*2004

REPORT NO. TRC-93-N05

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY

1994 FORD BRONCO

SPECIAL PURPOSE VEHICLE

NHTSA NO. MR0204

TRC TEST NO. 931124

PREPARED BY:

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

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DECEMBER 17, 1993

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF MARKET INCENTIVES

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15. Supplemental Notes

16. Abstract

A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1994 Ford Bronco special purpose vehicle, NHTSA No. MR0204, at Transportation Research Center Inc. on November 24, 1993. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.2 kph. The vehicle's maximum static crush was 592 millimeters. The ambient temperature was 20° C.

The driver's Head Injury Criteria (HIC) was 299. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.5 g. The driver's chest maximum deflection was 38 millimeters. The driver's left and right femur maximum axial forces were 3172 N and 1584 N, respectively.

The passenger's HIC was 335. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 35.3 g. The passenger's left and right femur maximum axial forces were 780 N and 1062 N, respectively.

17. Key Words	18. Distribution Statement
56.3 KPH (35 MPH) Frontal Barrier Impact Test: New Car Assessment Program (NCAP) FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Retention" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"	Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division Nassif Building, Room 5108 400 Seventh Street, S.W. Washington, DC 20590

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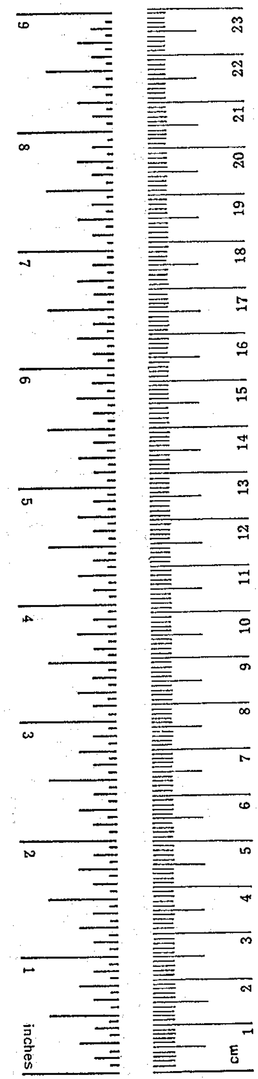
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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

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



Approximate Conversions from Metric Measures

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

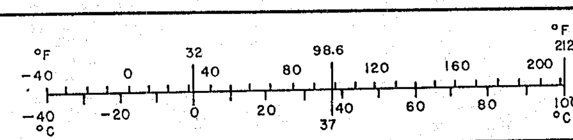


TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS, CONT'D.

SECTION 1.0

PURPOSE 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 Ford Bronco, NHTSA No. MR0204, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

TEST PROCEDURE

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

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

The test vehicle contained two (2) 50th percentile adult male anthropomorphic test devices (dummies). One (1) Part 572E dummy was seated in the left front outboard designated seating position. One (1) Part 572B dummy was positioned in the right front outboard designated seating position. The dummies were positioned according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure.

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 seventy-six (76) data channels were multiplexed and recorded on two (2) 14-track tape drives. The data was digitally sampled at 12,500 samples per second and processed per section IP11 of the Laboratory Indicant Test Procedure.

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

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

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This frontal load cell barrier test was conducted at TRC on November 24, 1993.

The test vehicle, a 1994 Ford Bronco, NHTSA No. MR0204, was equipped with a 5.0-liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 2447 KG. The vehicle's impact speed was 56.2 kph. The vehicle sustained 592 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 299. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.5 g. The driver's chest maximum deflection was 38 mm. The driver's left and right femur maximum axial forces were 3172 N and 1584 N, respectively.

The passenger's HIC was 335. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 35.3 g. The passenger's left and right femur maximum axial forces were 780 N and 1062 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 X-axis accelerometer, HEDXG1, recorded a questionable data spike at 169 milliseconds. The driver's head Z-axis accelerometer, HEDZG1, recorded questionable data spikes at 49, 77, and 169 milliseconds. The driver's head resultant acceleration was affected by the data spikes. The driver's HIC was calculated using only data prior to 168 milliseconds. The data acquisition circuits were checked after the test. No cause for the data spikes could be found.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MR0204	TEST TYPE: Frontal Load Cell Barrier		
TEST DATE: 11/24/93	TEST TIME: 1508	AMBIENT TEMP.: 20° C	
VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Ford/Bronco/special purpose			
VEHICLE TEST WEIGHT (KG): 2447			
IMPACT ANGLE (DEG)[1]: 0			
IMPACT VELOCITY (KPH)[2]:	PRIMARY = 56.2	SECONDARY = 56.2	
MAXIMUM STATIC CRUSH (MM): 592			
AVERAGE REBOUND (MM): 433			
DUMMIES:	Driver #142	Passenger #713	
TYPE:	Part 572 E	Part 572 B	
LOCATION:	Left front	Right front	
RESTRAINT:	3-point unibelt and airbag	3-point unibelt	
NUMBER OF DATA CHANNELS: 76			
NUMBER OF CAMERAS:	HIGH-SPEED 16	REAL-TIME 2	

[1]With respect to tow track centerline.
[2]Speed trap measurement (± .08 kph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford/Bronco VIN: 1FMEU15N2RLA14736

BODY STYLE: special purpose MODEL YEAR: 1994

NHTSA NO.: MR0204 COLOR: Red

ENGINE DATA: TYPE: inline CYLINDERS: 8 DISPLACEMENT: 5.0-liter

TRANSMISSION DATA: _4_SPEED, ___MANUAL, _X_AUTOMATIC, ___FWD, ___RWD, _X_4WD

DATE VEHICLE RECEIVED: 11/17/93 ODOMETER READING: 188

DEALER'S NAME AND ADDRESS: RICART Ford, Inc.
P.O. Box 27130
Columbus, Ohio 43227

ACCESSORIES:

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

REMARKS:

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

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Ford Motor Company

DATE OF MANUFACTURE: 10/93 VIN: 1FMEU15N2RLA14736

GVWR: 2744 KG

GAWR: FRONT: 1270 KG, REAR: 1710 KG

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear Wrangler HT, P235/75R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 280 kPa
REAR: 280 kPa

SPARE TIRE (MFR., SIZE): Goodyear Wrangler HT, P235/75R15

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: manually adjustable

MAXIMUM WIDTH: 2026 MM

WHEELBASE: 2648 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: P235/75R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 35 lbs; REAR: 41 lbs

DESIGNATED SEATING CAPACITY: NA FRONT NA REAR
NA TOTAL

VEHICLE CAPACITY WEIGHT: NA KG

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE:	LF 879;	RF 876;	LR 912;	RR 902
PRE-TEST ATTITUDE:	LF 801;	RF 880;	LR 800;	RR 828
POST-TEST ATTITUDE:	LF 861;	RF 892;	LR 870;	RR 844

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	558 KG	RIGHT REAR	530 KG
LEFT FRONT	554 KG	LEFT REAR	527 KG
TOTAL FRONT WEIGHT	1112 KG	(51.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1057 KG	(48.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2169 KG		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW[1] = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2169 KG)

VCW = VEHICLE CAPACITY WEIGHT (136)

DSC = DESIGNATED SEATING CAPACITY (NA)

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

TARGET TEST WEIGHT=UDW + RCLW[1] + (NO. OF HYBRID III DUMMIES X 76 KG/DUMMY)
+ (NO. OF HYBRID II DUMMIES X 74 KG/DUMMY)

TARGET TEST WEIGHT = 2169 + 136 + 76 + 74

TARGET TEST WEIGHT = 2455 KG

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 128 KG OF CARGO WEIGHT:

RIGHT FRONT	585 KG	RIGHT REAR	640 KG
LEFT FRONT	582 KG	LEFT REAR	640 KG
TOTAL FRONT WEIGHT	1167 KG	(47.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1280 KG	(52.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2447 KG	(0.3% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 23 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 1385 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: 931124

NHTSA NO.: MR0204

TEST DATE: 11/24/93

TEST TIME: 1508

TEST TYPE: Frontal load cell barrier

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 20° C

TEMPERATURE IN OCCUPANT COMPARTMENT: 22° C

IMPACT VELOCITY: PRIMARY = 56.2 KPH SECONDARY = 56.2 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):

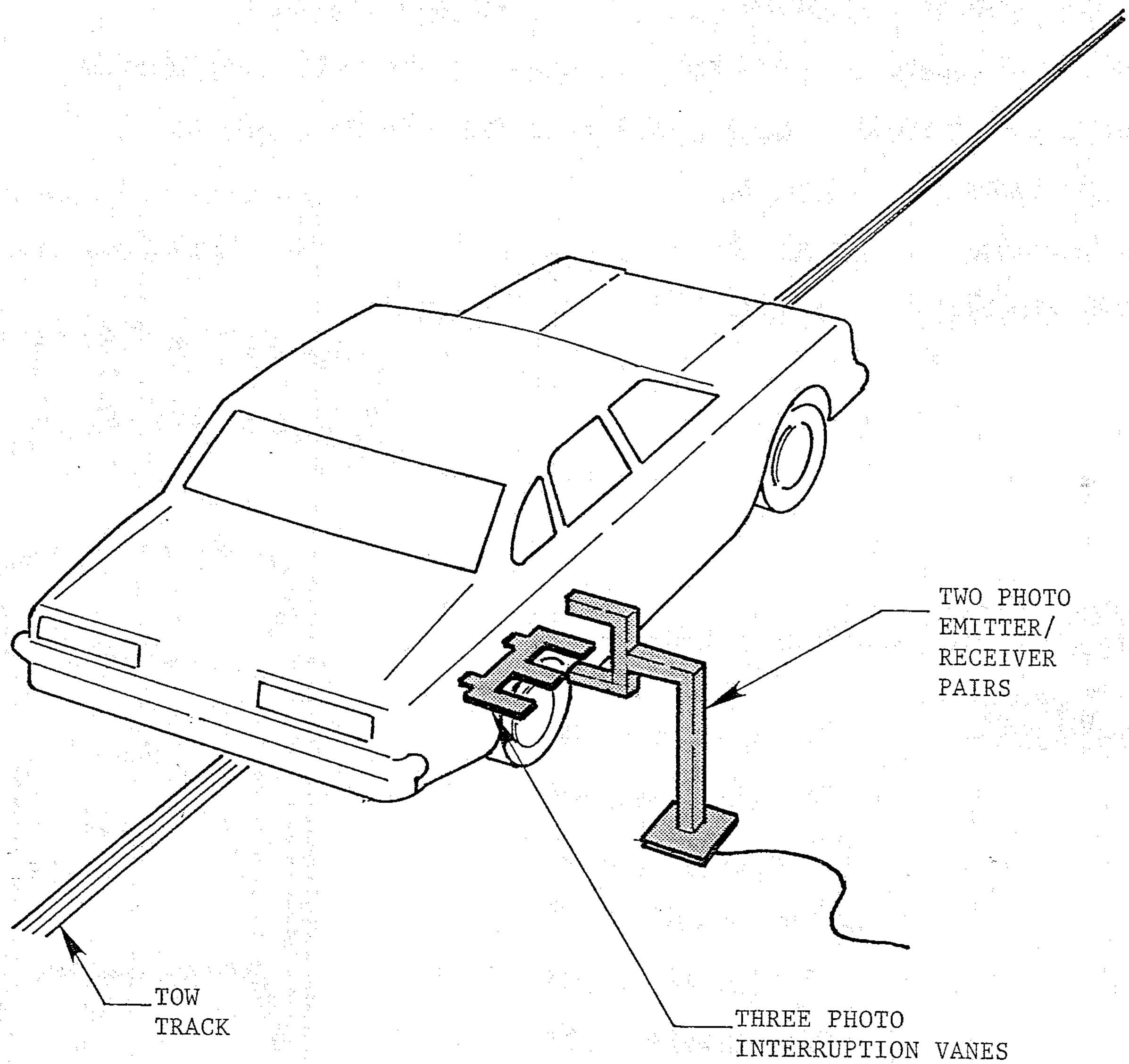
OVERALL LENGTH OF TEST VEHICLE:

PRE-TEST:	L	4553;	C	4674;	R	4540
POST-TEST:	L	4055;	C	4090;	R	4080
TOTAL CRUSH:	L	498;	C	584;	R	460
AVERAGE CRUSH:	514					

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 471; C 451; R 376; AVG. 433

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: Ford/Bronco/special purpose

VEHICLE NHTSA NO.: MR0204 ; VIN: 1FMEU15N2RLA14736

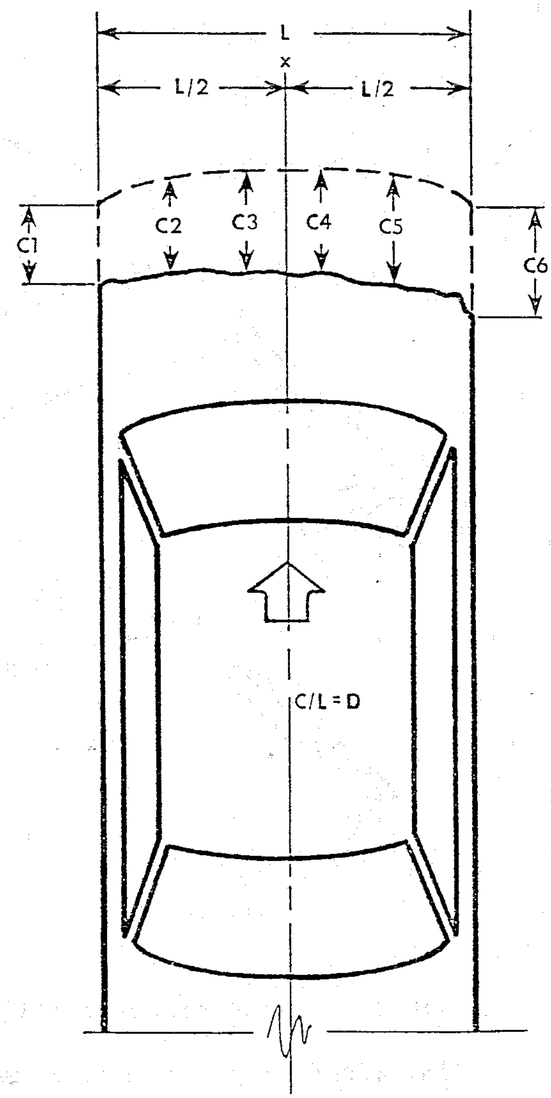
MODEL YEAR: 1994 ; BUILD DATE: 10/93 ; TEST DATE: 11/24/93

VEHICLE SIZE CATEGORY: special purpose ; TEST WEIGHT: 2447 KG

VEHICLE WHEELBASE: 2648 MM

MAXIMUM WIDTH: 2026 MM

FRONT OVERHANG: 876 MM



COLLISION DEFORMATION
CLASSIFICATION (CDC) CODE: 12FDEW3

CRUSH DEPTH
MEASUREMENTS:

C1 = 498 MM

C2 = 568 MM

C3 = 592 MM

C4 = 567 MM

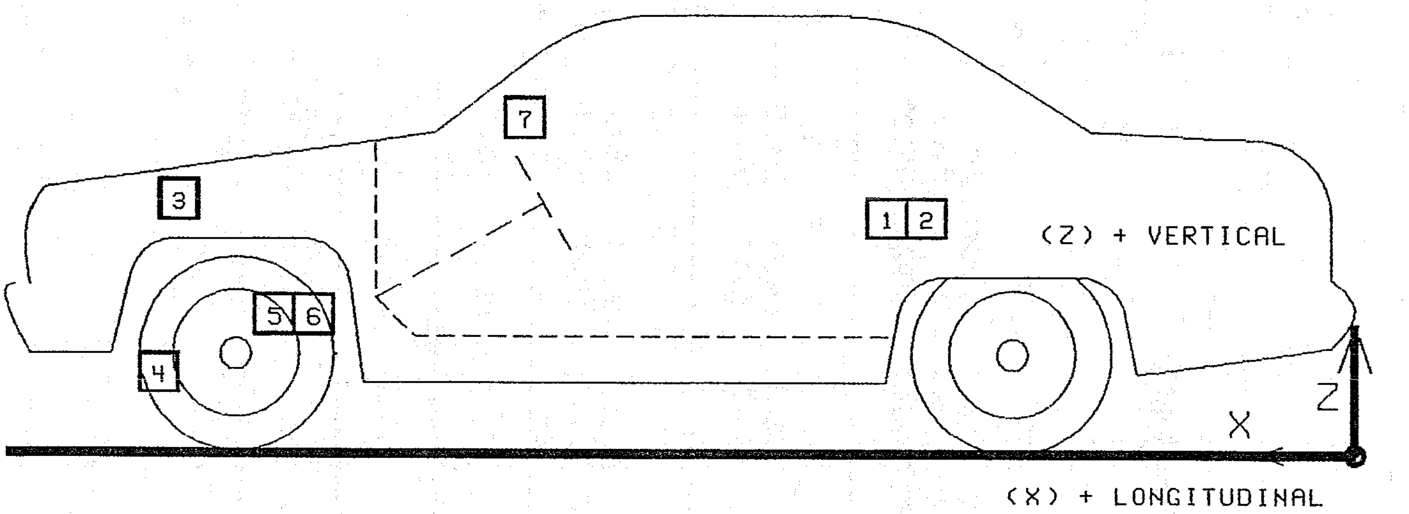
C5 = 536 MM

C6 = 460 MM

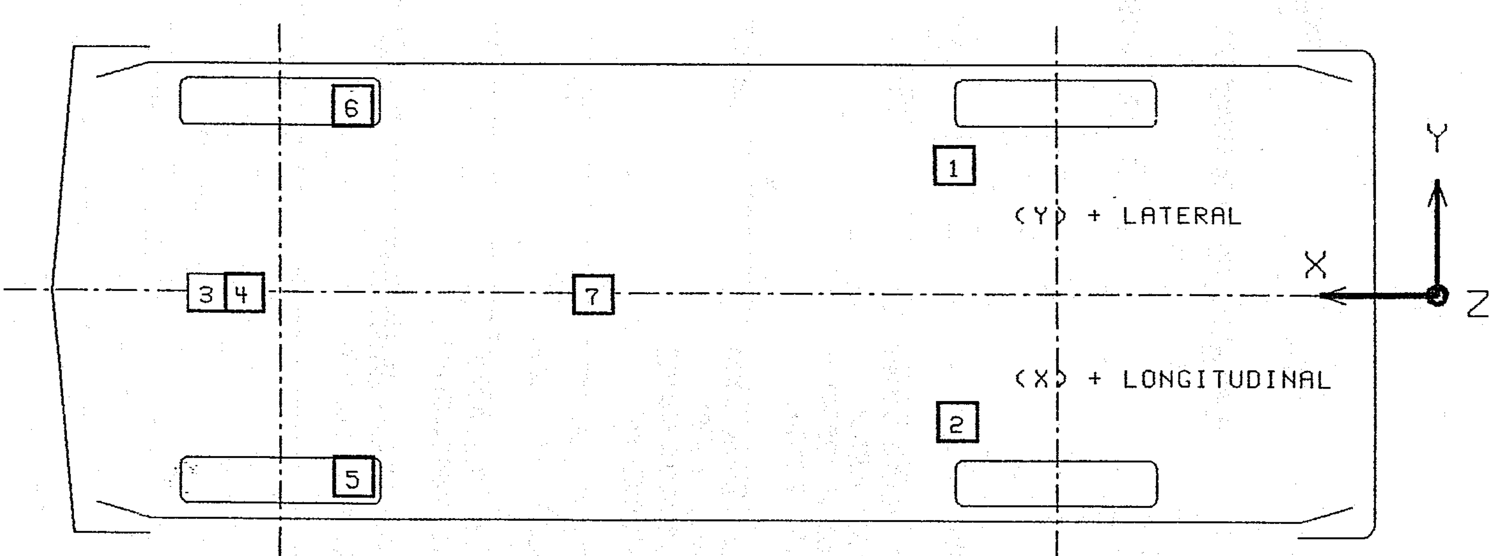
MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE (LONGITUDINAL)

LENGTH OF DAMAGED REGION: L = 1714 MM

FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 931124

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1 LEFT REAR SEAT CROSSMEMBER	3036	538	740				
LONGITUDINAL				1.9	166.6	30.7	12.4
REDUNDANT				1.6	166.0	35.6	11.8
2 RIGHT REAR SEAT CROSSMEMBER	3048	-498	742				
LONGITUDINAL				2.1	178.8	30.3	12.1
REDUNDANT				1.9	179.1	30.9	43.4
3 ENGINE TOP	1086	-152	1151				
LONGITUDINAL				18.2	62.8	92.9	45.7
4 ENGINE BOTTOM	1115	76	453				
LONGITUDINAL				23.3	56.3	93.8	47.4
5 RIGHT BRAKE CALIPER	966	-673	334				
LONGITUDINAL				29.0	70.9	85.1	37.8

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 931124

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
6	LEFT BRAKE CALIPER LONGITUDINAL	985	673	334	32.2	51.7	84.3	39.1
7	INSTRUMENT PANEL CENTER LONGITUDINAL	1569	38	1293	20.6	71.0	65.7	77.5

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

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

TABLE 5 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #142	PASSENGER #713
HEAD	Airbag	Chest and right knee
CHEST	Airbag	None
ABDOMEN	None	None
LEFT KNEE	Instrument panel	Instrument panel
RIGHT KNEE	Instrument panel	Instrument panel

DOOR OPENING:

	LEFT	RIGHT
FRONT	Easy	Easy
REAR	NA	NA

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	None	None
REAR	NA	NA

GLAZING DAMAGE:

The entire windshield cracked on impact.

OTHER NOTABLE IMPACT EFFECTS:

The right front tire deflated after impact.

TABLE 6 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1994/Ford/Bronco/special purpose

VEH. NHTSA NO.: MR0204 ; TEST DATE: 11/24/93

MAXIMUM ACCELERATIONS (G):	DRIVER DUMMY #142	PASSENGER DUMMY #713
HEAD X-AXIS[1]	-40.0	-15.1
HEAD Y-AXIS	6.6	-19.1
HEAD Z-AXIS	-33.4	-45.8
HEAD RESULTANT[1]	42.3	46.4
CHEST X-AXIS	-41.6	-33.7
CHEST Y-AXIS	-7.4	-26.5
CHEST Z-AXIS	19.0	-16.8
CHEST RESULTANT[2]	43.5	35.3
CHEST RESULTANT TIME INTERVAL (SEC.)[2]	.003	.003
HEAD INJURY CRITERIA (HIC) VALUES:		
HIC[3]	299	335
HIC STARTING TIME (SEC.)	.058	.059
HIC ENDING TIME (SEC.)	.094	.095
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	30.3	30.7
MAXIMUM CHEST DEFLECTIONS (MM):		
CHEST X-AXIS	38	NA
MAXIMUM CHEST DEFLECTION TIME (SEC)	.078	NA
MAXIMUM COMPRESSIVE FEMUR FORCES (N):		
LEFT FEMUR	3172	780
RIGHT FEMUR	1584	1062
MAXIMUM SEAT BELT FORCES (N):		
LAP BELT	6605	9282
SHOULDER BELT	7423	8648

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

[1]See DATA ACQUISITION EXPLANATIONS.

[2]0.003 SEC. MINIMUM DURATION.

[3]THE MAXIMUM HIC TIME INTERVAL IS 36 MILLISECONDS.

TABLE 7 HYBRID III NECK DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1994/Ford/Bronco/special purpose

VEHICLE NHTSA NO.: MR0204 ; TEST DATE: 11/24/93

MAXIMUM VALUES:	DRIVER DUMMY #142	PASSENGER DUMMY #713
NECK X-AXIS FORCE (N)	389	NA
NECK Y-AXIS FORCE (N)	-160	NA
NECK Z-AXIS FORCE (N)	1923	NA
NECK MOMENT ABOUT X AXIS (N-M)	12	NA
NECK MOMENT ABOUT Y AXIS (N-M)	-18	NA
NECK MOMENT ABOUT Z AXIS (N-M)	7	NA

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

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's chest impacted the airbag. The dummy's head impacted the airbag rotating slightly downward. The driver dummy was restrained by the three-point unibelt and airbag. The dummy rebounded rearward into the seat back as the dummy's head rotated rearward contacting the seat back. The driver dummy came to rest in the driver's seat restrained by the three-point unibelt.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and upper torso rotated downward and to the right with the dummy's head impacting the dummy's chest and right knee. The right front passenger dummy was restrained by the three-point unibelt. The dummy then rebounded rearward and slightly to the left into the seat back as the dummy's head rotated rearward. The right front passenger dummy came to rest in the right front passenger's seat, leaning slightly to the left and rotated slightly to the right, restrained by the three-point unibelt.

TABLE 8 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

	DRIVER	PASSENGER
BELT LENGTH DATA:		
BELT LENGTH FROM TRIM PANEL EXIT TO BOLT HOLE ANCHOR POINT FOR CONTINUOUS WEBBING SYSTEMS.	3195	3250
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	905	904
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	1016	1001
SHOULDER BELT SPOOL-OFF LENGTH:		
AS DETERMINED BY FILM ANALYSIS[1]	NA	NA
AS DETERMINED MECHANICALLY	33	28
AS DETERMINED ELECTRONICALLY	54	65
BELT STRETCH LENGTH (MM/M):		
AS MEASURED MECHANICALLY	0	0
AS MEASURED ELECTRONICALLY	0	0
RETRACTOR LOCK-UP TIME (MS):		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF[1]	NA	NA

[1]Film from the driver's and passenger's seat belt motion picture cameras is not available as a result of the cameras malfunctioning on impact.

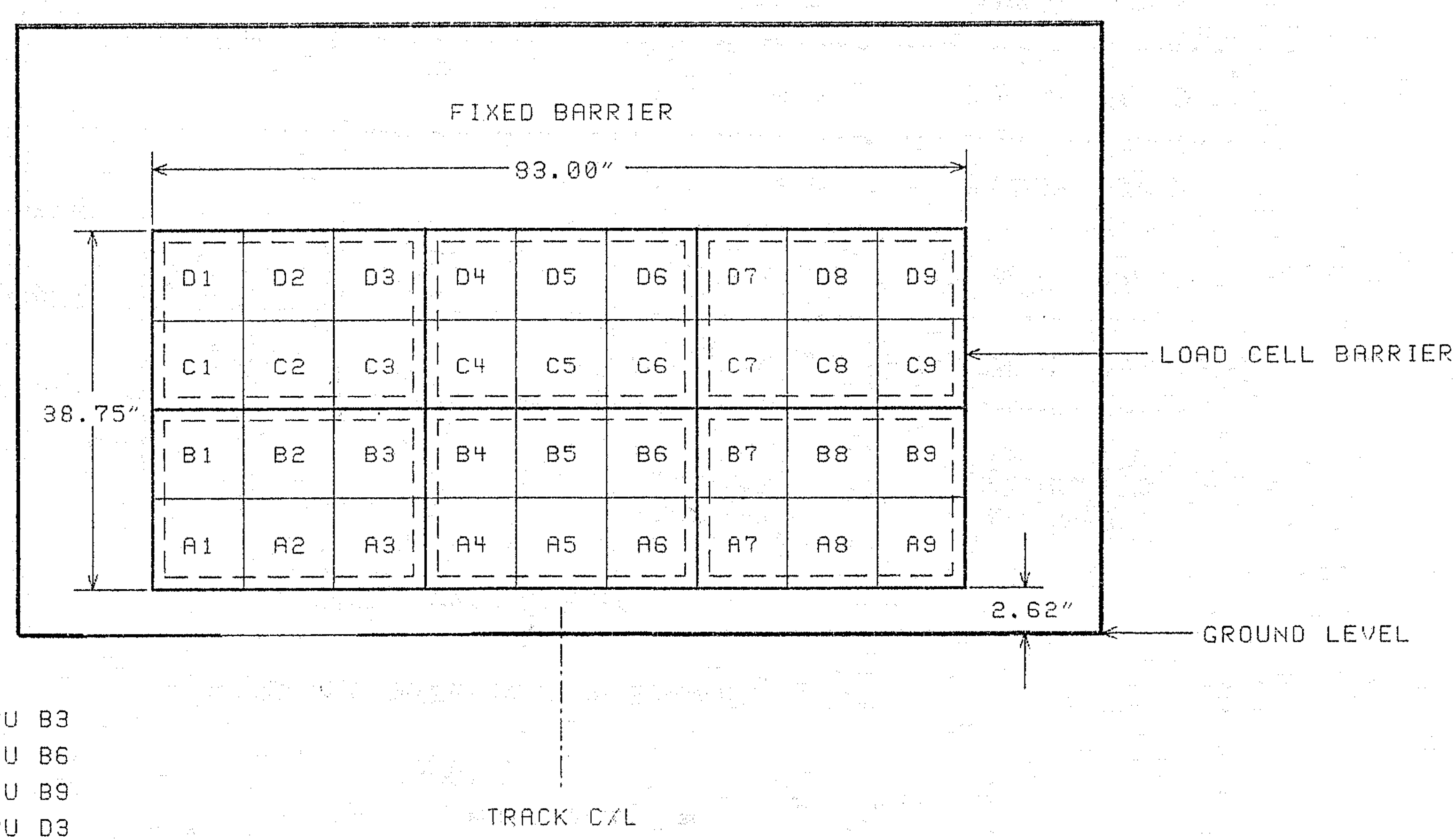
ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

FIGURE 4

LOAD CELL BARRIER CONFIGURATION

FRONT VIEW

36 LOAD CELLS
4 ROWS
9 COLUMNS



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

TABLE 9

LOAD CELL BARRIER DATA SUMMARY

TEST NUMBER 931124

LOCATION	POSITIVE DIRECTION KN	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION KN	NEGATIVE DIRECTION MSEC
TOTAL GROUP 1	3.0	2.2	175.0	39.9
TOTAL GROUP 2	2.2	19.7	36.6	38.0
TOTAL GROUP 3	2.2	1.4	119.7	38.1
TOTAL GROUP 4	3.1	0.7	164.4	42.3
TOTAL GROUP 5	0.9	144.5	346.9	46.8
TOTAL GROUP 6	3.3	0.4	180.4	48.7

TABLE 9

LOAD CELL BARRIER DATA SUMMARY CONTINUED

TEST NUMBER 931124

LOCATION	POSITIVE DIRECTION KN	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION KN	NEGATIVE DIRECTION MSEC
TOTAL LOAD CELL FORCE	4.6	279.9	892.8	44.6

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

FMVSS 212, 219 (PARTIAL), AND 301 DATA

FIGURE 5 FMVSS 212 TEST DATA

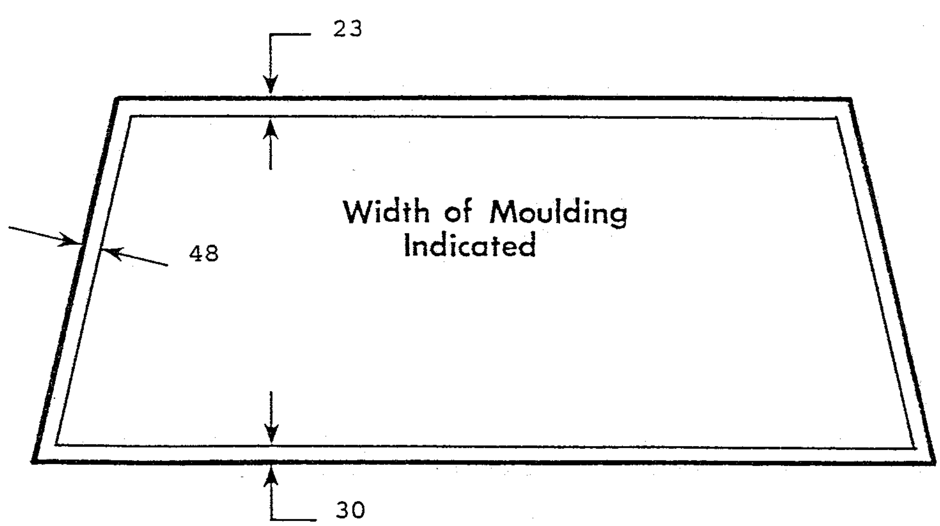
DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:
Metal trim around outer perimeter, adhesive around inner perimeter.

FMVSS 212 REQUIREMENTS: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

WINDSHIELD PERIPHERY MEASUREMENTS:

	PRE-TEST	POST-TEST	PERCENT RETENTION
RIGHT SIDE	2162	2162	100.0
LEFT SIDE	2162	2162	100.0
TOTAL	4324	4324	100.0

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 21° C



FRONT VIEW OF WINDSHIELD[1]

LOSS OF WINDSHIELD RETENTION LENGTHS:
NA

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 = 1519

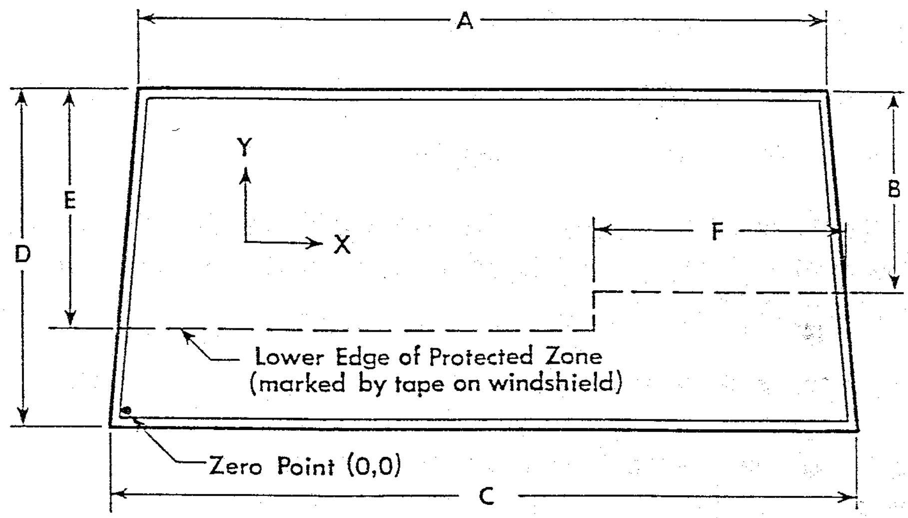
B = 363

C = 1793

D = 617

E = 450

F = 691



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:	Ford/Bronco
NHTSA NO.:	MR0204
FUEL SYSTEM CAPACITY:	121.0 LITERS (FROM OWNER'S MANUAL)
USABLE CAPACITY:	121.0 LITERS (FURNISHED BY COTR)
TEST VOLUME RANGE:	111.3 LITERS TO 113.7 LITERS (92-94% OF USABLE)
ACTUAL TEST VOLUME:	112.0 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 is on the left. The fuel lines run along the left frame rail 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.: MR0204 ; TEST DATE: 11/24/93

VEHICLE MAKE/MODEL/BODY STYLE: Ford/Bronco/special purpose

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:

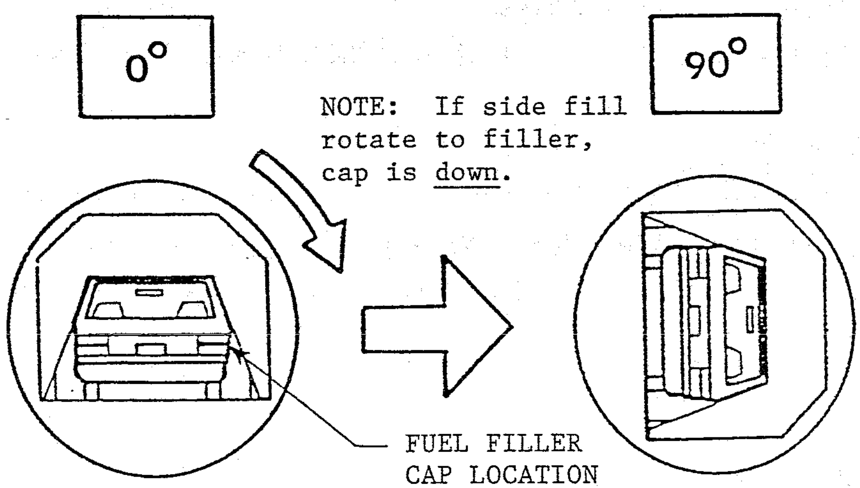
	TEST RESULTS	MAXIMUM ALLOWABLE
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 G	28 G
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 G	142 G
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - - -	0 G	28 G/MN

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: MR0204
TEST PHASE



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

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

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

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

NEXT WHOLE MINUTE INTERVAL - - - - - = 7 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

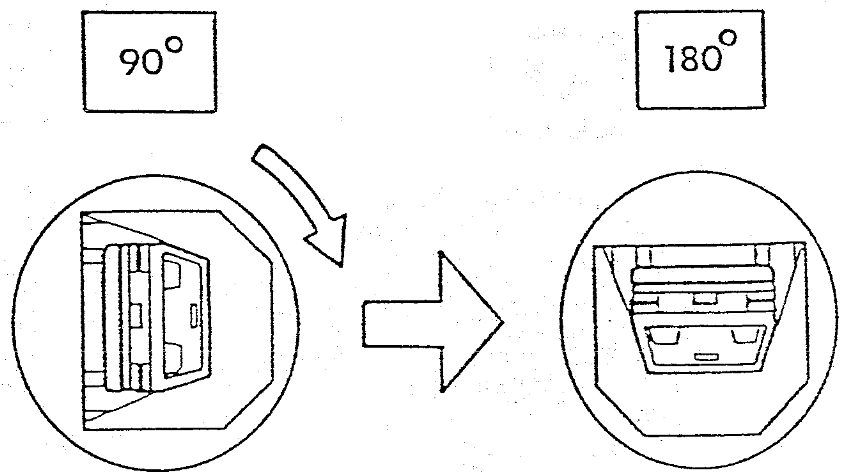
0° TO 90° ROTATION (FUEL FILLER CAP DOWN)	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0204
TEST PHASE



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

TIME REQ. FOR MACHINE TO ROTATE 90° =	2	minutes,	00	seconds
FMVSS 301 POSITION HOLD TIME =	5	minutes,	00	seconds
TOTAL - - - - - - - - - - =	7	minutes,	00	seconds
NEXT WHOLE MINUTE INTERVAL - - - - - =	14	minutes		

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

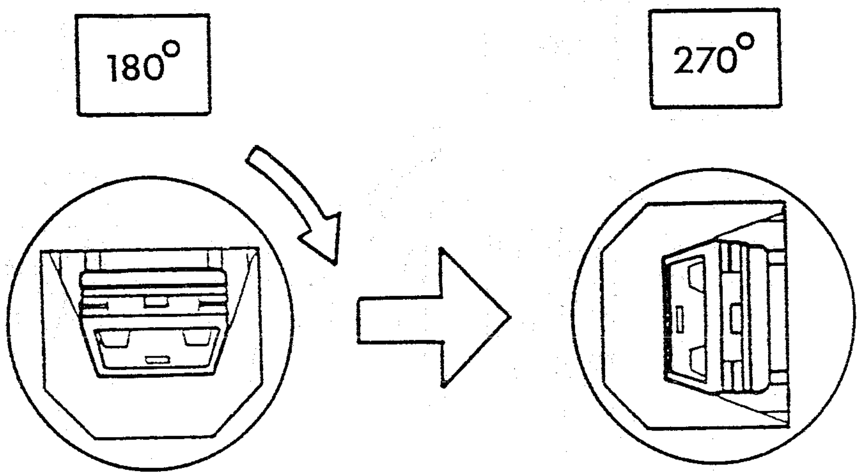
90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0204
TEST PHASE



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

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

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

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

NEXT WHOLE MINUTE INTERVAL - - - - - = 21 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

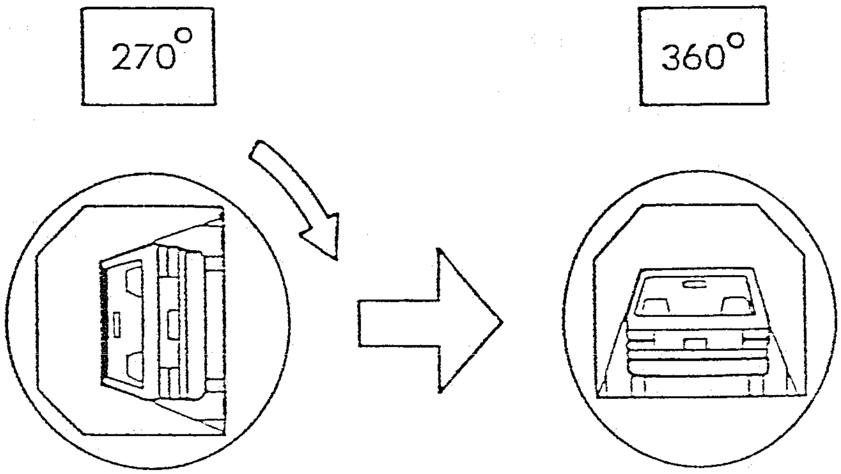
180° TO 270° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0204
TEST PHASE



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

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

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

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

NEXT WHOLE MINUTE INTERVAL - - - - = 28 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

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

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

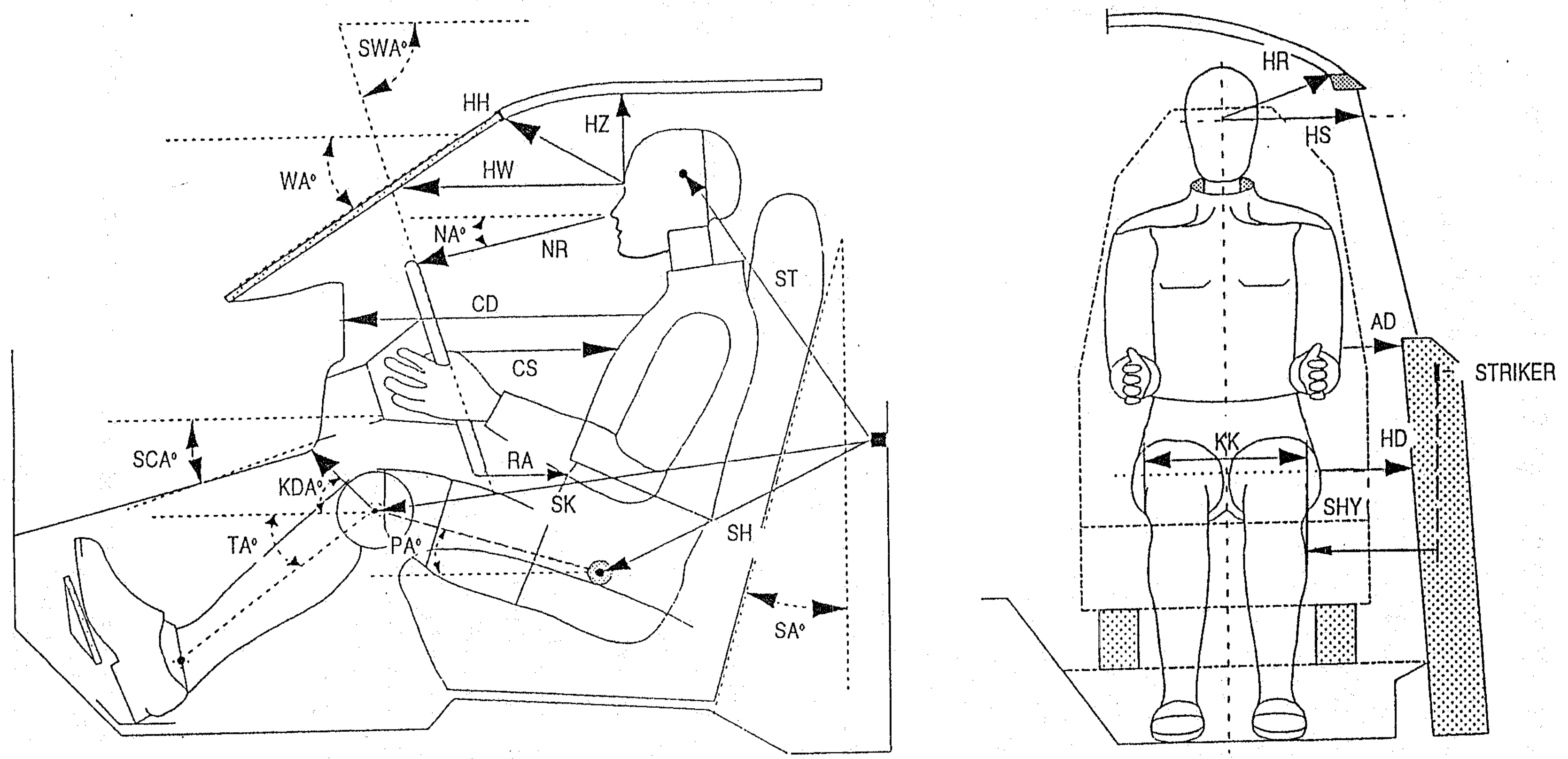
None

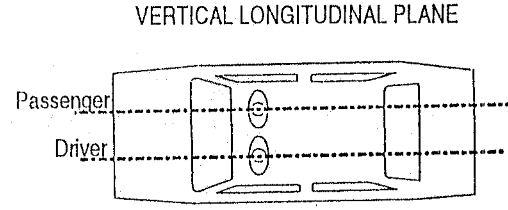
SECTION 4.0

VEHICLE, OCCUPANT, AND CAMERA INFORMATION

FIGURE 8

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS





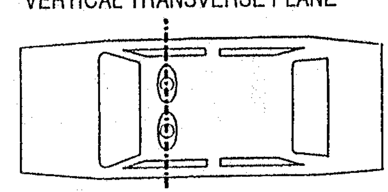
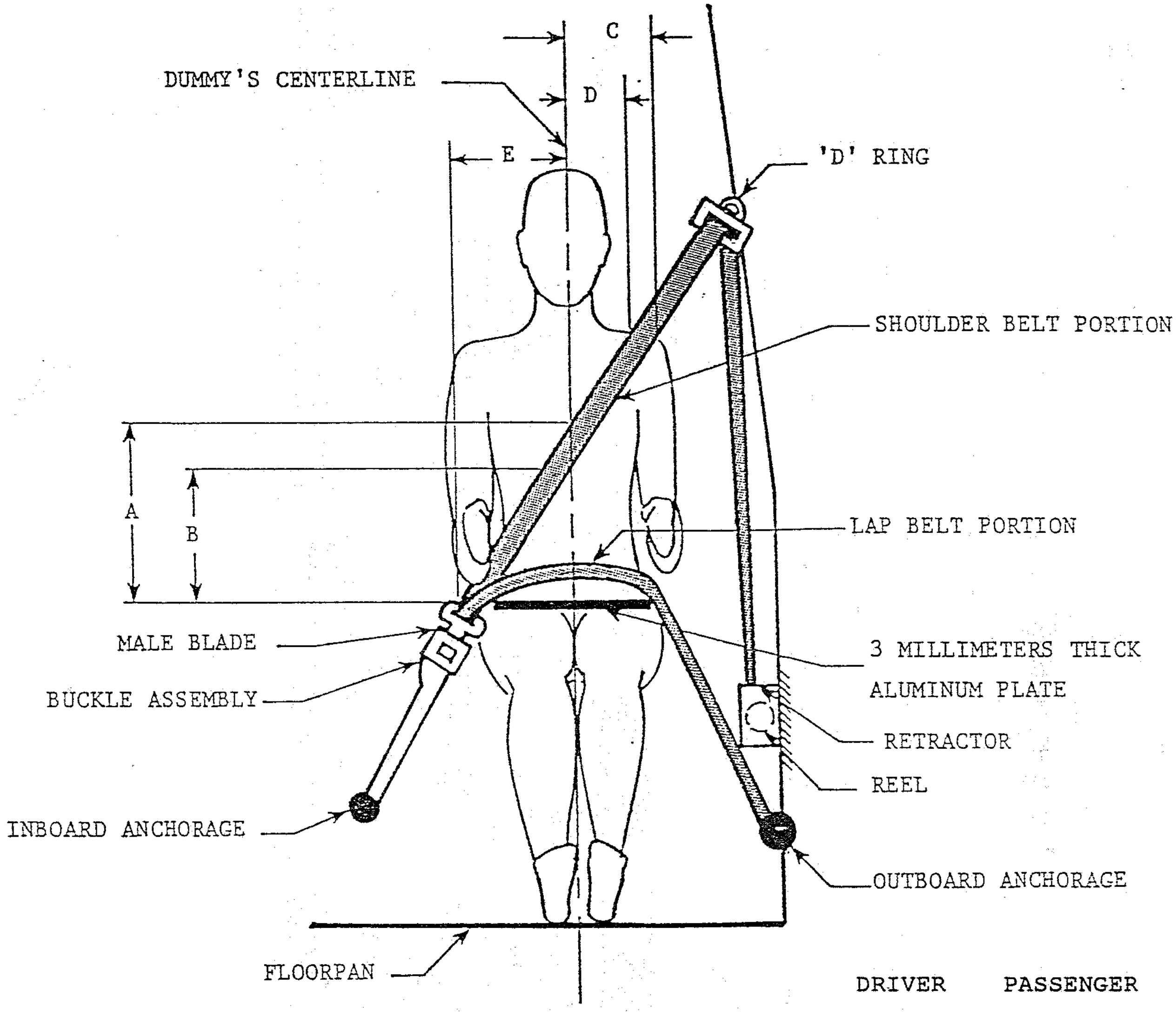


TABLE 12 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #142)	PASSENGER (SERIAL #713)
WA°	WINDSHIELD ANGLE	45	NA
SWA°	STEERING WHEEL ANGLE	30	NA
SCA°	STEERING COLUMN ANGLE	61	NA
SA°	SEAT BACK ANGLE	15	18
HZ	HEAD TO ROOF	254	131
HH	HEAD TO HEADER	468	496
HW	HEAD TO WINDSHIELD	611	643
HR	HEAD TO SIDE HEADER	261	214
NR	NOSE TO RIM	358	NA
NA	NOSE TO RIM ANGLE	12	NA
CD	CHEST TO DASH	534	572
CS	STEERING WHEEL TO CHEST	276	NA
RA	RIM TO ABDOMEN	165	NA
KDL	LEFT KNEE TO DASH	171	200
KDR	RIGHT KNEE TO DASH	165	201
KDA	OUTBOARD KNEE TO DASH ANGLE	26	38
PA°	PELVIC ANGLE	20	9
TA°	TIBIAL ANGLE	44	42
KK	KNEE TO KNEE	222	300
ST	STRIKER TO HEAD	636	630
	STRIKER TO HEAD ANGLE	-80	-81
SK	STRIKER TO KNEE	756	710
	STRIKER TO KNEE ANGLE	0	-4
SH	STRIKER TO H-POINT	357	323
	STRIKER TO H-POINT ANGLE	14	4
SHY	STRIKER TO H-POINT (Y DIR.)	251	220
HS	HEAD TO SIDE WINDOW	352	325
HD	H-POINT TO DOOR	174	174
AD	ARM TO DOOR	112	119

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

FIGURE 9 SEAT BELT POSITIONING DATA



	DRIVER	PASSENGER
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	325	325
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	245	235
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	110	155
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	55	105
LAPBELT TENSION (N)	18	18
SHOULDER BELT TENSION (N)	18	18
ADJUSTABLE SEAT BELT ANCHORAGE POSITION	NA	NA

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 10

CAMERA POSITIONS

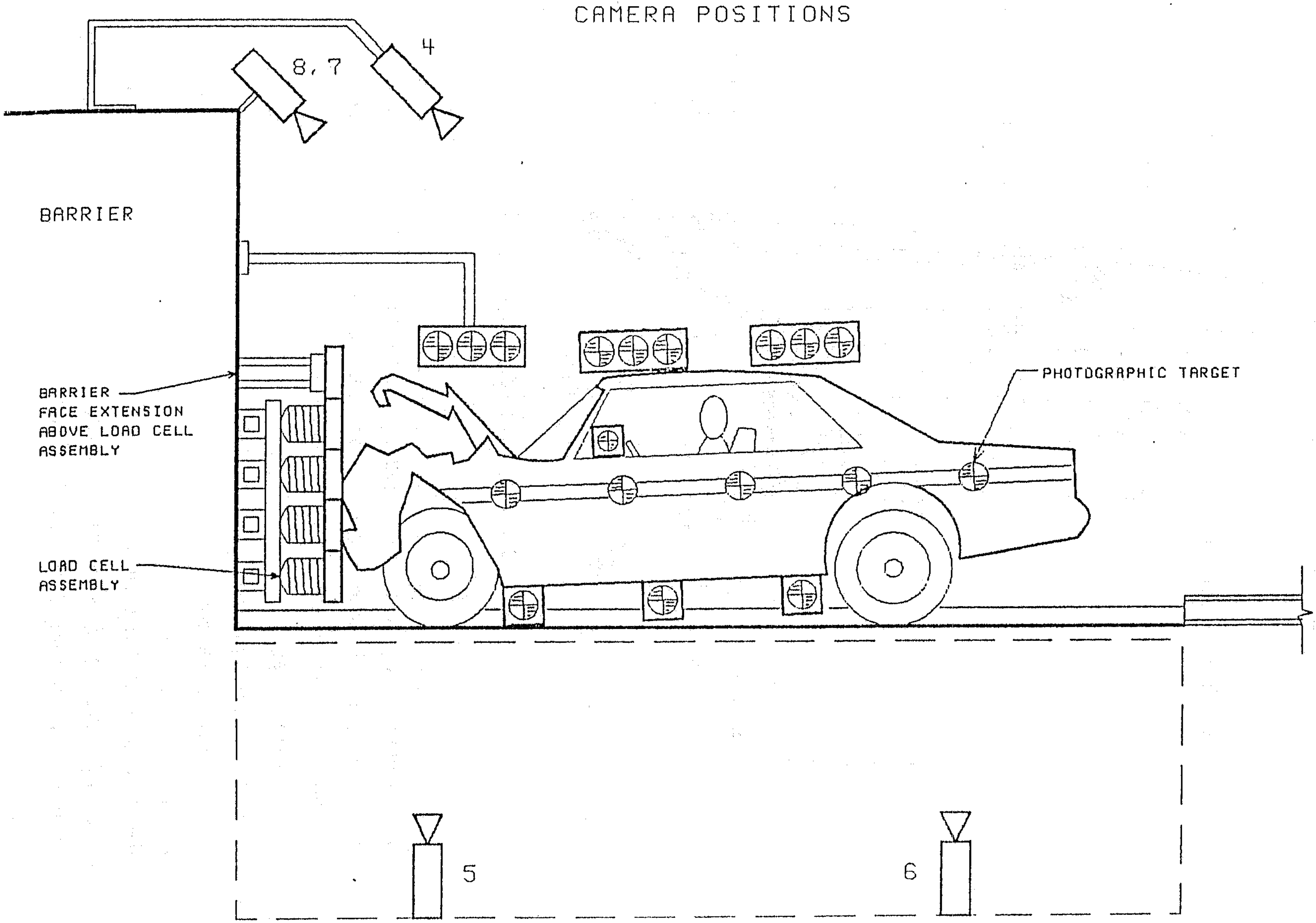


FIGURE 10

CAMERA POSITIONS, CONTINUED

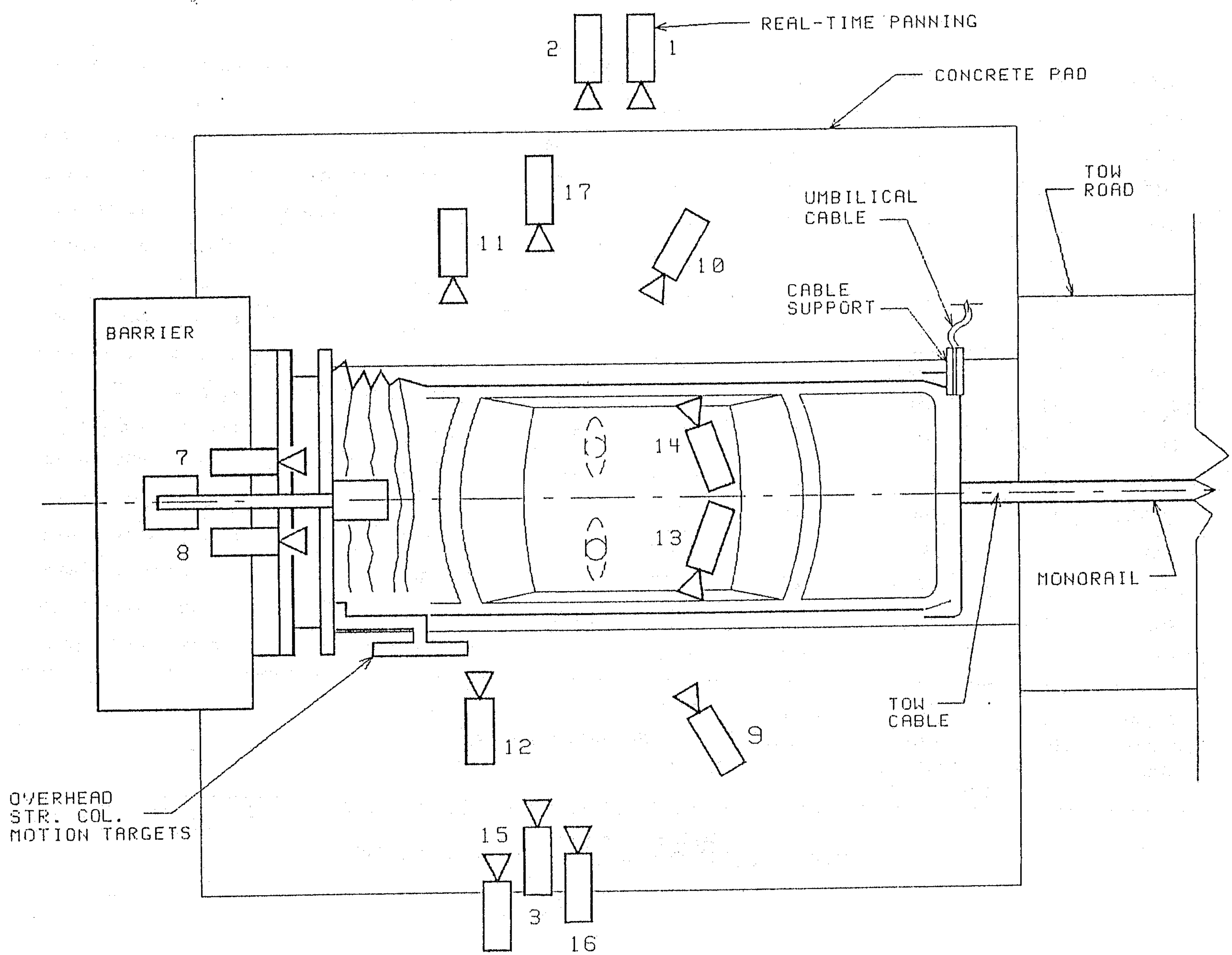


TABLE 13 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 931124 VEHICLE: 1994 Ford Bronco special purpose

CAMERA NO.	VIEW	CAMERA POSITIONS (MM)[1] X	Y	Z	ANGLE[2] (DEG)	FILM PLANE TO HEAD TARGET (MM)	LENS (MM)	FILM SPEED (FPS)
1	Real-time panning	-3607	-12802	1549	NA	NA	16	24
2	Vehicle crush	-2065	-6767	942	-2	NA	13	498
3	Dummy kinematics	-1054	7493	1118	-12	5512	25	998
4	Windshield damage	-925	0	2489	-40	NA	13	502
5	Crush & fluid spillage	-1283	0	-2347	90	NA	13	1000
6	Fluid spillage	-2522	0	-2515	90	NA	13	975
7	Passenger kinematics	-114	-351	2159	-40	NA	17	500
8	Driver kinematics	-173	368	2159	-41	NA	17	505
9	Driver kinematics	-4572	1854	2591	-27	2057	25	498
10	Passenger kinematics	-4674	-1880	2540	-26	1981	25	492
11	Windshield intrusion	-968	-7775	1118	0	NA	50	508
12	Windshield intrusion	-1346	7859	1074	0	NA	50	505
13	Driver seat belt movement[3]	NA	NA	NA	NA	NA	13	NA
14	Passenger seat belt movement[3]	NA	NA	NA	NA	NA	13	NA
15	Column movement	-3048	7264	2616	-14	NA	25	505
16	Column movement	-3048	7264	1908	-9	NA	25	500
17	Passenger kinematics	-986	-5354	1151	7	5410	25	1002

[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

[3] No film as a result of camera malfunction.

FIGURE 11 VEHICLE TARGET LOCATIONS

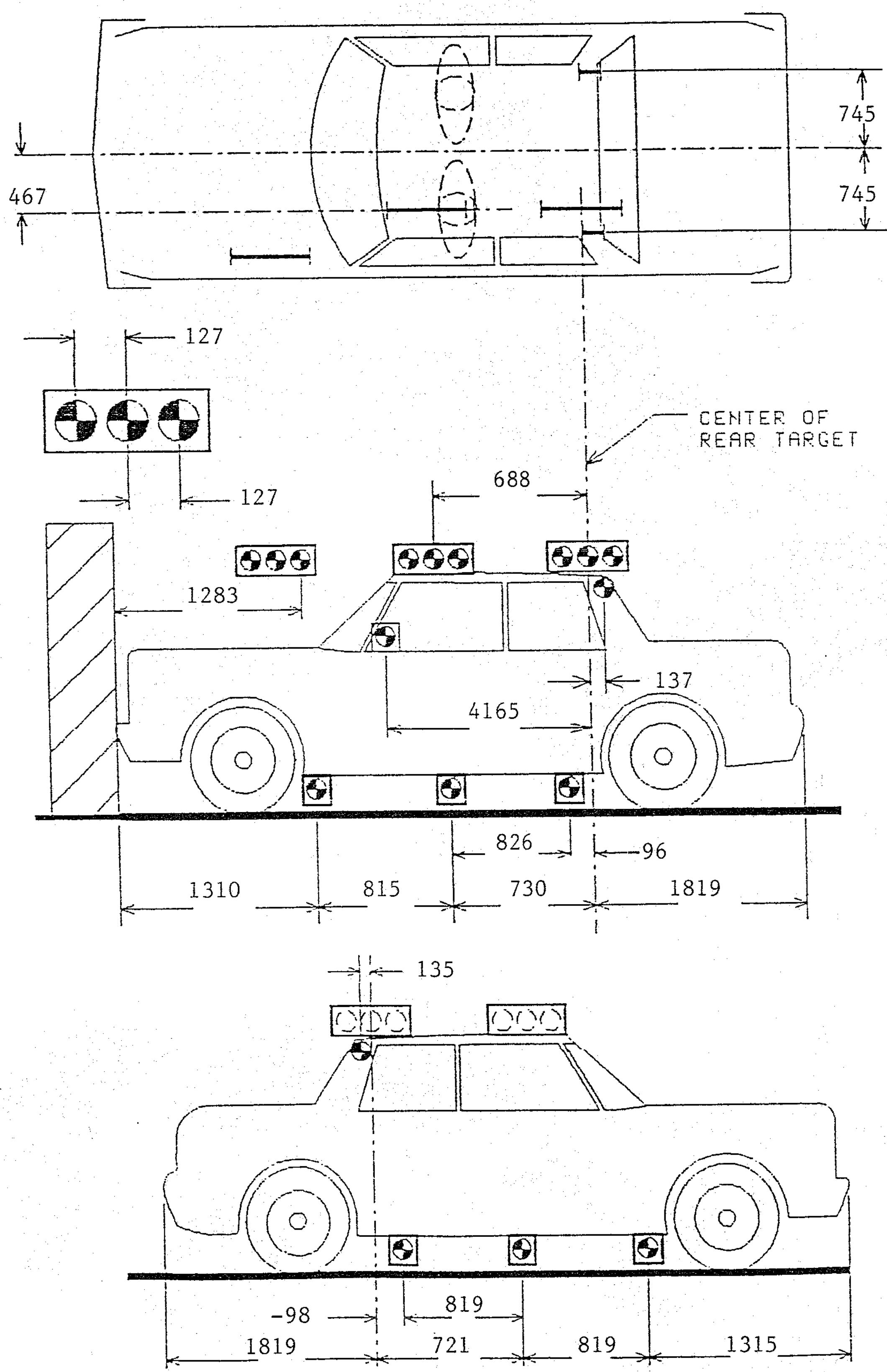
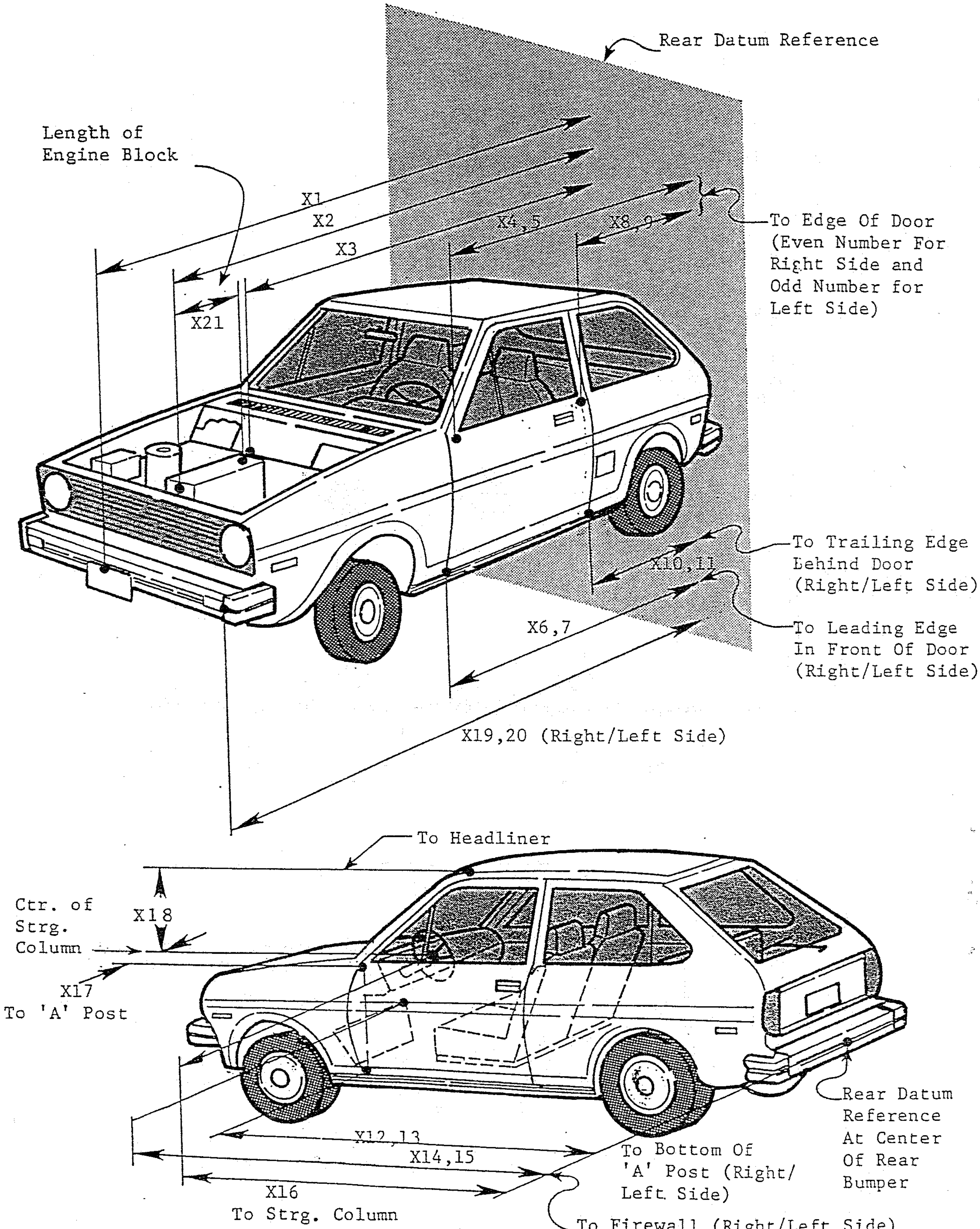


FIGURE 12 PRE-TEST AND POST-TEST MEASUREMENT POINTS



931124

TABLE 14 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Ford/Bronco TEST NUMBER: 931124

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4674	4090	584
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	3950	NA	NA
X3	REAR SURFACE OF VEHICLE TO FIREWALL	3452	NA	NA
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3076	3132	-56
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3067	3116	-49
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3051	3086	-35
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3054	3090	-36
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2007	2062	-55
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2009	2057	-48
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	1984	2016	-32
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	1984	2024	-40
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3054	3099	-45
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3054	3105	-51
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	3334	3357	-23
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3359	3455	-96
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	2673	2719	-46
X17	CENTER OF STEERING COLUMN TO "A" POST	305	243	62
X18	CENTER OF STEERING COLUMN TO HEADLINER	511	524	-13
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4540	4080	460
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4553	4055	498
X21	LENGTH OF ENGINE BLOCK	470	470	0

All measurements are in millimeters.

