V 2139

Report Number TRC-95-N01

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Volkswagen De Mexico S.A. DeC. V.

1994 Volkswagen Jetta III

4-door Sedan

NHTSA Number: MS5800

TRC Test Number: 941005

Prepared By:

Transportation Research Center Inc.

10820 State Route 347

East Liberty, Ohio 43319

October 28, 1994

Final Report

Prepared For:

U. S. Department Of Transportation

National Highway Traffic Safety Administration

Office Of Market Incentives

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16. Abstract

A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1994 Volkswagen Jetta III 4-door sedan, NHTSA No. MS5800, at Transportation Research Center Inc. on October 5, 1994. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.2 kph. The vehicle's maximum static crush was 566 millimeters. The ambient temperature was 18 °C.

The driver's Head Injury Criteria (HIC) was 725. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.4 g. The driver's chest maximum deflection was 36 millimeters. The driver's left and right femur maximum axial forces were 5910 N and 6229 N, respectively.

The passenger's HIC was 637. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 56.5 g. The passenger's chest maximum deflection was 51 millimeters. The passenger's left and right femur maximum axial forces were 4611 N and 6187 N, respectively.

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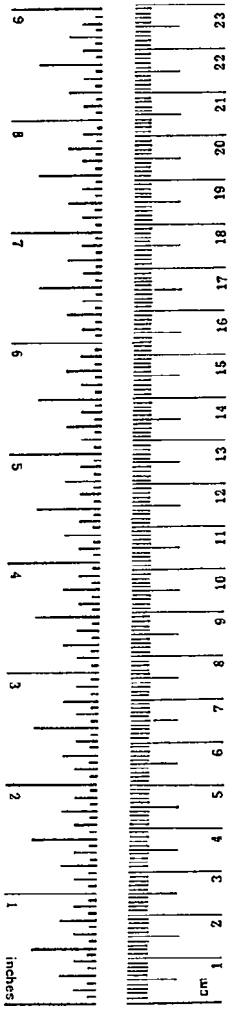
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

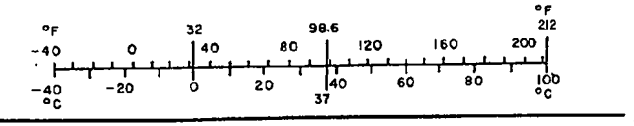
Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	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 Number 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 Volkswagen Jetta III 4-door sedan, NHTSA Number MS5800, 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 first use of the driver dummy and the passenger dummy.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. 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 5, 1994.

The test vehicle, a 1994 Volkswagen Jetta III 4-door sedan, NHTSA Number MS5800, was equipped with a 2.0-liter transverse engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1467 kg. The vehicle's impact speed was 56.2 kph. The vehicle sustained 566 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 725. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.4 g. The driver's chest maximum deflection was 36 mm. The driver's left and right femur maximum axial forces were 5910 N and 6229 N, respectively.

The passenger's HIC was 637. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 56.5 g. The passenger's chest maximum deflection was 51 mm. The passenger's left and right femur maximum axial forces were 4611 N and 6187 N, respectively.

There was loss of windshield periphery retention along the lower edge of the windshield from 370 mm to 450 mm measured from the lower left corner. Windshield periphery retention was also lost along the right side of the windshield along the A-pillar from 25 mm to 95 mm measured from the lower right corner.

There was no penetration through the windshield.

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

Table 1 Crash Test Summary

NHTSA number:	MS5800	
Test type:	Frontal Load Cell Barrier	
Test date:	10/05/94	
Test time:	1545	
Ambient temperature:	18° C	
Vehicle year/make/ model/body style:	1994/Volkswagen/Jetta III/4-door sedan	
Vehicle test weight:	1467 kg	
Impact angle[1]:	0°	
Impact velocity[2]:	Primary = 56.2 kph Secondary = 56.2 kph	
Maximum static crush:	566 mm	
Average rebound:	480 mm	
Dummies:	Driver #142	Passenger #192
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	Airbag and 3-point unibelt	Airbag and 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 year/make/ model/body style:	1995/Volkswagen/Jetta III/4-door sedan
Color:	White
VIN:	3VWRA81HXSM000205
NHTSA number:	MS5800
Engine data:	
Placement:	Transverse
Cylinders:	4
Displacement	2.0 liters
Transmission data:	_4_speed, __manual, _X_automatic, __overdrive _X_FWD, __RWD, __4WD
Date vehicle received:	09/15/94
Odometer reading:	87
Dealer's name and address:	Capital Imported Cars, Inc. 301 Morth Hamilton Rd. Columbus, OH 43213

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	No	Tilting steering wheel	Yes
Power windows	No	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	No
Clock	Yes	Rear window defroster	Yes
Other	No		

Certification data from vehicle's label:

Vehicle manufactured by:	Volkswagen De Mexico S.A. DeC. V.
Date of manufacture:	05/94
VIN:	3VWRA81HXSM000205
GVWR:	3682 lb
GAWR: Front:	1962 lb
Rear:	1808 lb

Table 2 Test Vehicle Information, Cont'd.

Size of tires:	P195/60R14
Tire pressure with maximum capacity vehicle load:	
Front:	300 kPa
Rear:	300 kPa
Spare tire:	Temporary
Type of front seats:	Bucket

Tire & capacity data from vehicle's label:

Recommended tire size:	P195/60R14
Recommended cold tire pressure:	
Front:	228 kPa
Rear:	262 kPa
Designated seating capacity:	
Front	2
Rear	3
Total	5
Vehicle capacity weight:	415 kg

Test vehicle attitude:

Delivered attitude:	LF 667 mm;	RF 667 mm;	LR 643 mm;	RR 640 mm
Pre-test attitude:	LF 636 mm;	RF 642 mm;	LR 613 mm;	RR 609 mm
Post-test attitude:	LF 742 mm;	RF 708 mm;	LR 627 mm;	RR 591 mm

Table 2 Test Vehicle Information Cont'd

Weight of test vehicle as received (with maximum fluids):

Right front	372	kg	Right rear	243	kg
Left front	377	kg	Left rear	244	kg
Total front weight	749	kg	(60.6% of total vehicle weight)		
Total rear weight	487	kg	(39.4% of total vehicle weight)		
Total delivered weight	1236	kg			

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1246 kg)

VCW[1] = Vehicle capacity weight (415 kg)

DSC = Designated seating capacity (5)

RCLW = VCW - 68 (DSC) = 75 kg

Target test weight = UDW + RCLW[1] + (Number of Hybrid III dummies x 76 kg/dummy)

Target test weight = 1236 + 75 + 152

Target test weight = 1463 kg

Weight of test vehicle with required dummies and 78 kg of cargo weight:

Right front	412	kg	Right rear	313	kg
Left front	419	kg	Left rear	323	kg
Total front weight	831	kg	(56.6% of total vehicle weight)		
Total rear weight	636	kg	(43.4% of total vehicle weight)		
Total test weight	1467	kg	(0.3% over target test weight)		

Weight of ballast secured in vehicle: 0 kg

Components removed to meet target test weight: rear bumper, trunk lid, rear seat belts, rear door trim and glass

CG rearward of front wheel centerline: 1075 mm

Vehicle wheelbase: 2480 mm

[1] From the vehicle's recomended tire pressure label.

Table 3 Post-Impact Data

Test number:	941005
NHTSA number:	MS5800
Test date:	10/05/94
Test time:	1545
Test type:	Frontal load cell barrier
Impact angle:	0°
Ambient temperature at impact area:	18° C
Temperature in occupant compartment:	21° C
Impact velocity:	
Primary	56.2 kph
Secondary	56.2 kph
Specified range	55.5 to 57.1 kph

Distance from vehicle to barrier:

Entering velocity trap	356 mm
Exiting velocity trap	51 mm

Test vehicle static crush:

Overall length of test vehicle:

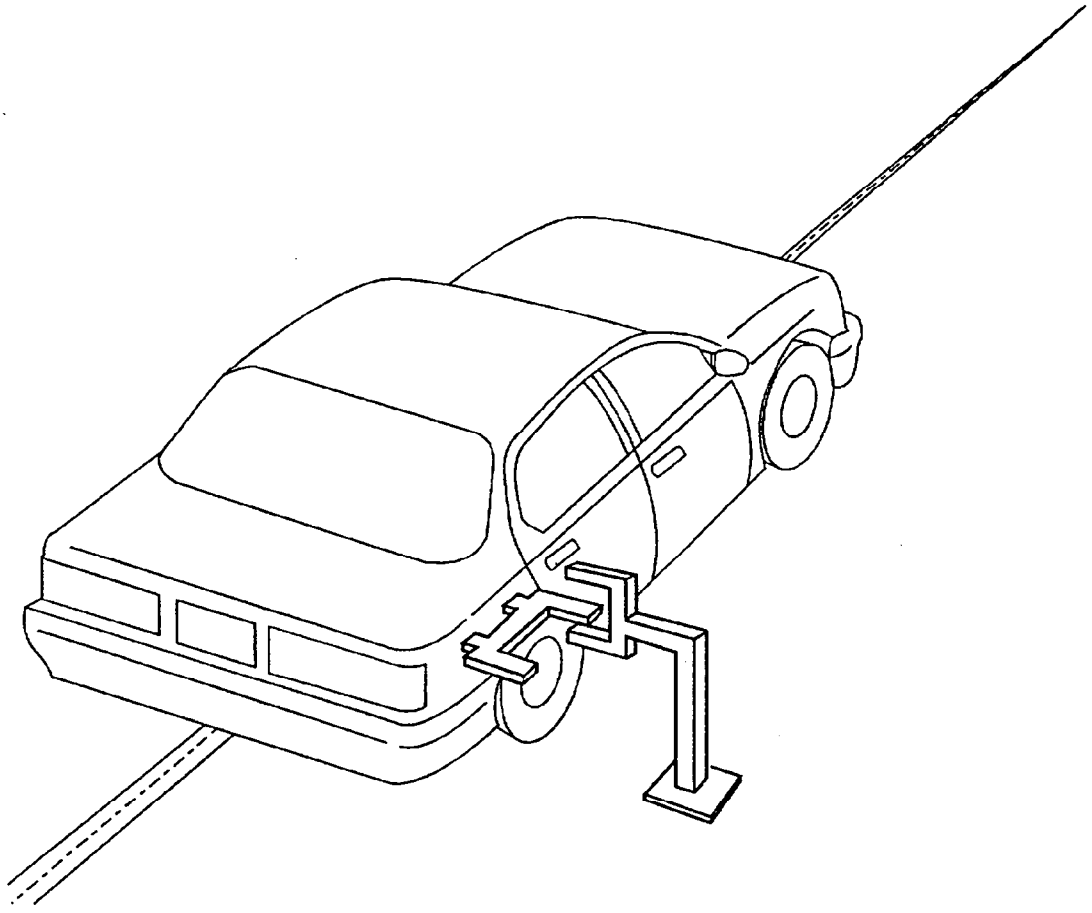
Pre-test:	L	4226 mm;	C	4320 mm;	R	4220 mm
Post-test:	L	3721 mm;	C	3770 mm;	R	3721 mm
Total crush:	L	505 mm;	C	550 mm;	R	499 mm
Average crush:	518 mm					

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test:	L	488 mm;	C	465 mm;	R	488 mm
Average rebound	480 mm					

Figure 1 Impact Velocity Measurement System

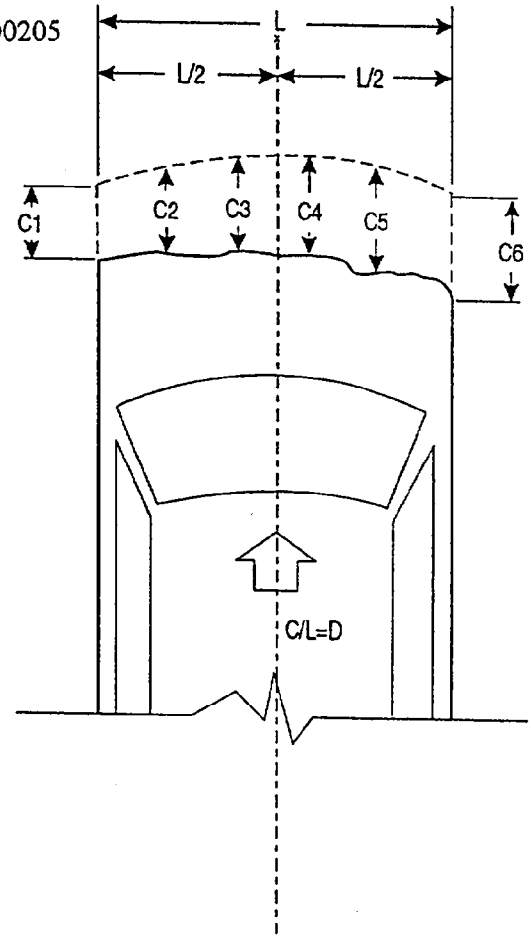


The final vane clears emitter/receiver pair 51 millimeters before impact.

The vanes have 305-millimeter spacing.

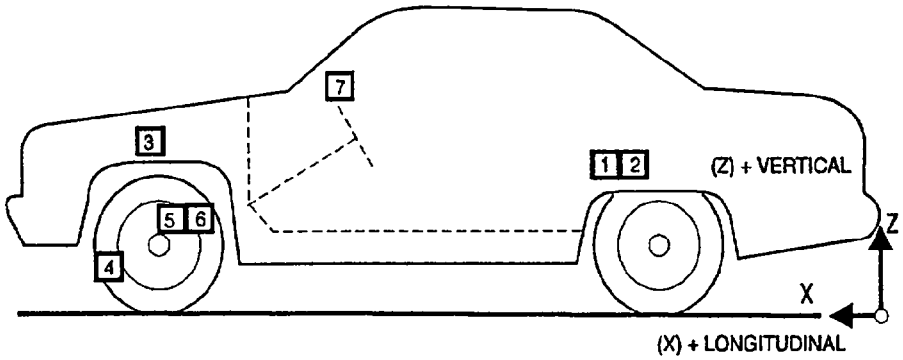
Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact

NHTSA number:	MS5800
Test date:	10/05/94
Vehicle year/make/ model/body style:	1994/Volkswagen/Jetta III/4-door sedan
Vehicle size category:	Compact
VIN:	3VWRA81HXSM000205
Build date:	05/94
Test weight:	1467 kg
Vehicle wheelbase:	2480 mm
Maximum width:	1685 mm
Front overhang:	854 mm

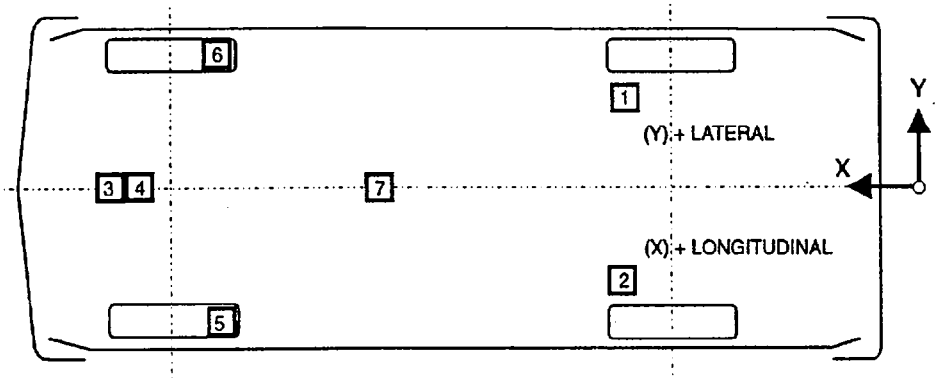


Collision Deformation Classification (CDC) code:	12FDEW3
Crush depth measurements:	C1 = 505 mm
	C2 = 558 mm
	C3 = 566 mm
	C4 = 553 mm
	C5 = 536 mm
	C6 = 499 mm
Midpoint of damage:	D: Vehicle Longitudinal Centerline
Length of damaged region:	L: 1380 mm

Figure 3 Vehicle Accelerometer Placement



SIDE VIEW



BOTTOM VIEW

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 941005 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 LEFT REAR SEAT CROSSMEMBER	2644 mm	362 mm	428 mm				
LONGITUDINAL				5.9 g	@ 121.0 ms	42.5 g	@ 49.8 ms
REDUNDANT				6.0 g	@ 120.9 ms	42.8 g	@ 49.8 ms
2 RIGHT REAR SEAT CROSSMEMBER	2650 mm	-362 mm	428 mm				
LONGITUDINAL				6.8 g	@ 132.8 ms	46.2 g	@ 50.1 ms
REDUNDANT				7.0 g	@ 132.6 ms	46.1 g	@ 50.0 ms
3 ENGINE TOP	703 mm	-90 mm	842 mm				
LONGITUDINAL				110.6 g	@ 48.3 ms	165.7 g	@ 27.0 ms
4 ENGINE BOTTOM	624 mm	-145 mm	181 mm				
LONGITUDINAL				30.8 g	@ 28.6 ms	148.7 g	@ 19.0 ms
5 RIGHT BRAKE CALIPER	755 mm	-625 mm	268 mm				
LONGITUDINAL				70.4 g	@ 49.7 ms	121.6 g	@ 34.6 ms
6 LEFT BRAKE CALIPER	657 mm	625 mm	268 mm				
LONGITUDINAL				45.0 g	@ 55.2 ms	91.6 g	@ 32.3 ms
7 INSTRUMENT PANEL CENTER	1381 mm	15 mm	991 mm				
LONGITUDINAL				26.6 g	@ 40.6 ms	88.2 g	@ 53.8 ms

NOTE: X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER.

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

Table 5 Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	Driver #142	Passenger #192
Head	Airbag	Airbag
Chest	Airbag	Airbag
Abdomen	None	None
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door Opening:

	Left	Right
Front	Easy	Easy
Rear	Easy	Easy

Seat Movement:

	Seat Back Failure	Seat Shift
Front	None	None
Rear	NA	NA

Glazing Damage: The entire windshield cracked on impact.

Other Notable Impact Effects: None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/
model/body style: 1994/Volkswagen/Jetta III/4-door sedan

Vehicle NHTSA number: MS5800

Test date: 10/05/94

	Driver Dummy #142		Passenger Dummy #192	
Maximum Accelerations:				
Head X-axis	-69.8	g	-73.7	g
Head Y-axis	5.5	g	-11.9	g
Head Z-axis	-24.6	g	-27.8	g
Head resultant	70.9	g	74.5	g
Chest X-axis	-56.7	g	-57.6	g
Chest Y-axis	6.1	g	-5.1	g
Chest Z-axis	9.6	g	-11.2	g
Chest resultant[1]	55.4	g	56.5	g
Chest resultant time interval[1]	.003	sec	.003	sec
Head Injury Criteria (HIC) Values:				
HIC[2]	725		637	
HIC starting time	.056	sec	.049	sec
HIC ending time	.089	sec	.084	sec
Avg. head resultant accel. during HIC time interval	54.1	g	50.5	g
Maximum Chest Deflections:				
Chest X-axis	36	mm	51	mm
Maximum chest deflection time	.060	sec	.067	sec
Maximum Compressive Femur Forces:				
Left femur	5910	N	4611	N
Right femur	6229	N	6187	N
Maximum Seat Belt Forces:				
Lap belt	3379	N	2941	N
Shoulder belt	8226	N	6409	N

Note: All values listed must be occurring during primary impact event.
(Head accelerations listed must be during hic time interval.)

[1] 0.003 Sec. Minimum duration.

[2] The maximum hic time interval is 36 milliseconds.

Table 7 Hybrid III Neck Data Summary

Vehicle year/make/
model/body style: 1994/Volkswagen/Jetta III/4-door sedan

Vehicle NHTSA number: MS5800

Test date: 10/05/94

	Driver Dummy #142		Passenger Dummy #192	
Maximum Values:				
Neck X-axis force	420	N	-1007	N
Neck Y-axis force	-165	N	282	N
Neck Z-axis force	2262	N	2313	N
Neck moment about X-axis	-11	N-m	12	N
Neck moment about Y-axis	-21	N-m	88	N
Neck moment about Z-axis	-7	N-m	16	N

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 rotated slightly forward impacting the airbag. The driver dummy was restrained by the airbag and the three-point unibelt. The dummy rebounded rearward into the seat back with the dummy's head rotating rearward contacting the head restraint. The driver dummy came to rest in the driver's seat, restrained by the three-point unibelt.

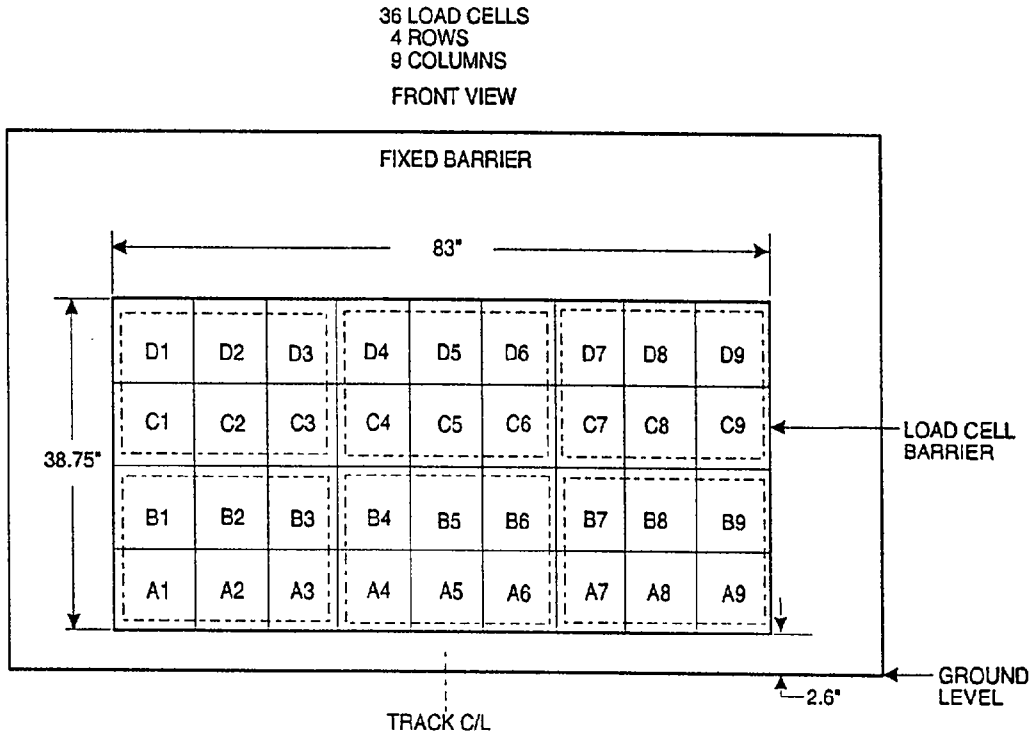
Right Front Passenger Dummy

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The right front passenger dummy was restrained by the airbag and three-point unibelt. The dummy rebounded rearward into the seat back as the dummy's head rotated slightly 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.	2490 mm	2490 mm
Shoulder belt length as measured on Part 572 dummy.	840 mm	920 mm
Lap belt length as measured on Part 572 dummy.	840 mm	880 mm
Shoulder belt spool-off length:		
As determined by film analysis	46 mm	36 mm
As determined mechanically	53 mm	38 mm
As determined electronically	64 mm	68 mm
Belt stretch length:		
As measured mechanically	4 mm/m	2 mm/m
As measured electronically	1 mm/m	17 mm/m
Retractor lock-up time:		
As determined by shoulder belt spool-off	64 ms	62 ms

Figure 4 Load Cell Barrier Configuration



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

Table 9 Load Cell Barrier Data Summary

Location	Positive direction	Negative direction
Total group 1	1.5 kN @ 1.5 ms	100.1 kN @ 22.9 ms
Total group 2	1.0 kN @ 197.9 ms	235.1 kN @ 32.2 ms
Total group 3	1.6 kN @ 1.4 ms	135.4 kN @ 16.8 ms
Total group 4	1.3 kN @ 3.0 ms	49.0 kN @ 32.5 ms
Total group 5	2.5 kN @ 2.7 ms	34.0 kN @ 11.6 ms
Total group 6	1.1 kN @ 122.9 ms	34.0 kN @ 25.5 ms
Total load cell force	4.3 kN @ 180.6 ms	484.8 kN @ 23.8 ms

Tension is positive
Compression is negative

Section 3.0

FMVSS 212, 219 (partial), and 301 Data

Figure 5 FMVSS 212 Test Data

Details of windshield mounting such as retention method, trim type, etc.:

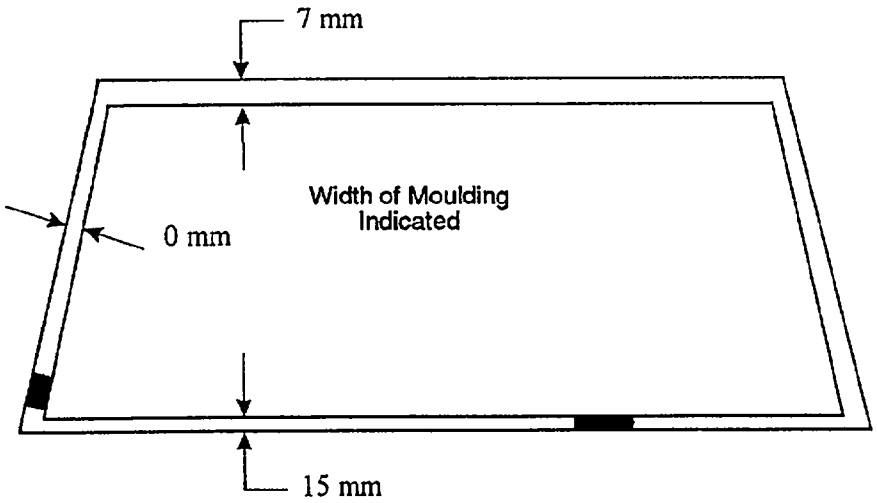
Plastic trim around outer perimeter, adhesive around inner perimeter.

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

Windshield periphery measurements:

	Pre-test	Post-test	Percent retention
Right side	1942 mm	1872 mm	96.4
Left side	1942 mm	1762 mm	90.7
Total	3884 mm	3634 mm	93.6

Pre-test windshield mounting material temperature: 21° C



Front view of windshield[1]

Loss of windshield retention lengths: There was loss of windshield retention along the lower edge of the windshield from 370 mm to 450 mm measured from the lower left corner. Retention loss also occurred along the A-pillar from 25 mm to 95 mm measuring from the lower right corner.

[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 = 1035 mm

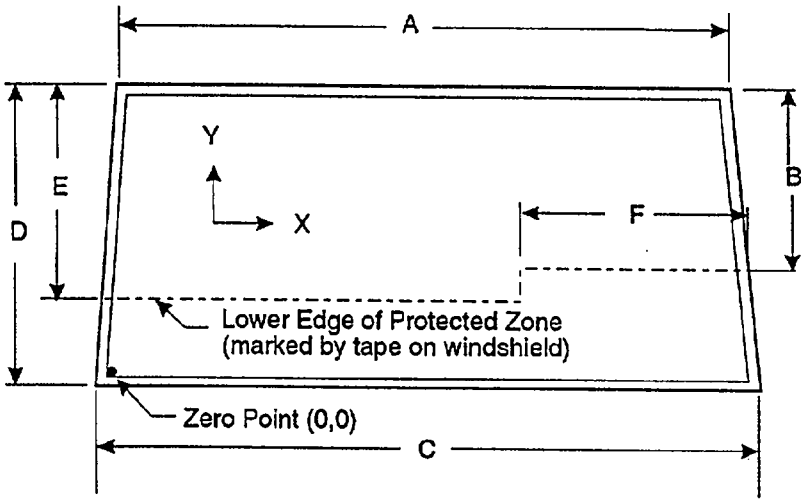
B = 380 mm

C = 1490 mm

D = 705 mm

E = 474 mm

F = 865 mm



FRONT VIEW

Method of adhering protected zone template to windshield: NA

Areas of windshield template penetration greater than 6 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.		

Table 10 Fuel System Data

Vehicle year/make/ model/body style:	1994/Volkswagen/Jetta/4-door sedan
NHTSA number:	MS5800
Fuel system capacity:	55.0 liters (from owner's manual)
Usable capacity:	54.9 liters (furnished by COTR)
Test volume range:	50.5 liters to 51.6 liters (92-94% of usable)
Actual test volume:	51.1 liters (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple

The electric fuel pump does not operate with ignition switch "on" and the engine not operating?

Details of fuel system: The fuel tank is located behind the rear axle.
The fuel filler neck is located on the right side.
The fuel lines run along the right side to the front.

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MS5800

Test date: 10/05/94

Vehicle year/make/
model/body style: 1994 Volkswagen/Jetta III/4-door sedan

Test requirements:

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

Test vehicle impact type:

_x_ Frontal (_56_ kph)

___ Oblique (48 kph) with __° barrier face first contacting ___ (driver/pass.) side

___ Rear moving barrier (48 kph)

___ Lateral moving barrier (32 kph)

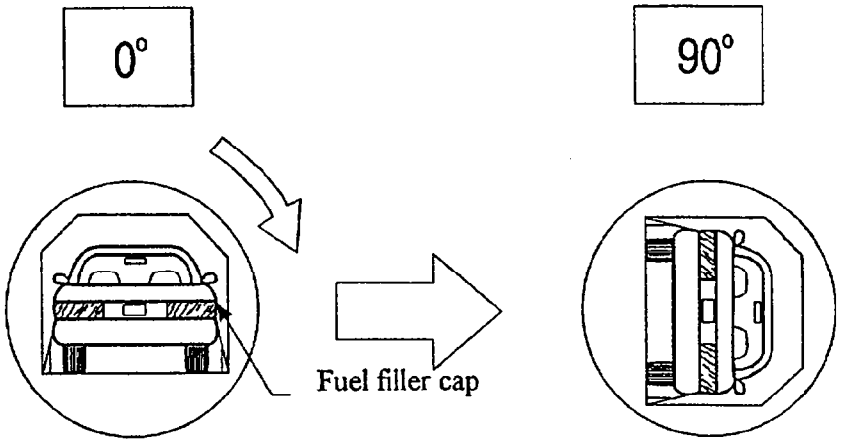
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MS5800
Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0	seconds
FMVSS 301 position hold time	=	5	minutes,	0	seconds
Total	=	7	minutes,	0	seconds
Next whole minute interval	=	7	minutes		

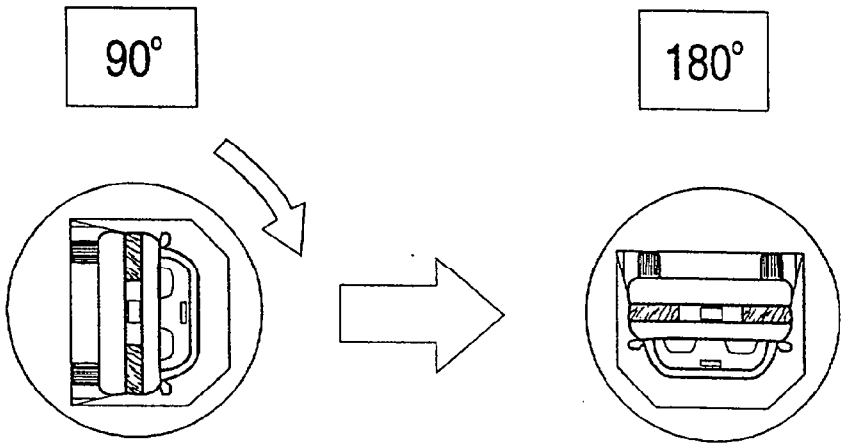
Fuel system fluid spillage measurements:

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. Sixth minute from onset of rotation	0 g	28 g
3. Seventh 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.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0 seconds
FMVSS 301 position hold time	=	5	minutes,	0 seconds
Total	=	7	minutes,	0 seconds
Next whole minute interval	=	14	minutes	

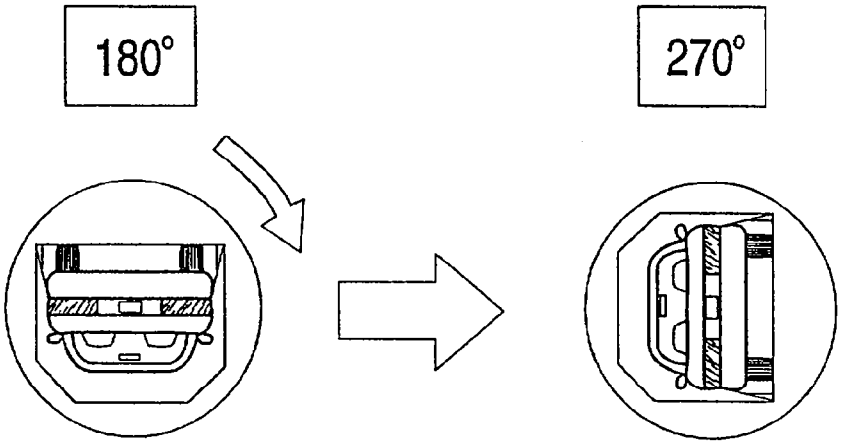
Fuel system fluid spillage measurements:

90° to 180° rotation	Test Results	Maximum Allowable
1. First 5 minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh 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.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0 seconds
FMVSS 301 position hold time	=	5	minutes,	0 seconds
Total	=	7	minutes,	0 seconds
Next whole minute interval	=	21	minutes	

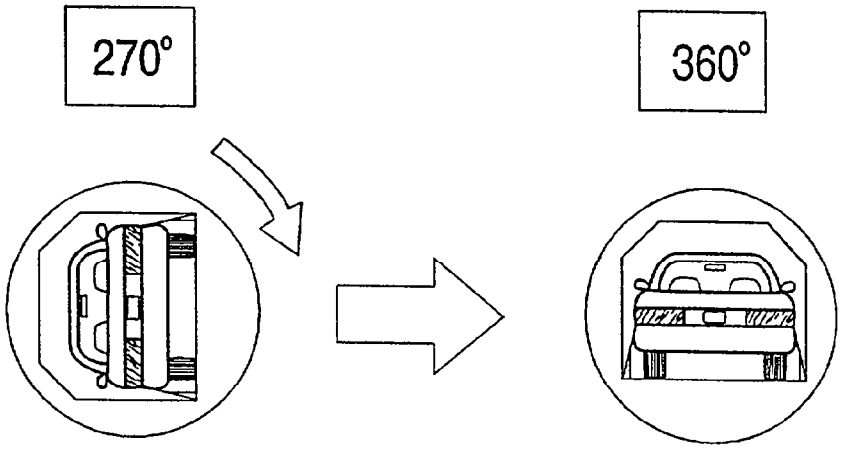
Fuel system fluid spillage measurements:

180° to 270° rotation	Test Results	Maximum Allowable
1. First 5 minutes from onset of rotation	0 g	142 g
2. Sixth minute from onset of rotation	0 g	28 g
3. Seventh 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.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90°	=	2	minutes,	0	seconds
FMVSS 301 position hold time	=	5	minutes,	0	seconds
Total	=	7	minutes,	0	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. Sixth minute from onset of rotation	0 g	28 g
3. Seventh minute from onset of rotation	0 g	28 g

Fuel system fluid spillage location(s): None

Section 4.0

Vehicle, Occupant, and Camera Information

Figure 8 Dummy Measurement Locations for Front Seat Occupants

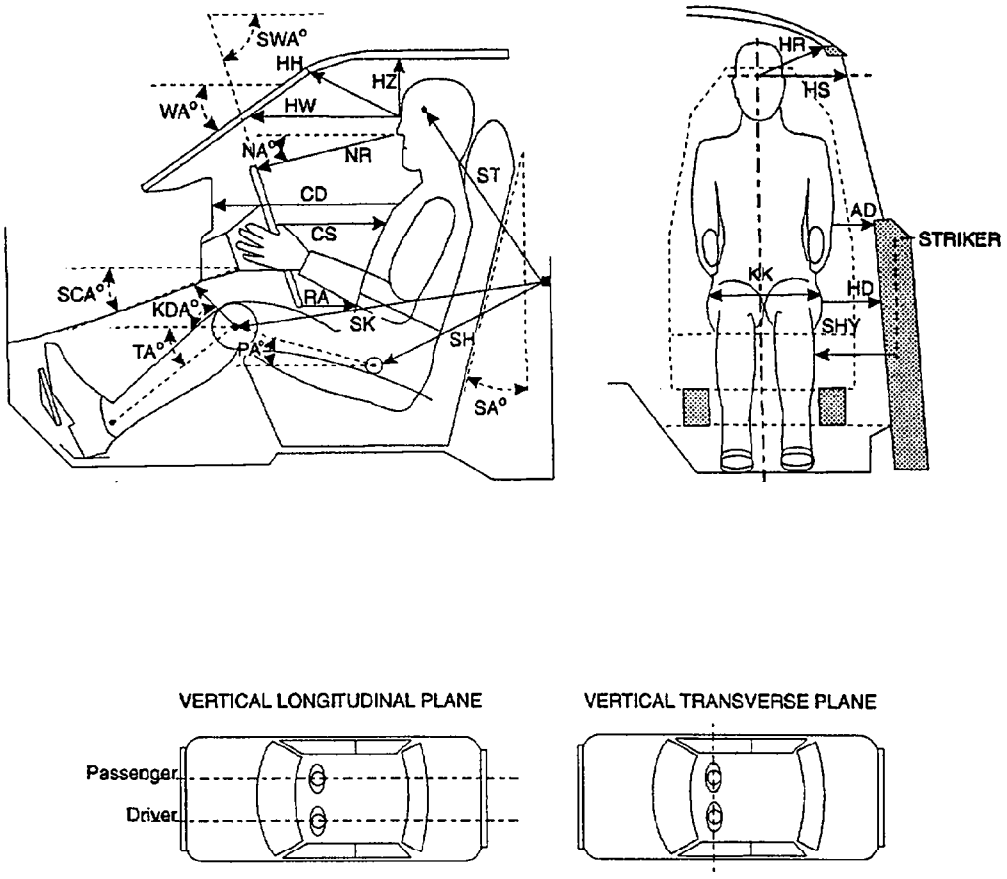


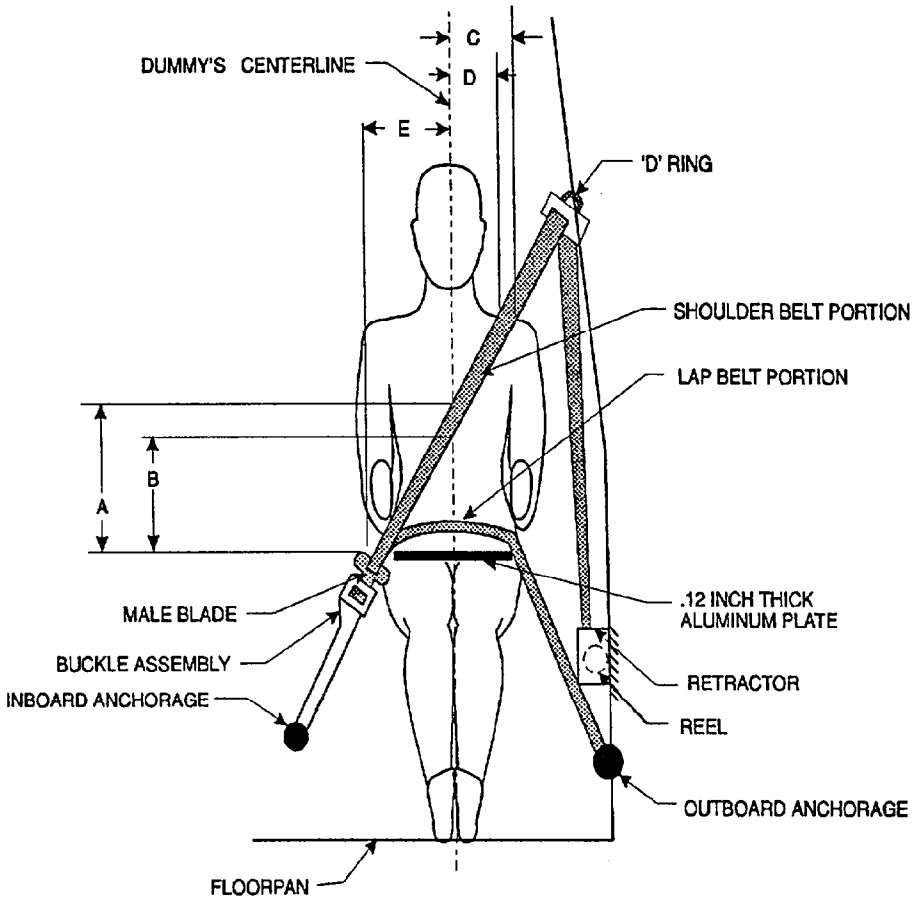
Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #142)	Passenger (Serial #192)
WA	Windshield angle	33°	33°
SWA	Steering wheel angle	68°	NA
SCA	Steering column angle	26°	NA
SA	Seat back angle	22°	22°
HZ	Head to roof	205 mm	173 mm
HH	Head to header	389 mm	360 mm
HW	Head to windshield	600 mm	540 mm
HR	Head to side header	125 mm	195 mm
NR	Nose to rim	425 mm	NA
NA	Nose to rim angle	14°	NA
CD	Chest to dash	570 mm	511 mm
CS	Steering wheel to chest	351 mm	NA
RA	Rim to abdomen	220 mm	NA
KDL	Left knee to dash	172 mm	131 mm
KDR	Right knee to dash	170 mm	131 mm
KDA	Outboard knee to dash angle	25°	25°
PA	Pelvic angle	22°	22°
TA	Tibial angle	40°	40°
KK	Knee to knee	340 mm	270 mm
ST[1]	Striker to head	377 mm	425 mm
	Striker to head angle	-77°	-76°
SK[1]	Striker to knee	626 mm	653 mm
	Striker to knee angle	15°	11°
SH[1]	Striker to H-point	355 mm	363 mm
	Striker to H-point angle	53°	47°
SHY	Striker to H-point (Y dir.)	240 mm	233 mm
HS	Head to side window	310 mm	295 mm
HD	H-point to door	188 mm	200 mm
AD	Arm to door	110 mm	70 mm

The seat back angle (SA°) is measured relative to vertical, all other angles are measured relative to horizontal.

[1] Angle measured from head restraint support.

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
A - Top surface of aluminum plate to belt upper edge	345 mm	320 mm
B - Top surface of aluminum plate to belt lower edge	275 mm	240 mm
C - Dummy centerline to outer edge of belt at chest flesh top	110 mm	133 mm
D - Dummy centerline to inner edge of belt at chest flesh top	45 mm	75 mm
Lap belt tension	13 N	13 N
Shoulder belt tension	18 N	13 N
Adjustable seat belt anchorage position	One down from uppermost	One down from uppermost

Figure 10 Camera Positions

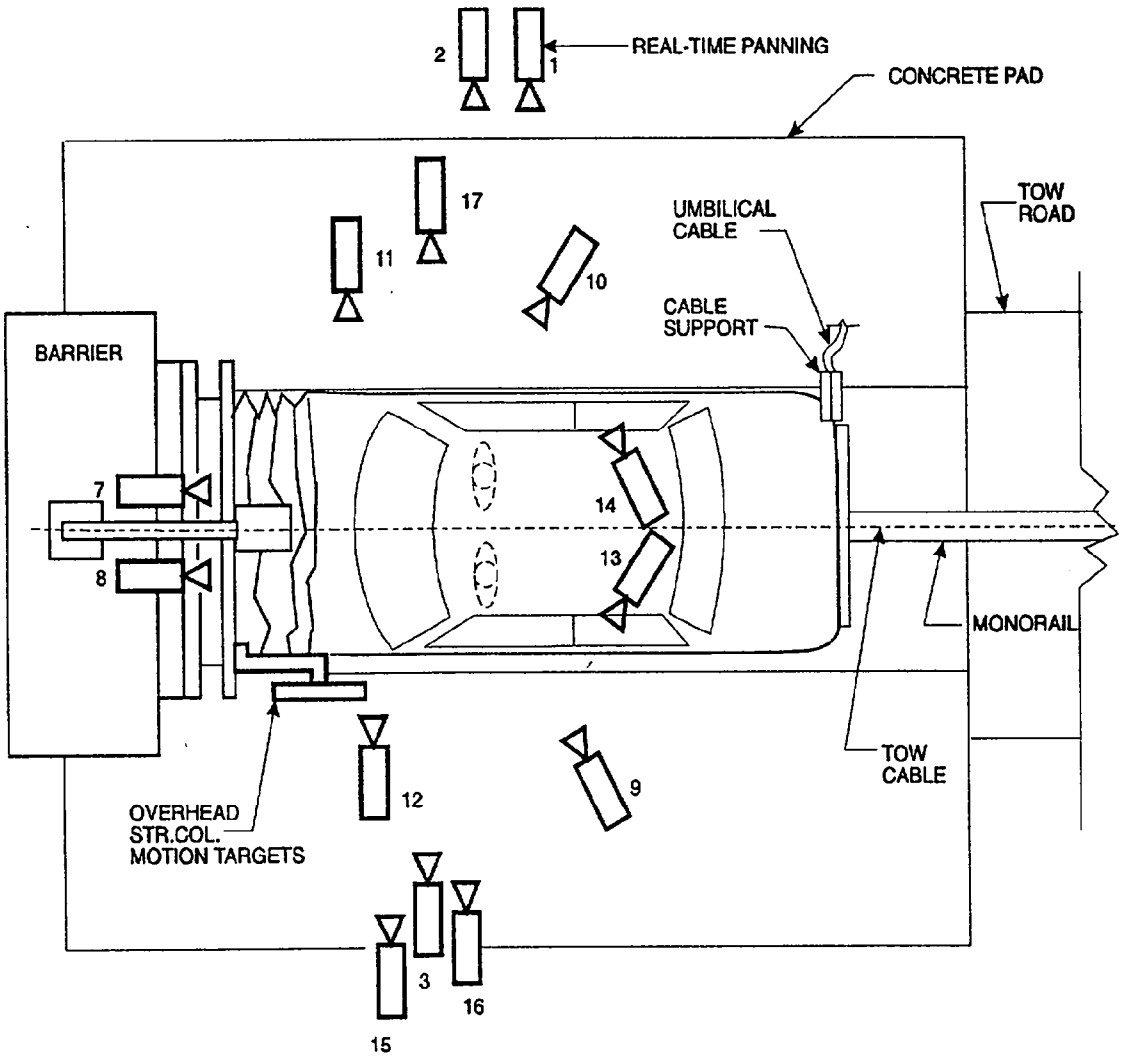


Figure 10 Camera Positions, Cont'd.

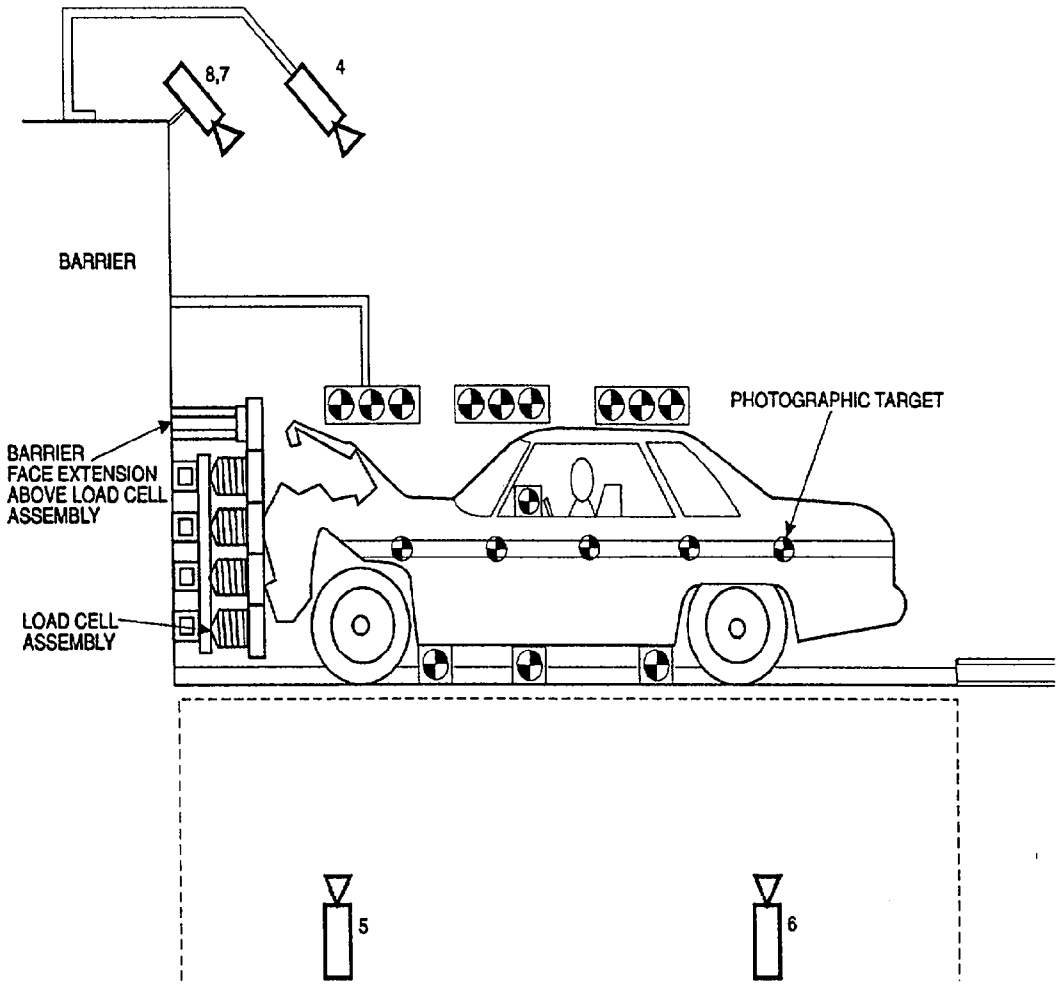


Table 13 Motion Picture Camera Locations

Test Number: 941005

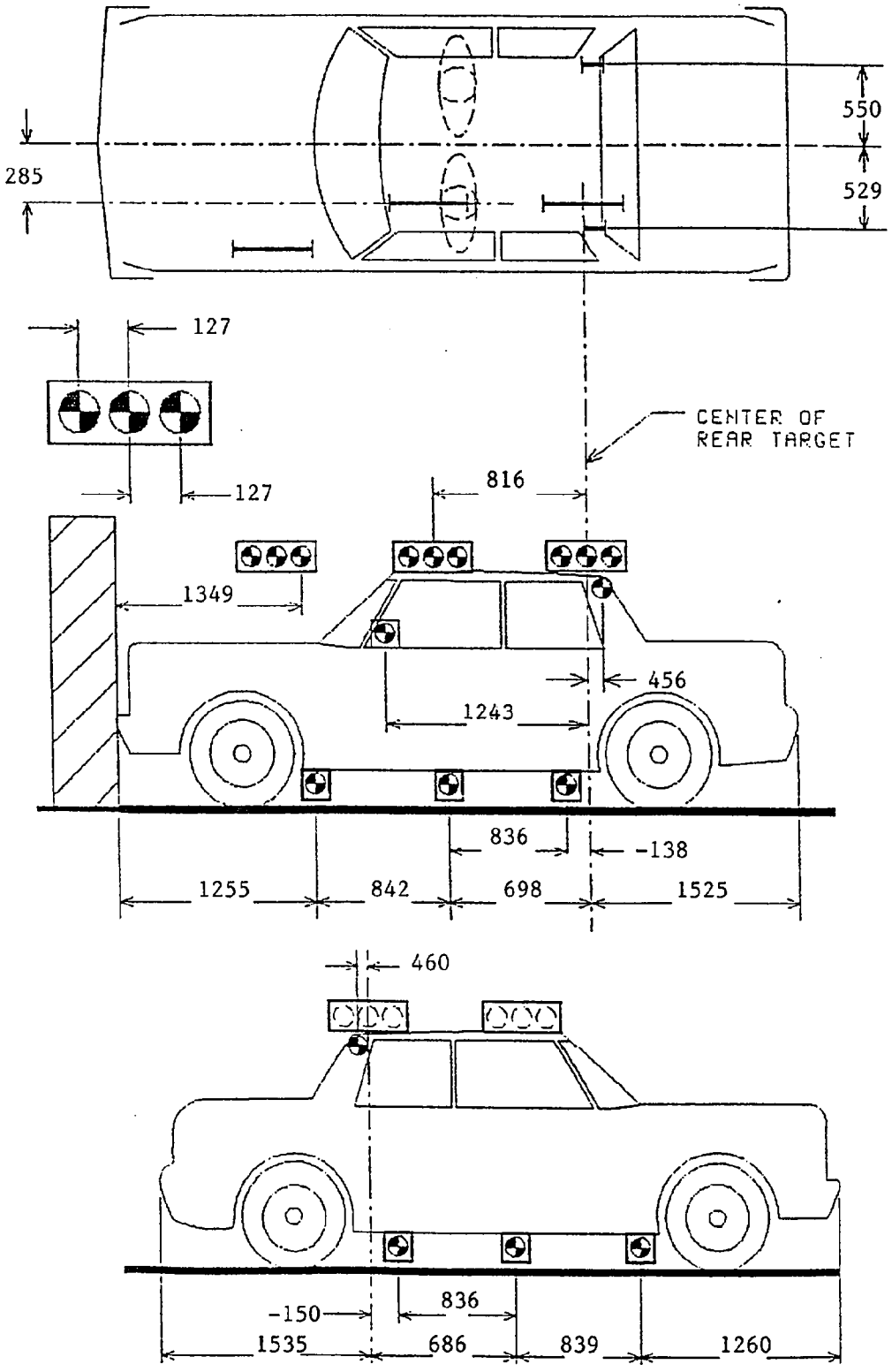
Vehicle year/make/model/body style: 1994/Volkswagen/Jetta III/4-door sedan

Camera Number	View	Camera Positions[1] X	Y	Z	Angle[2]	Film Plane to Head Target	Lens	Film Speed
1	Real-time panning	-3607 mm	-2802 mm	1549 mm	NA	NA mm	16 mm	24 frames/s
2	Vehicle crush	-2065 mm	-6767 mm	942 mm	-2°	NA mm	13 mm	498 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	6020 mm	25 mm	1018 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	NA mm	13 mm	500 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	NA mm	13 mm	1000 frames/s
6	Fluid spillage	-2522 mm	0 mm	-2515 mm	90°	NA mm	13 mm	1000 frames/s
7	Passenger kinematics	-114 mm	-351 mm	2159 mm	-40°	NA mm	17 mm	498 frames/s
8	Driver kinematics	-173 mm	368 mm	2159 mm	-41°	NA mm	17 mm	515 frames/s
9	Driver kinematics	-4572 mm	1854 mm	2591 mm	-27°	2261 mm	25 mm	498 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	2311 mm	25 mm	492 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA mm	50 mm	513 frames/s
12	Windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA mm	50 mm	502 frames/s
13	Driver seat belt movement	NA	NA	NA	NA	NA mm	13 mm	495 frames/s
14	Passenger seat belt movement	NA	NA	NA	NA	NA mm	13 mm	500 frames/s
15	Column movement	-2667 mm	7264 mm	2616 mm	-14°	NA mm	25 mm	515 frames/s
16	Column movement	-2667 mm	7264 mm	1908 mm	-9°	NA mm	25 mm	500 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	5029 mm	25 mm	500 frames/s

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

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

Figure 11 Vehicle Target Locations



All measurements are in millimeters.

Figure 12 Pre-Test And Post-Test Measurement Points

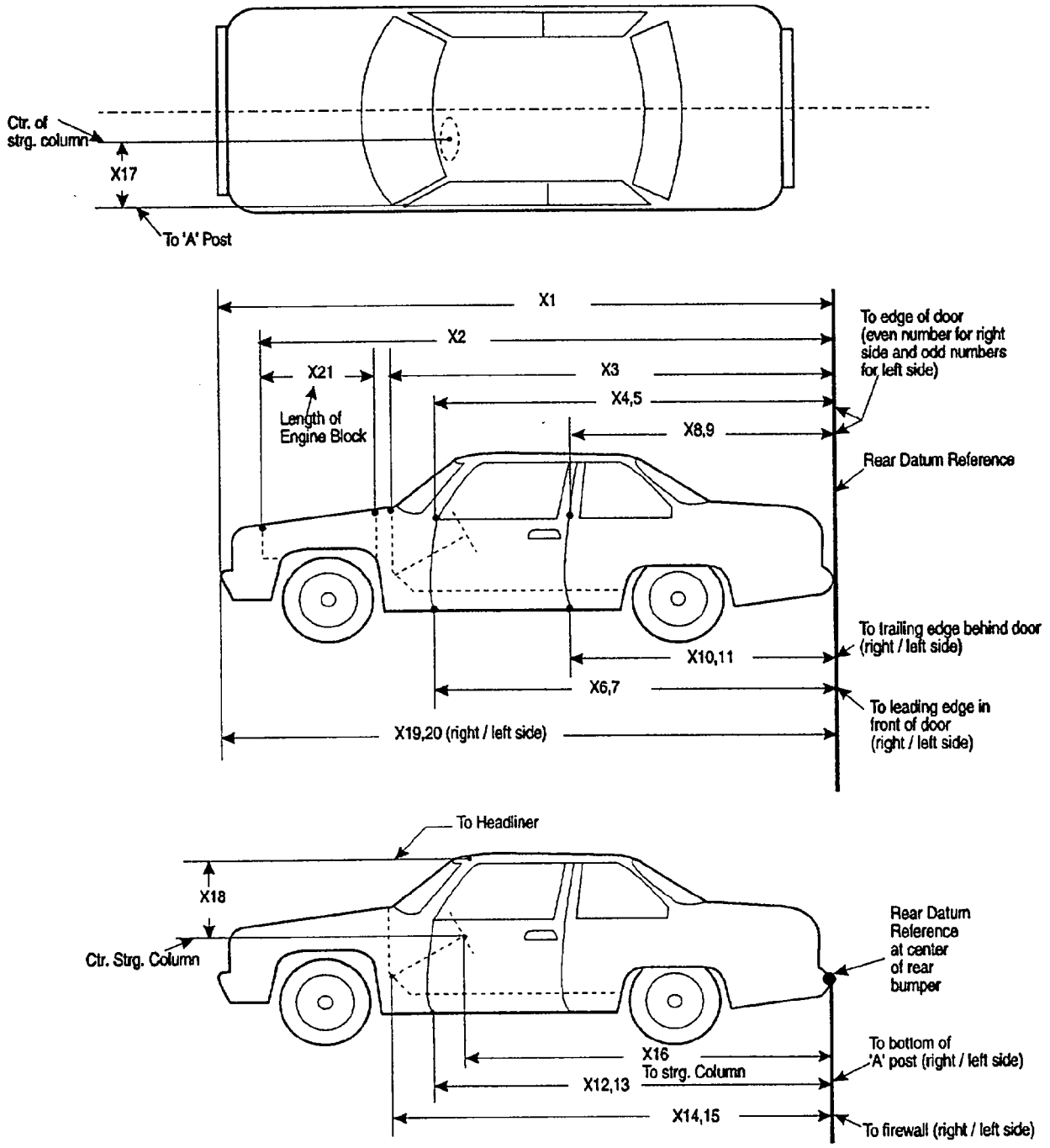


Table 14 Impacted Vehicle Measurements

Vehicle Make/Model: Volkswagen Jetta III Test Number: 941005

No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4320 mm	3770 mm	550 mm
X2	Rear surface of vehicle to front of engine block	3664 mm	3390 mm	274 mm
X3	Rear surface of vehicle to firewall	3317 mm	3200 mm	117 mm
X4	Rear surface of vehicle to upper leading edge of right door	3060 mm	3020 mm	40 mm
X5	Rear surface of vehicle to upper leading edge of left door	3062 mm	3022 mm	40 mm
X6	Rear surface of vehicle to lower leading edge of right door	3019 mm	2985 mm	34 mm
X7	Rear surface of vehicle to lower leading edge of left door	3030 mm	2993 mm	37 mm
X8	Rear surface of vehicle to upper trailing edge of right door	1980 mm	1940 mm	40 mm
X9	Rear surface of vehicle to upper trailing edge of left door	1980 mm	1942 mm	38 mm
X10	Rear surface of vehicle to lower trailing edge of right door	1995 mm	1957 mm	38 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2006 mm	1974 mm	32 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3020 mm	2972 mm	48 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3020 mm	2981 mm	39 mm
X14	Rear surface of vehicle to firewall - right side	3283 mm	3173 mm	110 mm
X15	Rear surface of vehicle to firewall - left side	3381 mm	3193 mm	188 mm
X16	Rear surface of vehicle to steering wheel center	2595 mm	2565 mm	30 mm
X17	Center of steering column to "A" post	265 mm	260 mm	5 mm
X18	Center of steering column to headliner	455 mm	496 mm	-41 mm
X19	Rear surface of vehicle to right side of front bumper	4220 mm	3721 mm	499 mm
X20	Rear surface of vehicle to left side of front bumper	4226 mm	3721 mm	505 mm
X21	Length of engine block	380 mm	380 mm	0 mm

