2318

Report Numbers: TRC-95-V002

Rear Impact Full-Scale Crash Testing for Upgrade of FMVSS 301 Test Procedure

Deformable Impactor into Rear of
1993 Ford Mustang
at 80 kph with 80% Overlap
TRC Test Number: 950821

Prepared by:
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10820 State Route 347
East Liberty, OH 43319

September 14, 1995
Final Report

Prepared for:
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This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTRS57-95-C-00011.

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15. Supplemental Notes

16. Abstract

An 80 kph deformable impactor rear crash test with 80% overlap was conducted on a 1993 Ford Mustang 2-door coupe at Transportation Research Center Inc. on August 21, 1995. This test was conducted to determine vehicle and occupant response in the rear 80% overlap test mode. The impactor's velocity was 79.7 kph. The impactor's weight was 1349 kg. The vehicle's maximum crush was 785 millimeters. The ambient temperature was 32° C.

The driver's Head Injury Criteria (HIC) was 892. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.0 g. The driver's chest maximum deflection was 5 mm. The driver's left and right femur maximum axial forces were 1038 N and 538 N, respectively.

The passenger's HIC was 1191. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 60.4 g. The passenger's chest maximum deflection was 7 mm. The passenger's left and right femur maximum axial forces were 1283 N and 1001 N, respectively.

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Table of Contents

List of Tables

List of Figures

List of Photographs

List of Photographs

Section 1.0

Purpose and Test Procedure

Purpose

This crash test was conducted to determine vehicle and occupant response in the 80 kph rear impact with 80% overlap test mode. The test was performed on a 1993 Ford Mustang 2-door coupe.

Test Procedure

This test was conducted per Contract No. DTRS57-95-C-00011, Technical Task Directive No. 1, "Rear Impact Full-Scale Crash Testing for Upgrade of FMVSS 301 Test Procedure."

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendix C of the Laboratory Test Procedure TP-208-09.

The deformable impactor was instrumented with five (5) force load cells to measure longitudinal axis forces on the barrier face.

The impactor's specified velocity range was 78.5 to 81.5 kph.

Both dummies were instrumented with head center of gravity and Position 1, 2, and 3 accelerometers to measure longitudinal, lateral, and vertical accelerations; neck upper and lower 6-axis load cells to measure longitudinal, lateral, and vertical force and moments; chest and pelvis accelerometers to measure longitudinal, lateral, and vertical axis accelerations; and with left and right femur load cells to measure axial forces. Each Part 572 E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection.

The seventy-six (76) data channels were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 12,500 samples per second and processed per Sections 11.13 through 11.15 of the Laboratory Test Procedure.

The crash event was recorded by thirteen (13) high-speed motion picture cameras.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 301 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the dummy calibration information. Appendix D contains miscellaneous test information

Section 2.0

Rear Deformable Barrier Impact Test Summary

Test Results Summary

This 80 kph rear crash test with 80% overlap was conducted at TRC on August 21, 1995.

The test vehicle, a 1993 Ford Mustang 2-door coupe, was equipped with an airbag at the driver's seating position and three-point unibelts at the driver's and right front passenger's seating position. The vehicle's test weight was 1525 kg. The vehicle's maximum static crush was 785 mm.

The driver's HIC was 892. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.0 g. The driver's chest maximum deflection was 5 mm. The driver's left and right femur maximum compressive forces were 1038 N and 538 N, respectively.

The right front passenger's HIC was 1191. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 60.4 g. The right front passenger's chest maximum deflection was 7 mm. The right front passenger's left and right femur maximum compressive forces were 1283 kg and 1001 kg, respectively.

Following the impact, a trace of fluid spillage occurred immediately after the impact. During the first five minutes following the impact 46.1 grams of fluid spilled from the vehicle's fuel system. During the first five minutes of the 180° portion of the static rollover 59.2 grams of fluid spilled from the vehicle's fuel system. The fuel spillage appears to have come from the intersection of the fuel filler neck and the fuel tank.

Data Acquisition Explanations

The right front passenger head Position 1 X-axis and Z-axis accelerometers, HD1XG2 and HD1ZG2, recorded a questionable data spike at 132 milliseconds.

The right front passenger head Position 2 Y-axis accelerometer, HD2YG2, recorded a questionable data spike at 179 milliseconds.

The right front passenger's head Y-axis accelerometer, HEDYG2, recorded a questionable data spike at 97 milliseconds. The data spike affected the right front passenger's head resultant acceleration and Head Injury Criteria (HIC) calculations.

The right rear wheel axle X-axis accelerometer, RAXXG2, lost data at 110 milliseconds as a result of the accelerometer's cable being cut by the vehicle's crush on impact.

Table 1 Crash Test Summary

Test type:	80 kph rear impact with 80% overlap
Test date:	08/21/95
Test time:	1611
Ambient temperature at impact area:	32° C
Vehicle year/make/ model/body style:	1993/Ford/Mustang/2-door coupe
Vehicle test weight:	1525 kg
Impact angle[1]:	180°
Impact velocity[2]:	
Primary:	79.7 kph
Secondary:	79.7 kph
Maximum static crush:	910 mm
Number of cameras:	
High-speed:	13
Door opening data:	
Left-front:	Difficult
Right-front:	Difficult

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

Table 1 Crash Test Summary, Cont'd.

Dummies:	Driver #34	Passenger #35
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	Airbag/3-point unibelt	3-point unibelt
Number of data channels:	30	30
Front seat data:		
Seat track failure:	None	None
Seat back failure:	None	None
Visible dummy contact points:		
Head:	Rear seat cushion and header	Rear seat cushion and header
Chest:	None	None
Abdomen:	None	None
Left knee:	Steering wheel	None
Right knee:	Steering wheel	None

Table 2 Test Vehicle Information

Vehicle year/make/ model/body style:	1993/Ford/Mustang/2-door coupe			
Color:	Red			
VIN:	1FACP40M8PF215447			
Engine data:				
Placement:	Longitudinal/Inline			
Cylinders:	4			
Displacement:	2.3 liters			
Transmission data:	4 speed,	__manual,	X automatic,	__overdrive
Final drive:	__fwd,	X rwd,	__4wd	
Date vehicle received:				
Odometer reading:	17,830			
Dealer's name and address:	NA			

Accessories:

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

Certification data from vehicle's label:

Vehicle manufactured by:		Ford Motor Company
Date of manufacture:		08/93
VIN:		1FACP40M8PF215447
GVWR:		1751 kg
GAWR:	Front:	887 kg
	Rear:	873 kg

Table 2 Test Vehicle Information, Cont'd.

Size of tires on vehicle:	P195/75R14 M+S
Spare tire:	Temporary
Type of front seats:	Bucket

Tire & capacity data from vehicle's label:

Recommended tire size:	P195/70R14
Recommended cold tire pressure:	
Front:	240 kPa
Rear:	240 kPa
Designated Seating Capacity:	
Front	2
Rear	2
Total	4
Vehicle Capacity Weight:	317 kg

Test vehicle attitudes:

Delivered attitude:	LF: 685 mm	RF: 688 mm	LR: 686 mm	RR: 679 mm
Fully loaded attitude:	LF: 665 mm	RF: 658 mm	LR: 657 mm	RR: 642 mm
Pre-test attitude:	LF: 678 mm	RF: 682 mm	LR: 643 mm	RR: 742 mm

Table 2 Test Vehicle Information, Cont'd.

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

Right front	363	kg	Right rear	282	kg
Left front	390	kg	Left rear	273	kg
Total front weight	753	kg	(57.6% of total vehicle weight)		
Total rear weight	555	kg	(42.4% of total vehicle weight)		
Total delivered weight	1308	kg			

Calculation of test vehicle's target test weight:

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (1308 kg)

VCW[1] = Vehicle Capacity Weight = 317

DSC = Designated Seating Capacity (4)

RCLW = VCW - 68 (DSC) = 317 - 68 (4) = 45

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

Target test weight = 1308 + 45 + 152 = 1505 kg

Weight of test vehicle with required dummies and 95 kg of cargo weight:

Right front	437	kg	Right rear	341	kg
Left front	422	kg	Left rear	325	kg
Total front weight	859	kg	(56.3% of total vehicle weight)		
Total rear weight	666	kg	(43.7% of total vehicle weight)		
Total test weight	1525	kg	(1% over target test weight)		

Weight of ballast secured in vehicle cargo area: 0

Components removed to meet target test weight: Front bumper, grill, head lights, starter, engine pulleys and belts

CG rearward of front wheel centerline: 1113 mm

Vehicle Wheelbase: 2548 mm

[1] From vehicle's tire load label.

Table 3 Post-Impact Data

Test number:	950821
Test date:	08/21/95
Test time:	1611
Test type:	80 kph rear impact with 80% overlap
Impact angle:	180°
Ambient temperature at impact area:	32° C
Temperature in occupant compartment:	29° C

Impact velocity:

Primary:	79.7 kph
Secondary	79.7 kph
Specified range:	78.5 to 81.5 kph

Distance from vehicle to barrier:

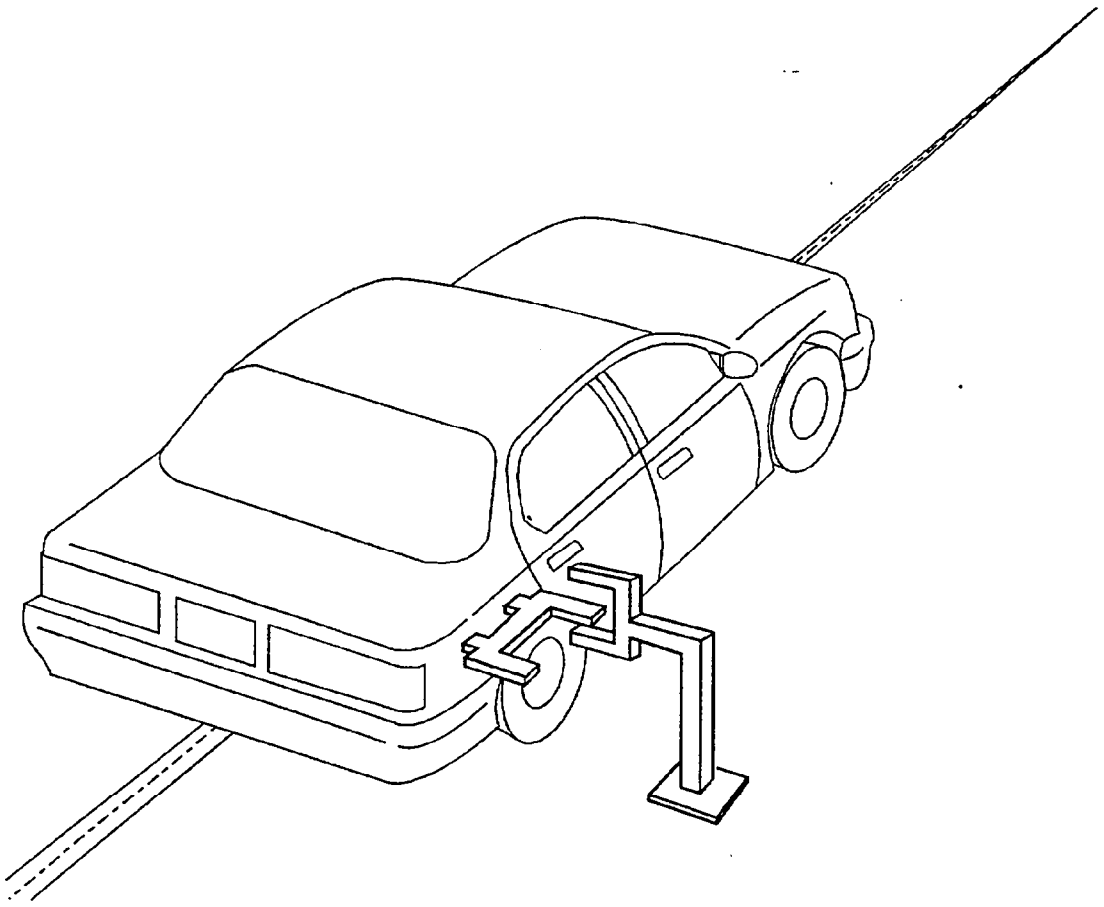
Entering velocity trap:	356 mm
Exiting velocity trap:	51 mm

Test vehicle static crush:

Overall length of test vehicle:

Pre-test:	L:	4537 mm	C:	4582 mm	R:	4537 mm
Post-test:	L:	4294 mm	C:	4089 mm	R:	3774 mm
Total crush:	L:	243 mm	C	493 mm	R:	763 mm
Average crush:	500 mm					

Figure 1 Impact Velocity Measurement System

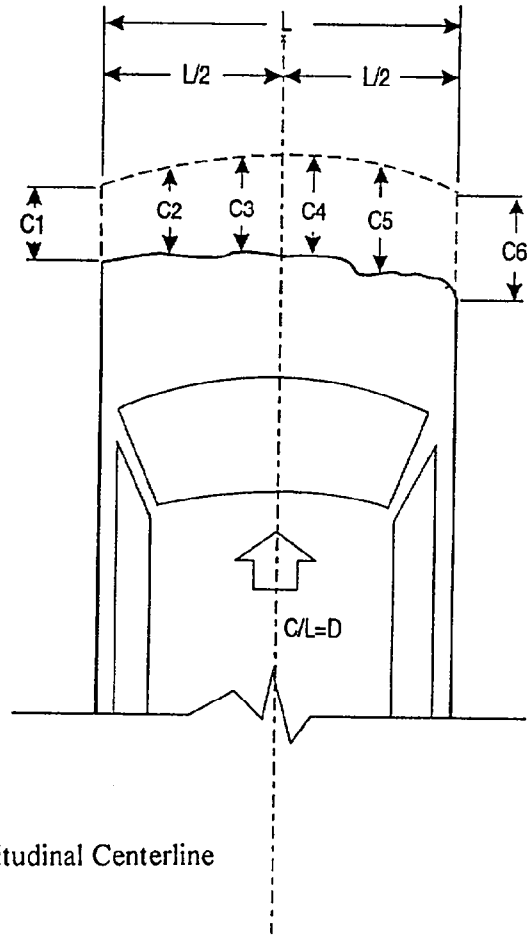


The final vane clears the final emitter/receiver pair 51 millimeters before impact.

The vanes have 305-millimeter spacing.

Figure 2 Accident Investigation Division Data

Test date:	08/21/95
Vehicle year/make/ model/body style:	1993/Ford/Mustang/2-door coupe
VIN:	1FACP40M8PF215447
Build date:	08/93
Test weight:	1525 kg
Vehicle wheelbase:	2548 mm
Maximum width:	1770 mm
Front overhang:	1057 mm



Collision Deformation

Classification (CDC) Code: 06BDEW4

Crush depth measurements:	C1: 243 mm
	C2: 443 mm
	C3: 598 mm
	C4: 675 mm
	C5: 778 mm
	C6: 763 mm
Midpoint of damage:	D: Vehicle Longitudinal Centerline
Length of damaged region:	L: 1423 mm

Section 3.0

FMVSS 301 Data

Table 4 Dummy Injury Criteria

Maximum Acceleration

	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	130.9 g	35.9 g	-23.6 g	137.6 g	37.6 g	11.3 g	-7.9 g
Passenger	206.9 g	206.2 g	-42.1 g	232.6 g	63.8 g	4.5 g	-13.8 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	1038 N	538 N
Passenger	1283 N	1001 N

Head Injury Criteria[1]

	HIC	Time t_1	Time t_2
Driver	892	109.4 ms	119.6 ms
Passenger[3]	1191	93.3 ms	97.8 ms

Head Maximum Resultant Acceleration[2]

	Acceleration	Time t_1	Time t_2
Driver	115.7 g	111.1 ms	114.4 ms
Passenger	113.0 g	93.6 ms	97.0 ms

Chest Maximum Resultant Acceleration[2]

	Acceleration	Time t_1	Time t_2
Driver	38.0 g	112.8 ms	115.8 ms
Passenger	60.4 g	101.0 ms	103.9 ms

Maximum Chest Deflection

Driver	5 mm
Passenger	7 mm

[1] As defined in FMVSS No. 208

[2] Defined as equal to or exceeding 0.003 sec. duration

[3] See Data Acquisition Explanations

Table 5 Fuel System Data

Vehicle year/make/model/body style:	1993/Ford/Mustang/2-door coupe
Fuel system capacity:	NA (from owner's manual)
Usable capacity:	15.7 gal (furnished by COTR)
Test volume range:	14.4 gal to 14.8 gal (92-94% of usable)
Actual test volume:	14.6 gal (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	purple
Type of fuel pump:	electric
Does the electric fuel pump operate with ignition switch "on" and the engine not operating.	No
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 left side to the front.

Table 6 FMVSS 301 Post-Impact Test Data

Test date: 08/21/95

Vehicle year/make/model/body style: 1993/Ford/Mustang/2-door coupe

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:

____ Frontal (48 kph)

____ Oblique (48 kph) with __° barrier face first contacting (driver's/passenger's) side

__X__ Rear moving barrier (80 kph)

____ Lateral moving barrier (32 kph)

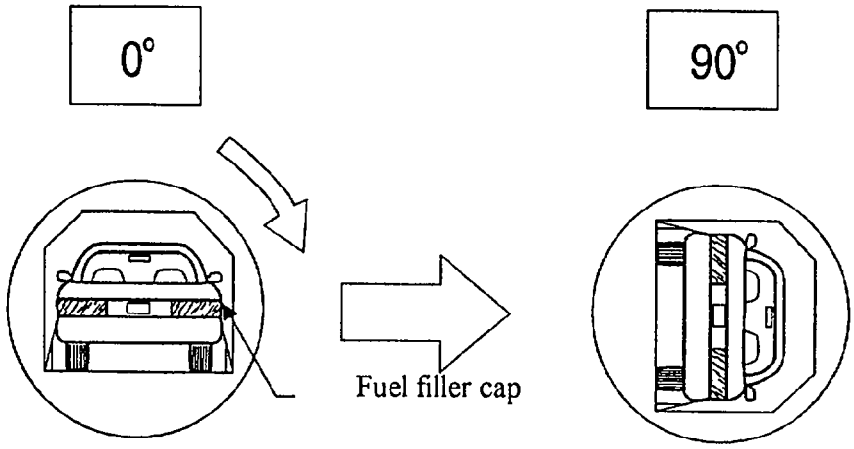
Fuel system fluid spillage measurements:

		Test Results	Maximum Allowable
1.	From impact until vehicle motion ceases	Trace	28 g
2.	5-Minute period after vehicle motion ceases	46.1 g	140 g
3.	Next 25 minutes after 5-minute period	0 g	28 g/1 min

Fuel system fluid spillage location(s): Intersection of fuel filler neck and fuel tank.

Figure 3 FMVSS 301 Static Rollover Test Data

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		

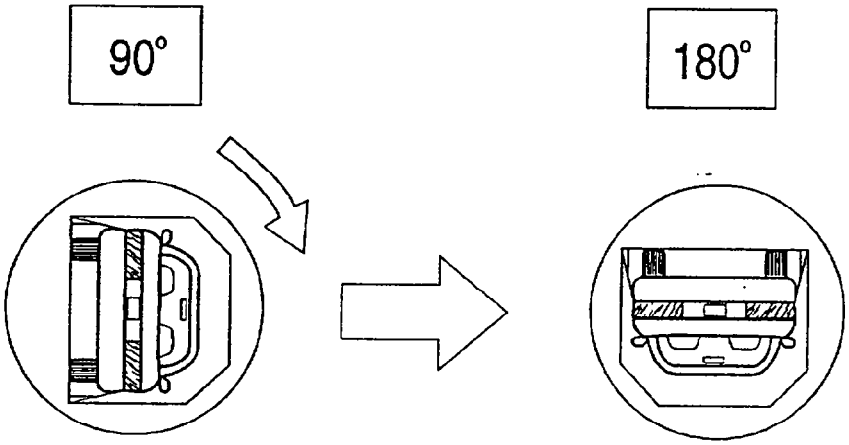
Fuel system fluid spillage measurements:

0° to 90° rotation (fuel filler cap down)	Test Results	Maximum Allowable
1. First five 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 3 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	

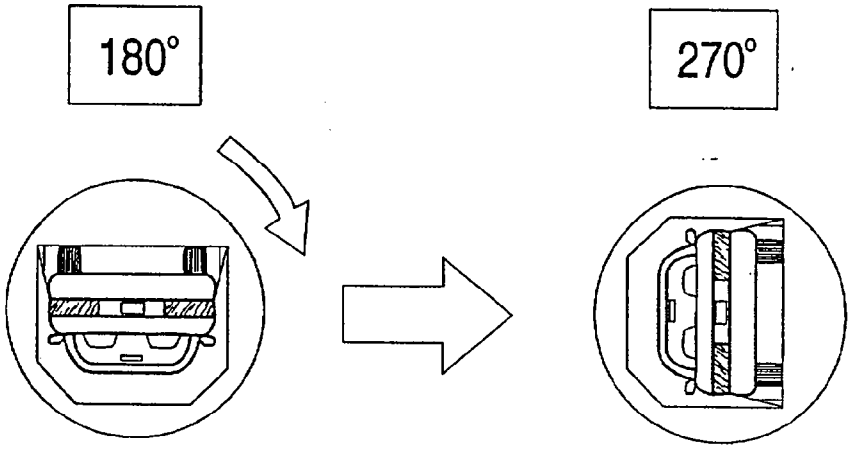
Fuel system fluid spillage measurements:

90° to 180° rotation	Test Results	Maximum Allowable
1. First five minutes from onset of rotation	59.2 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): Intersection of fuel filler neck and fuel tank.

Figure 3 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	

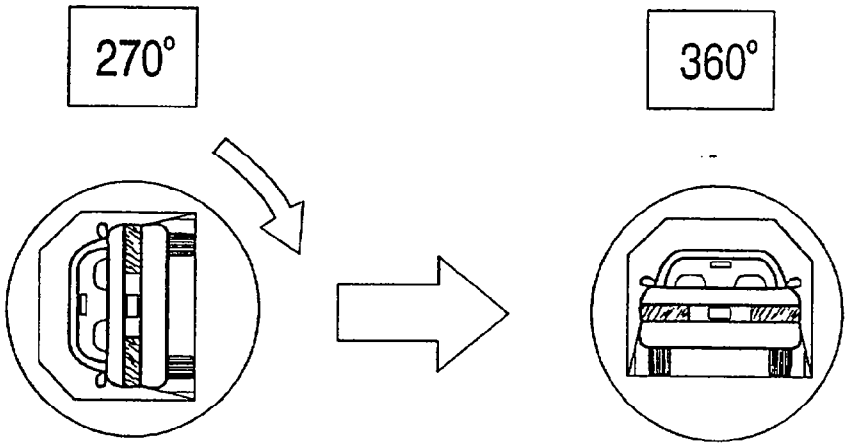
Fuel system fluid spillage measurements:

180° to 270° rotation	Test Results	Maximum Allowable
1. First five 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 3 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 five 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, Moving Deformable Barrier, Occupant, and Camera Measurements

Figure 4 Pre-test and Post-test Measurement Points

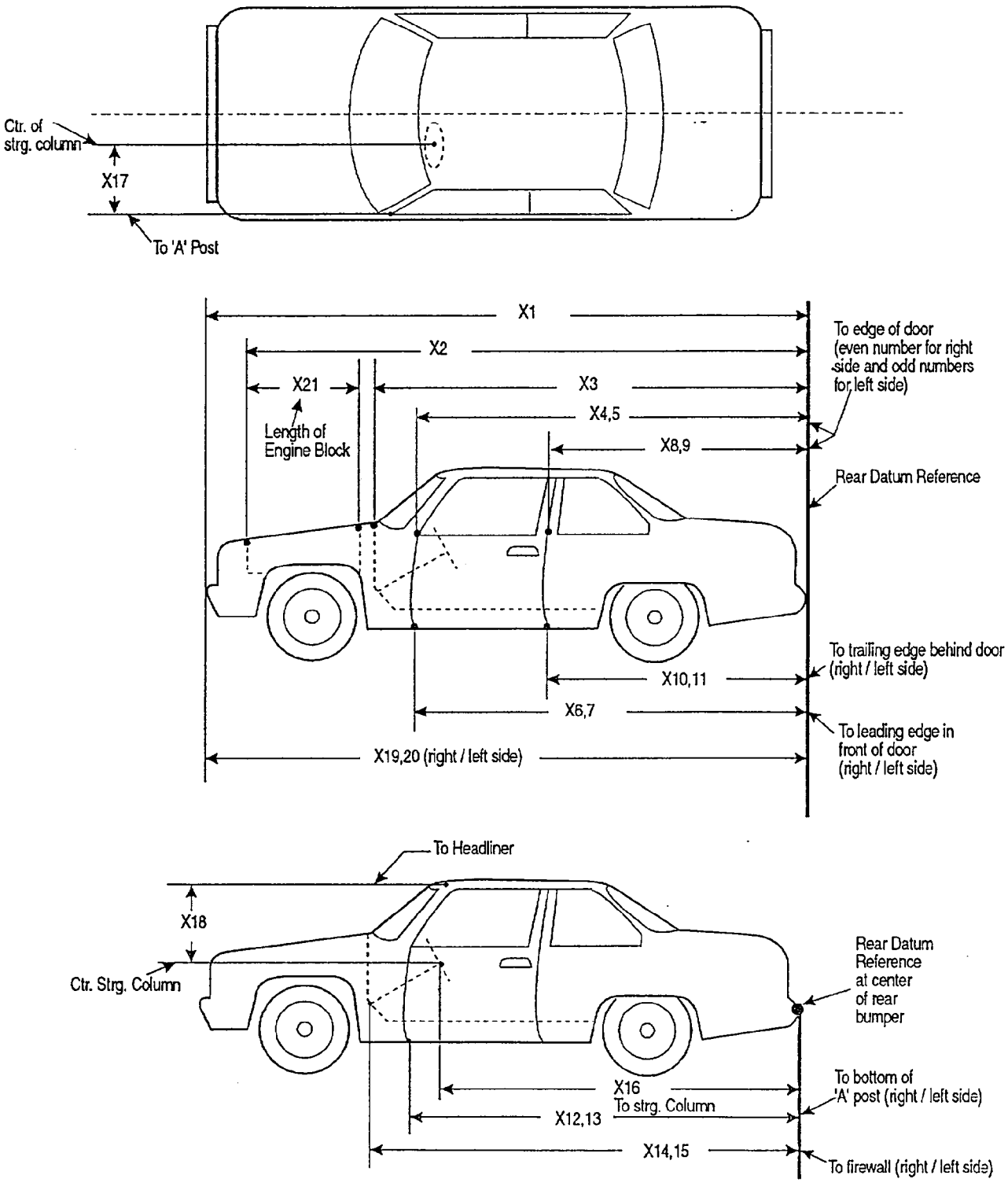


Table 7 Impacted Vehicle Measurements

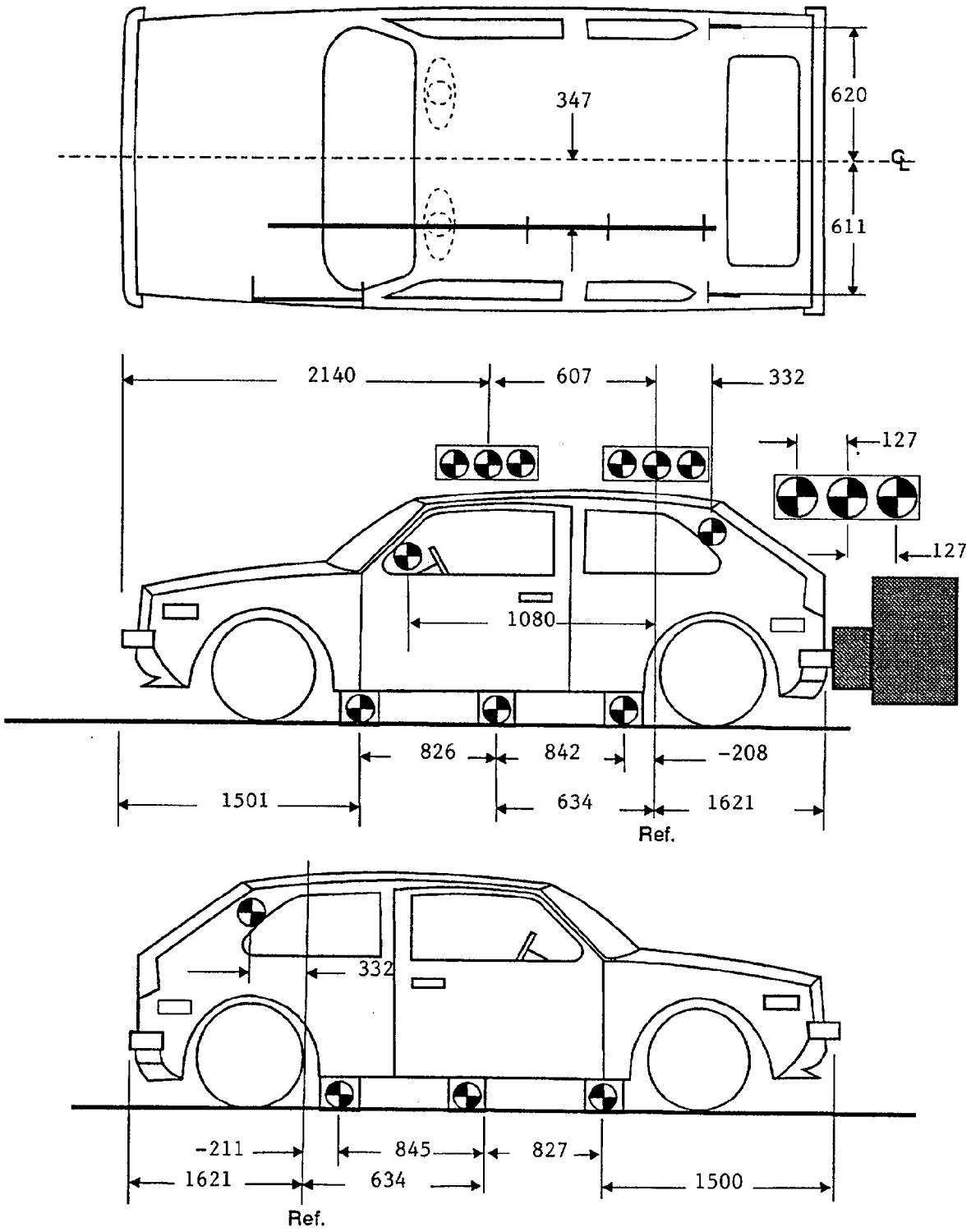
Vehicle year/make/model/body style: 1993/Ford/Mustang/2-door coupe Test Number: 950713

No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4582 mm	4089 mm	493 mm
X2	Rear surface of vehicle to front of engine block	825 mm	849 mm	-24 mm
X3	Rear surface of vehicle to firewall	1353 mm	1387 mm	-34 mm
X4	Rear surface of vehicle to upper leading edge of right door	1712 mm	1727 mm	-15 mm
X5	Rear surface of vehicle to upper leading edge of left door	1683 mm	1704 mm	-21 mm
X6	Rear surface of vehicle to lower leading edge of right door	1639 mm	1637 mm	2 mm
X7	Rear surface of vehicle to lower leading edge of left door	1640 mm	1644 mm	-4 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2949 mm	2919 mm	30 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2954 mm	2965 mm	-11 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2942 mm	2918 mm	24 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2949 mm	2919 mm	30 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	1739 mm	1719 mm	20 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	1735 mm	1754 mm	-19 mm
X14	Rear surface of vehicle to firewall - right side	1354 mm	1376 mm	-22 mm
X15	Rear surface of vehicle to firewall - left side	1331 mm	1382 mm	-51 mm
X16	Rear surface of vehicle to steering wheel center	2082 mm	2069 mm	13 mm
X17	Center of steering column to "A" post	361 mm	329 mm	32 mm
X18	Center of steering column to headliner	436 mm	405 mm	31 mm
X19	Rear surface of vehicle to right side of front bumper	4537 mm	3774 mm	763 mm
X20	Rear surface of vehicle to left side of front bumper	4537 mm	4294 mm	243 mm
X21	Length of engine block	483 mm	483 mm	0 mm

Table 8 Vehicle Measurements

No.	Description of Measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4582	4089	493
X2	Front Surface of Vehicle to Bottom of "A" Post of Right Side	1739	1719	20
X3	Front Surface of Vehicle to Bottom of "A" Post of Left Side	1735	1754	-19
X4	Front Surface of Vehicle to Right Side of Rear Bumper	4537	3774	763
X5	Front Surface of Vehicle to Left Side of Rear Bumper	4537	4294	243
X6	Right Front Sill to Ground Plane	186	226	-40
X7	Left Front Sill to Ground Plane	189	231	-42
X8	Right Rear Sill to Ground Plane	165	141	24
X9	Left Rear Sill to Ground Plane	174	149	25
X10	Wheelbase of Vehicle - Left Side	2548	2470	78
X11	Width of Vehicle at Maximum Width Point	1750	1927	-177
X12	Front Surface of Vehicle to Engine Target	556	580	-24
X13	Front Surface of Vehicle to Compartment Target	2140	2140	0
X14	Front Surface of Vehicle to Rear Bumper Target	4263	3636	627
X15	Wheelbase of Vehicle - Right Side	2548	2241	307

Figure 5 Vehicle Target Locations



(Dimensions in Millimeters)

Table 9 Test Vehicle Rear Profile Data

X-axis measurements referenced to a plane 430 millimeters forward of the front bumper centerline. Y-axis measurements are left and right of the original vehicle centerline. Y-axis measurements (6 points) should divide the width of the car and be clearly indicated on the form. Z-axis (height) measurements are from the ground.

Pre-Test Profile

		Vehicle Left			Vehicle Right		
		pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of rear bumper	X	4920	4964	4977	4979	4956	4926
	Y	710	430	145	-140	-423	-705
	Z	360	363	354	351	347	336
Top of rear bumper	X	4971	5004	5012	5013	5000	4971
	Y	713	429	144	-141	-425	-710
	Z	520	513	505	505	503	499
Center of trunk	X	4857	4872	4894	4891	4877	4855
	Y	713	430	144	-145	-431	-713
	Z	788	803	800	802	798	785

Post-Test Profile

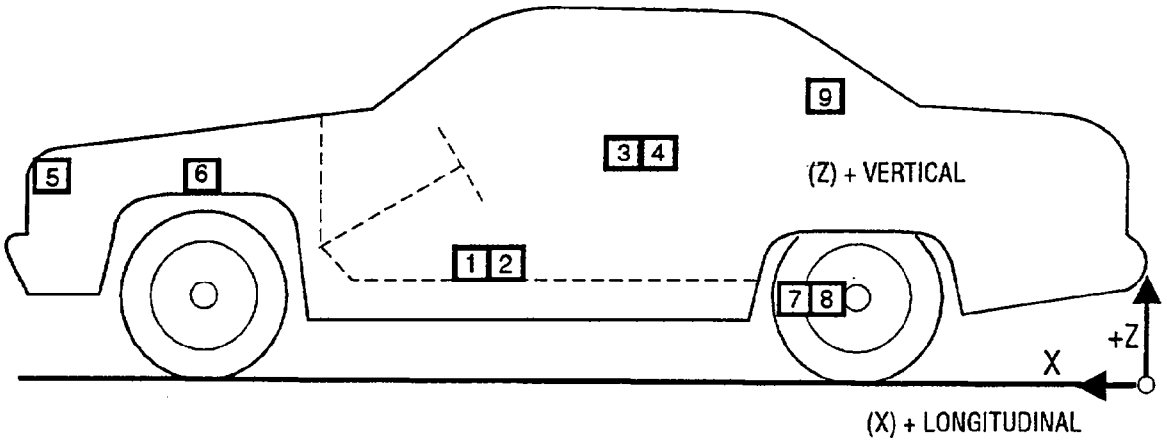
		Vehicle Left			Vehicle Right		
		pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of rear bumper	X	4602	4560	4502	4443	4365	4237
	Y	708	422	142	-140	-419	-704
	Z	214	205	207	259	328	425
Top of rear bumper	X	4694	4561	4414	4338	4222	4186
	Y	679	402	147	-140	-410	-650
	Z	353	362	333	370	373	556
Center of trunk	X	4551	4098	4030	3994	3967	4074
	Y	535	406	142	-135	-420	-671
	Z	572	717	740	775	816	721

Table 9 Test Vehicle Rear Profile Data, Cont'd.

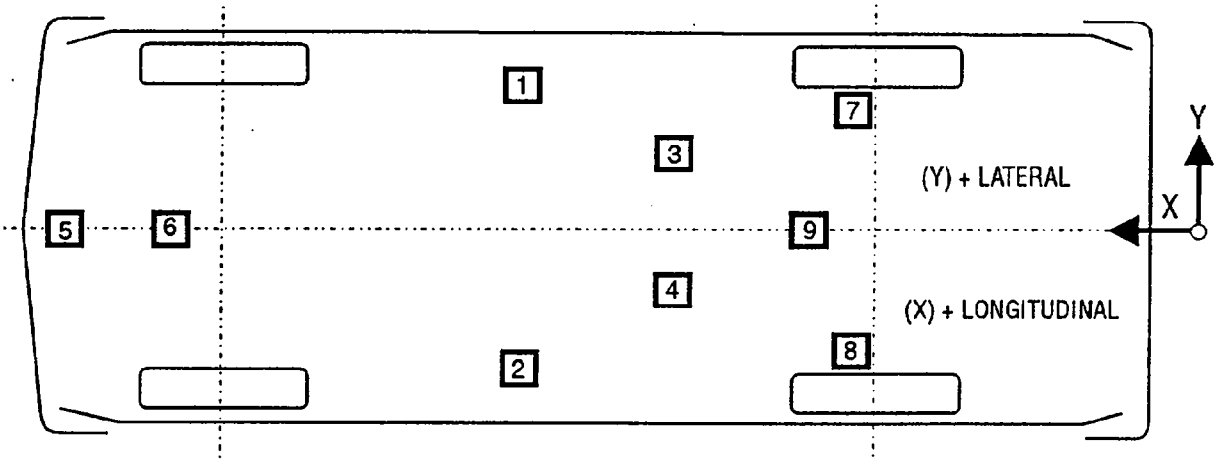
		Change					
		Vehicle Left			Vehicle Right		
		pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of rear bumper	X	318	404	475	536	591	689
	Y	-2	-8	-3	0	4	1
	Z	-146	-158	-147	-92	-19	89
Top of rear bumper	X	277	443	598	675	778	785
	Y	-34	-27	3	1	15	60
	Z	-167	-151	-172	-135	-130	57
Center of trunk	X	306	774	864	897	910	781
	Y	-178	-24	-2	10	11	42
	Z	-216	-86	-60	-27	18	-64

+X: Rearward from a reference plane 430 mm forward of the vehicle front bumper
+Y: Left from vehicle longitudinal centerline
+Z: Up from ground

Figure 6 Vehicle Accelerometer Mounting Locations



SIDE VIEW



BOTTOM VIEW

Table 10 Pre- and Post-Test Position of Vehicle Accelerometer Mounting Locations

Accelerometer Description		X, Y, Z Location[1]		
		X	Y	Z
Left front seat outboard mounting rail	Pre	2129 mm	575 mm	272 mm
	Post	2107 mm	575 mm	312 mm
	Change	22 mm	0 mm	40 mm
Right front seat outboard mounting rail	Pre	2131 mm	577 mm	270 mm
	Post	2072 mm	577 mm	310 mm
	Change	59 mm	0 mm	40 mm
Left front seat back (mid-point of seat)	Pre	2726 mm	380 mm	766 mm
	Post	2833 mm	380 mm	527 mm
	Change	-107 mm	0 mm	-239 mm
Right front seat back (mid-point of seat)	Pre	2726 mm	-380 mm	764 mm
	Post	2774 mm	-380 mm	695 mm
	Change	-48 mm	0 mm	-69 mm
Radiator support	Pre	333 mm	-24 mm	753 mm
	Post	353 mm	-24 mm	850 mm
	Change	-20 mm	0 mm	97 mm
Top of engine	Pre	1010 mm	-30 mm	816 mm
	Post	1033 mm	-30 mm	855 mm
	Change	-23 mm	0 mm	39 mm
Left rear wheel axle	Pre	3556 mm	347 mm	297 mm
	Post	3484 mm	347 mm	297 mm
	Change	72 mm	0 mm	0 mm
Right rear wheel axle	Pre	3556 mm	334 mm	297 mm
	Post	3204 mm	334 mm	297 mm
	Change	352 mm	0 mm	0 mm
Rear package shelf (top of rear seat back)	Pre	3675 mm	-3 mm	906 mm
	Post	3274 mm	70 mm	937 mm
	Change	401 mm	73 mm	31 mm

[1] Reference Point: X - vertical plane at front bumper
Y - vehicle centerline
Z - ground

TABLE 7 MOVING DEFORMABLE BARRIER FACE STATIC CRUSH
ZERO DISTANCE AT BARRIER CENTERLINE[1]

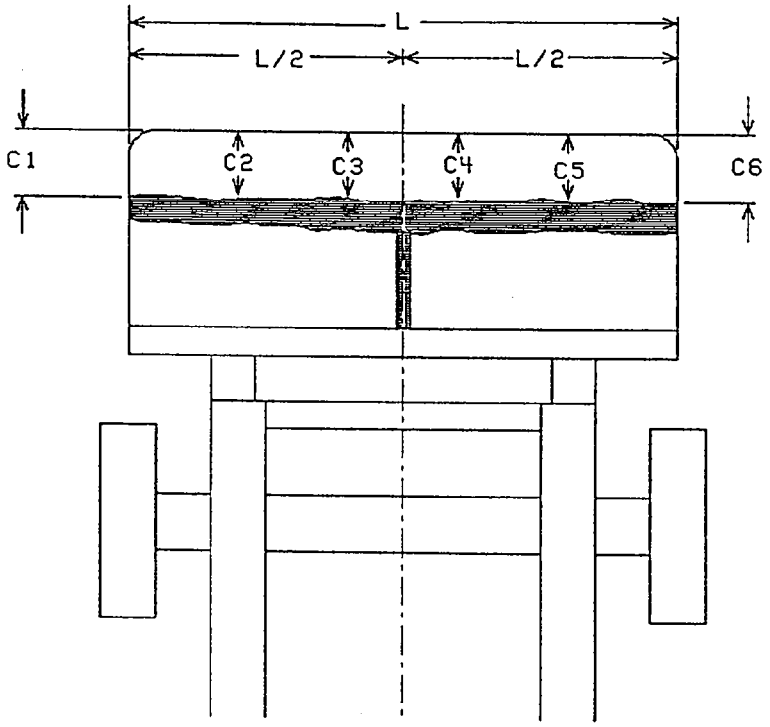
		813	711	610	508	406	305	203	102	0	102	203	305	406	508	610	711	813
LOCATION	HEIGHT mm	PRE-TEST PROFILE (DISTANCE IN MILLIMETERS FROM REFERENCE PLANE[1])																
TOP OF FACE	813	364	361	363	364	369	367	365	366	365	365	359	362	361	359	361	362	364
MID-FACE	559	368	362	364	365	368	367	367	366	366	365	363	363	364	361	361	364	365
BUMPER	432	285	262	265	264	266	265	265	265	264	264	263	262	263	261	260	213	288
LOCATION	HEIGHT mm	POST-TEST PROFILE (DISTANCE IN MILLIMETERS FROM REFERENCE PLANE[1])																
TOP OF FACE	813	443	360	348	345	339	336	337	335	336	337	340	339	344	344	344	343	340
MID-FACE	559	454	448	426	409	410	390	380	389	373	371	374	342	339	339	339	339	336
BUMPER	432	550	515	513	498	487	470	467	448	428	423	423	403	385	342	330	313	332
LOCATION	HEIGHT mm	STATIC CRUSH (MM)																
TOP OF FACE	813	79	-1	-15	-19	-30	-31	-28	-31	-29	-28	-19	-23	-17	-15	-17	-19	-24
MID-FACE	559	86	86	62	44	42	23	13	23	7	6	11	-21	-25	-22	-22	-25	-29
BUMPER	432	265	253	248	234	221	205	202	183	164	159	160	141	122	81	70	100	44

All measurements are in millimeters.

[1]Column readings are left to right across barrier face from left to right.

[2]Reference plane is 800 mm forward of the rear surface of the aluminum mounting plate.

Figure 7 Moving Deformable Barrier Face Crush



Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is moving barrier centerline.

	Pre-test	Post-test	Crush
L	1676 mm		
C1	368 mm	454 mm	86 mm
C2	365 mm	409 mm	44 mm
C3	367 mm	390 mm	23 mm
C4	363 mm	342 mm	-21 mm
C5	361 mm	339 mm	-22 mm
C6	365 mm	336 mm	-29 mm
CL	366 mm	373 mm	7 mm

Figure 8 Dummy Measurement Locations for Front Seat Occupants

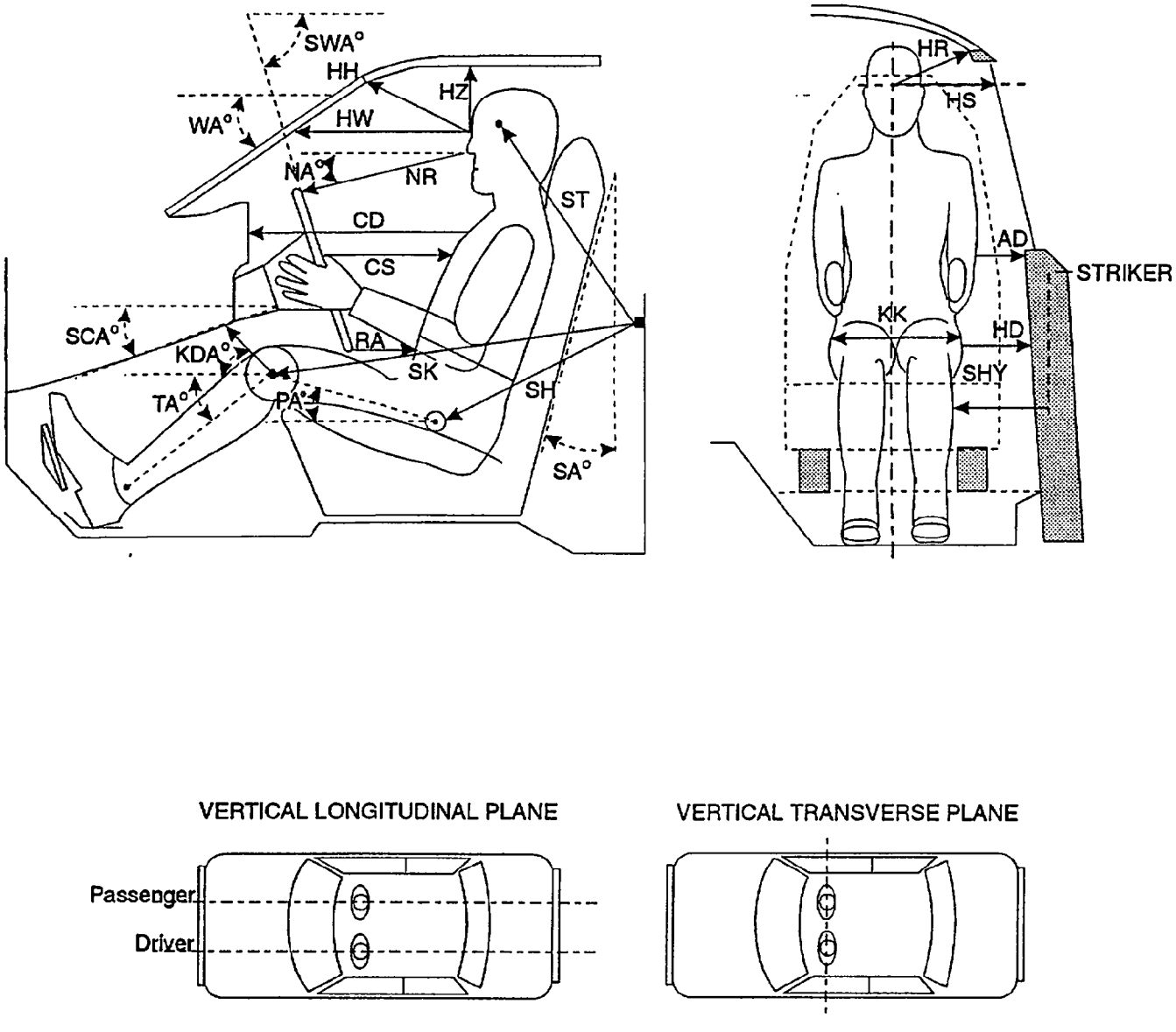
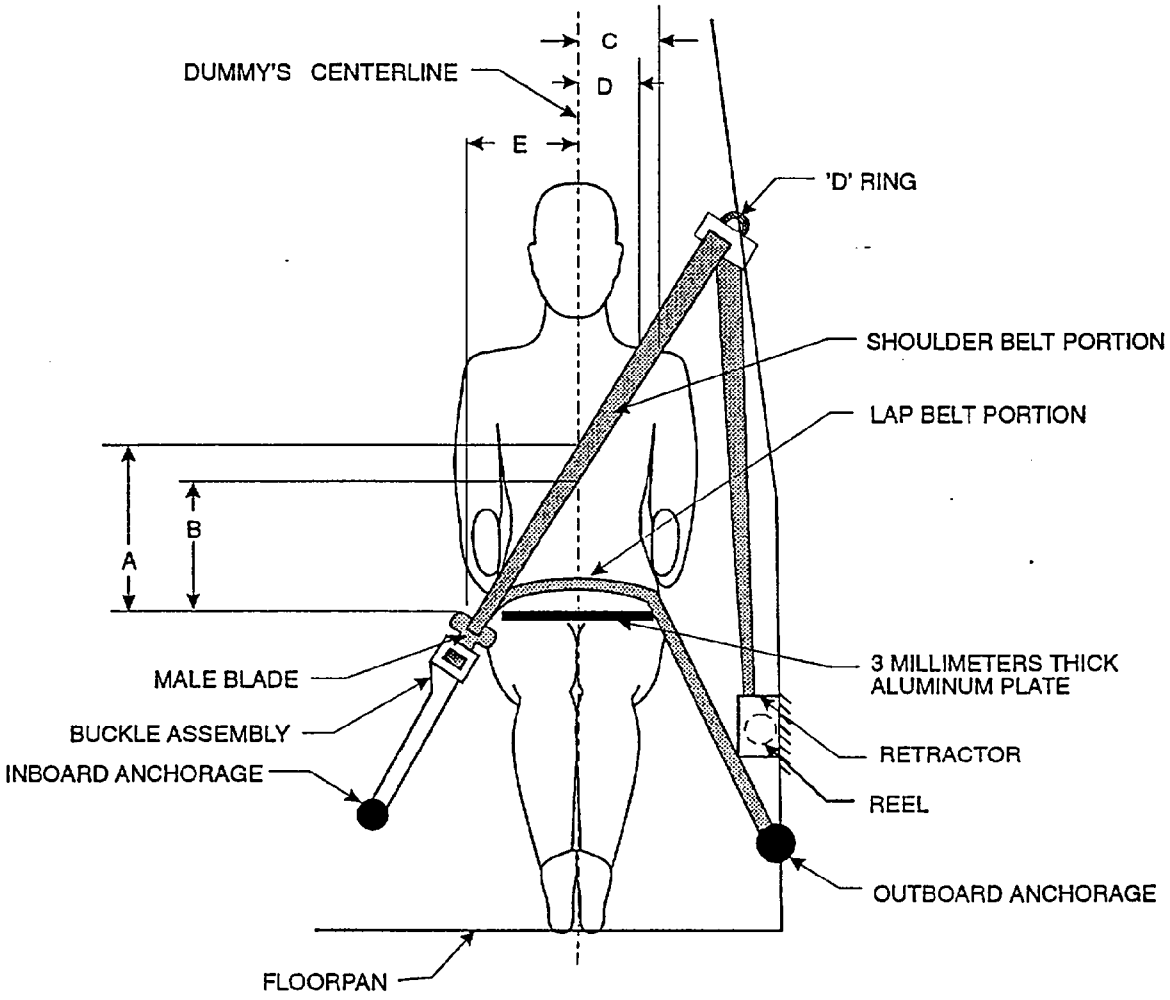


Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #34)	Passenger (Serial #35)
WA	Windshield angle	32°	NA
SWA	Steering wheel angle	66°	NA
SCA	Steering column angle	24°	NA
SA	Seat back angle	20°	20°
HZ	Head to roof	168 mm	168 mm
HH	Head to header	290 mm	358 mm
HW	Head to windshield	462 mm	427 mm
HR	Head to side header	206 mm	179 mm
NR	Nose to rim	350 mm	NA
NA	Nose to rim angle	11°	NA
CD	Chest to dash	499 mm	556 mm
CS	Steering wheel to chest	295 mm	NA
RA	Rim to abdomen	156 mm	NA
KDL	Left knee to dash	152 mm	217 mm
KDR	Right knee to dash	154 mm	207 mm
KDA	Outboard knee to dash angle	35°	28°
PA	Pelvic angle	25°	25°
TA	Tibial angle	38°	32°
KK	Knee to knee	318 mm	247 mm
ST[1]	Striker to head	641 mm	628 mm
	Striker to head angle	-48°	-47°
SK[1]	Striker to knee	920 mm	929 mm
	Striker to knee angle	-2°	0°
SH[1]	Striker to H-point	571 mm	587 mm
	Striker to H-point angle	20°	17°
SHY	Striker to H-point (Y dir.)	181 mm	183 mm
HS	Head to side window	290 mm	272 mm
HD	H-point to door	165 mm	128 mm
AD	Arm to door	88 mm	48 mm

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

Figure 9 Seat Belt Positioning Data



		Driver	Passenger
A	Top surface of aluminum plate to belt upper edge	291 mm	NA
B	Top surface of aluminum plate to belt lower edge	220 mm	NA
C	Dummy centerline to outer edge of belt at chest flesh top	125 mm	NA
D	Dummy centerline to inner edge of belt at chest flesh top	71 mm	NA
E	Dummy centerline to intersection of upper torso belt and lap belt	236 mm	NA