APPENDIX A

PHOTOGRAPHS

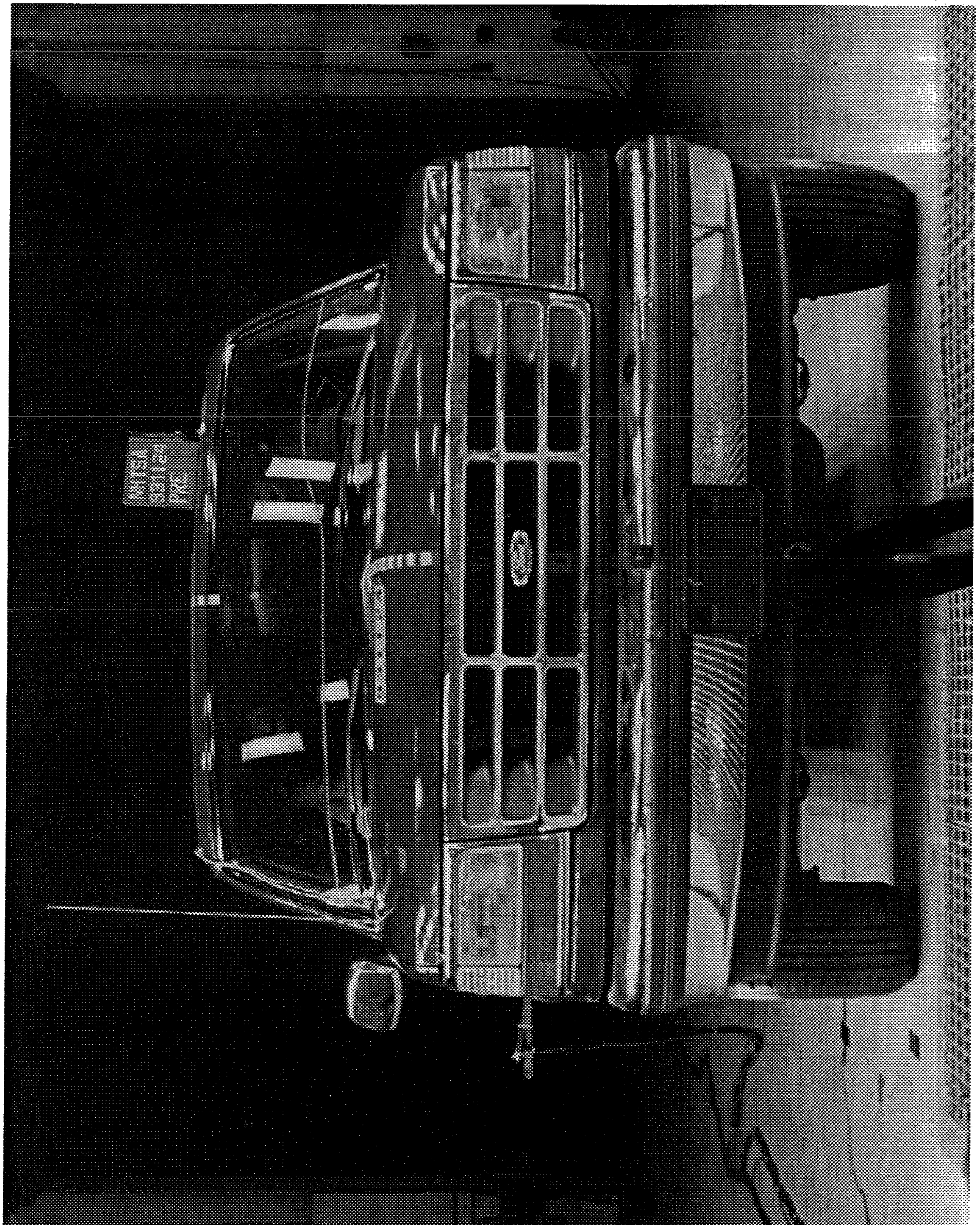


Figure A-1. PRE-TEST FRONT VIEW

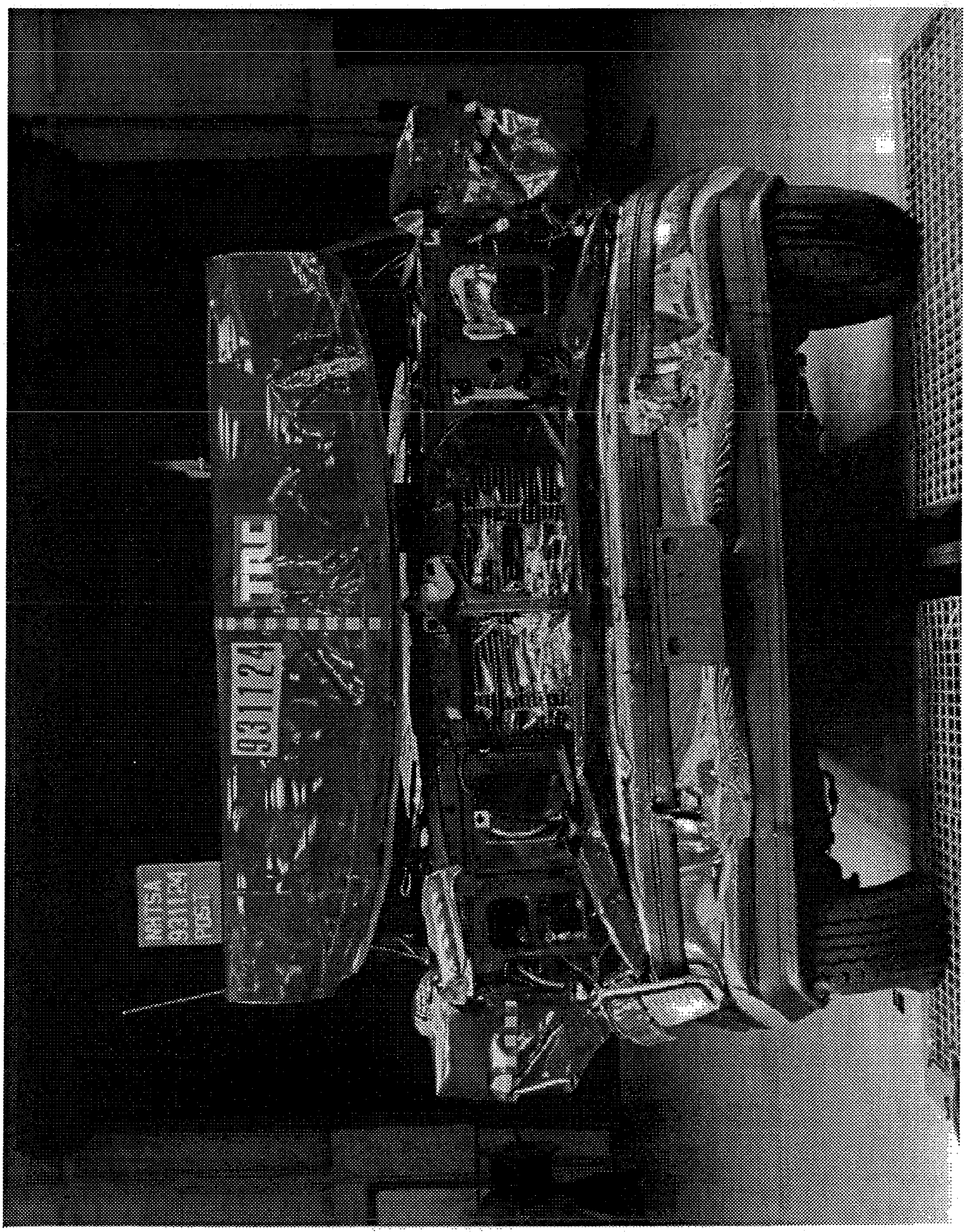


Figure A-2. POST-TEST FRONT VIEW

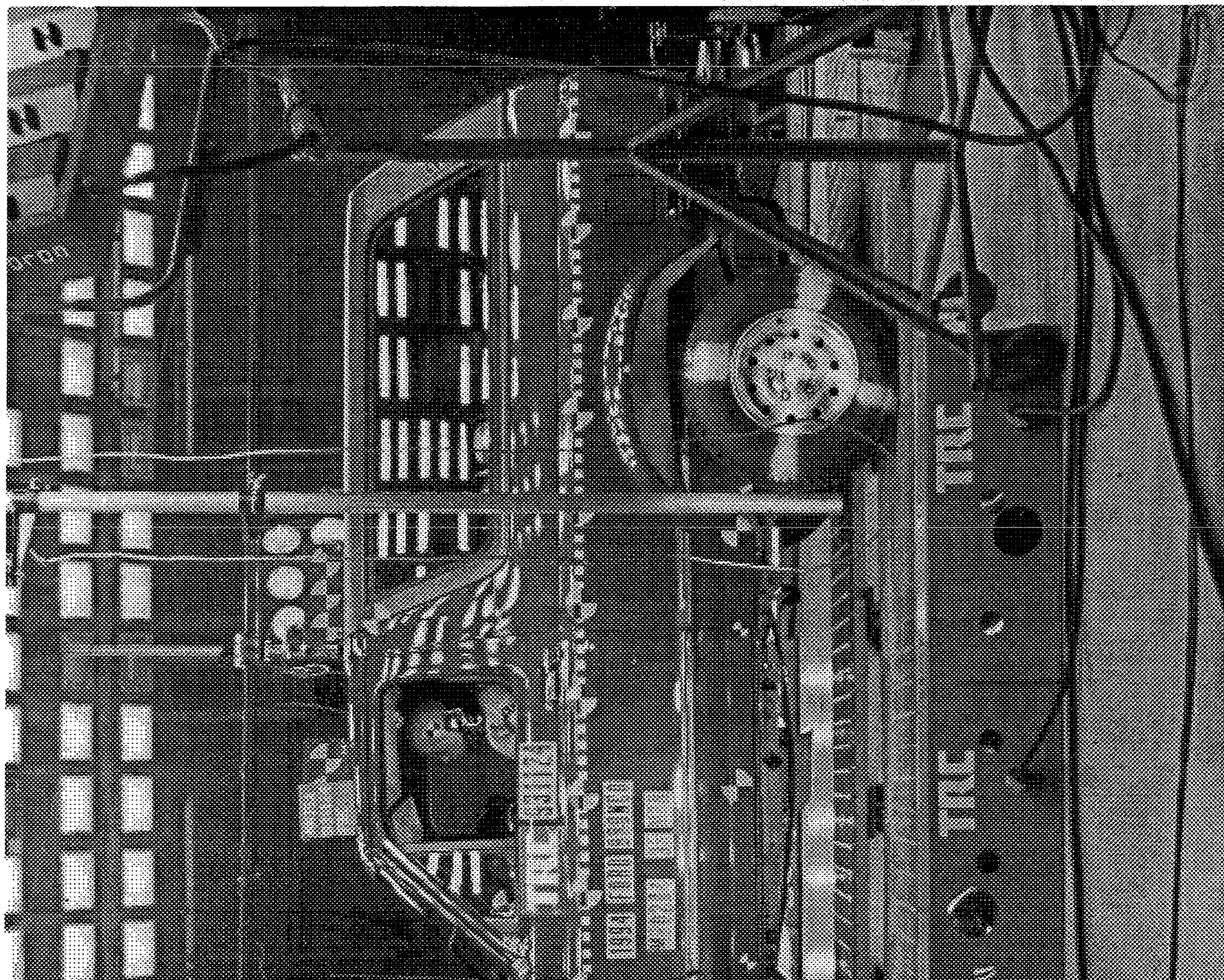


Figure A-3. PRE-TEST LEFT SIDE VIEW

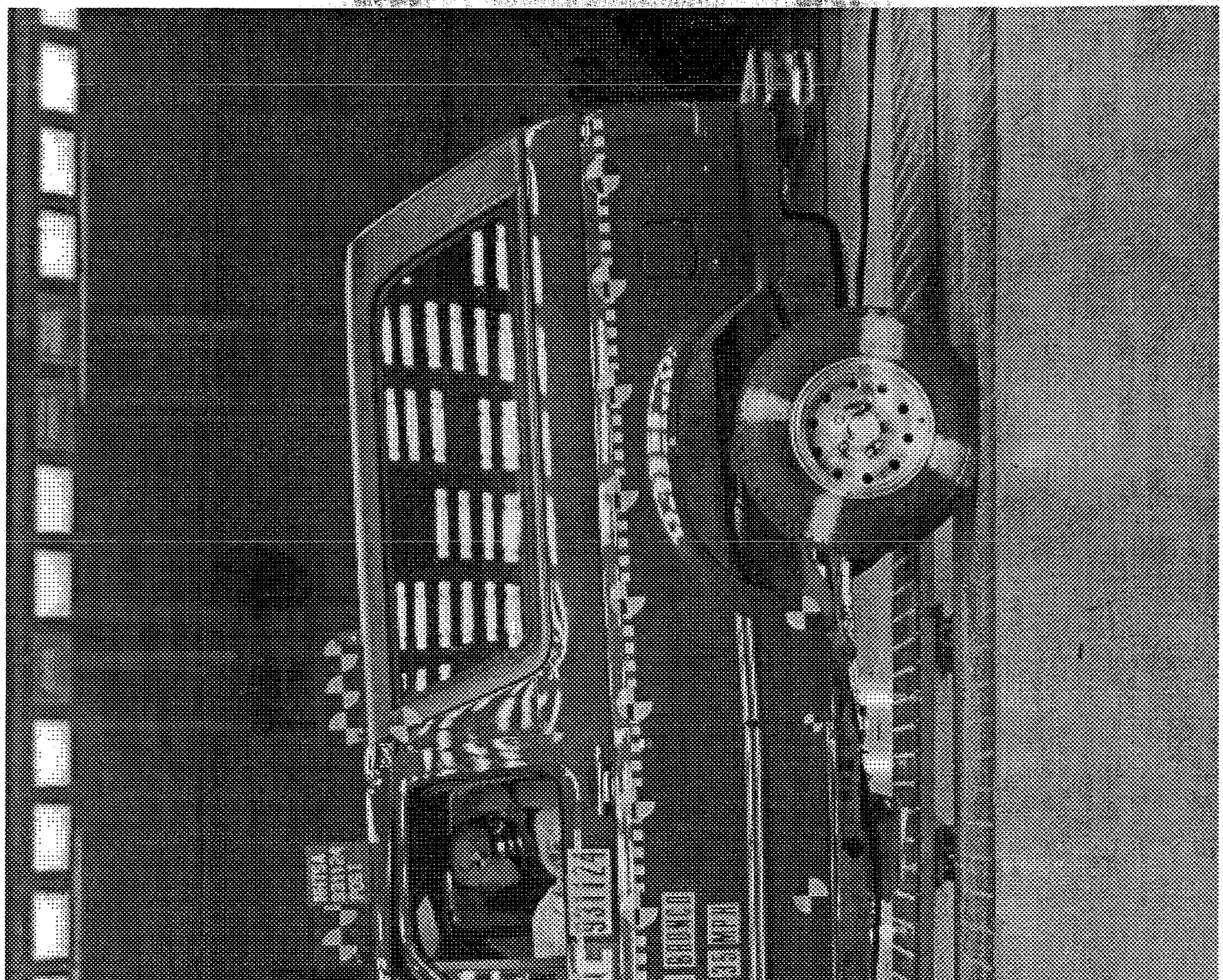


Figure A-4. POST-TEST LEFT SIDE VIEW

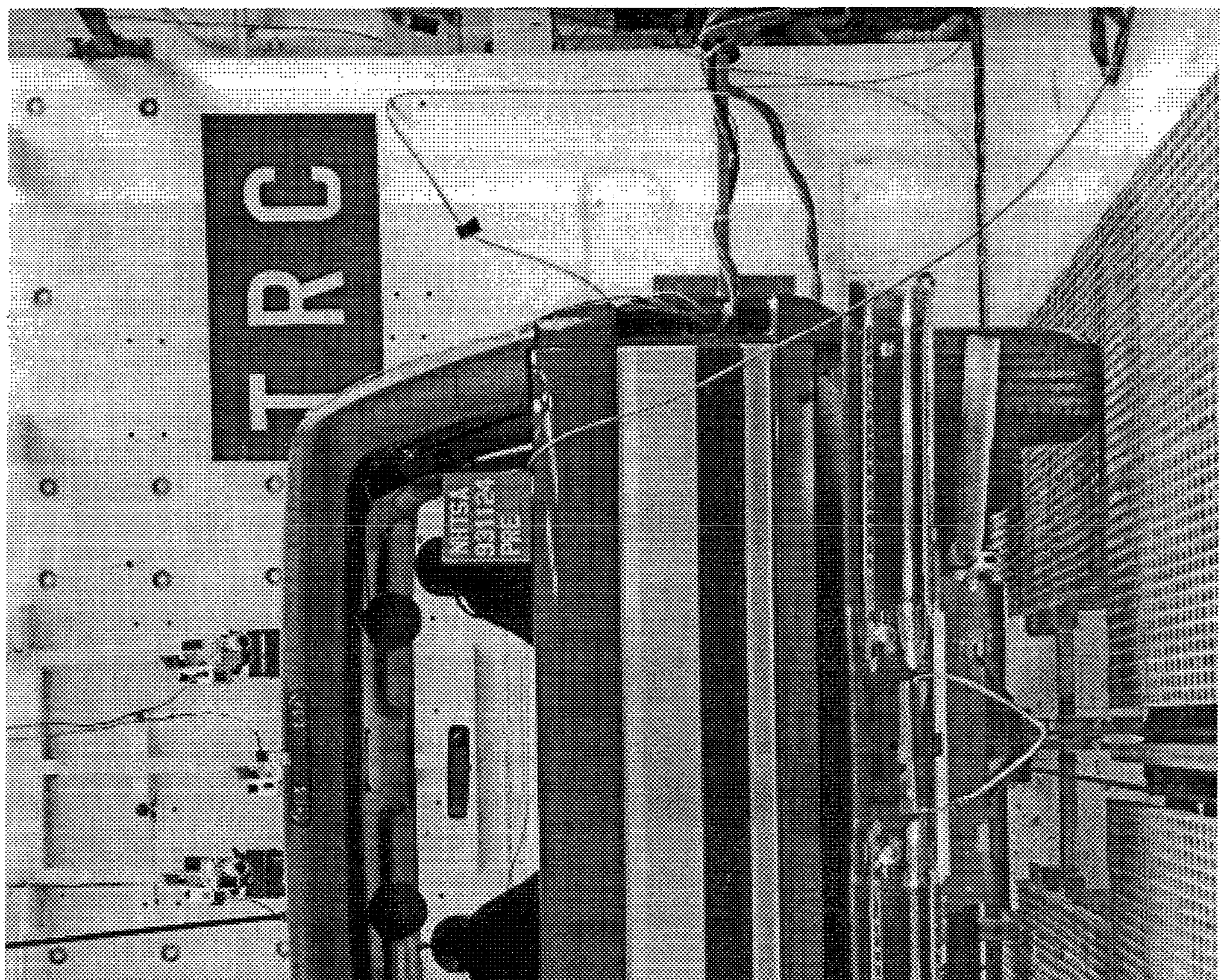


Figure A-5. PRE-TEST REAR VIEW

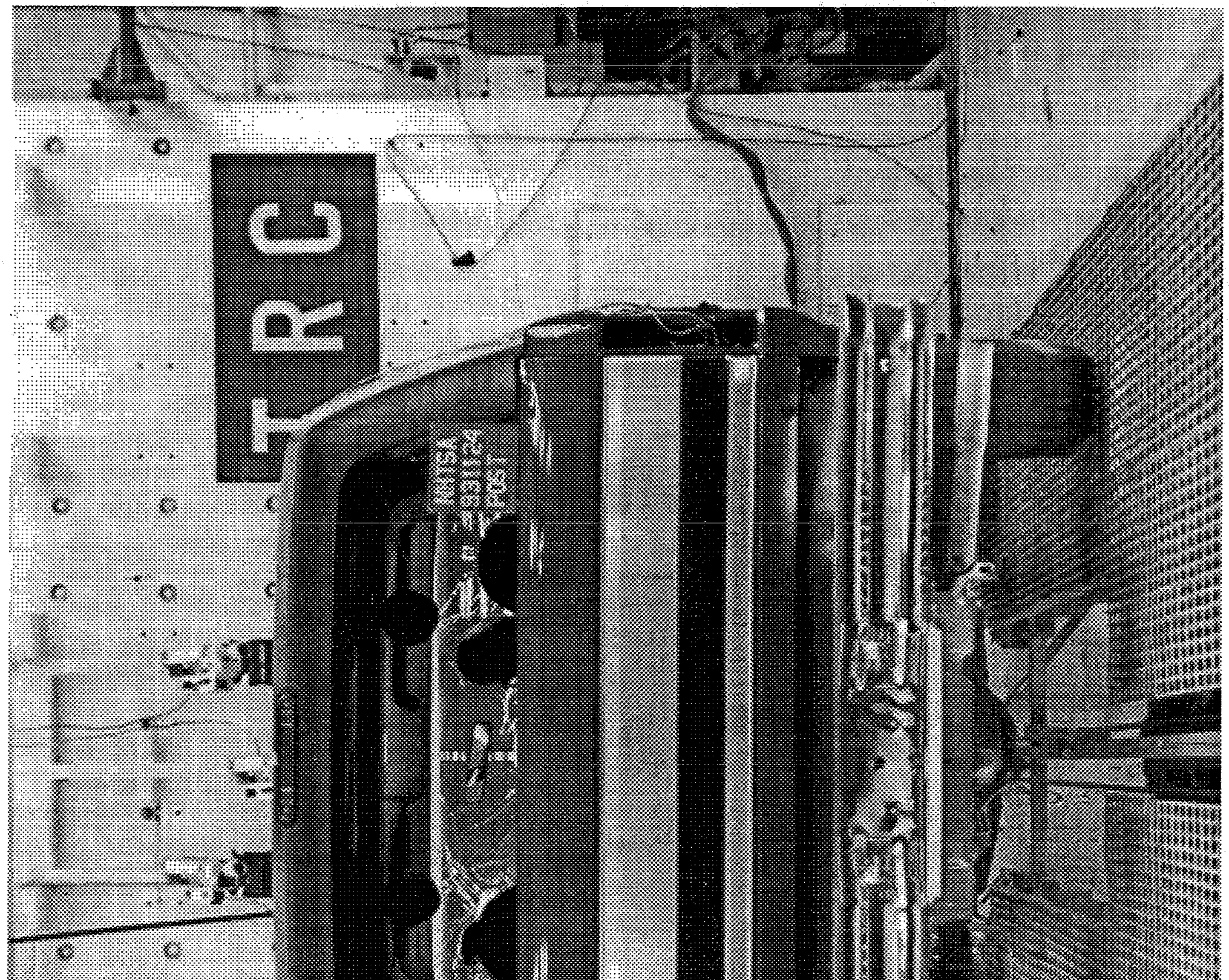


Figure A-6. POST-TEST REAR VIEW

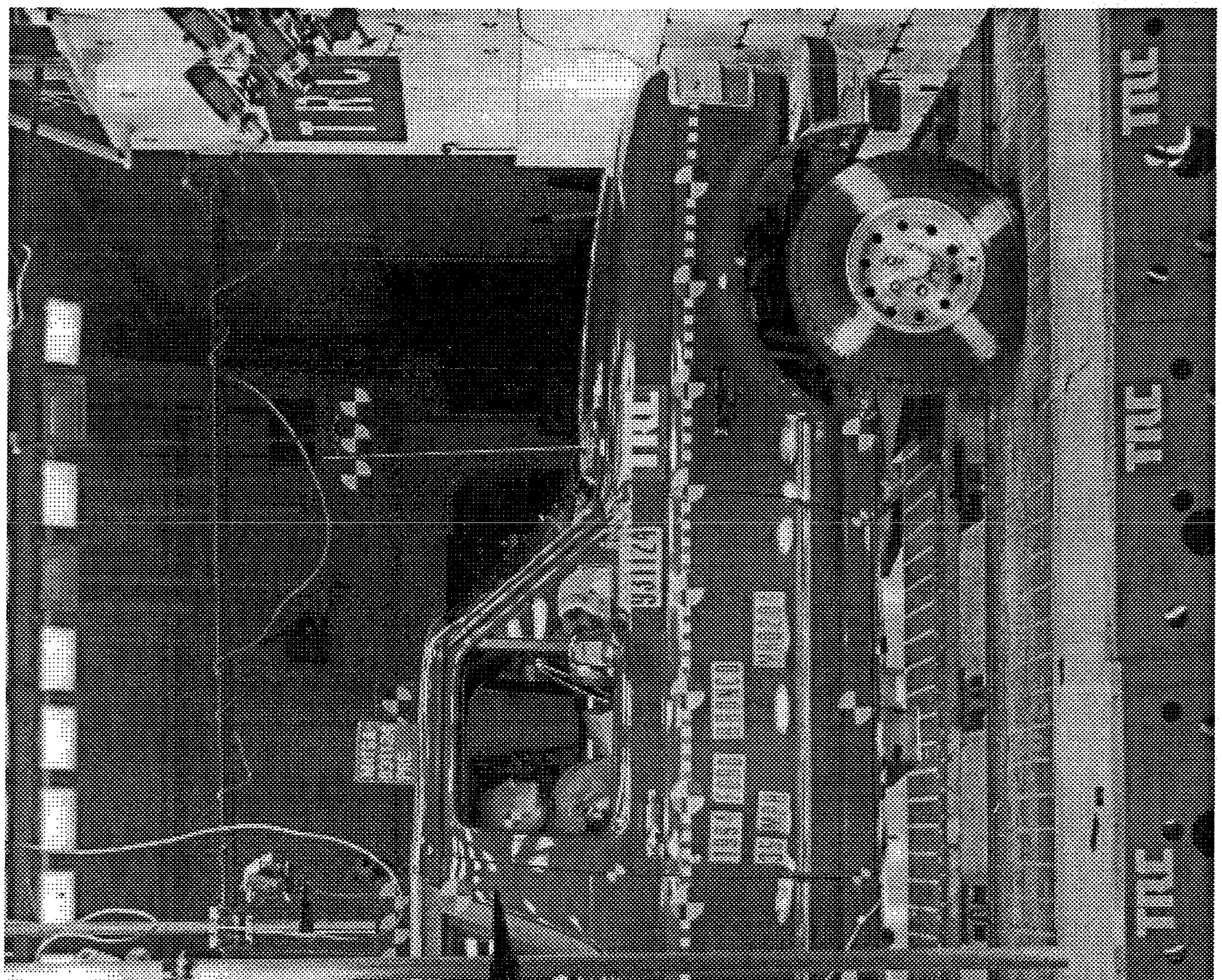


Figure A-7. PRE-TEST RIGHT SIDE VIEW

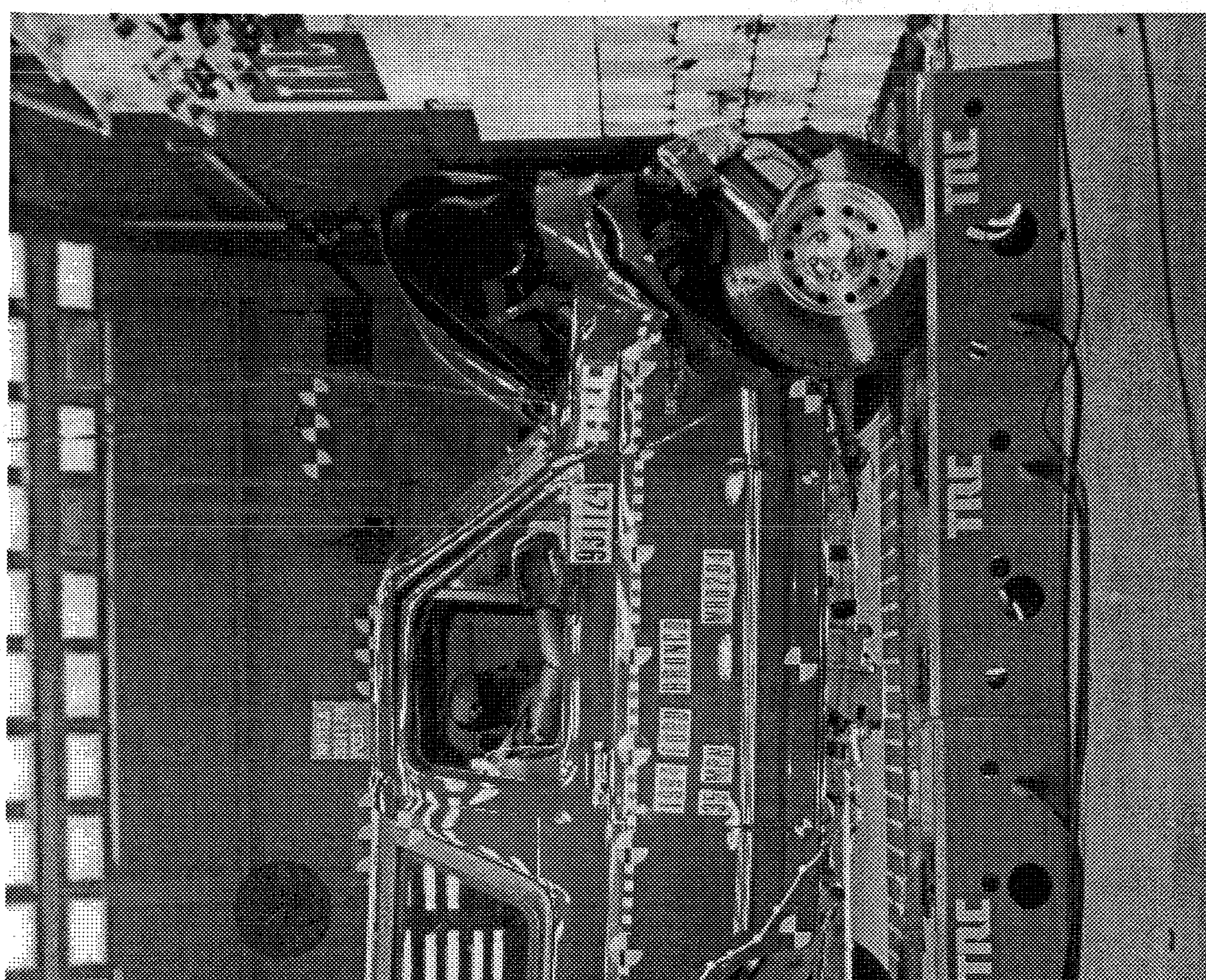


Figure A-8. POST-TEST RIGHT SIDE VIEW

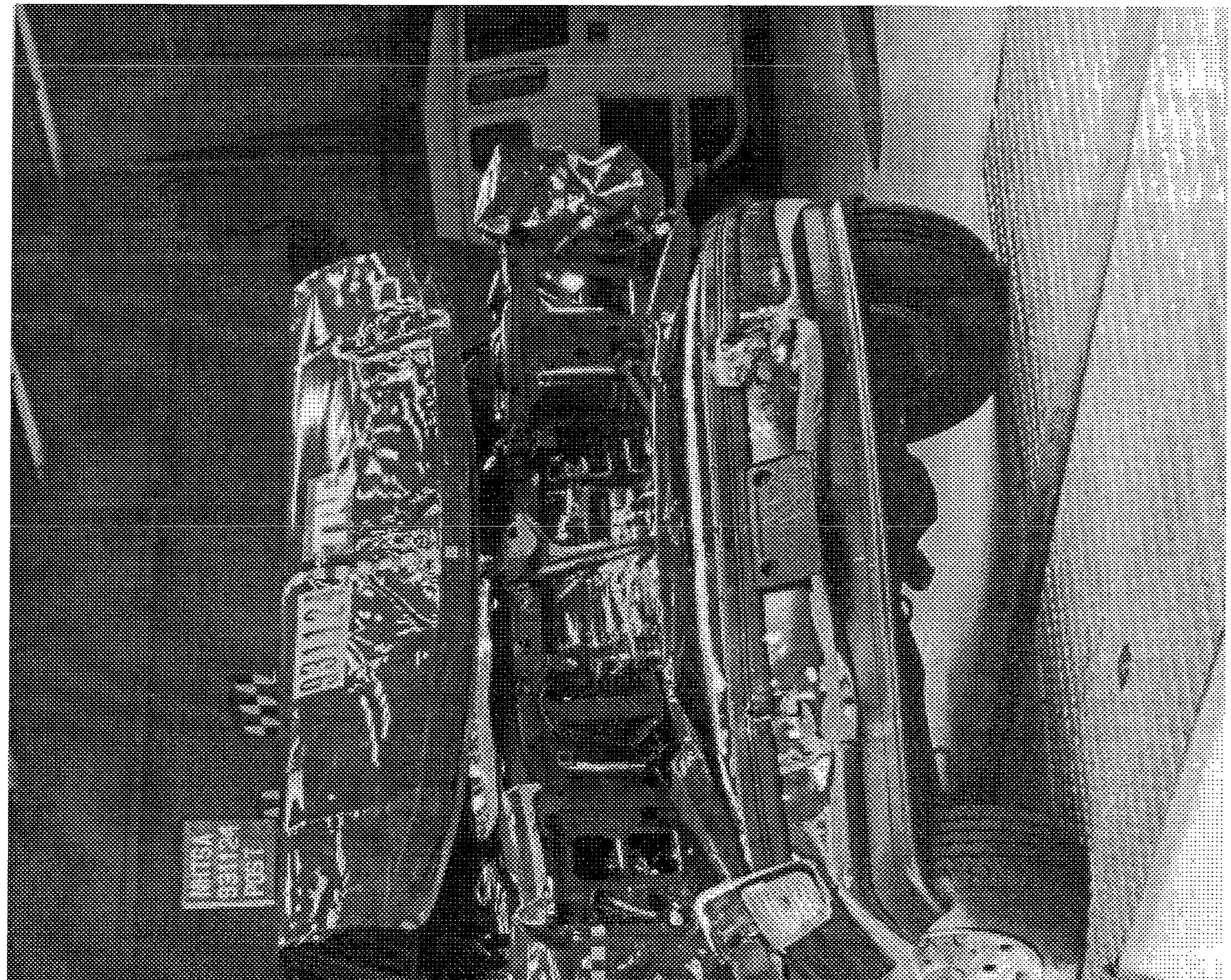


Figure A-9. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

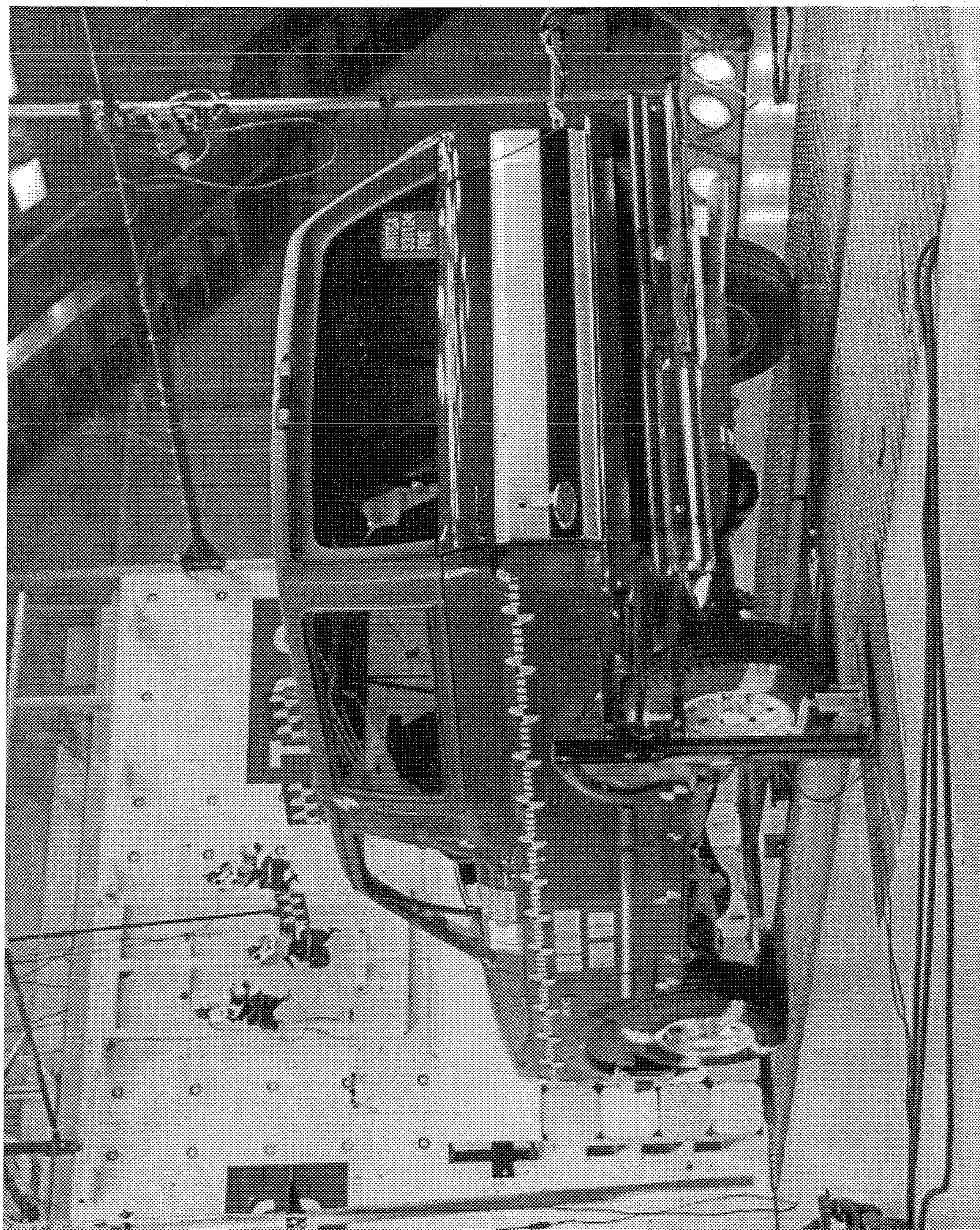


Figure A-10. PRE-TEST LEFT REAR THREE-QUARTER VIEW

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

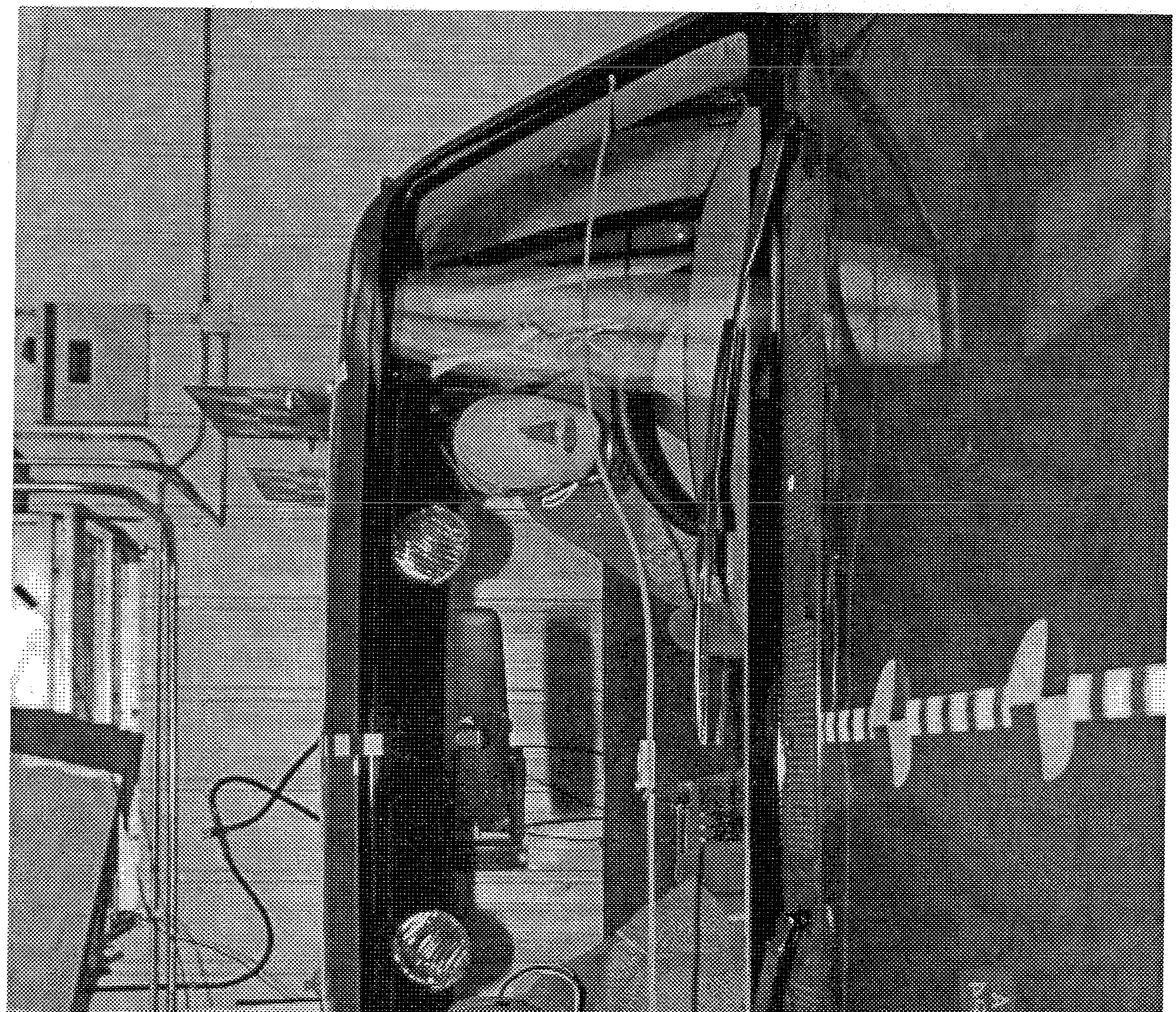


Figure A-12. PRE-TEST WINDSHIELD VIEW

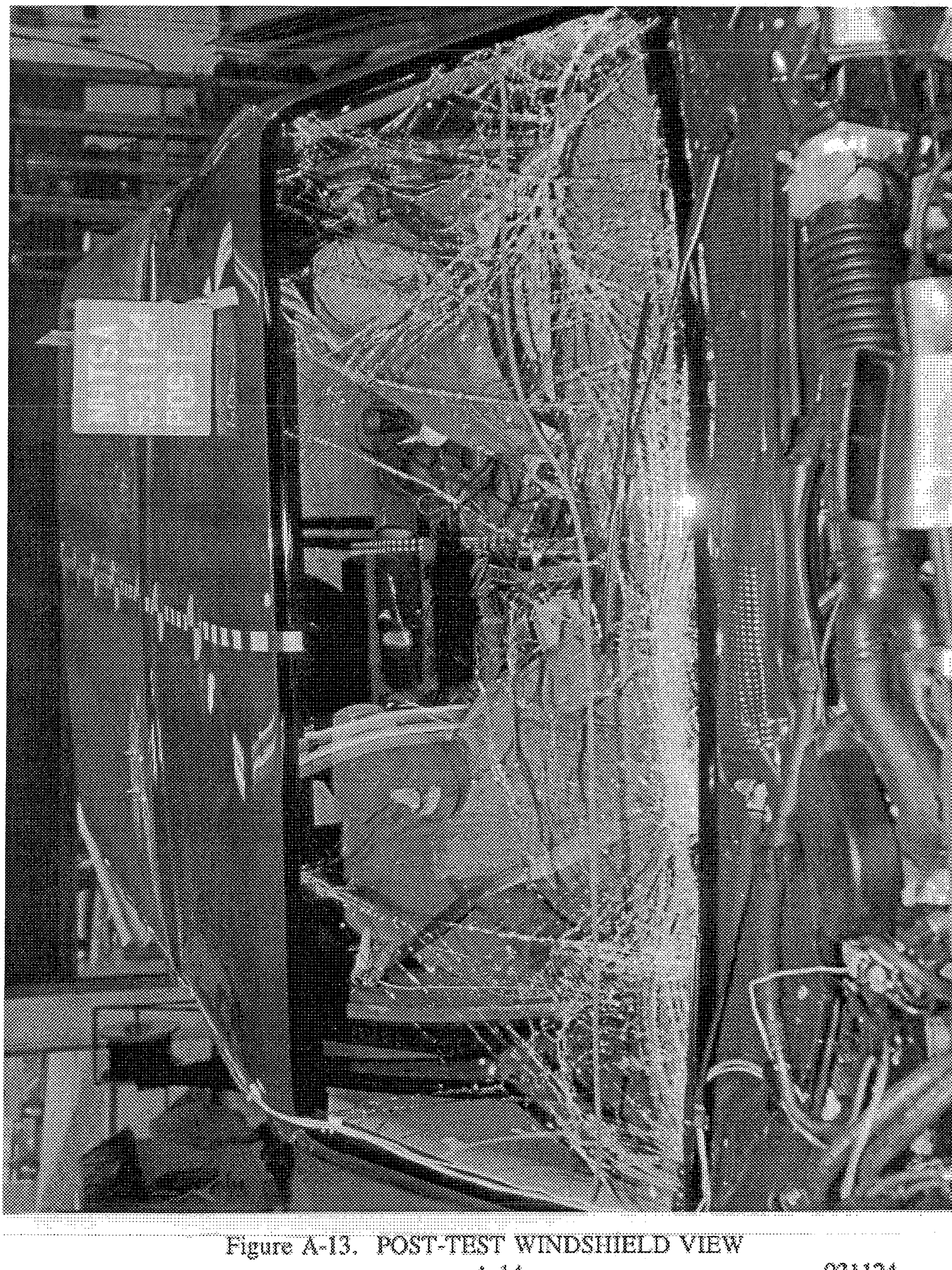


Figure A-13. POST-TEST WINDSHIELD VIEW

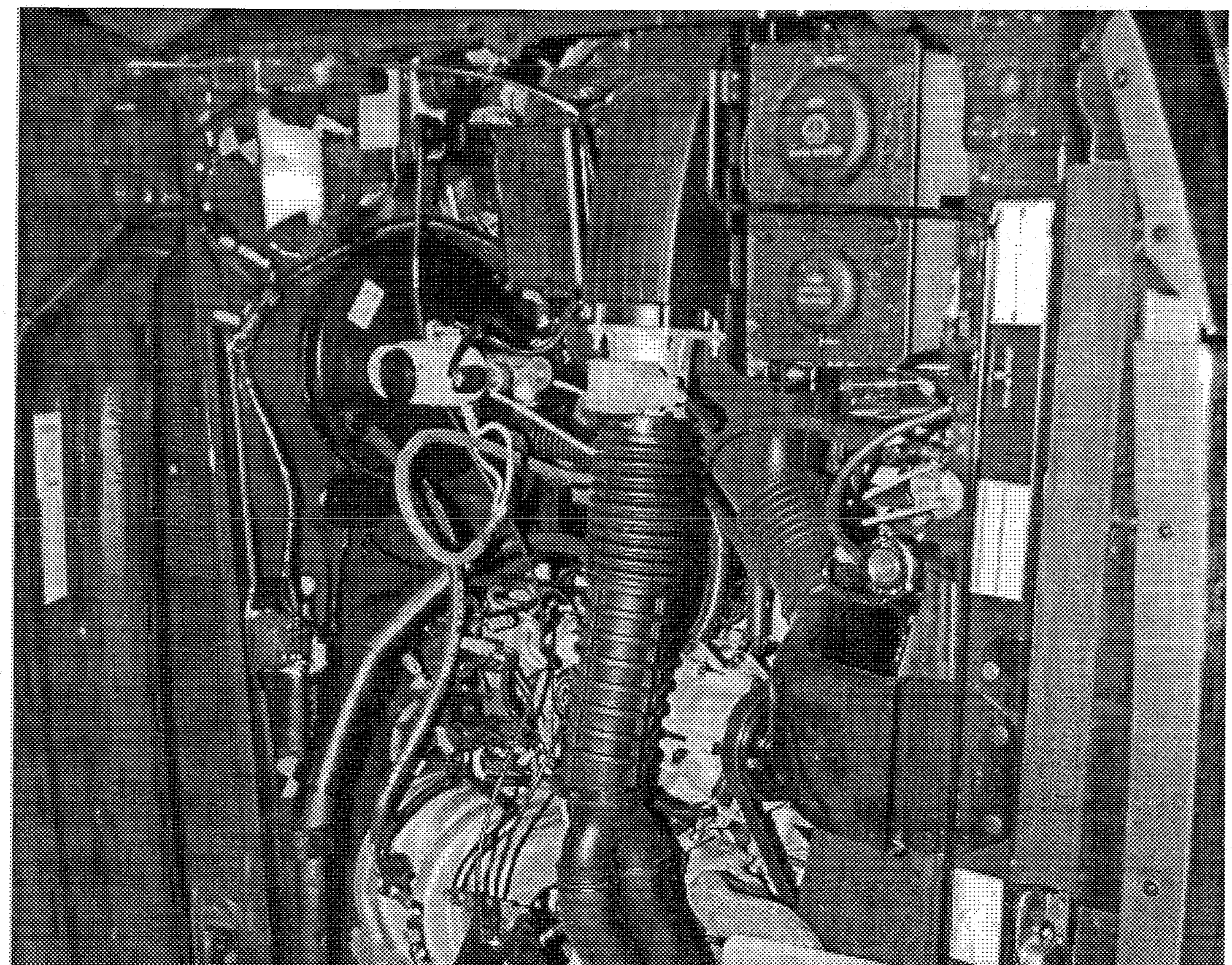


Figure A-14. PRE-TEST ENGINE COMPARTMENT VIEW

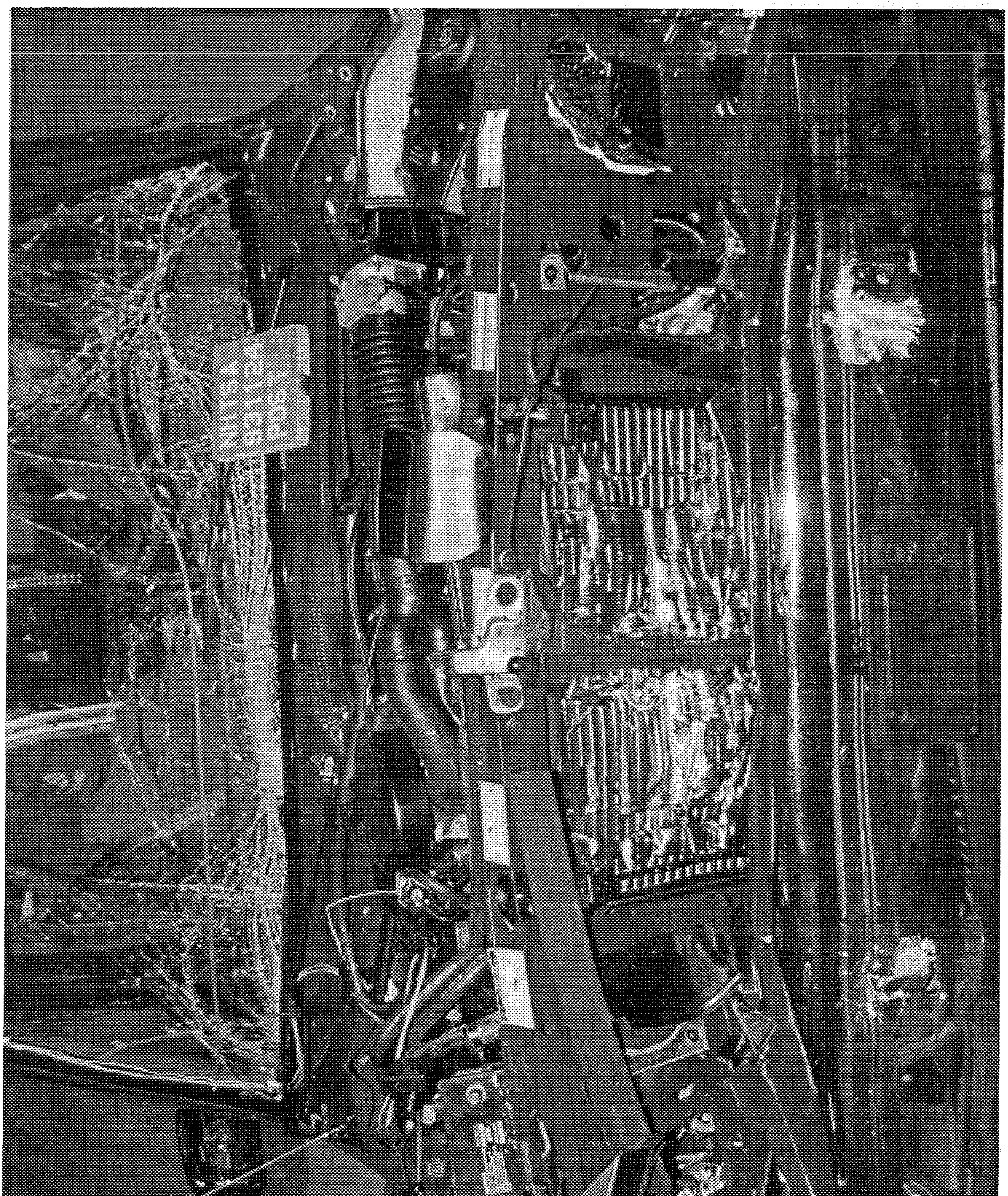


Figure A-15. POST-TEST ENGINE COMPARTMENT VIEW

Figure A-16. PRE-TEST FUEL FILLER CAP VIEW

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

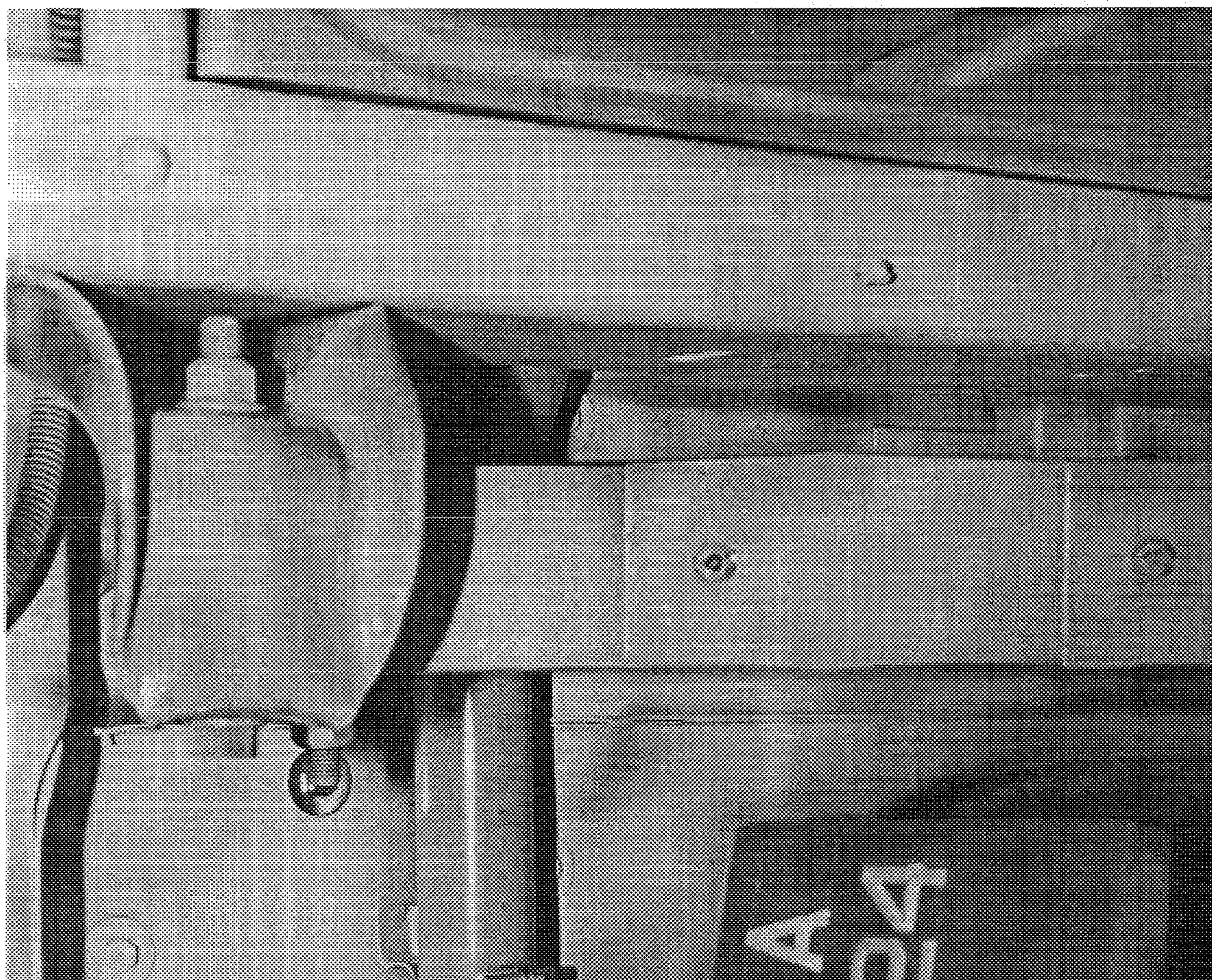


Figure A-18. PRE-TEST FUEL FILLER NECK VIEW

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

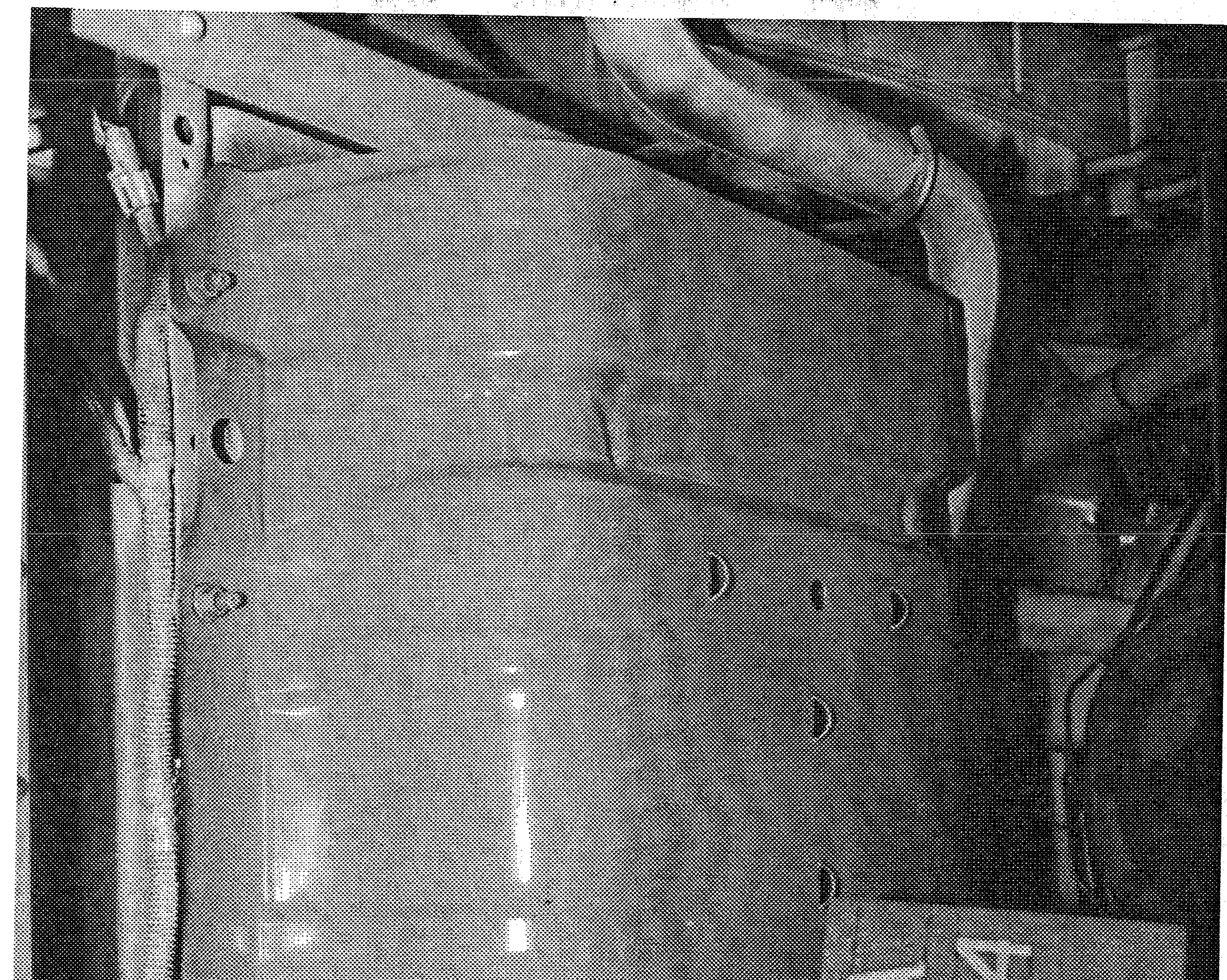


Figure A-20. PRE-TEST FUEL TANK VIEW

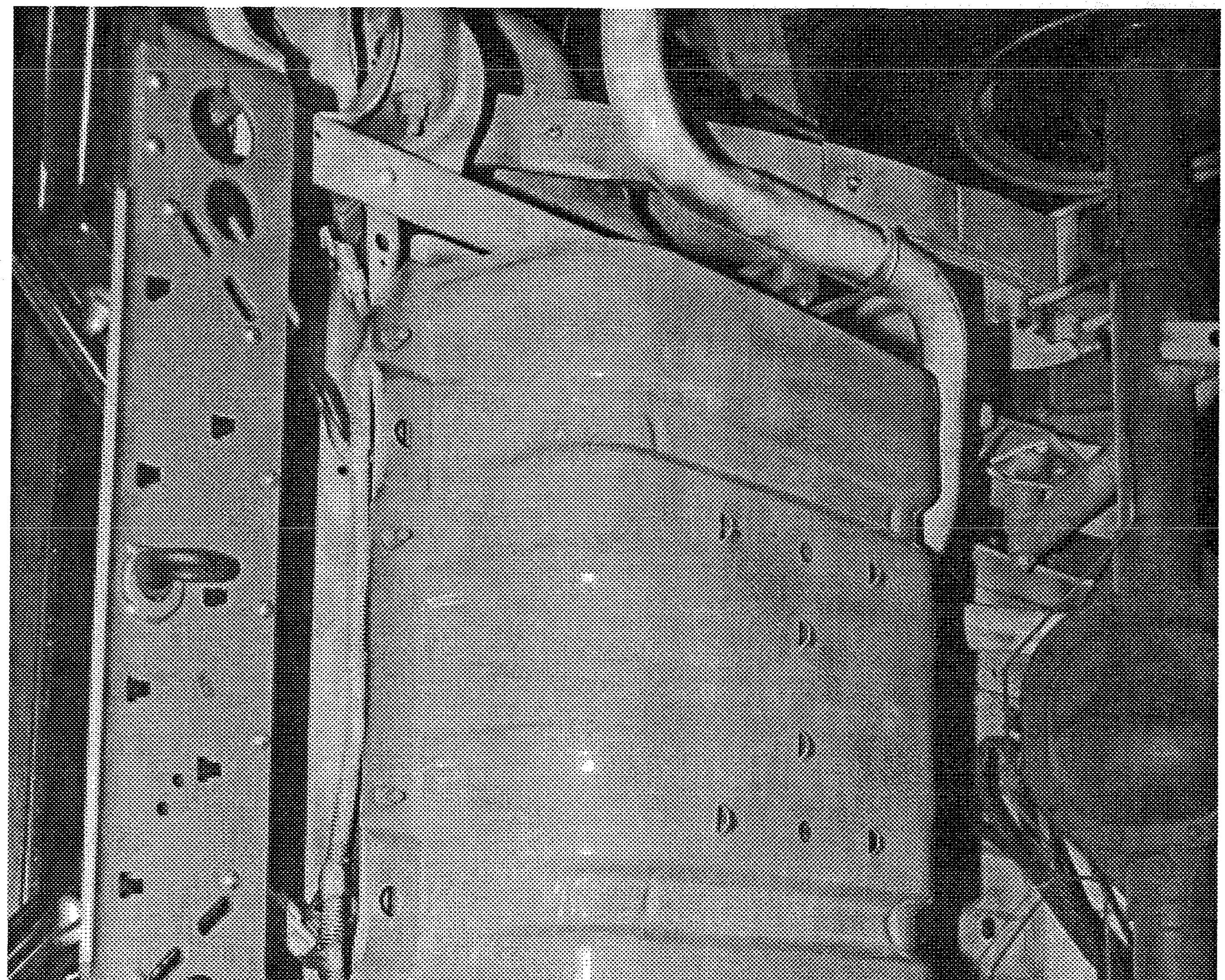


Figure A-21. POST-TEST FUEL TANK VIEW

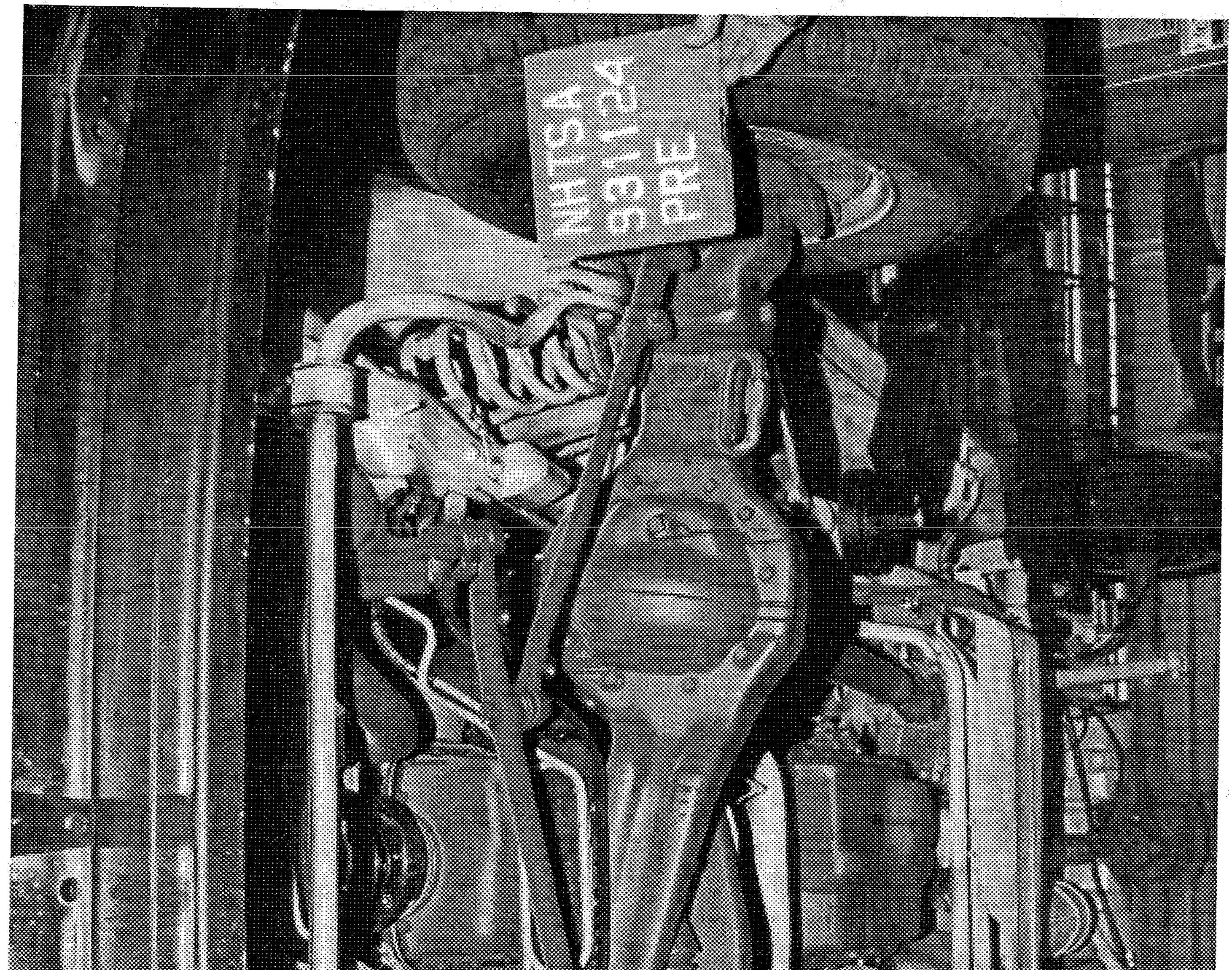


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW

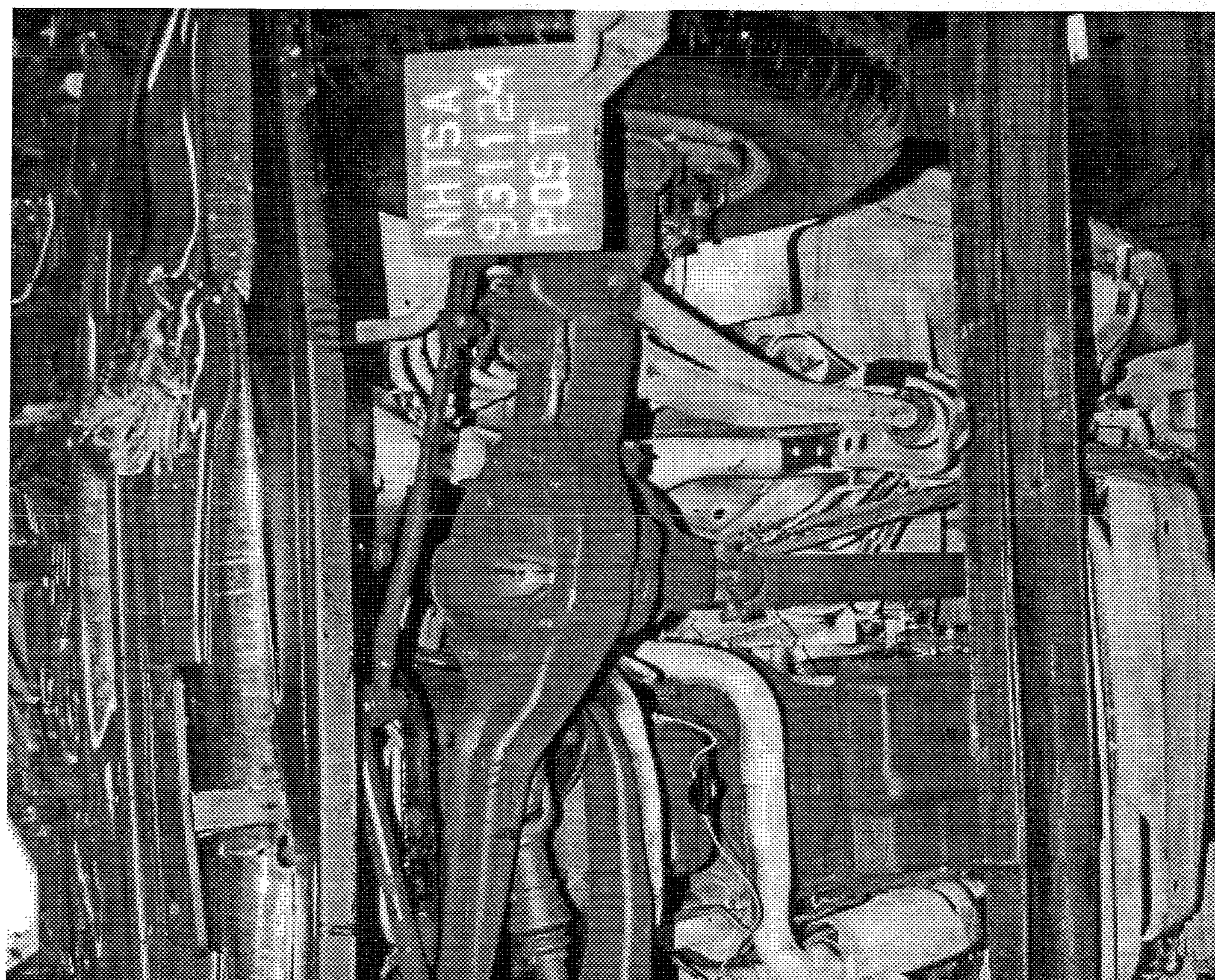


Figure A-23. POST-TEST FRONT UNDERBODY VIEW

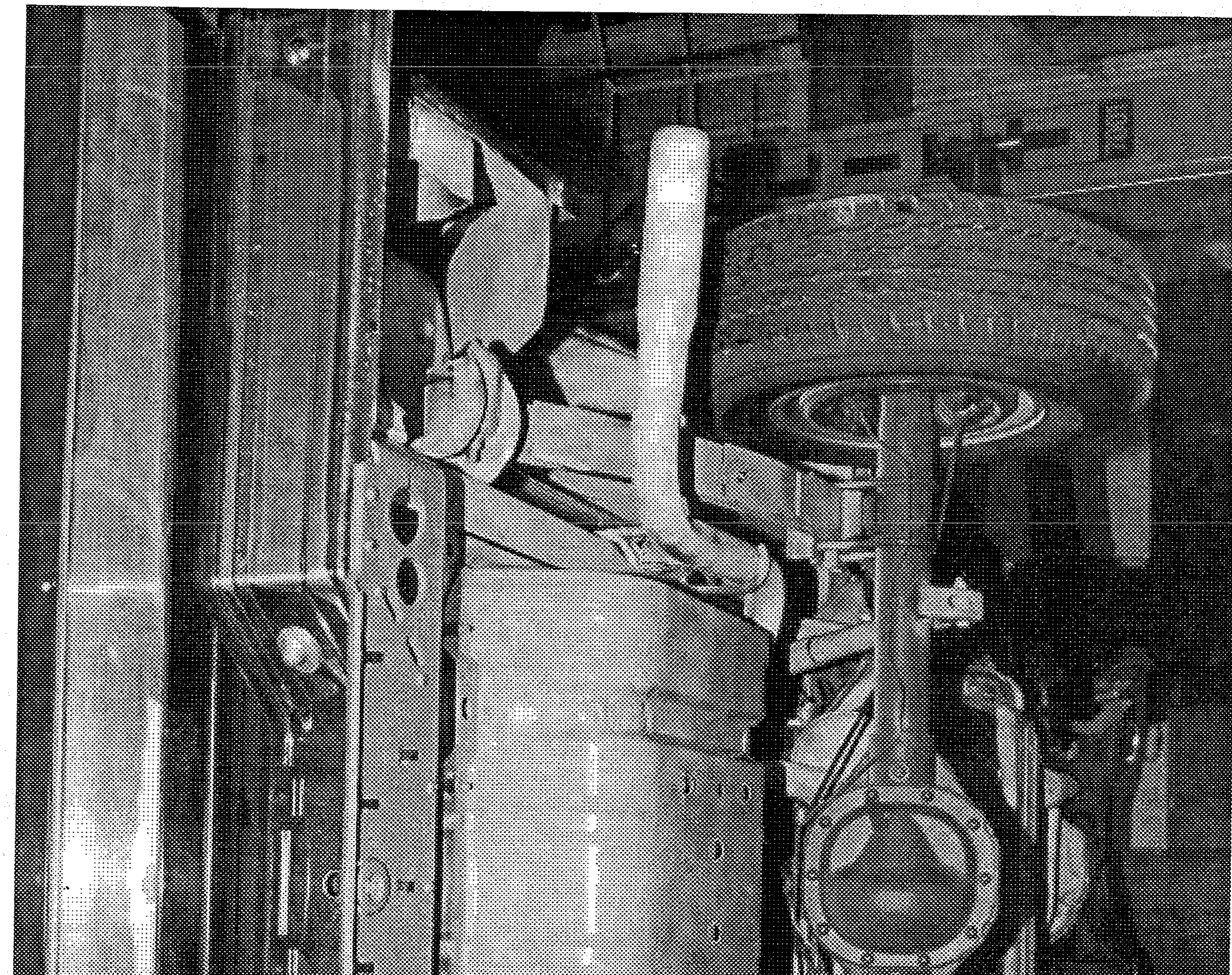


Figure A-24. PRE-TEST REAR UNDERBODY VIEW

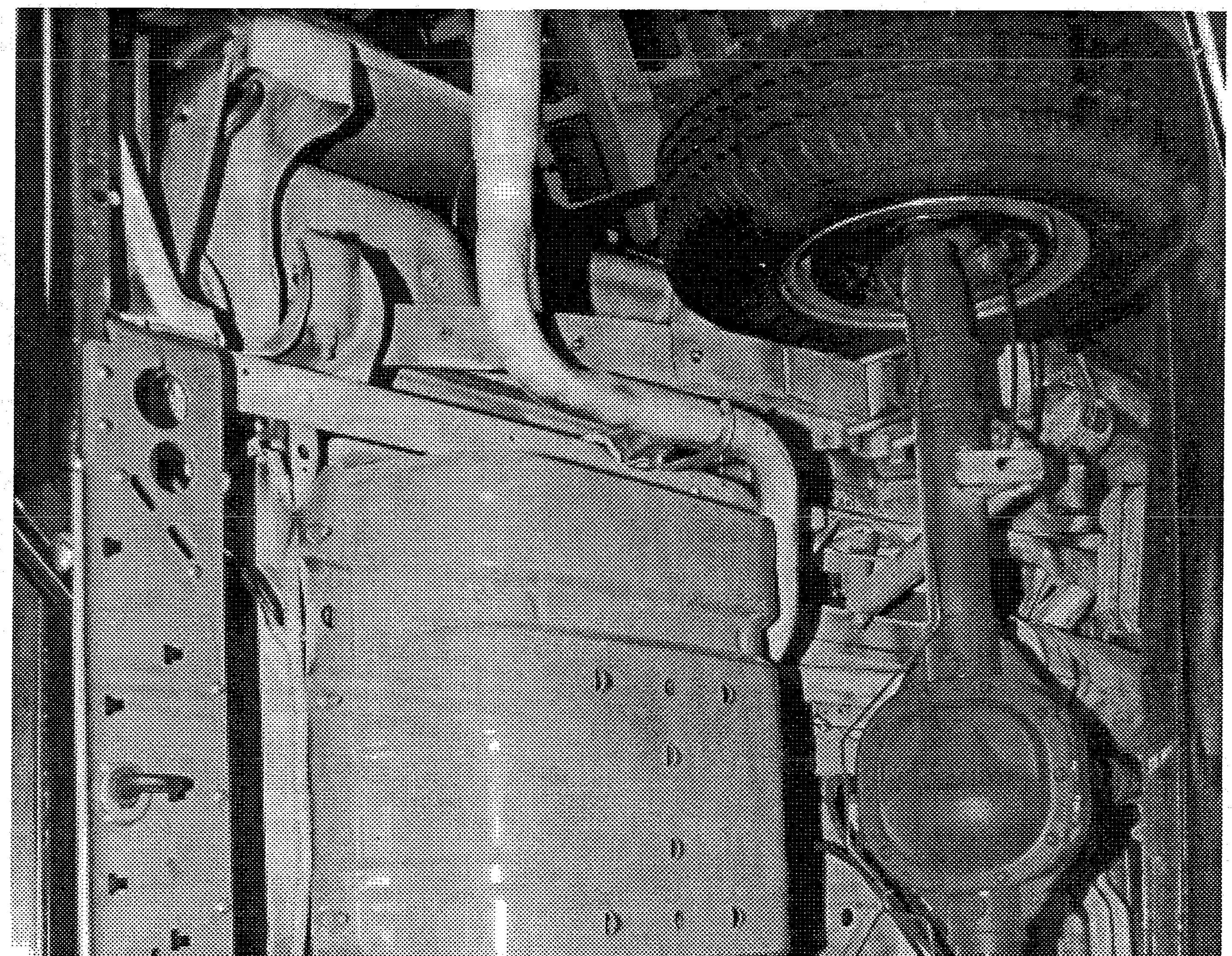


Figure A-25. POST-TEST REAR UNDERBODY VIEW

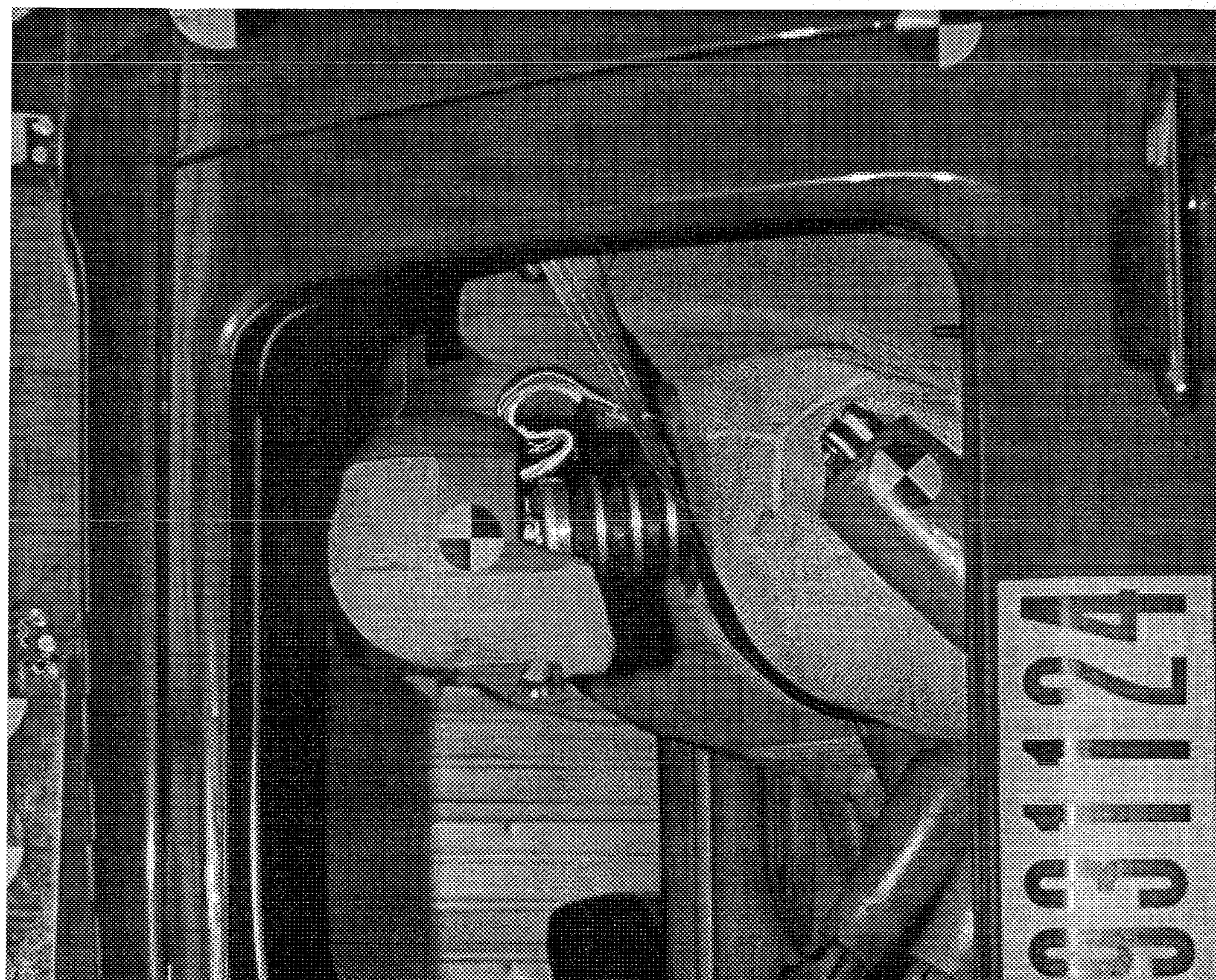


Figure A-26. PRE-TEST DRIVER DUMMY POSITION VIEW

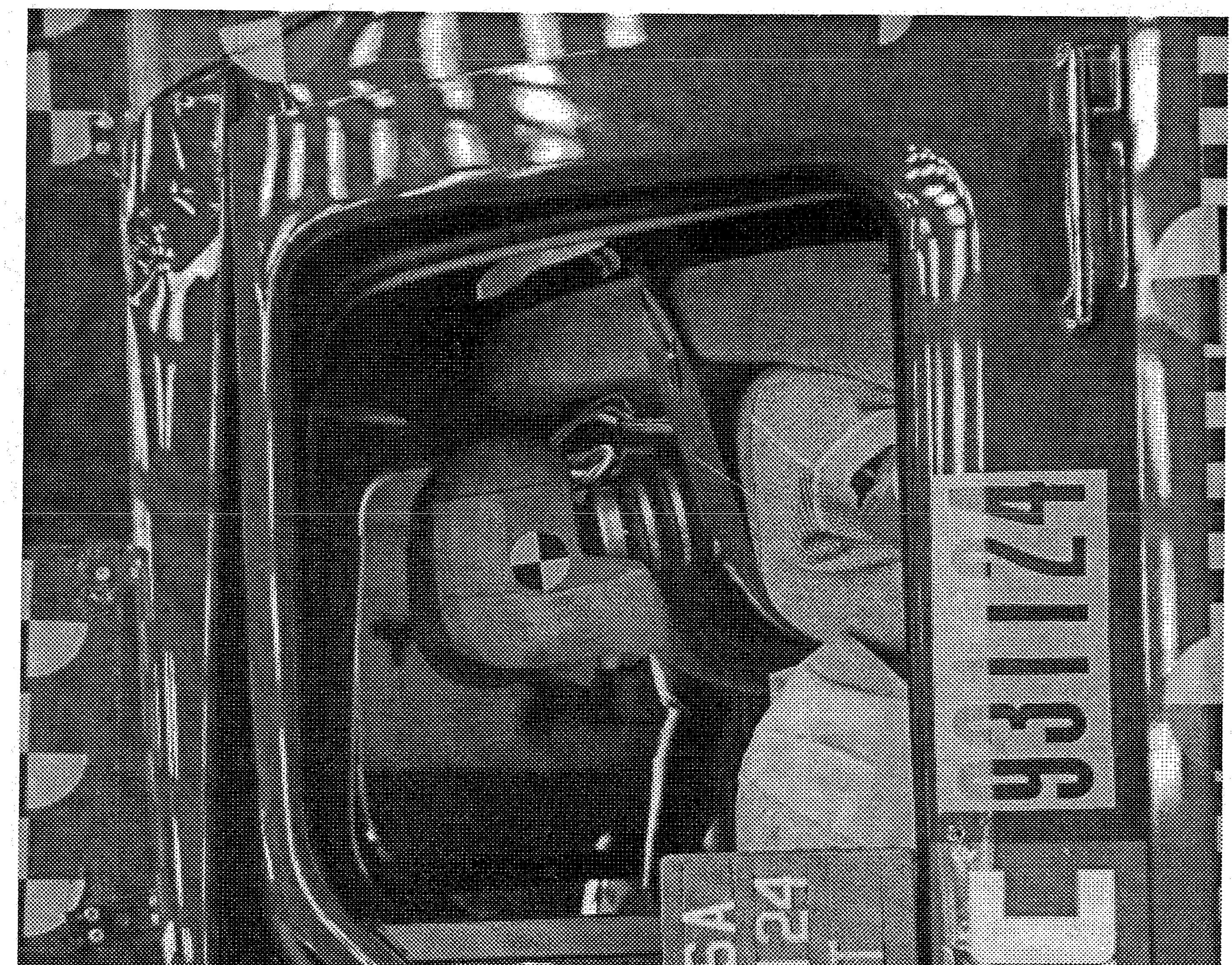


Figure A-27. POST-TEST DRIVER DUMMY POSITION VIEW

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

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

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

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

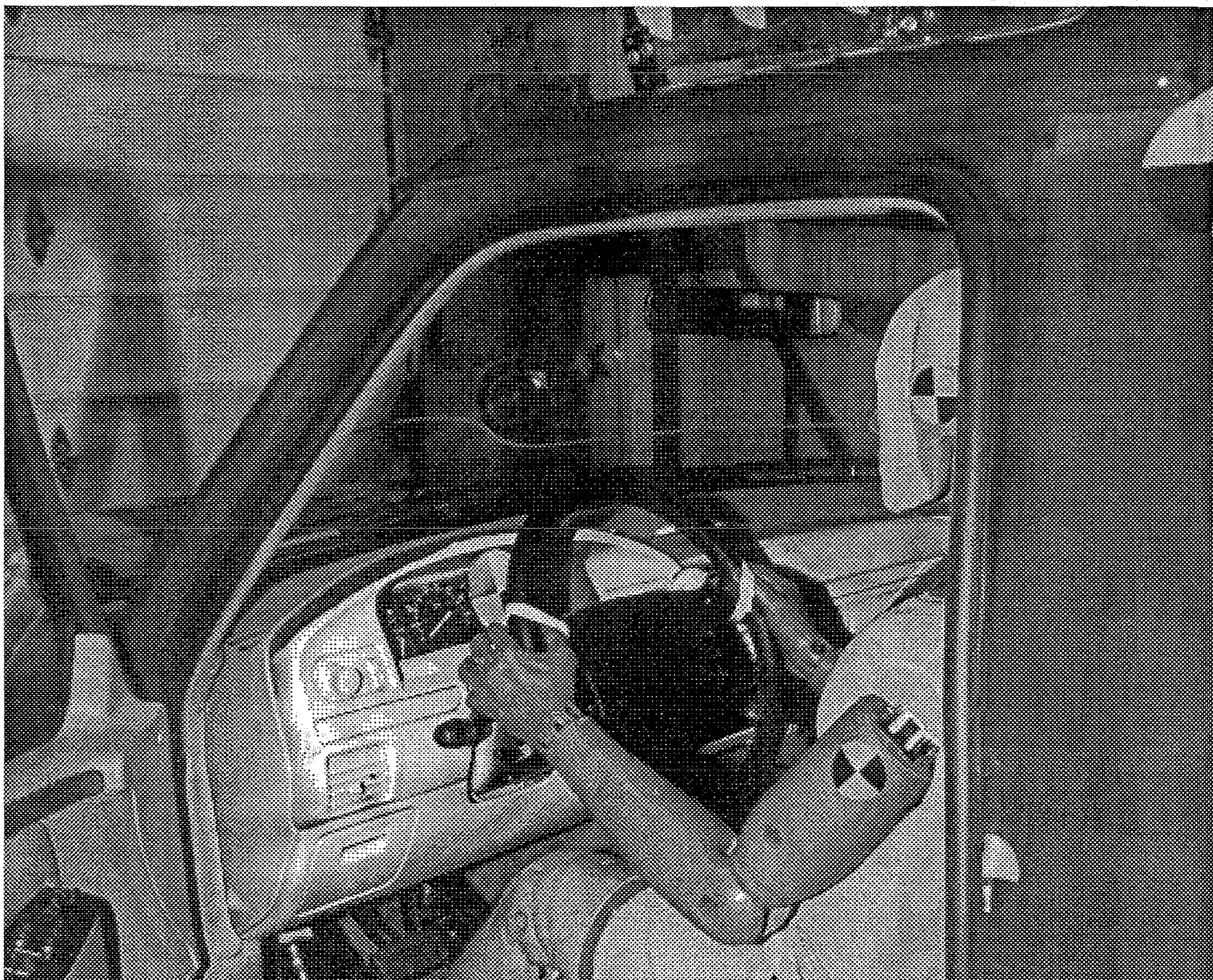


Figure A-32. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

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

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

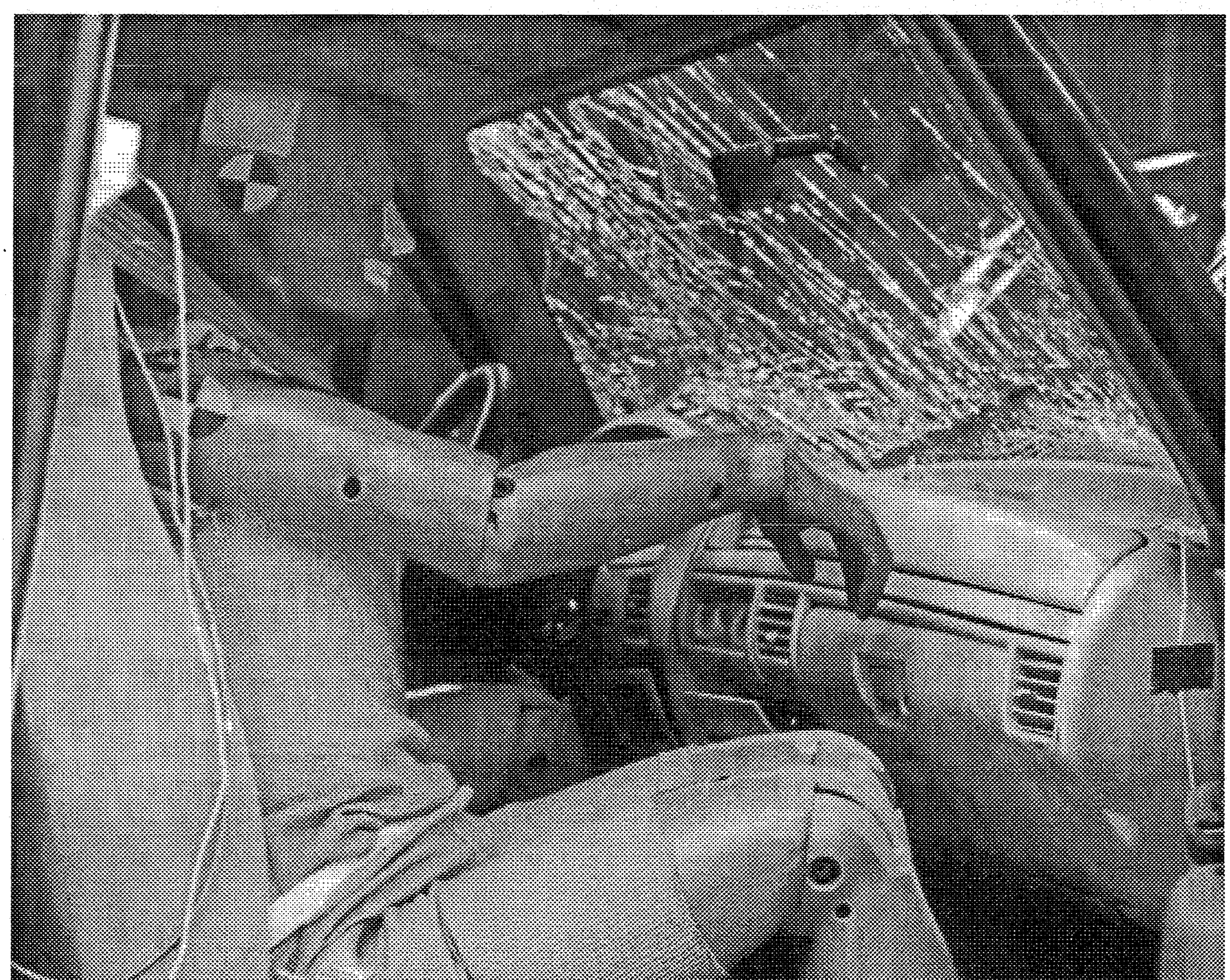


Figure A-35. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

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

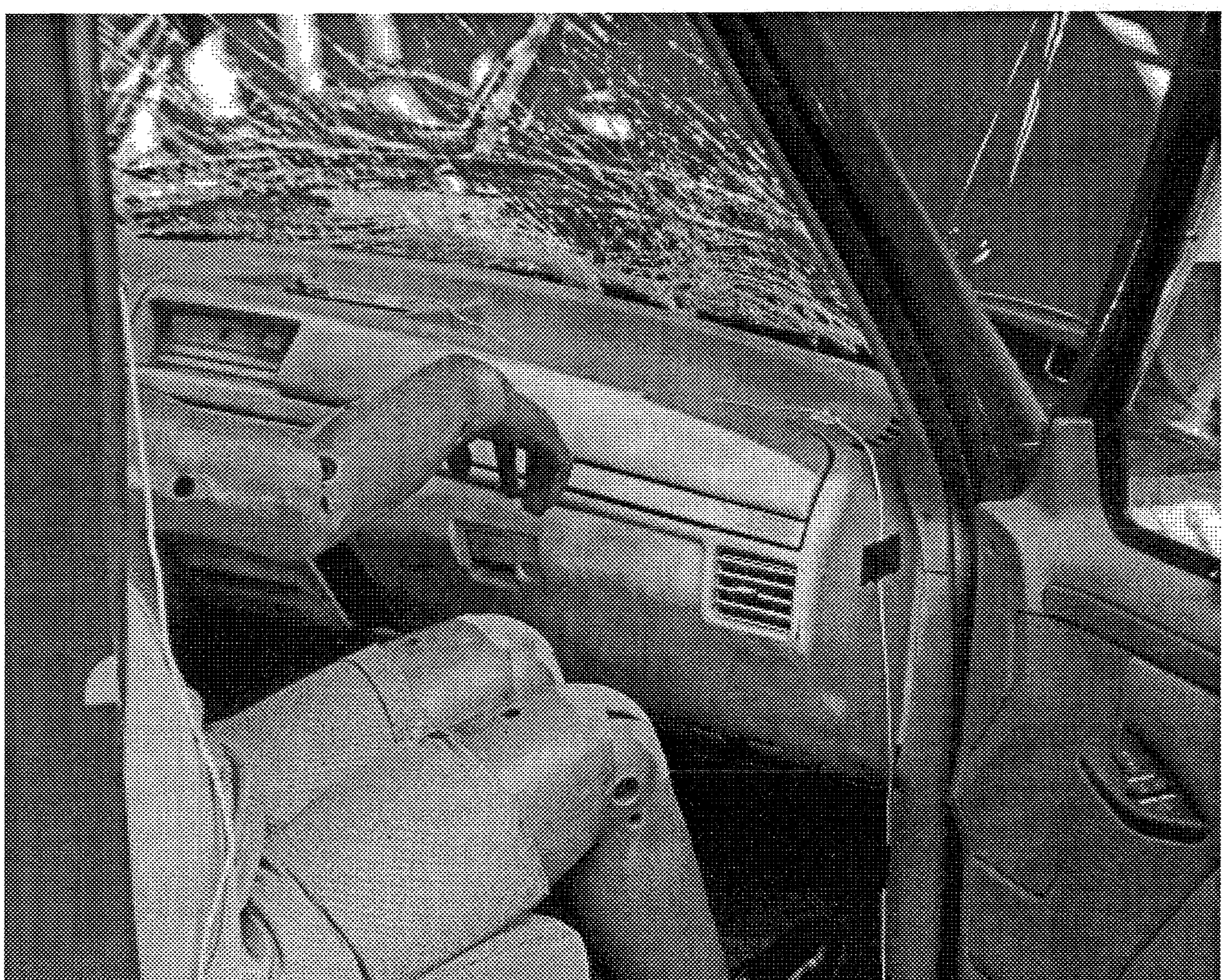


Figure A-37. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

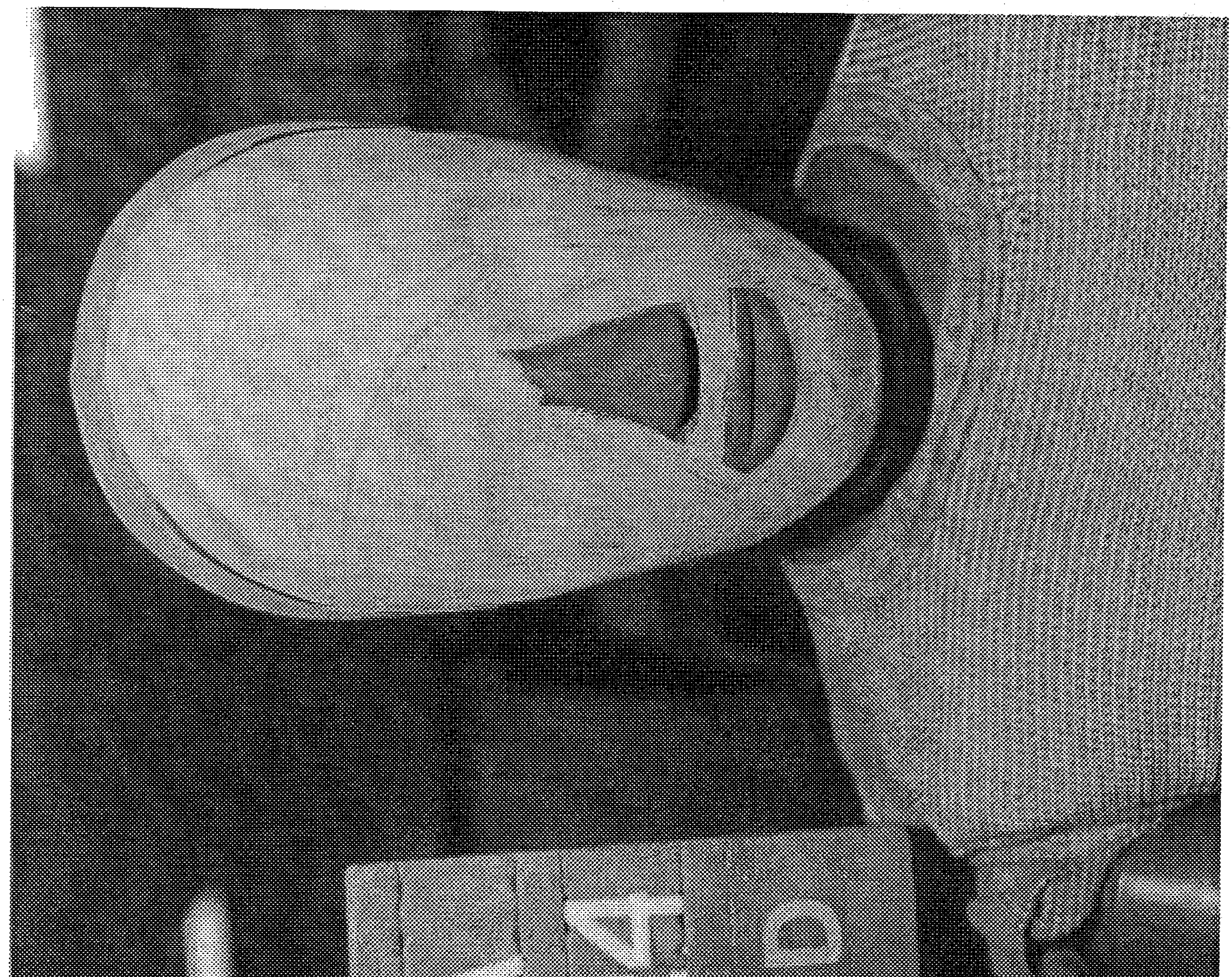


Figure A-38. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

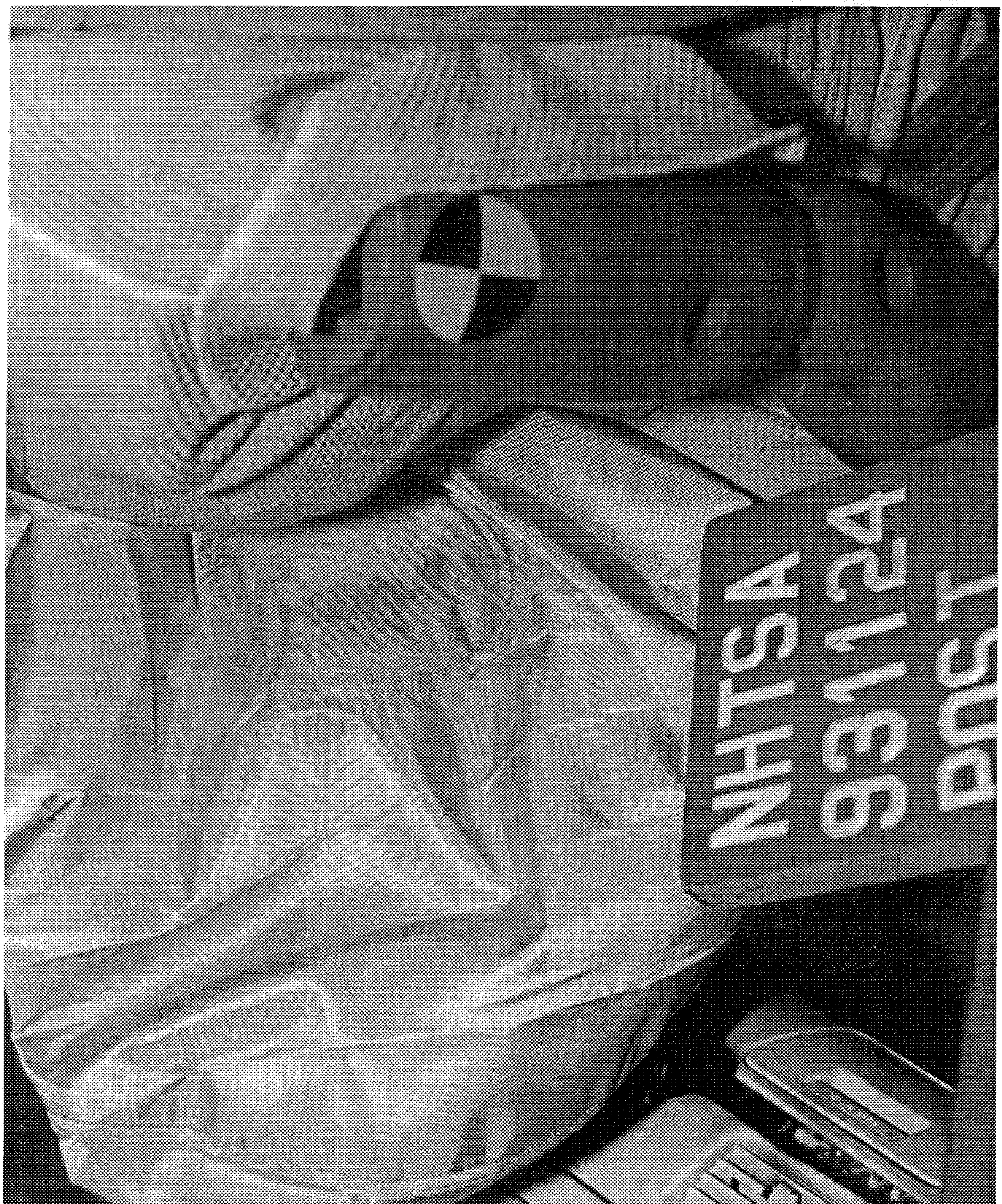


Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 2

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

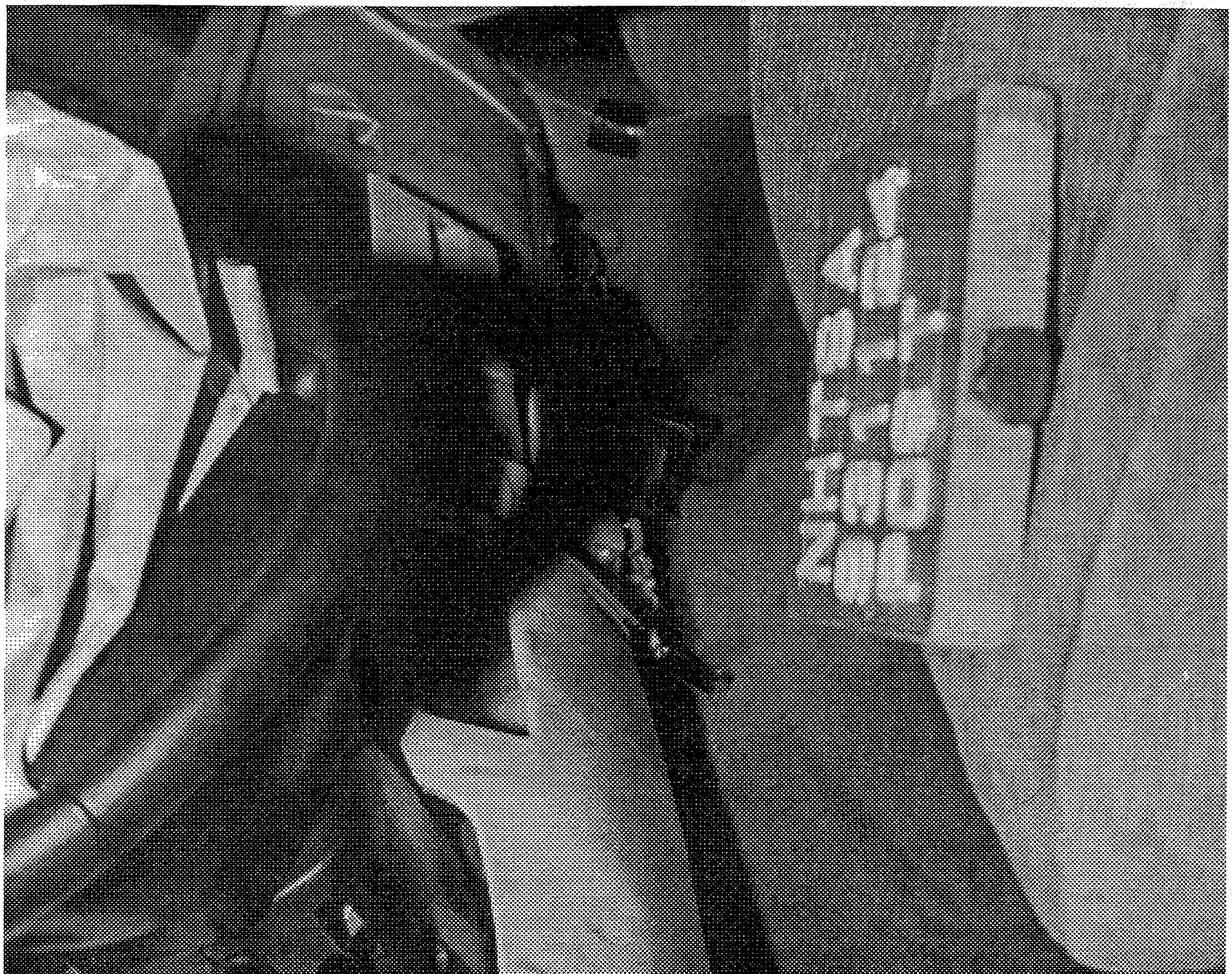


Figure A-41. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

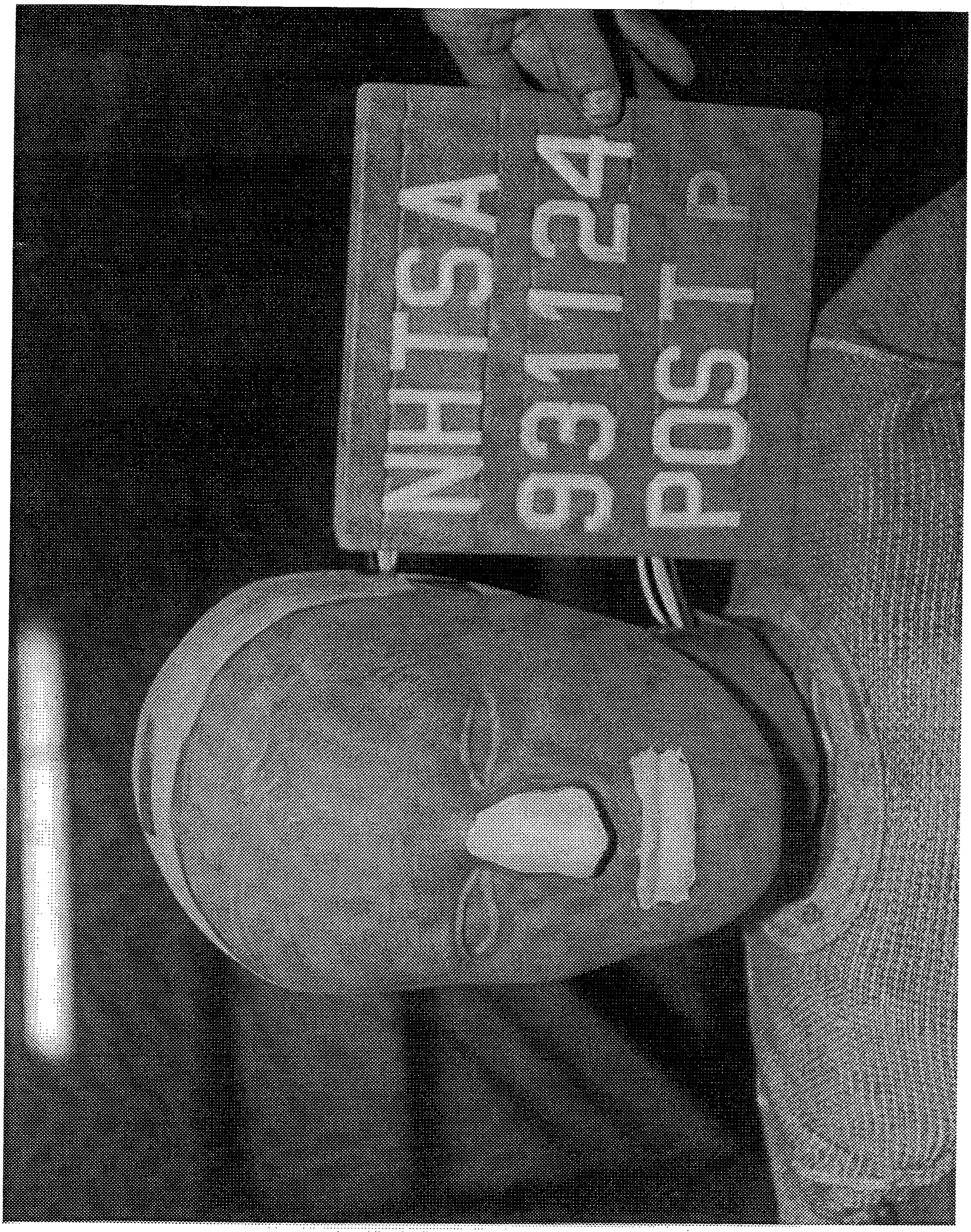


Figure A-42. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

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

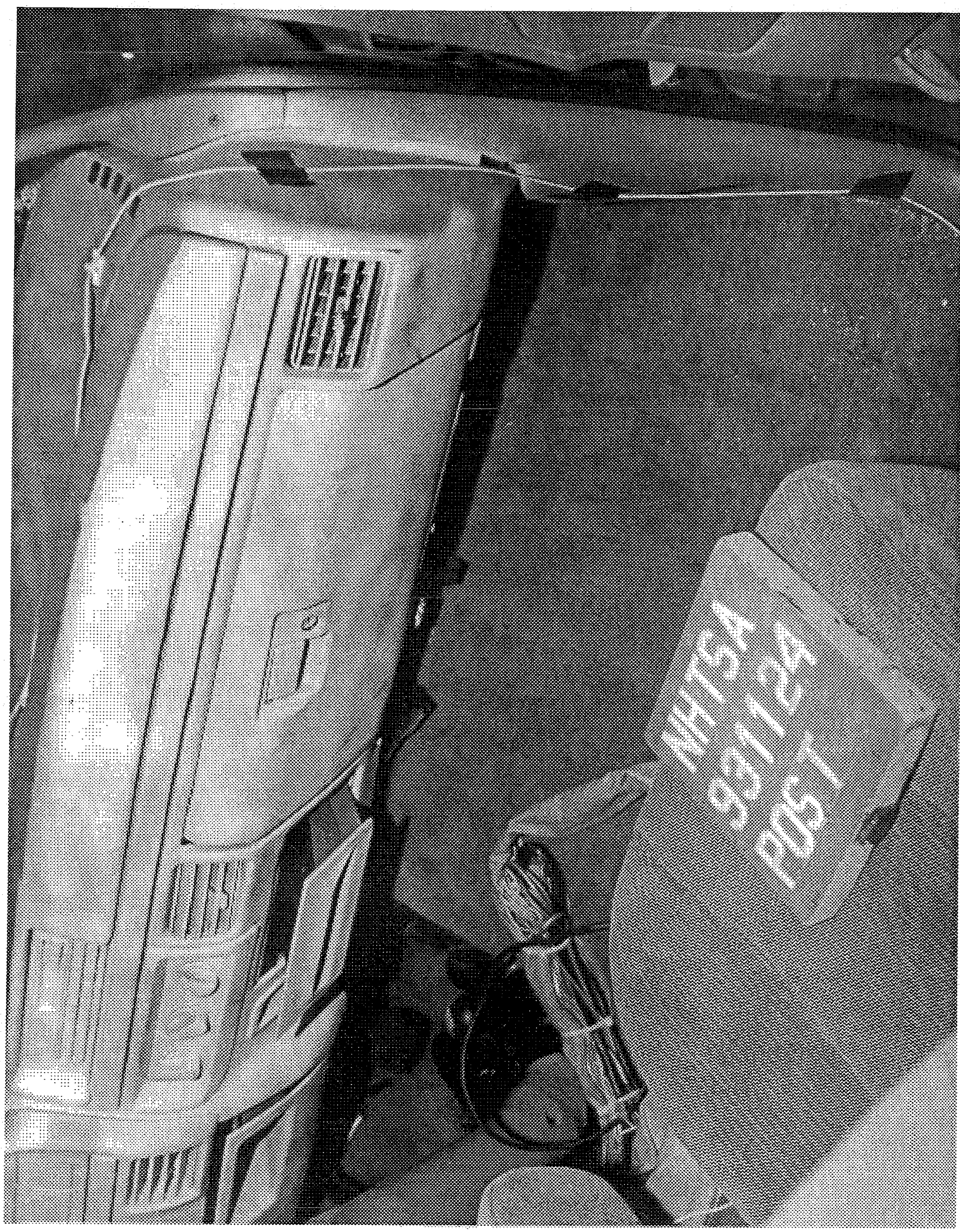


Figure A-44. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

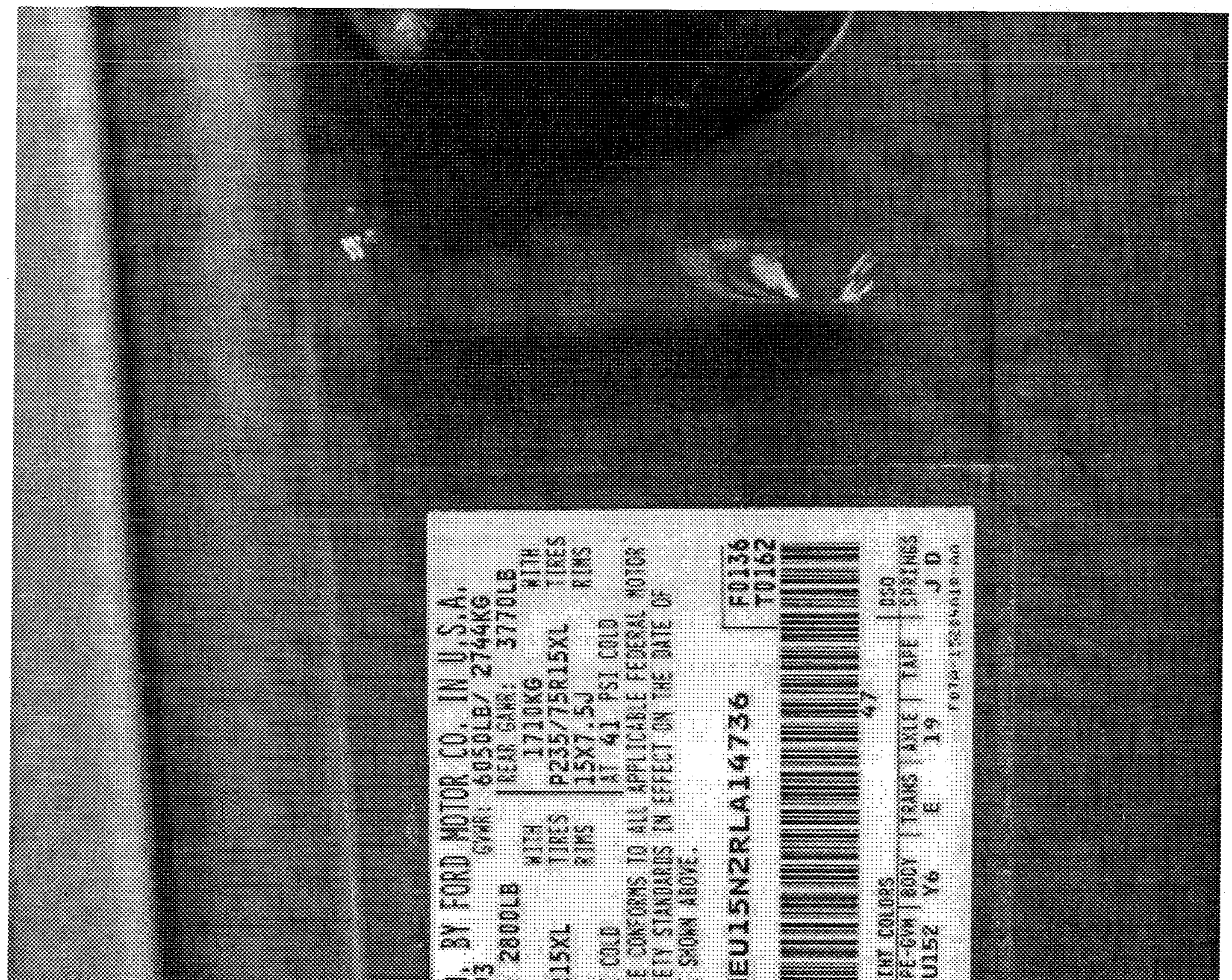


Fig. A-45. PRE-TEST VEHICLE CERT. & RECOMMENDED TIRE PRES. LABEL

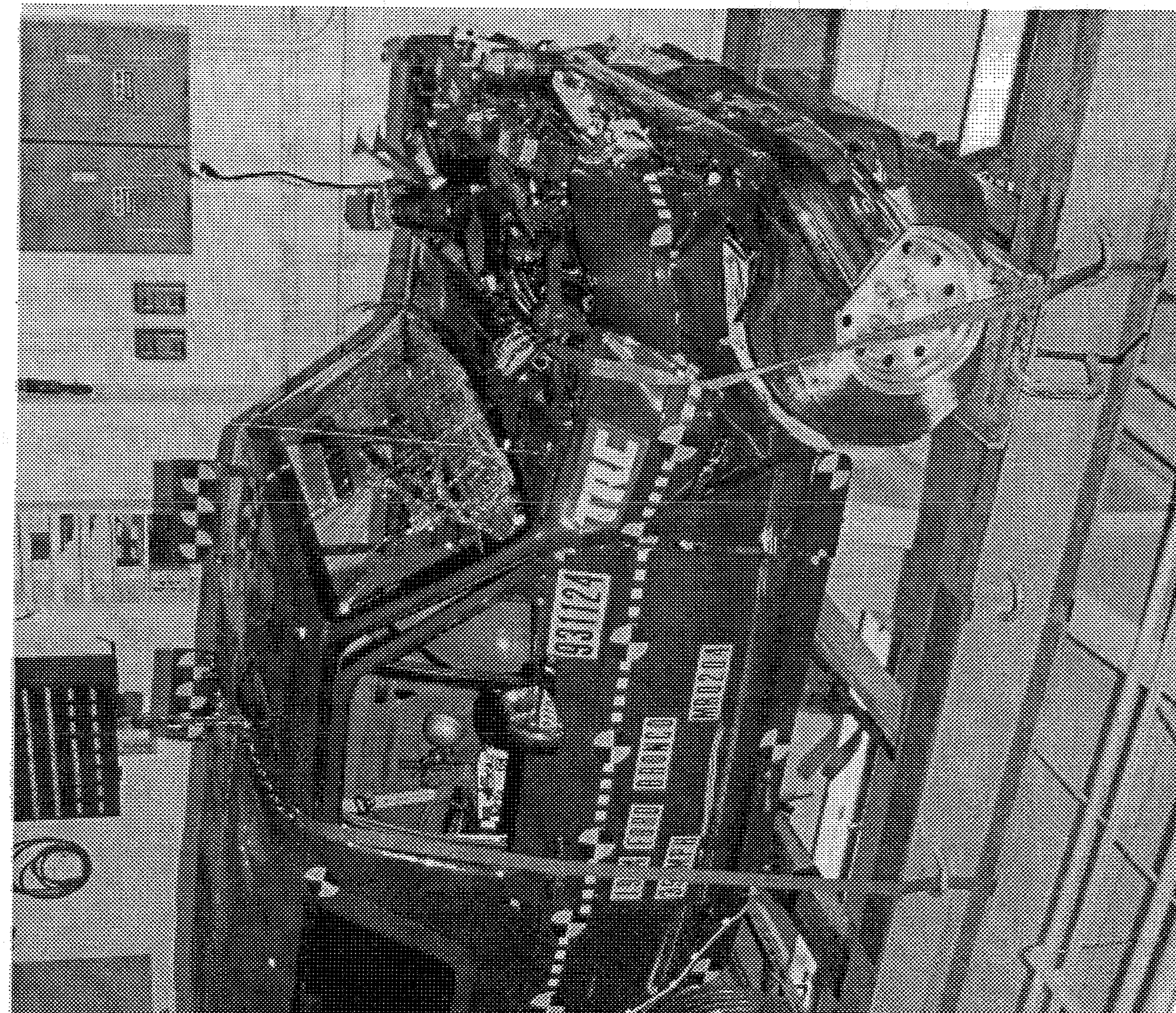


Figure A-46. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

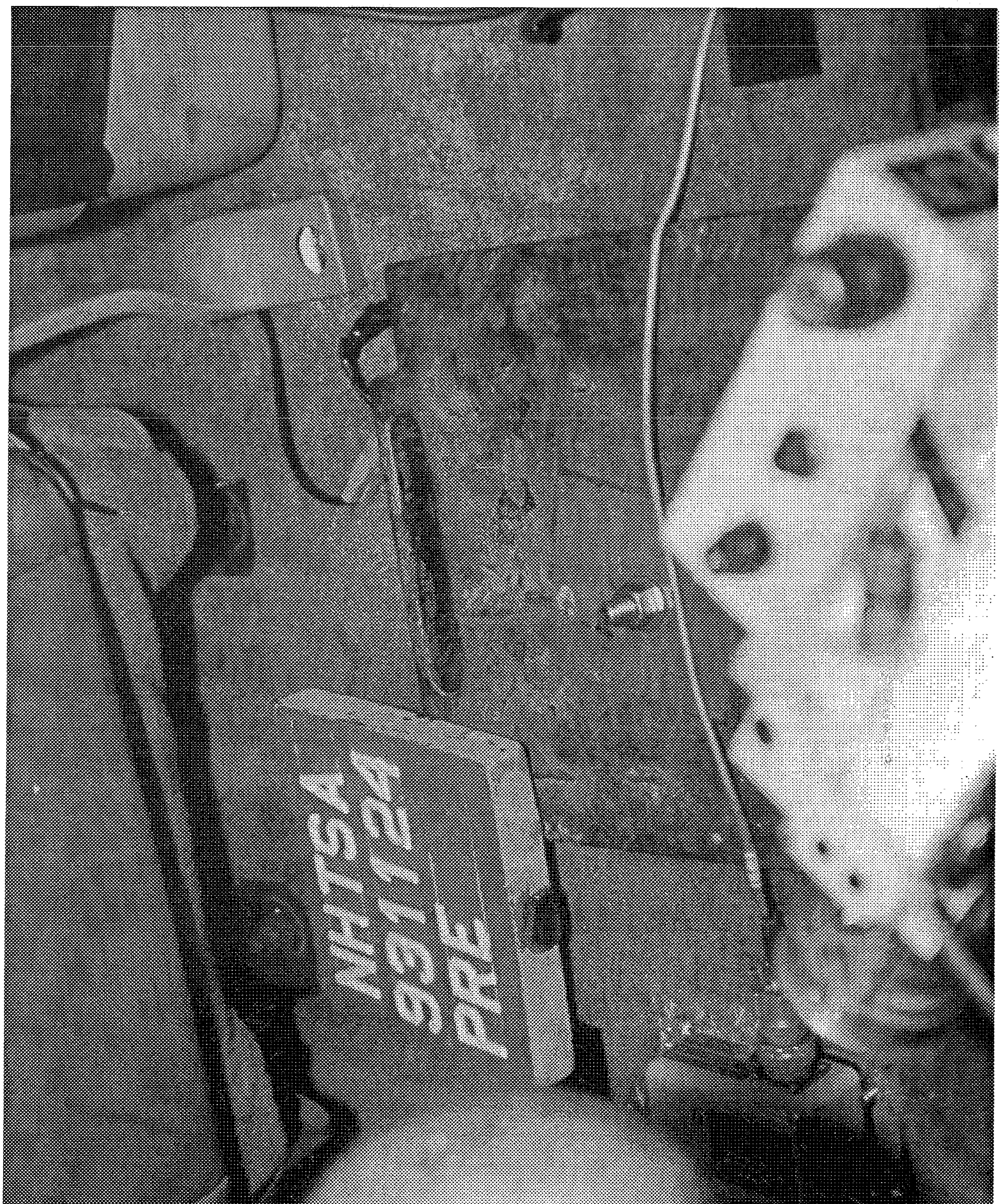
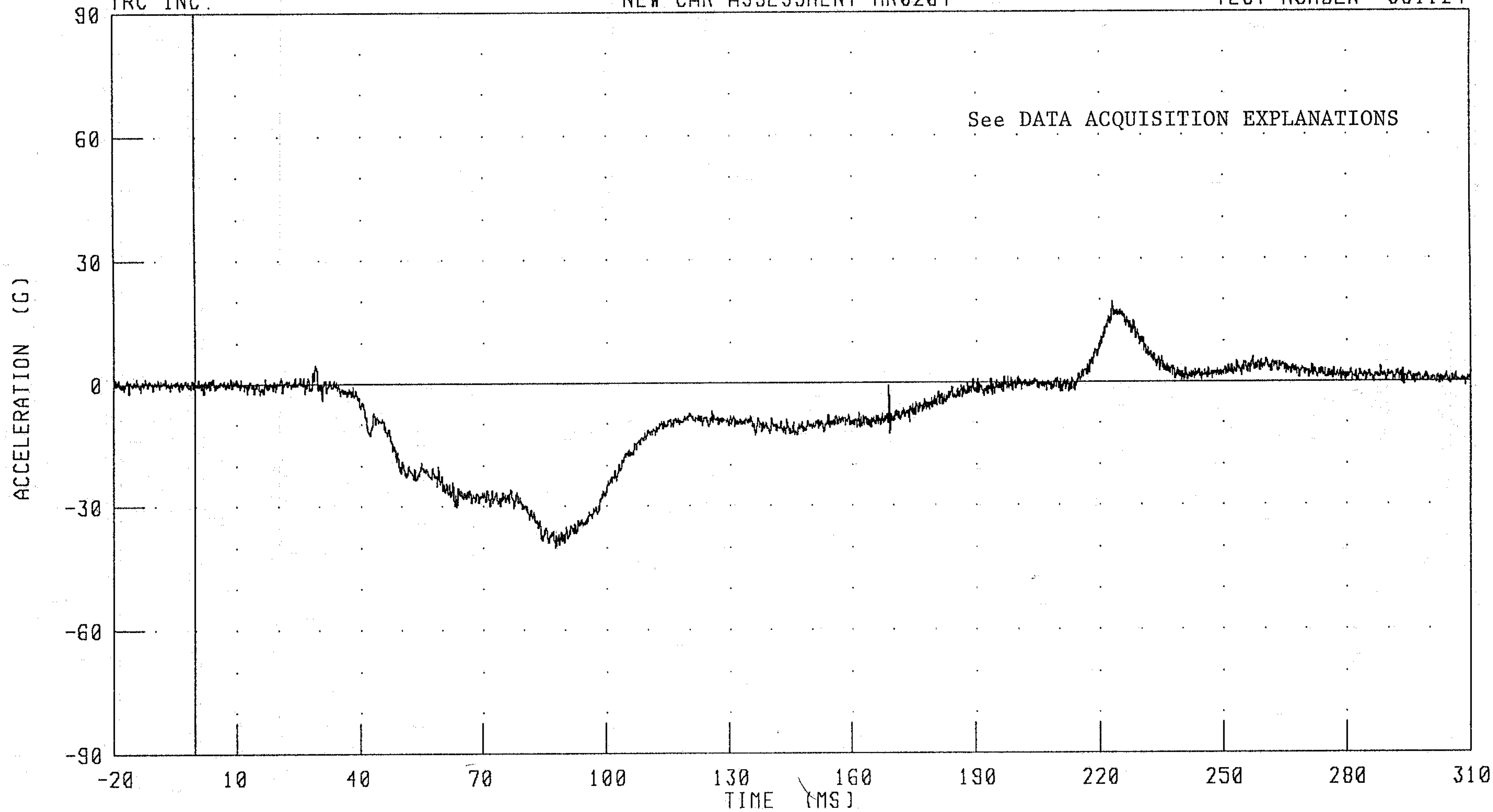