Appendix A

Photographs

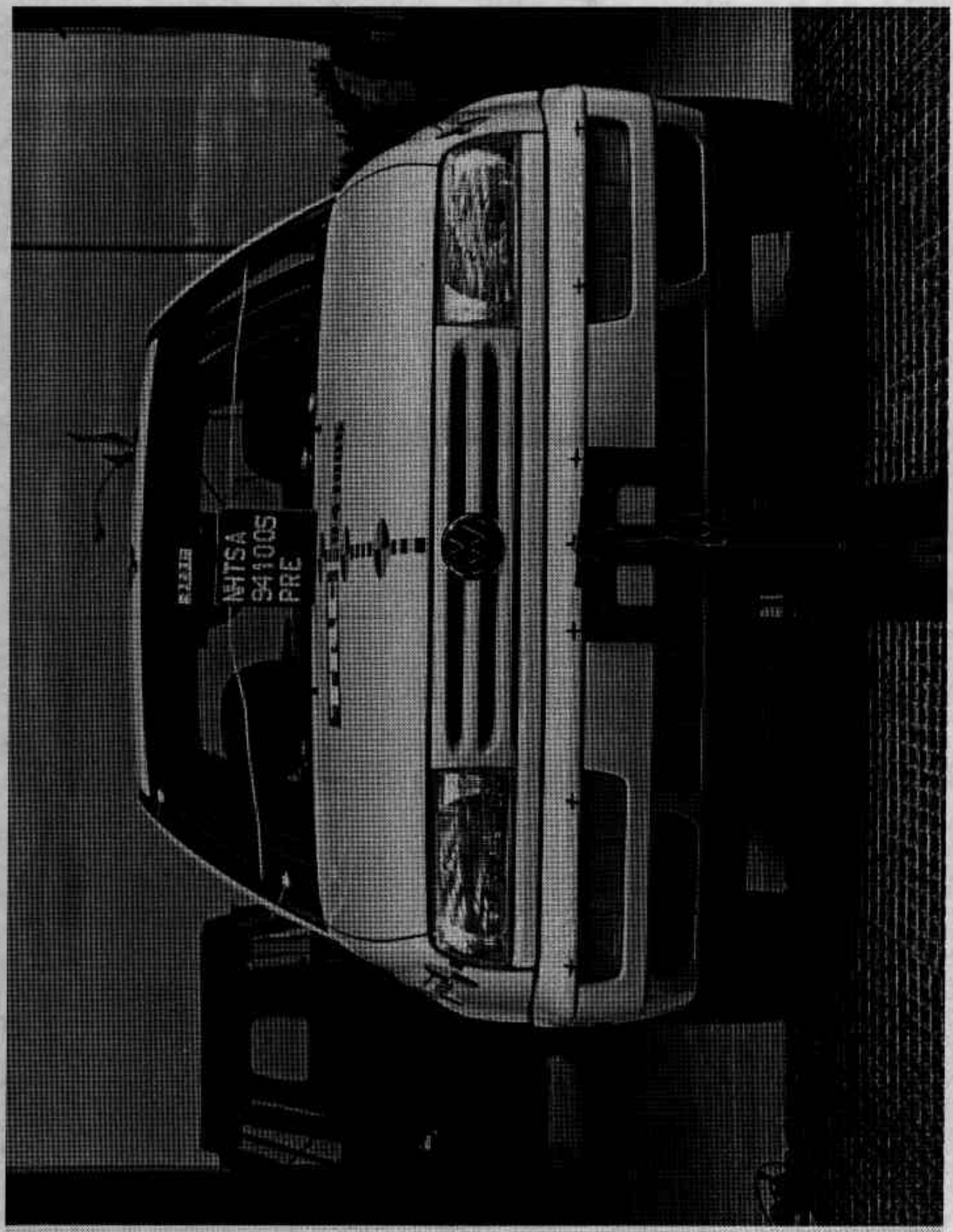


Figure A-1. Pre-Test Front View

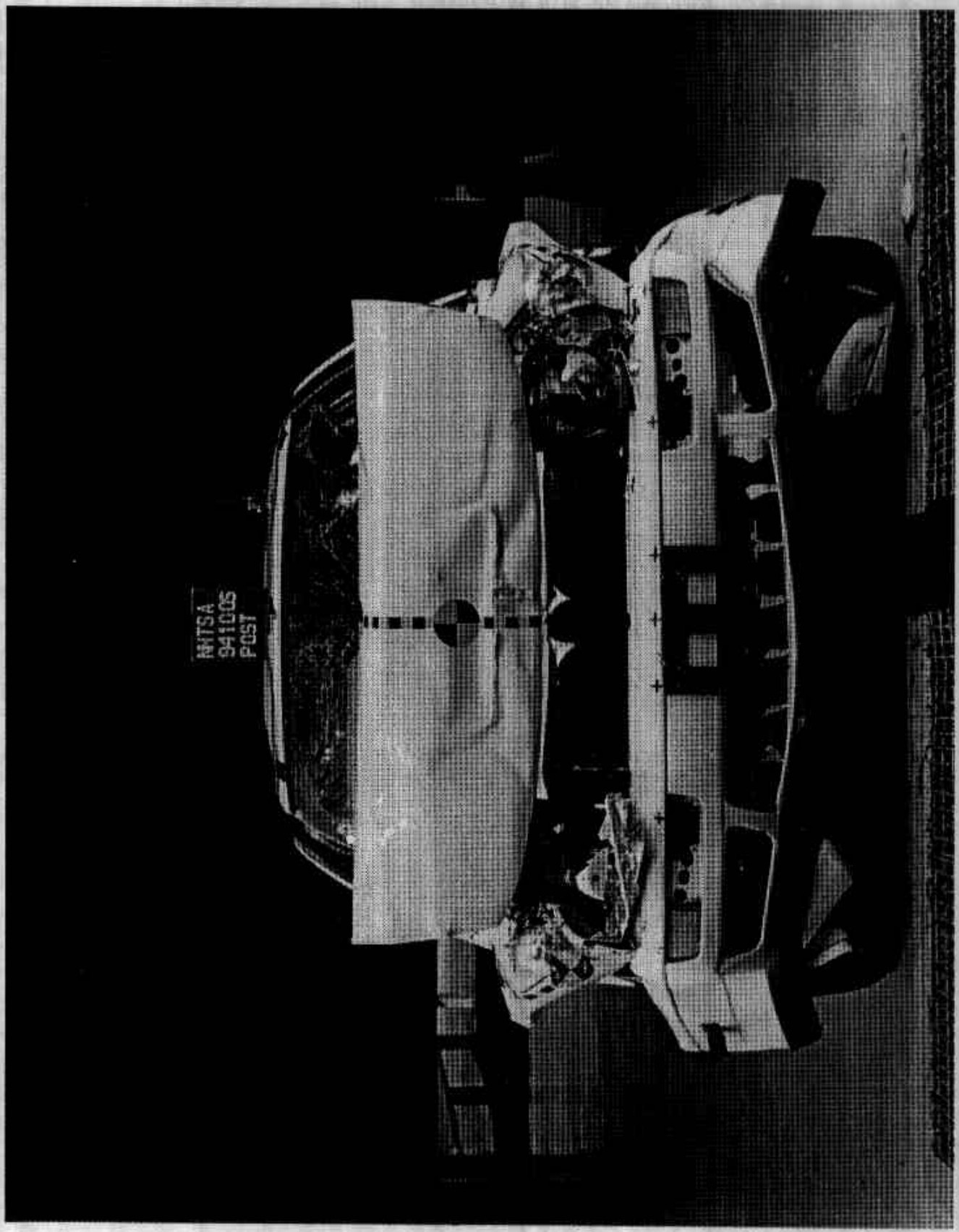


Figure A-2. Post-Test Front View

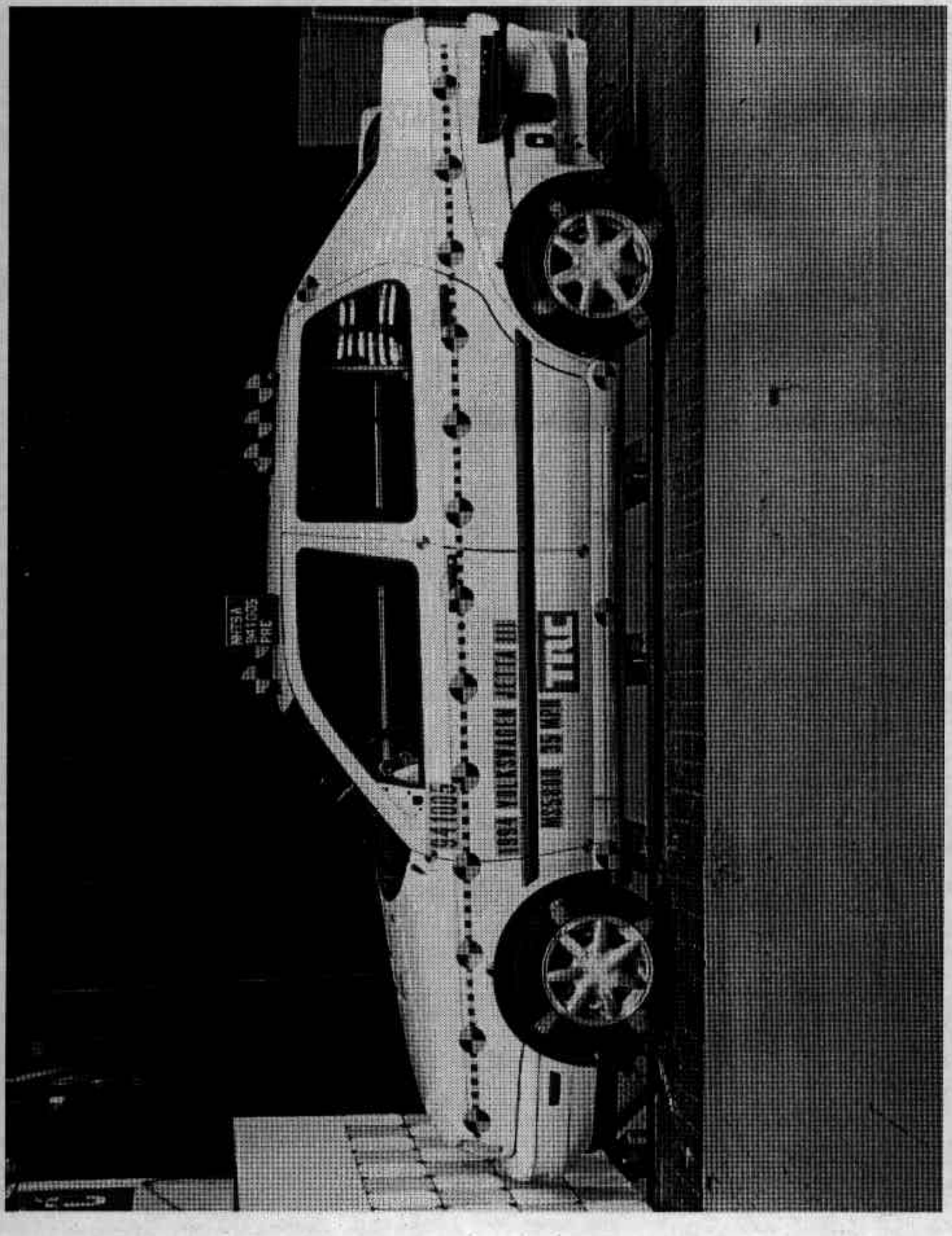


Figure A-3. Pre-Test Left Side View

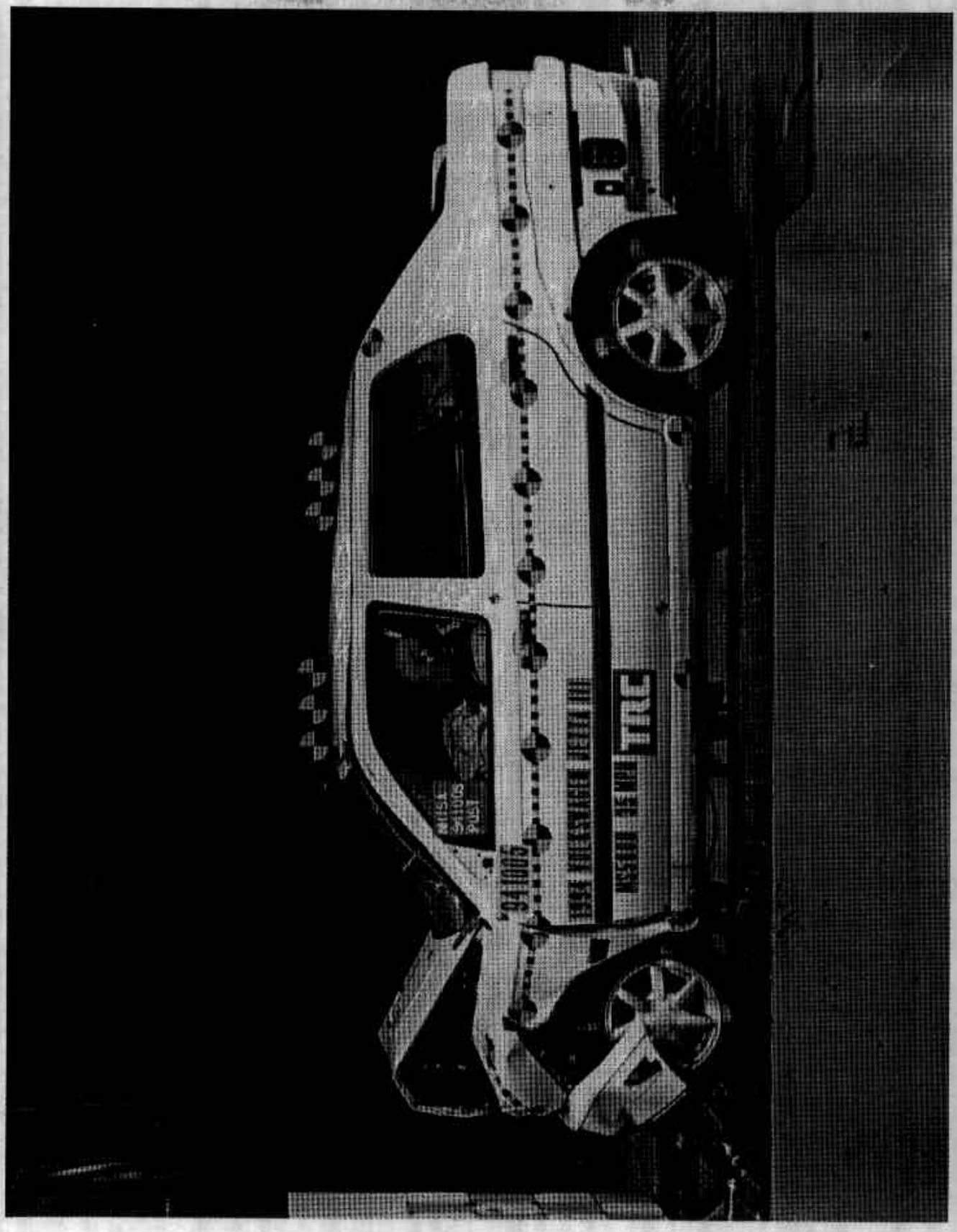


Figure A-4. Post-Test Left Side View

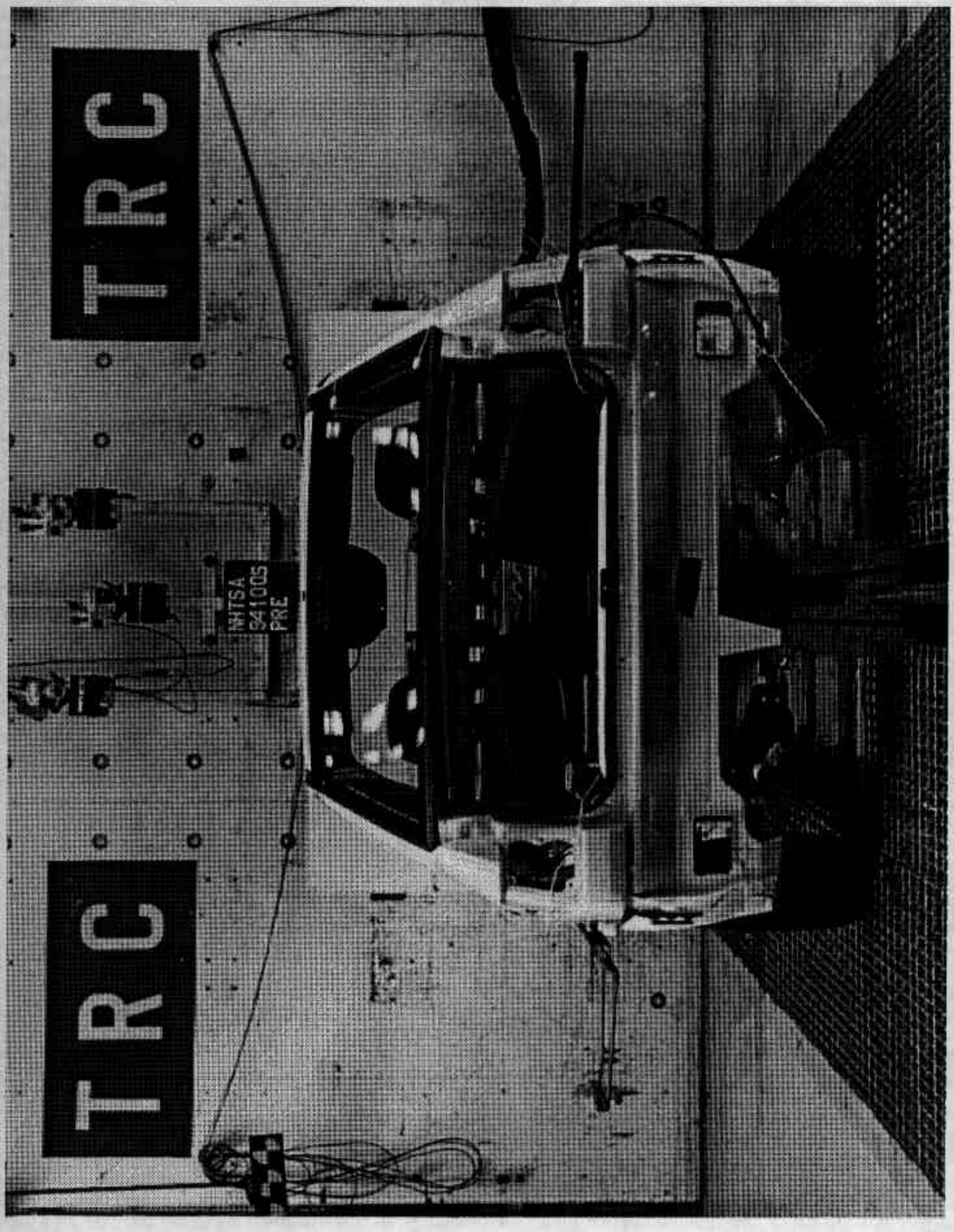


Figure A-5. Pre-Test Rear View

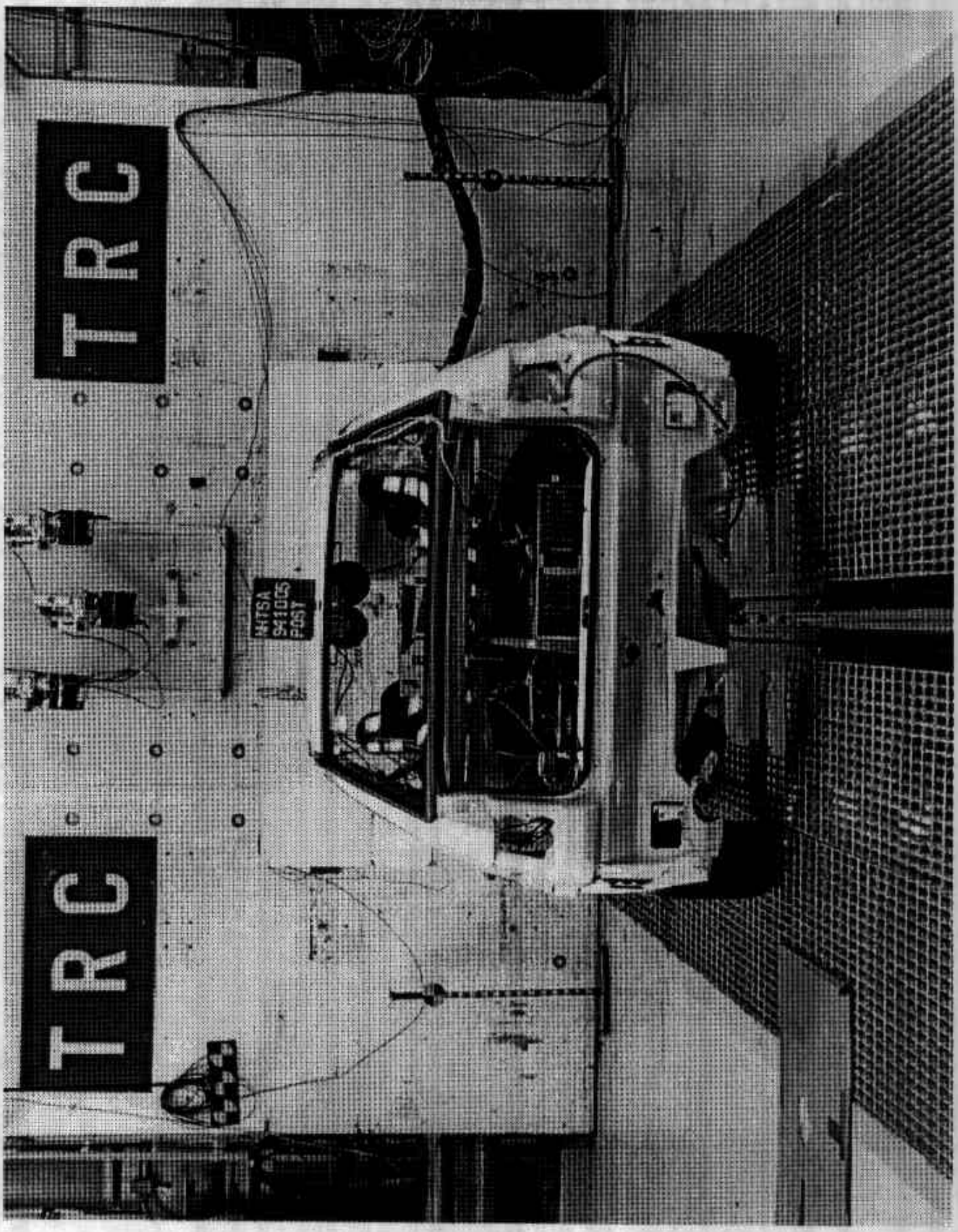


Figure A-6. Post-Test Rear View

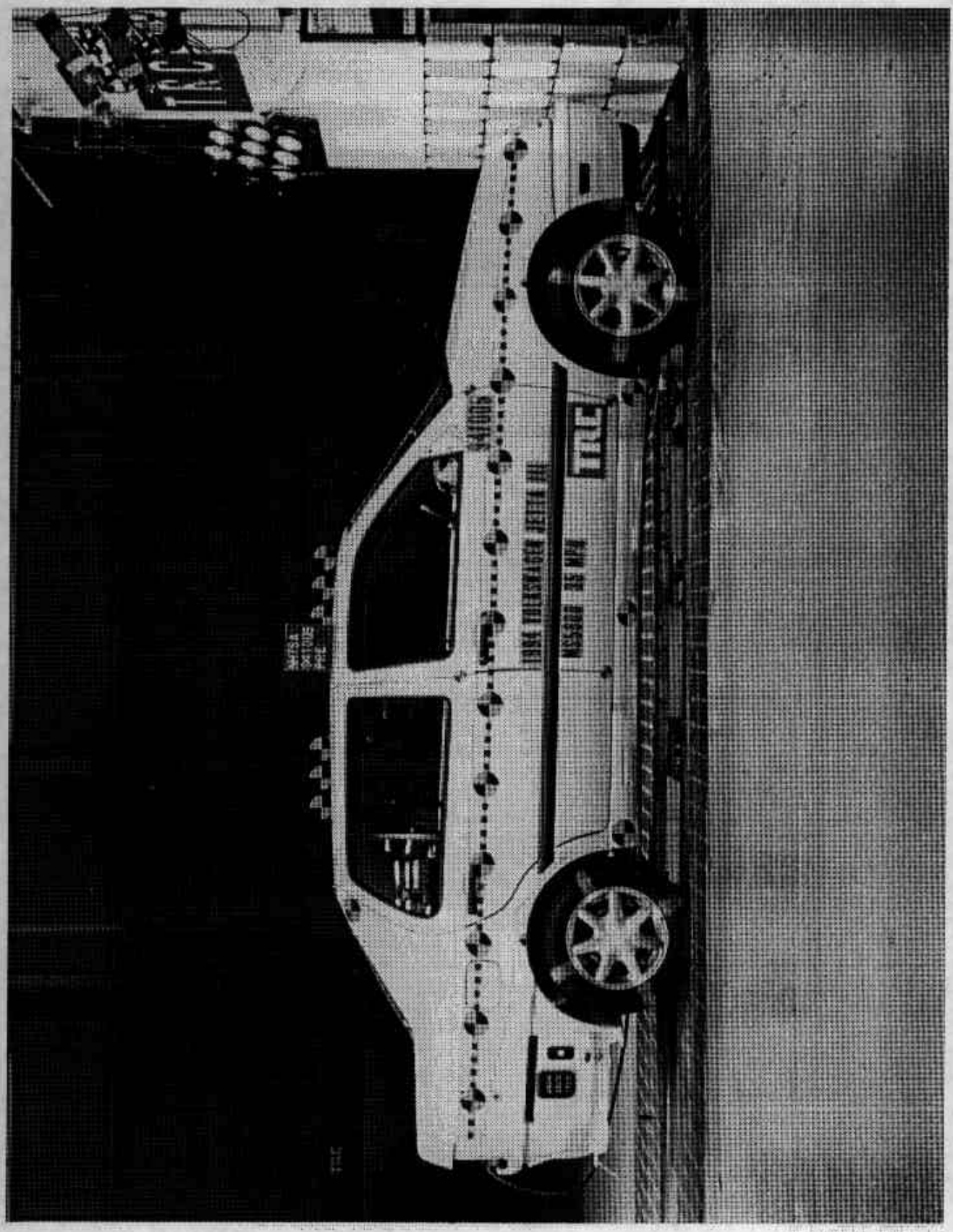


Figure A-7. Pre-Test Right Side View

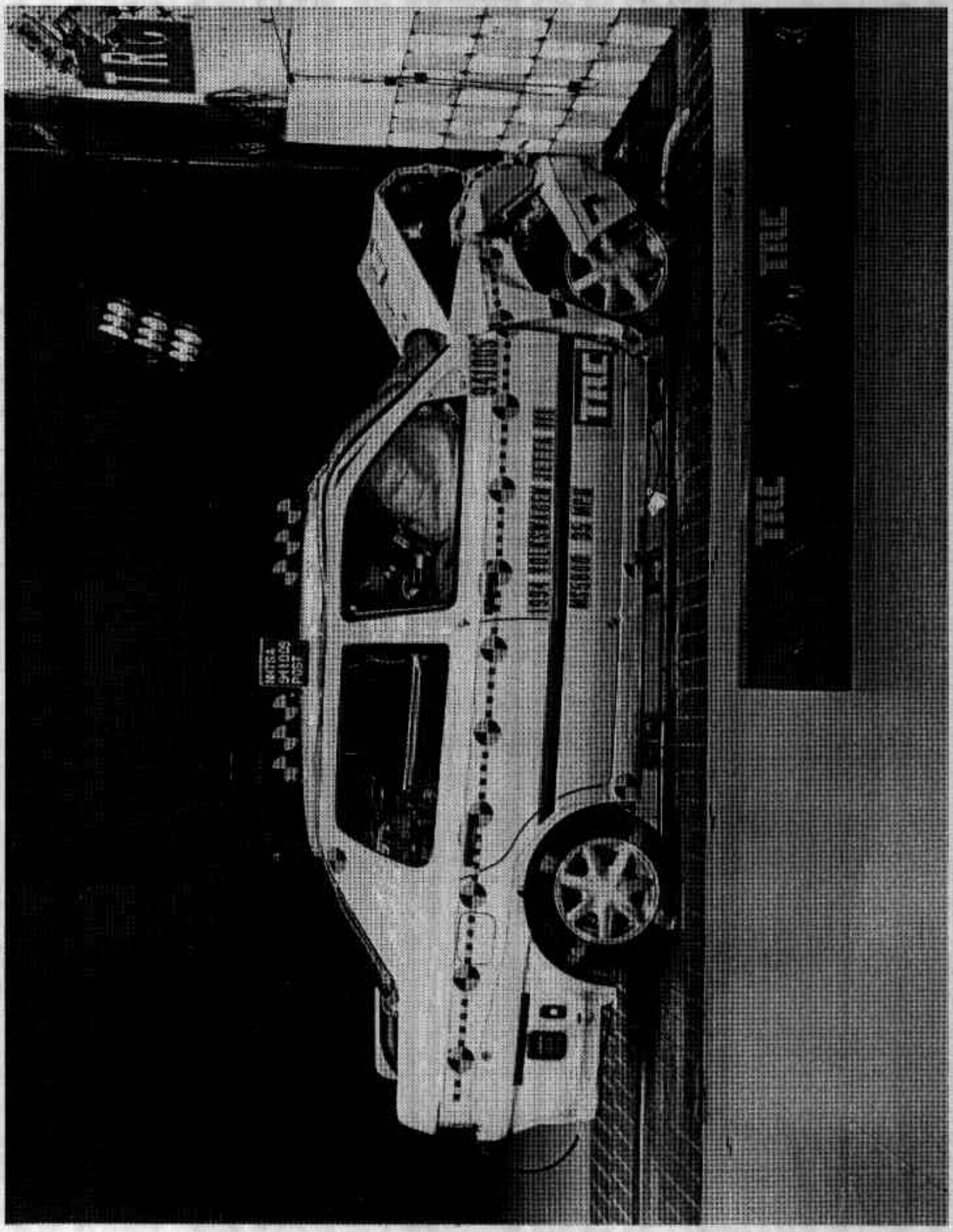


Figure A-8. Post-Test Right Side View

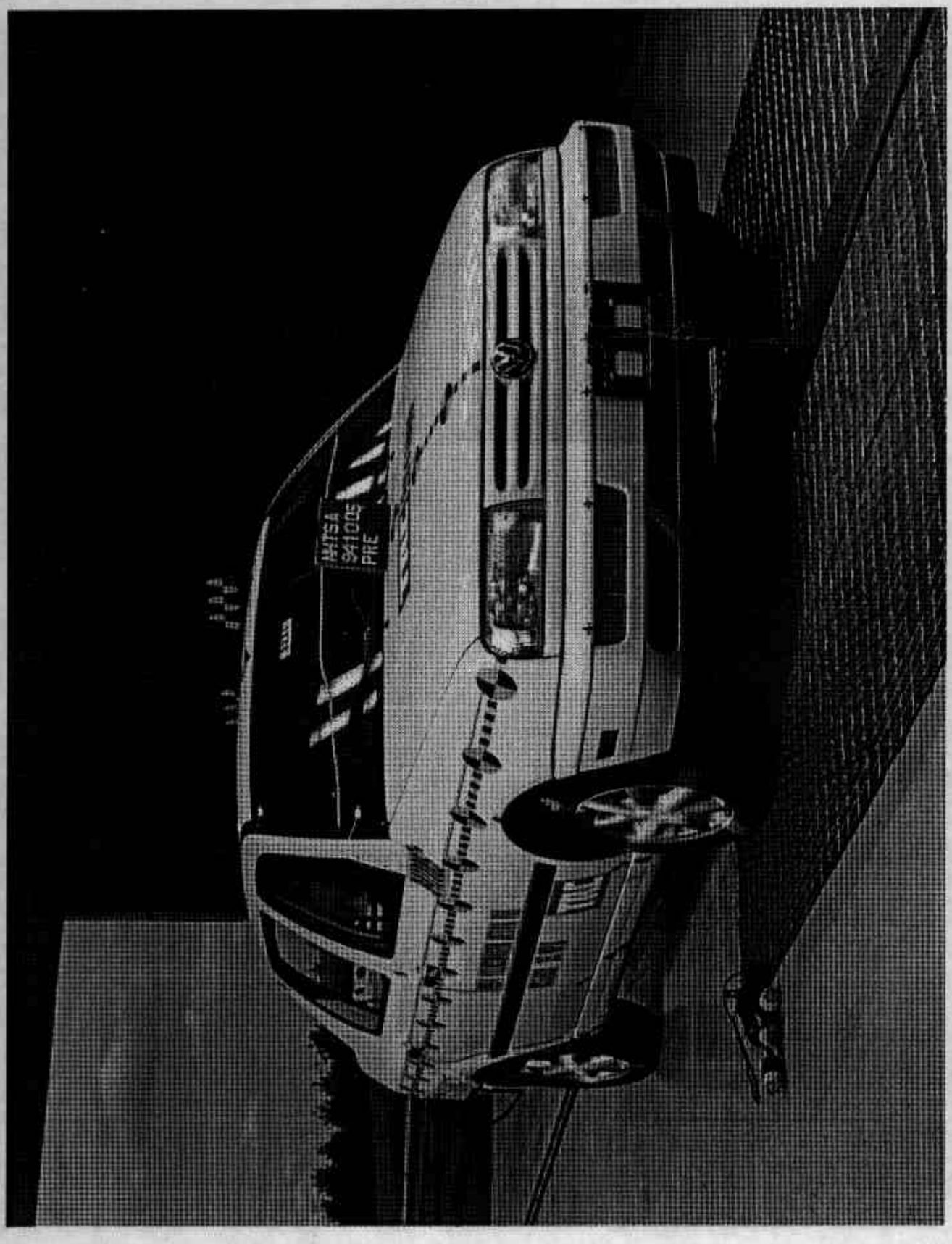


Figure A-9. Pre-Test Right Front Three-Quarter View

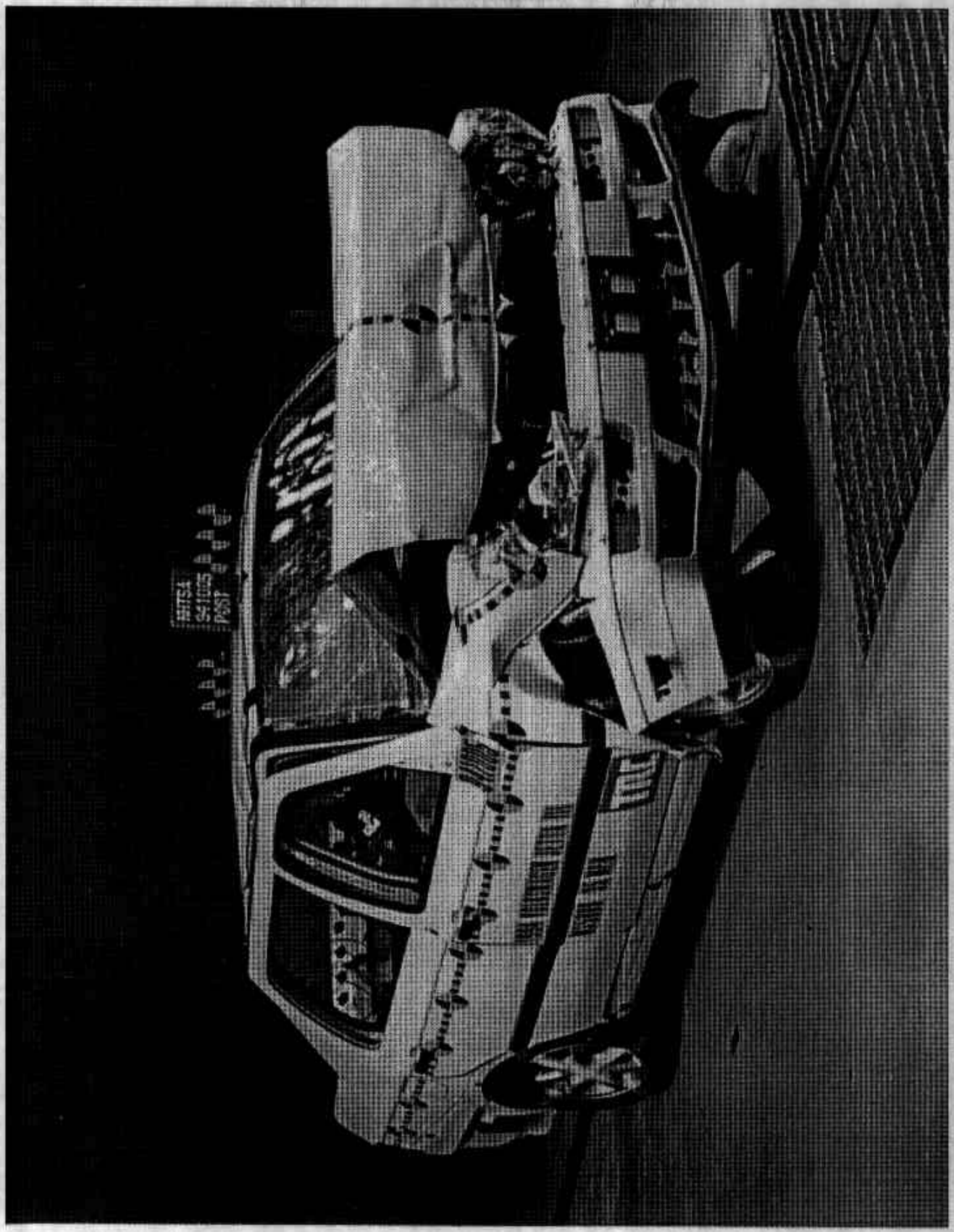


Figure A-10. Post-Test Right Front Three-Quarter View

Figure A-11. Pre-Test Left Rear Three-Quarter View

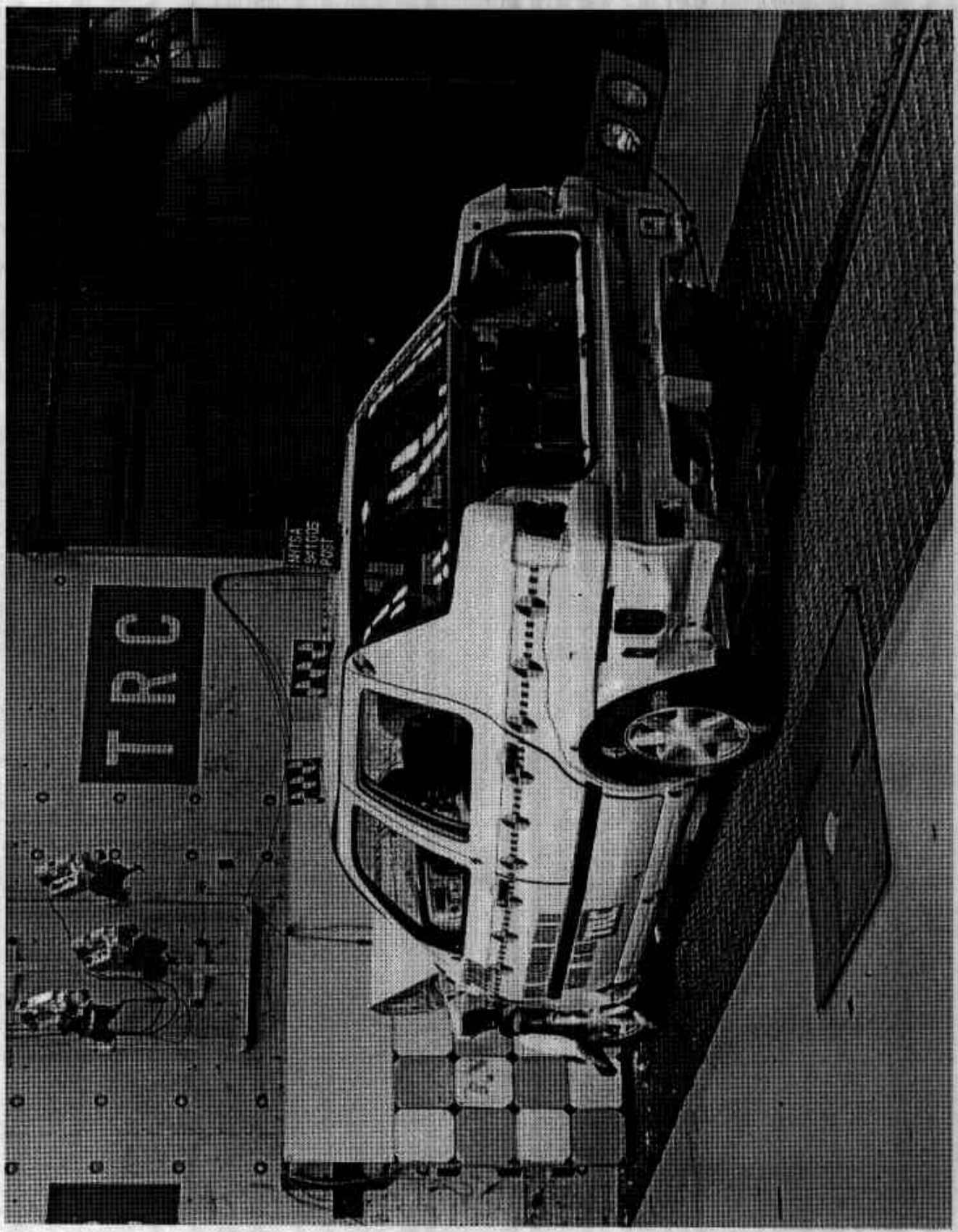


Figure A-12. Post-Test Left Rear Three-Quarter View

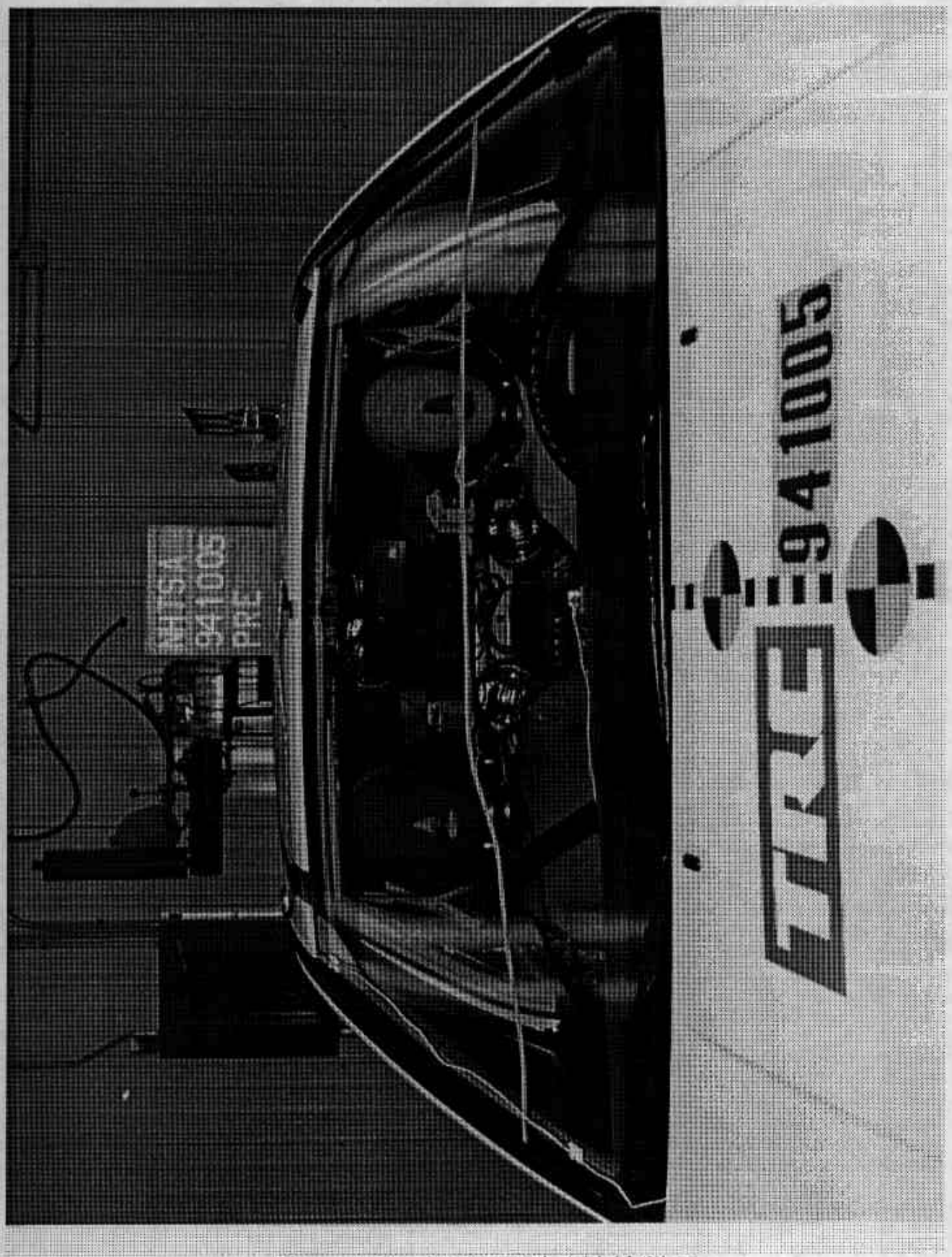


Figure A-13. Pre-Test Windshield View

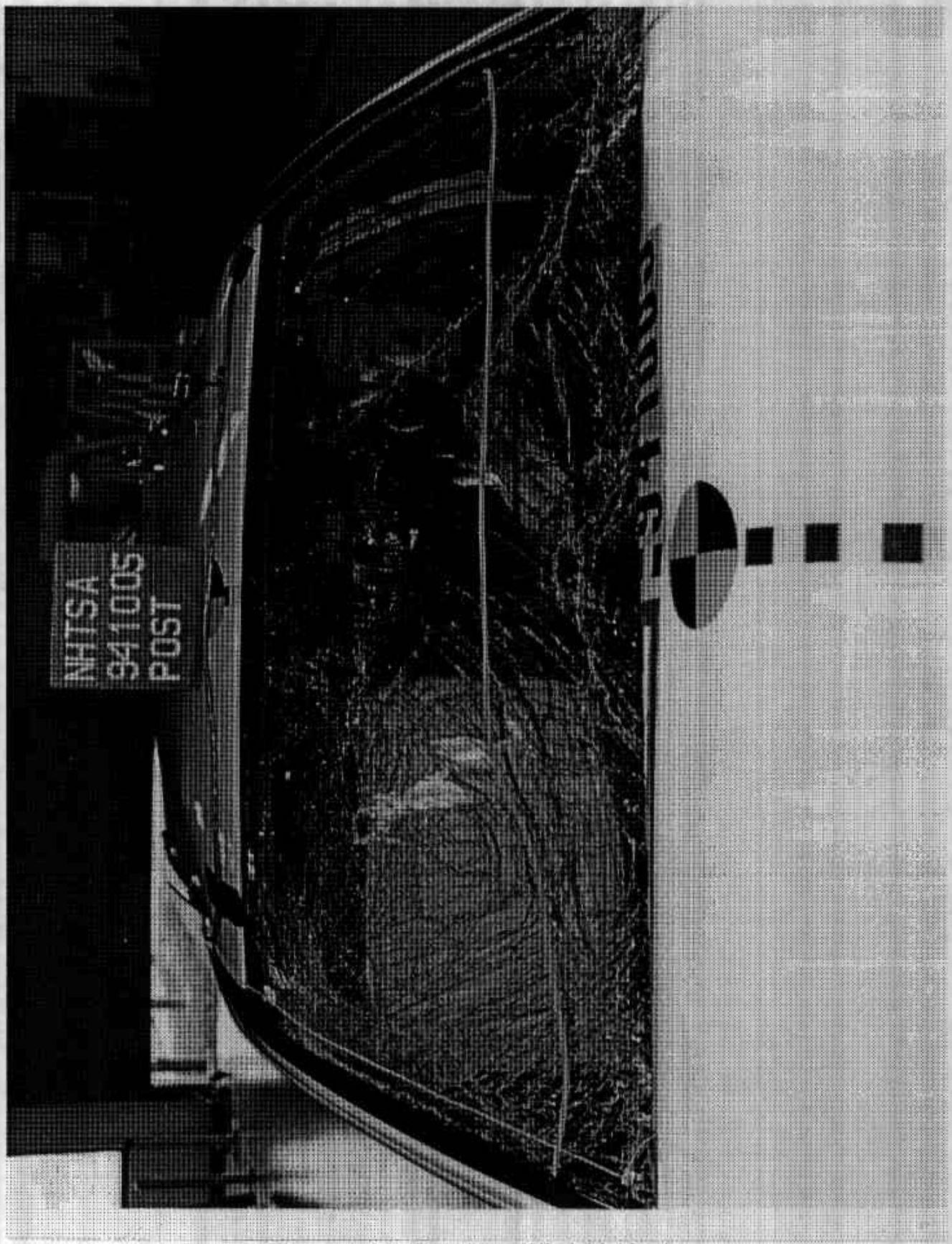


Figure A-14. Post-Test Windshield View

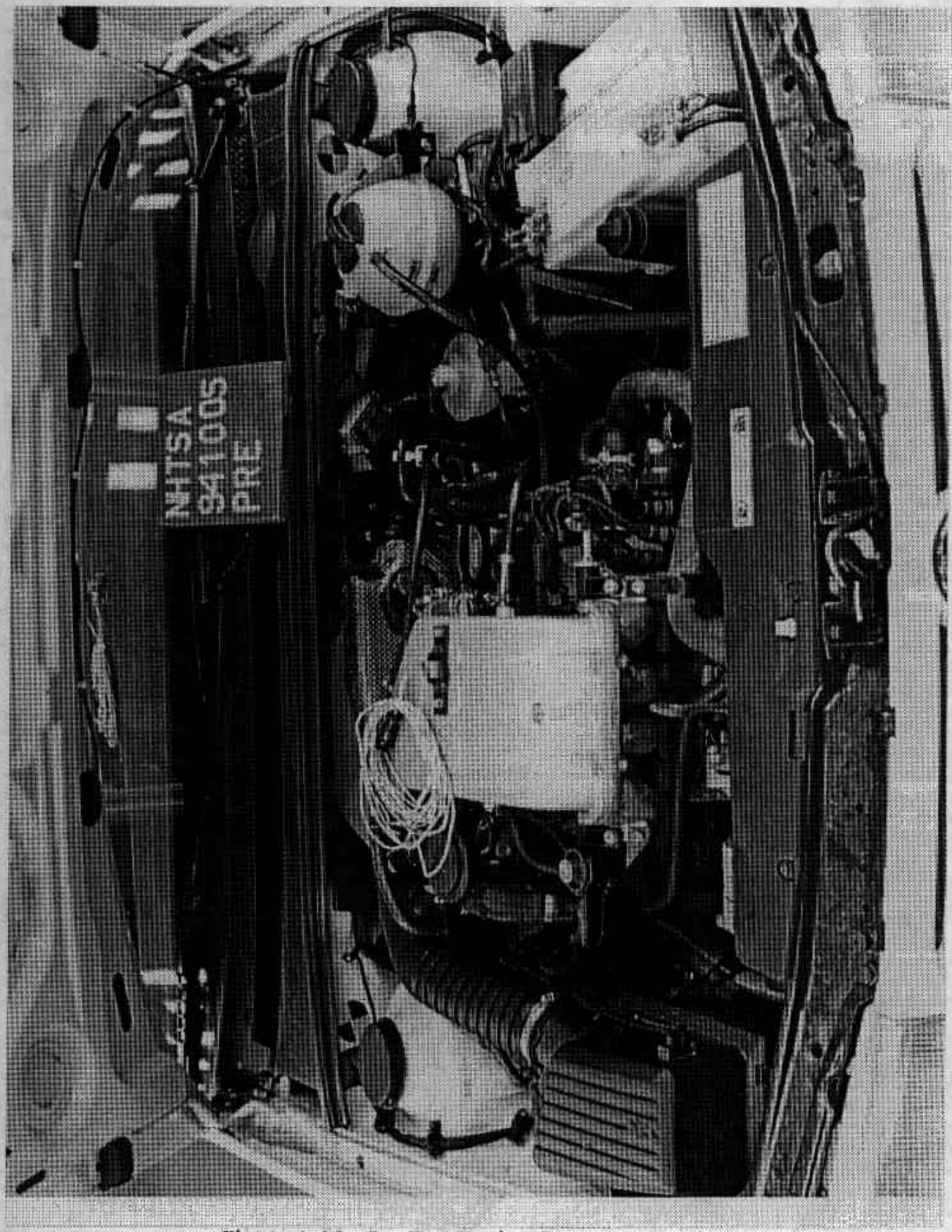


Figure A-15. Pre-Test Engine Compartment View

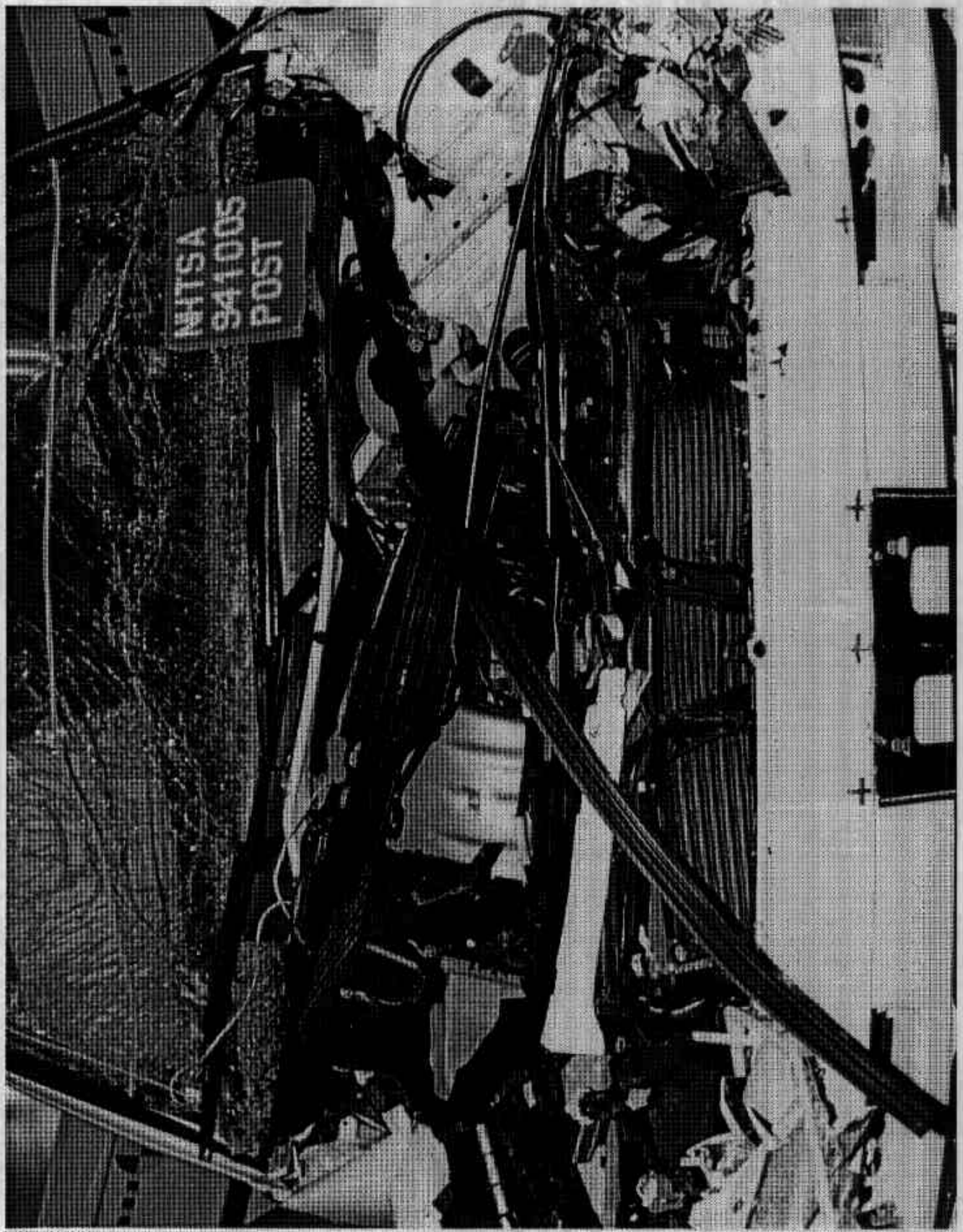


Figure A-16. Post-Test Engine Compartment View

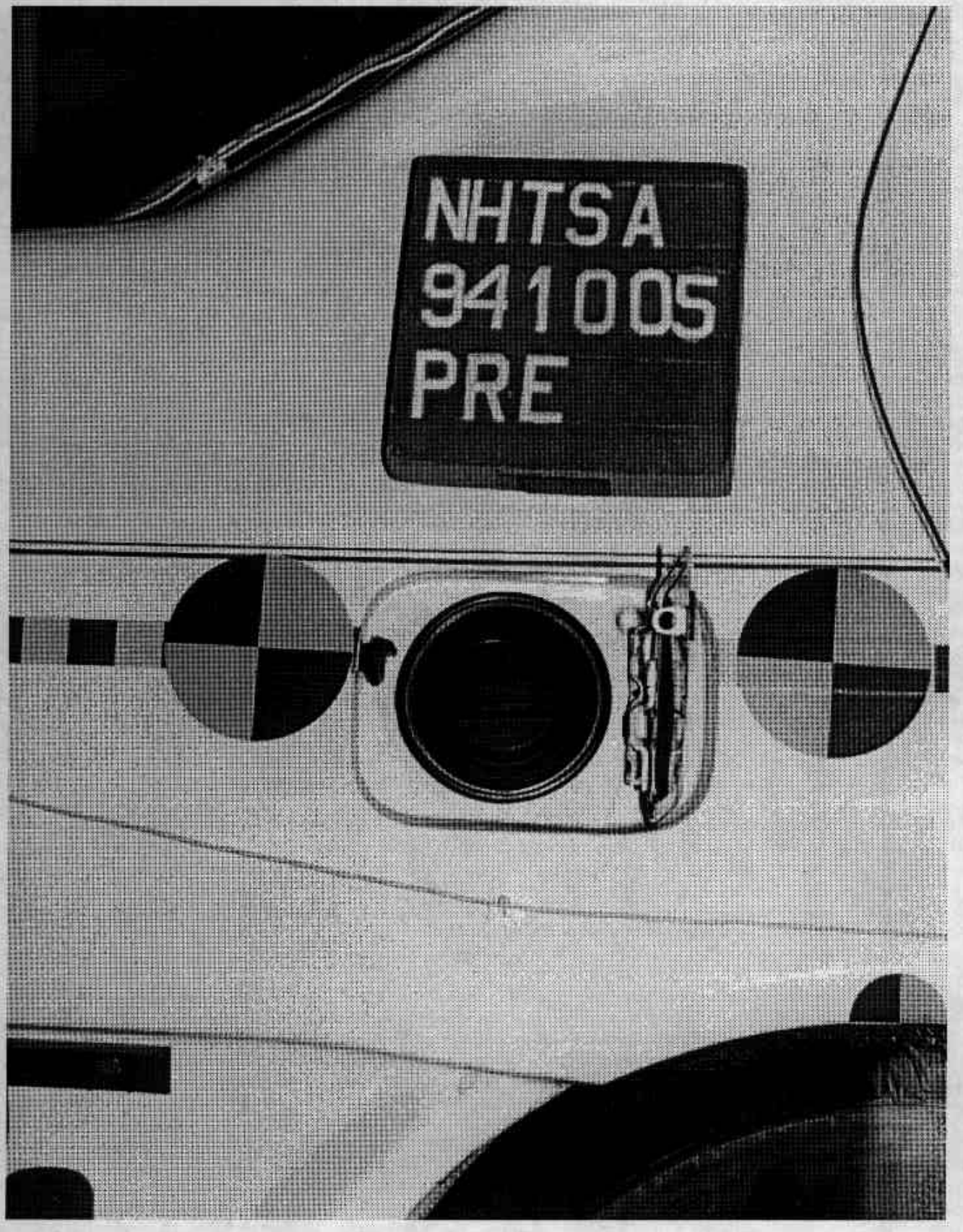


Figure A-17. Pre-Test Fuel Filler Cap View

Figure A-18. Post-Test Fuel Filler Cap View

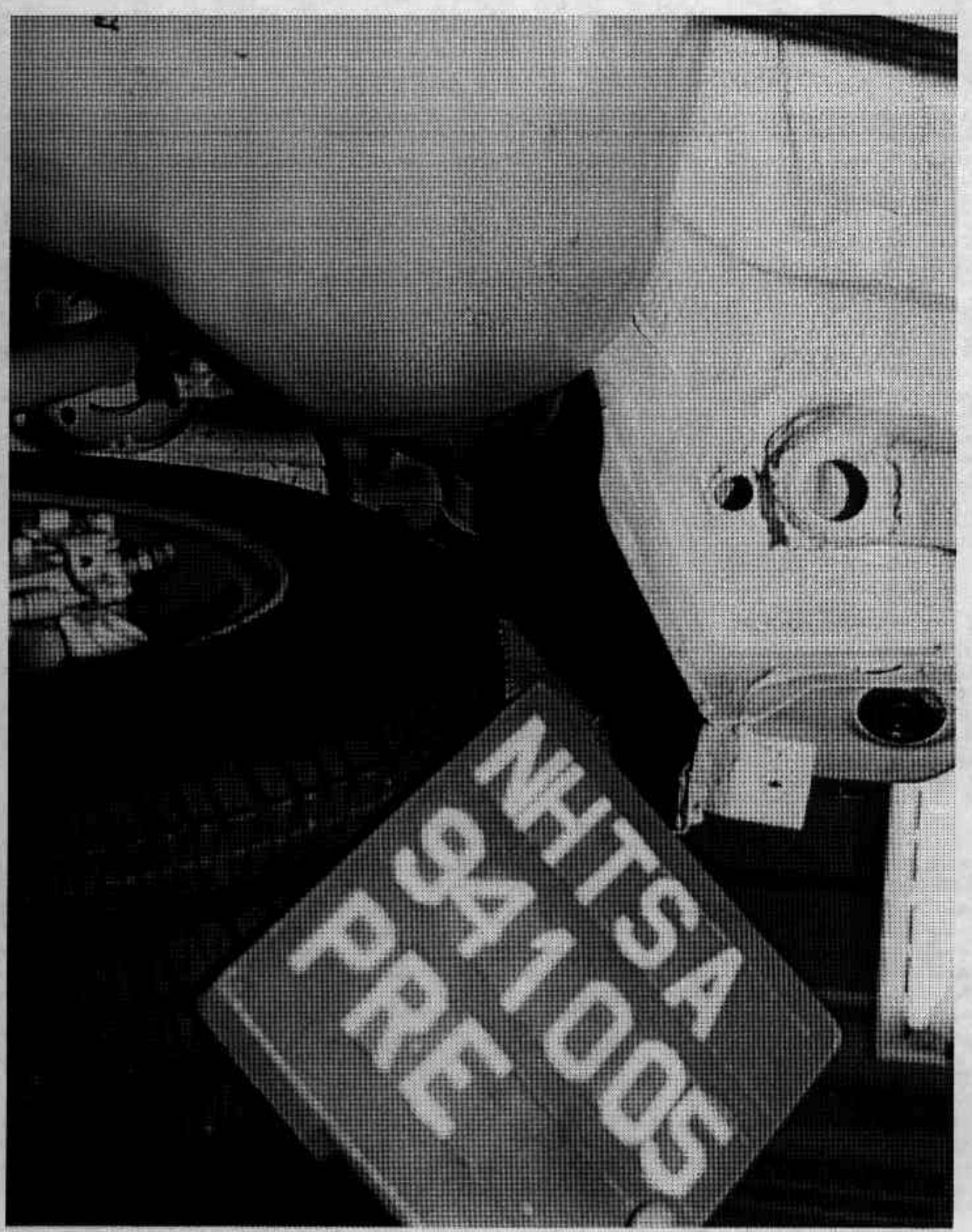


Figure A-19. Pre-Test Fuel Filler Neck View

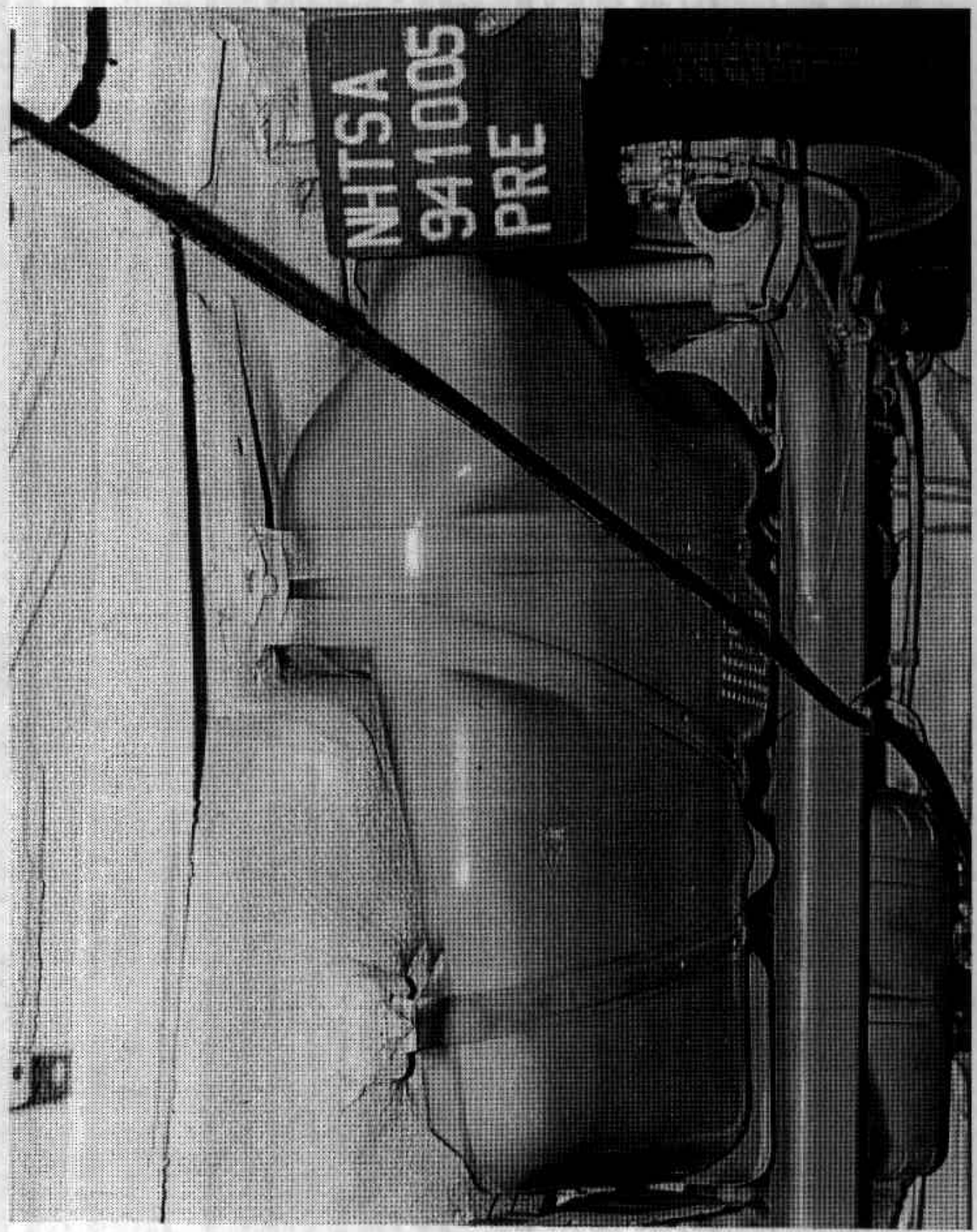


Figure A-20. Pre-Test Fuel Tank View

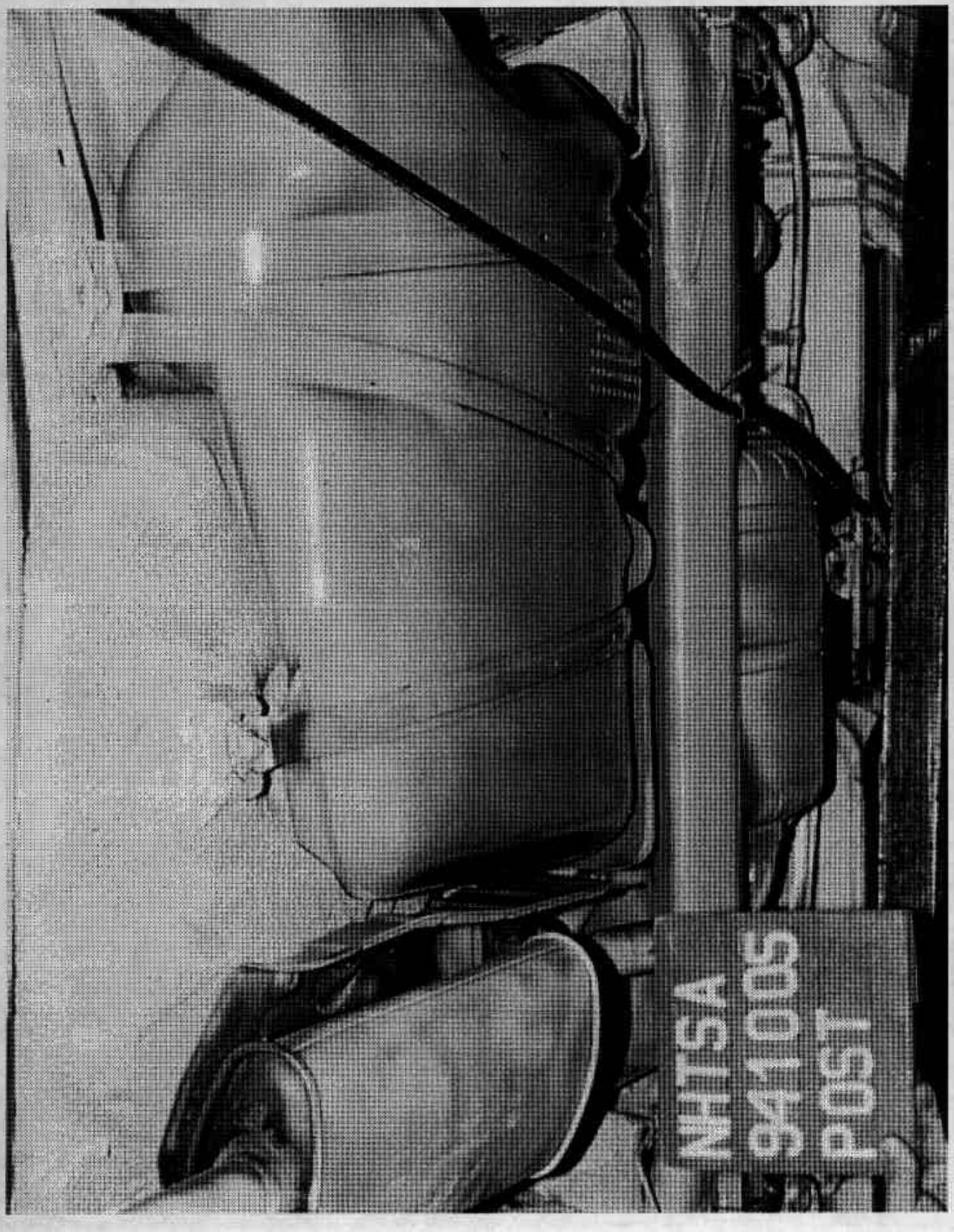


Figure A-21. Post-Test Fuel Tank View

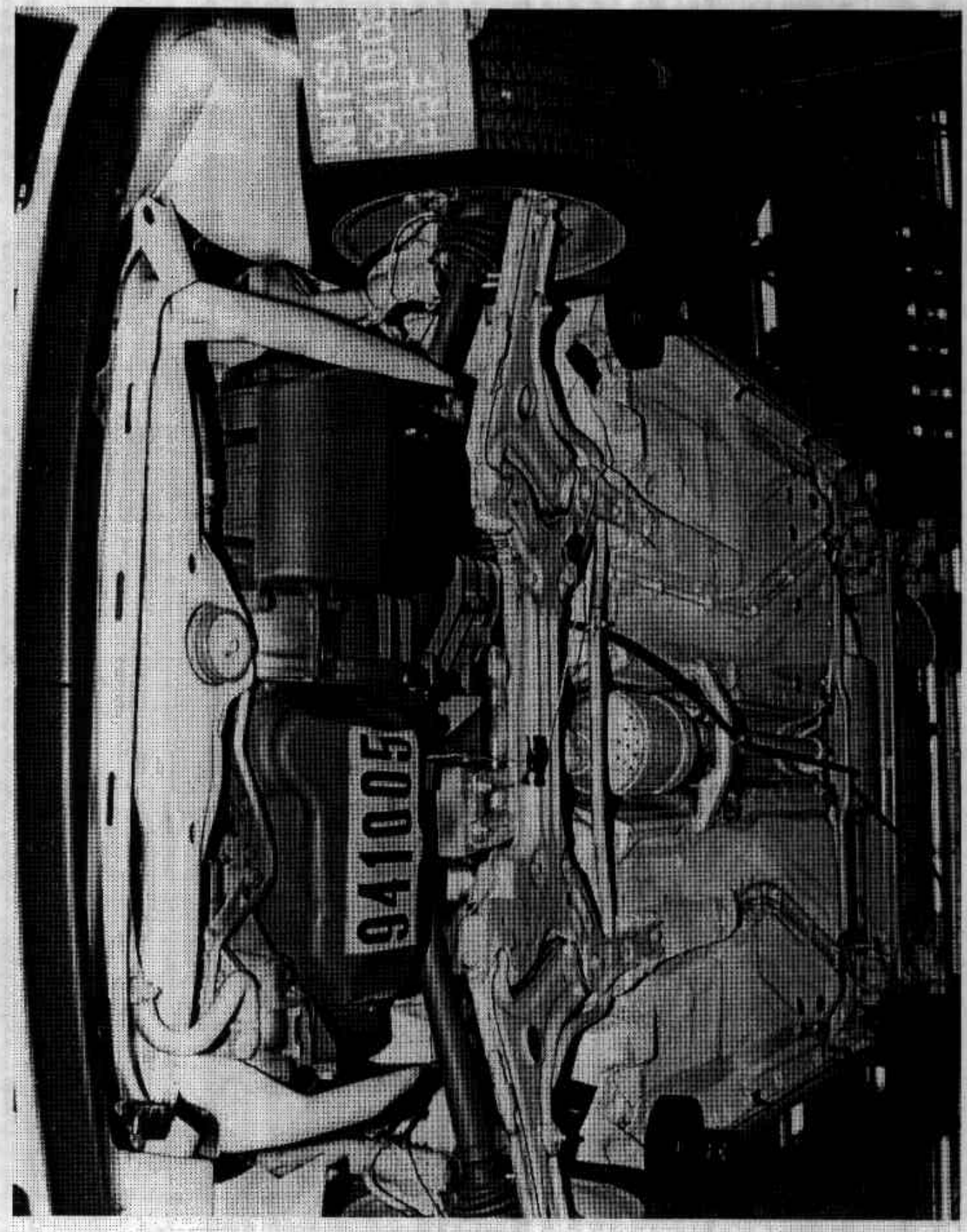


Figure A-22. Pre-Test From Underbody View

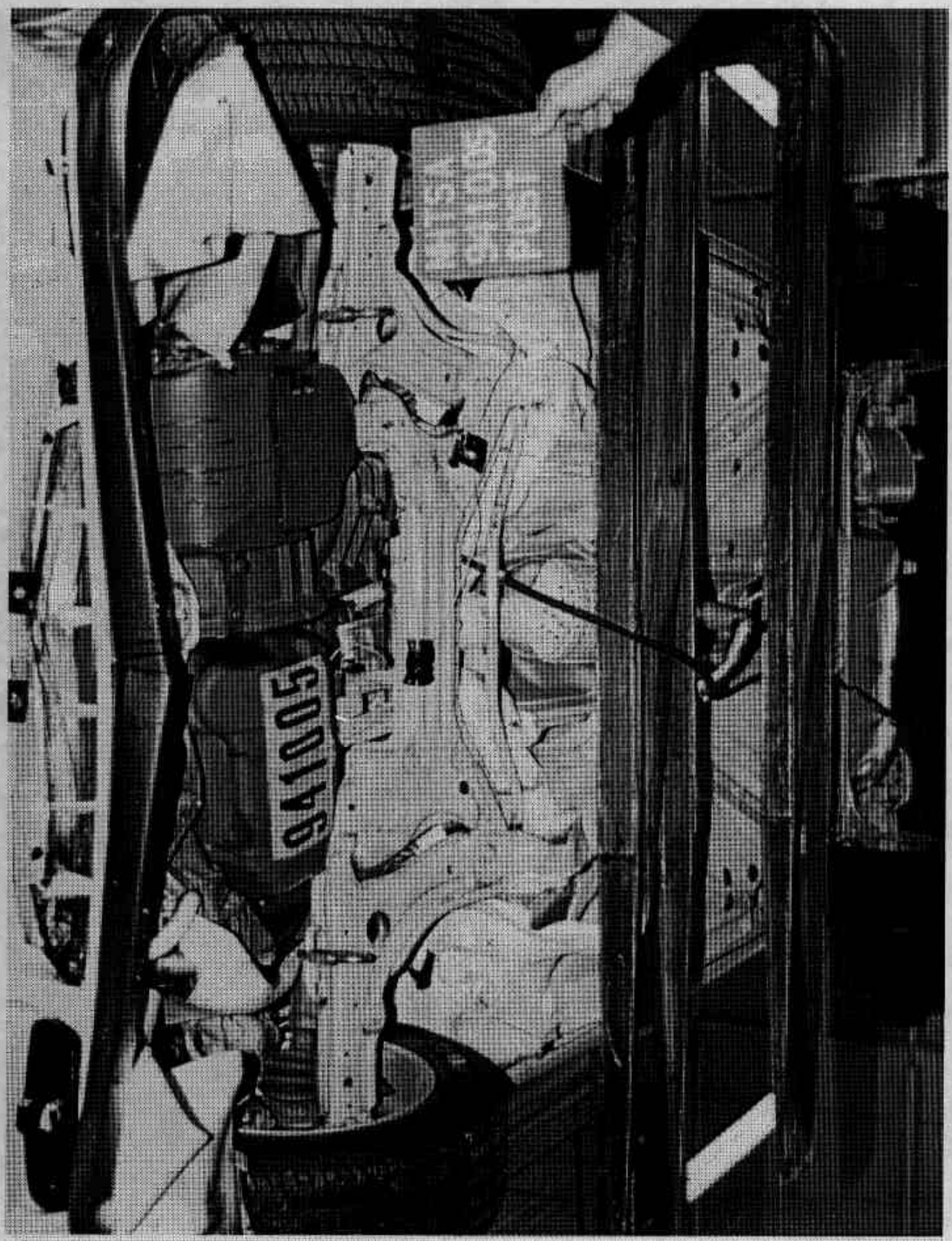


Figure A-23. Post-Test Front Underbody View

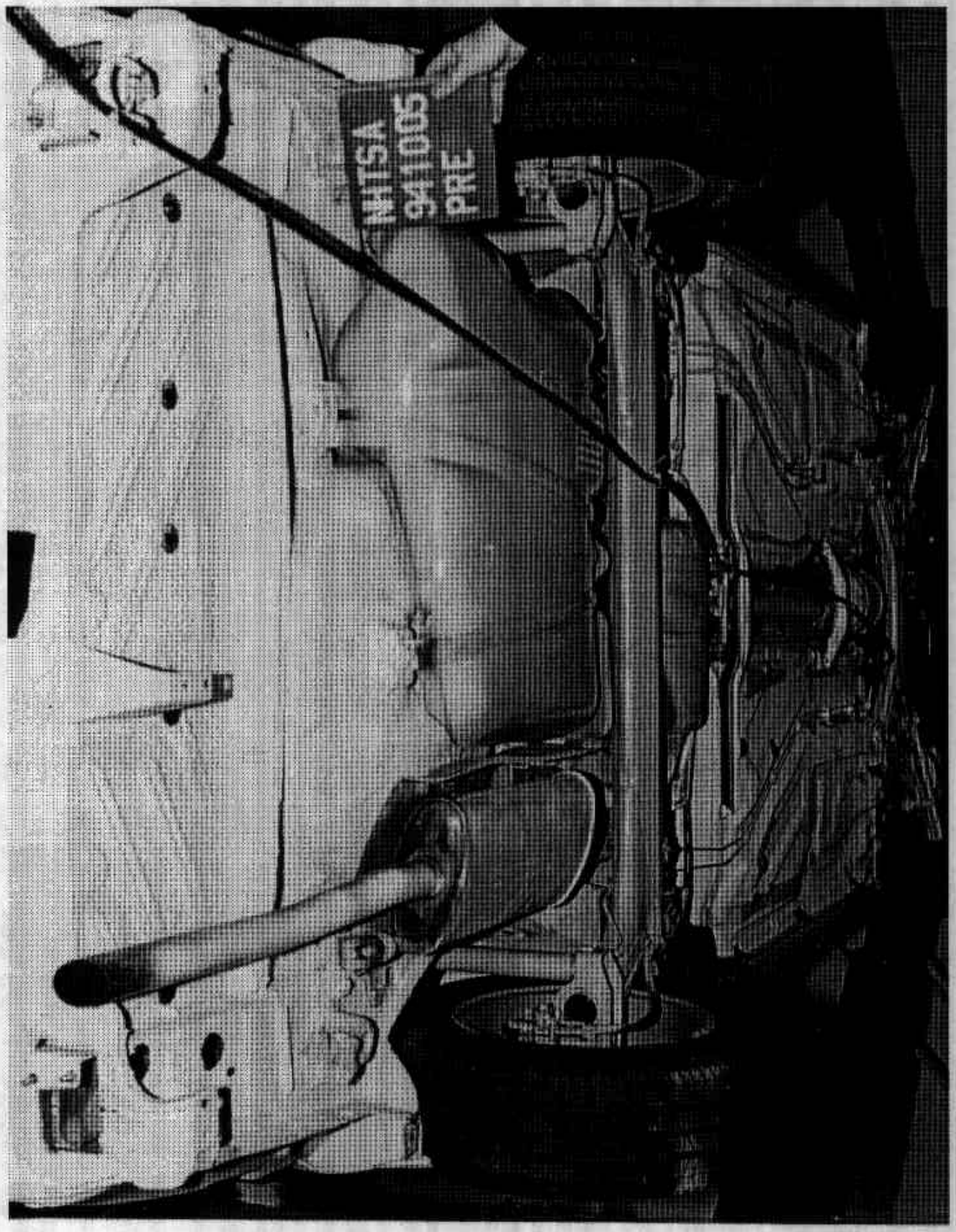


Figure A-24. Pre-Test Rear Underbody View

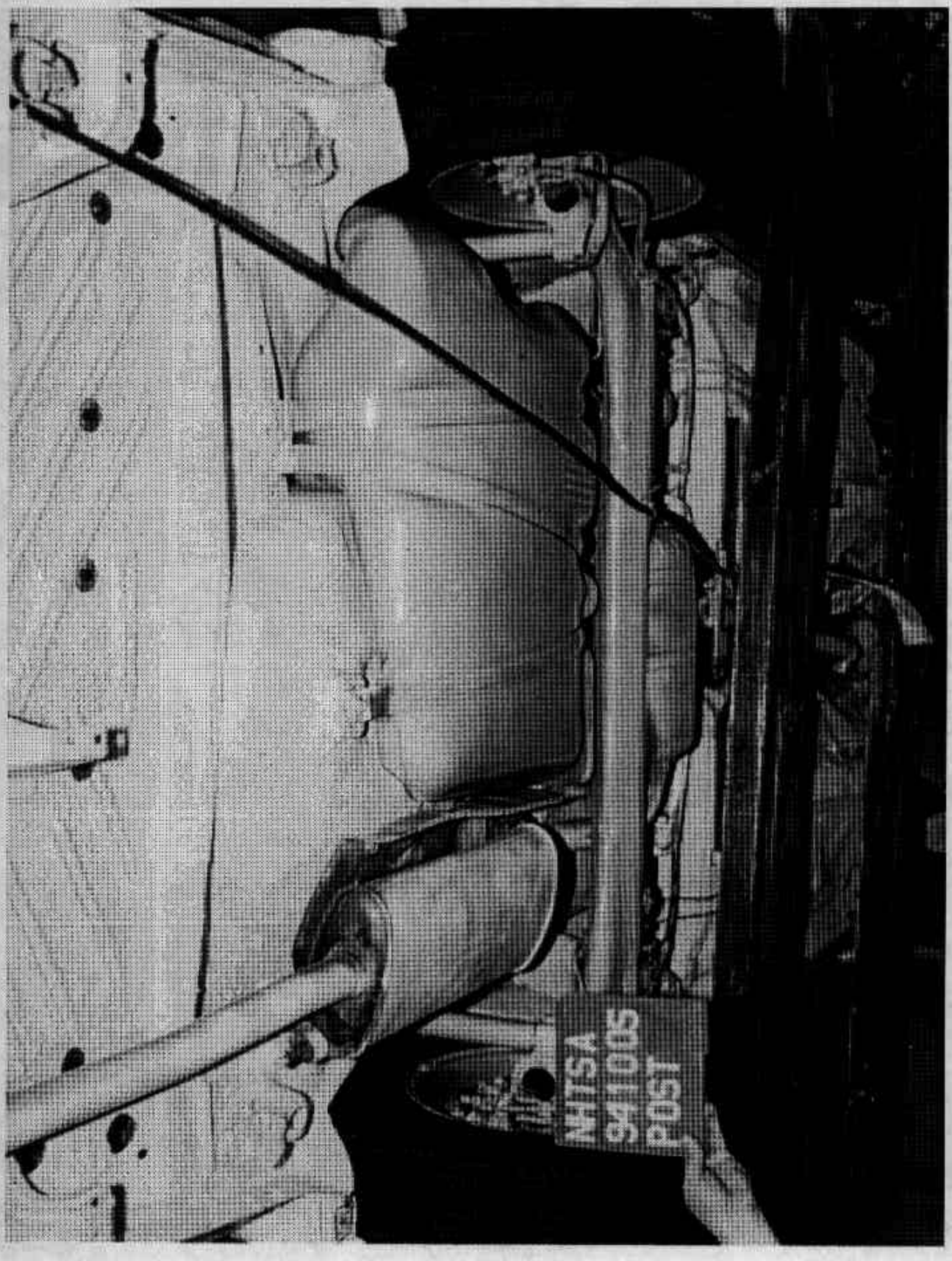


Figure A-25. Post-Test Rear Underbody View

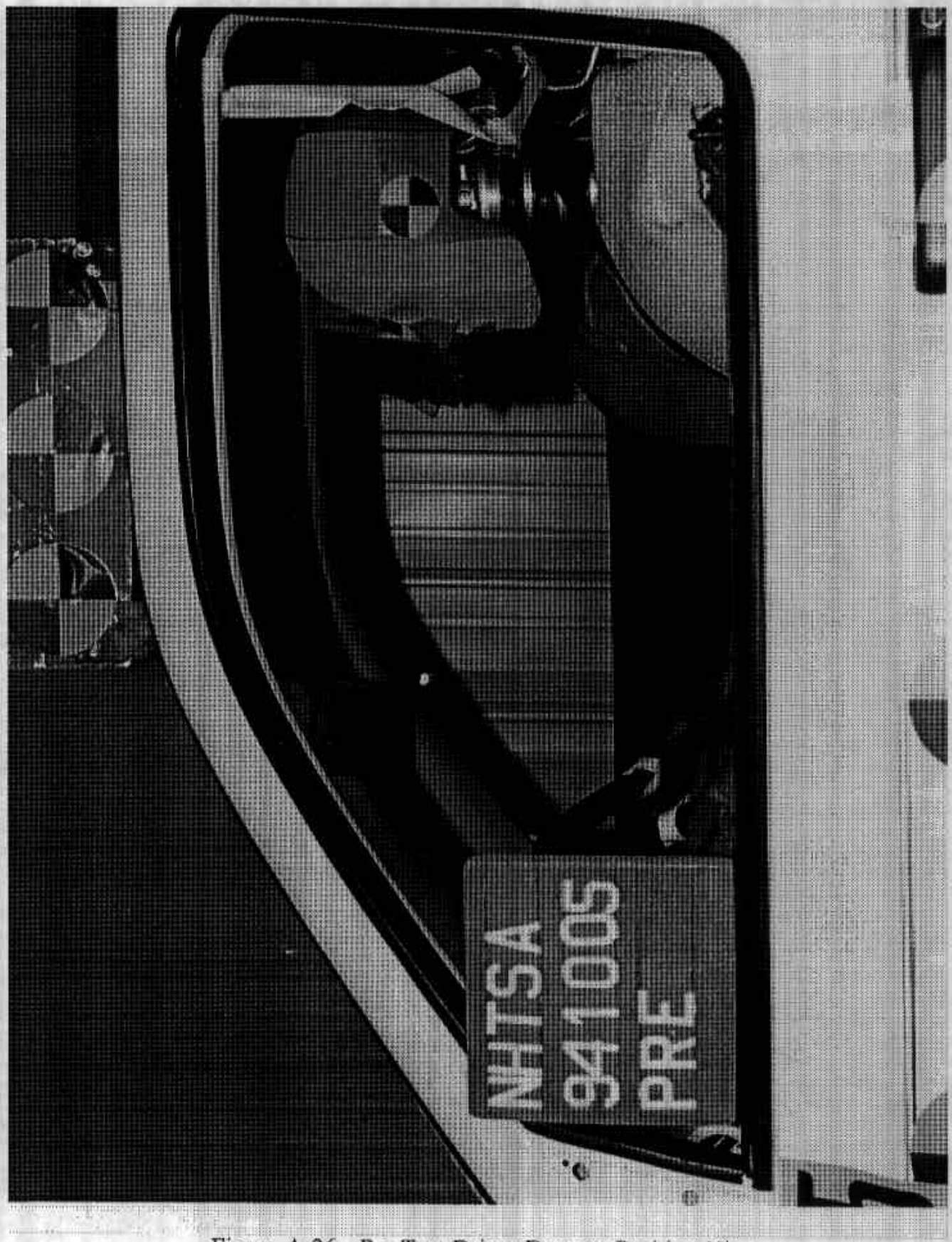


Figure A-26. Pre-Test Driver Dummy Position View

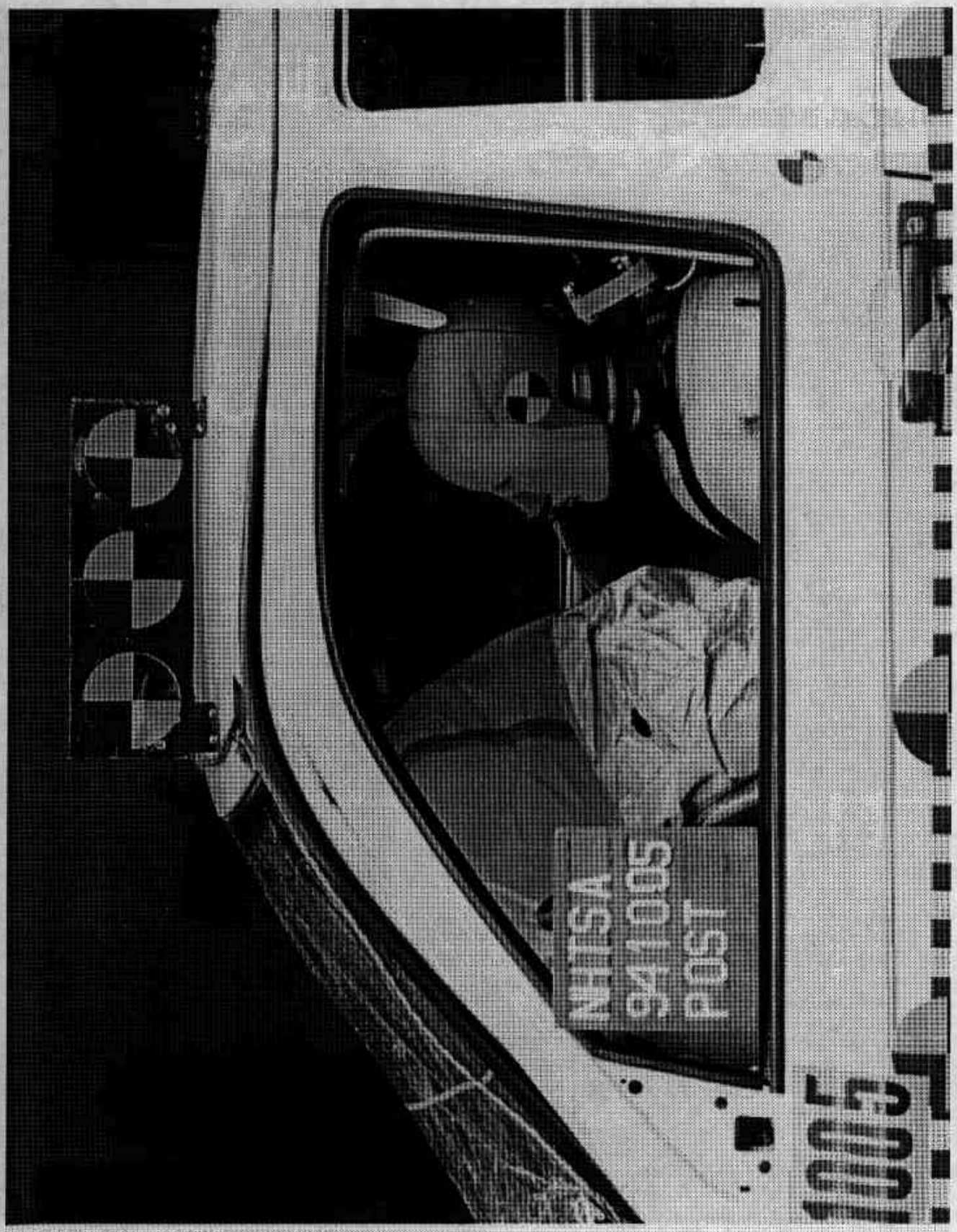


Figure A-27. Post-Test Driver Dummy Position View

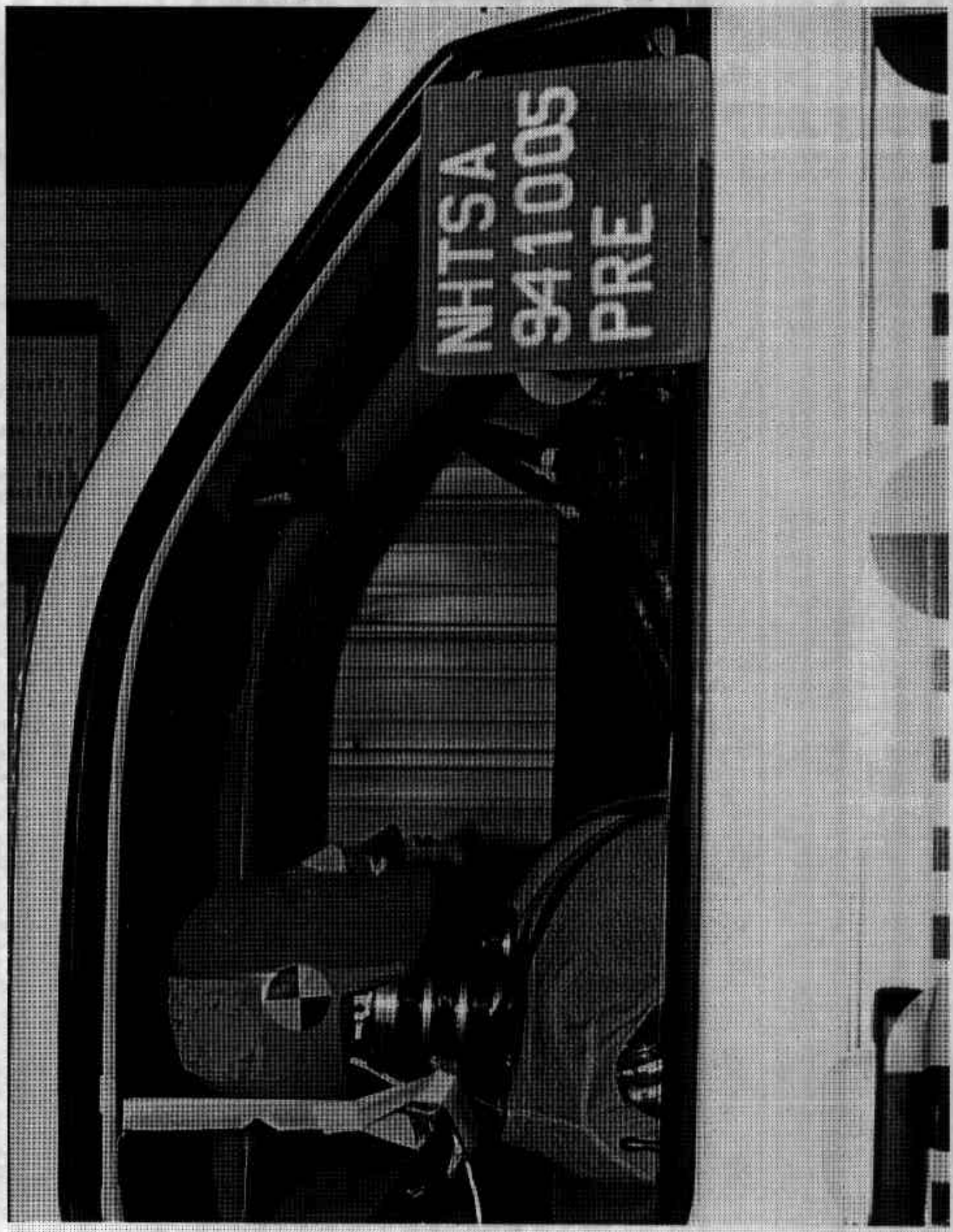


Figure A-28. Pre-Test Passenger Dummy Position View

Figure A-29. Post-Test Passenger Dummy Position View

Figure A-30. Pre-Test Driver Dummy & Vehicle Interior - View 1

Figure A-31. Post-Test Driver Dummy & Vehicle Interior - View 1

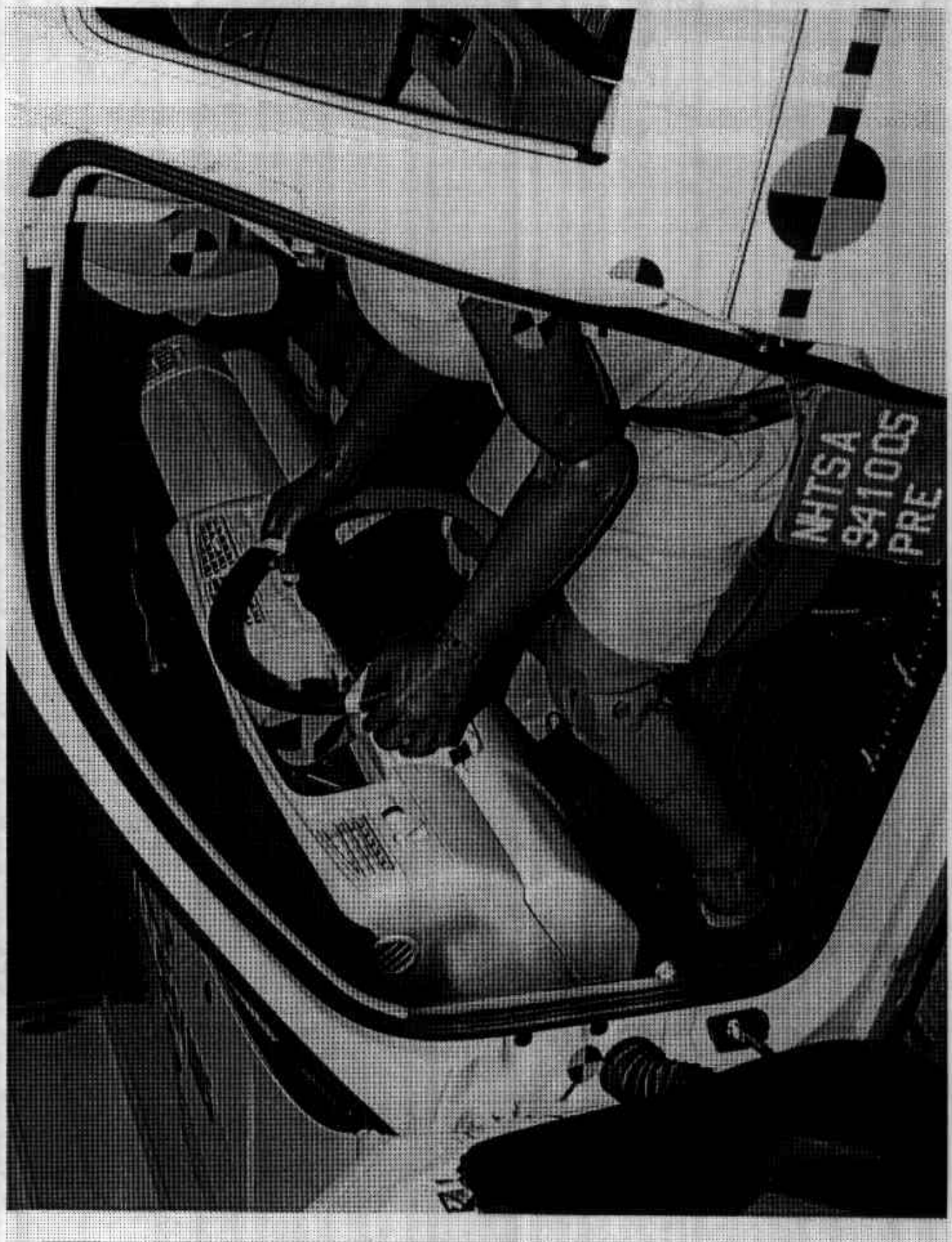


Figure A-32. Pre-Test Driver Dummy & Vehicle Interior - View 2

Figure A-33. Post-Test Driver Dummy & Vehicle interior - View 2

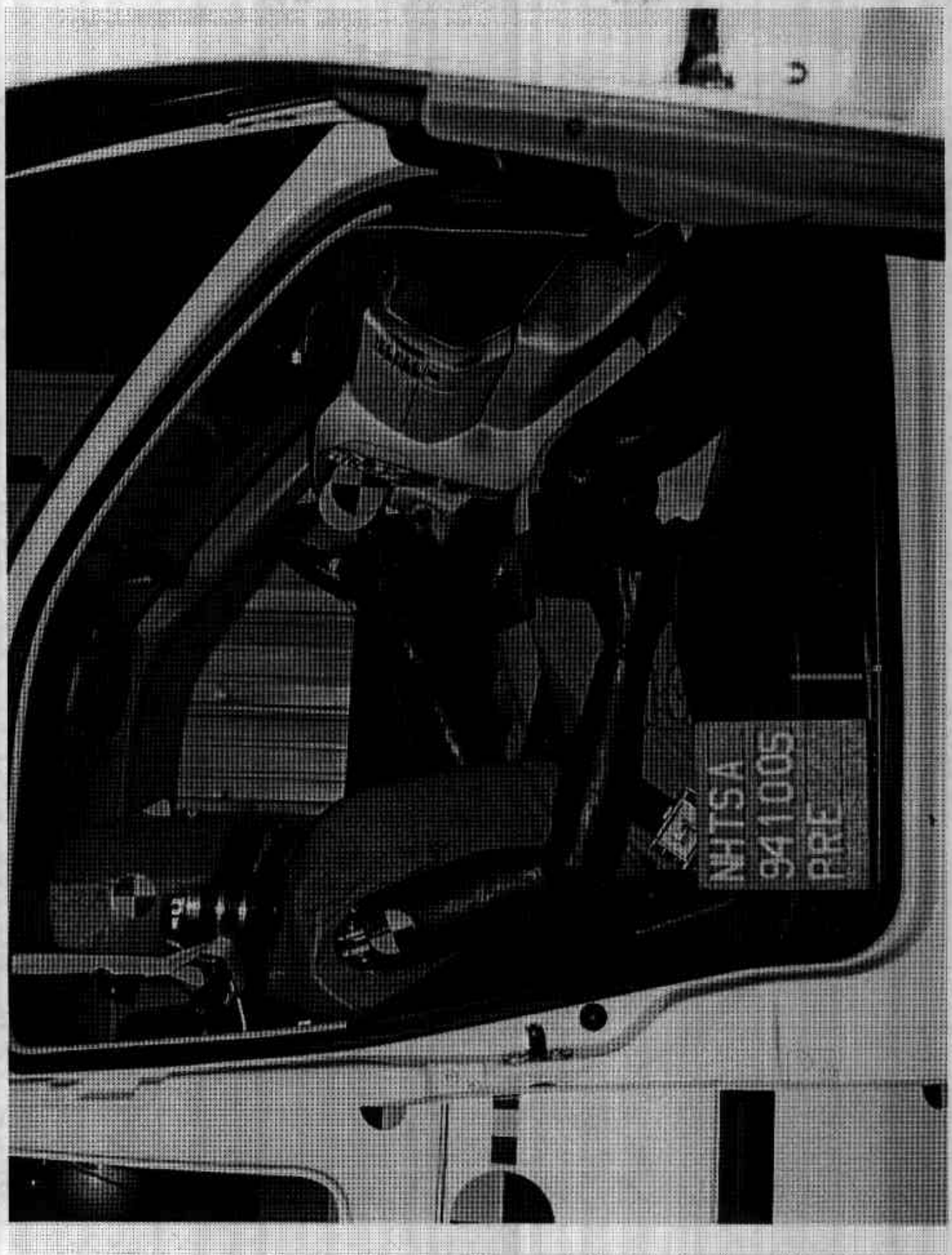


Figure A-34. Pre-Test Passenger Dummy & Vehicle interior - View 1

Figure A-35. Post-Test Passenger Dummy & Vehicle Interior - View 1

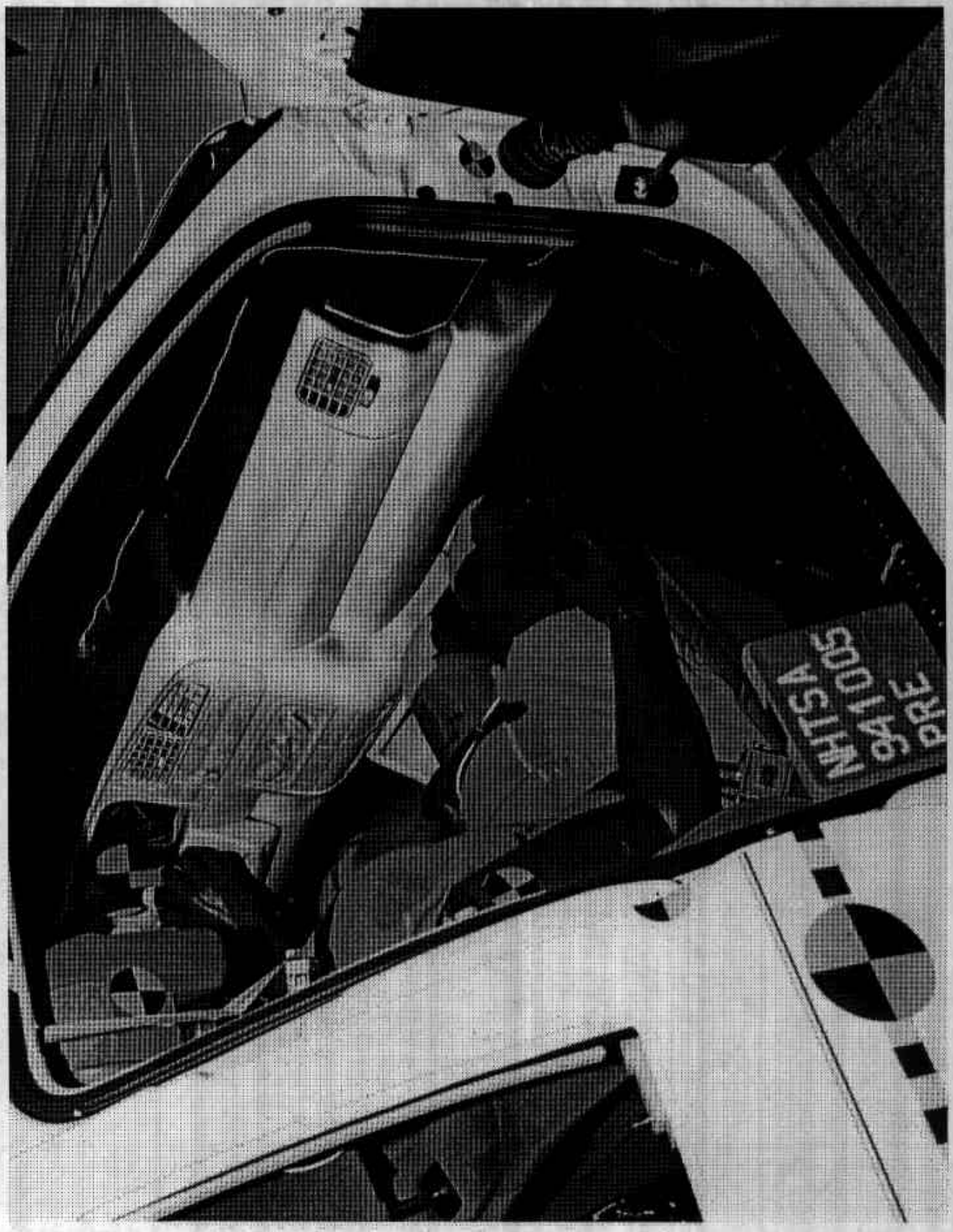


Figure A-36. Pre-Test Passenger Dummy & Vehicle Interior - View 2

Figure A-37. Post-Test Passenger Dummy & Vehicle Interior - View 2

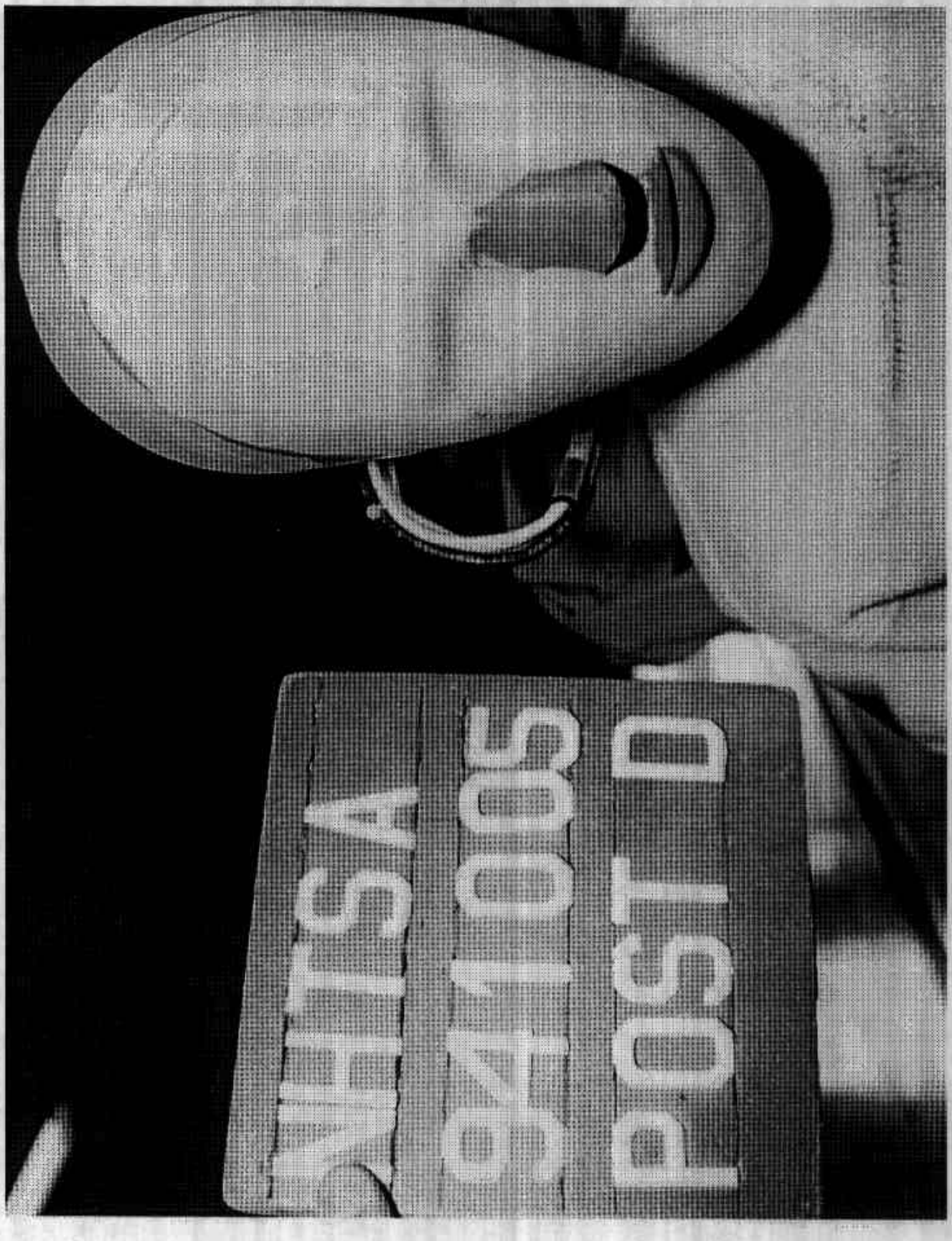


Figure A-38. Post-Test Driver Dummy Head Contact - View 1

Figure A-39. Post-Test Driver Dummy Head Contact - View 2

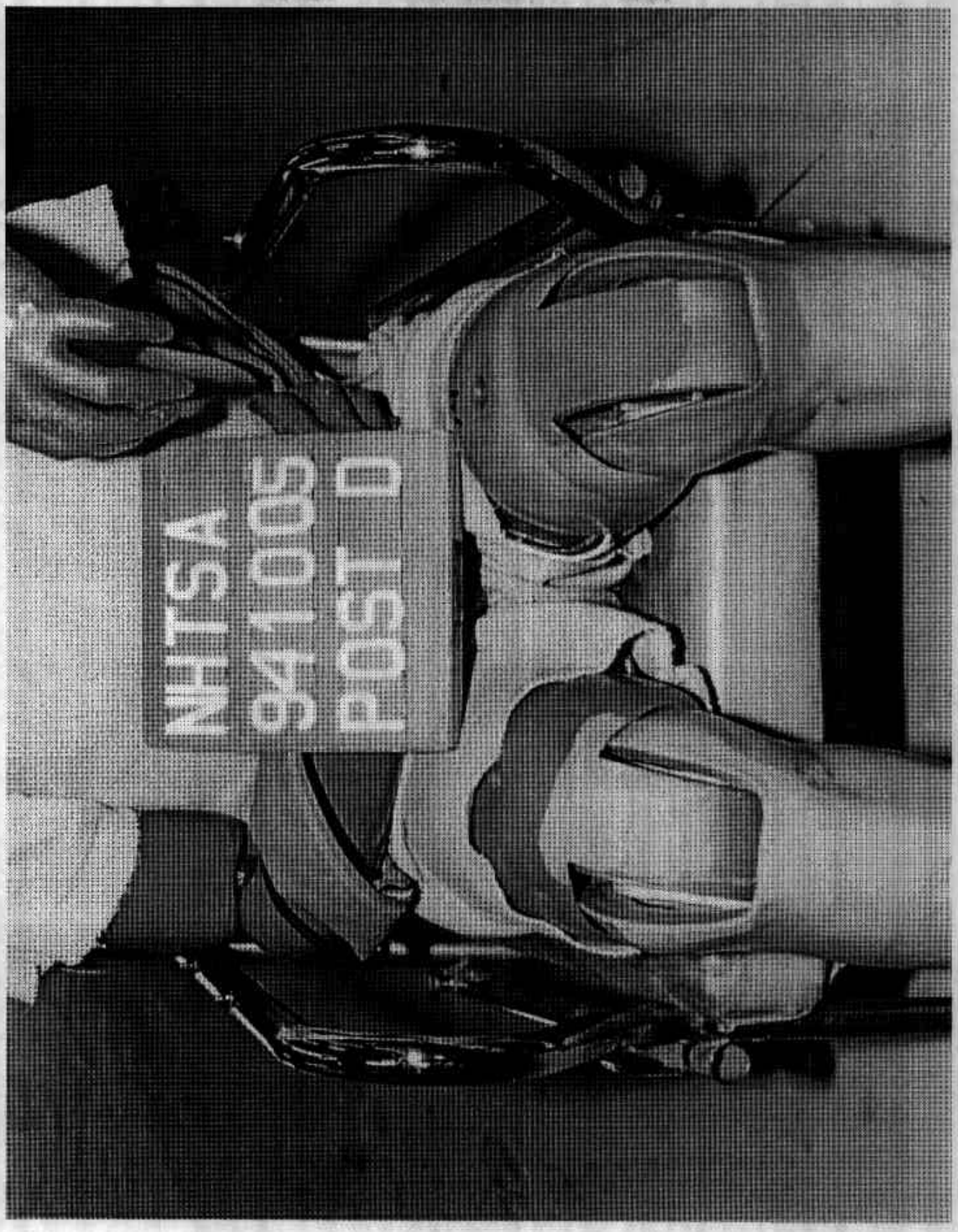


Figure A-40. Post-Test Driver Dummy Knee Contact - View 1

Figure A-41. Post-Test Driver Dummy Knee Contact - View 2

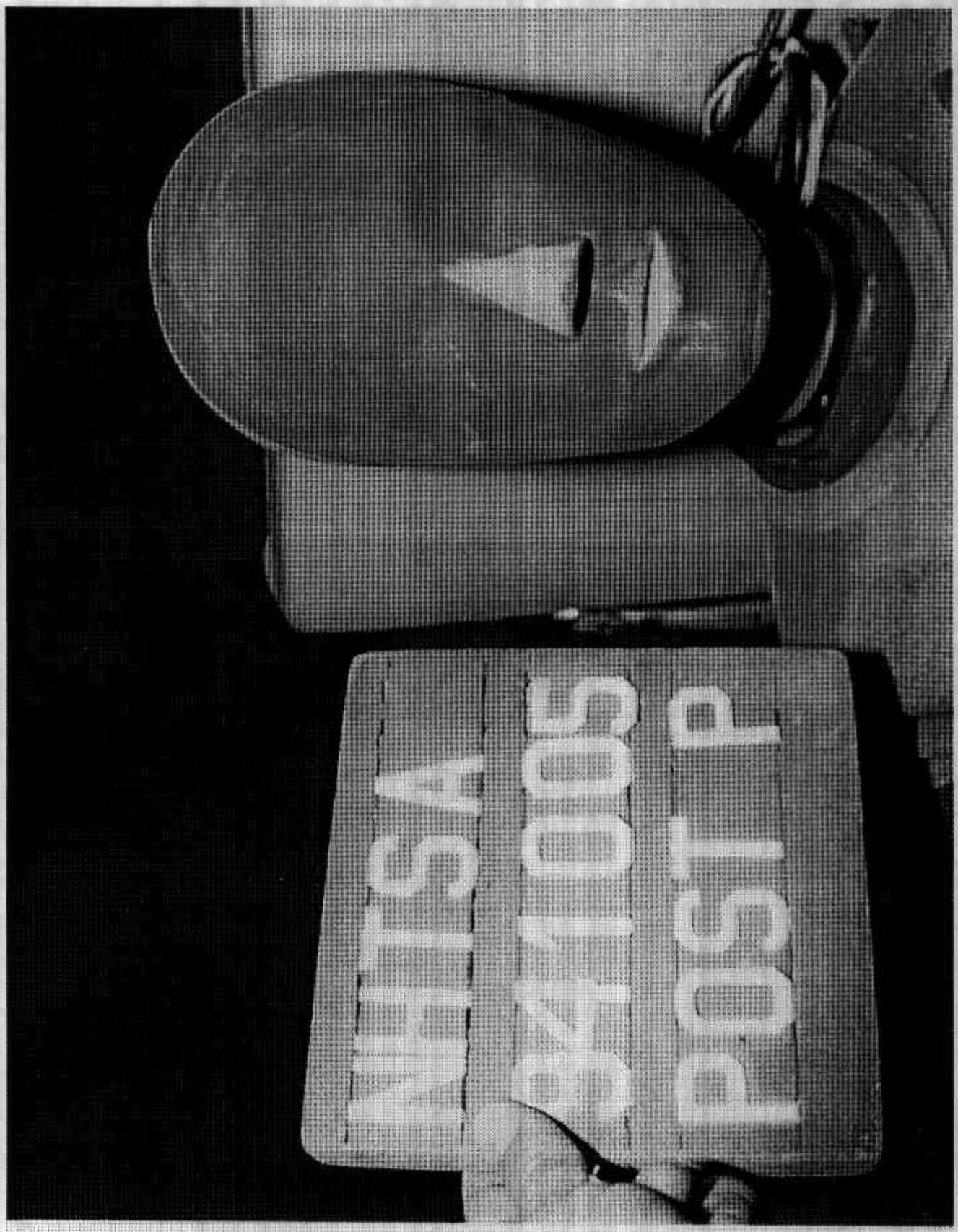


Figure A-42. Post-Test Passenger Dummy Head Contact - View 1

Figure A-43. Post-Test Passenger Dummy Head Contact - View 2

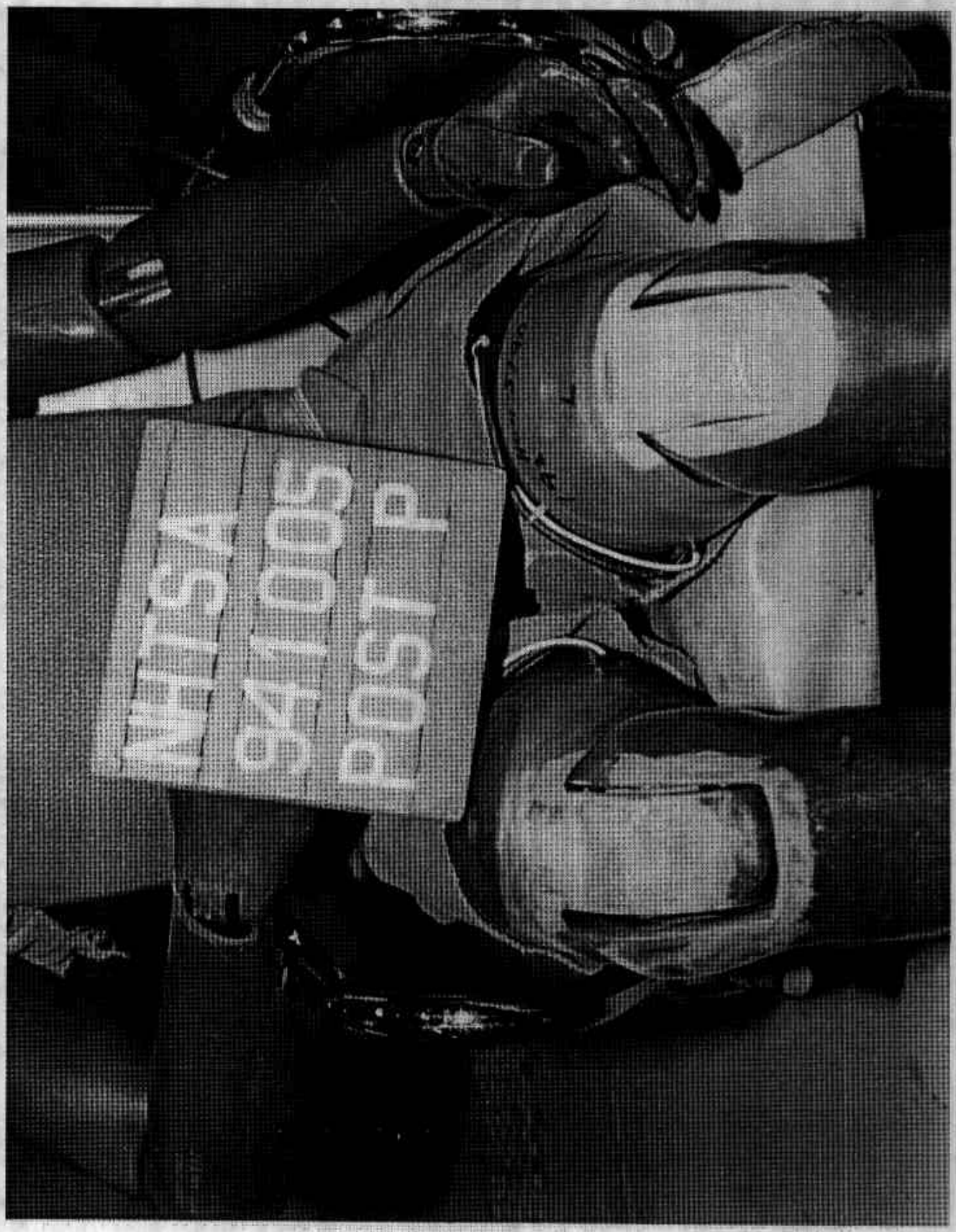


Figure A-44. Post-Test Passenger Dummy Knee Contact - View 1

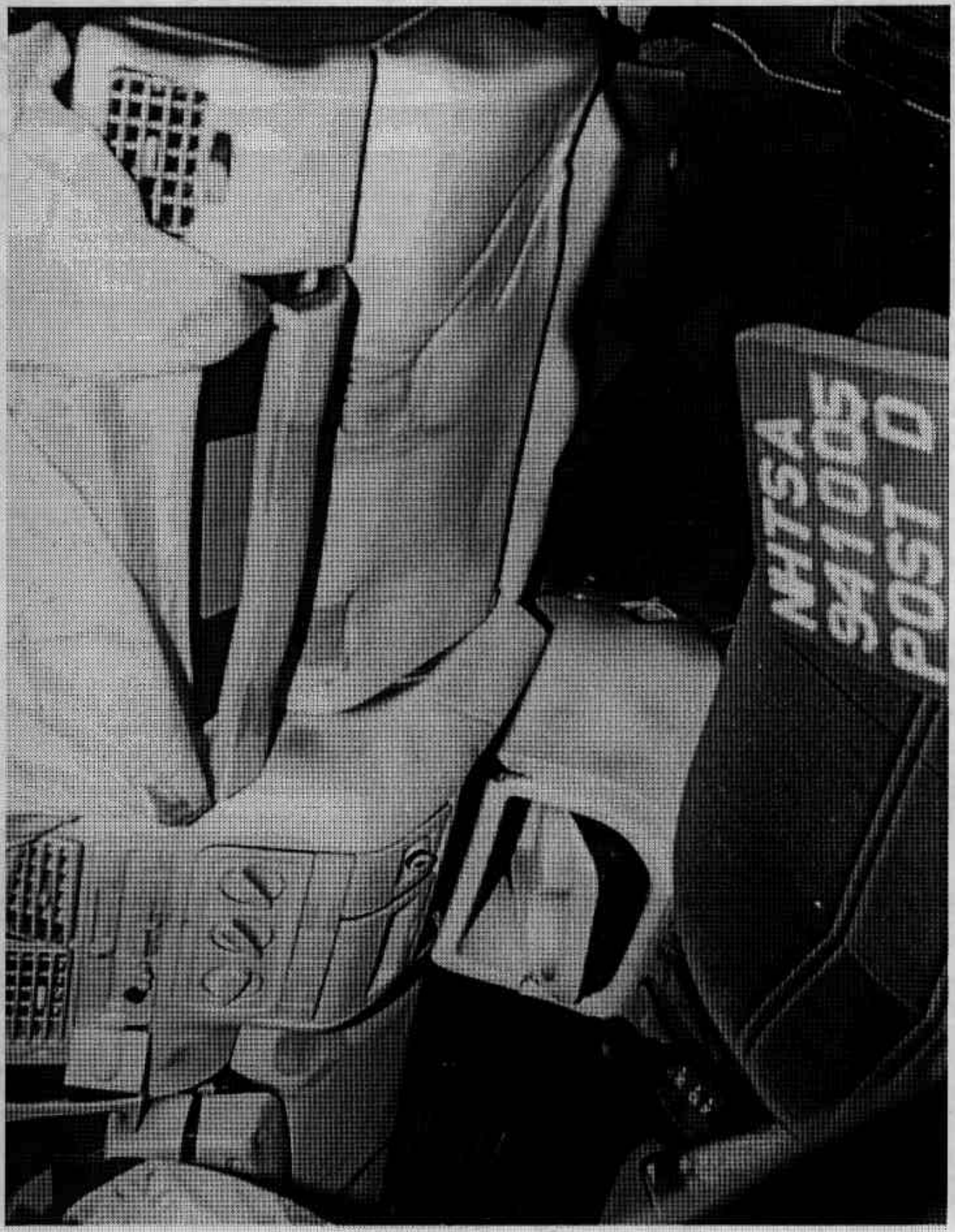


Figure A-45. Post-Test Passenger Dummy Knee Contact - View 2

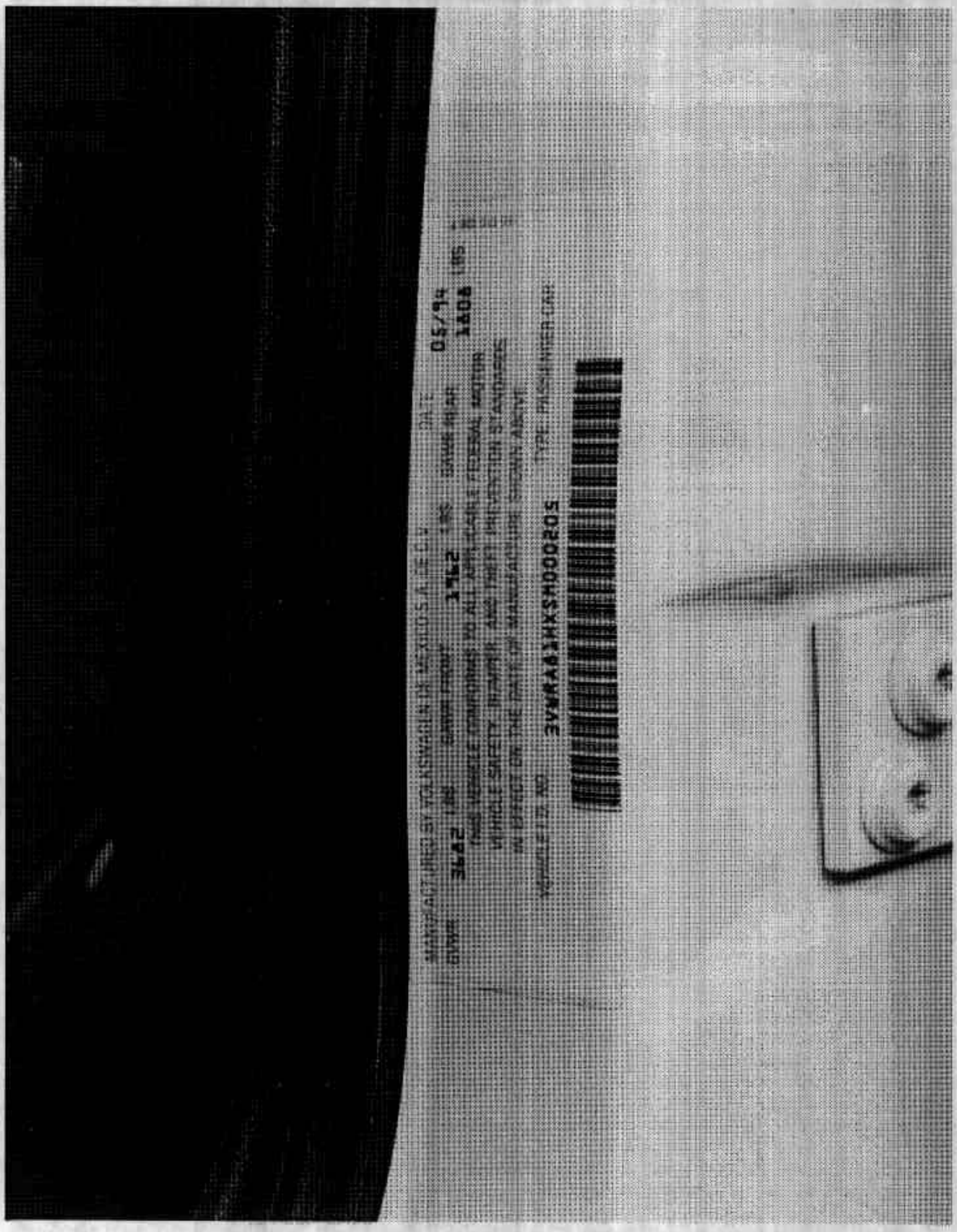


Figure A-46. Pre-Test Vehicle Certification Label View

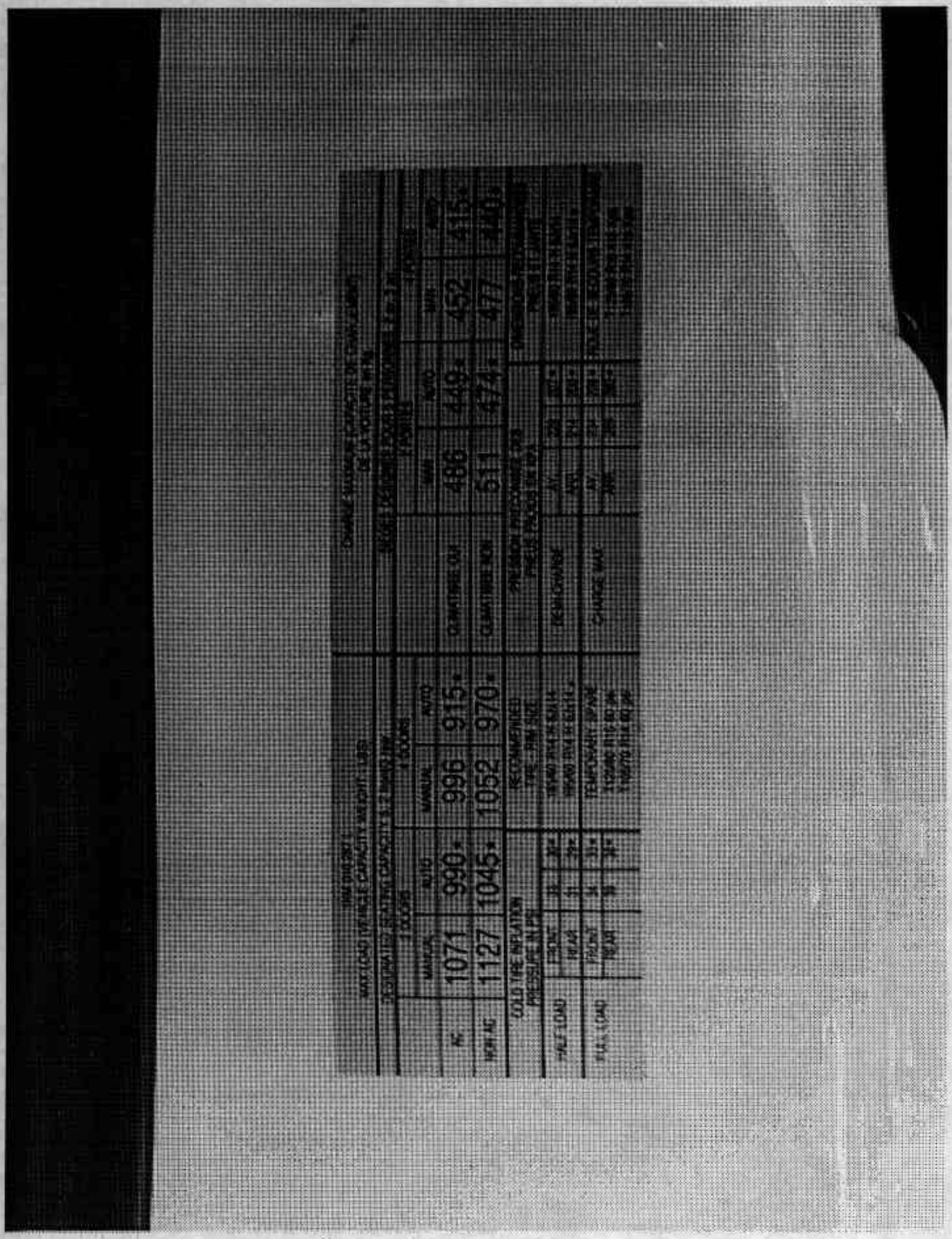


Figure A-47. Pre-Test Vehicle Recommended Tire Pressure Label View

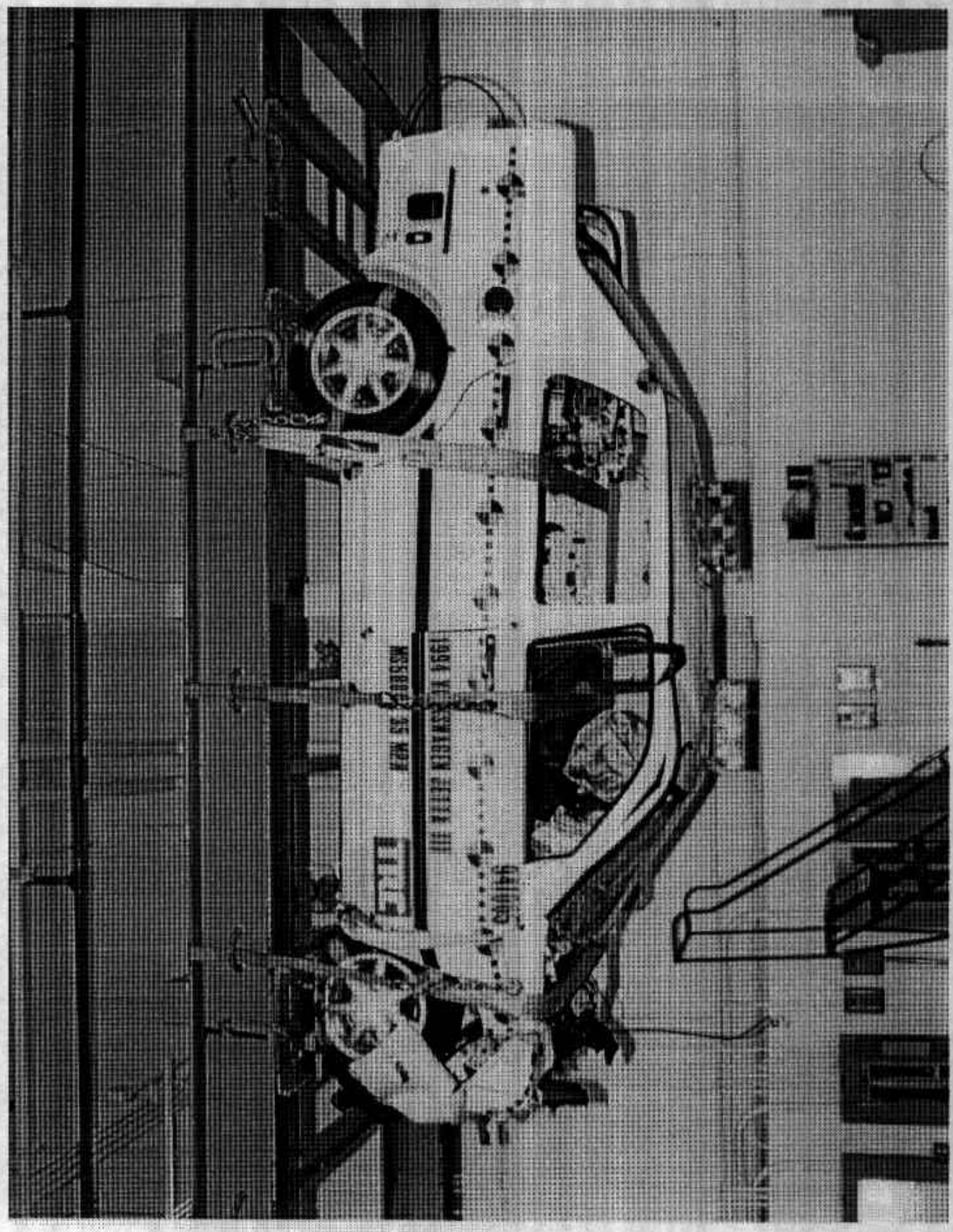
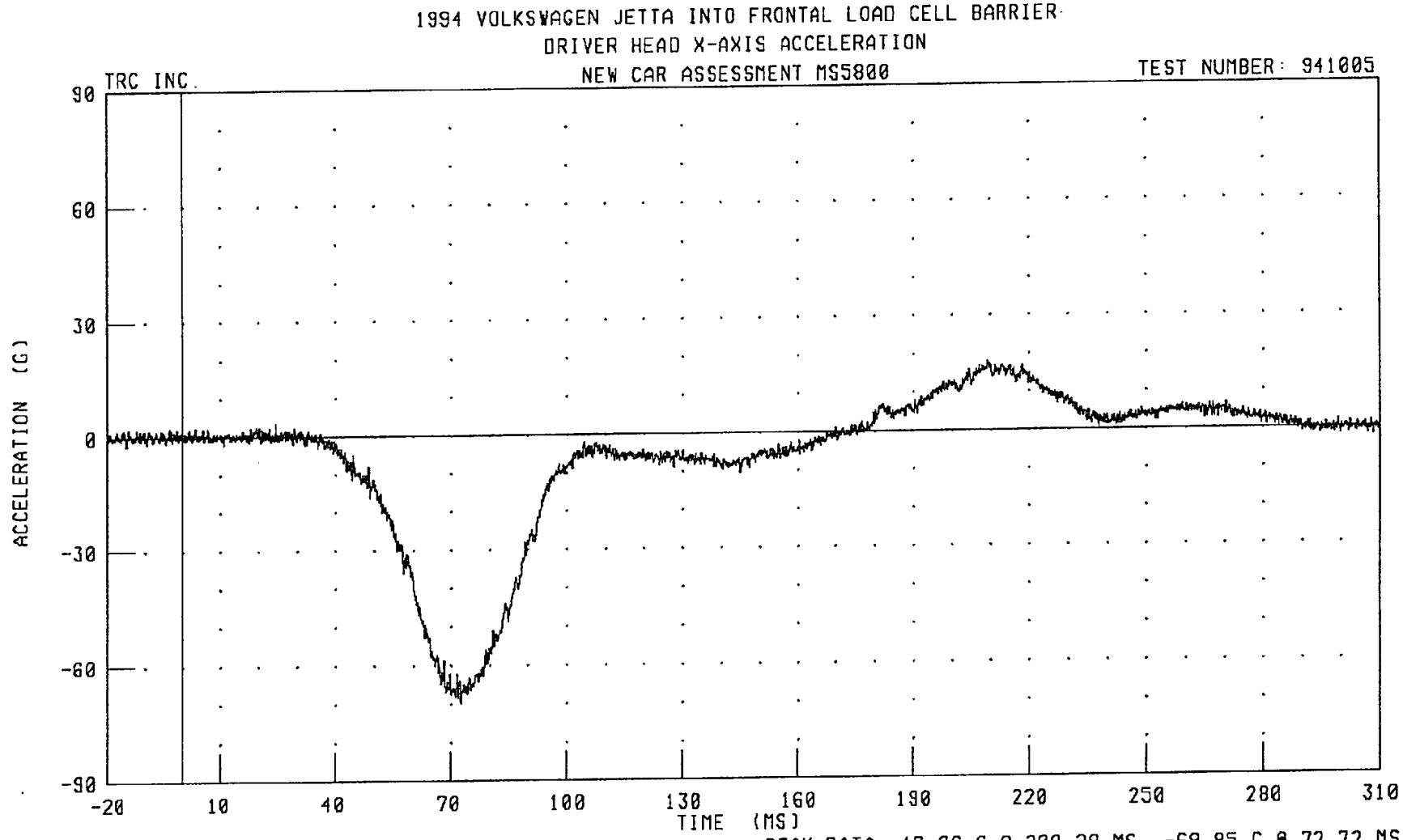


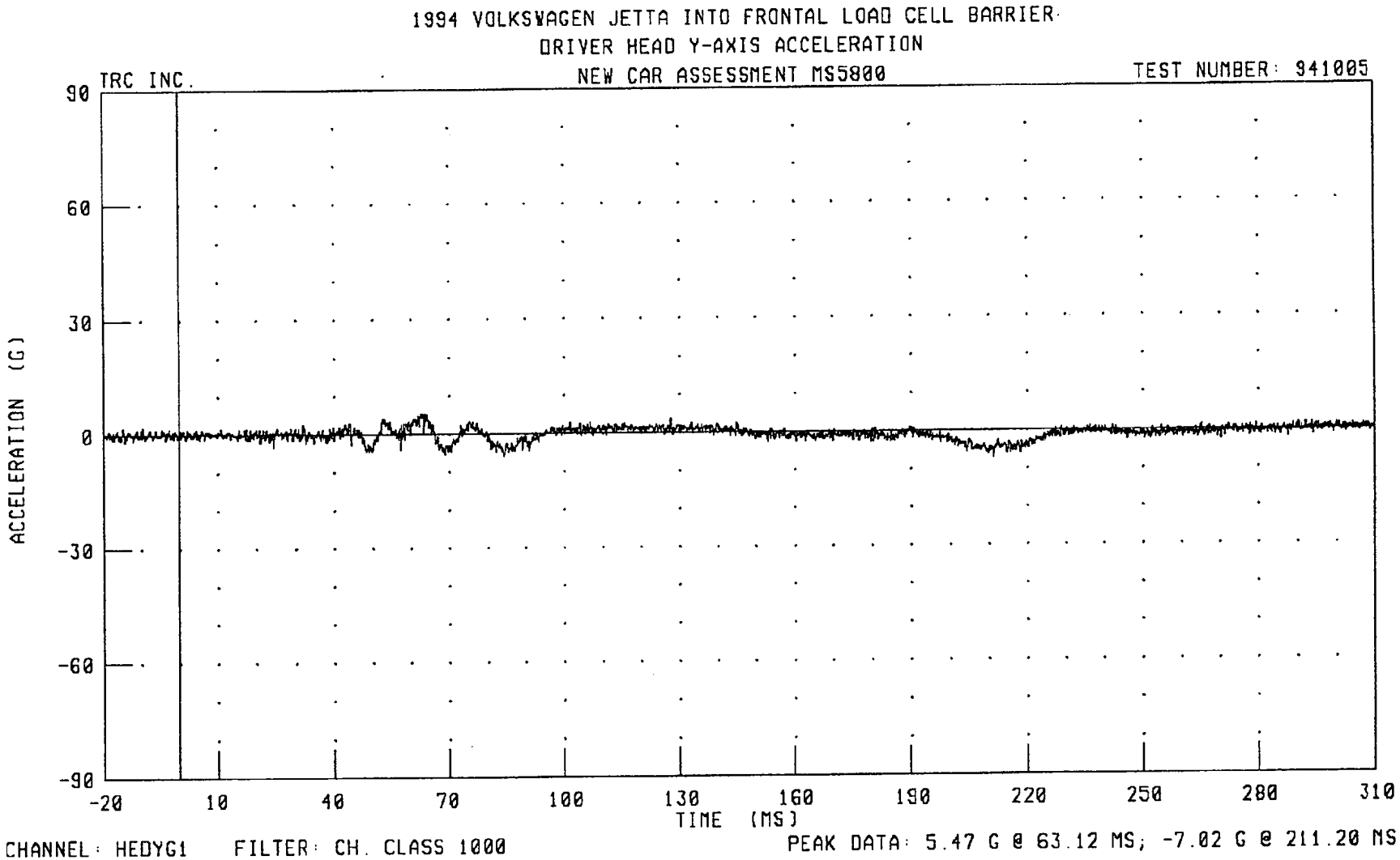
Figure A-48. Post-Test Vehicle on Static Rollover Machine View

