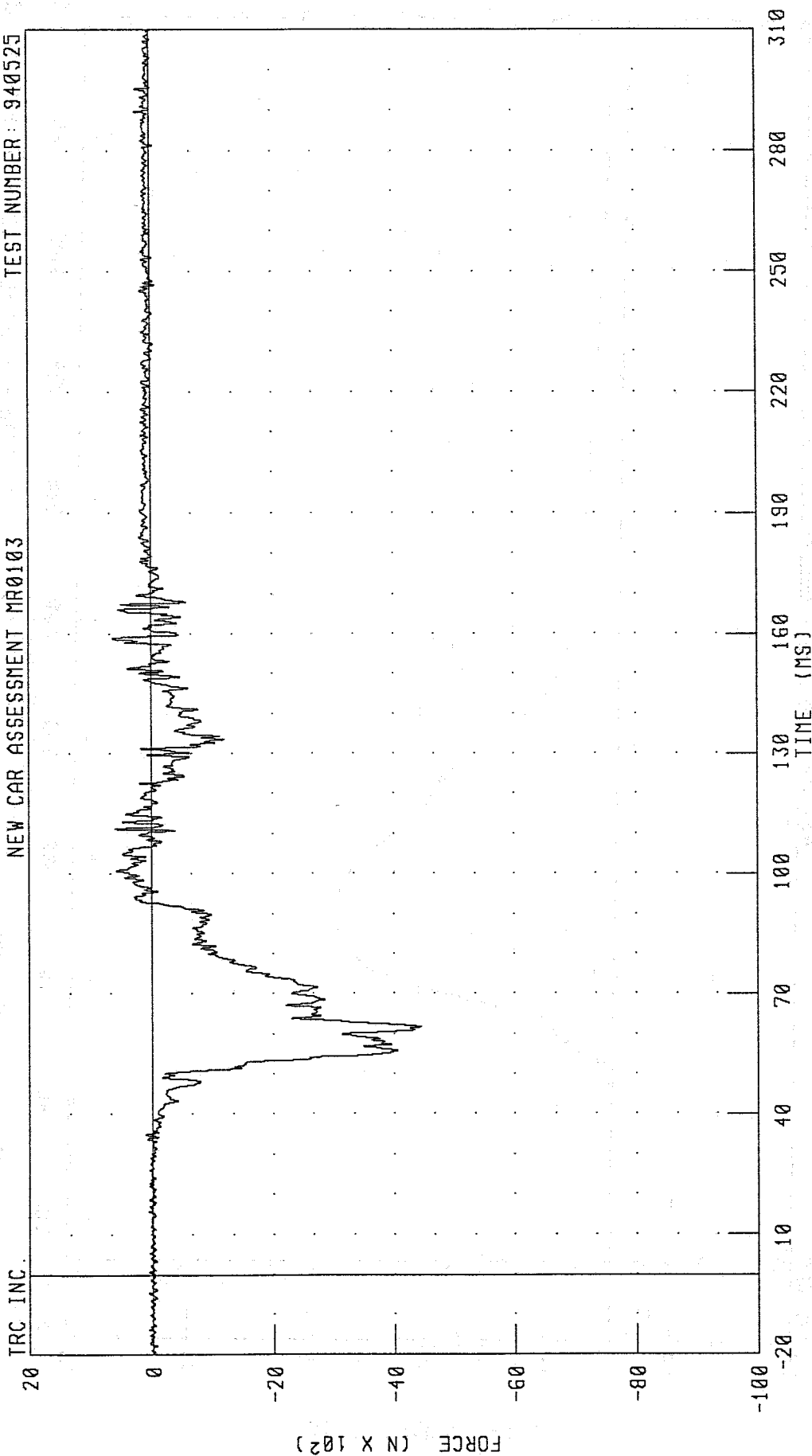
PEAK DATA: 0.23 MM @ 8.16 MS; -46.82 MM @ 87.68 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER LEFT FEMUR FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

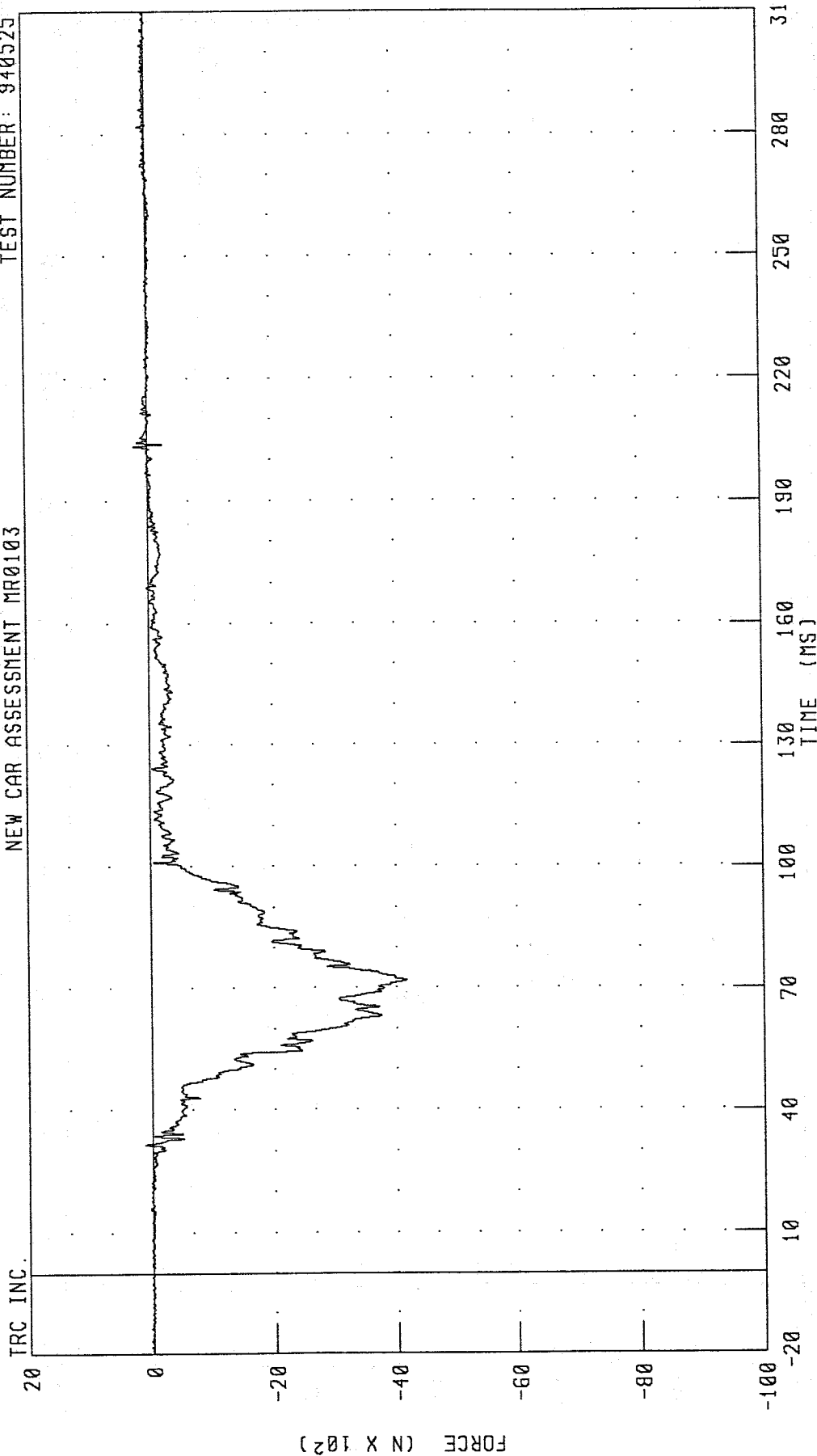


PEAK DATA: 621.91 N @ 158.88 MS; -4433.17 N @ 61.84 MS

CHANNEL: LFMF2 FILTER: CH. CLASS 600

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



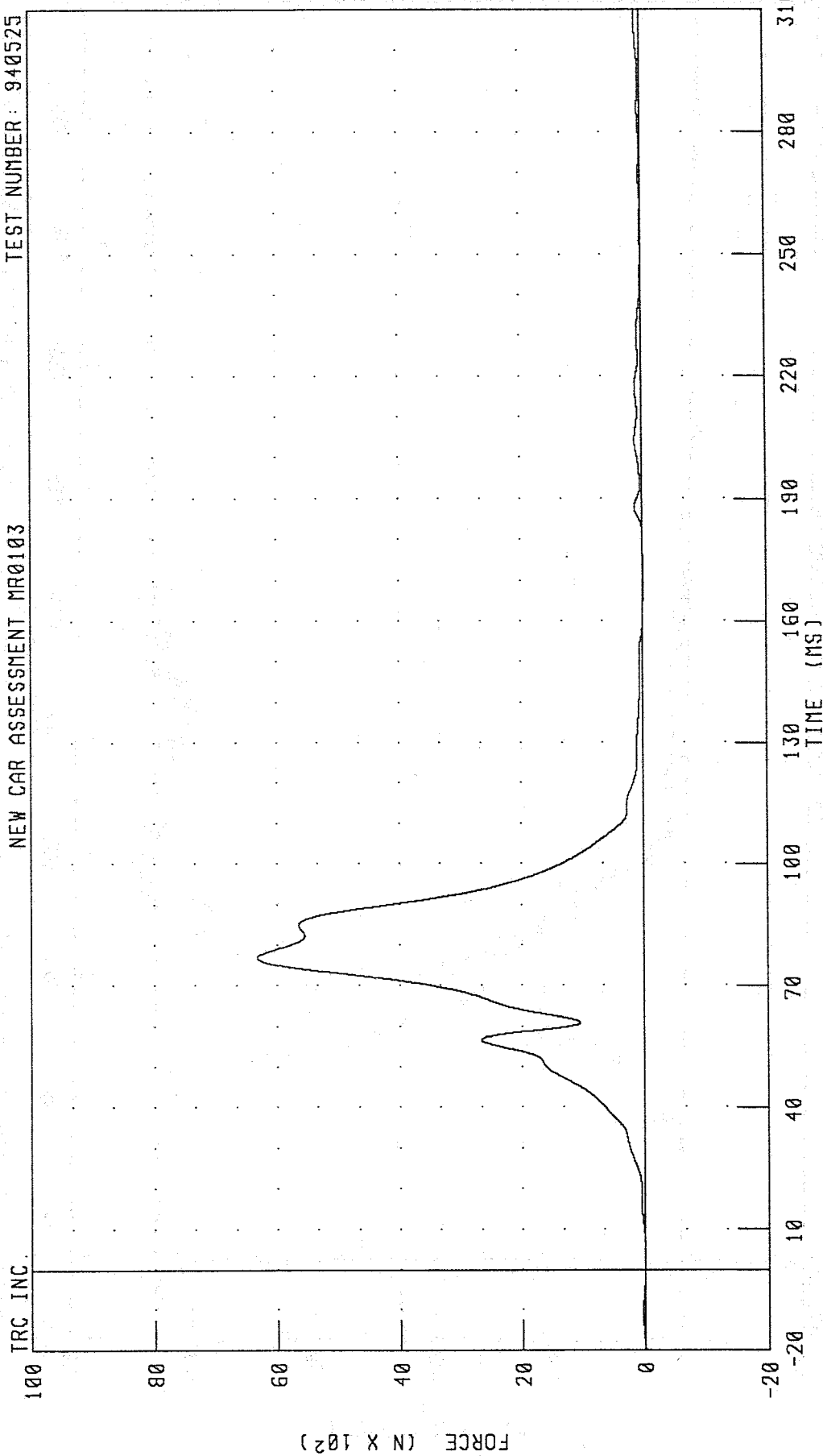
CHANNEL: RFMF2 FILTER: CH. CLASS 600

PEAK DATA: 216.62 N @ 203.44 MS; -4160.66 N @ 71.92 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



CHANNEL: LBOF2 FILTER: CH. CLASS 60

PEAK DATA: 6326.62 N @ 76.88 MS; -19.57 N @ 171.84 MS

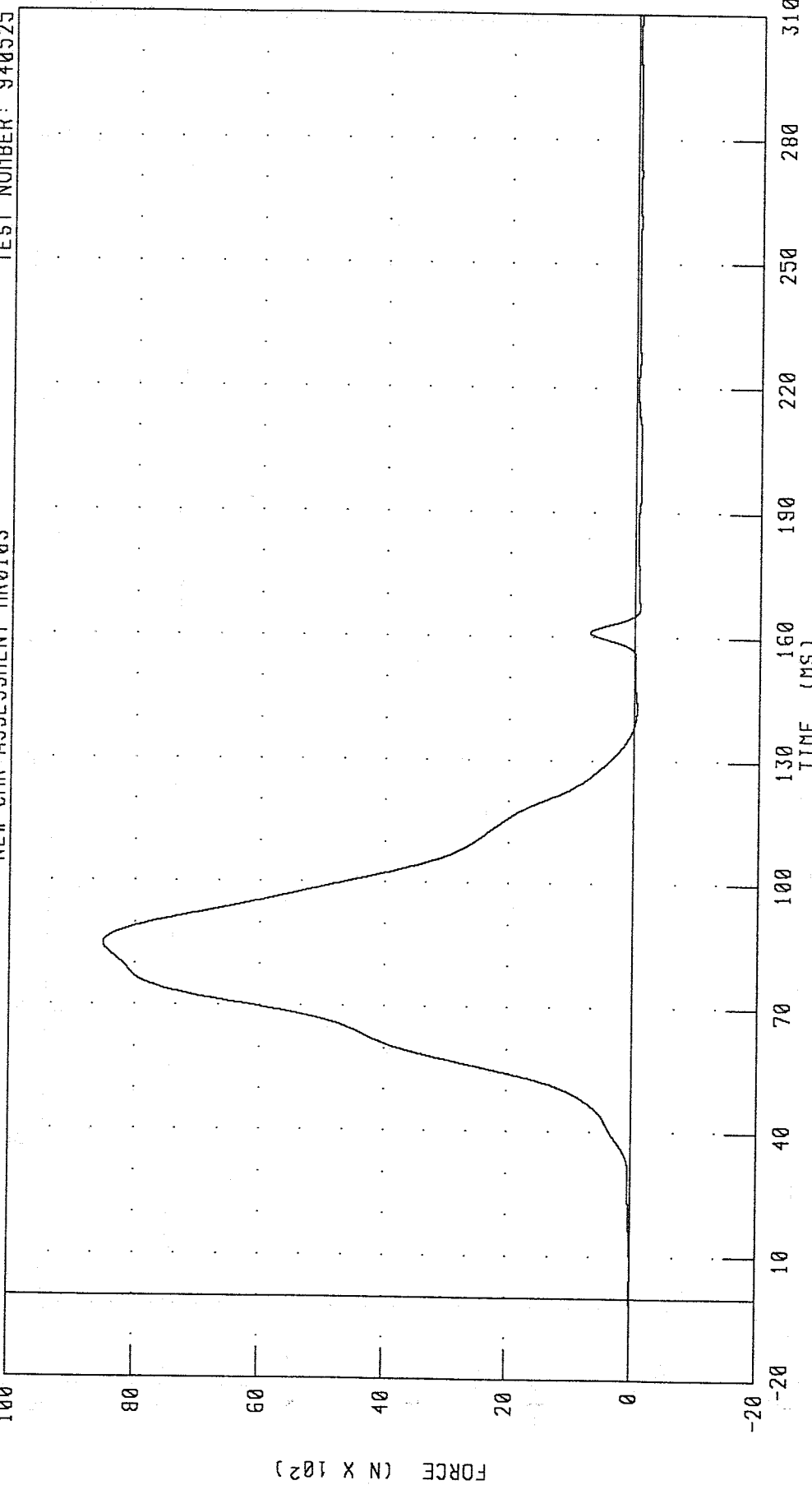
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

PASSENGER SHOULDER BELT FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



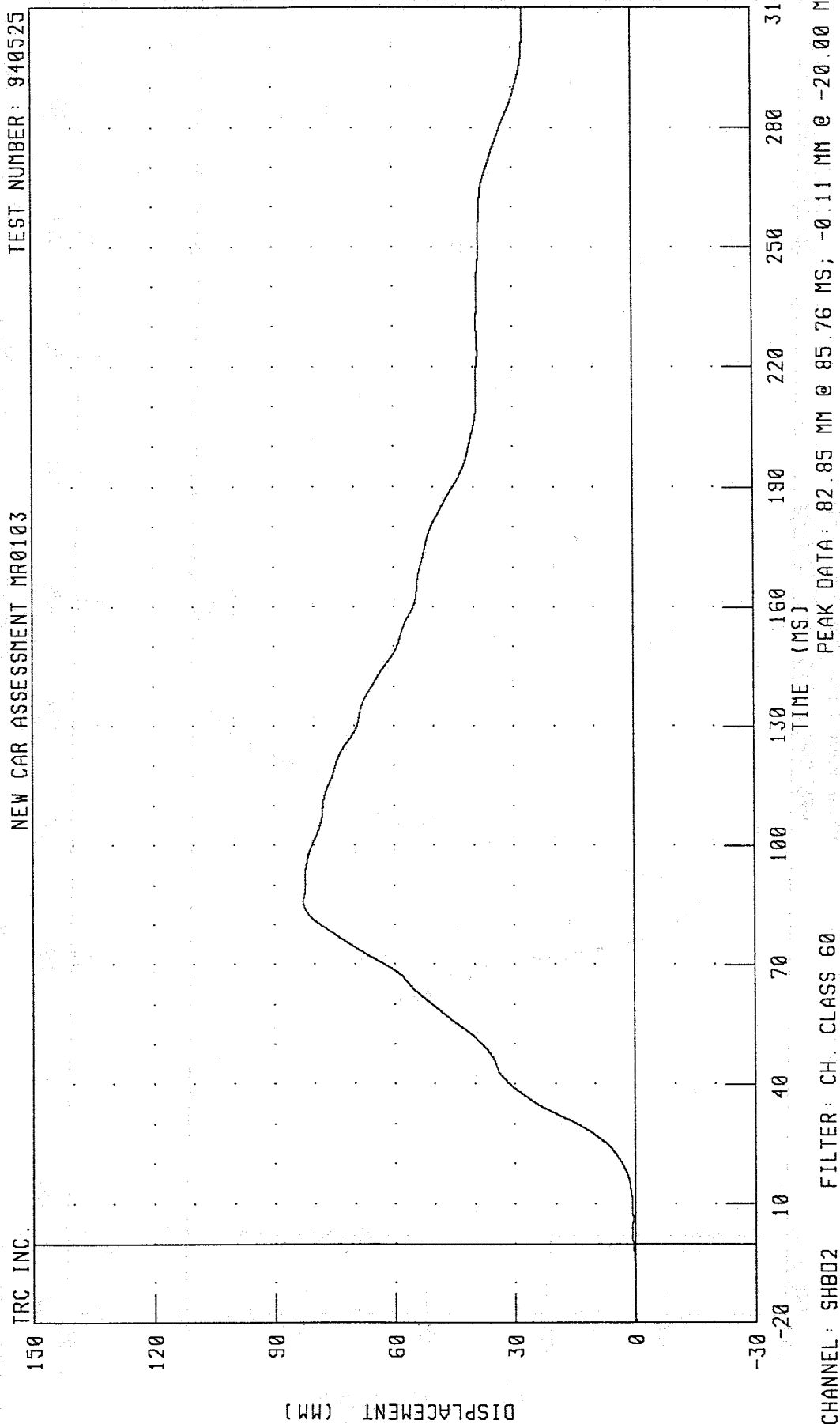
CHANNEL: SHBF2 FILTER: CH. CLASS 60

PEAK DATA: 8512.97 N @ 84.96 MS; -81.79 N @ 195.76 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT

TEST NUMBER: 940525

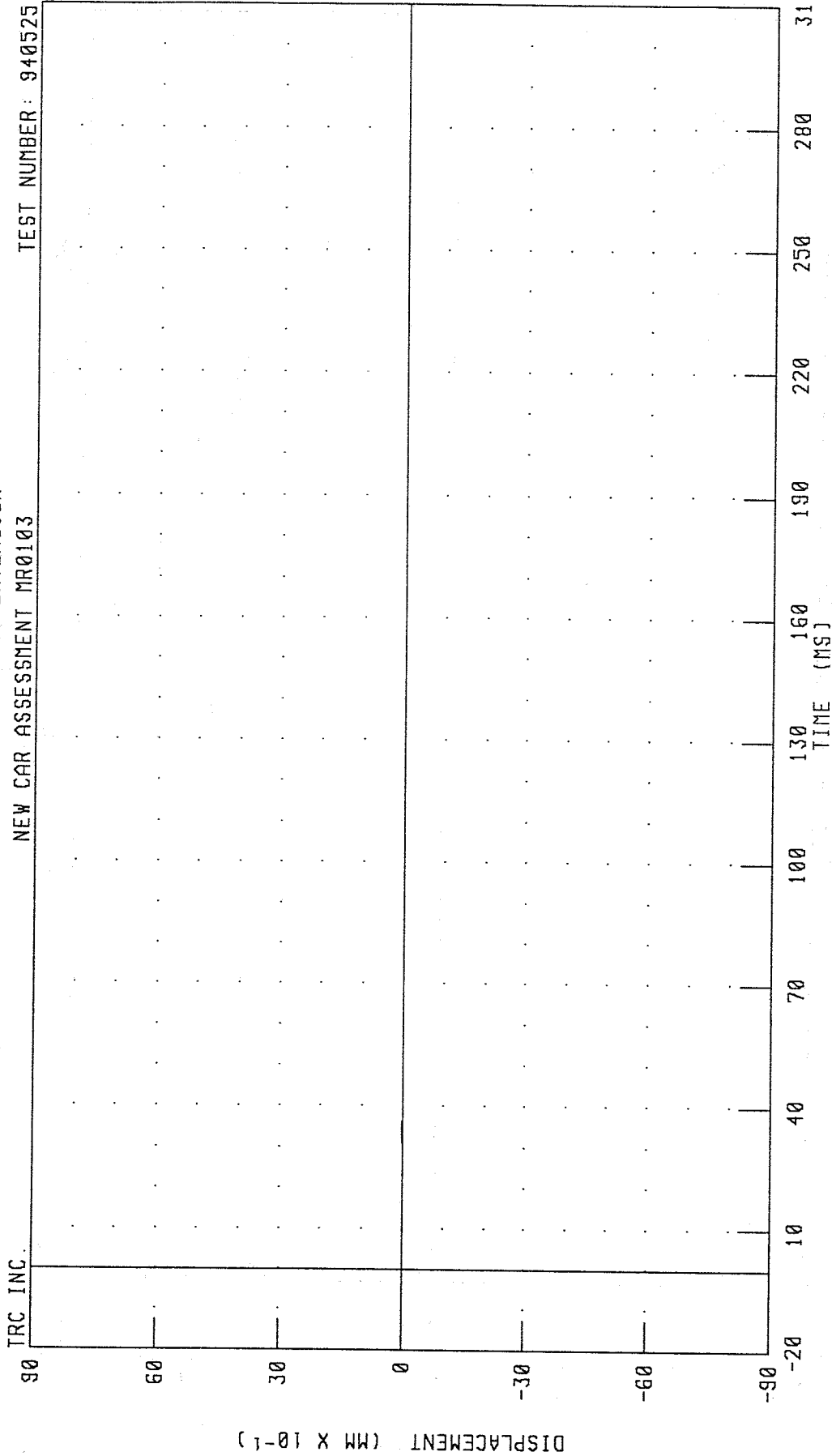
NEW CAR ASSESSMENT MR0103



CHANNEL: SHBD2 FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SEAT BELT EXTENSION
 NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



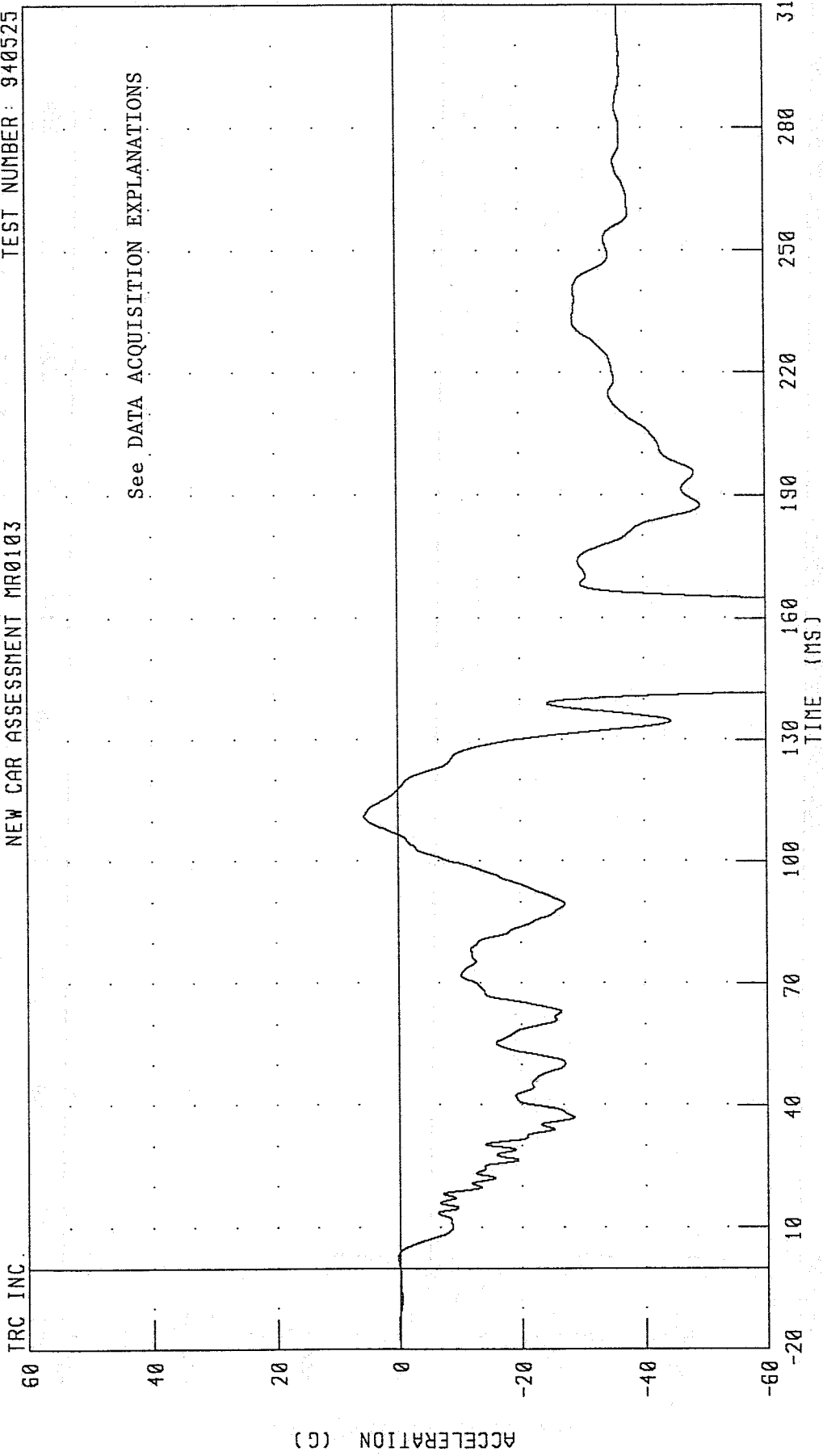
CHANNEL: SBED2 FILTER: CH. CLASS 60

PEAK DATA: 0.04 MM @ 33.76 MS; -0.01 MM @ 245.60 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

PEAK DATA: 5.55 G @ 111.12 MS; -248.82 G @ 150.72 MS

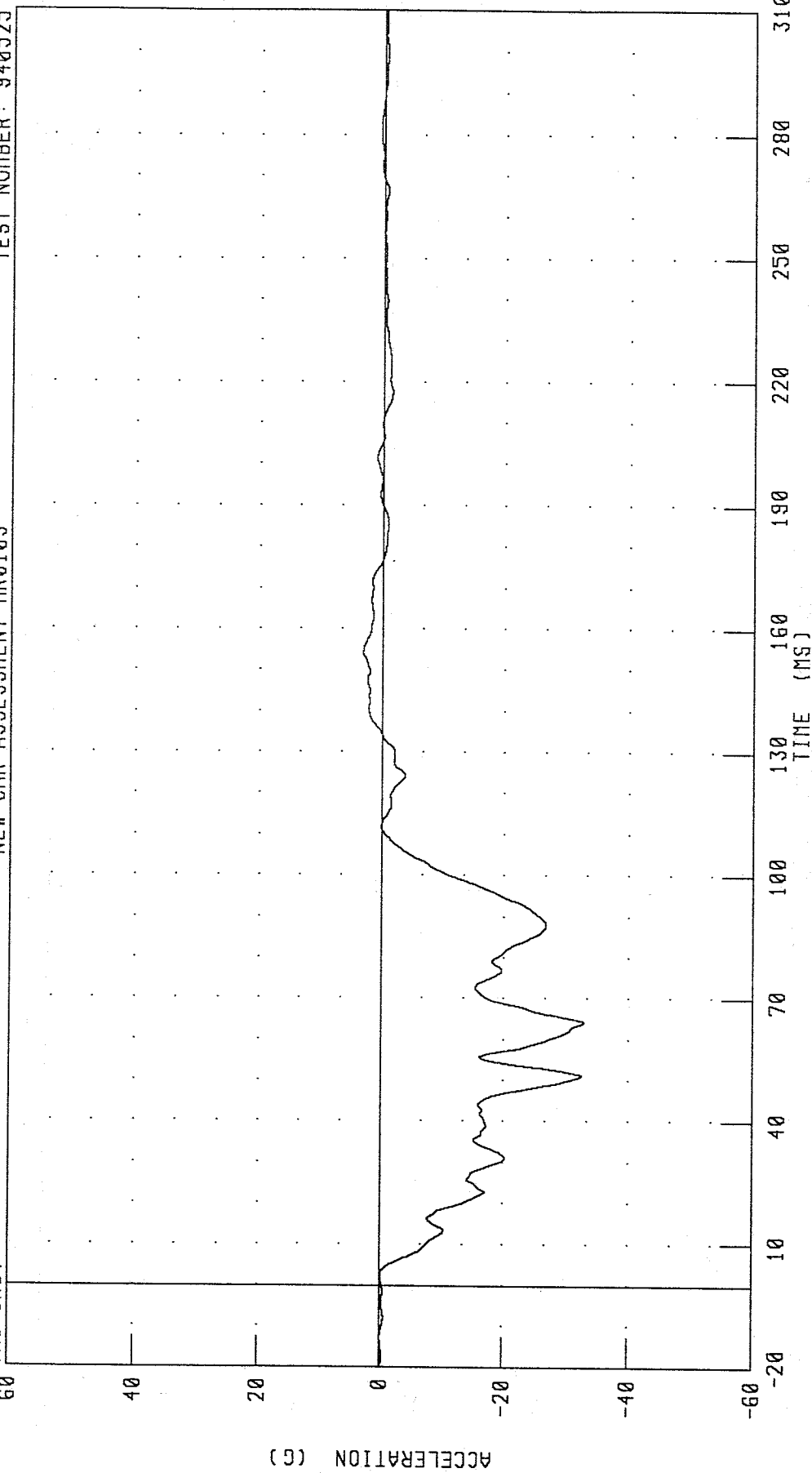
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

RIGHT REAR SEAT X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: TRRXG1 FILTER: CH. CLASS 60

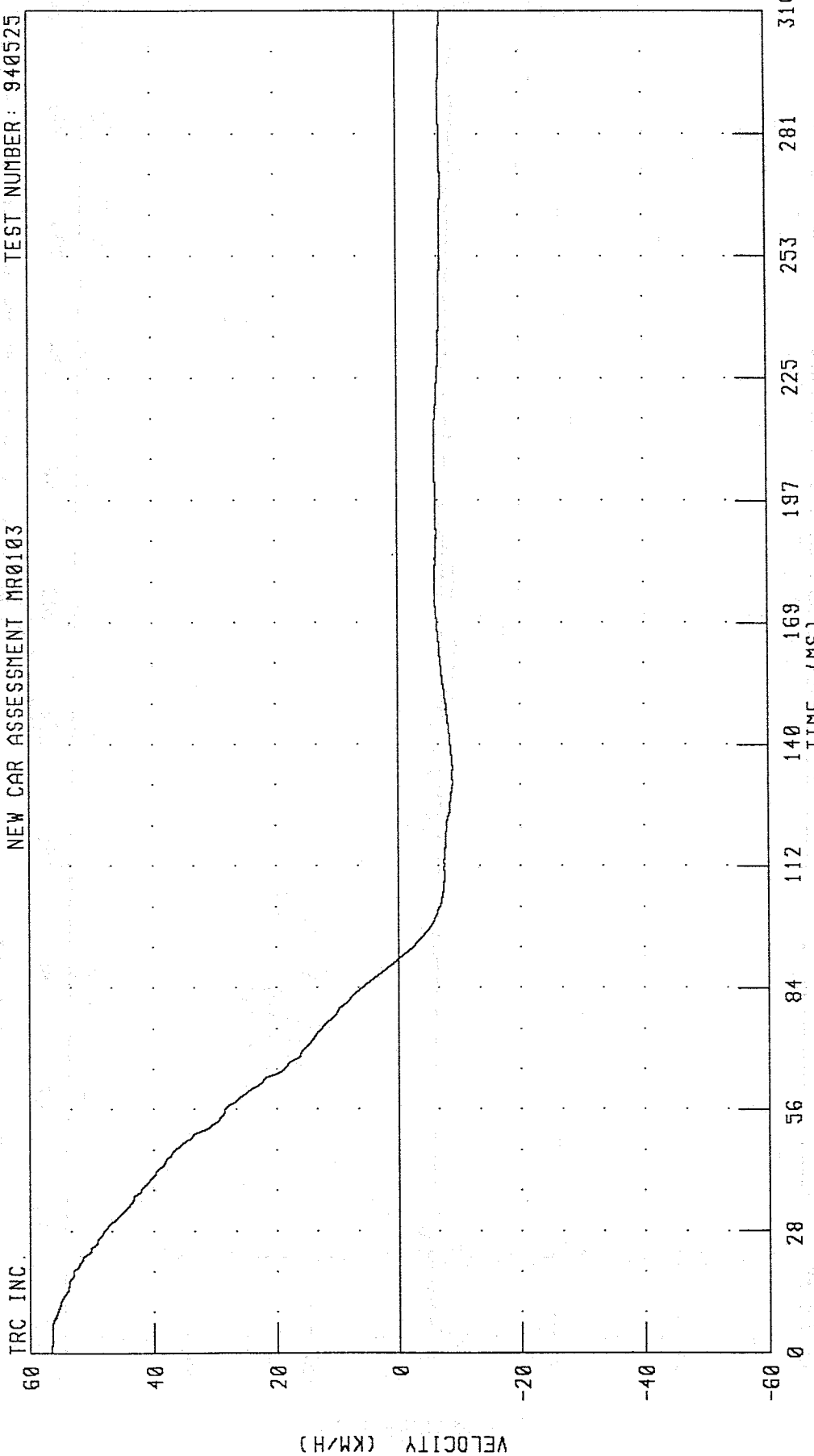
PEAK DATA: 3.18 G @ 154.24 MS; -32.77 G @ 64.24 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

RIGHT REAR SEAT X-AXIS VELOCITY

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: TRRXV1 FILTER: CH. CLASS 180

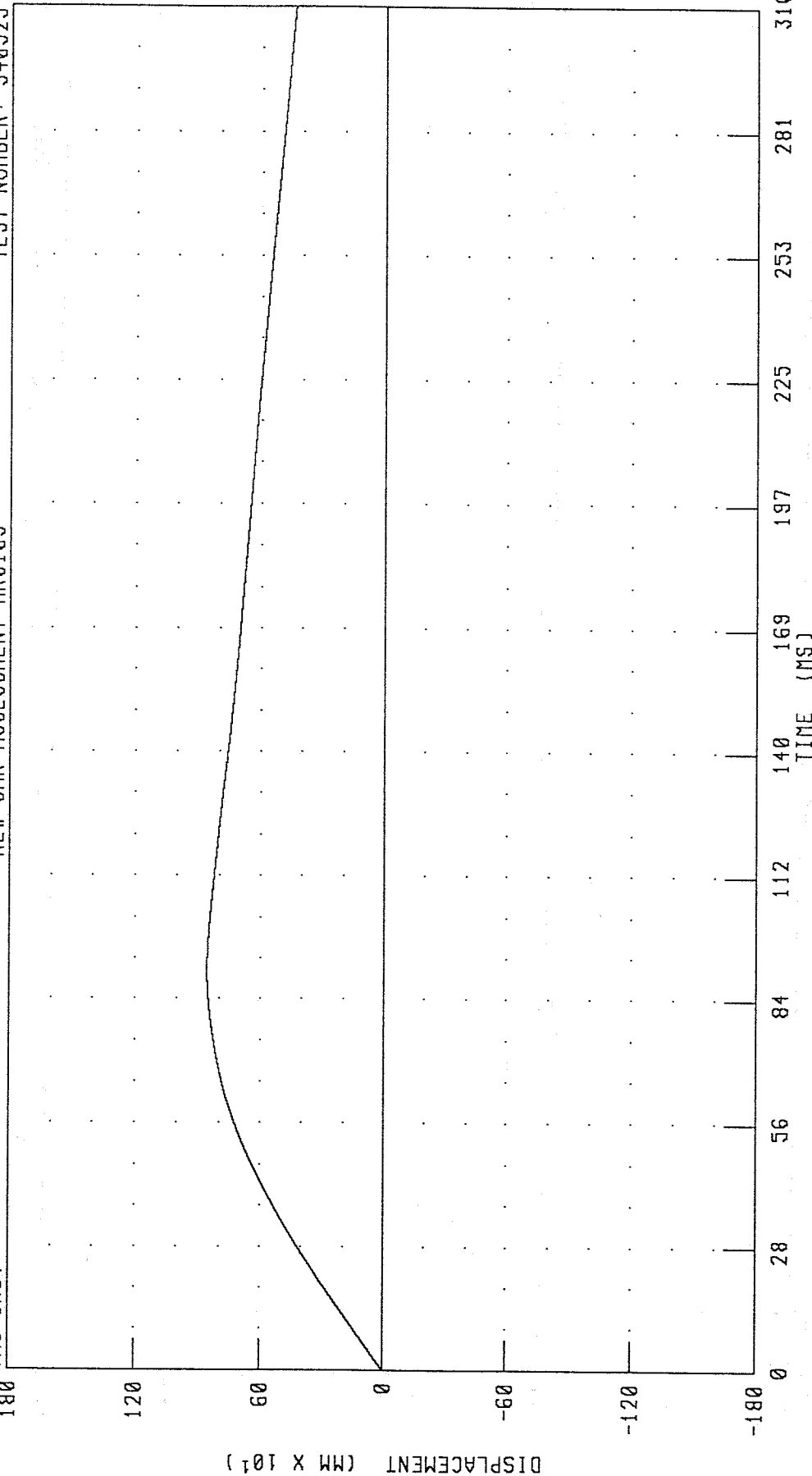
PEAK DATA: 56.50 KM/H @ 0.00 MS; -8.93 KM/H @ 132.08 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103

TRC INC.



CHANNEL: TRRX01 FILTER: CH. CLASS 180

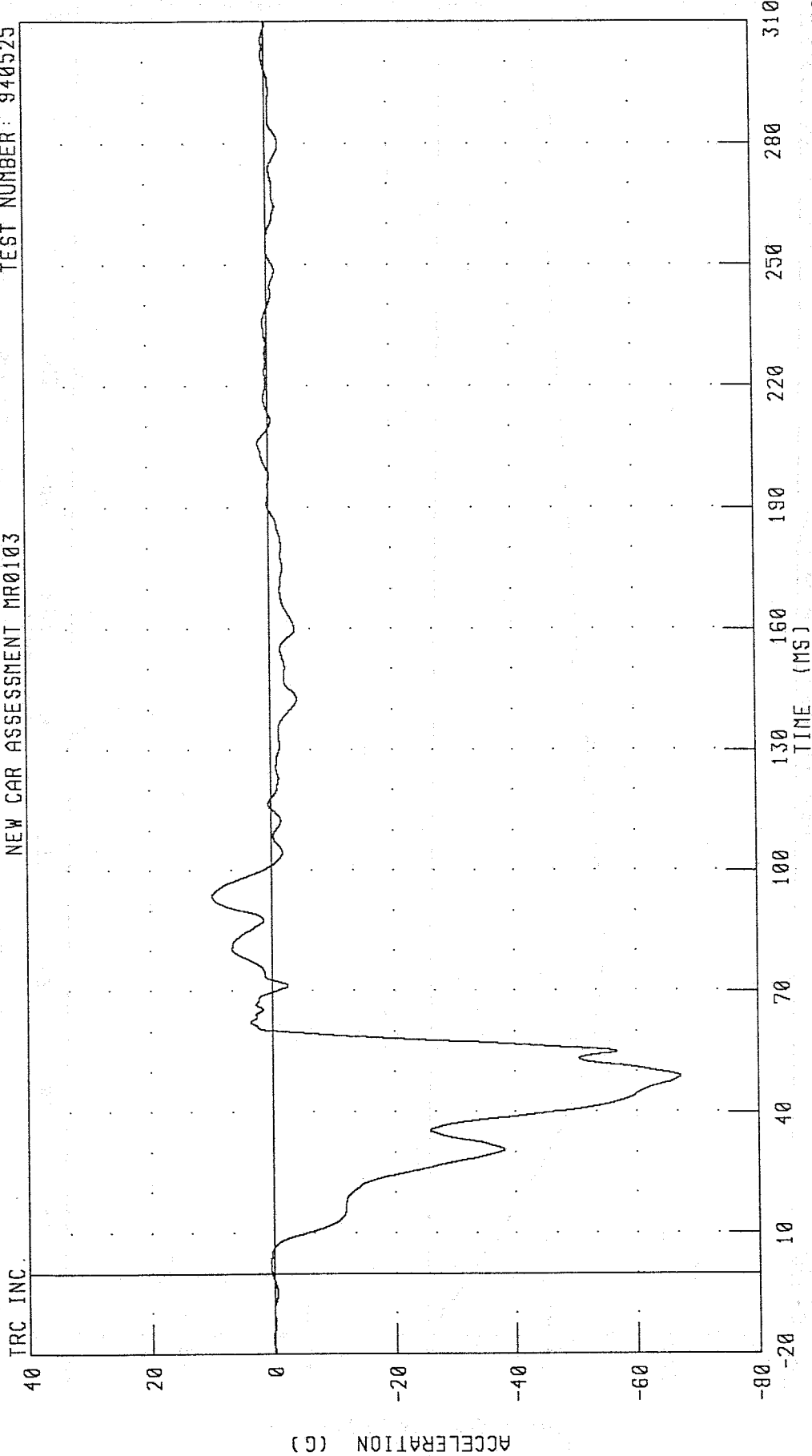
PEAK DATA: 857.23 MM @ 91.28 MS; 0.00 MM @ 0.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

ENGINE TOP X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 9.78 G @ 93.76 MS; -67.28 G @ 48.88 MS

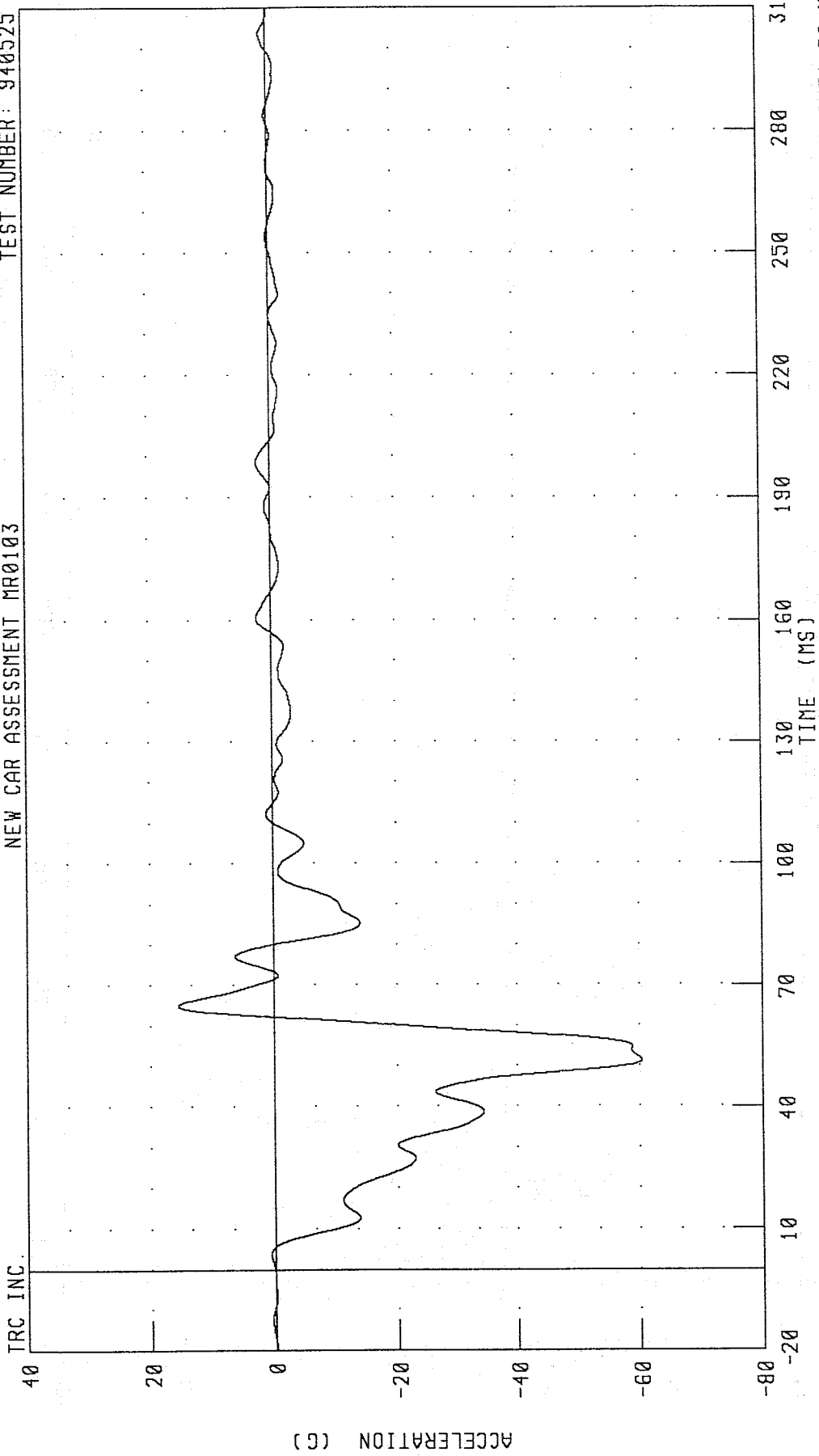
CHANNEL: ENGCG1 FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

ENGINE BOTTOM X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



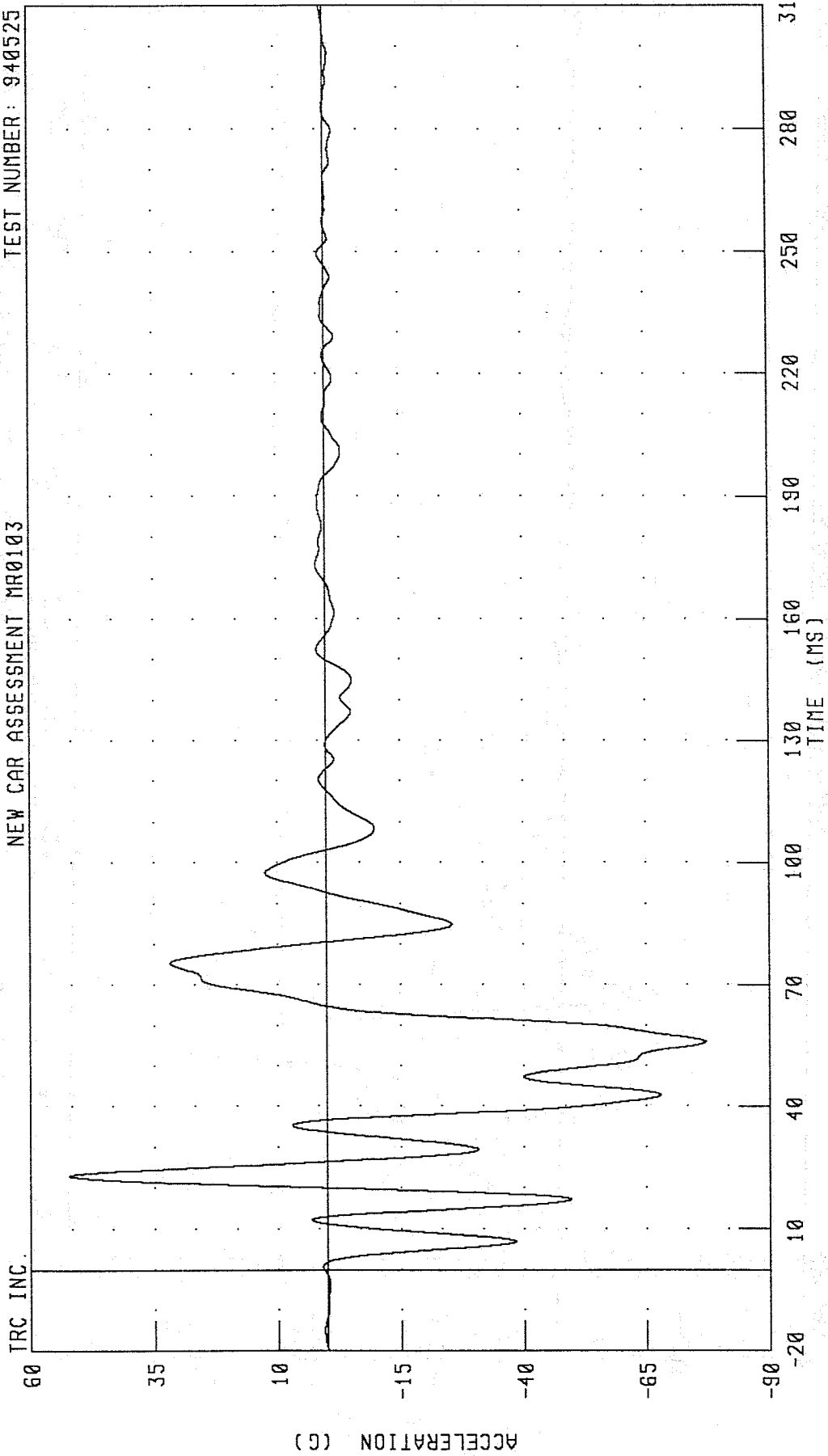
CHANNEL: ENGXC2 FILTER: CH. CLASS 60

PEAK DATA: 15.47 G @ 65.04 MS; -60.31 G @ 51.36 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



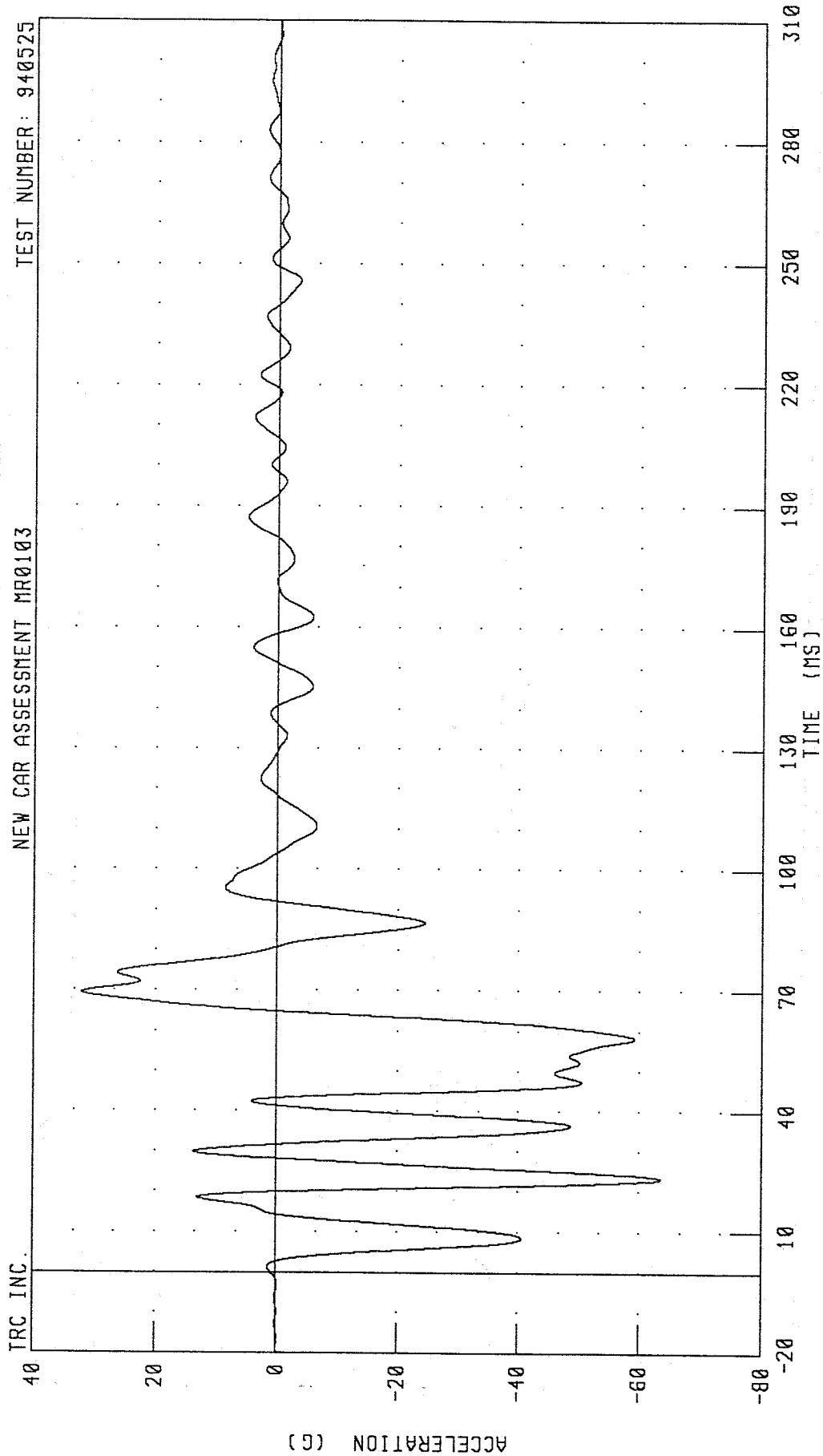
CHANNEL: BCRXG1 FILTER: CH. CLASS 60

PEAK DATA: 52.27 G @ 22.96 MS; -77.19 G @ 56.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



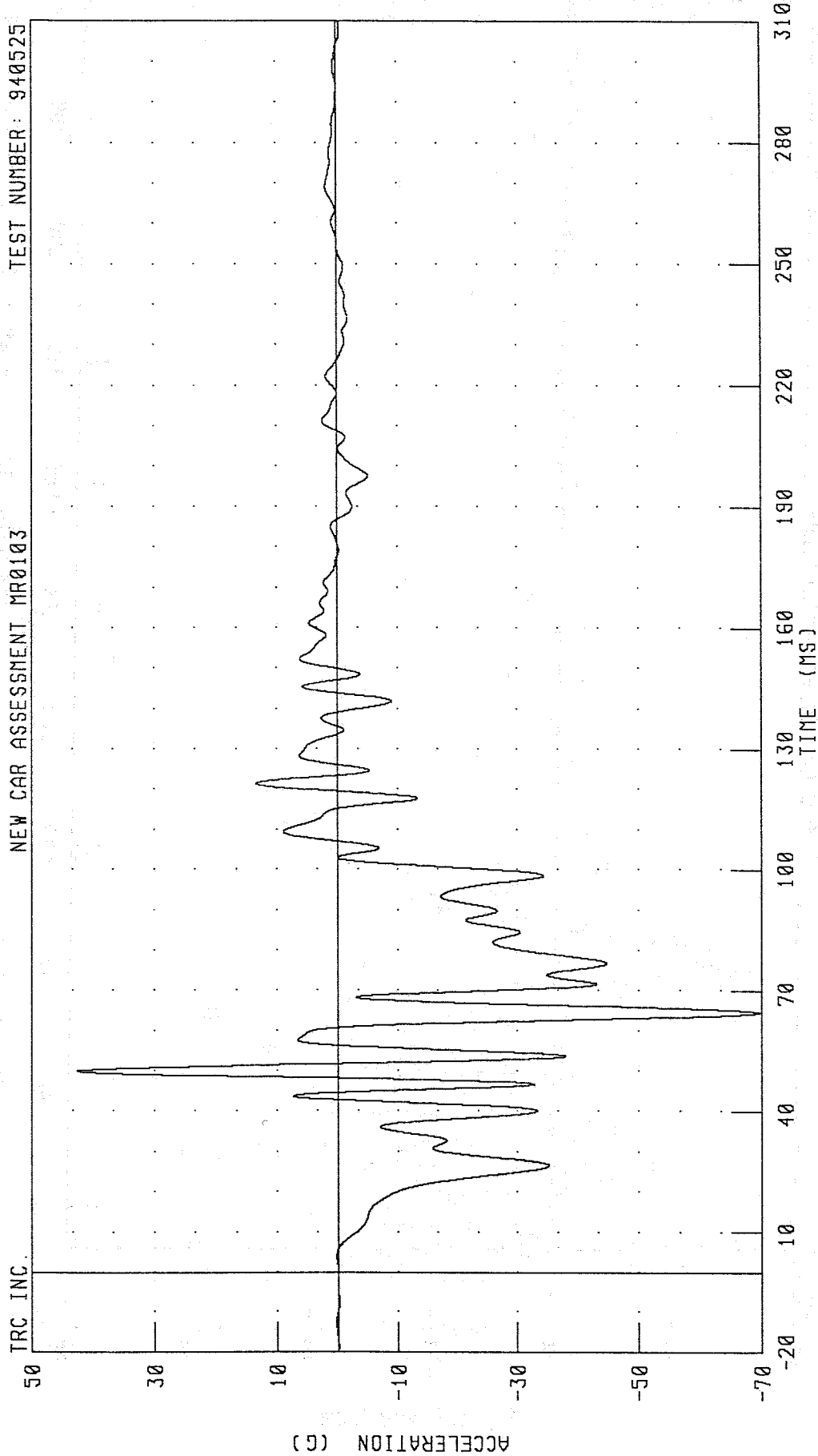
CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 32.11 G @ 69.52 MS; -63.54 G @ 23.28 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

