V1990

REPORT NO. TRC-93-N02

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

GENERAL MOTORS CORPORATION

1994 PONTIAC TRANS SPORT

SPECIAL PURPOSE VEHICLE

NHTSA NO. MR0100

TRC TEST NO. 931013

PREPARED BY:

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

EAST LIBERTY, OHIO 43319

NOVEMBER 5, 1993

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF MARKET INCENTIVES

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REPORT PREPARED BY:

Craig A. Markusic Date 11/15/93

Craig A. Markusic, Senior Project Engineer
Transportation Research Center Inc.

REPORT APPROVED BY:

Jeffery W. Sankey Date 11/15/93

Jeffery W. Sankey, Engineering Supervisor
Transportation Research Center Inc.

FINAL REPORT ACCEPTED BY:

JAN 28 1994

Date

Manager, New Car Assessment Program
NHTSA, Office of Market Incentives

JAN 28 1994

Date

Contracting Officer's Technical Representative (COTR),
NHTSA, 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 Pontiac Trans Sport special purpose vehicle, NHTSA No. MR0100, at Transportation Research Center Inc. on October 13, 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 56.5 kph. The vehicle's maximum static crush was 632 millimeters. The ambient temperature was 20° C.

The driver's Head Injury Criteria (HIC) was 454. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.9 g. The driver's chest maximum deflection was 37 millimeters. The driver's left and right femur maximum axial forces were 6095 N and 5685 N, respectively.

The passenger's HIC was 1003. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 41.0 g. The passenger's chest maximum deflection was 38 millimeters. The passenger's left and right femur maximum axial forces were 5372 N and 3026 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

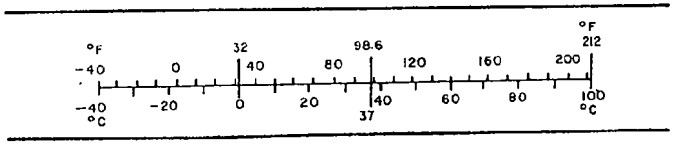
Approximate Conversions to Metric Measures

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



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SECTION 1.0

PURPOSE AND TEST PROCEDURE

PURPOSE

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

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1994 Pontiac Trans Sport special purpose vehicle, NHTSA No. MR0100, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

TEST PROCEDURE

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

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

The test vehicle contained two (2) Part 572E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the second use for both dummies which were previously used in NHTSA Test No. MR0301.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. Each Part 572E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection and a six-axis neck load cell to measure longitudinal, lateral, and vertical forces and moments.

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

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

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

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This frontal load cell barrier test was conducted at TRC on October 13, 1993.

The test vehicle, a 1994 Pontiac Trans Sport special purpose vehicle, NHTSA No. MR0100, was equipped with a 3.1-liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1962 KG. The vehicle's impact speed was 56.5 kph. The vehicle sustained 632 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 454. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.9 g. The driver's chest maximum deflection was 37 mm. The driver's left and right femur maximum axial forces were 6095 N and 5685 N, respectively.

The passenger's HIC was 1003. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 41.0 g. The passenger's chest maximum deflection was 38 mm. The passenger's left and right femur maximum axial forces were 5372 N and 3026 N, respectively.

Loss of windshield periphery retention was 250 mm extending from the lower left corner, and 330 mm extending from 600 to 930 mm from the lower left corner.

There was no penetration through the windshield.

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

DATA ACQUISITION EXPLANATIONS

The right front passenger's head Y-axis accelerometer, HEDYG2, recorded questionable data spikes at 59, 112, and 262 milliseconds. The data spikes affected the right front passenger's head resultant acceleration calculation. The data acquisition circuit was checked after the test. The cause of the data spikes could not be found.

The engine top X-axis accelerometer, ENGXG1, lost data at 77 milliseconds as a result of the accelerometer's cable being cut by the vehicle's crush on impact.

The instrument panel center X-axis accelerometer, DPCXG1, did not return to zero following the impact event. The zero shift appeared to be caused by a malfunction in the potentiometer that adjusts the multiplex frequency range for this channel. The potentiometer was replaced after the test.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: MR0100 TEST TYPE: Frontal Load Cell Barrier

TEST DATE: 10/13/93 TEST TIME: 1503 AMBIENT TEMP.: 20° C

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1994/Pontiac/Trans Sport/ special purpose vehicle

VEHICLE TEST WEIGHT (KG): 1962

IMPACT ANGLE (DEG)[1]: 0

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

MAXIMUM STATIC CRUSH (MM): 632

AVERAGE REBOUND (MM): 458

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

NUMBER OF DATA CHANNELS: 83

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

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

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: General Motors Corporation

MAKE/MODEL: Pontiac/Trans Sport VIN: 1GMDU06D5RT202095

BODY STYLE: special purpose vehicle MODEL YEAR: 1994

NHTSA NO.: MR0100 COLOR: Green

ENGINE DATA: TYPE: transverse CYLINDERS: 6 DISPLACEMENT: 3.1-liter

TRANSMISSION DATA: _3_SPEED, ___MANUAL, _X_AUTOMATIC, _X_FWD, ___RWD, ___4WD

DATE VEHICLE RECEIVED: 09/29/93 ODOMETER READING: 97.0

DEALER'S NAME AND ADDRESS: Layman-Hendron Pontiac, Inc.
P.O. Box 605
Lancaster, OH 43130-0605

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	Yes
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: General Motors Corporation

DATE OF MANUFACTURE: 08/93 VIN: 1GMDU06D5RT202095

GVWR: 2325 KG

GAWR: FRONT: 1198 KG, REAR: 1165 KG

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): General, Ameritech ST, P205/70R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 240 kPa
REAR: 240 kPa

SPARE TIRE (MFR., SIZE): Goodyear, temporary, T125/70R15

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually adjustable

MAXIMUM WIDTH: 1905 MM

WHEELBASE: 2800 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: P205/70R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 240 kPa; REAR: 240 kPa

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	744;	RF	749;	LR	675;	RR 670
PRE-TEST ATTITUDE:	LF	737;	RF	732;	LR	635;	RR 630
POST-TEST ATTITUDE:	LF	891;	RF	795;	LR	688;	RR 563

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	496 KG	RIGHT REAR	347 KG
LEFT FRONT	508 KG	LEFT REAR	331 KG
TOTAL FRONT WEIGHT	1004 KG	(59.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	678 KG	(40.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1682 KG		

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW[1] = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (1682 KG)

VCW = VEHICLE CAPACITY WEIGHT (NA)

DSC = DESIGNATED SEATING CAPACITY (NA)

RCLW[1] = VCW - 68 (DSC) = 136 KG

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

TARGET TEST WEIGHT = 1682 + 136 + 152

TARGET TEST WEIGHT = 1970 KG

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

RIGHT FRONT	556 KG	RIGHT REAR	460 KG
LEFT FRONT	521 KG	LEFT REAR	425 KG
TOTAL FRONT WEIGHT	1077 KG	(54.9% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	885 KG	(45.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	1962 KG	(0.4% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 45 KG

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 1263 MM REARWARD OF FRONT WHEEL CENTERLINE

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

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 931013 NHTSA NO.: MR0100

TEST DATE: 10/13/93 TEST TIME: 1503

TEST TYPE: Frontal load cell barrier IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 20° C

TEMPERATURE IN OCCUPANT COMPARTMENT: 21° C

IMPACT VELOCITY: PRIMARY = 56.5 KPH SECONDARY = 56.5 KPH

(SPECIFIED RANGE = 55.5 TO 57.1 KPH)

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

EXITING VELOCITY TRAP = 51 MM

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

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 4696; C 4842; R 4692

POST-TEST: L 4185; C 4224; R 4092

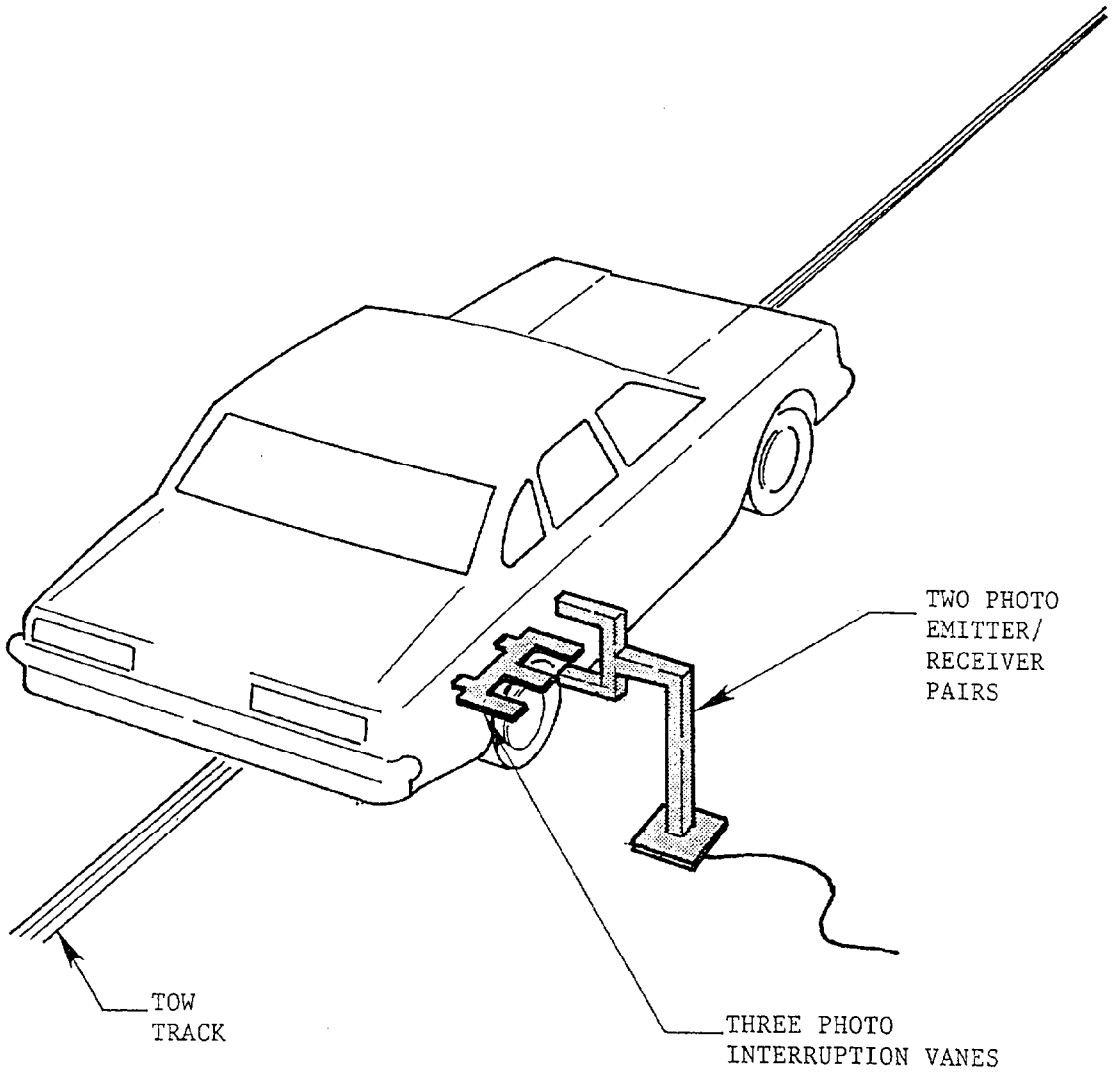
TOTAL CRUSH: L 511; C 618; R 600

AVERAGE CRUSH: 576

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

DISTANCE FROM TEST VEHICLE TO BARRIER: L 447; C 408; R 520; AVG. 458

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: Pontiac/Trans Sport/special purpose vehicle

VEHICLE NHTSA NO.: MR0100 ; VIN: 1GMDU06D5RT202095

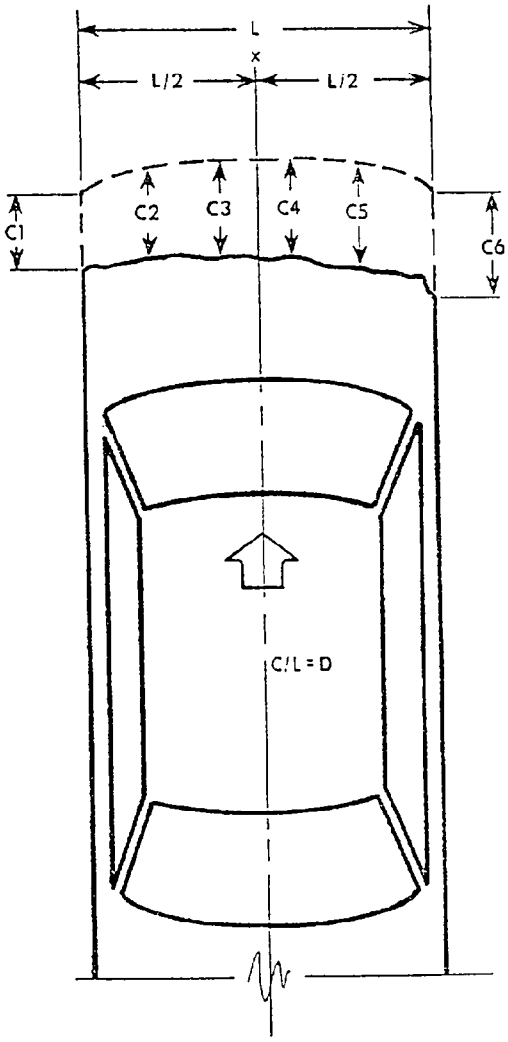
MODEL YEAR: 1994 ; BUILD DATE: 08/93 ; TEST DATE: 10/13/93

VEHICLE SIZE CATEGORY: Special purpose veh. ; TEST WEIGHT: 1962 KG

VEHICLE WHEELBASE: 2800 MM

MAXIMUM WIDTH: 1905 MM

FRONT OVERHANG: 1040 MM



COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: 12FDEW4

CRUSH DEPTH MEASUREMENTS:

C1 = 511 MM

C2 = 595 MM

C3 = 615 MM

C4 = 631 MM

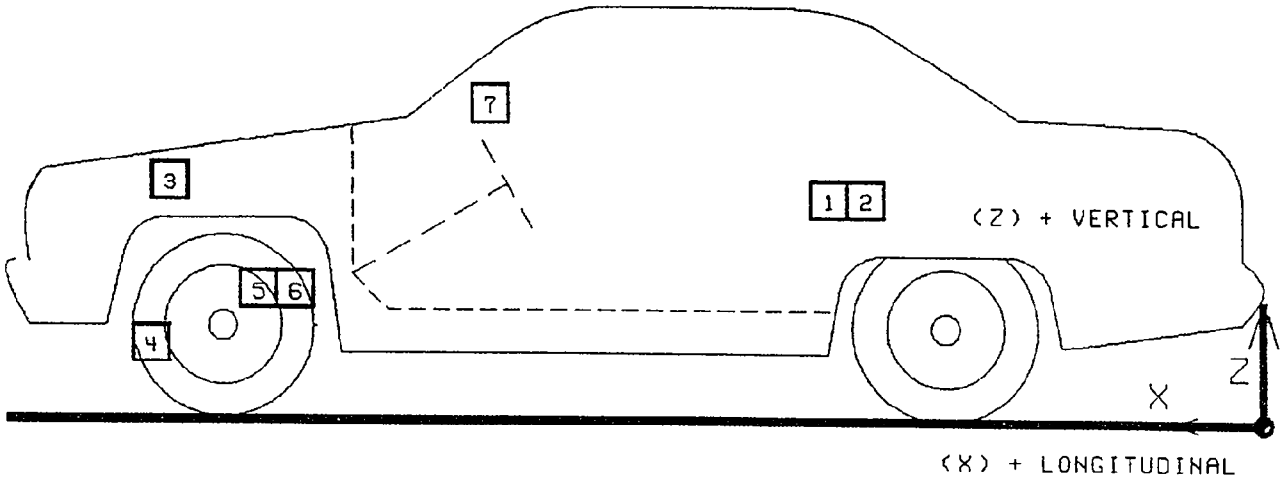
C5 = 632 MM

C6 = 600 MM

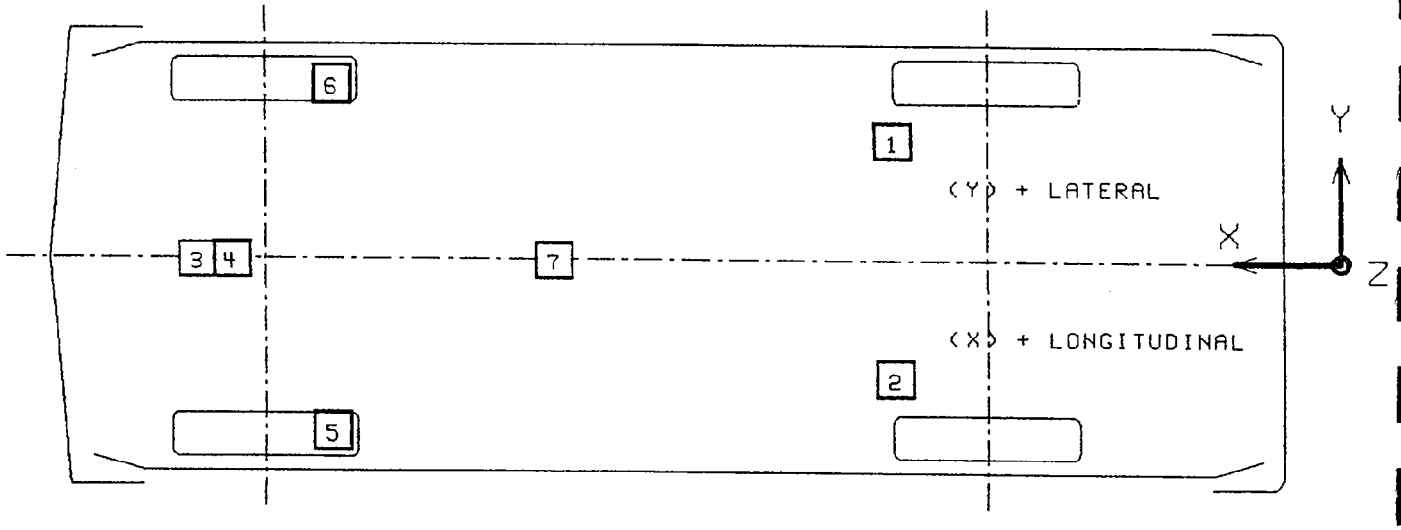
MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE (LONGITUDINAL)

LENGTH OF DAMAGED REGION: L = 1524 MM

FIGURE 3 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 931013

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	LEFT REAR SEAT CROSSMEMBER	3322	455	715				
	LONGITUDINAL				2.0	165.4	24.6	66.9
	REDUNDANT				2.1	165.4	25.3	67.0
2	RIGHT REAR SEAT CROSSMEMBER	3337	-460	702				
	LONGITUDINAL				1.7	189.9	23.6	73.1
	REDUNDANT				2.1	190.3	22.4	73.4
3	ENGINE TOP LONGITUDINAL[1]	666	25	759	---	---	---	---
4	ENGINE BOTTOM LONGITUDINAL	885	-160	228	29.8	53.8	138.3	35.5
5	RIGHT BRAKE CALIPER LONGITUDINAL	918	-620	382	18.3	92.7	77.8	49.8

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY CONTINUED

TEST NUMBER 931013

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
6	LEFT BRAKE CALIPER LONGITUDINAL	920	620	382	3.8	102.6	83.3	49.3
7	INSTRUMENT PANEL CENTER LONGITUDINAL[1]	4492	0	1029	---	---	---	---

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

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

[1] See DATA ACQUISITION EXPLANATIONS

TABLE 5 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #192	PASSENGER #142
HEAD	Airbag	Instrument panel
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	Easy

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	None	None
REAR	NA	NA

GLAZING DAMAGE:

The entire windshield cracked on impact. Both front side windows shattered on impact.

OTHER NOTABLE IMPACT EFFECTS:

The right front tire deflated on impact. The upper glove compartment door came open on impact.

TABLE 6 FMVSS 208 DATA SUMMARY

VEH. YR./MAKE/MODEL/BODY STYLE: 1994/Pontiac/Trans Sport/special purpose

VEH. NHTSA NO.: MR0100 ; TEST DATE: 10/13/93

MAXIMUM ACCELERATIONS (G):	DRIVER DUMMY #192	PASSENGER DUMMY #142
HEAD X-AXIS	-57.9	-84.5
HEAD Y-AXIS	28.8	18.6[1]
HEAD Z-AXIS	10.4	-64.4
HEAD RESULTANT	64.6	103.0[1]
CHEST X-AXIS	-44.3	-40.9
CHEST Y-AXIS	-7.5	17.5
CHEST Z-AXIS	6.3	-13.8
CHEST RESULTANT[2]	43.9	41.0
CHEST RESULTANT TIME INTERVAL (SEC.)[1]	.003	.003
HEAD INJURY CRITERIA (HIC) VALUES:		
HIC[3]	454	1003
HIC STARTING TIME (SEC.)	.058	.079
HIC ENDING TIME (SEC.)	.094	.115
AVG. HEAD RESULTANT ACCEL. DURING HIC TIME INTERVAL (G)	43.6	60.0
MAXIMUM CHEST DEFLECTIONS (MM):		
CHEST X-AXIS	37	38
MAXIMUM CHEST DEFLECTION TIME (SEC)	.079	.104
MAXIMUM COMPRESSIVE FEMUR FORCES (N):		
LEFT FEMUR	6095	5372
RIGHT FEMUR	5685	3026
MAXIMUM SEAT BELT FORCES (N):		
LAP BELT	1057	4347
SHOULDER BELT	5109	8549

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/Pontiac/Trans Sport/special purpose

VEHICLE NHTSA NO.: MR0100 ; TEST DATE: 10/13/93

MAXIMUM VALUES:	DRIVER DUMMY #192	PASSENGER DUMMY #142
NECK X-AXIS FORCE (N)	573	1711
NECK Y-AXIS FORCE (N)	338	-443
NECK Z-AXIS FORCE (N)	2181	2626
NECK MOMENT ABOUT X AXIS (N-M)	22	24
NECK MOMENT ABOUT Y AXIS (N-M)	-49	67
NECK MOMENT ABOUT Z AXIS (N-M)	41	-7

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

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy's head rotated upward and to the left. The driver dummy was restrained by the three-point unibelt and airbag. The dummy's upper torso then rebounded slightly rearward. 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 rotated downward impacting the instrument panel. The dummy then rebounded rearward into the seat back as the dummy's head rotated rearward contacting the head restraint. The right front passenger dummy came to rest in the right front passenger's seat restrained by the three-point 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.	2565	2570
SHOULDER BELT LENGTH AS MEASURED ON PART 572 DUMMY.	971	950
LAP BELT LENGTH AS MEASURED ON PART 572 DUMMY.	787	790
SHOULDER BELT SPOOL-OFF LENGTH:		
AS DETERMINED BY FILM ANALYSIS	51	84
AS DETERMINED MECHANICALLY	71	77
AS DETERMINED ELECTRONICALLY	65	102
BELT STRETCH LENGTH (MM/M):		
AS MEASURED MECHANICALLY	5	8
AS MEASURED ELECTRONICALLY	0	0
RETRACTOR LOCK-UP TIME (MS):		
AS DETERMINED BY SHOULDER BELT SPOOL-OFF	66	92

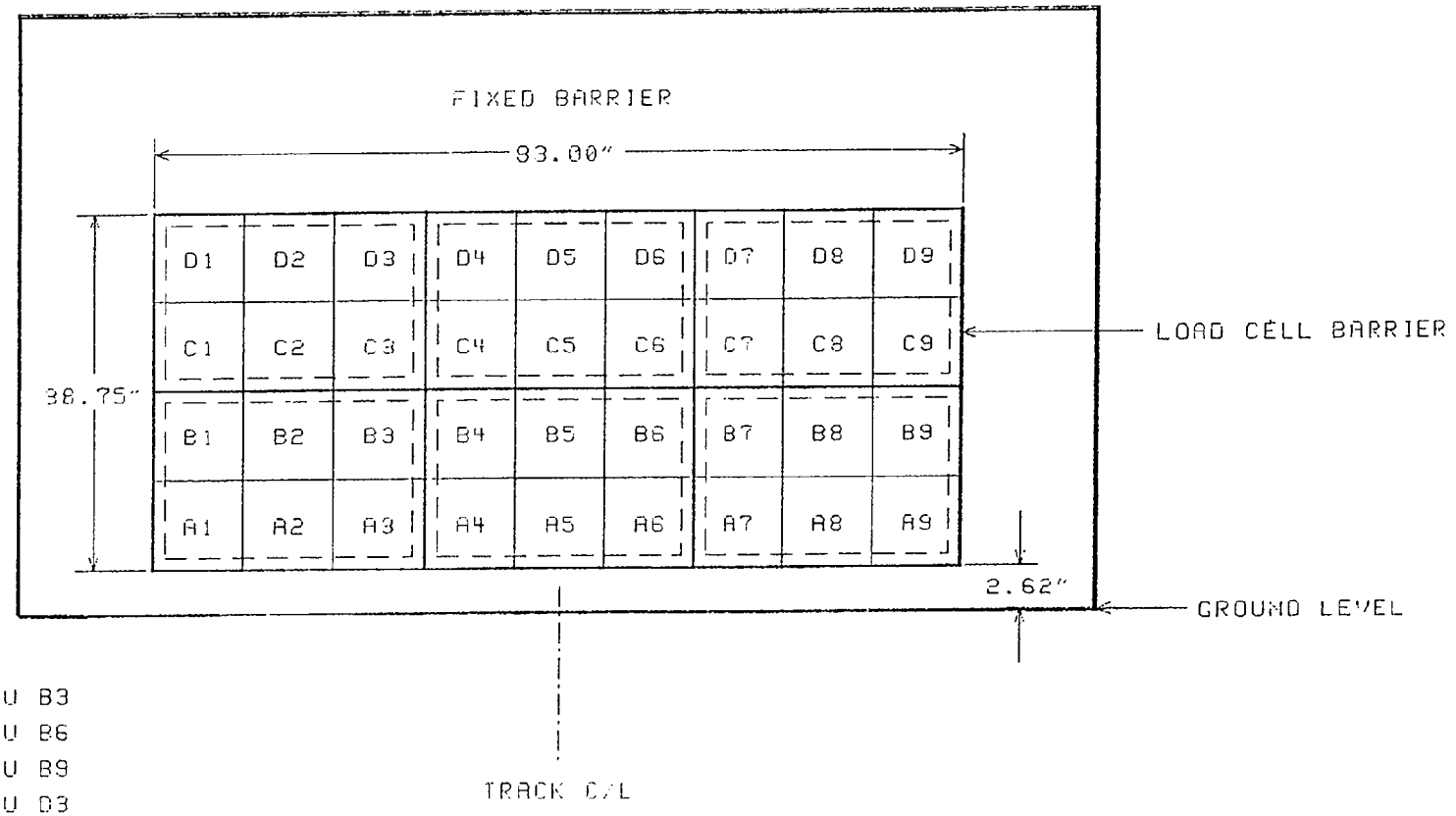
ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

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 931013

LOCATION	POSITIVE DIRECTION KN	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION KN	NEGATIVE DIRECTION MSEC
TOTAL GROUP 1	1.0	249.8	69.6	22.2
TOTAL GROUP 2	1.5	306.4	152.3	70.4
TOTAL GROUP 3	1.5	2.9	107.9	38.4
TOTAL GROUP 4	1.1	272.6	88.0	42.9
TOTAL GROUP 5	0.6	305.8	151.3	38.1
TOTAL GROUP 6	0.7	263.7	98.3	42.6

TABLE 9

LOAD CELL BARRIER DATA SUMMARY CONTINUED

TEST NUMBER 931013

LOCATION	POSITIVE DIRECTION KN	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION KN	NEGATIVE DIRECTION MSEC
TOTAL LOAD CELL FORCE	4.4	305.8	608.2	39.2

TENSION IS POSITIVE
COMPRESSION IS NEGATIVE

SECTION 3.0

FMVSS 212, 219 (PARTIAL), AND 301 DATA

FIGURE 5 FMVSS 212 TEST DATA

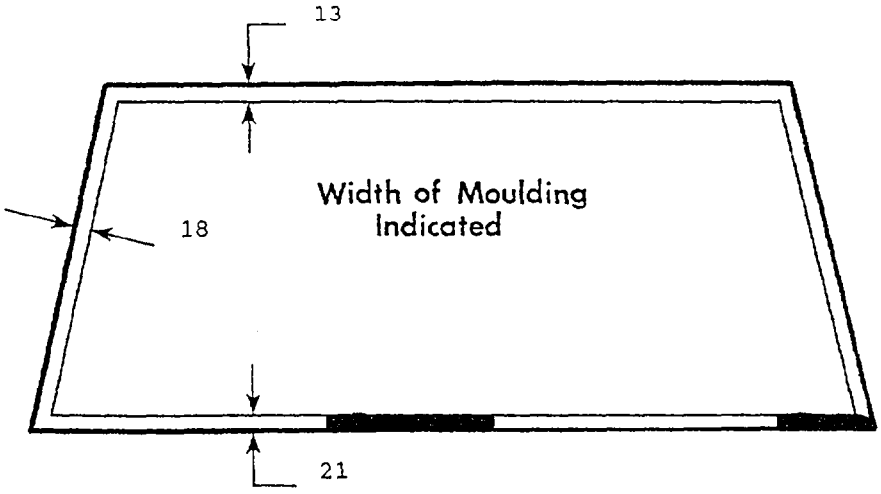
DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:
Plastic trim around outer perimeter, adhesive around inner perimeter.

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

WINDSHIELD PERIPHERY MEASUREMENTS:

	PRE-TEST	POST-TEST	PERCENT RETENTION
RIGHT SIDE	2483	2315	93.2
LEFT SIDE	2483	2071	83.4
TOTAL	4966	4386	88.3

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 21° C



FRONT VIEW OF WINDSHIELD[1]

LOSS OF WINDSHIELD RETENTION LENGTHS:
Loss of windshield periphery retention was 250 mm extending from the lower left corner, and 330 mm extending from 600 to 930 mm from the lower left corner.

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.
[1]INDICATE AREAS OF LOSS OF RETENTION, IF ANY, ON WINDSHIELD DIAGRAM.

FIGURE 6 FMVSS 219 TEST DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165-millimeter diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 13 millimeters from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

WINDSHIELD MEASUREMENTS:

A = 1388

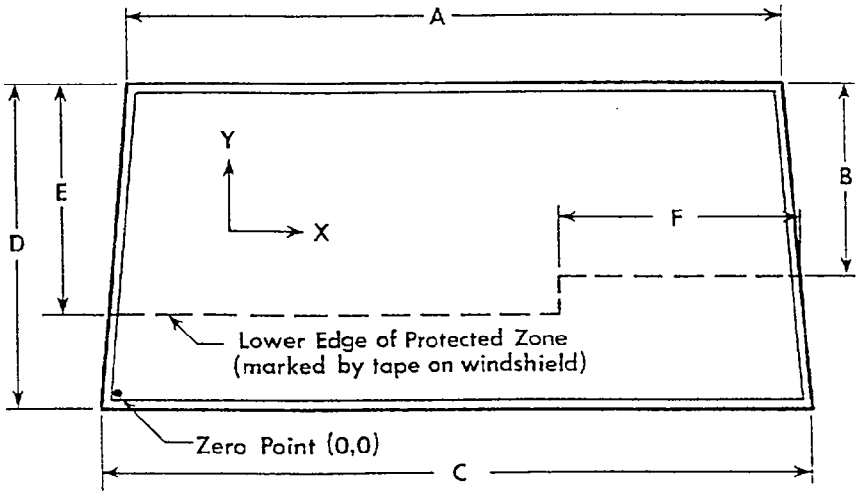
B = 689

C = 1524

D = 1047

E = 689

F = NA



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:	Pontiac/Trans Sport
NHTSA NO.:	MR0100
FUEL SYSTEM CAPACITY:	76.0 LITERS (FROM OWNER'S MANUAL)
USABLE CAPACITY:	75.7 LITERS (FURNISHED BY COTR)
TEST VOLUME RANGE:	69.6 LITERS TO 71.2 LITERS (92-94% OF USABLE)
ACTUAL TEST VOLUME:	70.4 LITERS (WITH ENTIRE FUEL SYSTEM FILLED)
TEST FLUID TYPE:	STODDARD SOLVENT
SPECIFIC GRAVITY:	0.764
KINEMATIC VISCOSITY:	0.99 CENTISTOKES
TEST FLUID COLOR:	PURPLE

DETAILS OF FUEL SYSTEM: The fuel tank is located in front of the rear axle. The fuel filler is on the left. The fuel lines run along the left side to the front.

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

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

TABLE 11 FMVSS 301 POST-IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: MR0100 ; TEST DATE: 10/13/93

VEHICLE MAKE/MODEL/BODY STYLE: Pontiac/Trans Sport/special purpose vehicle

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:

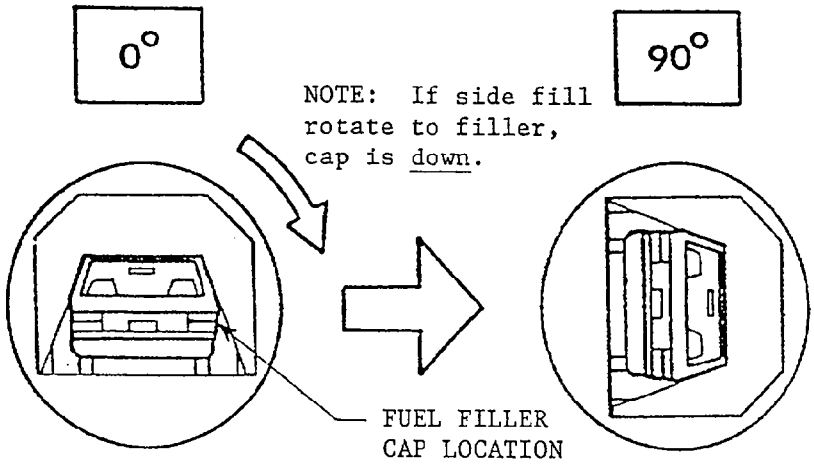
	TEST RESULTS	MAXIMUM ALLOWABLE
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 G	28 G
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 G	142 G
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - - -	0 G	28 G/MN

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 7 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: MR0100
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:

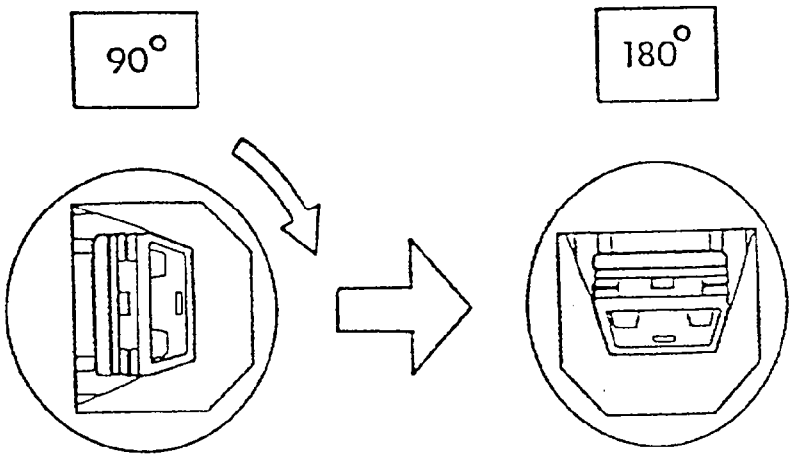
0° TO 90° ROTATION (FUEL FILLER CAP DOWN)	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0100
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:

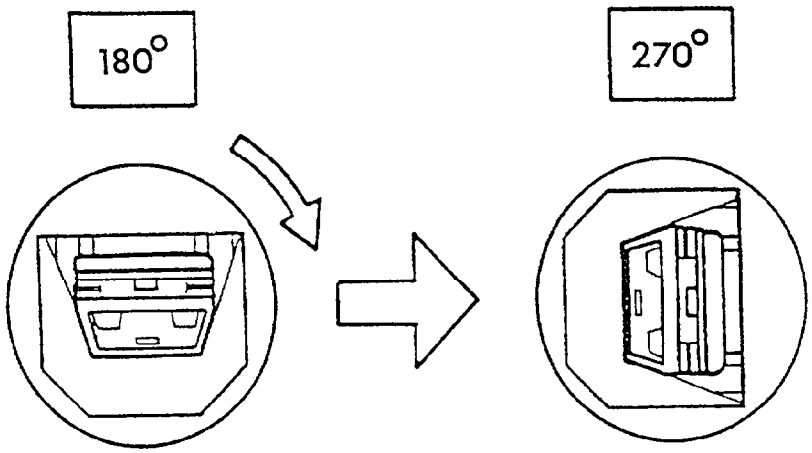
90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0100
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:

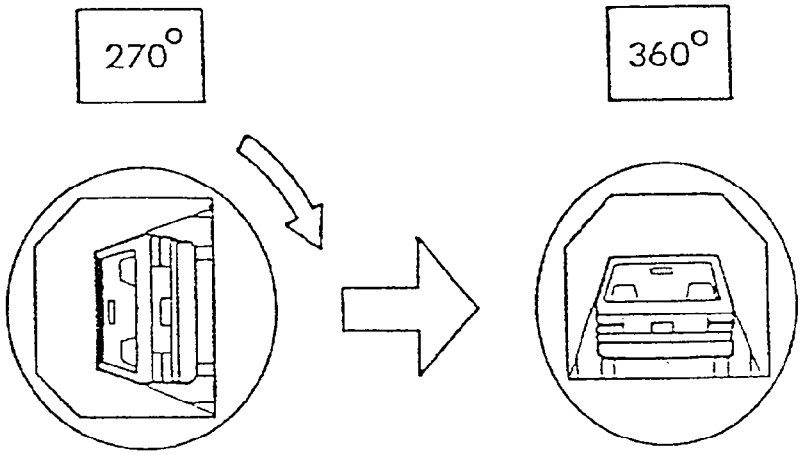
180° TO 270° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - - -	0 G	142 G
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 G	28 G
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - - - - -	0 G	28 G

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

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

NHTSA NO.: MR0100
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):

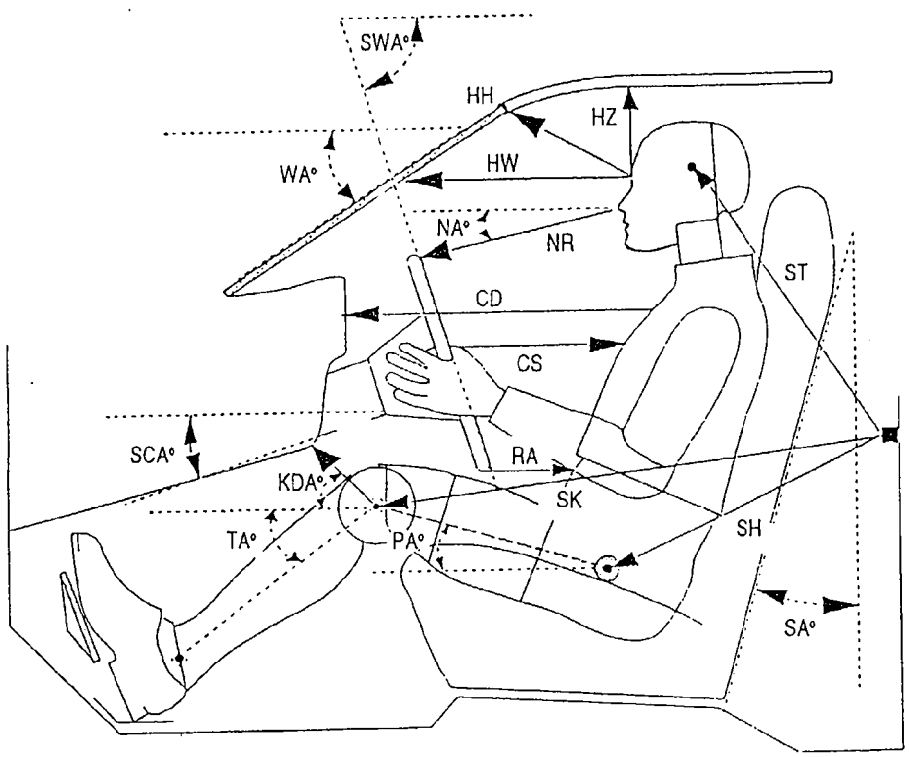
None

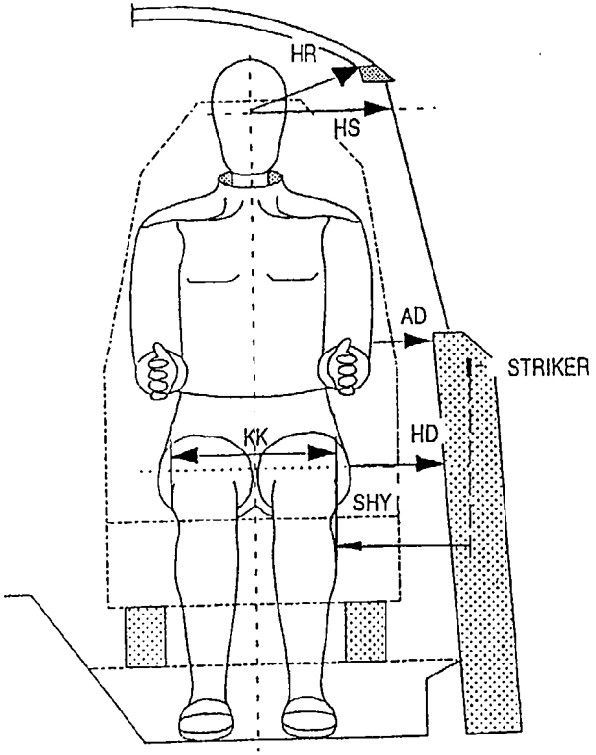
SECTION 4.0

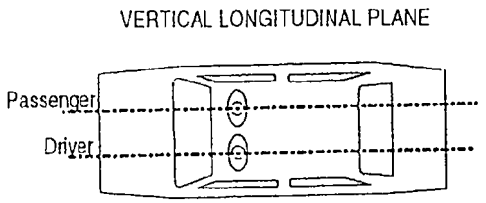
VEHICLE, OCCUPANT, AND CAMERA INFORMATION

FIGURE 8

DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS







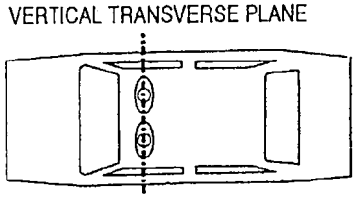
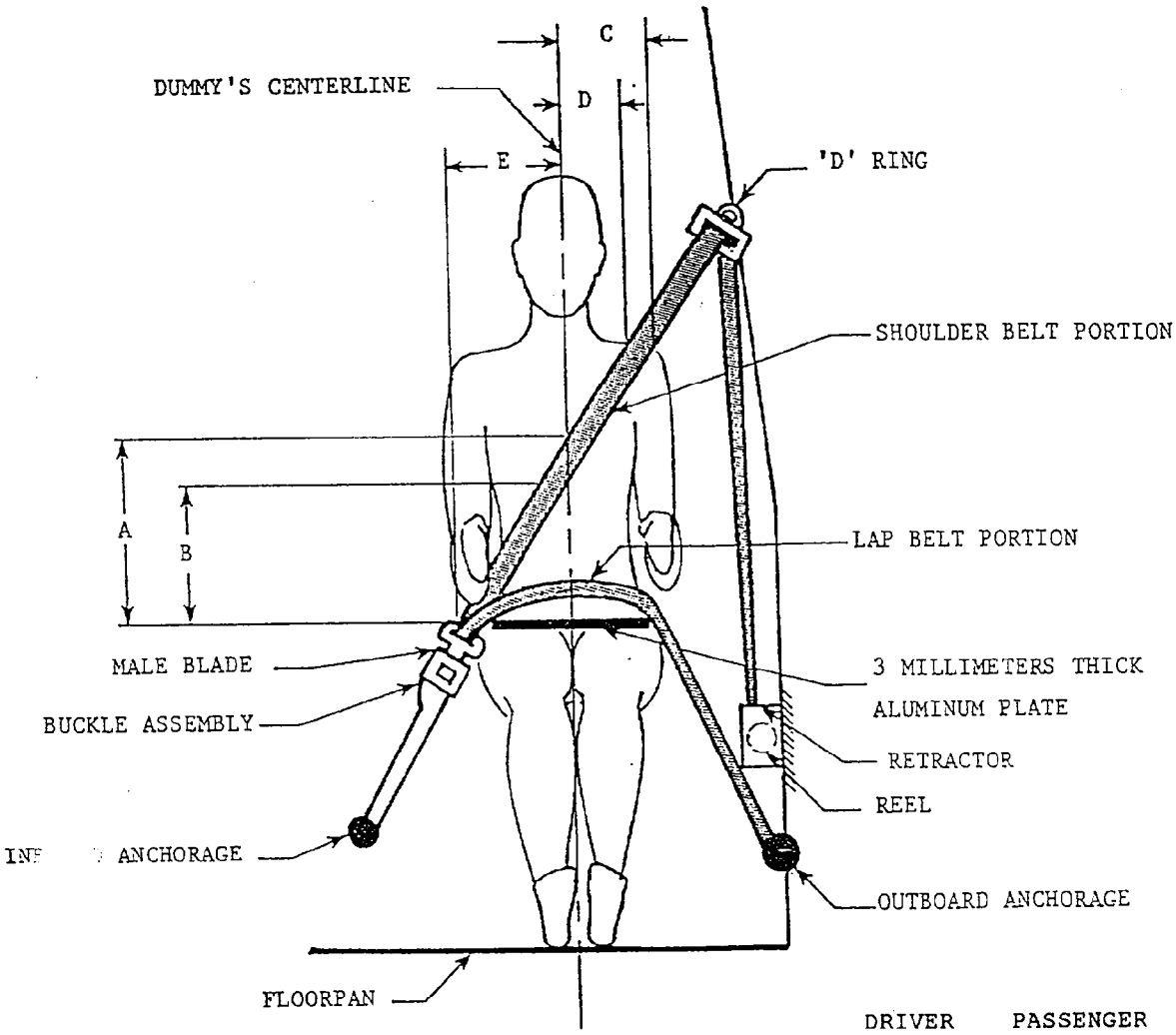


TABLE 12 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #192)	PASSENGER (SERIAL #142)
WA°	WINDSHIELD ANGLE	23	NA
SWA°	STEERING WHEEL ANGLE	59	NA
SCA°	STEERING COLUMN ANGLE	31	NA
SA°	SEAT BACK ANGLE	24	24
HZ	HEAD TO ROOF	245	215
HH	HEAD TO HEADER	448	452
HW	HEAD TO WINDSHIELD	809	835
HR	HEAD TO SIDE HEADER	303	240
NR	NOSE TO RIM	143	NA
NA	NOSE TO RIM ANGLE	10	NA
CD	CHEST TO DASH	494	558
CS	STEERING WHEEL TO CHEST	255	NA
RA	RIM TO ABDOMEN	136	NA
KDL	LEFT KNEE TO DASH	150	142
KDR	RIGHT KNEE TO DASH	155	120
KDA	OUTBOARD KNEE TO DASH ANGLE	22	24
PA°	PELVIC ANGLE	24	20
TA°	TIBIAL ANGLE	53	45
KK	KNEE TO KNEE	270	245
ST	STRIKER TO HEAD	575	578
	STRIKER TO HEAD ANGLE	-74	-78
SK	STRIKER TO KNEE	694	686
	STRIKER TO KNEE ANGLE	1	5
SH	STRIKER TO H-POINT	300	275
	STRIKER TO H-POINT ANGLE	-24	-17
SHY	STRIKER TO H-POINT (Y DIR.)	290	243
HS	HEAD TO SIDE WINDOW	333	340
HD	H-POINT TO DOOR	173	127
AD	ARM TO DOOR	137	104

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	375	410
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	284	315
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	100	102
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	40	37
LAP BELT TENSION (N)	13	13
SHOULDER BELT TENSION (N)	18	13

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 10

CAMERA POSITIONS

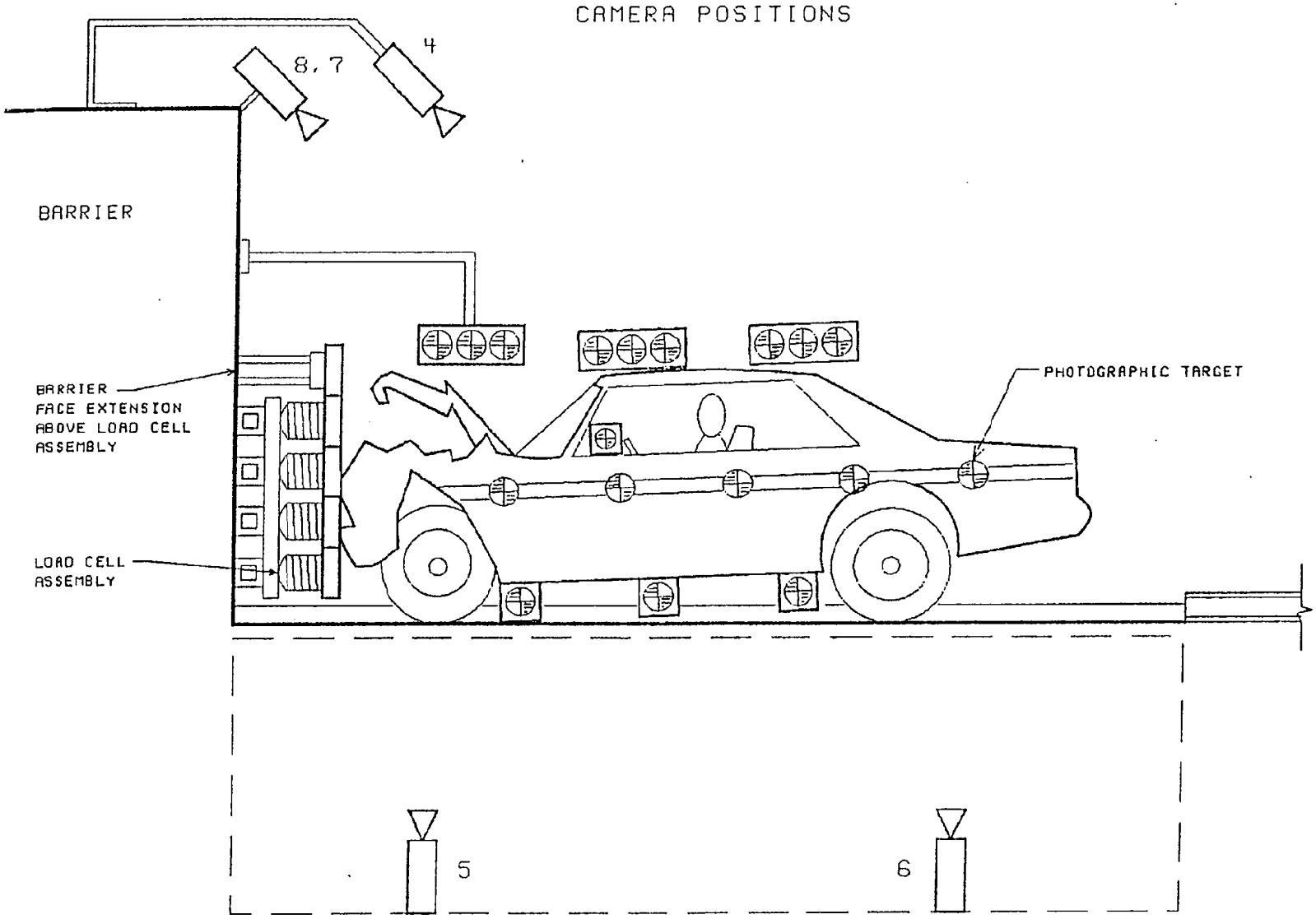


FIGURE 10

CAMERA POSITIONS, CONTINUED

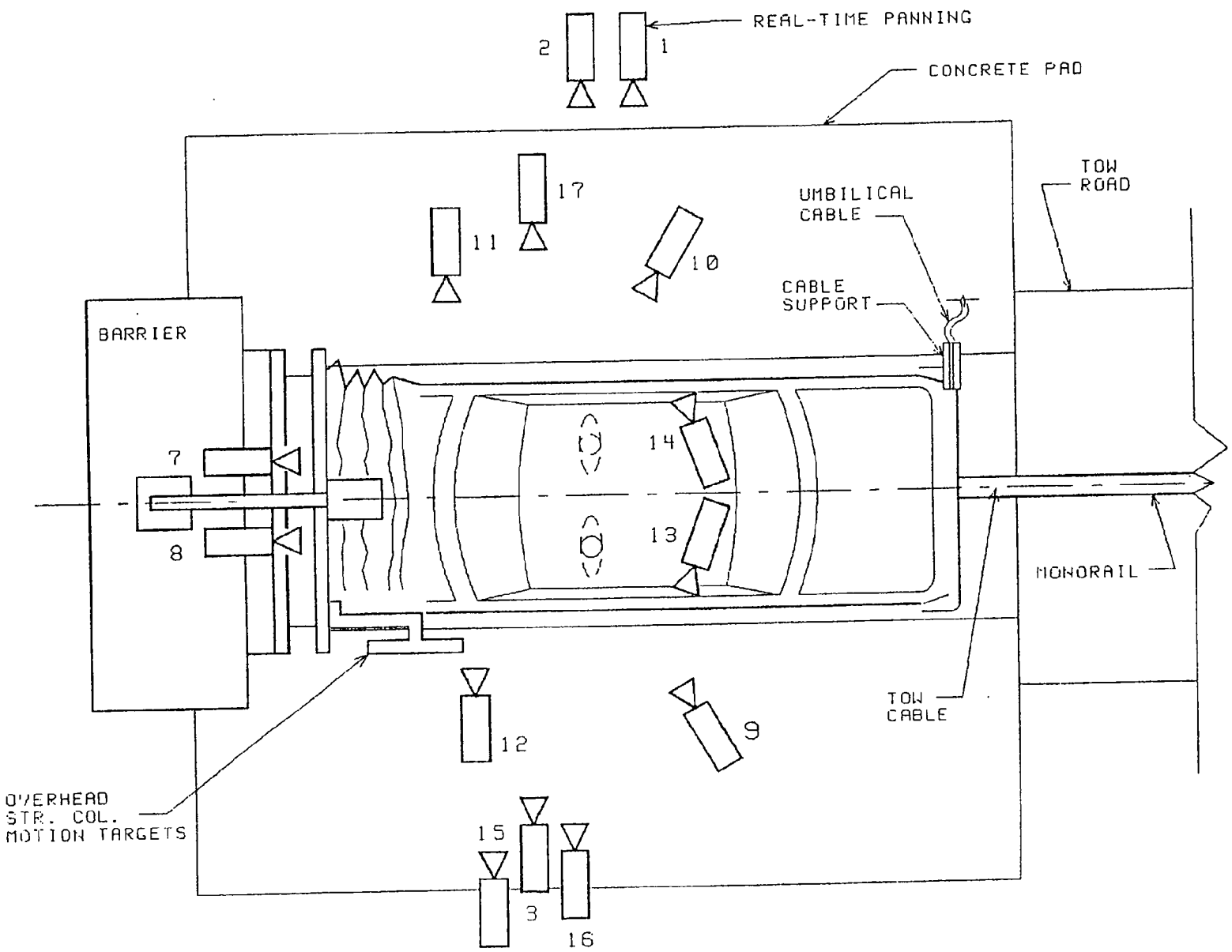


TABLE 13 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 931013 VEHICLE: 1994 Pontiac Trans Sport special purpose vehicle

CAMERA NO.	VIEW	CAMERA POSITIONS (CM)[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	488
3	Dummy kinematics	-1054	7493	1118	-12	6858	25	1002
4	Windshield damage	-925	0	2489	-40	NA	13	500
5	Crush & fluid spillage	-1283	0	-2347	90	NA	13	1015
6	Fluid spillage	-2522	0	-2515	90	NA	13	1002
7	Passenger kinematics	-114	-351	2159	-40	NA	17	498
8	Driver kinematics	-173	368	2159	-41	NA	17	505
9	Driver kinematics	-4572	1854	2591	-27	2362	25	498
10	Passenger kinematics	-4674	-1880	2540	-26	2083	25	483
11	Windshield intrusion	-968	-7775	1118	0	NA	50	510
12	Windshield intrusion	-1346	7859	1074	0	NA	50	505
13	Driver seat belt movement	NA	NA	NA	NA	NA	13	1000
14	Passenger seat belt movement	NA	NA	NA	NA	NA	13	1000
15	Column movement	-2946	7264	2616	-14	NA	25	500
16	Column movement	2946	7264	1908	-9	NA	25	506
17	Passenger kinematics	-986	-5354	1151	7	6299	25	1020

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

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

FIGURE 11 VEHICLE TARGET LOCATIONS

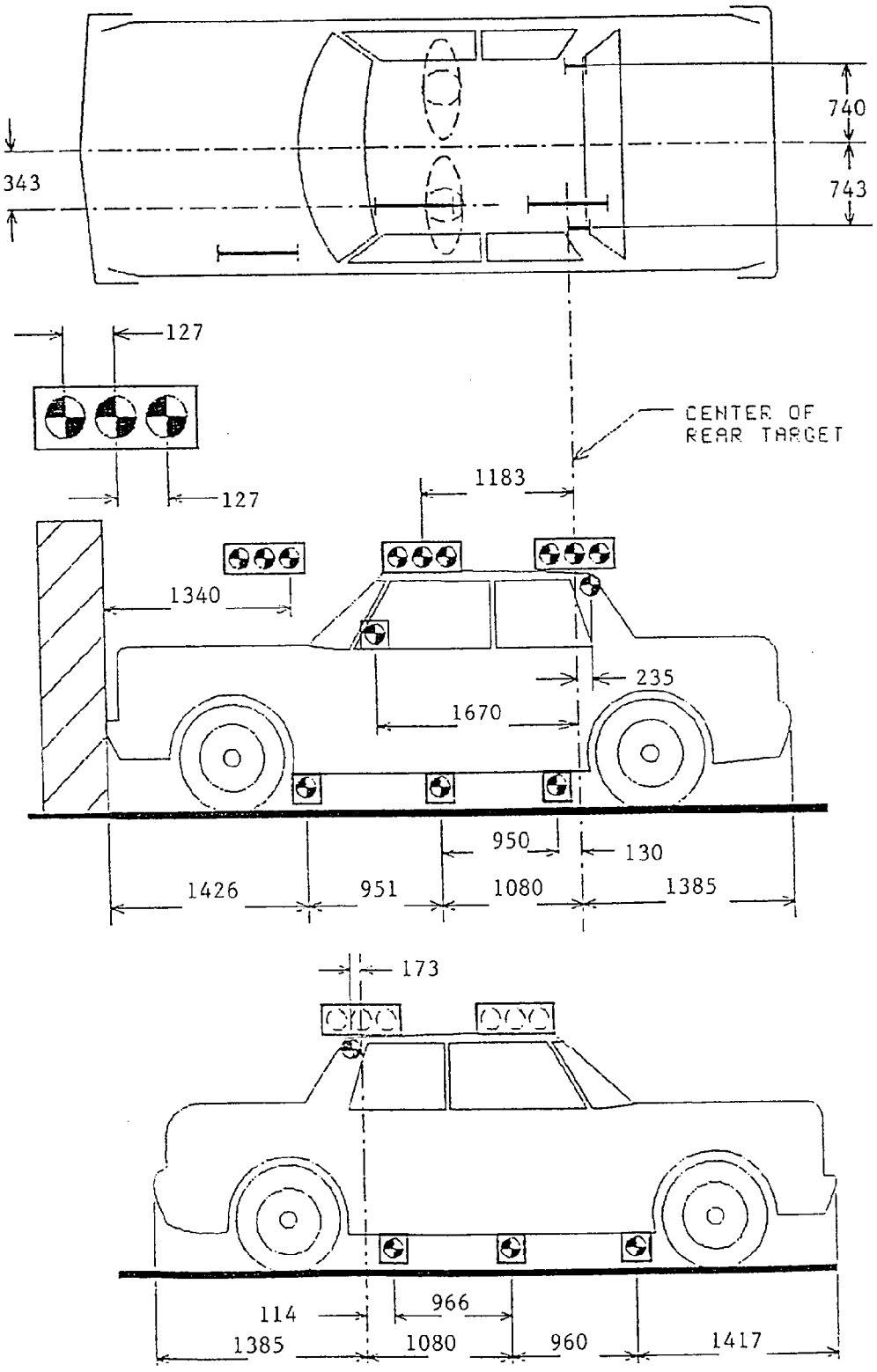


FIGURE 12 PRE-TEST AND POST-TEST MEASUREMENT POINTS

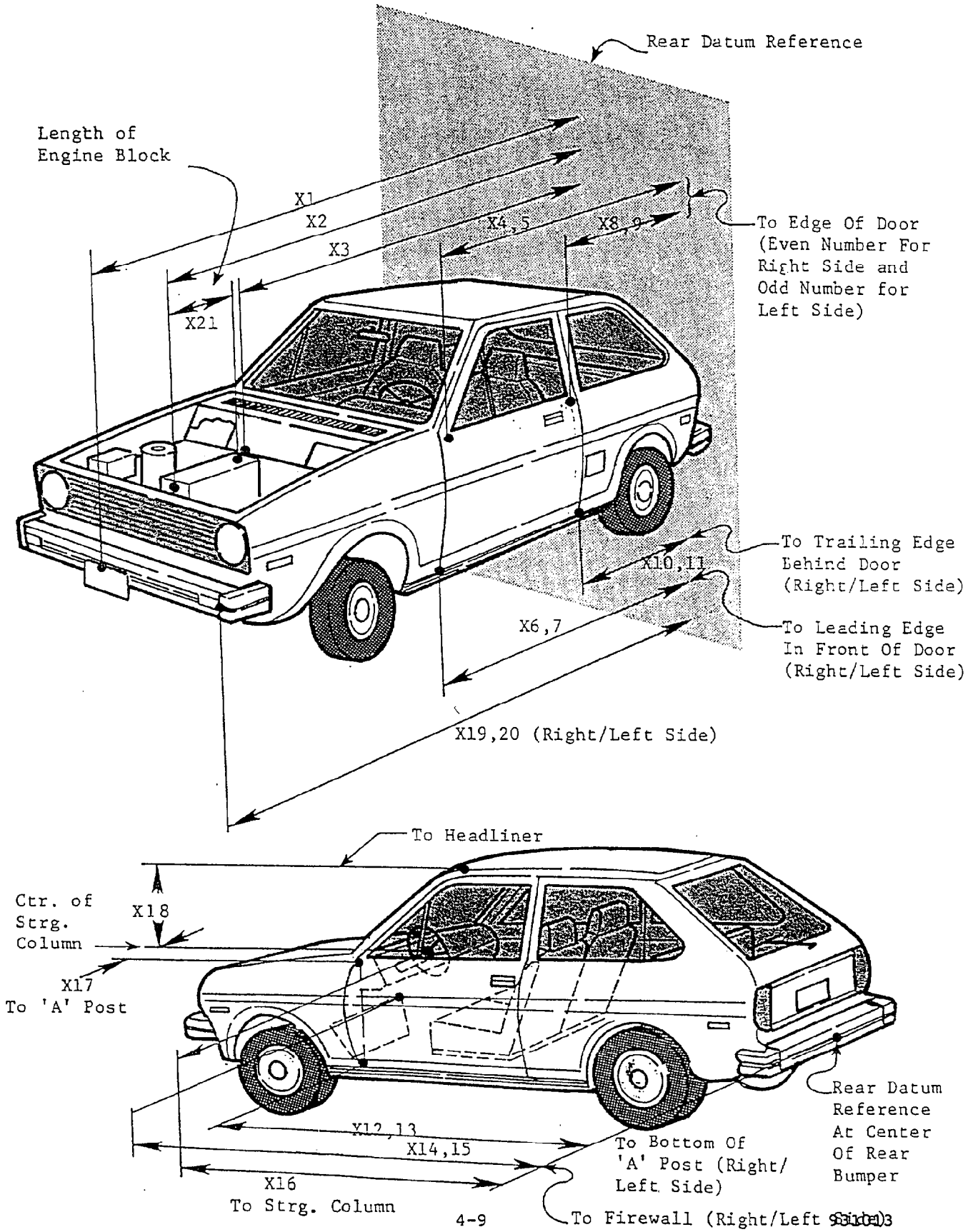


TABLE 14 IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Pontiac/Trans Sport TEST NUMBER: 931013

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4842	4224	618
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	4196	3816	380
X3	REAR SURFACE OF VEHICLE TO FIREWALL	3654	3514	140
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3371	3347	24
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3365	3395	-30
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3380	3300	80
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3380	3390	-10
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2295	2275	20
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2297	2230	67
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2315	2320	-5
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2315	2225	90
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3333	3321	12
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3341	3348	-7
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	3542	3440	102
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3612	3549	63
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	2878	2886	-8
X17	CENTER OF STEERING COLUMN TO "A" POST	365	240	125
X18	CENTER OF STEERING COLUMN TO HEADLINER	440	440	0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4692	4092	600
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4696	4185	511
X21	LENGTH OF ENGINE BLOCK	360	360	0

All measurements are in millimeters.