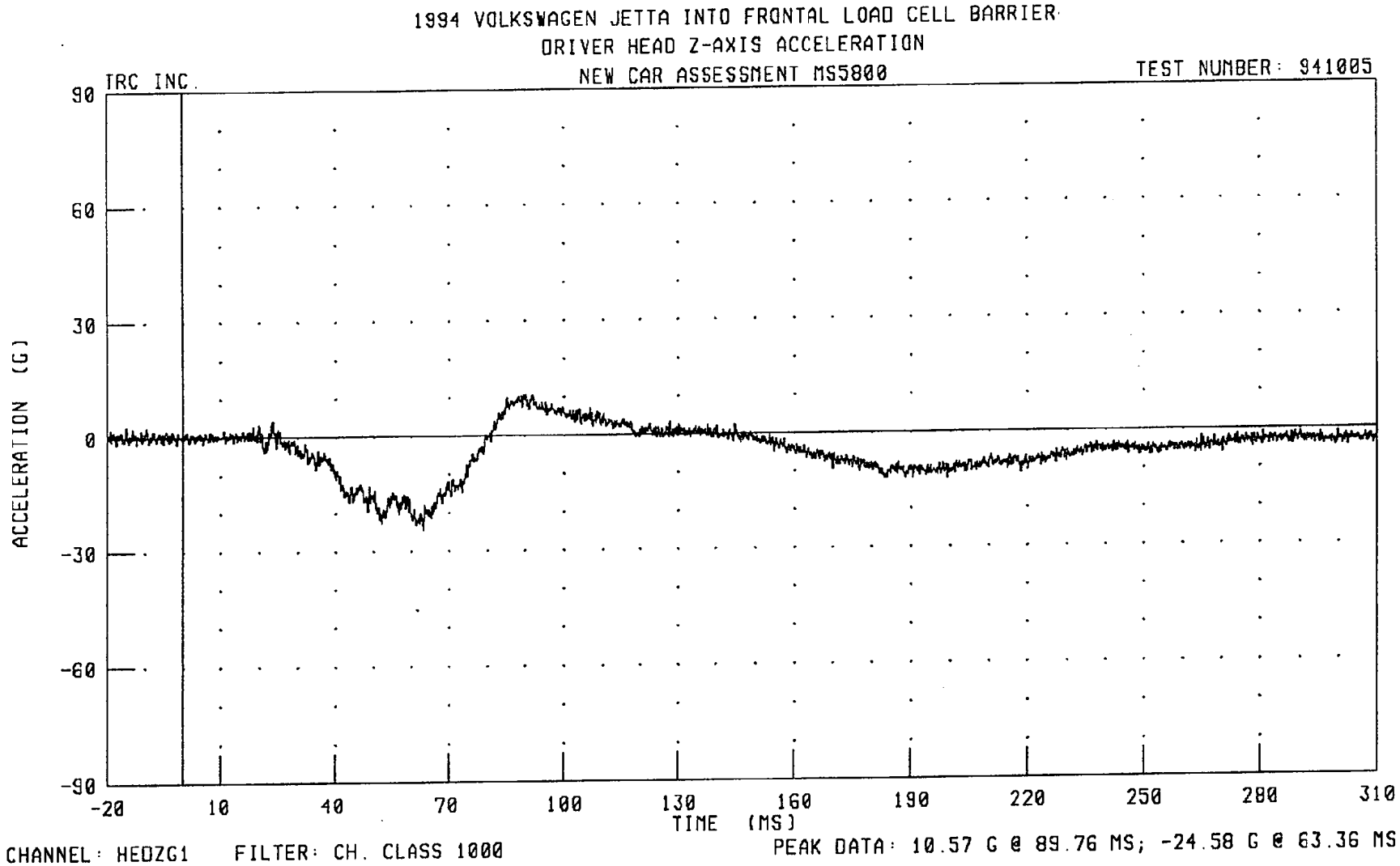
Appendix B

Data Plots

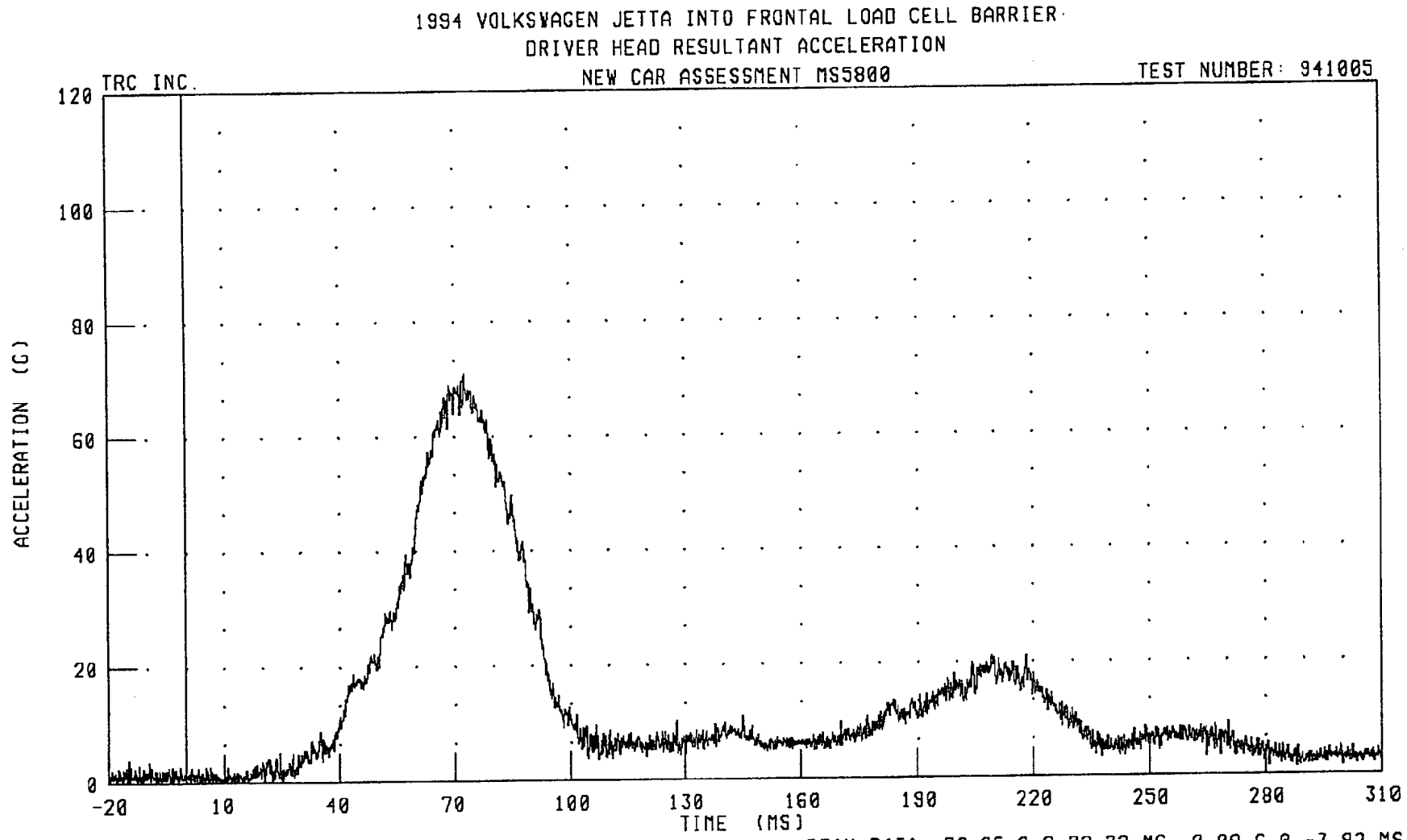

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDXG1
FILTER: CH. CLASS 1000
PEAK DATA: 17.96 G @ 209.28 MS; -69.85 G @ 72.72 MS

941005

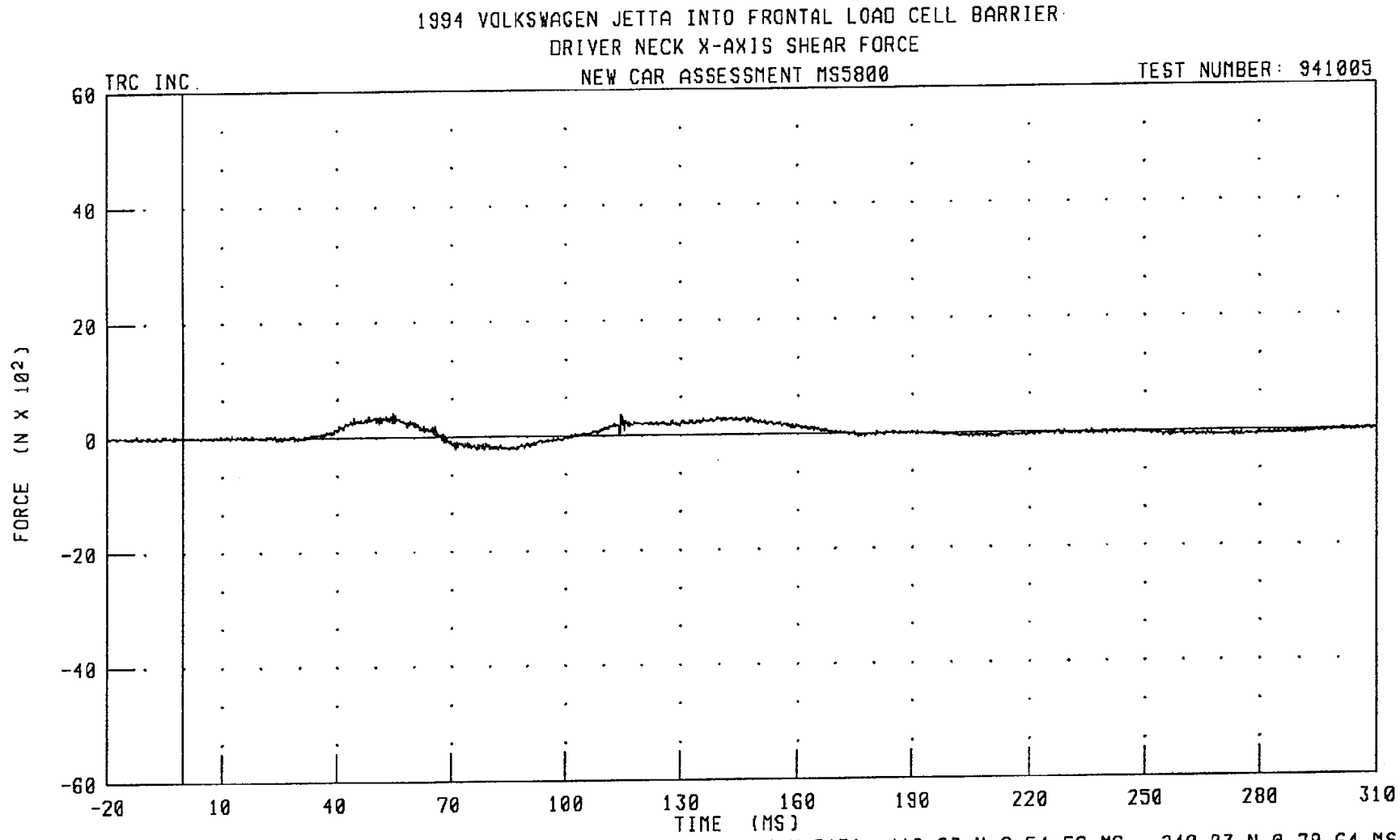

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
ACCELERATION (G)
90
60
30
0
-30
-60
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG1
FILTER: CH. CLASS 1000
PEAK DATA: 5.47 G @ 63.12 MS; -7.02 G @ 211.20 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG1
FILTER: CH. CLASS 1000
PEAK DATA: 10.57 G @ 89.76 MS; -24.58 G @ 63.36 MS

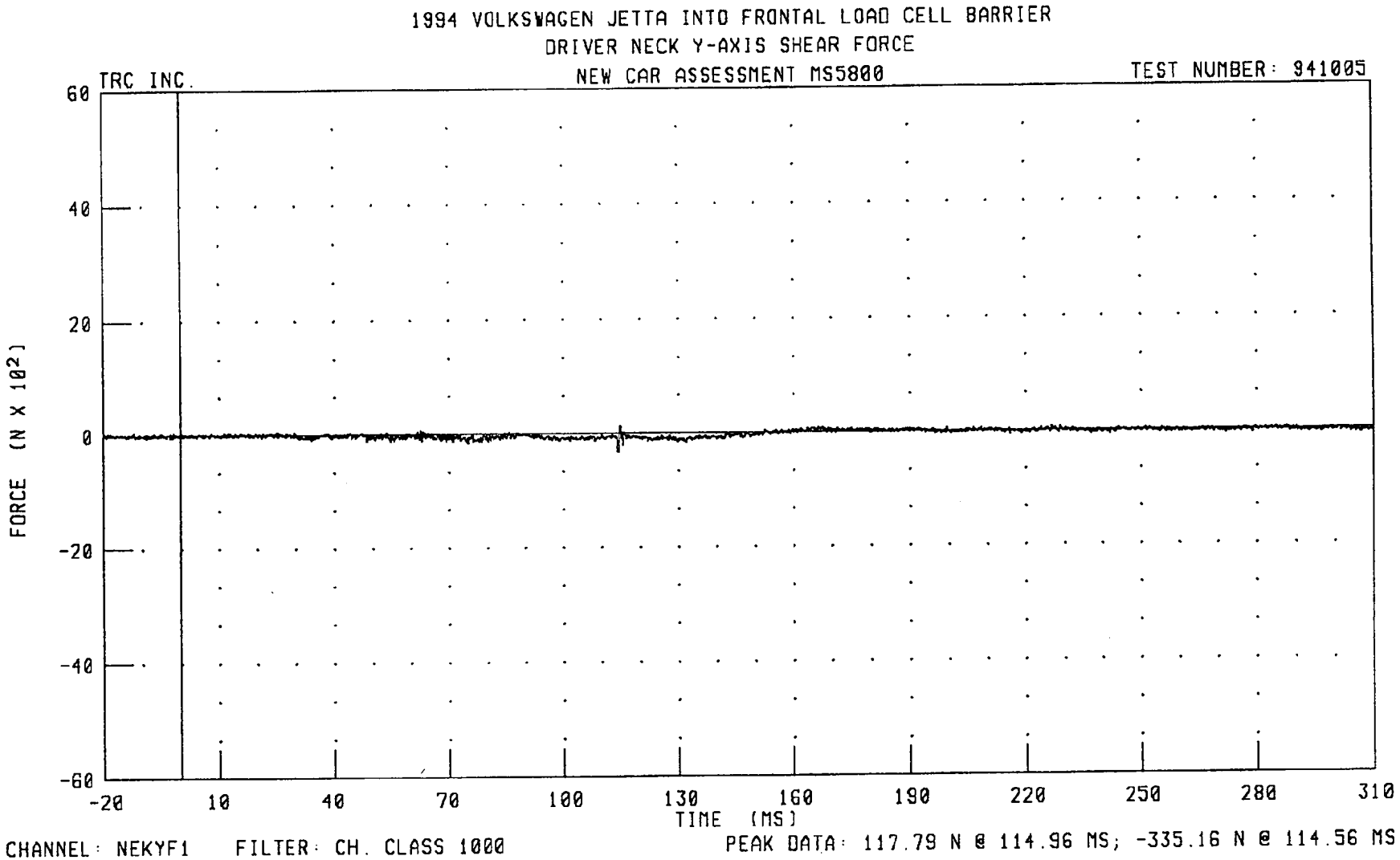
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 70.95 G @ 72.72 MS; 0.09 G @ -3.92 MS

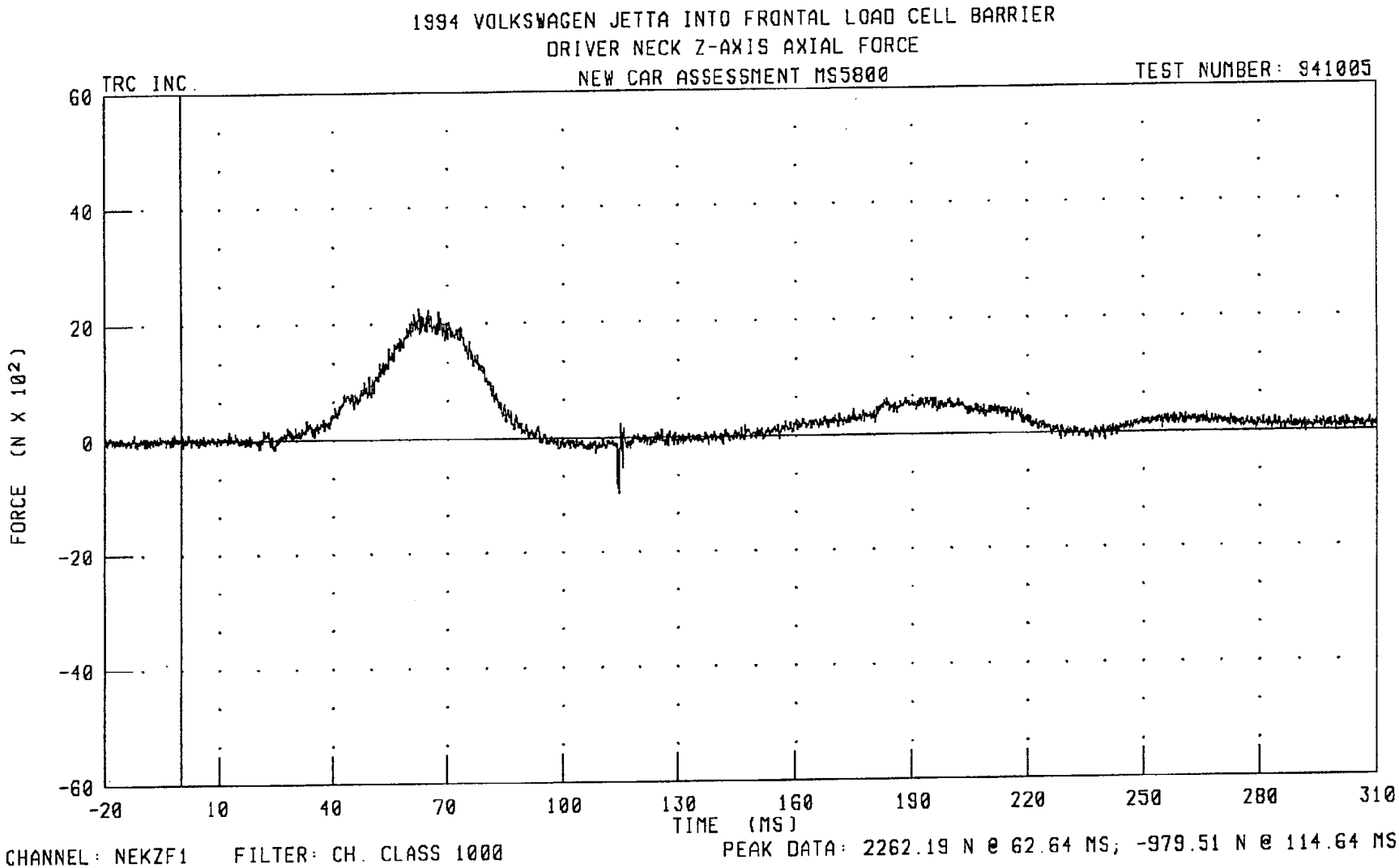
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: NEKXF1
FILTER: CH. CLASS 1000
PEAK DATA: 419.63 N @ 54.56 MS; -240.03 N @ 78.64 MS

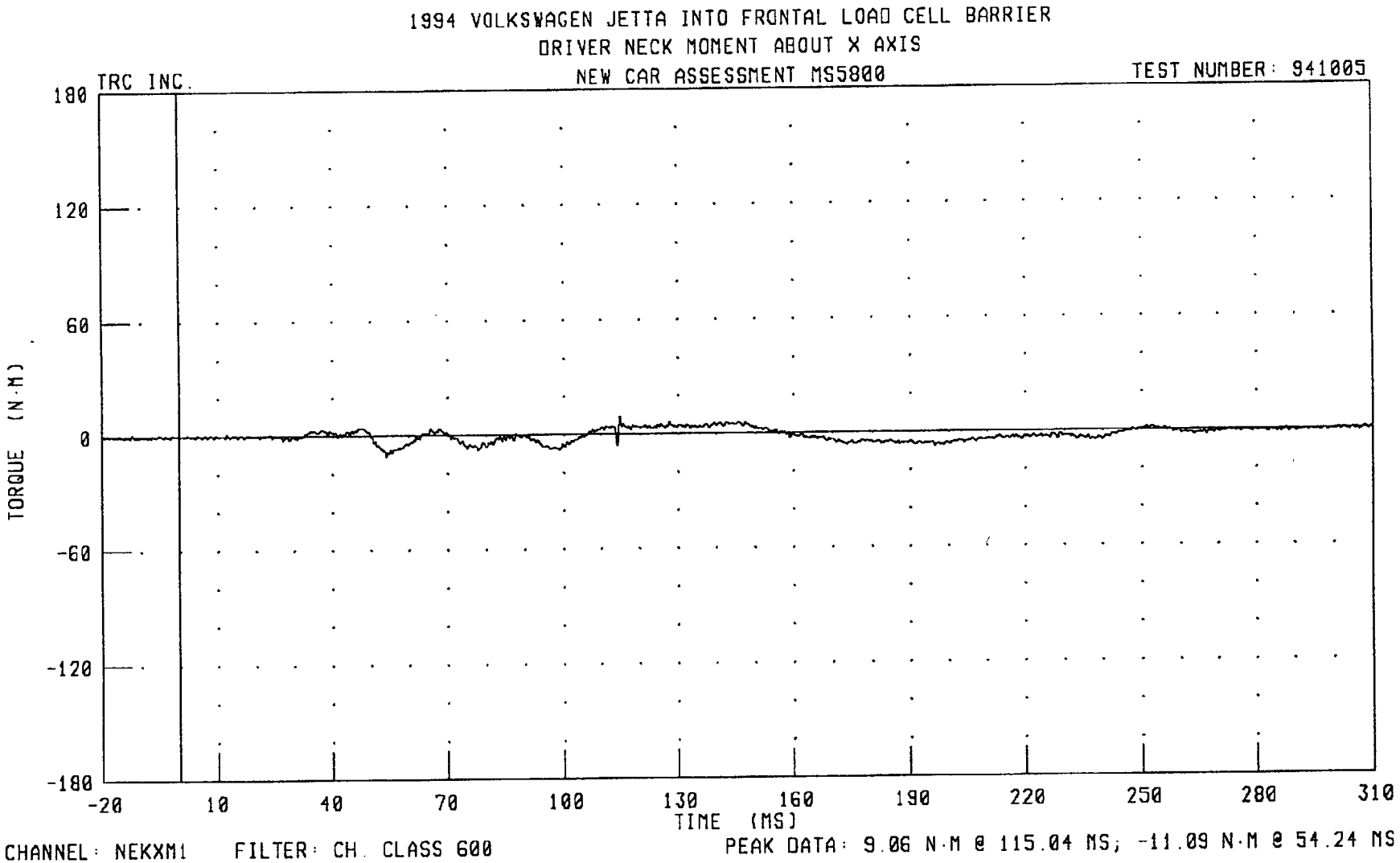
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 117.79 N @ 114.96 MS; -335.16 N @ 114.56 MS

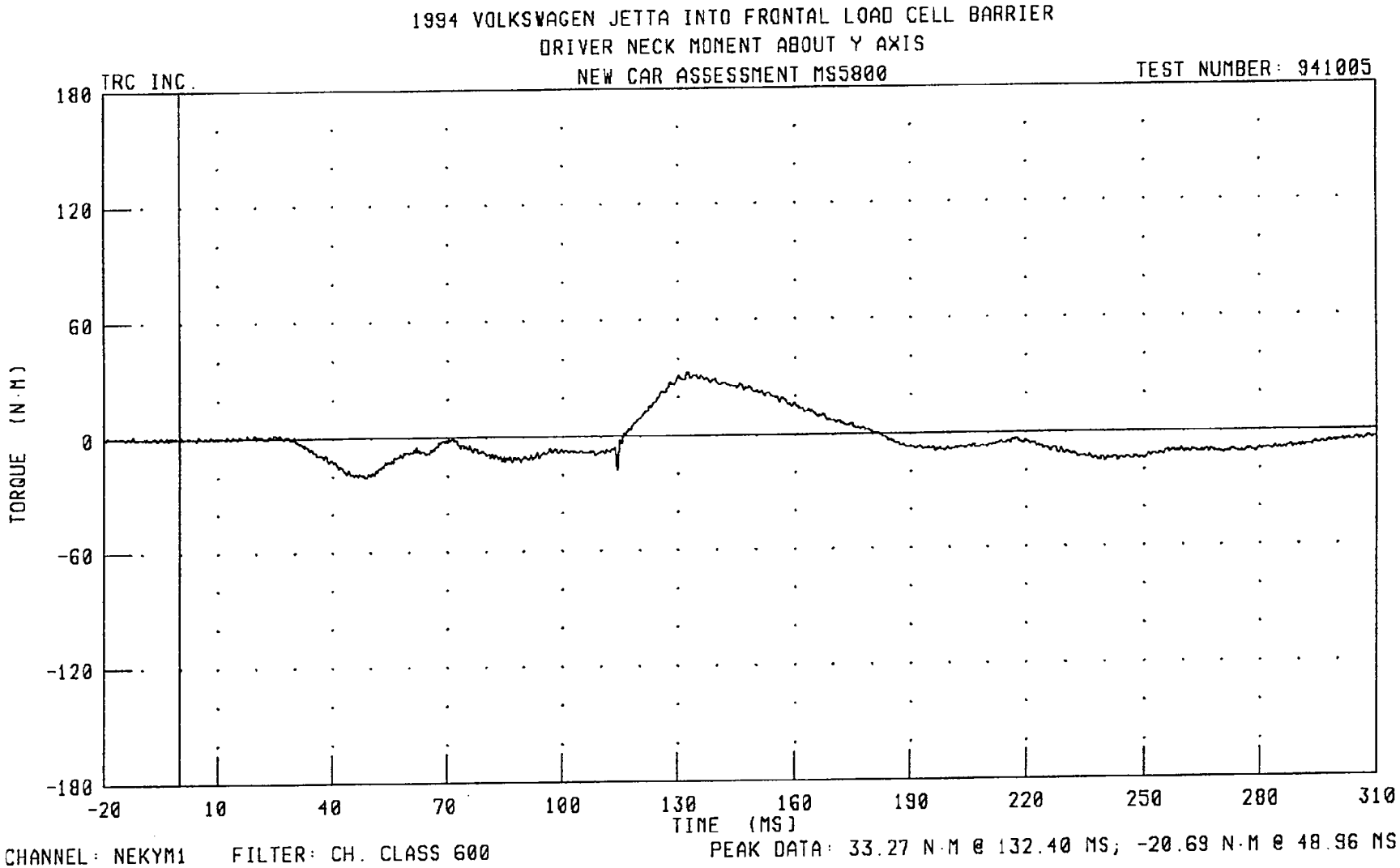
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: NEKZF1
FILTER: CH. CLASS 1000
PEAK DATA: 2262.19 N @ 62.64 MS; -979.51 N @ 114.64 MS

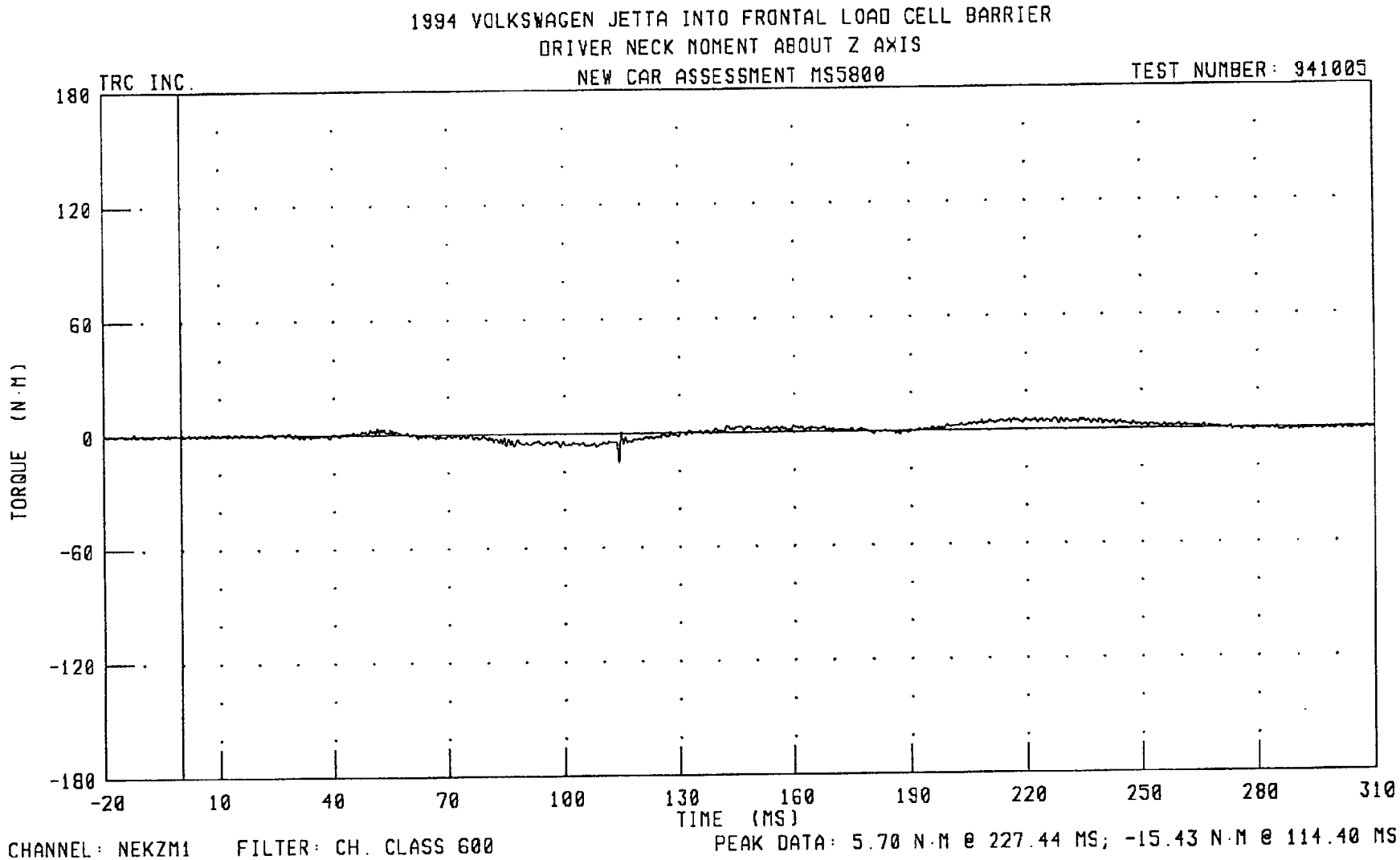
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 9.06 N-M @ 115.04 MS; -11.09 N-M @ 54.24 MS

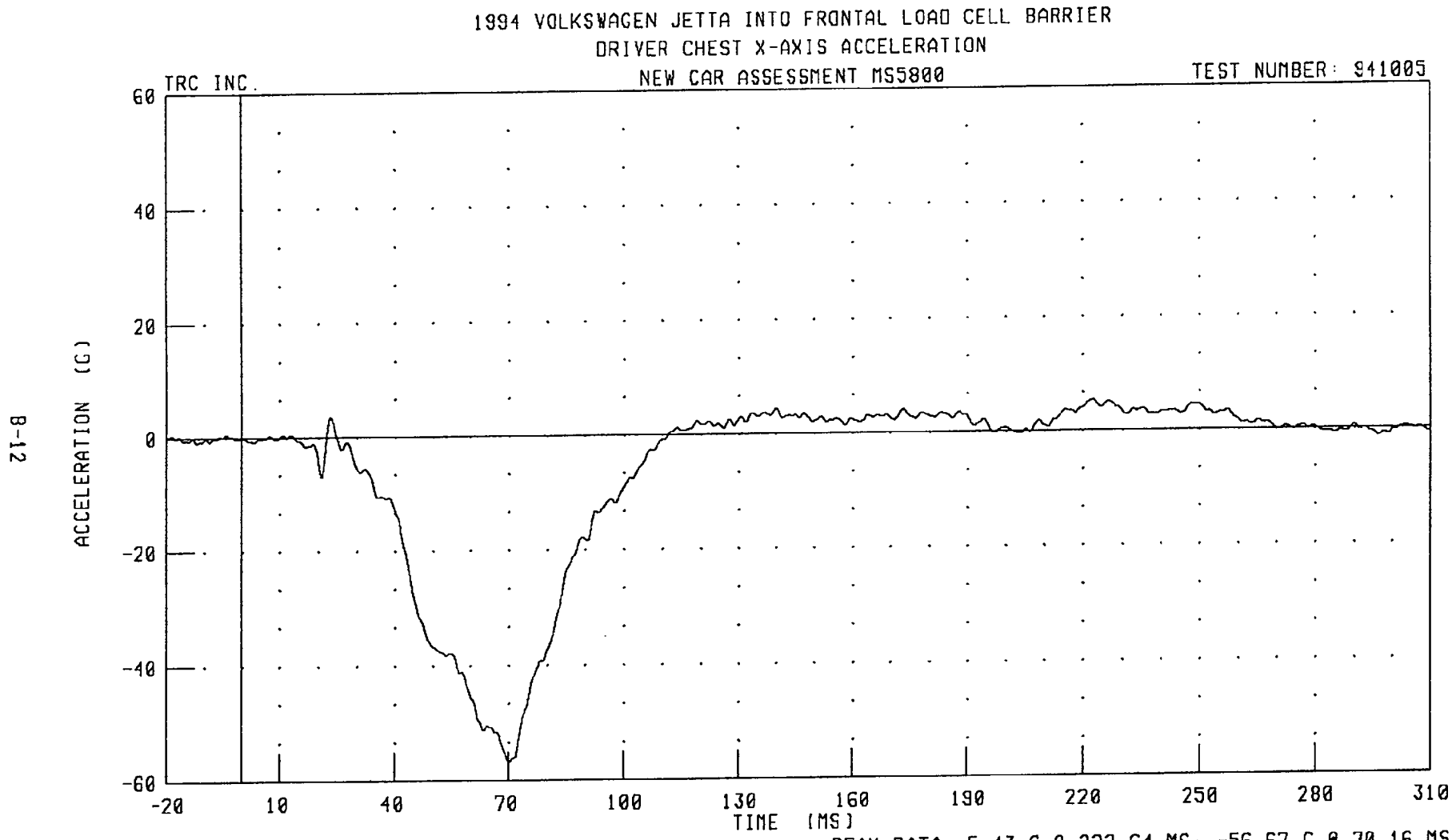
941005

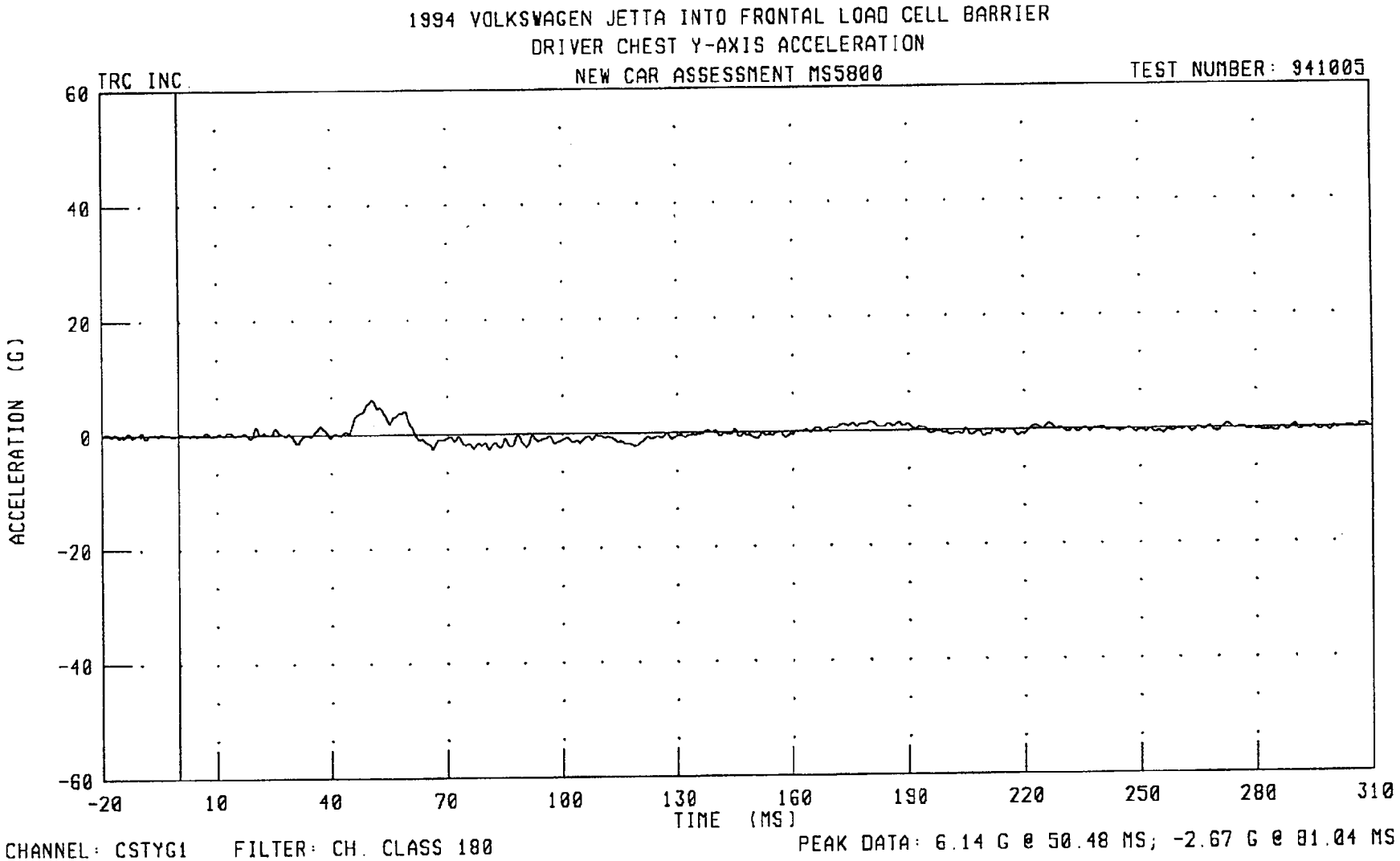

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
180
120
60
0
-60
-120
-180
TORQUE (N-M)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKYM1
FILTER: CH. CLASS 600
PEAK DATA: 33.27 N-M @ 132.40 MS; -20.69 N-M @ 48.96 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 5.70 N-M @ 227.44 MS; -15.43 N-M @ 114.40 MS

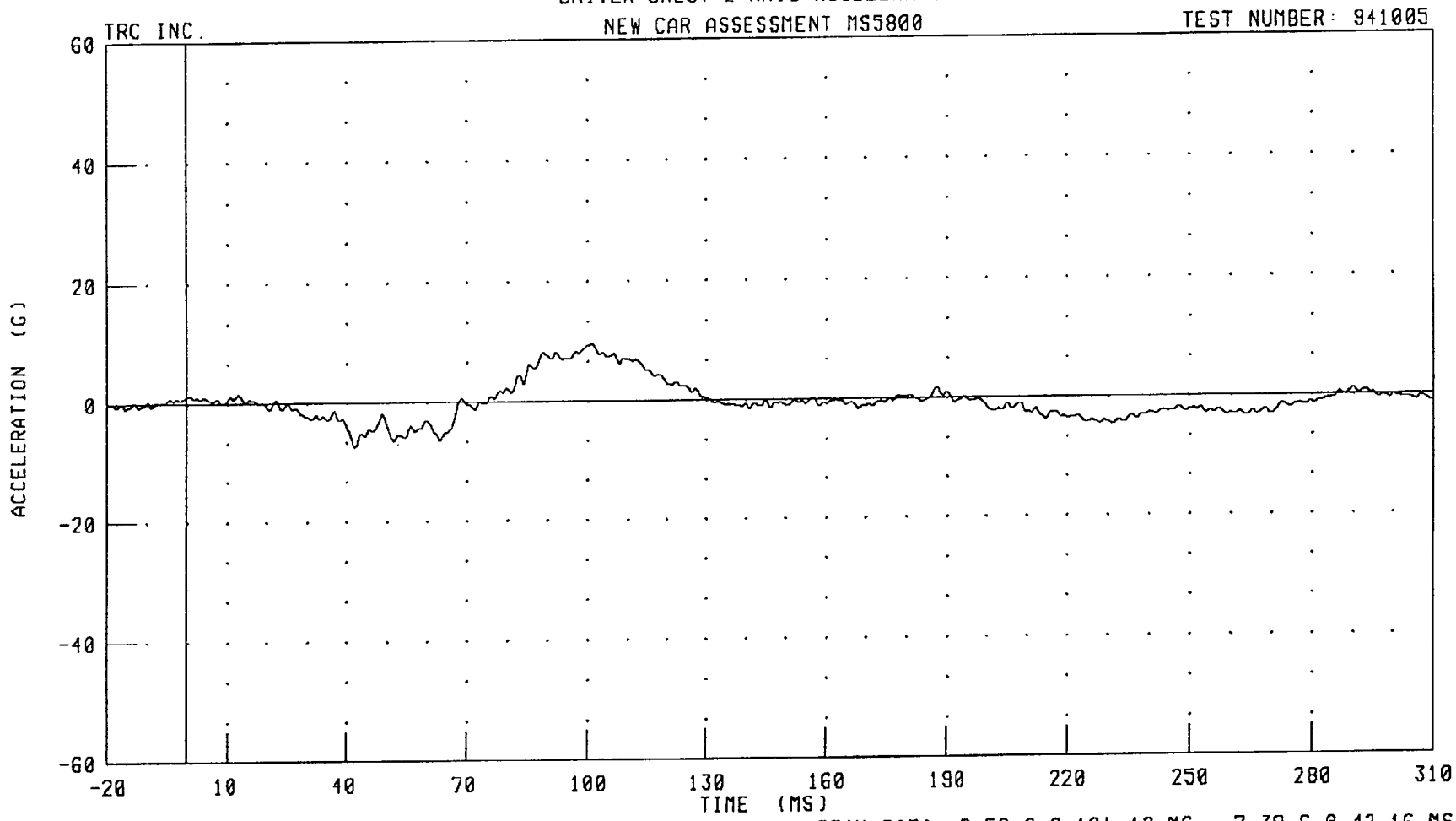
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG1
FILTER: CH. CLASS 180
PEAK DATA: 5.43 G @ 222.64 MS; -56.67 G @ 70.16 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC
TEST NUMBER: 941005
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTYG1
FILTER: CH. CLASS 180
PEAK DATA: 6.14 G @ 50.48 MS; -2.67 G @ 81.04 MS

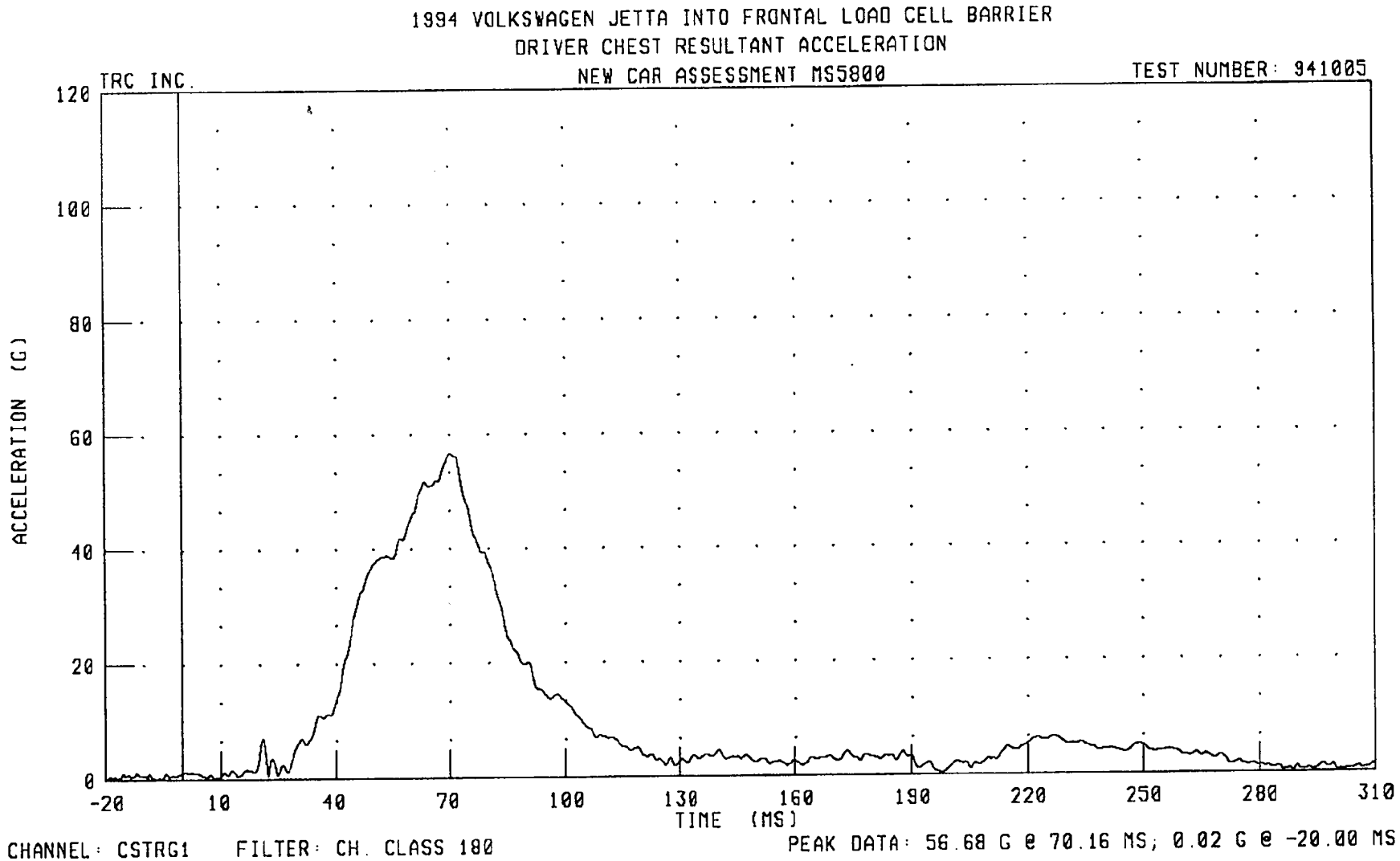
941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800

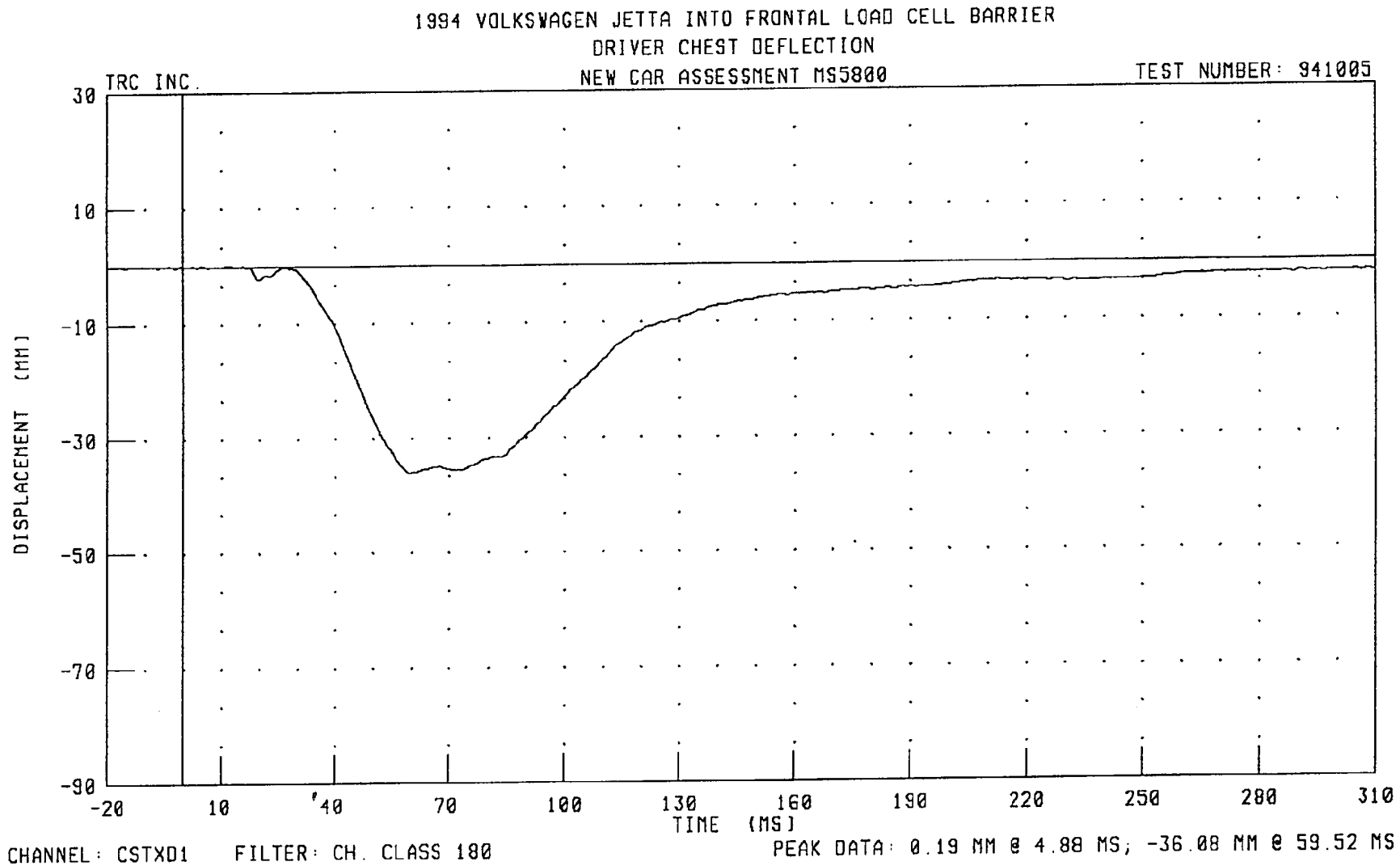


CHANNEL: CSTZG1 FILTER: CH. CLASS 180

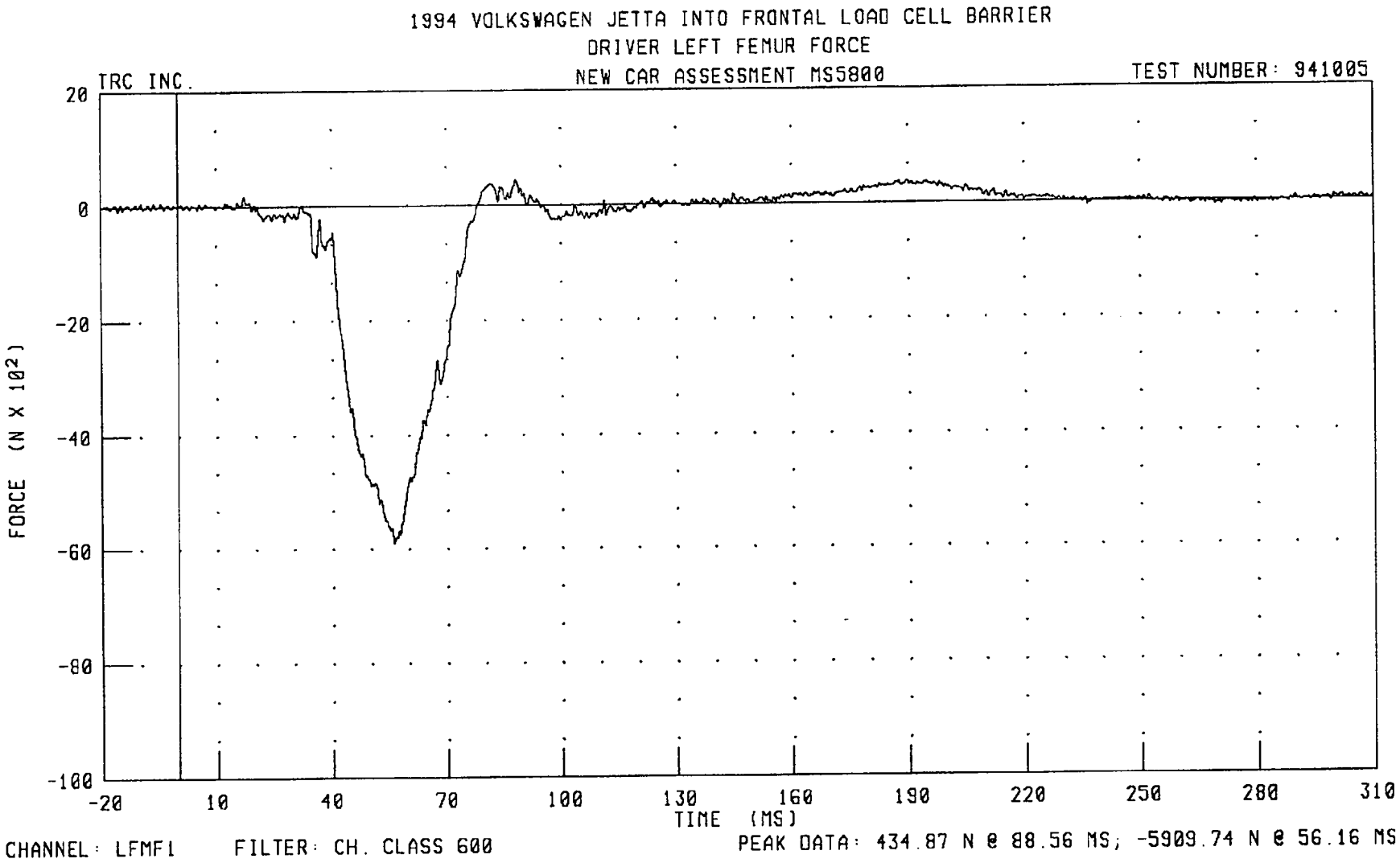
PEAK DATA: 9.59 G @ 101.12 MS; -7.39 G @ 42.16 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 56.68 G @ 70.16 MS; 0.02 G @ -20.00 MS

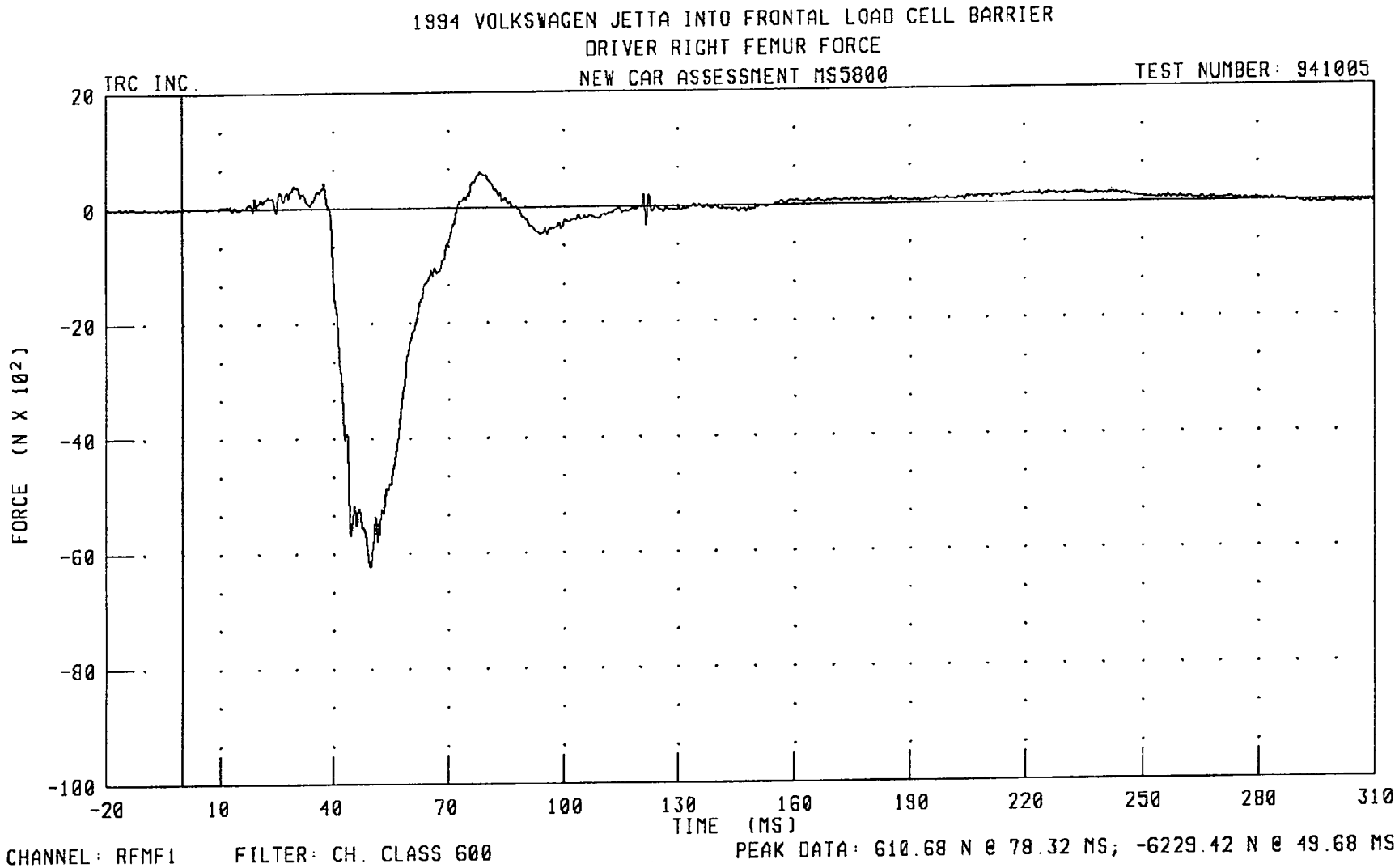
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.19 MM @ 4.88 MS; -36.08 MM @ 59.52 MS

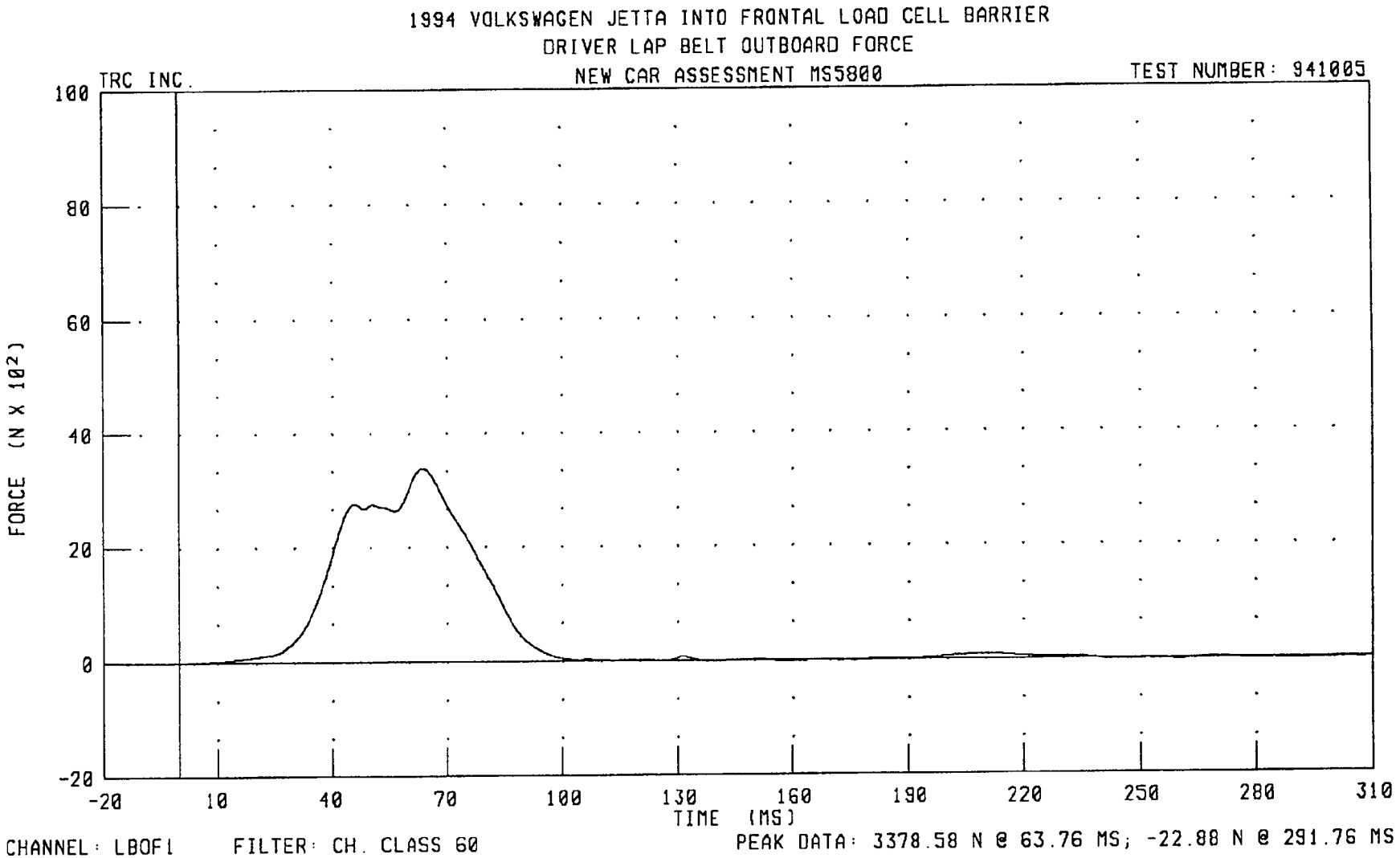
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: LFMF1
FILTER: CH. CLASS 600
PEAK DATA: 434.87 N @ 88.56 MS; -5909.74 N @ 56.16 MS

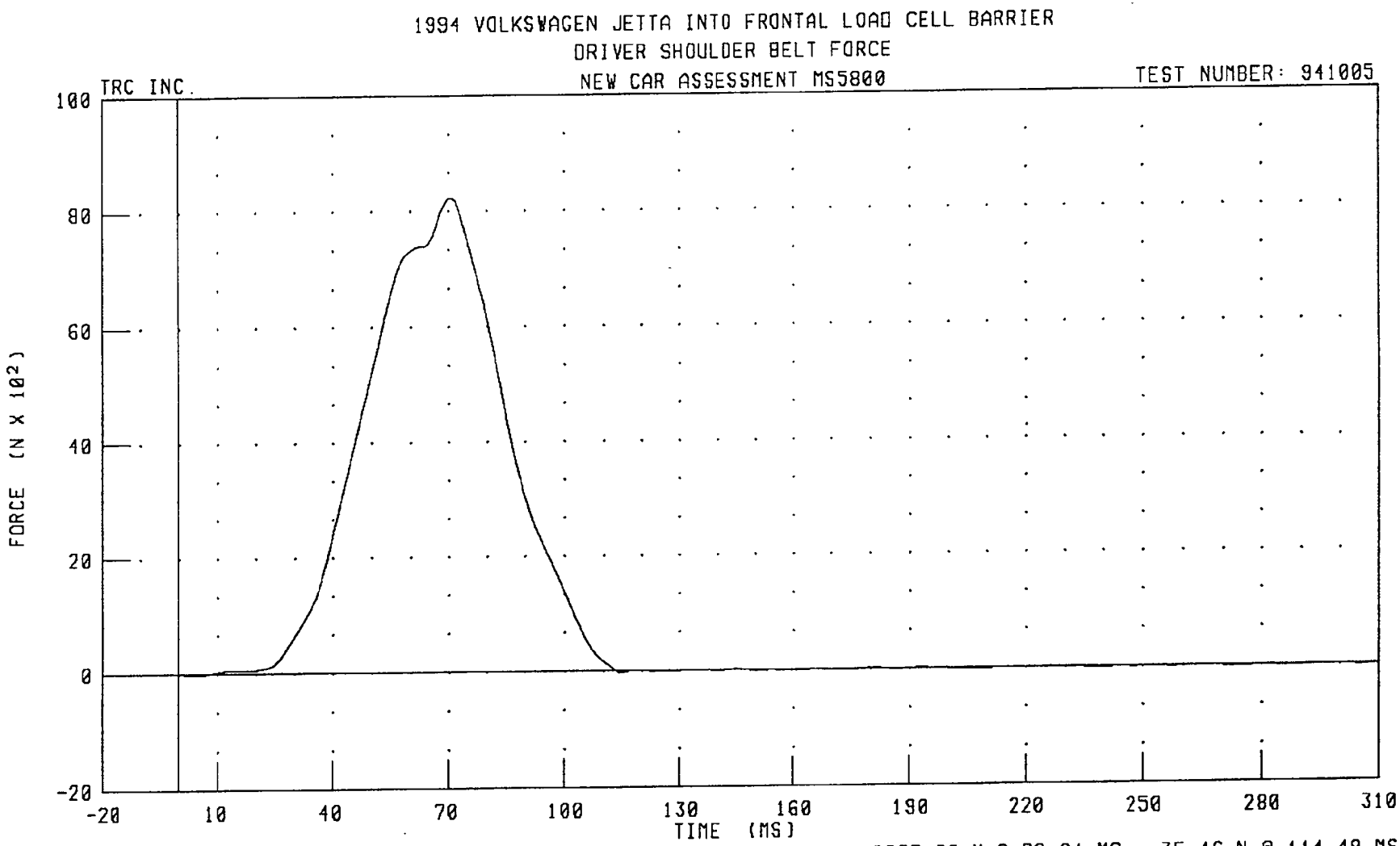
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 610.68 N @ 78.32 MS; -6229.42 N @ 49.68 MS

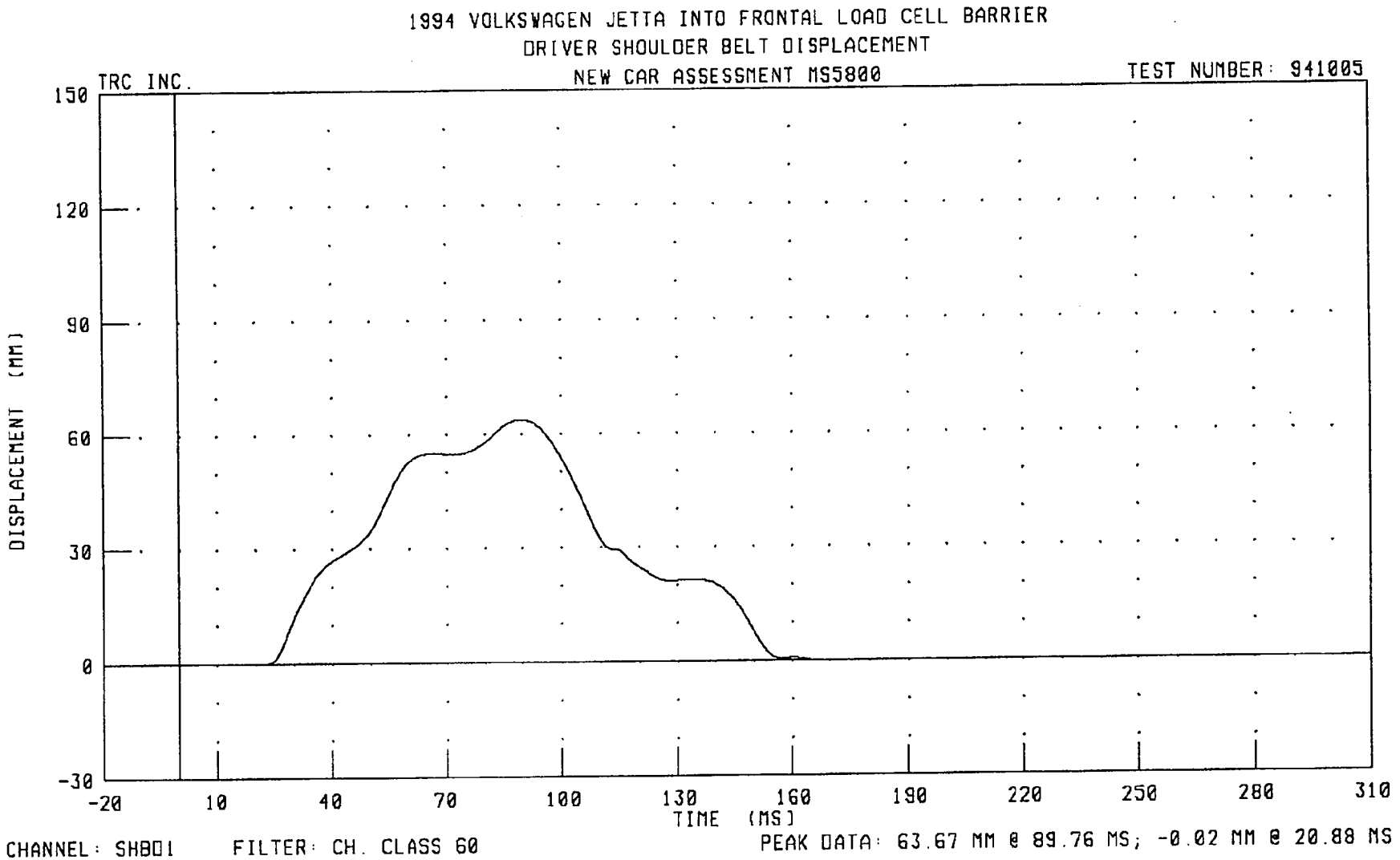
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 3378.58 N @ 63.76 MS; -22.88 N @ 291.76 MS

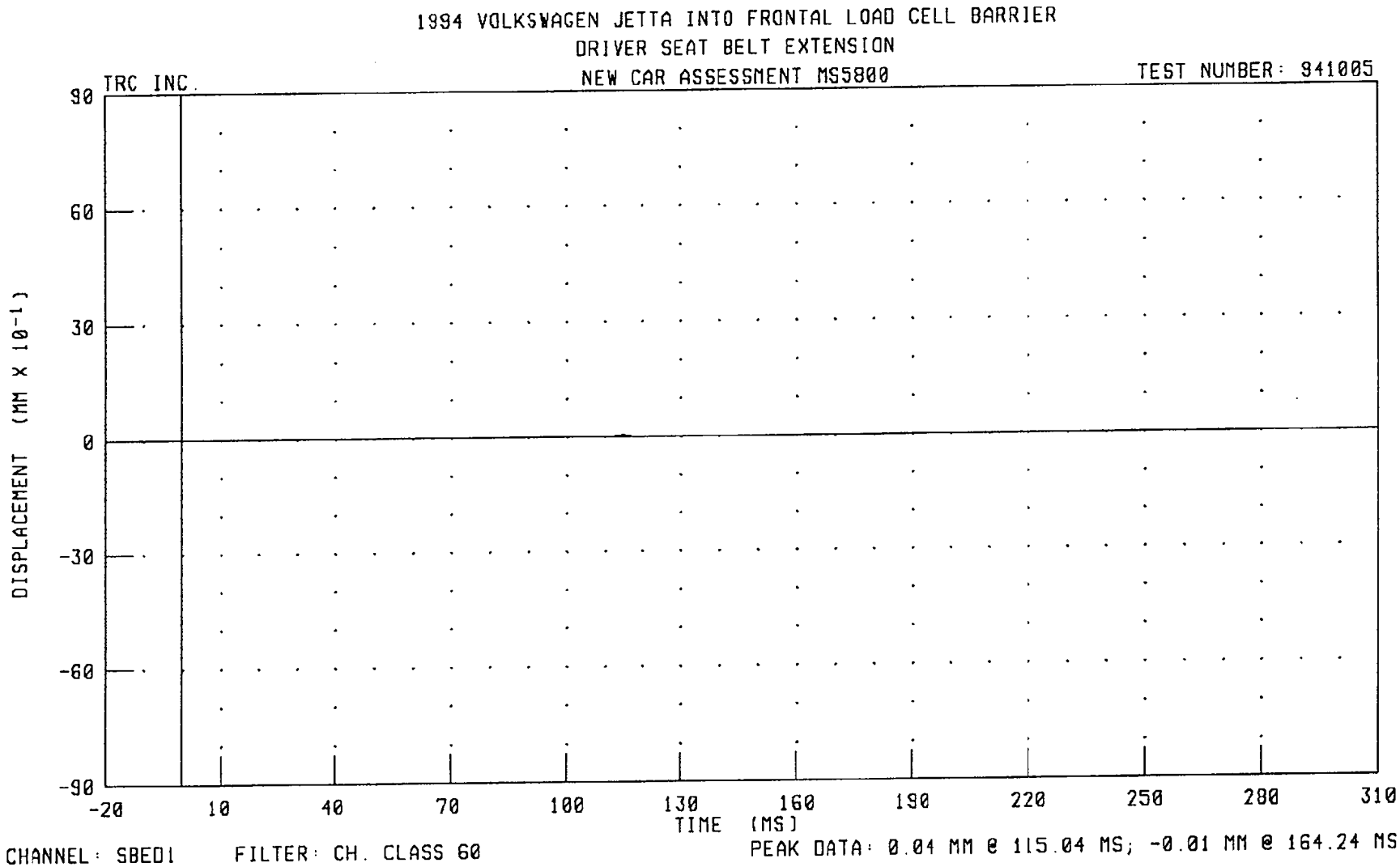
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 8225.86 N @ 70.64 MS; -35.46 N @ 114.48 MS

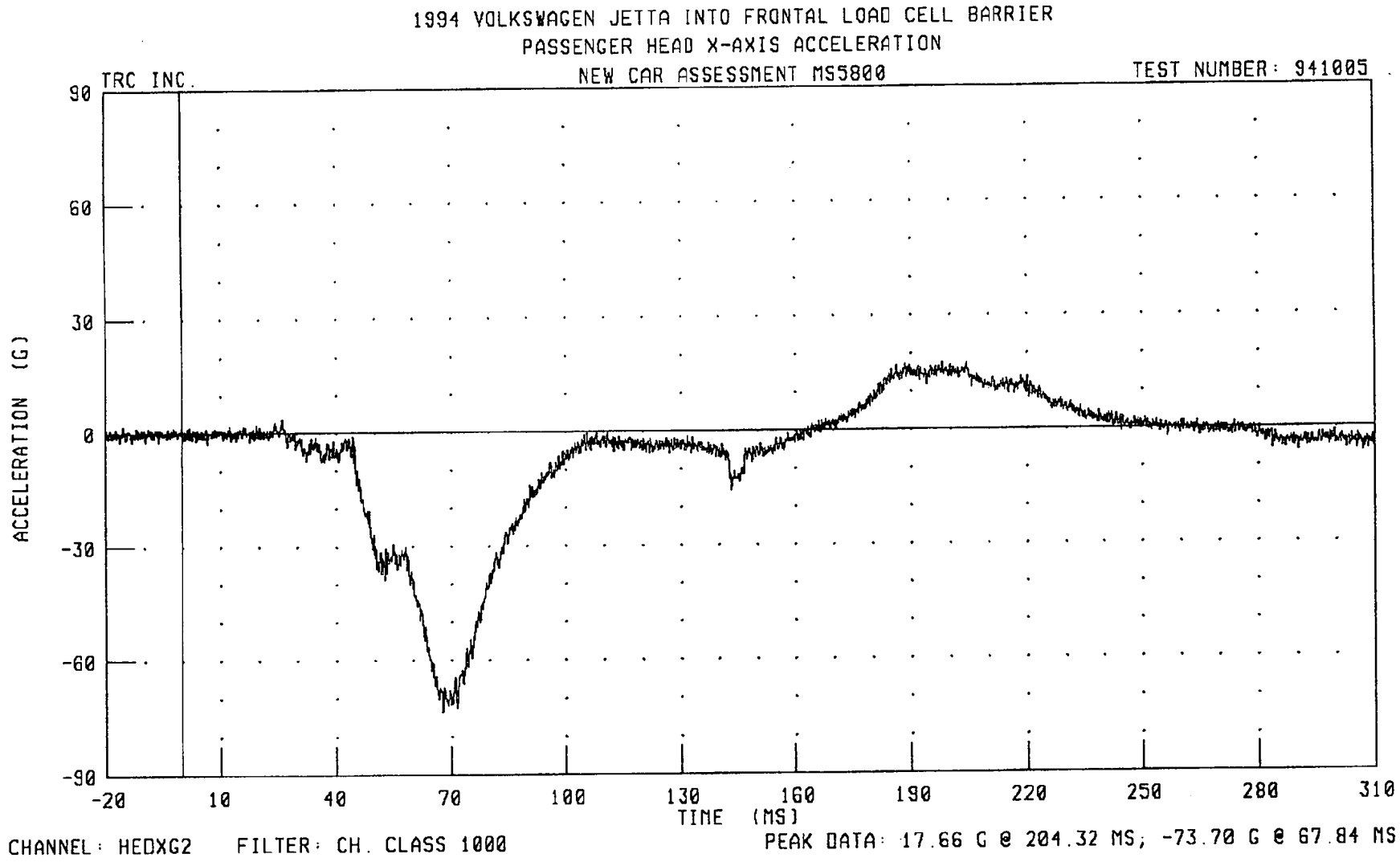
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 63.67 MM @ 89.76 MS; -0.02 MM @ 20.88 MS

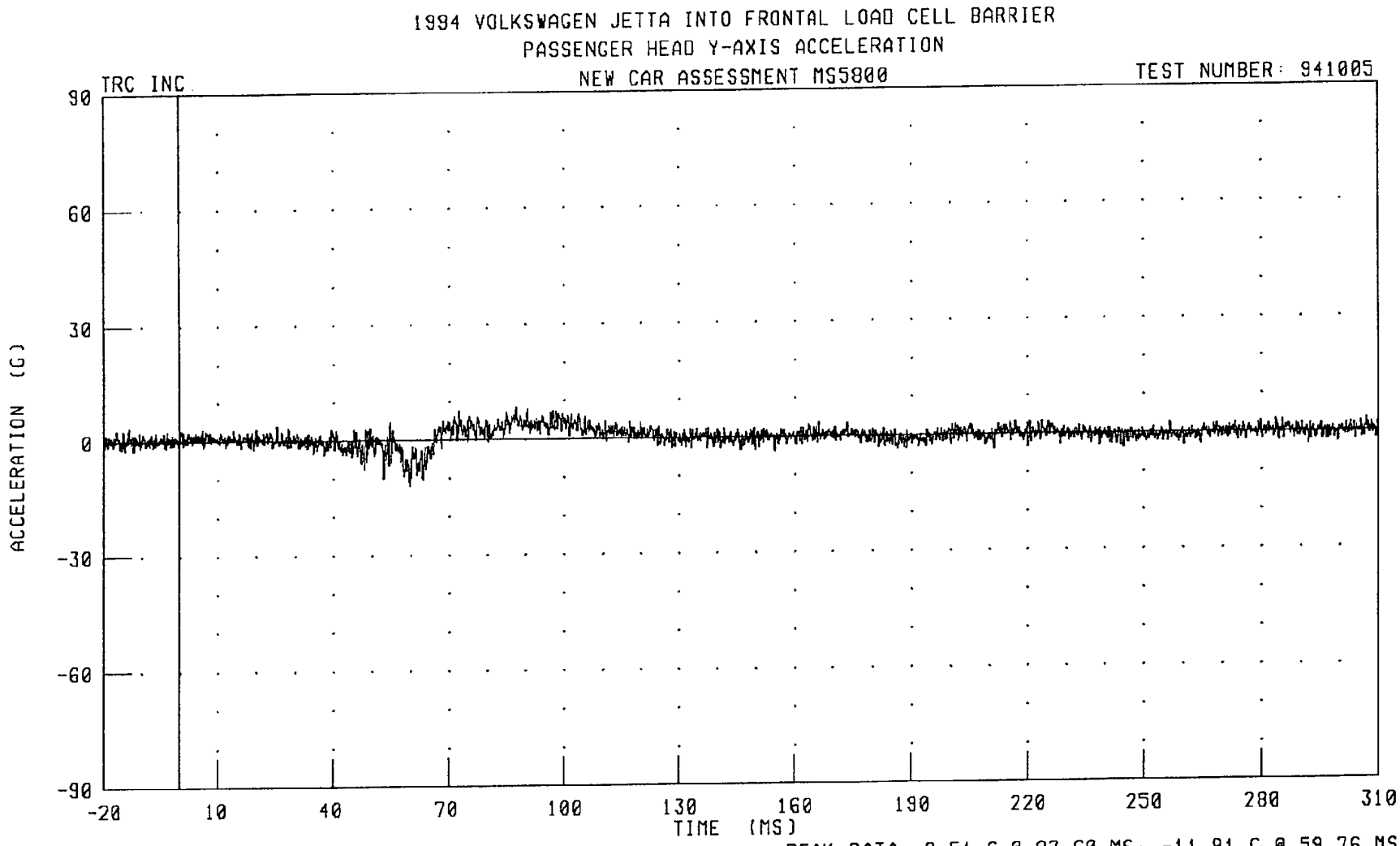
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
90
60
30
0
-30
-60
-90
DISPLACEMENT (MM X 10⁻¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SBED1
FILTER: CH. CLASS 60
PEAK DATA: 0.04 MM @ 115.04 MS; -0.01 MM @ 164.24 MS

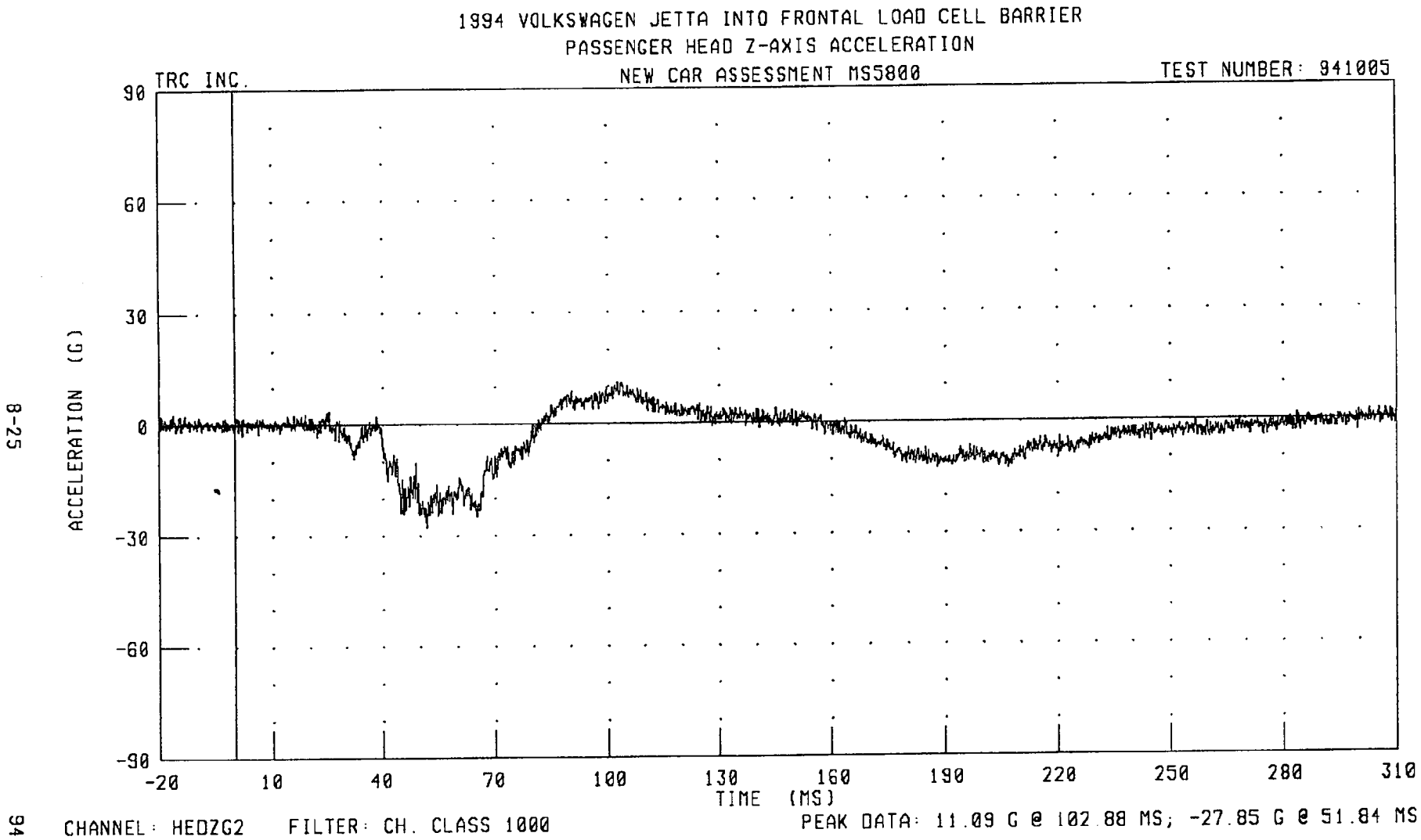
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 17.66 G @ 204.32 MS; -73.70 G @ 67.84 MS

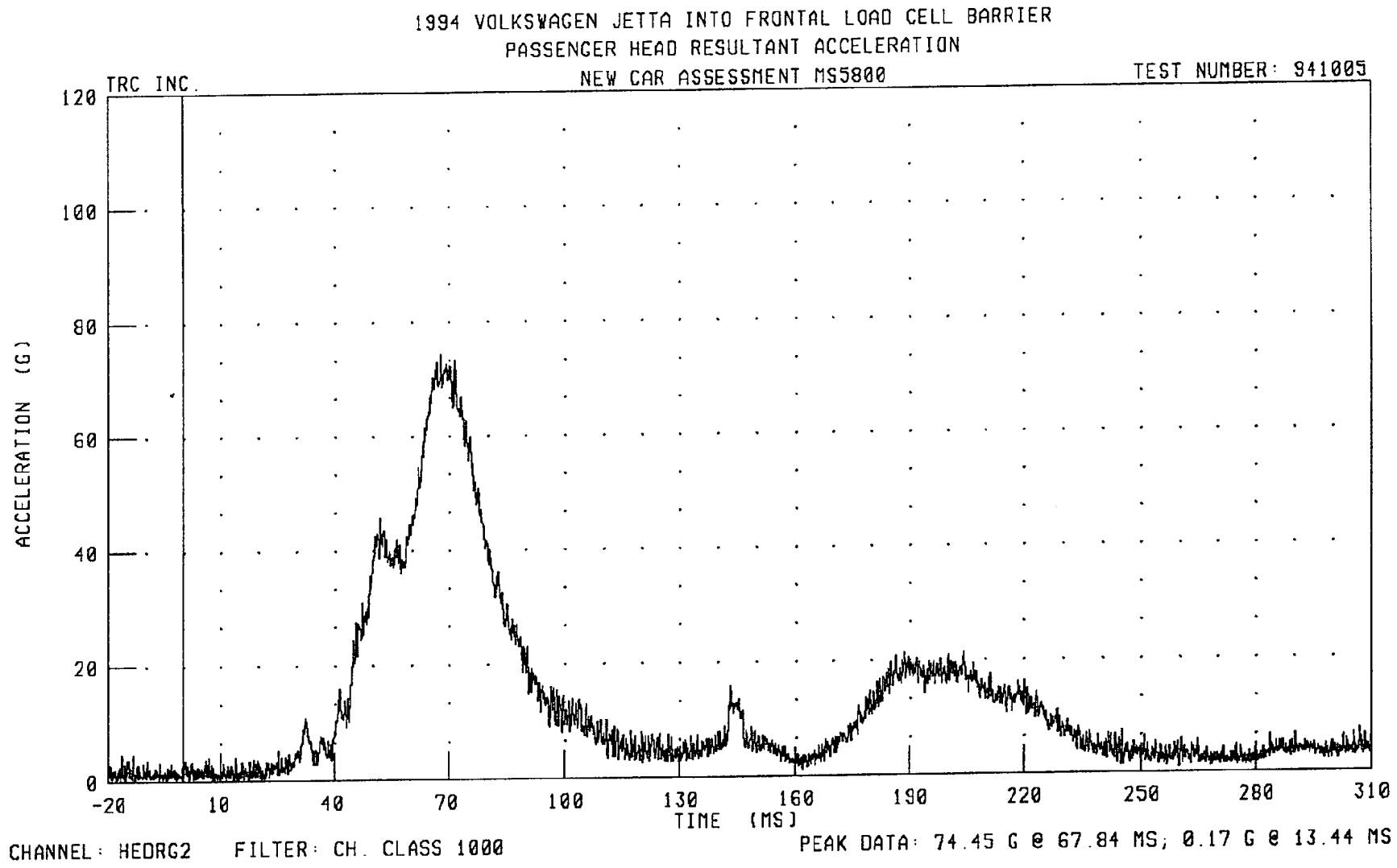
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDYG2
FILTER: CH. CLASS 1000
PEAK DATA: 8.51 G @ 87.60 MS; -11.91 G @ 59.76 MS

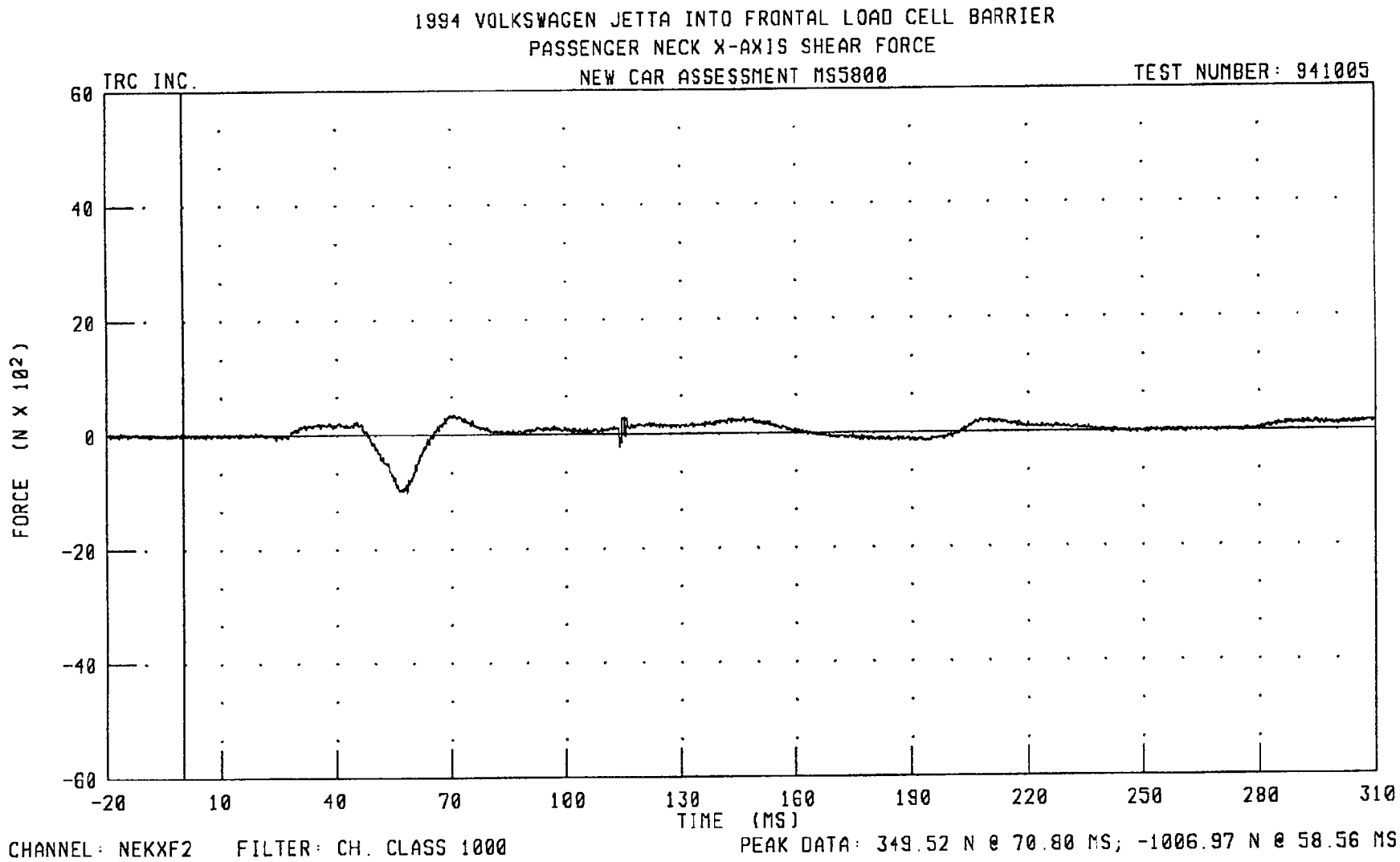
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
90
60
30
0
-30
-60
-90
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZG2
FILTER: CH. CLASS 1000
PEAK DATA: 11.09 G @ 102.88 MS; -27.85 G @ 51.84 MS

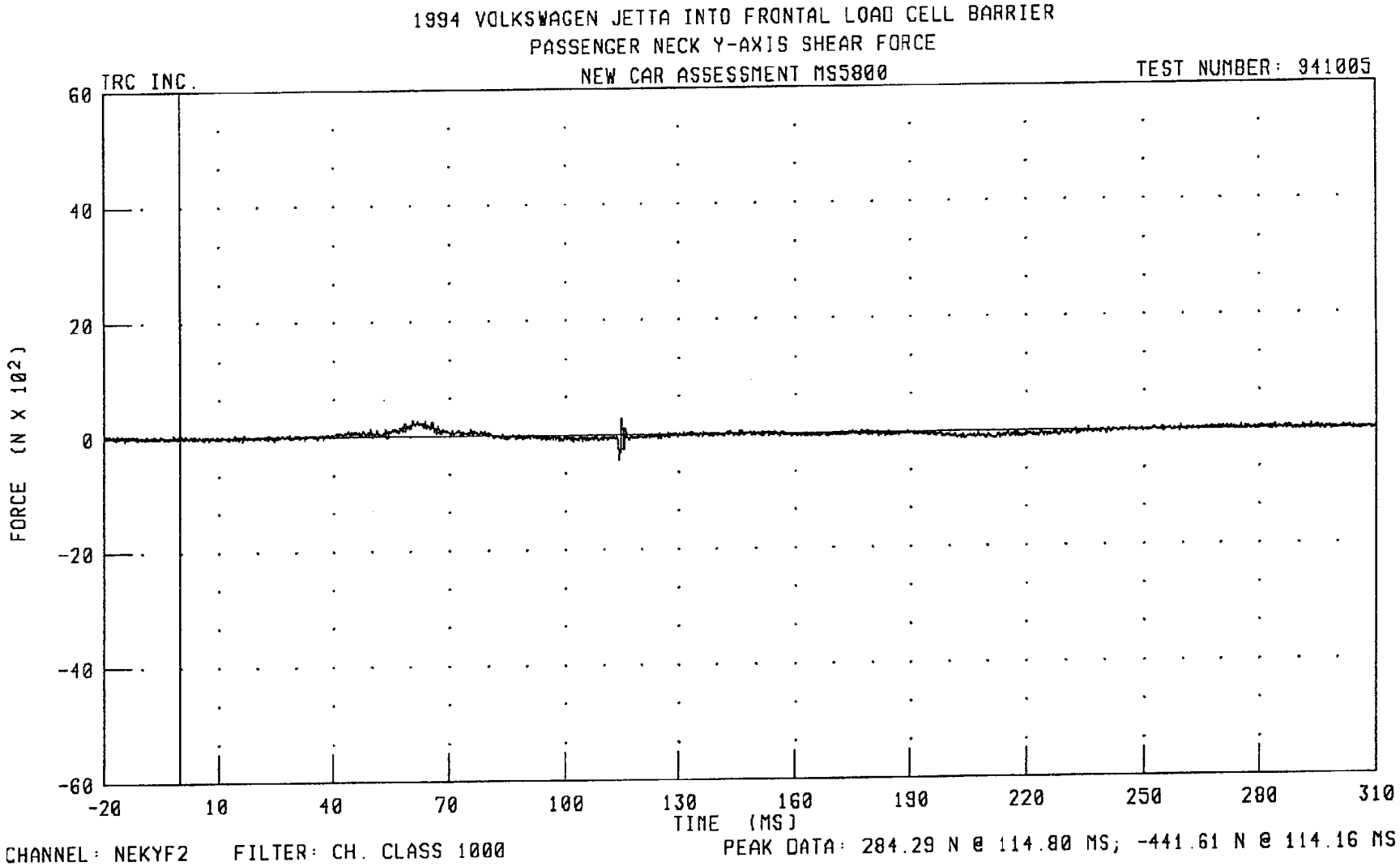
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 74.45 G @ 67.84 MS; 0.17 G @ 13.44 MS

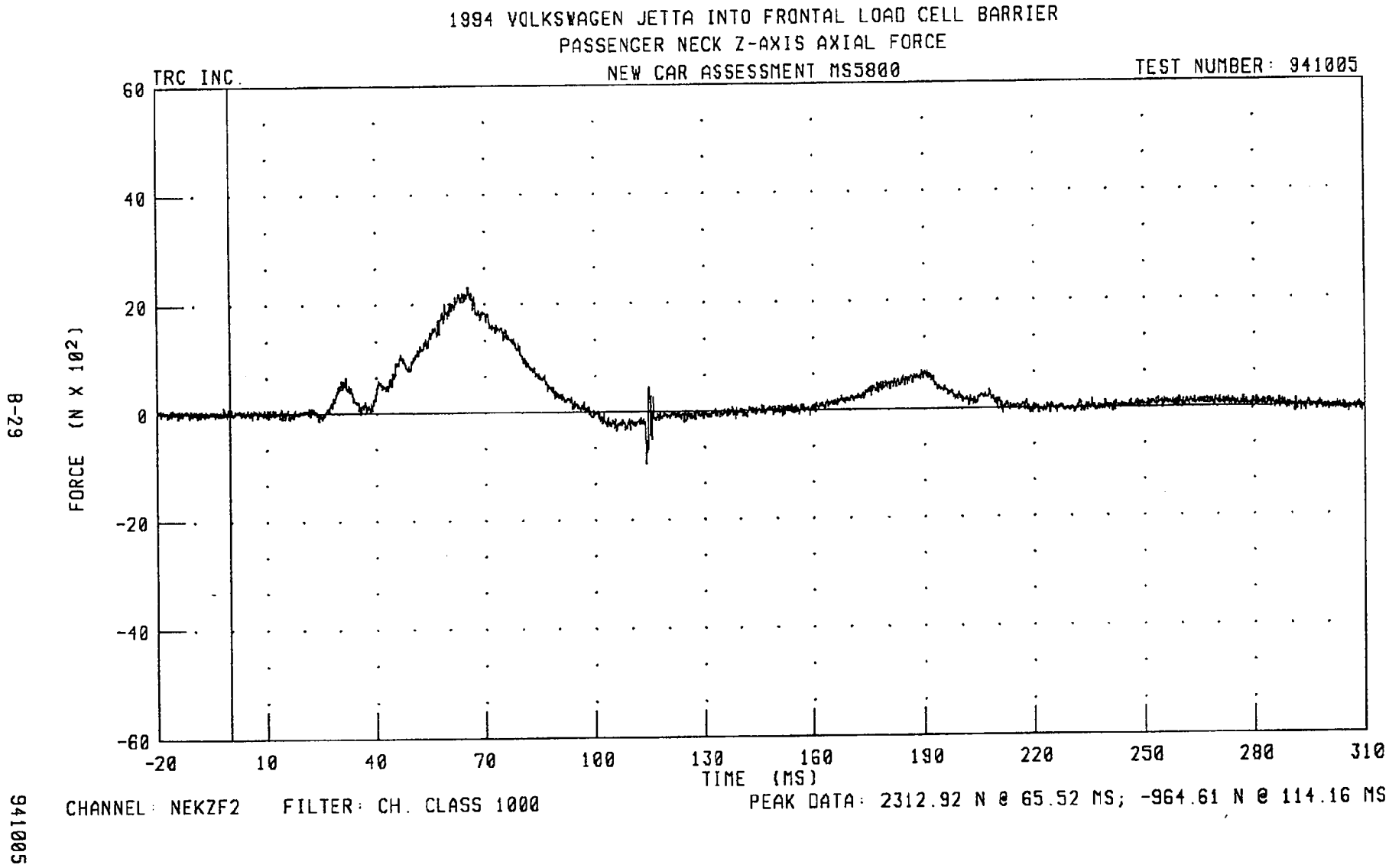
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 349.52 N @ 70.80 MS; -1006.97 N @ 58.56 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 284.29 N @ 114.80 MS; -441.61 N @ 114.16 MS

941005

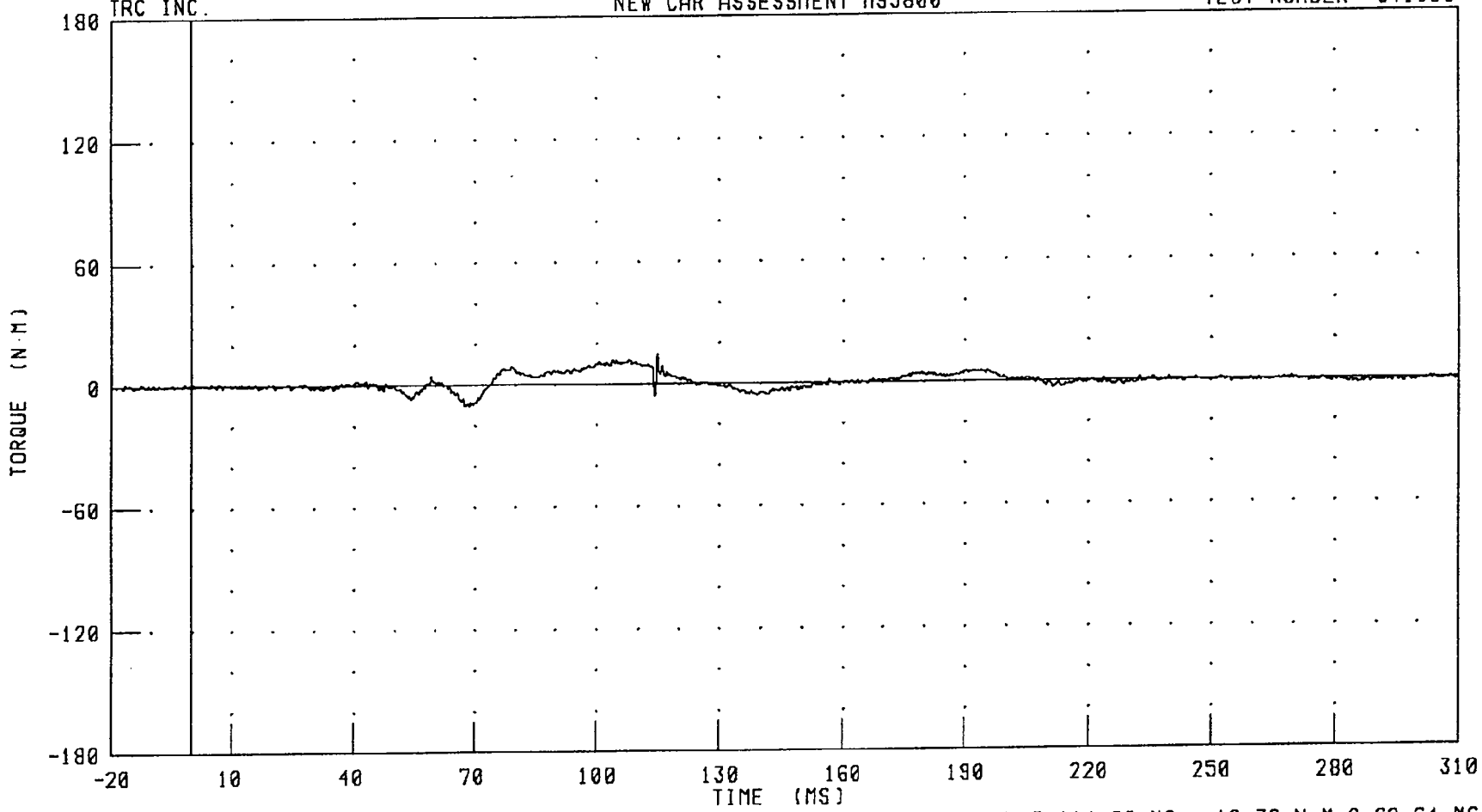

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
40
20
0
-20
-40
-60
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NEKZF2
FILTER: CH. CLASS 1000
PEAK DATA: 2312.92 N @ 65.52 MS; -964.61 N @ 114.16 MS

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT MS5800

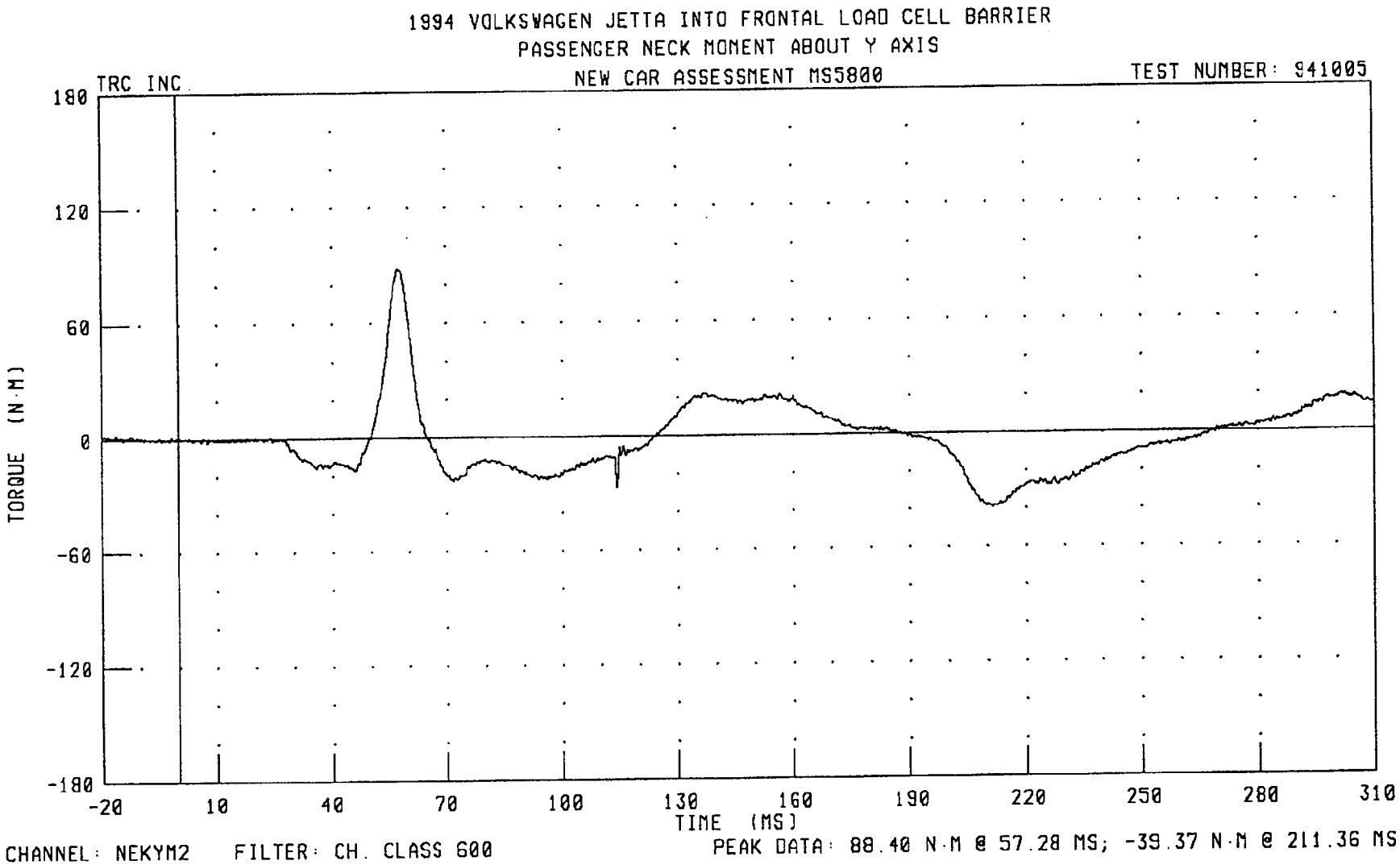
TRC INC.