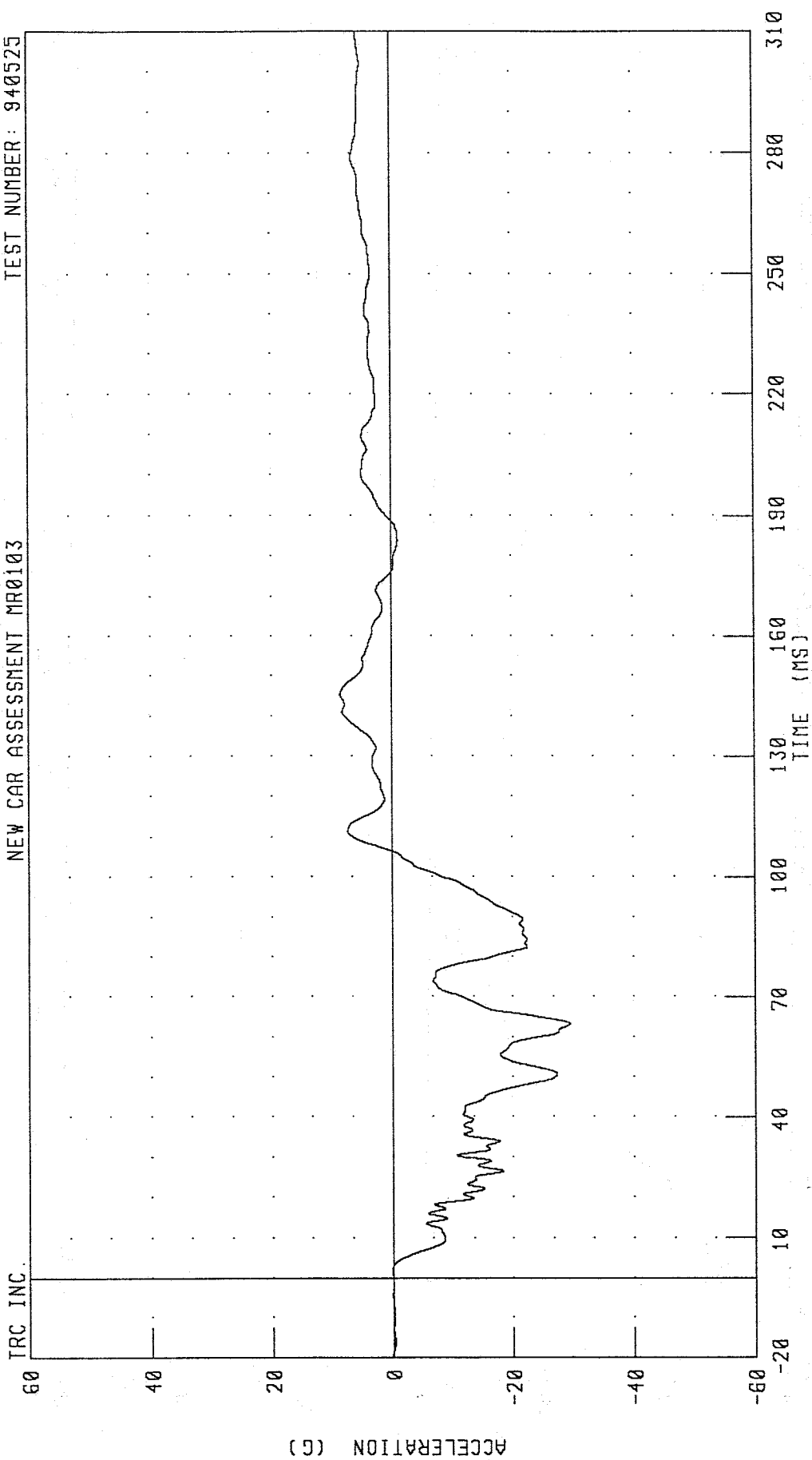


CHANNEL: DPCXG1 FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

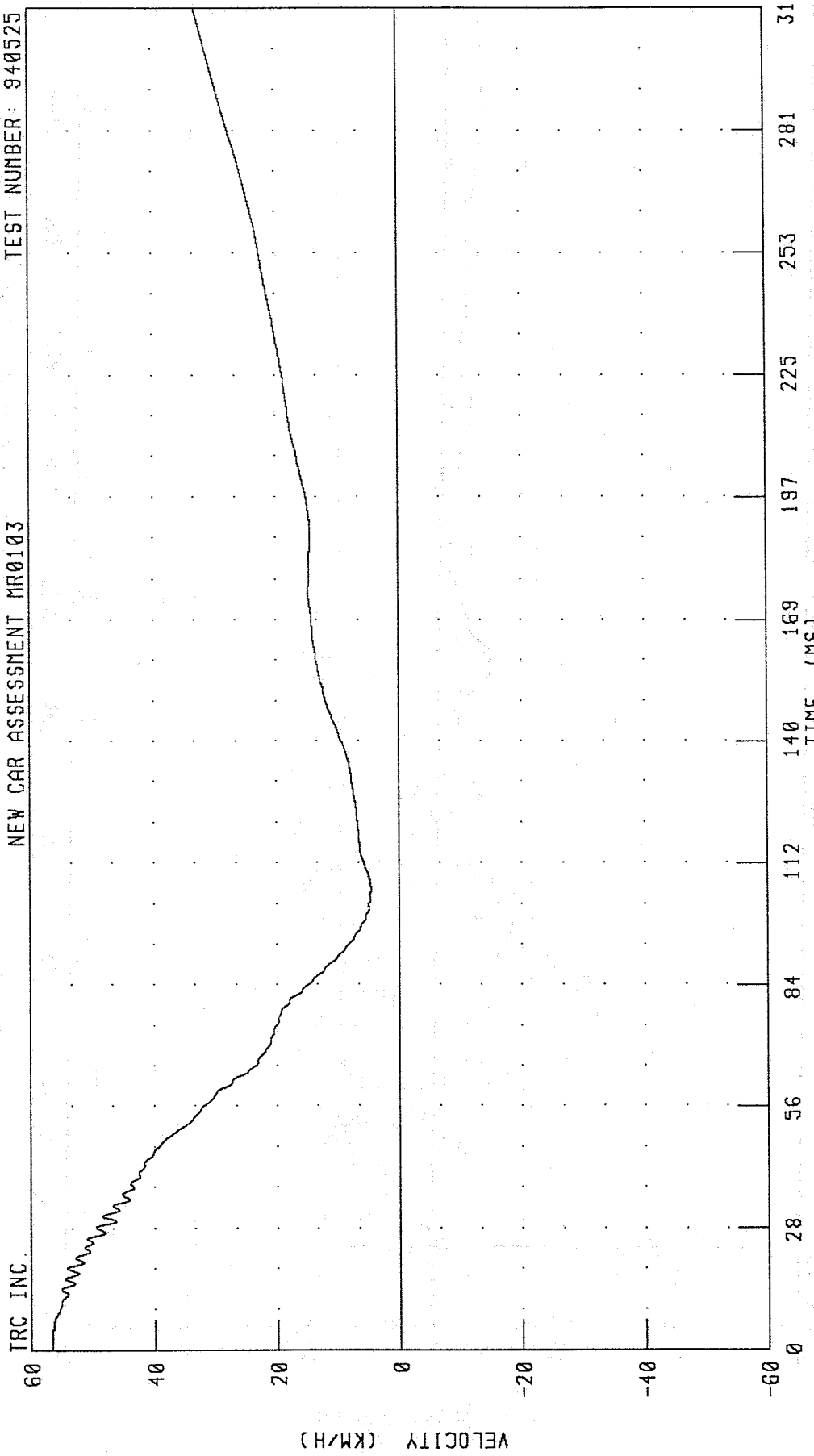


CHANNEL: TLRXGA FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS VELOCITY

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



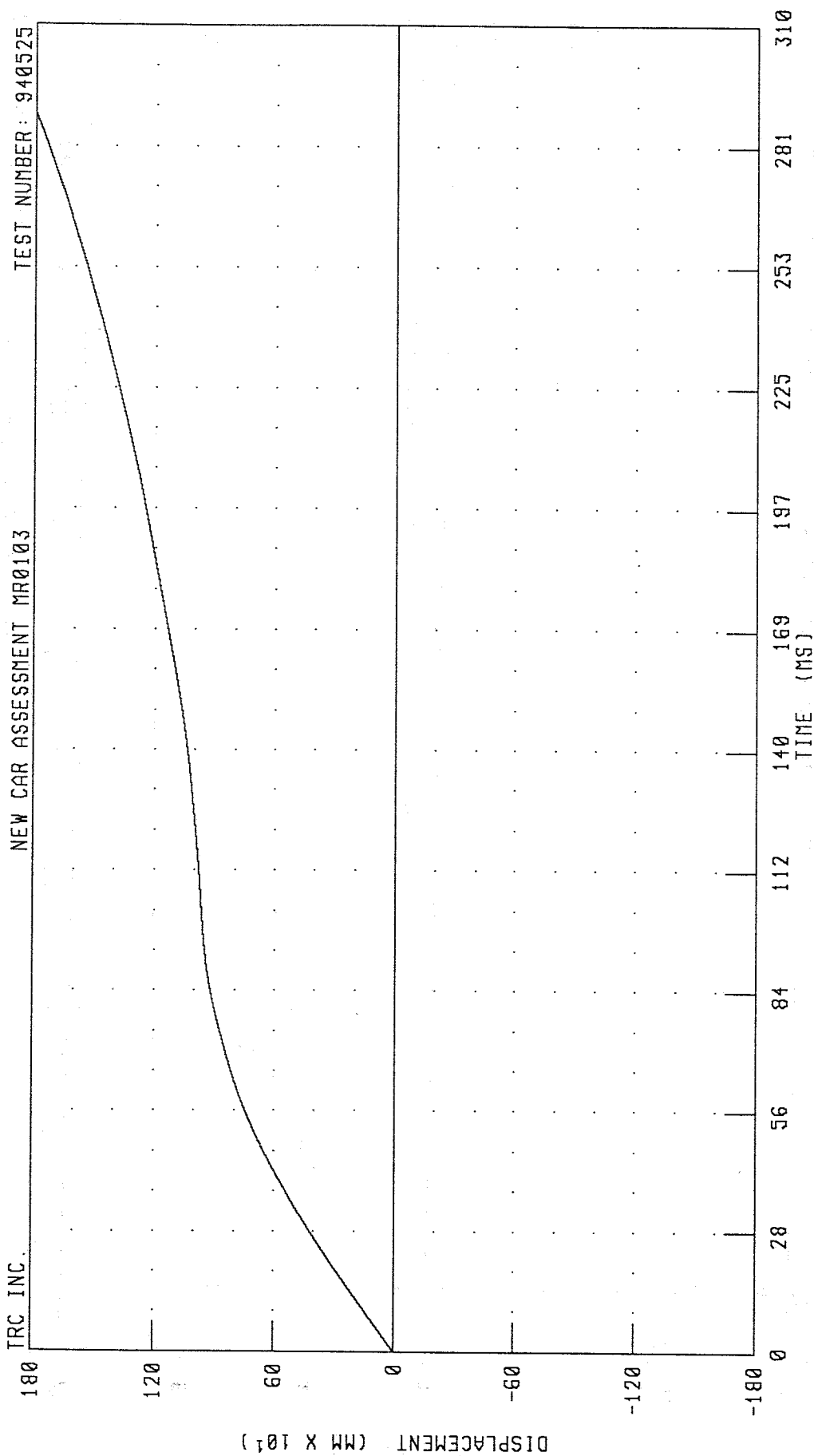
CHANNEL: TLRXVA FILTER: CH. CLASS 180

PEAK DATA: 56.50 KM/H @ 4.24 MS, 4.58 KM/H @ 106.56 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS DISPLACEMENT

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



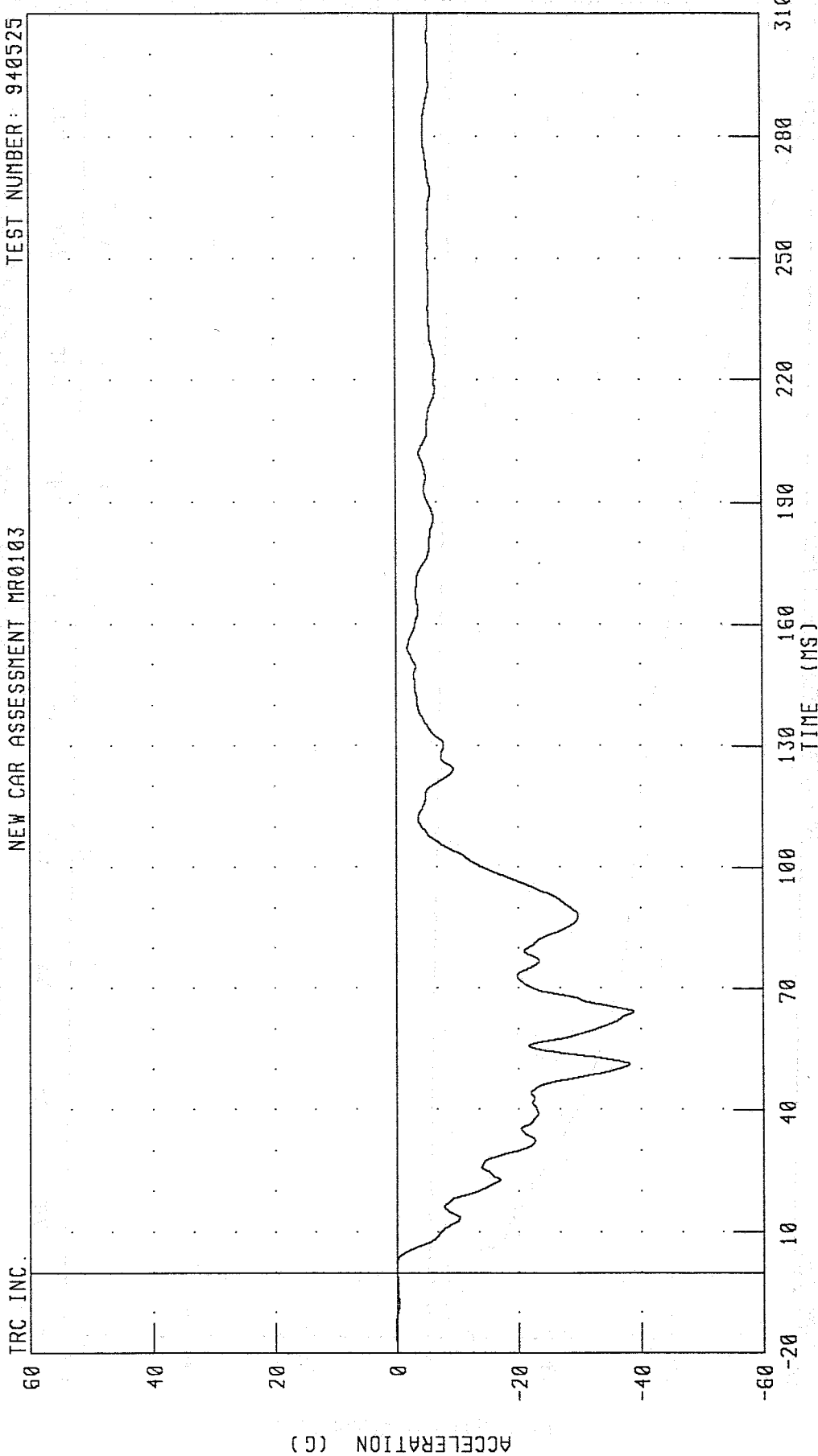
CHANNEL: TLRXDA FILTER: CH. CLASS 180

PEAK DATA: 1975.70 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



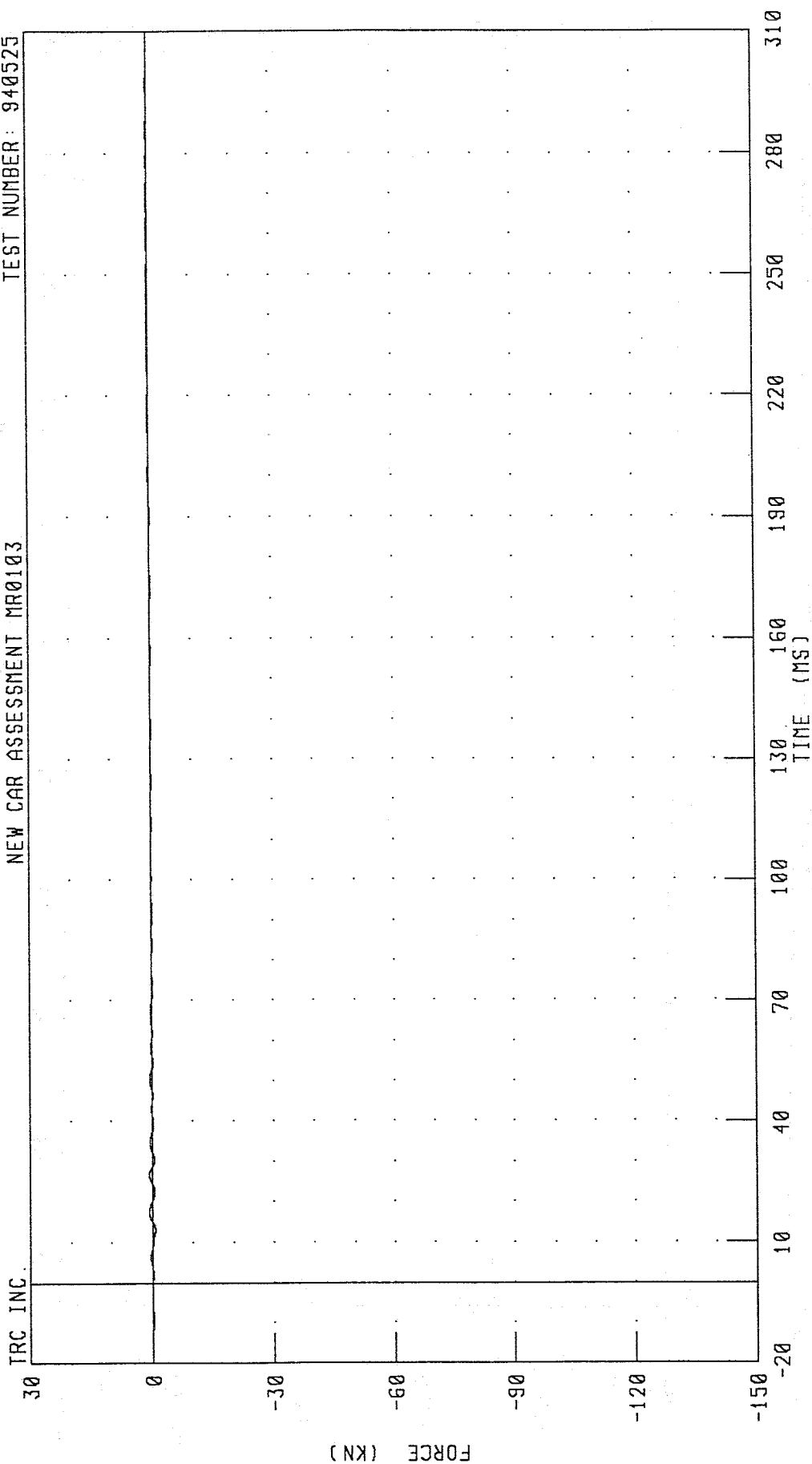
CHANNEL: TRRXGA FILTER: CH. CLASS 60

PEAK DATA: 0.23 G @ -14.24 MS; -38.76 G @ 64.24 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 0.77 KN @ 17.28 MS; -0.71 KN @ 13.04 MS

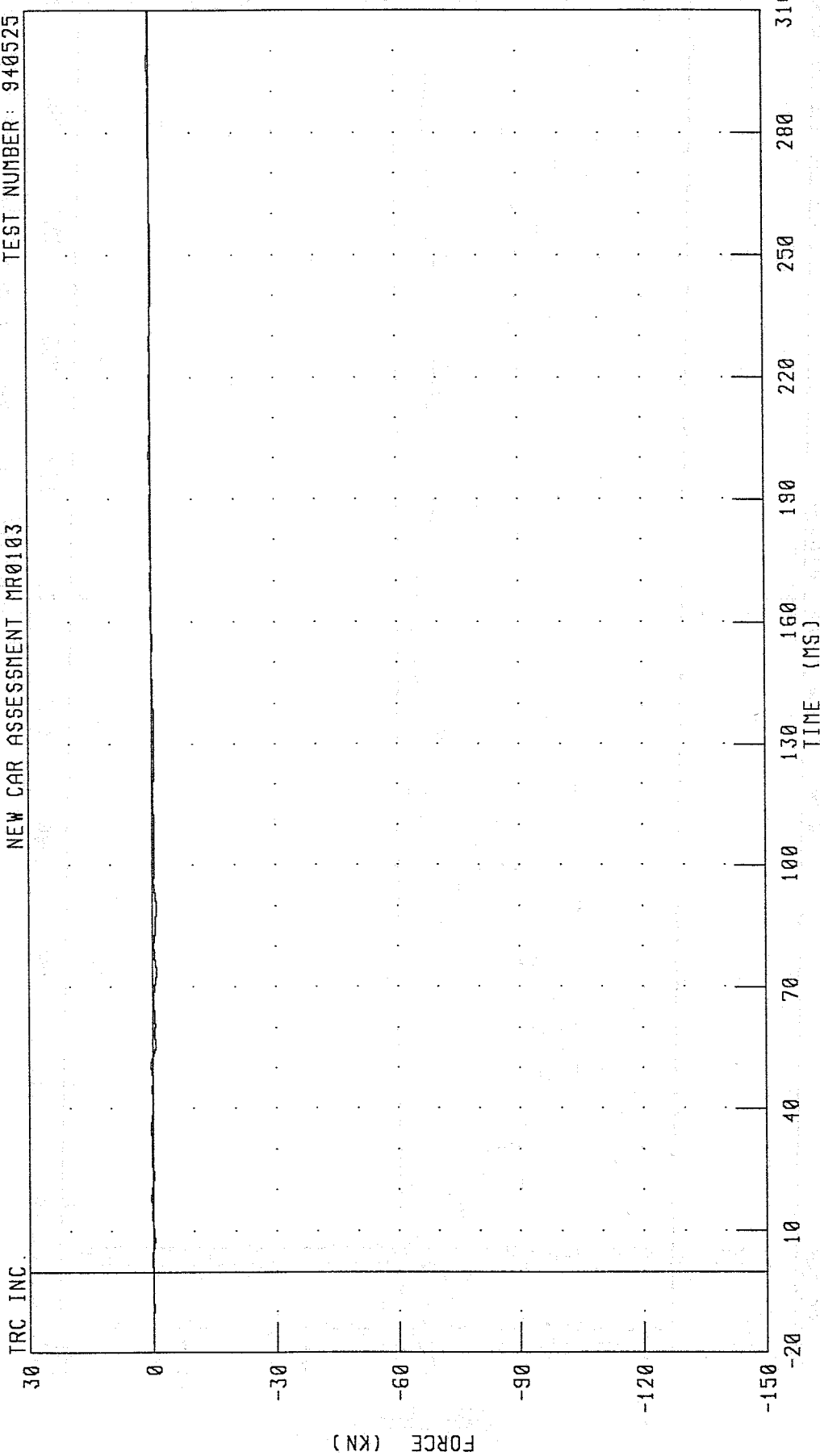
CHANNEL: BA1F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A2 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: BA2F FILTER: CH. CLASS 60

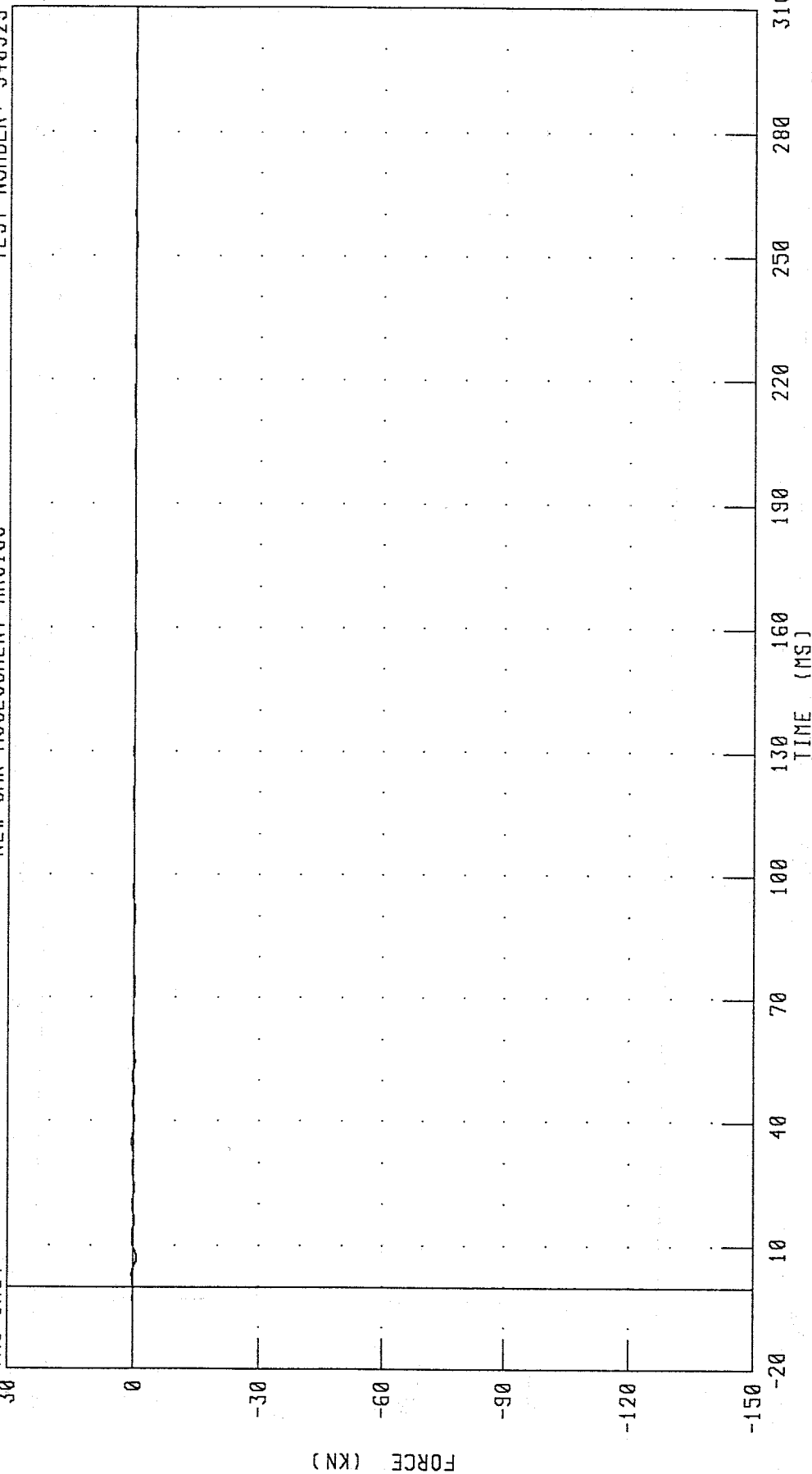
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A3 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: BA3F FILTER: CH. CLASS 60

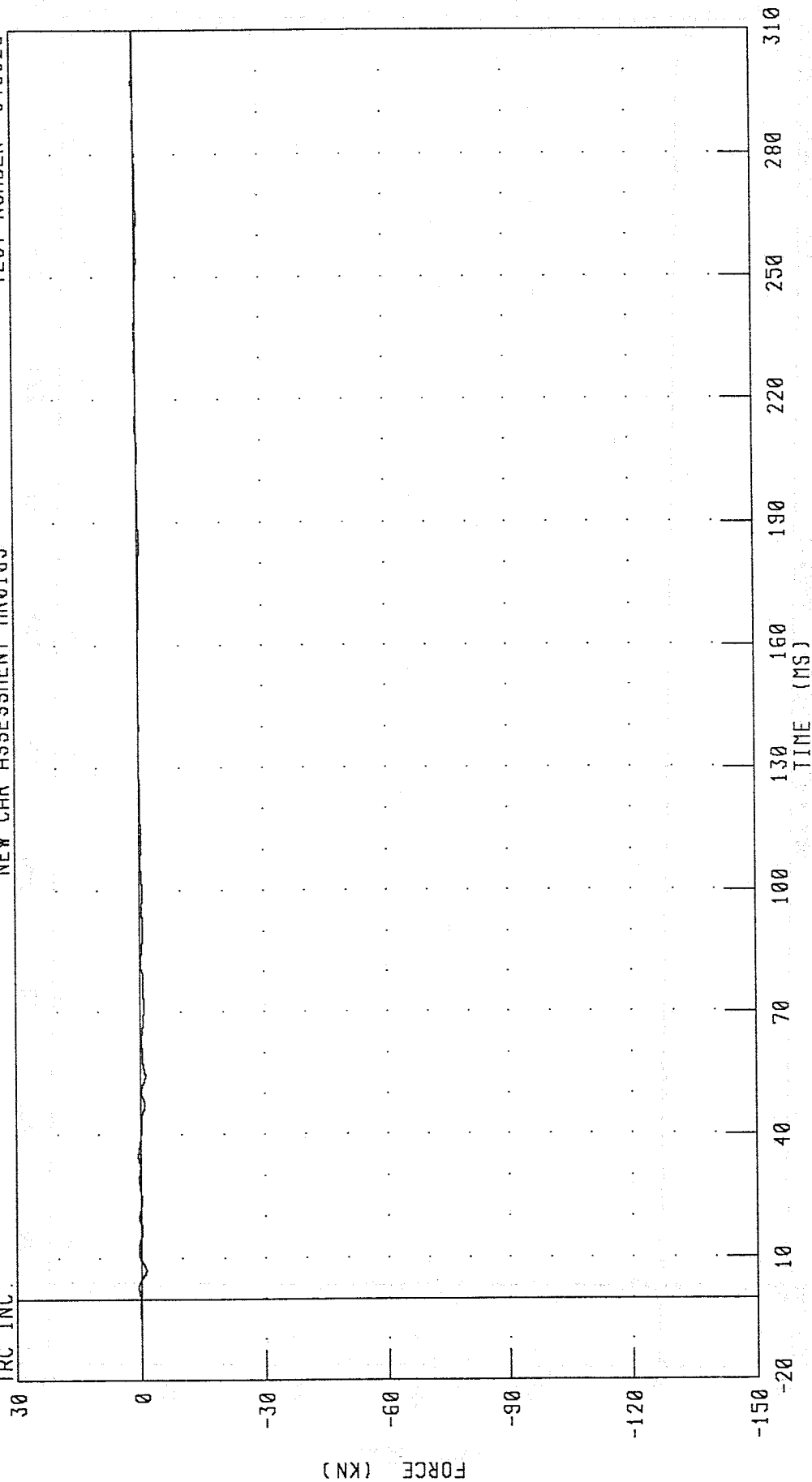
PEAK DATA: 0.42 KN @ 35.04 MS; -0.91 KN @ 7.12 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



PEAK DATA: 0.65 KN @ 2.72 MS; -1.23 KN @ 54.40 MS

FILTER: CH. CLASS 60

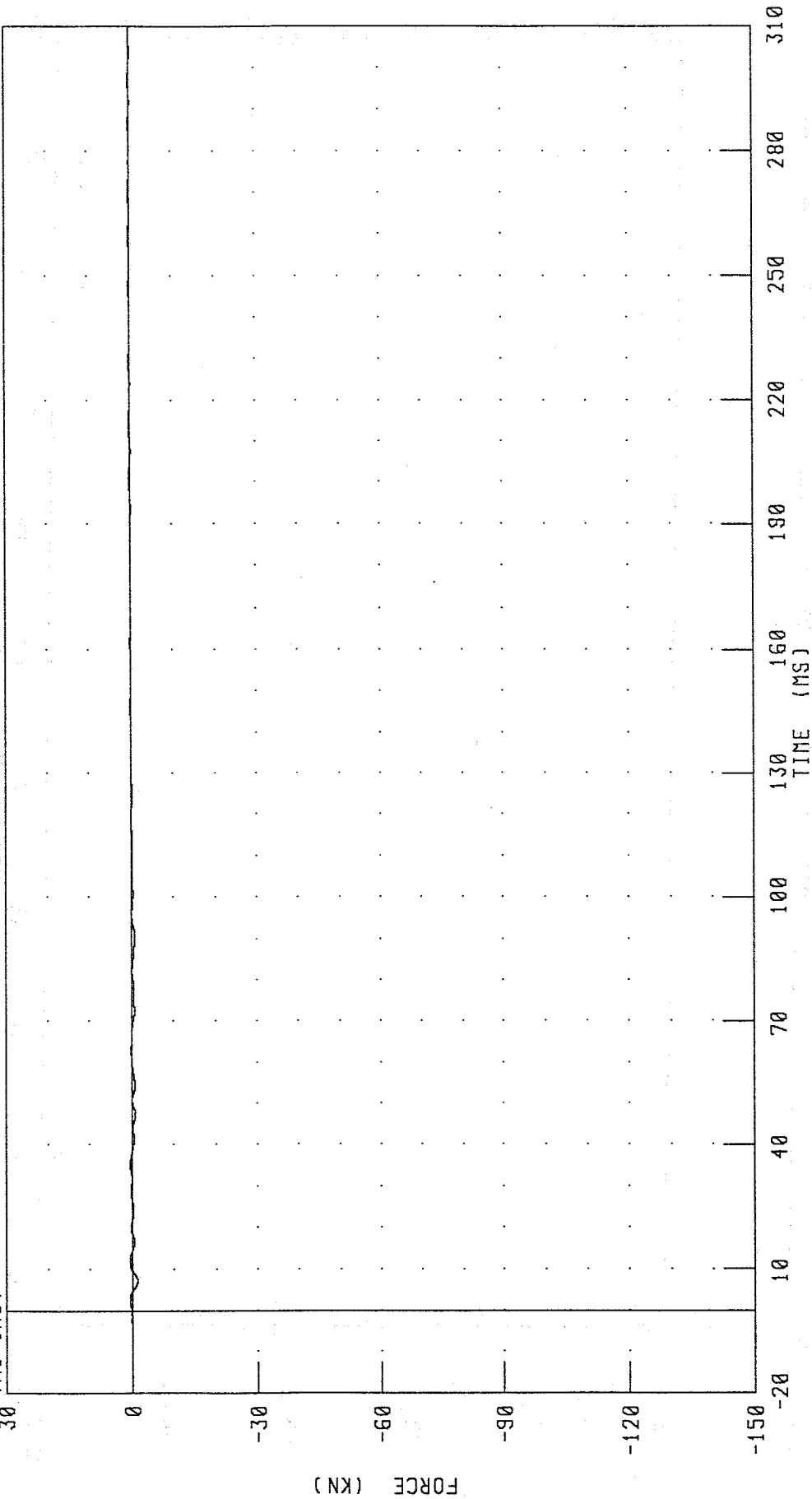
CHANNEL: BA4F

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103

TRC INC.



CHANNEL: BA5F FILTER: CH. CLASS 60

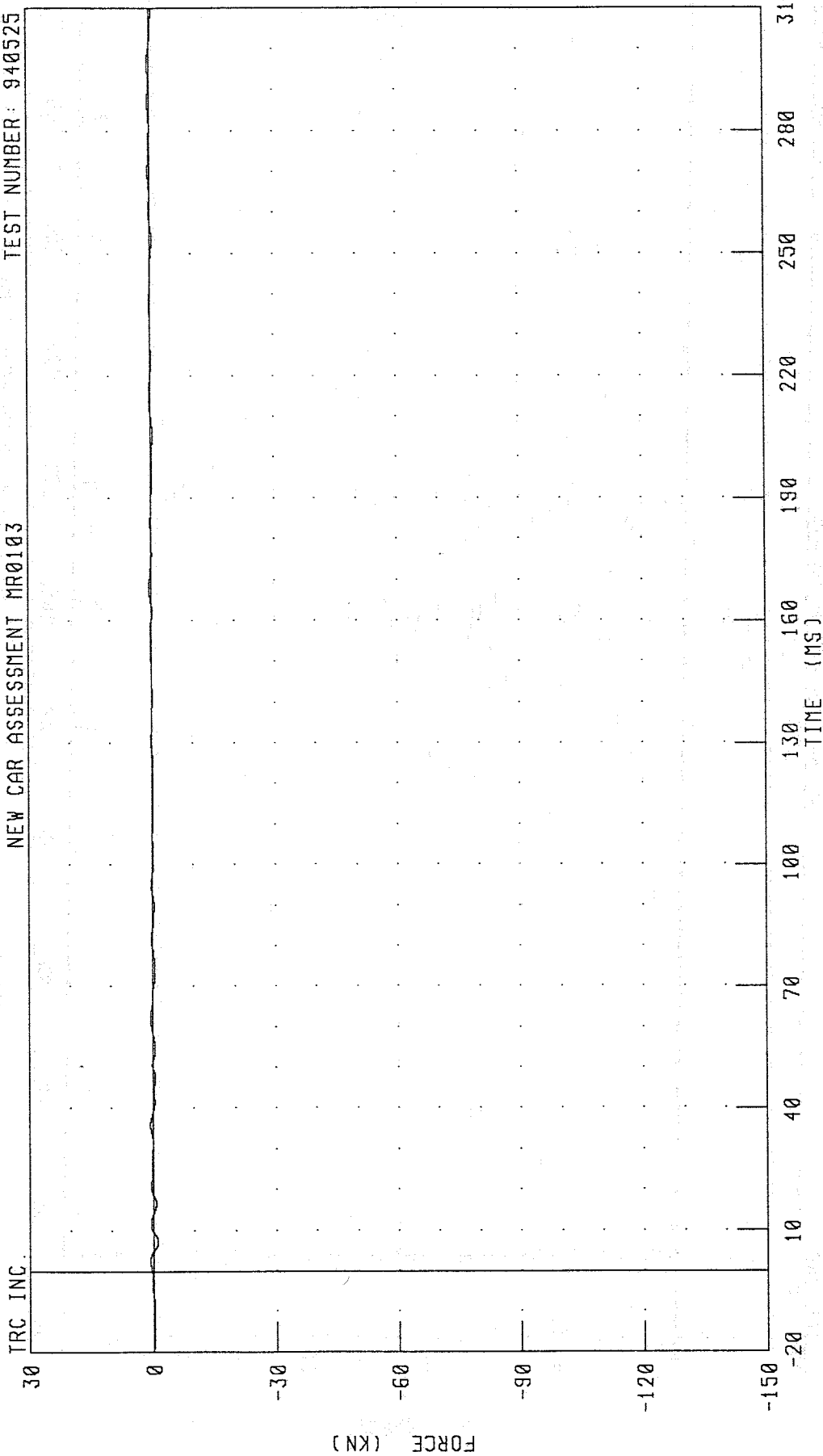
PEAK DATA: 0.59 KN @ 2.64 MS; -1.27 KN @ 7.12 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A6 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: BA6F FILTER: CH. CLASS 60

PEAK DATA: 0.73 KN @ 2.64 MS; -1.14 KN @ 7.28 MS

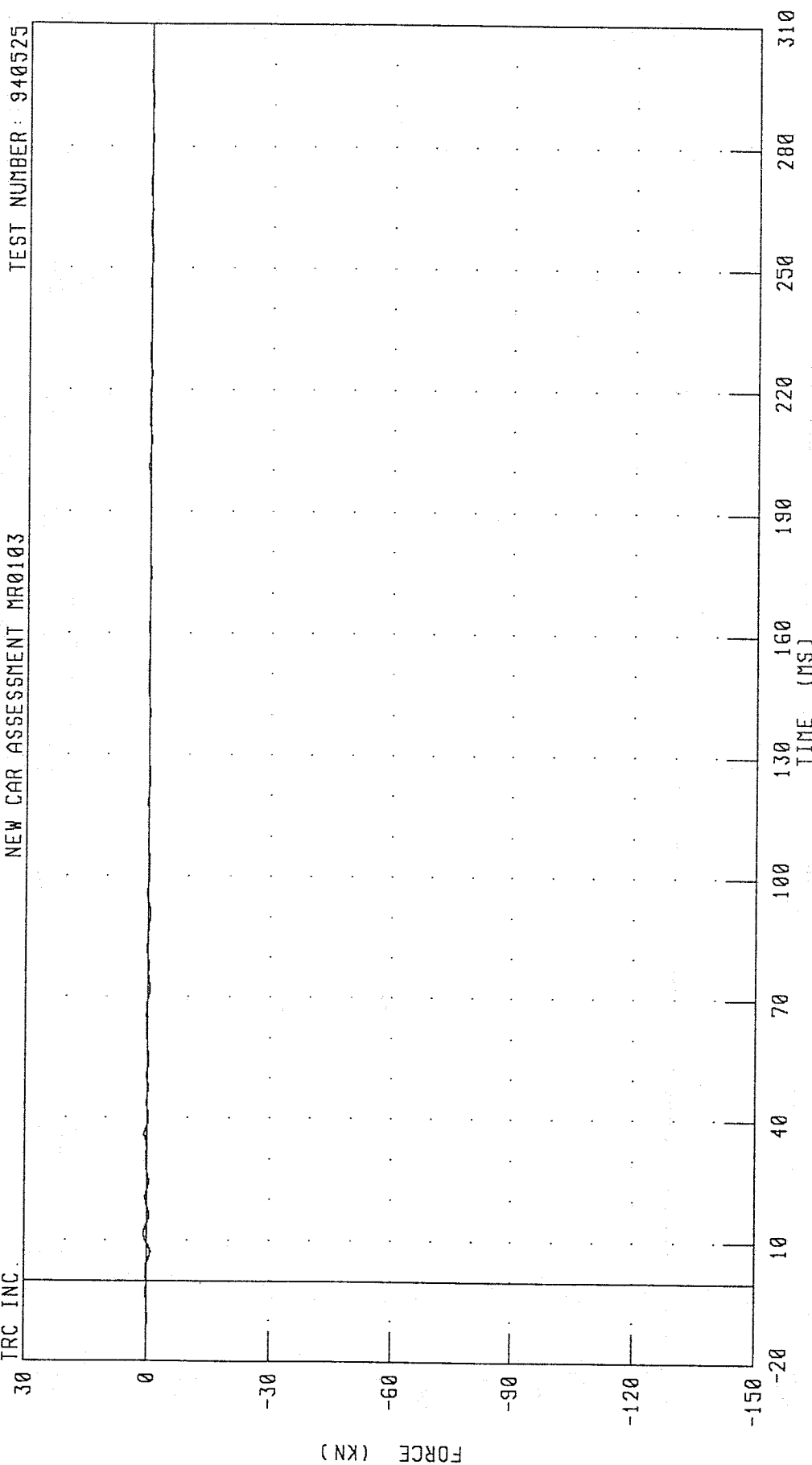
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A7 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: BA7F FILTER: CH. CLASS 60

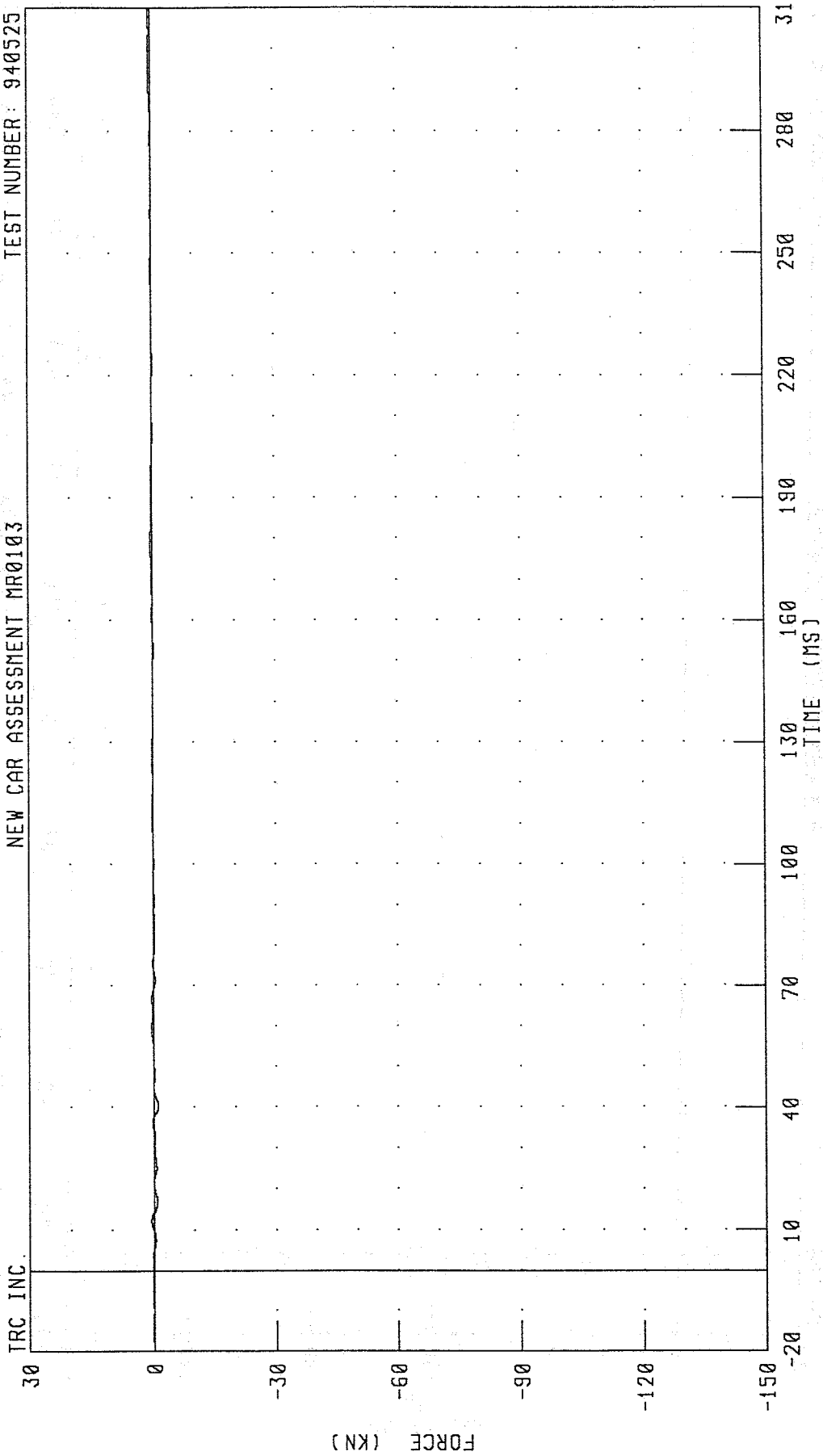
PEAK DATA: 0.74 KN @ 11.60 MS; -0.93 KN @ 7.04 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A8 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: BA8F FILTER: CH. CLASS 60

PEAK DATA: 0.63 KN @ 12.16 MS; -1.19 KN @ 40.32 MS

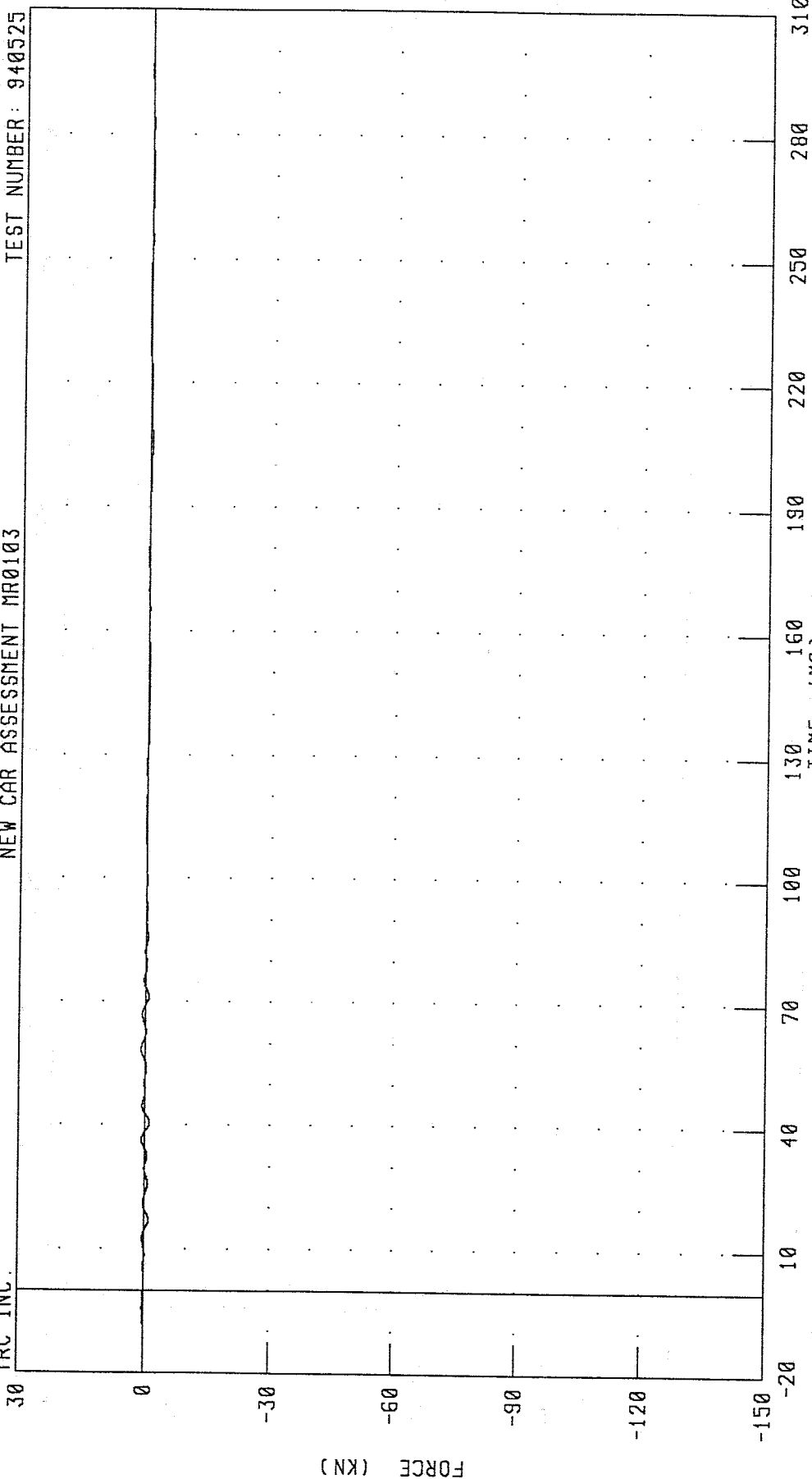
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION A9 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: BA9F FILTER: CH. CLASS 60

PEAK DATA: 0.92 KN @ 58.48 MS; -1.17 KN @ 40.64 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

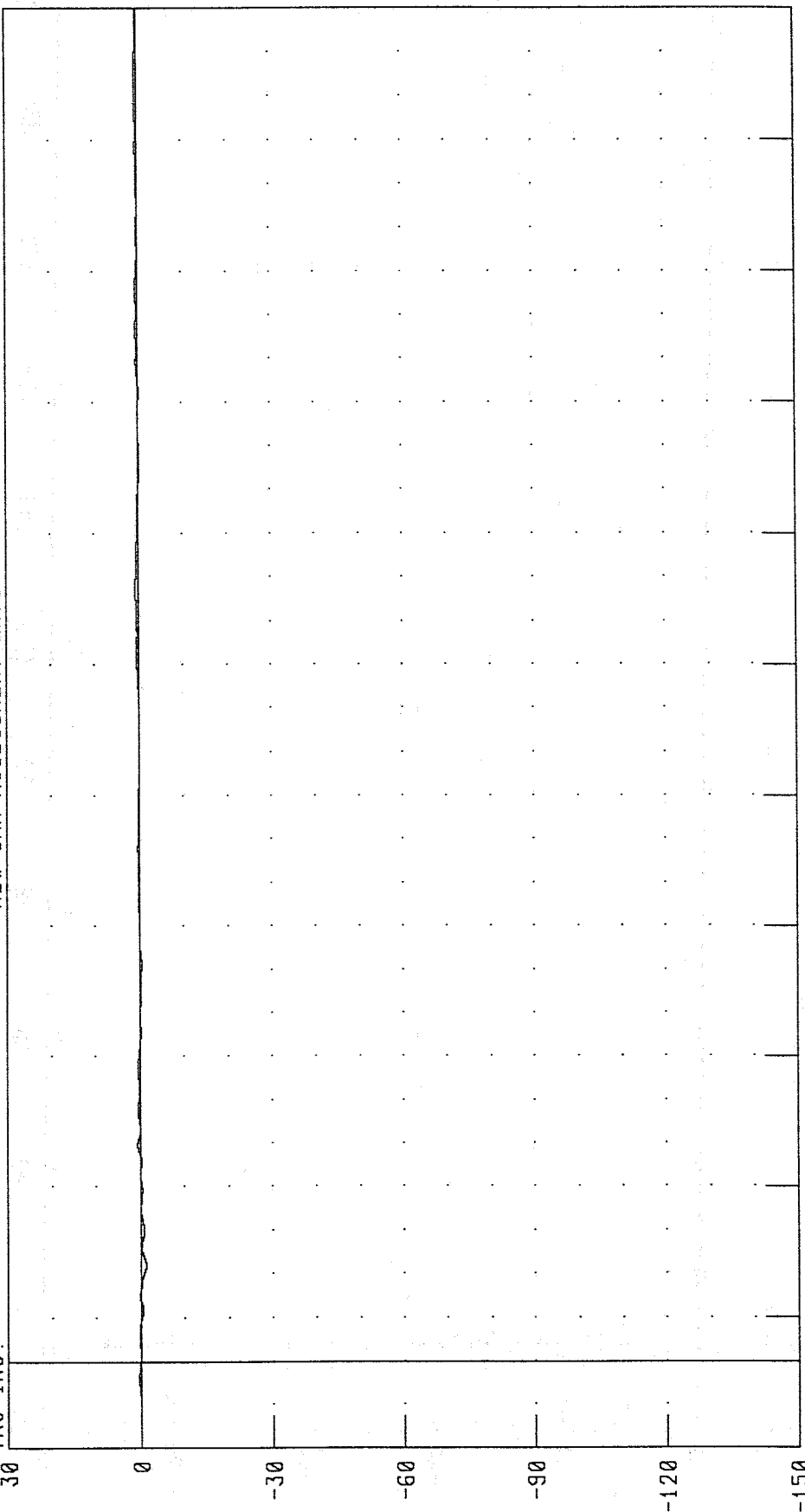
LOAD CELL BARRIER POSITION B1 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.