APPENDIX A

PHOTOGRAPHS

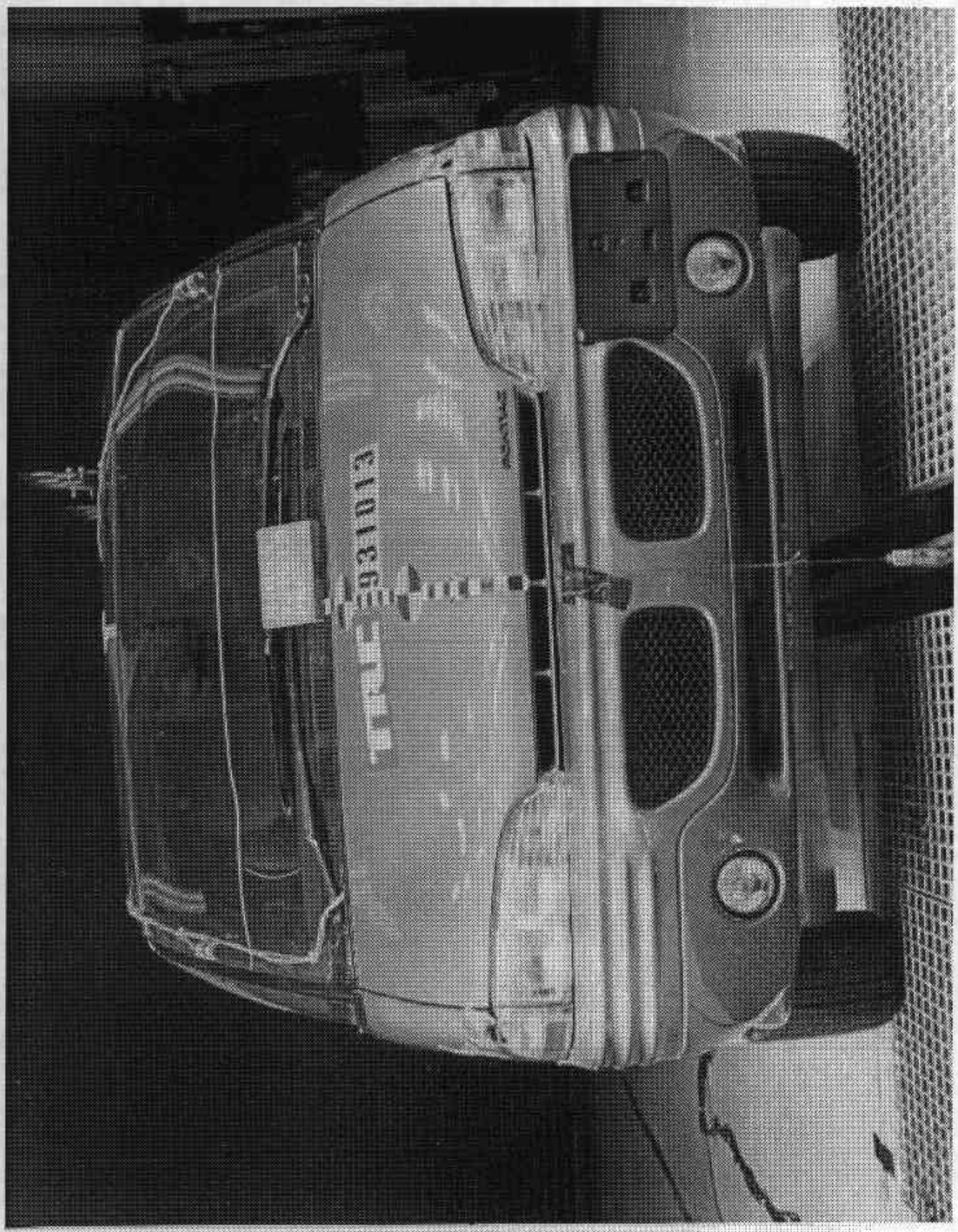


Figure A-1. PRE-TEST FRONT VIEW

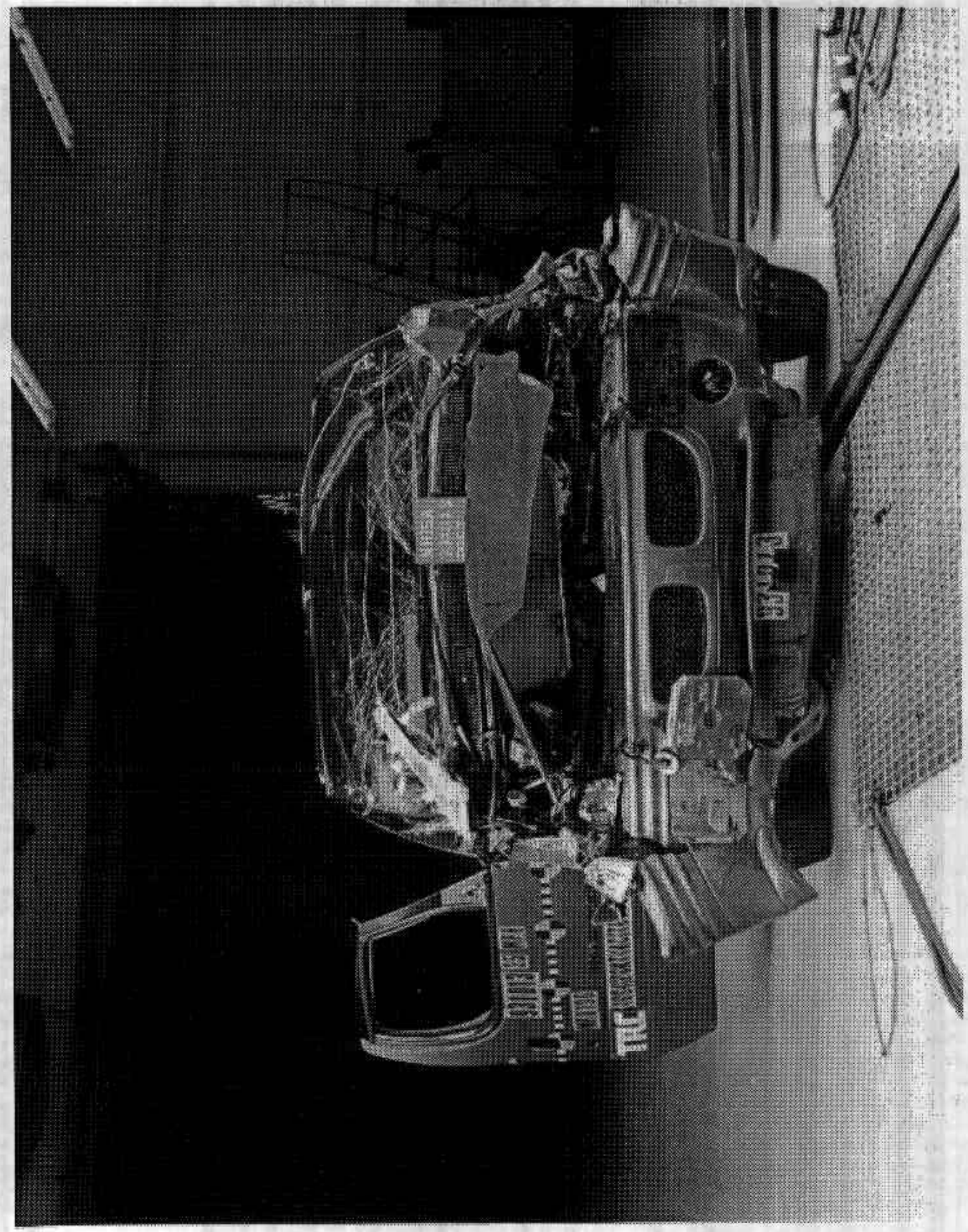


Figure A-2. POST-TEST FRONT VIEW

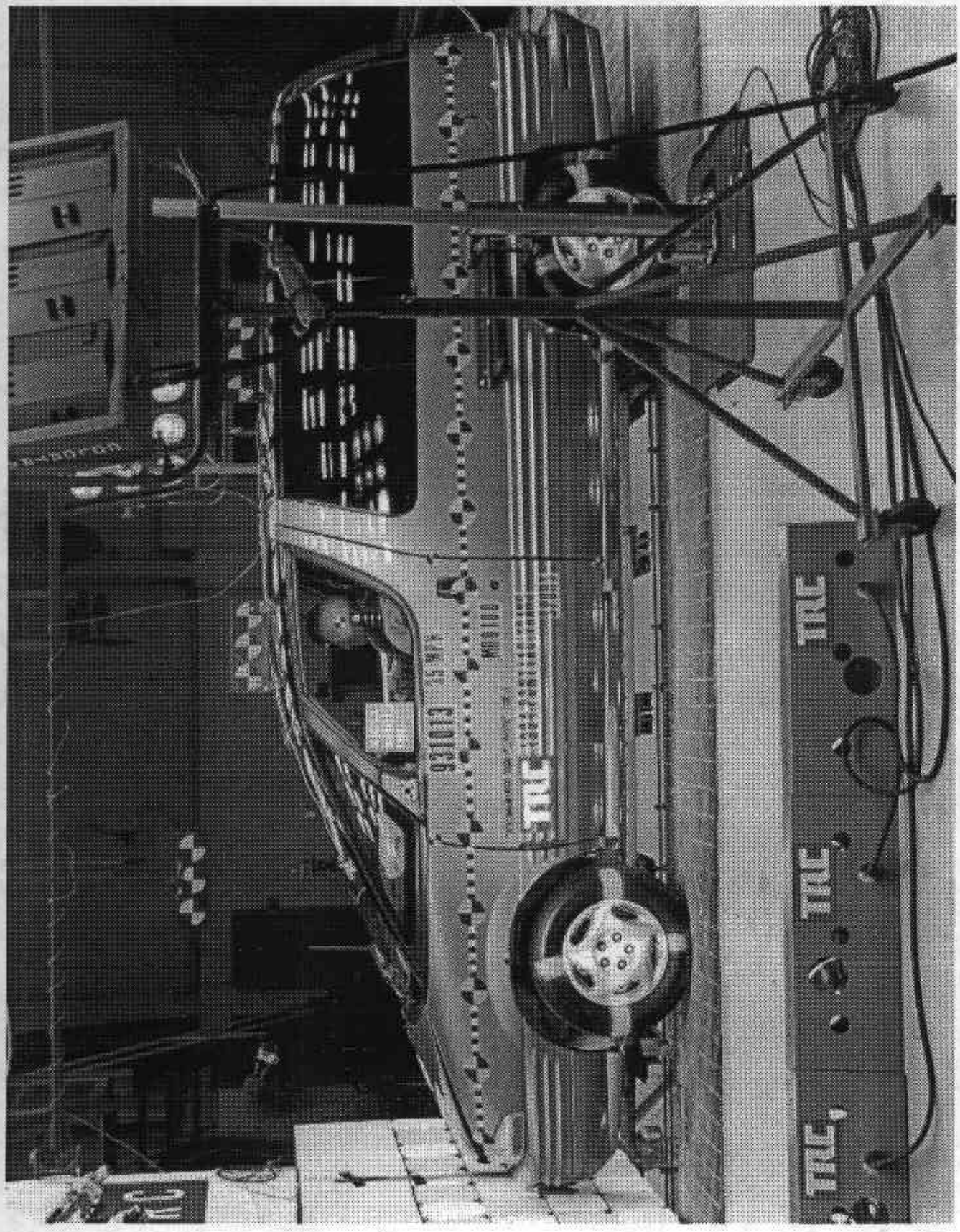


Figure A-3. PRE-TEST LEFT SIDE VIEW

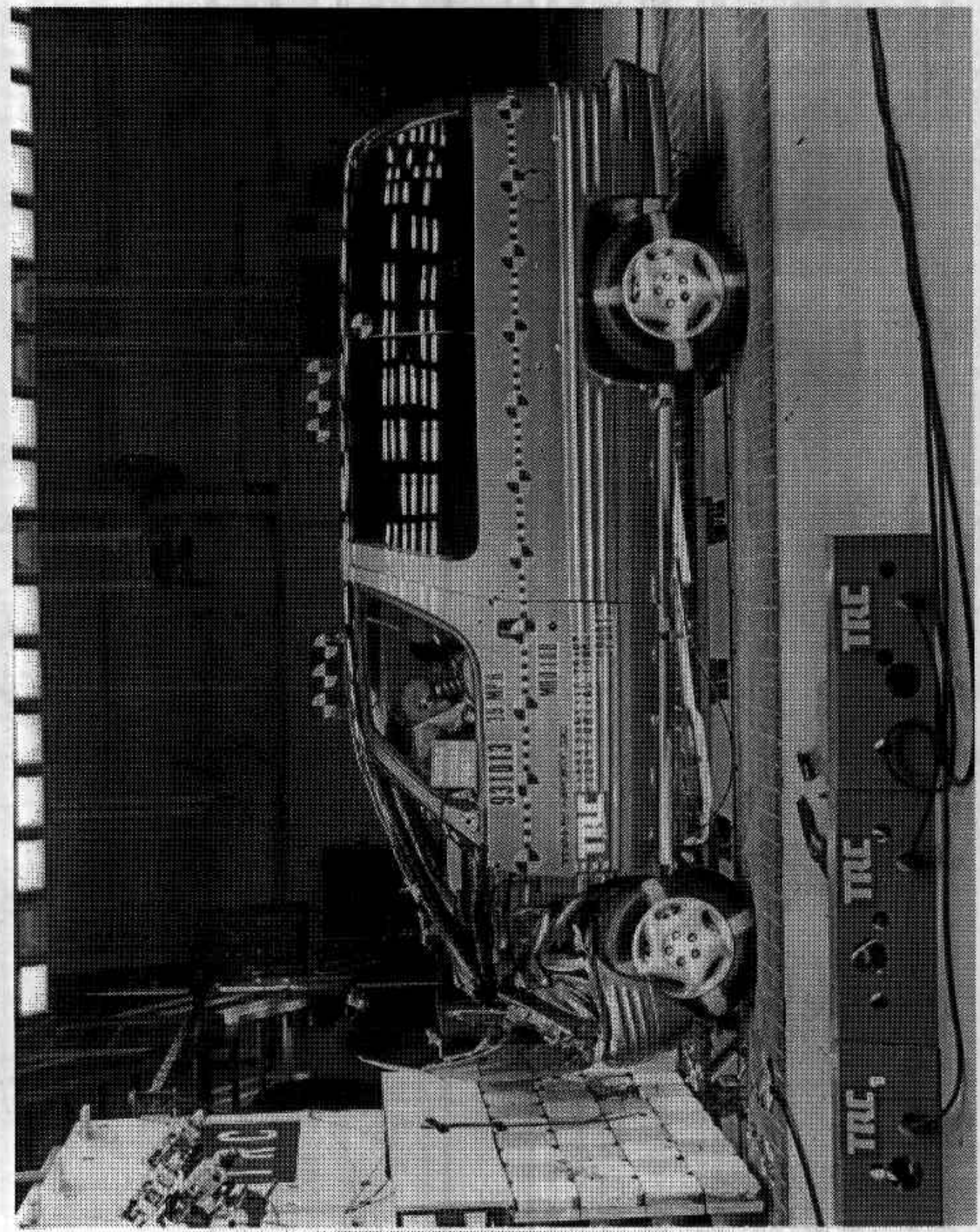


Figure A-4. POST-TEST LEFT SIDE VIEW

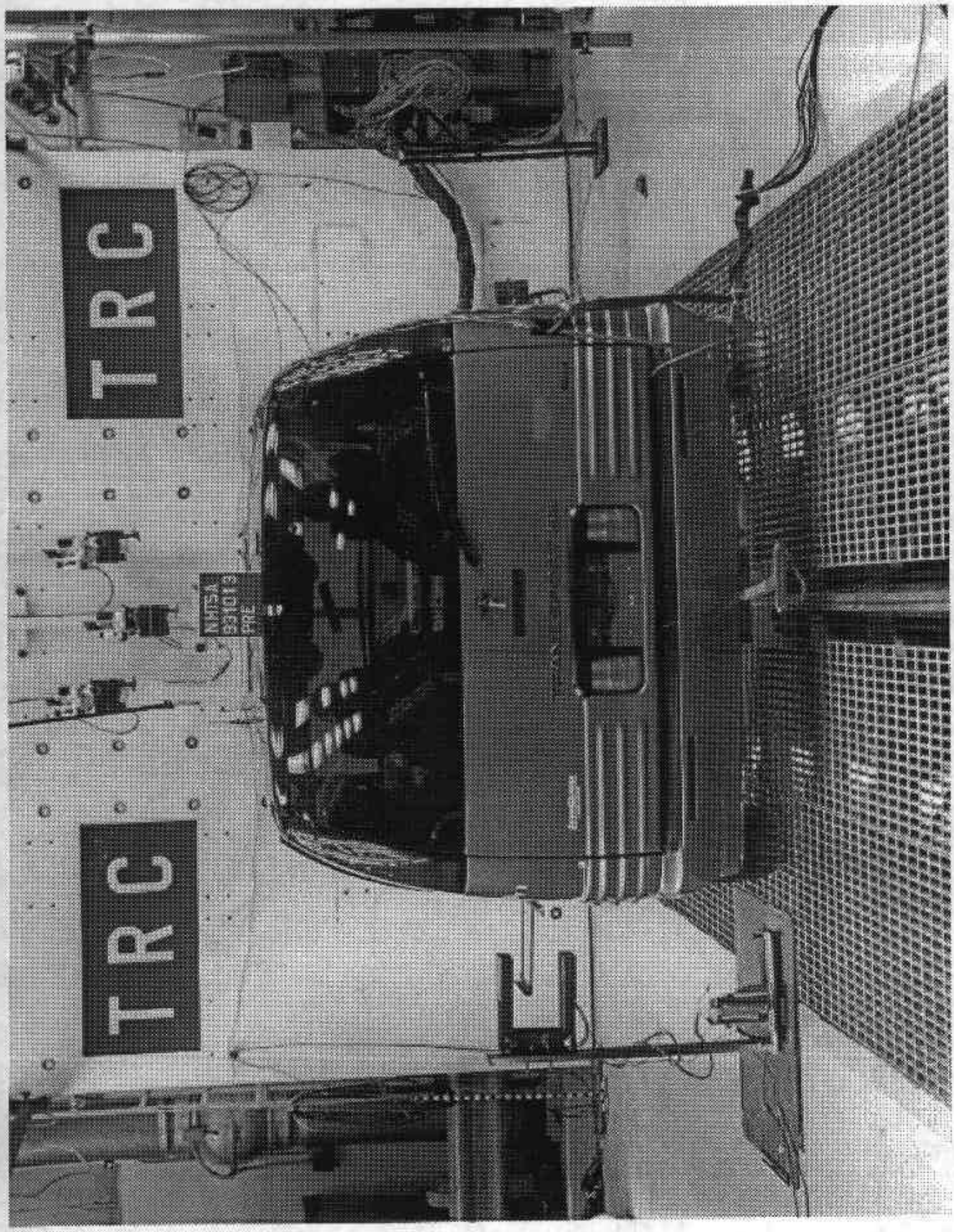


Figure A-5. PRE-TEST REAR VIEW

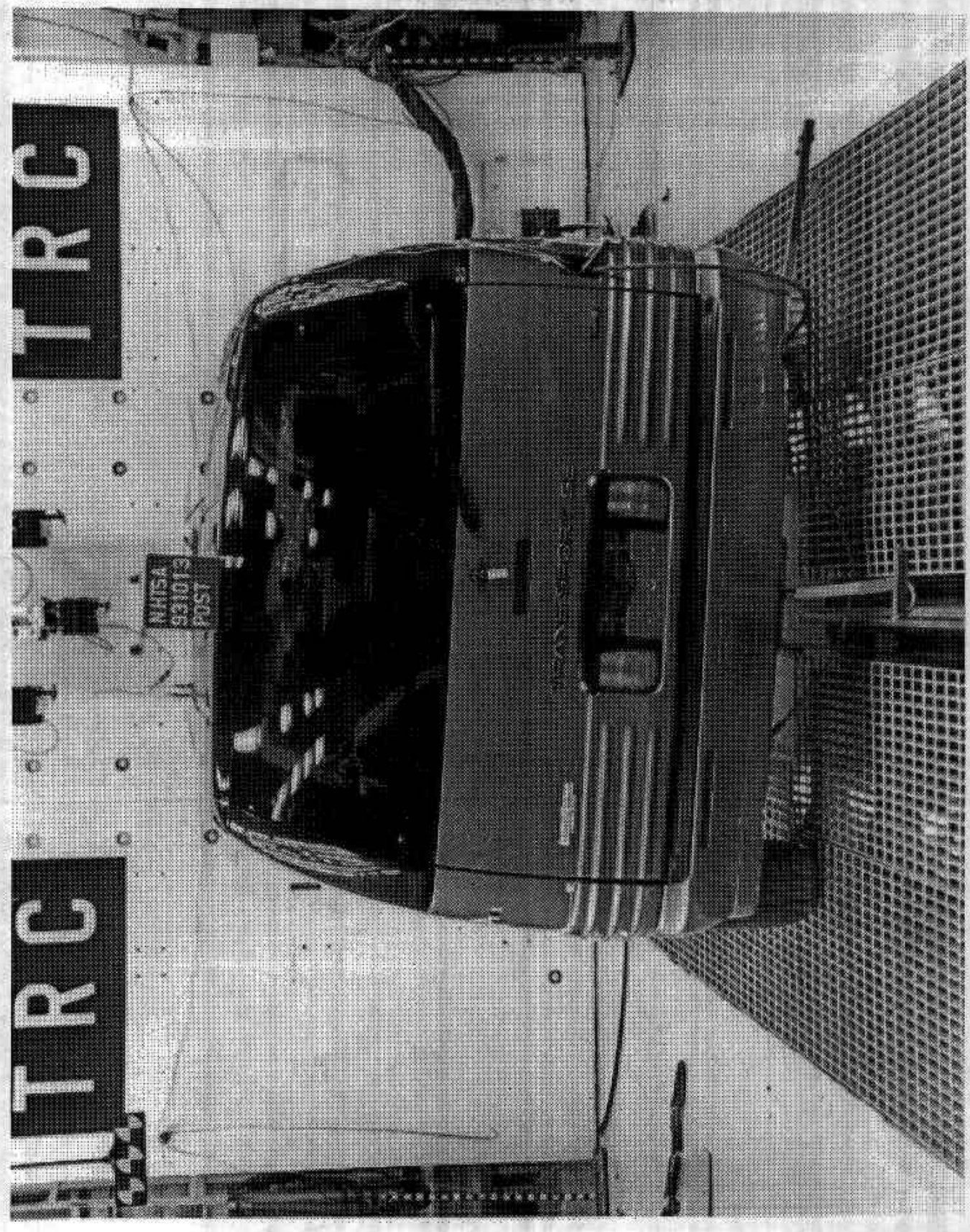


Figure A-6. POST-TEST REAR VIEW

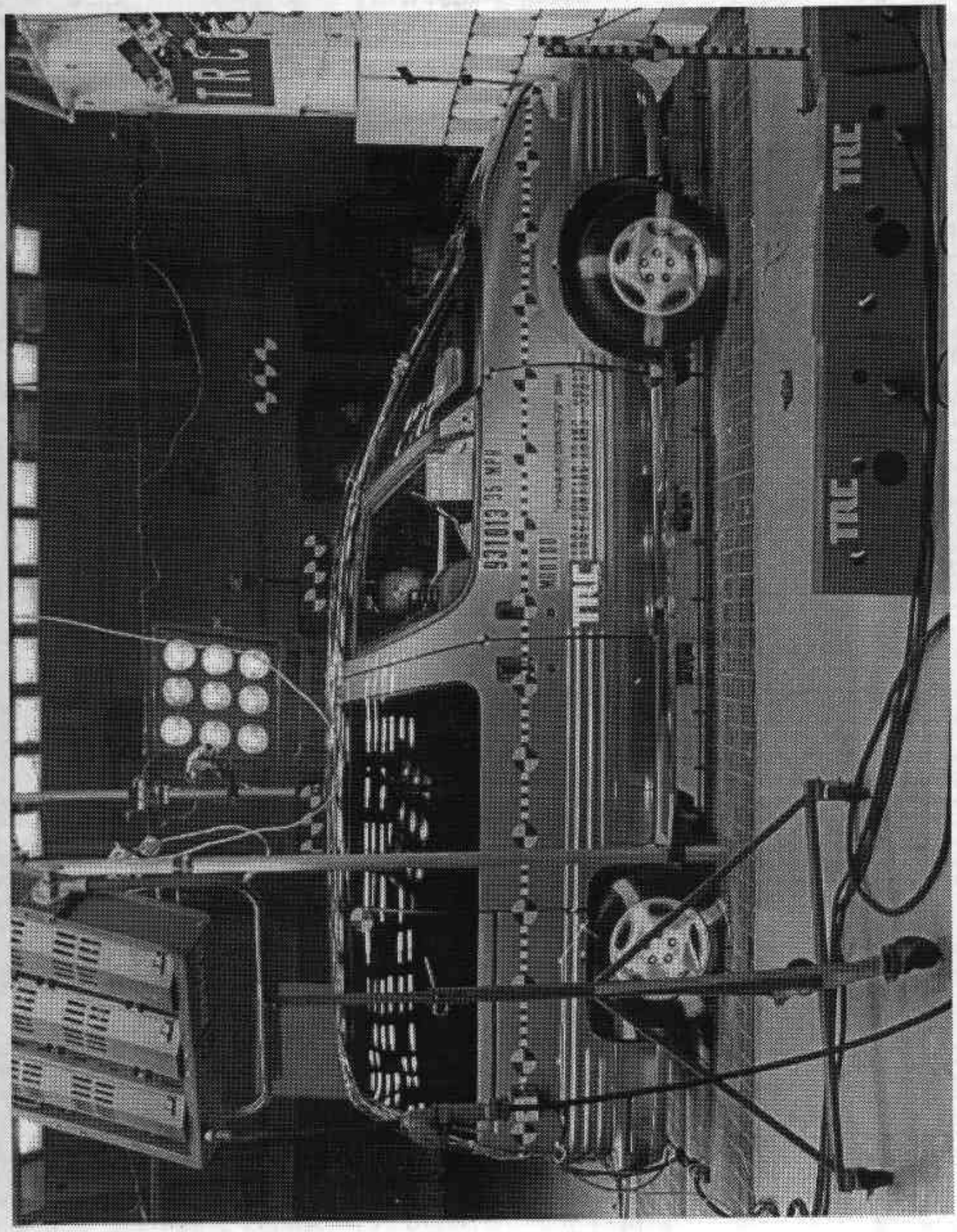


Figure A-7. PRE-TEST RIGHT SIDE VIEW

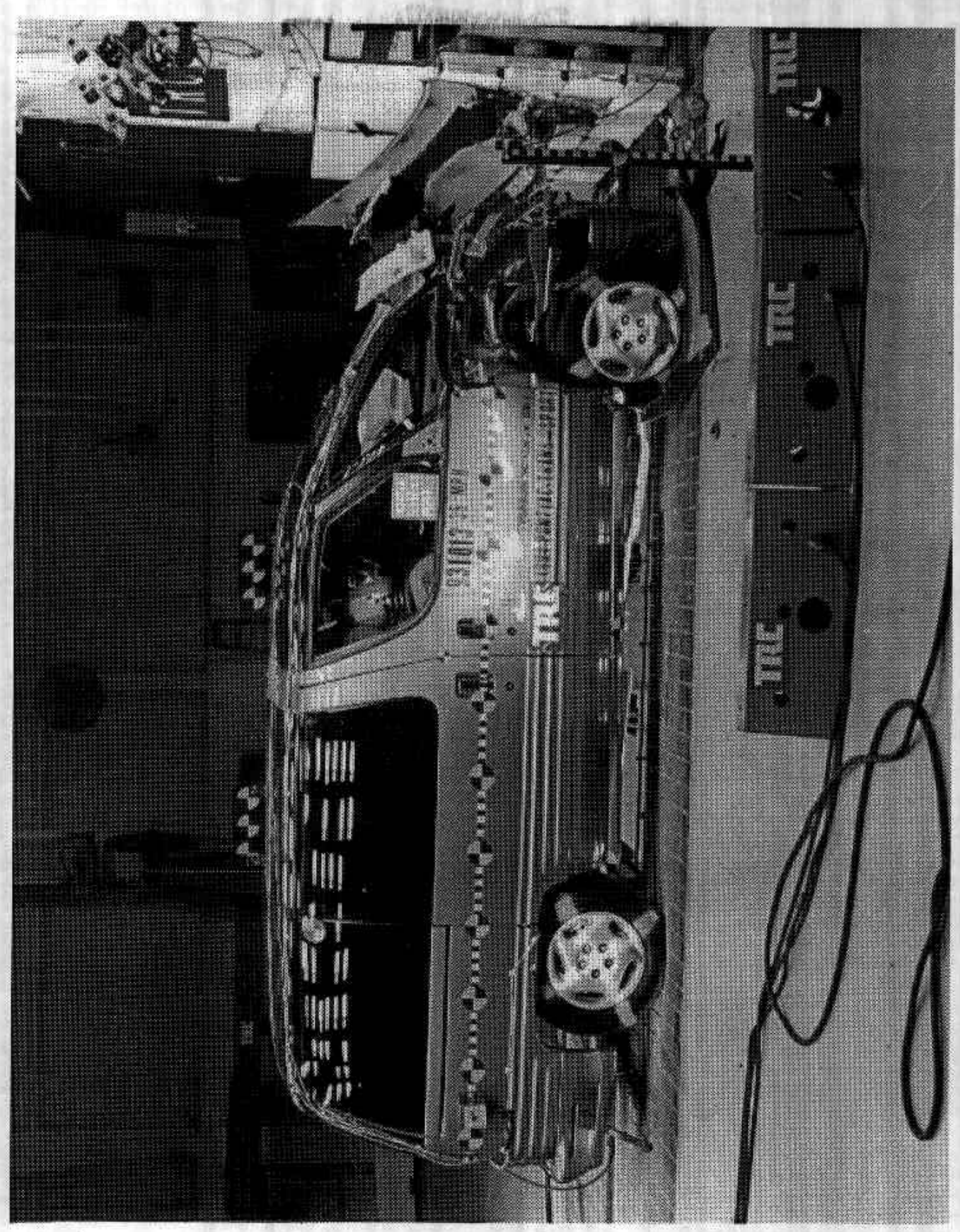


Figure A-8. POST-TEST RIGHT SIDE VIEW

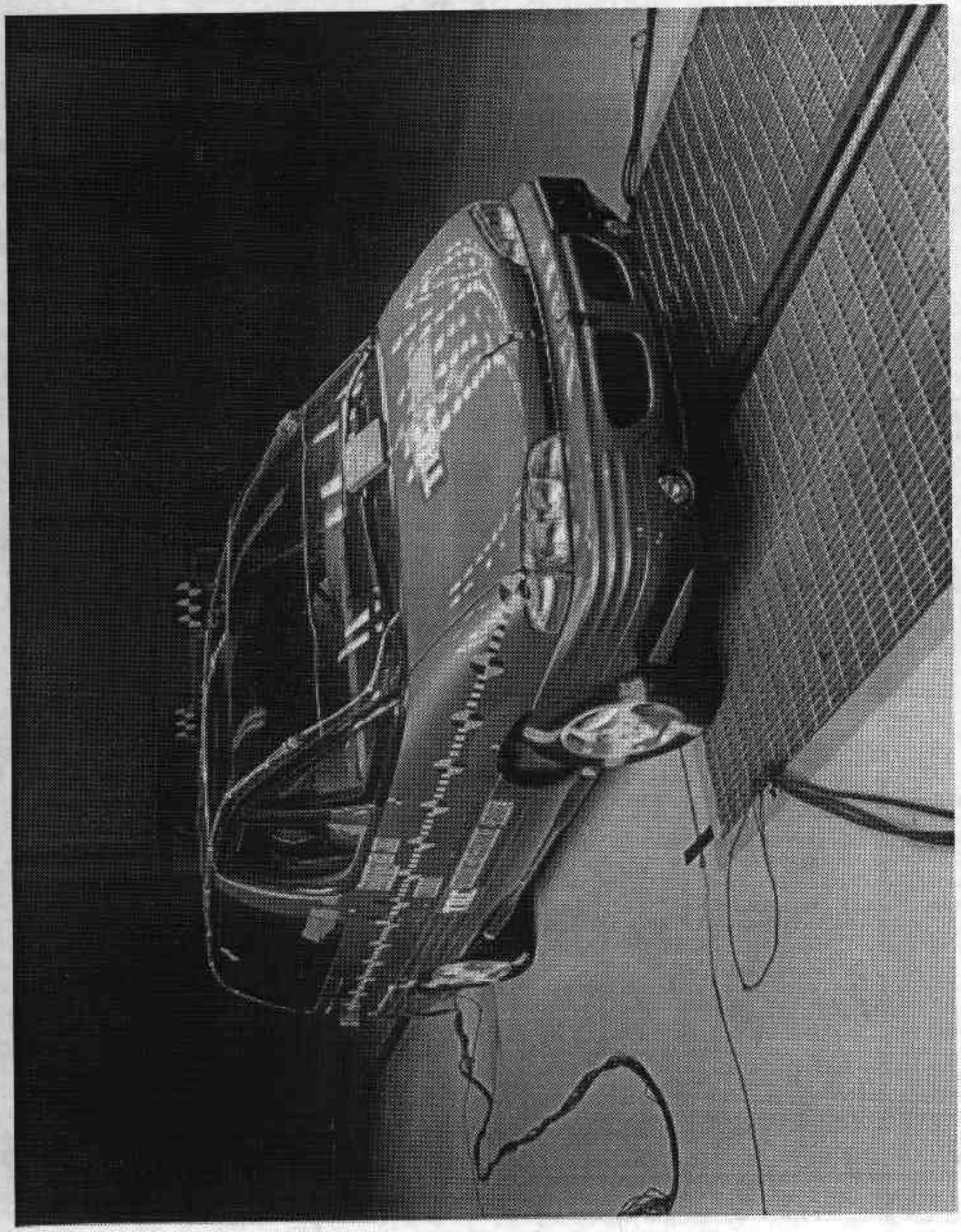


Figure A-9. PRE-TEST RIGIIT FRONT THREE-QUARTER VIEW

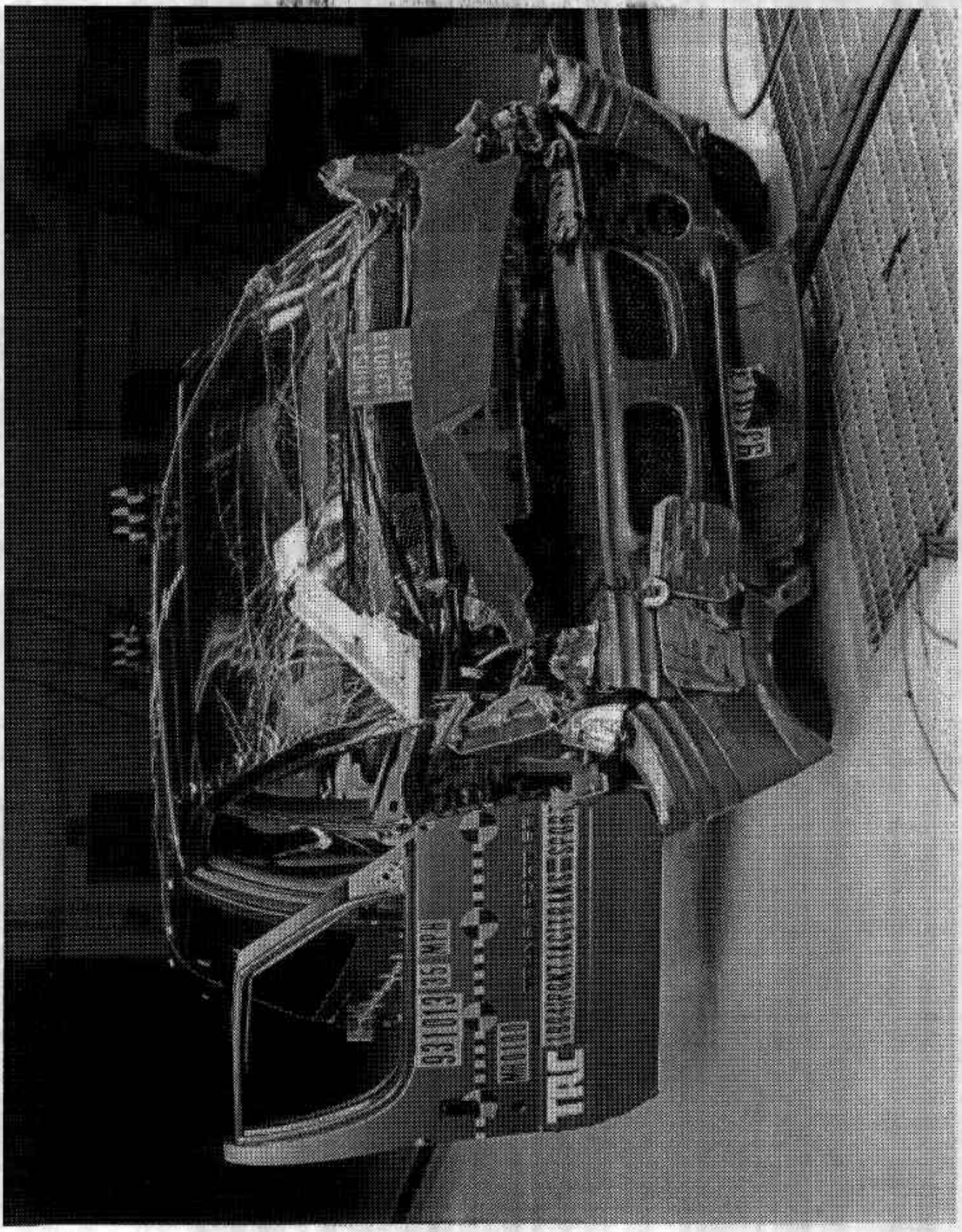


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

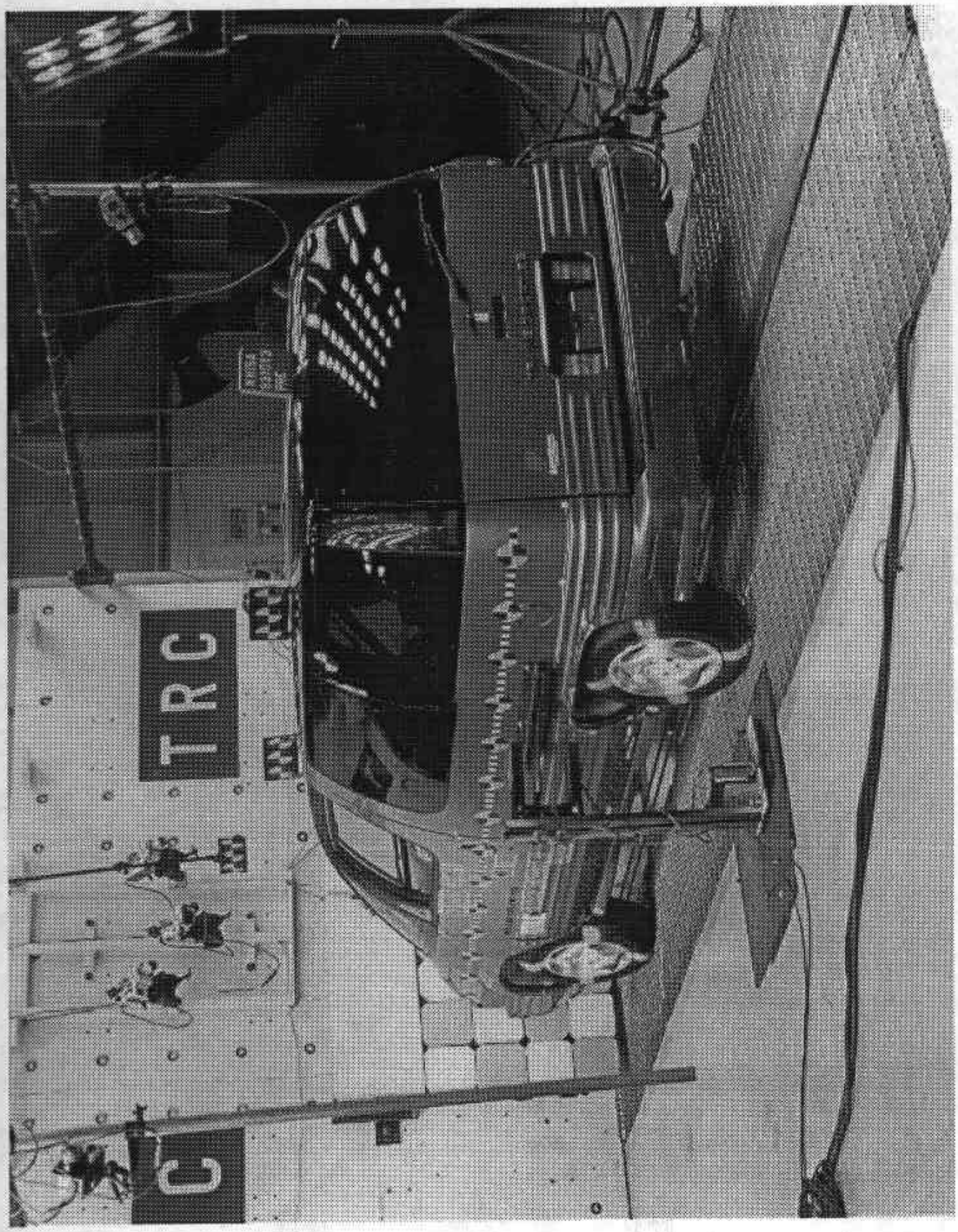


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

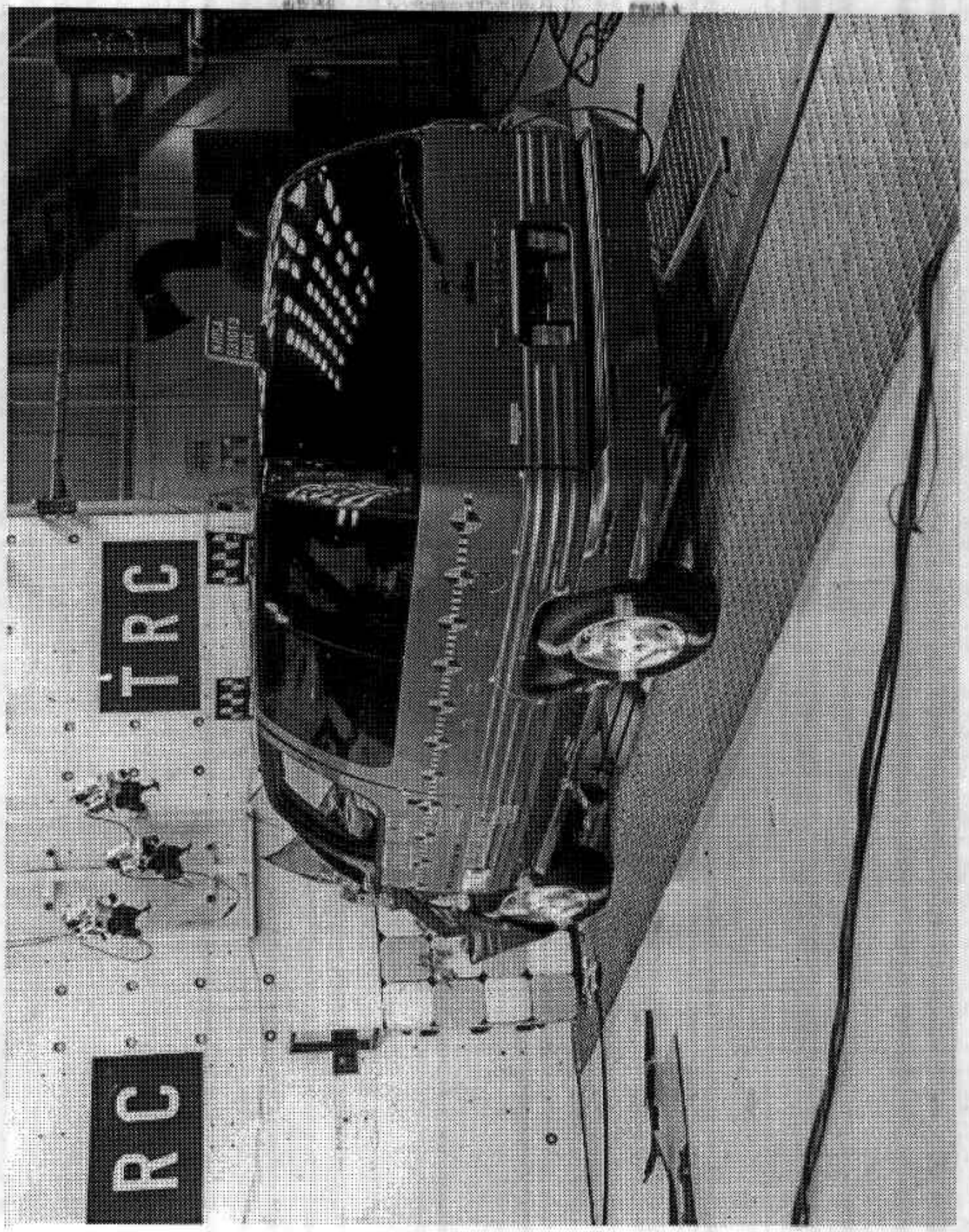


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

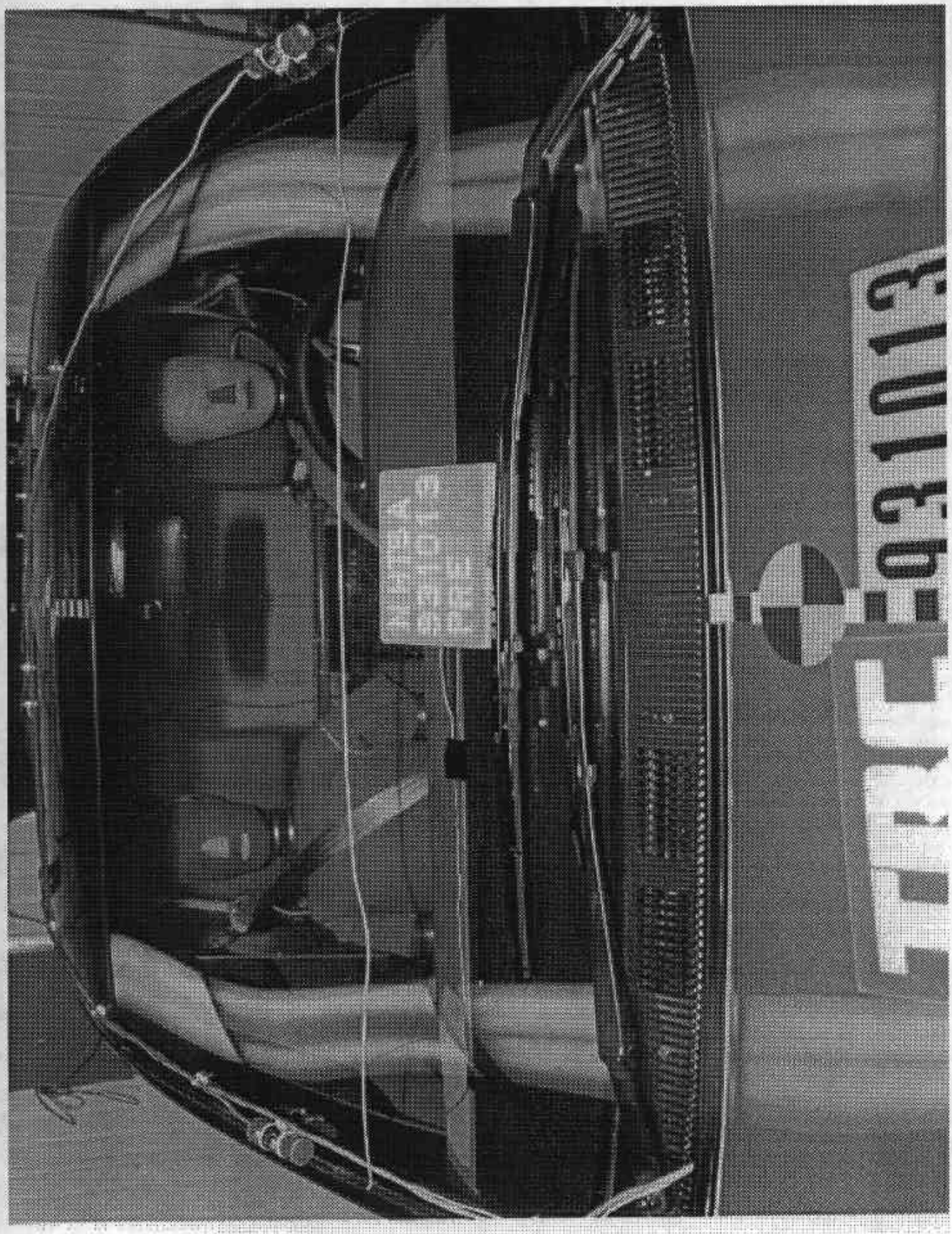


Figure A-13. PRE-TEST WINDSHIELD VIEW

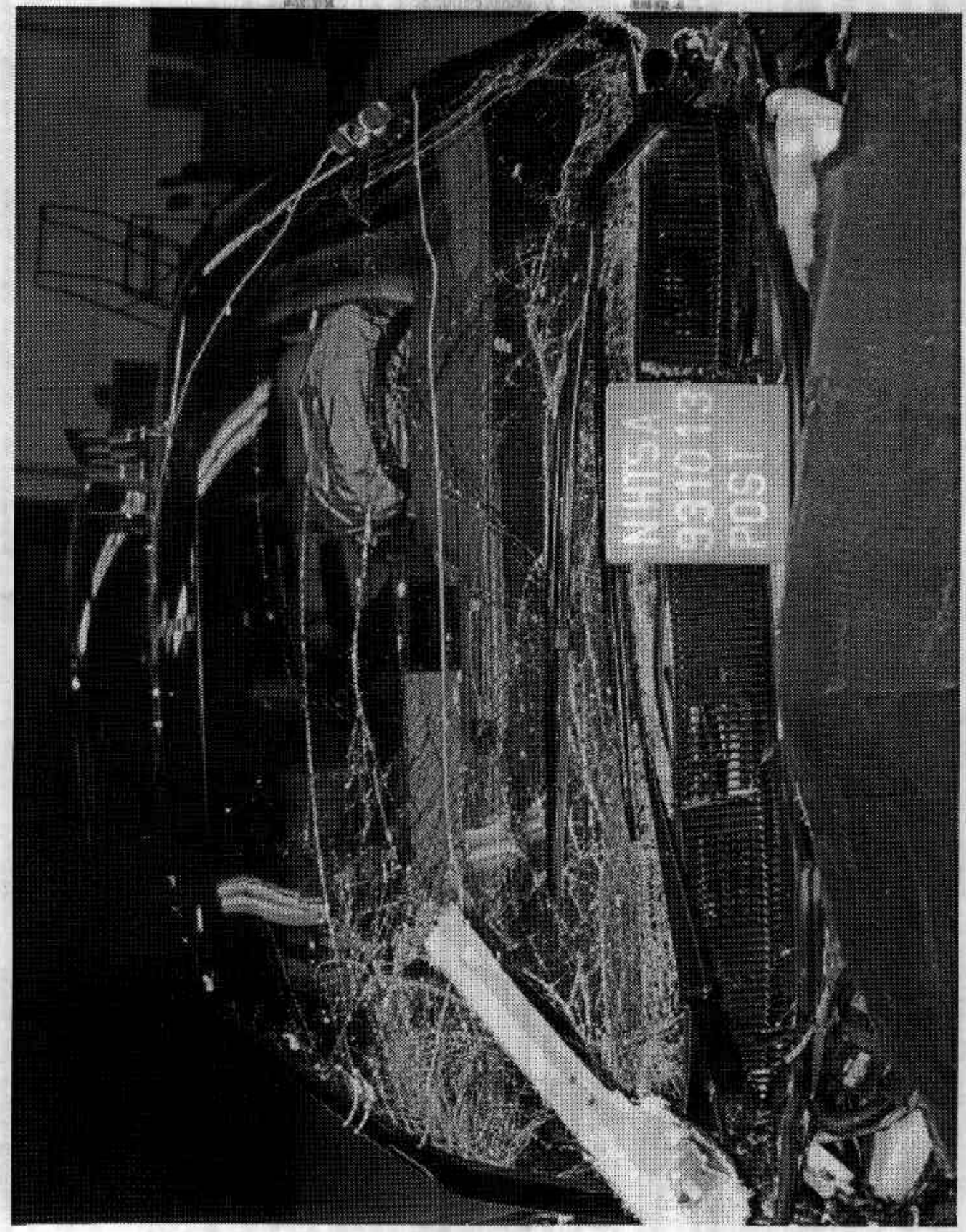


Figure A-14. POST-TEST WINDSHIELD VIEW

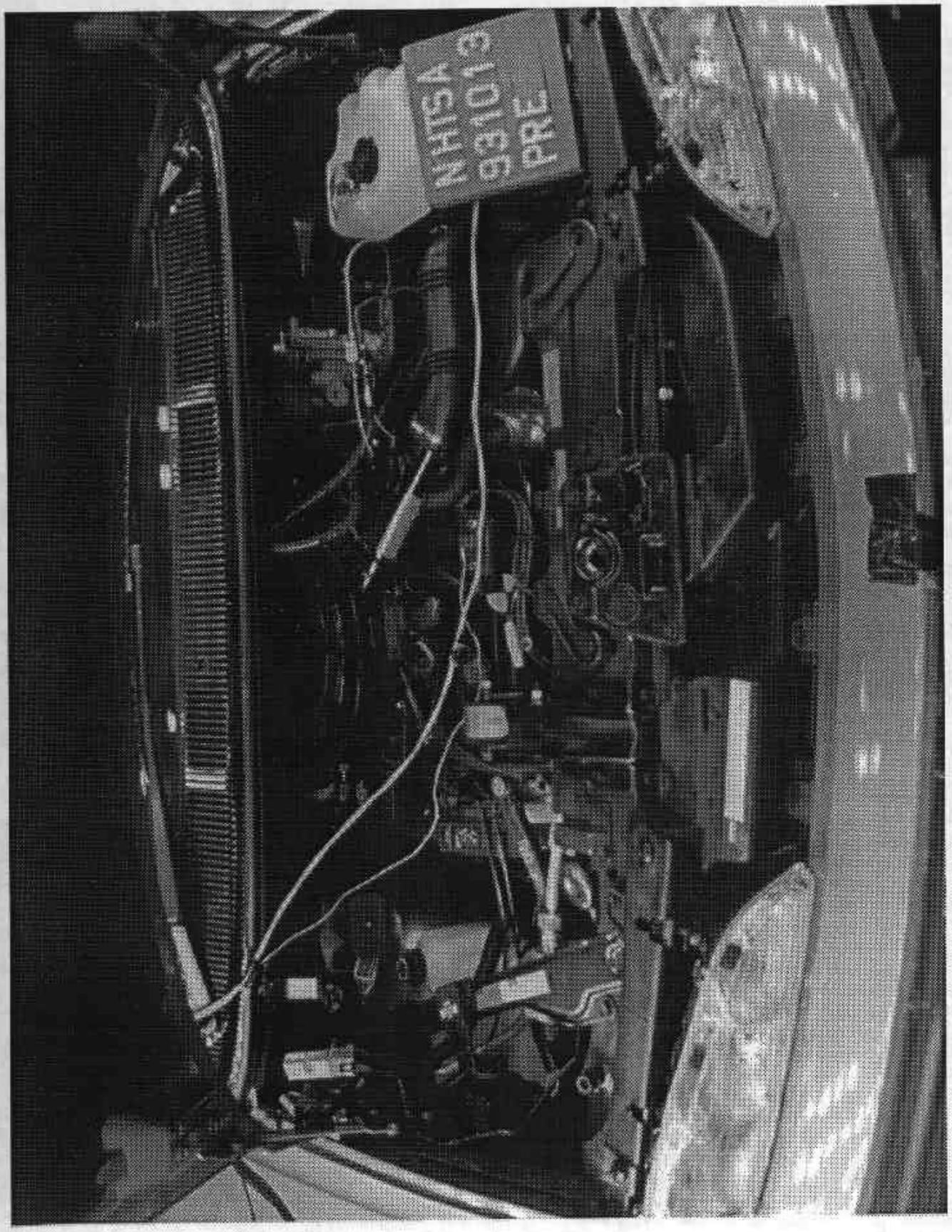


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

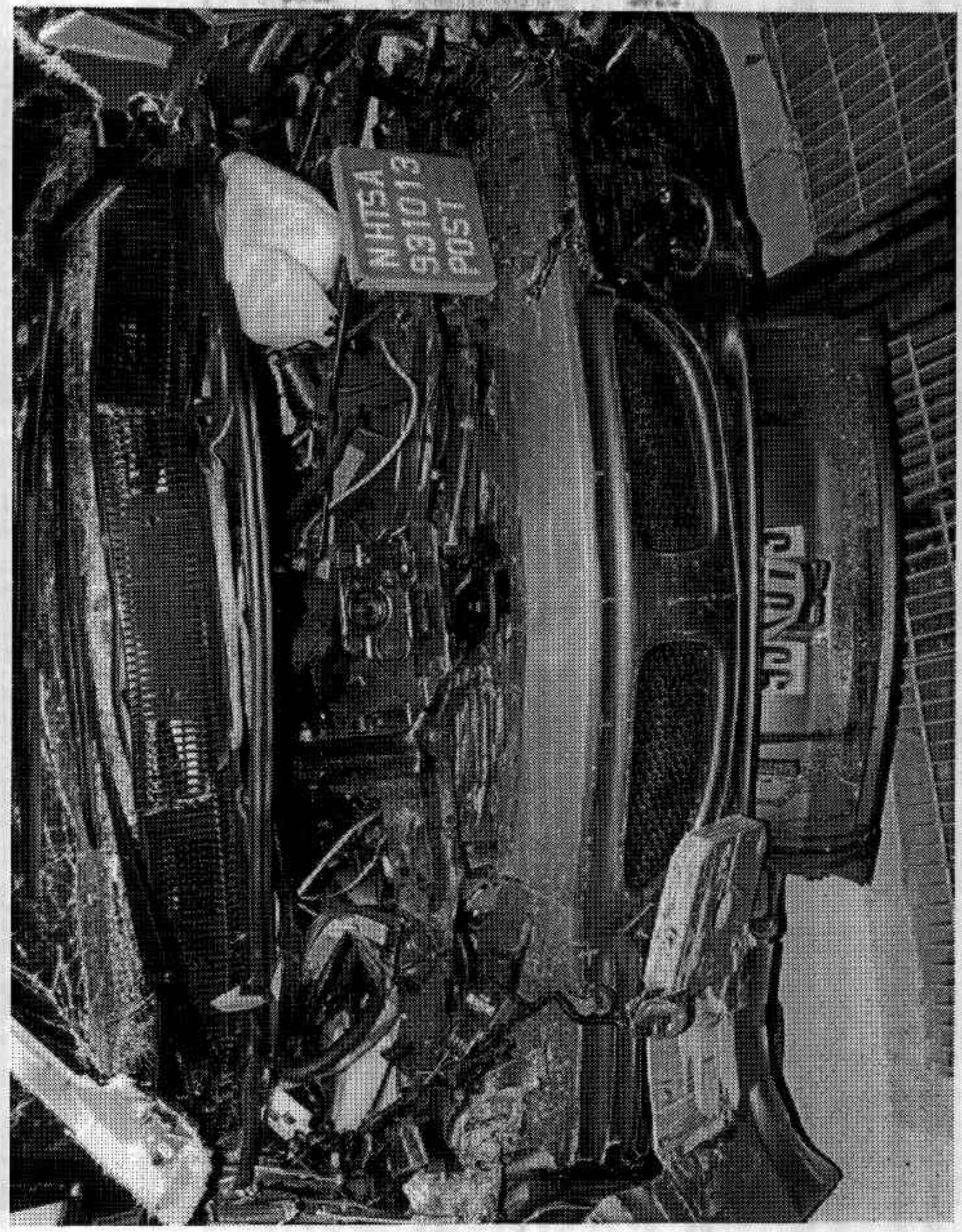


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

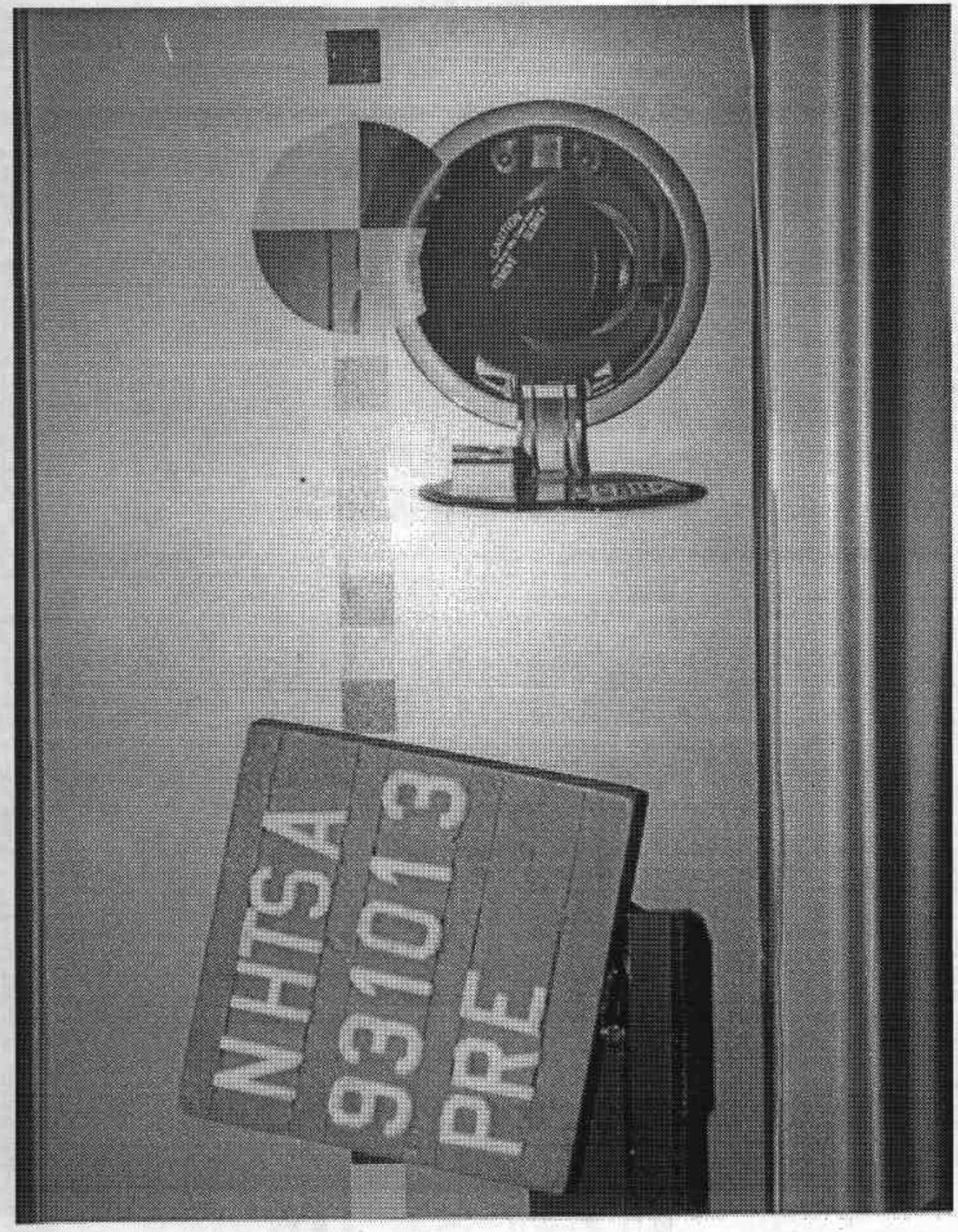


Figure A-17. PRE-TEST FUEL FILLER CAP VIEW

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

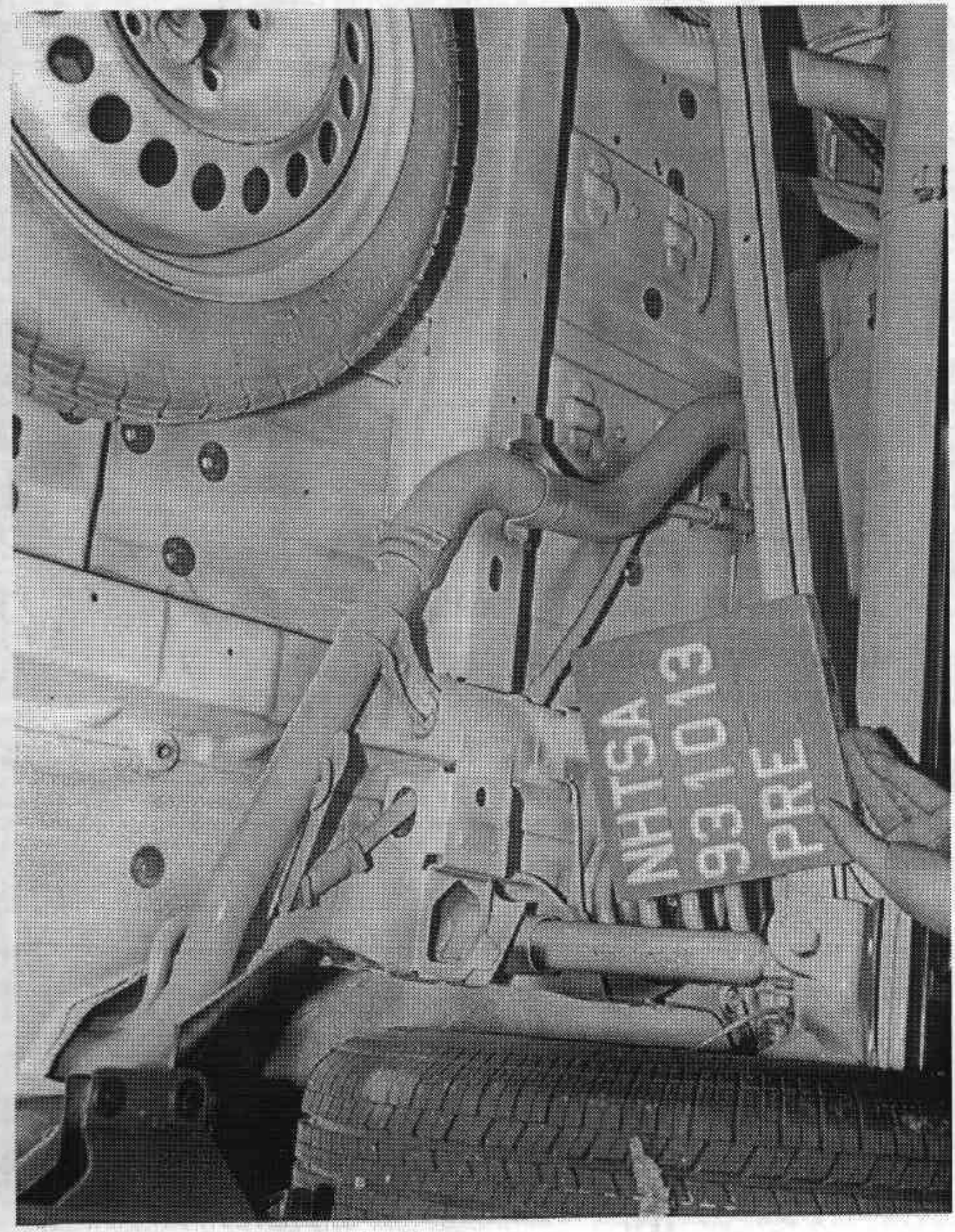


Figure A-19. PRE-TEST FUEL FILLER NECK VIEW

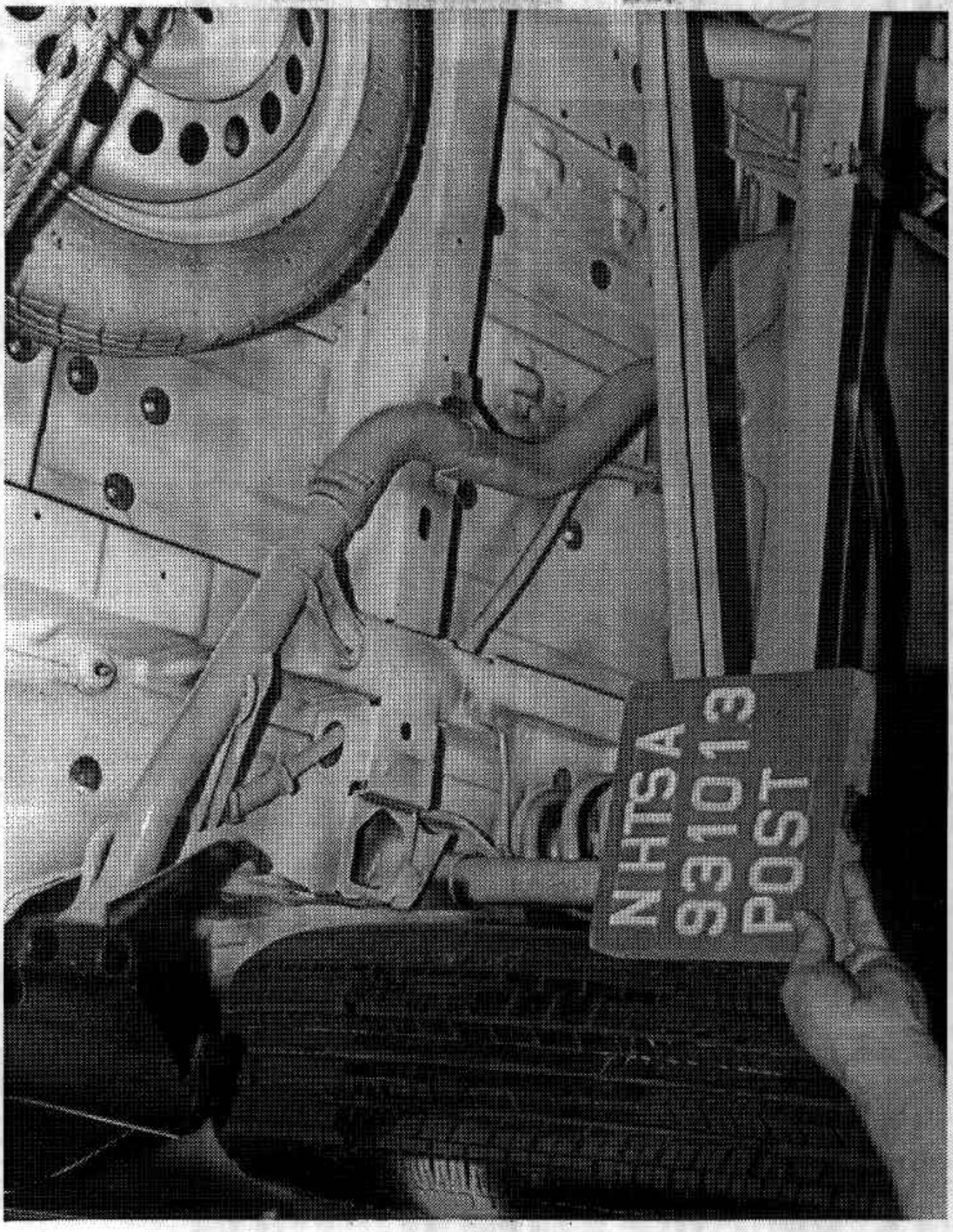


Figure A-20. POST-TEST FUEL FILLER NECK VIEW

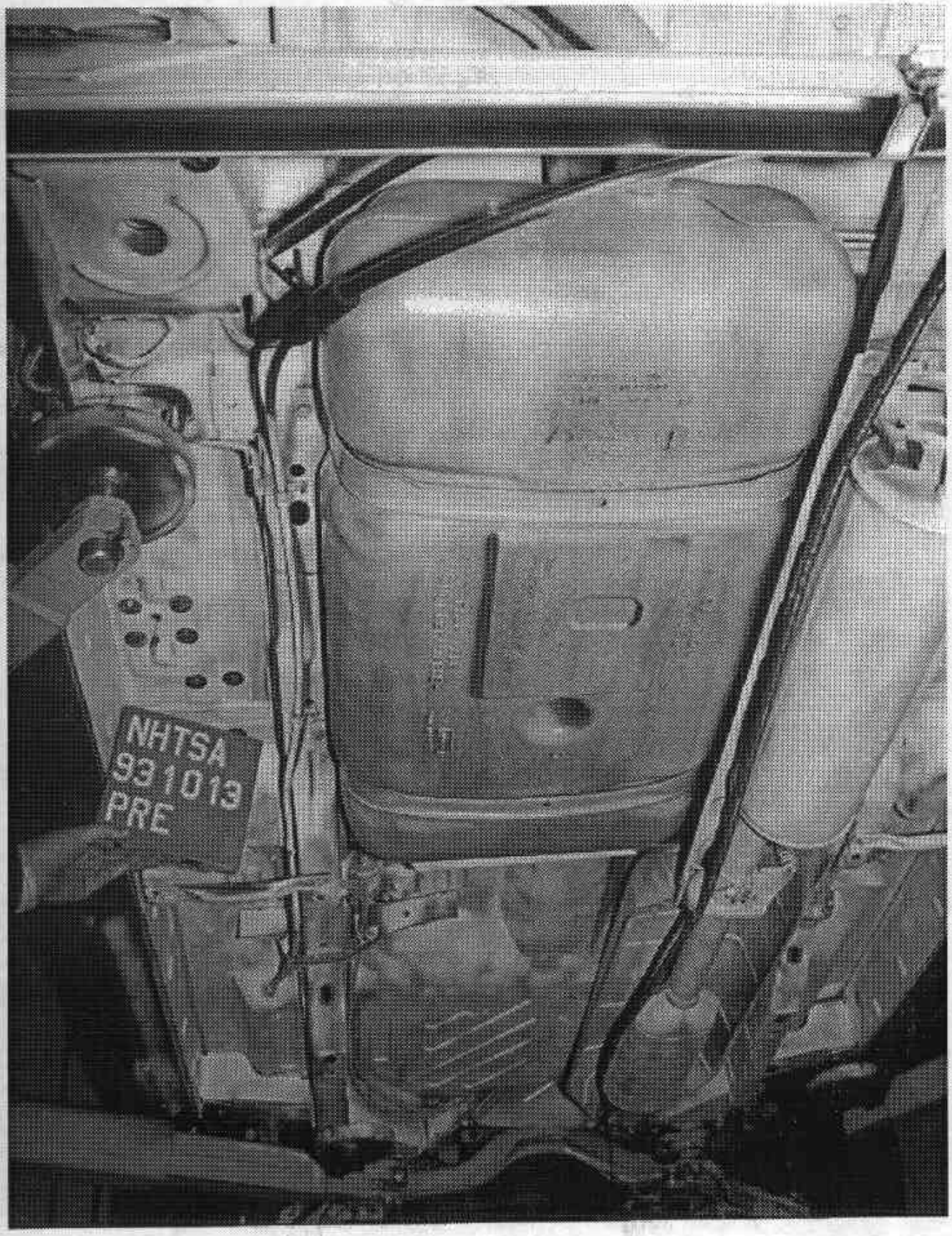


Figure A-21. PRE-TEST FUEL FILLER NECK AND FUEL LINES VIEW

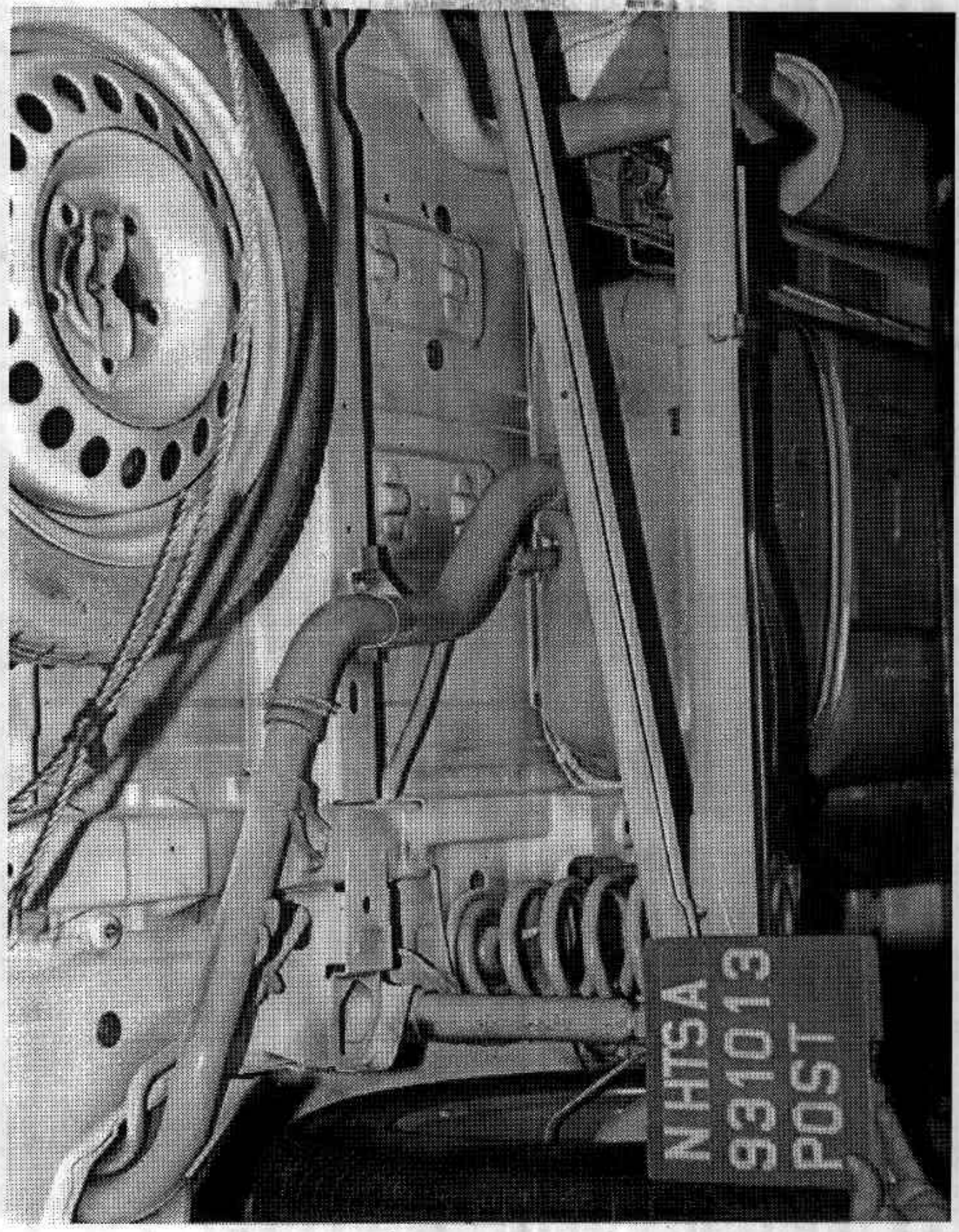


Figure A-22. POST-TEST FUEL FILLER NECK & FUEL TANK VIEW

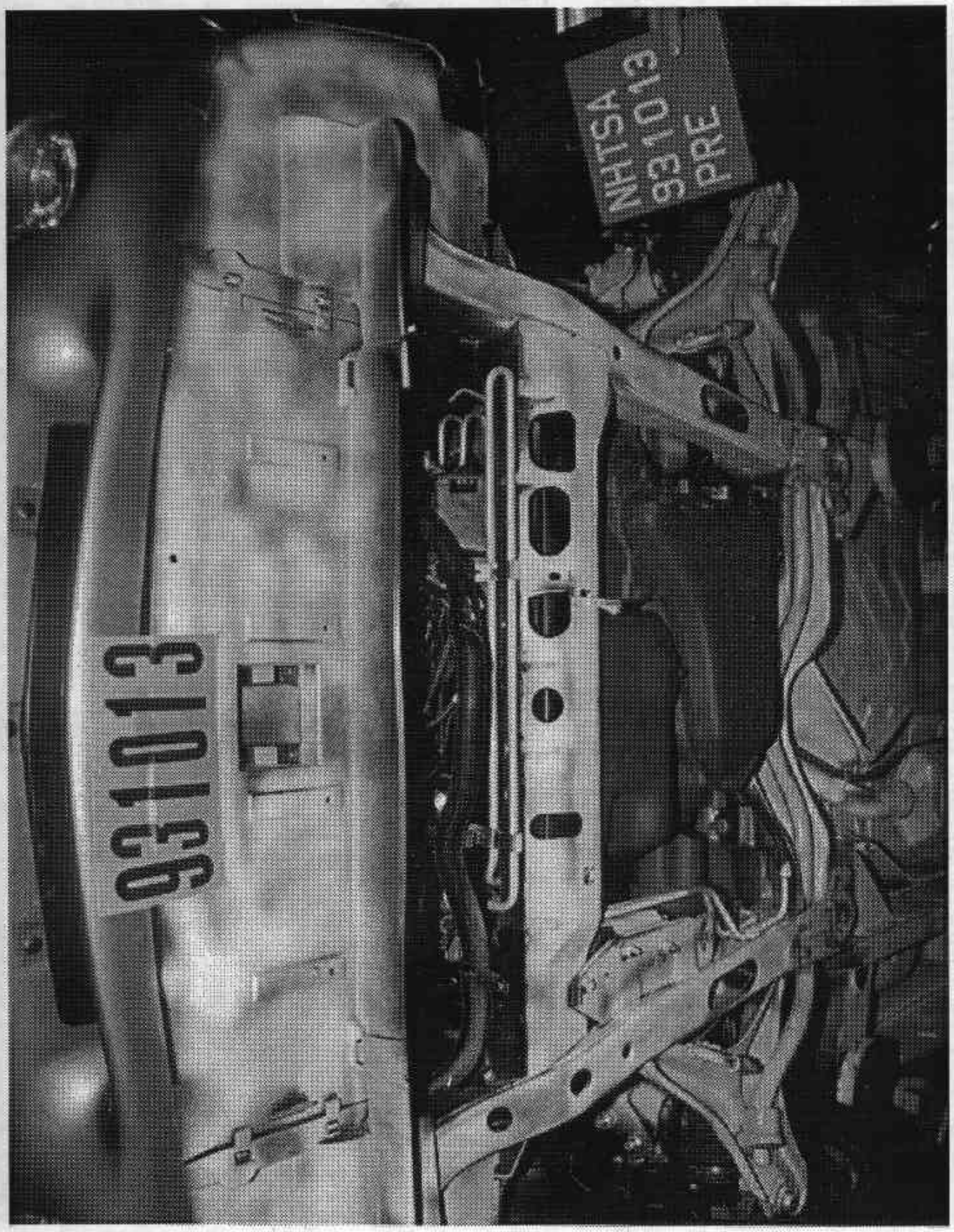


Figure A-23. PRE-TEST FRONT UNDERBODY VIEW

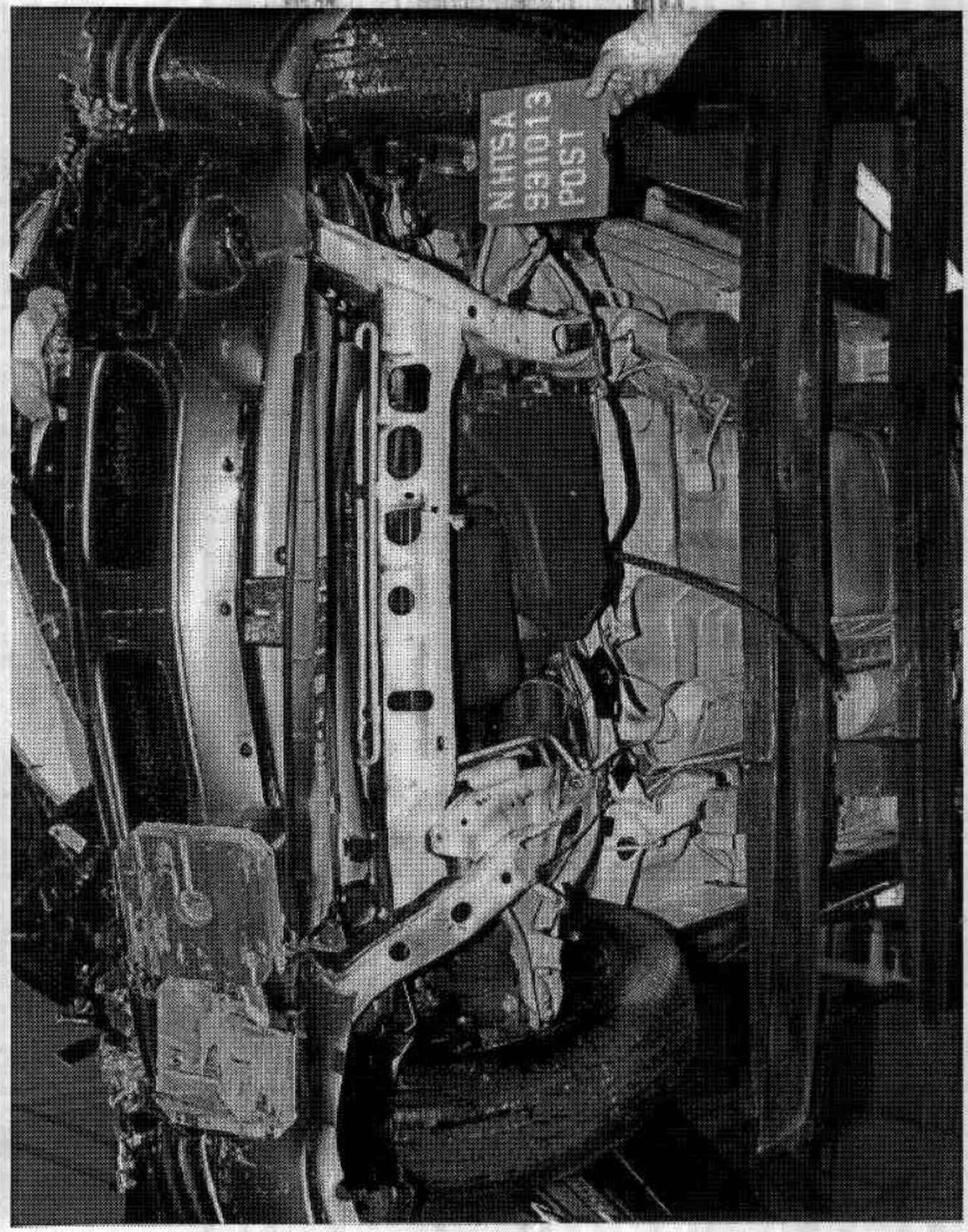


Figure A-24. POST-TEST FRONT UNDERBODY VIEW

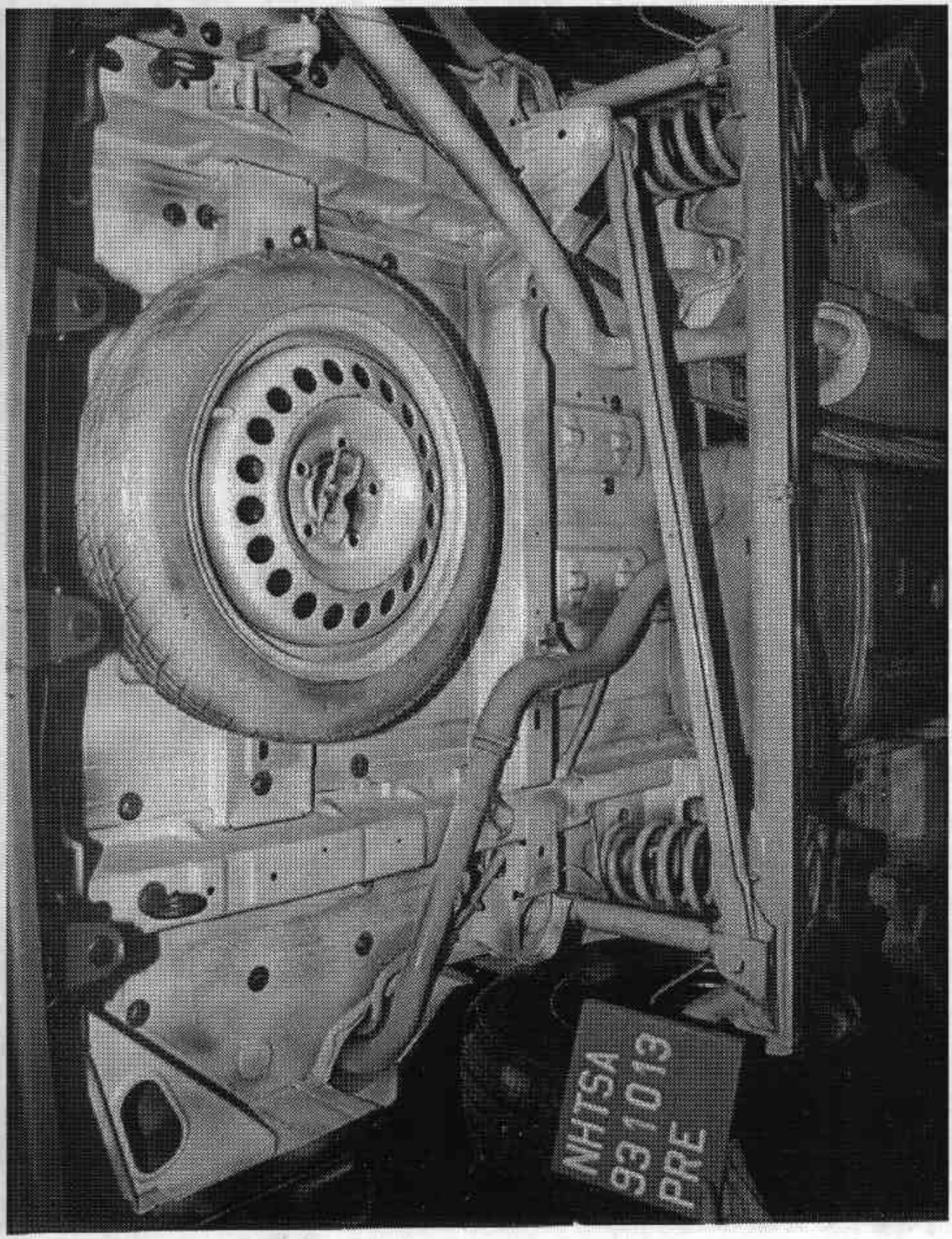


Figure A-25. PRE-TEST REAR UNDERBODY VIEW

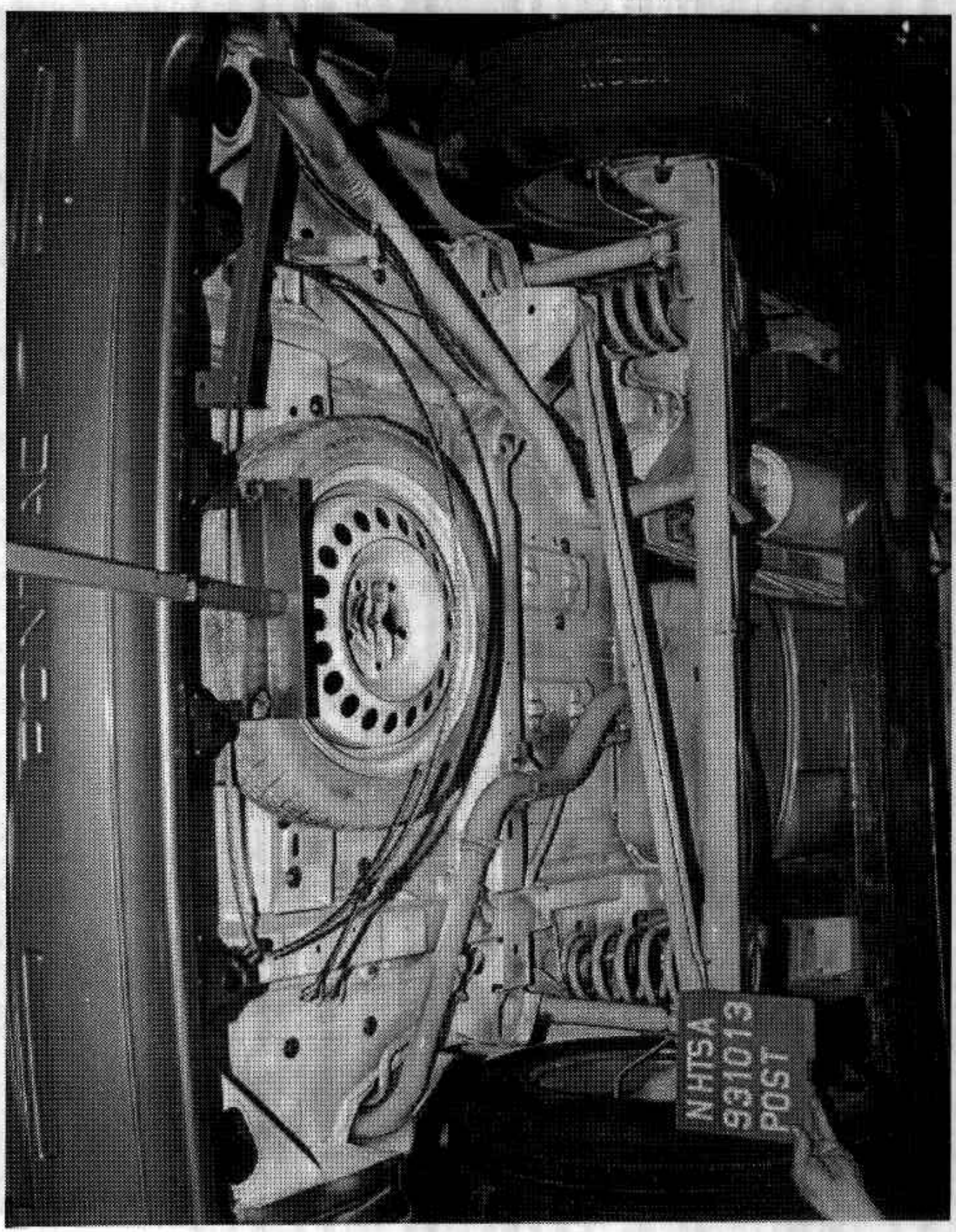


Figure A-26. POST-TEST REAR UNDERBODY VIEW

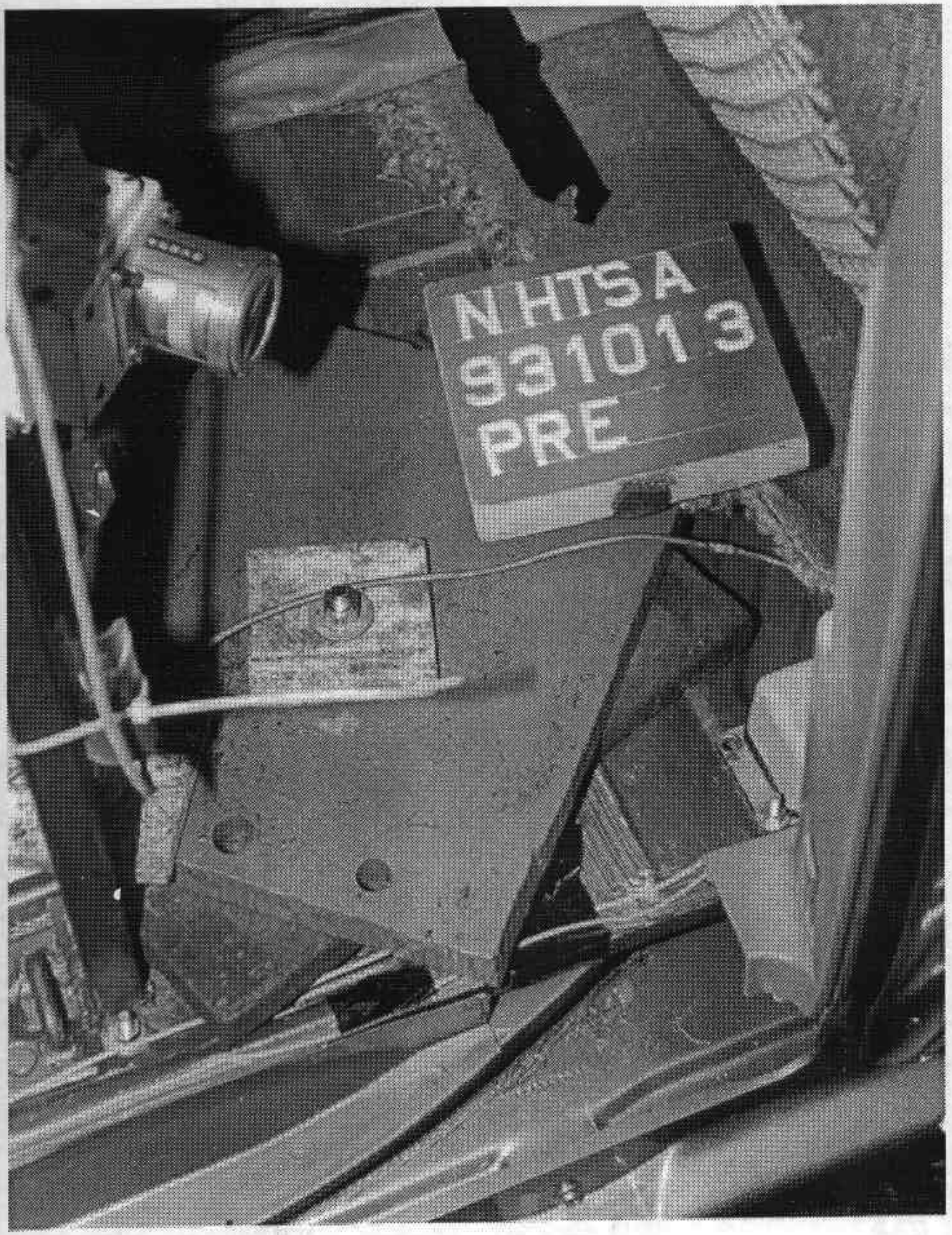


Figure A-27. PRE-TEST BALLAST LOCATION VIEW

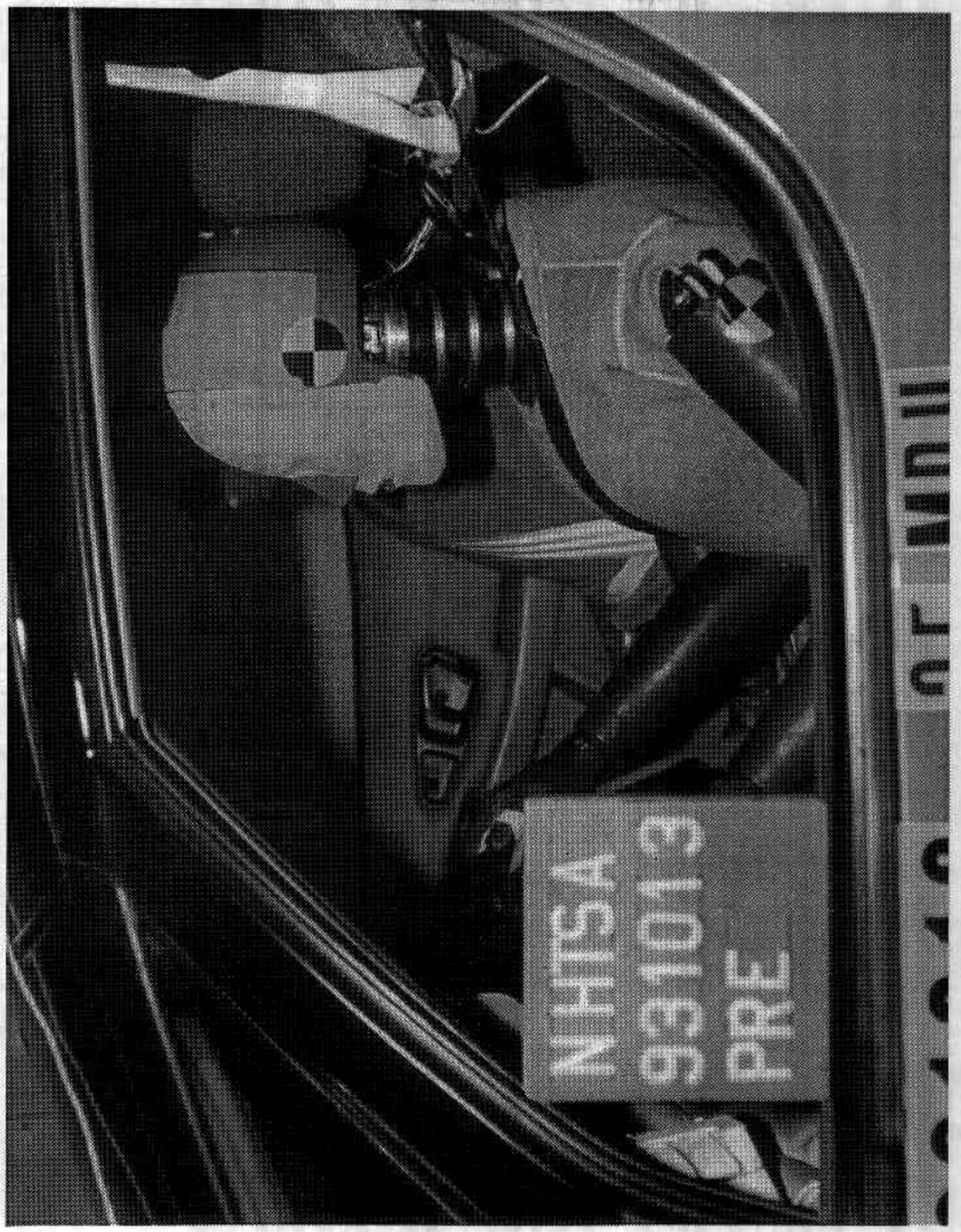


Figure A-28. PRE-TEST DRIVER DUMMY POSITION VIEW

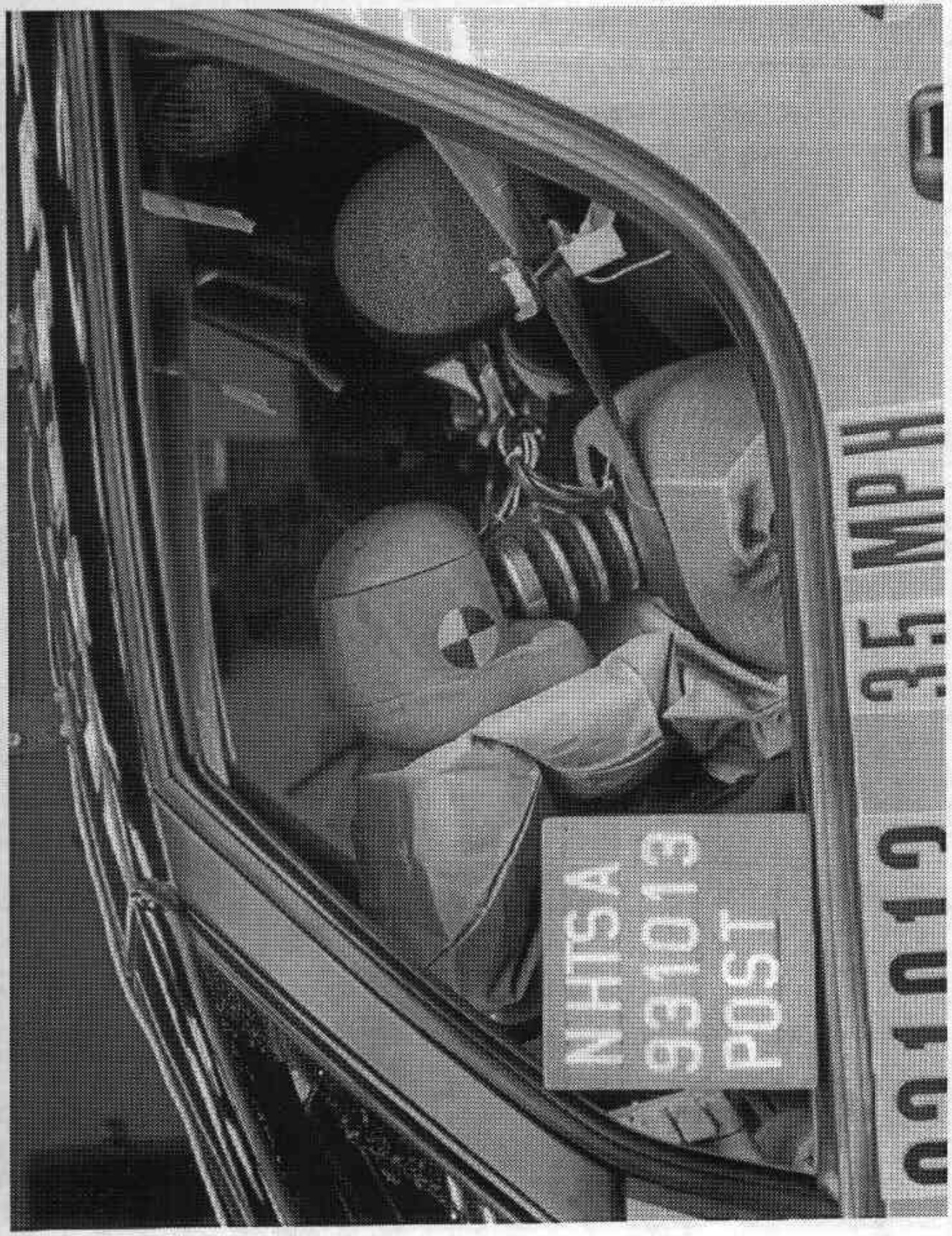


Figure A-29. POST-TEST DRIVER DUMMY POSITION VIEW

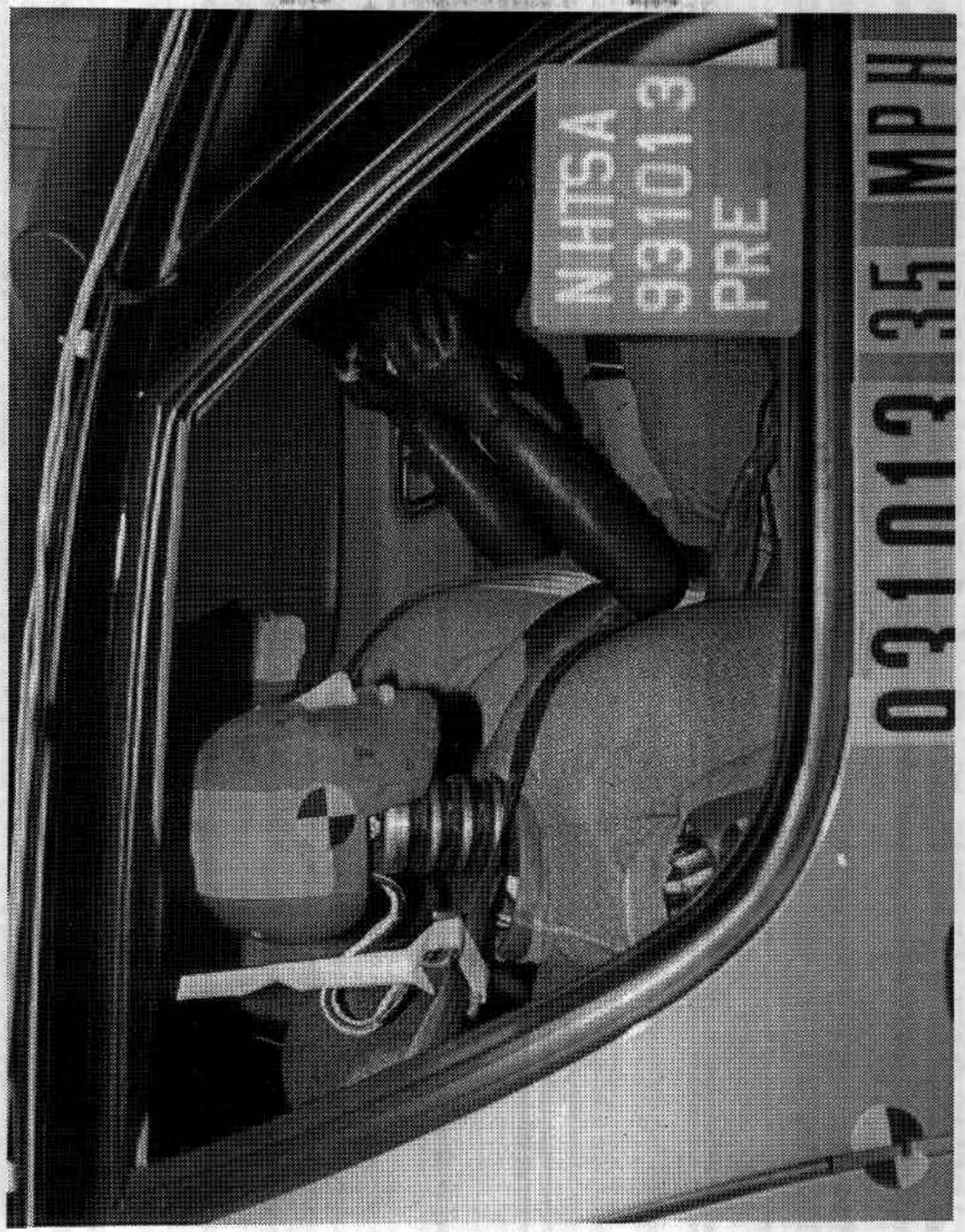


Figure A-30. PRE-TEST PASSENGER DUMMY POSITION VIEW

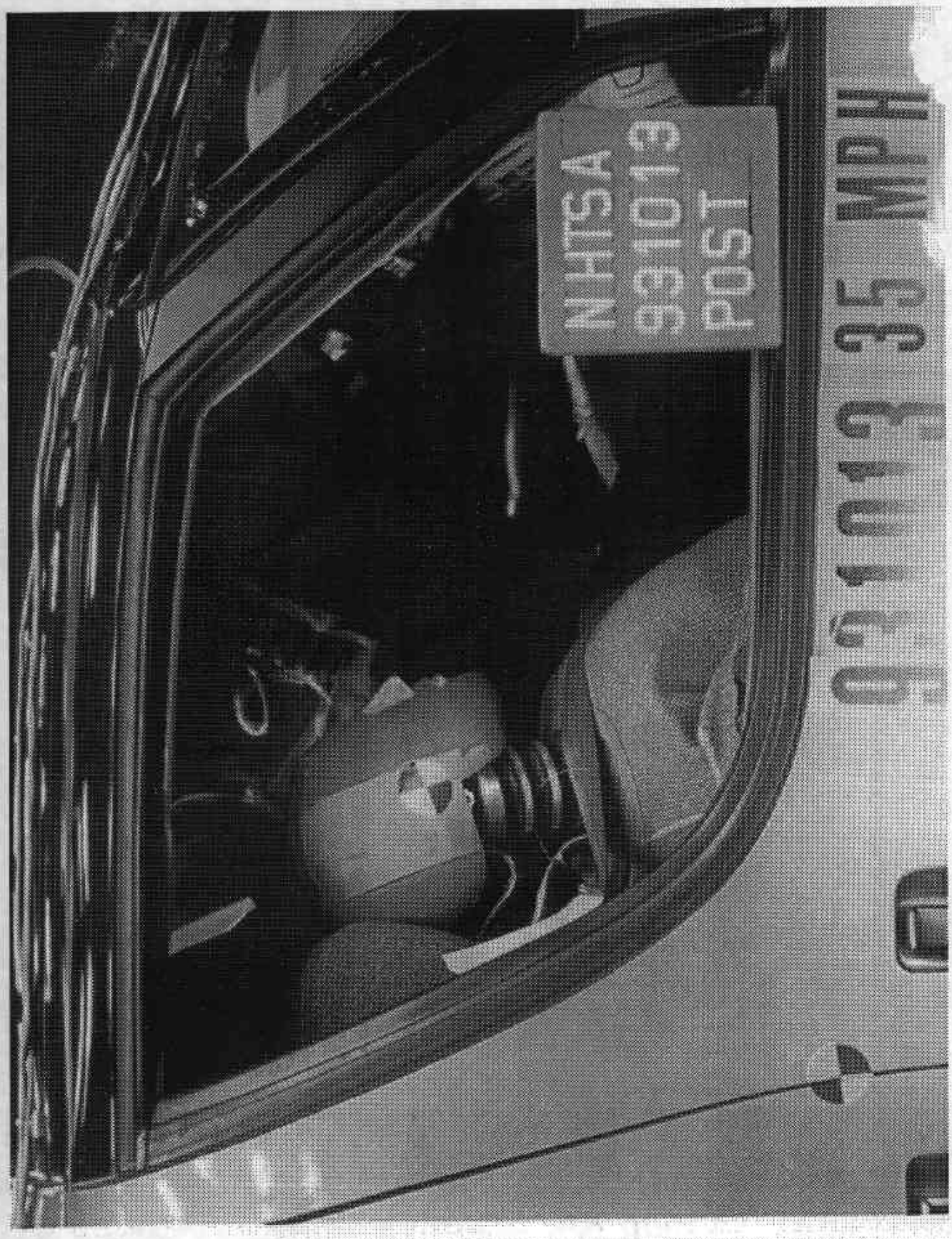


Figure A-31. POST-TEST PASSENGER DUMMY POSITION VIEW

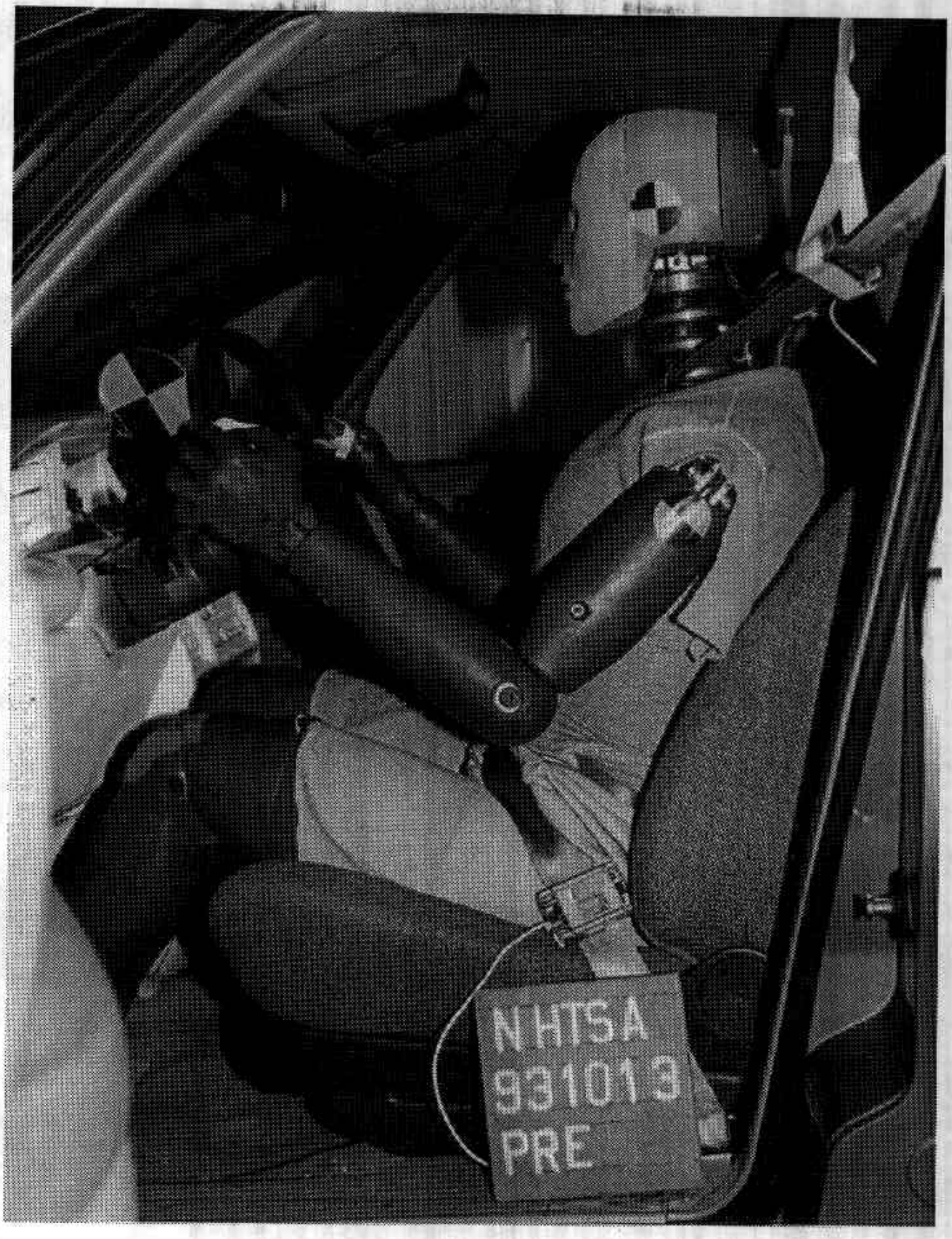


Figure A-32. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

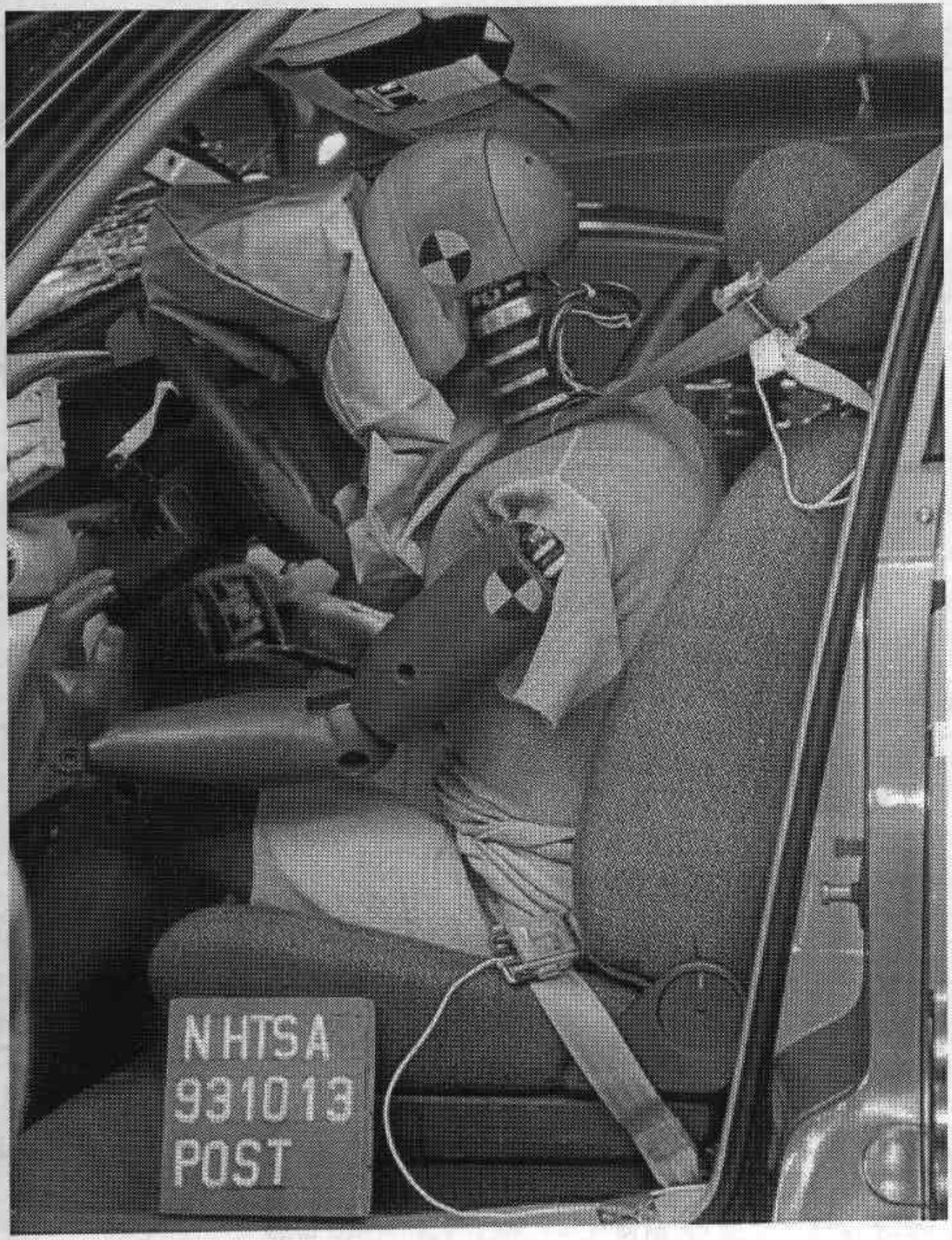


Figure A-33. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

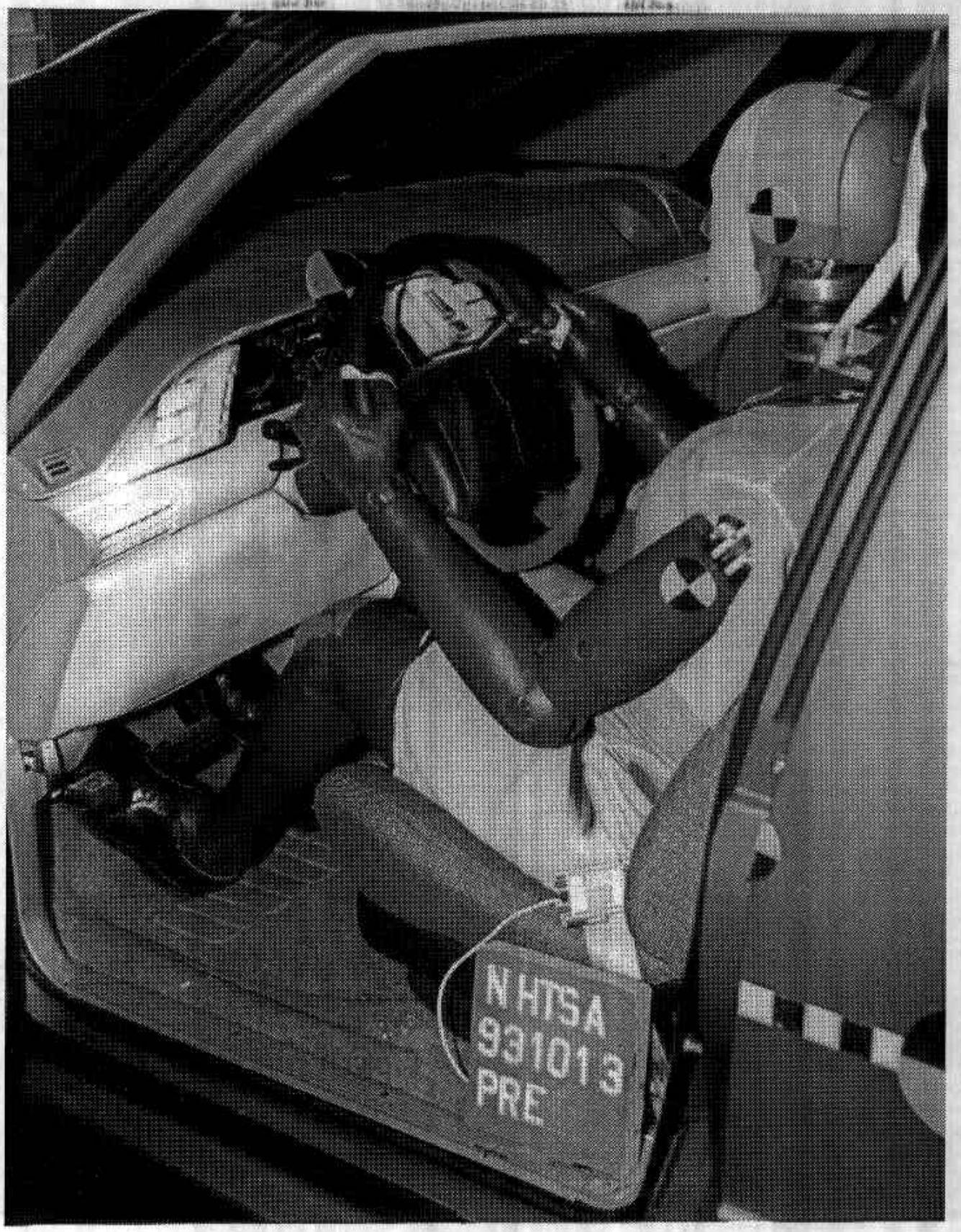


Figure A-34. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

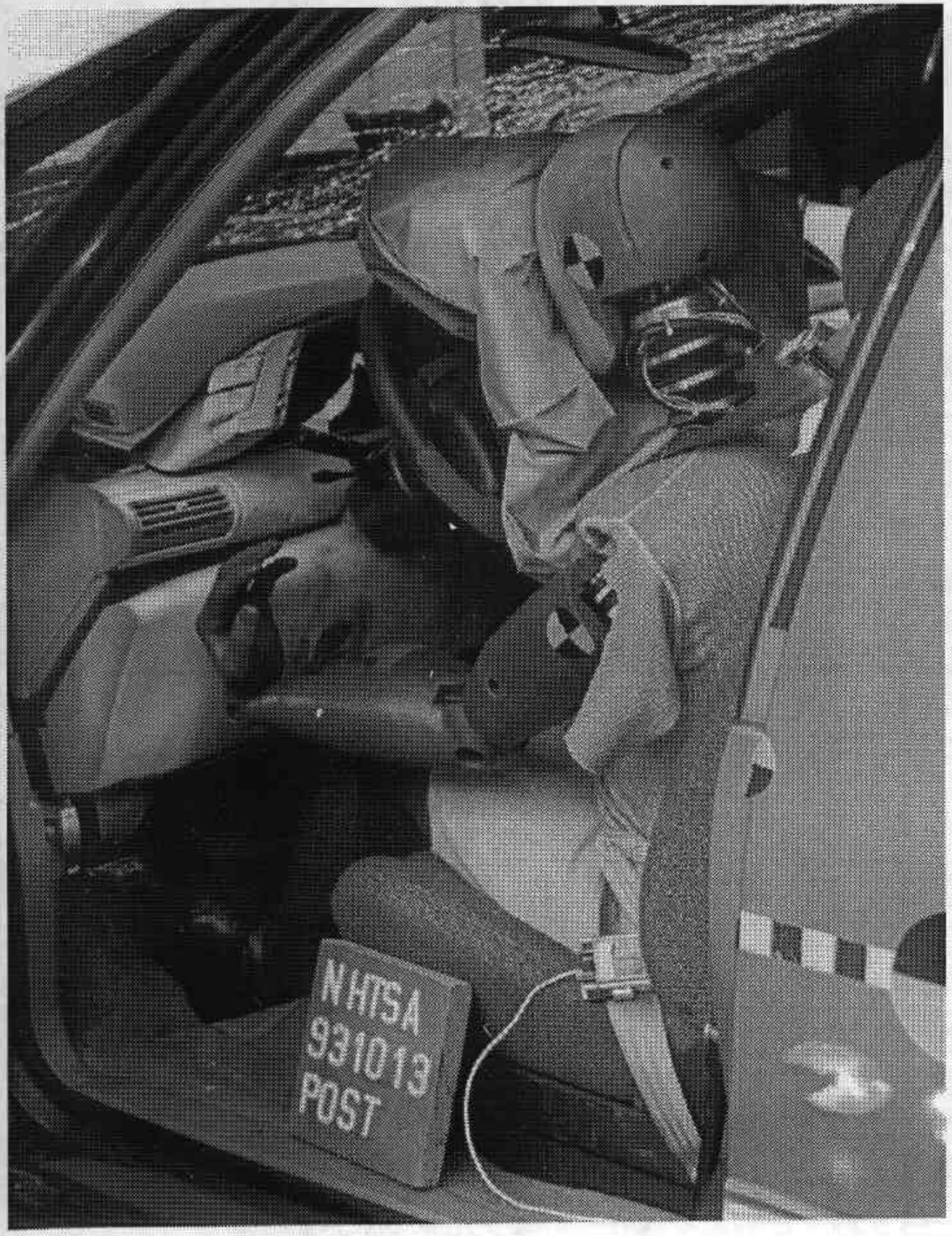


Figure A-35. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

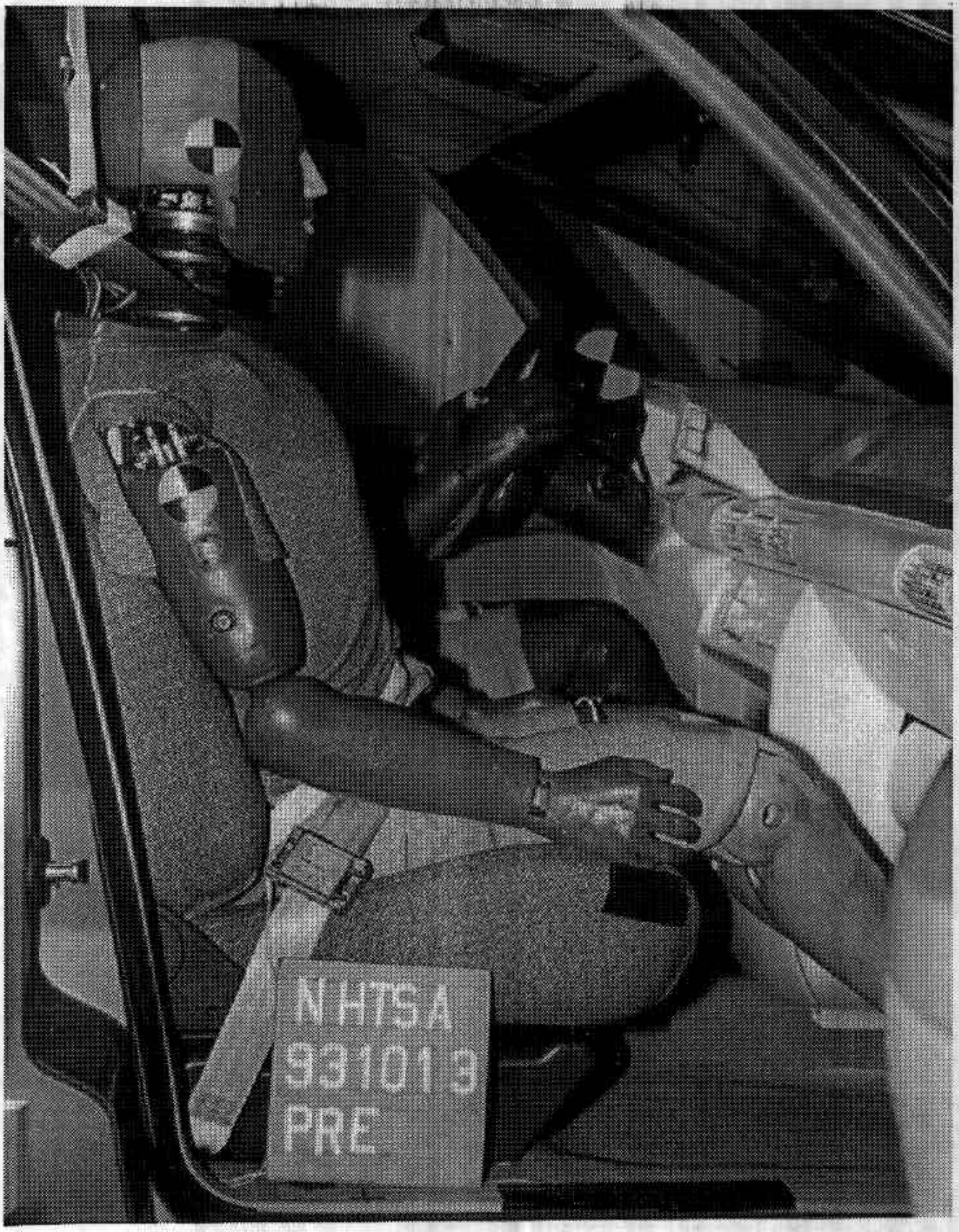


Figure A-36. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

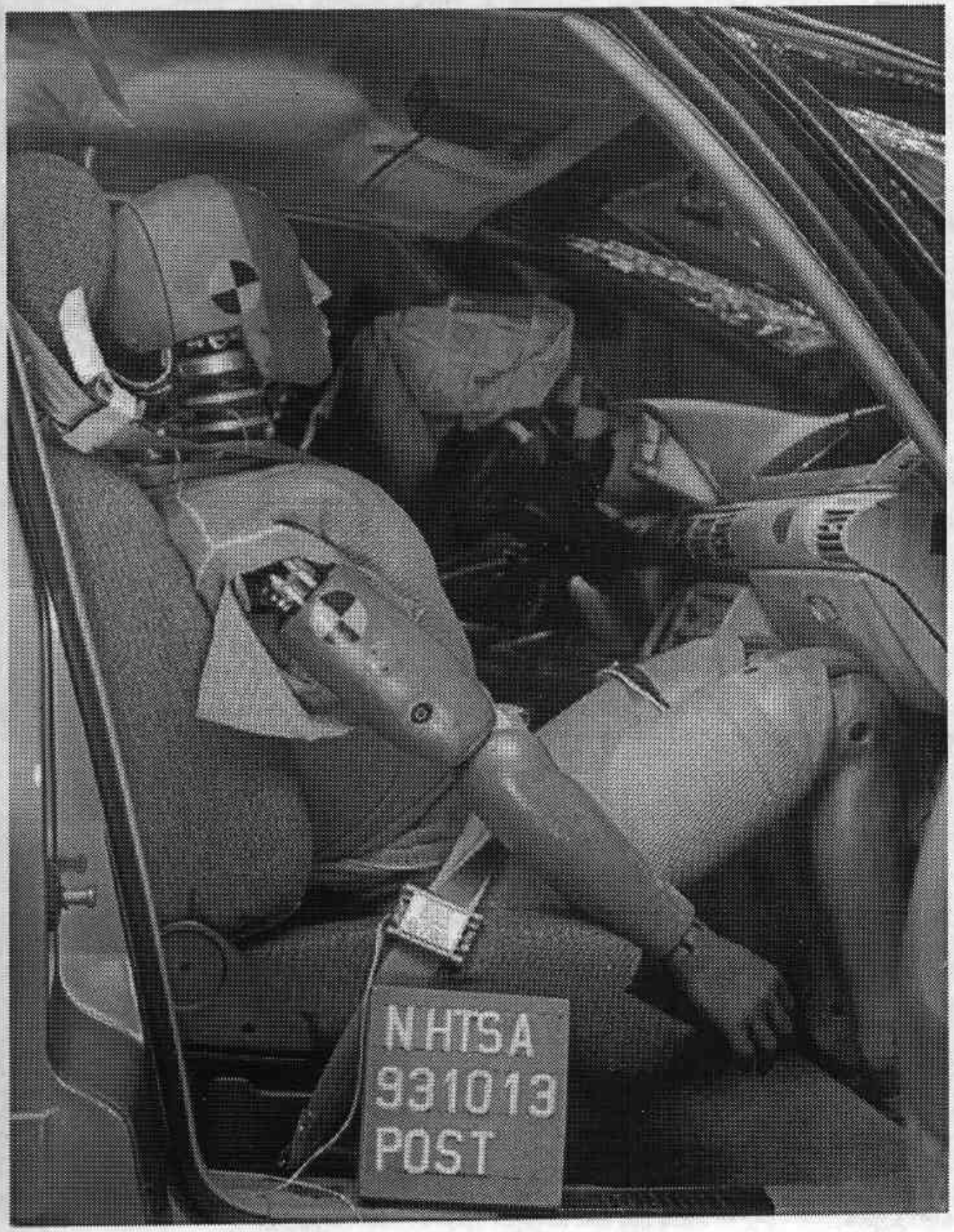


Figure A-37. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

Figure A-38. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

Figure A-39. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

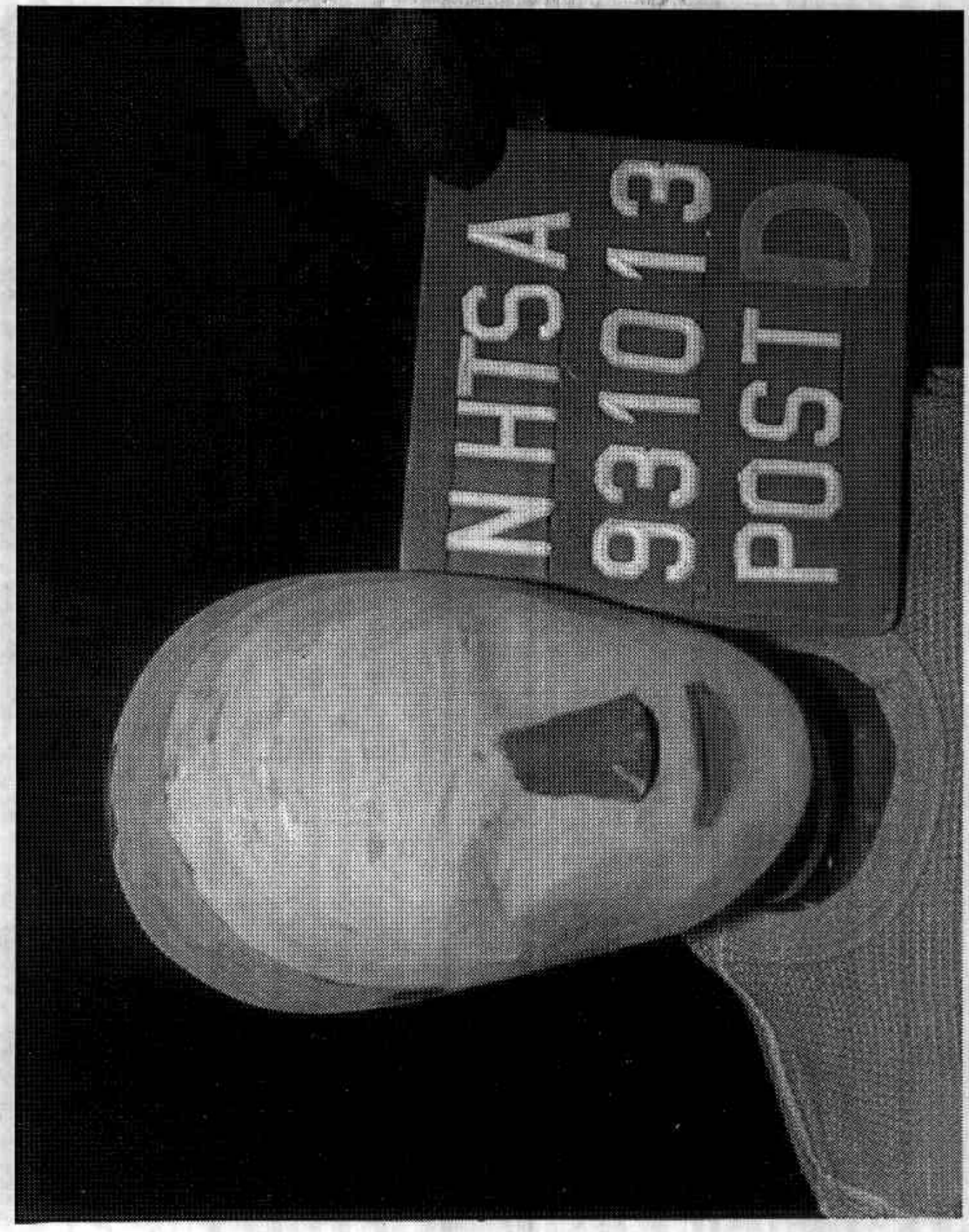


Figure A-40. POST-TEST DRIVER DUMMY HEAD CONTACT - VIEW 1

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

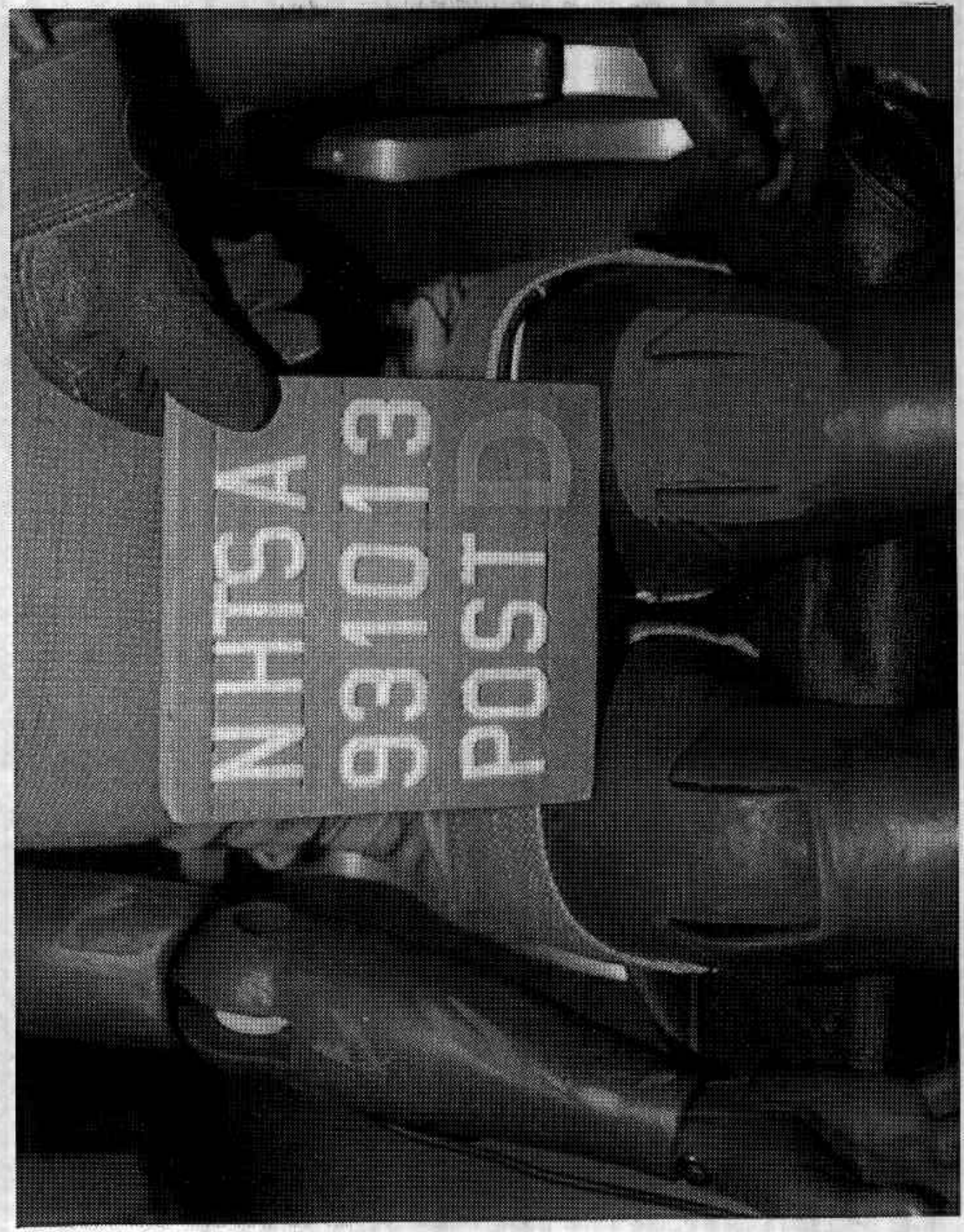


Figure A-42. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

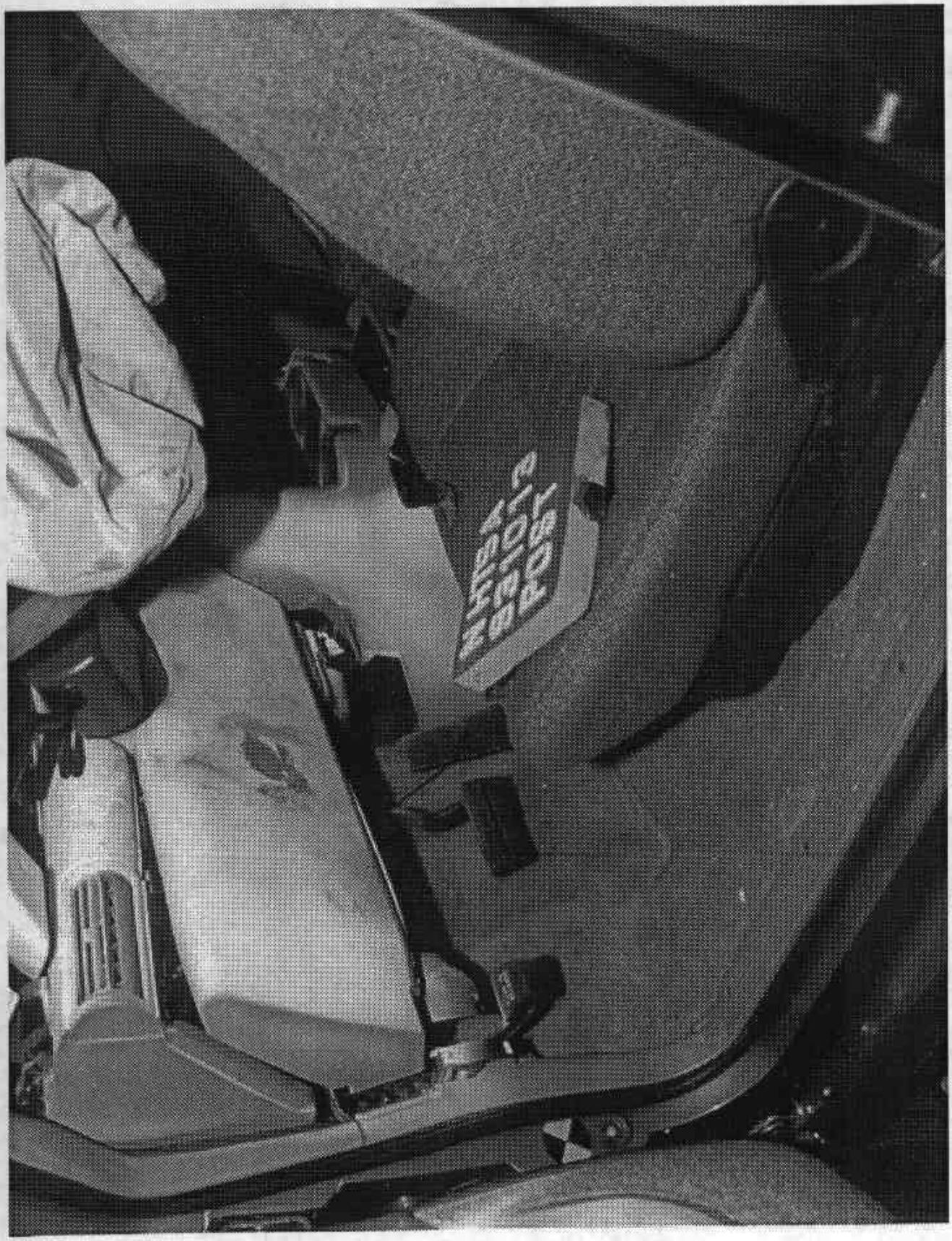


Figure A-43. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

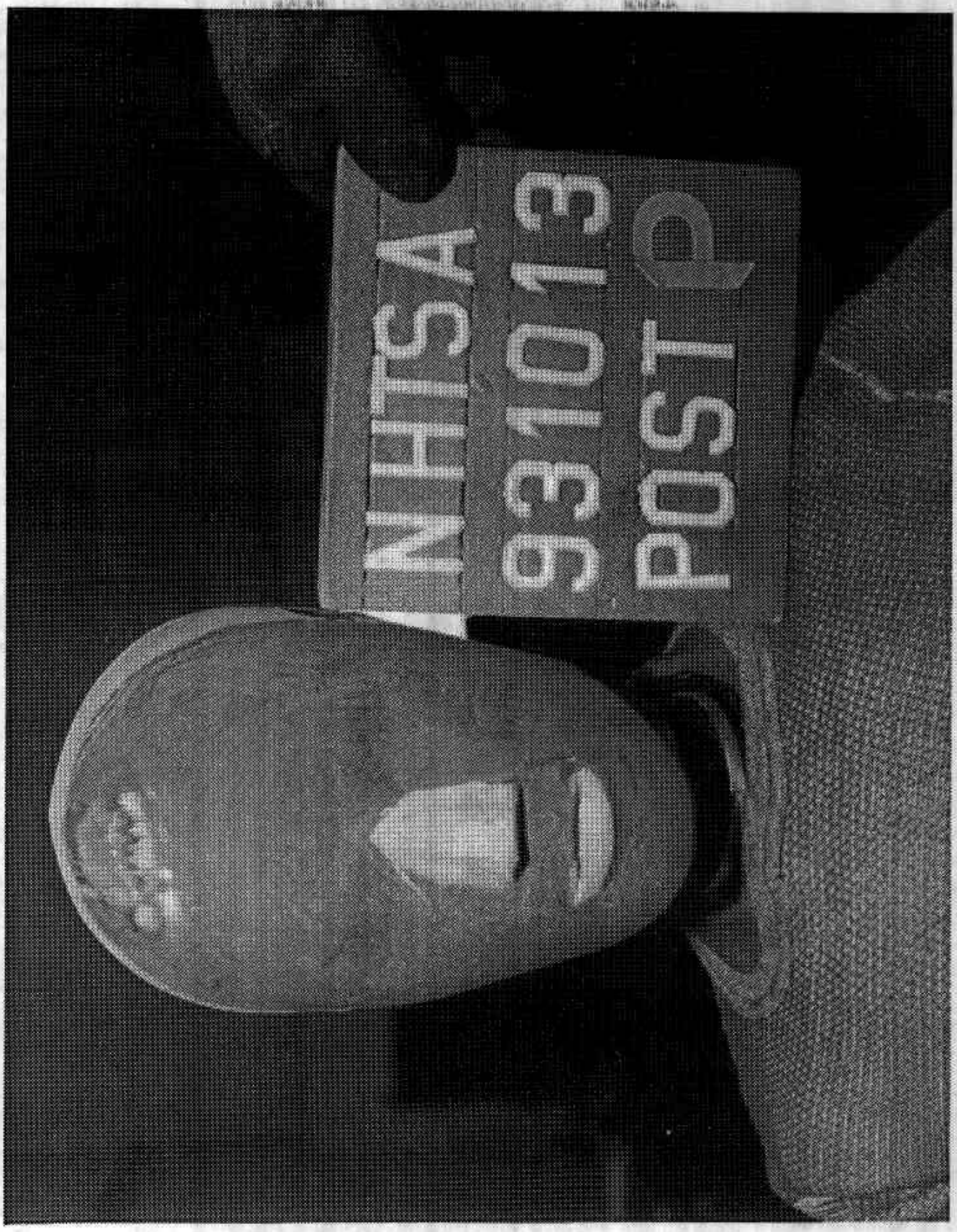


Figure A-44. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

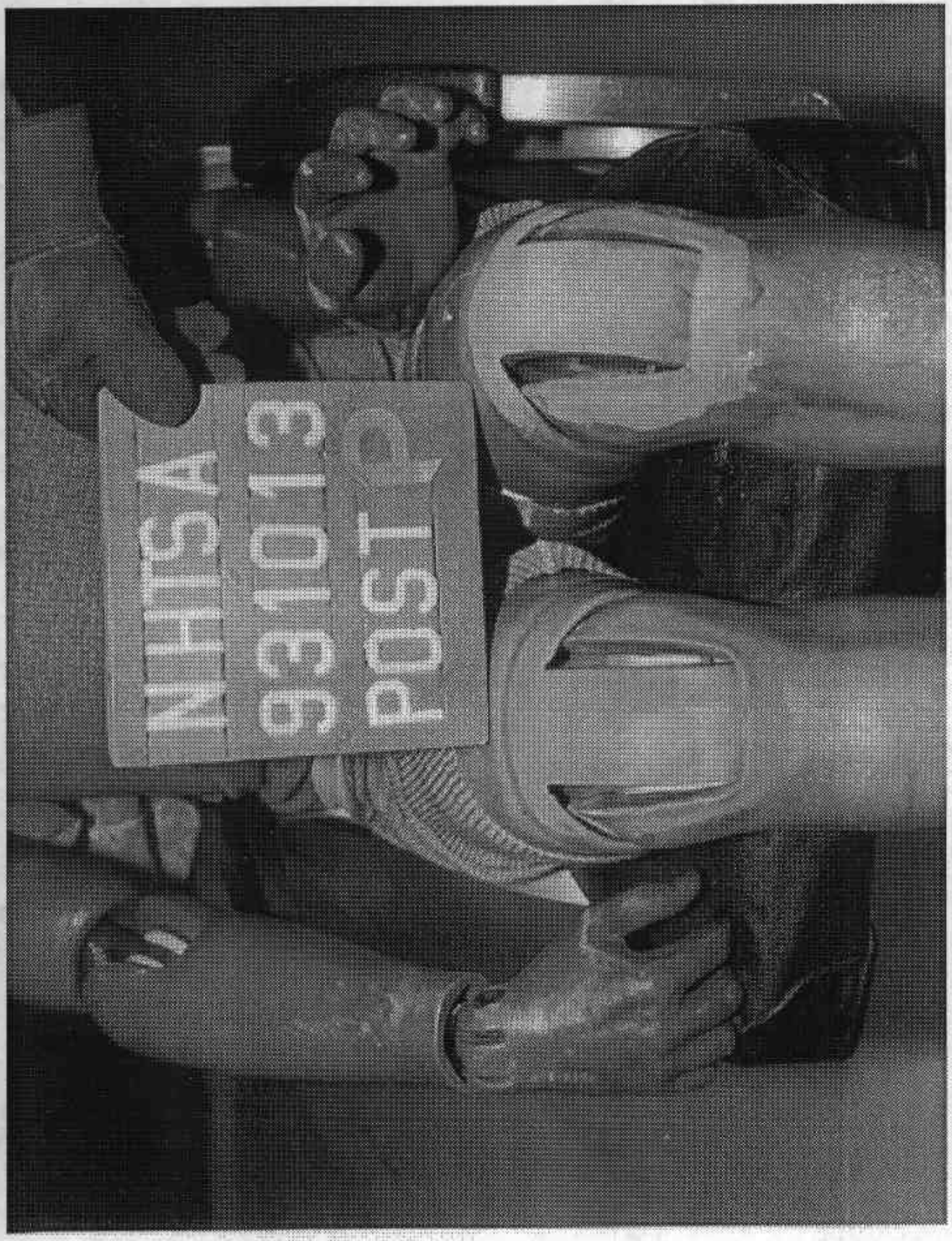


Figure A-45. POST-TEST PASSENGER DUMMY KNEE CONTACT VIEW

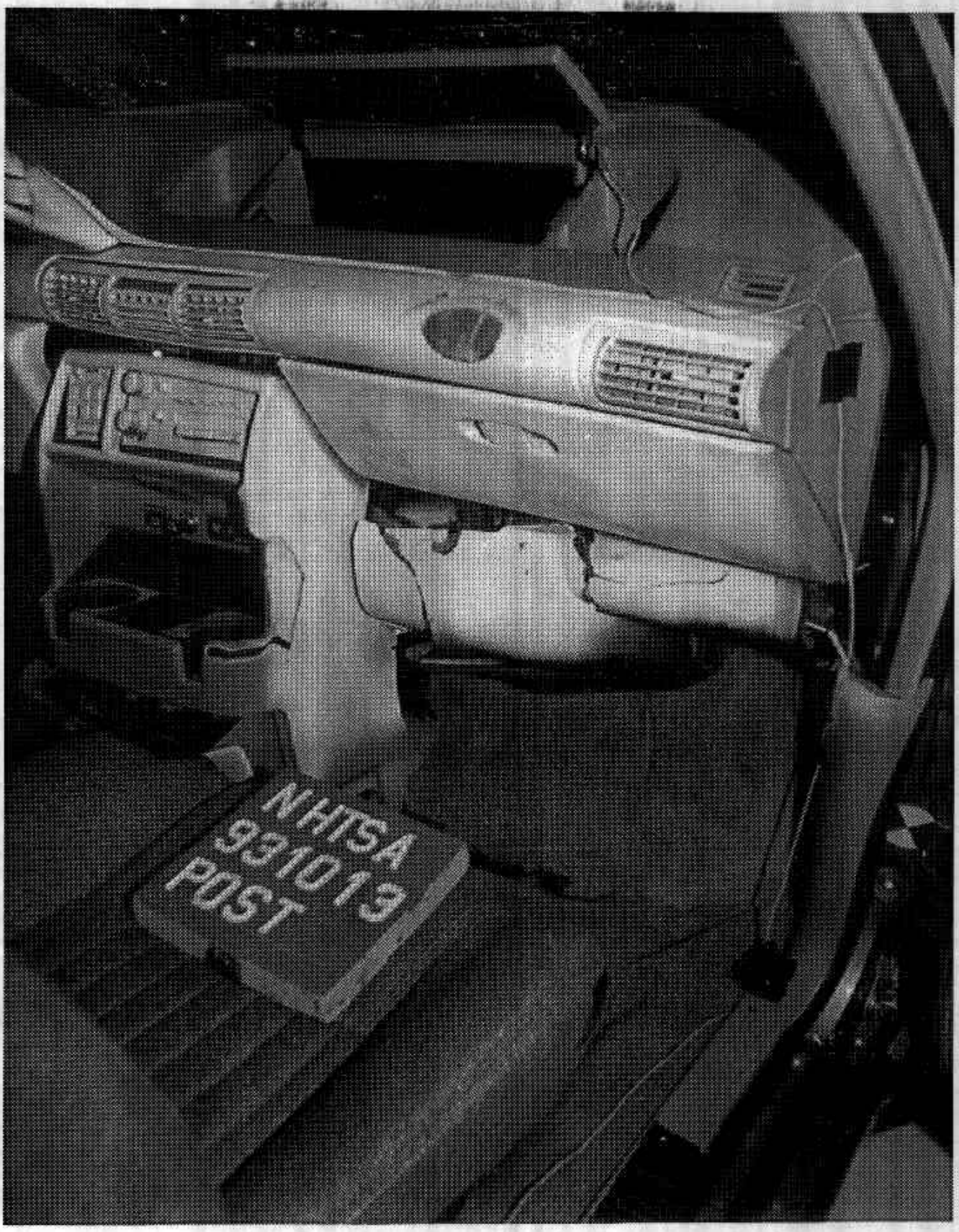


Figure A-46. POST-TEST PASSENGER DUMMY HEAD & KNEE CONTACT VIEW

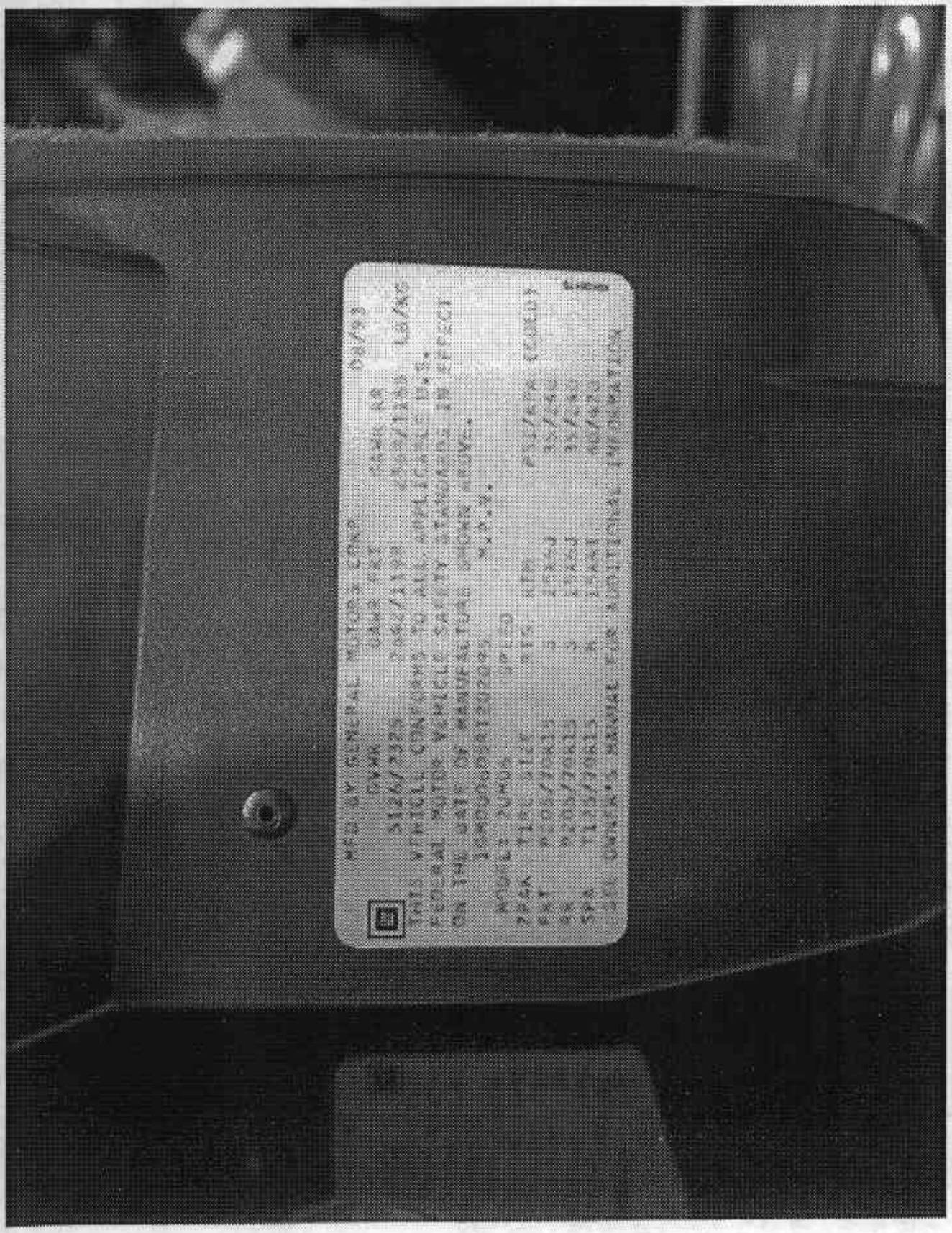


Fig. A-47. PRE-TEST VEHICLE CERT. & RECOMMENDED TIRE PRES. LABEL

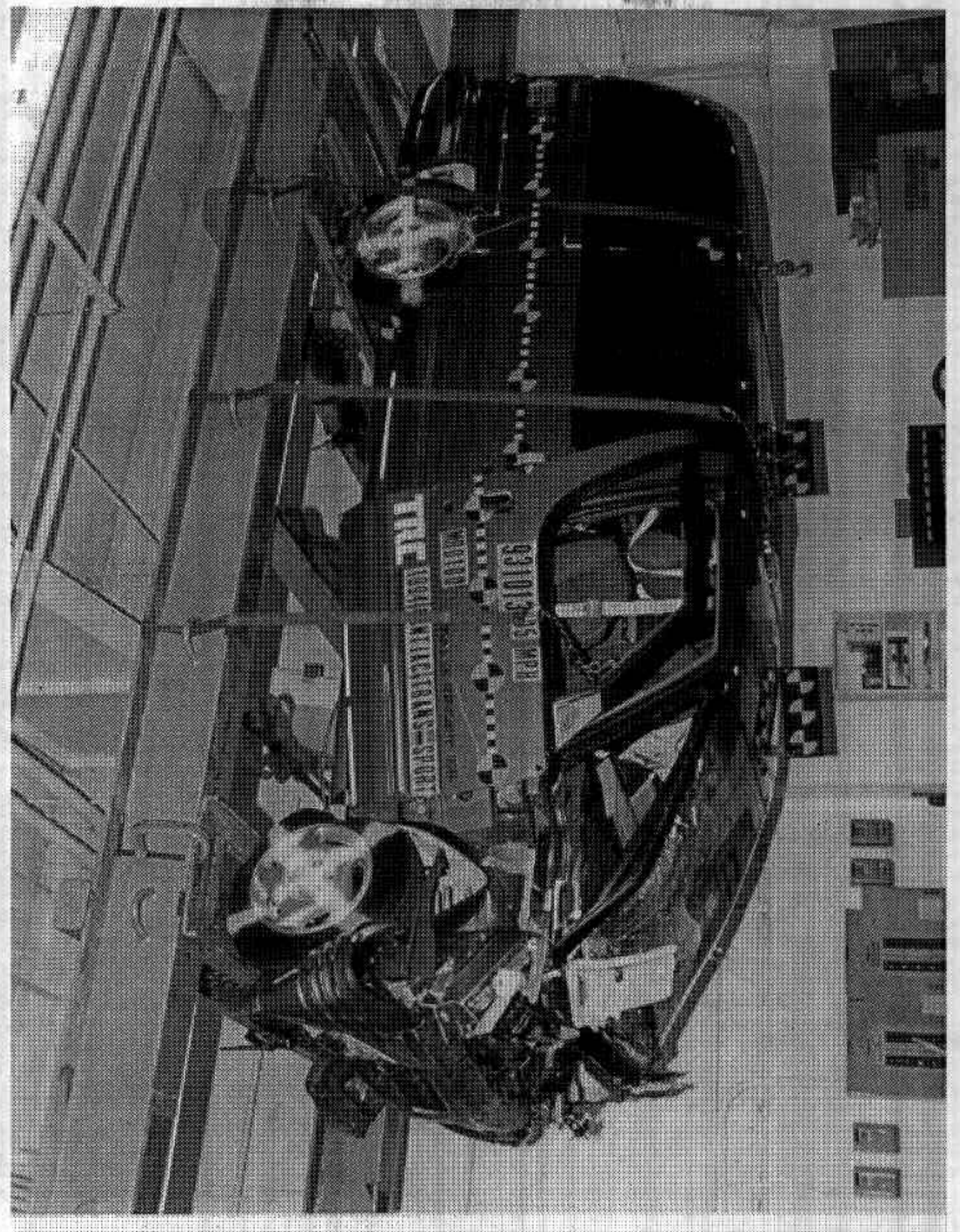
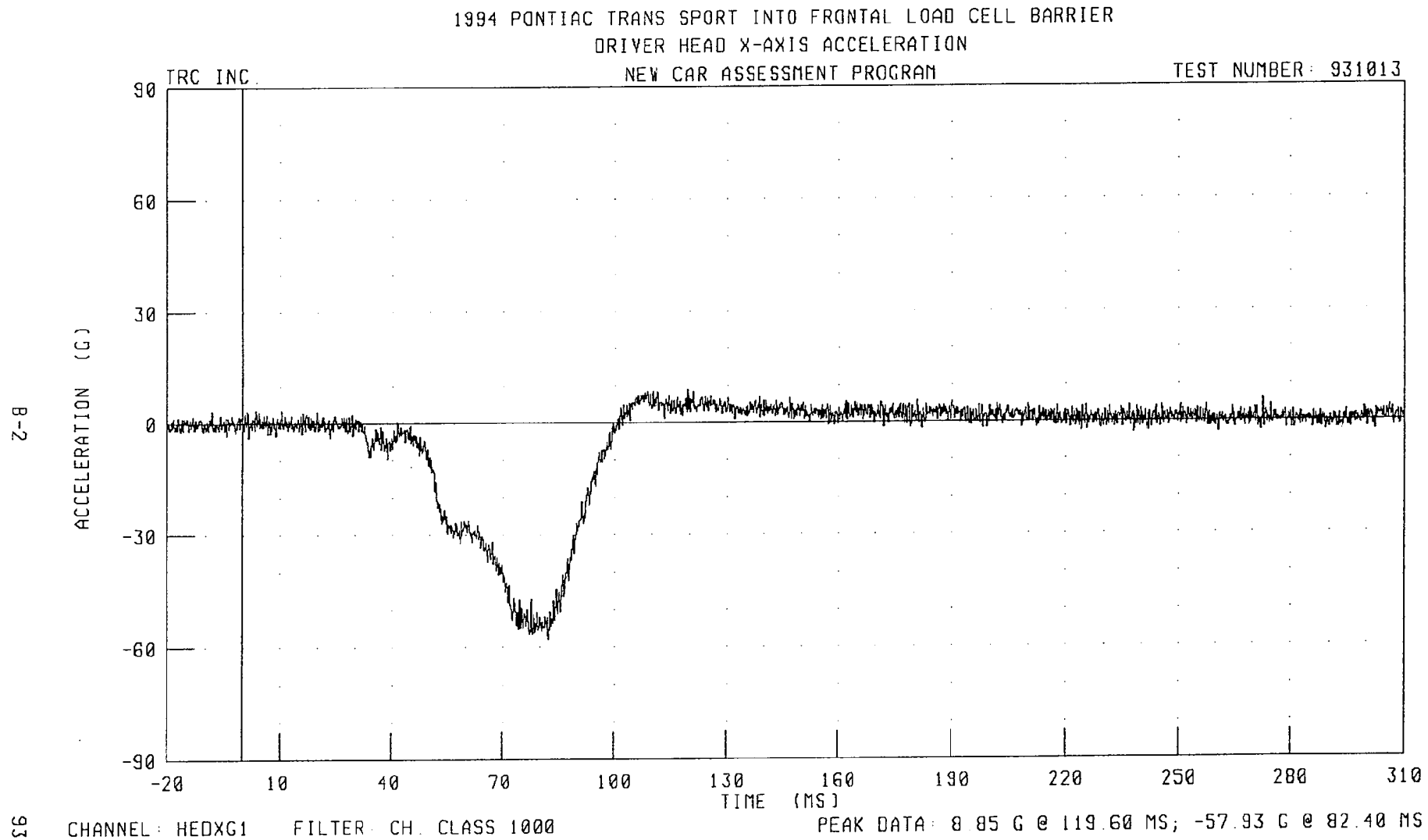