TEST NUMBER: 941005

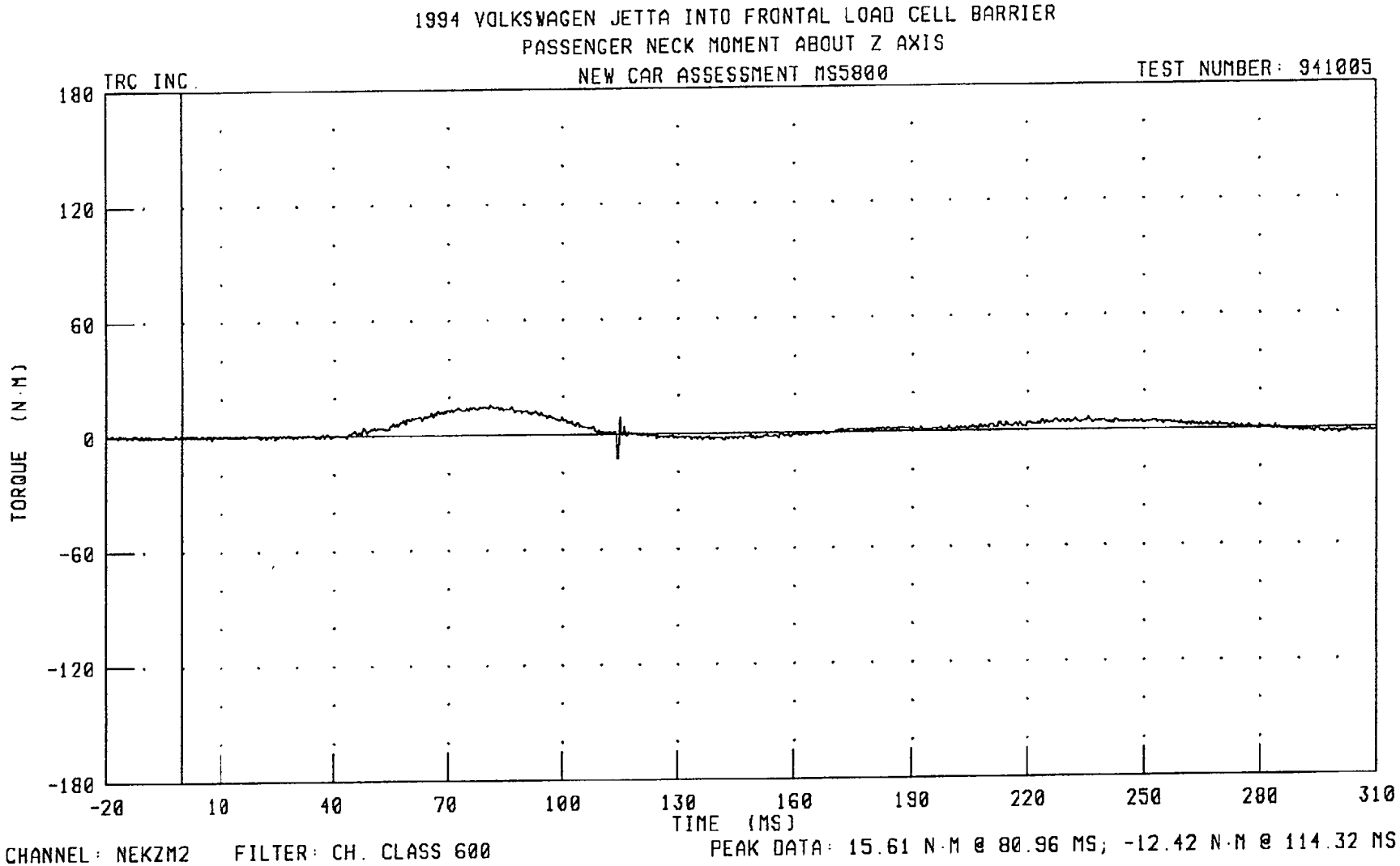


CHANNEL: NEKXM2 FILTER: CH. CLASS 600

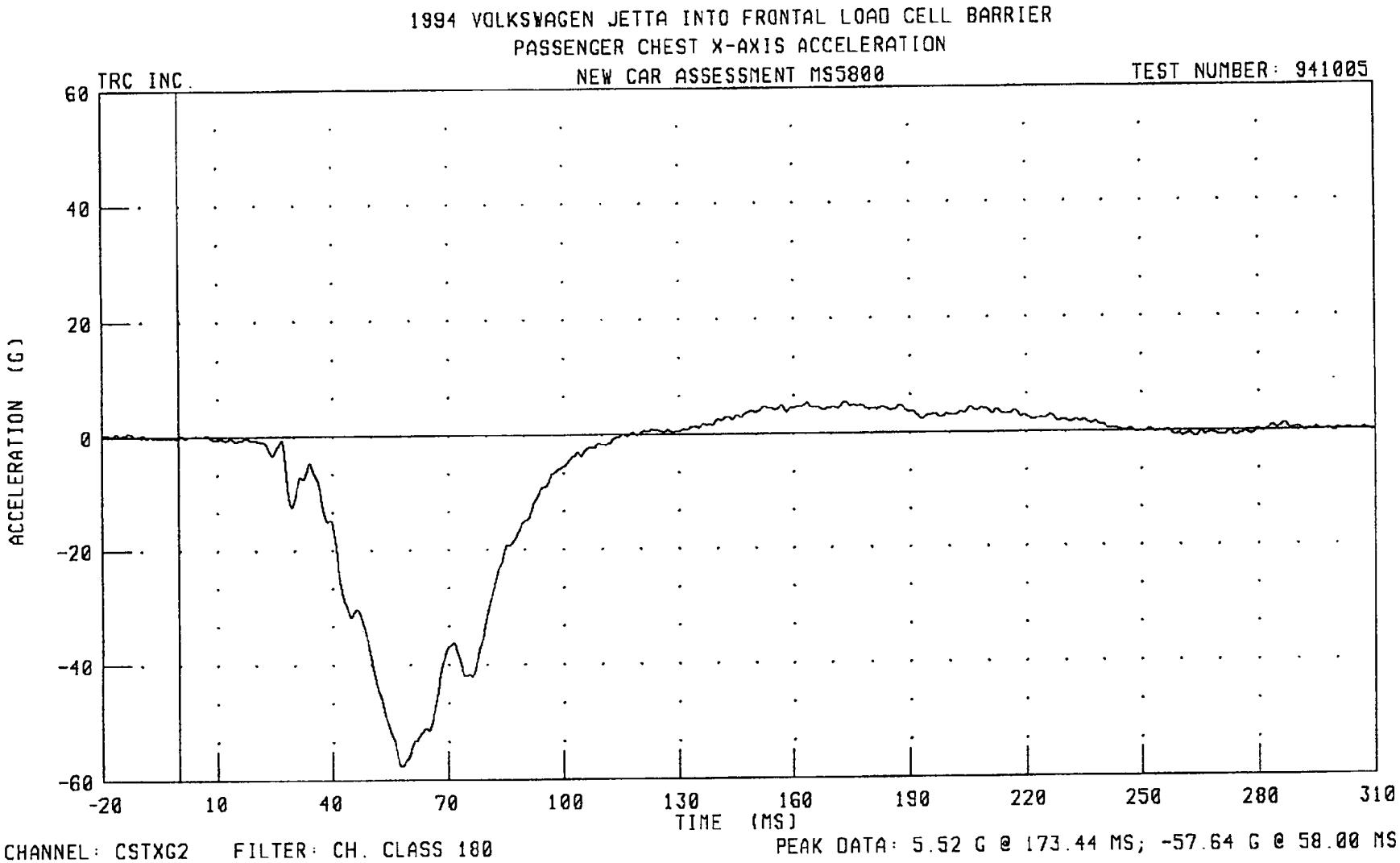
PEAK DATA: 14.93 N-M @ 114.88 MS; -10.38 N-M @ 68.64 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT MS5800
TRC INC
TEST NUMBER: 941005
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: 88.40 N-M @ 57.28 MS; -39.37 N-M @ 211.36 MS

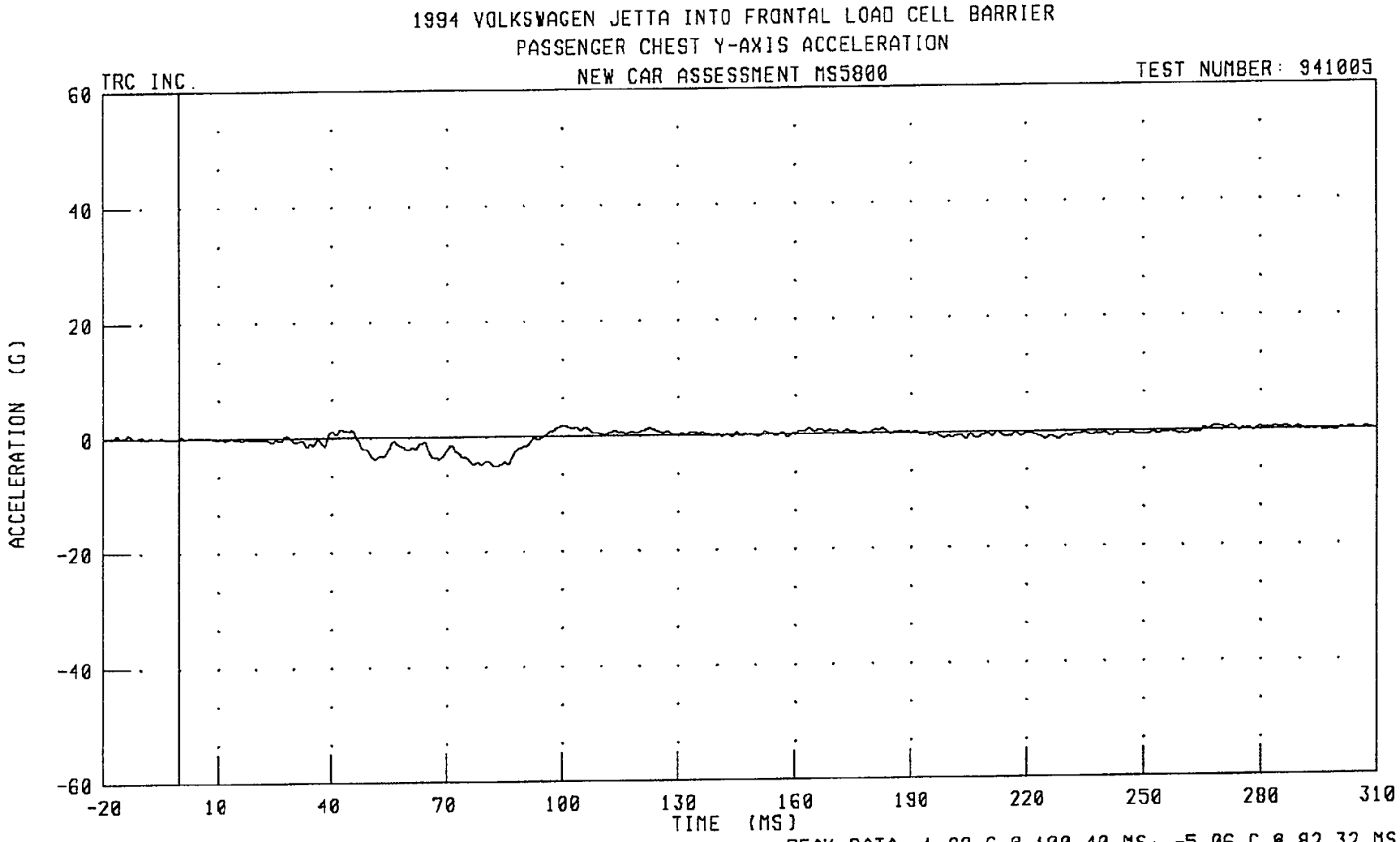
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 15.61 N-M @ 80.96 MS; -12.42 N-M @ 114.32 MS

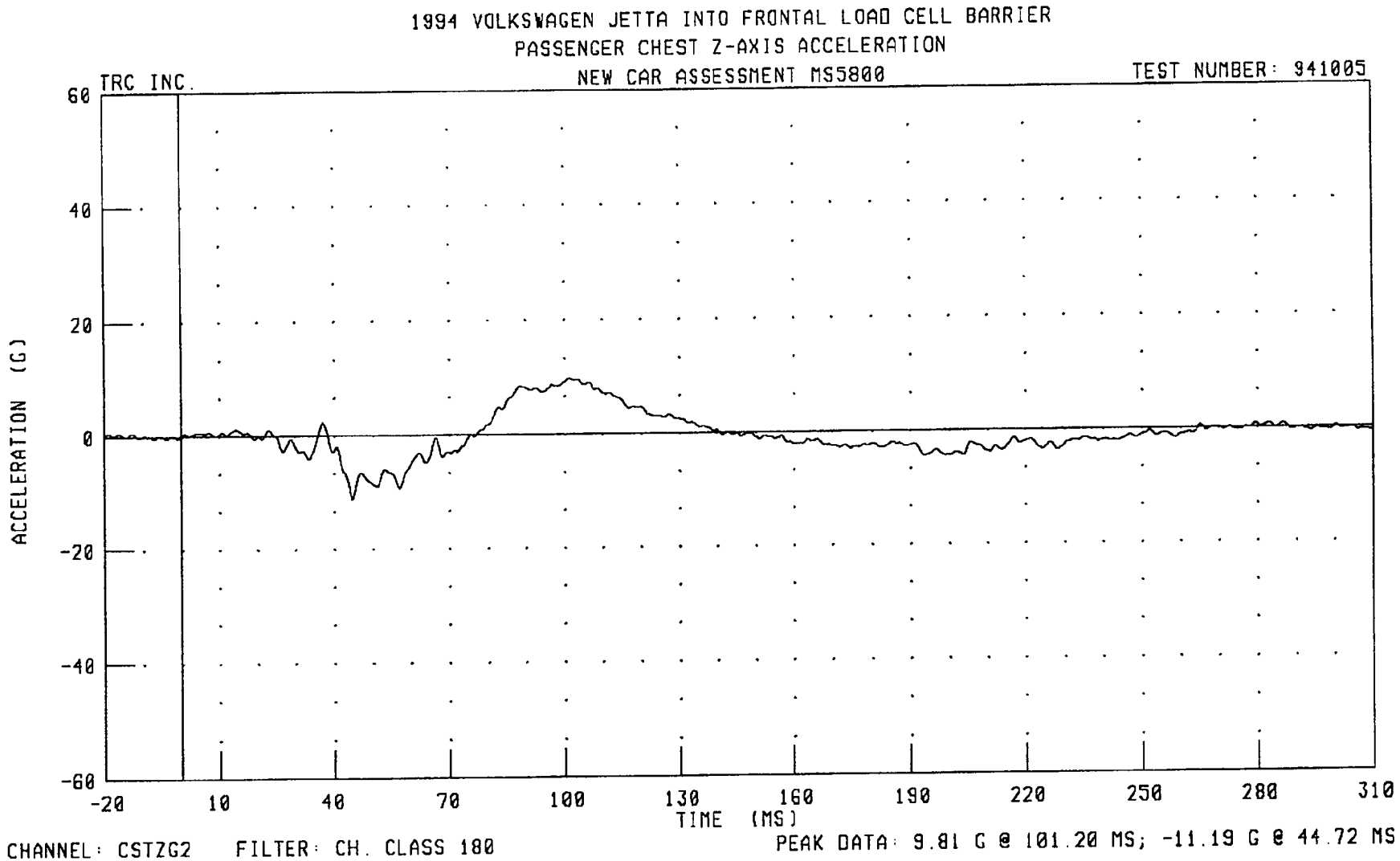
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTXG2
FILTER: CH. CLASS 180
PEAK DATA: 5.52 G @ 173.44 MS; -57.64 G @ 58.00 MS

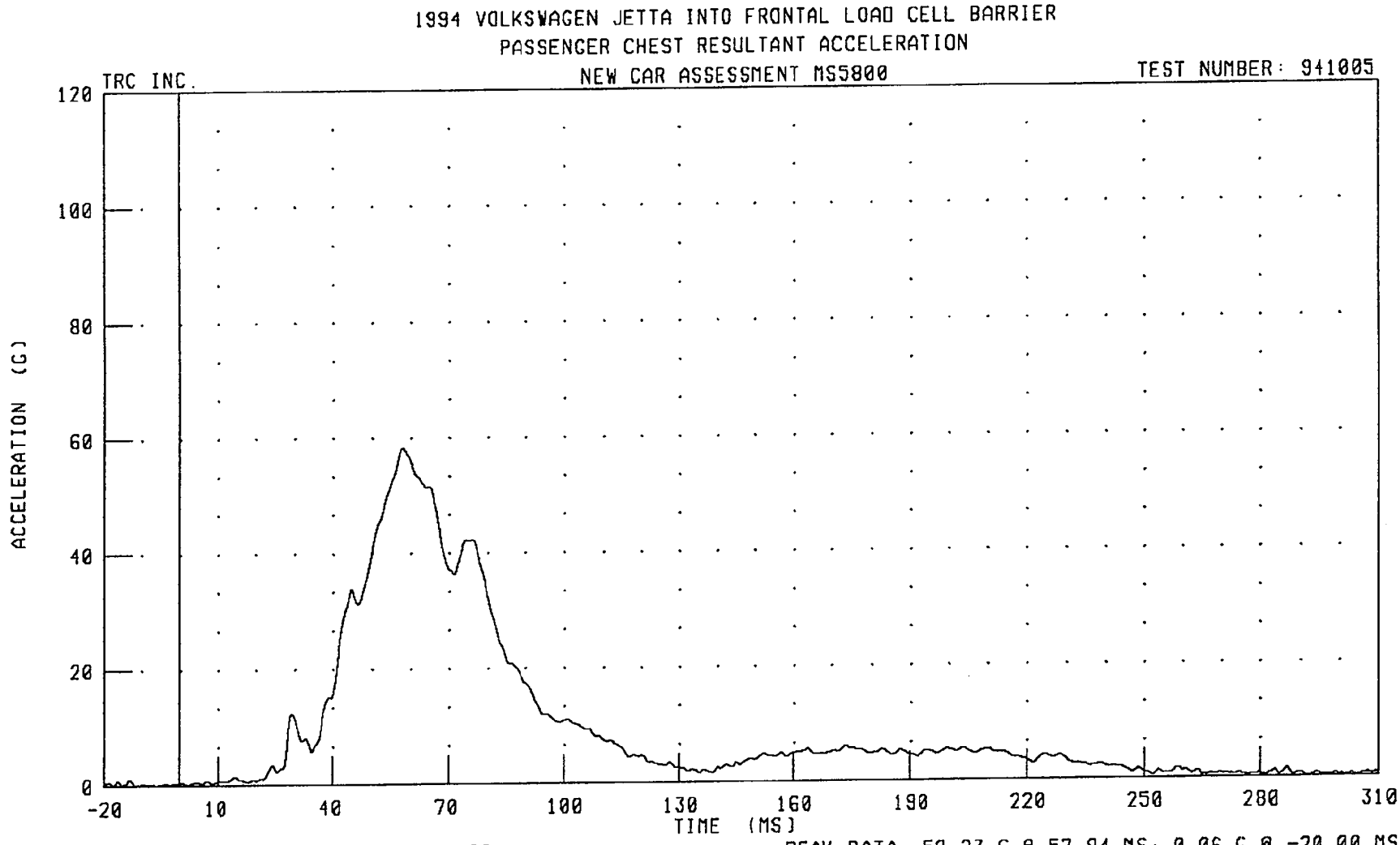
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTYG2
FILTER: CH. CLASS 180
PEAK DATA: 1.80 G @ 100.40 MS; -5.06 G @ 82.32 MS

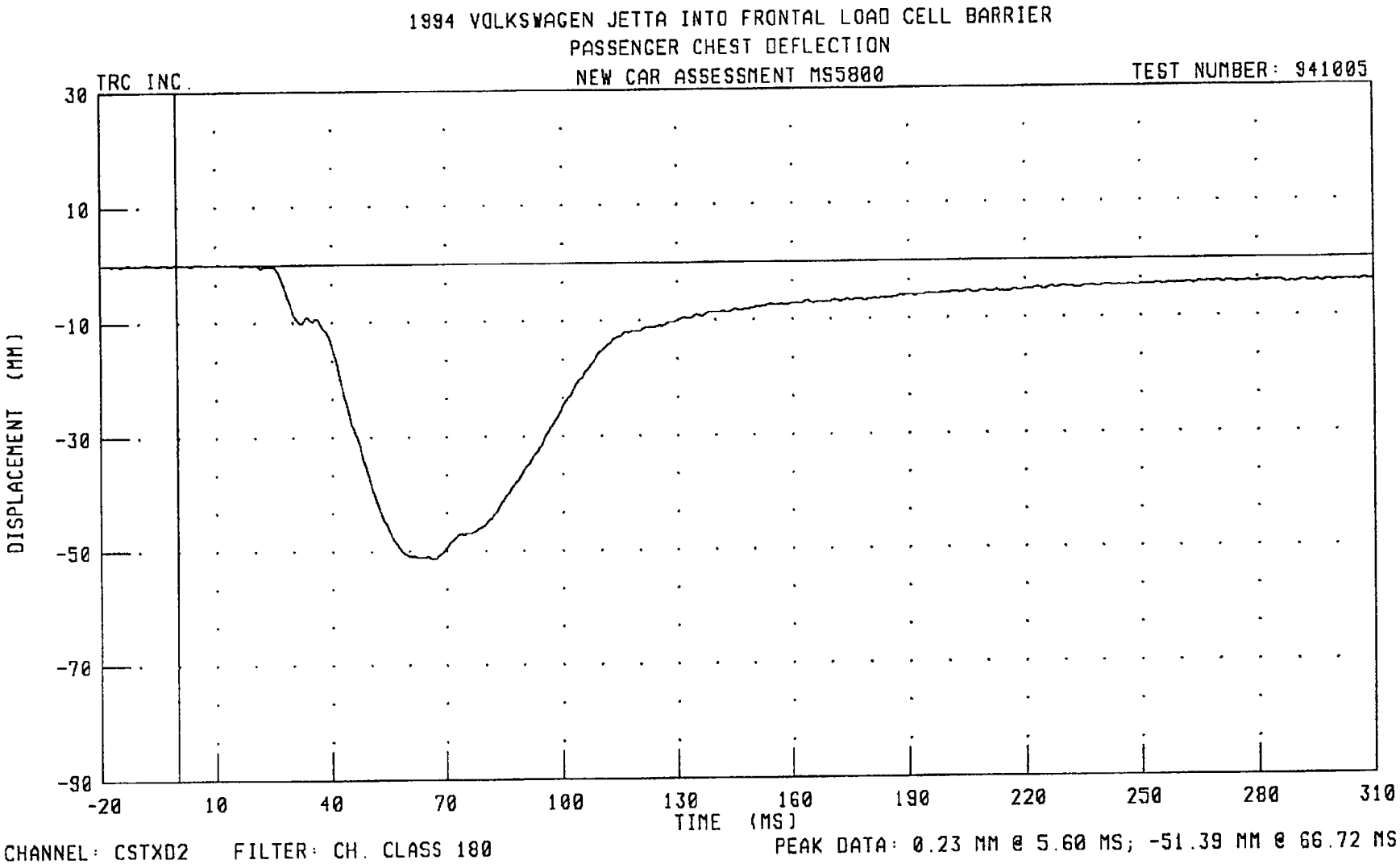
941005

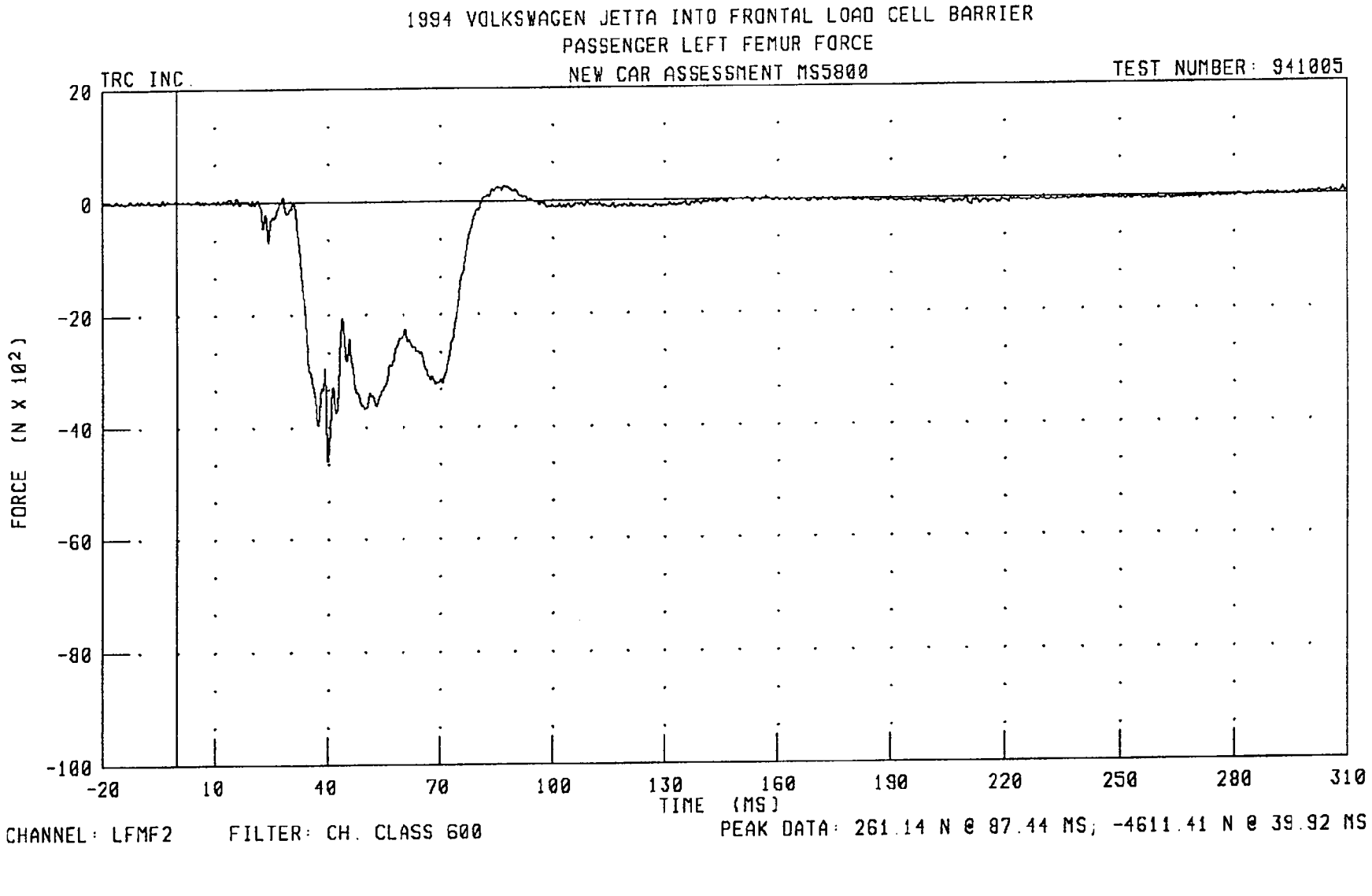

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTZG2
FILTER: CH. CLASS 180
PEAK DATA: 9.81 G @ 101.20 MS; -11.19 G @ 44.72 MS

941005

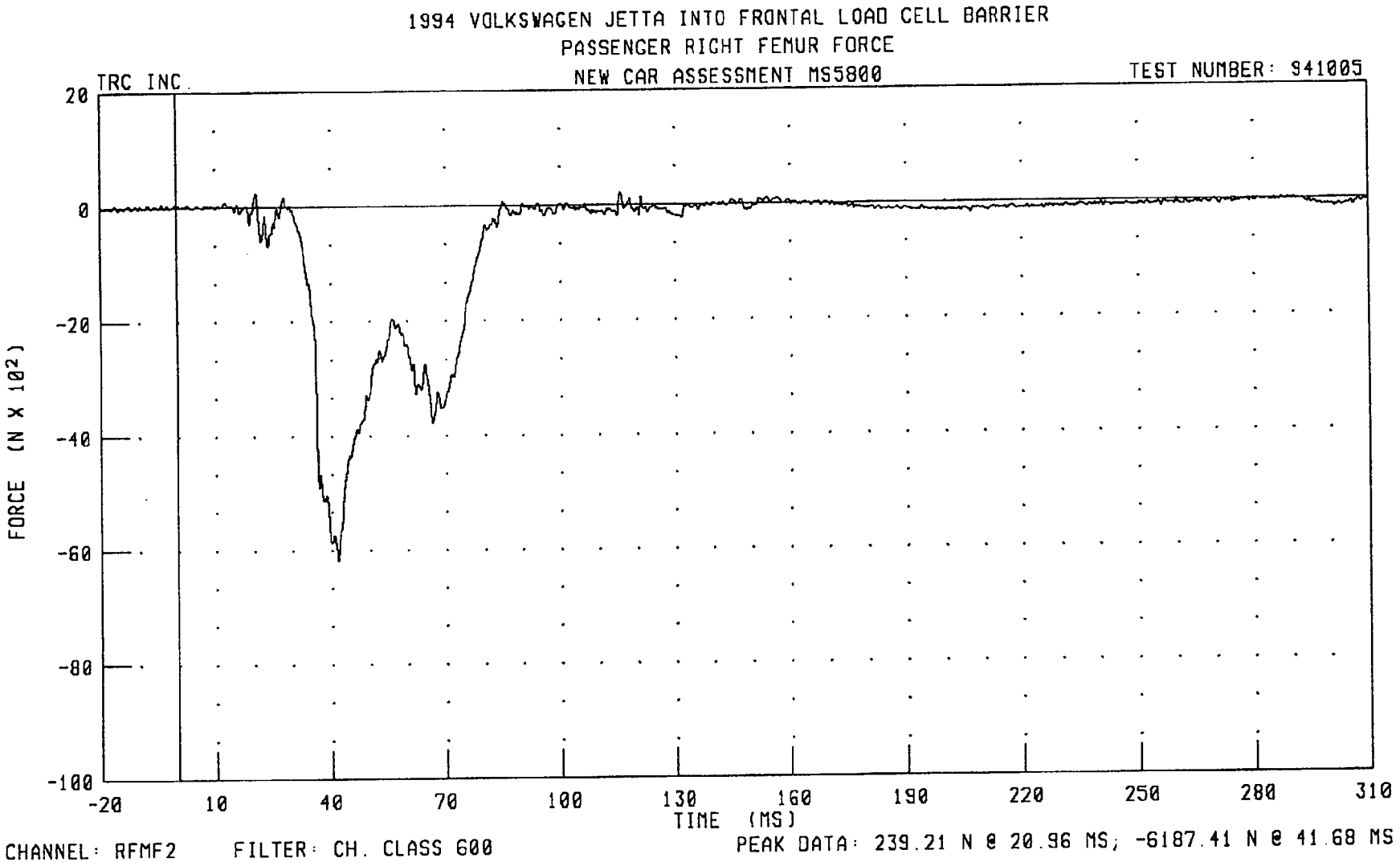

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
ACCELERATION (G)
120
100
80
60
40
20
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG2
FILTER: CH. CLASS 180
PEAK DATA: 58.23 G @ 57.84 MS; 0.06 G @ -20.00 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.23 MM @ 5.60 MS; -51.39 MM @ 66.72 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
FORCE (N X 10²)
20
0
-20
-40
-60
-80
-100
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LFMF2
FILTER: CH. CLASS 600
PEAK DATA: 261.14 N @ 87.44 MS; -4611.41 N @ 39.92 MS

941005

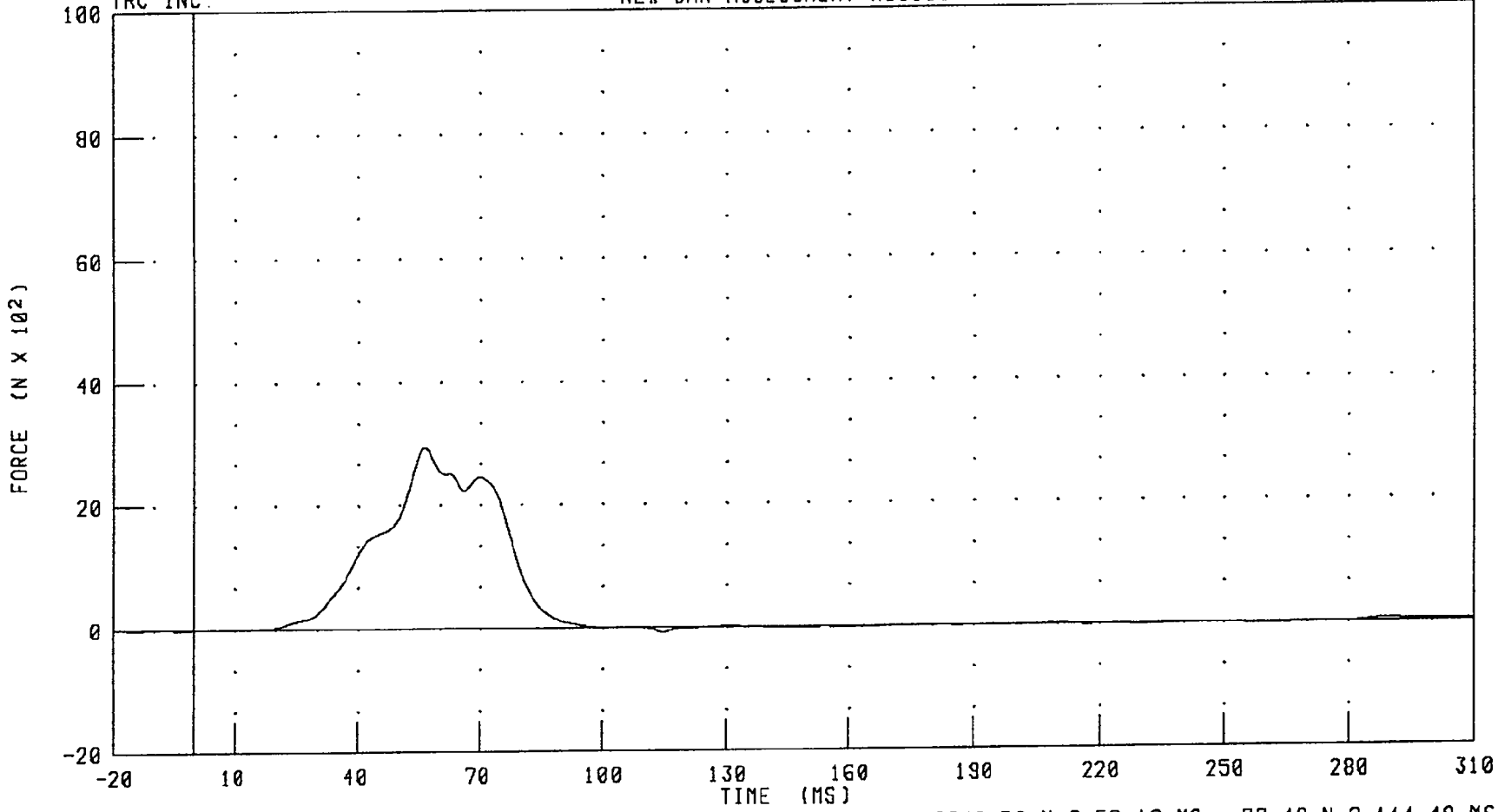

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
20
0
-20
-40
-60
-80
-100
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMF2
FILTER: CH. CLASS 600
PEAK DATA: 239.21 N @ 20.96 MS; -6187.41 N @ 41.68 MS

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT MS5800

TRC INC.

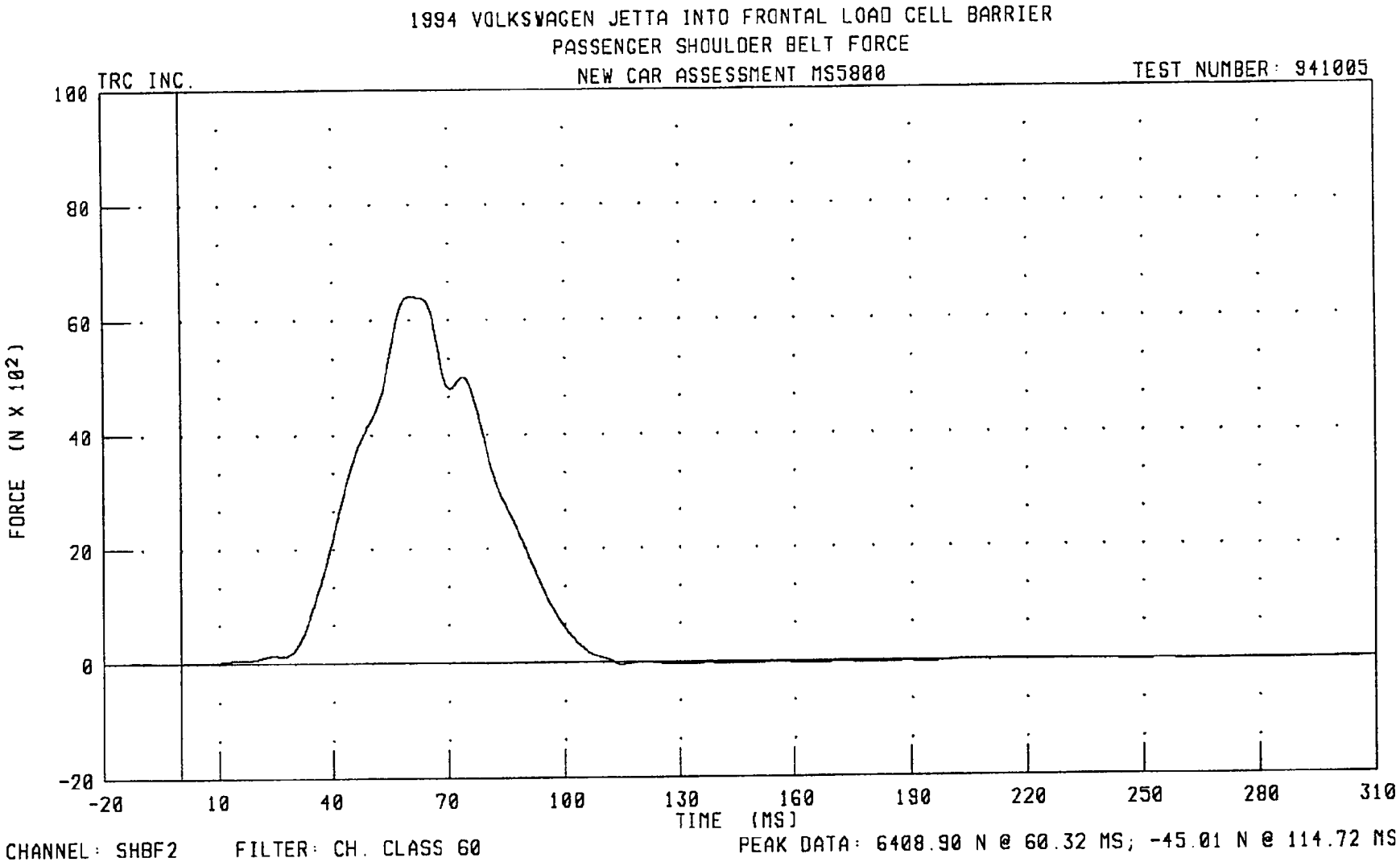
TEST NUMBER: 941005



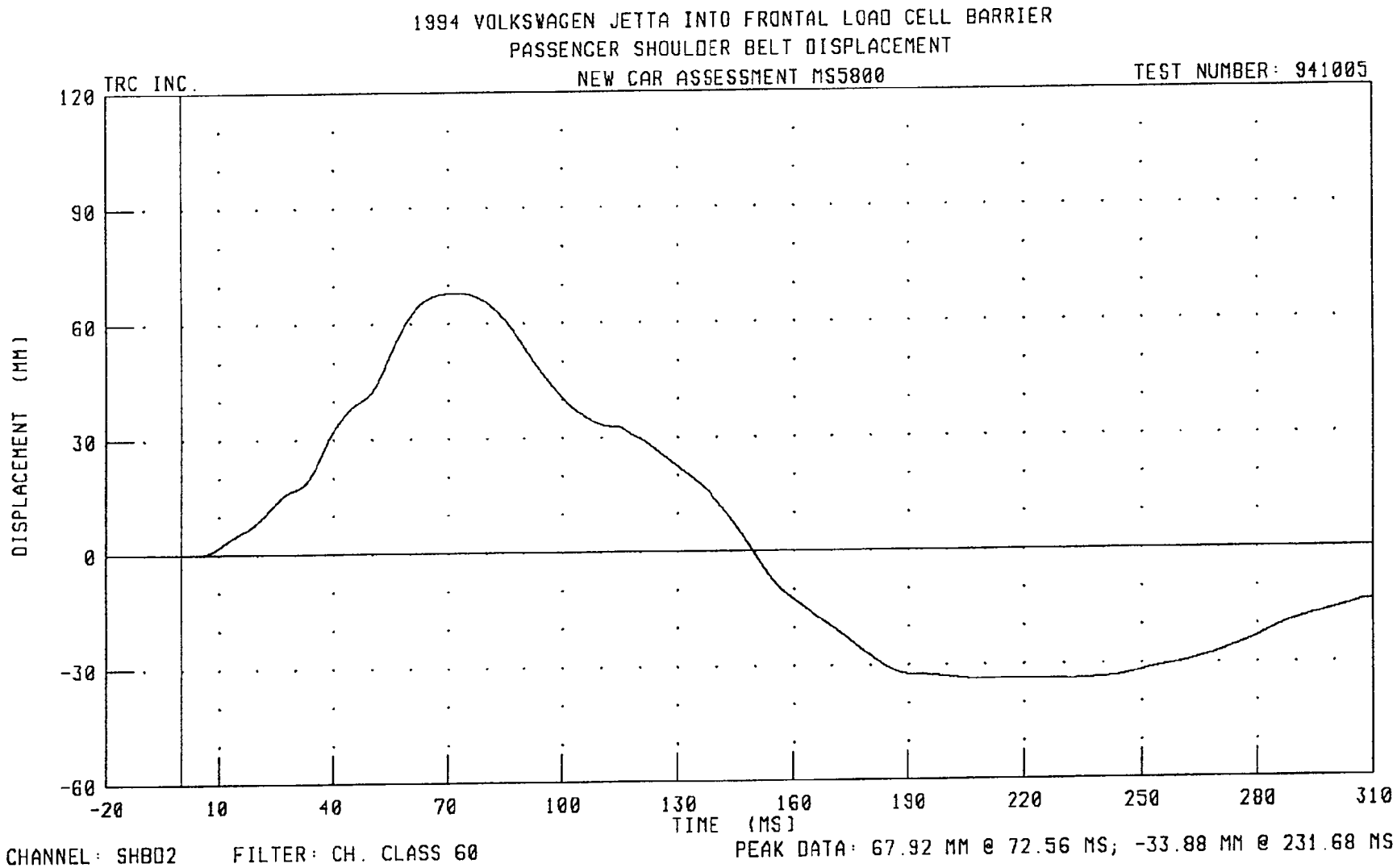
CHANNEL: LBOF2 FILTER: CH. CLASS 60

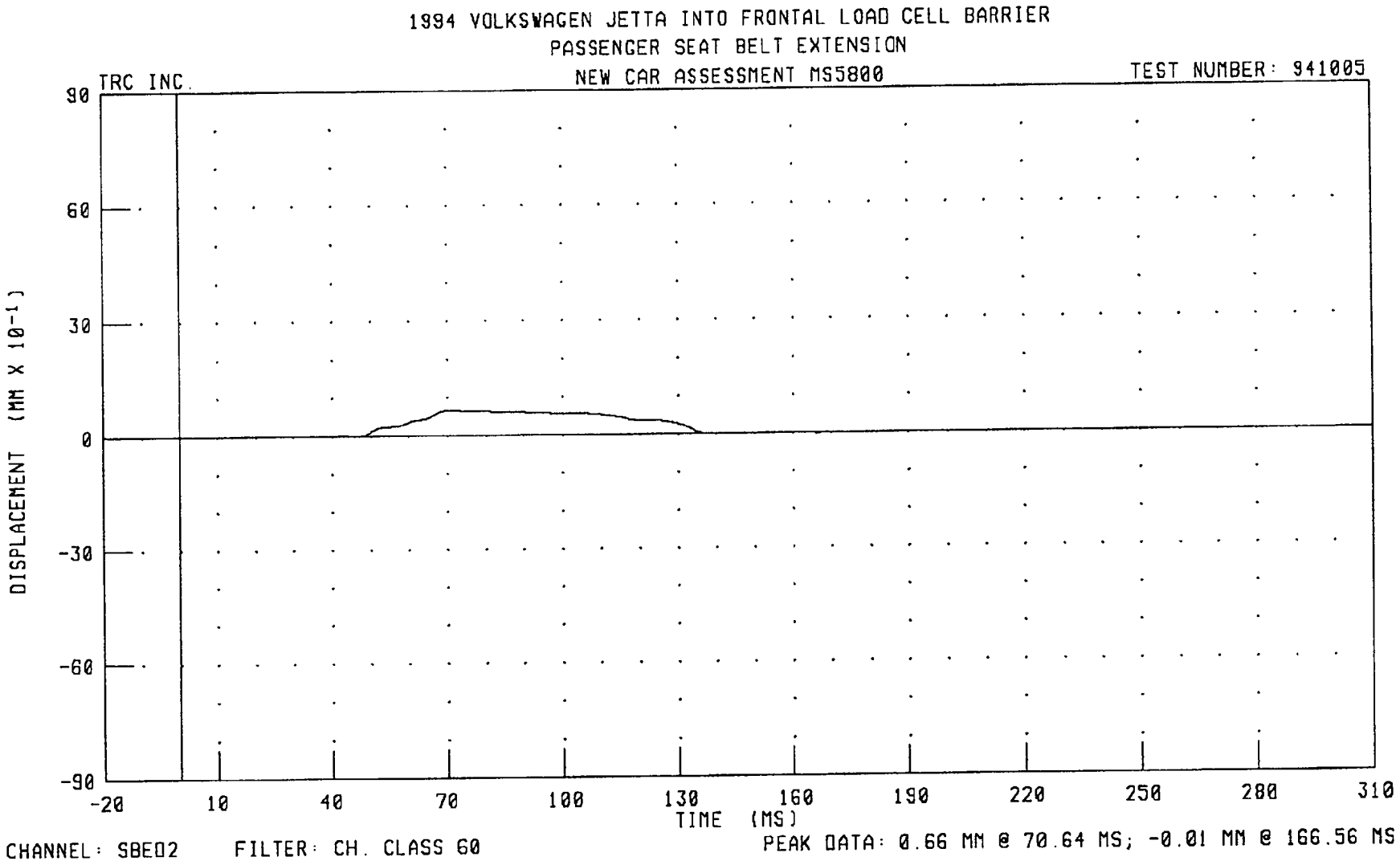
PEAK DATA: 2940.72 N @ 56.16 MS; -77.49 N @ 114.48 MS

941005

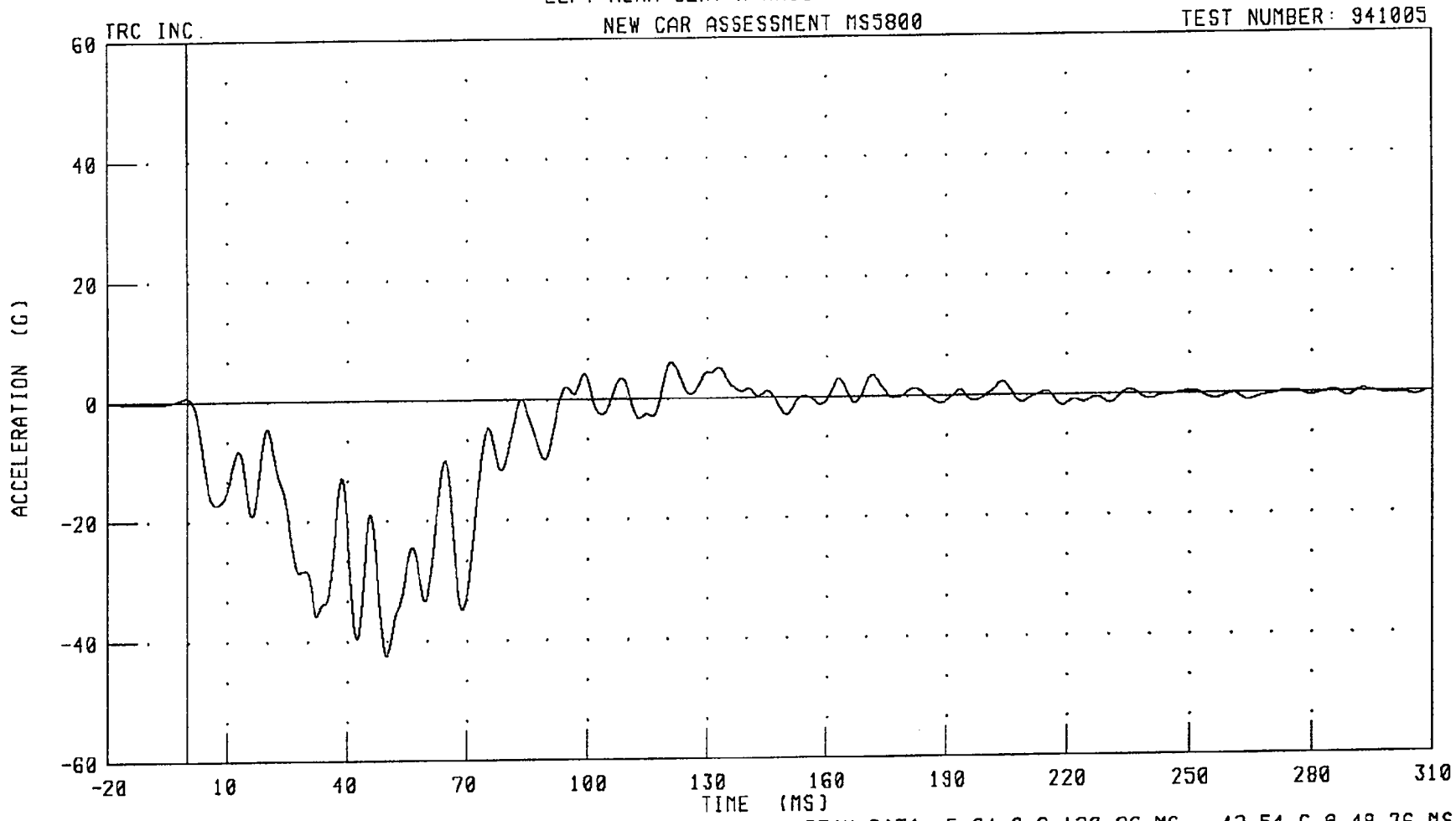

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
100
80
60
40
20
0
-20
FORCE (N X 10²)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SHBF2
FILTER: CH. CLASS 60
PEAK DATA: 6408.90 N @ 60.32 MS; -45.01 N @ 114.72 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
DISPLACEMENT (MM)
120
90
60
30
0
-30
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: SHB02
FILTER: CH. CLASS 60
PEAK DATA: 67.92 MM @ 72.56 MS; -33.88 MM @ 231.68 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.66 MM @ 70.64 MS; -0.01 MM @ 166.56 MS

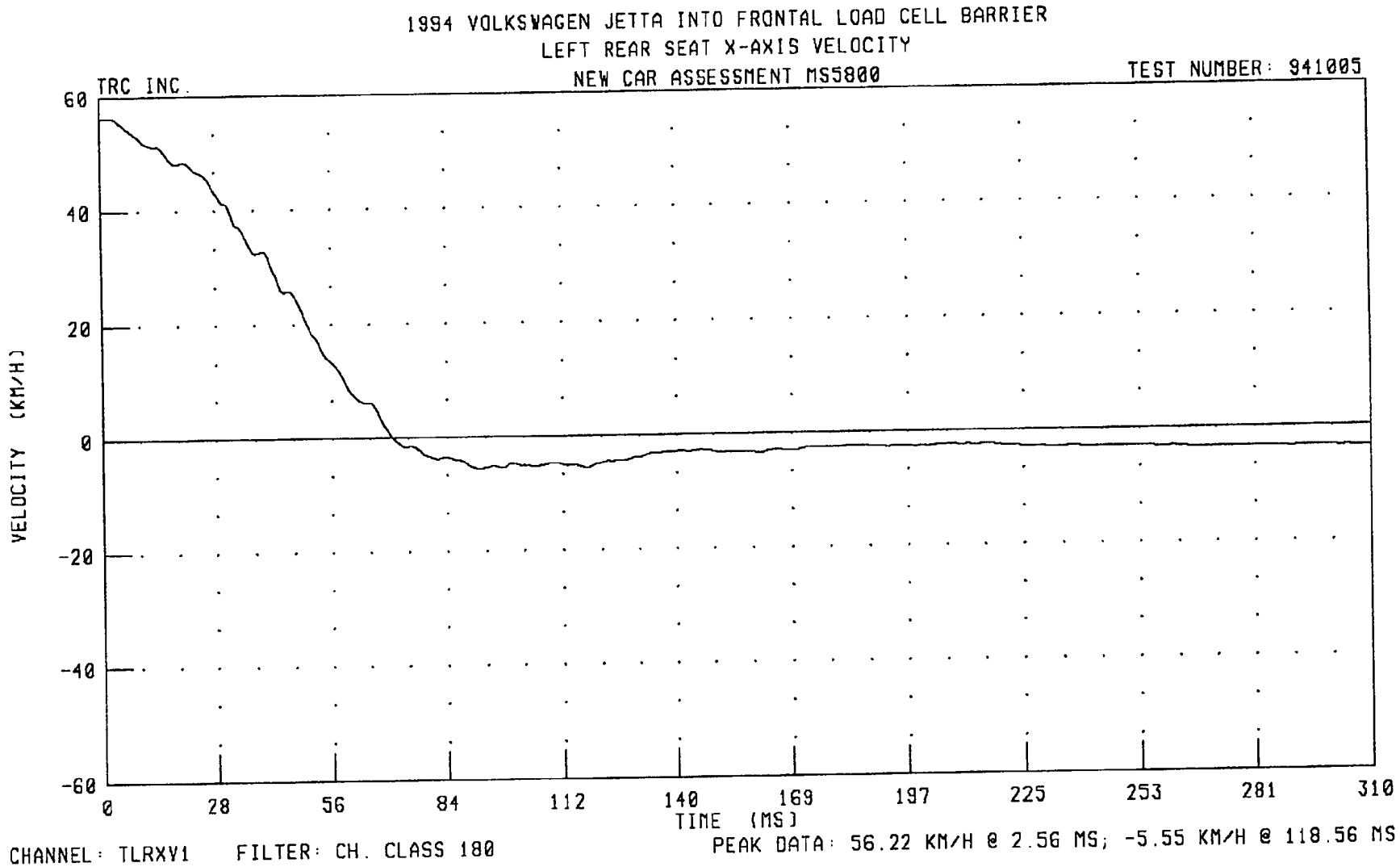
1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

PEAK DATA: 5.94 G @ 120.96 MS; -42.54 G @ 49.76 MS

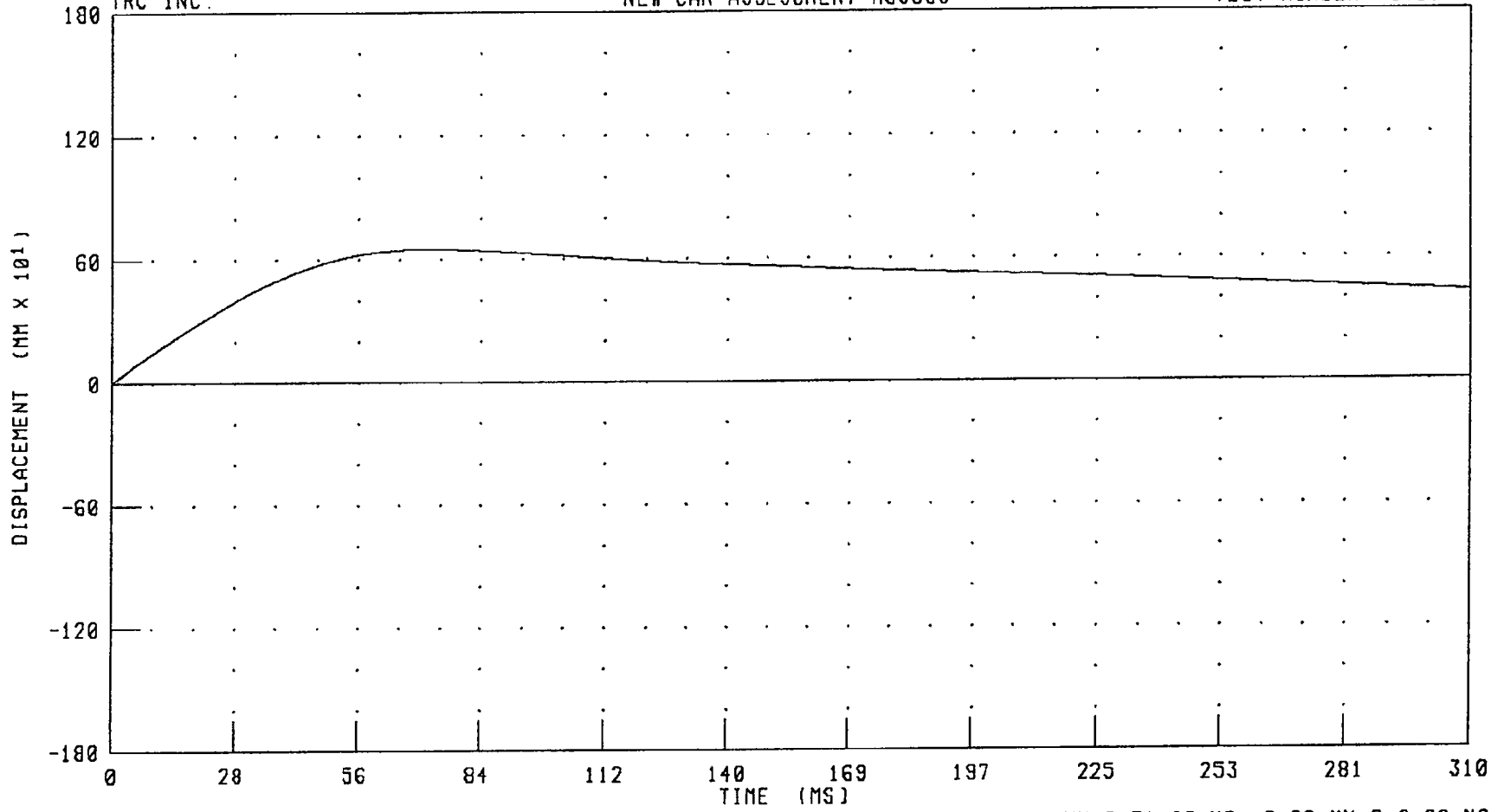
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
VELOCITY (KM/H)
60
40
20
0
-20
-40
-60
0
28
56
84
112
140
169
197
225
253
281
310
TIME (MS)
CHANNEL: TLRXV1
FILTER: CH. CLASS 180
PEAK DATA: 56.22 KM/H @ 2.56 MS; -5.55 KM/H @ 118.56 MS

941005

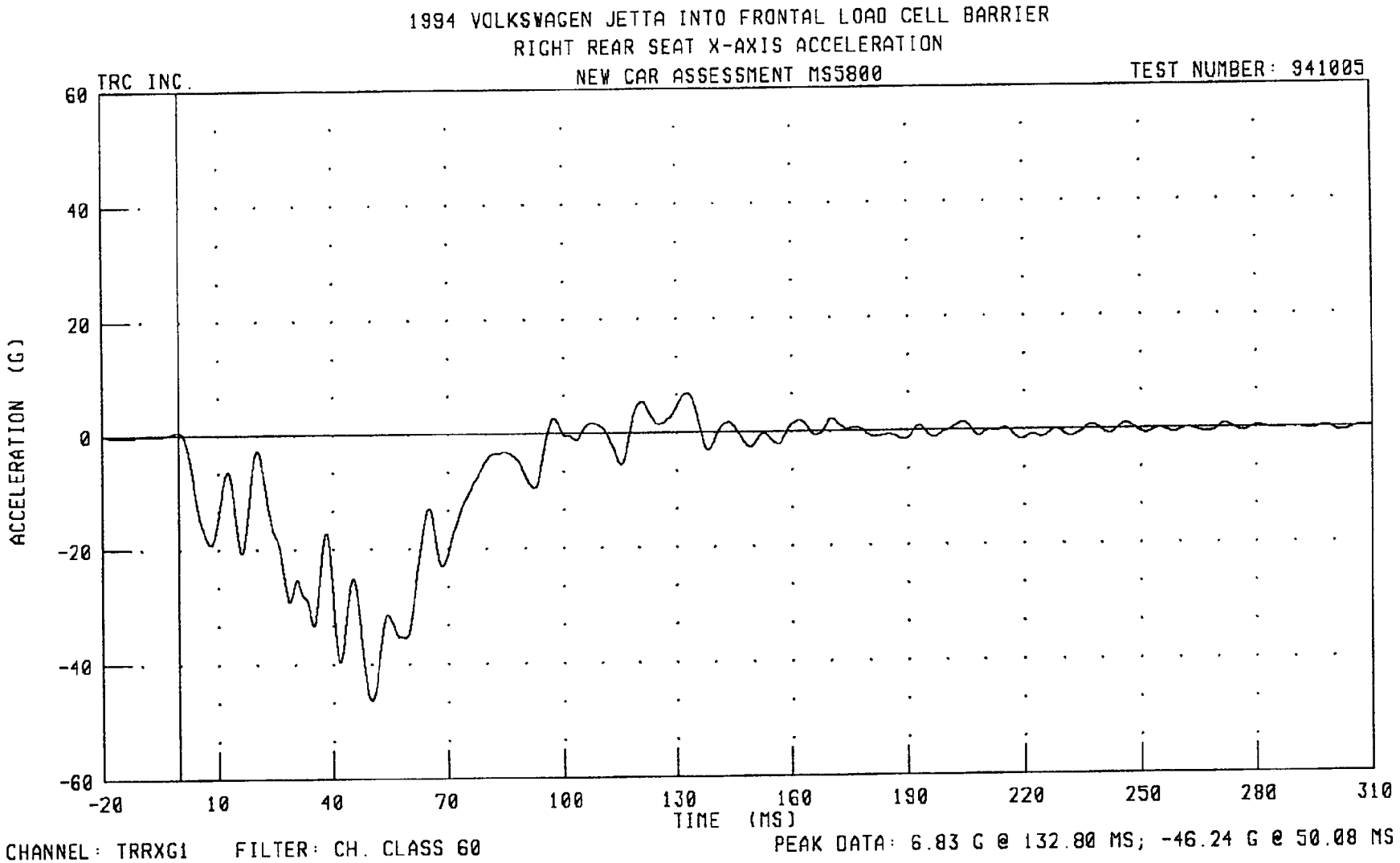
1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

TRC INC. NEW CAR ASSESSMENT MS5800 TEST NUMBER: 941005



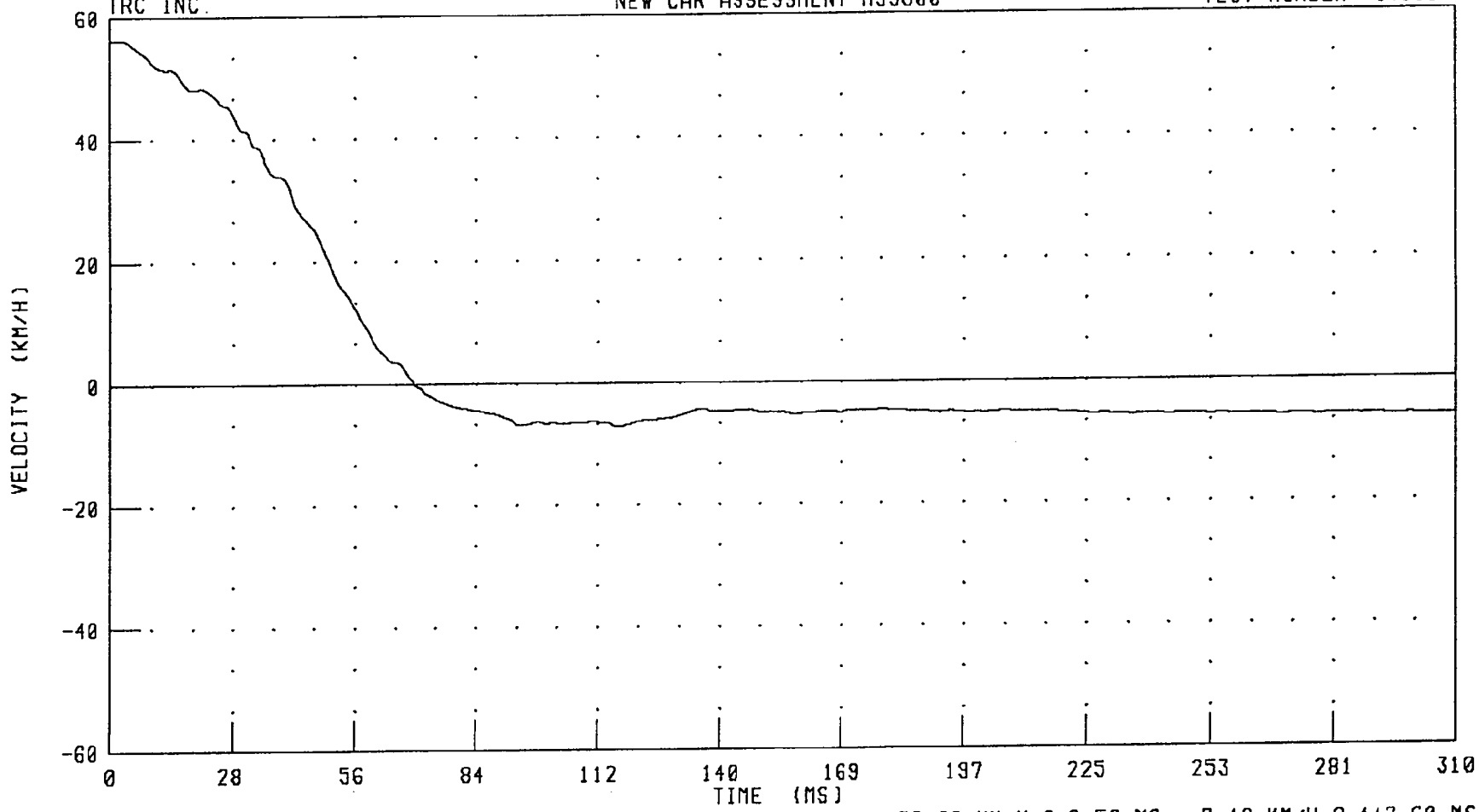
CHANNEL: TLRXD1 FILTER: CH. CLASS 180 PEAK DATA: 651.59 MM @ 71.28 MS; 0.00 MM @ 0.00 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TRRXG1
FILTER: CH. CLASS 60
PEAK DATA: 6.83 G @ 132.80 MS; -46.24 G @ 50.08 MS

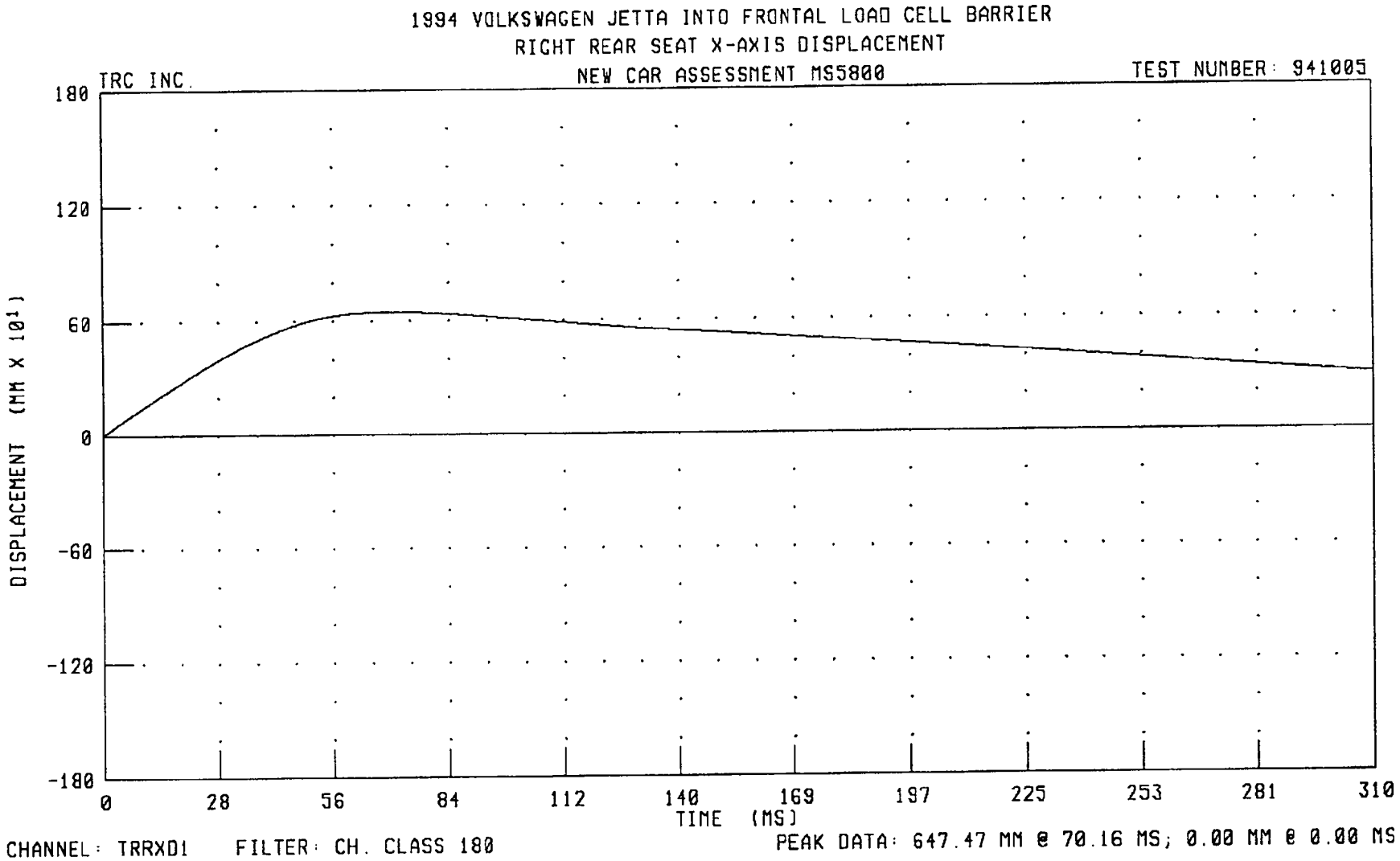
941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY
TRC INC. NEW CAR ASSESSMENT MS5800 TEST NUMBER: 941005

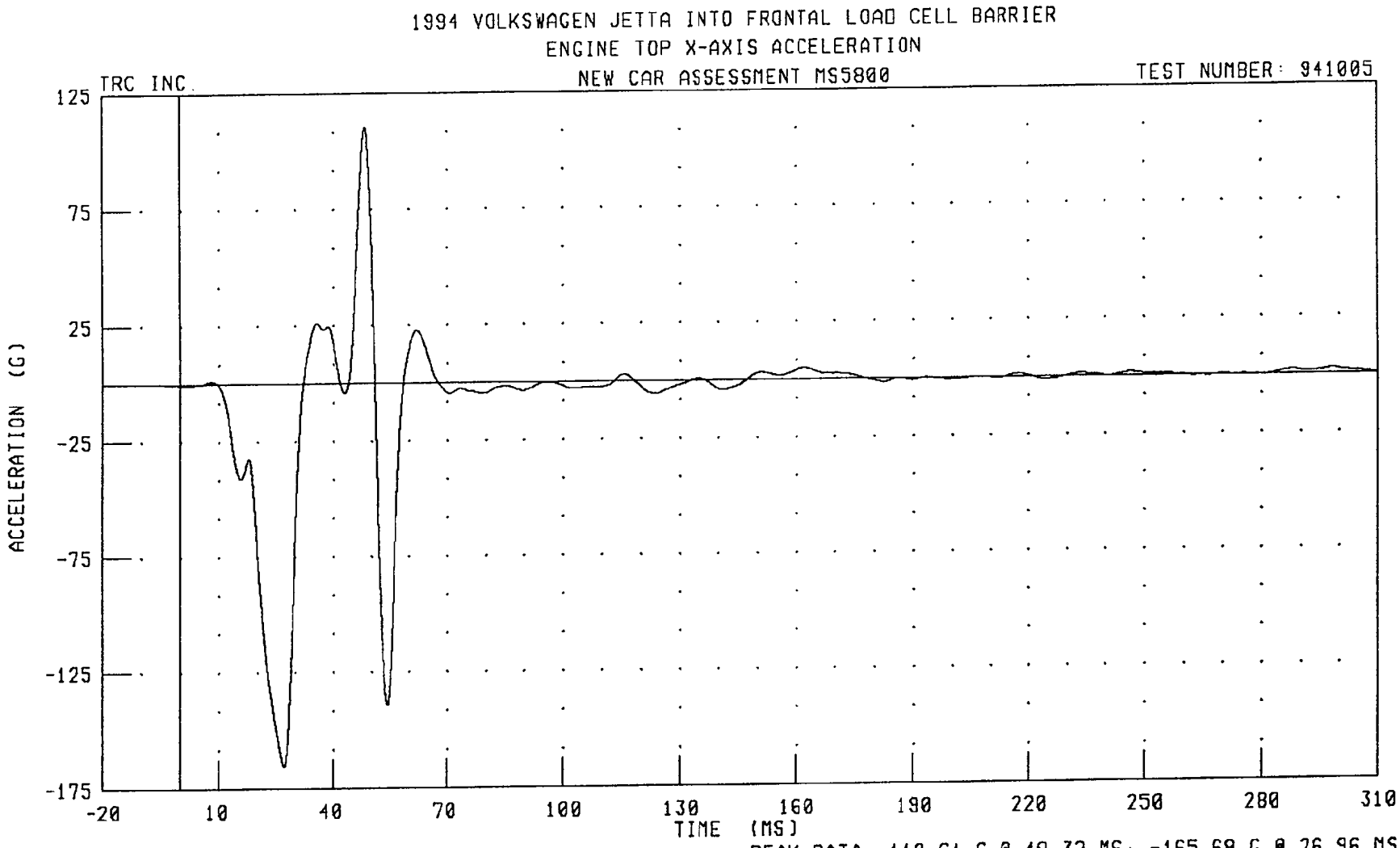


CHANNEL: TRRXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.20 KM/H @ 2.56 MS; -7.18 KM/H @ 117.60 MS

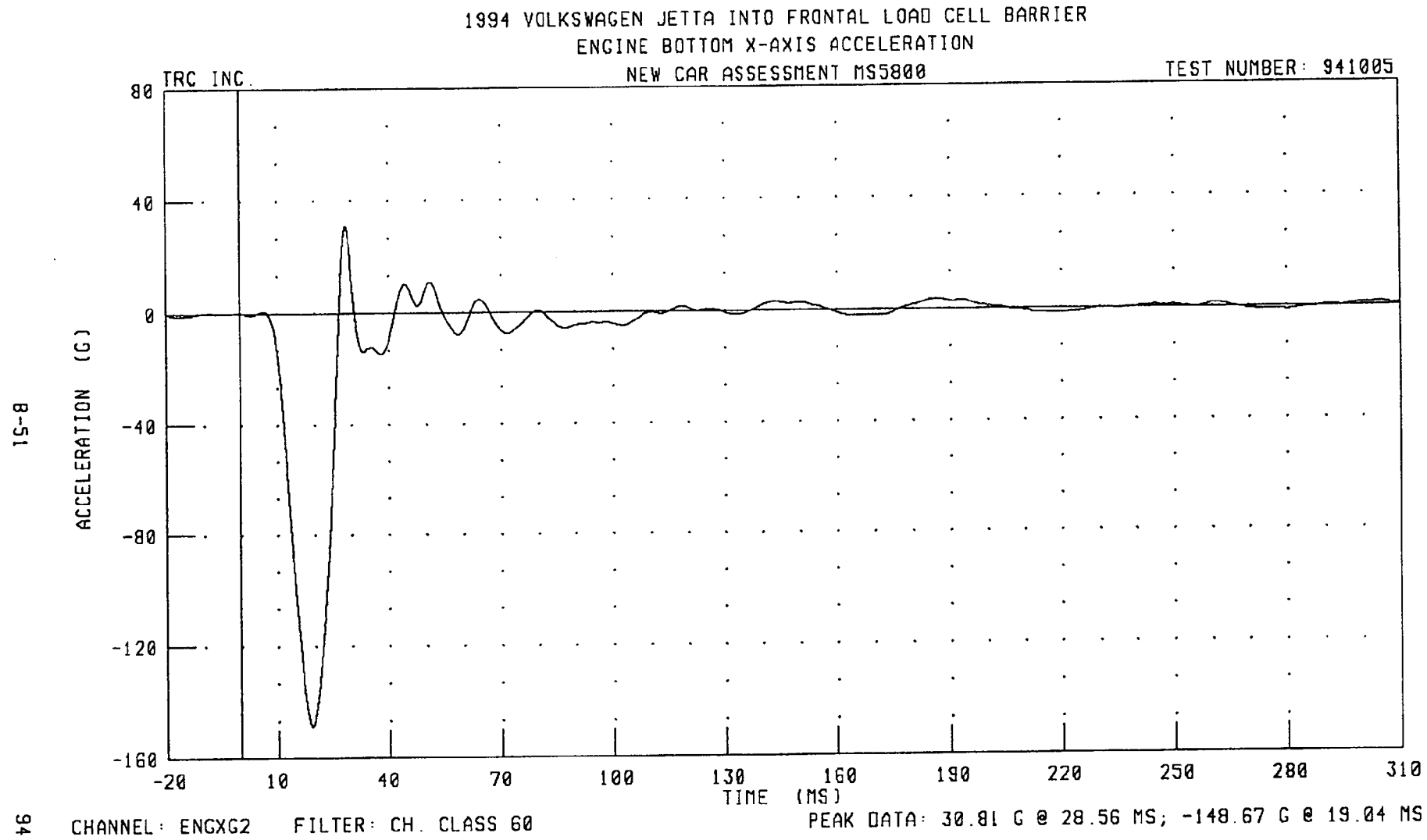
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS DISPLACEMENT
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
180
120
60
0
-60
-120
-180
DISPLACEMENT (MM X 10¹)
0
28
56
84
112
140
169
197
225
253
281
310
TIME (MS)
CHANNEL: TRRXD1
FILTER: CH. CLASS 180
PEAK DATA: 647.47 MM @ 70.16 MS; 0.00 MM @ 0.00 MS

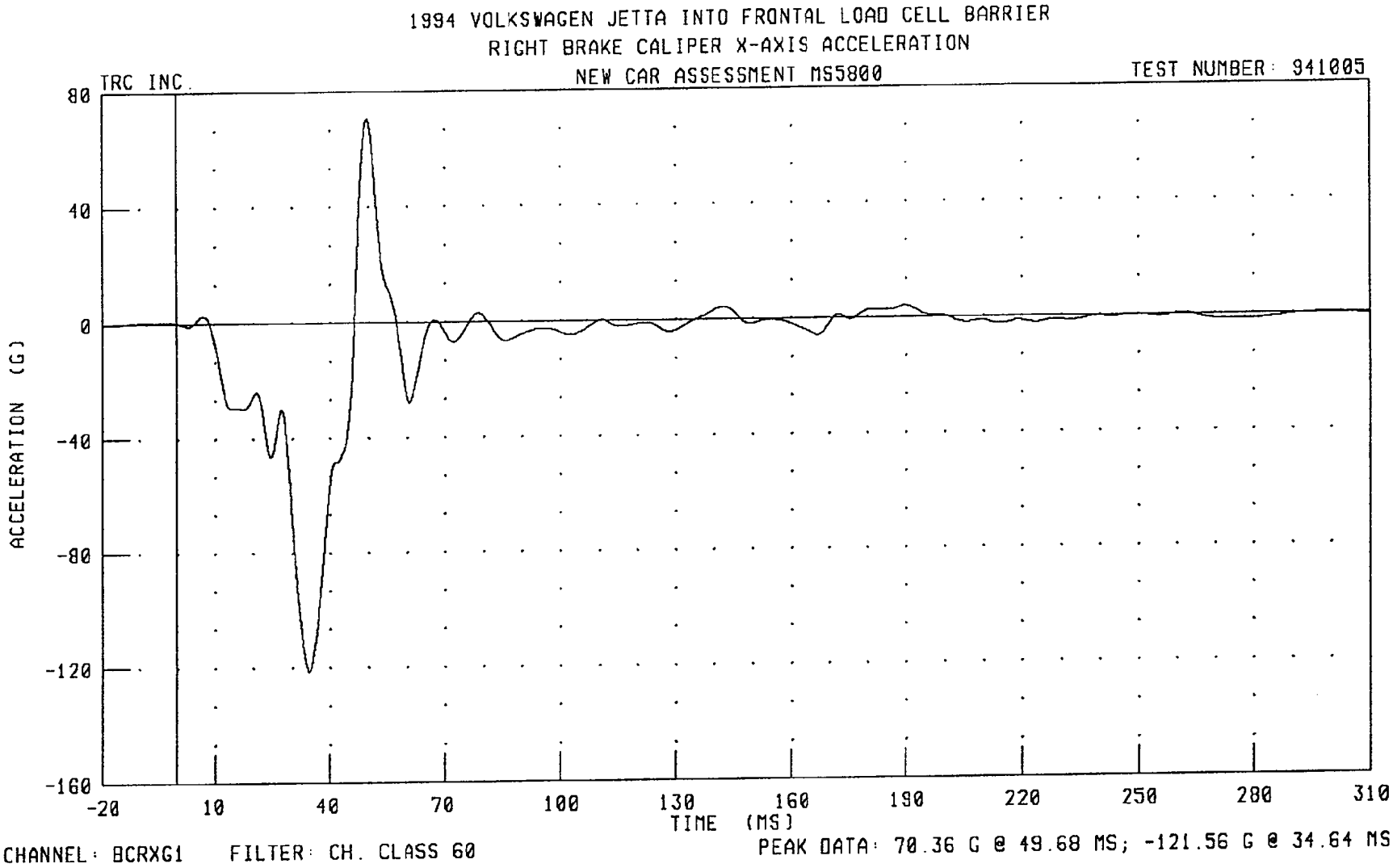
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
125
75
25
-25
-75
-125
-175
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG1
FILTER: CH. CLASS 60
PEAK DATA: 110.61 G @ 48.32 MS; -165.68 G @ 26.96 MS

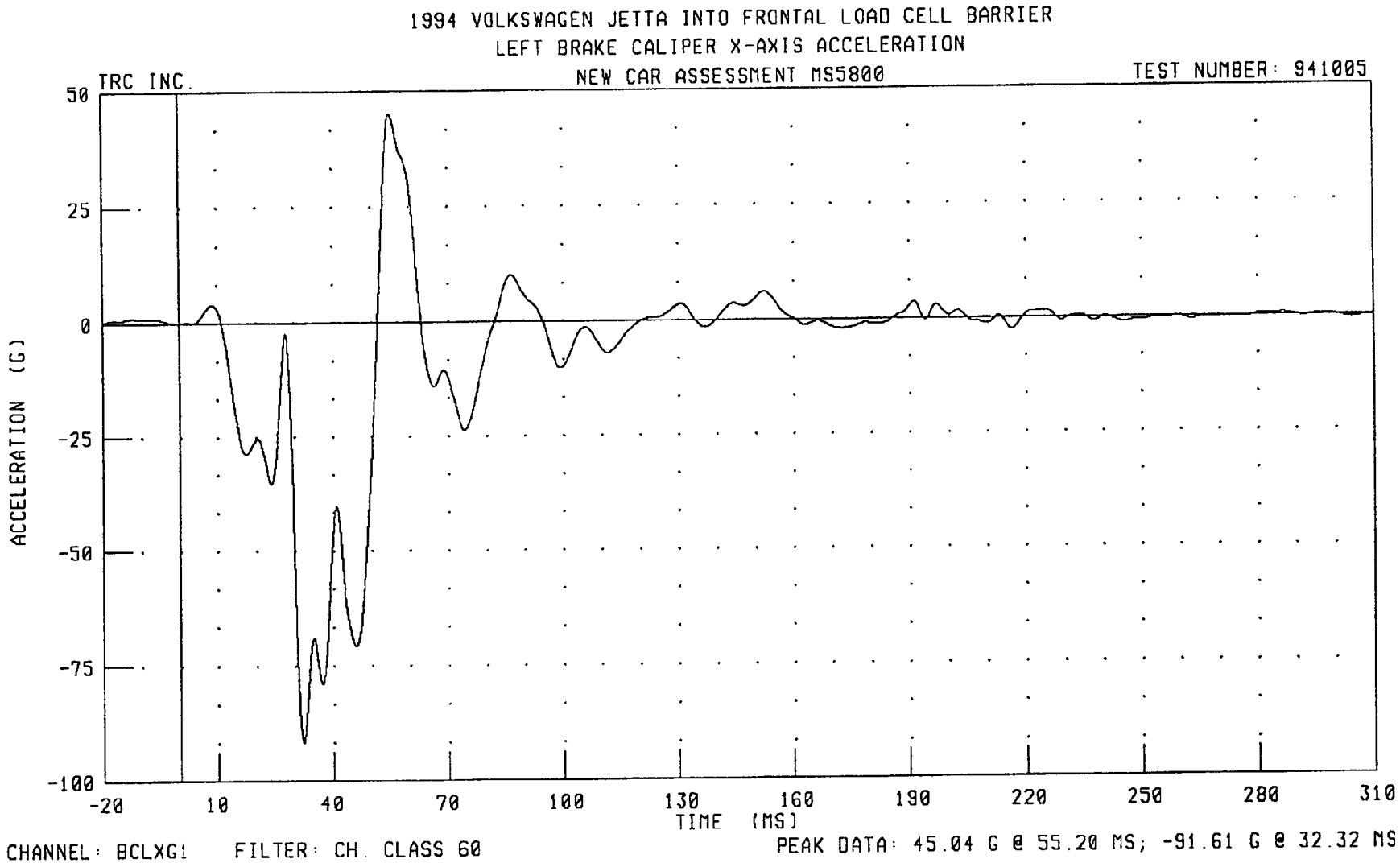
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
80
40
0
-40
-80
-120
-160
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG2
FILTER: CH. CLASS 60
PEAK DATA: 30.81 G @ 28.56 MS; -148.67 G @ 19.04 MS

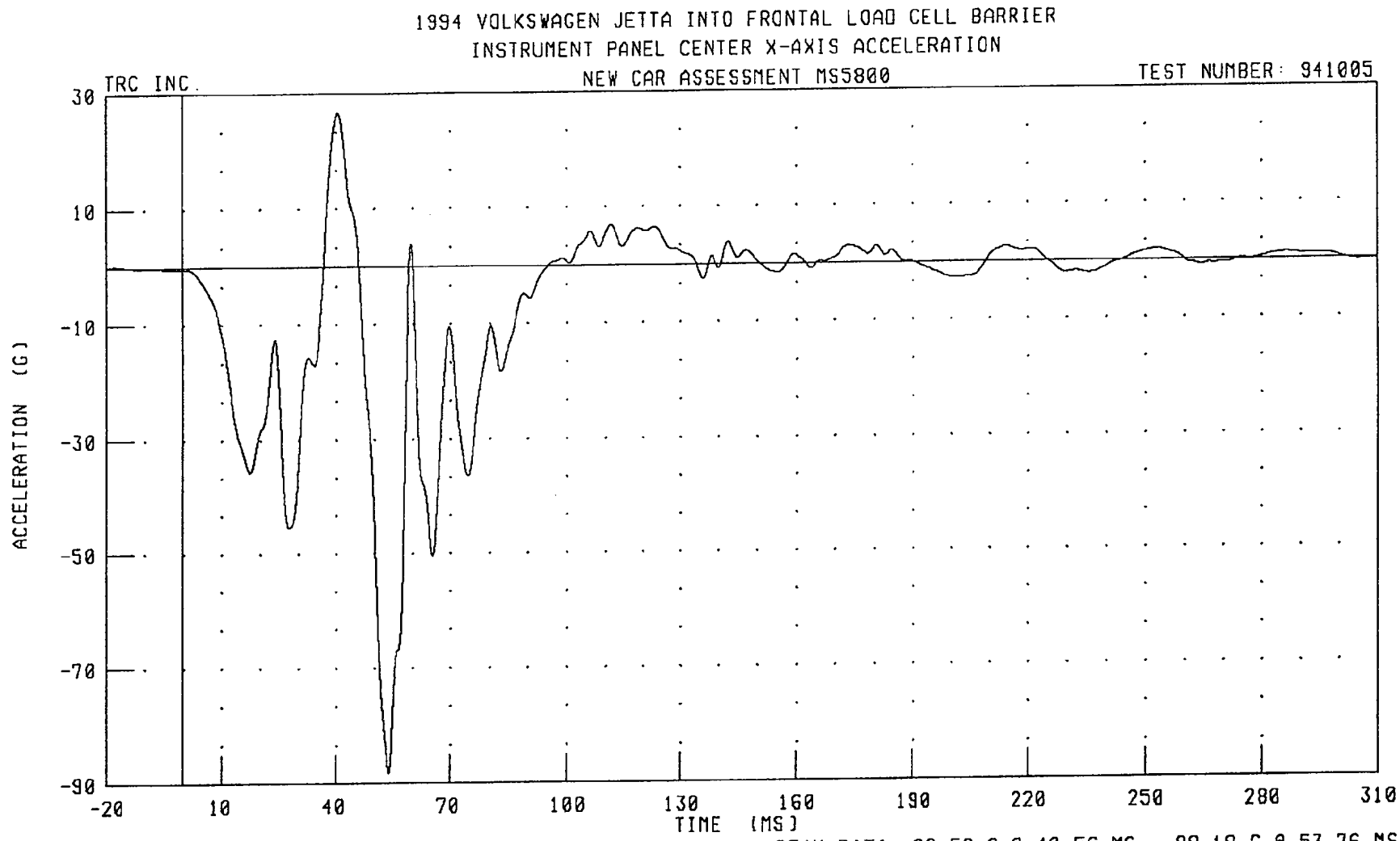
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
80
40
0
-40
-80
-120
-160
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCRXG1
FILTER: CH. CLASS 60
PEAK DATA: 70.36 G @ 49.68 MS; -121.56 G @ 34.64 MS

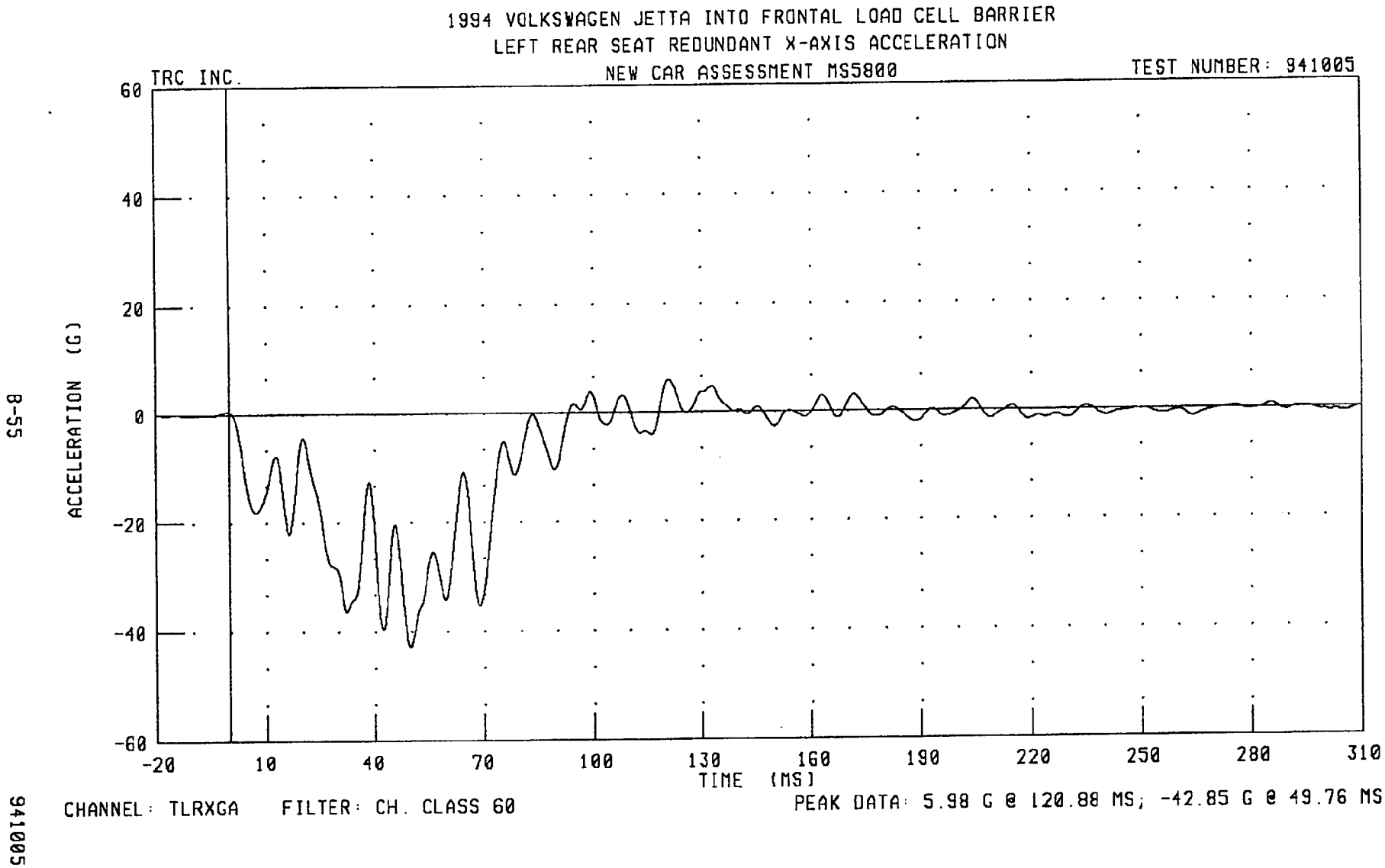
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
50
25
0
-25
-50
-75
-100
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BCLXG1
FILTER: CH. CLASS 60
PEAK DATA: 45.04 G @ 55.20 MS; -91.61 G @ 32.32 MS

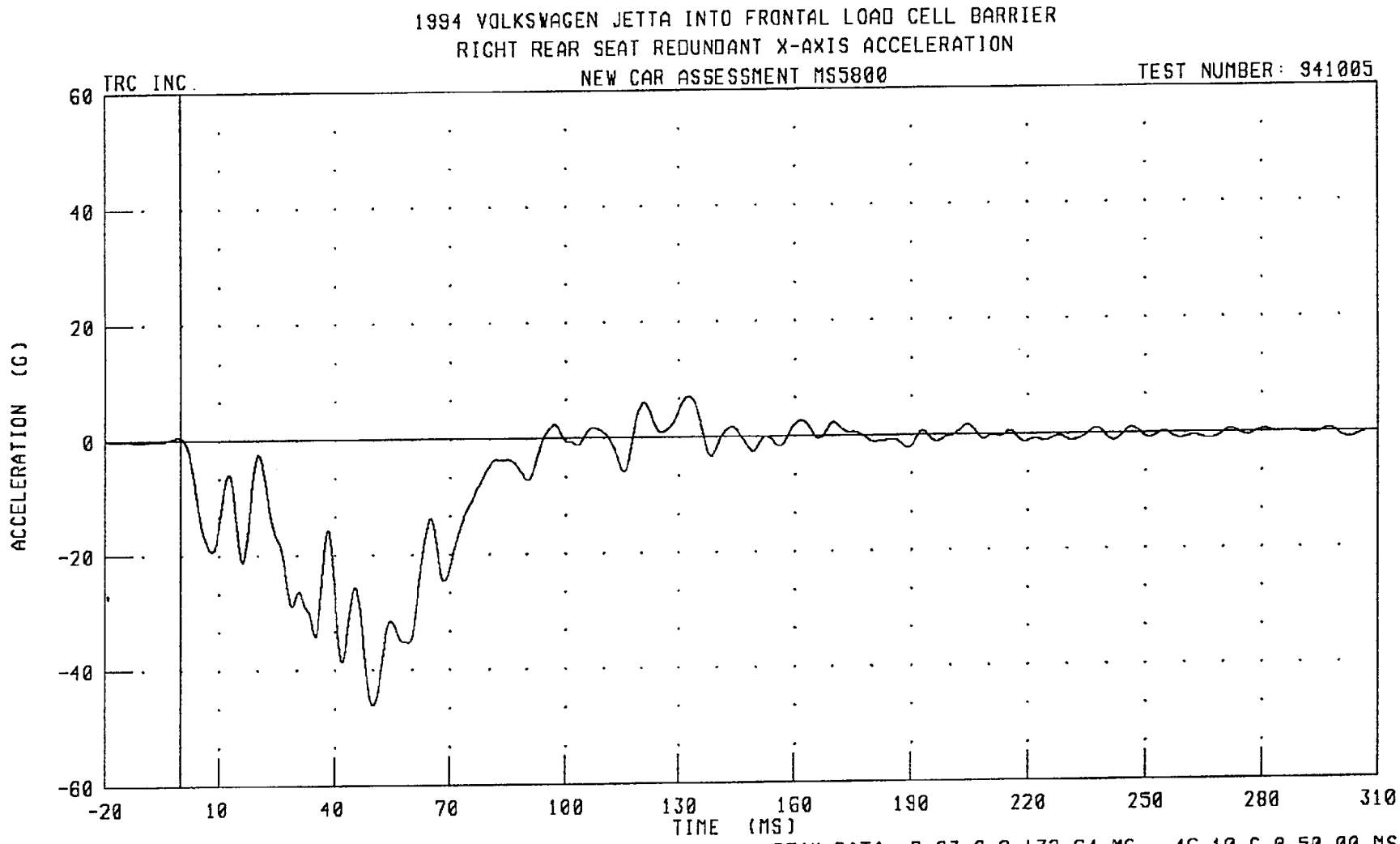
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
ACCELERATION (G)
30
10
-10
-30
-50
-70
-90
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: DPCXG1
FILTER: CH. CLASS 60
PEAK DATA: 26.56 G @ 40.56 MS; -88.19 G @ 53.76 MS

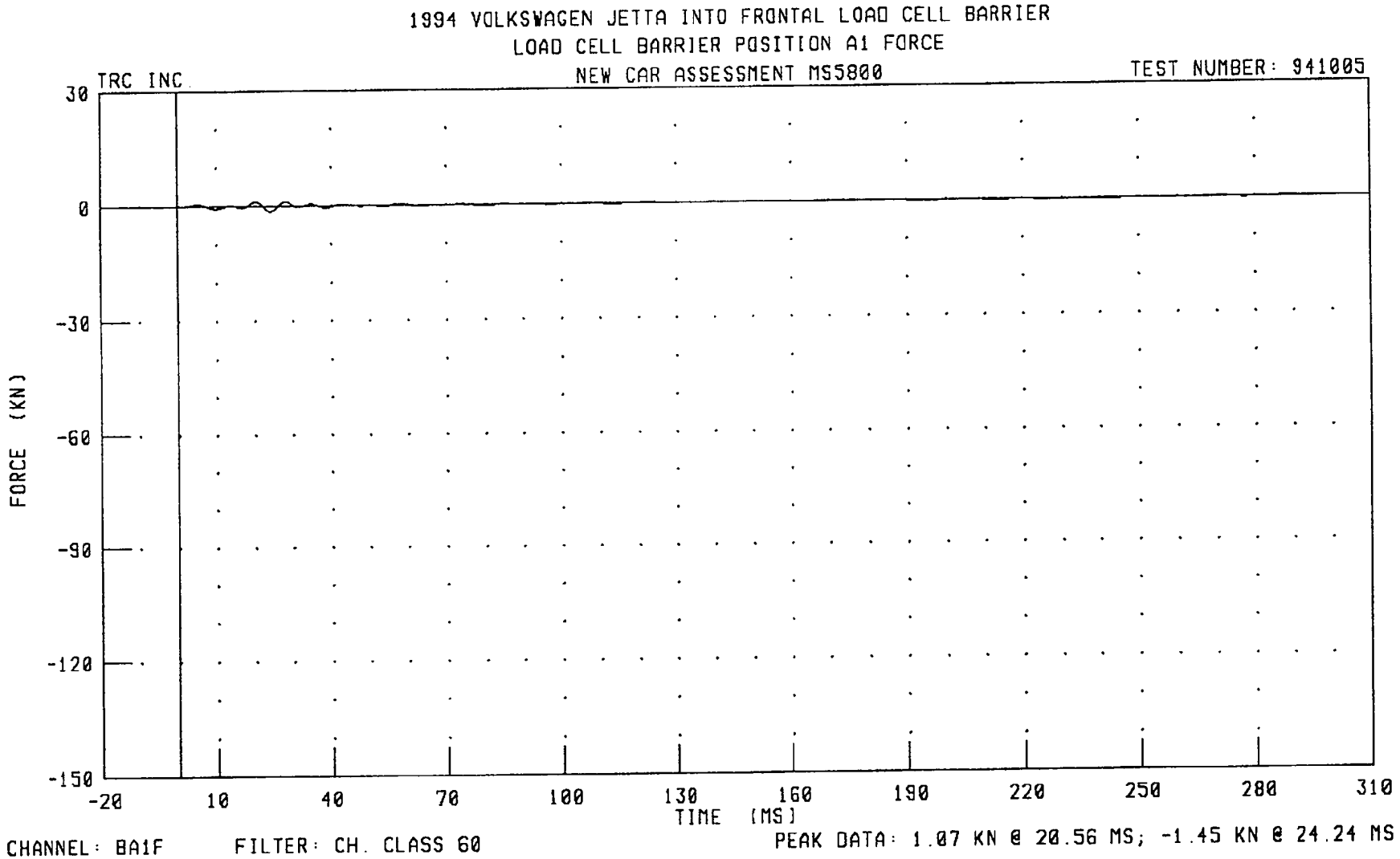
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
TRC INC.
NEW CAR ASSESSMENT MS5800
TEST NUMBER: 941005
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TLRXGA
FILTER: CH. CLASS 60
PEAK DATA: 5.98 G @ 120.88 MS; -42.85 G @ 49.76 MS

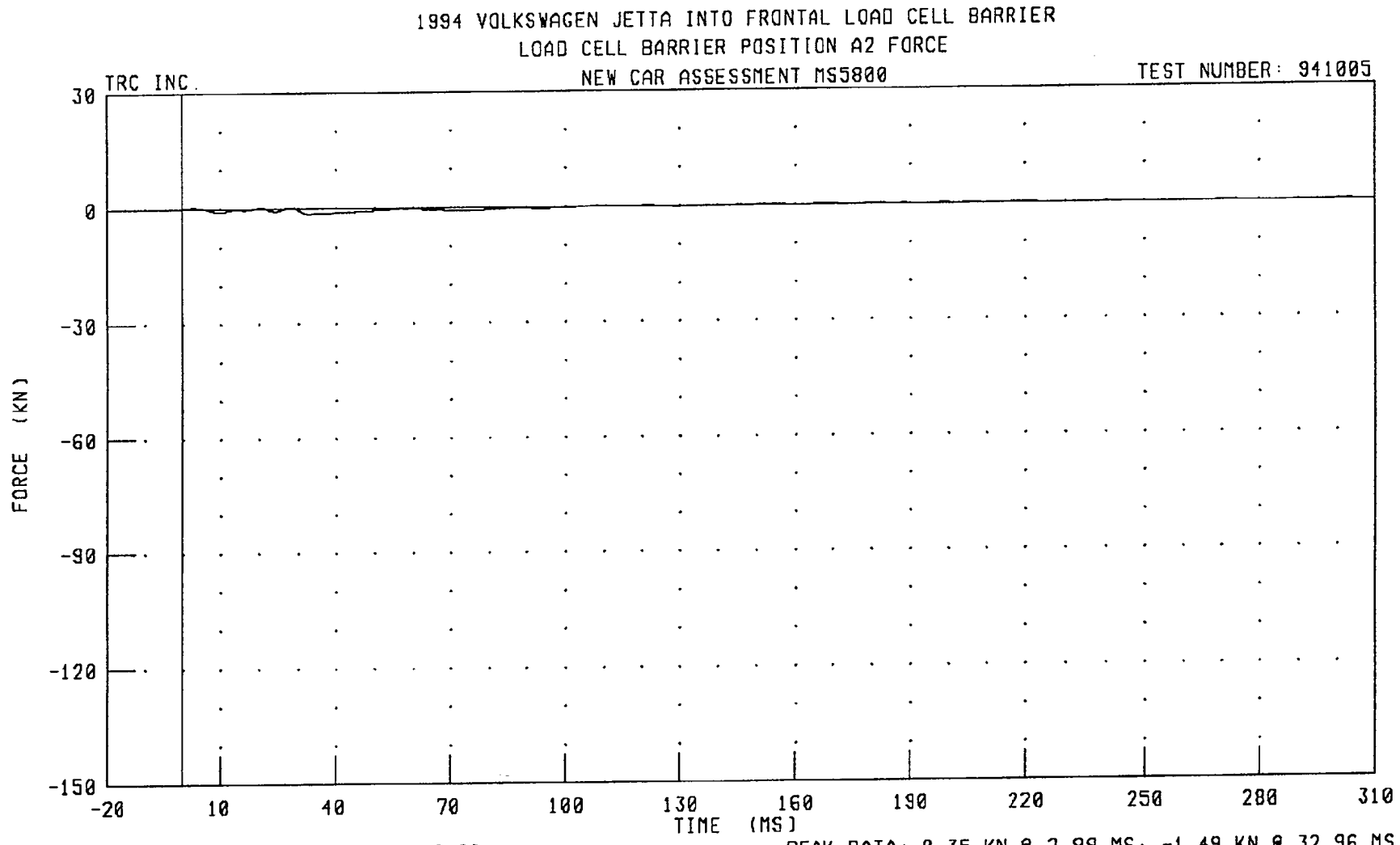
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION
TRC INC.
NEW CAR ASSESSMENT MS5800
TEST NUMBER: 941005
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TRRXGA
FILTER: CH. CLASS 60
PEAK DATA: 7.03 G @ 132.64 MS; -46.10 G @ 50.00 MS

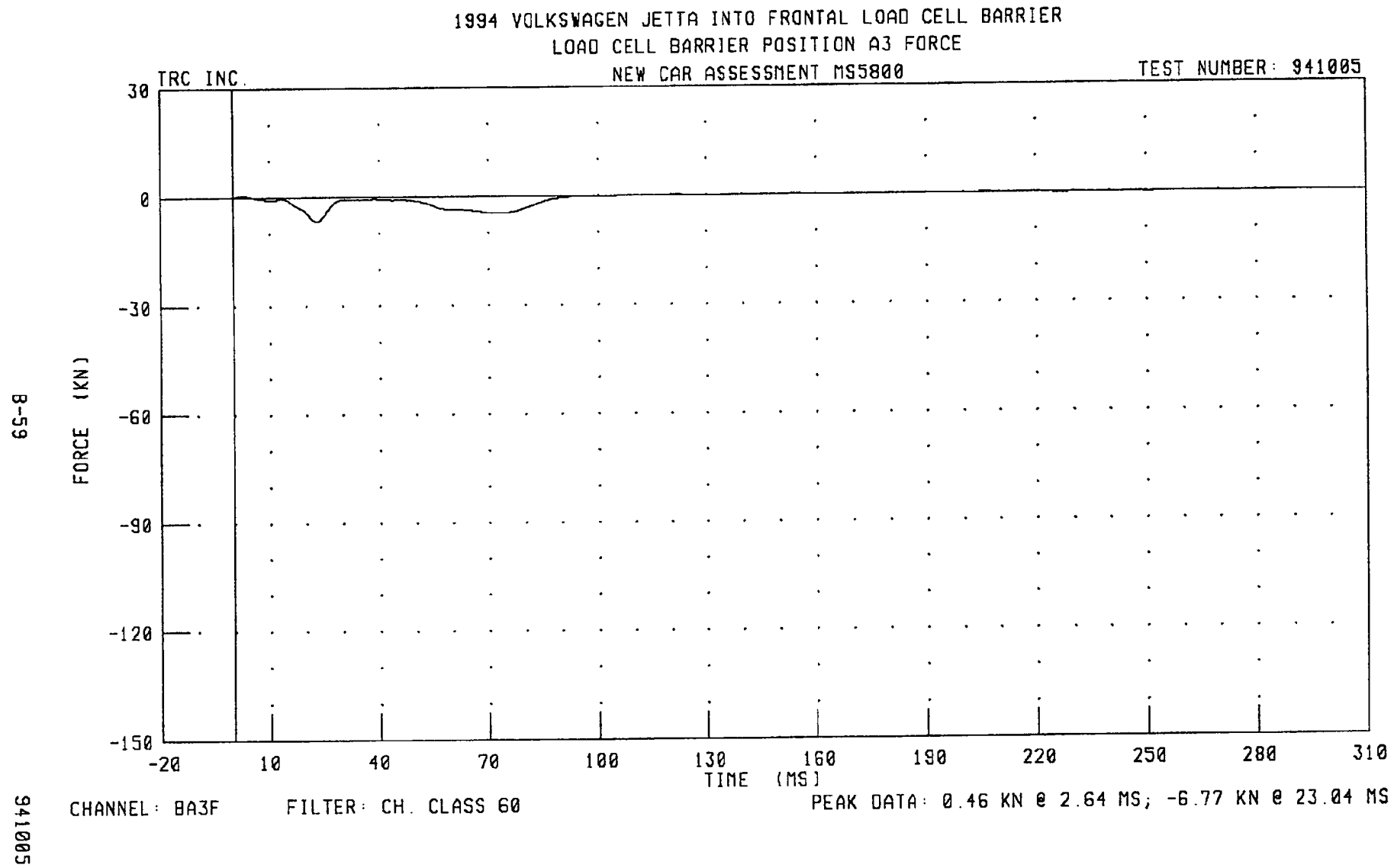
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC
TEST NUMBER: 941005
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: 1.07 KN @ 20.56 MS; -1.45 KN @ 24.24 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.35 KN @ 2.88 MS; -1.49 KN @ 32.96 MS

941005

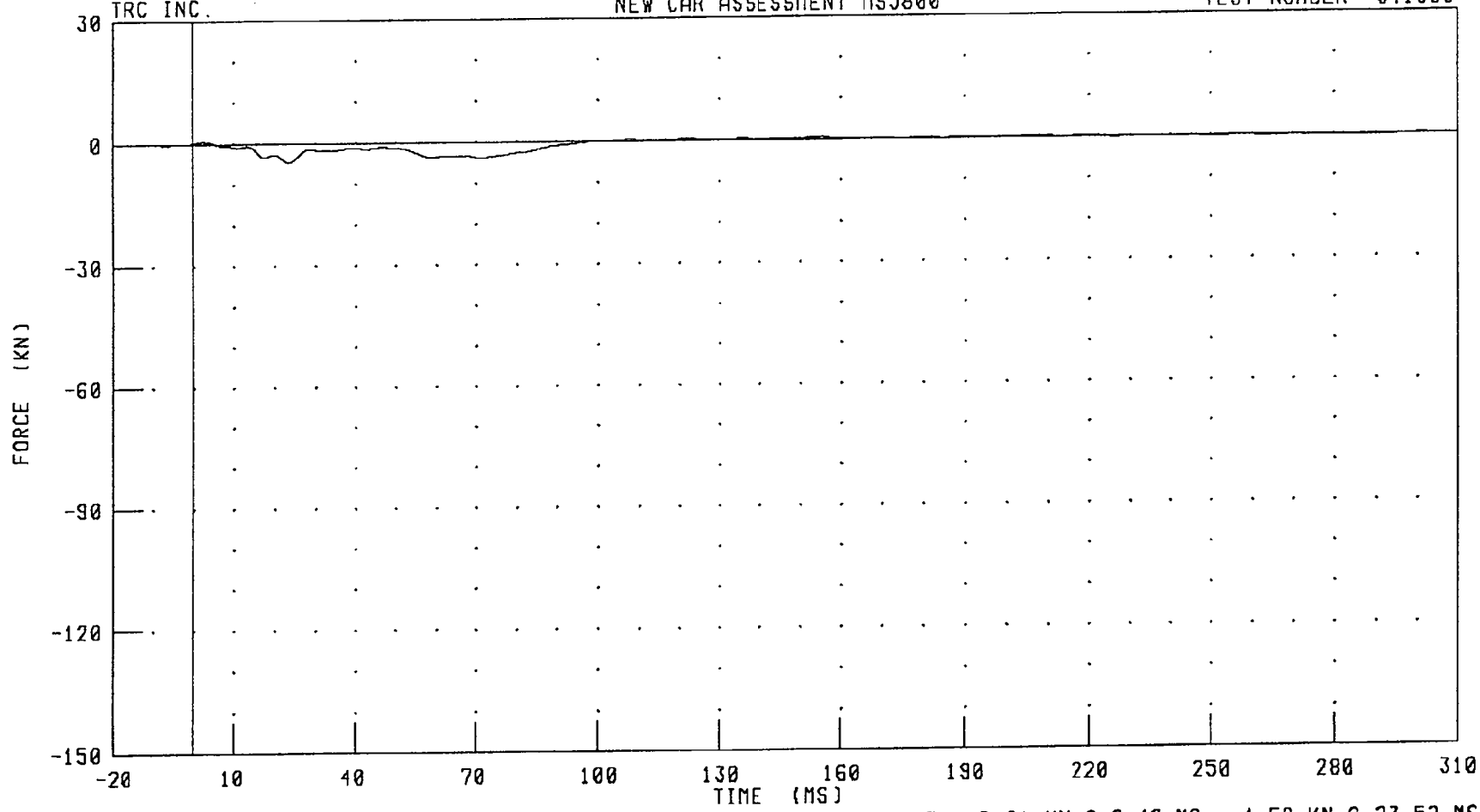

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA3F
FILTER: CH. CLASS 60
PEAK DATA: 0.46 KN @ 2.64 MS; -6.77 KN @ 23.04 MS

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE
NEW CAR ASSESSMENT MS5800

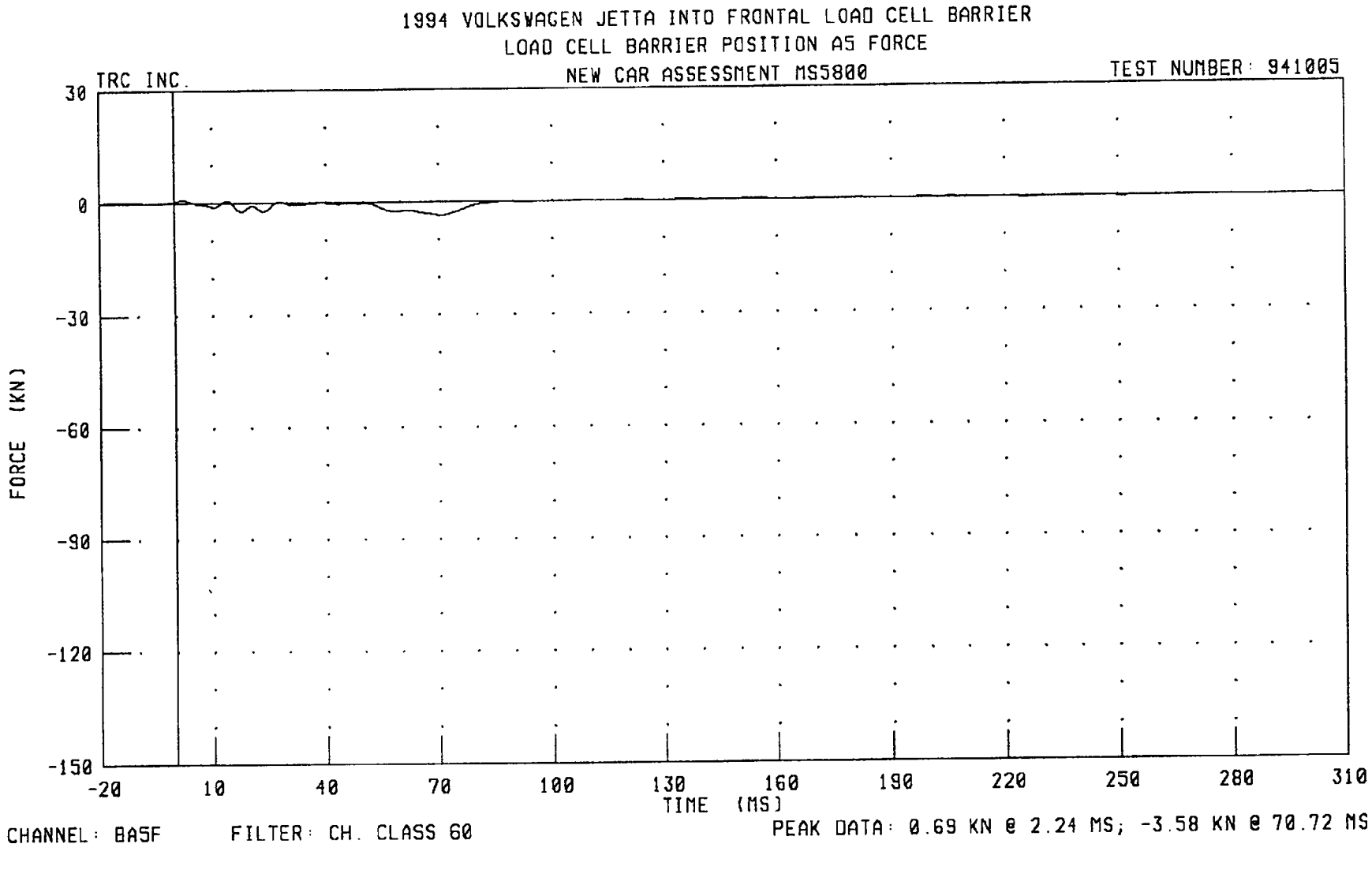
TRC INC.