Figure A-47. PRE-TEST BALLAST LOCATION VIEW

APPENDIX B

DATA PLOTS

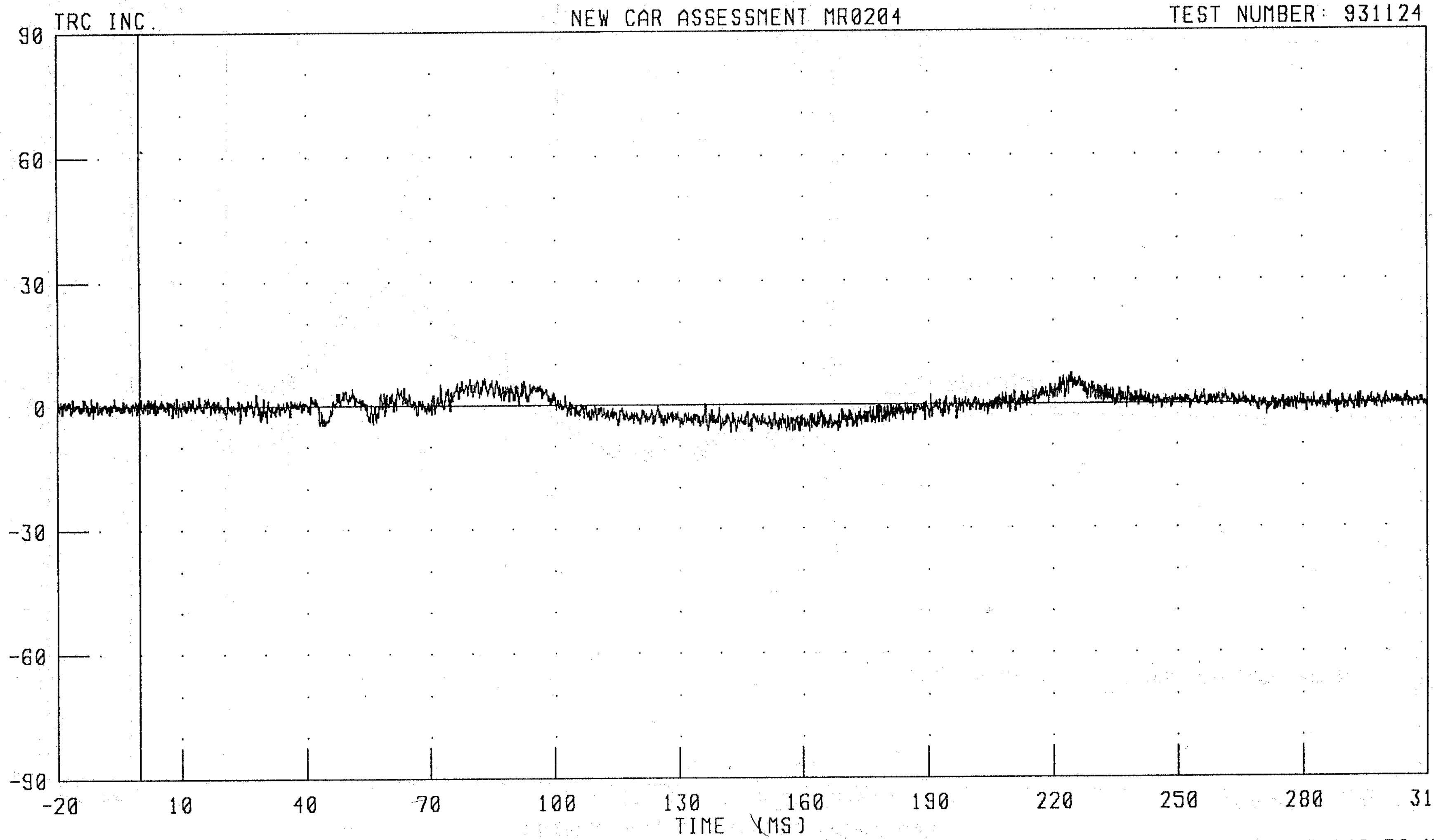
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

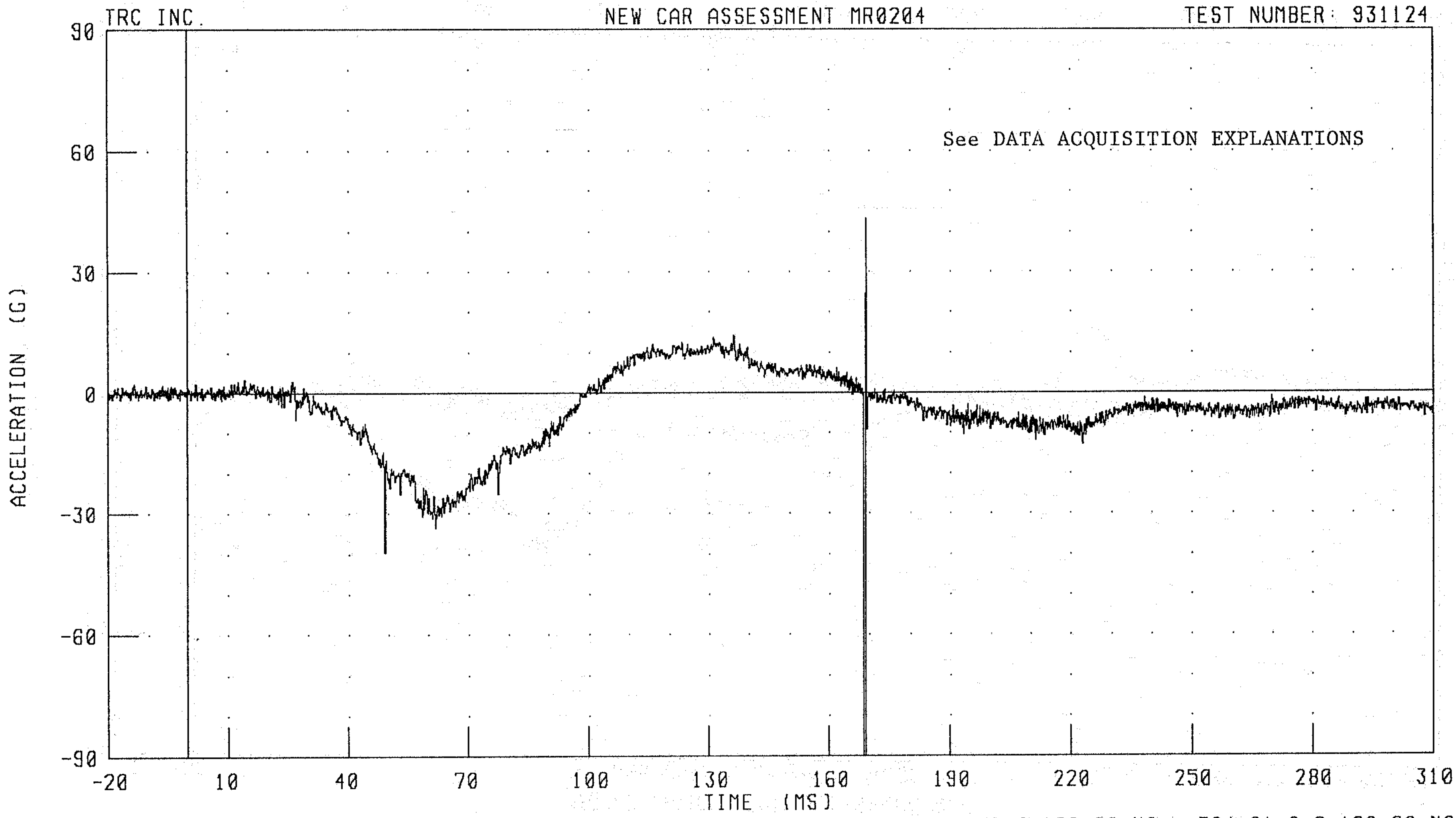
PEAK DATA: 19.60 G @ 223.12 MS; -39.99 G @ 87.68 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



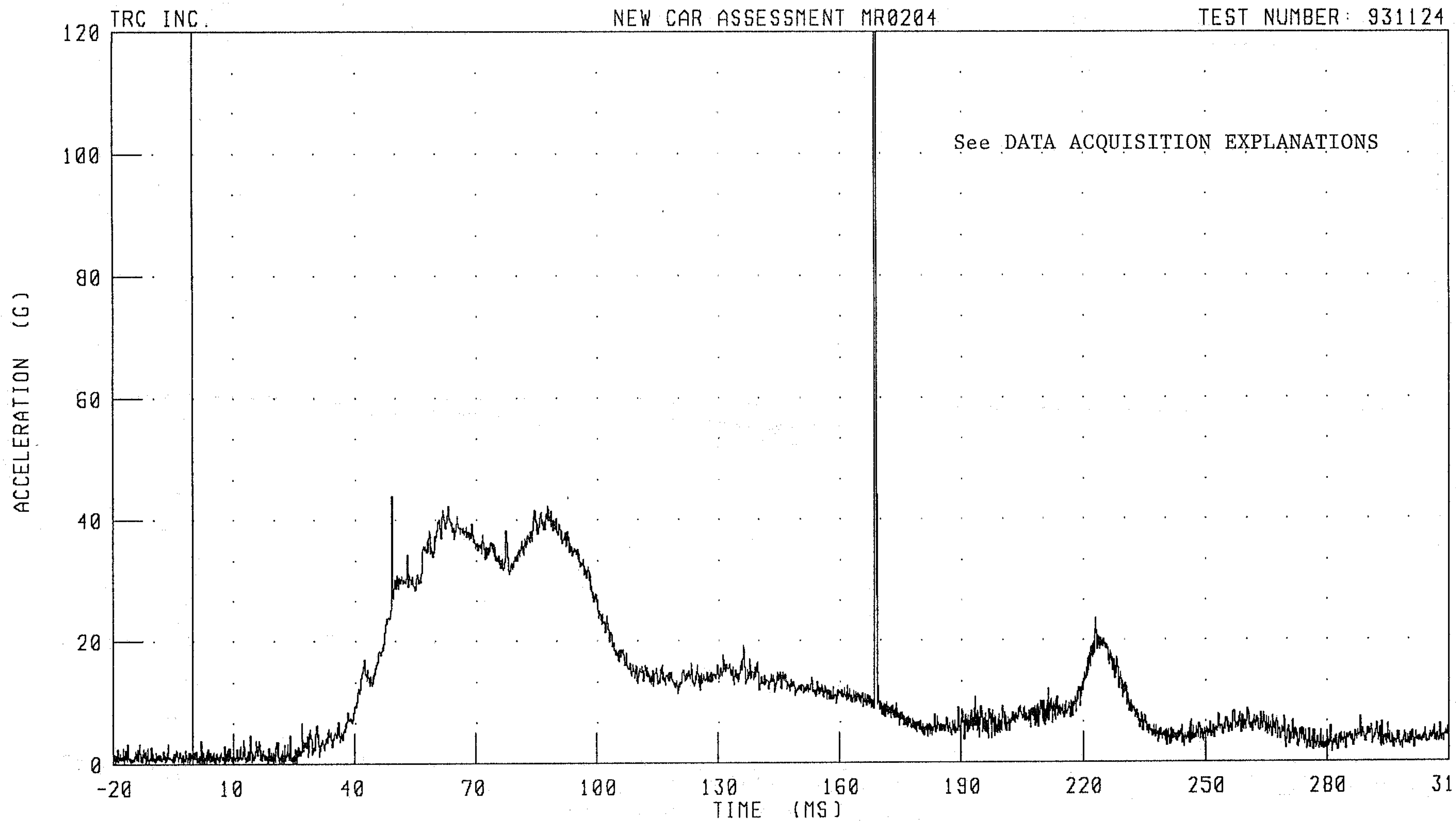
CHANNEL: HEDYG1 FILTER: CH. CLASS 1000 PEAK DATA: 7.43 G @ 224.56 MS; -6.66 G @ 142.56 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000 PEAK DATA: 43.13 G @ 169.20 MS; -384.61 G @ 168.88 MS

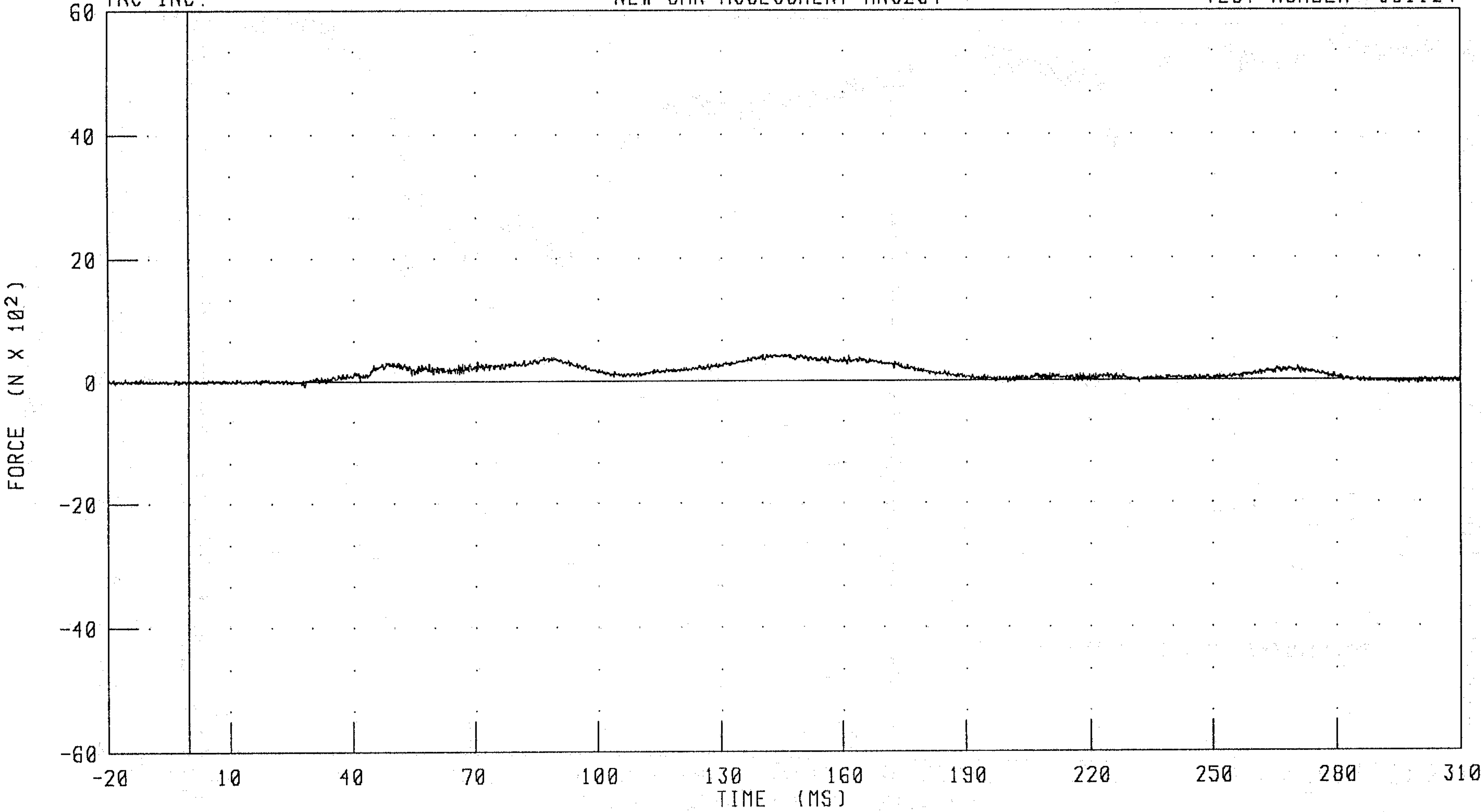
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000 PEAK DATA: 384.66 G @ 168.88 MS; 0.08 G @ -11.12 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MR0204

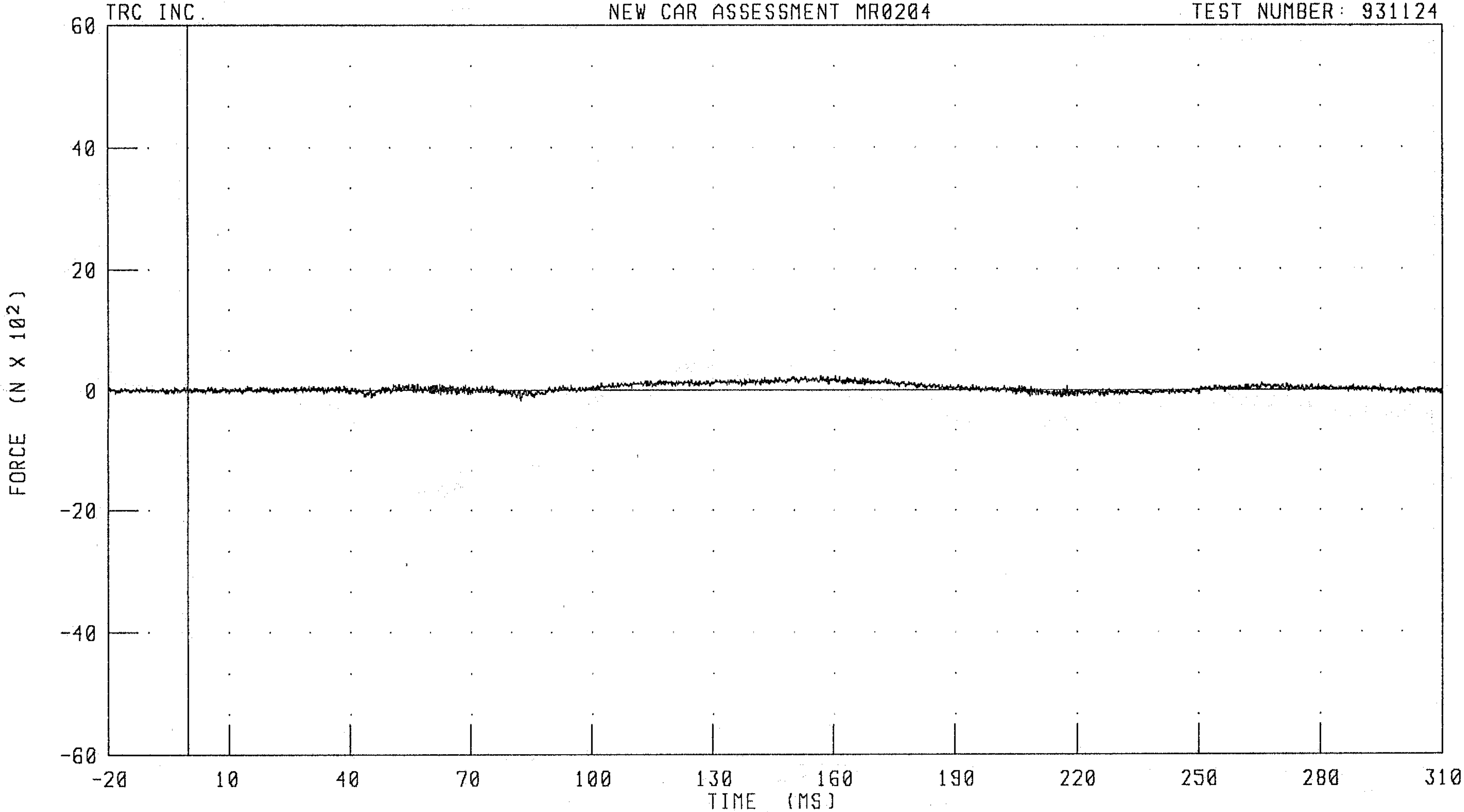
TRC INC. TEST NUMBER: 931124



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 432.59 N @ 144.88 MS; -80.87 N @ 28.24 MS

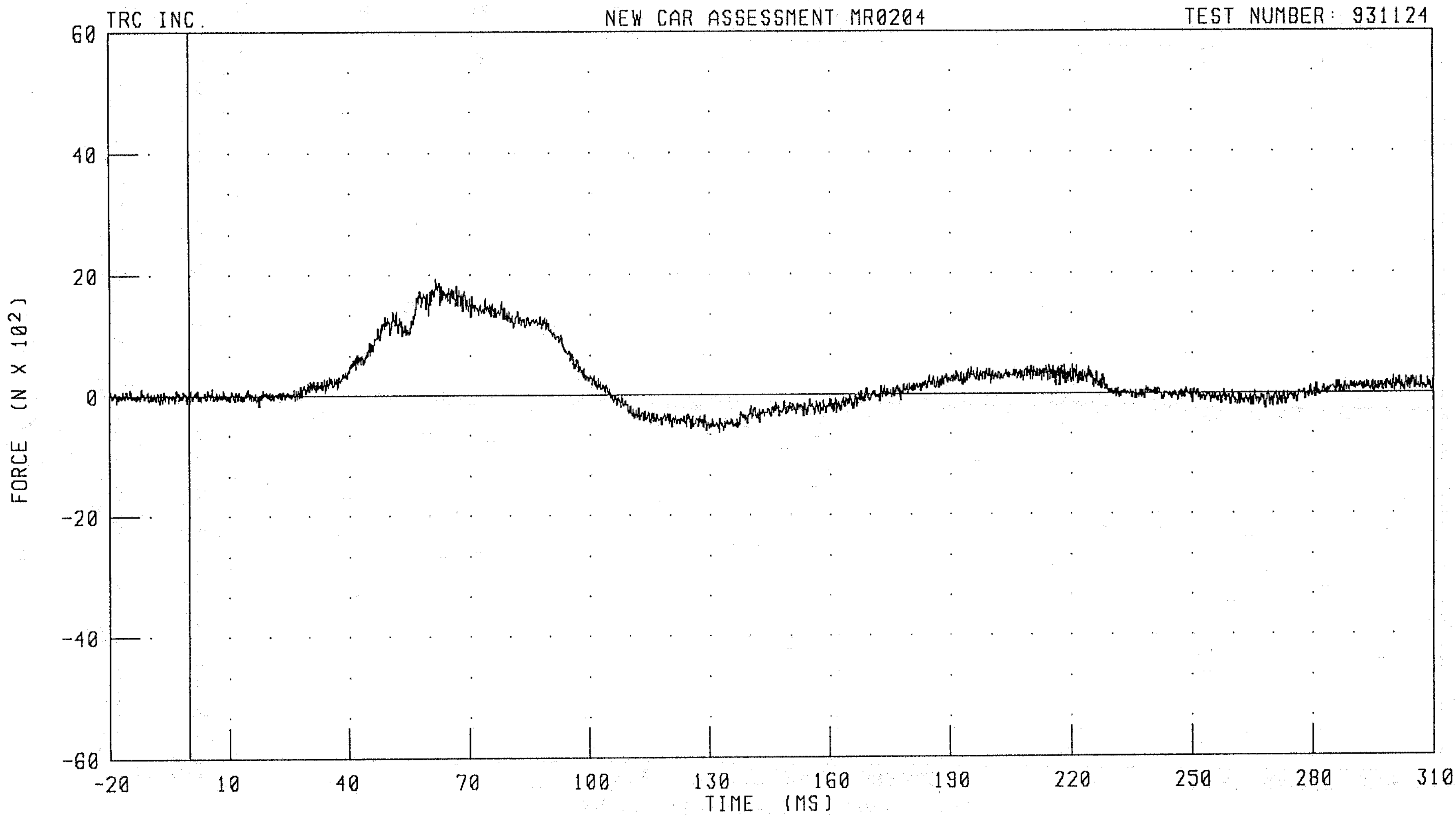
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MR0204

TRC INC. TEST NUMBER: 931124

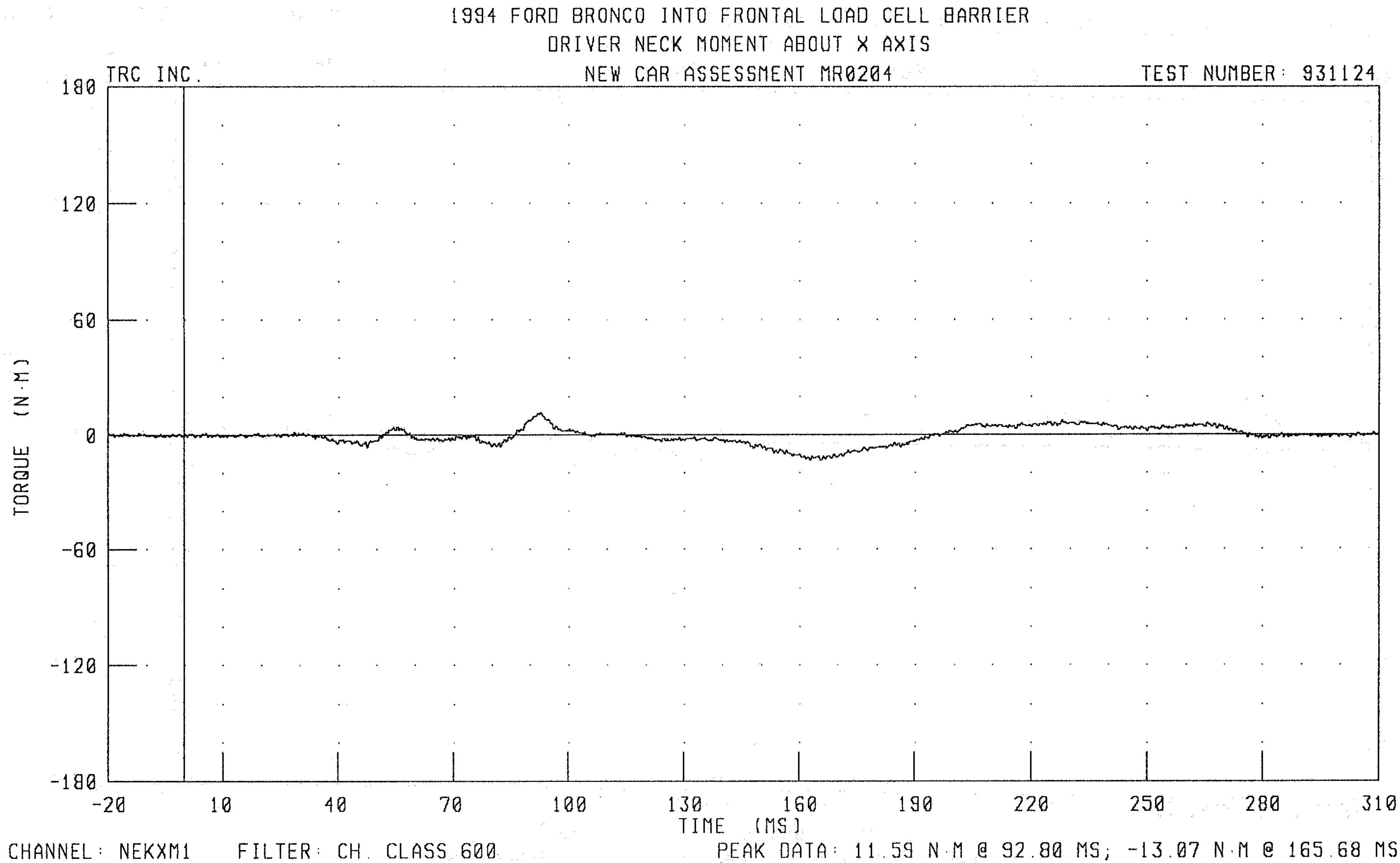


CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 237.09 N @ 160.40 MS; -160.32 N @ 82.40 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT MR0204

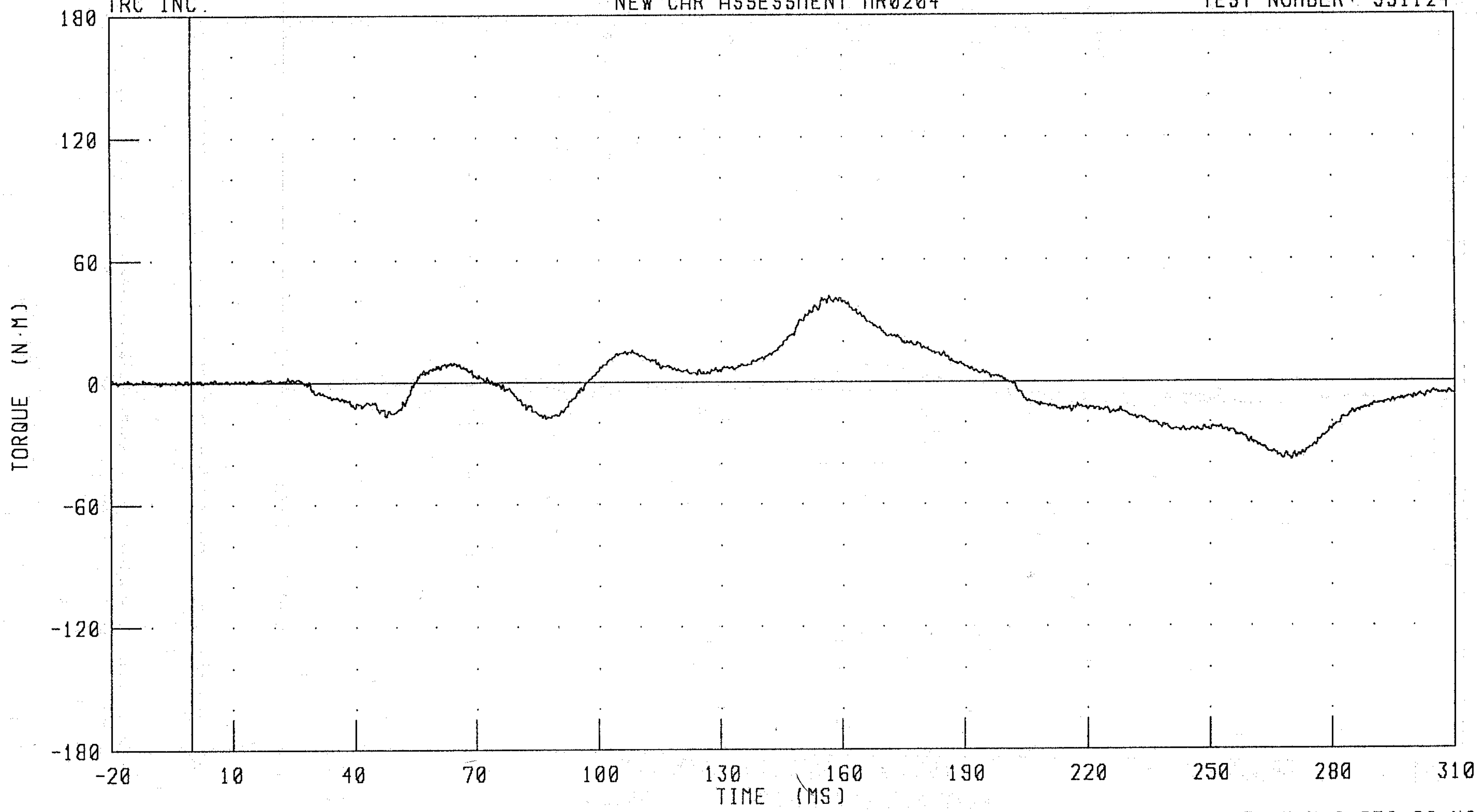


CHANNEL: NEKZF1 FILTER: CH. CLASS 1000 PEAK DATA: 1923.16 N @ 61.60 MS; -624.85 N @ 132.40 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
TORQUE (N·M)
180
120
60
0
-60
-120
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXM1
FILTER: CH. CLASS 600
PEAK DATA: 11.59 N·M @ 92.80 MS; -13.07 N·M @ 165.68 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT MR0204

TRC INC.　　TEST NUMBER: 931124

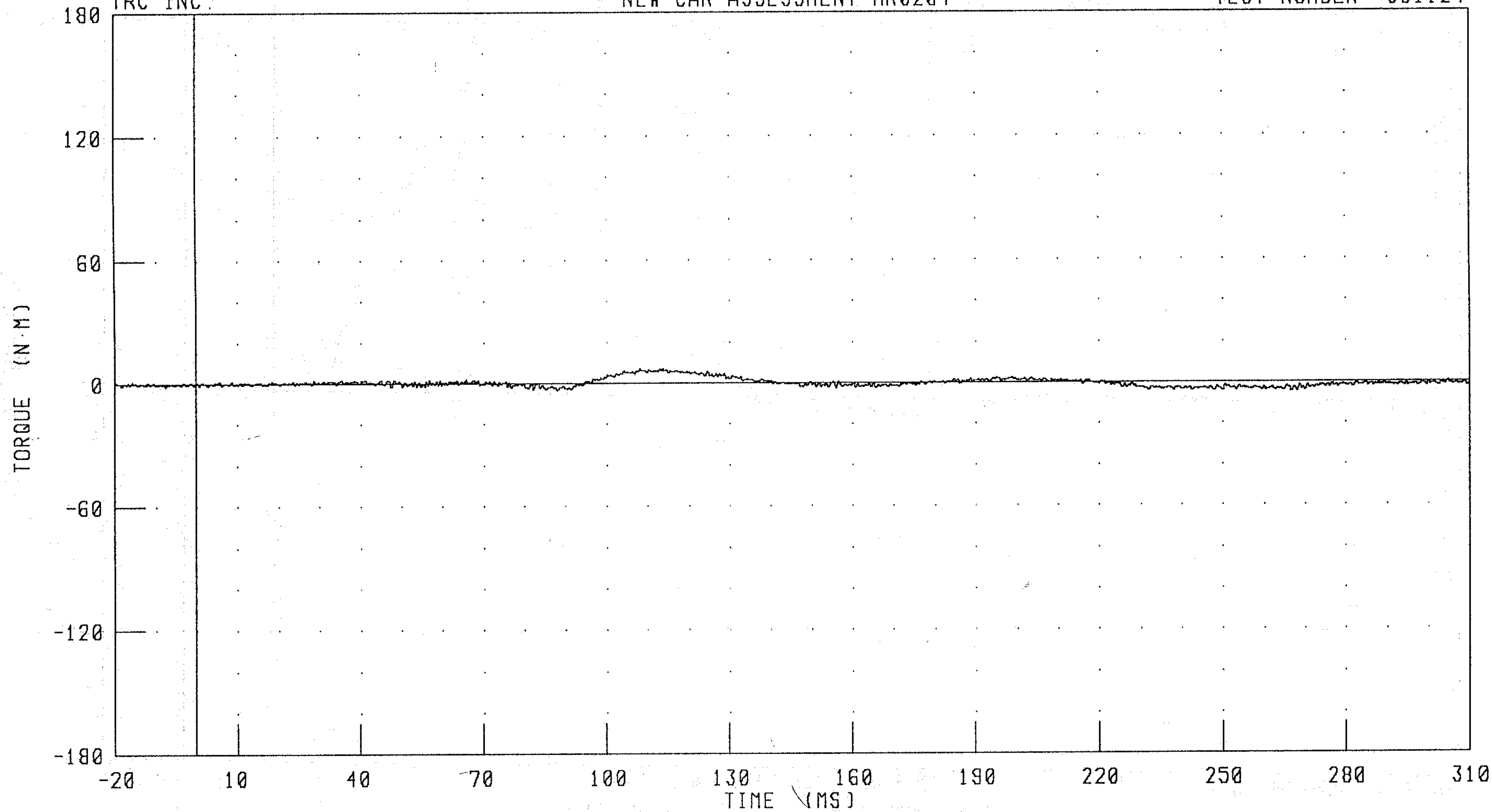


CHANNEL: NEKYM1　　FILTER: CH. CLASS 600　　PEAK DATA: 41.99 N·M @ 156.72 MS; -38.51 N·M @ 270.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT MR0204

TRC INC.

TEST NUMBER: 931124

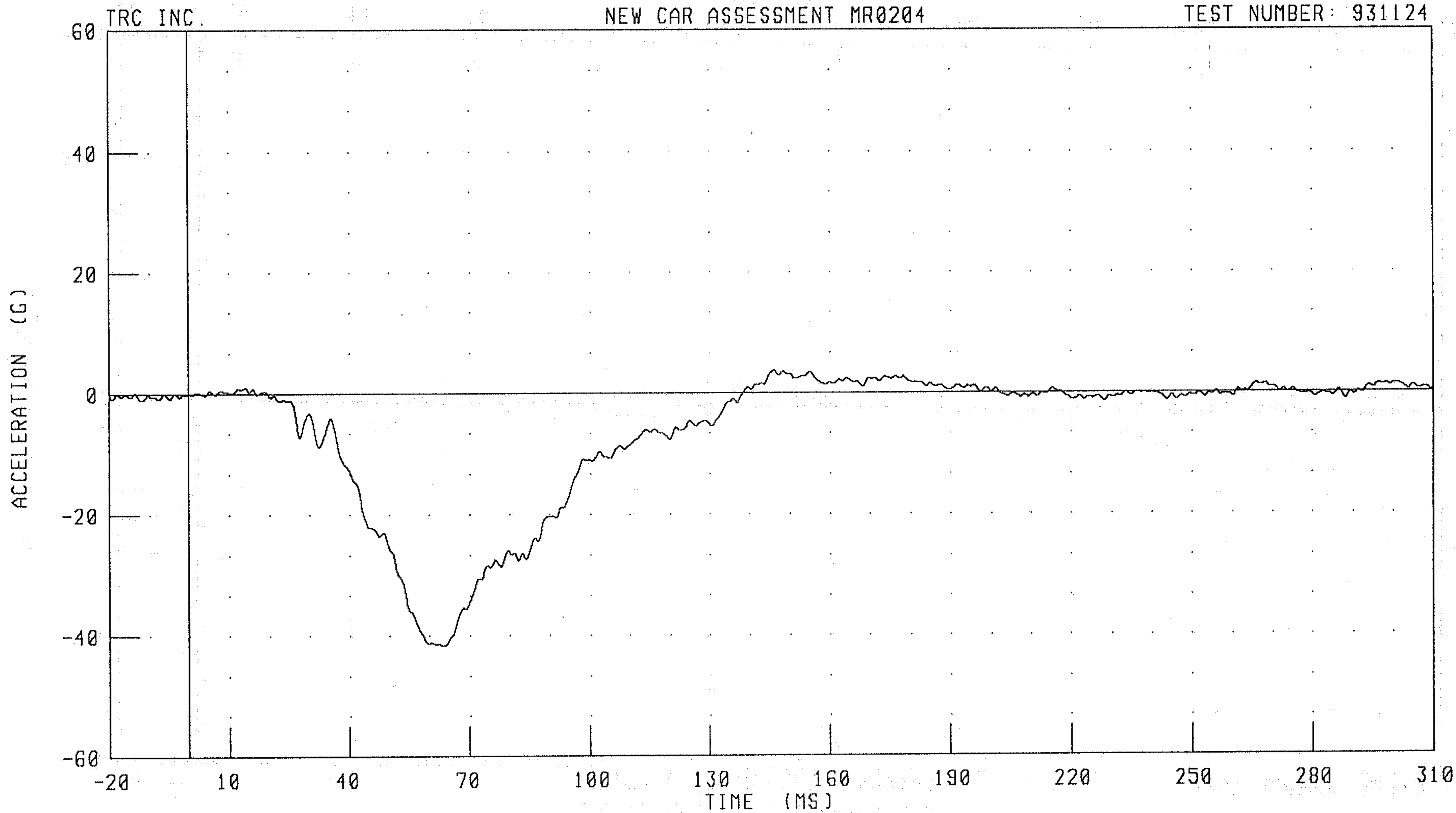


CHANNEL: NEKZM1 FILTER: CH. CLASS 600

PEAK DATA: 7.04 N·M @ 108.16 MS; -4.59 N·M @ 266.80 MS

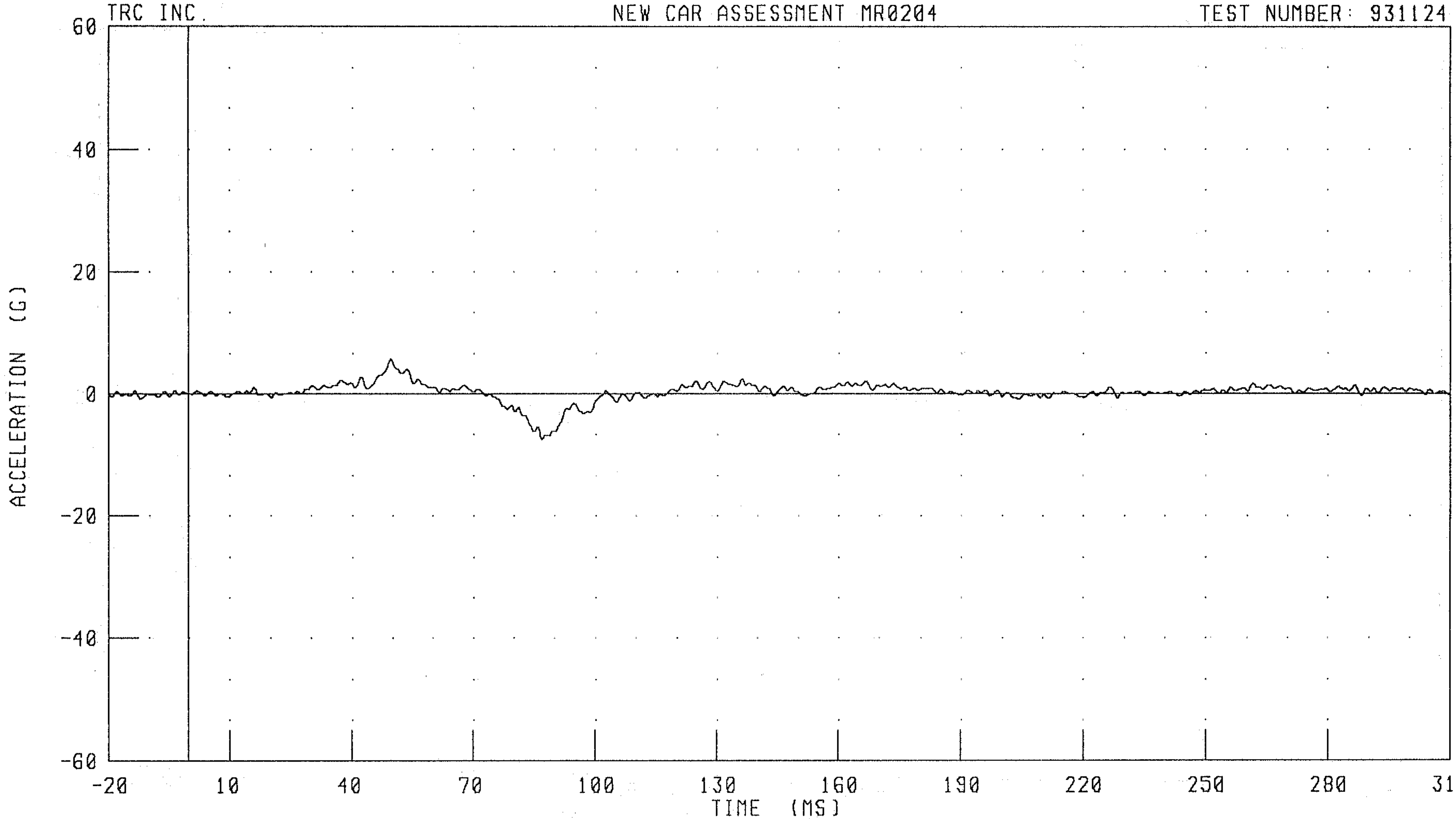
931124

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: CSTXG1   FILTER: CH. CLASS 180   PEAK DATA: 3.72 G @ 146.24 MS; -41.65 G @ 63.44 MS

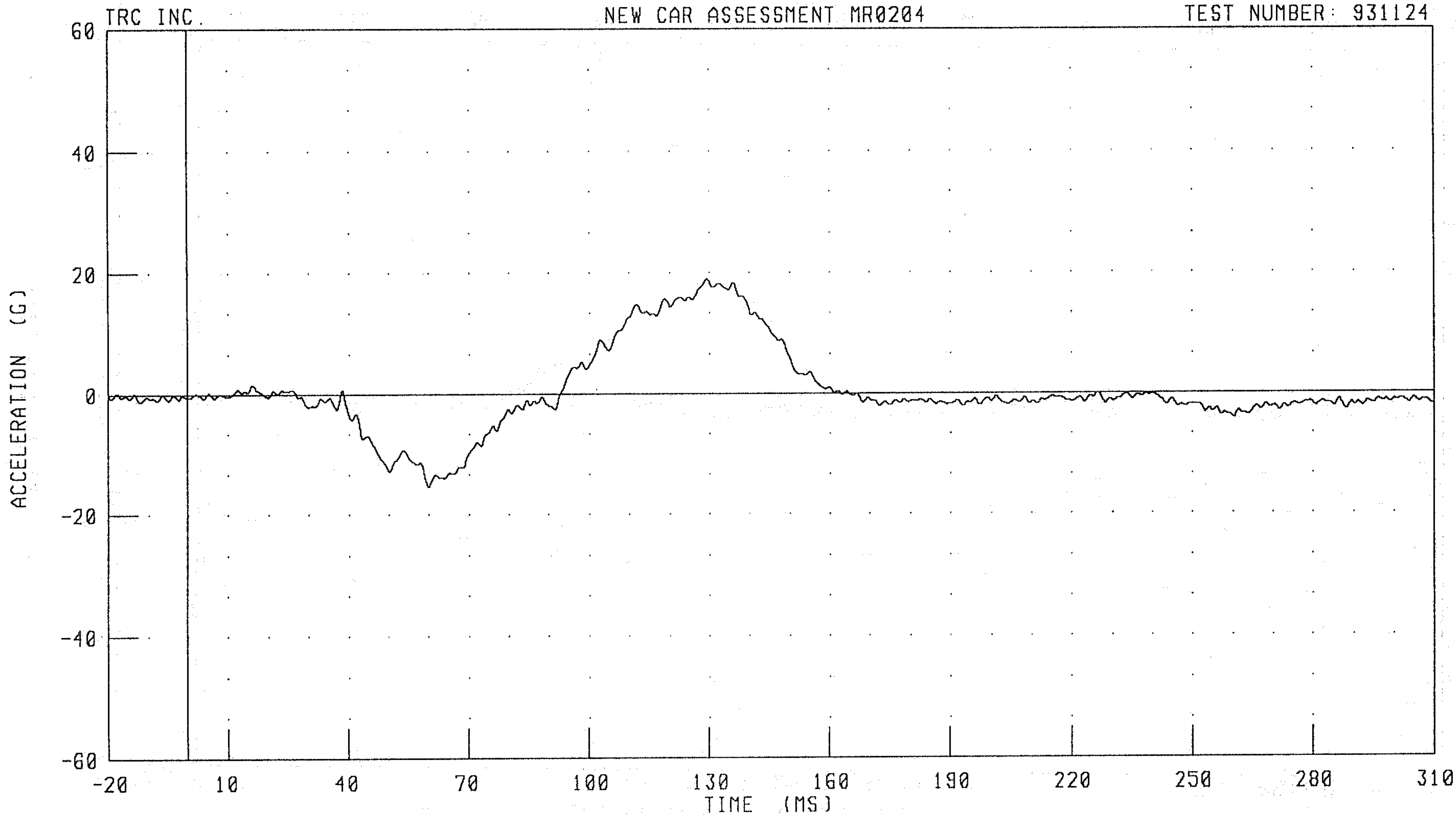
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: CSTYG1 FILTER: CH. CLASS 180 PEAK DATA: 5.73 G @ 49.60 MS; -7.38 G @ 87.04 MS

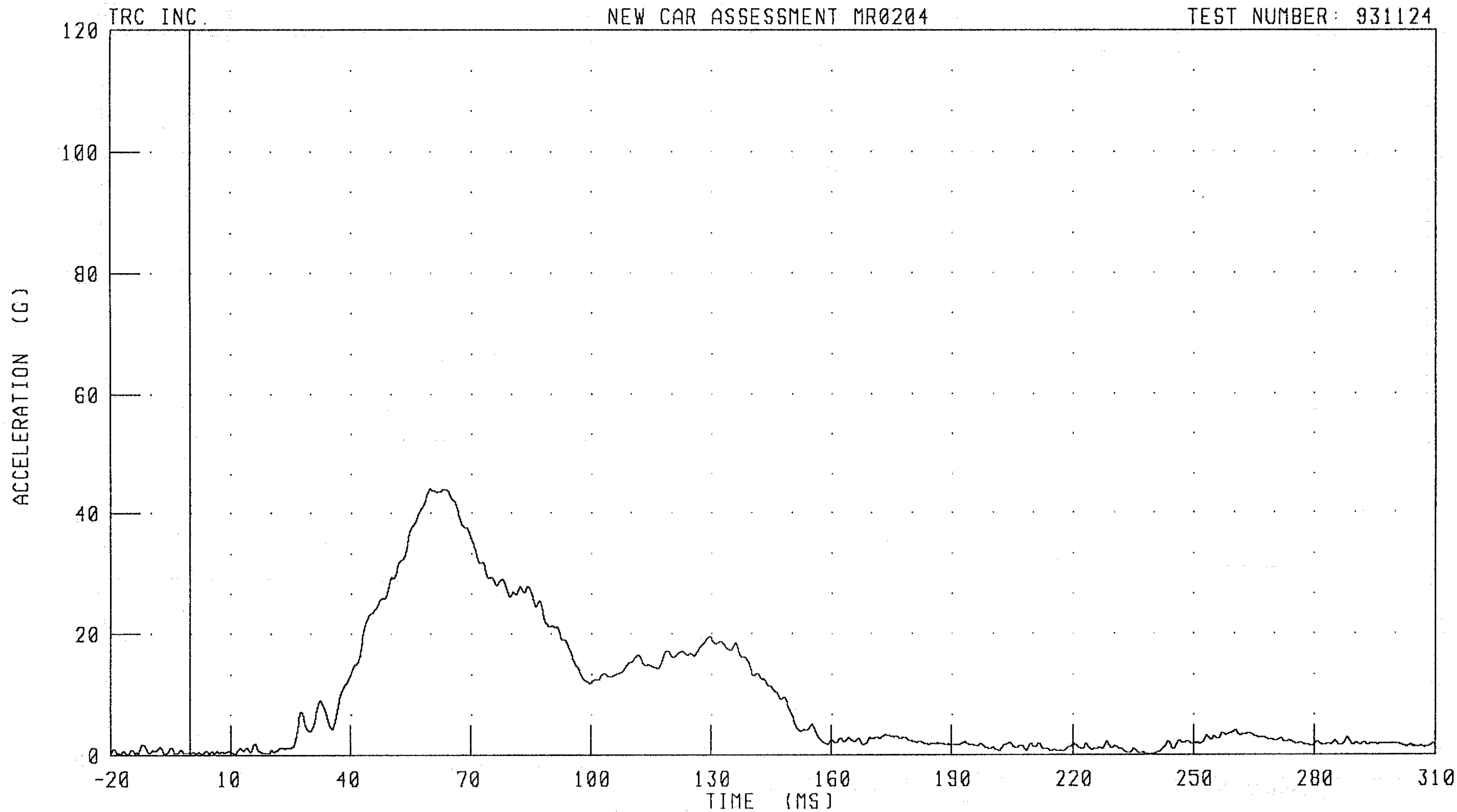
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

TEST NUMBER: 931124



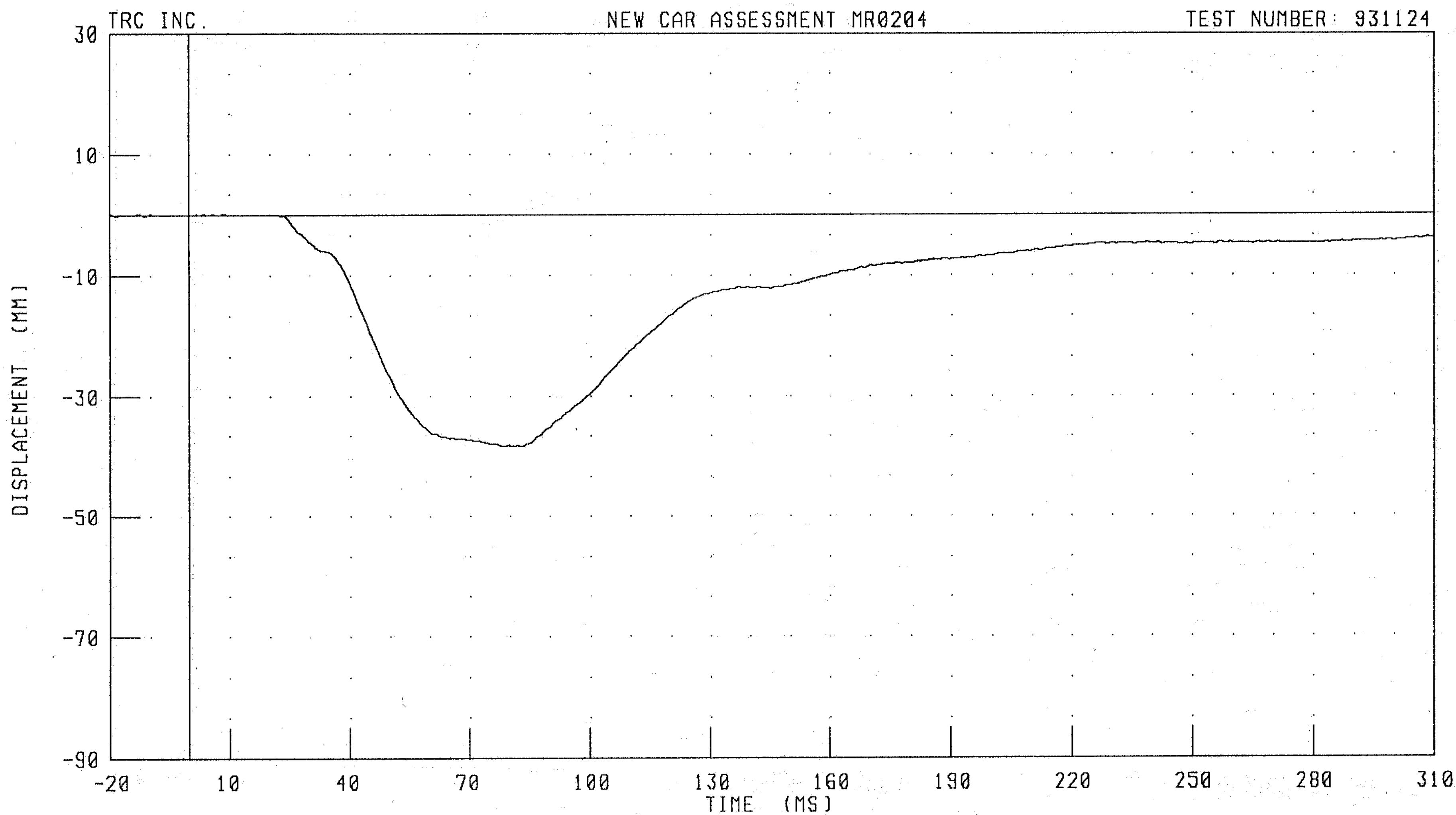
CHANNEL: CSTZG1   FILTER: CH. CLASS 180   PEAK DATA: 18.96 G @ 129.52 MS; -15.38 G @ 60.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: CSTRG1 FILTER: CH. CLASS 180 PEAK DATA: 44.07 G @ 59.92 MS; 0.13 G @ 238.64 MS

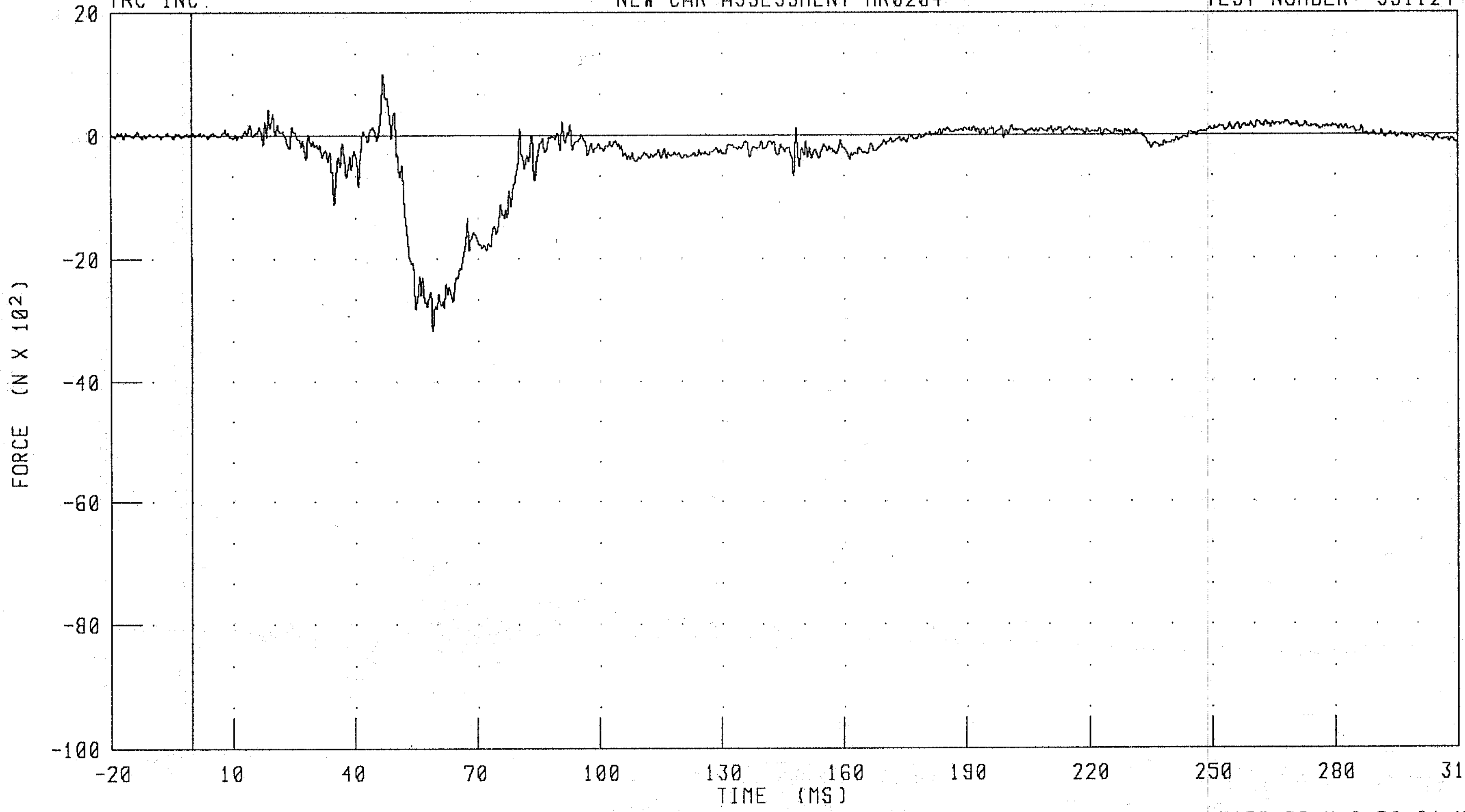
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT MR0204



CHANNEL: CSTXD1 FILTER: CH CLASS 180 PEAK DATA: 0.14 MM @ 8.48 MS; -38.31 MM @ 78.32 MS

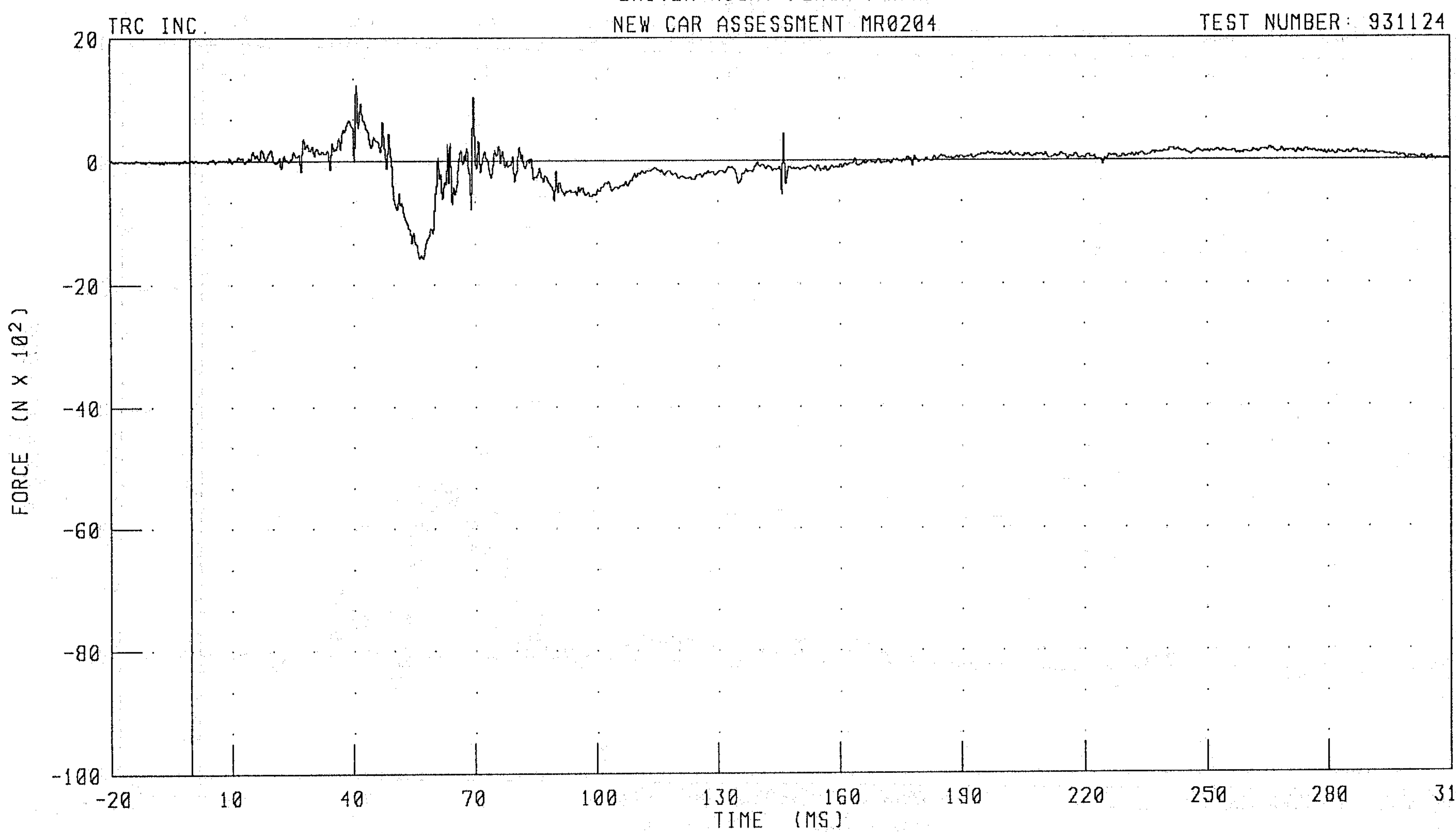
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MR0204

TRC INC. TEST NUMBER: 931124



CHANNEL: LFMF1 FILTER: CH. CLASS 600 PEAK DATA: 989.74 N @ 46.96 MS; -3172.38 N @ 59.04 MS

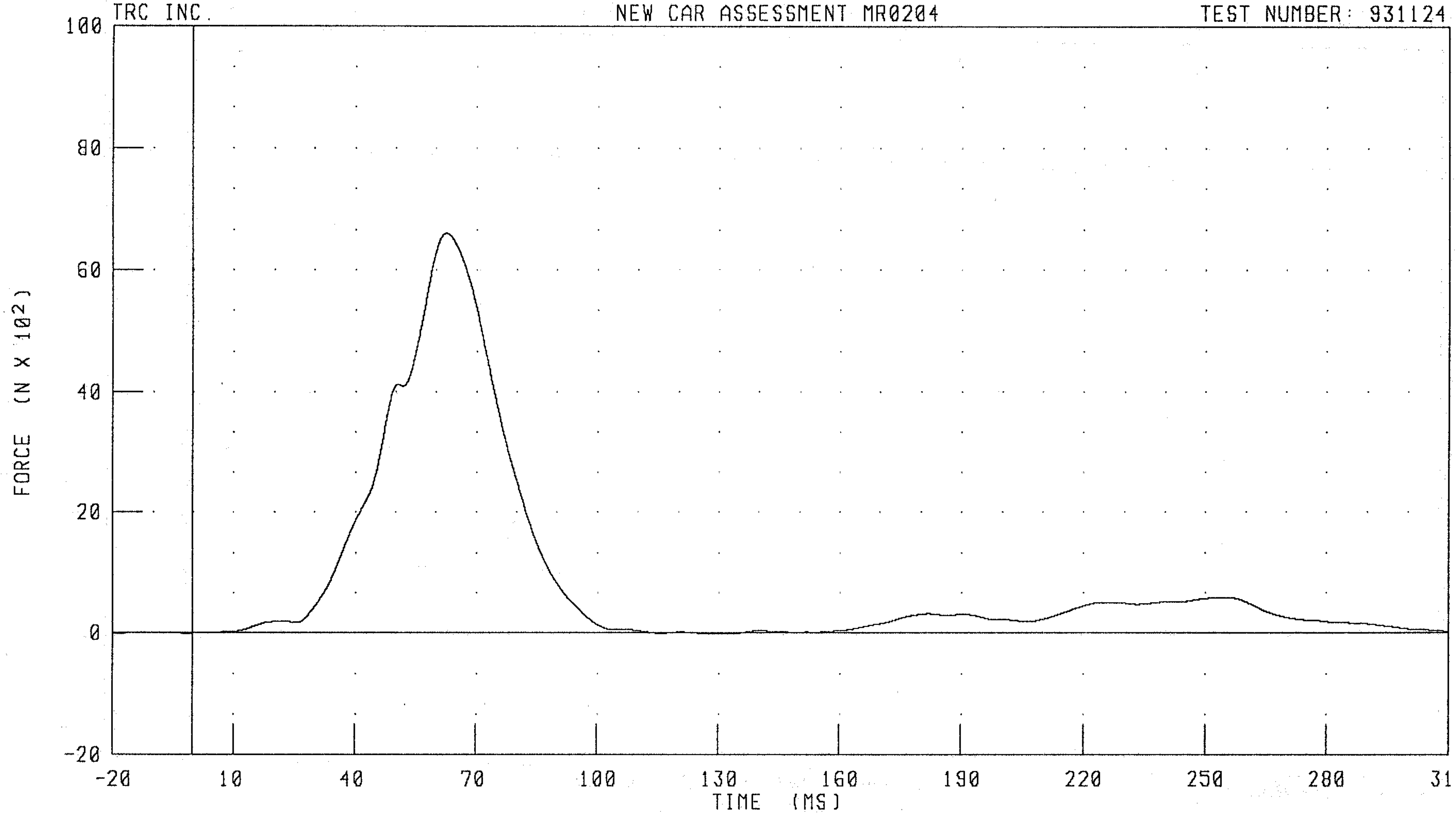
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MR0204



CHANNEL: RFMF1 FILTER: CH. CLASS 600 PEAK DATA: 1236.57 N @ 40.96 MS; -1583.63 N @ 57.36 MS

931124

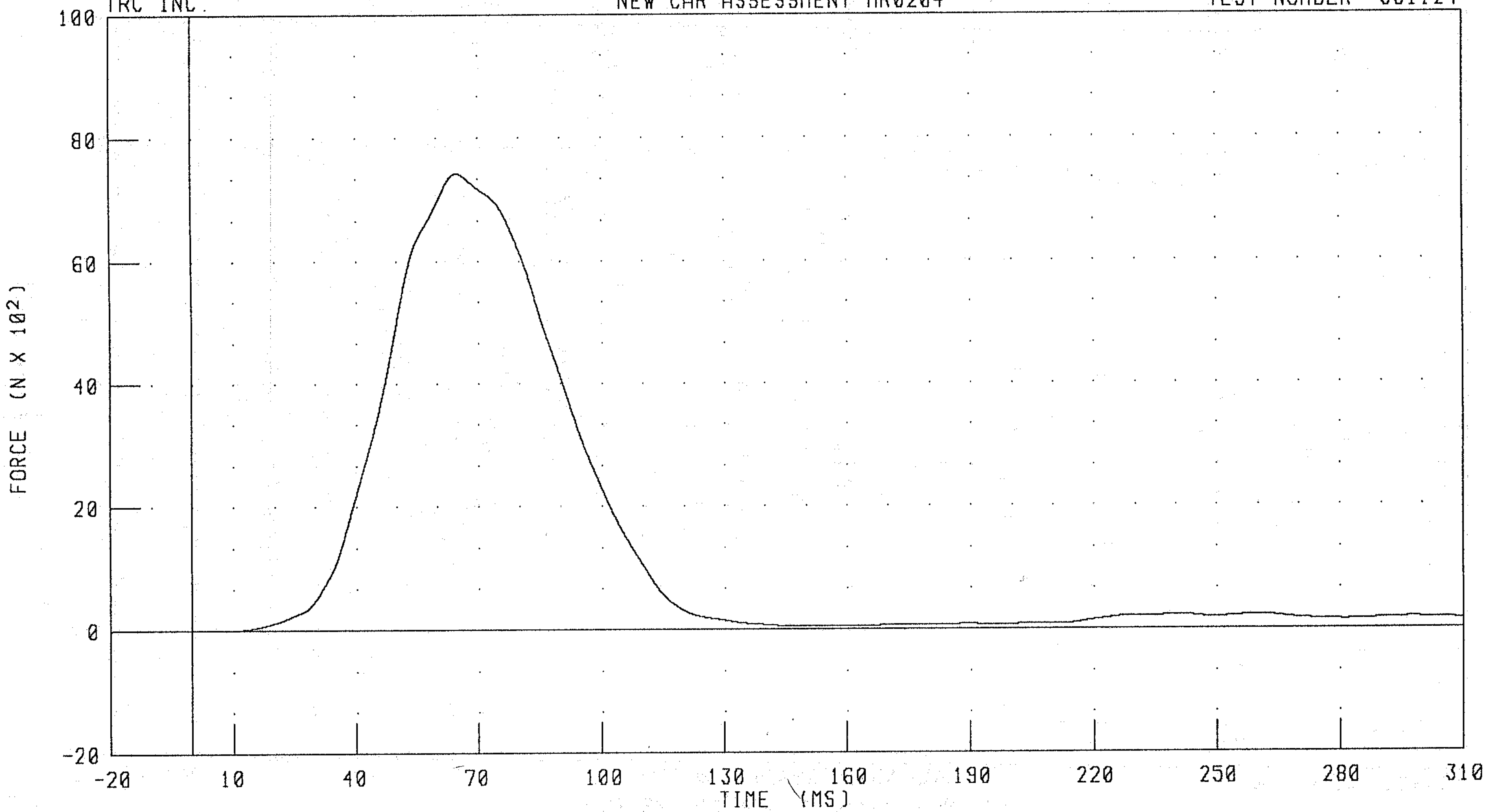
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MR0204



CHANNEL: LBOF1 FILTER: CH. CLASS 60 PEAK DATA: 6605.21 N @ 62.56 MS; -12.10 N @ 127.36 MS

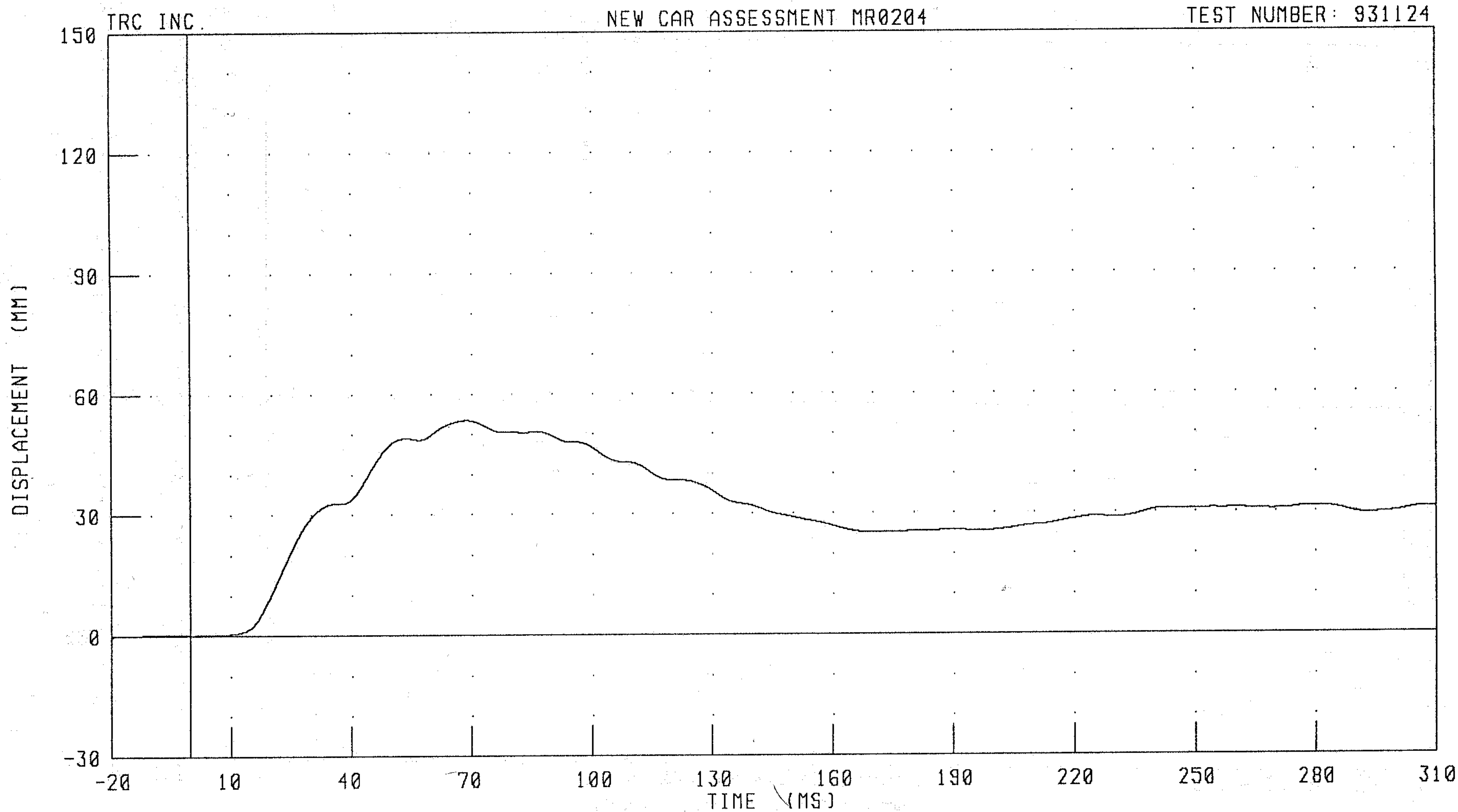
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MR0204

TEST NUMBER: 931124



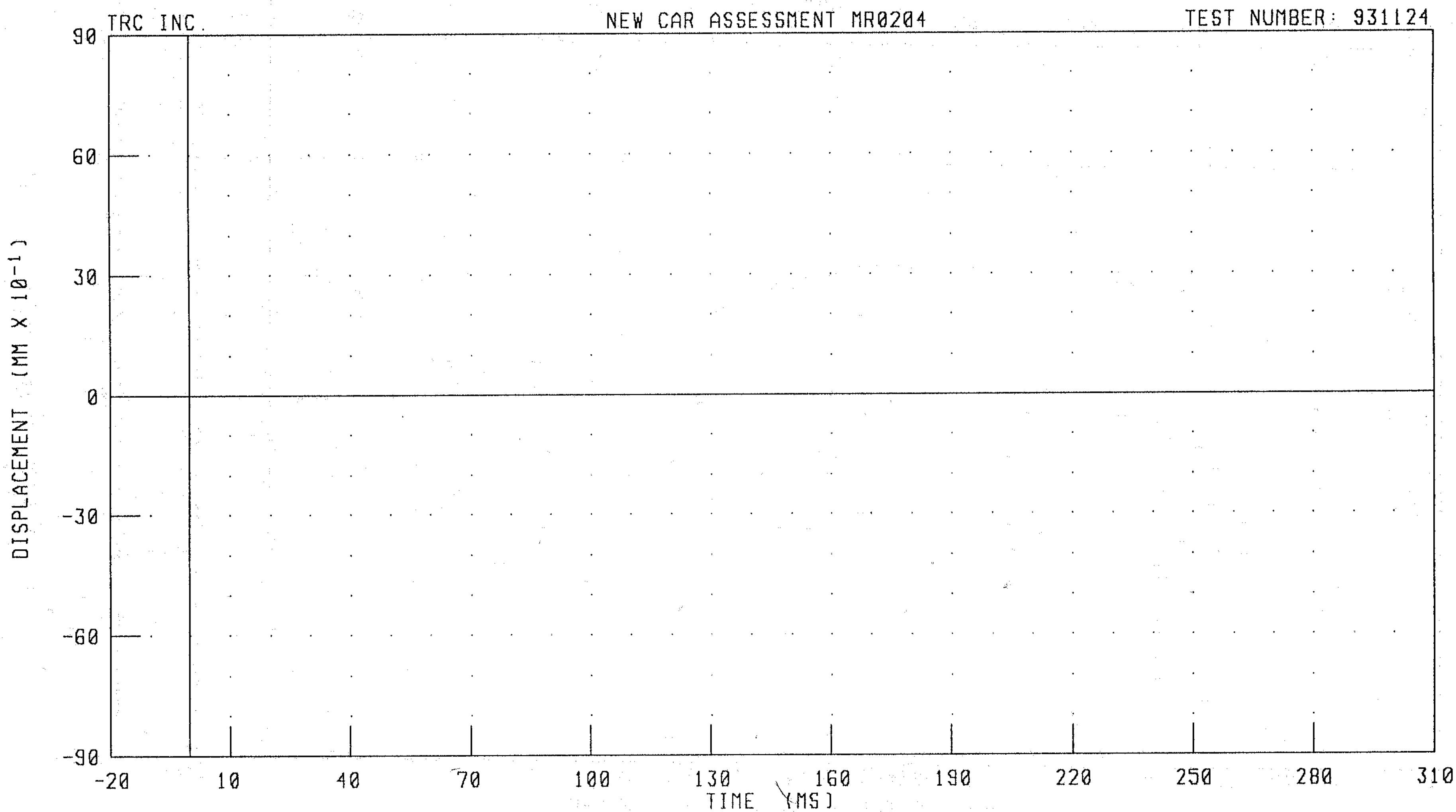
CHANNEL: SHBF1 FILTER: CH. CLASS 60 PEAK DATA: 7423.38 N @ 64.96 MS; -4.69 N @ -20.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MR0204



CHANNEL: SHB01 FILTER: CH. CLASS 60 PEAK DATA: 53.56 MM @ 68.80 MS; -0.11 MM @ -20.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MR0204

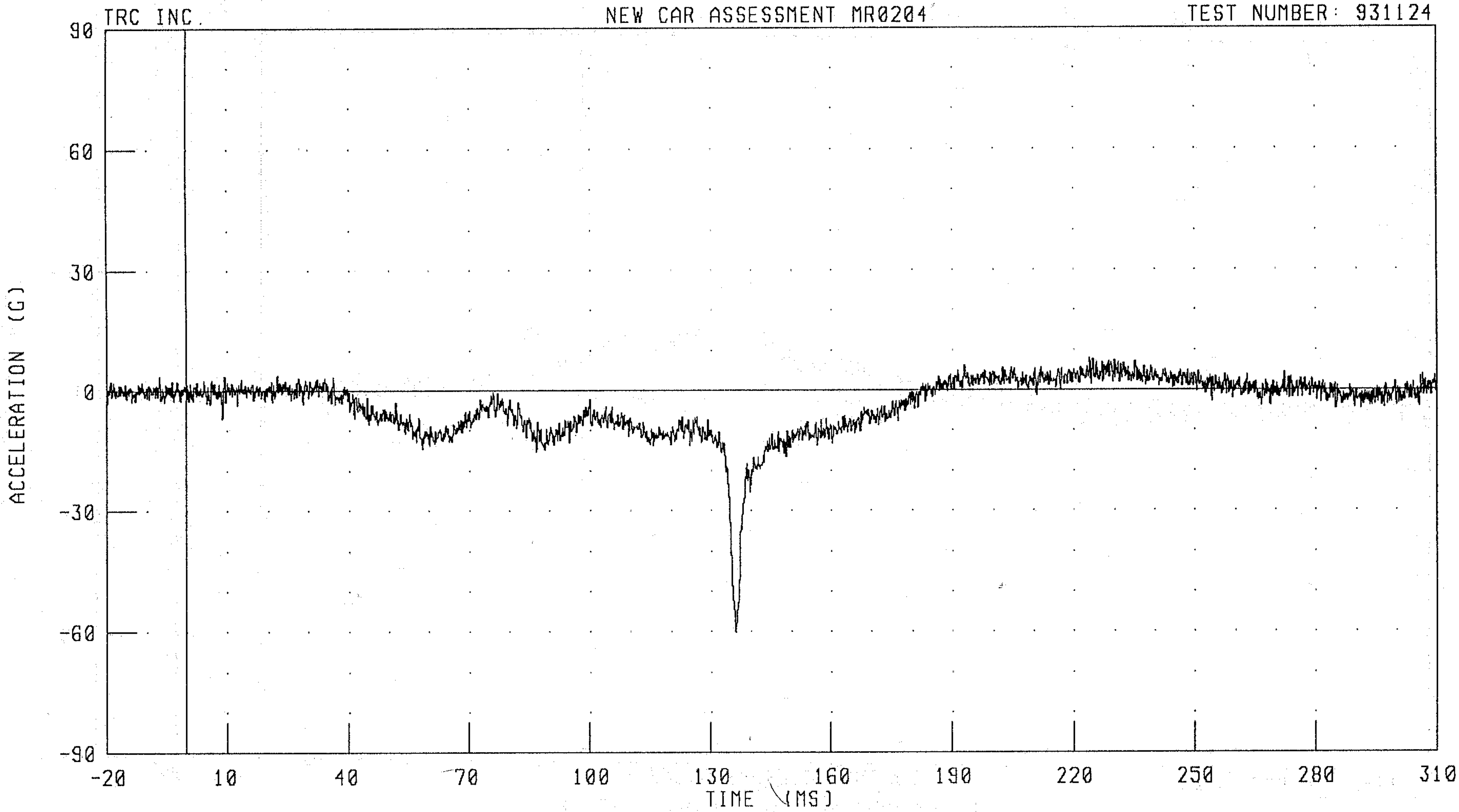


CHANNEL: SBE01 FILTER: CH. CLASS 60 PEAK DATA: 0.00 MM @ 240.16 MS; -0.01 MM @ 83.60 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

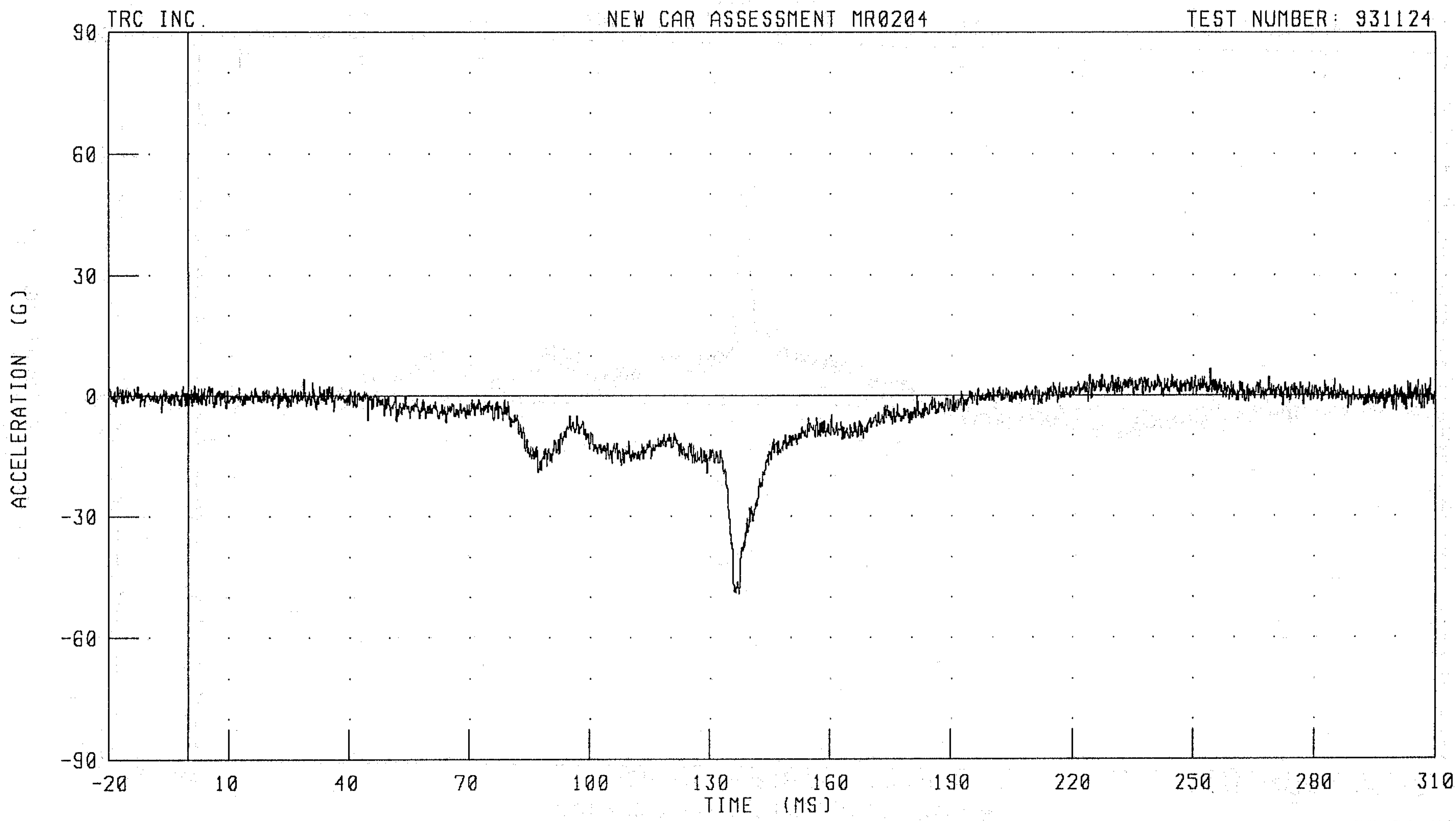
TRC INC.