Figure 10 Camera Positions

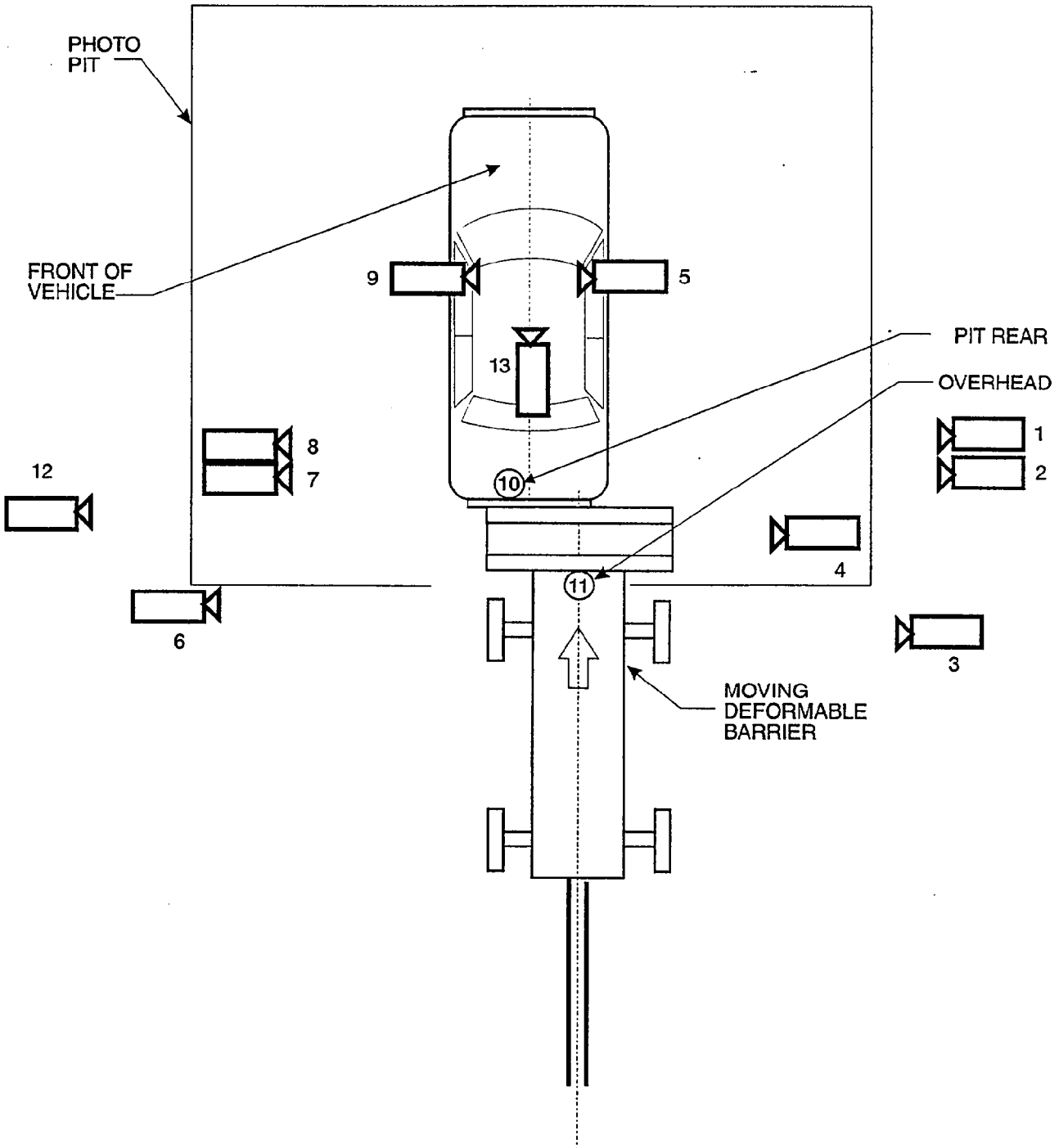


Table 13 Motion Picture Camera Locations

Vehicle year/make/model/body style: 1993/Ford/Mustang/2-door coupe

Test number: 950821

Camera Number	View	Camera Positions[1] X	Y	Z	Angle of Inclination[2]	Angle of Rotation[3]	Camera Lens	Film Speed
1	Right side vehicle	2743	12725	1016	0°	0°	25 mm	1018 frames/s
2	Right side overall	-432	13970	737	0°	0°	13 mm	1022 frames/s
3	Right MDB	610	15723	813	0°	0°	25 mm	848 frames/s
4	Right close-up	0	5867	1092	-3°	0°	17 mm	998 frames/s
5	Right front passenger onboard	NA	NA	NA	NA	NA	8 mm	995 frames/s
6	Left side MDB	1981	-13411	826	0°	0°	25 mm	1022 frames/s
7	Left side close-up	0	-6629	1105	-3°	0°	17 mm	1000 frames/s
8	Left side vehicle	1676	-15646	1194	-2°	0°	25 mm	998 frames/s
9	Driver onboard	NA	NA	NA	NA	NA	8 mm	1000 frames/s
10	Underbody vehicle	NA	NA	NA	90°	0°	17 mm	1008 frames/s
11	Overhead	NA	NA	NA	90°	0°	13 mm	1008 frames/s
12	Left side overall	457	-14122	1156	0°	0°	13 mm	998 frames/s
13	Seat back view	NA	NA	NA	NA	NA	13 mm	933 frames/s

[1] +X: Forward from impact point MDB face
+Y: Rightward from monorail centerline
+Z: Upward from ground level

[2] +Angle of Inclination: Camera lens (upward from horizontal)

[3] +Angle of Rotation: Camera lens toward barrier from line perpendicular to monorail centerline