FORCE (KN)



TIME (MS)

CHANNEL: BB1F FILTER: CH. CLASS 60

PEAK DATA: 0.73 KN @ 177.44 MS; -1.27 KN @ 22.00 MS

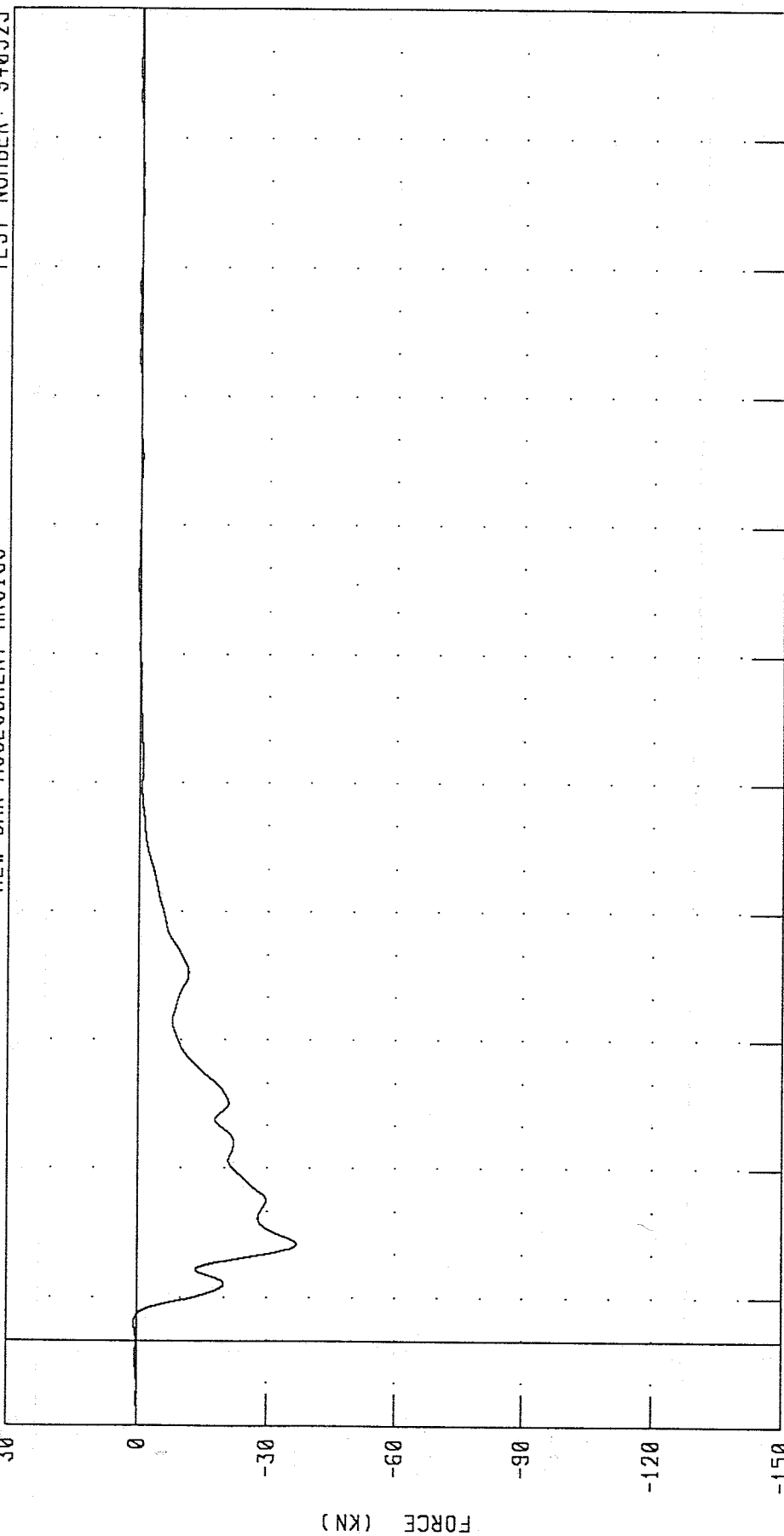
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B2 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



TIME (MS)

CHANNEL: BB2F FILTER: CH. CLASS 60

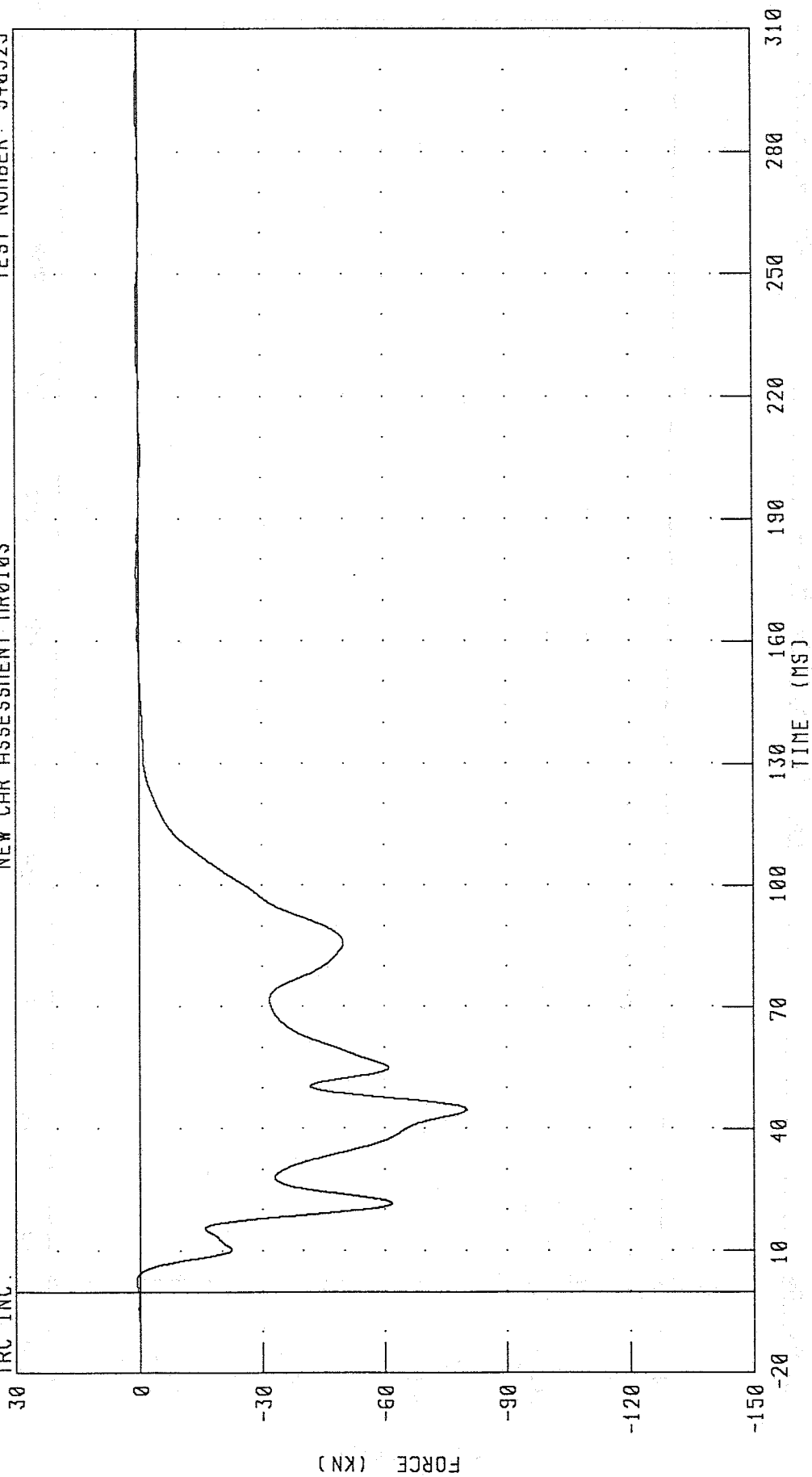
PEAK DATA: 0.68 KN @ 3.92 MS; -36.87 KN @ 22.40 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



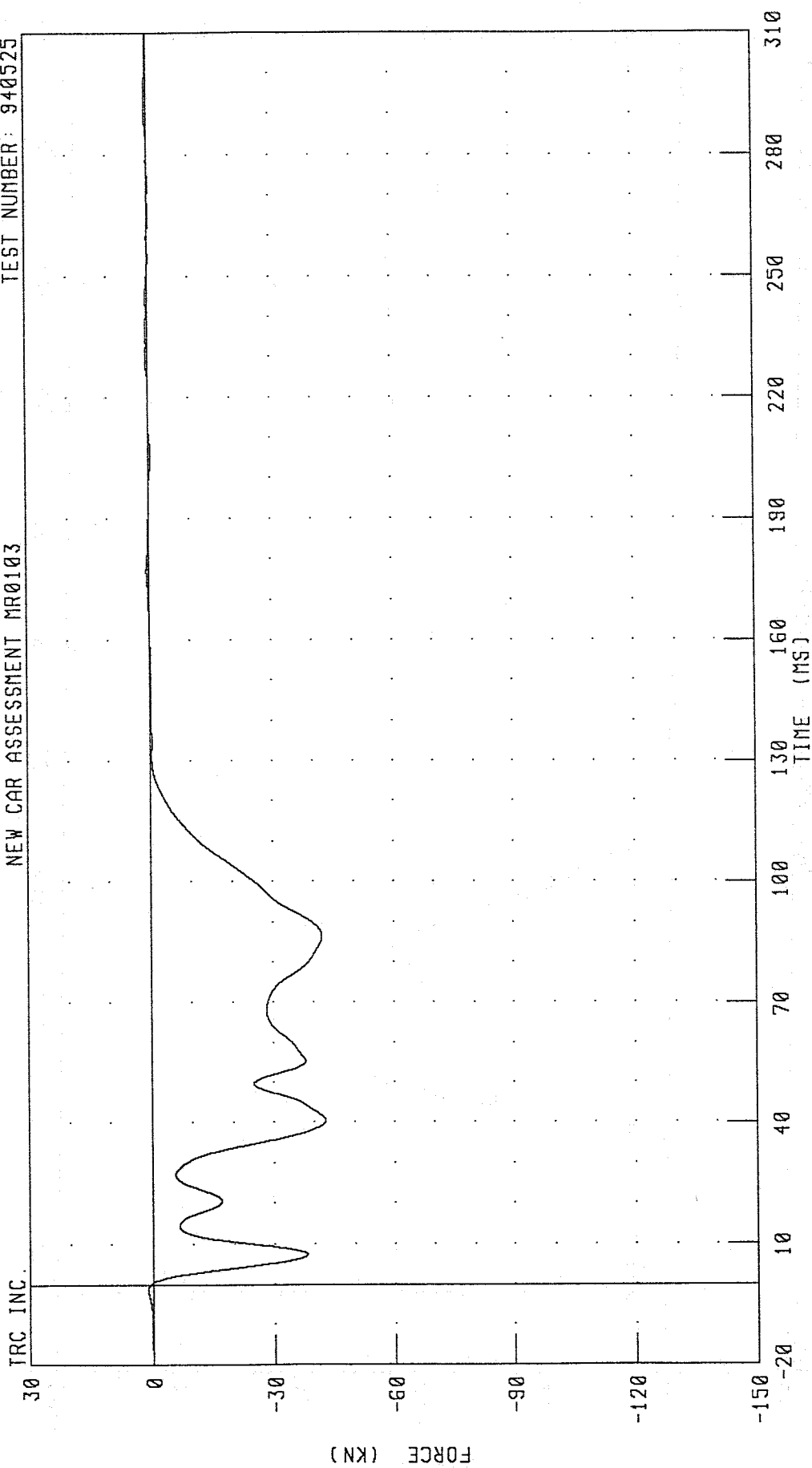
PEAK DATA: 0.83 KN @ 2.48 MS; -80.19 KN @ 44.80 MS

CHANNEL: BB3F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



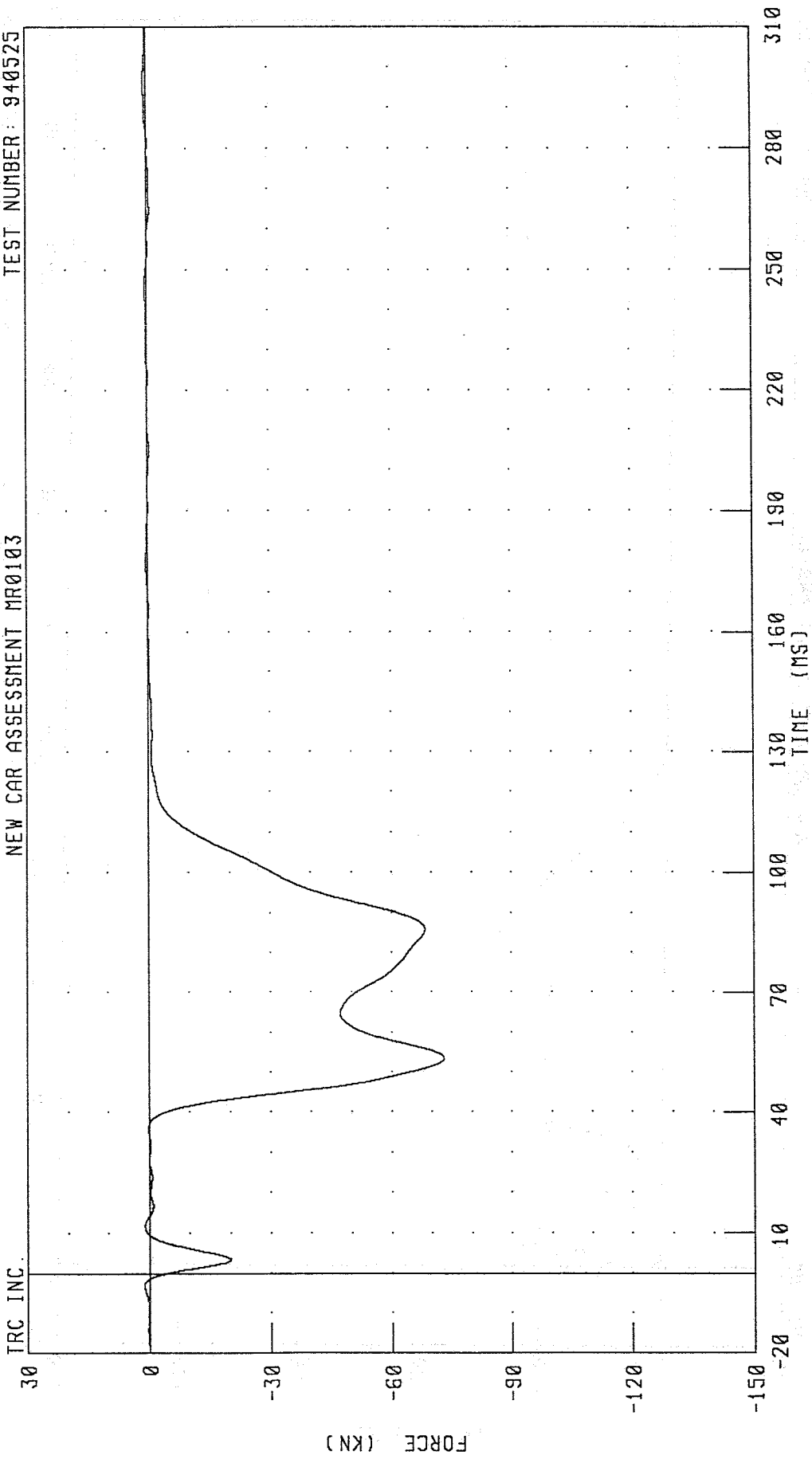
CHANNEL: BB4F FILTER: CH. CLASS 60

PEAK DATA: 1.22 KN @ -1.36 MS; -42.68 KN @ 40.48 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



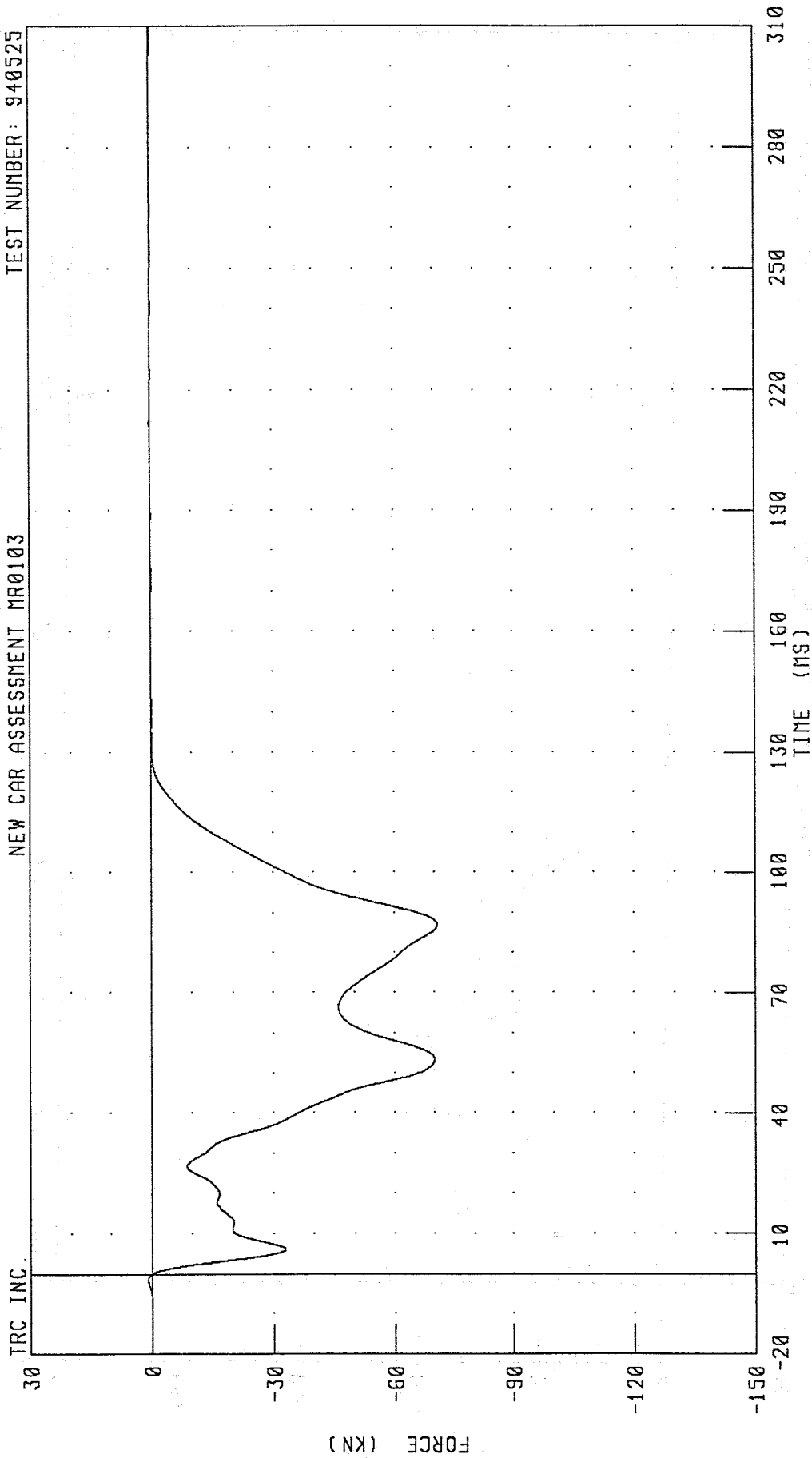
CHANNEL: BB5F FILTER: CH. CLASS 60

1984 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B6 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



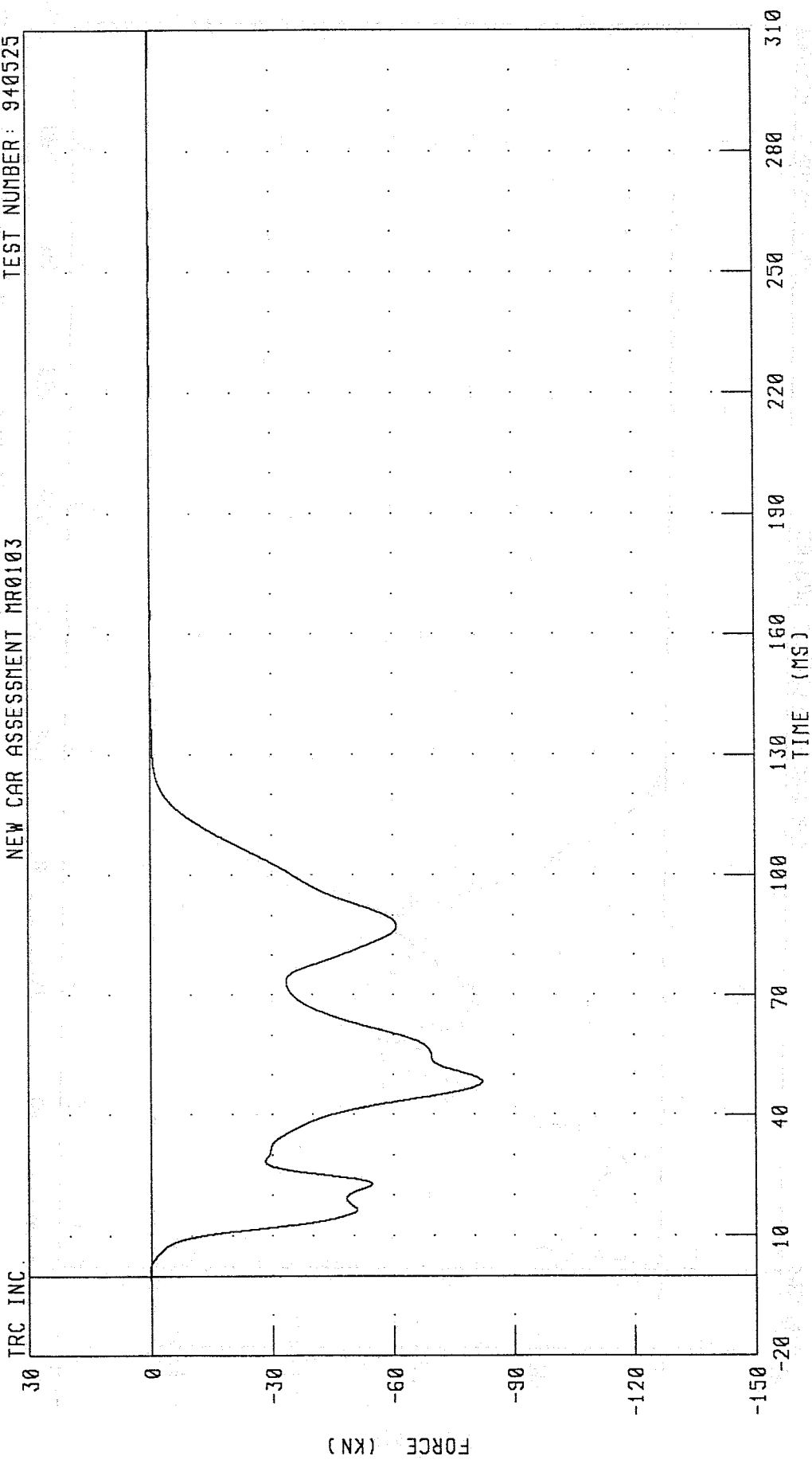
PEAK DATA: 0.99 KN @ -1.44 MS; -70.65 KN @ 86.96 MS

CHANNEL: BB6F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

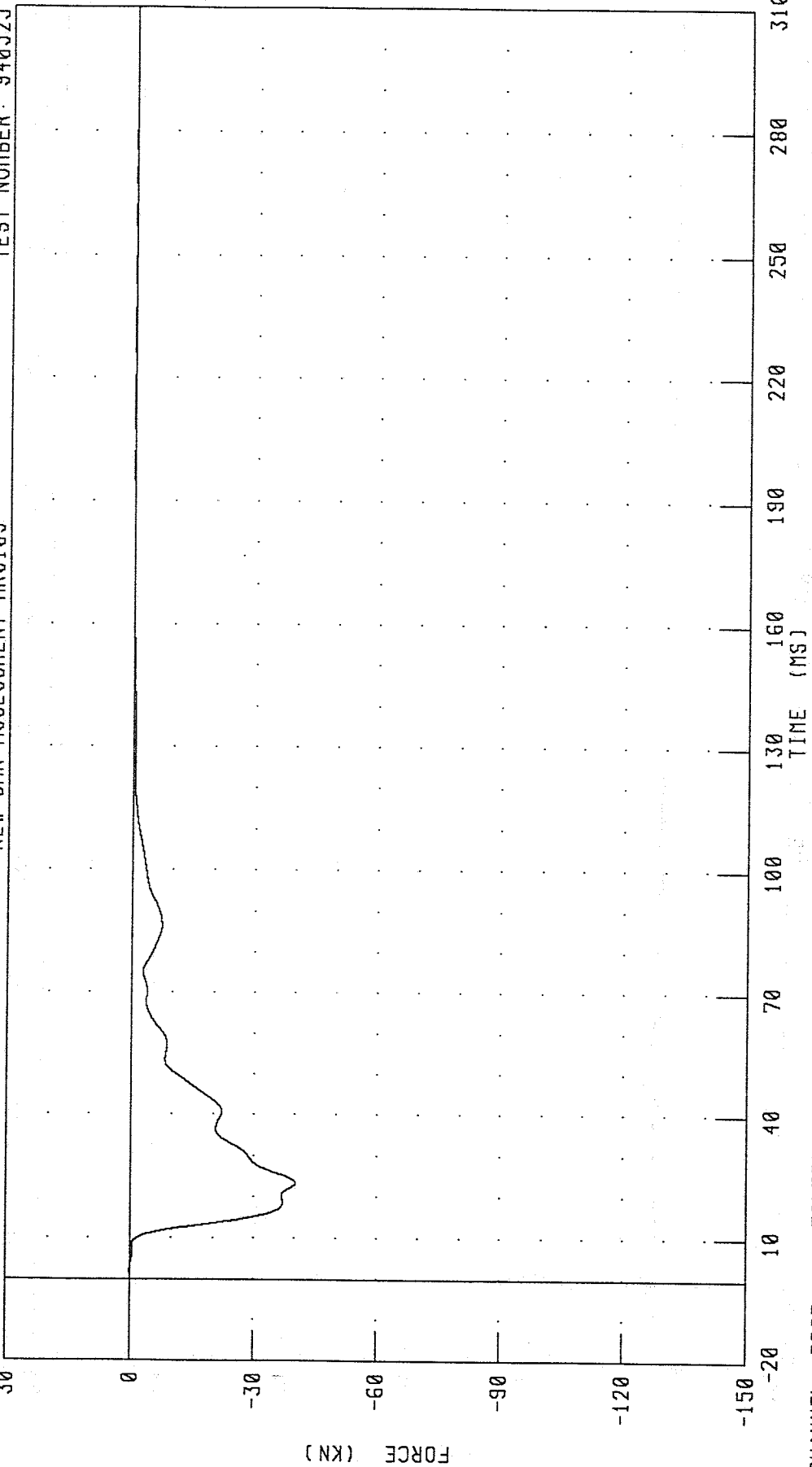


CHANNEL: 007F FILTER: CH. CLASS 60

PEAK DATA: 0.24 KN @ 1.36 MS; -81.99 KN @ 48.32 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE

TRC INC. TEST NUMBER: 940525
NEW CAR ASSESSMENT MR0103



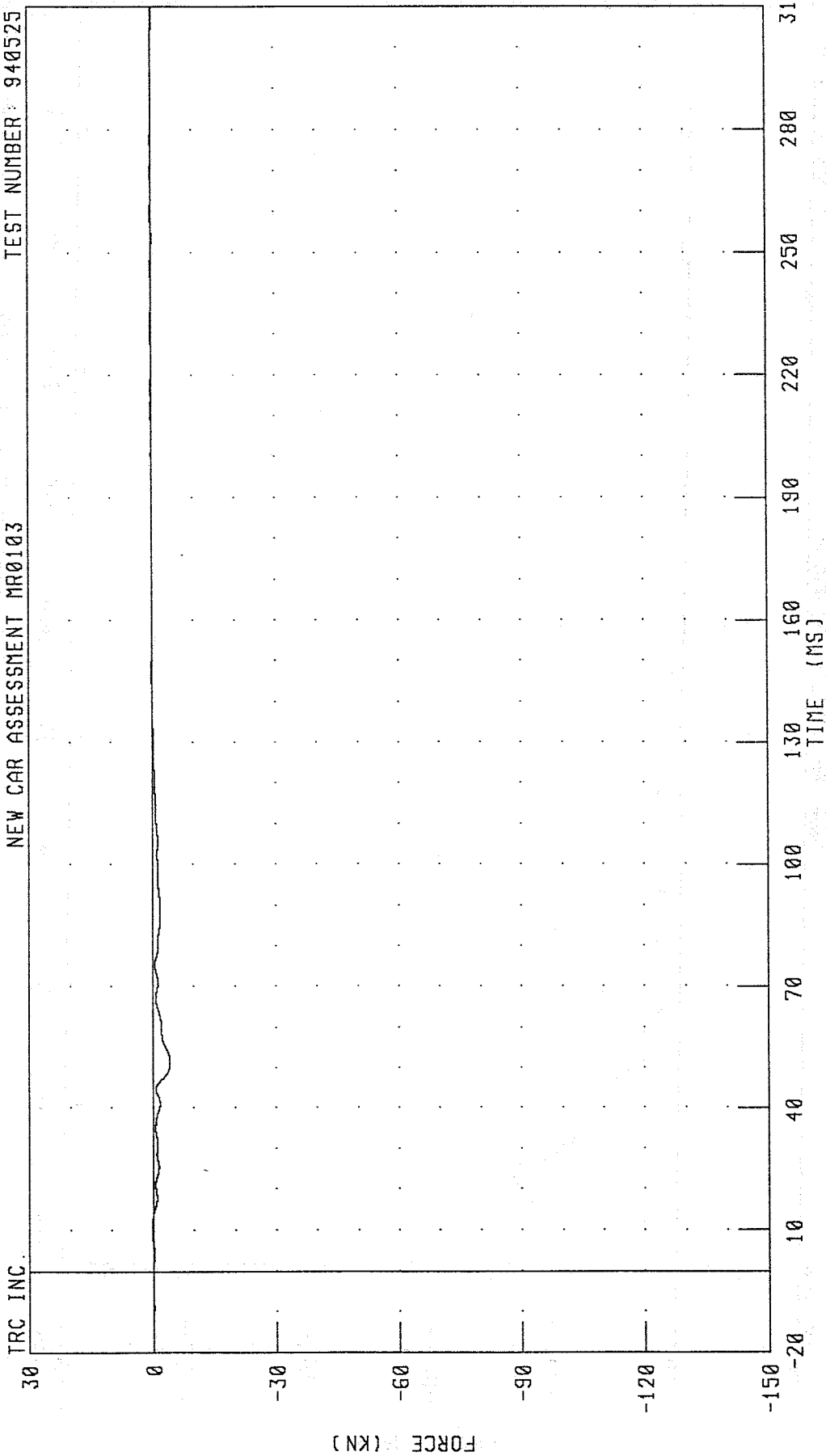
CHANNEL: BB8F FILTER: CH. CLASS 60 PEAK DATA: 0.29 KN @ 211.68 MS; -40.20 KN @ 23.44 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION B9 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 0.30 KN @ 9.36 MS; -4.10 KN @ 51.76 MS

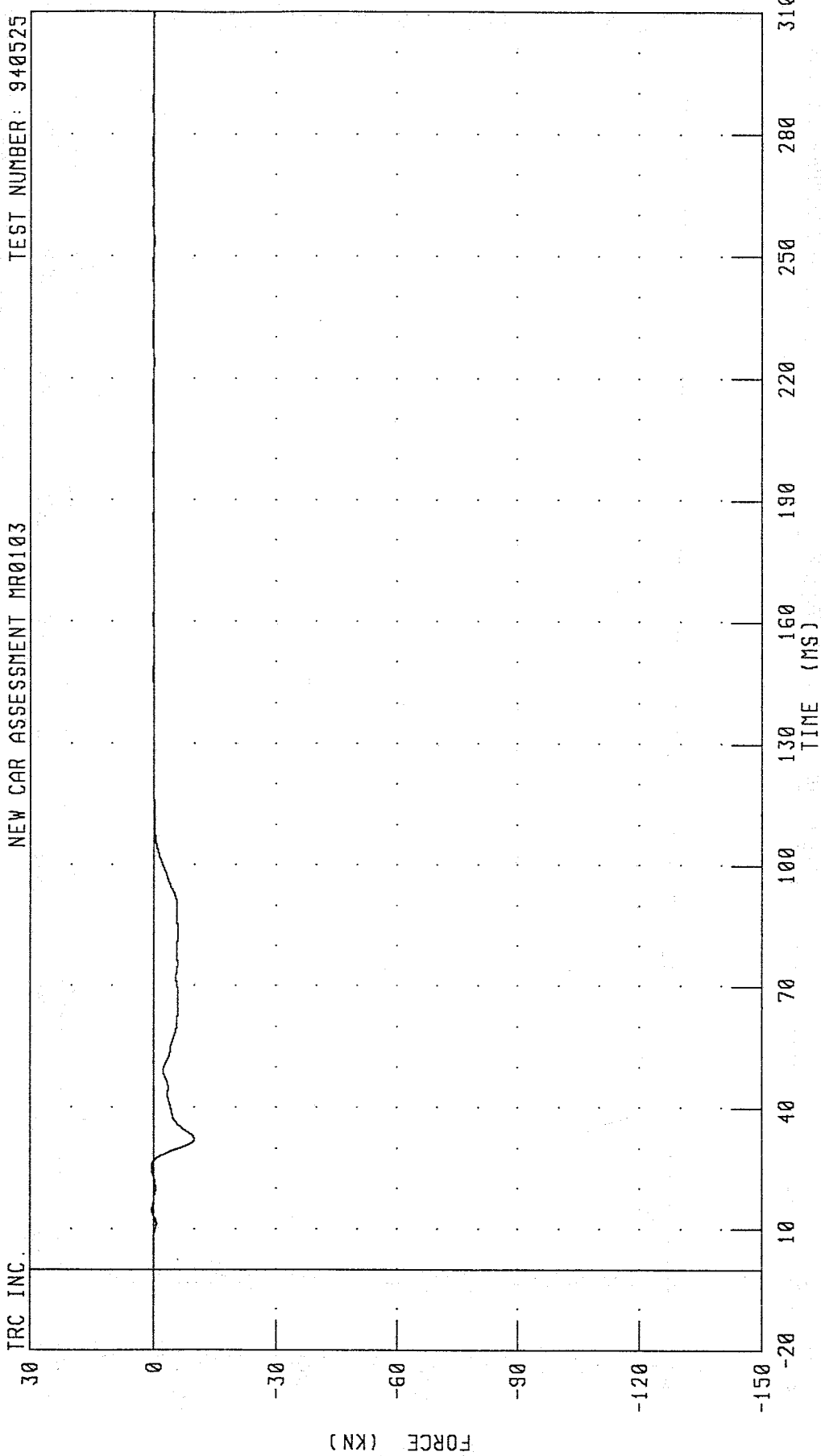
CHANNEL: BB9F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C1 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



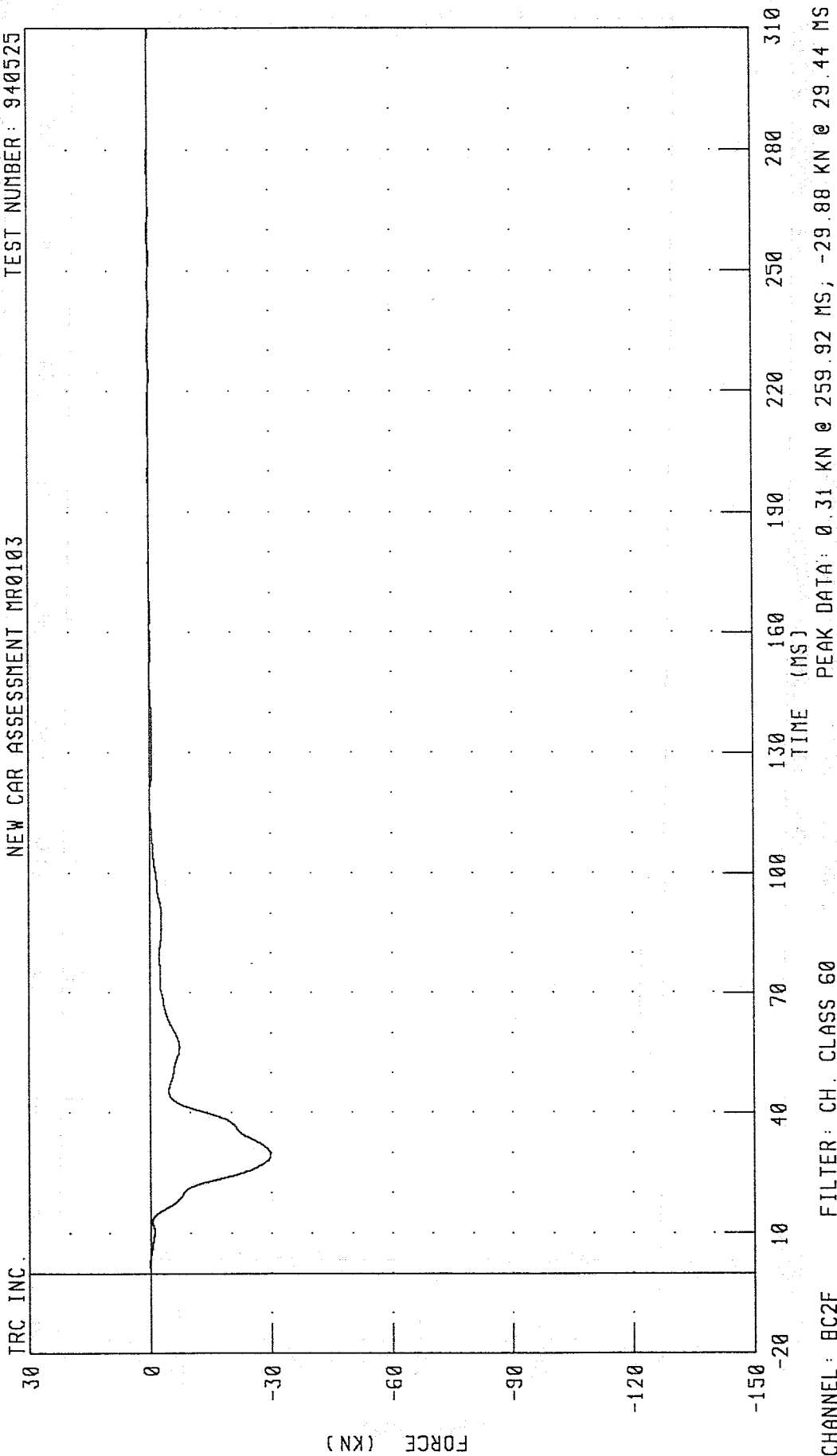
CHANNEL: BC1F FILTER: CH. CLASS 60

PEAK DATA: 0.58 KN @ 25.28 MS; -9.93 KN @ 32.32 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



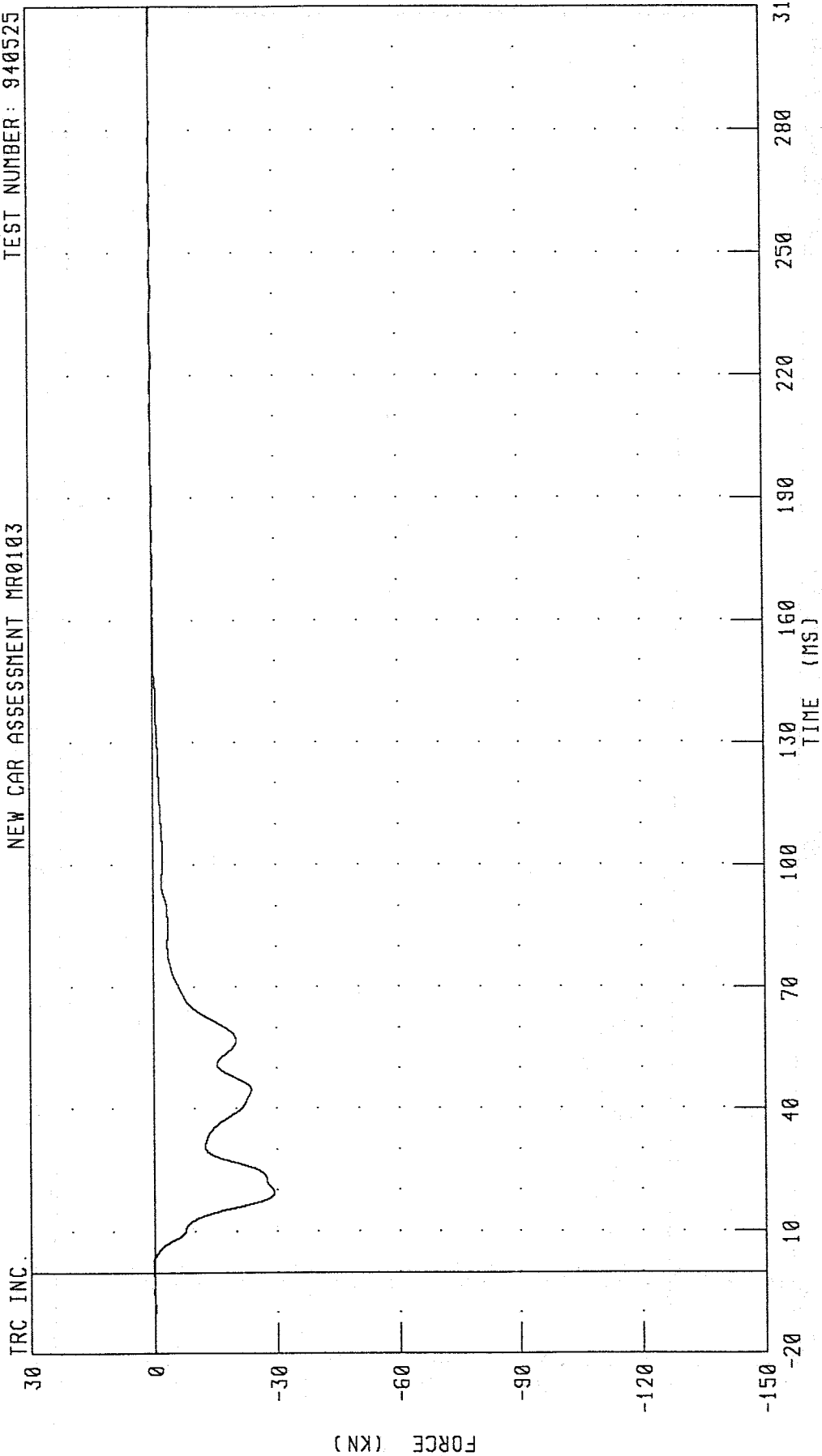
CHANNEL: BC2F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C3 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 0.34 KN @ 1.76 MS; -29.30 KN @ 19.44 MS

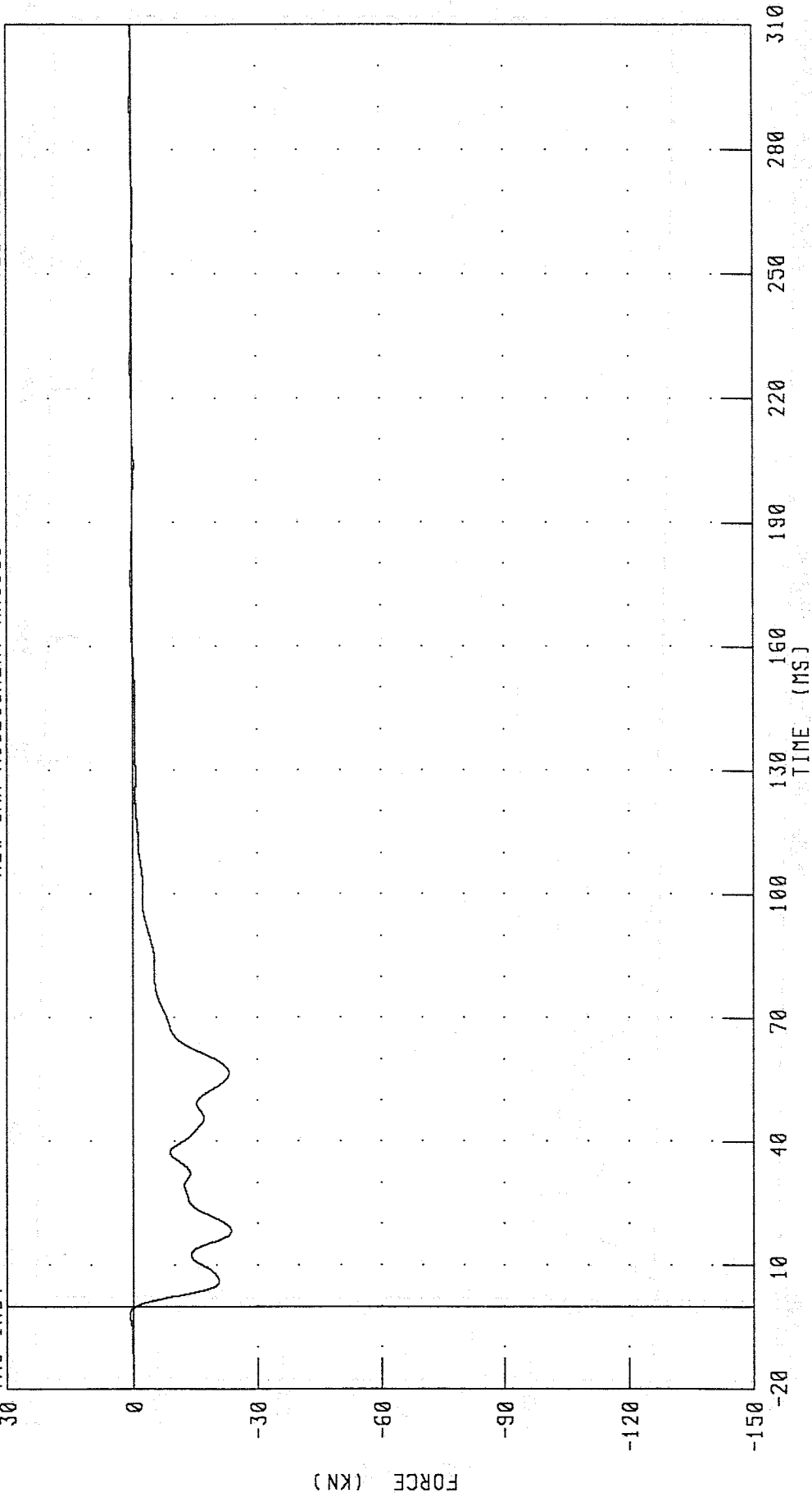
CHANNEL: BC3F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: BC4F

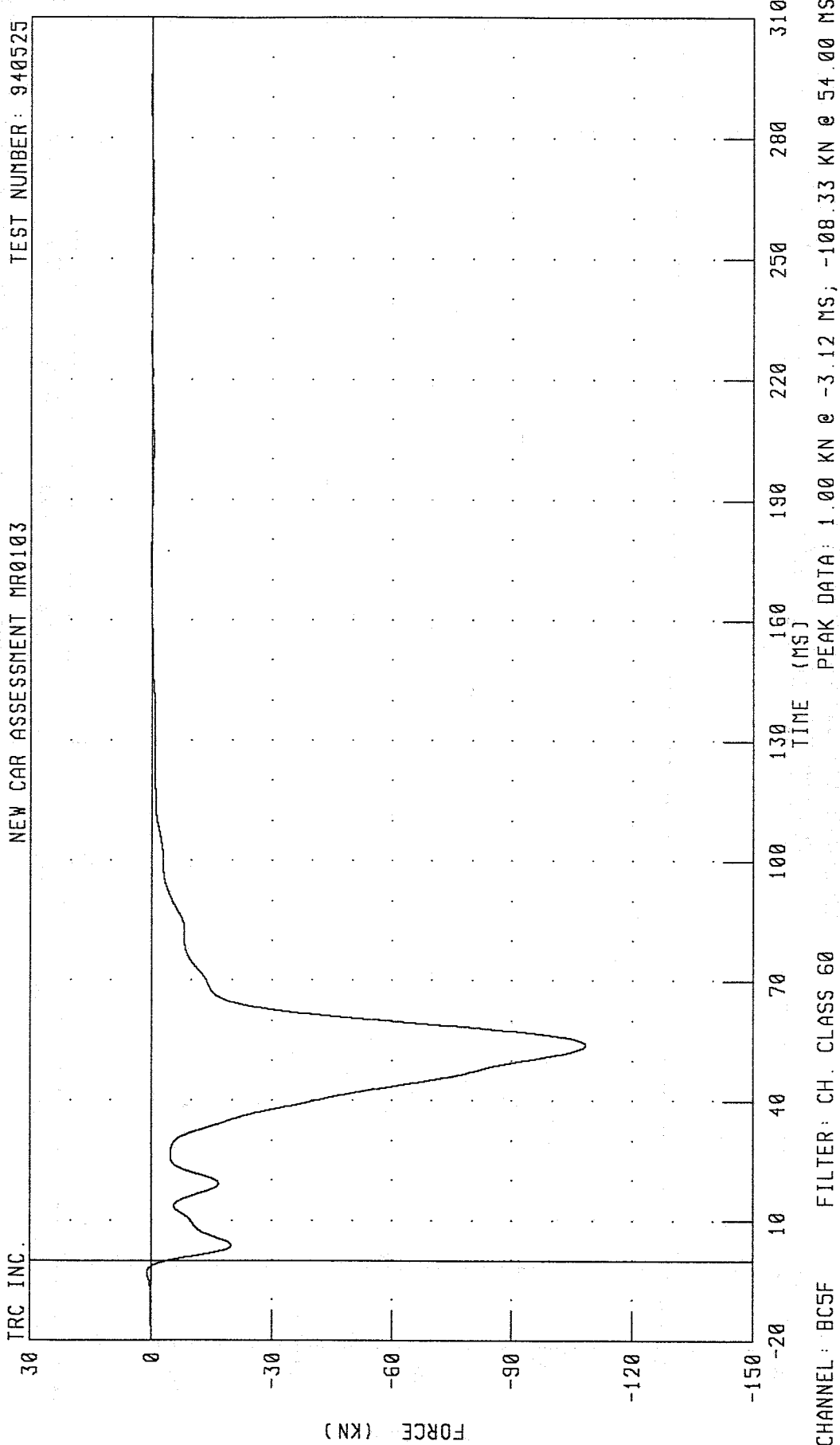
FILTER: CH. CLASS 60

PEAK DATA: 0.78 KN @ -2.00 MS; -23.64 KN @ 18.16 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



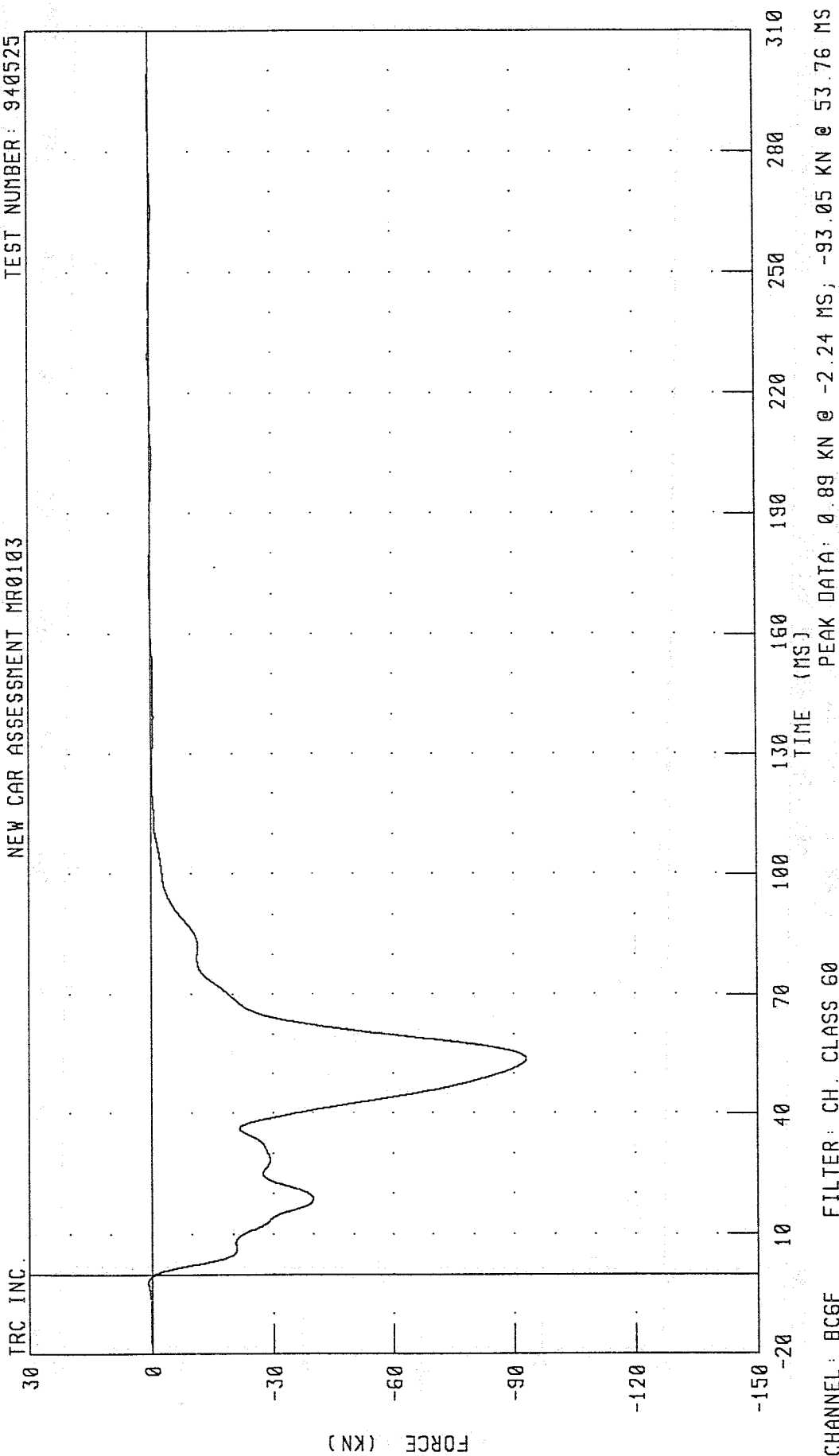
CHANNEL: BC5F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C6 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

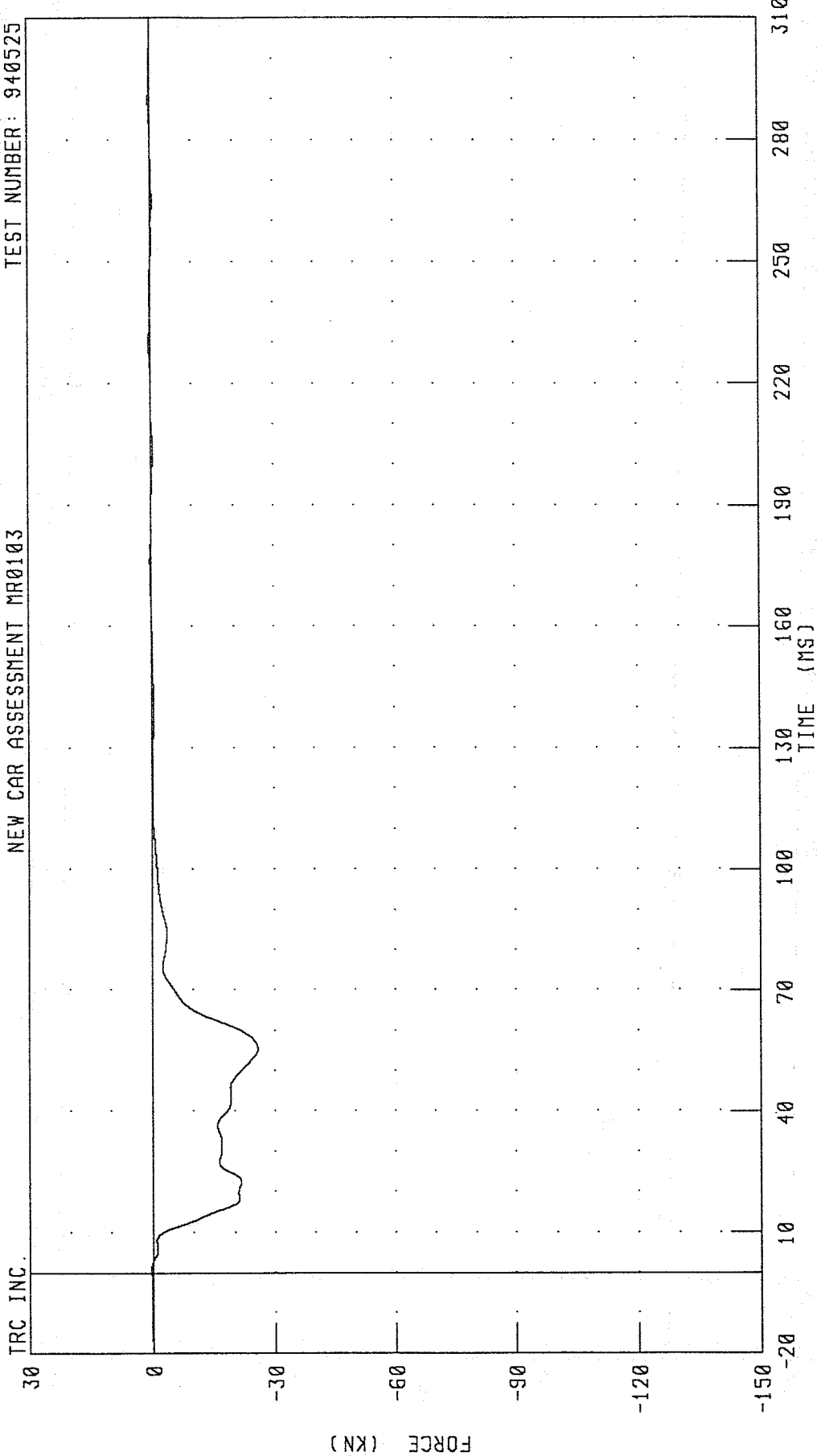


1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C7 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



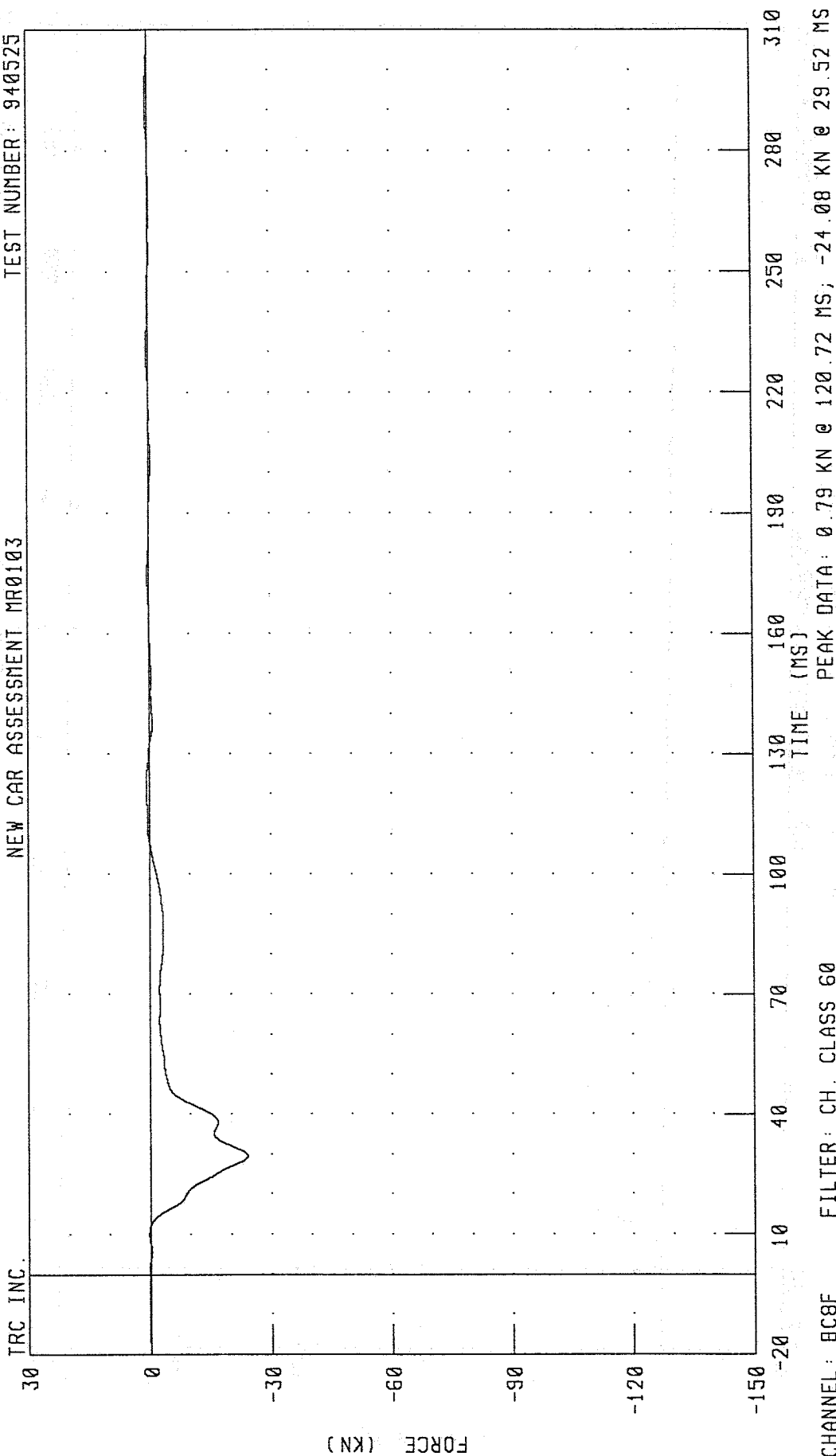
CHANNEL: BC7F FILTER: CH. CLASS 60

PEAK DATA: 0.41 KN @ 229.52 MS; -25.88 KN @ 55.36 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



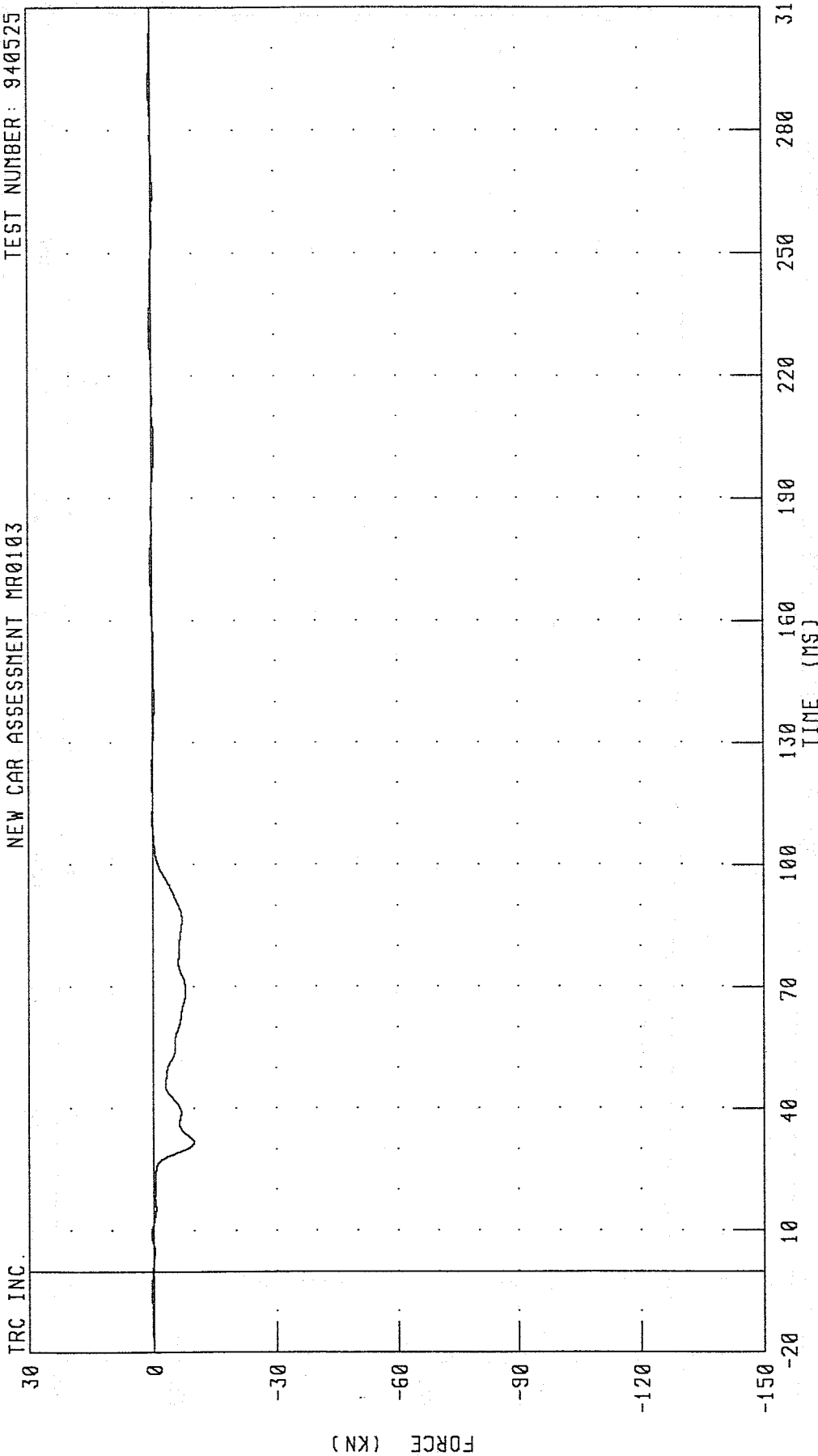
CHANNEL: BC8F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION C9 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 0.54 KN @ 229.84 MS; -9.88 KN @ 31.76 MS

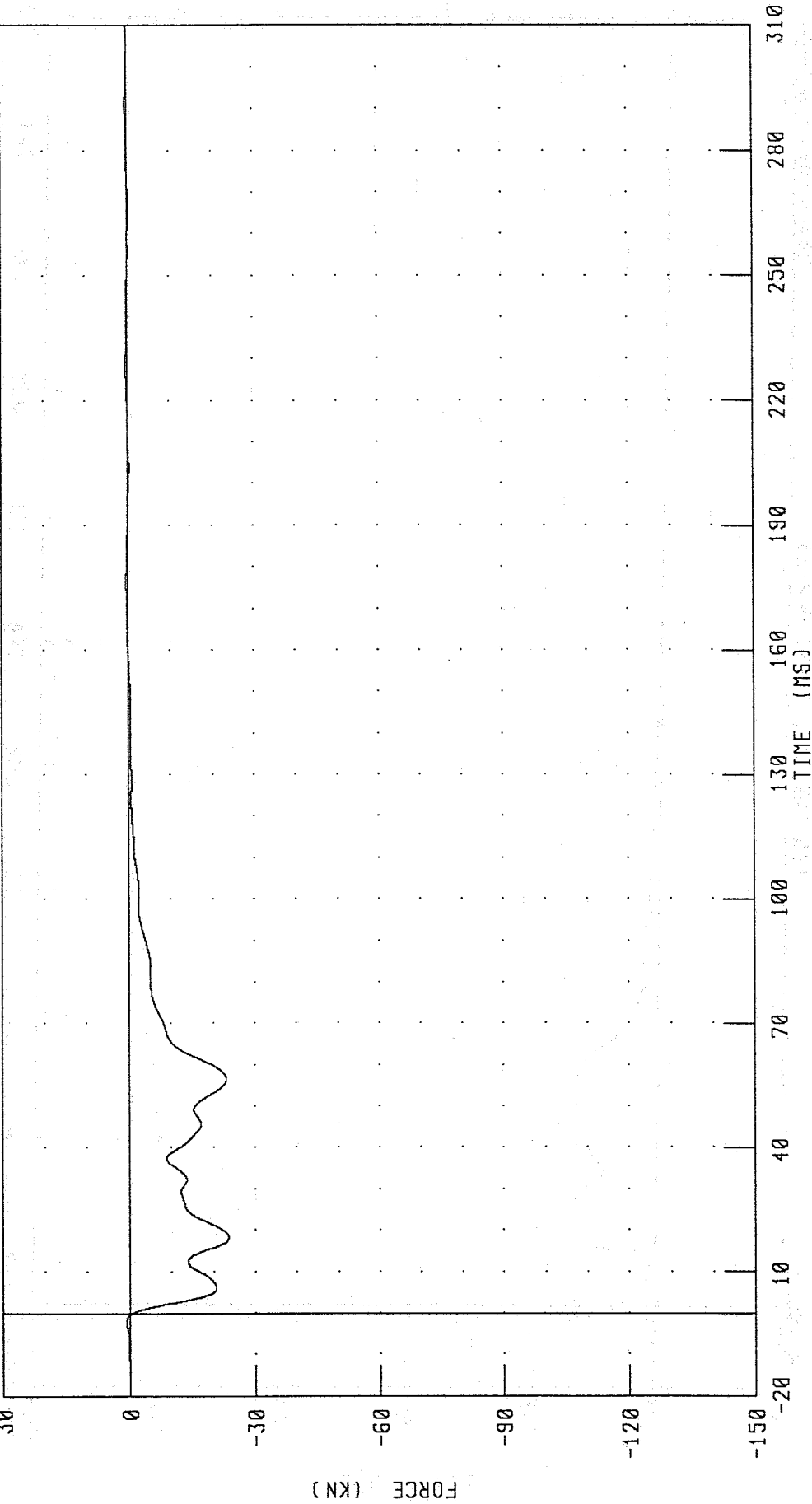
CHANNEL: BC9F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103

TRC INC.