TEST NUMBER: 931124

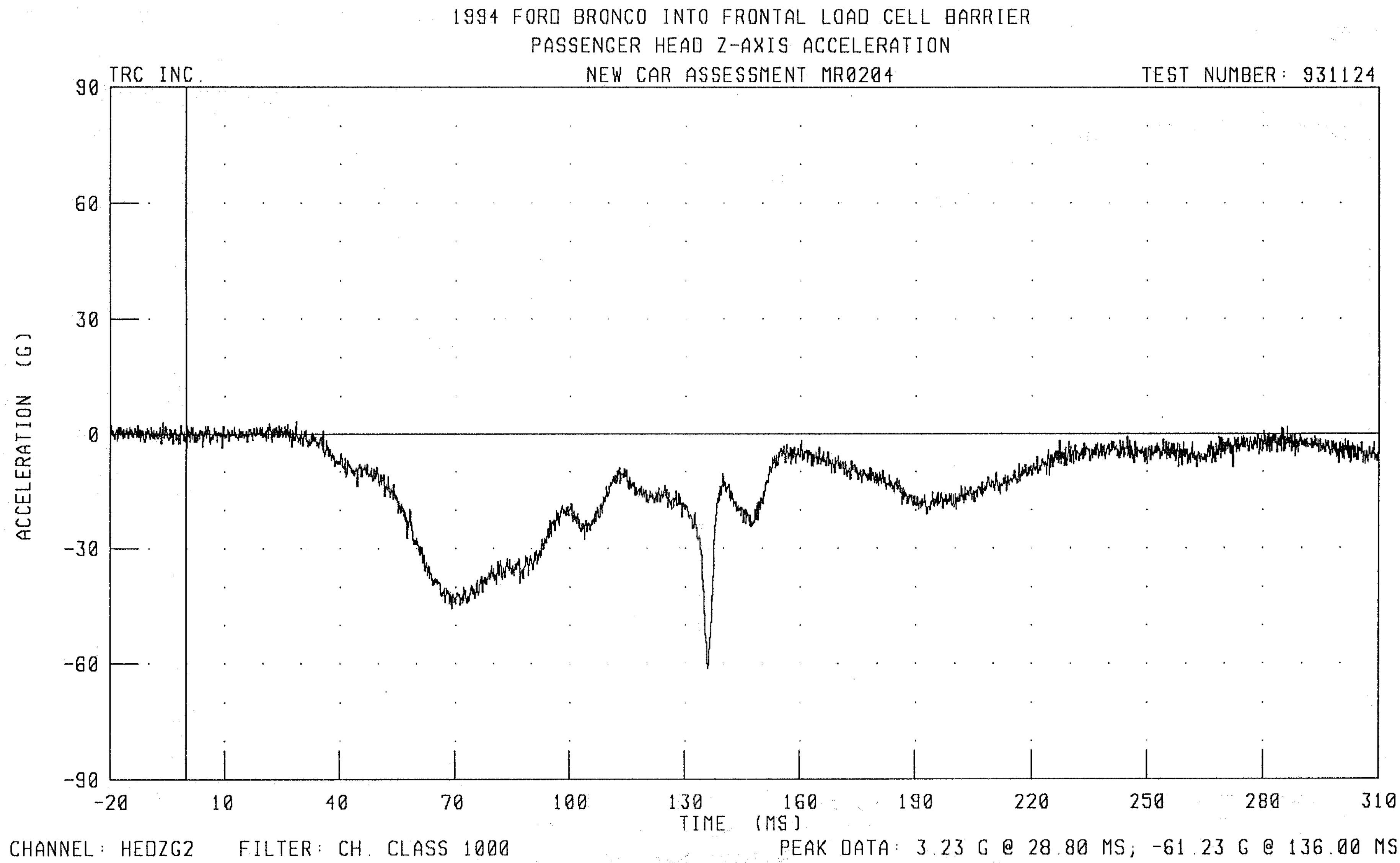


CHANNEL: HEDXG2 FILTER: CH. CLASS 1000 PEAK DATA: 7.97 G @ 223.92 MS; -60.16 G @ 136.24 MS

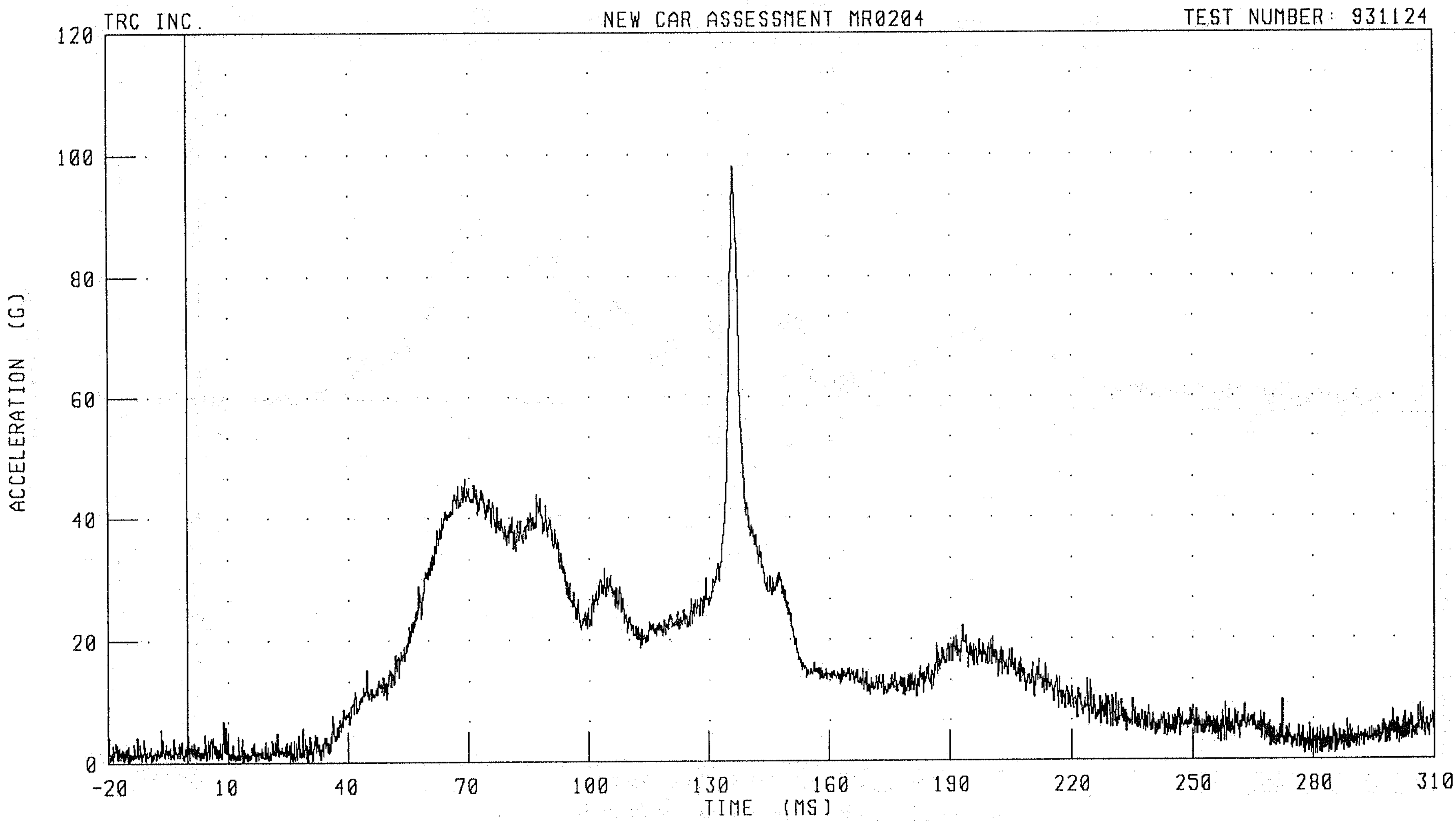
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000 PEAK DATA: 6.58 G @ 254.24 MS; -49.37 G @ 137.36 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG2
FILTER: CH. CLASS 1000
PEAK DATA: 3.23 G @ 28.80 MS; -61.23 G @ 136.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT MR0204

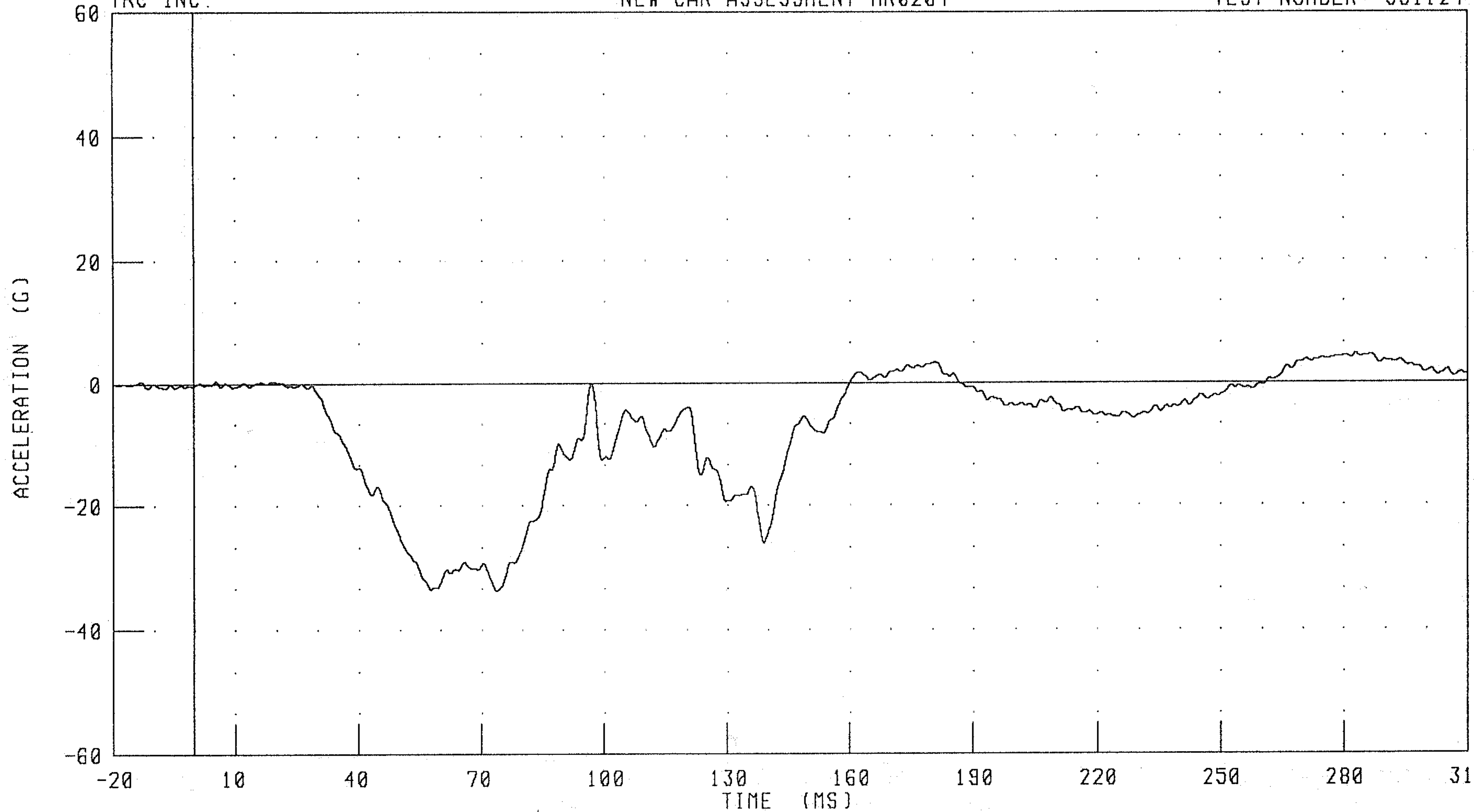


CHANNEL: HEDRG2   FILTER: CH. CLASS 1000   PEAK DATA: 98.09 G @ 136.08 MS; 0.22 G @ 25.60 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

TRC INC.

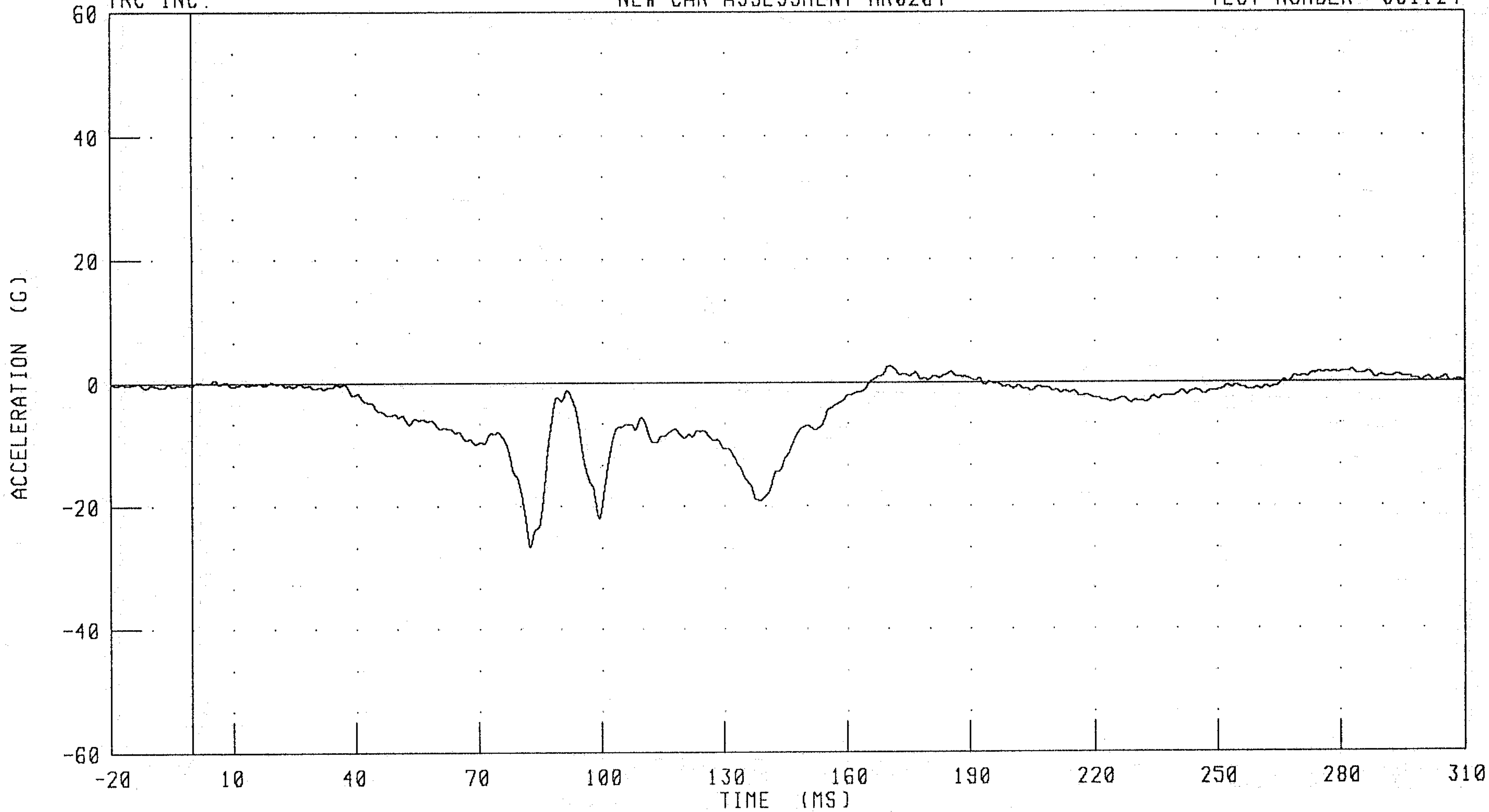
TEST NUMBER: 931124



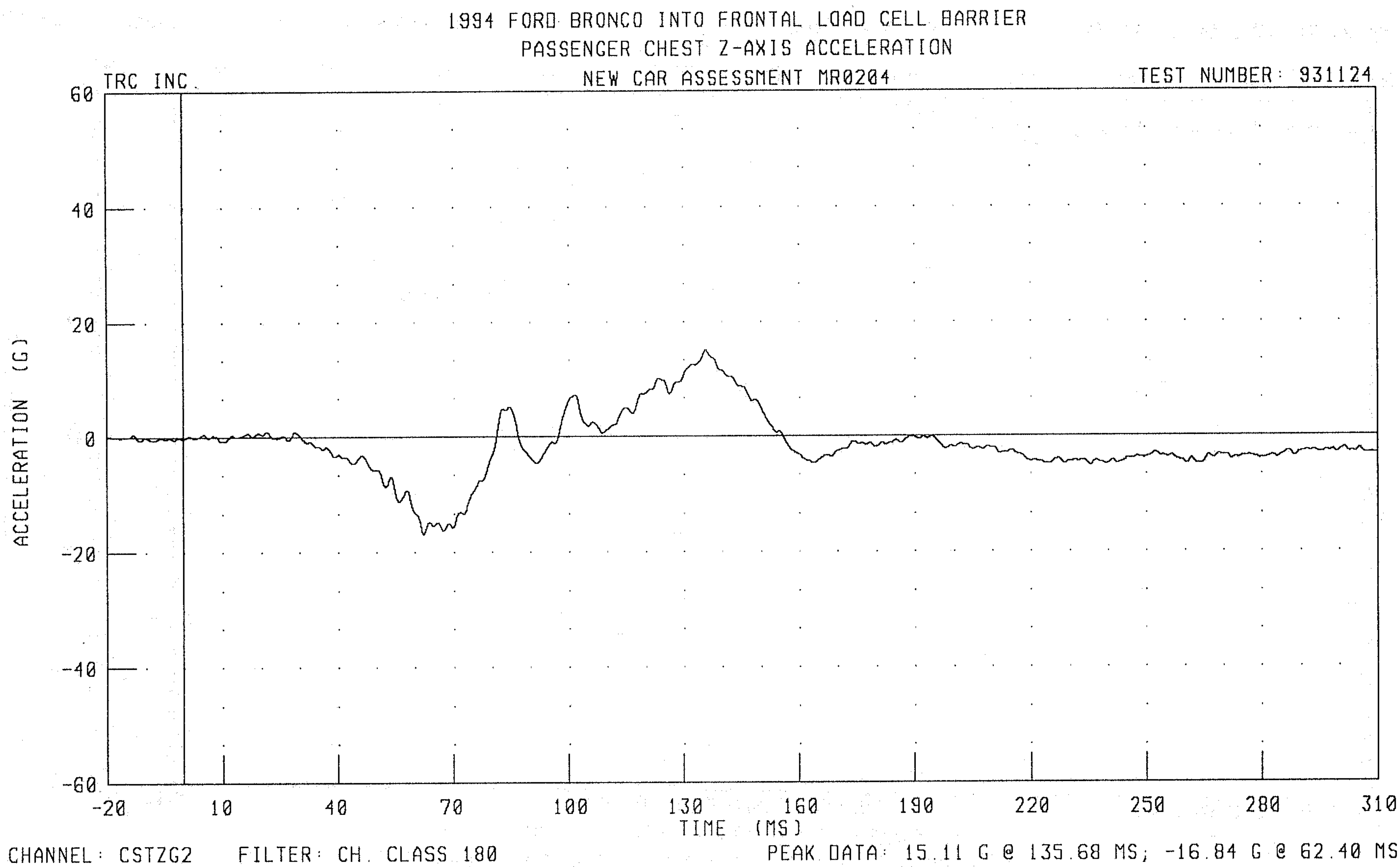
CHANNEL: CSTXG2   FILTER: CH. CLASS 180   PEAK DATA: 4.78 G @ 282.88 MS; -33.69 G @ 73.68 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

TRC INC. TEST NUMBER: 931124

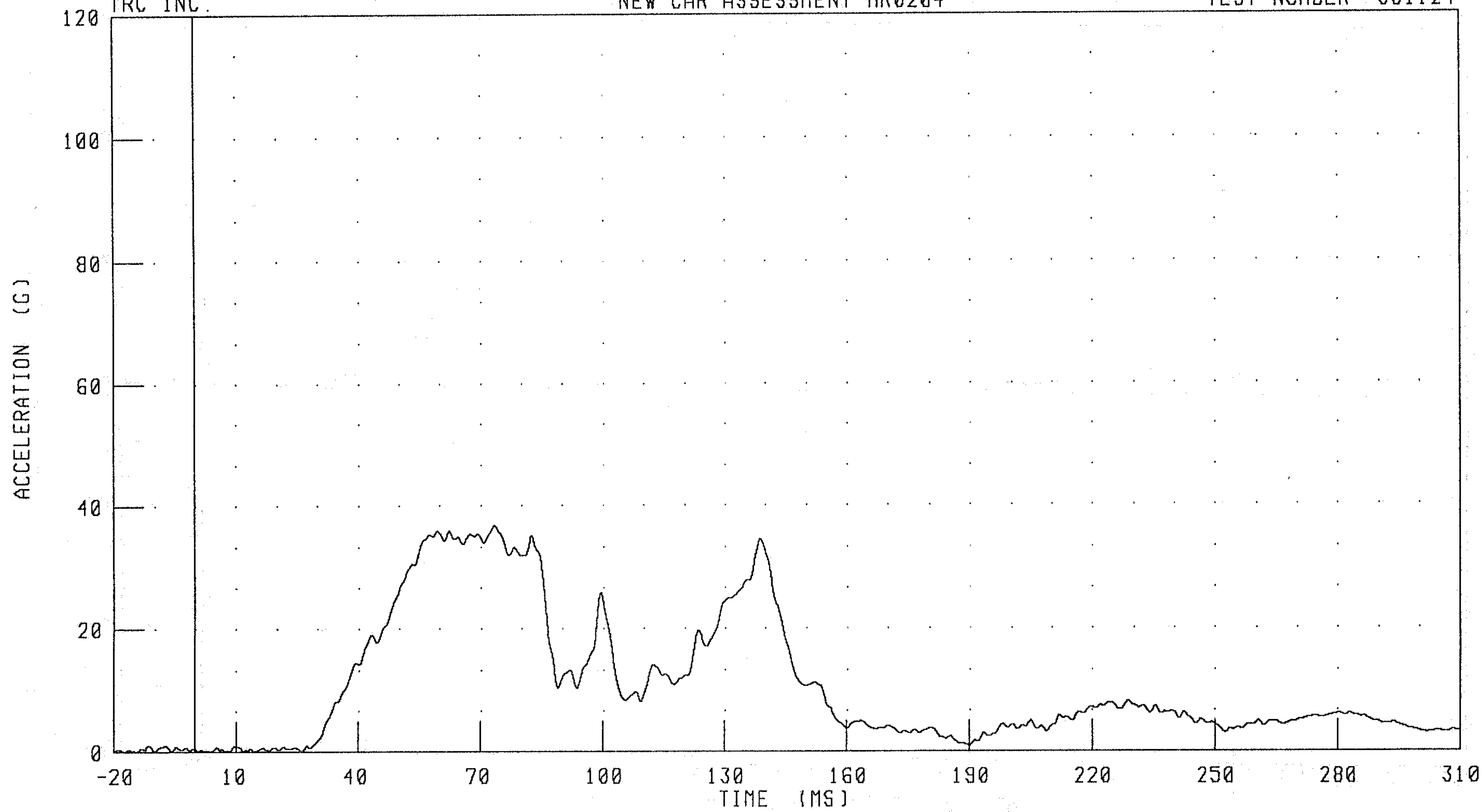


CHANNEL: CSTYG2 FILTER: CH. CLASS 180 PEAK DATA: 2.67 G @ 170.16 MS; -26.53 G @ 82.48 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG2
FILTER: CH. CLASS 180
PEAK DATA: 15.11 G @ 135.68 MS; -16.84 G @ 62.40 MS

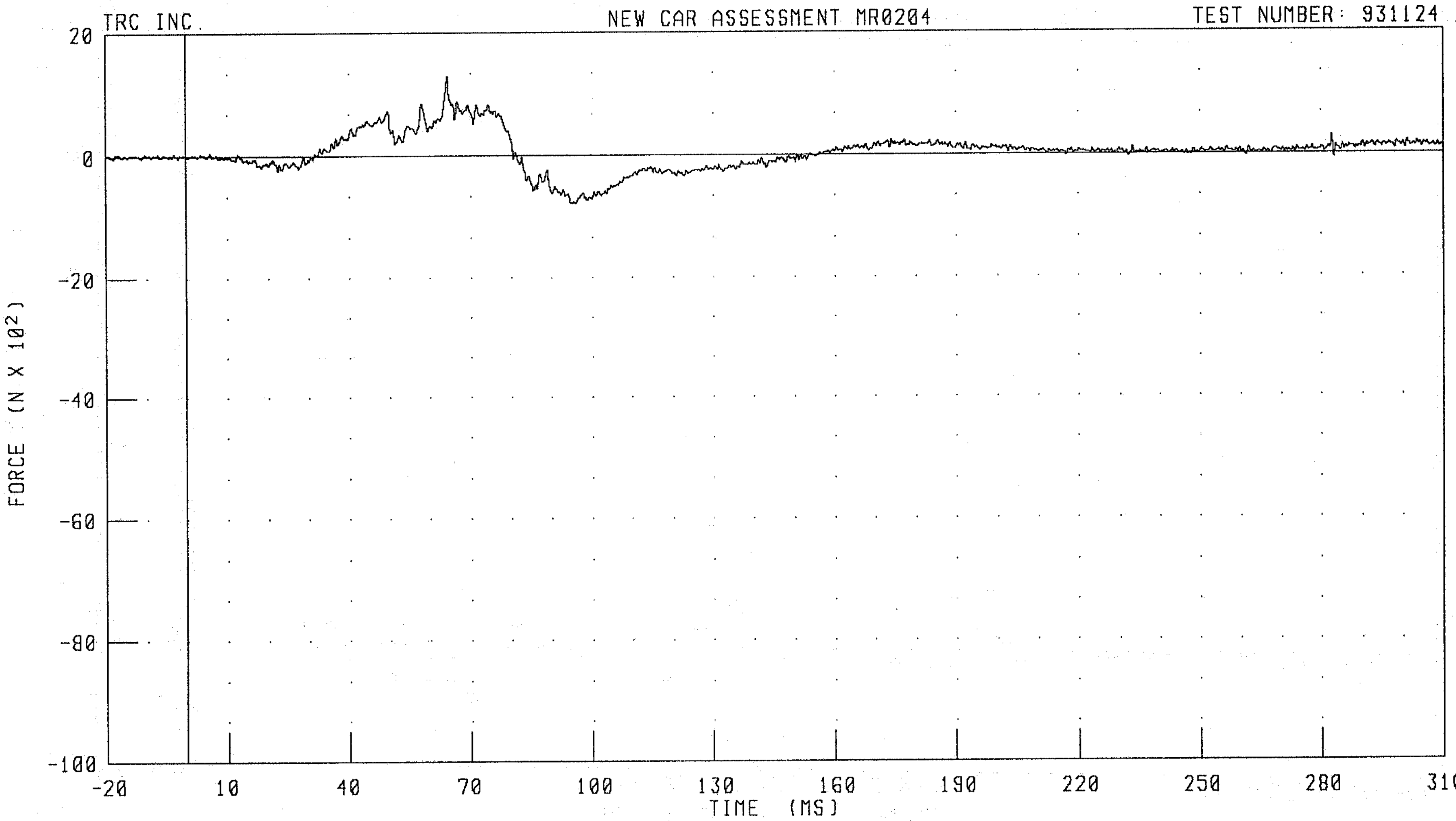
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MR0204

TRC INC. TEST NUMBER: 931124

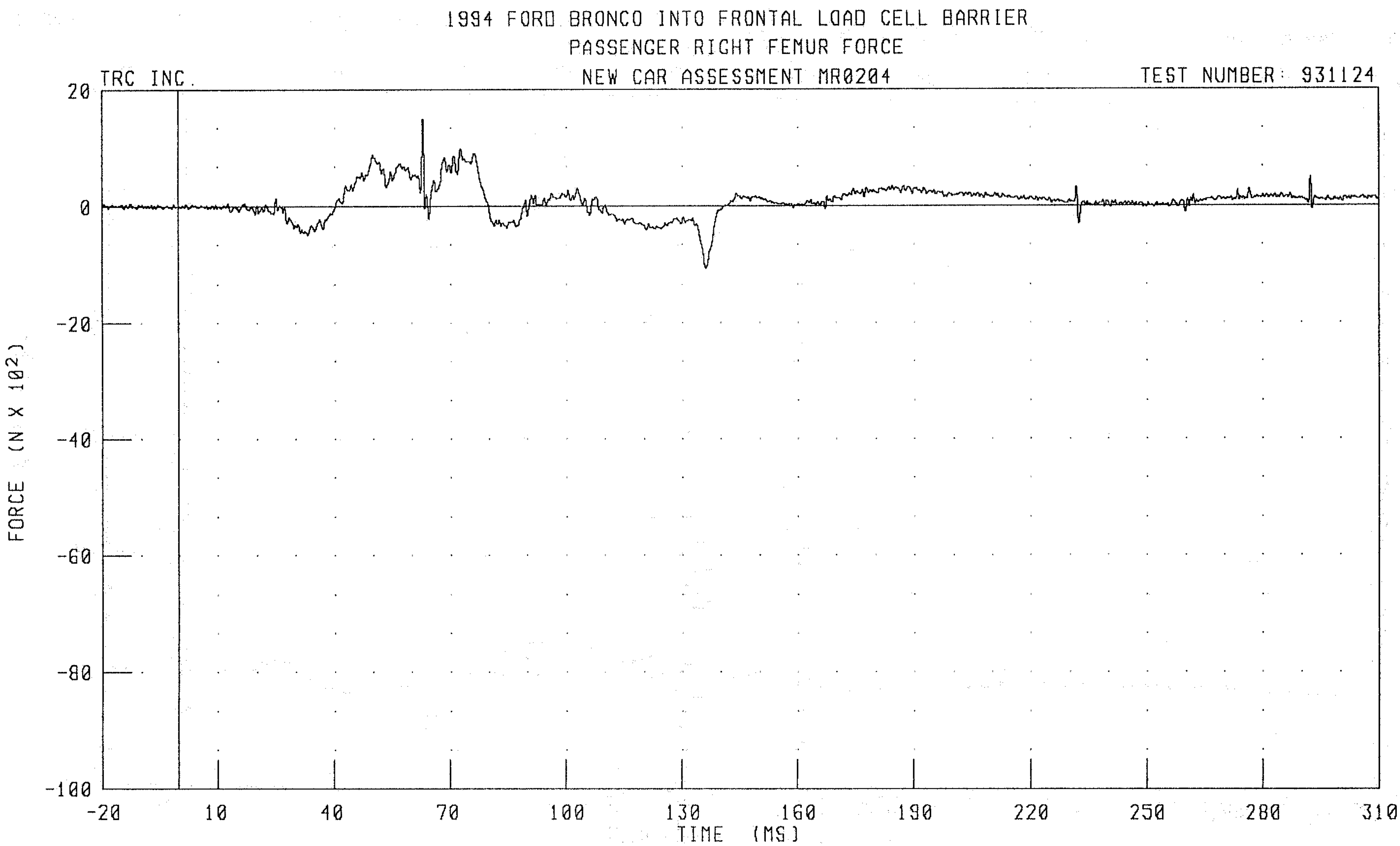


CHANNEL: CSTRG2 FILTER: CH. CLASS 180 PEAK DATA: 36.79 G @ 73.44 MS; 0.06 G @ -20.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MR0204

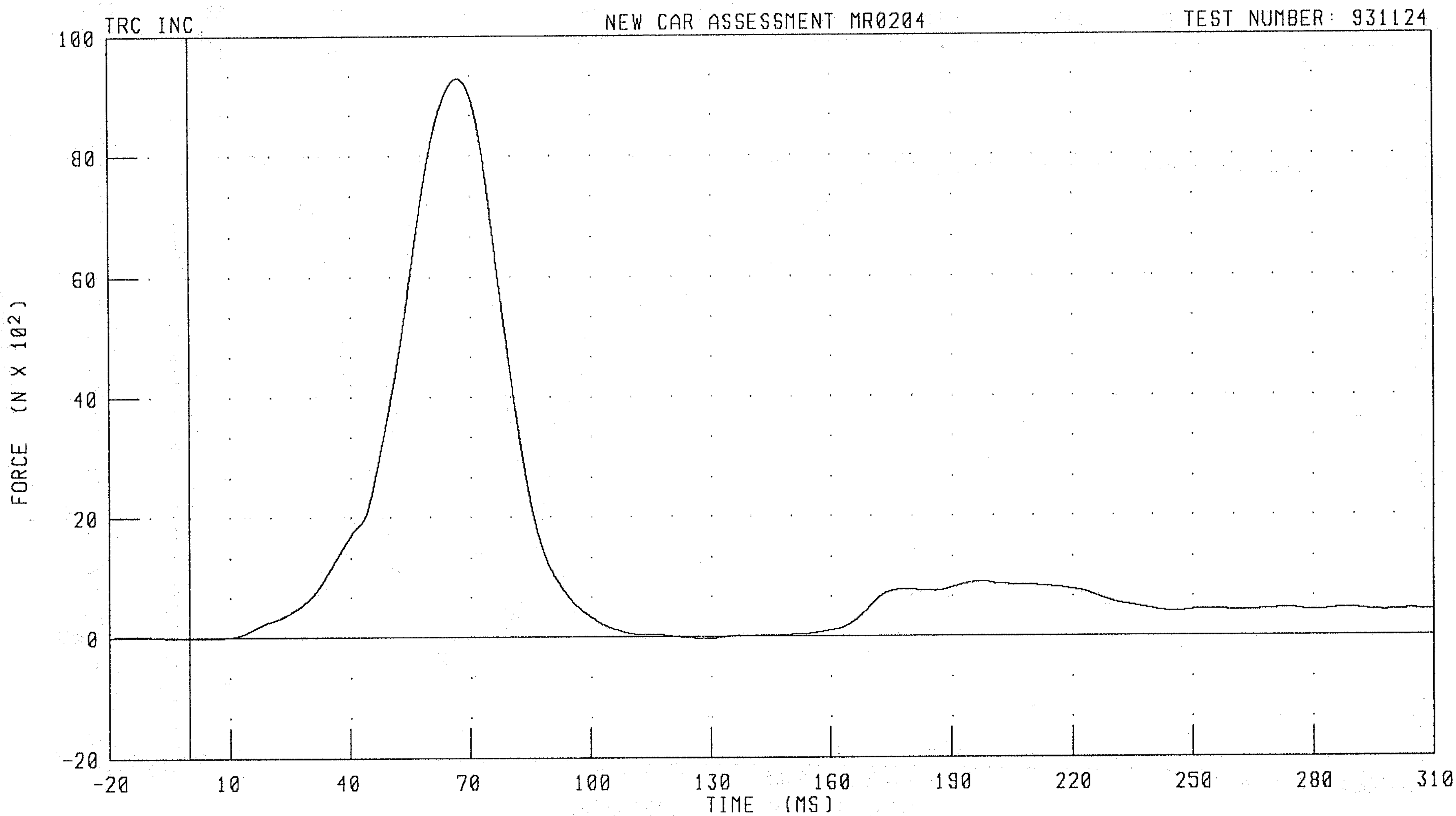


CHANNEL: LFMF2 FILTER: CH. CLASS 600 PEAK DATA: 1280.56 N @ 64.40 MS; -779.50 N @ 94.88 MS



CHANNEL: RFMF2 FILTER: CH. CLASS 600 PEAK DATA: 1481.11 N @ 62.96 MS; -1062.00 N @ 136.24 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MR0204



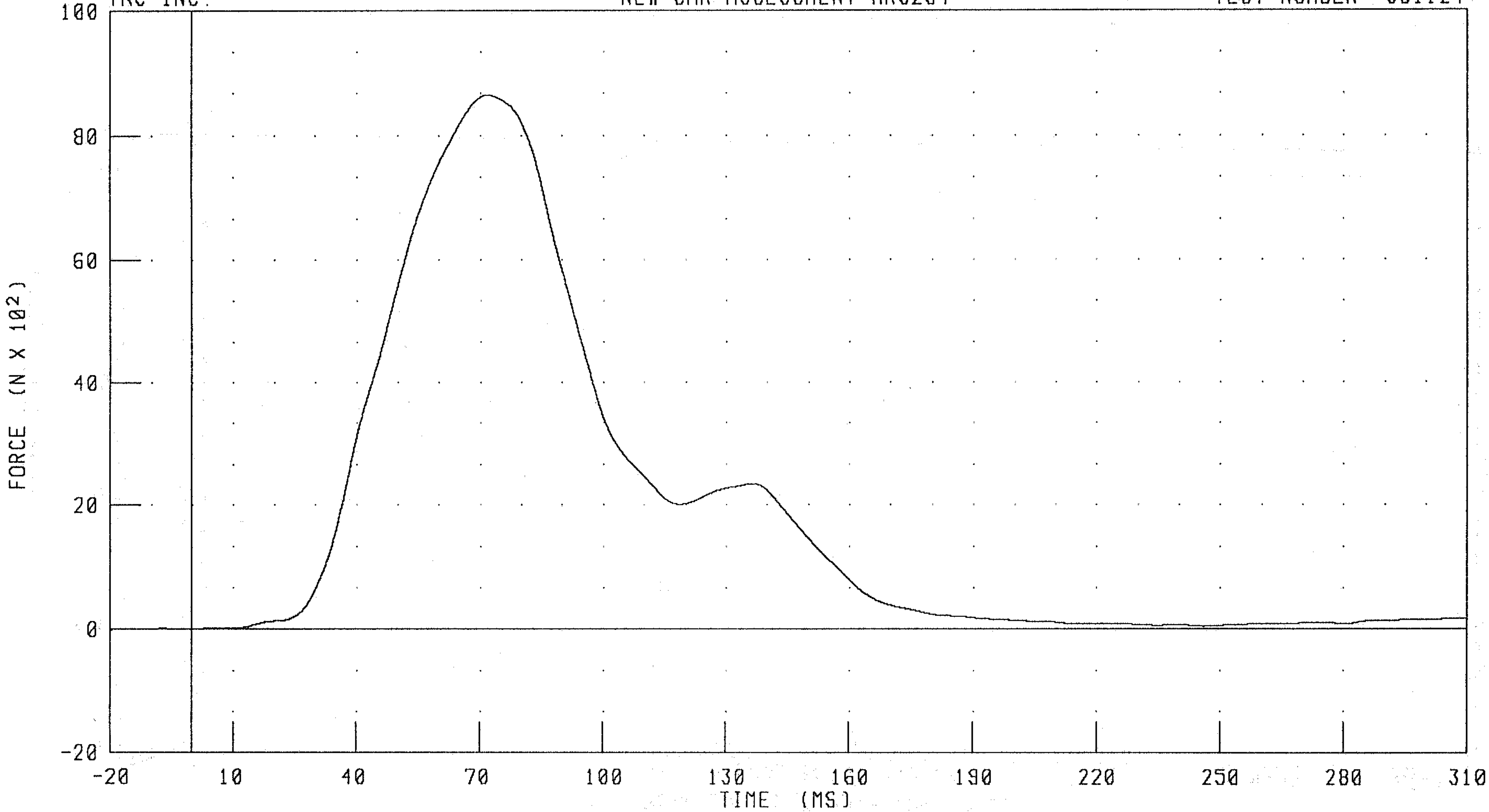
CHANNEL: LBOF2 FILTER: CH. CLASS 60 PEAK DATA: 9282.23 N @ 67.12 MS; -30.00 N @ 129.36 MS

931124

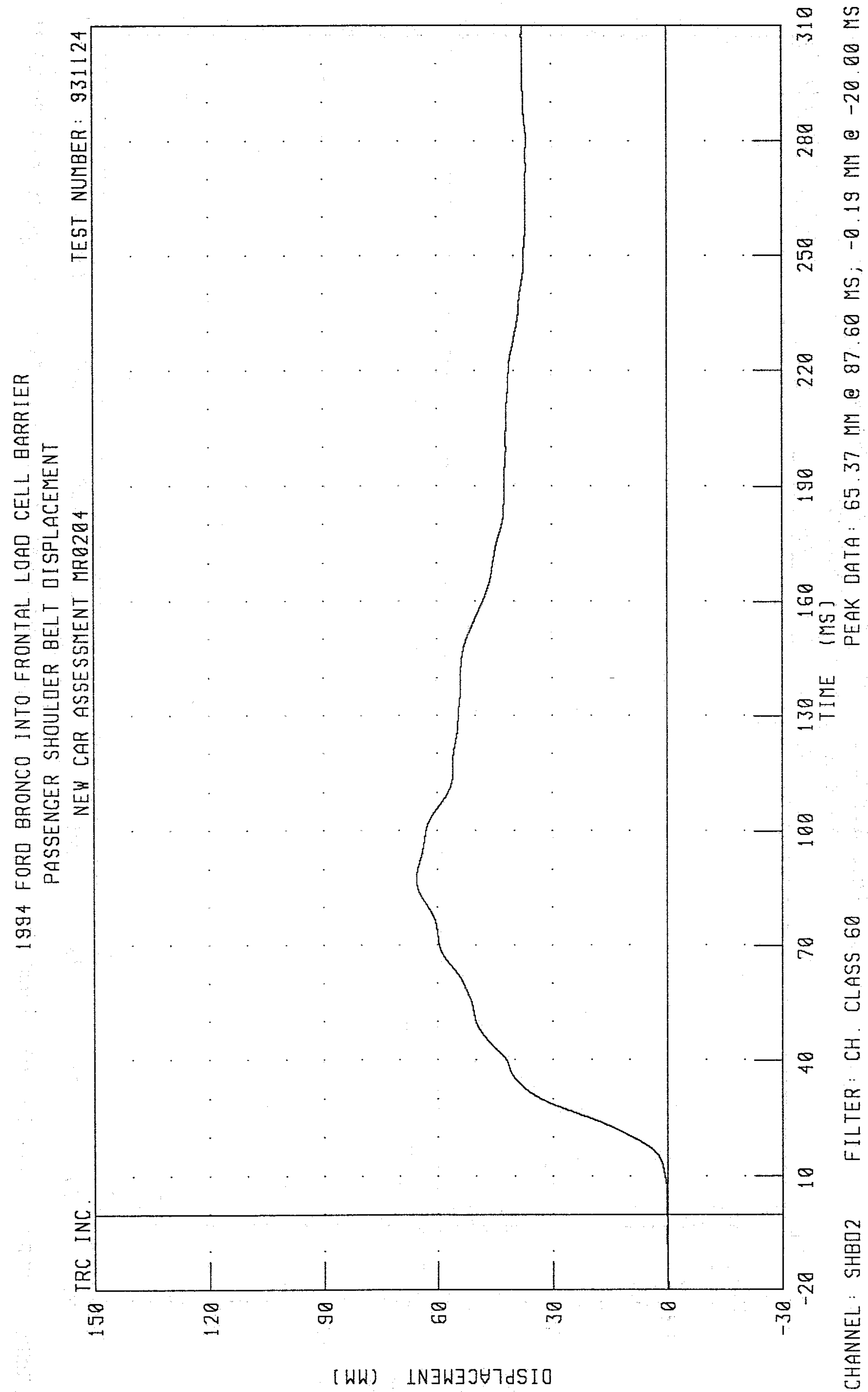
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MR0204

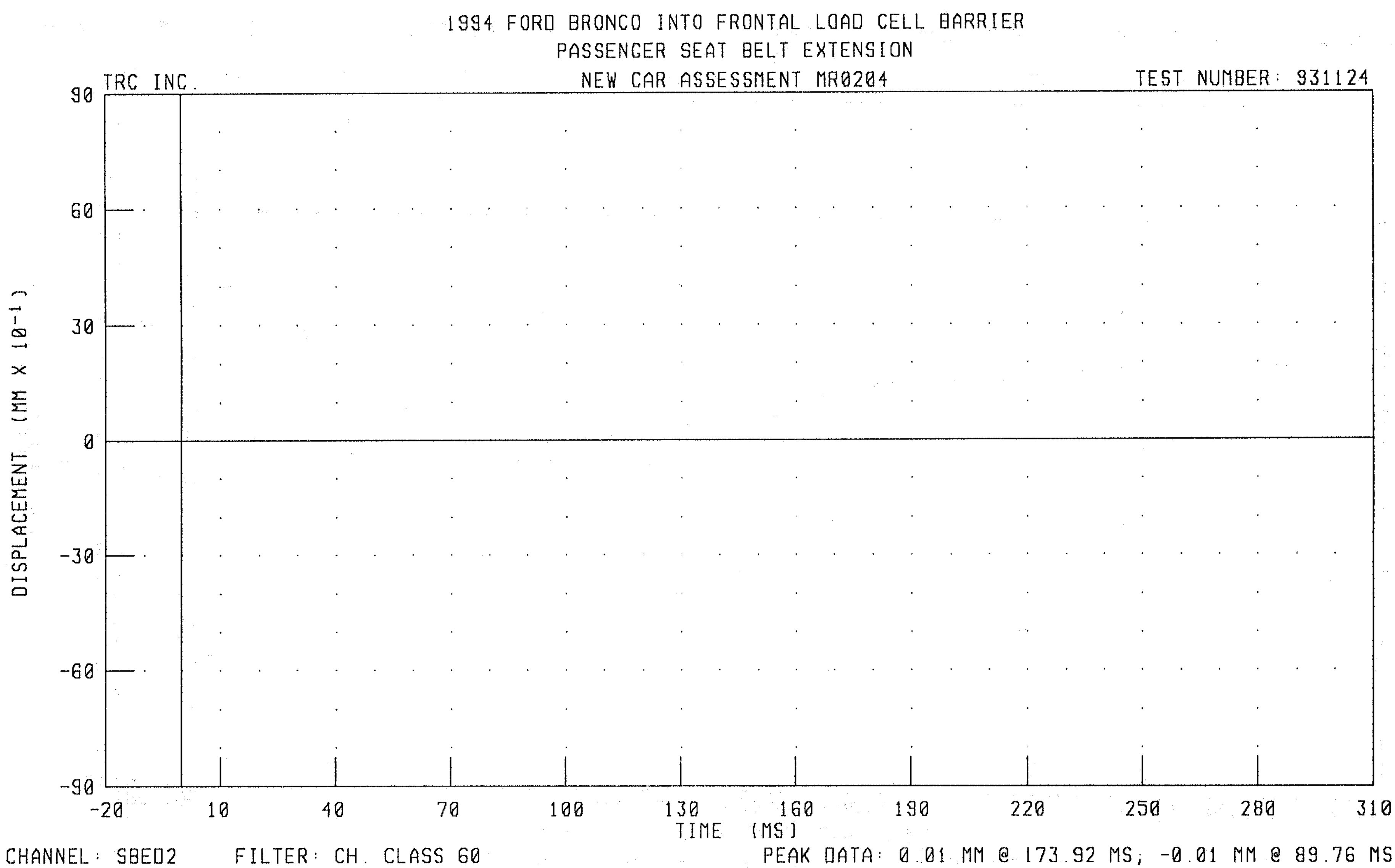
TRC INC.

TEST NUMBER: 931124

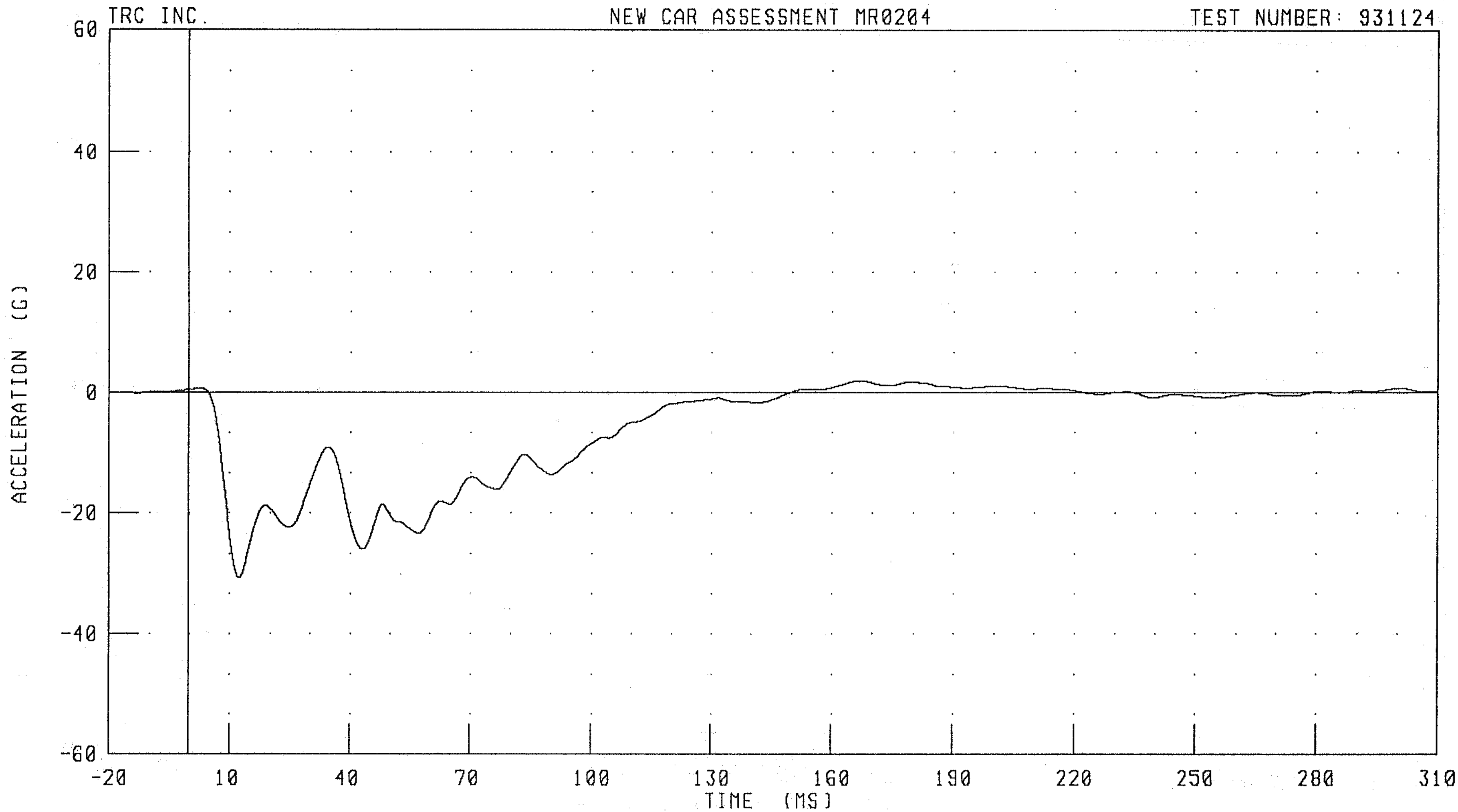


CHANNEL: SHBF2 FILTER: CH. CLASS 60 PEAK DATA: 8648.38 N @ 71.84 MS; -8.91 N @ -20.00 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
DISPLACEMENT (MM)
150
120
90
60
30
0
-30
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SHB02
FILTER: CH. CLASS 60
PEAK DATA: 65.37 MM @ 87.60 MS; -0.19 MM @ -20.00 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
DISPLACEMENT (MM X 10-1)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SBED2
FILTER: CH. CLASS 60
PEAK DATA: 0.01 MM @ 173.92 MS; -0.01 MM @ 89.76 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

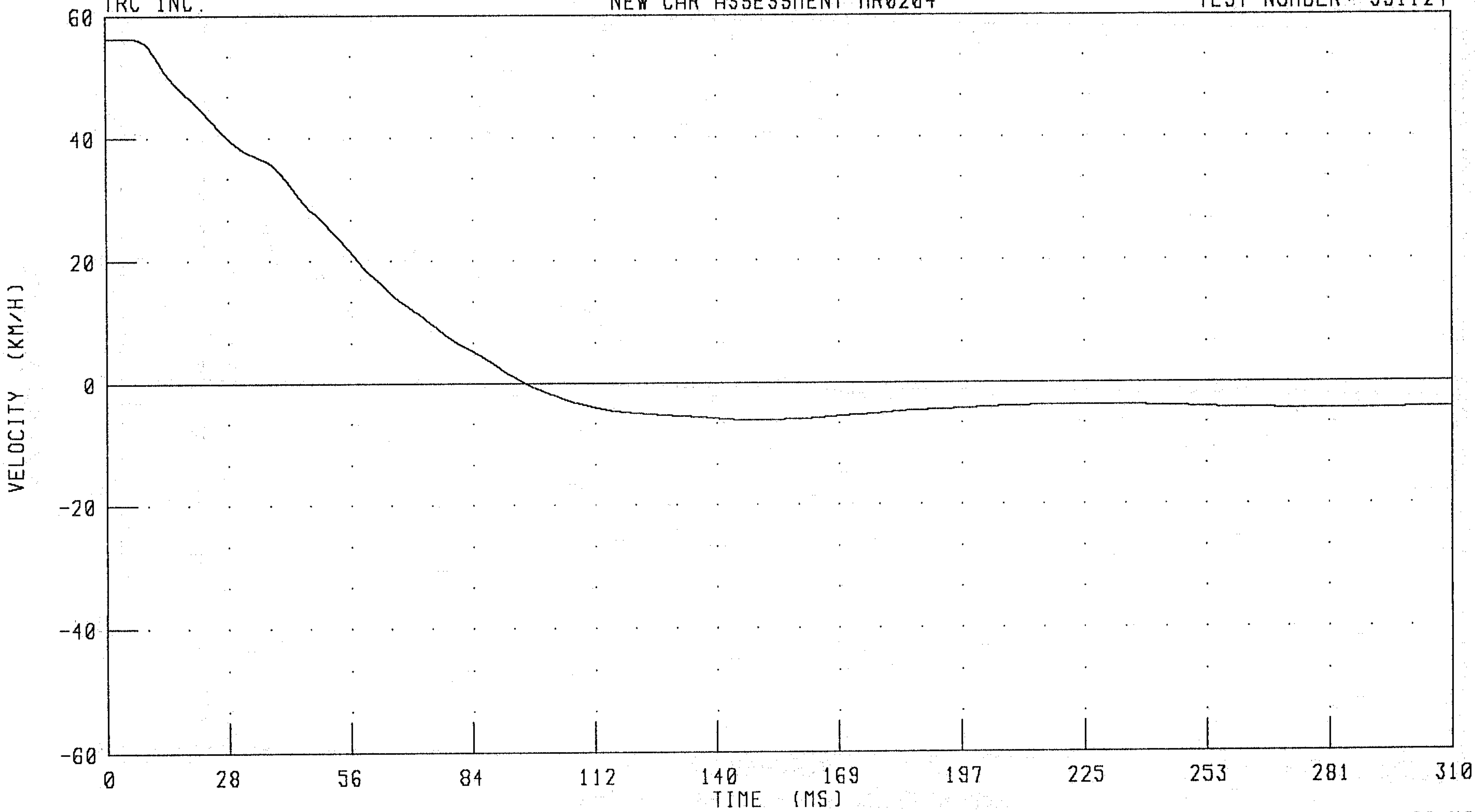


CHANNEL: TLRXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.87 G @ 166.64 MS; -30.72 G @ 12.40 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT MR0204

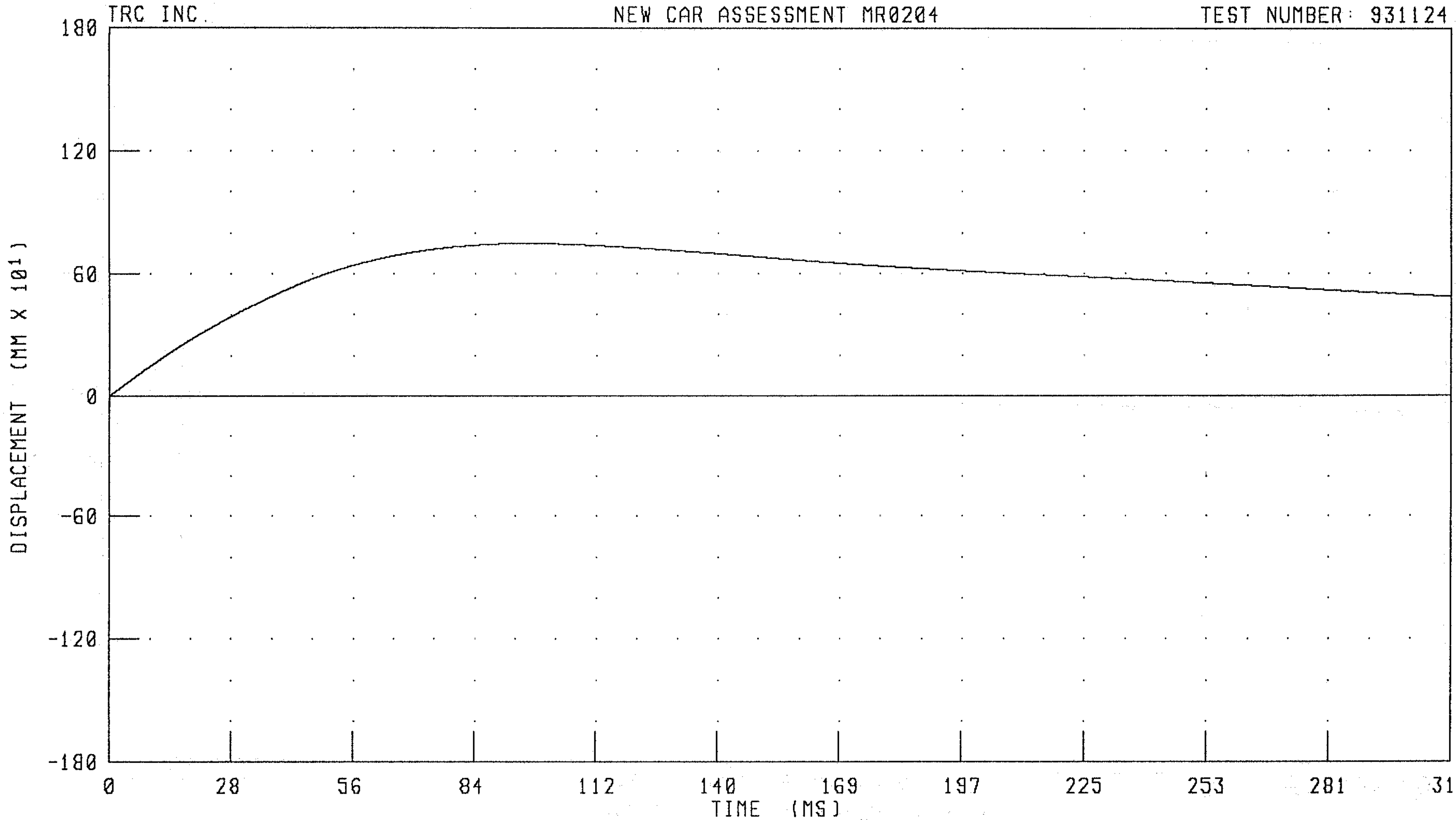
TRC INC.

TEST NUMBER: 931124



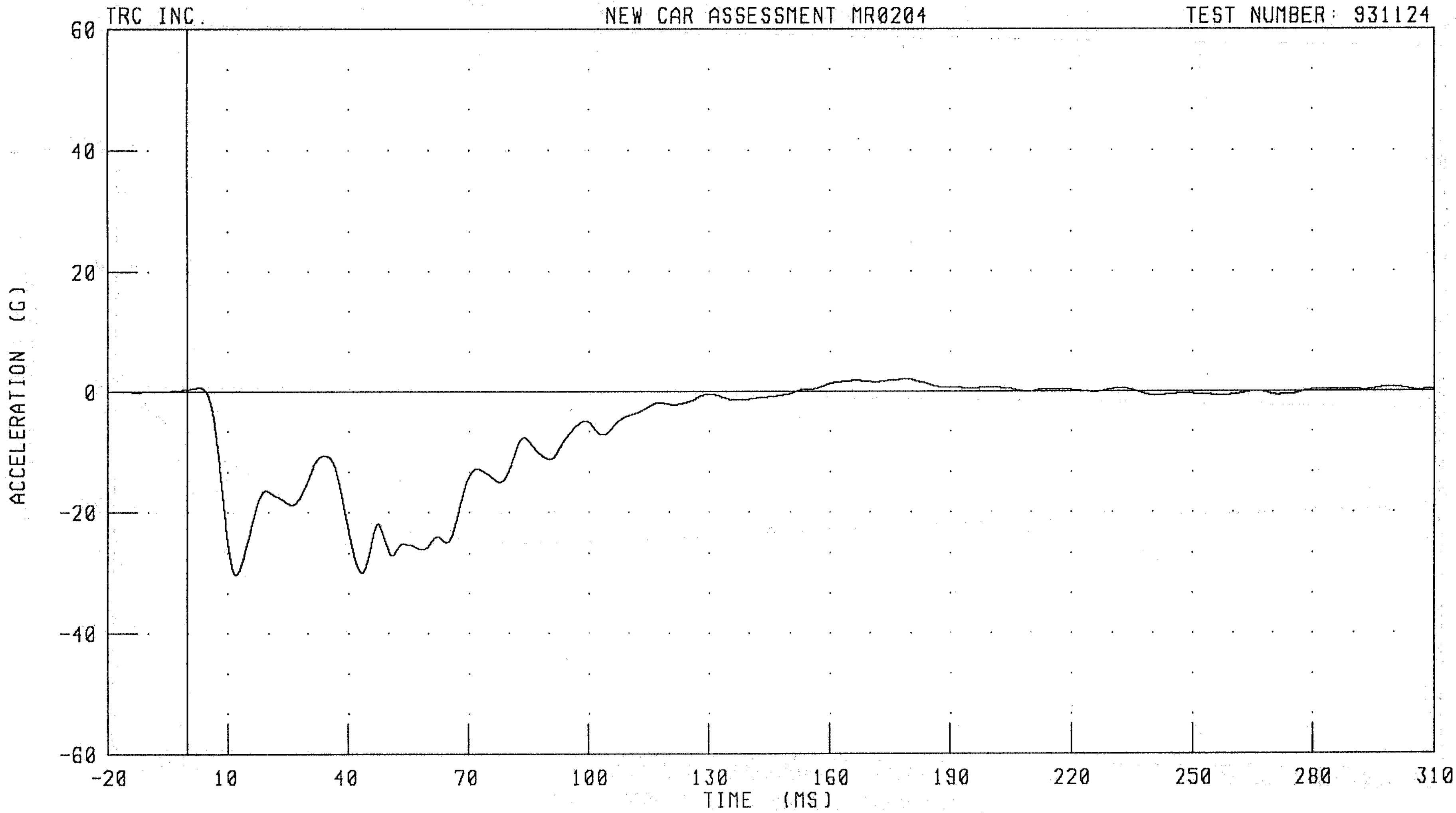
CHANNEL: TLRXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.24 KM/H @ 4.08 MS; -6.12 KM/H @ 150.08 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT
NEW CAR ASSESSMENT MR0204

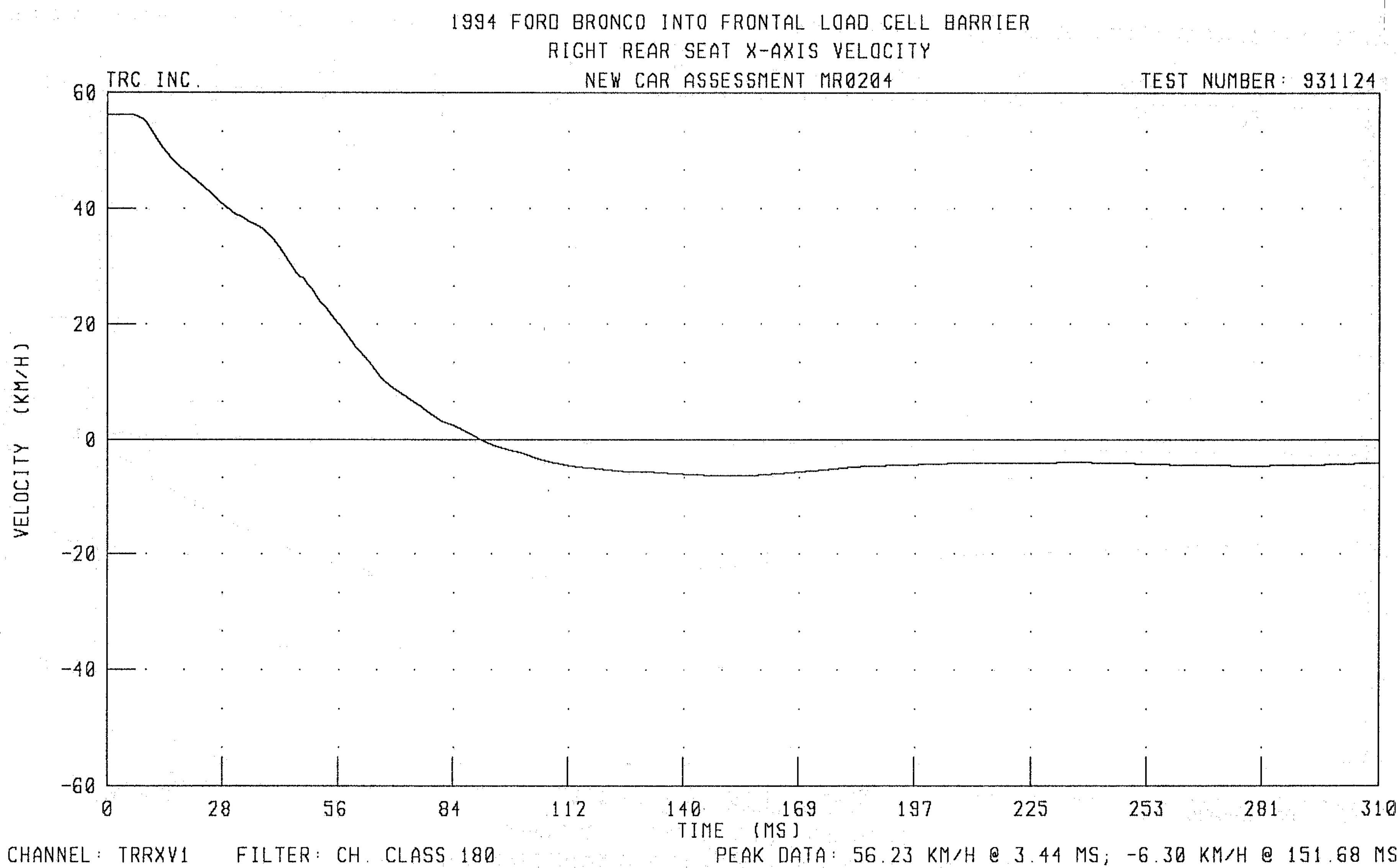


CHANNEL: TLRXD1 FILTER: CH. CLASS 180 PEAK DATA: 746.79 MM @ 96.72 MS; 0.00 MM @ 0.00 MS

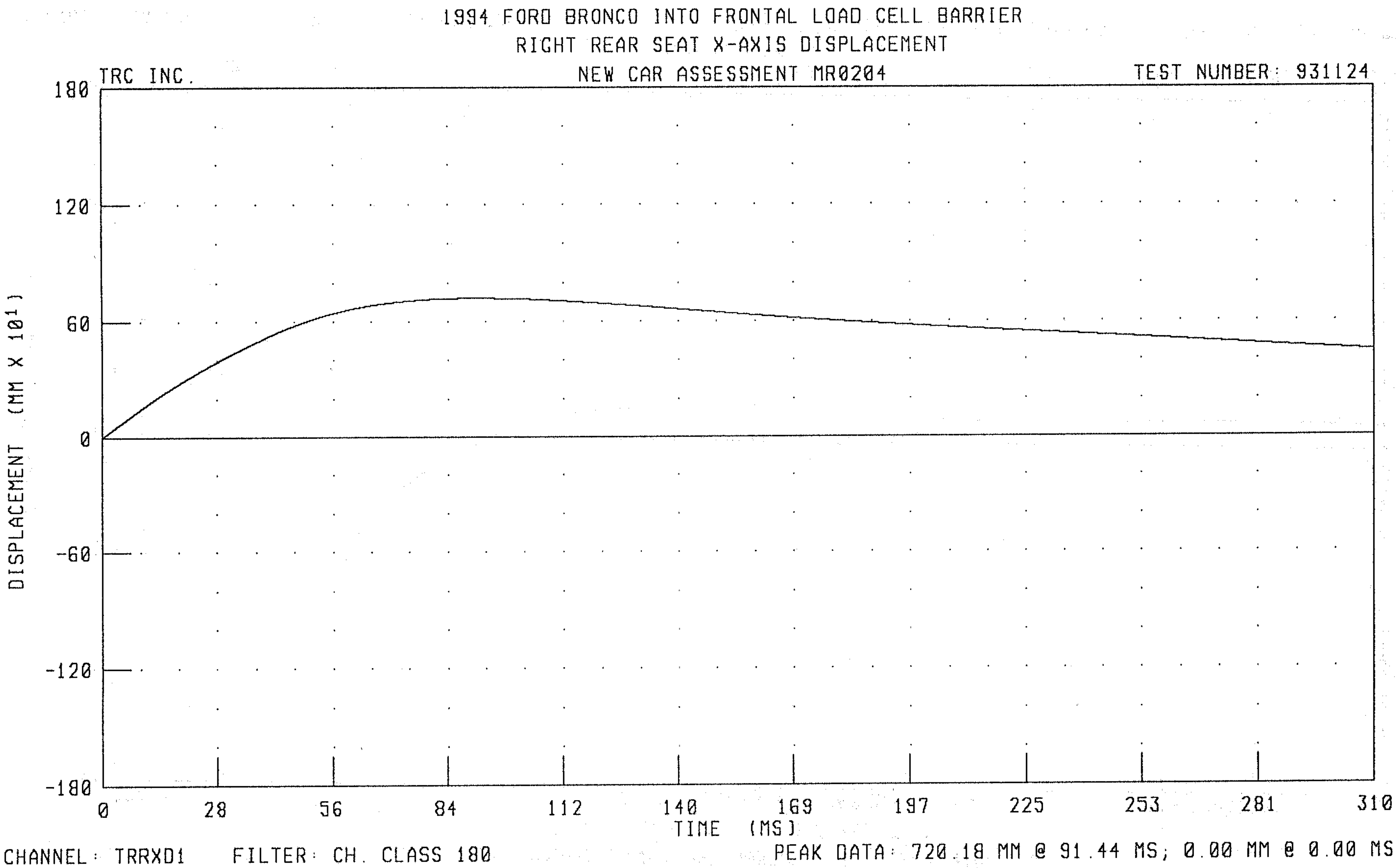
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



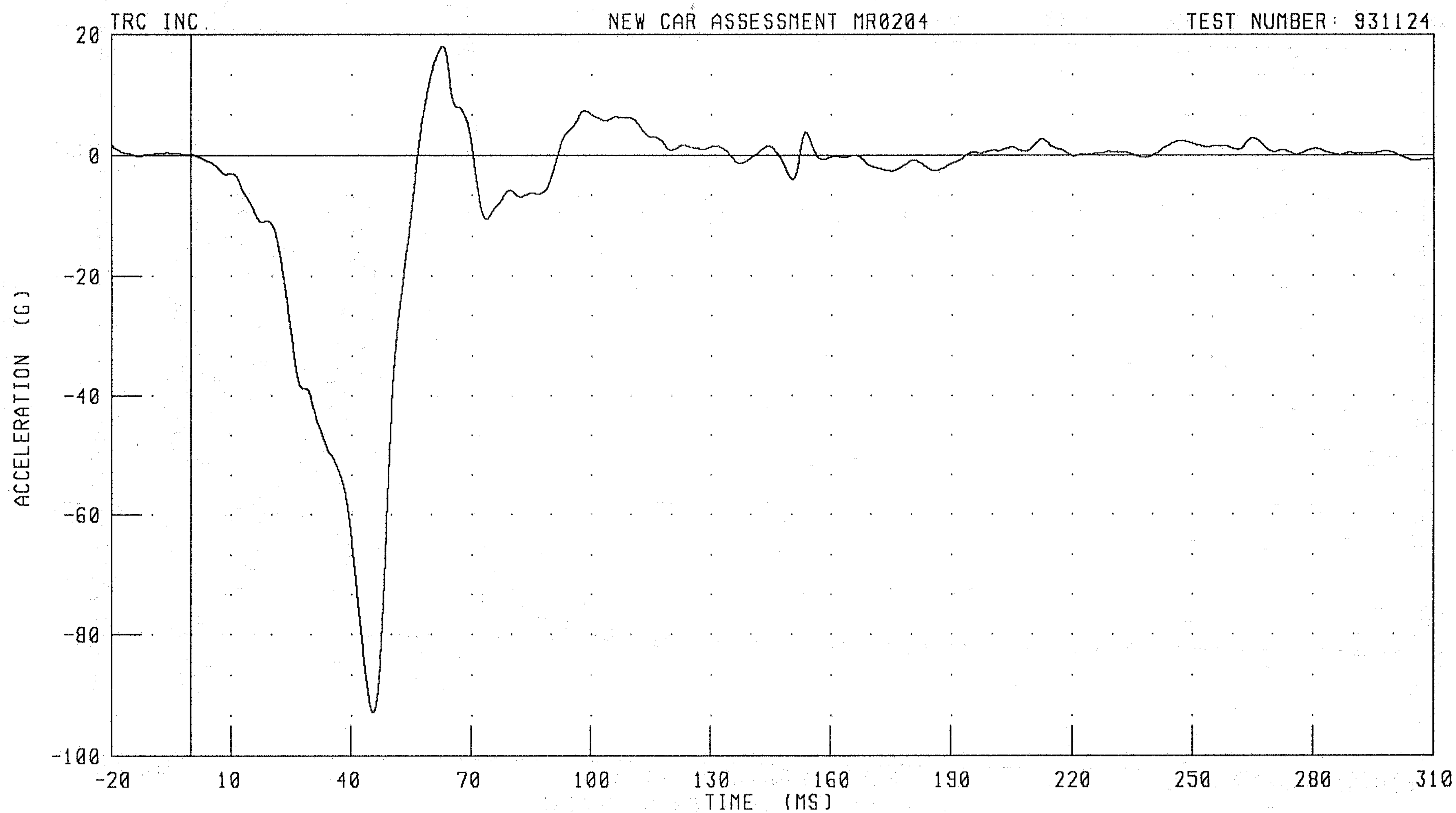
CHANNEL: TRRXG1 FILTER: CH. CLASS 60 PEAK DATA: 2.10 G @ 178.80 MS; -30.25 G @ 12.08 MS



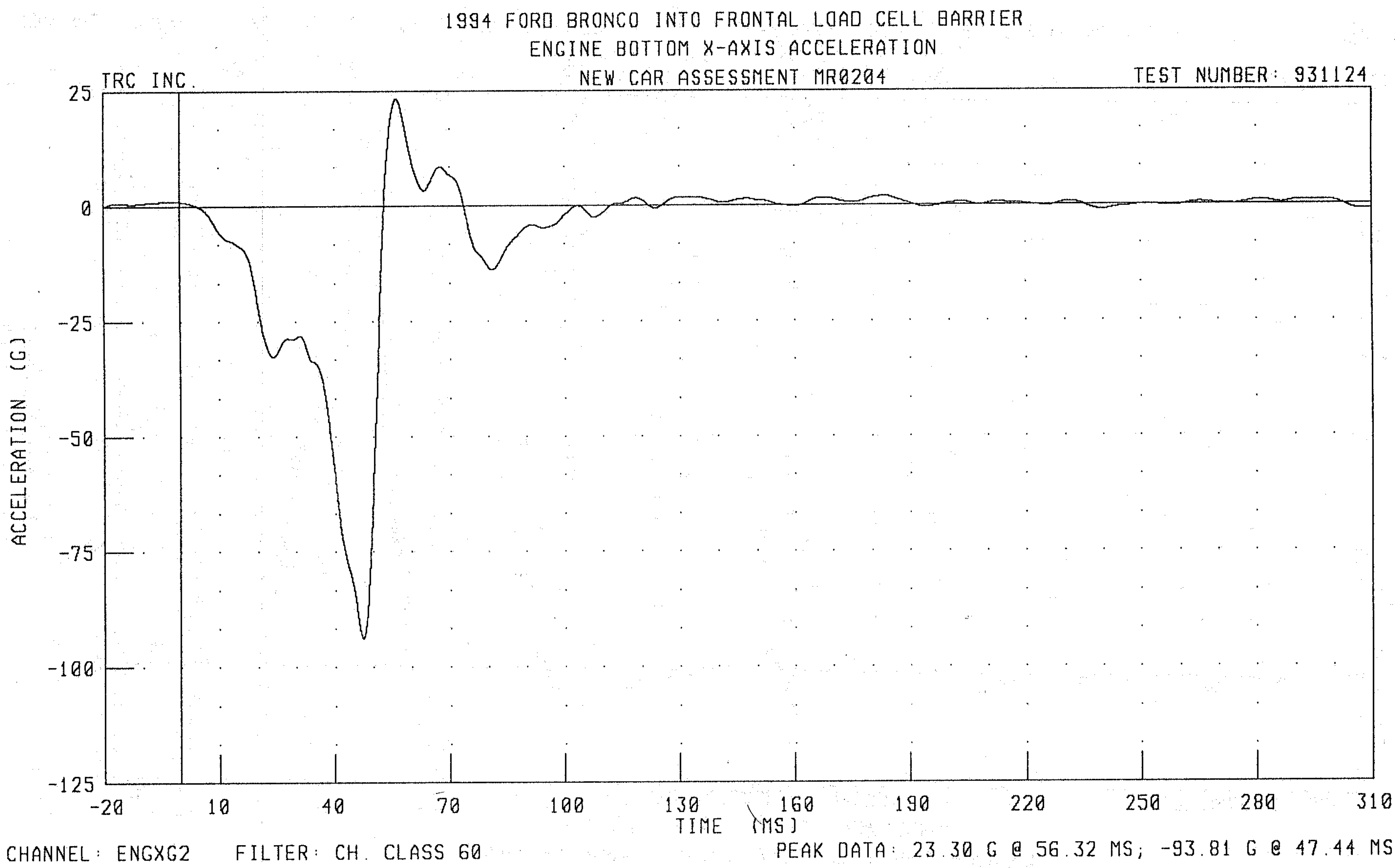
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
60
40
20
0
-20
-40
-60
VELOCITY (KM/H)
0
28
56
84
112
140
169
197
225
253
281
310
TIME (MS)
CHANNEL: TRRXV1
FILTER: CH. CLASS 180
PEAK DATA: 56.23 KM/H @ 3.44 MS; -6.30 KM/H @ 151.68 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
DISPLACEMENT (MM X 10¹)
180
120
60
0
-60
-120
-180
0
28
56
84
112
140
169
197
225
253
281
310
TIME (MS)
CHANNEL: TRRXD1
FILTER: CH. CLASS 180
PEAK DATA: 720.18 MM @ 91.44 MS; 0.00 MM @ 0.00 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



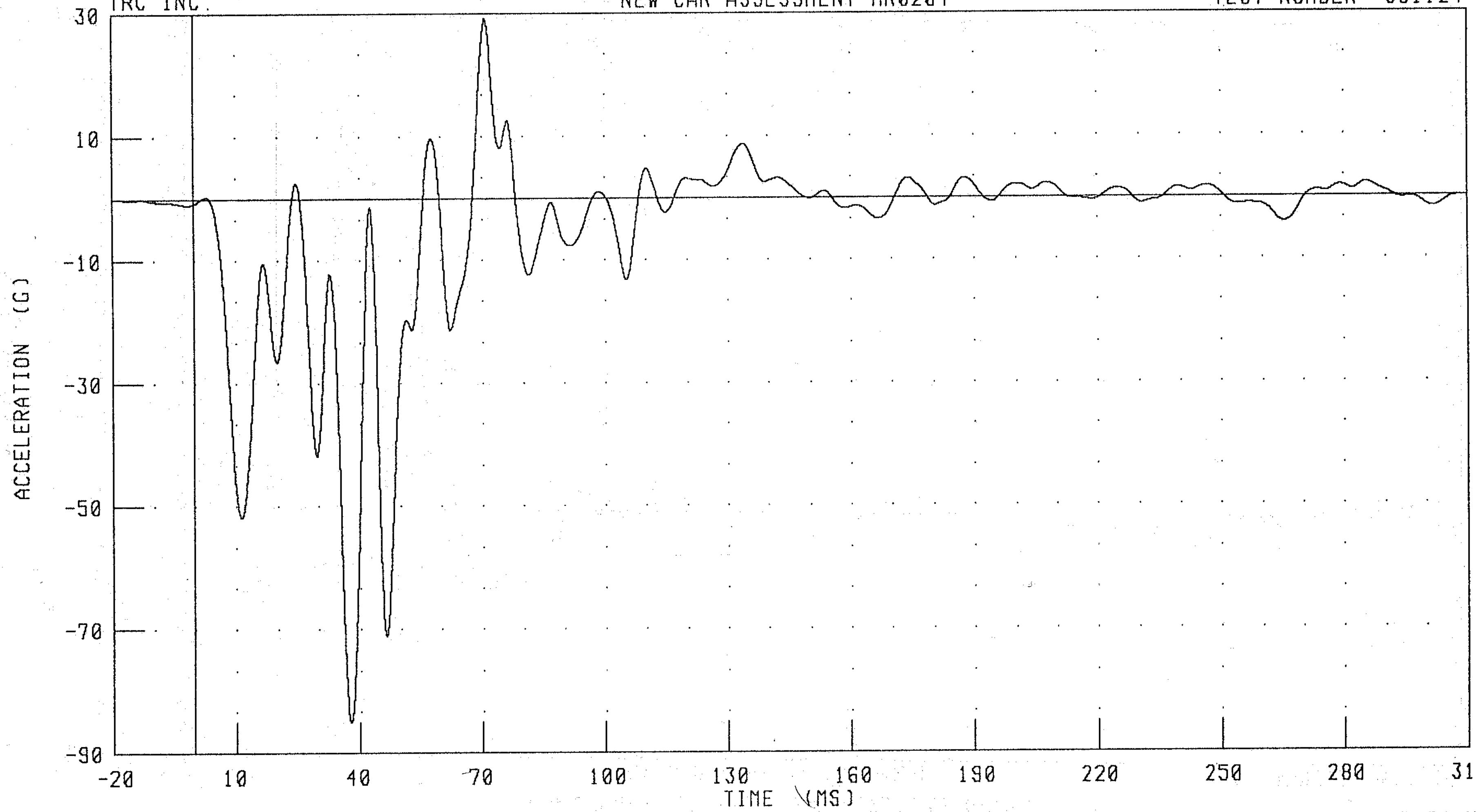
CHANNEL: ENGXG1 FILTER: CH. CLASS 60 PEAK DATA: 18.18 G @ 62.80 MS; -92.87 G @ 45.68 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
ACCELERATION (G)
25
0
-25
-50
-75
-100
-125
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG2
FILTER: CH. CLASS 60
PEAK DATA: 23.30 G @ 56.32 MS; -93.81 G @ 47.44 MS

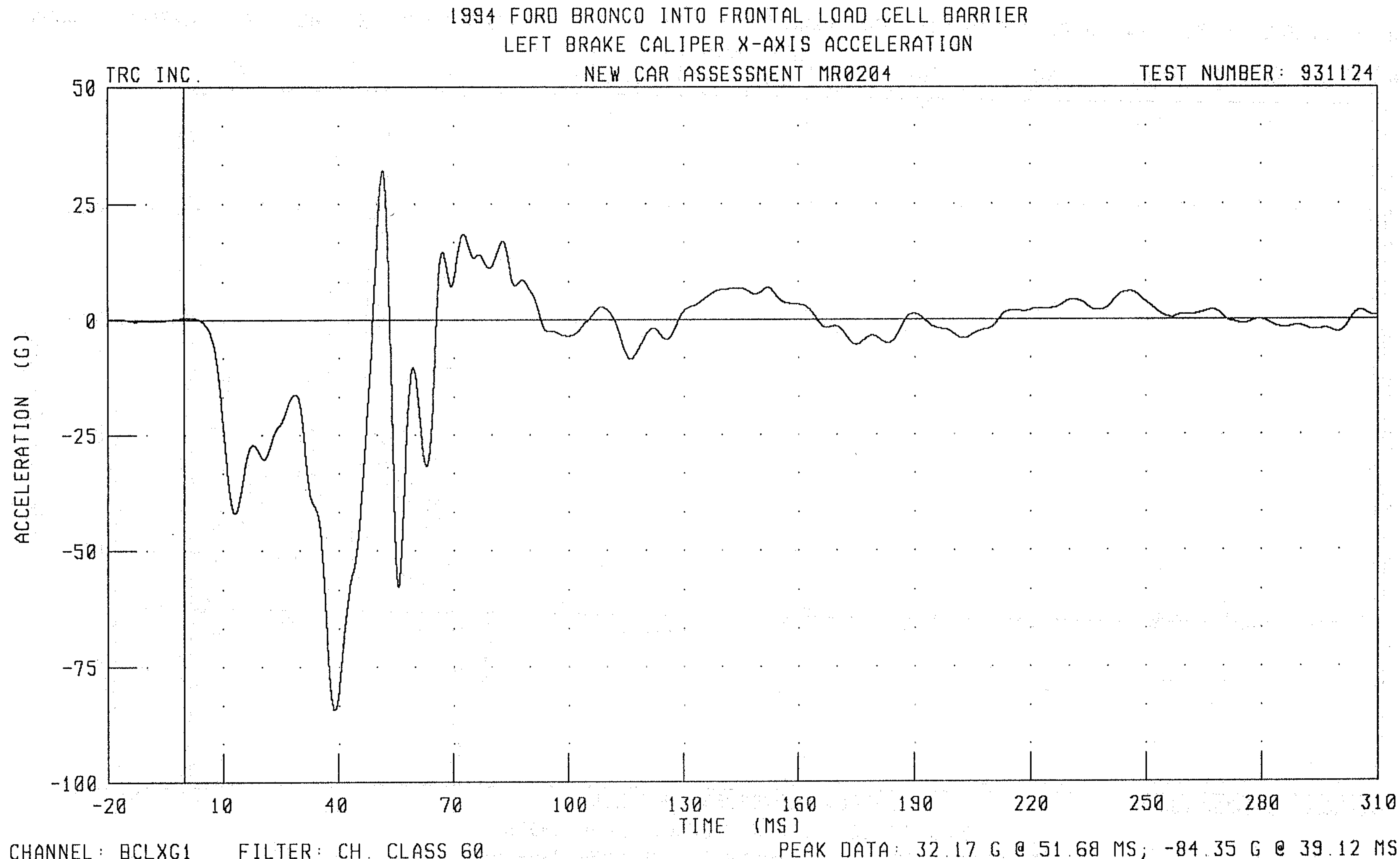
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

TRC INC.

TEST NUMBER: 931124

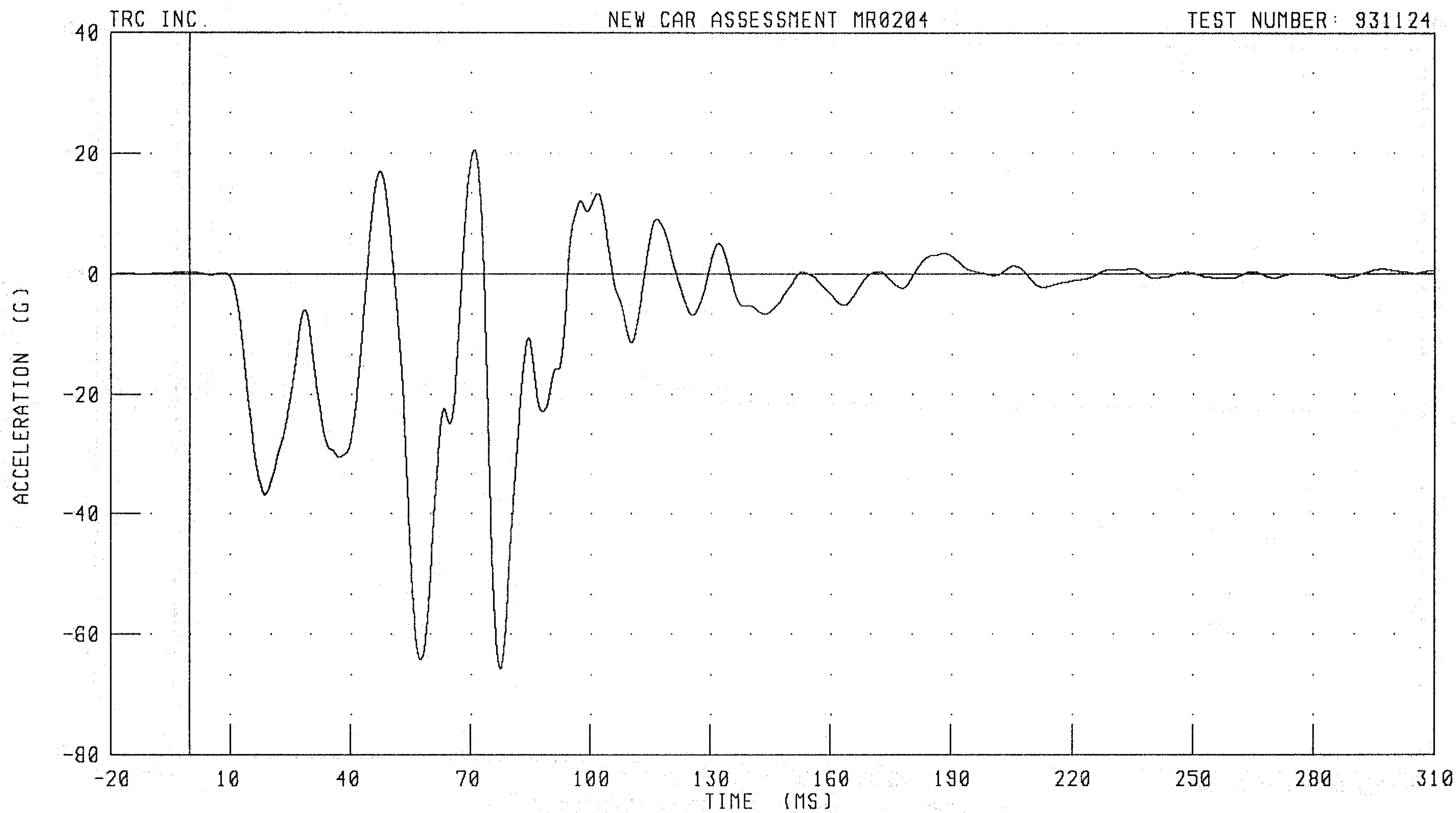


CHANNEL: BCRXG1 FILTER: CH. CLASS 60 PEAK DATA: 29.04 G @ 70.88 MS; -85.07 G @ 37.84 MS



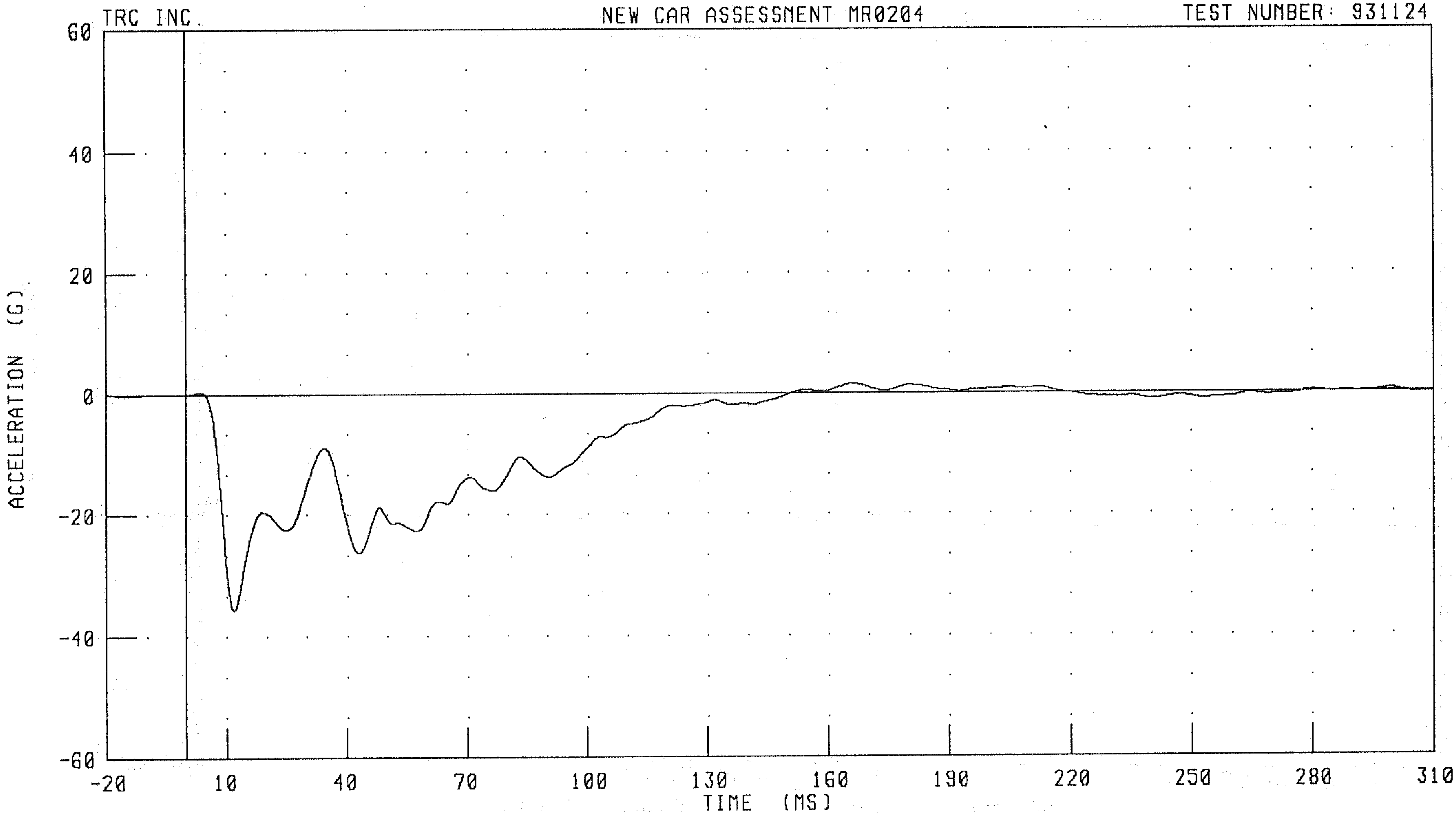
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
ACCELERATION (G)
50
25
0
-25
-50
-75
-100
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCLXG1
FILTER: CH. CLASS 60
PEAK DATA: 32.17 G @ 51.68 MS; -84.35 G @ 39.12 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204

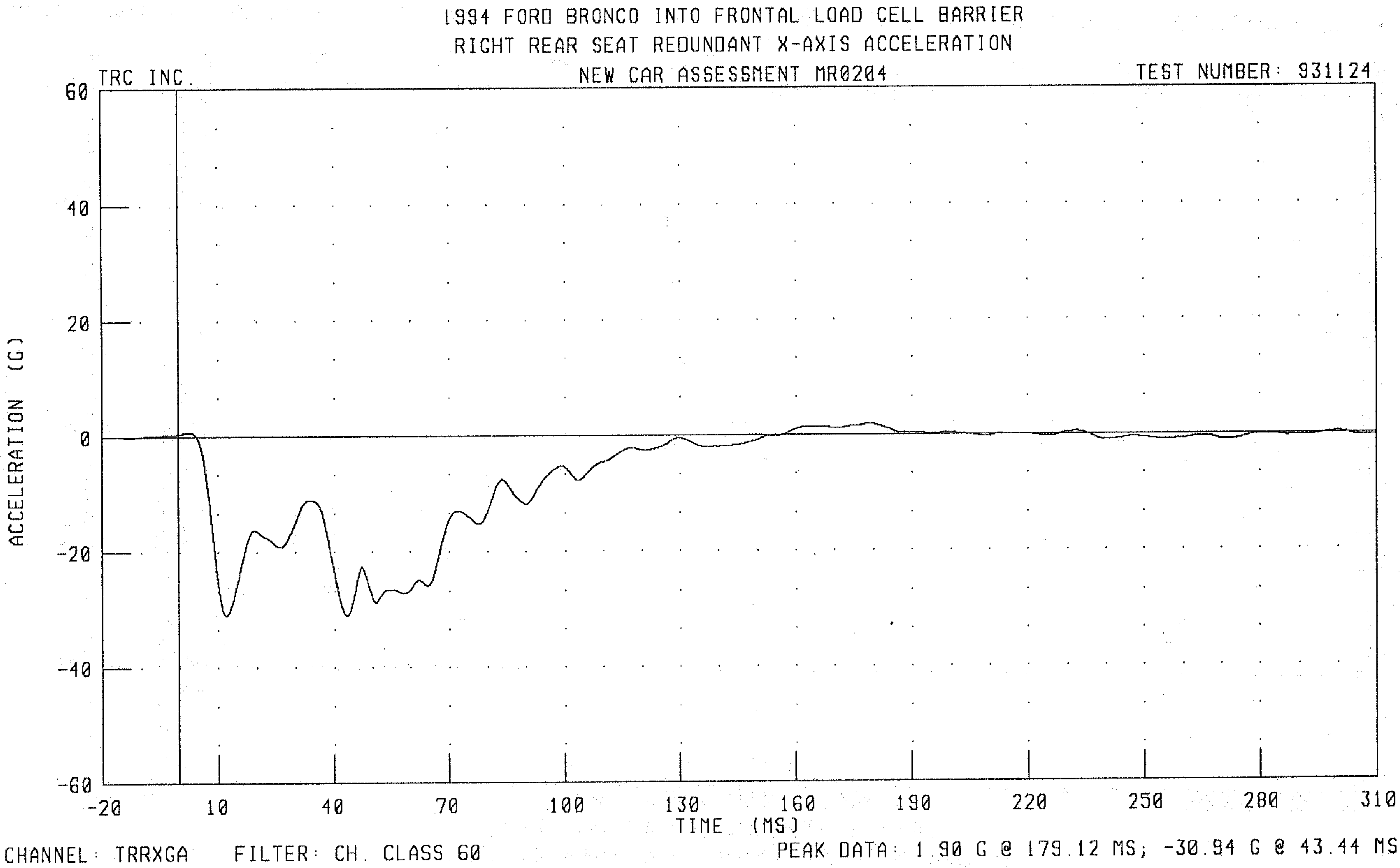


CHANNEL: DPCXG1 FILTER: CH. CLASS 60 PEAK DATA: 20.55 G @ 70.96 MS; -65.67 G @ 77.52 MS

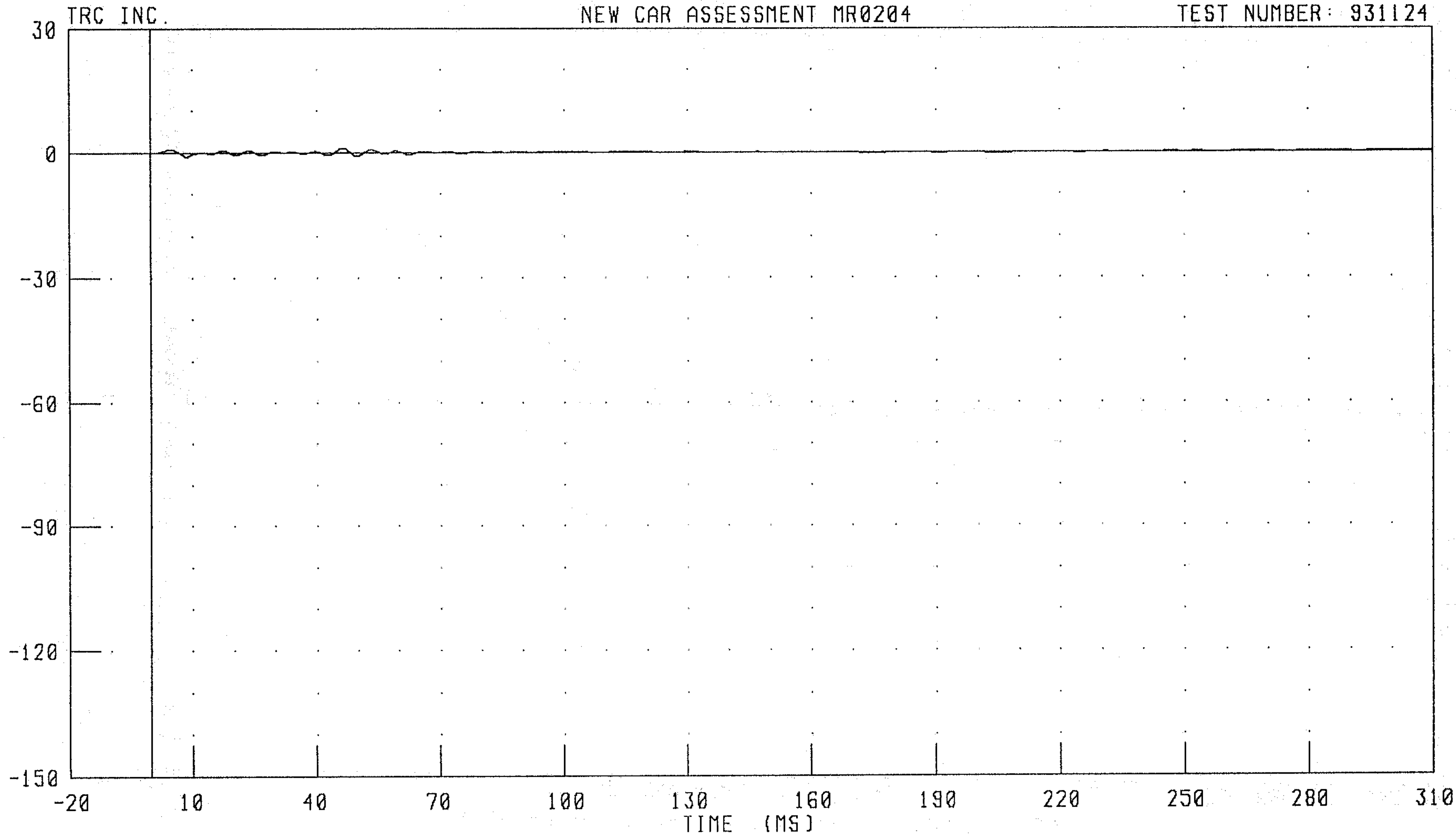
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204