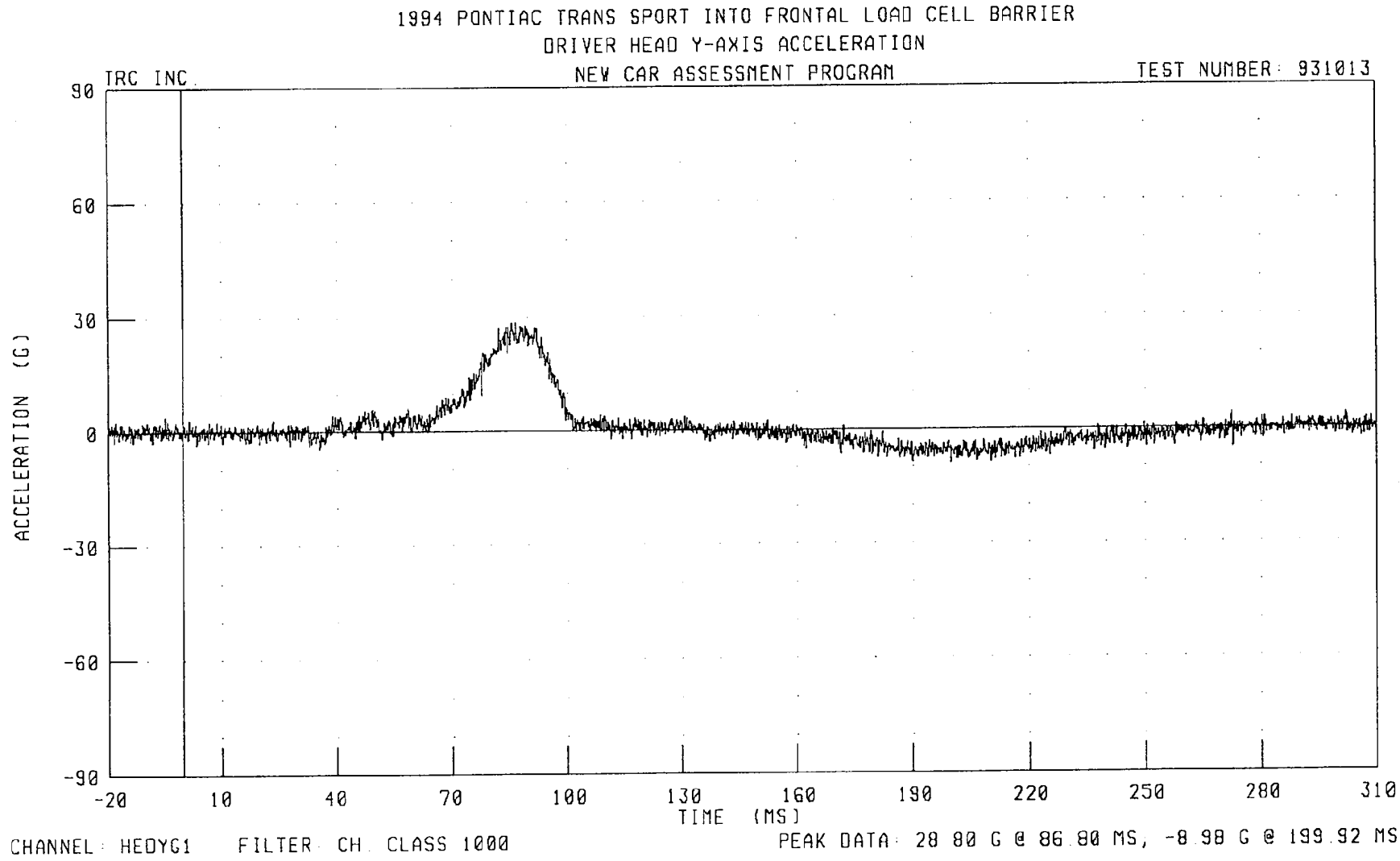
Figure A-48. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

APPENDIX B

DATA PLOTS

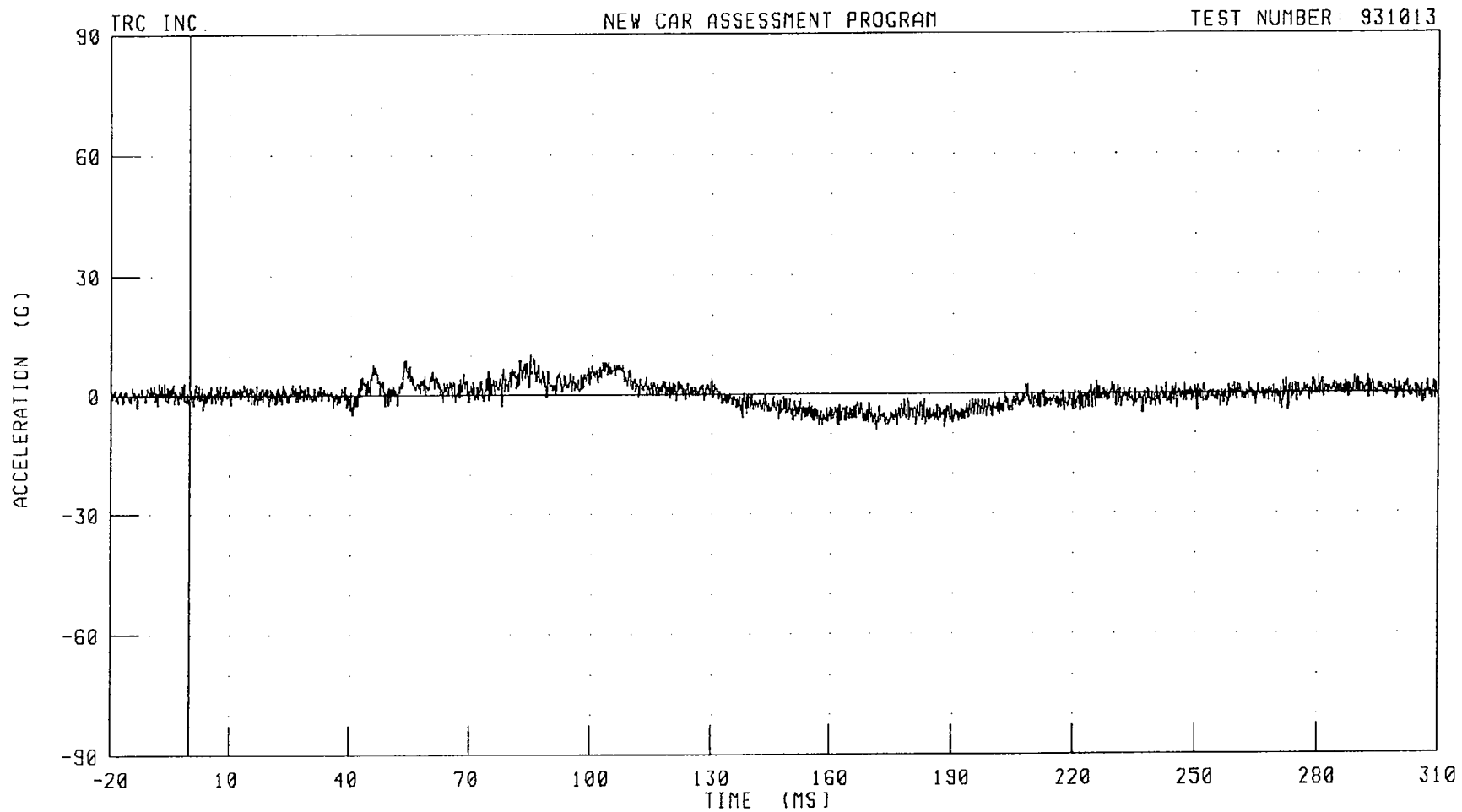

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG1
FILTER: CH. CLASS 1000
PEAK DATA: 8.85 G @ 119.60 MS; -57.93 G @ 82.40 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG1 FILTER: CH CLASS 1000
PEAK DATA: 28.80 G @ 86.80 MS, -8.98 G @ 199.92 MS

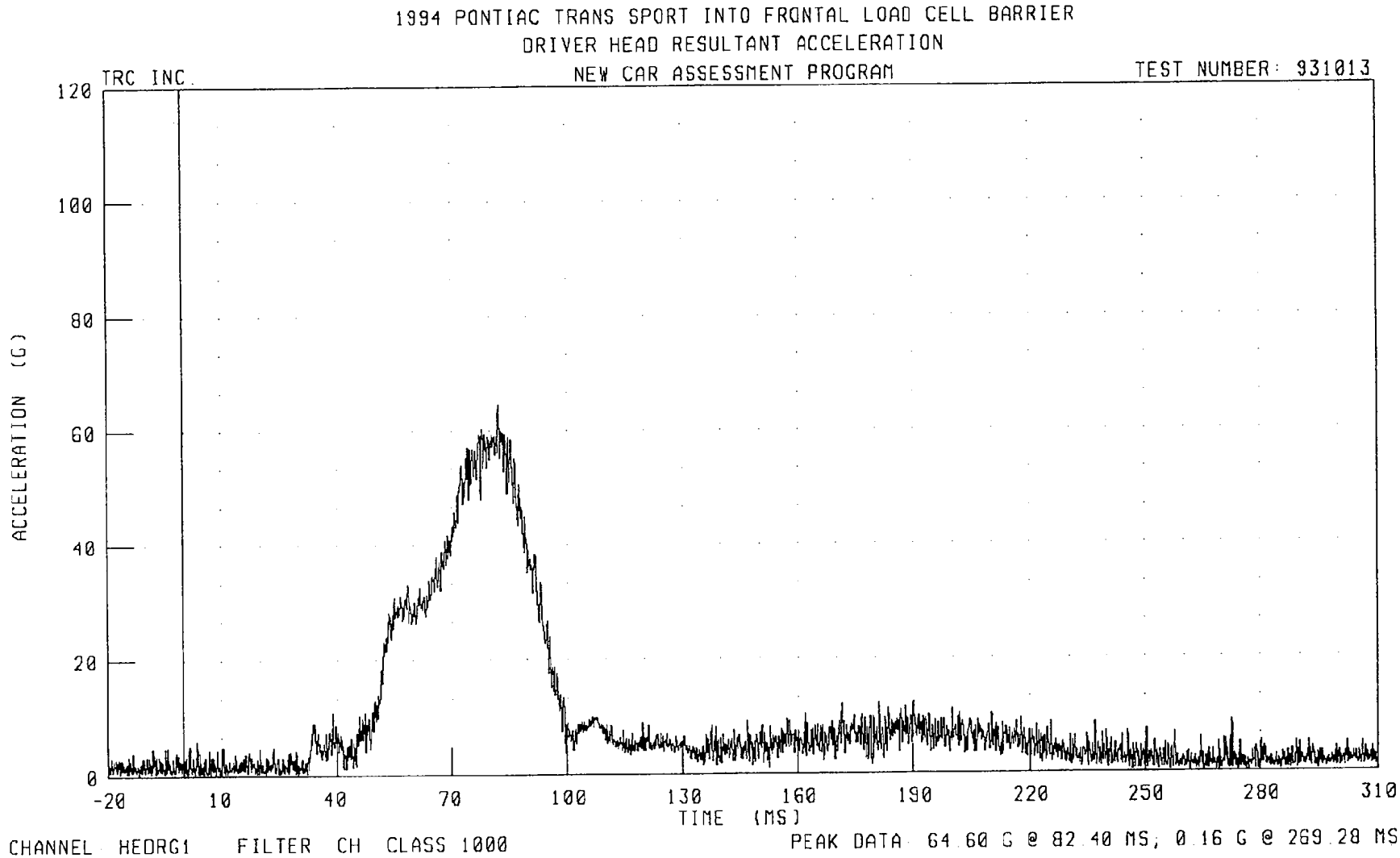
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION



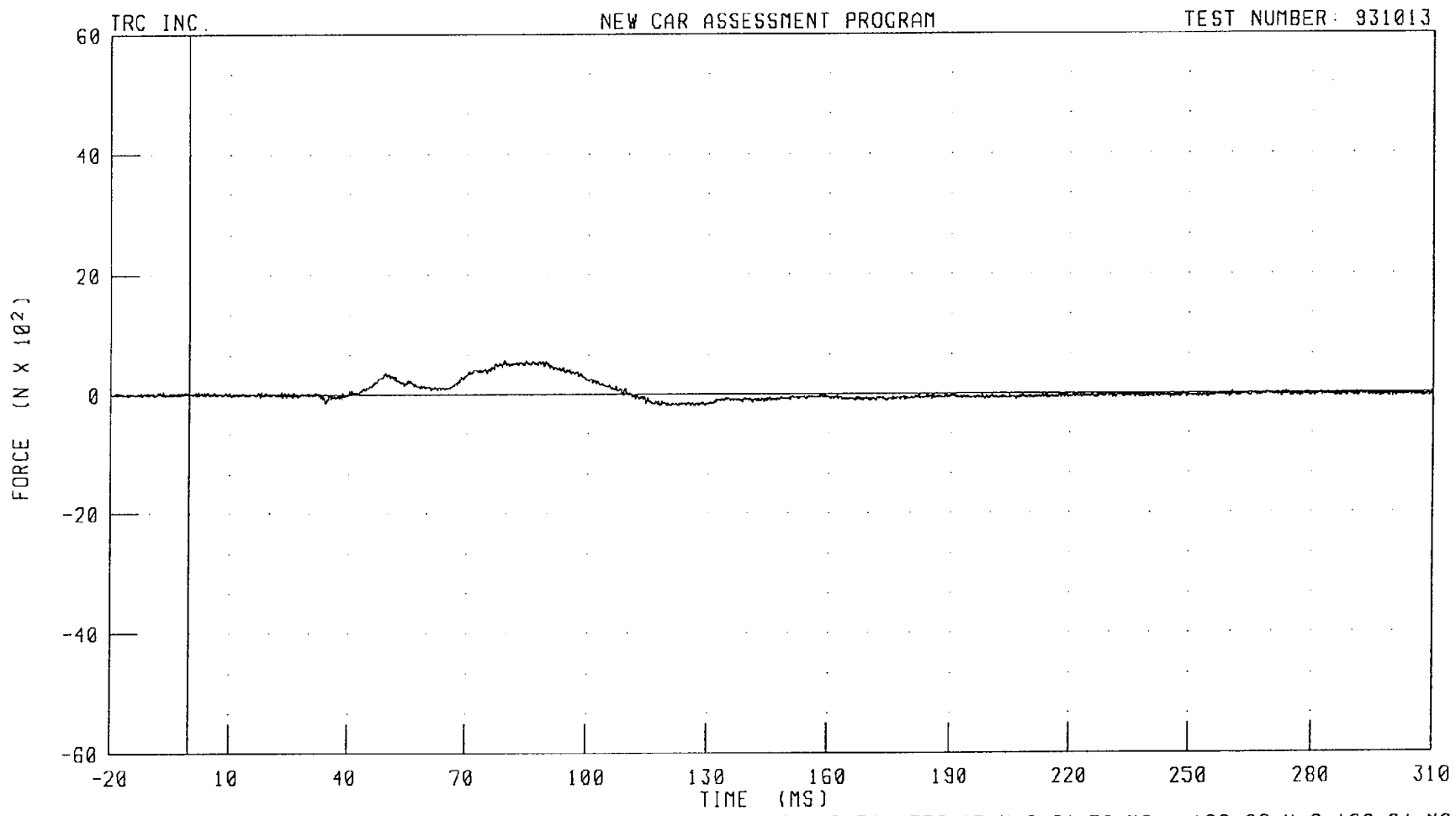
CHANNEL: HEDZG1 FILTER: CH. CLASS 1000 PEAK DATA: 10.43 G @ 84.88 MS; -8.98 G @ 171.60 MS

931013

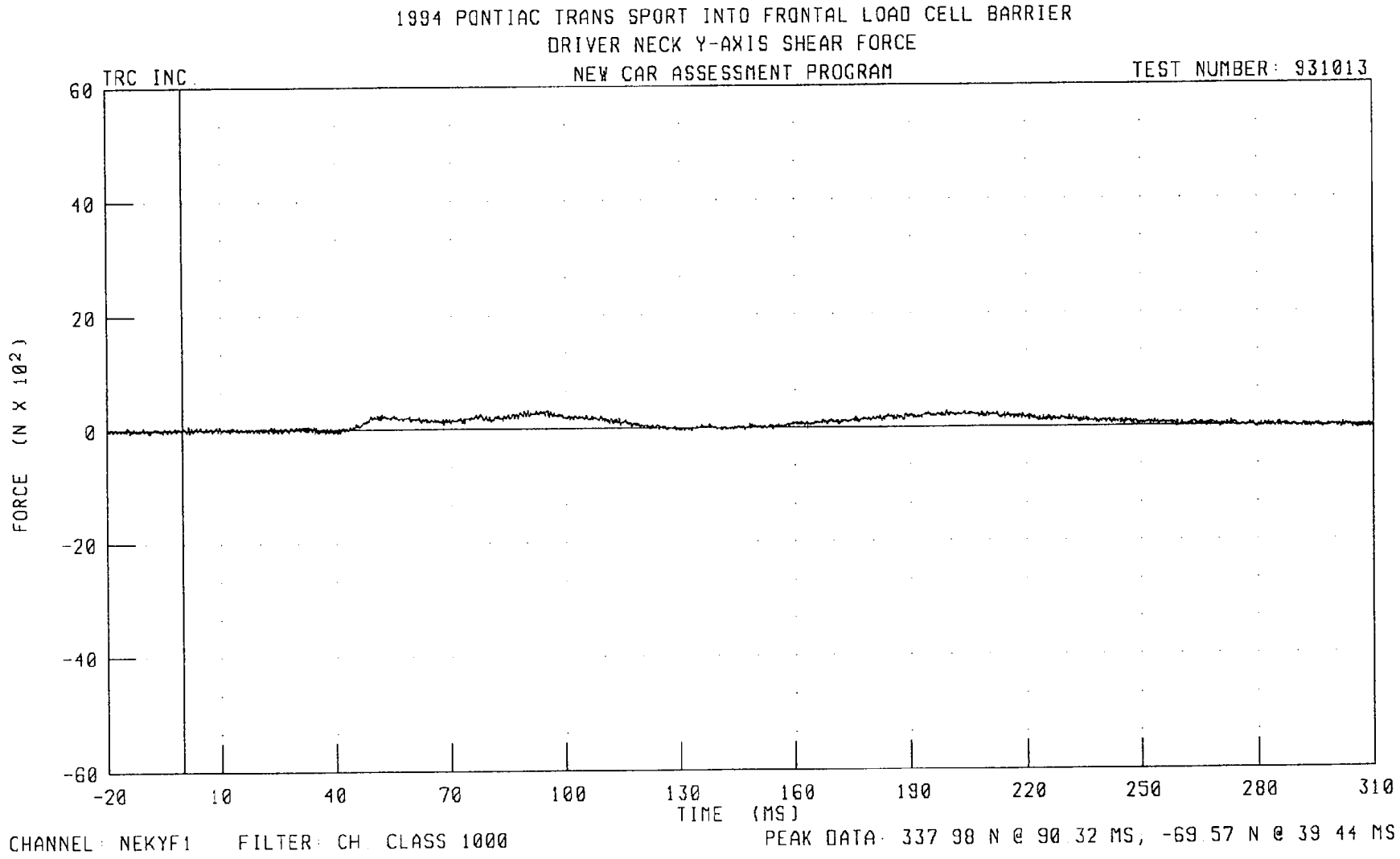

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL HEDRG1 FILTER CH CLASS 1000
PEAK DATA 64.60 G @ 82.40 MS; 0.16 G @ 269.28 MS

931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK X-AXIS SHEAR FORCE

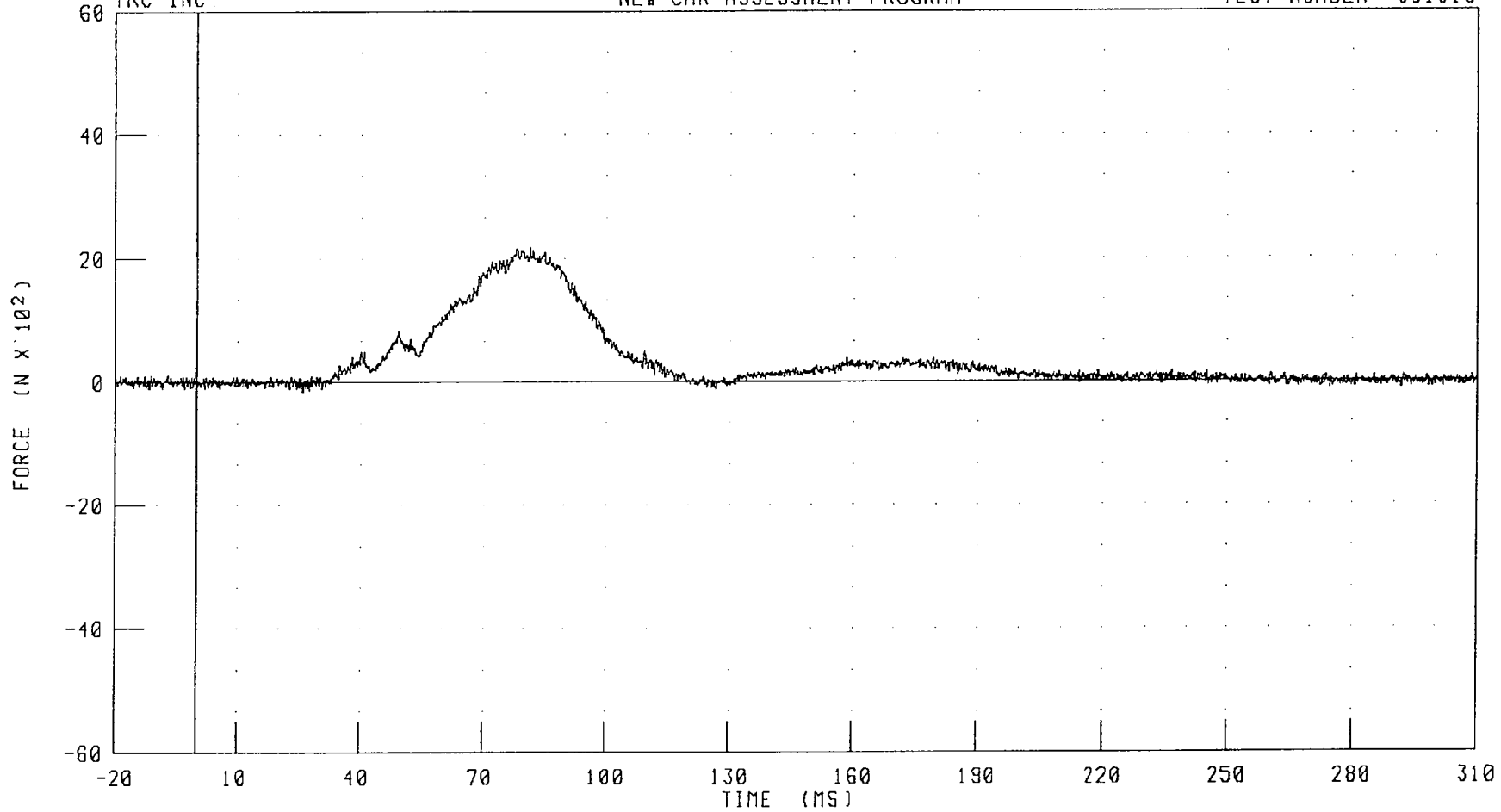


CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 573.17 N @ 84.72 MS; -196.02 N @ 126.64 MS

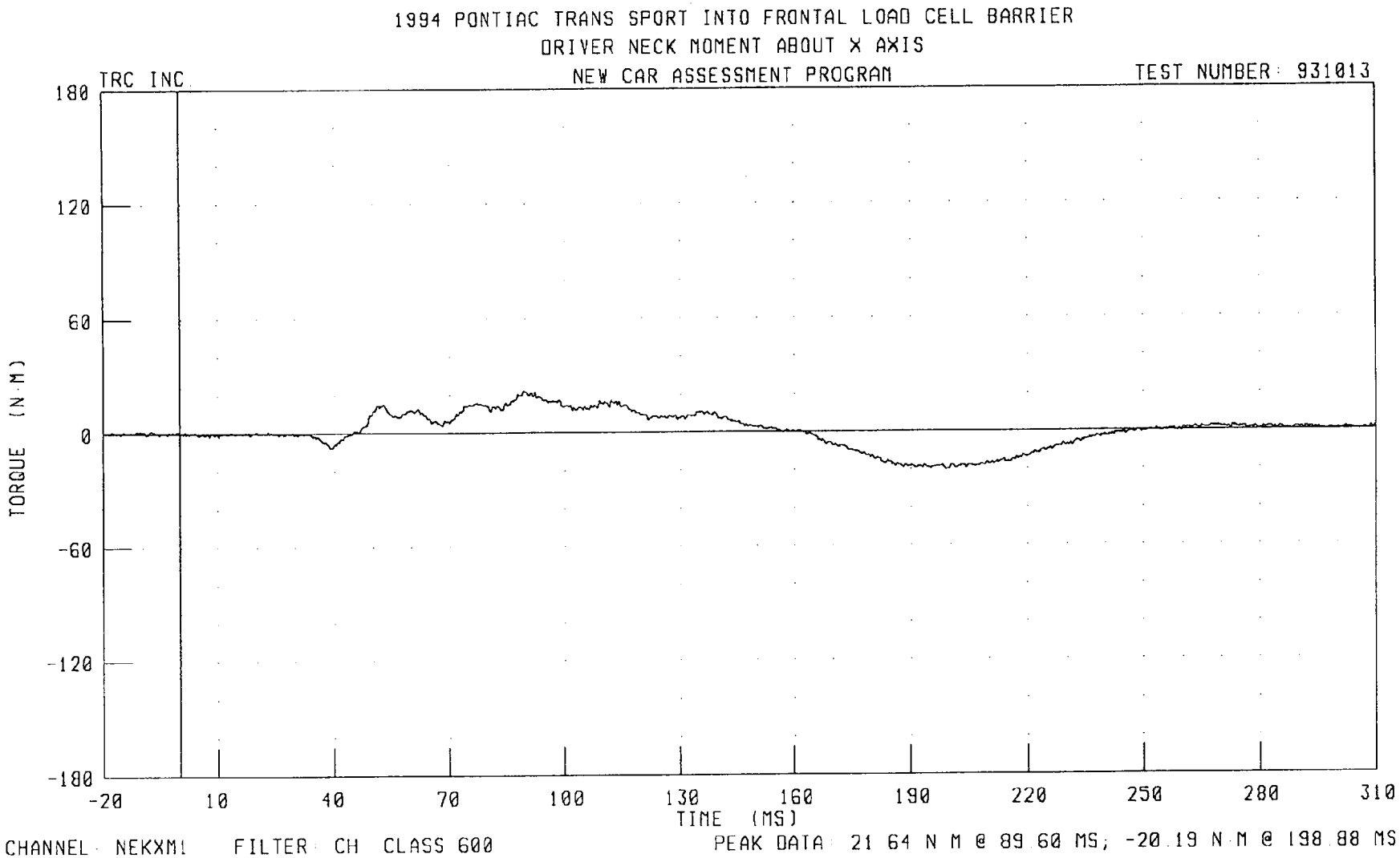

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYF1 FILTER: CH CLASS 1000
PEAK DATA: 337.98 N @ 90.32 MS, -69.57 N @ 39.44 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE

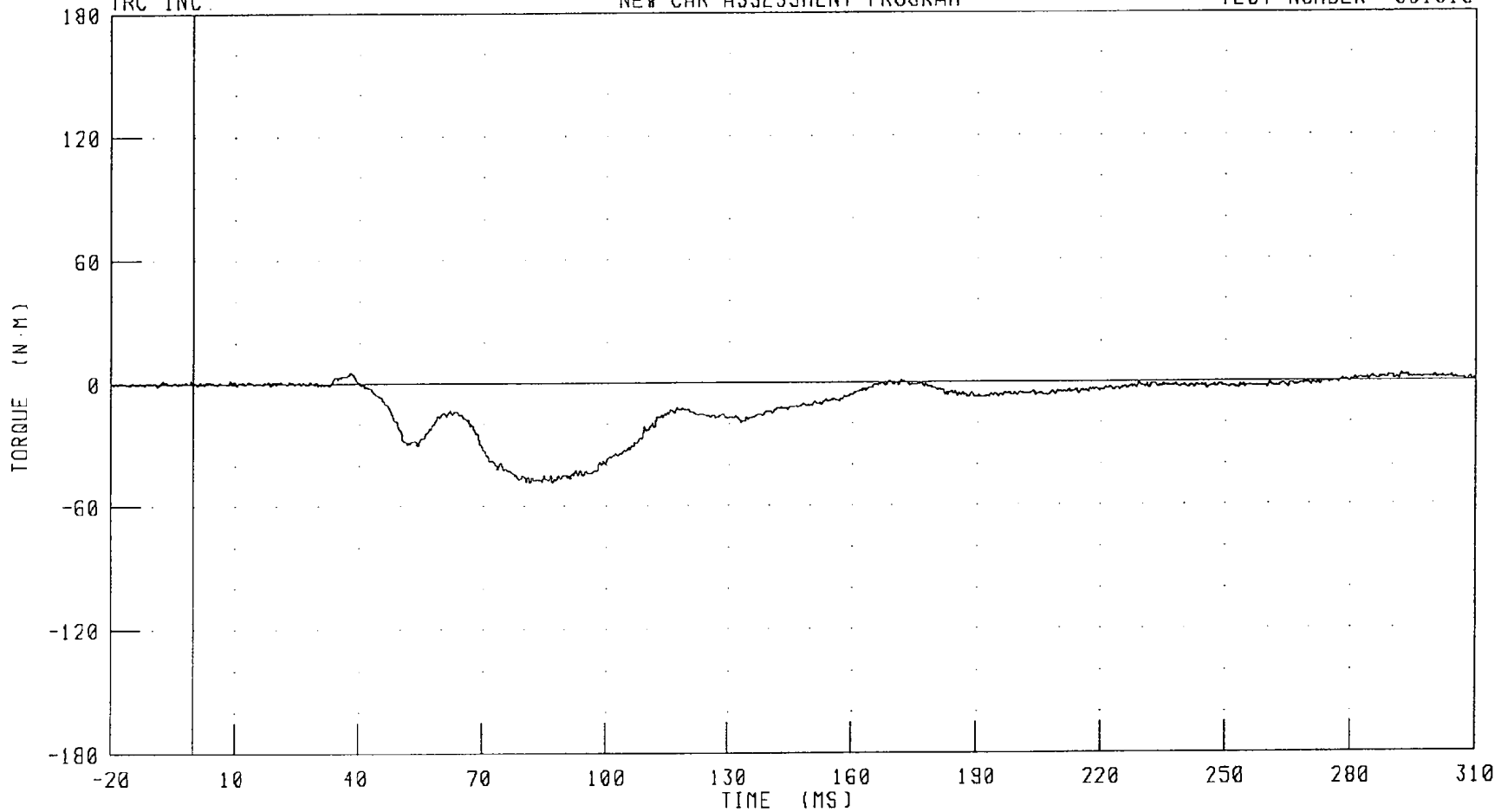
TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 931013



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000 PEAK DATA: 2180.59 N @ 81.52 MS; -159.42 N @ 25.92 MS

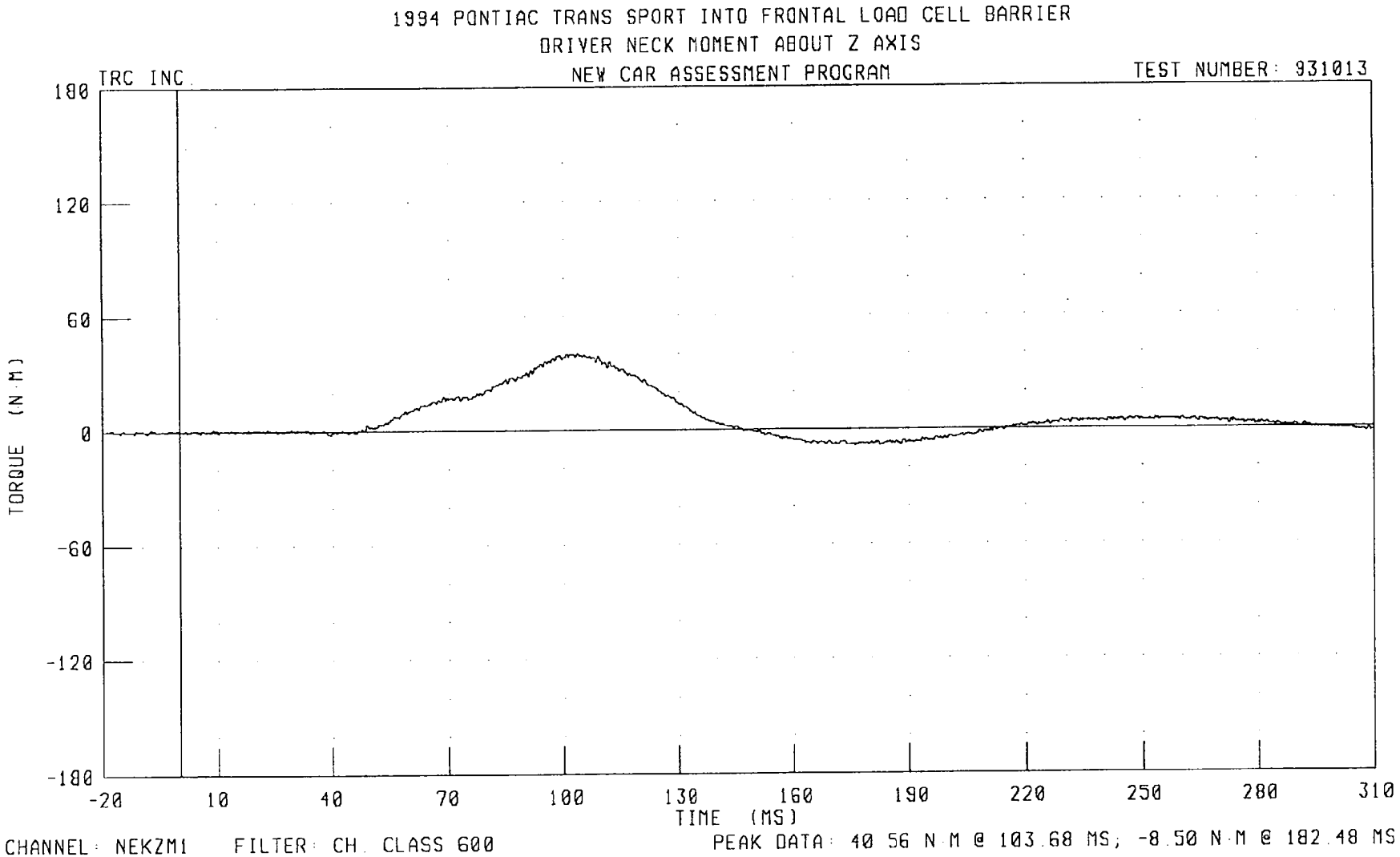

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
180
120
60
0
-60
-120
-180
TORQUE (N.M)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXM1 FILTER: CH CLASS 600
PEAK DATA: 21.64 N.M @ 89.60 MS; -20.19 N.M @ 198.88 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 931013

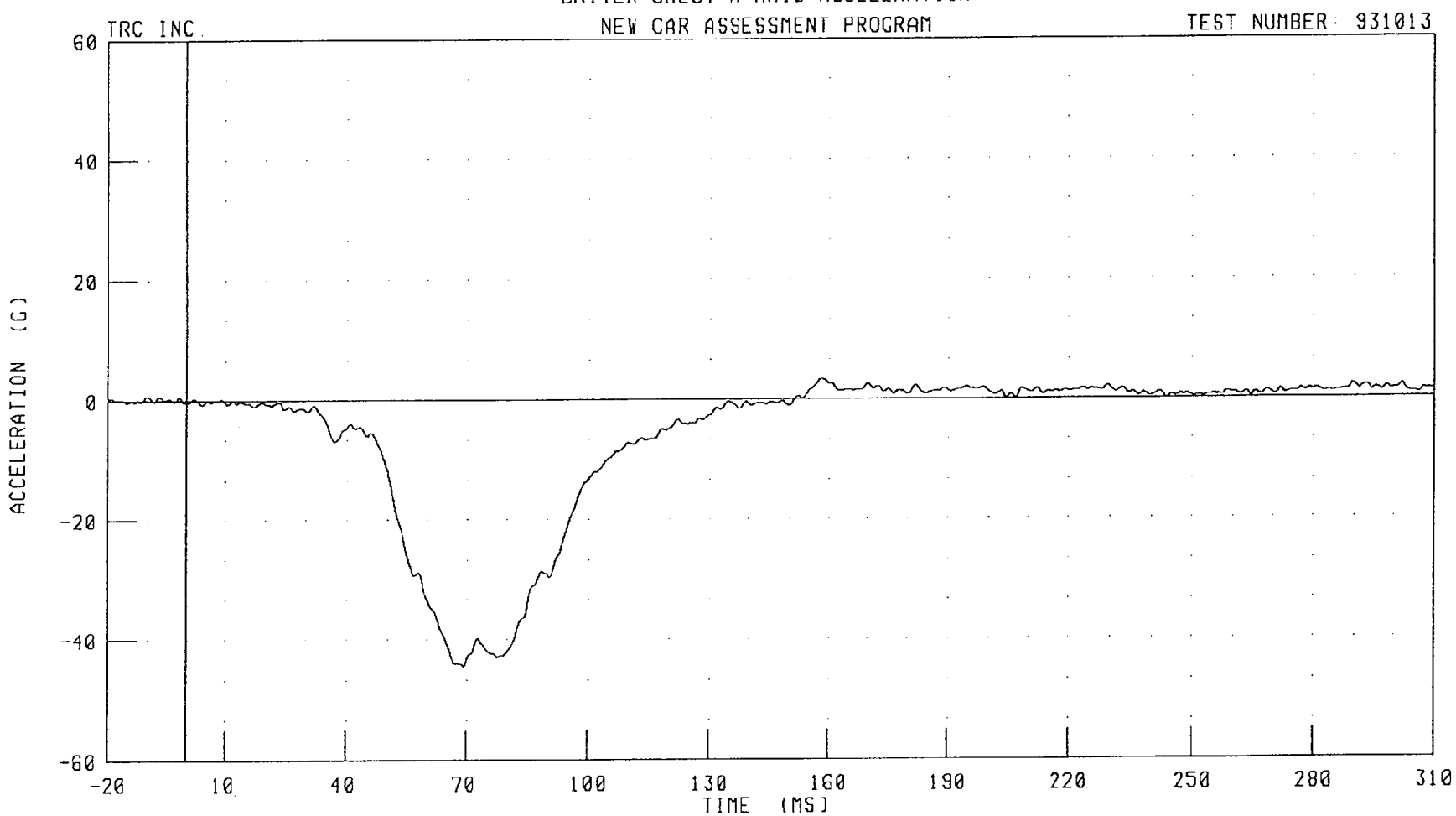


CHANNEL: NEKYM1 FILTER: CH CLASS 600 PEAK DATA: 5.59 N M @ 38.00 MS; -48.75 N·M @ 81.36 MS

931013

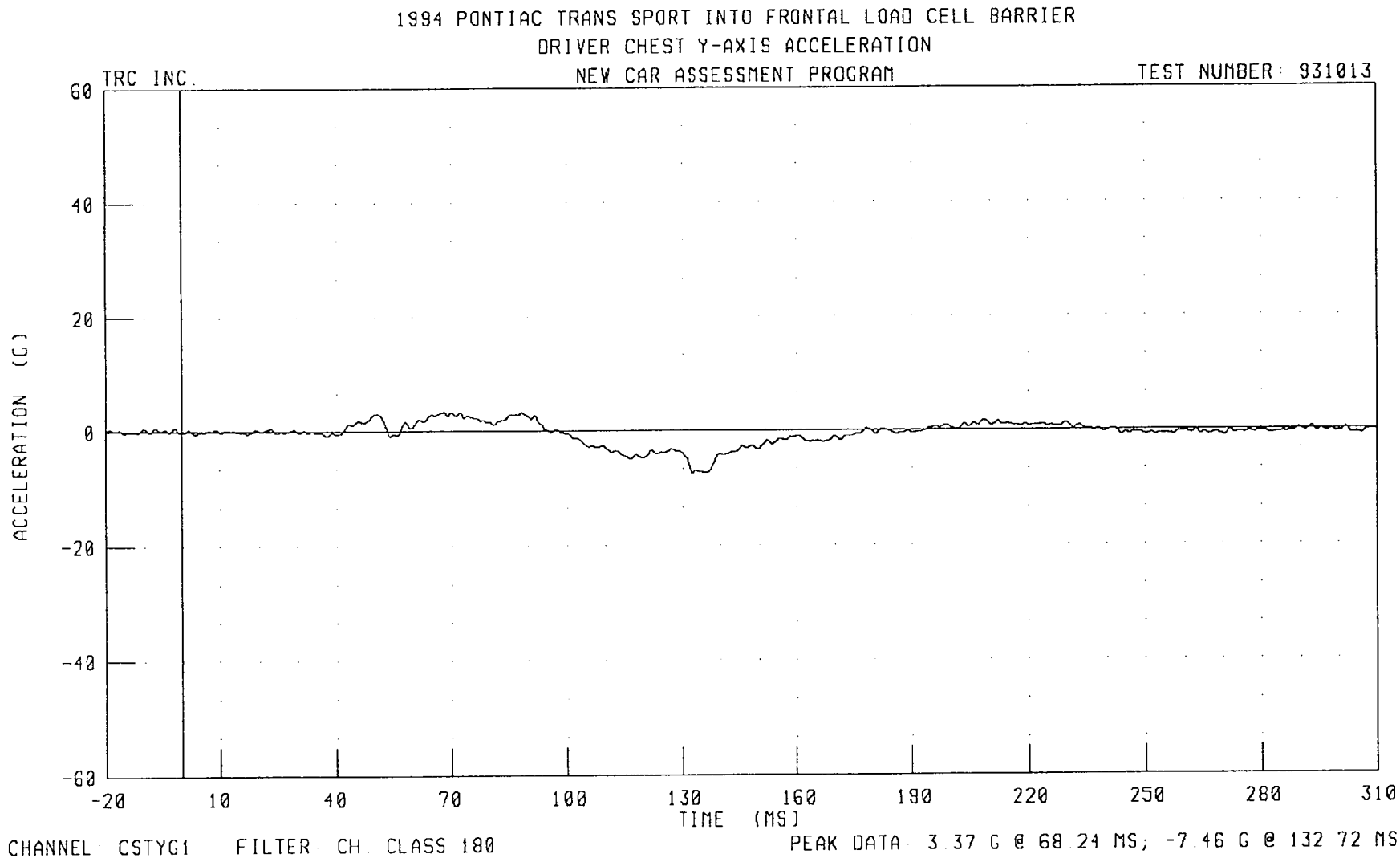

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
180
120
60
0
-60
-120
-180
TORQUE (N-M)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZM1
FILTER: CH. CLASS 600
PEAK DATA: 40.56 N-M @ 103.68 MS; -8.50 N-M @ 182.48 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG1 FILTER: CH. CLASS 180 PEAK DATA: 3.34 G @ 158.32 MS; -44.32 G @ 69.36 MS

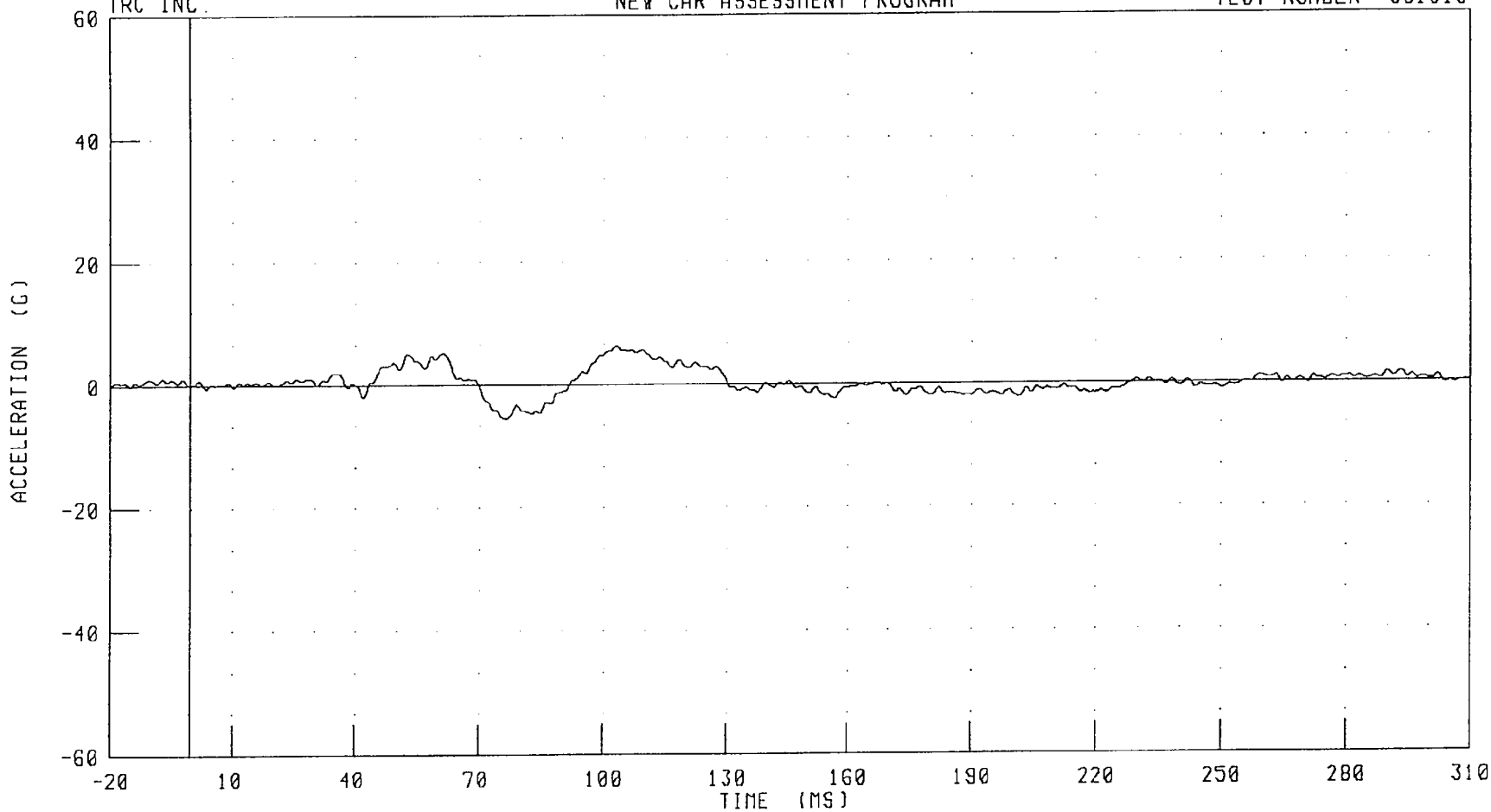
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL CSTYG1 FILTER CH CLASS 180
PEAK DATA 3.37 G @ 68.24 MS; -7.46 G @ 132.72 MS

931013

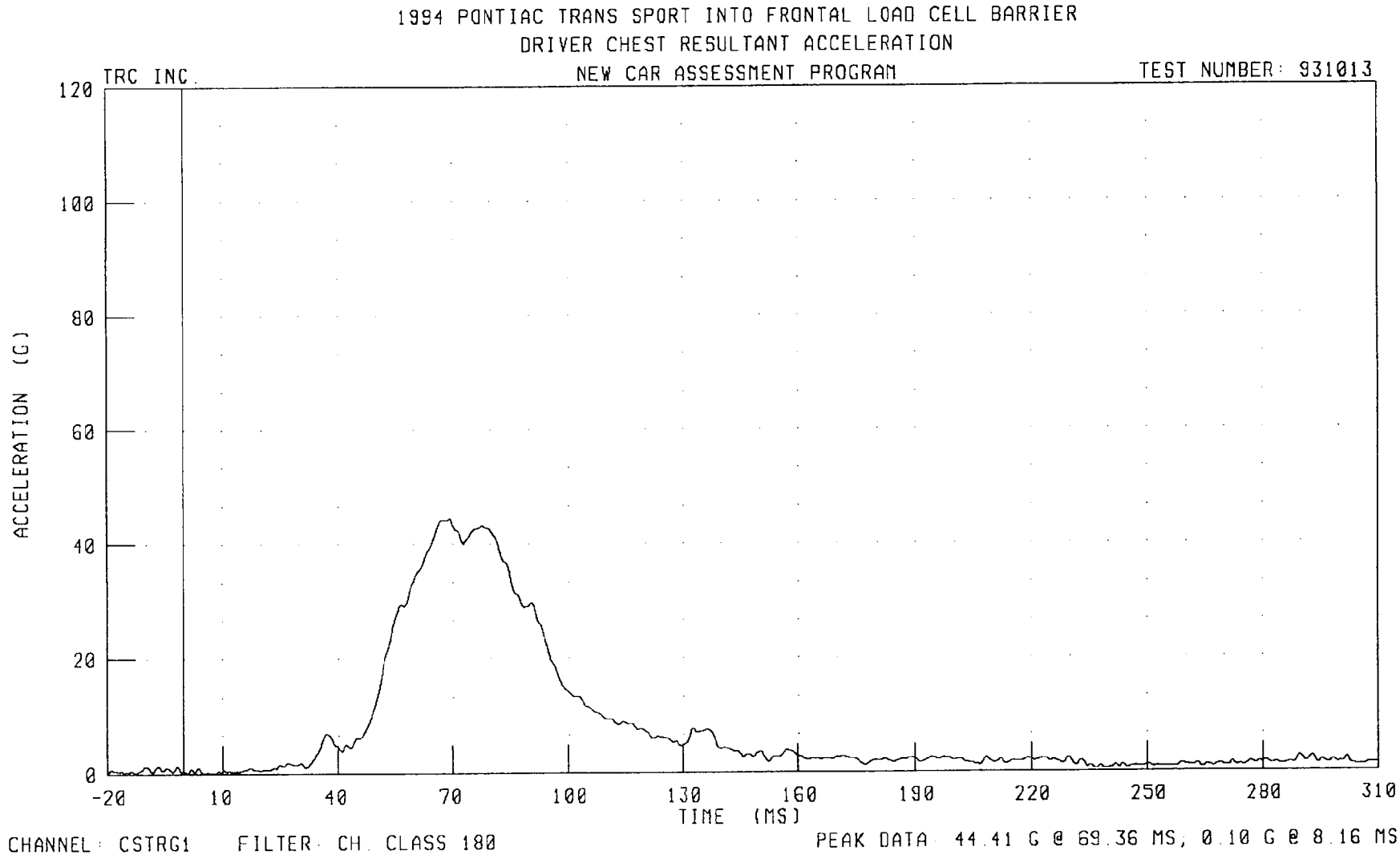
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TRC INC. TEST NUMBER: 931013

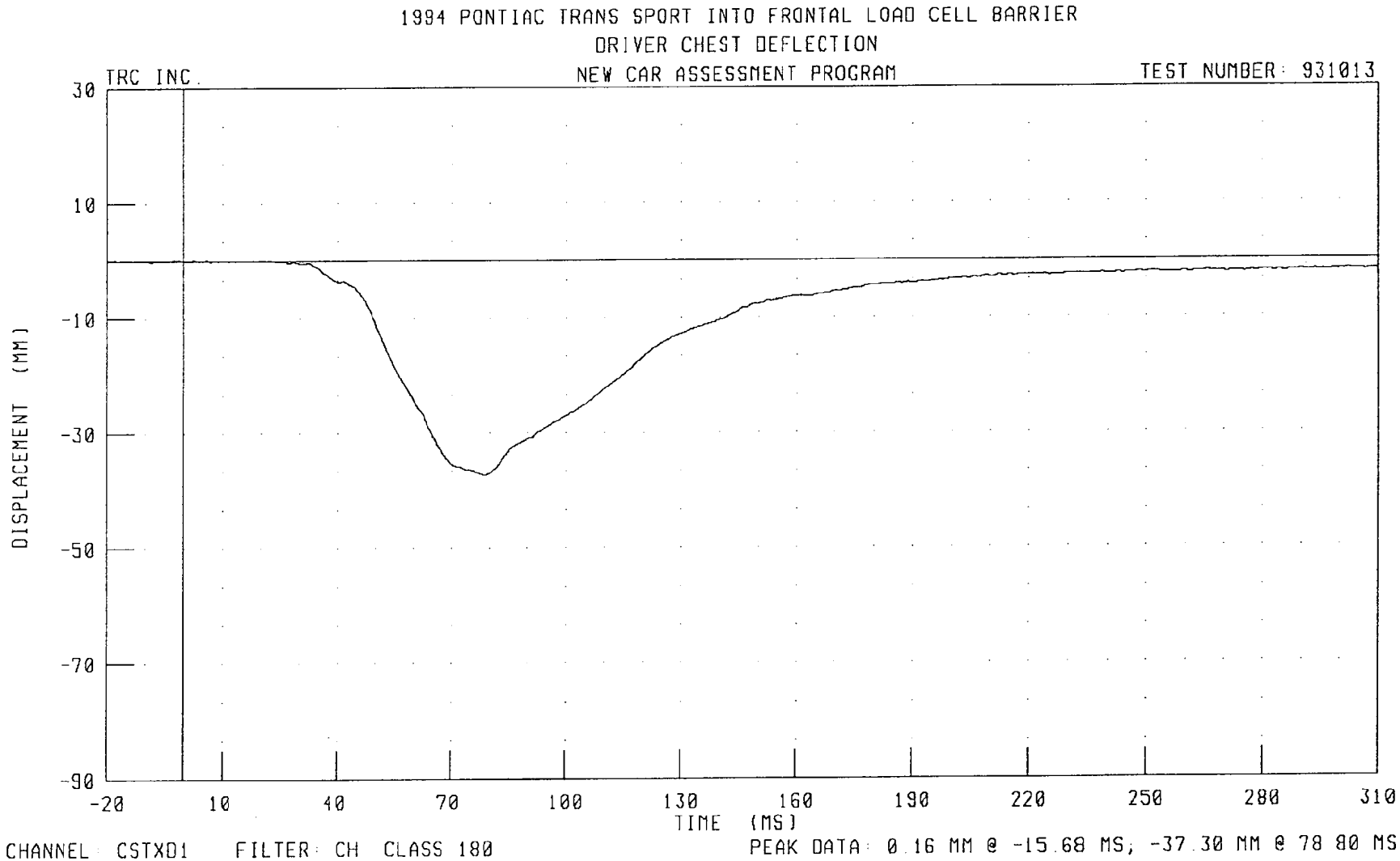


CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 6.35 G @ 103.04 MS; -5.52 G @ 76.40 MS

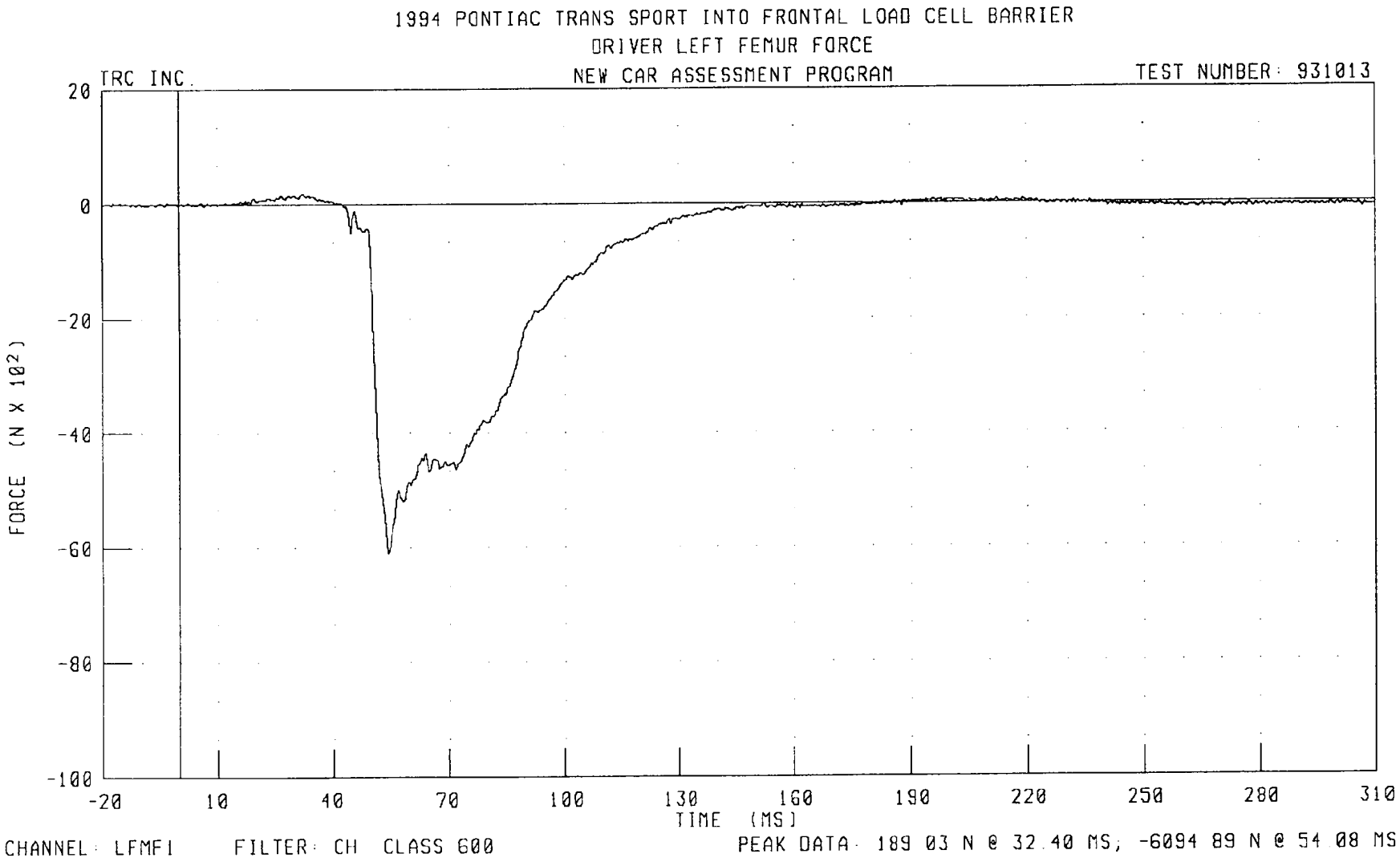
931013

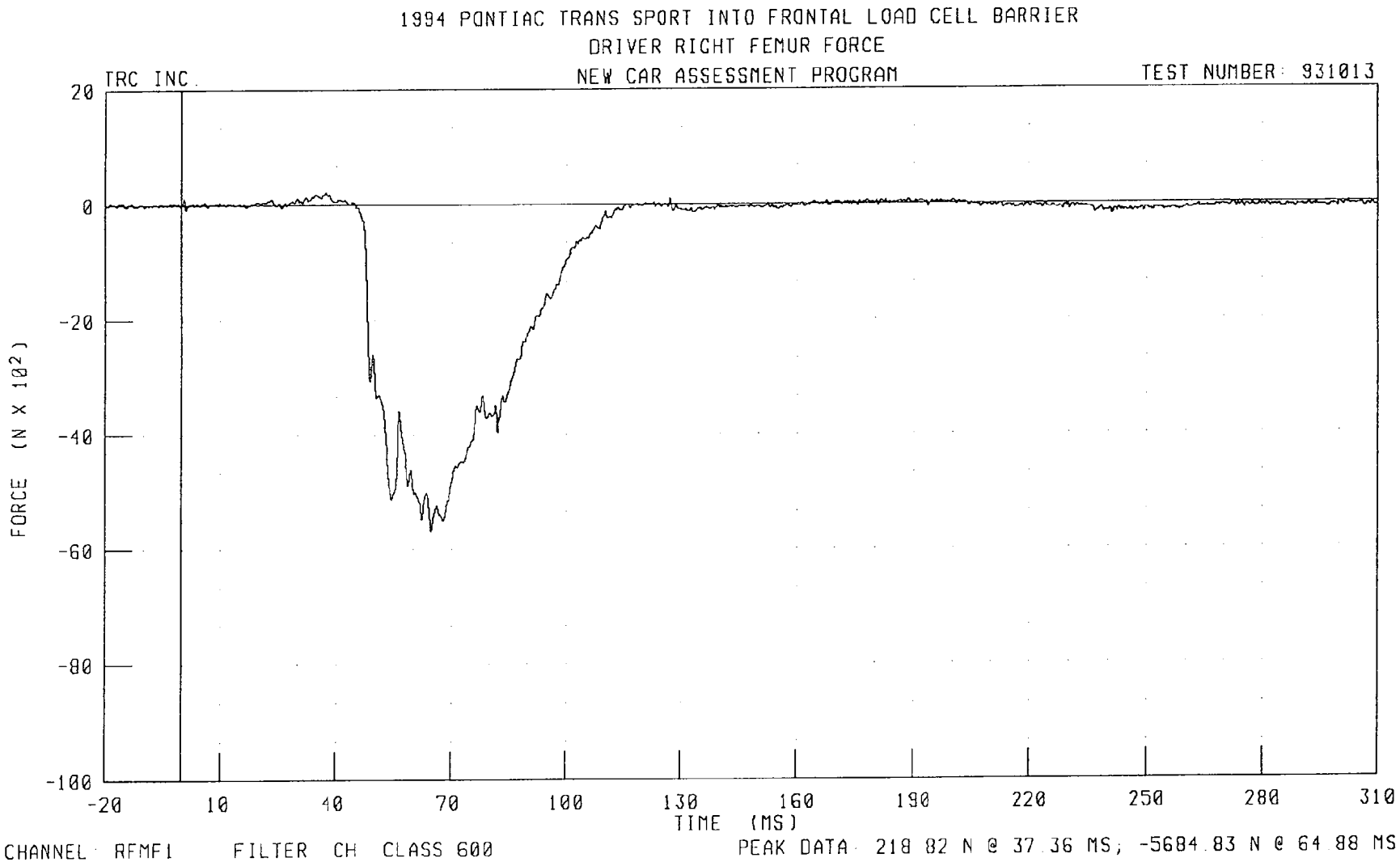

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG1
FILTER: CH. CLASS 180
PEAK DATA: 44.41 G @ 69.36 MS, 0.10 G @ 8.16 MS

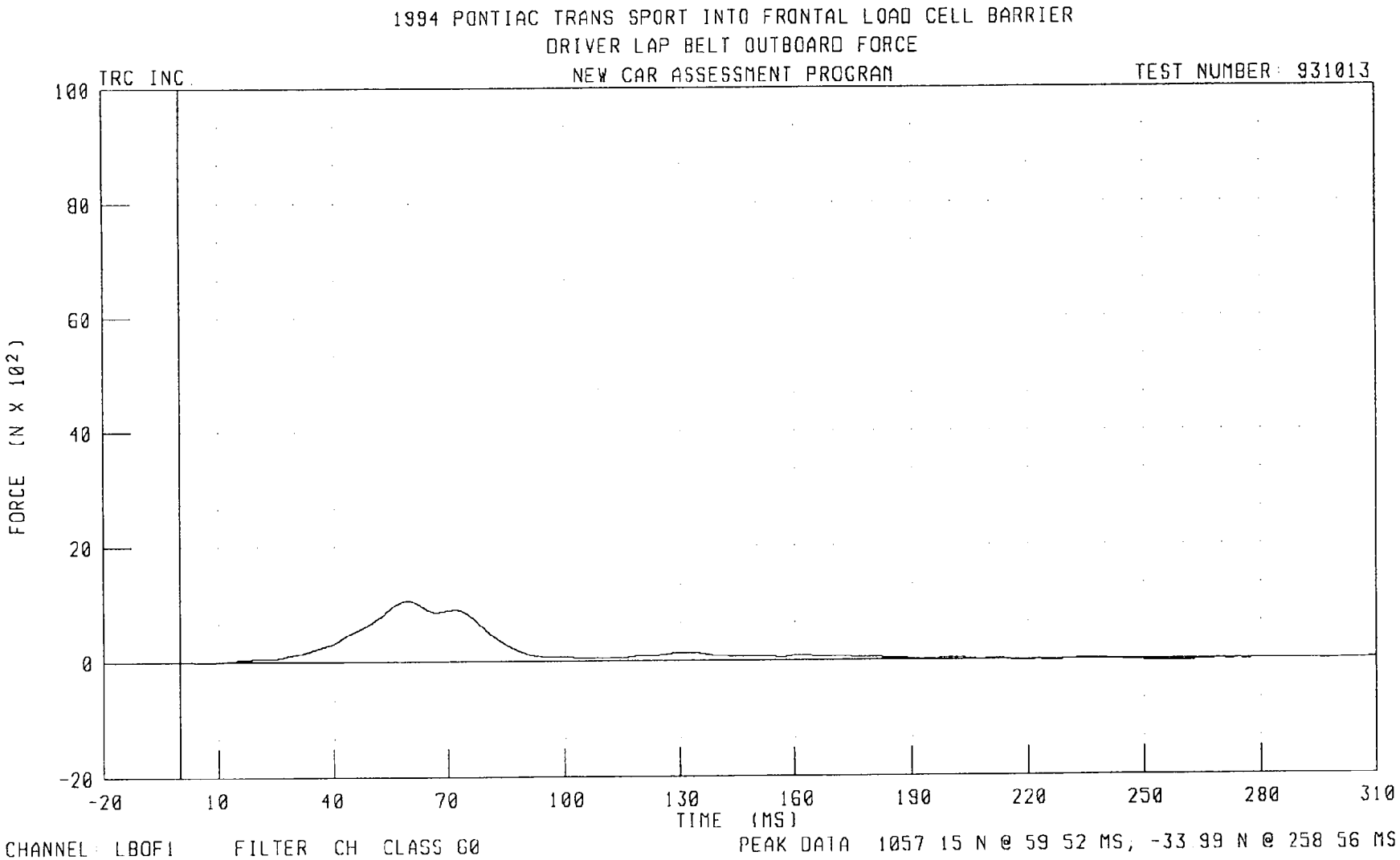
931013

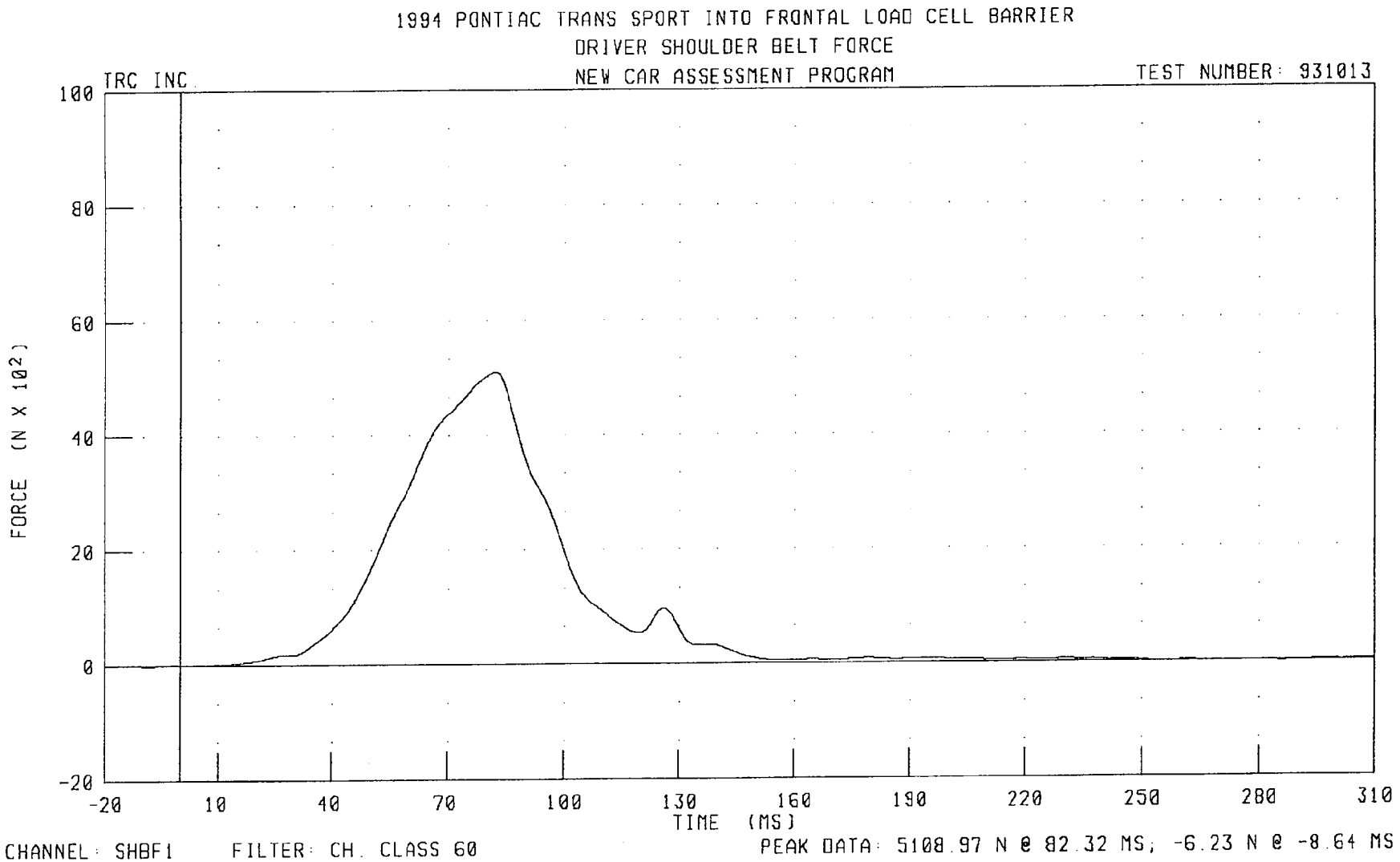

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
30
10
-10
-30
-50
-70
-90
DISPLACEMENT (MM)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXD1 FILTER: CH CLASS 180
PEAK DATA: 0.16 MM @ -15.68 MS; -37.30 MM @ 78.80 MS

931013

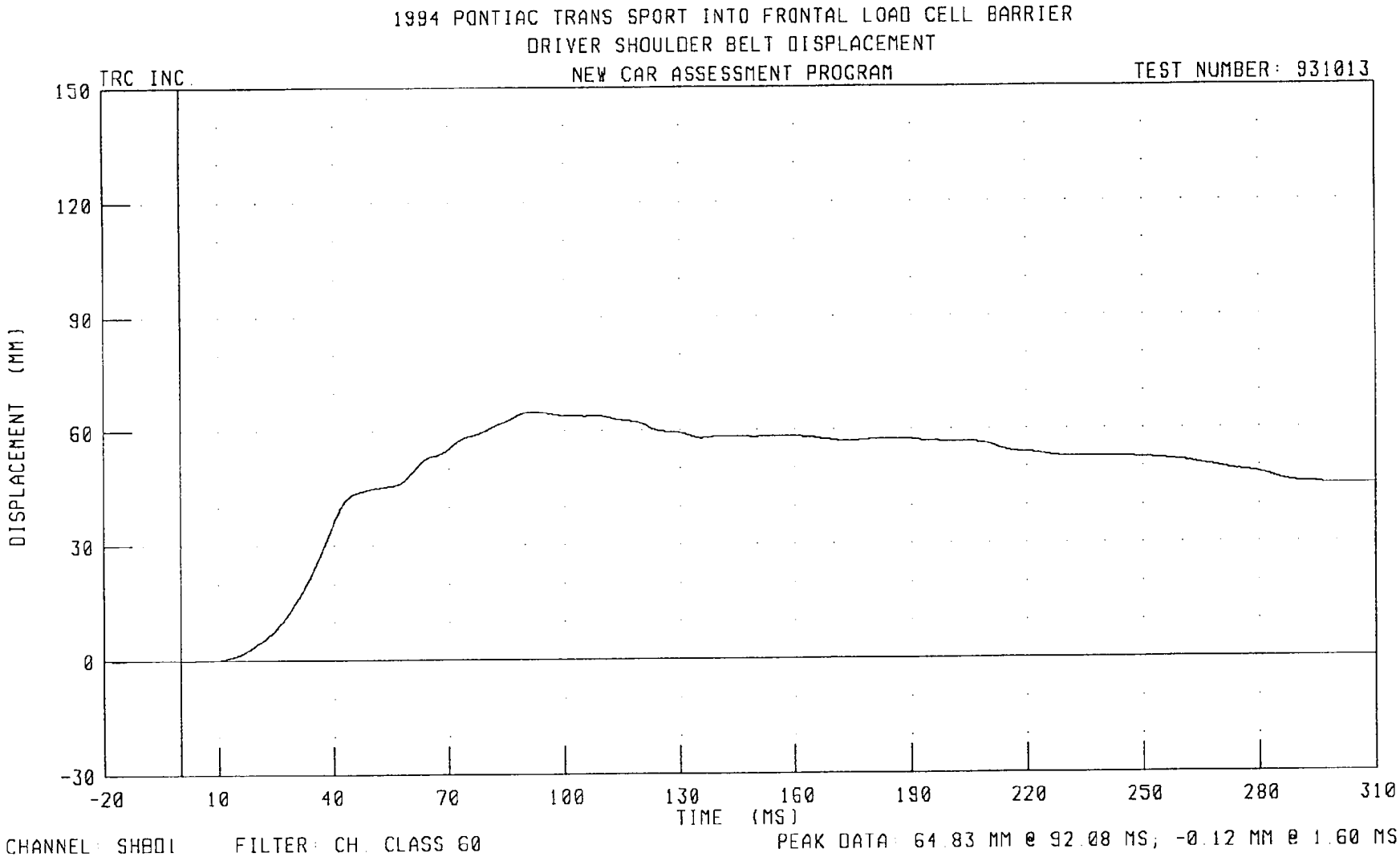

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
20
0
-20
-40
-60
-80
-100
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LFMFI
FILTER: CH CLASS 600
PEAK DATA: 189.03 N @ 32.40 MS, -6094.89 N @ 54.08 MS

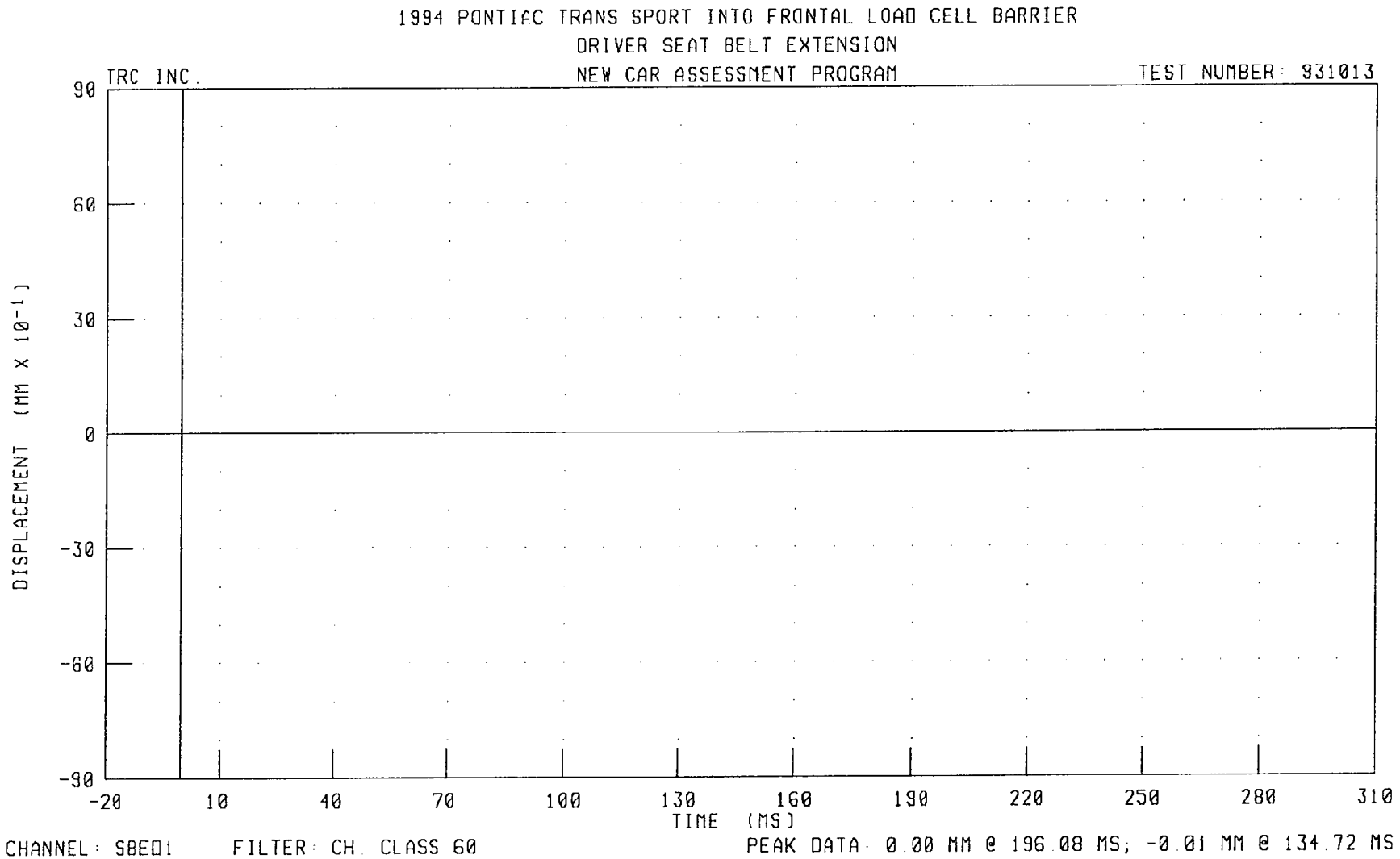

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
20
0
-20
-40
-60
-80
-100
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL RFMF1
FILTER CH CLASS 600
PEAK DATA 218.82 N @ 37.36 MS; -5684.83 N @ 64.88 MS

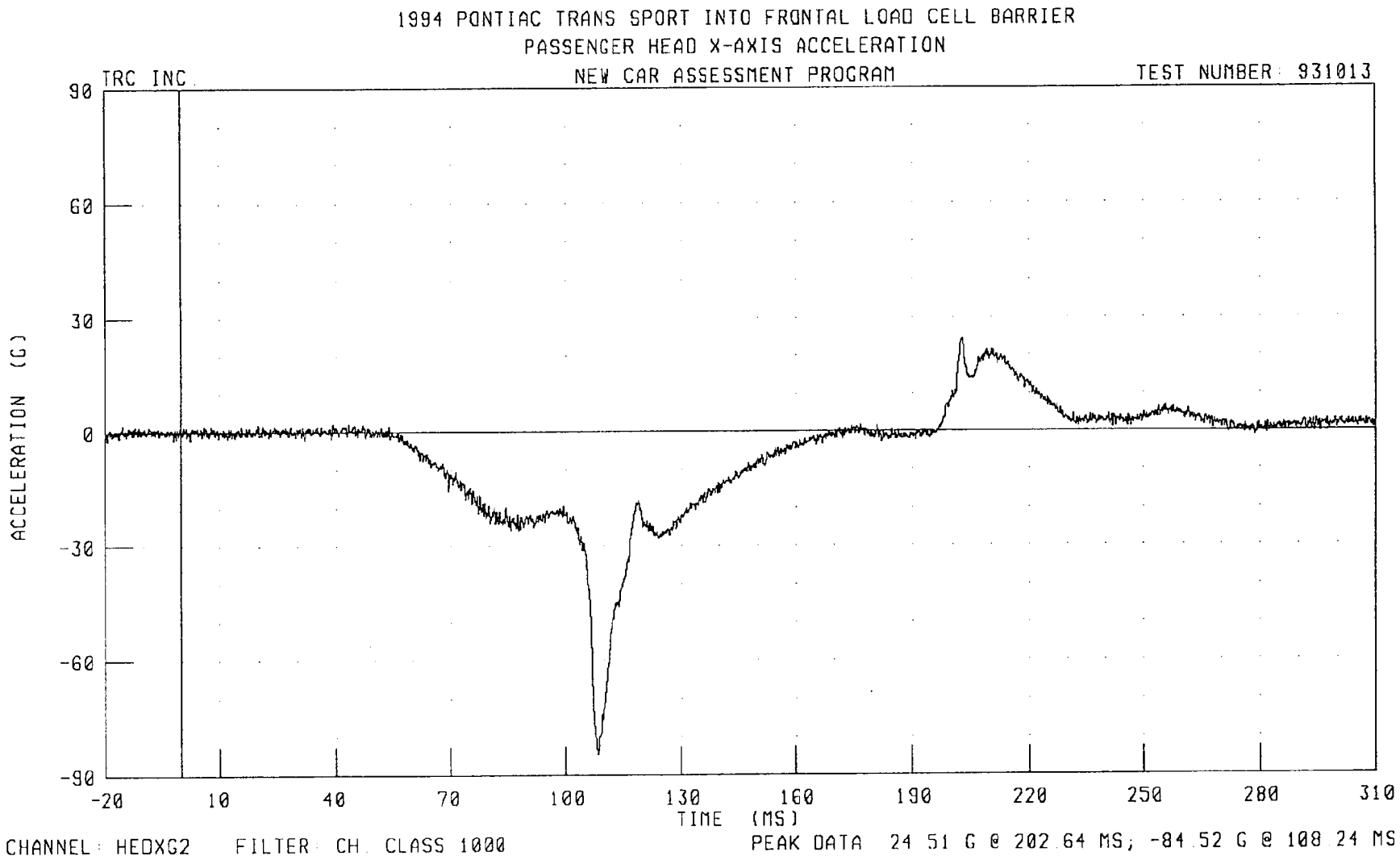

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
100
80
60
40
20
0
-20
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LBOF1
FILTER CH CLASS 60
PEAK DATA 1057.15 N @ 59.52 MS, -33.99 N @ 258.56 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
FORCE (N X 10²)
100
80
60
40
20
0
-20
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SHBF1
FILTER: CH. CLASS 60
PEAK DATA: 5108.97 N @ 82.32 MS; -6.23 N @ -8.64 MS

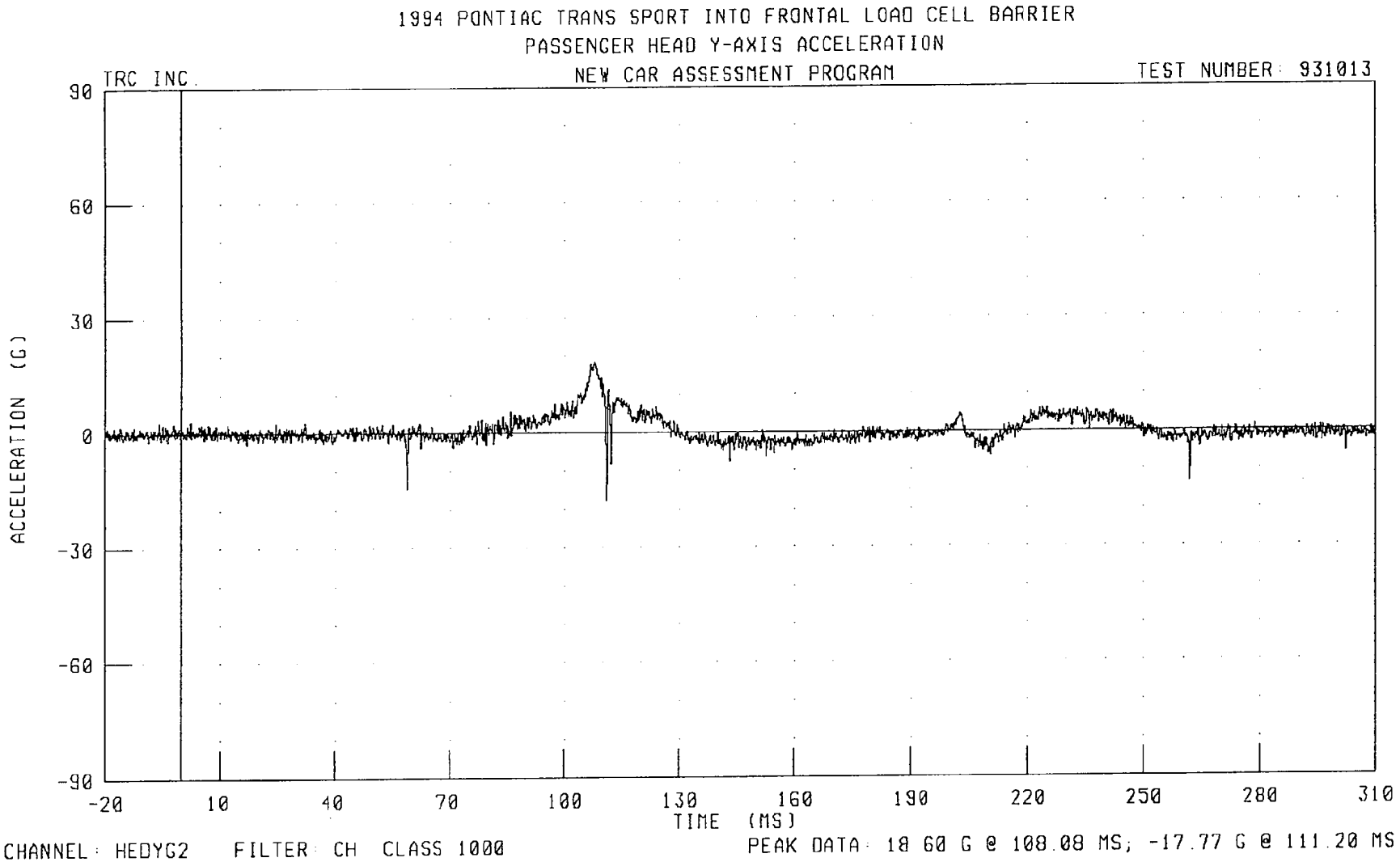
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
DISPLACEMENT (MM)
150
120
90
60
30
0
-30
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SHB01
FILTER: CH CLASS 60
PEAK DATA: 64.83 MM @ 92.08 MS; -0.12 MM @ 1.60 MS

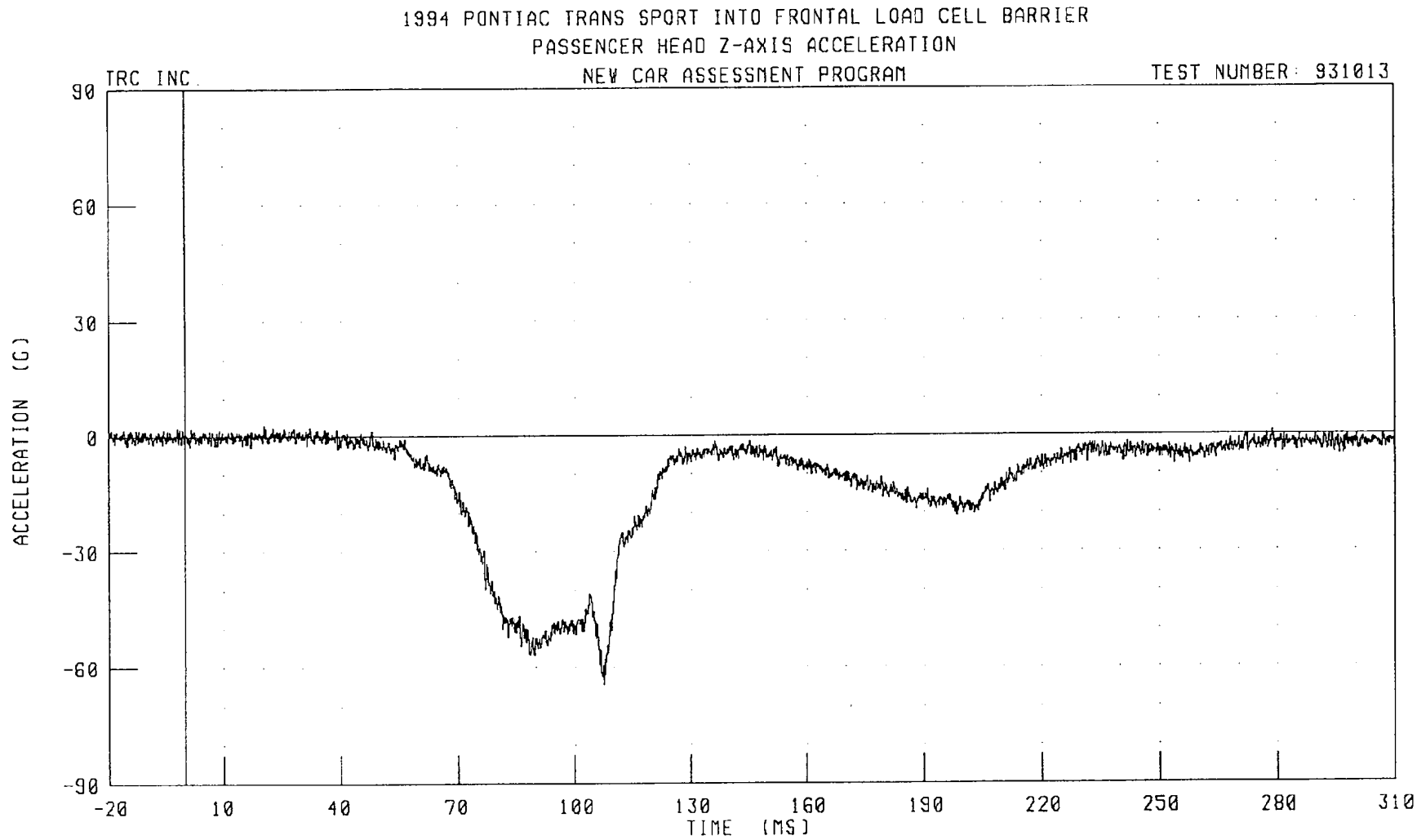

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
DISPLACEMENT (MM X 10-1)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SBE01
FILTER: CH CLASS 60
PEAK DATA: 0.00 MM @ 196.08 MS; -0.01 MM @ 134.72 MS

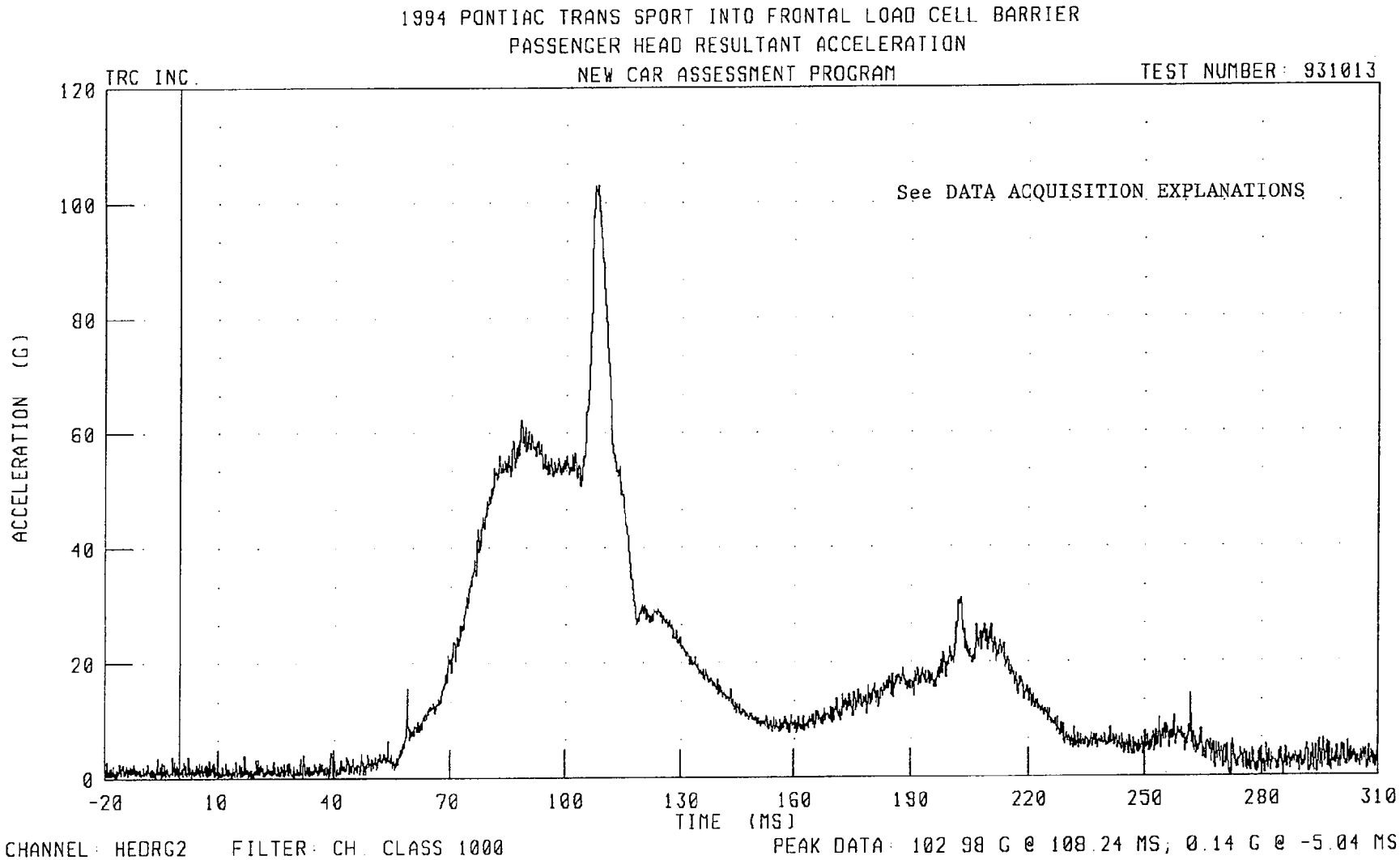

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG2
FILTER: CH. CLASS 1000
PEAK DATA 24.51 G @ 202.64 MS; -84.52 G @ 108.24 MS

931013

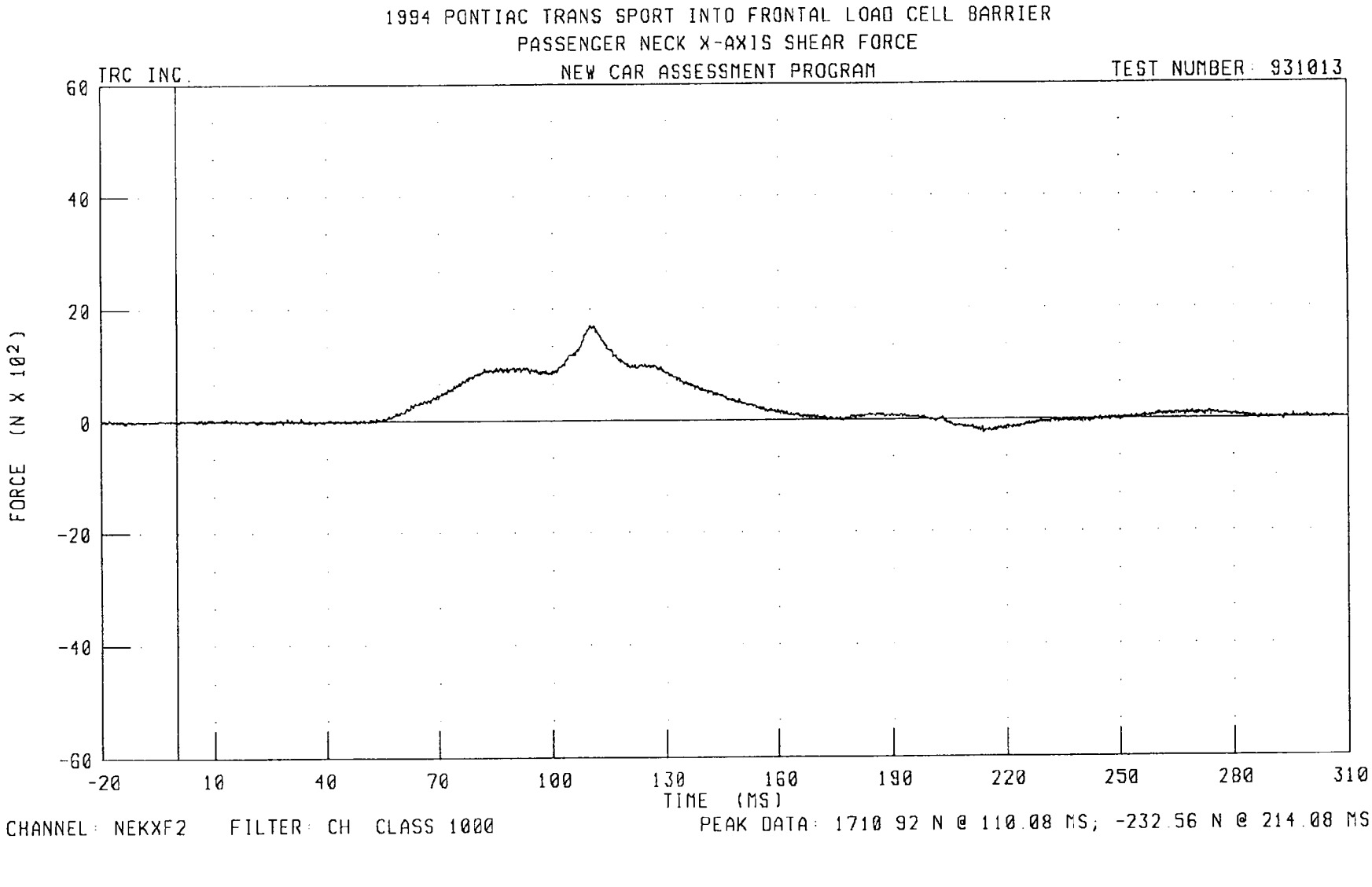

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG2 FILTER: CH CLASS 1000
PEAK DATA: 18 60 G @ 108.08 MS; -17.77 G @ 111.20 MS

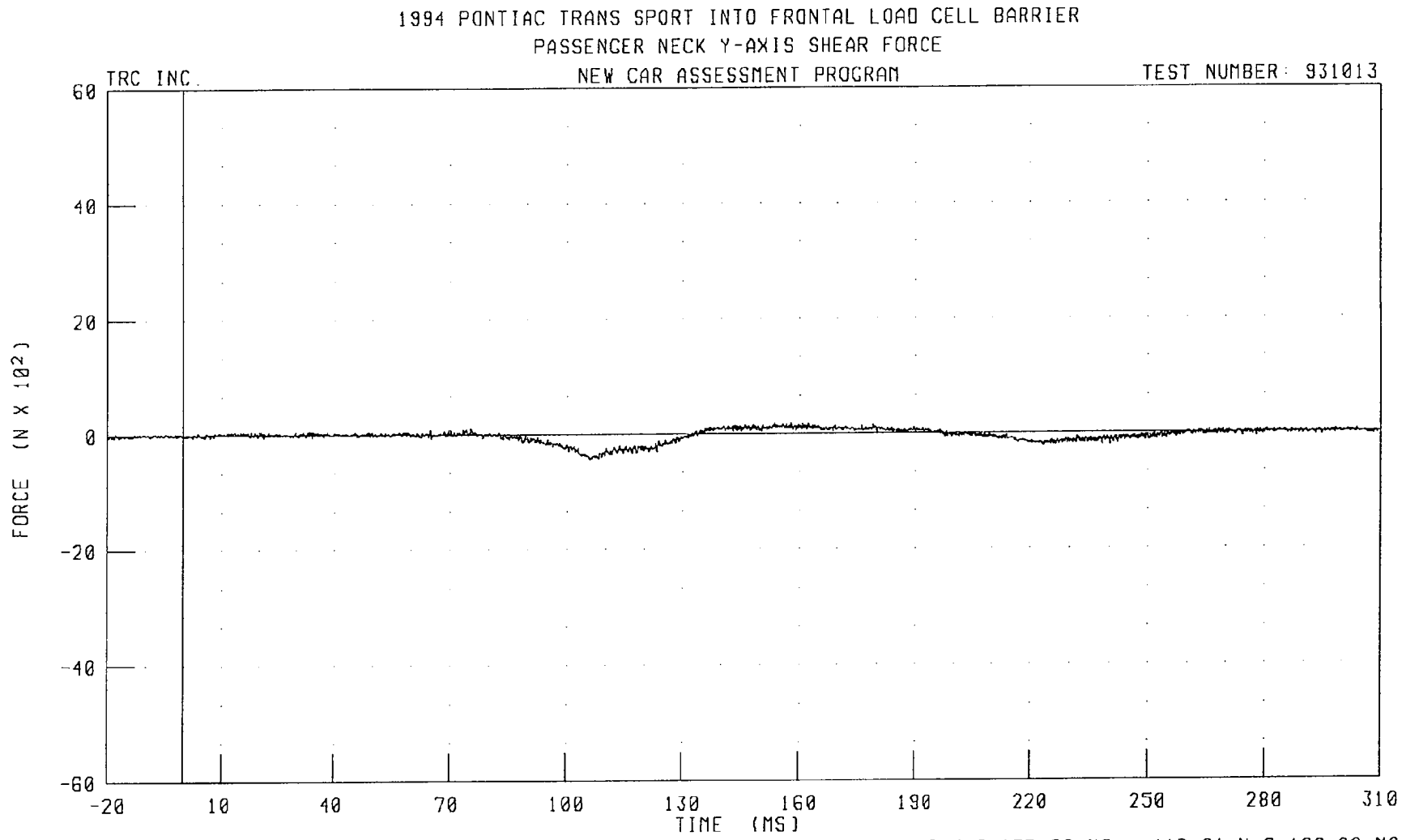
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
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: 2.80 G @ 20.48 MS; -64.40 G @ 107.60 MS

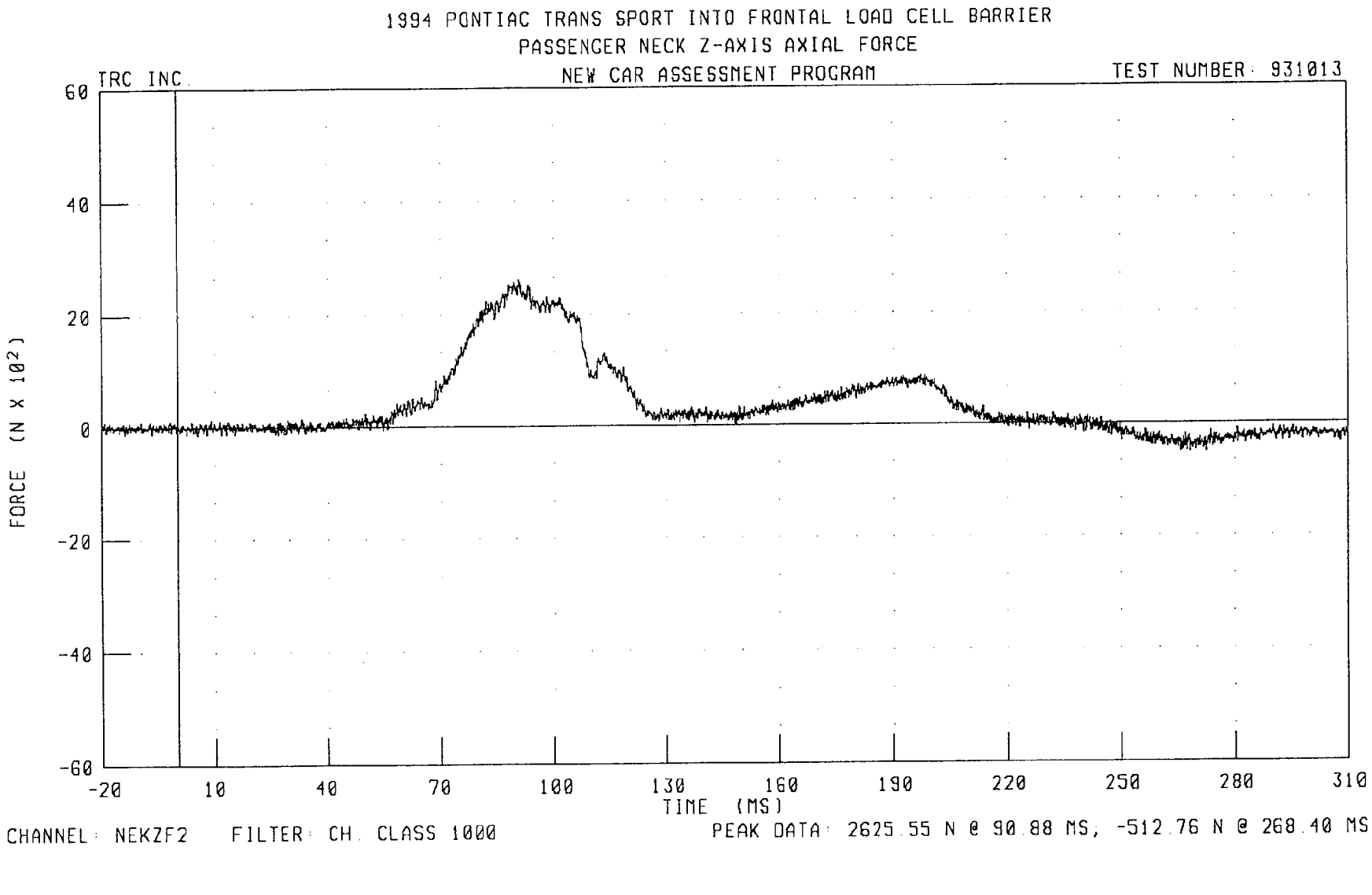

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
See DATA ACQUISITION EXPLANATIONS
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDRG2 FILTER: CH CLASS 1000
PEAK DATA: 102.98 G @ 108.24 MS; 0.14 G @ -5.04 MS