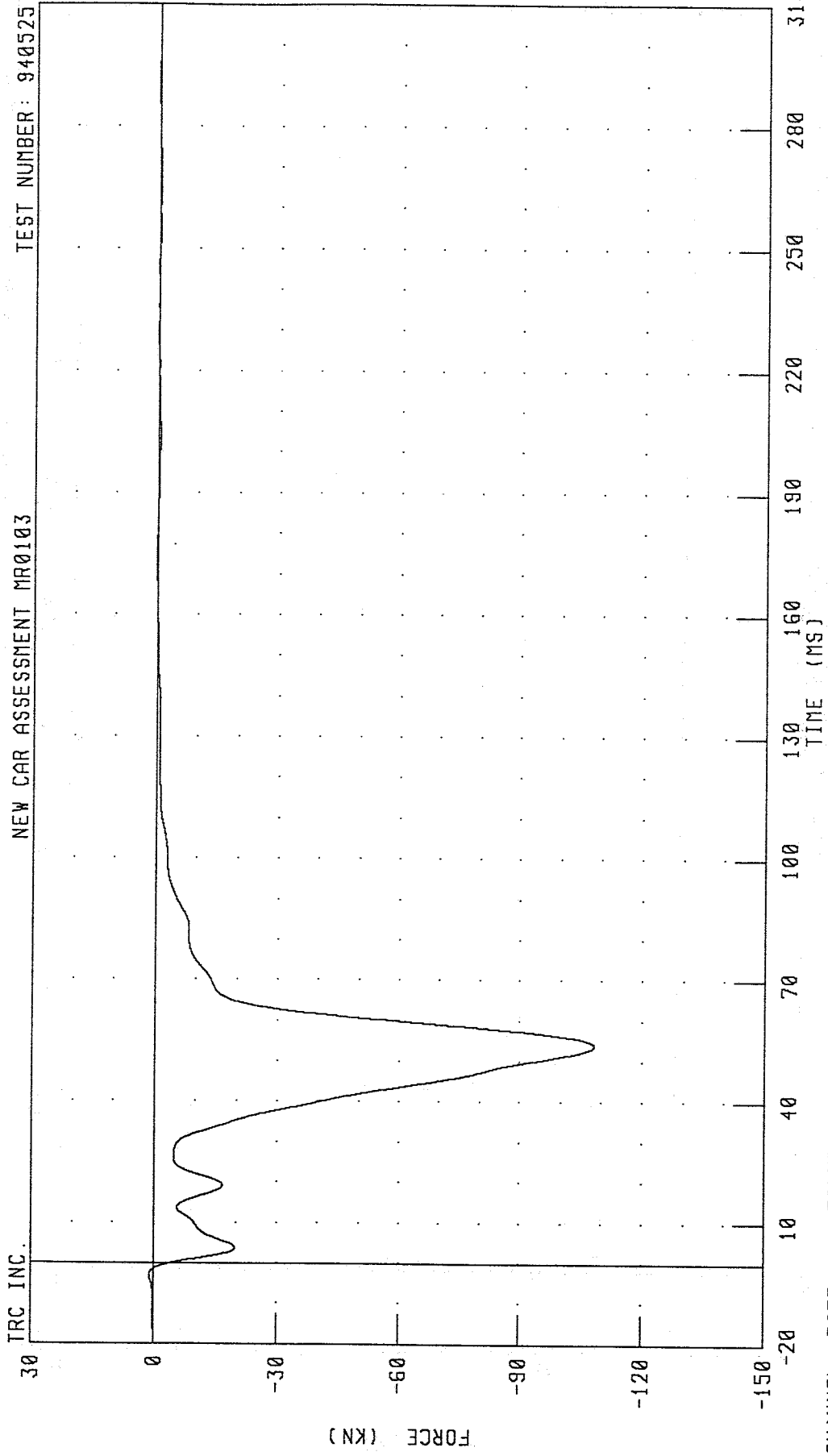
CHANNEL: BC4F FILTER: CH. CLASS 60

PEAK DATA: 0.78 KN @ -2.00 MS; -23.64 KN @ 18.16 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C5 FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



PEAK DATA: 1.00 KN @ -3.12 MS; -108.33 KN @ 54.00 MS

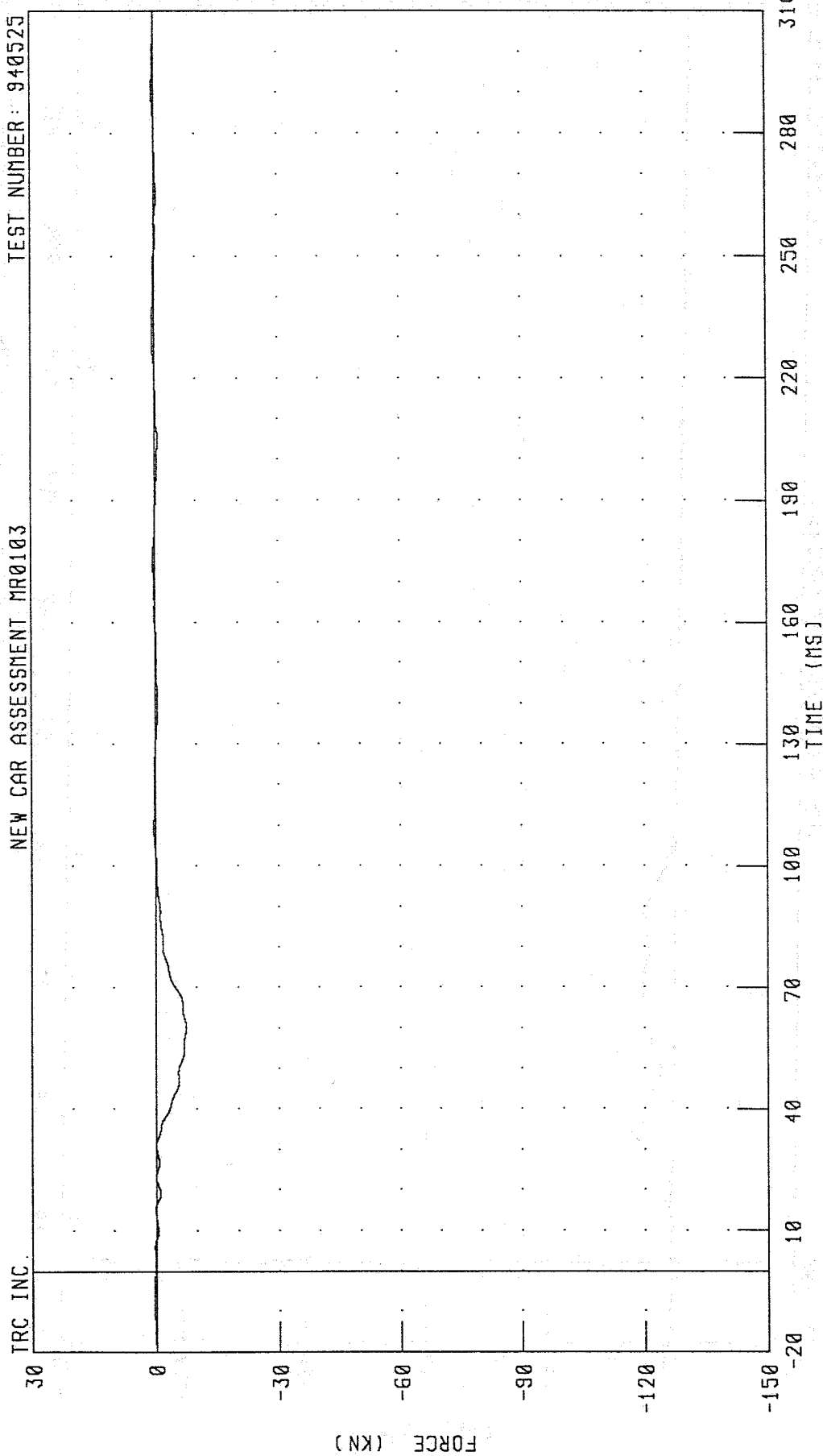
CHANNEL: BC5F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION D1 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 0.58 KN @ 176.00 MS; -7.42 KN @ 60.24 MS

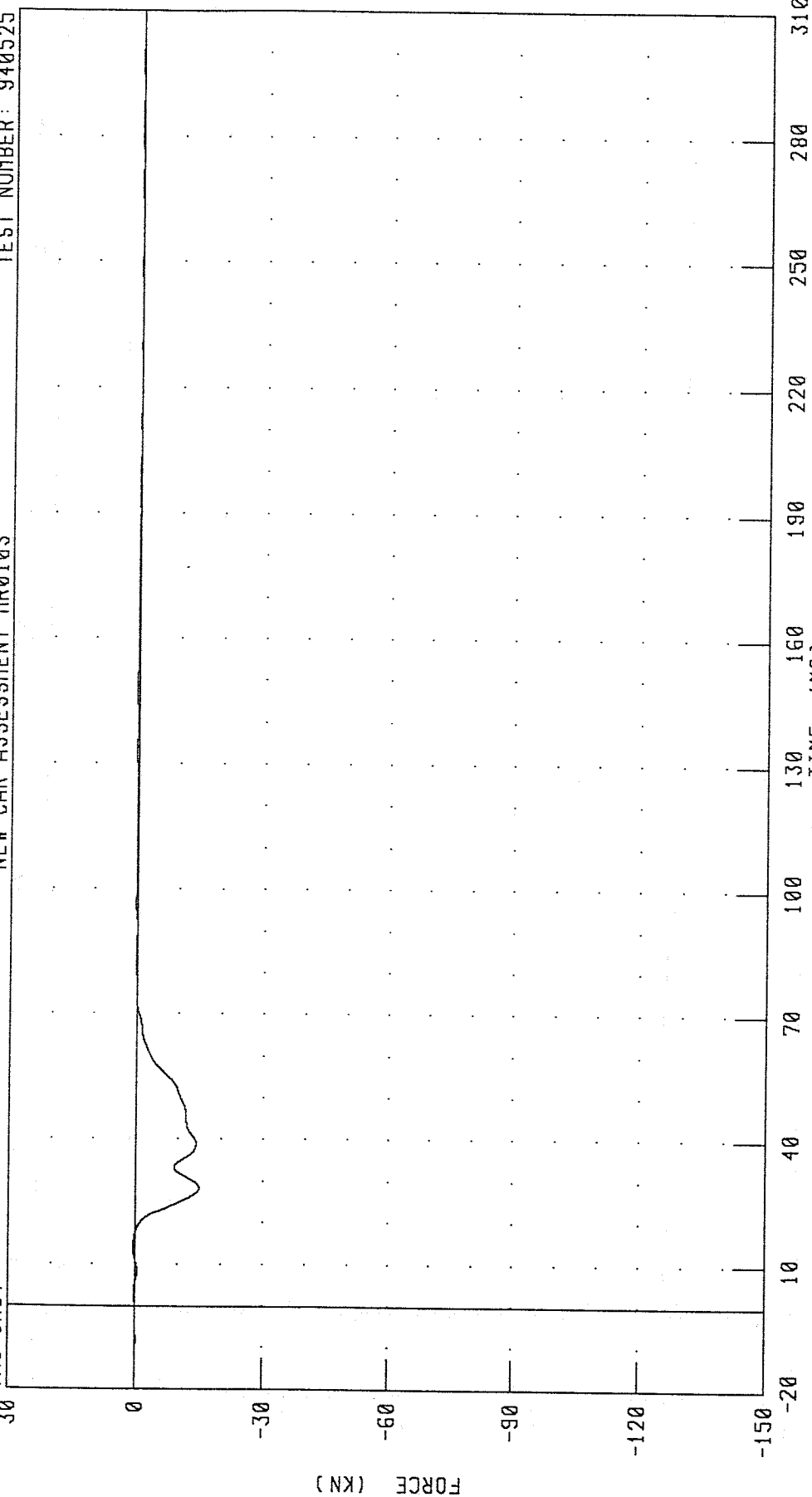
CHANNEL: BD1F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103

TRC INC.



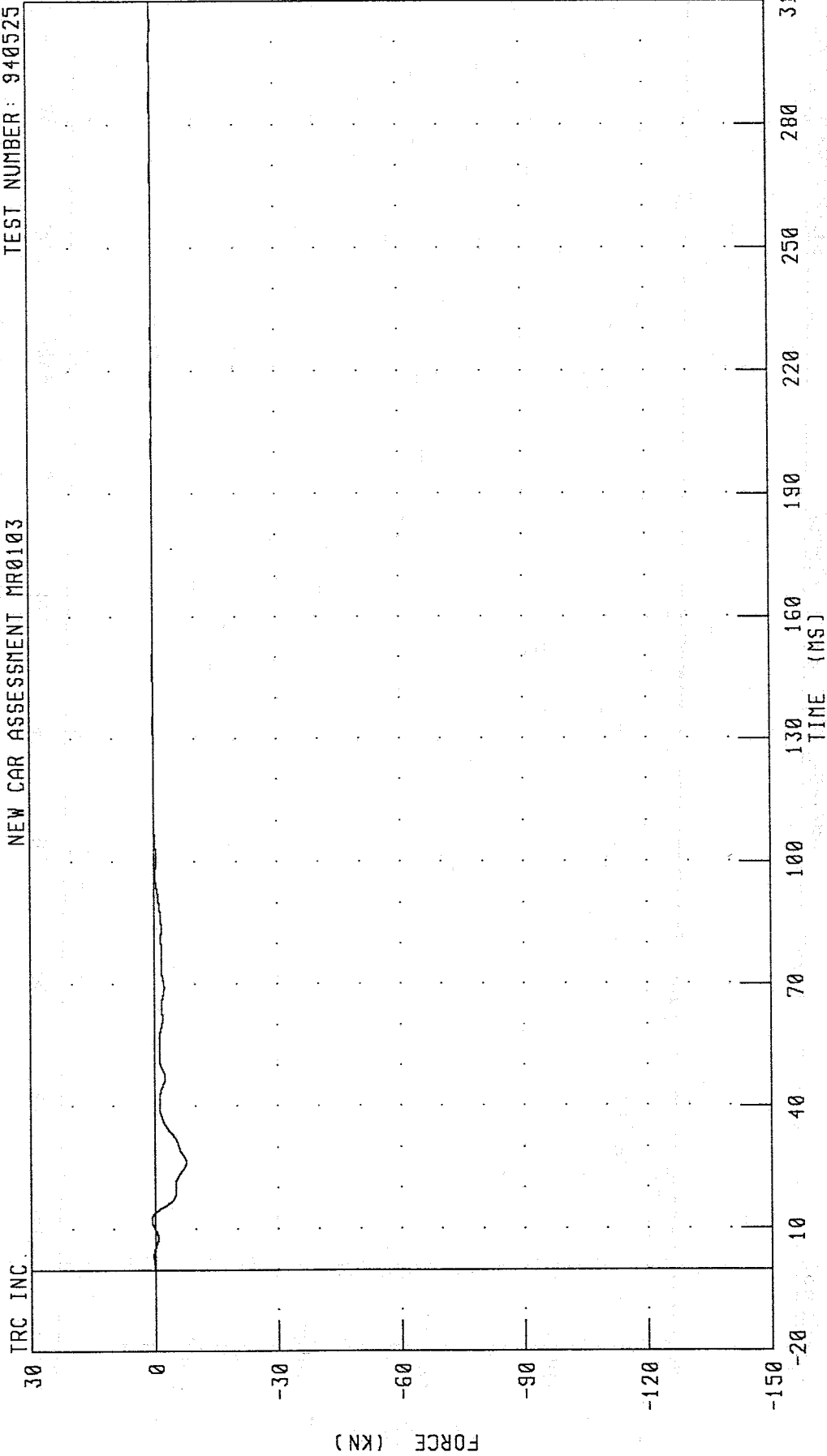
CHANNEL: BD2F FILTER: CH. CLASS 60

PEAK DATA: 0.51 KN @ 13.92 MS; -14.93 KN @ 28.24 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



PEAK DATA: 0.78 KN @ 12.00 MS; -7.67 KN @ 26.40 MS

CHANNEL: BD3F FILTER: CH. CLASS 60

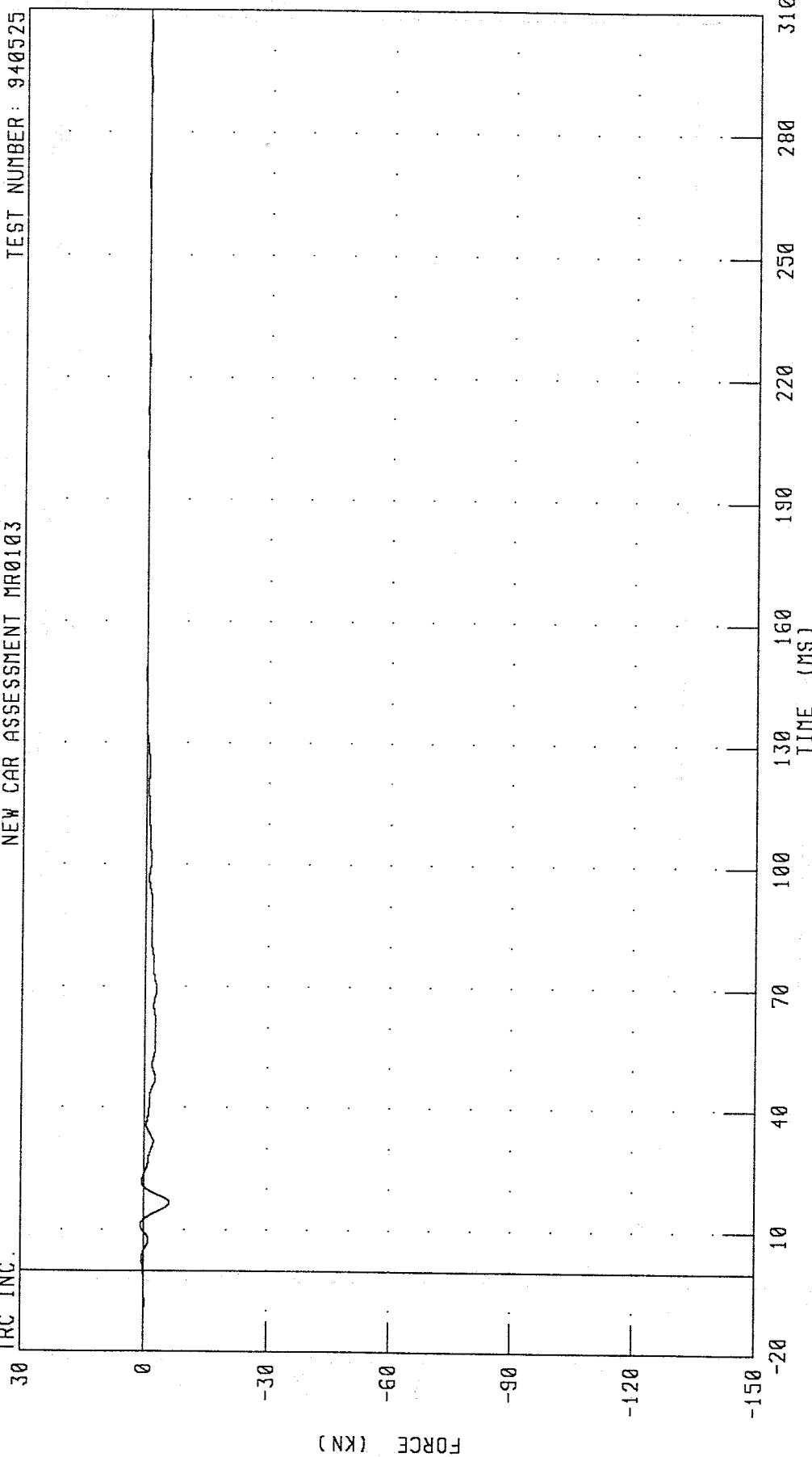
1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION D4 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: BD4F FILTER: CH. CLASS 60

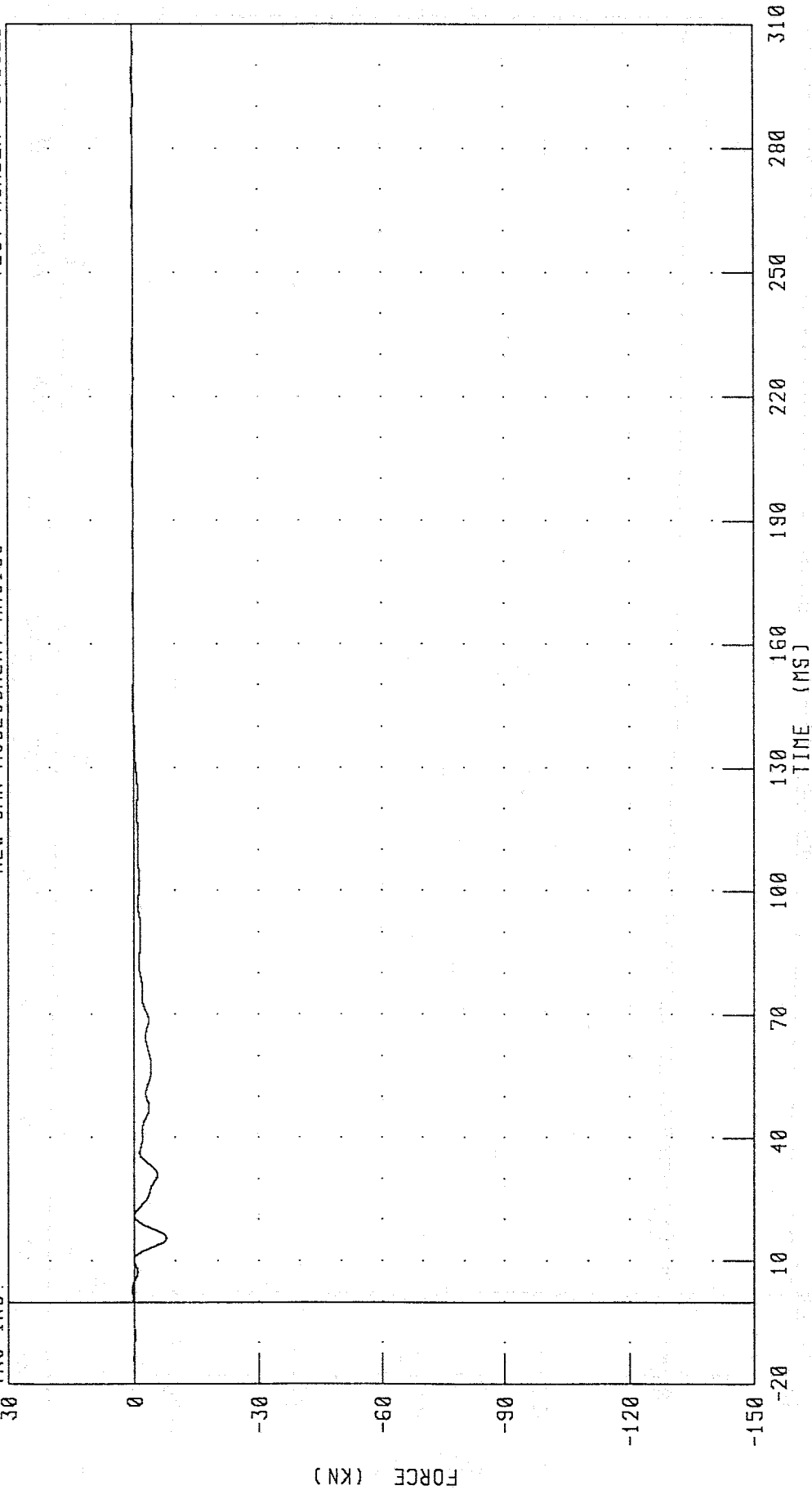
PEAK DATA: 0.82 KN @ 11.04 MS; -6.25 KN @ 16.56 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525

TRC INC.



CHANNEL: B05F

FILTER: CH. CLASS 60

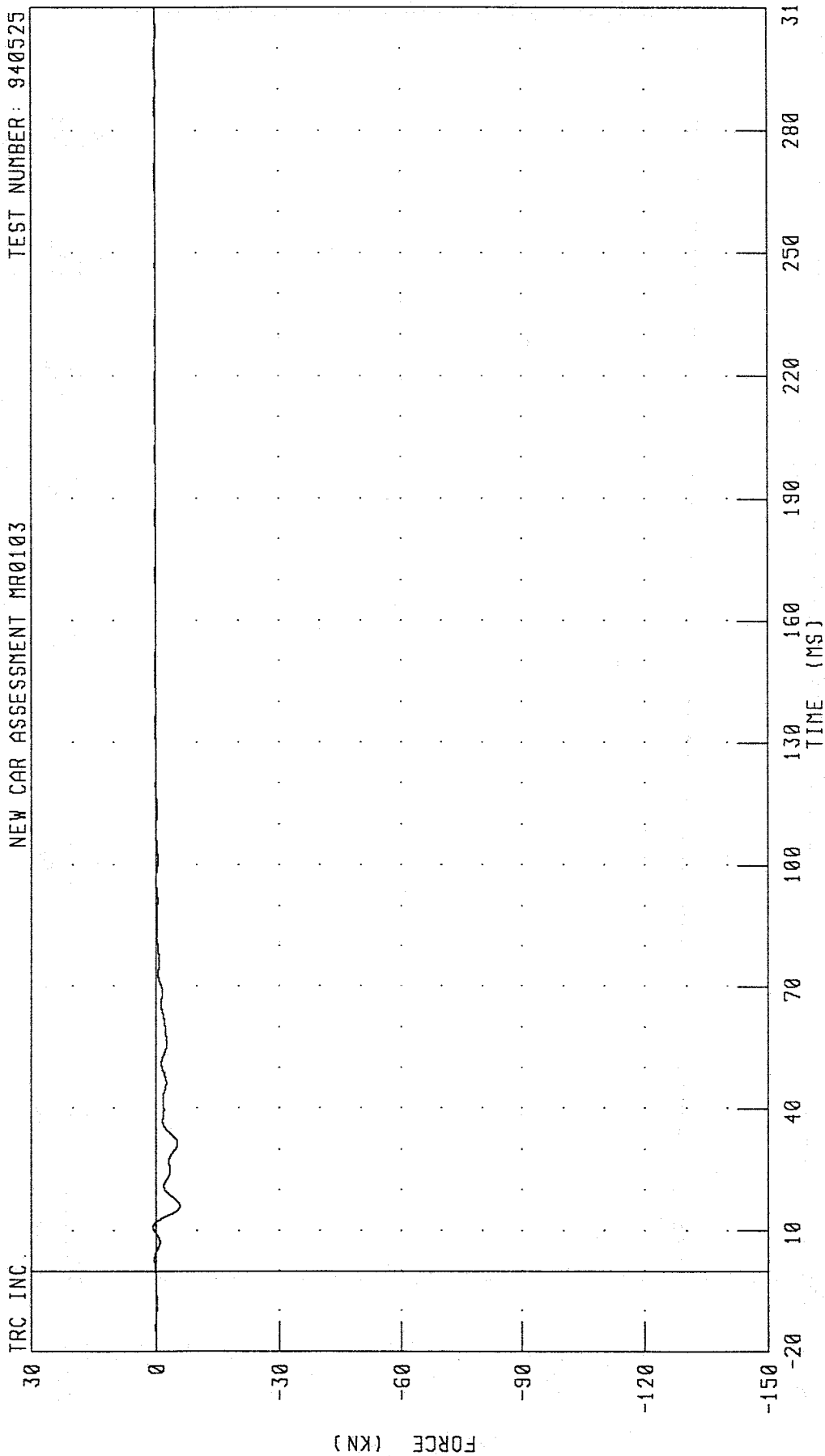
TIME (MS)

PEAK DATA: 0.44 KN @ 2.96 MS; -7.83 KN @ 15.44 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: BD6F FILTER: CH. CLASS 60

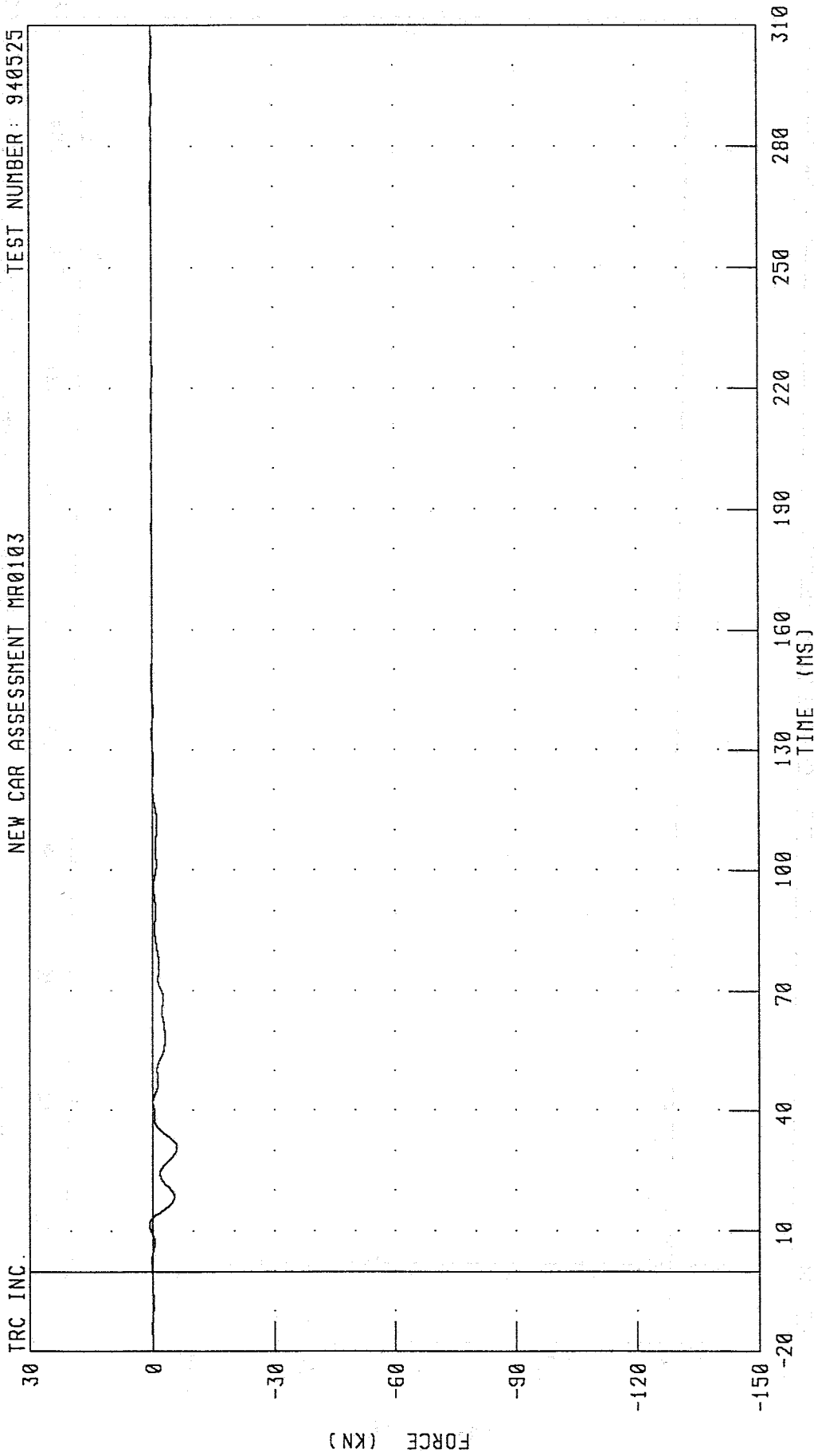
PEAK DATA: 0.68 KN @ 10.88 MS; -5.80 KN @ 16.08 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER POSITION D7 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



PEAK DATA: 0.83 KN @ 11.44 MS; -5.97 KN @ 30.88 MS

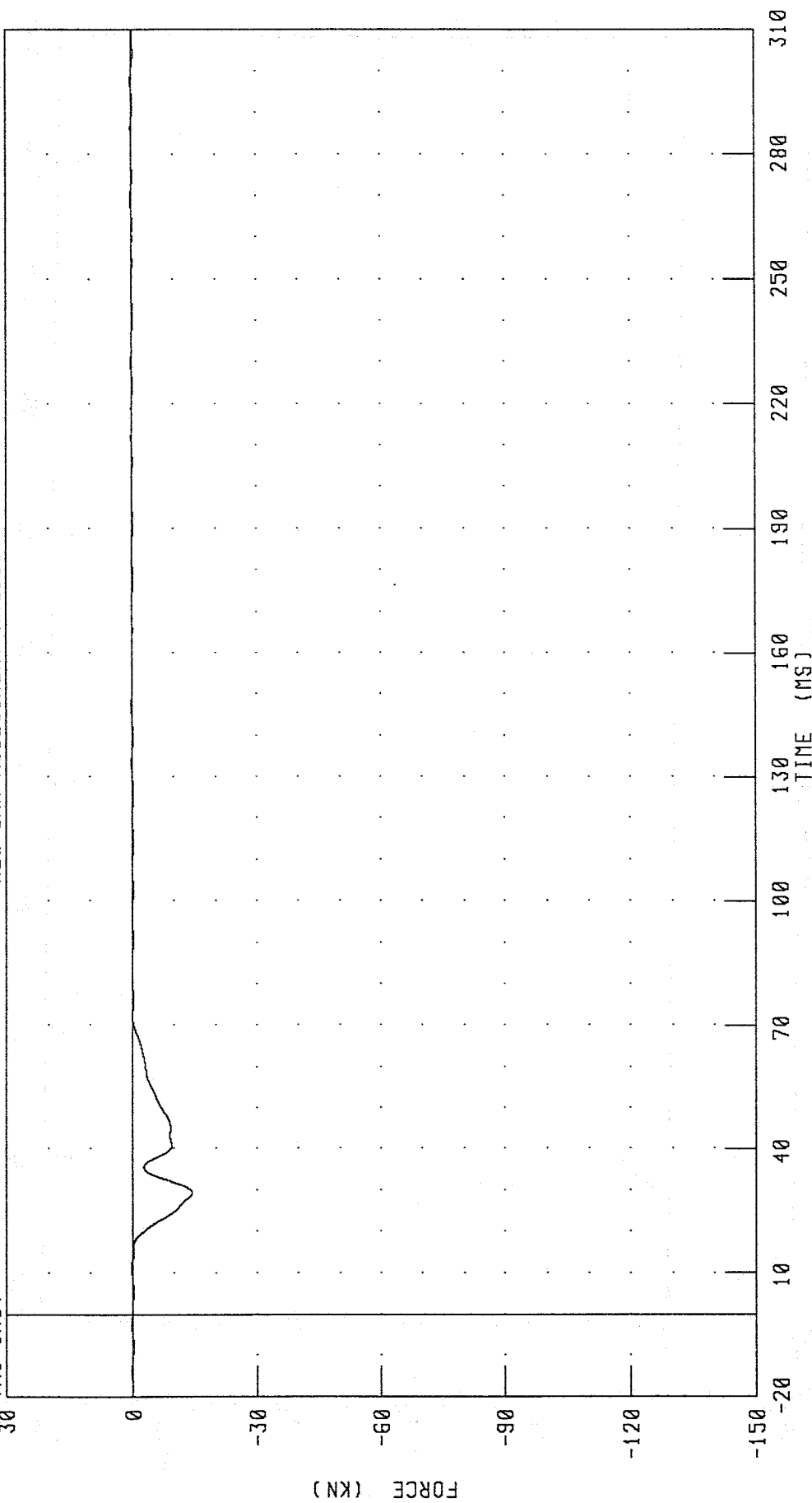
CHANNEL: B07F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103

TRC INC.



PEAK DATA: 0.31 KN @ 11.28 MS; -14.31 KN @ 29.36 MS

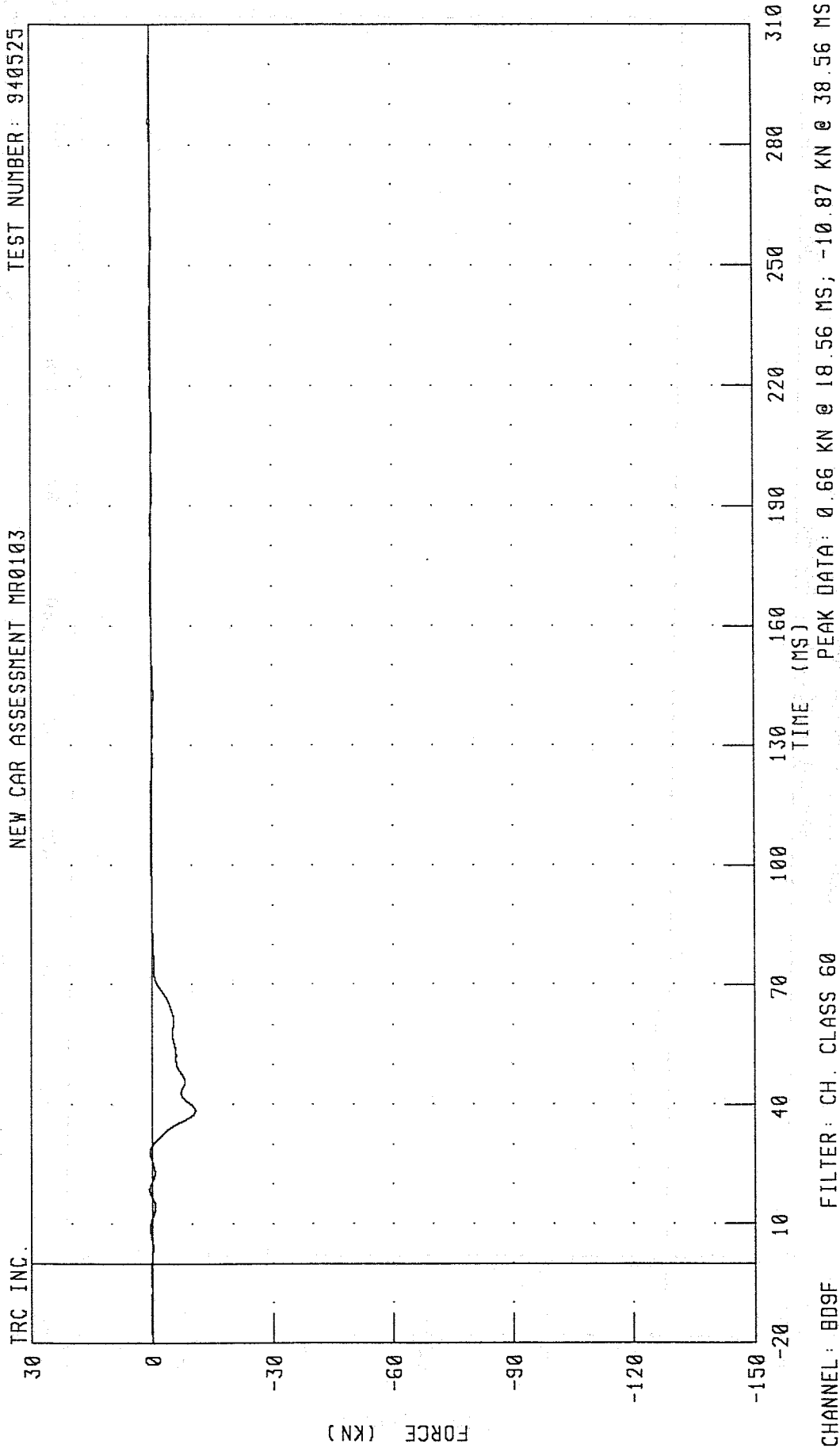
FILTER: CH. CLASS 60

CHANNEL: B08F

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



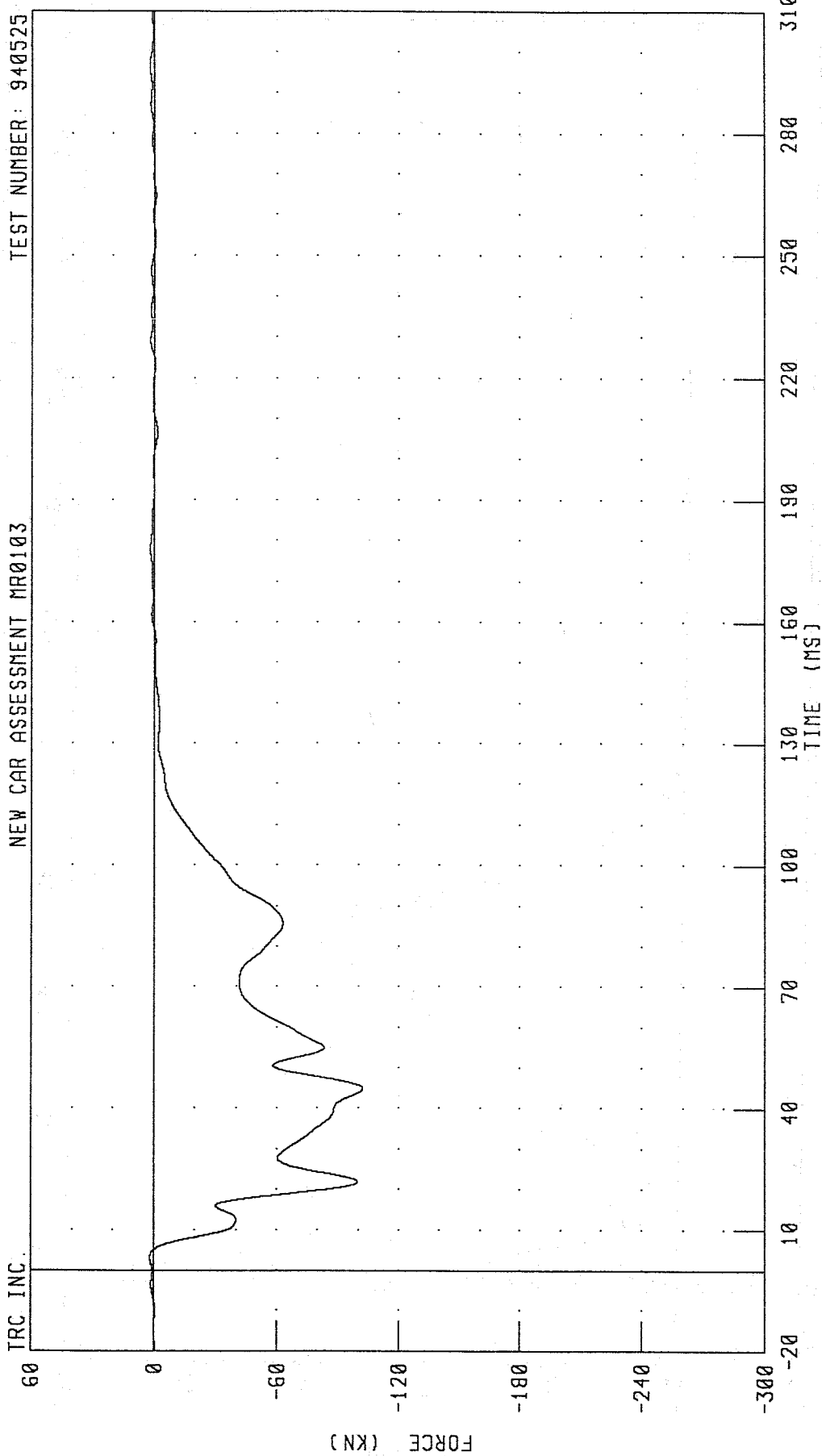
CHANNEL: BD9F FILTER: CH. CLASS 60

PEAK DATA: 0.66 KN @ 18.56 MS; -10.87 KN @ 38.56 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL

TEST NUMBER: 940525

NEW CAR ASSESSMENT MR0103



PEAK DATA: 2.10 KN @ 296.88 MS; -102.19 KN @ 44.88 MS

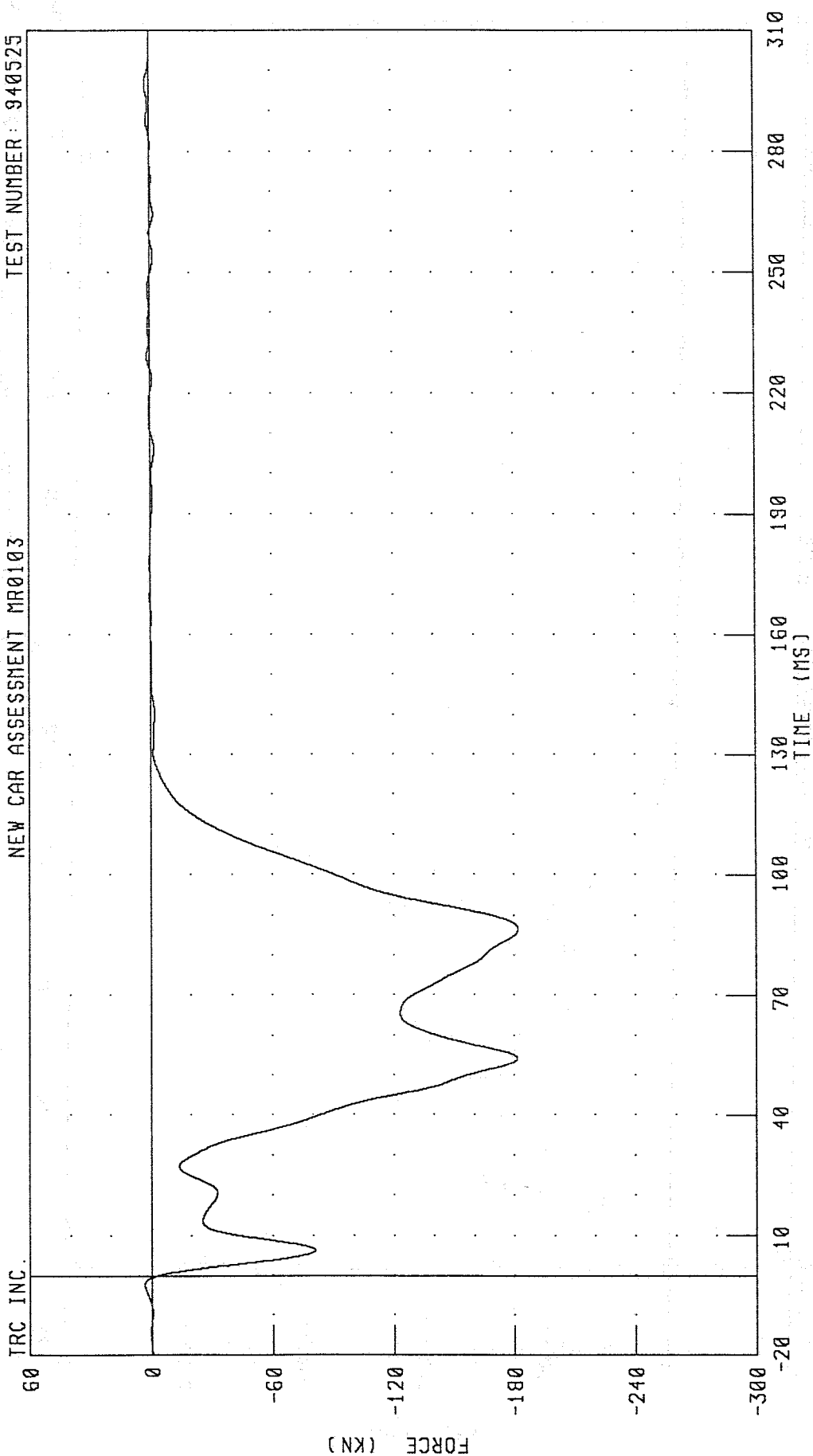
CHANNEL: LCBGIF FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER GROUP # 2 FORCE TOTAL

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



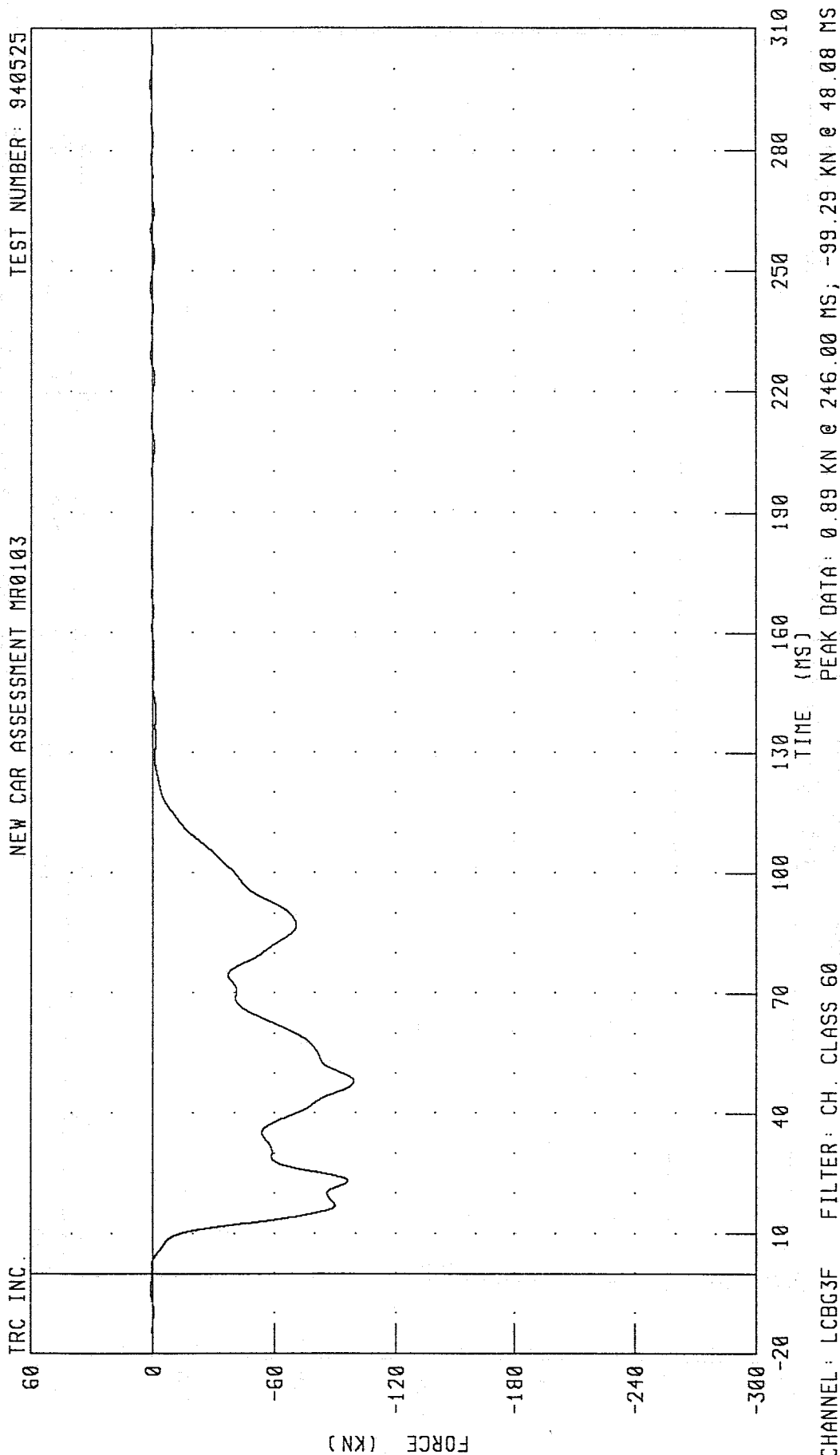
PEAK DATA: 3.43 KN @ -2.40 MS, -182.16 KN @ 86.56 MS