CHANNEL: TLRXGA FILTER: CH. CLASS 60 PEAK DATA: 1.57 G @ 166.00 MS; -35.63 G @ 11.84 MS

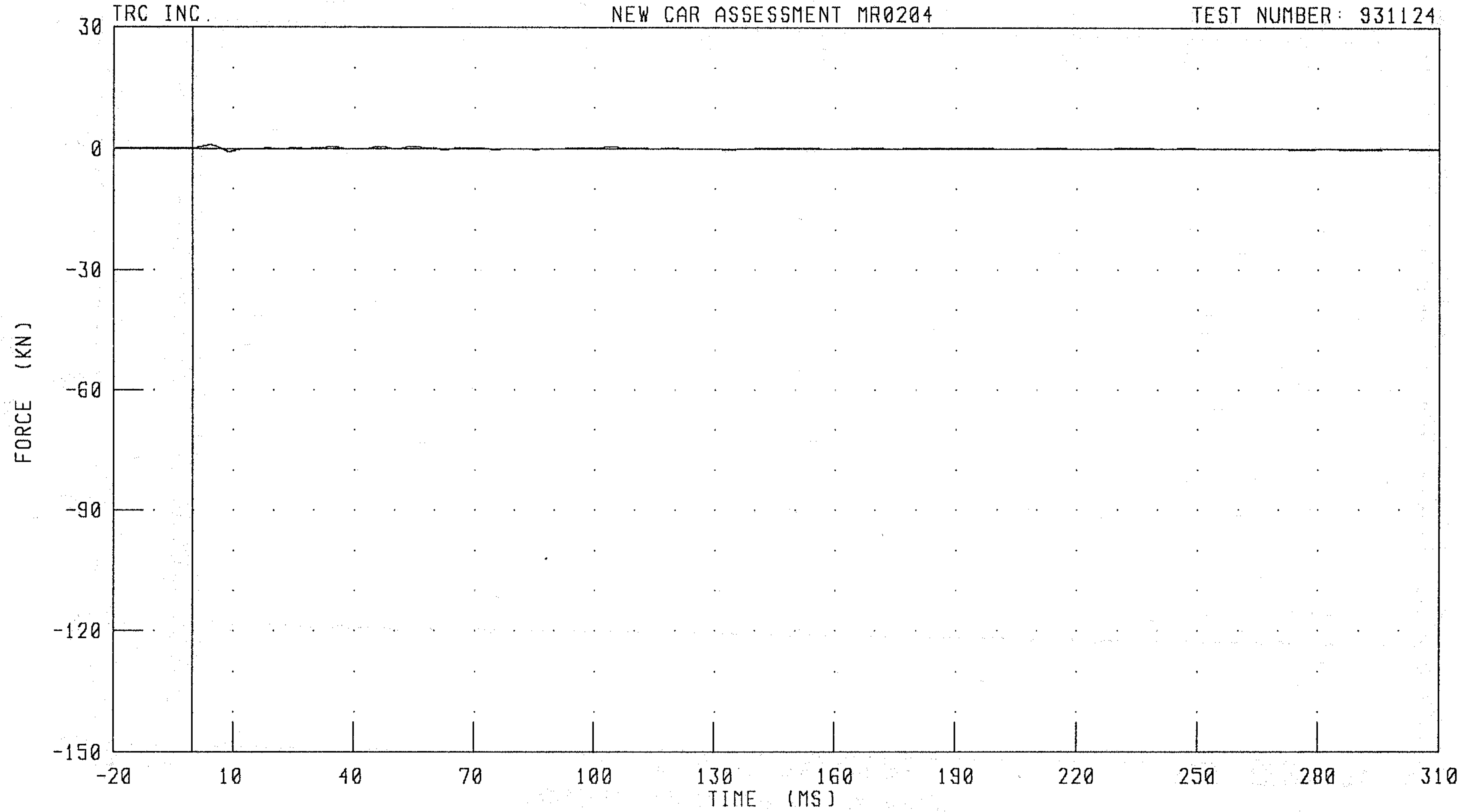

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TRRXGA
FILTER: CH. CLASS 60
PEAK DATA: 1.90 G @ 179.12 MS; -30.94 G @ 43.44 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE
NEW CAR ASSESSMENT MR0204



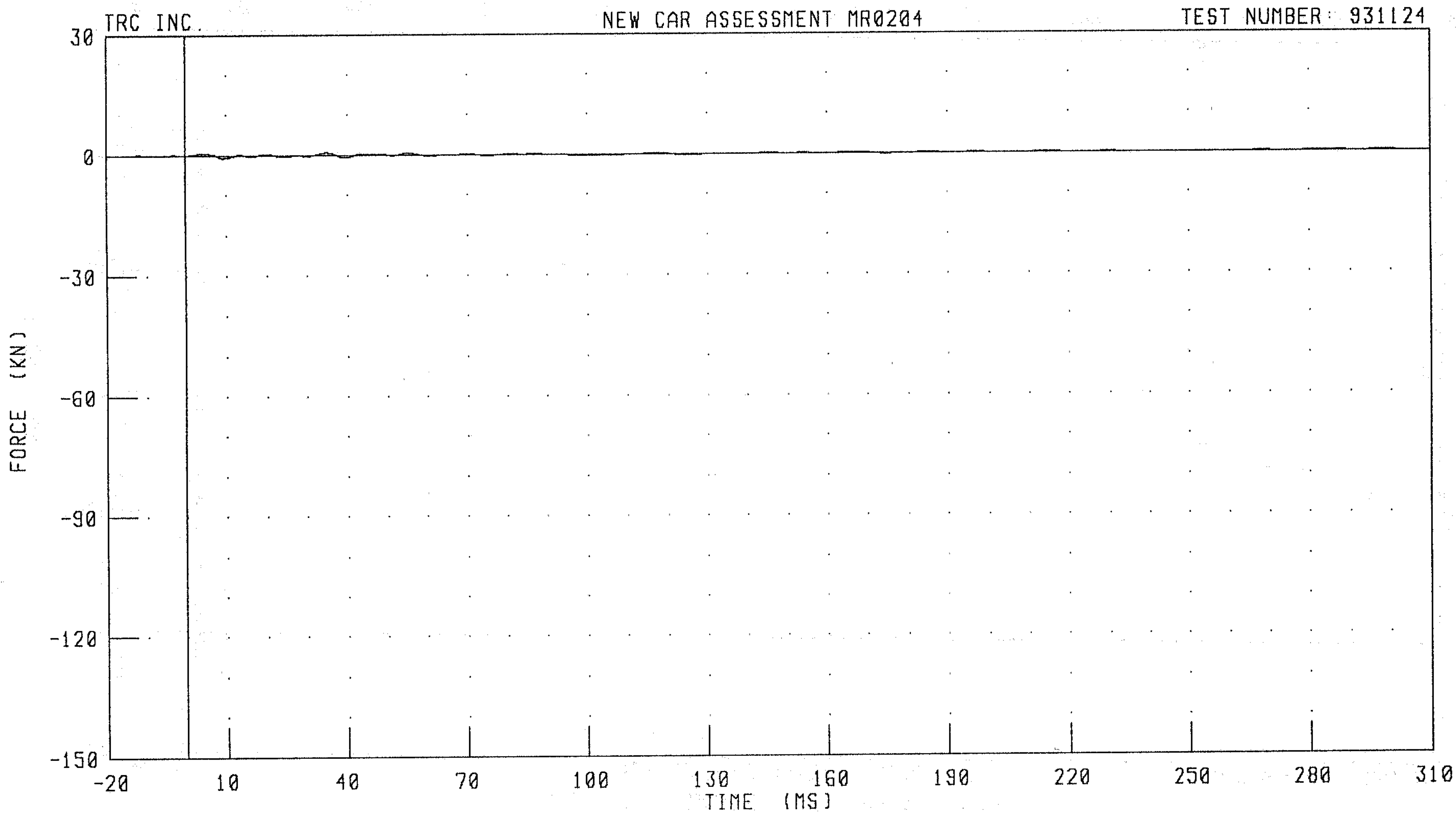
CHANNEL: BA1F FILTER: CH. CLASS 60 PEAK DATA: 1.08 KN @ 46.40 MS; -0.97 KN @ 8.72 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE
NEW CAR ASSESSMENT MR0204



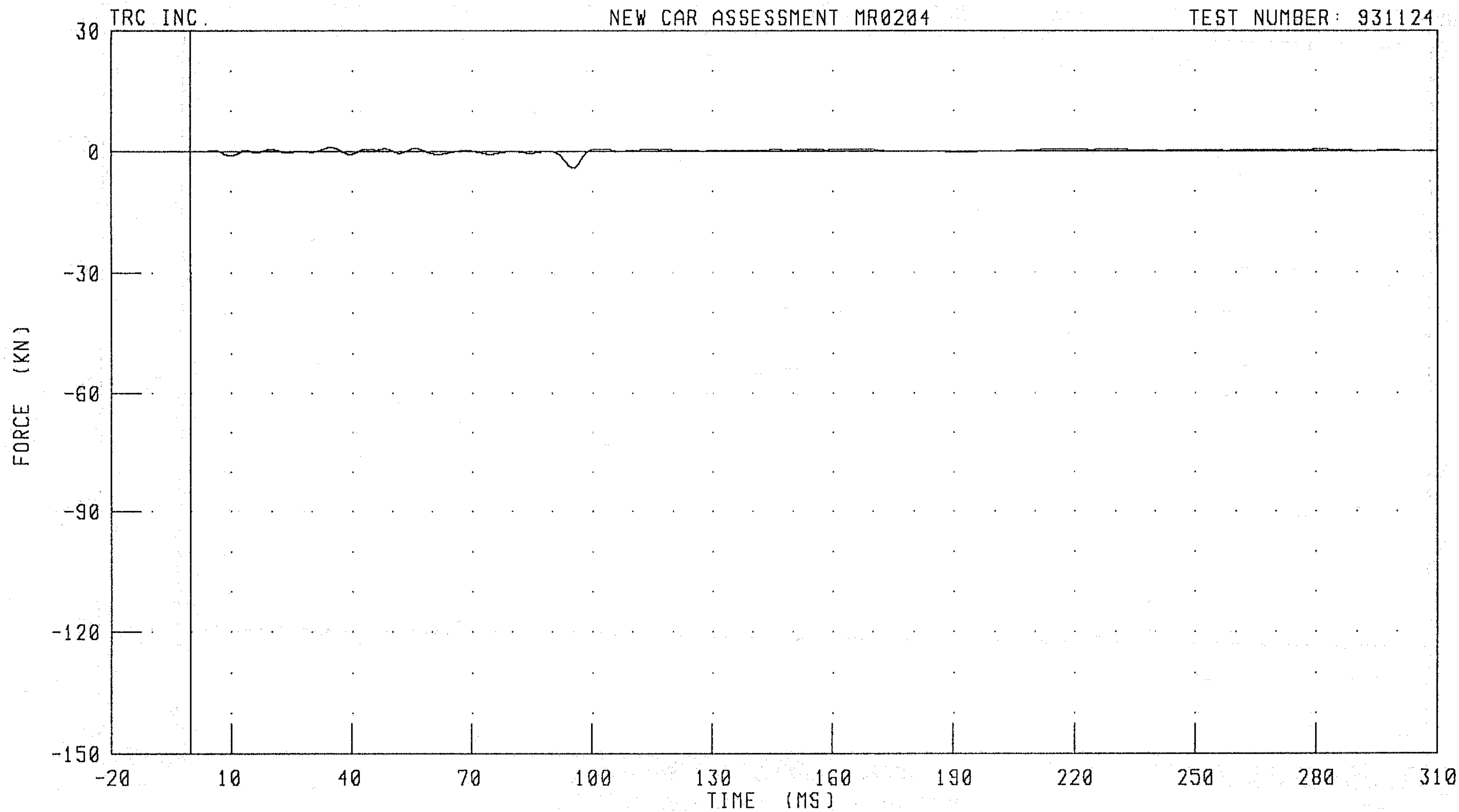
CHANNEL: BA2F FILTER: CH. CLASS 60 PEAK DATA: 0.87 KN @ 4.16 MS; -0.73 KN @ 8.96 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE
NEW CAR ASSESSMENT MR0204

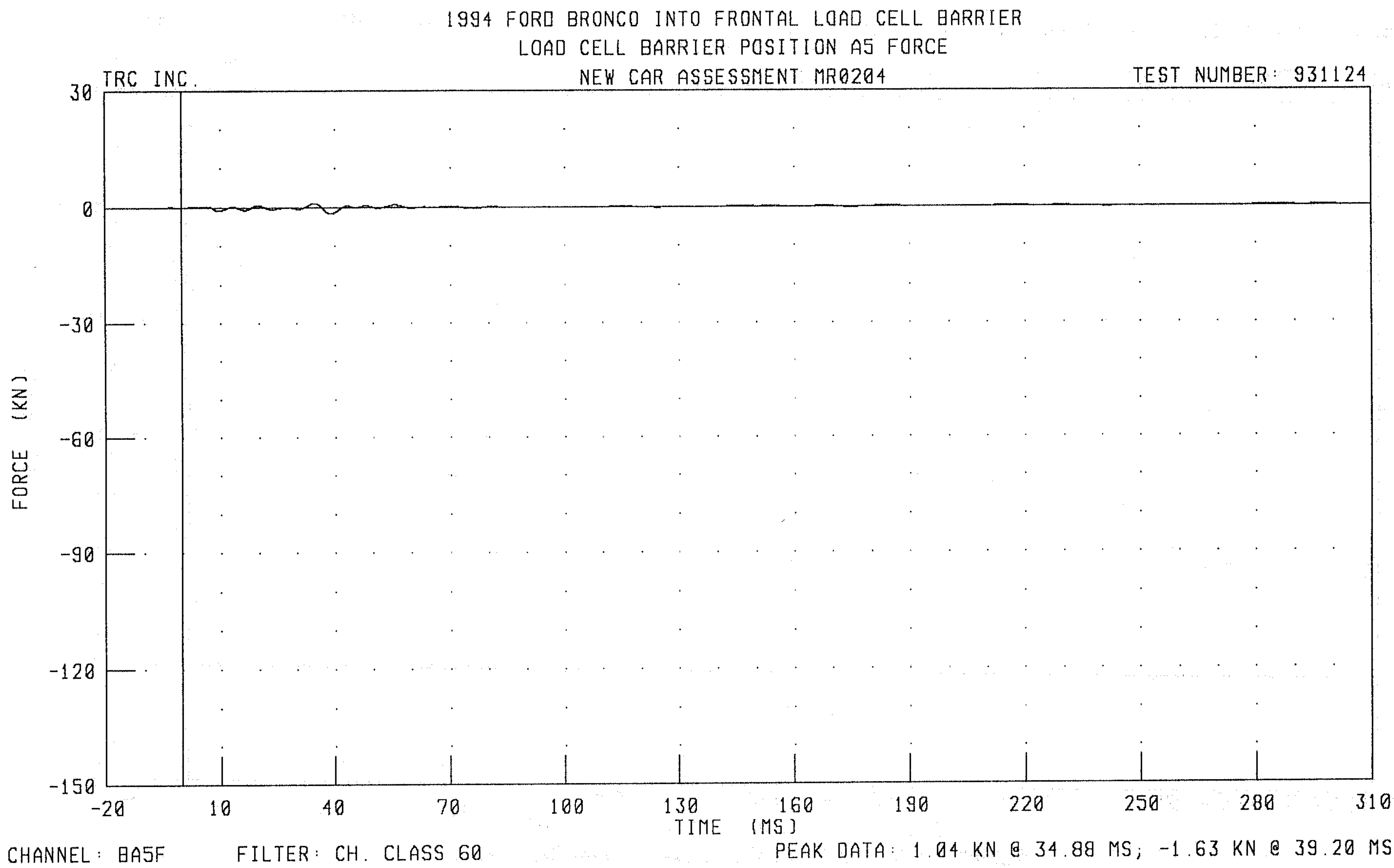


CHANNEL: BA3F FILTER: CH. CLASS 60 PEAK DATA: 0.61 KN @ 35.12 MS; -0.69 KN @ 9.36 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE
NEW CAR ASSESSMENT MR0204

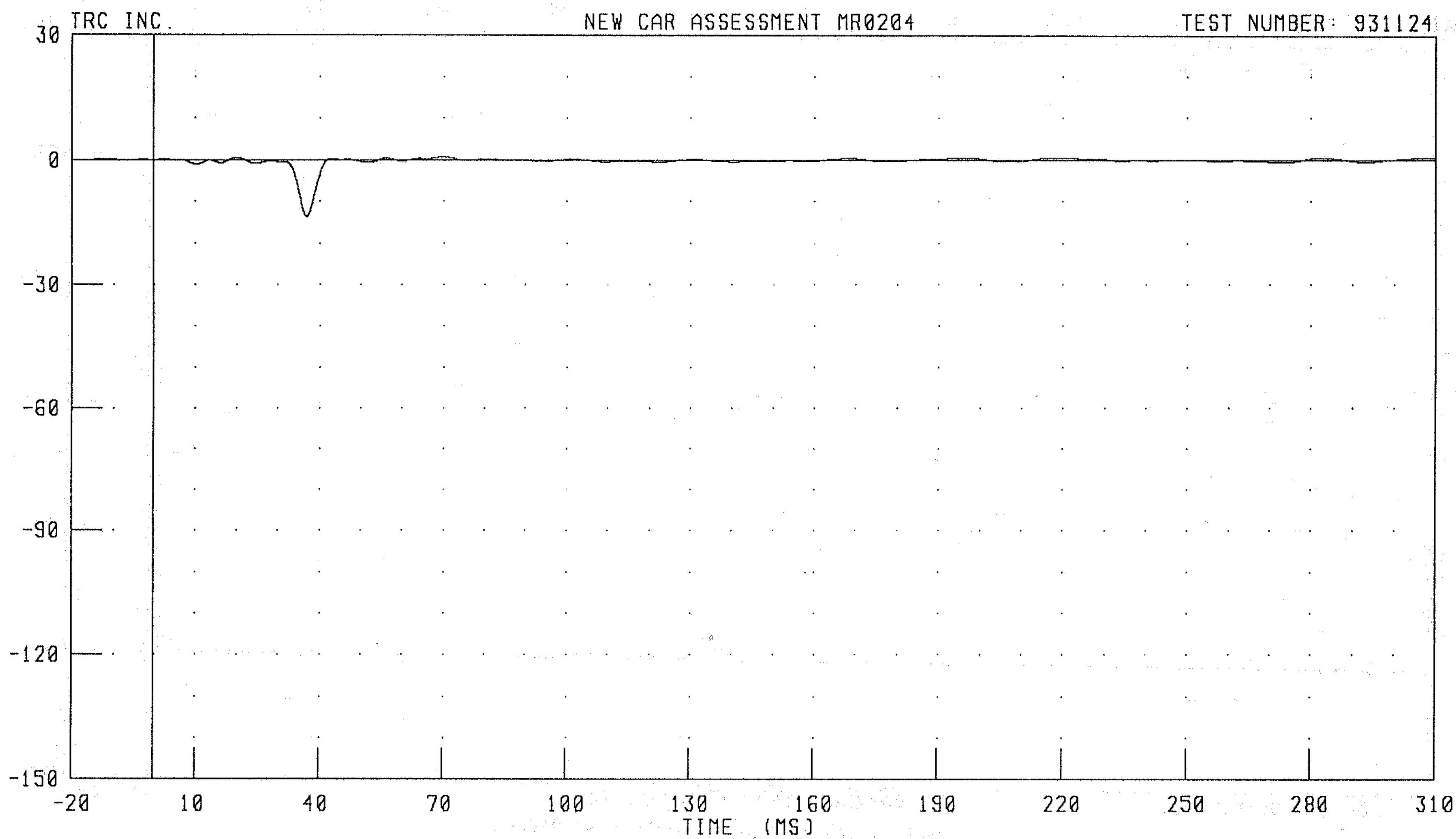


CHANNEL: BA4F FILTER: CH. CLASS 60 PEAK DATA: 1.01 KN @ 34.80 MS; -4.15 KN @ 95.28 MS



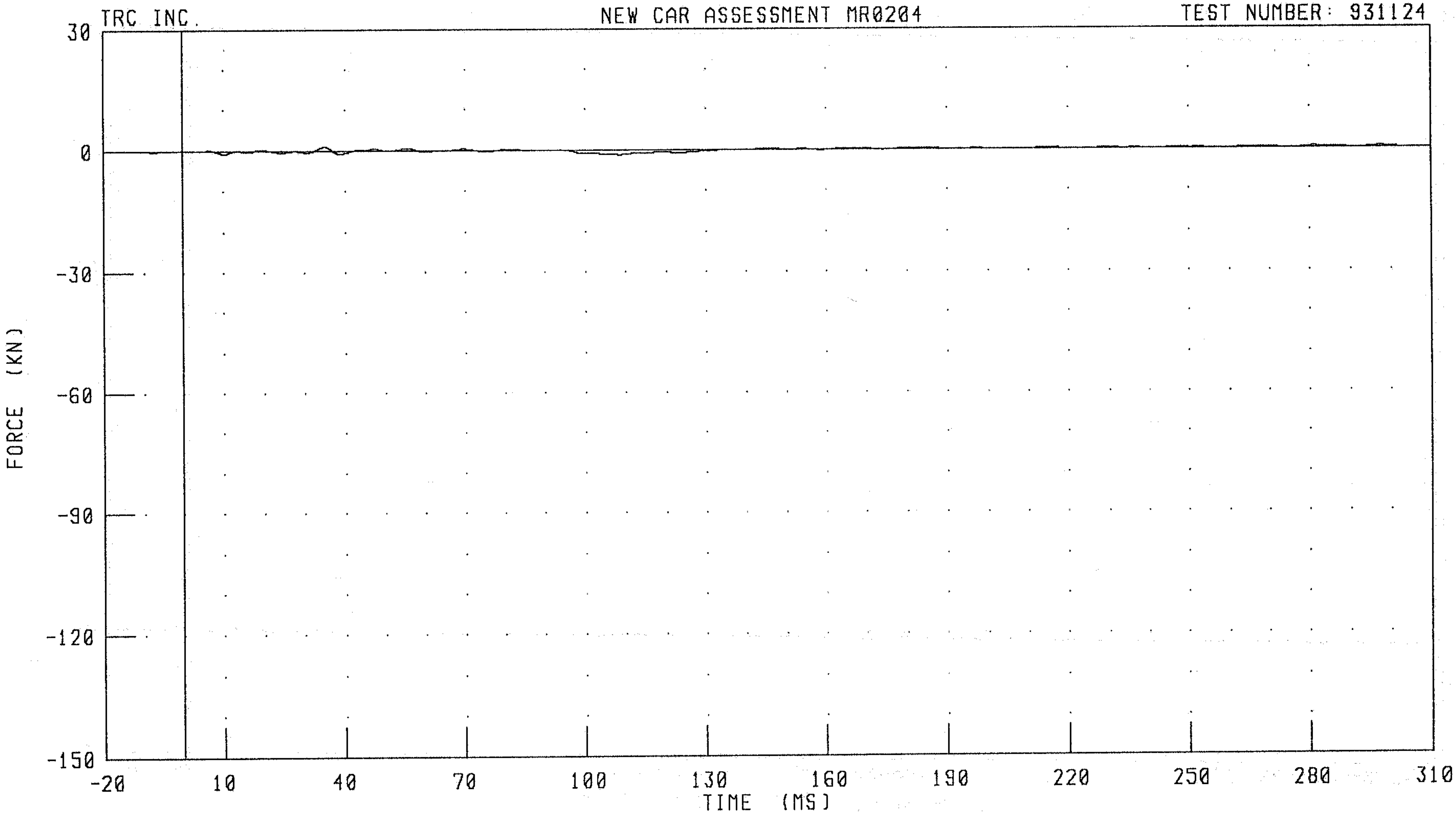
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA5F
FILTER: CH. CLASS 60
PEAK DATA: 1.04 KN @ 34.88 MS; -1.63 KN @ 39.20 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE
NEW CAR ASSESSMENT MR0204



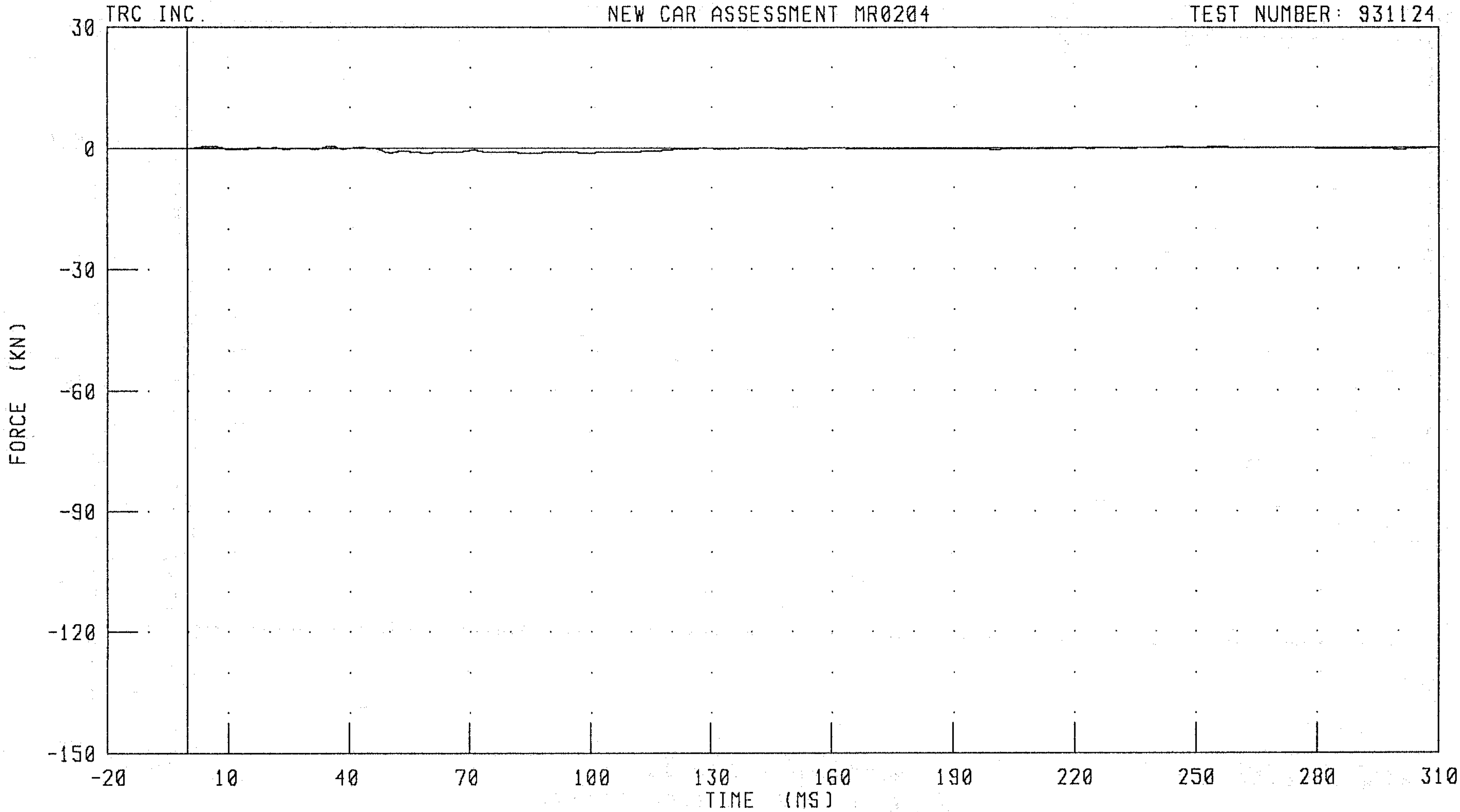
CHANNEL: BA6F FILTER: CH. CLASS 60 PEAK DATA: 0.72 KN @ 70.08 MS; -13.71 KN @ 37.04 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE
NEW CAR ASSESSMENT MR0204



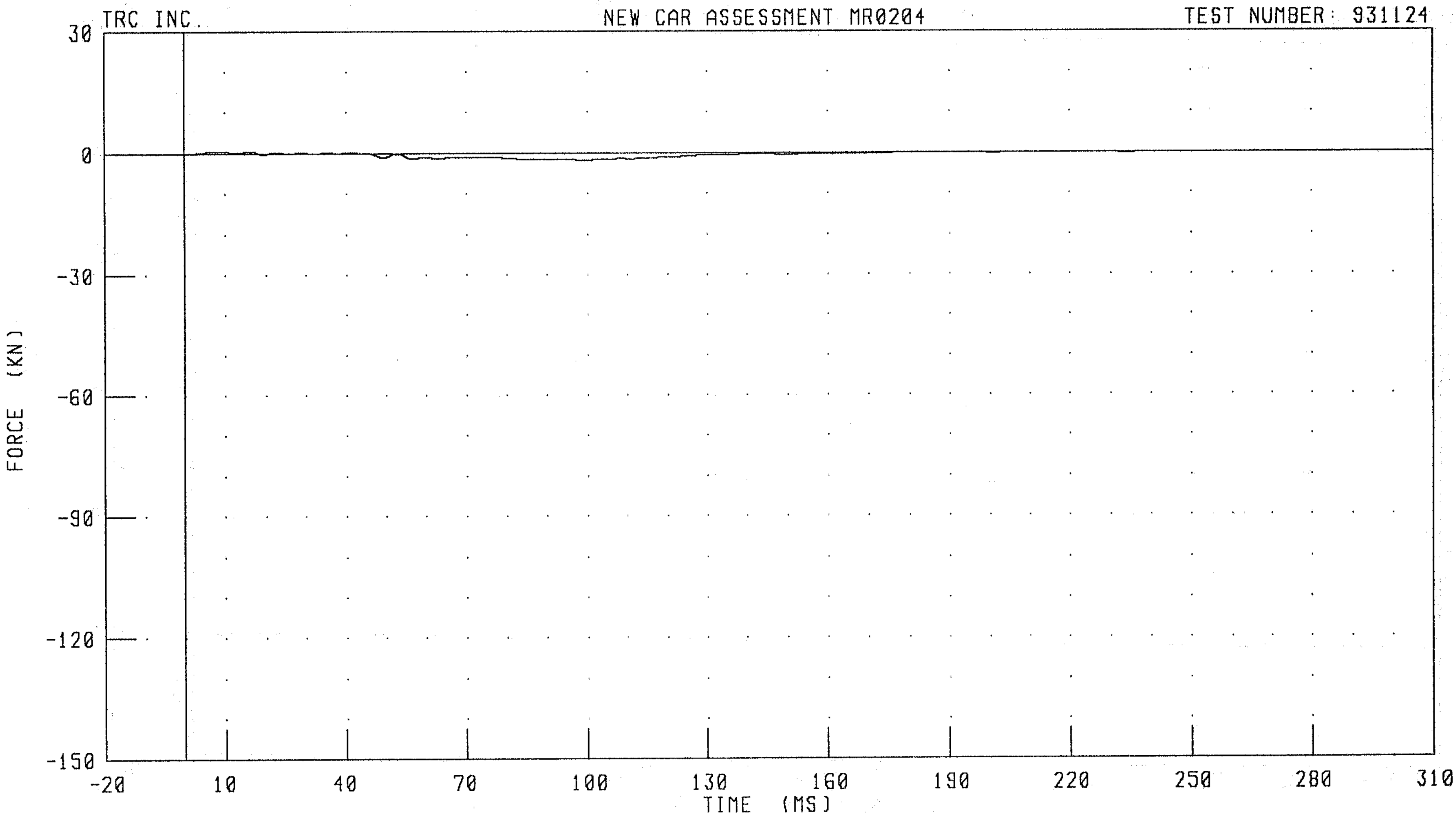
CHANNEL: BA7F FILTER: CH. CLASS 60 PEAK DATA: 0.89 KN @ 35.20 MS; -1.20 KN @ 108.88 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE
NEW CAR ASSESSMENT MR0204



CHANNEL: BA8F FILTER: CH. CLASS 60 PEAK DATA: 0.55 KN @ 35.52 MS; -1.37 KN @ 99.28 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A9 FORCE
NEW CAR ASSESSMENT MR0204

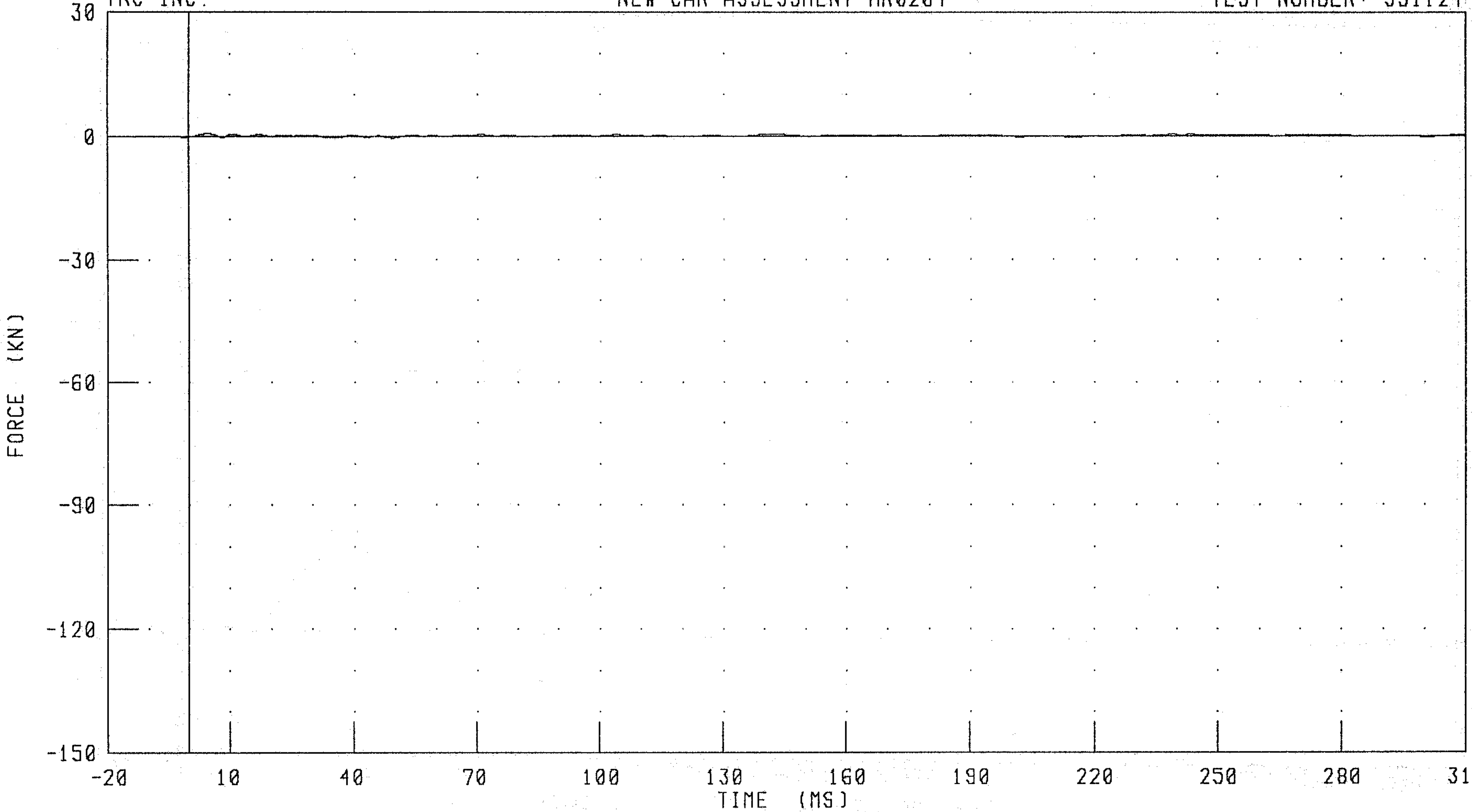


CHANNEL: BA9F FILTER: CH. CLASS 60 PEAK DATA: 0.59 KN @ 16.16 MS; -1.81 KN @ 99.68 MS

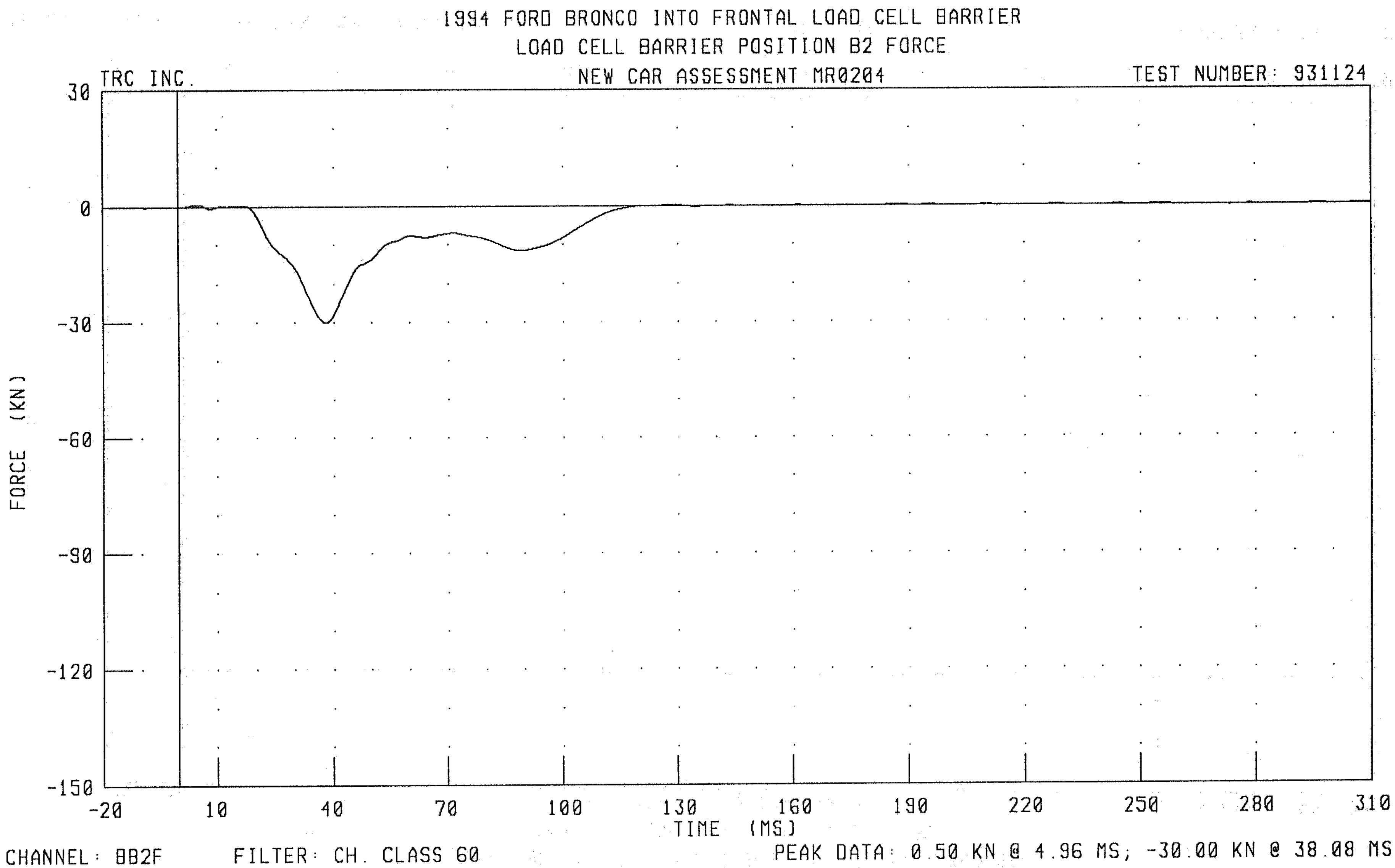
931124

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE
NEW CAR ASSESSMENT MR0204

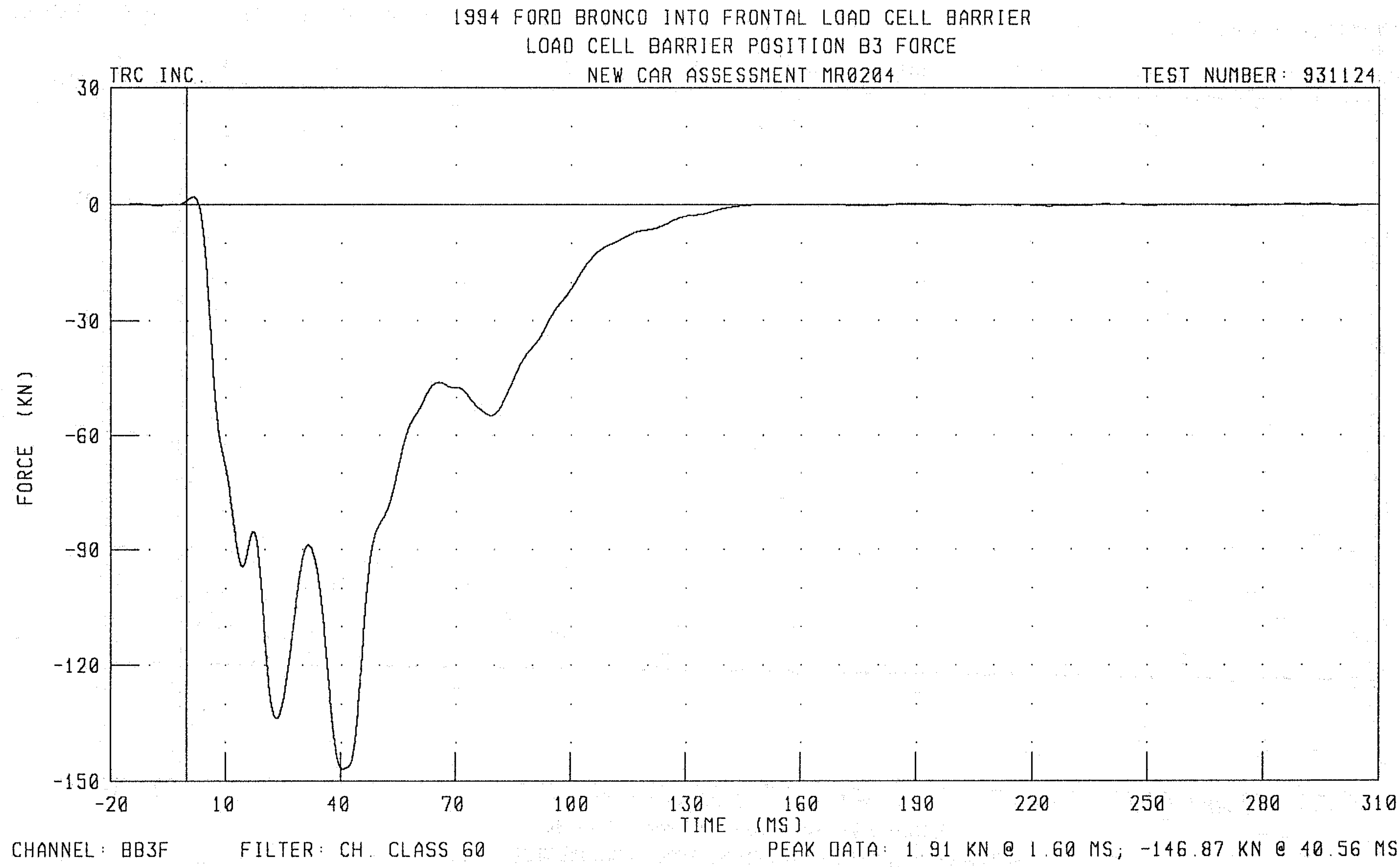
TRC INC. TEST NUMBER: 931124



CHANNEL: BB1F FILTER: CH. CLASS 60 PEAK DATA: 0.66 KN @ 4.56 MS; -0.44 KN @ 49.52 MS

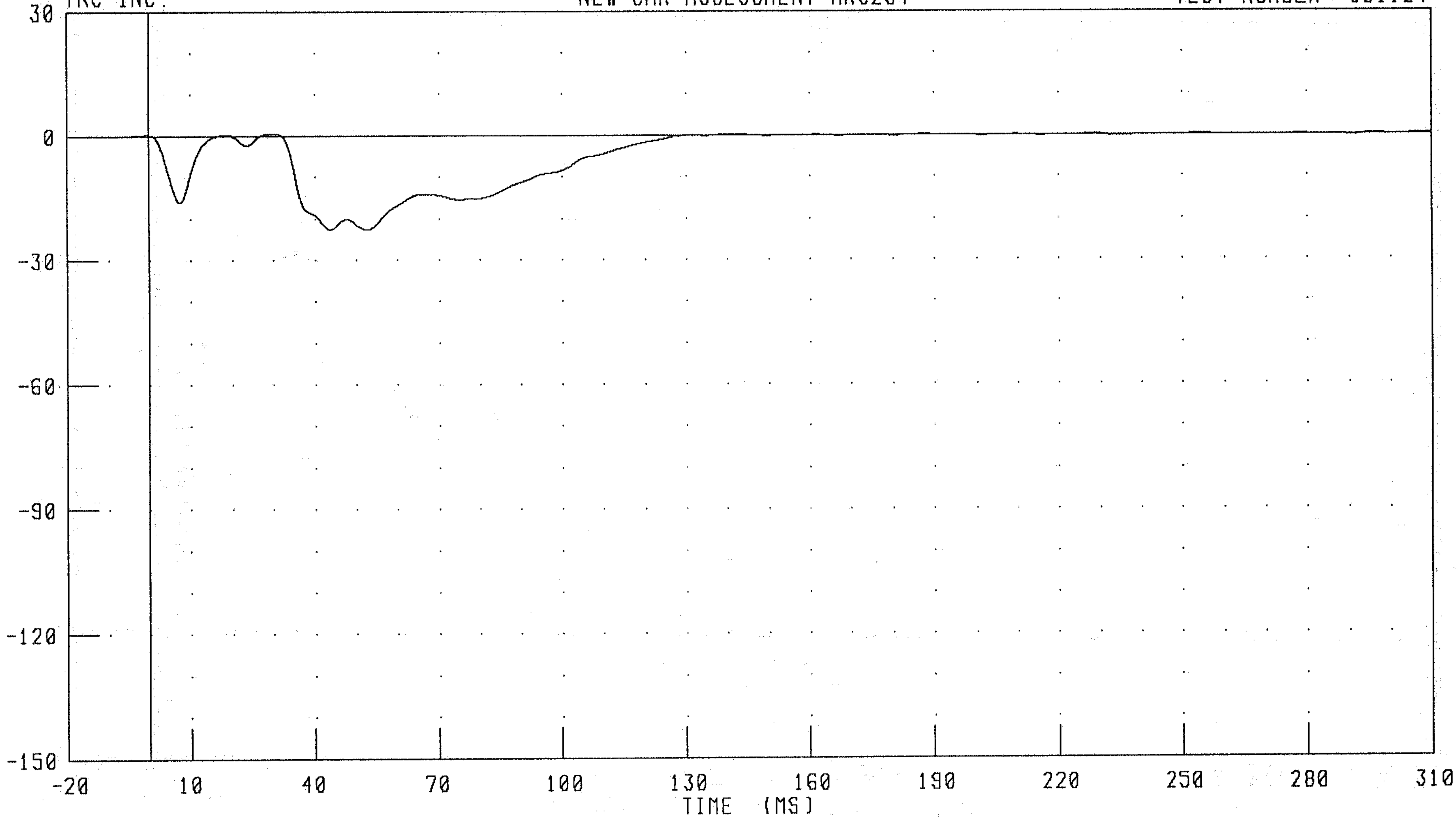

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB2F
FILTER: CH. CLASS 60
PEAK DATA: 0.50 KN @ 4.96 MS; -30.00 KN @ 38.08 MS

931124

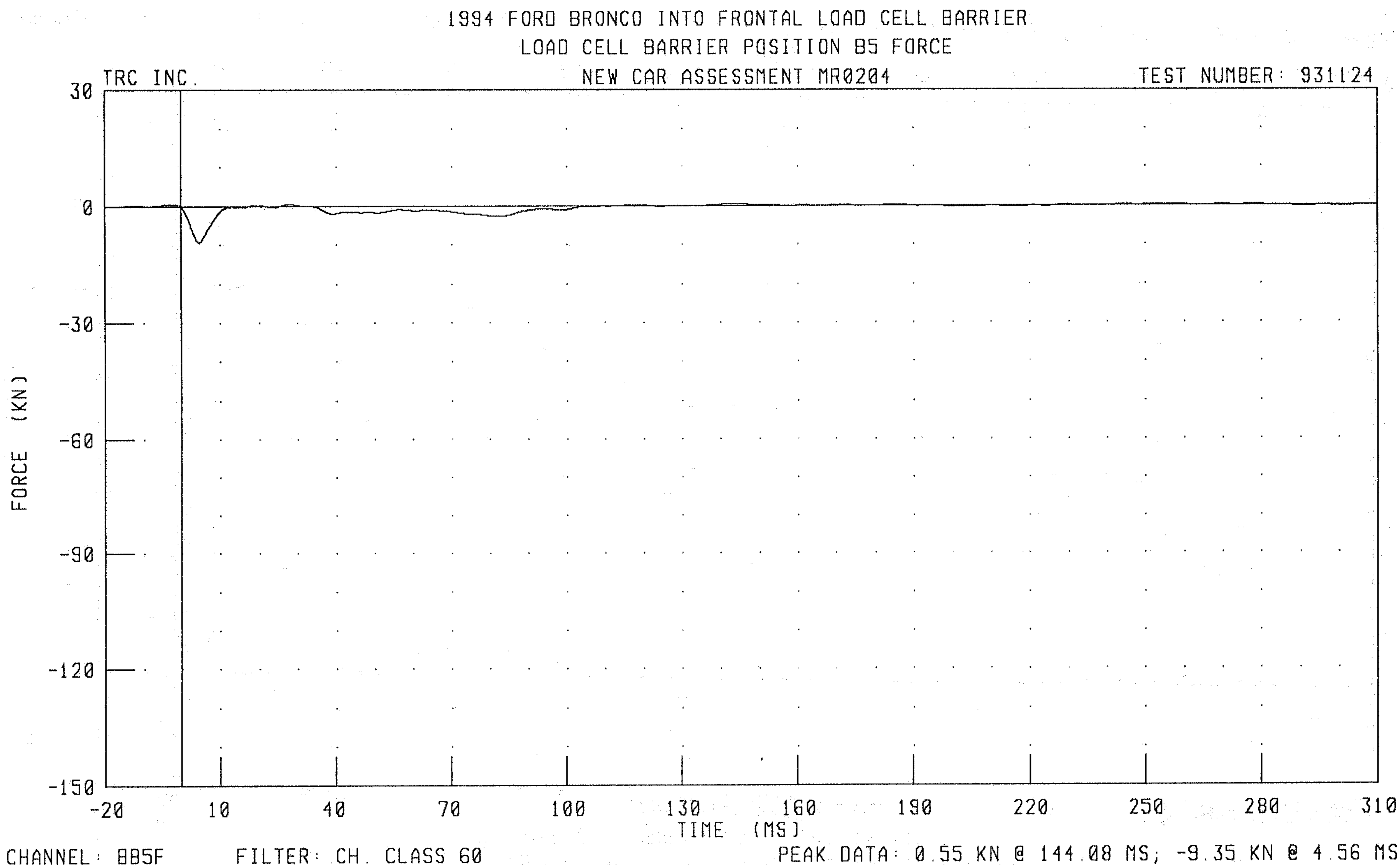

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
FORCE (KN)
30
0
-30
-60
-90
-120
-150
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB3F
FILTER: CH. CLASS 60
PEAK DATA: 1.91 KN @ 1.60 MS; -146.87 KN @ 40.56 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE
NEW CAR ASSESSMENT MR0204

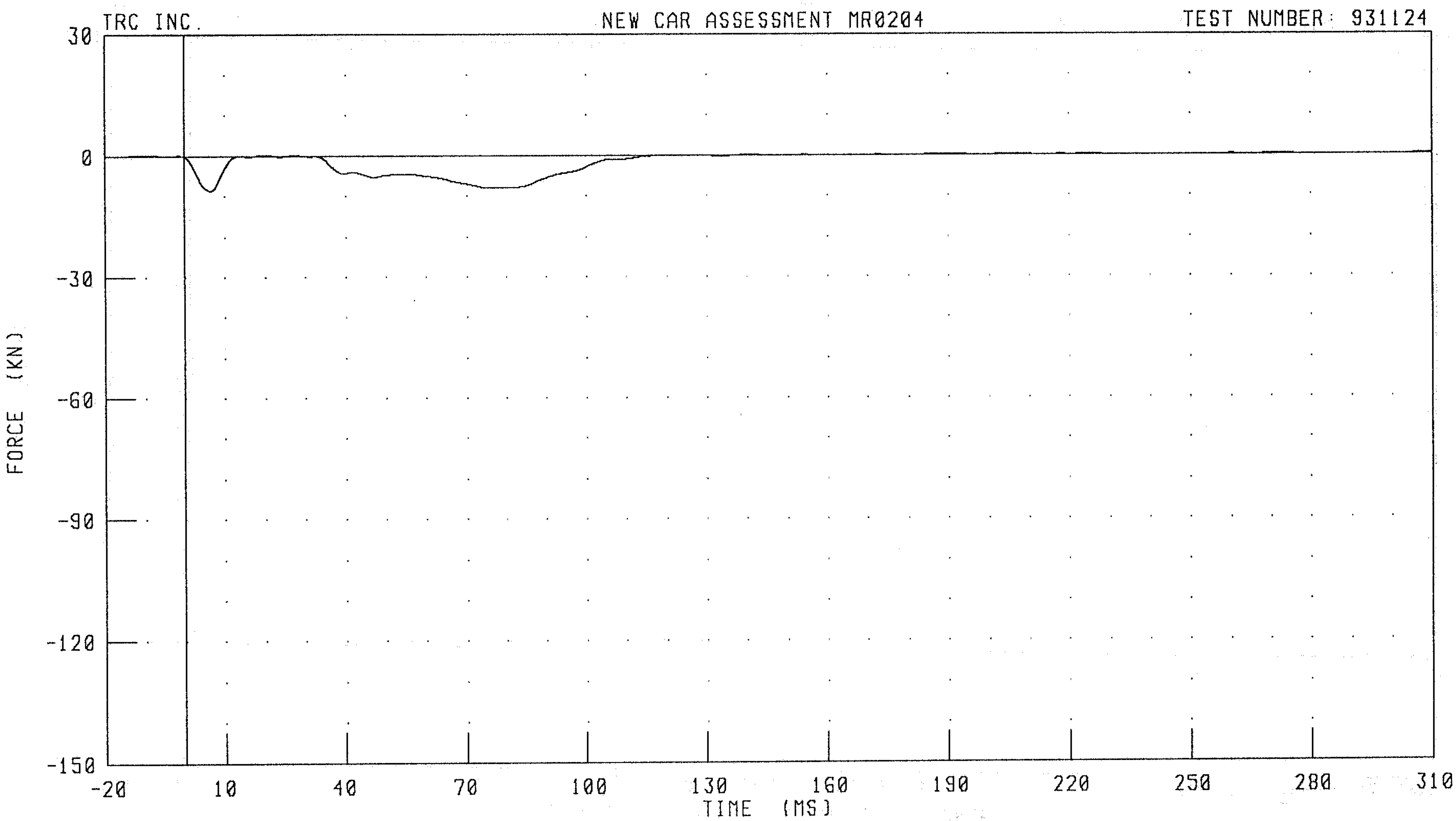
TRC INC. TEST NUMBER: 931124



CHANNEL: BB4F FILTER: CH. CLASS 60 PEAK DATA: 0.57 KN @ 30.16 MS; -22.70 KN @ 52.80 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
FORCE (KN)
30
0
-30
-60
-90
-120
-150
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB5F
FILTER: CH. CLASS 60
PEAK DATA: 0.55 KN @ 144.08 MS; -9.35 KN @ 4.56 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE
NEW CAR ASSESSMENT MR0204



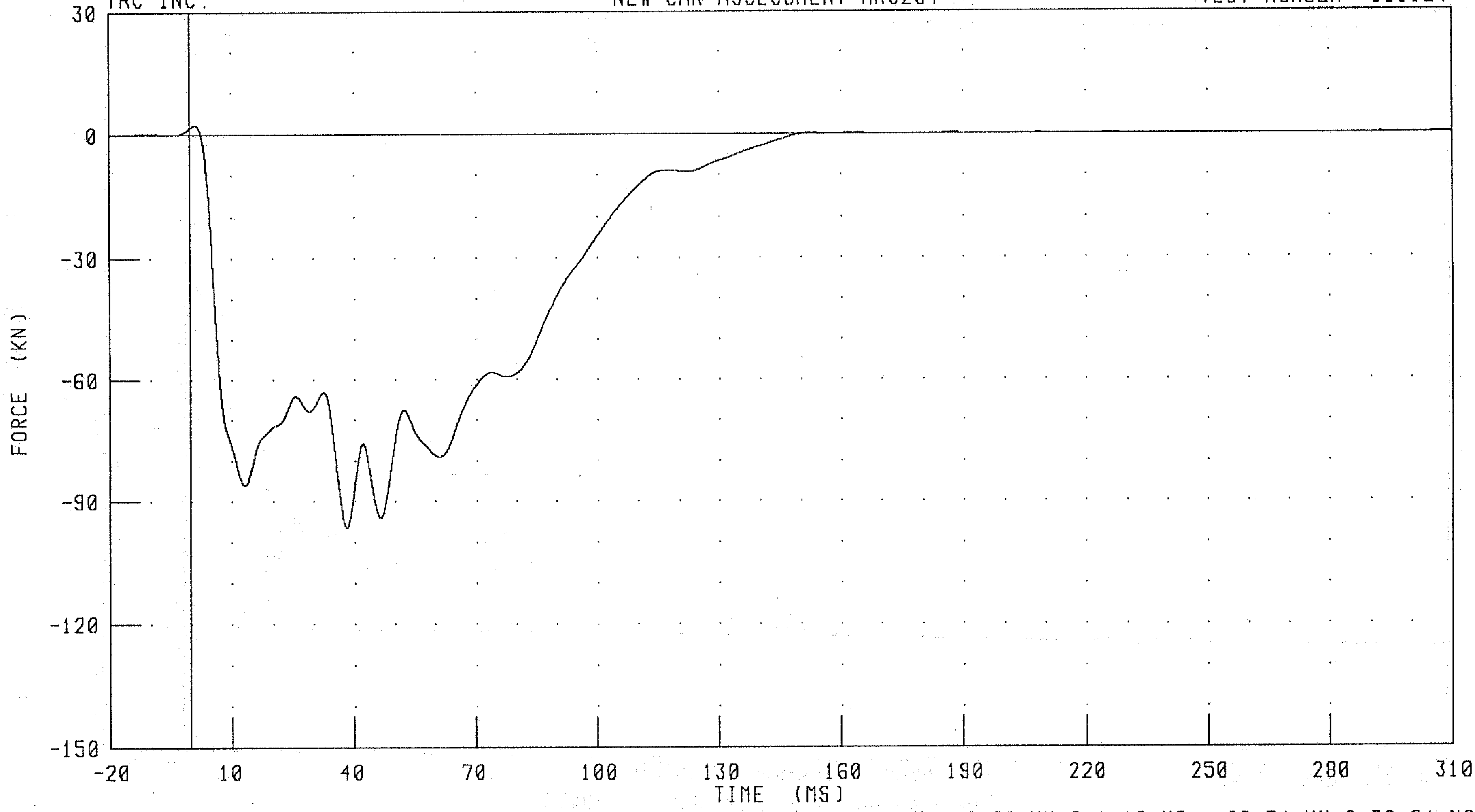
CHANNEL: BB6F FILTER: CH. CLASS 60 PEAK DATA: 0.29 KN @ 19.92 MS; -8.57 KN @ 6.48 MS

931124

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE
NEW CAR ASSESSMENT MR0204

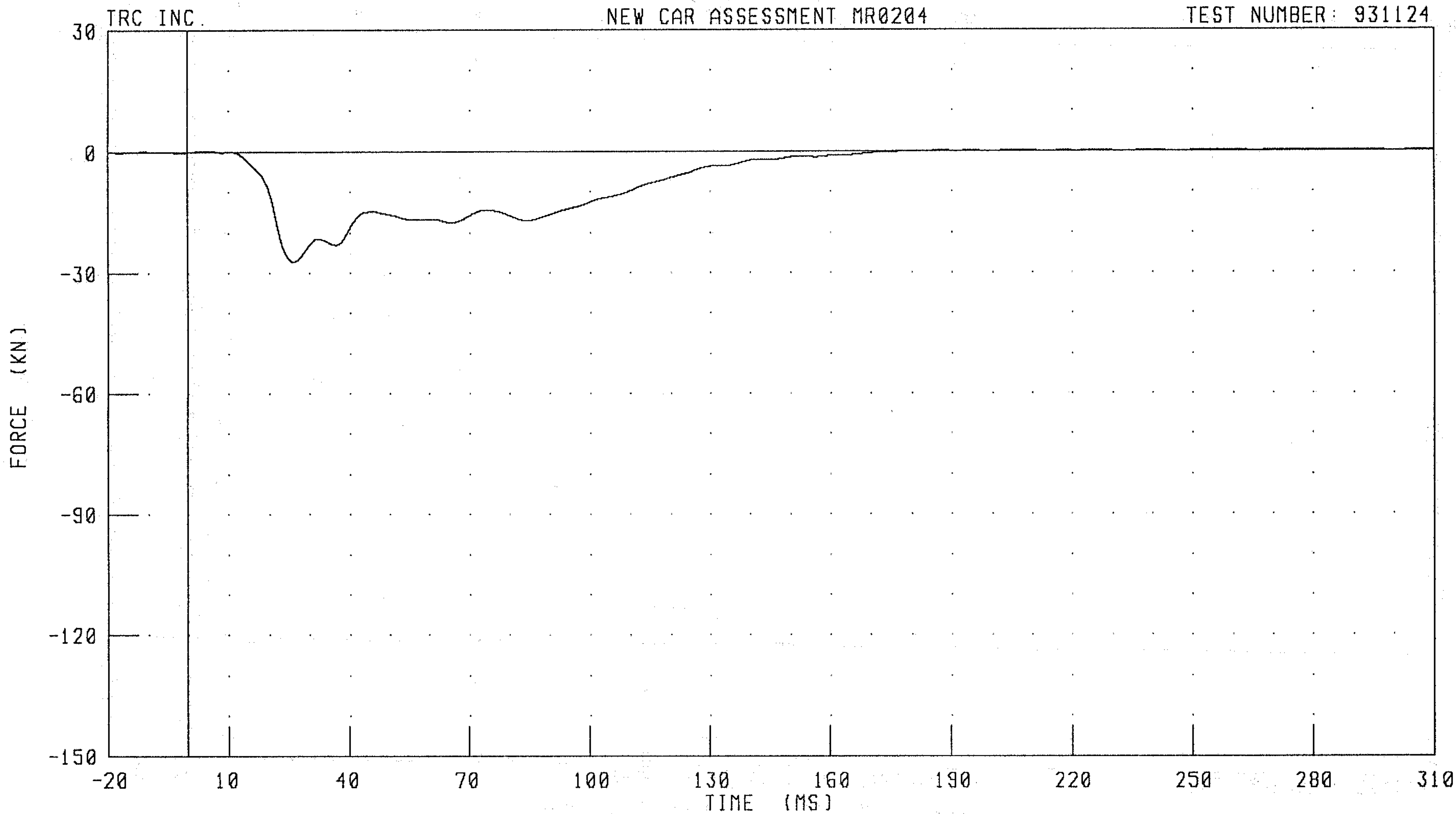
TRC INC.

TEST NUMBER: 931124



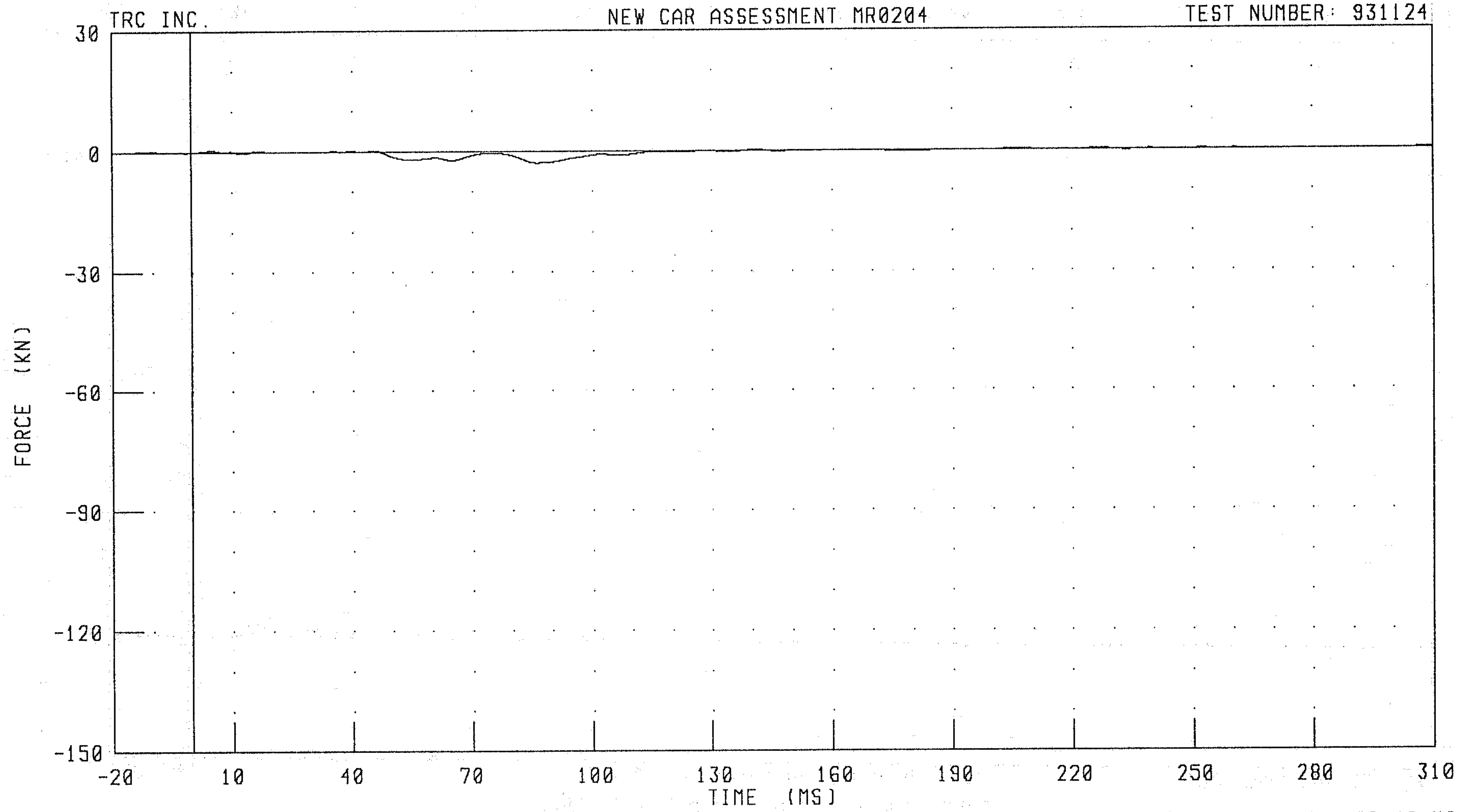
CHANNEL: BB7F FILTER: CH. CLASS 60 PEAK DATA: 2.28 KN @ 1.12 MS; -96.54 KN @ 38.24 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE
NEW CAR ASSESSMENT MR0204



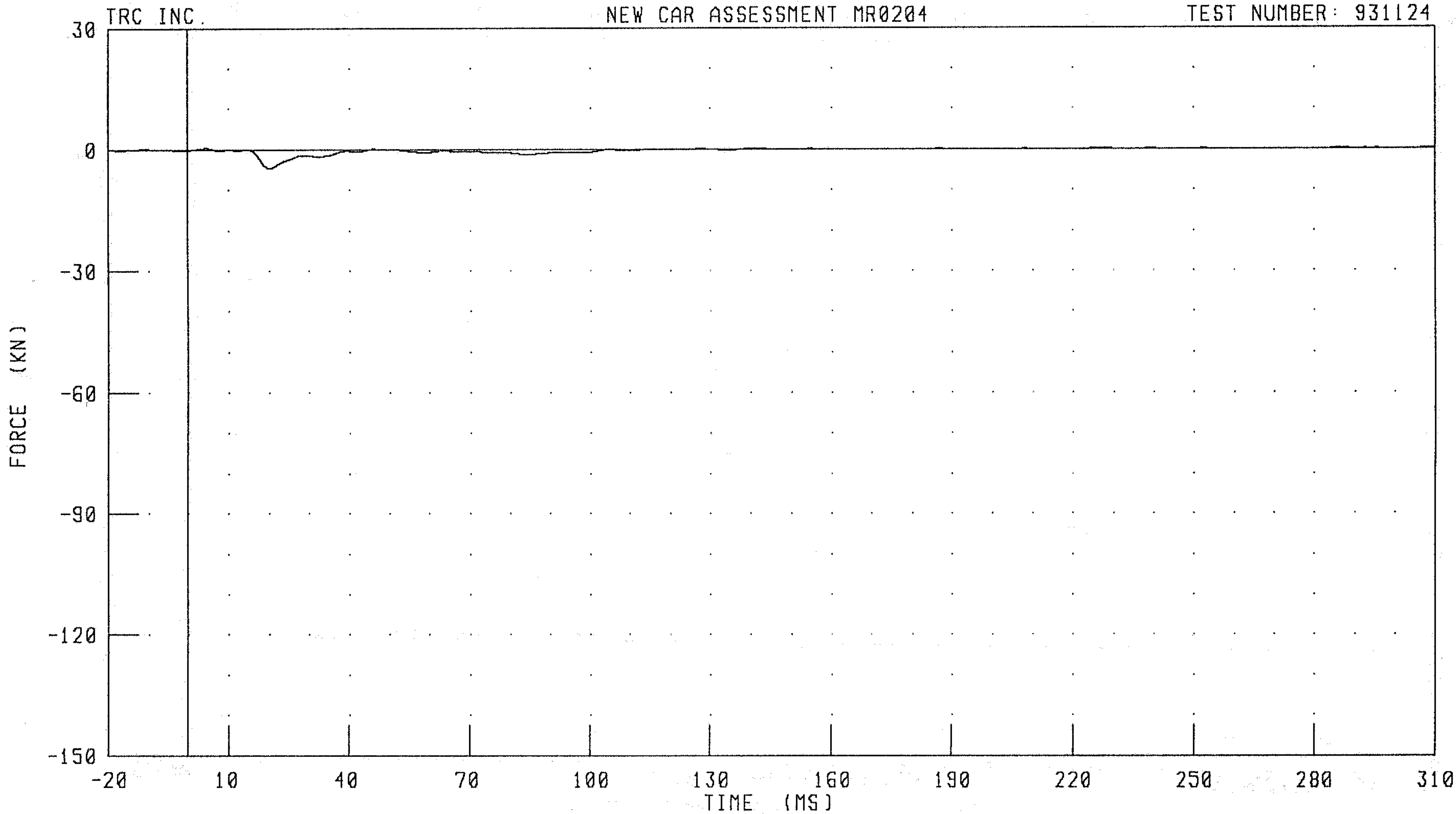
CHANNEL: BB8F FILTER: CH. CLASS 60 PEAK DATA: 0.33 KN @ 5.12 MS; -27.20 KN @ 26.08 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE
NEW CAR ASSESSMENT MR0204



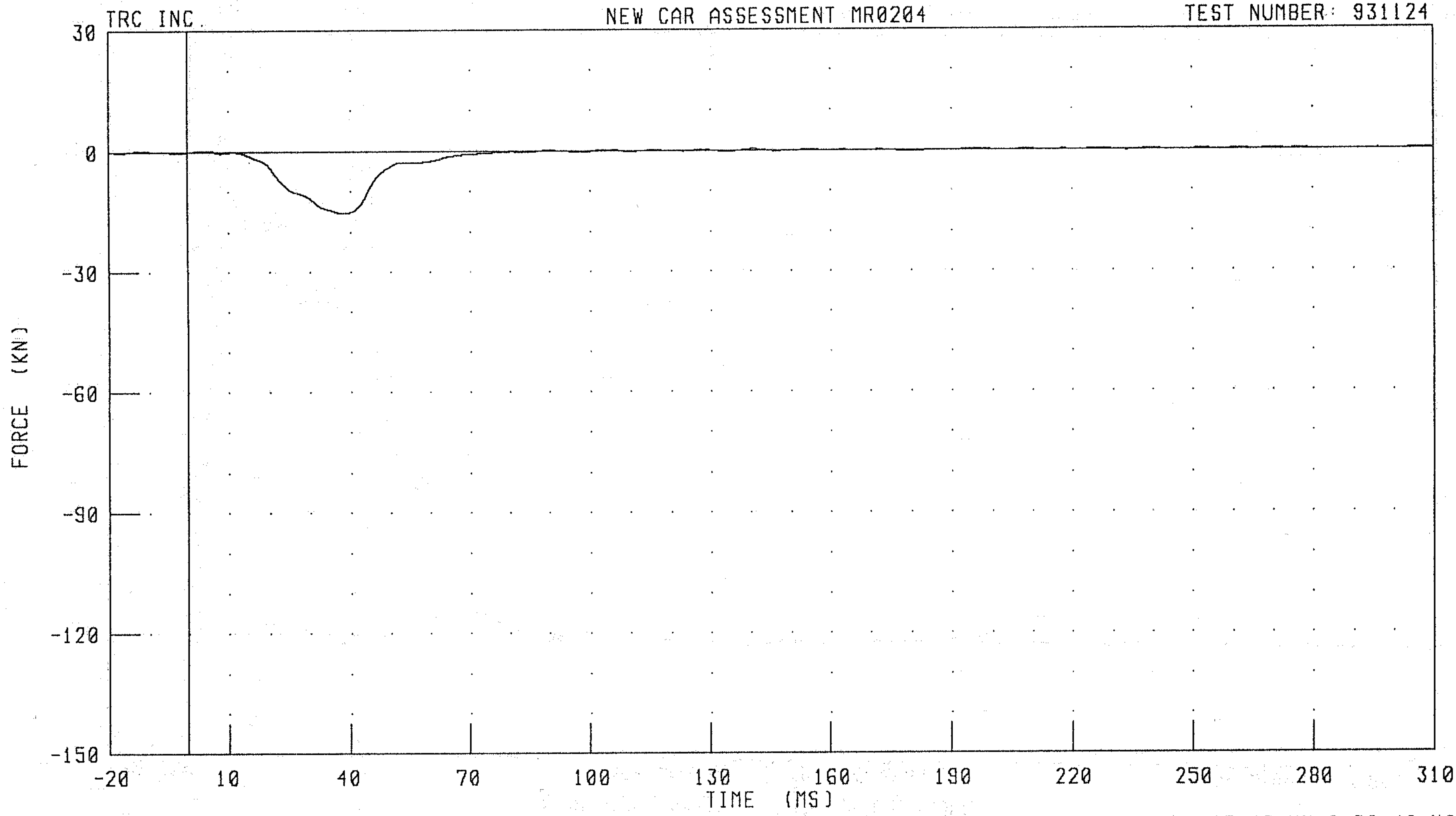
CHANNEL: BB9F FILTER: CH. CLASS 60 PEAK DATA: 0.38 KN @ 4.96 MS; -2.97 KN @ 86.48 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE
NEW CAR ASSESSMENT MR0204



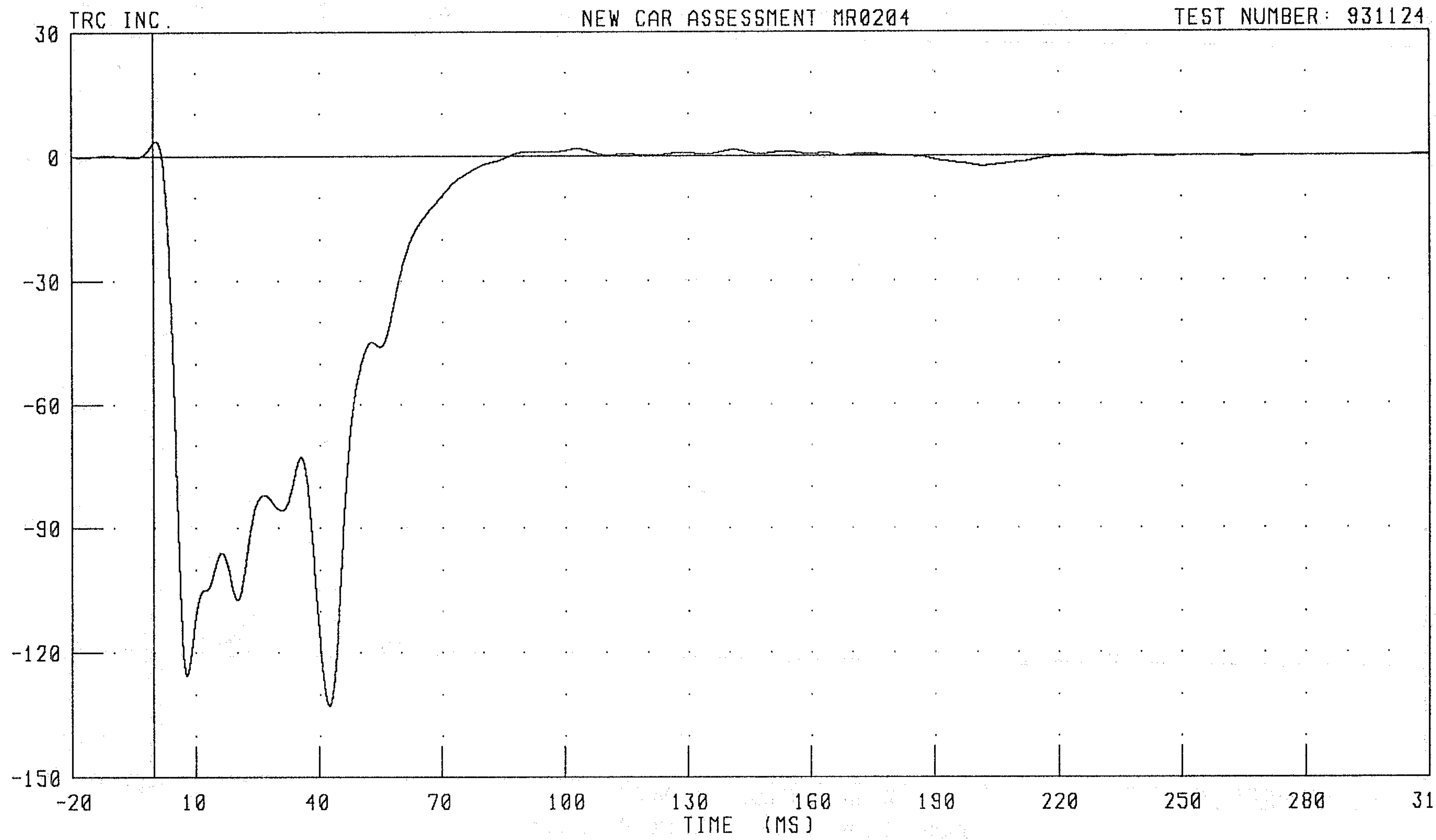
CHANNEL: BC1F FILTER: CH. CLASS 60 PEAK DATA: 0.35 KN @ 4.48 MS; -4.60 KN @ 20.32 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE
NEW CAR ASSESSMENT MR0204



CHANNEL: BC2F FILTER: CH. CLASS 60 PEAK DATA: 0.37 KN @ 140.80 MS; -15.40 KN @ 38.48 MS

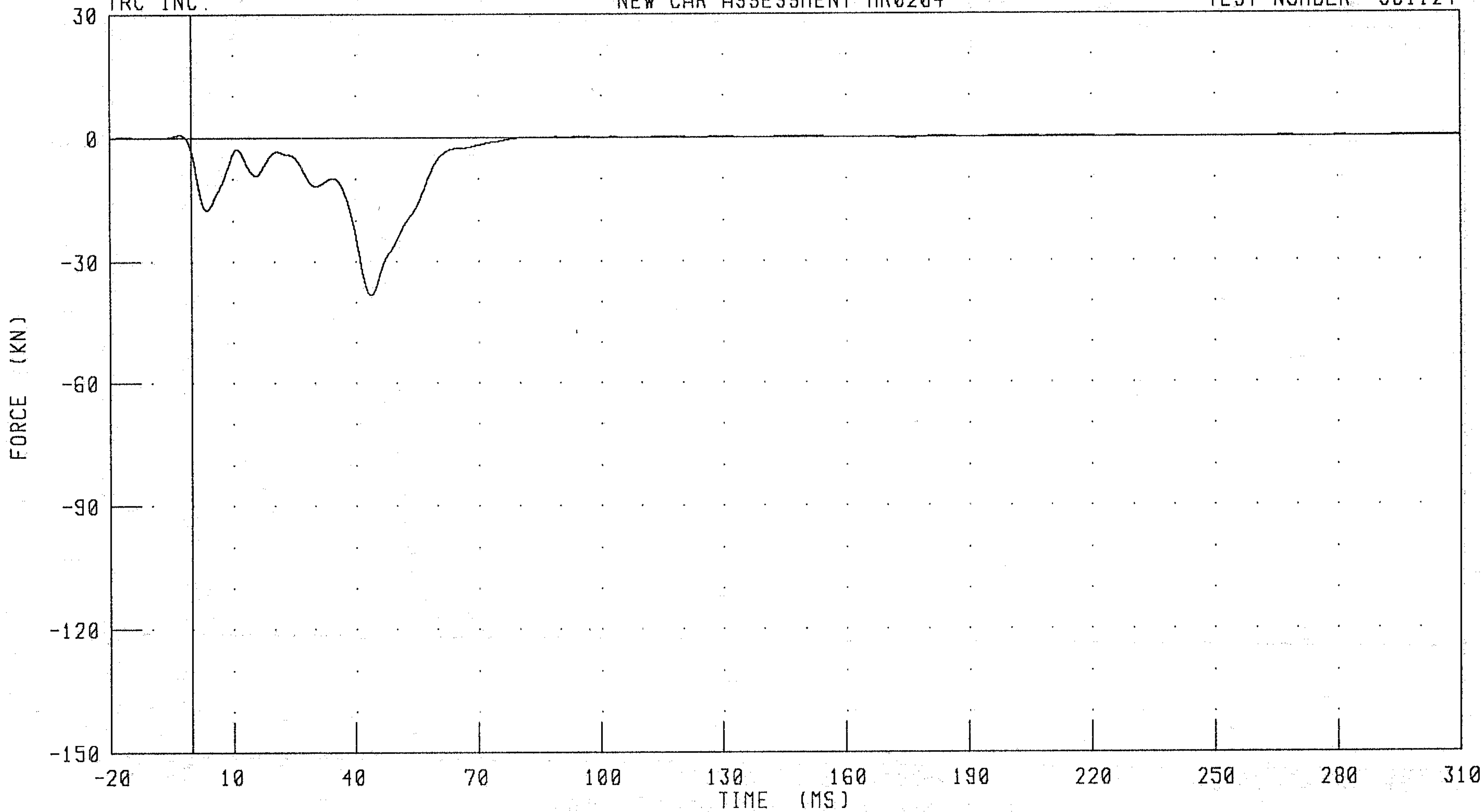
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE
NEW CAR ASSESSMENT MR0204



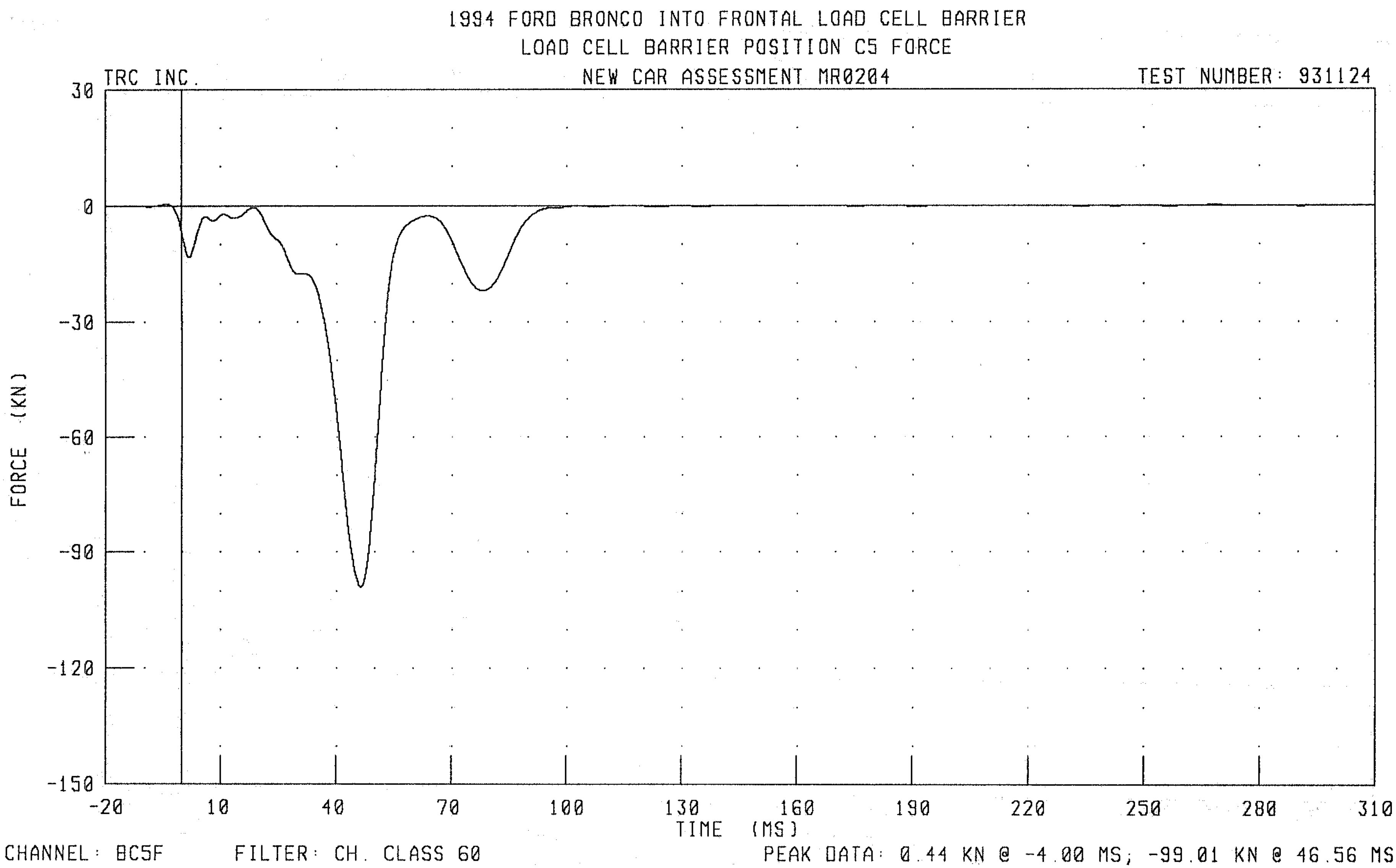
CHANNEL: BC3F FILTER: CH. CLASS 60 PEAK DATA: 3.55 KN @ 0.56 MS; -132.77 KN @ 42.48 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE
NEW CAR ASSESSMENT MR0204

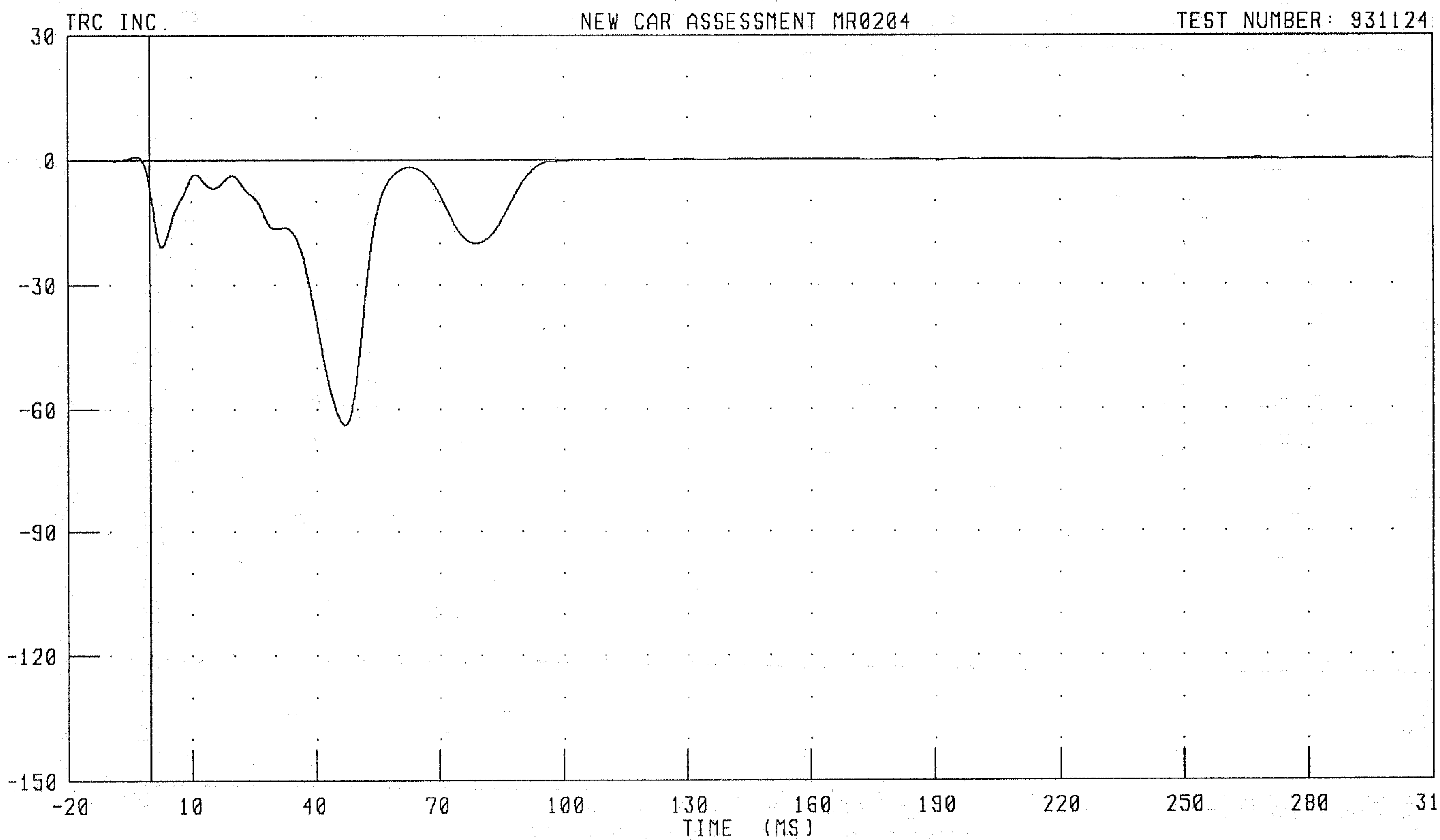
TRC INC.　　　　　　　　　　TEST NUMBER: 931124



CHANNEL: BC4F　　FILTER: CH. CLASS 60　　PEAK DATA: 0.65 KN @ -2.88 MS; -38.22 KN @ 43.92 MS

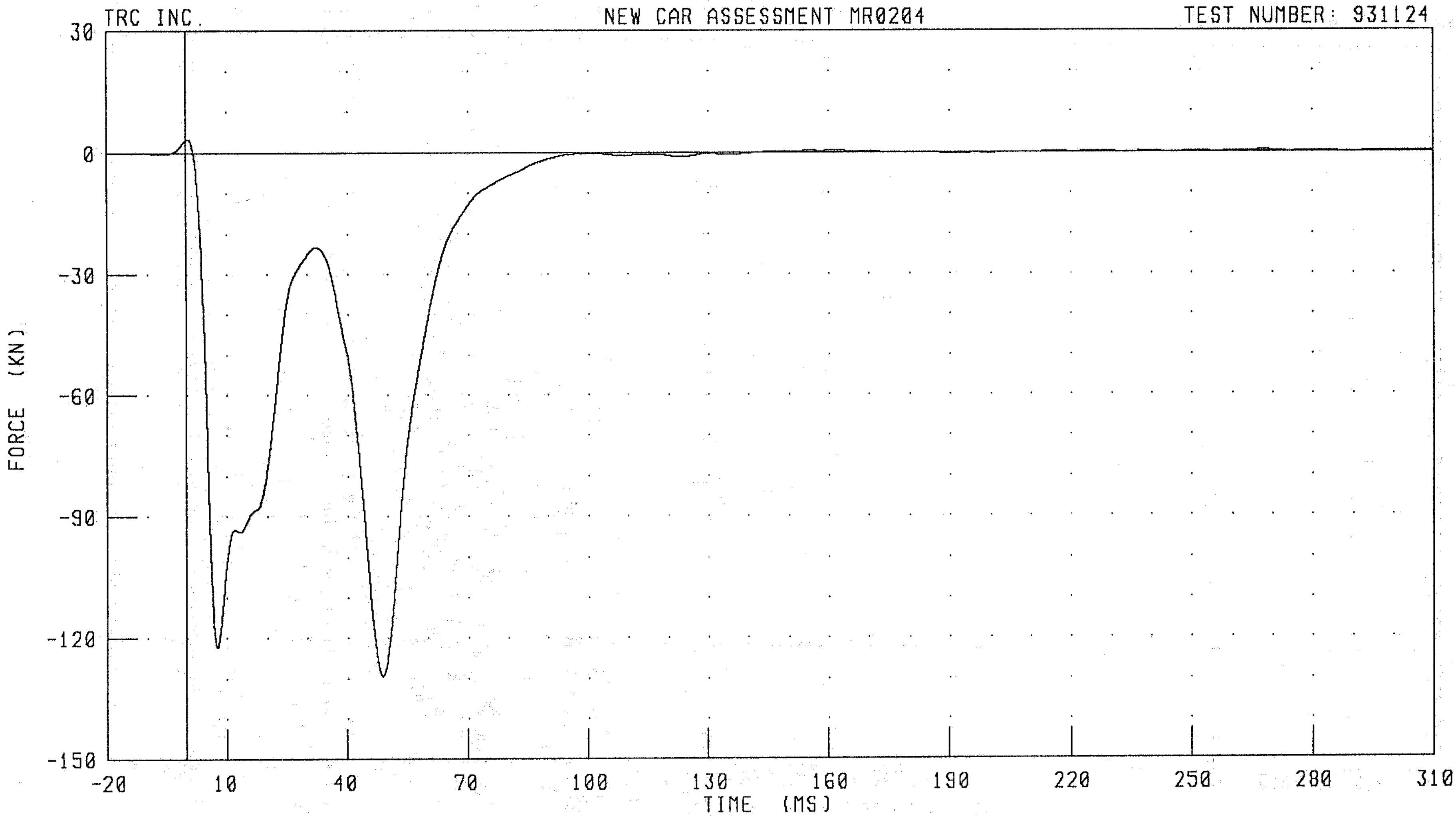

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
FORCE (KN)
30
0
-30
-60
-90
-120
-150
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC5F
FILTER: CH. CLASS 60
PEAK DATA: 0.44 KN @ -4.00 MS; -99.01 KN @ 46.56 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE
NEW CAR ASSESSMENT MR0204



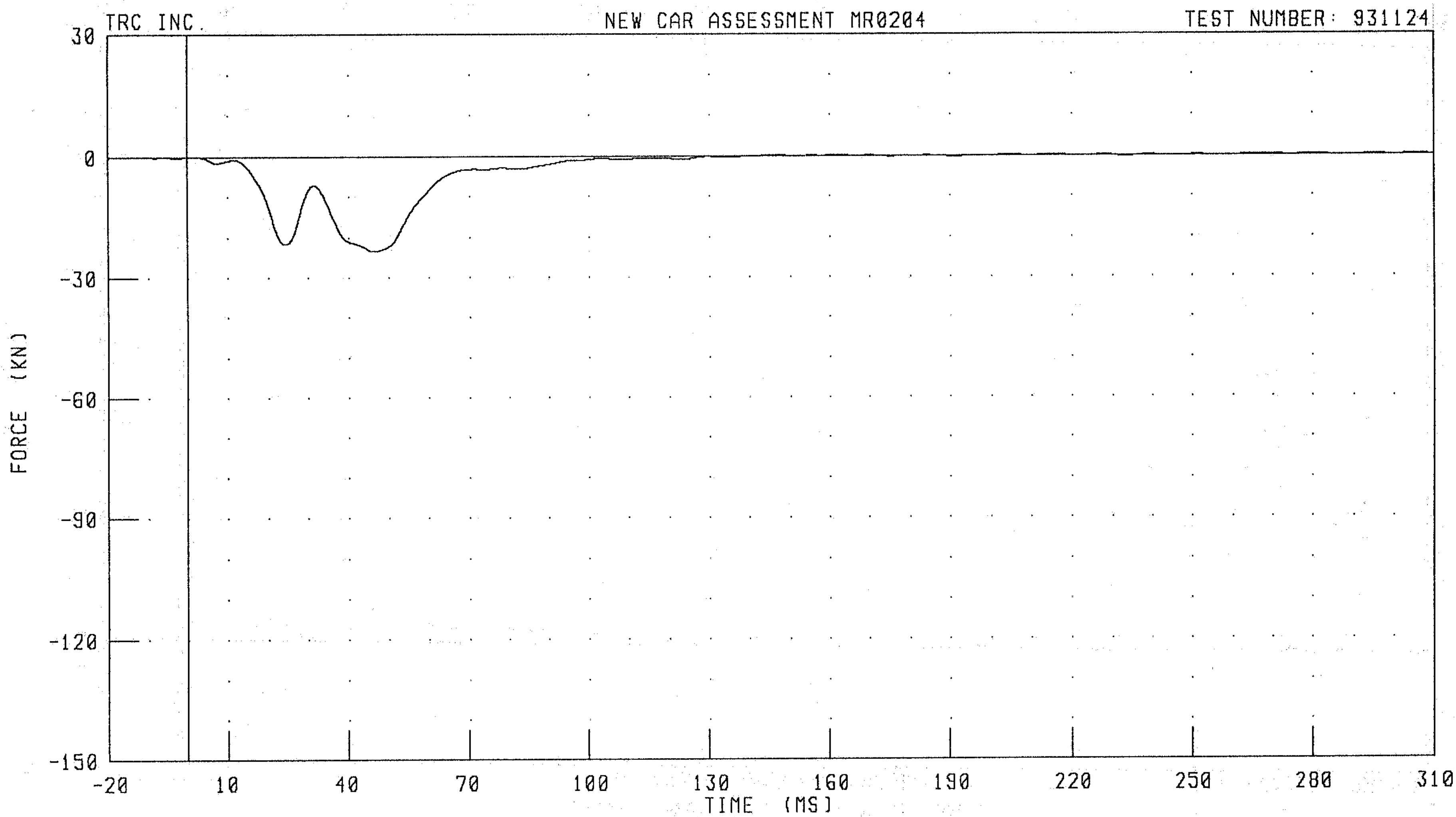
CHANNEL: BC6F FILTER: CH. CLASS 60 PEAK DATA: 0.76 KN @ -3.44 MS; -63.77 KN @ 47.12 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE
NEW CAR ASSESSMENT MR0204