931013

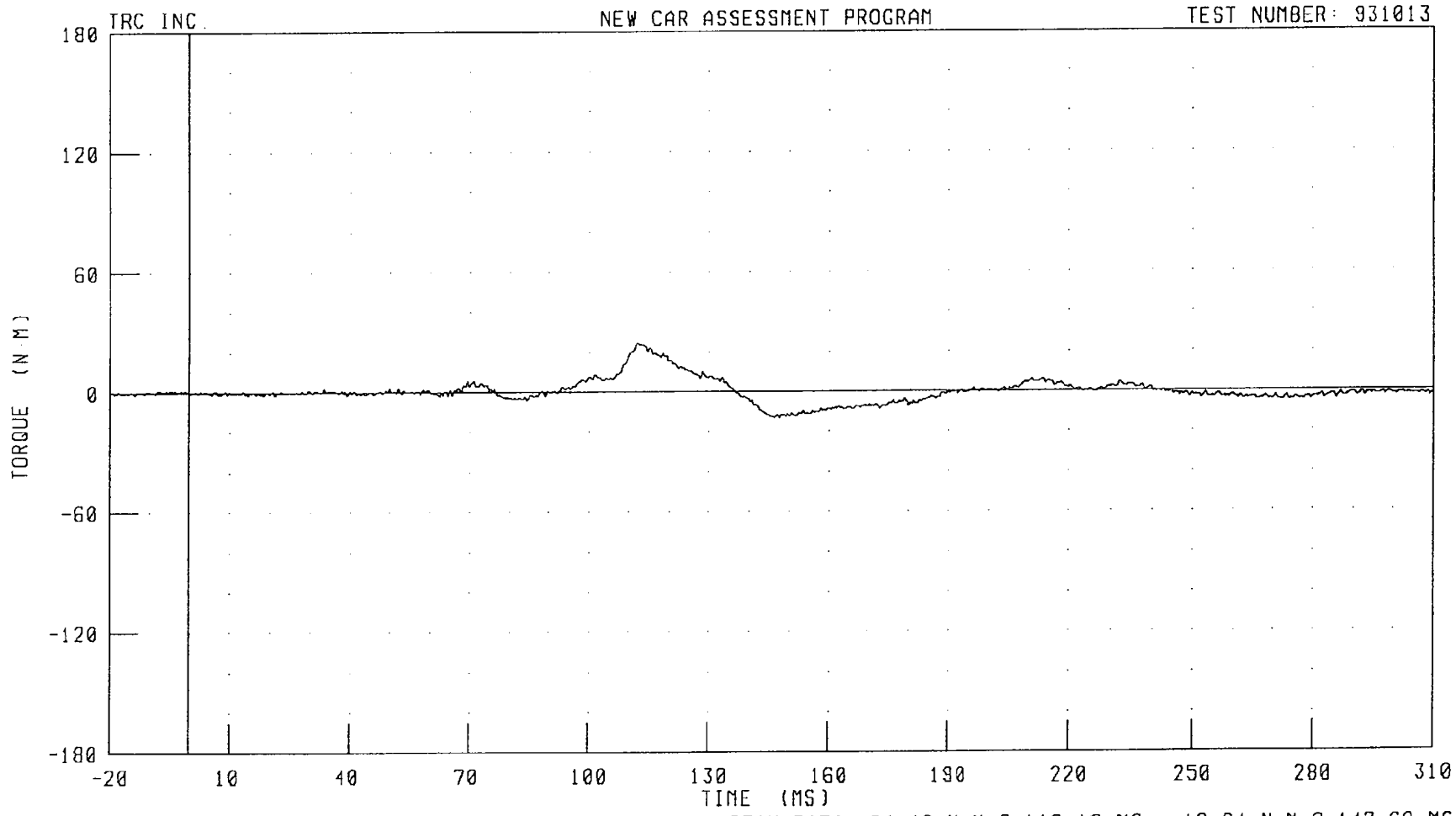

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
FORCE (N X 10²)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKXF2 FILTER: CH CLASS 1000
PEAK DATA: 1710.92 N @ 110.08 MS; -232.56 N @ 214.08 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYF2
FILTER: CH. CLASS 1000
PEAK DATA: 192.95 N @ 157.92 MS; -442.91 N @ 106.00 MS

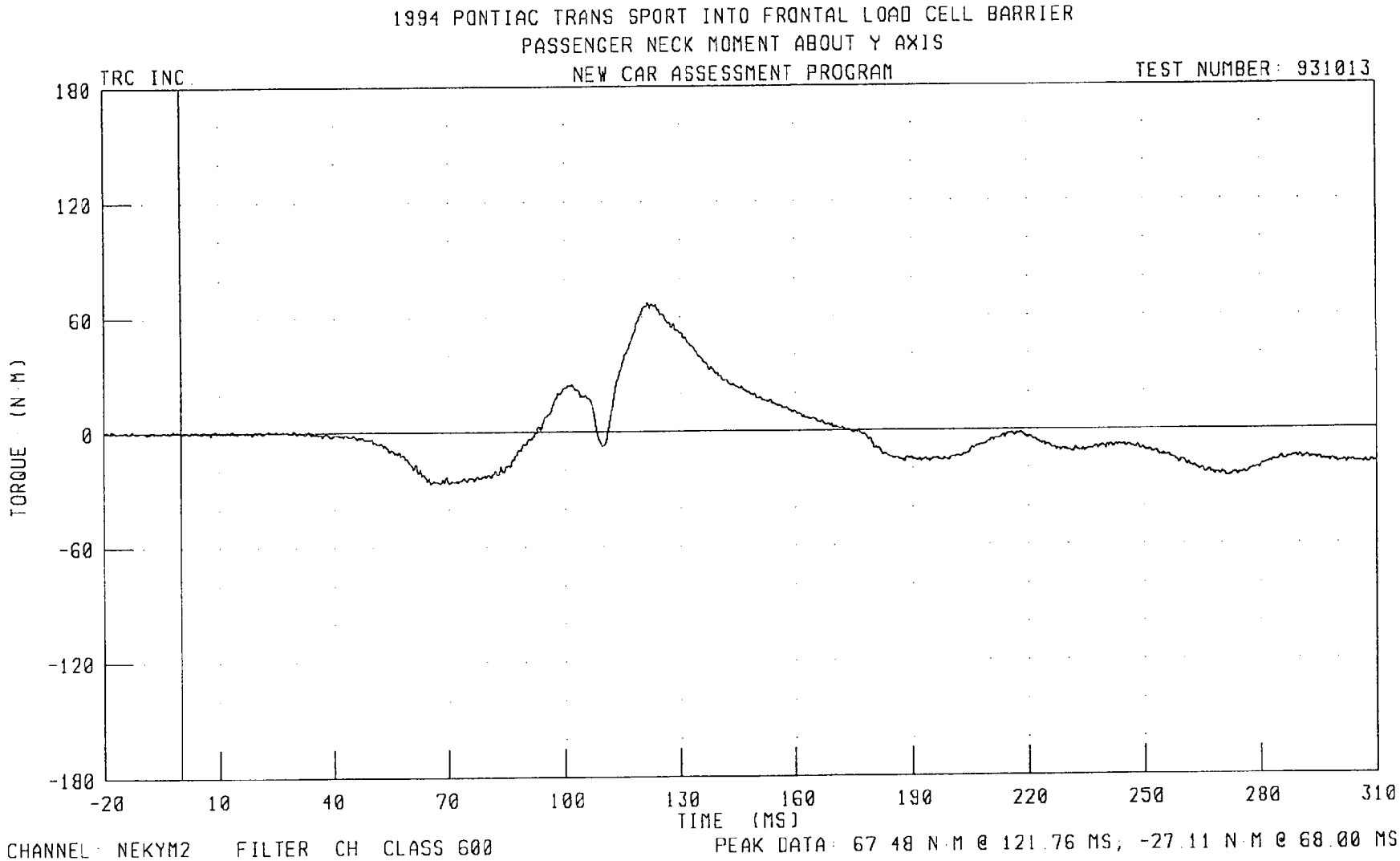
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZF2 FILTER: CH. CLASS 1000
PEAK DATA: 2625.55 N @ 90.88 MS, -512.76 N @ 268.40 MS

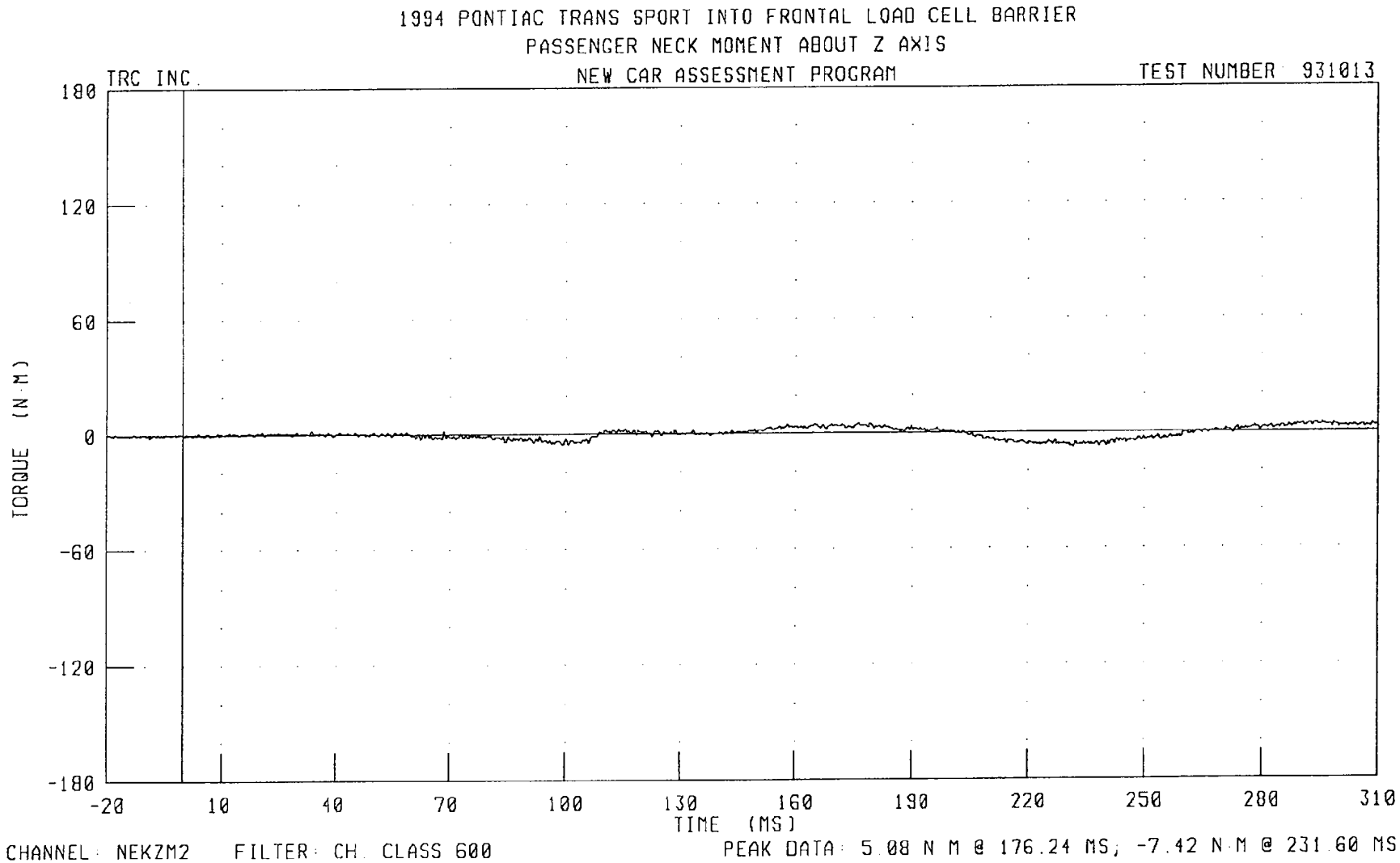
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS



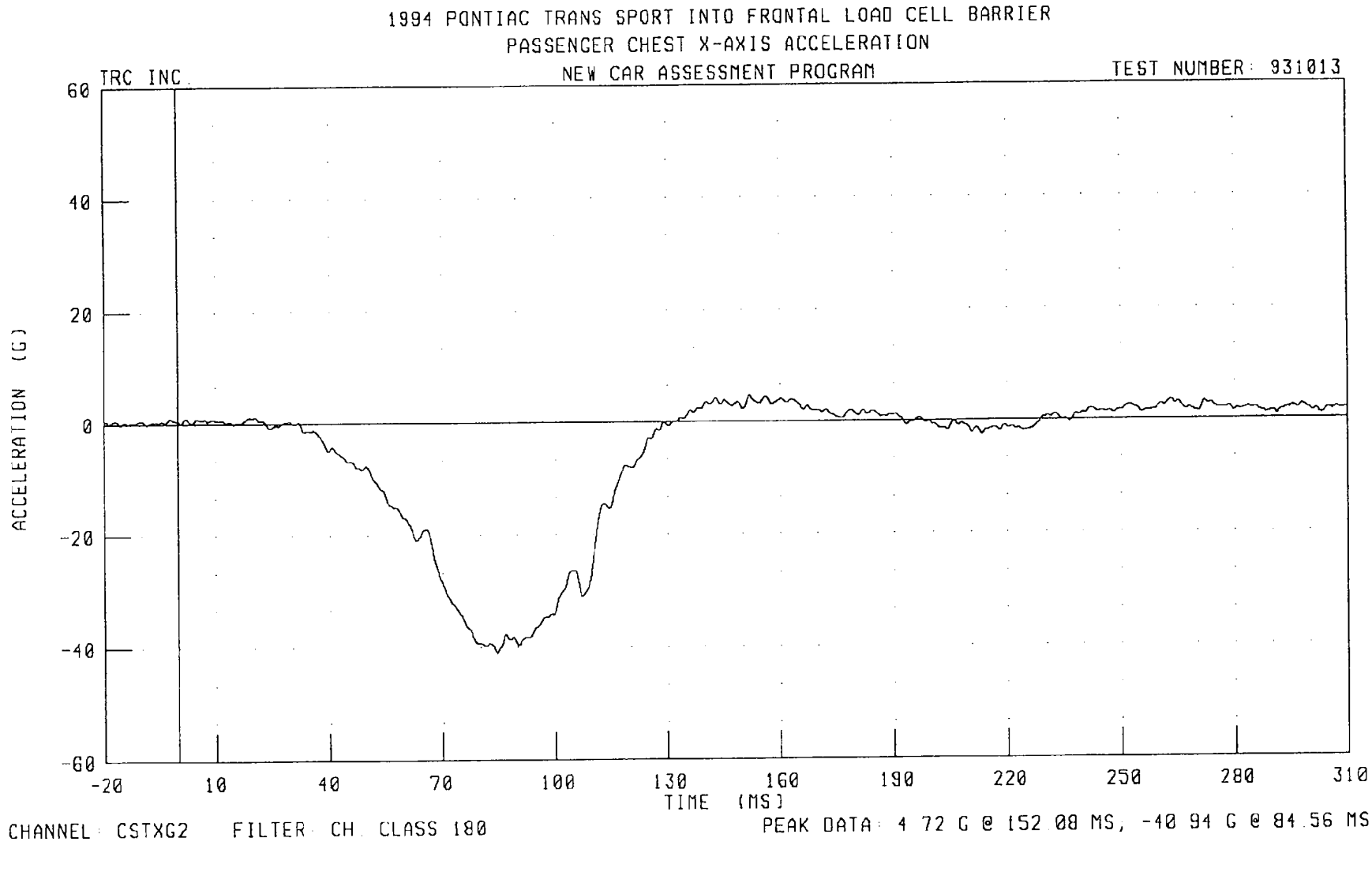
CHANNEL: NEKXM2 FILTER: CH. CLASS 600 PEAK DATA: 24.48 N-M @ 112.16 MS; -12.94 N-M @ 147.68 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
180
120
60
0
-60
-120
-180
TORQUE (N-M)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYM2 FILTER CH CLASS 600
PEAK DATA: 67.48 N-M @ 121.76 MS, -27.11 N-M @ 68.00 MS

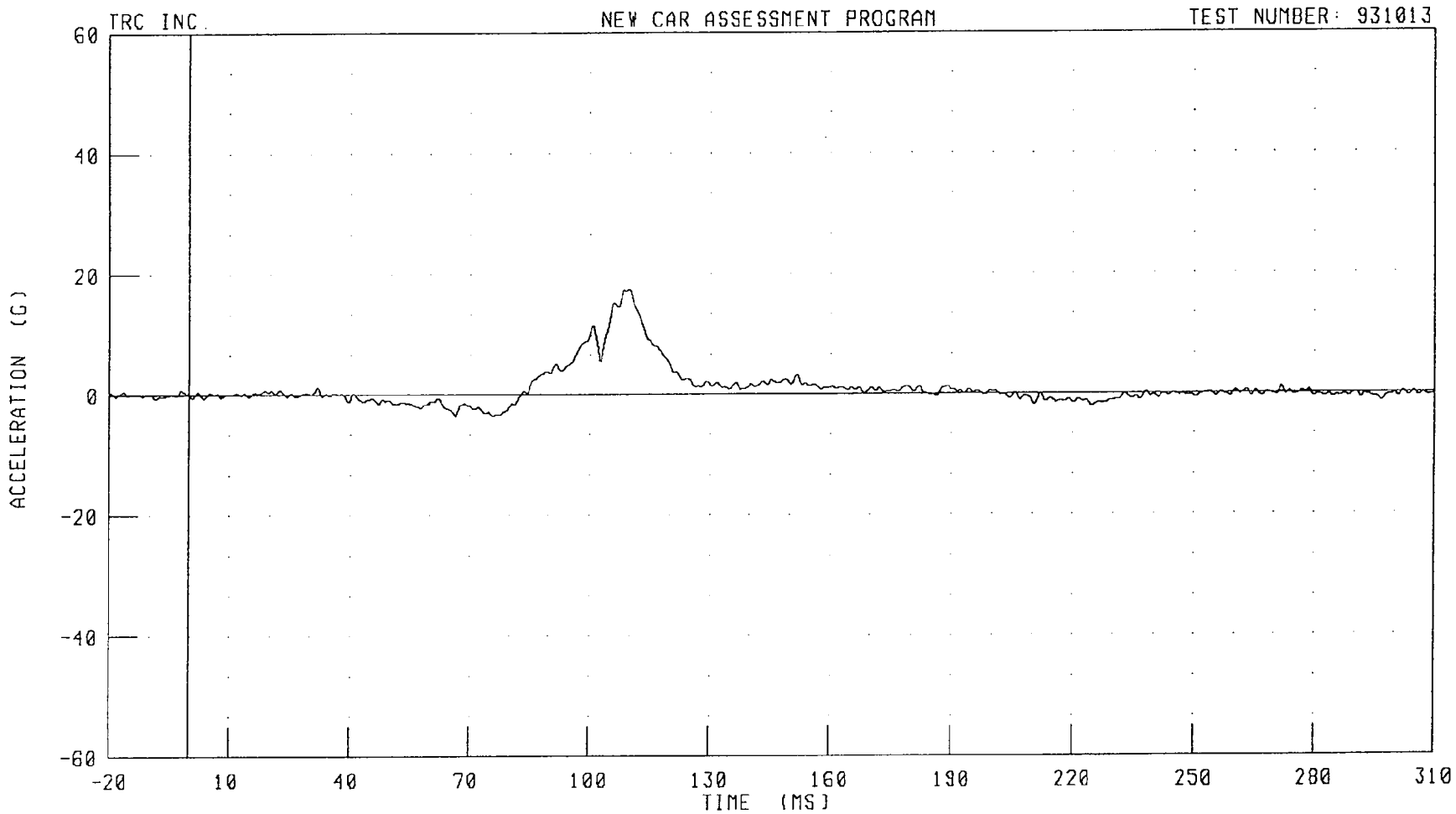
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
180
120
60
0
-60
-120
-180
TORQUE (N-M)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZM2
FILTER: CH. CLASS 600
PEAK DATA: 5.08 N M @ 176.24 MS; -7.42 N-M @ 231.60 MS

931013

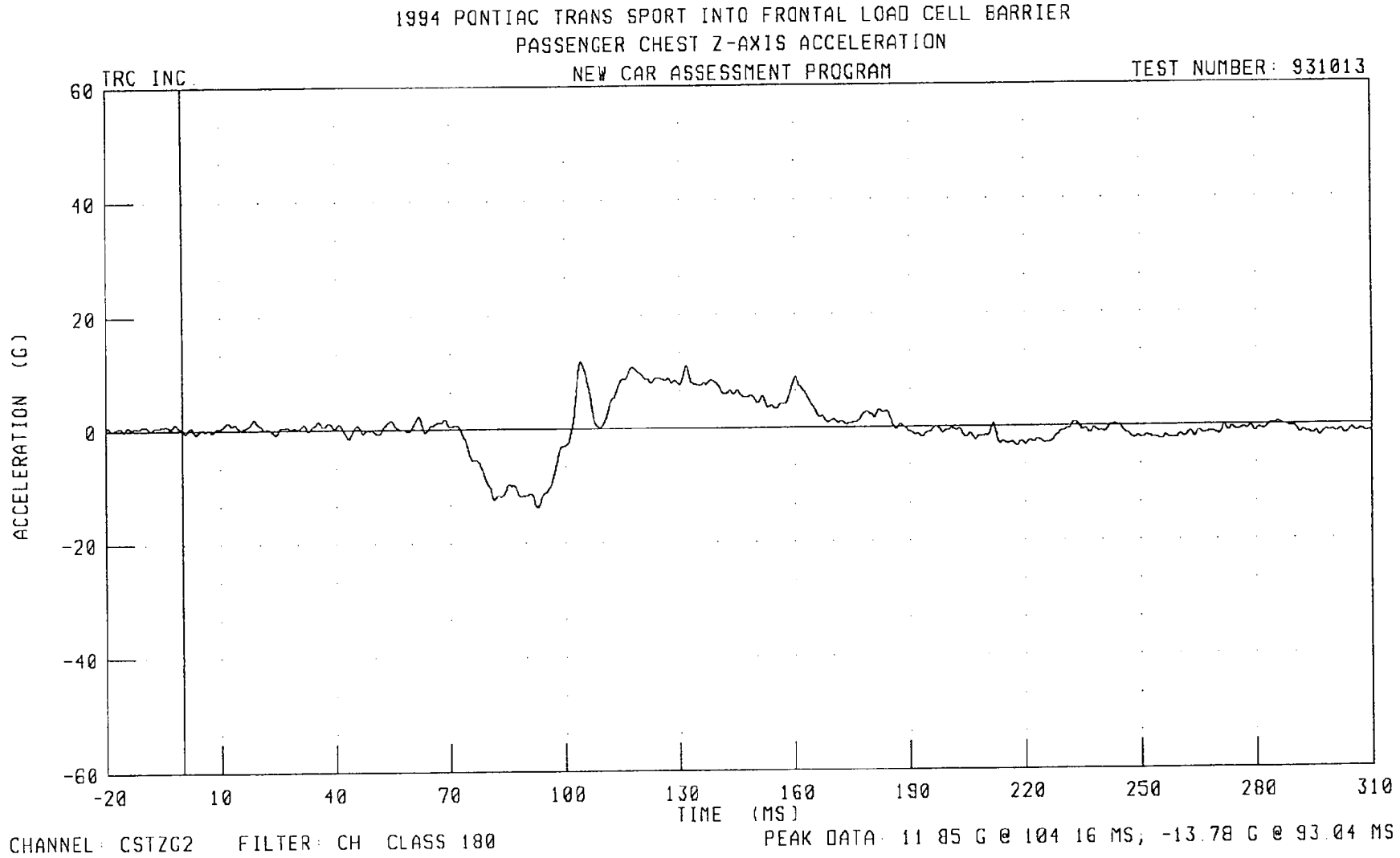

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG2 FILTER: CH. CLASS 180
PEAK DATA: 4.72 G @ 152.08 MS, -40.94 G @ 84.56 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION



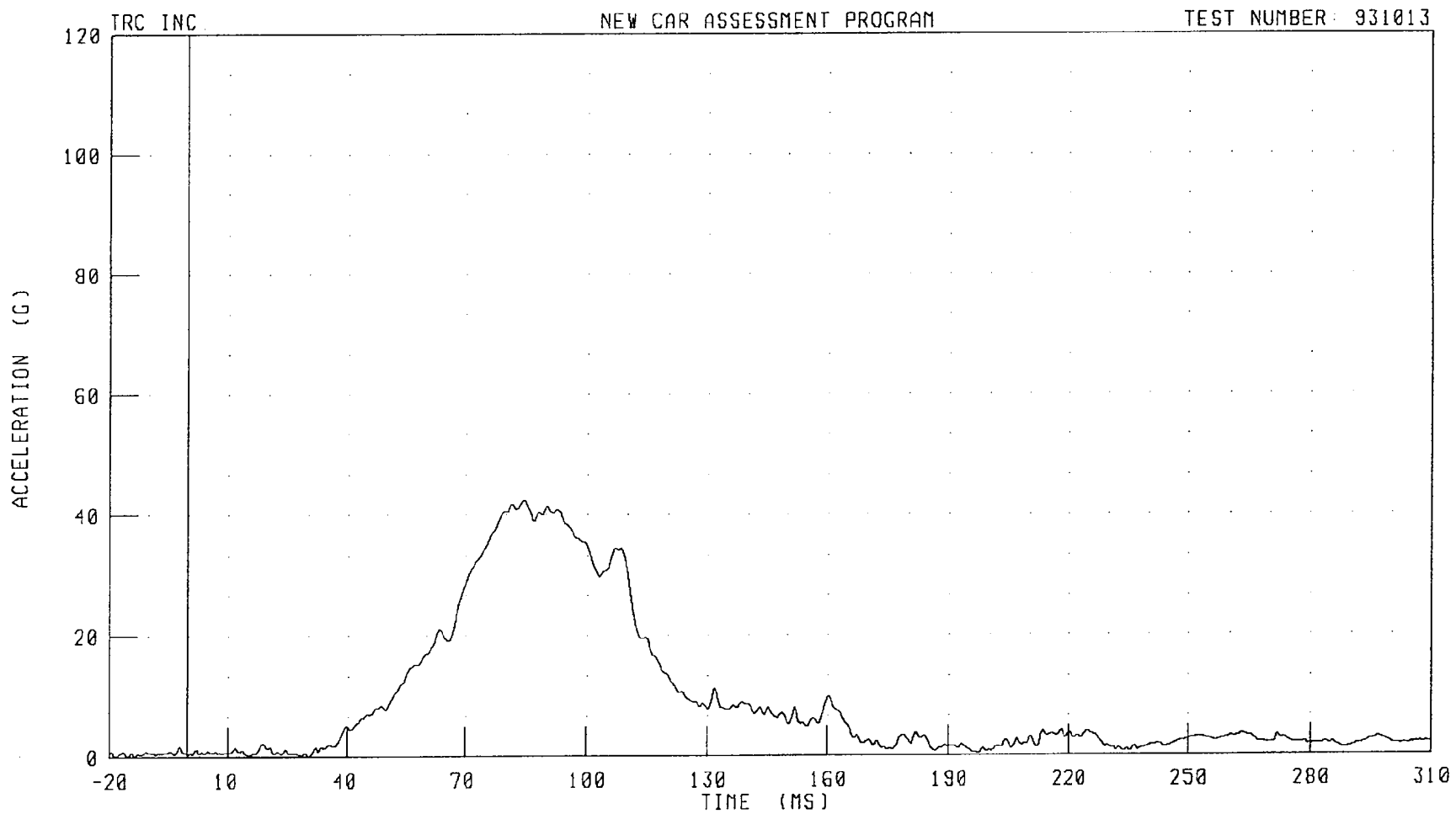
CHANNEL: CSTYG2 FILTER: CH. CLASS 180 PEAK DATA: 17.49 G @ 109.92 MS; -3.59 G @ 75.92 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
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: 11.85 G @ 104.16 MS; -13.78 G @ 93.04 MS

931013

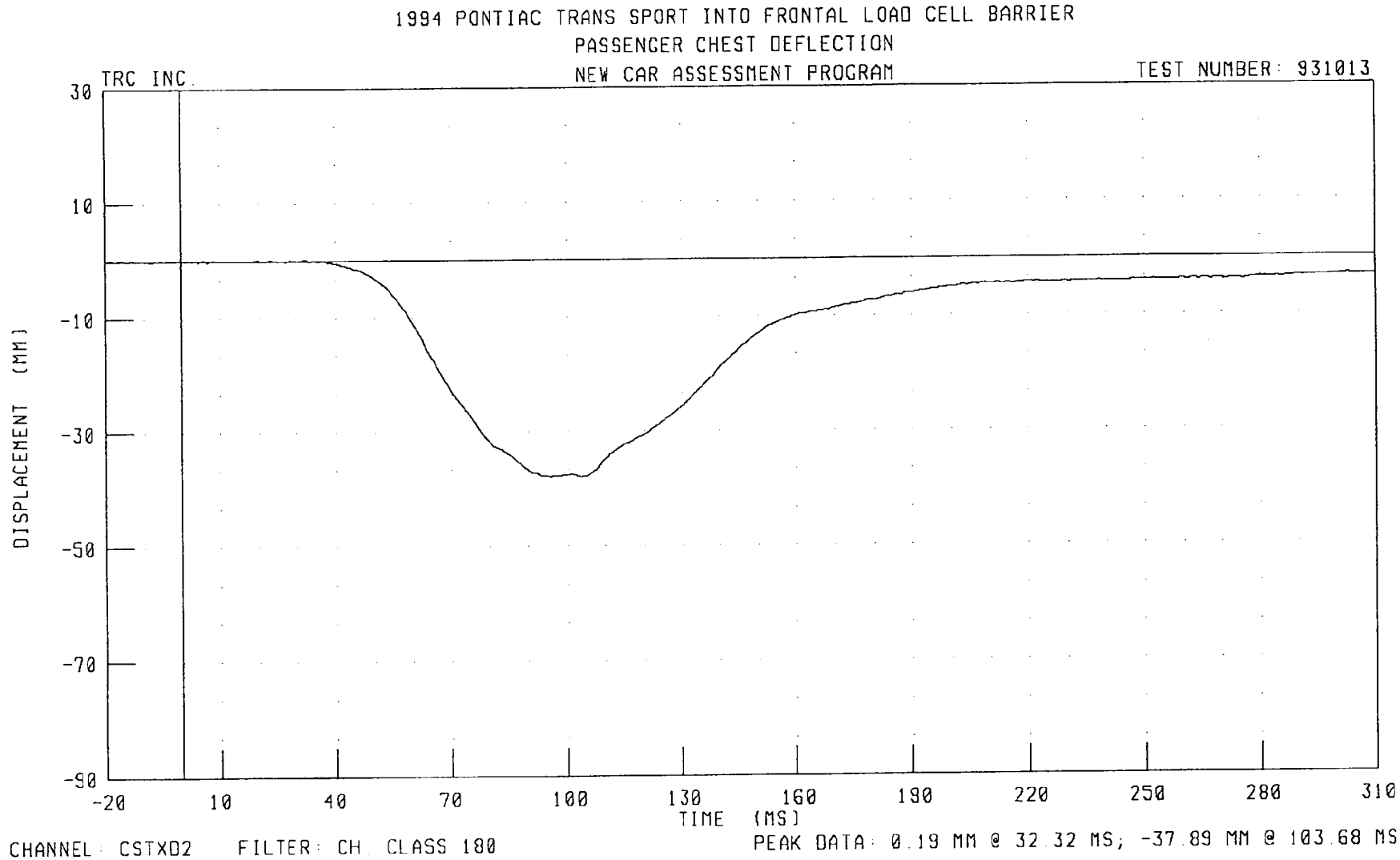
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION



CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 42.44 G @ 84.40 MS; 0.05 G @ -15.52 MS

931013

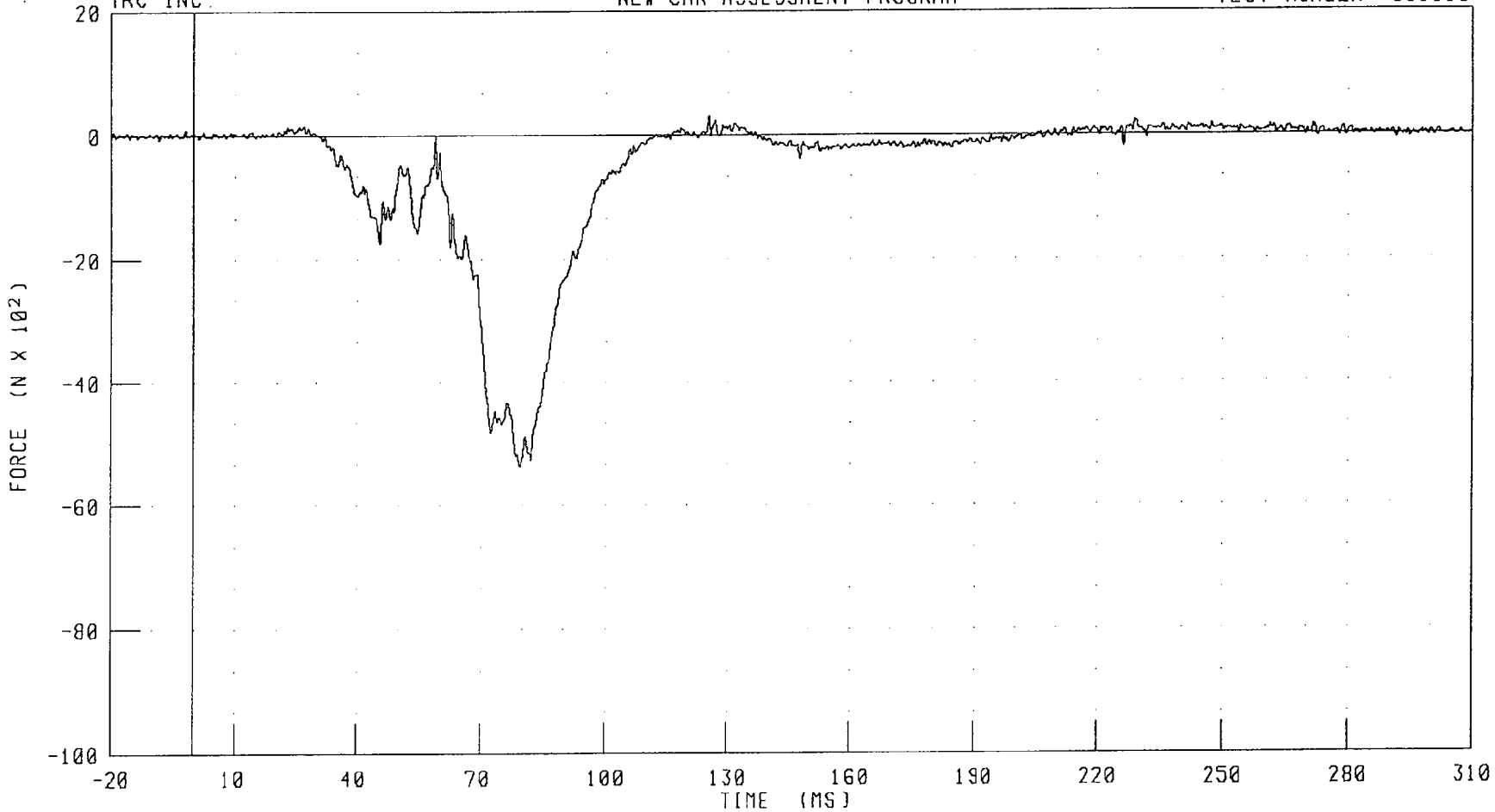

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
30
10
-10
-30
-50
-70
-90
DISPLACEMENT (MM)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXD2 FILTER: CH CLASS 180
PEAK DATA: 0.19 MM @ 32.32 MS; -37.89 MM @ 103.68 MS

931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC.

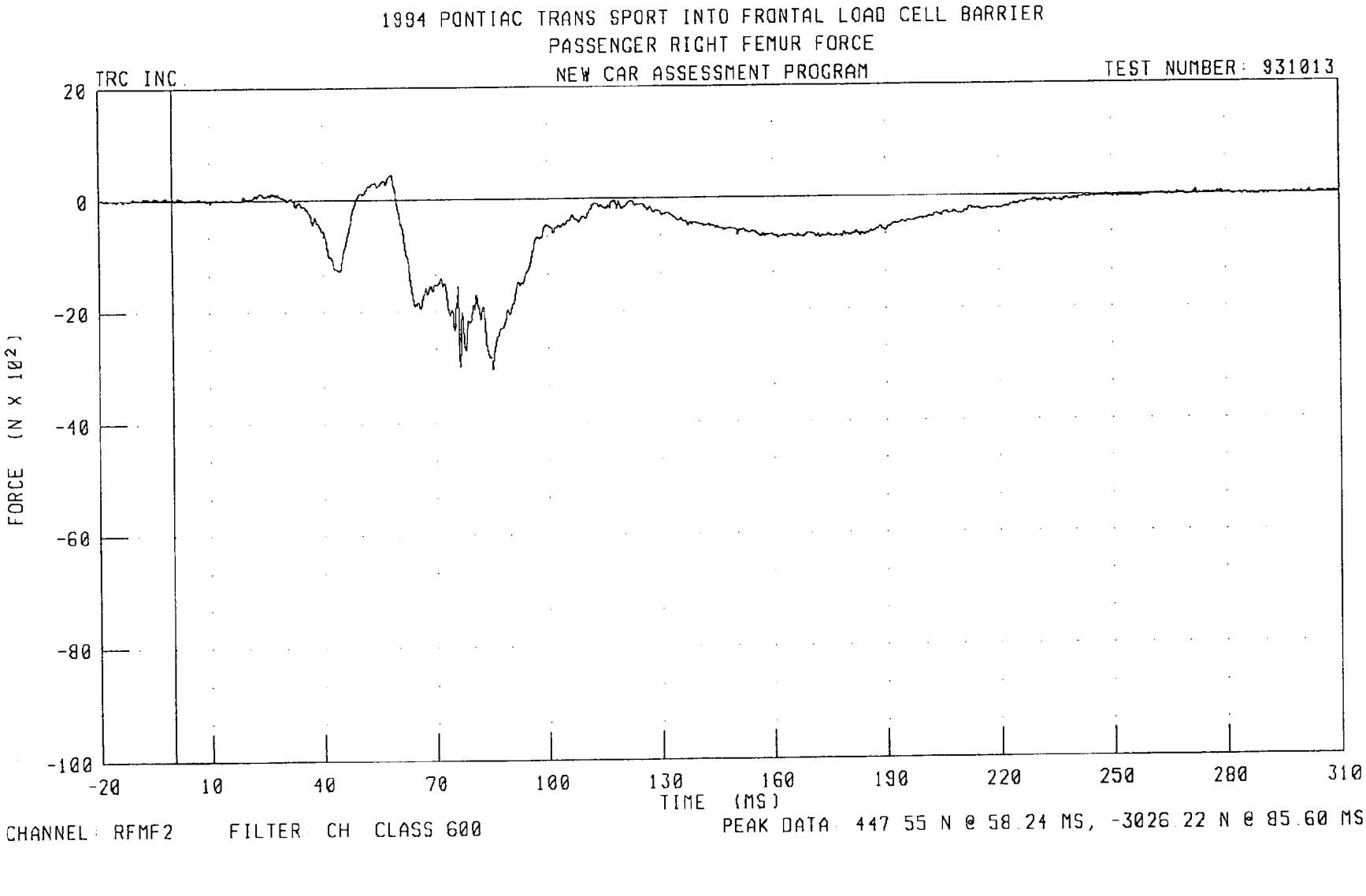
TEST NUMBER: 931013



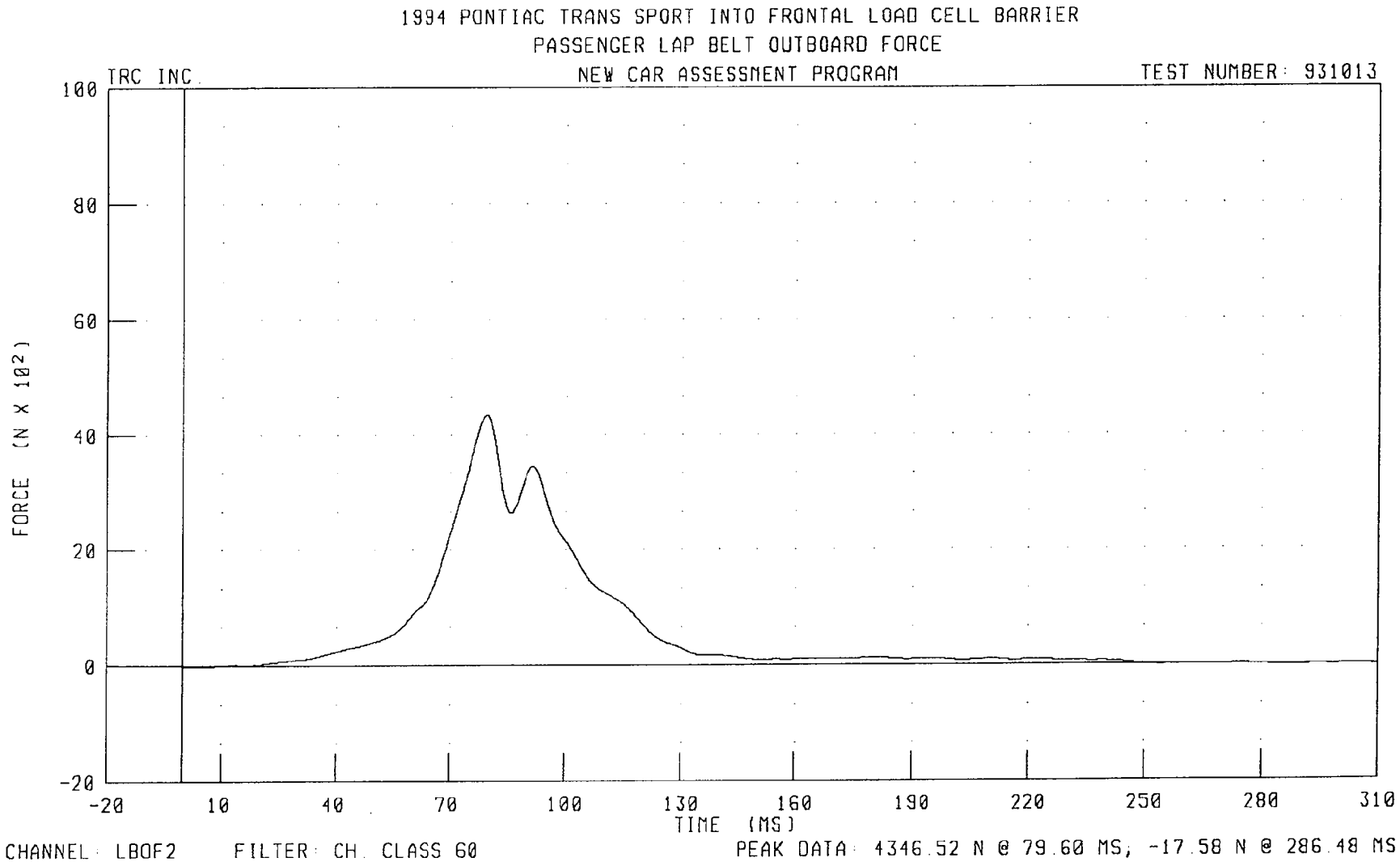
CHANNEL: LFMF2 FILTER: CH CLASS 600

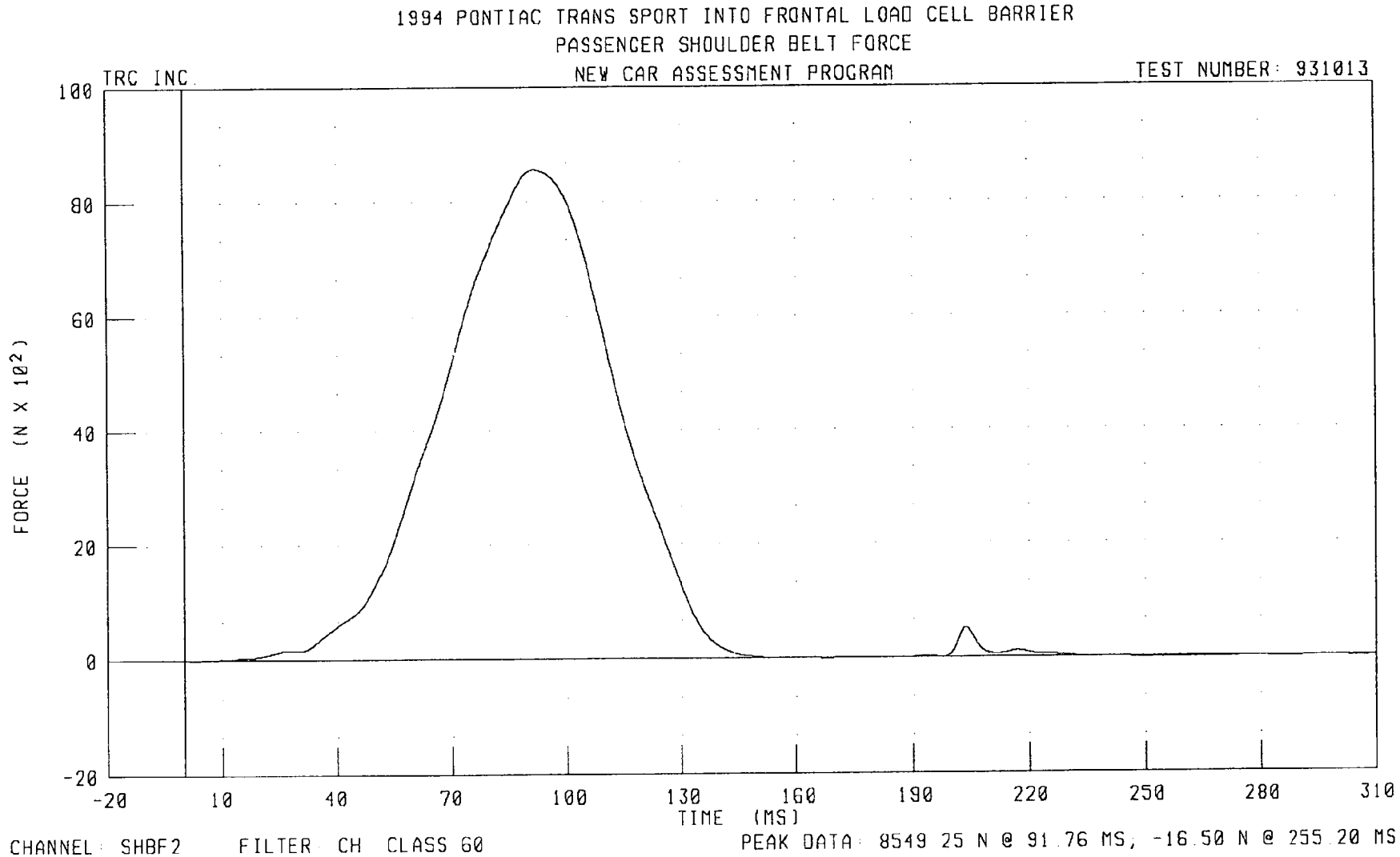
PEAK DATA: 307.58 N @ 125.44 MS, -5372.08 N @ 79.44 MS

931013

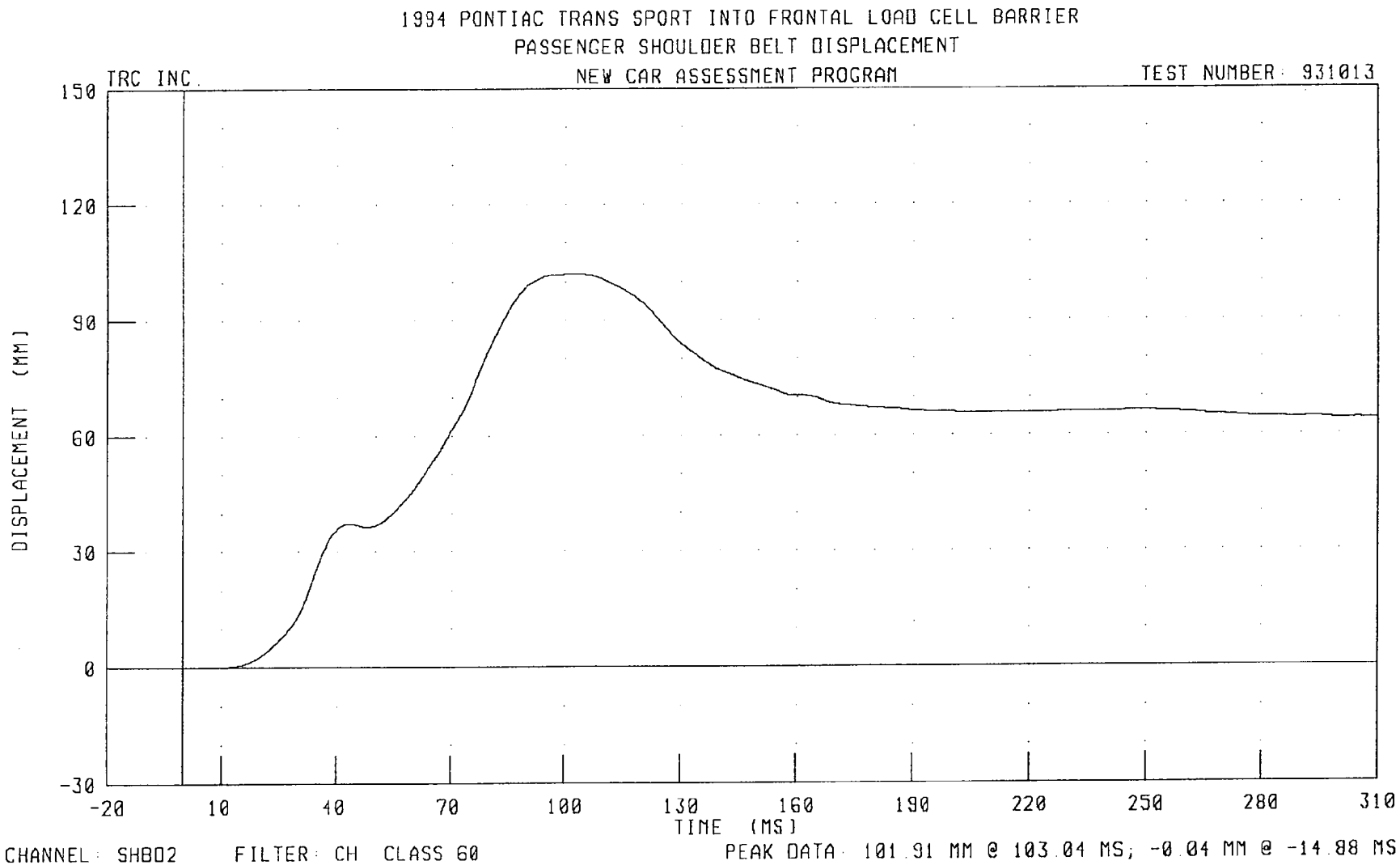

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
20
0
-20
-40
-60
-80
-100
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMF2
FILTER: CH CLASS 600
PEAK DATA: 447.55 N @ 58.24 MS, -3026.22 N @ 85.60 MS

931013

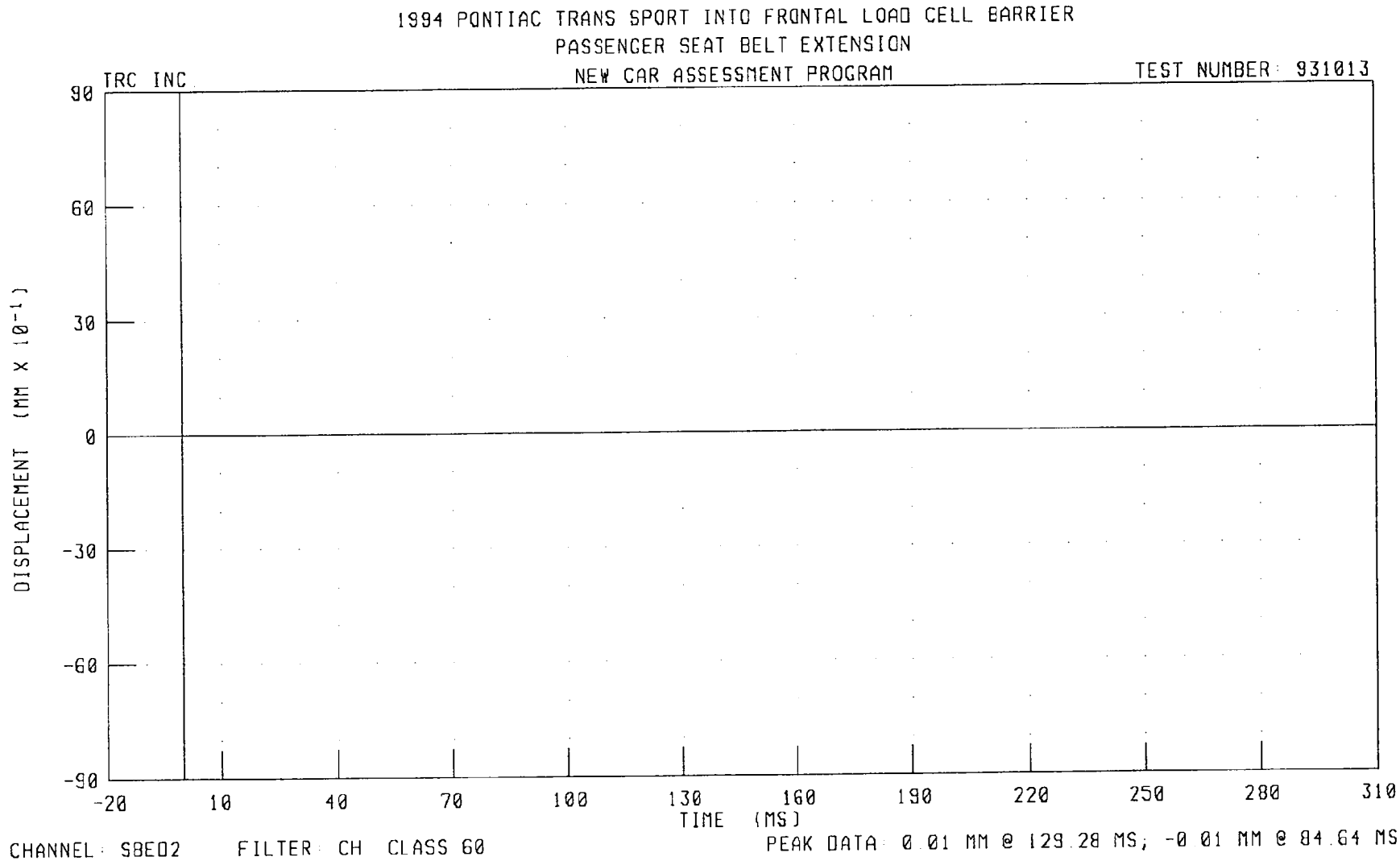

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
100
80
60
40
20
0
-20
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LBOF2
FILTER: CH. CLASS 60
PEAK DATA: 4346.52 N @ 79.60 MS, -17.58 N @ 286.48 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
100
80
60
40
20
0
-20
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SHBF2
FILTER: CH CLASS 60
PEAK DATA: 8549.25 N @ 91.76 MS, -16.50 N @ 255.20 MS

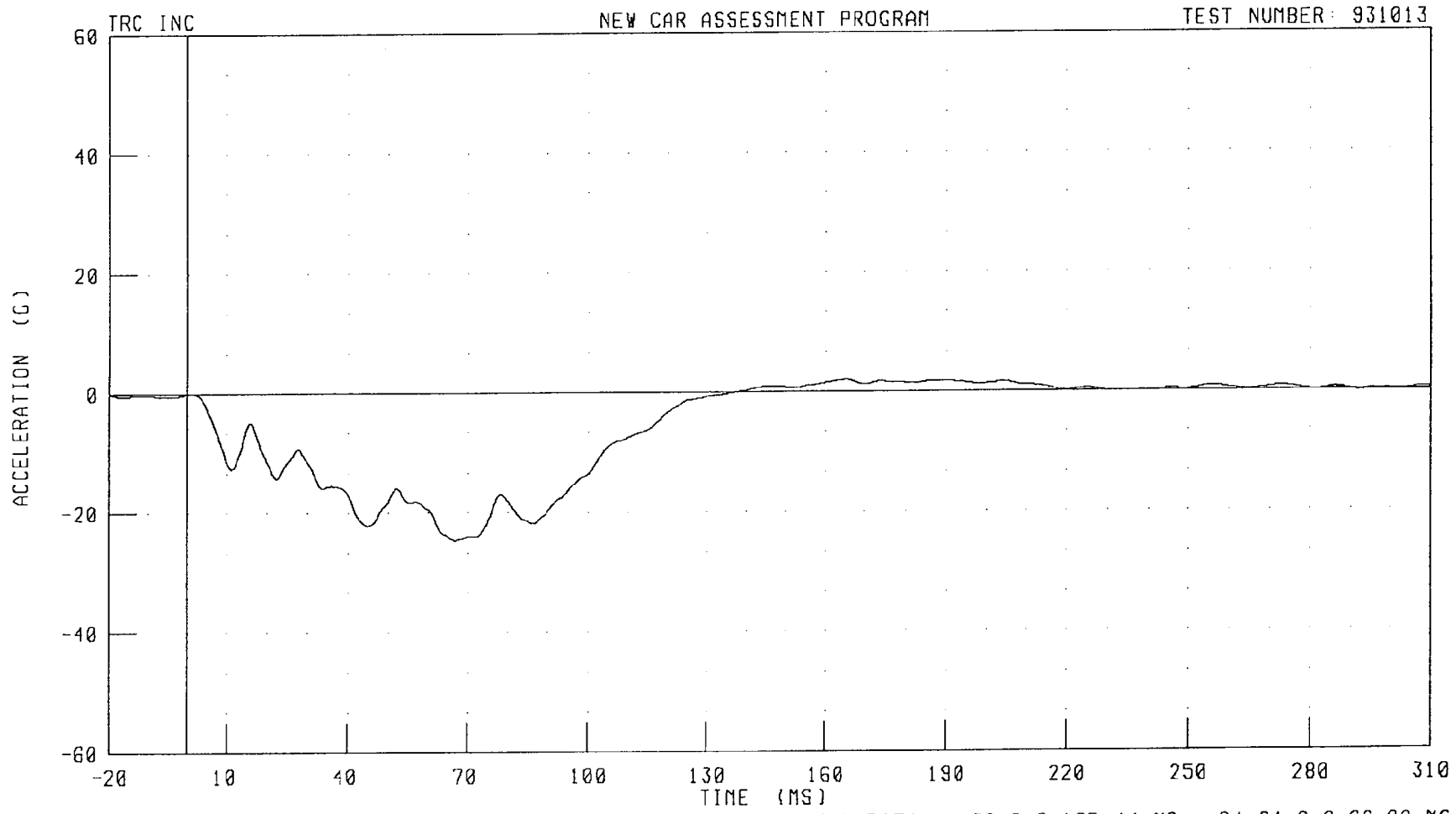
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
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: 101.91 MM @ 103.04 MS; -0.04 MM @ -14.88 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
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: SBE02
FILTER: CH CLASS 60
PEAK DATA: 0.01 MM @ 129.28 MS; -0.01 MM @ 84.64 MS

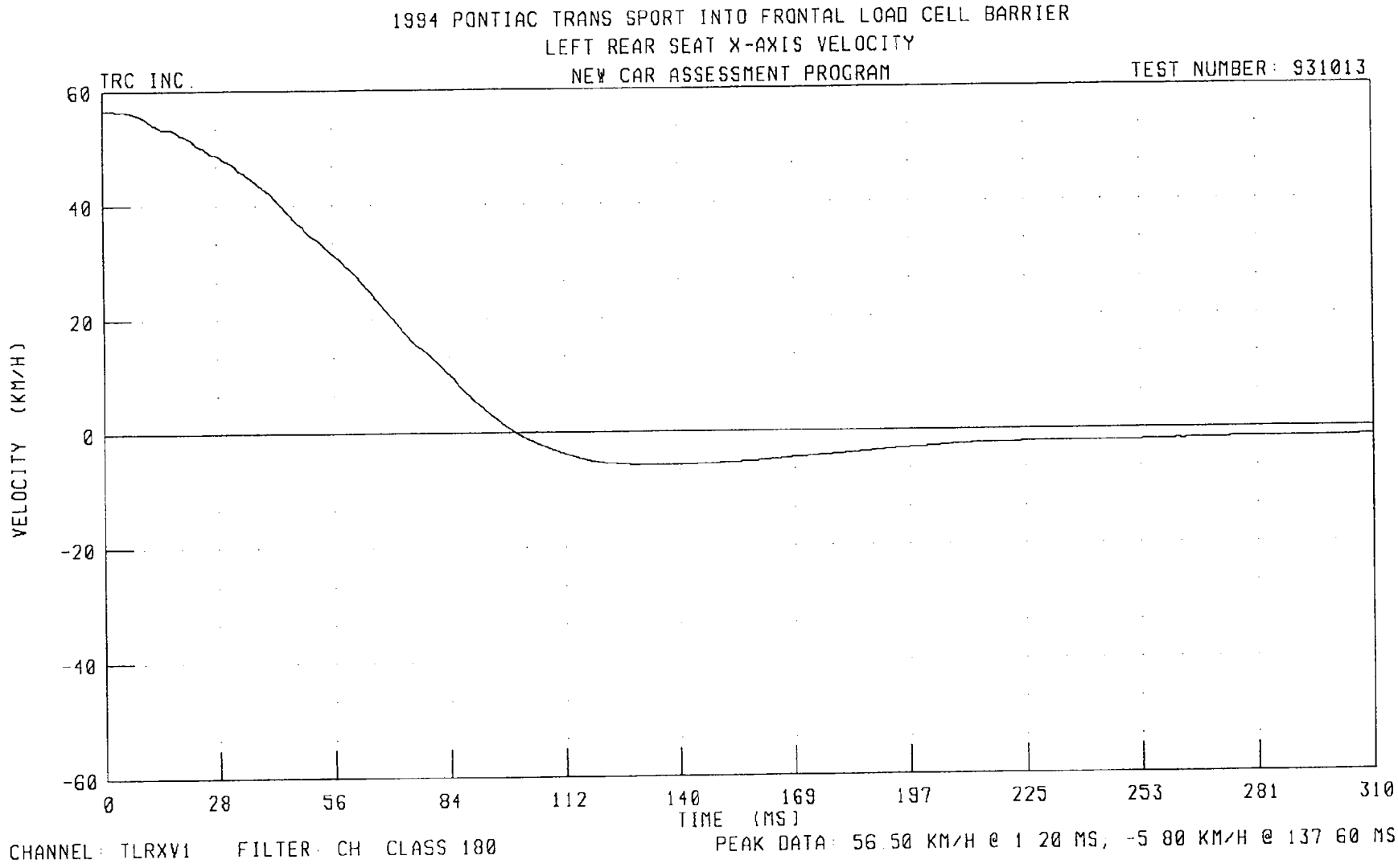
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION



CHANNEL: TLRXG1 FILTER: CH CLASS 60

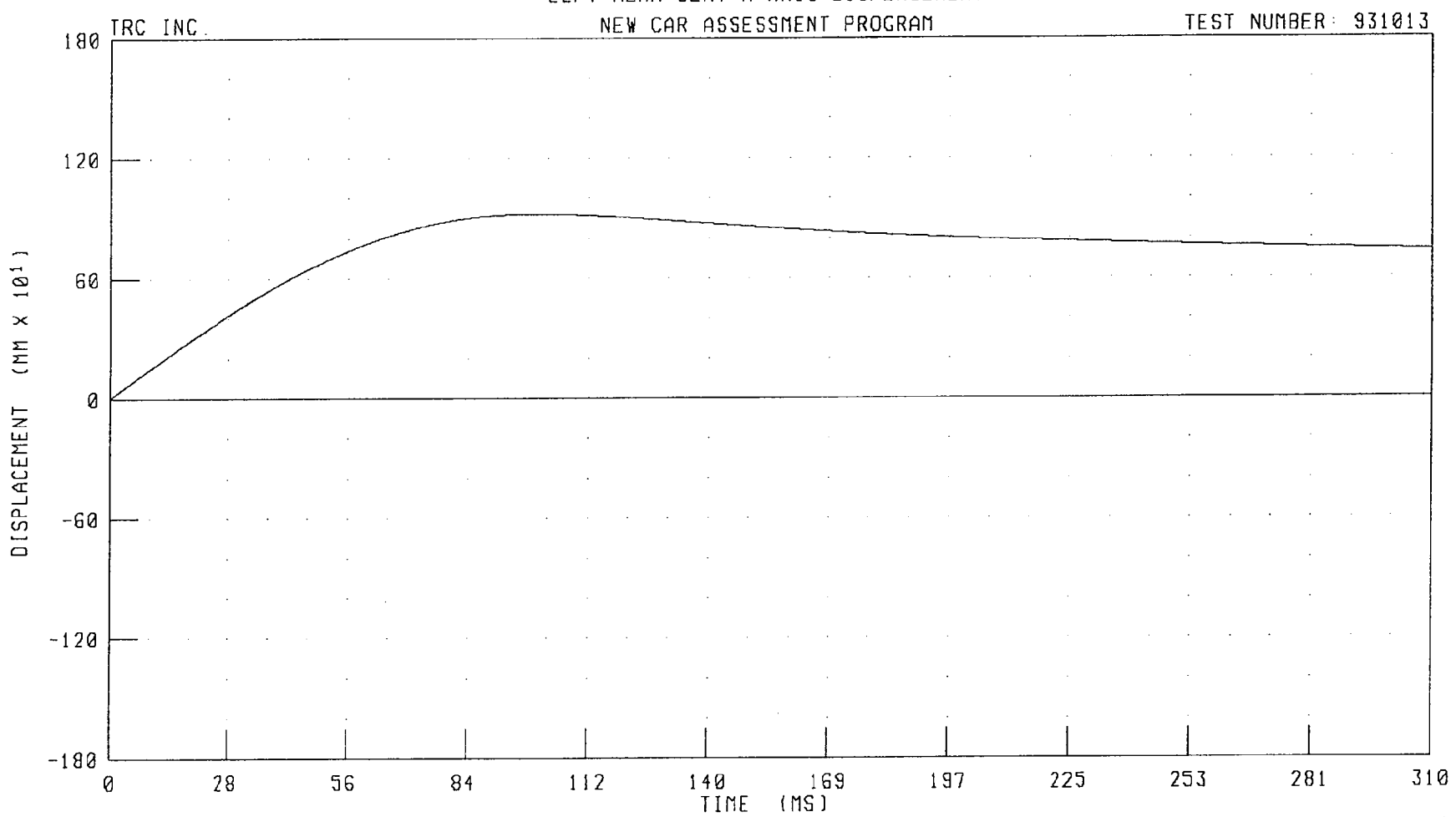
PEAK DATA: 1.98 G @ 165.44 MS; -24.64 G @ 66.88 MS

931013

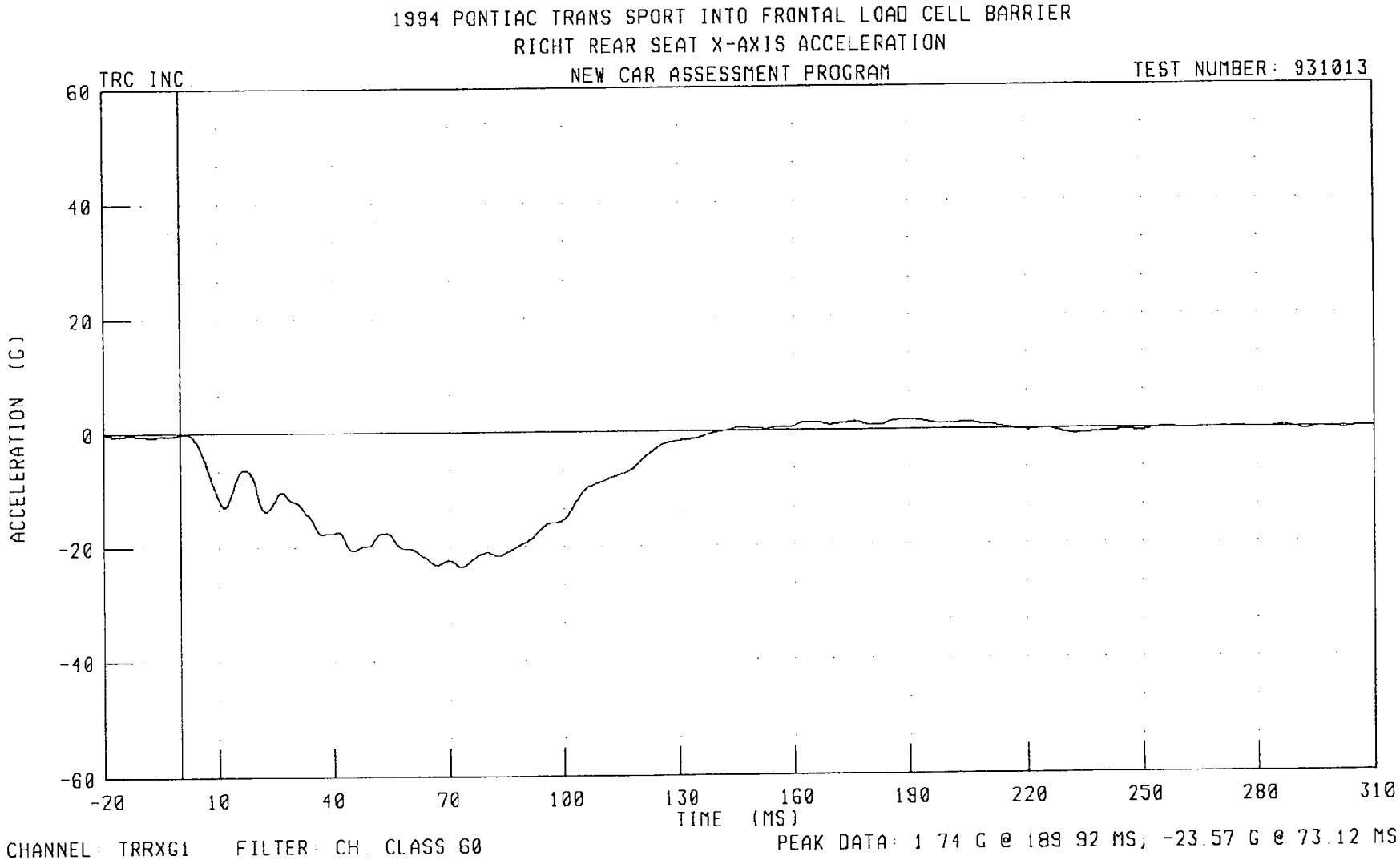

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
VELOCITY (KM/H)
0
28
56
84
112
140
169
197
225
253
281
310
TIME (MS)
CHANNEL: TLRXV1 FILTER: CH CLASS 180
PEAK DATA: 56.50 KM/H @ 1.20 MS, -5.80 KM/H @ 137.60 MS

931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

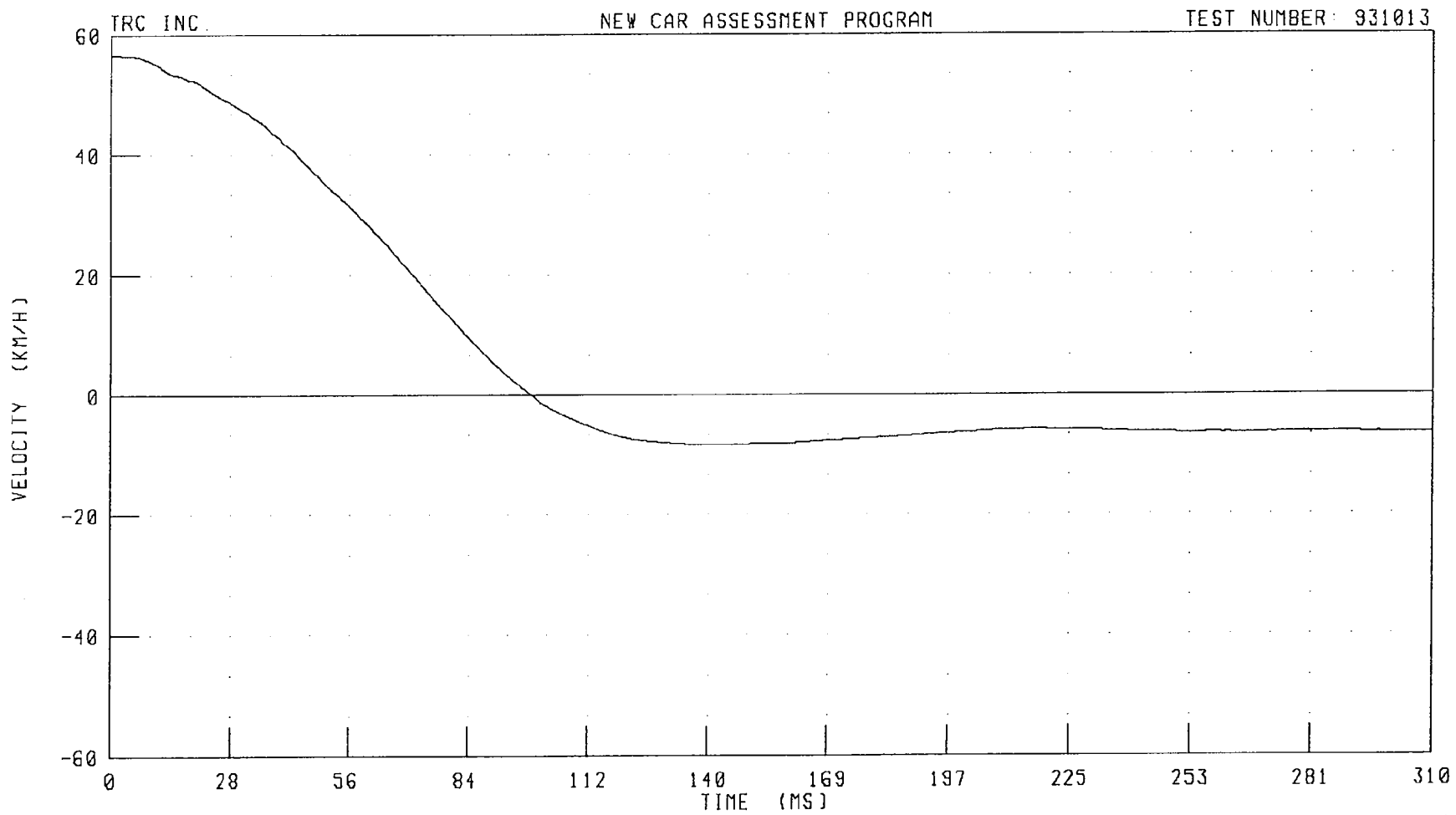


CHANNEL: TLRXD1 FILTER: CH. CLASS 180 PEAK DATA: 921.42 MM @ 100.88 MS; 0.00 MM @ 0.00 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TRRXG1 FILTER: CH CLASS 60
PEAK DATA: 1 74 G @ 189 92 MS; -23.57 G @ 73.12 MS

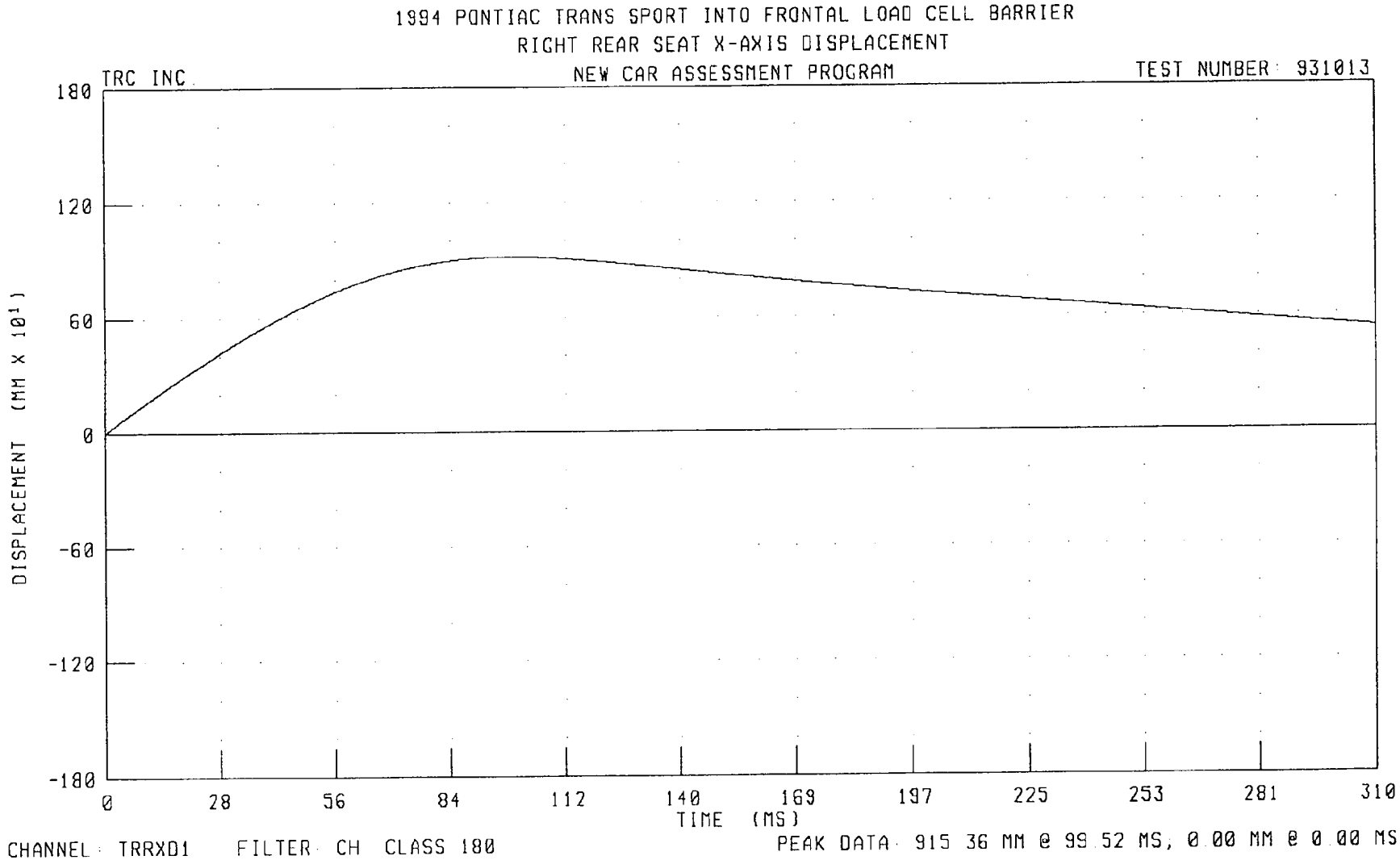
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY

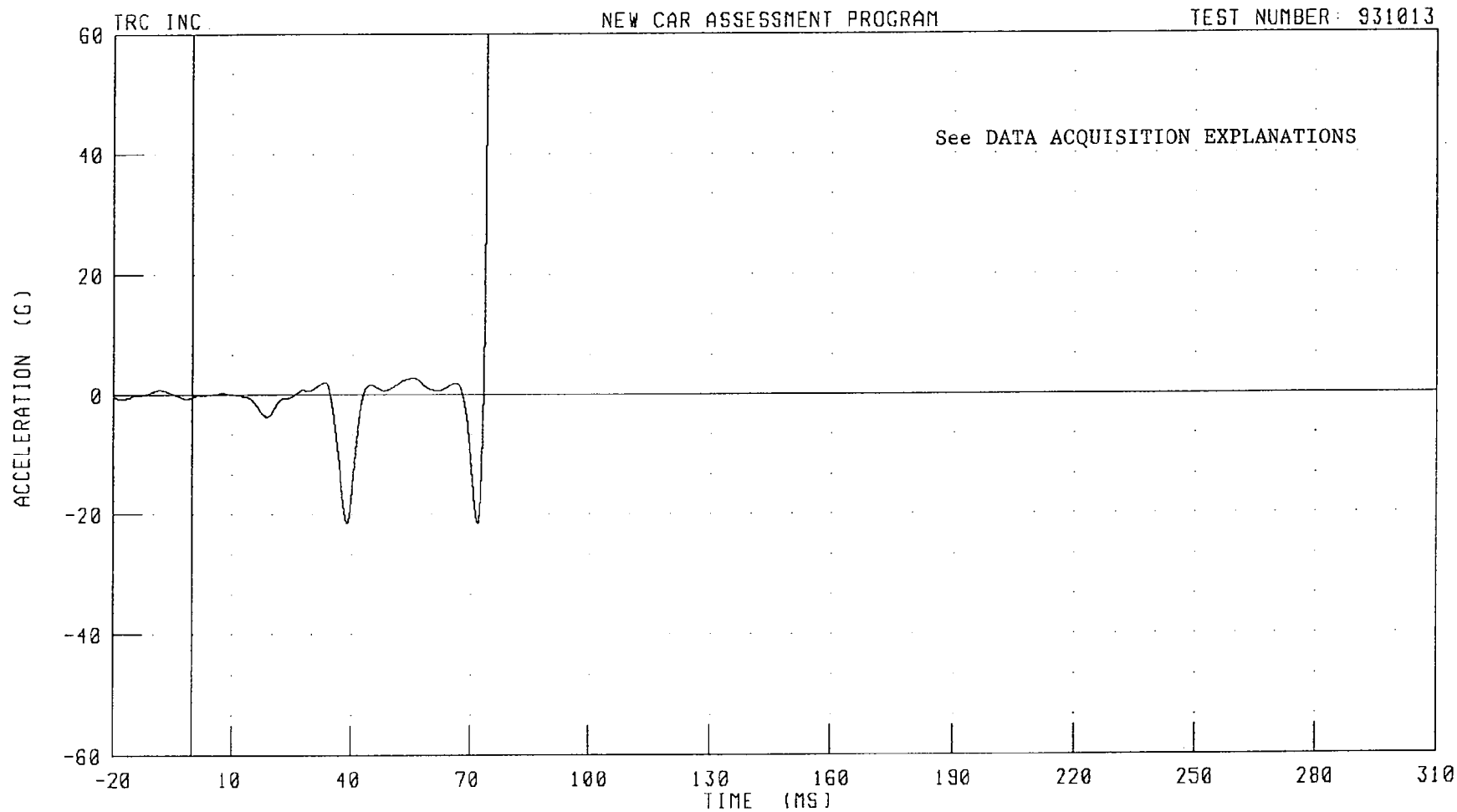


CHANNEL: TRRXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.50 KM/H @ 0.96 MS; -8.31 KM/H @ 143.76 MS

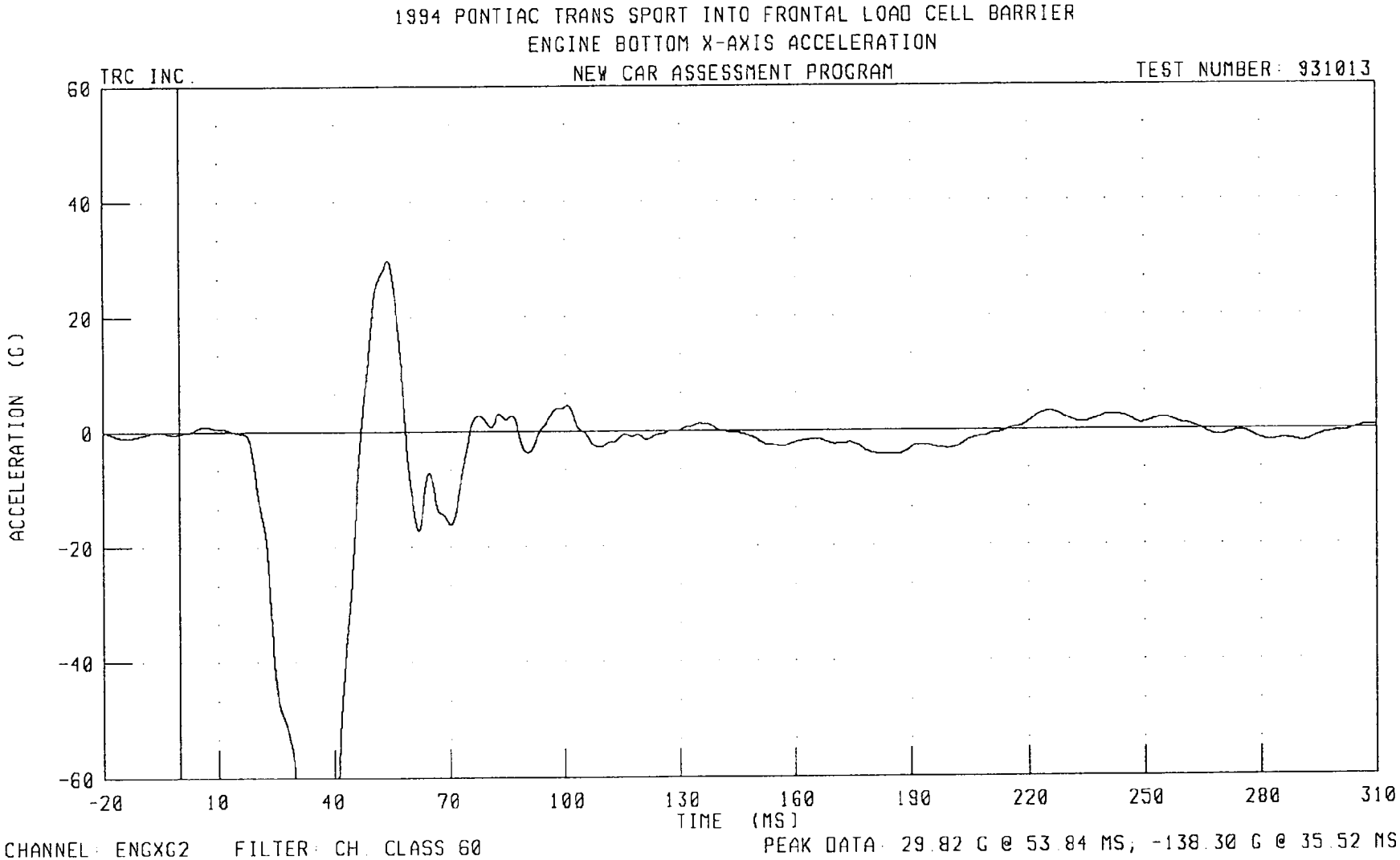
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
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: 915.36 MM @ 99.52 MS, 0.00 MM @ 0.00 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

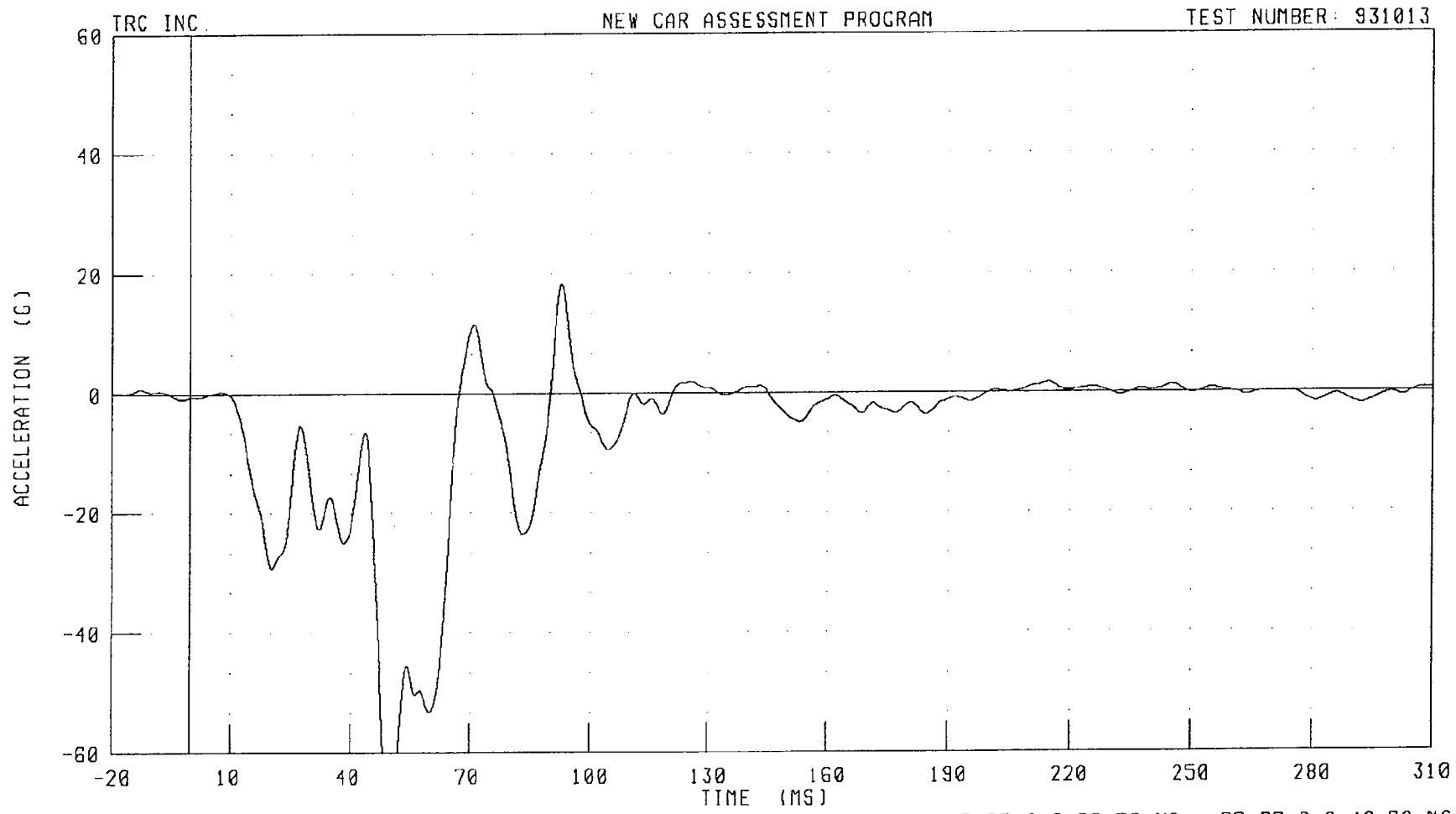


CHANNEL: ENGXG1 FILTER: CH. CLASS 60 PEAK DATA: 984.87 G @ 83.04 MS; -21.53 G @ 71.76 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG2 FILTER: CH CLASS 60
PEAK DATA: 29.82 G @ 53.84 MS, -138.30 G @ 35.52 MS

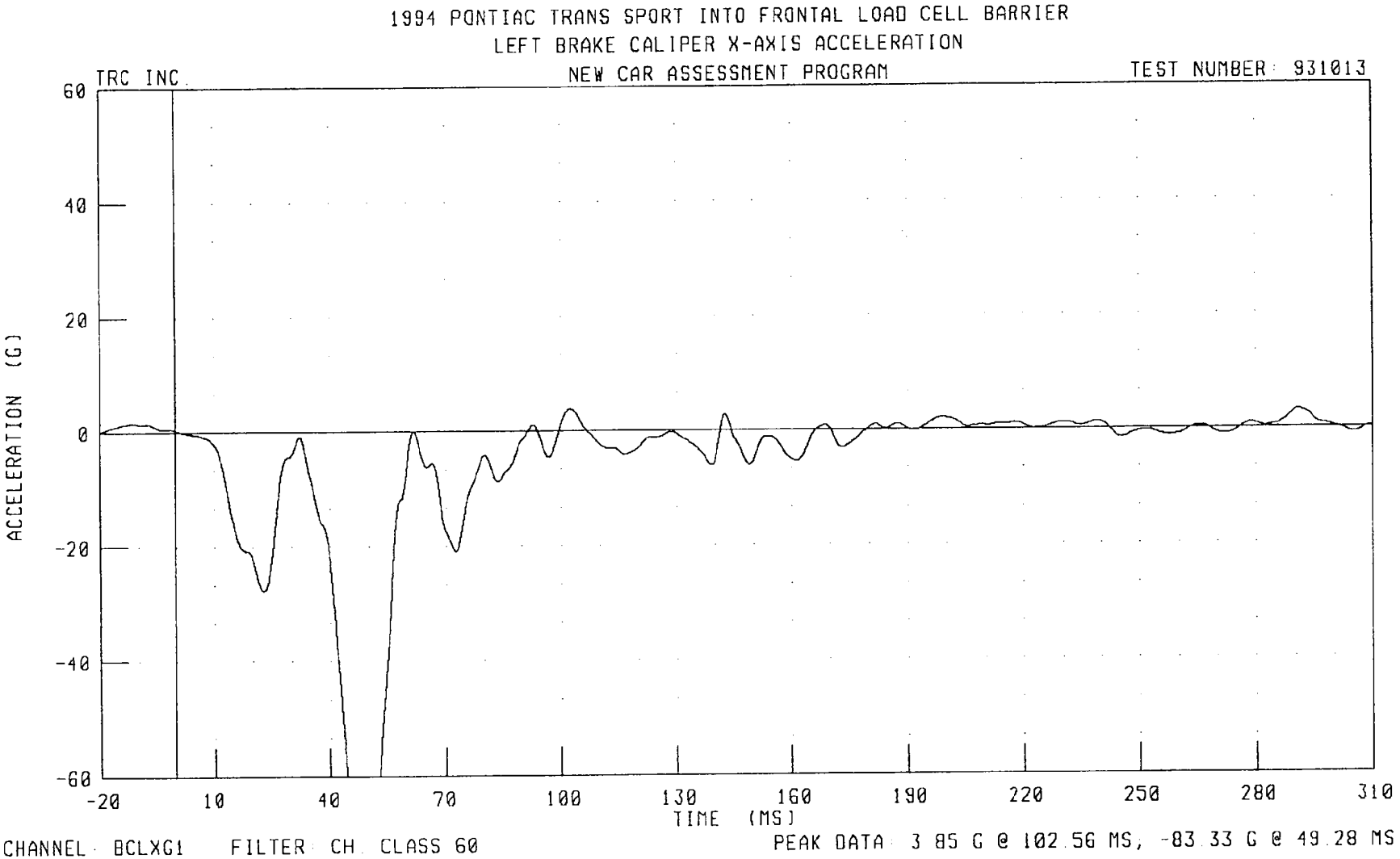
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION



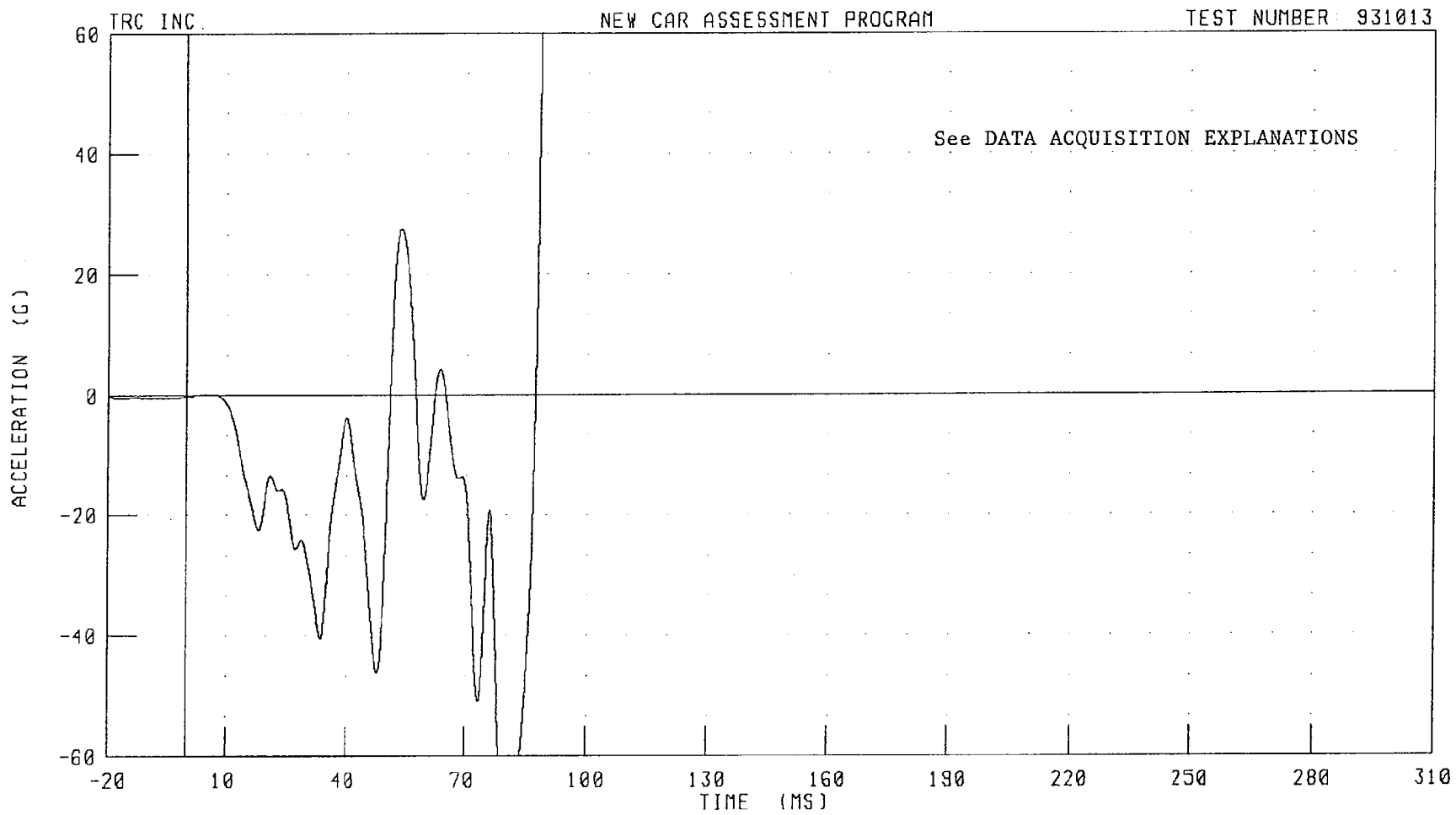
CHANNEL: BCRXG1 FILTER: CH. CLASS 60 PEAK DATA: 18.25 G @ 92.72 MS; -77.77 G @ 49.76 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCLXG1
FILTER: CH CLASS 60
PEAK DATA: 3.85 G @ 102.56 MS, -83.33 G @ 49.28 MS

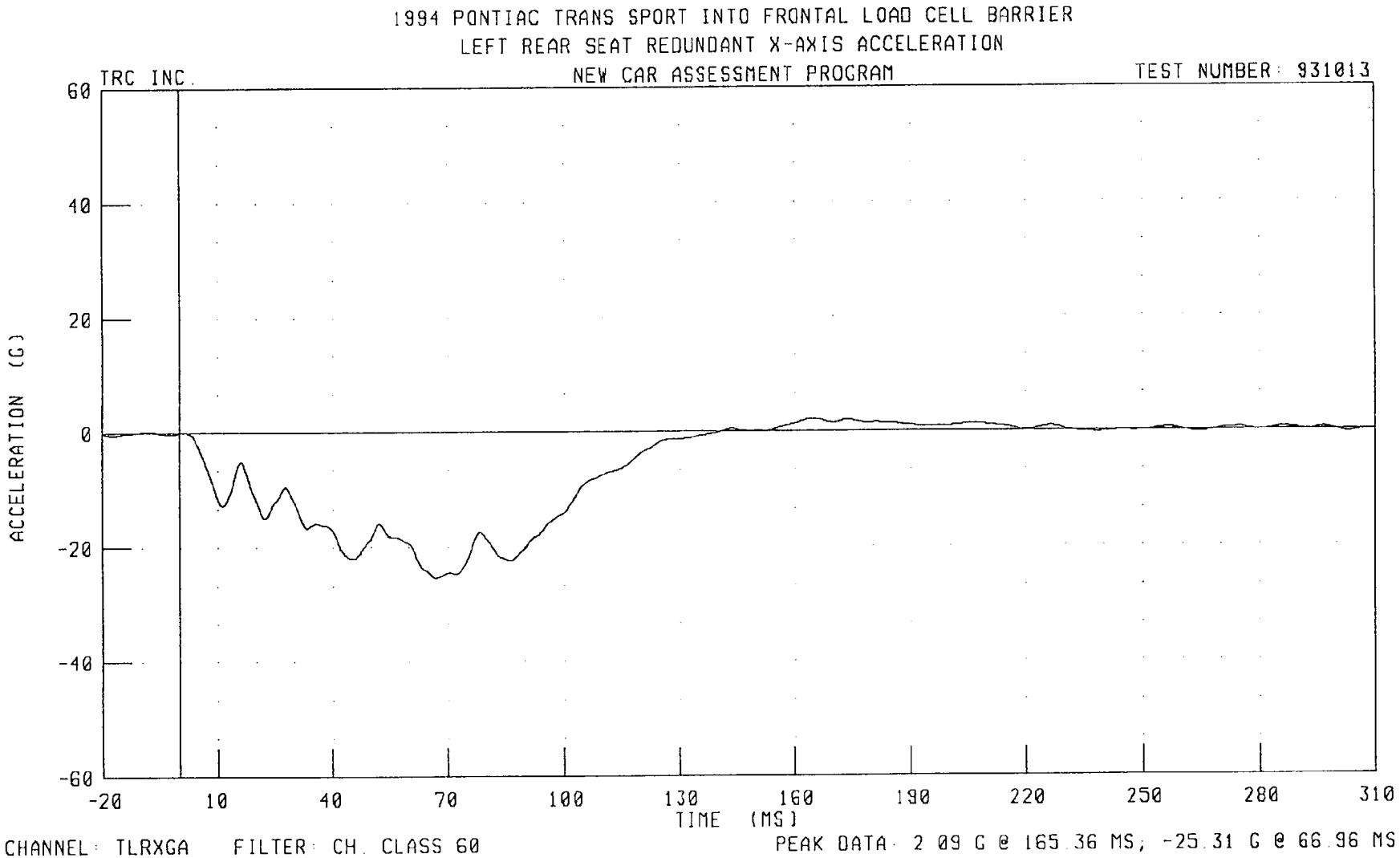
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

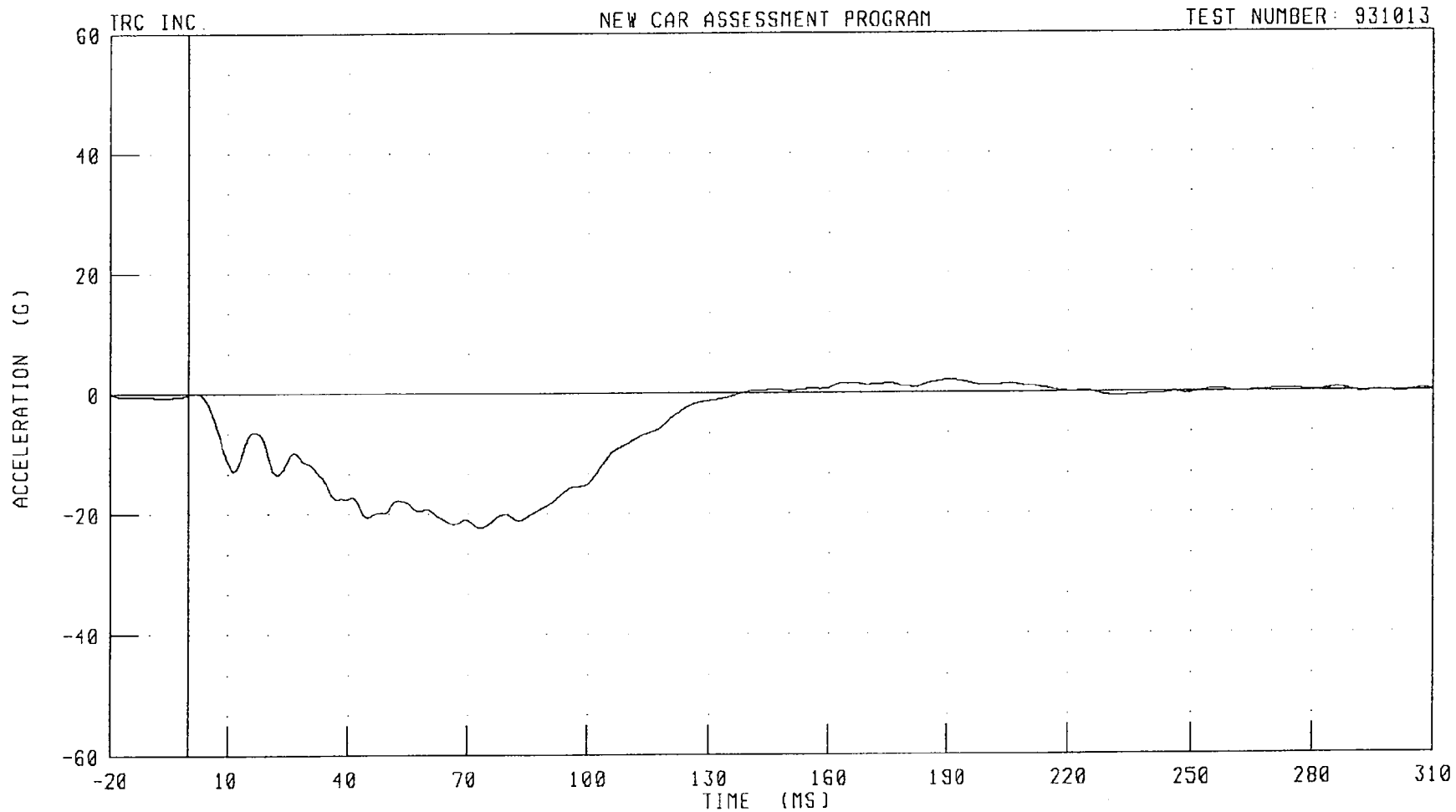


CHANNEL: DPCXG1 FILTER: CH CLASS 60 PEAK DATA: 115.19 G @ 99.36 MS; -66.74 G @ 79.36 MS

931013

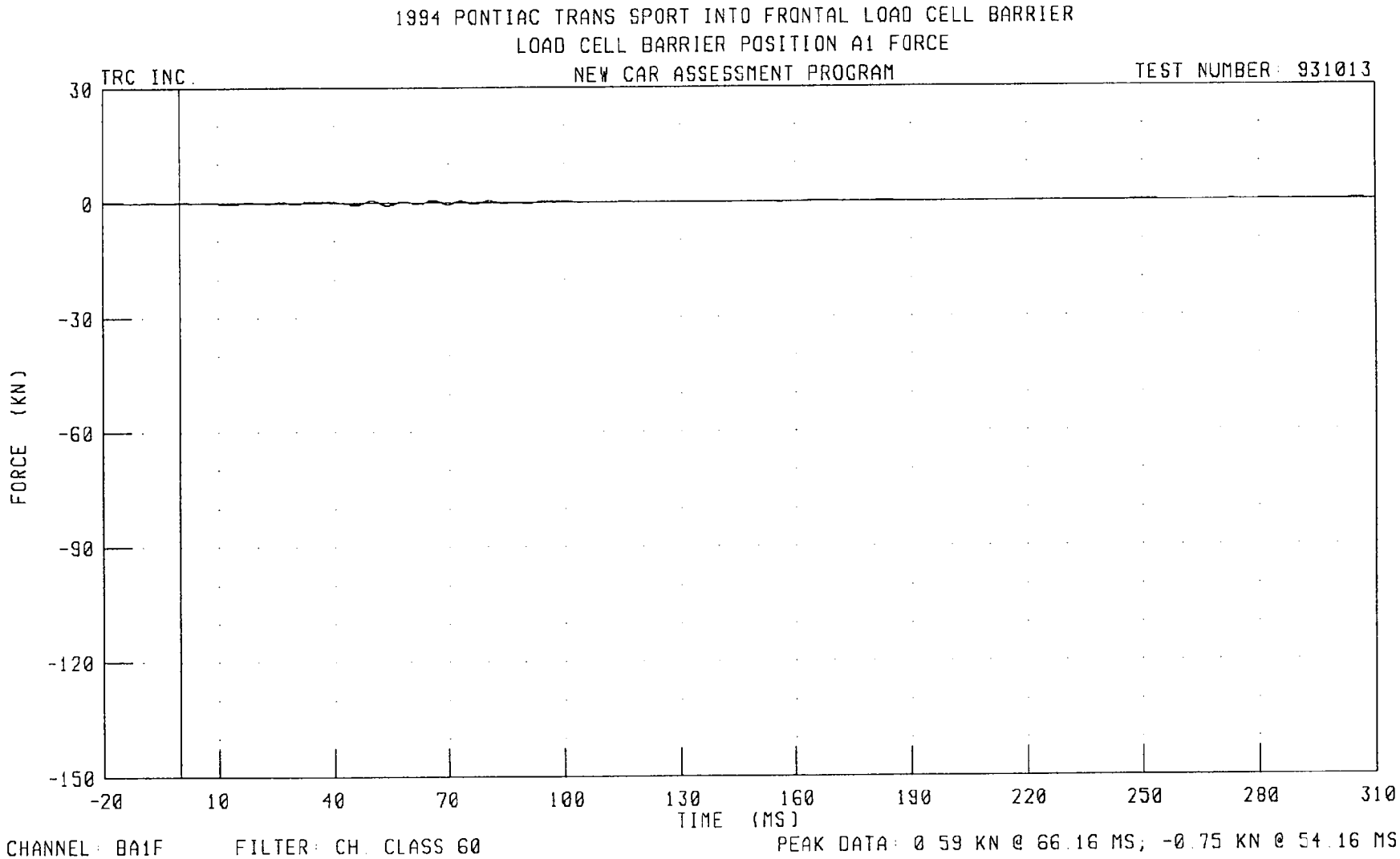

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TLRXGA FILTER: CH. CLASS 60
PEAK DATA: 2.09 G @ 165.36 MS; -25.31 G @ 66.96 MS