Appendix A

Photographs

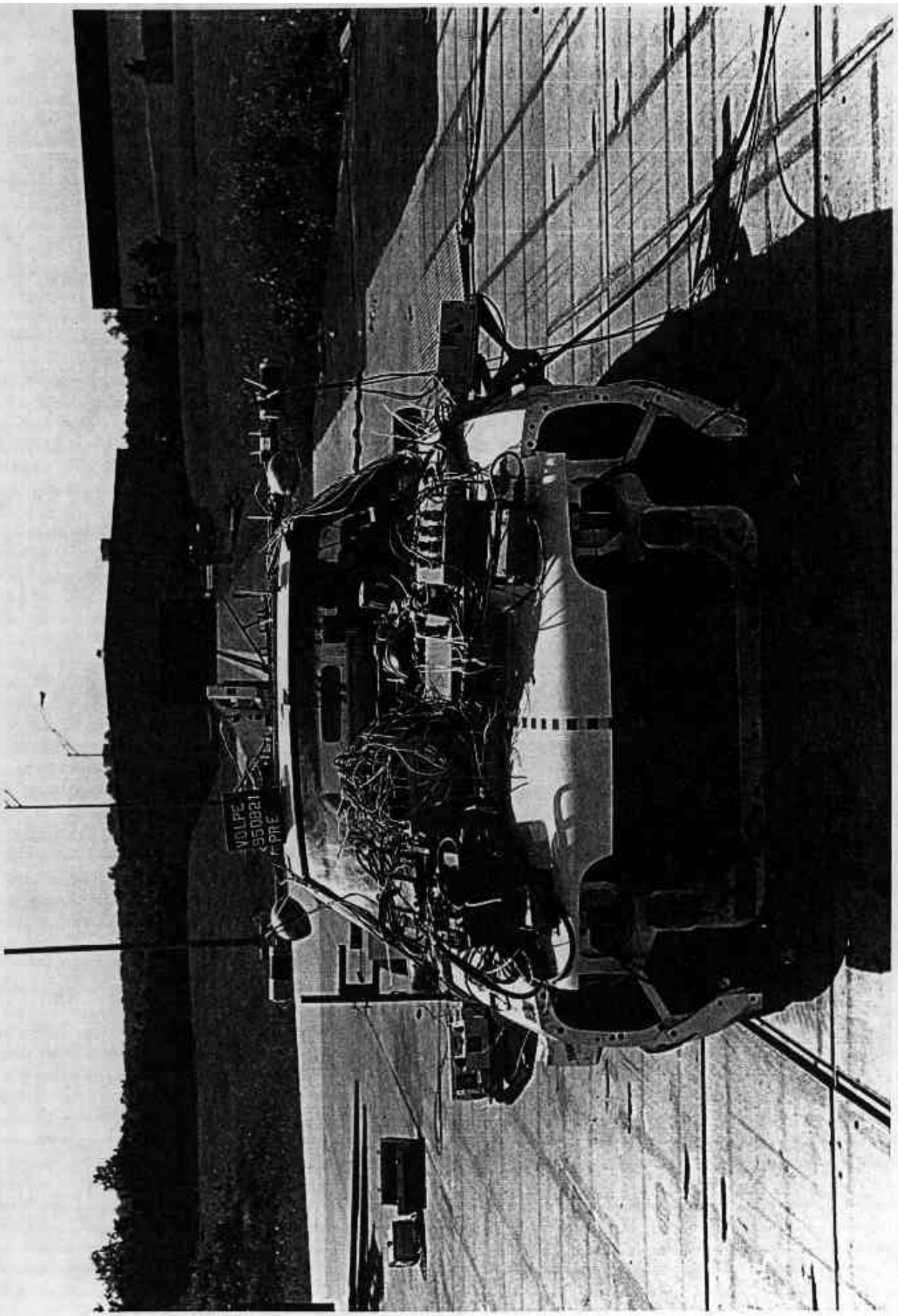


Figure A-1. Pre-Test Front View

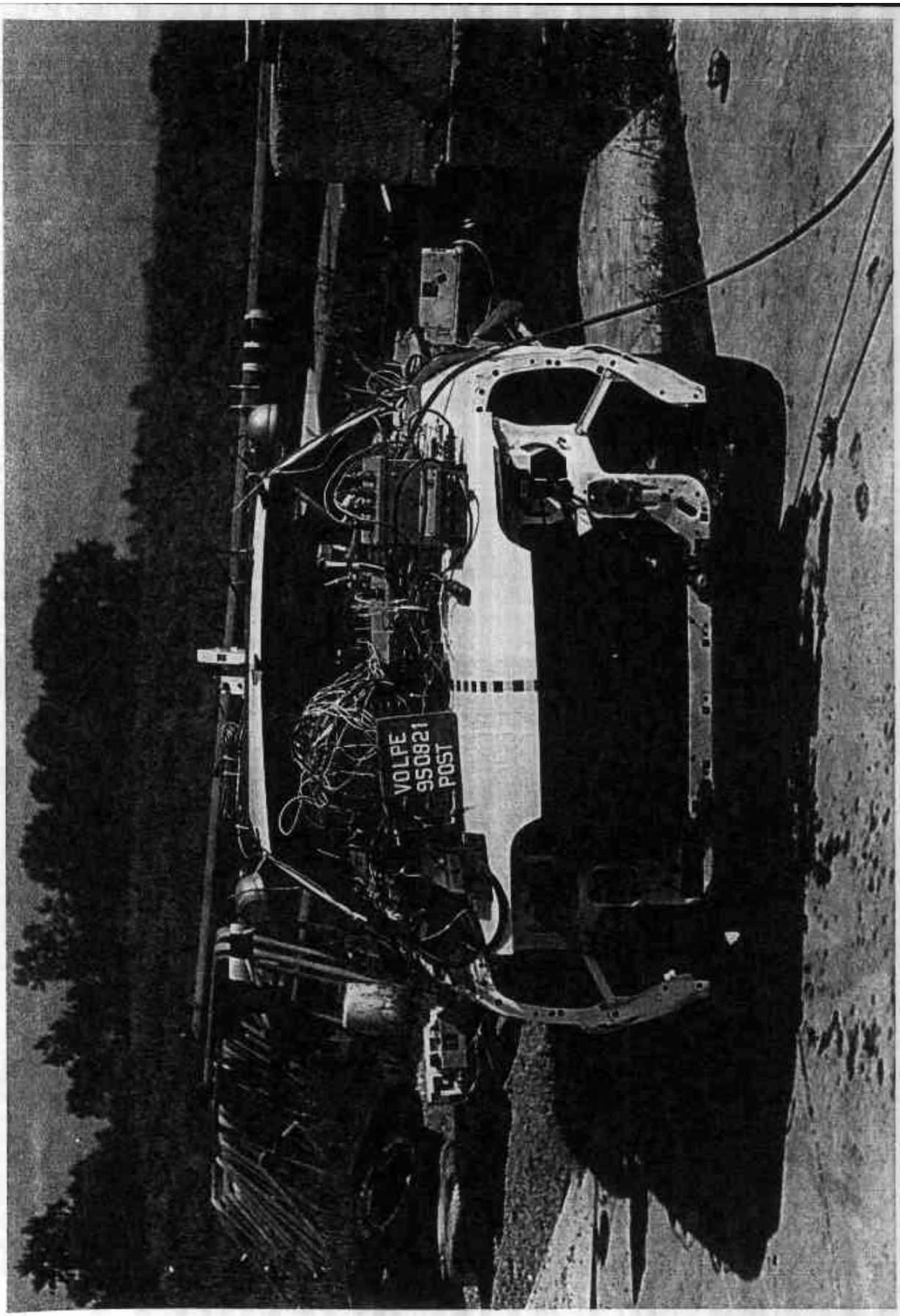


Figure A-2. Post-Test Front View

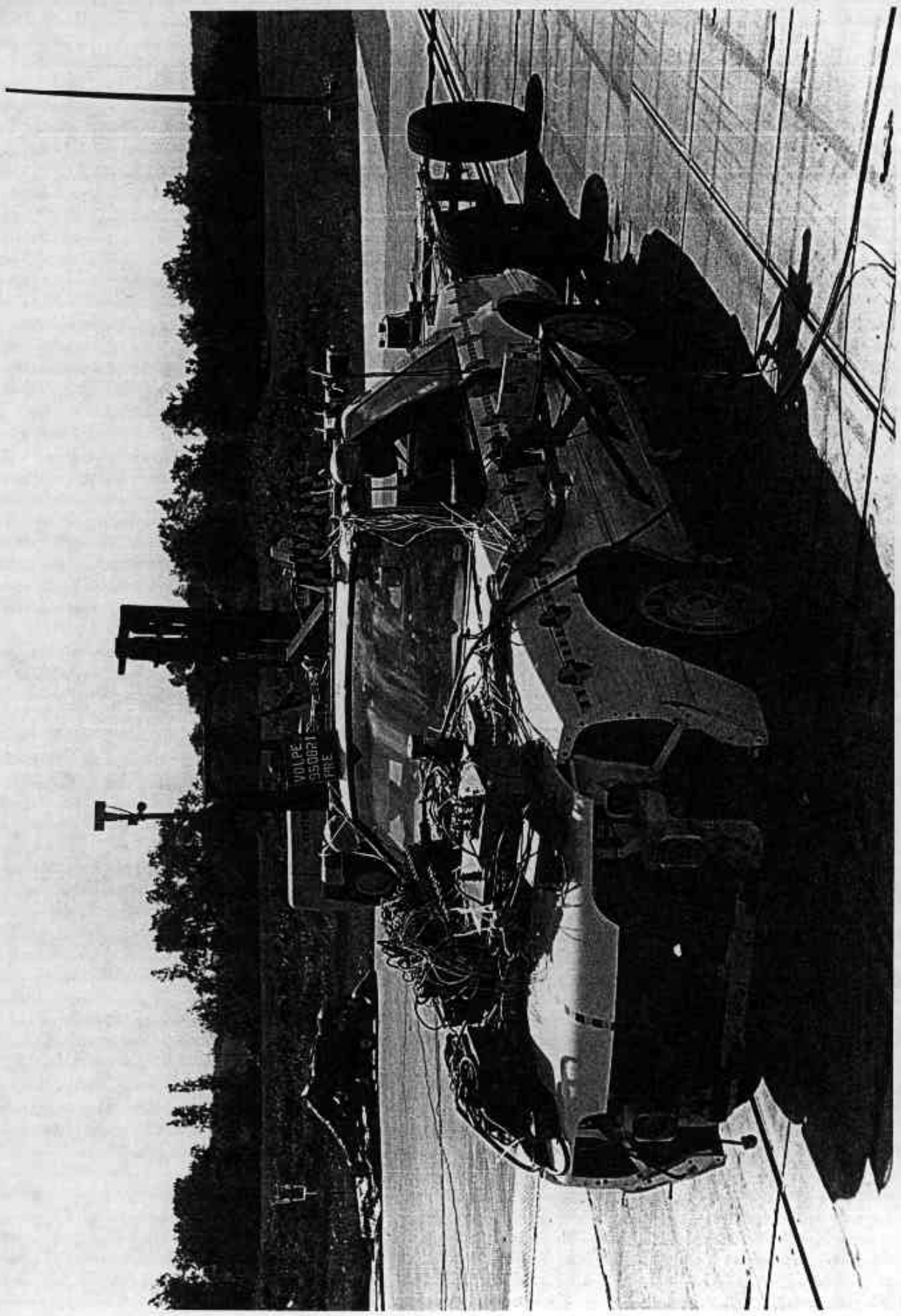


Figure A-3. Pre-Test Left Front Three-Quarter View

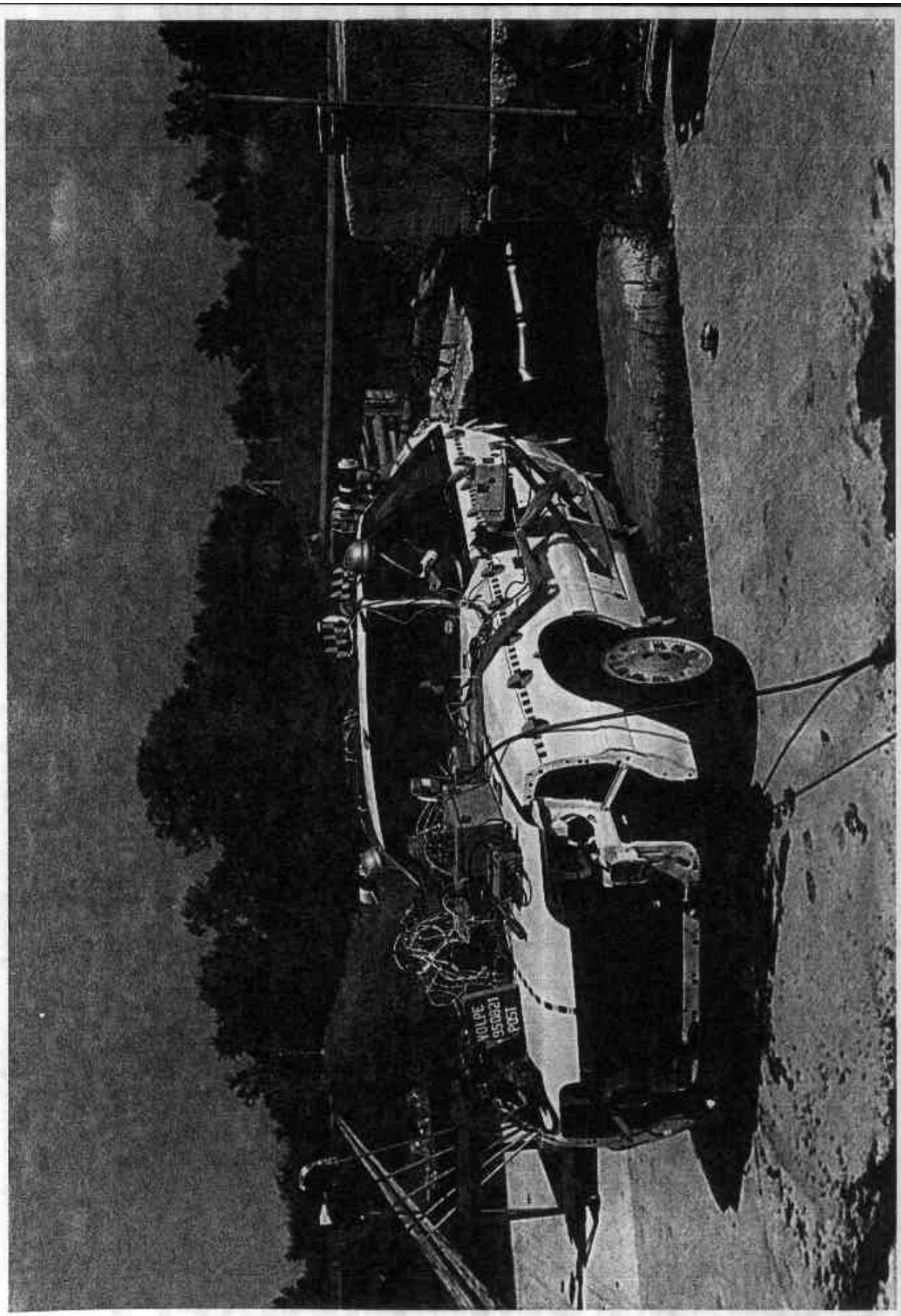


Figure A-4. Post-Test Left Front Three-Quarter View

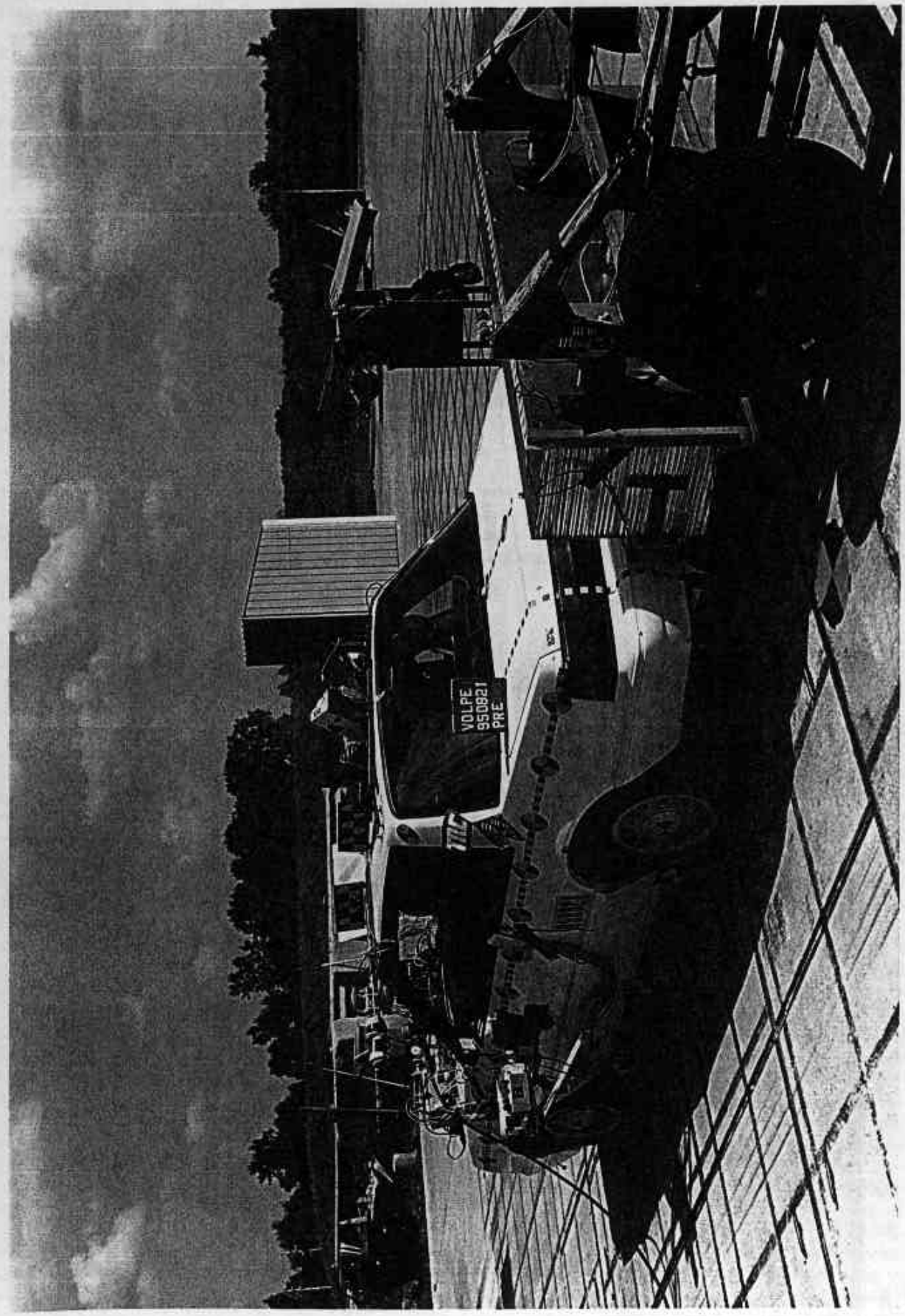


Figure A-5. Pre-Test Left Rear Three-Quarter View

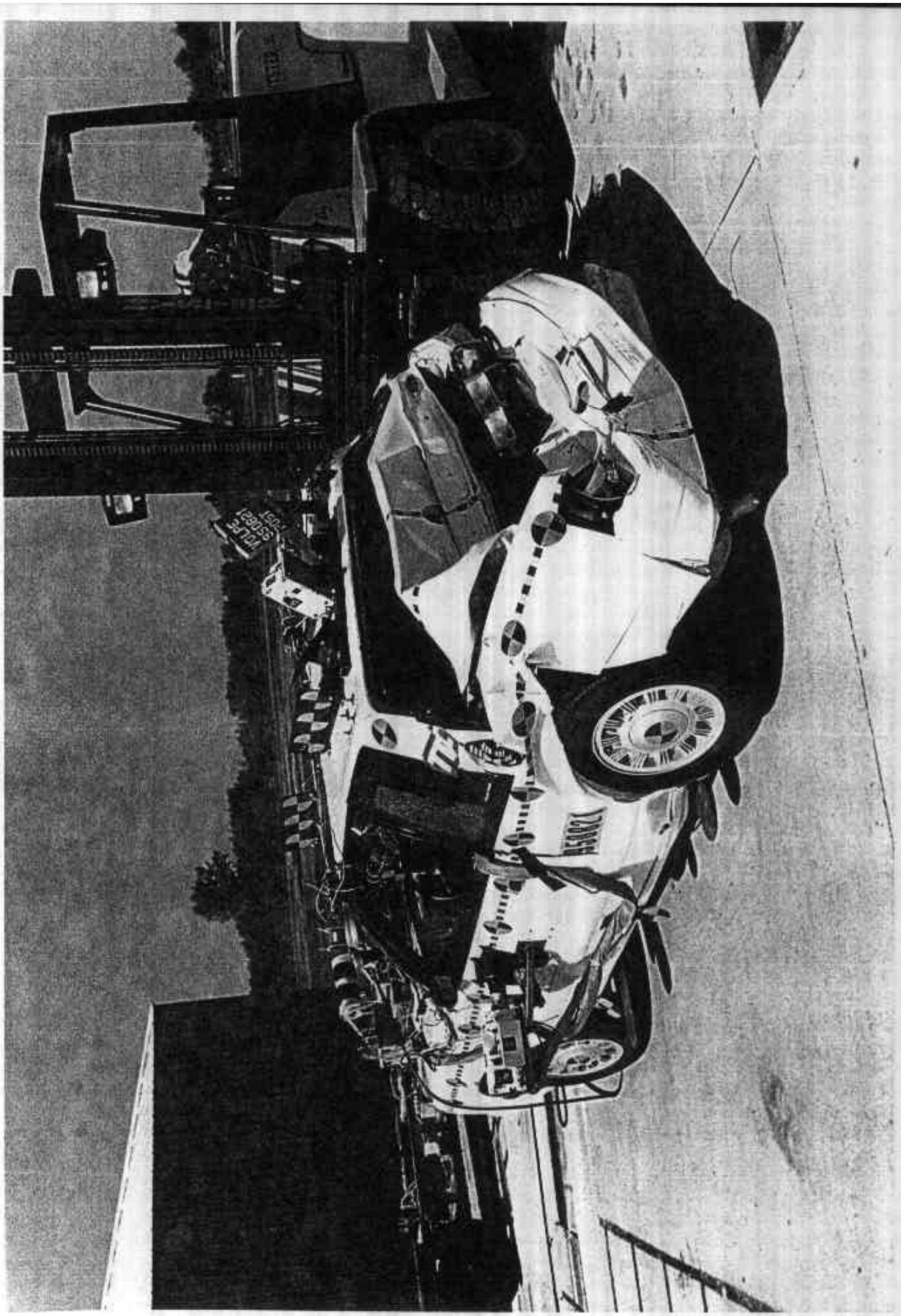


Figure A-6. Post-Test Left Rear Three-Quarter View

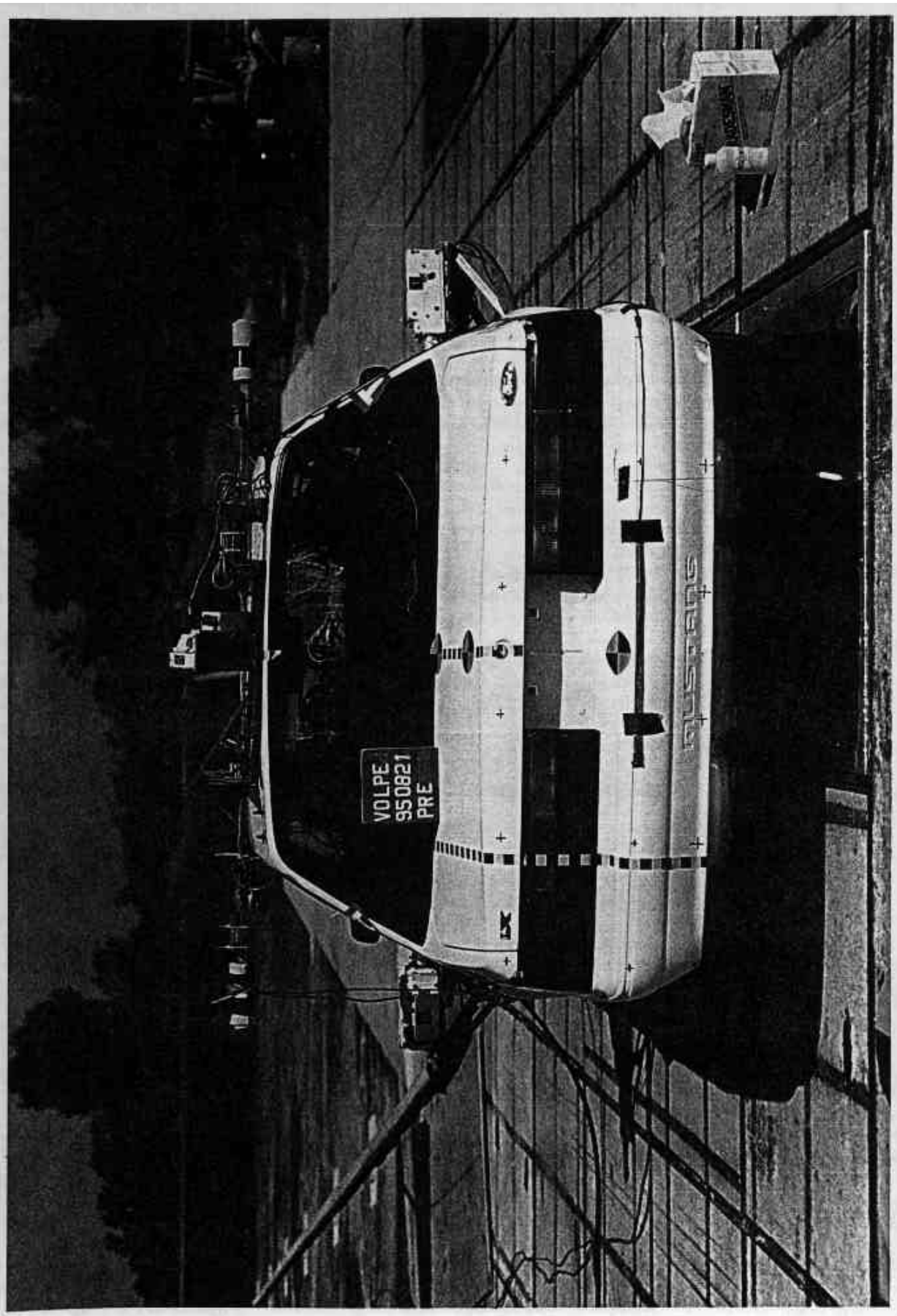


Figure A-7. Pre-Test Rear View

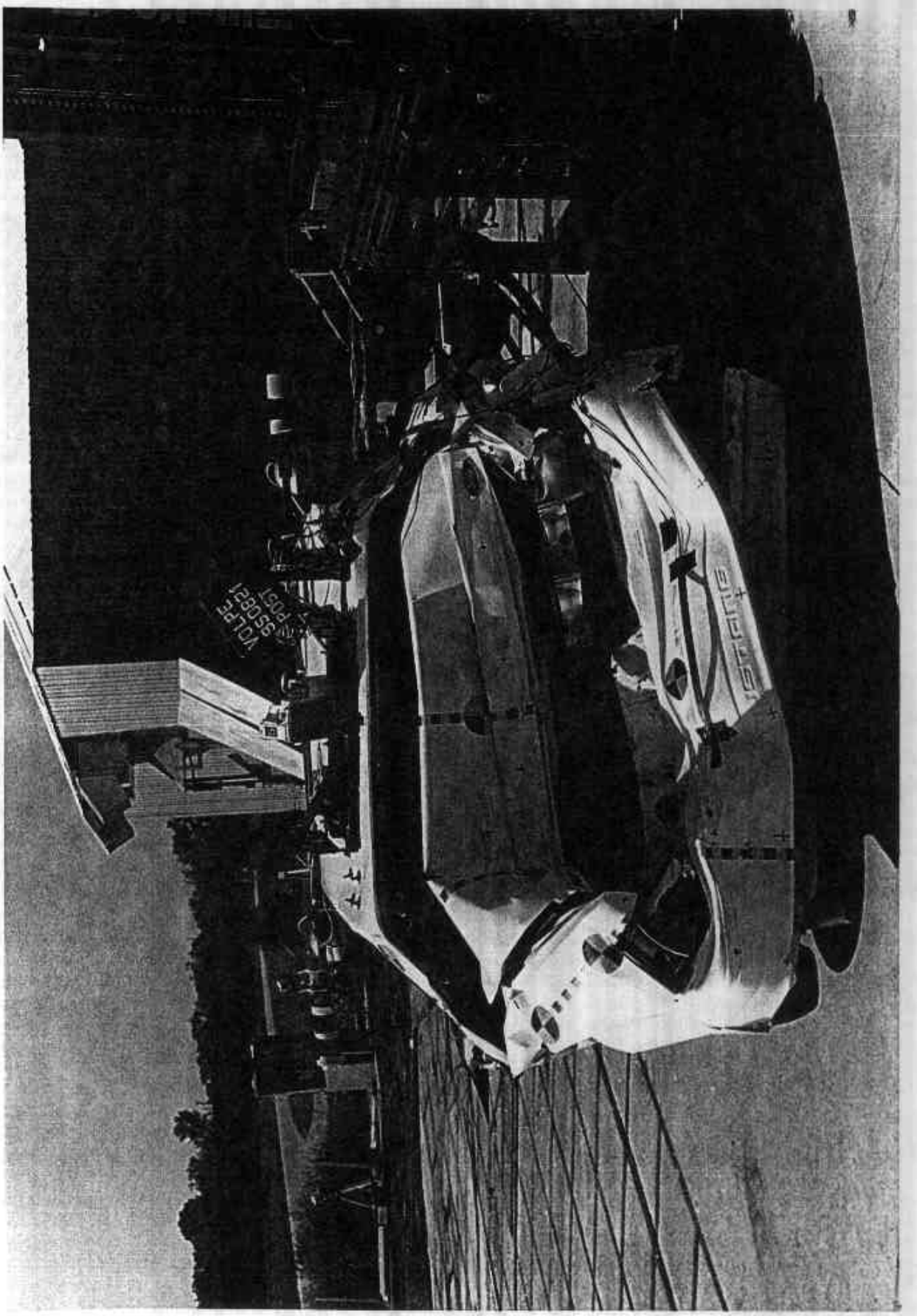


Figure A-8. Post-Test Rear View

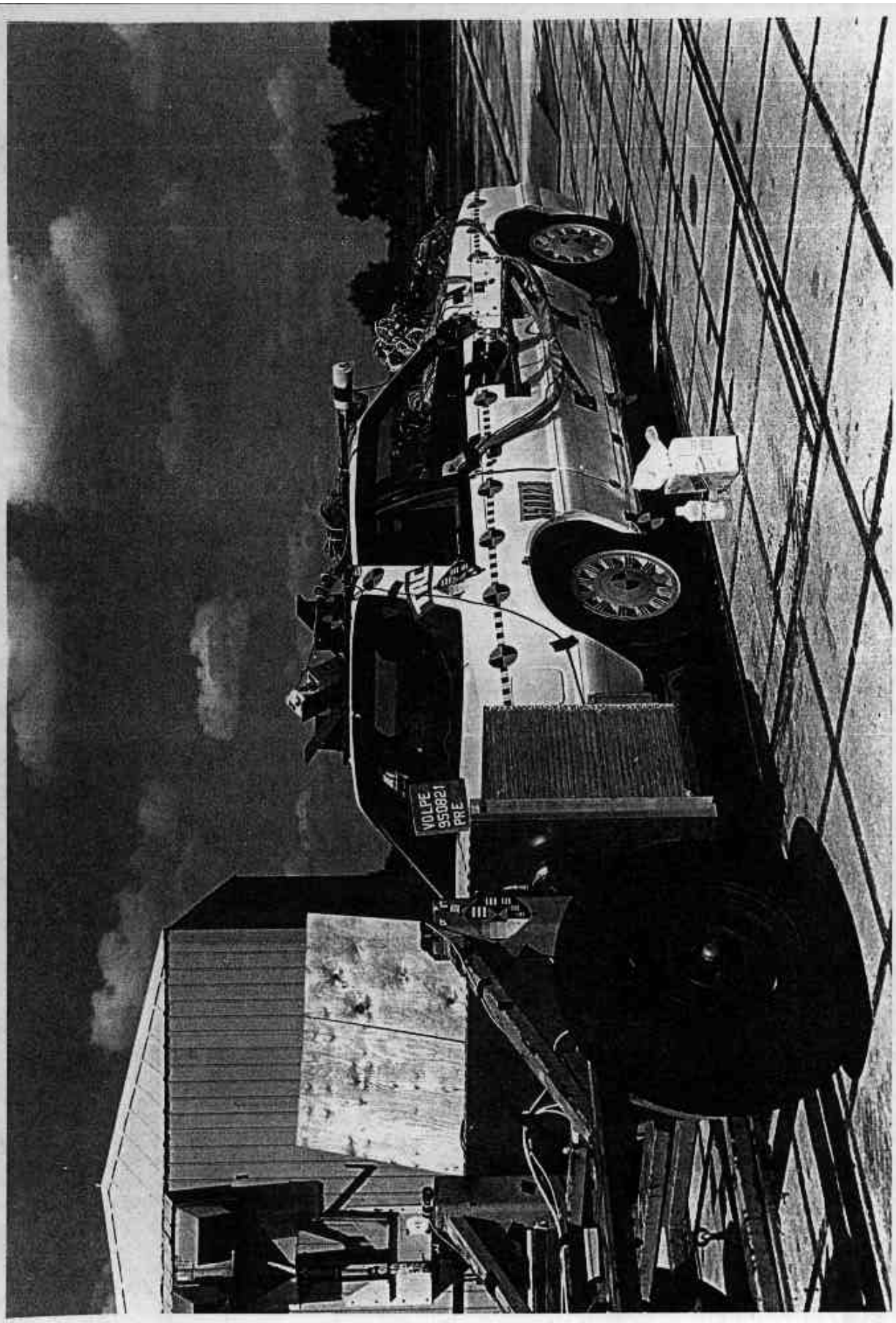


Figure A-9. Pre-Test Right Rear Three-Quarter View

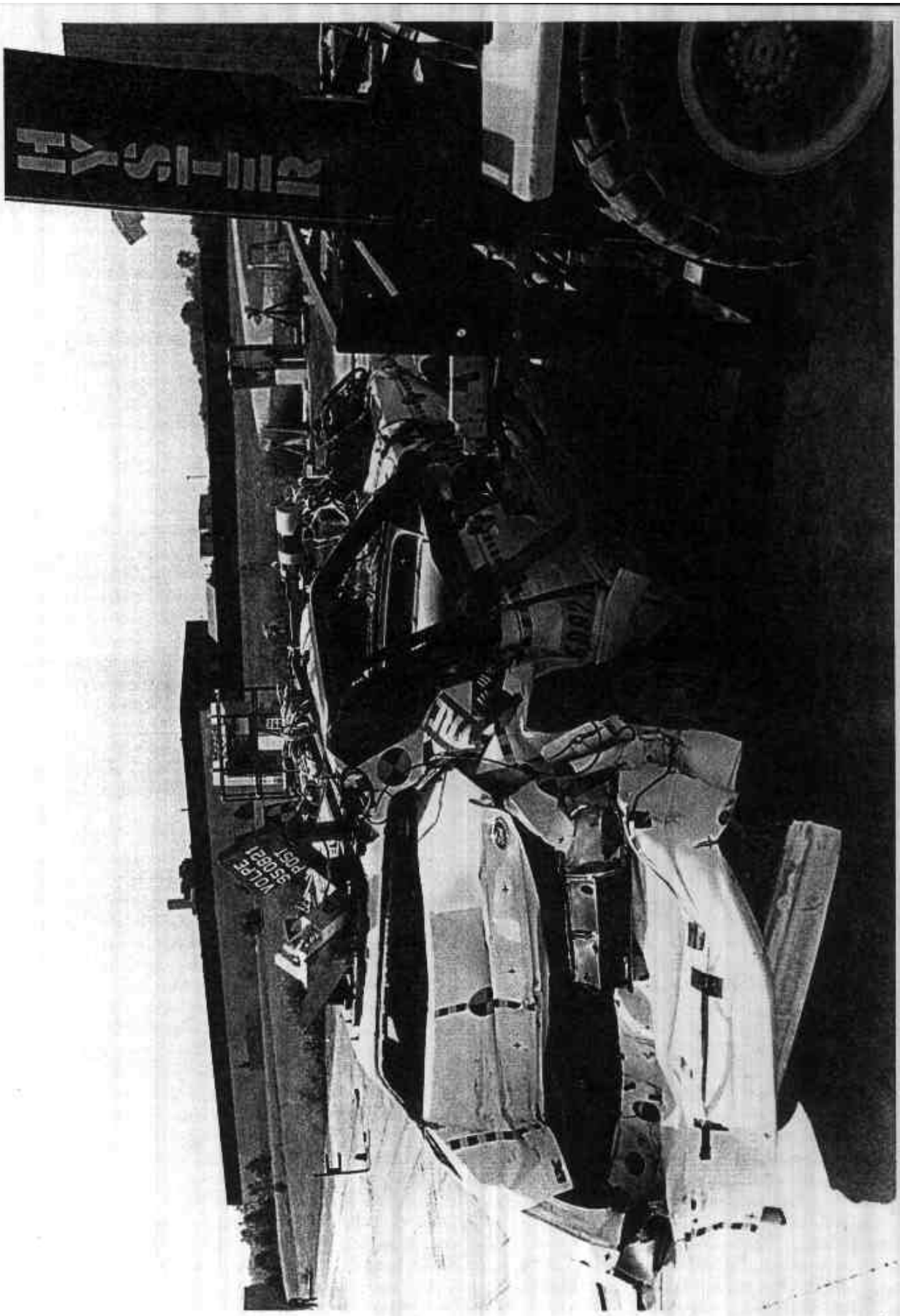


Figure A-10. Post-Test Right Rear Three-Quarter View

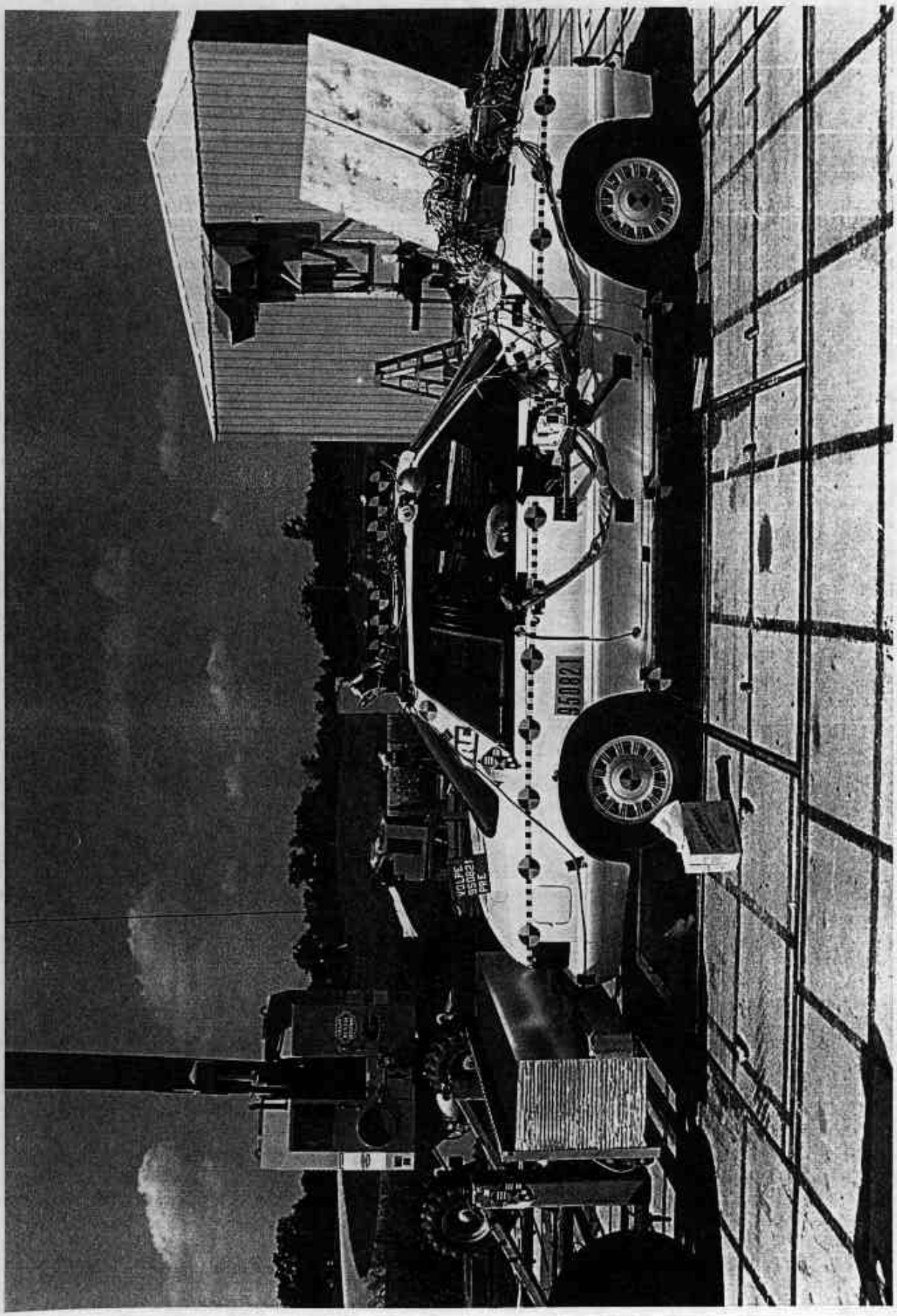


Figure A-11. Pre-Test Right Side View

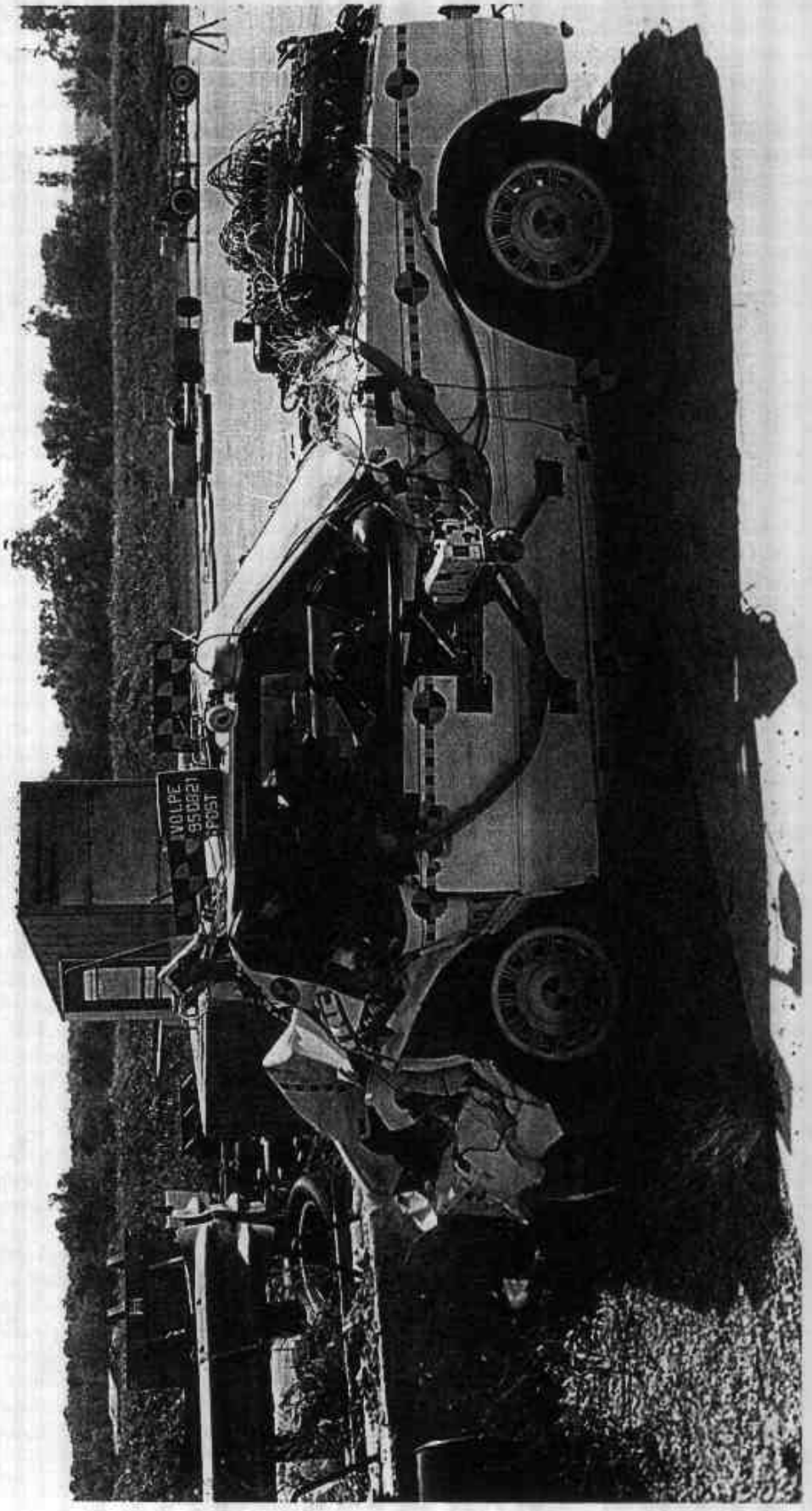


Figure A-12. Post-Test Right Side View

Figure A-13. Pre-Test Right Front Three-Quarter View

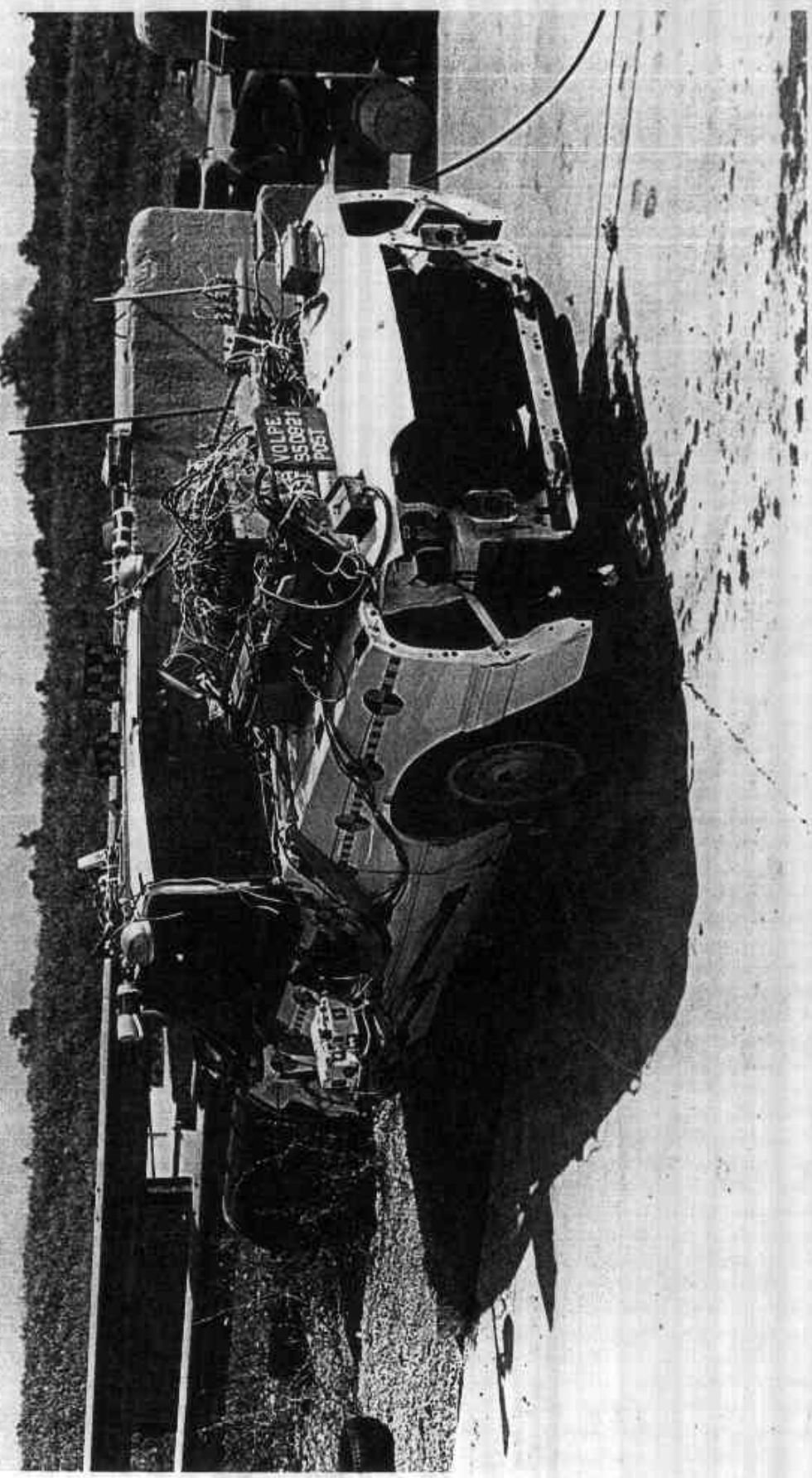


Figure A-14. Post-Test Right Front Three-Quarter View

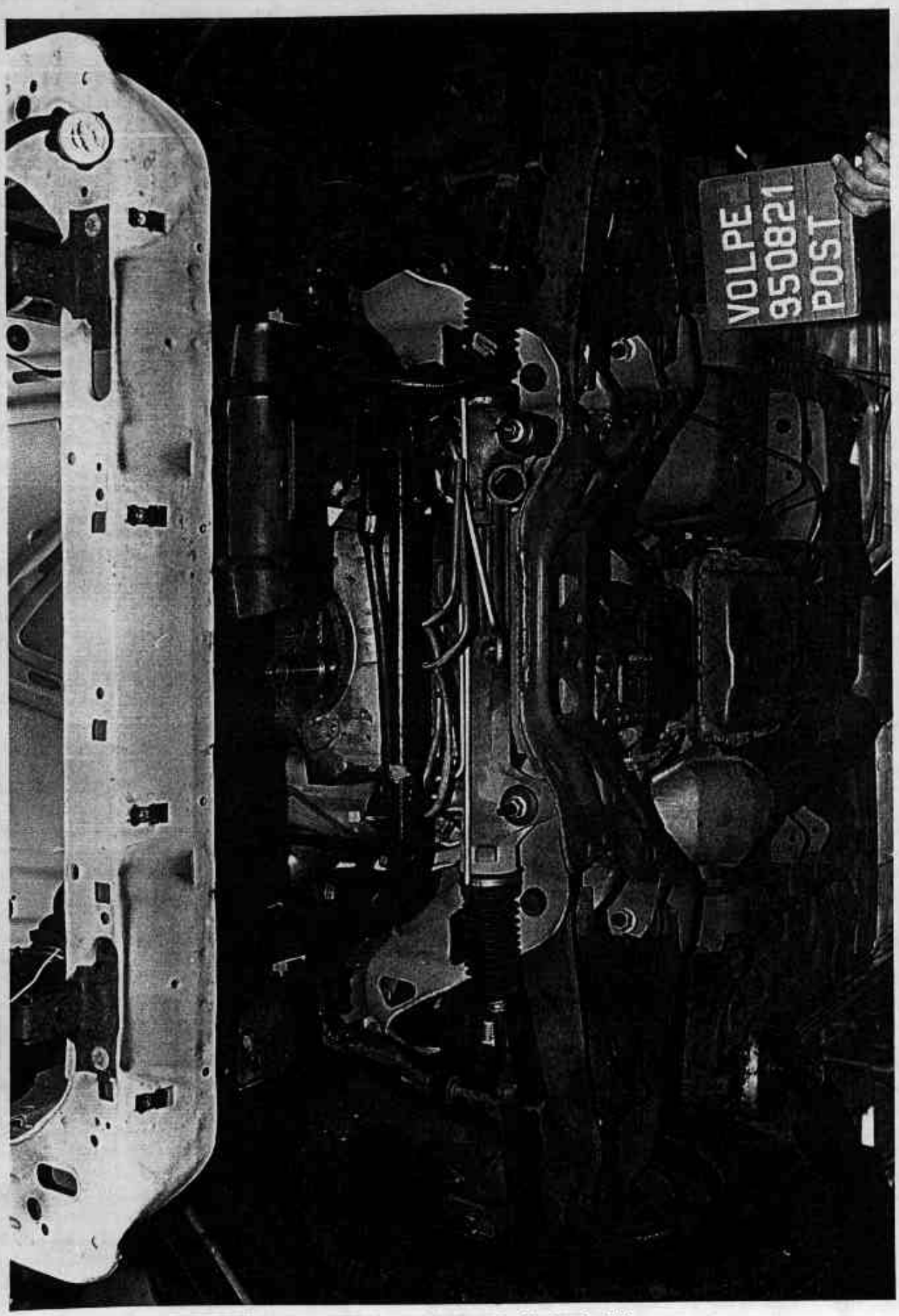


Figure A-15. Pre-Test Front Underbody View

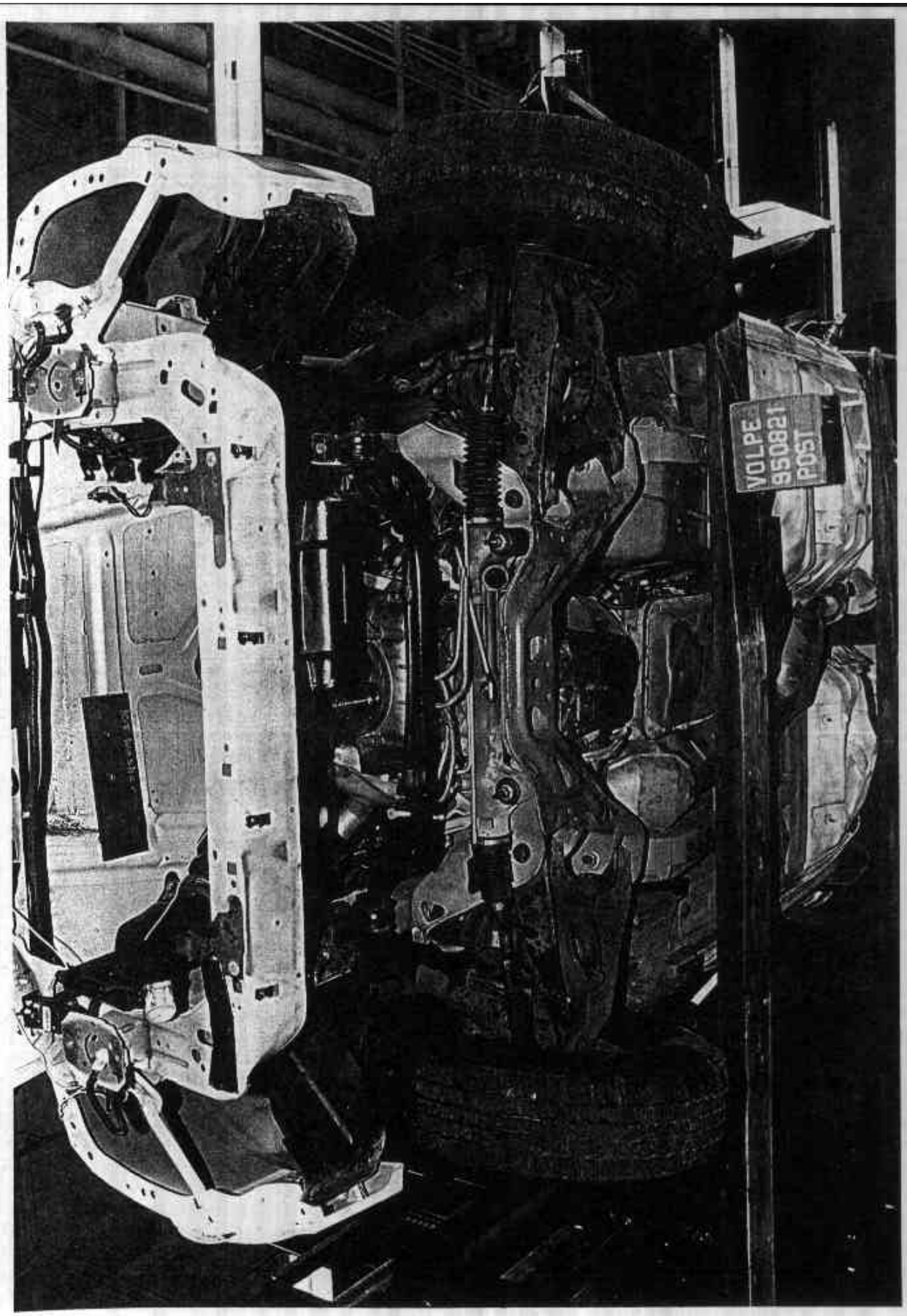


Figure A-16. Post-Test Front Underbody - View 1

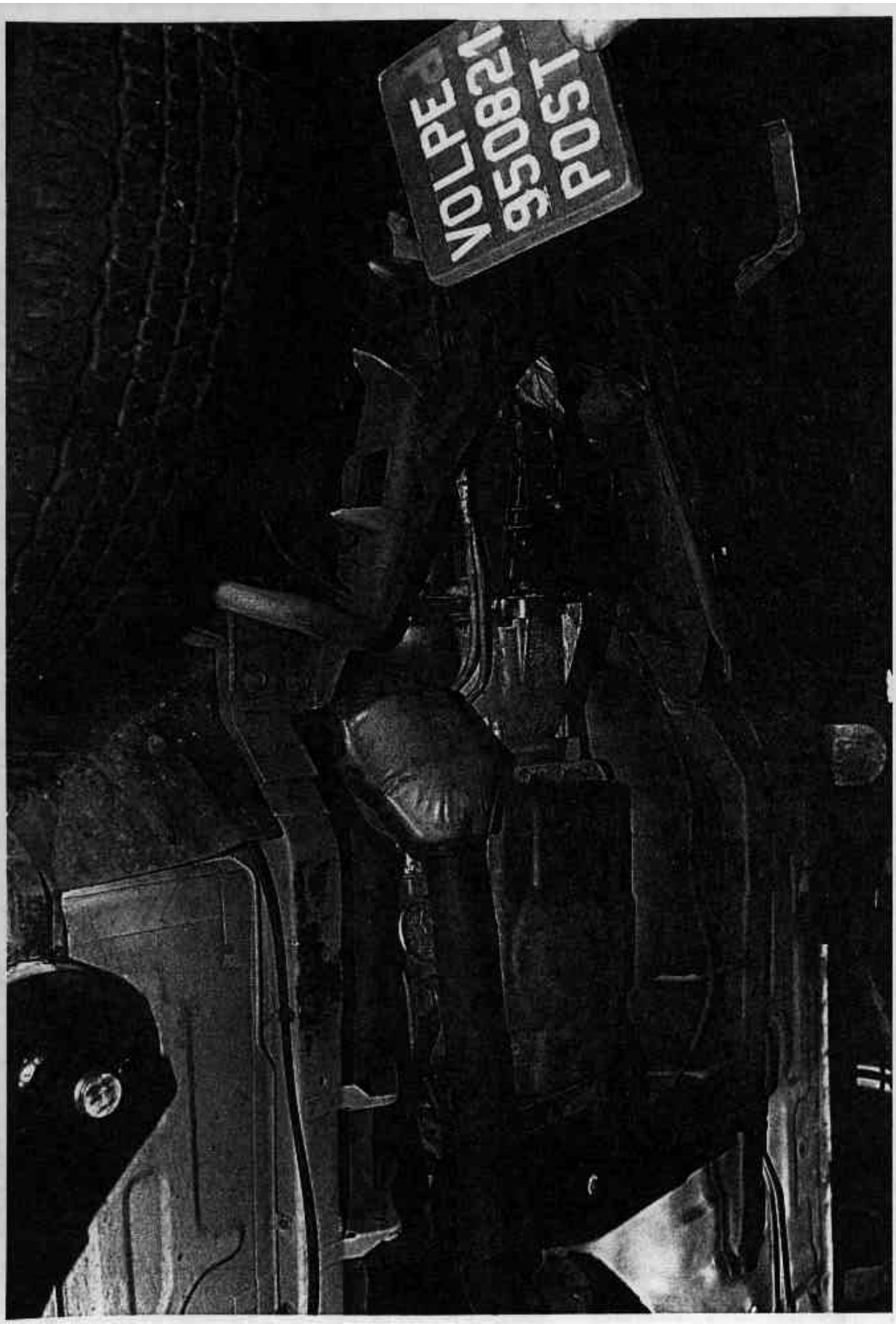


Figure A-17. Post-Test Front Underbody - View 2

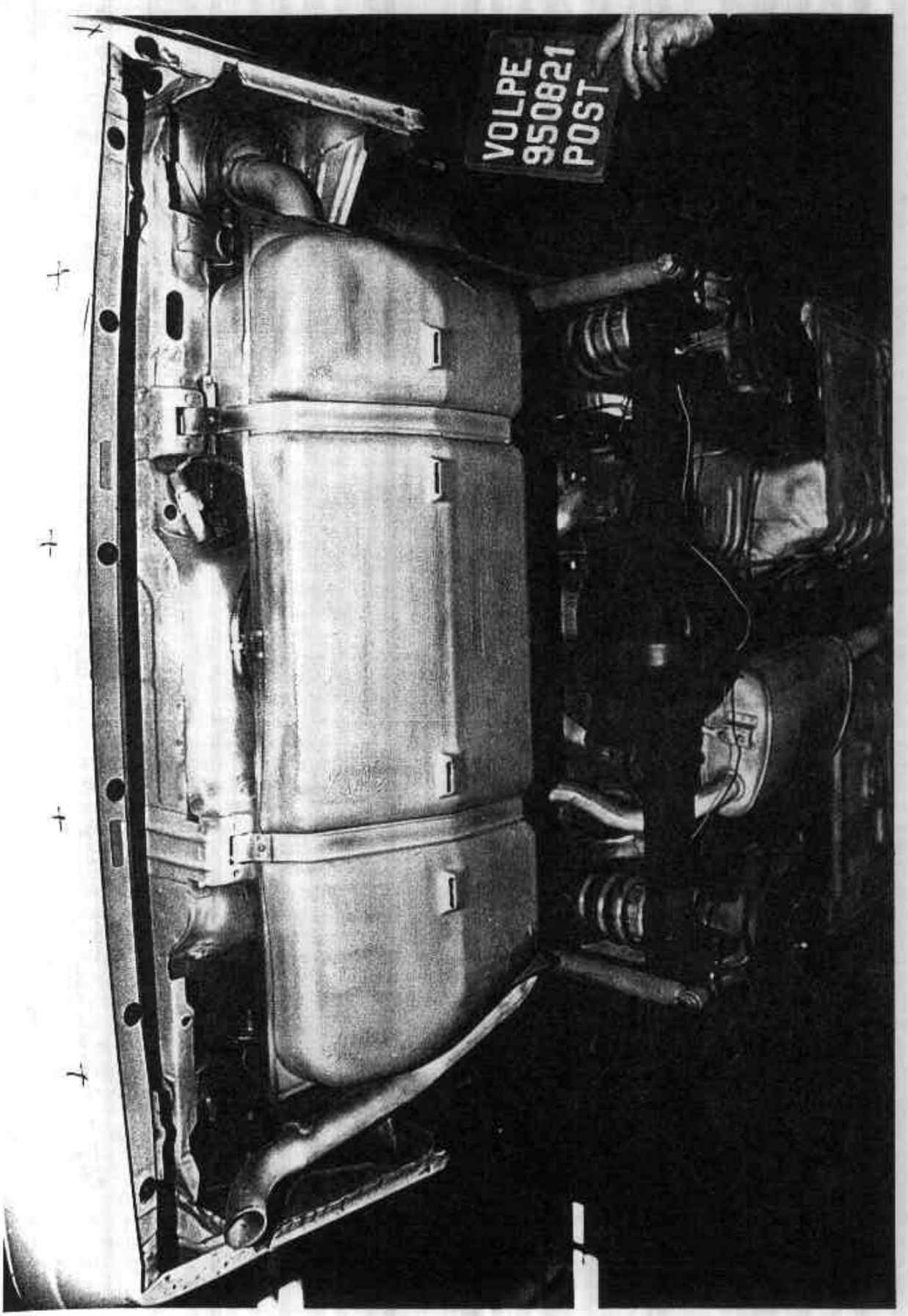


Figure A-18. Pre-Test Rear Underbody View

Figure A-19. Post-Test Rear Underbody - View 1

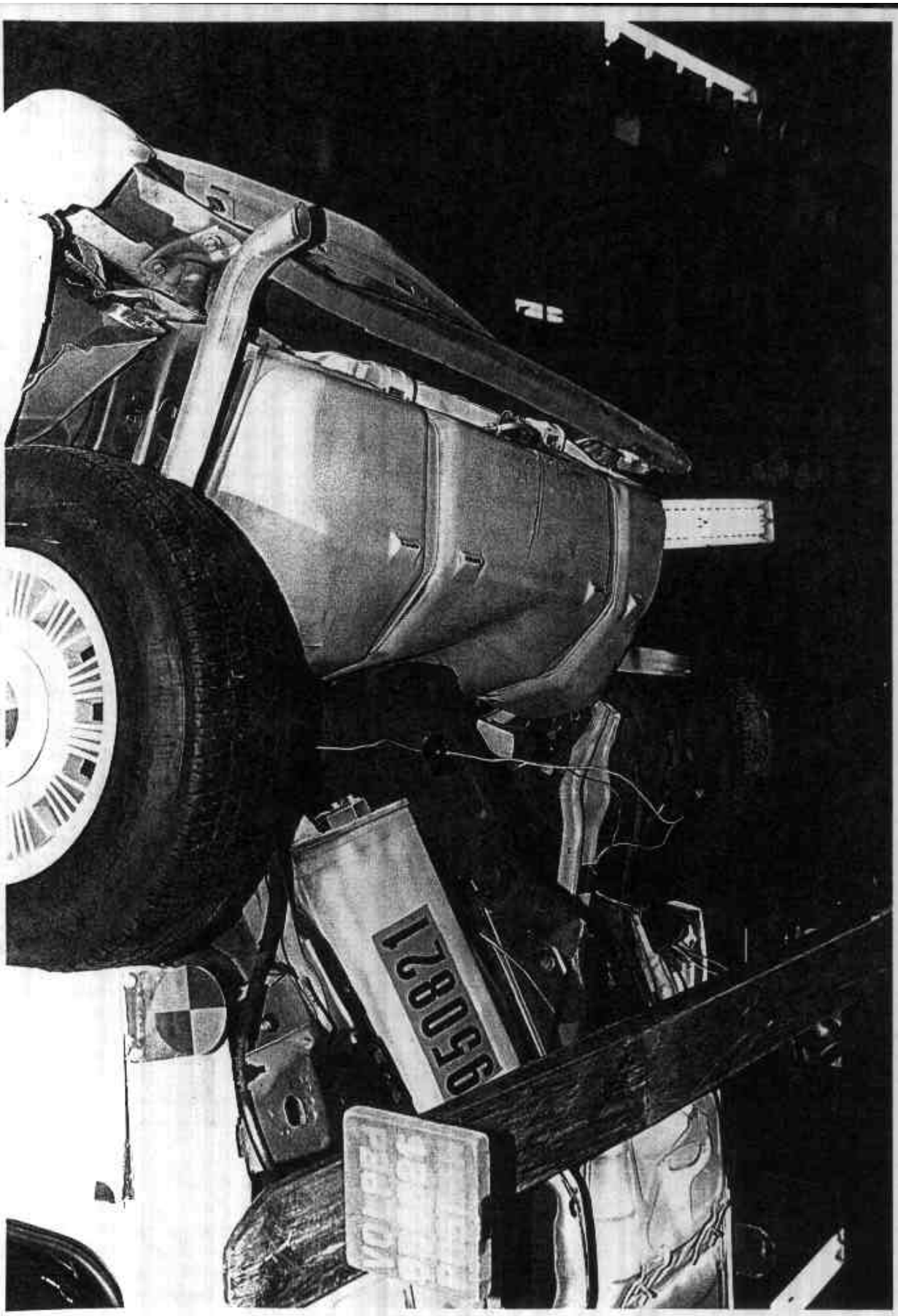


Figure A-20. Post-Test Rear Underbody - View 2

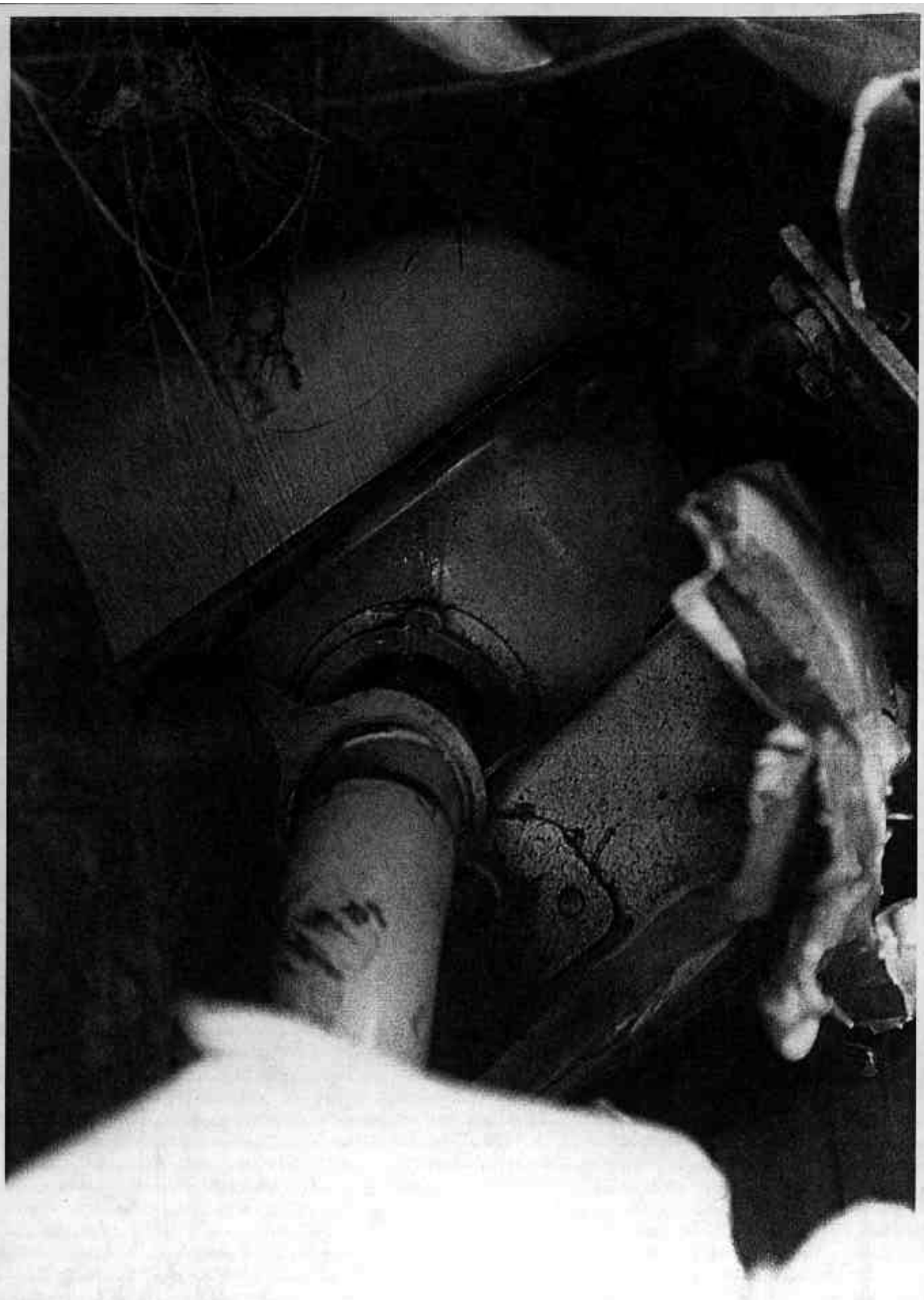


Figure A-21. Post-Test Fuel Tank/Fuel Filler Neck View

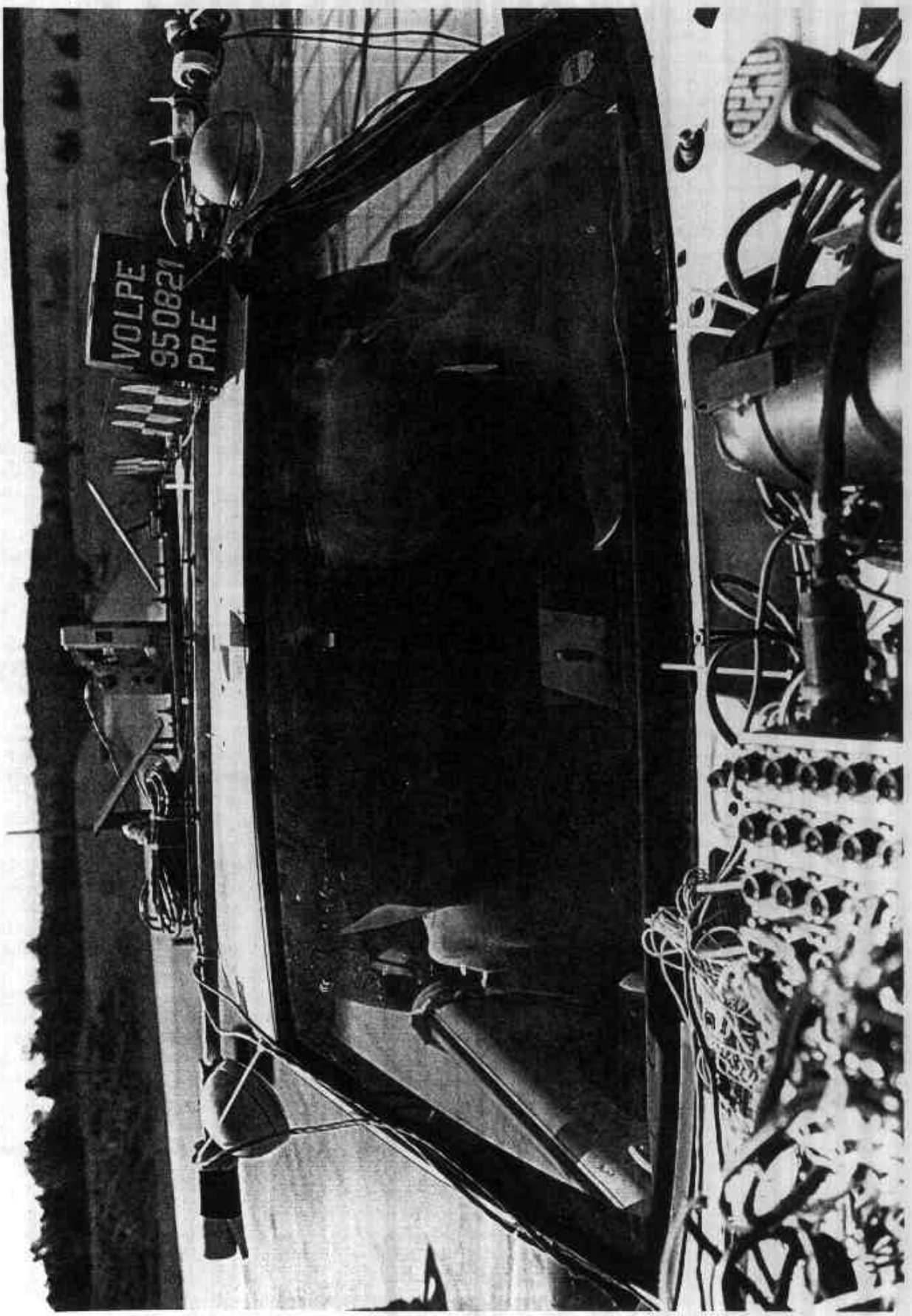


Figure A-22. Pre-Test Windshield View

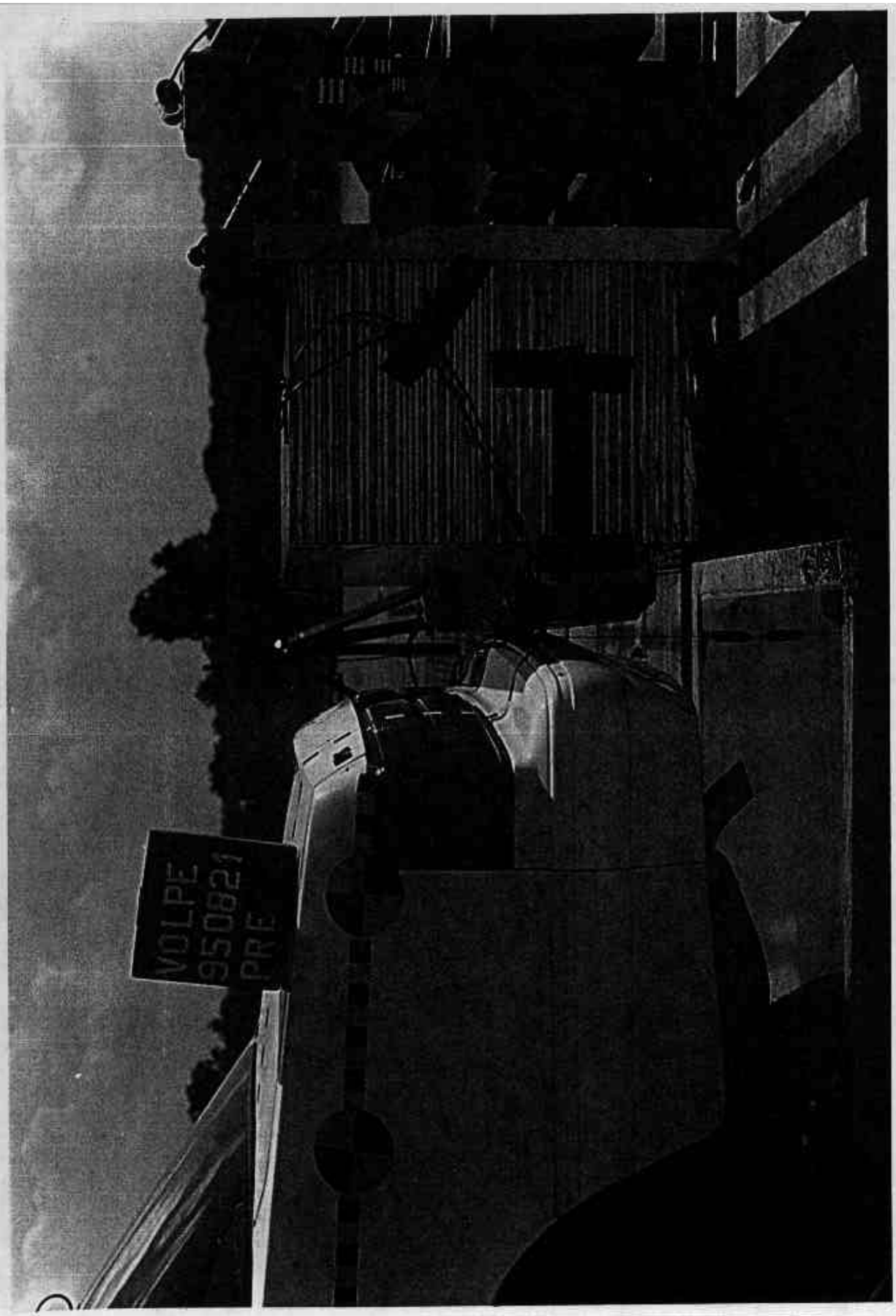


Figure A-23. Pre-Test Barrier to Vehicle Alignment View - Left

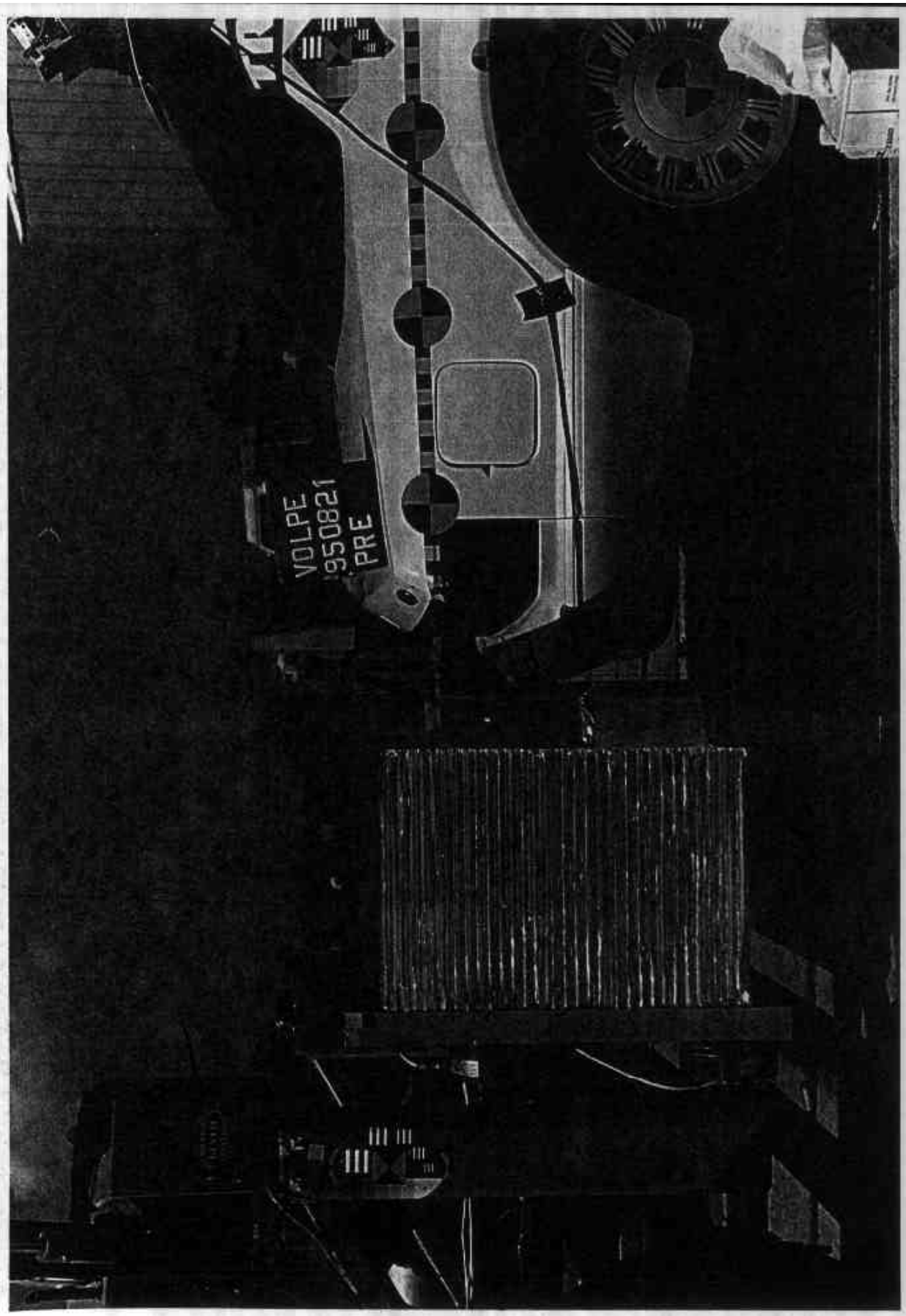


Figure A-24. Pre-Test Barrier to Vehicle Alignment View - Right

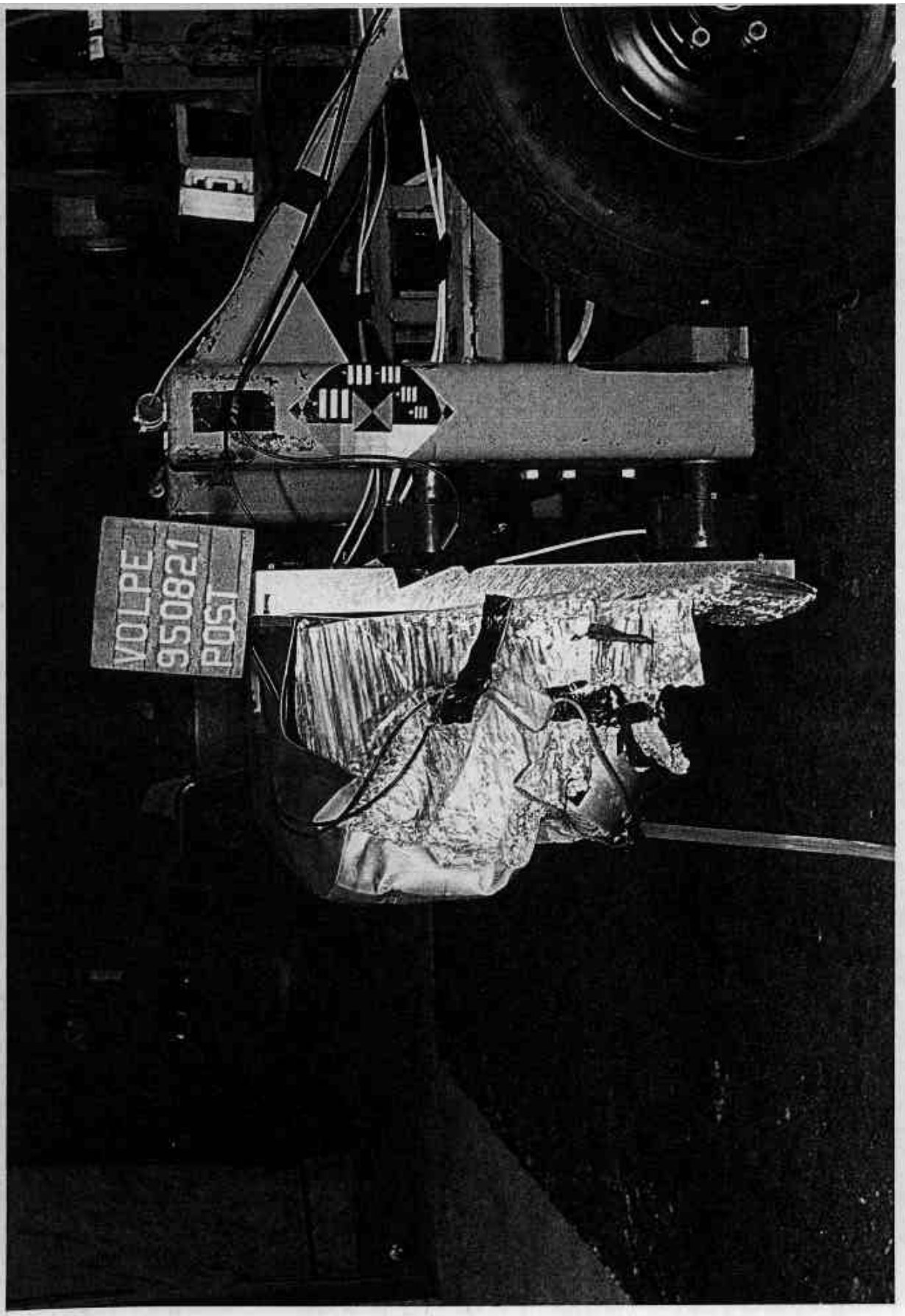


Figure A-25. Post-Test Barrier Face Deformation View - Left Side

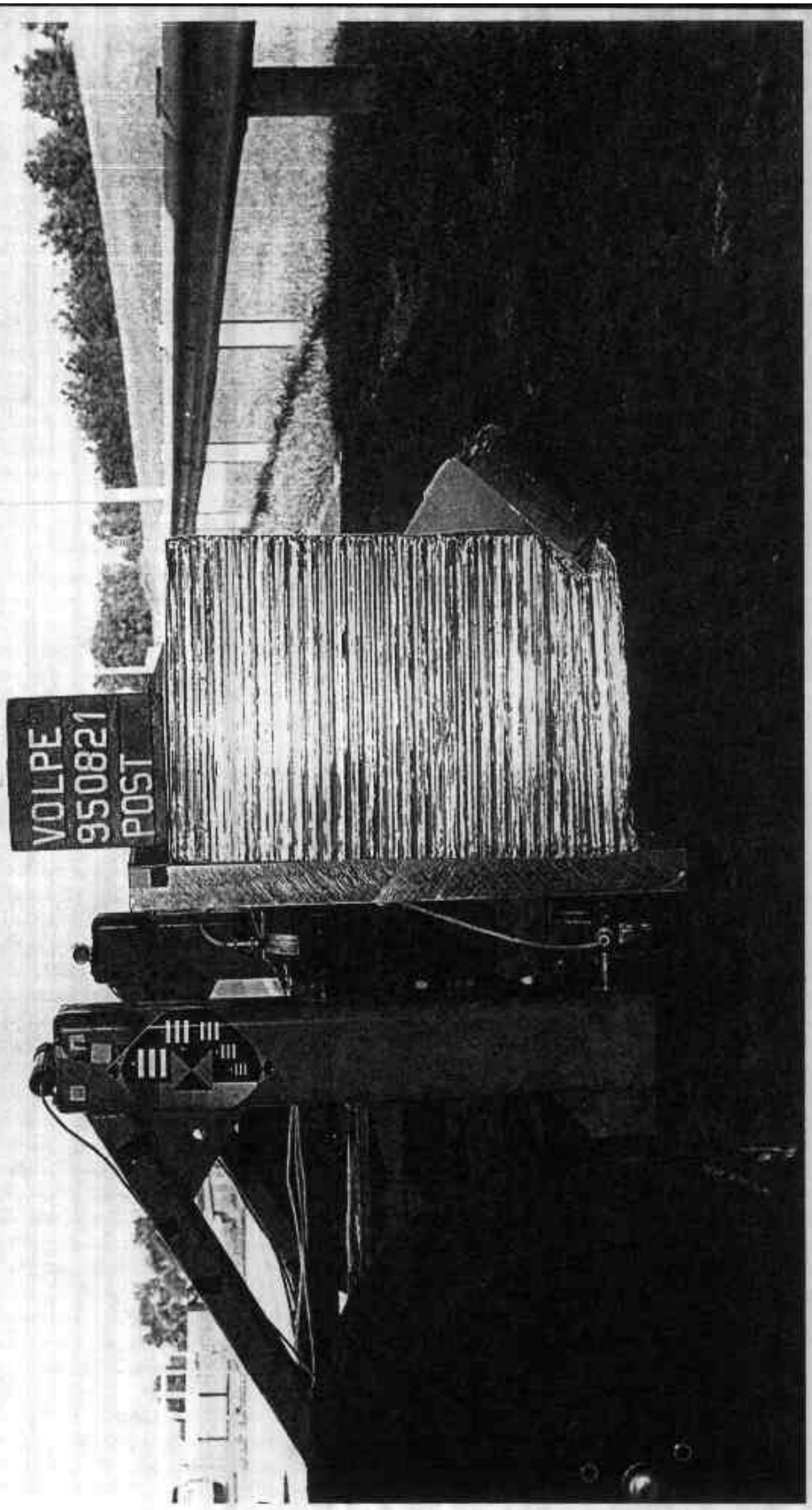


Figure A-26. Post-Test Barrier Face Deformation View - Right Side

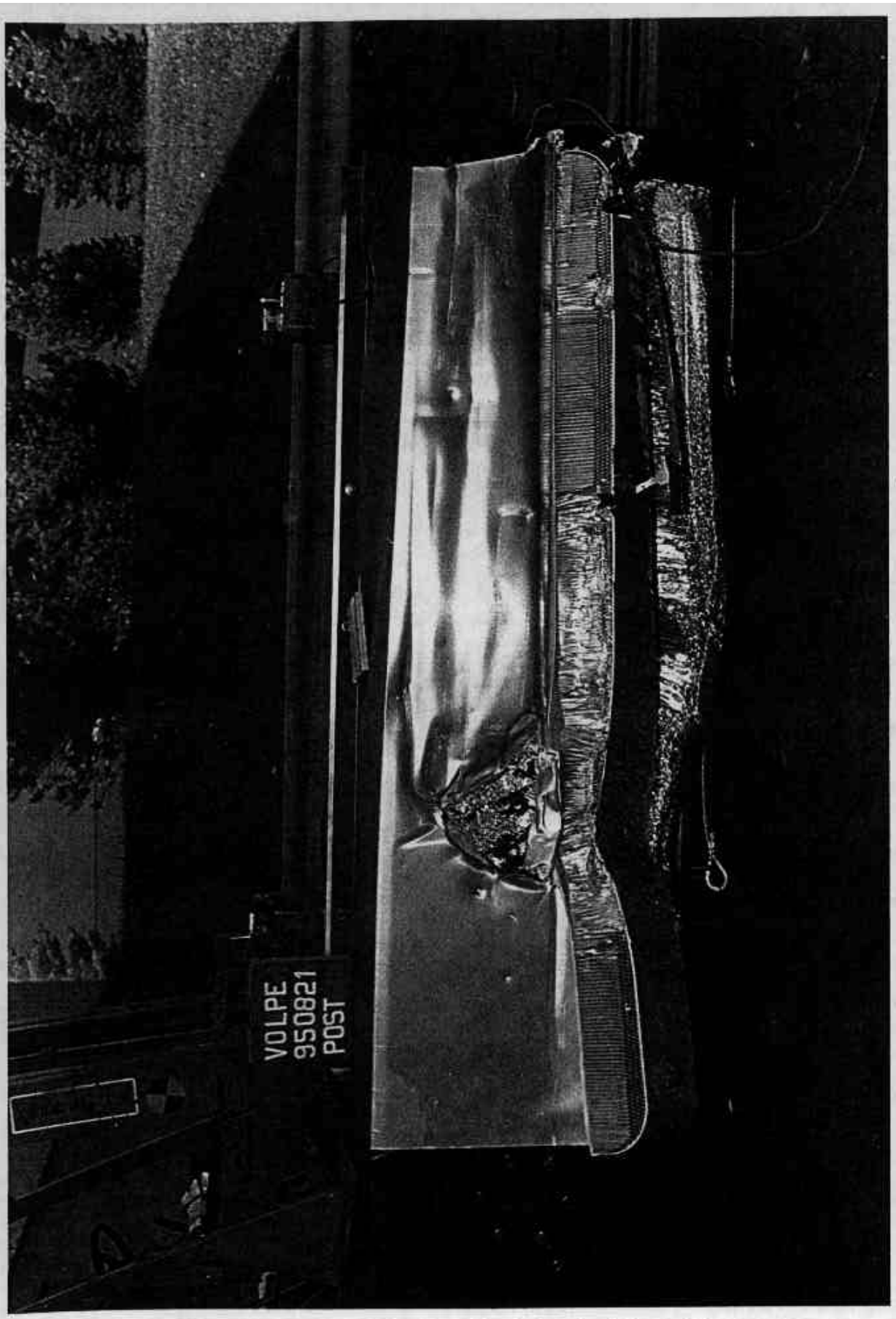


Figure A-27. Post-Test Barrier Face Deformation View - Front

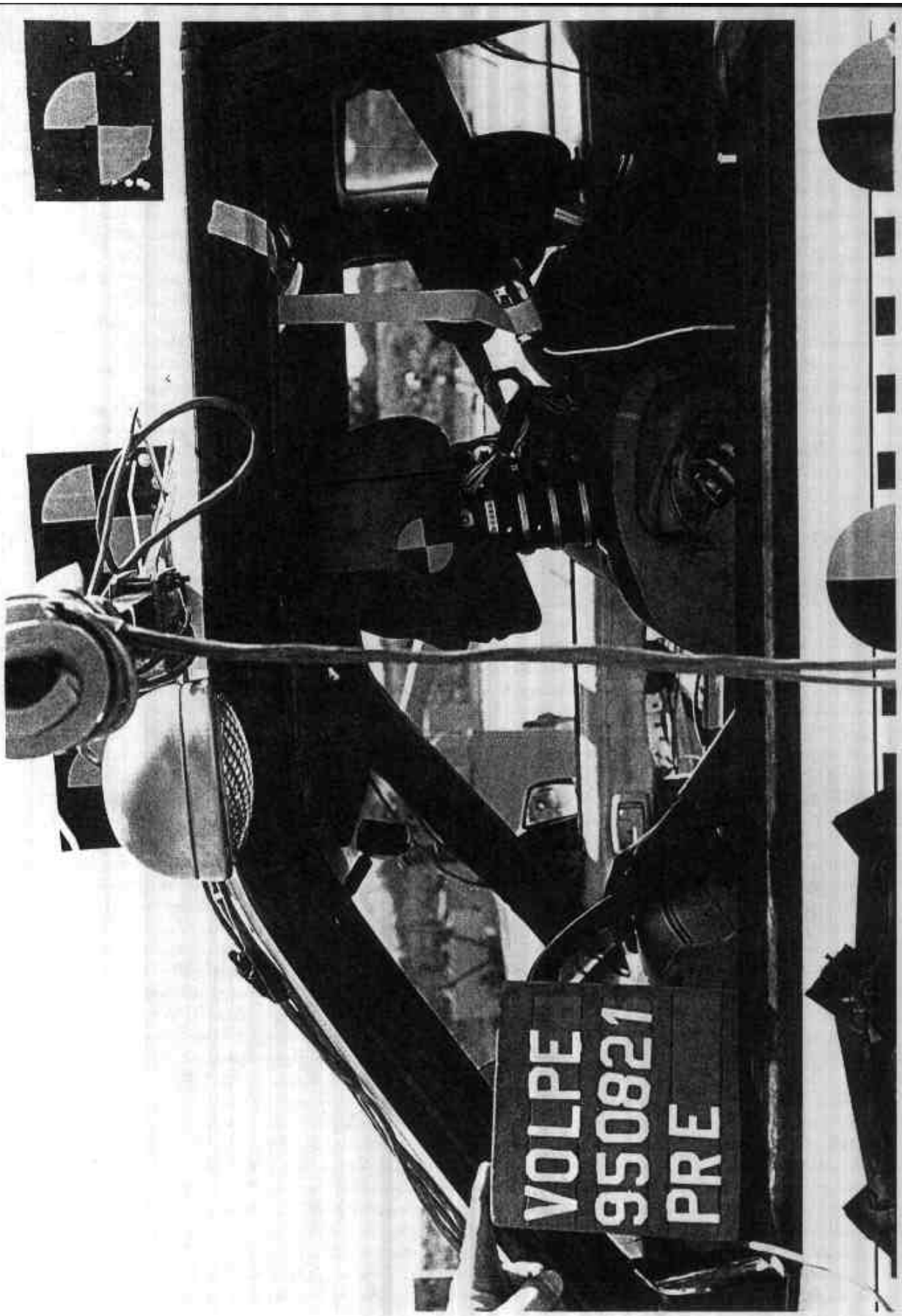


Figure A-28. Pre-Test Driver Dummy Position View