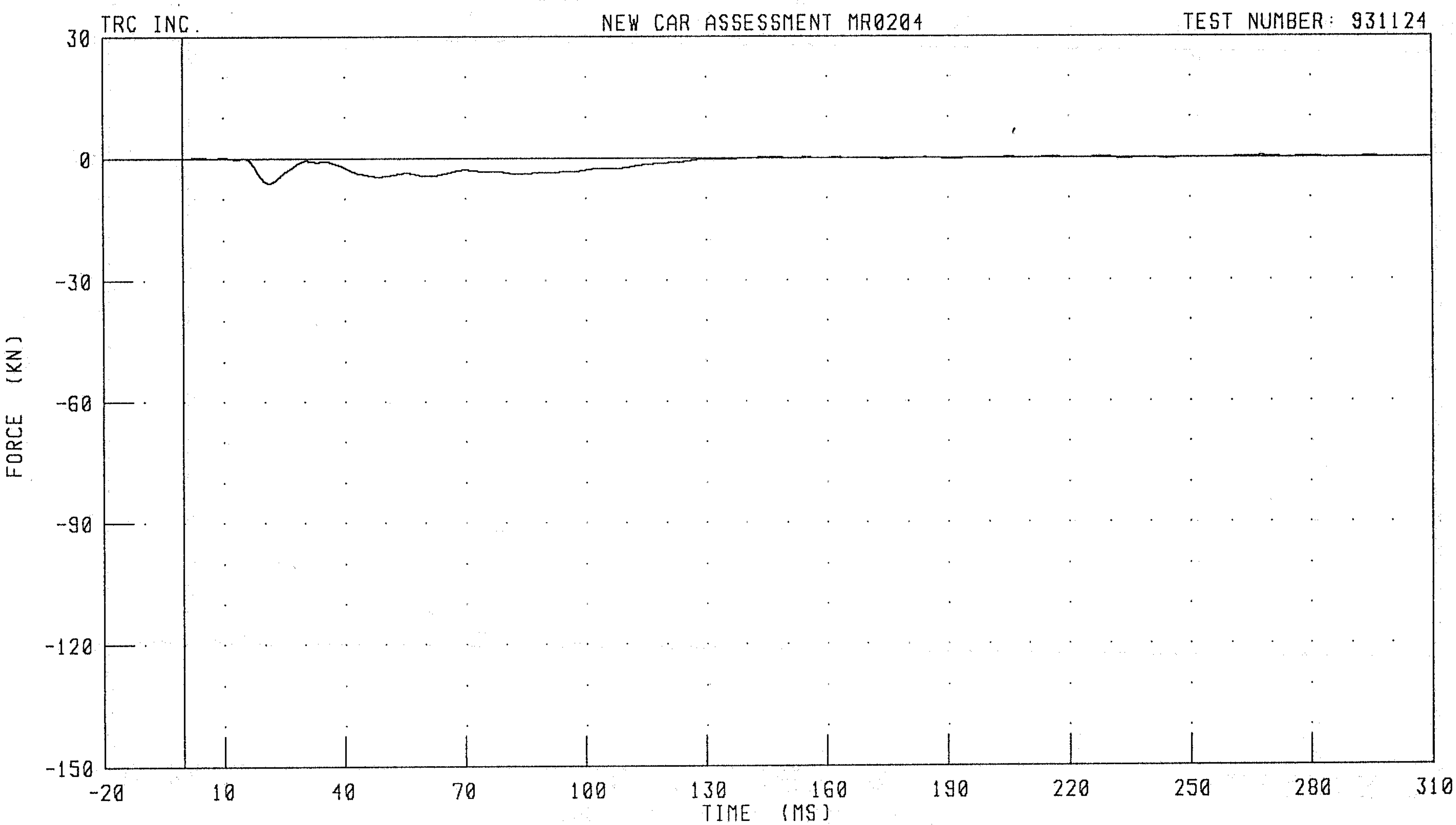
CHANNEL: BC7F FILTER: CH. CLASS 60 PEAK DATA: 3.32 KN @ 0.32 MS; -129.49 KN @ 48.88 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE
NEW CAR ASSESSMENT MR0204

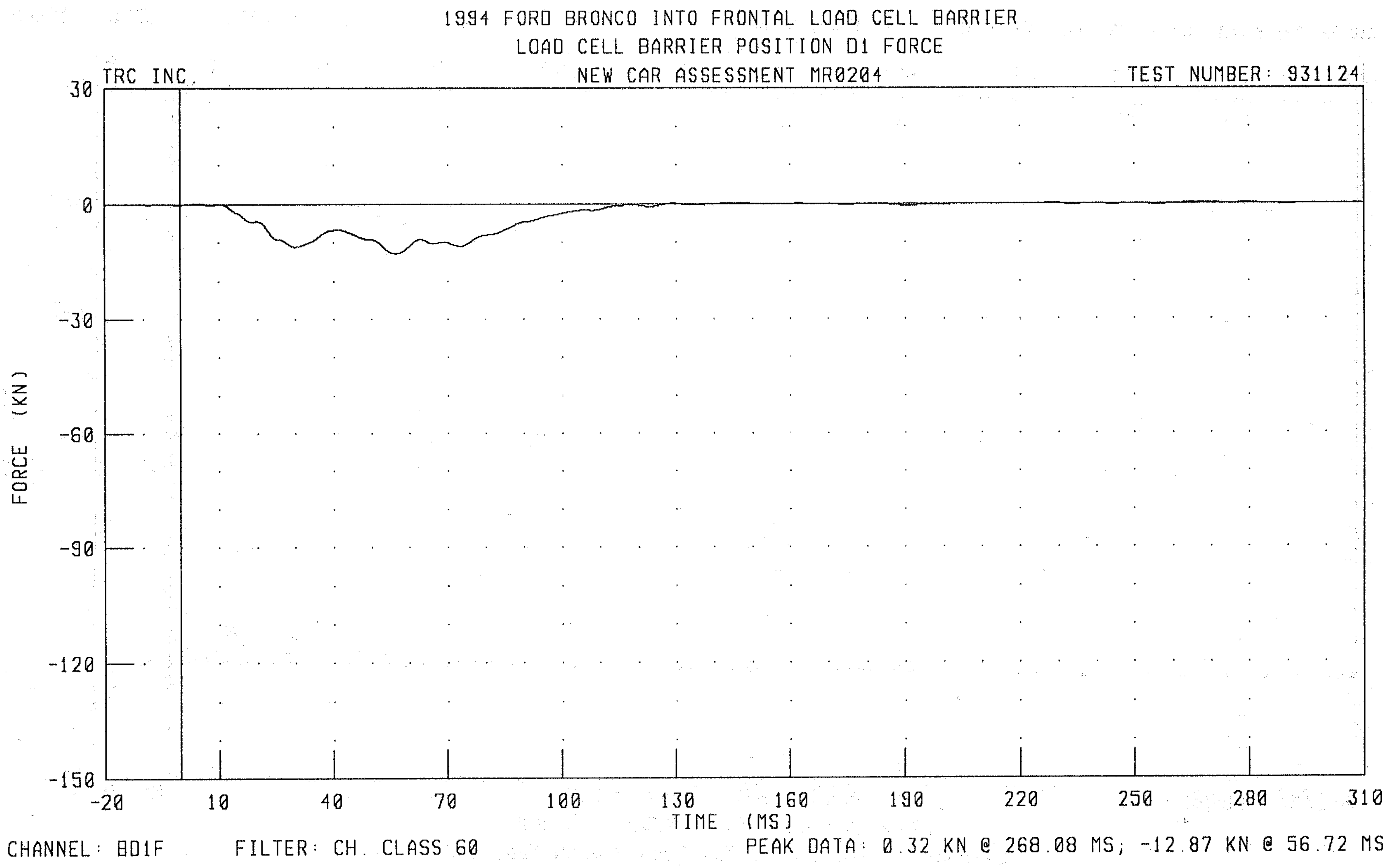


CHANNEL: BC8F FILTER: CH. CLASS 60 PEAK DATA: 0.28 KN @ 268.16 MS; -23.51 KN @ 46.56 MS

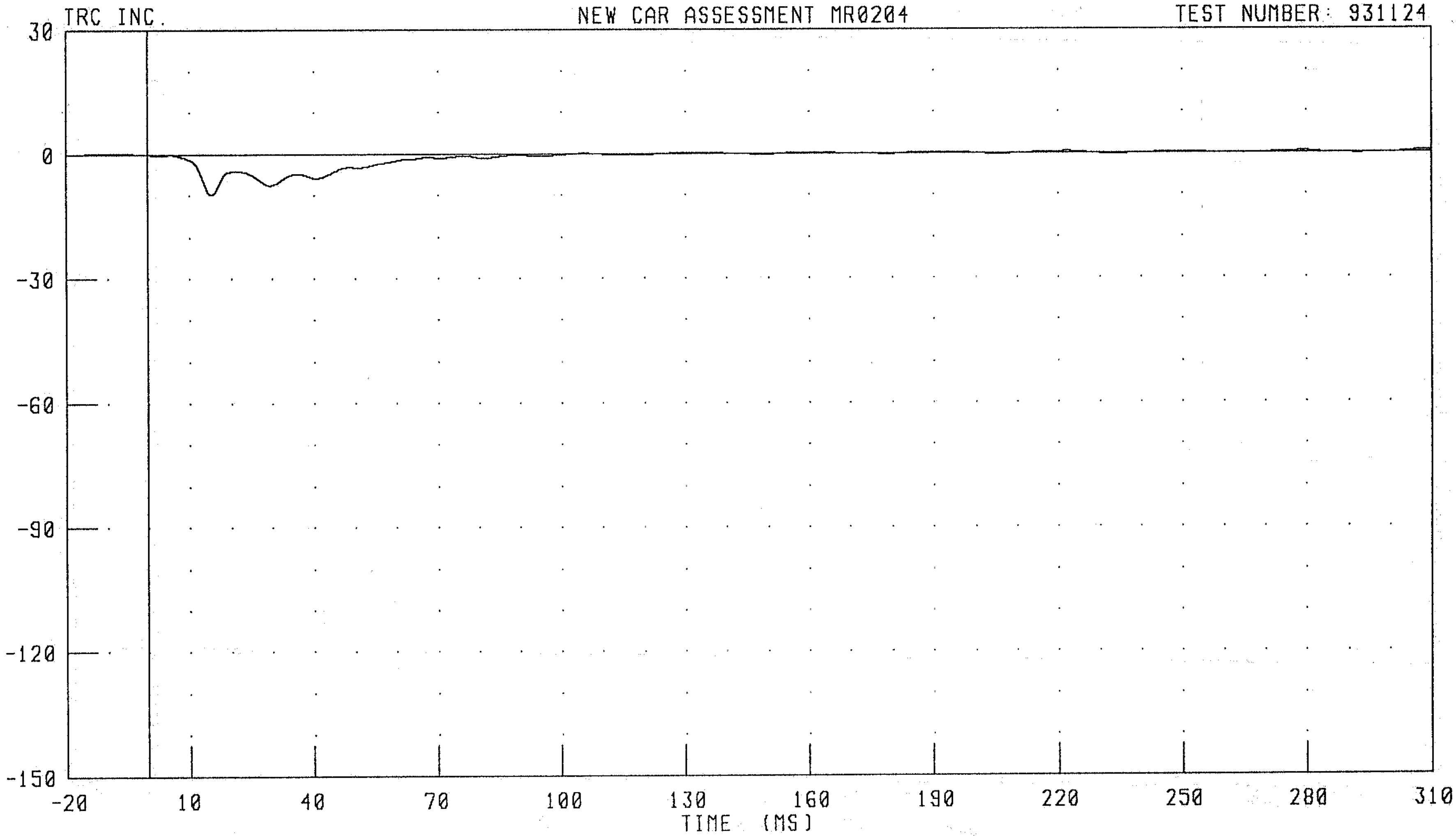
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE
NEW CAR ASSESSMENT MR0204



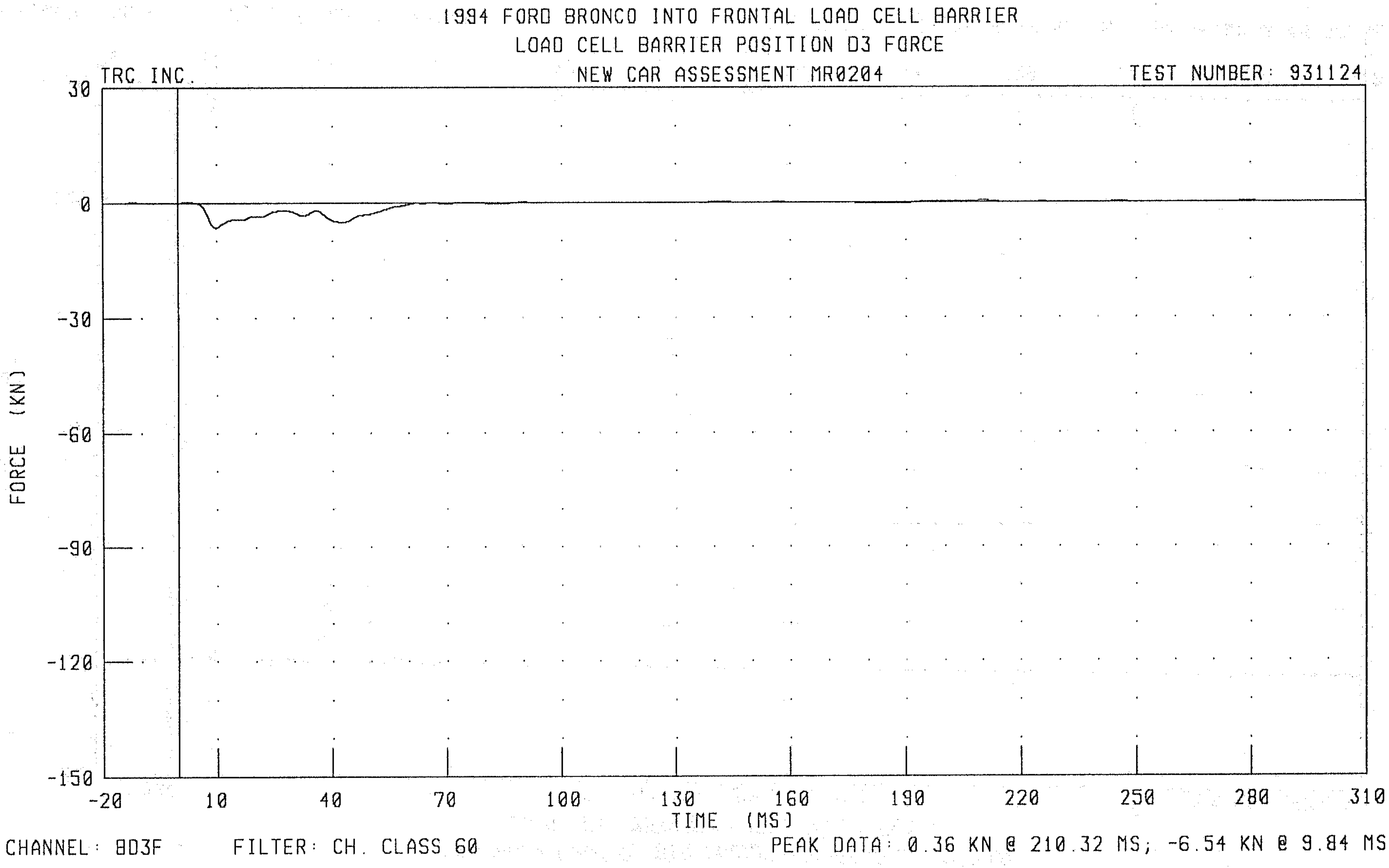
CHANNEL: BC9F FILTER: CH. CLASS 60 PEAK DATA: 0.35 KN @ 268.00 MS; -6.09 KN @ 21.44 MS

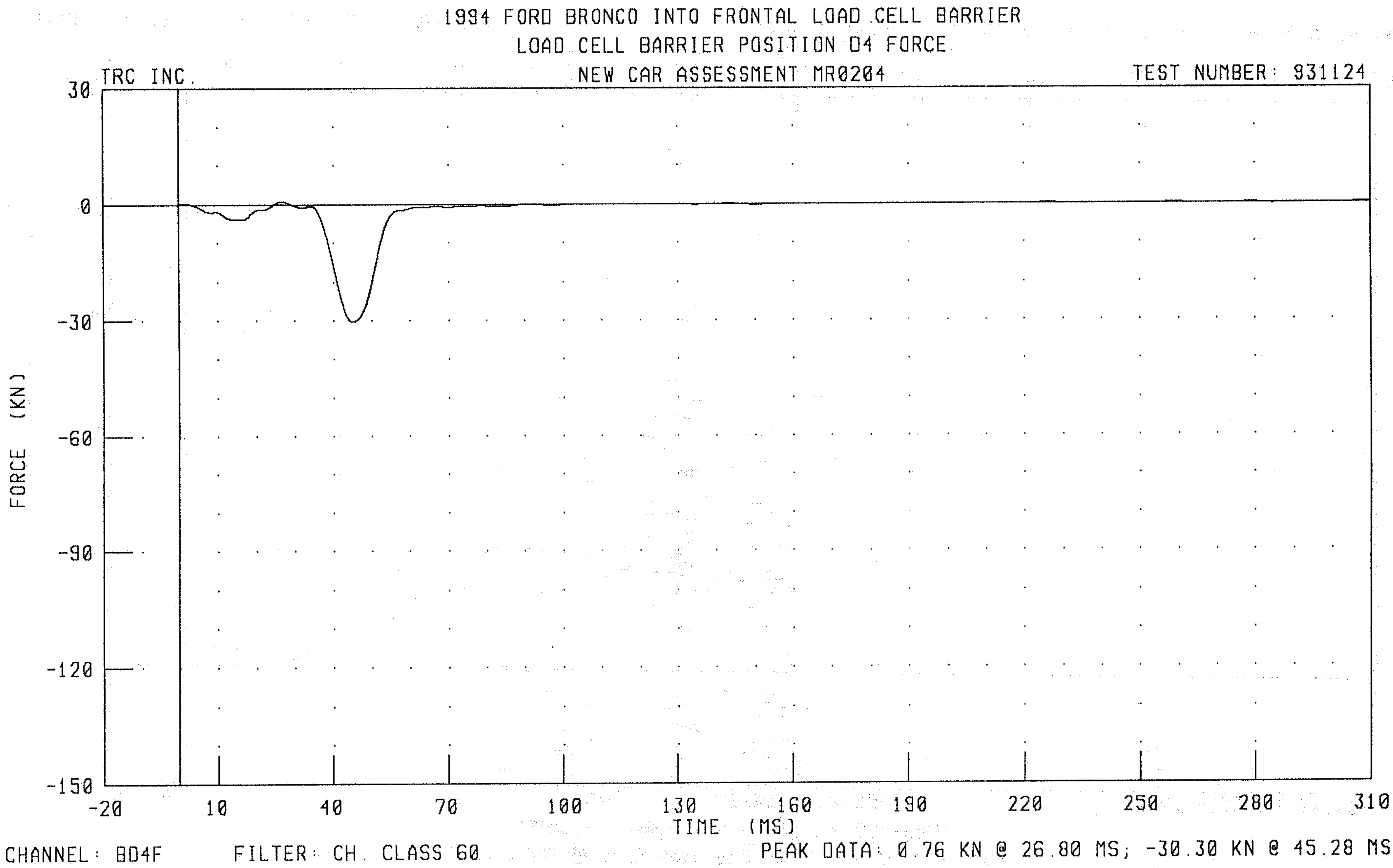

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD1F
FILTER: CH. CLASS 60
PEAK DATA: 0.32 KN @ 268.08 MS; -12.87 KN @ 56.72 MS

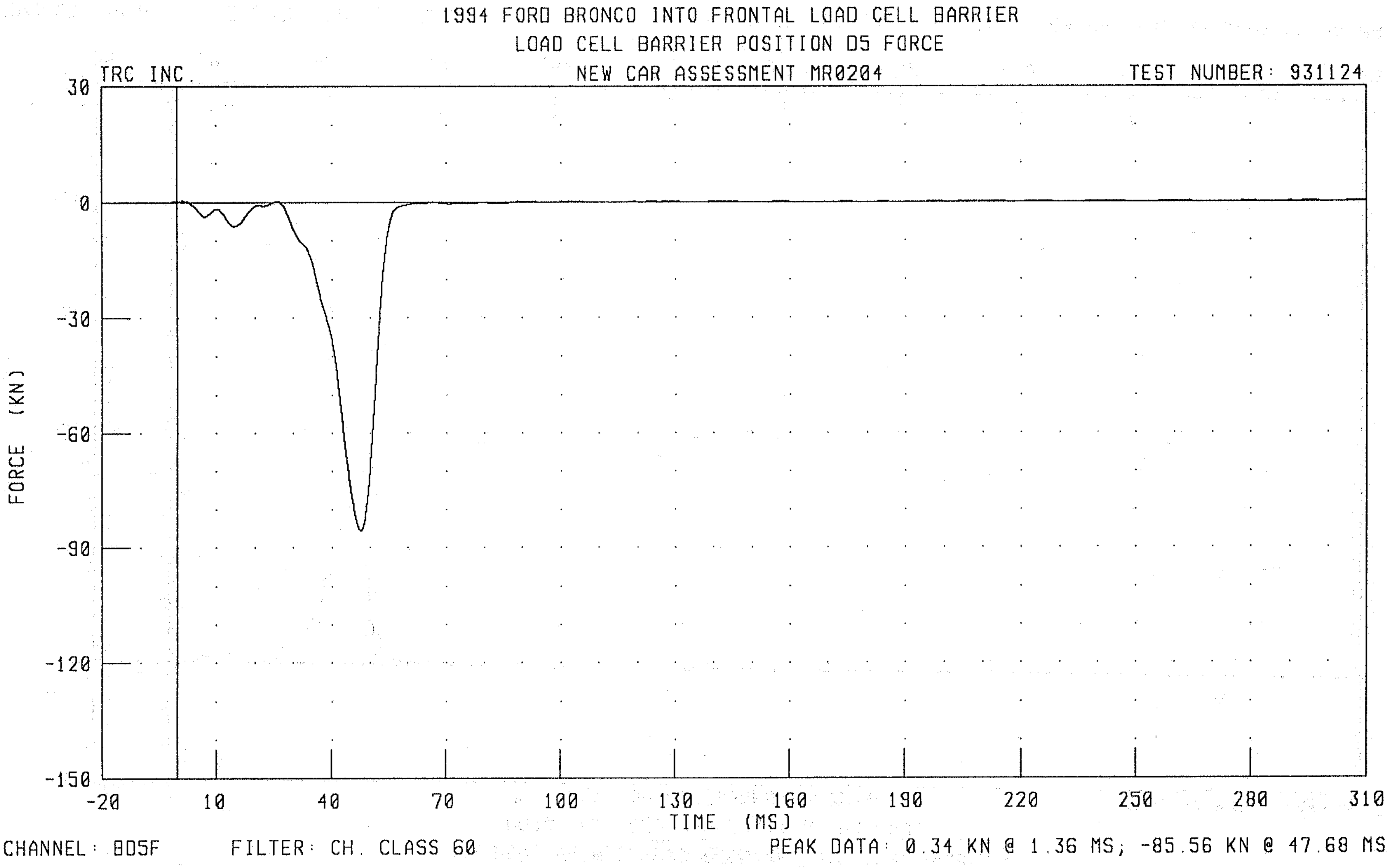
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE
NEW CAR ASSESSMENT MR0204



CHANNEL: BD2F FILTER: CH. CLASS 60 PEAK DATA: 0.41 KN @ 308.96 MS; -9.79 KN @ 15.36 MS

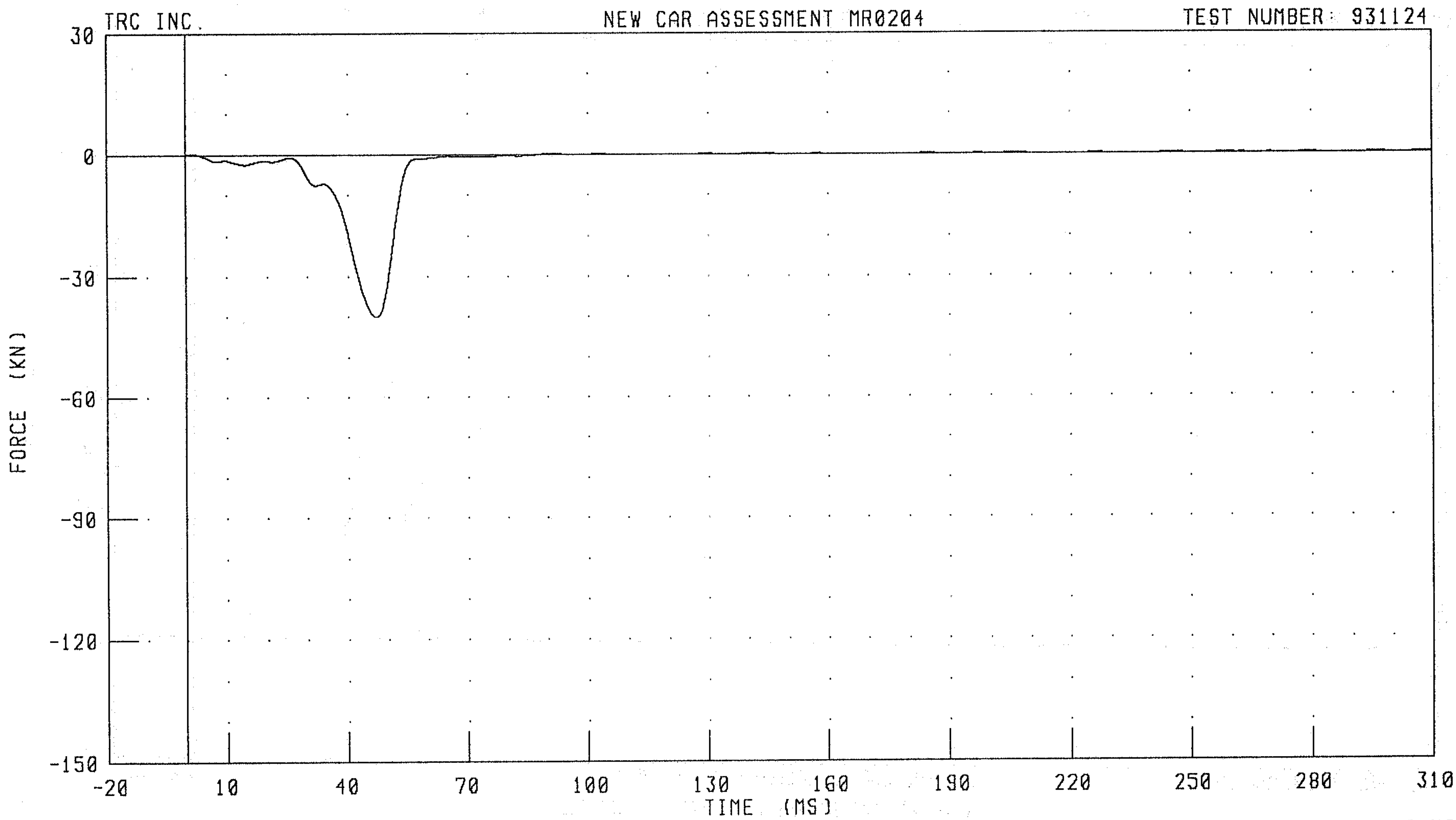

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD3F
FILTER: CH. CLASS 60
PEAK DATA: 0.36 KN @ 210.32 MS; -6.54 KN @ 9.84 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D4 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD4F
FILTER: CH. CLASS 60
PEAK DATA: 0.76 KN @ 26.80 MS; -30.30 KN @ 45.28 MS



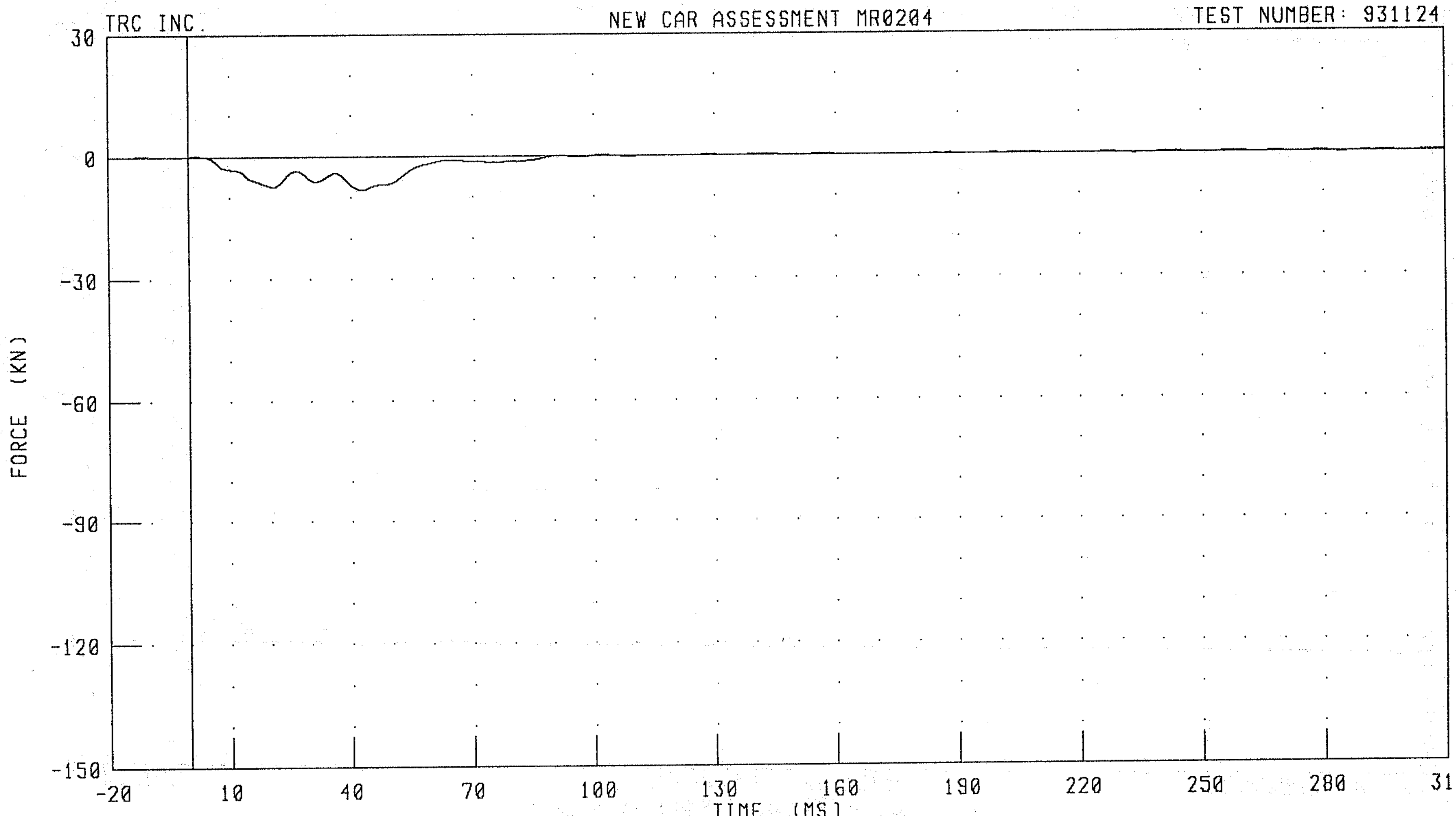
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 8D5F
FILTER: CH. CLASS 60
PEAK DATA: 0.34 KN @ 1.36 MS; -85.56 KN @ 47.68 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE
NEW CAR ASSESSMENT MR0204

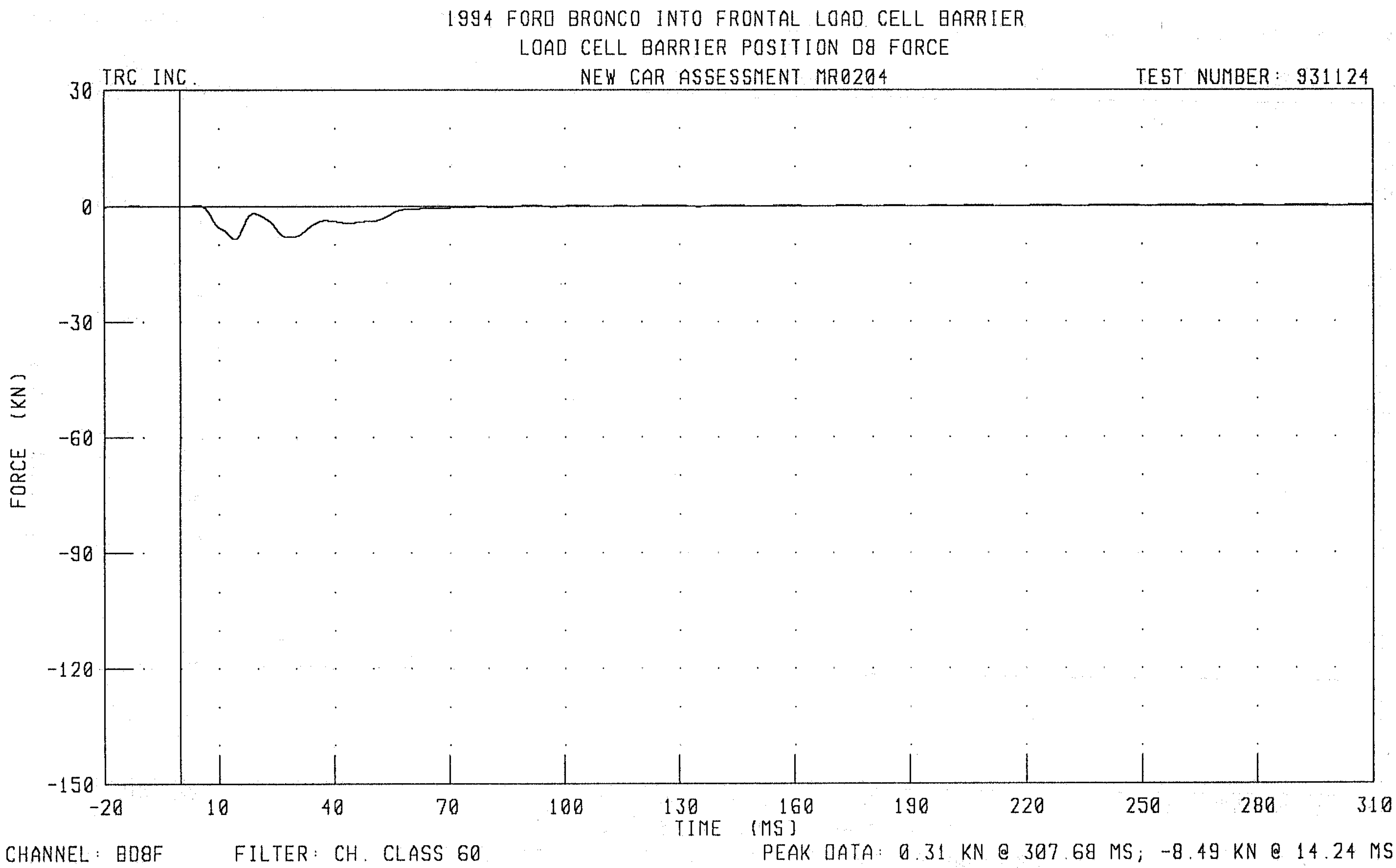


CHANNEL: BD6F FILTER: CH. CLASS 60 PEAK DATA: 0.22 KN @ 143.84 MS; -40.04 KN @ 47.12 MS

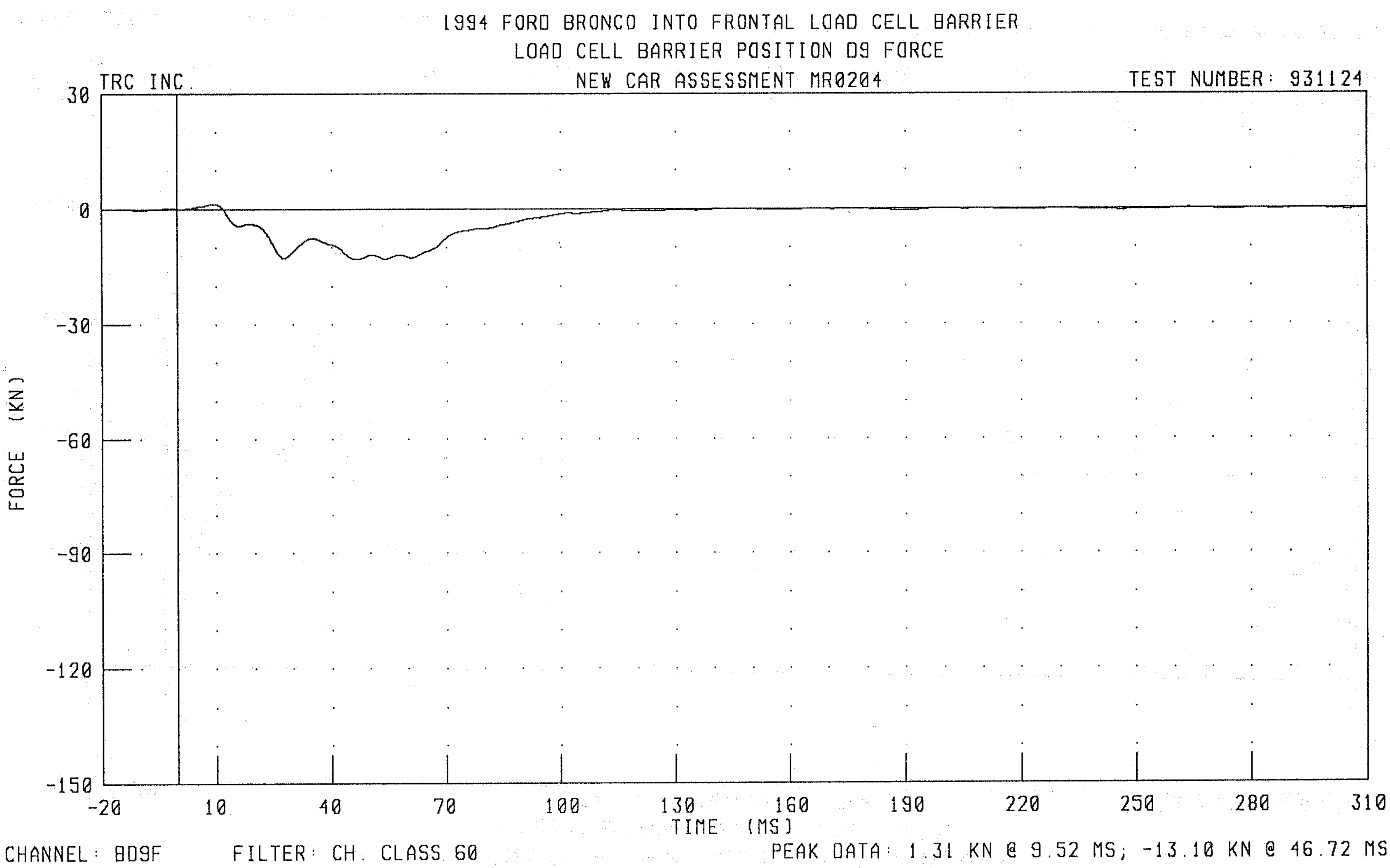
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE
NEW CAR ASSESSMENT MR0204



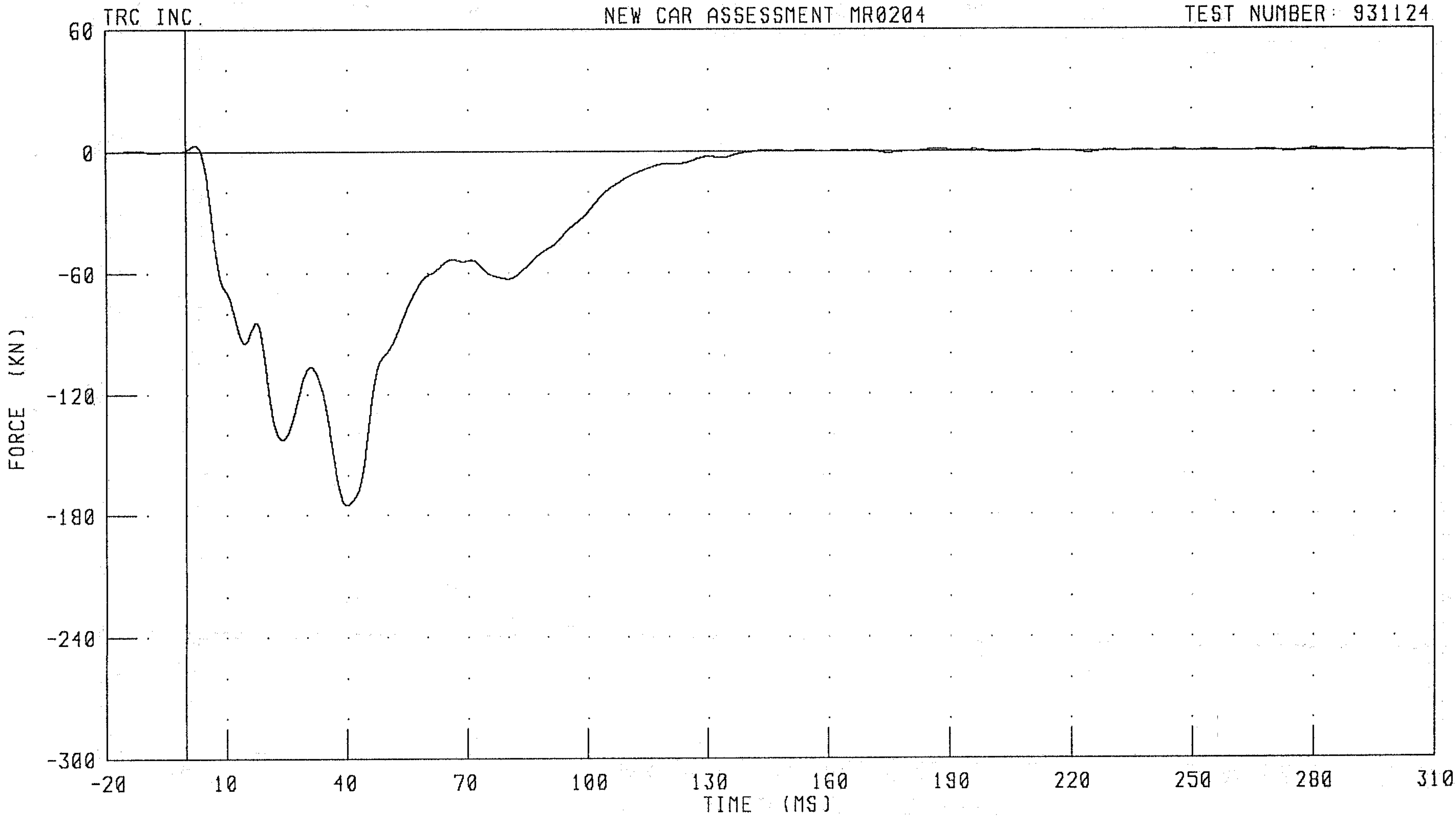
CHANNEL: BD7F FILTER: CH. CLASS 60 PEAK DATA: 0.24 KN @ 142.88 MS; -8.26 KN @ 43.12 MS



1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
FORCE (KN)
30
0
-30
-60
-90
-120
-150
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD8F
FILTER: CH. CLASS 60
PEAK DATA: 0.31 KN @ 307.68 MS; -8.49 KN @ 14.24 MS

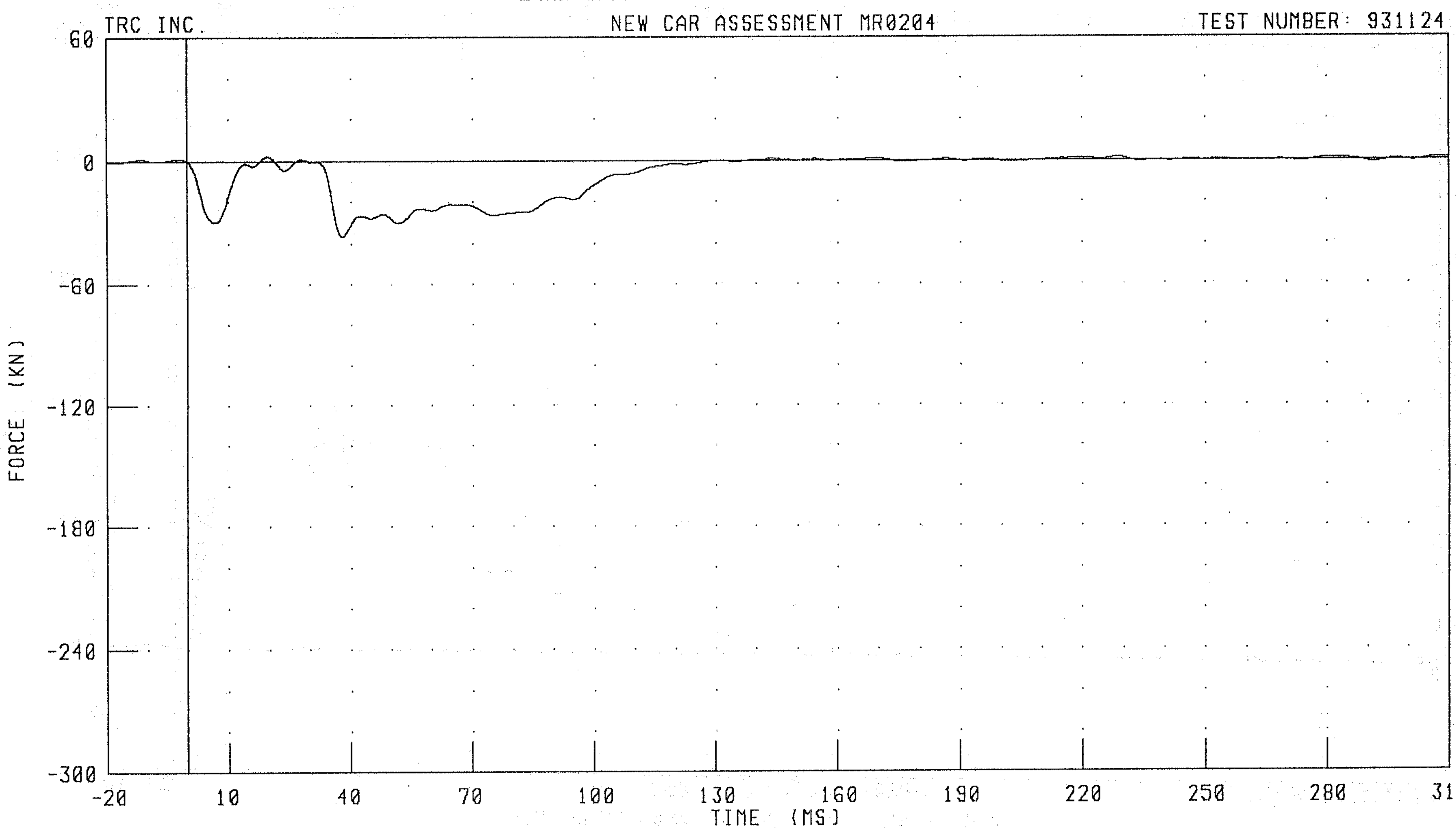

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD9F
FILTER: CH. CLASS 60
PEAK DATA: 1.31 KN @ 9.52 MS; -13.10 KN @ 46.72 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
NEW CAR ASSESSMENT MR0204



CHANNEL: LCBG1F   FILTER: CH. CLASS 60   PEAK DATA: 3.05 KN @ 2.24 MS; -174.99 KN @ 39.92 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
NEW CAR ASSESSMENT MR0204



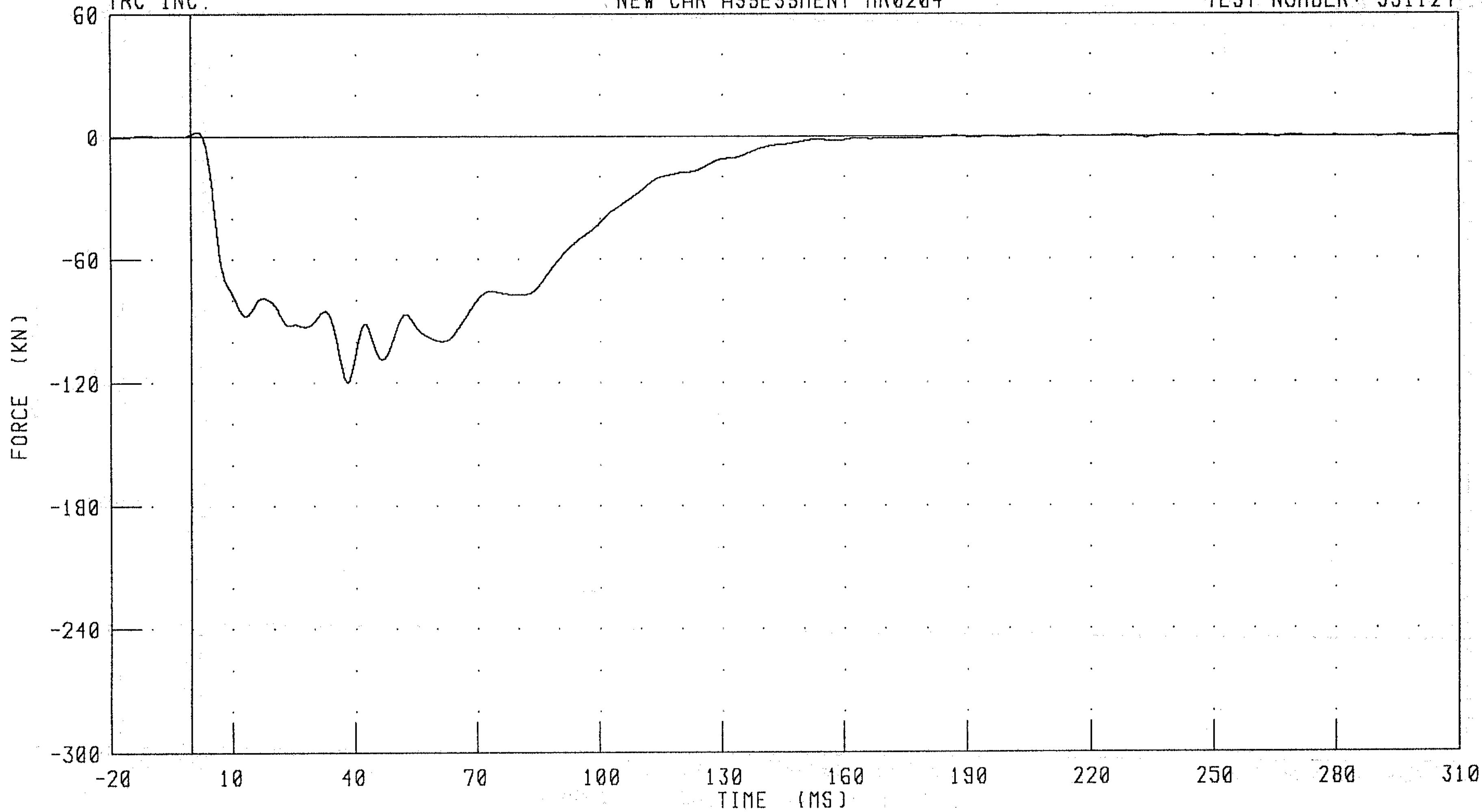
CHANNEL: LCBG2F FILTER: CH. CLASS 60 PEAK DATA: 2.23 KN @ 19.68 MS; -36.61 KN @ 38.00 MS

931124

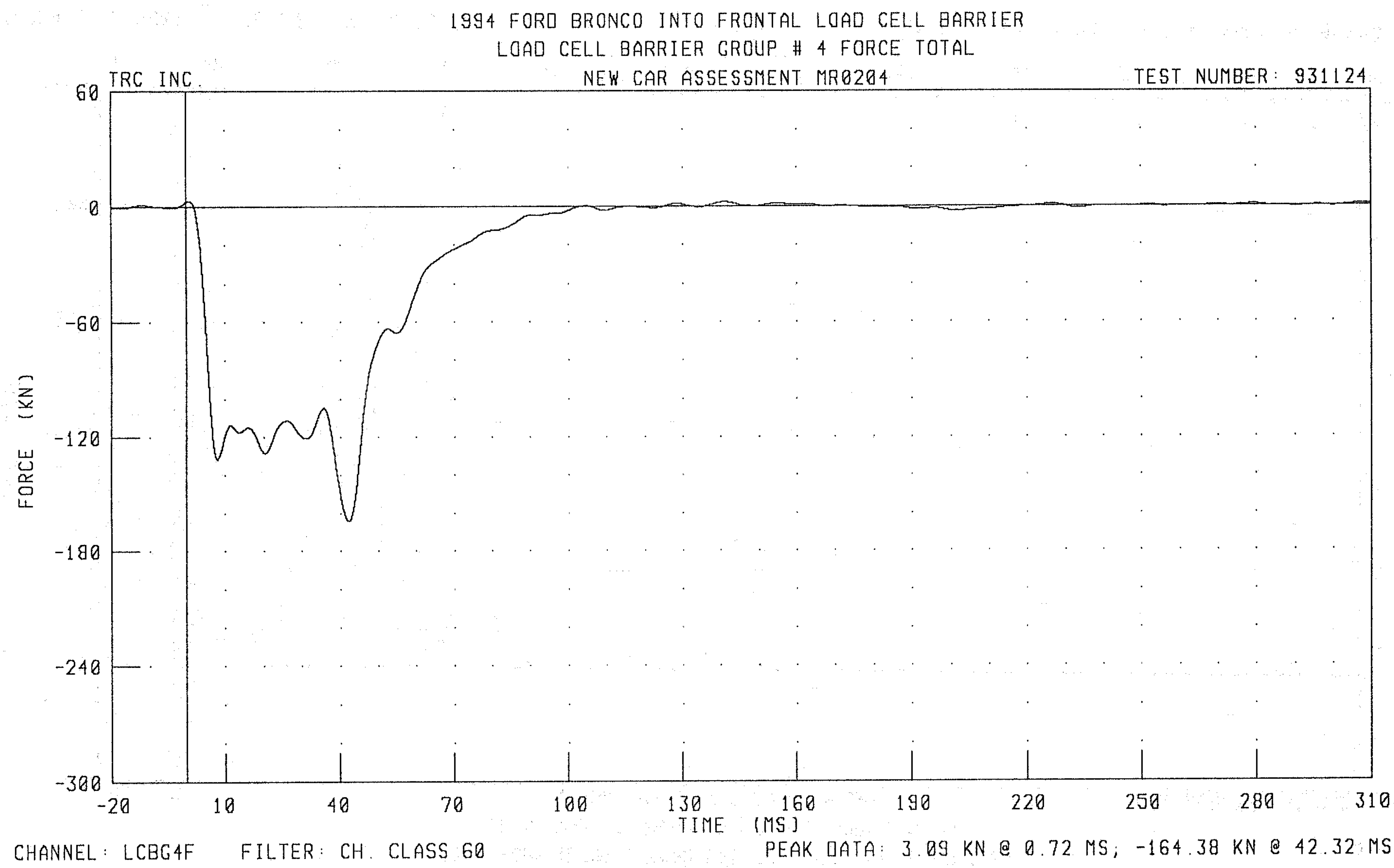
1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
NEW CAR ASSESSMENT MR0204

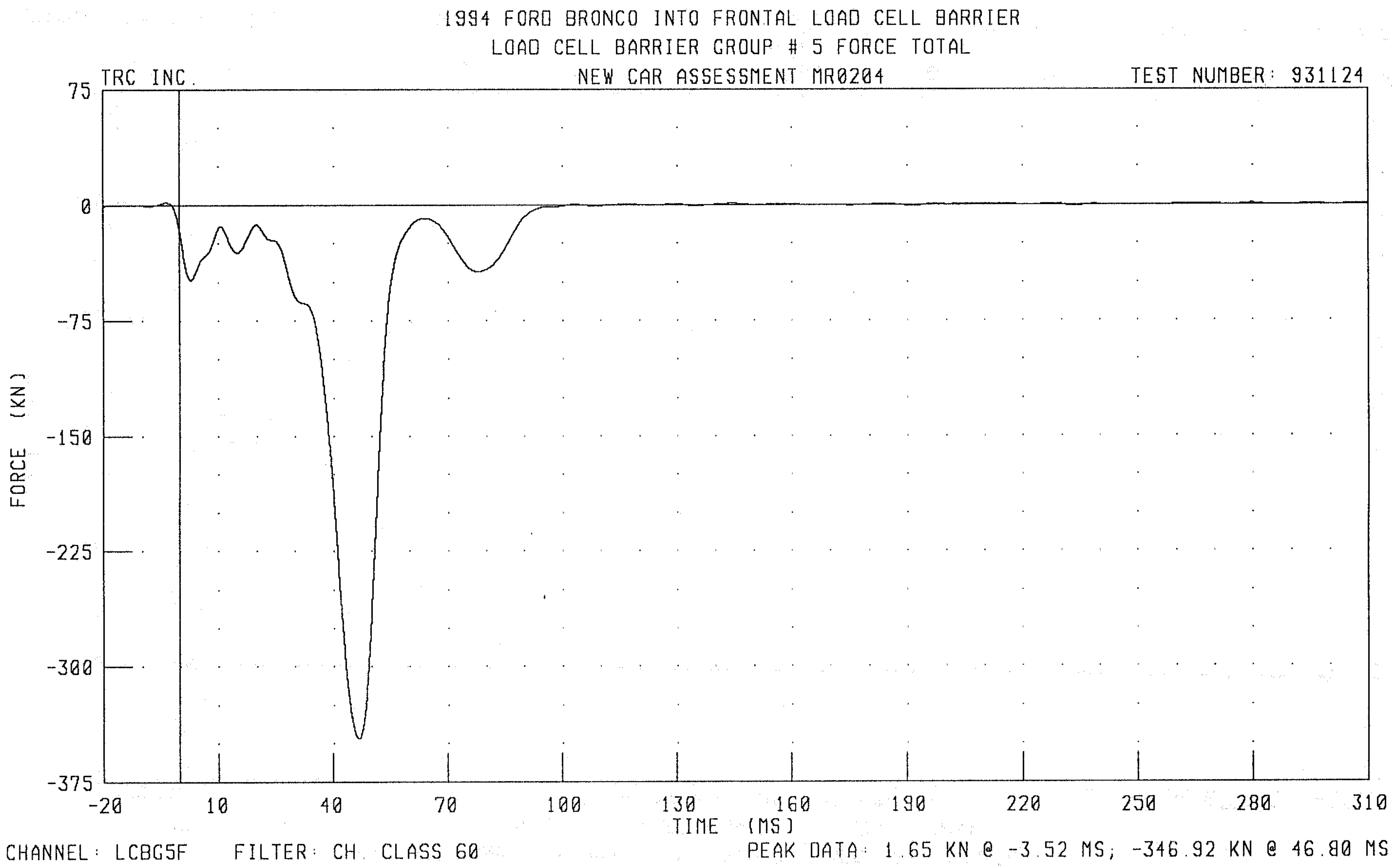
TRC INC.

TEST NUMBER: 931124

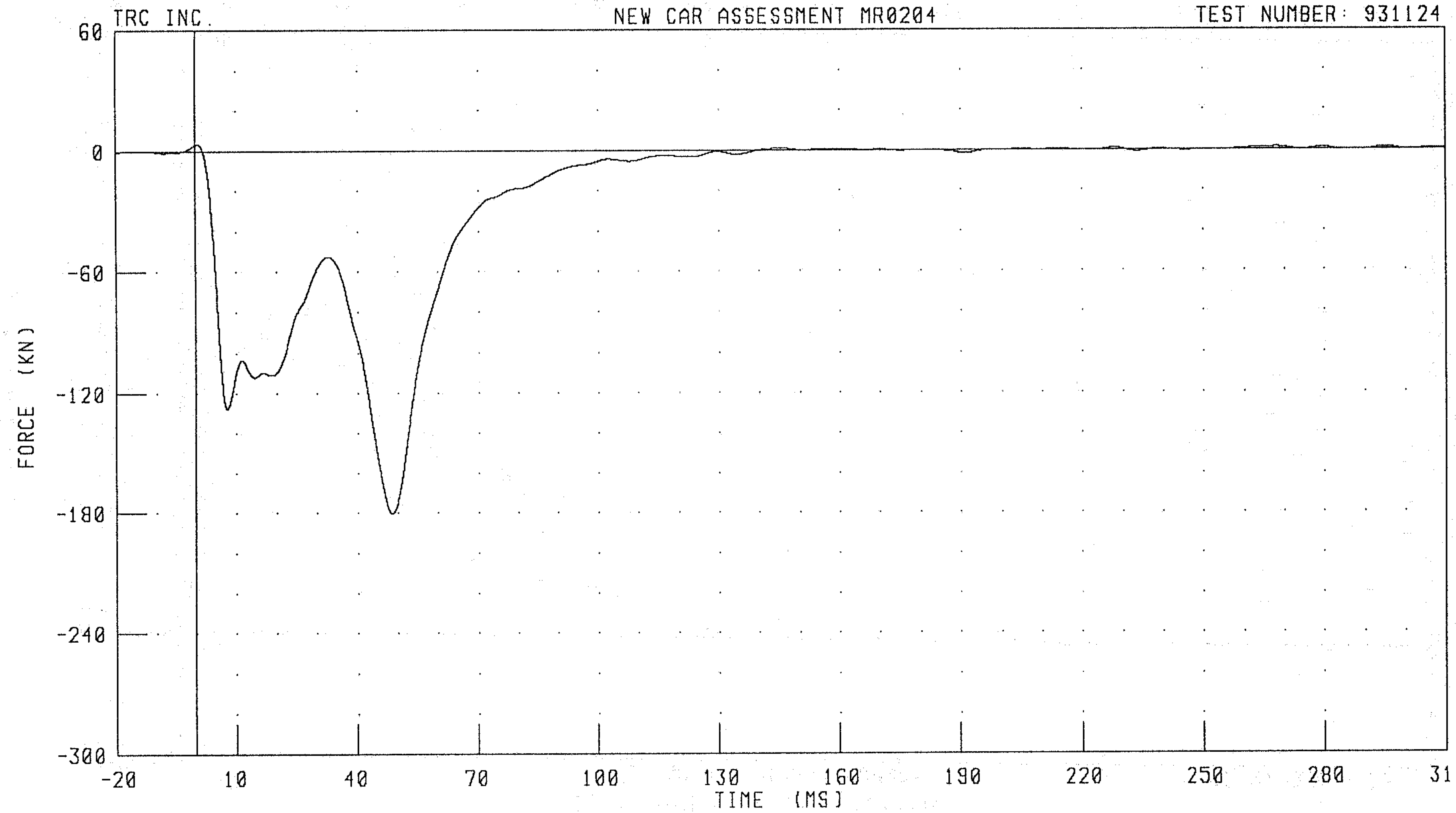


CHANNEL: LCBG3F   FILTER: CH. CLASS 60   PEAK DATA: 2.16 KN @ 1.44 MS; -119.71 KN @ 38.08 MS


1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
FORCE (KN)
60
0
-60
-120
-180
-240
-300
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG4F
FILTER: CH. CLASS 60
PEAK DATA: 3.09 KN @ 0.72 MS; -164.38 KN @ 42.32 MS

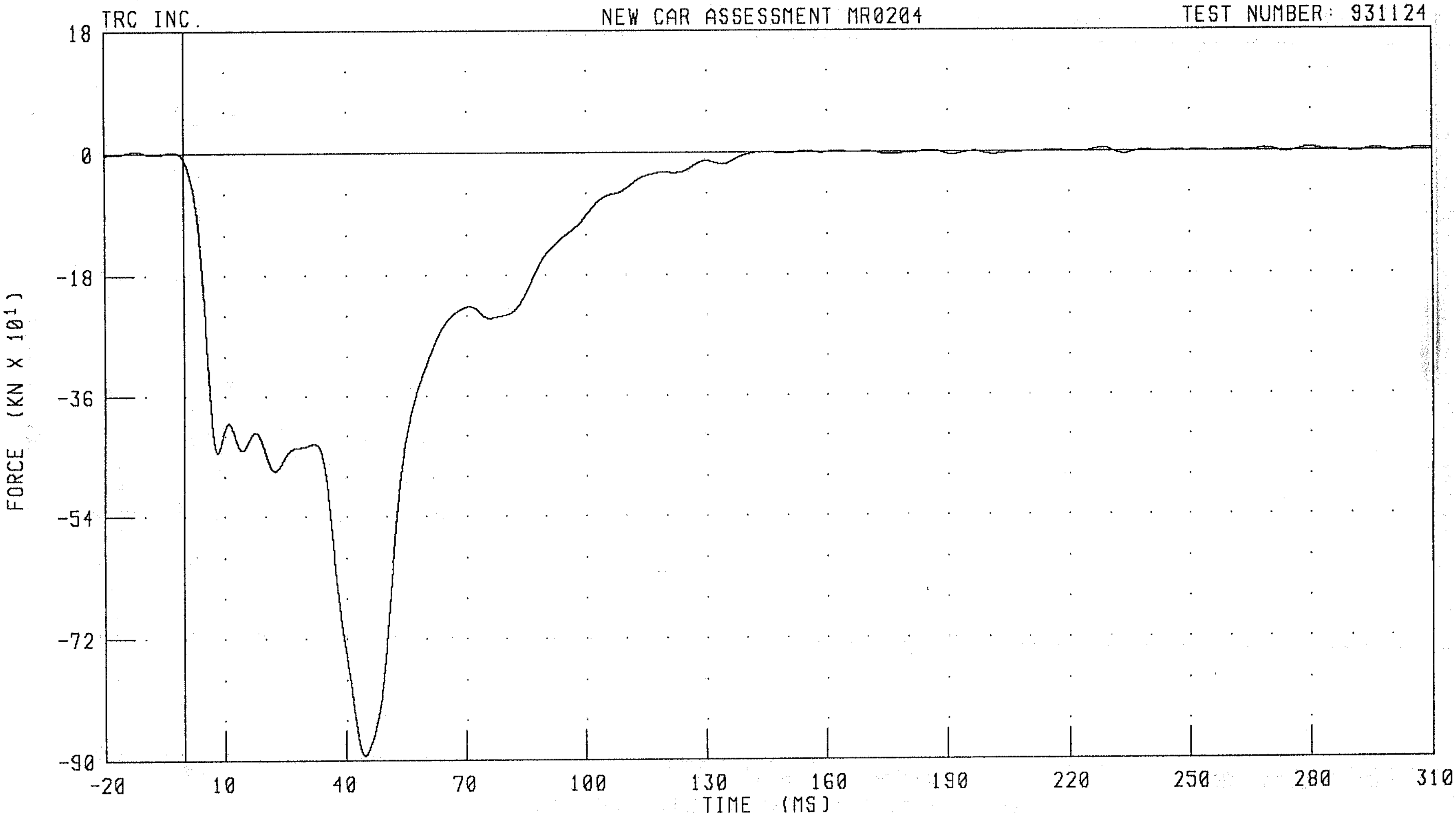

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
NEW CAR ASSESSMENT MR0204
TRC INC.
TEST NUMBER: 931124
75
0
-75
-150
-225
-300
-375
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG5F
FILTER: CH. CLASS 60
PEAK DATA: 1.65 KN @ -3.52 MS; -346.92 KN @ 46.80 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL
NEW CAR ASSESSMENT MR0204



CHANNEL: LCBG6F FILTER: CH. CLASS 60 PEAK DATA: 3.32 KN @ 0.40 MS; -180.40 KN @ 48.72 MS

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE
NEW CAR ASSESSMENT MR0204

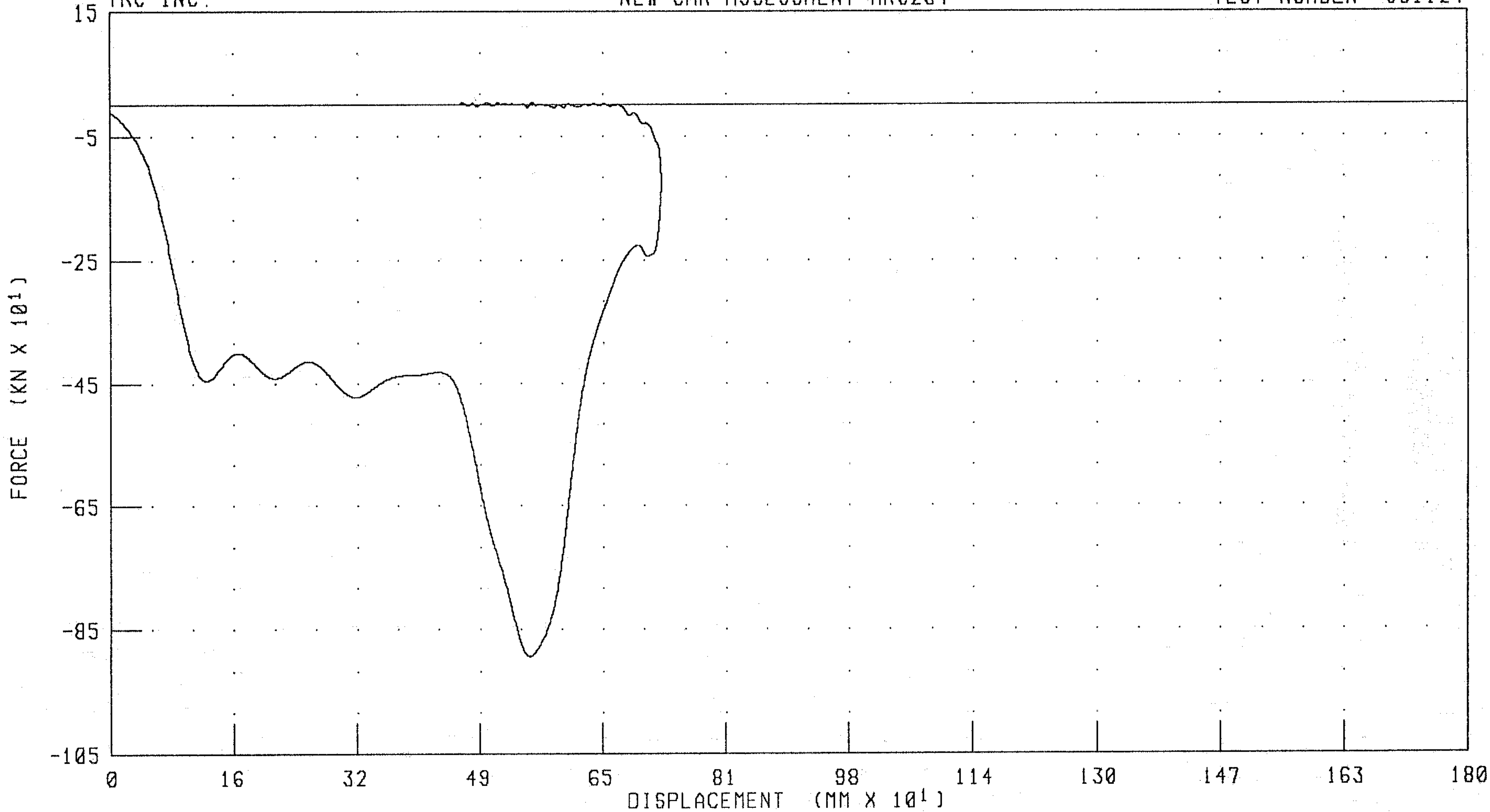


CHANNEL: LCBGT FILTER: CH. CLASS 60 PEAK DATA: 4.61 KN @ 279.92 MS; -892.83 KN @ 44.64 MS

931124

1994 FORD BRONCO INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TRC INC. NEW CAR ASSESSMENT MR0204 TEST NUMBER: 931124



CHANNEL: 0THXD FILTER: CH. CLASS 180
LCBGT CH. CLASS 60

PEAK DATA: 733.12 MM @ 94.48 MS; 0.00 MM @ 0.00 MS
4.61 KN @ 279.92 MS; -892.83 KN @ 44.64 MS

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
142 HUMANOID 19-NOV-93

TRC INC. 142C18ED1 572E SN142 EXT.DIMENSION CAL18

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

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 19-NOV-93

TRC INC. 142C18HD1 572E SN142 HEAD DROP CAL 18

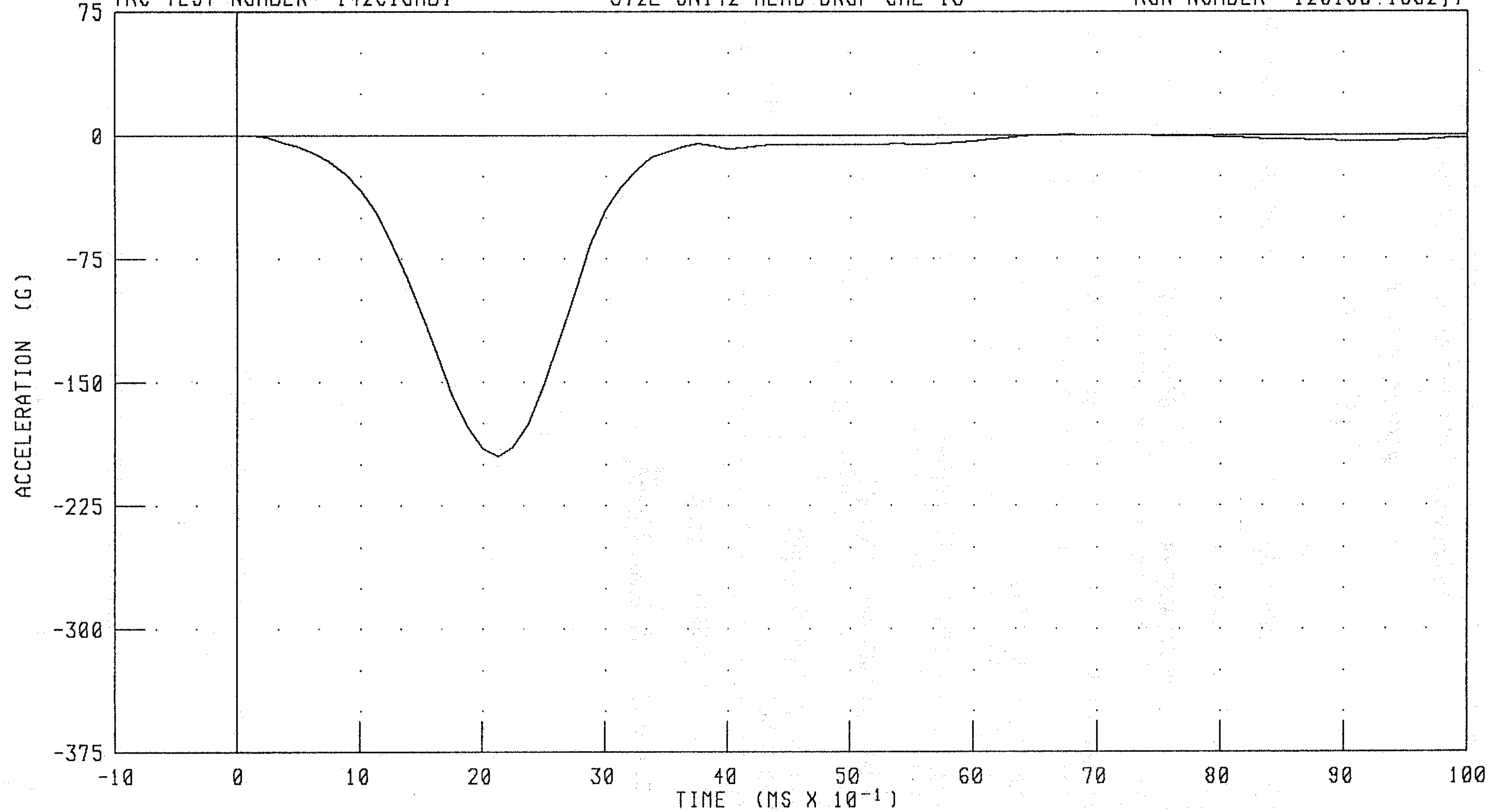
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	226.03 G
PEAK LATERAL ACCELERATION	15 G MAX	2.19 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Peter Fost

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

TRC TEST NUMBER: 142C18HD1 572E SN142 HEAD DROP CAL 18 RUN NUMBER: 120193.1552;7

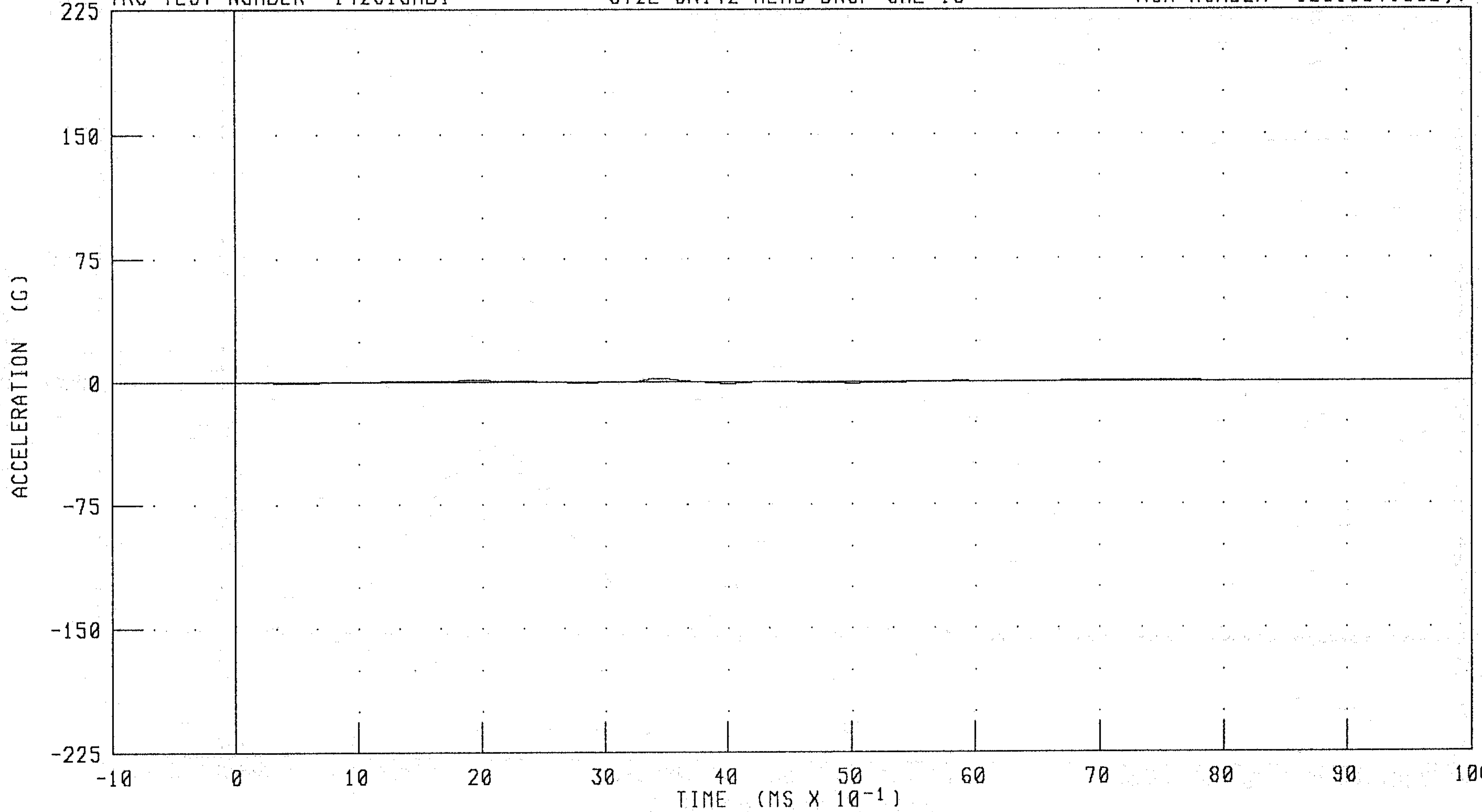


CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 0.30 G @ 6.75 MS; -195.06 G @ 2.13 MS

931124

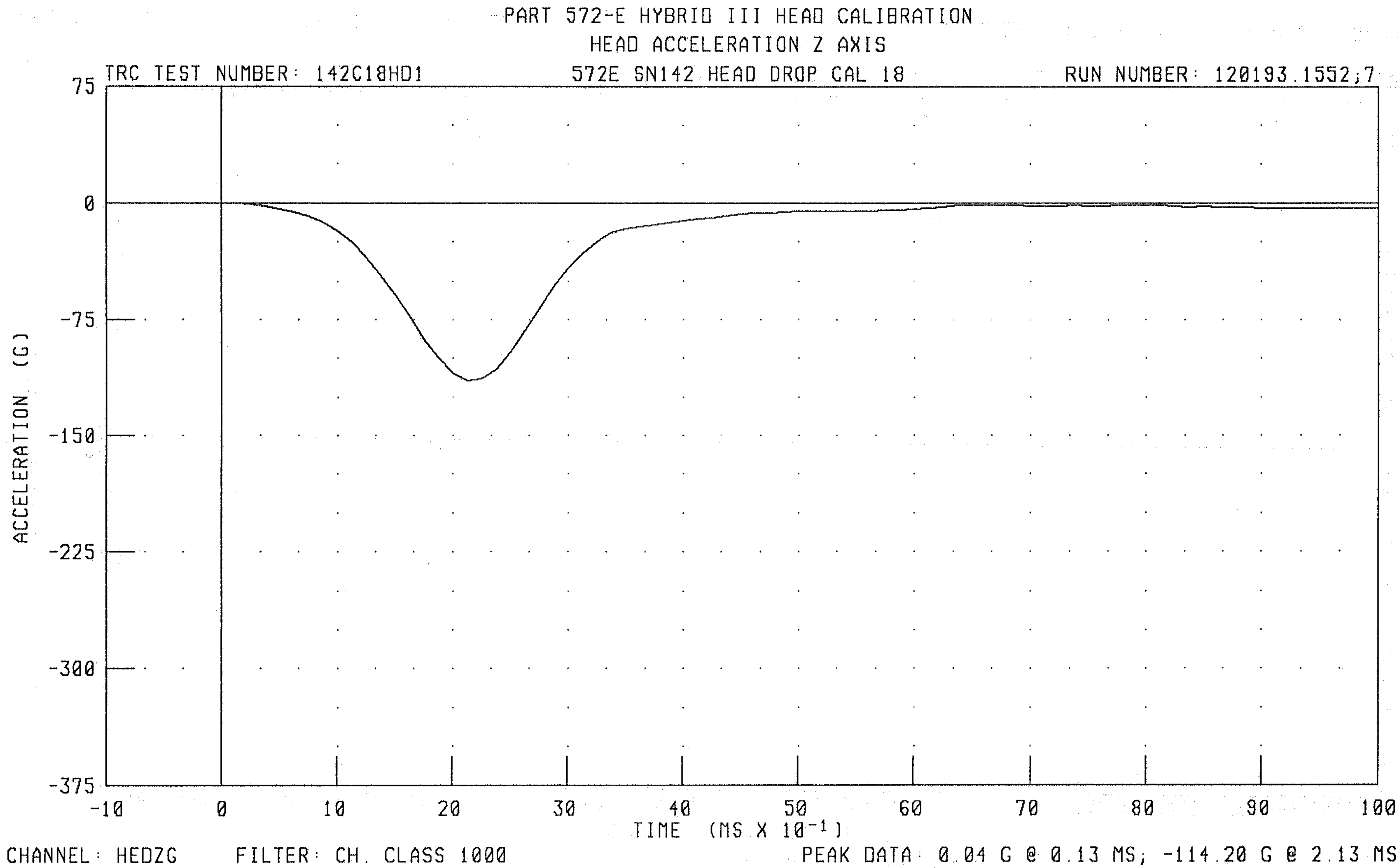
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 142C18HD1 572E SN142 HEAD DROP CAL 18 RUN NUMBER: 120193.1552;7



CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 2.20 G @ 3.50 MS; -1.16 G @ 5.00 MS

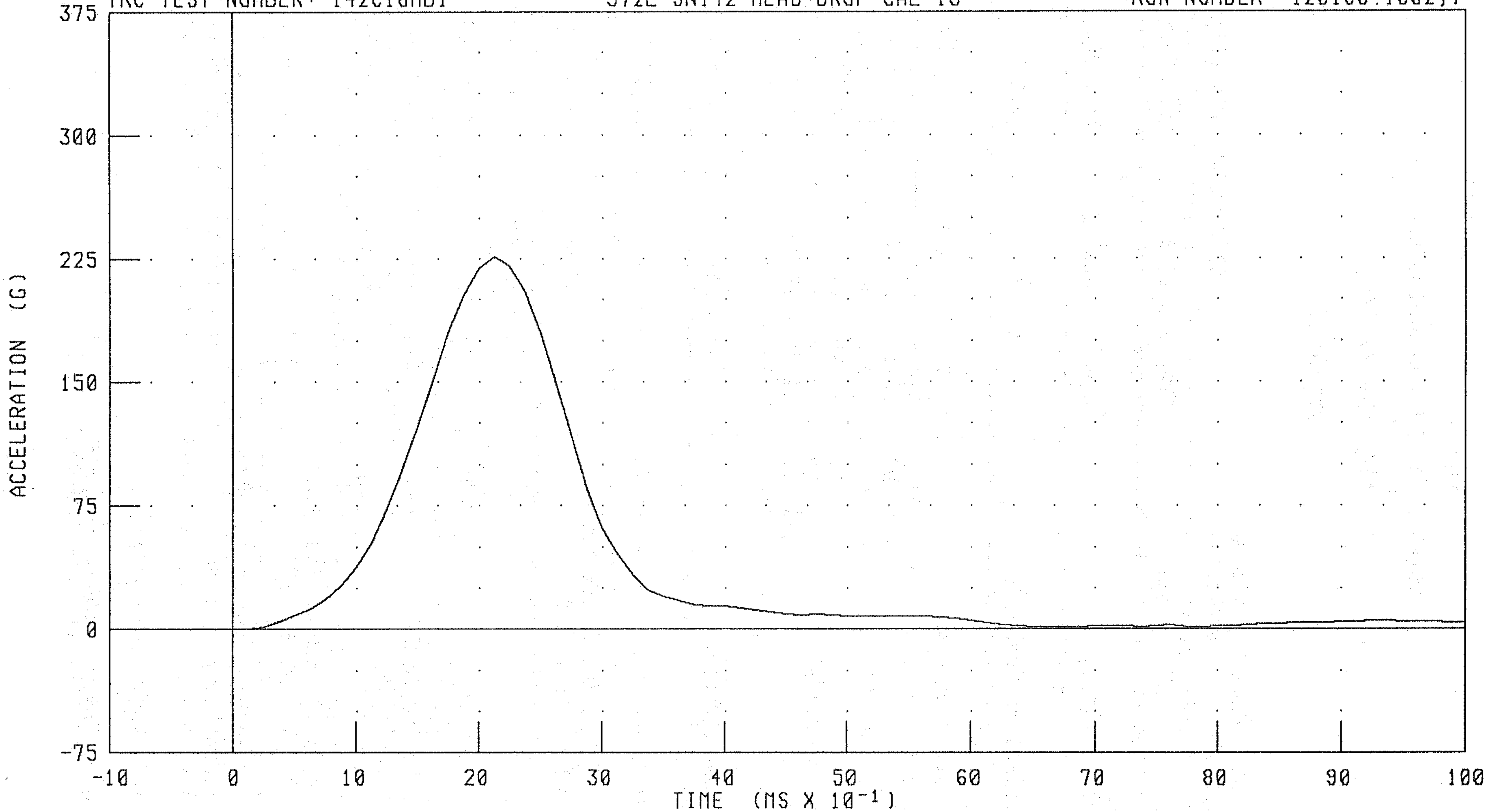
931124


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 142C18HD1
572E SN142 HEAD DROP CAL 18
RUN NUMBER: 120193.1552;7
75
0
-75
-150
-225
-300
-375
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10^-1)
CHANNEL: HEDZG
FILTER: CH. CLASS 1000
PEAK DATA: 0.04 G @ 0.13 MS; -114.20 G @ 2.13 MS

931124

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 142C18HD1 572E SN142 HEAD DROP CAL 18 RUN NUMBER: 120193.1552;7



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 226.03 G @ 2.13 MS; 0.05 G @ -0.88 MS

931124

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST

HYBRID III 22-NOV-93

6 AXIS NECK TRANSDUCER
TRC INC. 142C18NF1 572E SN142 NECK FLEXION CAL18

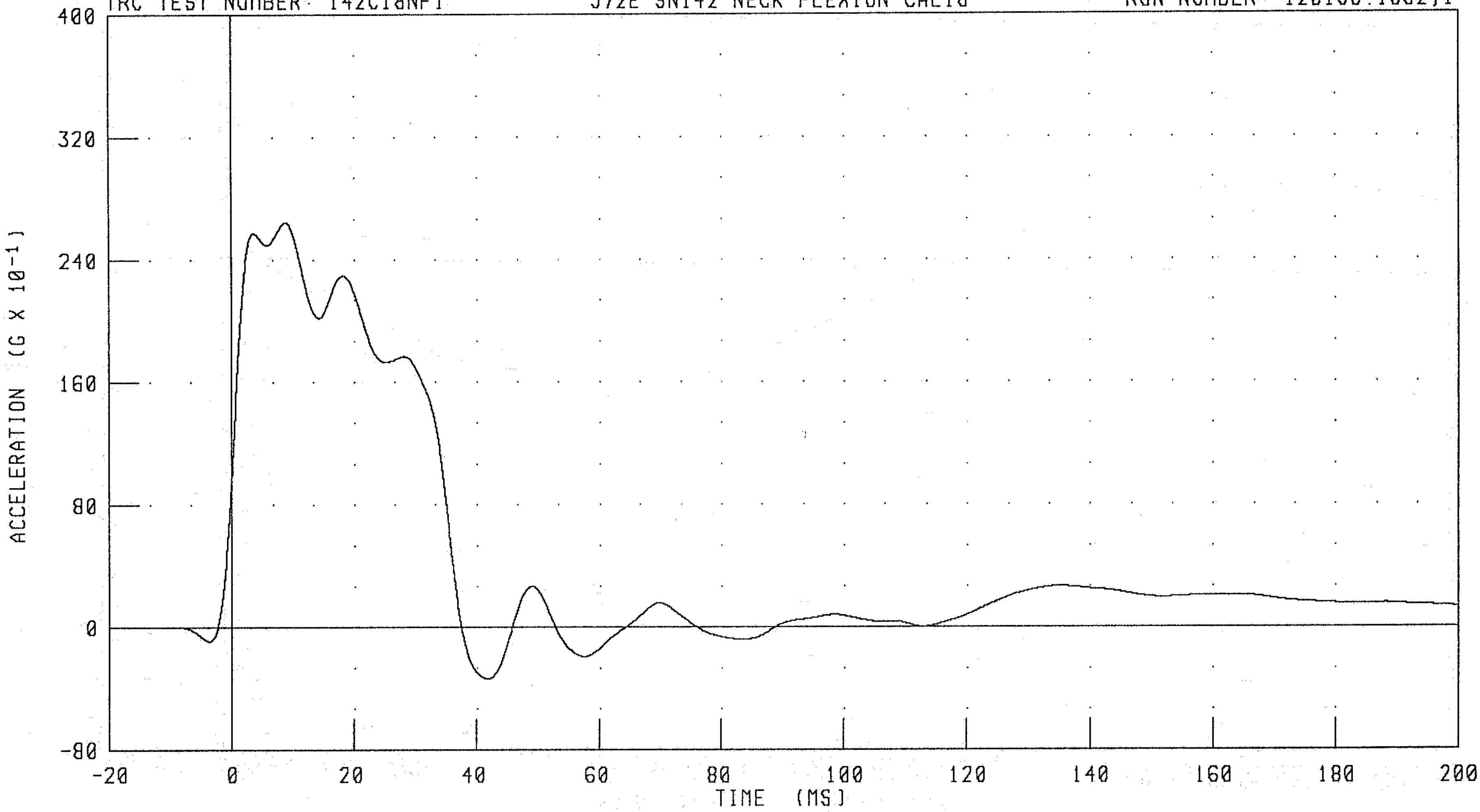
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	55.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	25.65 G
	20 MS	17.60 - 22.60 G	21.89 G
	30 MS	12.50 - 18.50 G	16.99 G
MAX PENDULUM G		29 G MAX	26.44 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.93 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	35.84 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	74.09 DEG.
	TIME	57 - 64 MS	59.04 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	91.77 NM
	TIME	47 - 58 MS	49.44 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.56 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	101.20 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C18NF1 572E SN142 NECK FLEXION CAL18 RUN NUMBER: 120193.1552;1

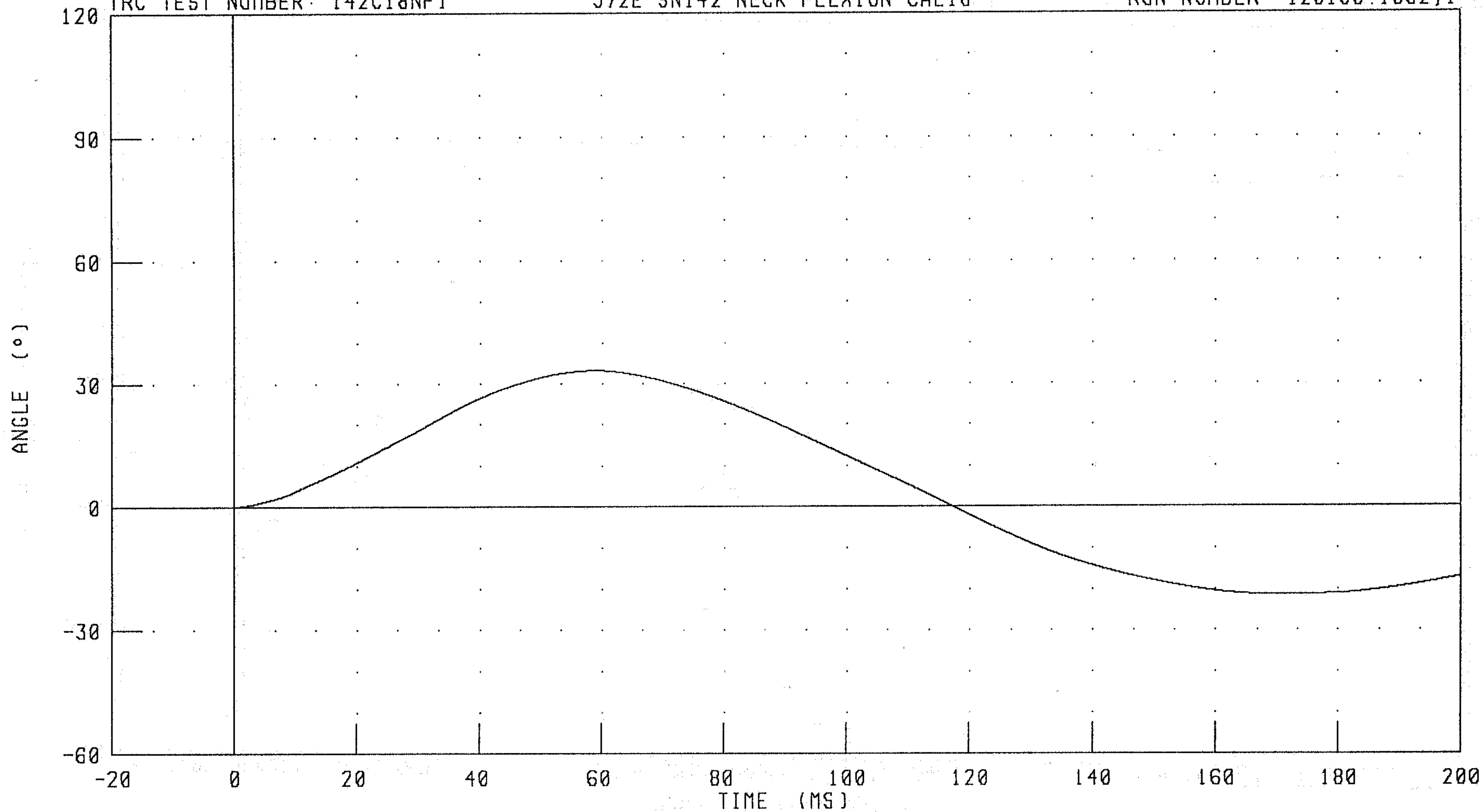


CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 26.45 G @ 8.80 MS; -3.37 G @ 41.76 MS