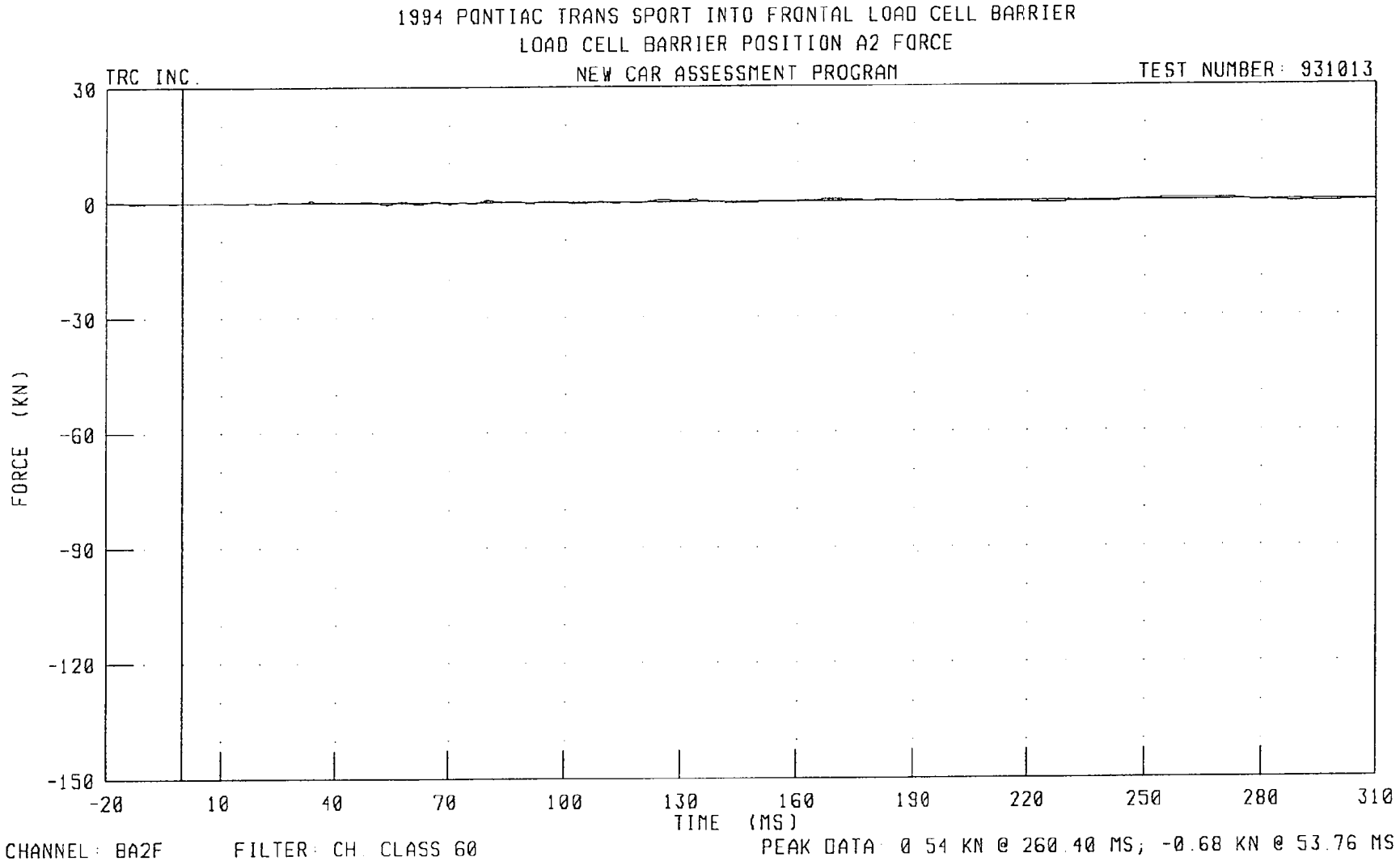
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION



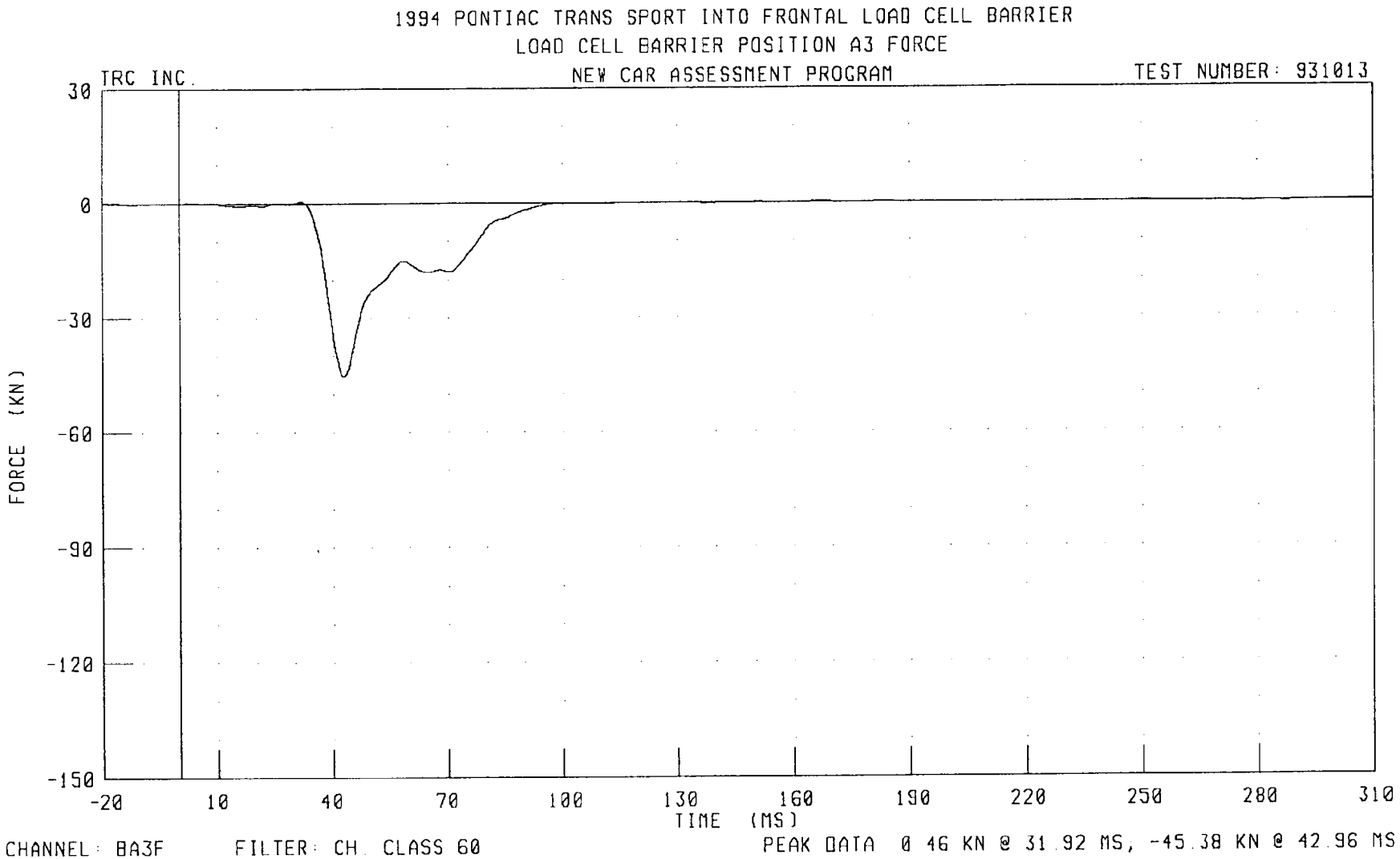
CHANNEL: TRRXGA FILTER: CH CLASS 60 PEAK DATA: 2.07 G @ 190.32 MS; -22.38 G @ 73.36 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA1F
FILTER: CH. CLASS 60
PEAK DATA: 0.59 KN @ 66.16 MS; -0.75 KN @ 54.16 MS

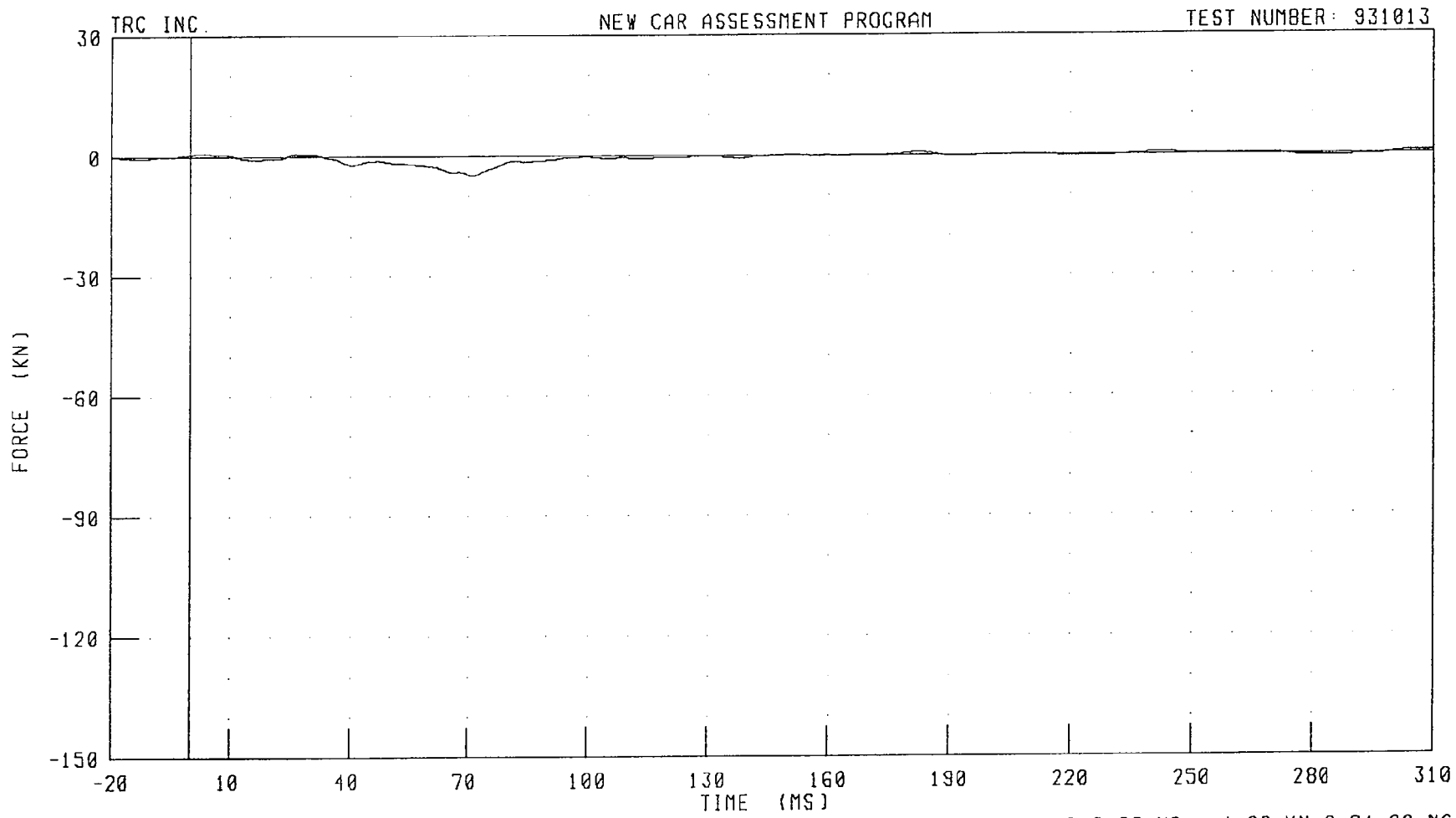

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA2F
FILTER: CH CLASS 60
PEAK DATA: 0.54 KN @ 260.40 MS; -0.68 KN @ 53.76 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA3F
FILTER: CH. CLASS 60
PEAK DATA 0.46 KN @ 31.92 MS, -45.38 KN @ 42.96 MS

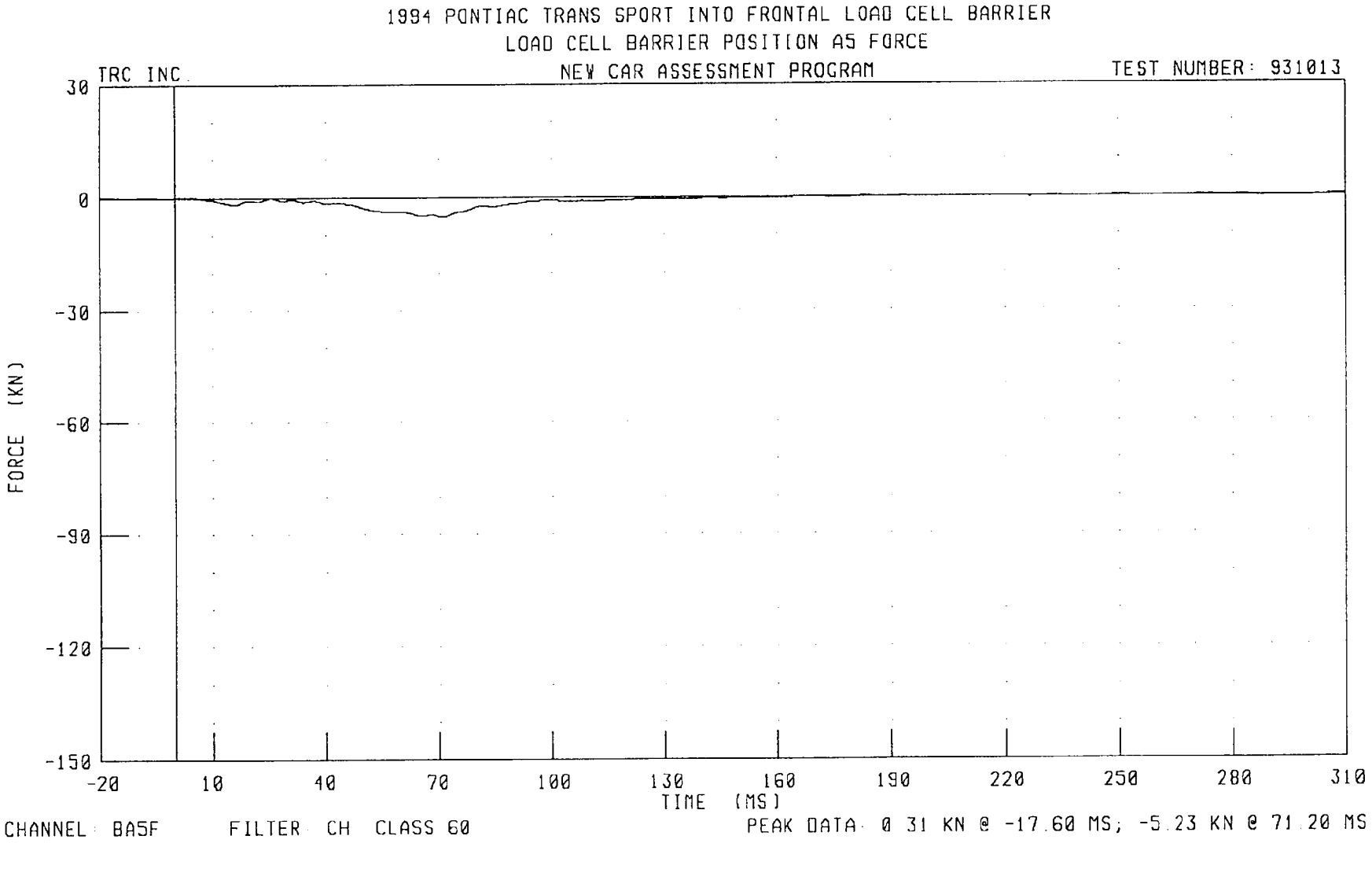
931013

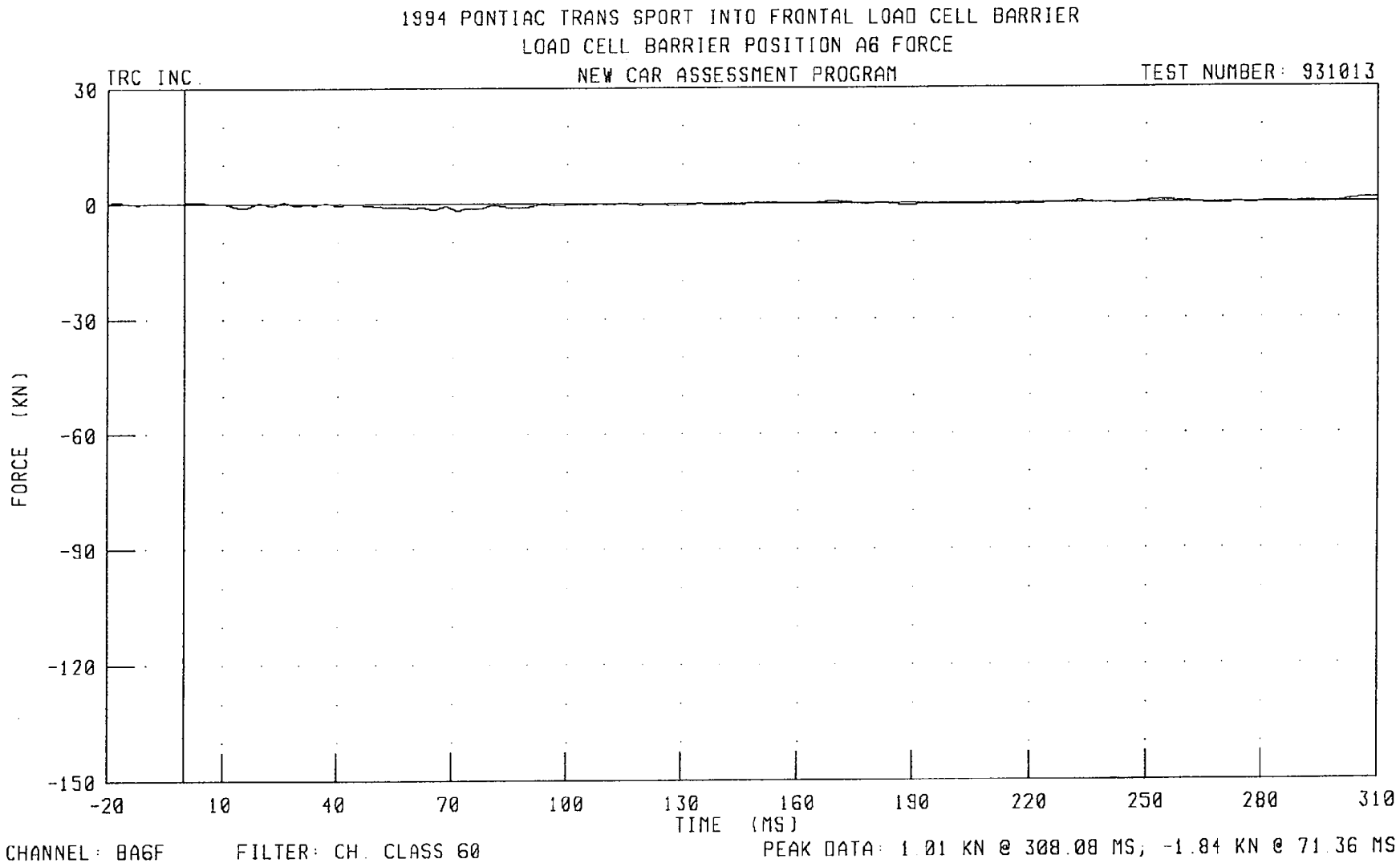
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE



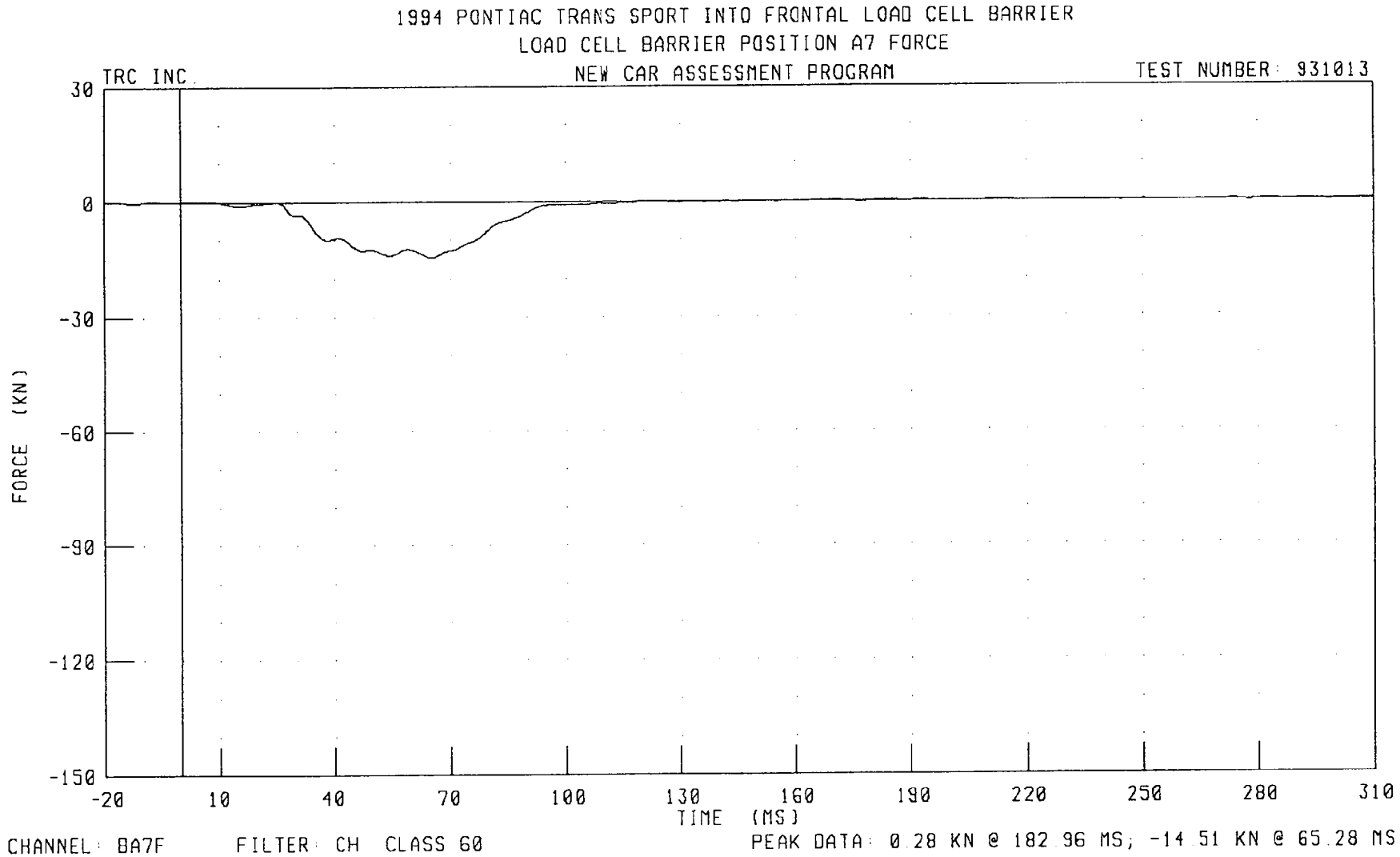
CHANNEL: BA4F FILTER: CH. CLASS 60 PEAK DATA: 0.72 KN @ 2.88 MS; -4.90 KN @ 71.20 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
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 0 31 KN @ -17.60 MS; -5.23 KN @ 71.20 MS

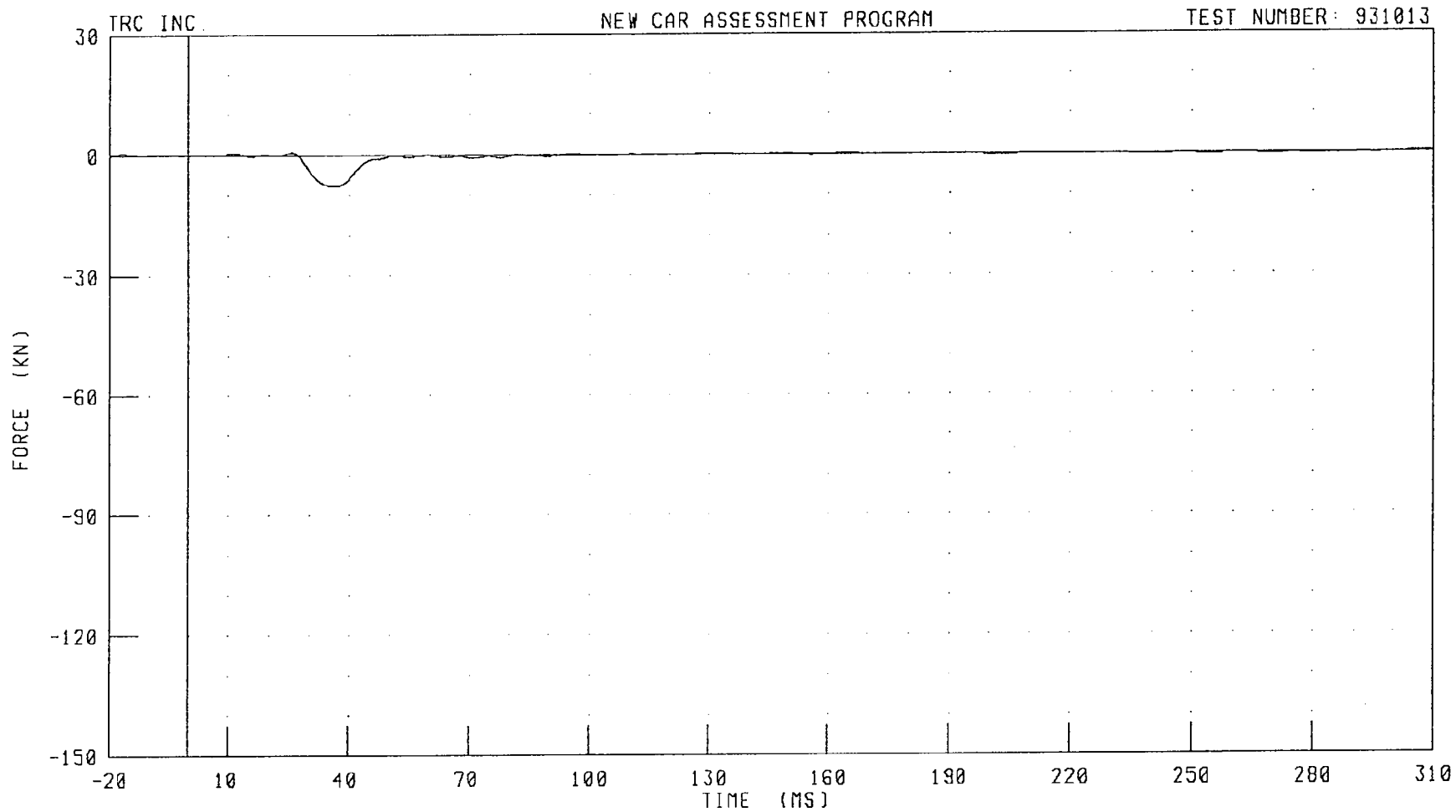

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA6F
FILTER: CH. CLASS 60
PEAK DATA: 1.01 KN @ 308.08 MS; -1.84 KN @ 71.36 MS

931013

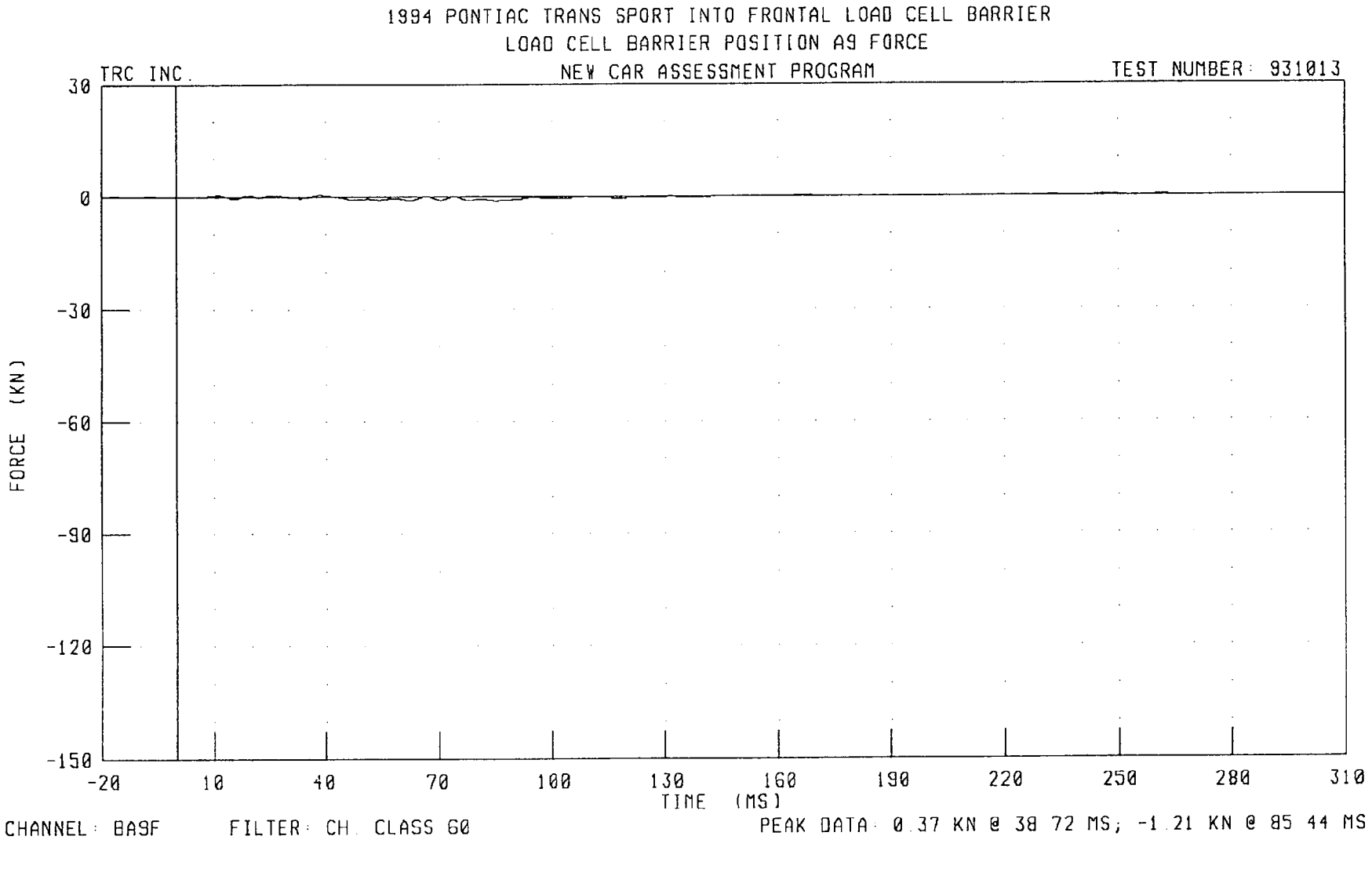

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA7F
FILTER: CH CLASS 60
PEAK DATA: 0.28 KN @ 182.96 MS; -14.51 KN @ 65.28 MS

931013

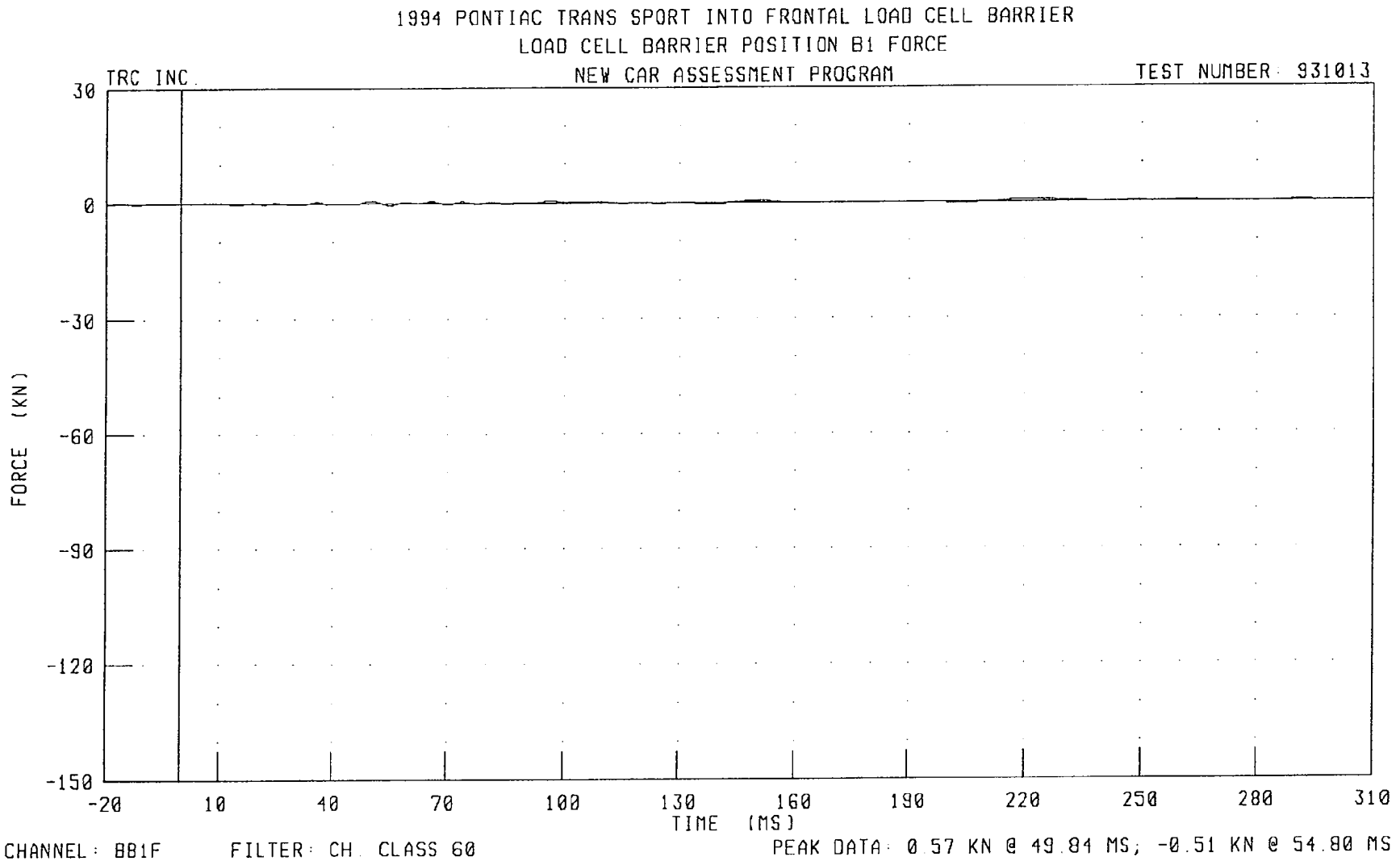
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE



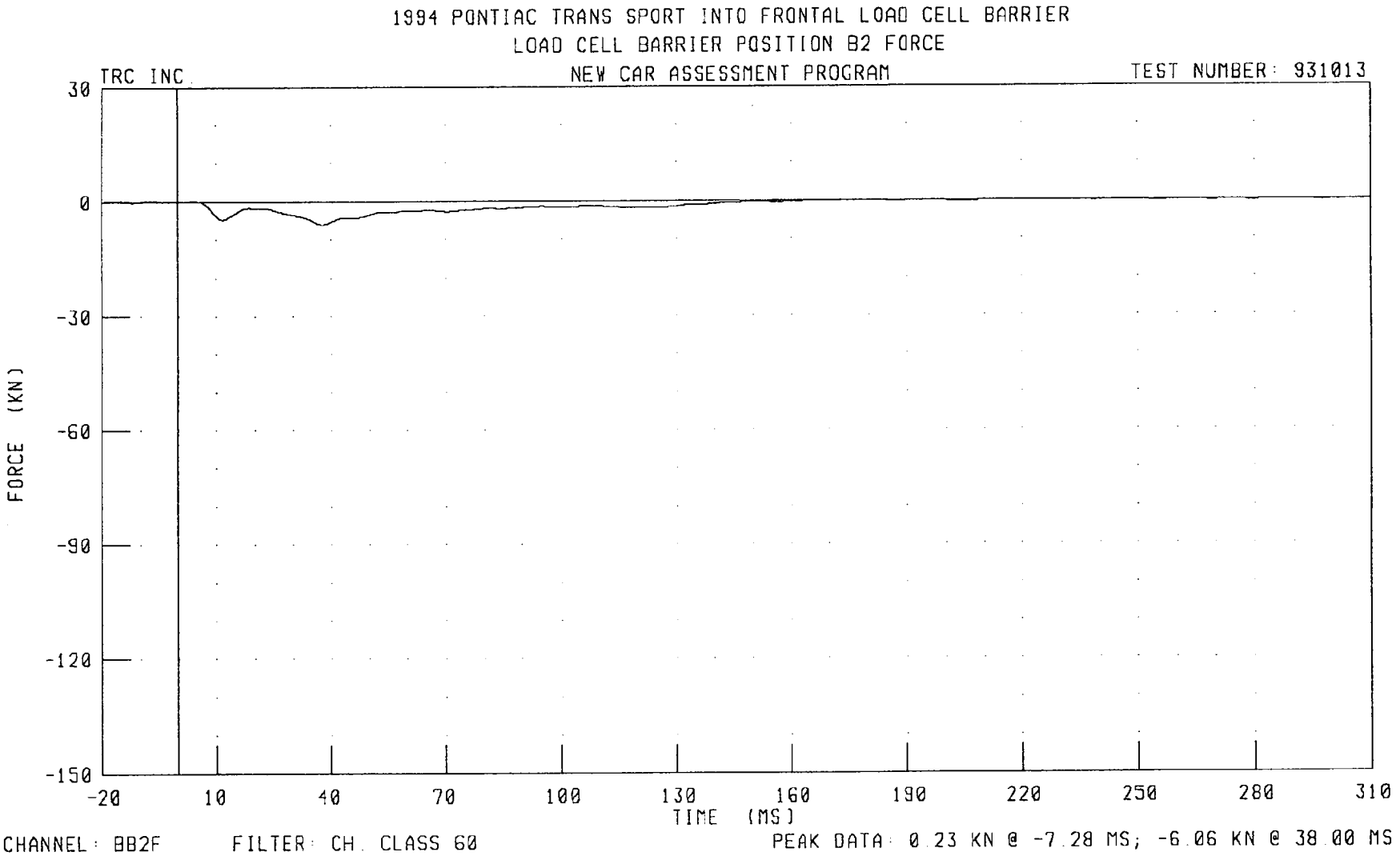
CHANNEL: 8A8F FILTER: CH. CLASS 60 PEAK DATA: 0.62 KN @ 25.76 MS; -7.64 KN @ 37.04 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AS FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BASF
FILTER: CH. CLASS 60
PEAK DATA: 0.37 KN @ 38.72 MS; -1.21 KN @ 85.44 MS

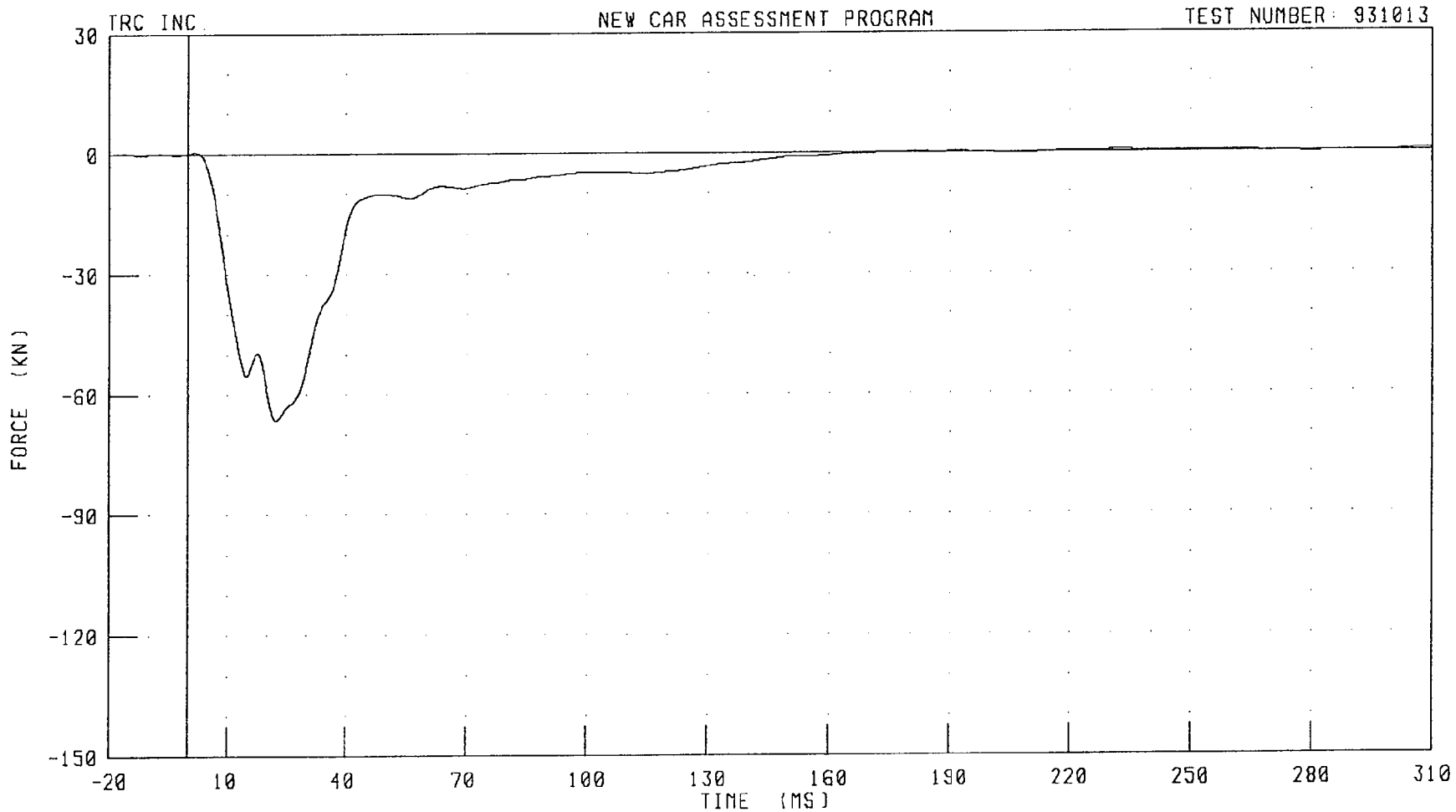
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB1F
FILTER: CH CLASS 60
PEAK DATA: 0.57 KN @ 49.84 MS; -0.51 KN @ 54.80 MS

931013

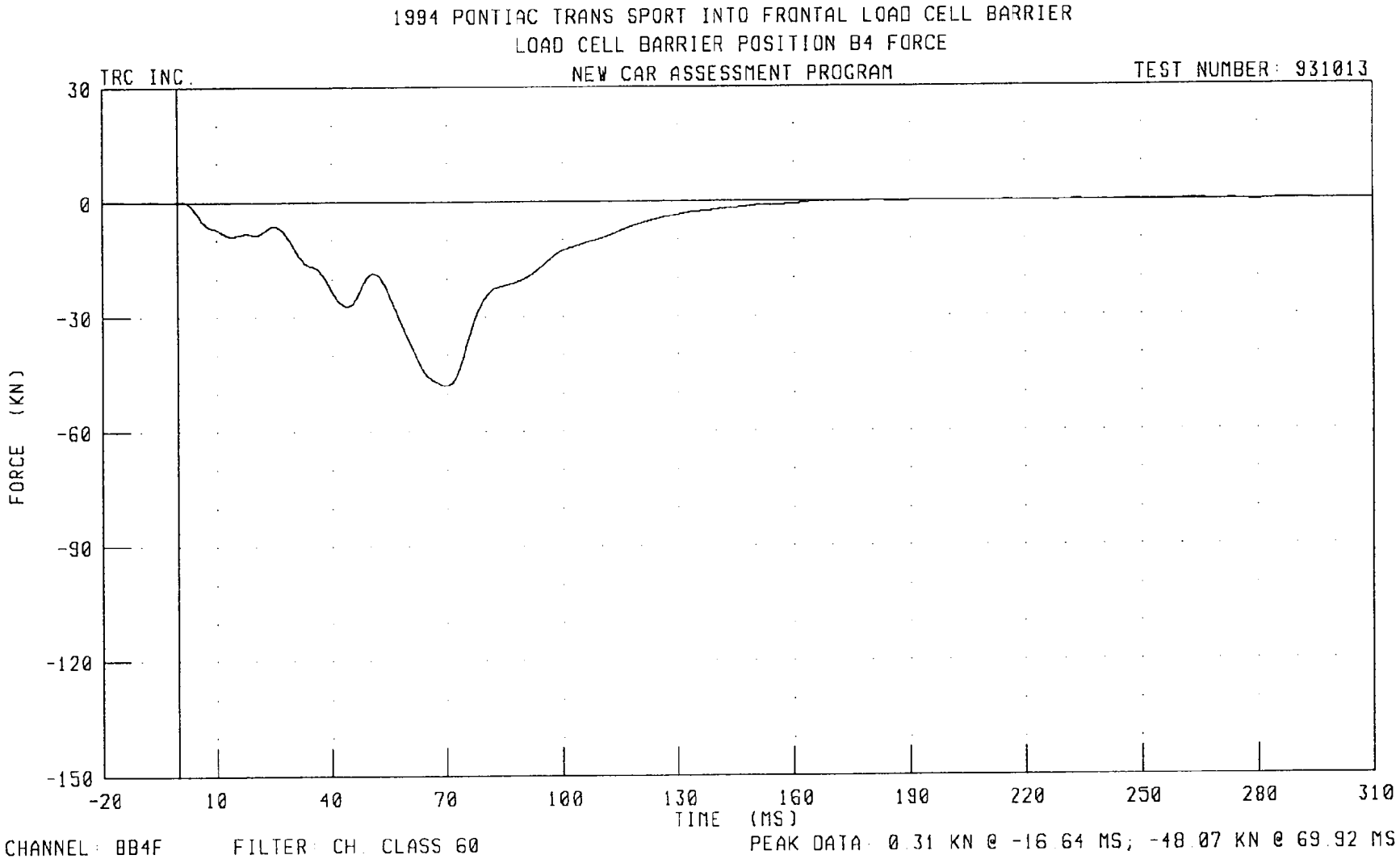

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB2F
FILTER: CH. CLASS 60
PEAK DATA: 0.23 KN @ -7.28 MS; -6.06 KN @ 38.00 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE



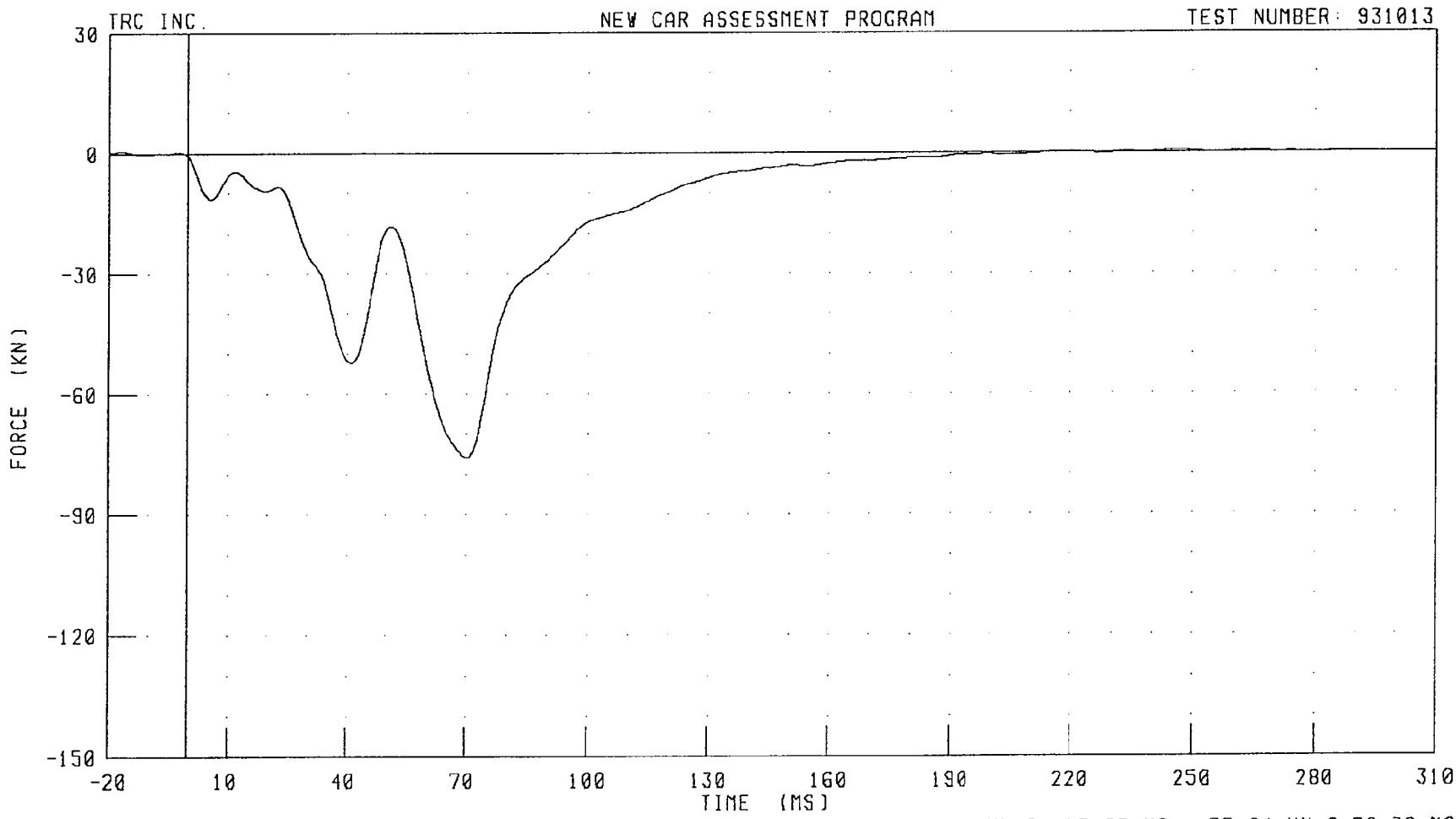
CHANNEL: BB3F FILTER: CH. CLASS 60 PEAK DATA: 0.51 KN @ 308.80 MS; -66.44 KN @ 22.32 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB4F
FILTER: CH. CLASS 60
PEAK DATA: 0.31 KN @ -16.64 MS; -48.07 KN @ 69.92 MS

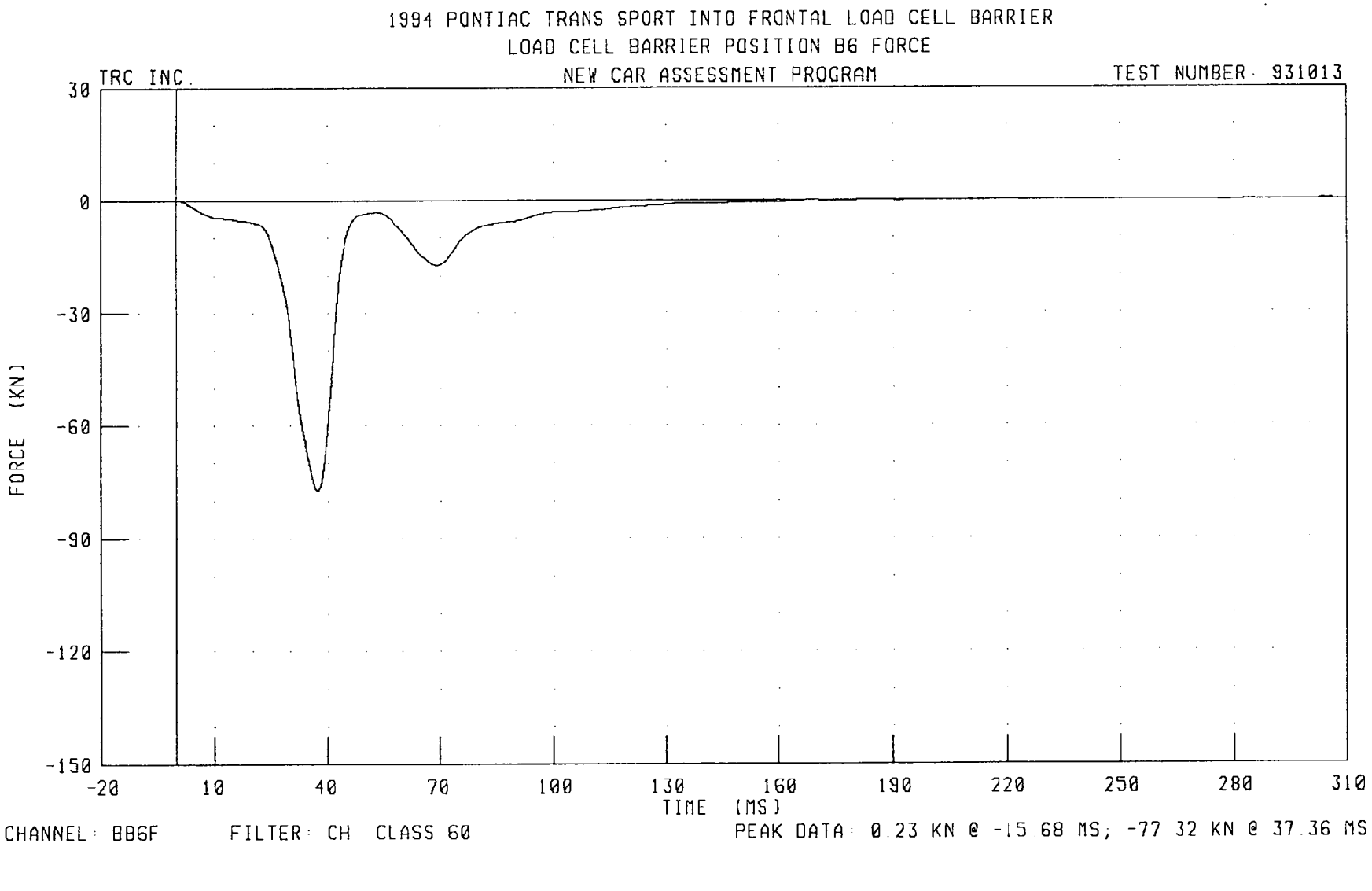
931013

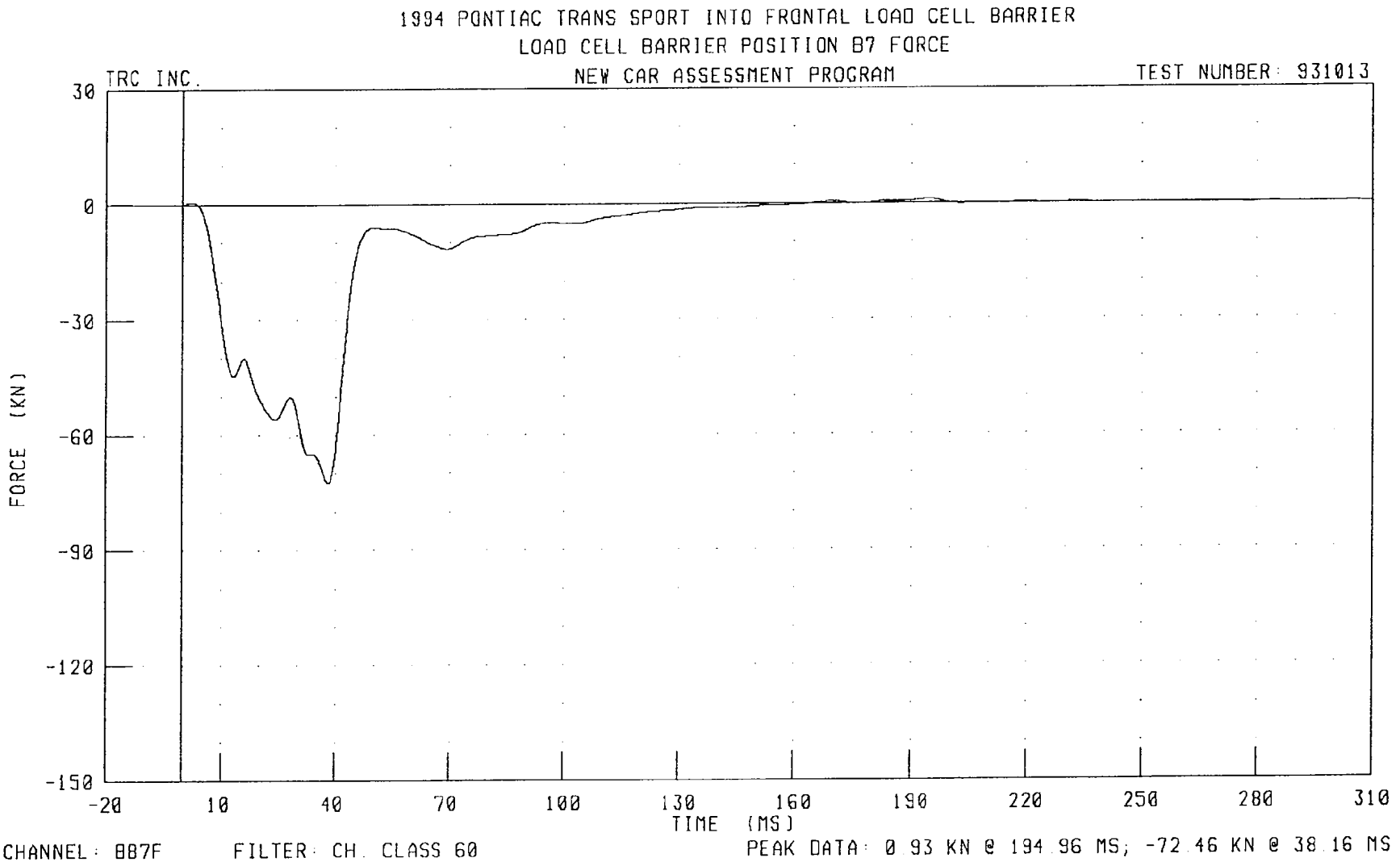
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE



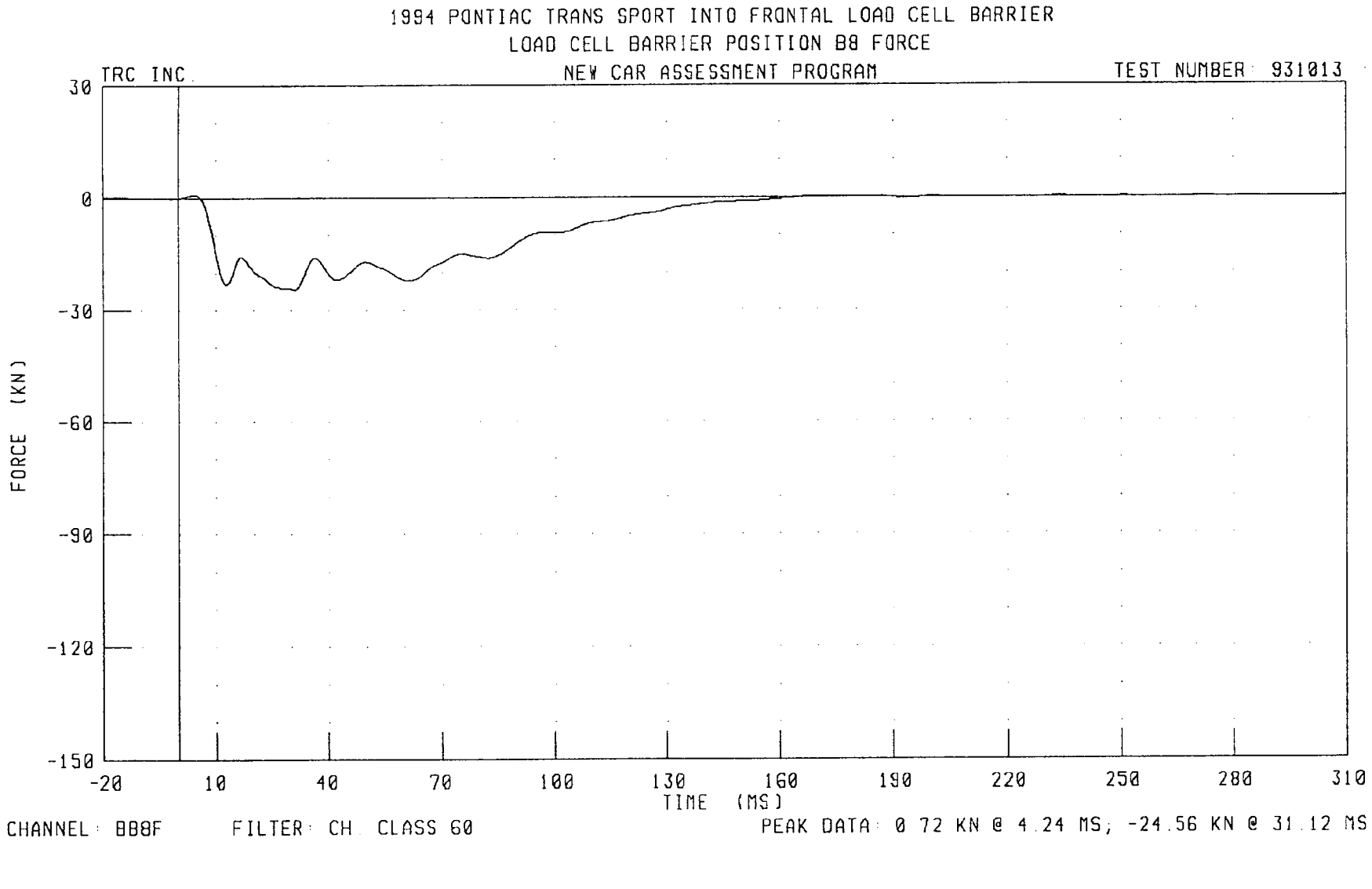
CHANNEL: B85F FILTER: CH. CLASS 60 PEAK DATA: 0.41 KN @ -16.96 MS; -75.84 KN @ 70.32 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB6F
FILTER: CH CLASS 60
PEAK DATA: 0.23 KN @ -15.68 MS; -77.32 KN @ 37.36 MS

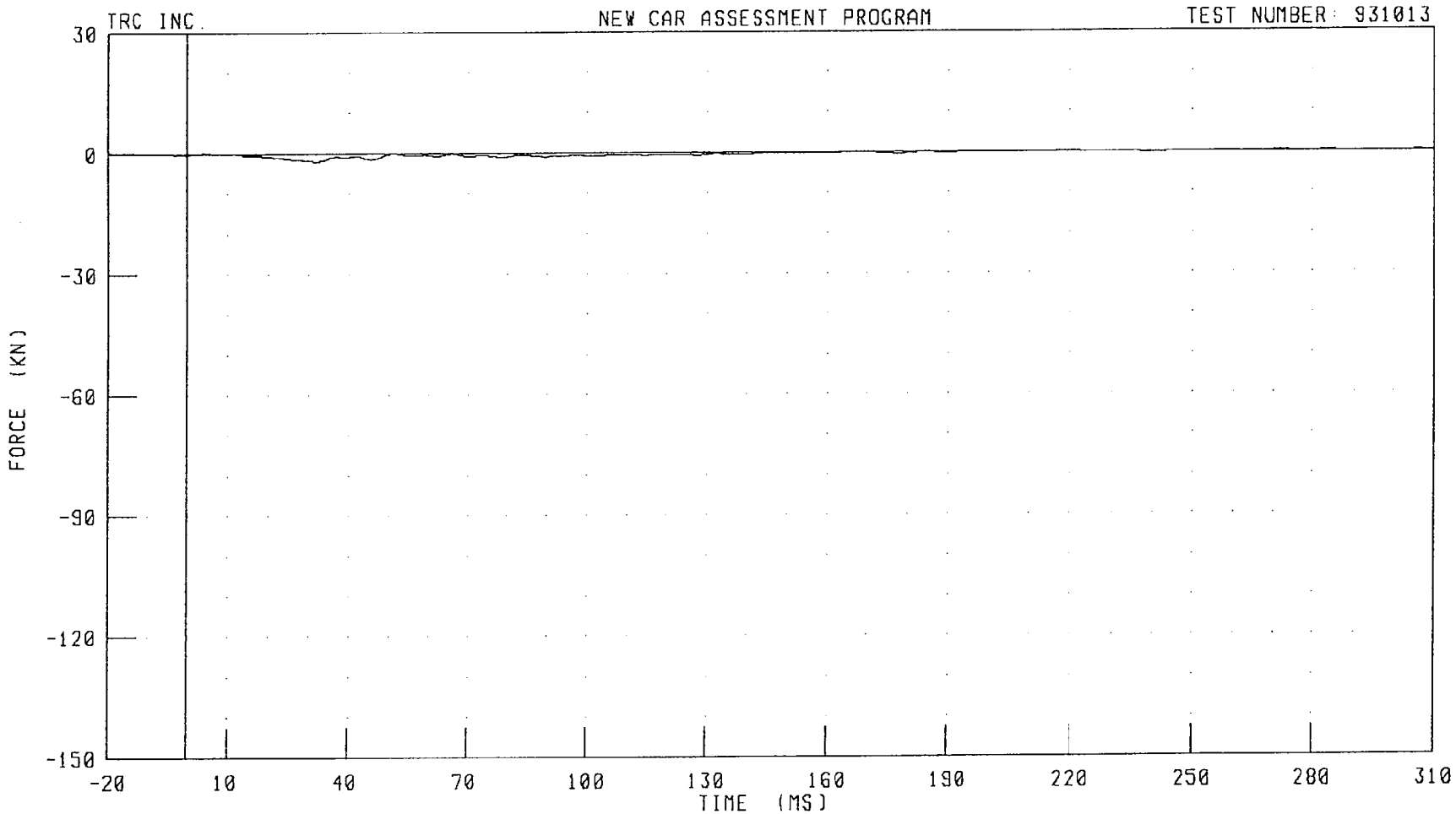

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: B87F
FILTER: CH. CLASS 60
PEAK DATA: 0.93 KN @ 194.96 MS; -72.46 KN @ 38.16 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: B8BF
FILTER: CH CLASS 60
PEAK DATA: 0.72 KN @ 4.24 MS; -24.56 KN @ 31.12 MS

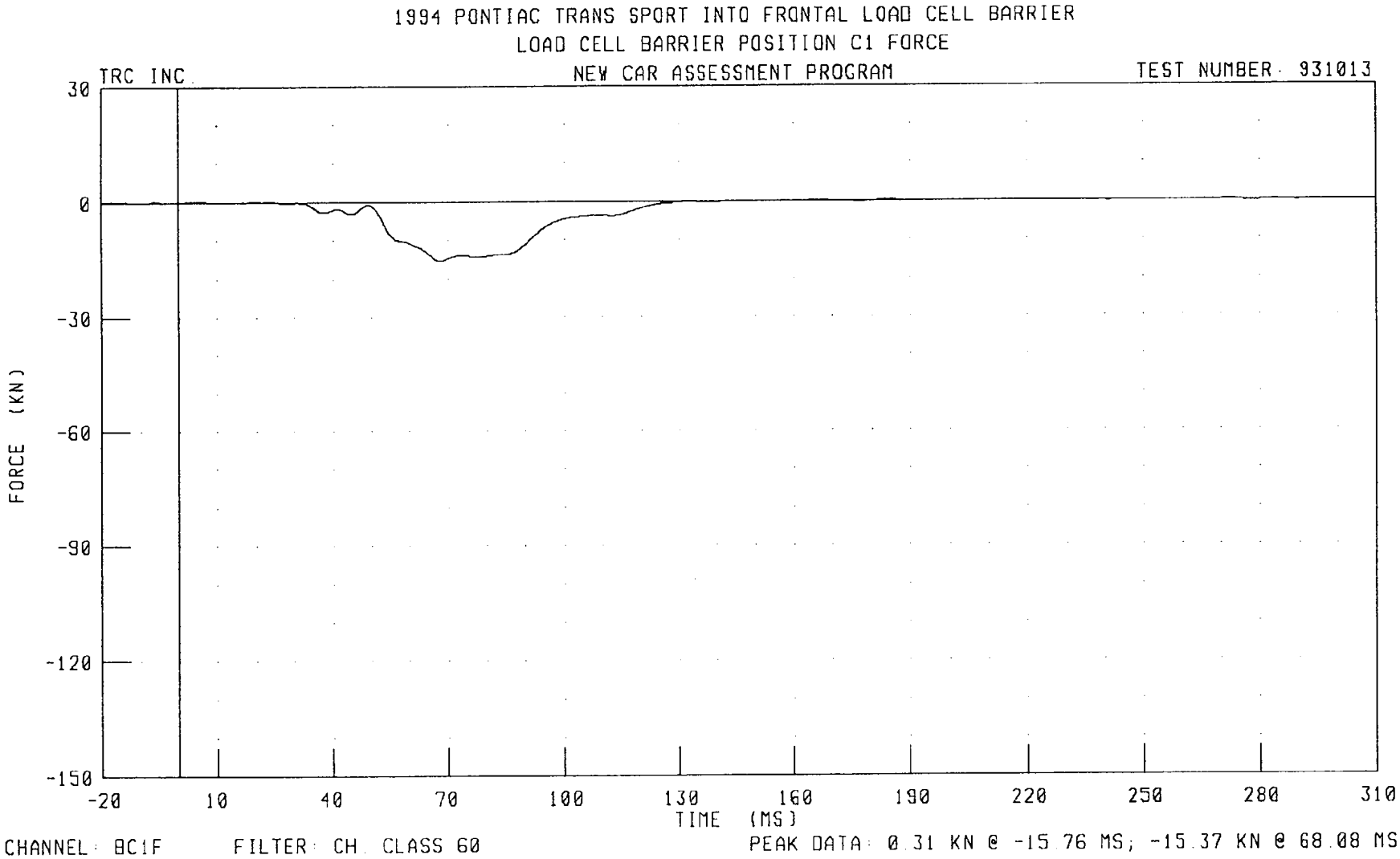
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE



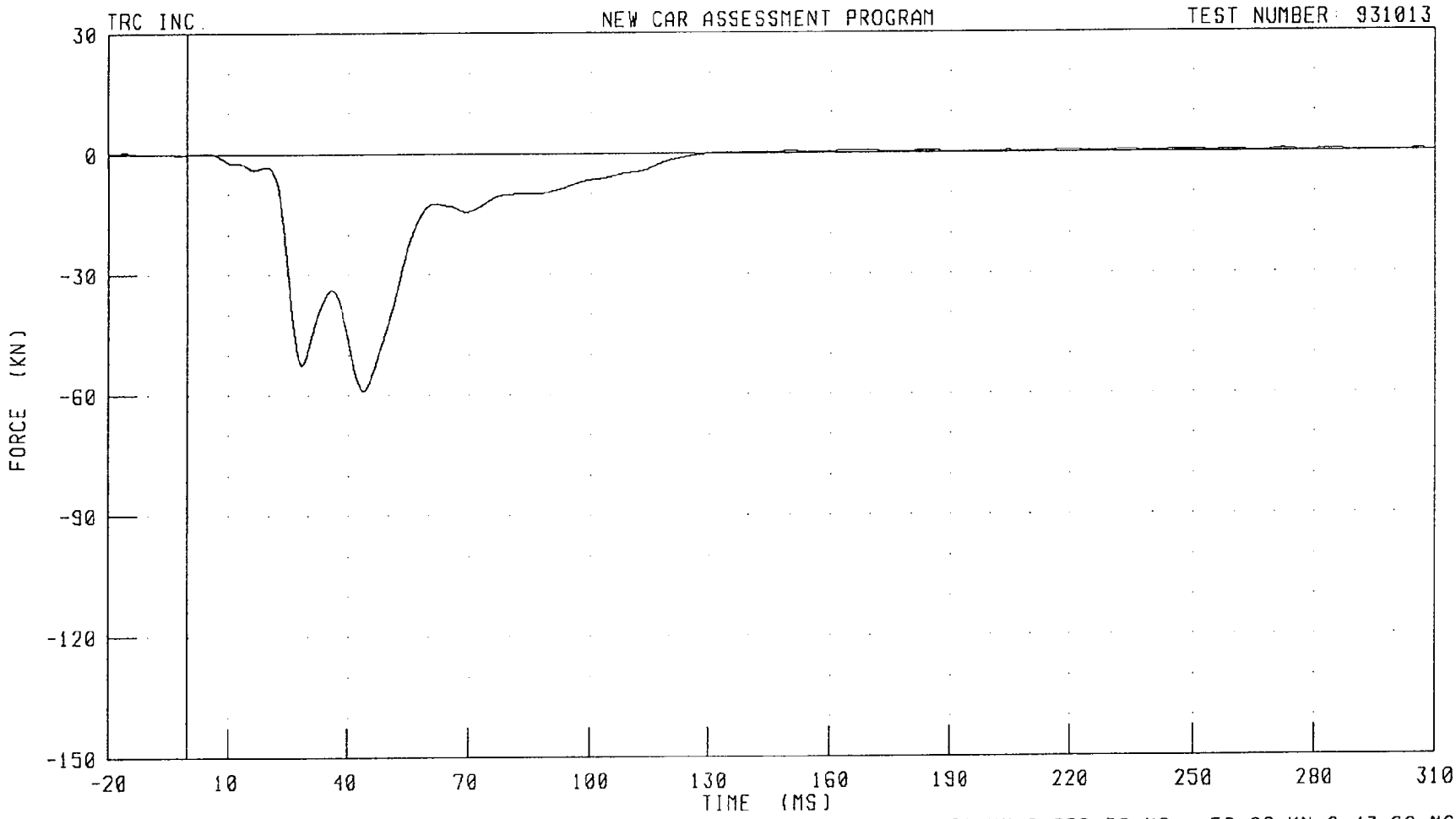
CHANNEL: BB9F FILTER: CH. CLASS 60 PEAK DATA: 0.31 KN @ -15.84 MS; -2.01 KN @ 31.92 MS

931013

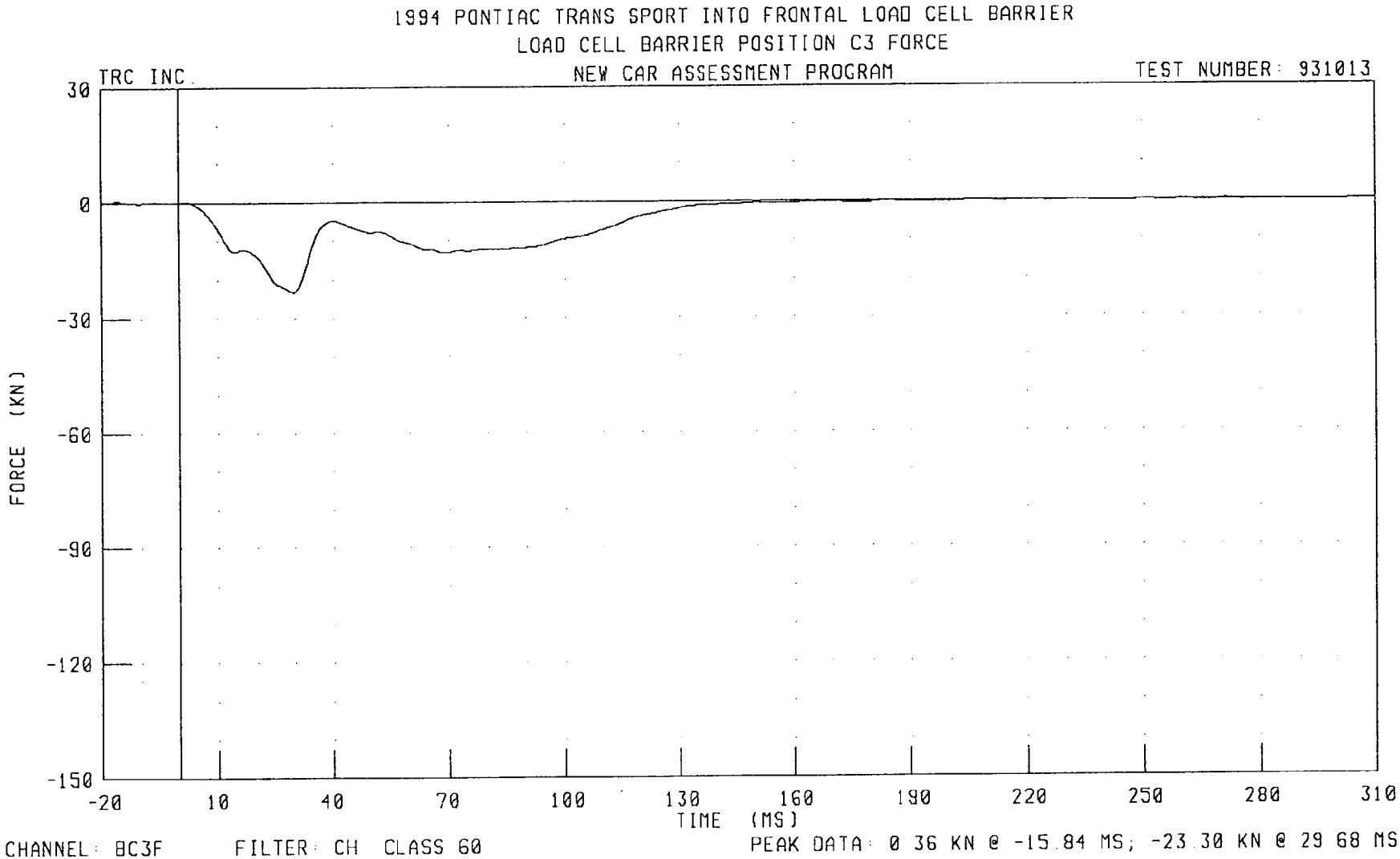

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC1F
FILTER: CH CLASS 60
PEAK DATA: 0.31 KN @ -15.76 MS; -15.37 KN @ 68.08 MS

931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE
NEW CAR ASSESSMENT PROGRAM

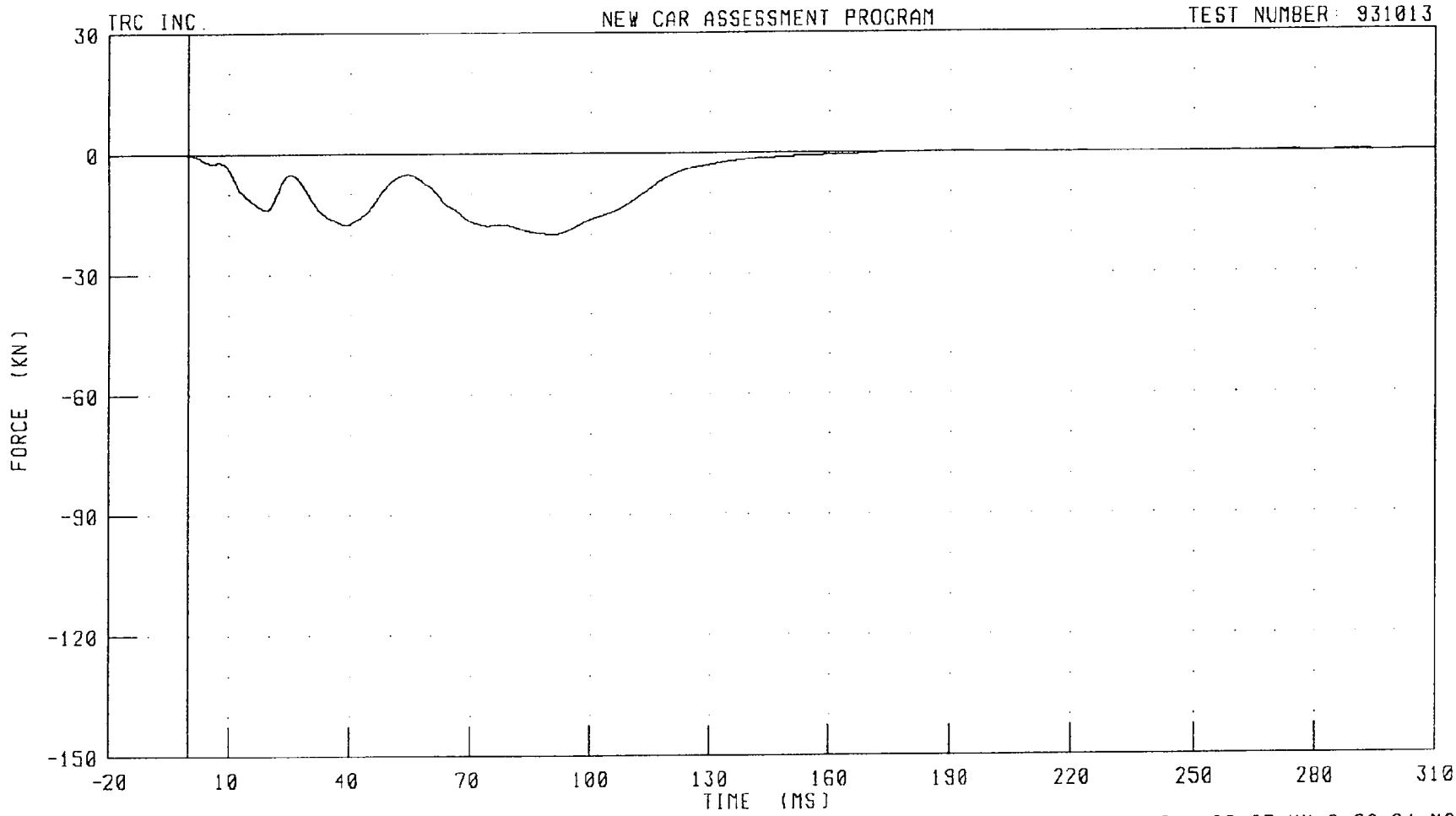


CHANNEL: BC2F FILTER: CH. CLASS 60 PEAK DATA: 0.61 KN @ 272.32 MS; -58.92 KN @ 43.92 MS


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC3F
FILTER: CH CLASS 60
PEAK DATA: 0.36 KN @ -15.84 MS; -23.30 KN @ 29.68 MS

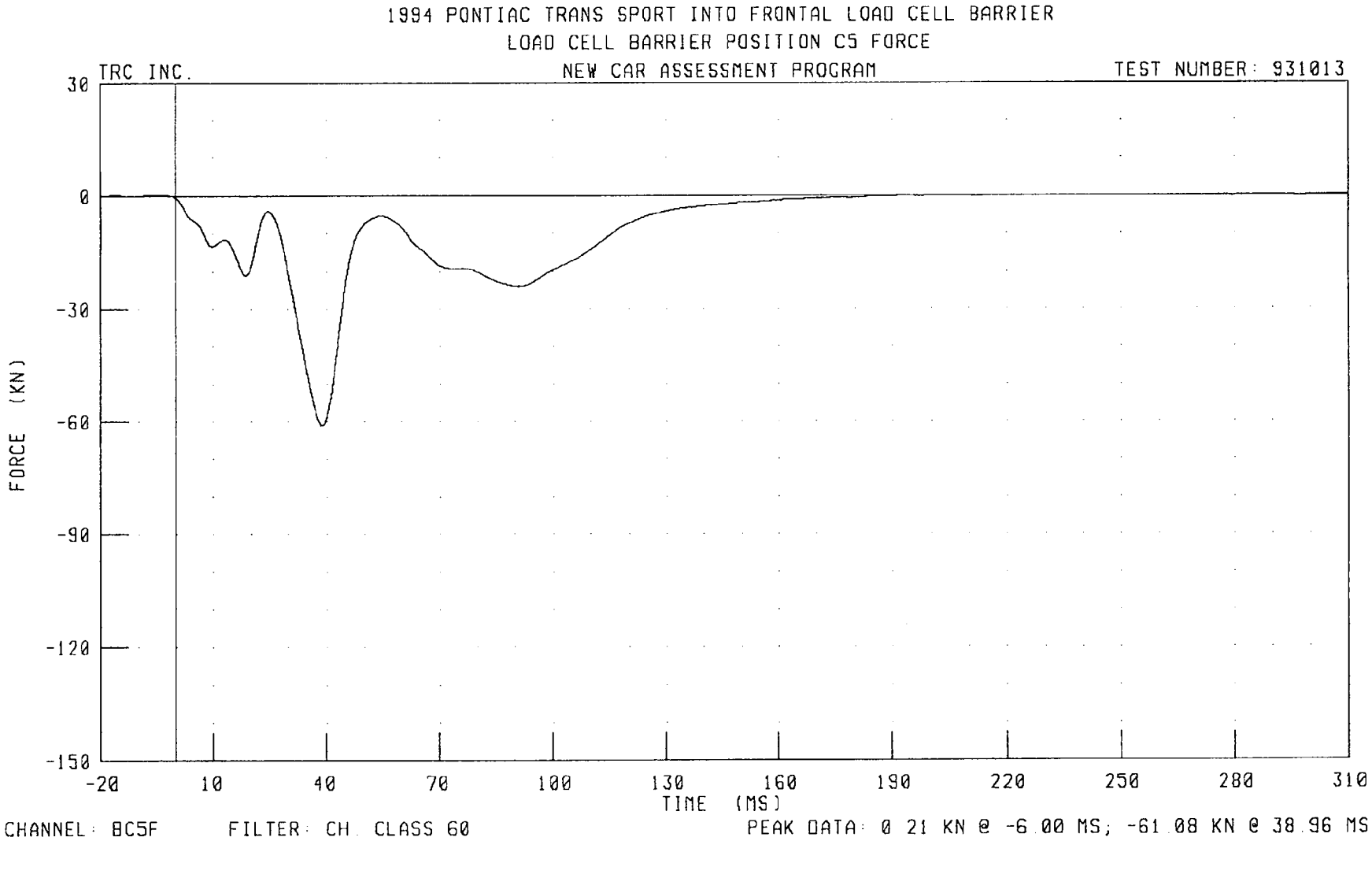
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE



CHANNEL: 8C4F FILTER: CH CLASS 60 PEAK DATA: 0.28 KN @ 308.72 MS; -20.07 KN @ 90.64 MS

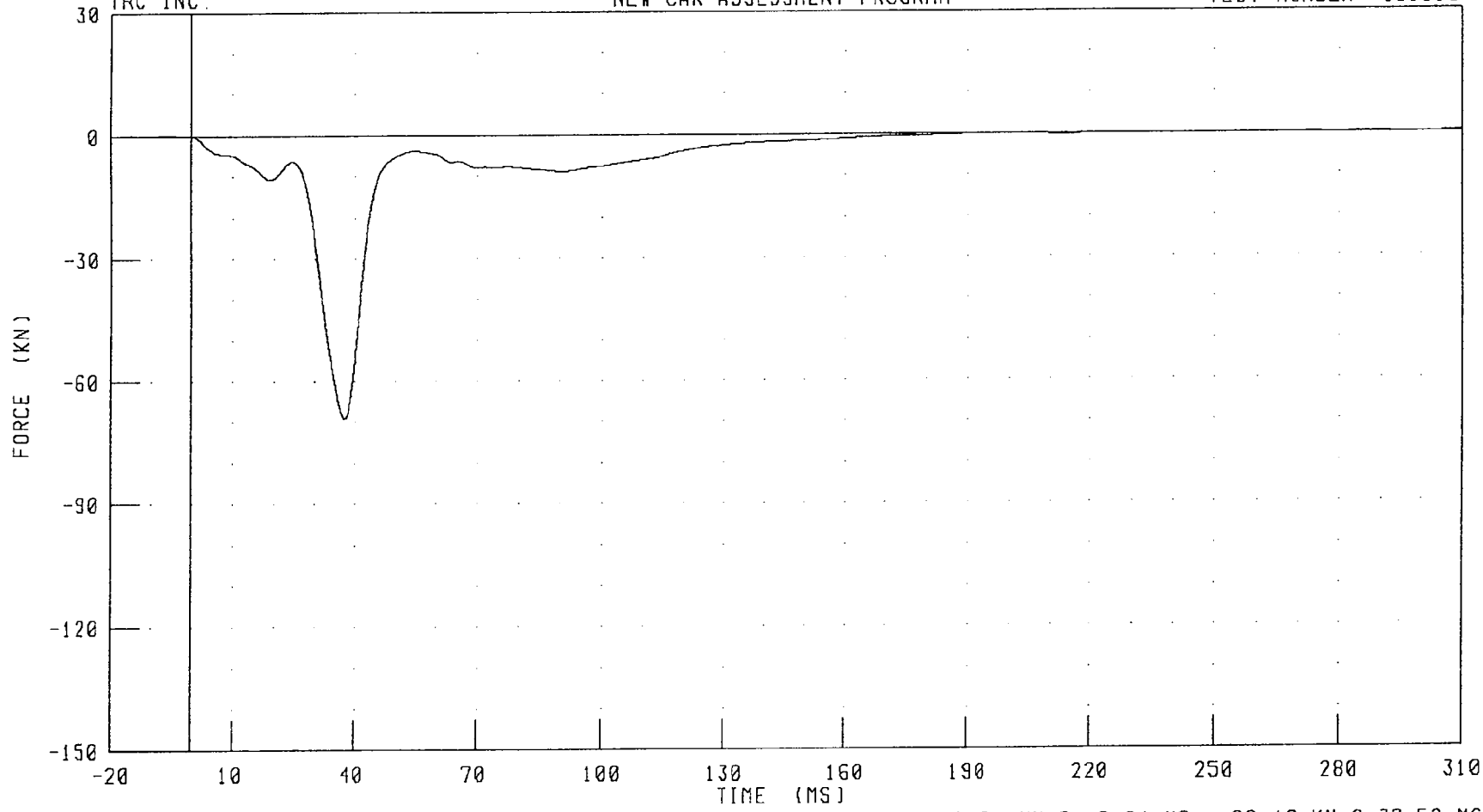
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC5F
FILTER: CH. CLASS 60
PEAK DATA: 0.21 KN @ -6.00 MS; -61.08 KN @ 38.96 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION CG FORCE
NEW CAR ASSESSMENT PROGRAM

TRC INC.

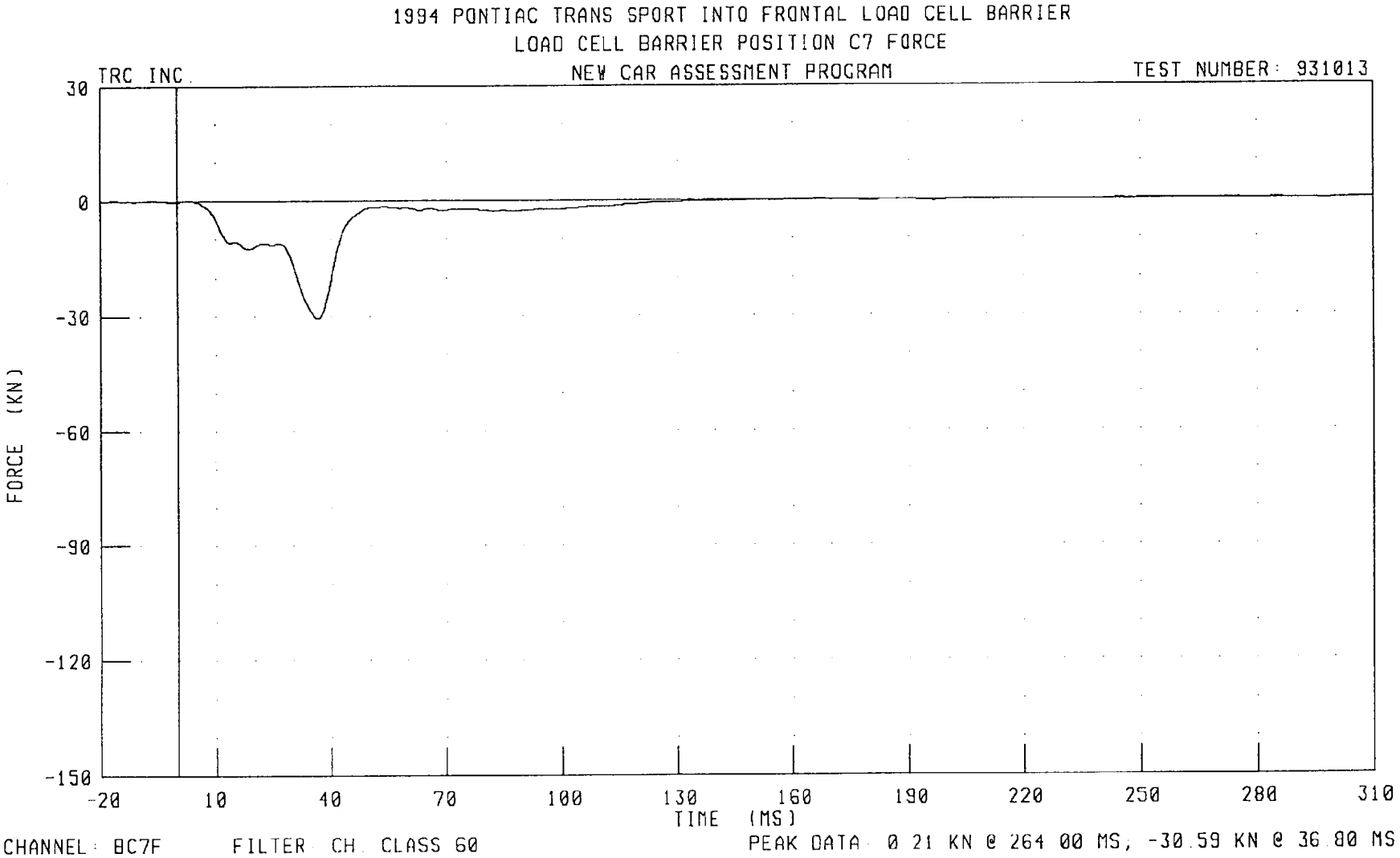
TEST NUMBER: 931013



CHANNEL: BCGF FILTER: CH. CLASS 60

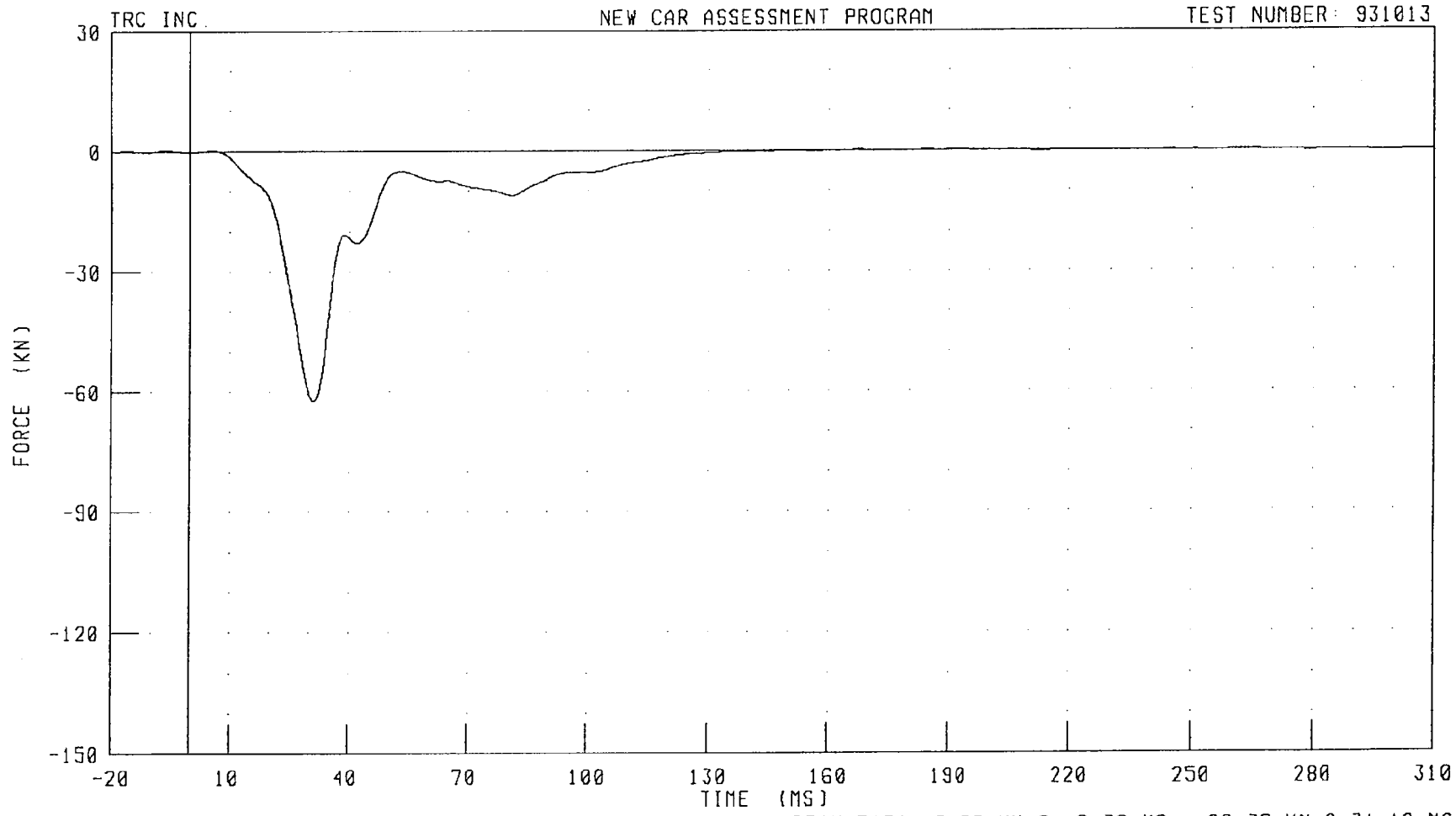
PEAK DATA: 0.21 KN @ -6.24 MS; -69.12 KN @ 37.52 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC7F
FILTER CH CLASS 60
PEAK DATA 0 21 KN @ 264 00 MS, -30 59 KN @ 36 80 MS

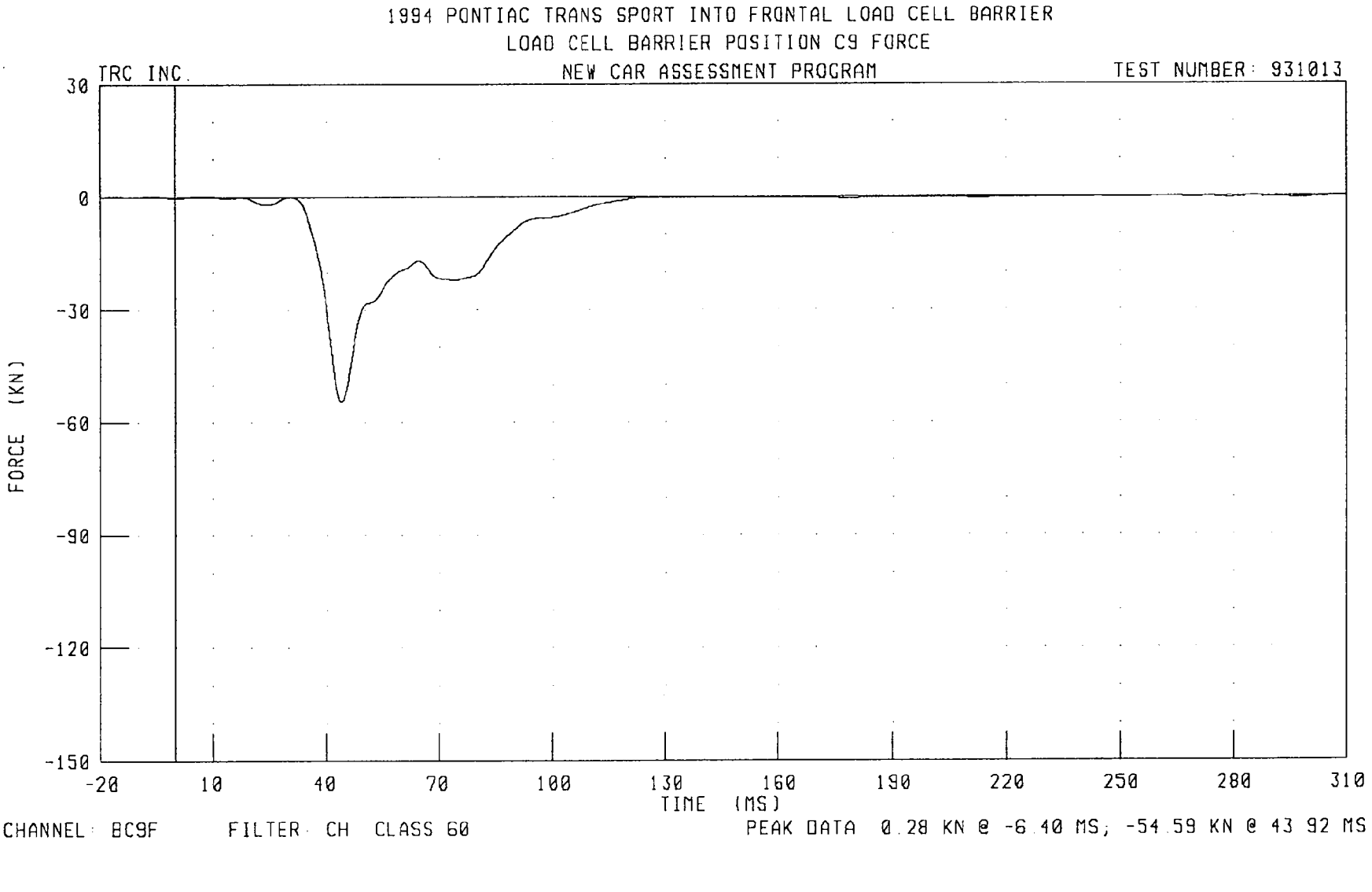
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

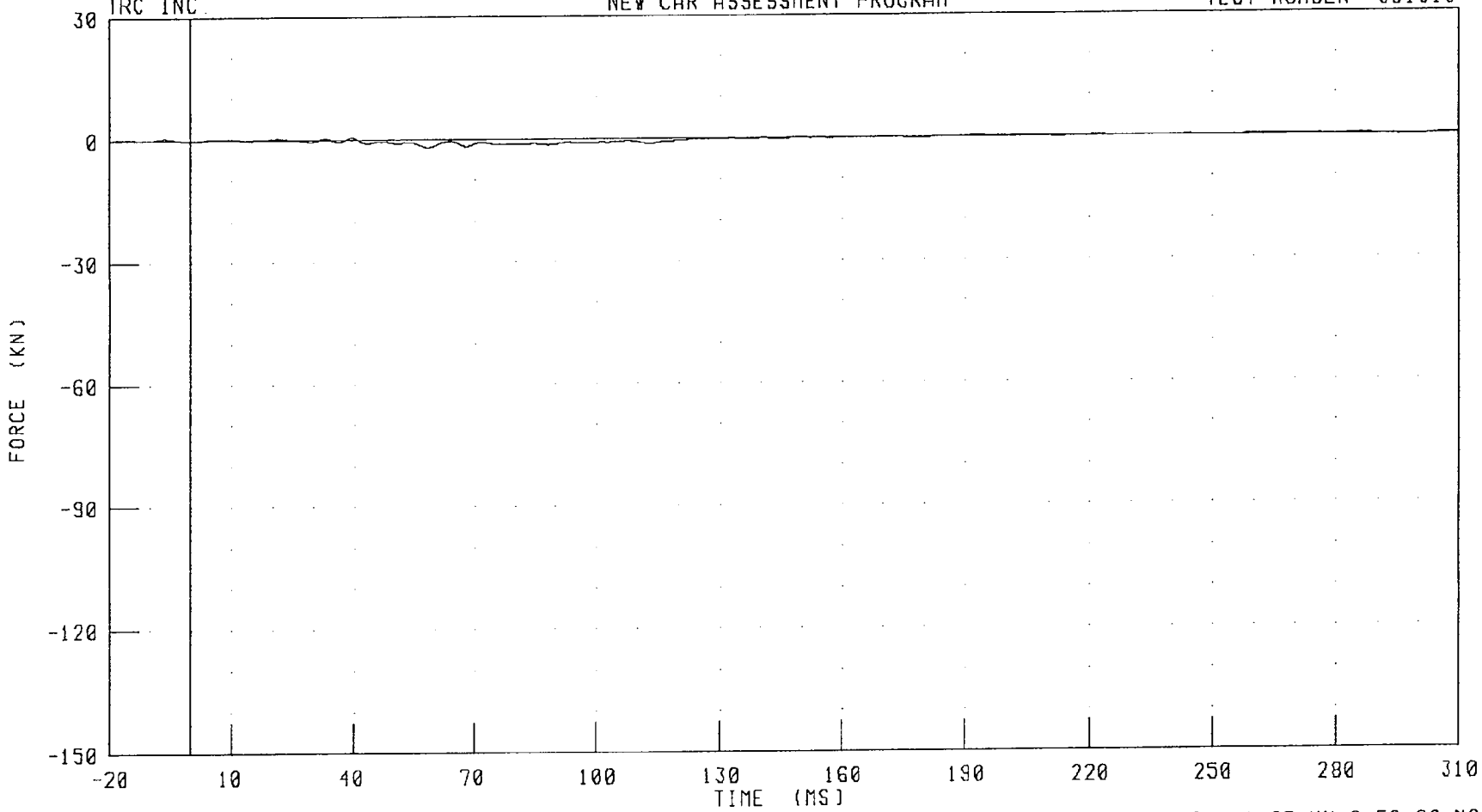


CHANNEL: 8C8F FILTER: CH CLASS 60 PEAK DATA: 0.20 KN @ -6.32 MS; -62.37 KN @ 31.12 MS

931013

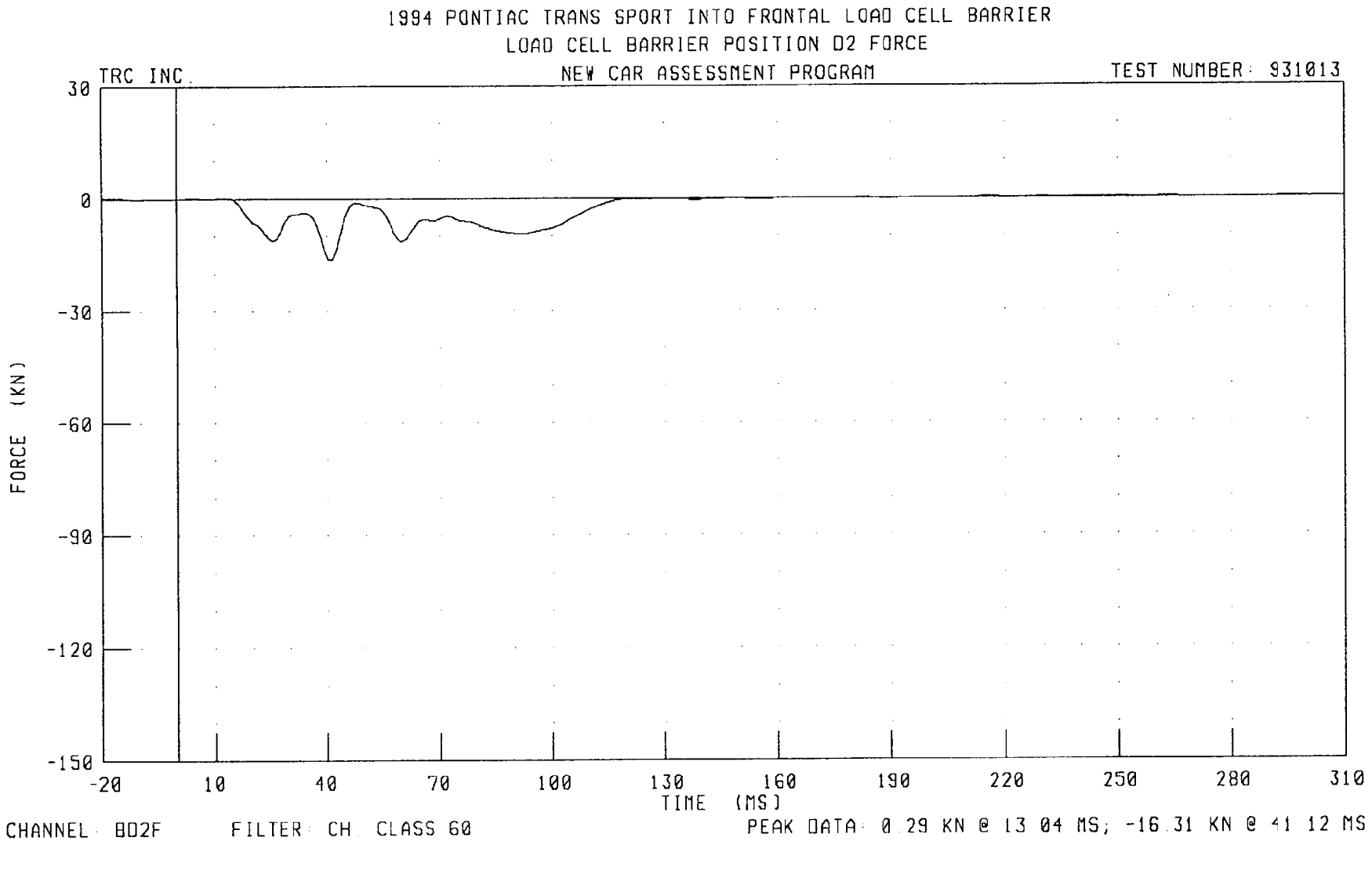

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC9F
FILTER: CH CLASS 60
PEAK DATA 0.28 KN @ -6.40 MS; -54.59 KN @ 43.92 MS

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 01 FORCE
TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 931013

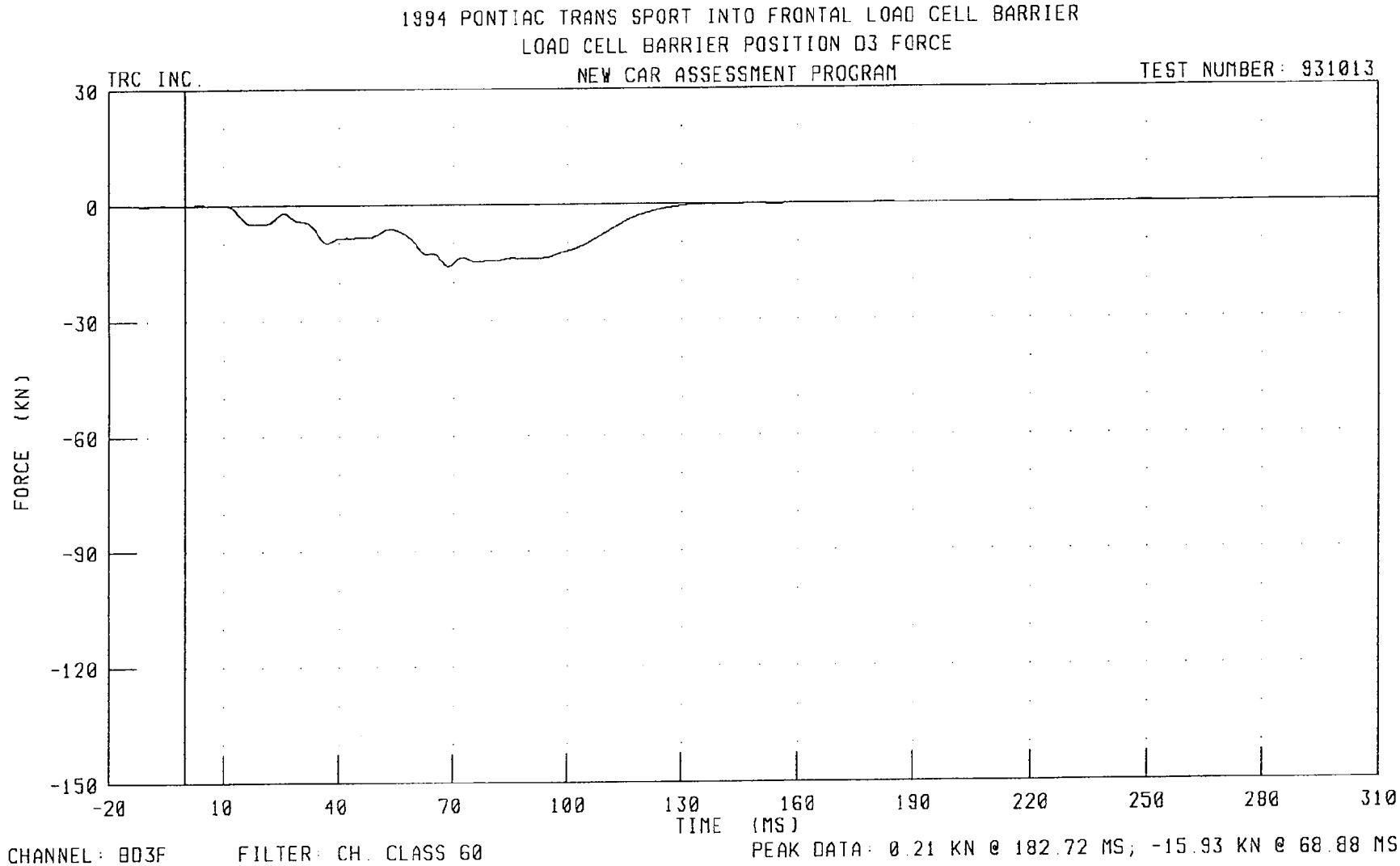


CHANNEL: B01F FILTER: CH CLASS 60 PEAK DATA: 0.45 KN @ 39.44 MS; -1.97 KN @ 58.00 MS

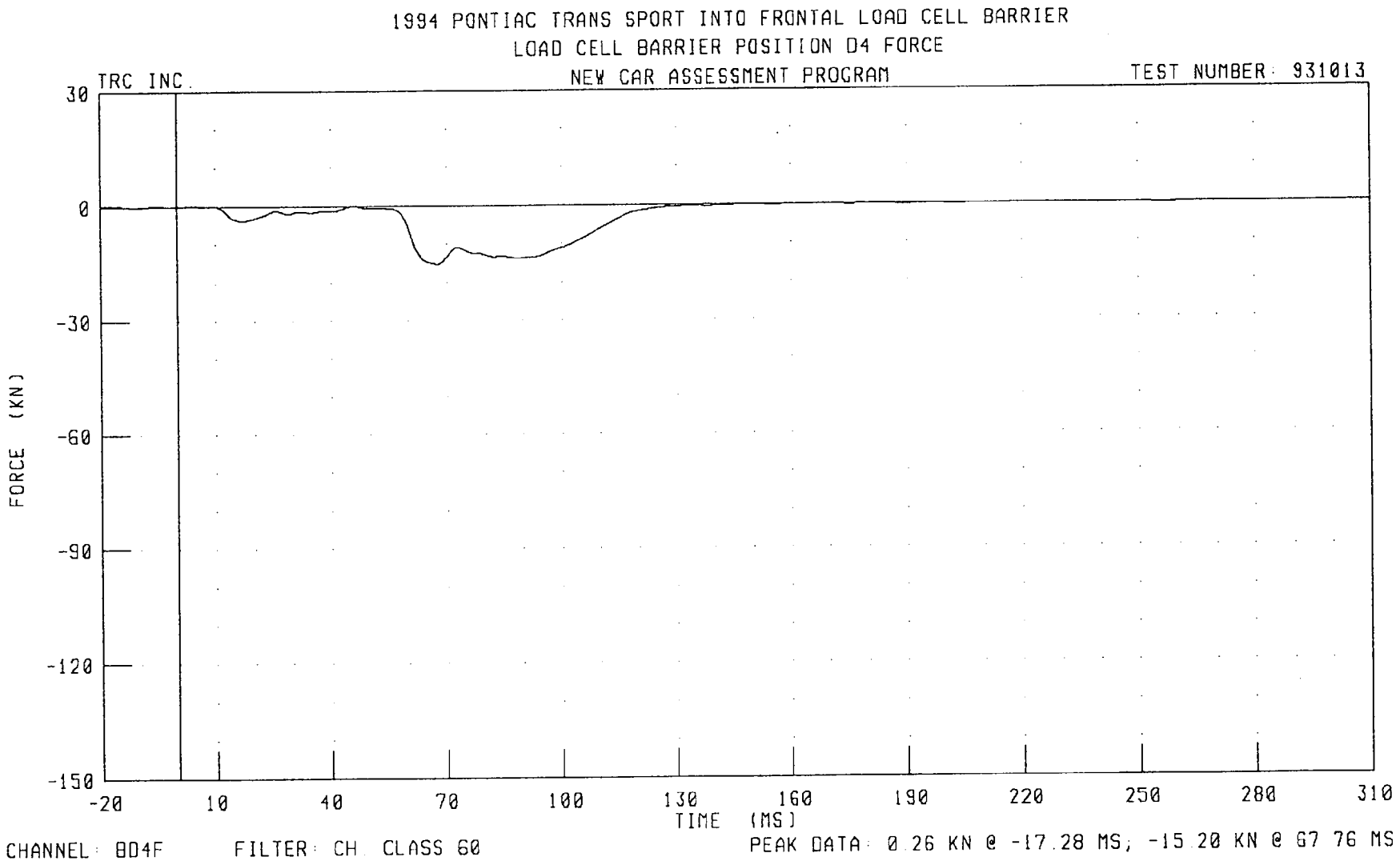
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD2F
FILTER: CH CLASS 60
PEAK DATA: 0.29 KN @ 13.04 MS; -16.31 KN @ 41.12 MS