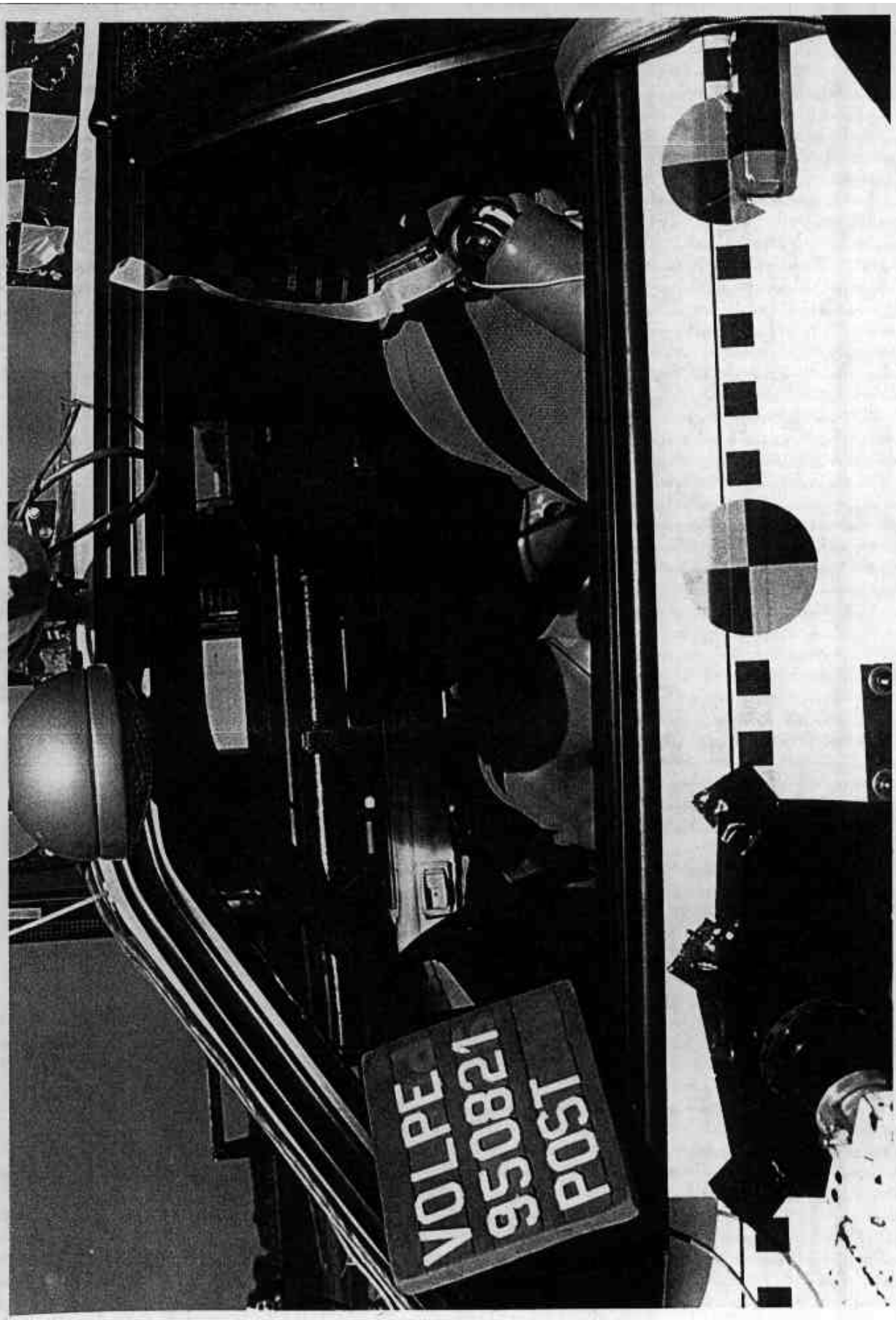


Figure A-29. Post-Test Driver Dummy Position View

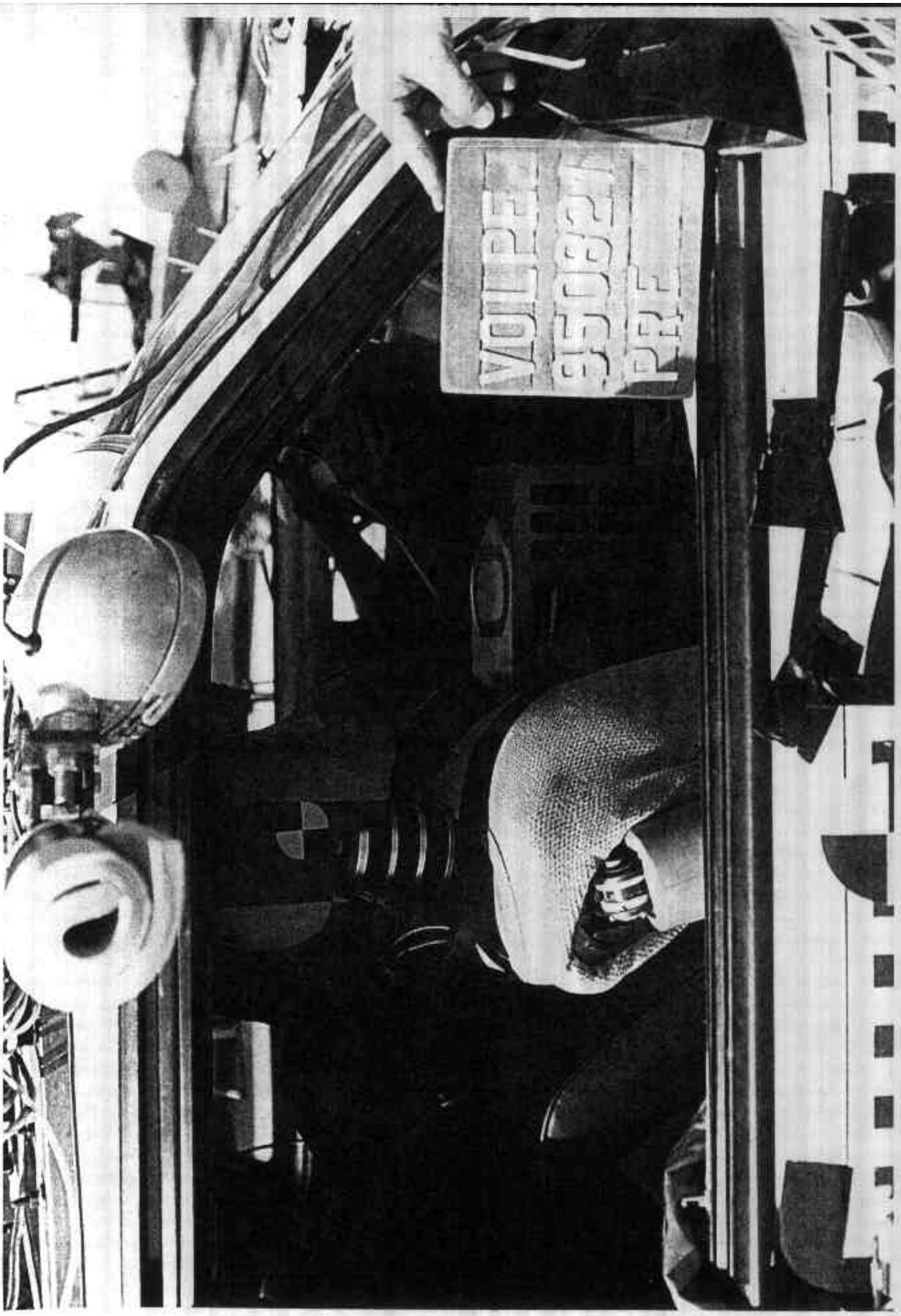


Figure A-30. Pre-Test Passenger Dummy Position View

Figure A-31. Post-Test Passenger Dummy Position View

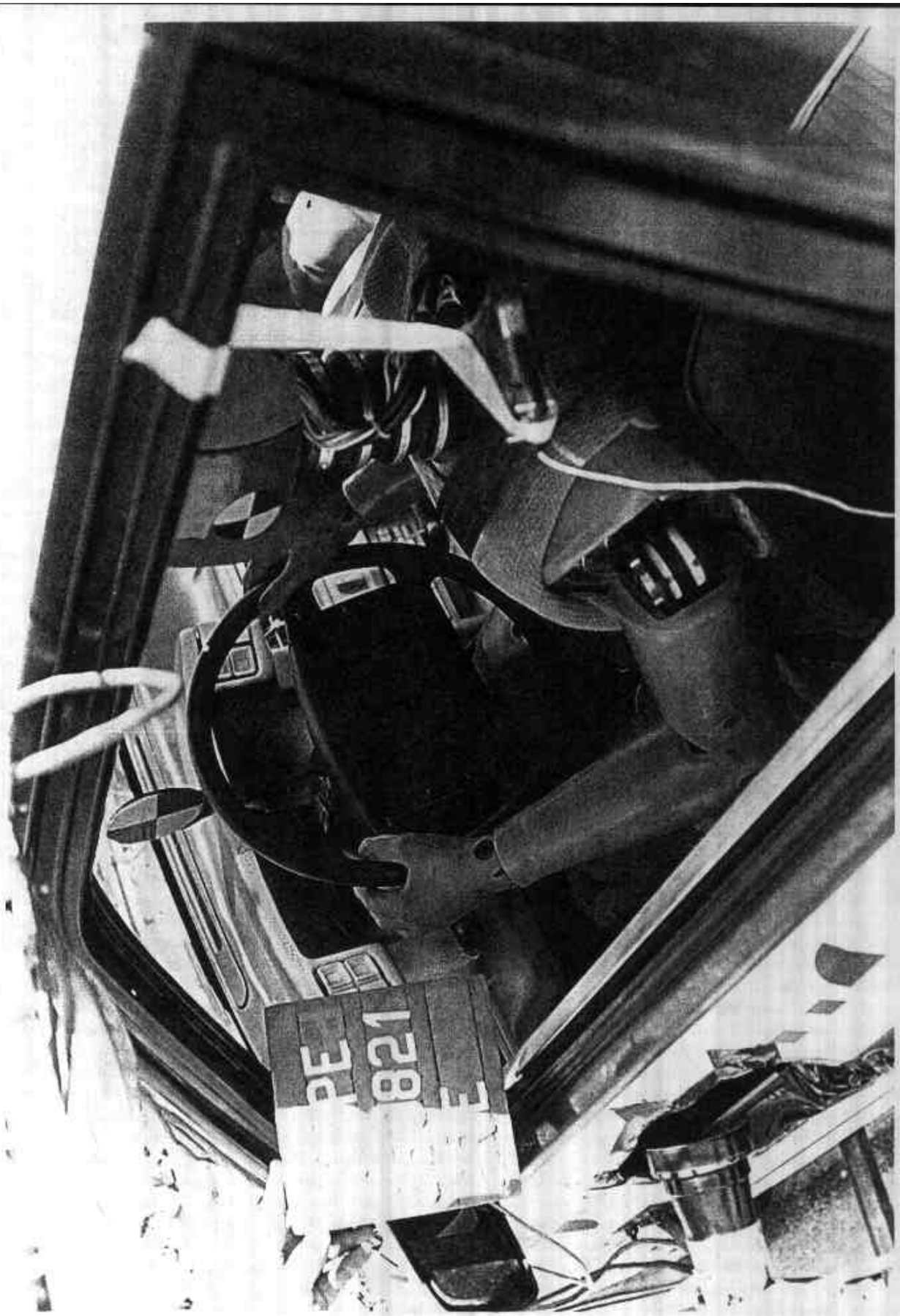


Figure A-32. Pre-Test Driver Dummy & Vehicle Interior View

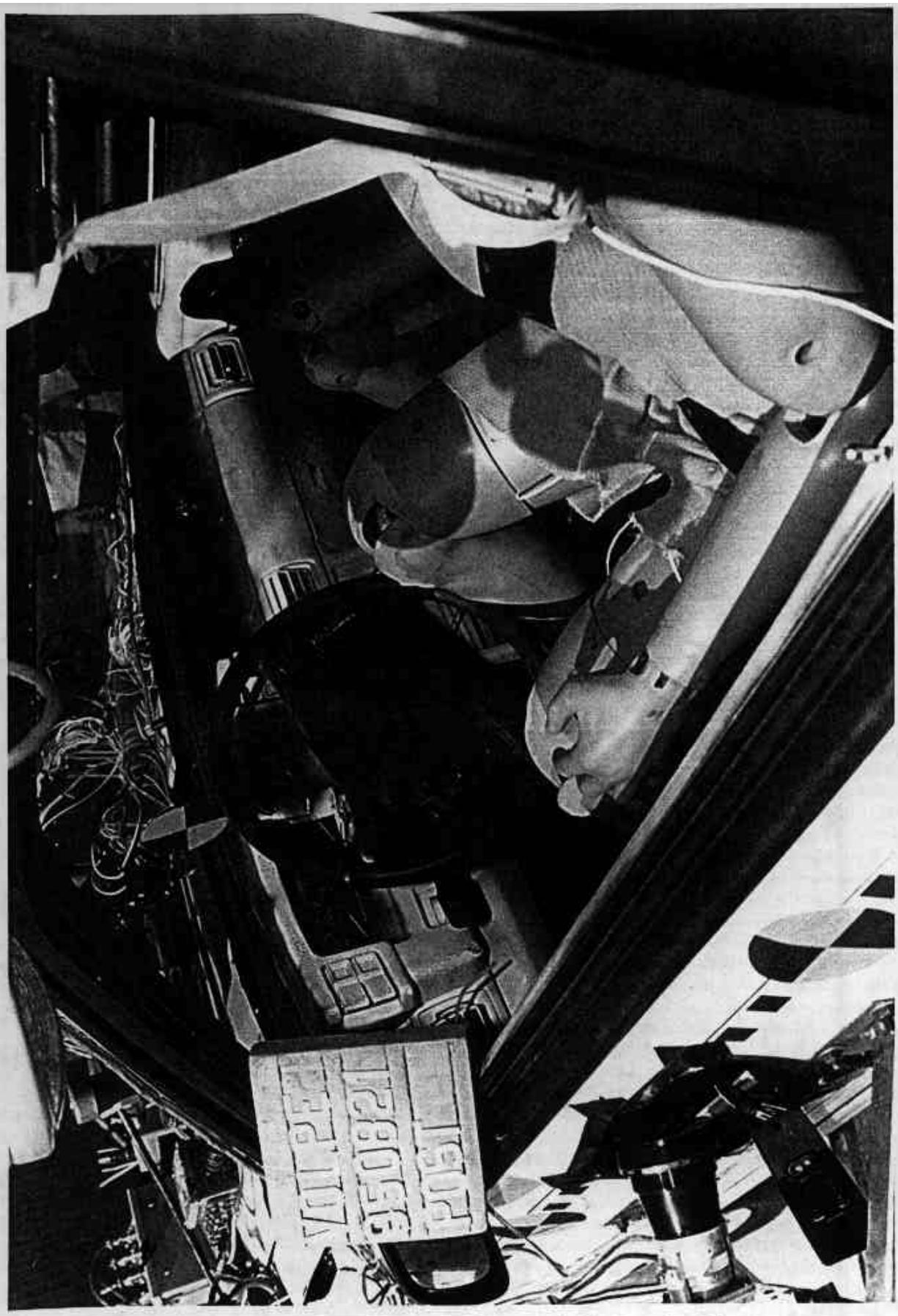


Figure A-33. Post-Test Driver Dummy & Vehicle Interior View

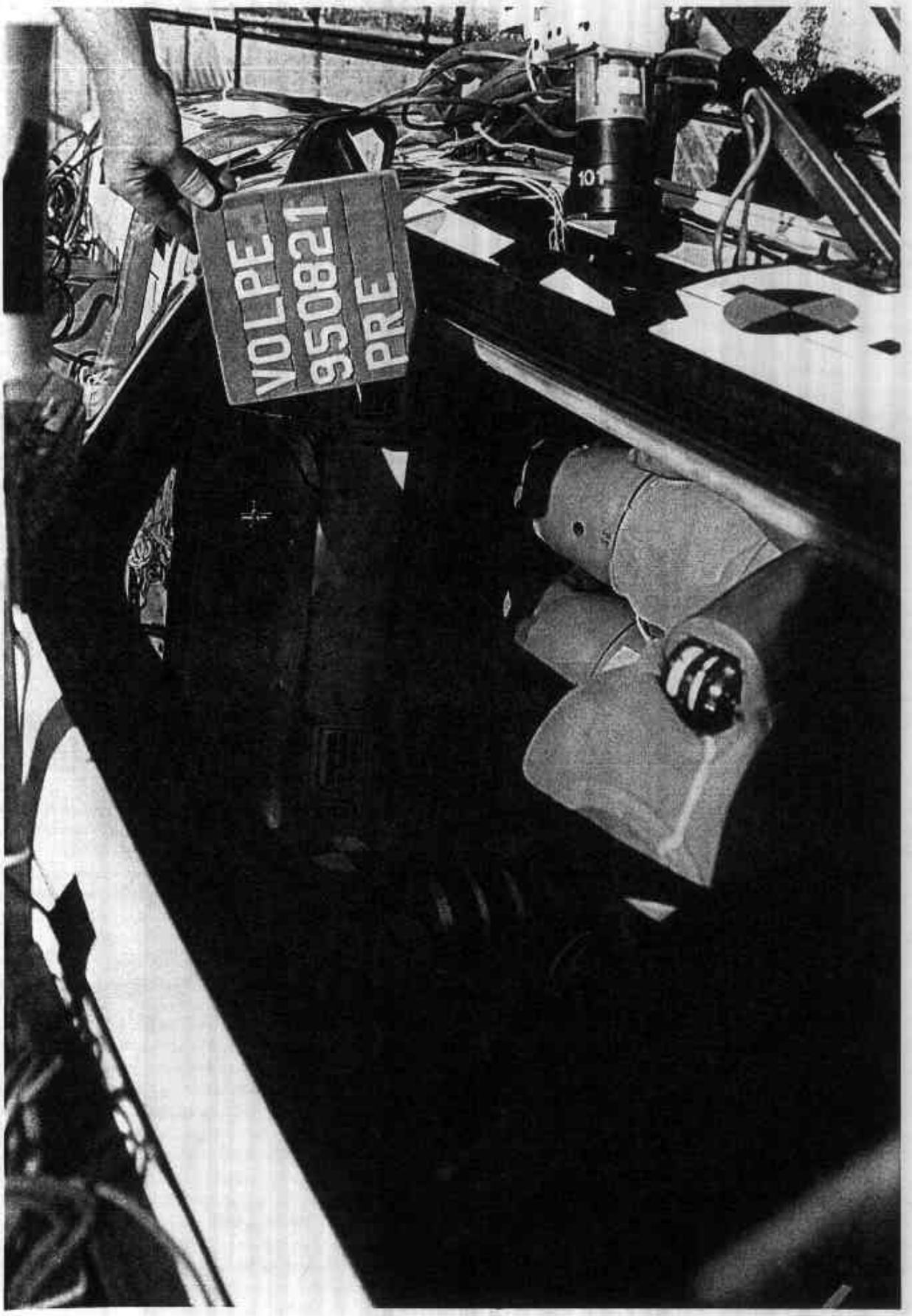


Figure A-34. Pre-Test Passenger Dummy & Vehicle Interior View

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

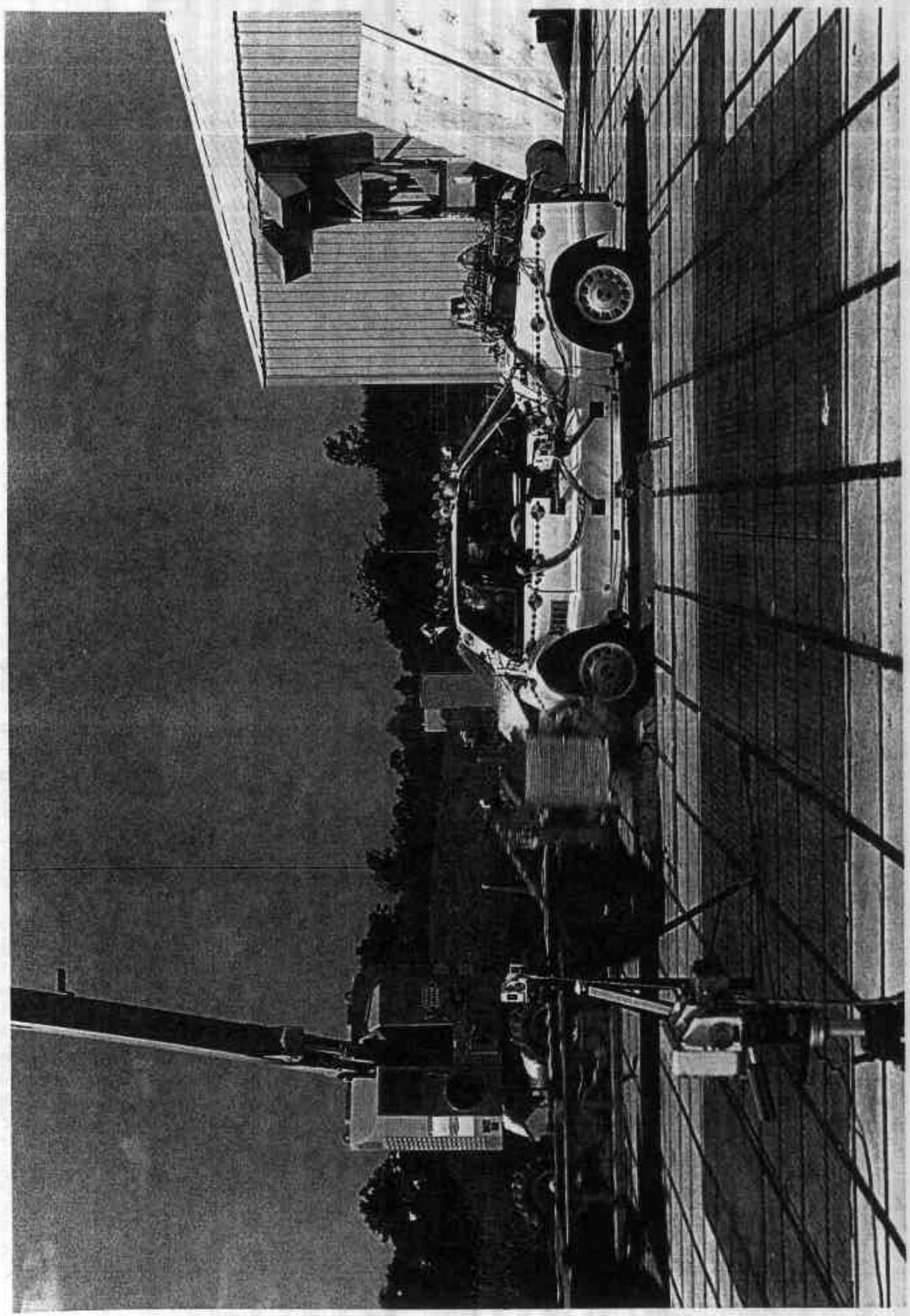


Figure A-36. Impact Event View

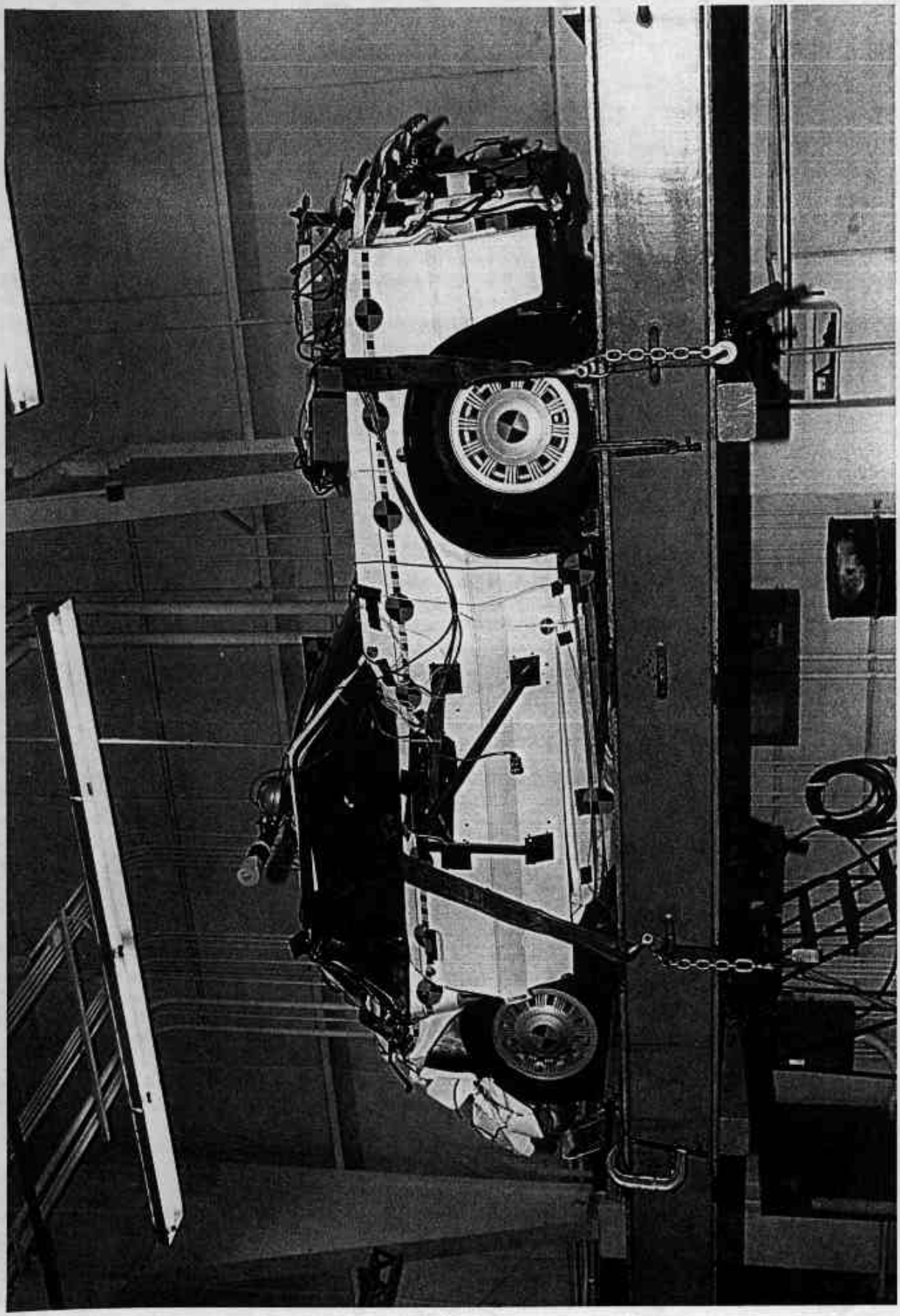


Figure A-37. Post-Test Vehicle on Static Rollover Device View - 0° Phase

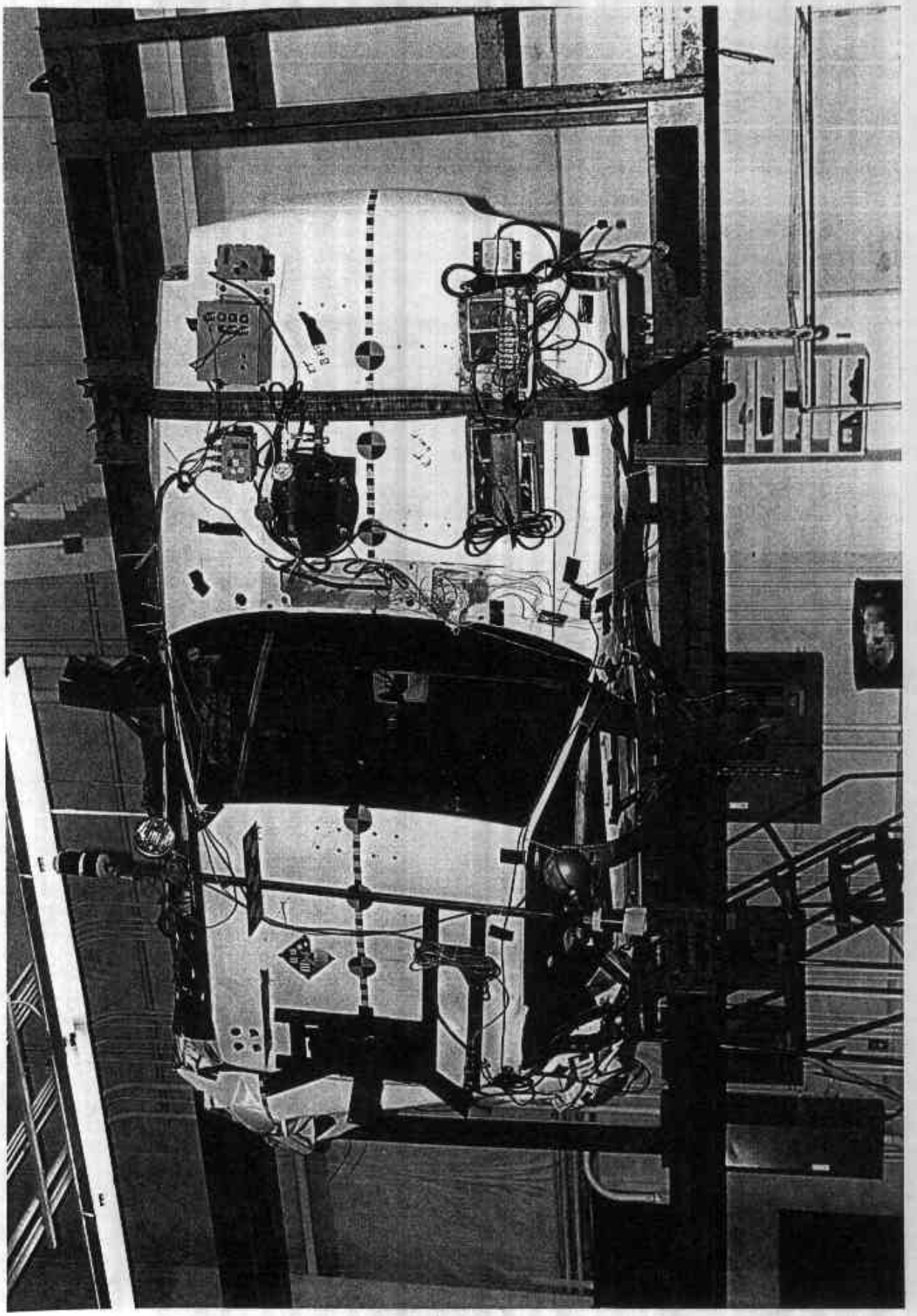


Figure A-38. Post-Test Vehicle on Static Rollover Device View - 90° Phase

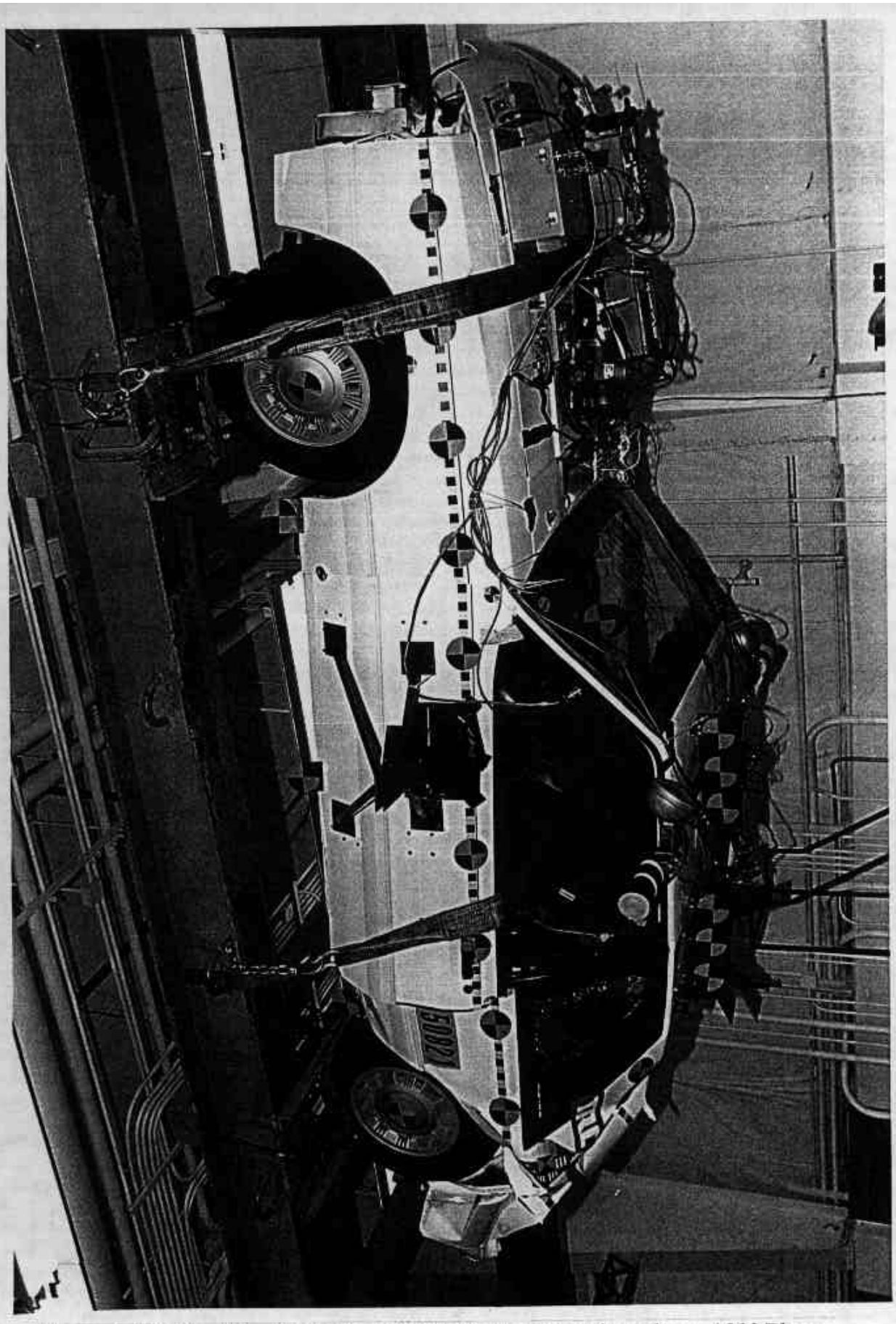


Figure A-39. Post-Test Vehicle on Static Rollover Device View - 180° Phase

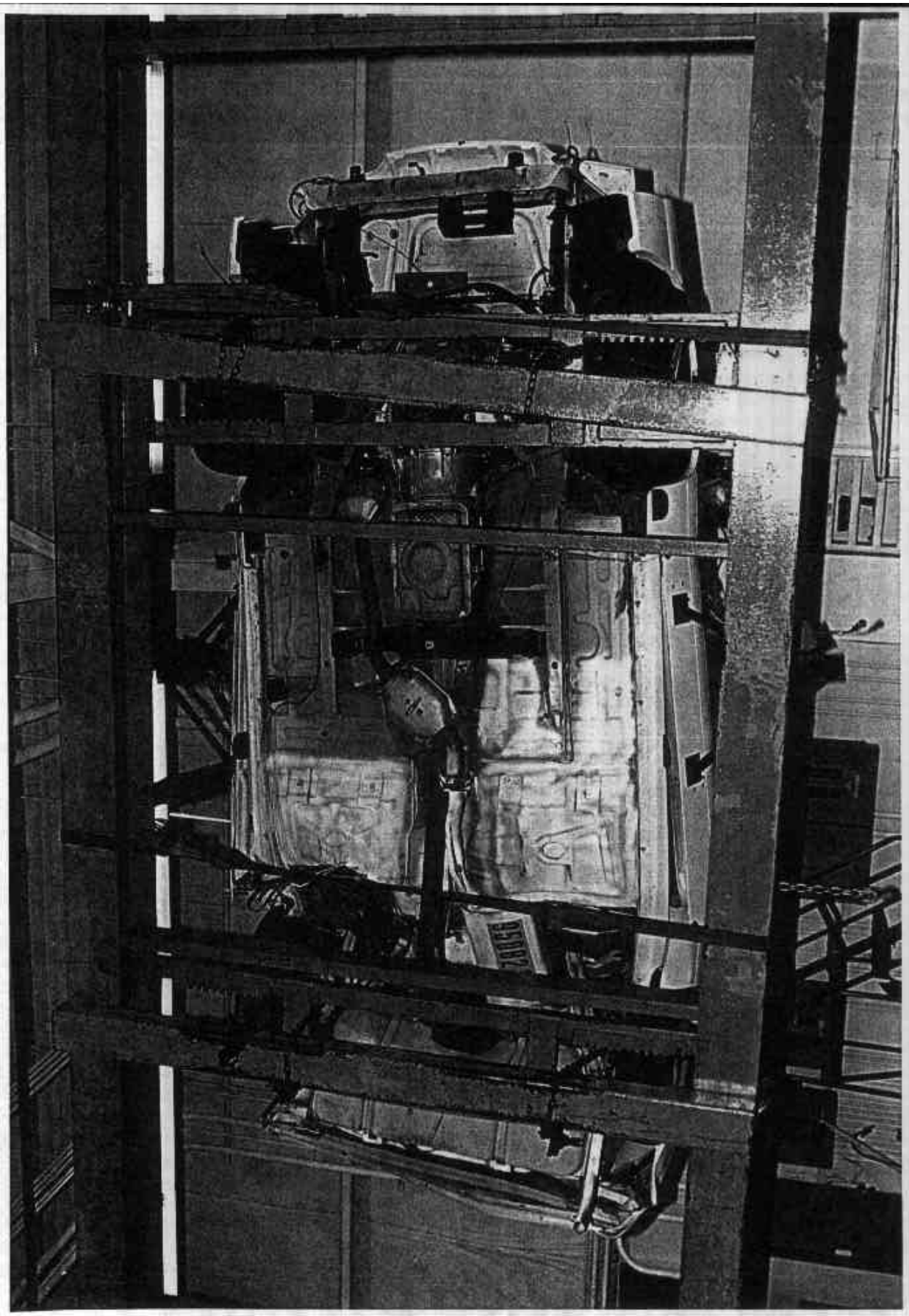


Figure A-40. Post-Test Vehicle on Static Rollover Device View - 270° Phase

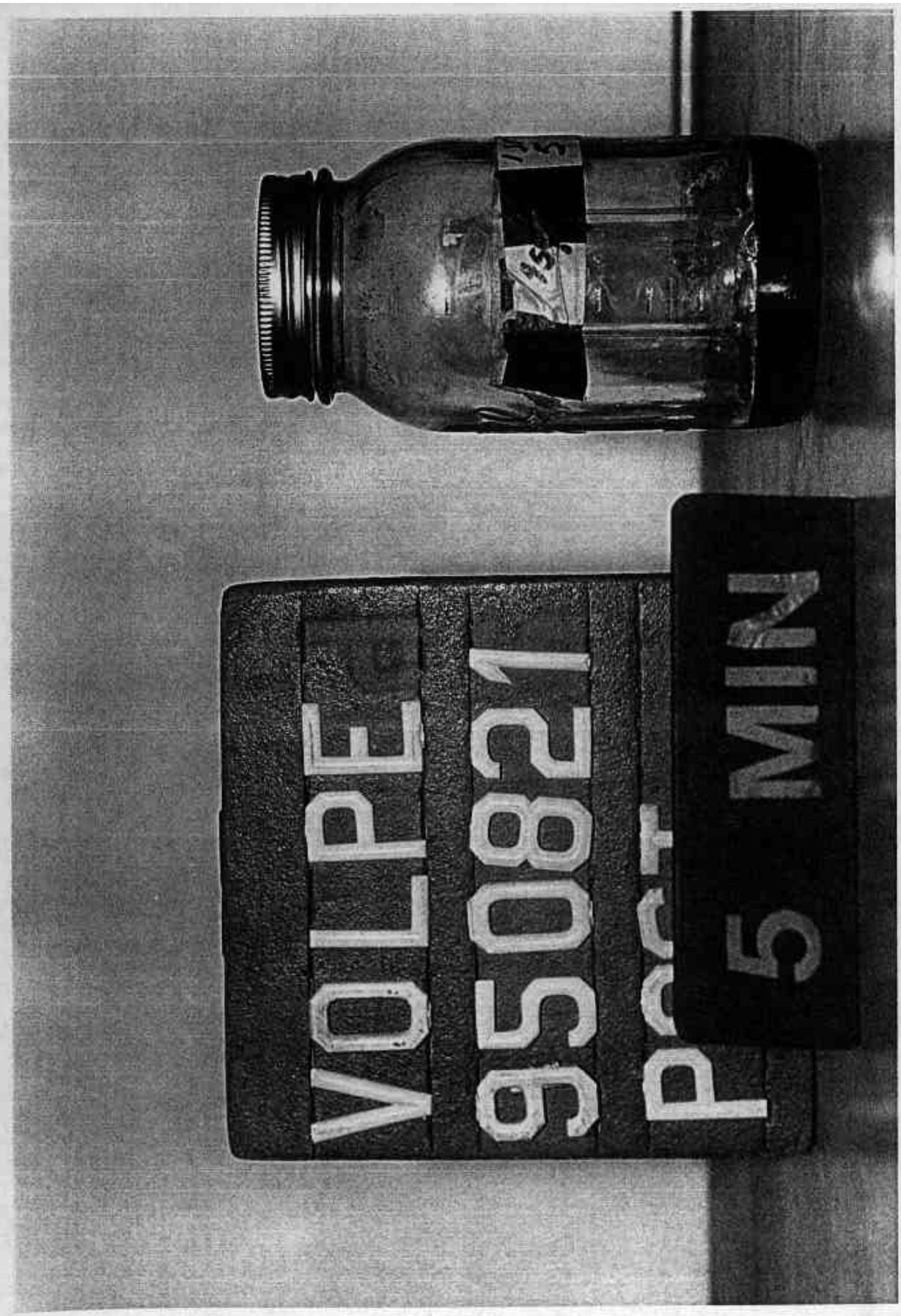


Figure A-41. Fuel System Fluid Spillage View - First Five Minutes after Impact

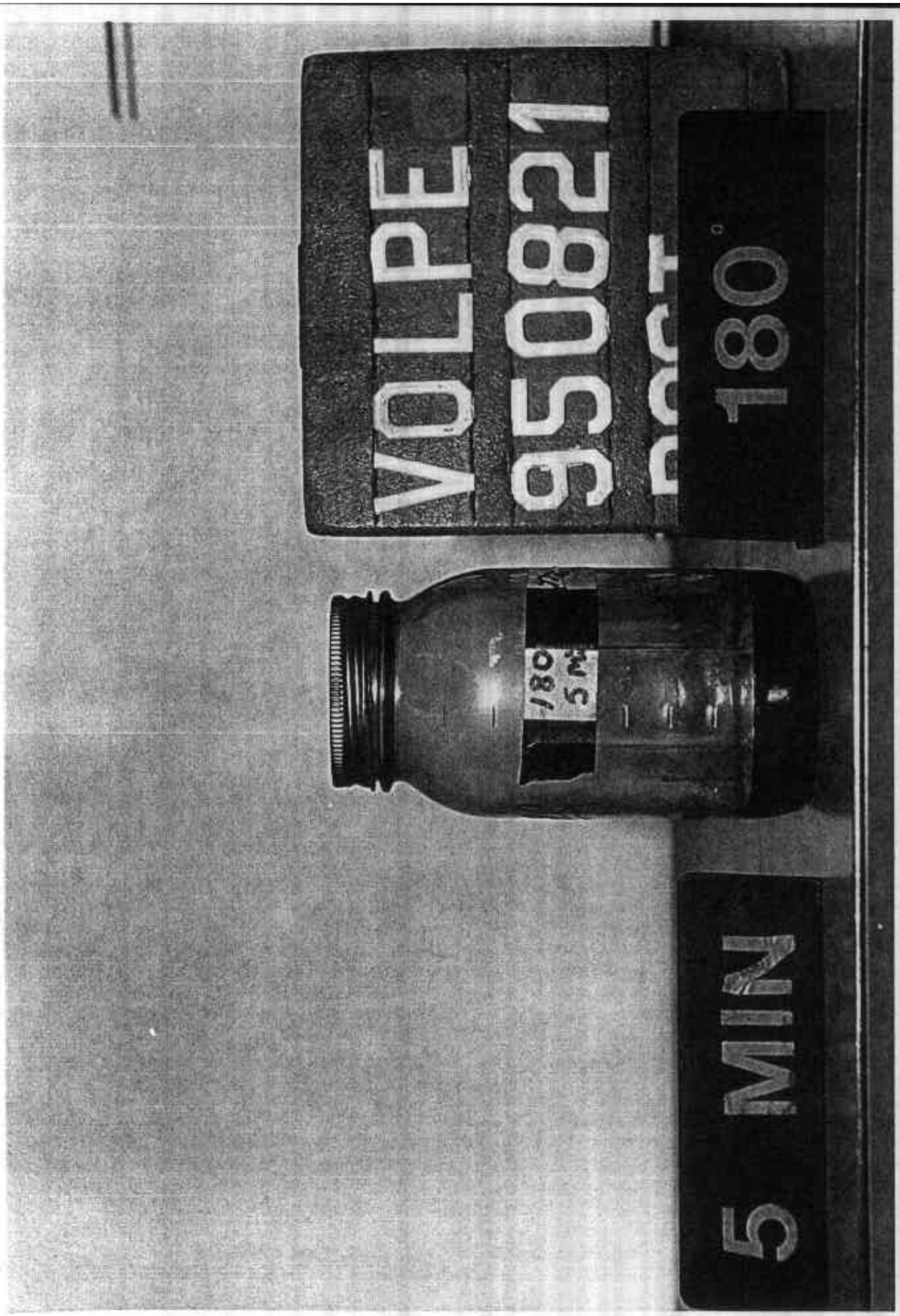


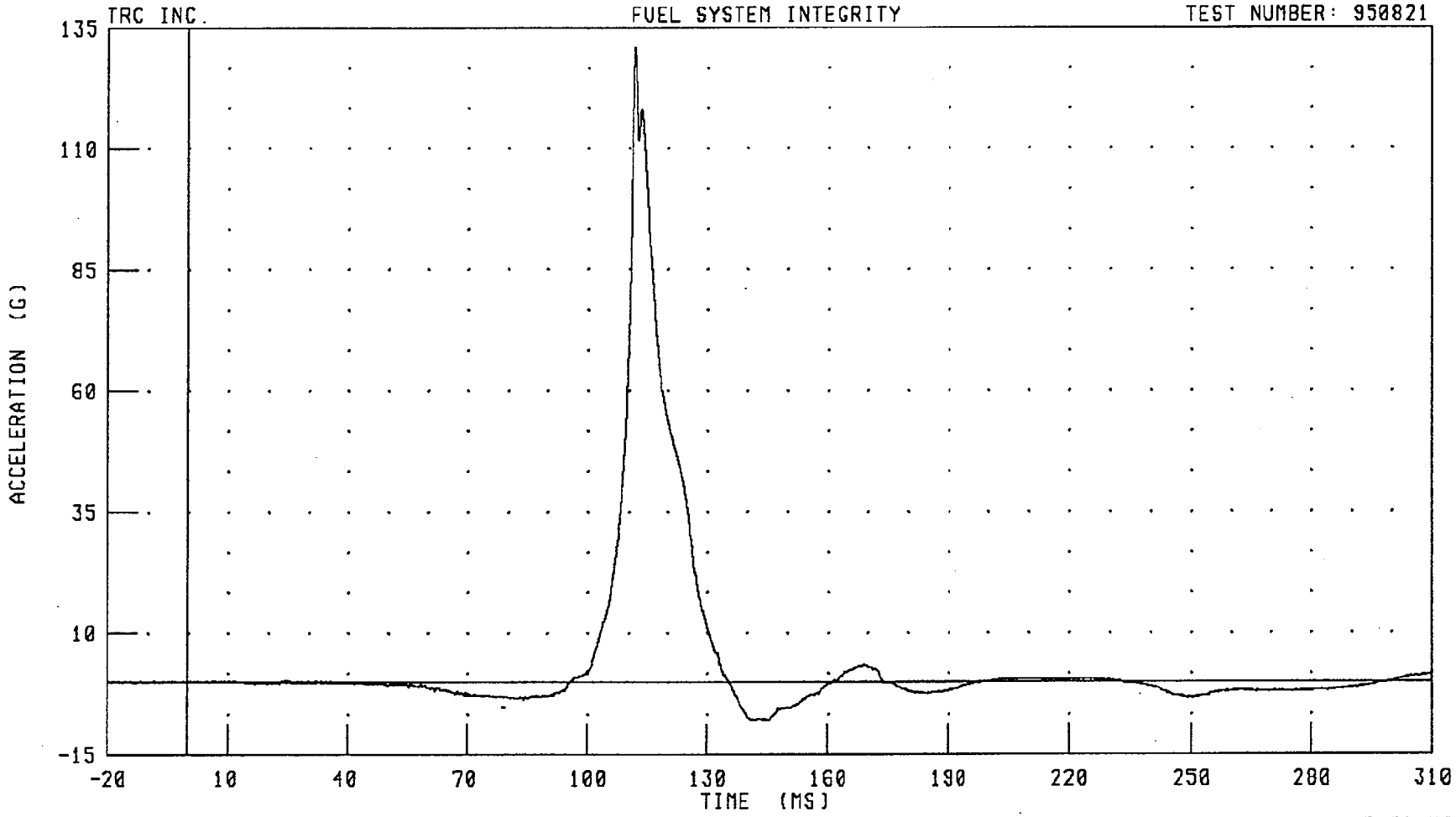
Figure A-42. Fuel System Fluid Spillage View - First Five Minutes of 180° Phase

Appendix B

Data Plots

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

DRIVER HEAD X-AXIS ACCELERATION

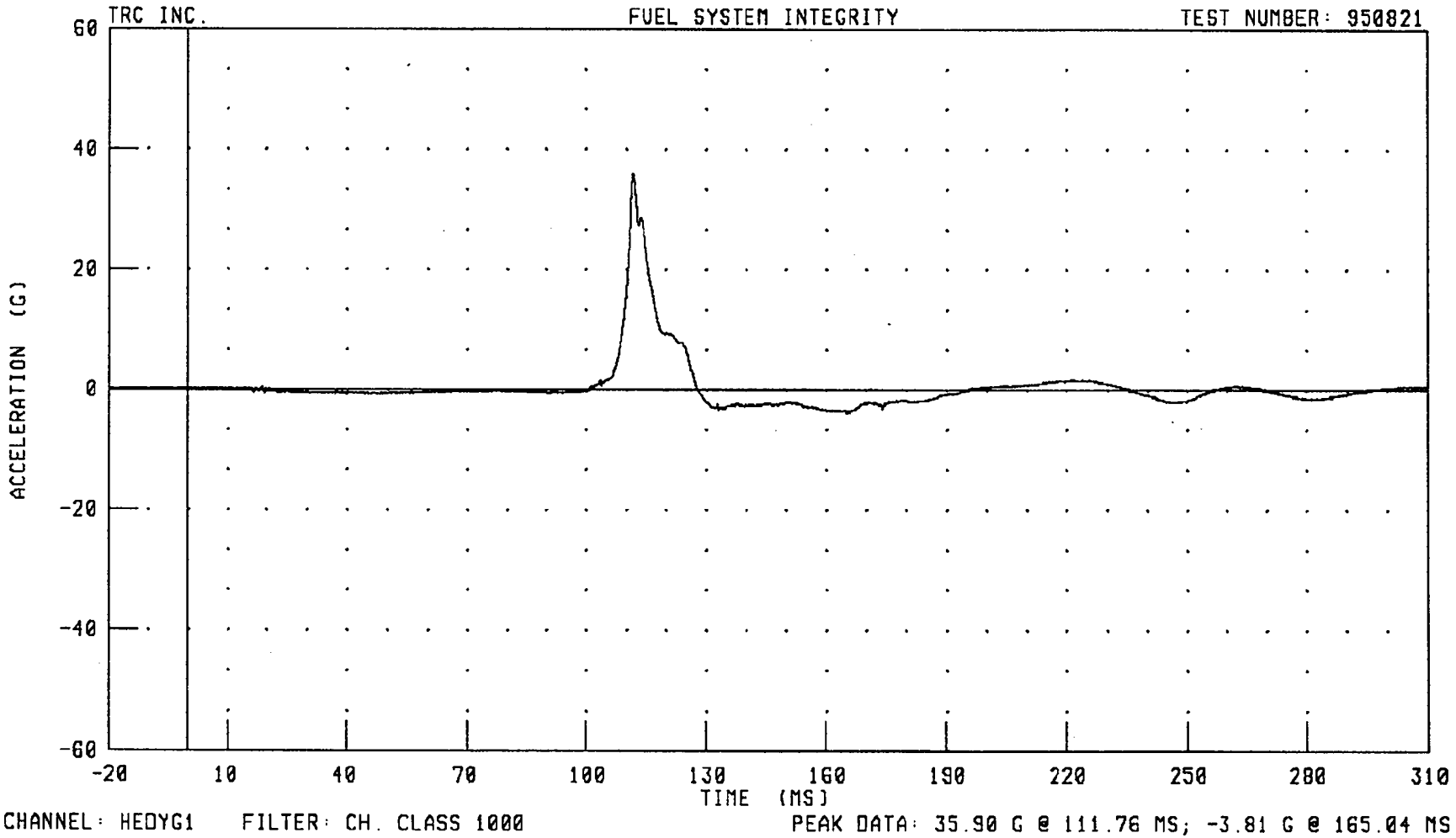


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 130.90 G @ 111.76 MS; -8.03 G @ 145.60 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000 PEAK DATA: 35.90 G @ 111.76 MS; -3.81 G @ 165.04 MS

950821

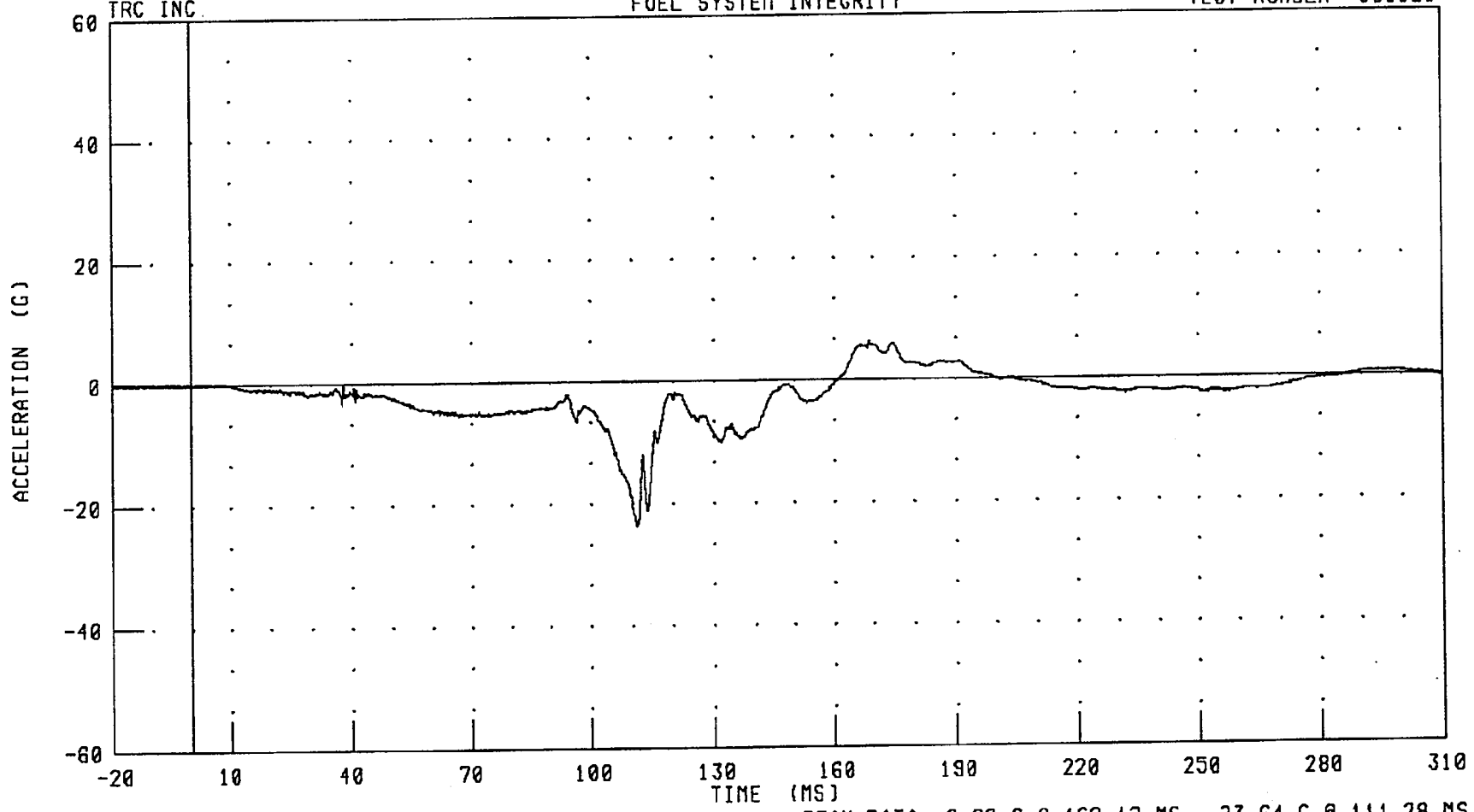
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

DRIVER HEAD Z-AXIS ACCELERATION

FUEL SYSTEM INTEGRITY

TRC INC.

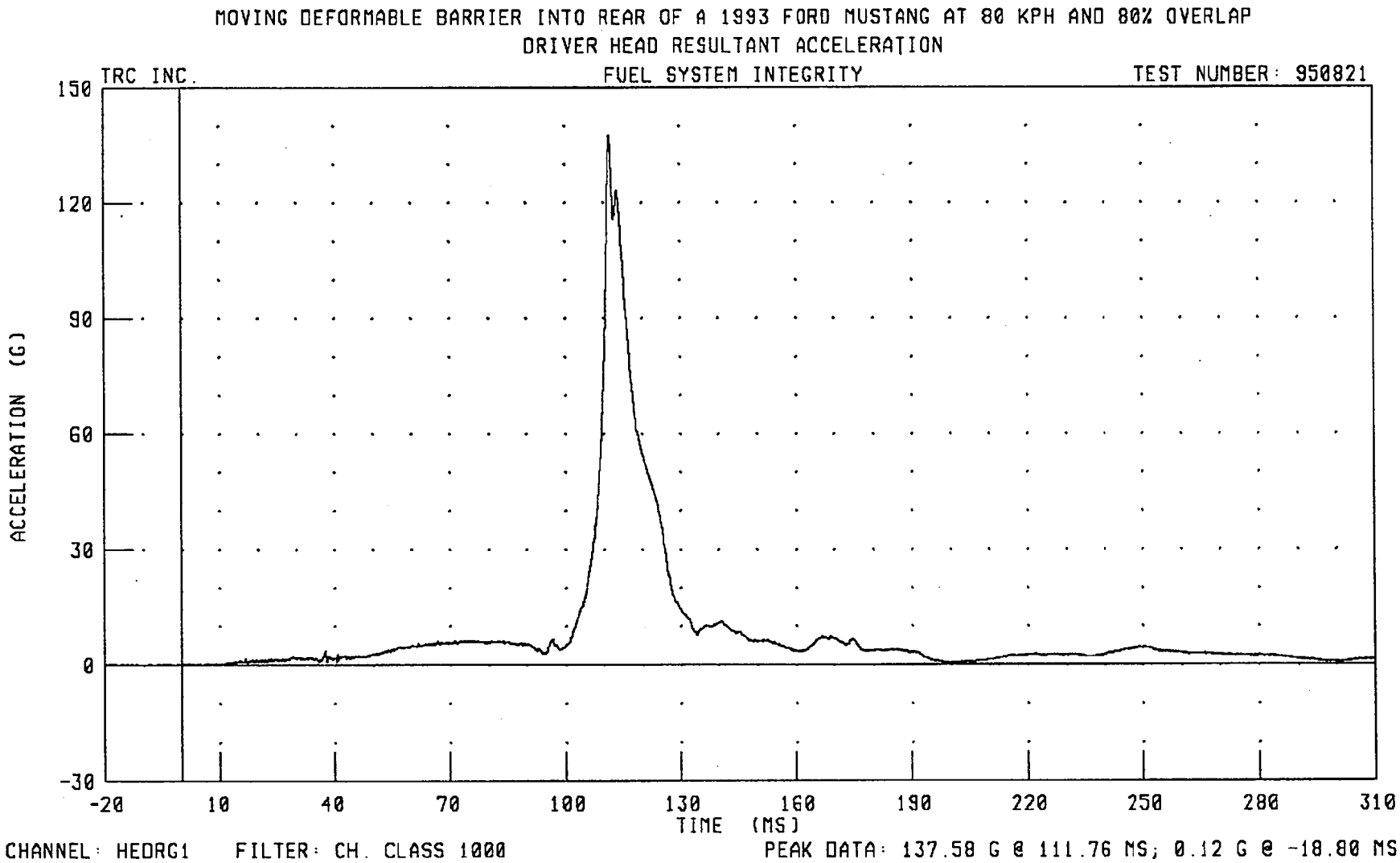
TEST NUMBER: 950821



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

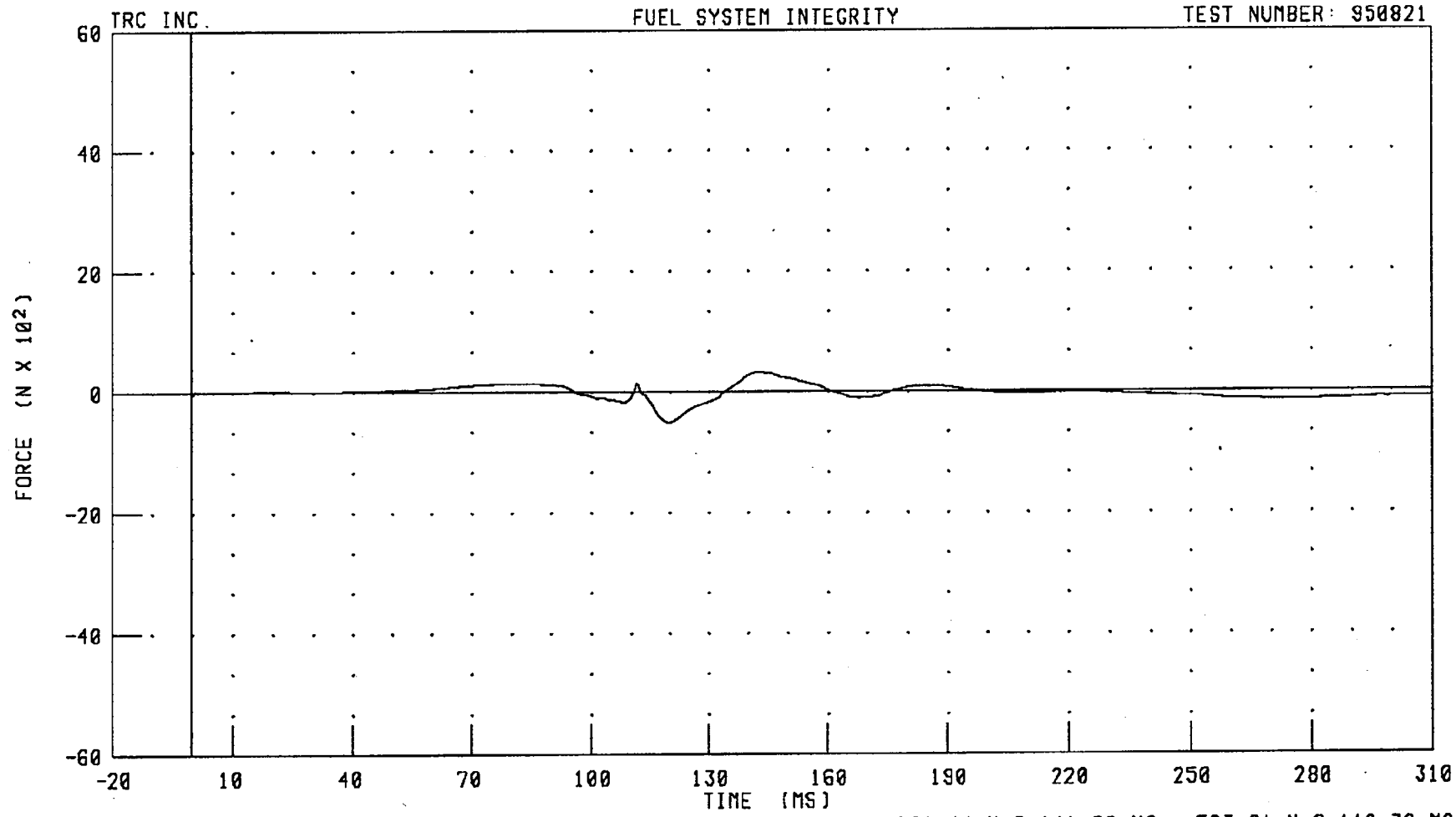
PEAK DATA: 6.20 G @ 169.12 MS; -23.64 G @ 111.28 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD RESULTANT ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
150
120
90
60
30
0
-30
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDRG1
FILTER: CH. CLASS 1000
PEAK DATA: 137.58 G @ 111.76 MS; 0.12 G @ -18.80 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER UPPER NECK X-AXIS SHEAR FORCE