CHANNEL: LCBG2F FILTER: CH. CLASS 60

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



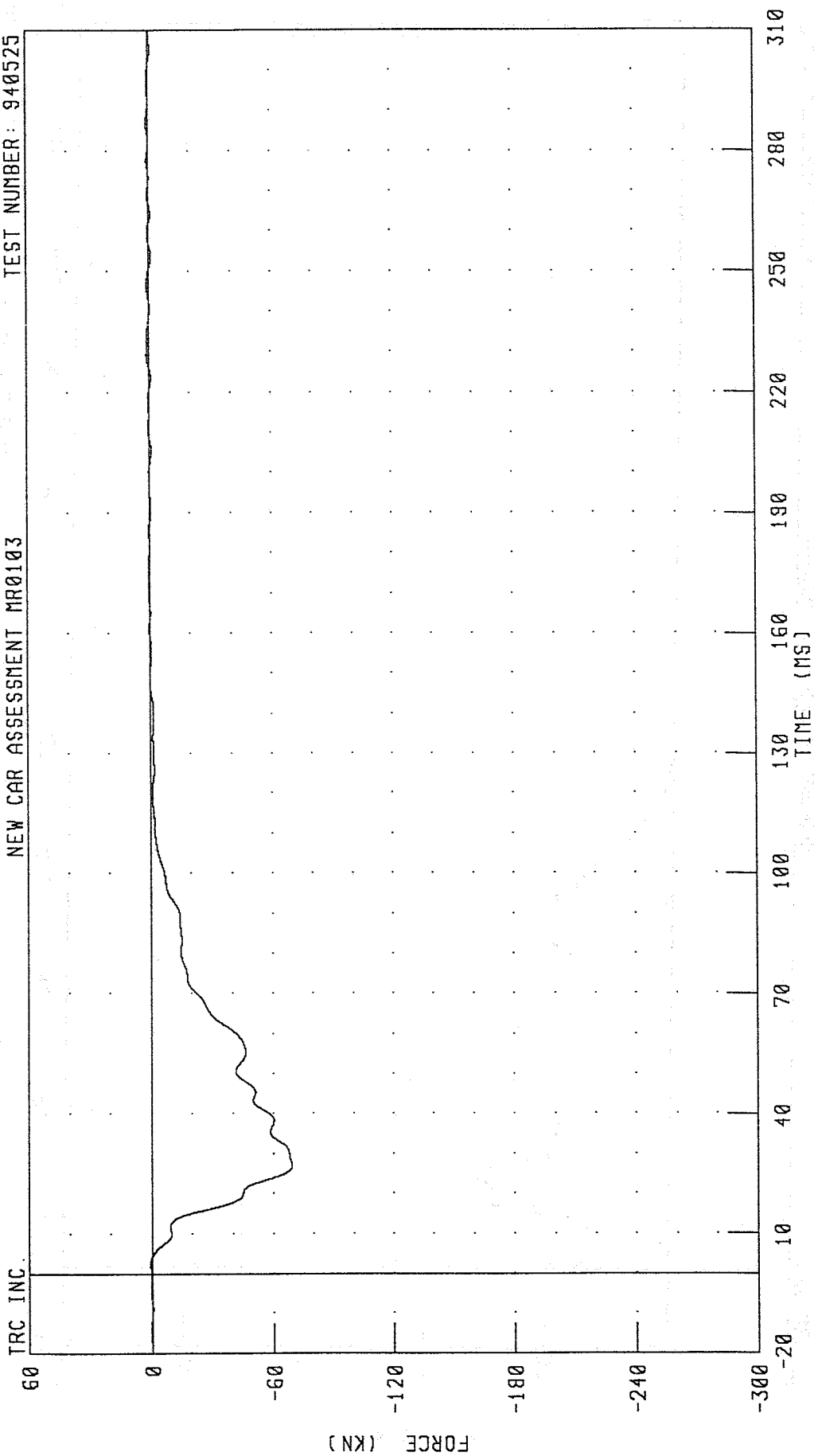
CHANNEL: LCBG3F FILTER: CH. CLASS 60

PEAK DATA: 0.89 KN @ 246.00 MS; -99.29 KN @ 48.08 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



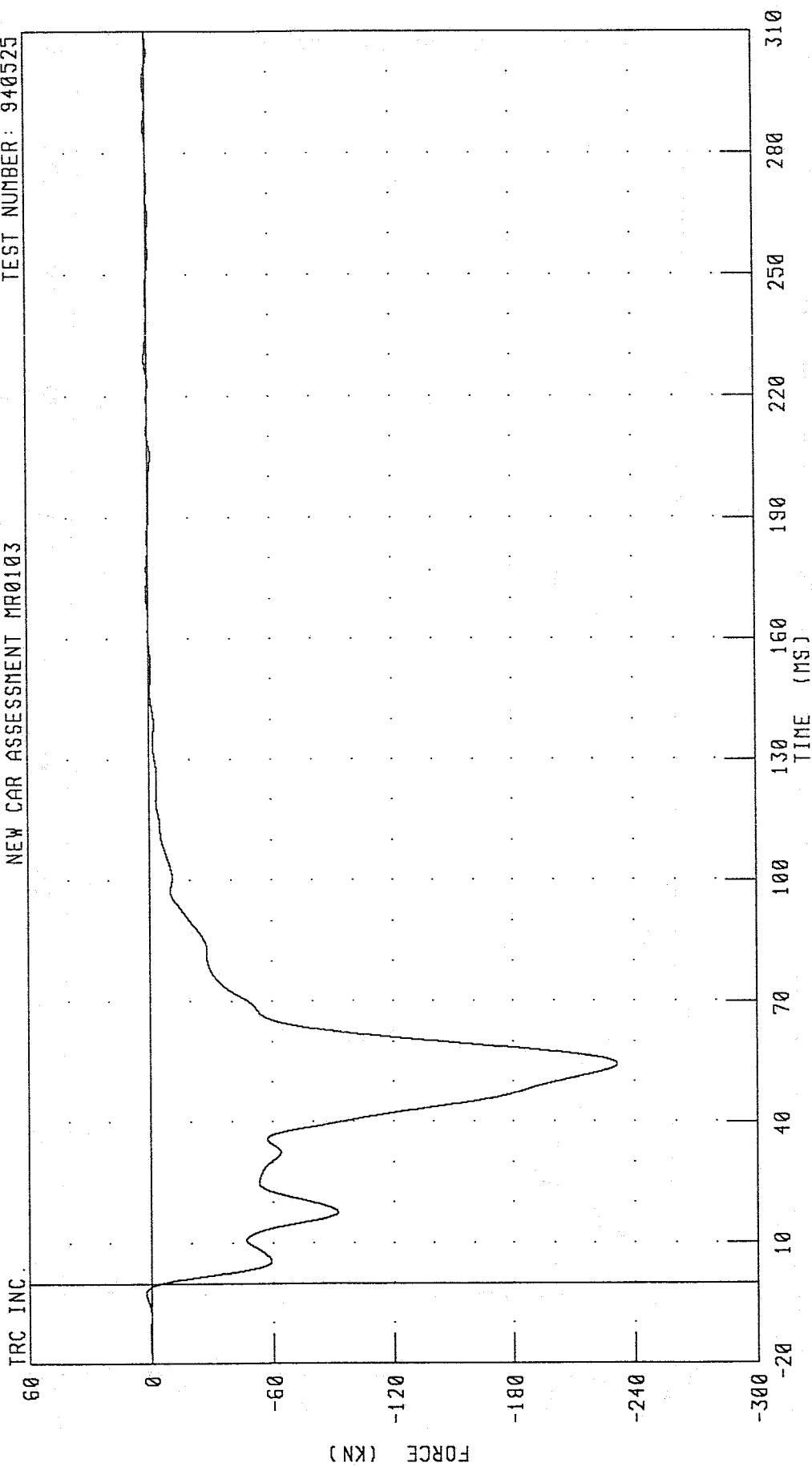
PEAK DATA: 1.20 KN @ 229.36 MS; -69.34 KN @ 26.96 MS

CHANNEL: LCBG4F FILTER: CH. CLASS 60

1984 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: LCBG5F FILTER: CH. CLASS 60

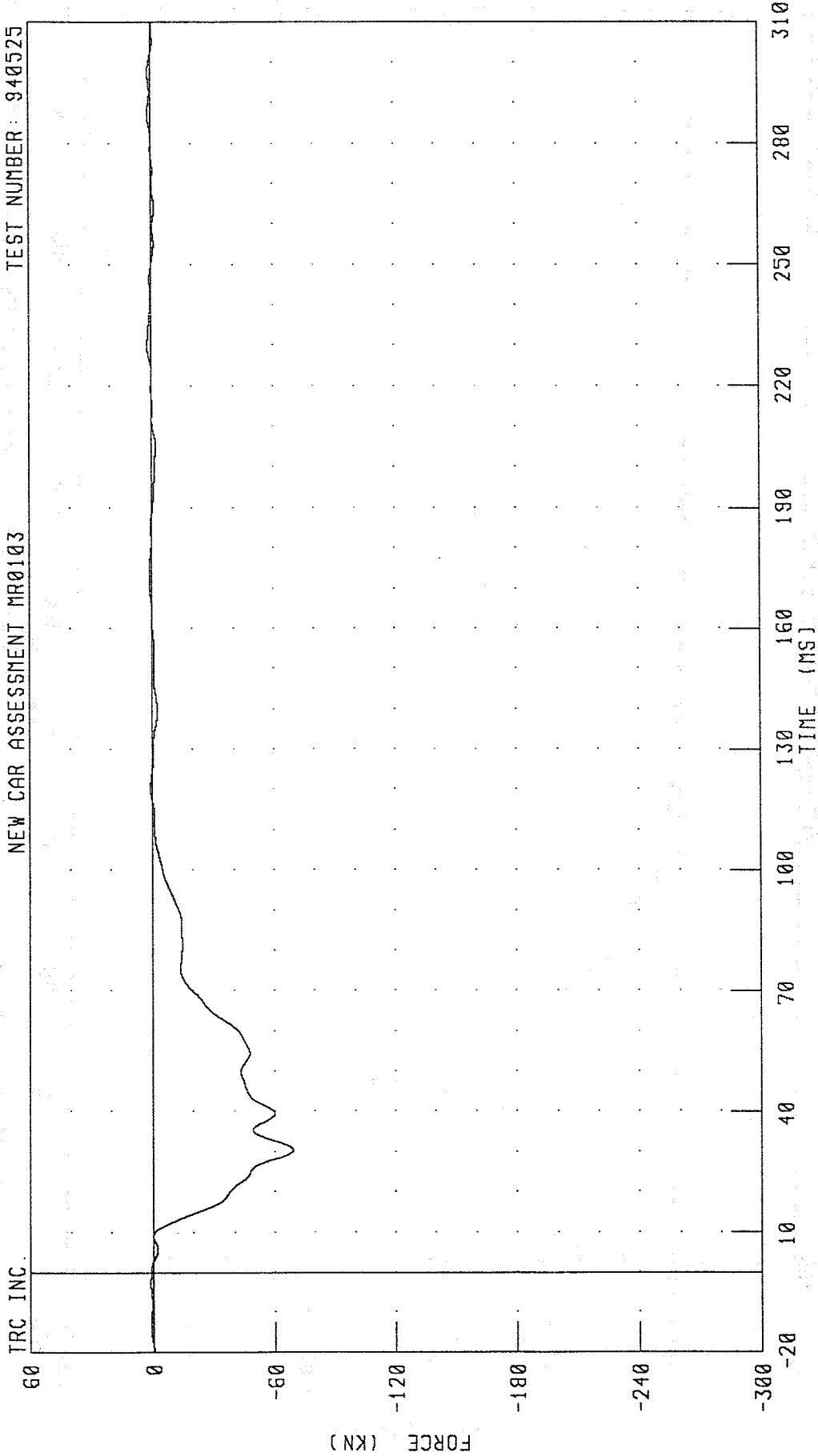
PEAK DATA: 2.61 KN @ -2.64 MS; -231.31 KN @ 54.40 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: LCBG6F FILTER: CH. CLASS 60

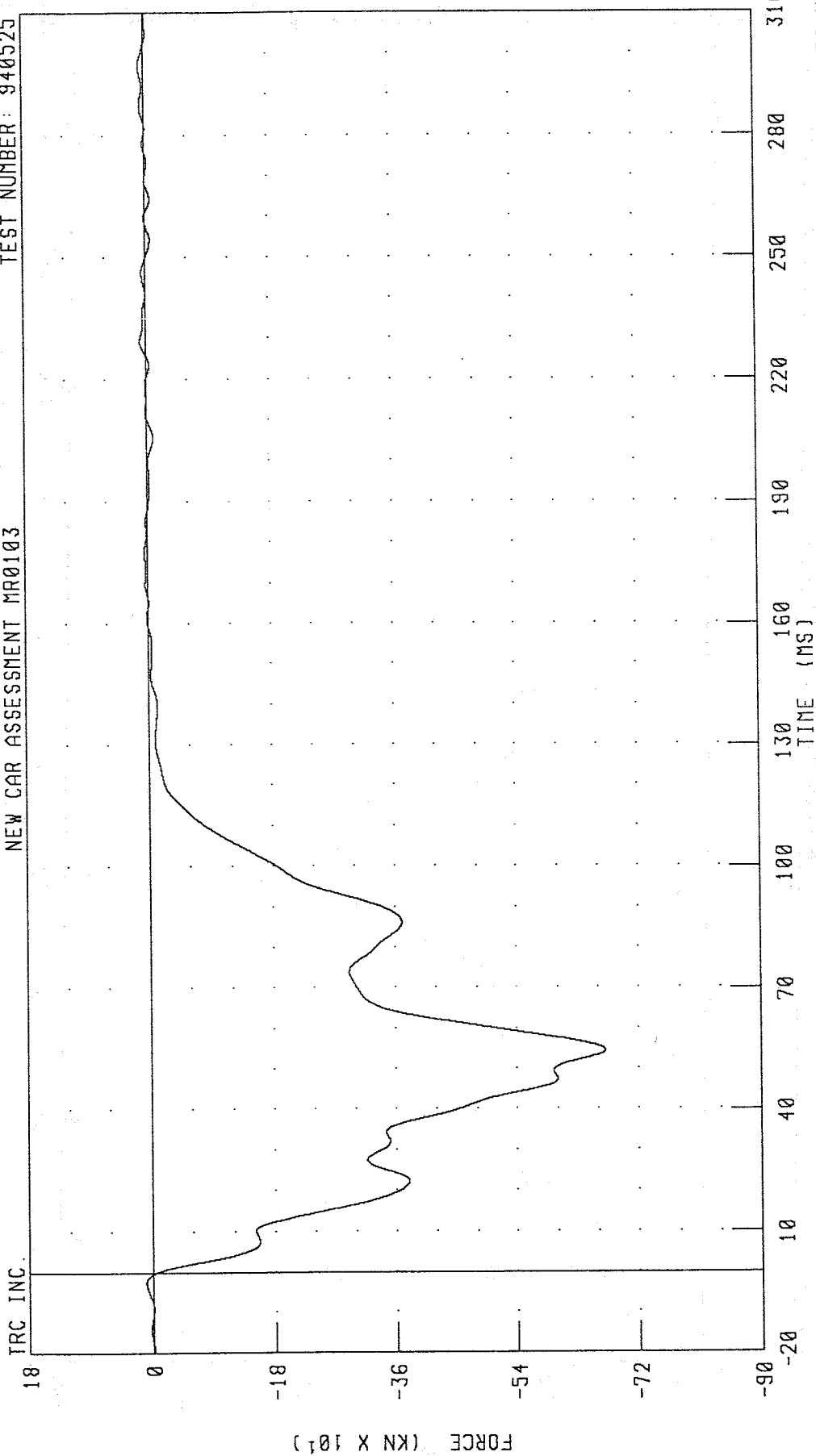
PEAK DATA: 1.96 KN @ 229.84 MS; -69.00 KN @ 30.40 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER

TOTAL LOAD CELL BARRIER FORCE

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



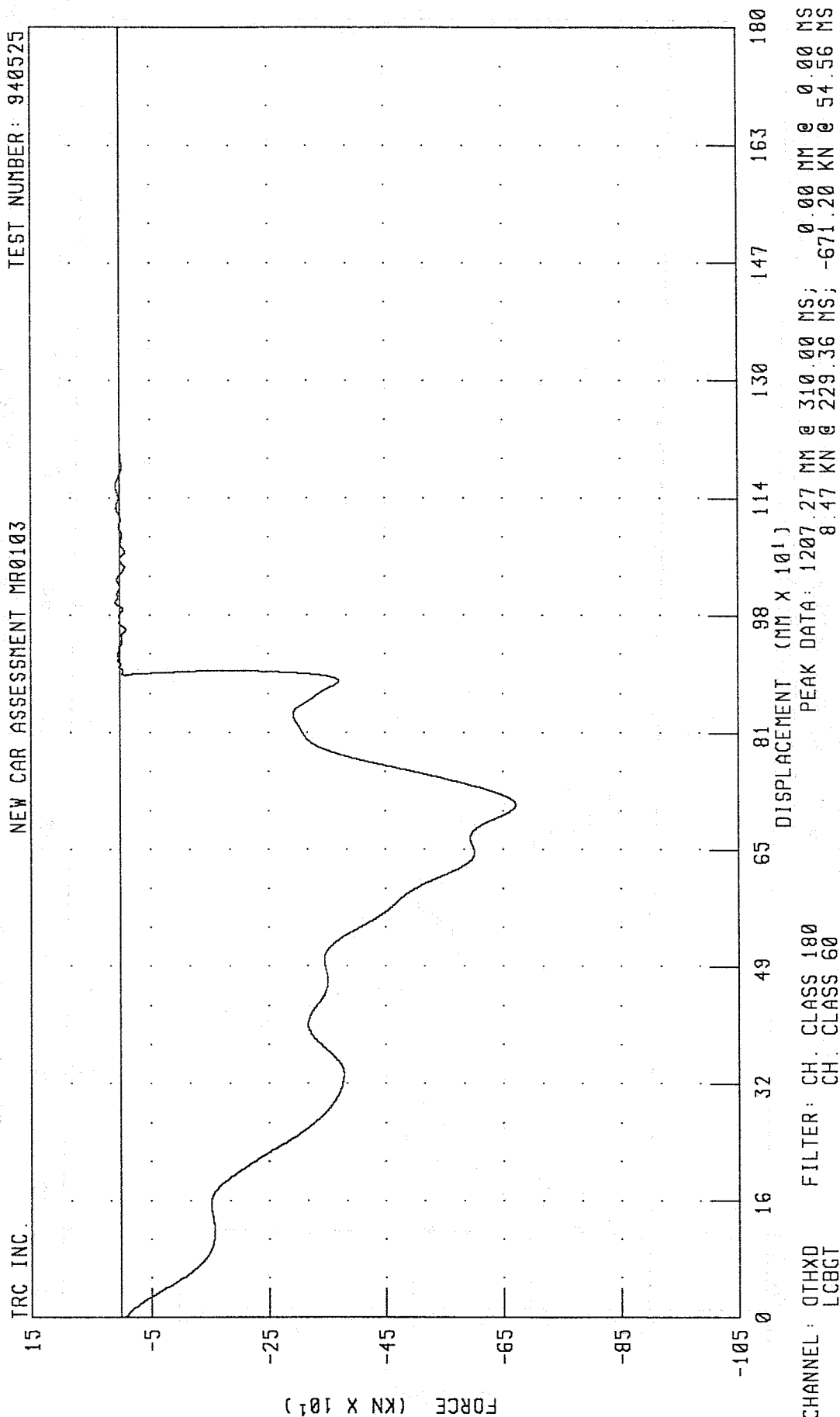
CHANNEL: LCBGT FILTER: CH CLASS 60

PEAK DATA: 9.71 KN @ -2.64 MS; -671.20 KN @ 54.56 MS

1994 CHEVROLET CAPRICE INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

NEW CAR ASSESSMENT MR0103

TEST NUMBER: 940525



CHANNEL: 0THXD
LCBGT
FILTER: CH: CLASS 180
CH: CLASS 60
DISPLACEMENT (MM X 10¹)
PEAK DATA: 1207.27 MM @ 310.00 MS;
8.47 KN @ 229.36 MS; -671.20 KN @ 54.56 MS

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 192

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III EXTERNAL DIMENSIONS

192 ALDERSON

23-MAY-94

TRC INC.

TEST NO: 192C21ED1

572E SN192 EXT.DIMENSION CAL21

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

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

RUN NUMBER: 052394.1302

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

23-MAY-94

TRC INC.

TEST NO: 192C21HD4

572E SN192 HEAD DROP CAL 21

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	52.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	236.48 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.64 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas Middleton

RUN NUMBER: 052394.1222;3

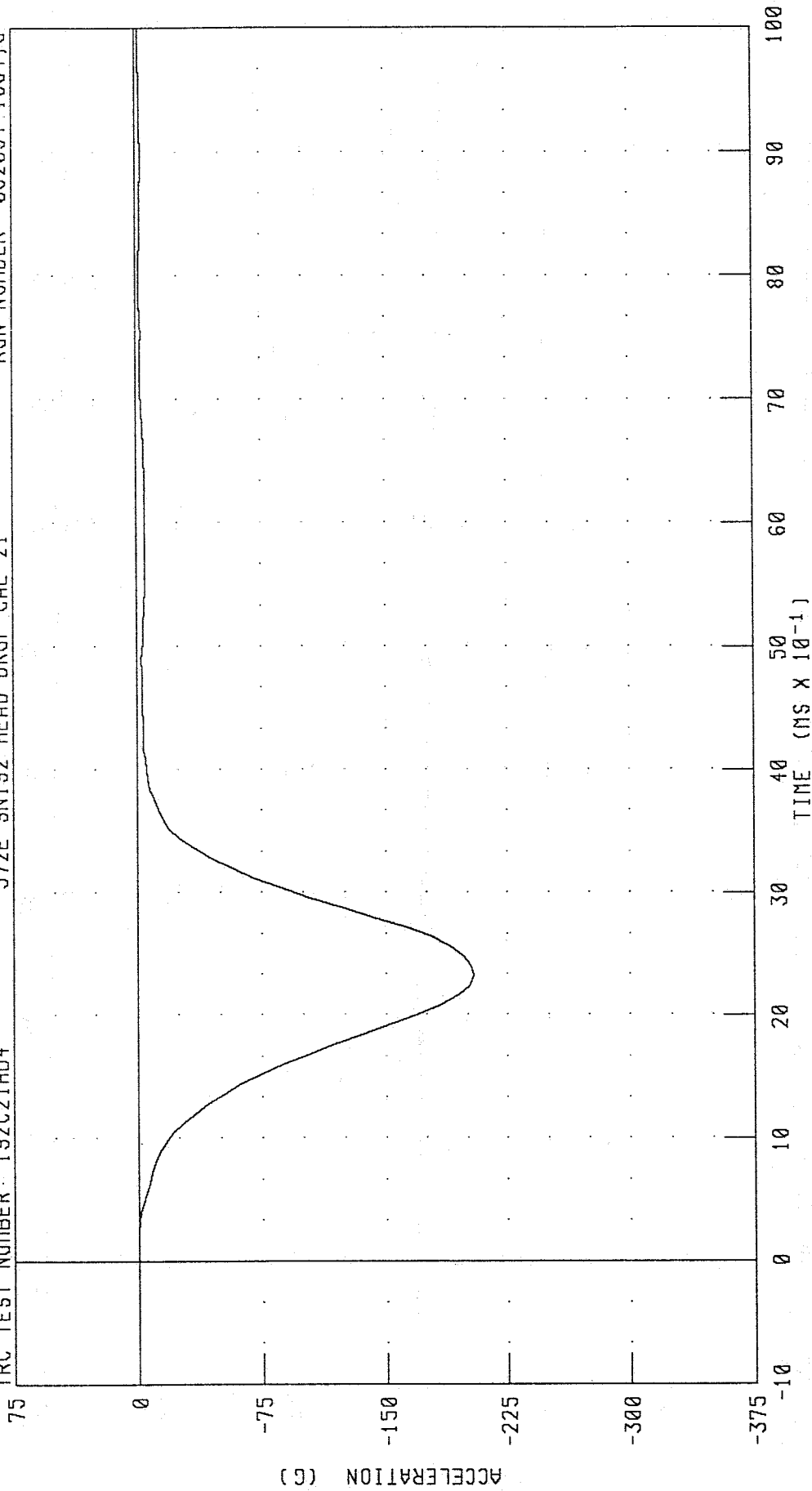
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 192C21HD4

572E SN192 HEAD DROP CAL 21

RUN NUMBER: 062094 1504.3



CHANNEL: HEDXG FILTER: CH. CLASS 1000

PEAK DATA: 0.02 G @ -0.48 MS; -203.85 G @ 2.32 MS

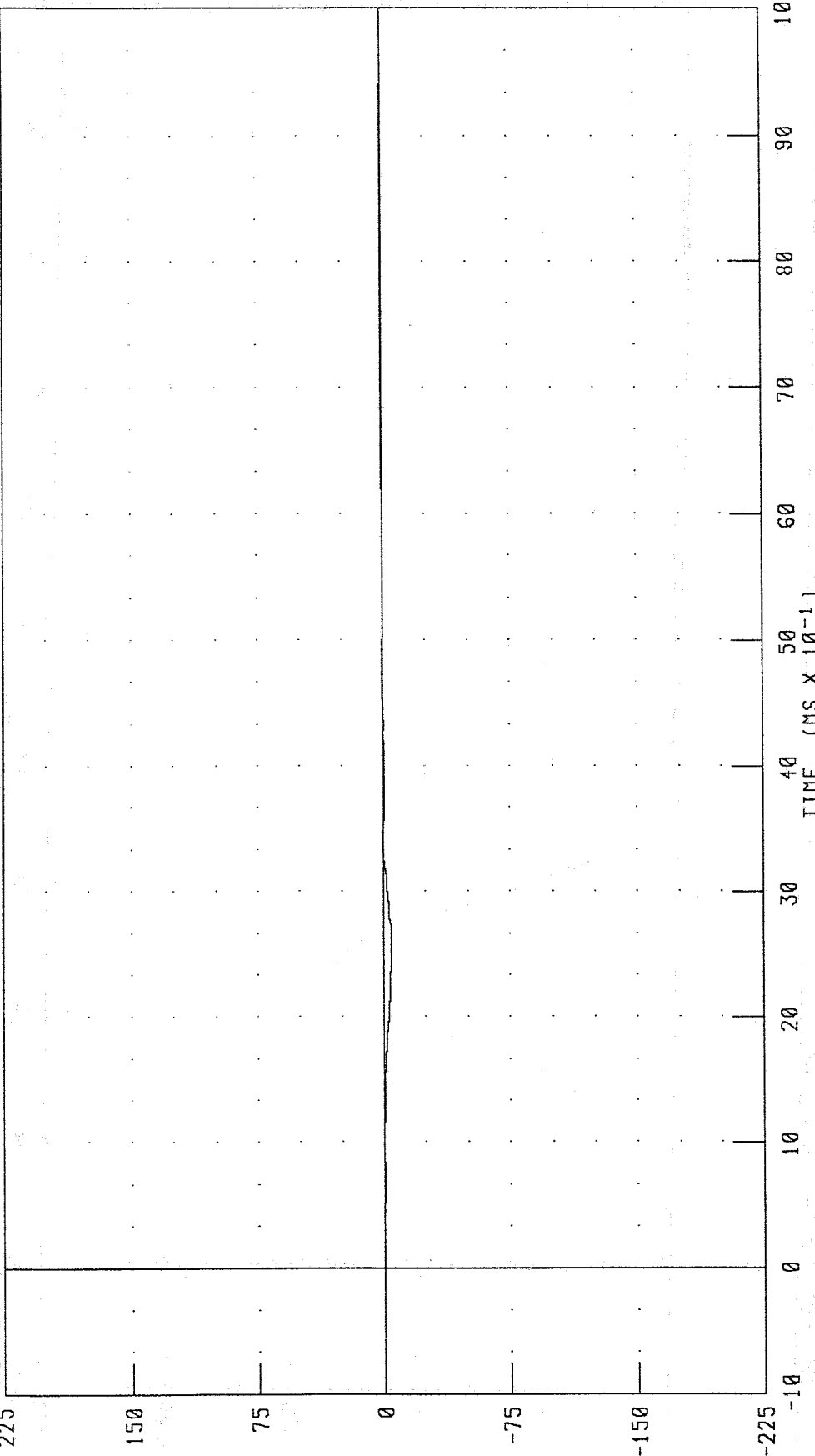
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 192C21HD4

572E SN192 HEAD DRQP CAL 21

RUN NUMBER: 062094.1504,3



PEAK DATA: 0.96 G @ 4.88 MS; -4.65 G @ 2.56 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

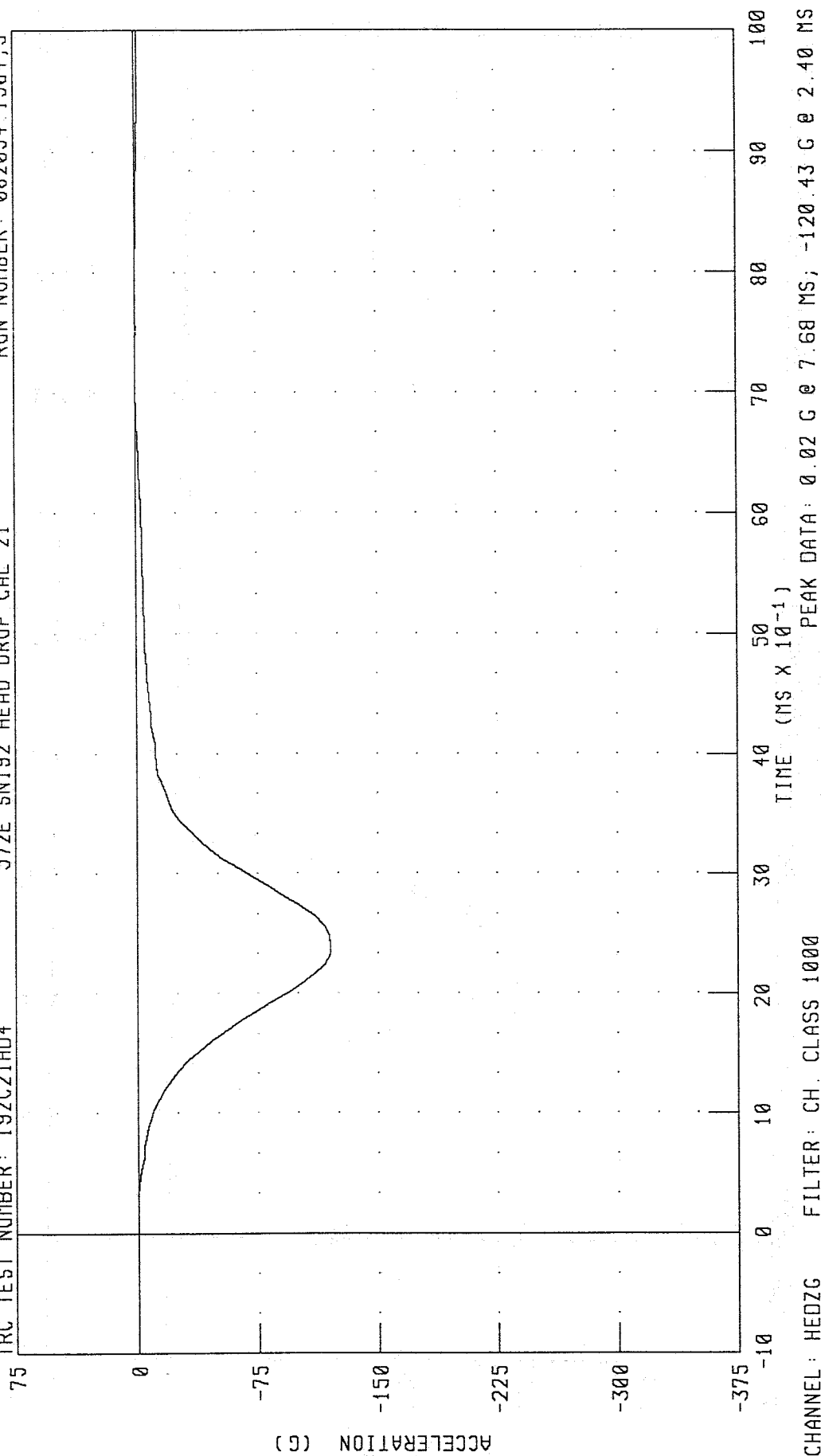
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

IRC TEST NUMBER: 192C21HD4

572E SN192 HEAD DROP CAL 21

RUN NUMBER: 062094.1504,3



CHANNEL: HEDZG FILTER: CH. CLASS 1000

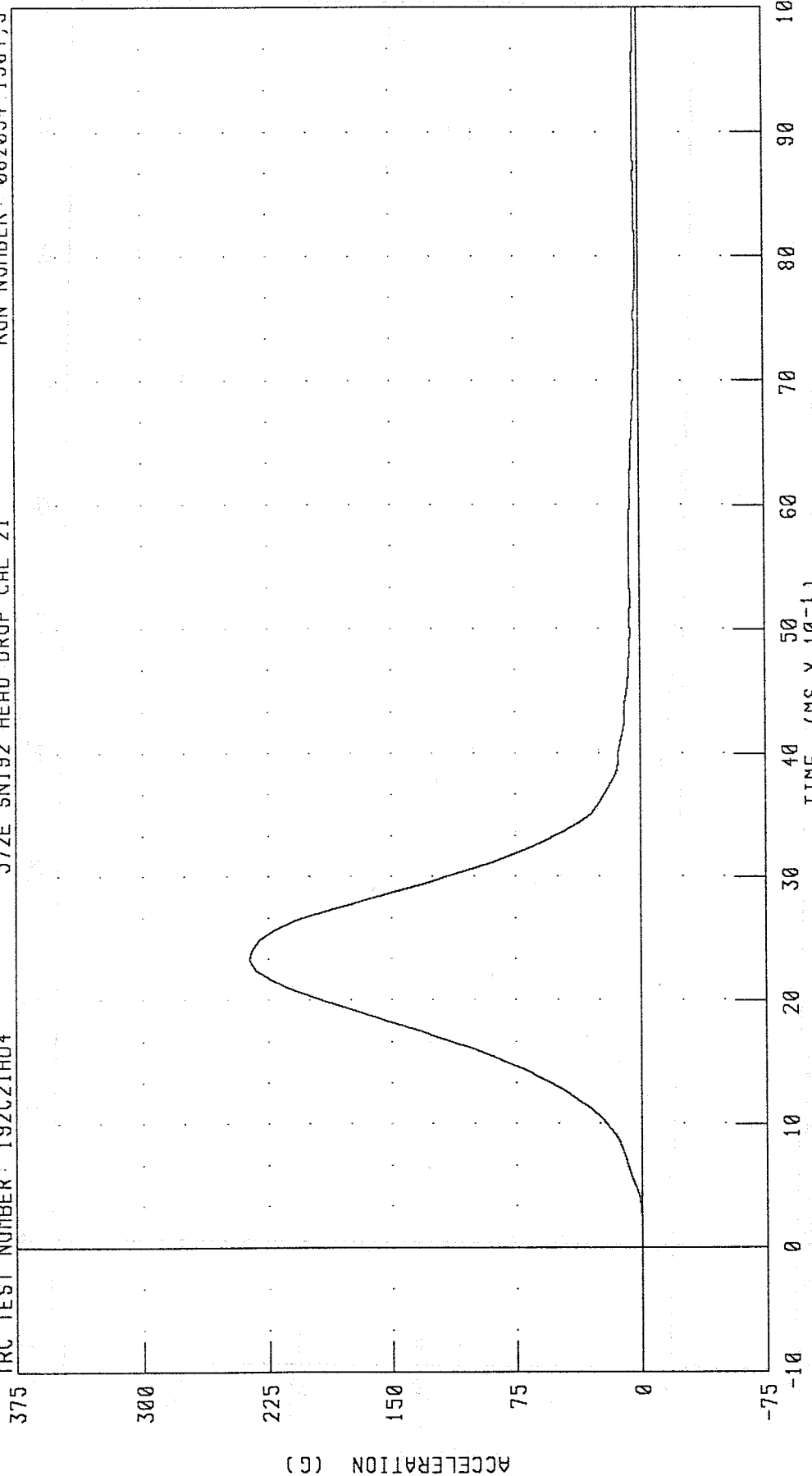
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 192C21HD4

572E SN192 HEAD DROP CAL 21

RUN NUMBER: 062094 1504,3



PEAK DATA: 236.49 G @ 2.32 MS; 0.09 G @ 0.00 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

20-MAY-94

TRC INC. TEST NO: 192C21NF1 572E SN192 NECK FLEXION CAL21

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	55.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.10 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.01 G
	20 MS	17.60 - 22.60 G	18.72 G
	30 MS	12.50 - 18.50 G	15.35 G
MAX PENDULUM G		29 G MAX	23.89 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.32 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	41.12 MS
D PLANE	MAX	64 - 78 DEG.	65.32 DEG.
ROTATION	TIME	57 - 64 MS	59.28 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	90.47 NM
	TIME	47 - 58 MS	53.84 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.04 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	105.04 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

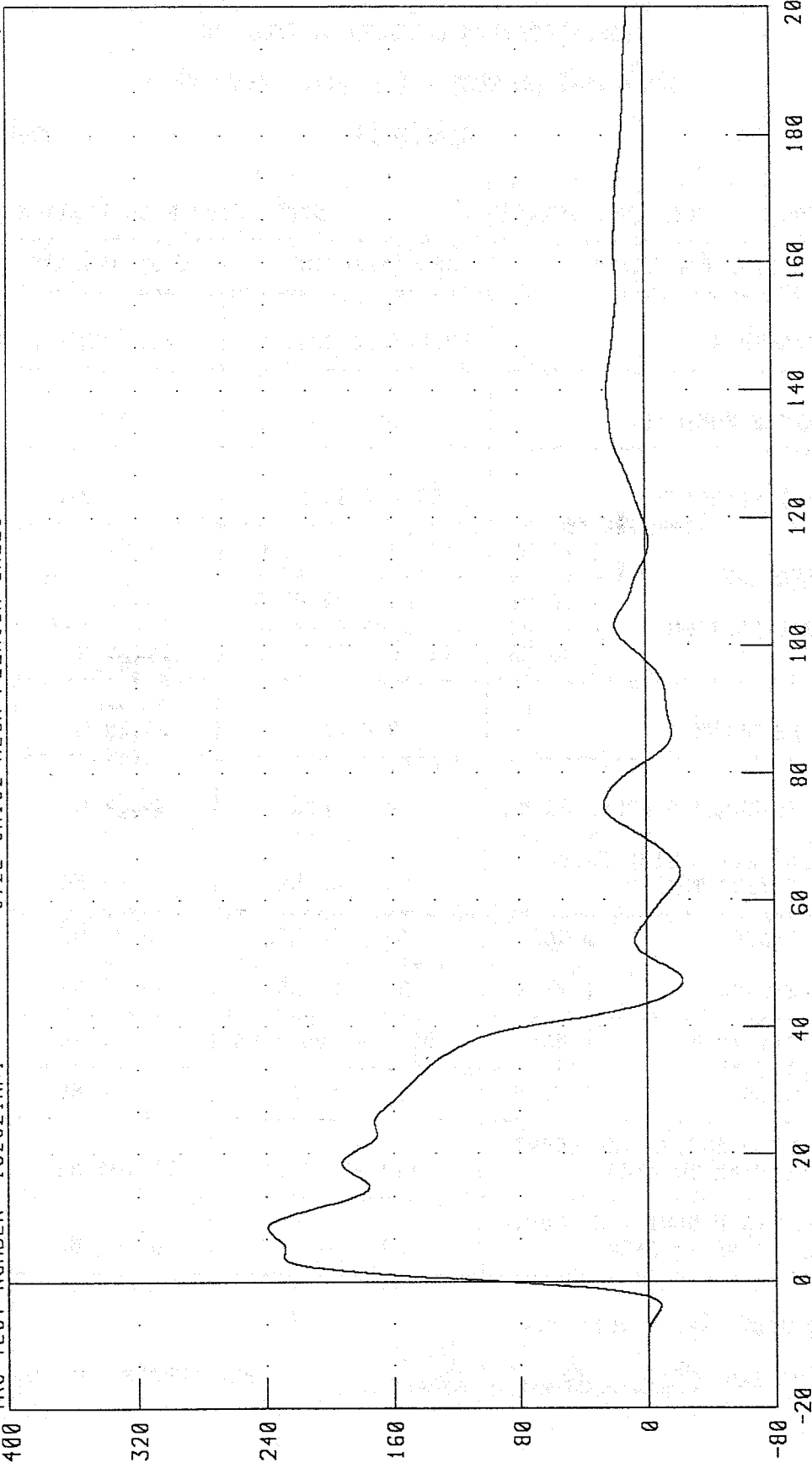
Chas. Middleton

RUN NUMBER: 052094.0818;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192C21NF1 572E SN192 NECK FLEXION CAL21 RUN NUMBER: 062094 1504,1

ACCELERATION (G X 10⁻¹)



CHANNEL: PENXC FILTER: CH. CLASS 60

PEAK DATA: 23.90 G @ 8.48 MS; -2.25 G @ 47.20 MS

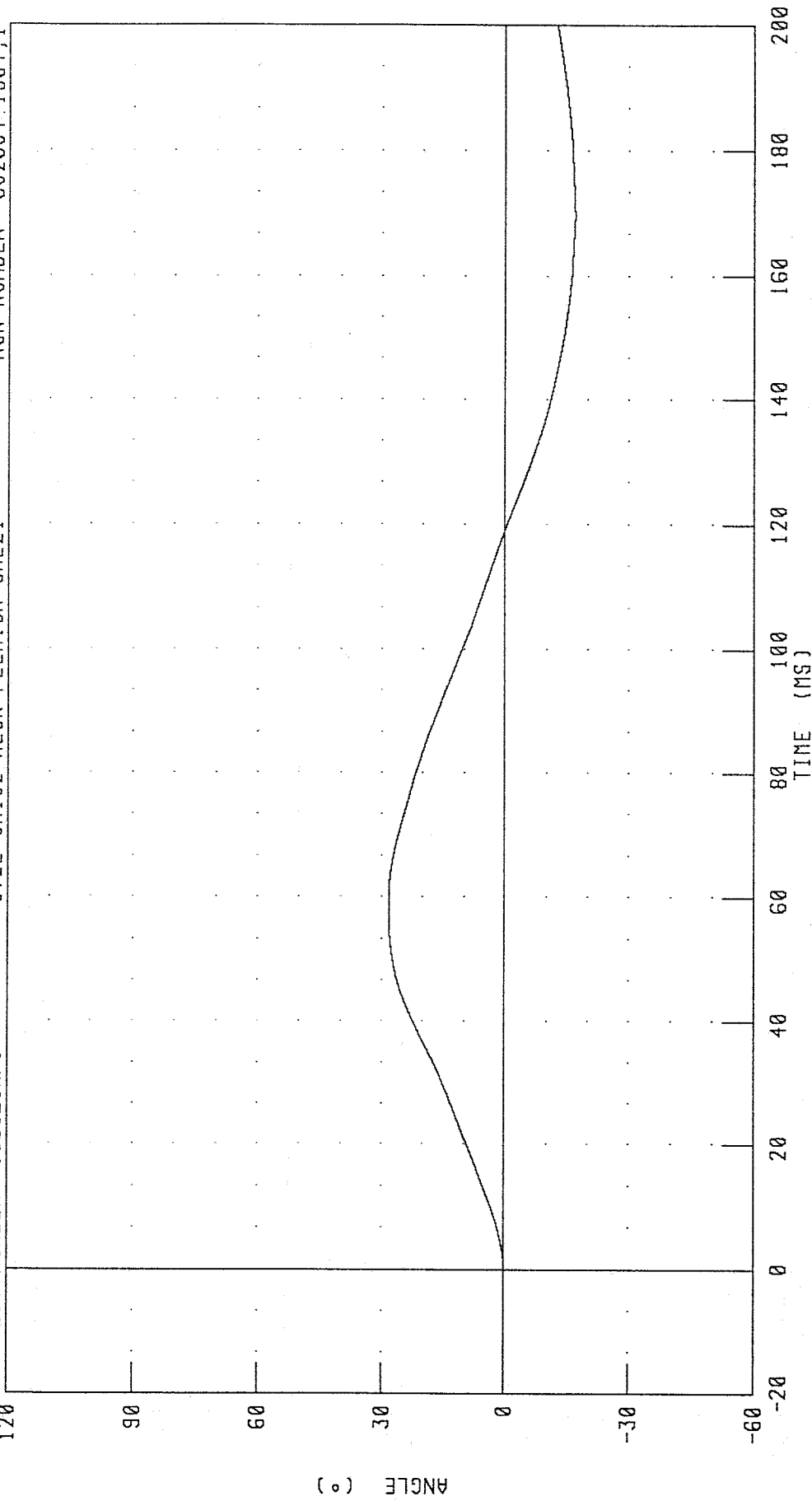
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 192C21NF1

572E SN192 NECK FLEXION CAL21

RUN NUMBER: 062094.1504,1



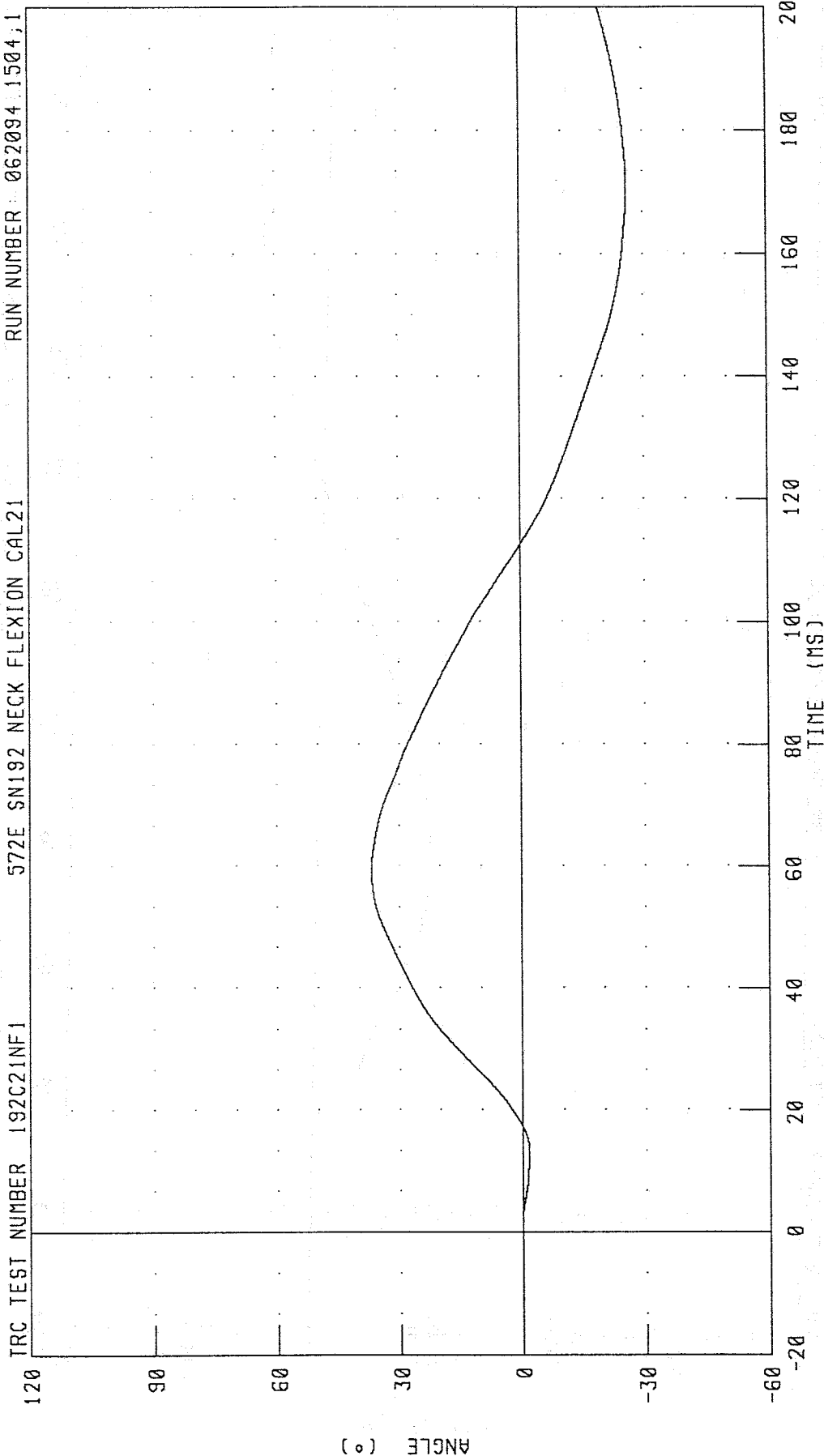
CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 28.35 ° @ 58.88 MS; -16.85 ° @ 169.68 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 192C21NF1 572E SN192 NECK FLEXION CAL21 RUN NUMBER 062094 1504;1



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 36.98 ° @ 59.36 MS; -25.81 ° @ 168.88 MS

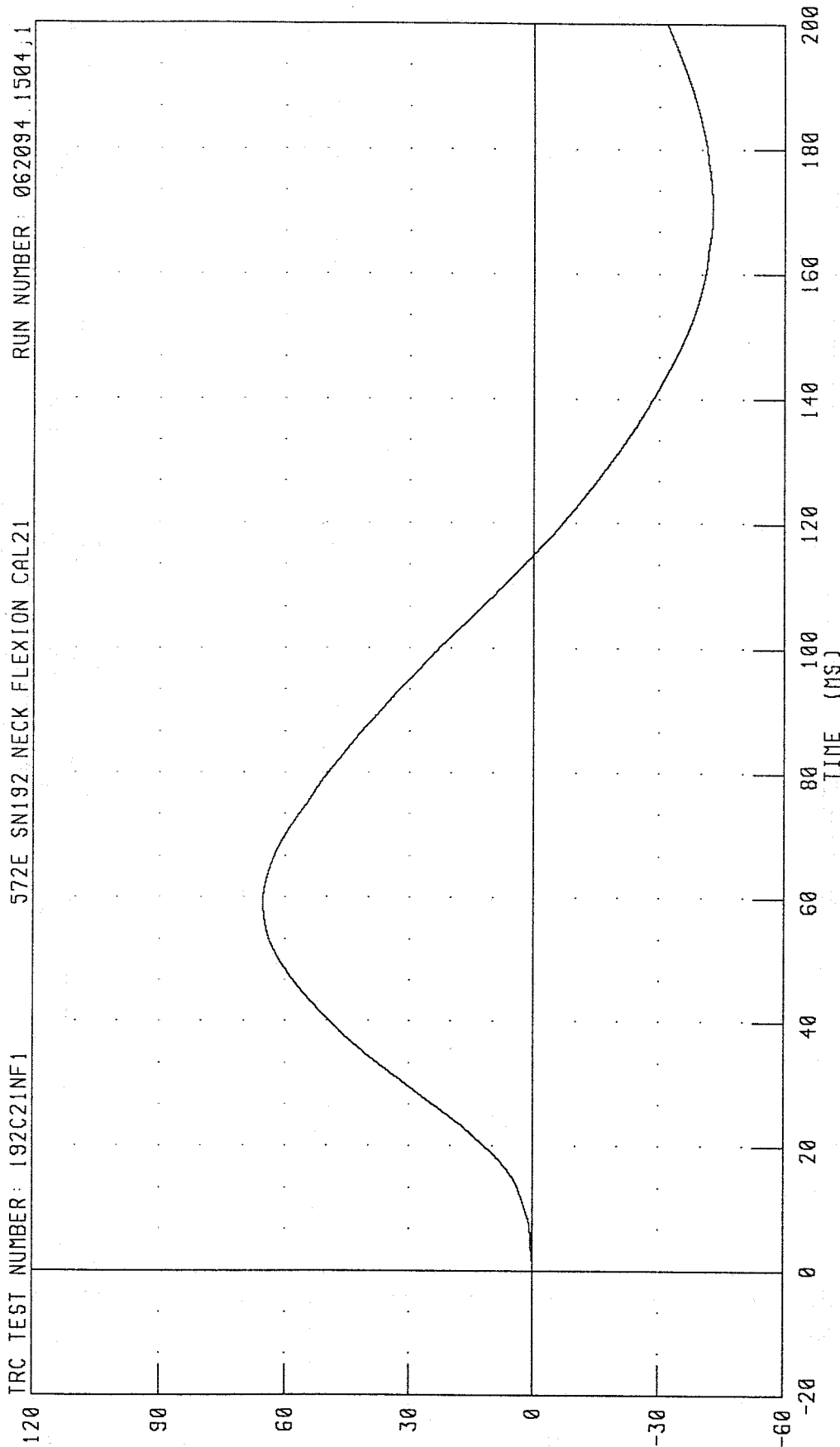
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C21NF1

572E SN192 NECK FLEXION CAL21

RUN NUMBER: 062094.1504.1



CHANNEL: TOTAL FILTER: CH. CLASS 60

PEAK DATA: 65.33 ° @ 59.28 MS; -42.66 ° @ 169.60 MS

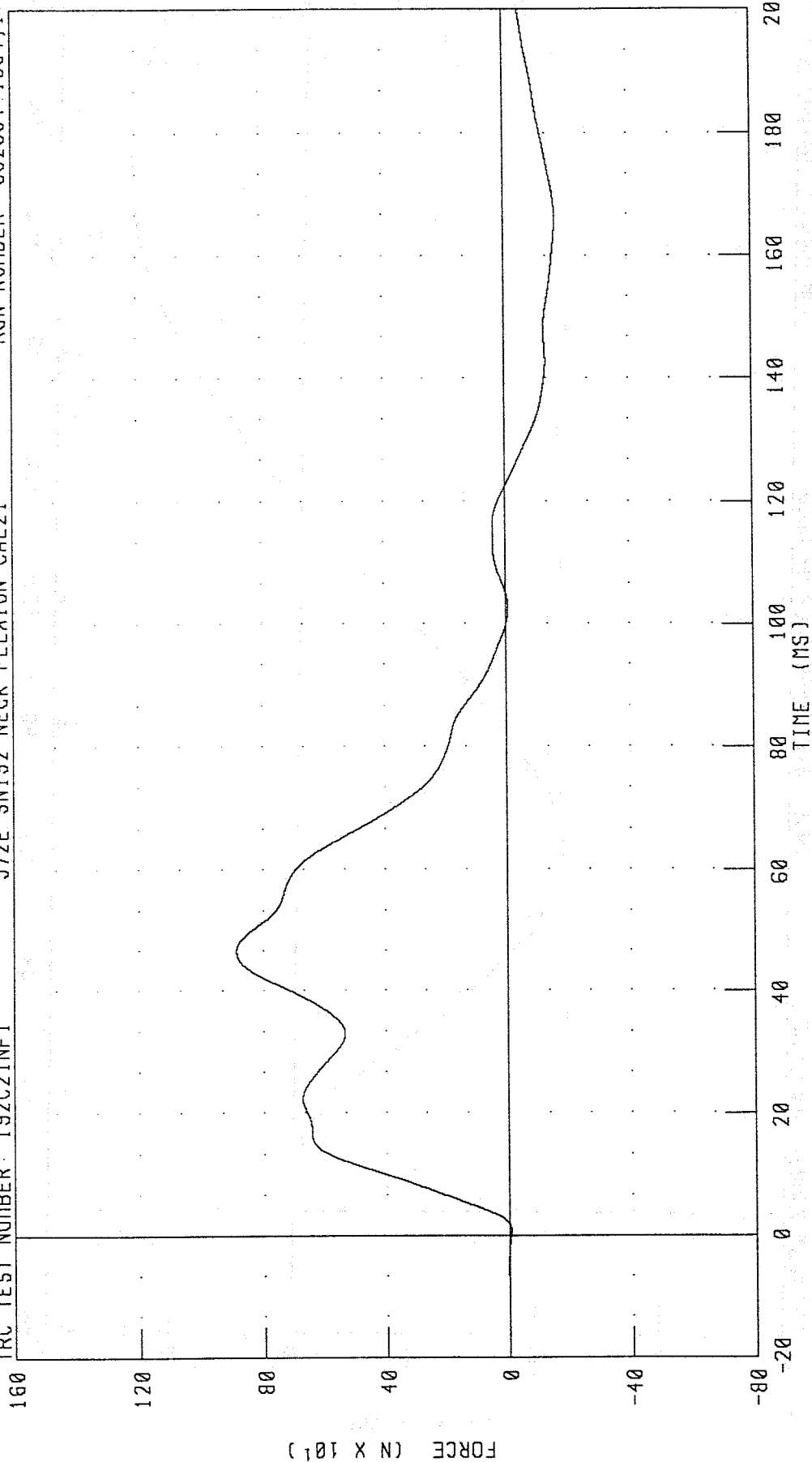
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C21NF1

572E SN192 NECK FLEXION CAL21

RUN NUMBER 062094 1504,1



CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 886.48 N @ 46.56 MS, -165.18 N @ 166.16 MS

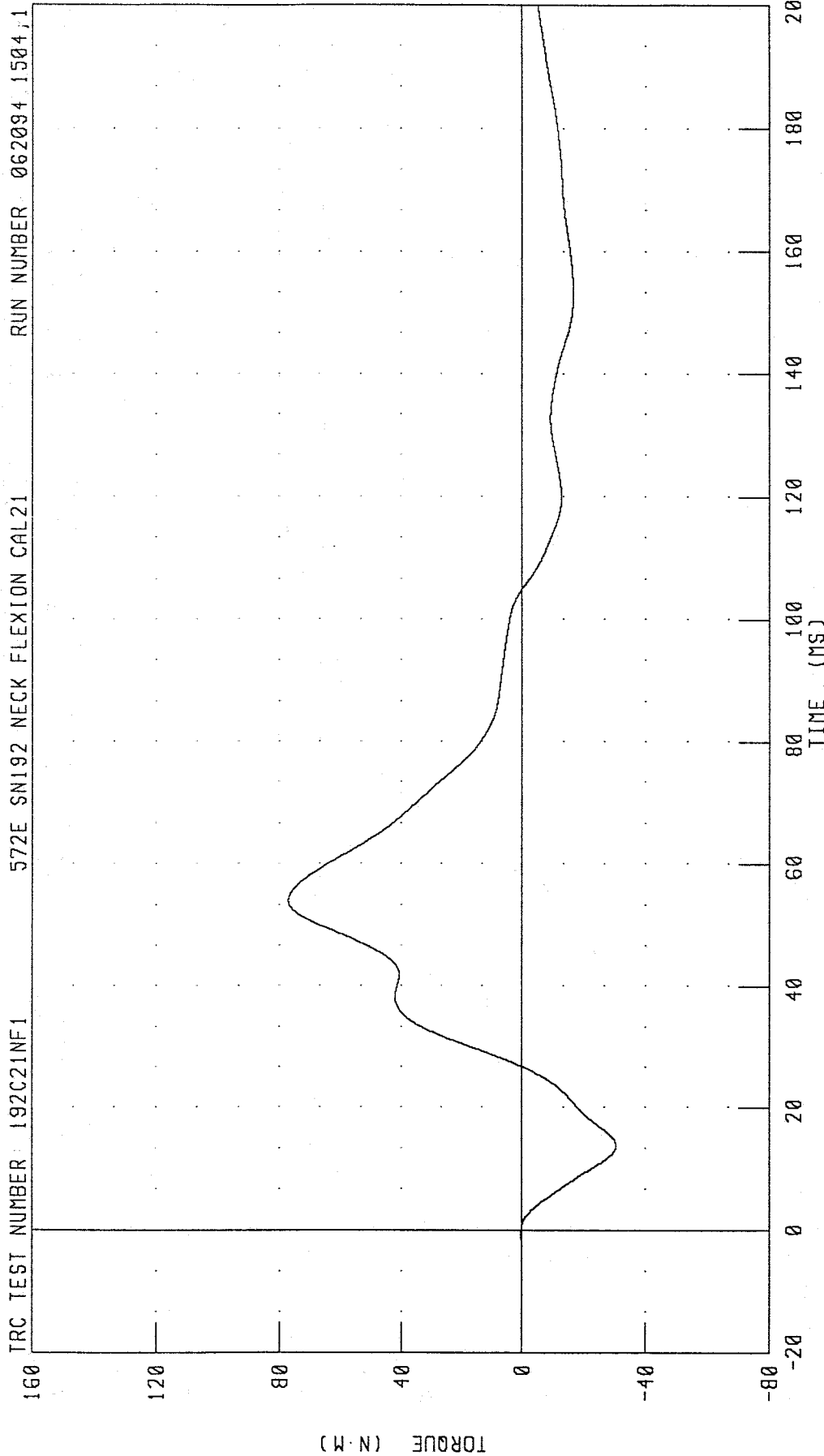
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C21NF1