931124

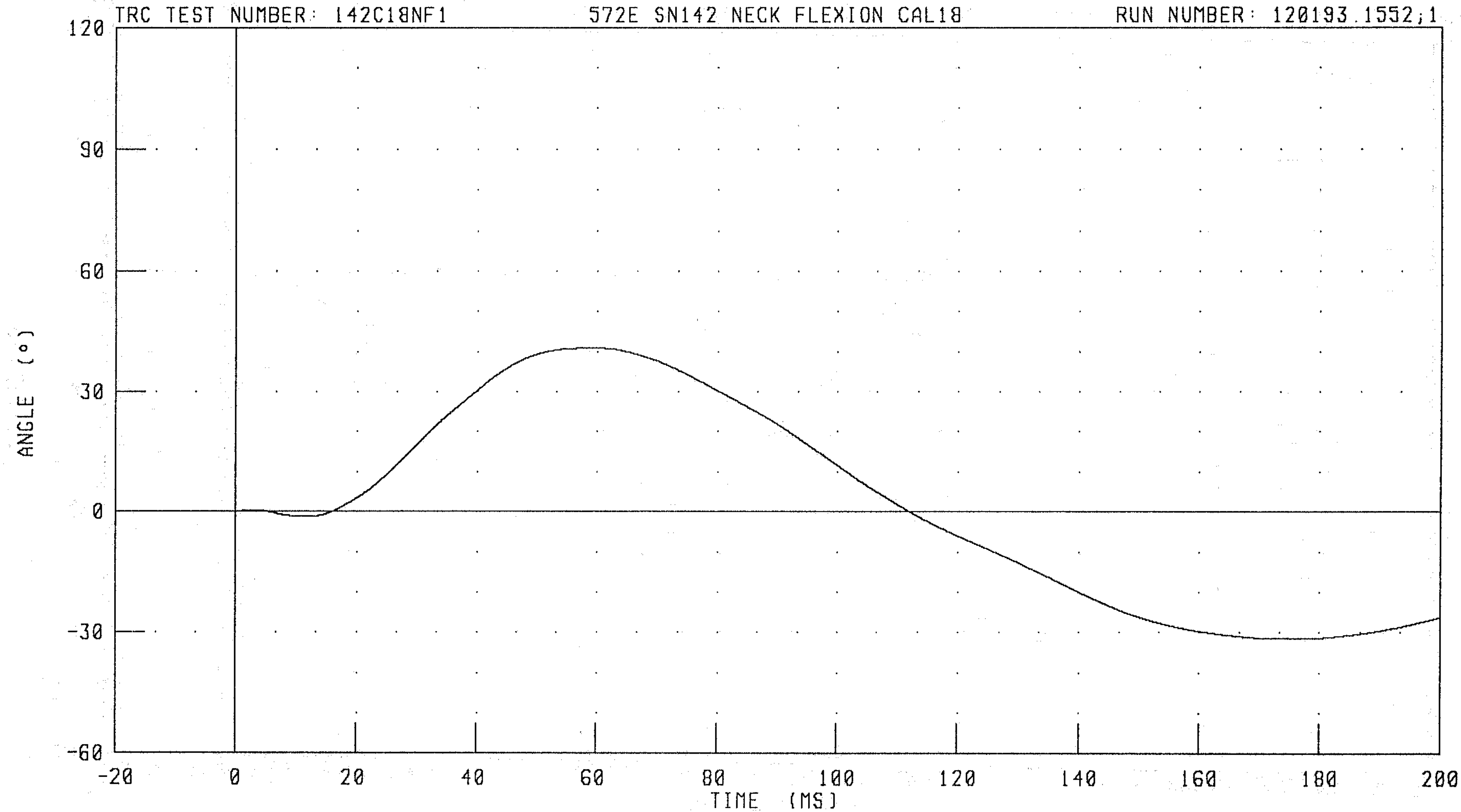
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C18NF1   572E SN142 NECK FLEXION CAL18   RUN NUMBER: 120193.1552;1



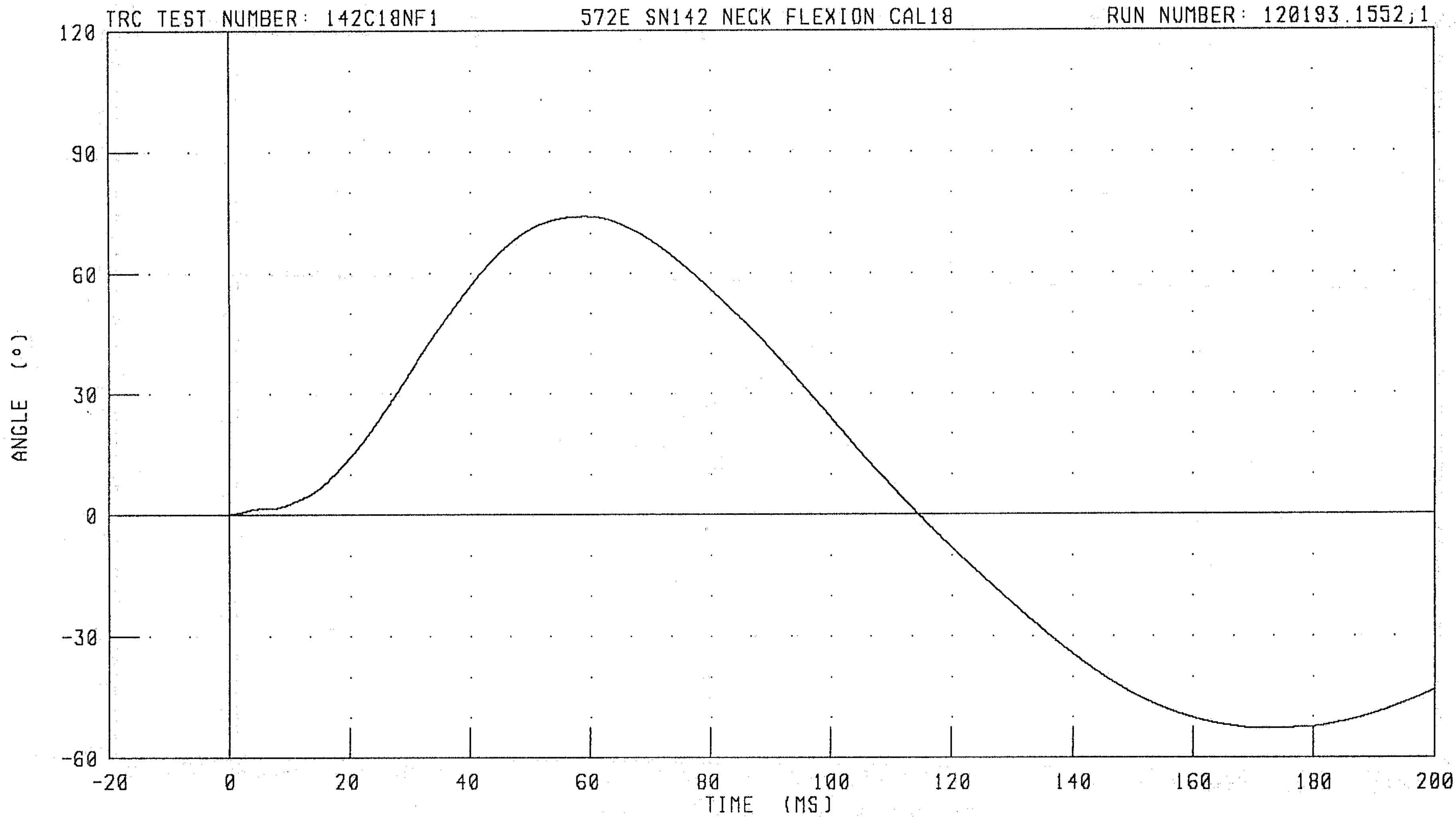
CHANNEL: BETA   FILTER: CH. CLASS 60   PEAK DATA: 33.26 ° @ 58.96 MS; -21.41 ° @ 171.84 MS

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



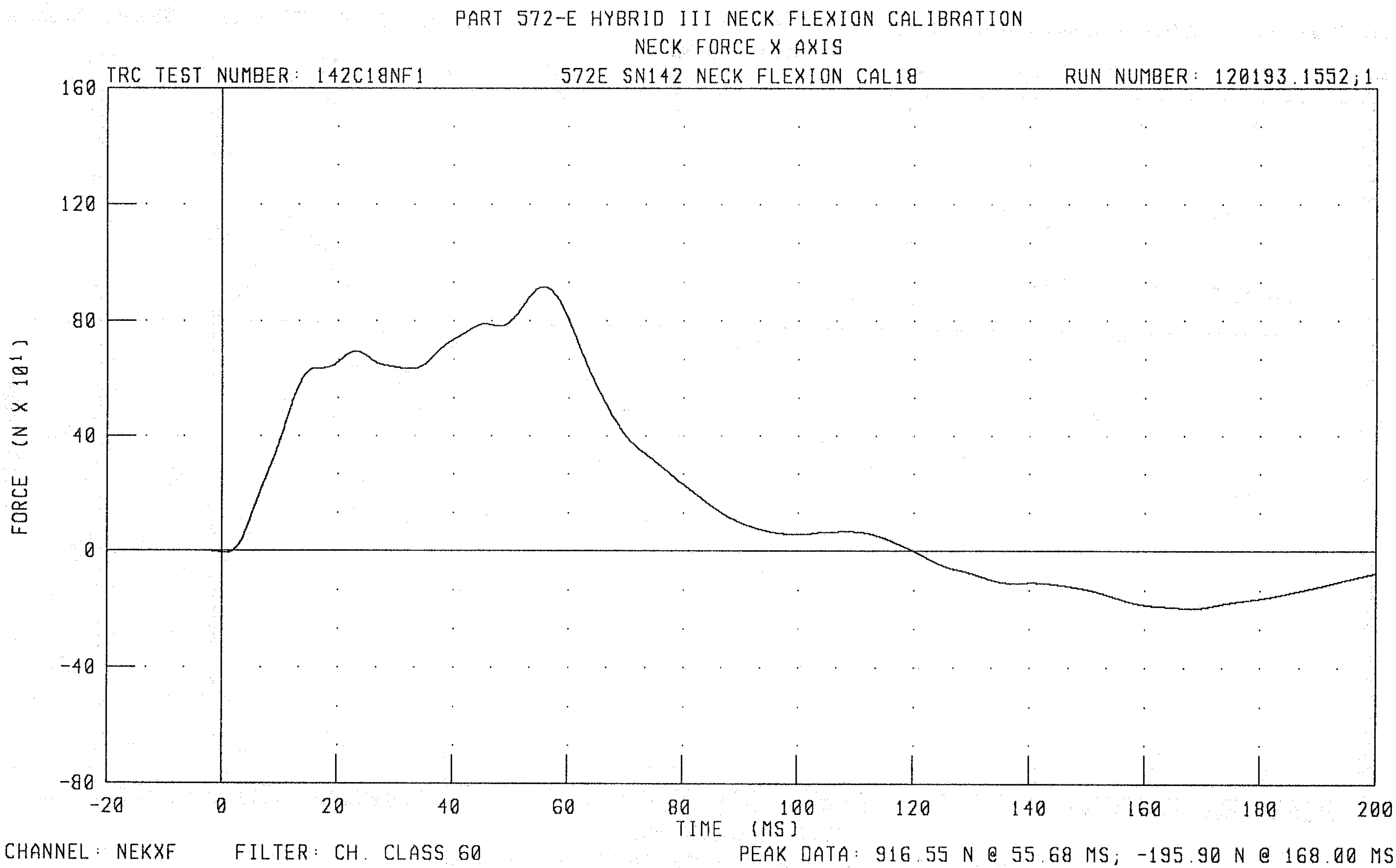
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 40.84 ° @ 59.68 MS; -31.42 ° @ 178.16 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 74.10 ° @ 59.04 MS; -52.83 ° @ 171.68 MS

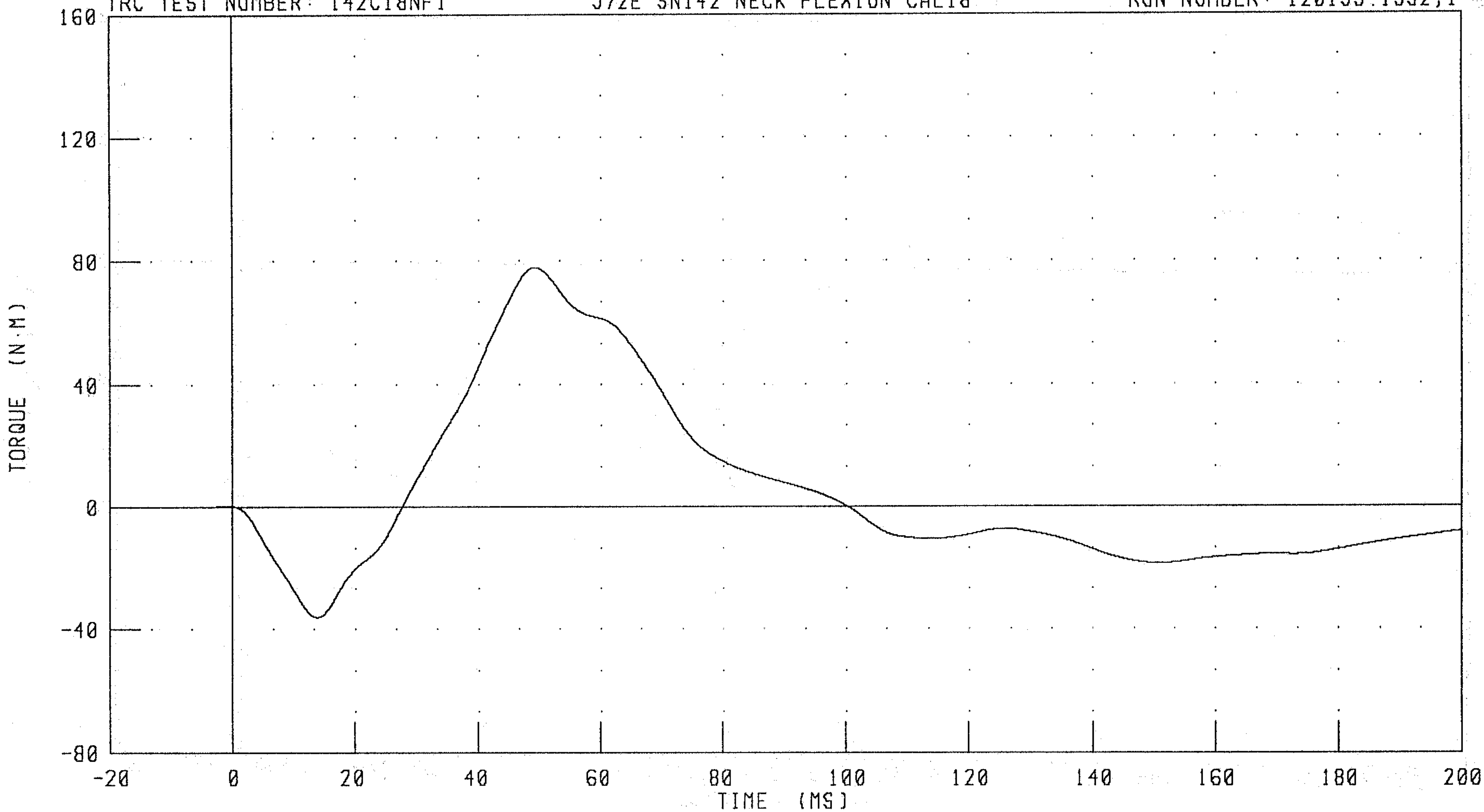
931124


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 142C18NF1
572E SN142 NECK FLEXION CAL18
RUN NUMBER: 120193.1552;1
160
120
80
40
0
-40
-80
FORCE (N X 10¹)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKXF
FILTER: CH. CLASS 60
PEAK DATA: 916.55 N @ 55.68 MS; -195.90 N @ 168.00 MS

931124

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

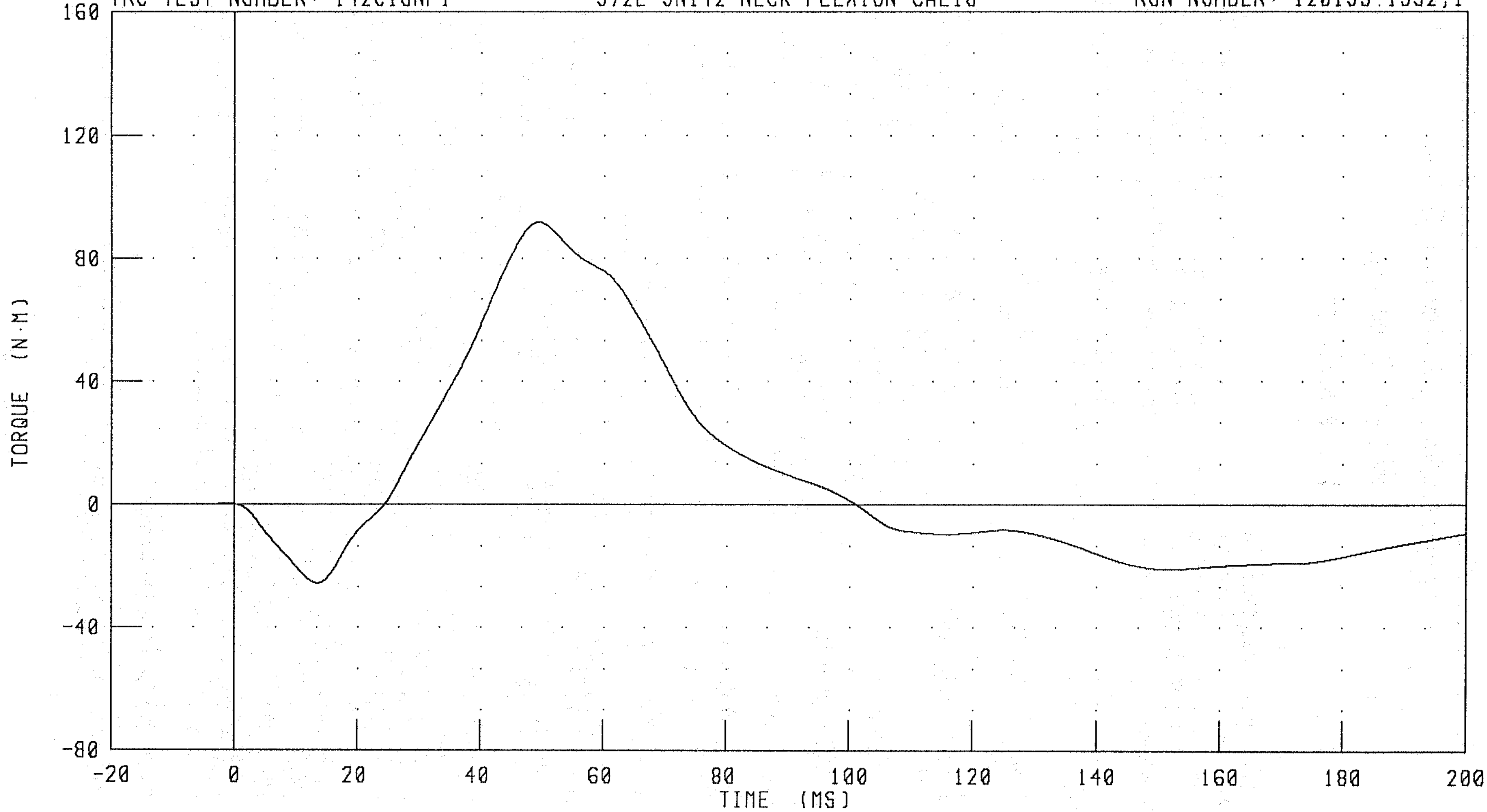
TRC TEST NUMBER: 142C18NF1 572E SN142 NECK FLEXION CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 77.76 N·M @ 49.28 MS; -36.06 N·M @ 13.92 MS

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

TRC TEST NUMBER: 142C18NF1 572E SN142 NECK FLEXION CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 91.77 N·M @ 49.44 MS; -25.54 N·M @ 13.44 MS

931124

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST

HYBRID III 22-NOV-93

6 AXIS NECK TRANSDUCER
TRC INC. 142C18NE1 572E SN142 NECK EXT. CAL18

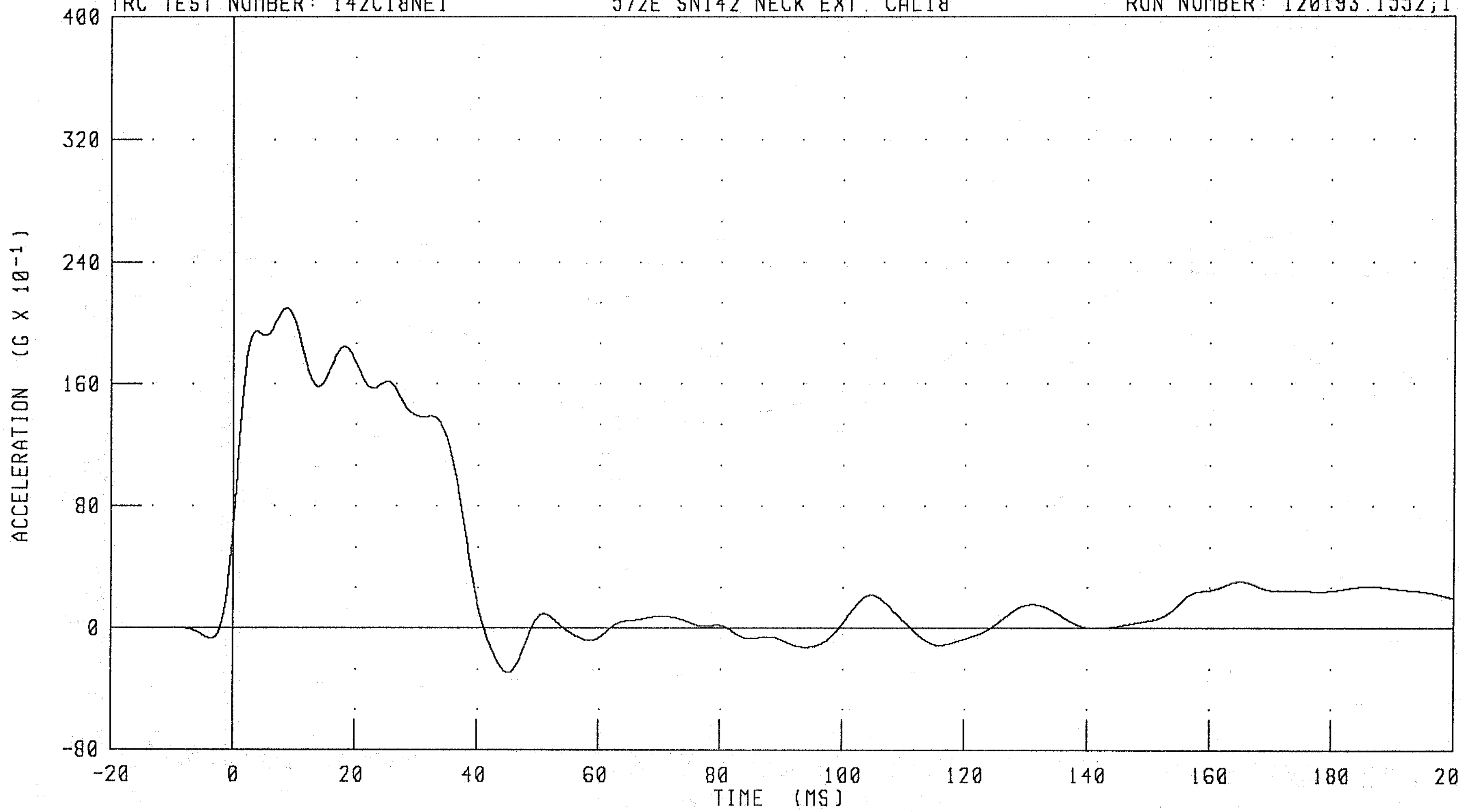
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	55.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.02 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	20.26 G
	20 MS	14.00 - 19.00 G	17.51 G
	30 MS	11.00 - 16.00 G	13.93 G
MAX PENDULUM G		22 G MAX	21.00 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.92 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.48 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	97.69 DEG.
	TIME	72 - 82 MS	76.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-73.68 NM
	TIME	65 - 79 MS	68.96 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	152.00 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.48 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

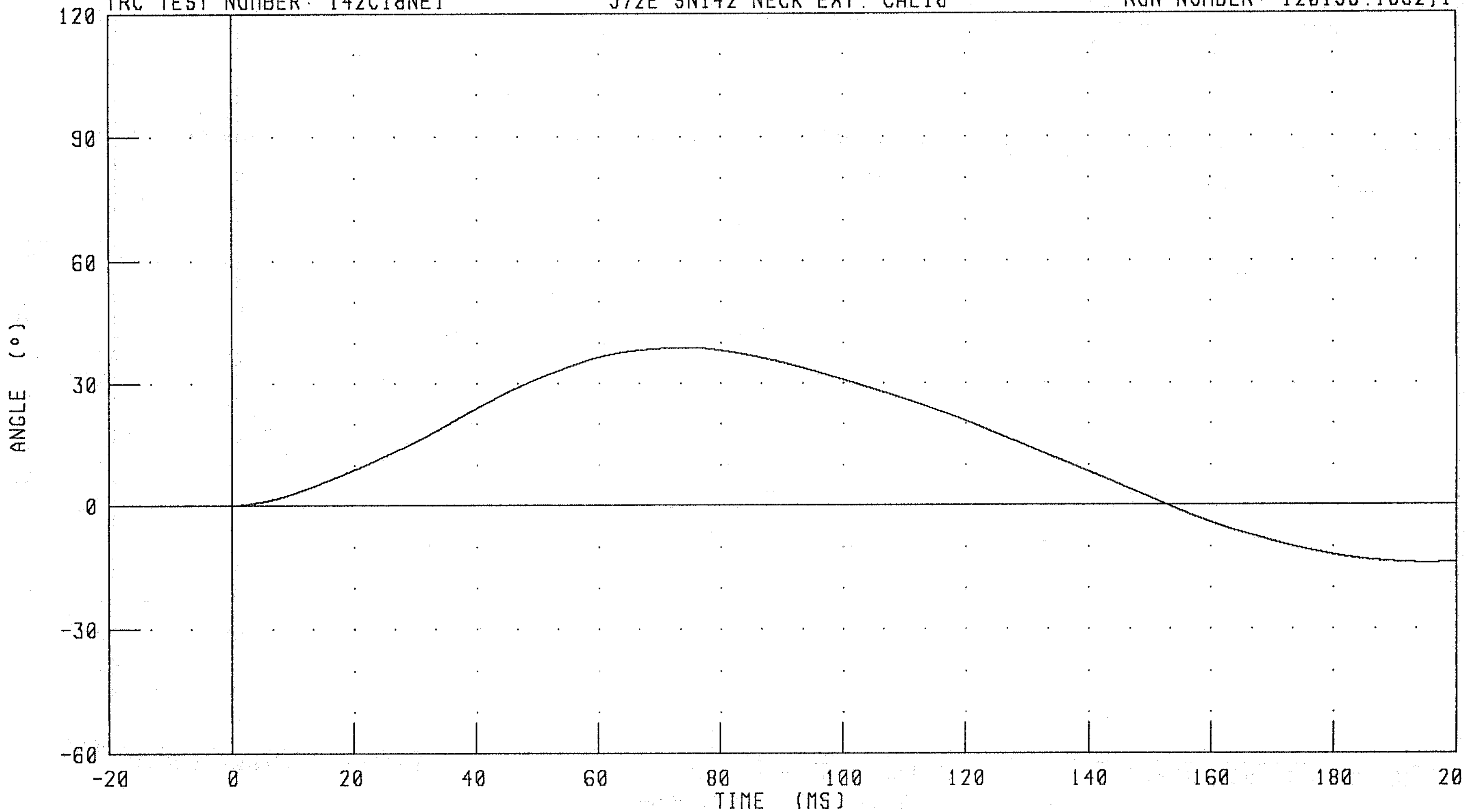
TRC TEST NUMBER: 142C18NE1 572E SN142 NECK EXT. CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 21.01 G @ 8.72 MS; -2.90 G @ 45.12 MS

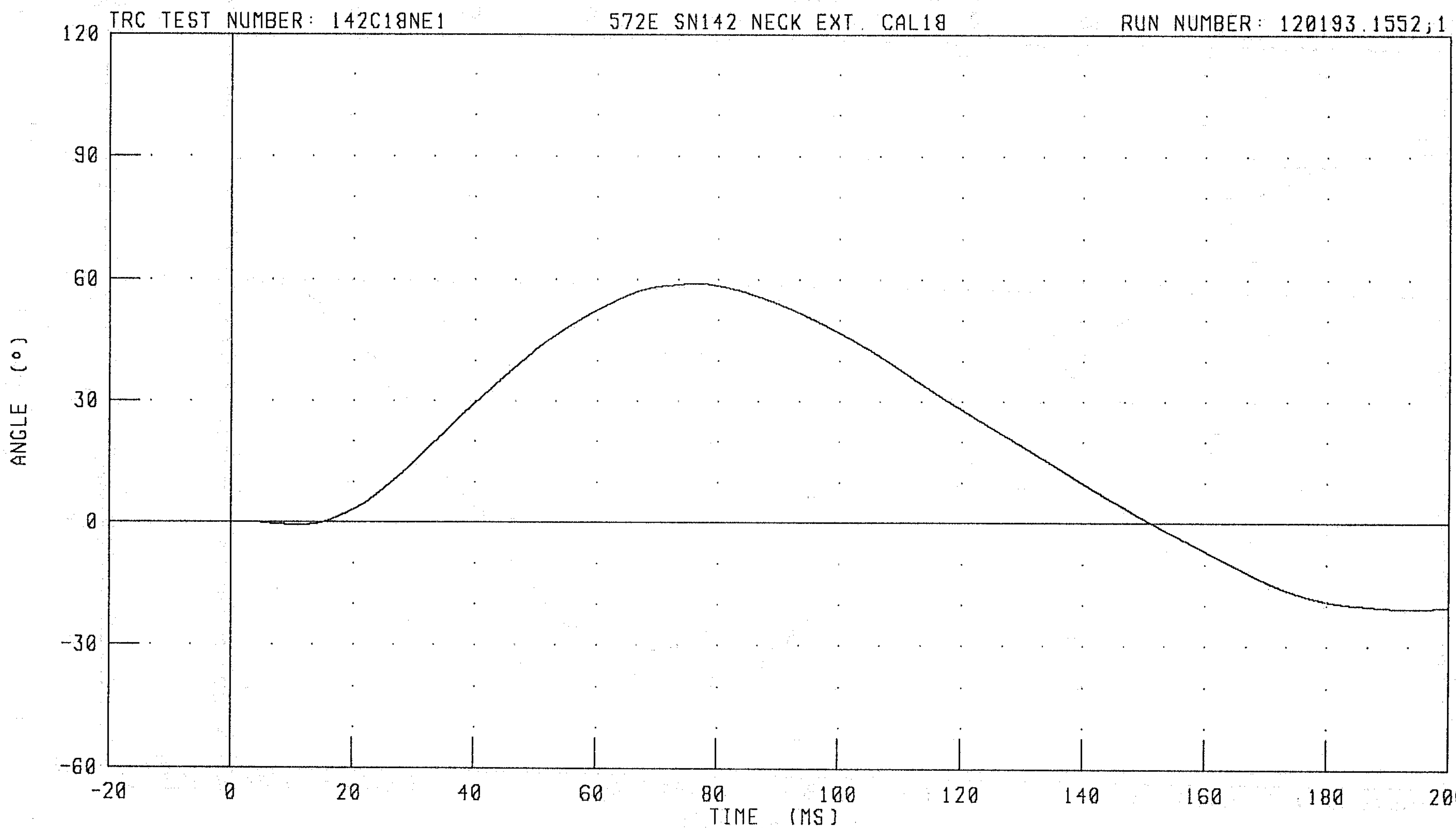
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C18NE1 572E SN142 NECK EXT. CAL18 RUN NUMBER: 120193.1552;1

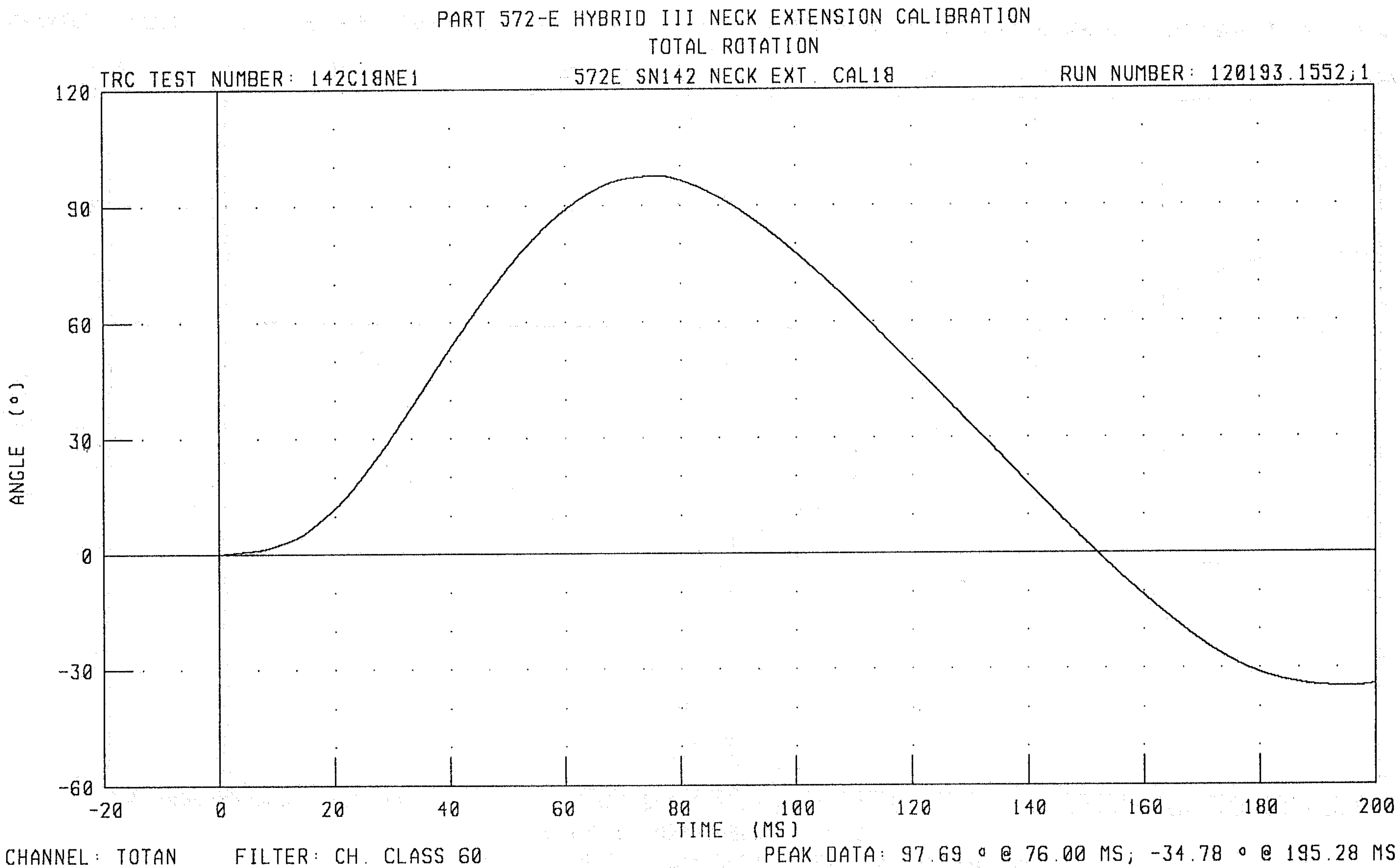


CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 38.70 ° @ 74.16 MS; -14.10 ° @ 195.20 MS

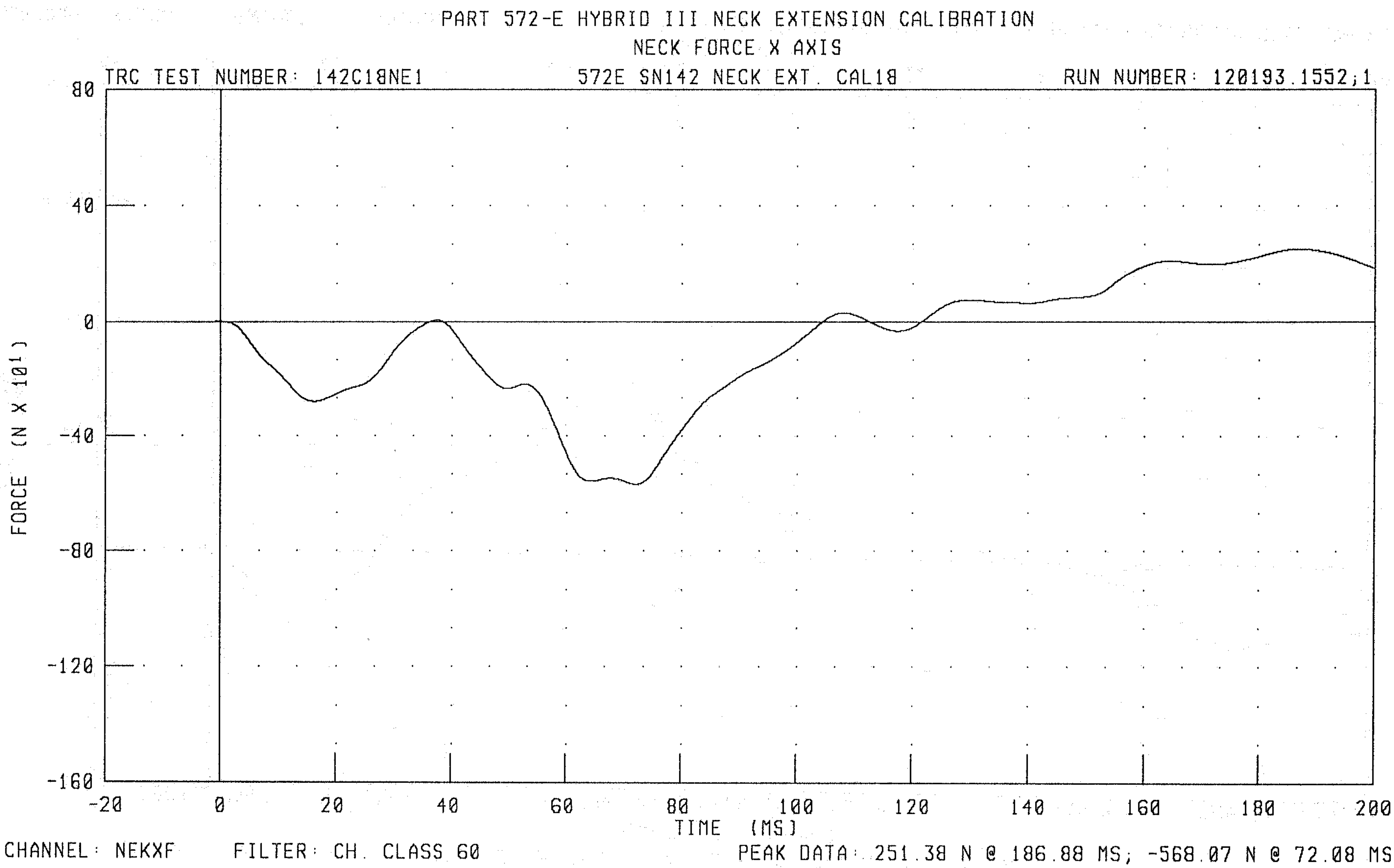
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE



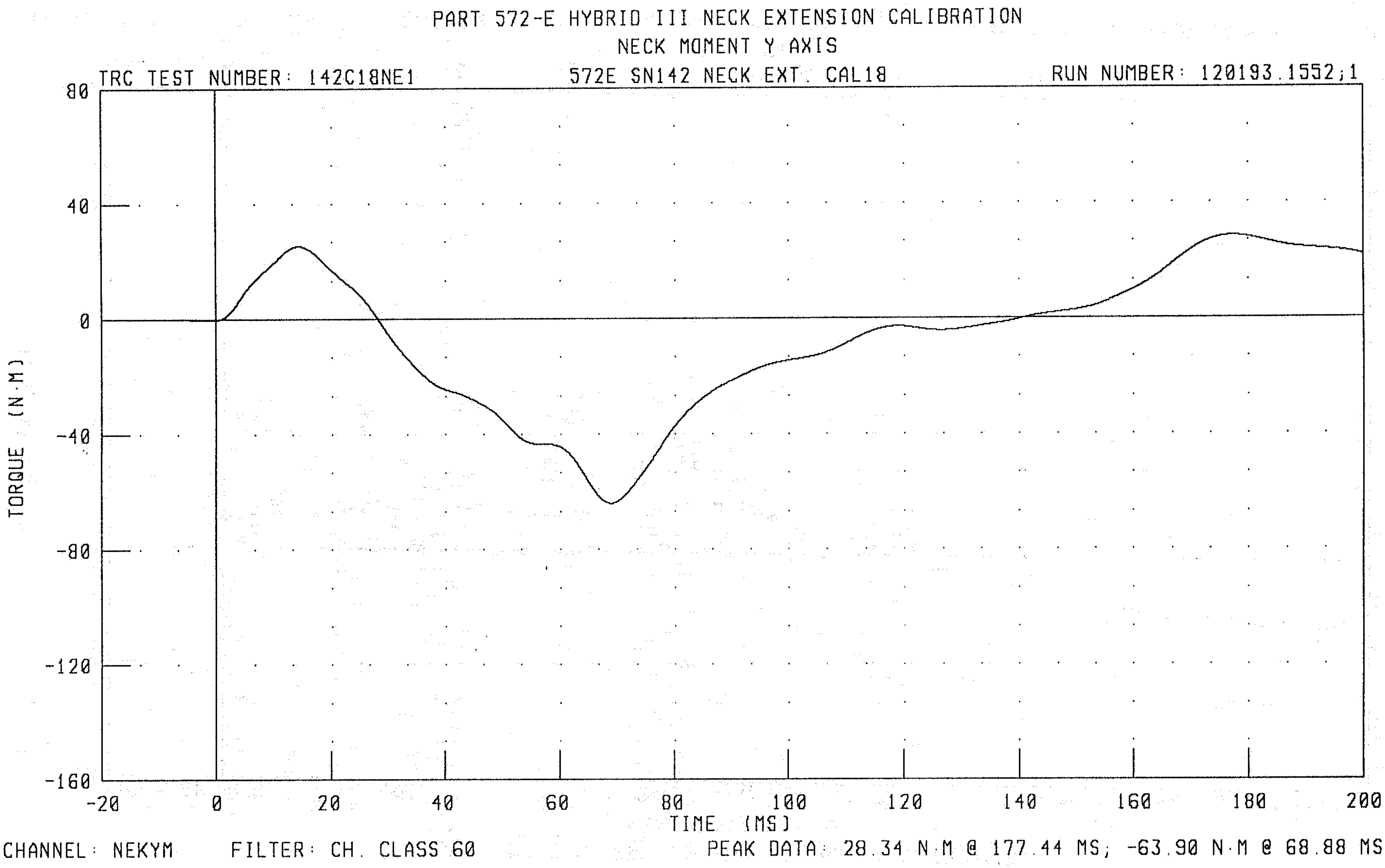
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 59.04 ° @ 76.56 MS; -20.68 ° @ 195.60 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: 142C18NE1
572E SN142 NECK EXT. CAL18
RUN NUMBER: 120193.1552;1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: TOTAN
FILTER: CH. CLASS 60
PEAK DATA: 97.69 ° @ 76.00 MS; -34.78 ° @ 195.28 MS

931124

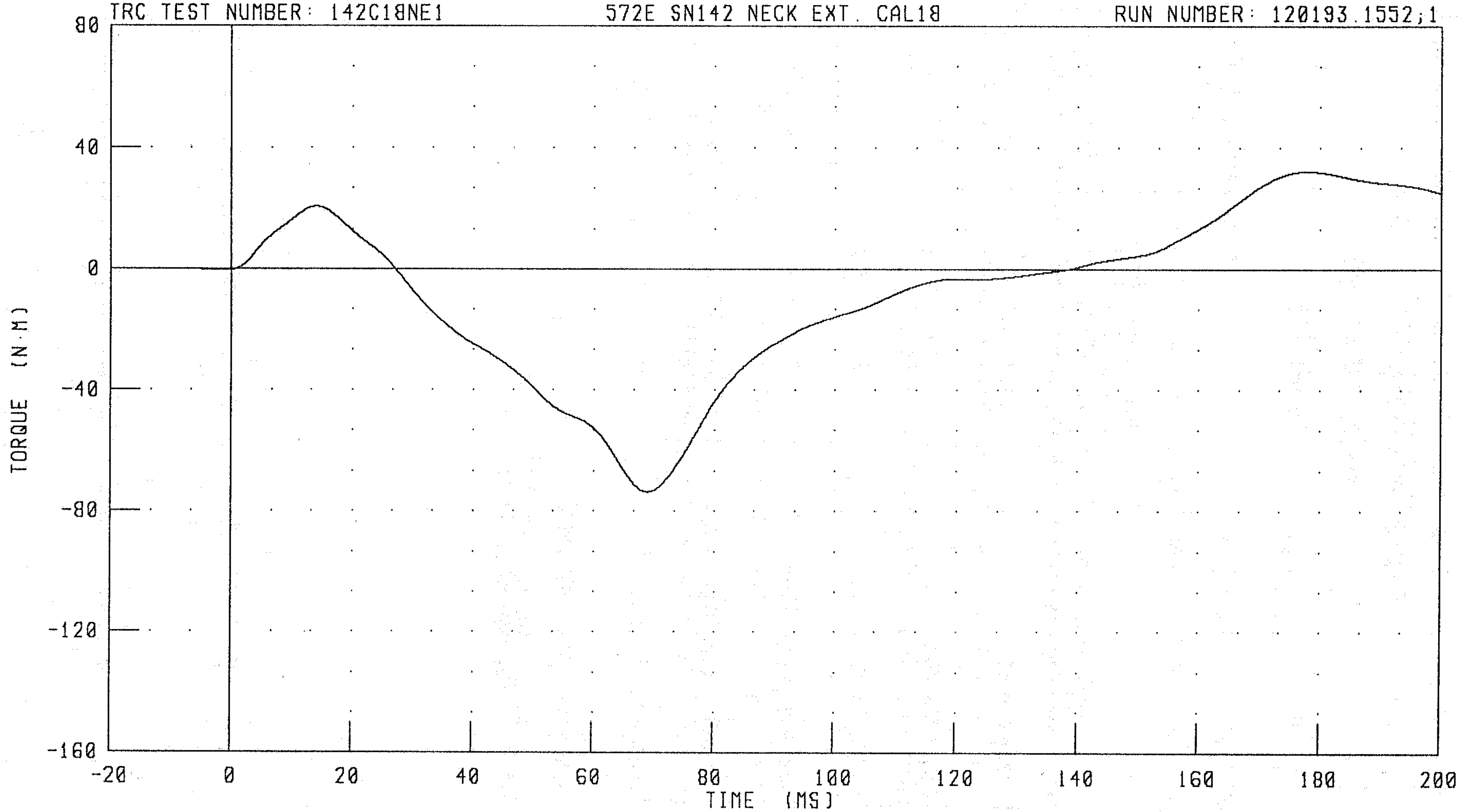

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 142C18NE1
572E SN142 NECK EXT. CAL18
RUN NUMBER: 120193.1552;1
80
40
0
-40
-80
-120
-160
FORCE (N X 10¹)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKXF
FILTER: CH. CLASS 60
PEAK DATA: 251.38 N @ 186.88 MS; -568.07 N @ 72.08 MS

931124


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 142C18NE1
572E SN142 NECK EXT. CAL18
RUN NUMBER: 120193.1552;1
80
40
0
-40
-80
-120
-160
TORQUE (N·M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKYM
FILTER: CH. CLASS 60
PEAK DATA: 28.34 N·M @ 177.44 MS; -63.90 N·M @ 68.88 MS

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

TRC TEST NUMBER: 142C18NE1 572E SN142 NECK EXT. CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 32.16 N·M @ 178.00 MS; -73.68 N·M @ 68.96 MS

931124

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 22-NOV-93

TRC INC. 142C18TH1 572E SN142 H.S.THORAX CAL18

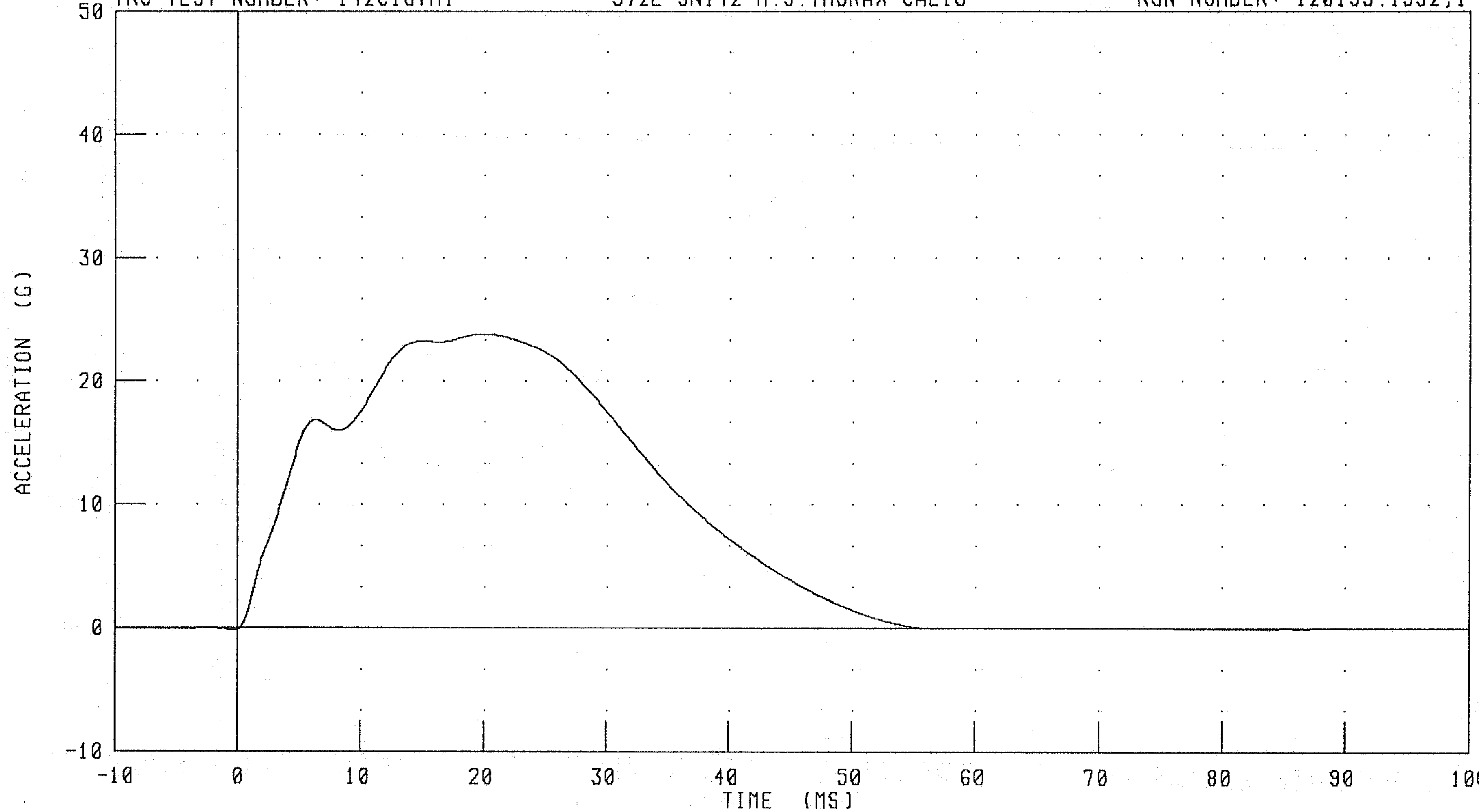
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	69.9 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5442. N
INTERNAL HYSTERESIS	69% - 85%	74.0%

TEST MEETS SPECIFICATIONS

TECHNICIAN Peter Fox

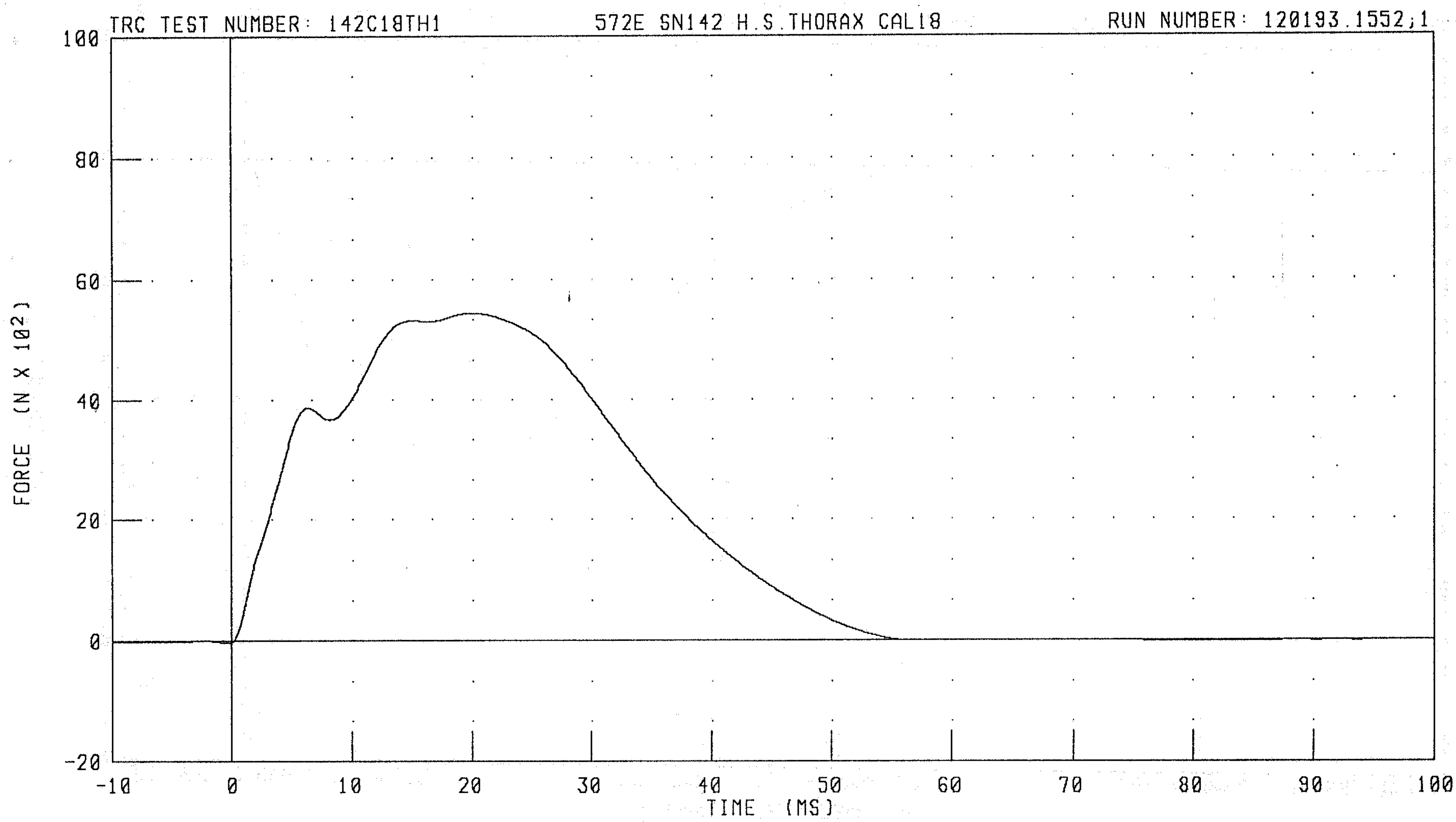
PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C18TH1 572E SN142 H.S.THORAX CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 23.76 G @ 19.92 MS; -0.16 G @ -0.32 MS

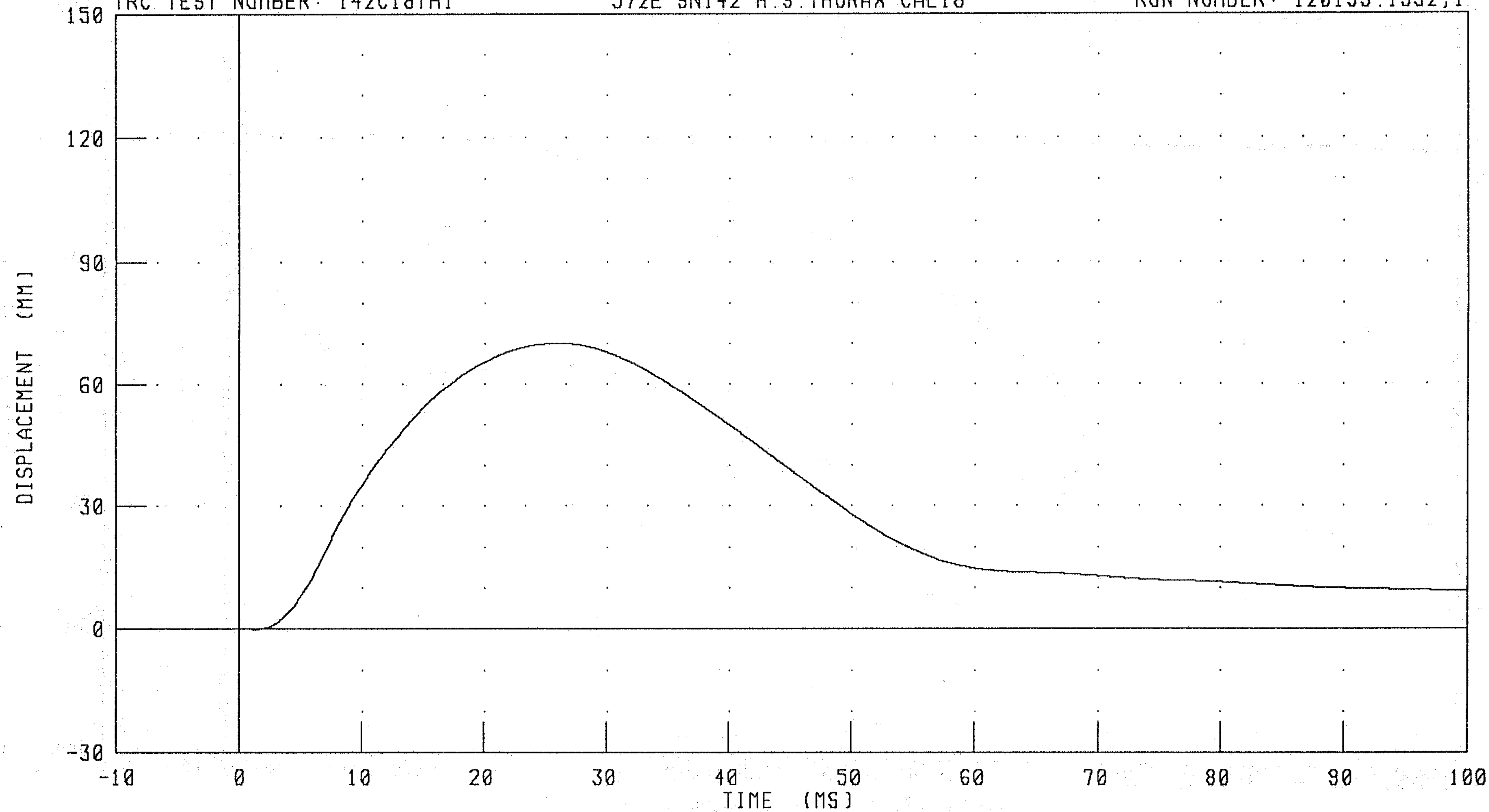
PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5442.76 N @ 19.92 MS; -35.75 N @ -0.32 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

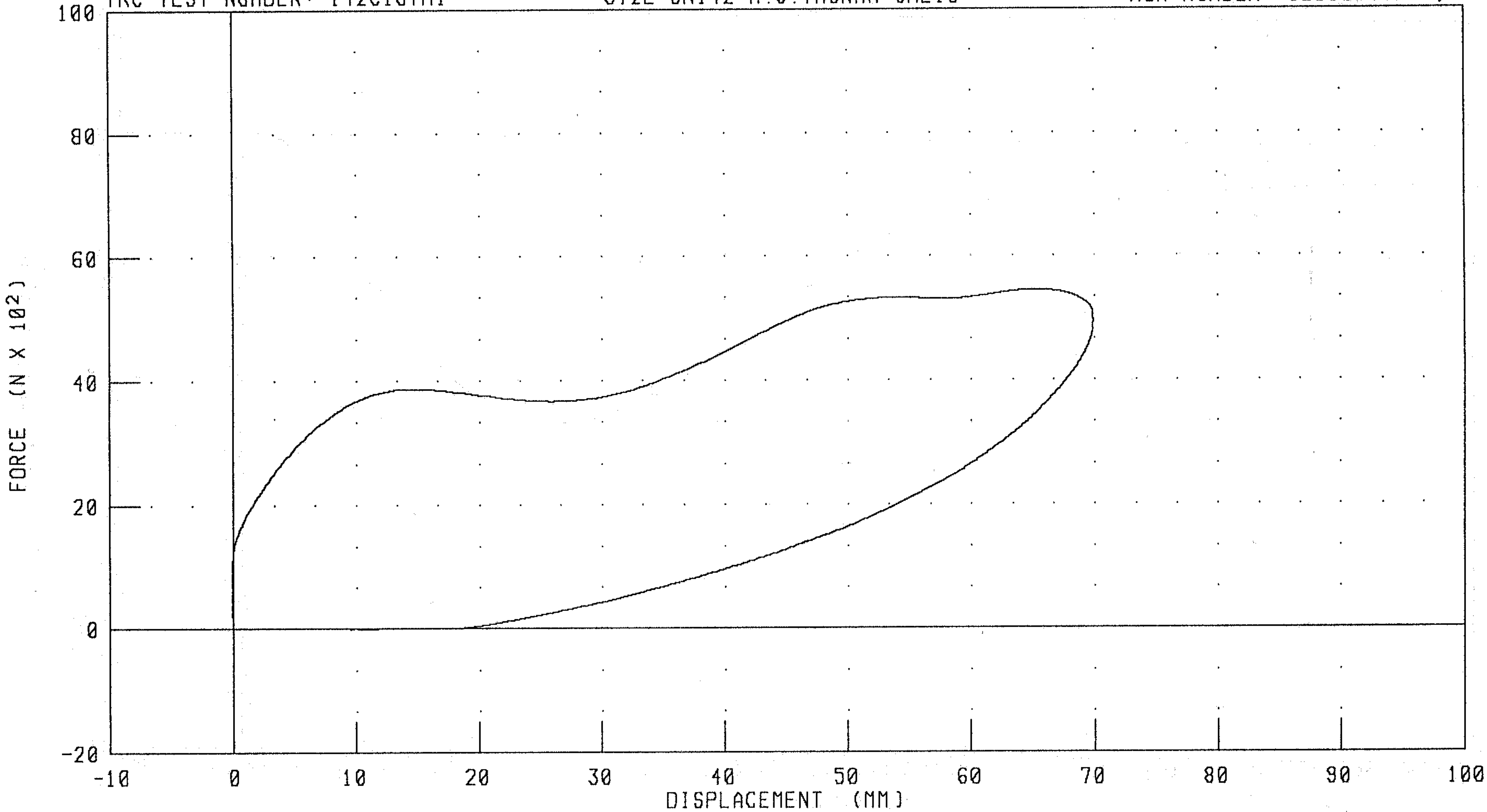
TRC TEST NUMBER: 142C18TH1 572E SN142 H.S.THORAX CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 69.91 MM @ 26.08 MS; -0.06 MM @ 1.36 MS

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

TRC TEST NUMBER: 142C18TH1 572E SN142 H.S.THORAX CAL18 RUN NUMBER: 120193.1552;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 69.91 MM @ 26.08 MS; -0.06 MM @ 1.36 MS
PENXF CH. CLASS 180 5442.76 N @ 19.92 MS; -35.75 N @ -0.32 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 22-NOV-93

TRC INC. 142C18RK1 572E SN142 RIGHT KNEE CAL 18

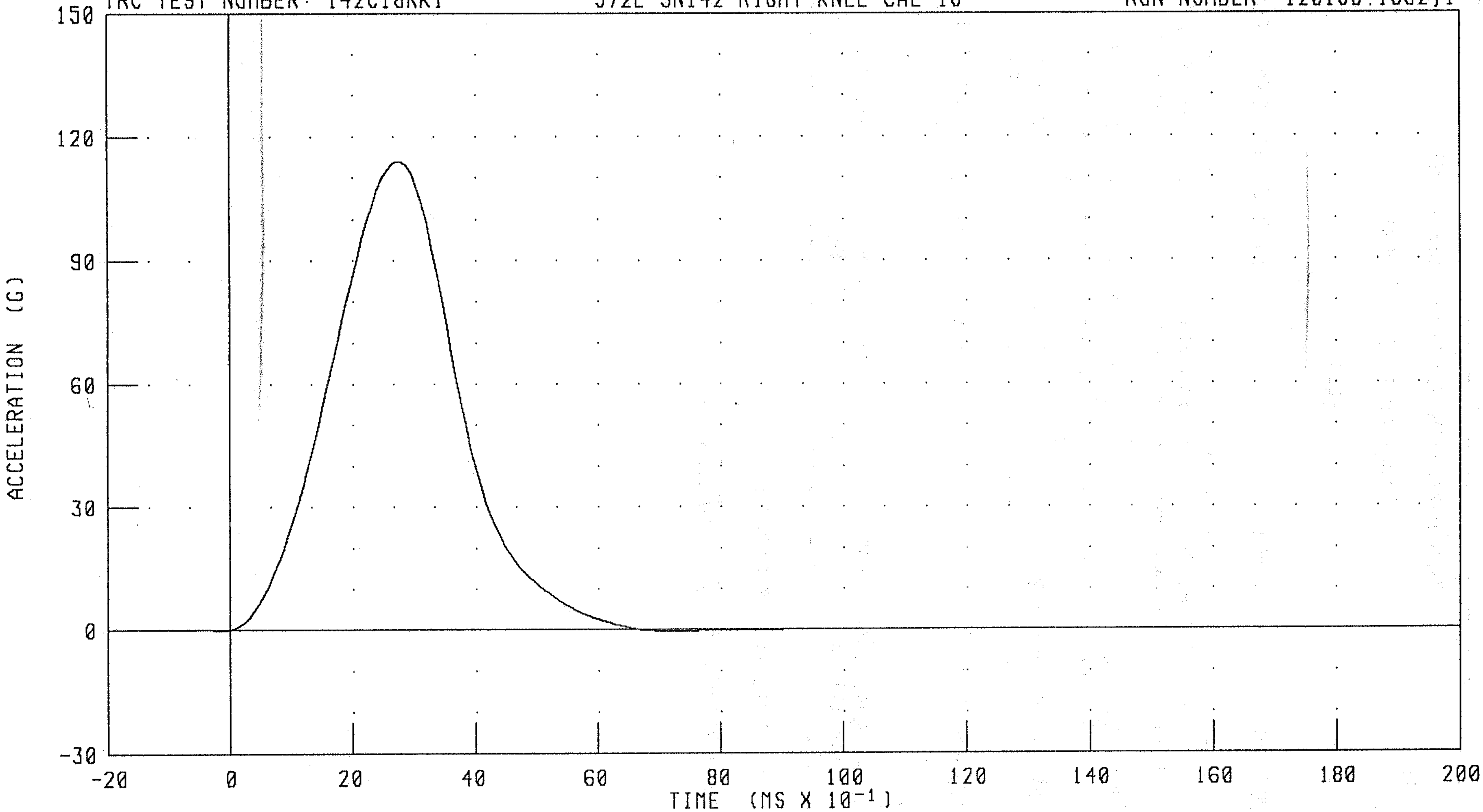
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5577.3 N

TEST MEETS SPECIFICATIONS

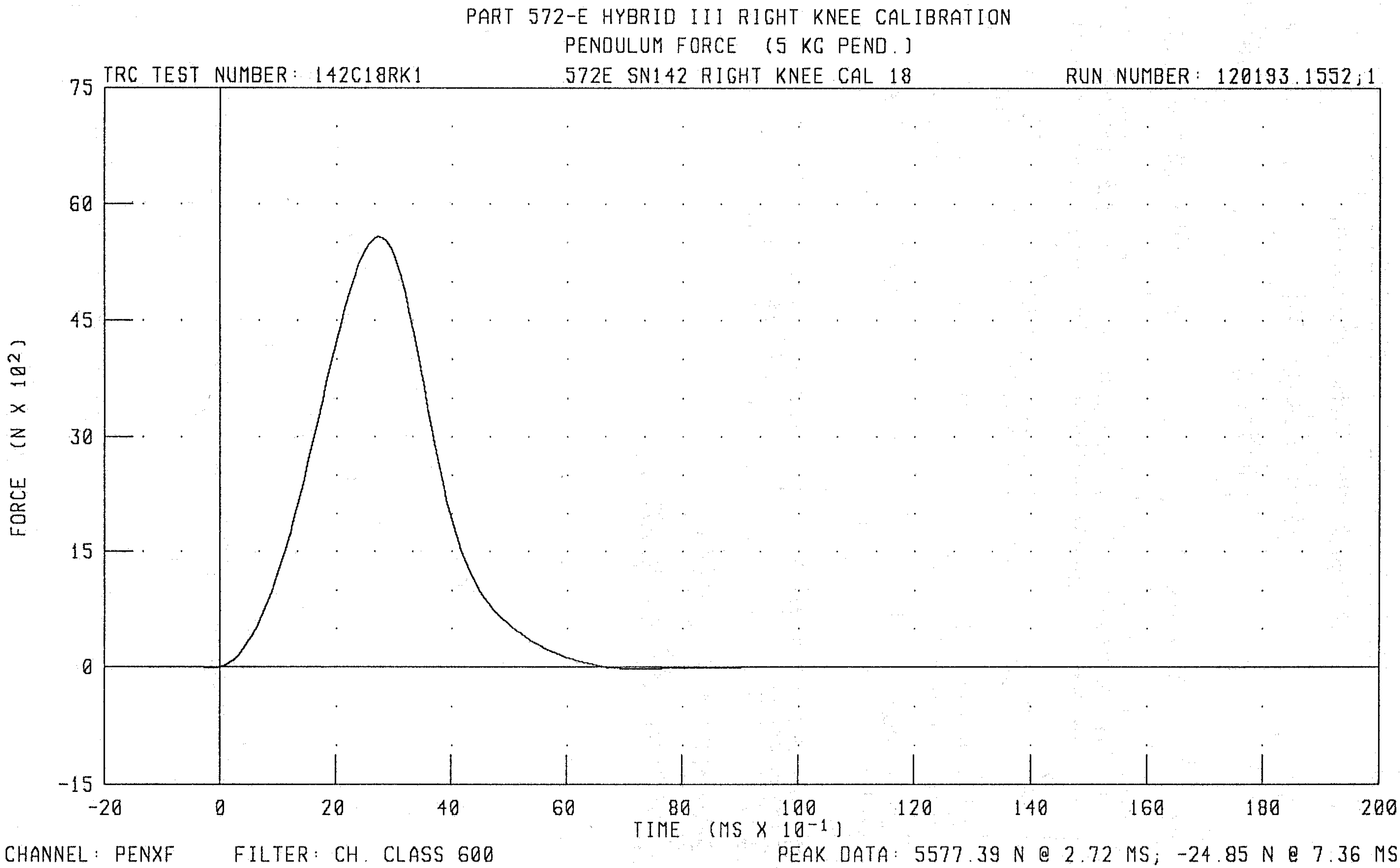
TECHNICIAN Pete Foust

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

TRC TEST NUMBER: 142C18RK1 572E SN142 RIGHT KNEE CAL 18 RUN NUMBER: 120193.1552;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 113.99 G @ 2.72 MS; -0.51 G @ 7.36 MS



PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 142C18RK1
572E SN142 RIGHT KNEE CAL 18
RUN NUMBER: 120193.1552;1
75
60
45
30
15
0
-15
FORCE (N X 10²)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXF
FILTER: CH. CLASS 600
PEAK DATA: 5577.39 N @ 2.72 MS; -24.85 N @ 7.36 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 22-NOV-93

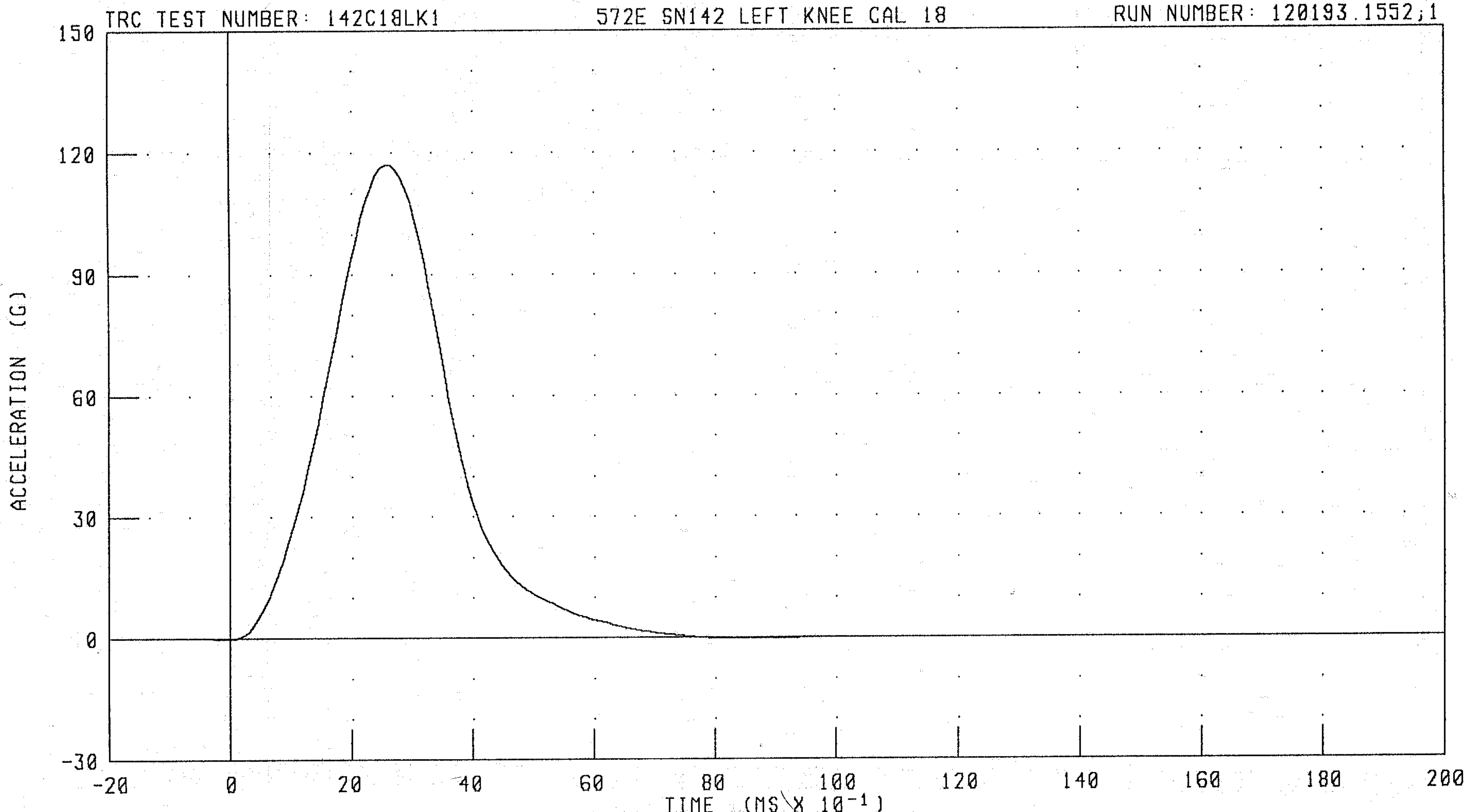
TRC INC. 142C18LK1 572E SN142 LEFT KNEE CAL 18

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	2.08 M/S
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5720.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

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

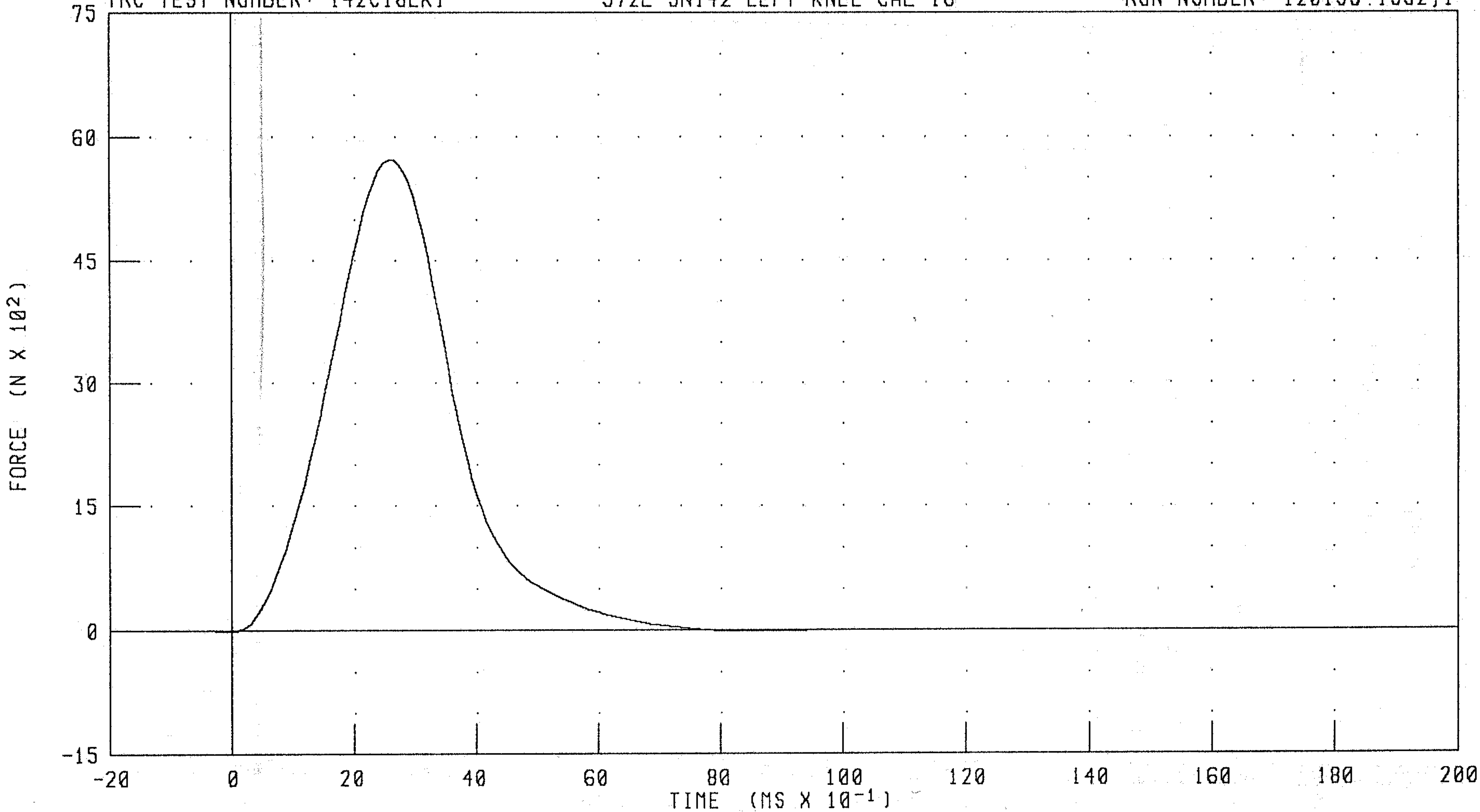


CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 116.92 G @ 2.56 MS; -0.19 G @ 0.00 MS

931124

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

TRC TEST NUMBER: 142C18LK1 572E SN142 LEFT KNEE CAL 18 RUN NUMBER: 120193.1552;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5720.68 N @ 2.56 MS; -9.13 N @ 0.00 MS

931124

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 713

TRANSPORTATION RESEARCH CENTER INC.
EXTERNAL DIMENSIONS
PART 572B

19-NOV-93

TRC INC. TEST NO: ED71308 572B SN713 EXT.DIMENSION CAL08
SN 713 HUMANOID

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	53 %
SITTING HEIGHT	904 - 909 MM	904. MM
SHOULDER PIVOT HEIGHT	553 - 569 MM	561. MM
HIP PIVOT HEIGHT	99 MM	REFERENCE
HIP PIVOT FROM BACKLINE	122 MM	REFERENCE
KNEE PIVOT FROM BACKLINE	511 - 526 MM	521. MM
REAR OF HEAD FROM BACKLINE	43 MM	REFERENCE
CHEST DEPTH	231 - 241 MM	239. MM
SHOULDER WIDTH	452 - 467 MM	455. MM
CHEST CIRCUMFERENCE OVER NIPPLES	935 - 965 MM	958. MM
WAIST CIRCUMFERENCE AT MIN. GIRTH	798 - 828 MM	818. MM
HIP WIDTH	356 - 391 MM	378. MM
KNEE PIVOT FROM FLOOR	490 - 506 MM	498. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

RUN NUMBER: 112293.1034

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

PART 572B 19-NOV-93

TRC INC. TEST NO: HD71308 572B SN 713 HEAD DROP CAL 08

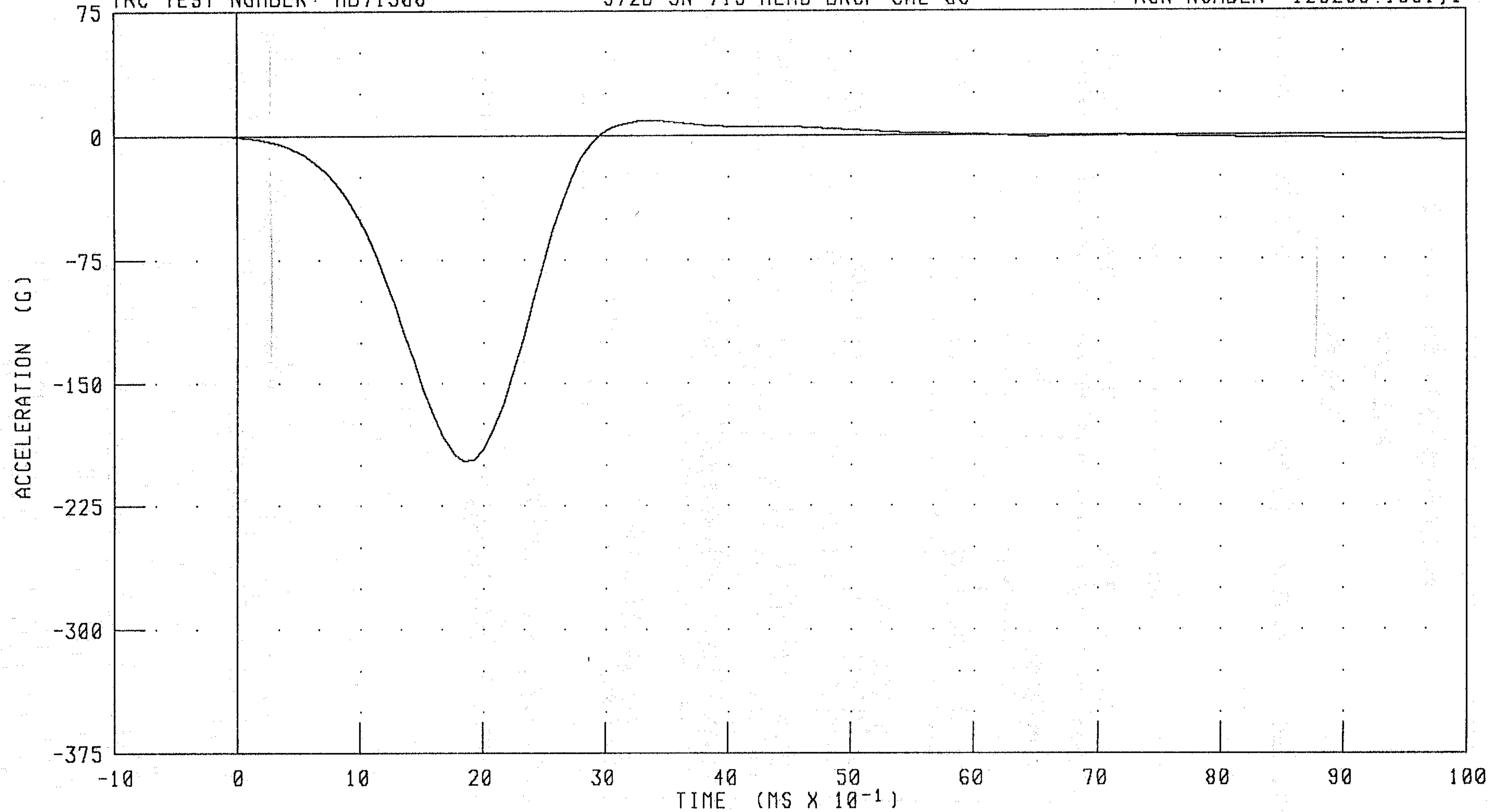
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	53 %
PEAK RESULTANT ACCELERATION	210 - 260 G	235.05 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.27 MS
PEAK LATERAL ACCELERATION	10 G MAX	-2.02 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Frost RUN NUMBER: 111993.0955;1

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

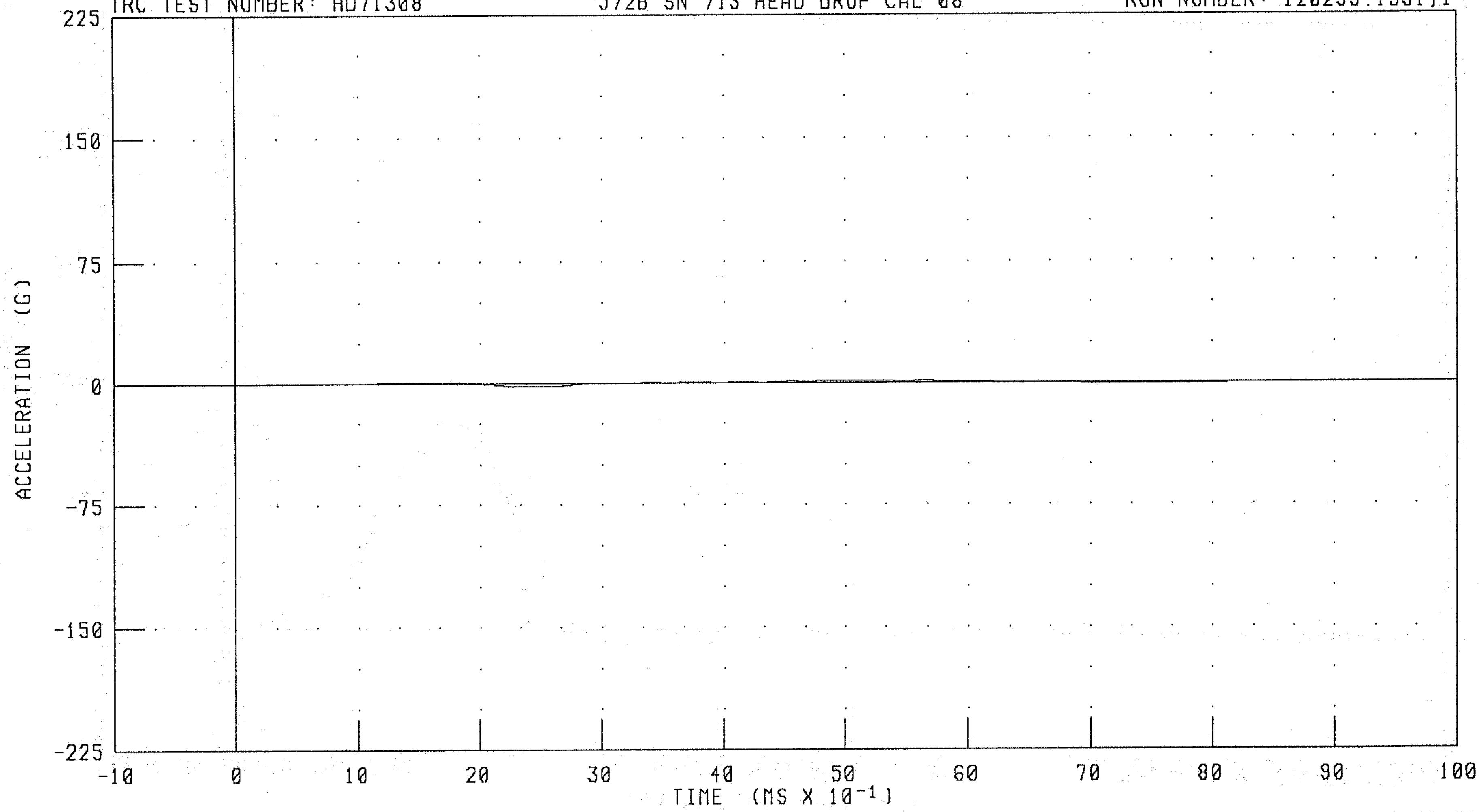
TRC TEST NUMBER: HD71308 572B SN 713 HEAD DROP CAL 08 RUN NUMBER: 120293.1331;1



CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 9.09 G @ 3.36 MS; -197.50 G @ 1.84 MS

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

TRC TEST NUMBER: HD71308 | 572B SN 713 HEAD DROP CAL 08 | RUN NUMBER: 120293.1331;1

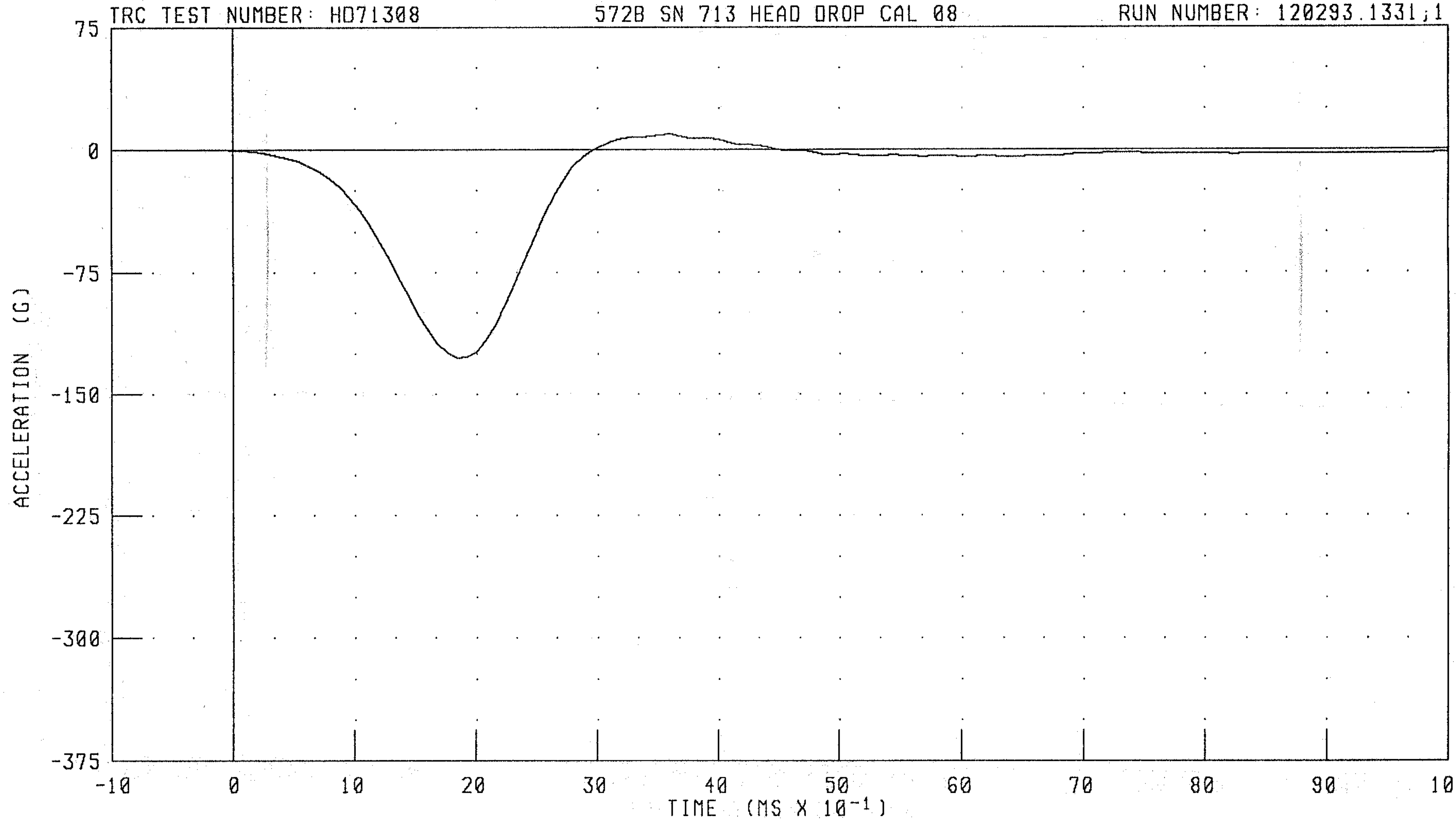


CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 1.54 G @ 5.28 MS; -2.02 G @ 2.40 MS

931124

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

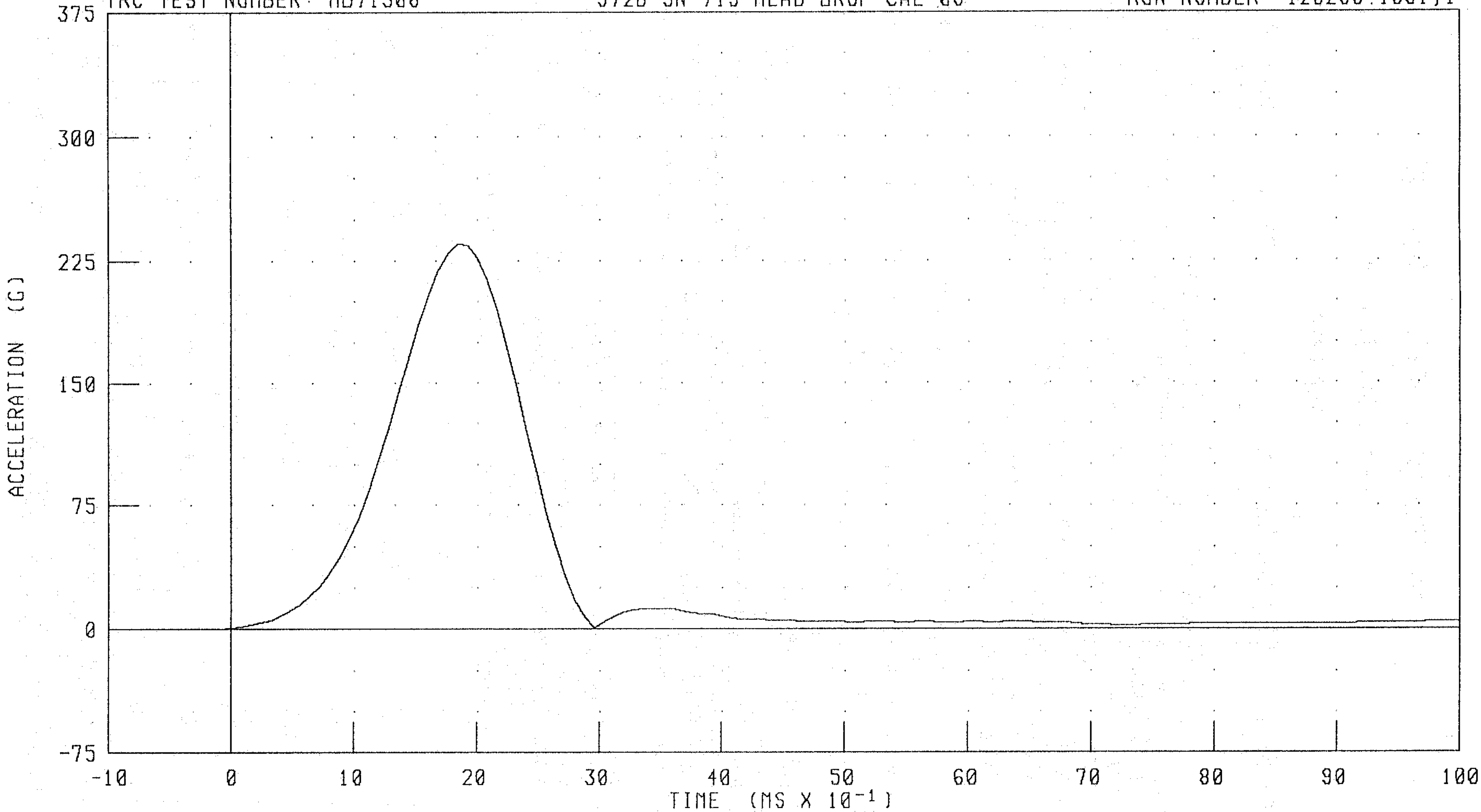
TRC TEST NUMBER: HD71308 572B SN 713 HEAD DROP CAL 08 RUN NUMBER: 120293.1331;1



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 9.32 G @ 3.60 MS; -127.45 G @ 1.84 MS

PART 572-B HYBRID II HEAD DROP CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HD71308 572B SN 713 HEAD DROP CAL 08 RUN NUMBER: 120293.1331;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 235.05 G @ 1.84 MS; 0.01 G @ -0.88 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK PENDULUM TEST

PART 572B 19-NOV-93

TRC INC. TEST NO: HN71308 572B SN 713 HEAD/NECK CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	53 %
PENDULUM VELOCITY	6.55 - 7.77 M/S	7.28 M/S
PENDULUM DECELERATION:		
T1 - T2 TIME (5 - 20 G)	3 MS MAX	1.69 MS
T2 - T3 TIME (20 - 20 G)	25 - 30 MS	28.60 MS
T3 - T4 TIME (20 - 5 G)	10 MS MAX	3.57 MS
AVG. G LEVEL T2 - T3	20 - 24 G	23.99 G
MAXIMUM ROTATION ANGLE	63 - 73 DEG.	70.47 DEG.
PEAK HEAD RESULTANT ACCEL	26 G MAX	22.40 G