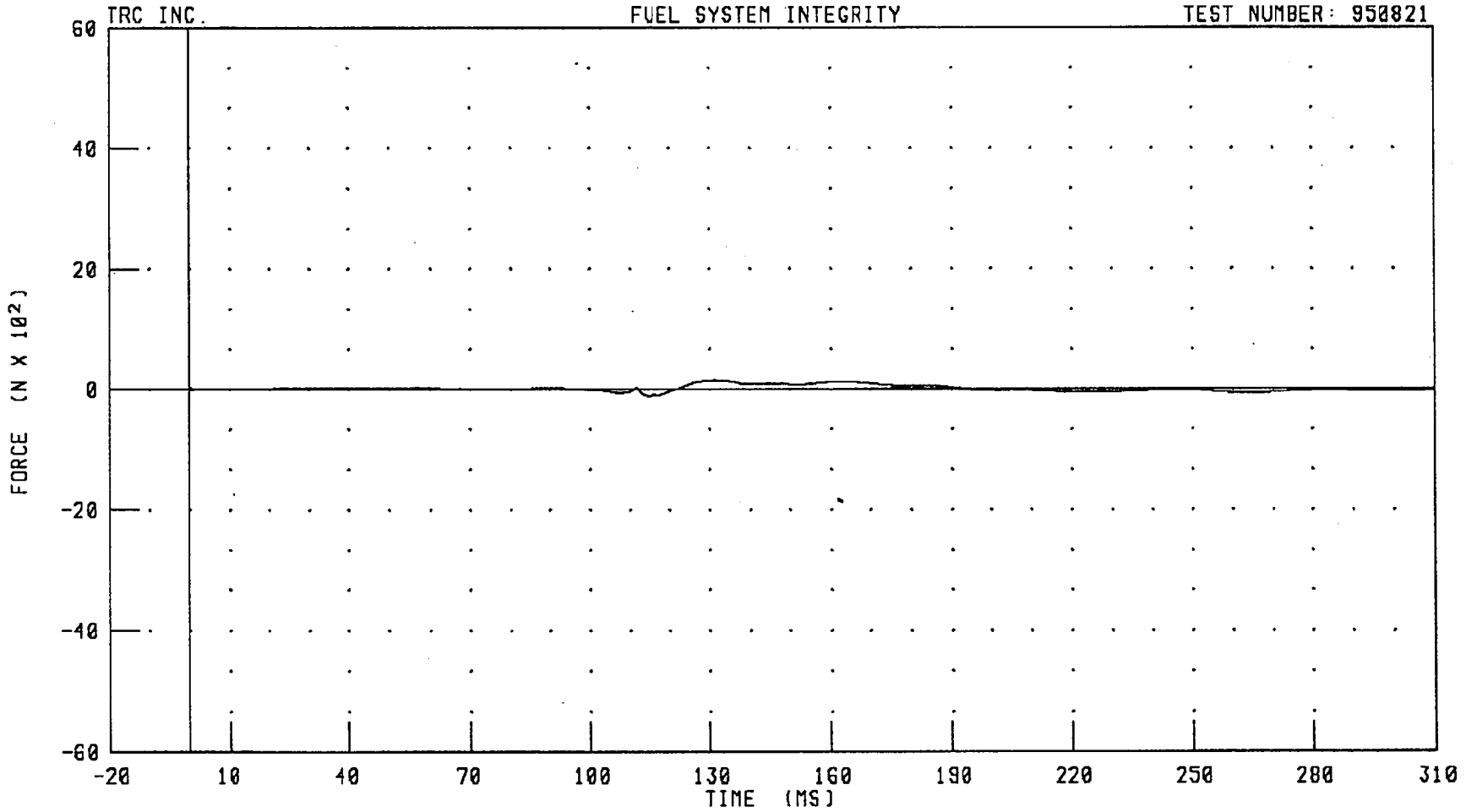


CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 321.44 N @ 141.68 MS; -503.91 N @ 119.36 MS

950821

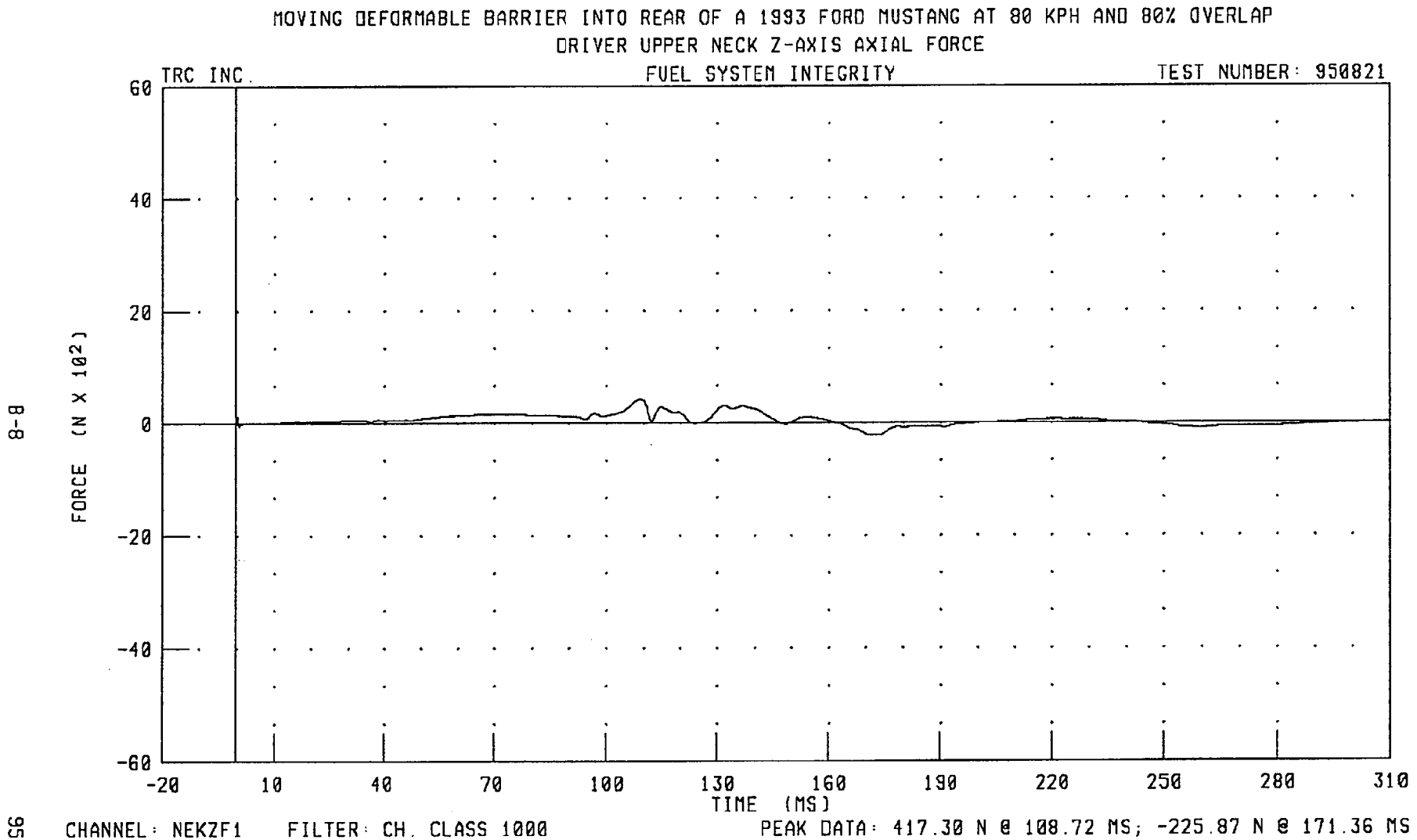
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

DRIVER UPPER NECK Y-AXIS SHEAR FORCE



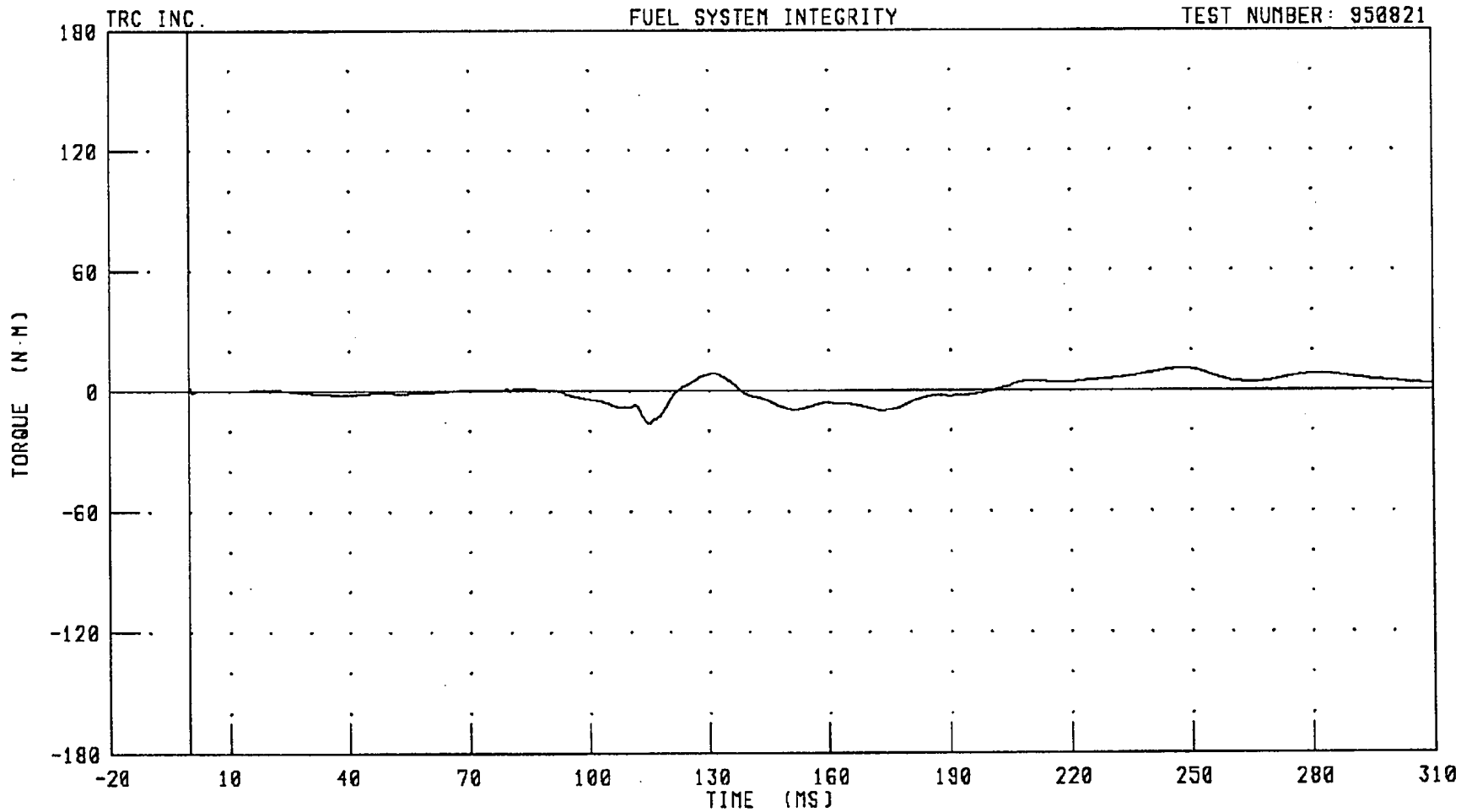
CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 147.89 N @ 131.28 MS; -117.44 N @ 114.72 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER UPPER NECK Z-AXIS AXIAL FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
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: 417.30 N @ 108.72 MS; -225.87 N @ 171.36 MS

950821

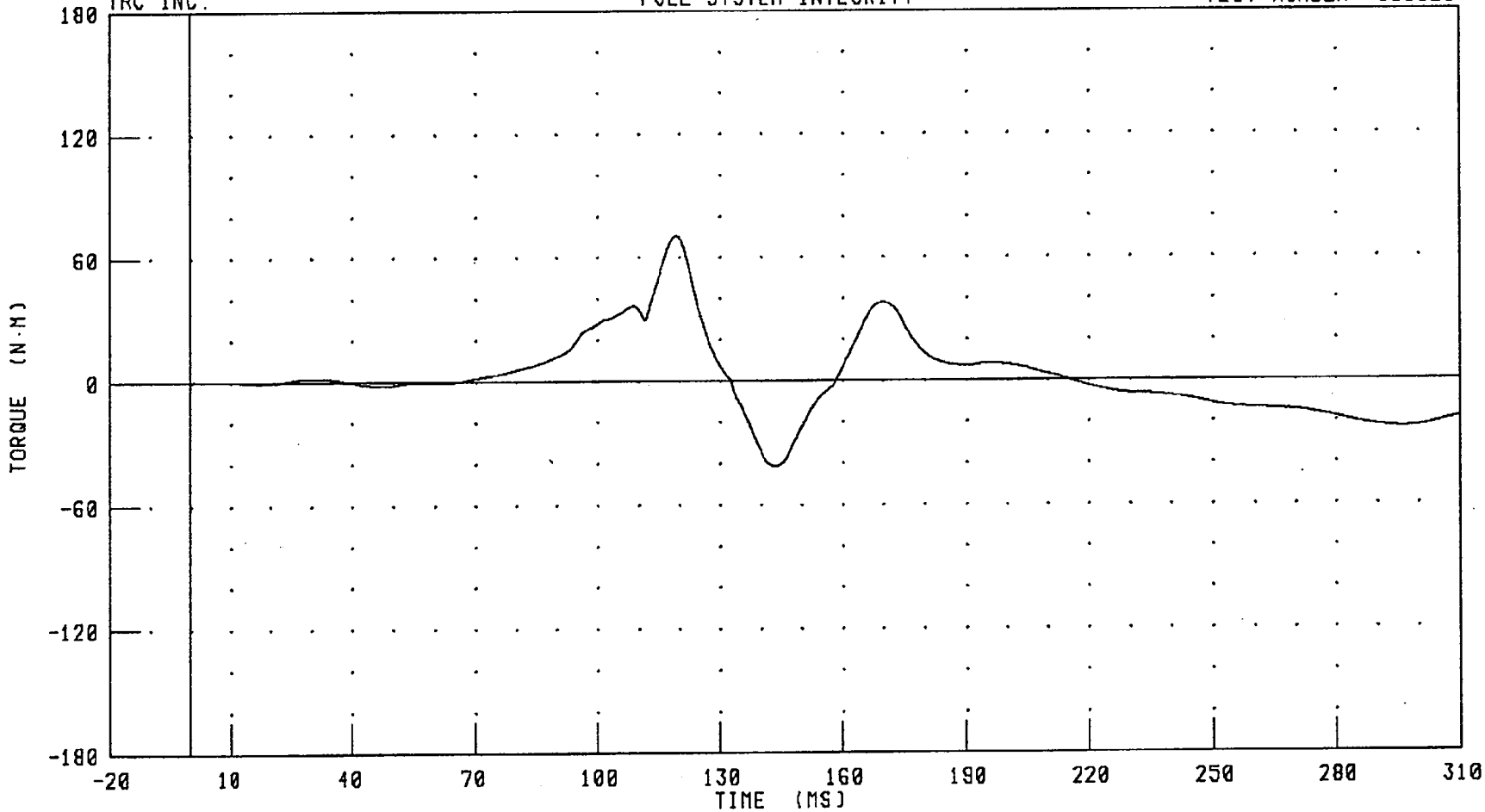
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER UPPER NECK MOMENT ABOUT X-AXIS



CHANNEL: NEKXM1 FILTER: CH. CLASS 600 PEAK DATA: 10.67 N-M @ 247.20 MS; -16.10 N-M @ 115.04 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER UPPER NECK MOMENT ABOUT Y-AXIS
TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



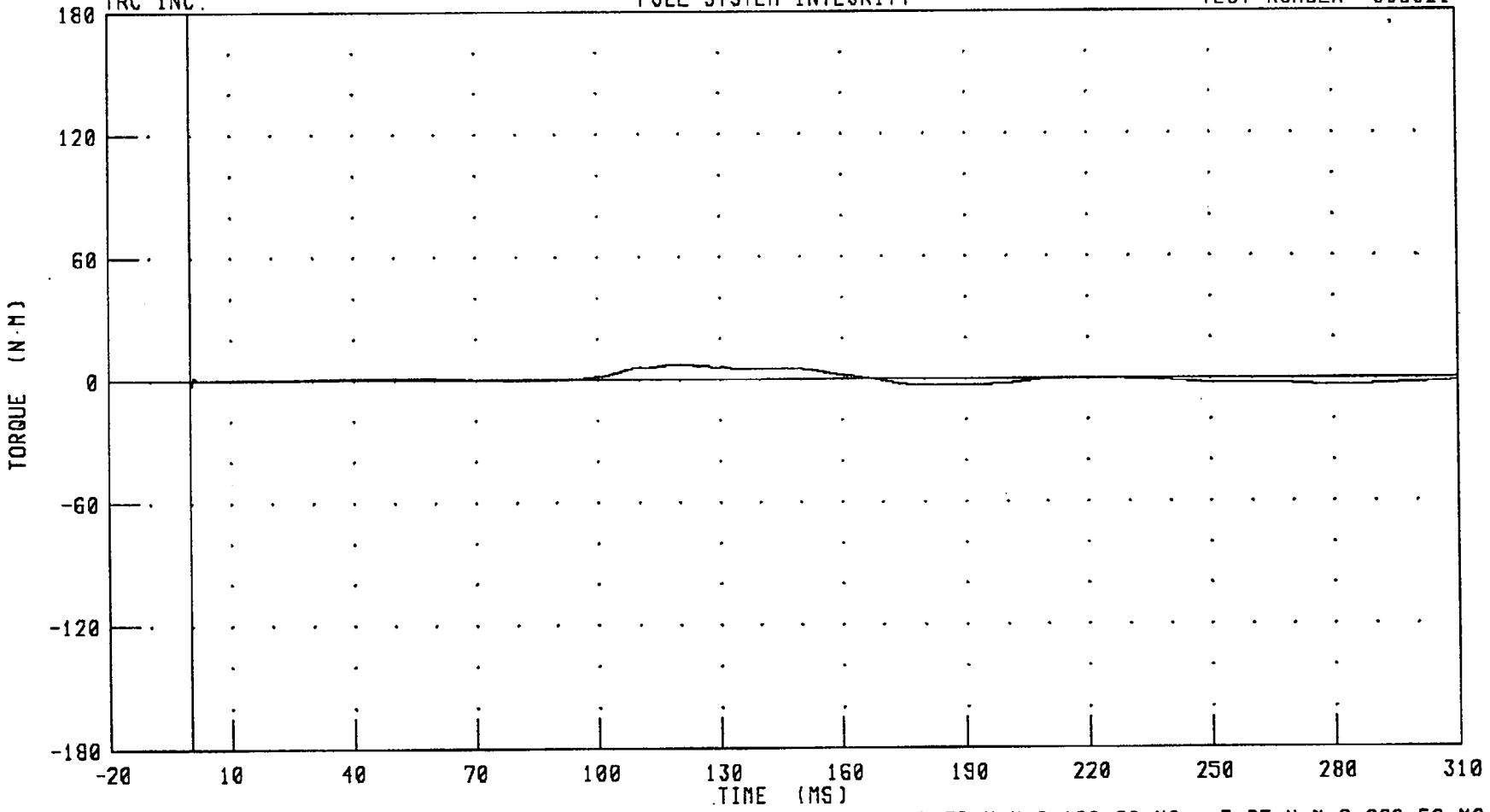
CHANNEL: NEKYM1 FILTER: CH. CLASS 600
PEAK DATA: 70.54 N-M @ 119.28 MS; -41.14 N-M @ 143.76 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

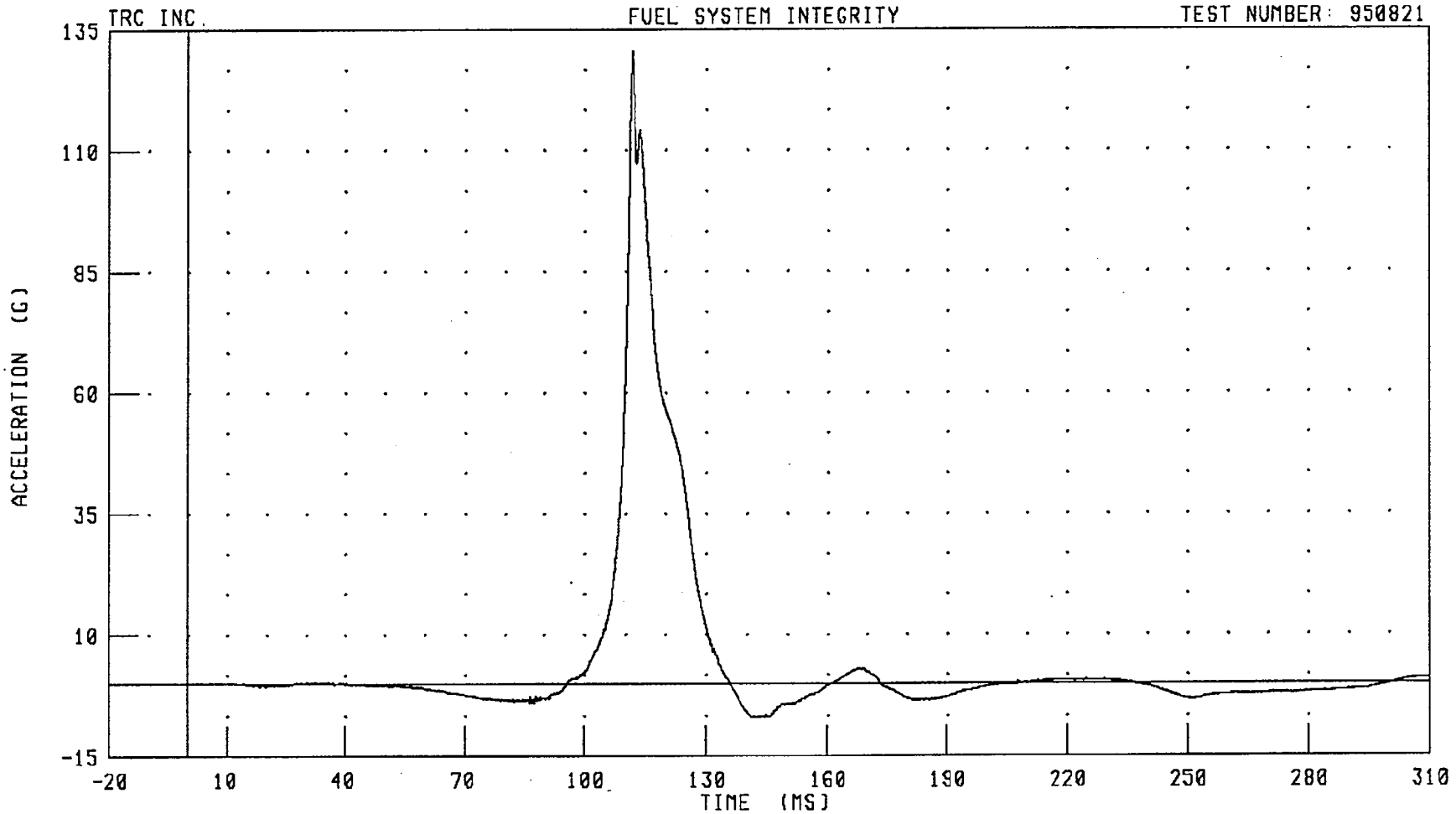
DRIVER UPPER NECK MOMENT ABOUT Z-AXIS

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



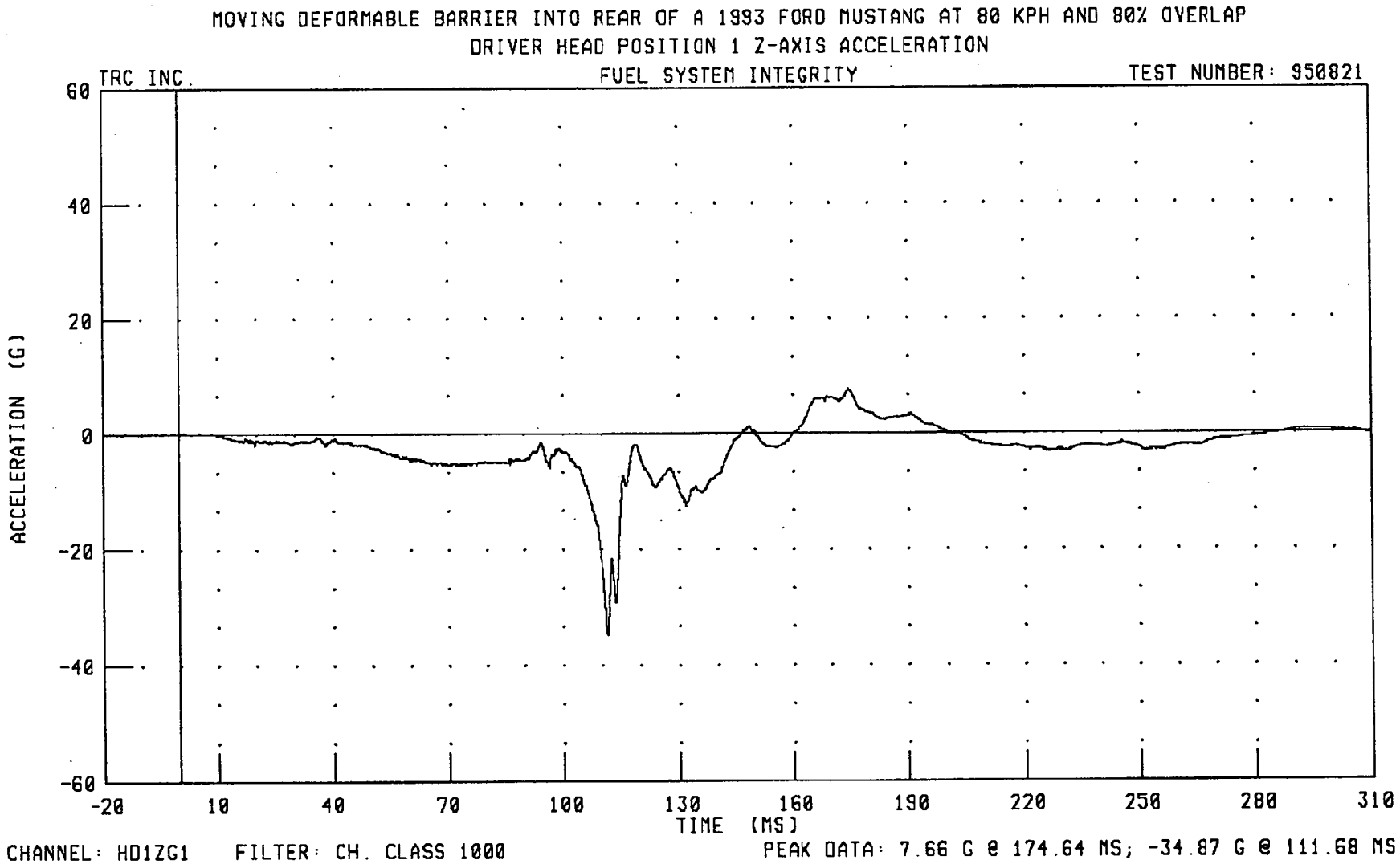
CHANNEL: NEKZM1 FILTER: CH. CLASS 600 PEAK DATA: 7.33 N-M @ 120.80 MS; -3.65 N-M @ 282.56 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD POSITION 1 X-AXIS ACCELERATION

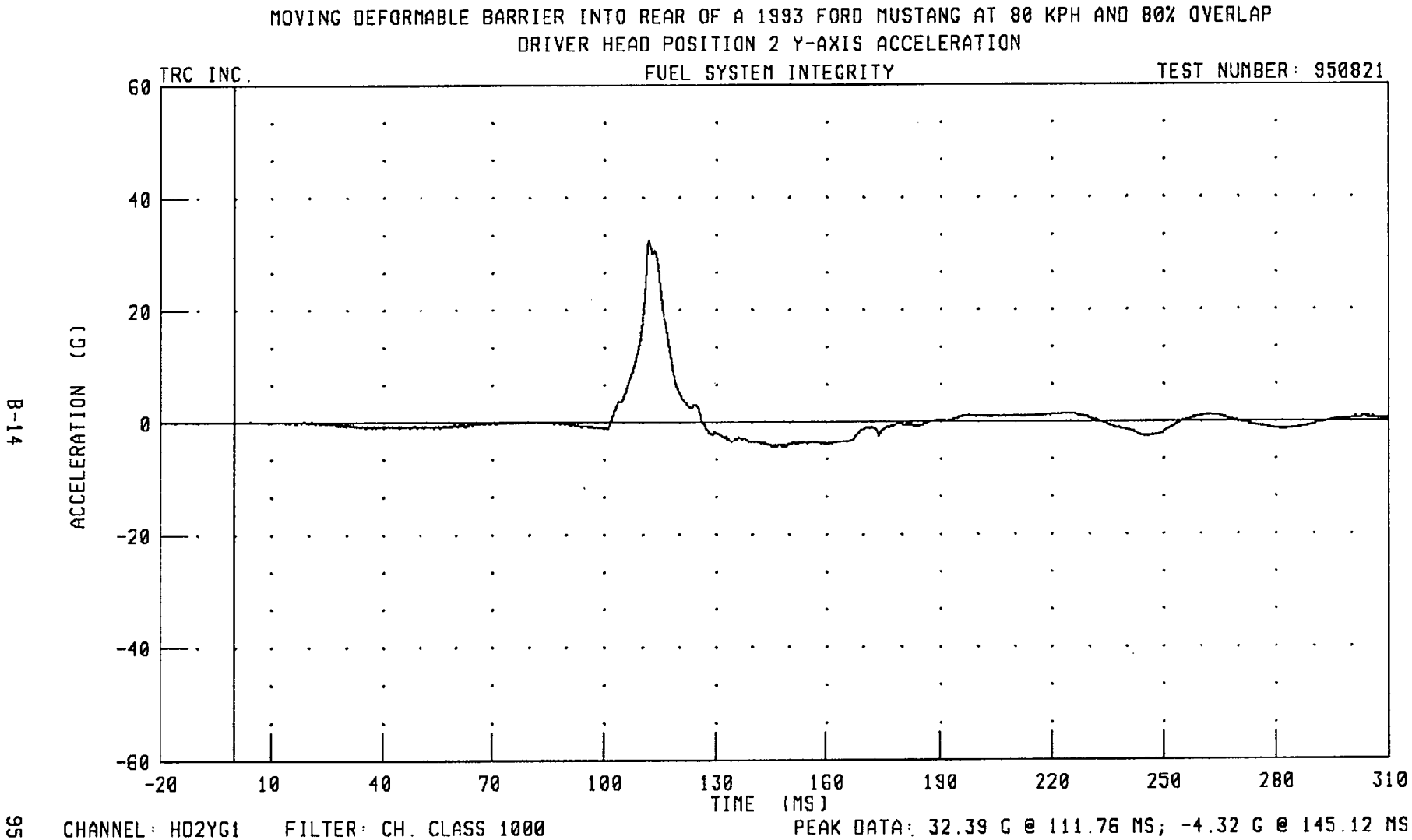


CHANNEL: HD1XG1 FILTER: CH. CLASS 1000 PEAK DATA: 130.55 G @ 111.76 MS; -7.19 G @ 143.36 MS

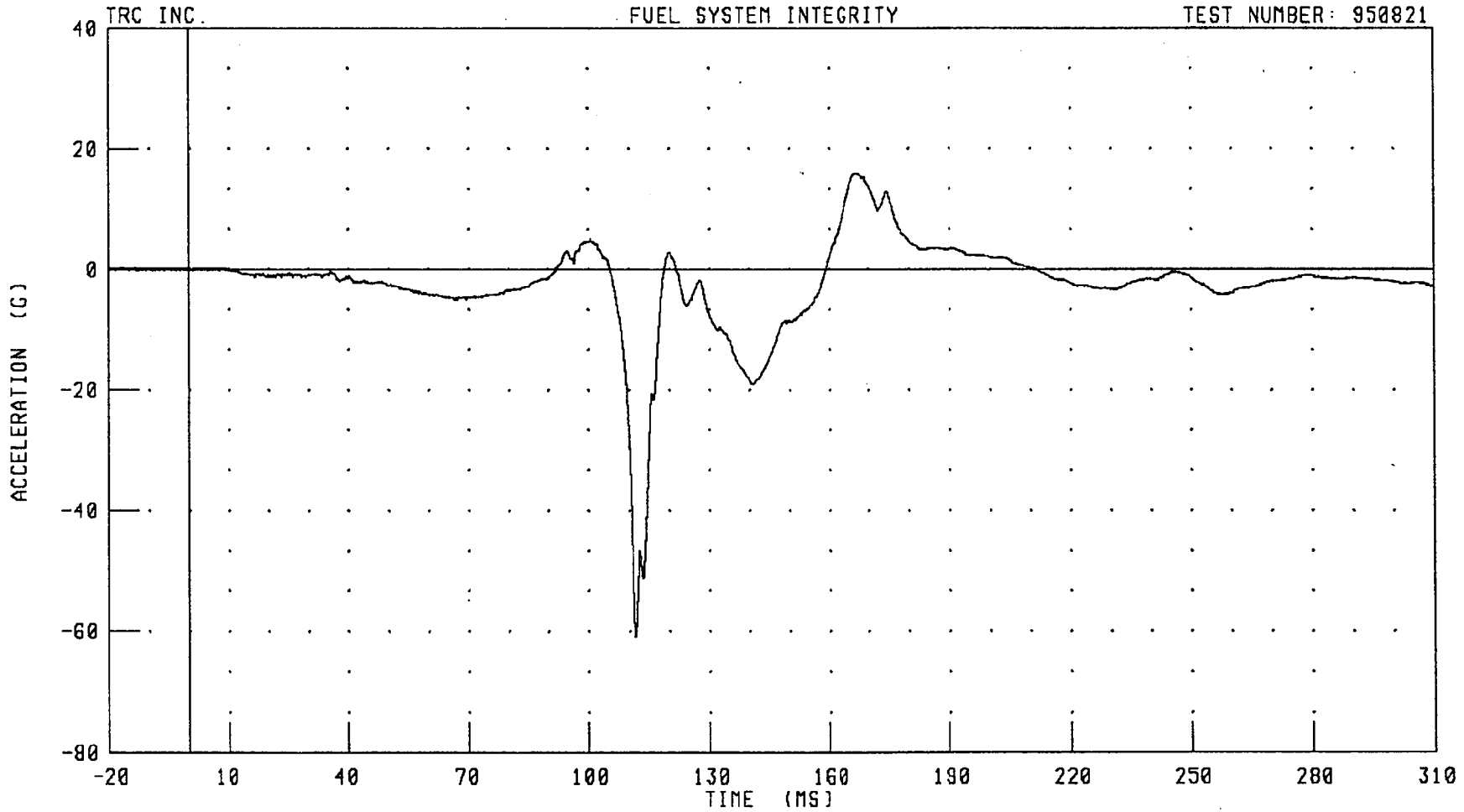
950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD POSITION 1 Z-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HD1ZG1
FILTER: CH. CLASS 1000
PEAK DATA: 7.66 G @ 174.64 MS; -34.87 G @ 111.68 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD POSITION 2 Y-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HD2YG1
FILTER: CH. CLASS 1000
PEAK DATA: 32.39 G @ 111.76 MS; -4.32 G @ 145.12 MS

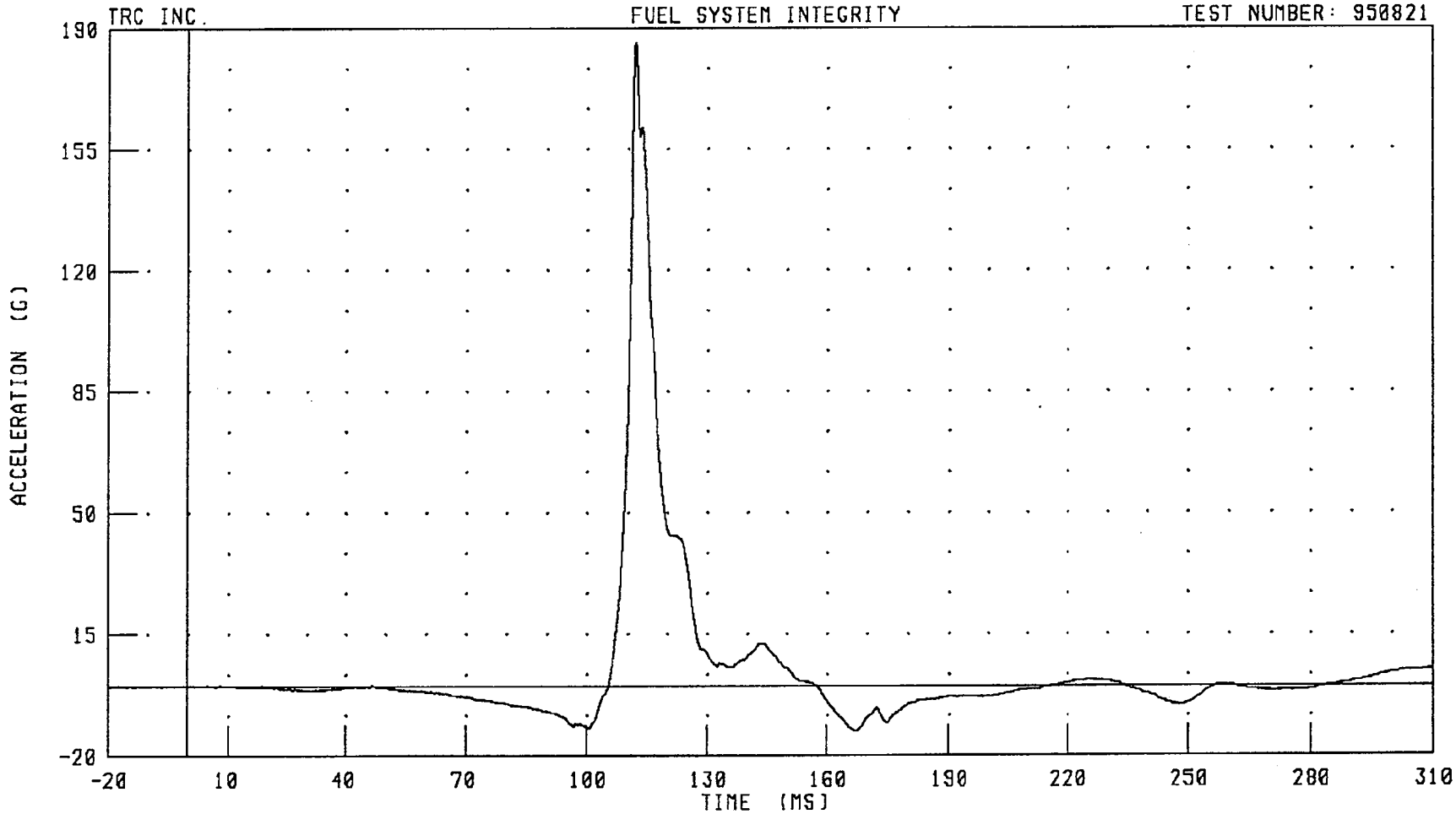
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD POSITION 2 Z-AXIS ACCELERATION



CHANNEL: HD2ZG1 FILTER: CH. CLASS 1000 PEAK DATA: 15.98 G @ 166.72 MS; -60.93 G @ 111.76 MS

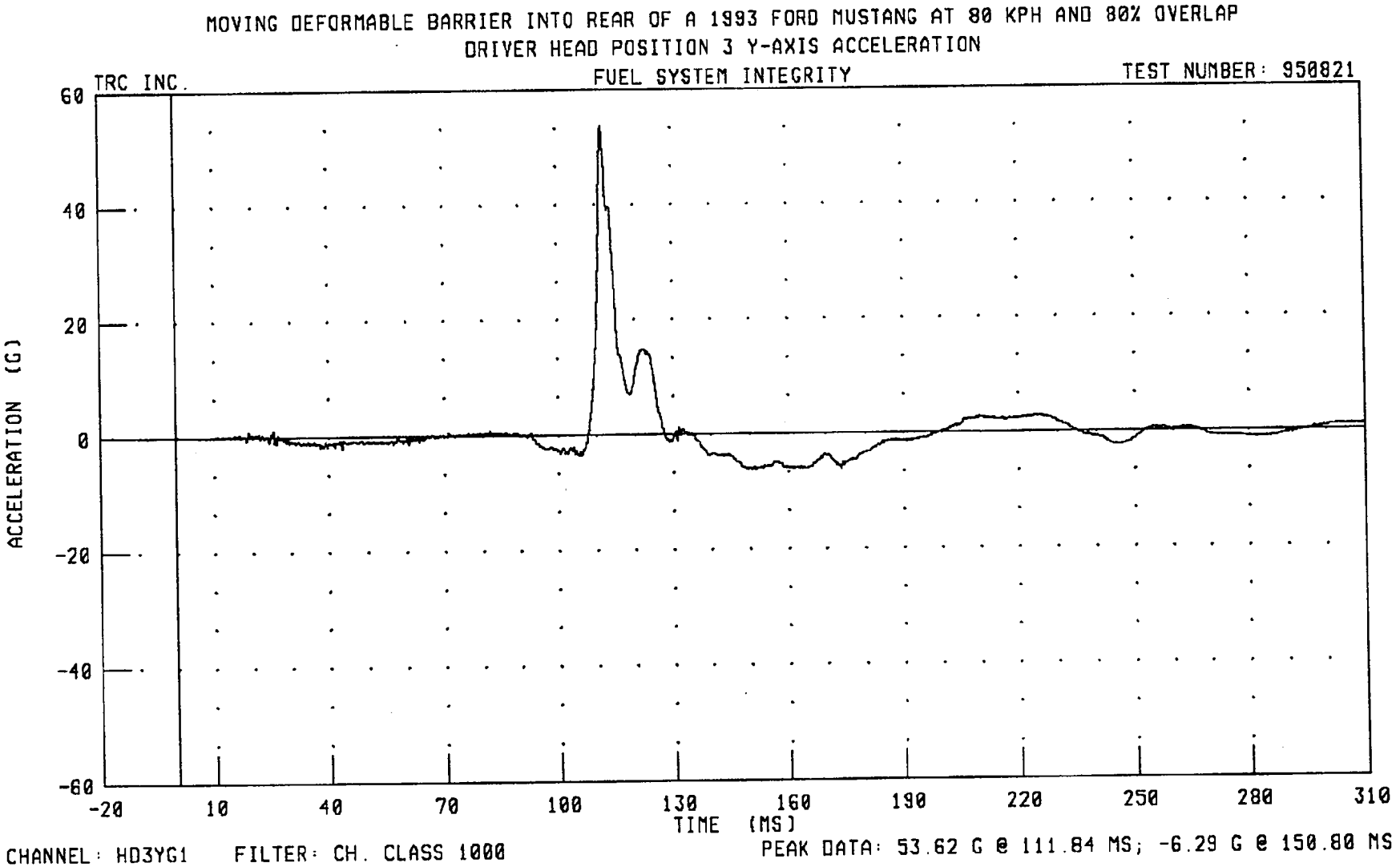
950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD POSITION 3 X-AXIS ACCELERATION

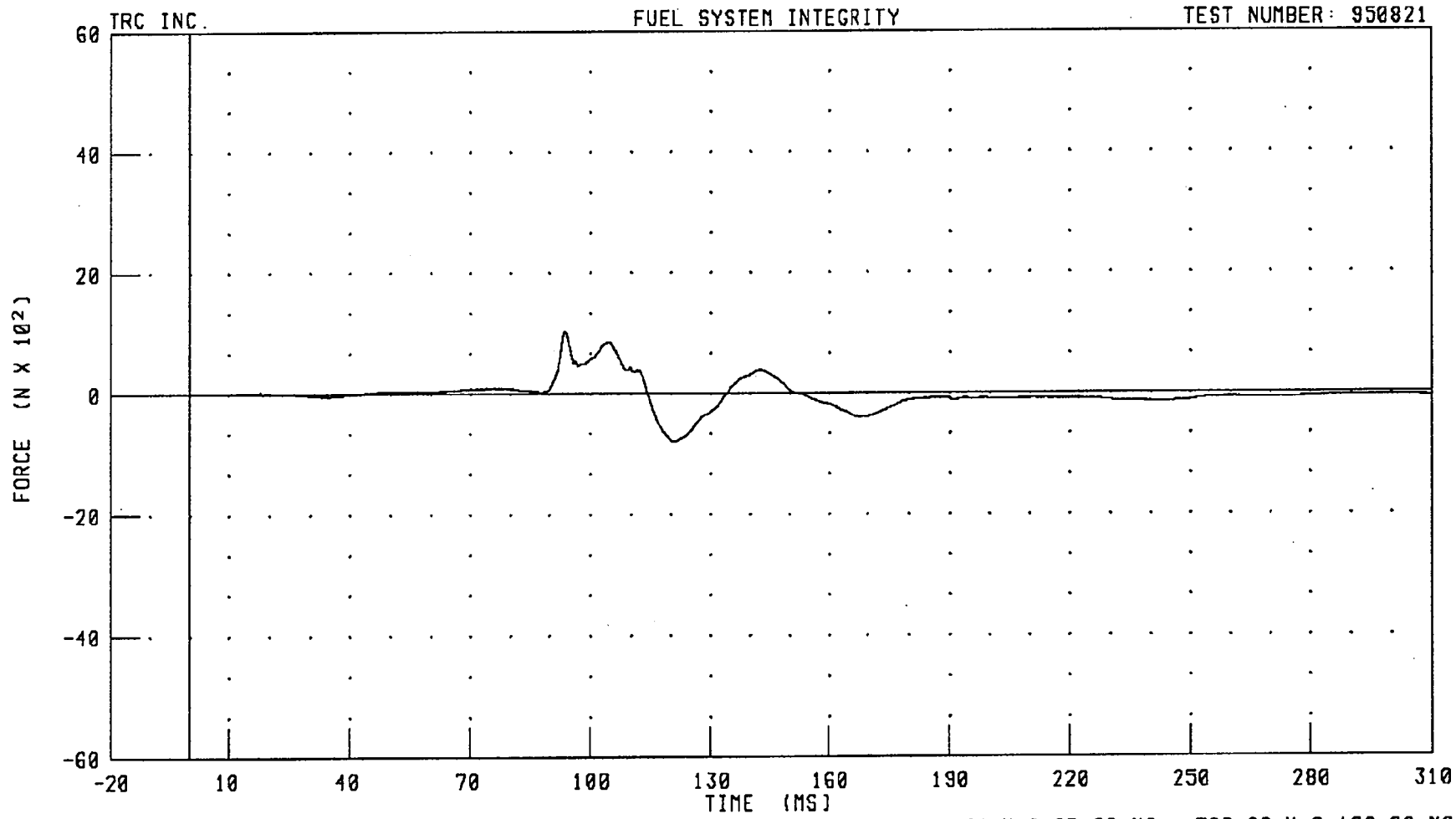


CHANNEL: H03XG1 FILTER: CH. CLASS 1000 PEAK DATA: 185.90 G @ 111.84 MS; -12.80 G @ 166.56 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER HEAD POSITION 3 Y-AXIS ACCELERATION
FUEL SYSTEM INTEGRITY
TRC INC.
TEST NUMBER: 950821
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HD3YG1
FILTER: CH. CLASS 1000
PEAK DATA: 53.62 G @ 111.84 MS; -6.29 G @ 150.80 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LOWER NECK X-AXIS SHEAR FORCE



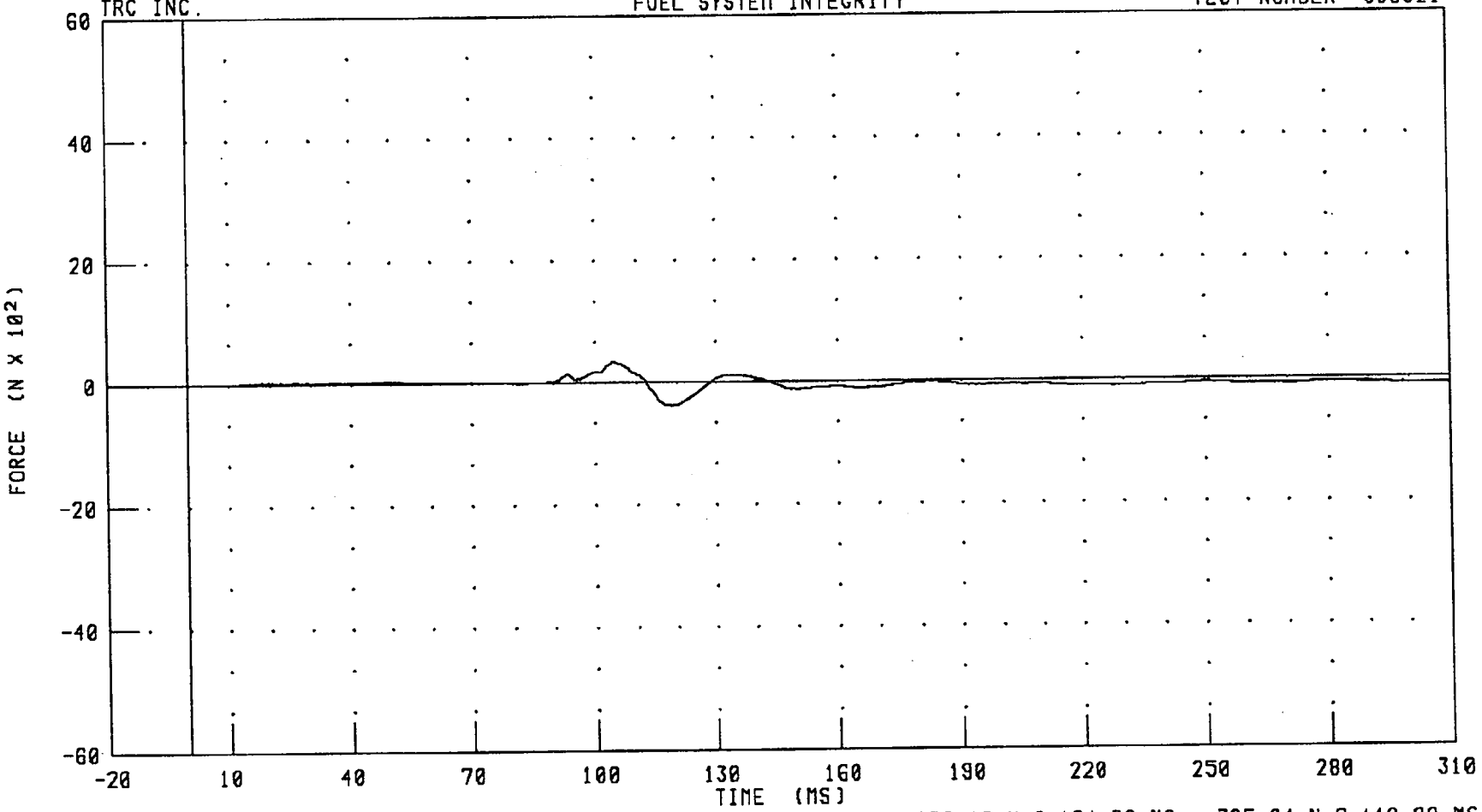
CHANNEL: NKLXF1 FILTER: CH. CLASS 1000 PEAK DATA: 1031.54 N @ 93.92 MS; -799.89 N @ 120.80 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LOWER NECK Y-AXIS SHEAR FORCE
FUEL SYSTEM INTEGRITY

TRC INC.