TEST NUMBER: 941005

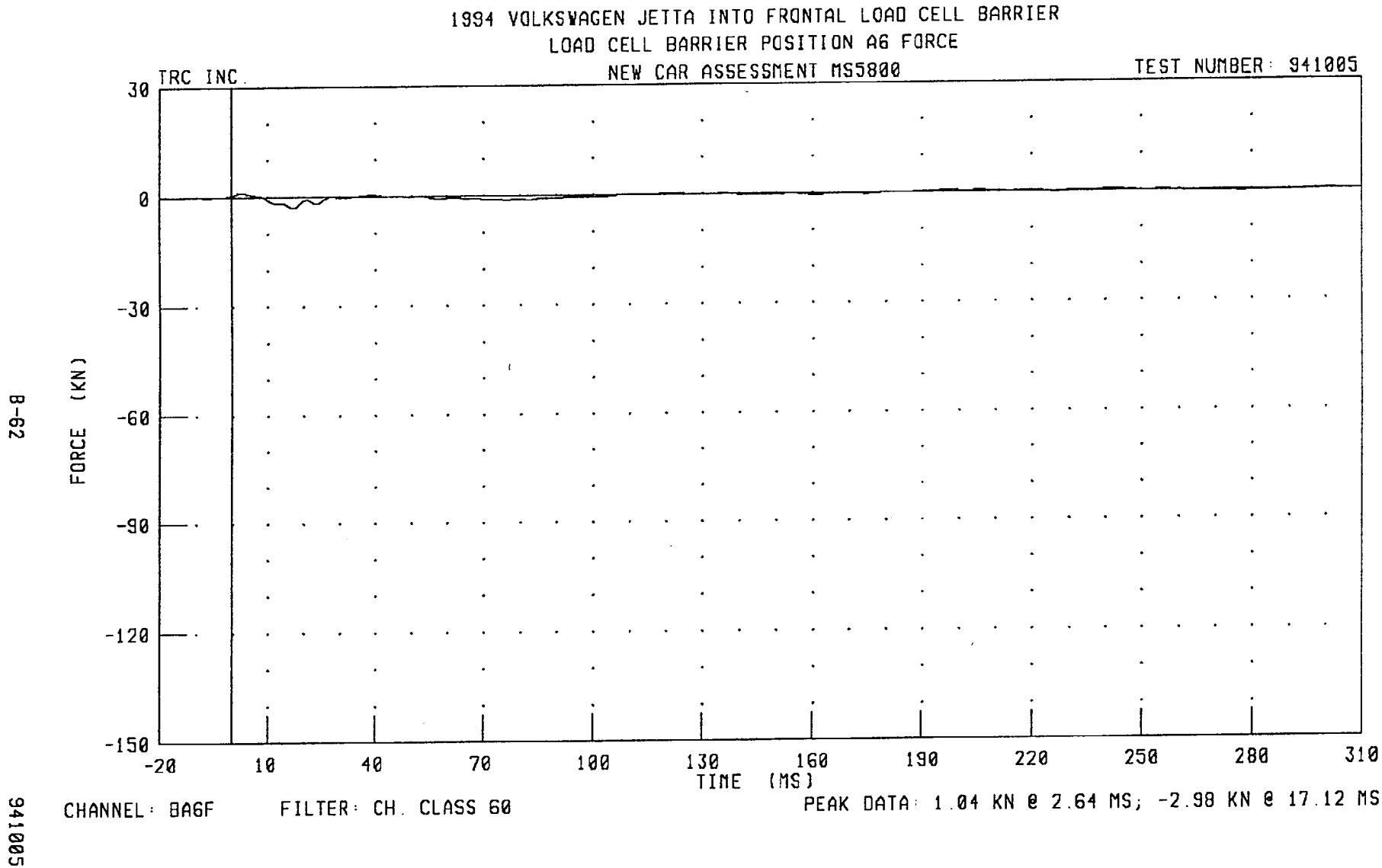


CHANNEL: BA4F FILTER: CH. CLASS 60

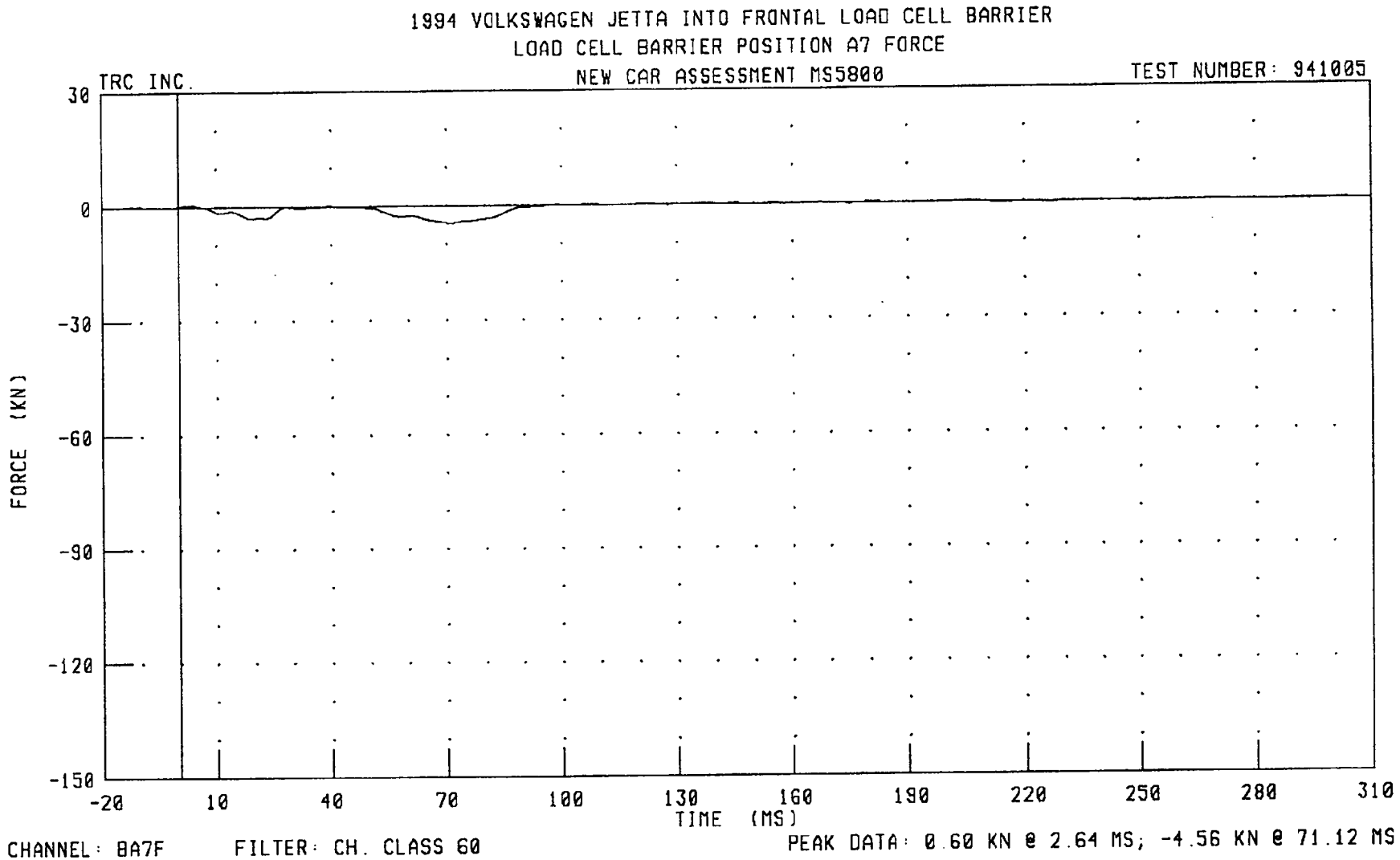
PEAK DATA: 0.61 KN @ 2.40 MS; -4.58 KN @ 23.52 MS


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.69 KN @ 2.24 MS; -3.58 KN @ 70.72 MS

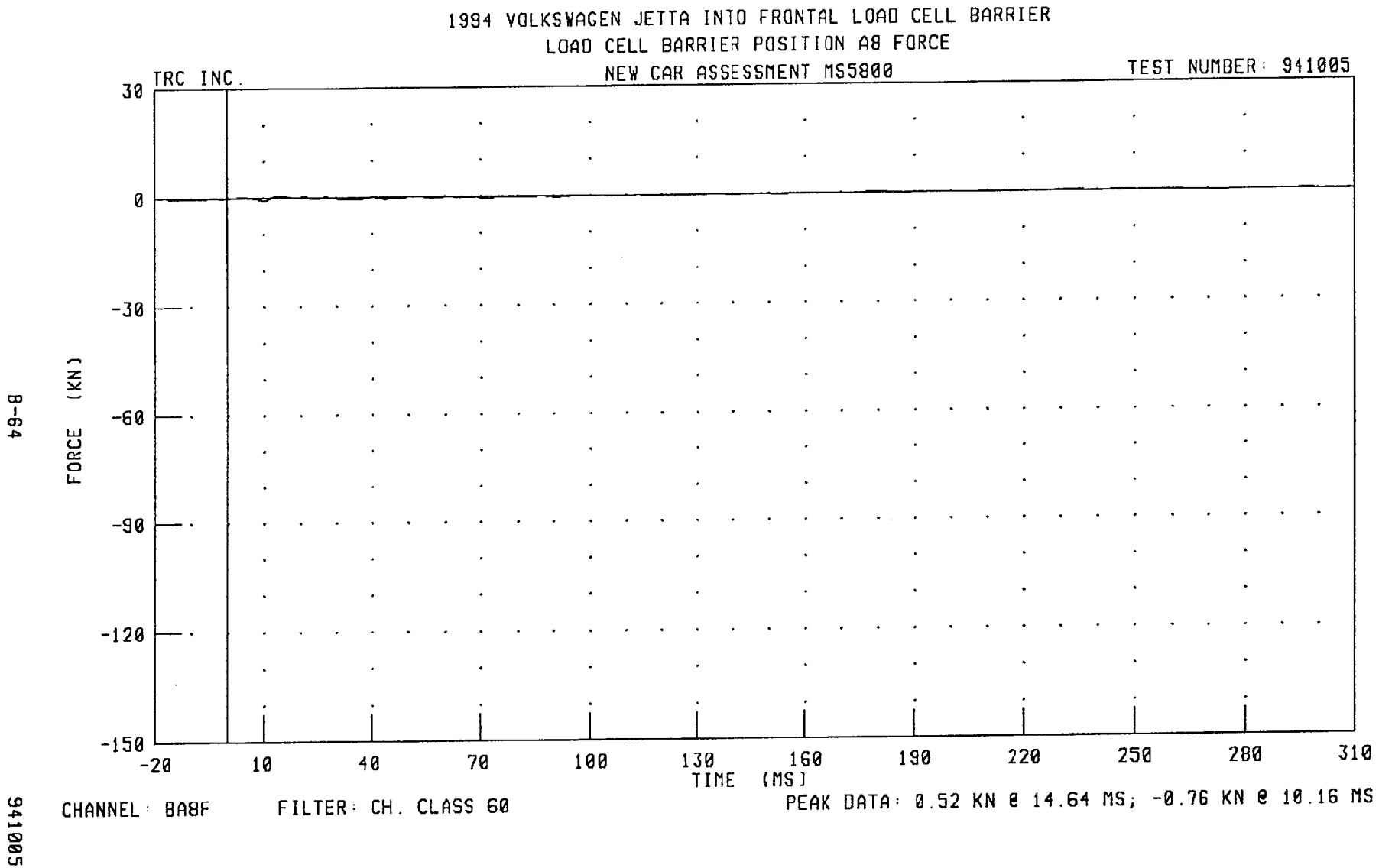
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 1.04 KN @ 2.64 MS; -2.98 KN @ 17.12 MS

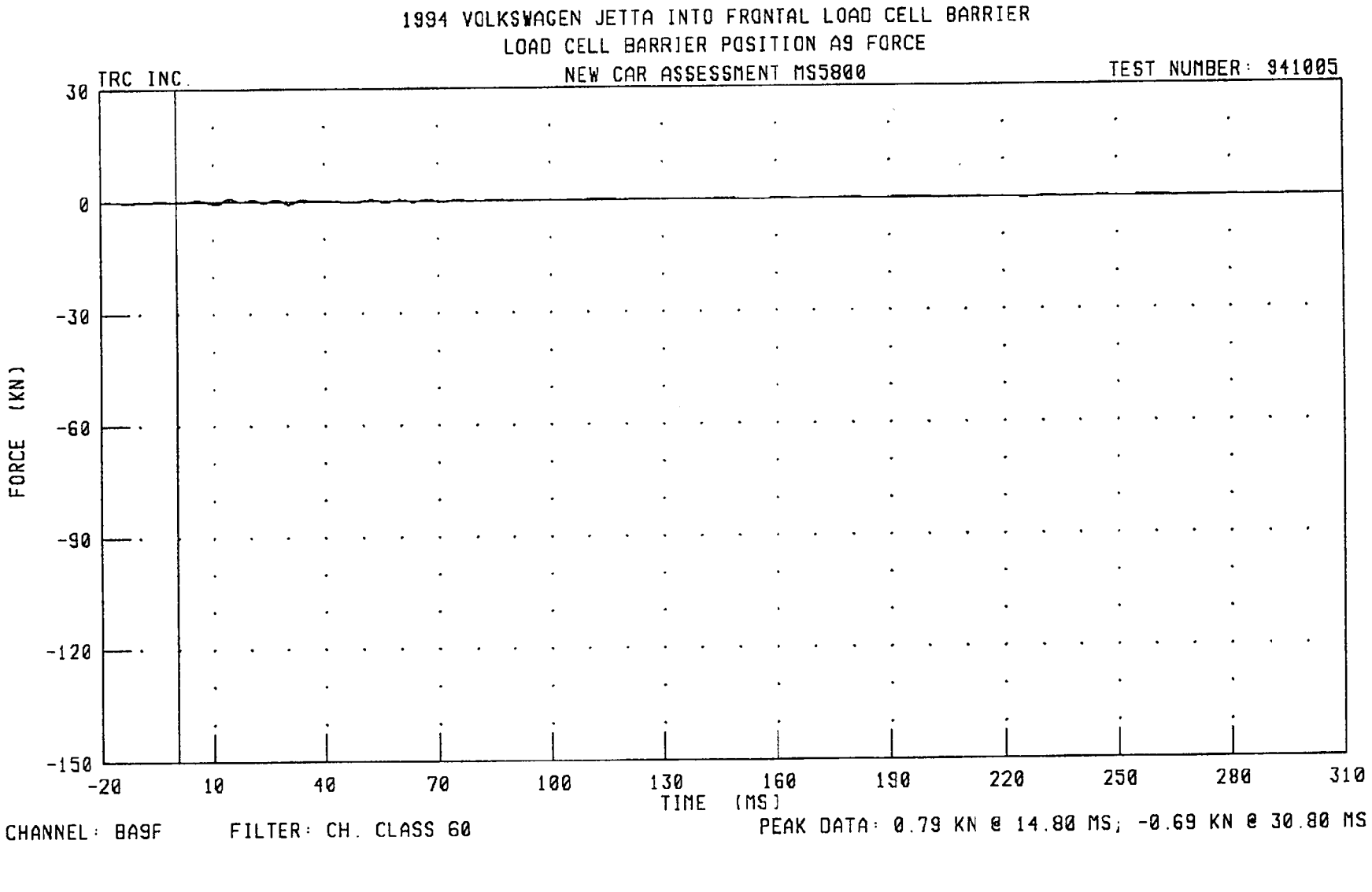
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.60 KN @ 2.64 MS; -4.56 KN @ 71.12 MS

941005

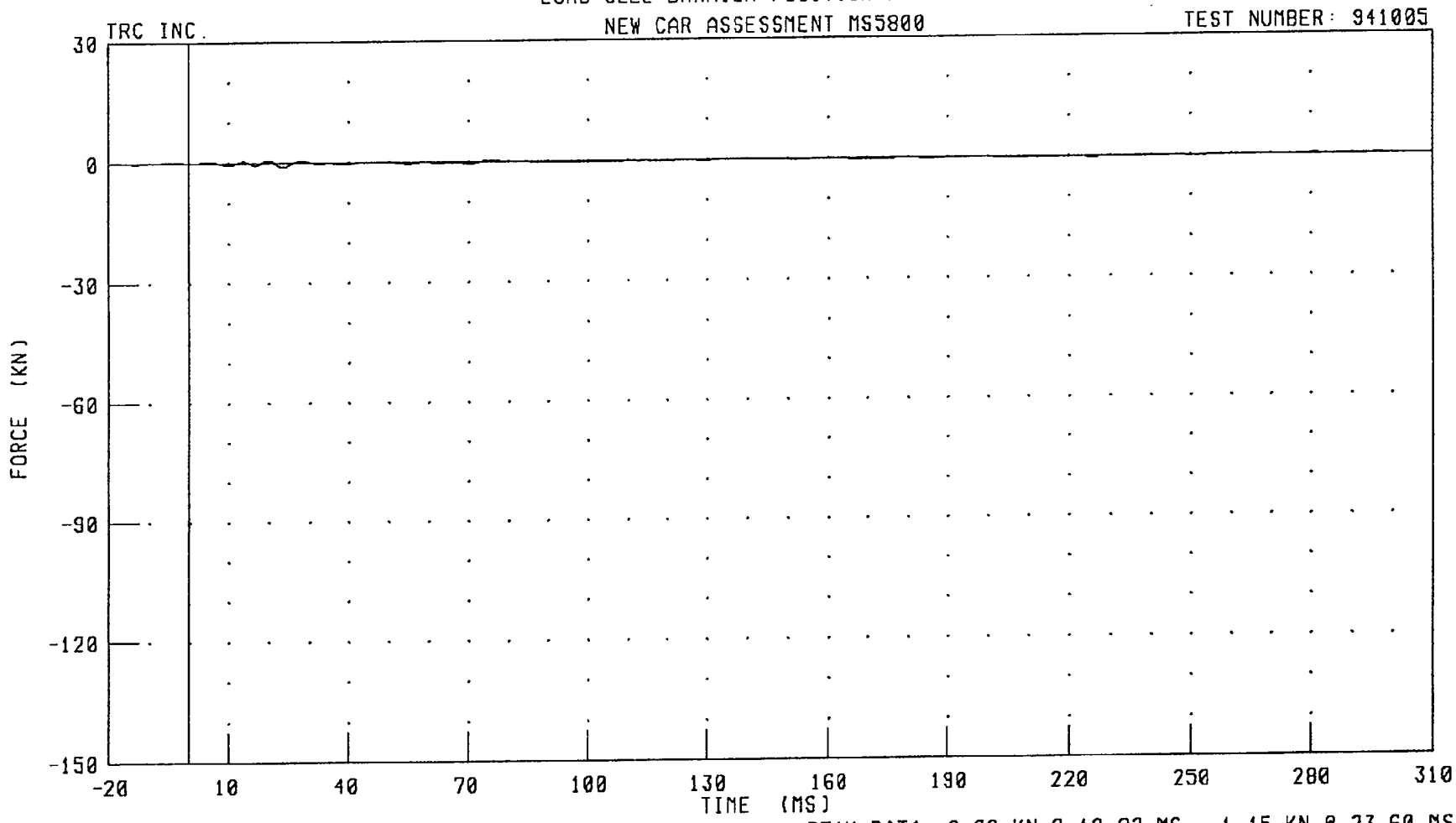

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA8F
FILTER: CH. CLASS 60
PEAK DATA: 0.52 KN @ 14.64 MS; -0.76 KN @ 10.16 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A9 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BA9F
FILTER: CH. CLASS 60
PEAK DATA: 0.79 KN @ 14.80 MS; -0.69 KN @ 30.80 MS

941005

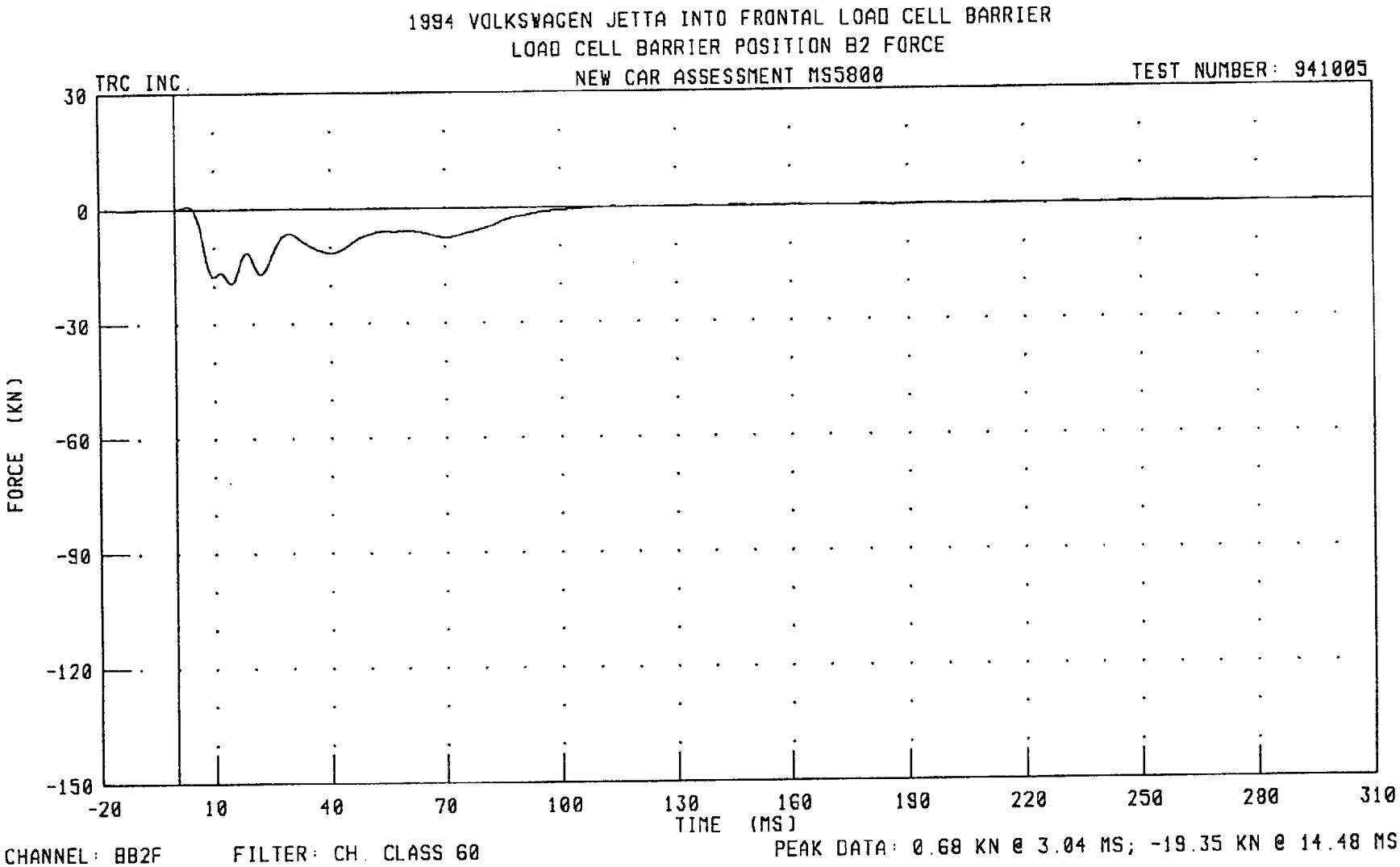
1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE
NEW CAR ASSESSMENT MS5800



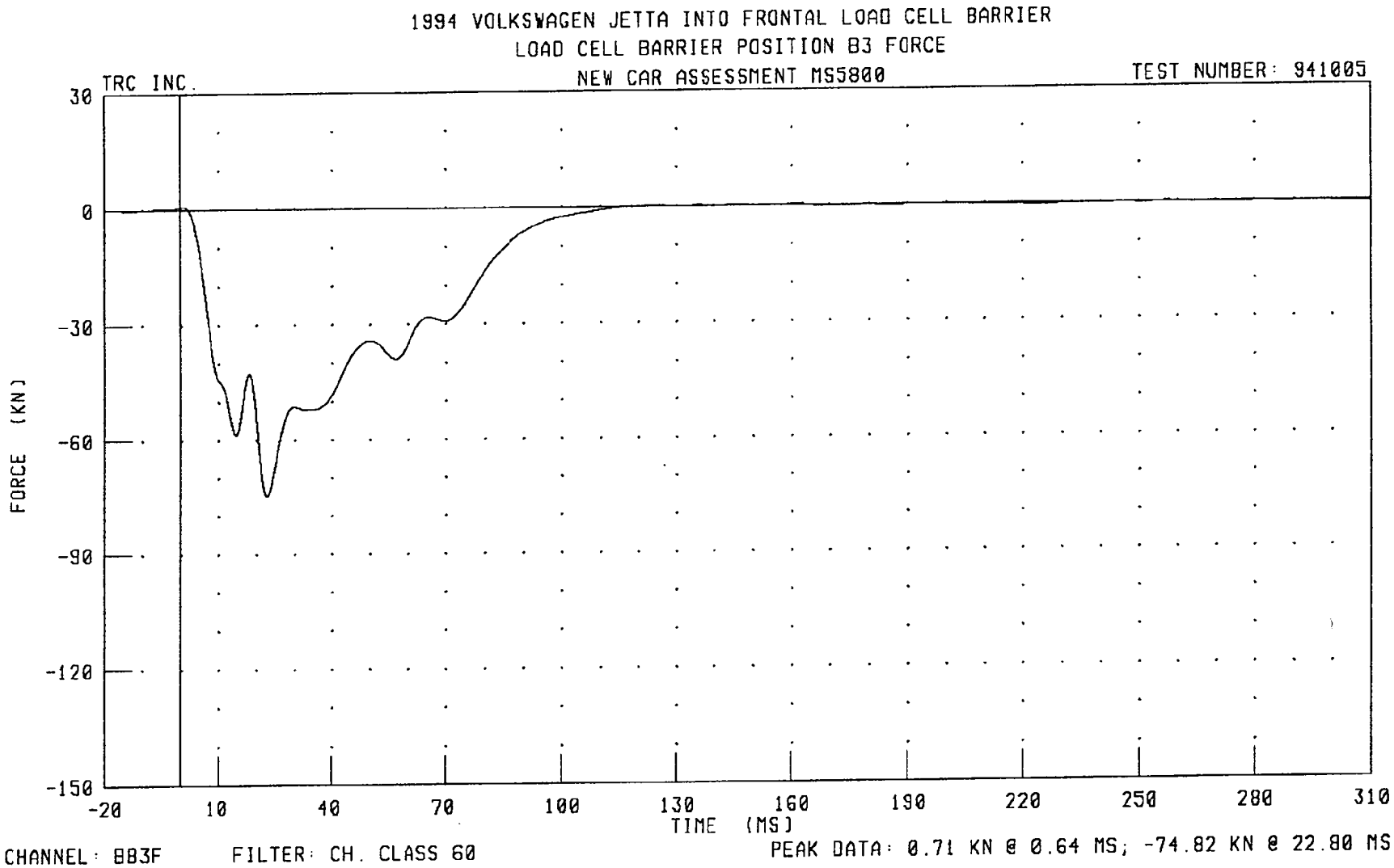
CHANNEL: BB1F FILTER: CH. CLASS 60 PEAK DATA: 0.60 KN @ 19.92 MS; -1.15 KN @ 23.60 MS

8-66

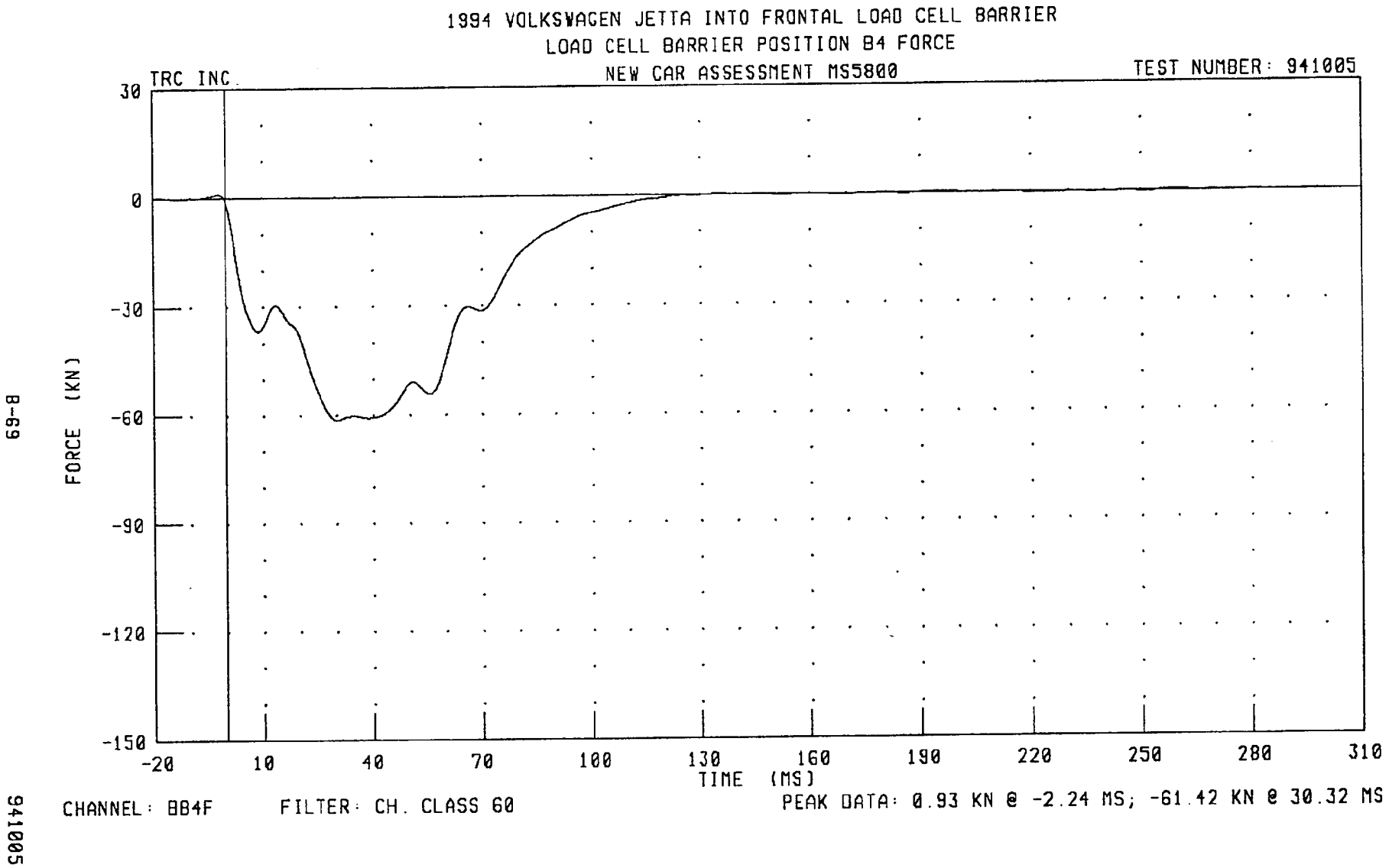
941005

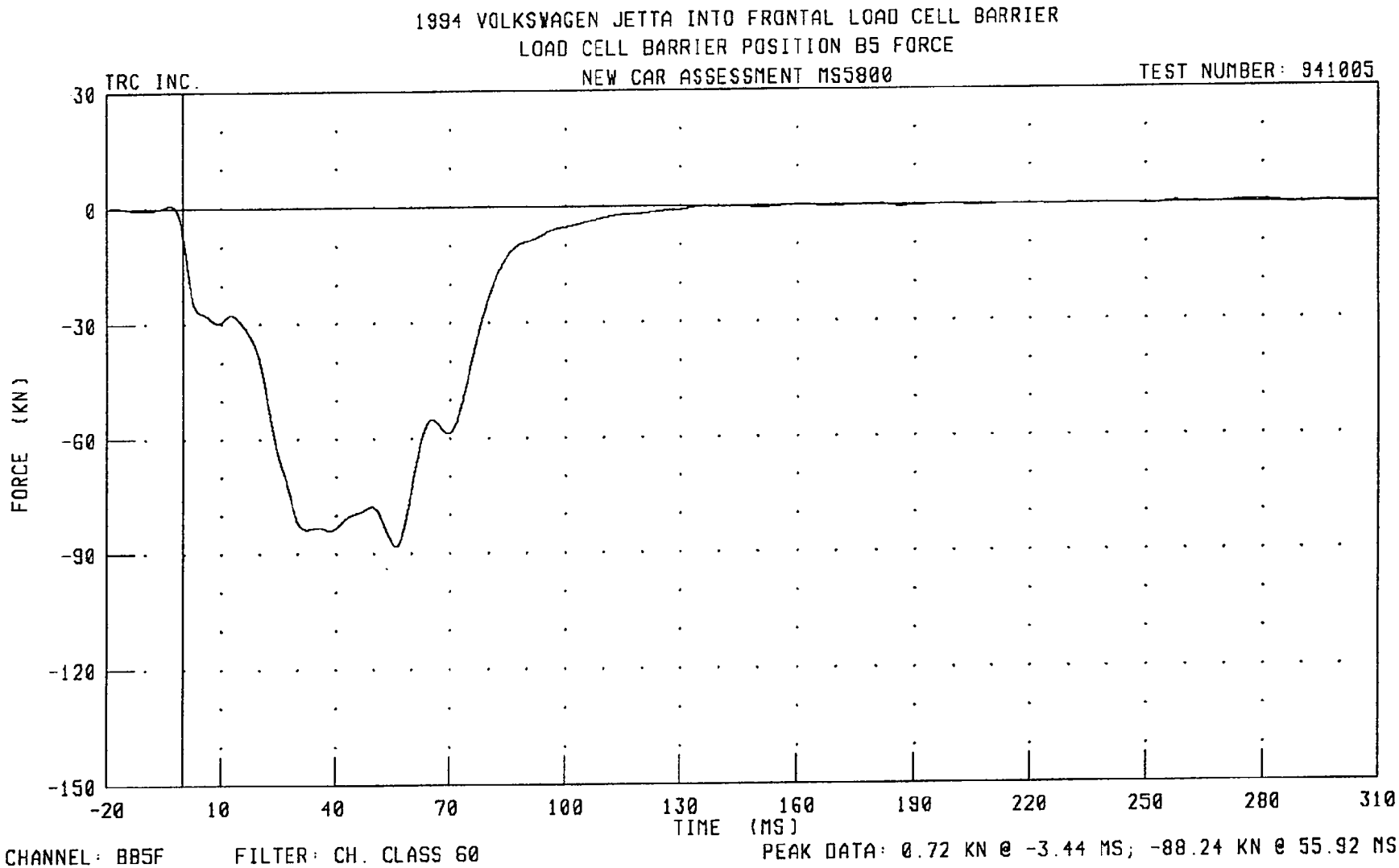

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB2F
FILTER: CH. CLASS 60
PEAK DATA: 0.68 KN @ 3.04 MS; -19.35 KN @ 14.48 MS

941005

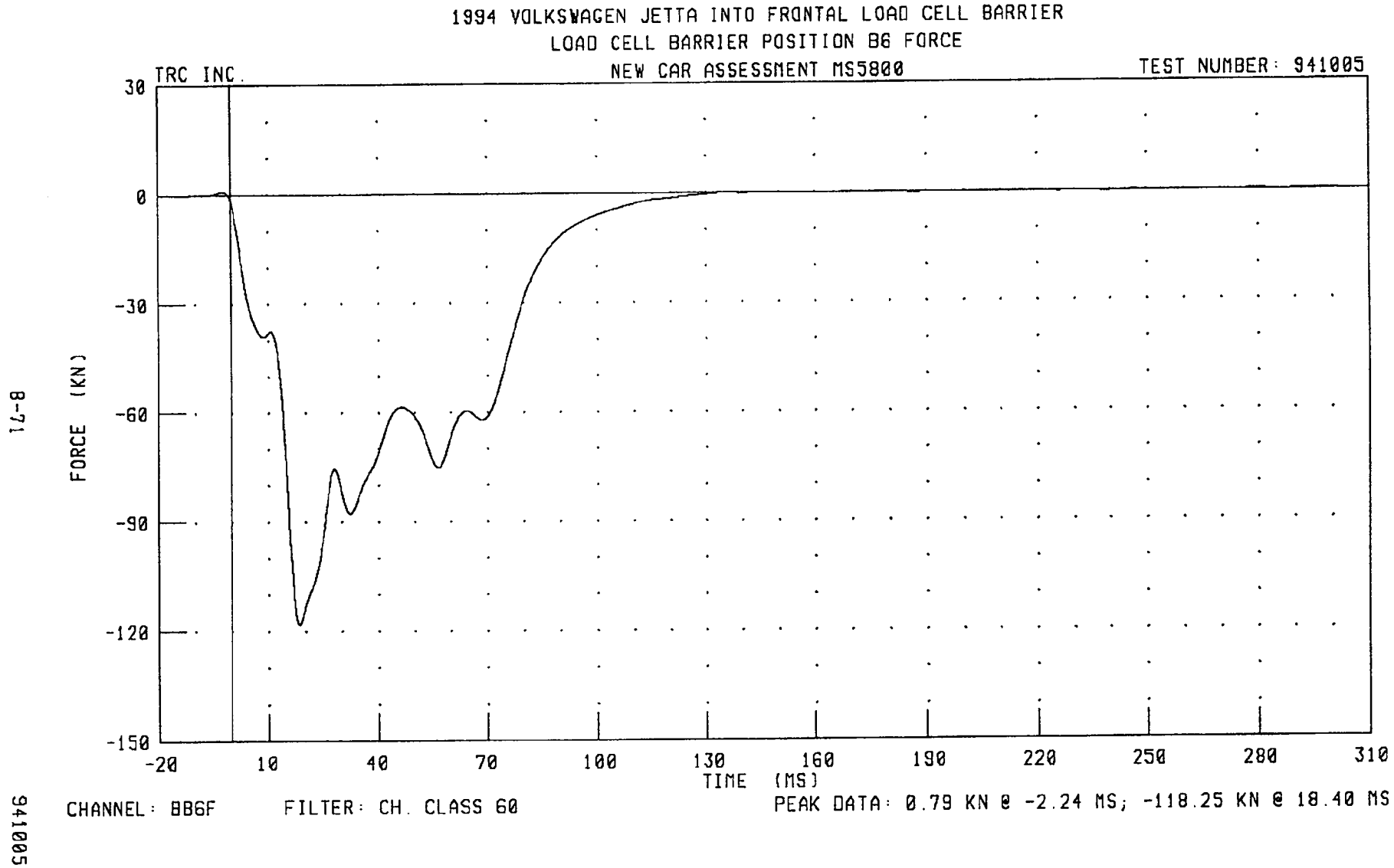

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: B83F
FILTER: CH. CLASS 60
PEAK DATA: 0.71 KN @ 0.64 MS; -74.82 KN @ 22.80 MS

941005

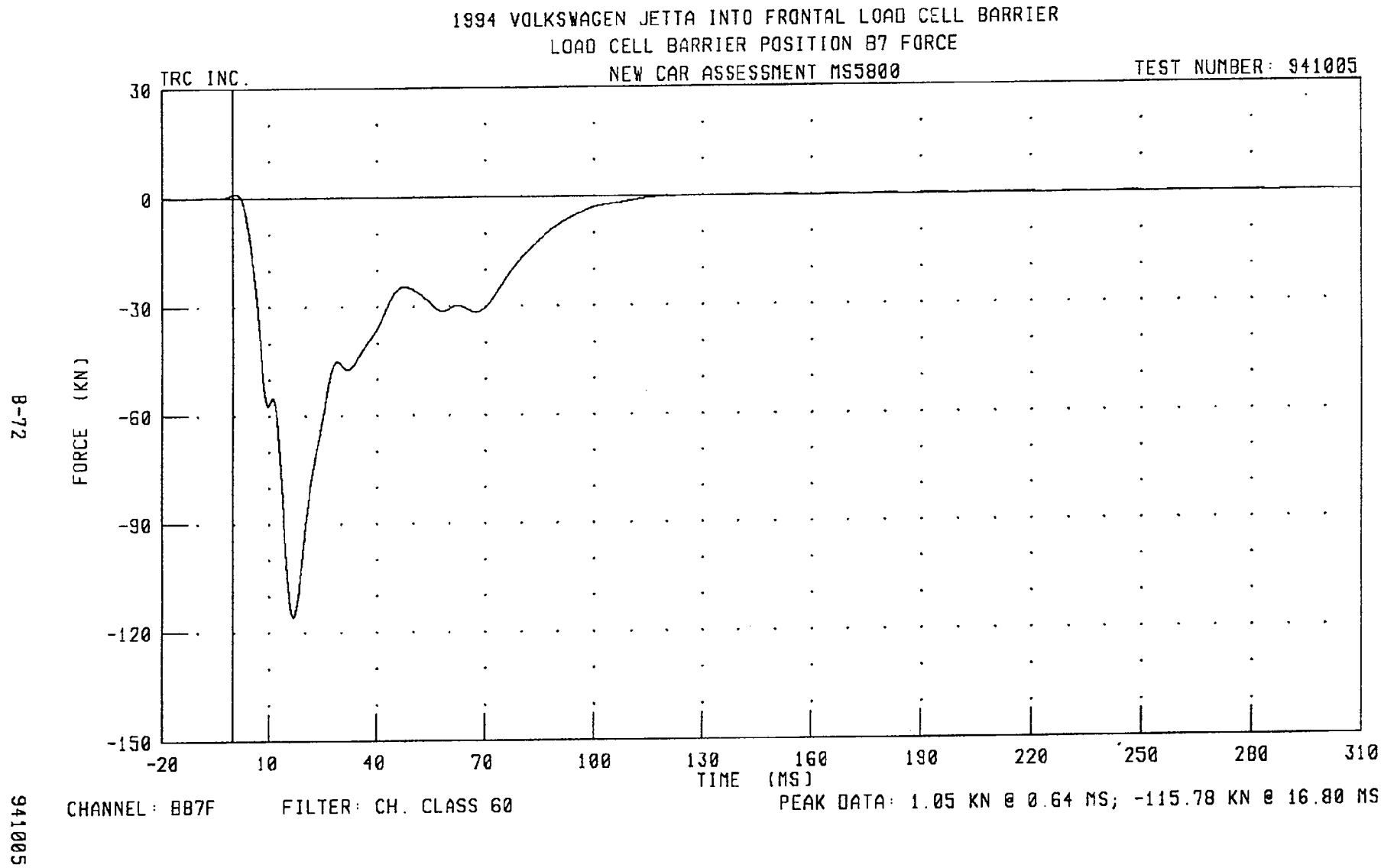

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB4F
FILTER: CH. CLASS 60
PEAK DATA: 0.93 KN @ -2.24 MS; -61.42 KN @ 30.32 MS
B-69
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BB5F
FILTER: CH. CLASS 60
PEAK DATA: 0.72 KN @ -3.44 MS; -88.24 KN @ 55.92 MS

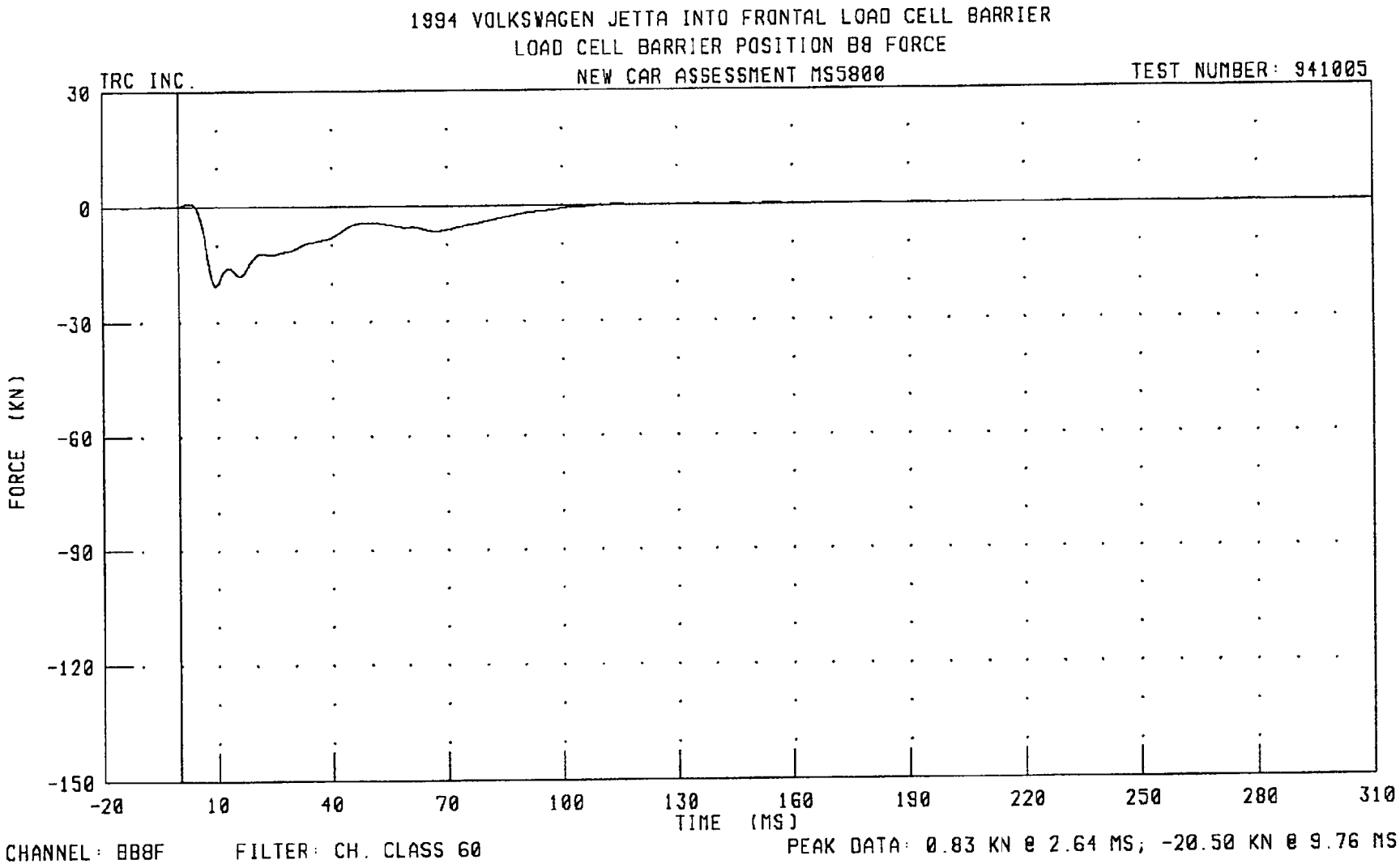
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.79 KN @ -2.24 MS; -118.25 KN @ 18.40 MS

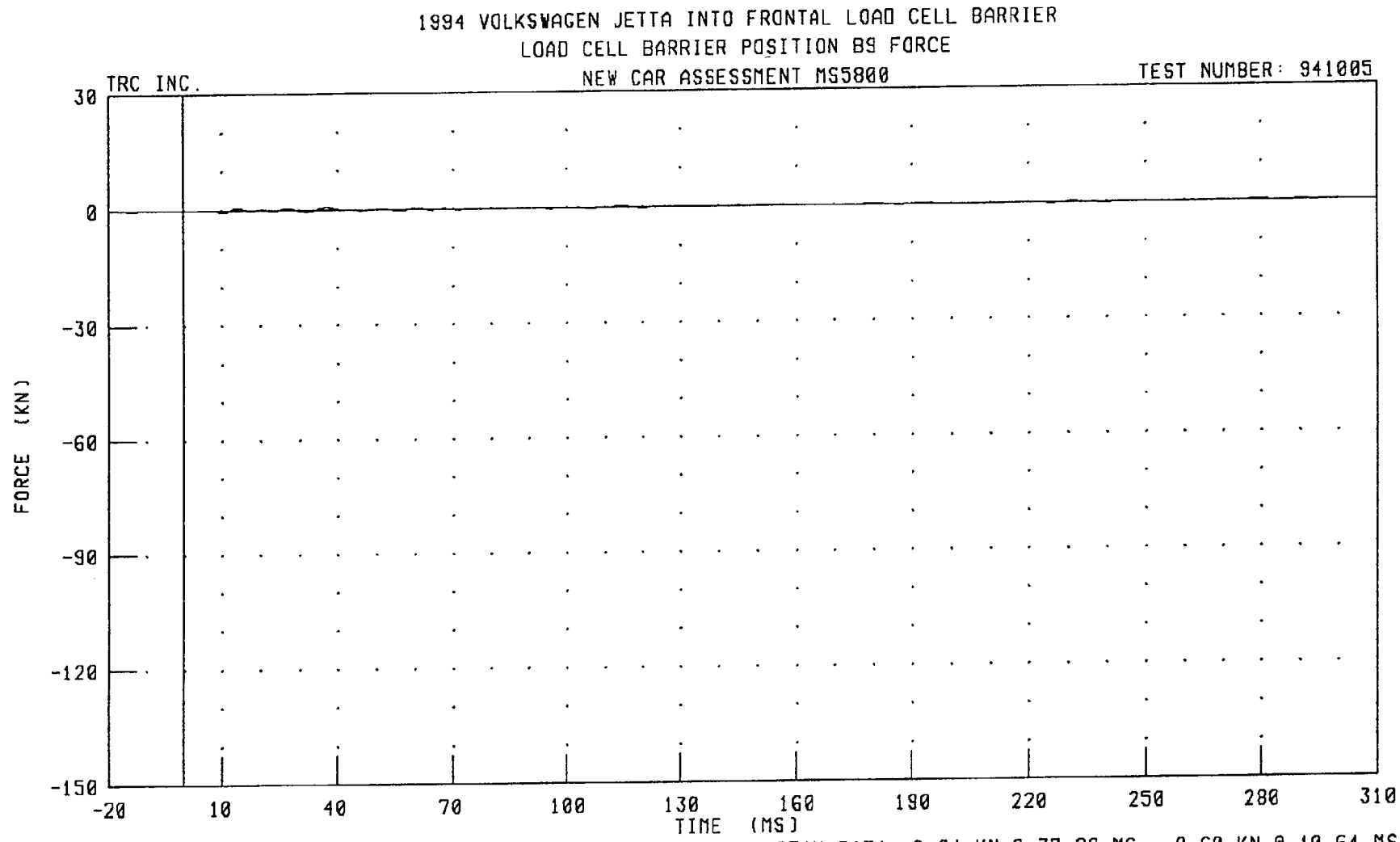
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 1.05 KN @ 0.64 MS; -115.78 KN @ 16.80 MS

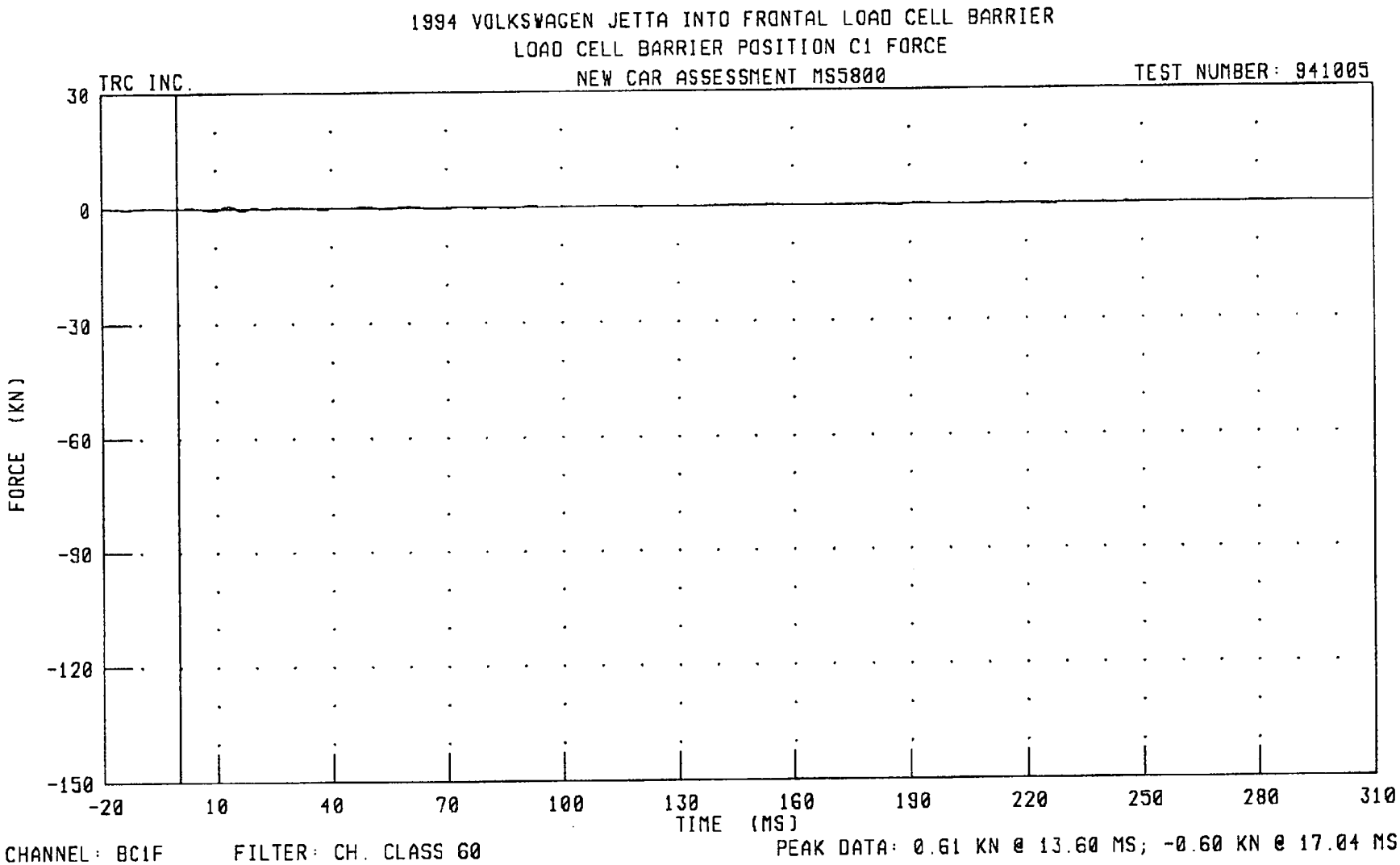
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.83 KN @ 2.64 MS; -20.50 KN @ 9.76 MS

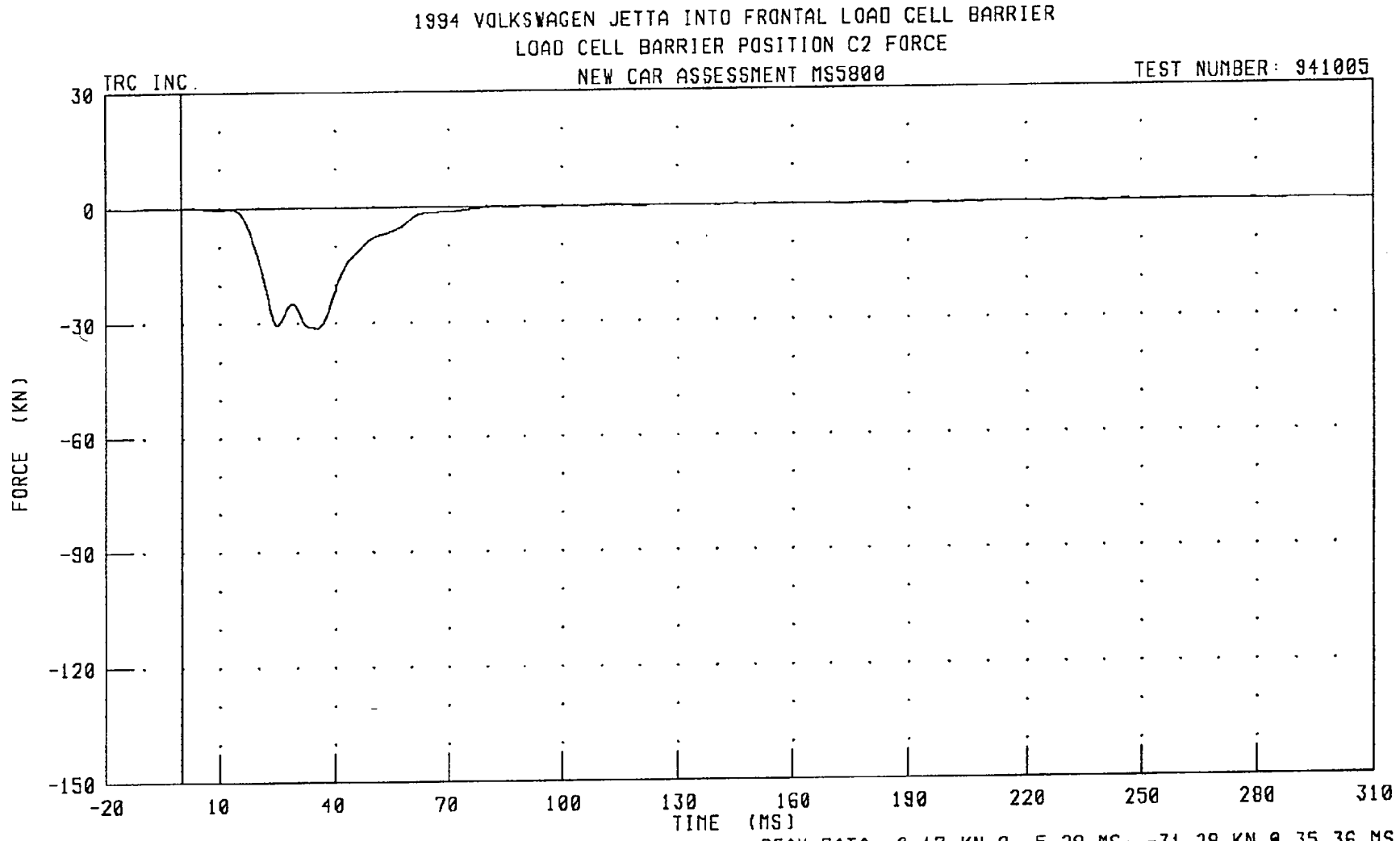
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 8B9F
FILTER: CH. CLASS 60
PEAK DATA: 0.64 KN @ 37.28 MS; -0.60 KN @ 10.64 MS

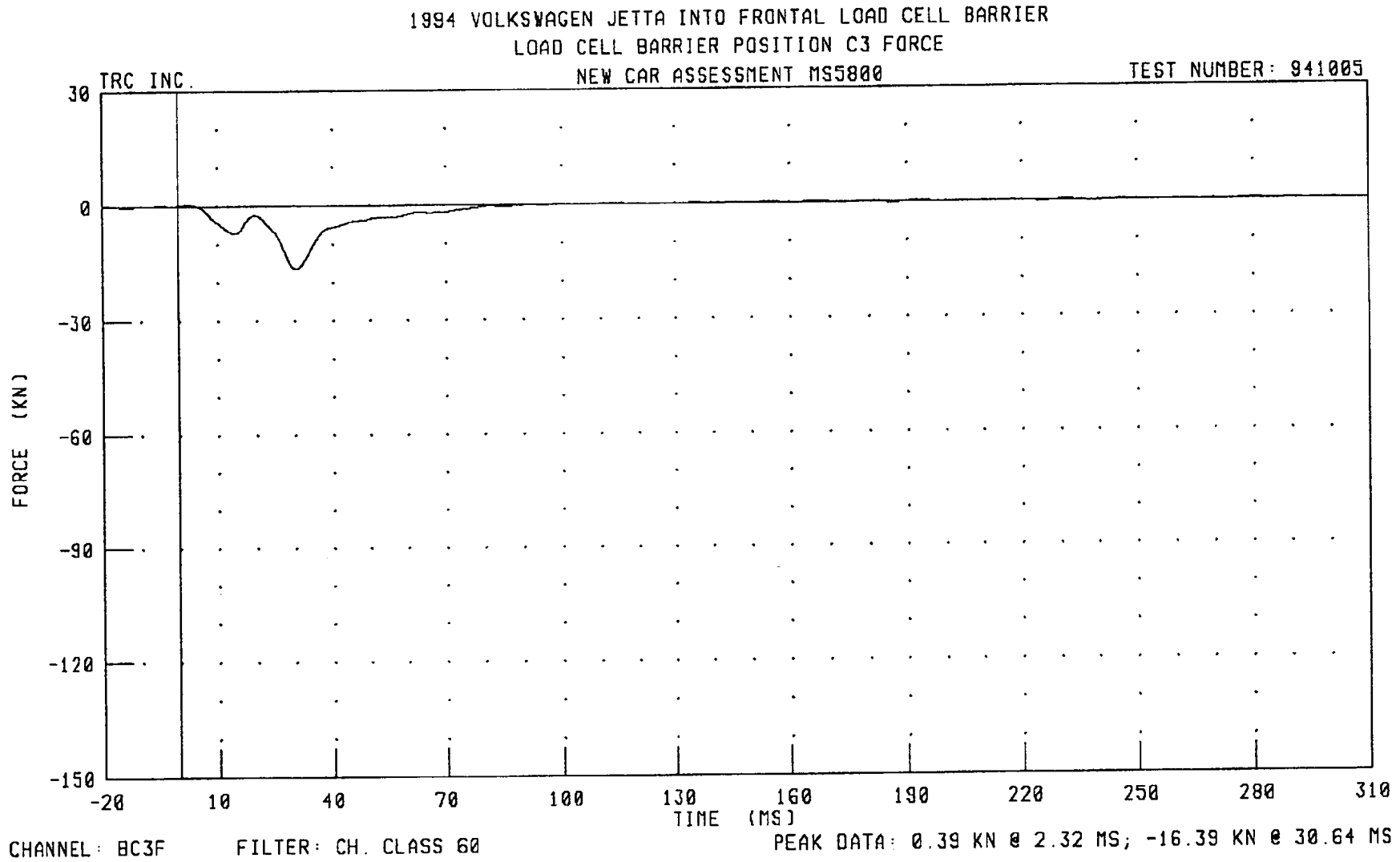
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.61 KN @ 13.60 MS; -0.60 KN @ 17.04 MS

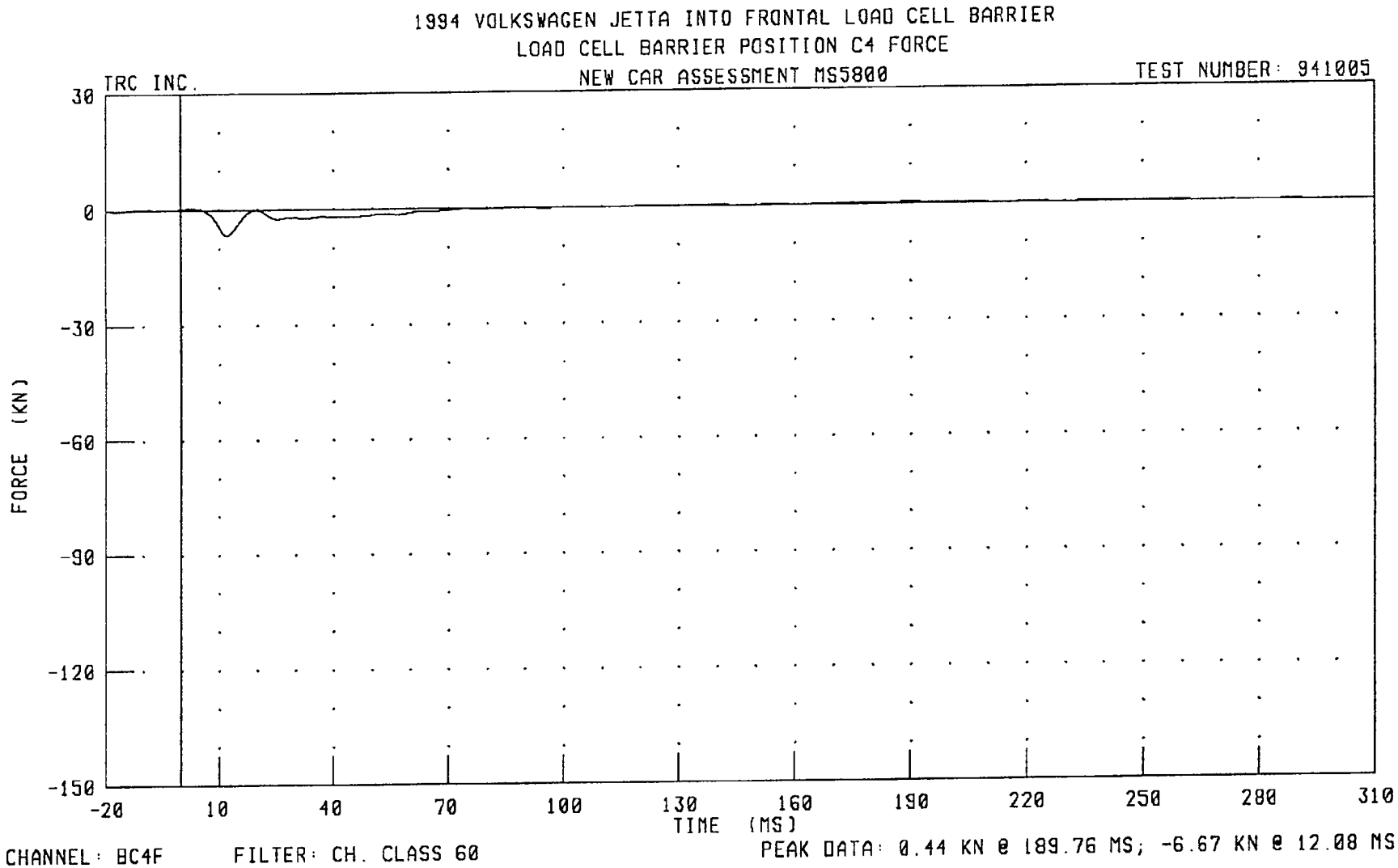
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC2F
FILTER: CH. CLASS 60
PEAK DATA: 0.17 KN @ -5.28 MS; -31.28 KN @ 35.36 MS

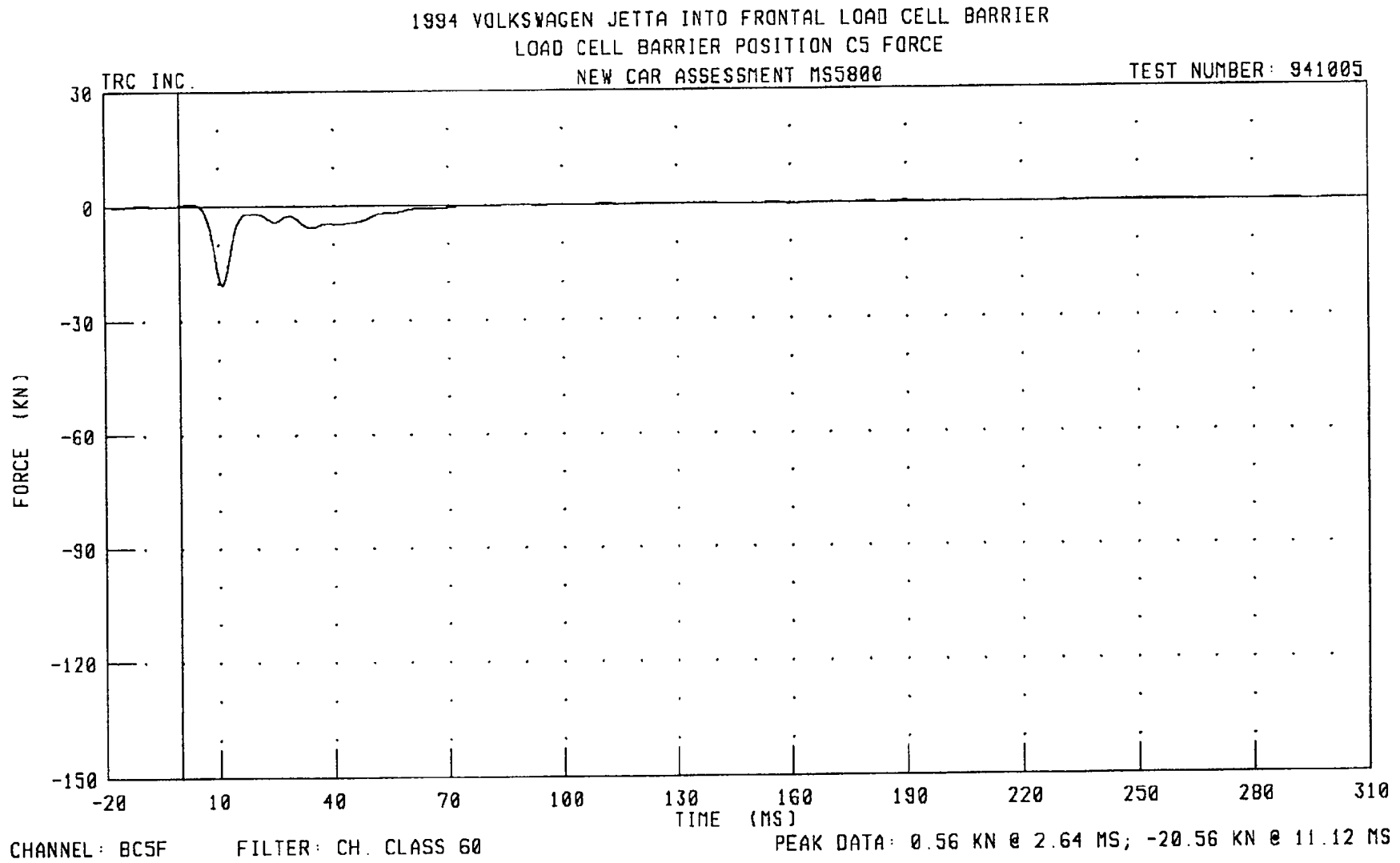
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.39 KN @ 2.32 MS; -16.39 KN @ 30.64 MS

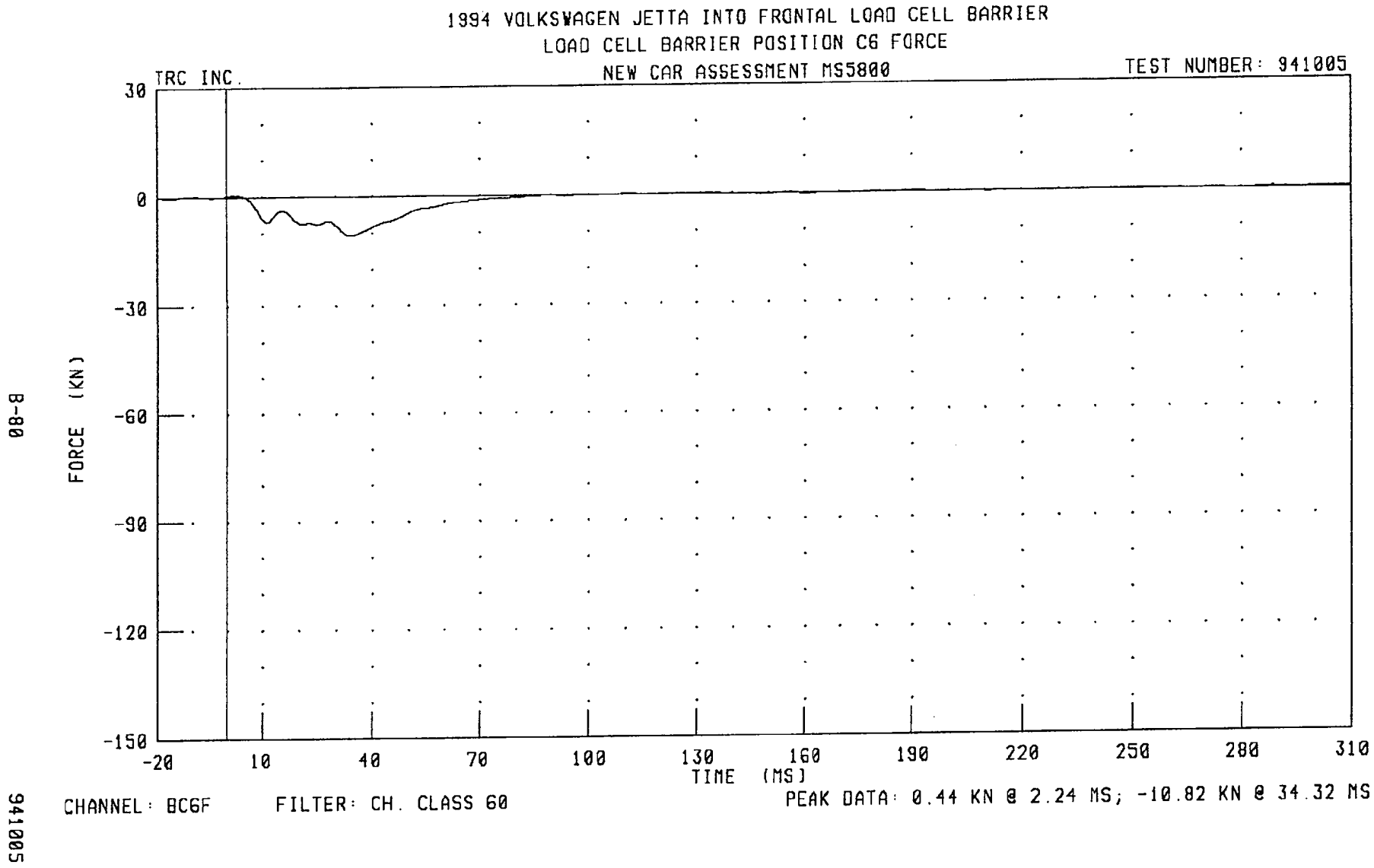
941005

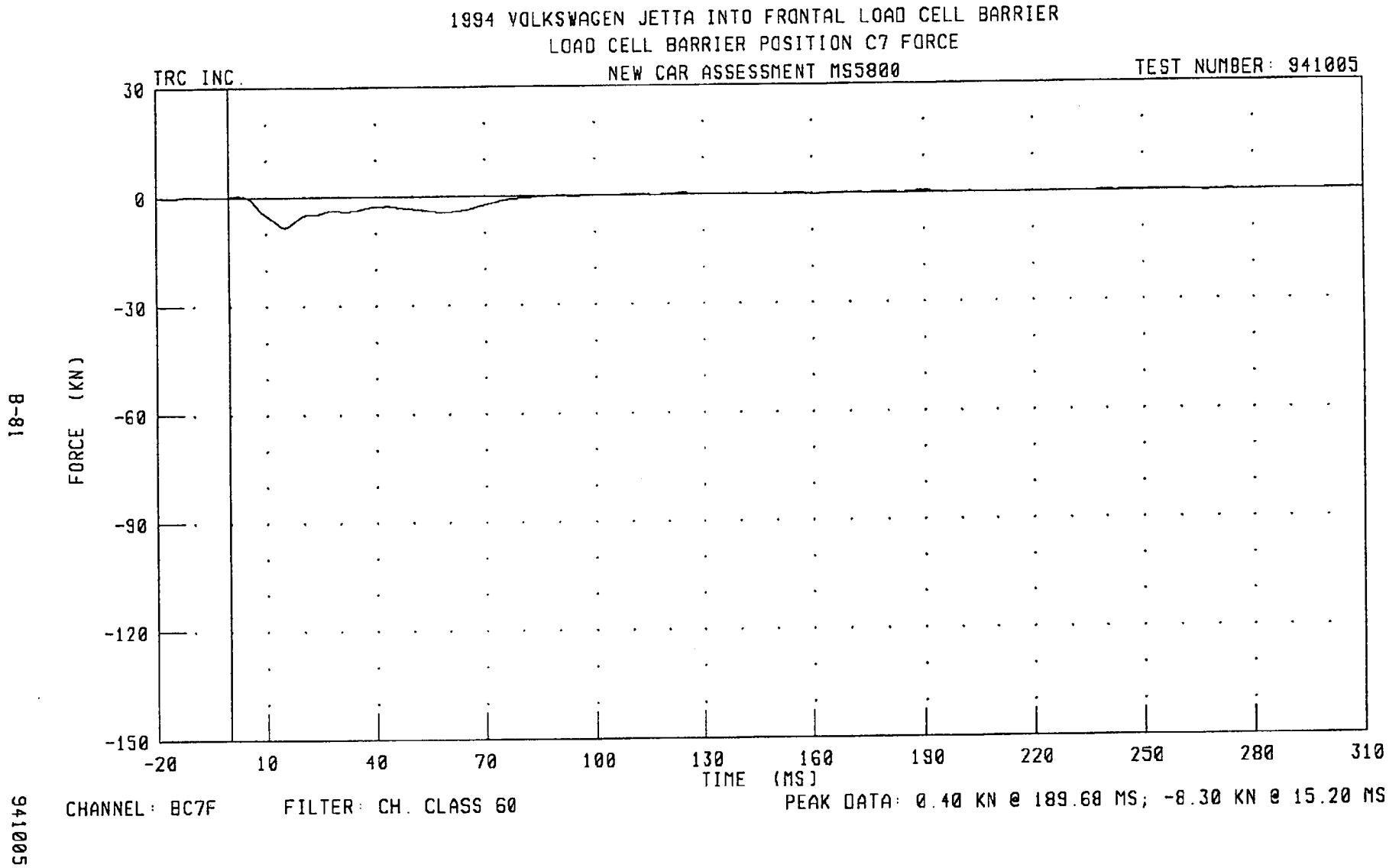

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC4F
FILTER: CH. CLASS 60
PEAK DATA: 0.44 KN @ 189.76 MS; -6.67 KN @ 12.08 MS

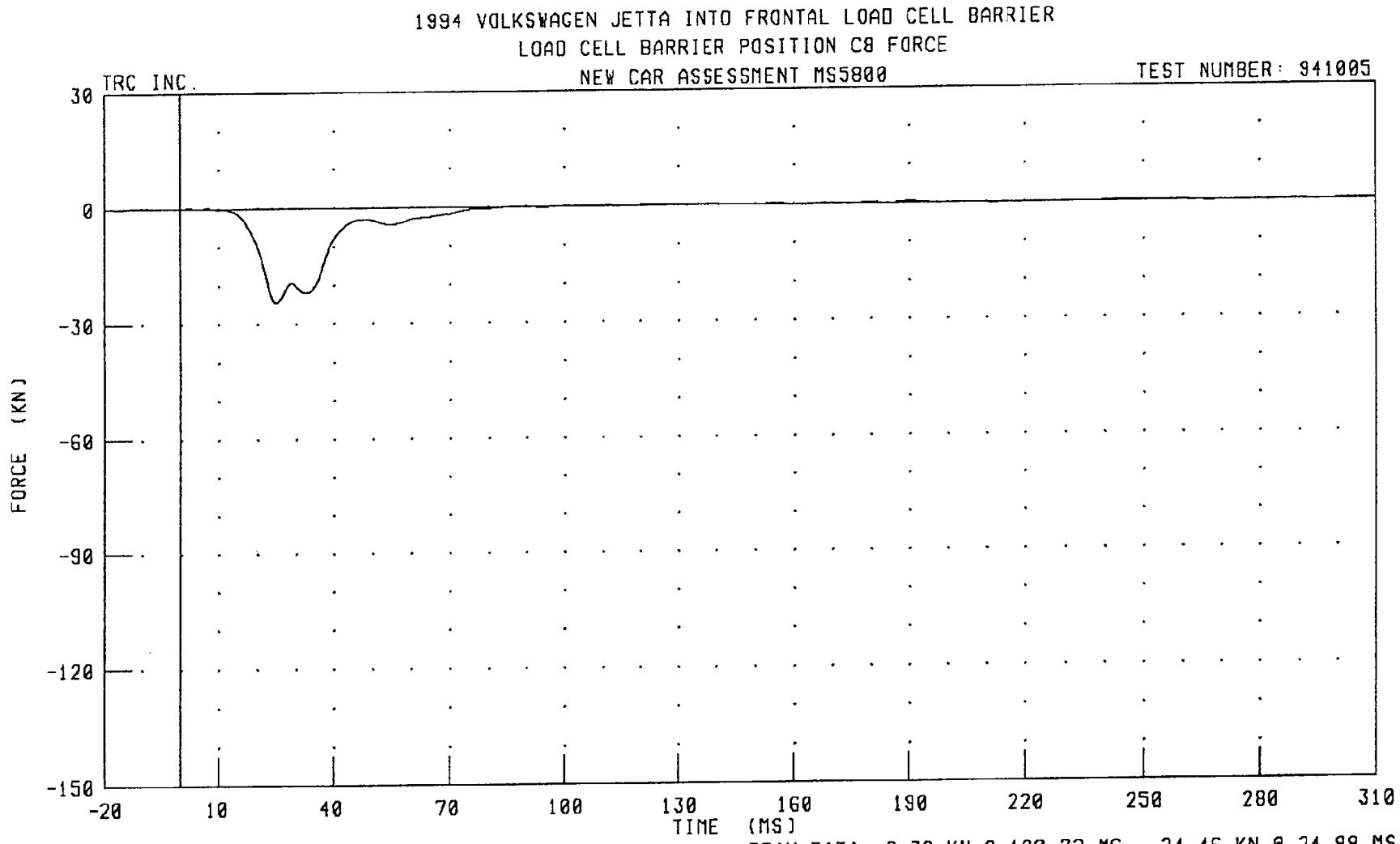
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.56 KN @ 2.64 MS; -20.56 KN @ 11.12 MS

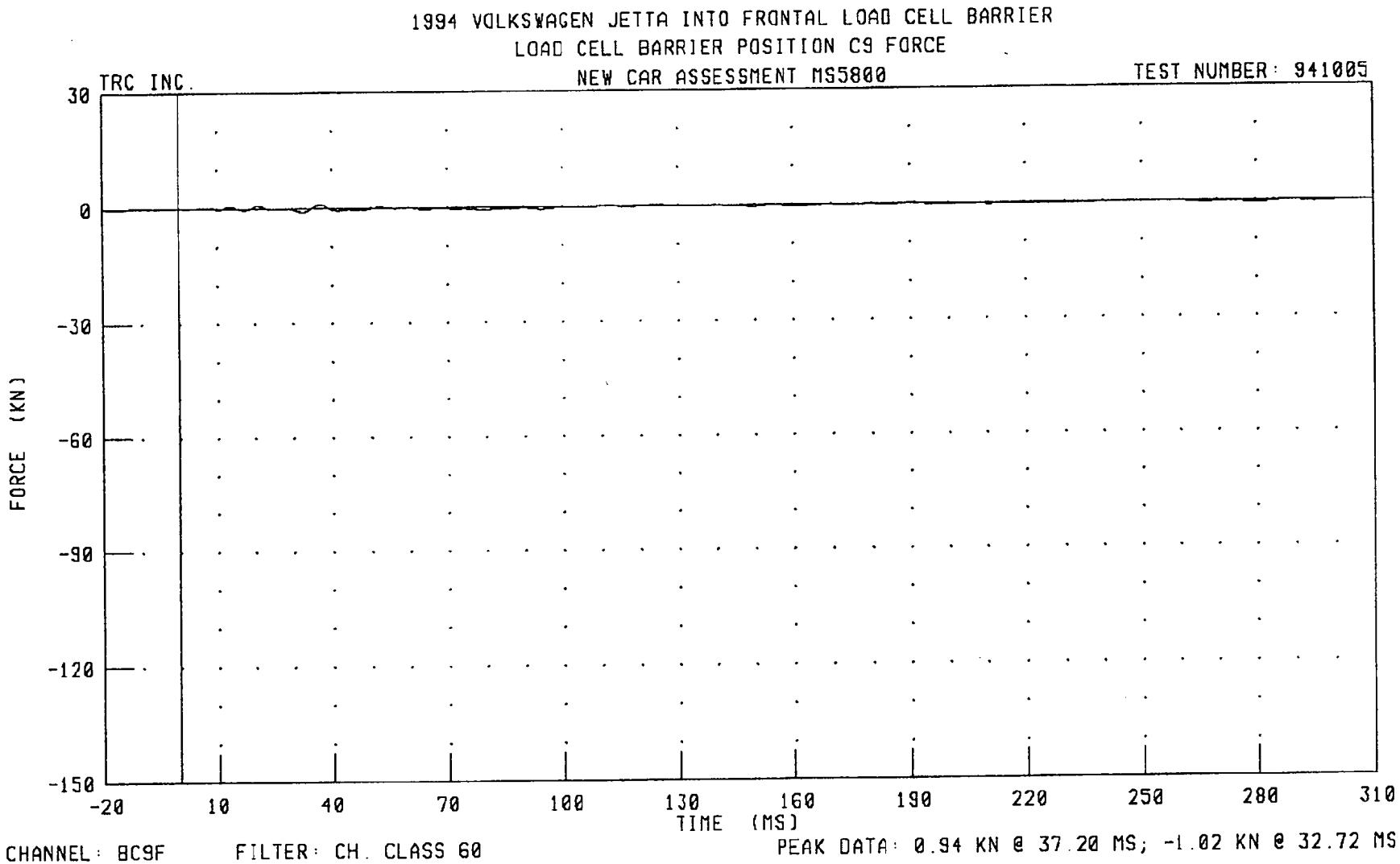
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC6F
FILTER: CH. CLASS 60
PEAK DATA: 0.44 KN @ 2.24 MS; -10.82 KN @ 34.32 MS
B-80
941005

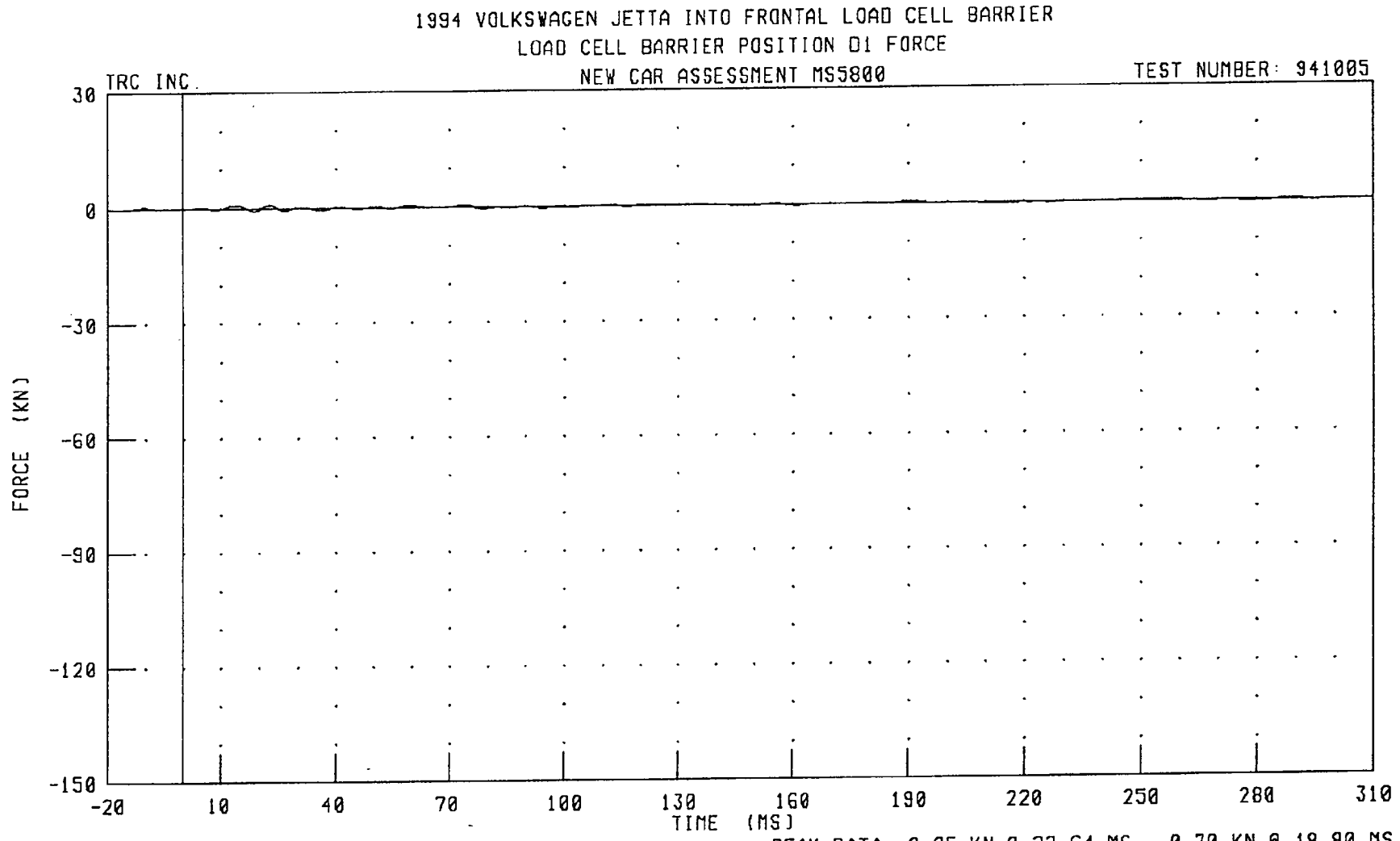

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC7F
FILTER: CH. CLASS 60
PEAK DATA: 0.40 KN @ 189.68 MS; -8.30 KN @ 15.20 MS
18-8
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BC8F
FILTER: CH. CLASS 60
PEAK DATA: 0.36 KN @ 190.72 MS; -24.46 KN @ 24.88 MS

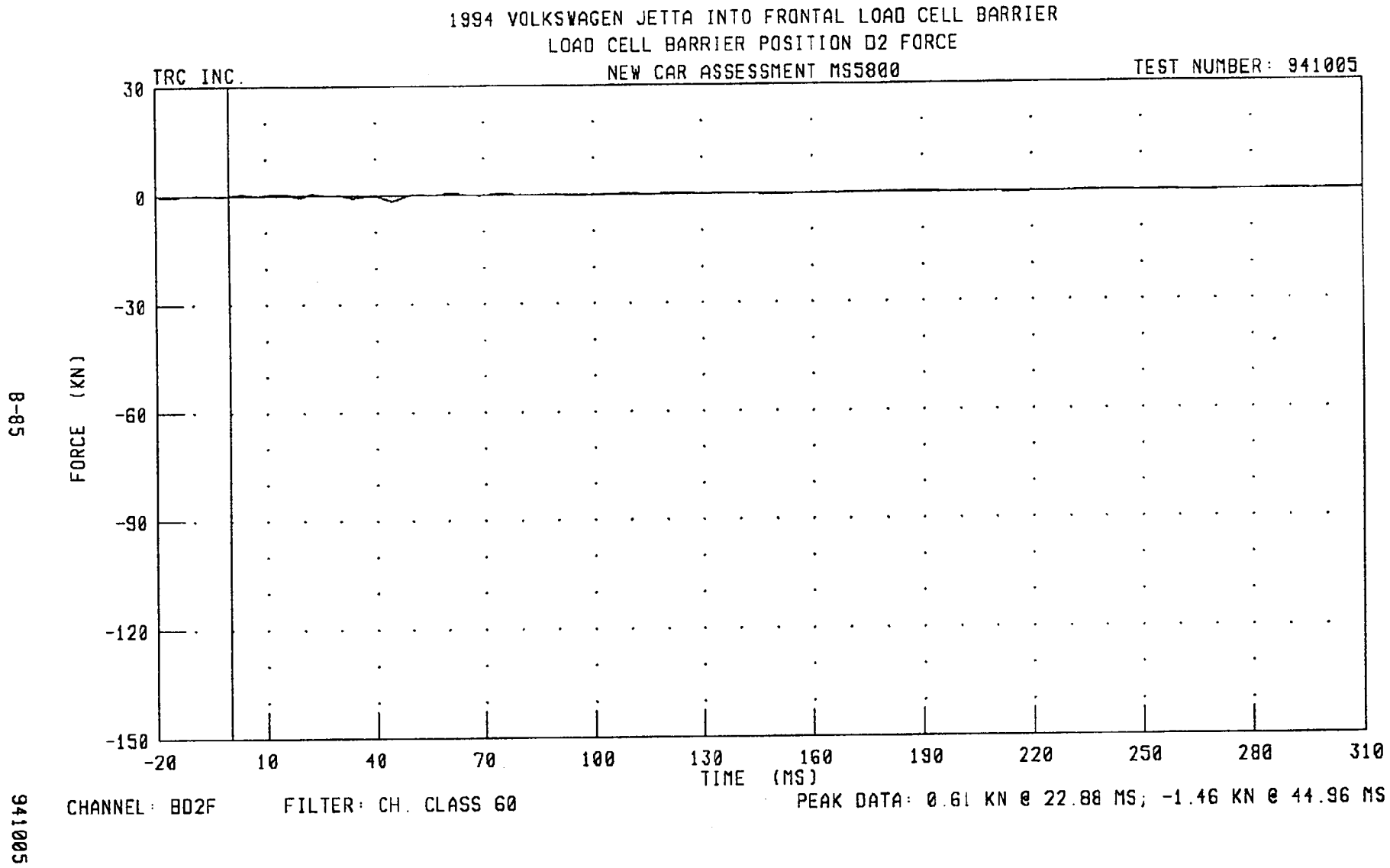
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 8C9F
FILTER: CH. CLASS 60
PEAK DATA: 0.94 KN @ 37.20 MS; -1.02 KN @ 32.72 MS