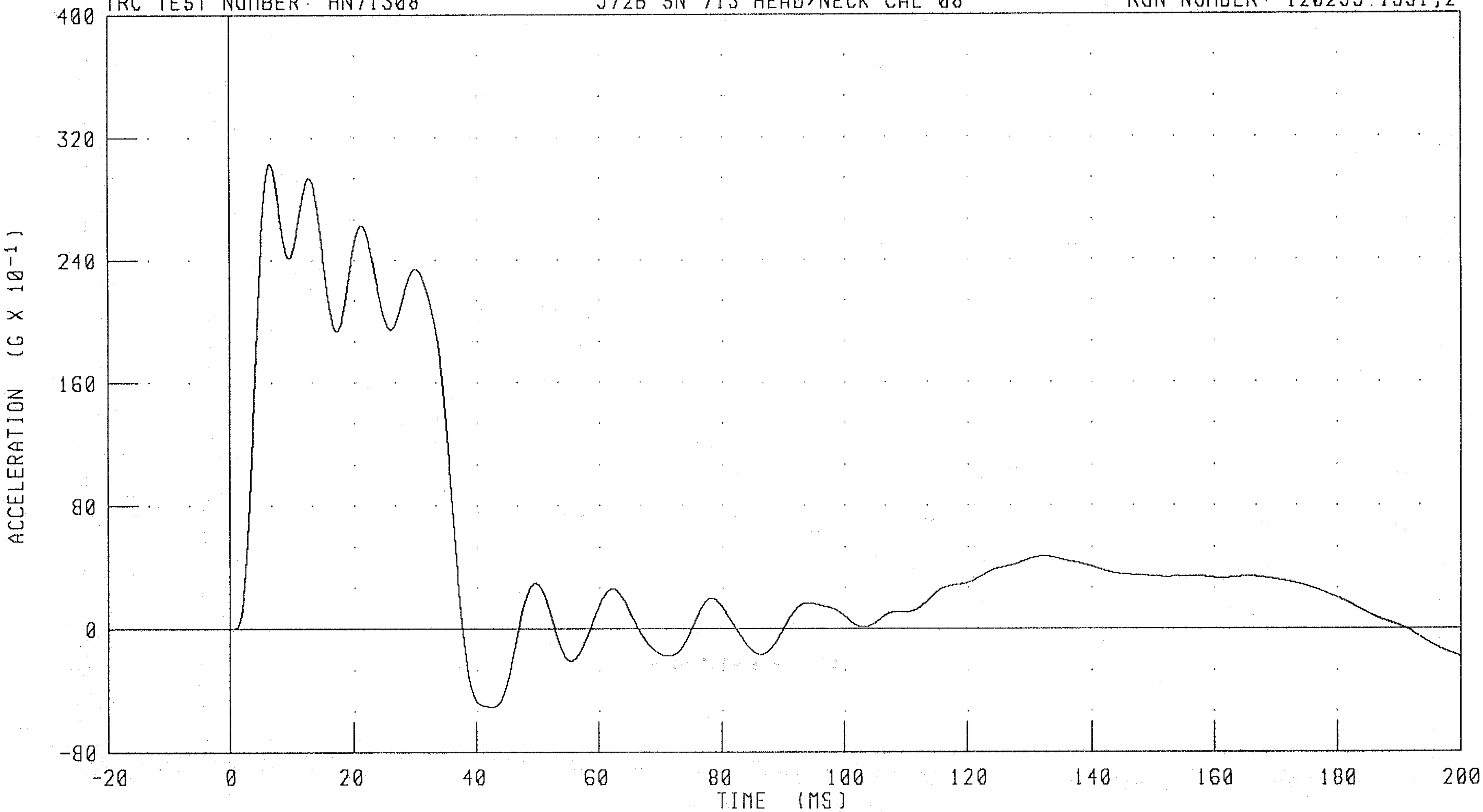
TEST PARAMETER	SPECIFICATION		TEST RESULTS	
ROTATION ANGLE (DEGREES)	TIME (MS)	CHORDAL DISP. (MM)	TIME (MS)	CHORDAL DISP. (MM)
0	-2.0 - +2.0	-12.7 - +12.7	1.12	0.06
30	25.6 - 34.4	53.3 - 78.7	29.67	64.67
60	40.3 - 51.7	109.2 - 134.6	45.14	122.43
MAX	53.2 - 66.8	127.0 - 152.4	62.16	140.83
60	67.0 - 83.0	109.2 - 134.6	78.02	119.26
30	85.4 - 104.6	53.3 - 78.7	96.97	56.24
0	101.0 - 123.0	-12.7 - +12.7	111.17	2.44

DUMMY MEETS SPECIFICATIONS SND: 151.13 MM

TECHNICIAN Peter Foster RUN NUMBER: 111993.1050;2

PART 572-B HYBRID II HEAD/NECK CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



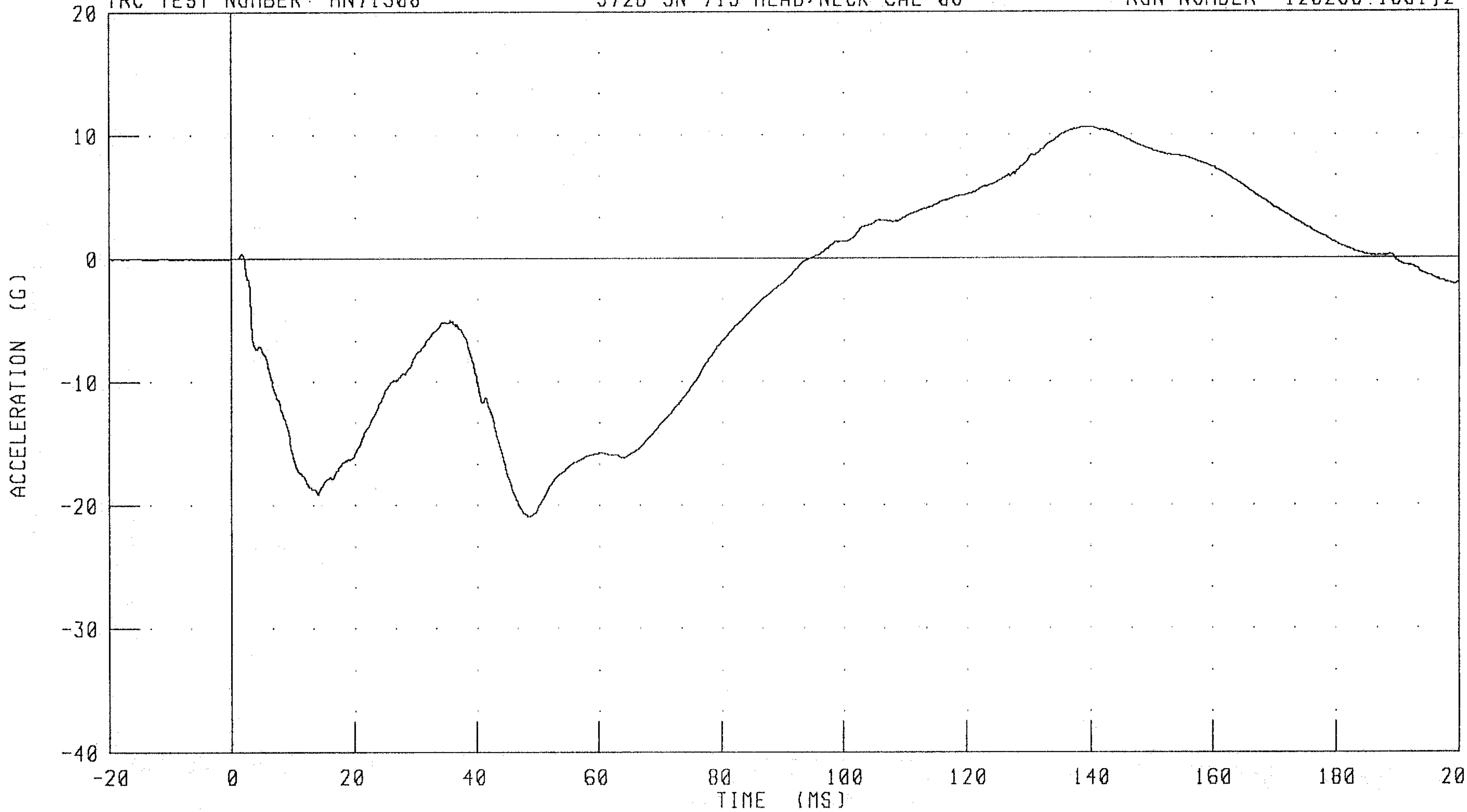
CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 30.32 G @ 6.56 MS; -5.05 G @ 42.56 MS

931124

PART 572-B HYBRID II HEAD/NECK CALIBRATION

HEAD ACCELERATION X AXIS

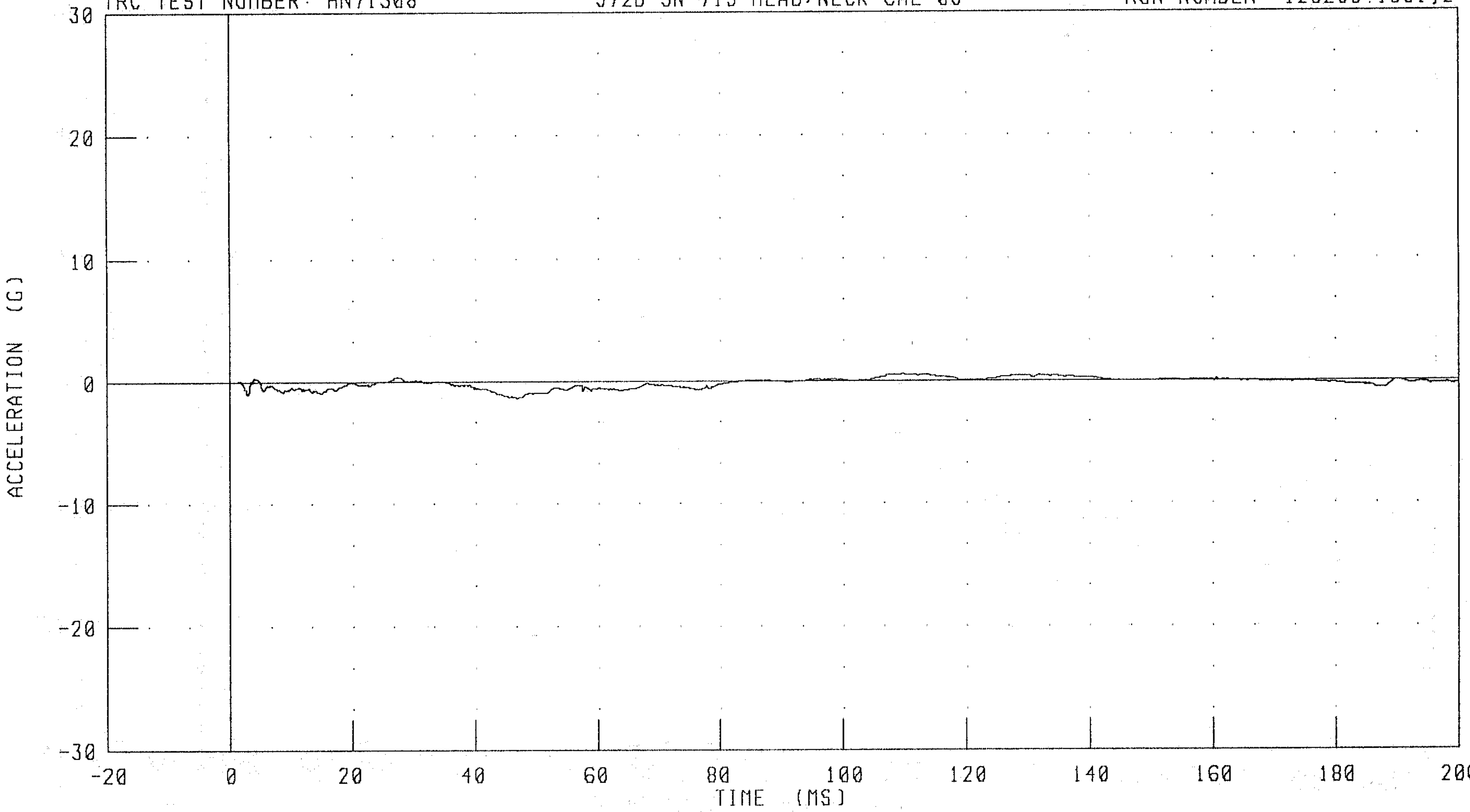
TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 10.62 G @ 138.48 MS; -20.92 G @ 48.72 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Y AXIS

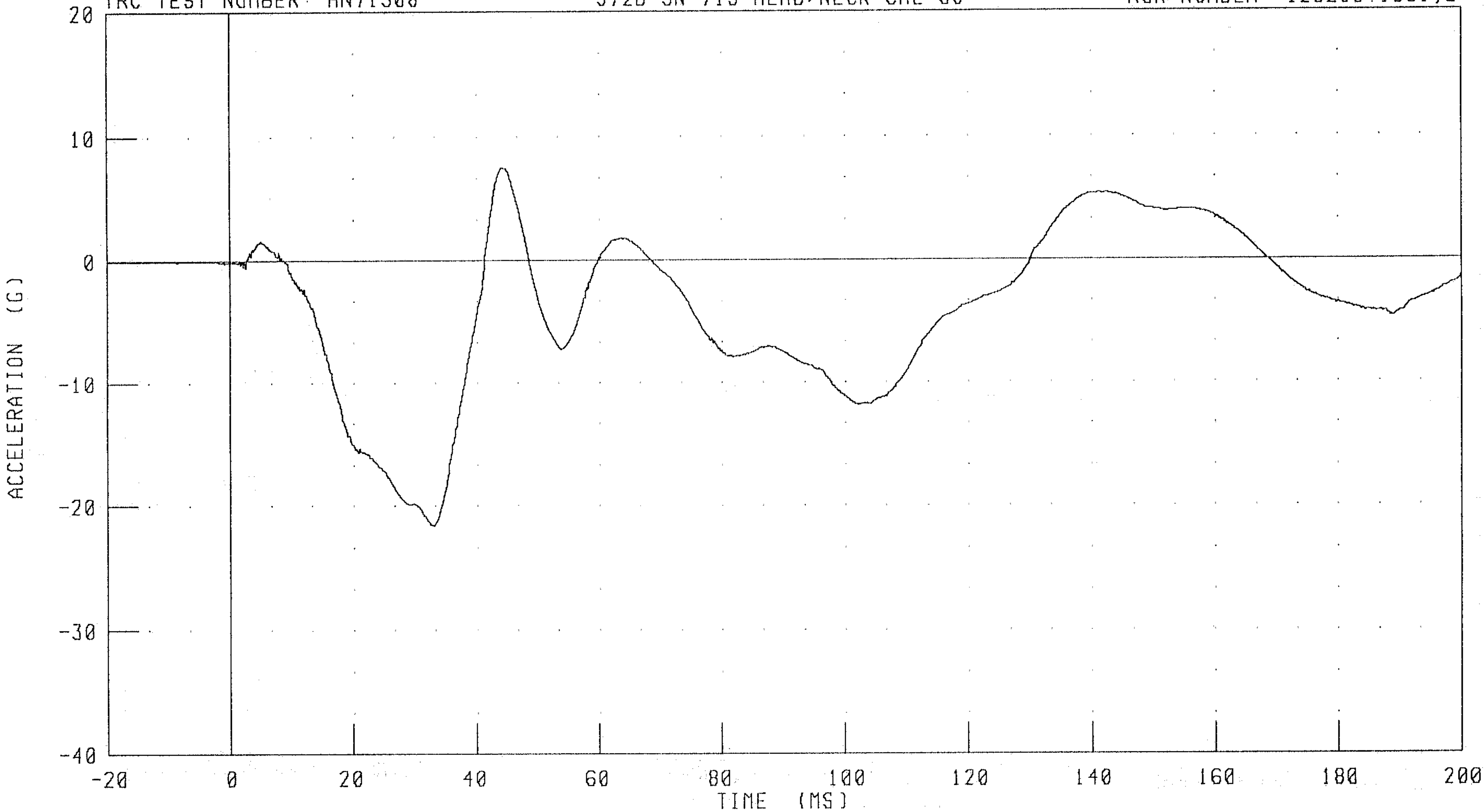
TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 0.60 G @ 109.44 MS; -1.34 G @ 46.80 MS

PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HN71308   572B SN 713 HEAD/NECK CAL 08   RUN NUMBER: 120293.1331;2

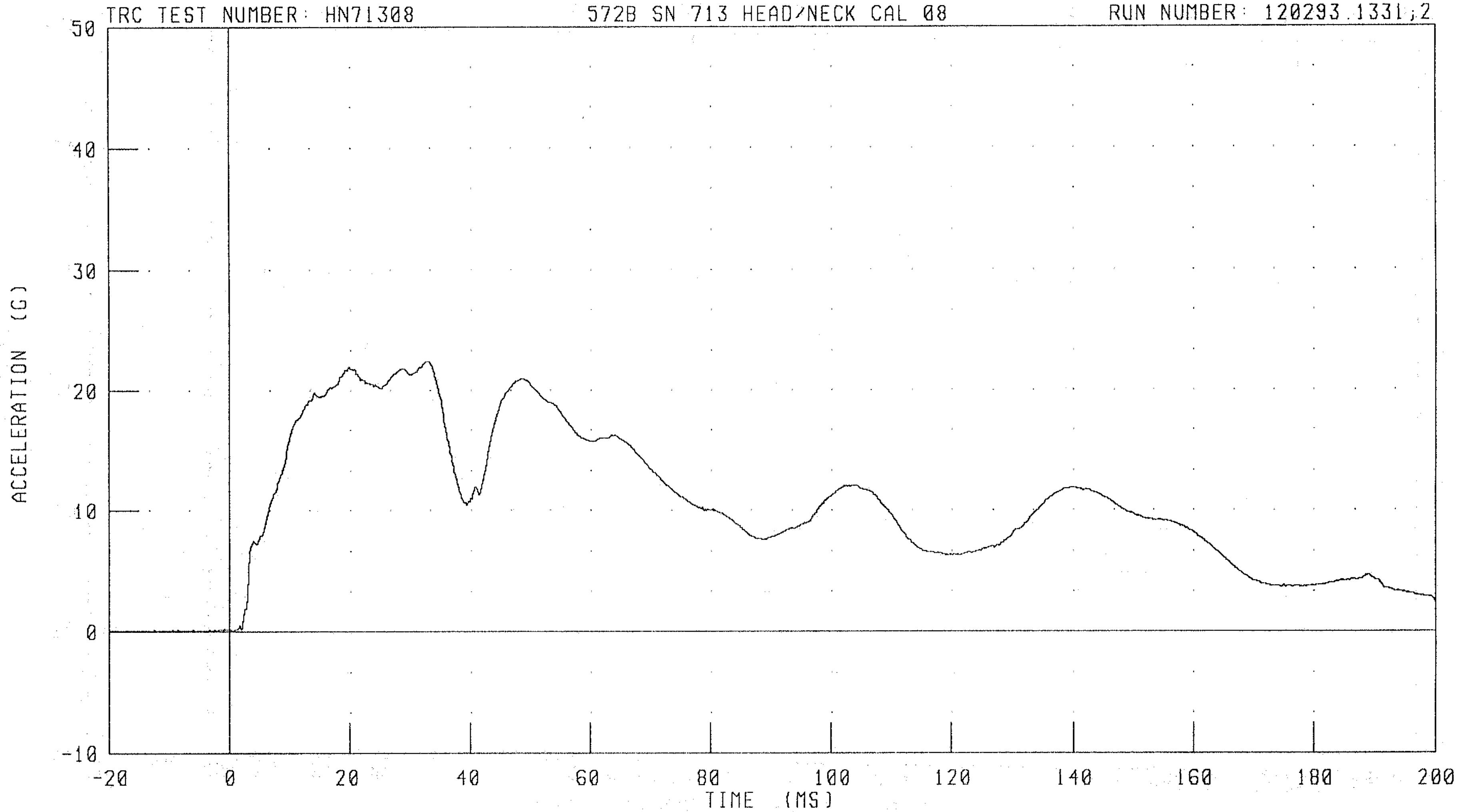


CHANNEL: HEDZG   FILTER: CH. CLASS 1000   PEAK DATA: 7.55 G @ 44.16 MS, -21.60 G @ 33.04 MS

931124

PART 572-B HYBRID II HEAD/NECK CALIBRATION
HEAD RESULTANT ACCELERATION

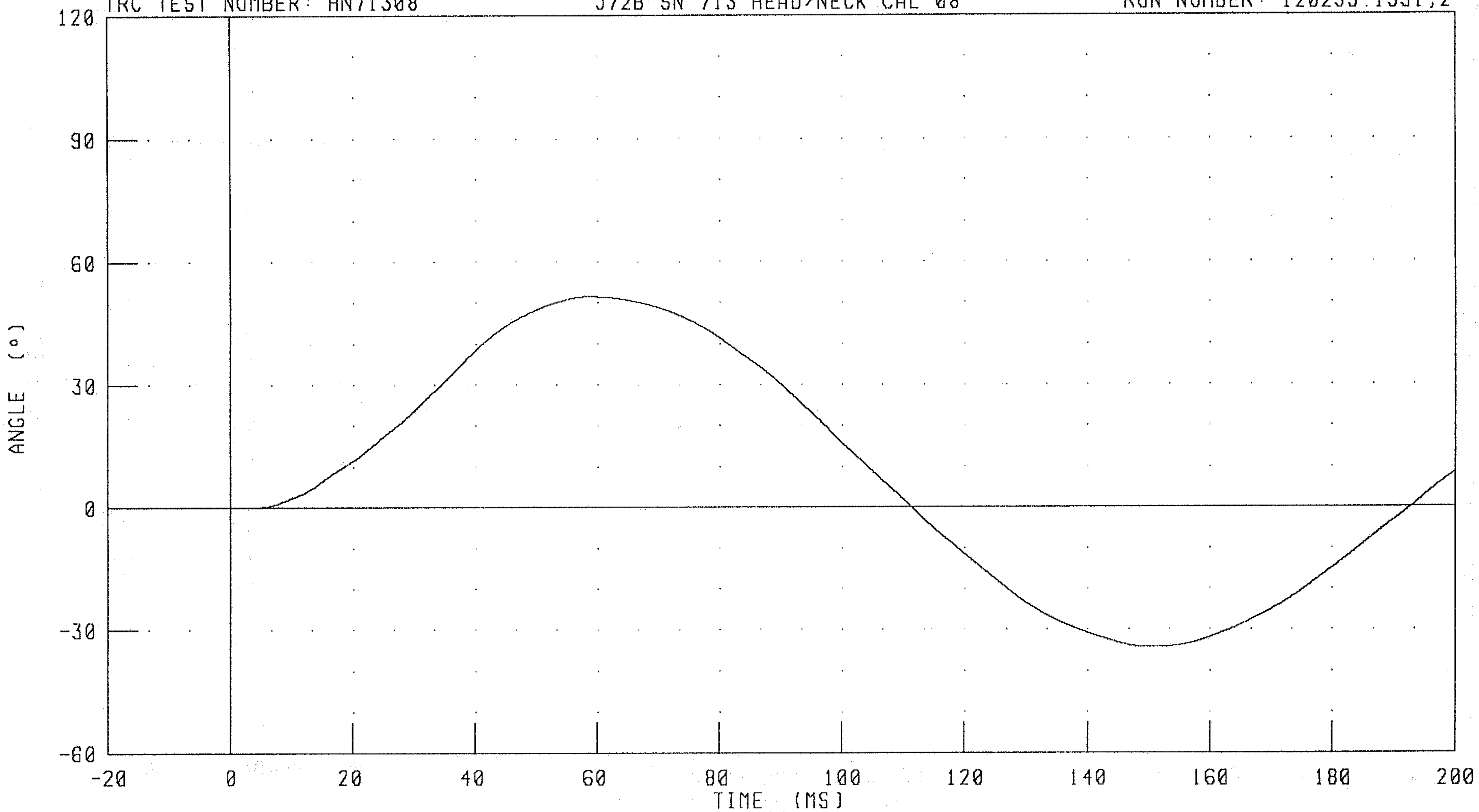
TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 22.40 G @ 33.04 MS; 0.08 G @ -11.76 MS

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

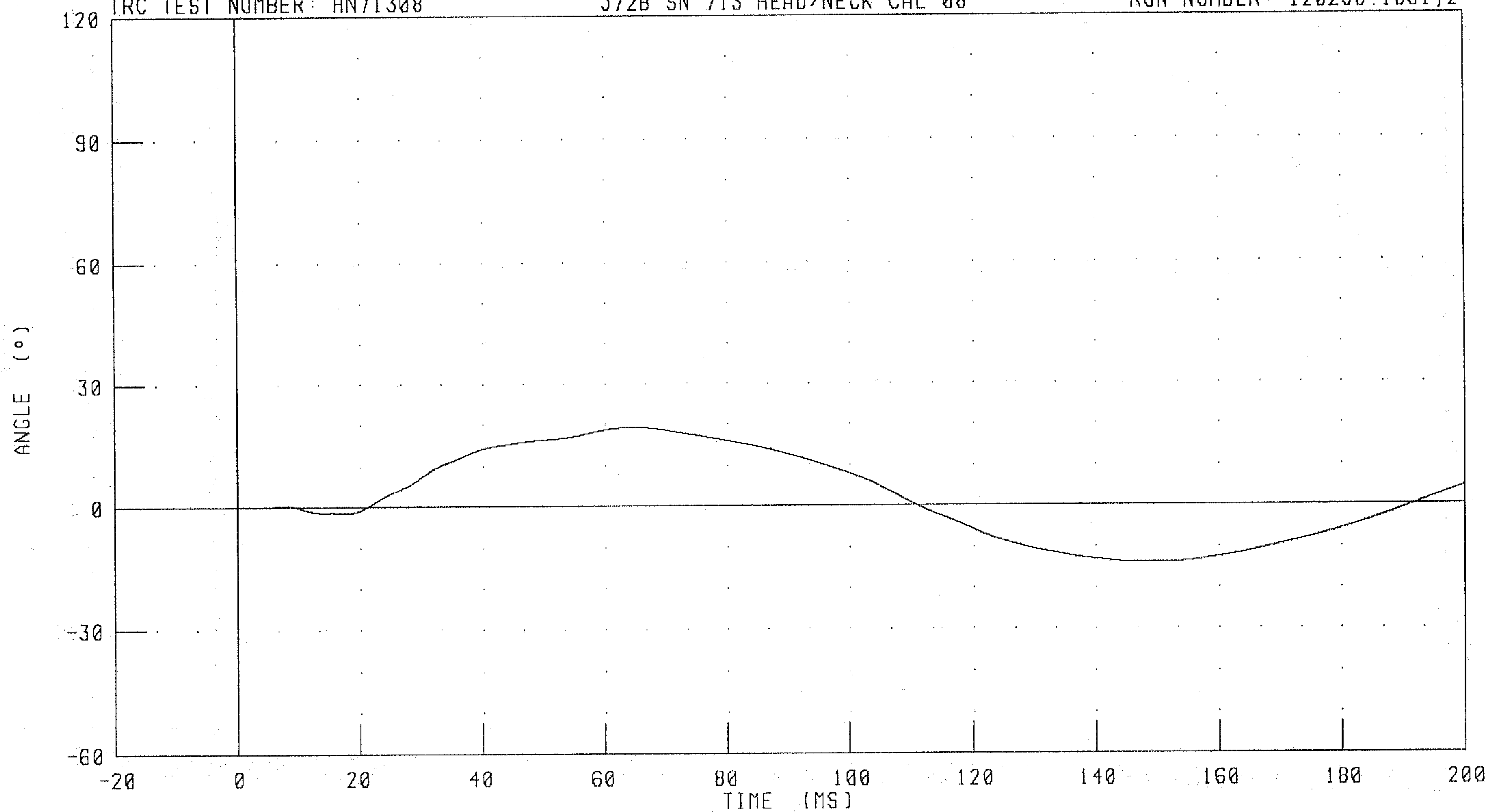
TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 51.52 ° @ 58.64 MS; -34.32 ° @ 150.72 MS

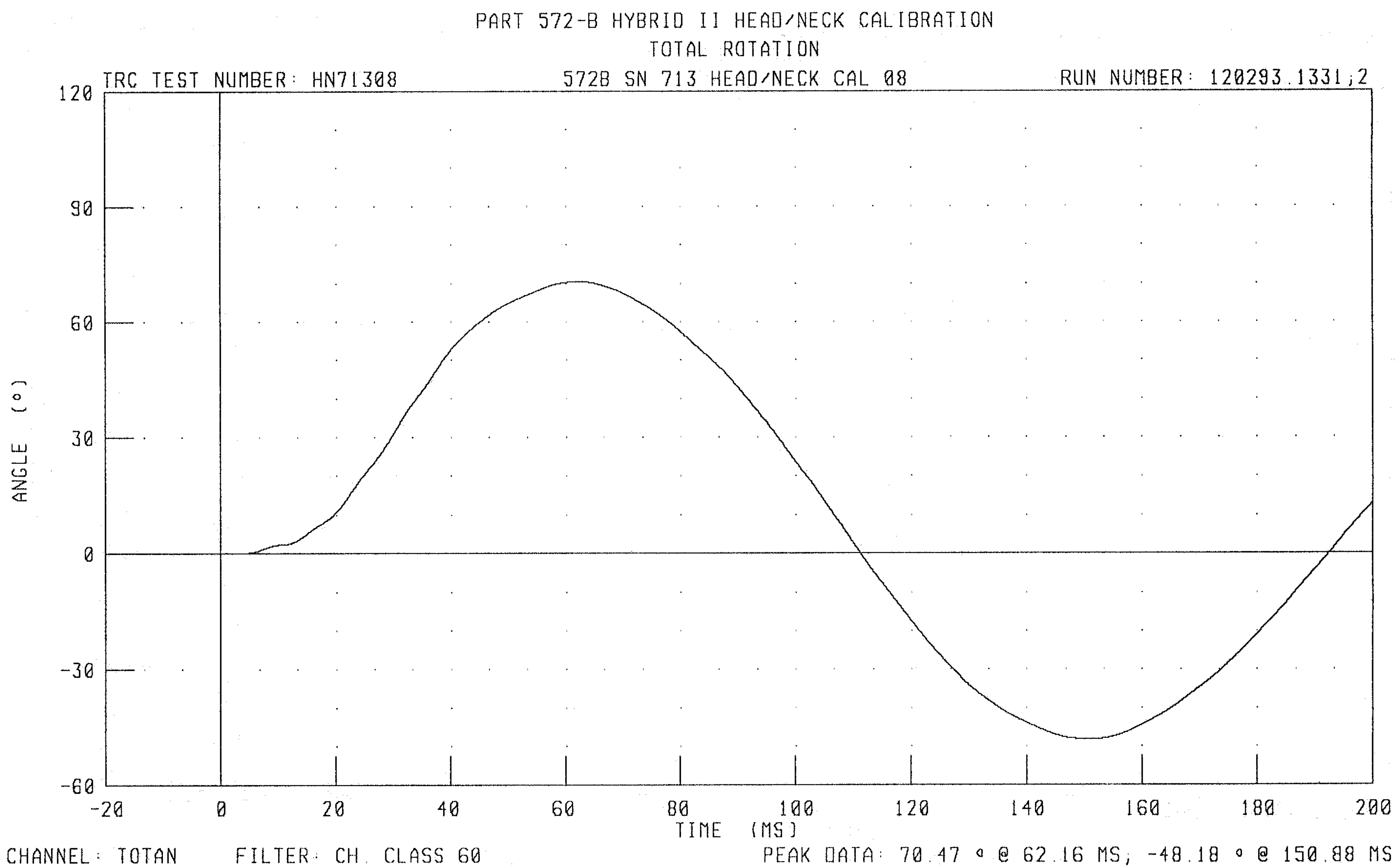
PART 572-B HYBRID II HEAD/NECK CALIBRATION
ROTATION ABOUT THE HEAD C.G.

TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



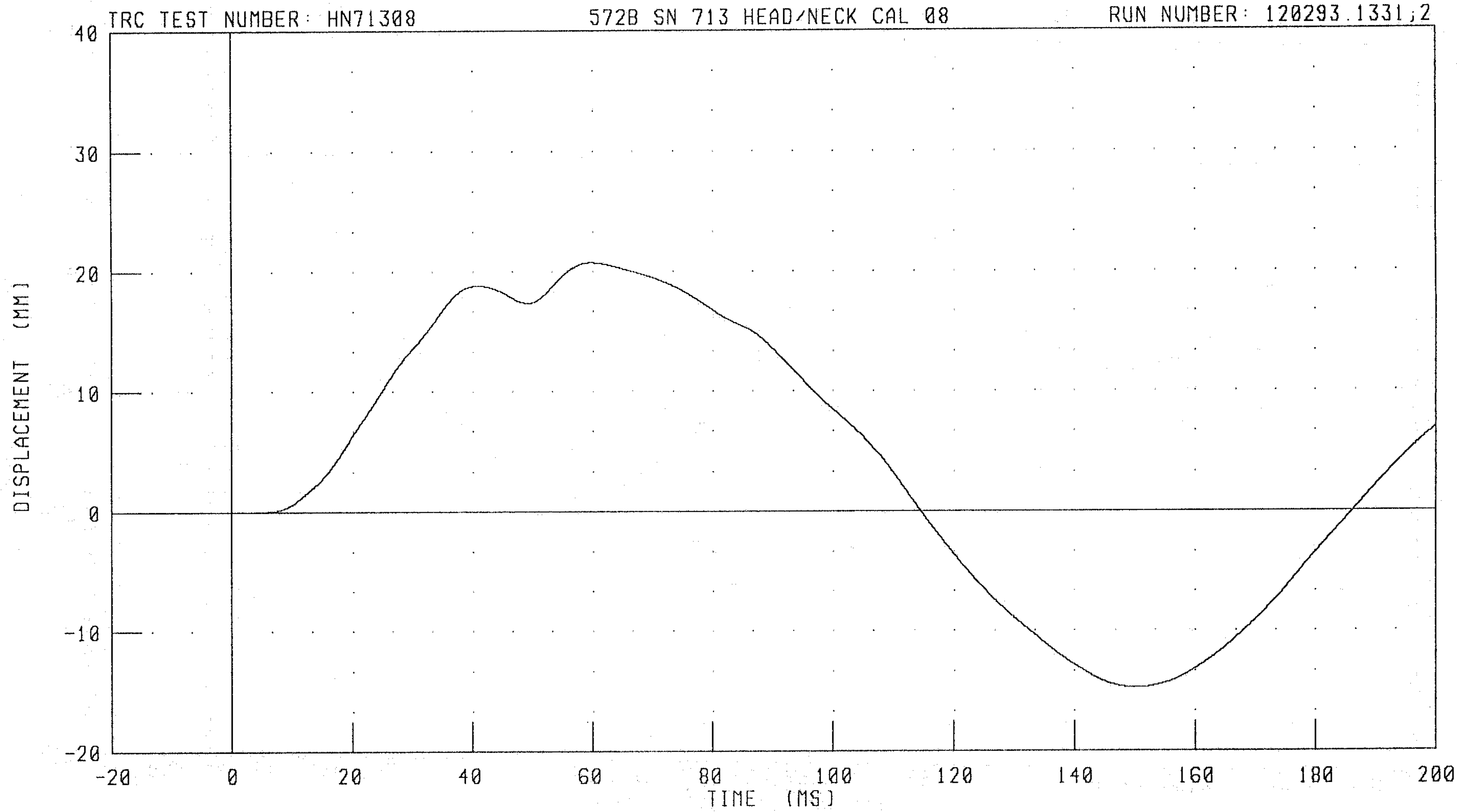
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 19.37 ° @ 64.80 MS; -13.93 ° @ 146.16 MS

931124


PART 572-B HYBRID II HEAD/NECK CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: HN71308
572B SN 713 HEAD/NECK CAL 08
RUN NUMBER: 120293.1331;2
ANGLE (°)
120
90
60
30
0
-30
-60
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: TOTAN
FILTER: CH. CLASS 60
PEAK DATA: 70.47 ° @ 62.16 MS; -48.18 ° @ 150.88 MS

931124

PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK DISPLACEMENT Z AXIS

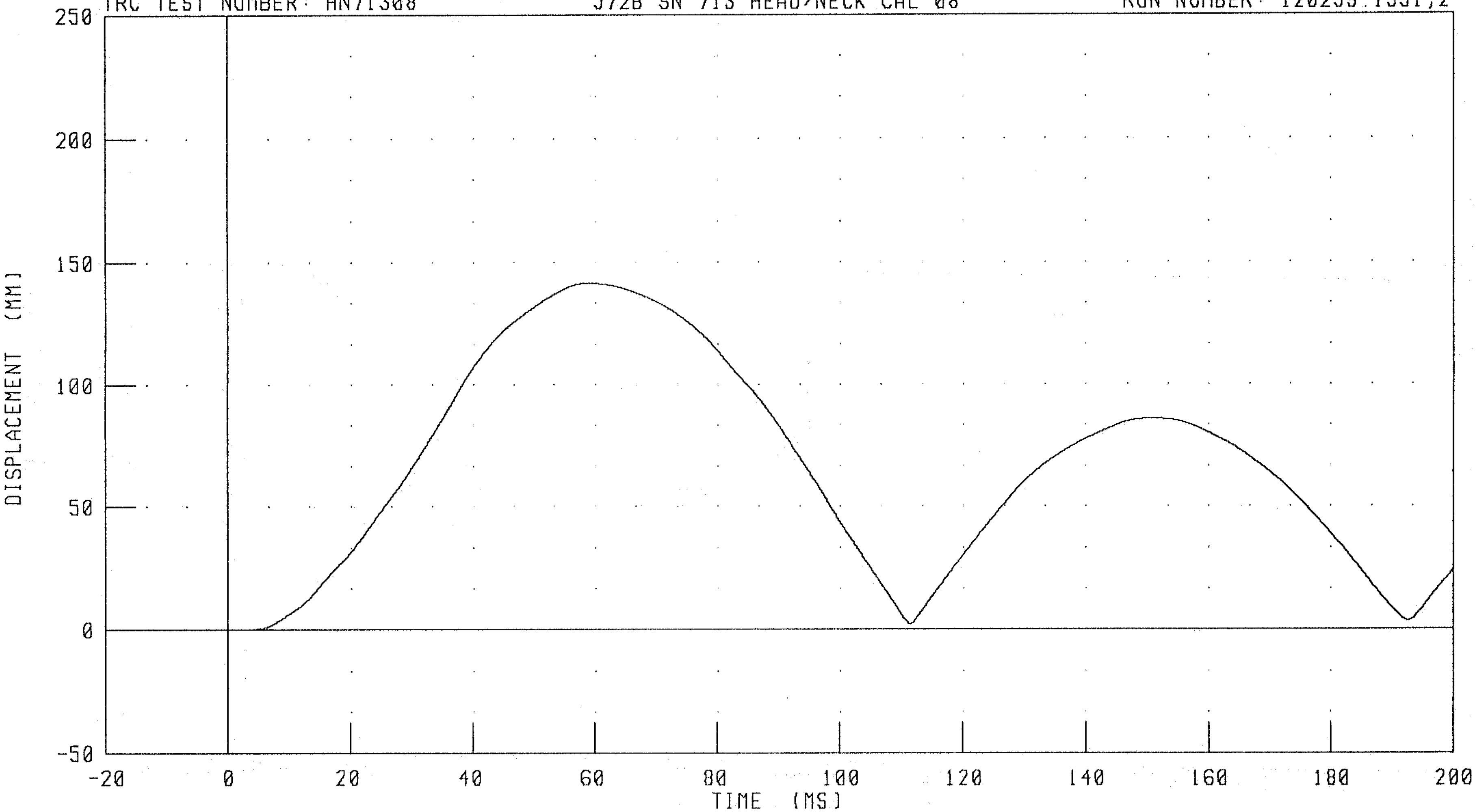


CHANNEL: NEKZD   FILTER: CH. CLASS 60   PEAK DATA: 20.73 MM @ 59.84 MS; -14.74 MM @ 150.24 MS

931124

PART 572-B HYBRID II HEAD/NECK CALIBRATION
NECK CHORDAL DISPLACEMENT

TRC TEST NUMBER: HN71308 572B SN 713 HEAD/NECK CAL 08 RUN NUMBER: 120293.1331;2



CHANNEL: NEKCD FILTER: CH. CLASS 60 PEAK DATA: 141.51 MM @ 58.88 MS; 0.00 MM @ -11.52 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B 22-NOV-93

TRC INC. TEST NO: TL71308 572B SN 713 L.S.THORAX CAL 08

TEST PARAMETER	LOW SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	4.22 - 4.31 M/S	4.29 M/S
PEAK STERNUM DEFLECTION	28 MM MAX.	25.69 MM
PEAK RESISTIVE FORCE	6450. N MAX.	5846. N
INTERNAL HYSTERESIS	50 - 70 %	59.1 %

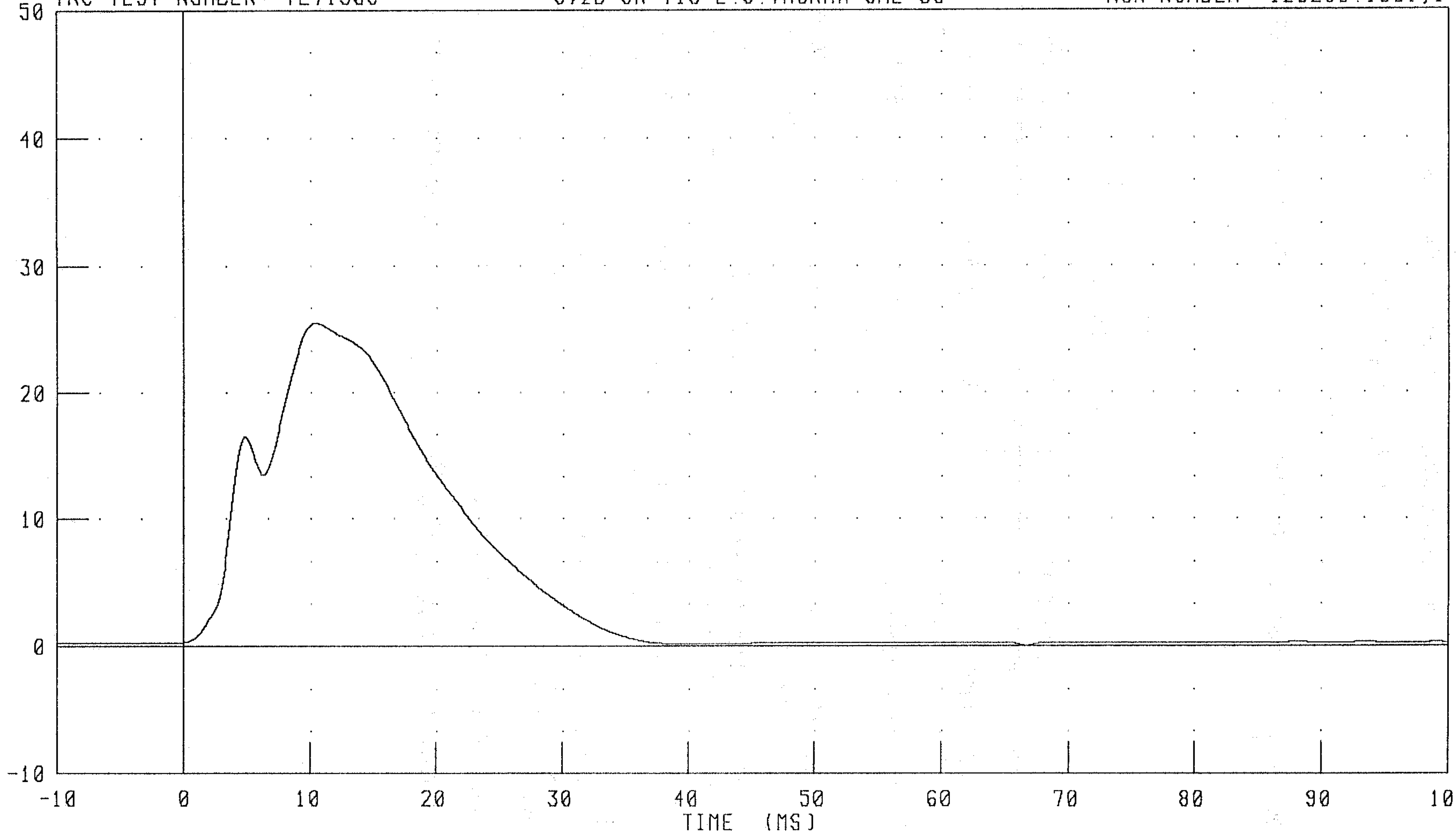
SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Foster RUN NUMBER: 112293.0838;1

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

TRC TEST NUMBER: TL71308 572B SN 713 L.S.THORAX CAL 08 RUN NUMBER: 120293.1331;1

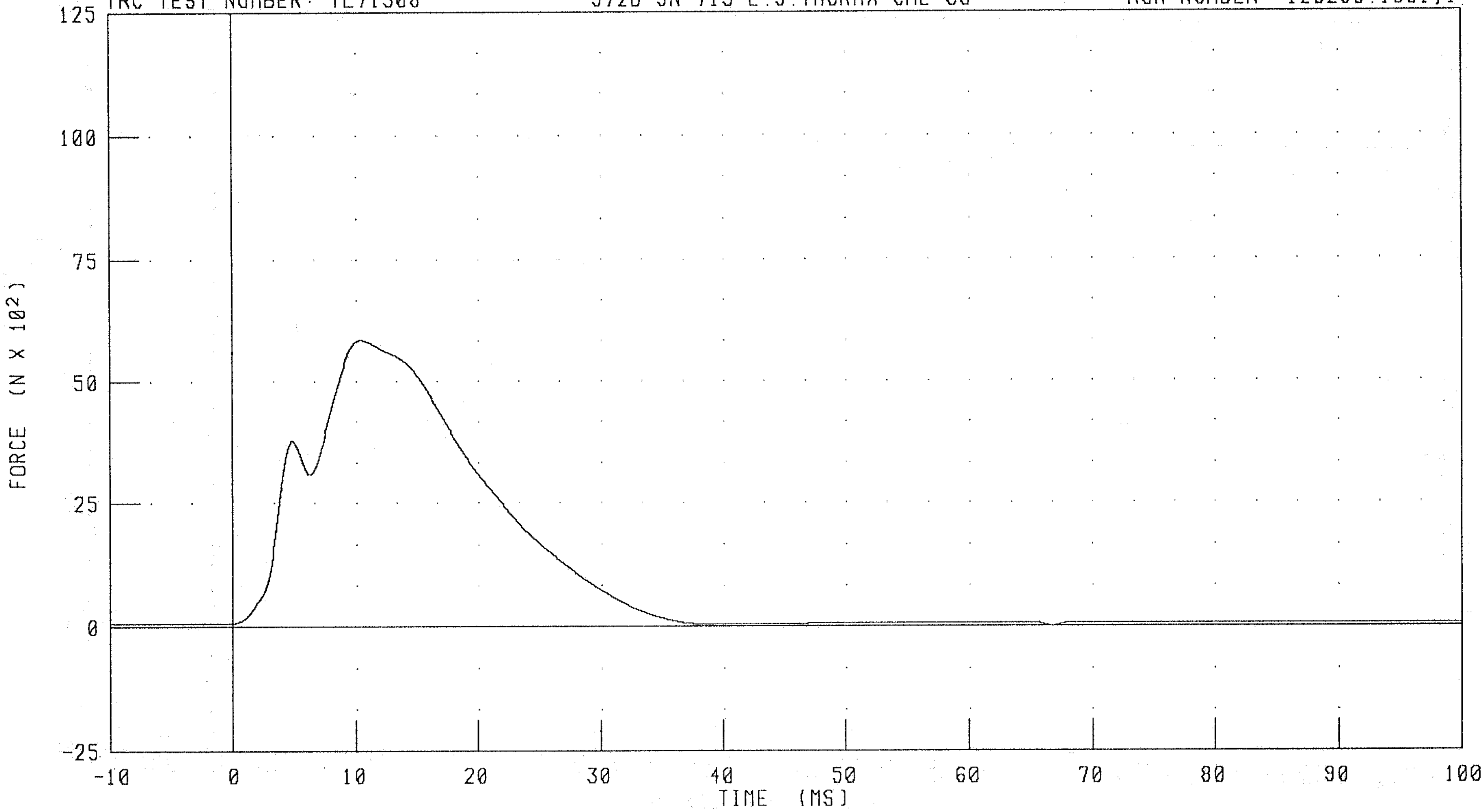


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 25.52 G @ 10.40 MS; 0.05 G @ 66.64 MS

931124

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

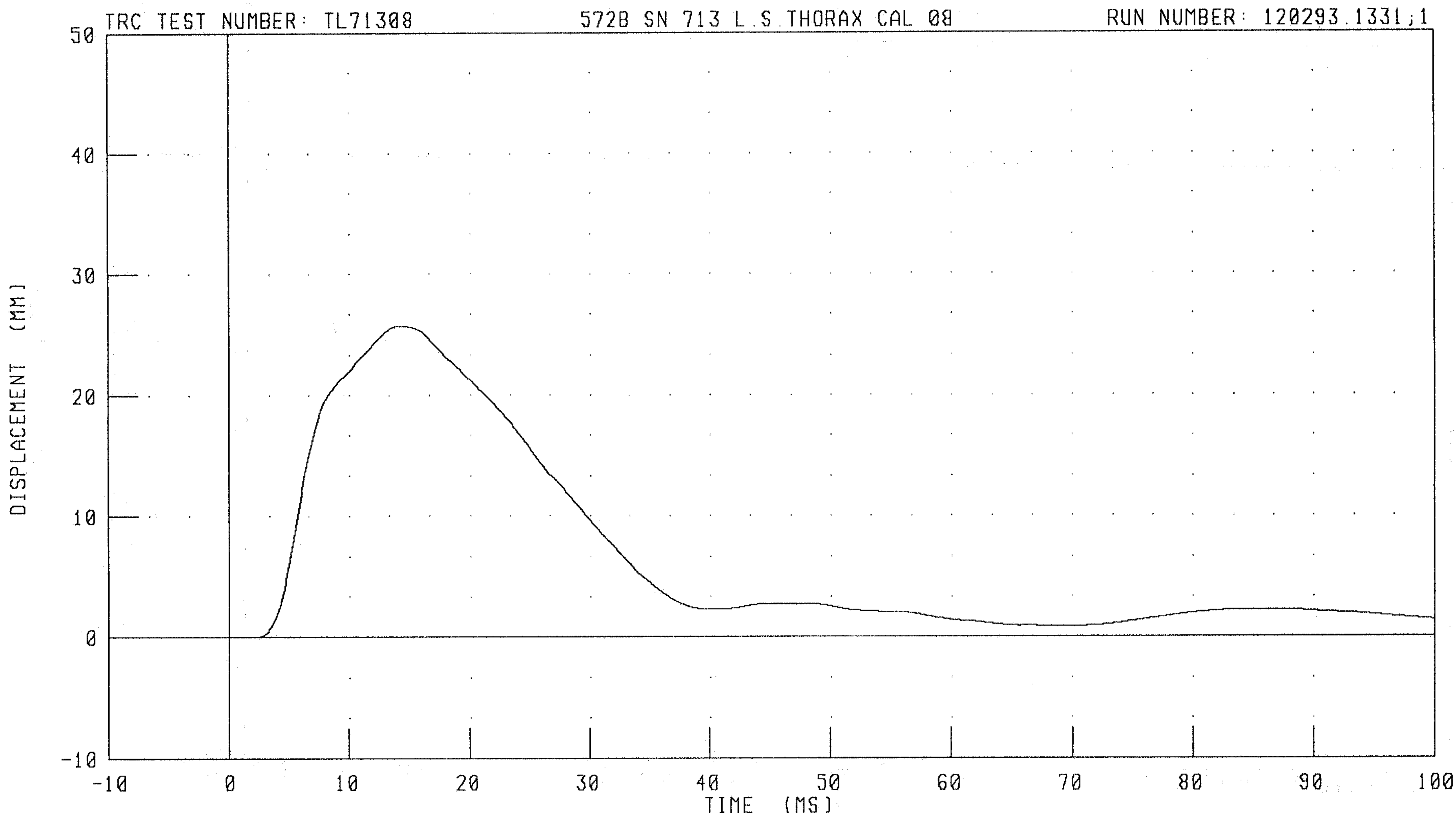
TRC TEST NUMBER: TL71308 572B SN 713 L.S.THORAX CAL 08 RUN NUMBER: 120293.1331;1



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5845.90 N @ 10.40 MS; 11.27 N @ 66.64 MS

931124

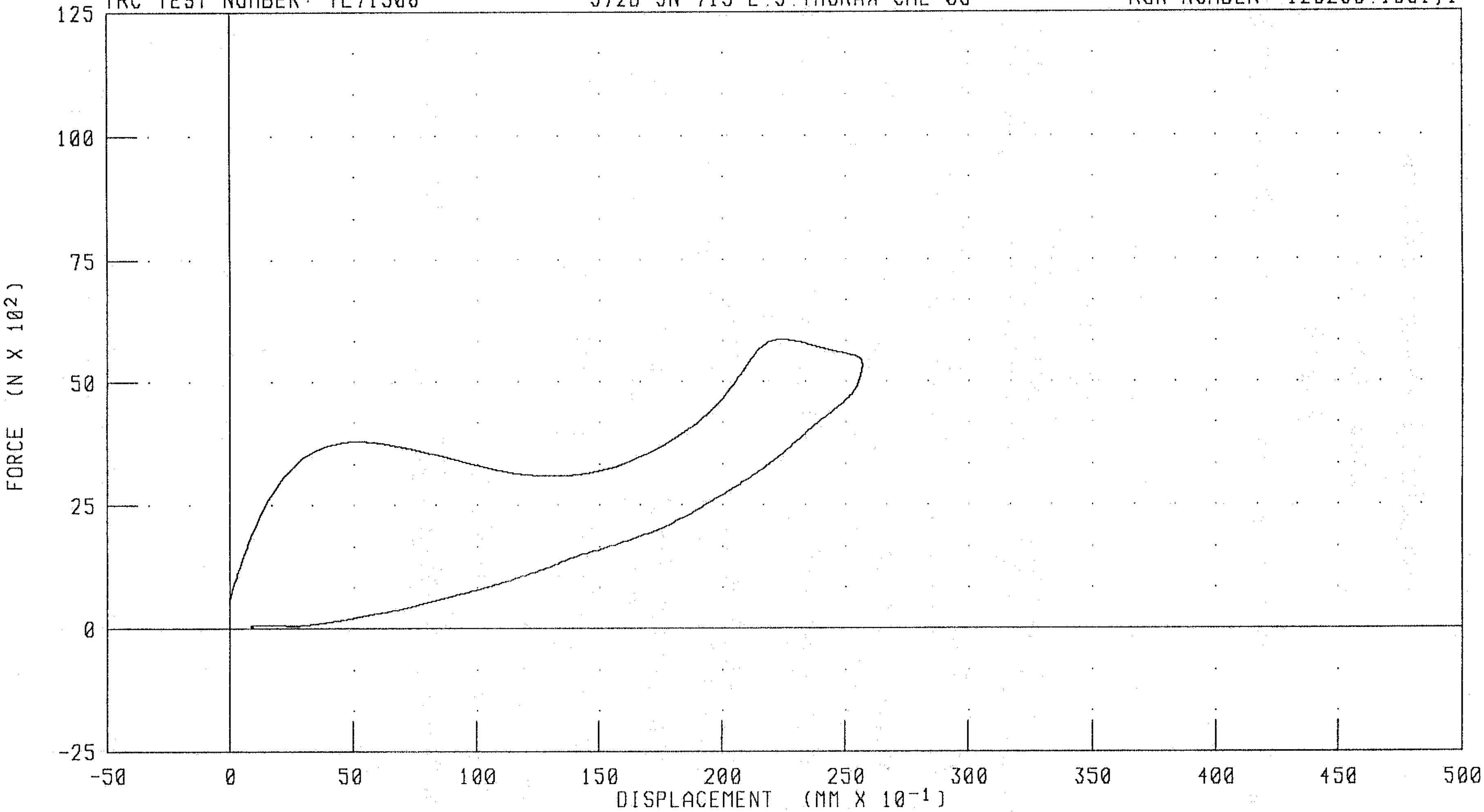
PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)
STERNUM DISPLACEMENT



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 25.69 MM @ 14.32 MS; 0.00 MM @ -1.68 MS

PART 572-B HYBRID II THORAX CALIBRATION (4.3 M/SEC)
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: TL71308 572B SN 713 L.S.THORAX CAL 08 RUN NUMBER: 120293.1331;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 25.69 MM @ 14.32 MS; 0.00 MM @ -1.68 MS
PENXF CH. CLASS 180 5845.90 N @ 10.40 MS; 11.27 N @ 66.64 MS

931124

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

PART 572B 22-NOV-93

TRC INC. TEST NO: TH71308 572B SN 713 H.S.THORAX CAL 08

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	6.64 - 6.77 M/S	6.68 M/S
PEAK STERNUM DEFLECTION	43 MM MAX.	39.95 MM
PEAK RESISTIVE FORCE	10009. N MAX.	8921. N
INTERNAL HYSTERESIS	50 - 70 %	60.2 %

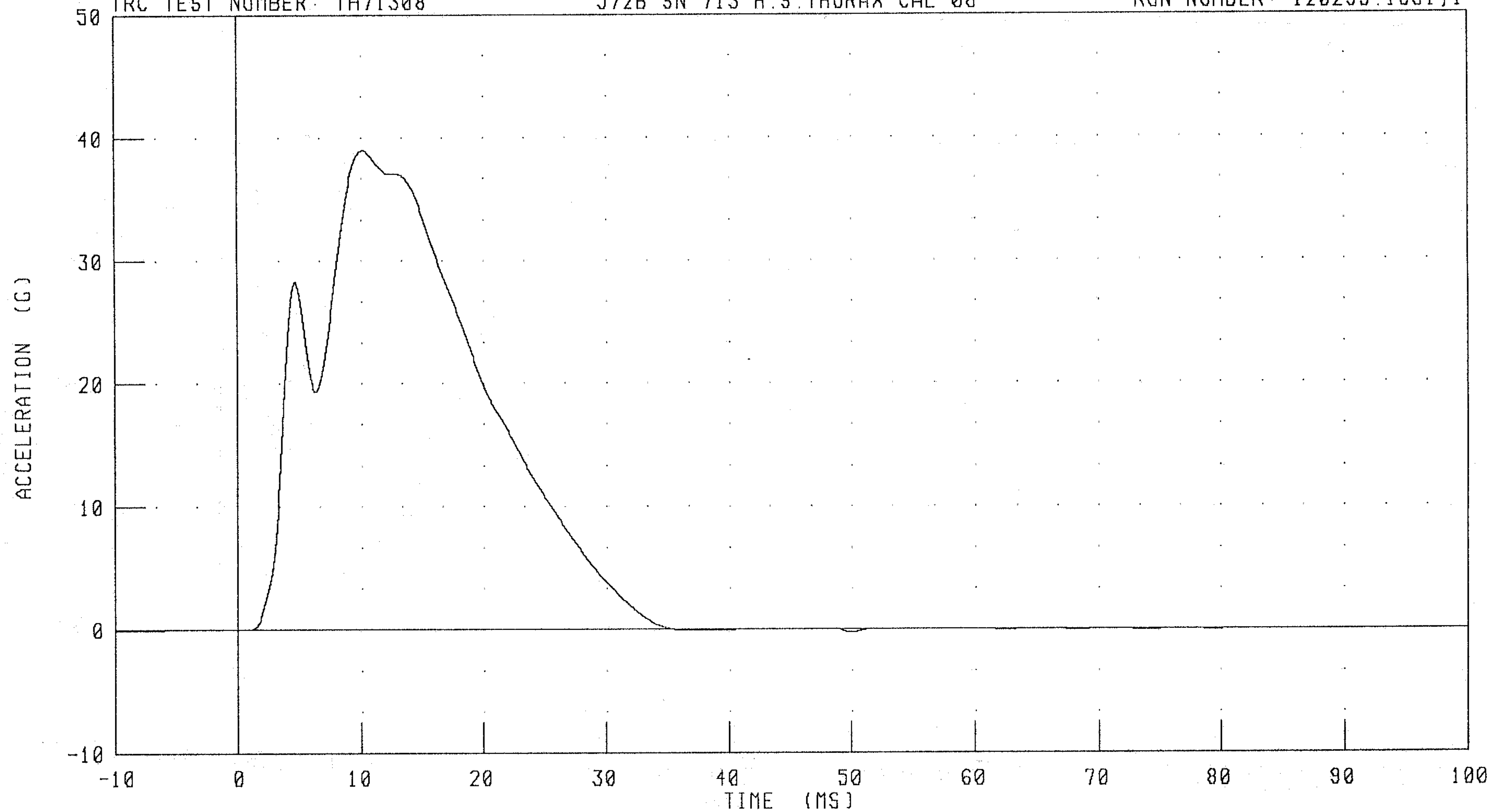
SCD: 53.34 MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Peter Foot RUN NUMBER: 112293.0907;1

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

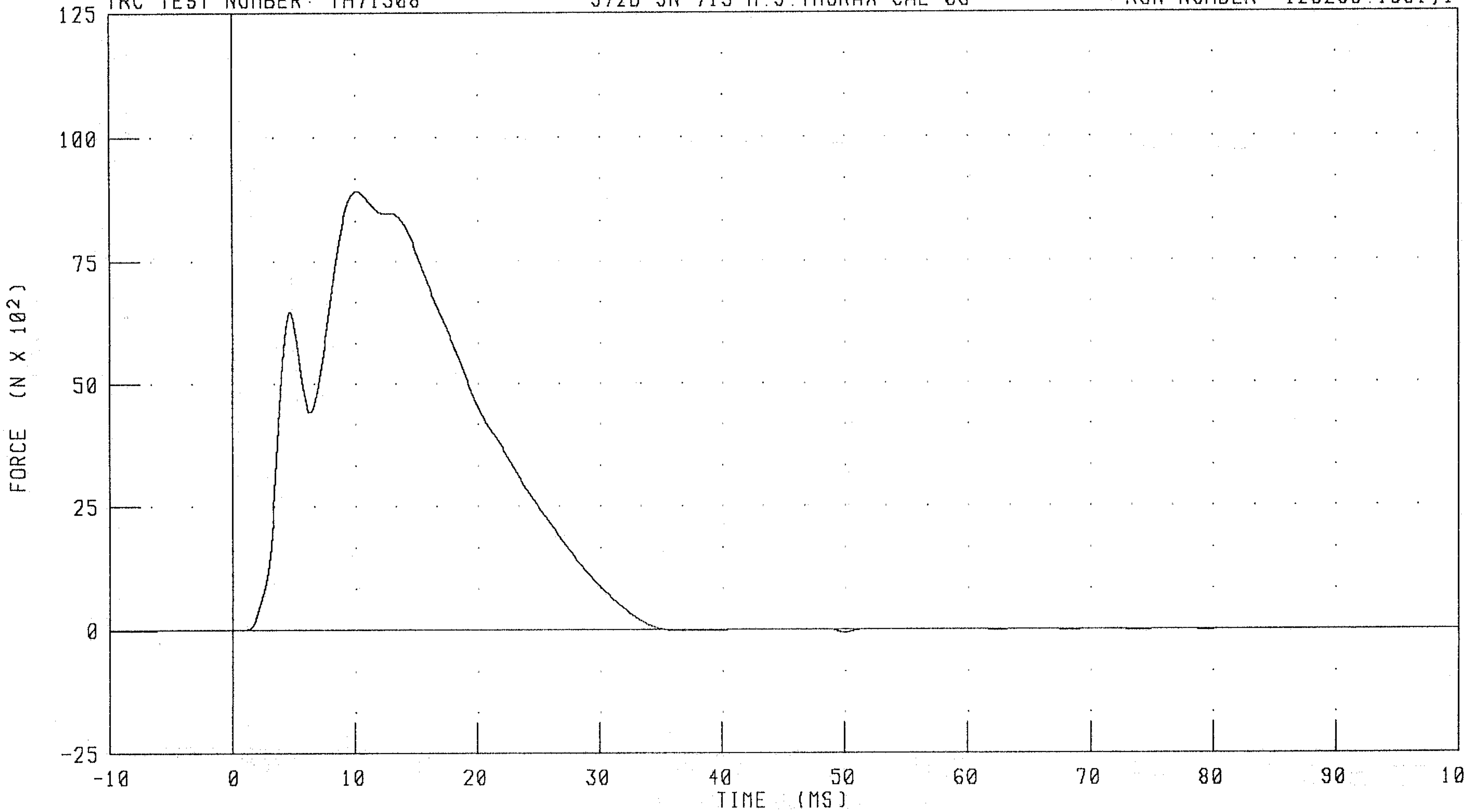
TRC TEST NUMBER: TH71308 | 572B SN 713 H.S.THORAX CAL 08 | RUN NUMBER: 120293.1331;1



CHANNEL: PENXG   FILTER: CH. CLASS 180   PEAK DATA: 38.94 G @ 10.16 MS; -0.27 G @ 49.92 MS

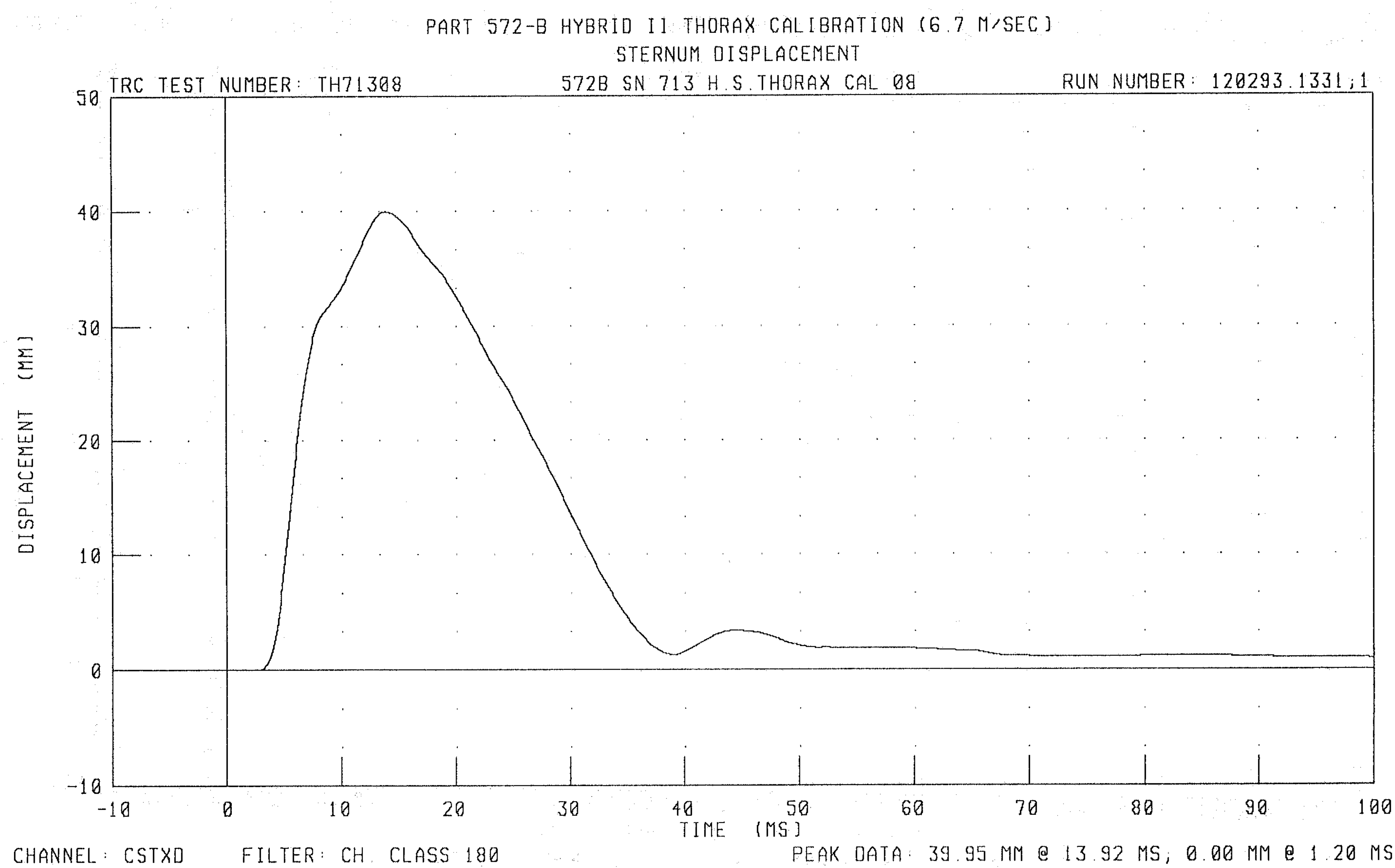
PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)
PENDULUM FORCE

TRC TEST NUMBER: TH71308 572B SN 713 H.S. THORAX CAL 08 RUN NUMBER: 120293.1331;1



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 8921.00 N @ 10.16 MS; -61.27 N @ 49.92 MS

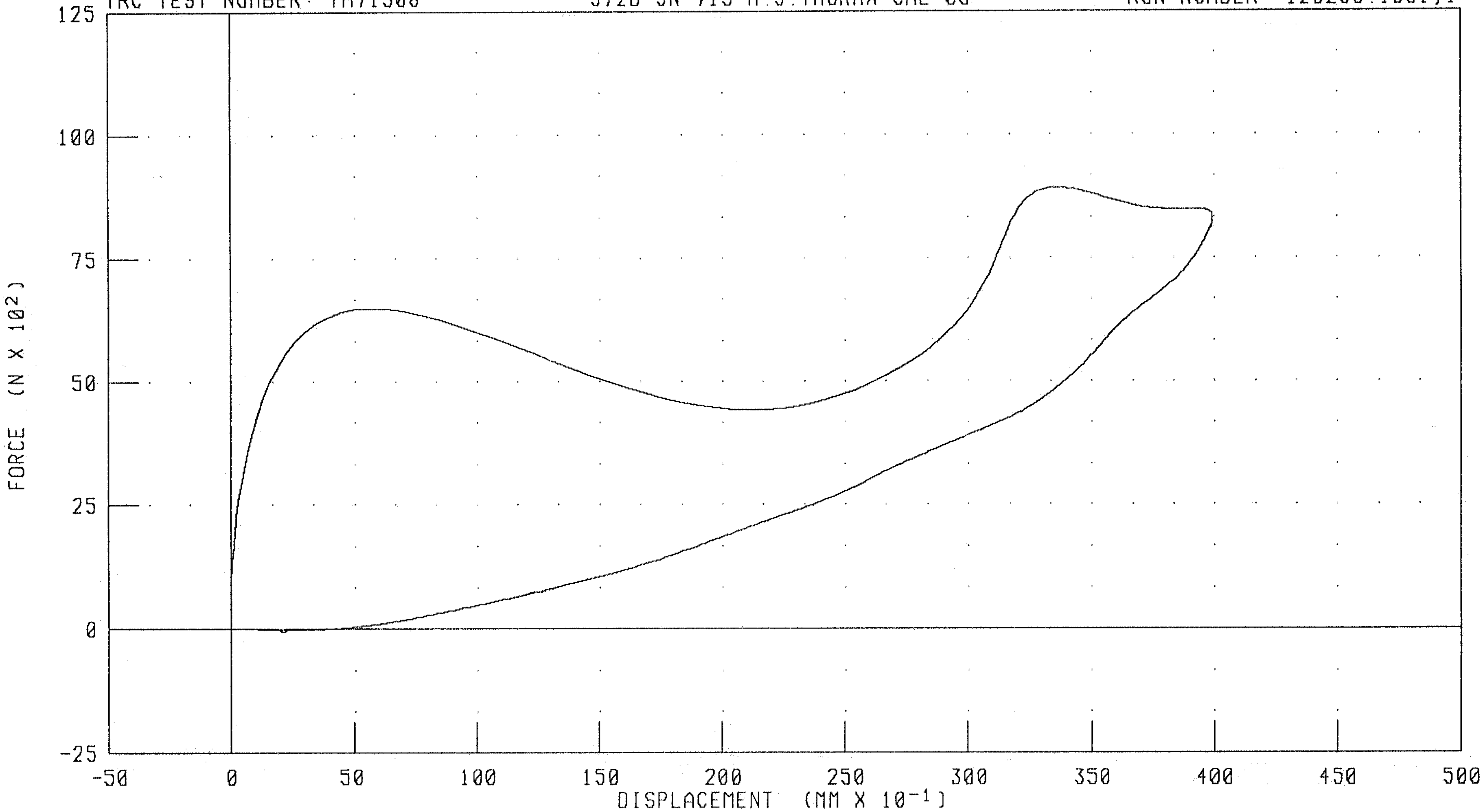
931124


PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)
STERNUM DISPLACEMENT
TRC TEST NUMBER: TH71308
572B SN 713 H.S.THORAX CAL 08
RUN NUMBER: 120293.1331;1
DISPLACEMENT (MM)
50
40
30
20
10
0
-10
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: CSTXD
FILTER: CH. CLASS 180
PEAK DATA: 39.95 MM @ 13.92 MS; 0.00 MM @ 1.20 MS

931124

PART 572-B HYBRID II THORAX CALIBRATION (6.7 M/SEC)
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: TH71308 572B SN 713 H.S.THORAX CAL 08 RUN NUMBER: 120293.1331;1



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

PEAK DATA: 39.95 MM @ 13.92 MS; 0.00 MM @ 1.20 MS
8921.00 N @ 10.16 MS; -61.27 N @ 49.92 MS

931124

TRANSPORTATION RESEARCH CENTER INC.

ABDOMEN COMPRESSION TEST

PART 572B 19-NOV-93

TRC INC. TEST NO: AB71308 572B SN 713 ABDOM COMPR CAL 08

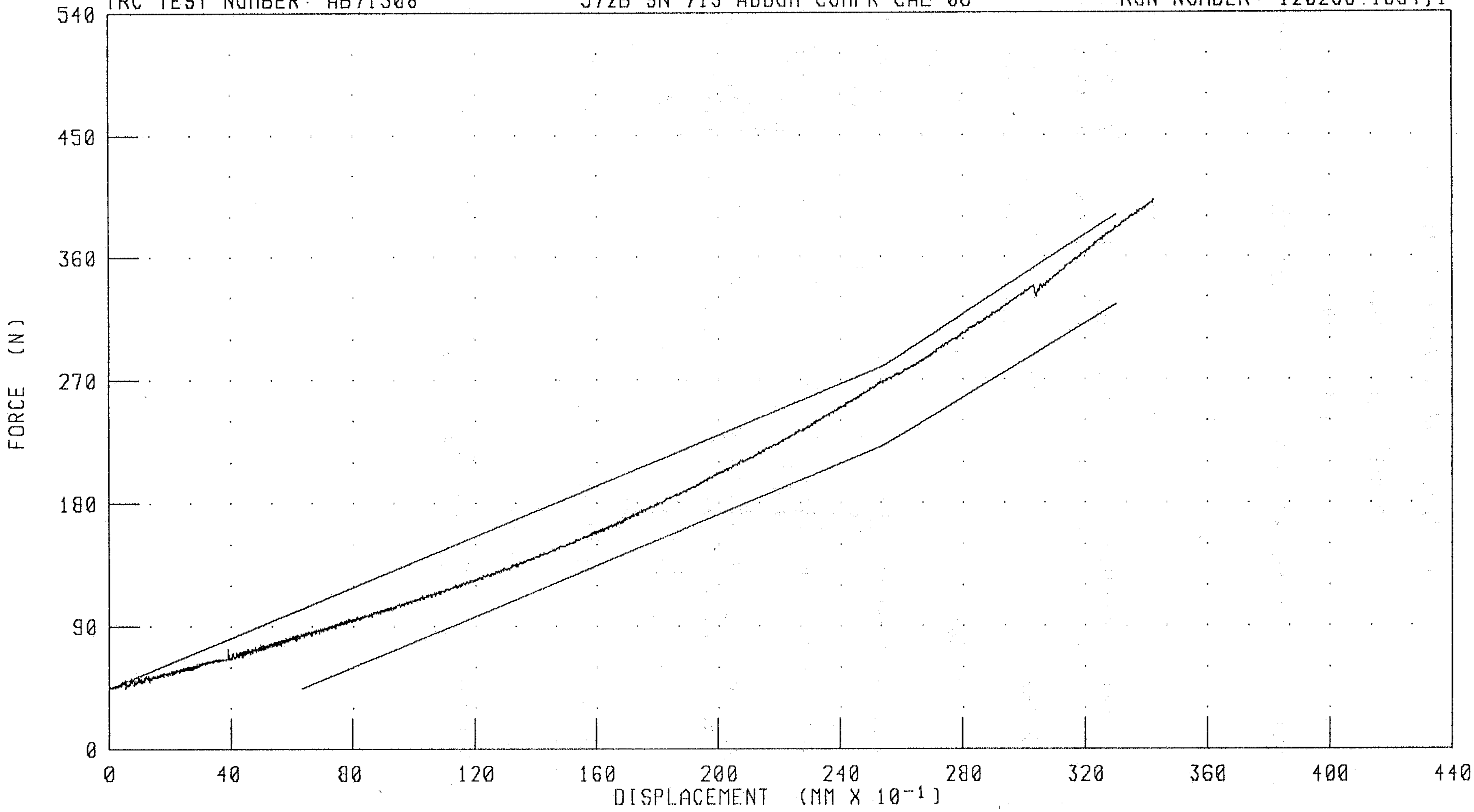
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	53 %
FORCE AT 0.00 MM DISP.	44.48 N	44.48 N
FORCE AT 12.7 MM DISP.	102.30 - 160.13 N	130.42 N
FORCE AT 19.1 MM DISP.	160.13 - 222.40 N	190.29 N
FORCE AT 25.4 MM DISP.	222.40 - 280.22 N	267.55 N
FORCE AT 33.0 MM DISP.	324.70 - 391.42 N	380.97 N

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Peter [signature] RUN NUMBER: 111993.1118;1

PART 572-B HYBRID II ABDOMEN CALIBRATION
ABDOMEN FORCE VS DISPLACEMENT

TRC TEST NUMBER: AB71308 572B SN 713 ABDOM COMPR CAL 08 RUN NUMBER: 120293.1334;1



CHANNEL: ABXD FILTER: CH. CLASS 1000 PEAK DATA: 34.30 MM @ 4.43 S; -0.01 MM @ 0.00 S
ABXF CH. CLASS 1000 402.11 N @ 4.43 S; 44.26 N @ 0.00 S

931124

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

PART 572B 19-NOV-93

TRC INC. TEST NO: LF71308 572B SN713 LUMBAR FLEX CAL08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	53 %
FORCE AT 0 DEG. FLEXION	-26.69 - +26.69 N	0.00 N
FORCE AT 20 DEG. FLEXION	97.86 - 151.24 N	137.89 N
FORCE AT 30 DEG. FLEXION	151.24 - 204.62 N	160.13 N
FORCE AT 40 DEG. FLEXION	204.62 - 258.00 N	217.95 N
NET RETURN ANGLE	< 12 DEG.	5.09 DEG.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Pete Foust RUN NUMBER: 112293.1040

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

PART 572B 22-NOV-93

TRC INC. TEST NO: RK71308 572B SN 713 R.KNEE IMP CAL 08

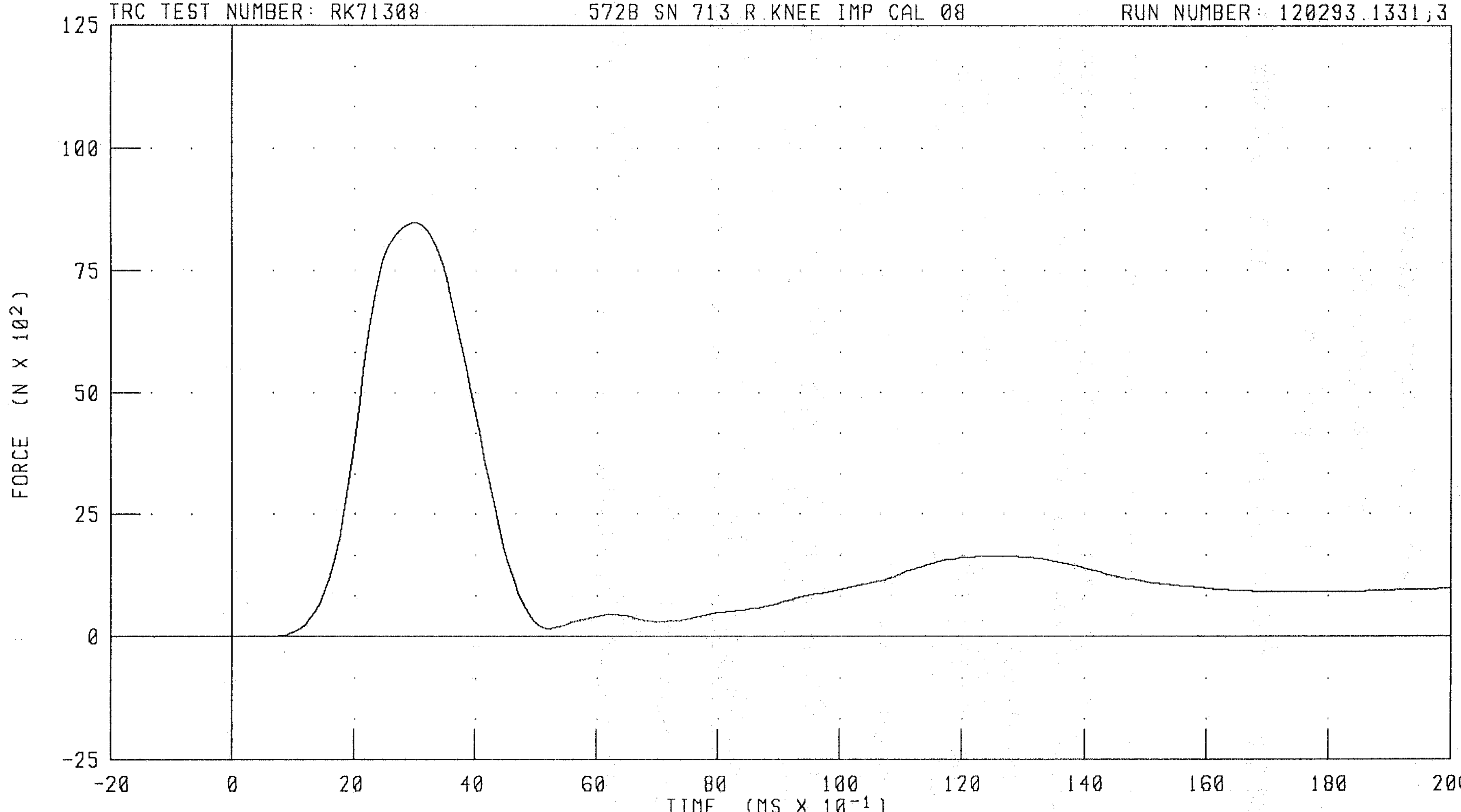
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.15 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	8474.89 N
DURATION ABOVE 4448 N	>=1.7 MS	1.98 MS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Peter Fo[illegible] RUN NUMBER: 112293.1005;3

PART 572-B HYBRID II RIGHT KNEE CALIBRATION
RIGHT FEMUR FORCE

TRC TEST NUMBER: RK71308 572B SN 713 R.KNEE IMP CAL 08 RUN NUMBER: 120293.1331;3



CHANNEL: RFMF FILTER: CH. CLASS 600 PEAK DATA: 8474.89 N @ 3.04 MS; -0.38 N @ -0.88 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

PART 572B 22-NOV-93

TRC INC. TEST NO: LK71308 572B SN 713 L.KNEE IMP CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.0 C
RELATIVE HUMIDITY	10 - 70 %	55 %
PENDULUM VELOCITY	2.06 - 2.15 M/S	2.15 M/S
PEAK KNEE IMPACT FORCE	8229 - 11121 N	8927.93 N
DURATION ABOVE 4448 N	>=1.7 MS	1.87 MS

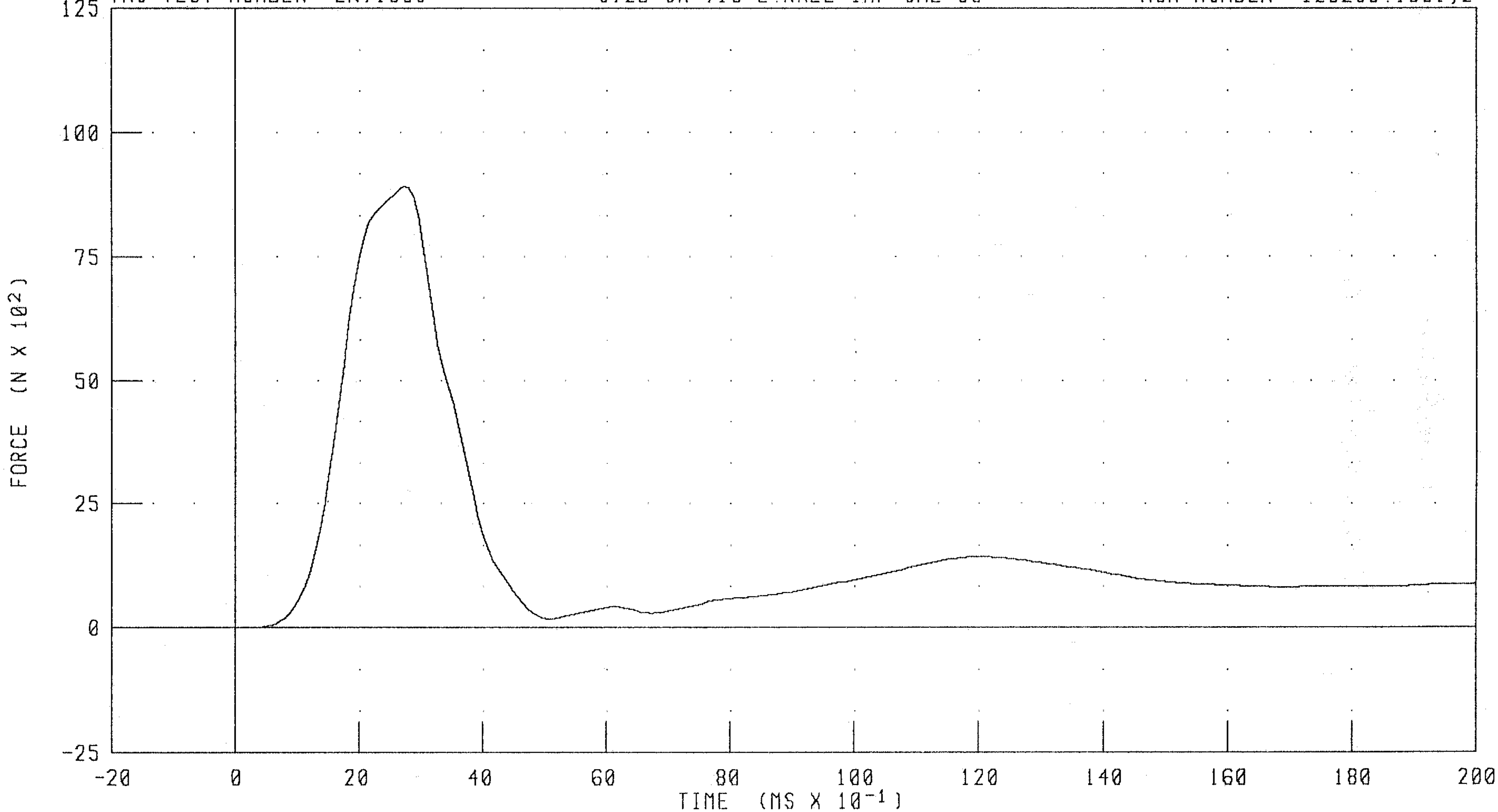
DUMMY MEETS SPECIFICATIONS

TECHNICIAN Peter Foster RUN NUMBER: 112293.0955;2

PART 572-B HYBRID II LEFT KNEE CALIBRATION

LEFT FEMUR FORCE

TRC TEST NUMBER: LK71308 572B SN 713 L.KNEE IMP CAL 08 RUN NUMBER: 120293.1331;2



CHANNEL: LFMF FILTER: CH. CLASS 600 PEAK DATA: 8927.93 N @ 2.72 MS; -2.66 N @ -1.52 MS

931124

APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #142

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	CALIBRATION DATE DUE
HEAD X-AXIS ACCEL.	FH25J	7264	ENDEVCO	09/24/93	03/24/94
Y-AXIS ACCEL.	CY32H	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	DB81H	7264	ENDEVCO	10/19/93	04/19/94
CHEST X-AXIS ACCEL.	DR49J7	7264	ENDEVCO	09/14/93	03/14/94
Y-AXIS ACCEL.	AC8W6	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	CW42H	7264	ENDEVCO	09/14/93	03/14/94
LEFT FEMUR FORCE LOAD CELL	901	2430	GSE	09/23/93	03/23/94
RIGHT FEMUR FORCE LOAD CELL	902	2430	GSE	09/23/93	03/23/94
*NECK X-AXIS FORCE LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
Y-AXIS FORCE LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
Z-AXIS FORCE LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
*NECK MOMENT ABOUT X-AXIS LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Y-AXIS LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Z-AXIS LOAD CELL	0280	1716	DENTON	09/20/93	03/20/94
*CHEST DEFLECTION POTENTIOMETER	90320B	81422A	VERNITECH	09/22/93	03/22/94
LAP BELT FORCE LOAD CELL	674	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT FORCE LOAD CELL	236	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A51809	PT-101-50A	CELESCO	09/23/93	03/23/94
SHOULDER BELT STRETCH POTENTIOMETER	2690	2051414101	BOURNES	09/23/93	03/23/94

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

RIGHT FRONT PASSENGER DUMMY #713

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	CALIBRATION DATE DUE
HEAD X-AXIS ACCEL.	CT44H	7264	ENDEVCO	09/10/93	03/10/94
Y-AXIS ACCEL.	AAMT5	7264	ENDEVCO	09/10/93	03/10/94
Z-AXIS ACCEL.	ACCM9	7264	ENDEVCO	09/10/93	03/10/94
CHEST X-AXIS ACCEL.	AAMJ5	7264	ENDEVCO	10/10/93	04/10/94
Y-AXIS ACCEL.	AC8B8	7264	ENDEVCO	09/10/93	03/10/94
Z-AXIS ACCEL.	CR63H	7264	ENDEVCO	09/10/93	03/10/94
LEFT FEMUR FORCE LOAD CELL	964	2430	GSE	11/10/93	05/10/94
RIGHT FEMUR FORCE LOAD CELL	982	2430	GSE	11/10/93	05/10/94
*NECK X-AXIS FORCE LOAD CELL					
Y-AXIS FORCE LOAD CELL					
X-AXIS FORCE LOAD CELL					
*NECK MOMENT ABOUT X-AXIS LOAD CELL					
MOMENT ABOUT Y-AXIS LOAD CELL					
MOMENT ABOUT Z-AXIS LOAD CELL					
*CHEST DEFLECTION POTENTIOMETER					
LAP BELT FORCE LOAD CELL	616	3419	LEBOW	08/24/93	02/24/94
SHOULDER BELT FORCE LOAD CELL	610	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A02465	PT-101-40A	CELESCO	09/23/93	03/23/94
SHOULDER BELT STRETCH POTENTIOMETER	1291	2051414101	BOURNES	09/23/93	03/23/94

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	CALIBRATION DATE DUE
LEFT REAR SEAT CROSSMEMBER X-AXIS	DA06H	7264	ENDEVCO	10/12/93	04/12/94
LEFT REAR SEAT CROSSMEMBER X-AXIS REDUN	CR26H	7264	ENDEVCO	09/01/93	03/01/94
RIGHT REAR SEAT CROSSMEMBER X-AXIS	DA06H	7264	ENDEVCO	10/12/93	04/12/94
RIGHT REAR SEAT CROSSMEMBER X-AXIS REDUN	BW77J	7264	ENDEVCO	11/04/93	05/04/94
ENGINE TOP X-AXIS	CR84H	7264	ENDEVCO	10/12/93	04/12/94
ENGINE BOTTOM X-AXIS	CJ66H	7264	ENDEVCO	10/12/93	04/12/94
RIGHT BRAKE CALIPER X-AXIS	CH34H	7264	ENDEVCO	09/01/93	03/01/94
LEFT BRAKE CALIPER X-AXIS	CL83H	7264	ENDEVCO	10/12/93	04/12/94
INSTRUMENT PANEL CENTER X-AXIS	BM06J	7264	ENDEVCO	10/12/93	04/12/94

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	CALIBRATION DATE DUE
NECK BENDING PENDULUM ACCEL.	CB27	7232	ENDEVCO	10/04/93	04/04/94
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/06/93	04/06/94
THORAX/HYBRID II FEMUR PEND. ACCEL.	CC64	7232	ENDEVCO	10/06/93	04/06/94
LUMBAR FLEXION FORCE GAUGE	NA	DPPH-50	CHATILLON	05/03/89	REPAIRED
LUMBAR FLEXION ROTATION GAUGE	CP17-0601-1	7020	HUMPHREY	MFR. SPECIFICATION	
ABDOMEN COMPRESSION DISPL. GAUGE	4075-175	80294-2051941504	BOURNES	10/06/93	04/06/94
ABDOMEN COMPRESSION FORCE GAUGE	3443	3167	LEBOW	10/06/93	04/06/94
HYBRID III FEMUR PEND. ACCEL.	CG83	7232	ENDEVCO	10/06/93	04/06/94

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

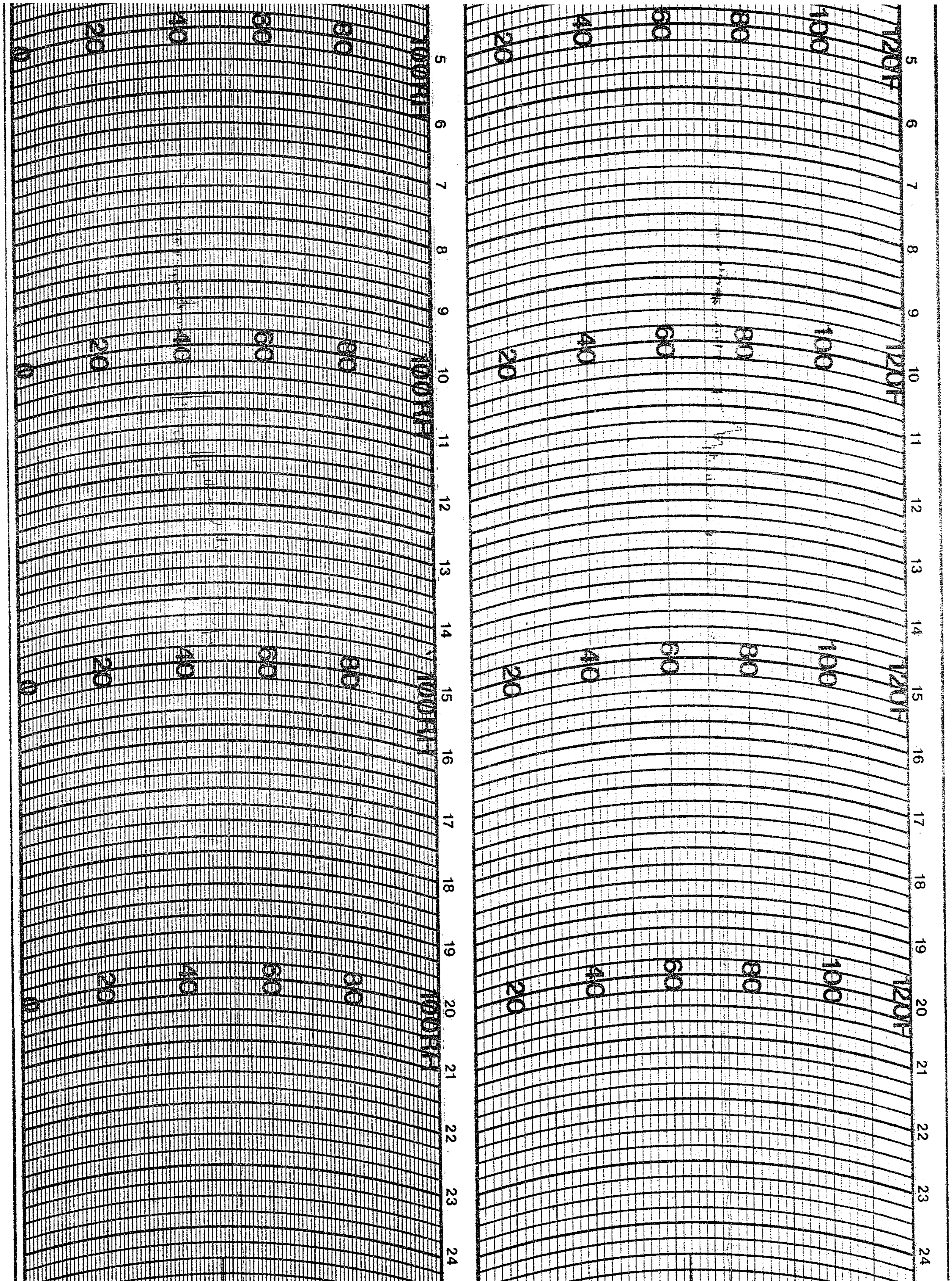
NECK LOAD CELLS:	+X FORCE:	HEAD PUSHED FORWARD
	+Y FORCE:	HEAD PUSHED LEFTWARD
	+Z FORCE:	HEAD PULLED UPWARD (TENSION ON NECK)
	+X MOMENT:	RIGHT EAR ROTATING TOWARD RIGHT SHOULDER
	+Y MOMENT:	CHIN ROTATING TOWARD CHEST
	+Z MOMENT:	CHIN ROTATING TOWARD LEFT SHOULDER

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
Headform 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________________