931013

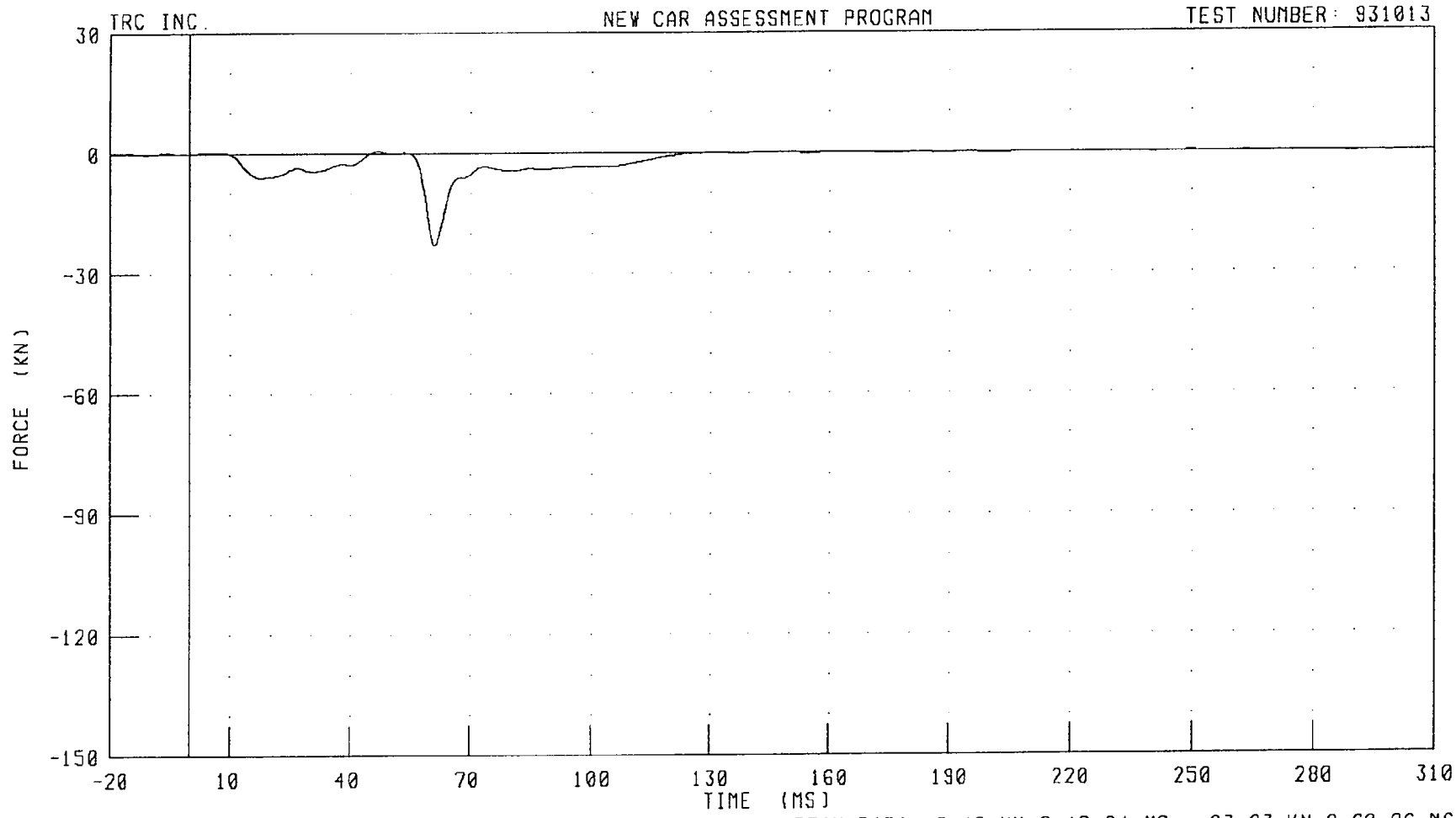

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 03 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 03F
FILTER: CH. CLASS 60
PEAK DATA: 0.21 KN @ 182.72 MS; -15.93 KN @ 68.88 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D4 FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
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: 0.26 KN @ -17.28 MS; -15.20 KN @ 67.76 MS

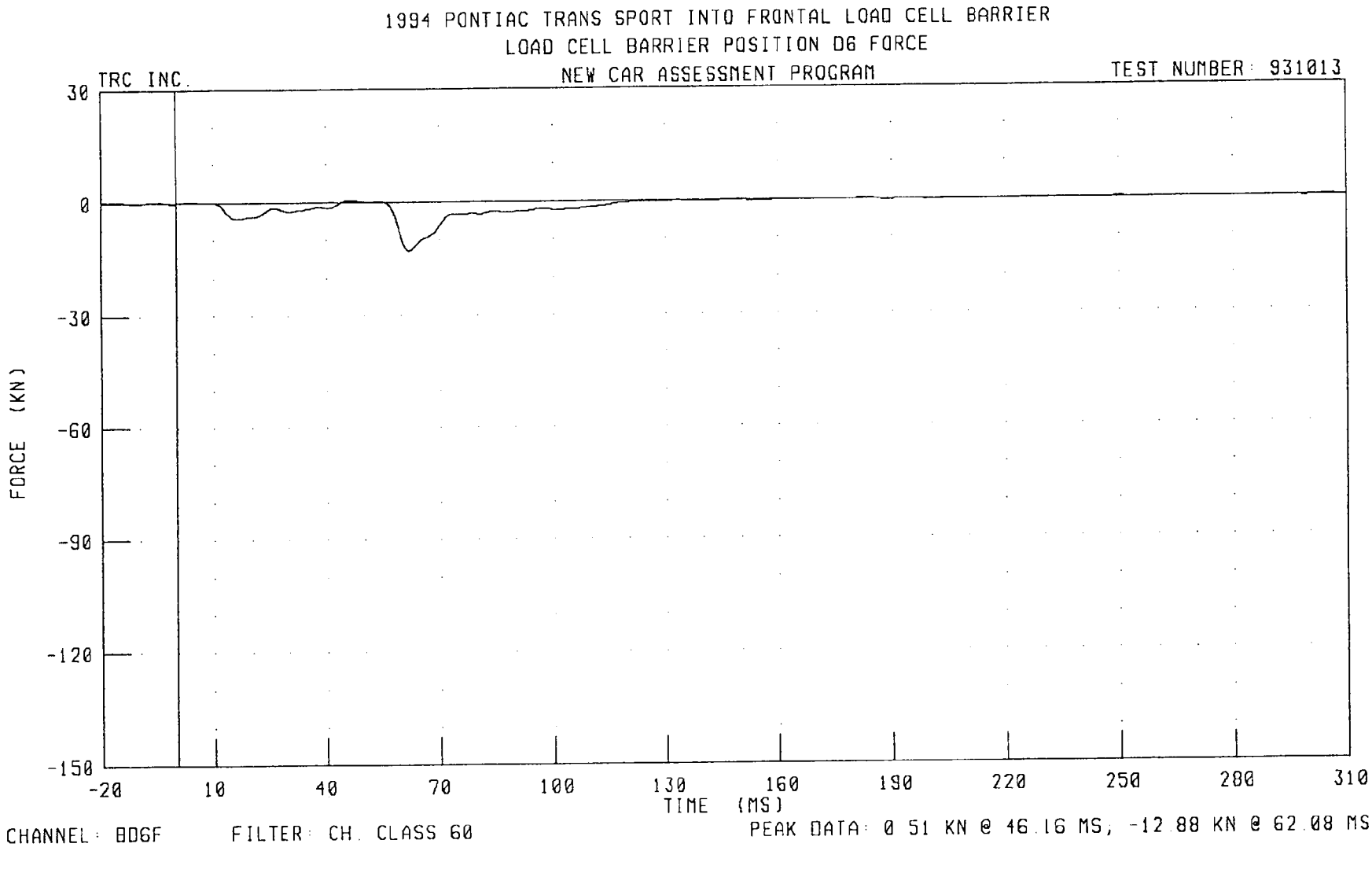
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 05 FORCE



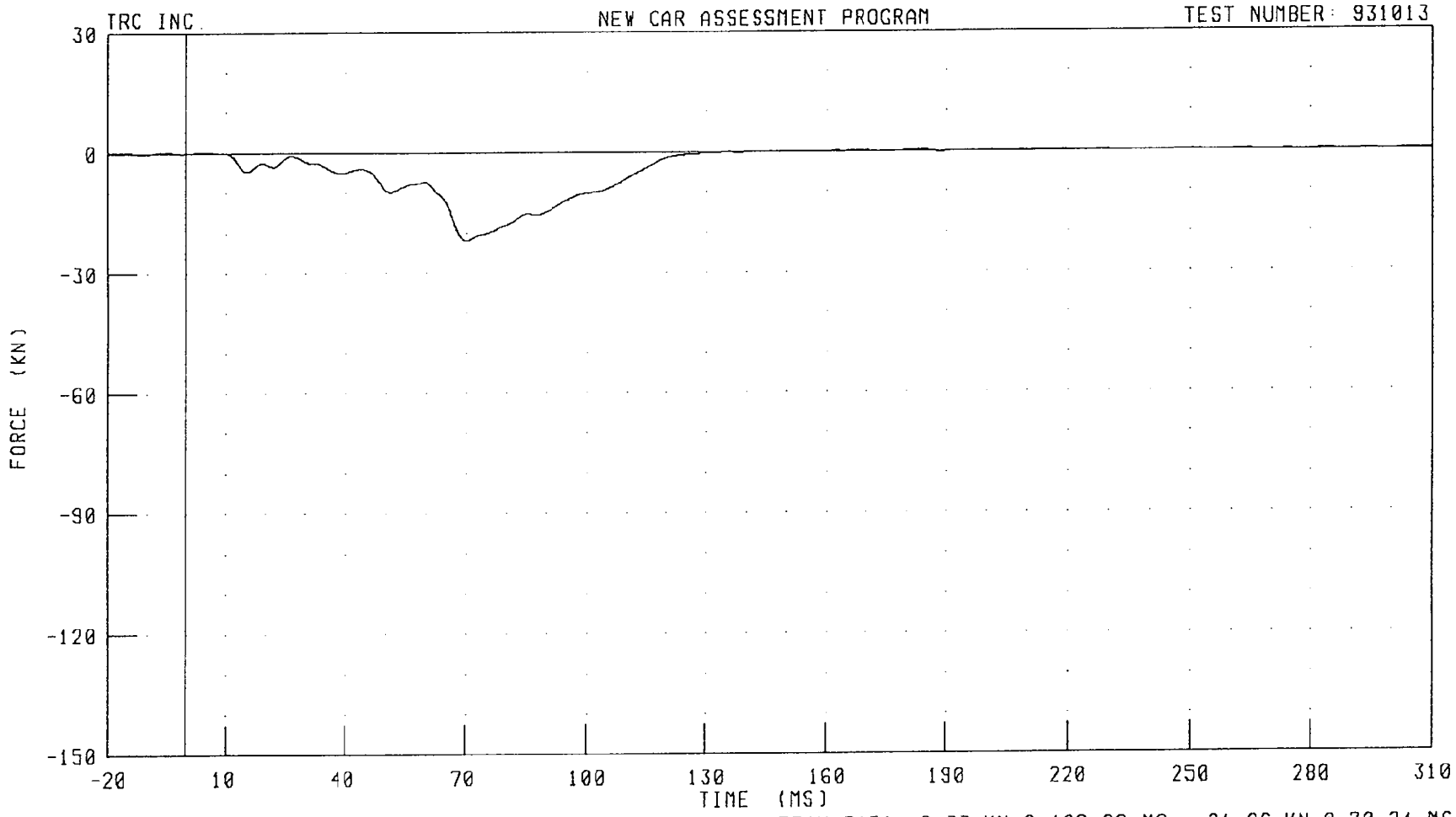
CHANNEL: 805F FILTER: CH. CLASS 60 PEAK DATA: 0.46 KN @ 46.64 MS; -23.03 KN @ 60.96 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BDGF
FILTER: CH. CLASS 60
PEAK DATA: 0.51 KN @ 46.16 MS, -12.88 KN @ 62.08 MS

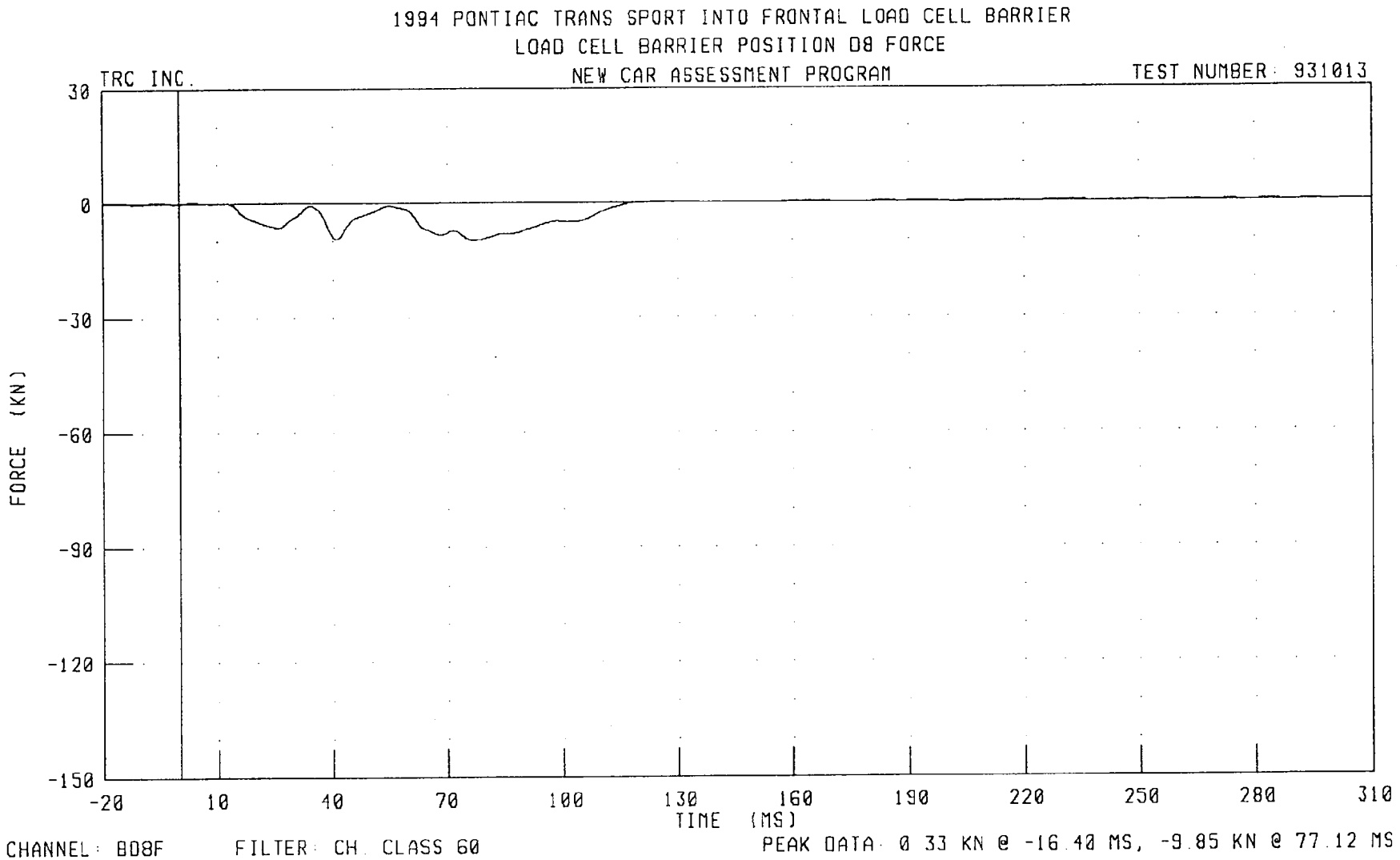
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

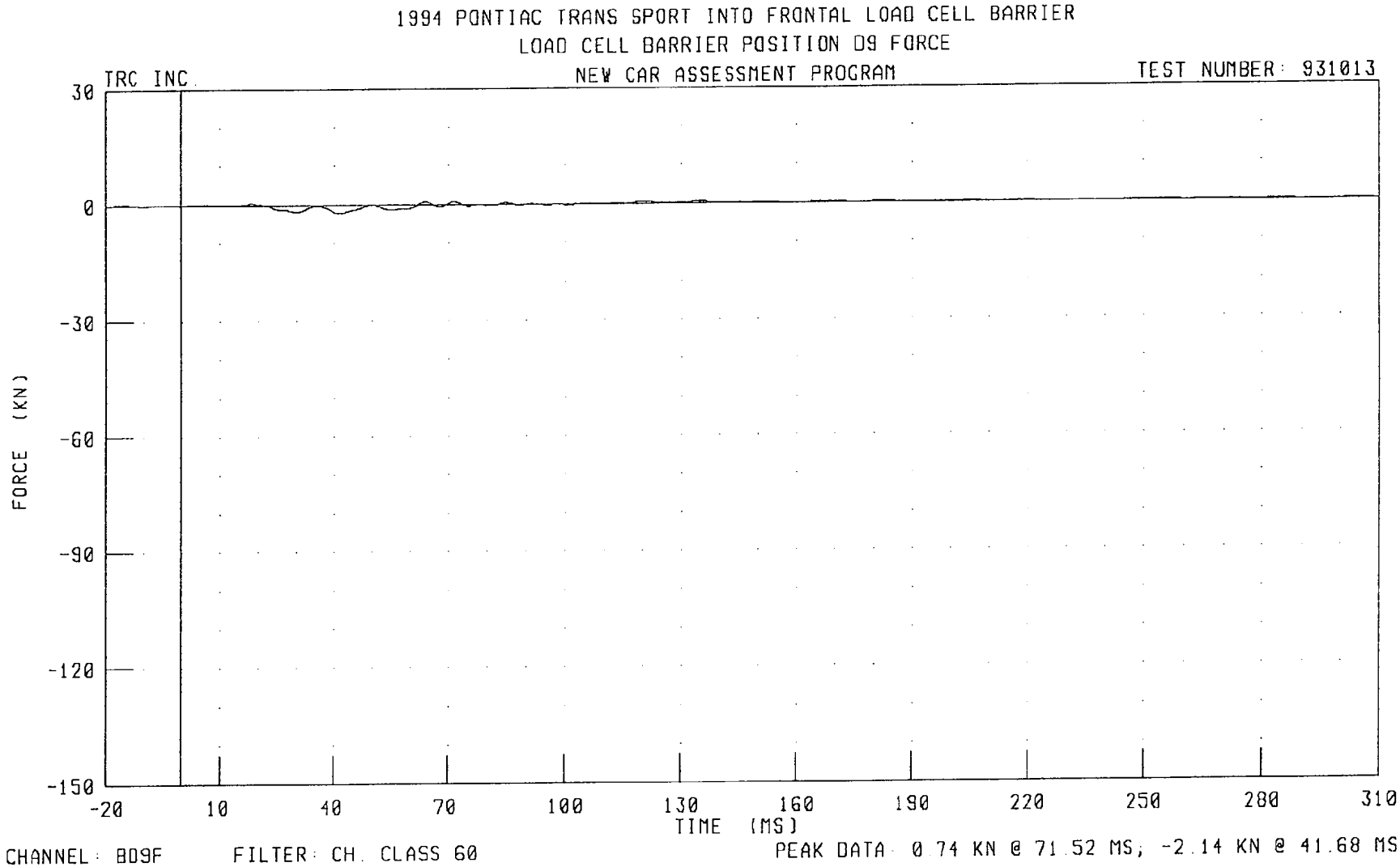


CHANNEL: 8D7F FILTER: CH CLASS 60 PEAK DATA: 0.33 KN @ 182.88 MS, -21.96 KN @ 70.24 MS

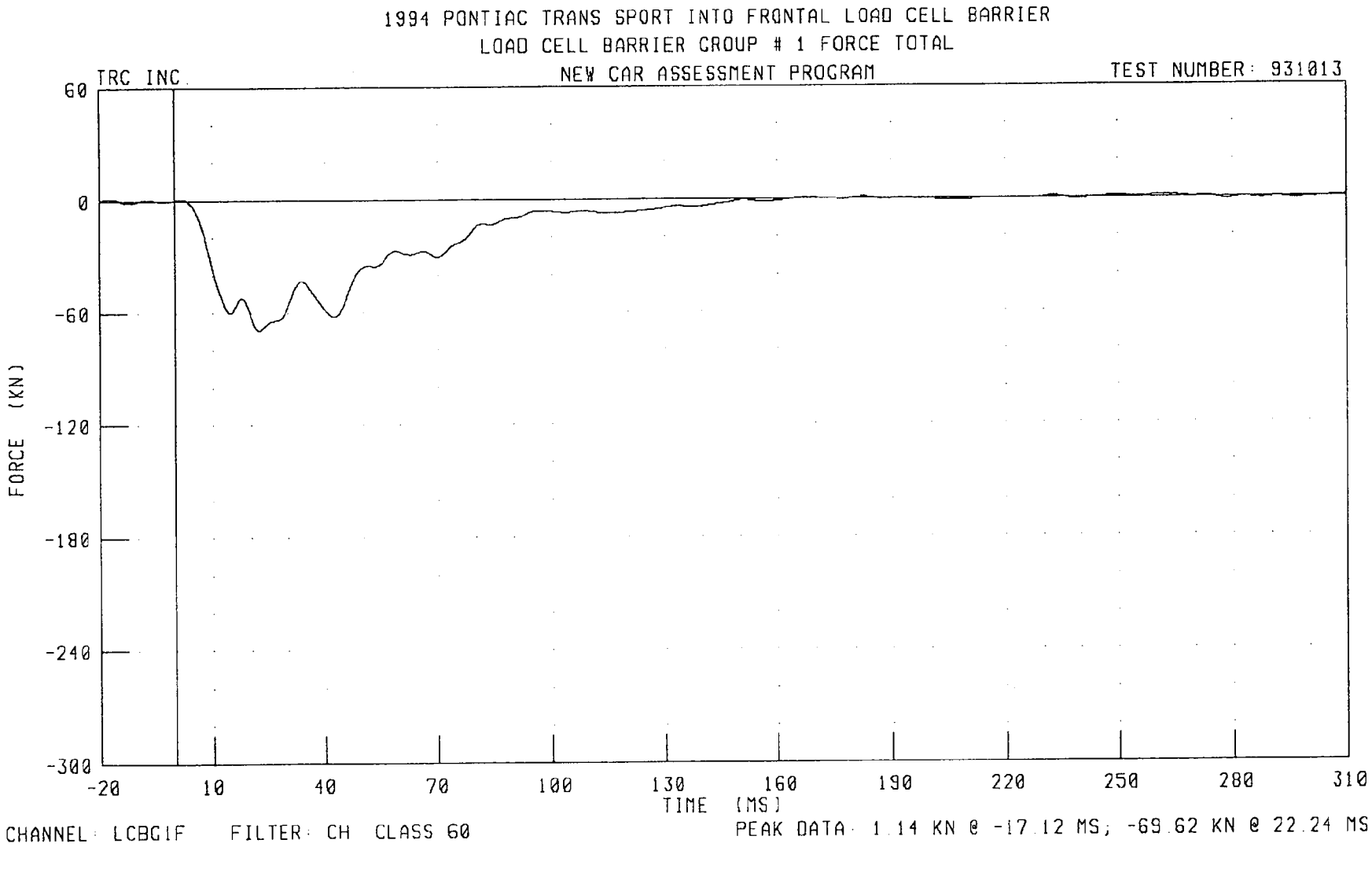
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD8F
FILTER: CH CLASS 60
PEAK DATA: 0.33 KN @ -16.40 MS, -9.85 KN @ 77.12 MS

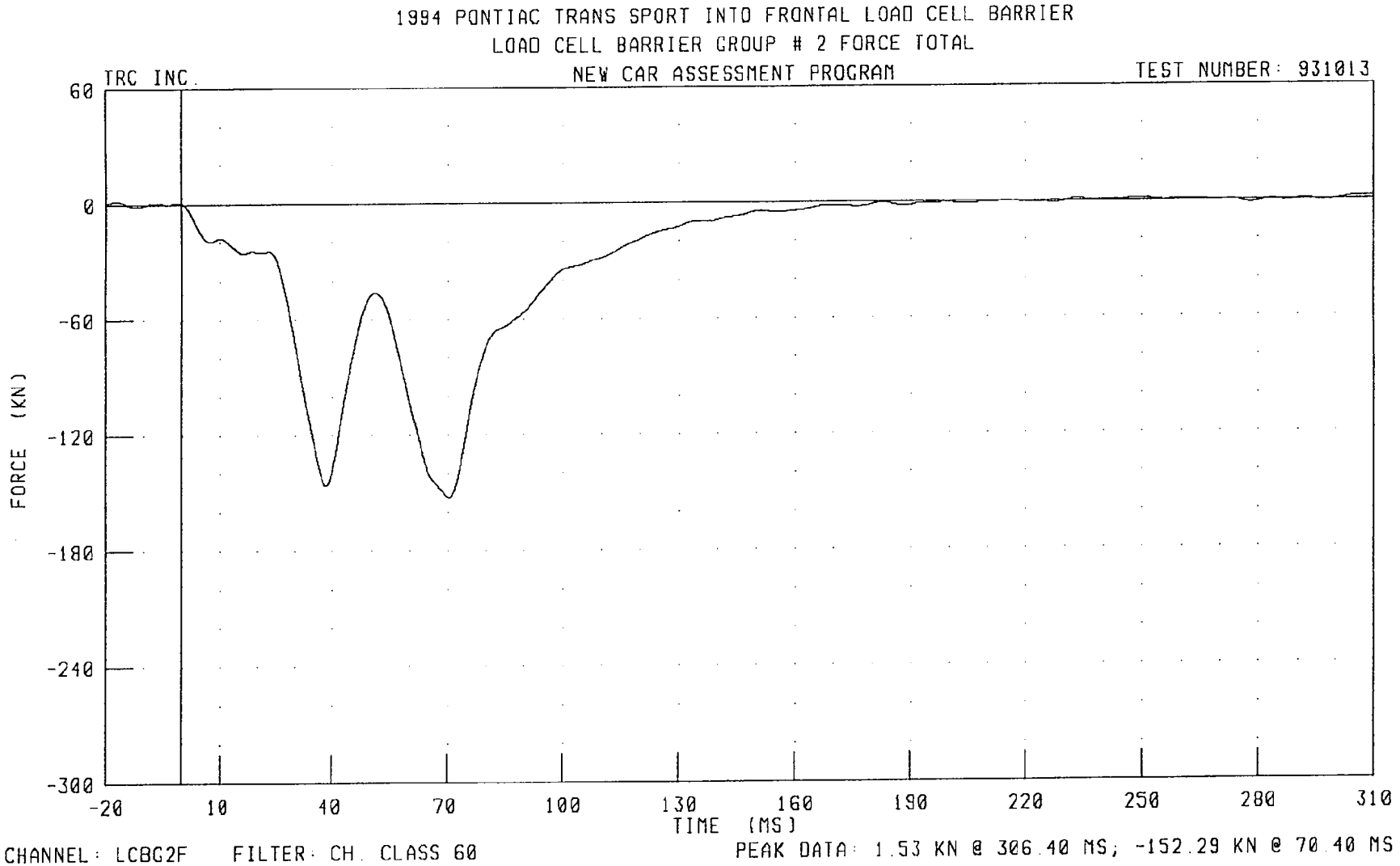
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 09 FORCE
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 809F
FILTER: CH. CLASS 60
PEAK DATA: 0.74 KN @ 71.52 MS; -2.14 KN @ 41.68 MS

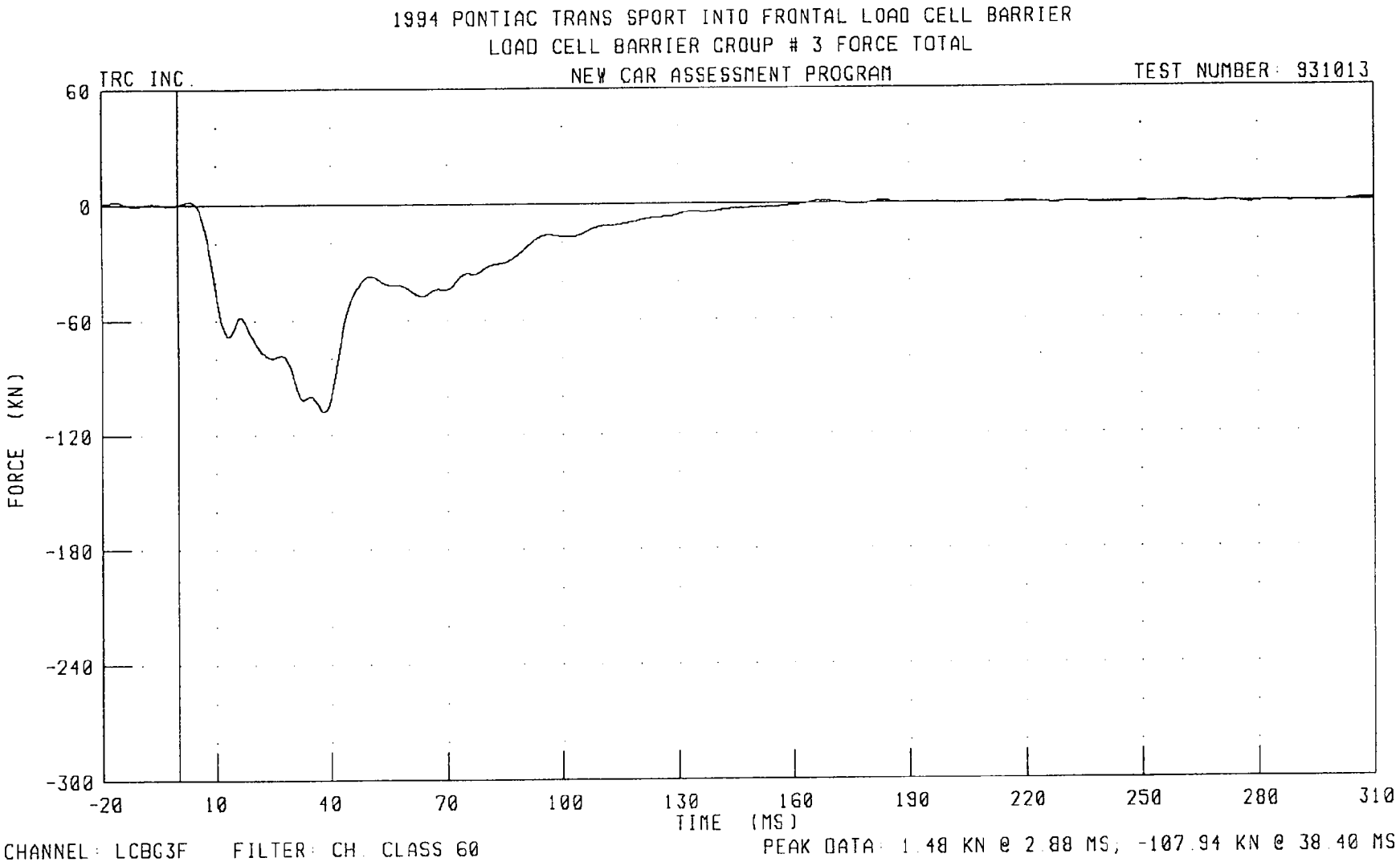
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
TRC INC
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
60
0
-60
-120
-180
-240
-300
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG1F FILTER: CH CLASS 60
PEAK DATA: 1.14 KN @ -17.12 MS; -69.62 KN @ 22.24 MS

931013

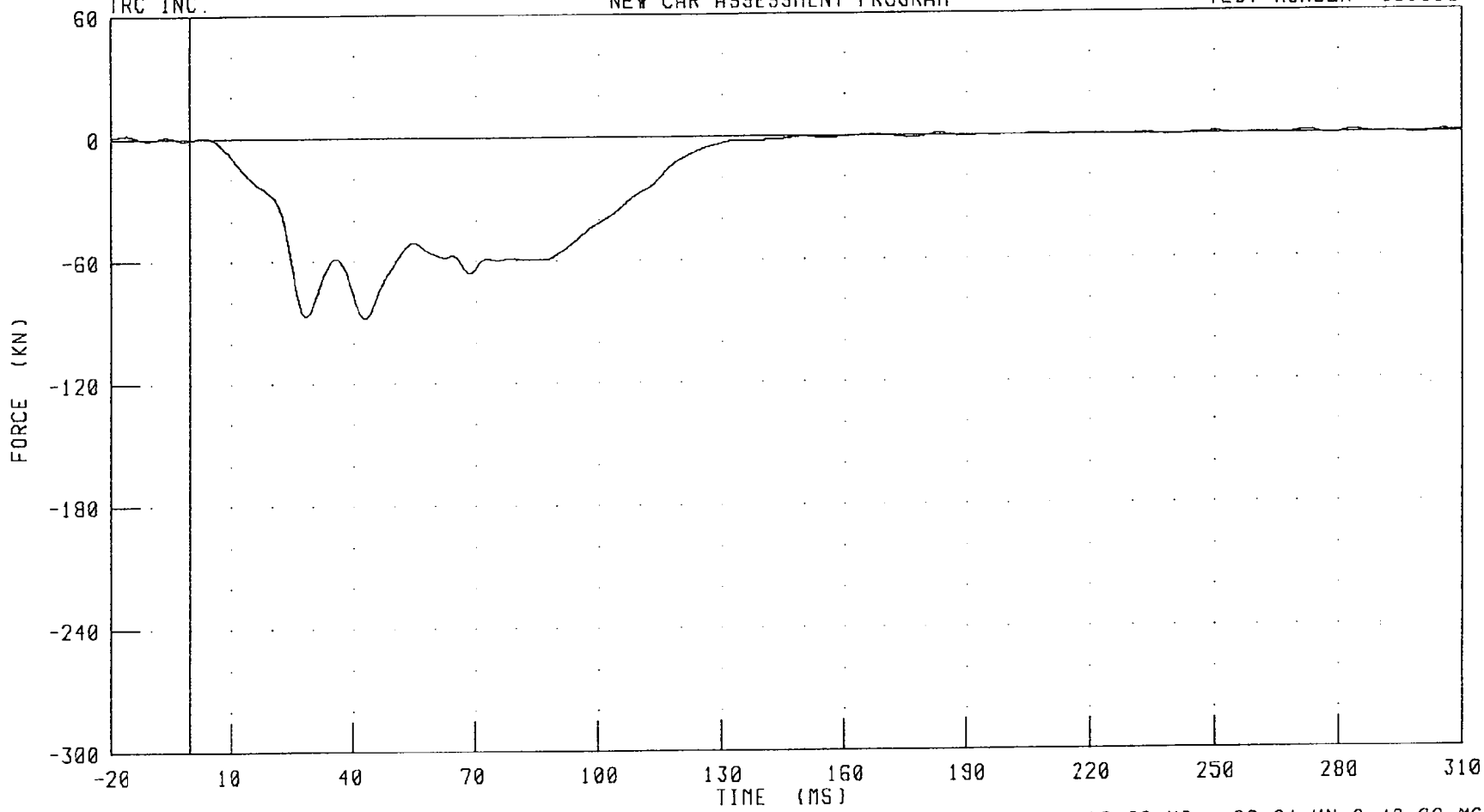

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
60
0
-60
-120
-180
-240
-300
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG2F
FILTER: CH. CLASS 60
PEAK DATA: 1.53 KN @ 306.40 MS; -152.29 KN @ 70.40 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
60
0
-60
-120
-180
-240
-300
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG3F FILTER: CH CLASS 60
PEAK DATA: 1.48 KN @ 2.88 MS, -107.94 KN @ 38.40 MS

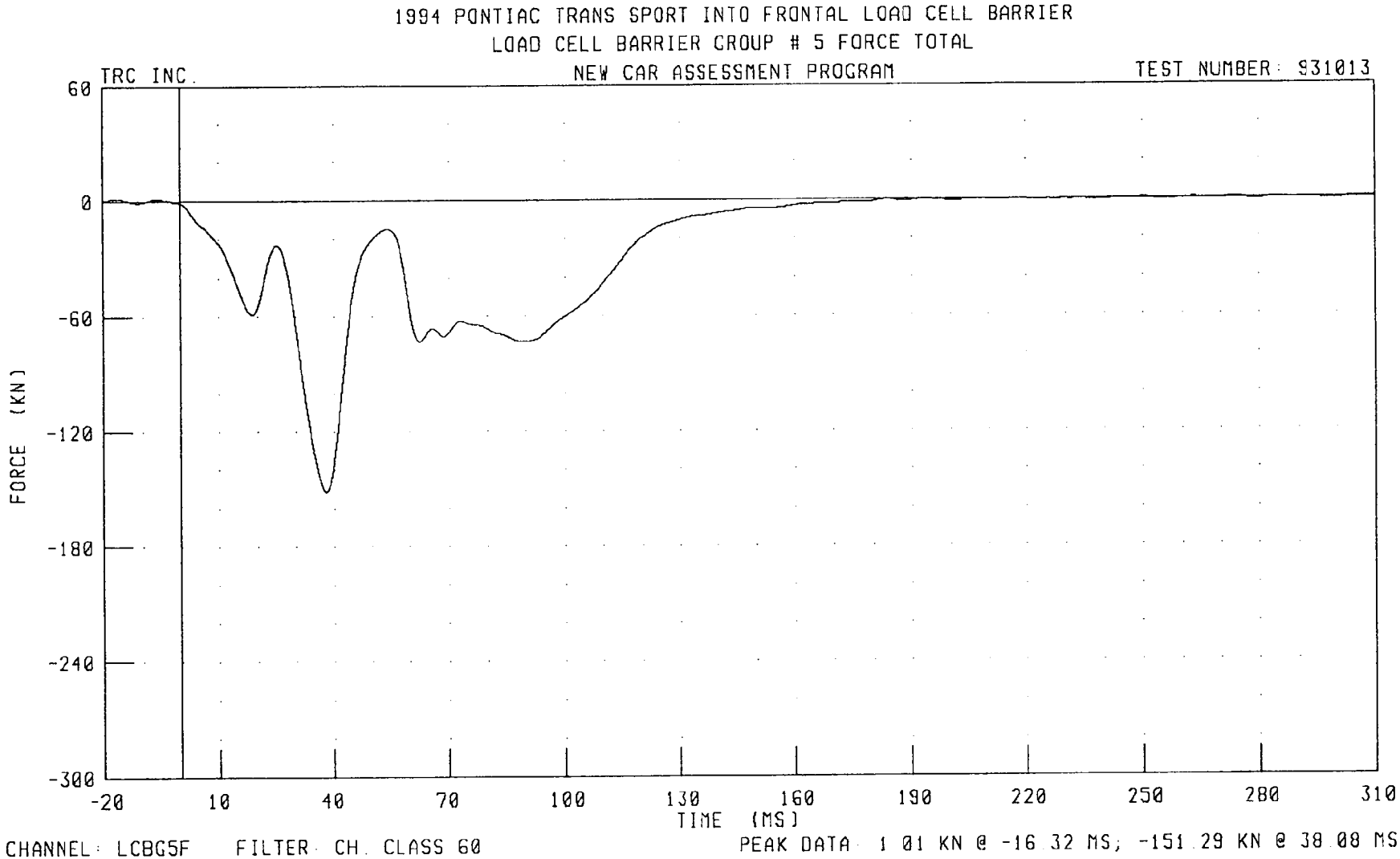
931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 931013



CHANNEL: LCBG4F FILTER: CH. CLASS 60
PEAK DATA: 1.71 KN @ -16.08 MS; -88.04 KN @ 42.88 MS

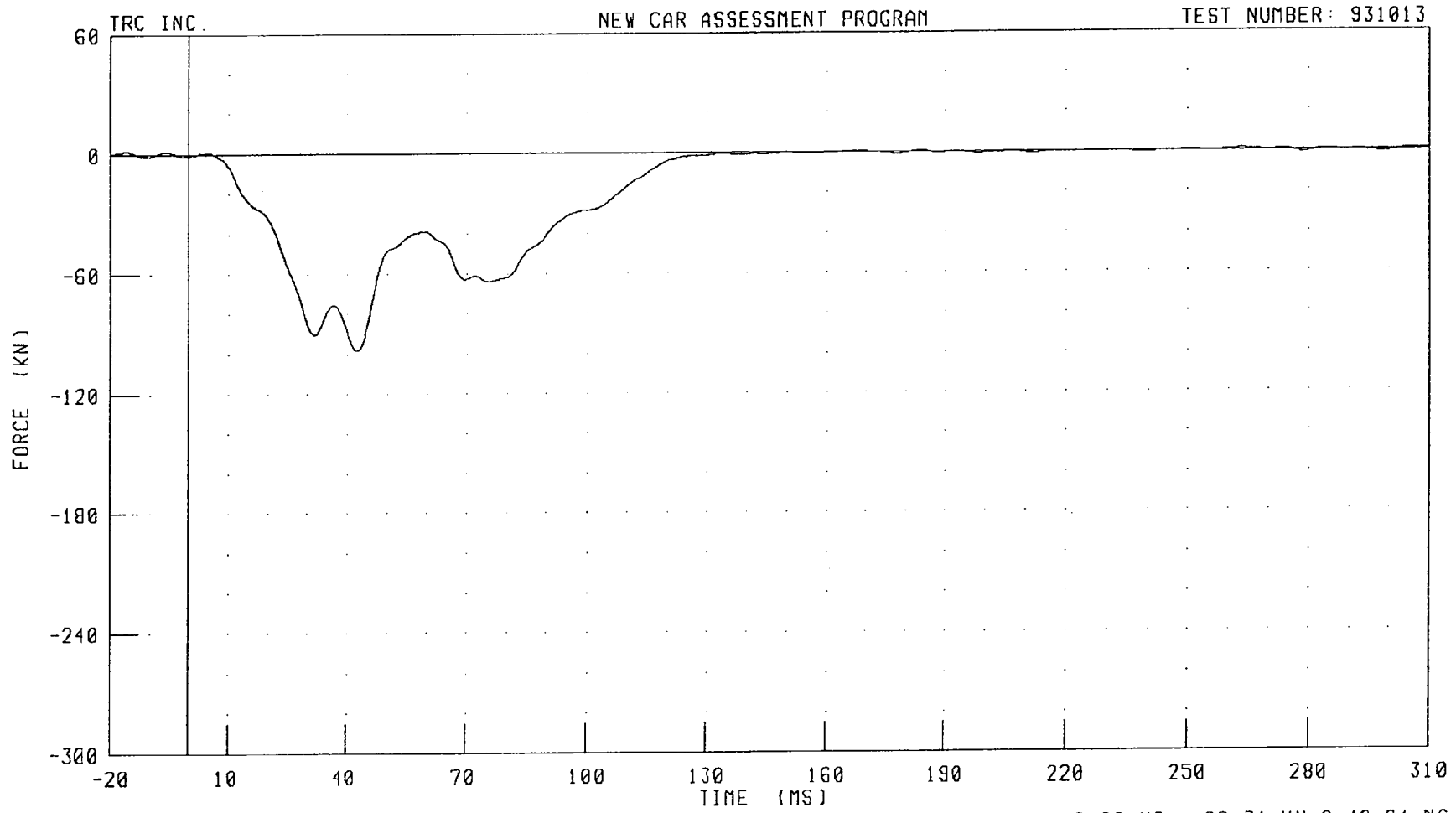
931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
TRC INC.
NEW CAR ASSESSMENT PROGRAM
TEST NUMBER: 931013
60
0
-60
-120
-180
-240
-300
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG5F FILTER: CH. CLASS 60
PEAK DATA: 1.01 KN @ -16.32 MS; -151.29 KN @ 38.08 MS

8-97

931013

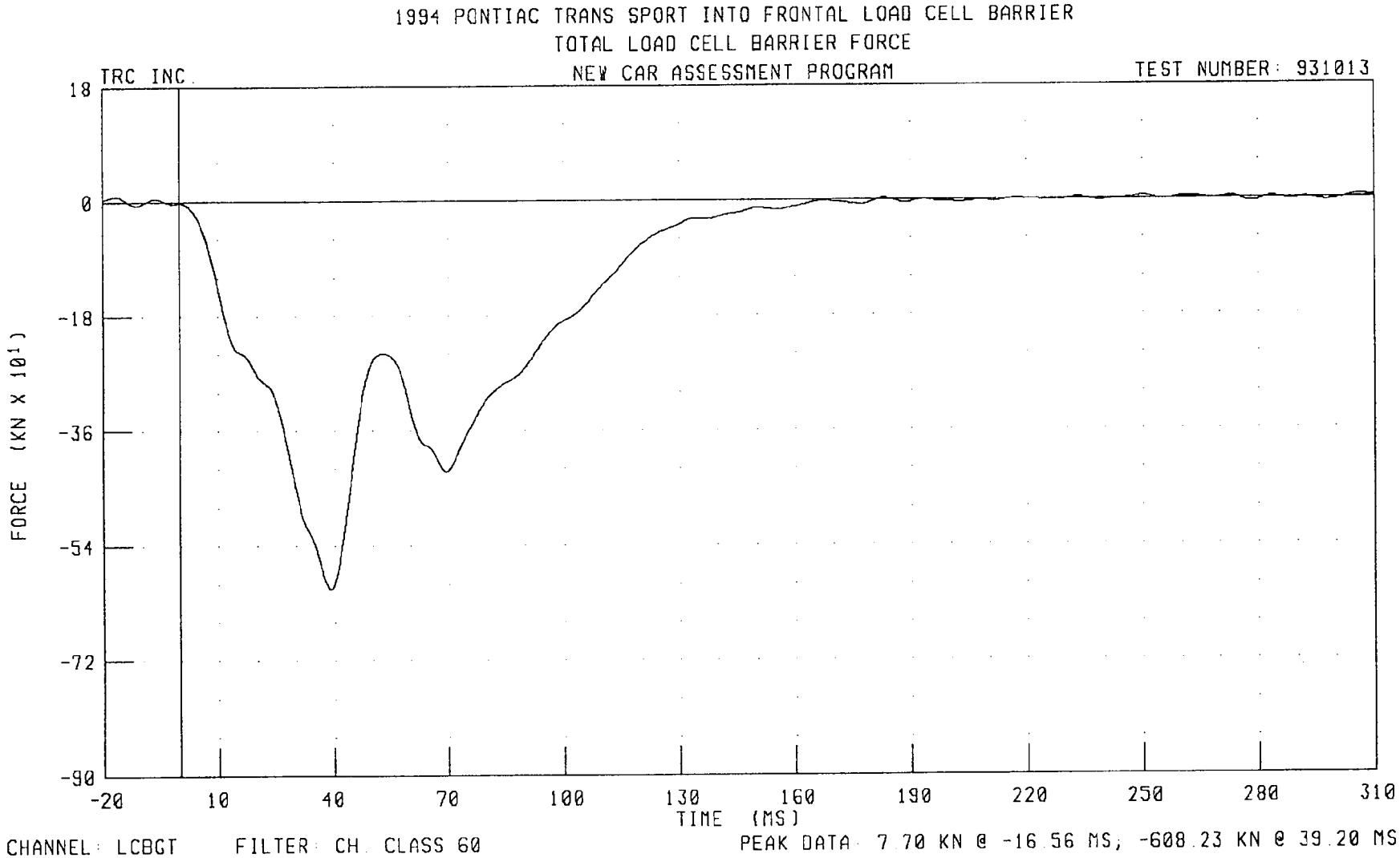
1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM



CHANNEL: LCBG6F FILTER: CH. CLASS 60

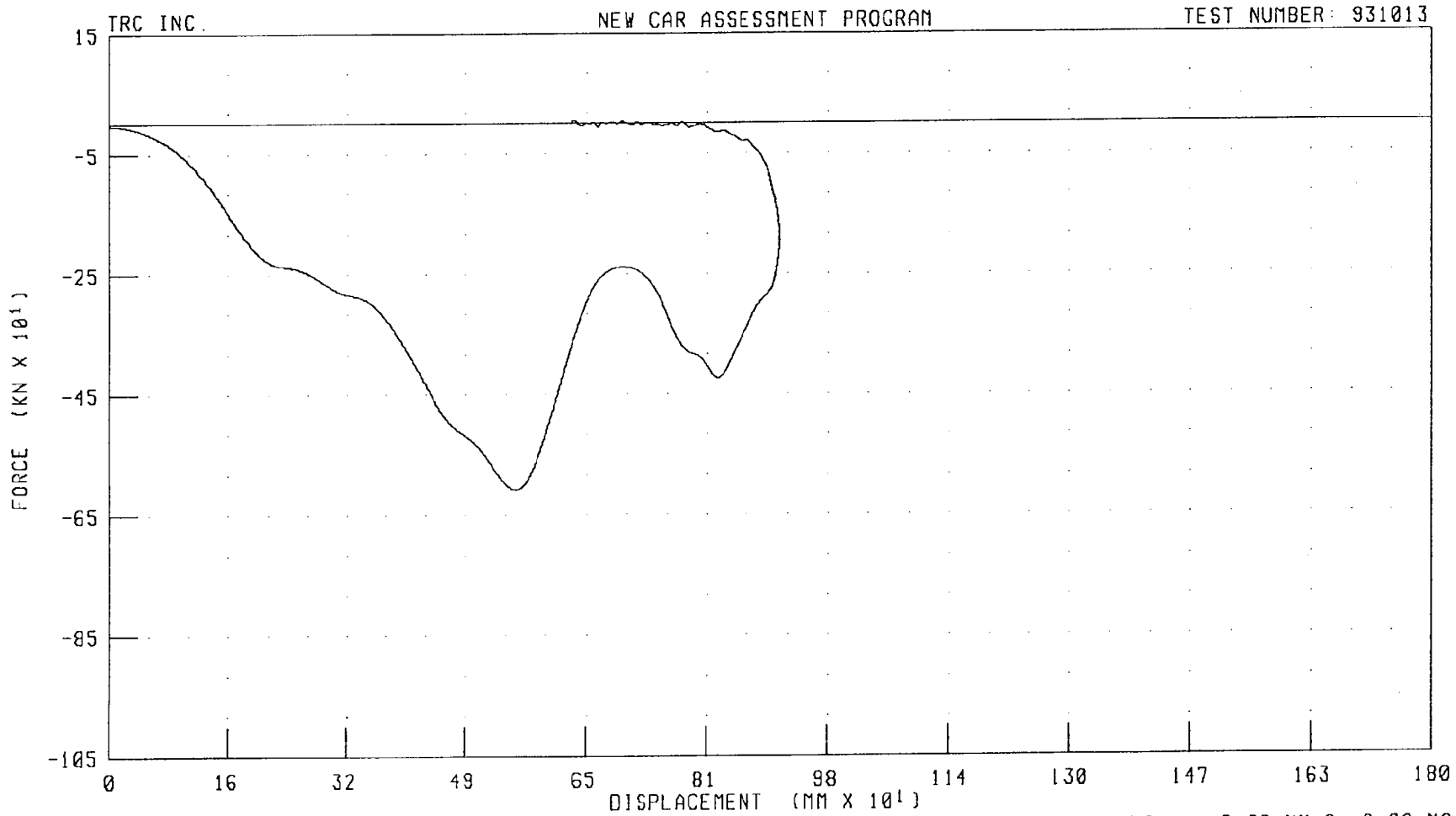
PEAK DATA: 1.29 KN @ -16.08 MS; -98.31 KN @ 42.64 MS

931013


1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE
NEW CAR ASSESSMENT PROGRAM
TRC INC.
TEST NUMBER: 931013
18
0
-18
-36
-54
-72
-90
FORCE (KN X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBGT
FILTER: CH CLASS 60
PEAK DATA: 7.70 KN @ -16.56 MS; -608.23 KN @ 39.20 MS

931013

1994 PONTIAC TRANS SPORT INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT



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

PEAK DATA: 918.35 MM @ 100.16 MS; 0.00 MM @ 0.00 MS
4.42 KN @ 305.84 MS; -608.23 KN @ 39.20 MS

001-B

931013

APPENDIX C

DUMMY CERTIFICATION DATA

PRE-TEST CERTIFICATION DATA

DRIVER DUMMY S/N: 192

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
192 ARL 23-SEP-93

TRC 192C15ED1 572E SN192 EXT.DIMENSION CAL15

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

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

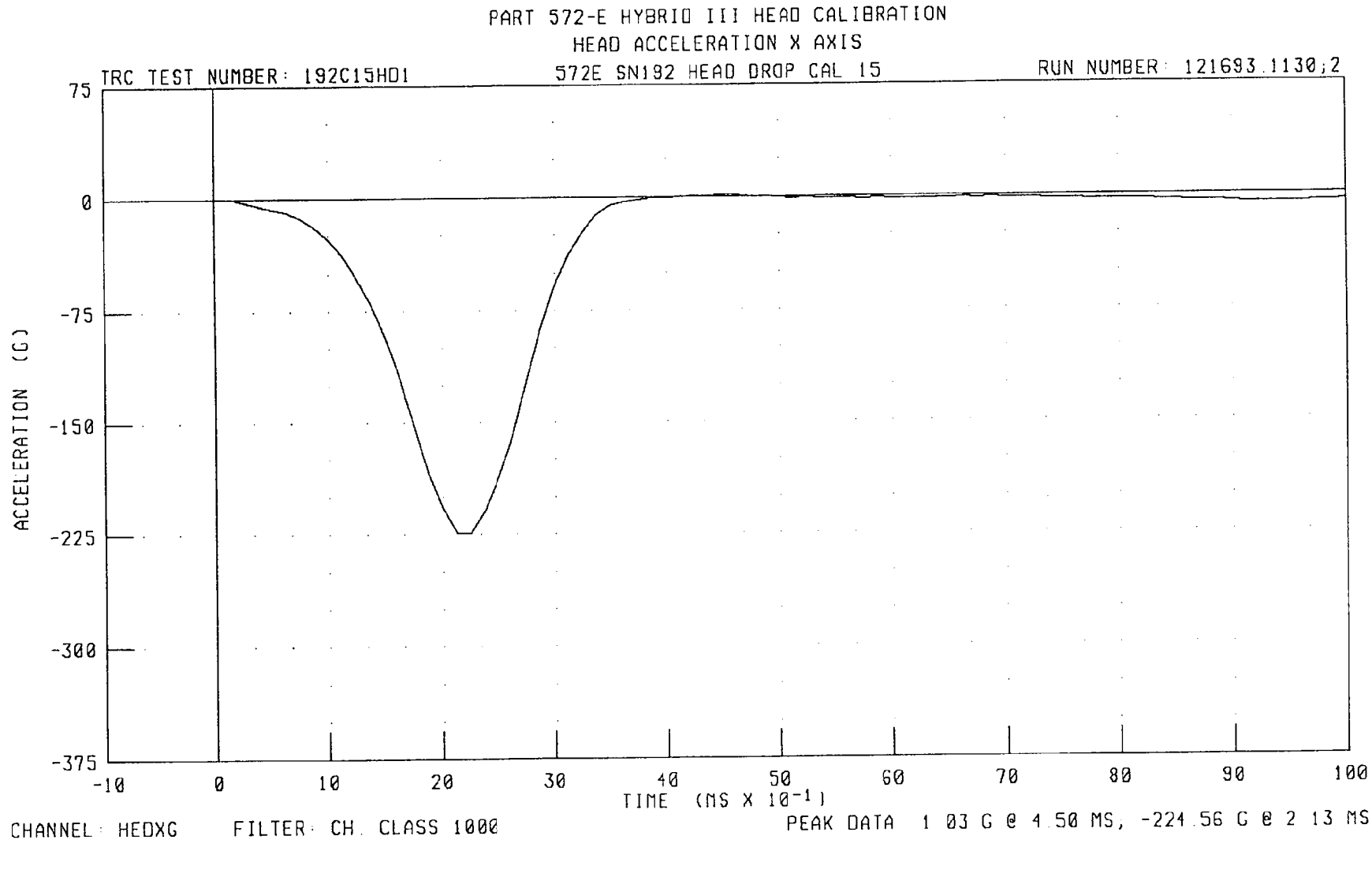
HYBRID III 27-SEP-93

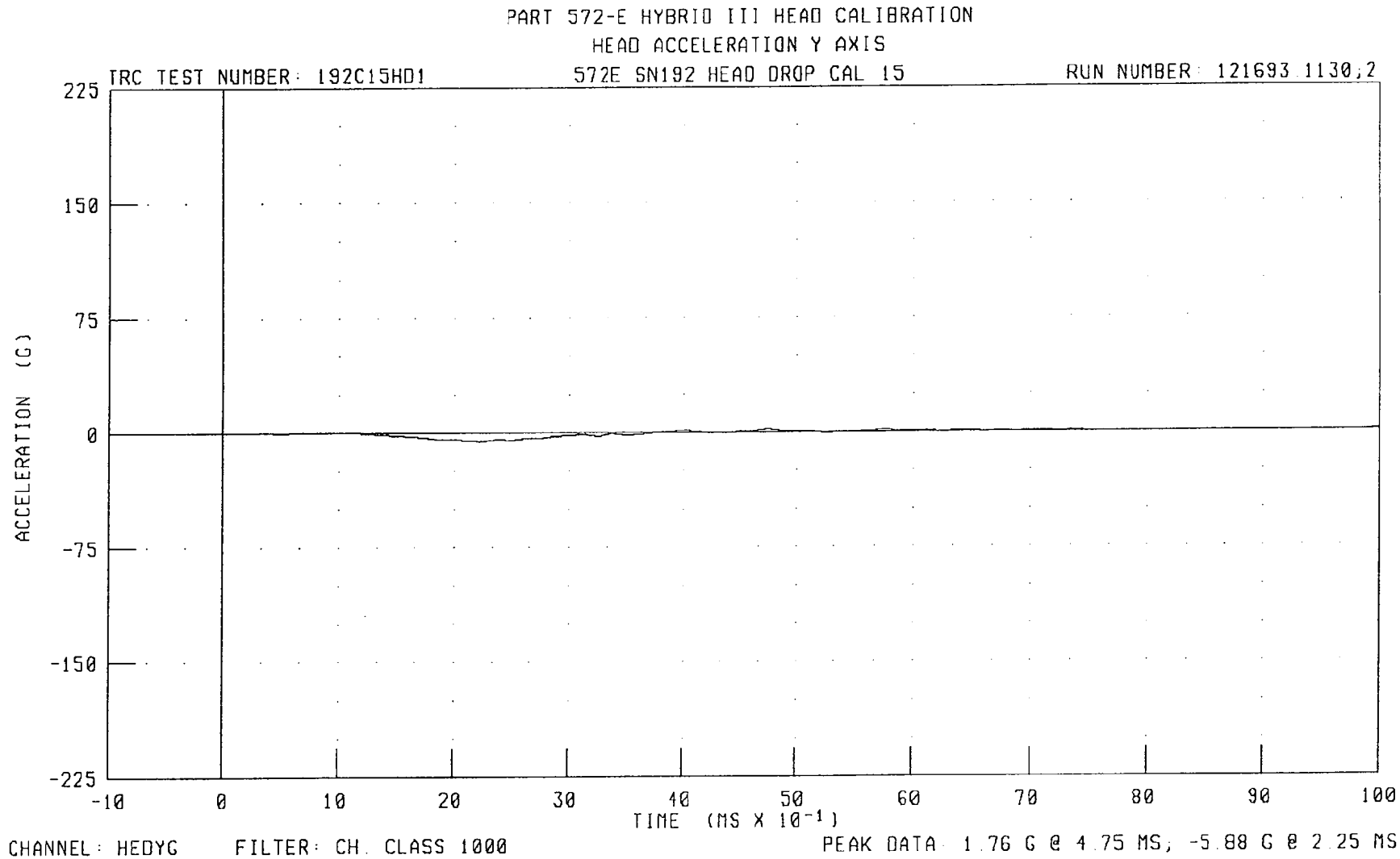
TRC 192C15HD1 572E SN192 HEAD DROP CAL 15

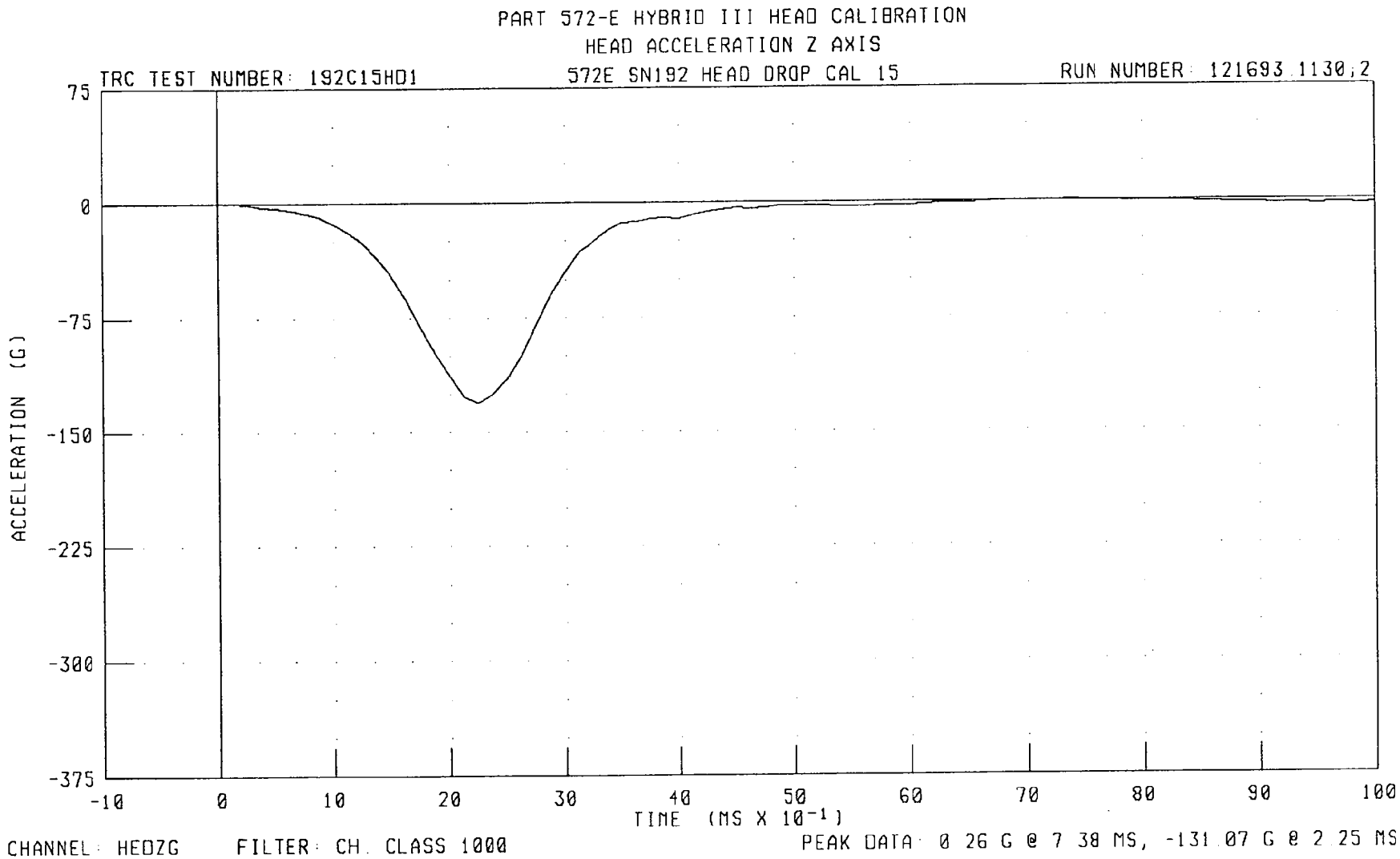
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	52.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	259.59 G
PEAK LATERAL ACCELERATION	15 G MAX	-5.88 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

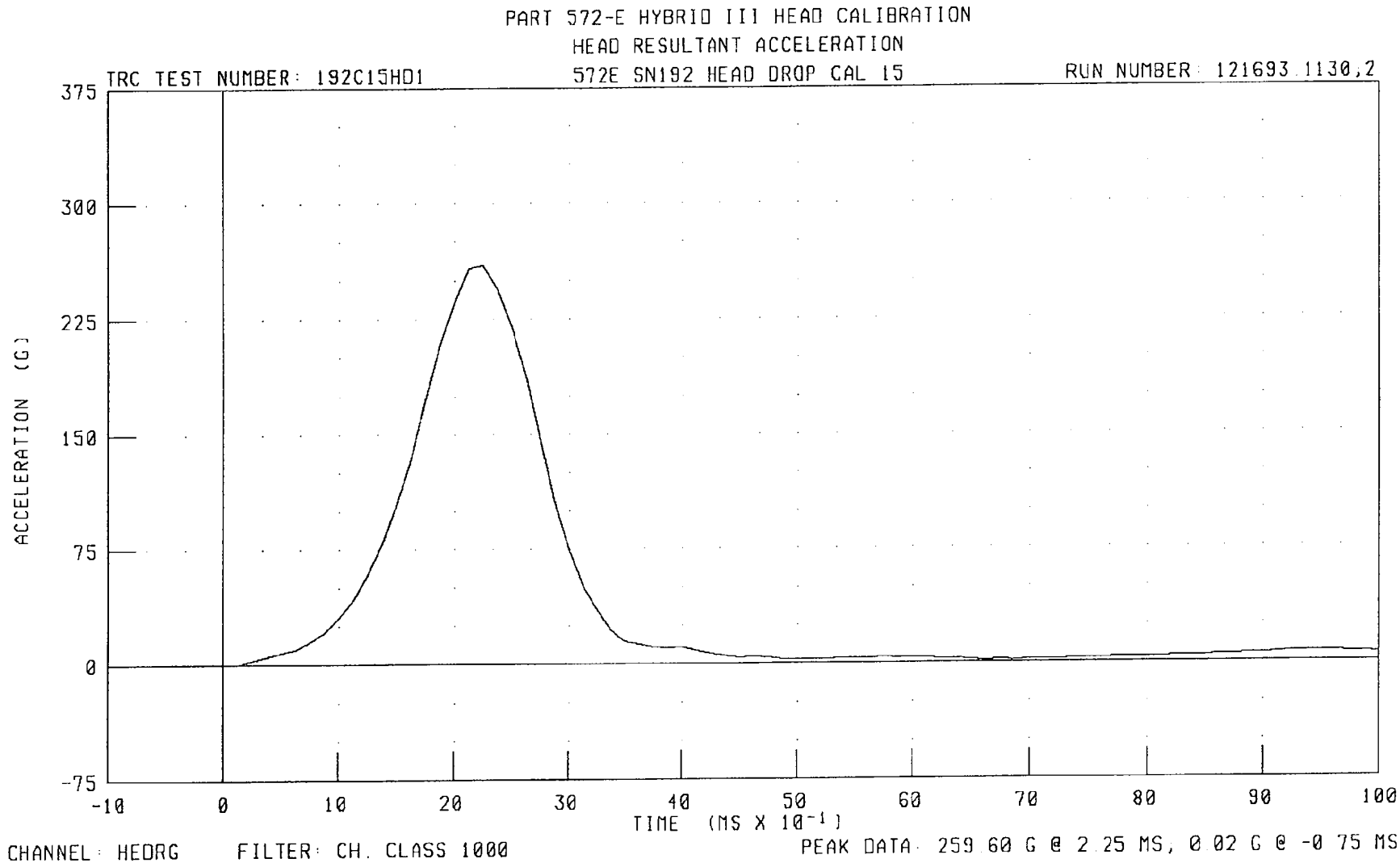
TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Fast


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS
TRC TEST NUMBER: 192C15HD1
572E SN192 HEAD DROP CAL 15
RUN NUMBER: 121693.1130;2
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: HEDXG
FILTER: CH. CLASS 1000
PEAK DATA 1.03 G @ 4.50 MS, -224.56 G @ 2.13 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS
TRC TEST NUMBER: 192C15HD1
572E SN192 HEAD DROP CAL 15
RUN NUMBER: 121693.1130;2
225
150
75
0
-75
-150
-225
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10⁻¹)
CHANNEL: HEDYG
FILTER: CH. CLASS 1000
PEAK DATA: 1.76 G @ 4.75 MS; -5.88 G @ 2.25 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 192C15HD1
572E SN192 HEAD DROP CAL 15
RUN NUMBER: 121693.1130;2
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: 0.26 G @ 7.38 MS, -131.07 G @ 2.25 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
TRC TEST NUMBER: 192C15HD1
572E SN192 HEAD DROP CAL 15
RUN NUMBER: 121693.1130,2
ACCELERATION (G)
375
300
225
150
75
0
-75
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10⁻¹)
CHANNEL: HEDRG
FILTER: CH. CLASS 1000
PEAK DATA: 259.60 G @ 2.25 MS, 0.02 G @ -0.75 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST

HYBRID III 27-SEP-93

6 AXIS NECK TRANSDUCER
TRC 192C15NF1 572E SN192 NECK FLEXION CAL15

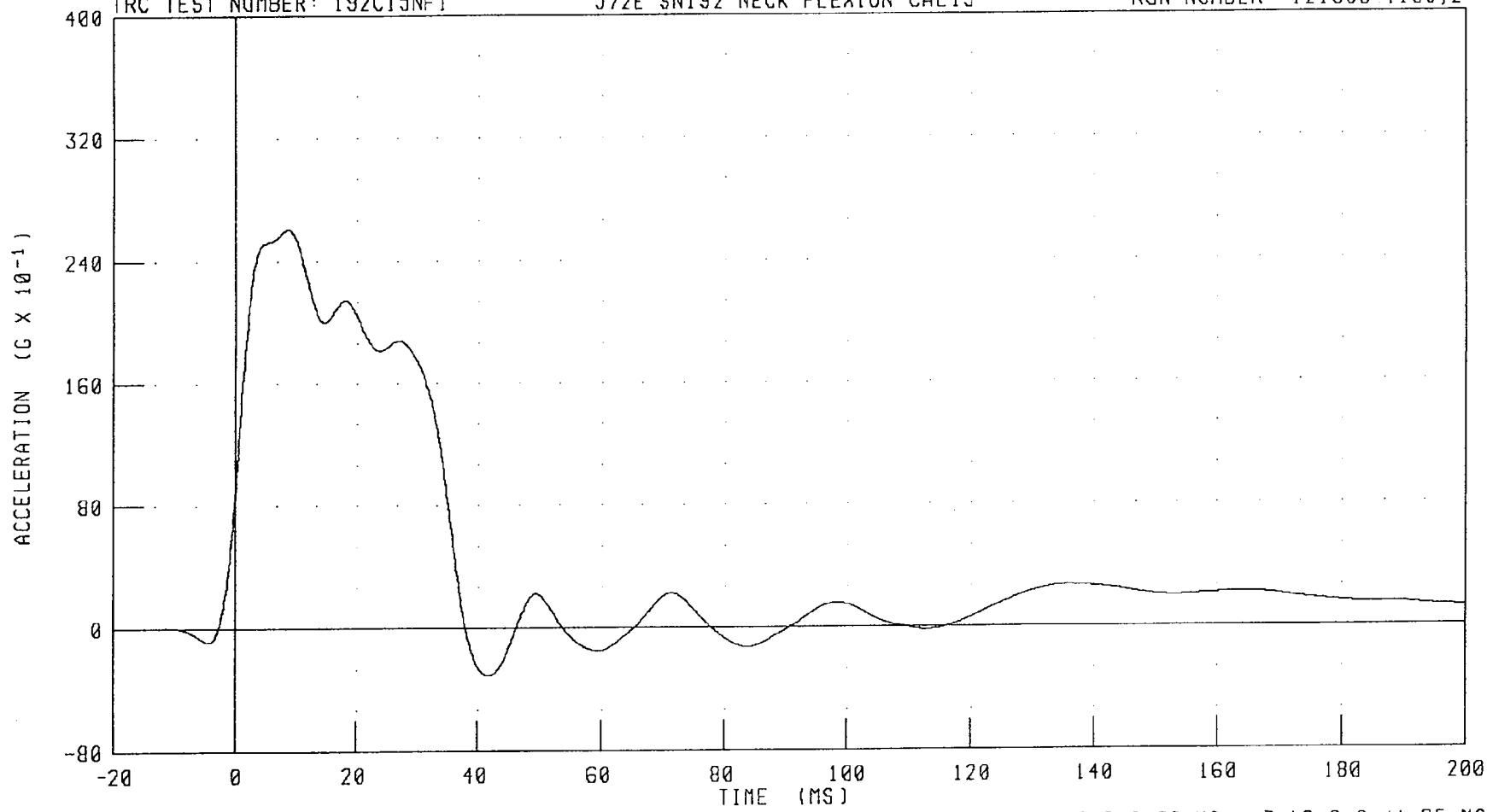
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10% - 70%	52.0 %
IMPACT VELOCITY		6.89 - 7.13 M/SEC	6.97 M/SEC
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	25.31 G
	20 MS	17.60 - 22.60 G	20.48 G
	30 MS	12.50 - 18.50 G	17.42 G
MAX PENDULUM G		29 G MAX	26.08 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	17.32 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.00 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	69.98 DEG.
	TIME	57 - 64 MS	57.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	90.38 NM
	TIME	47 - 58 MS	48.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.63 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Ewert

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

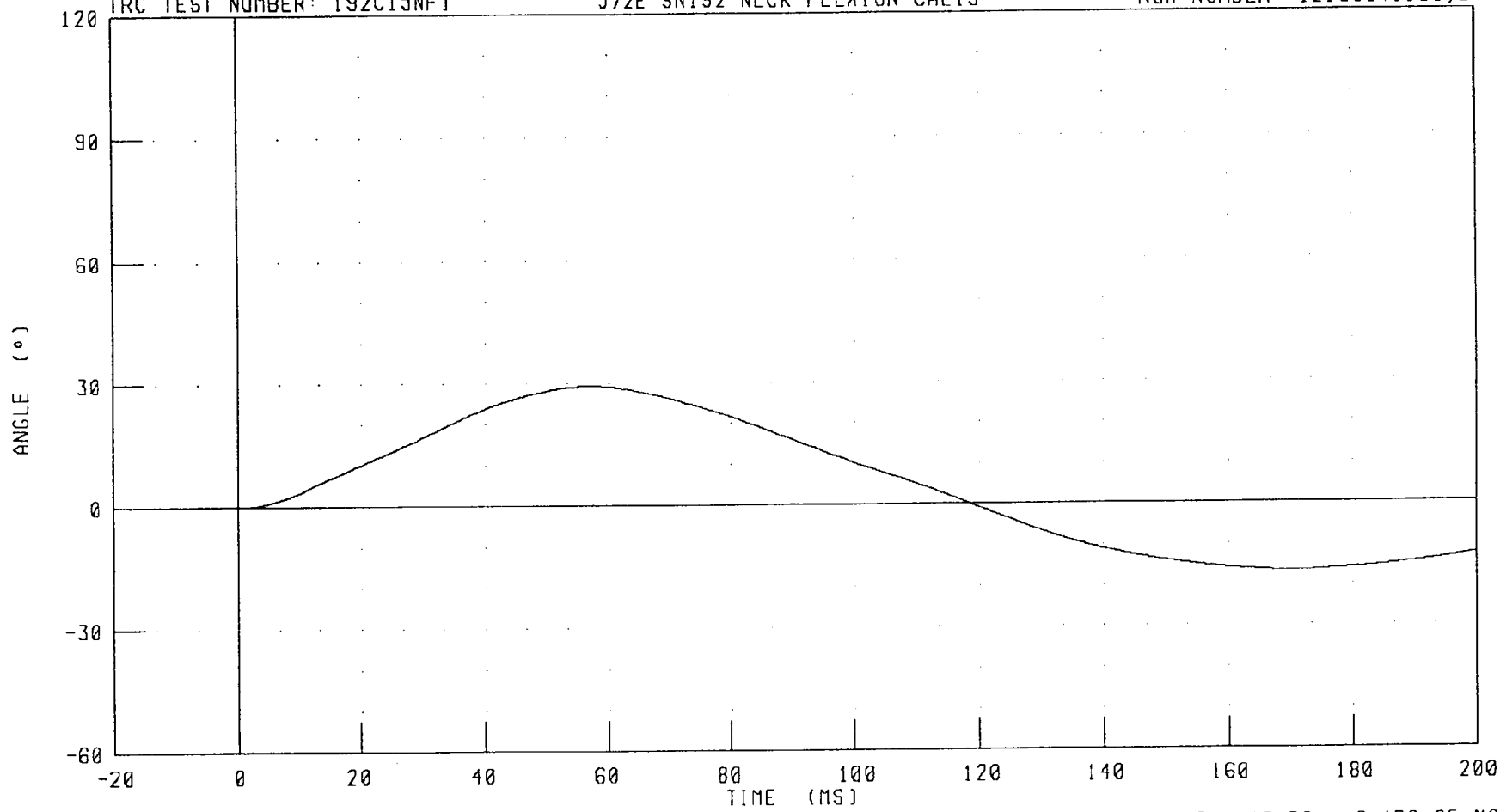
TRC TEST NUMBER: 192C15NF1 572E SN192 NECK FLEXION CAL15 RUN NUMBER: 121693 1130,2



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA 26.08 G @ 8.63 MS; -3.12 G @ 41.75 MS

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

TRC TEST NUMBER: 192C15NF1 572E SN192 NECK FLEXION CAL15 RUN NUMBER: 121693.1130;2

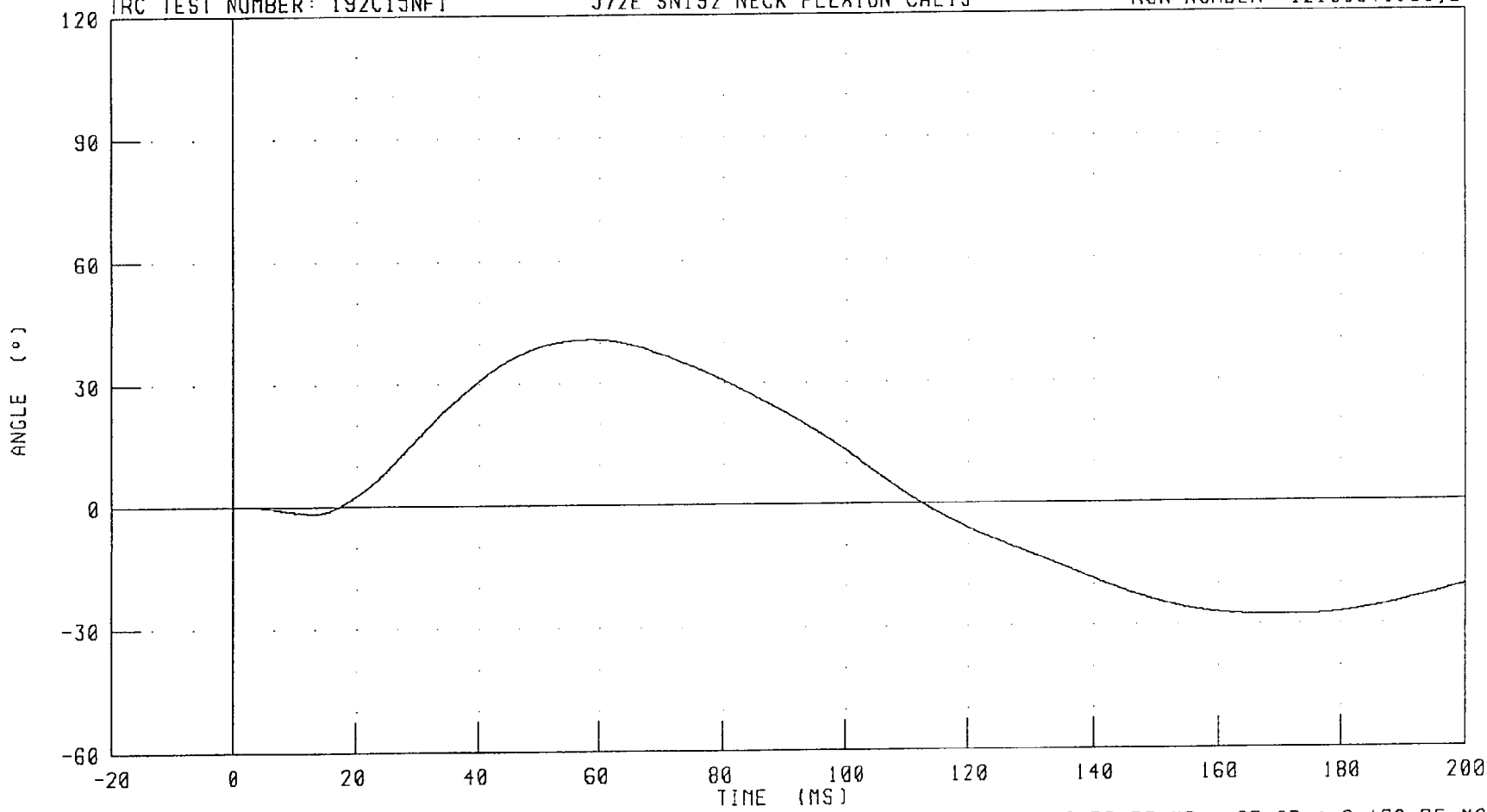


CHANNEL: BETA FILTER: CH CLASS 60 PEAK DATA: 29.19 ° @ 57.00 MS, -16.70 ° @ 170.25 MS

931013

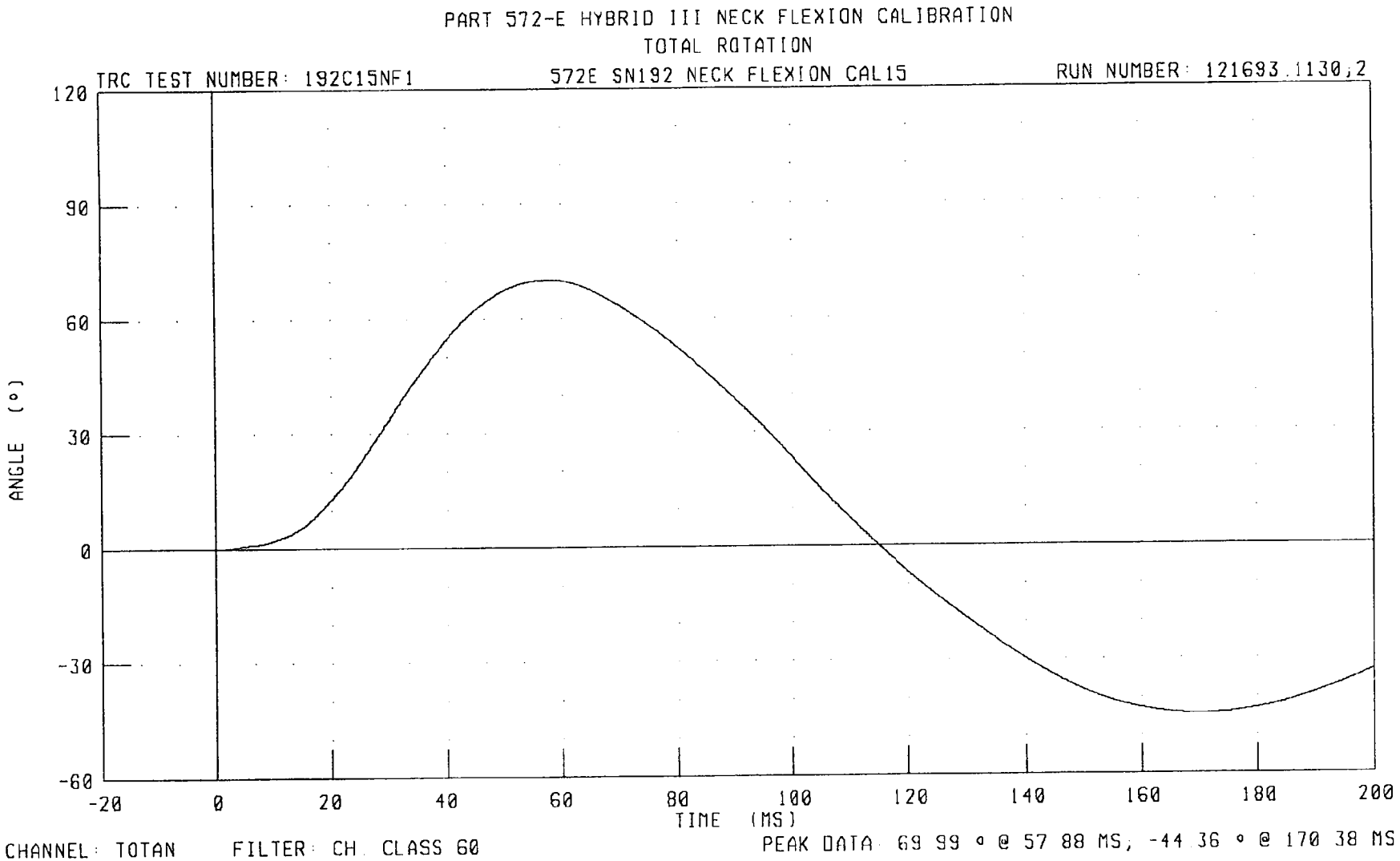
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

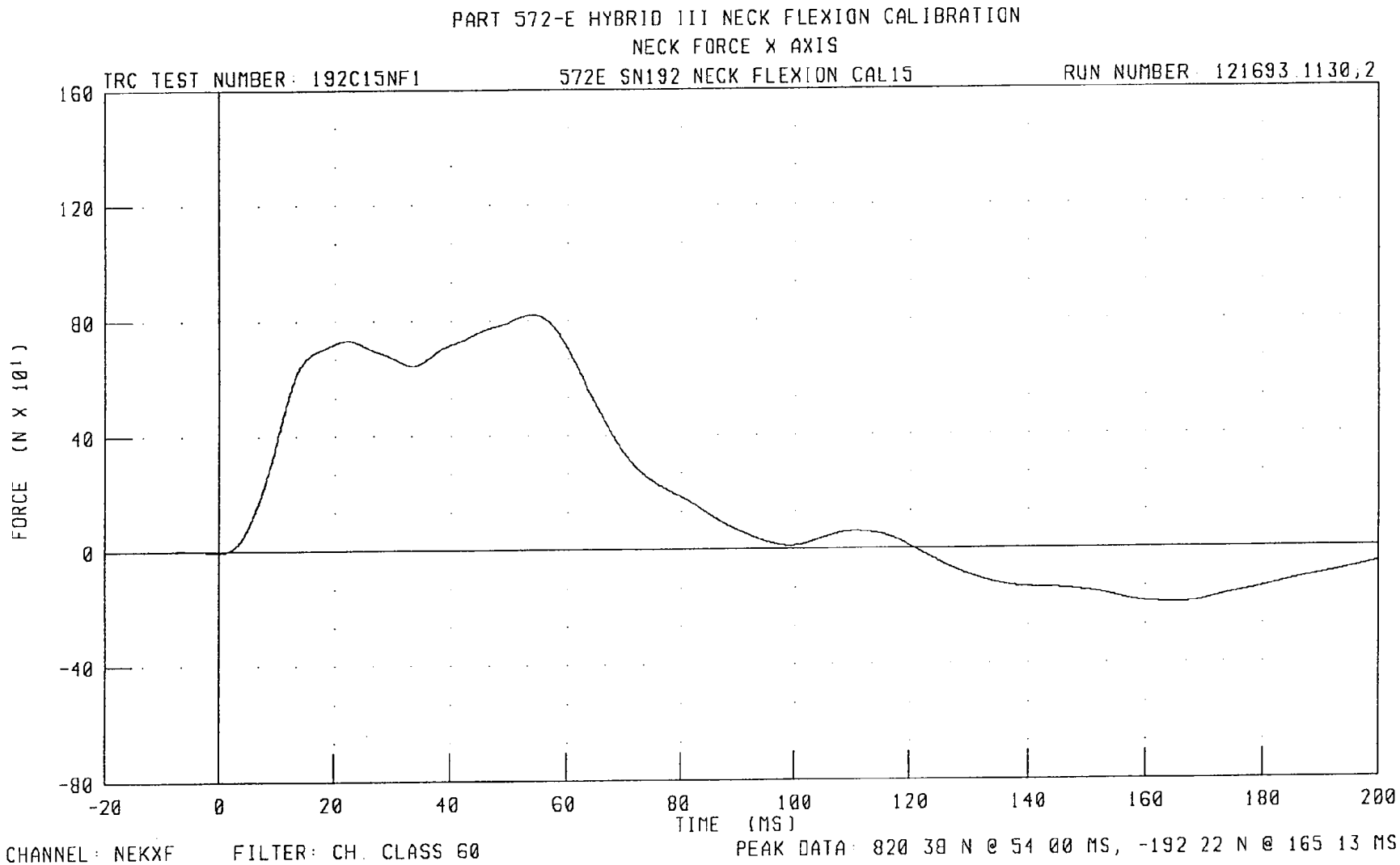
TRC TEST NUMBER: 192C15NF1 572E SN192 NECK FLEXION CAL15 RUN NUMBER: 121693.1130;2

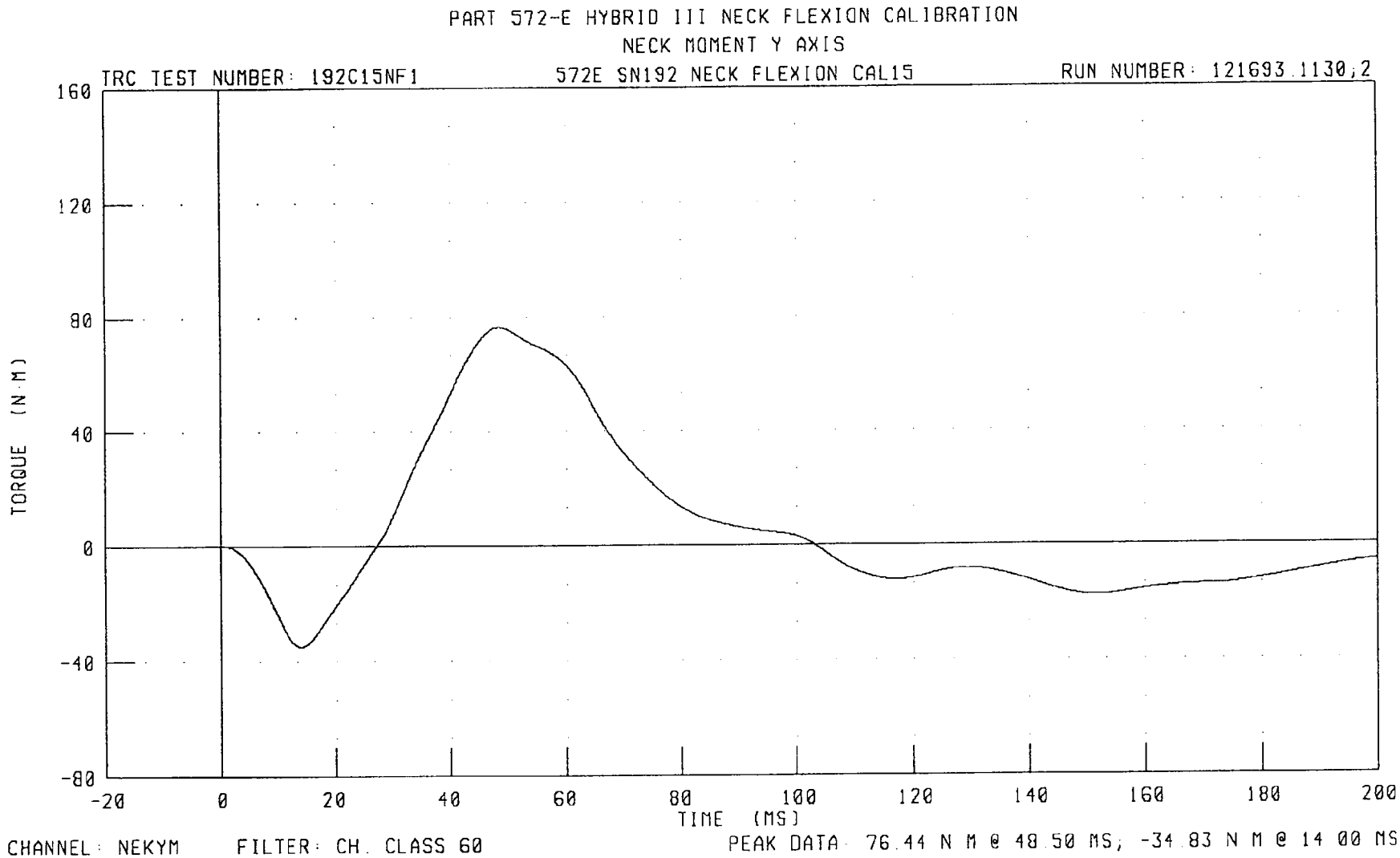


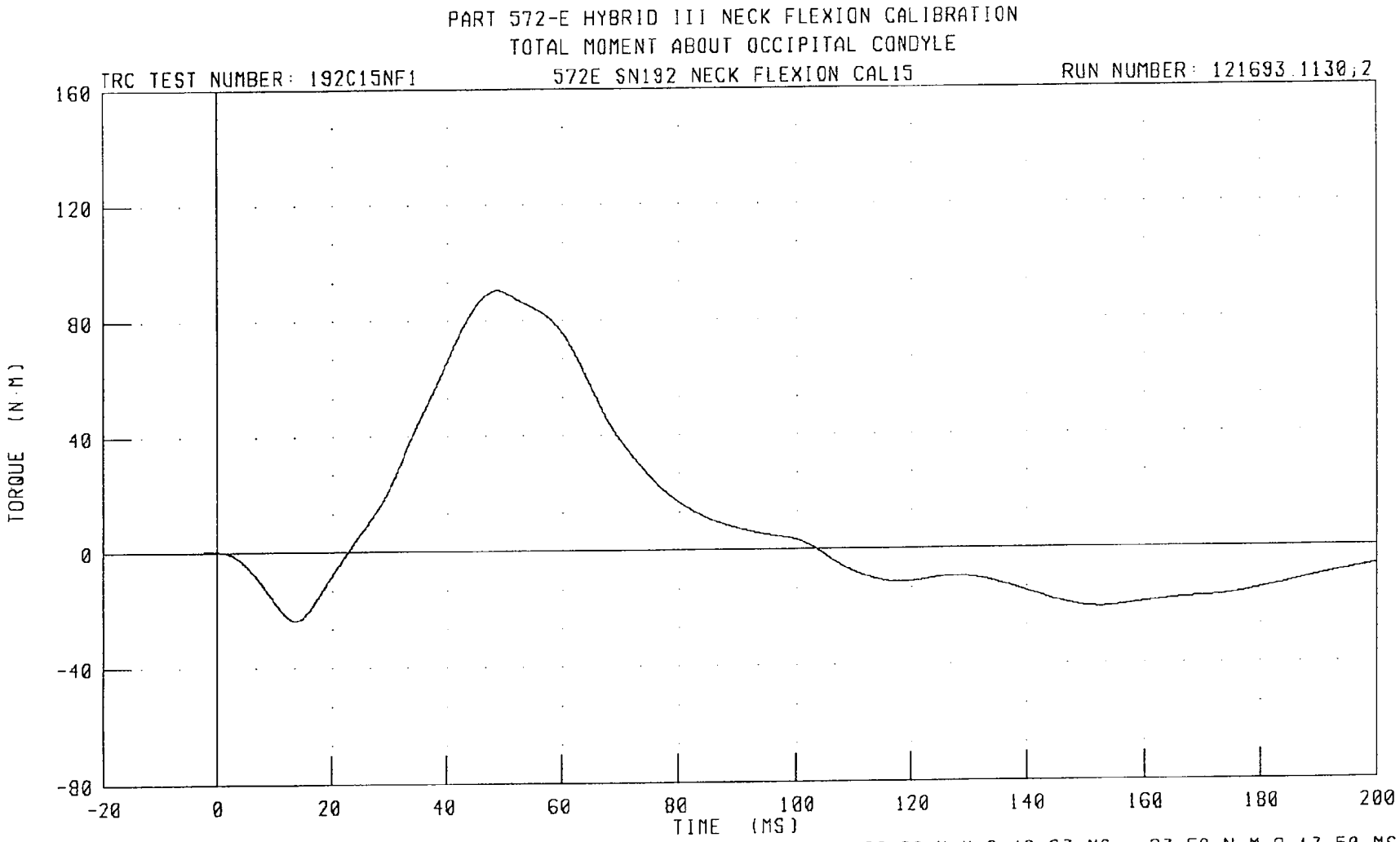
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 40.82 ° @ 58.50 MS; -27.67 ° @ 172.75 MS

931013


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: 192C15NF1
572E SN192 NECK FLEXION CAL15
RUN NUMBER: 121693.1130;2
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: 69 99 ° @ 57 88 MS, -44 36 ° @ 170 38 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 192C15NF1
572E SN192 NECK FLEXION CAL15
RUN NUMBER: 121693.1130,2
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: 820.38 N @ 54.00 MS, -192.22 N @ 165.13 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 192C15NF1
572E SN192 NECK FLEXION CAL15
RUN NUMBER: 121693.1130;2
160
120
80
40
0
-40
-80
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: 76.44 N M @ 48.50 MS; -34.83 N M @ 14.00 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 192C15NF1
572E SN192 NECK FLEXION CAL15
RUN NUMBER: 121693.1130;2
TORQUE (N.M)
160
120
80
40
0
-40
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 90.38 N.M @ 48.63 MS, -23.59 N.M @ 13.50 MS

TRANSPORTATION RESEARCH CENTER INC.