941005

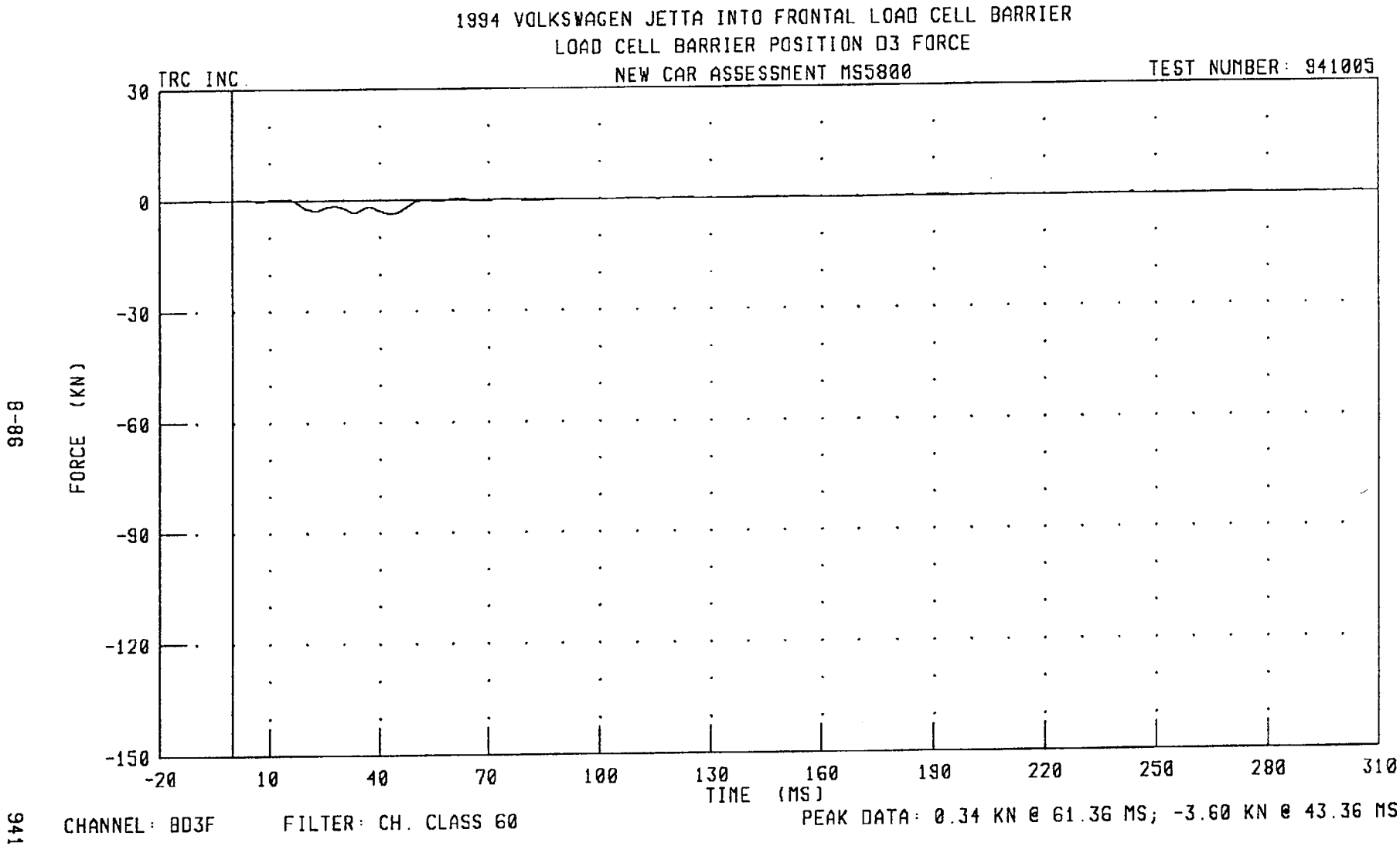

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 01 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 801F
FILTER: CH. CLASS 60
PEAK DATA: 0.85 KN @ 22.64 MS; -0.70 KN @ 18.80 MS

941005

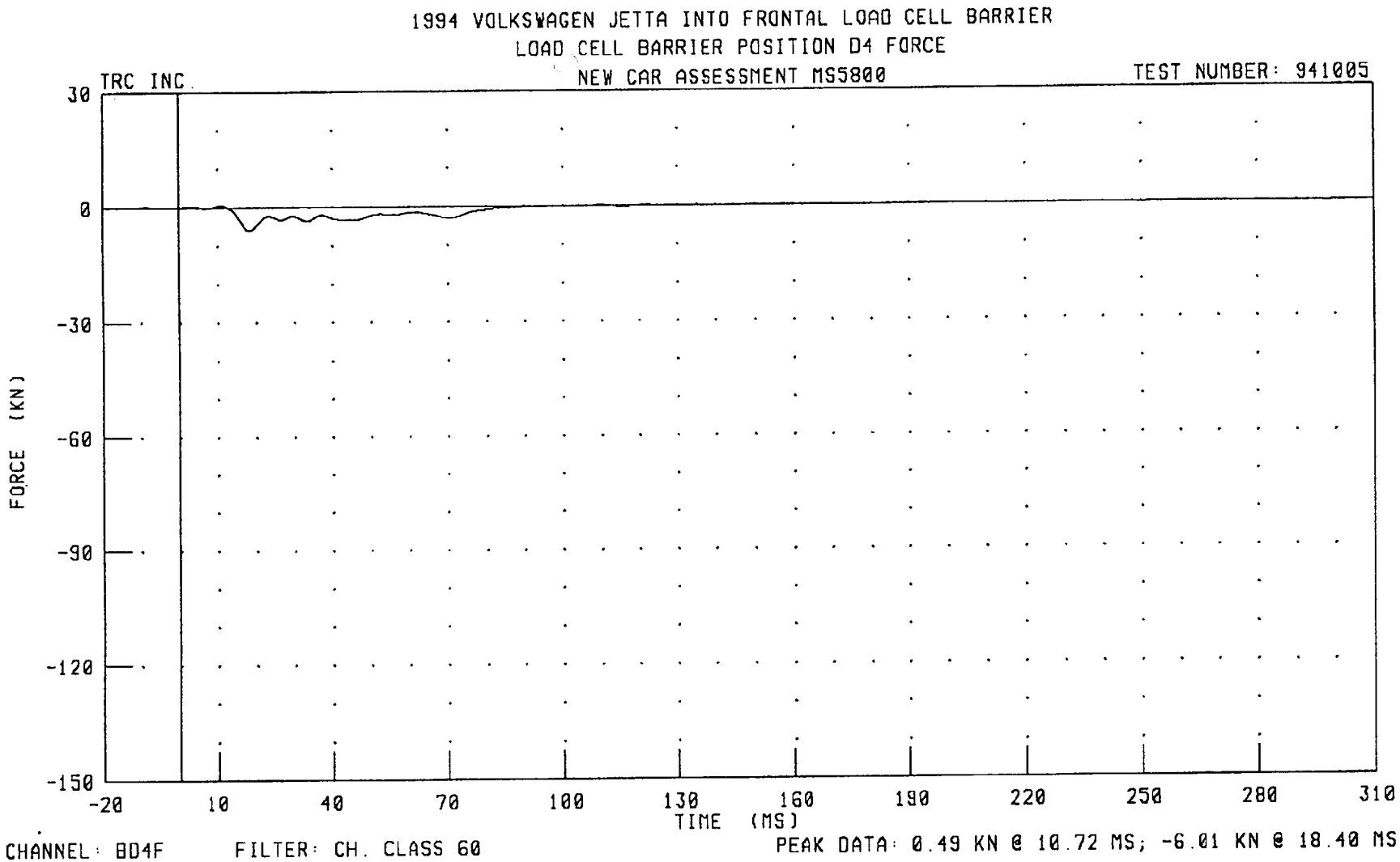

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD2F
FILTER: CH. CLASS 60
PEAK DATA: 0.61 KN @ 22.88 MS; -1.46 KN @ 44.96 MS

8-85

941005

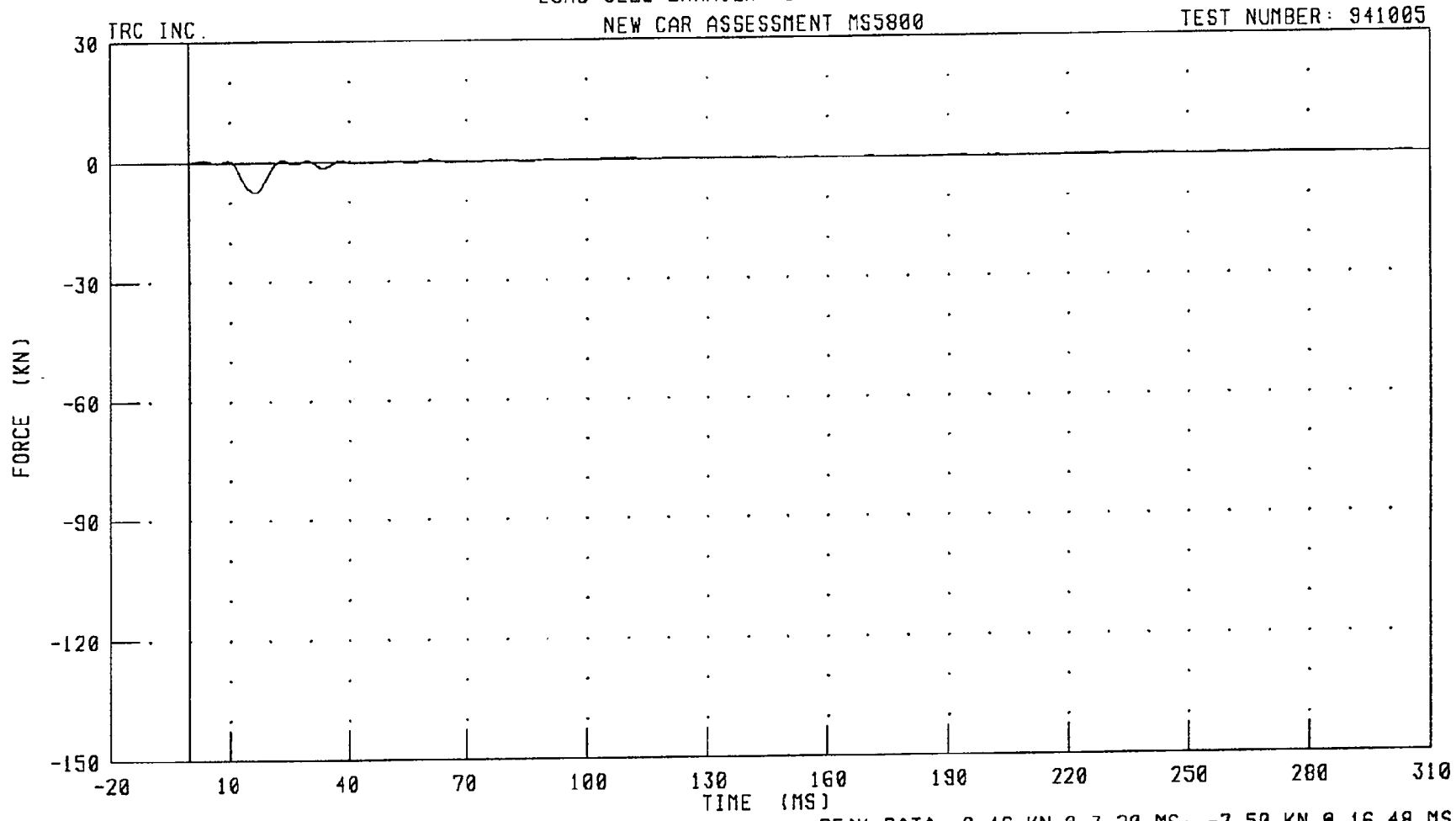

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: 8D3F
FILTER: CH. CLASS 60
PEAK DATA: 0.34 KN @ 61.36 MS; -3.60 KN @ 43.36 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D4 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 0.49 KN @ 10.72 MS; -6.01 KN @ 18.40 MS

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE
NEW CAR ASSESSMENT MS5800

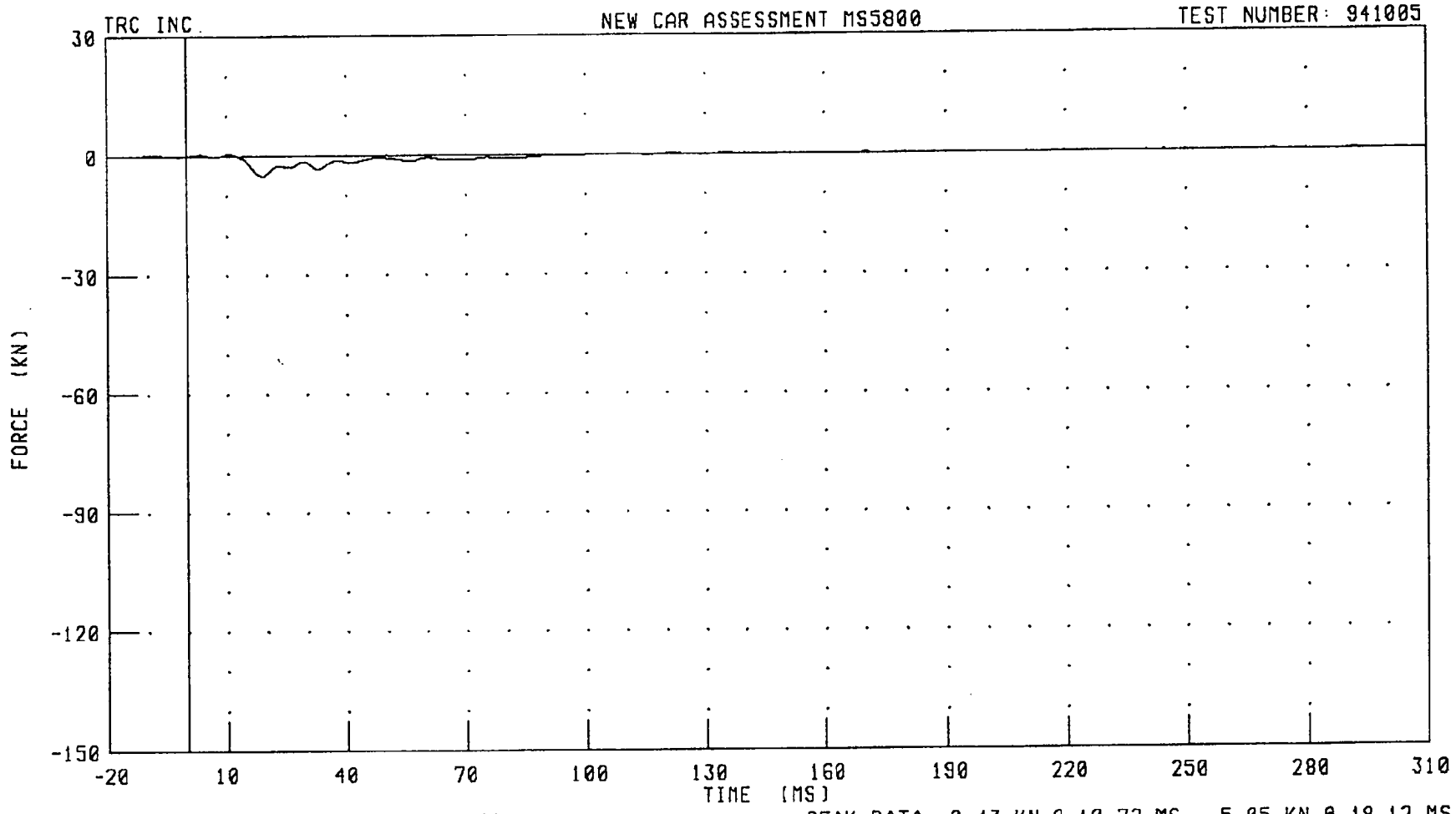


CHANNEL: BD5F FILTER: CH. CLASS 60 PEAK DATA: 0.46 KN @ 3.20 MS; -7.50 KN @ 16.48 MS

88-8

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE
NEW CAR ASSESSMENT MS5800

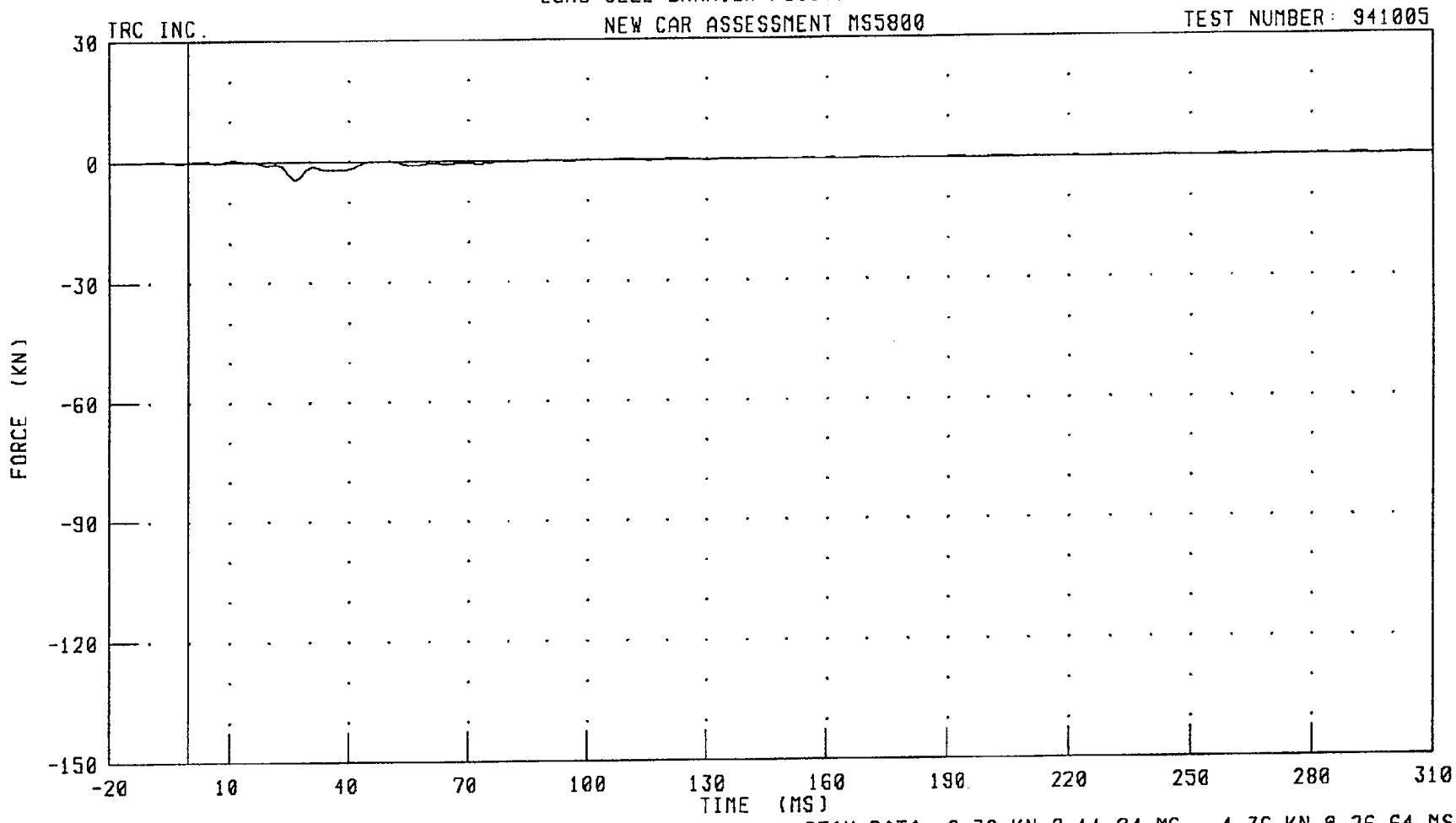


CHANNEL: BD6F FILTER: CH. CLASS 60 PEAK DATA: 0.43 KN @ 10.72 MS; -5.05 KN @ 19.12 MS

8-89

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 07 FORCE
NEW CAR ASSESSMENT MS5800



CHANNEL: 807F FILTER: CH. CLASS 60 PEAK DATA: 0.38 KN @ 11.04 MS; -4.36 KN @ 26.64 MS

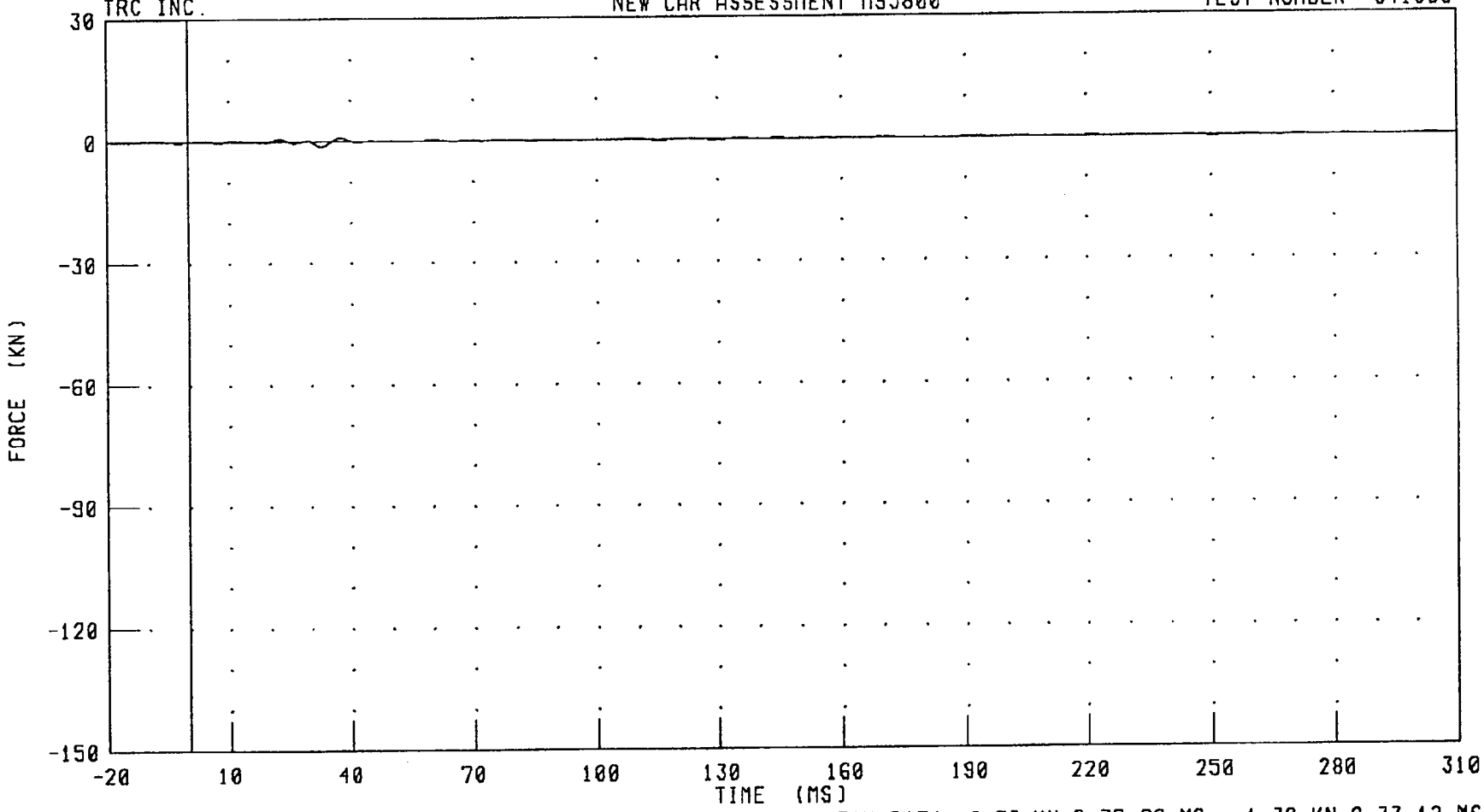
B-90

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE
NEW CAR ASSESSMENT MS5800

TRC INC.

TEST NUMBER: 941005

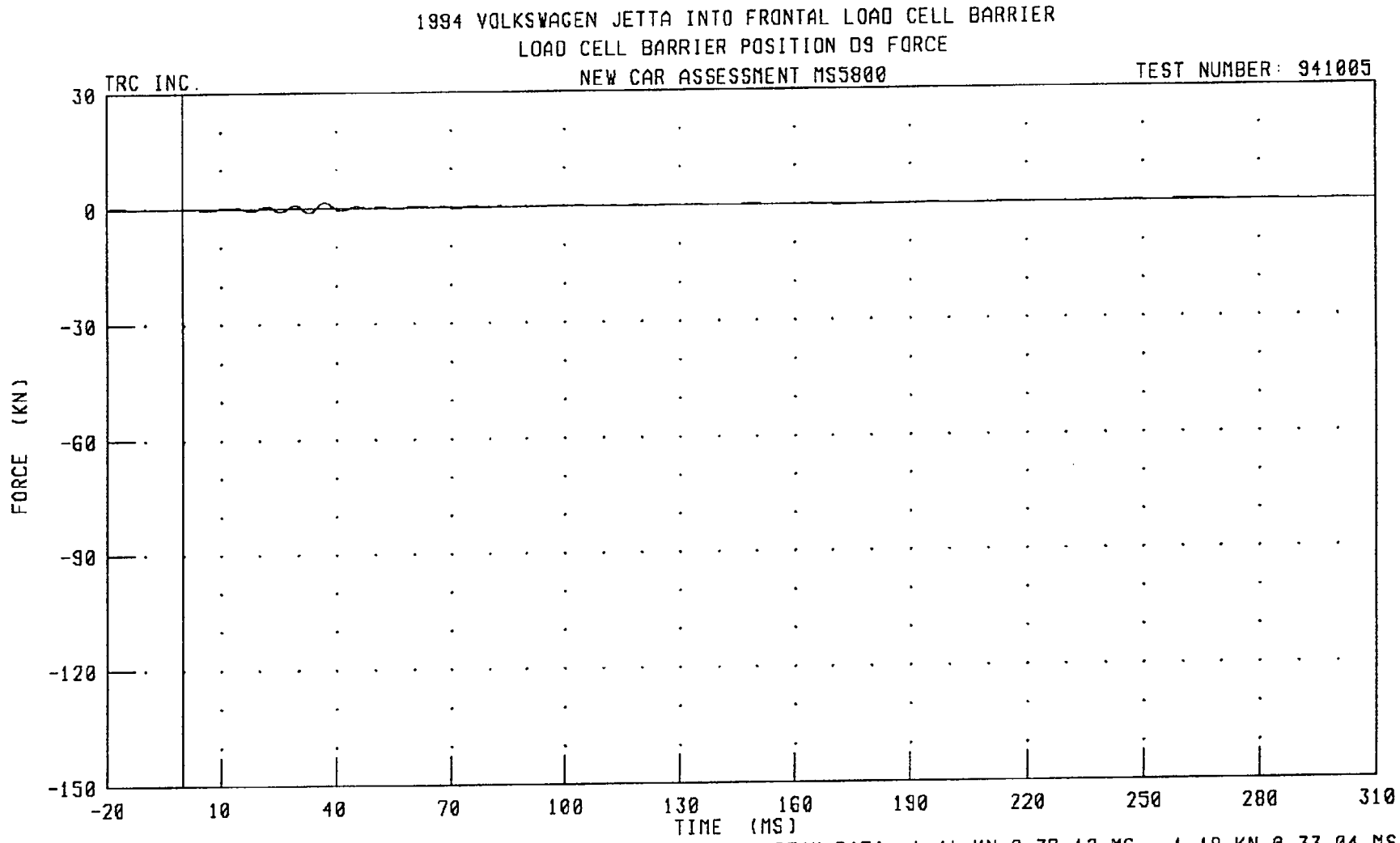


CHANNEL: BD8F FILTER: CH. CLASS 60

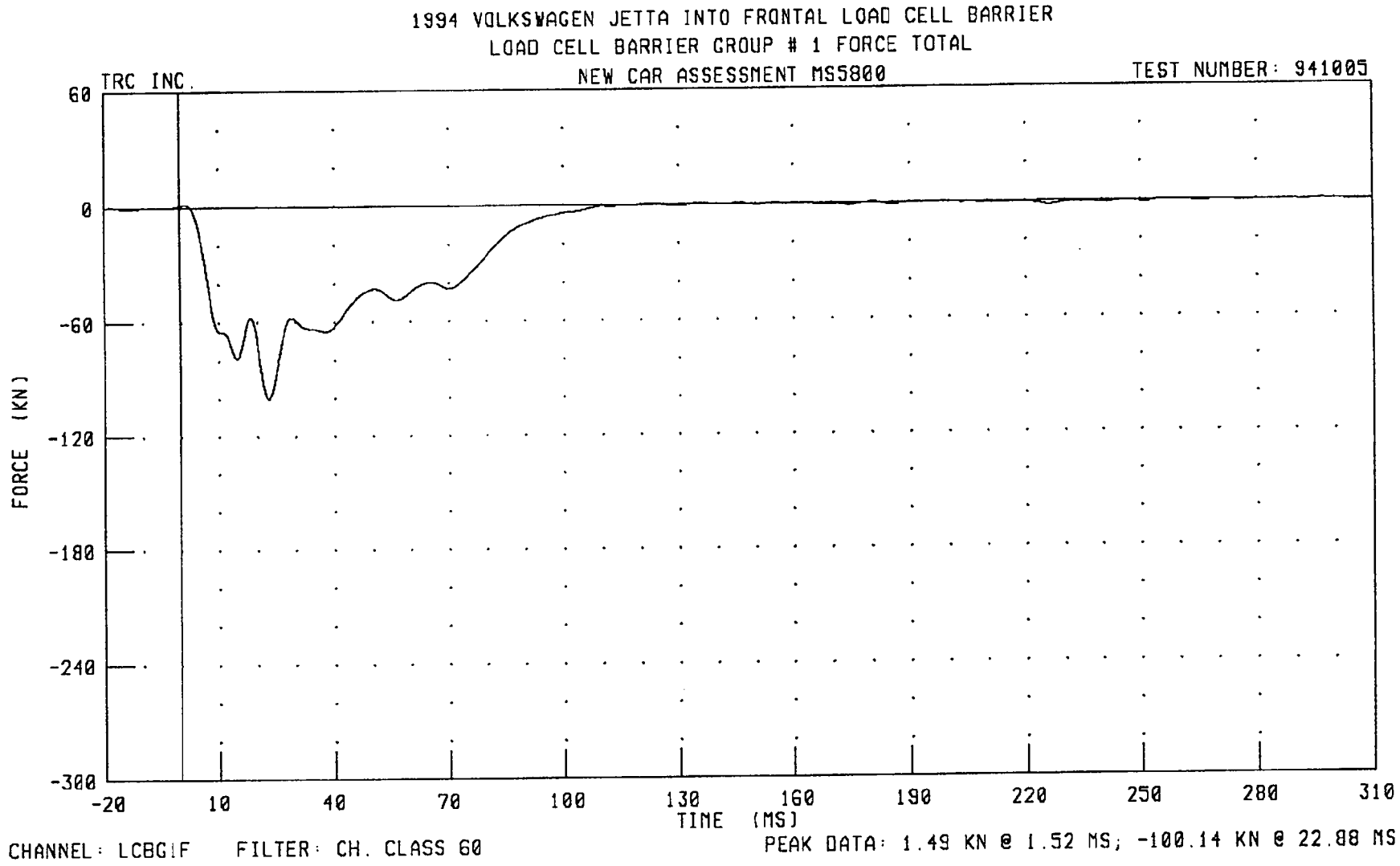
PEAK DATA: 0.73 KN @ 37.68 MS; -1.30 KN @ 33.12 MS

B-91

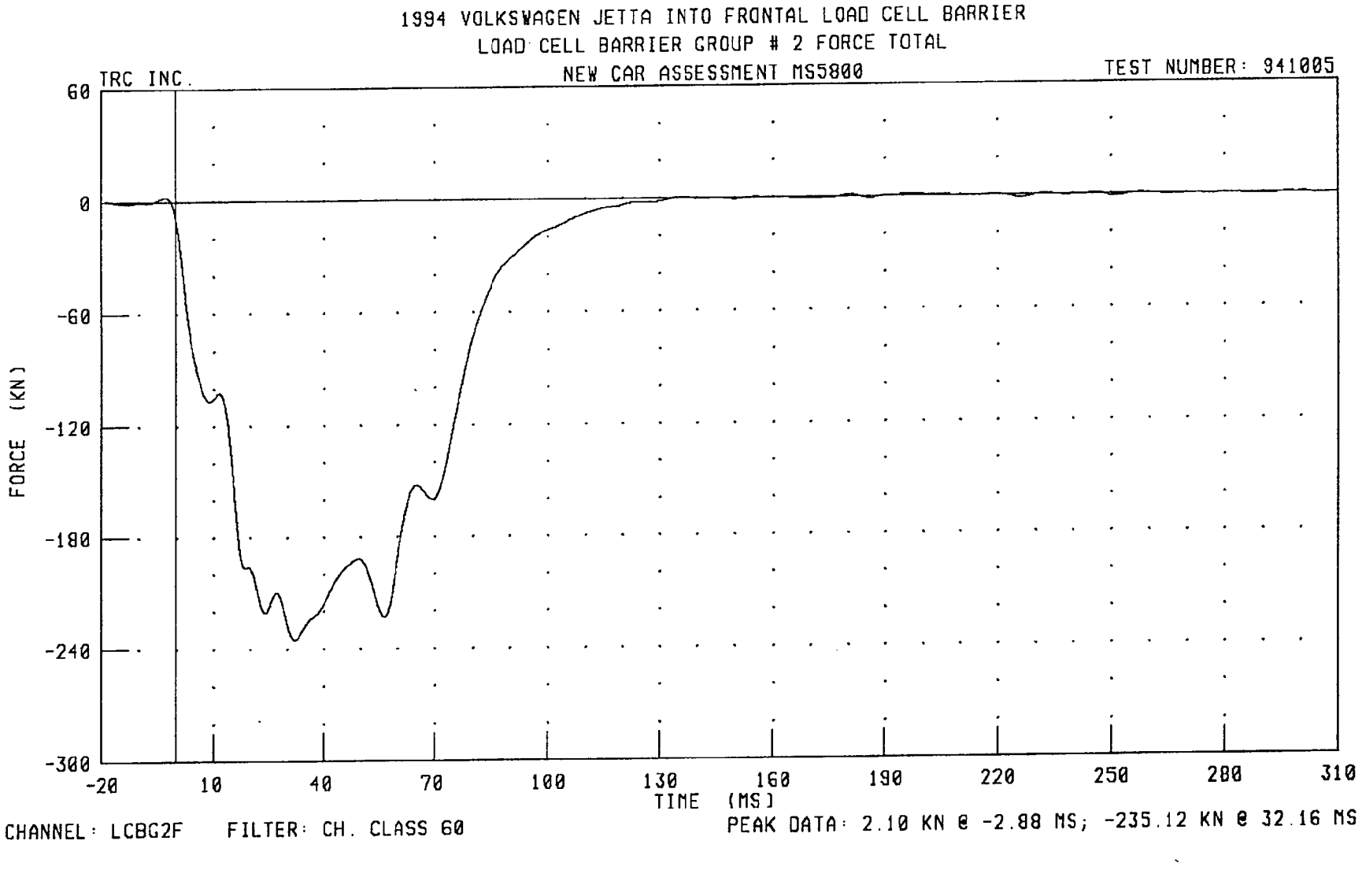
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION 09 FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
30
0
-30
-60
-90
-120
-150
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BD9F
FILTER: CH. CLASS 60
PEAK DATA: 1.41 KN @ 37.12 MS; -1.18 KN @ 33.04 MS

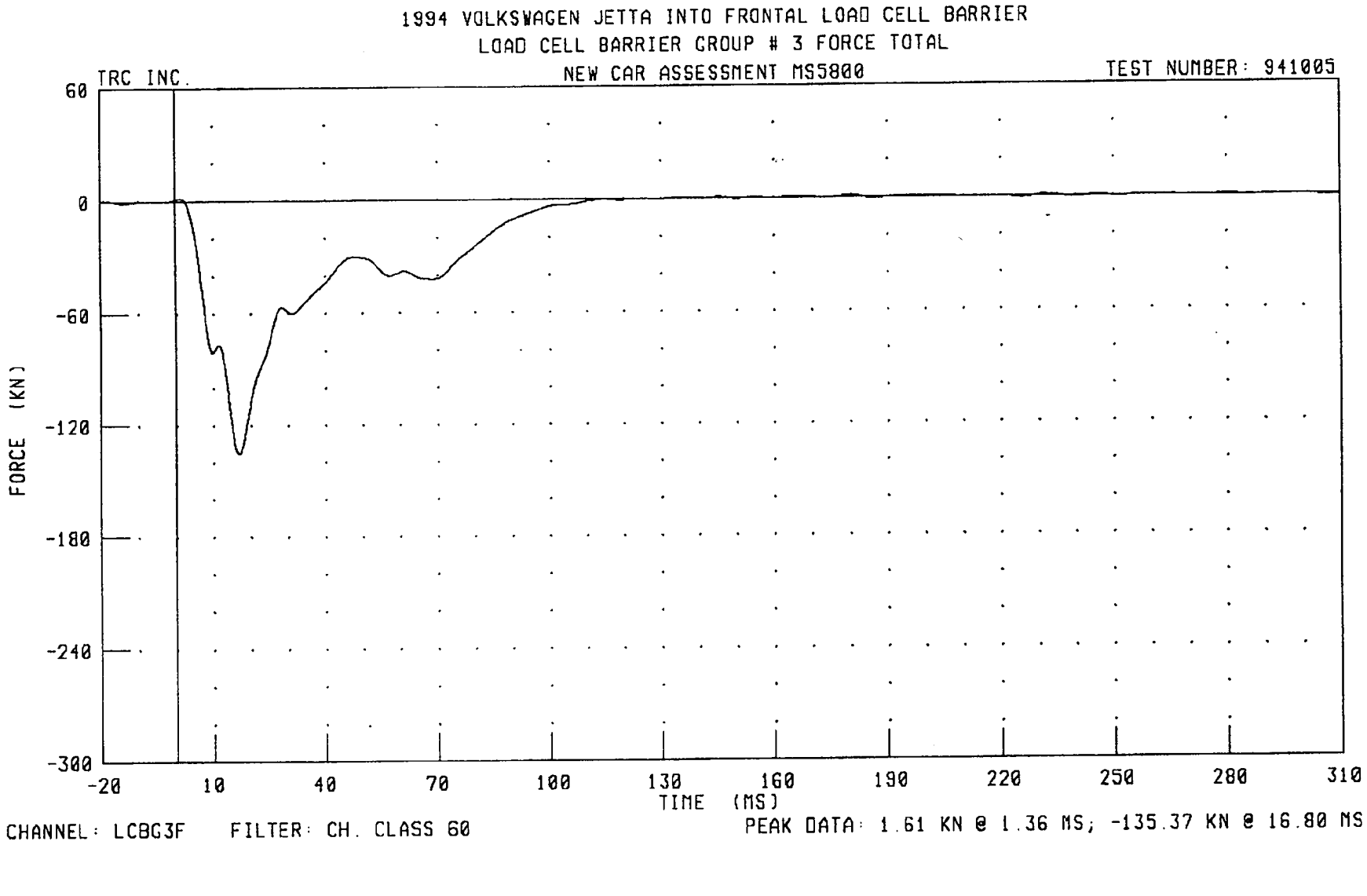
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 1.49 KN @ 1.52 MS; -100.14 KN @ 22.88 MS

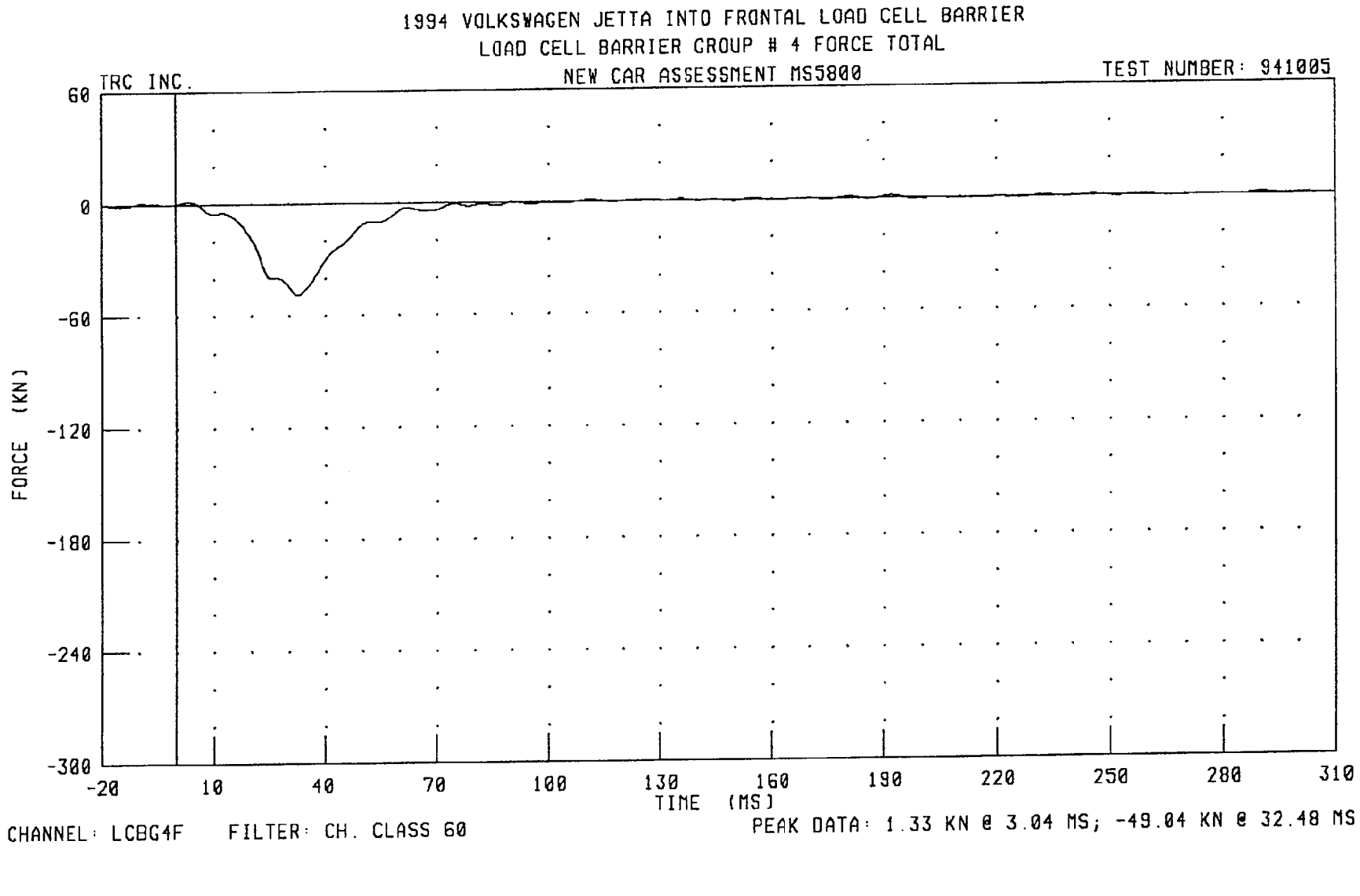
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 2.10 KN @ -2.88 MS; -235.12 KN @ 32.16 MS

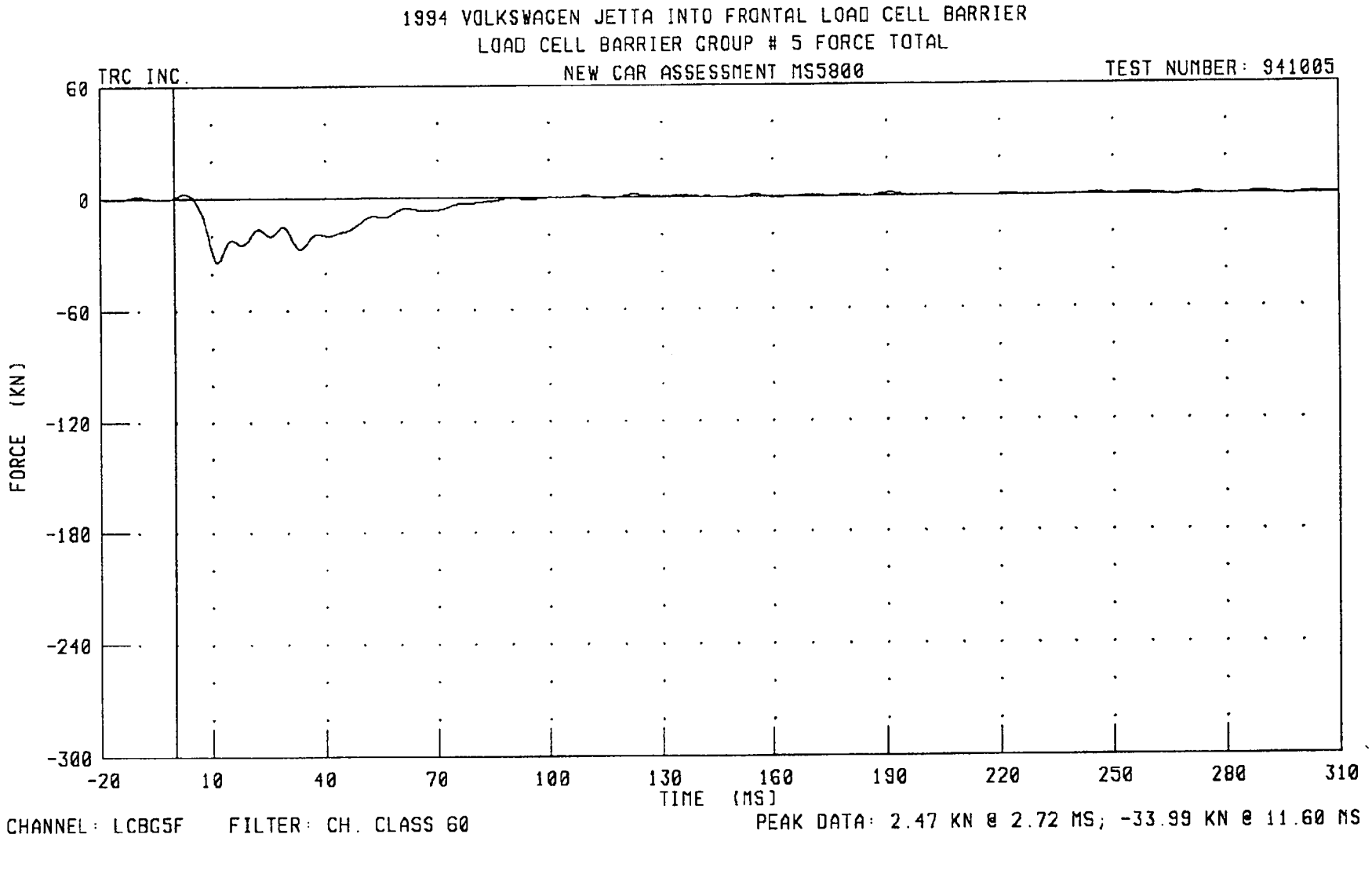
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 1.61 KN @ 1.36 MS; -135.37 KN @ 16.80 MS

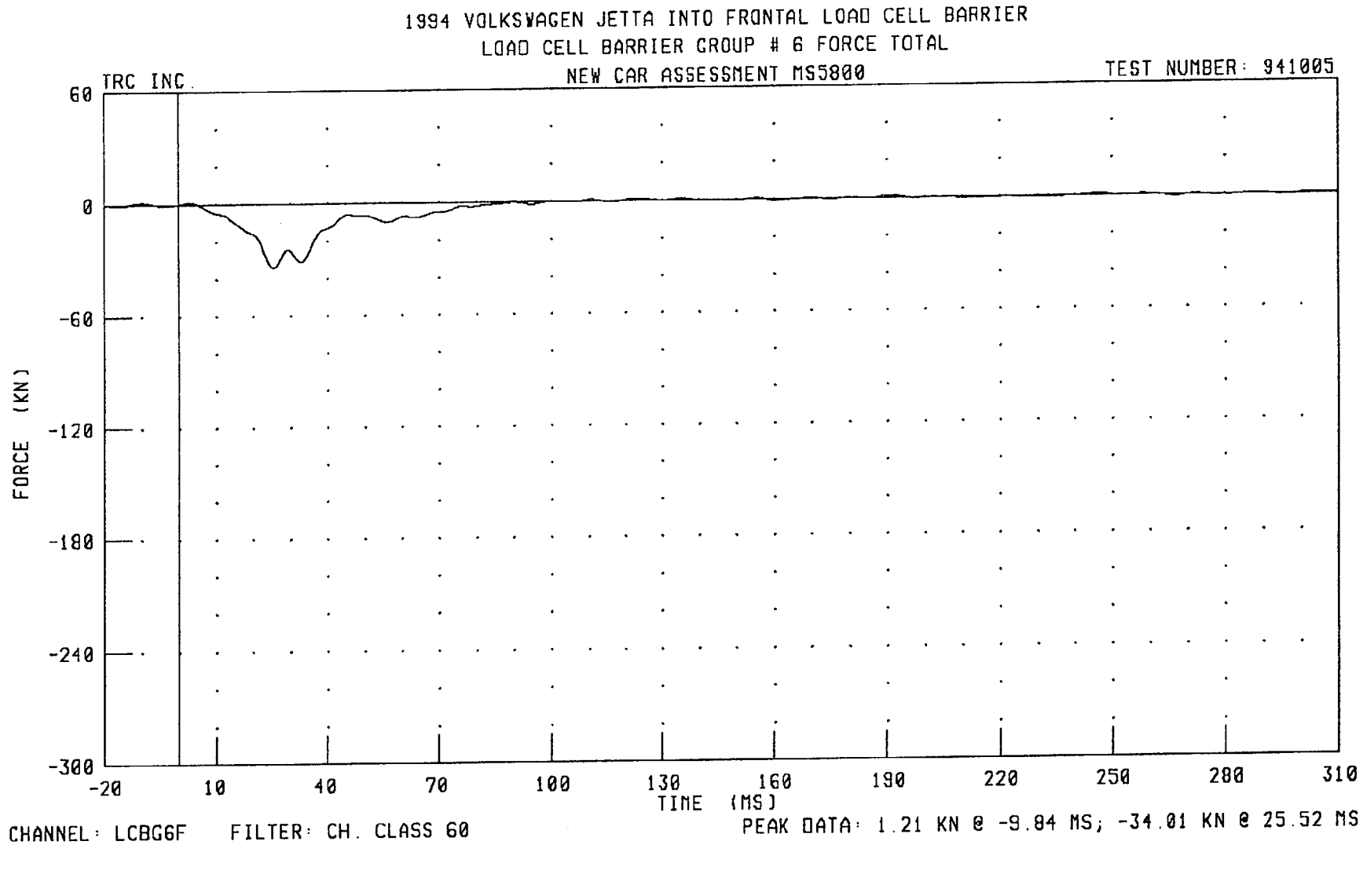
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
0
-60
-120
-180
-240
-300
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG4F
FILTER: CH. CLASS 60
PEAK DATA: 1.33 KN @ 3.04 MS; -49.04 KN @ 32.48 MS

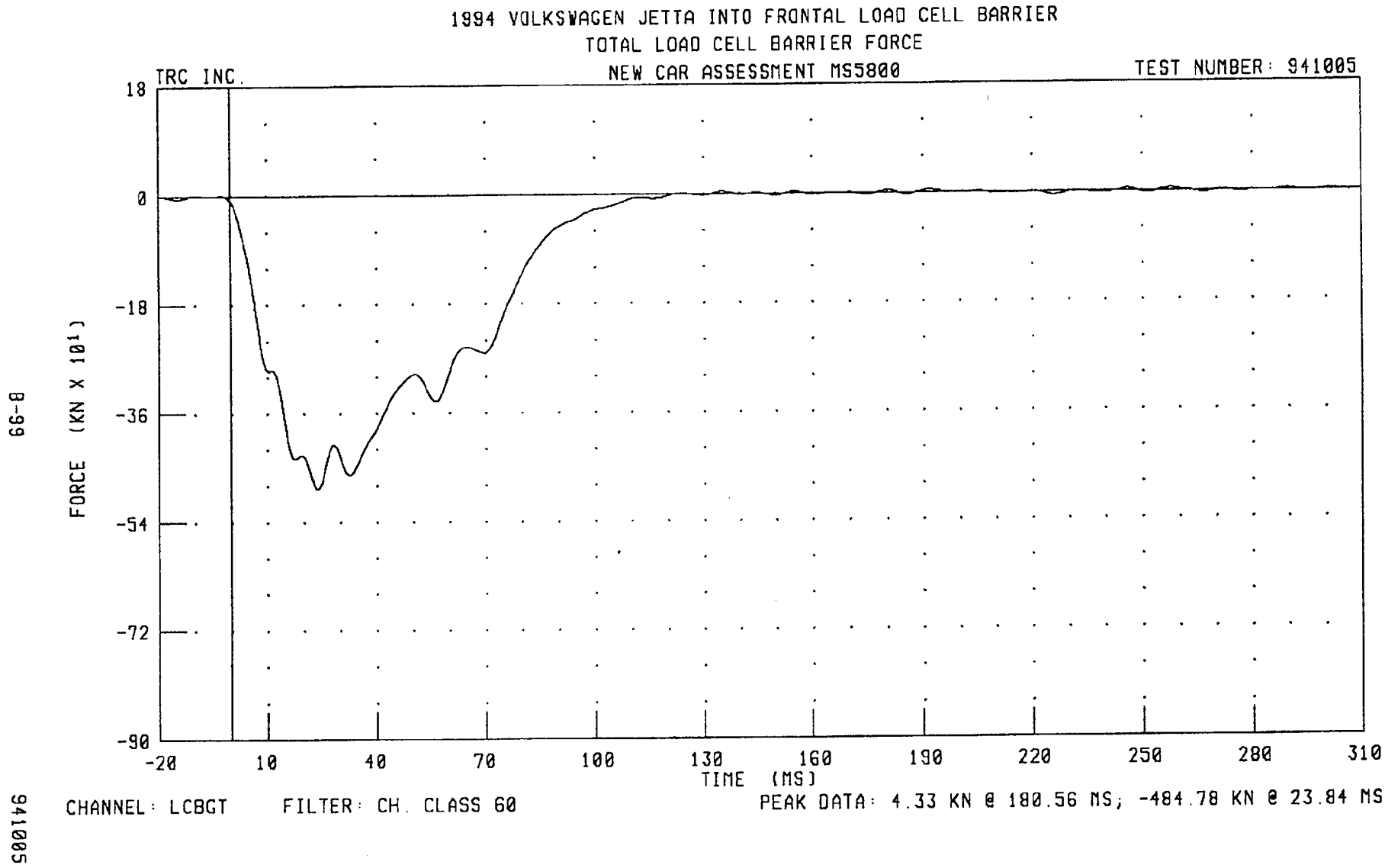
941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 2.47 KN @ 2.72 MS; -33.99 KN @ 11.60 MS

941005

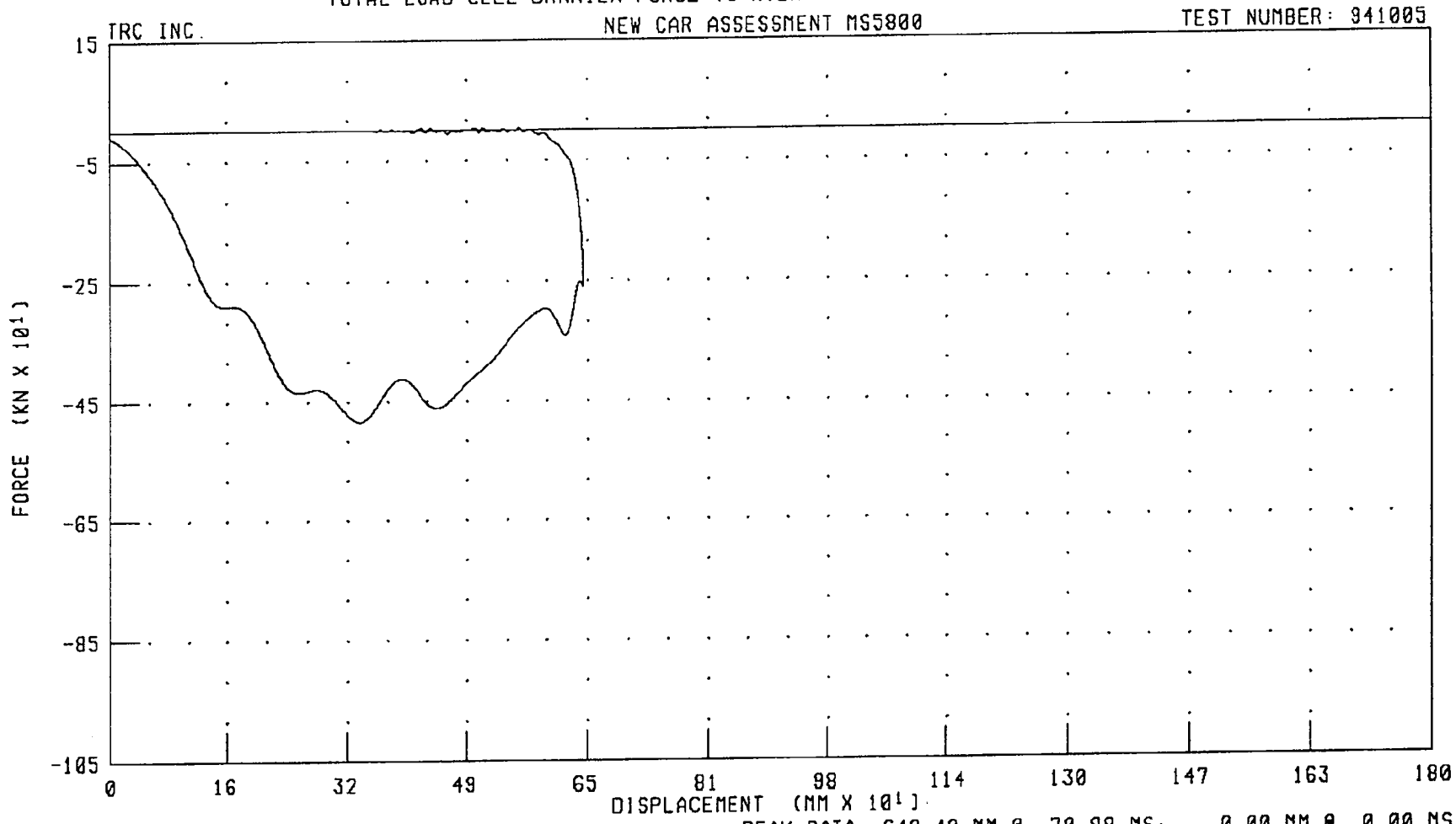

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
60
0
-60
-120
-180
-240
-300
FORCE (KN)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: LCBG6F
FILTER: CH. CLASS 60
PEAK DATA: 1.21 KN @ -9.84 MS; -34.01 KN @ 25.52 MS

941005


1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE
NEW CAR ASSESSMENT MS5800
TRC INC.
TEST NUMBER: 941005
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: 4.33 KN @ 180.56 MS; -484.78 KN @ 23.84 MS

941005

1994 VOLKSWAGEN JETTA INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT



001-B

CHANNEL: DTHXD
LCBGT

FILTER: CH. CLASS 180
CH. CLASS 60

PEAK DATA: 649.49 MM @ 70.88 MS; 0.00 MM @ 0.00 MS
4.33 KN @ 180.56 MS; -484.78 KN @ 23.84 MS

941005

Appendix C

Dummy Certification Data

Pre-test Certification Data

Driver Dummy S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
142 HUMANOID

TRC INC. TEST NO: 142C23ED1 572E SN142 EXT.DIMENSION CAL23 08-SEP-94

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	986. MM
WAIST CIRCUMFERENCE (Z)	836 - 866 MM	848. MM
CHEST DEPTH (O)	213 - 229 MM	221. 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	879. MM
THIGH CLEARANCE (F)	140 - 155 MM	145. MM
BUTTOCK KNEE LENGTH (K)	579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH (N)	452 - 478 MM	470. MM
POPLITEAL HEIGHT (L)	429 - 455 MM	445. MM
KNEE PIVOT HEIGHT (M)	485 - 500 MM	488. 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	91. MM
SHOULDER BREADTH (V)	422 - 437 MM	429. MM
SHOULDER PIVOT HEIGHT (B)	506 - 521 MM	508. MM
ELBOW REST HEIGHT (J)	191 - 211 MM	203. MM
SHOULDER-ELBOW LENGTH (I)	330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT (G)	290 - 305 MM	292. MM

DUMMY MEETS SPECIFICATIONS
TECHNICIAN Pete Eck

RUN NUMBER: 090994.1059

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

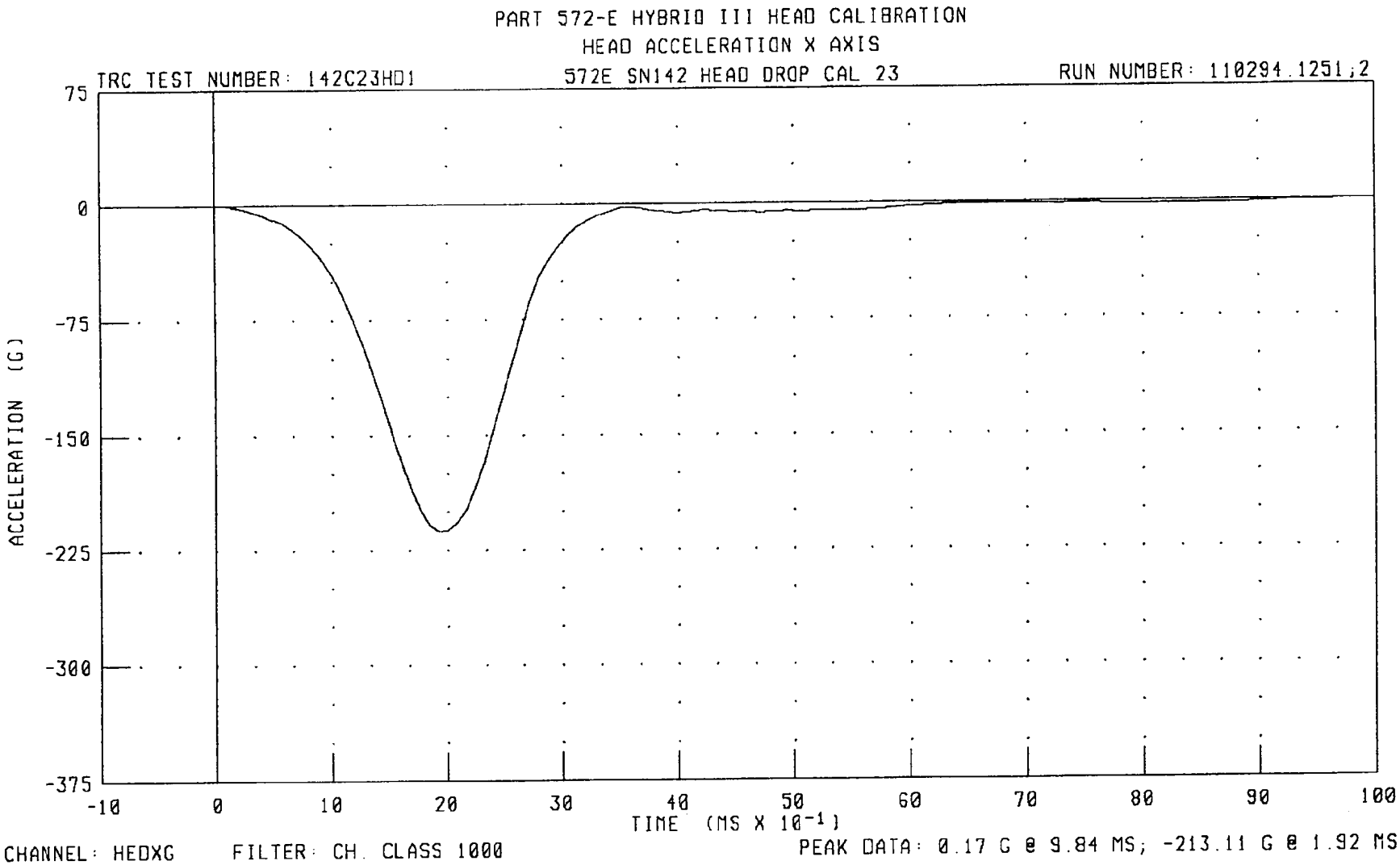
HYBRID III 08-SEP-94

TRC INC. TEST NO: 142C23HD1 572E SN142 HEAD DROP CAL 23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	244.94 G
PEAK LATERAL ACCELERATION	15 G MAX	-2.58 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

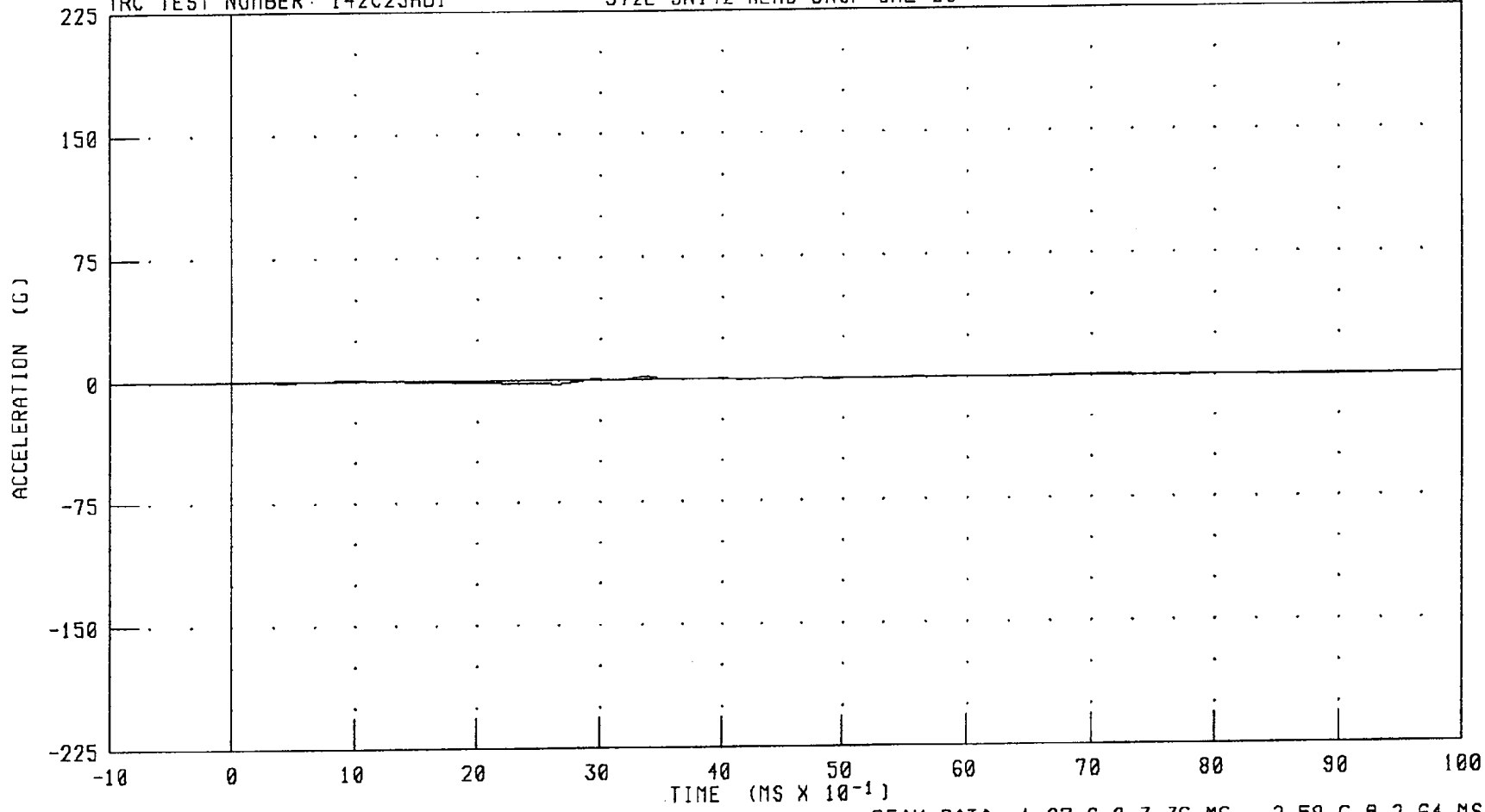
TEST MEETS SPECIFICATIONS

TECHNICIAN Peter Foster RUN NUMBER: 090894.1443;2


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS
TRC TEST NUMBER: 142C23HD1
572E SN142 HEAD DROP CAL 23
RUN NUMBER: 110294.1251;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: 0.17 G @ 9.84 MS; -213.11 G @ 1.92 MS

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

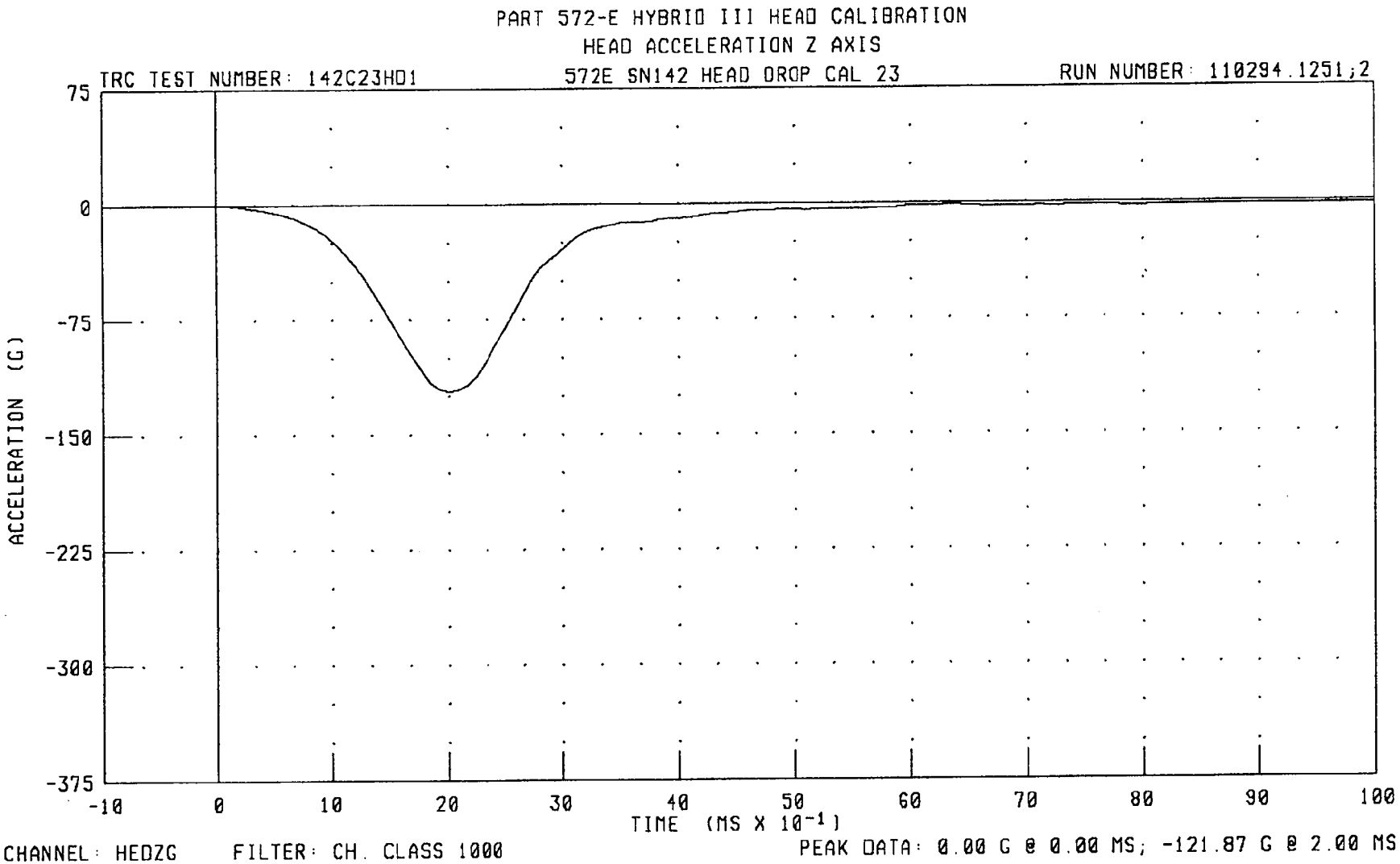
TRC TEST NUMBER: 142C23HD1 572E SN142 HEAD DROP CAL 23 RUN NUMBER: 110294.1251;2

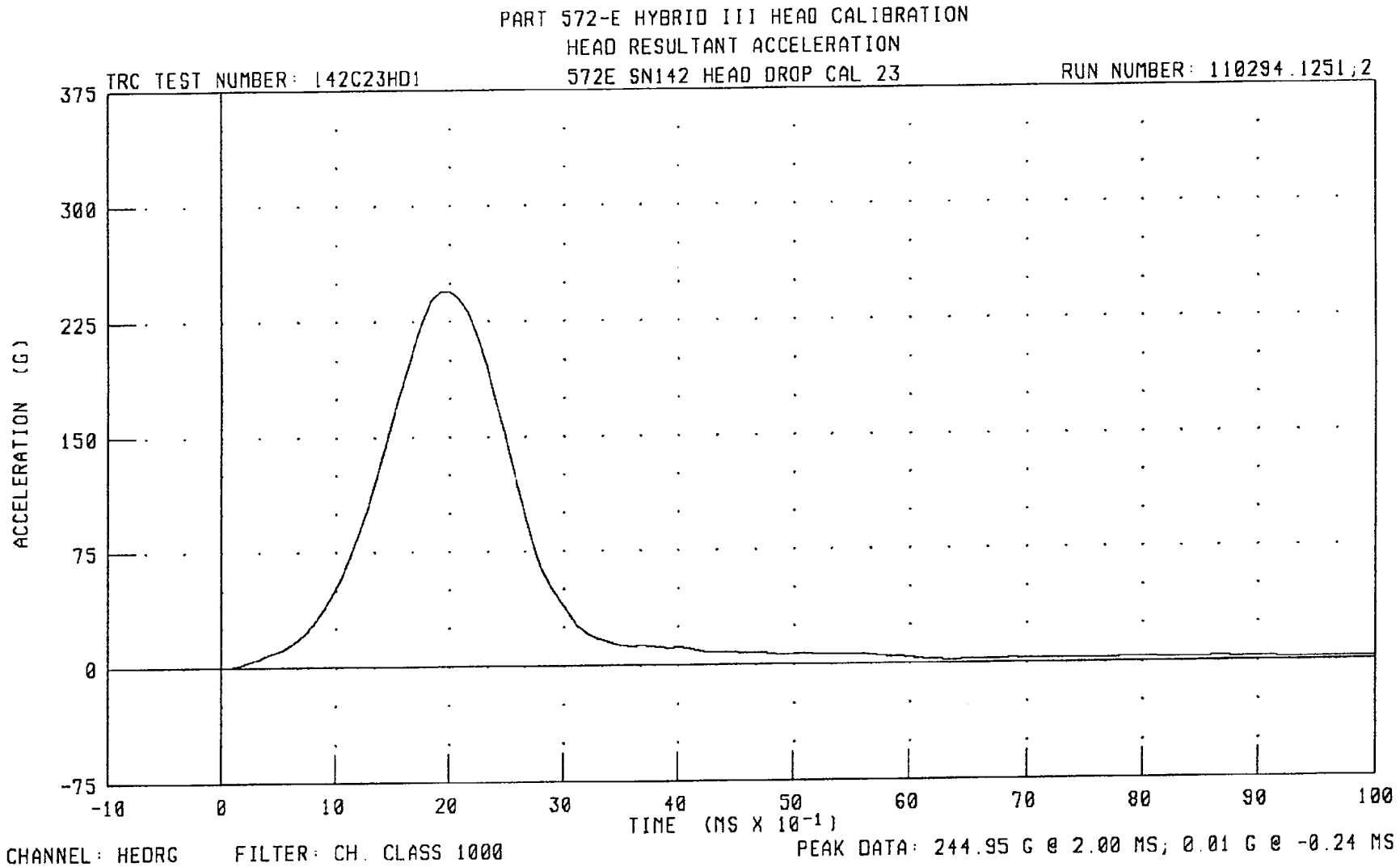


CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 1.97 G @ 3.36 MS; -2.59 G @ 2.64 MS

C-6

941005


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 142C23HD1
572E SN142 HEAD DROP CAL 23
RUN NUMBER: 110294.1251;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: 0.00 G @ 0.00 MS; -121.87 G @ 2.00 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
TRC TEST NUMBER: 142C23HD1
572E SN142 HEAD DROP CAL 23
RUN NUMBER: 110294.1251;2
375
300
225
150
75
0
-75
ACCELERATION (G)
-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: 244.95 G @ 2.00 MS; 0.01 G @ -0.24 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

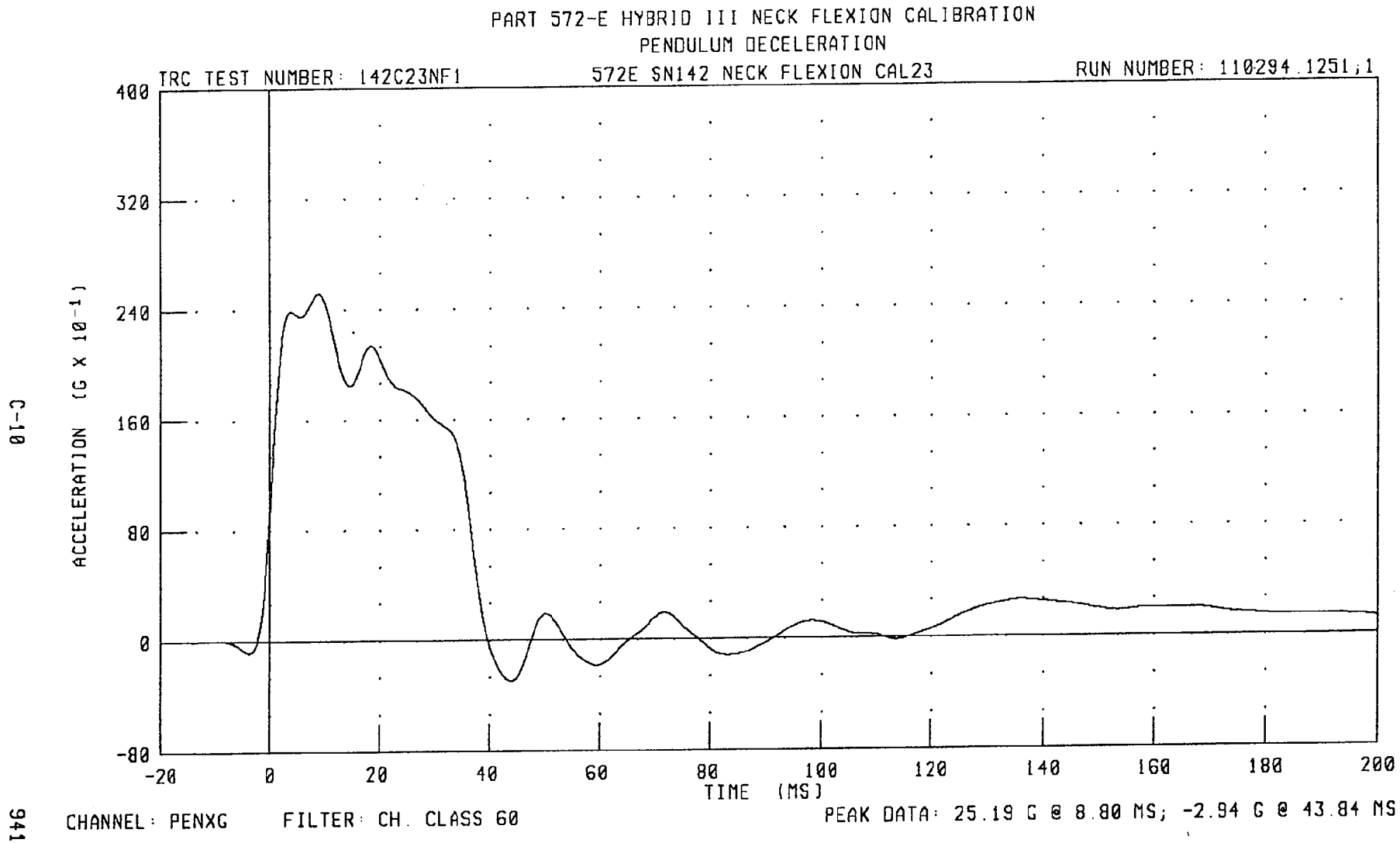
HYBRID III 08-SEP-94

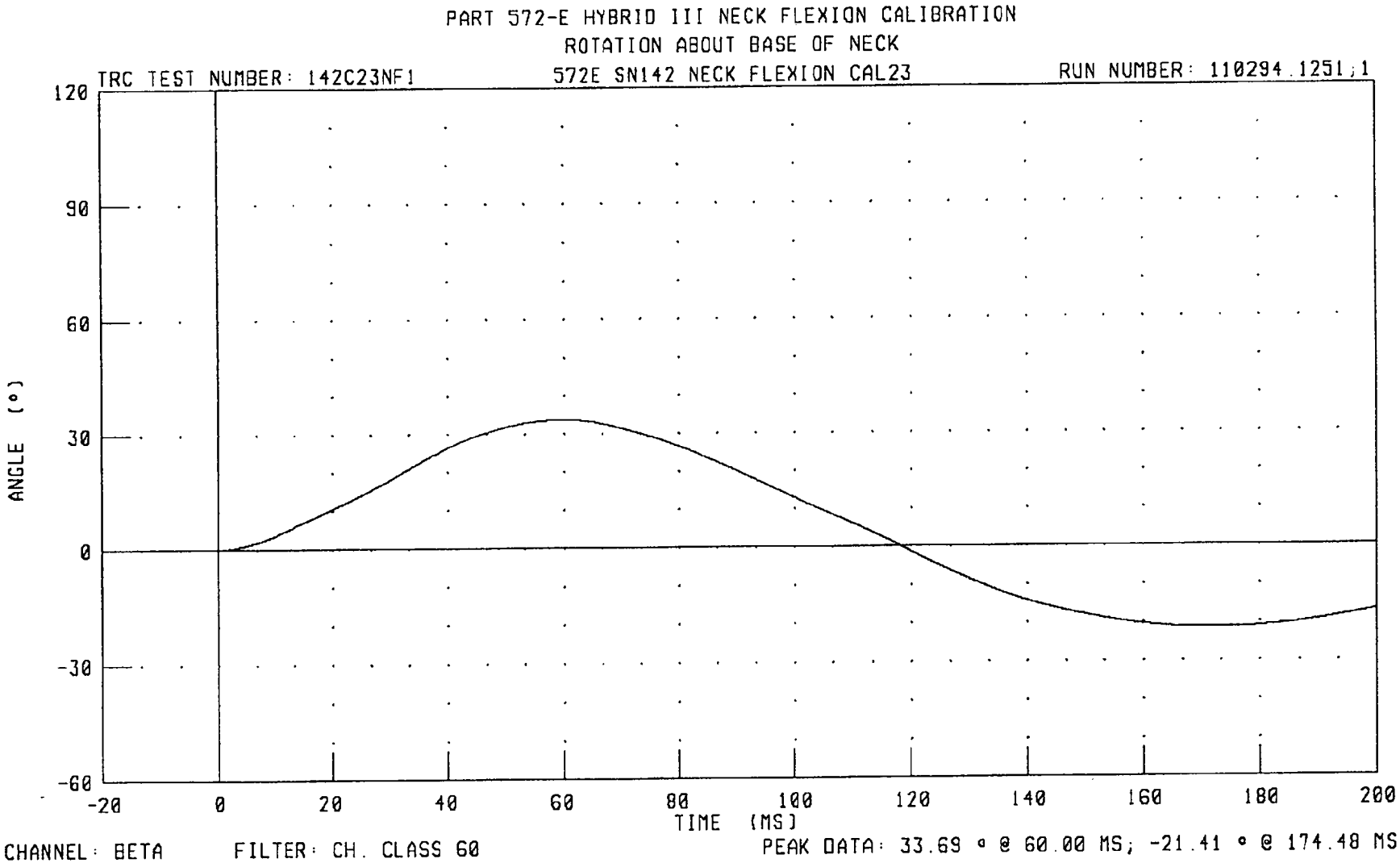
TRC INC. TEST NO: 142C23NF1 572E SN142 NECK FLEXION CAL23

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.01 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	24.40 G
	20 MS	17.60 - 22.60 G	20.41 G
	30 MS	12.50 - 18.50 G	15.95 G
MAX PENDULUM G		29 G MAX	25.19 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.93 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.44 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	72.10 DEG.
	TIME	57 - 64 MS	59.68 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	91.84 NM
	TIME	47 - 58 MS	50.96 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.96 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.20 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Peter Foust RUN NUMBER: 090994.0823;1

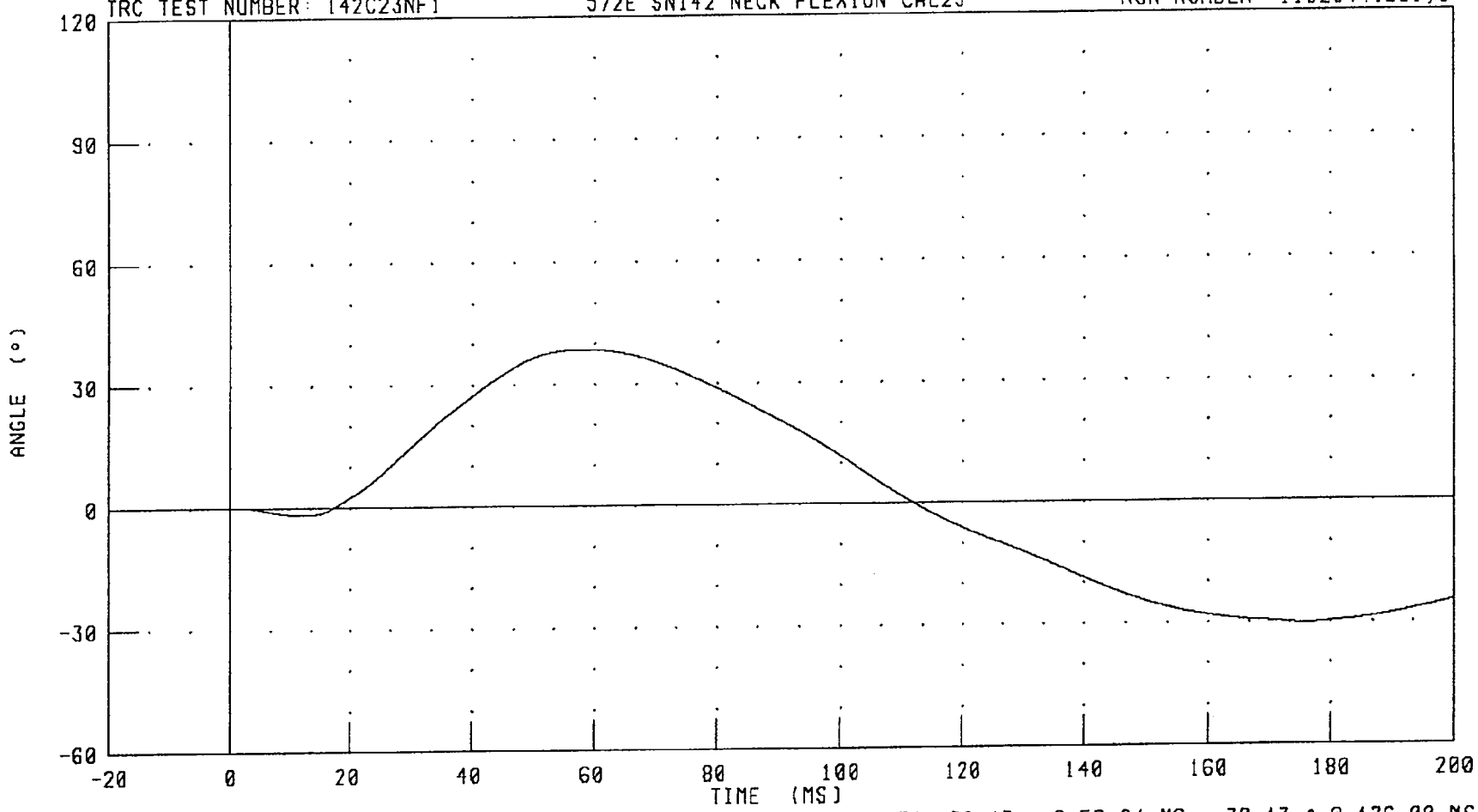

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 142C23NF1
572E SN142 NECK FLEXION CAL23
RUN NUMBER: 110294.1251;1
ACCELERATION (G X 10⁻¹)
400
320
240
160
80
0
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 60
PEAK DATA: 25.19 G @ 8.80 MS; -2.94 G @ 43.84 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 142C23NF1
572E SN142 NECK FLEXION CAL23
RUN NUMBER: 110294.1251;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: 33.69 ° @ 60.00 MS; -21.41 ° @ 174.48 MS

941005

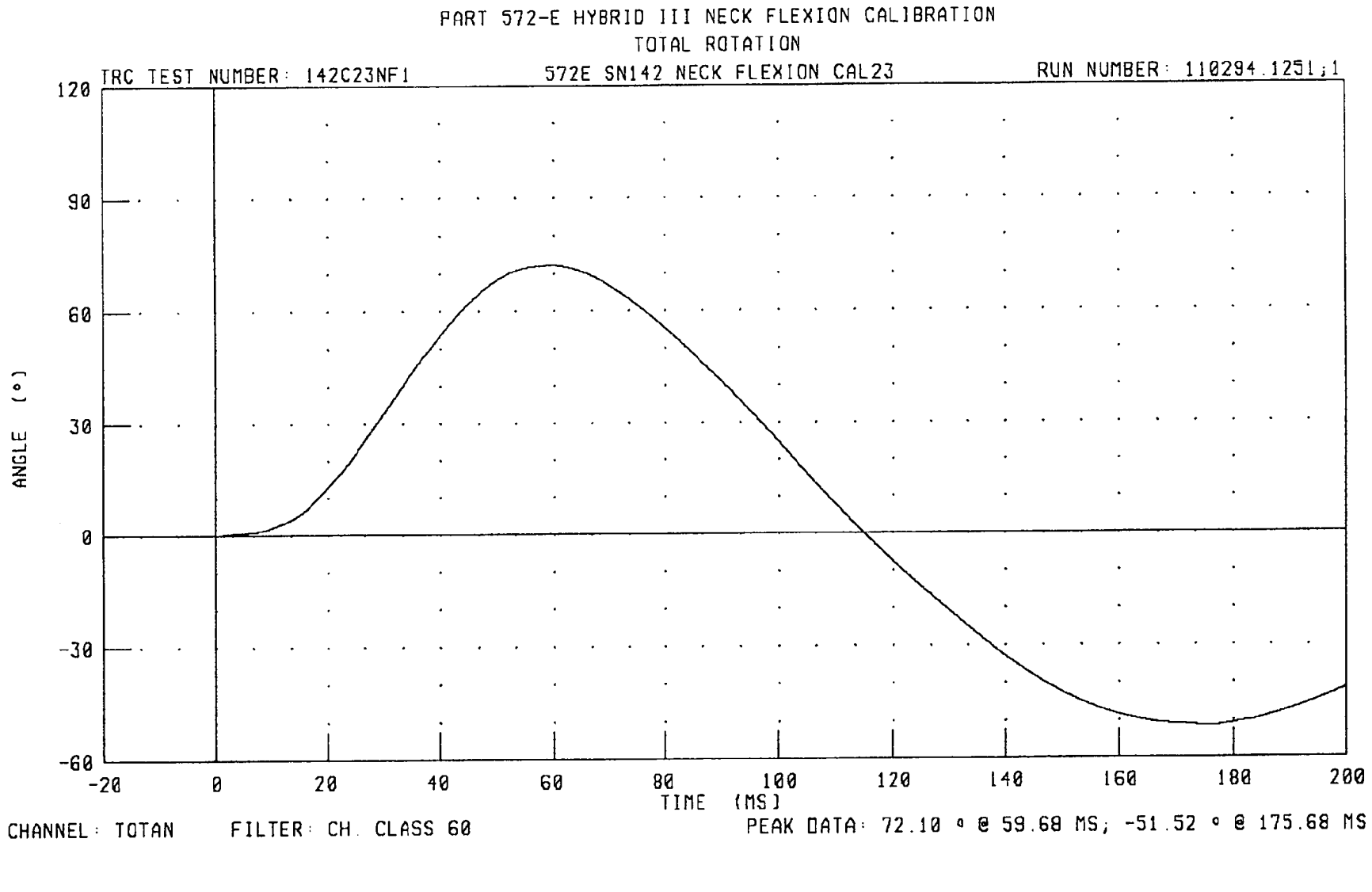
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

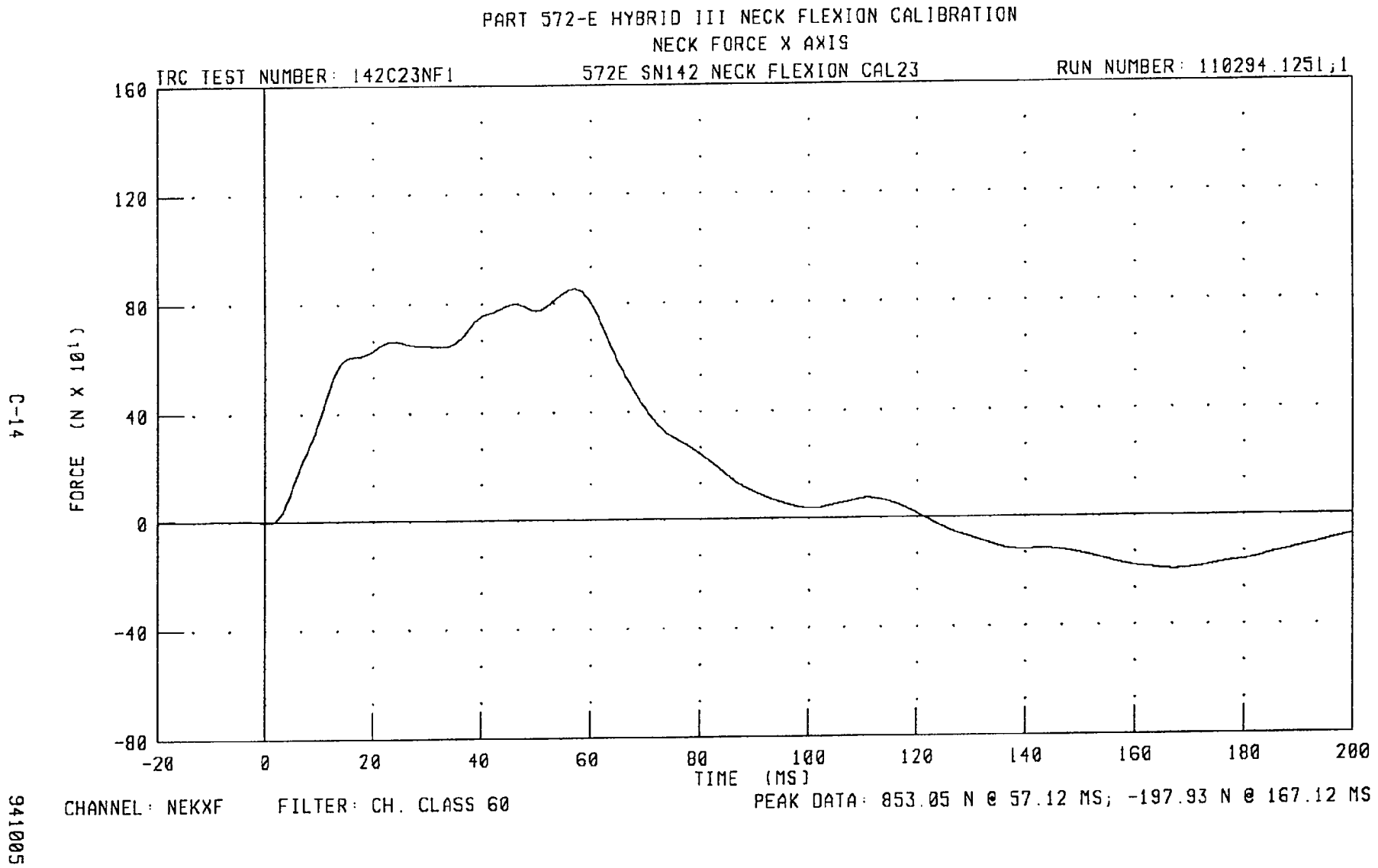
TRC TEST NUMBER: 142C23NF1 572E SN142 NECK FLEXION CAL23 RUN NUMBER: 110294.1251;1



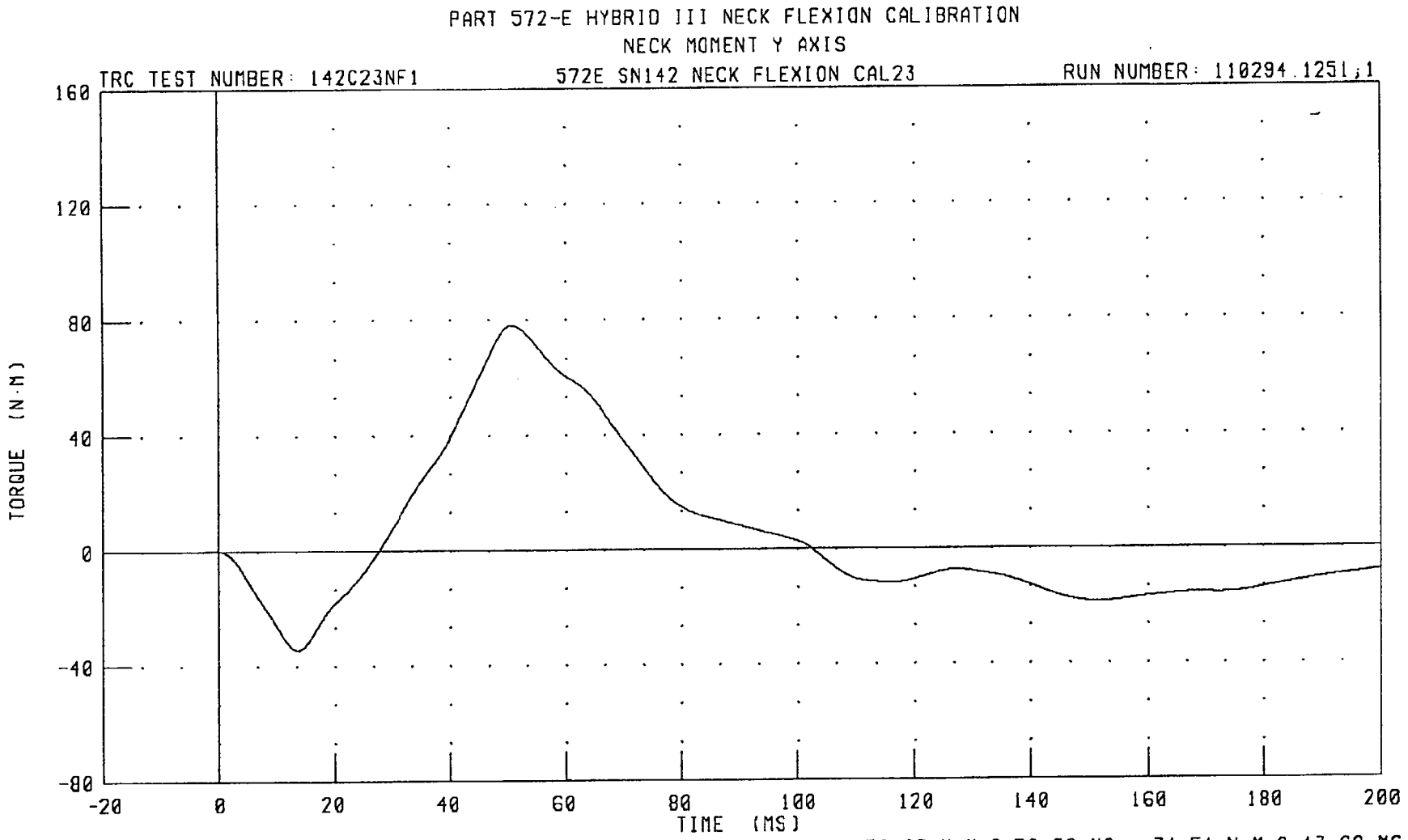
CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 38.43 ° @ 58.24 MS; -30.13 ° @ 176.00 MS

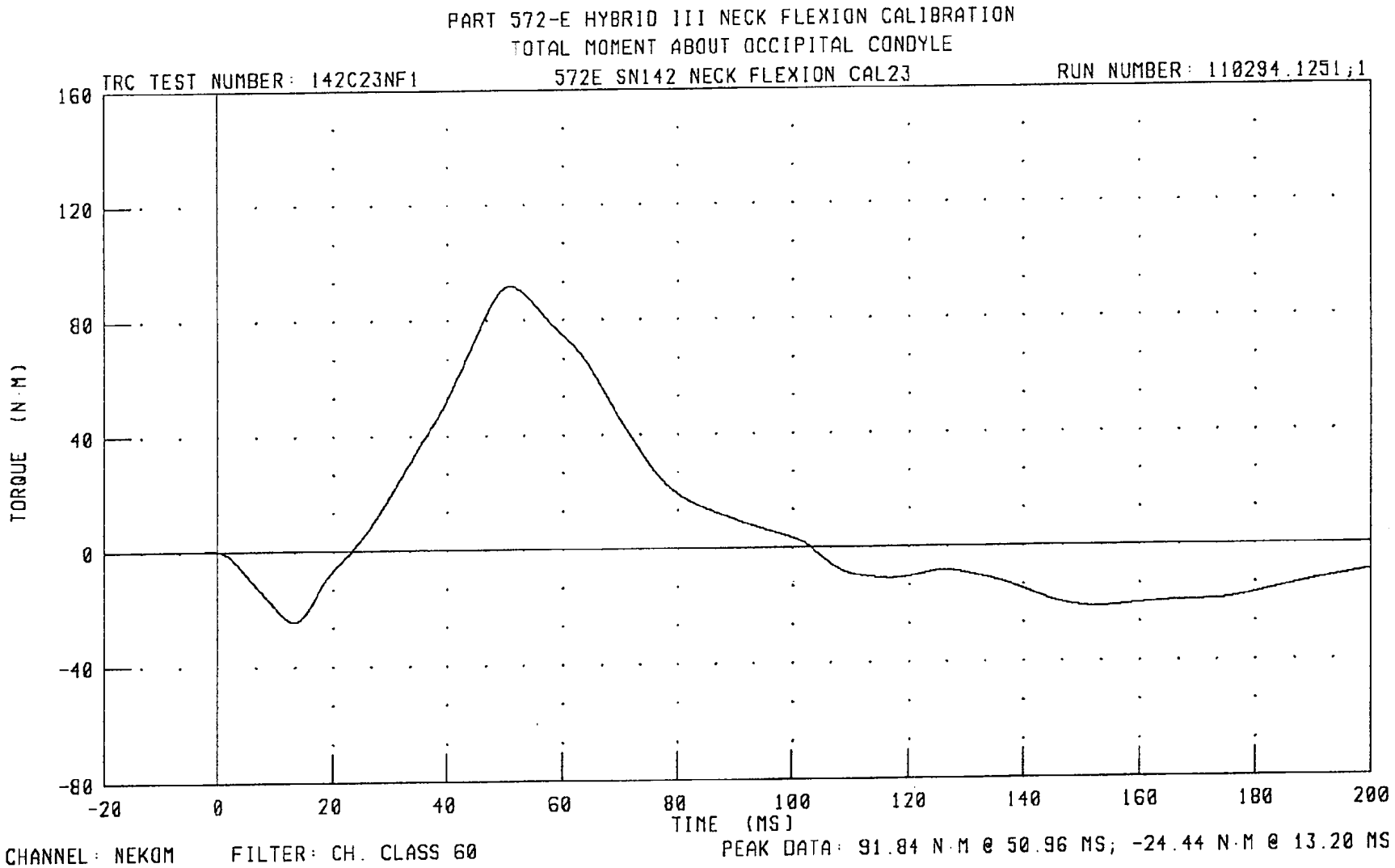
941005


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: 142C23NF1
572E SN142 NECK FLEXION CAL23
RUN NUMBER: 110294.1251;1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: TOTAN
FILTER: CH. CLASS 60
PEAK DATA: 72.10 ° @ 59.68 MS; -51.52 ° @ 175.68 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 142C23NF1
572E SN142 NECK FLEXION CAL23
RUN NUMBER: 110294.1251;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: 853.05 N @ 57.12 MS; -197.93 N @ 167.12 MS

941005


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 142C23NF1
572E SN142 NECK FLEXION CAL23
RUN NUMBER: 110294.1251;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: 78.03 N-M @ 50.80 MS; -34.51 N-M @ 13.68 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C23NF1
572E SN142 NECK FLEXION CAL23
RUN NUMBER: 110294.1251;1
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: 91.84 N-M @ 50.96 MS; -24.44 N-M @ 13.20 MS

TRANSPORTATION RESEARCH CENTER INC.