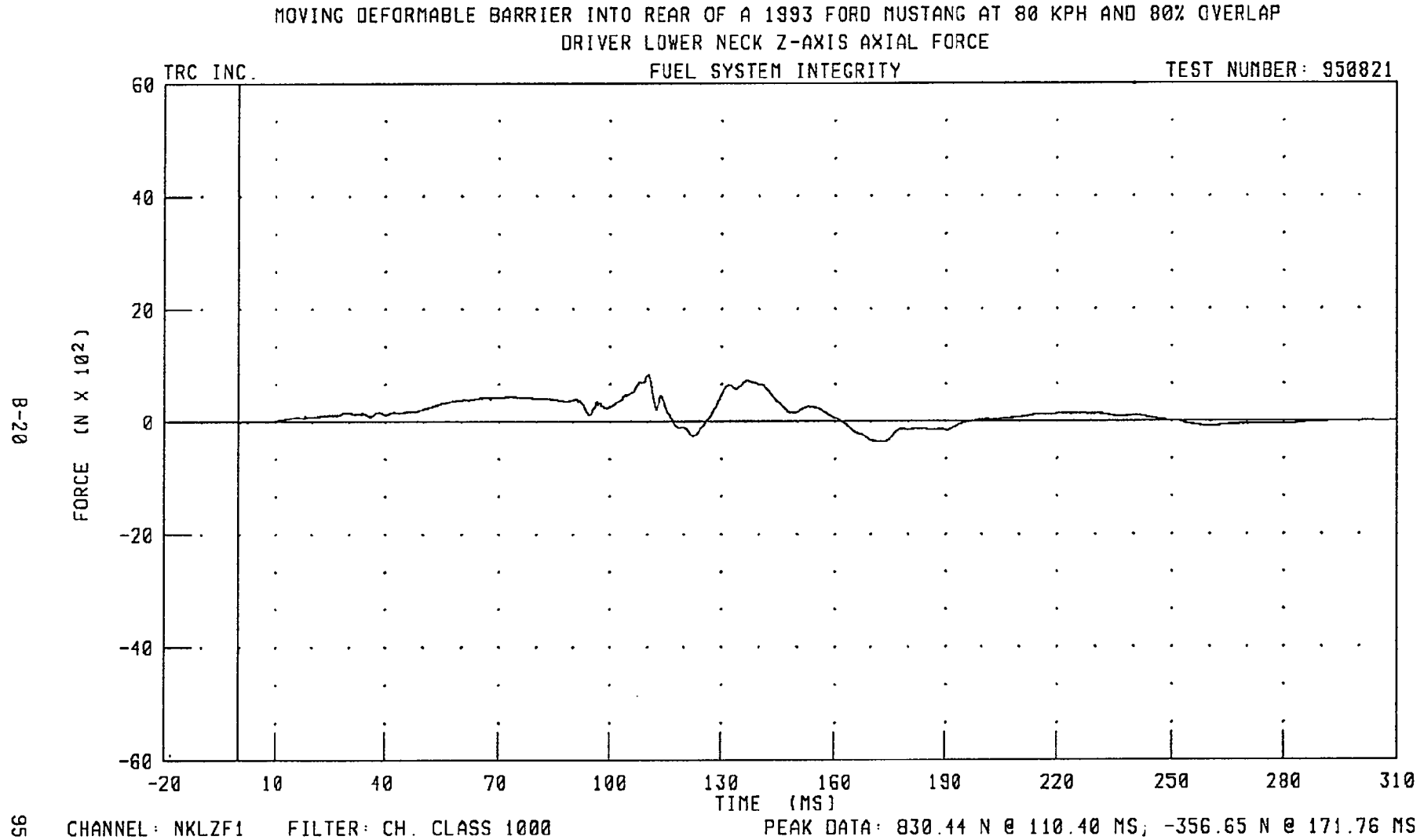
TEST NUMBER: 950821



CHANNEL: NKLYF1 FILTER: CH. CLASS 1000

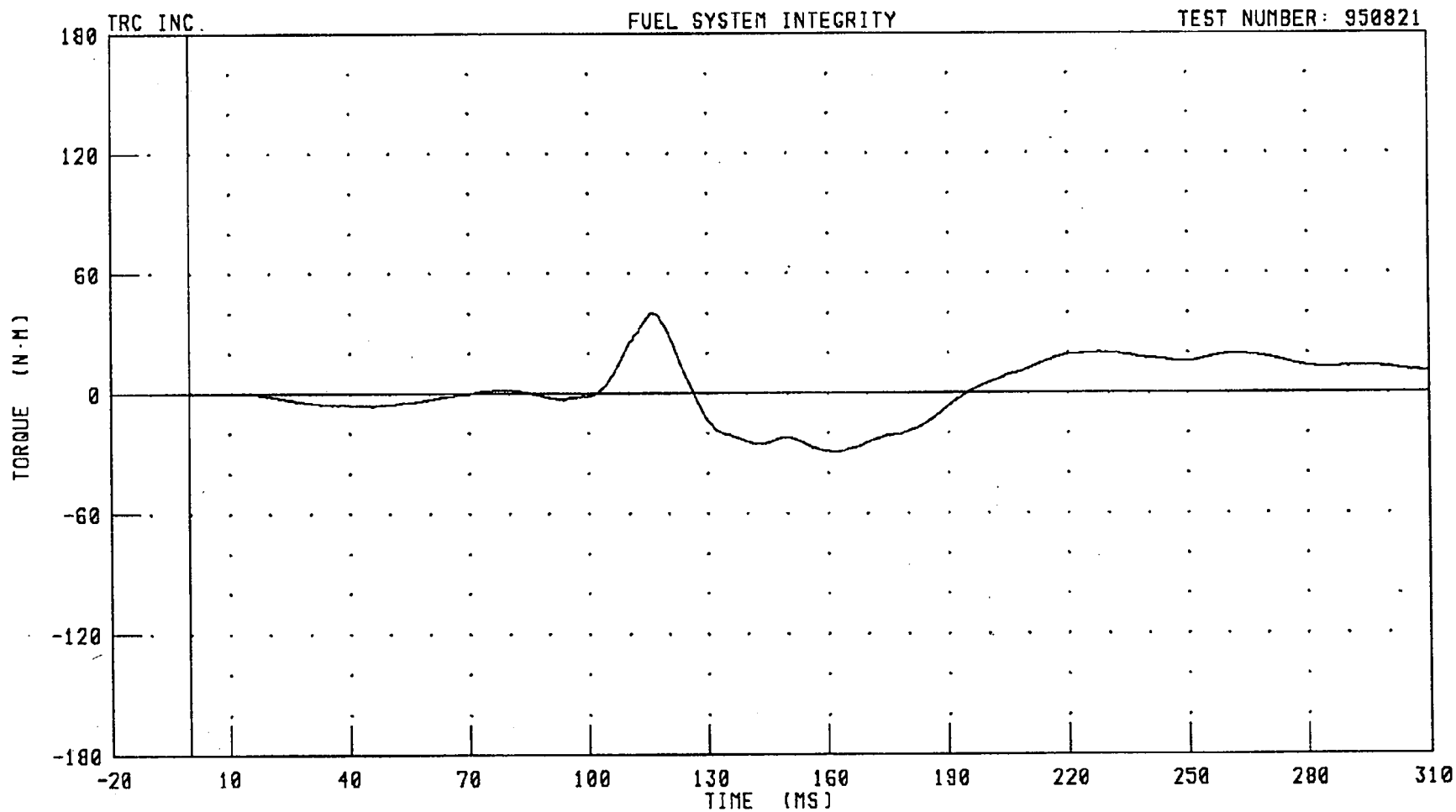
PEAK DATA: 338.19 N @ 104.32 MS; -385.94 N @ 118.88 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LOWER NECK Z-AXIS AXIAL FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
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: NKLZF1
FILTER: CH. CLASS 1000
PEAK DATA: 830.44 N @ 110.40 MS; -356.65 N @ 171.76 MS

950821

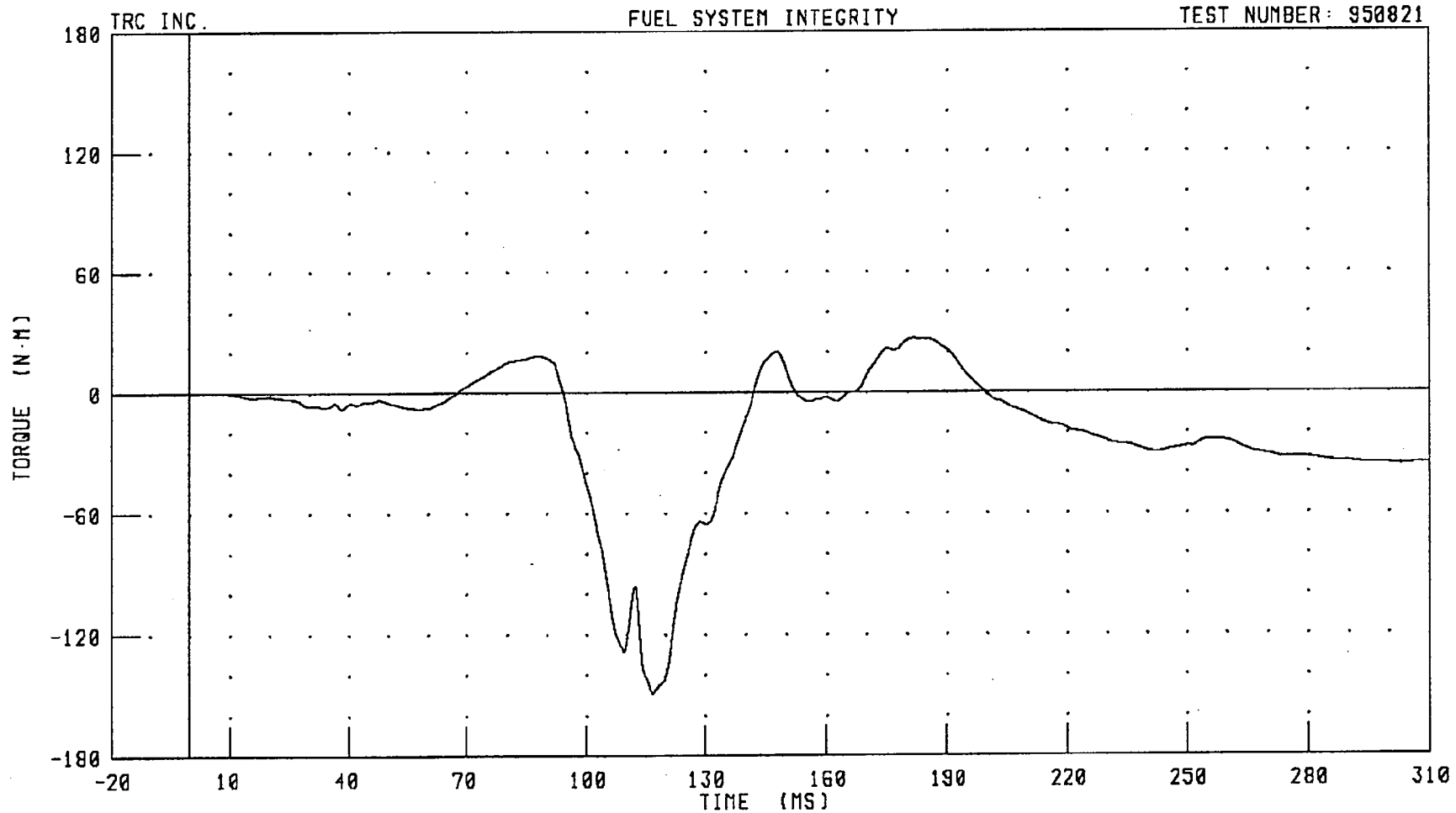
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LOWER NECK MOMENT ABOUT X-AXIS



CHANNEL: NKLXM1 FILTER: CH. CLASS 600 PEAK DATA: 40.35 N-M @ 116.00 MS; -29.52 N-M @ 162.32 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LOWER NECK MOMENT ABOUT Y-AXIS

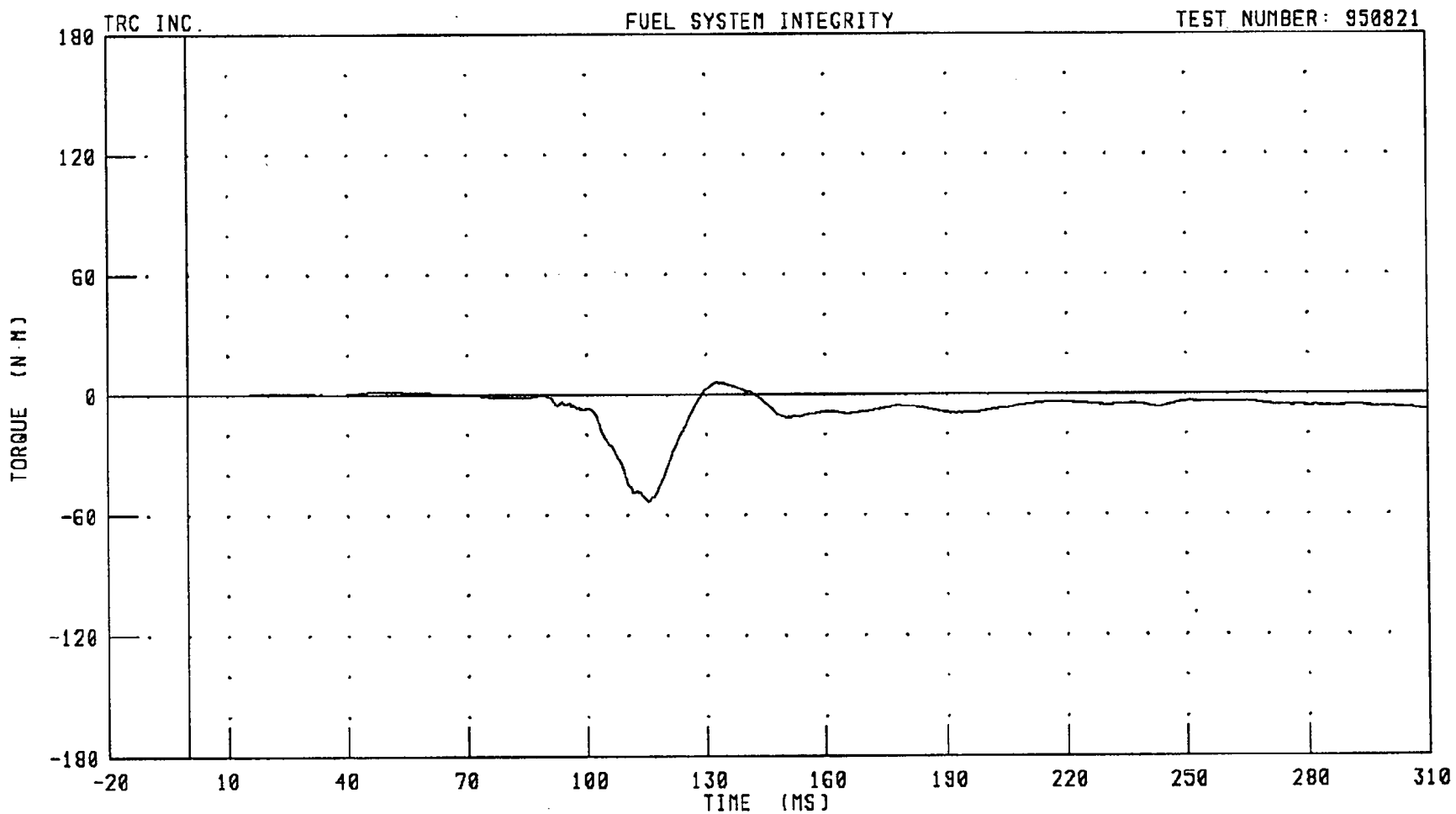


CHANNEL: NKLYM1 FILTER: CH. CLASS 600

PEAK DATA: 26.87 N-M @ 181.52 MS; -149.18 N-M @ 116.96 MS

950821

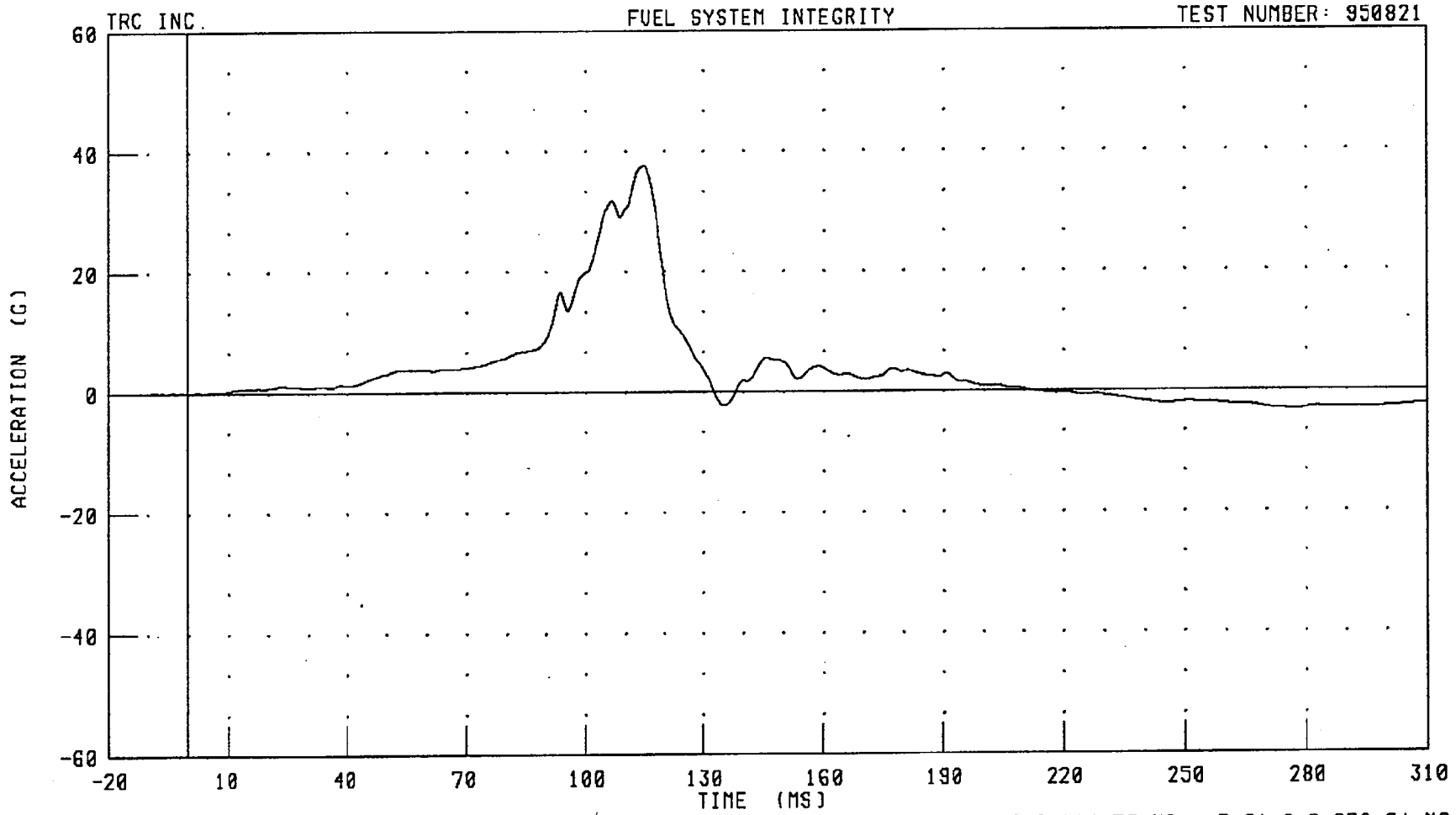
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LOWER NECK MOMENT ABOUT Z-AXIS



CHANNEL: NKLZM1 FILTER: CH. CLASS 600 PEAK DATA: 5.99 N-M @ 132.80 MS; -53.06 N-M @ 115.68 MS

950821

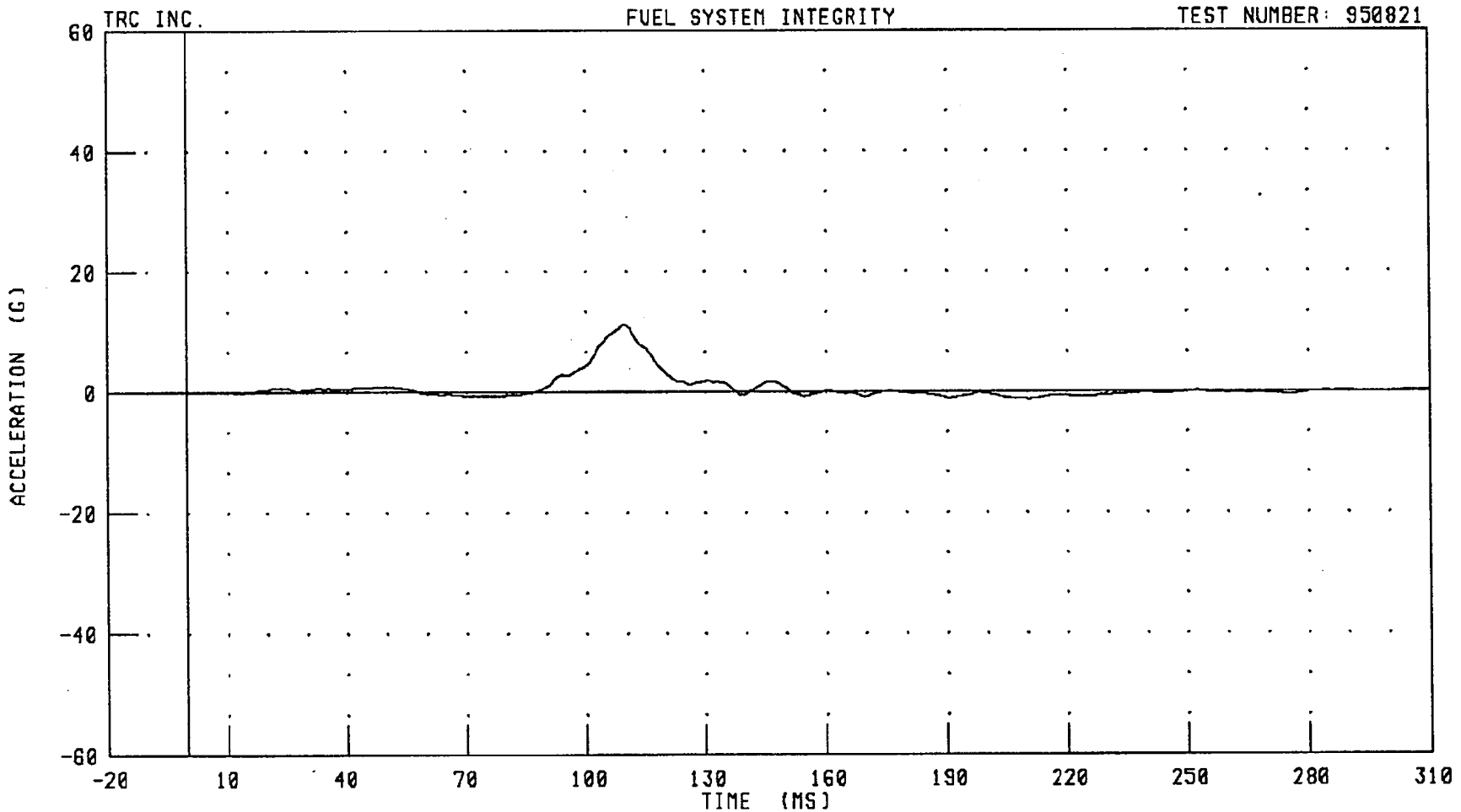
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG1 FILTER: CH. CLASS 180 PEAK DATA: 37.61 G @ 114.72 MS; -3.21 G @ 276.24 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER CHEST Y-AXIS ACCELERATION



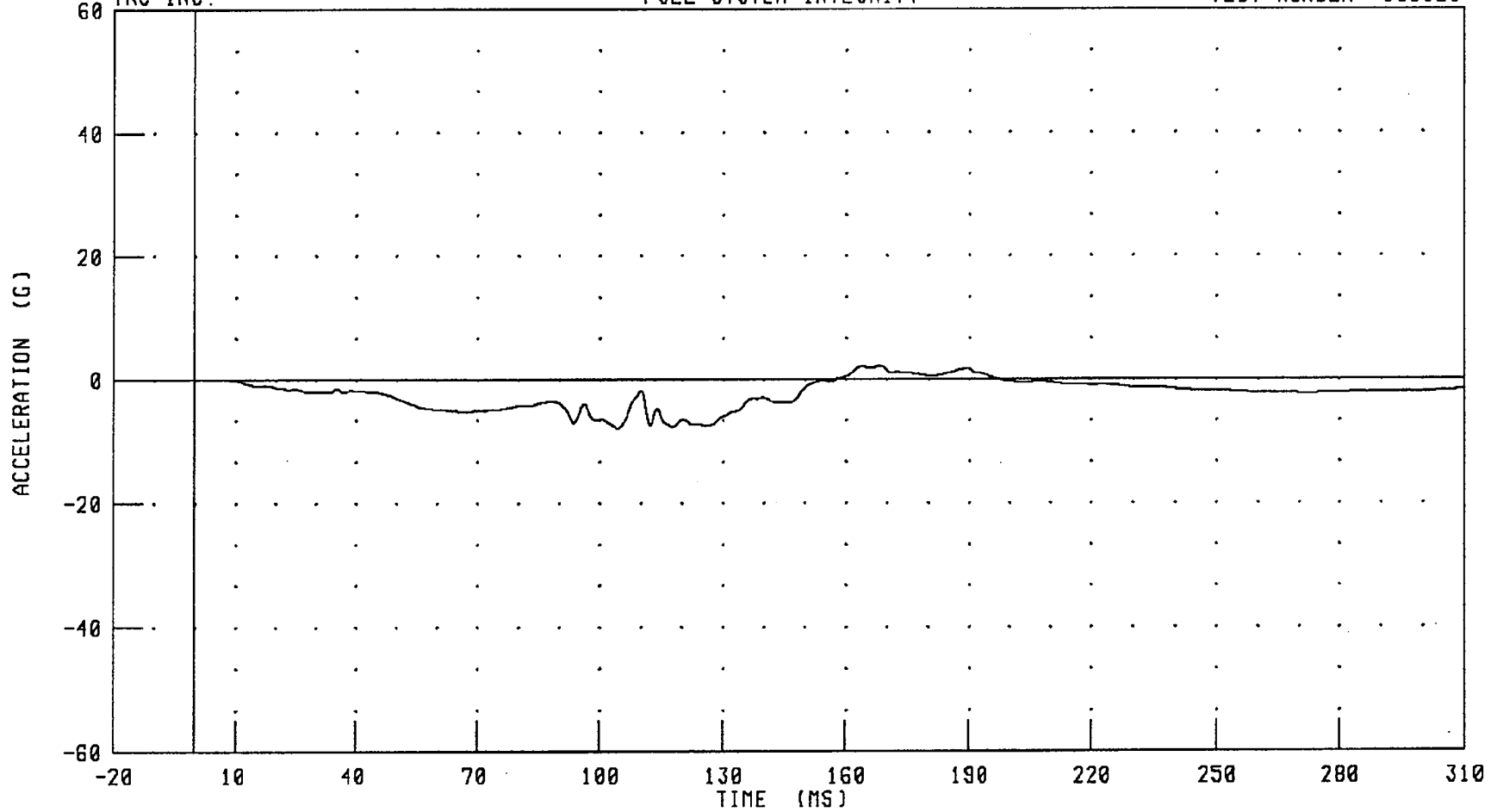
CHANNEL: CSTYG1 FILTER: CH. CLASS 180 PEAK DATA: 11.26 G @ 109.68 MS; -1.26 G @ 210.56 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

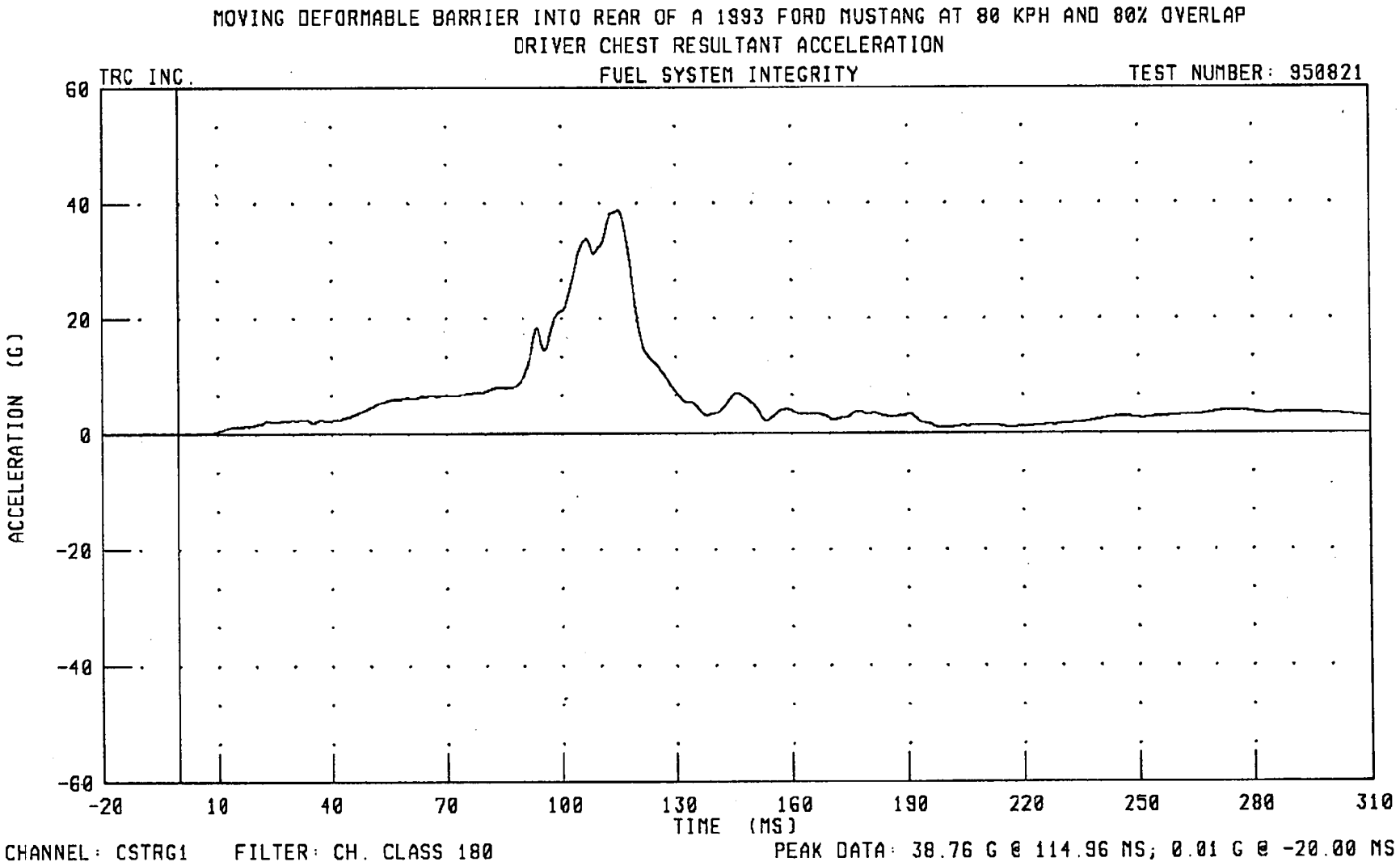
DRIVER CHEST Z-AXIS ACCELERATION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 2.14 G @ 168.08 MS; -7.95 G @ 104.48 MS

950821

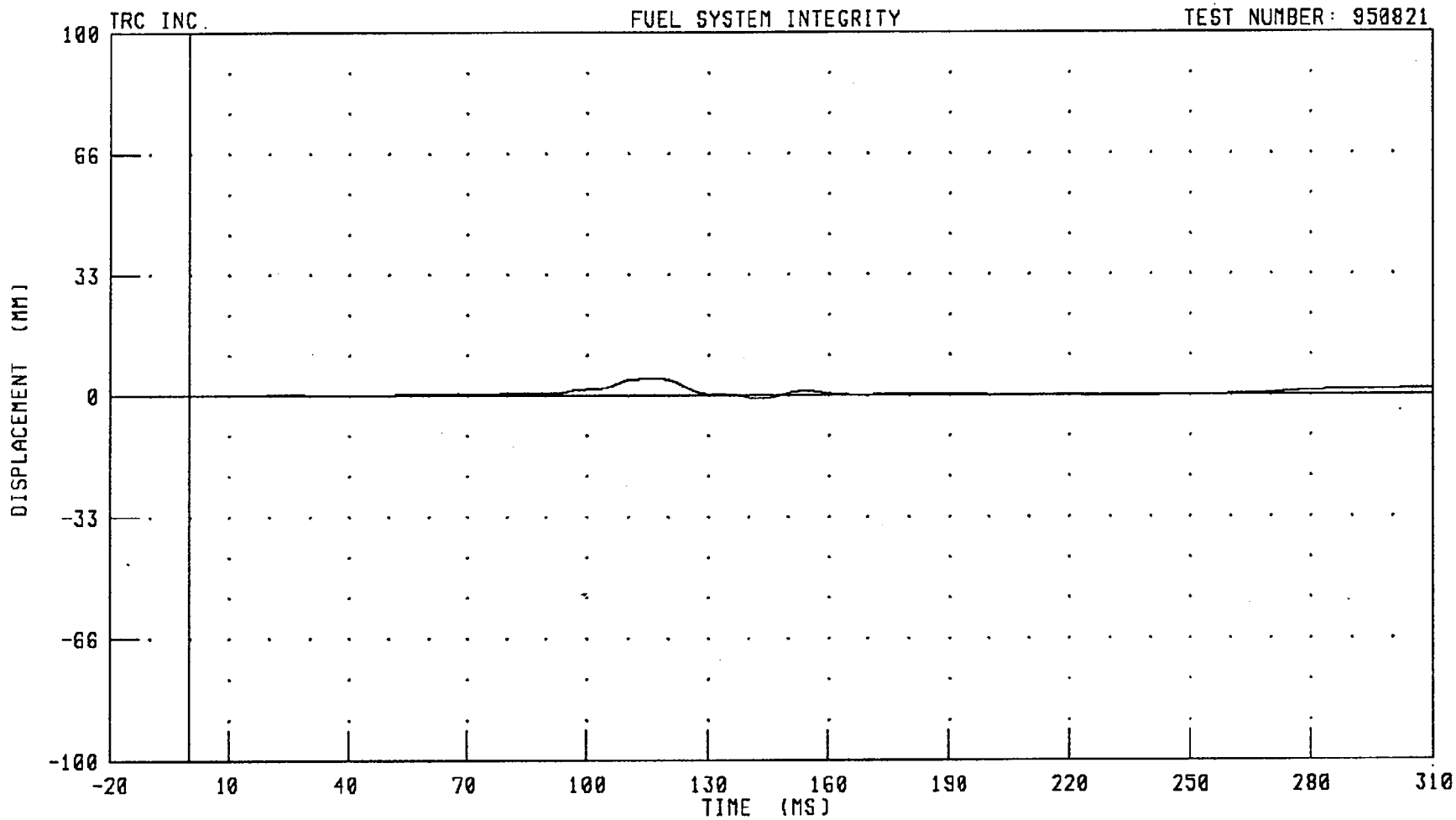

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER CHEST RESULTANT ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: CSTRG1
FILTER: CH. CLASS 180
PEAK DATA: 38.76 G @ 114.96 MS; 0.01 G @ -20.00 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

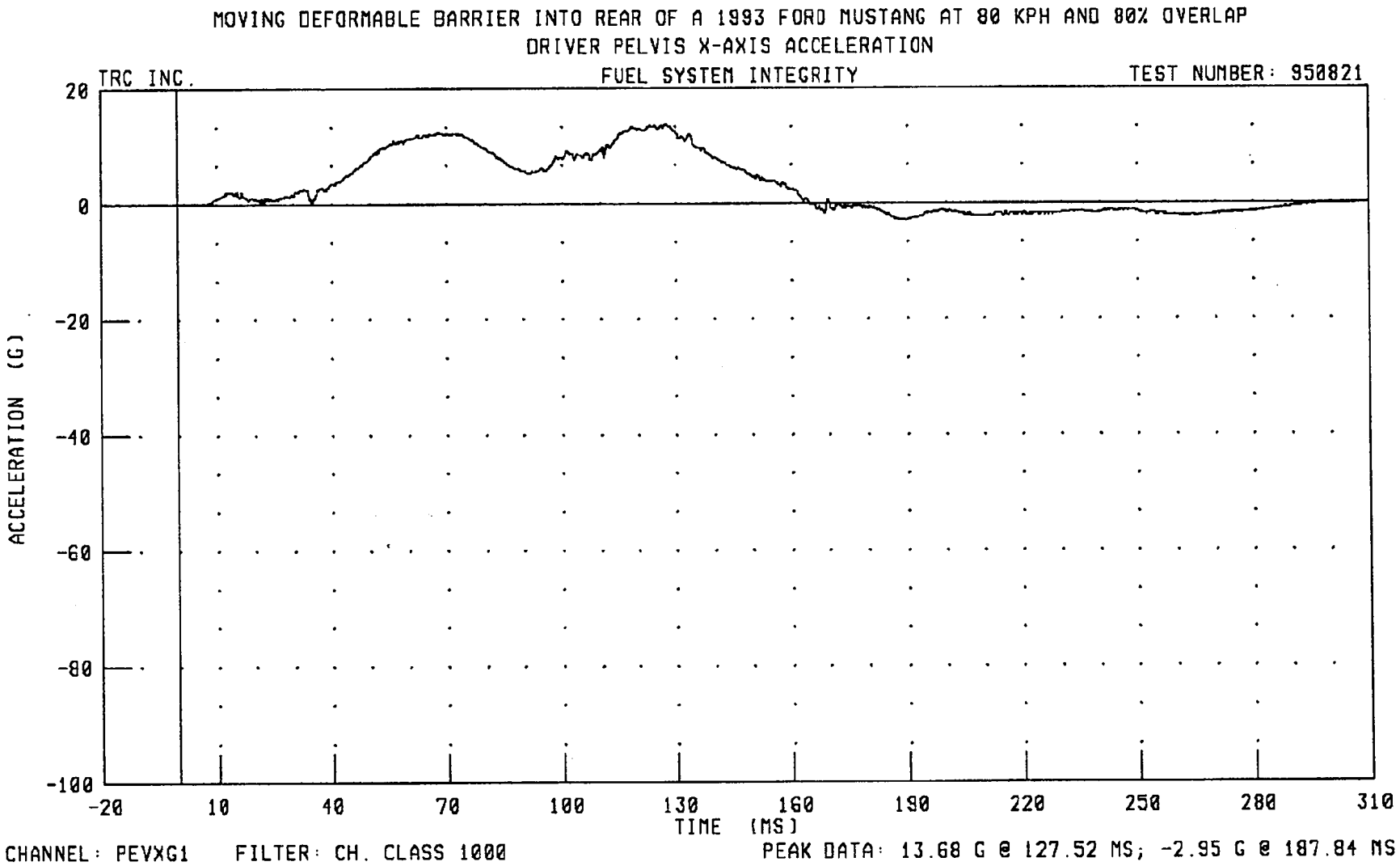
DRIVER CHEST DEFLECTION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: CSTXD1 FILTER: CH. CLASS 180 PEAK DATA: 4.54 MM @ 115.52 MS; -0.86 MM @ 143.04 MS

950821

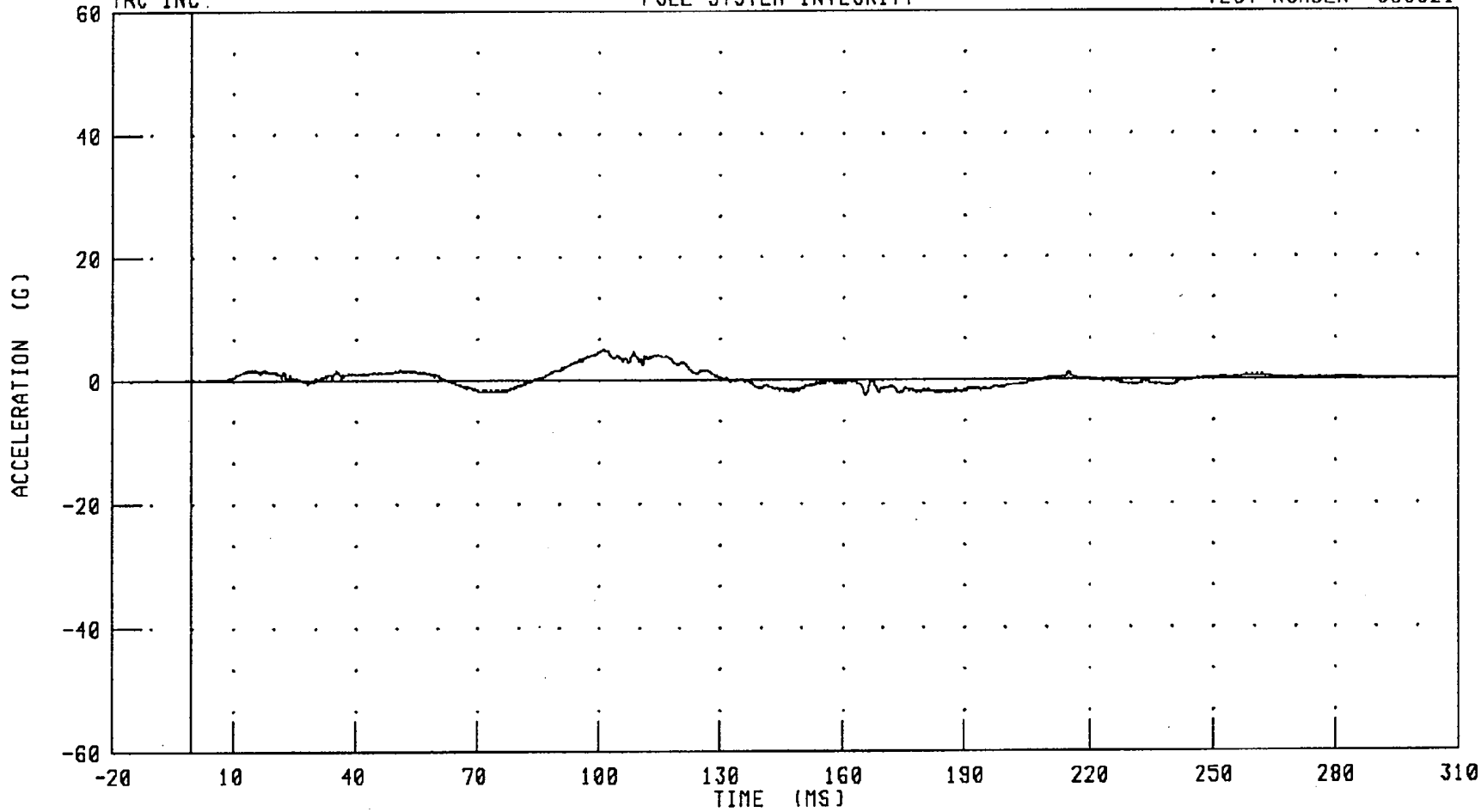

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER PELVIS X-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
20
0
-20
-40
-60
-80
-100
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVXG1
FILTER: CH. CLASS 1000
PEAK DATA: 13.68 G @ 127.52 MS; -2.95 G @ 187.84 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

DRIVER PELVIS Y-AXIS ACCELERATION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



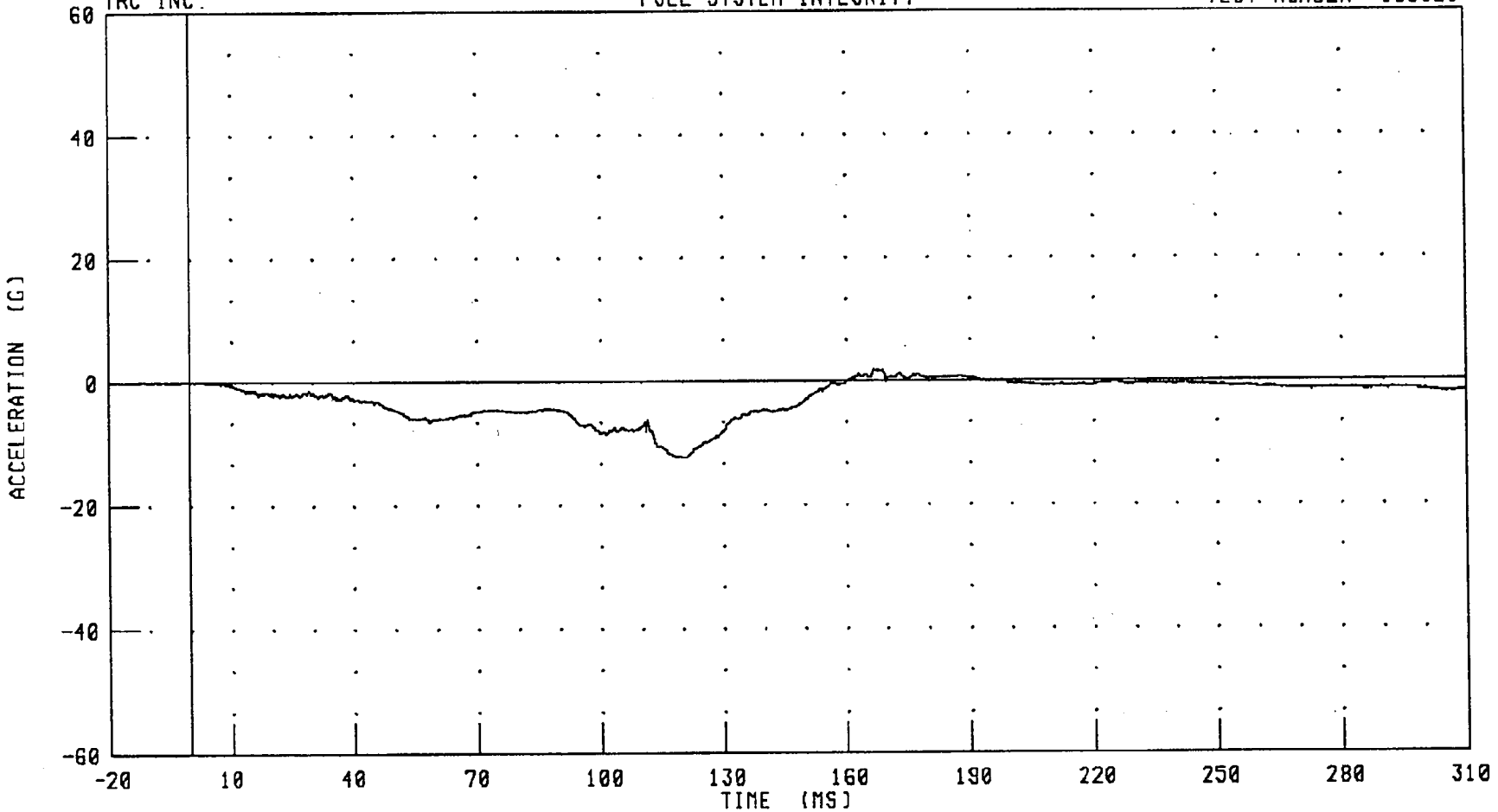
CHANNEL: PEVYG1 FILTER: CH. CLASS 1000 PEAK DATA: 4.91 G @ 100.96 MS; -2.56 G @ 165.44 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

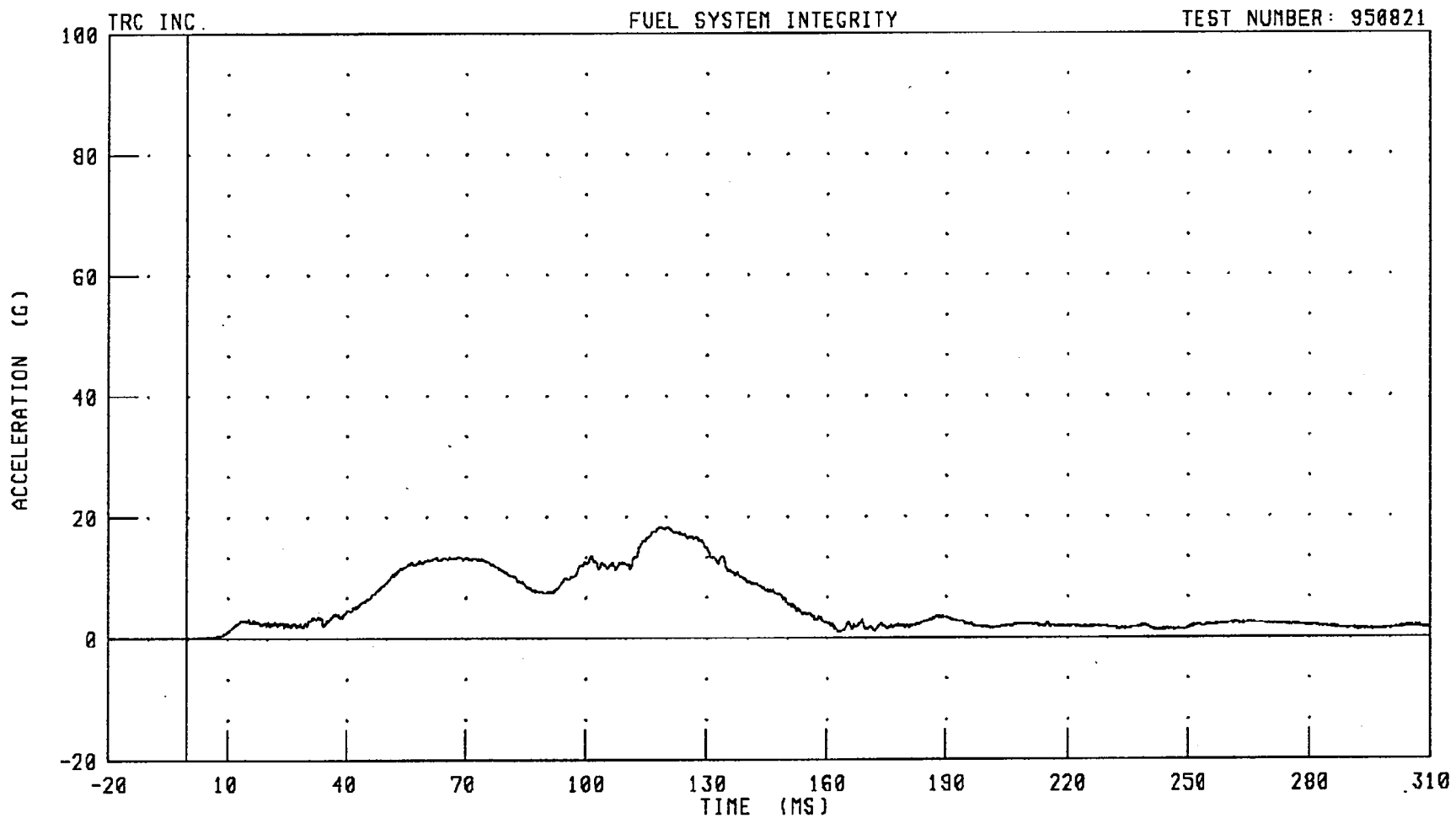
DRIVER PELVIS Z-AXIS ACCELERATION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: PEVZG1 FILTER: CH. CLASS 1000 PEAK DATA: 1.92 G @ 166.80 MS; -12.41 G @ 118.40 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER PELVIS RESULTANT ACCELERATION



CHANNEL: PEVRG1 FILTER: CH. CLASS 1000 PEAK DATA: 18.42 G @ 118.40 MS; 0.05 G @ -19.84 MS

950821

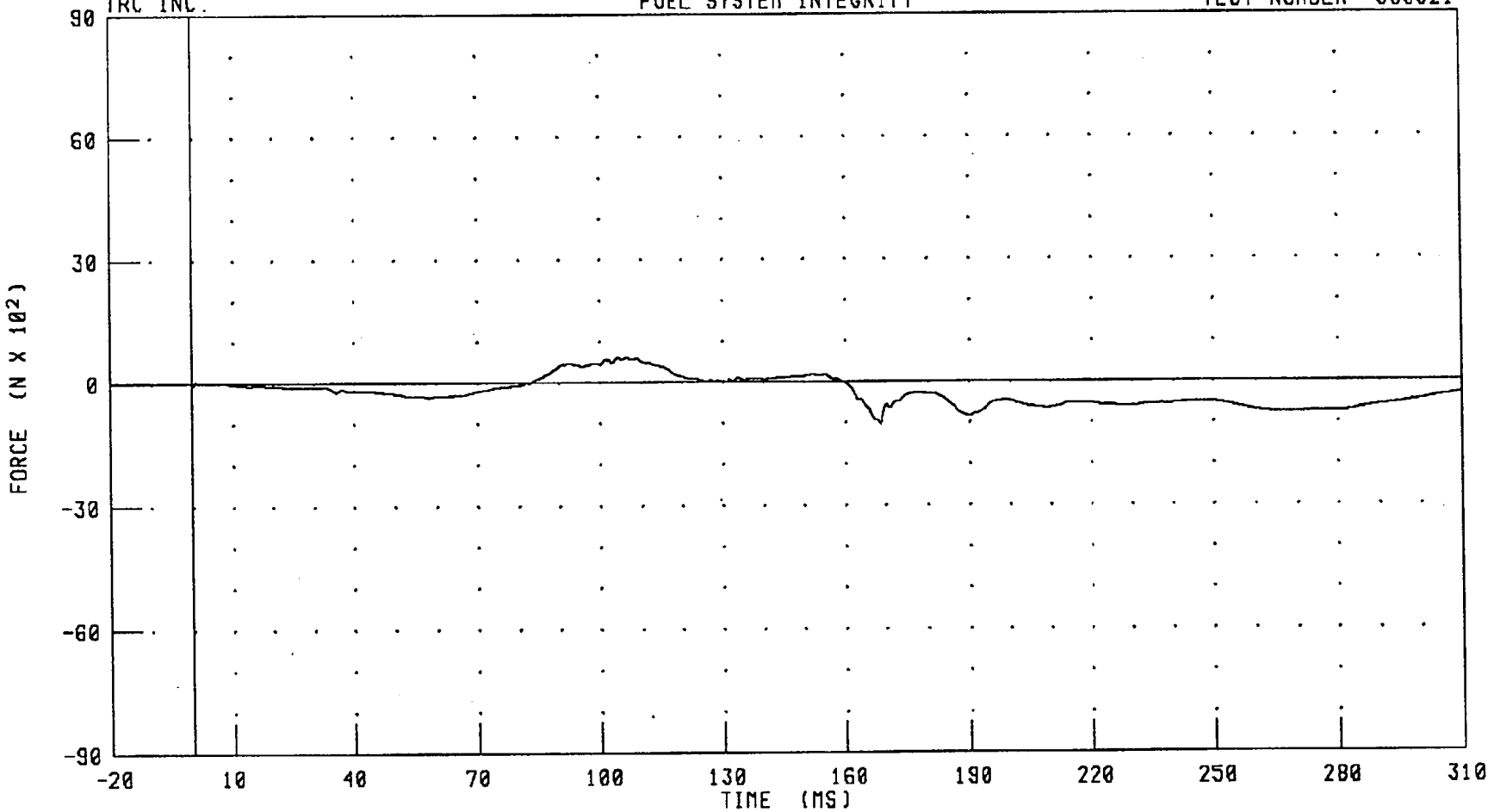
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

DRIVER LEFT FEMUR FORCE

FUEL SYSTEM INTEGRITY

TRC INC.