572E SN192 NECK FLEXION CAL21

RUN NUMBER 062094 1504,1



CHANNEL: NEKYM FILTER: CH. CLASS 60

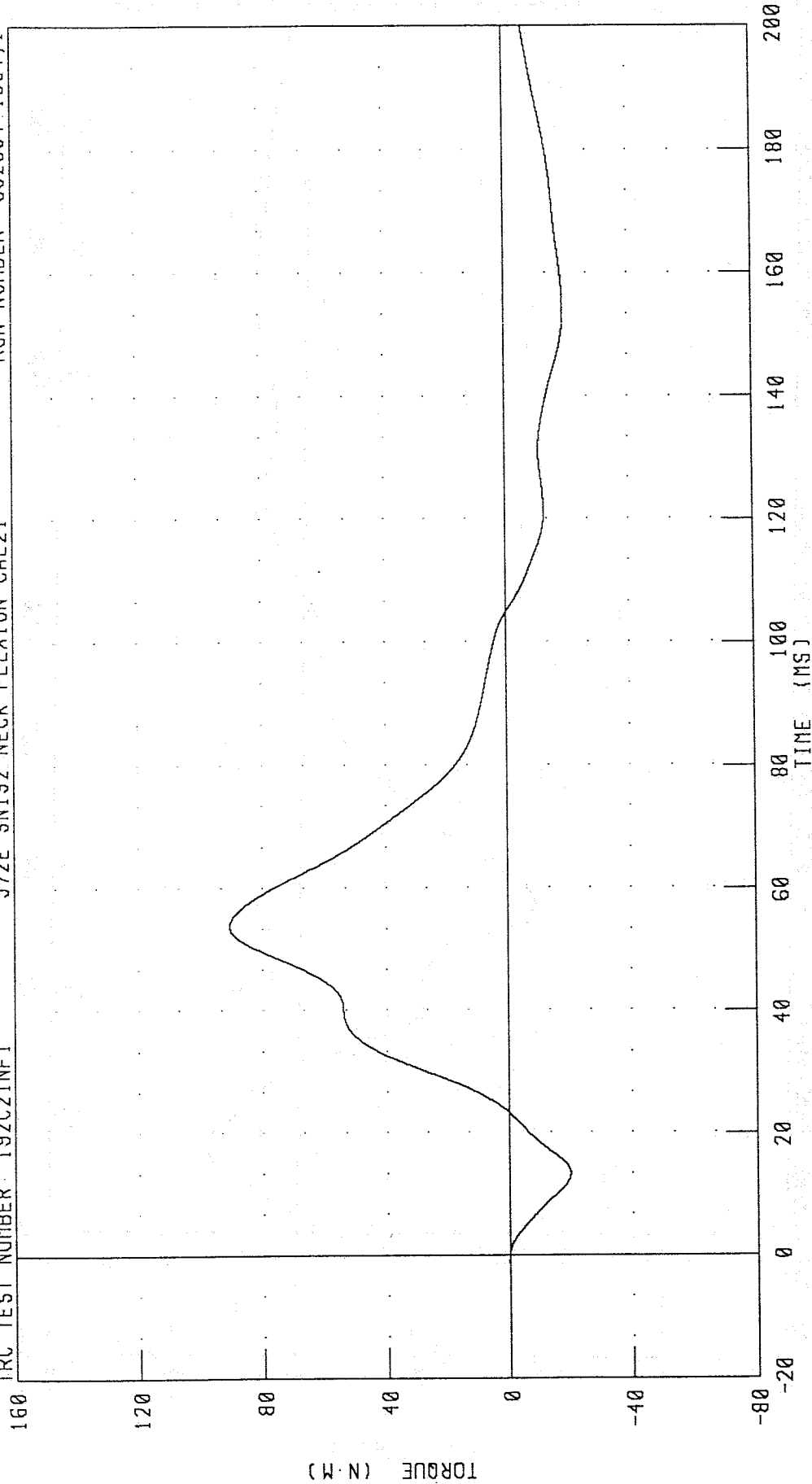
PEAK DATA: 77.12 N-M @ 54.00 MS; -30.43 N-M @ 13.76 MS

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

IRC TEST NUMBER: 192C21NF1

572E SN192 NECK FLEXION CAL21

RUN NUMBER: 062094 1504;1



CHANNEL: NEKDM FILTER: CH. CLASS 60

PEAK DATA: 90.47 N·M @ 53.84 MS; -19.81 N·M @ 13.28 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

20-MAY-94

TRC INC. TEST NO: 192C21NE1 572E SN192 NECK EXT. CAL21

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	55.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.18 G
	20 MS	14.00 - 19.00 G	16.31 G
	30 MS	11.00 - 16.00 G	13.26 G
MAX PENDULUM G		22 G MAX	19.60 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.25 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	41.44 MS
D PLANE	MAX	81 - 106 DEG.	92.37 DEG.
ROTATION	TIME	72 - 82 MS	76.24 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-59.60 NM
	TIME	65 - 79 MS	71.28 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.40 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	139.36 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middle

RUN NUMBER: 052094.0902;2

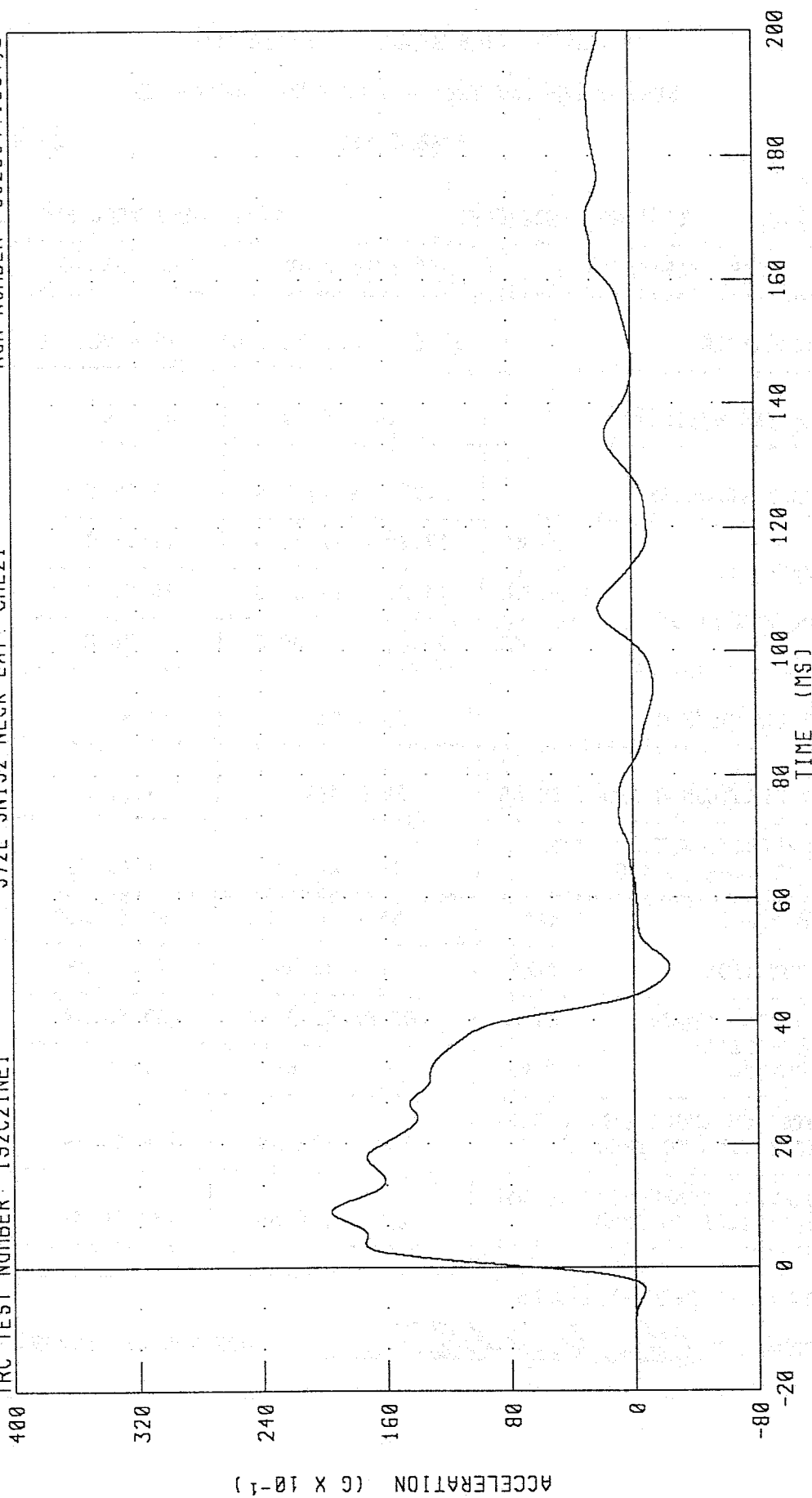
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 192C21NE1

572E SN192 NECK EXT. CAL21

RUN NUMBER: 062094.1504.2



CHANNEL: PENXG FILTER: CH. CLASS 60

PEAK DATA: 19.60 G @ 9.04 MS; -2.29 G @ 48.72 MS

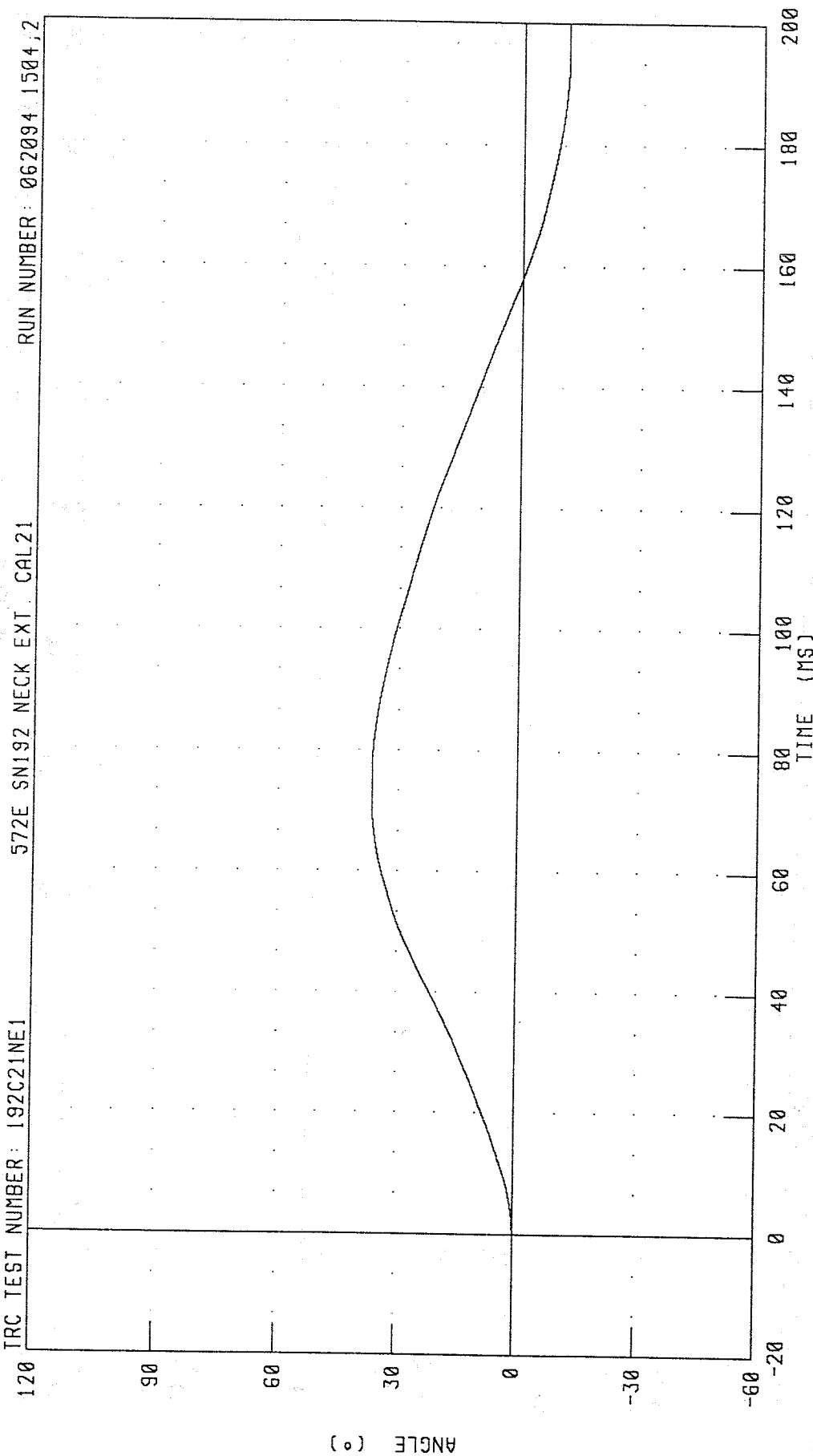
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

IRC TEST NUMBER: 192C21NE1

572E SN192 NECK EXT CAL21

RUN NUMBER: 062094 1504,2



CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 36.72 ° @ 74.72 MS, -11.09 ° @ 197.92 MS

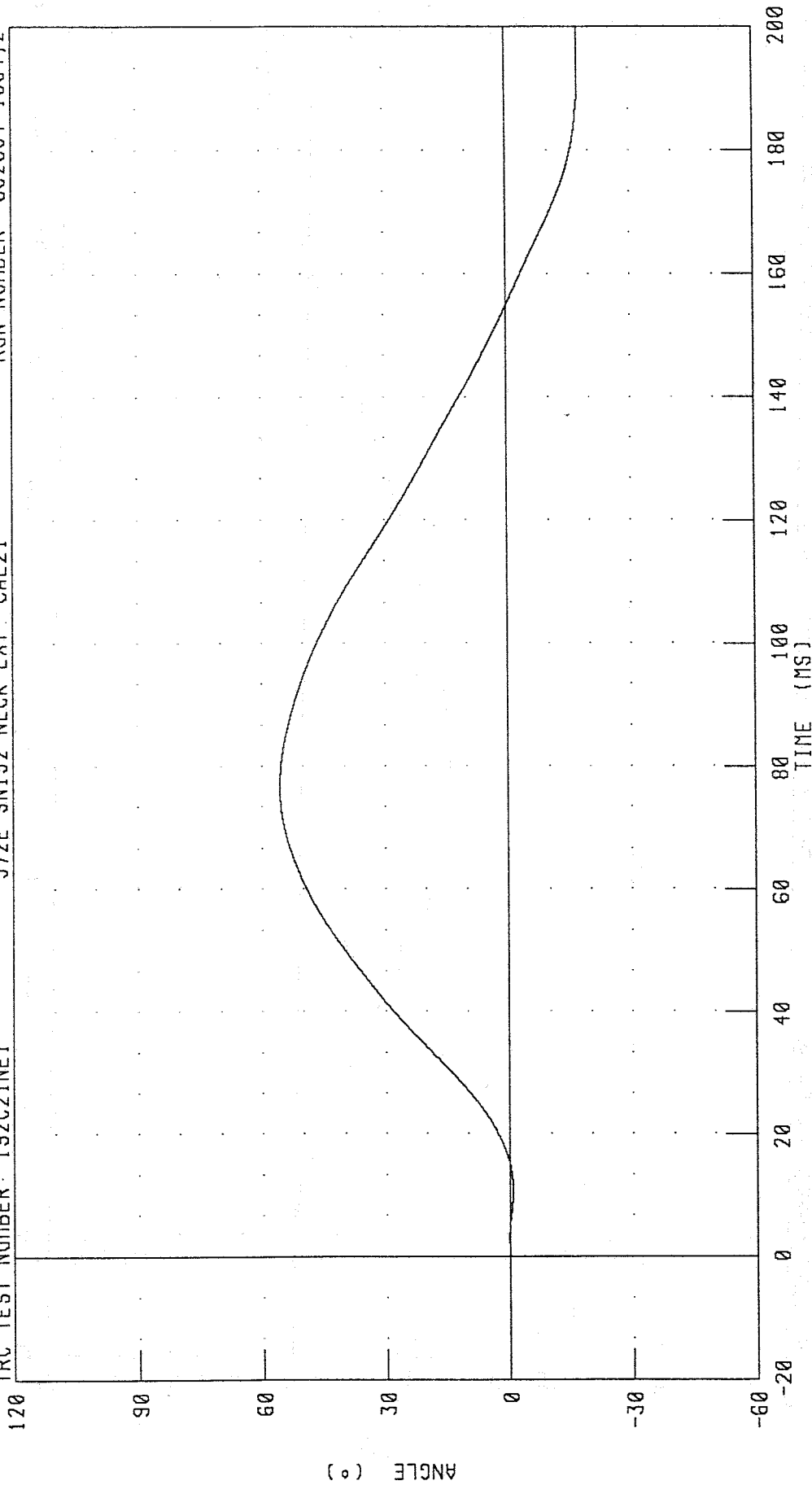
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 192C21NE1

572E SN192 NECK EXT. CAL21

RUN NUMBER: 062094 1504,2



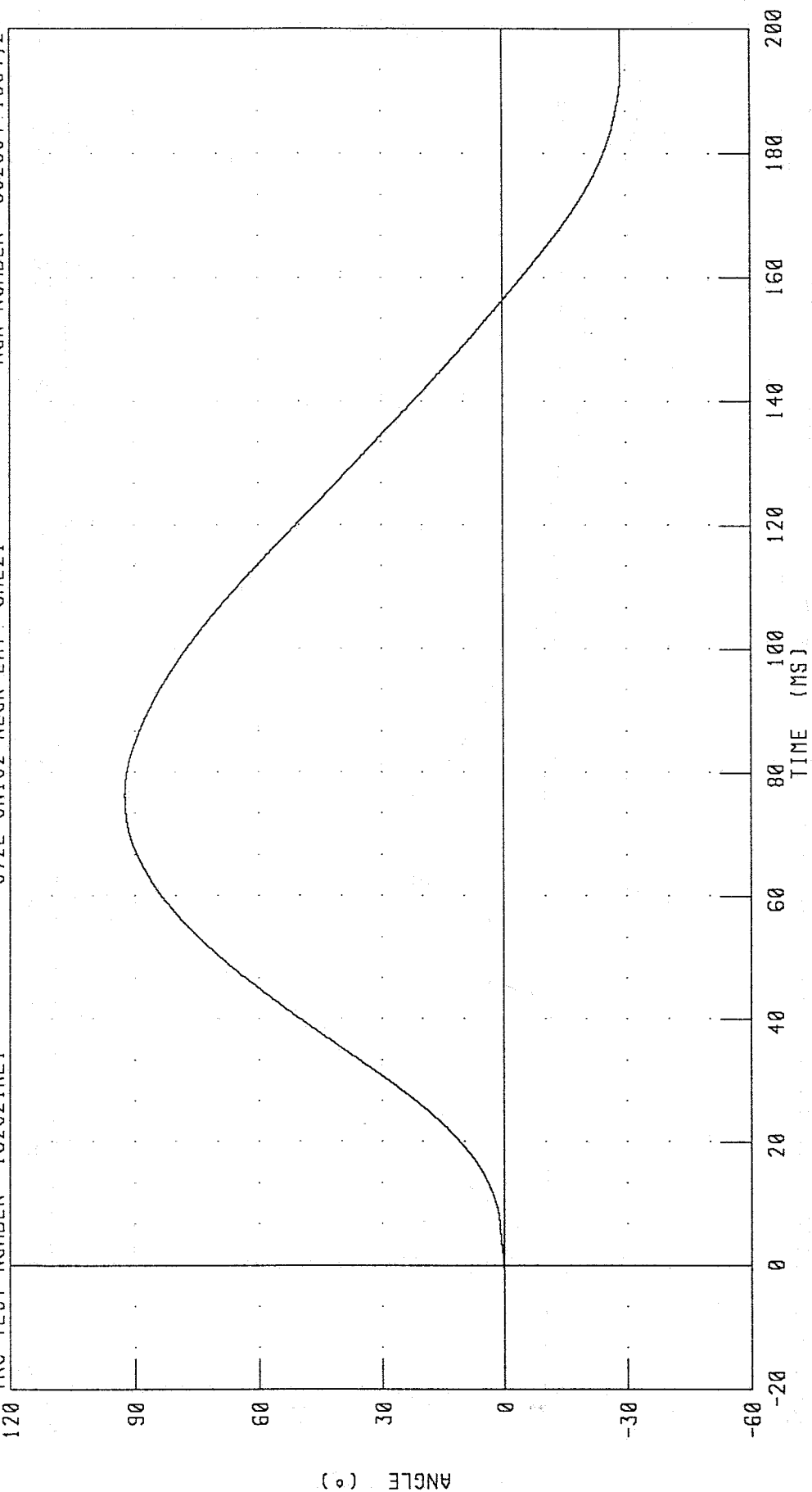
PEAK DATA: 55.66 ° @ 76.48 MS; -17.60 ° @ 197.68 MS

CHANNEL: THETA FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C21NE1 572E SN192 NECK EXT CAL21 RUN NUMBER: 062094 1504,2



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 92.37 ° @ 76.24 MS, -28.68 ° @ 197.76 MS

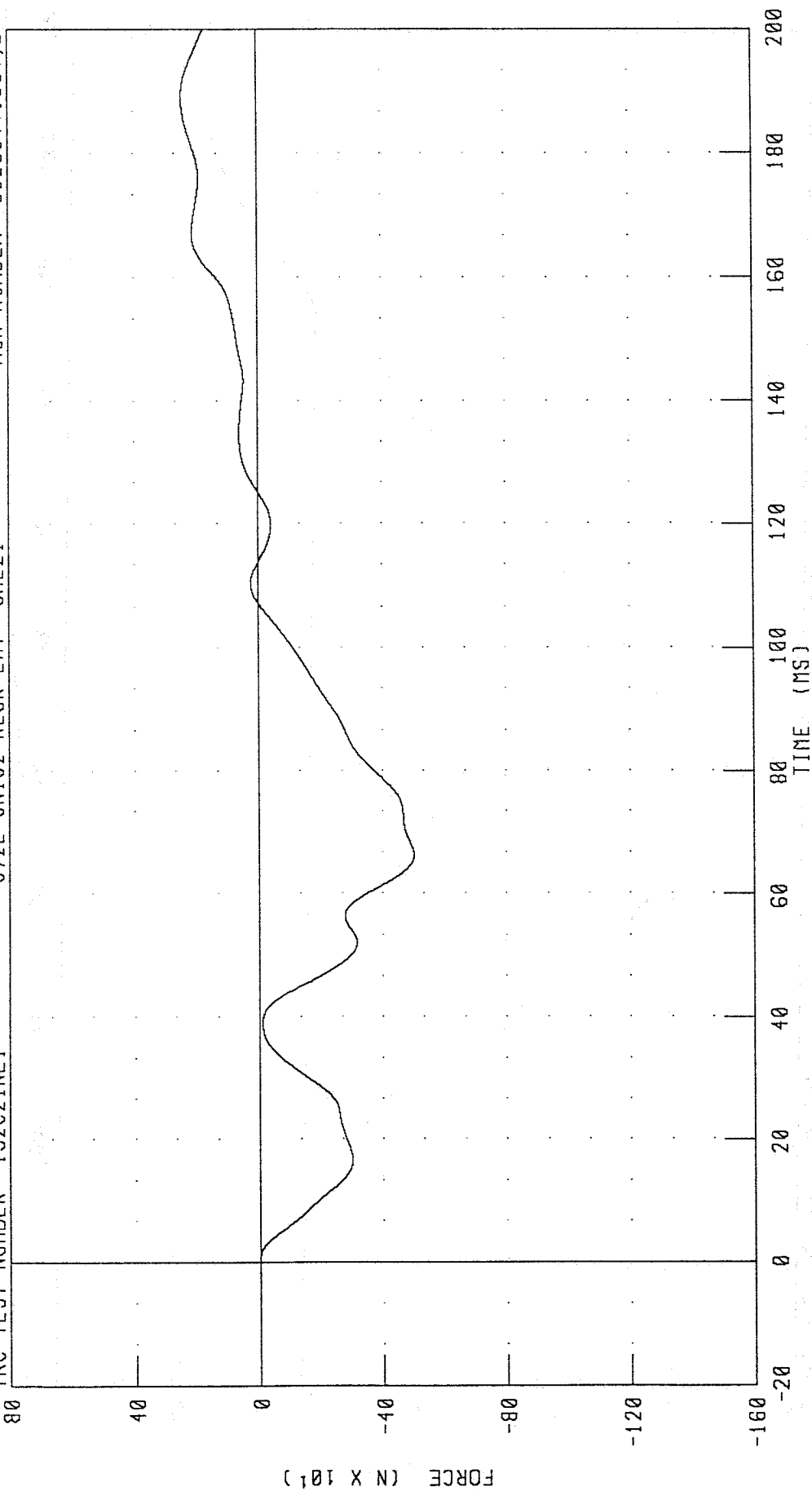
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C21NE1

572E SN192 NECK EXT CAL21

RUN NUMBER: 062094 1504,2



CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 243.24 N @ 188.80 MS; -500.66 N @ 66.24 MS

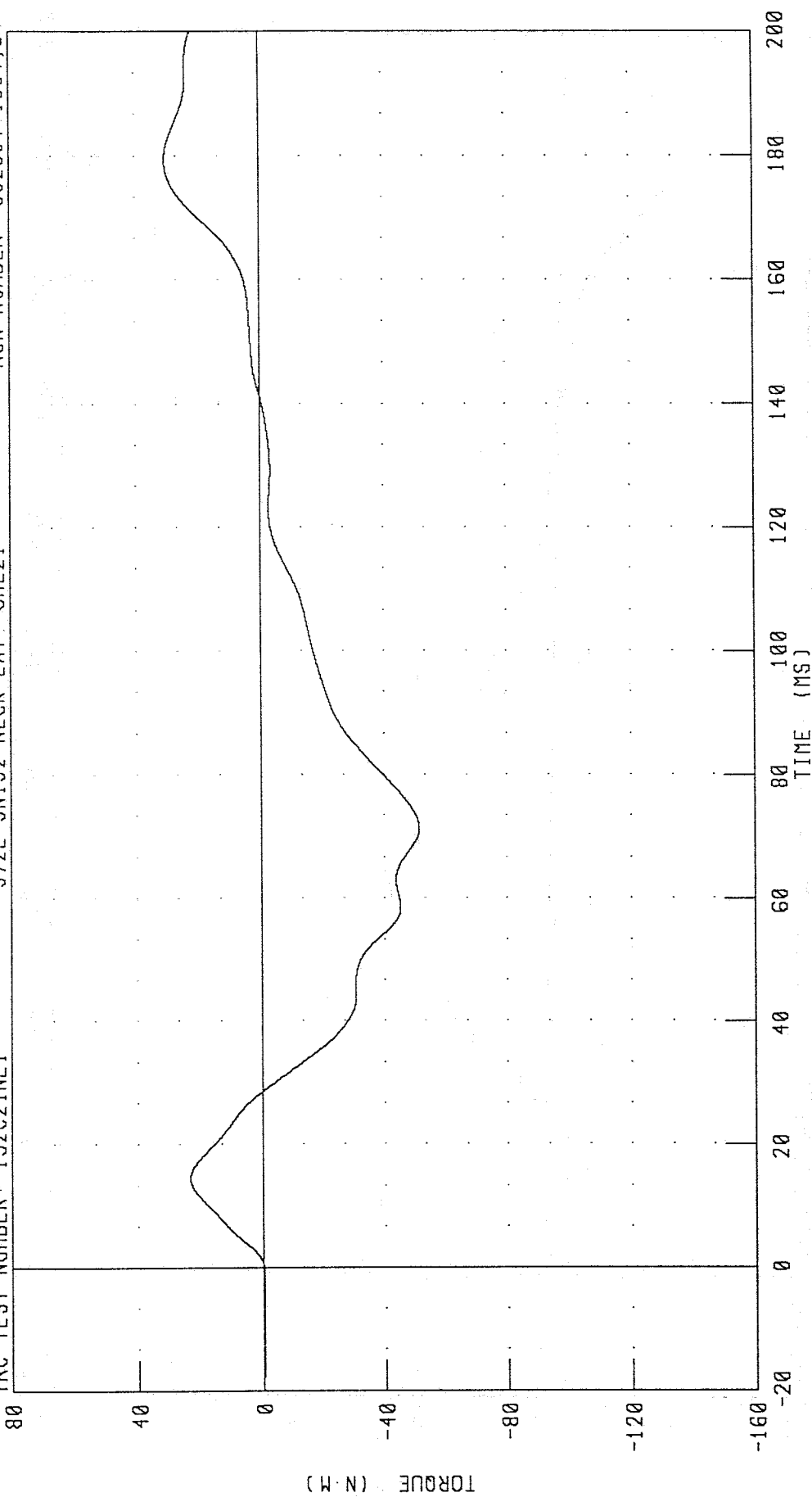
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192021NE1

572E SN192 NECK EXT CAL21

RUN NUMBER: 062094 1504;2



PEAK DATA: 30.41 N·M @ 179.28 MS; -51.27 N·M @ 71.36 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

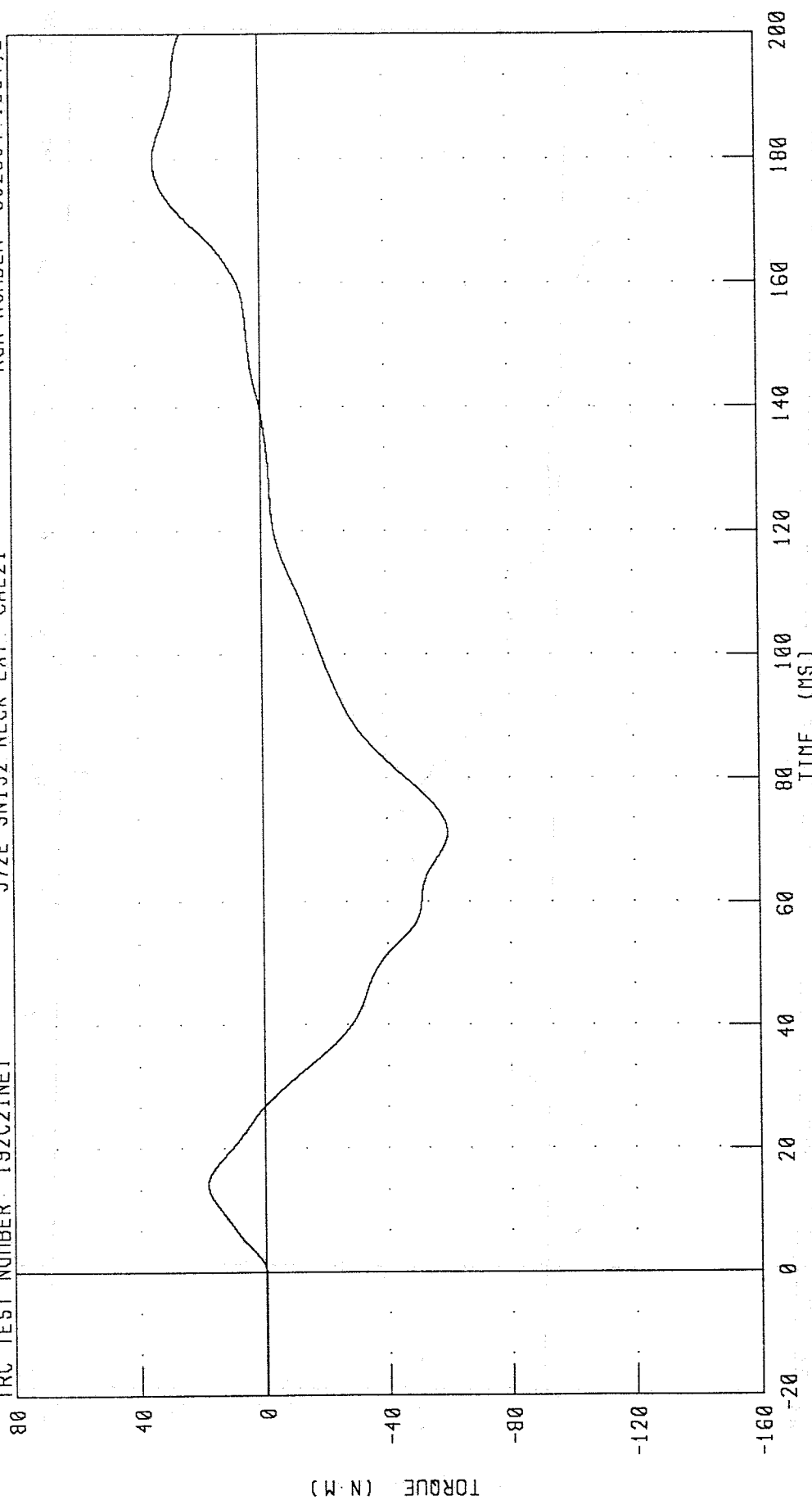
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 192C21NE1

572E SN192 NECK EXT CAL21

RUN NUMBER 062094 1504;2



TIME (MS)

PEAK DATA: 33.98 N.M @ 179.76 MS; -59.60 N.M @ 71.28 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

23-MAY-94

TRC INC.

TEST NO: 192C21TH1

572E SN192 H.S.THORAX CAL21

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	52.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	64.5 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5619. N
INTERNAL HYSTERESIS	69% - 85%	73.7%

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. H. Hildt

RUN NUMBER: 052394.1259;1

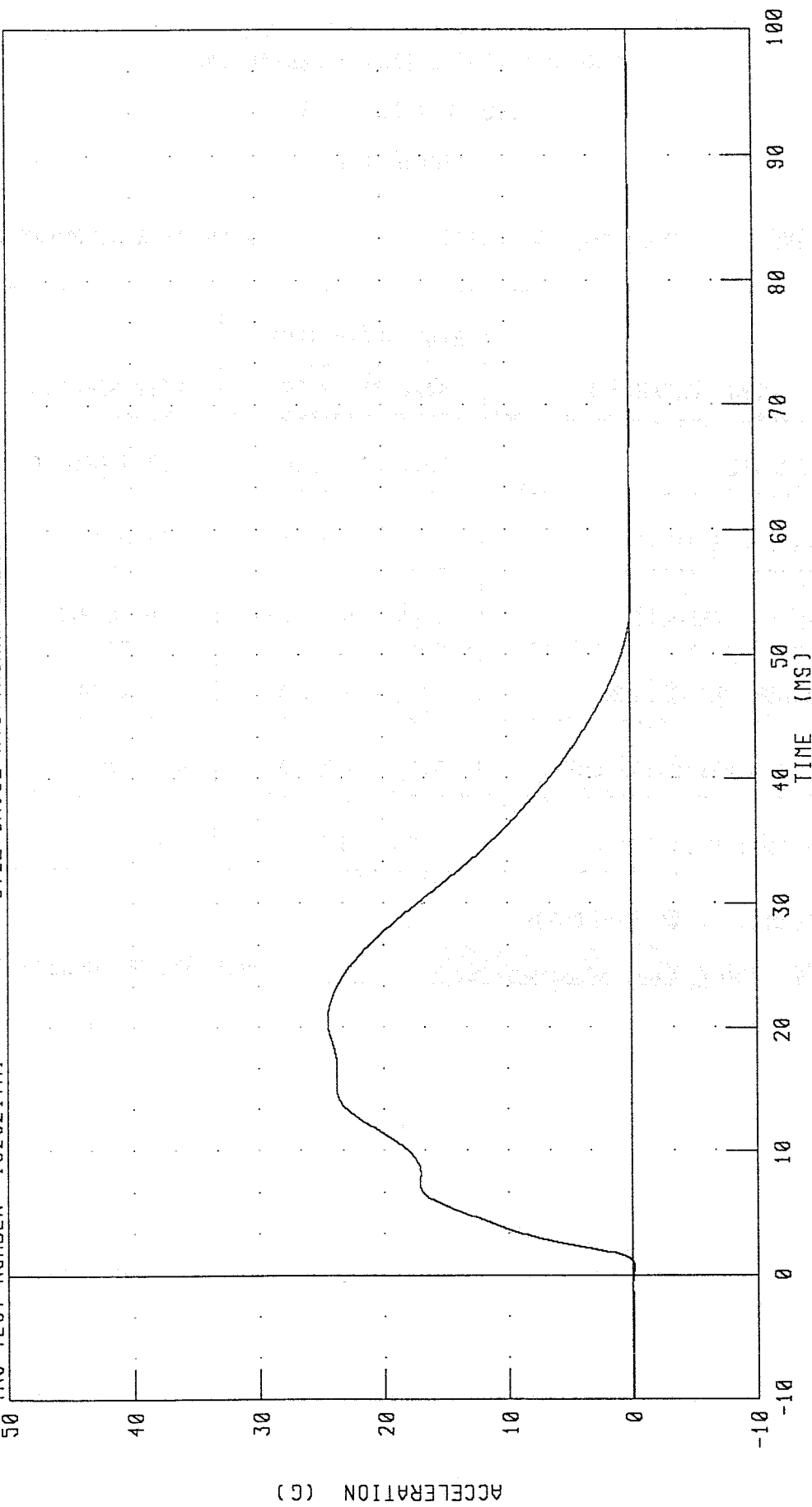
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 192C21TH1

572E SN192 H S THORAX CAL21

RUN NUMBER 062094 1504.1



CHANNEL: PENXG FILTER: CH. CLASS 180

PEAK DATA: 24.53 G @ 20.48 MS; -0.13 G @ 0.64 MS

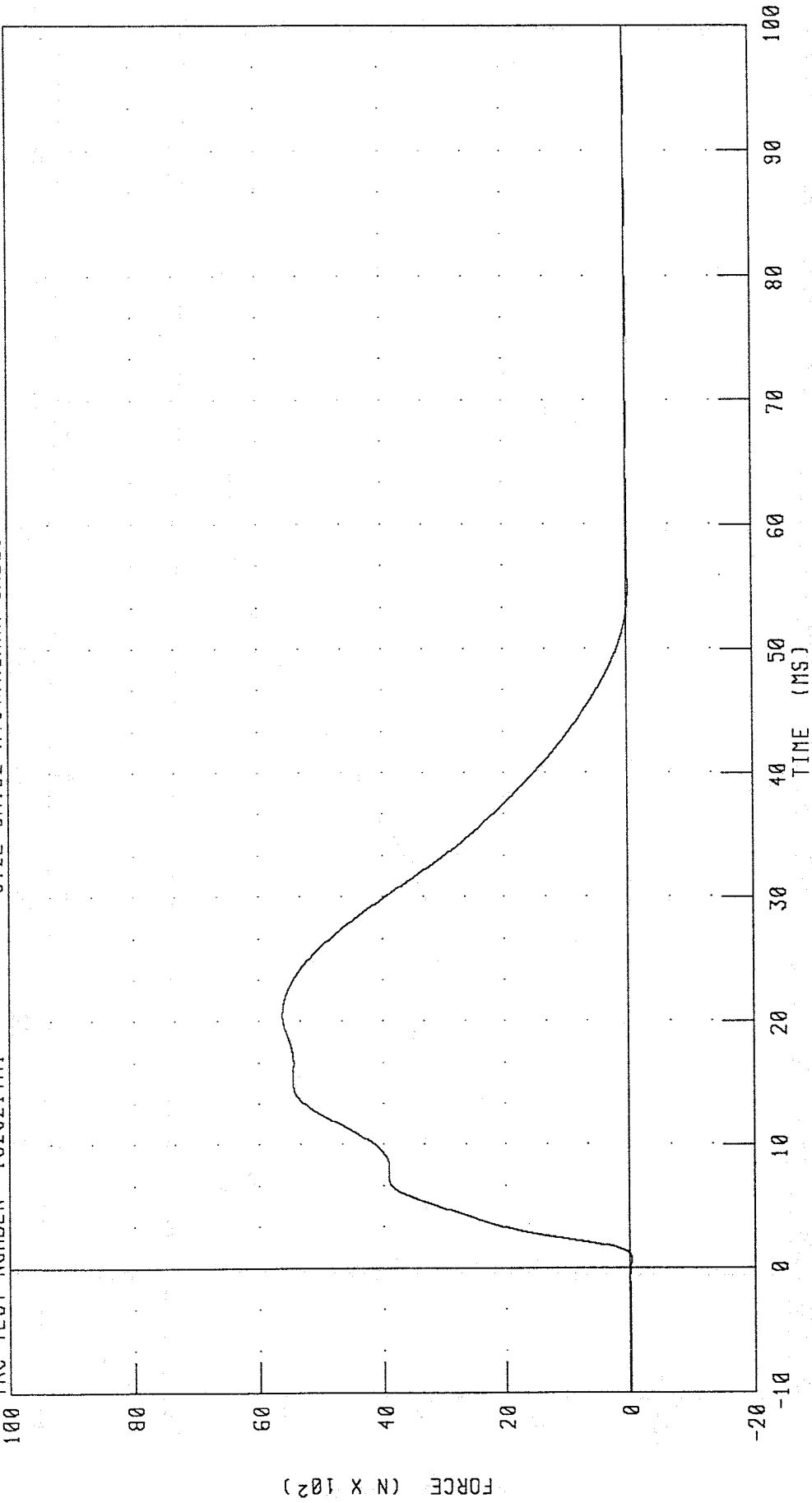
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 192C21TH1

572E SN192 H S THORAX CAL21

RUN NUMBER: 062094.1504.1



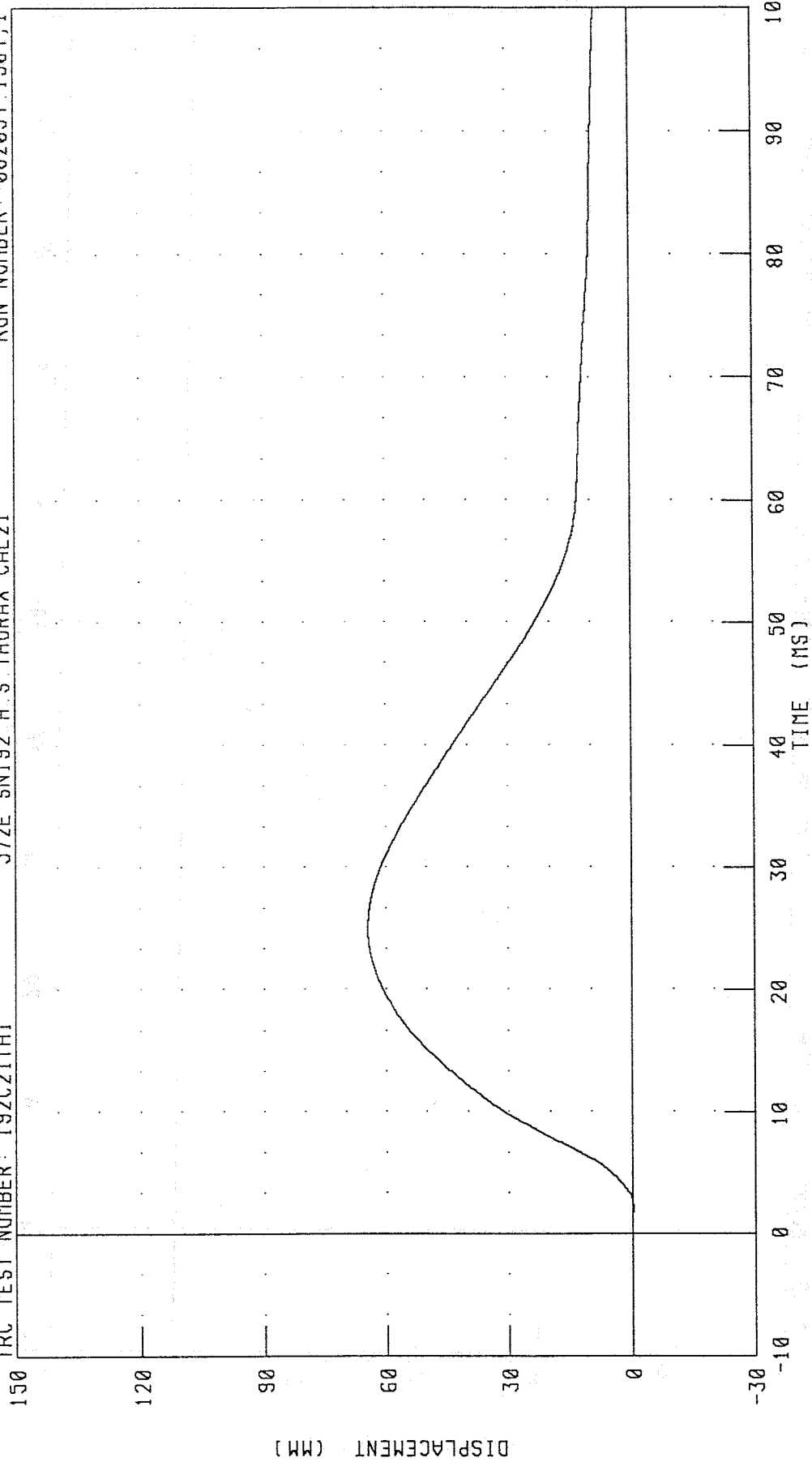
CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5619.98 N @ 20.48 MS, -30.52 N @ 0.64 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C21TH1 RUN NUMBER: 062094.1504.1

572E SN192 H.S. THORAX CAL21



CHANNEL: CSTXD FILTER: CH. CLASS 180

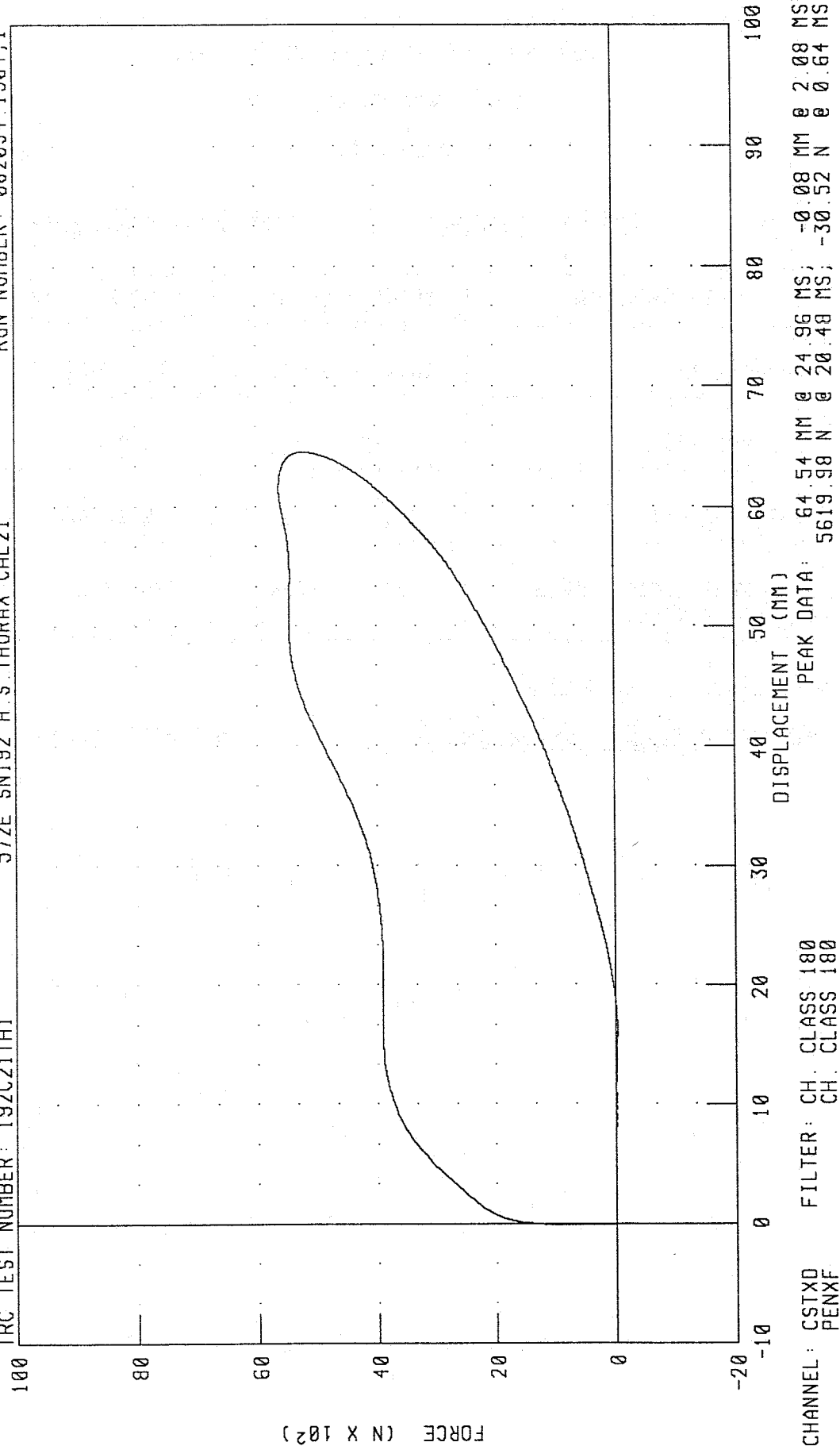
PEAK DATA: 64.54 MM @ 24.96 MS; -0.08 MM @ 2.08 MS

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

TRC TEST NUMBER: 192C21TH1

572E SN192 H.S. THORAX CAL21

RUN NUMBER: 062094.1504.1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

20-MAY-94

TRC INC.

TEST NO: 192C21RK1

572E SN192 RIGHT KNEE CAL 21

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5352.6 N

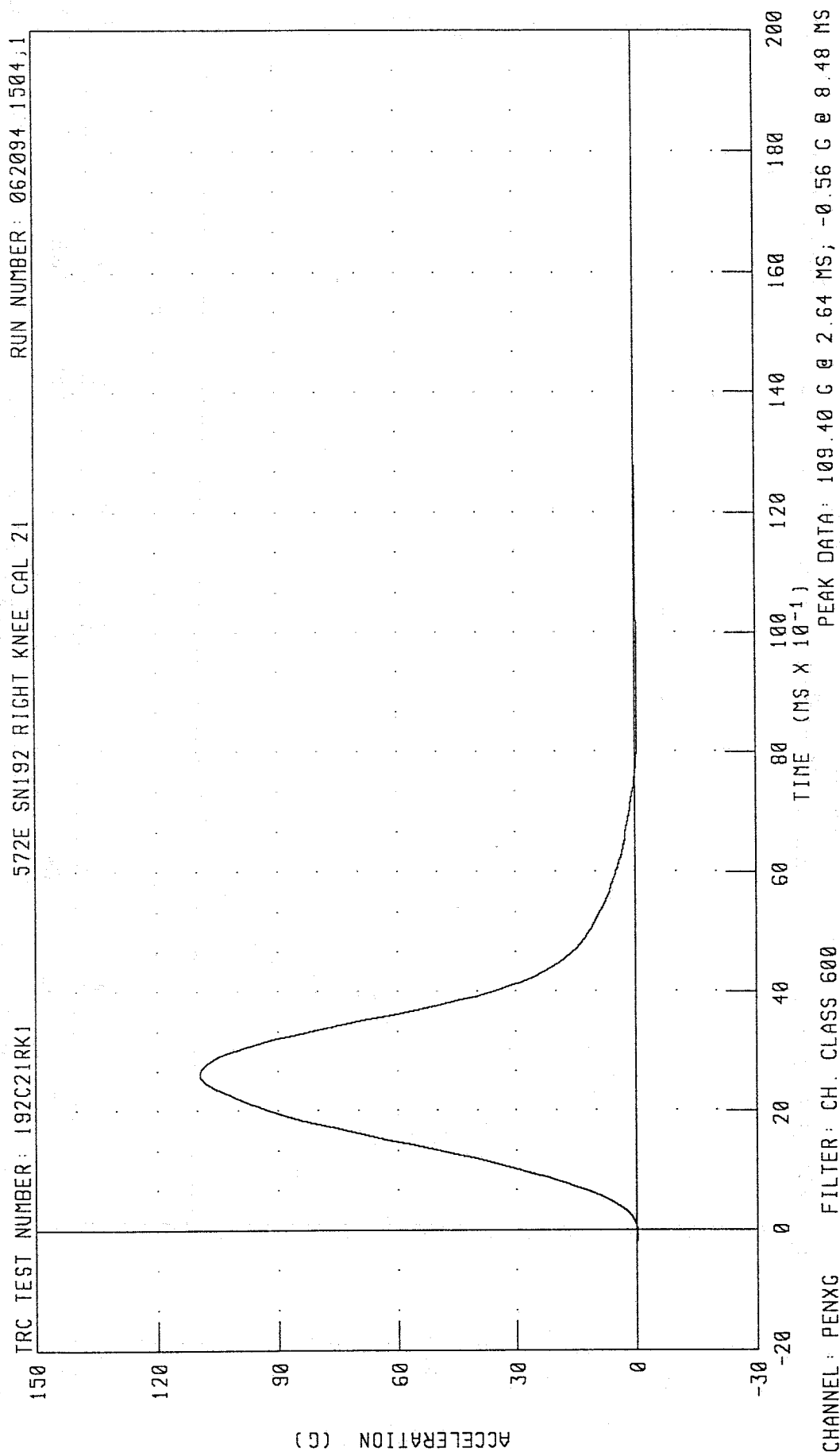
TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

RUN NUMBER: 052094.0809;1

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



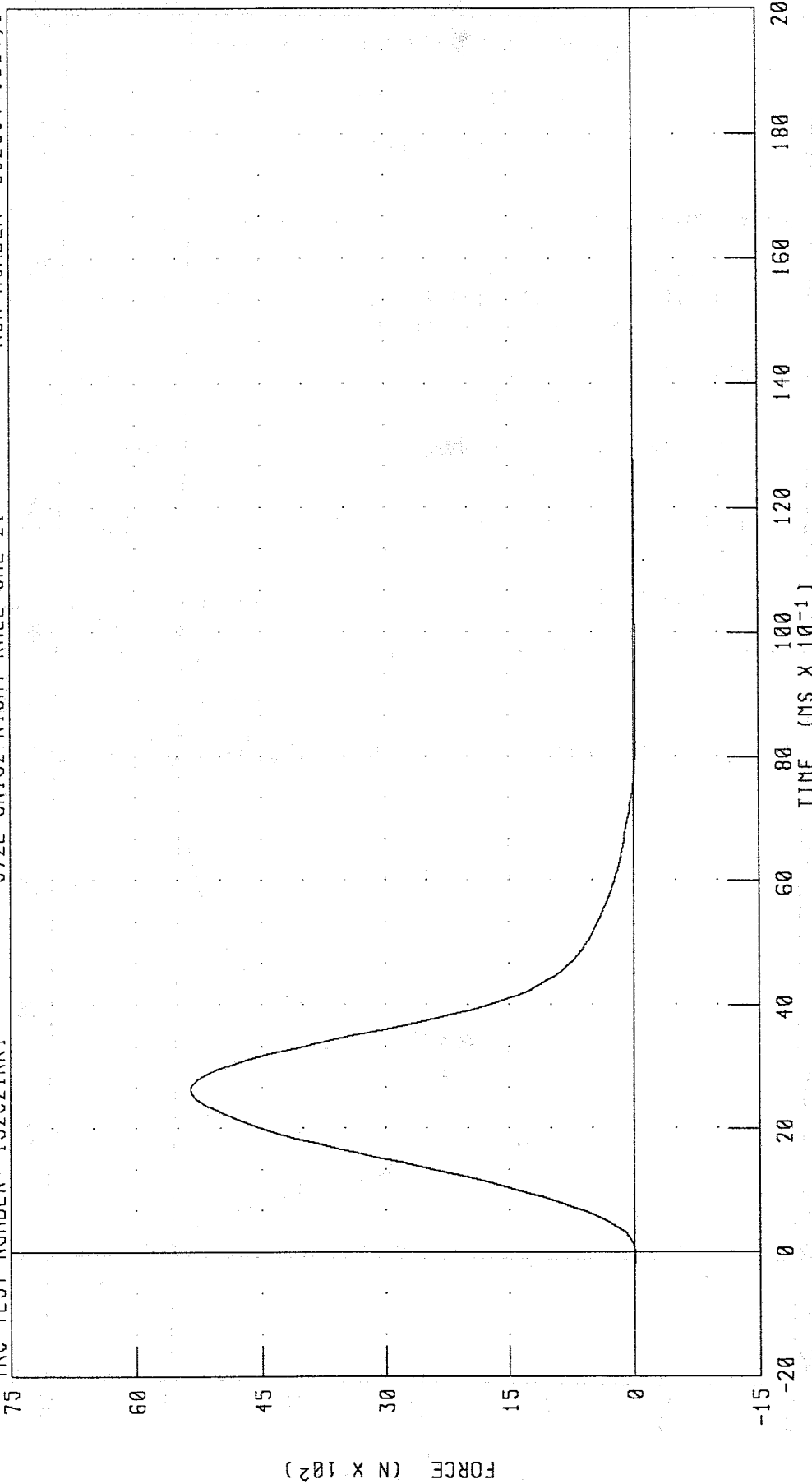
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN192 RIGHT KNEE CAL 21

RUN NUMBER: 062094 1504,1

TRC TEST NUMBER: 192021RK1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5352.62 N @ 2.64 MS; -27.17 N @ 8.48 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

20-MAY-94

TRC INC.