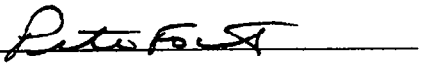
NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III 09-SEP-94

TRC INC. TEST NO: 142C23NE1 572E SN142 NECK EXT. CAL23

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.75 G
	20 MS	14.00 - 19.00 G	15.59 G
	30 MS	11.00 - 16.00 G	14.10 G
MAX PENDULUM G		22 G MAX	19.62 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.06 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.64 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	95.32 DEG.
	TIME	72 - 82 MS	74.96 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-70.49 NM
	TIME	65 - 79 MS	69.84 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	139.84 MS

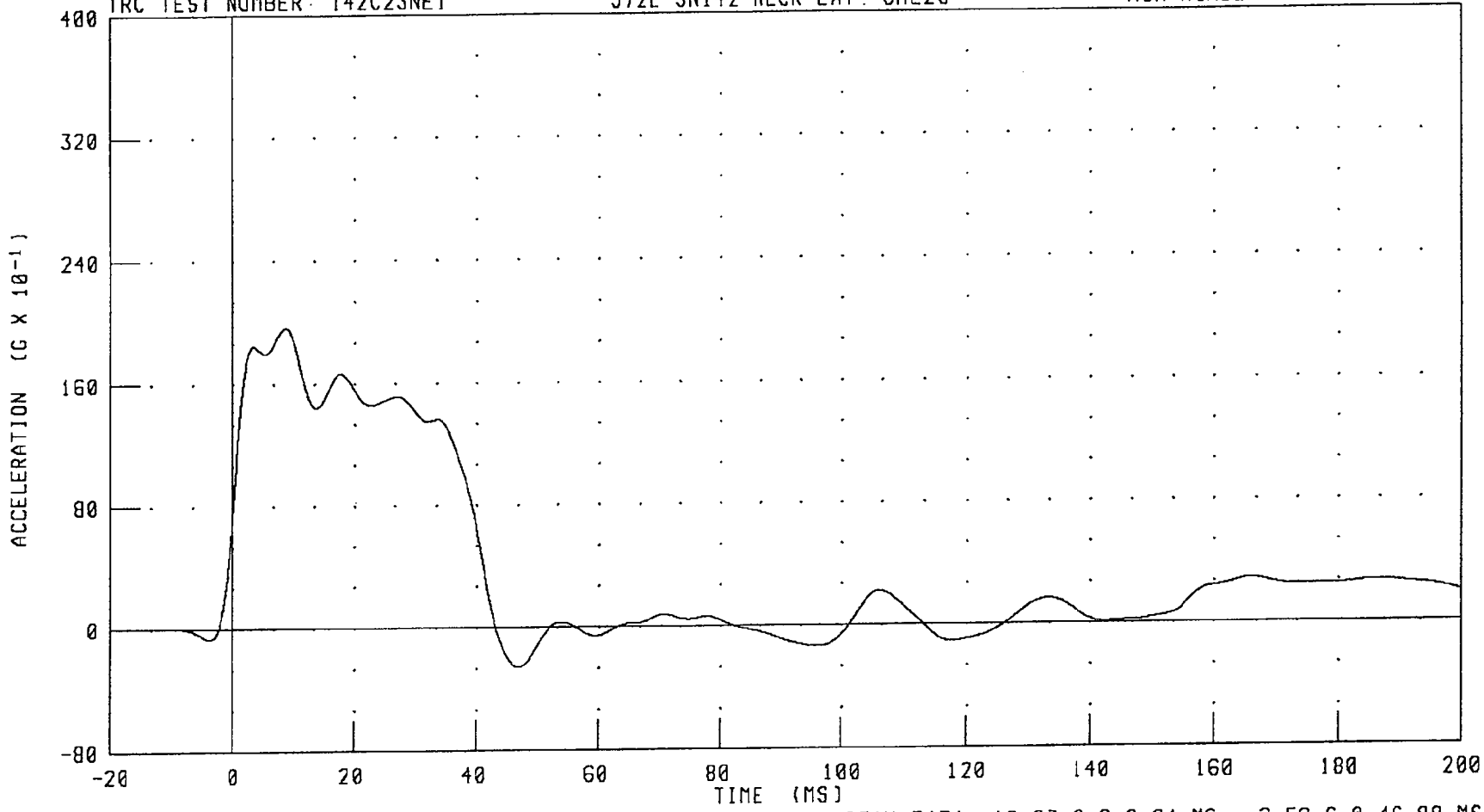
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 090994.0916;2

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C23NE1 572E SN142 NECK EXT. CAL23 RUN NUMBER: 110294.1251;2

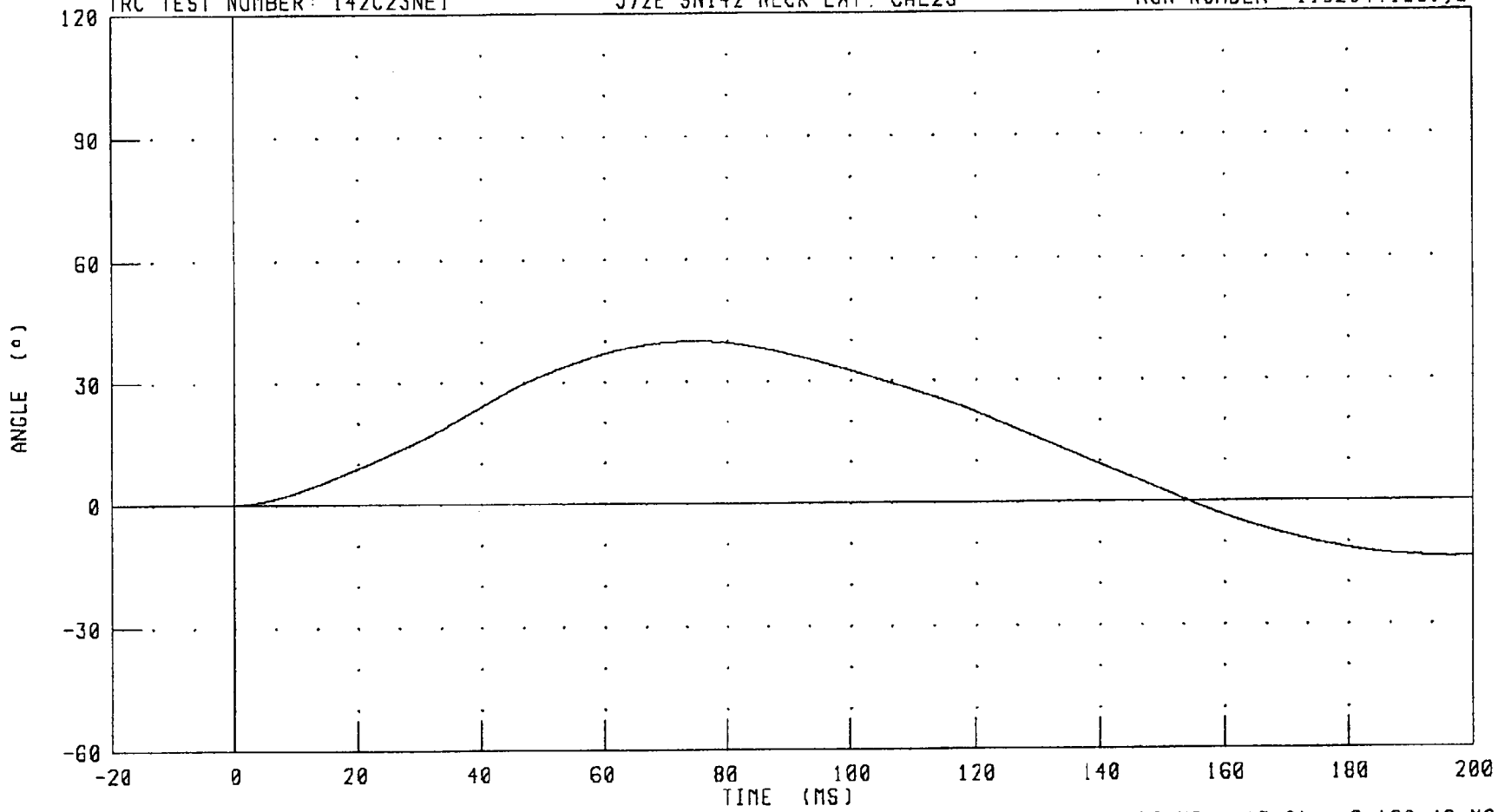


CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 19.63 G @ 8.64 MS; -2.59 G @ 46.88 MS

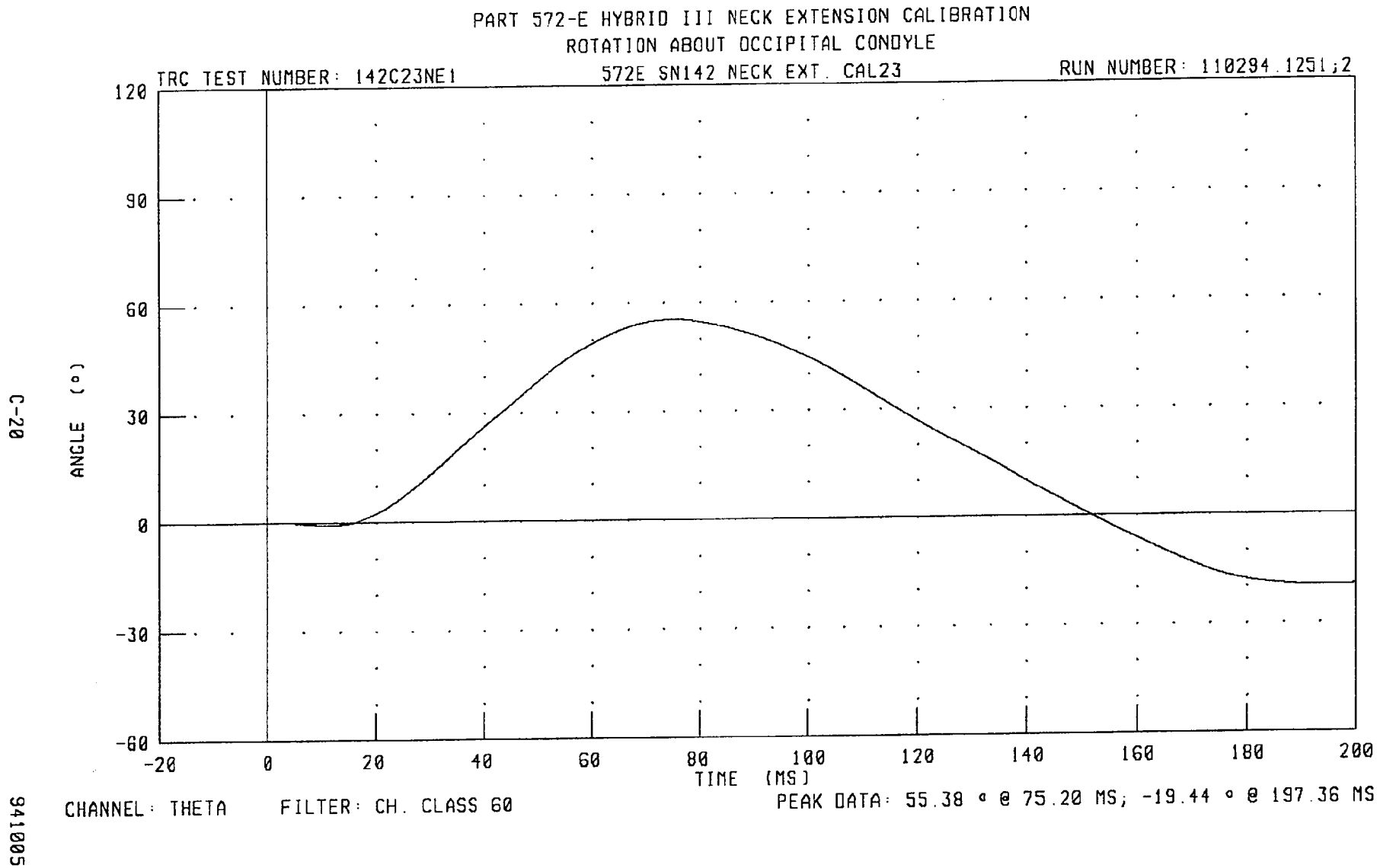
941005

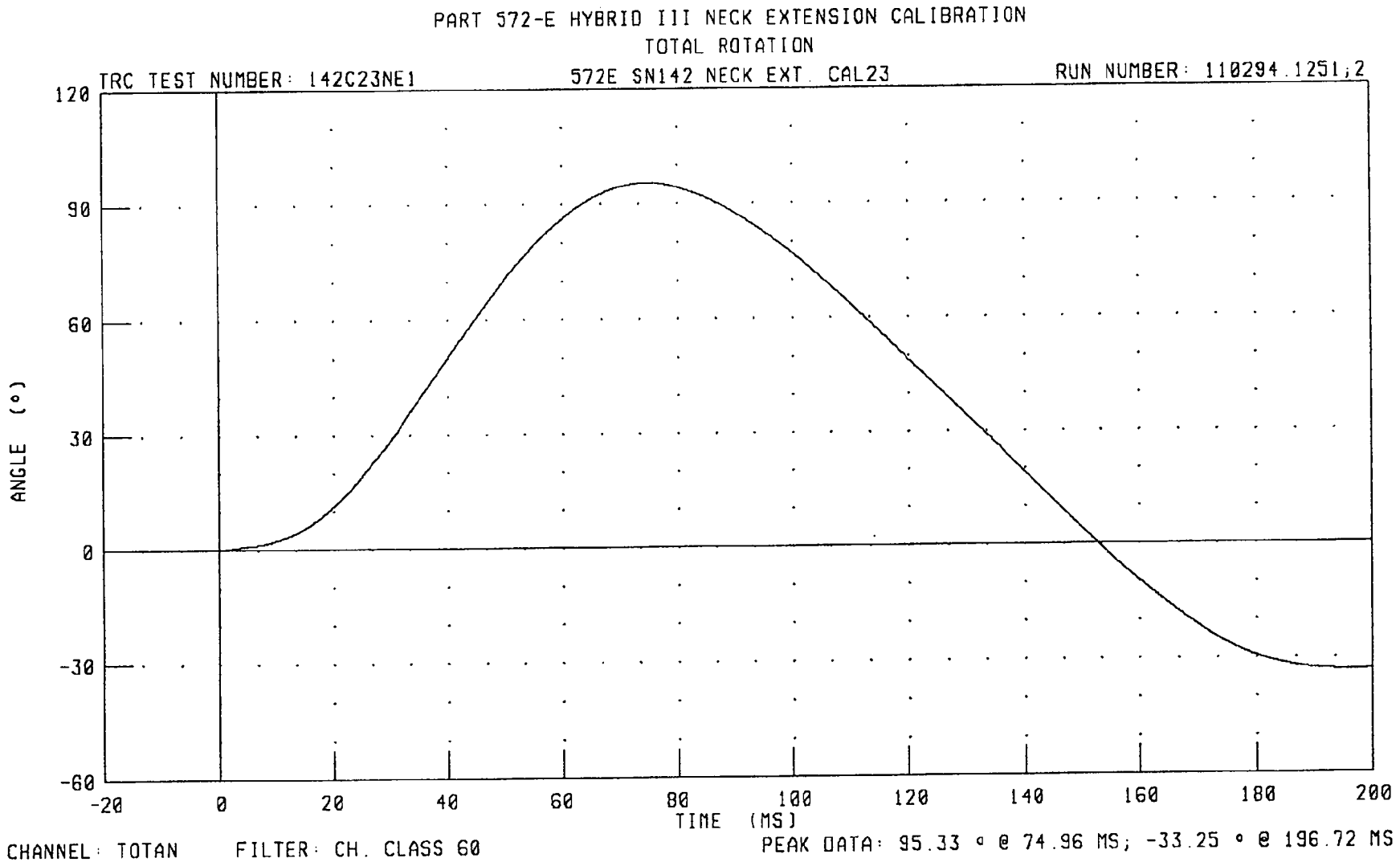
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

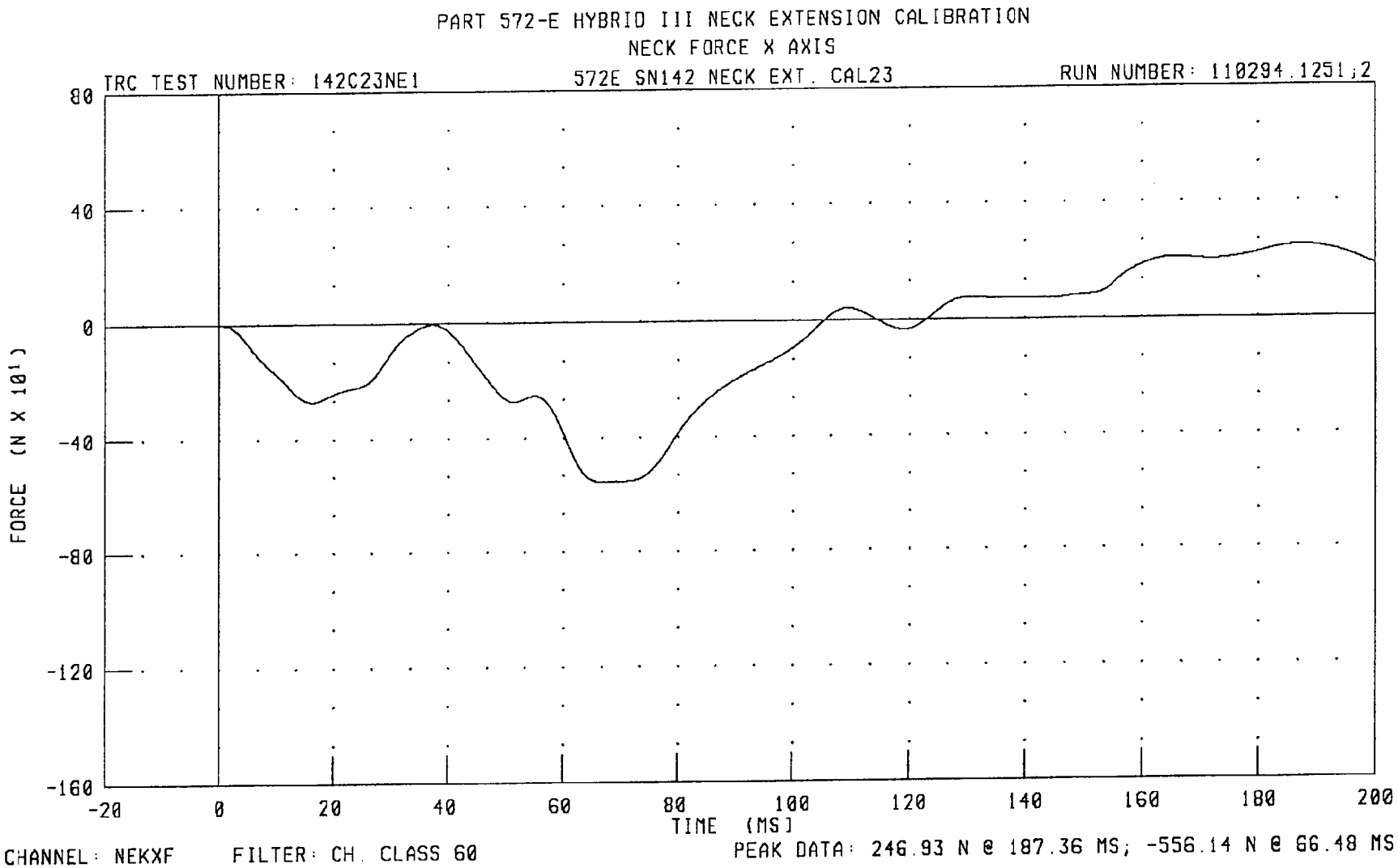
TRC TEST NUMBER: 142C23NE1 572E SN142 NECK EXT. CAL23 RUN NUMBER: 110294.1251;2



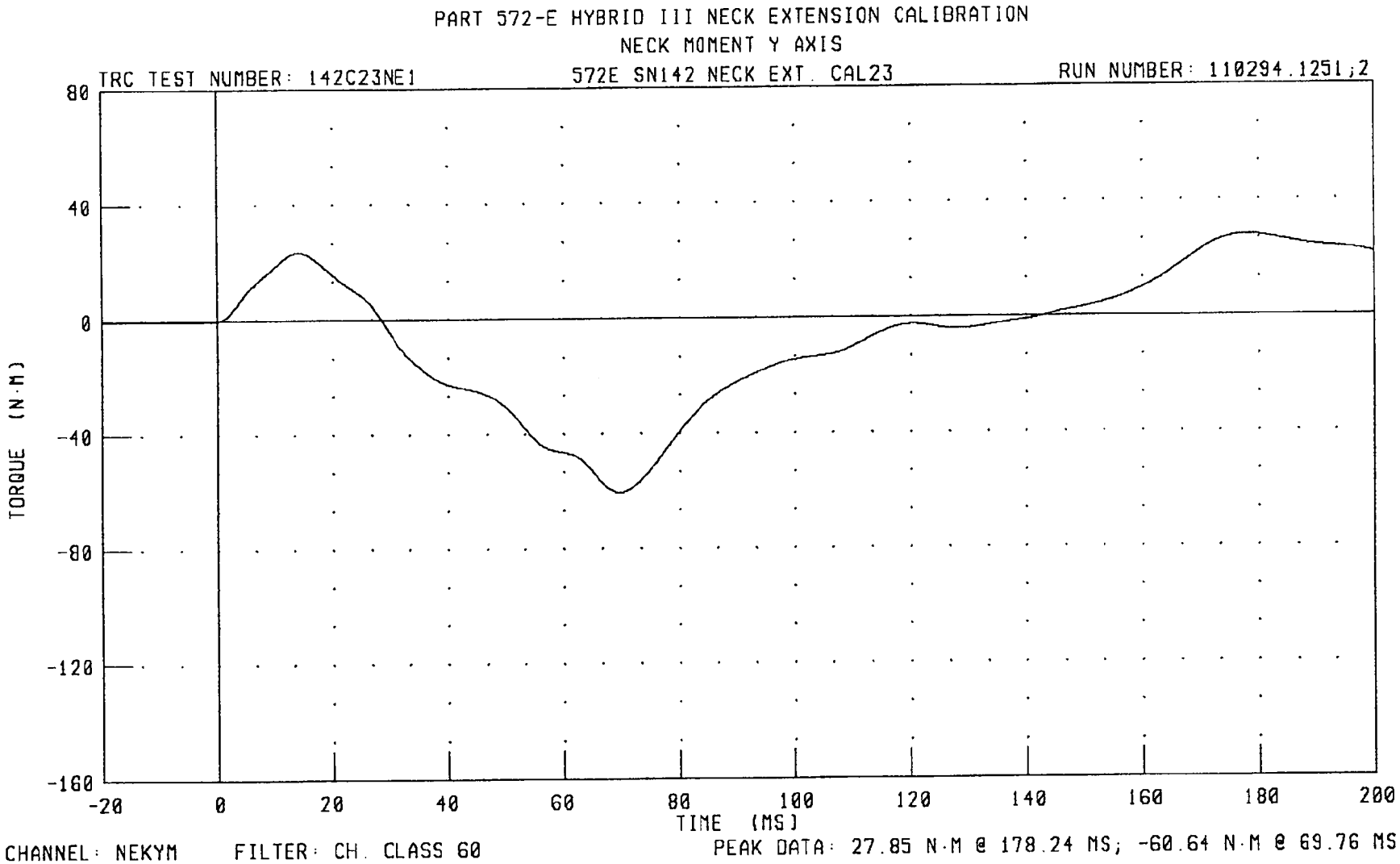
CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 39.94 ° @ 74.72 MS; -13.81 ° @ 196.48 MS

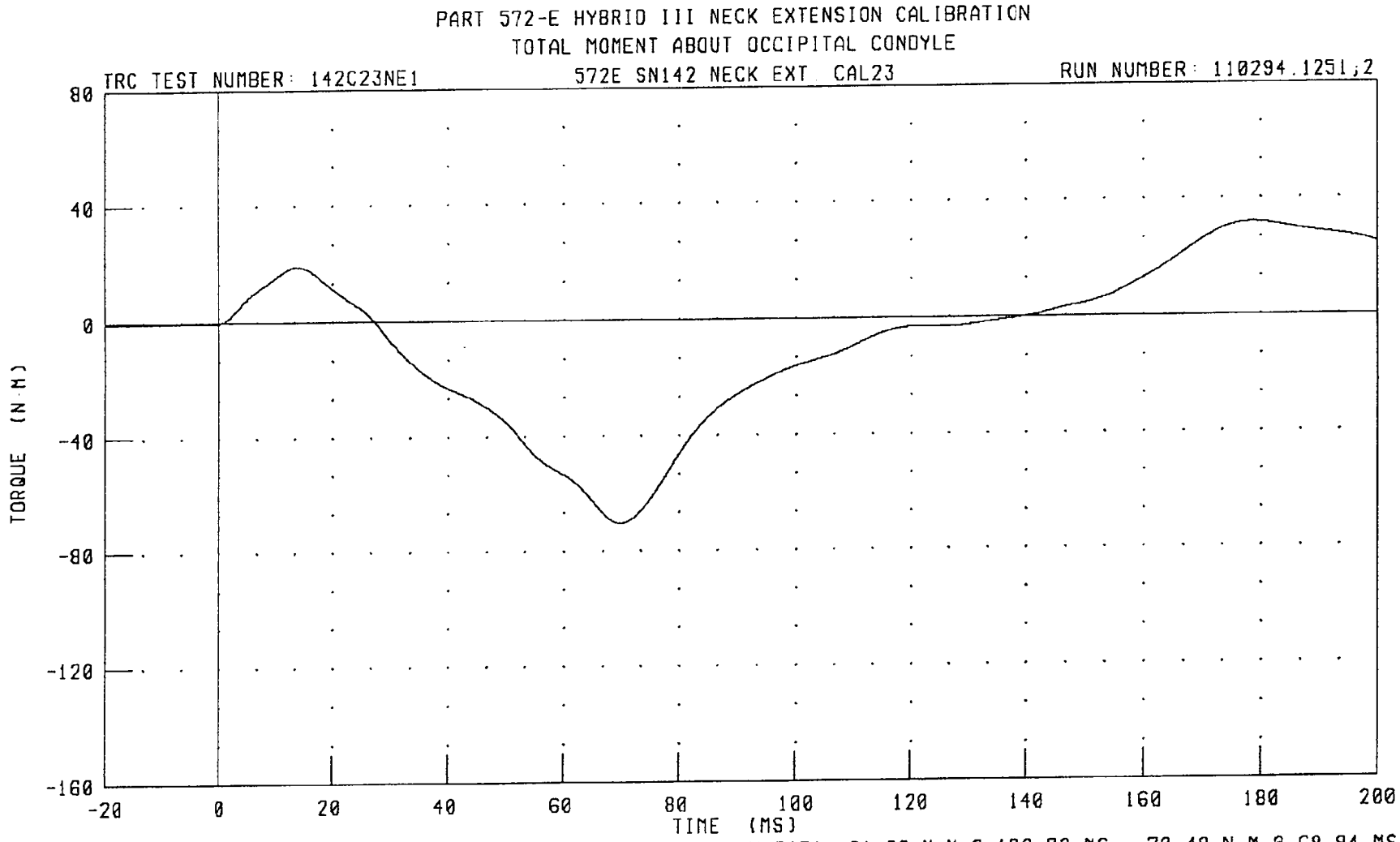

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C23NE1
572E SN142 NECK EXT. CAL23
RUN NUMBER: 110294.1251;2
ANGLE (°)
120
90
60
30
0
-30
-60
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 55.38 ° @ 75.20 MS; -19.44 ° @ 197.36 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: 142C23NE1
572E SN142 NECK EXT. CAL23
RUN NUMBER: 110294.1251;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: 95.33 ° @ 74.96 MS; -33.25 ° @ 196.72 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 142C23NE1
572E SN142 NECK EXT. CAL23
RUN NUMBER: 110294.1251;2
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: 246.93 N @ 187.36 MS; -556.14 N @ 66.48 MS

941005


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 142C23NE1
572E SN142 NECK EXT. CAL23
RUN NUMBER: 110294.1251;2
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: 27.85 N-M @ 178.24 MS; -60.64 N-M @ 69.76 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 142C23NE1
572E SN142 NECK EXT CAL23
RUN NUMBER: 110294.1251;2
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: 31.69 N-M @ 178.72 MS; -70.49 N-M @ 69.84 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

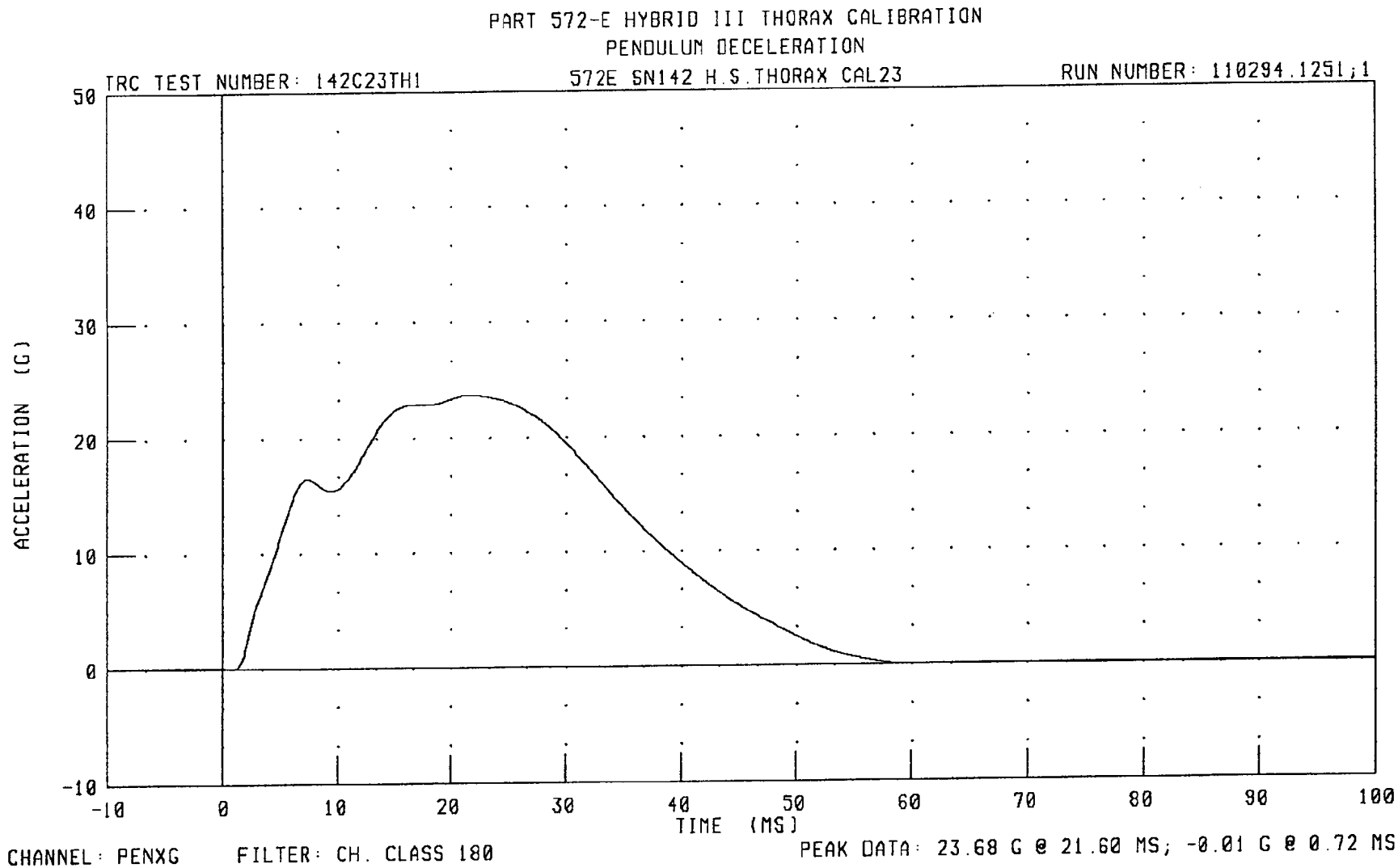
HYBRID III 09-SEP-94

TRC INC. TEST NO: 142C23TH1 572E SN142 H.S.THORAX CAL23

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	72.3 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5424. N
INTERNAL HYSTERESIS	69% - 85%	72.0%

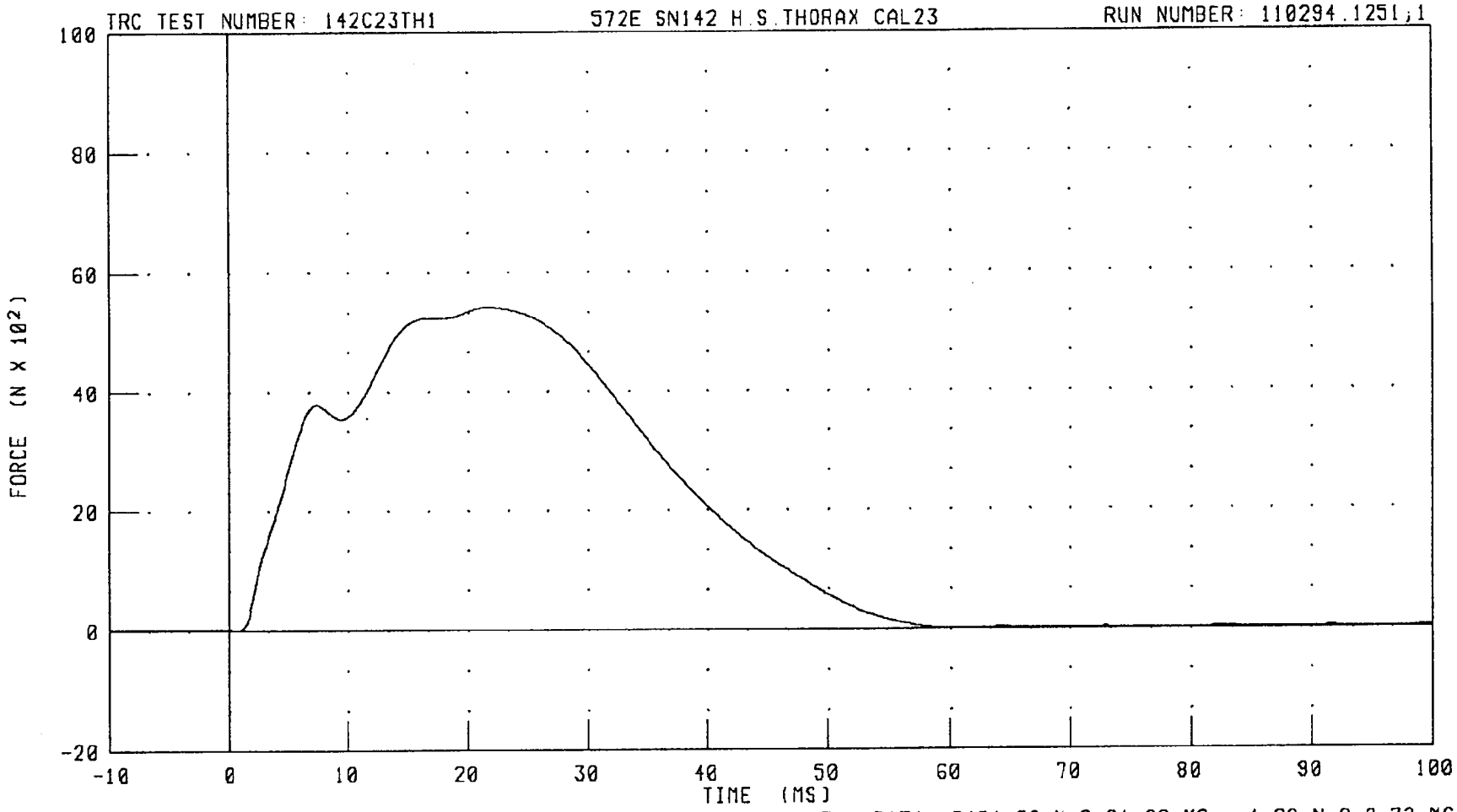
TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 090994.1029;1


PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 142C23TH1
572E SN142 H.S.THORAX CAL23
RUN NUMBER: 110294.1251;1
ACCELERATION (G)
50
40
30
20
10
0
-10
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 180
PEAK DATA: 23.68 G @ 21.60 MS; -0.01 G @ 0.72 MS

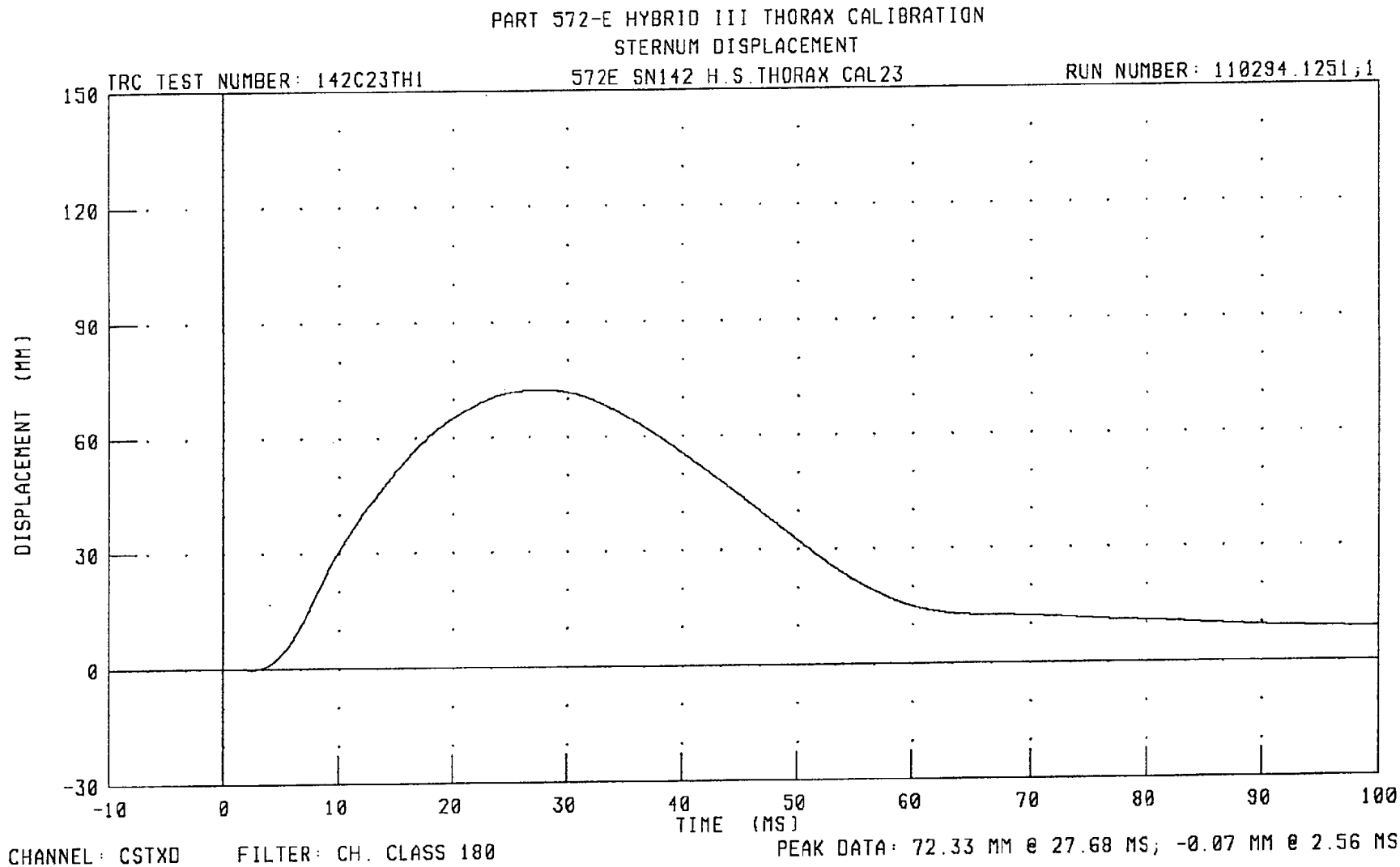
PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 142C23TH1 572E SN142 H.S.THORAX CAL23 RUN NUMBER: 110294.1251;1

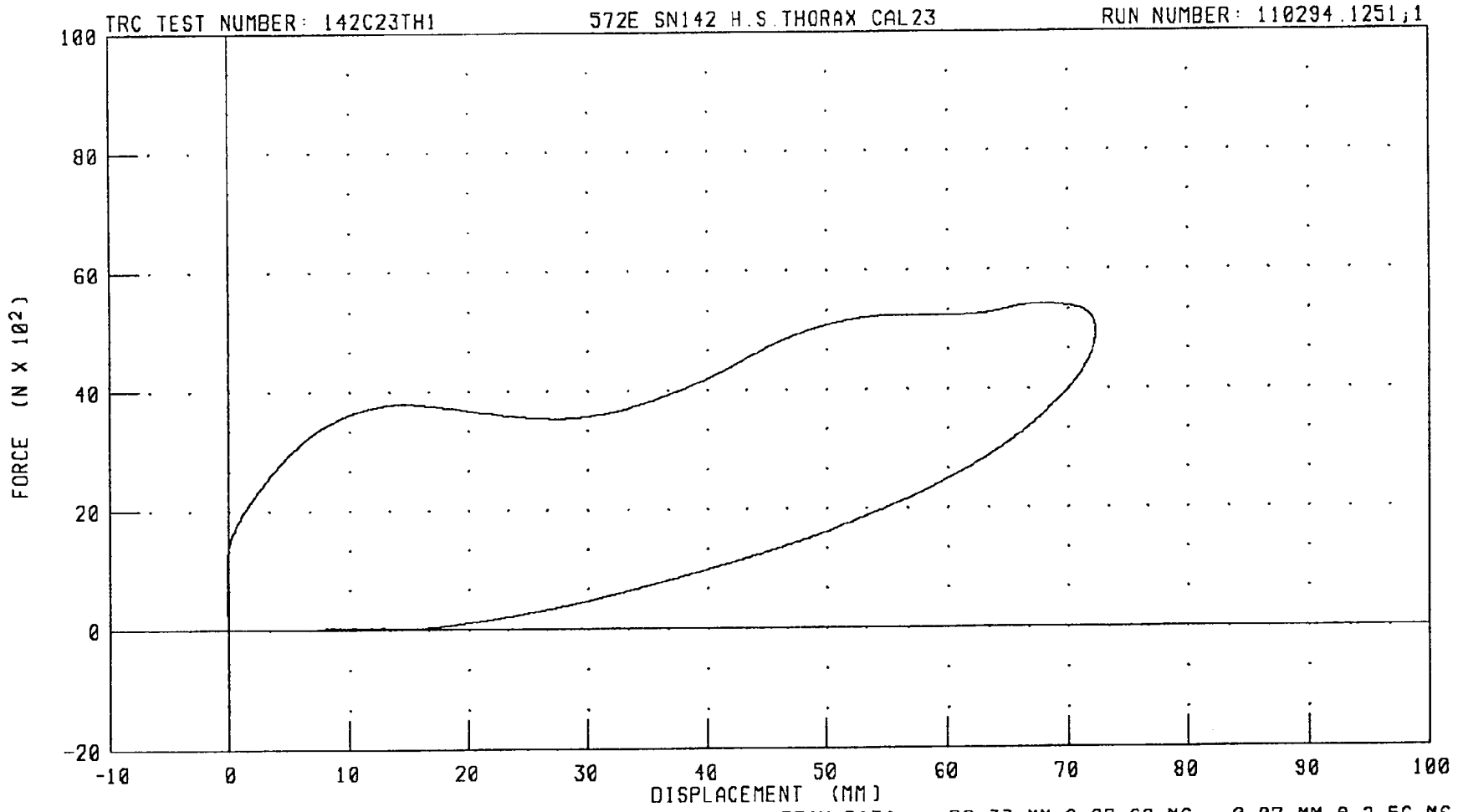


CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5424.69 N @ 21.60 MS; -1.88 N @ 0.72 MS

941005


PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT
TRC TEST NUMBER: 142C23TH1
572E SN142 H.S.THORAX CAL23
RUN NUMBER: 110294.1251;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: 72.33 MM @ 27.68 MS; -0.07 MM @ 2.56 MS

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



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

PEAK DATA: 72.33 MM @ 27.68 MS; -0.07 MM @ 2.56 MS
5424.69 N @ 21.60 MS; -1.88 N @ 0.72 MS

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TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

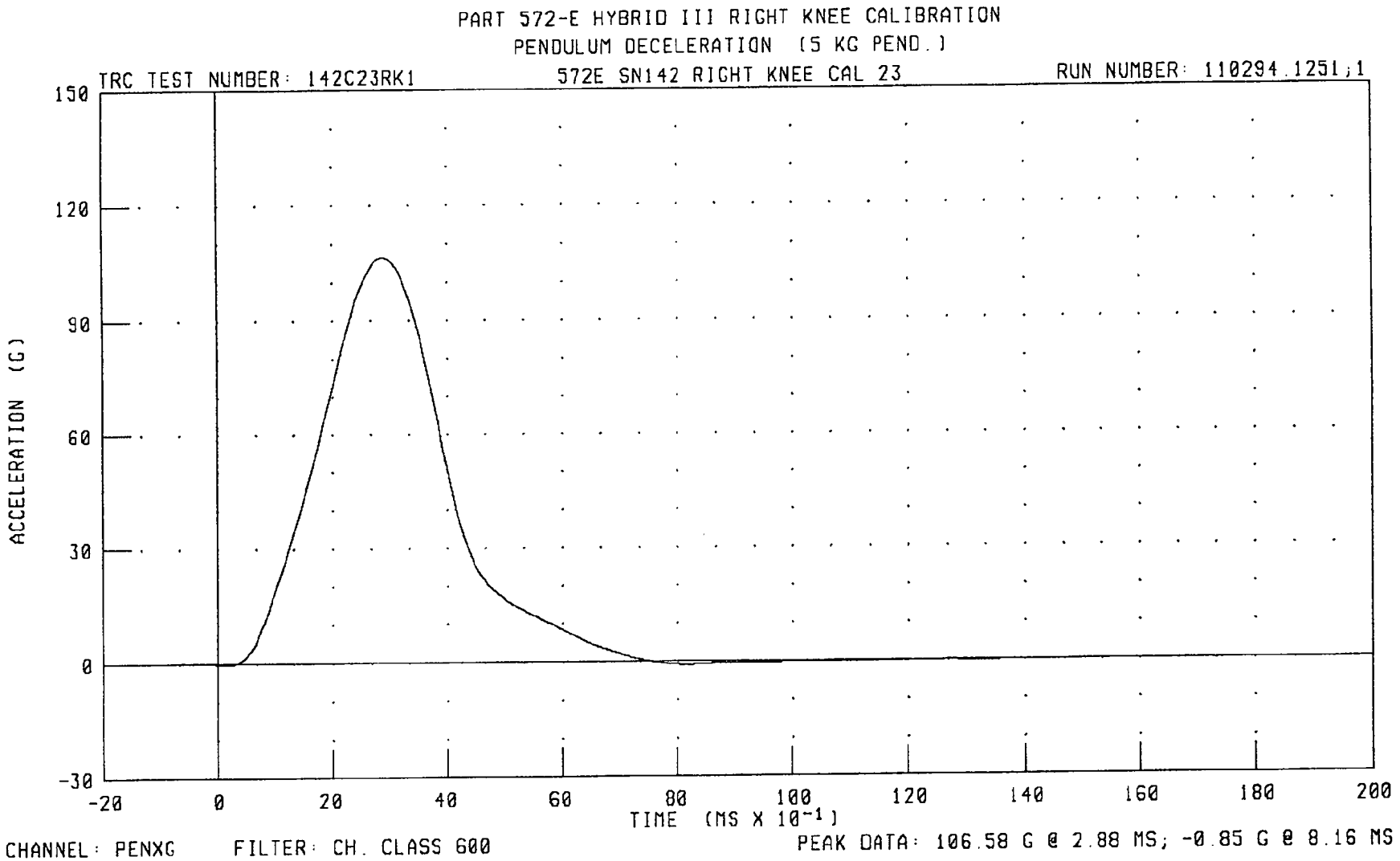
HYBRID III 08-SEP-94

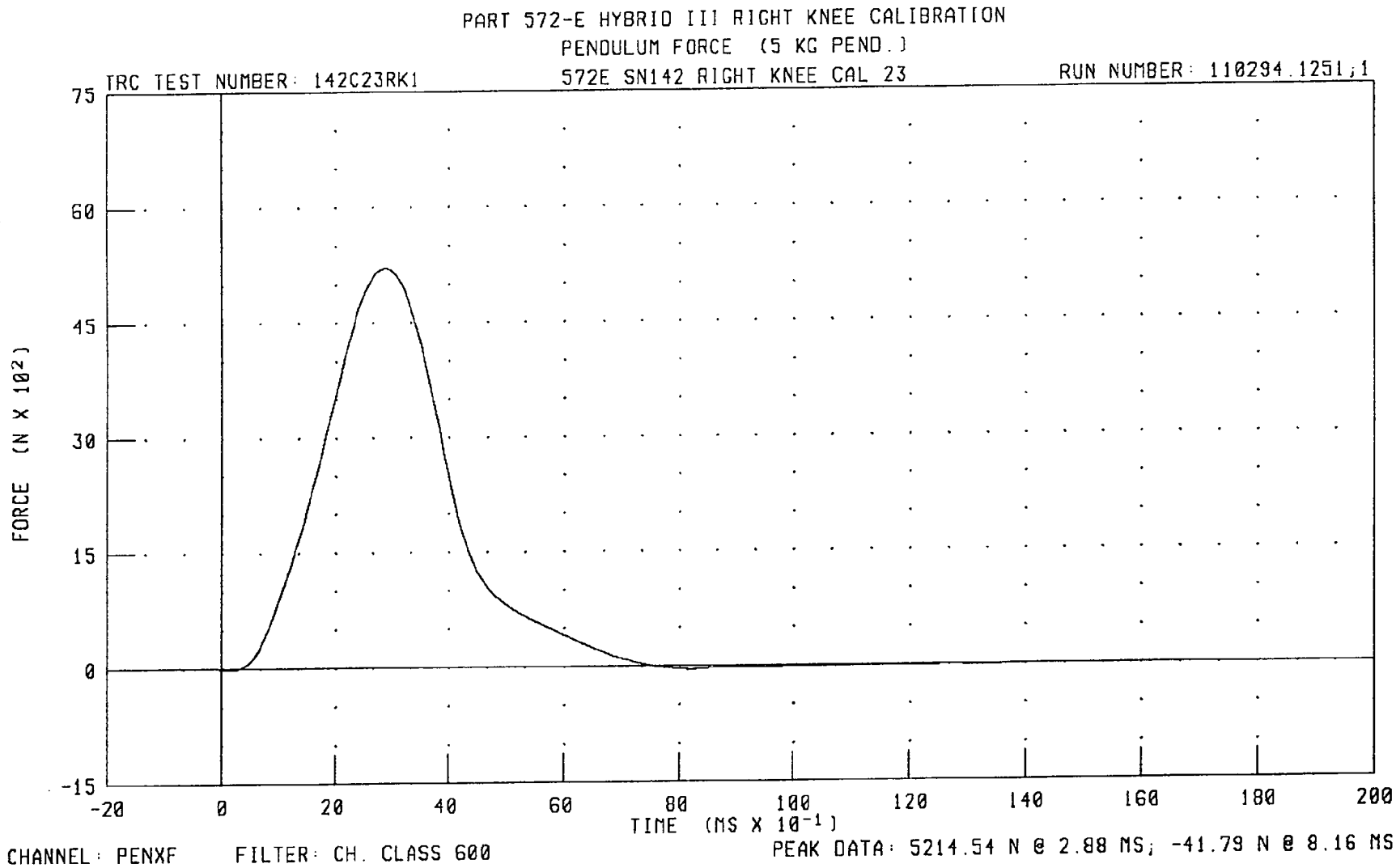
TRC INC. TEST NO: 142C23RK1 572E SN142 RIGHT KNEE CAL 23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5214.5 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foust RUN NUMBER: 090894.1505;1


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 142C23RK1
572E SN142 RIGHT KNEE CAL 23
RUN NUMBER: 110294.1251;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: 106.58 G @ 2.88 MS; -0.85 G @ 8.16 MS


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 142C23RK1
572E SN142 RIGHT KNEE CAL 23
RUN NUMBER: 110294.1251;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: 5214.54 N @ 2.88 MS; -41.79 N @ 8.16 MS

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TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

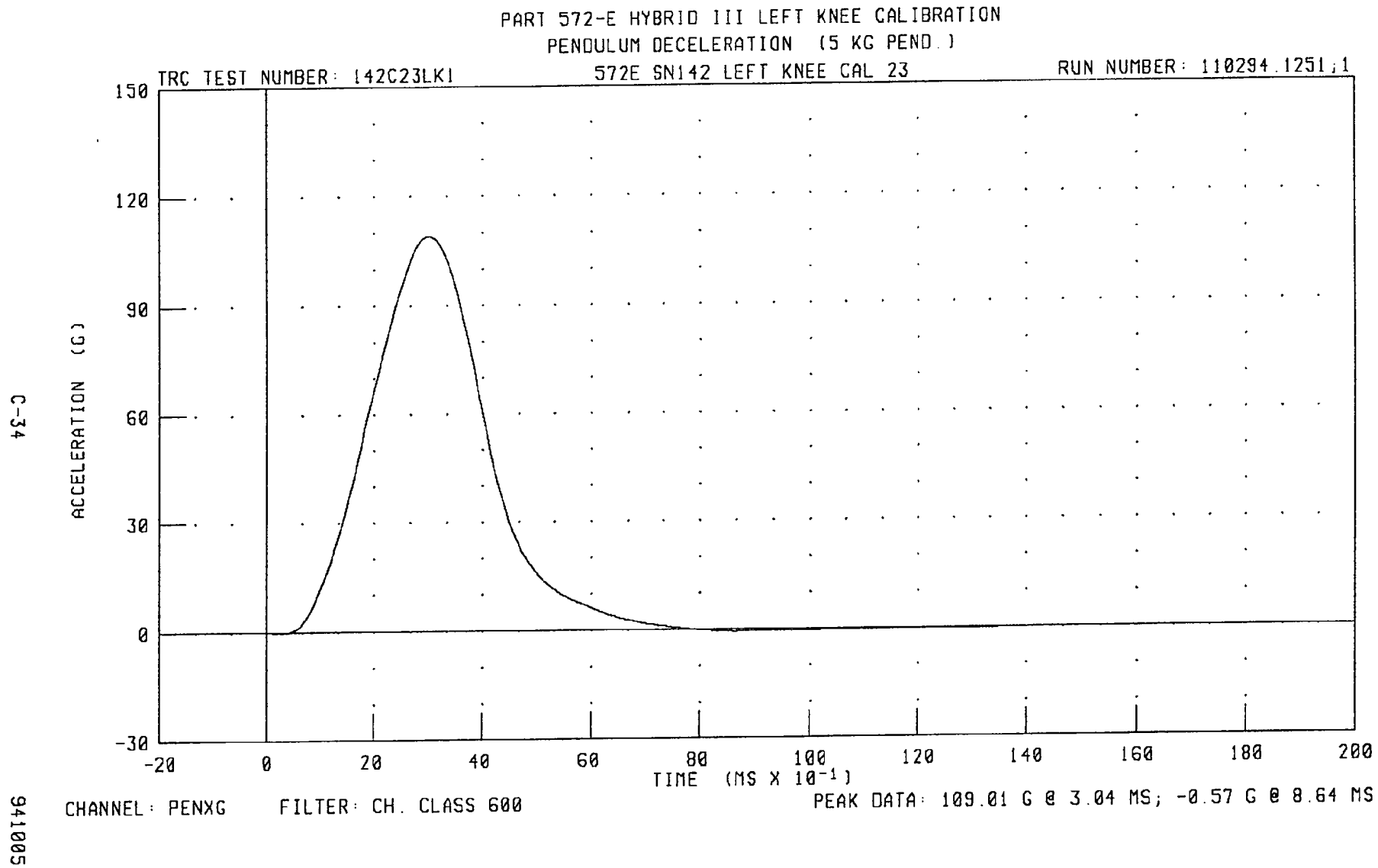
HYBRID III 08-SEP-94

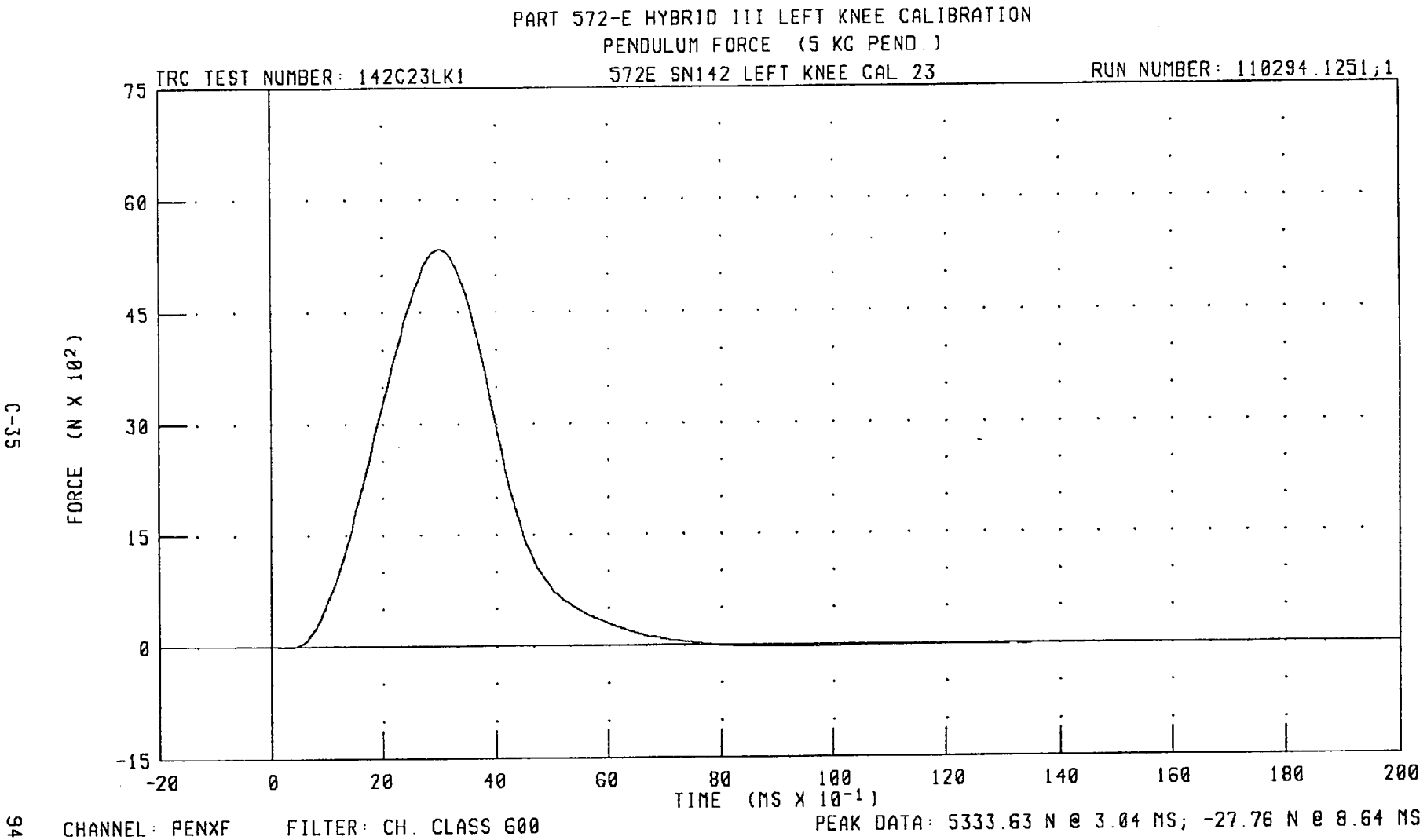
TRC INC. TEST NO: 142C23LK1 572E SN142 LEFT KNEE CAL 23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5333.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 090894.1459;1


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 142C23LK1
572E SN142 LEFT KNEE CAL 23
RUN NUMBER: 110294.1251;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: 109.01 G @ 3.04 MS; -0.57 G @ 8.64 MS


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 142C23LK1
572E SN142 LEFT KNEE CAL 23
RUN NUMBER: 110294.1251;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: 5333.63 N @ 3.04 MS; -27.76 N @ 8.64 MS

Pre-test Certification Data

Passenger Dummy S/N: 192

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
192 ALDERSON 08-SEP-94

TRC INC. TEST NO: 192C22ED1 572E SN192 EXT.DIMENSION CAL22

TEST PARAMETER (DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226 - 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)	970 -1001 MM	980. MM
WAIST CIRCUMFERENCE (Z)	836 - 866 MM	851. 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	135. MM
SKULL CAP TO BACKLINE (H)	41 - 46 MM	43. MM
TOTAL SITTING HEIGHT (A)	879 - 889 MM	889. MM
THIGH CLEARANCE (F)	140 - 155 MM	150. MM
BUTTOCK KNEE LENGTH (K)	579 - 605 MM	597. MM
BUTTOCK POPLITEAL LENGTH (N)	452 - 478 MM	470. MM
POPLITEAL HEIGHT (L)	429 - 455 MM	447. 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	94. MM
SHOULDER BREADTH (V)	422 - 437 MM	429. MM
SHOULDER PIVOT HEIGHT (B)	506 - 521 MM	516. MM
ELBOW REST HEIGHT (J)	191 - 211 MM	211. MM
SHOULDER-ELBOW LENGTH (I)	330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT (G)	290 - 305 MM	290. MM

DUMMY MEETS SPECIFICATIONS
TECHNICIAN Pete Foss RUN NUMBER: 090994.1056

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 09-SEP-94

TRC INC. TEST NO: 192C22HD1 572E SN192 HEAD DROP CAL 22

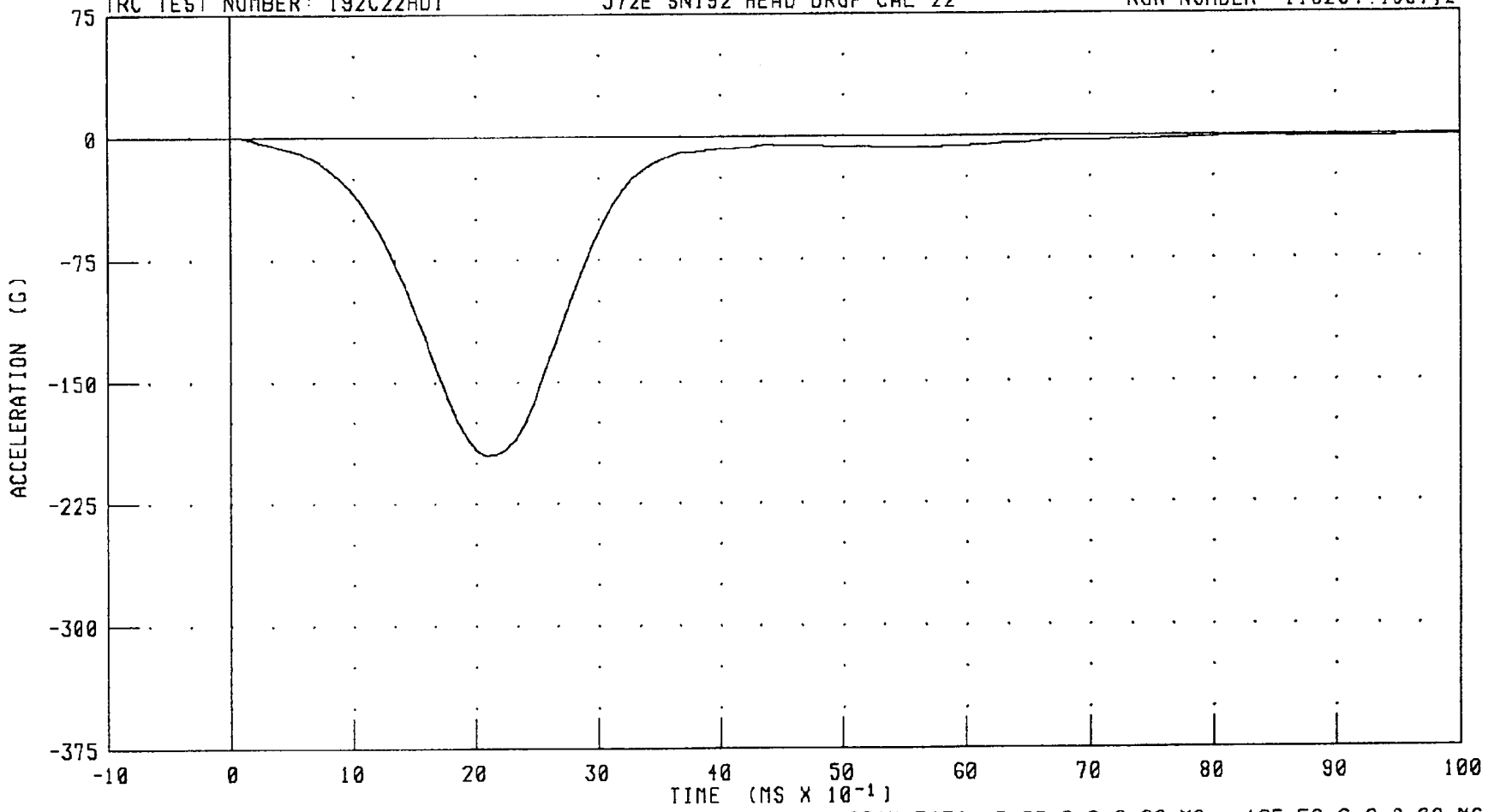
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	227.58 G
PEAK LATERAL ACCELERATION	15 G MAX	-3.21 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

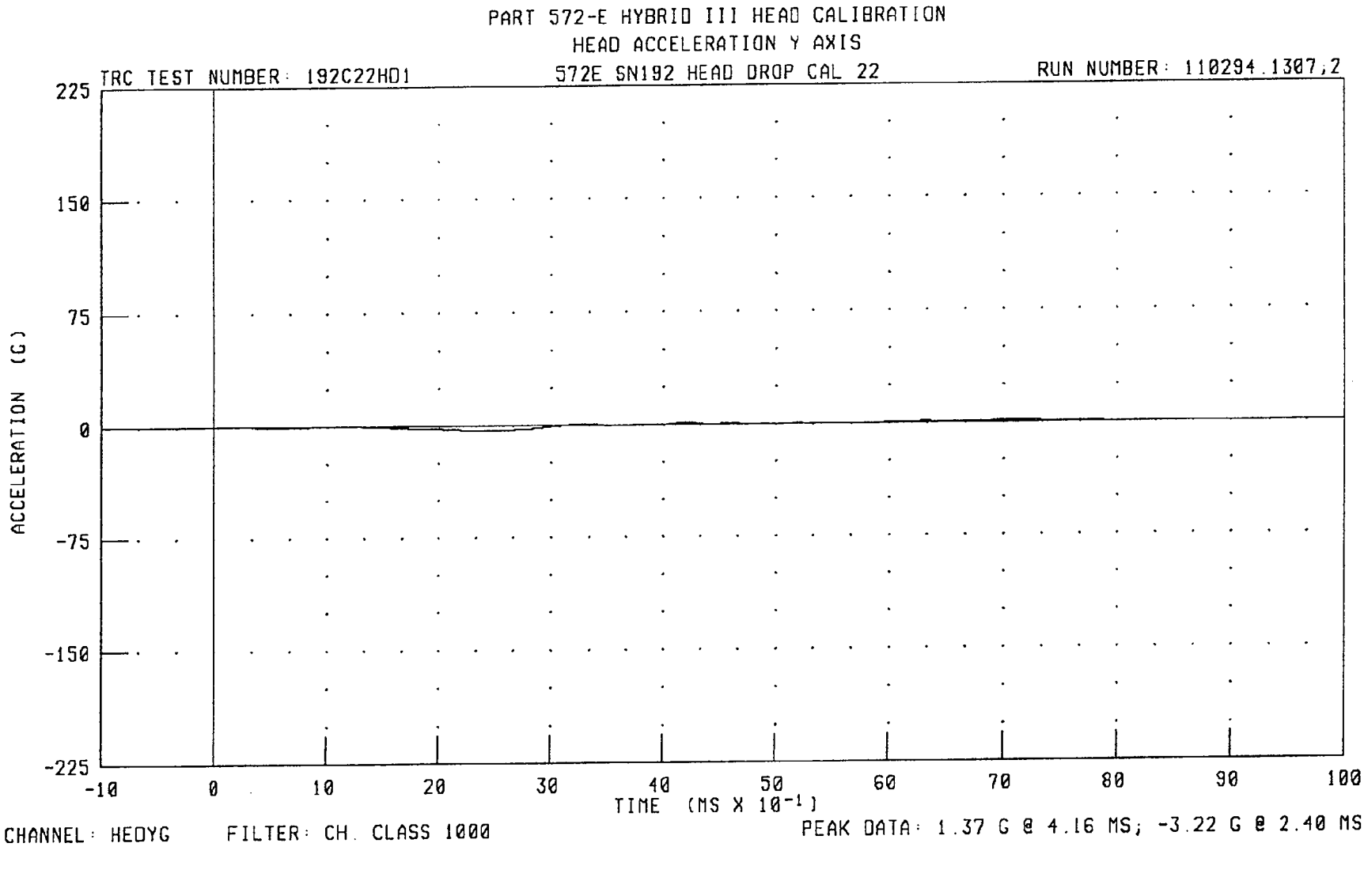
TECHNICIAN _____ RUN NUMBER: 090994.0739;2

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

TRC TEST NUMBER: 192C22HD1 572E SN192 HEAD DROP CAL 22 RUN NUMBER: 110294.1307;2



CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 0.03 G @ 0.00 MS; -195.56 G @ 2.08 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS
TRC TEST NUMBER: 192C22HD1
572E SN192 HEAD DROP CAL 22
RUN NUMBER: 110294.1307.2
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: 1.37 G @ 4.16 MS; -3.22 G @ 2.40 MS

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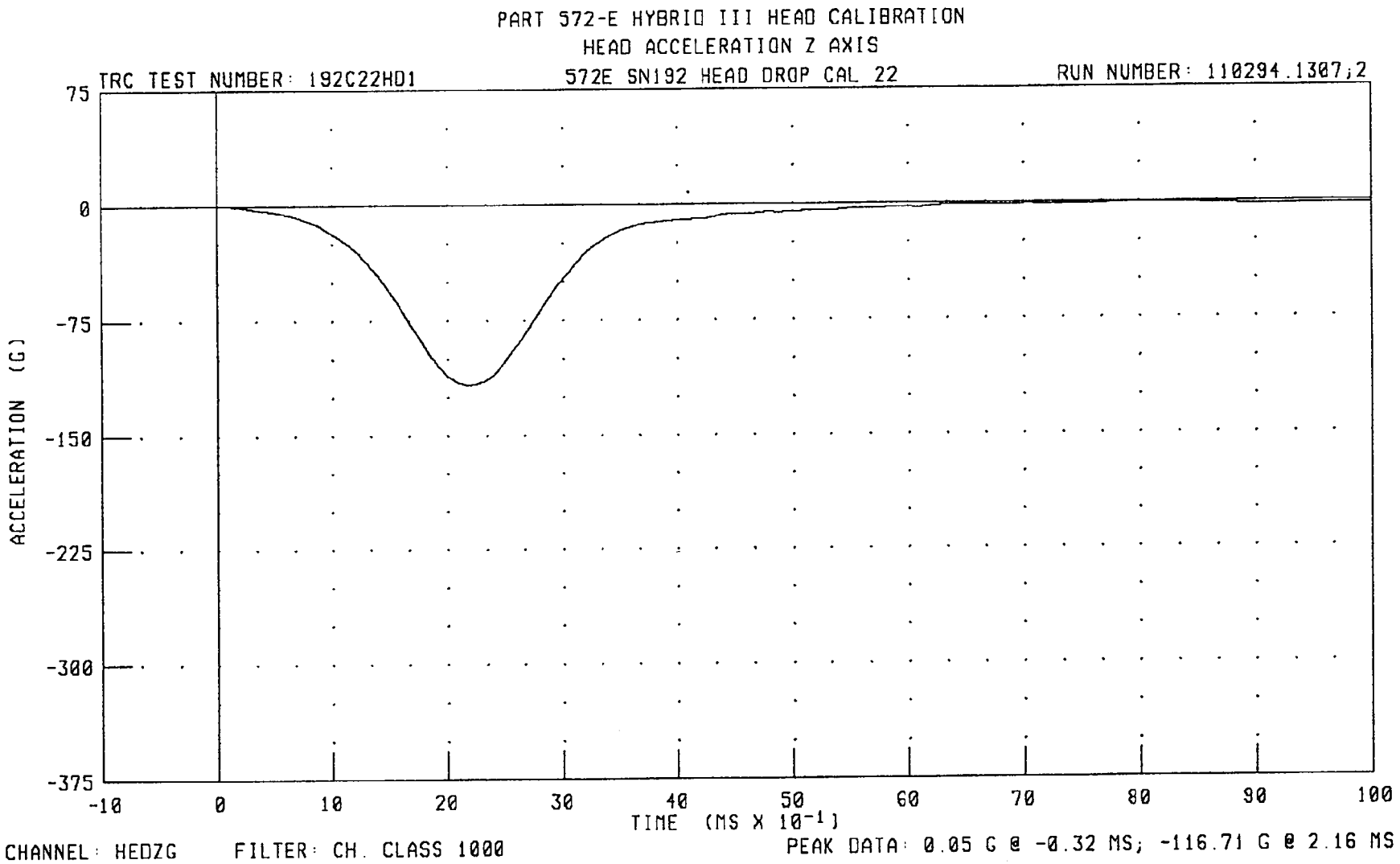
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 192C22HD1
572E SN192 HEAD DROP CAL 22
RUN NUMBER: 110294.1307;2
75
0
-75
-150
-225
-300
-375
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10-1)
CHANNEL: HEDZG
FILTER: CH. CLASS 1000
PEAK DATA: 0.05 G @ -0.32 MS; -116.71 G @ 2.16 MS

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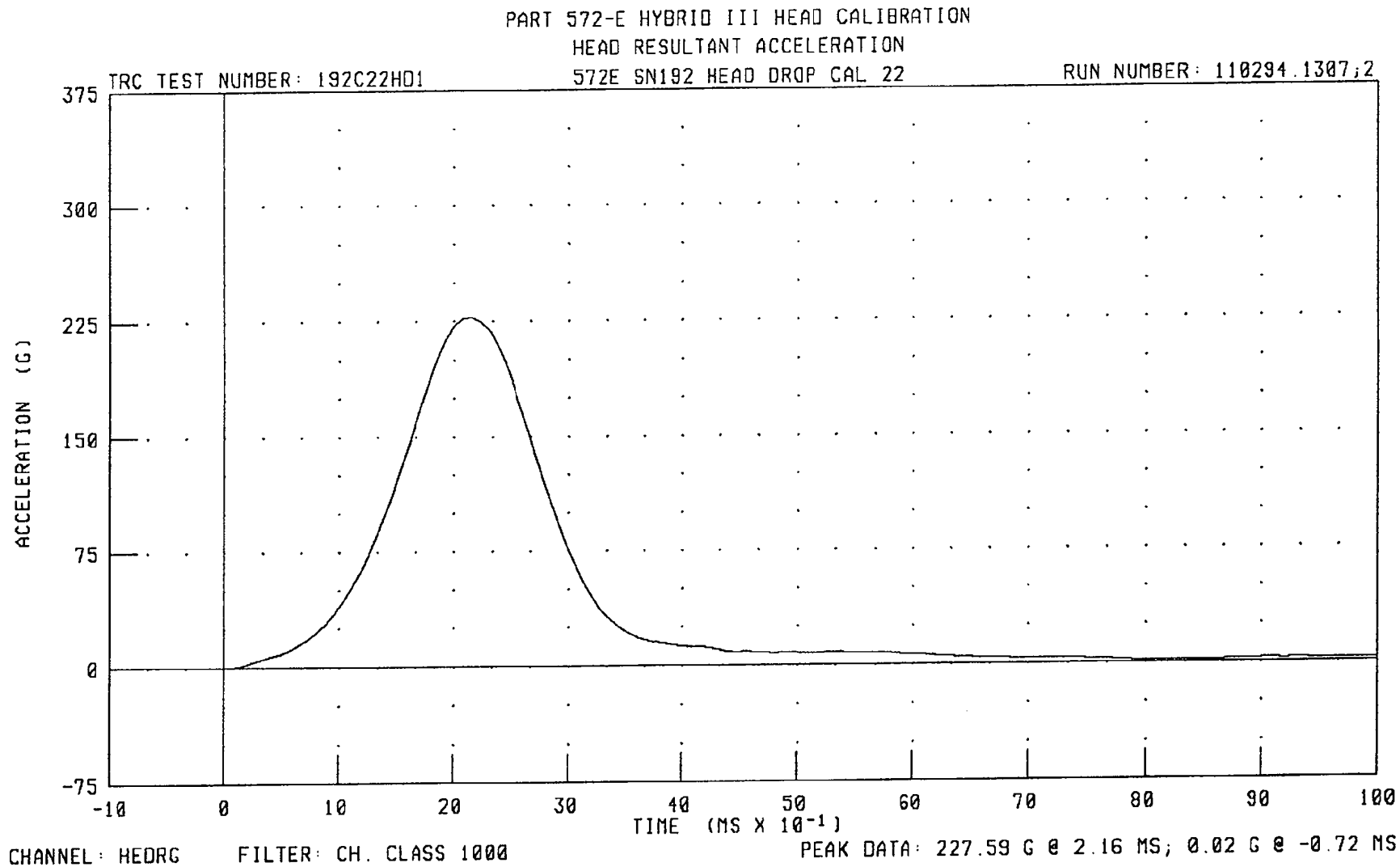
PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
TRC TEST NUMBER: 192C22HD1
572E SN192 HEAD DROP CAL 22
RUN NUMBER: 110294.1307;2
375
300
225
150
75
0
-75
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10-1)
CHANNEL: HEDRG
FILTER: CH. CLASS 1000
PEAK DATA: 227.59 G @ 2.16 MS; 0.02 G @ -0.72 MS

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TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

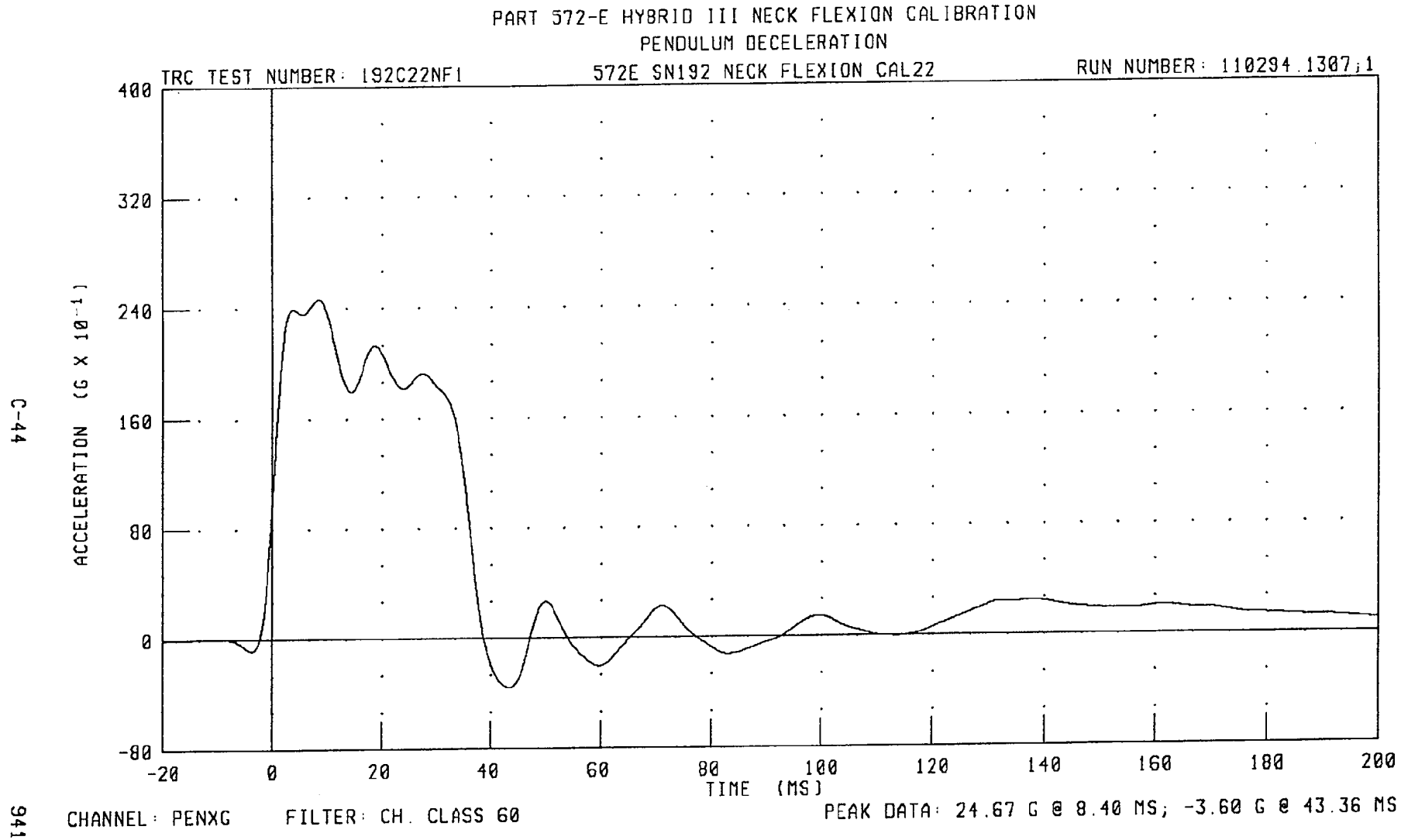
HYBRID III 09-SEP-94

TRC INC. TEST NO: 192C22NF1 572E SN192 NECK FLEXION CAL22

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.51 G
	20 MS	17.60 - 22.60 G	20.71 G
	30 MS	12.50 - 18.50 G	18.29 G
MAX PENDULUM G		29 G MAX	24.67 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	18.26 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.88 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	67.94 DEG.
	TIME	57 - 64 MS	57.28 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	92.33 NM
	TIME	47 - 58 MS	49.84 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.32 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	102.64 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Peter Fo St RUN NUMBER: 090994.0907;1


PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: I92C22NF1
572E SN192 NECK FLEXION CAL22
RUN NUMBER: 110294.1307;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: 24.67 G @ 8.40 MS; -3.60 G @ 43.36 MS

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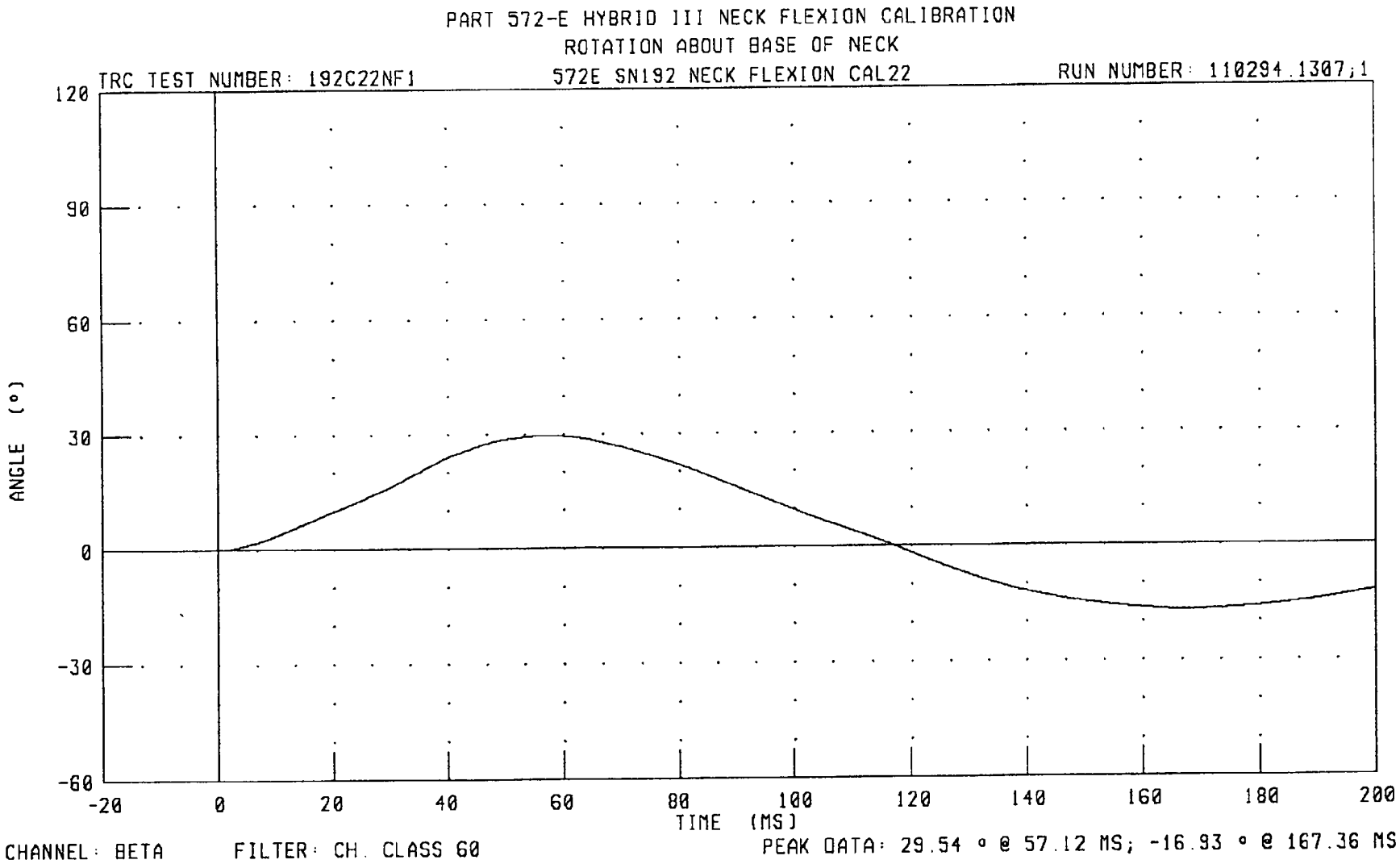
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 192C22NF1
572E SN192 NECK FLEXION CAL22
RUN NUMBER: 110294.1307;1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 29.54 ° @ 57.12 MS; -16.93 ° @ 167.36 MS

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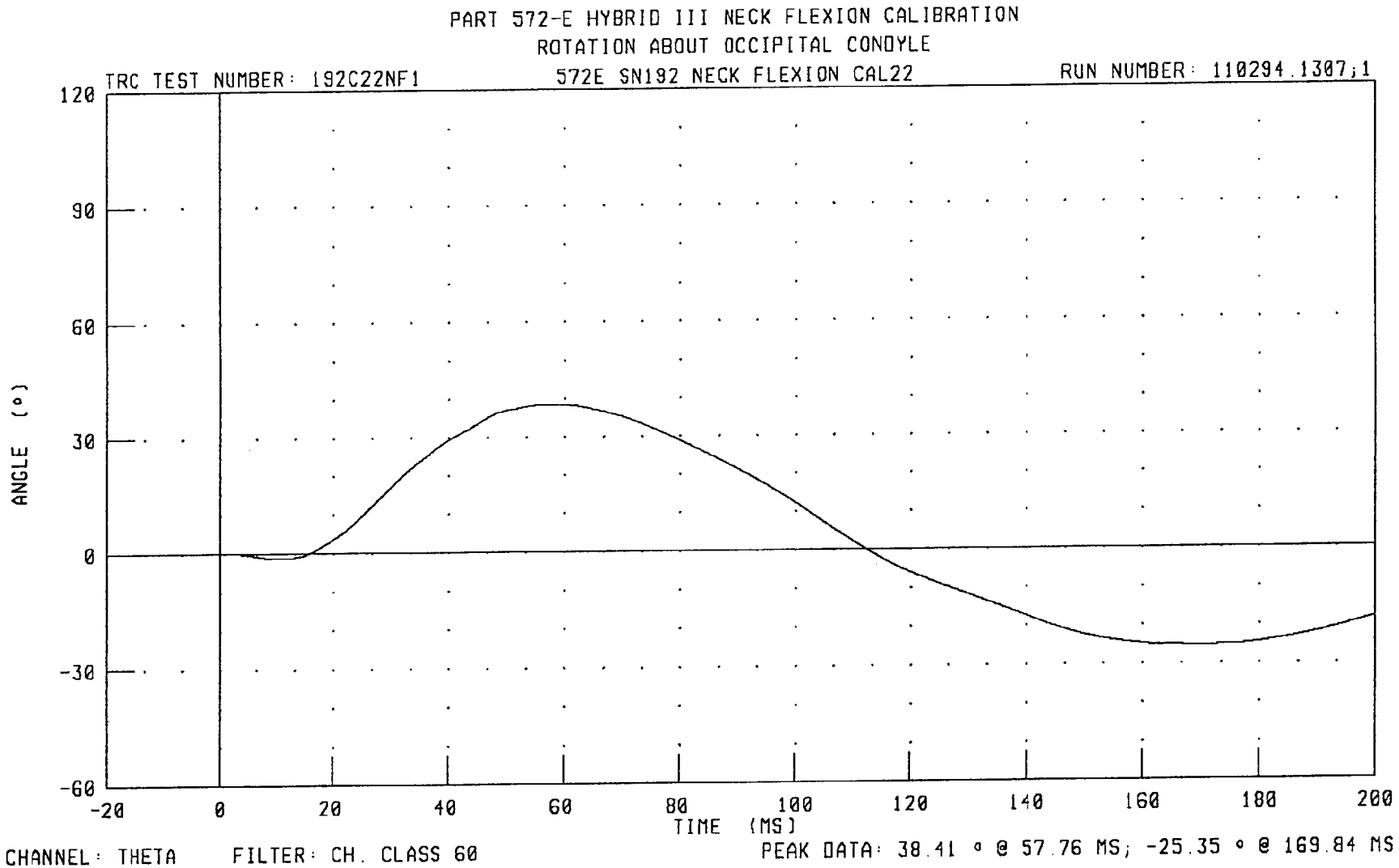
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 192C22NF1
572E SN192 NECK FLEXION CAL22
RUN NUMBER: 110294.1307;1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 38.41 ° @ 57.76 MS; -25.35 ° @ 169.84 MS

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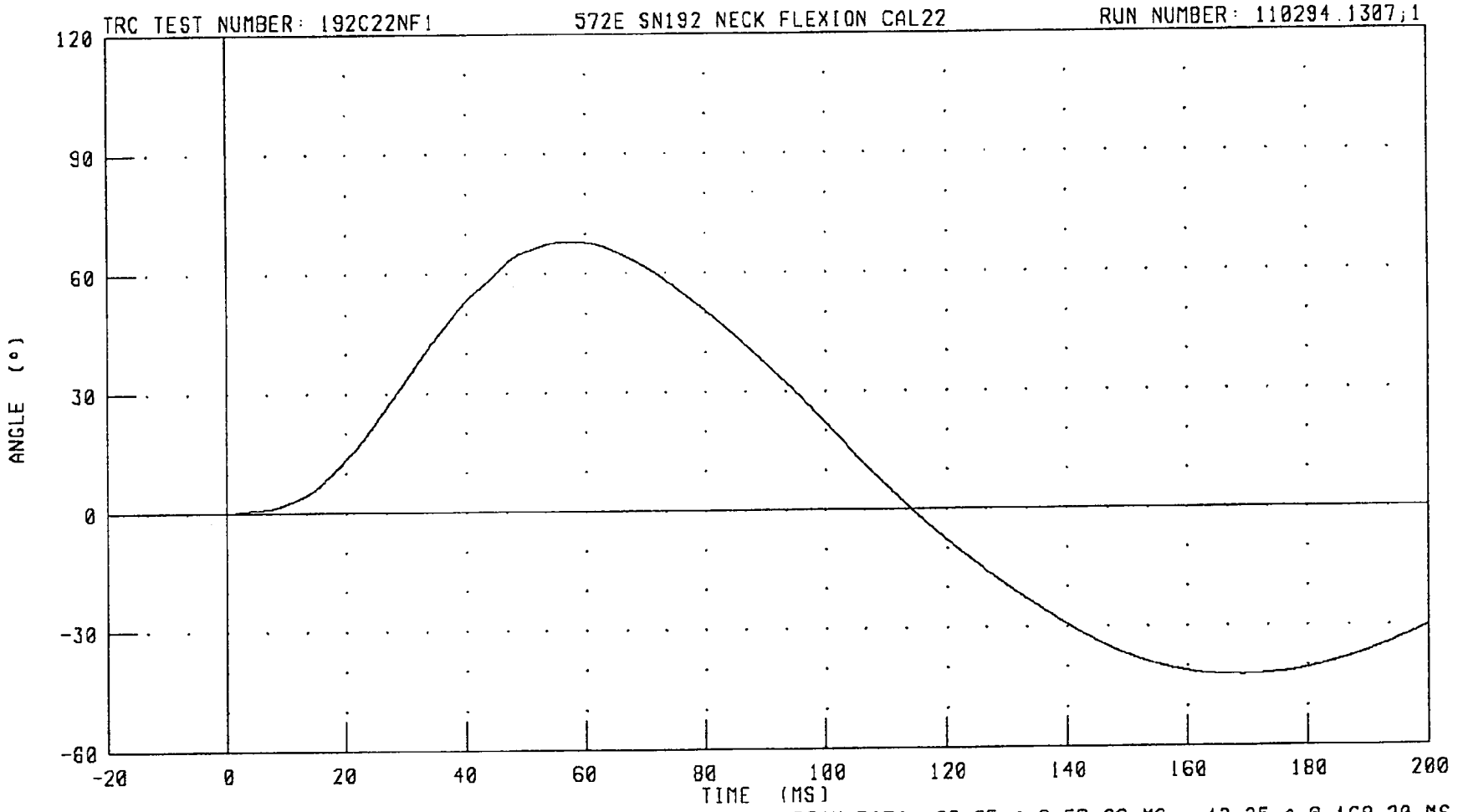
PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION

TRC TEST NUMBER: 192C22NF1 572E SN192 NECK FLEXION CAL22 RUN NUMBER: 110294.1307;1



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 67.95 ° @ 57.28 MS; -42.25 ° @ 169.20 MS

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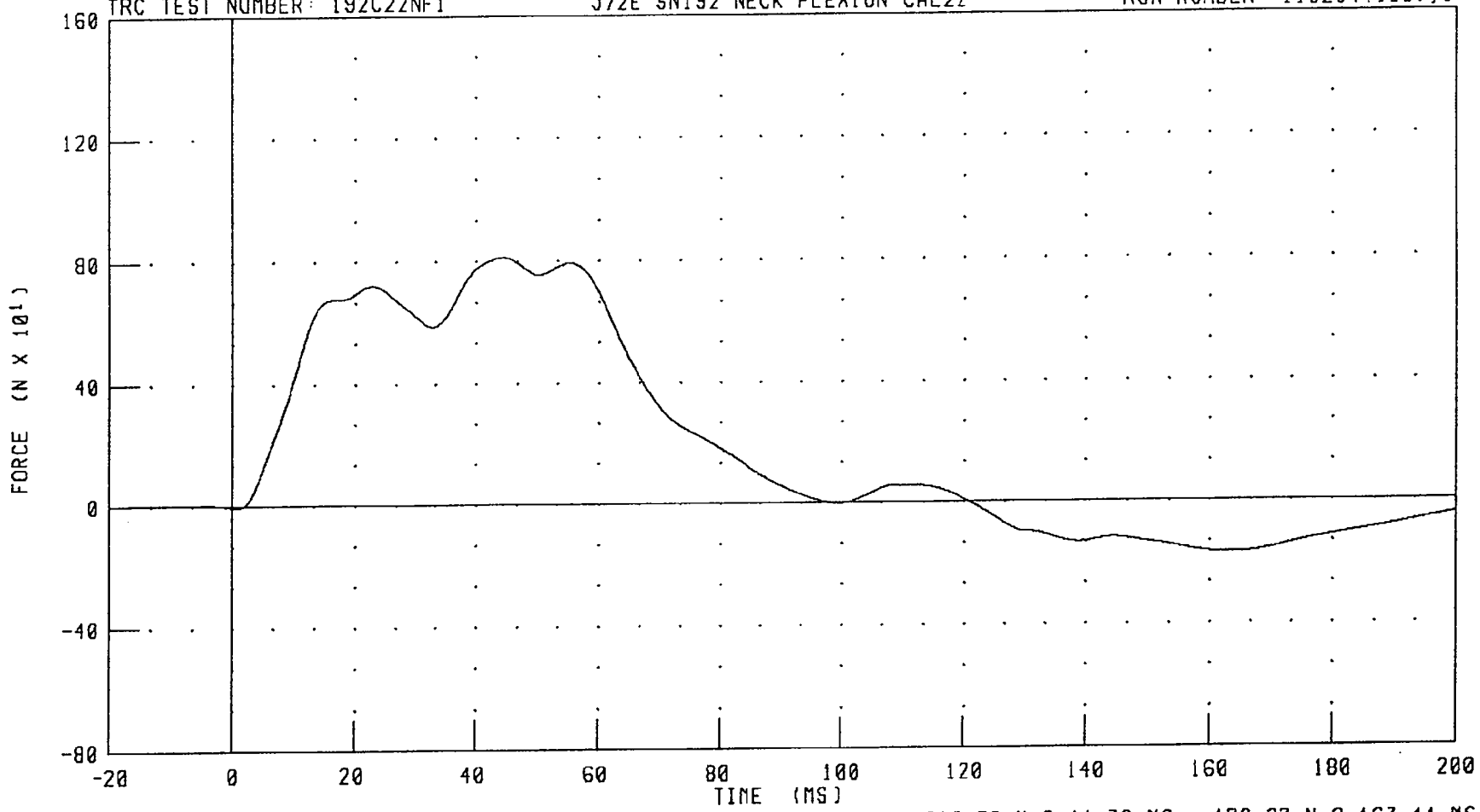
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C22NF1 572E SN192 NECK FLEXION CAL22 RUN NUMBER: 110294.1307;1



CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 812.59 N @ 44.32 MS; -170.27 N @ 163.44 MS

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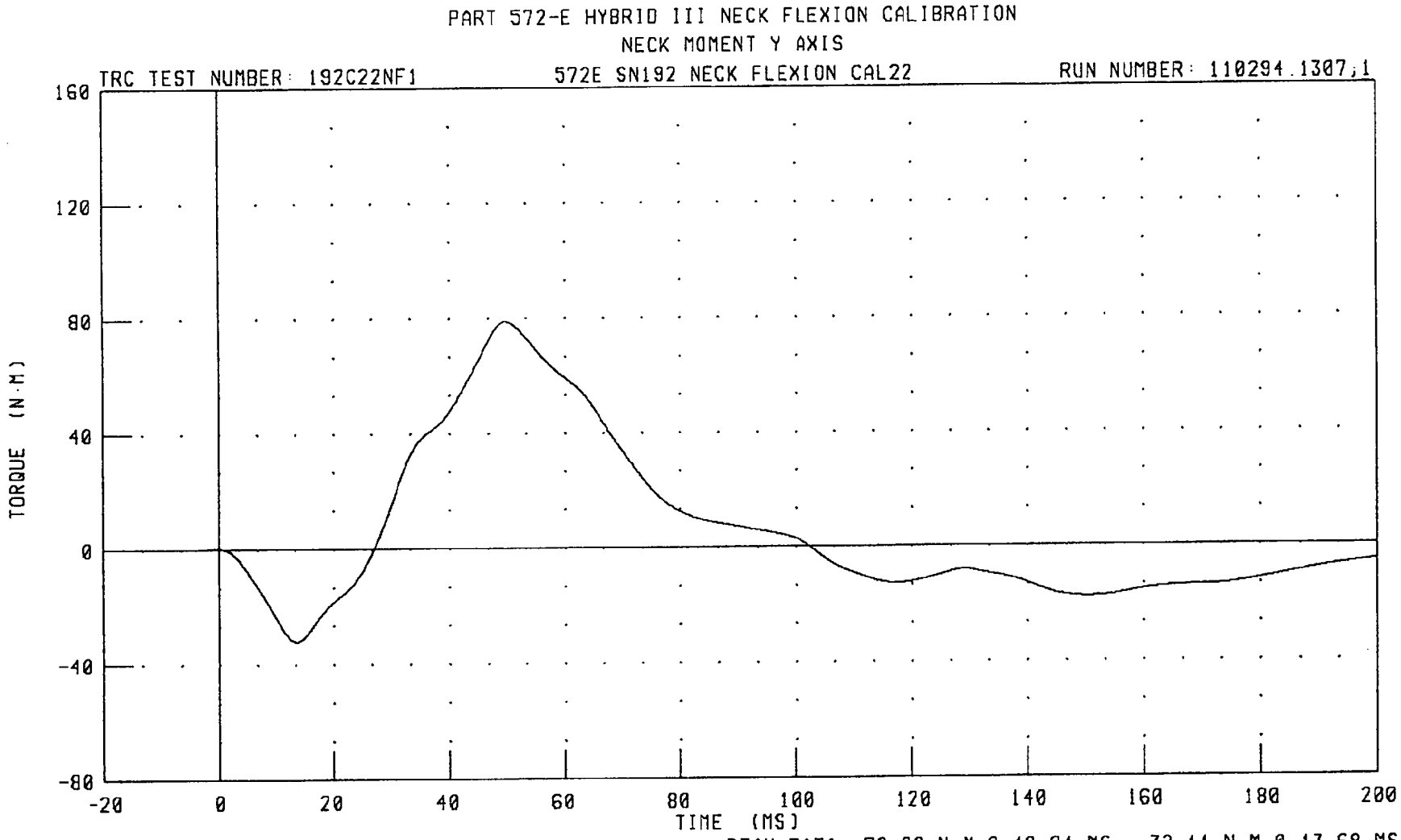
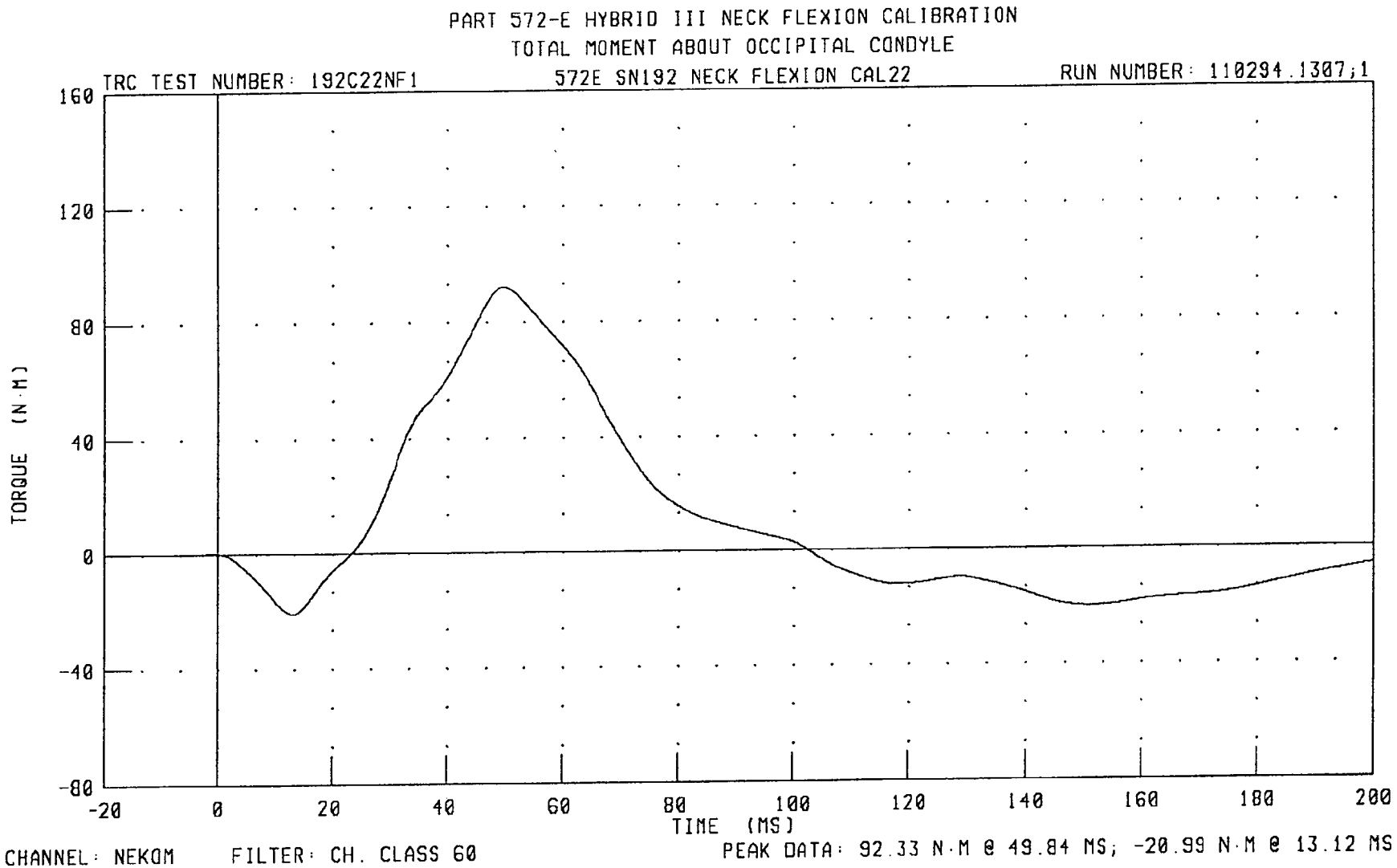

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 192C22NF1
572E SN192 NECK FLEXION CAL22
RUN NUMBER: 110294.1307;1
160
120
80
40
0
-40
-80
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKYM
FILTER: CH. CLASS 60
PEAK DATA: 78.90 N-M @ 49.84 MS; -32.11 N-M @ 13.68 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 192C22NF1
572E SN192 NECK FLEXION CAL22
RUN NUMBER: 110294.1307;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: 92.33 N·M @ 49.84 MS; -20.99 N·M @ 13.12 MS

941005

TRANSPORTATION RESEARCH CENTER INC.