TEST NUMBER: 950821



CHANNEL: LFMF1 FILTER: CH. CLASS 600

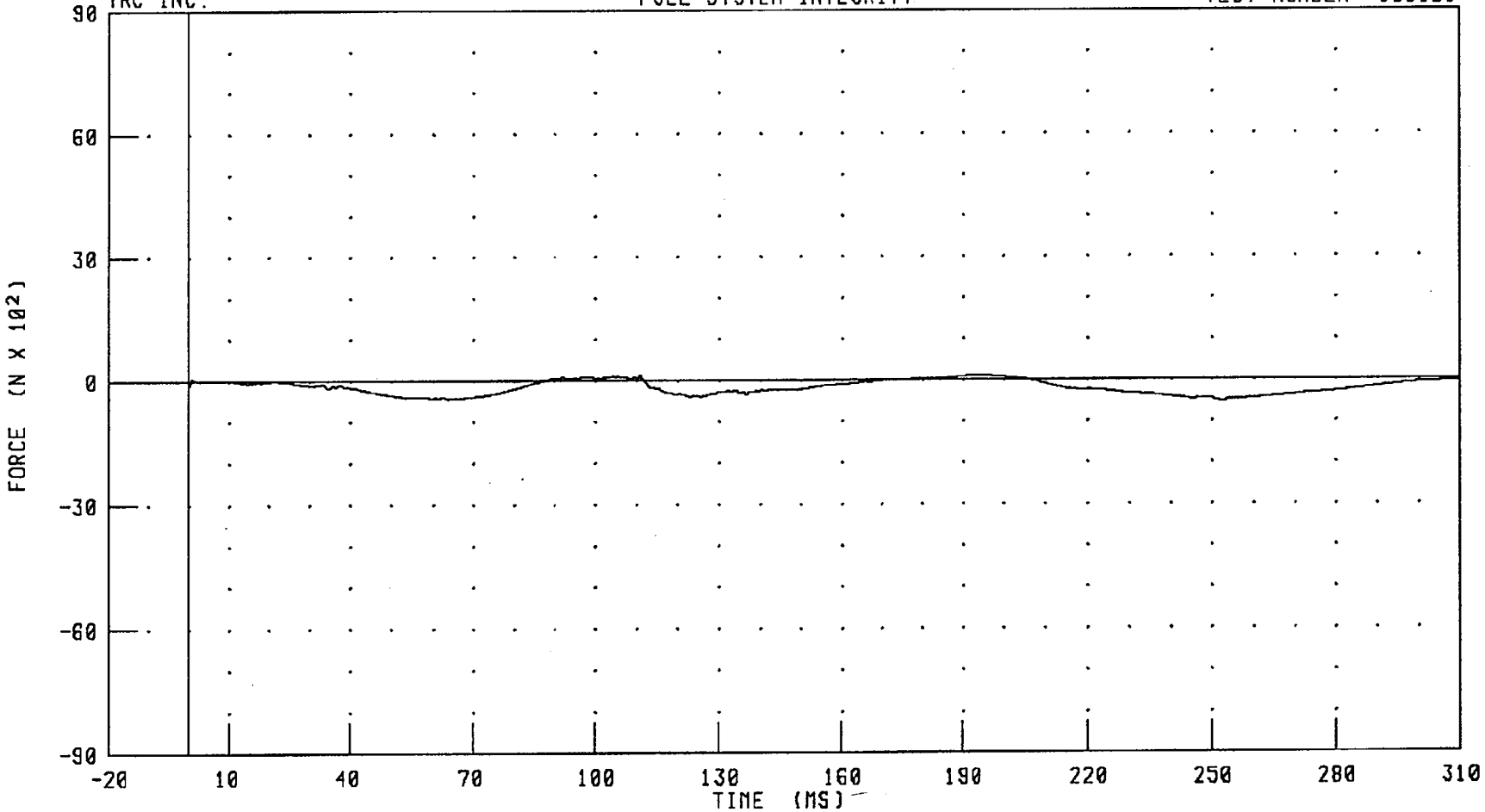
PEAK DATA: 623.50 N @ 106.64 MS; -1037.89 N @ 168.88 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

DRIVER RIGHT FEMUR FORCE

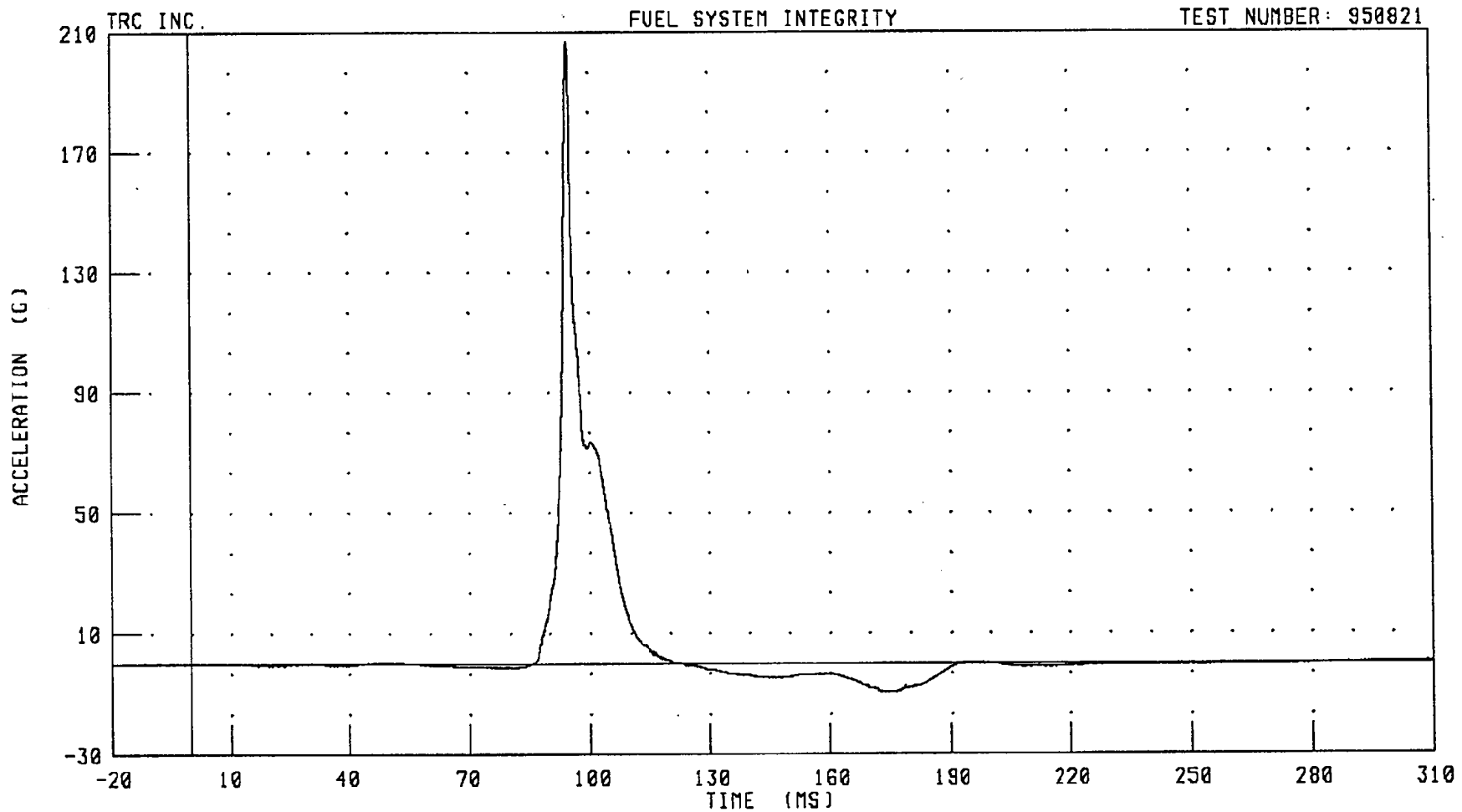
TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: RFMF1 FILTER: CH. CLASS 600 PEAK DATA: 129.52 N @ 110.88 MS; -537.91 N @ 252.64 MS

950821

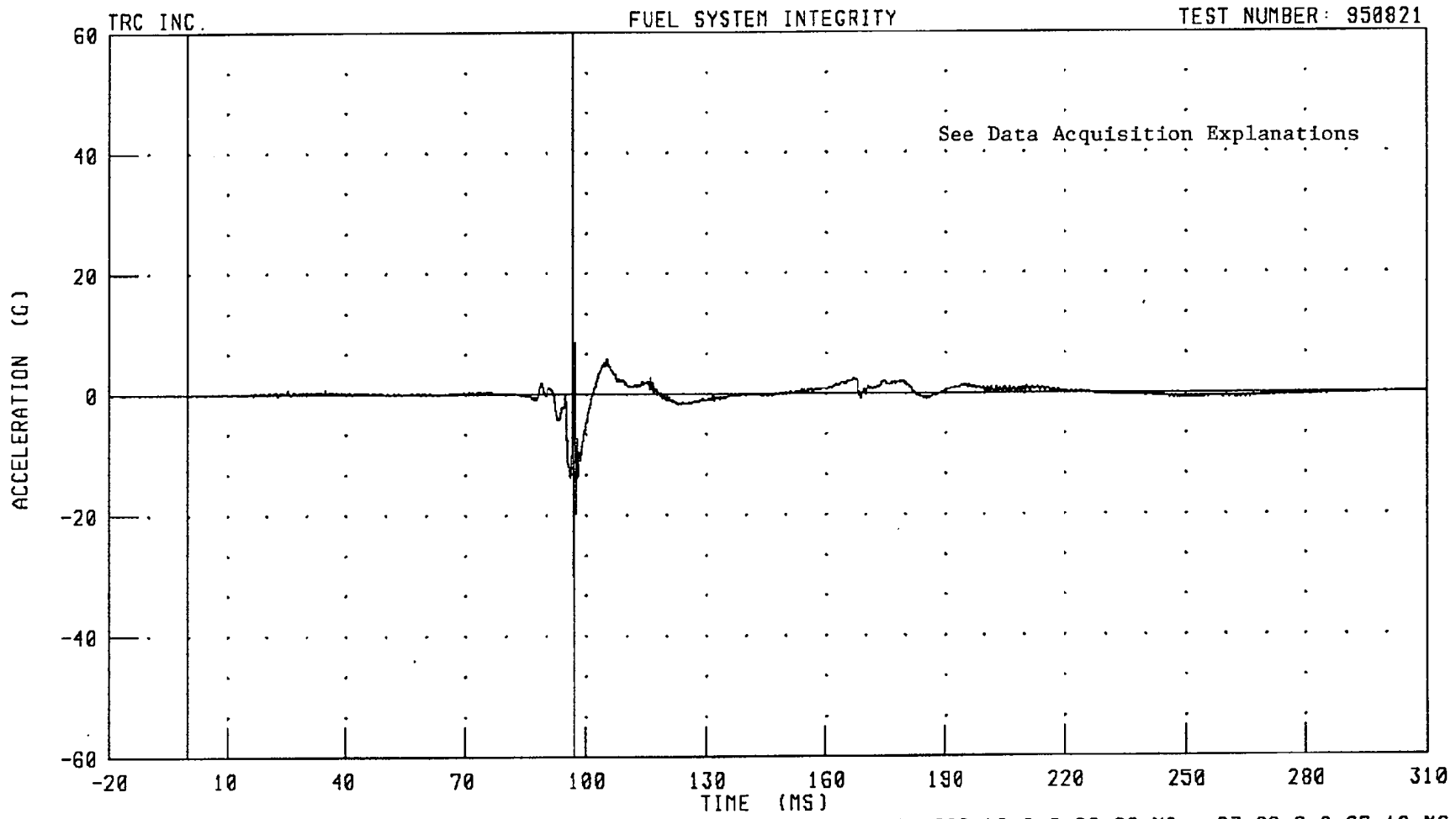
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000 PEAK DATA: 206.88 G @ 94.80 MS; -9.64 G @ 173.44 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

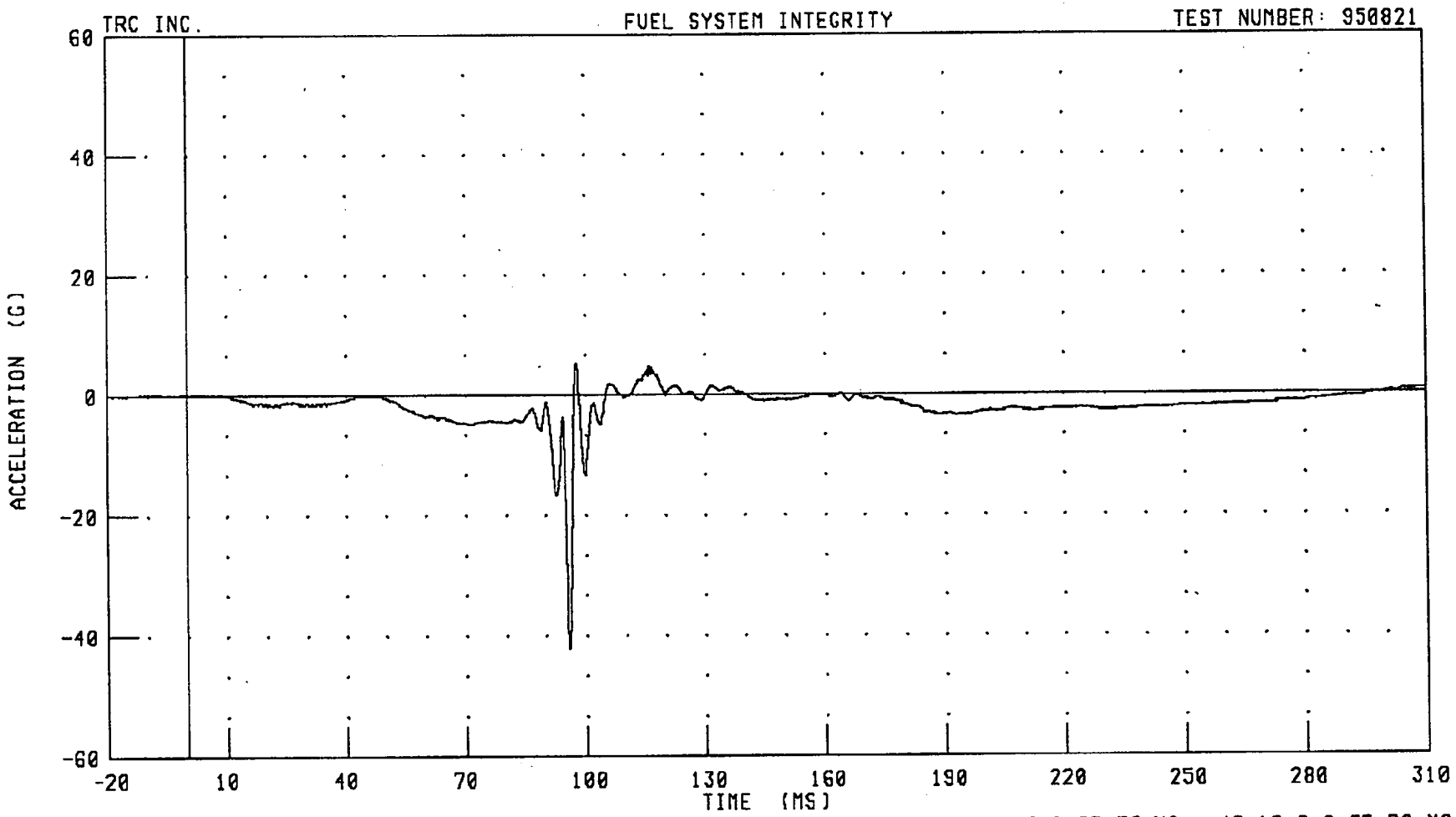


CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA: 206.18 G @ 96.80 MS; -63.92 G @ 97.12 MS

950821

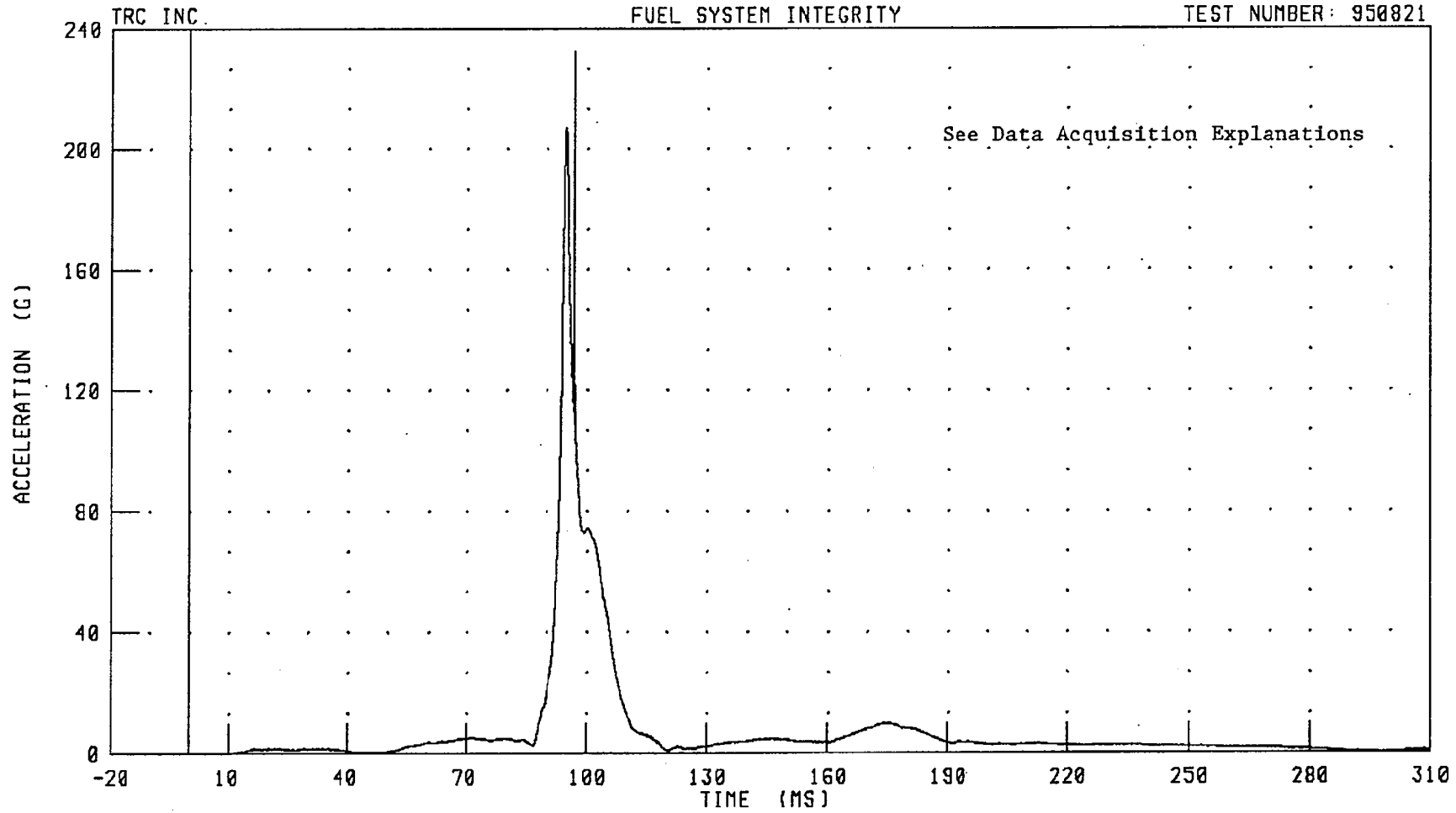
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION



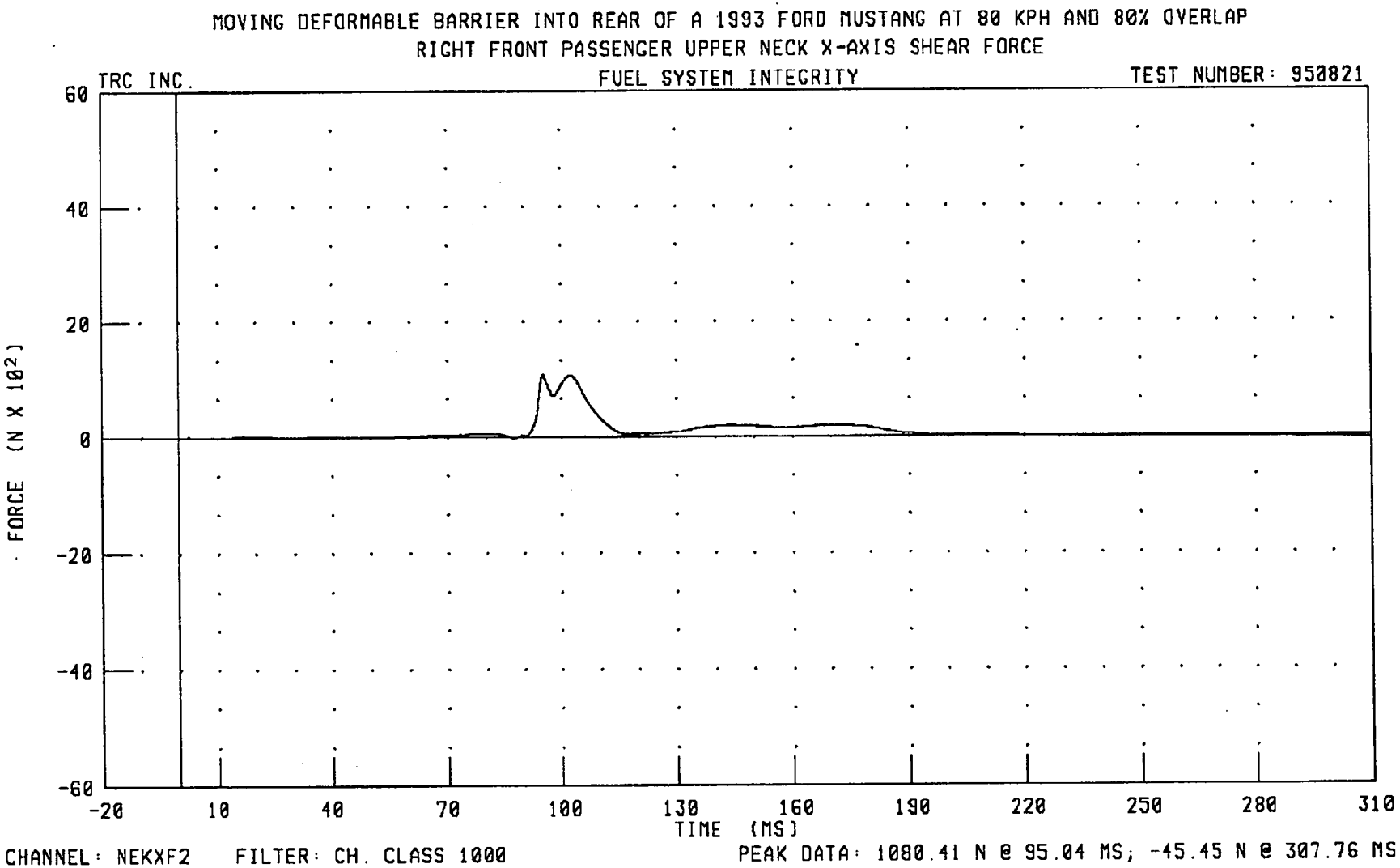
CHANNEL: HEDZG2 FILTER: CH. CLASS 1000 PEAK DATA: 5.31 G @ 97.76 MS; -42.10 G @ 95.76 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

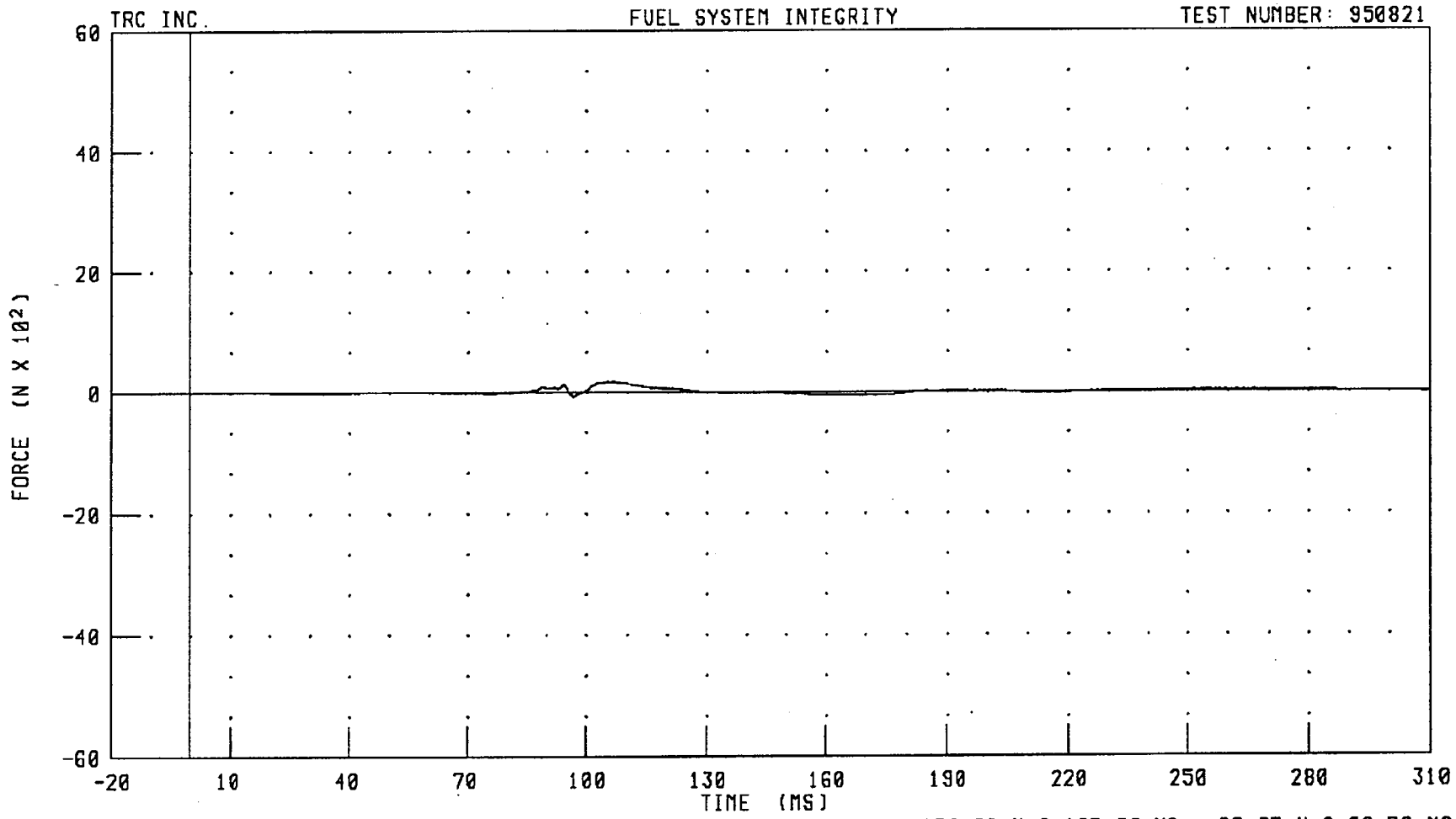


CHANNEL: HEDRG2 FILTER: CH. CLASS 1000 PEAK DATA: 232.56 G @ 96.80 MS; 0.04 G @ -19.84 MS


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK X-AXIS SHEAR FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
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: NEKXF2
FILTER: CH. CLASS 1000
PEAK DATA: 1080.41 N @ 95.04 MS; -45.45 N @ 307.76 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK Y-AXIS SHEAR FORCE

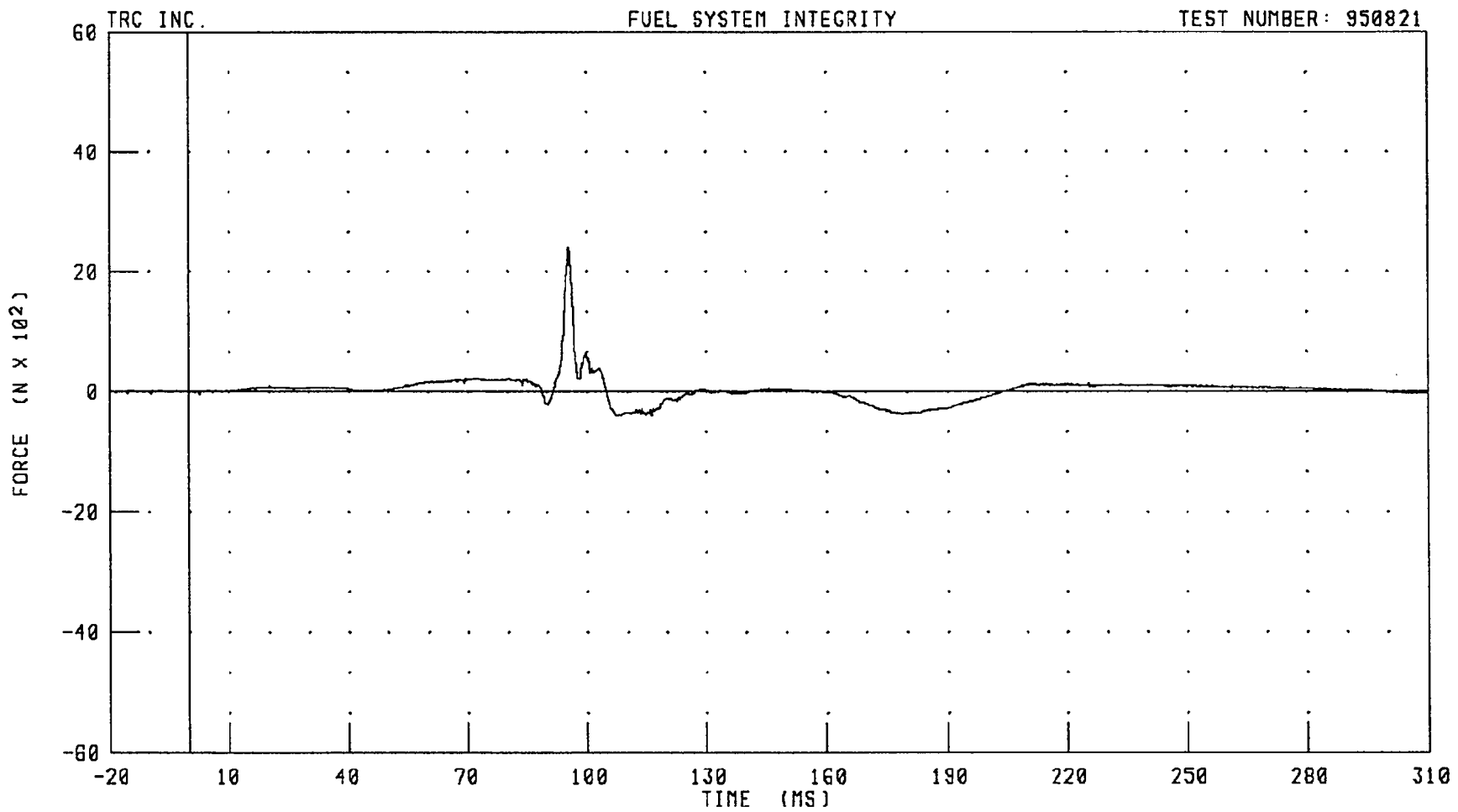


CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

PEAK DATA: 179.60 N @ 105.20 MS; -89.95 N @ 96.72 MS

950821

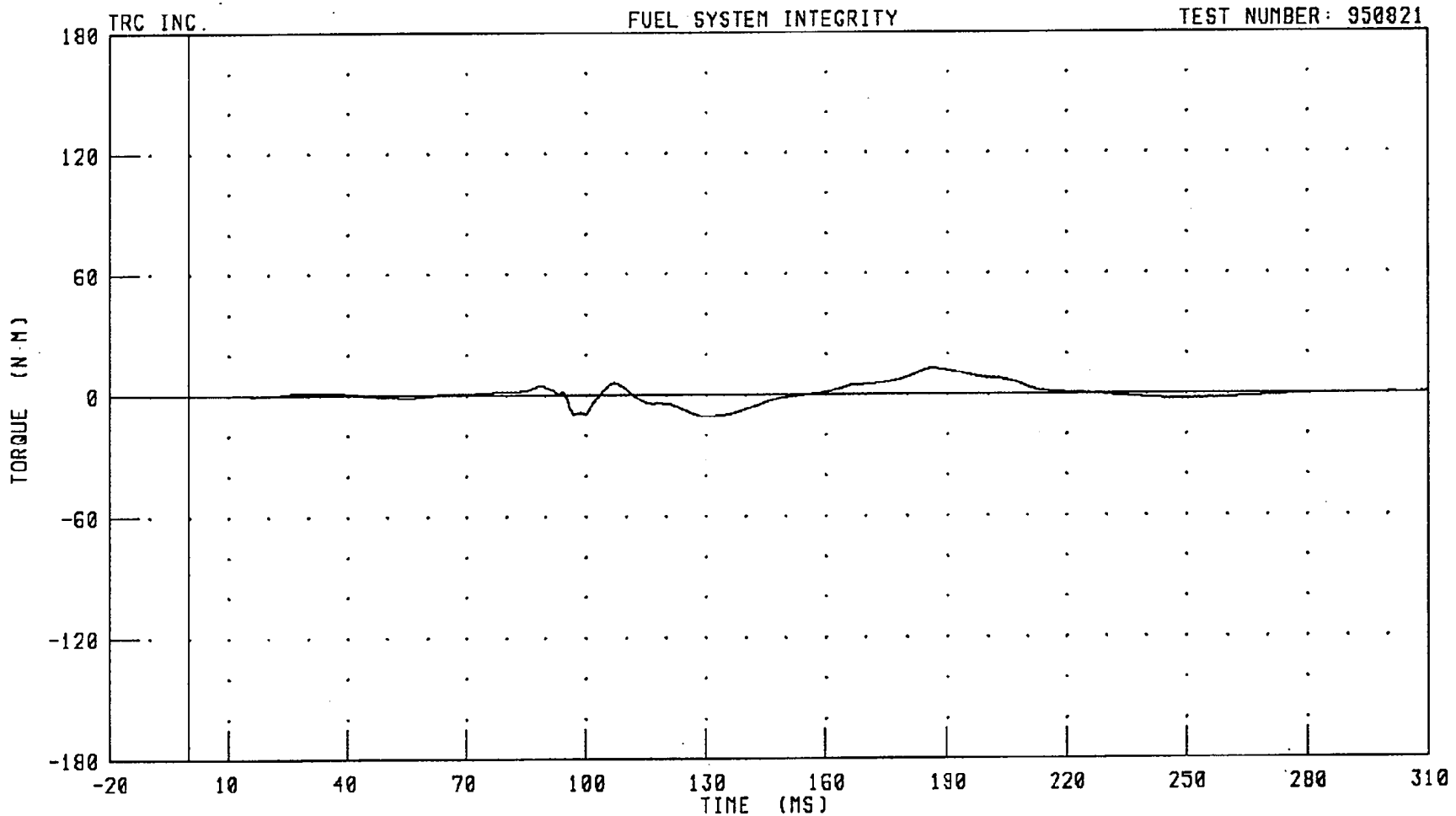
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK Z-AXIS AXIAL FORCE



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000 PEAK DATA: 2404.63 N @ 95.60 MS; -411.88 N @ 107.52 MS

950821

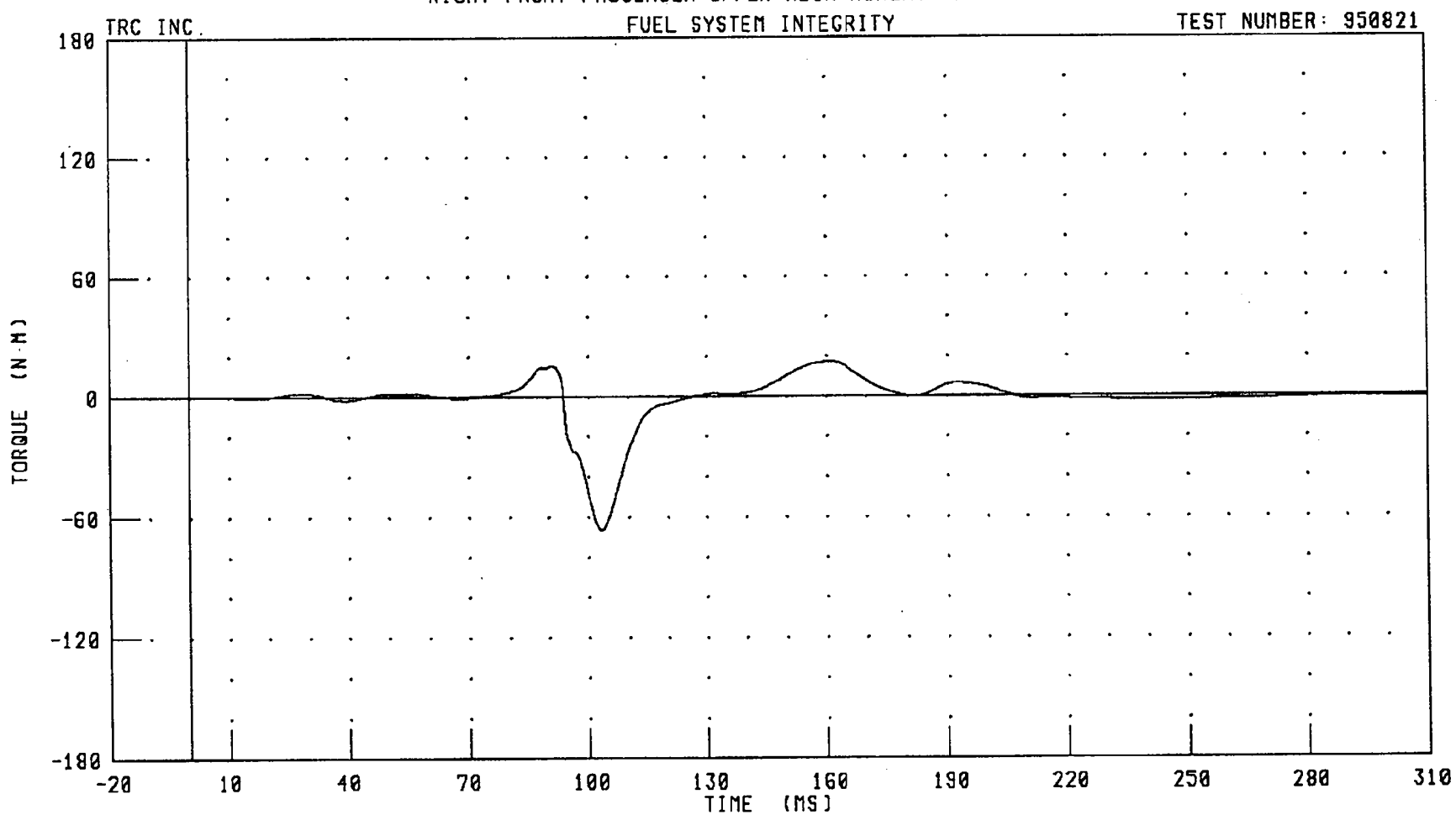
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT X-AXIS



CHANNEL: NEKXM2 FILTER: CH. CLASS 600 PEAK DATA: 12.69 N-M @ 186.08 MS; -10.69 N-M @ 129.04 MS

950821

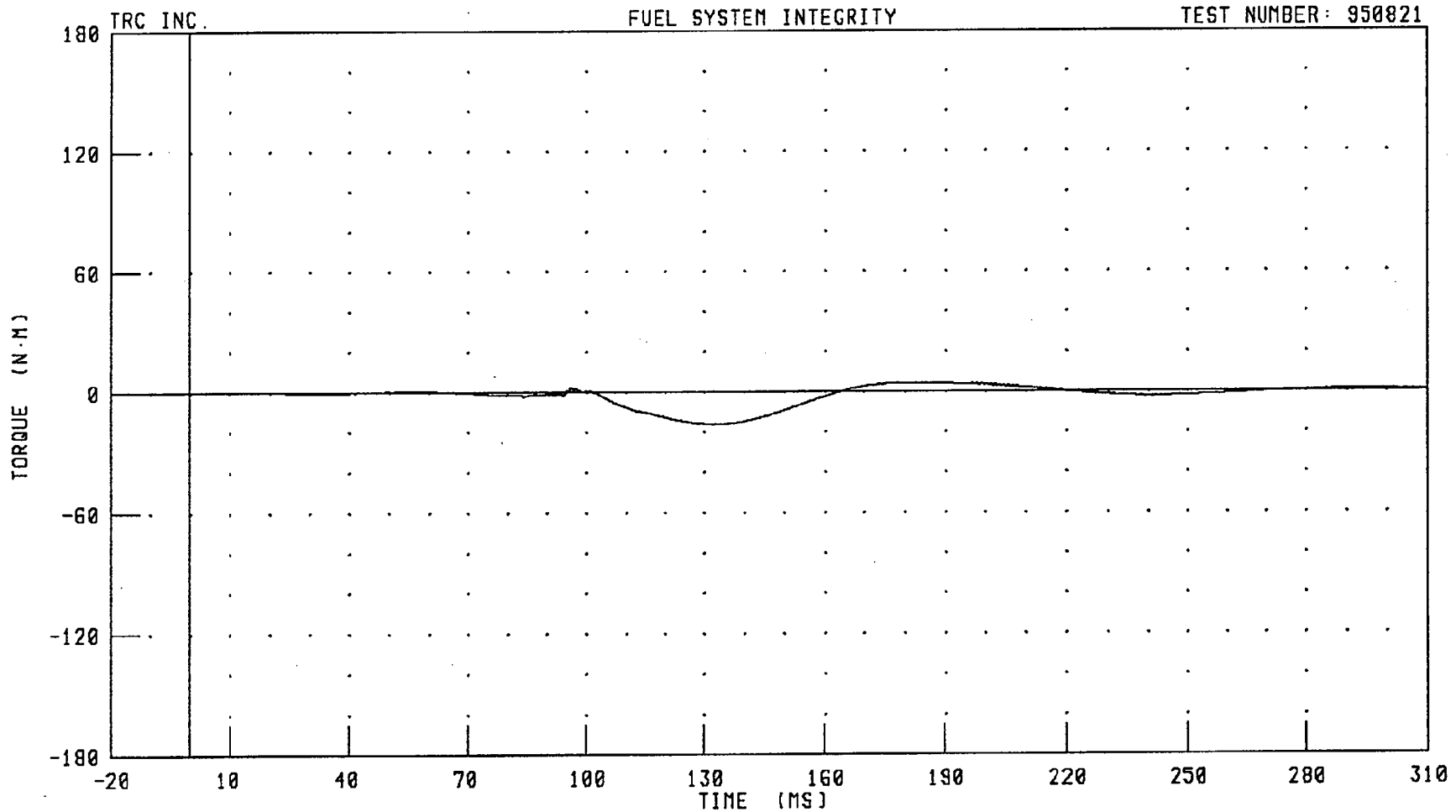
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT Y-AXIS



CHANNEL: NEKYM2 FILTER: CH. CLASS 600 PEAK DATA: 17.21 N-M @ 161.04 MS; -66.31 N-M @ 103.20 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT Z-AXIS

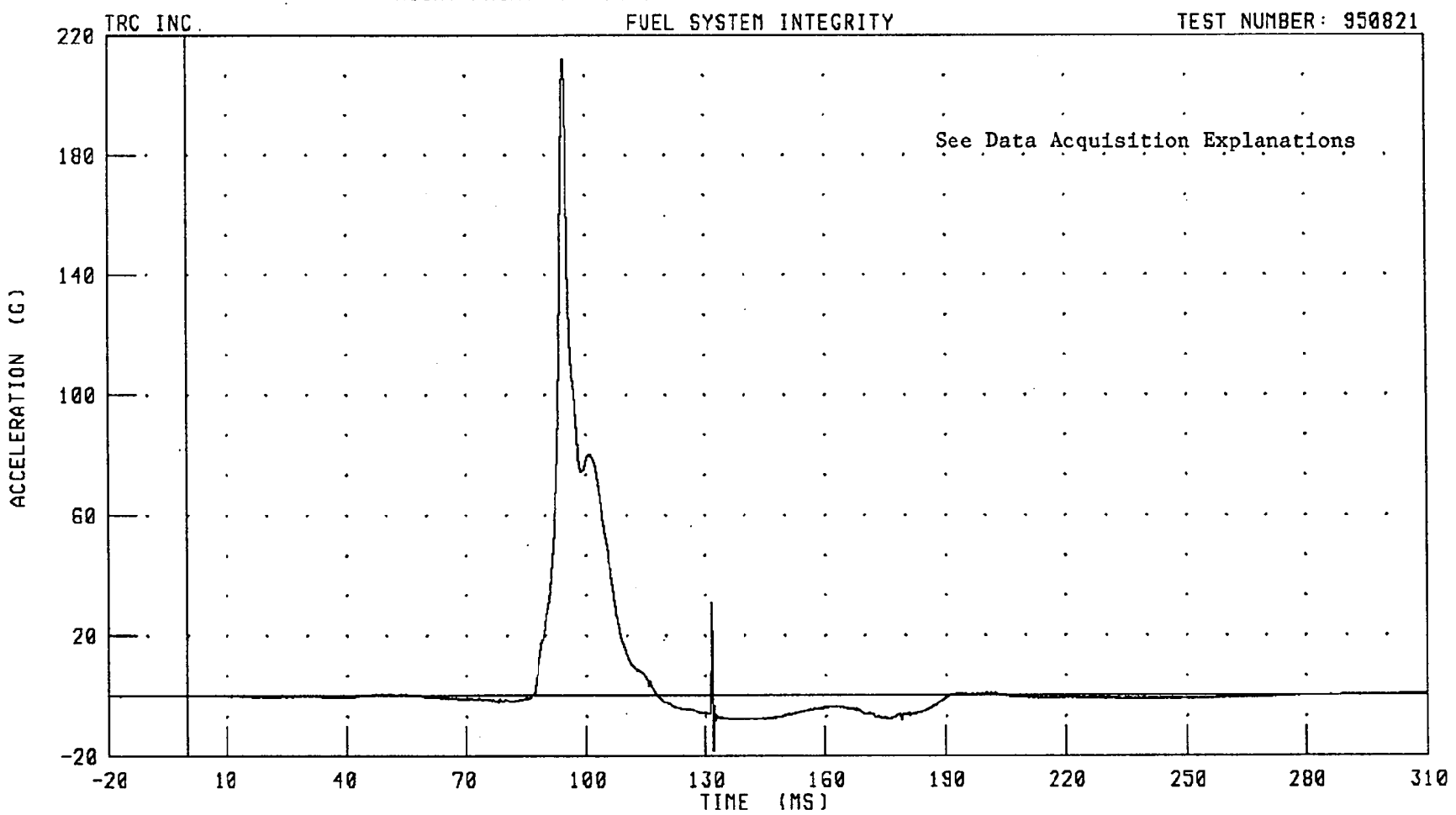


CHANNEL: NEKZM2 FILTER: CH. CLASS 600

PEAK DATA: 4.27 N-M @ 181.60 MS; -16.22 N-M @ 134.72 MS

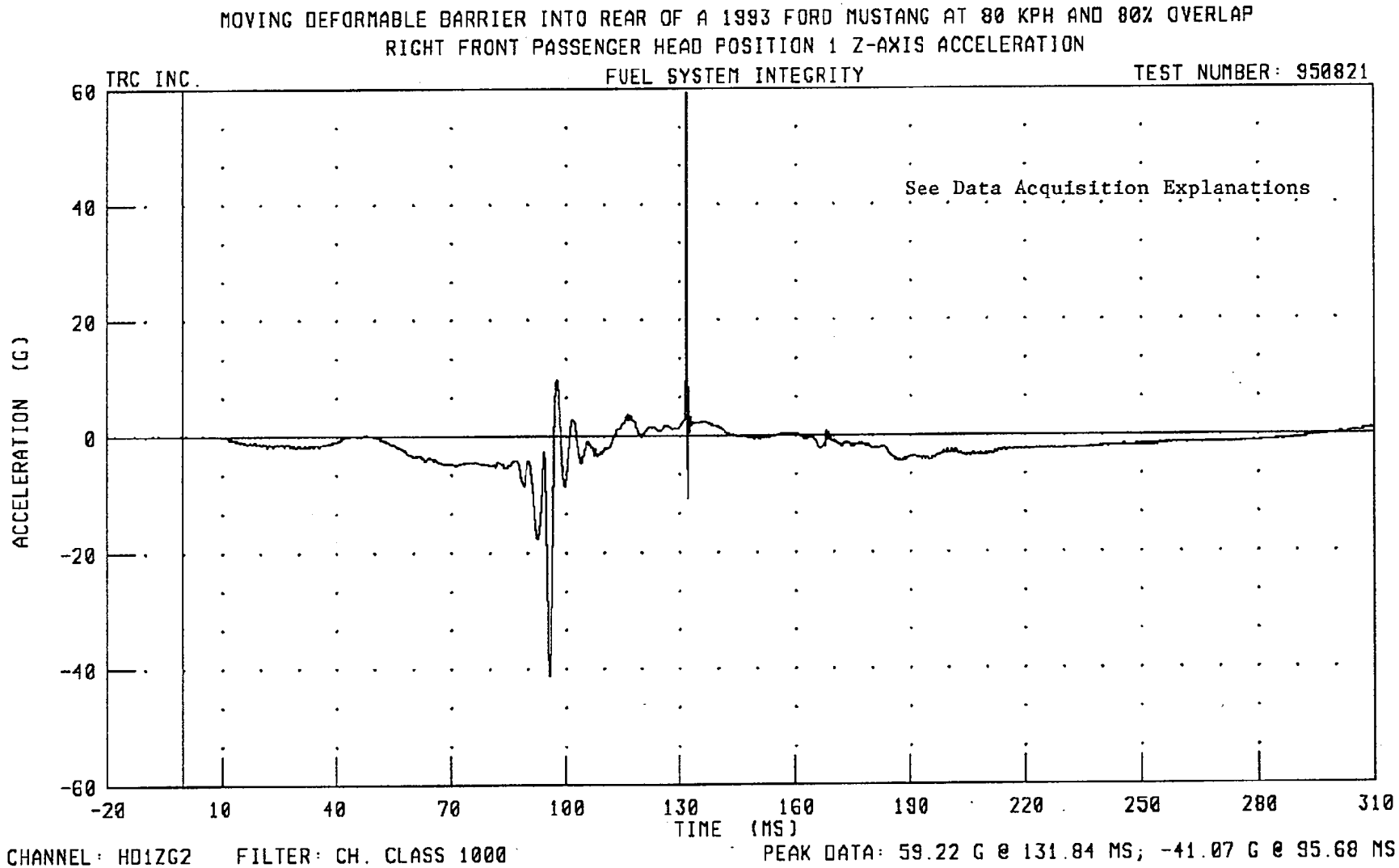
950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 1 X-AXIS ACCELERATION



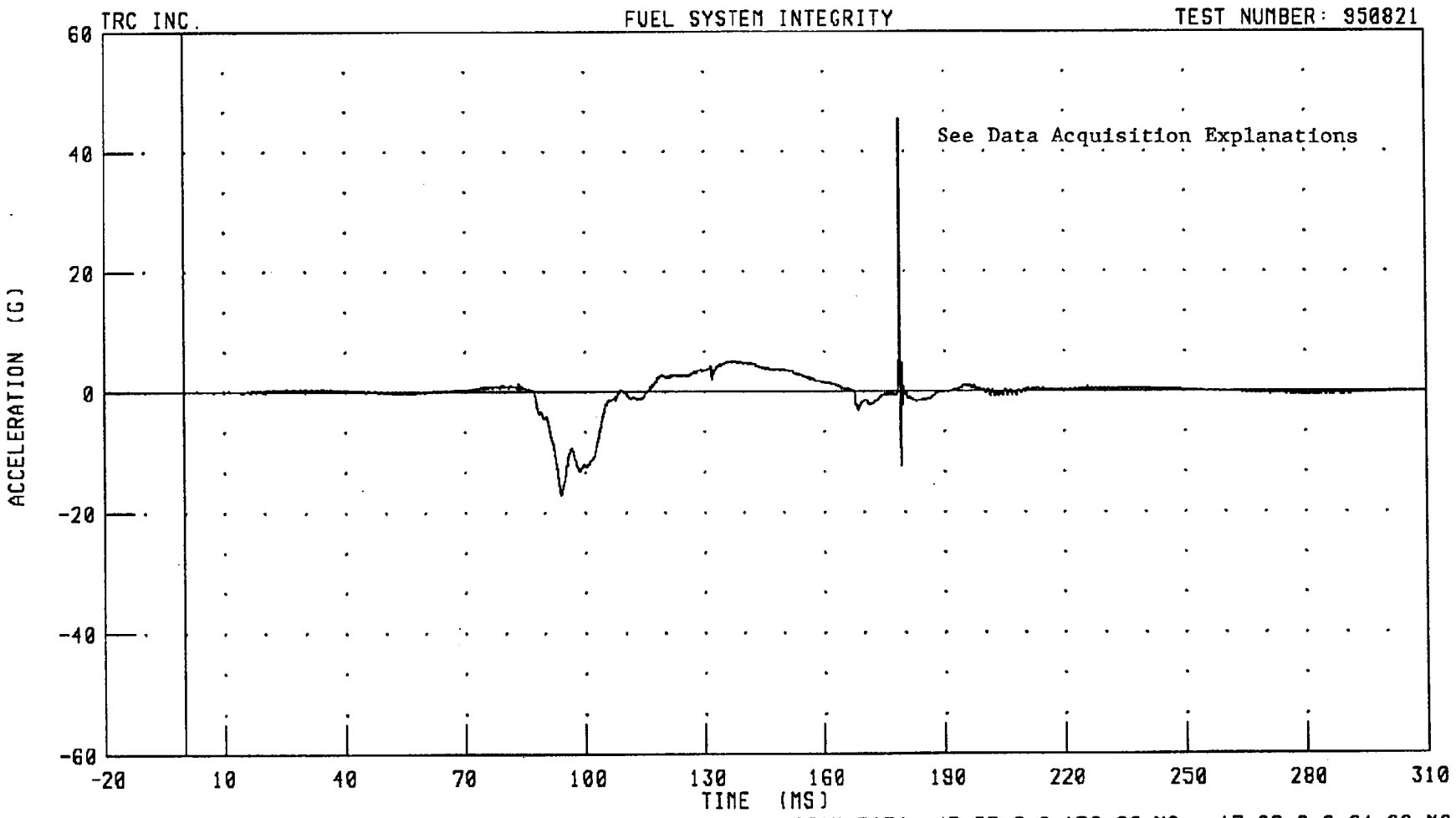
CHANNEL: HD1XG2 FILTER: CH. CLASS 1000 PEAK DATA: 211.97 G @ 94.72 MS; -18.24 G @ 132.08 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 1 Z-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
See Data Acquisition Explanations
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: H01ZG2
FILTER: CH. CLASS 1000
PEAK DATA: 59.22 G @ 131.84 MS; -41.07 G @ 95.68 MS

950821

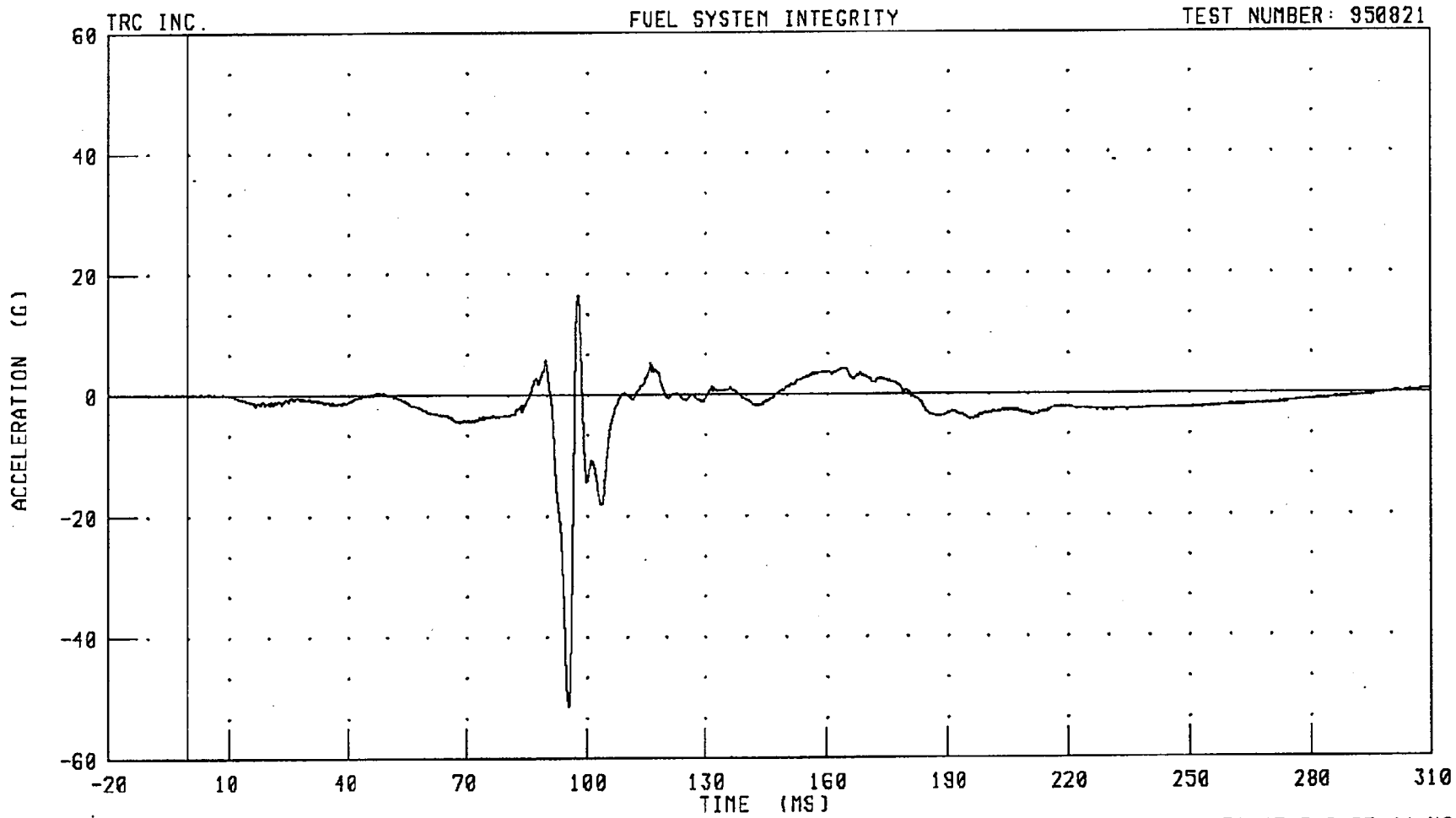
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 2 Y-AXIS ACCELERATION



CHANNEL: H02YG2 FILTER: CH. CLASS 1000 PEAK DATA: 45.35 G @ 178.80 MS; -17.08 G @ 94.08 MS

950821

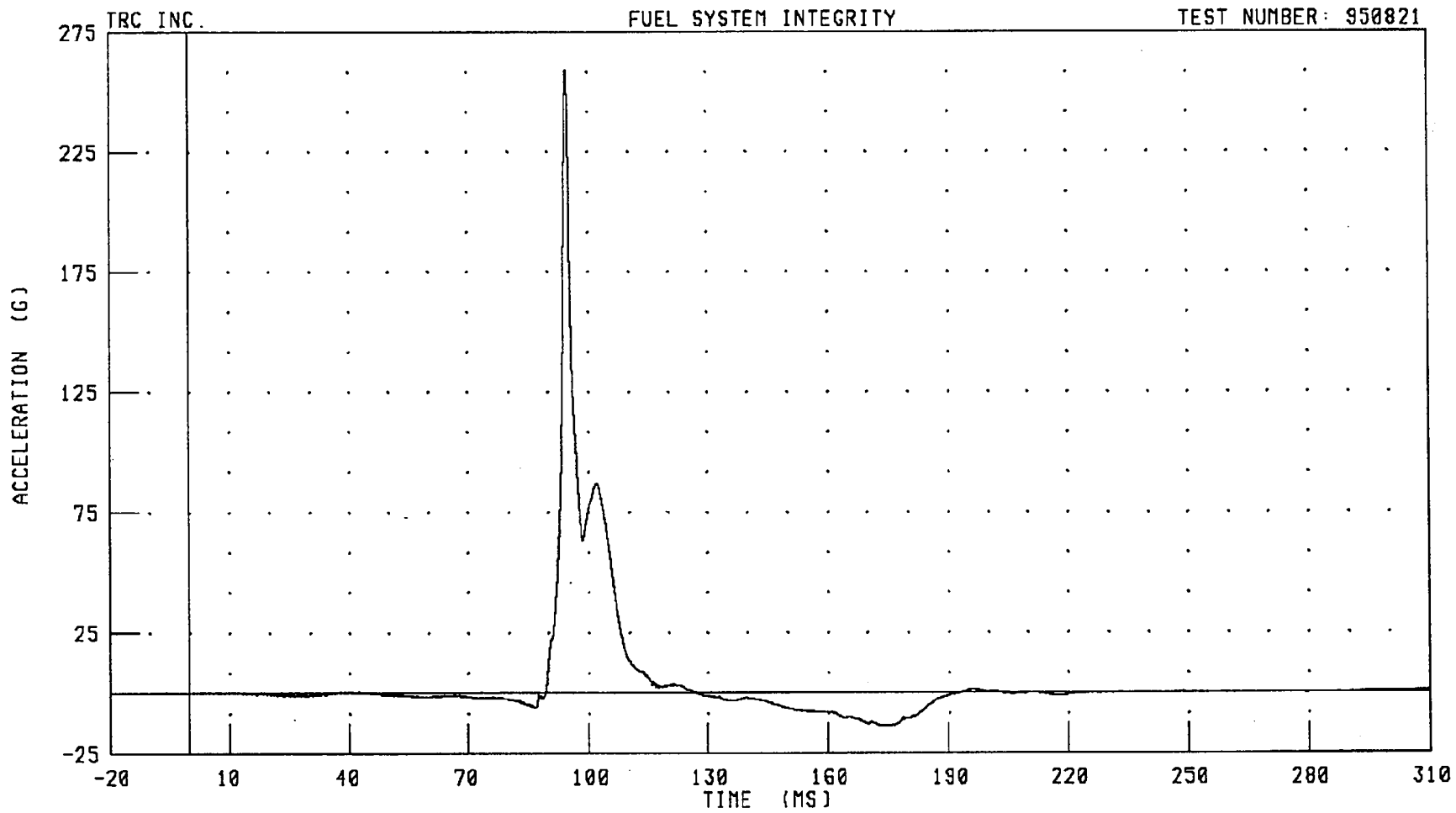
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 2 Z-AXIS ACCELERATION