TEST NO: 192C21LK1

572E SN192 LEFT KNEE CAL 21

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5312.1 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middel

RUN NUMBER: 052094.0803;1

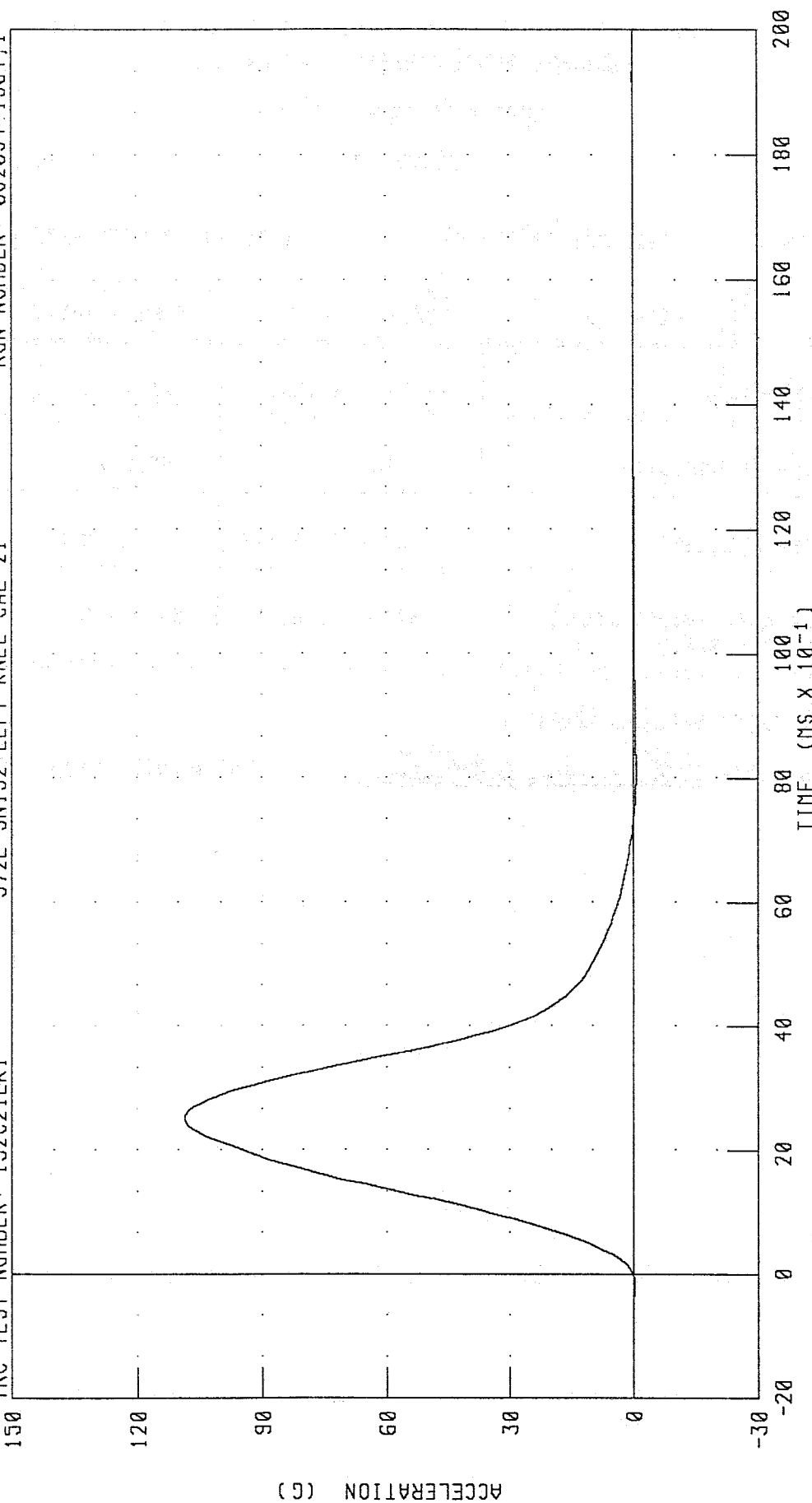
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM DECELERATION (5 KC PEND)

TRC TEST NUMBER: 192C21LK1

572E SN192 LEFT KNEE CAL 21

RUN NUMBER: 062094.1504.1



CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 108.57 G @ 2.48 MS; -0.60 G @ 8.08 MS

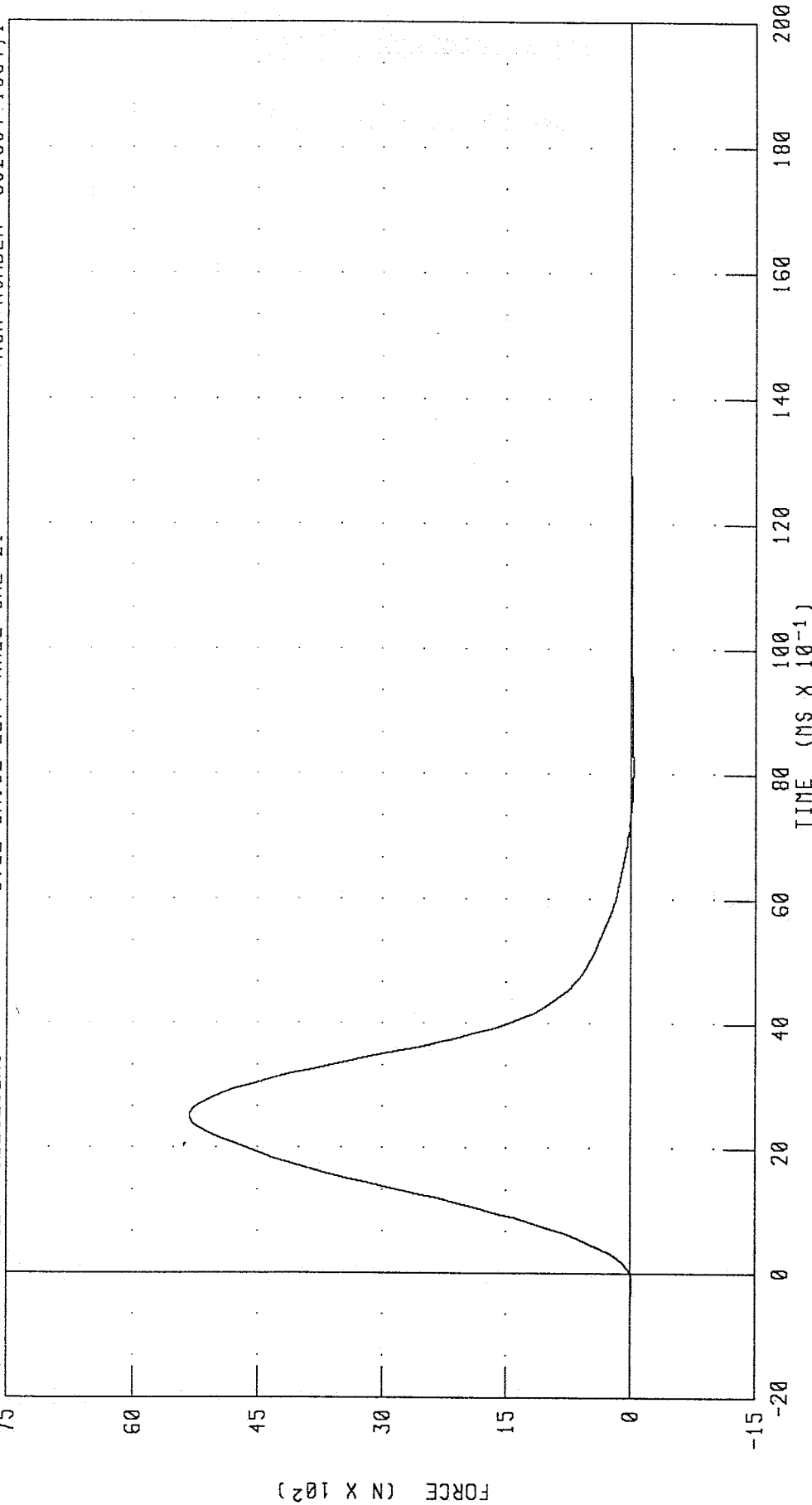
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C21LK1

572E SN192 LEFT KNEE CAL 21

RUN NUMBER: 062094.1504;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5312.19 N @ 2.48 MS; -29.15 N @ 8.08 MS

PRE-TEST CERTIFICATION DATA

PASSENGER 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

Chas. Muddlet

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

Chas. Middleton

RUN NUMBER: 051994.0917;4

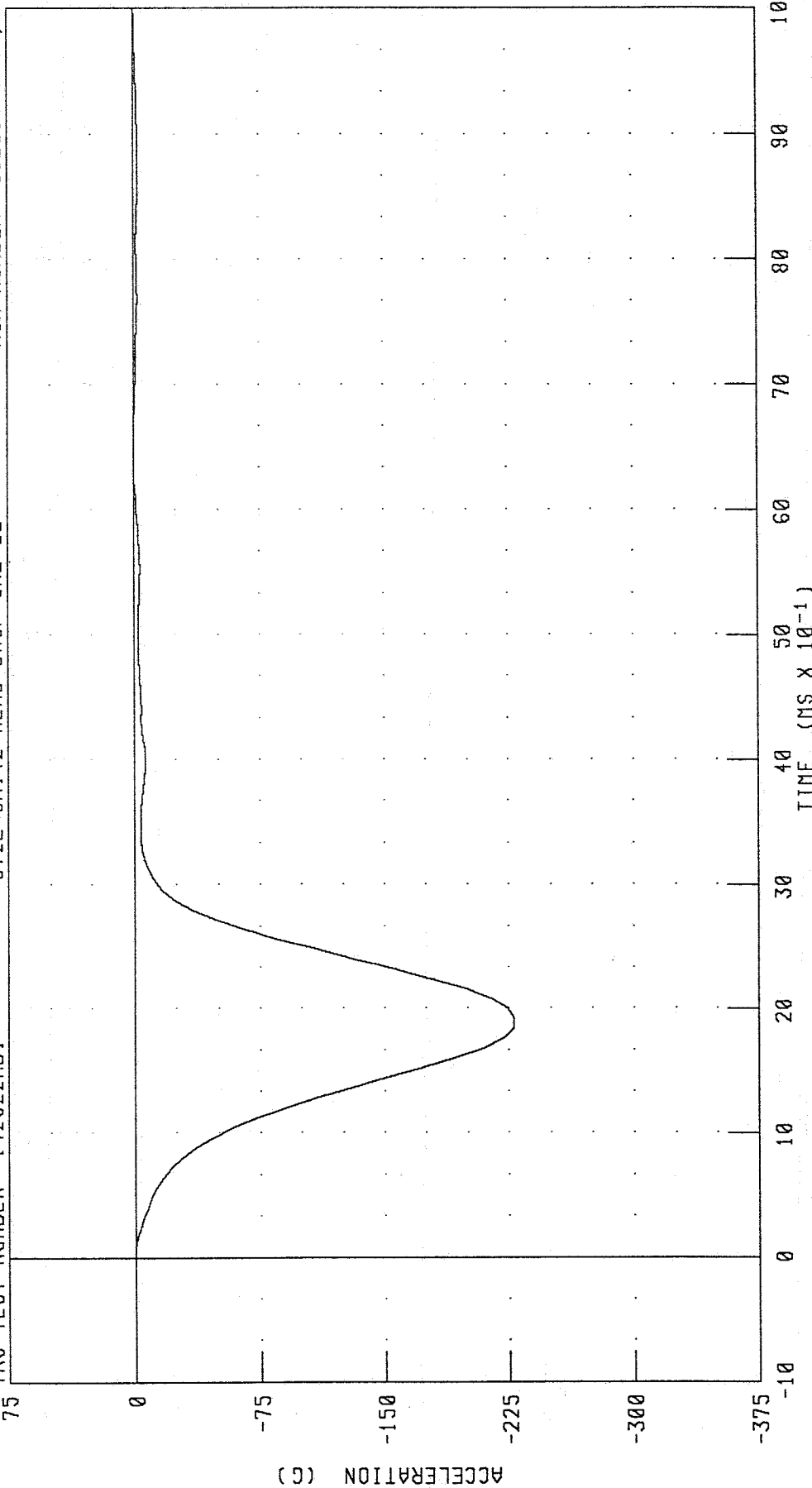
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 142C22HD1

572E SN142 HEAD DROP CAL 22

RUN NUMBER: 062094.1526,4



CHANNEL: HEDXG FILTER: CH. CLASS 1000

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

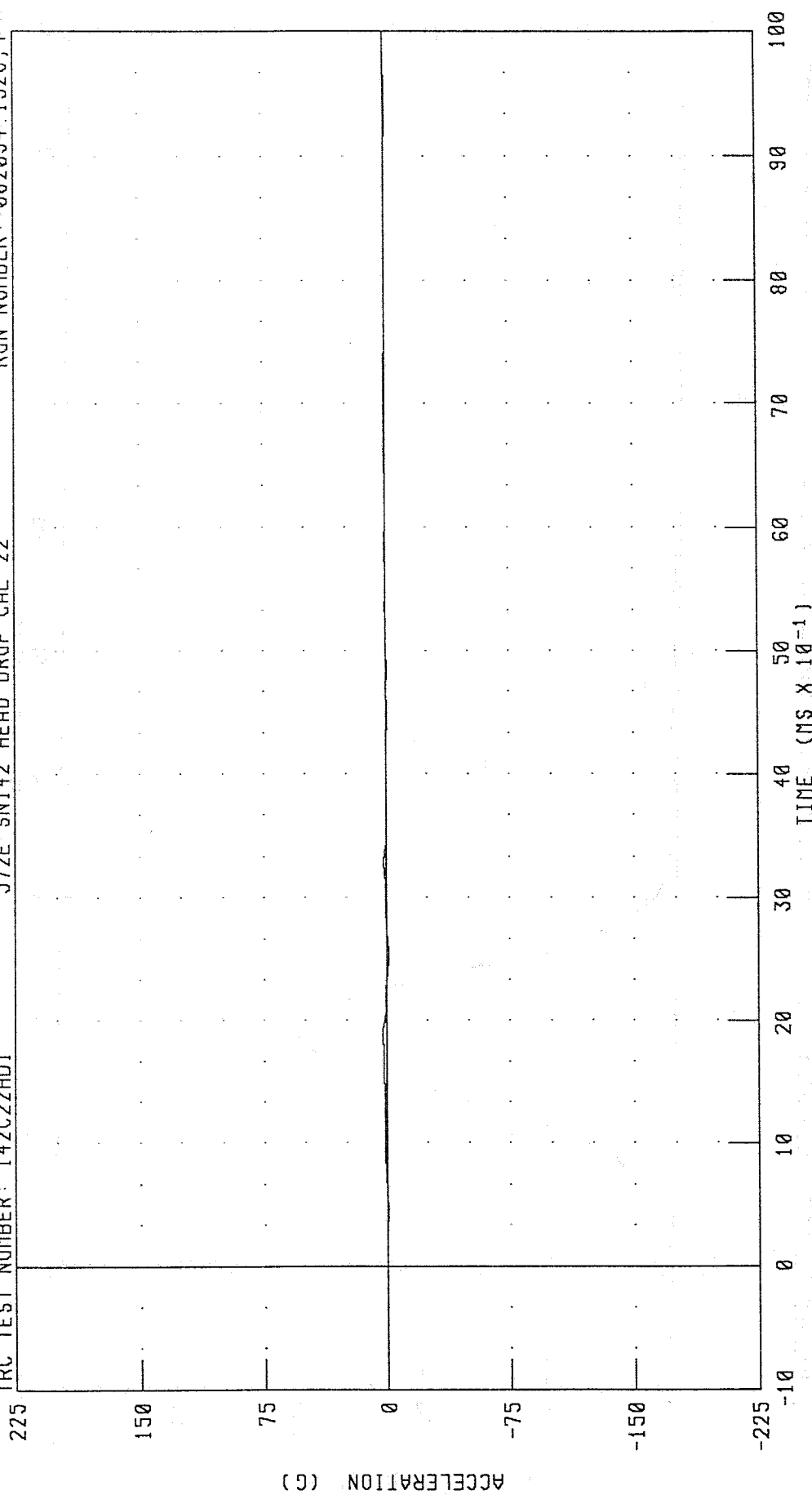
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 142C22HD1

572E SN142 HEAD DROP CAL 22

RUN NUMBER: 062094.1526,4



CHANNEL: HEDYG FILTER: CH. CLASS 1000

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

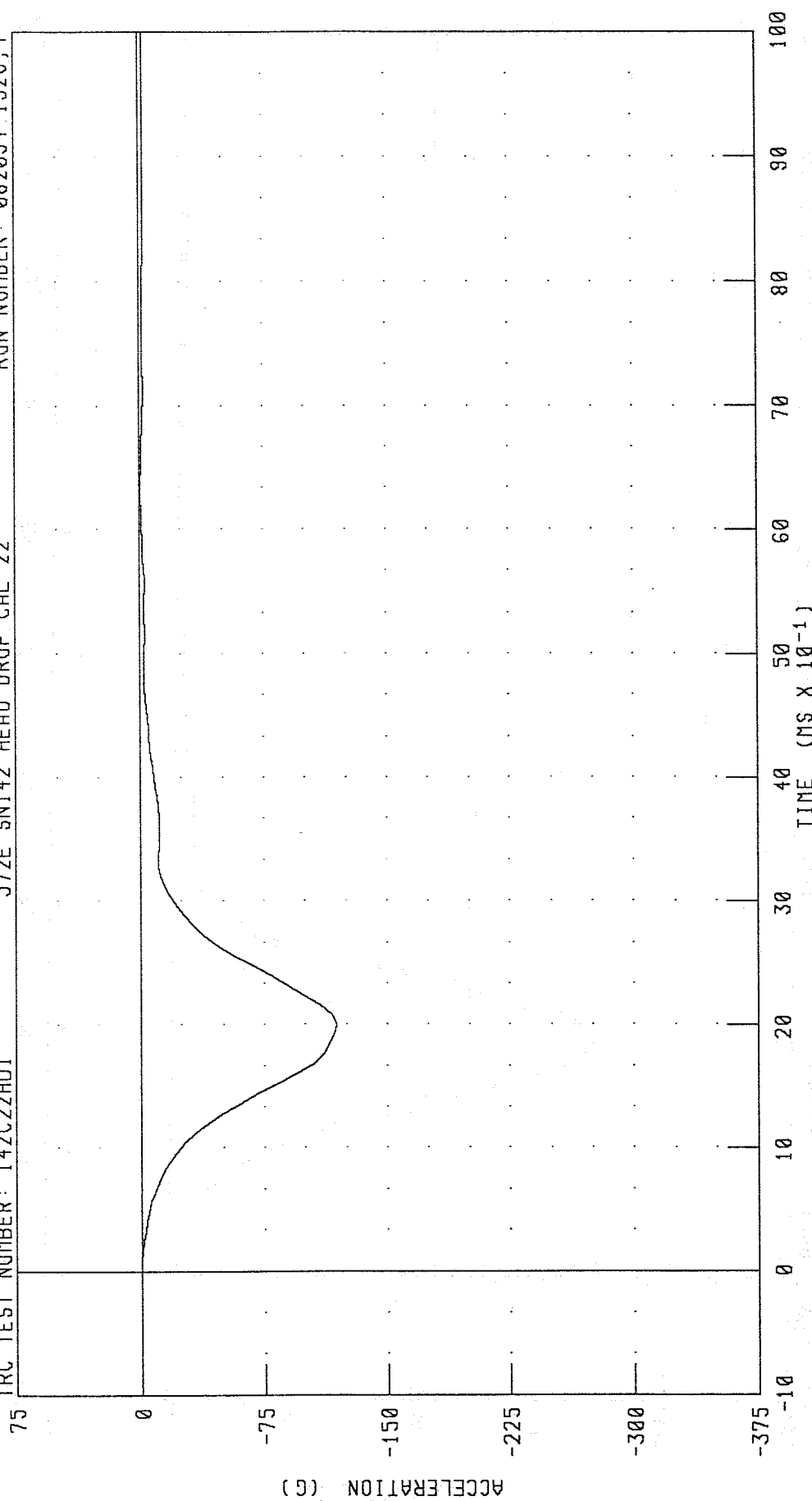
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 142C22H01

572E SN142 HEAD DROP CAL 22

RUN NUMBER: 062094 1526,4



CHANNEL: HEDZG FILTER: CH. CLASS 1000

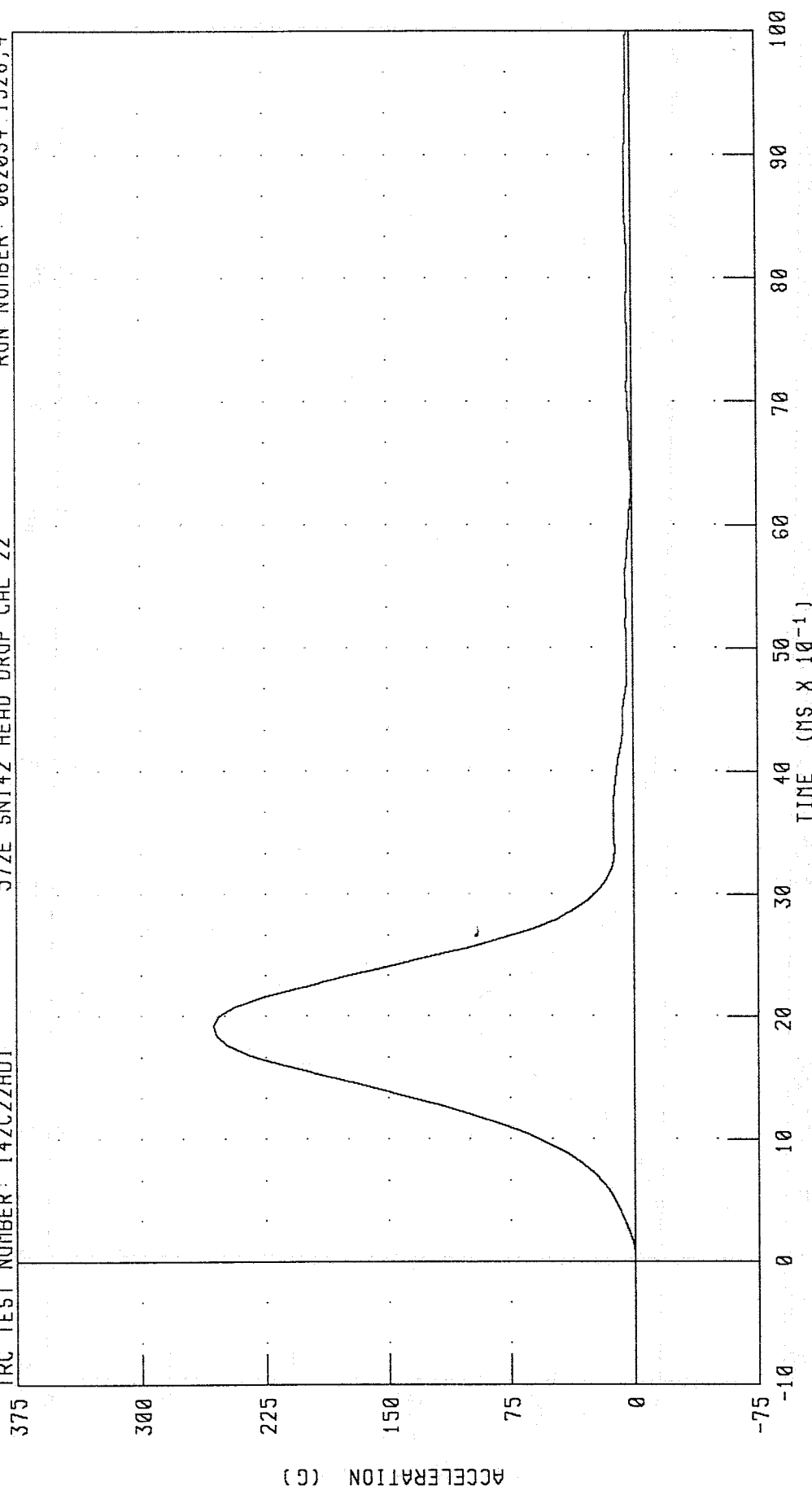
PEAK DATA: 0.05 G @ 0.00 MS; -118.98 G @ 2.00 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 142C22HD1

572E SN142 HEAD DRQP CAL 22

RUN NUMBER: 062094 1526,4



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

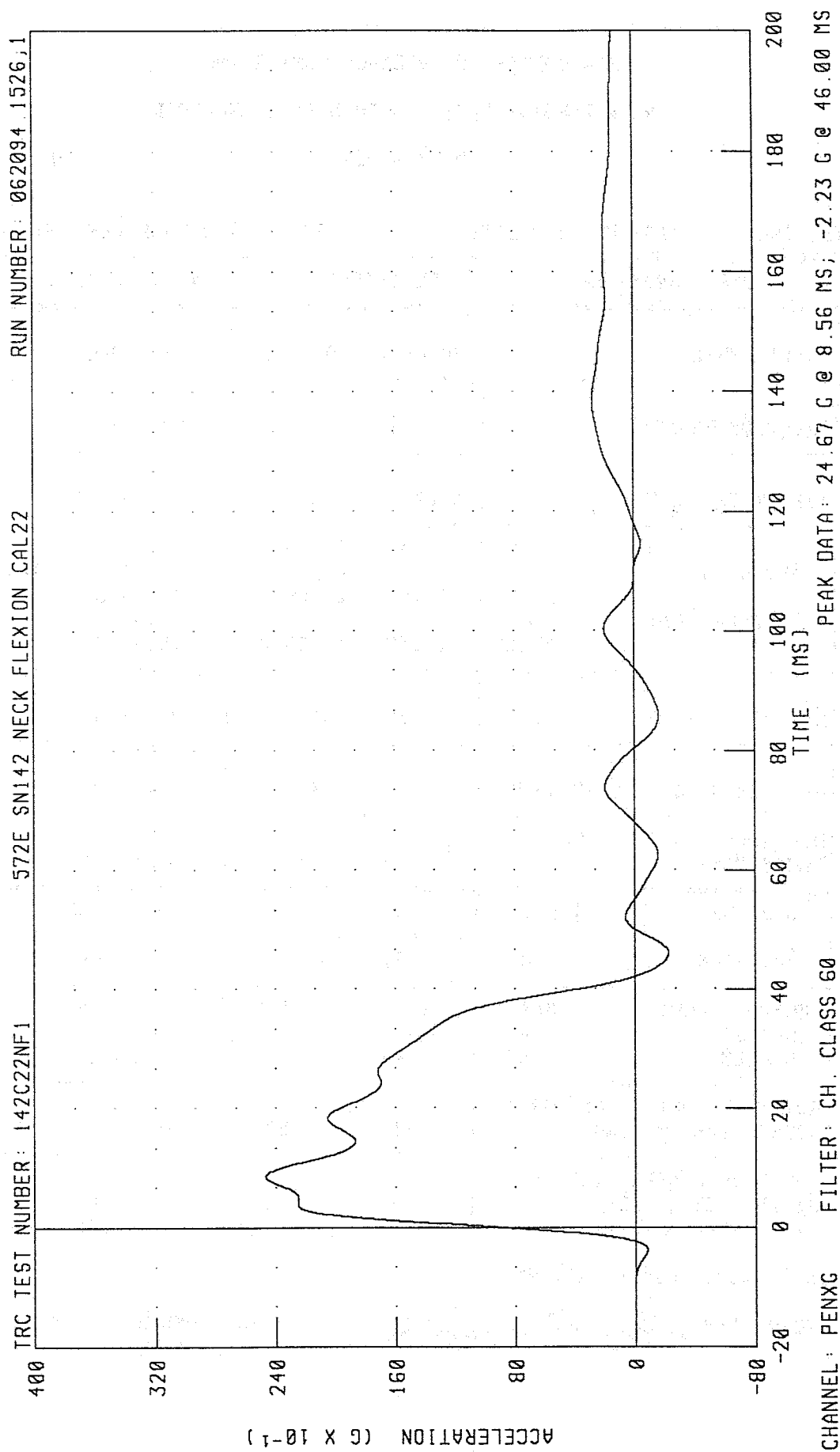
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	53.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.70 G
	20 MS	17.60 - 22.60 G	19.75 G
	30 MS	12.50 - 18.50 G	15.46 G
MAX PENDULUM G		29 G MAX	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 Phas. Middleton

RUN NUMBER: 051994.1034;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION



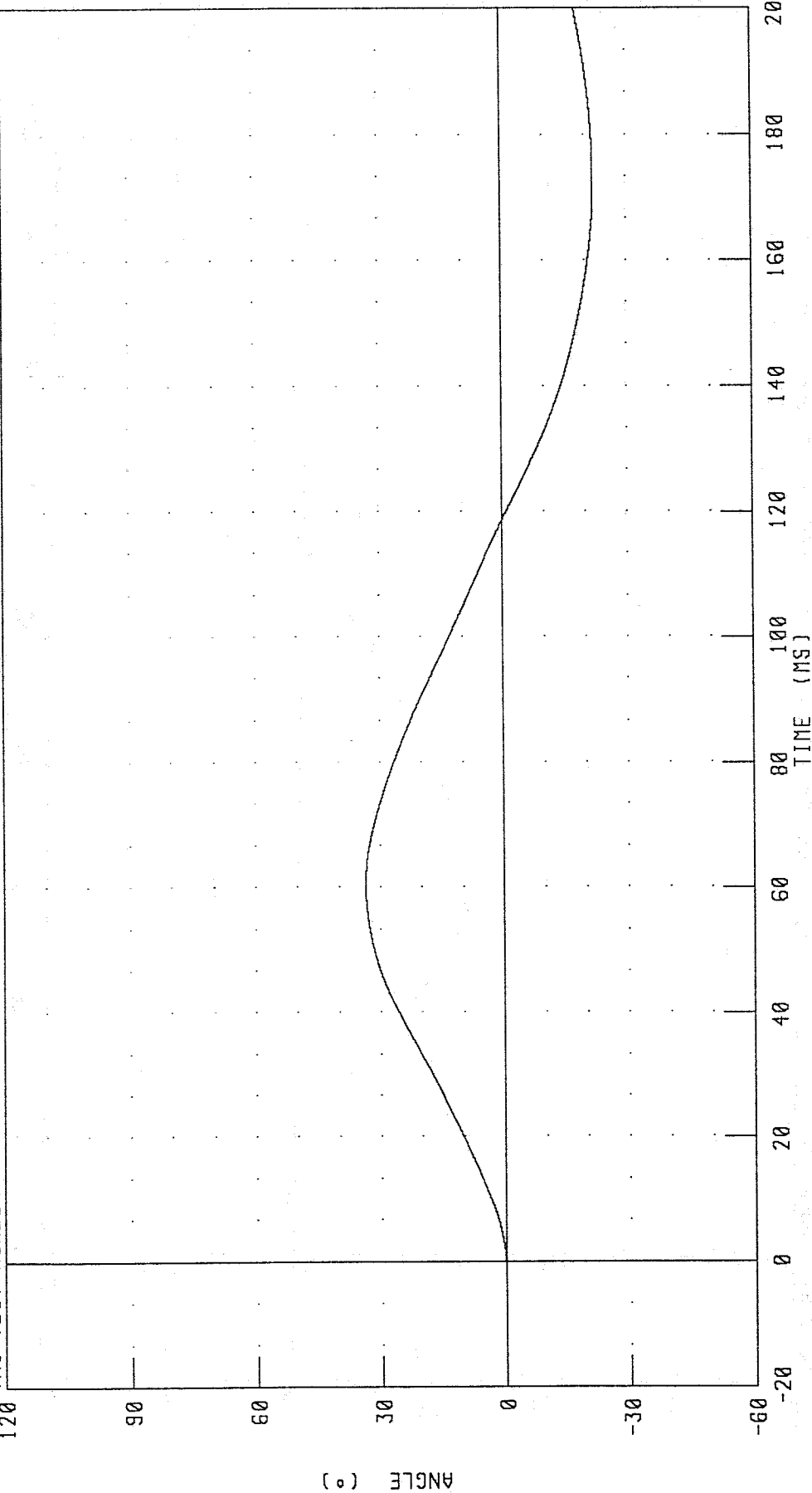
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 062094 1526.1



CHANNEL: BETA FILTER: CH. CLASS 60

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

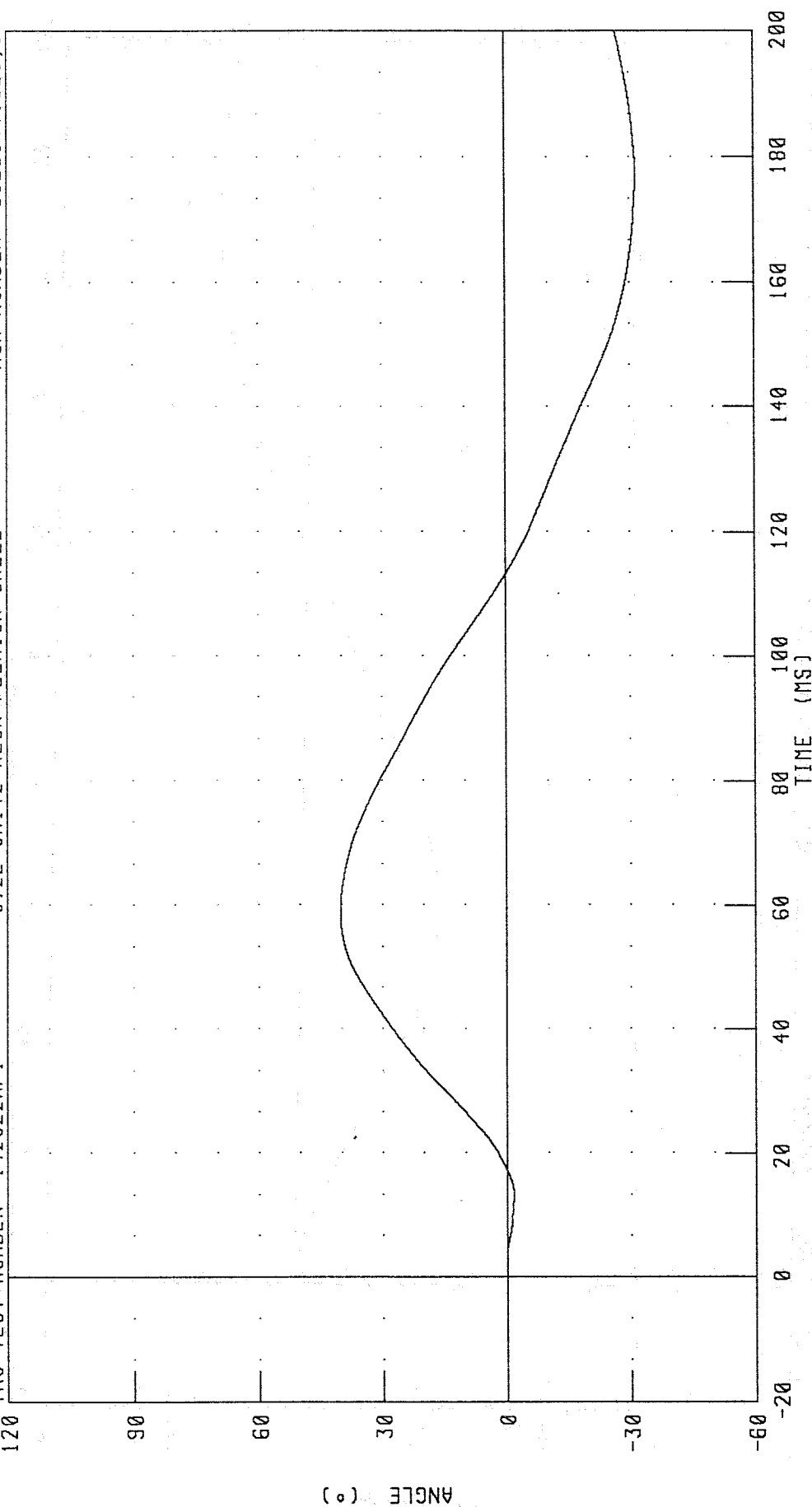
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 062094.1526,1



CHANNEL: THETA FILTER: CH. CLASS 60

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

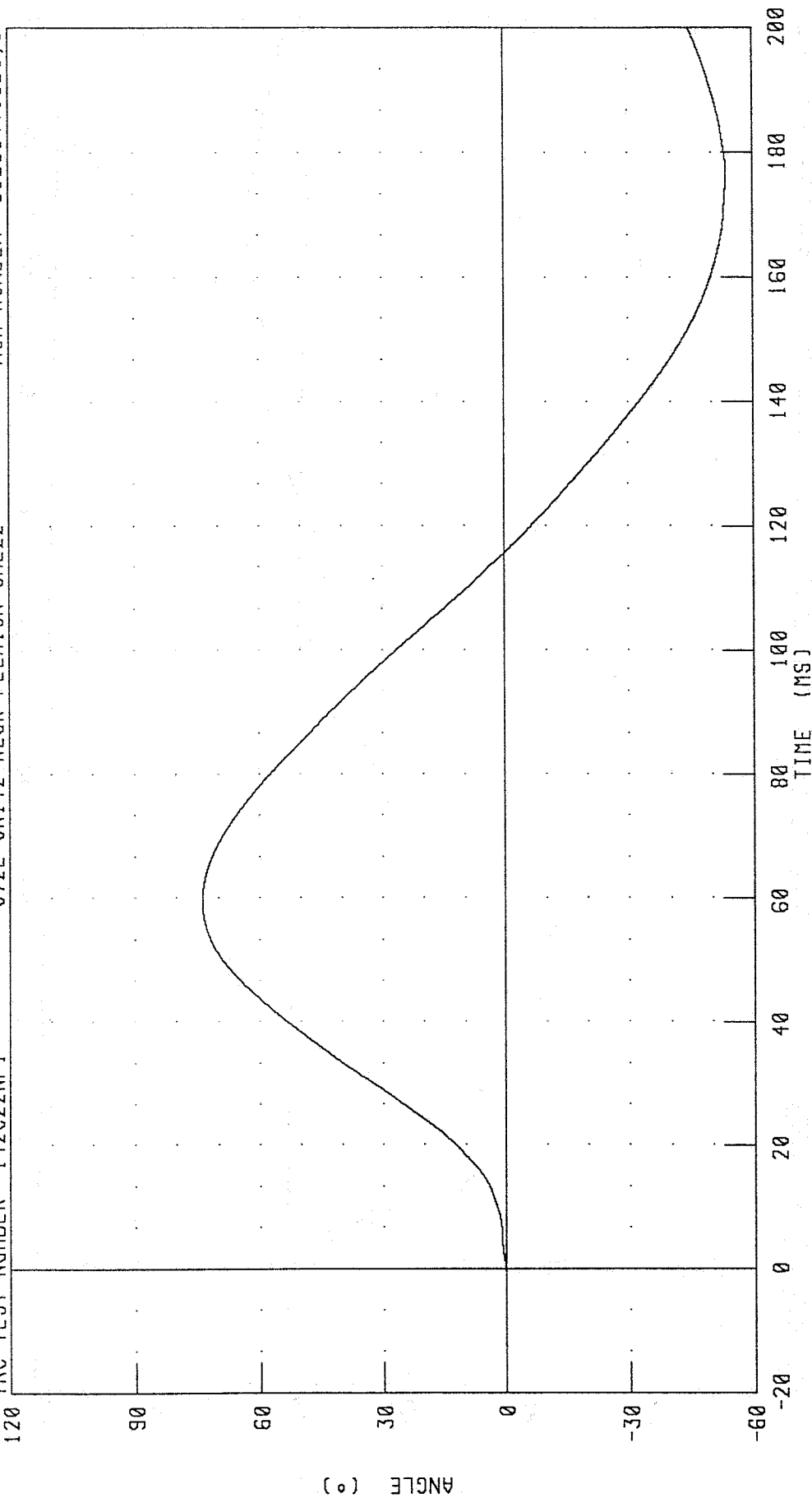
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 062094 1526,1



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

CHANNEL: TOTAN FILTER: CH. CLASS 60

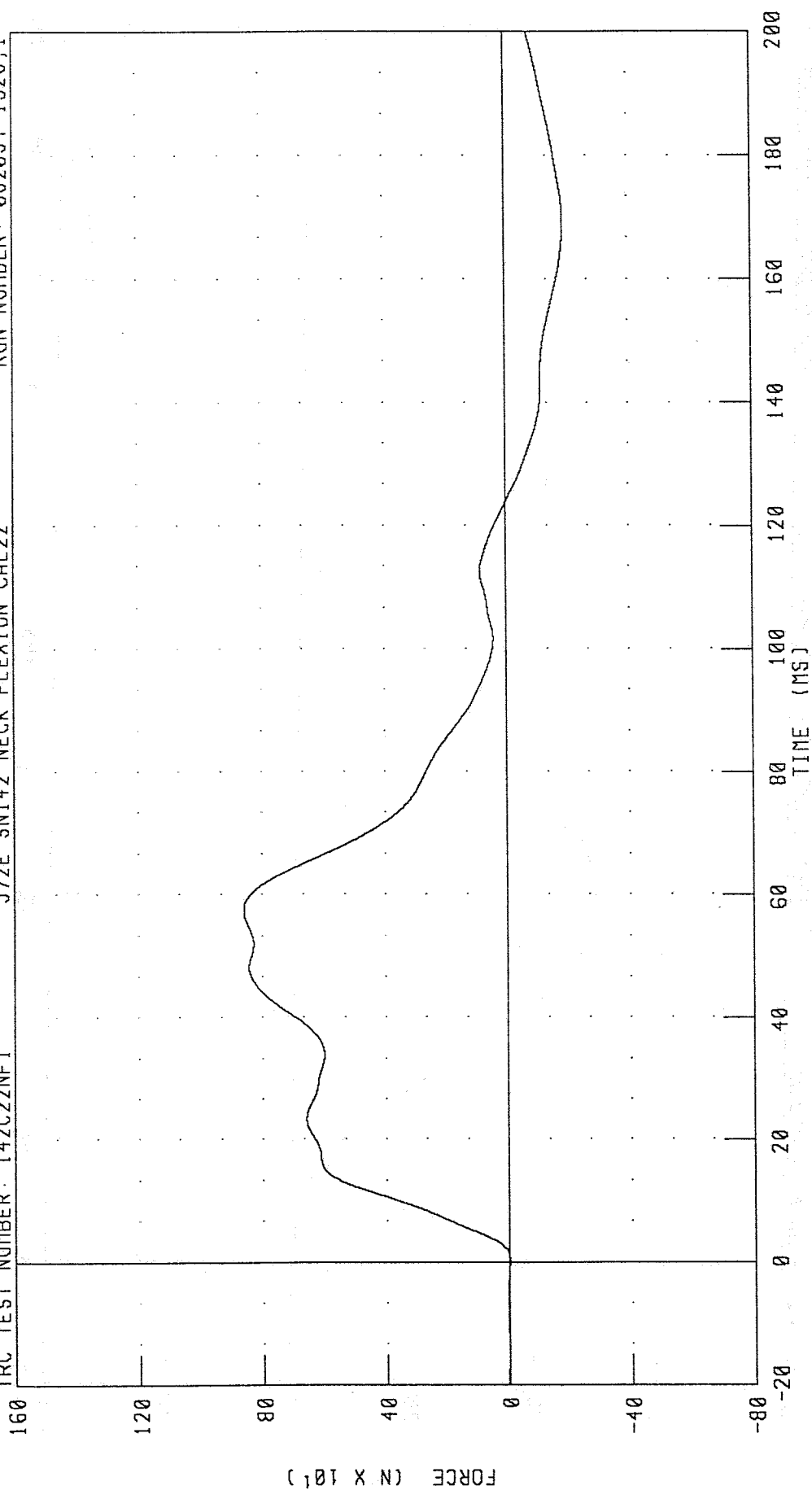
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 062094 1526,1



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

CHANNEL: NEKXF FILTER: CH. CLASS 60

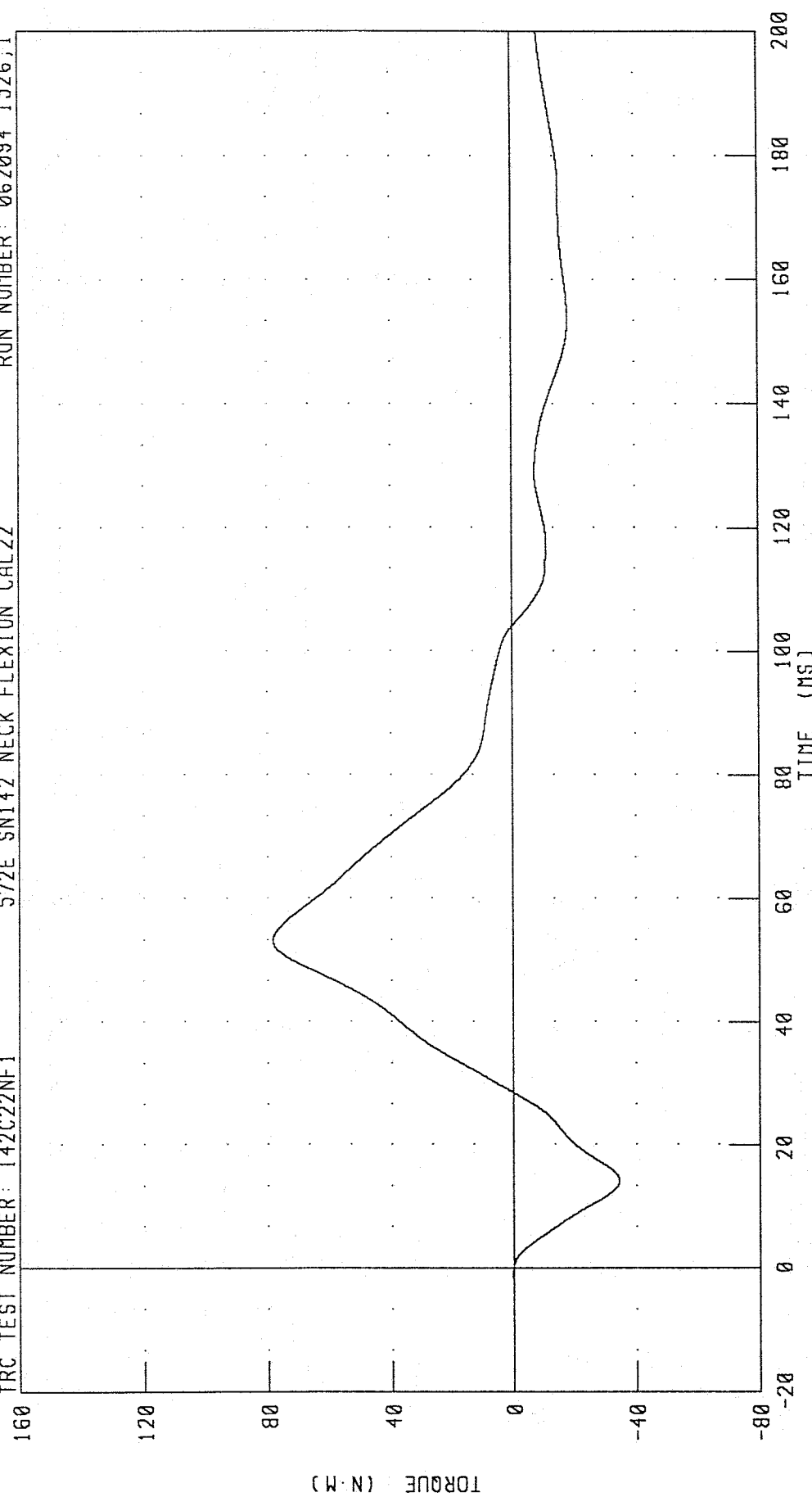
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 062094 1526,1



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

CHANNEL: NEKYM FILTER: CH. CLASS 60

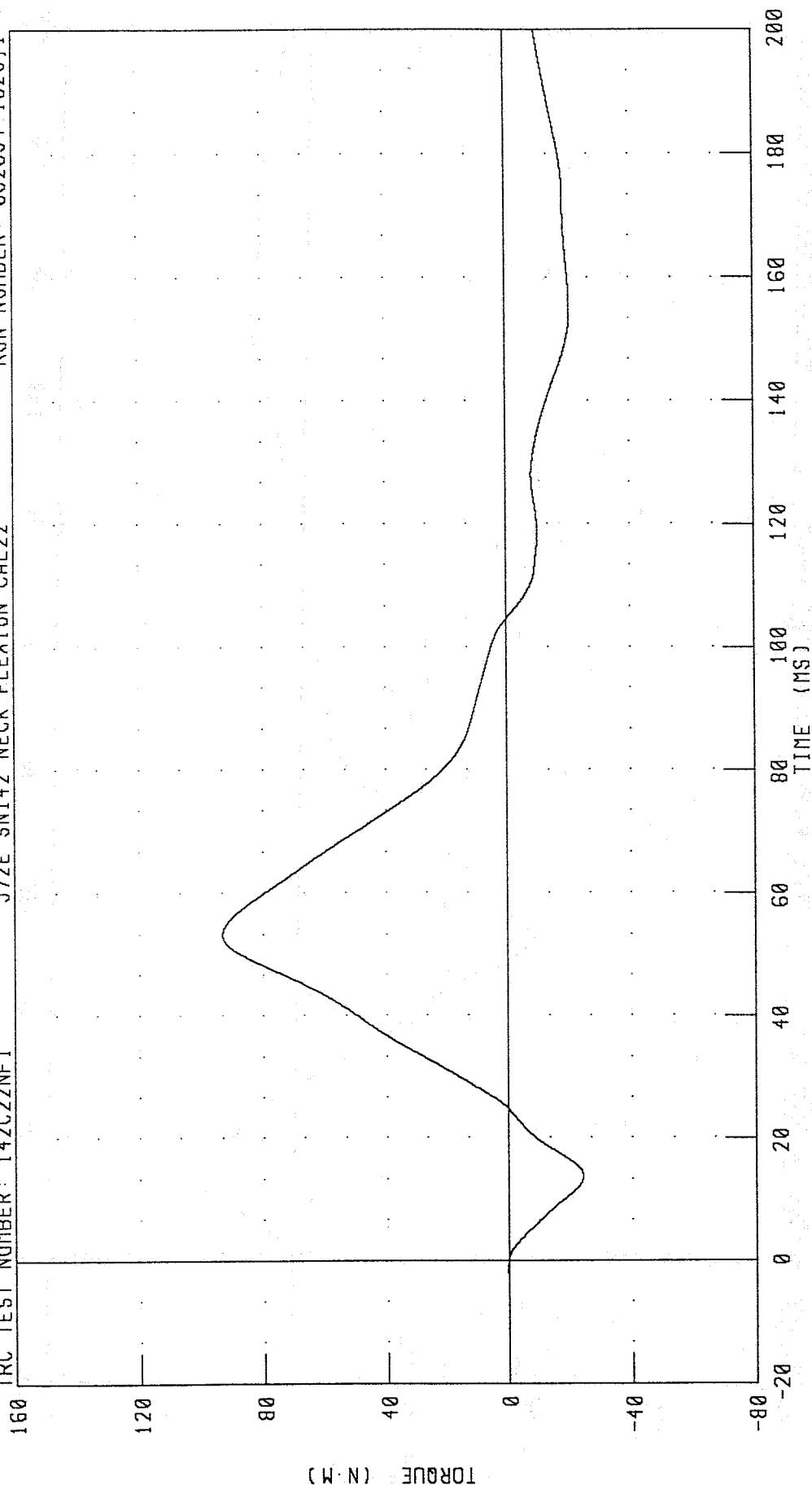
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C22NF1

572E SN142 NECK FLEXION CAL22

RUN NUMBER: 062094 1526.1



CHANNEL: NEKOM FILTER: CH. CLASS 60

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

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 Chas. Middleton

RUN NUMBER: 051994.1044;1

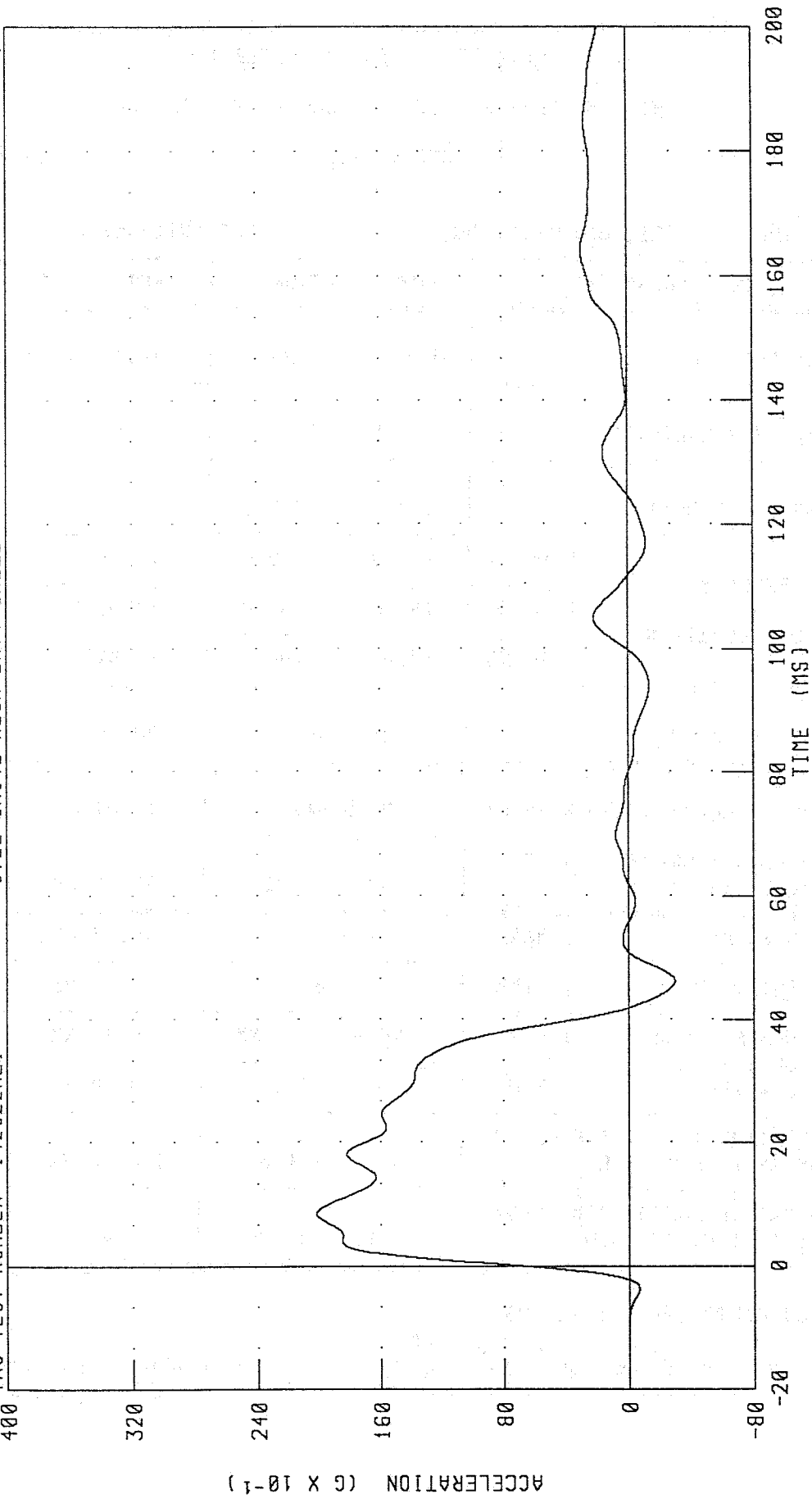
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

IRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 062094.1526.1



CHANNEL: PENXG FILTER: CH. CLASS 60

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

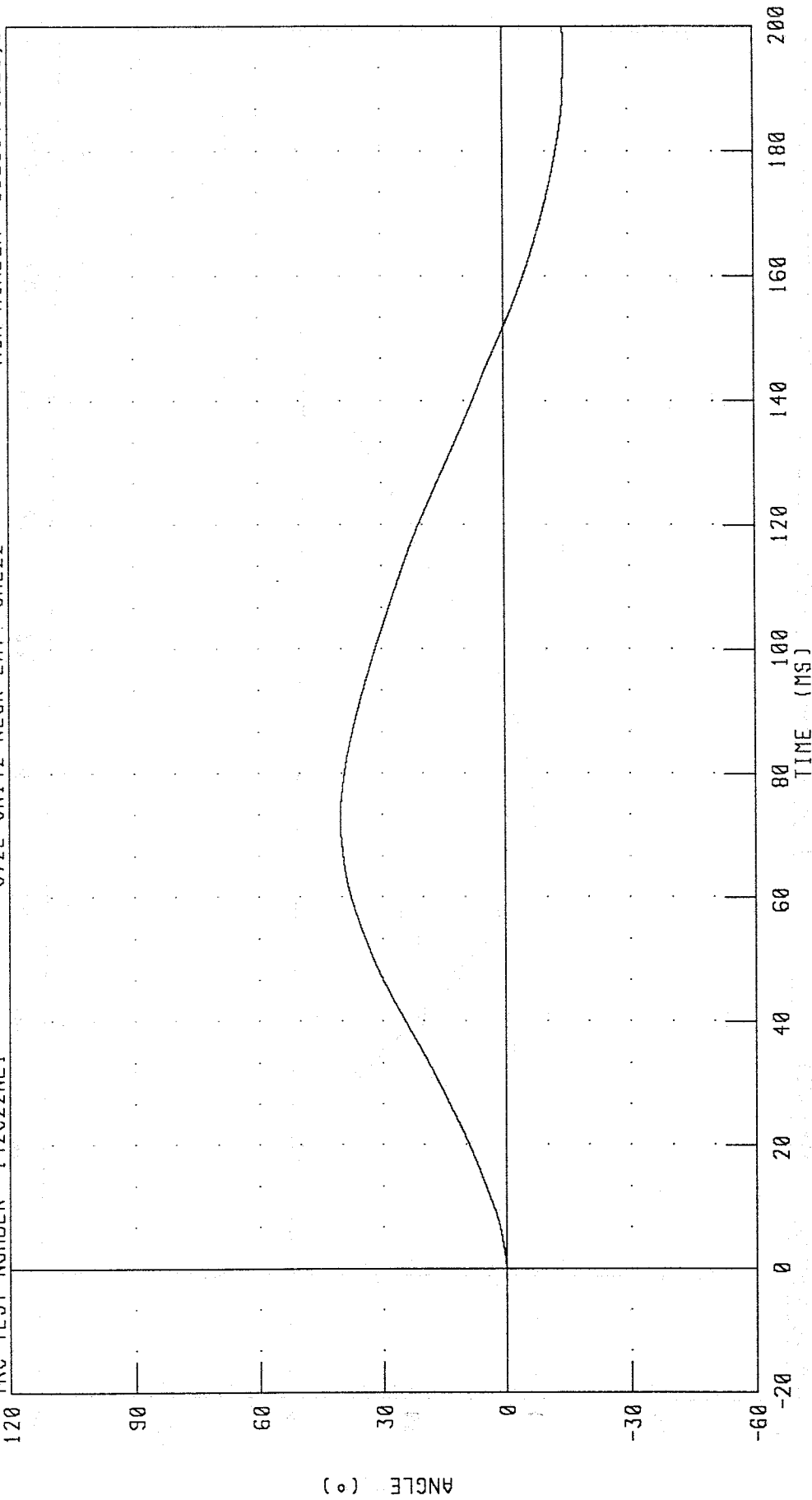
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