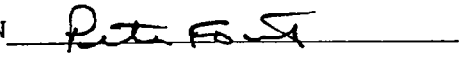
NECK EXTENSION TEST

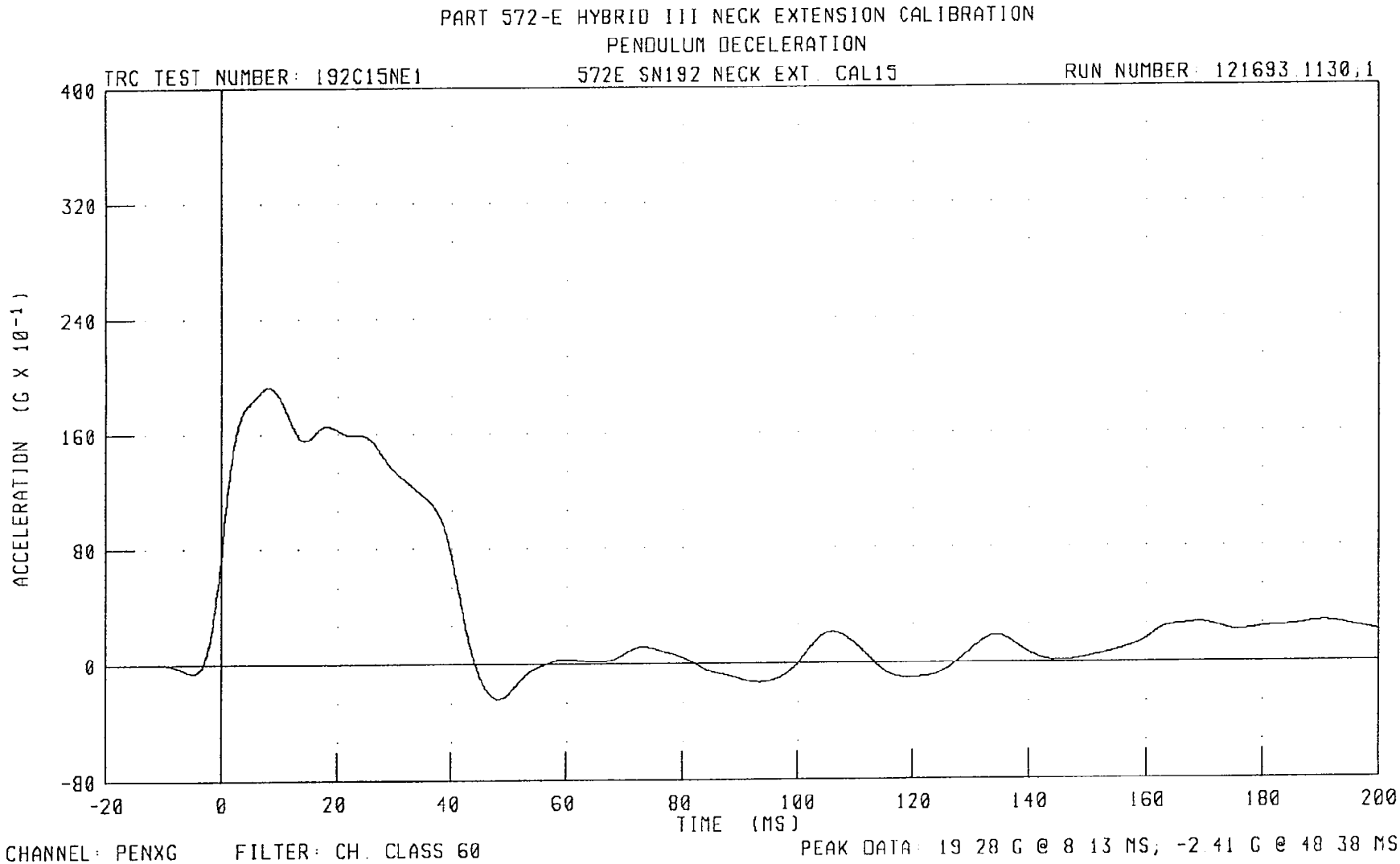
HYBRID III 27-SEP-93

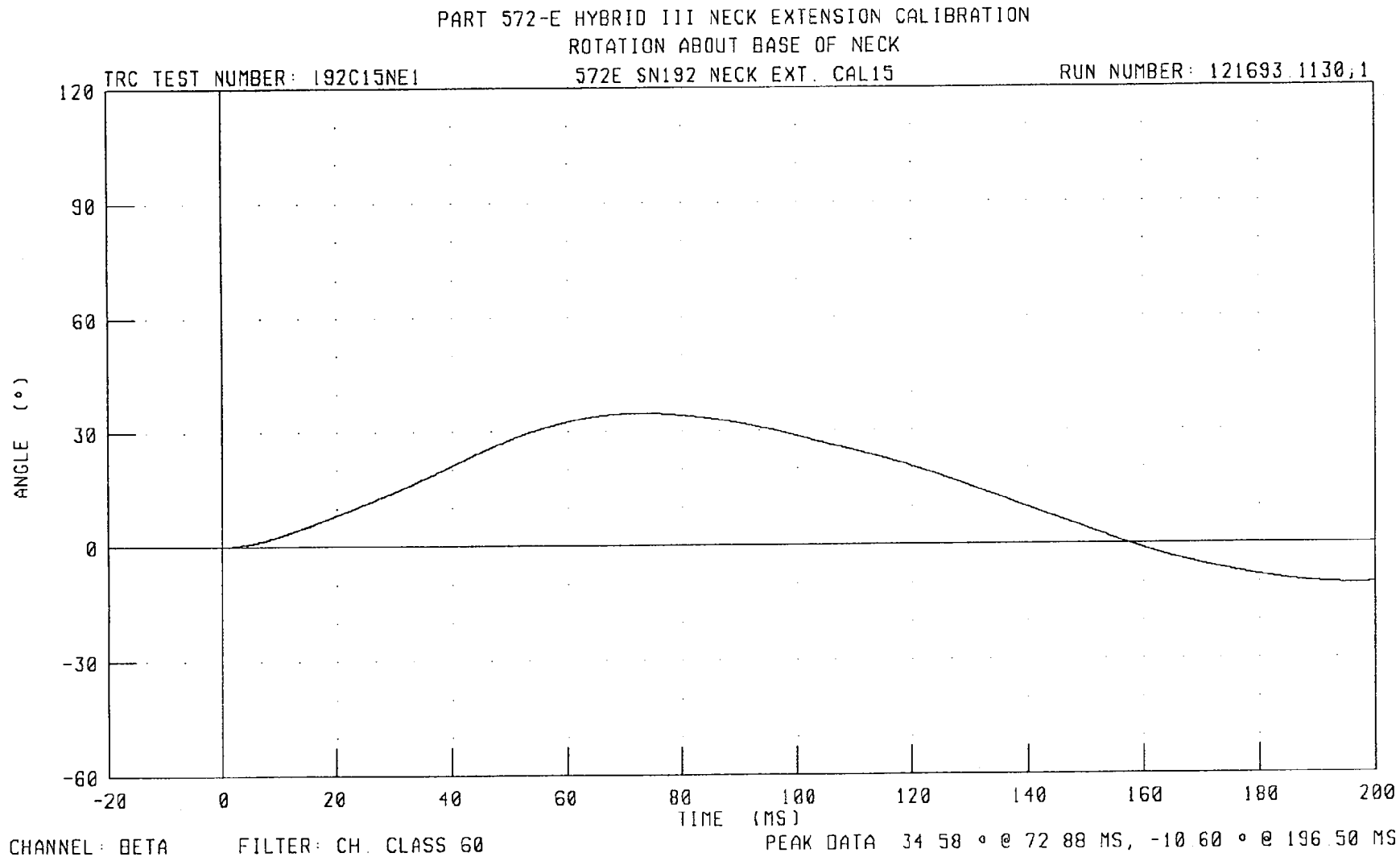
6 AXIS NECK TRANSDUCER
TRC 192C15NE1 572E SN192 NECK EXT. CAL15

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10% - 70%	52.0 %
IMPACT VELOCITY		5.95 - 6.19 M/SEC	6.00 M/SEC
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.54 G
	20 MS	14.00 - 19.00 G	16.28 G
	30 MS	11.00 - 16.00 G	13.38 G
MAX PENDULUM G		22 G MAX	19.28 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.34 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	41.25 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	90.41 DEG.
	TIME	72 - 82 MS	75.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-56.79 NM
	TIME	65 - 79 MS	71.13 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.63 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.00 MS

TEST MEETS SPECIFICATIONS

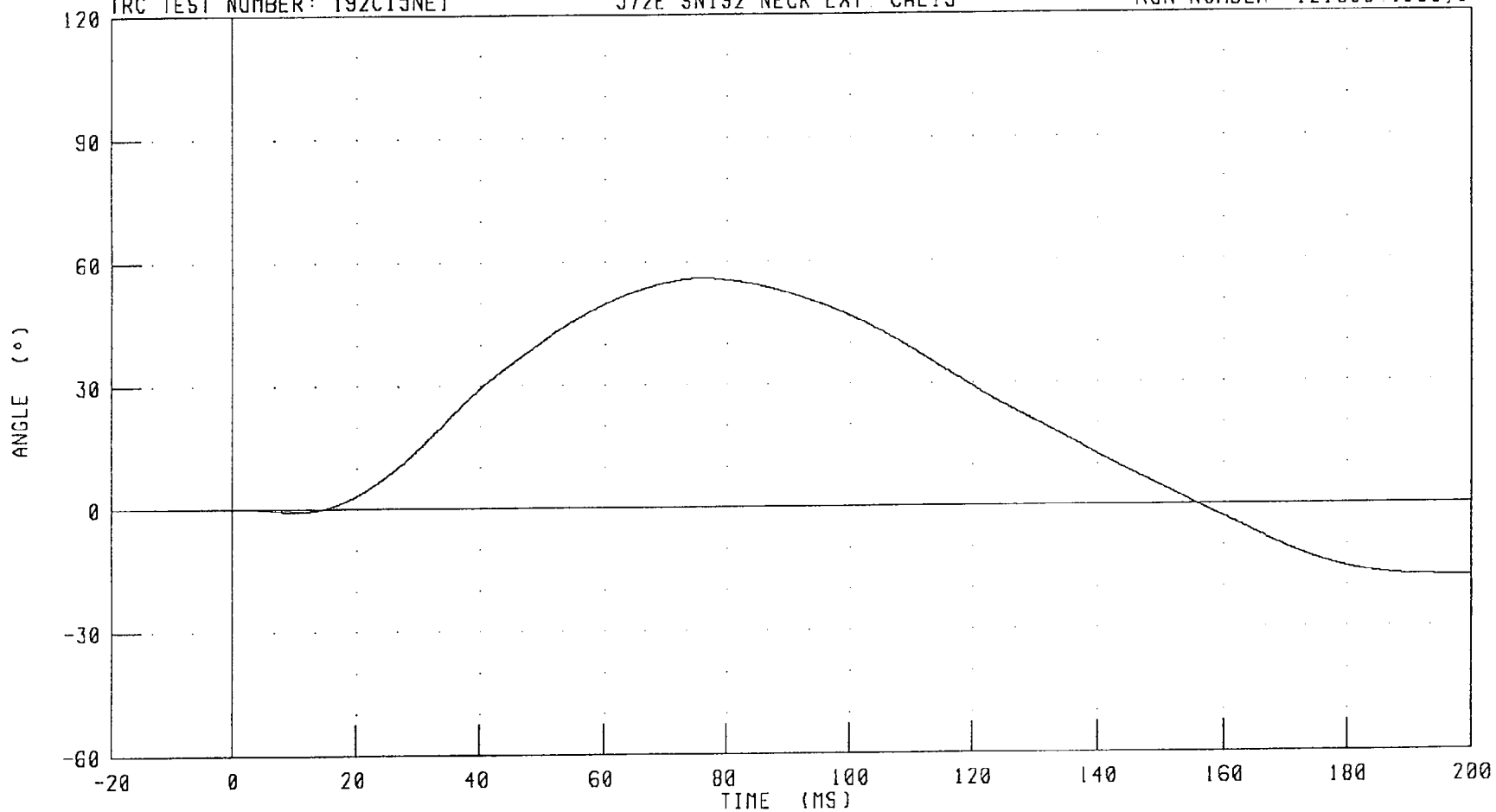
TECHNICIAN 


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 192C15NE1
572E SN192 NECK EXT CAL15
RUN NUMBER: 121693 1130,1
ACCELERATION (G X 10⁻¹)
400
320
240
160
80
0
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH CLASS 60
PEAK DATA: 19 28 G @ 8 13 MS; -2 41 G @ 48 38 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 192C15NE1
572E SN192 NECK EXT. CAL15
RUN NUMBER: 121693 1130,1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA 34 58 ° @ 72 88 MS, -10 60 ° @ 196 50 MS

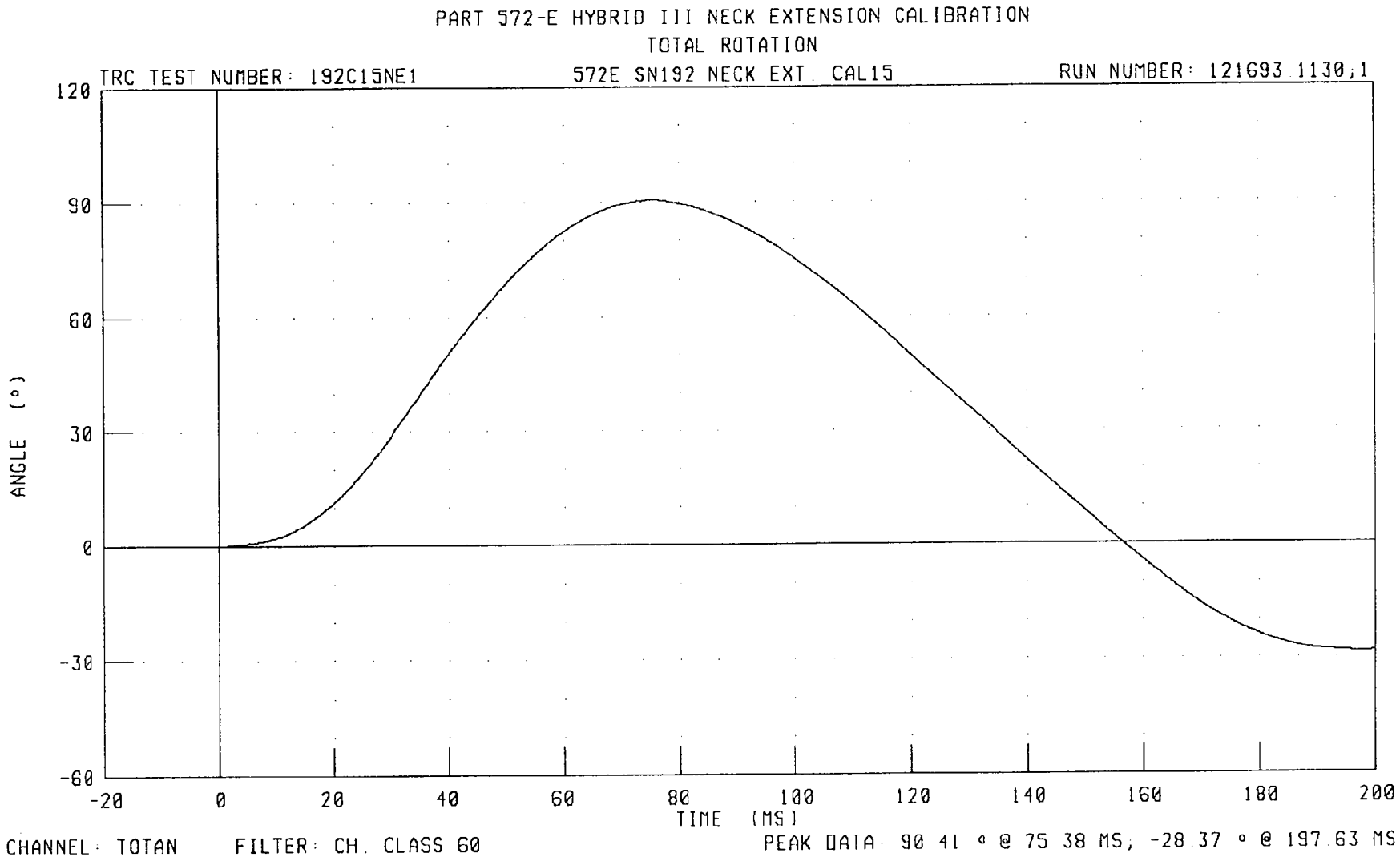
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

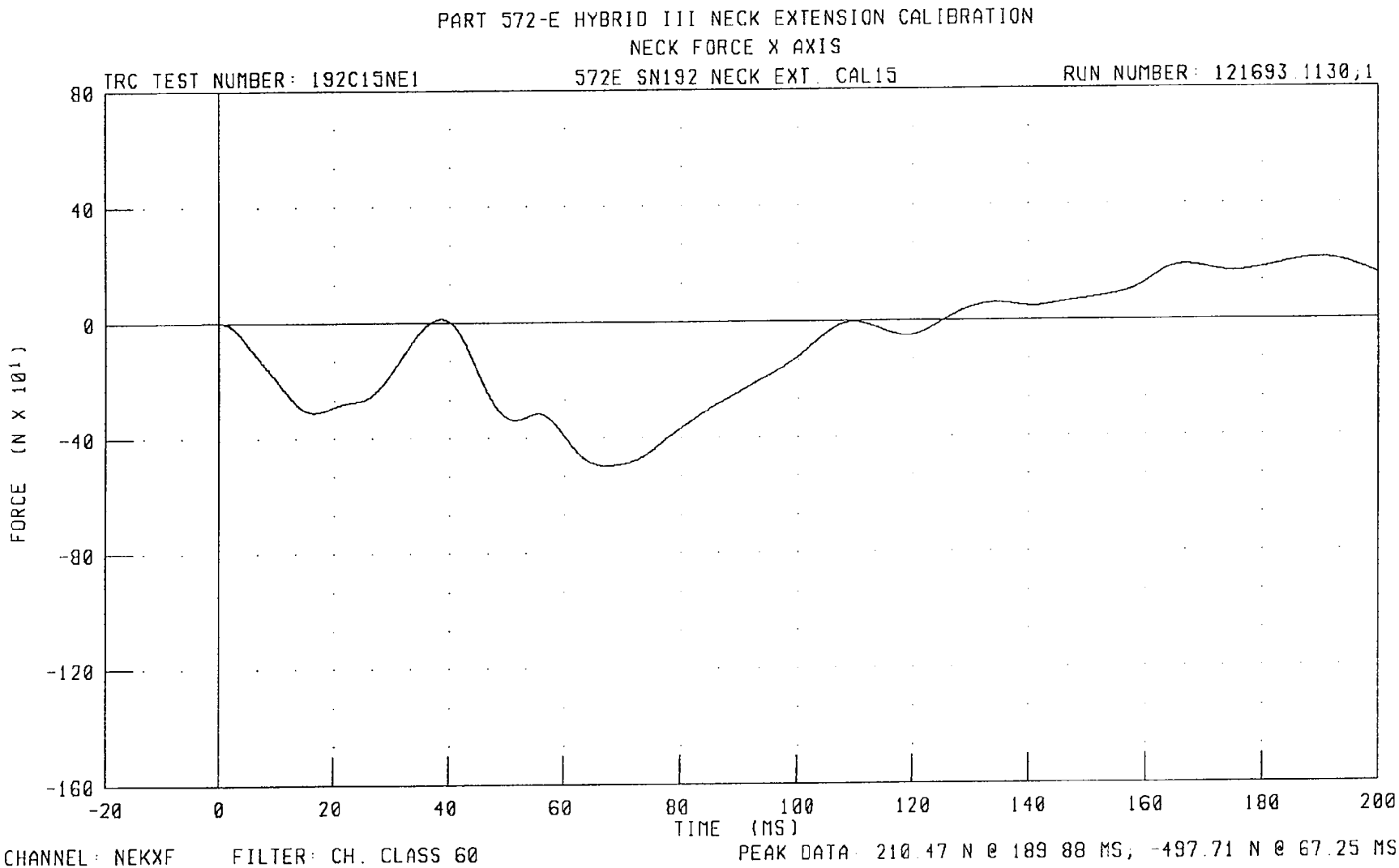
TRC TEST NUMBER: 192C15NE1 572E SN192 NECK EXT CAL15 RUN NUMBER: 121693 1130;1



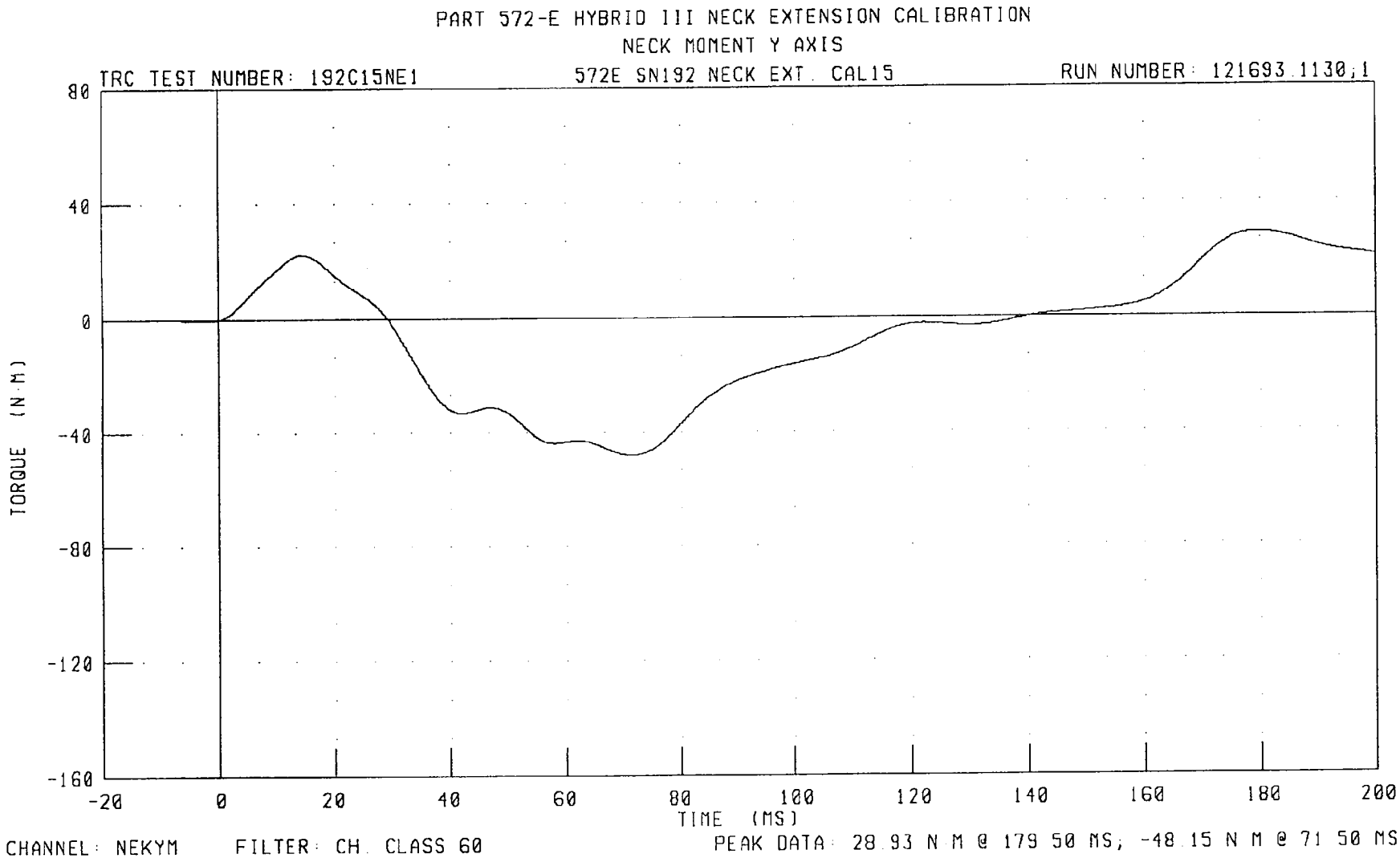
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 55 90 ° @ 76 00 MS; -17.81 ° @ 198 50 MS

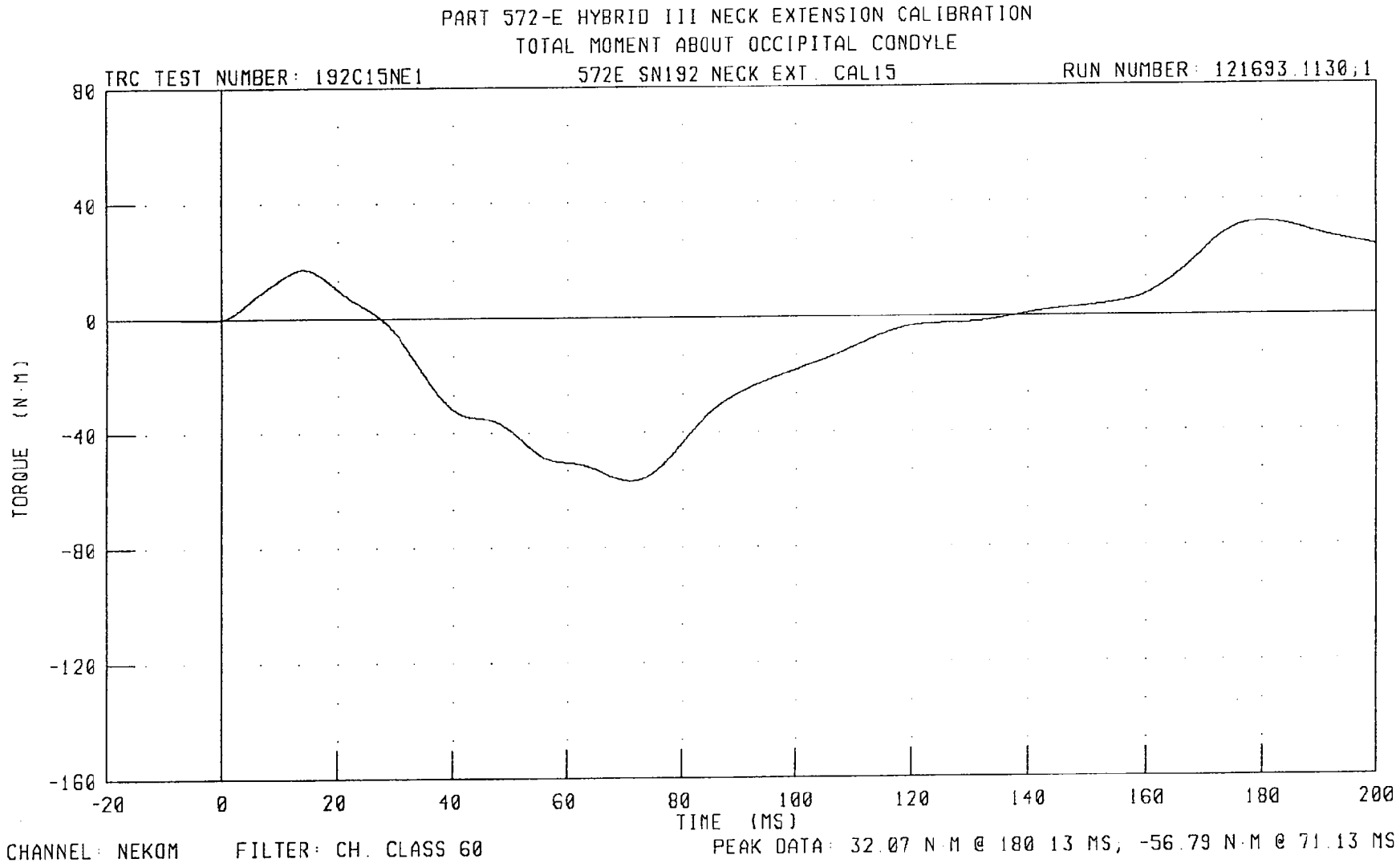
931013


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: 192C15NE1
572E SN192 NECK EXT. CAL15
RUN NUMBER: 121693 1130;1
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 90.41 ° @ 75.38 MS, -28.37 ° @ 197.63 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 192C15NE1
572E SN192 NECK EXT. CAL15
RUN NUMBER: 121693.1130;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: 210.47 N @ 189.88 MS, -497.71 N @ 67.25 MS

931013


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 192C15NE1
572E SN192 NECK EXT. CAL15
RUN NUMBER: 121693.1130;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: 28.93 N M @ 179.50 MS; -48.15 N M @ 71.50 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 192C15NE1
572E SN192 NECK EXT. CAL15
RUN NUMBER: 121693.1130;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: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 32.07 N-M @ 180.13 MS, -56.79 N-M @ 71.13 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 27-SEP-93

TRC 192C15TH1 572E SN192 H.S.THORAX CAL15

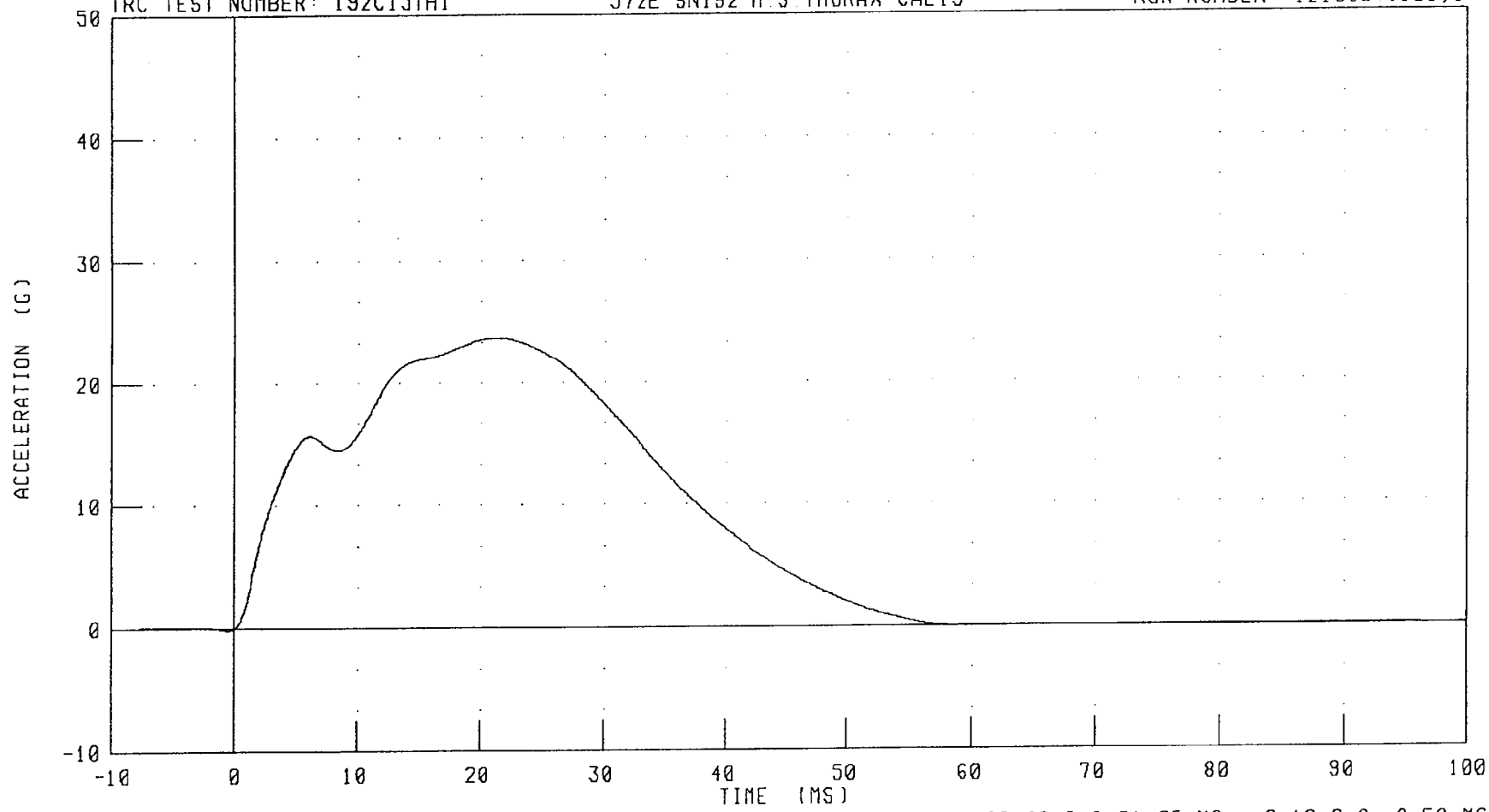
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	52.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/SEC	6.68 M/SEC
MAXIMUM DEFLECTION	63.5 - 72.6 MM	71.7 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5426. N
INTERNAL HYSTERESIS	69% - 85%	71.9%

TEST MEETS SPECIFICATIONS

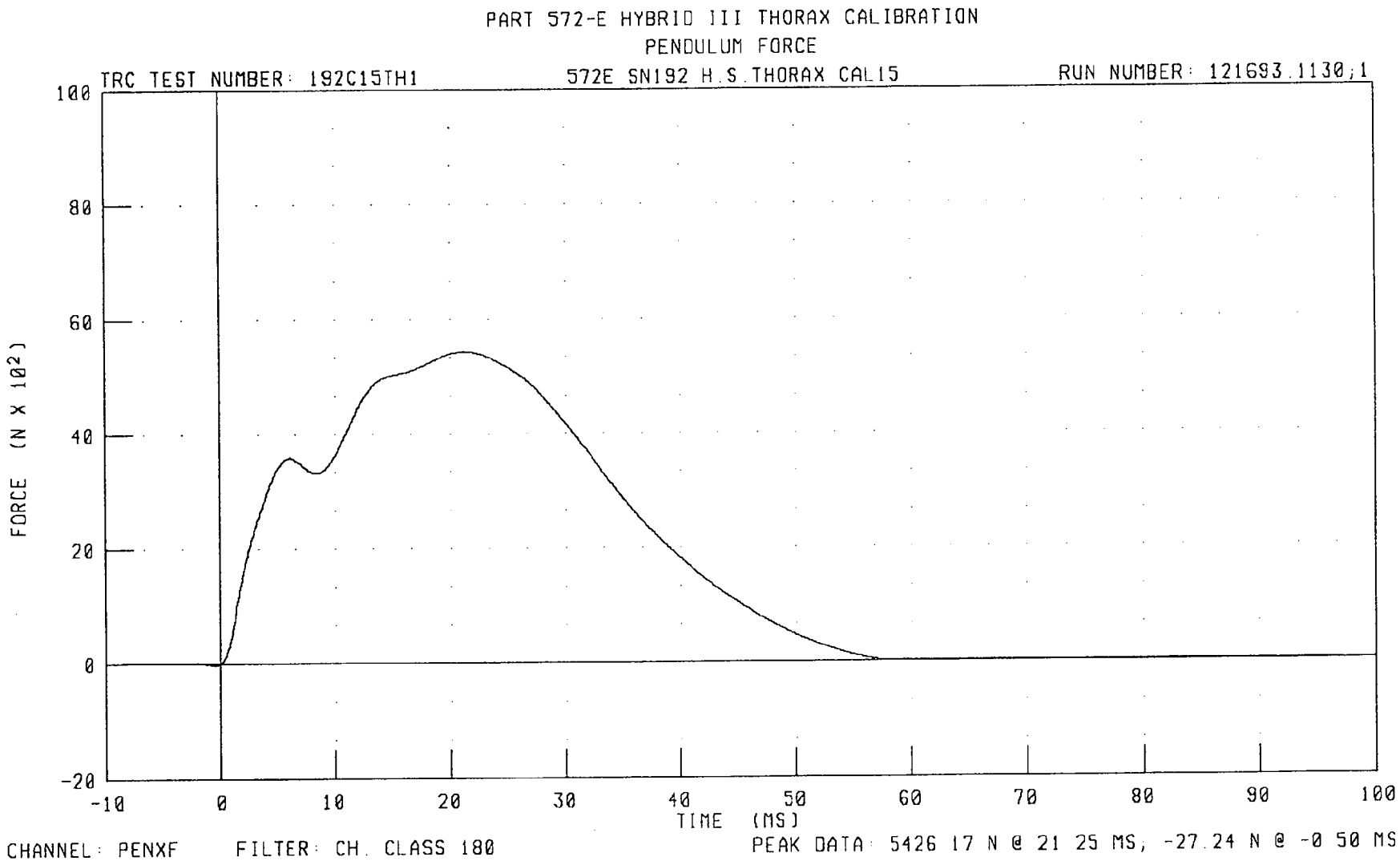
TECHNICIAN

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192C15TH1 572E SN192 H.S THORAX CAL15 RUN NUMBER: 121693 1130;1

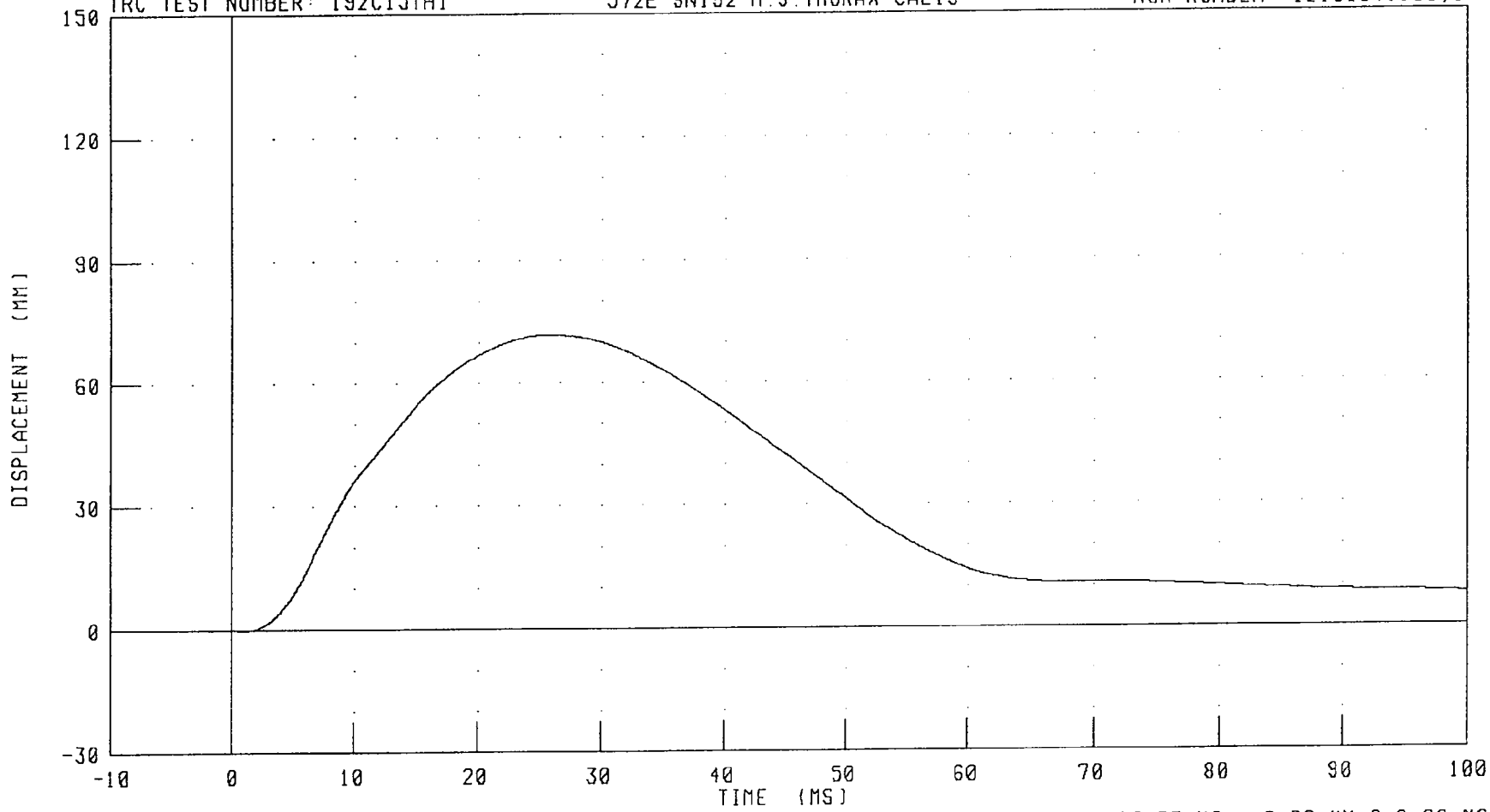


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 23.69 G @ 21.25 MS; -0.12 G @ -0.50 MS


PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE
TRC TEST NUMBER: 192C15TH1
572E SN192 H.S.THORAX CAL15
RUN NUMBER: 121693.1130;1
100
80
60
40
20
0
-20
FORCE (N X 10²)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: PENXF
FILTER: CH. CLASS 180
PEAK DATA: 5426.17 N @ 21.25 MS, -27.24 N @ -0.50 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

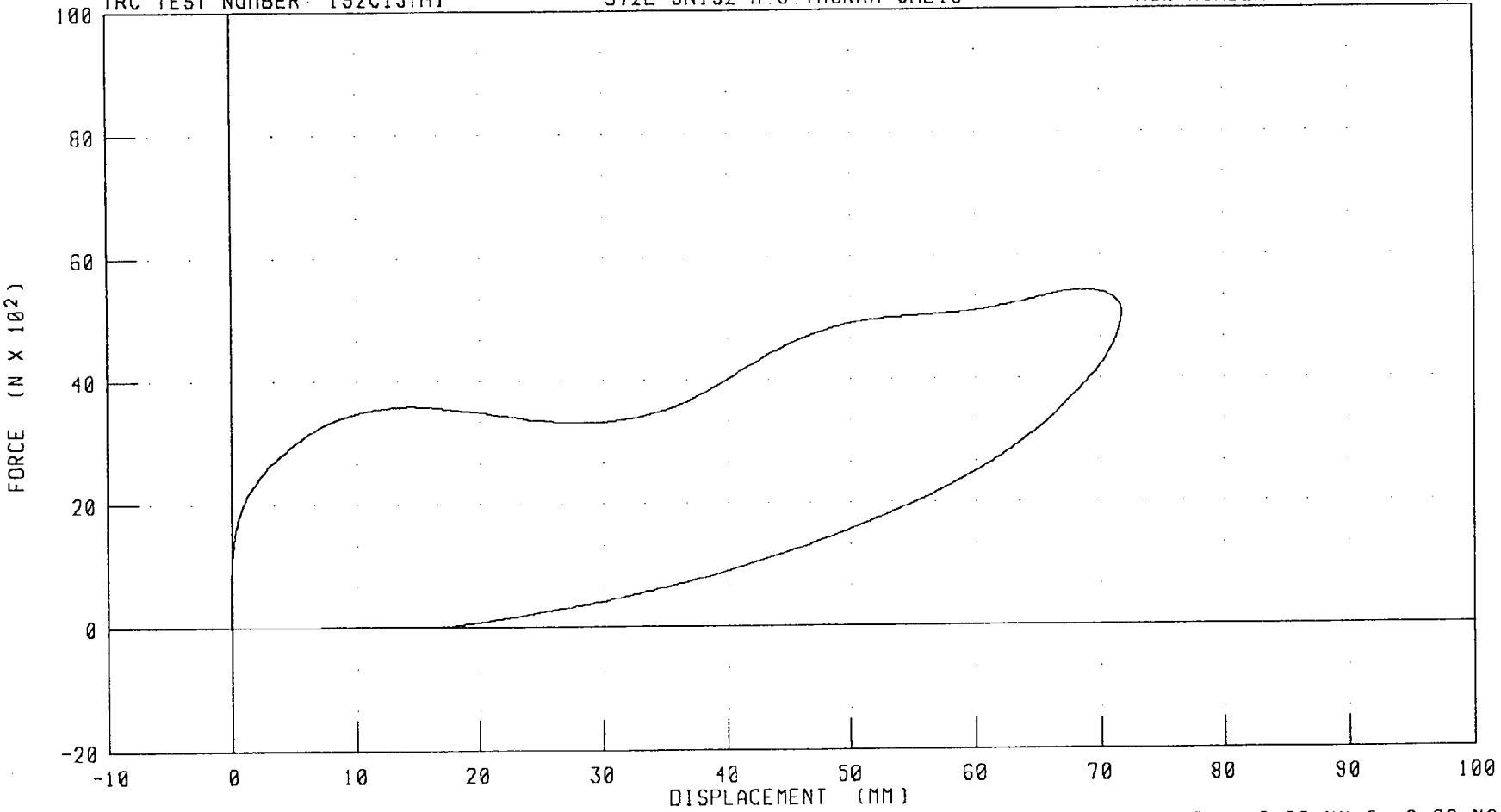
TRC TEST NUMBER: 192C15TH1 572E SN192 H.S.THORAX CAL15 RUN NUMBER: 121693.1130;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 71.71 MM @ 25.75 MS; -0.08 MM @ 0.88 MS

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

TRC TEST NUMBER: 192C15TH1 572E SN192 H.S.THORAX CAL15 RUN NUMBER: 121693 1130;1



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

PEAK DATA: 71 71 MM @ 25 75 MS; -0.08 MM @ 0 88 MS
5426 17 N @ 21 25 MS; -27.24 N @ -0 50 MS

931013

TRANSPORTATION RESEARCH CENTER INC.

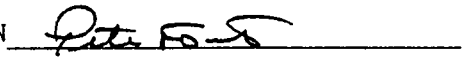
KNEE IMPACT TEST

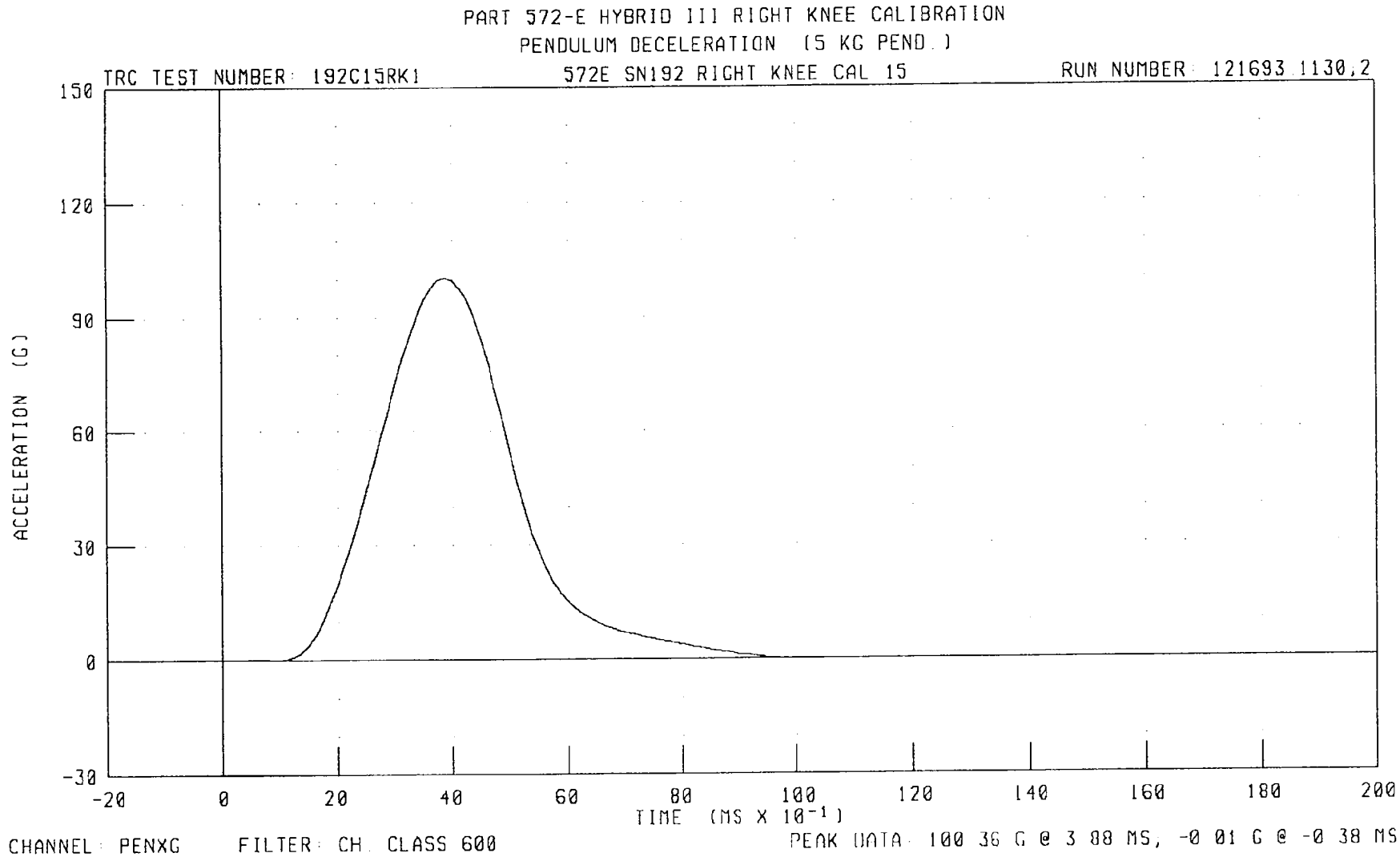
HYBRID III 23-SEP-93

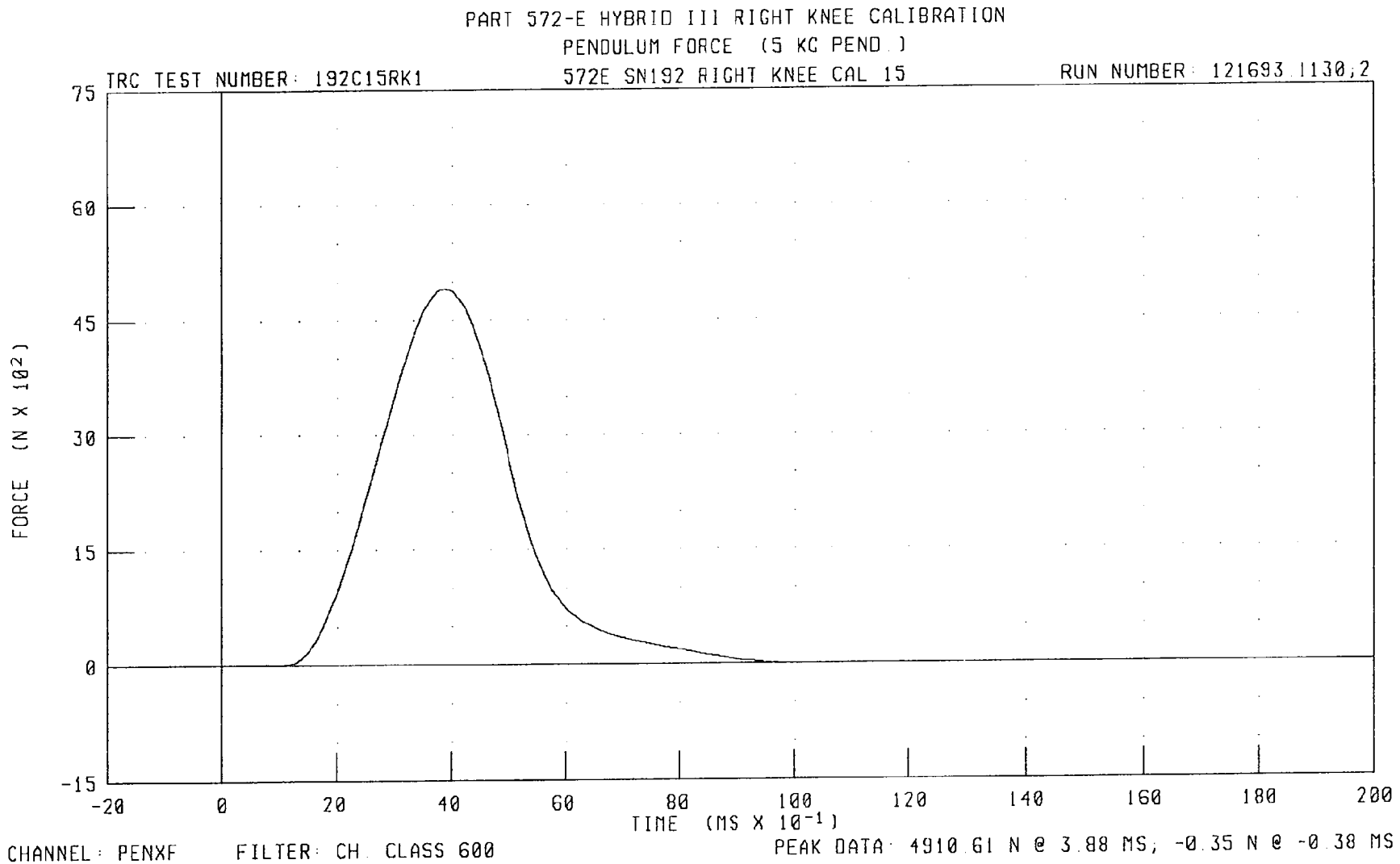
RIGHT KNEE
TRC 192C15RK1 572E SN192 RIGHT KNEE CAL 15

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	64.0 %
PROBE VELOCITY	2.07 - 2.13 M/SEC	2.10 M/SEC
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	4910.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN 


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 192C15RK1
572E SN192 RIGHT KNEE CAL 15
RUN NUMBER: 121693 1130,2
ACCELERATION (G)
150
120
90
60
30
0
-30
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXG
FILTER: CH. CLASS 600
PEAK DATA: 100.36 G @ 3.88 MS, -0.01 G @ -0.38 MS


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 192C15RK1
572E SN192 RIGHT KNEE CAL 15
RUN NUMBER: 121693.1130;2
FORCE (N X 10²)
75
60
45
30
15
0
-15
-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: 4910.61 N @ 3.88 MS; -0.35 N @ -0.38 MS

TRANSPORTATION RESEARCH CENTER INC.

KNEE IMPACT TEST

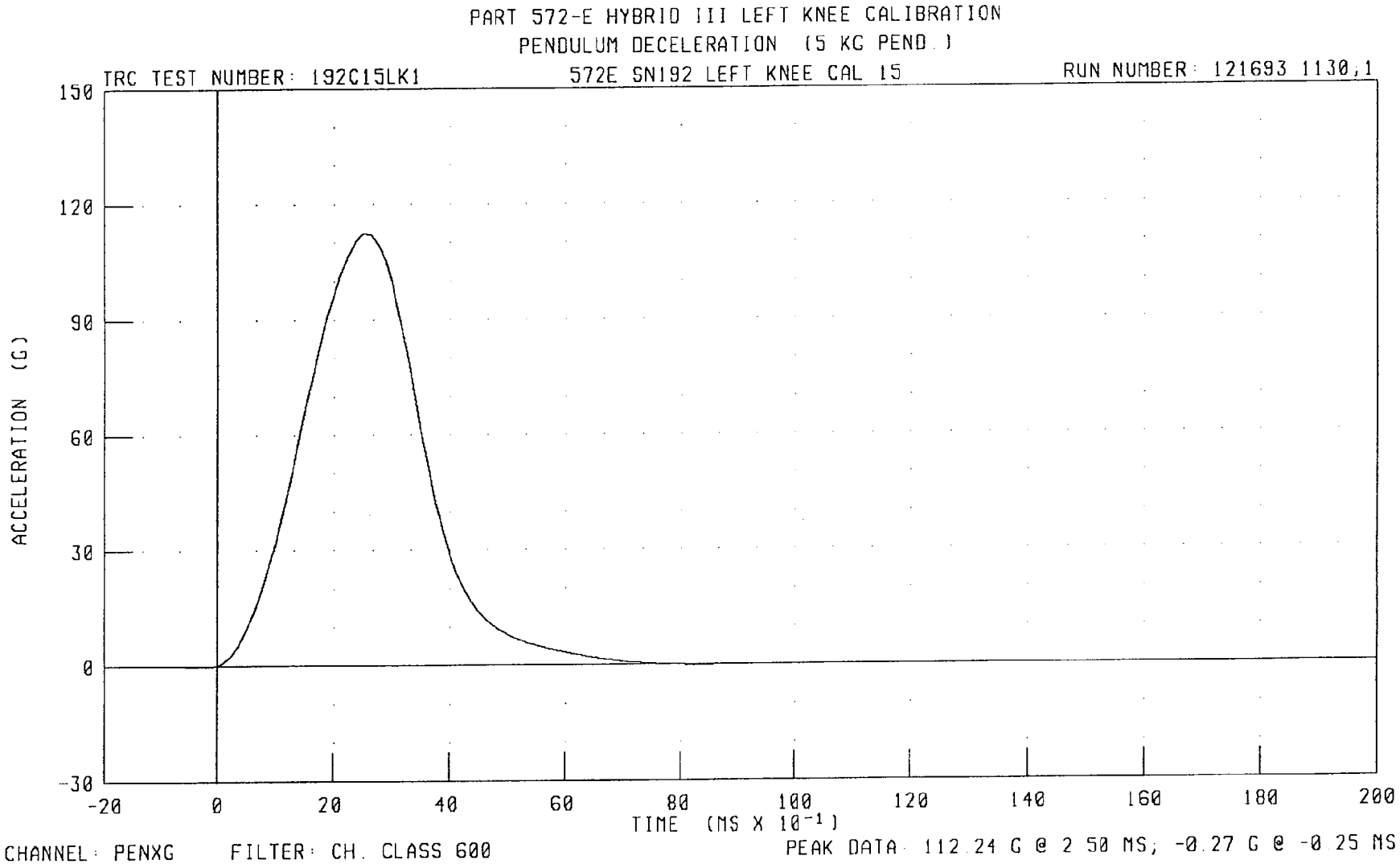
HYBRID III 23-SEP-93

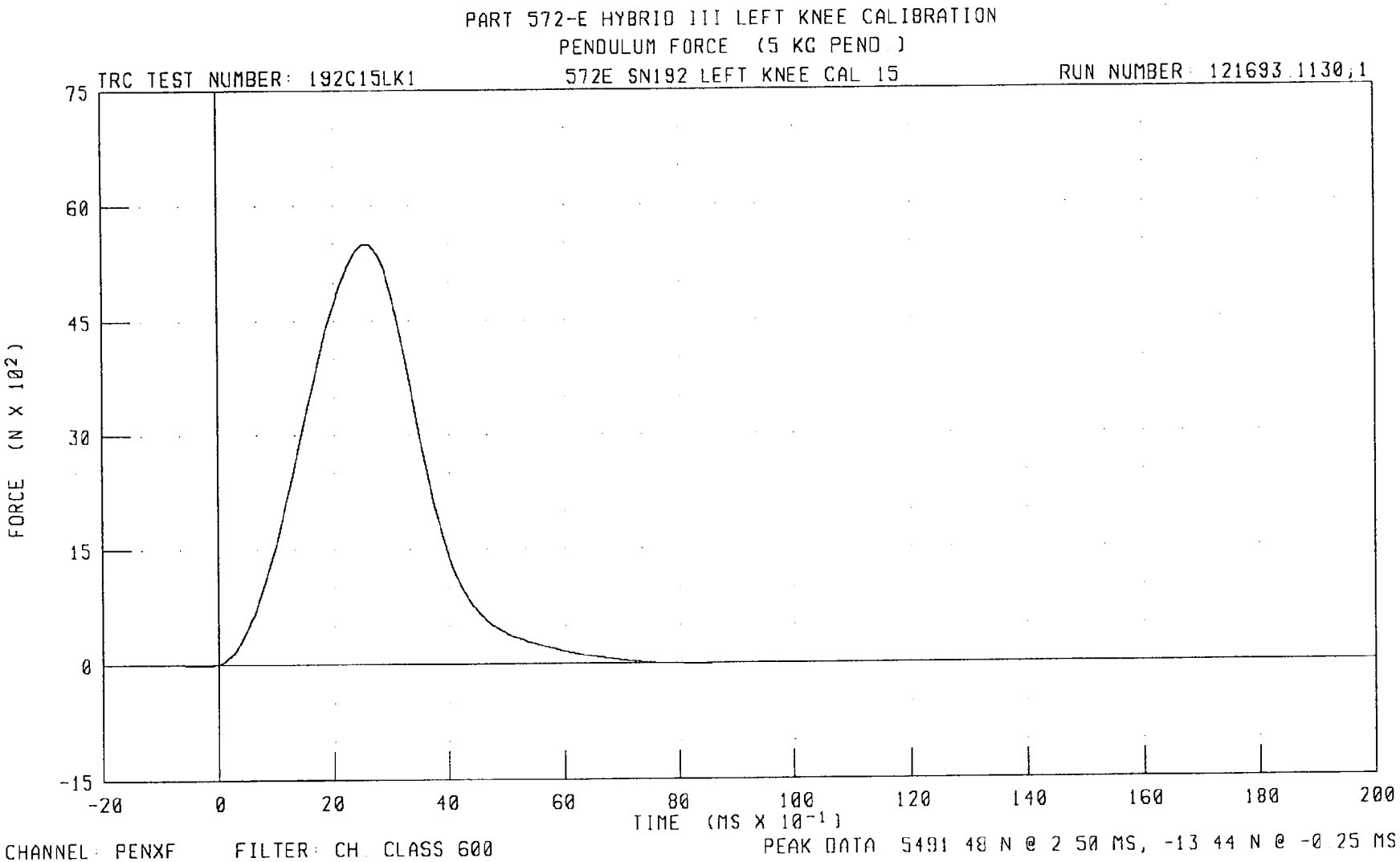
LEFT KNEE
TRC 192C15LK1 572E SN192 LEFT KNEE CAL 15

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	64.0 %
PROBE VELOCITY	2.07 - 2.13 M/SEC	2.09 M/SEC
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5491.4 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Fourt


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 192C15LK1
572E SN192 LEFT KNEE CAL 15
RUN NUMBER: 121693 1130,1
ACCELERATION (G)
150
120
90
60
30
0
-30
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXG
FILTER: CH. CLASS 600
PEAK DATA: 112.24 G @ 2.50 MS; -0.27 G @ -0.25 MS


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 192C15LK1
572E SN192 LEFT KNEE CAL 15
RUN NUMBER: 121693.1130,1
FORCE (N X 10²)
75
60
45
30
15
0
-15
-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 5491.48 N @ 2.50 MS, -13.44 N @ -0.25 MS

PRE-TEST CERTIFICATION DATA

PASSENGER DUMMY S/N: 142

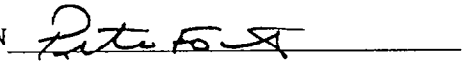
TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
142 HUMANOID

23-SEP-93

TRC 142C16ED1 572E SN142 EXT.DIMENSION CAL16

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE	(AA)	429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE	(BB)	226 - 231 MM	229. MM
CHEST CIRCUMFERENCE	(Y)	970 -1001 MM	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 

TRANSPORTATION RESEARCH CENTER INC.

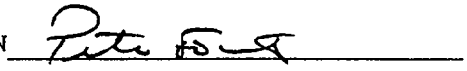
HEAD DROP TEST

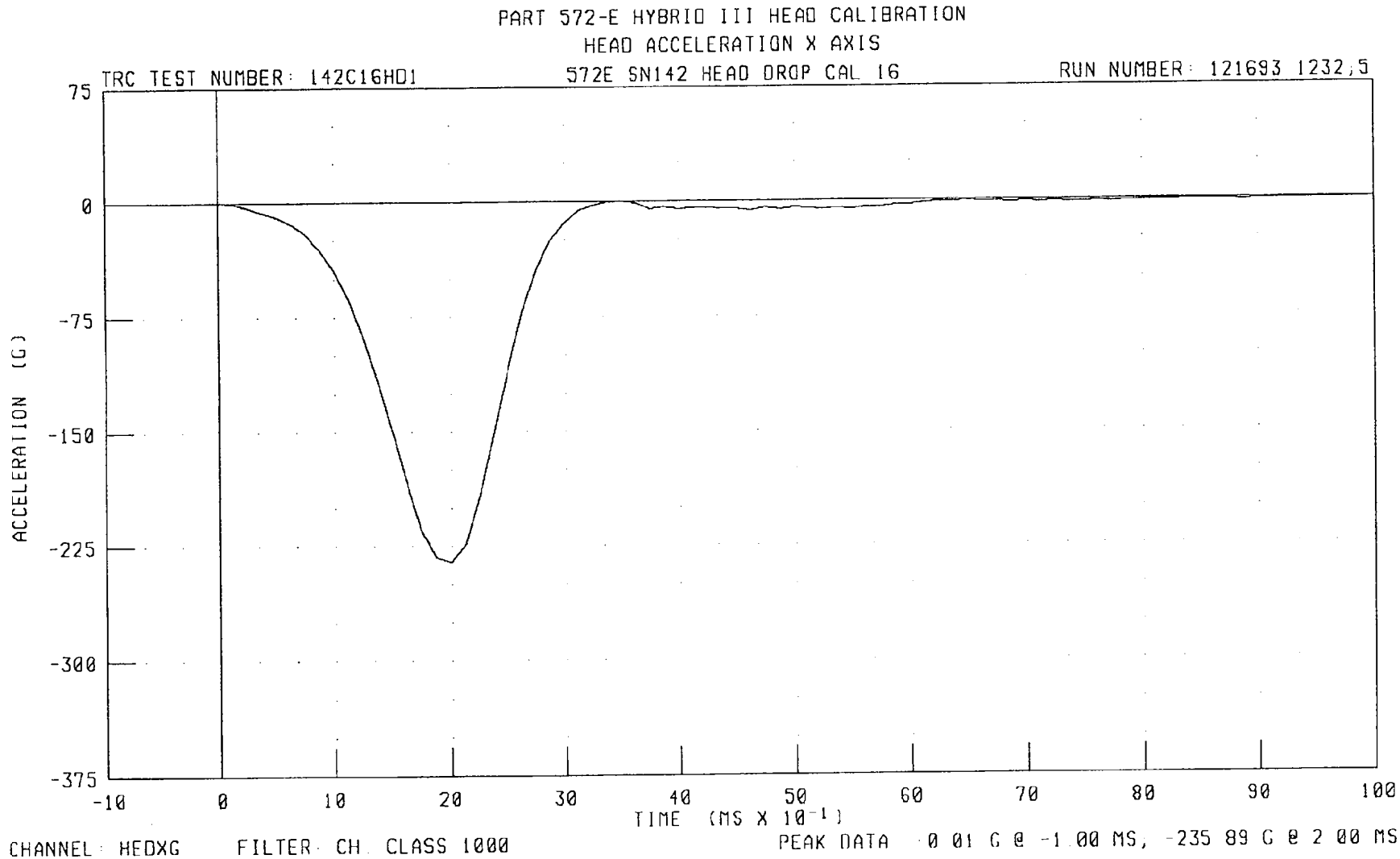
HYBRID III 27-SEP-93

TRC 142C16HD1 572E SN142 HEAD DROP CAL 16

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	52.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	273.31 G
PEAK LATERAL ACCELERATION	15 G MAX	-0.95 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

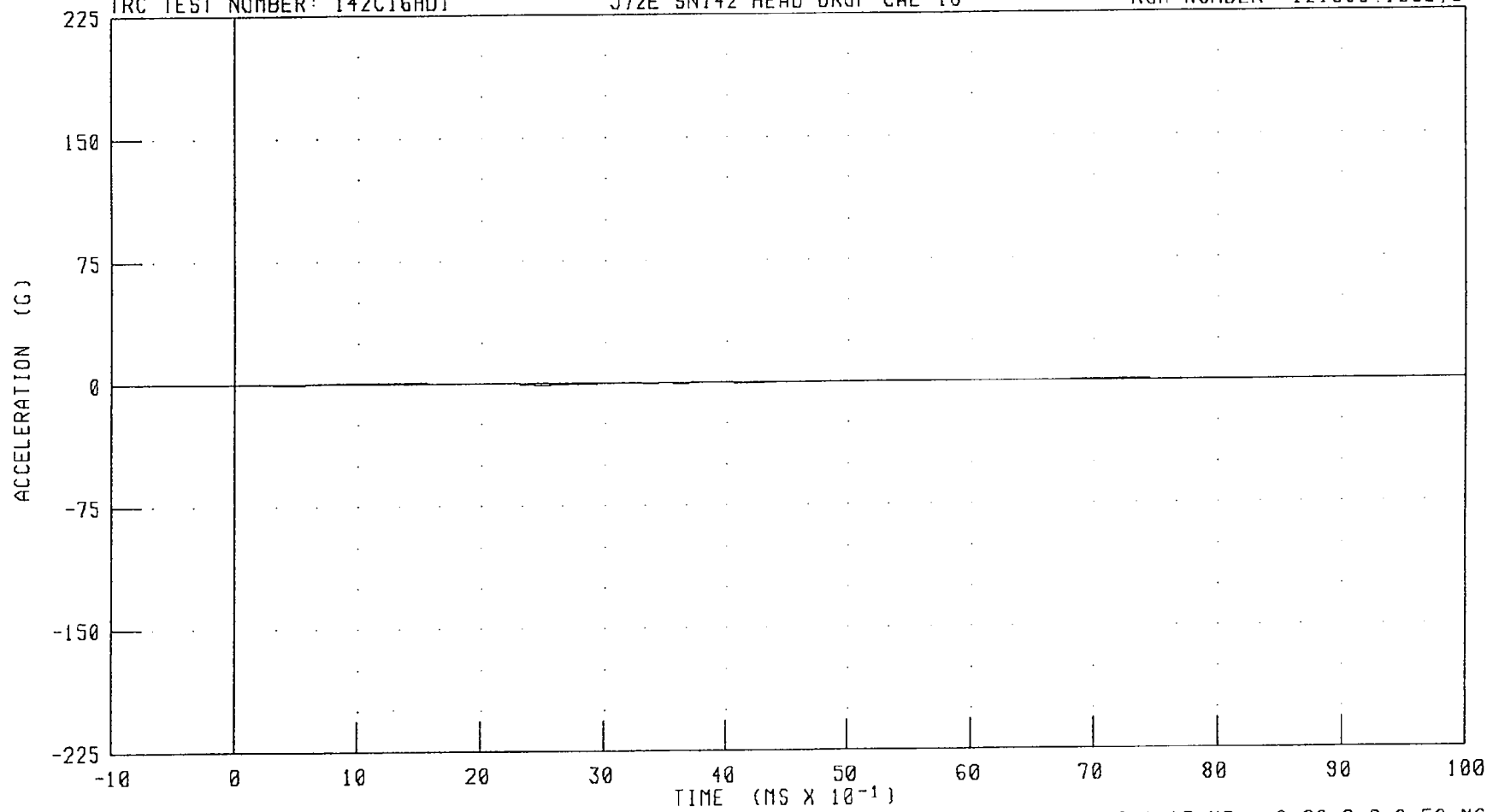
TEST MEETS SPECIFICATIONS

TECHNICIAN 

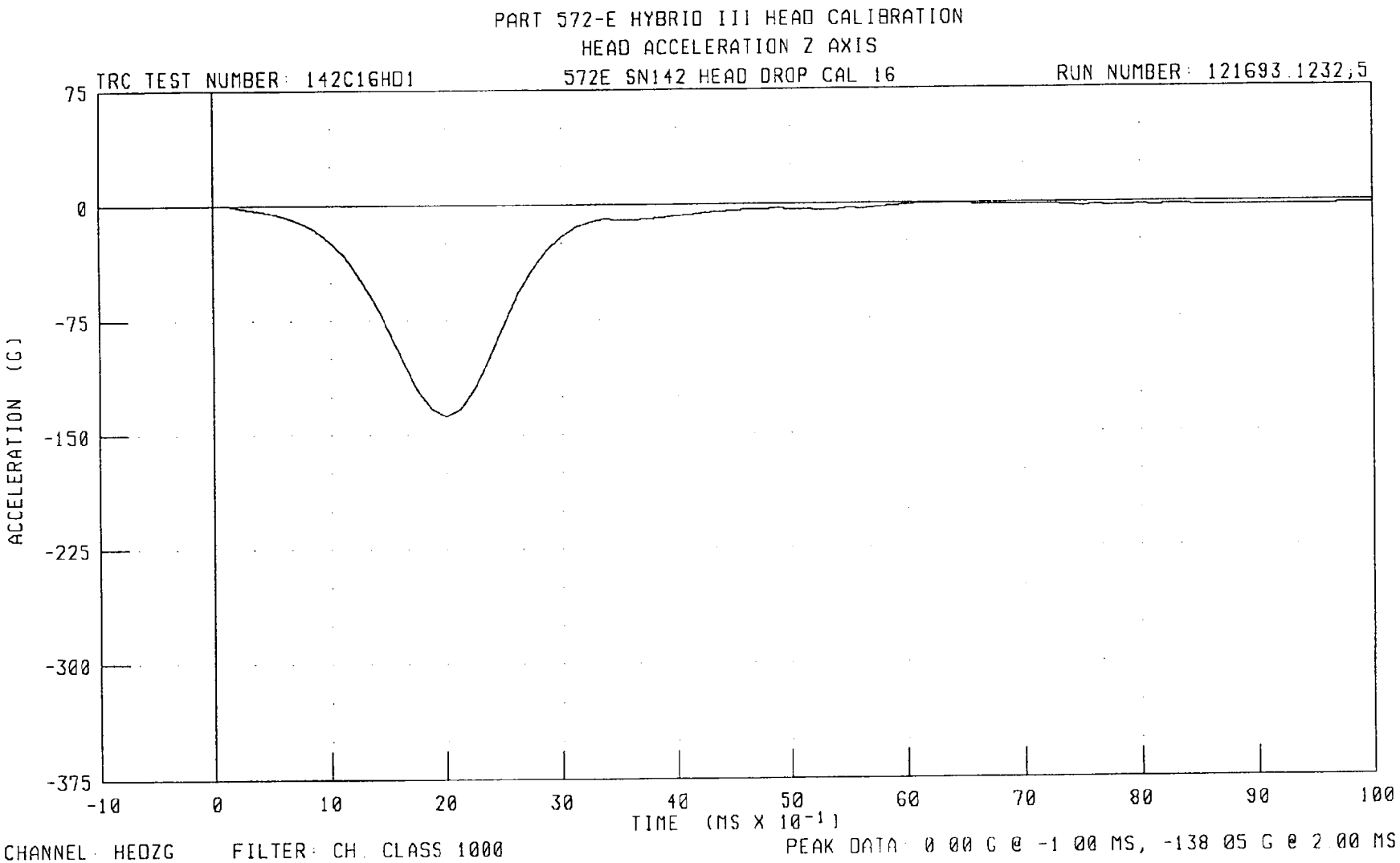

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS
TRC TEST NUMBER: 142C16HD1
572E SN142 HEAD DROP CAL 16
RUN NUMBER: 121693 1232,5
75
0
-75
-150
-225
-300
-375
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10⁻¹)
CHANNEL: HEDXG
FILTER: CH CLASS 1000
PEAK DATA: 0 01 G @ -1 00 MS, -235 89 G @ 2 00 MS

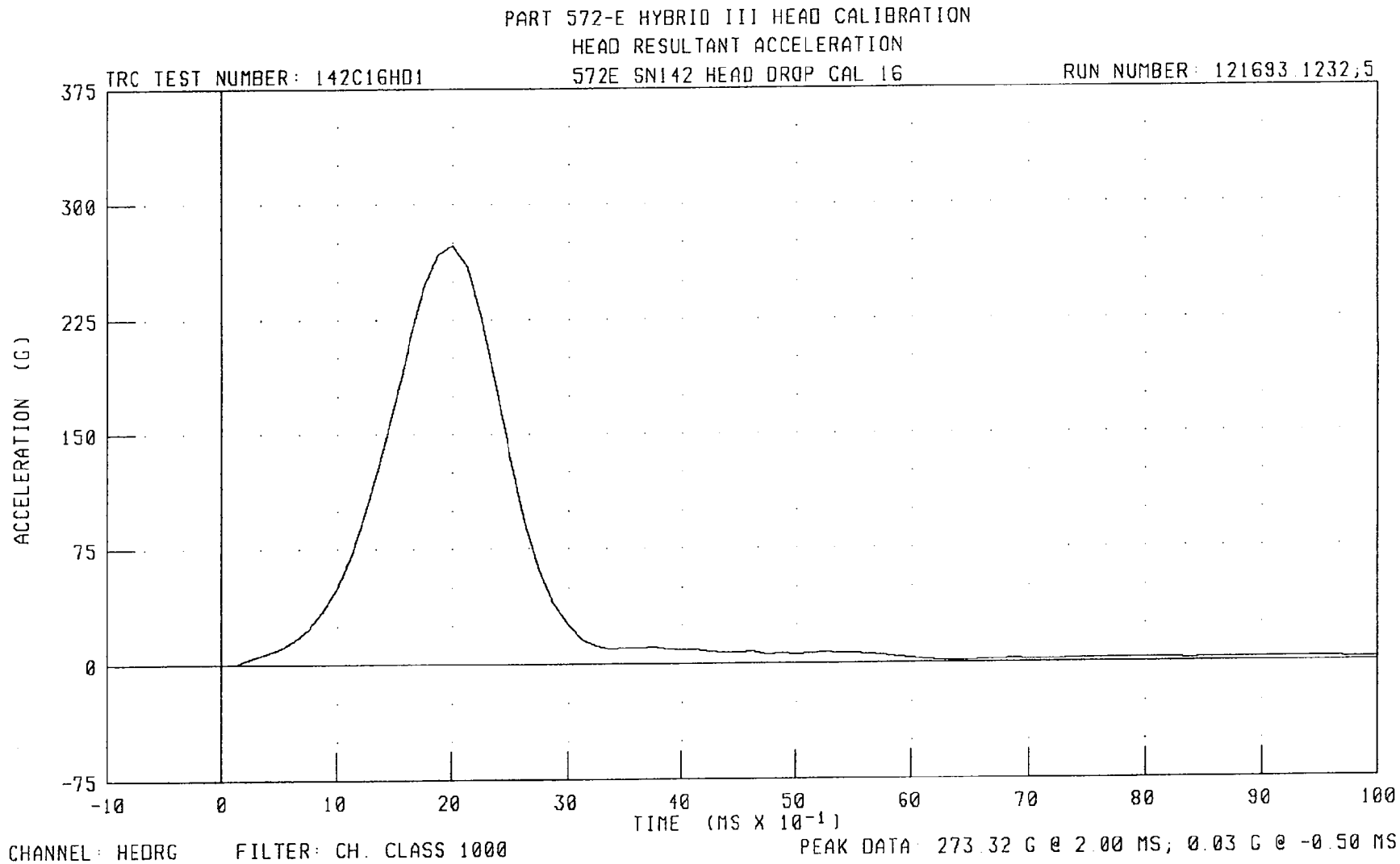
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 142C16HD1 572E SN142 HEAD DROP CAL 16 RUN NUMBER: 121693.1232;5



CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 0.48 G @ 1.13 MS; -0.96 G @ 2.50 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 142C16HD1
572E SN142 HEAD DROP CAL 16
RUN NUMBER: 121693.1232,5
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: 0.00 G @ -1.00 MS, -138.05 G @ 2.00 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
TRC TEST NUMBER: 142C16HD1
572E SN142 HEAD DROP CAL 16
RUN NUMBER: 121693 1232;5
ACCELERATION (G)
375
300
225
150
75
0
-75
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10-1)
CHANNEL: HEDRG
FILTER: CH. CLASS 1000
PEAK DATA: 273.32 G @ 2.00 MS; 0.03 G @ -0.50 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST

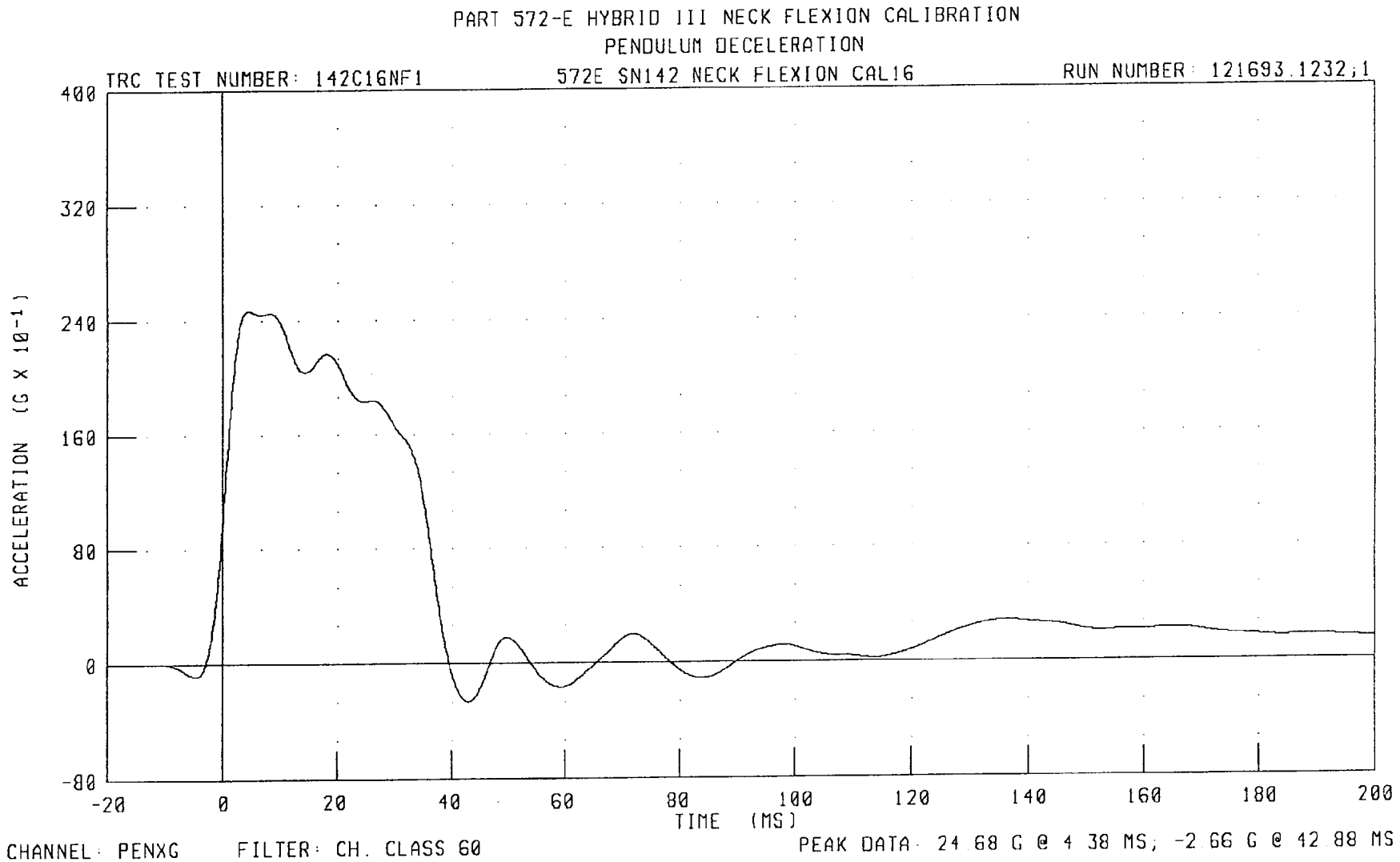
HYBRID III 27-SEP-93

6 AXIS NECK TRANSDUCER
TRC 142C16NF1 572E SN142 NECK FLEXION CAL16

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10% - 70%	52.0 %
IMPACT VELOCITY		6.89 - 7.13 M/SEC	7.03 M/SEC
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.80 G
	20 MS	17.60 - 22.60 G	20.94 G
	30 MS	12.50 - 18.50 G	16.52 G
MAX PENDULUM G		29 G MAX	24.68 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.45 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.25 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.05 DEG.
	TIME	57 - 64 MS	59.25 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	92.04 NM
	TIME	47 - 58 MS	50.88 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	102.38 MS

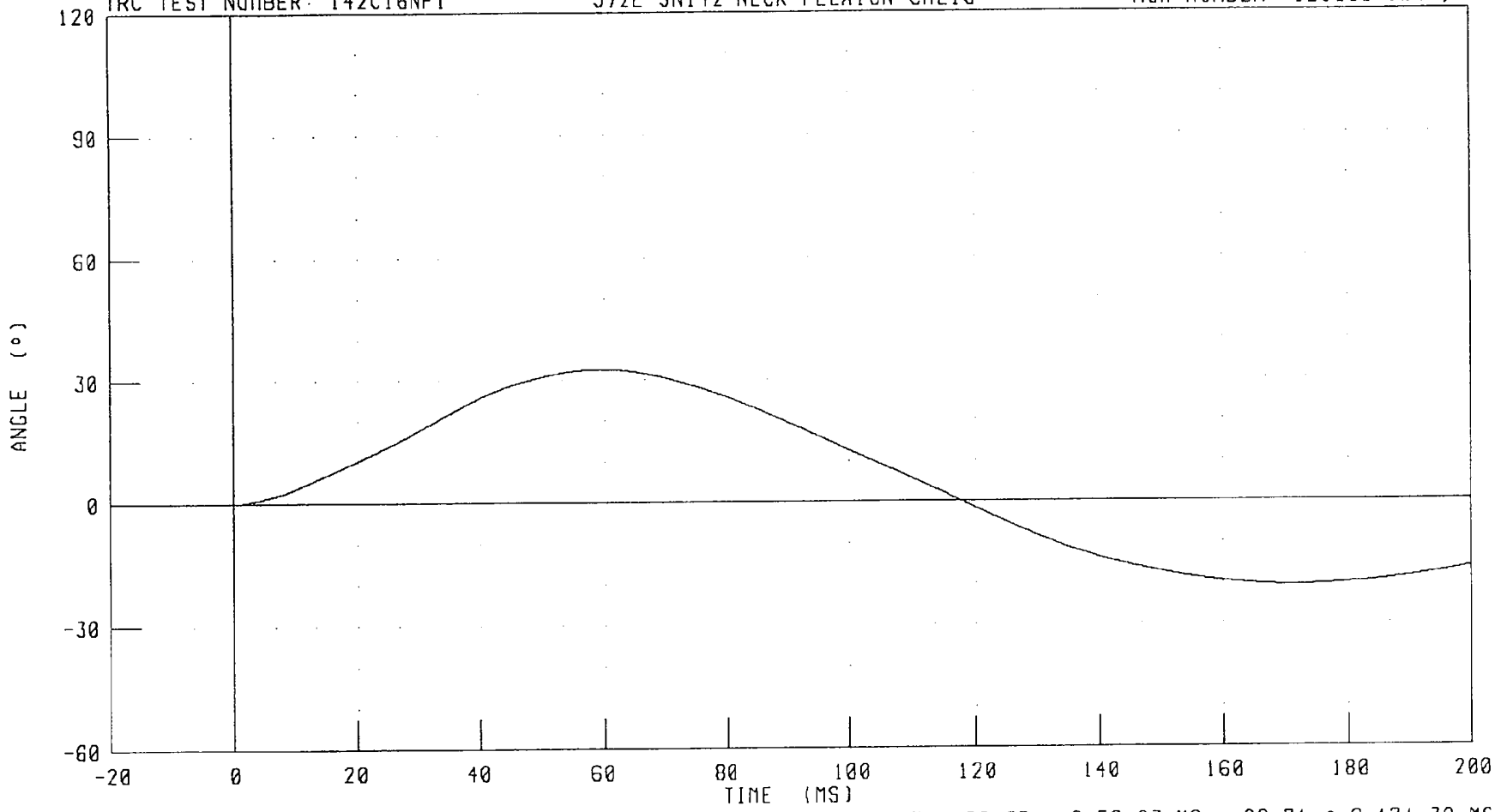
TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Fonts


PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 142C16NF1
572E SN142 NECK FLEXION CAL16
RUN NUMBER: 121693.1232;1
ACCELERATION (G X 10-1)
400
320
240
160
80
0
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 60
PEAK DATA: 24.68 G @ 4.38 MS; -2.66 G @ 42.88 MS

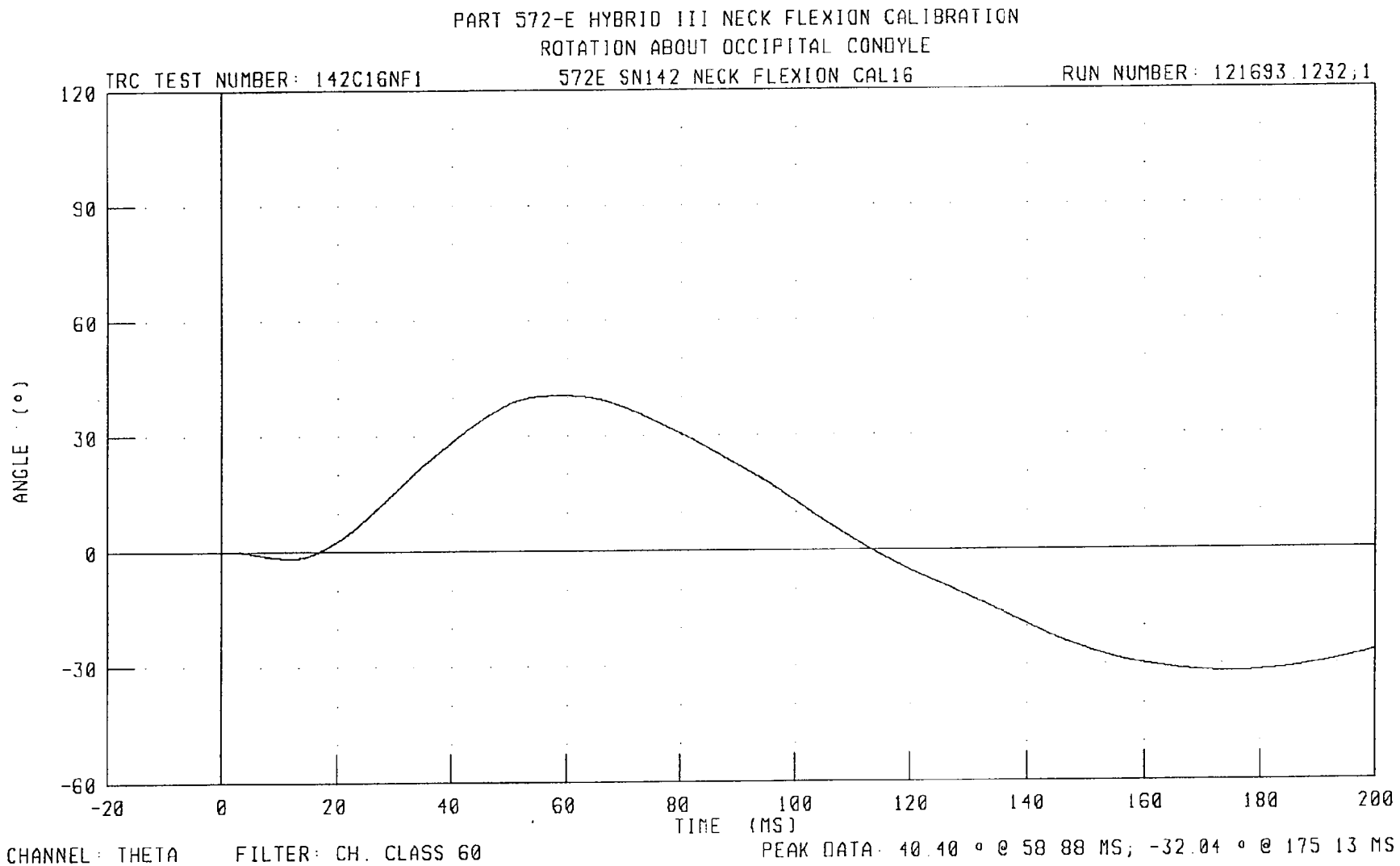
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C1GNF1 572E SN142 NECK FLEXION CAL1G RUN NUMBER: 121693 1232,1



CHANNEL: BETA FILTER: CH CLASS 60 PEAK DATA: 32.67 ° @ 59 63 MS; -20 71 ° @ 171 38 MS

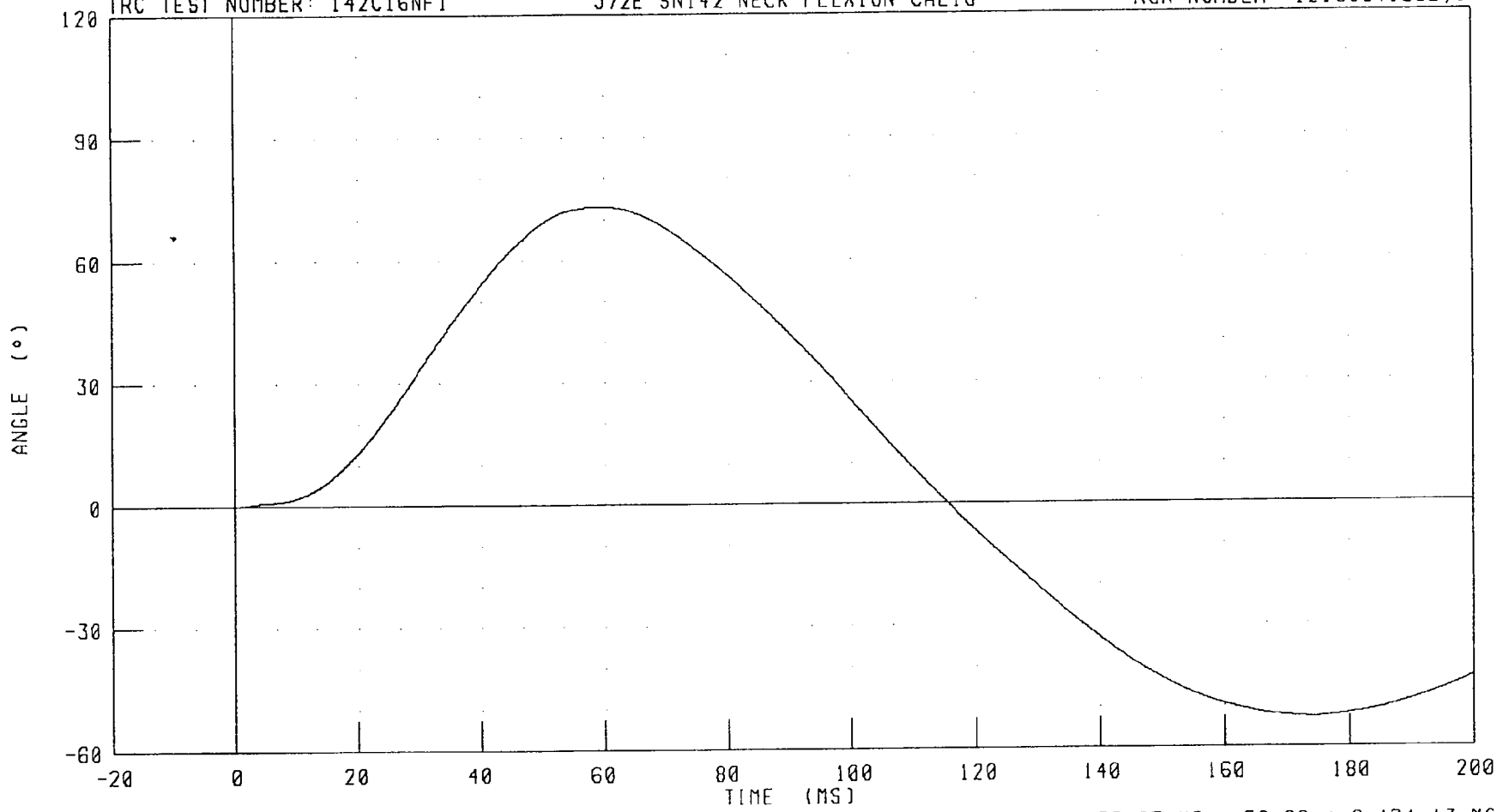
931013


PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C16NF1
572E SN142 NECK FLEXION CAL16
RUN NUMBER: 121693.1232;1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 40.40 ° @ 58.88 MS; -32.04 ° @ 175.13 MS

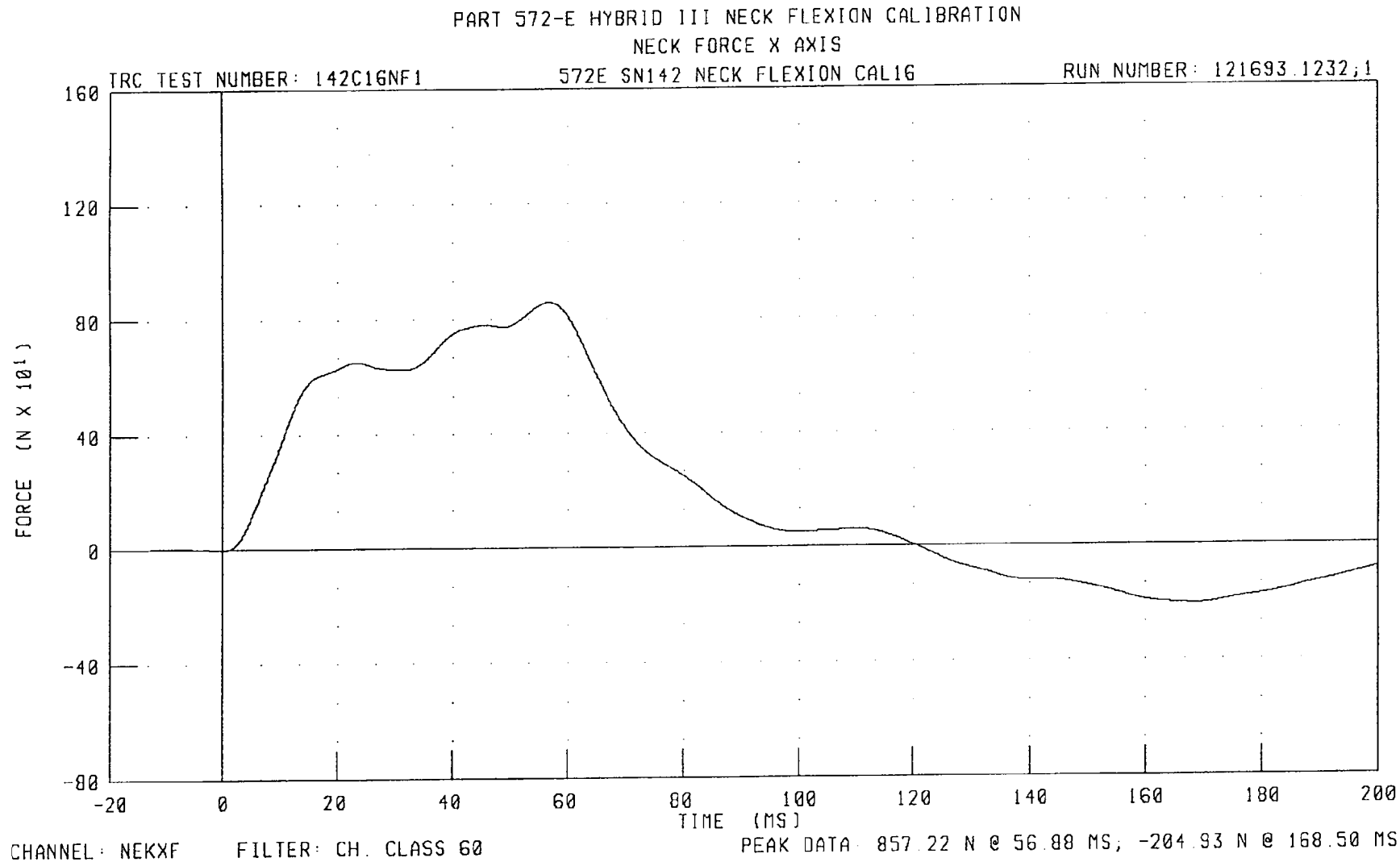
PART 572-E HYBRID III NECK FLEXION CALIBRATION

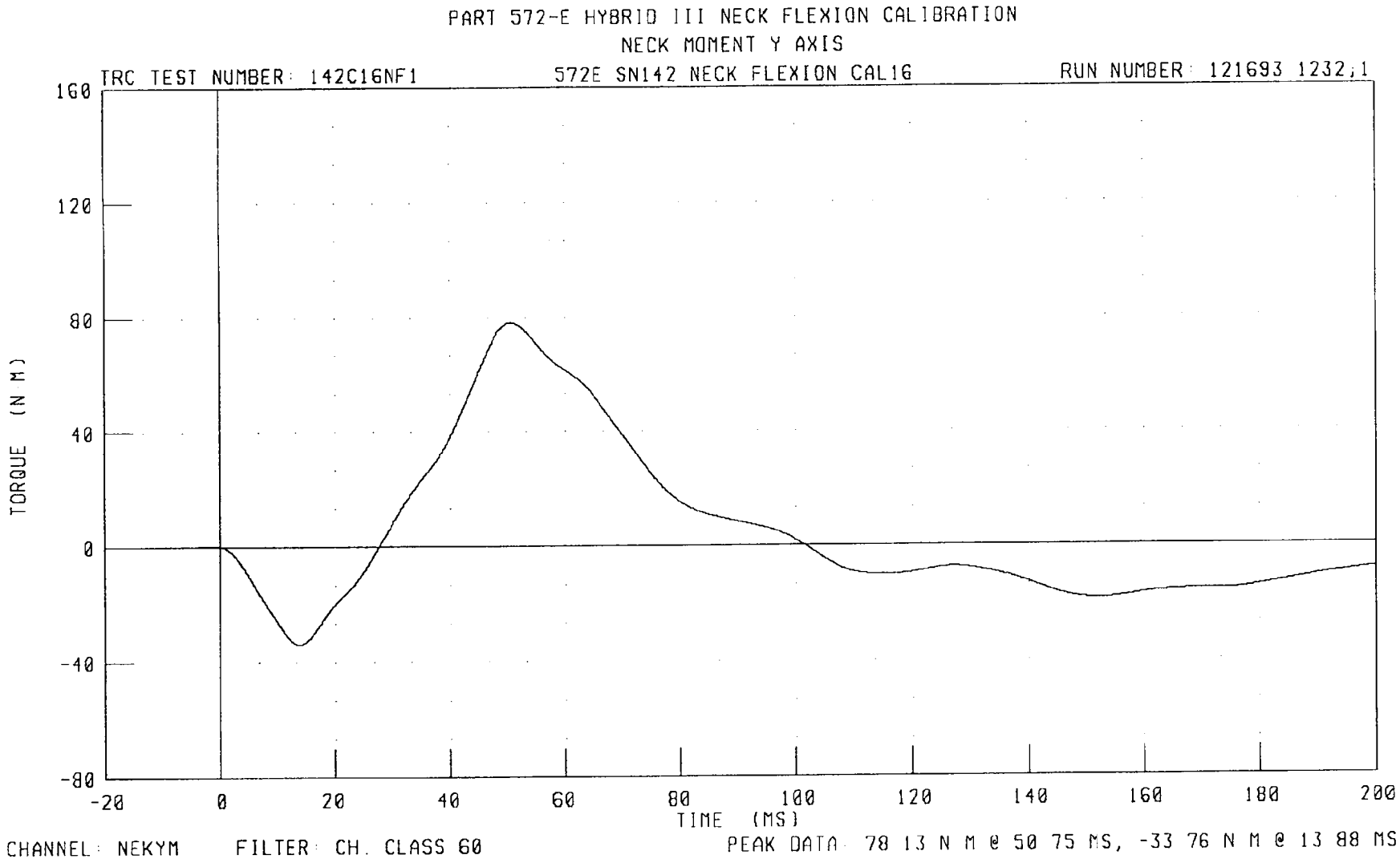
TOTAL ROTATION

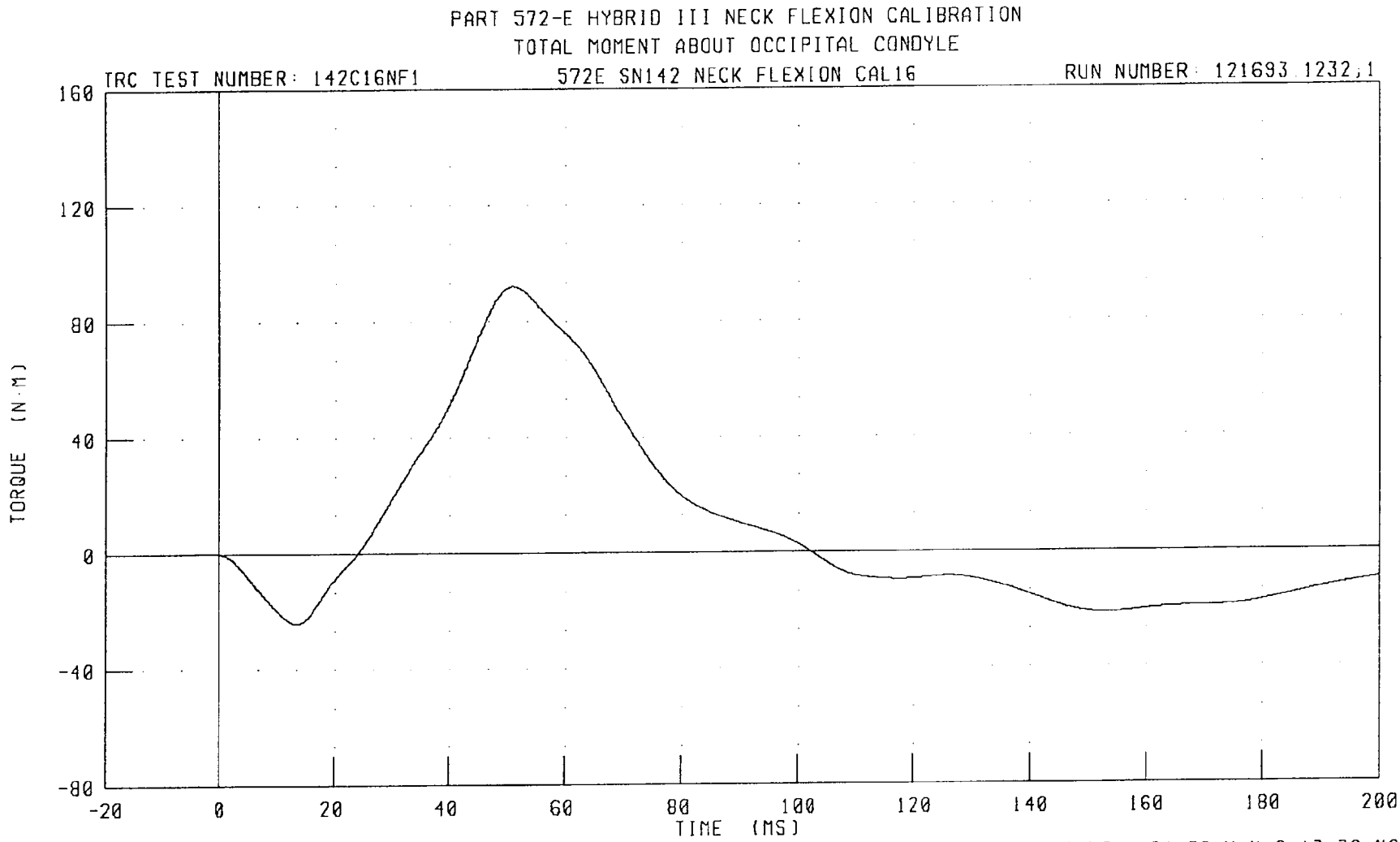
TRC TEST NUMBER: 142C16NF1 572E SN142 NECK FLEXION CAL16 RUN NUMBER: 121693.1232;1



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA 73.06 ° @ 59.25 MS; -52.69 ° @ 174.13 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 142C1GNF1
572E SN142 NECK FLEXION CAL1G
RUN NUMBER: 121693.1232;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: 857.22 N @ 56.88 MS, -204.93 N @ 168.50 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 142C16NF1
572E SN142 NECK FLEXION CAL16
RUN NUMBER: 121693 1232;1
160
120
80
40
0
-40
-80
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: 78 13 N M @ 50 75 MS, -33 76 N M @ 13 88 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C16NF1
572E SN142 NECK FLEXION CAL16
RUN NUMBER: 121693 1232,1
160
120
80
40
0
-40
-80
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 92.04 N M @ 50.88 MS, -24.09 N-M @ 13.38 MS

TRANSPORTATION RESEARCH CENTER INC.