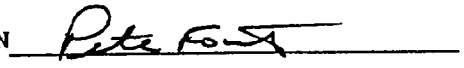
NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

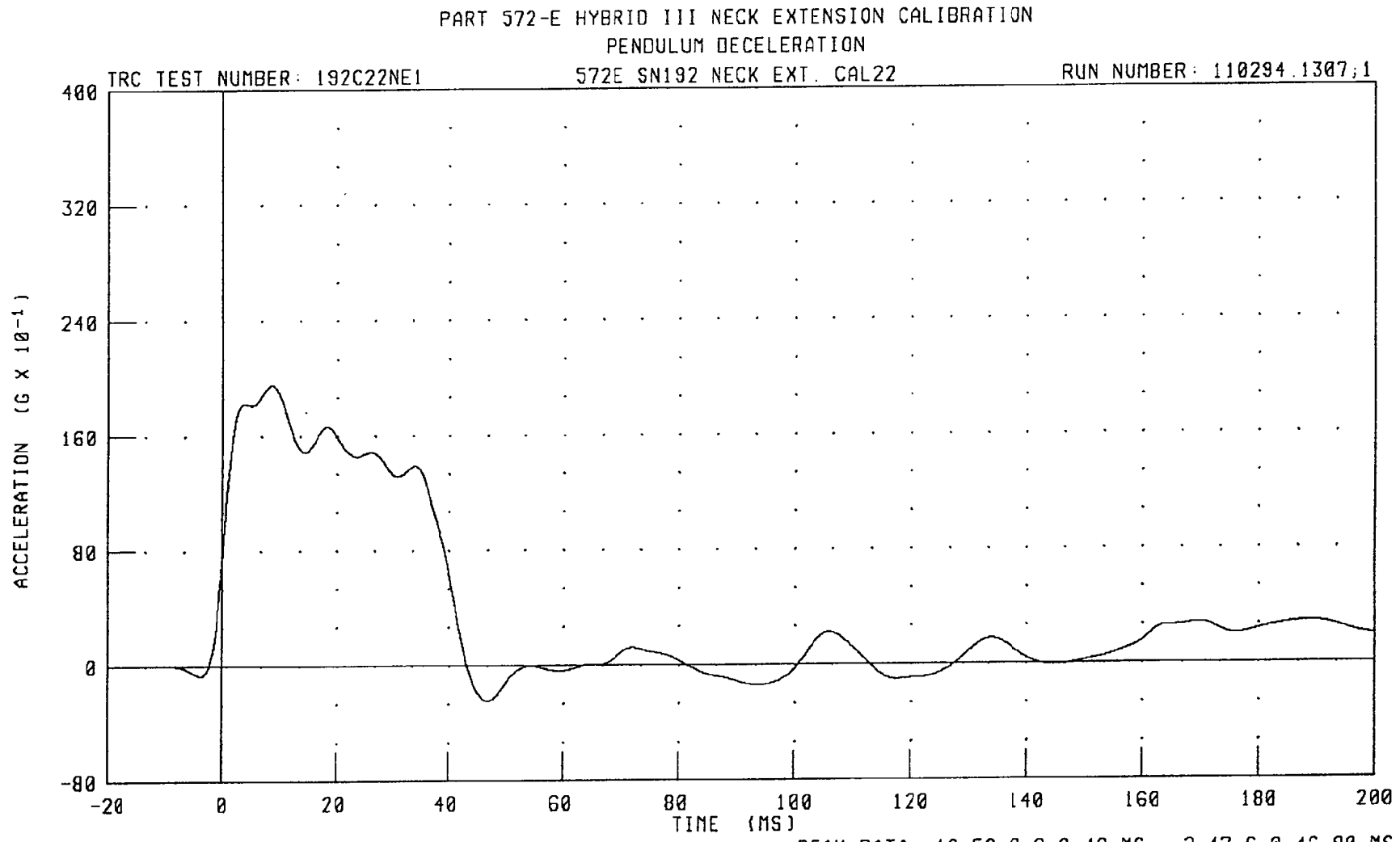
HYBRID III 09-SEP-94

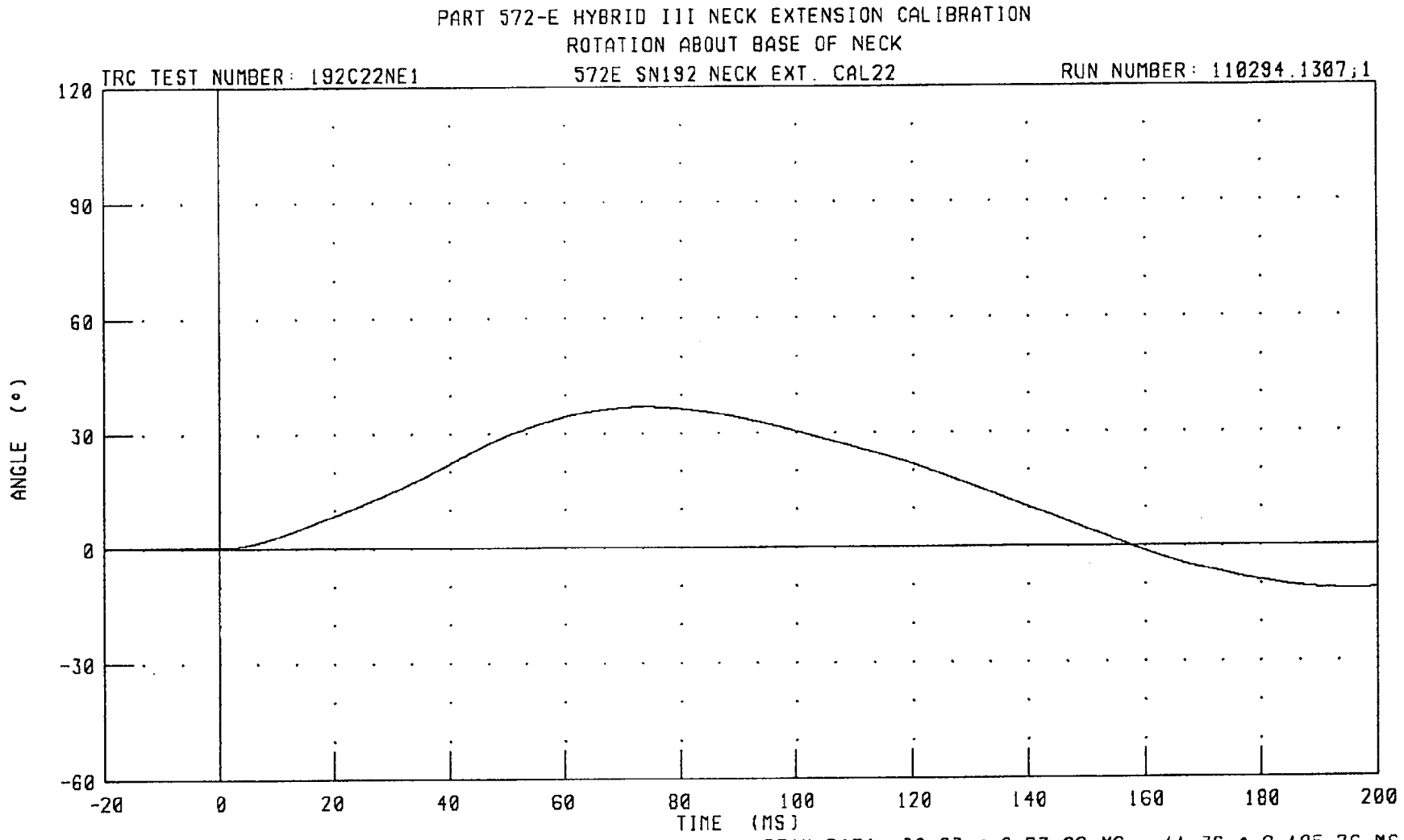
TRC INC. TEST NO: 192C22NE1 572E SN192 NECK EXT. CAL22

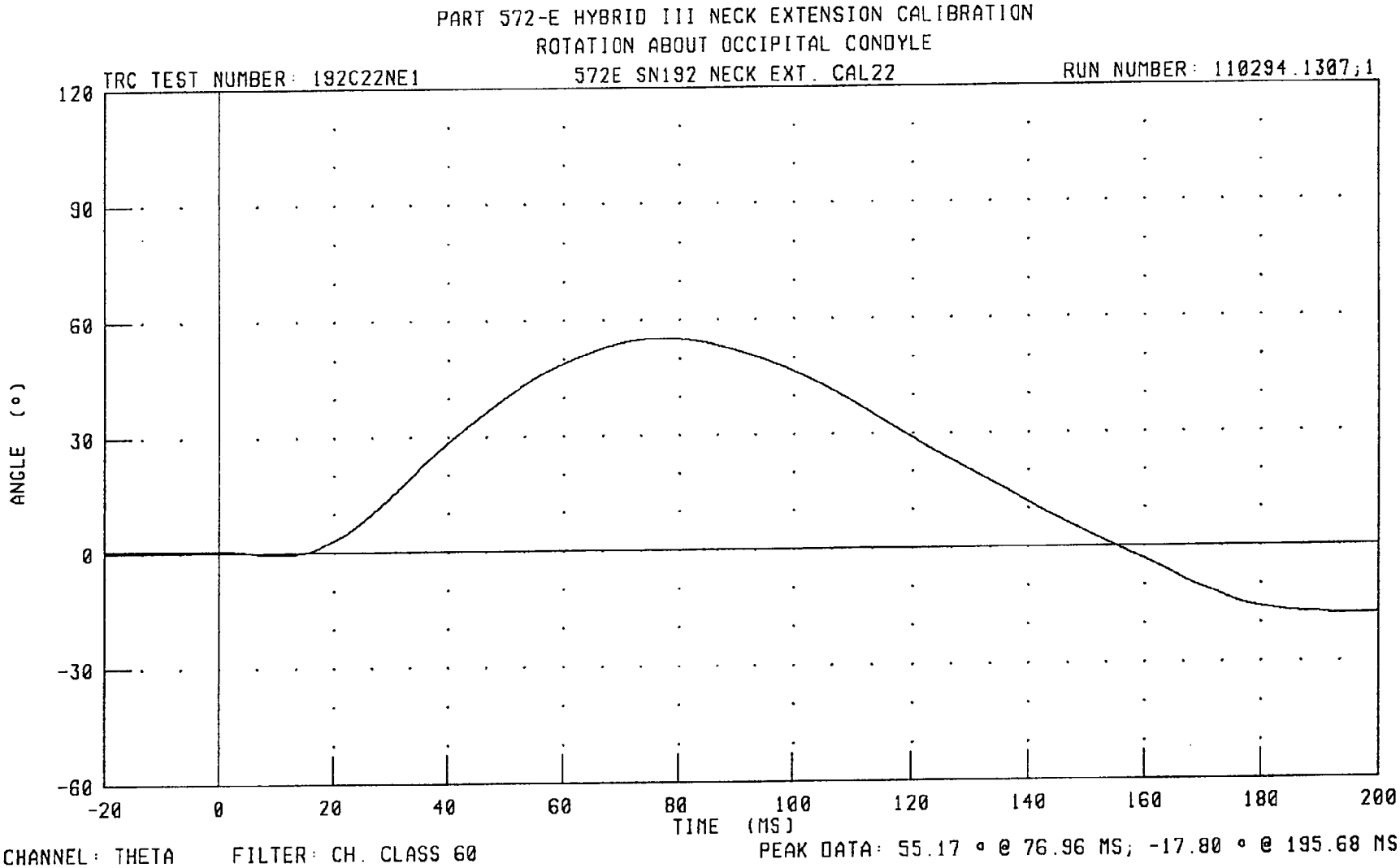
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.73 G
	20 MS	14.00 - 19.00 G	15.91 G
	30 MS	11.00 - 16.00 G	13.22 G
MAX PENDULUM G		22 G MAX	19.52 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.89 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.64 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	91.91 DEG.
	TIME	72 - 82 MS	75.04 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-58.32 NM
	TIME	65 - 79 MS	70.64 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.32 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.80 MS

TEST MEETS SPECIFICATIONS

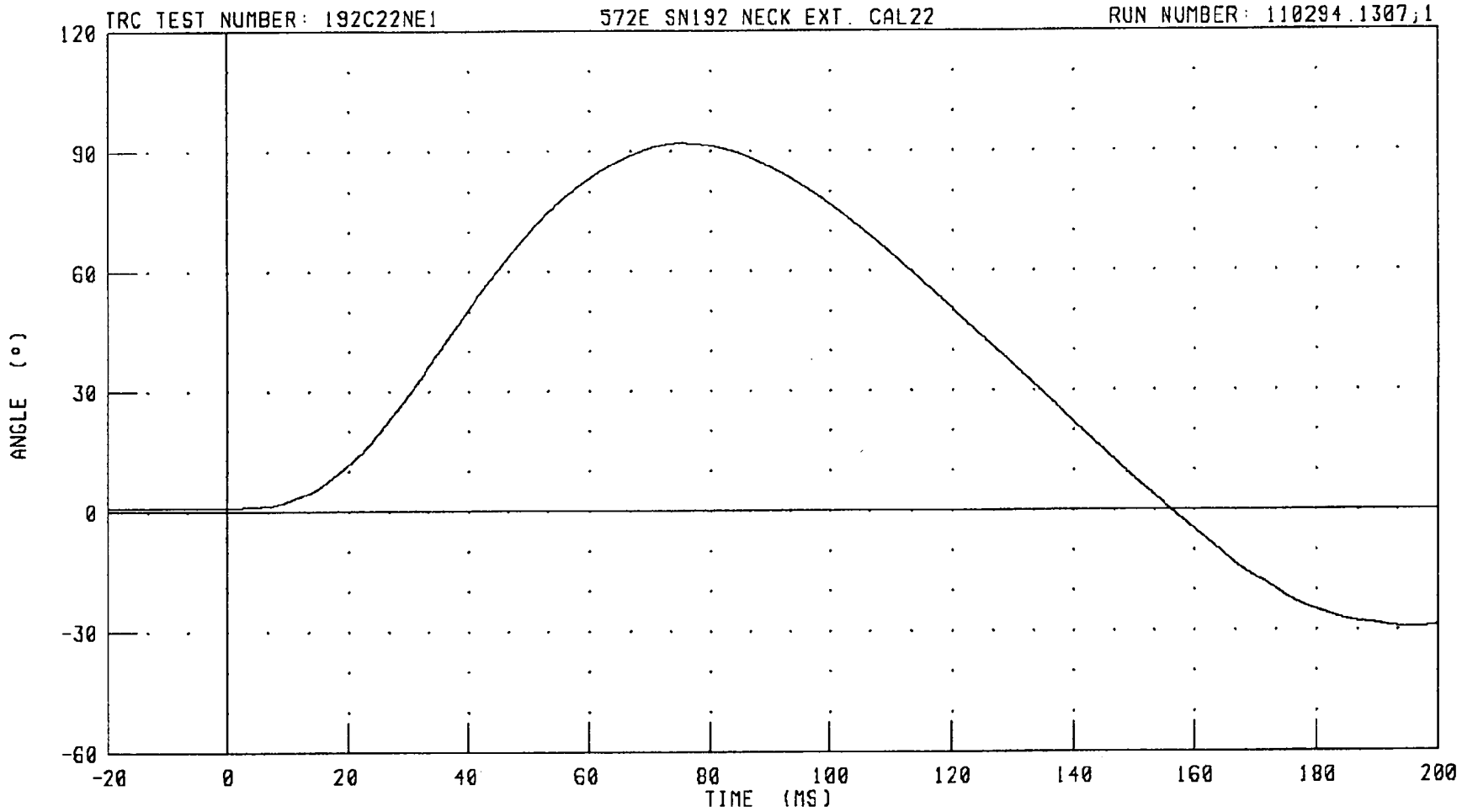
TECHNICIAN  RUN NUMBER: 090994.0924;1


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 192C22NE1
572E SN192 NECK EXT. CAL22
RUN NUMBER: 110294.1307;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: 19.52 G @ 8.48 MS; -2.47 G @ 46.80 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 192C22NE1
572E SN192 NECK EXT. CAL22
RUN NUMBER: 110294.1307;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: 36.83 ° @ 73.28 MS; -11.36 ° @ 195.76 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 192C22NE1
572E SN192 NECK EXT. CAL22
RUN NUMBER: 110294.1307;1
ANGLE (°)
120
90
60
30
0
-30
-60
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 55.17 ° @ 76.96 MS; -17.80 ° @ 195.68 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION



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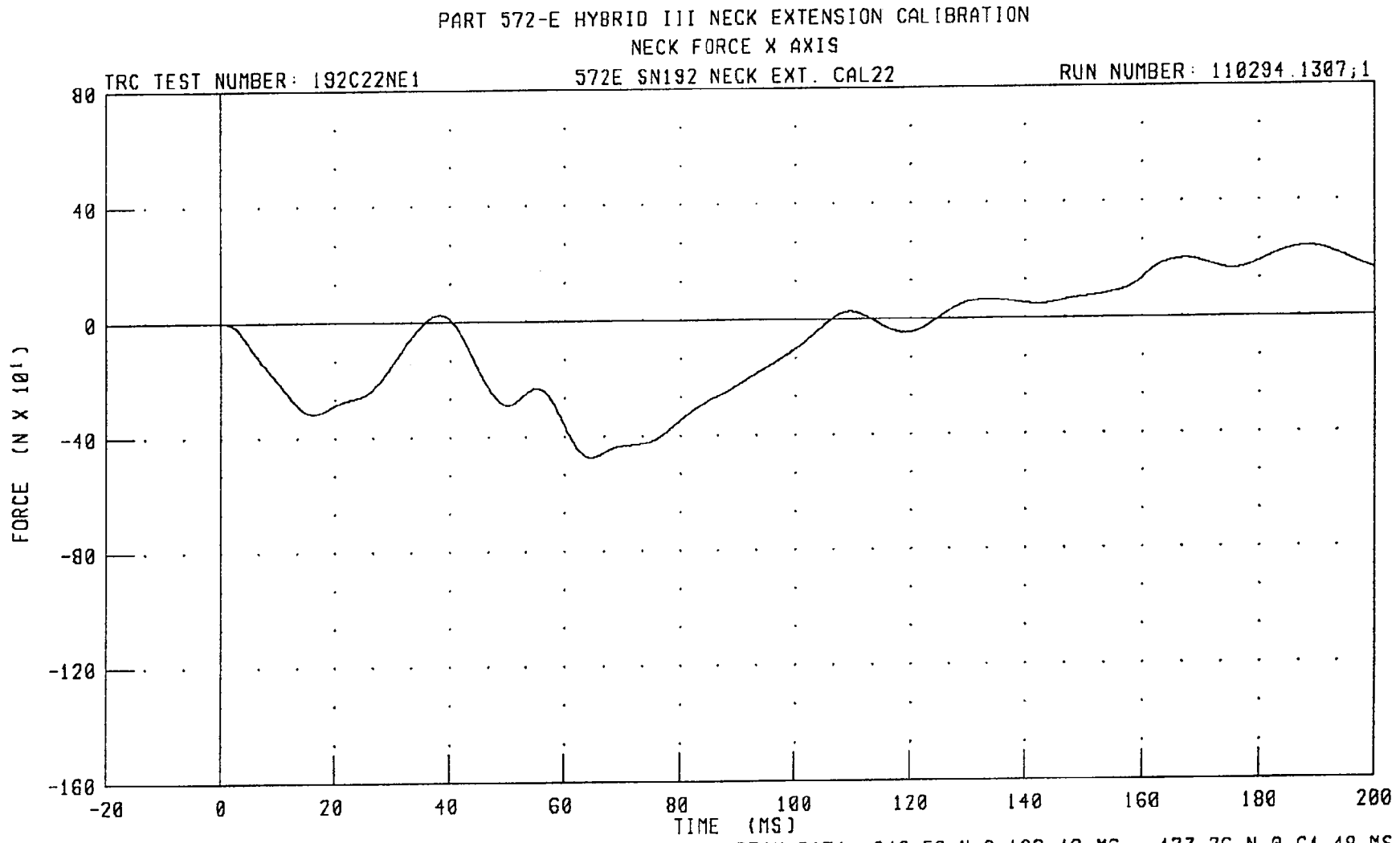
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 192C22NE1
572E SN192 NECK EXT. CAL22
RUN NUMBER: 110294.1307;1
80
40
0
-40
-80
-120
-160
FORCE (N X 10¹)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKXF
FILTER: CH. CLASS 60
PEAK DATA: 240.59 N @ 188.40 MS; -473.76 N @ 64.48 MS

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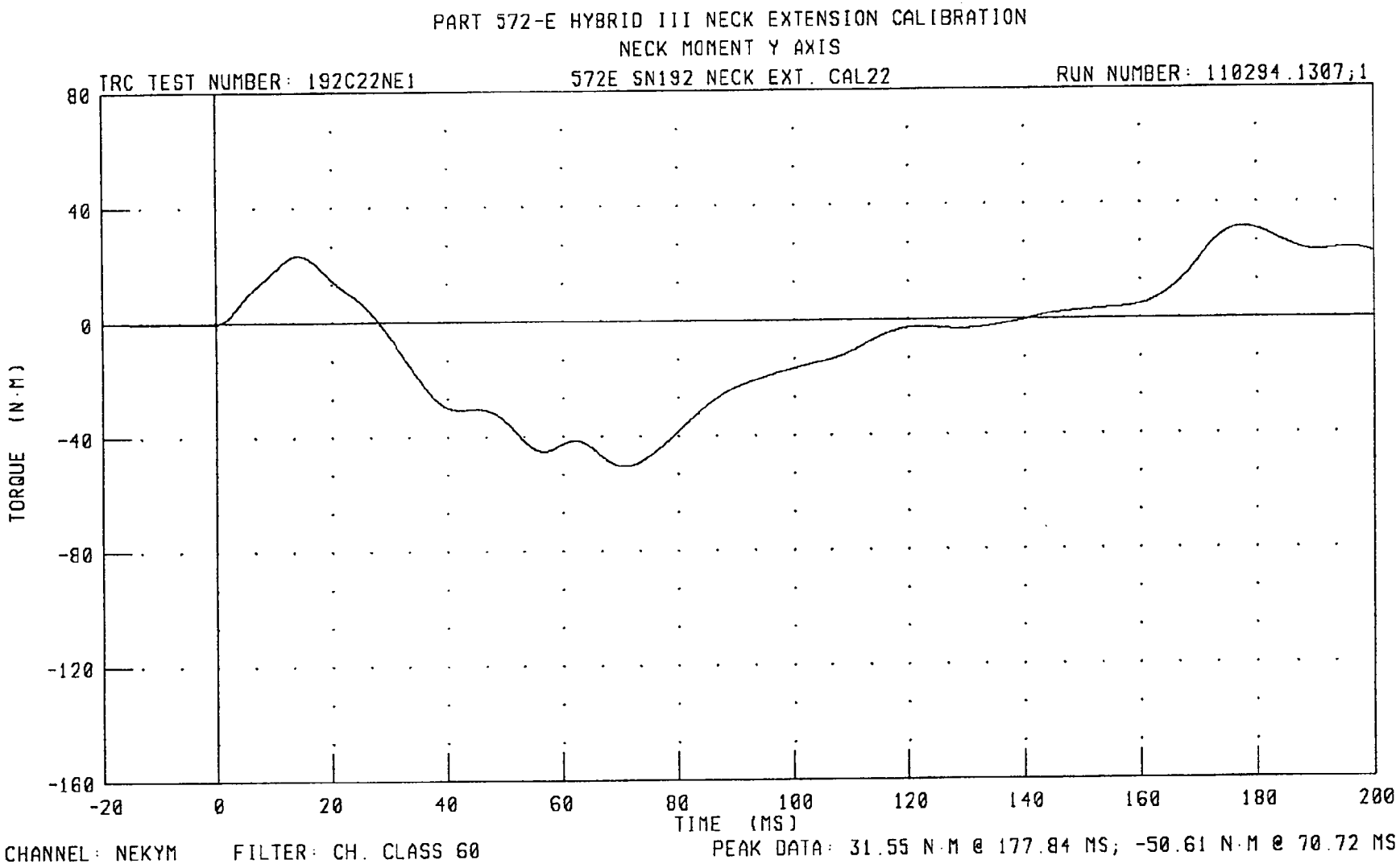
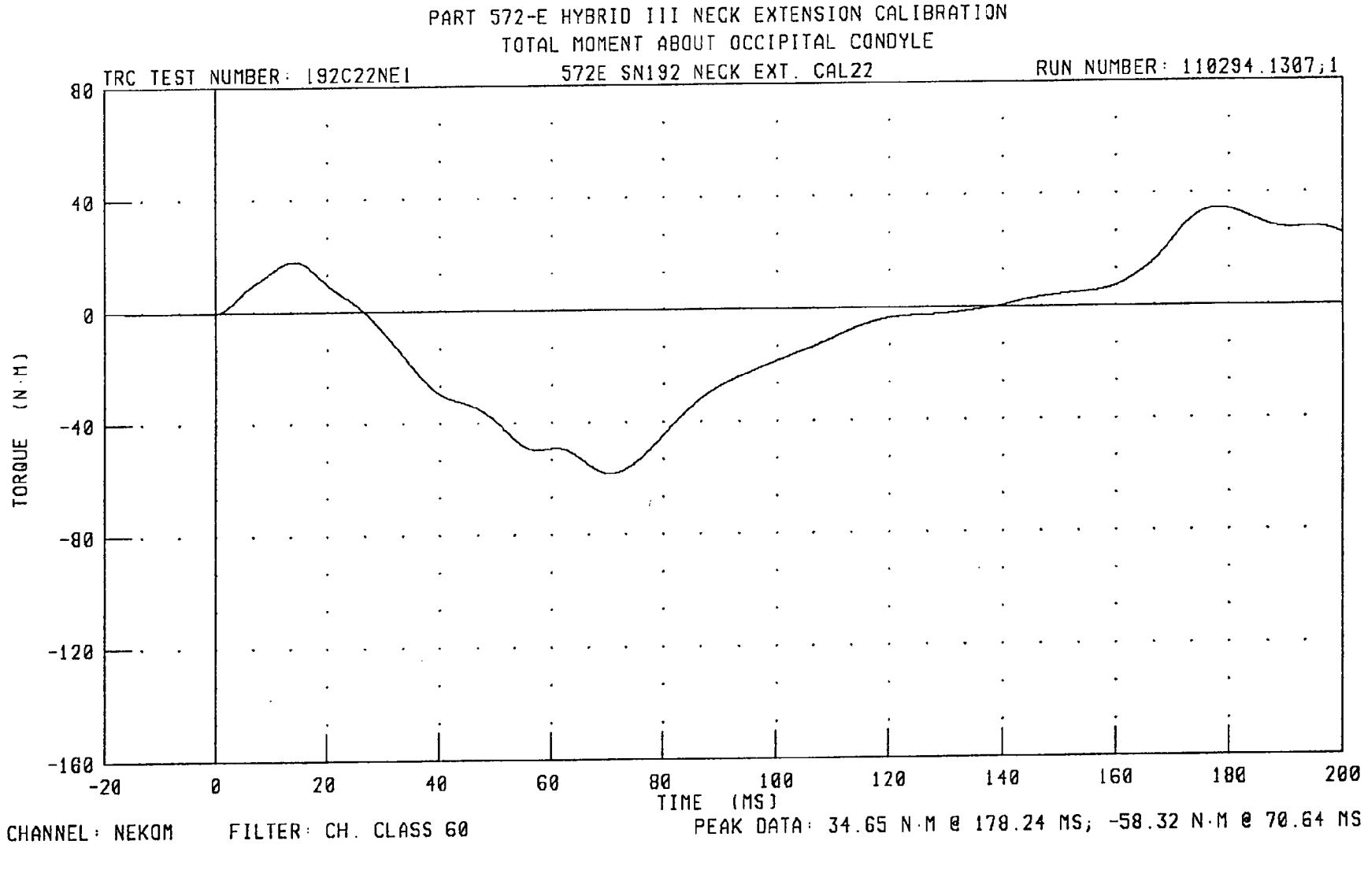

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 192C22NE1
572E SN192 NECK EXT. CAL22
RUN NUMBER: 110294.1307;1
80
40
0
-40
-80
-120
-160
TORQUE (N·M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKYM
FILTER: CH. CLASS 60
PEAK DATA: 31.55 N·M @ 177.84 MS; -50.61 N·M @ 70.72 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 192C22NE1
572E SN192 NECK EXT. CAL22
RUN NUMBER: 110294.1307;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: 34.65 N-M @ 178.24 MS; -58.32 N-M @ 70.64 MS

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TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 09-SEP-94

TRC INC. TEST NO: 192C22TH1 572E SN192 H.S.THORAX CAL22

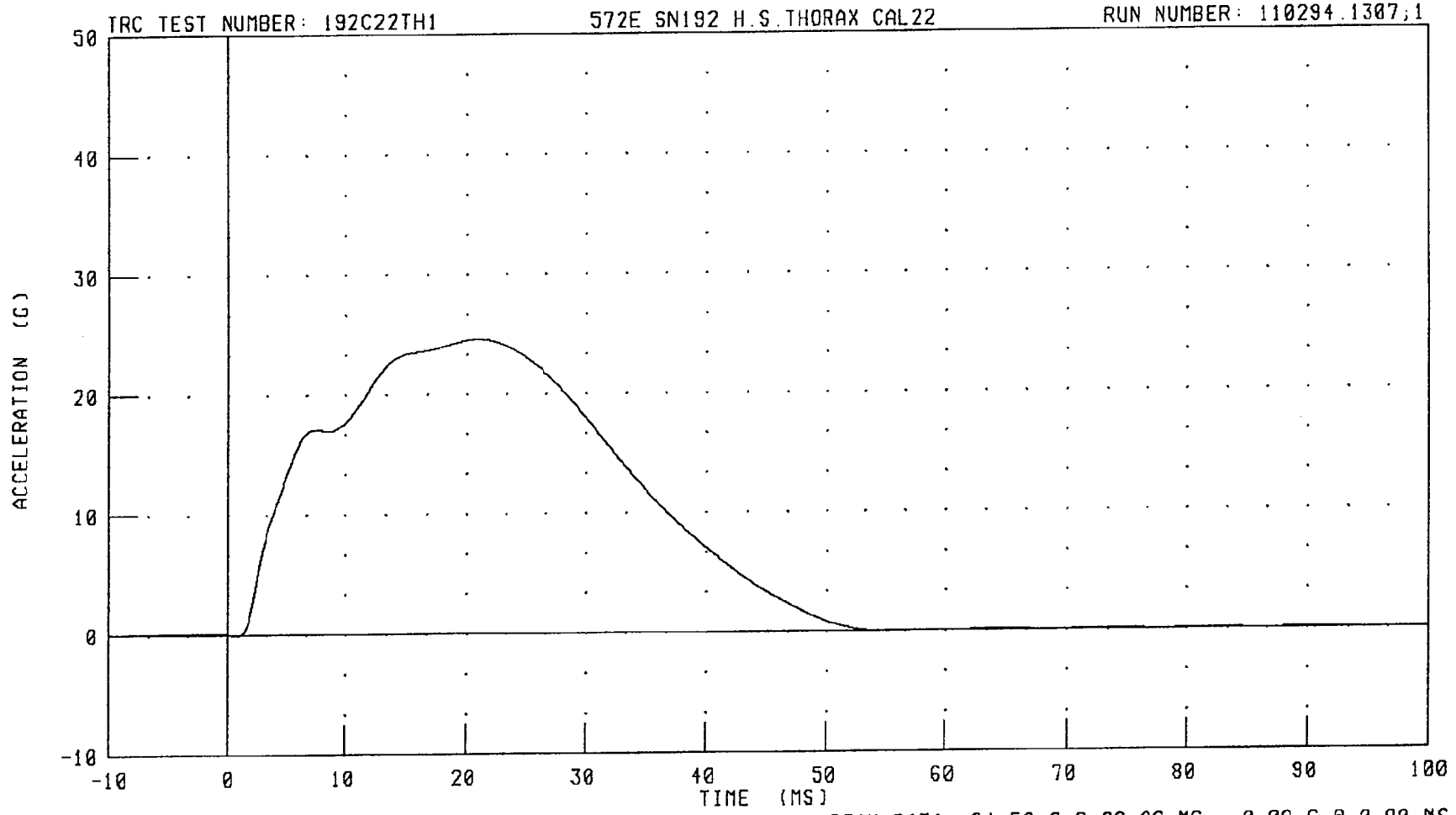
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.65 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	65.9 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5625. N
INTERNAL HYSTERESIS	69% - 85%	73.5%

TEST MEETS SPECIFICATIONS

TECHNICIAN Peter Foster RUN NUMBER: 090994.1047;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192C22TH1 572E SN192 H.S.THORAX CAL22 RUN NUMBER: 110294.1307;1



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 24.56 G @ 20.96 MS; -0.08 G @ 0.80 MS

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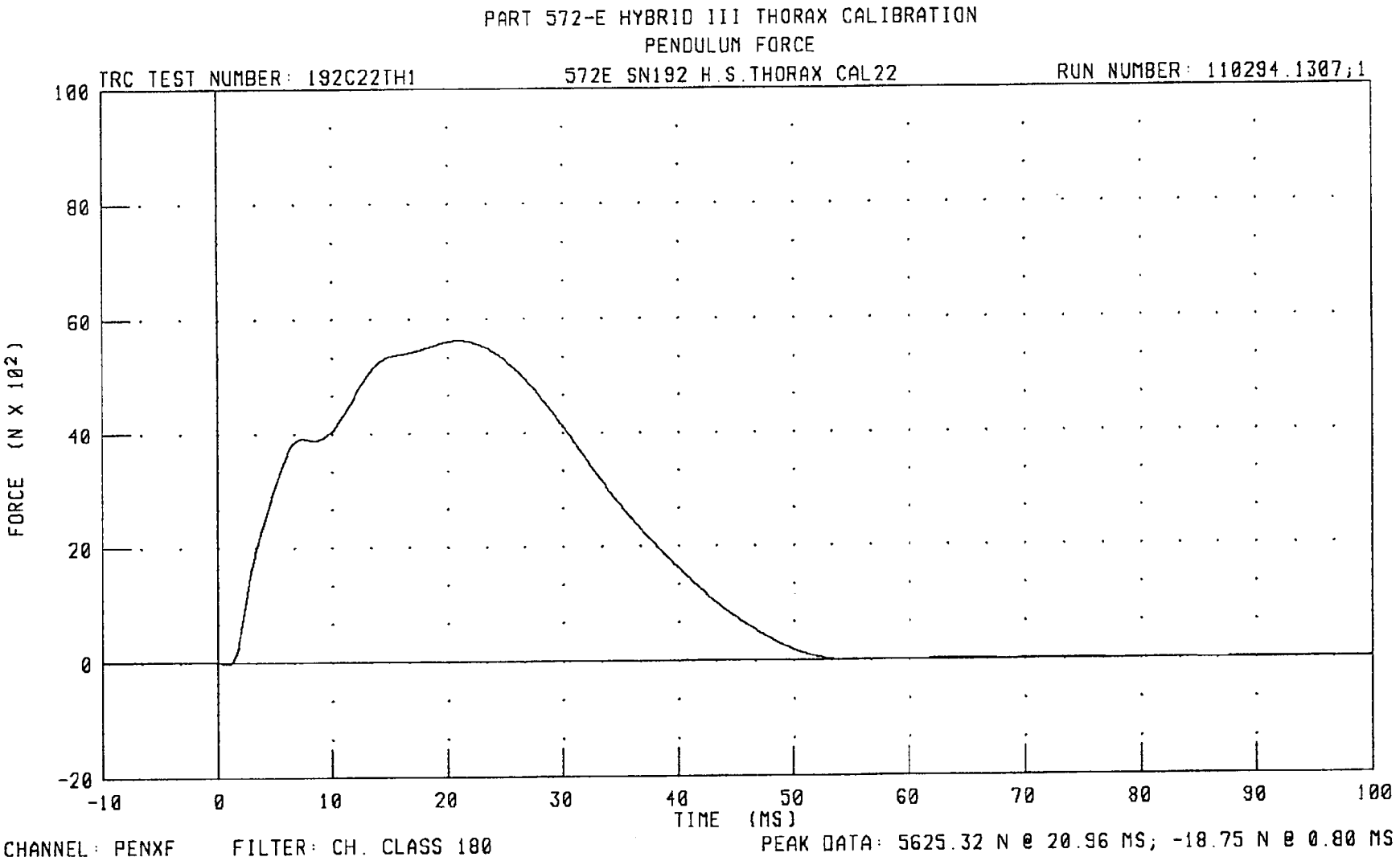
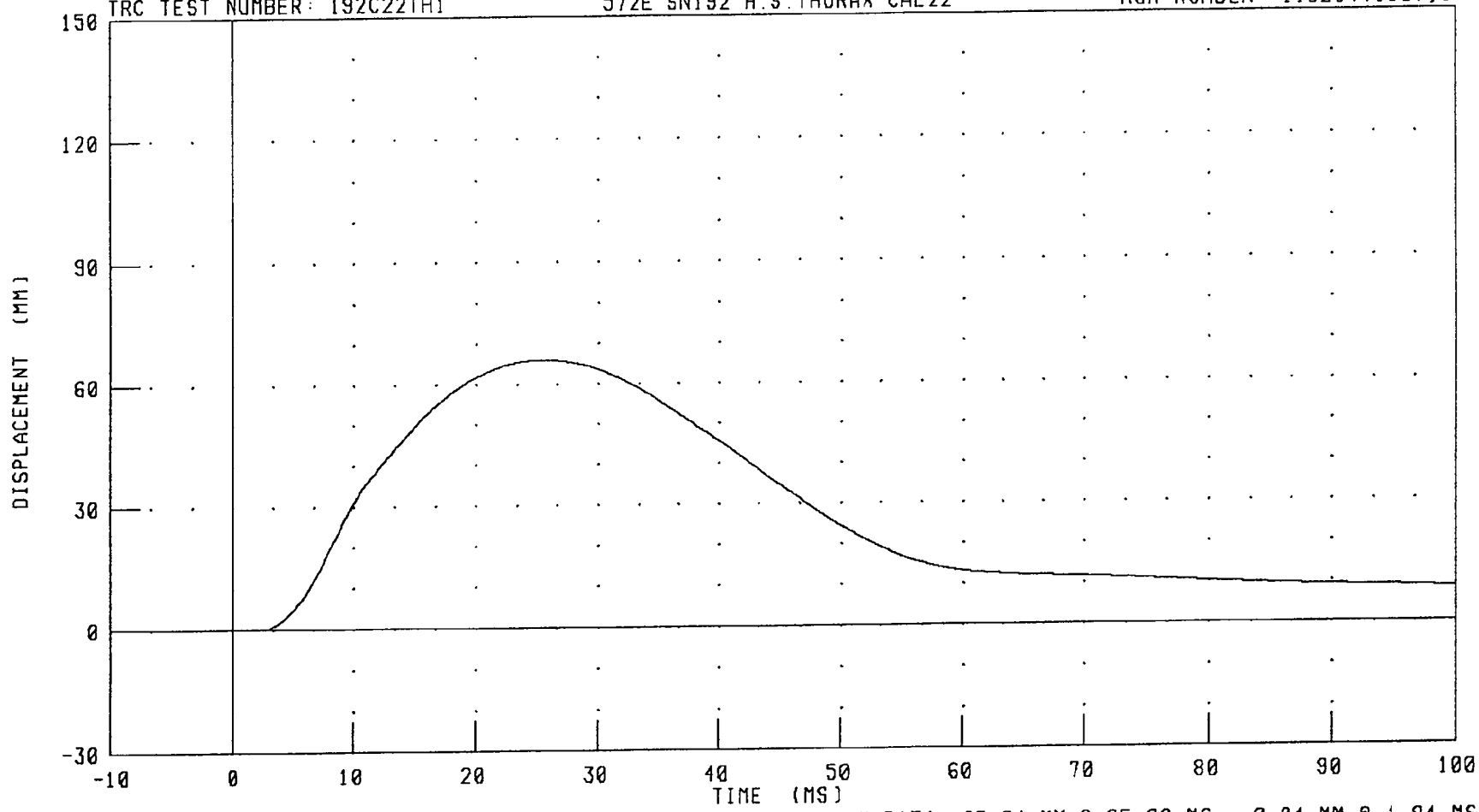

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE
TRC TEST NUMBER: 192C22TH1
572E SN192 H.S.THORAX CAL22
RUN NUMBER: 110294.1307;1
100
80
60
40
20
0
-20
FORCE (N X 10²)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: PENXF
FILTER: CH. CLASS 180
PEAK DATA: 5625.32 N @ 20.96 MS; -18.75 N @ 0.80 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C22TH1 572E SN192 H.S.THORAX CAL22 RUN NUMBER: 110294.1307;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 65.94 MM @ 25.60 MS; -0.04 MM @ 1.84 MS

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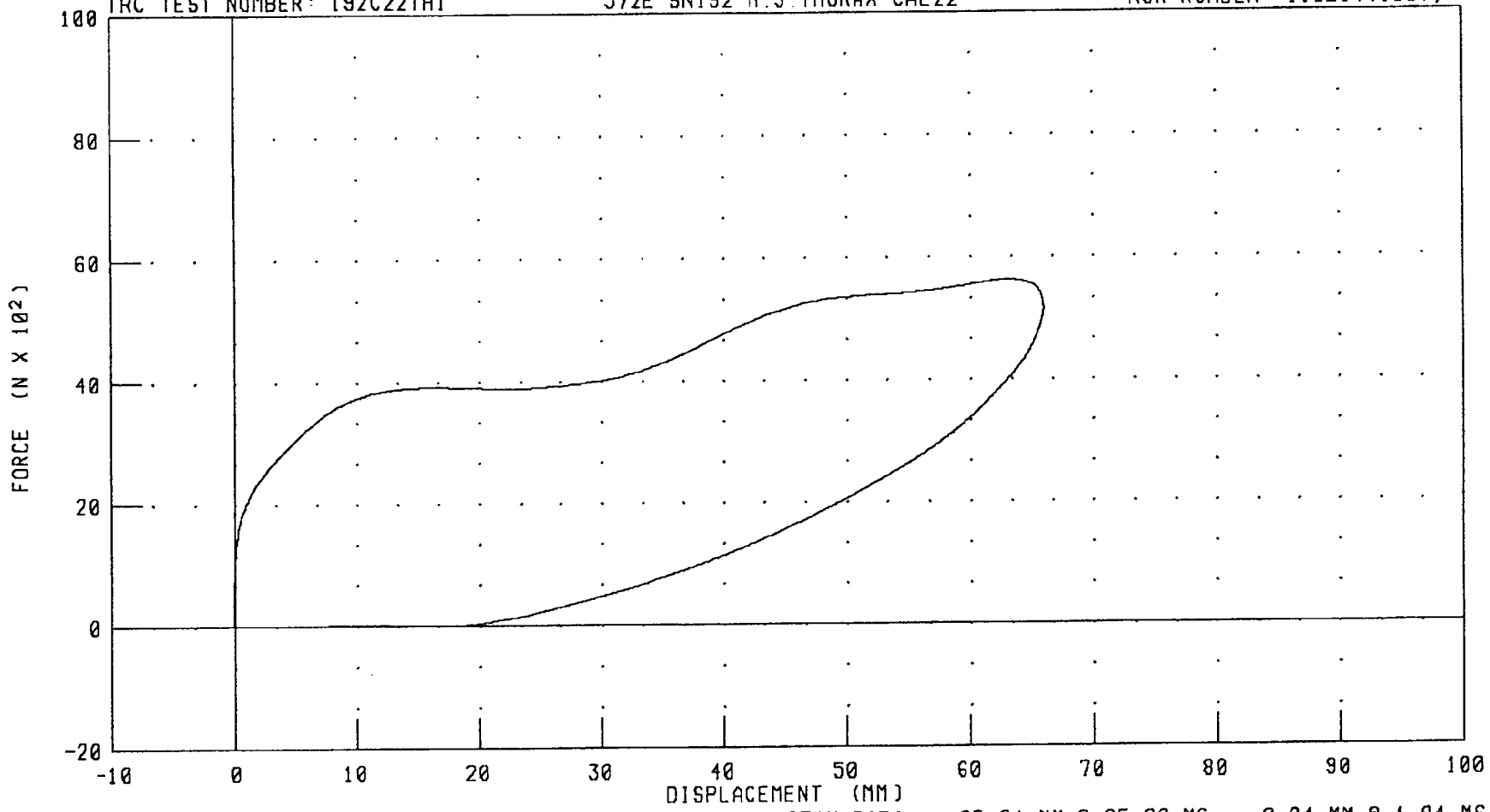
PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 192C22TH1 572E SN192 H.S.THORAX CAL22 RUN NUMBER: 110294.1307;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 65.94 MM @ 25.60 MS; -0.04 MM @ 1.84 MS
PENXF CH. CLASS 180 5625.32 N @ 20.96 MS; -18.75 N @ 0.80 MS

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TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

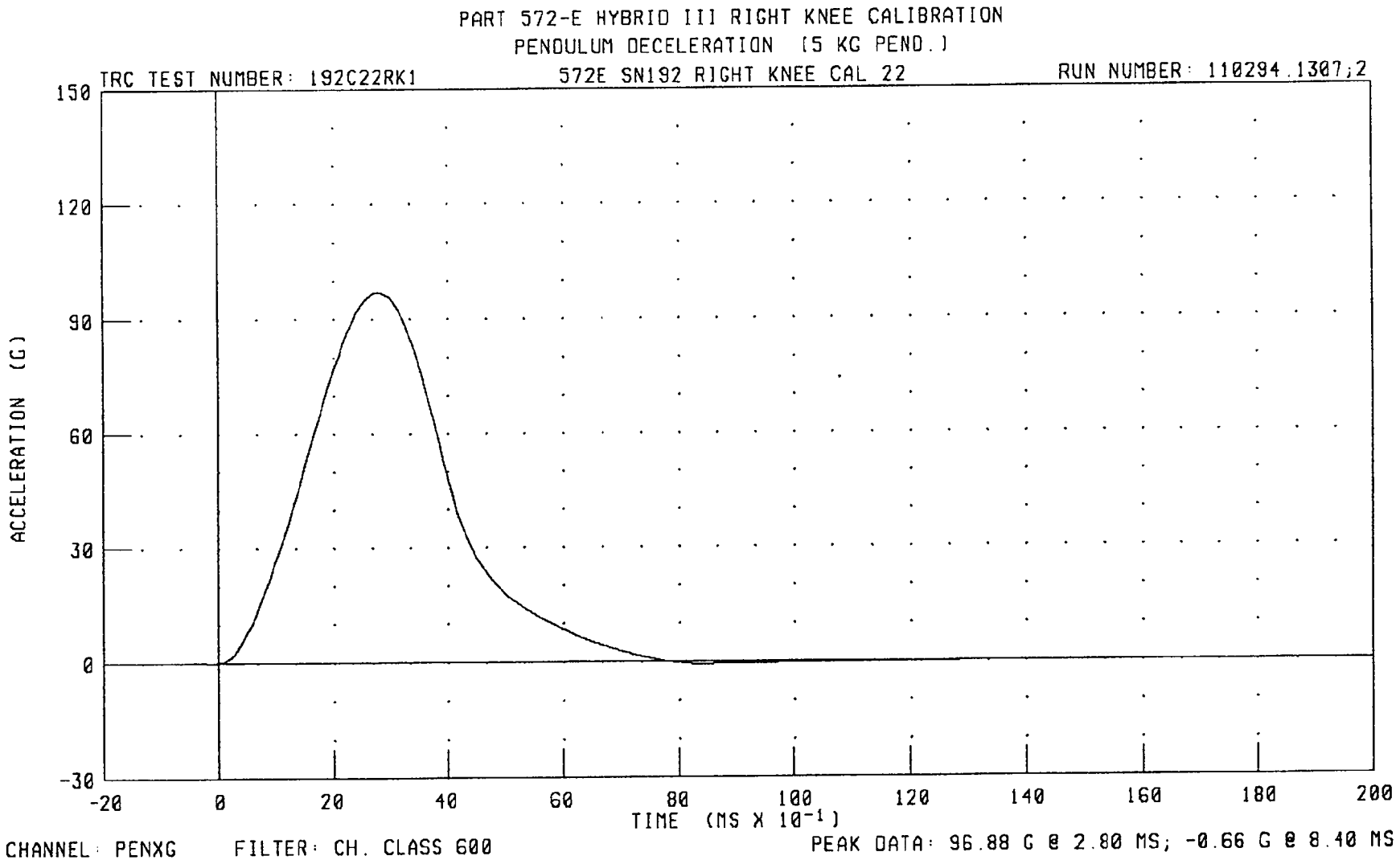
HYBRID III 09-SEP-94

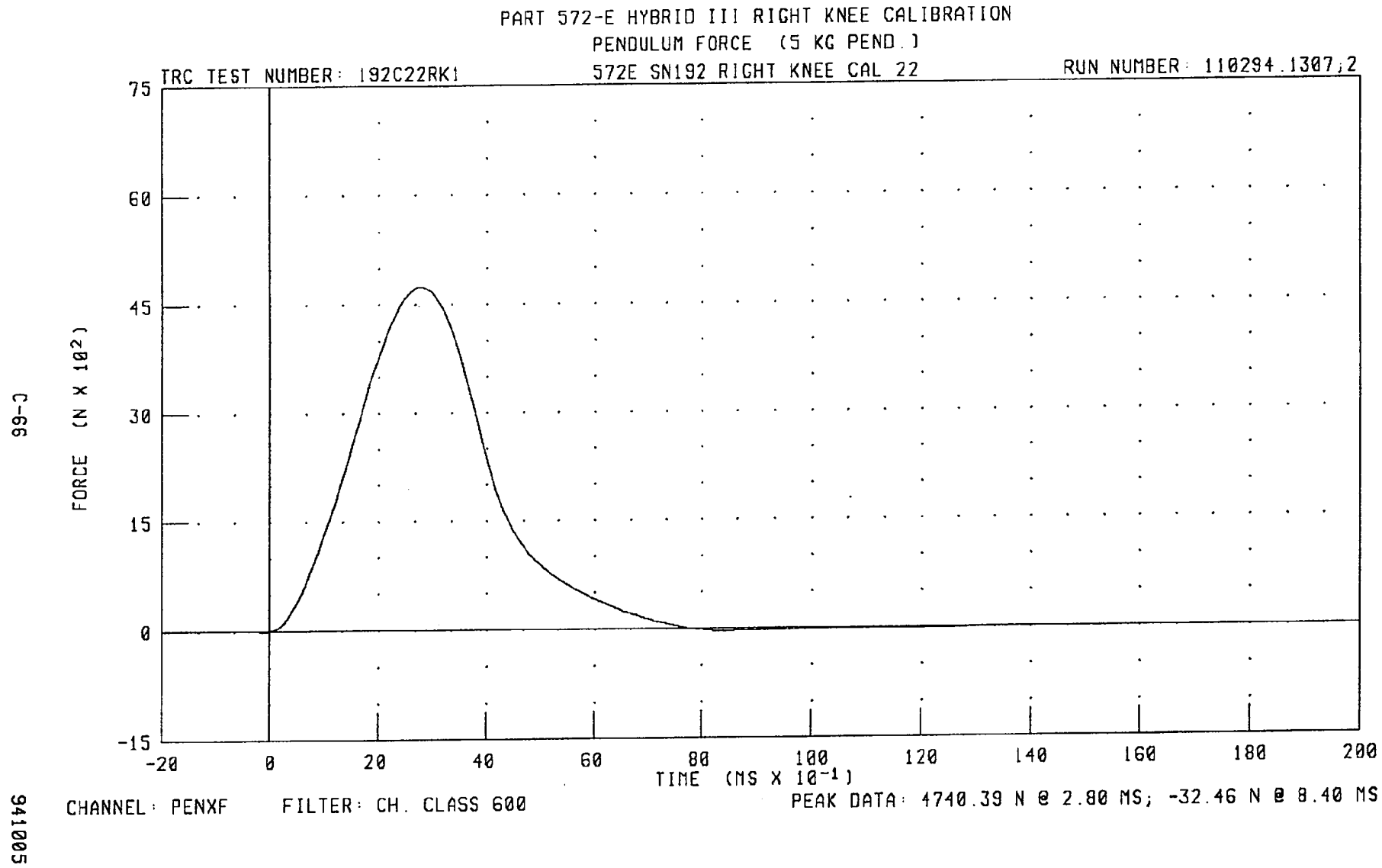
TRC INC. TEST NO: 192C22RK1 572E SN192 RIGHT KNEE CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	4740.3 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foss RUN NUMBER: 090994.0729;2


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 192C22RK1
572E SN192 RIGHT KNEE CAL 22
RUN NUMBER: 110294.1307;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: 96.88 G @ 2.80 MS; -0.66 G @ 8.40 MS


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 192C22RK1
572E SN192 RIGHT KNEE CAL 22
RUN NUMBER: 110294.1307;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: 4740.39 N @ 2.80 MS; -32.46 N @ 8.40 MS

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TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

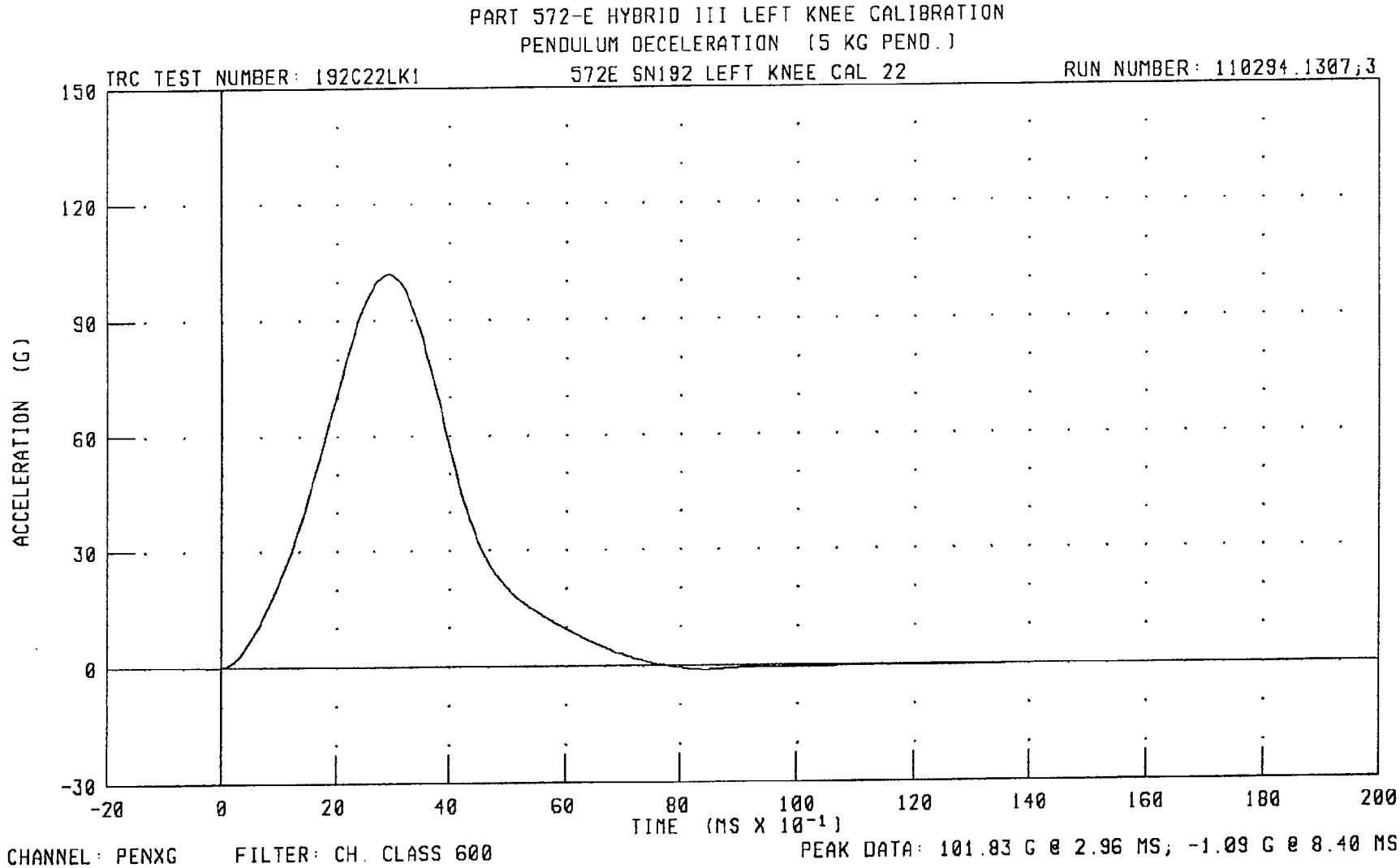
HYBRID III 09-SEP-94

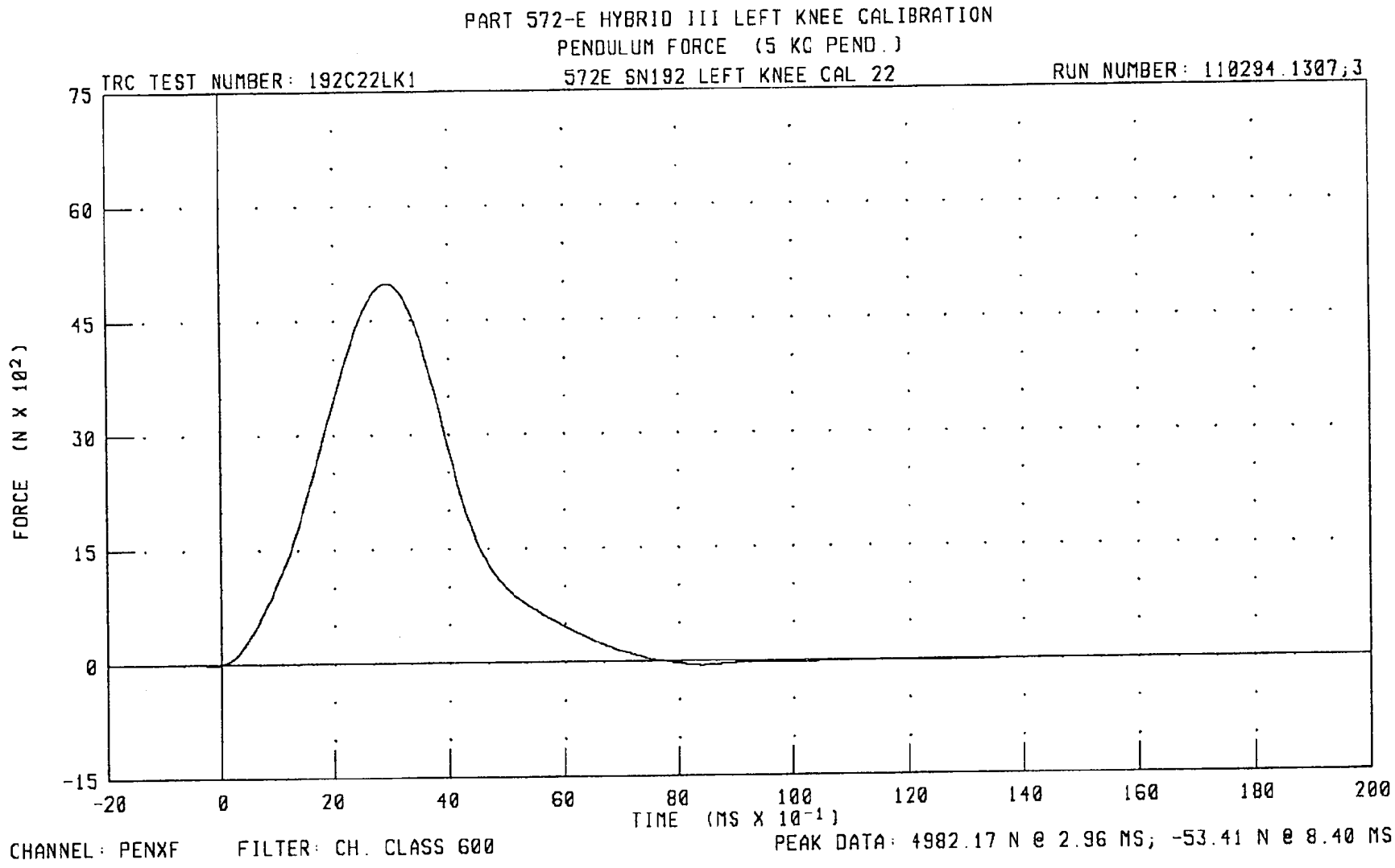
TRC INC. TEST NO: 192C22LK1 572E SN192 LEFT KNEE CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.08 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	4982.1 N

TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 110294.1233;3


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 192C22LK1
572E SN192 LEFT KNEE CAL 22
RUN NUMBER: 110294.1307;3
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: 101.83 G @ 2.96 MS; -1.09 G @ 8.40 MS


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 192C22LK1
572E SN192 LEFT KNEE CAL 22
RUN NUMBER: 110294.1307;3
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: 4982.17 N @ 2.96 MS; -53.41 N @ 8.40 MS

Appendix D

Miscellaneous Test Information

Dummy Instrument Calibrations

Driver Dummy #142

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Head X-axis accelerometer	FH25J	7264	Endevco	08/29/94	02/29/95
Head Y-axis accelerometer	CY32H	7264	Endevco	08/29/94	02/29/95
Head Z-axis accelerometer	DB81H	7264	Endevco	08/29/94	02/29/95
Chest X-axis accelerometer	A79GJ	7264	Endevco	08/25/94	02/25/95
Chest Y-axis accelerometer	AC8W6	7264	Endevco	08/29/94	02/29/95
Chest Z-axis accelerometer	CW42H	7264	Endevco	08/29/94	02/29/95
Left femur force load cell	901	2430	GSE	08/30/94	02/30/95
Right femur force load cell	902	2430	GSE	08/30/94	02/30/95
Neck X-axis force load cell[1]	0280	1716	Denton	08/30/94	02/30/95
Neck Y-axis force load cell[1]	0280	1716	Denton	08/30/94	02/30/95
Neck Z-axis force load cell[1]	0280	1716	Denton	08/30/94	02/30/95
Neck Moment about X-axis load cell[1]	0280	1716	Denton	08/30/94	02/30/95
Neck Moment about Y-axis load cell[1]	0280	1716	Denton	08/30/94	02/30/95
Neck Moment about Z-axis load cell[1]	0280	1716	Denton	08/30/94	02/30/95
Chest deflection potentiometer[1]	14CB1-2981	81422A	Vernitech	08/29/94	02/29/95
Lap belt force load cell	571	3419	Lebow	08/19/94	02/19/95
Shoulder belt force load cell	610	3419	Lebow	08/19/94	02/19/95

[1] Hybrid III use only.

Dummy Instrument Calibrations

Right Front Passenger Dummy #192

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Head X-axis accelerometer	AAL82	7264	Endevco	08/30/94	02/30/95
Head Y-axis accelerometer	A84JJ	7264	Endevco	08/30/94	02/30/95
Head Z-axis accelerometer	DW04J	7264	Endevco	08/30/94	02/30/95
Chest X-axis accelerometer	CT22H	7264	Endevco	08/30/94	02/30/95
Chest Y-axis accelerometer	AC708	7264	Endevco	08/30/94	02/30/95
Chest Z-axis accelerometer	CW59H	7264	Endevco	08/30/94	02/30/95
Left femur force load cell	986	2430	GSE	08/30/94	02/30/95
Right femur force load cell	987	2430	GSE	08/30/94	02/30/95
Neck X-axis force load cell[1]	085	1716	Denton	08/30/94	02/30/95
Neck Y-axis force load cell[1]	085	1716	Denton	08/30/94	02/30/95
Neck Z-axis force load cell[1]	085	1716	Denton	08/30/94	02/30/95
Neck Moment about X-axis load cell[1]	085	1716	Denton	08/30/94	02/30/95
Neck Moment about Y-axis load cell[1]	085	1716	Denton	08/30/94	02/30/95
Neck Moment about Z-axis load cell[1]	085	1716	Denton	08/30/94	02/30/95
Chest deflection potentiometer[1]	87313-96	81422A	Vernitech	08/30/94	02/30/95
Lap belt force load cell	130	3419	Lebow	08/19/94	02/19/95
Shoulder belt force load cell	615	3419	Lebow	08/19/94	02/19/95

[1] Hybrid III use only.

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Left rear seat crossmember X-axis	DT96JT	7264	Endevco	05/26/94	11/26/94
Left rear seat crossmember X-axis redundant	CR59H	7264	Endevco	08/04/94	02/04/95
Right rear seat crossmember X-axis	DY61J	7264	Endevco	04/28/94	10/28/94
Right rear seat crossmember X-axis redundant	CY36H	7264	Endevco	04/28/94	10/28/94
Engine top X-axis	AGRG7	7264	Endevco	09/08/94	03/08/95
Engine bottom X-axis	DW34JC	7264	Endevco	04/27/94	10/27/94
Right brake caliper X-axis	AGRF7	7264	Endevco	08/09/94	02/09/95
Left brake caliper X-axis	AGRJ1	7264	Endevco	08/24/94	02/24/95
Instrument panel center X-axis	CW06H	7264	Endevco	08/15/94	02/15/95

Calibration Laboratory Instruments

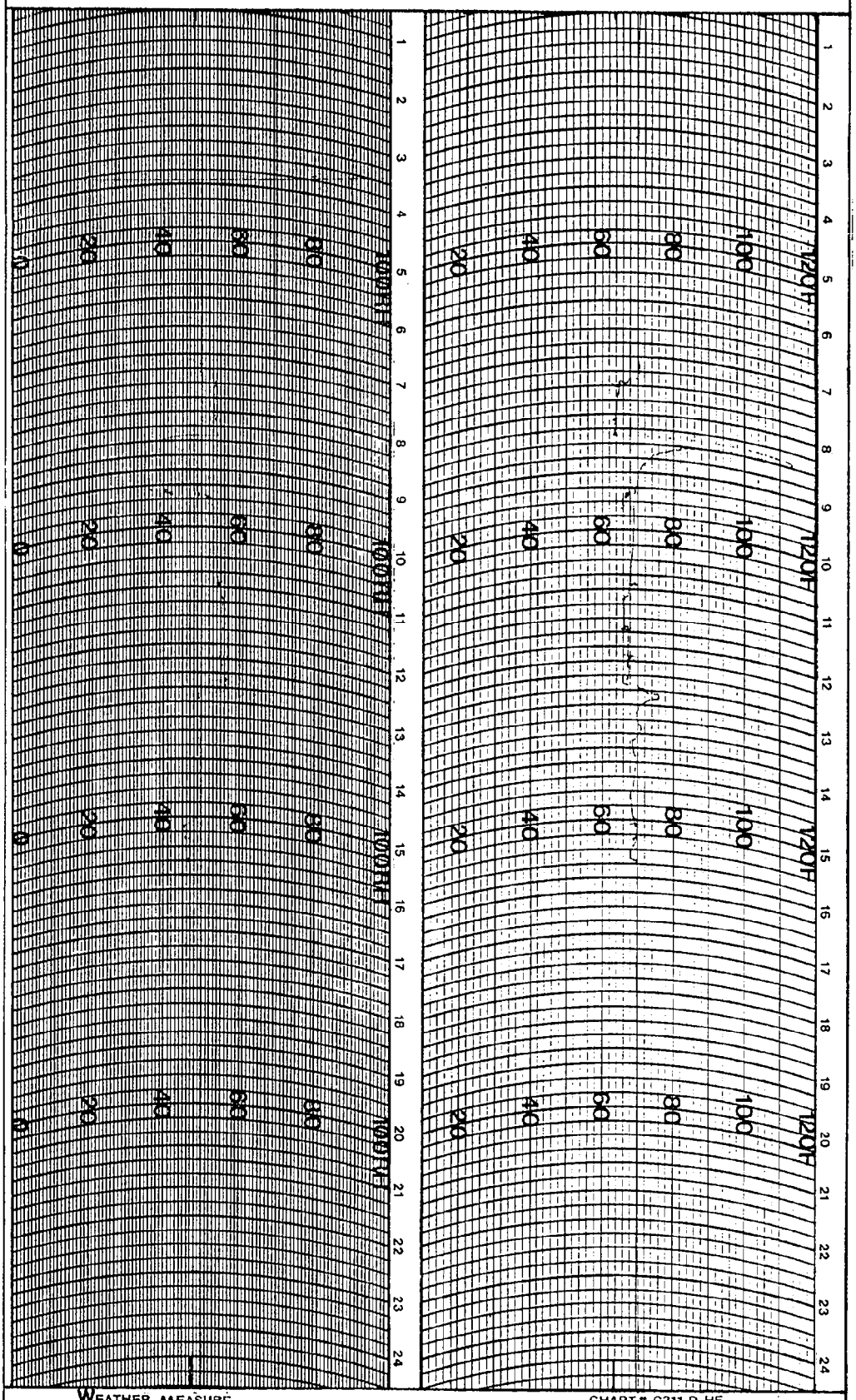
	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Neck bending pendulum accelerometer	CB27	7232	Endevco	09/26/94	03/26/95
Neck bending rotary potentiometer	NA	35435-1-102	Bournes	Mfr. Specification	
Neck bending linear potentiometer	NA	5184-2051846003	Bournes	09/26/94	03/26/95
Thorax/Hybrid II femur pendulum accelerometer	CC64	7232	Endevco	09/26/94	03/26/95
Lumbar flexion force gauge	NA	DPPH-50	Chatillon	05/03/89	repaired
Lumbar flexion rotation gauge	CP17-0601-1	7020	Humphrey	Mfr. Specification	
Abdomen compression displacement gauge	4075-175	80294-2051941504	Bournes	09/26/94	03/26/95
Abdomen compression force gauge	3443	3167	Lebow	09/26/94	03/26/95
Hybrid III femur pendulum accelerometer	CG83	7232	Endevco	09/26/94	03/26/95

Sign Convention
NHTSA Data Tape Reference Guide

Accelerometers:	+X: Forward	
	+Y: Leftward	
	+Z: Upward	
Potentiometers:	+Chest longitudinal deflection:	Outward
	+Chest lateral deflection:	Leftward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (in relation to a seated dummy)
Load cells:	+Femur force:	Tension
	+Seat belt force:	Tension
	+Barrier force:	Tension
Neck load cells:	+X force:	Head pushed forward
	+y force:	Head pushed leftward
	+Z force:	Head pulled upward (tension on neck)
	+X moment:	Right ear rotating toward right shoulder
	+Y moment:	Chin rotating toward chest
	+Z moment:	Chin rotating toward left shoulder
Tibia load cells:	+X force:	Tension
	+Y force:	Tension
	+Z force:	Tension
	+X moment:	Bottom of tibia moving leftward
	+Y moment:	Bottom of tibia moving rearward

Frequency Response Classes
SAE J211 OCT88

Typical Test Measurements	Channel Class
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	180
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000



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

HYGROTHERMOGRAPH
1 DAY DKS 17:15

CHART # C311 D HF
PART # 699123

STATION Runway Land-Off DATE ON 10-4-94 DATE OFF 10-5-94

Appendix E

Restraint System Instructions from Owner's Manual

Always wear your safety belts!

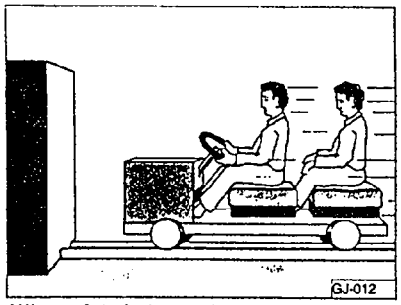
WARNING

Safety belts have been shown to be the single most effective means available for reducing the potential for serious injury and death in automobile accidents. Therefore, for your own protection as well as that of your passengers always properly wear safety belts when the vehicle is in motion.

Pregnant women, injured or physically impaired persons should also use safety belts. Like all vehicle occupants, they are more likely to be seriously injured if they do not wear safety belts. The best way to protect the fetus is to protect the mother.

Why safety belts work and how to wear them properly is explained in this chapter. Read all the information given and always observe the following instructions and warnings pertaining to the use of the safety belts installed in your vehicle.

For information on child safety see page 23.



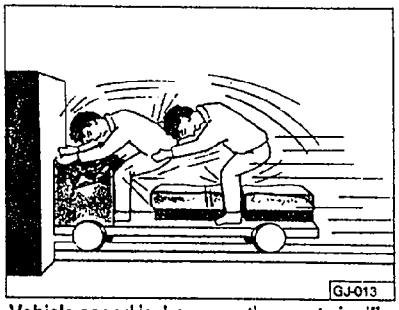
Why safety belts work

Safety belts can't work unless they are worn and worn properly.

The illustration above shows the passengers on a "vehicle" which is headed for a brick wall. They are not using safety belts.

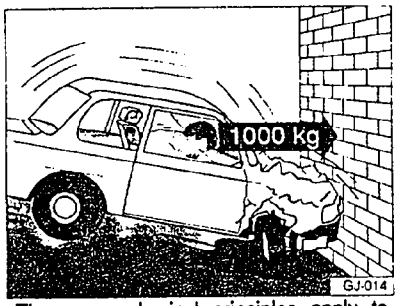
The physical principles involved are simple. Both the vehicle and the passengers possess energy which varies with vehicle speed and body weight. Engineers call this energy "kinetic energy."

The higher the speed of the vehicle and the greater the passenger's weight, the more kinetic energy there is and the more energy which must be "absorbed" in an accident.



Vehicle speed is, however, the most significant factor. If the speed doubles from 15 to 30 mph (25 to 50 km/h), for example, the kinetic energy increases 4 times!

Because these passengers are not using safety belts, their kinetic energy remains unchanged. They will keep moving at the same speed the vehicle was moving just before the crash, until something gets in the way, here, the wall.



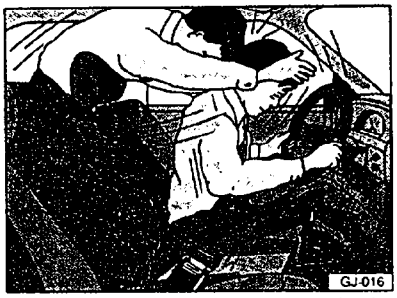
The same physical principles apply to people sitting in a passenger car which is involved in a frontal collision.

Even when driving at speeds of only 20 to 30 mph (30–50 km/h), the forces acting on the body can reach one ton (2000 lb/1000 kg) or more. At greater speeds these forces are even higher.

People who do not use safety belts are also not attached to their car. In a frontal collision they will also continue to move forward at the speed their car was traveling just before the impact.

Unable to resist the tremendous forces arising at impact, they will slam violently into the steering wheel, dashboard, windshield or whatever else is in the way. Their impact with the vehicle interior takes place with all of the kinetic energy they had just before their car crashed. Those who do not use safety belts can also be thrown out of their car where even more severe or fatal injuries can occur.

Nobody is strong enough to overcome the forces of an accident by holding tight or bracing themselves against the dashboard. Safety belts can help to reduce the risk of injury caused by uncontrolled impact with the vehicle and the possibility of ejection.



Passengers sitting in the rear seats who do not use safety belts not only endanger themselves but also front seat passengers. In a frontal collision they will also move forward where they can hit and injure the driver or front seat passenger.

Safety belts protect

Safety belts used properly can make a big difference. Safety belts help to keep passengers in their seats, reduce energy levels applied to the body in an accident gradually and help prevent the uncontrolled movement which can cause serious injuries. Safety belts also help to keep passengers in their seats.

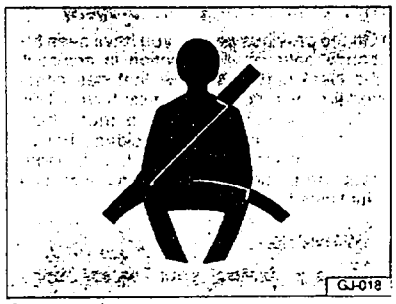
Safety belts attach passengers to the car and give them the benefit of being slowed down more gently or "softly" through the give in the safety belts, the crumple zones and other safety features engineered into today's Volkswagens. By reducing the kinetic emergency over a longer period of time, the forces on the body become more "tolerable" and less likely to produce injury.

In addition, safety belts reduce the danger of being thrown out of the car.

Although these examples are based on a frontal collision, safety belts can also substantially reduce the risk of injury in other types of accidents. So, regardless of whether you are on a long trip or just going to the corner store, always buckle up and make sure others do, too.

The following pages provide important instructions which will enable you to use safety belts properly. Be sure to read and follow the instructions carefully and heed all warnings.

To increase the driver's and front passenger's safety, the vehicle is equipped with an Automatic Safety Belt System as standard equipment.



Belt warning system

Your vehicle has a warning light to remind you to wear your safety belt.

If you do not put on your safety belt after switching on the ignition, the warning light in the instrument cluster will come on along with a warning tone for approximately 6 seconds. **Fasten your safety belt now and make sure that your passengers also properly put on their safety belts.**

How to wear safety belts properly

On the previous pages, you have seen how safety belts offer protection in accidents. Accident statistics show that passengers properly wearing safety belts have a lower risk of being injured and a much better chance of surviving an accident. For this reason, wearing a safety belt is legally required in most countries and in much of the United States and Canada.

WARNING

Always fasten your safety belts before driving off. Always make sure your passengers are properly restrained even those sitting in the rear.

Safety belts can only work when used properly. Always observe the following precautions:

- **Never wear belts twisted.**
- **Never strap in more than one person, including small children, with each belt. It is especially dangerous to place a safety belt over a child sitting on your lap.**
- **Never place your feet on the instrument panel or on the seat. Always keep both feet on the floor in front of the seat.**
- **Never wear belts over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc. as these may cause injury.**
- **Never wear safety belts in any other way than illustrated and described in this chapter. For instance, do not wear shoulder part of belt under your arm or otherwise out of position. This would increase the risk of serious injury in case of an accident.**
- **Several layers of heavy clothing may interfere with proper positioning of belts and reduce the overall effectiveness of the system.**

WARNING continued

- **Never allow safety belts to become damaged by being caught in door or seat hardware. Always keep belt buckles free of any obstruction that may prevent secure locking.**
- **Never use comfort clips or devices which create slack in the shoulder belt portion and can increase the risk of injury in an accident. However such clips may be required in the proper use of some child restraint systems.**
- **Inspect your belts periodically. If belts show damage to webbing, bindings, buckles or retractors, they must be replaced.**
- **The belts must be kept clean as otherwise the retractors may not work properly (see also "Vehicle Care", page 91).**
- **Safety belts that have been worn and loaded in an accident must be replaced by an authorized Volkswagen retailer.**
- **Never modify, disassemble or attempt to repair the safety belts in your vehicle.**

Your vehicle has 5 seating positions, 2 in the front and 3 in the rear. Each seating position has been provided with a safety belt, which must be used for your safety whenever the vehicle is in motion.

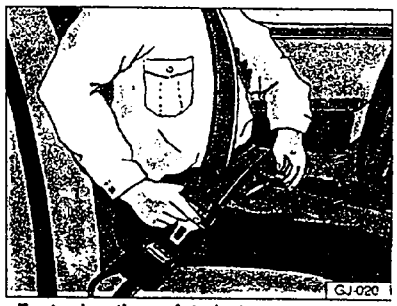
Three point, lap–shoulder belt*

On vehicles with the Automatic Safety Belt System, only the outside seating positions of the rear seat have the three point, lap–shoulder safety belt.

On vehicles equipped with the Supplemental Airbag System, the driver's and front passenger's seat, as well as the outside seating positions of the rear seat are equipped with a three point, lap–shoulder safety belt.

This combination lap-shoulder belt has a locking retractor. The system adjusts automatically to your size and movements as long as the pull on the belt is slow.

Hard braking or a collision locks the belt. The belt will also lock when you drive up or down a steep hill or in a sharp curve.



Fastening the safety belt

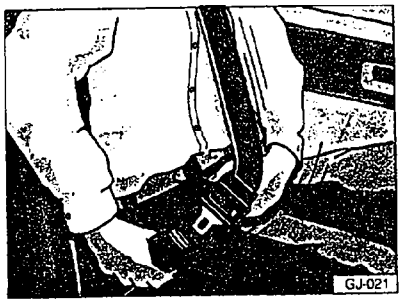
- Before fastening the safety belt, first adjust your seat – see page 35.

WARNING

Safety belts only offer optimum protection when the seat back is upright and belts are properly positioned on the body. Improperly positioned safety belts can cause serious personal injury in an accident.

- To fasten, grasp belt tongue and pull belt in continuous slow motion across your chest and lap.

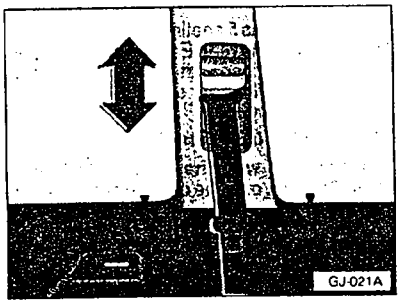
* Where applicable



■ Insert belt tongue into buckle on inboard side of seat. Push down until it is securely locked with an audible click. Pull belt to check.

WARNING

Always make certain that the safety belt tongue is inserted into the safety belt buckle associated with the corresponding seat. Attaching the safety belt to the buckle for another seat could reduce safety belt effectiveness and cause injury.



Safety belt height adjustors* of the front seats can be used to adjust the height of the shoulder portion of the safety belt.

■ Press the handle slowly up or down so that the shoulder portion of the safety belt is positioned nearly midway over the shoulder.

■ Pull on the shoulder belt to check whether the belt anchor is securely locked in place.

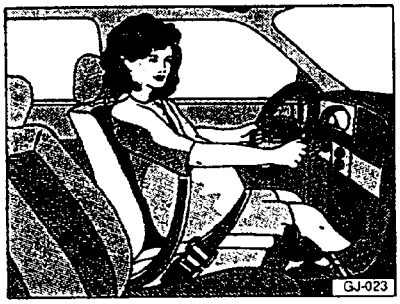
The shoulder belt must be positioned over the shoulder – it must never rest against the neck and must fit against your body. The lap belt must be worn low and tight across the pelvis. Pull belt tight if necessary.

WARNING

■ **Always position safety belts properly over the body for maximum levels of safety. Improperly positioned safety belts can cause serious personal injury in case of an accident.**

■ **Safety belts worn too loose will allow too much forward movement of your body in a crash. This will increase the risk of personal injury.**

* Where applicable



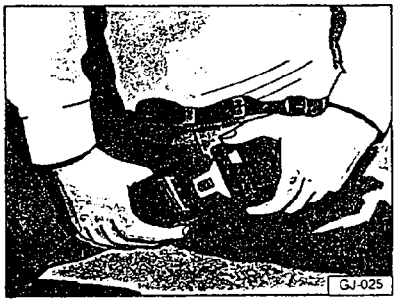
WARNING

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

Unfastening the safety belt

■ Push the orange release button on the buckle. The belt tongue will spring out of the buckle.

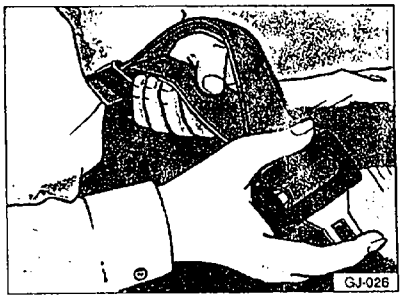
■ Allow belt to wind up on retractor as you guide belt tongue to its stowed position.



Lap belt

The rear center seating position is equipped with a lap belt.

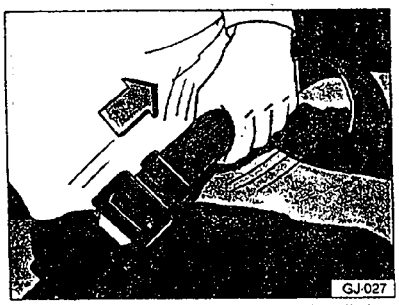
■ Pull the belt over the pelvis and insert the tongue into the buckle.



■ If the belt length is too short, you can lengthen the belt.

Hold belt tongue at a right angle to the belt and loop out the required portion.

For easy operation, press cap and tongue of buckle together.



■ To tighten belt, buckle up and pull the loose end of the belt.

WARNING

To reduce the risk of injury in an accident, position the lap belt tight and as low as possible across the pelvis.

Pregnant women should especially make sure to wear the lap portion of the safety belt as low as possible across the pelvis so that there is no pressure on the abdomen.

■ To unfasten belt, push in the orange release button on buckle.

Note

For safety reasons, keep the belt on top of the seat and fastened together when it is not being used.

CHILD SAFETY

The physical principles illustrated on pages 15 - 17 also apply to children. In contrast to adults and teenagers, their muscles and bones are not fully developed. In many respects children have a greater risk of serious injury in accidents than adults.

Because children's bodies are not fully developed, they require restraint systems which are especially designed for their size, weight and body structure. Many countries and all States of the United States have laws which require the use of approved child restraint systems for infants and small children.

Child restraints, like adult safety belts, must be used properly to be effective. Used improperly child restraints can also increase the risk of serious injury in an accident.

WARNING

All vehicle occupants and especially children should be restrained whenever riding in a vehicle. An unrestrained child could be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact. Do not allow children to stand or kneel on the seat. A child restraint system can help protect a child in a vehicle.

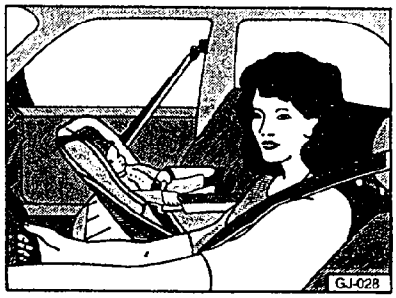
Accident statistics have shown that children are generally safer in the rear seat area than in the front seating position.

A suitable child restraint properly installed and used at one of the rear seating positions provides the highest degree of protection for infants and small children in most accident situations.

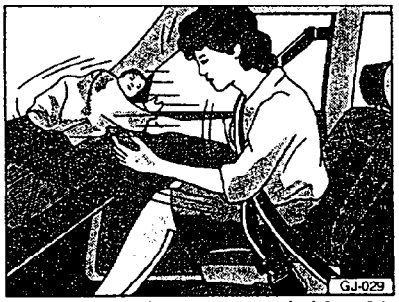
Children who are less than 12 years old should normally sit in the rear.

All children must use, depending on age and body size, either a child restraint system or the existing safety belts.

The Volkswagen Automatic Safety Belt System installed on United States models as standard equipment is not suitable for use with a child seat. See page 27 for further information.



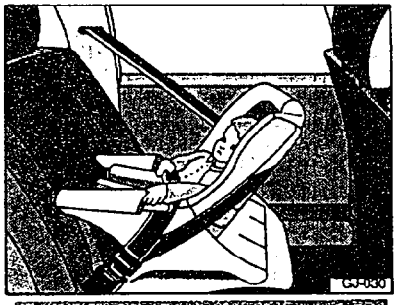
Your child may travel on the front passenger's seat only if you have a child restraint system which is specifically designed and approved by the child restraint system manufacturer for use in the front together with the restraint system installed at that position.



In a frontal accident at a speed of 20 - 35 mph (30 - 56 km/h) the forces acting on a 13 lb (6 kg) infant would be more than twenty times the weight of the child. This means that the weight of the child would suddenly be more than 260 lbs (120 kg). Only an appropriate child restraint system properly used can reduce the risk of serious injury under these conditions.

WARNING

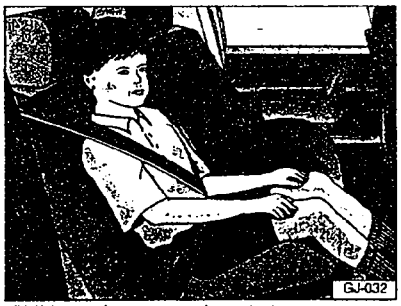
Infants and older children must never ride in a vehicle sitting on the lap of an adult. Holding a child in your arms is never a substitute for a child restraint system.



Forces acting on a child in an accident make it impossible to hold a child in the arms. The child would hit the dashboard, windshield or other parts of the vehicle interior and could receive serious injury. The adult's body could also move forward, particularly if the adult is not using safety belts and cause additional injury to the child.

Infants up to approximately 9 months old (22 lbs/10 kg) receive the best protection in special infant carriers and child seats designed for their age group. Many experts believe that infants and small children should only ride in special child restraints in which the child's back faces in driving direction.

Children up to 7 years old (55 lbs/25 kg) are best protected in child safety seats designed for their age and weight. Experts say that the skeletal structure, particularly the pelvis, of these children is not fully developed and that they should not use lap belts.



Children of average size of about 7 years and older may use available three point combination lap and shoulder belts usually together with appropriate booster seats meeting all applicable safety standards. Booster seats raise the seating position of the child and reposition both the lap and shoulder portions of the safety belt so that they pass across the child's body in the right places.

The routing of the belt over the child's body is extremely important for the child's protection whether or not a booster seat is used.

Always make sure that the shoulder portion of the three point belt is positioned midway over the shoulder. The shoulder portion must never rest against or across the neck and it may never contact or remain in front of the face, chin or throat. The lap belt portion of the three point belt as well as any lap belt alone must always pass as low as possible across the pelvis, never over the abdomen.

Children of average size of about 7 years of age and older may use available lap belts in exceptional circumstances if the proper use of three point belts alone is not possible. Always remember that children do not have the pronounced pelvic structure required for the proper function of lap belts and that the child's safety absolutely requires that the lap belt be fastened snugly and as low as possible around the pelvis. The lap belt must never pass over the stomach or abdomen.

Younger children should only use a lap belt in very exceptional situations and only if no child restraint system for the child's size and weight or safer alternative means of transportation of the child is available. The use of a lap belt in these exceptional situations is better than permitting the child to remain totally unrestrained. A lap belt cannot provide the same level of protection as a proper child restraint. The use of a lap belt for younger children may violate State law.

WARNING

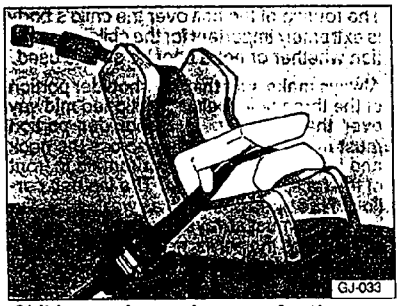
- **An improperly worn safety belt will not provide optimum protection in an accident and may cause serious personal injury. Always make sure that children and other vehicle occupants properly wear available restraint systems. Carefully follow the instructions provided by the manufacturers of child restraints.**
- **When purchasing a child restraint, select one which fits your child and vehicle.**

■ Commercially available child seats are required to comply with U.S. Federal Motor Vehicle Safety Standard (FMVSS) 213. These standards include installation requirements which utilize a lap belt or the lap portion of a combination lap-shoulder belt such as that installed in your vehicle.

Should these safety belts be too short, a special lap belt adapter is available from your authorized Volkswagen retailer.

■ Only use child restraint systems which fully contact the flat portion of the seat cushion. The child seat must not tip or lean to either side. We do not recommend the use of child seats which rest on legs or tube-like frames because they do not provide adequate contact with the seat.

Improperly or inadequately installed child restraint systems can increase the risk of injury to children in accidents, therefore always carefully read and follow all instructions on installation and use that come with the system.



Child restraint anchorages for the rear seats

Depending upon the child restraint system to be used, additional anchorage points may be required.

Your vehicle can be fitted with anchorage points for use with certain types of child restraints requiring a tether strap.

Ask your authorized Volkswagen retailer for proper installation and positioning of one or more anchorage points and the required hardware for the attachment of the tether.

WARNING

■ The child restraint anchorages are to be used to hold a child restraint system in its place.

■ Never use child restraint anchorages to secure safety belts of any kind. These anchorages are not designed to withstand the loads imposed during an accident by adult safety belts or special child safety belts. Under no circumstances are child restraint anchorages to be used for adult safety belts or harnesses.

■ Do not mount two child restraint seats on one anchor point.

■ Always follow the instructions provided by the manufacturer of the child restraint which you intend to install in your Volkswagen.

RESTRAINT AUTOMATIC SAFETY BELT SYSTEM FOR FRONT SEATS*

The Volkswagen Automatic Safety belt System is a passive restraint system. Driver and front seat passenger are buckled up automatically as they sit down and close the door.

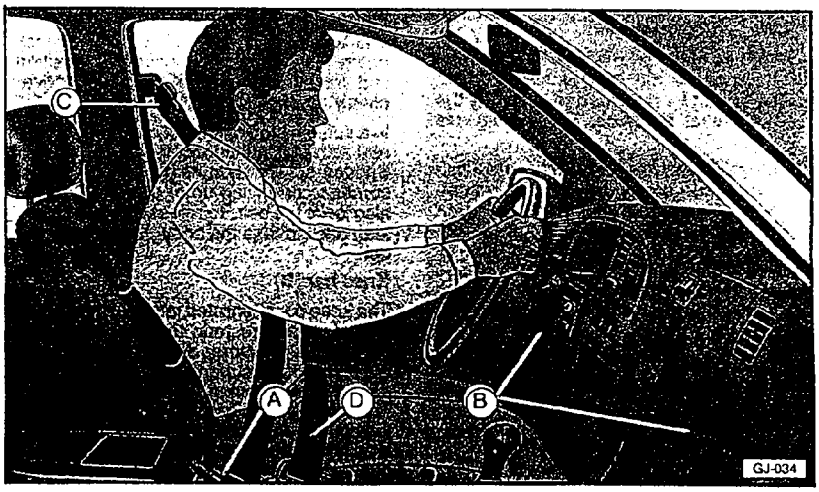
How the automatic seatbelt system works

The front seats of your vehicle are equipped with an automatic passive restraint system consisting of an upper torso belt and an integrated knee bar. The vehicle is also equipped with an additional lap belt. The upper torso restraint attached to the door frame automatically moves into position after you have entered the car and closed the door.

WARNING

■ Never attach the driver's torso belt to belt buckle on the passenger's side. Conversely never attach the passenger's torso belt to the buckle on the driver's side.

■ Make sure that the belt is positioned midway over the shoulder it must never rest against the neck.



■ Front seat passengers should never ride in a moving vehicle with the seatback reclined. Safety belts only offer optimum protection when the seatback is in an upright position as illustrated.

■ The automatic seatbelt must never be used to hold child's seat as the diagonal belt will not provide the needed protection.

Always heed WARNINGS on page 25.

* Where applicable

WARNING continued

■ If a child seat must be installed on front passenger seat, a separate lap belt must be mounted to securely the child seat in place. For details see page 30.

■ Improperly routed upper torso belt can cause serious injury in an accident. Always make sure the torso belt does not remain in front of or in contact with the child's head, face or neck. Press the emergency release on upper door frame and feed the belt into the retractor.

Always reconnect the belt after removing child's seat.

Always heed WARNINGS on page 15.

Driver's safety belt warning light and chime

The chime will sound for about six seconds, and the warning light will glow.

Inertia reel retractor (A)

The belt automatically takes up belt slack and adjusts to your normal seating position and movements so that you can conveniently reach all operating controls.

In a sudden stop or impact, the belt's inertia reel retractor automatically locks the belt. Sudden acceleration or hard braking, fast cornering or driving up or down steep hills also locks the belt. To release a locked belt, lean back to take the body pressure off the belt.

Knee bar (B)

The knee bar integrated into the dashboard is designed to restrain the forward movement of the lower torso during an impact and to prevent the occupant from sliding down in the seat and moving underneath the belt. The use of a knee bar also serves to protect the sensitive abdominal region from impact loadings and reduces the potential for serious injury in a wide range of accidents.

Note

The knee bar must not be removed.

Emergency release (C)

If required, press the emergency release on the belt buckle and pull out the belt tongue. Always reconnect the belt to the buckle.

Additional lap belt (D)

The additional lap belt offers those front seat occupants who are more accustomed to a combination lap-shoulder belt the ability to use a system which more closely resembles the seatbelts on previous vehicles which they have become used to.

The lap belt may also offer additional comfort under more extreme road and driving conditions when it may be difficult to maintain firm contact with the seat. Furthermore, in some types of accidents the lap belt may provide additional occupant restraint and mitigate certain types of occupant's injury.

WARNING

The additional lap belt must be routed in front of the automatic belt see illustration on page 27.

Note

On the passenger's side, the lap belt must not be used to secure a child restraint – please see following information.

To fasten a child's seat on the front passenger seat

We recommend that child seats and booster cushions only be installed at one of the rear seating positions.

WARNING

■ If a child seat must be installed on the front passenger seat, a special lap belt must be used to properly hold the child seat in place. See your retailer.

■ The upper torso belt must never be used to hold a child's seat as the diagonal belt will not provide the secure attachment needed.

■ An improperly routed upper torso belt can cause serious injury in an accident. Always make sure the torso belt does not remain in front of or in contact with the child's head, face or neck.

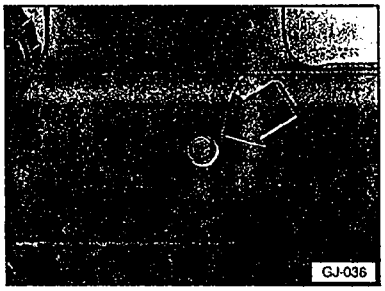
■ If you must install a child seat on the right front passenger seat, we recommend that you press the emergency release on the upper door frame and feed the belt into the retractor.

■ Always be sure to reconnect the belt after removing the child's seat.

■ If a booster seat must be used for average sized 6 to 7 year old children on the front passenger's seat always make sure that:

— the seat is adjusted so that the child's knees are close to the knee bar or

— that the additional lap belt is properly used and properly routed to prevent the child from passing beneath the upper torso belt.



Installation of the special lap belt

Child seats must be fastened with a special lap belt which complies with all applicable Federal Safety Standards. See your Volkswagen retailer. This belt must be mounted with a special safety belt anchor bolt to the anchorage point at the base of the right side member (see illustration above). The special safety belt and/or bolt is available from your Volkswagen retailer.

Installation instructions

■ Remove the threaded plastic plug which seals the anchorage point (arrow).

WARNING

To reduce the risk of serious personal injuries never use the plastic plug to mount the seat belt end. It is inadequate and not intended for this purpose.

■ Place the metal bolt through the seat belt mounting bracket so that the bend in the mounting plate is directed towards the interior of the vehicle.

■ Slide the washer supplied with the special safety belt onto the bolt.

■ Carefully screw the bolt into the anchorage making sure that the bolt is not cross threaded and screw the anchor bolt into the anchorage as far as possible by hand. Do not oil or grease the bolt.

■ With a torque wrench, tighten the safety belt anchor bolt to 21.7 ft. lbs/3 mkp/30 Nm.

If you are uncertain about how to properly install the lap belt, your Volkswagen retailer will install it for you.

WARNING

The proper routing of the lap belt is vital to the proper attachment and performance of the child seat installed. Therefore always carefully follow all of the instructions for installation and use provided by the child seat manufacturer.

SUPPLEMENTAL AIR BAG SYSTEM*

Your vehicle is equipped with two air bags, one for the driver and the other for the front passenger. The word "AIR BAG" is stamped into the covers on the steering wheel and the instrument panel.

The air bags are intended to supplement the three–point safety belts. When the safety belts are properly worn, the supplemental air bag restraints can provide additional protection for the chest and face of the driver and the front seat passenger in the event of a severe frontal collision.

Aside from providing proven safety benefits, the safety belts are particularly important to help keep front seat occupants in the proper seated position so that the air bag can unfold properly and provide added protection as intended.

It is very important to remember that the supplemental air bag systems are not intended to provide this added protection in side impacts, rear impacts, roll–over accidents or in less severe frontal impacts. **Therefore always wear your safety belts.**

The air bag system consists of the following components:

An electronic control/monitoring unit, an indicator light in the instrument panel just to the left of the headlight switch and an inflatable air bag equipped with a gas generator located inside the steering wheel and an inflatable air bag with a gas generator inside the instrument panel.

In addition to this, your vehicle is also equipped with a kneebar for extra protection.

The indicator light (readiness light) in the instrument panel will light up for approximately 10 seconds each time the ignition is switched on.

The light monitors the electronic control/monitoring unit, the igniter and sensor circuits, and the system wiring.

The system must be inspected if the indicator light:

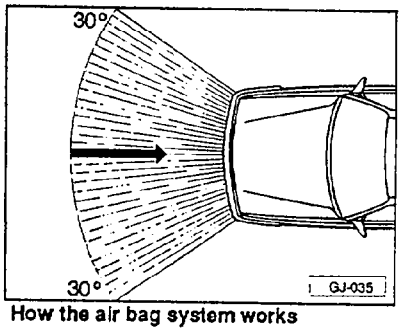
■ does not come on when the ignition is switched on;

■ does not go out approximately 10 seconds after the ignition is switched on, or;

■ comes on while driving.

In the event of a system malfunction, the indicator light will come on to catch the driver's attention and then stay on continuously to serve as a constant reminder to have the system repaired.

If any of these conditions occur, have the system inspected immediately by your Volkswagen retailer. If you do not do this, the air bag may not function properly in case of a frontal impact.

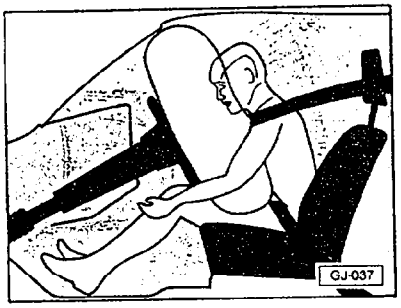


How the air bag system works

Both air bags inflate only in a severe frontal collision occuring within the area indicated in the illustration. The air bags will not inflate in minor frontal collisions, side or rear collisions, in a rollover or in cases where there is no considerable impact to the front of the vehicle.

When the system is activated, the air bag fills with a propellant gas, breaks open the padded cover and inflates between the driver and steering wheel, as well as between the front passenger and instrument panel.

* Where applicable



Fully inflated air bags in combination with properly worn safety belts slow down and limit the occupant's forward movement and help to reduce the risk of injury to the head and upper torso. See illustration.

Openings in the air bags then allow the gas to escape quickly. The air bags will deflate sufficiently enabling the front occupants to see forward once the impact has been absorbed.

When the air bag system is activated, fine dust is released. This is normal and is not caused by a fire in the vehicle.

This dust is mostly made up of a powder used to lubricate the air bags as they deploy and could irritate the skin. If you have been in an accident in which the air bags have deployed be sure to wash your hands and face with mild soap and water before eating. Be careful not to get the dust into your eyes or into any cuts or scratches. If the residue should get into your eyes flush them with water.

Importance of proper seating position

In order to help the air bag to do its job, it is important, both as a driver and as a passenger to maintain a proper seating position.

In a frontal collision air bags must inflate within a fraction of a second and with a considerable amount of force in order to provide additional protection for the driver and front seat passenger. Do not sit any closer than necessary to the steering wheel and instrument panel. By keeping room between your body and the front of the passenger compartment, the air bag can inflate fully and completely as intended and do its job more effectively.

Be sure to always:

■ adjust the driver's seat properly, consistent with your size. See also page 35.

■ make sure that the passenger's seat is no closer than necessary to the instrument panel.

■ maintain an upright seating position with your back against the backrest of your seat.

WARNING

Sitting too close to the steering wheel or dashboard will decrease the effectiveness of the air bags and can increase the risk of personal injury in an accident. Always wear safety belts properly and sit upright with the seat no closer to the steering wheel or instrument panel than necessary.

Use of child restraints on the front seat

A child seat or infant carrier installed on the front seat may be struck and knocked out of position by the rapidly inflating passenger's air bag in a frontal collision. The air bag could greatly reduce the effectiveness of the child restraint and even injure the child during inflation.

For this reason and because children are generally better Protected – When Properly restrained for their age and size – in a rear seating Position, we strongly recommend that children always sit in the back seat. See "Child Safety" on Page 23.

If exceptional circumstances require the use of a child seat on the front seat, the child's safety and well–being require that the following precautions be taken.

WARNING

■ Never install rearward facing child seats or infant carriers on the front passenger seat. A child can be seriously injured when the passenger air bag inflates and forces the child seat or carrier and child against the backrest, center arm rest or door. Always install rearward facing child seats or infant carriers on the rear seat.

■ Forward facing child seats or infant carriers installed on the front passenger seat may interfere with the deployment of the air bag and cause serious injury to the child. Always install forward facing child seats and infant carriers on the rear seat.

If you must install a forward facing child restraint on the front passenger's seat in exceptional circumstances,

WARNING

— always make sure that the forward facing child seat has been designed and certified by its manufacturer for use on the front seat of a car which is equipped with a passenger side air bag.

— always make sure that the passenger seat is adjusted as far to the rear as possible for the maximum possible distance between the instrument panel and the child. The backrest must remain in an upright position.

Always follow the manufacturer's instructions provided with the child seat or carrier. For further details on the use of child restraints in your Volkswagen see page 29.

Care, Servicing and Disposal

There are some general requirements for air bags which must be observed to make sure that the effectiveness of the system will not be impaired and the components which have been discarded do not cause injury or pollute the environment.

WARNING

■ Do not cover, obstruct or change the steering wheel horn pad or instrument panel above the glove compartment in any way. Such action could adversely affect the performance of the air bag and increase the risk of injury.

■ For cleaning the horn pad or instrument panel, use only a soft, dry cloth or one which has been moistened with water. Solvents or cleaners could adversely affect the air bag cover and proper deployment of the system.

■ Do not make any repairs, adjustments or modifications to the air bag system. Such actions could adversely affect the performance of the air bag, bring about an inadvertent deployment thereby increasing the risk of personal injury.

■ To assure continued reliability, the "Air Bag System" must be inspected by a qualified Volkswagen technician 4 and 8 years from the date of manufacture appearing on the safety compliance sticker and every two years thereafter. See your authorized retailer.

WARNING

- The replacement date is found on the label on the upper surface of the front passenger's sun visor. It is absolutely essential to observe this date in order to assure that the system is in good working order.
- If components of the air bag system must be discarded or if the vehicle must be scrapped, certain safety precautions must be observed. Your Volkswagen retailer knows these precautions and can give you the necessary information. Failure to follow these precautions and procedures could increase the risk of personal injury.
- Any work on the air bag system, such as removing/installing, repairing, or any work on the steering wheel must be performed by a qualified technician who has the training and special equipment necessary. Improper handling of the air bag system may result in serious personal injury. For any work on the air bag system, we strongly recommend that you see your Volkswagen retailer.

WARNING

- The air bag system can only be activated once. After it has been used, it must be replaced.
- If you sell your vehicle, be sure to inform the new owner of these important points and make certain that this manual is transferred to the new owner together with the vehicle.