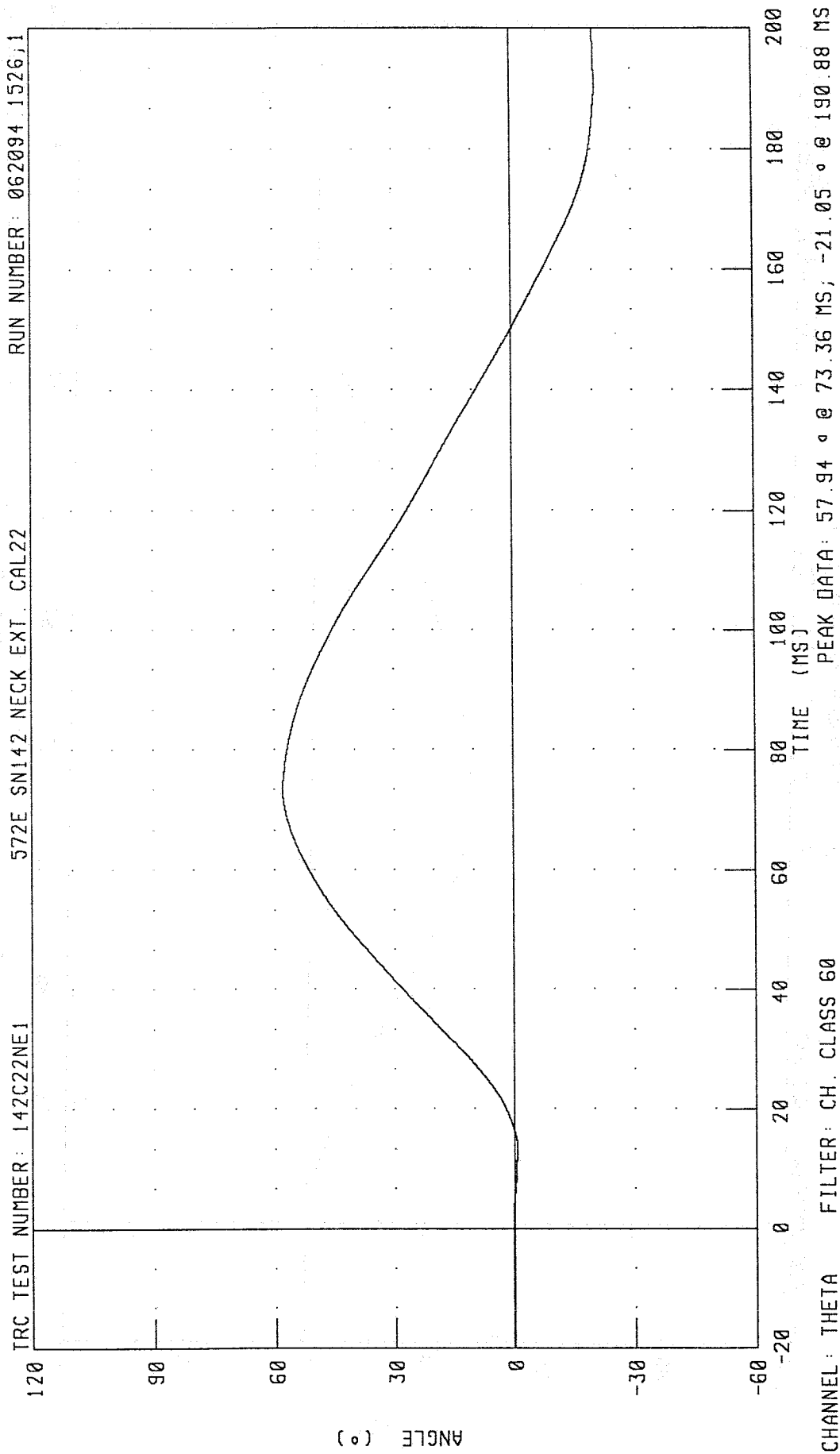
RUN NUMBER: 062094 1526;1



CHANNEL: BETA FILTER: CH. CLASS 60

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

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



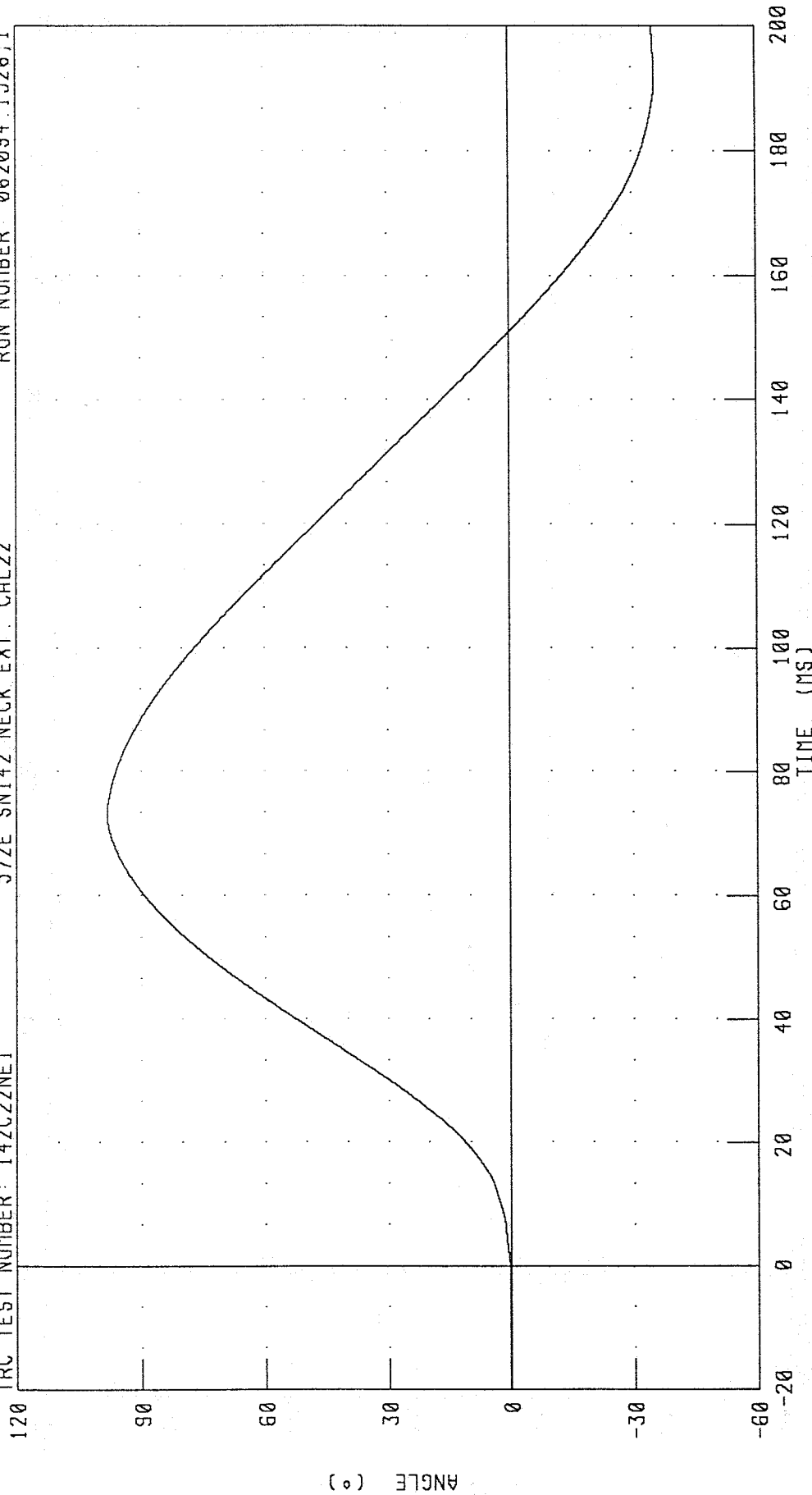
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER 062094 1526.1



CHANNEL: TOTAL FILTER: CH. CLASS 60

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

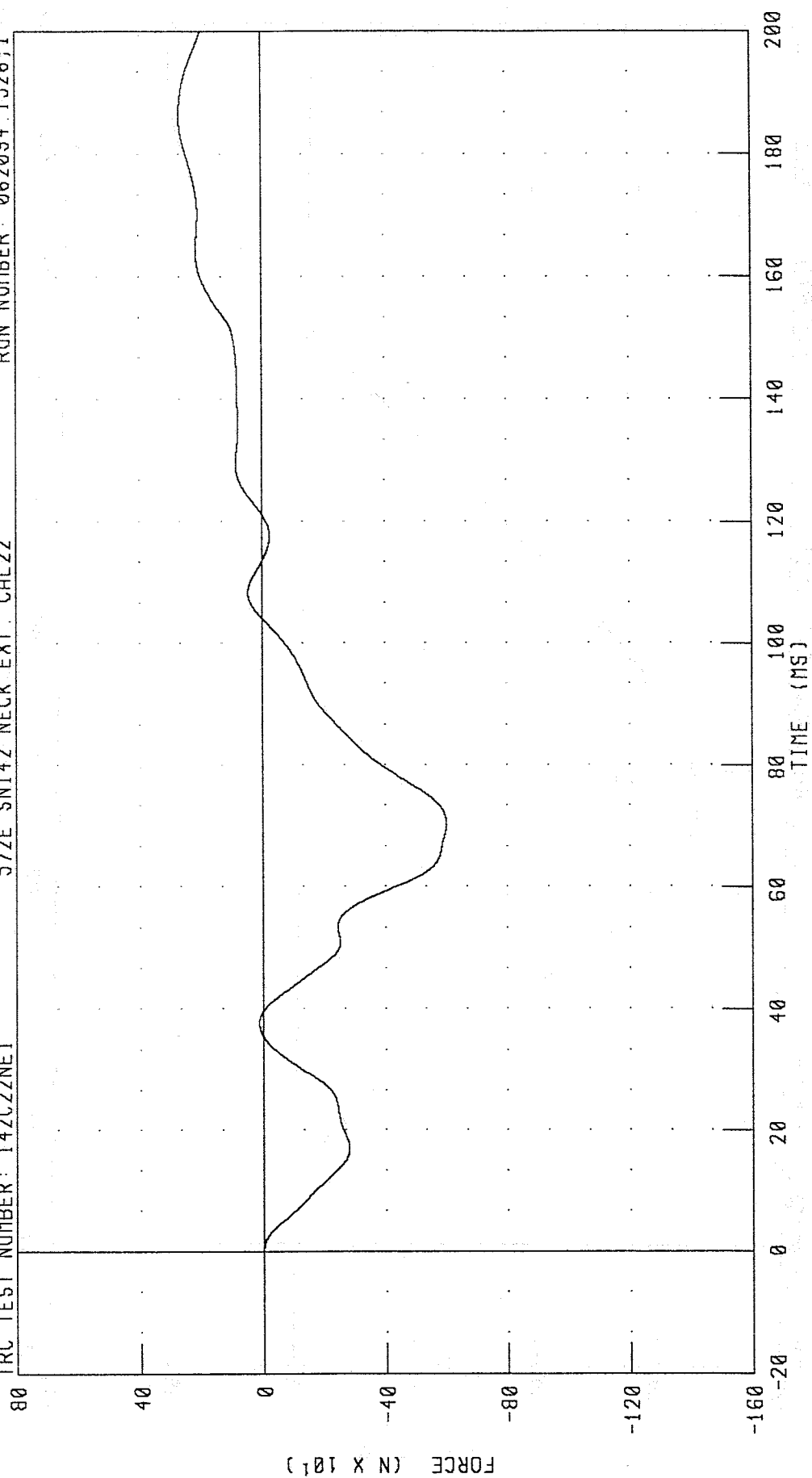
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 062094.1526,1



CHANNEL: NEKXF FILTER: CH. CLASS 60

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

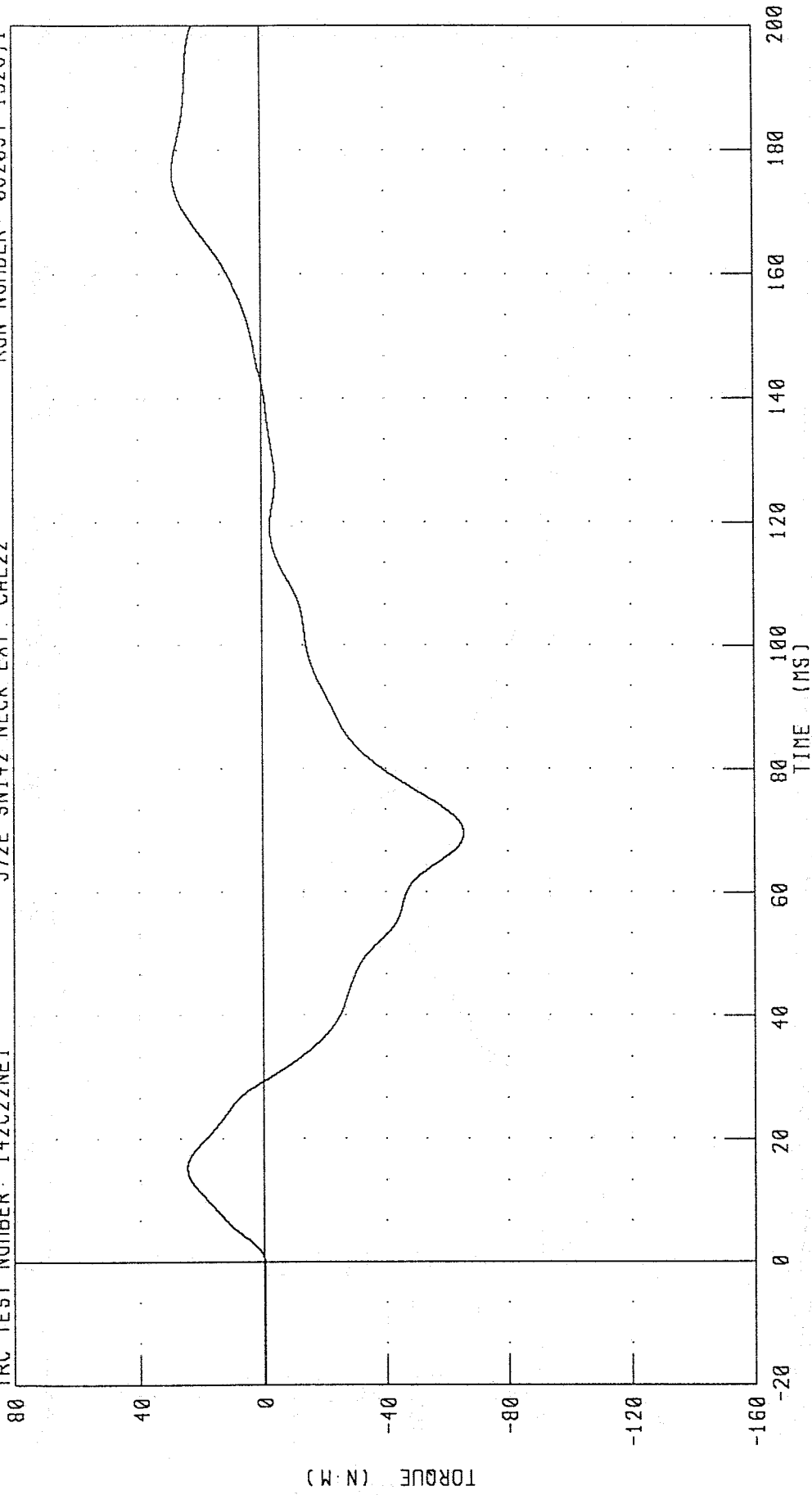
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 062094 1526,1



CHANNEL: NEKYM FILTER: CH. CLASS 60

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

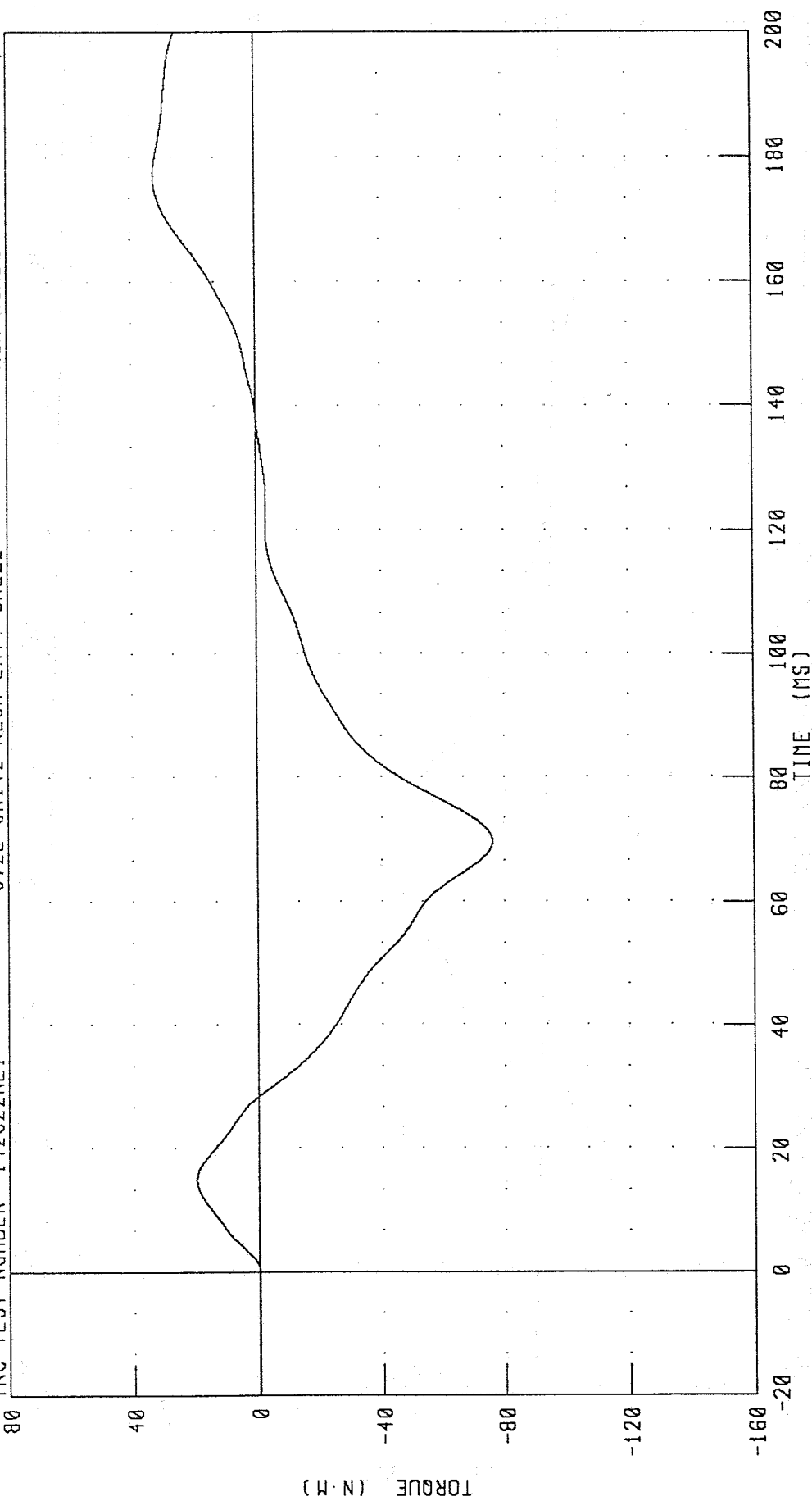
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 142C22NE1

572E SN142 NECK EXT. CAL22

RUN NUMBER: 062094.1526.1



CHANNEL: NEKOM FILTER: CH. CLASS 60

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

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 Chas. Middleton

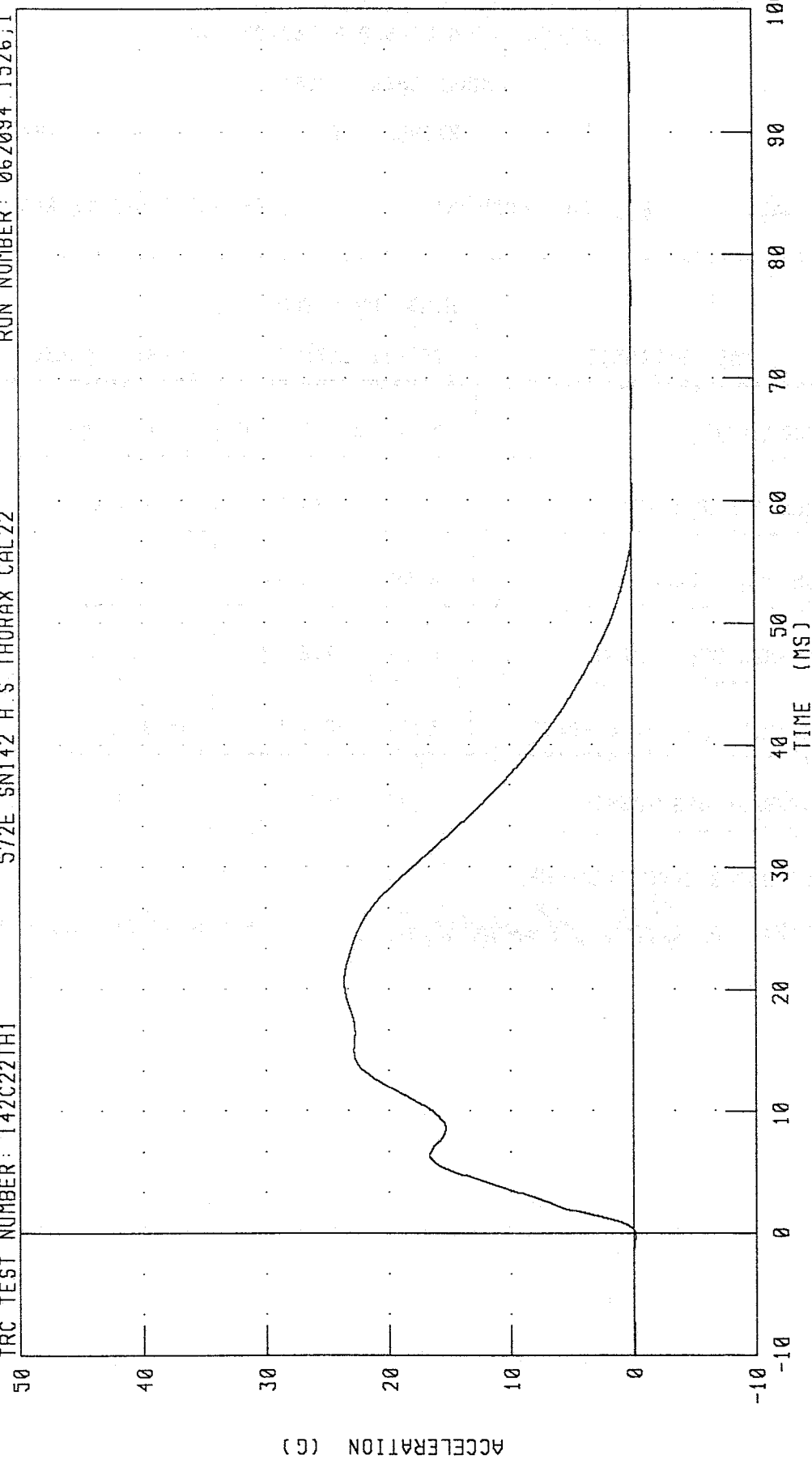
RUN NUMBER: 051994.1214;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C22TH1

572E SN142 H.S. THORAX CAL22

RUN NUMBER: 062094 1526;1



CHANNEL: PENXG FILTER: CH. CLASS 180

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

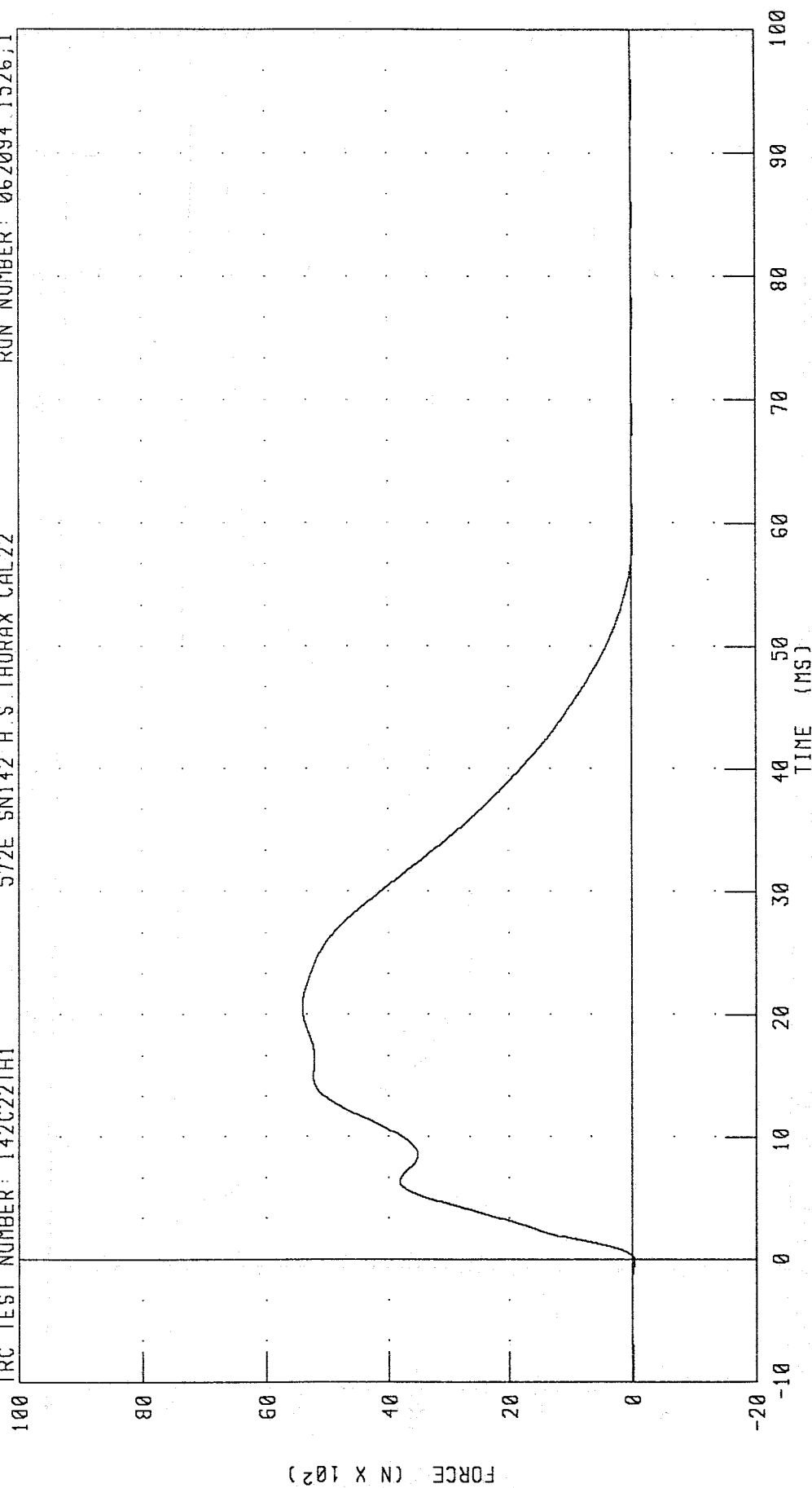
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 142C22TH1

572E SN142 H S THORAX CAL22

RUN NUMBER: 062094 1526.1

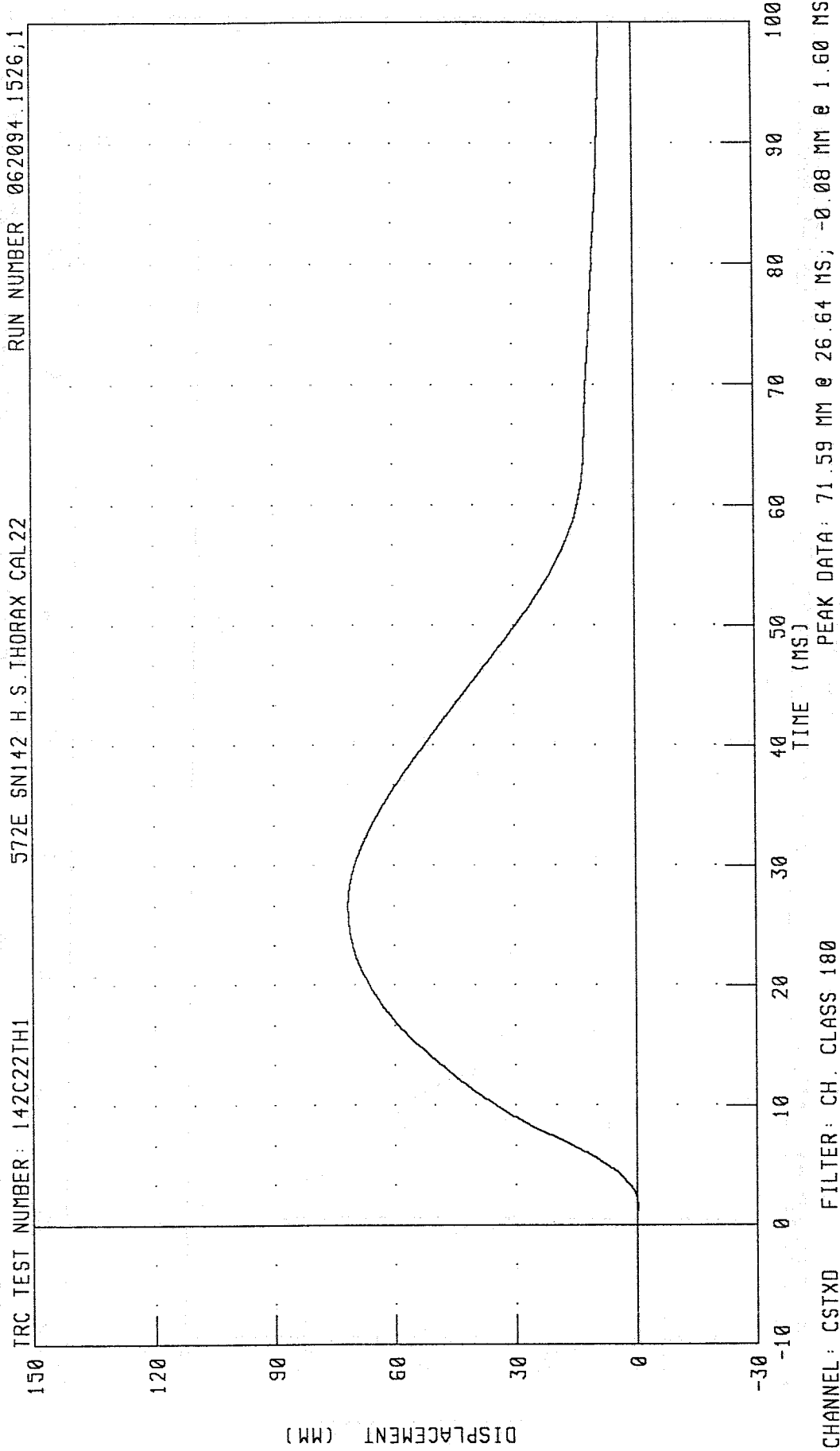


CHANNEL: PENXF FILTER: CH. CLASS 180

940525

C-61

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT



CHANNEL: CSTXD FILTER: CH. CLASS 180

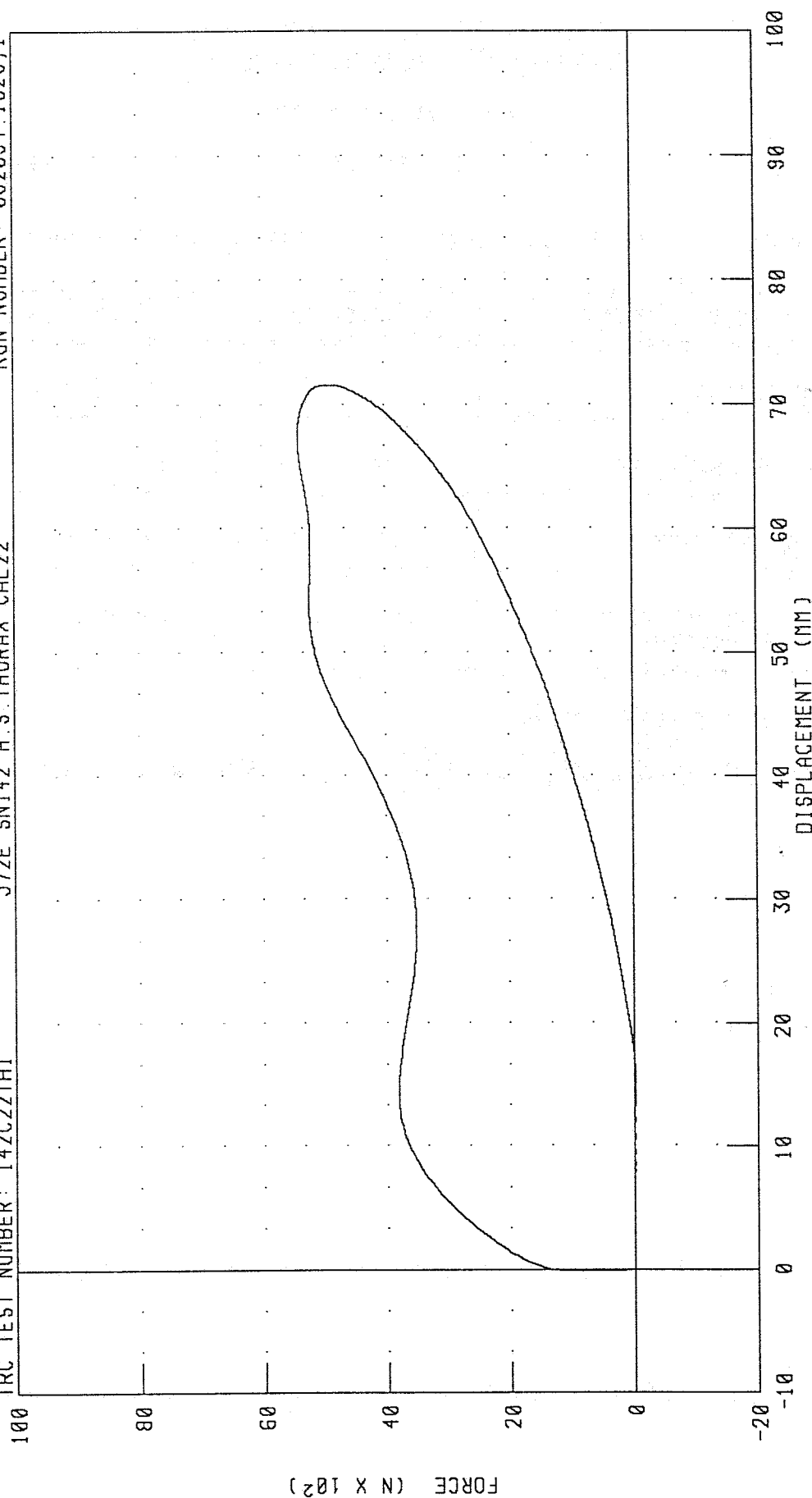
PART 572-E HYBRID III THORAX CALIBRATION

CHEST DISPLACEMENT VS PENDULUM FORCE

RUN NUMBER: 062094.1526,1

TRC TEST NUMBER: 142C22TH1

572E SN142 H.S. THORAX CAL22



PEAK DATA: 71.59 MM @ 26.64 MS; -0.08 MM @ 1.60 MS
5413.11 N @ 20.64 MS; -29.83 N @ -0.16 MS

CHANNEL: CSTXD
PENXF
FILTER: CH. CLASS 180
CH. CLASS 180

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

Chas. Middleton

RUN NUMBER: 051994.1039;2

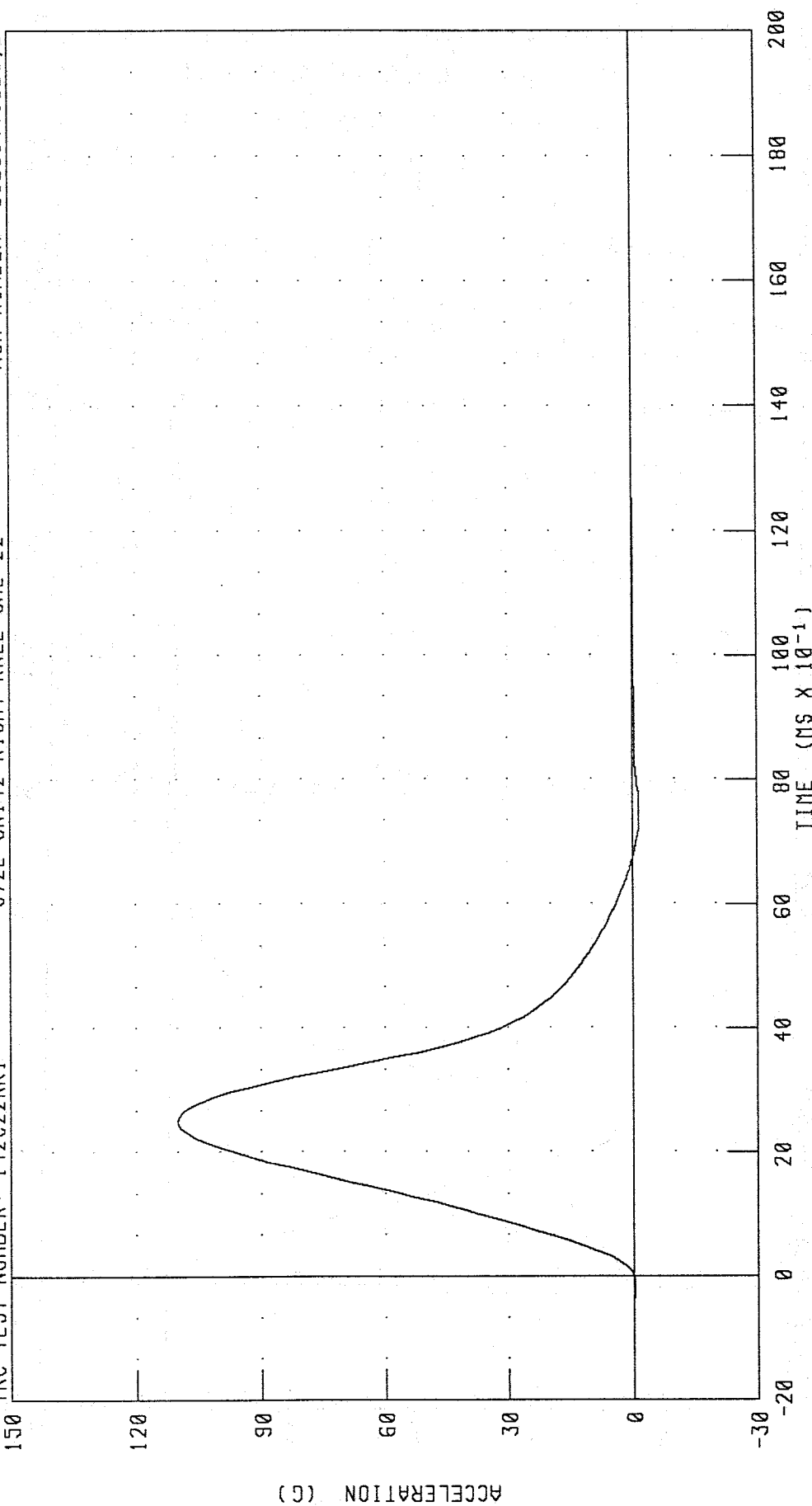
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 142C22RK1

572E SN142 RIGHT KNEE CAL 22

RUN NUMBER: 062094 1526,2



CHANNEL: PENXG FILTER: CH. CLASS 600

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

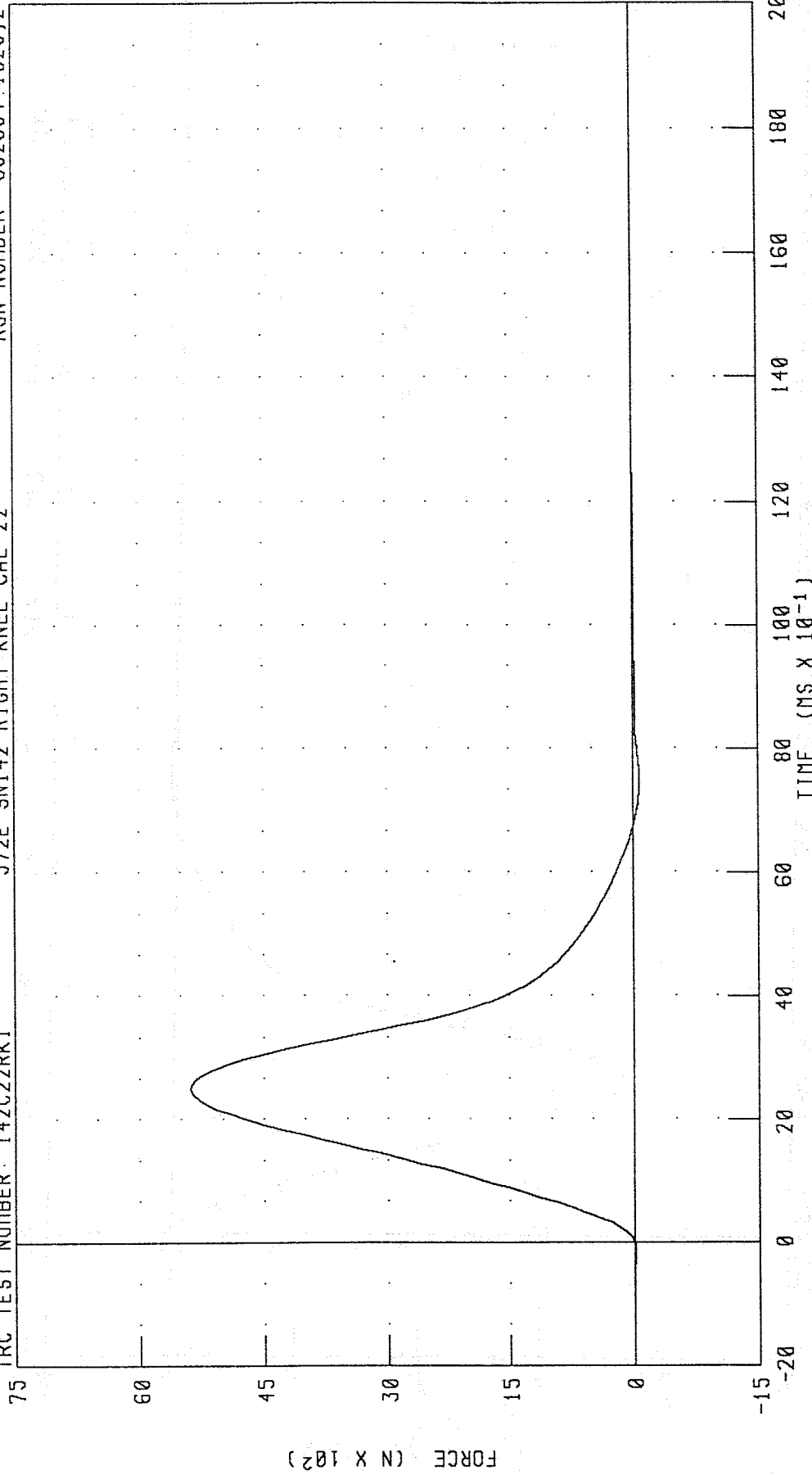
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C22RK1

572E SN142 RIGHT KNEE CAL 22

RUN NUMBER: 062094 1526;2



CHANNEL: PENXF FILTER: CH. CLASS 600

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

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

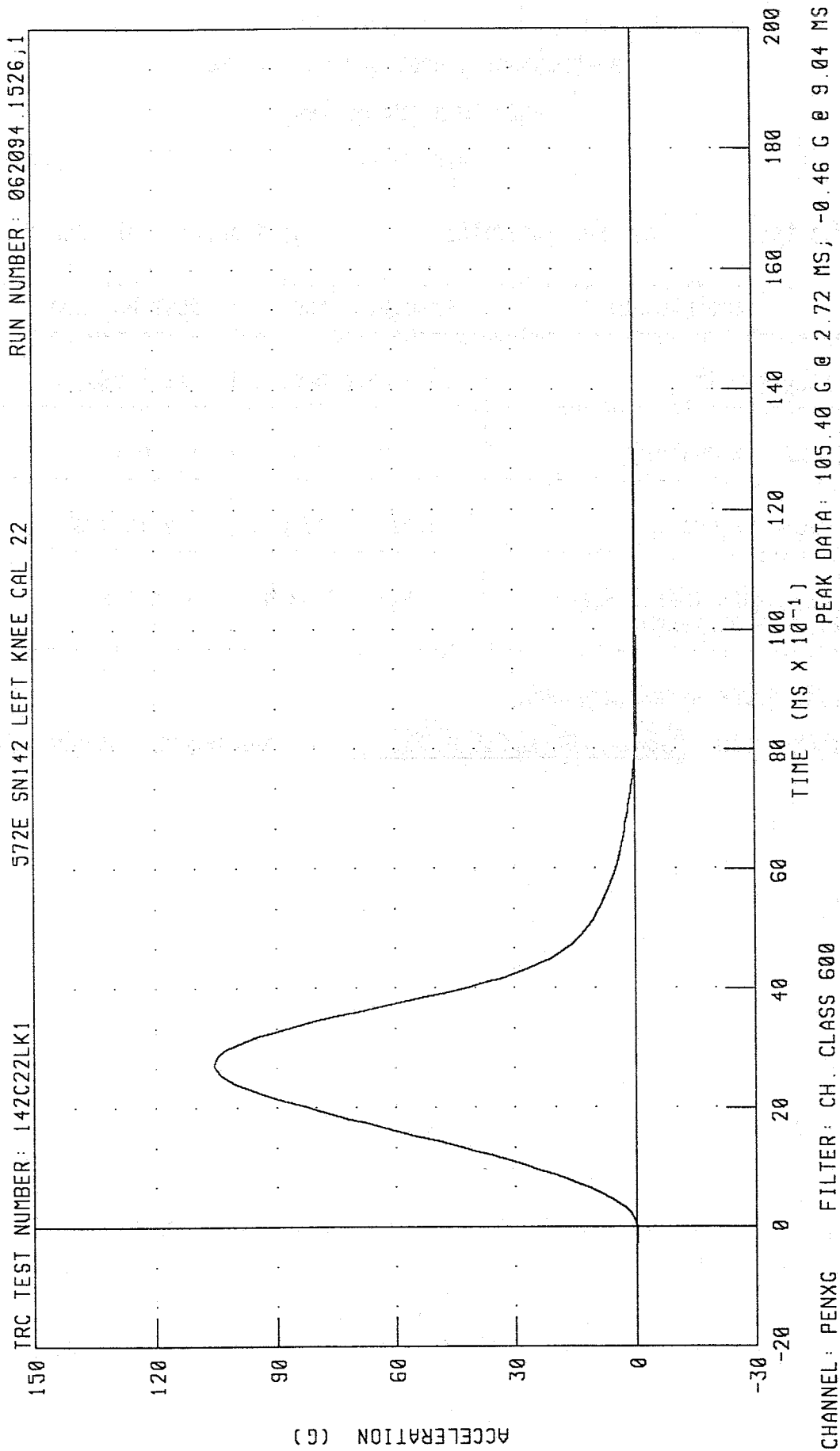
TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas Middleton

RUN NUMBER: 051994.0924;1

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



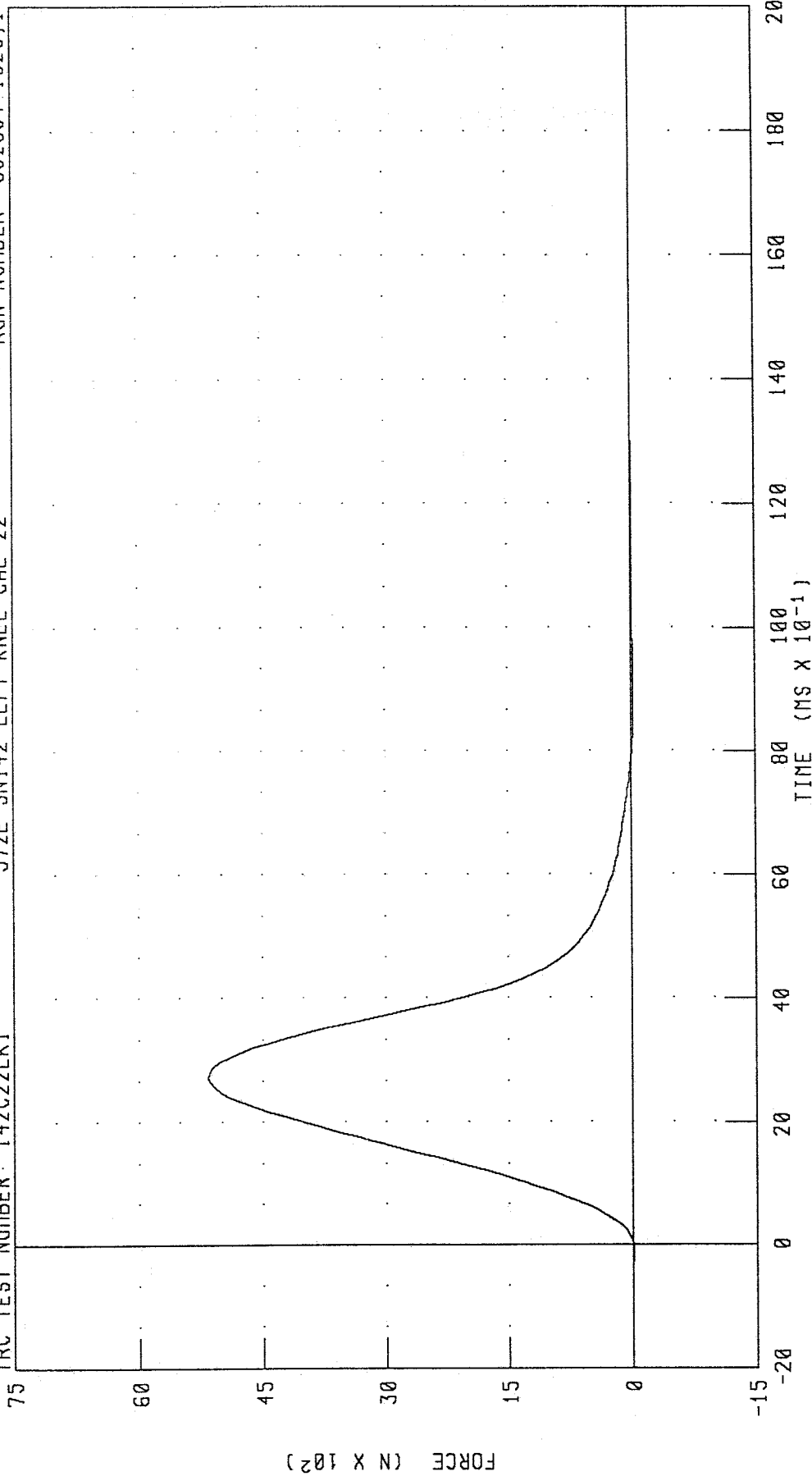
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C22LK1

572E SN142 LEFT KNEE CAL 22

RUN NUMBER: 062094 1526.1



CHANNEL: PENXF FILTER: CH. CLASS 600

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

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #192

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE	
				LAST	DUE
HEAD X-AXIS ACCELEROMETER	AAL82	7264	ENDEVCO	03/28/94	09/28/94
Y-AXIS ACCELEROMETER	A84JJ	7264	ENDEVCO	03/28/94	09/28/94
Z-AXIS ACCELEROMETER	DW04J	7264	ENDEVCO	03/28/94	09/28/94
CHEST X-AXIS ACCELEROMETER	CT22H	7264	ENDEVCO	03/28/94	09/28/94
Y-AXIS ACCELEROMETER	AC708	7264	ENDEVCO	03/28/94	09/28/94
Z-AXIS ACCELEROMETER	CW59H	7264	ENDEVCO	03/28/94	09/28/94
LEFT FEMUR FORCE LOAD CELL	986	2430	GSE	03/25/94	09/25/94
RIGHT FEMUR FORCE LOAD CELL	987	2430	GSE	03/25/94	09/25/94
*NECK X-AXIS FORCE LOAD CELL	085	1716	DENTON	03/28/94	09/28/94
Y-AXIS FORCE LOAD CELL	085	1716	DENTON	03/28/94	09/28/94
Z-AXIS FORCE LOAD CELL	085	1716	DENTON	03/28/94	09/28/94
*NECK MOMENT ABOUT X-AXIS LOAD CELL	085	1716	DENTON	03/28/94	09/28/94
MOMENT ABOUT Y-AXIS LOAD CELL	085	1716	DENTON	03/28/94	09/28/94
MOMENT ABOUT Z-AXIS LOAD CELL	085	1716	DENTON	03/28/94	09/28/94
*CHEST DEFLECTION POTENTIOMETER	87313-96	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 #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	612	3419	LEBOW	02/22/94	08/22/94
SHOULDER BELT FORCE LOAD CELL	127	3419	LEBOW	02/22/94	08/22/94

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NUMBER	MODEL NUMBER	MFR.	CALIBRATION DATE	
				LAST	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	AC867	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.	CALIBRATION DATE	
				LAST	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	DPH-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	LEBOW	04/05/94	10/05/94
HYBRID III FEMUR PENDULUM ACCELEROMETER	CG83	7232	ENDEVCO	04/04/94	10/04/94

SIGN CONVENTION

NHTSA DATA TAPE REFERENCE GUIDE

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

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

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

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

TIBIA LOAD CELLS: +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

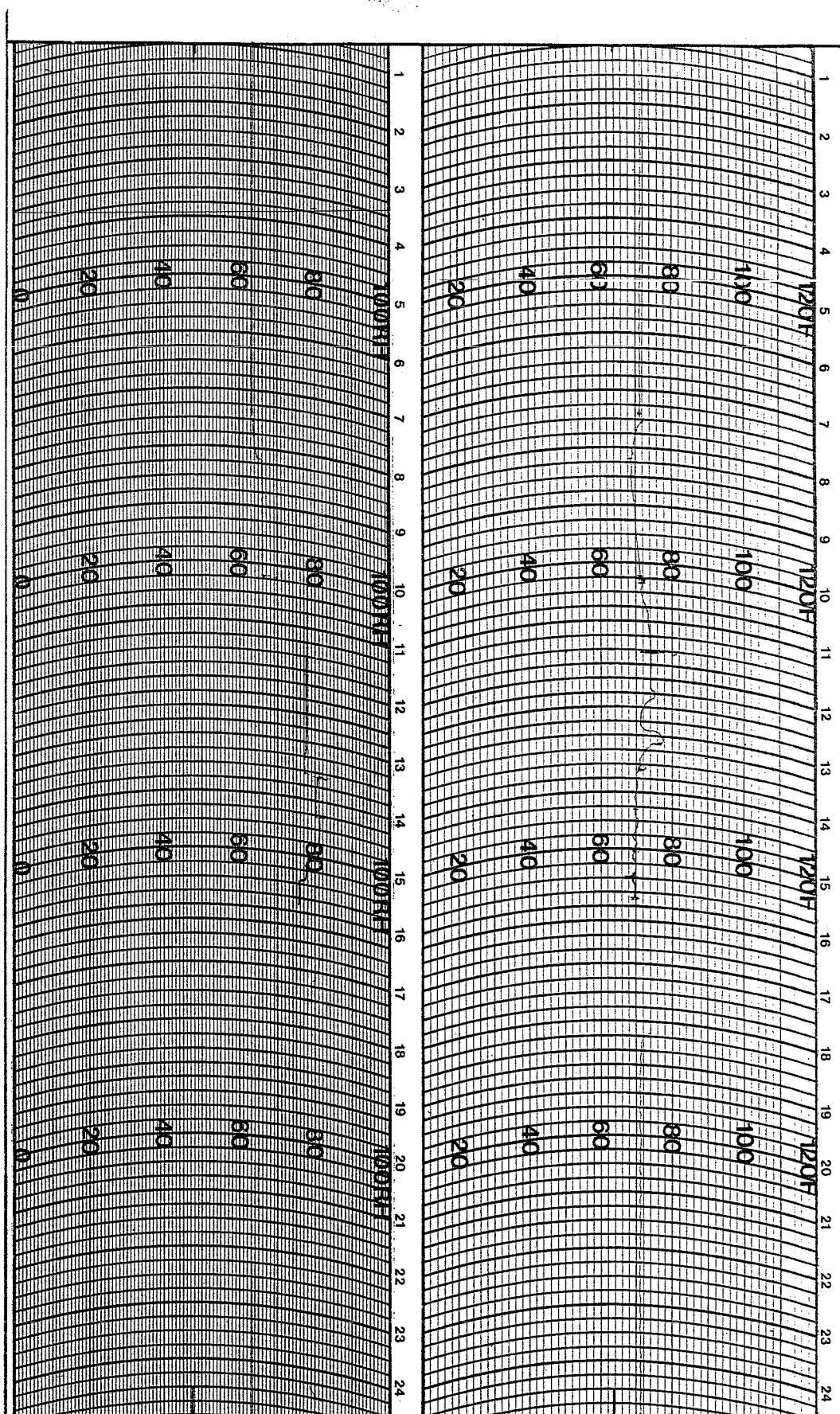
SAE J211 OCT88

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
Head form Accelerations	1000



WEATHER MEASURE
 P.O. BOX 41257
 SACRAMENTO, CA. 95841
 PHONE (916) 481-7565

HYGROTHERMOGRAPH
 1 DAY

CHART # C311 D HF
 PART # 699123

STATION _____ DATE ON _____ DATE OFF _____