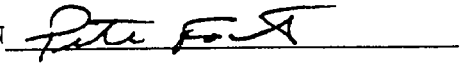
NECK EXTENSION TEST

HYBRID III 27-SEP-93

6 AXIS NECK TRANSDUCER
TRC 142C16NE1 572E SN142 NECK EXT. CAL16

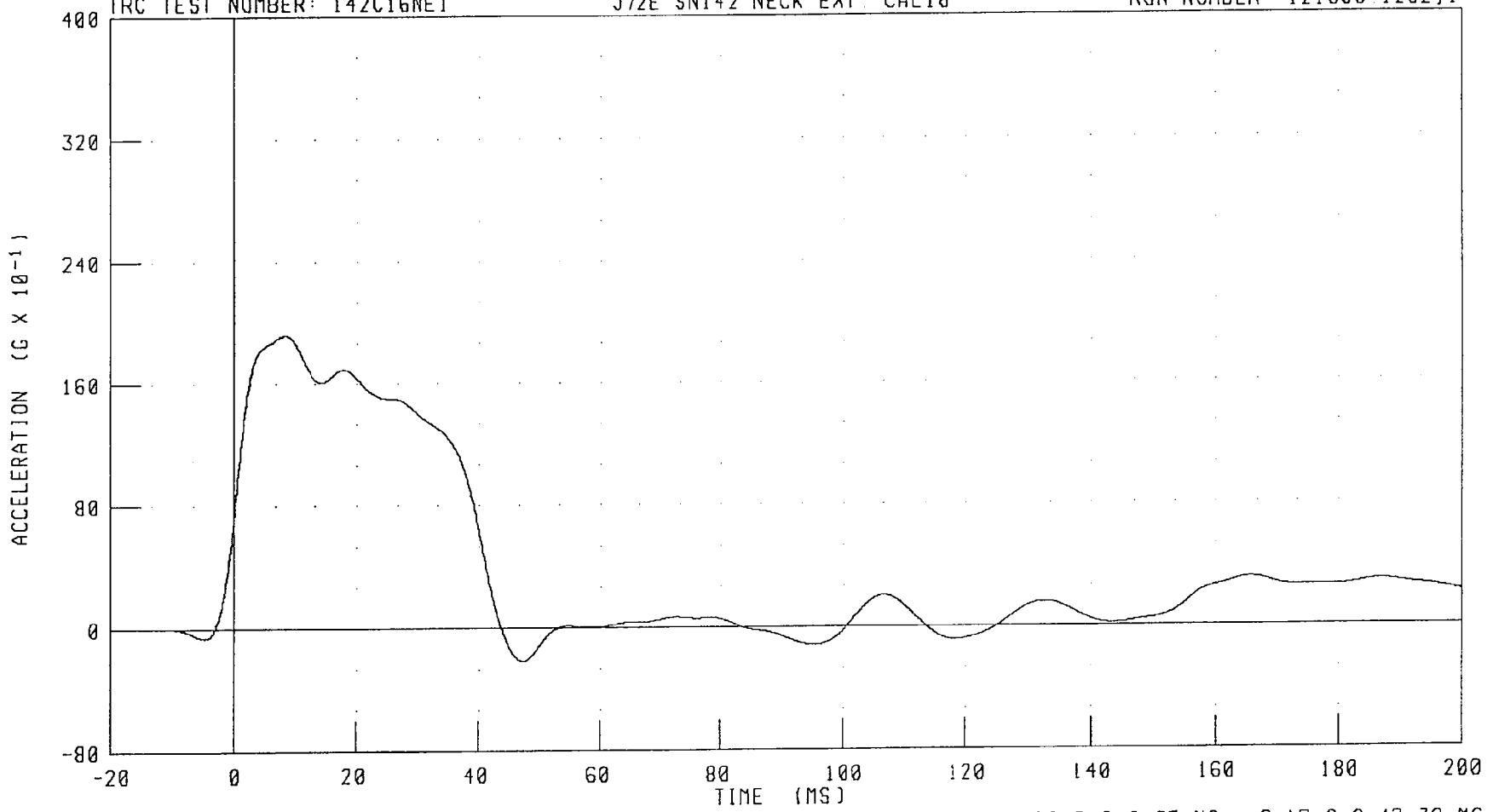
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10% - 70%	52.0 %
IMPACT VELOCITY		5.95 - 6.19 M/SEC	6.05 M/SEC
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.54 G
	20 MS	14.00 - 19.00 G	16.35 G
	30 MS	11.00 - 16.00 G	14.00 G
MAX PENDULUM G		22 G MAX	19.20 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.96 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.63 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	96.59 DEG.
	TIME	72 - 82 MS	74.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-71.29 NM
	TIME	65 - 79 MS	70.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	152.88 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	139.25 MS

TEST MEETS SPECIFICATIONS

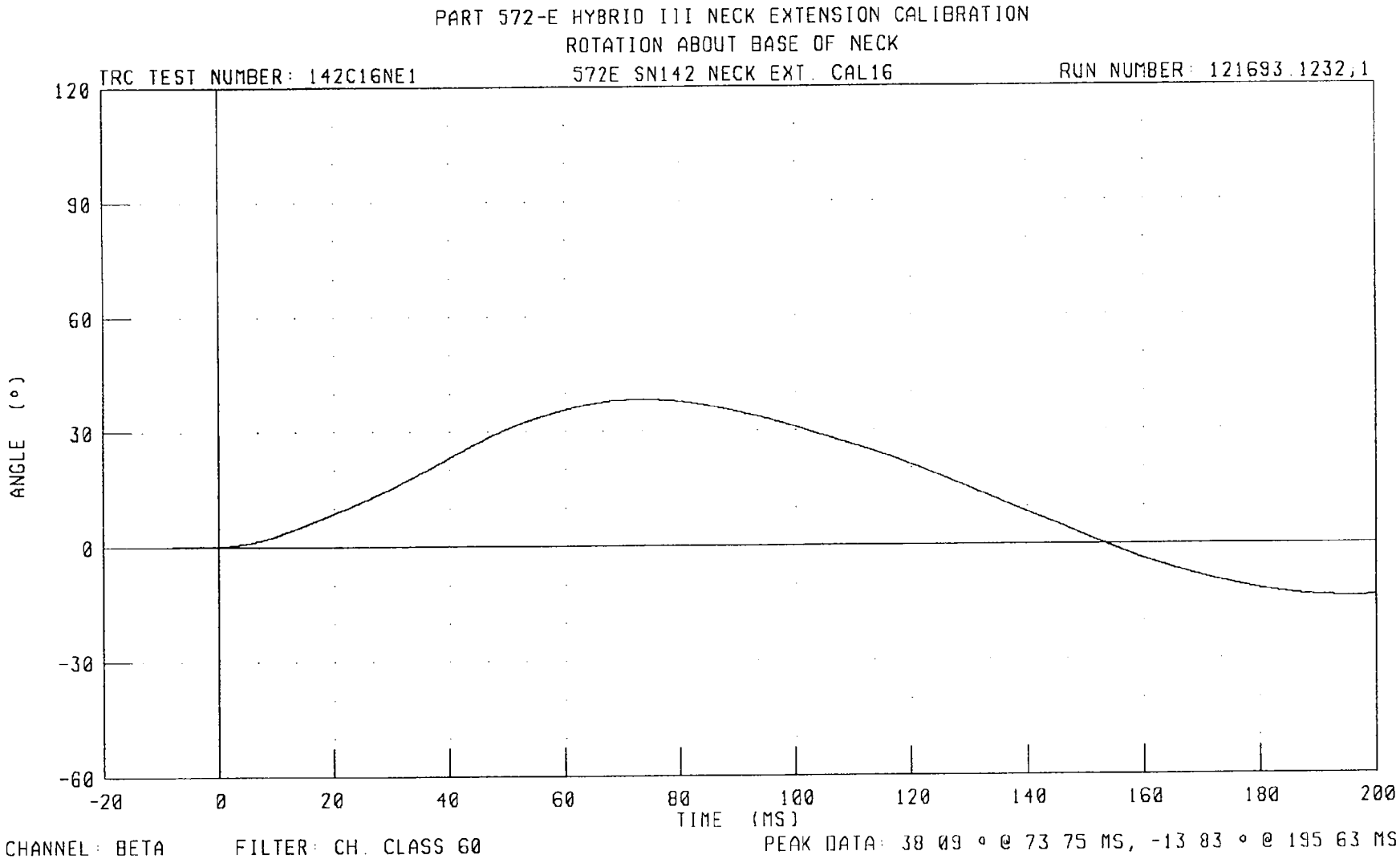
TECHNICIAN 

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C16NE1 572E SN142 NECK EXT CAL16 RUN NUMBER: 121693 1232,1

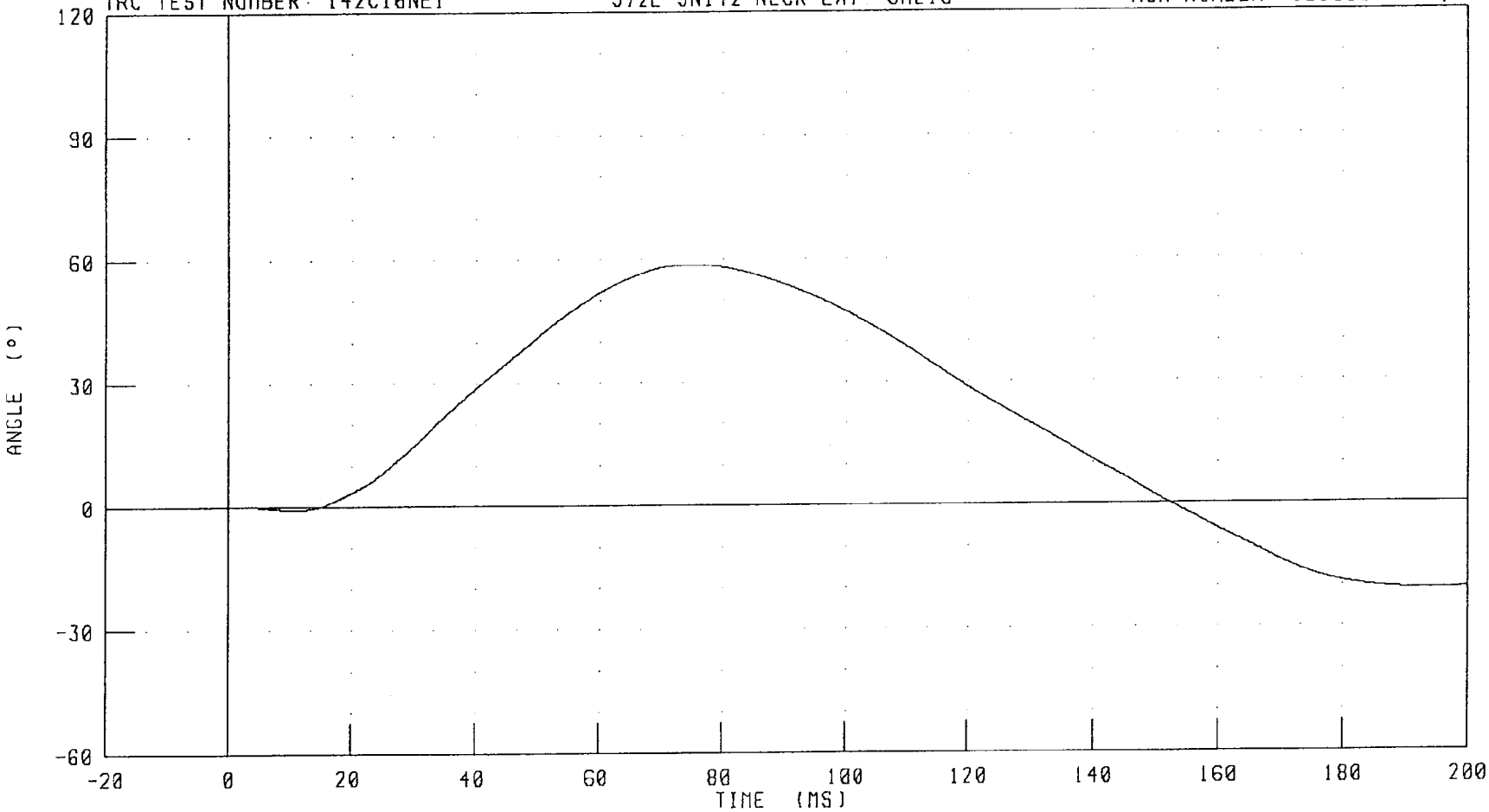


CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 19 20 G @ 8.25 MS; -2 17 G @ 47 38 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 142C16NE1
572E SN142 NECK EXT. CAL16
RUN NUMBER: 121693.1232,1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 38.09 ° @ 73.75 MS, -13.83 ° @ 195.63 MS

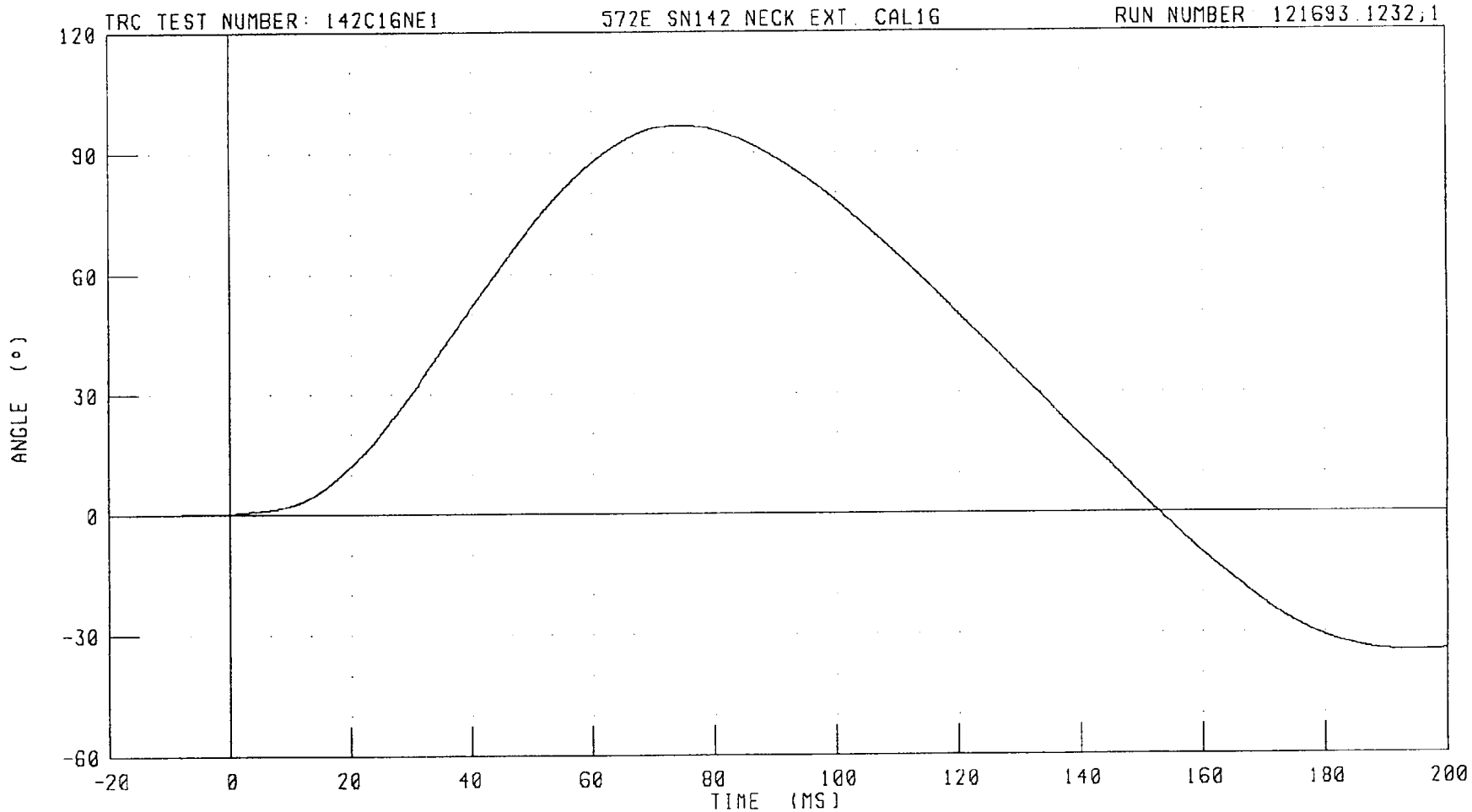
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

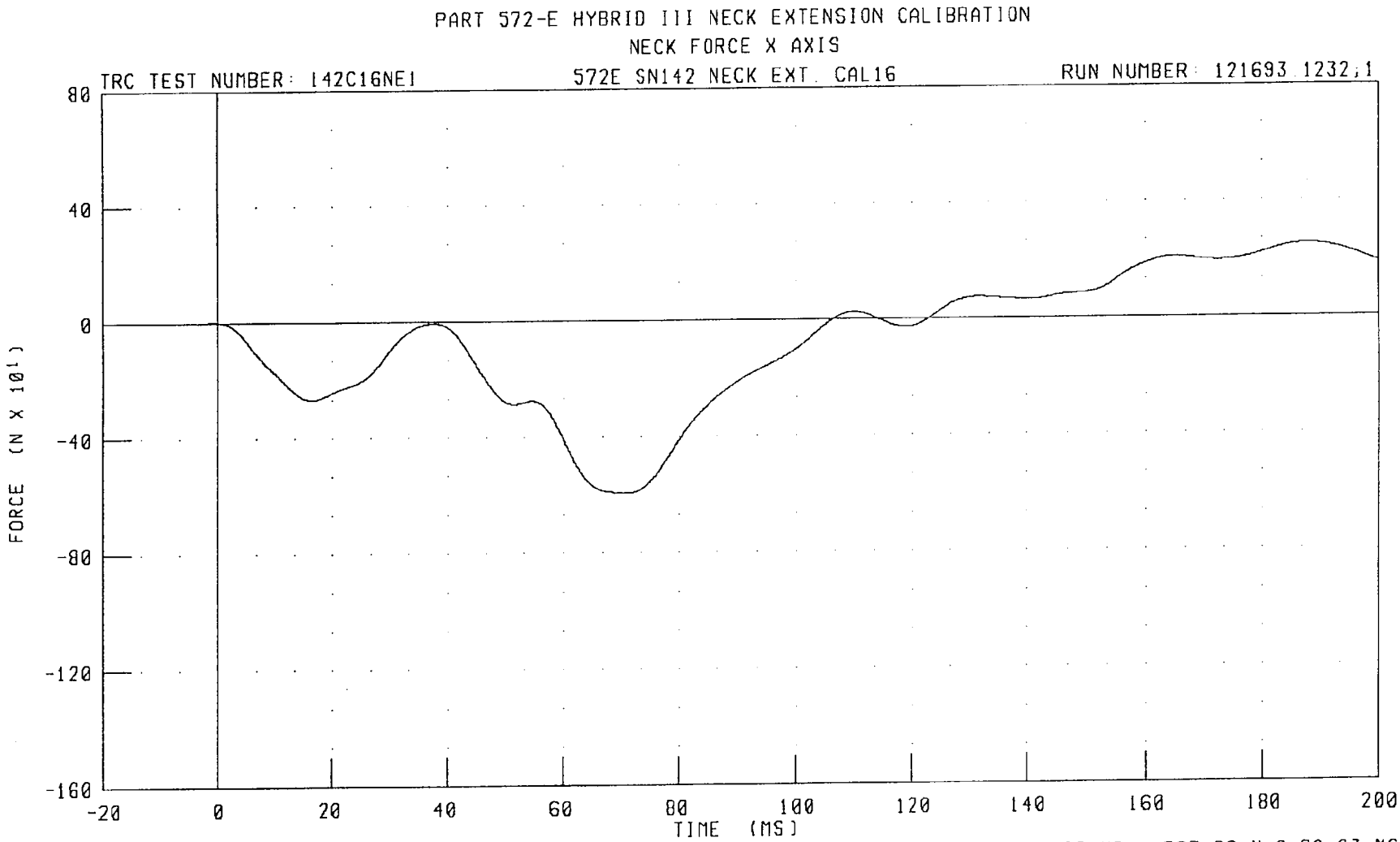
TRC TEST NUMBER: 142C16NE1 572E SN142 NECK EXT CAL16 RUN NUMBER: 121693 1232;1

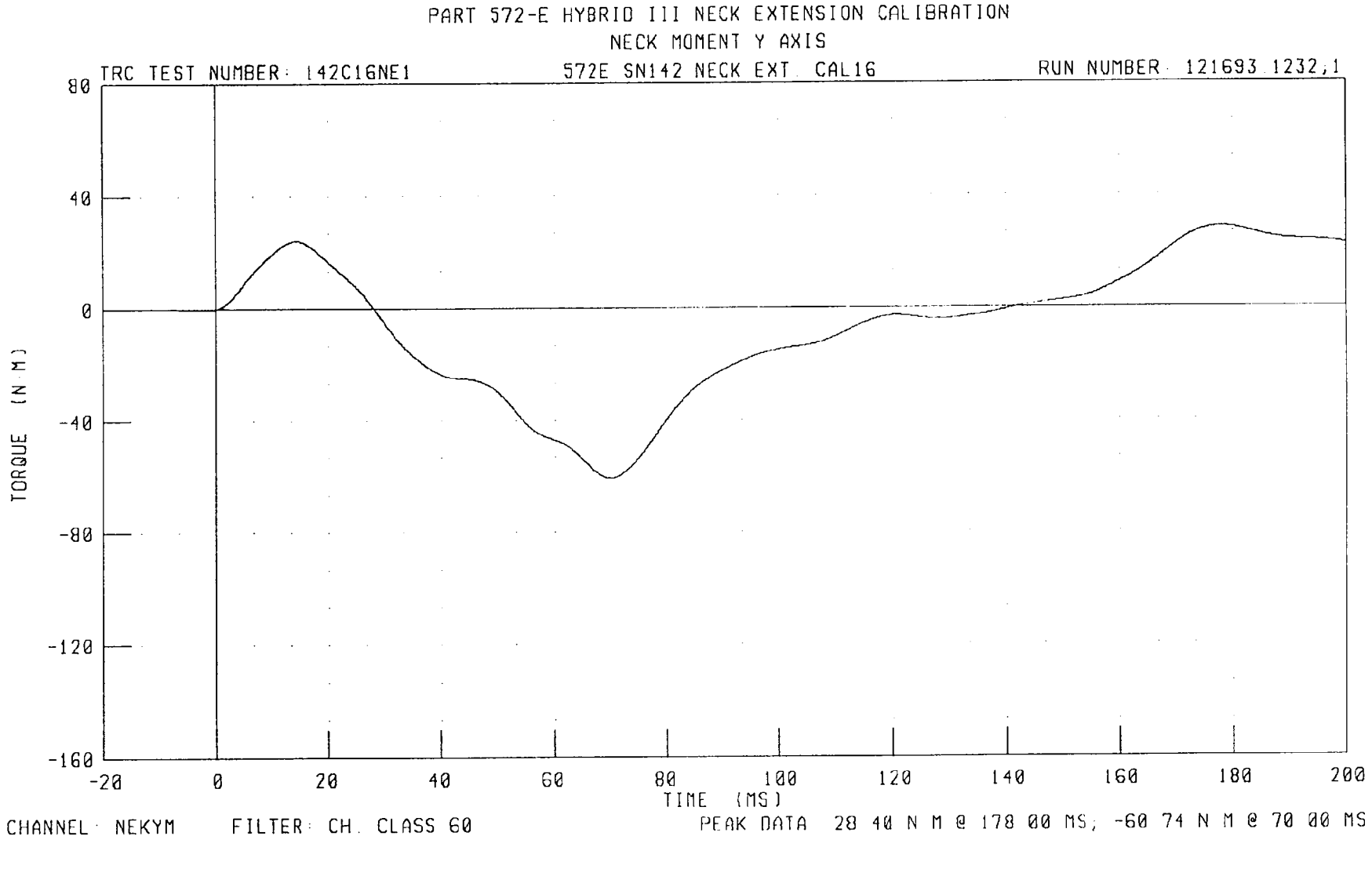


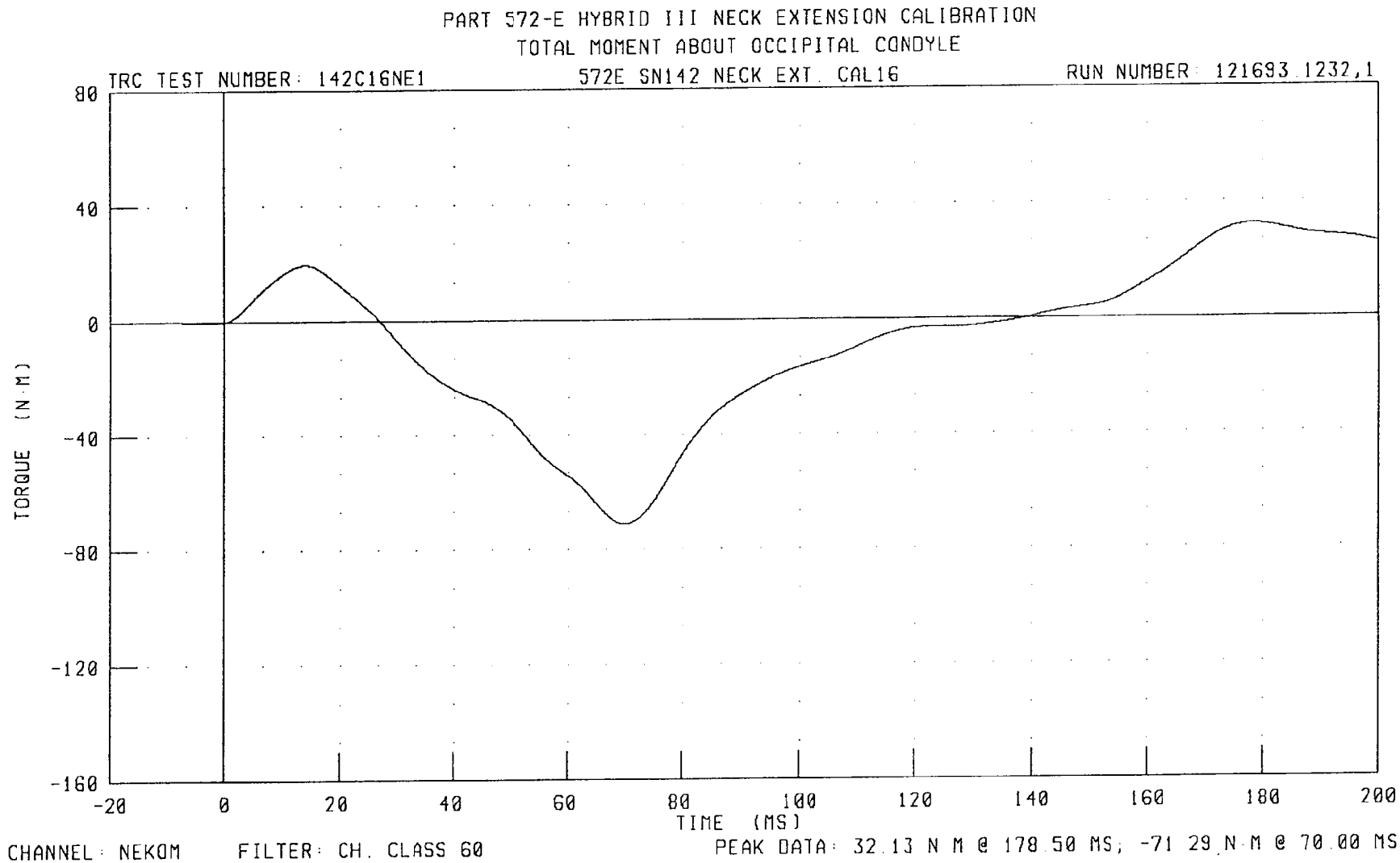
CHANNEL: THETA FILTER: CH CLASS 60 PEAK DATA: 58.51 ° @ 74.75 MS, -20.72 ° @ 195.88 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION




PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 142C16NE1
572E SN142 NECK EXT. CAL16
RUN NUMBER: 121693 1232;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: 250.58 N @ 187.88 MS, -593.99 N @ 70.63 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 142C16NE1
572E SN142 NECK EXT CAL16
RUN NUMBER: 121693 1232,1
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 40 N M @ 178 00 MS; -60 74 N M @ 70 00 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C16NE1
572E SN142 NECK EXT. CAL16
RUN NUMBER: 121693.1232,1
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: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 32.13 N M @ 178.50 MS; -71.29 N-M @ 70.00 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 28-SEP-93

TRC 142C16TH2 572E SN142 H.S.THORAX CAL16

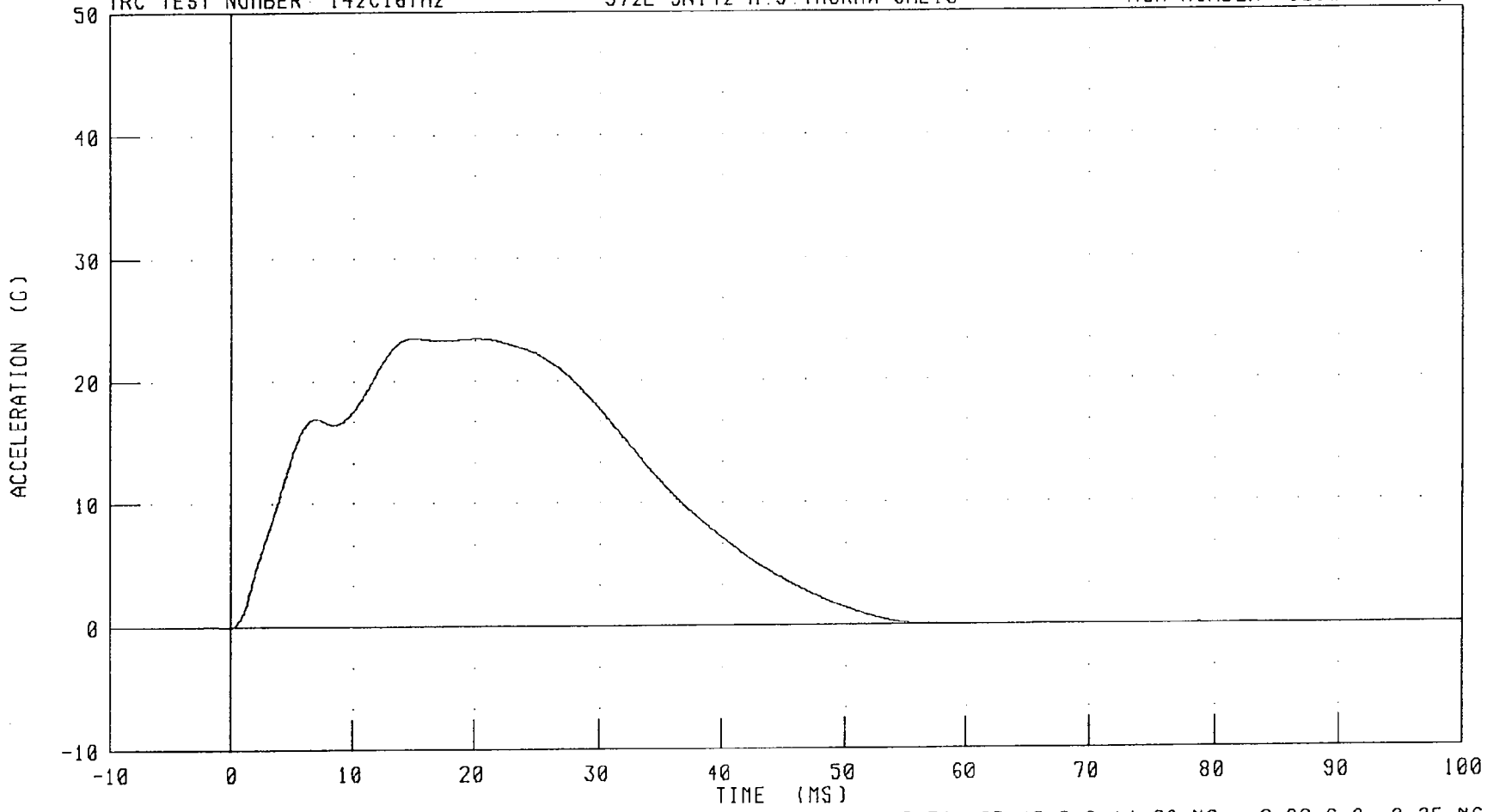
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	52.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/SEC	6.68 M/SEC
MAXIMUM DEFLECTION	63.5 - 72.6 MM	68.6 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5381. N
INTERNAL HYSTERESIS	69% - 85%	75.4%

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

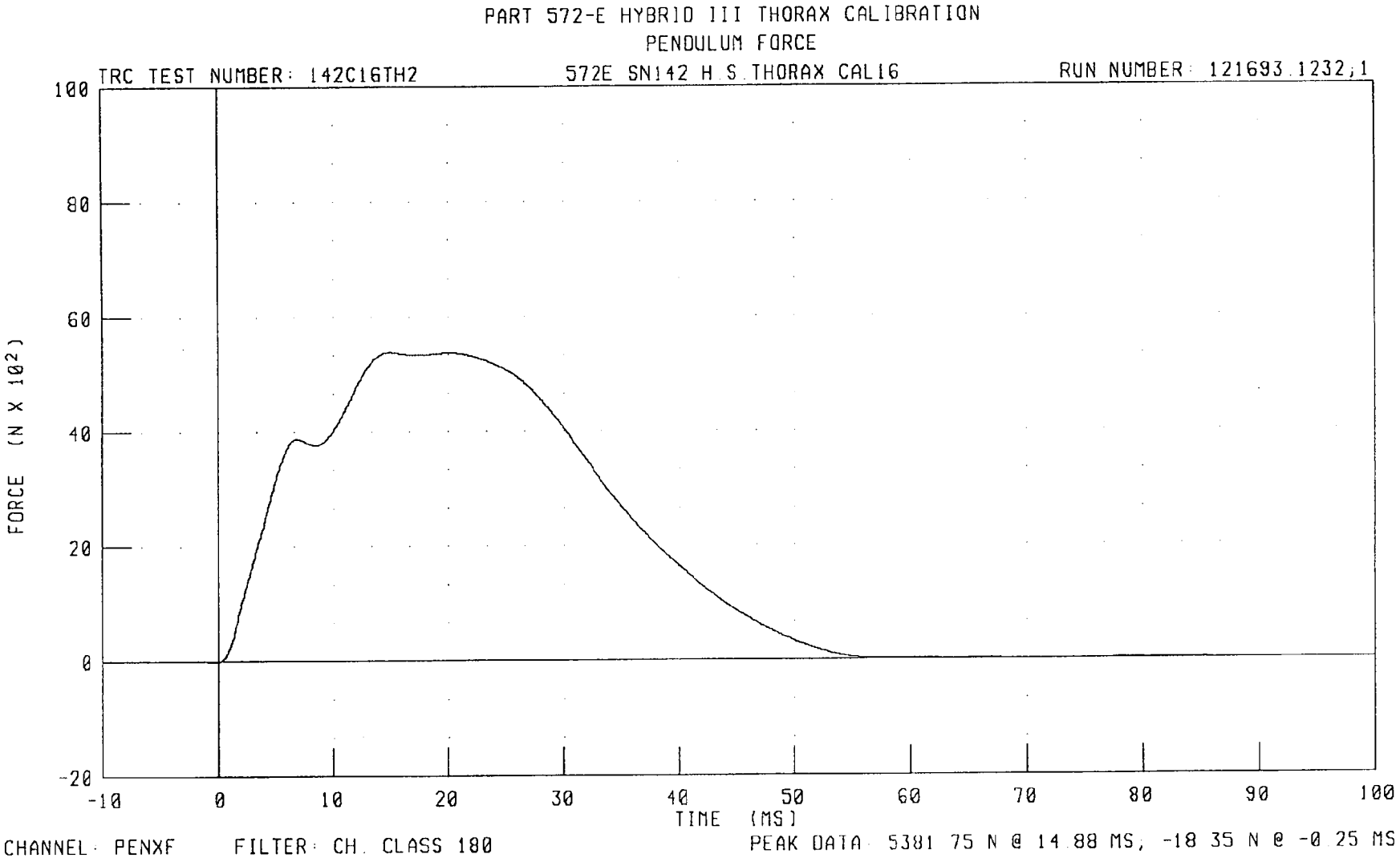
TRC TEST NUMBER: 142C16TH2 572E SN142 H.S THORAX CAL16 RUN NUMBER: 121693.1232;1

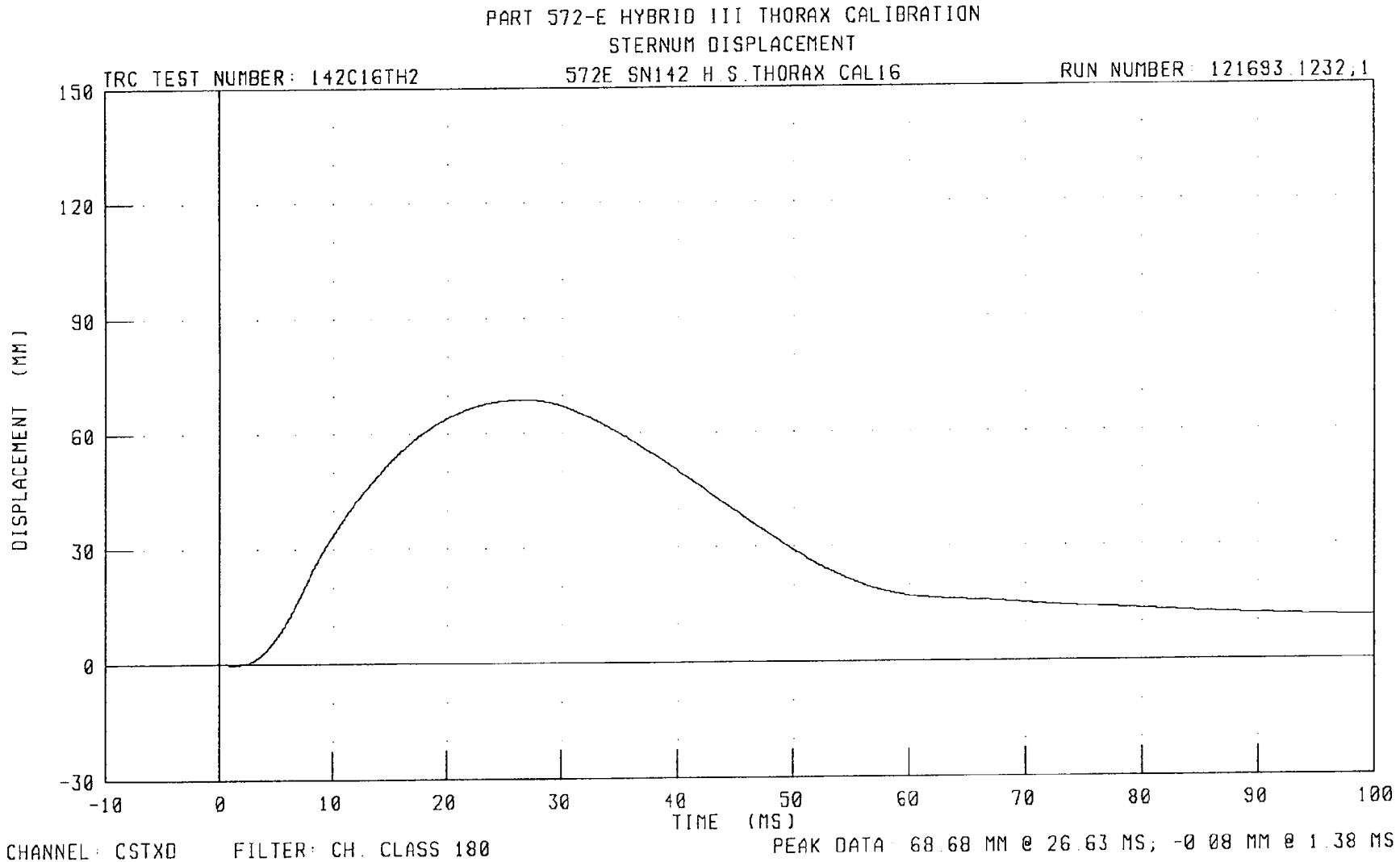


CHANNEL: PENXG FILTER: CH CLASS 180 PEAK DATA 23.49 G @ 14.88 MS, -0.08 G @ -0.25 MS

C-60

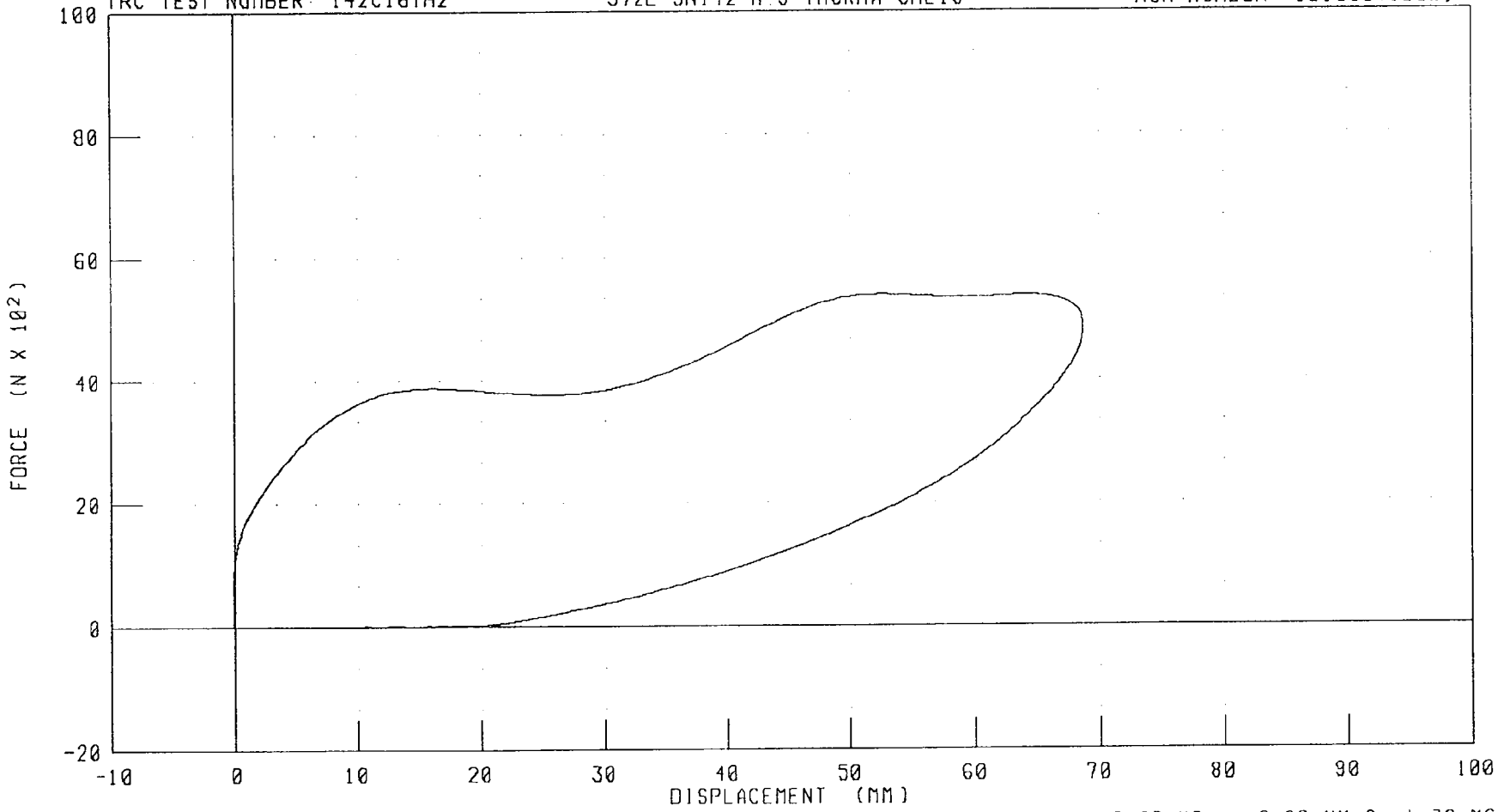
931013


PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE
TRC TEST NUMBER: 142C16TH2
572E SN142 H S THORAX CAL16
RUN NUMBER: 121693.1232;1
100
80
60
40
20
0
-20
FORCE (N X 10²)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: PENXF
FILTER: CH. CLASS 180
PEAK DATA: 5381.75 N @ 14.88 MS, -18.35 N @ -0.25 MS


PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT
TRC TEST NUMBER: 142C16TH2
572E SN142 H.S.THORAX CAL16
RUN NUMBER: 121693.1232,1
DISPLACEMENT (MM)
150
120
90
60
30
0
-30
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: CSTXD
FILTER: CH. CLASS 180
PEAK DATA: 68.68 MM @ 26.63 MS; -0.08 MM @ 1.38 MS

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

TRC TEST NUMBER: 142C16TH2 572E SN142 H S THORAX CAL16 RUN NUMBER: 121693 1232,1



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

PEAK DATA 68 68 MM @ 26 63 MS, -0 08 MM @ 1 38 MS
5381 75 N @ 14 88 MS; -18 35 N @ -0 25 MS

TRANSPORTATION RESEARCH CENTER INC.

KNEE IMPACT TEST

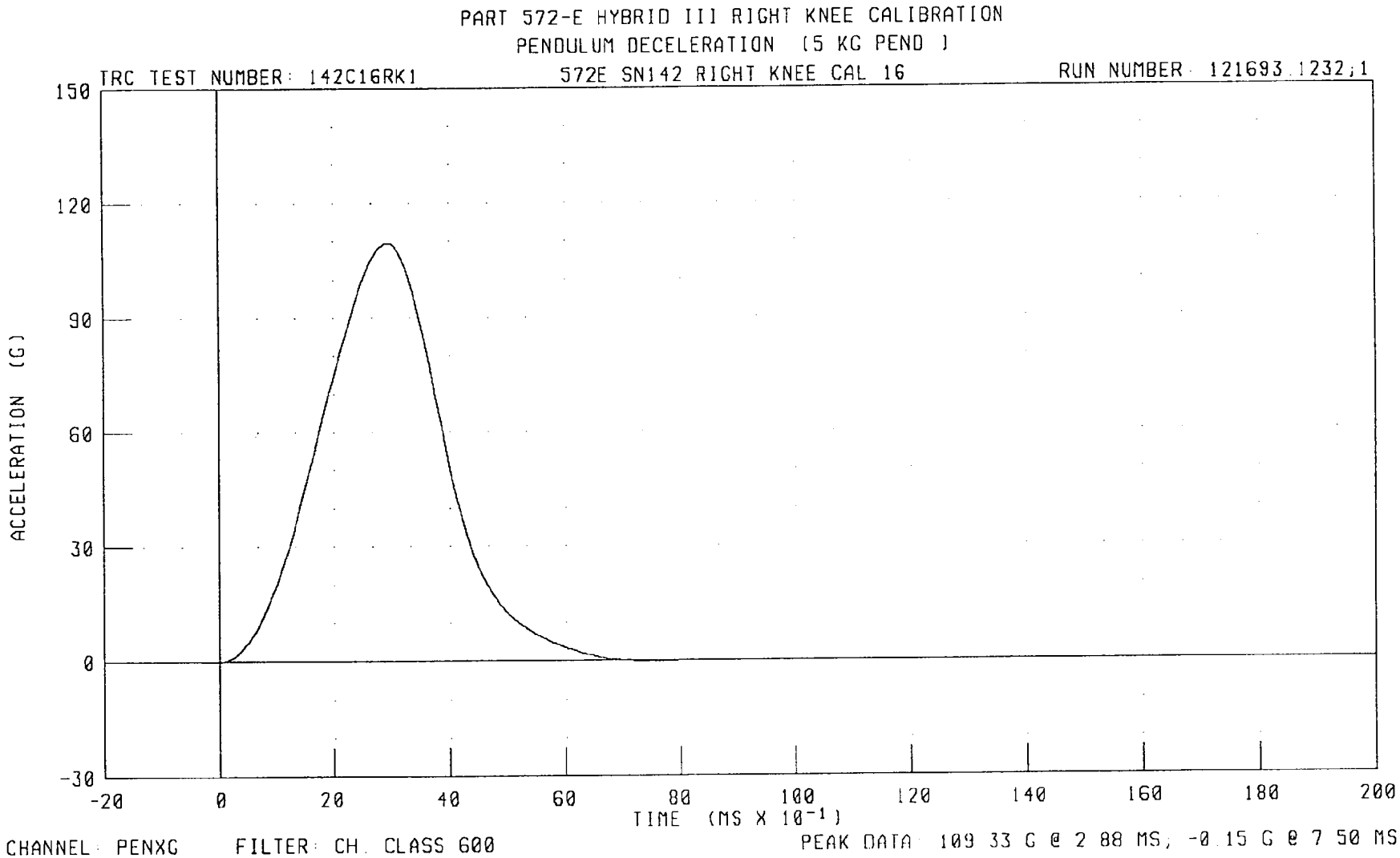
HYBRID III 23-SEP-93

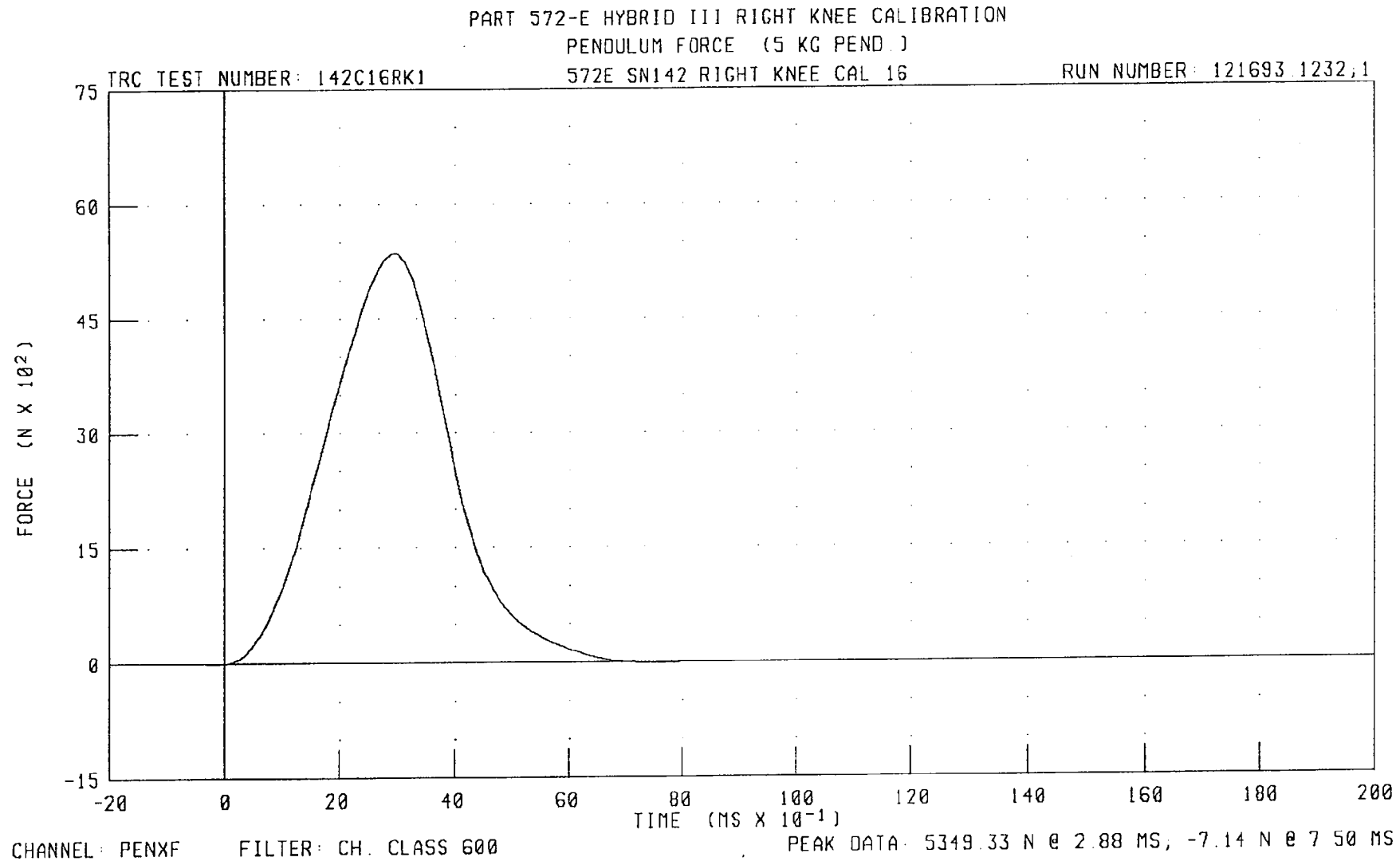
RIGHT KNEE
TRC 142C16RK1 572E SN142 RIGHT KNEE CAL 16

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	64.0 %
PROBE VELOCITY	2.07 - 2.13 M/SEC	2.09 M/SEC
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5349.3 N

TEST MEETS SPECIFICATIONS

TECHNICIAN _____


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND)
TRC TEST NUMBER: 142C16RK1
572E SN142 RIGHT KNEE CAL 16
RUN NUMBER: 121693.1232;1
ACCELERATION (G)
150
120
90
60
30
0
-30
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXG
FILTER: CH. CLASS 600
PEAK DATA: 109.33 G @ 2.88 MS, -0.15 G @ 7.50 MS


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 142C16RK1
572E SN142 RIGHT KNEE CAL 16
RUN NUMBER: 121693 1232;1
FORCE (N X 10²)
75
60
45
30
15
0
-15
-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: 5349.33 N @ 2.88 MS, -7.14 N @ 7.50 MS

TRANSPORTATION RESEARCH CENTER INC.

KNEE IMPACT TEST

HYBRID III 23-SEP-93

LEFT KNEE
TRC 142C16LK1 572E SN142 LEFT KNEE CAL 16

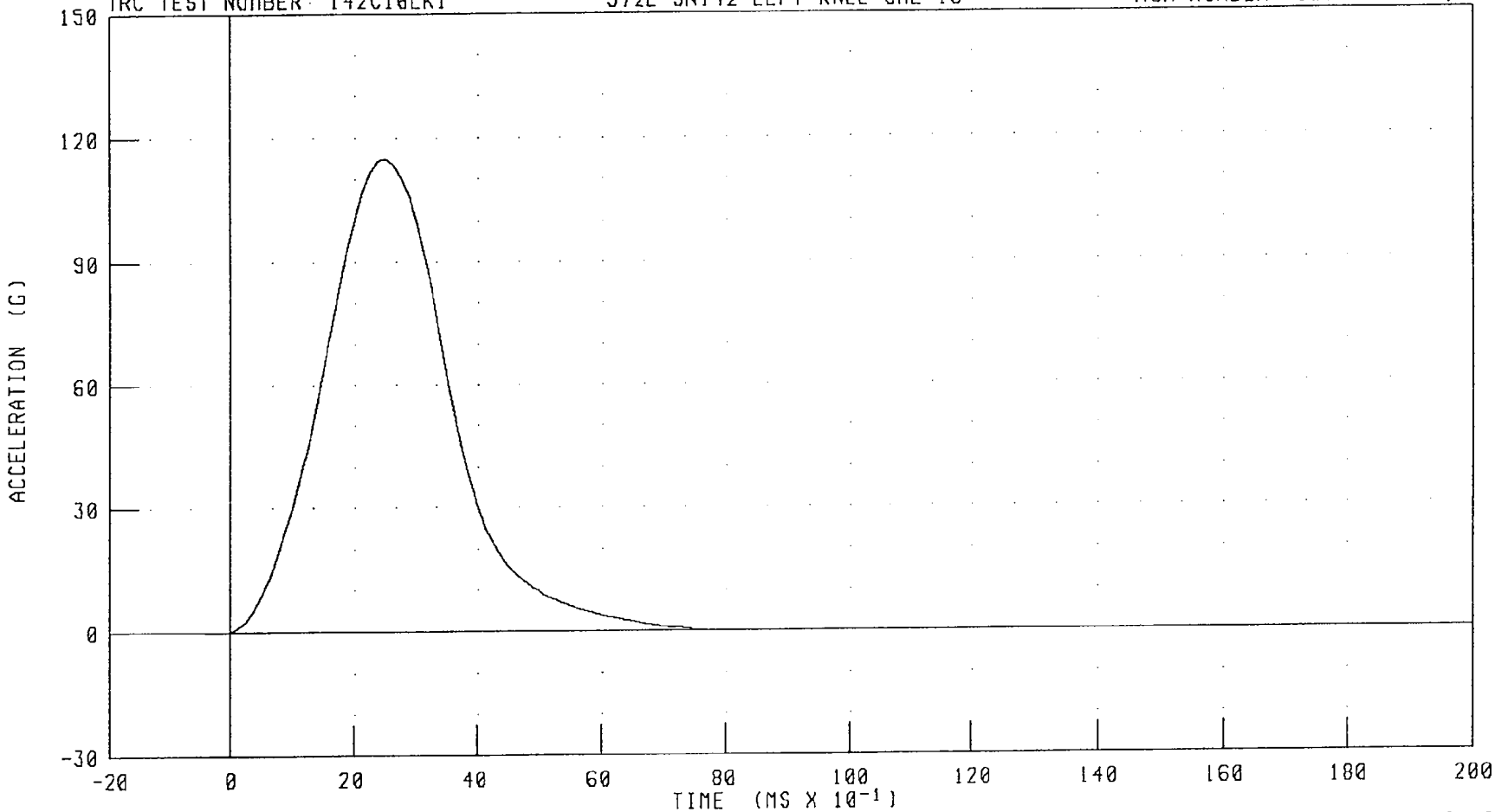
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10% - 70%	64.0 %
PROBE VELOCITY	2.07 - 2.13 M/SEC	2.09 M/SEC
PEAK KNEE IMPACT FORCE PROBE WEIGHT	4714 - 5783 N 5.0 KG	5622.0 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

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

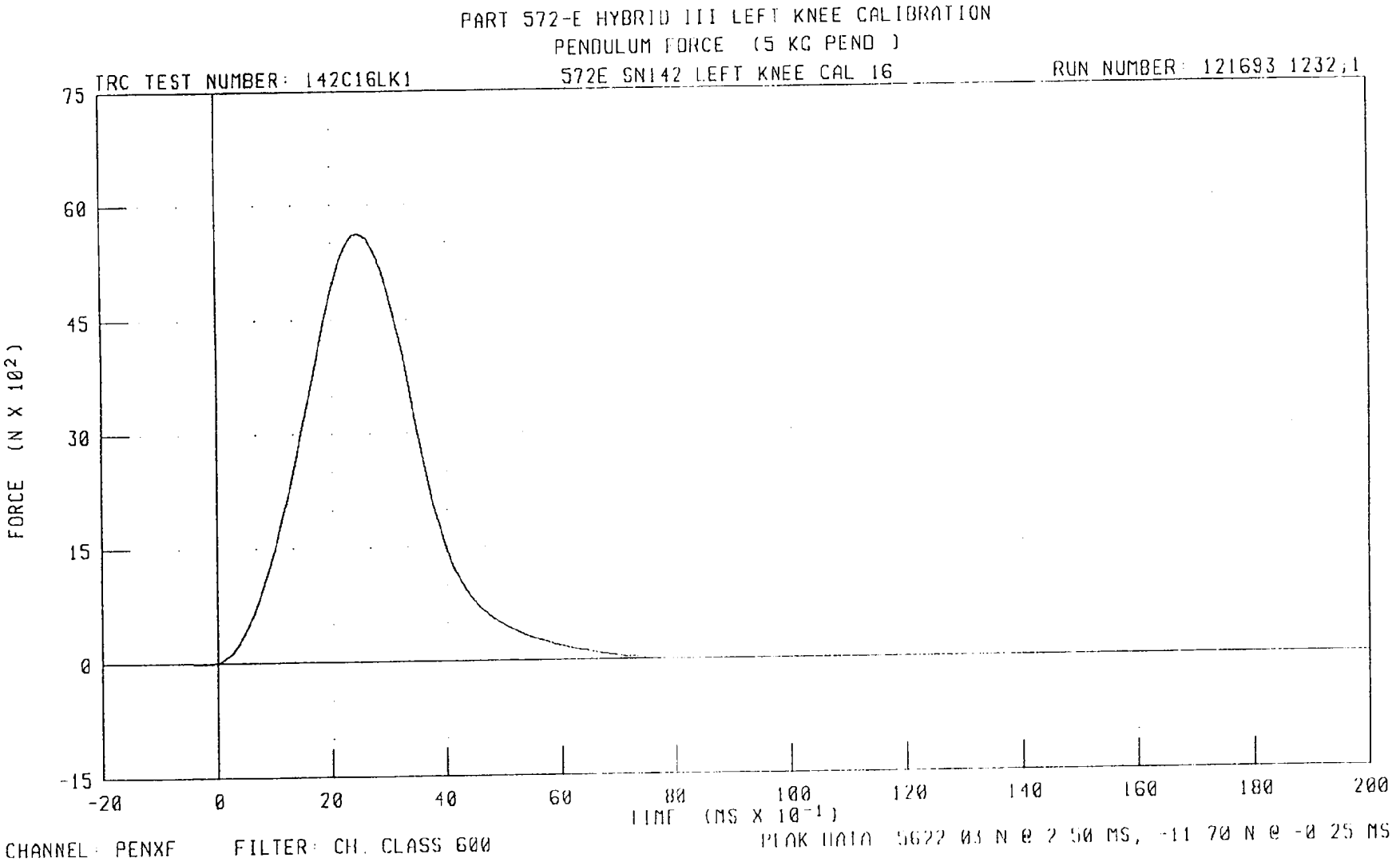
TRC TEST NUMBER: 142C16LK1
572E SN142 LEFT KNEE CAL 16
RUN NUMBER: 121693.1232;1



CHANNEL: PENXG FILTER: CH. CLASS 600
PEAK DATA: 114.90 G @ 2.50 MS; -0.24 G @ -0.25 MS

C-68

931013


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND)
TRC TEST NUMBER: 142C16LK1
572E SN142 LEFT KNEE CAL 16
RUN NUMBER: 121693 1232;1
FORCE (N X 10²)
75
60
45
30
15
0
-15
-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: 5622.03 N @ 2.50 MS, -11.70 N @ -0.25 MS

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APPENDIX D

MISCELLANEOUS TEST INFORMATION

DUMMY INSTRUMENT CALIBRATIONS

DRIVER DUMMY #192

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
HEAD X-AXIS ACCEL.	AAL82	7264	ENDEVCO	09/14/93	03/14/94
Y-AXIS ACCEL.	A84JJ	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	A62JJ	7264	ENDEVCO	09/14/93	03/14/94
CHEST X-AXIS ACCEL.	ACCJ0	7264	ENDEVCO	09/14/93	03/14/94
Y-AXIS ACCEL.	AC708	7264	ENDEVCO	09/14/93	03/14/94
Z-AXIS ACCEL.	CW59H	7264	ENDEVCO	09/14/93	03/14/94
LEFT FEMUR FORCE LOAD CELL	986	2430	GSE	09/23/93	03/23/94
RIGHT FEMUR FORCE LOAD CELL	987	2430	GSE	09/23/93	03/23/94
*NECK X-AXIS FORCE LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
Y-AXIS FORCE LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
X-AXIS FORCE LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
*NECK MOMENT ABOUT X-AXIS LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Y-AXIS LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
MOMENT ABOUT Z-AXIS LOAD CELL	085	1716	DENTON	09/20/93	03/20/94
*CHEST DEFLECTION POTENTIOMETER	87313-96	81422A	VERNITECH	09/24/93	03/24/94
LAP BELT FORCE LOAD CELL	616	3419	LEBOW	08/24/93	02/24/94
SHOULDER BELT FORCE LOAD CELL	610	3419	LEBOW	08/23/93	02/23/94
SHOULDER BELT SPOOL-OUT POTENTIOMETER	A51809	PT-101-40A	CELESCO	09/23/93	03/23/94
SHOULDER BELT STRETCH POTENTIOMETER	2690	2051414101	BOURNES	09/23/93	03/23/94

*HYBRID III USE ONLY.

DUMMY INSTRUMENT CALIBRATIONS

RIGHT FRONT PASSENGER DUMMY #142

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

*HYBRID III USE ONLY.

VEHICLE AND CALIBRATION LABORATORY INSTRUMENT CALIBRATIONS

VEHICLE ACCELEROMETERS

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

CALIBRATION LABORATORY INSTRUMENTS

	SERIAL NO.	MODEL NO.	MFR.	CALIBRATION DATE LAST	DUE
NECK BENDING PENDULUM ACCEL.	CB27	7232	ENDEVCO	10/04/93	04/04/94
NECK BENDING ROTARY POTENTIOMETER	NA	35435-1-102	BOURNES	MFR. SPECIFICATION	
NECK BENDING LINEAR POTENTIOMETER	NA	5184-2051846003	BOURNES	10/06/93	04/06/94
THORAX/HYBRID II FEMUR PEND. ACCEL.	CC64	7232	ENDEVCO	10/06/93	04/06/94
LUMBAR FLEXION FORCE GAUGE	NA	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

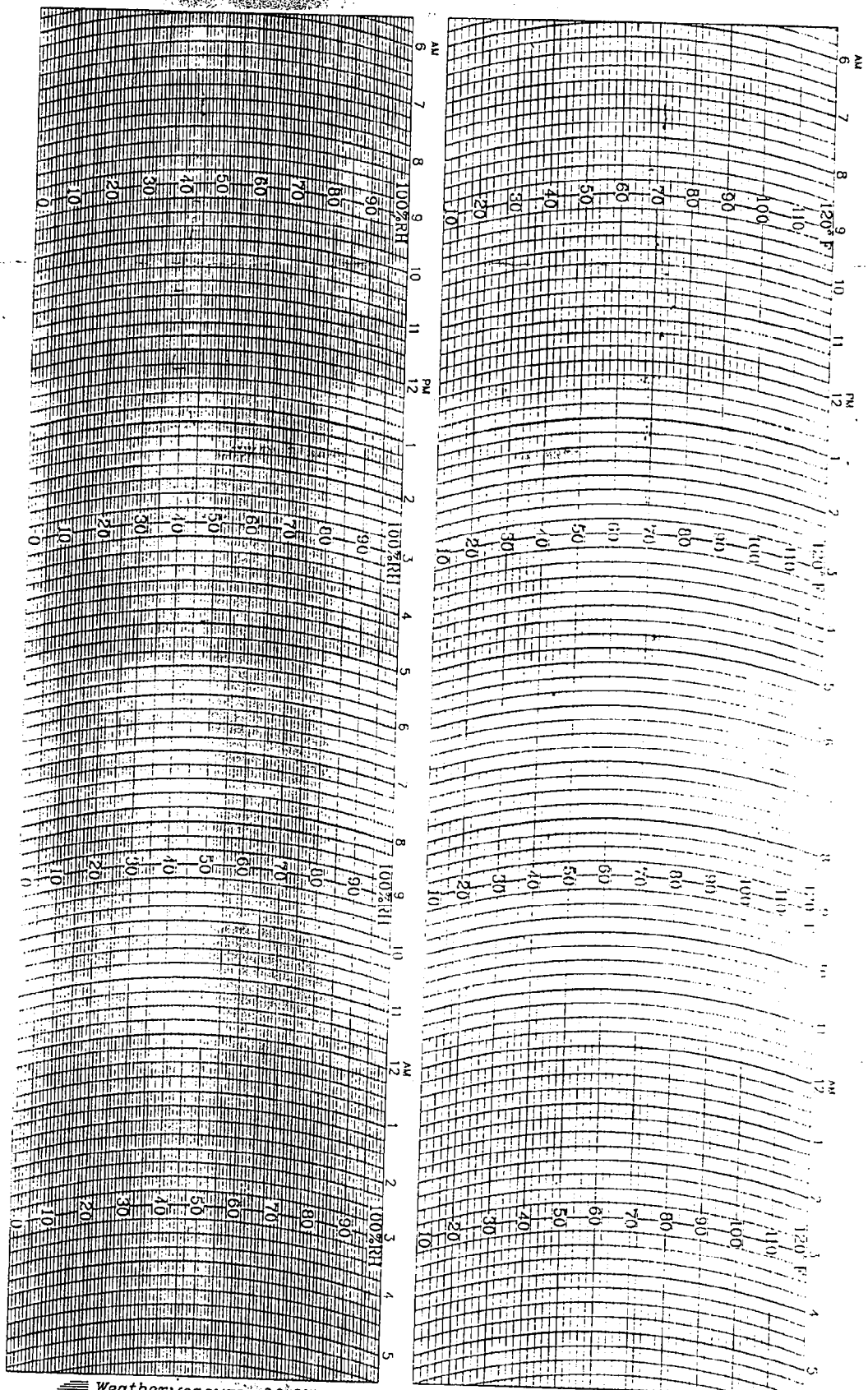
NECK LOAD CELLS:	+X FORCE:	HEAD PUSHED FORWARD
	+Y FORCE:	HEAD PUSHED LEFTWARD
	+Z FORCE:	HEAD PULLED UPWARD (TENSION ON NECK)
	+X MOMENT:	RIGHT EAR ROTATING TOWARD RIGHT SHOULDER
	+Y MOMENT:	CHIN ROTATING TOWARD CHEST
	+Z MOMENT:	CHIN ROTATING TOWARD LEFT SHOULDER

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


AM
PM
100%RH
Weatherymeasure
WEATHERtronics
Division of QUALIMETRICS, Inc.
P.O. BOX 41039
SACRAMENTO, CA 95841
PHONE: (916) 923-0055
HYGROTHERMOGRAPH
1 DAY
C311-D-HF
STATION
DATE ON 10-1-93
DATE OFF 10-12-93

931013

APPENDIX E

RESTRAINT SYSTEM INSTRUCTIONS FROM OWNER'S MANUAL

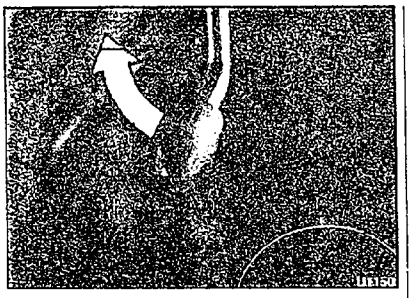
Part I
Seats & Restraint Systems

Here you'll find information about the seats in your Pontiac and how to use your safety belts properly. You can also learn about some things you should **not** do with safety belts.

Seats & Restraint Systems

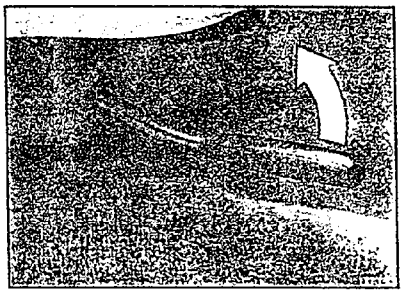
■ *Seats and Seat Controls*

This section tells you about the seats—how to adjust them, take them out, put them back in, and fold them up and down.



Manual Front Seats

Pull up the lever on the front of the seat to unlock it. Slide the seat to where you want it. Then release the lever and try to move the seat with your body, to make sure the seat is locked into place.



Four-Way Manual Seat

The driver's seat can be adjusted four ways.

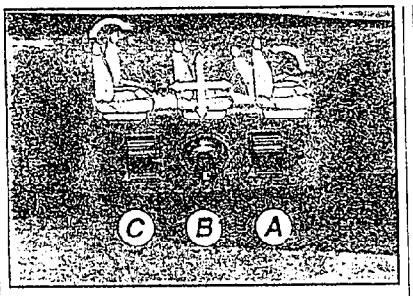
Use the lever on the front of the seat to adjust the seat forward or back (see *Manual Front Seats* earlier in this section).

To raise the driver's seat, pull up the lever on the side of the seat. To lower the seat, push the lever down.

. . . 8

⚠ CAUTION:

You can lose control of the vehicle if you try to adjust a manual driver's seat while the vehicle is moving. The sudden movement could startle and confuse you, or make you push a pedal when you don't want to. Adjust the driver's seat only when the vehicle is not moving.



Six-Way Power Seat

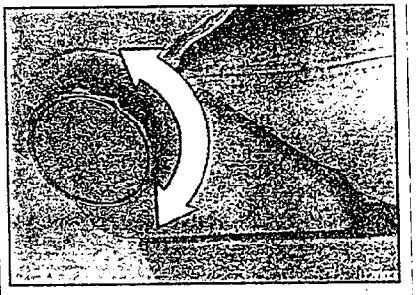
(OPTION)

To adjust the driver's six-way power seat:

Front Control (A): Raise the front of the seat by holding the switch up. Hold the switch down to lower the front of the seat.

Center Control (B): Move the seat forward or back by holding the control to the front or back. Raise or lower the seat by holding the control up or down.

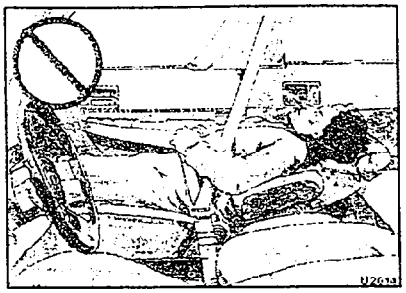
Rear Control (C): Raise the rear of the seat by holding the switch up. Hold the switch down to lower the rear of the seat.



Reclining Front Seatbacks

To adjust the seatback, rotate this knob.

But don't have a seatback reclined if your vehicle is moving.



Reclining Front Seatbacks *(CONT.)*

⚠ CAUTION:

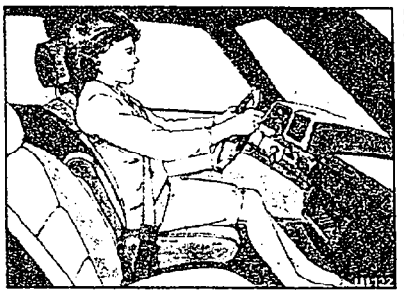
Sitting in a reclined position when your vehicle is in motion can be dangerous. Even if you buckle up, your safety belts can't do their job when you're reclined like this.

CAUTION: (Continued)

CAUTION: (Continued)

The lap belt can't do its job either. In a crash the belt could go up over your abdomen. The belt forces would be there, not at your pelvic bones. This could cause serious internal injuries.

For proper protection when the vehicle is in motion, have the seatback upright. Then sit well back in the seat and wear your safety belt properly.



Head Restraints

Slide the head restraint up or down so that the top of the restraint is closest to the top of your ears.

This position reduces the chance of a neck injury in a crash.

On some models, the head restraints tilt forward and rearward also.

Bench Seat

If you have a rear bench seat, the seatback can be folded down. Also, the bench seat can be removed or moved to a different floor location to provide extra storage space.

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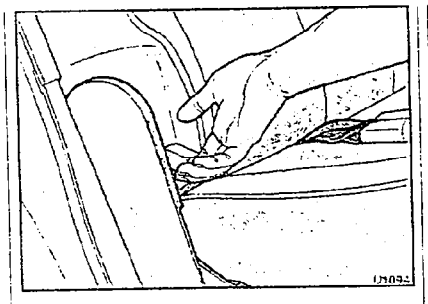
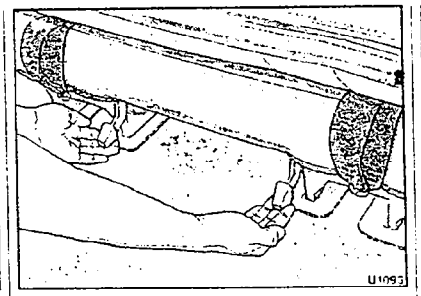


Folding the Seatback

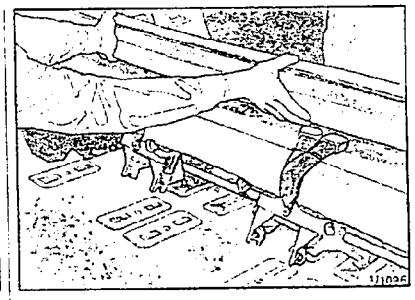
To fold down the seatback, lift the seatback latch release while folding the seatback forward.

To raise the seatback, lift the seatback latch release while raising the seatback until it locks upright. Push and pull on the seatback to check that it is locked.



Removing the Bench Seat

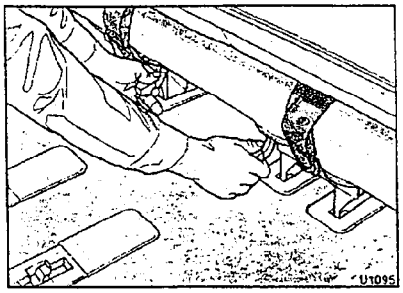
1. Make sure the seatback is in the upright position, and that all safety belts are on the seat.
2. Then lift the seatback latch release while folding the seatback forward.
3. From behind the bench seat, pull up the two rear levers, and lift the bench seat.
4. Remove the bench seat from the vehicle.

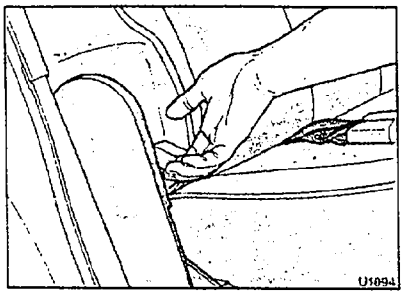


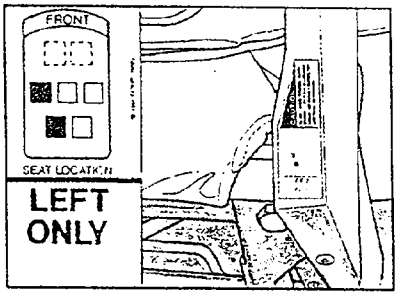
Replacing the Bench Seat

Don't put the bench seat in so it faces backward, because it won't latch that way. If you want more storage room behind the seat, use the floor pins closer to the front of the vehicle. See "Adjusting Rear Seats" later in this section.

1. Place the front hooks of the bench seat latch onto the front floor pins.







Replacing the Bench Seat (CONT.)

2. Push the rear hooks into the rear floor pins, then push down on the two levers to lock the rear of the bench in place.
3. Try to raise the bench seat to check that it is locked down.

⚠ CAUTION:

If the bench seat isn't locked in place, it could easily move in a crash, causing people to be injured. So, be sure to push the two levers down to lock the bench in place.

4. Lift the seatback latch release and raise the seatback until it locks upright.
5. Push and pull on the seatback to check that it is locked.

Removable Rear Bucket Seats (OPTION)

There are three types of rear seats: "RIGHT ONLY", "CENTER or LEFT", and "LEFT ONLY". "RIGHT ONLY" and "LEFT ONLY" seats may be equipped with the built-in child restraint option.

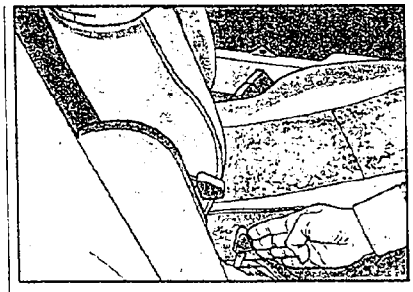
The rear bucket seats can be removed to provide extra storage. Each seat that has the built-in child restraint option fits in only one location in your vehicle, but seats that don't have the built-in child restraint can be moved to different floor locations. The back of each seat has a diagram (similar to the one above) that shows where the seat must be located in your vehicle.

. . . 12

"RIGHT ONLY" seats that don't have the built-in child restraint fit only in the right locations. "LEFT ONLY" seats that don't have the built-in child restraint fit only in the left locations. The "CENTER OR LEFT" seat fits in the center location and in either left location.

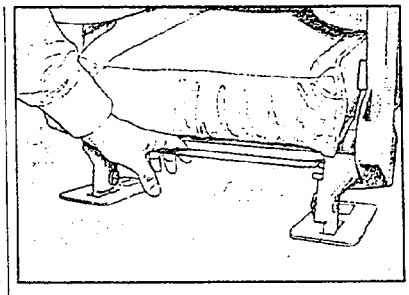
"RIGHT ONLY" seats that have the built-in child restraint option fit only in the rear set of floor pins in the right location of the second row. "LEFT ONLY" seats that have the built-in child restraint option fit only in the rear set of floor pins in the left location of the second row.

To install third row seats, the second row seats must be tilted forward or removed. Don't put the seats in the wrong locations.

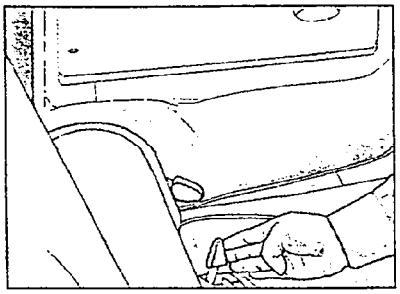


Entry to Third Row Bucket Seats

The "RIGHT ONLY" seats have a lower lever to tilt the seat forward. To get into third row seats, push the lever on the "RIGHT ONLY" seat nearest the sliding door and tilt the seat forward. Then pull the seat back and check that it locks into place.



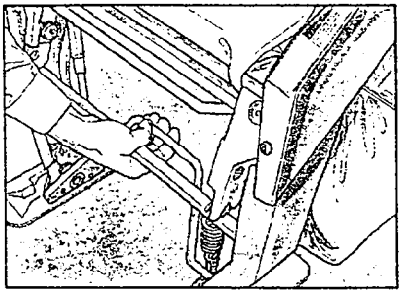
To get out of the third row seats, push down on the rear release bar under the seat ahead of you to tilt the seat forward.



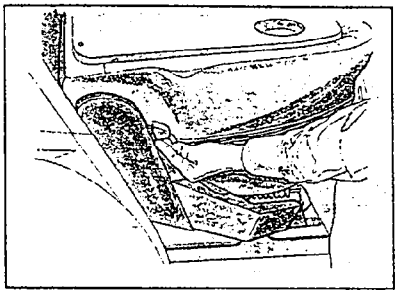
Removing Rear Bucket Seats

Removing the RIGHT ONLY Seats:

1. Lift the upper lever to fold the seatback forward.
2. Push the lower lever back so the entire seat and seatback tilt forward.



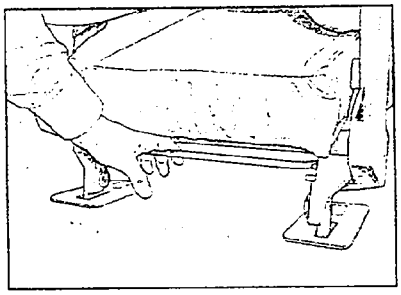
3. Then, from behind the seat, support the top portion of the seat with one hand as you squeeze the front release bar toward the crossbar. The seat will release from the floor pins.



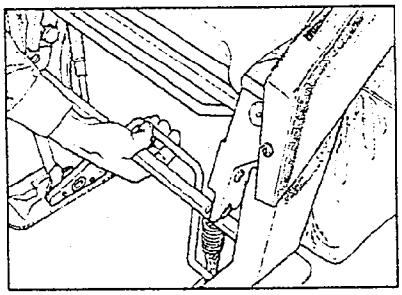
Removing LEFT ONLY and CENTER OR LEFT Seats:

1. Lift the upper lever to fold the seatback forward.

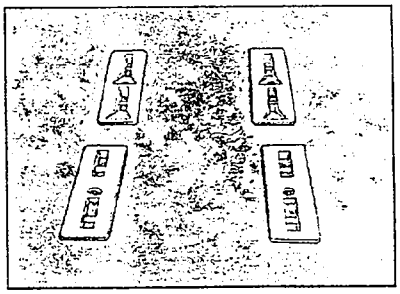
. . . 14



2. Push down on the rear release bar. The entire seat will tilt forward.

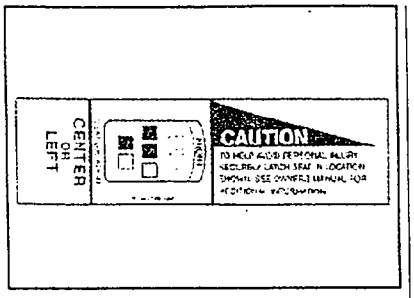


3. Then, from behind the seat, support the top portion of the seat with one hand as you squeeze the front release bar toward the crossbar. The seat will release from the floor pins.



Adjusting Rear Seats

Each rear seat location has two sets of floor pins. Seats equipped with the built-in child restraint option must be secured in the rear set of floor pins. Seats that don't have the built-in child restraint can be secured in either set of floor pins. Move the position of these seats up or back to provide a little more room behind or in front of a seat.



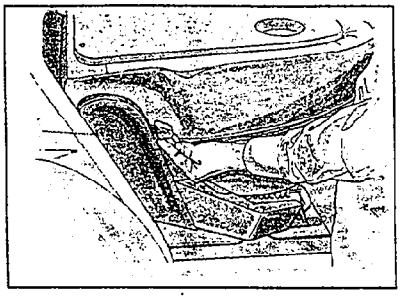
Replacing Rear Bucket Seats

Follow the diagram on the back of the seats to replace the seats in their proper location.

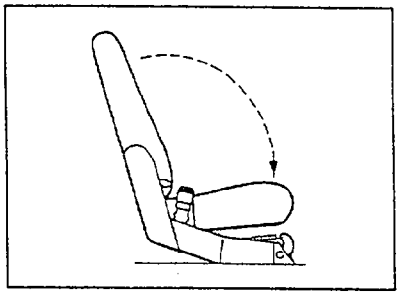
The "LEFT ONLY" seats fit only in the left positions. The "RIGHT ONLY" seats fit only in the right positions. The "CENTER OR LEFT" seat fits in the center position and in either left position.

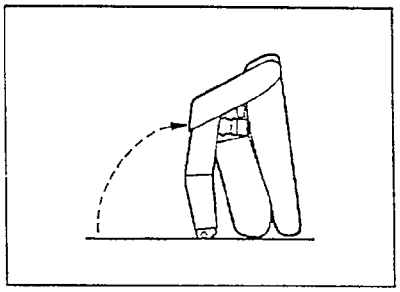
To install third row seats, if your vehicle is equipped with them, the second row seats must be tilted forward or removed.

Don't try to place the seats in backward, because they won't latch that way.



1. With the entire seat tilted forward, place the front hooks of the seat latch onto the front floor pins.
2. Firmly press the rear hooks onto the rear floor pins. The seat should lock into position.
3. Lift the upper lever and pull up on the seatback until it locks upright.
4. Push and pull on the seat to check that it is locked.
5. Check to see that you have put the seats into the proper location, according to the label on each seat. If not, the seats may not latch properly, and your passengers may not have the proper safety belt.





Dump And Stow Feature

Second and third row seats have been modified to allow them to fold fully upward and forward when the seats are anchored in the rear-most position. This modification improves both luggage/cargo capacity and rear seat entry/exit.

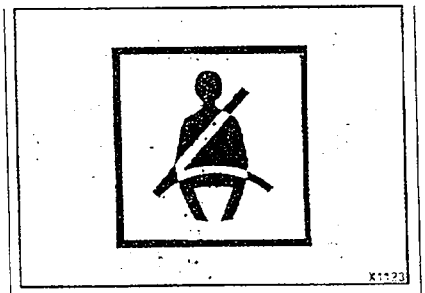
■ *Safety Belts: They're For Everyone*

This part of the manual tells you how to use safety belts properly. It also tells you some things you should not do with safety belts.

And it explains the Supplemental Inflatable Restraint, or "air bag" system.

⚠ CAUTION:

Don't let anyone ride where they can't wear a safety belt properly. If you are in a crash and you're not wearing a safety belt, your injuries can be much worse. You can hit things inside the vehicle or be ejected from it. You can be seriously injured or killed. In the same crash, you might not be if you are buckled up. Always fasten your safety belt, and check that your passengers' belts are fastened properly too.



This figure lights up as a reminder to buckle up. (See "Safety Belt Reminder Light" in the Index.)

In many states and Canadian provinces, the law says to wear safety belts. Here's why: They work.

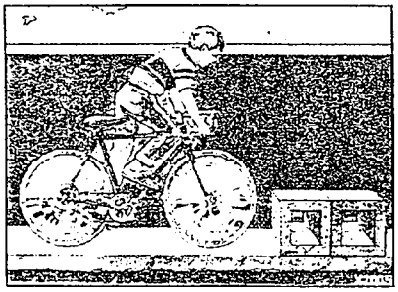
You never know if you'll be in a crash. If you do have a crash, you don't know if it will be a bad one.

■ *Safety Belts: They're For Everyone* (CONT.)

A few crashes are mild, and some crashes can be so serious that even buckled up a person wouldn't survive. But most crashes are in between. In many of them, people who buckle up can survive and sometimes walk away. Without belts they could have been badly hurt or killed.

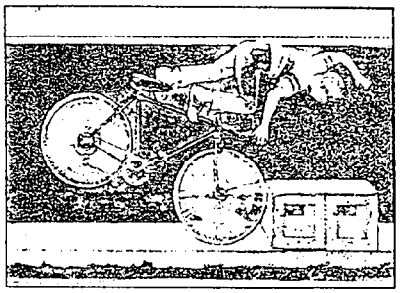
After more than 25 years of safety belts in vehicles, the facts are clear. In most crashes buckling up does matter ... a lot!

When you ride in or on anything, you go as fast as it goes.

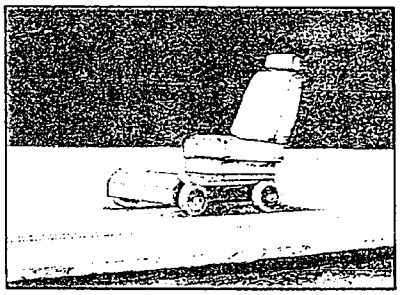


Why Safety Belts Work

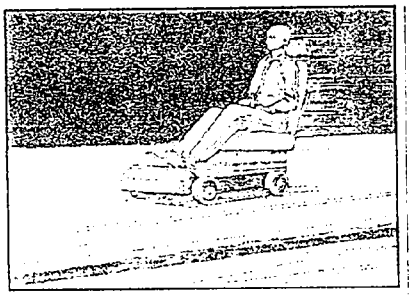
1. For example, if the bike is going 10 mph (16 km/h), so is the child.



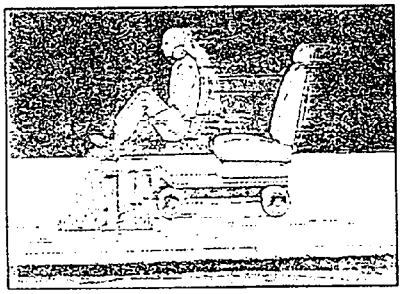
2. When the bike hits the block, it stops. But the child keeps going!



3. Take the simplest vehicle. Suppose it's just a seat on wheels.



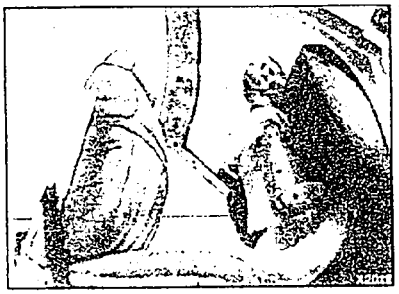
4. Put someone on it.



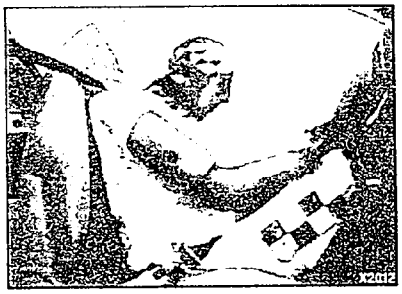
5. Get it up to speed. Then stop the vehicle. The rider doesn't stop.

6. The person keeps going until stopped by something.

   In a real vehicle, it could be the windshield ...



7. or the instrument panel ...



8. or the safety belts!

   With safety belts, you slow down as the vehicle does. You get more time to stop. You stop over more distance, and your strongest bones take the forces. That's why safety belts make such good sense.

■ *Here Are Questions Many People Ask About Safety Belts -- and the Answers*

Q: Won't I be trapped in the vehicle after an accident if I'm wearing a safety belt?

A: You could be -- whether you're wearing a safety belt or not. But you can easily unbuckle a safety belt, even if you're upside down. And your chance of being conscious during and after an accident, so you can unbuckle and get out, is much greater if you are belted.

Q: Why don't they just put in air bags so people won't have to wear safety belts?

A: Air bags, or Supplemental Inflatable Restraint systems, are in some vehicles today and will be in more of them in the future. But they are supplemental systems only -- so they work with safety belts, not instead of them. Every air bag system ever offered for sale has required the use of safety belts. Even if you're in a vehicle that has air bags, you still have to buckle up to get the most protection. That's true not only in frontal collisions, but especially in side and other collisions.

Q: If I'm a good driver, and I never drive far from home, why should I wear safety belts?

A: You may be an excellent driver, but if you're in an accident -- even one that isn't your fault -- you and your passengers can be hurt. Being a good driver doesn't protect you from things beyond your control, such as bad drivers.

Most accidents occur within 25 miles (40 km) of home. And the greatest number of serious injuries and deaths occur at speeds of less than 40 mph (65 km/h). Safety belts are for everyone.

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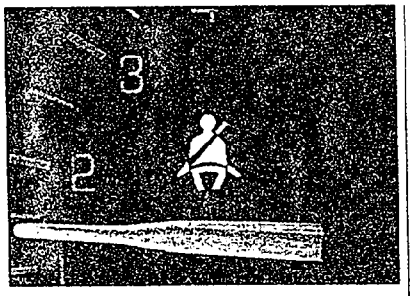


Safety Belt Reminder Light

When the key is turned to "Run" or "Start," a chime will come on for about eight seconds to remind people to fasten their safety belts, unless the driver's safety belt is already buckled. The safety belt light will also come on and stay on until the driver's belt is buckled.

■ *How To Wear Safety Belts Properly*

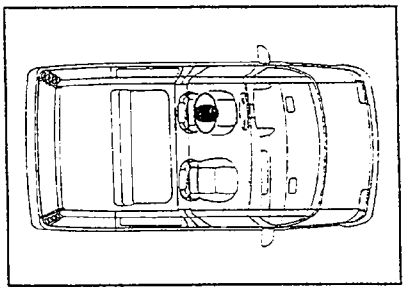
Adults

This section is only for people of adult size.

Be aware that there are special things to know about safety belts and children. And there are different rules for smaller children and babies. If a child will be riding in your Pontiac, see the section after this one, called "Children." Follow those rules for everyone's protection.

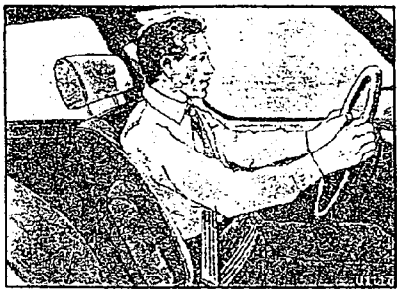
First, you'll want to know which restraint systems your vehicle has.

We'll start with the driver position.



■ *Driver Position*

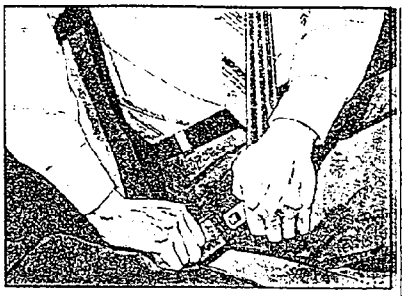
This section describes the driver's restraint system.



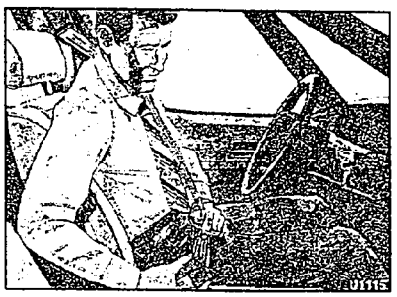
Lap-Shoulder Belt

The driver has a lap-shoulder belt. Here's how to wear it properly.

1. Close and lock the door.
2. Adjust the seat (to see how, see "Seats" in the Index) so you can sit up straight.



3. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
4. Push the latch plate into the buckle until it clicks.



If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle the belt.

Pull up on the latch plate to make sure it is secure.

If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

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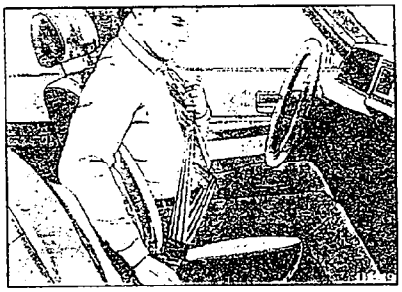
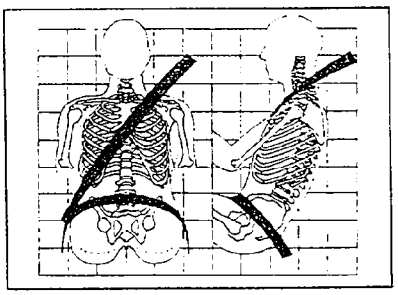
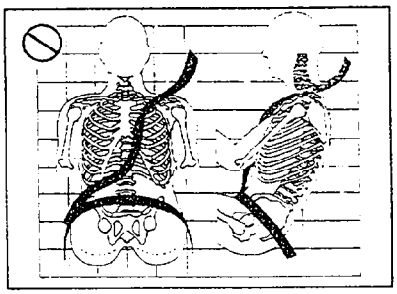


5. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder belt.



The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

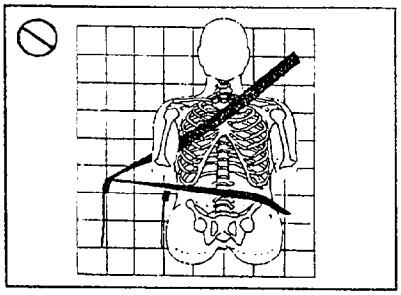
The safety belt locks if there's a sudden stop or a crash.



Q: What's wrong with this?

A: The shoulder belt is too loose. It won't give nearly as much protection this way.

> **⚠ CAUTION:**
>
> You can be seriously hurt if your shoulder belt is too loose. In a crash you would move forward too much, which could increase injury. The shoulder belt should fit against your body.



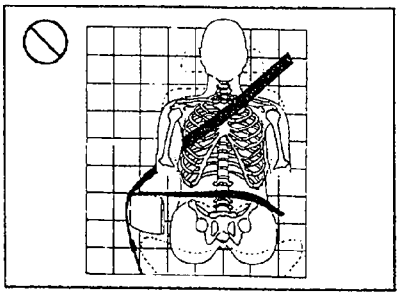
Lap-Shoulder Belt (CONT.)

Q: What's wrong with this?

A: The belt is buckled in the wrong place.

⚠ CAUTION:

You can be seriously injured if your belt is buckled in the wrong place like this. In a crash, the belt would go up over your abdomen. The belt forces would be there, not at the pelvic bones. This could cause serious internal injuries. Always buckle your belt into the buckle nearest you.

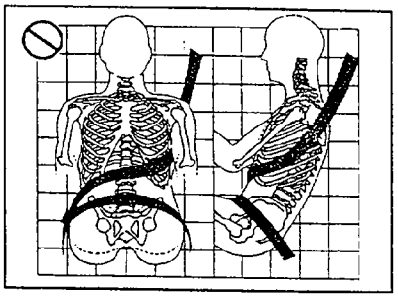


Q: What's wrong with this?

A: The belt is over an armrest.

⚠ CAUTION:

You can be seriously injured if your belt goes over an armrest like this. The belt would be much too high. In a crash, you can slide under the belt. The belt force would then be applied at the abdomen, not at the pelvic bones, and that could cause serious or fatal injuries. Be sure the belt goes under the armrests.

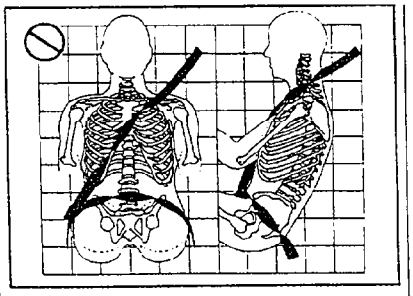


Q: What's wrong with this?

A: The shoulder belt is worn under the arm. It should be worn over the shoulder at all times.

⚠ CAUTION:

You can be seriously injured if you wear the shoulder belt under your arm. In a crash, your body would move too far forward, which would increase the chance of head and neck injury. Also, the belt would apply too much force to the ribs, which aren't as strong as shoulder bones. You could also severely injure internal organs like your liver or spleen.



Q: What's wrong with this?

A: The belt is twisted across the body.

⚠ CAUTION:

You can be seriously injured by a twisted belt. In a crash, you wouldn't have the full width of the belt to spread impact forces. If a belt is twisted, make it straight so it can work properly, or ask your dealer to fix it.

To unlatch the belt, just push the button on the buckle. The belt should go back out of the way.

Before you close the door, be sure the belt is out of the way. If you slam the door on it, you can damage both the belt and your vehicle.

■ *Supplemental Inflatable Restraint System (Air Bag)*

This section explains the driver's Supplemental Inflatable Restraint (SIR) system, commonly referred to as an air bag. Here are the most important things to know:

⚠ CAUTION:

- Even with an air bag, if you're not wearing a safety belt and you're in a crash, your injuries may be much worse. Air bags are not designed to inflate in rollovers or in rear, side or low-speed frontal crashes. You need to wear your safety belt to reduce the chance of hitting things inside the vehicle or being ejected from it. Always wear your safety belt, even with an air bag.

■ *Supplemental Inflatable Restraint System (Air Bag)* (CONT.)

⚠ CAUTION:

Air bags inflate with great force, faster than the blink of an eye. If you're too close to an inflating air bag, it could seriously injure you. Safety belts help keep you in position for an air bag inflation in a crash. Always wear your safety belt, even with an air bag, and sit as far back as you can while still maintaining control of your vehicle.

⚠ CAUTION:

When an air bag inflates, there is dust in the air. This dust could cause breathing problems for people with a history of asthma or other breathing trouble. To avoid this, everyone in the vehicle should get out as soon as it is safe to do so. If you have breathing problems but can't get out of the vehicle after an air bag inflates, then get fresh air by opening a window or door.

⚠ CAUTION:

Don't put anything on, or attach anything to, the driver air bag. Also, don't put anything (such as pets or objects) between the driver and the driver air bag. If something is between an occupant and an air bag, it could affect the performance of the air bag, or, worse, it could cause injury.

Air Bag Readiness Light

There is an air bag readiness light on the instrument panel, which shows "AIR BAG" on it. The system checks for electrical malfunctions, and the light tells you if there is a problem.

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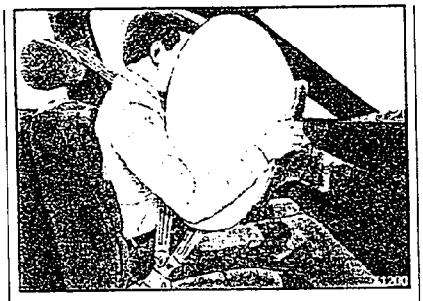
You will see this light flash for a few seconds when you turn your ignition to "Run" or "Start." Then the light should go out, which means the system is ready.

Remember, if the air bag readiness light doesn't come on when you start your vehicle, or stays on, or comes on when you are driving, your air bag system may not work properly. Have your vehicle serviced right away.



How The Air Bag System Works

Where is the air bag?

The driver's air bag is in the middle of the steering wheel.

When is an air bag expected to inflate?

The air bag is designed to inflate in moderate to severe frontal or near-frontal crashes. The air bag will only inflate if the velocity of the impact is above the designed threshold level. When impacting straight into a wall that does not move or deform, the threshold level for most GM vehicles is between 9 and 15 mph (14 and 23 km/h). However, this velocity threshold depends on the vehicle design and may be several miles-per-hour faster or slower. In addition, this threshold velocity will be considerably higher if the vehicle strikes an object such as a parked car which will move and deform on impact. The air bag is also not designed to inflate in rollovers, side impacts, or rear impacts where the inflation would provide no occupant protection benefit.

In any particular crash, the determination of whether the air bag should have inflated cannot be based solely on the level of damage on the vehicle(s). Inflation is determined by the angle of the impact and the vehicle's deceleration, of which vehicle damage is only one indication. Repair cost is not a good indicator of whether an air bag should have deployed.

How The Air Bag System Works (CONT.)

What makes an air bag inflate?

In a frontal impact of sufficient severity, the air bag sensing system detects that the vehicle is suddenly stopping as a result of a crash. The sensing system triggers a chemical reaction of the sodium azide sealed in the inflator. The reaction produces nitrogen gas, which inflates the cloth bag. The inflator, cloth bag, and related hardware are all part of the air bag inflator module packed inside the steering wheel.

How does an air bag restrain?

In moderate to severe frontal or near-frontal collisions, even belted occupants can contact the steering wheel. The air bag supplements the protection provided by safety belts. Air bags distribute the force of the impact more evenly over the occupant's upper body, stopping the occupant more gradually. But air bags would not provide protection in many types of collisions, including rollovers and rear and side impacts, primarily because an occupant's motion is not toward the air bag. Air bags should never be regarded as anything more than a supplement to safety belt protection in moderate to severe frontal and near-frontal collisions.

What will you see after an air bag inflation?

After the air bag has inflated, it will then quickly deflate. This occurs so quickly that some people may not even realize that the air bag inflated. Some components of the air bag module in the steering wheel hub may be hot for a short time, but the portion of the bag that comes into contact with you will not be hot to the touch. There will be small amounts of smoke and dust coming from vents in the deflated air bag. The air bag will not impede the driver's vision or ability to steer the vehicle, nor will it hinder the occupants from exiting the vehicle.

- The air bag is designed to inflate only once. After it inflates, you'll need some new parts for your air bag system. If you don't get them, the air bag system won't be there to help protect you in another crash. A new system will include the air bag module and possibly other parts. The service manual has information about the need to replace other parts.
- Your vehicle is equipped with a diagnostic module, which records information about the air bag system if the air bag deploys during a crash. The module records information about the readiness of the system, which sensors activated the deployment, and whether the driver's safety belt was in use.
- Let only qualified technicians work on your air bag system. Improper service can mean that your air bag system won't work properly. See your dealer for service.

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NOTICE:

If you damage the cover for the driver's air bag, it may not work properly. You may have to replace the air bag on the steering wheel. Do not open or break the air bag cover.

Is the smoke from an air bag inflation harmful?

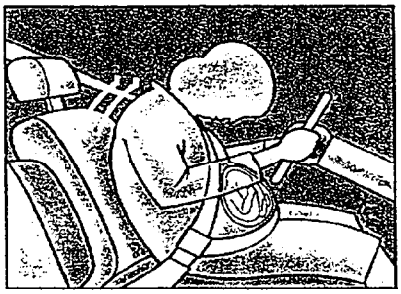
The particles emitted during air bag inflation are not harmful to most people. Some people with respiratory ailments may experience difficulty breathing if they stay in the vehicle with the windows closed after air bag inflation. So, if your air bag inflates, you and any passengers should exit the vehicle if and when it is safe to do so. If you or your passengers can't get out of the vehicle, try to get fresh air by opening a window, turning on the fan, or opening a door.

Servicing Your Pontiac with the Air Bag System

The air bag affects how your Pontiac should be serviced. There are parts of the air bag system in several places around your vehicle. Your Pontiac dealer and the 1994 Pontiac Service Manual have information about servicing your vehicle and the air bag system. The air bag system does not need regular maintenance.

⚠ CAUTION:

For up to 2 minutes after the ignition key is turned off and the battery is disconnected, an air bag can still inflate during improper service. You can be injured if you are close to an air bag when it inflates. Avoid wires wrapped with yellow tape, or yellow connectors. They are probably part of the air bag system. Be sure to follow proper service procedures, and make sure the person performing work for you is qualified to do so.

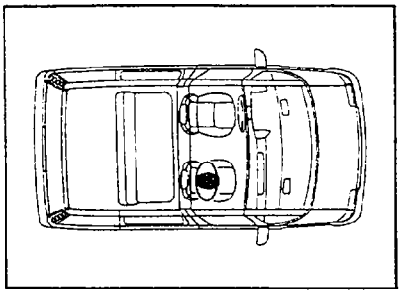


■ *Safety Belt Use During Pregnancy*

Safety belts work for everyone, including pregnant women. Like all occupants, they are more likely to be seriously injured if they don't wear safety belts.

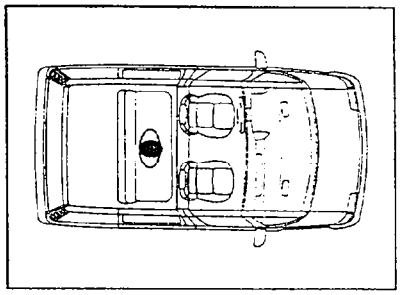
A pregnant woman should wear a lap-shoulder belt, and the lap portion should be worn as low as possible throughout the pregnancy.

The best way to protect the fetus is to protect the mother. When a safety belt is worn properly, it's more likely that the fetus won't be hurt in a crash. For pregnant women, as for anyone, the key to making safety belts effective is wearing them properly.



■ *Right Front Passenger Position*

The right front passenger's safety belt works the same way as the driver's safety belt. See "Driver Position," earlier in this part.



■ *Center Passenger Position (Bench Seat)*

If your vehicle has a rear bench seat, someone can sit in the center position.

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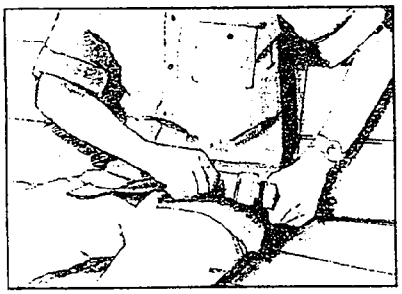
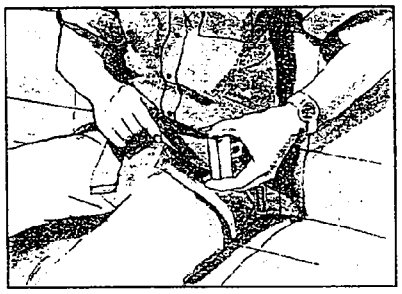


Lap Belt

When you sit in the center position of the bench seat, you have a lap safety belt, which has no retractor. To make the belt longer, tilt the latch plate and pull it along the belt.

To make the belt shorter, pull its free end as shown until the belt is snug.



Buckle, position and release it the same way as the lap part of a lap-shoulder belt. If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

■ *Center Passenger Position (Bucket Seat)*

Lap Belt

When you sit in the center position bucket seat, you have a lap safety belt which has a retractor.

1. Pick up the latch plate and, in a single motion, pull the belt across you. Don't let it get twisted.
2. Push the latch plate into the buckle until it clicks. If the belt stops before it reaches the buckle, let it go back all the way and start again. Pull up on the latch plate to make sure it is secure.
3. Feed the lap belt into the retractor to tighten it.
4. Position and release it the same way as the lap part of a lap-shoulder belt.

   If the belt isn't long enough, see "Safety Belt Extender" at the end of this section. Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

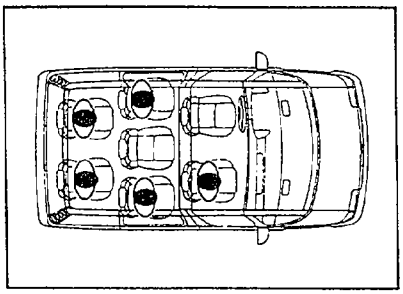
■ *Center Passenger Position (Bucket Seat)* *(CONT.)*

The center position bucket seat is a "Center or Left" type seat. Because it is the only bucket seat with a lap belt, and has a buckle on only one side, there are certain places a "Center or Left" type bucket seat should, and should not, be used. See "Seats" in the Index. If the "Center or Left" bucket seat is used on the left side of the vehicle, the person sitting there should use the lap-shoulder belt. It works the same way as the driver's safety belt. See "Driver Position" in the Index.

■ *Rear Seat Passengers*

It's very important for rear seat passengers to buckle up! Accident statistics show that unbelted people in the rear seat are hurt more often in crashes than those who are wearing safety belts.

Rear passengers who aren't safety belted can be thrown out of the vehicle in a crash. And they can strike others in the vehicle who are wearing safety belts.



Rear Seat Outside Passenger Positions

Lap-Shoulder Belt

The positions next to the windows have lap-shoulder belts. Here's how to wear one properly.

1. Pick up the latch plate and pull the belt across you. Don't let it get twisted.
2. Push the latch plate into the buckle until it clicks.

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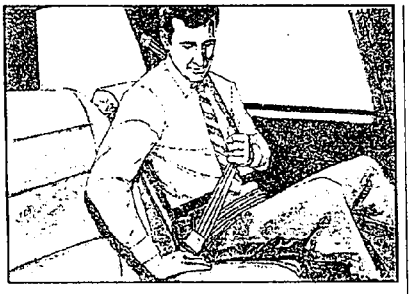
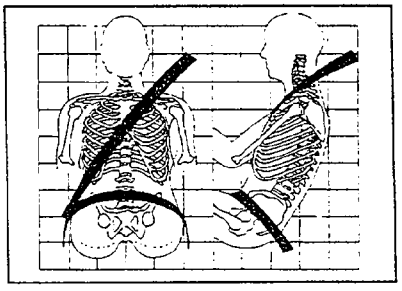
If the belt stops before it reaches the buckle, tilt the latch plate and keep pulling until you can buckle it.

Pull up on the latch plate to make sure it is secure.

If the belt is not long enough, see "Safety Belt Extender" at the end of this section. Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.



3. To make the lap part tight, pull down on the buckle end of the belt as you pull up on the shoulder part.



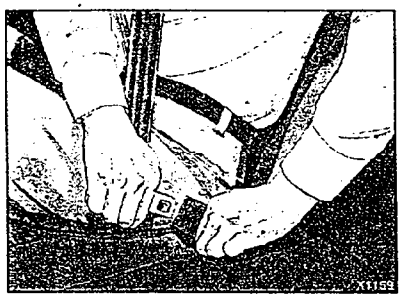
The lap part of the belt should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones. And you'd be less likely to slide under the lap belt. If you slid under it, the belt would apply force at your abdomen. This could cause serious or even fatal injuries. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt restraining forces.

Rear Seat Outside Passenger Positions (CONT.)

The safety belt locks if there's a sudden stop or a crash.

⚠ CAUTION:

You can be seriously hurt if your shoulder belt is too loose. In a crash you would move forward too much, which could increase injury. The shoulder belt should fit against your body.



- To unlatch the belt, just push the button on the buckle.

■ *Center Passenger Position*

Lap Belt

If your vehicle has a rear bench seat, someone can sit in the center position.

When you sit in a center seating position, you have a lap safety belt, which has no retractor. To make the belt longer, tilt the latch plate and pull it along the belt.

To make the belt shorter, pull its free end as shown until the belt is snug.

Buckle, position and release it the same way as the lap part of a lap-shoulder belt. If the belt isn't long enough, see "Safety Belt Extender" at the end of this section.

Make sure the release button on the buckle is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

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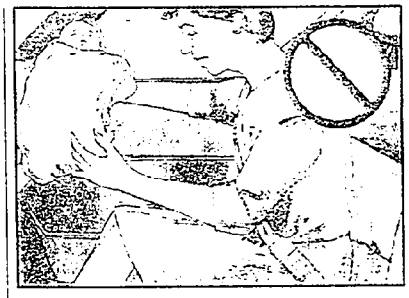
■ *Children*

Everyone in a vehicle needs protection! That includes infants and all children smaller than adult size. In fact, the law in every state in the United States and in every Canadian province says children up to some age must be restrained while in a vehicle.

Smaller Children and Babies

⚠ CAUTION:

Smaller children and babies should always be restrained in a child or infant restraint. The instructions for the restraint will say whether it is the right type and size for your child. A very young child's hip bones are so small that a regular belt might not stay low on the hips, as it should. Instead, the belt will likely be over the child's abdomen. In a crash the belt would apply force right on the child's abdomen, which could cause serious or fatal injuries. So, be sure that any child small enough for one is always properly restrained in a child or infant restraint.



Smaller Children and Babies (CONT.)

⚠ CAUTION:

Never hold a baby in your arms while riding in a vehicle. A baby doesn't weigh much -- until a crash. During a crash a baby will become so heavy you can't hold it. For example, in a crash at only 25 mph (40 km/h), a 12-pound (5.5 kg)

CAUTION: (Continued)

CAUTION: (Continued)

baby will suddenly become a 240-pound (110 kg) force on your arms. The baby would be almost impossible to hold.

Secure the baby in an infant restraint.

■ Built-In Child Restraint (OPTION)

If you have a rear seat with the optional built-in child restraint, see the operating instructions attached to the seat for information on use and appearance care.

■ Child Restraints

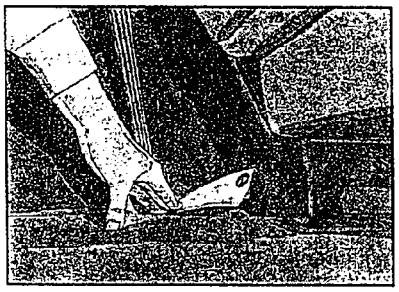
Be sure to follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both. These restraints use the belt system in your vehicle, but the child also has to be secured within the restraint to help reduce the chance of personal injury. The instructions that come with the infant or child restraint will show you how to do that.

Where to Put the Restraint

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. We at General Motors therefore recommend that you put your child restraint in the rear seat unless the child is an infant and you're the only adult in the vehicle. In that case, you might want to secure the restraint in the front seat where you can keep an eye on the baby.

Wherever you install it, be sure to secure the child restraint properly.

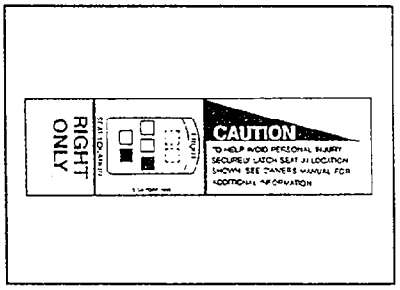
Keep in mind that an unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle. Be sure to properly secure any child restraint in your vehicle -- even when no child is in it.



Top Strap

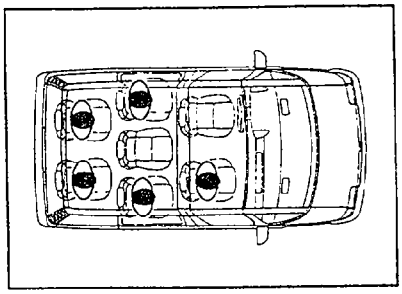
If your child restraint has a top strap, it should be anchored.

If your vehicle has third row seats, anchor brackets for the second row outside positions are located just above the place where the third row lap-shoulder belts meet the floor. There's a vinyl sleeve there; to get to the bracket, push this vinyl sleeve aside slightly. Anchor the top strap to the bracket.



If your vehicle does not have third row seats and belts, or if you need to have an anchor bracket installed for any additional passenger seat position, you can ask your Pontiac dealer to put it in for you. If you want to install an anchor bracket yourself, your dealer can tell you how to do it.

Once you have the top strap anchored, you'll be ready to secure the child restraint itself.

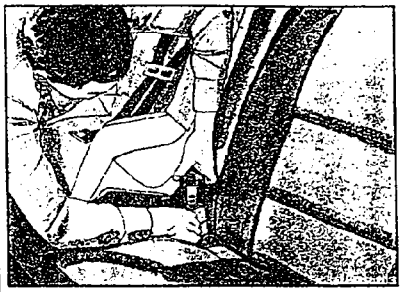


Securing a Child Restraint in an Outside Position

You'll be using the lap-shoulder belt. See the earlier section about the top strap if the child restraint has one.

1. Put the restraint on the seat. Follow the instructions for the child restraint.
2. Secure the child in the child restraint as the instructions say.
3. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how. Tilt the latch plate to adjust the belt if needed.

   If the shoulder belt goes in front of the child's face or neck, put it behind the child restraint.



4. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

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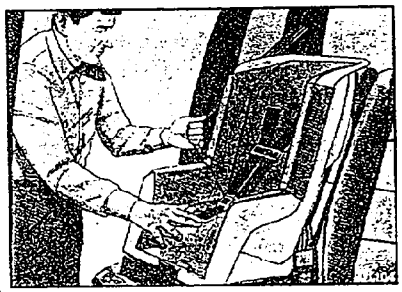
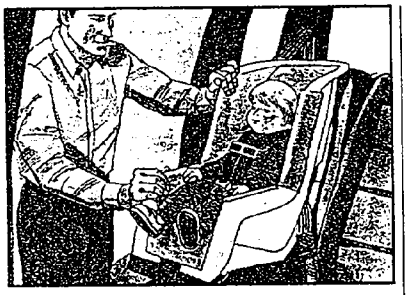
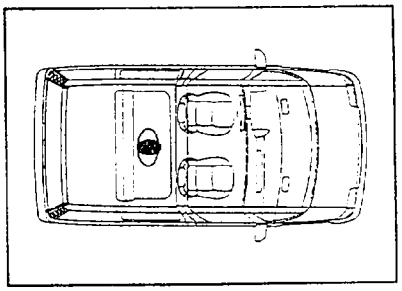


5. To tighten the belt, pull up on the shoulder belt while you push down on the child restraint.



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

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

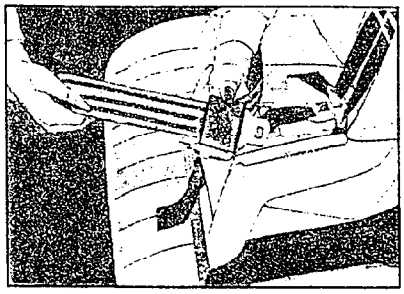


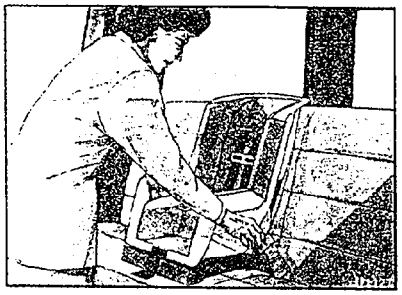
Securing a Child Restraint in the Center Seat Position (Bench Seat)

When you secure a child restraint in a center seating position, you'll be using the lap belt.

If the child restraint has a top strap, see " Top Strap" earlier in this section.

1. Make the belt as long as possible by tilting the latch plate and pulling it along the belt.





Securing a Child Restraint in the Center Seat Position (Bench Seat) (CONT.)

2. Put the restraint on the seat. Follow the instructions for the child restraint.
3. Secure the child in the child restraint as the instructions say.
4. Run the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.
5. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.
6. To tighten the belt, pull its free end while you push down on the child restraint.
7. Push and pull the child restraint in different directions to be sure it is secure. If the child restraint isn't secure, turn the latch plate over and buckle it again. Then see if it is secure. If it isn't, secure the restraint in a different place in the vehicle and contact the child restraint maker for their advice about how to attach the child restraint properly.

To remove the child restraint, just unbuckle the vehicle's safety belt. It will be ready to work for an adult or larger child passenger.

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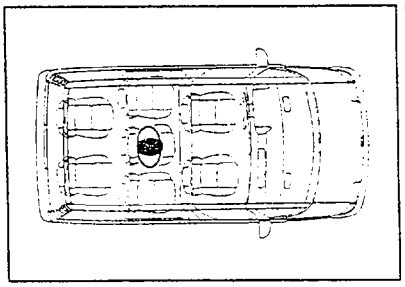
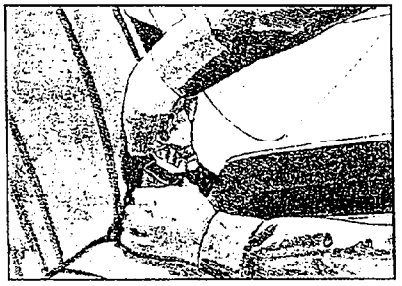




Securing a Child Restraint in the Center Seat Position (Bucket Seat)

You'll be using the lap belt. See the earlier section about the top strap if the child restraint has one.

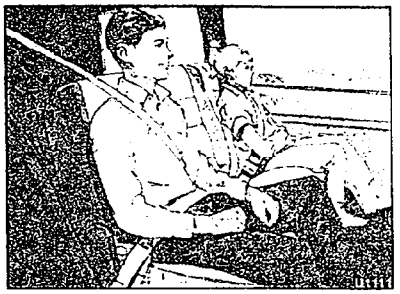
1. Put the restraint on the seat. Follow the instructions for the child restraint.
2. Secure the child in the child restraint as the instructions say.
3. Pull the lap belt all the way out without stopping.
4. While holding it out, run the belt through or around the child restraint. The child restraint instructions will show you how.
5. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

Securing a Child Restraint in the Center Seat Position (Bucket Seat) (CONT.)

6. To tighten the belt, feed it back into the retractor while you push down on the child restraint.

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

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.



Larger Children

Children who have outgrown child restraints should wear the vehicle's safety belts.

If you have the choice, a child should sit next to a window so the child can wear a lap-shoulder belt and get the additional restraint a shoulder belt can provide.

Accident statistics show that children are safer if they are restrained in the rear seat. But they need to use the safety belts properly.

- Children who aren't buckled up can be thrown out in a crash.

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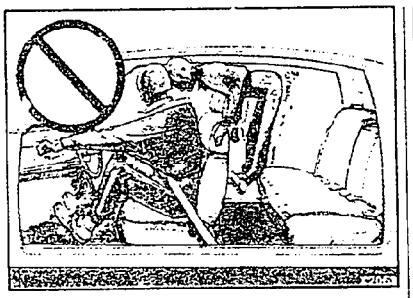
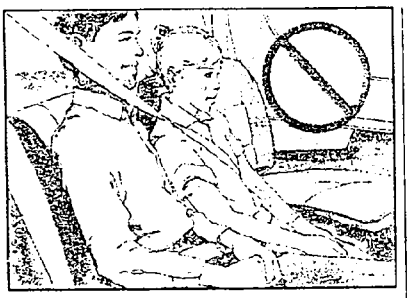


- Children who aren't buckled up can strike other people who are.



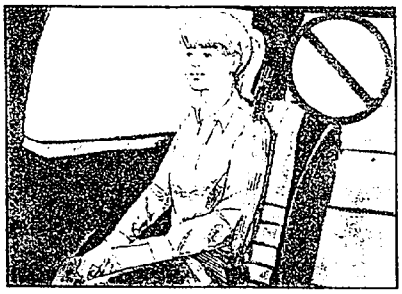
⚠ CAUTION:

Never do this.

Here two children are wearing the same belt. The belt can't properly spread the impact forces. In a crash, the two children can be crushed together and seriously injured. A belt must be used by only one person at a time.

Q: What if a child is wearing a lap-shoulder belt, but the child is so small that the shoulder belt is very close to the child's face or neck?

A: Move the child toward the center of the vehicle, but be sure that the shoulder belt still is on the child's shoulder, so that in a crash the child's upper body would have the restraint that belts provide. If the child is so small that the shoulder belt is still very close to the child's face or neck, you might want to place the child in a seat that has a lap belt, if your vehicle has one.



Larger Children (CONT.)

⚠ CAUTION:

Never do this.

Here a child is sitting in a seat that has a lap-shoulder belt, but the shoulder part is behind the child. If the child wears the belt in this way, in a crash the child might slide under the belt. The belt's force would then be applied right on the child's abdomen. That could cause serious or fatal injuries.

Wherever the child sits, the lap portion of the belt should be worn low and snug on the hips, just touching the child's thighs. This applies belt force to the child's pelvic bones in a crash.

■ *Safety Belt Extender*

If the vehicle's safety belt will fasten around you, you should use it.

But if a safety belt isn't long enough to fasten, your dealer will order you an extender. It's free. When you go in to order it, take the heaviest coat you will wear, so the extender will be long enough for you. The extender will be just for you, and just for the seat in your vehicle that you choose. Don't let someone else use it, and use it only for the seat it is made to fit. To wear it, just attach it to the regular safety belt.

■ *Checking Your Restraint Systems*

Now and then, make sure all your belts, buckles, latch plates, retractors, anchorages and reminder systems are working properly. Look for any loose parts or damage. If you see anything that might keep a restraint system from doing its job, have it repaired.

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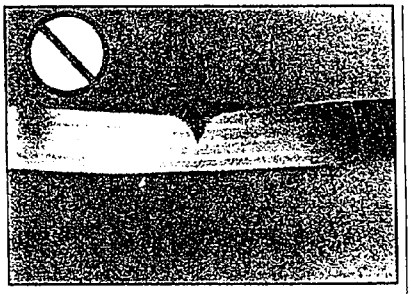
■ *Replacing Safety Belts After a Crash*

If you've had a crash, do you need new belts?

After a very minor collision, nothing may be necessary. But if the belts were stretched, as they would be if worn during a more severe crash, then you need new belts.

If belts are cut or damaged, replace them. Collision damage also may mean you will need to have safety belt or seat parts repaired or replaced. New parts and repairs may be necessary even if the belt wasn't being used at the time of the collision.

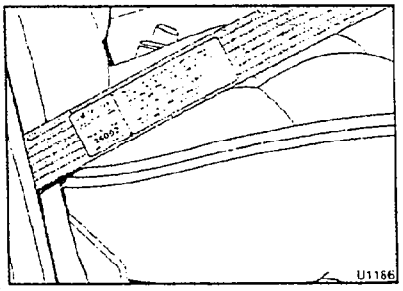


Q: What's wrong with this?

A: The belt is torn.

Torn or frayed belts may not protect you in a crash. They can rip apart under impact forces. If a belt is torn or frayed, get a new one right away.

Before replacing any safety belt, see your dealer for the correct part number. You'll need the model year and model number for your vehicle. The model year is on your title and registration. And you can find the model number on the Certification/Tire label of your vehicle. See "Certification/Tire Label" in the Index.



The model number on the replacement belt must be listed on the safety belt you want to replace.

Pull the shoulder belt all the way out to see the label.