CHANNEL: HD2ZG2 FILTER: CH. CLASS 1000 PEAK DATA: 16.43 G @ 97.76 MS; -51.43 G @ 95.44 MS

950821

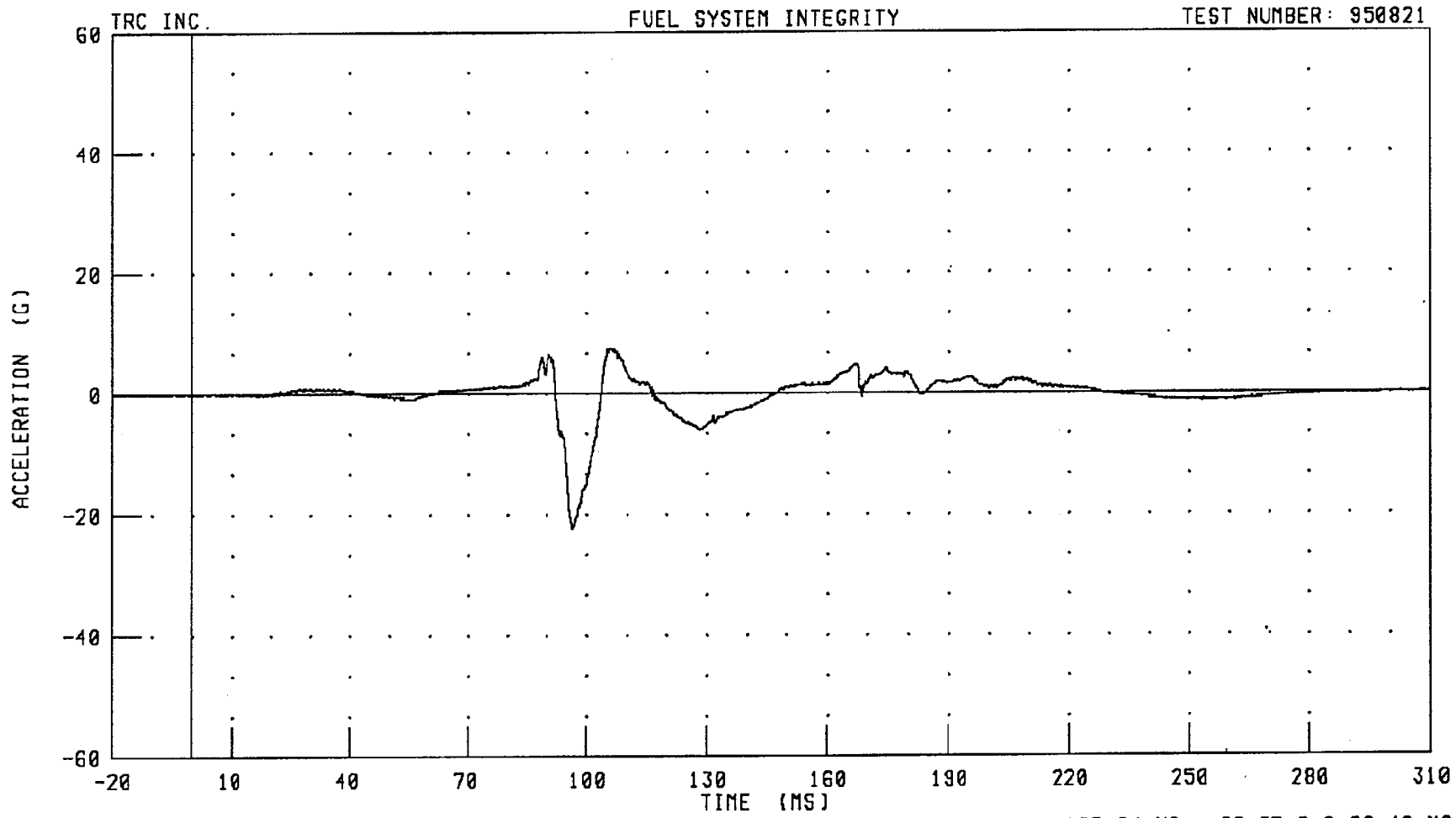
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 3 X-AXIS ACCELERATION



CHANNEL: HD3XG2 FILTER: CH. CLASS 1000 PEAK DATA: 258.92 G @ 94.72 MS; -13.80 G @ 173.84 MS

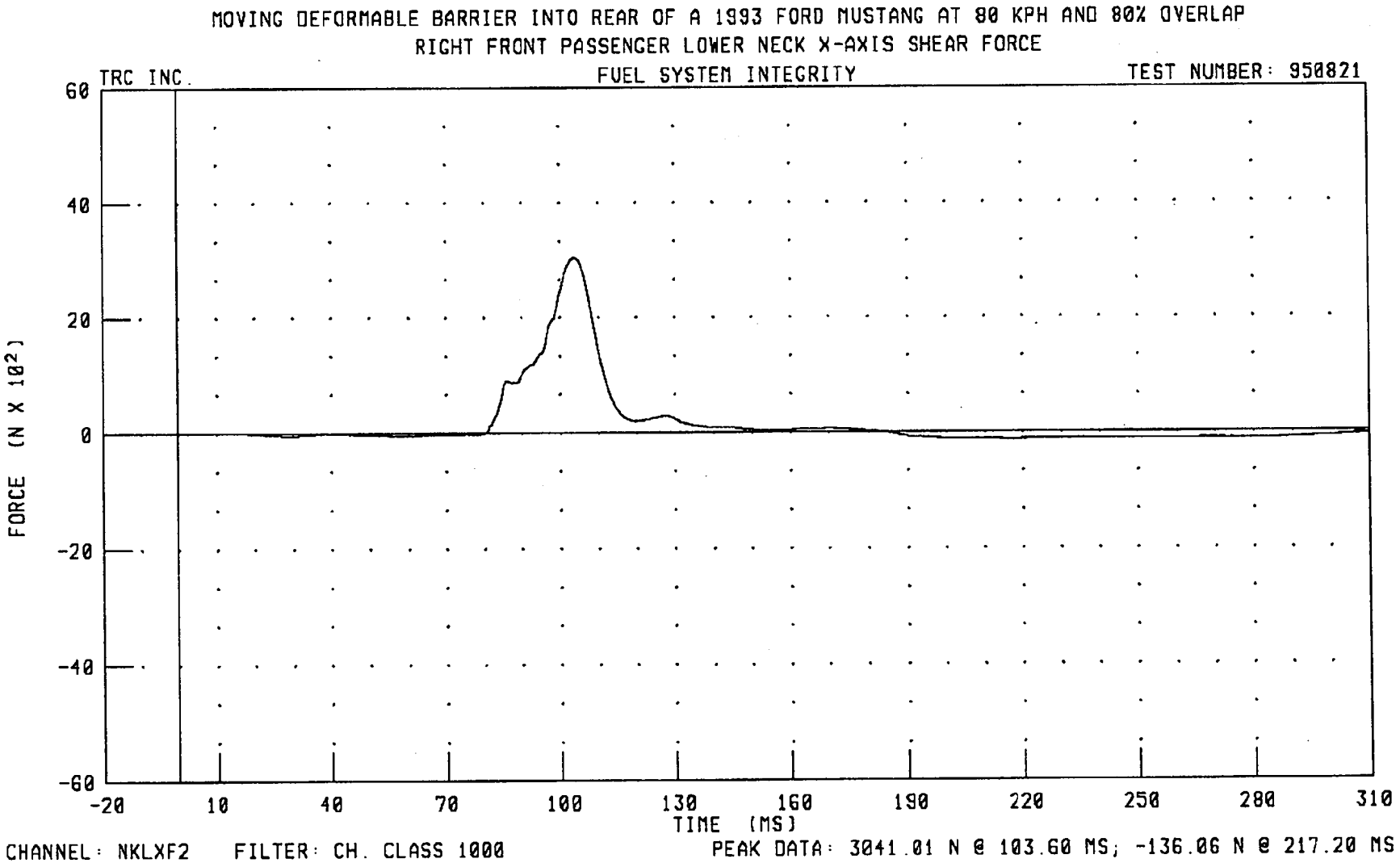
950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 3 Y-AXIS ACCELERATION



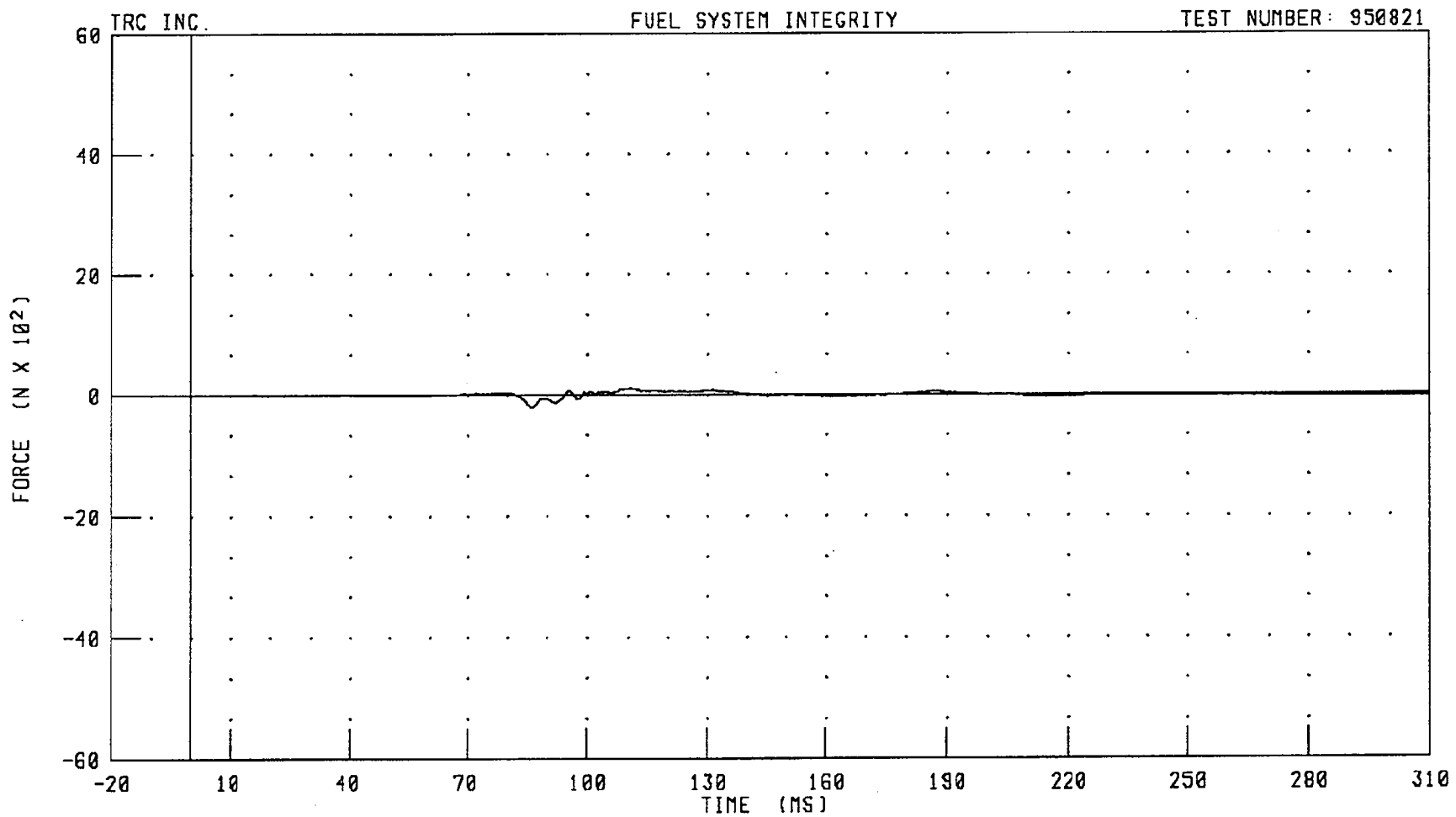
CHANNEL: HD3YG2 FILTER: CH. CLASS 1000 PEAK DATA: 7.54 G @ 105.84 MS; -22.37 G @ 96.48 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK X-AXIS SHEAR FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
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: NKLXF2
FILTER: CH. CLASS 1000
PEAK DATA: 3041.01 N @ 103.60 MS; -136.06 N @ 217.20 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK Y-AXIS SHEAR FORCE

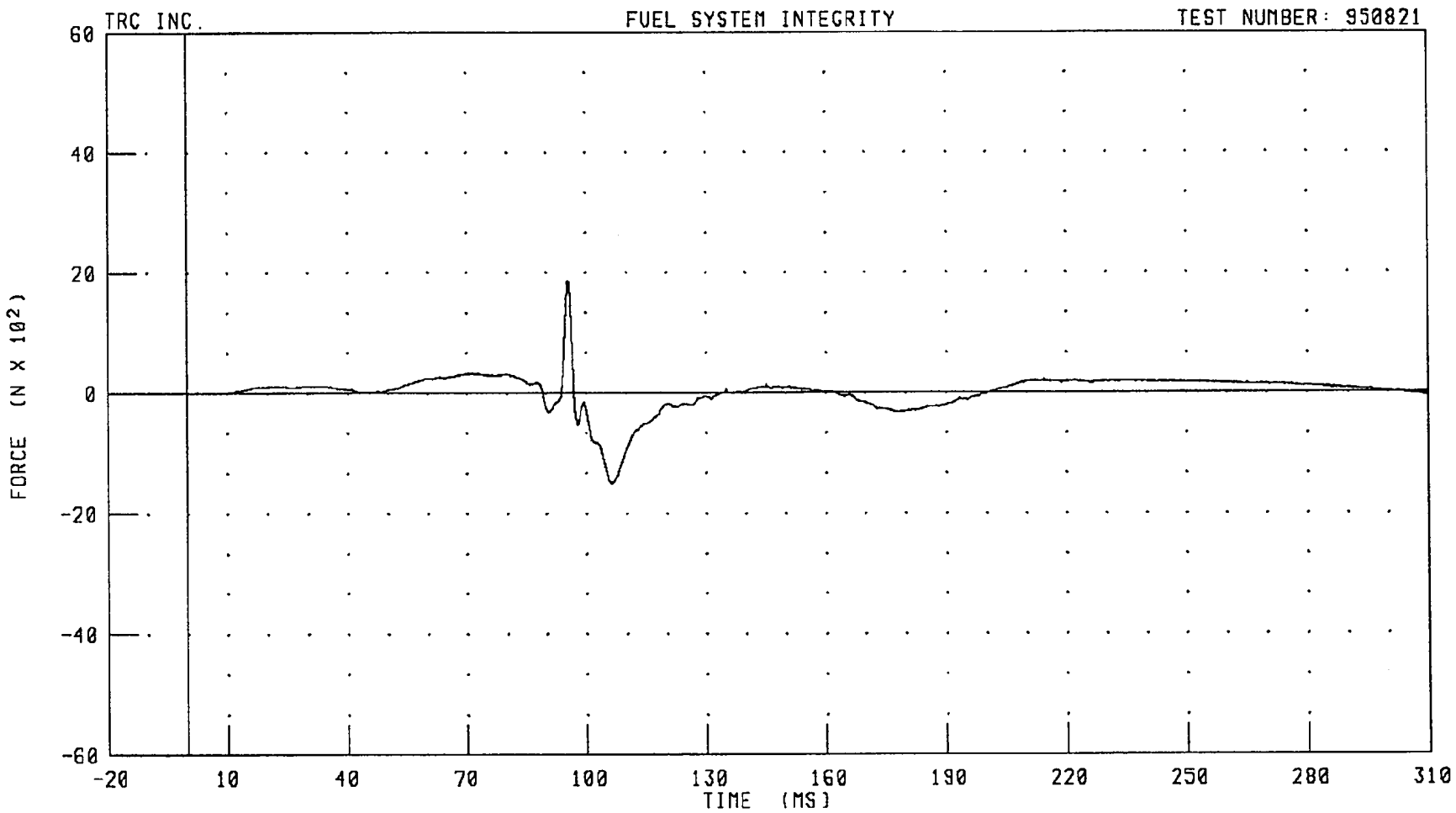


CHANNEL: NKLYF2 FILTER: CH. CLASS 1000

PEAK DATA: 117.38 N @ 110.72 MS; -202.00 N @ 86.00 MS

950821

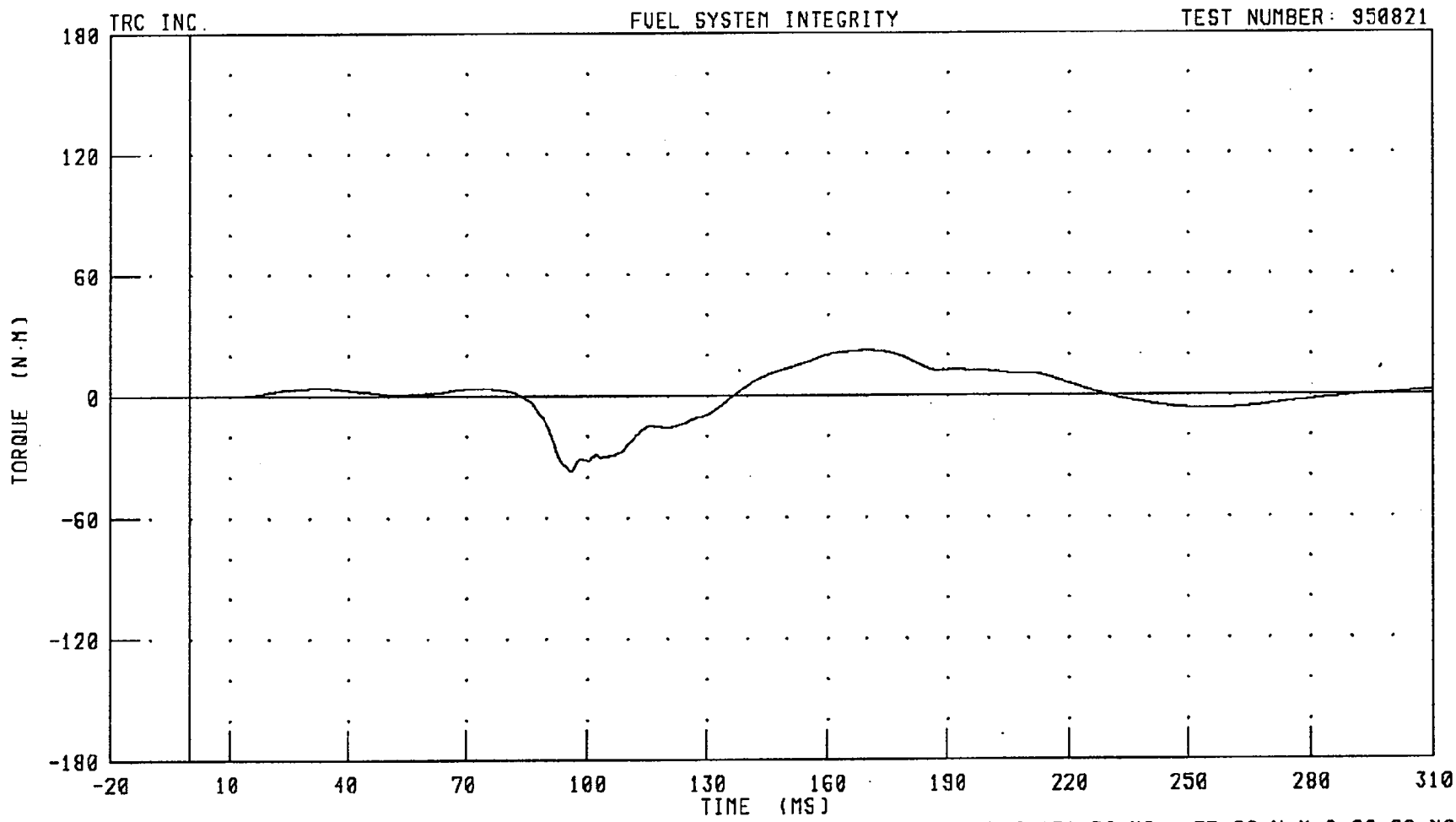
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK Z-AXIS AXIAL FORCE



CHANNEL: NKLZF2 FILTER: CH. CLASS 1000 PEAK DATA: 1867.99 N @ 95.60 MS; -1505.56 N @ 106.48 MS

950821

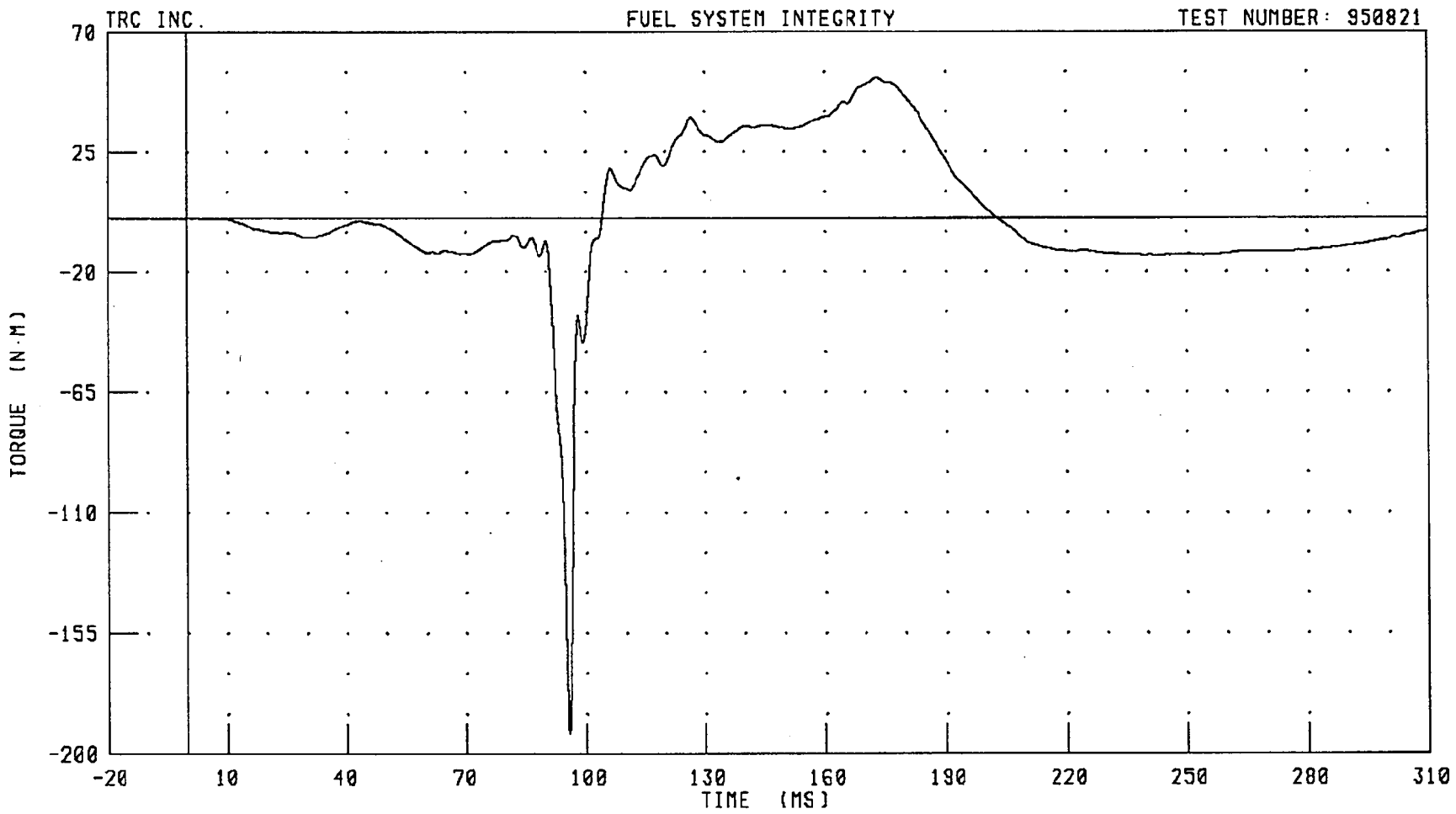
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT X-AXIS



CHANNEL: NKLXM2 FILTER: CH. CLASS 600 PEAK DATA: 22.28 N-M @ 171.36 MS; -37.22 N-M @ 96.08 MS

950821

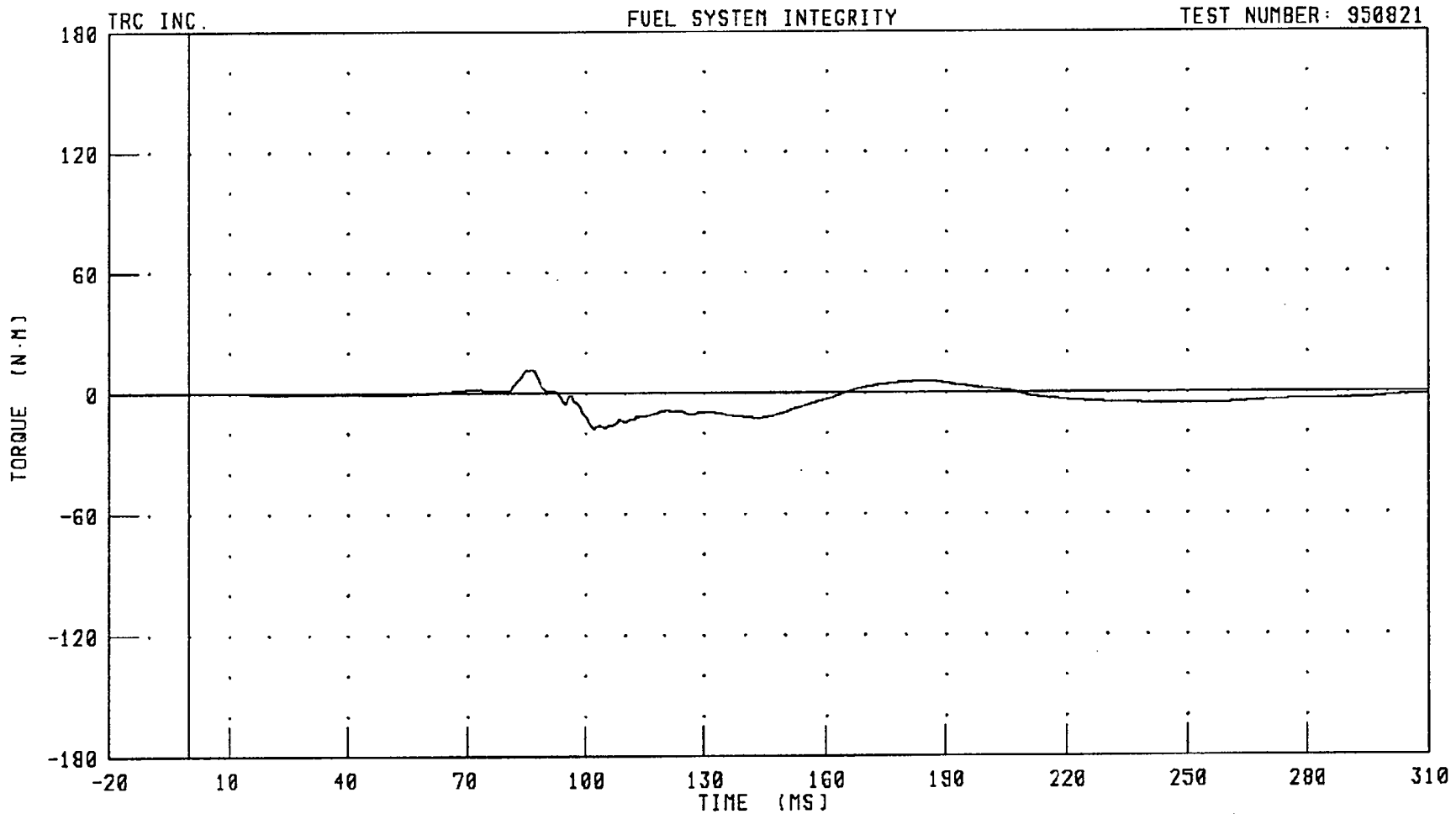
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT Y-AXIS



CHANNEL: NKLYM2 FILTER: CH. CLASS 600 PEAK DATA: 52.74 N-M @ 173.20 MS; -192.40 N-M @ 95.60 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT Z-AXIS

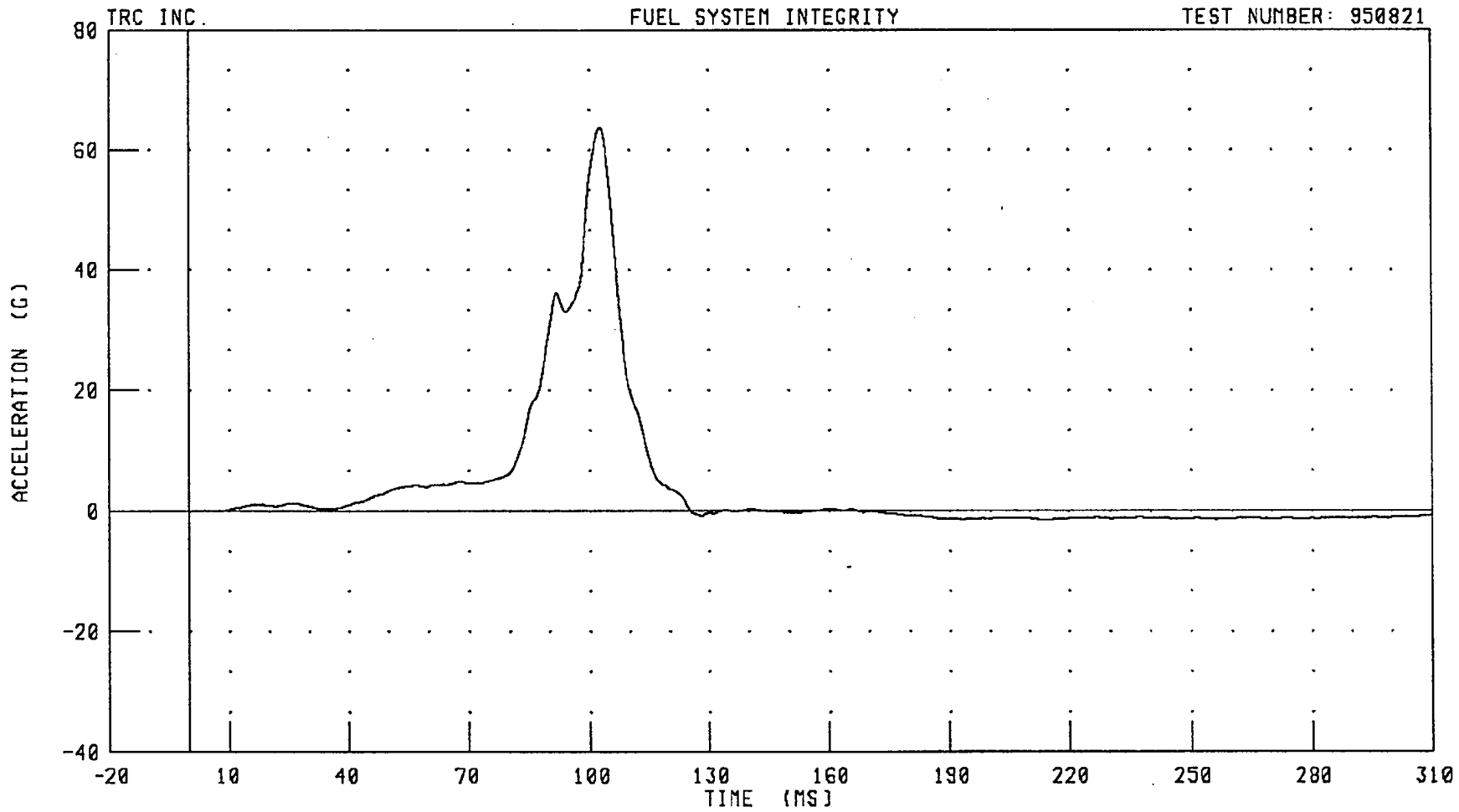


CHANNEL: NKLZM2 FILTER: CH. CLASS 600 PEAK DATA: 11.60 N·M @ 86.24 MS; -17.70 N·M @ 102.16 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

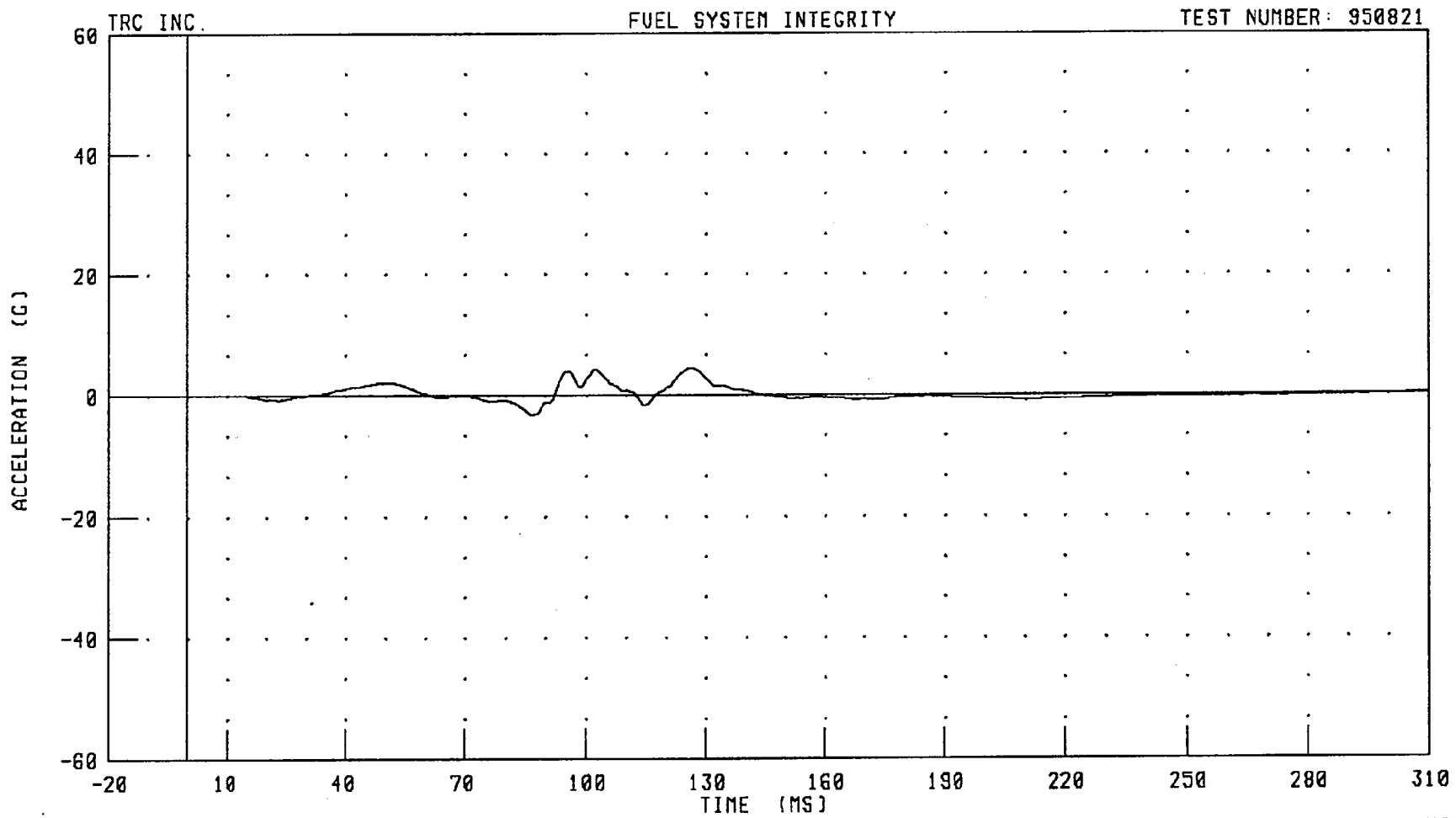
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG2 FILTER: CH. CLASS 180 PEAK DATA: 63.77 G @ 102.64 MS; -1.49 G @ 213.60 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYG2 FILTER: CH. CLASS 180

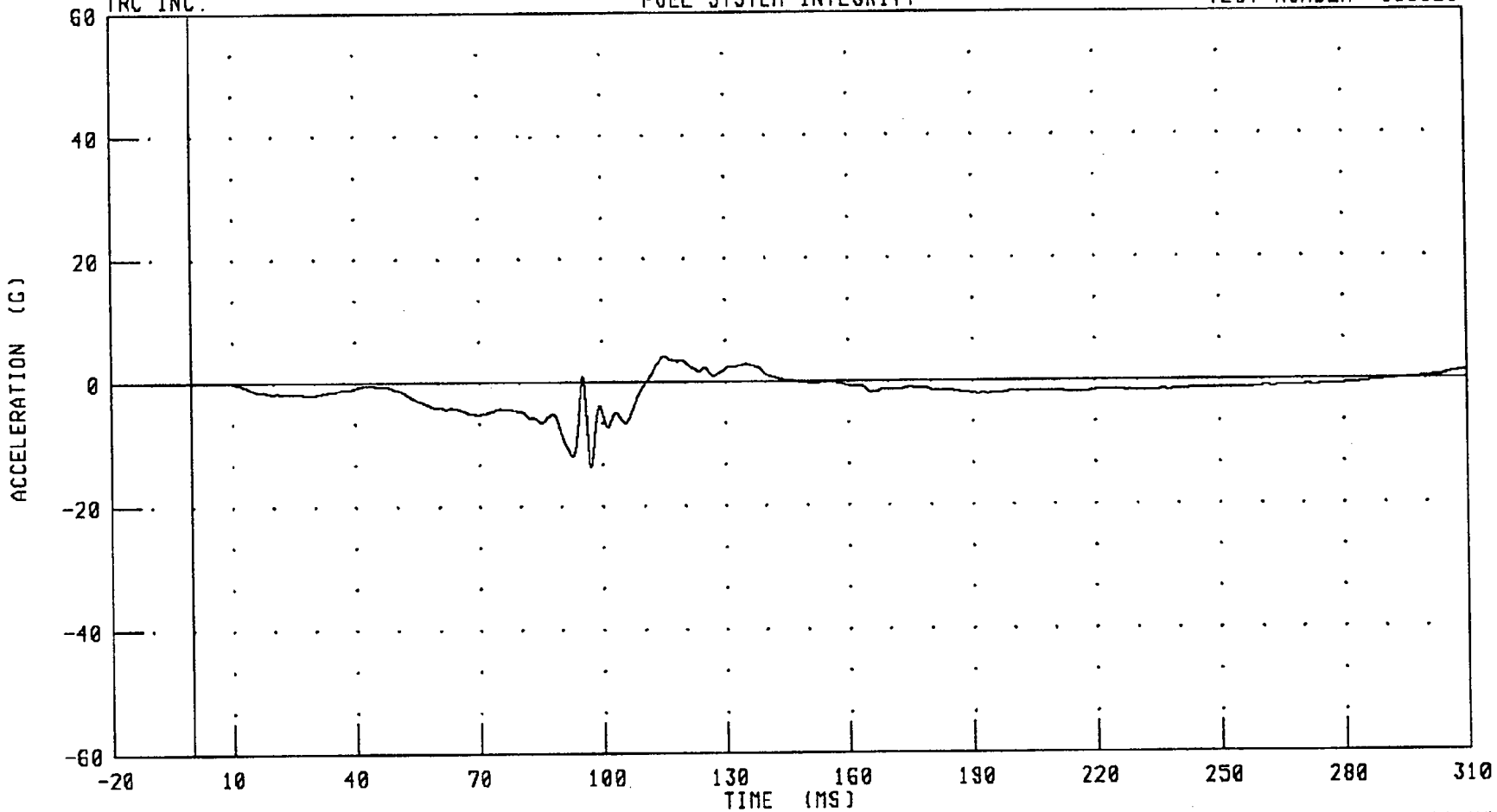
PEAK DATA: 4.48 G @ 126.24 MS; -3.25 G @ 86.40 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

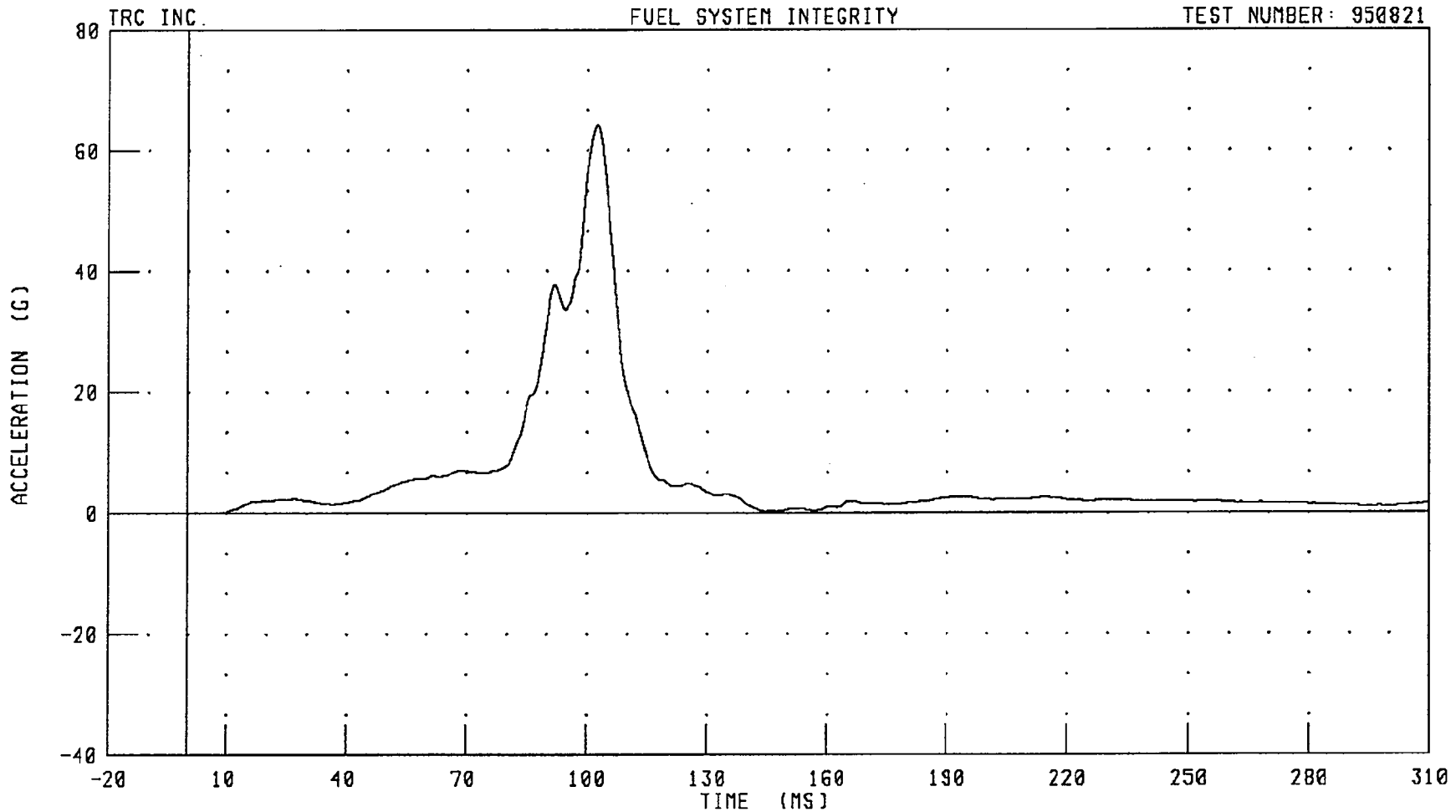
TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: CSTZG2 FILTER: CH. CLASS 180 PEAK DATA: 4.14 G @ 115.12 MS; -13.77 G @ 97.28 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

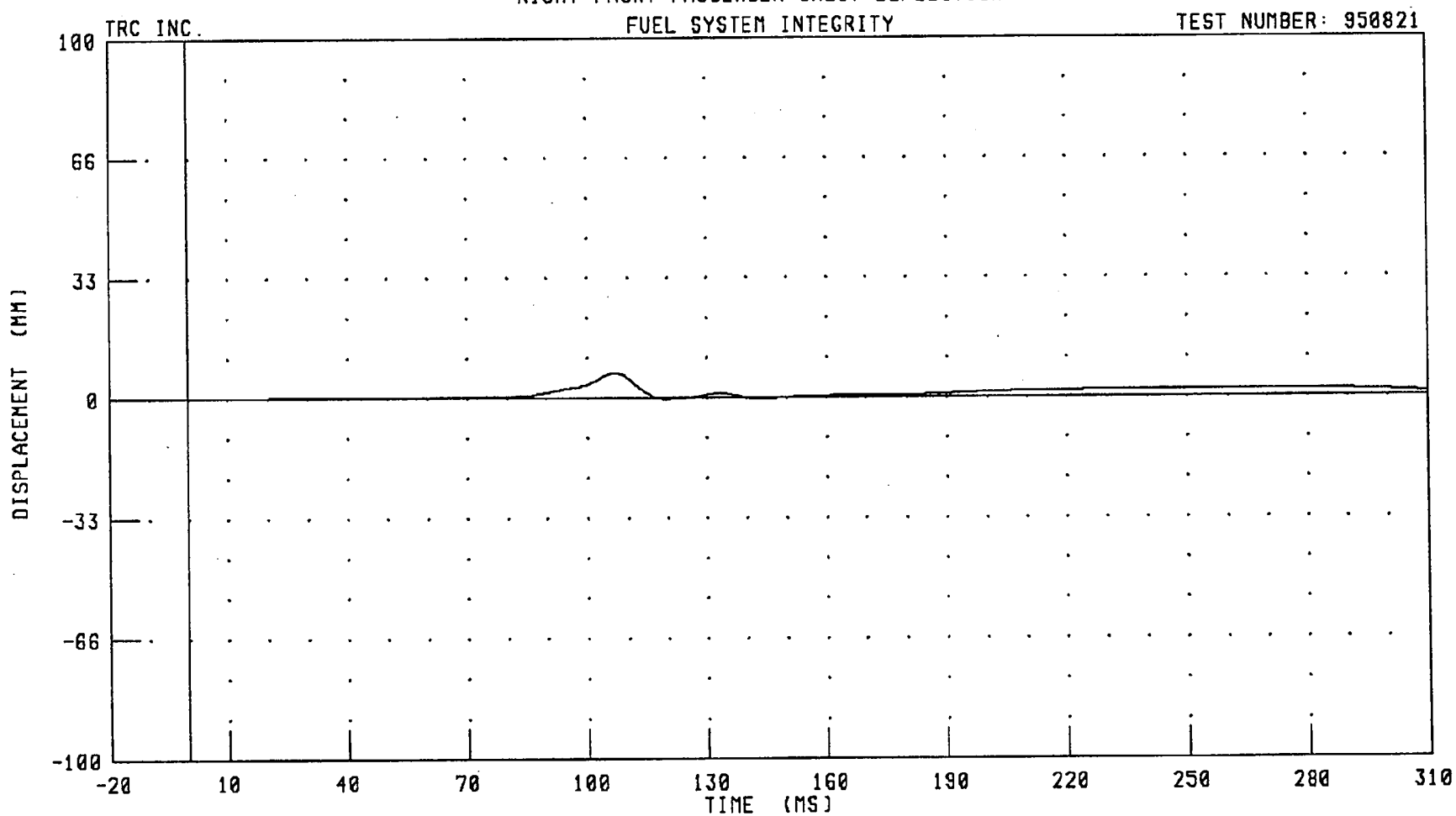


CHANNEL: CSTRG2 FILTER: CH. CLASS 180 PEAK DATA: 64.15 G @ 102.64 MS; 0.00 G @ -20.00 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

RIGHT FRONT PASSENGER CHEST DEFLECTION

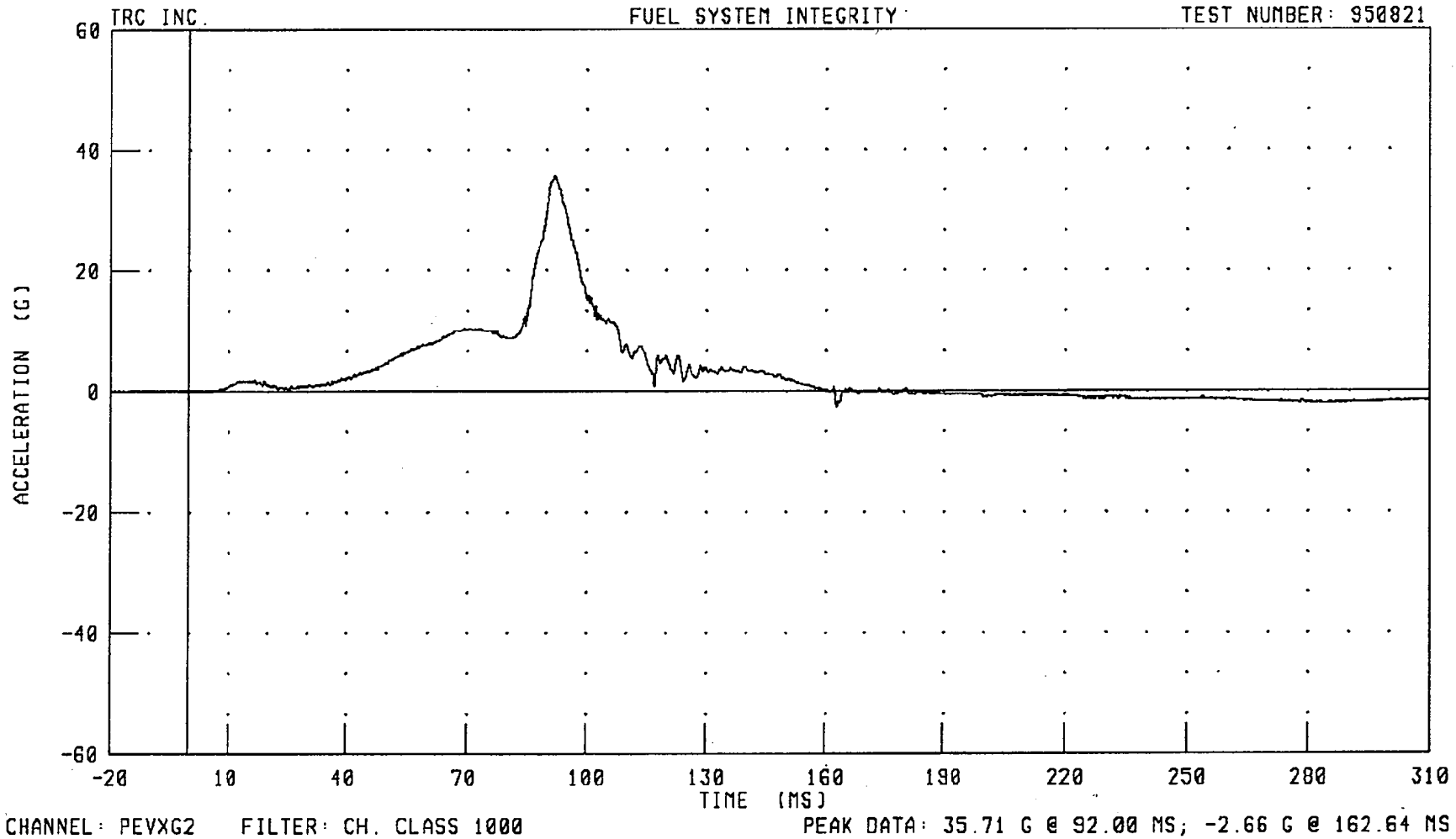


CHANNEL: CSTXD2 FILTER: CH. CLASS 180

PEAK DATA: 6.82 MM @ 106.72 MS; -0.50 MM @ 119.60 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION



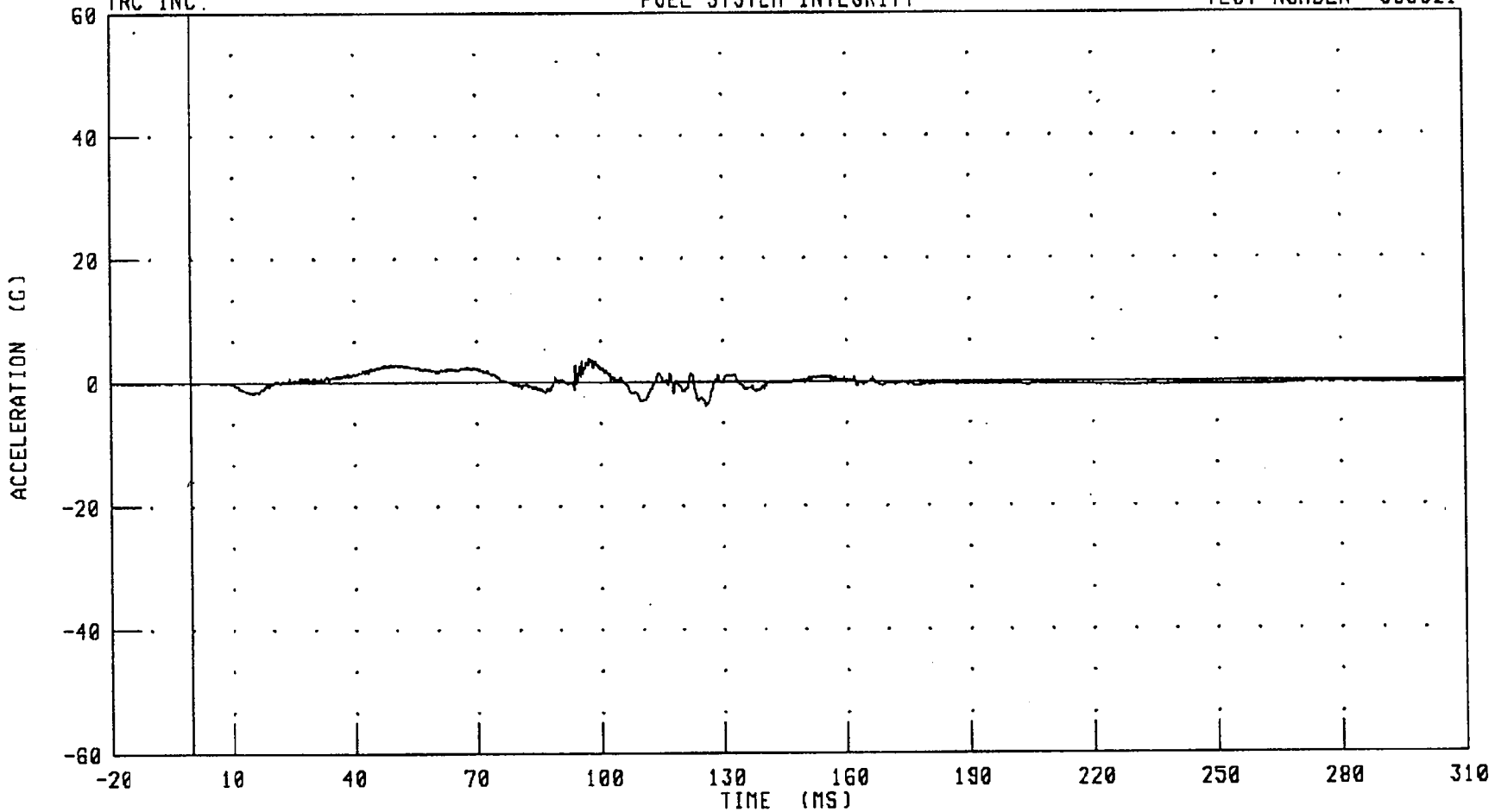
CHANNEL: PEVXG2 FILTER: CH. CLASS 1000 PEAK DATA: 35.71 G @ 92.00 MS; -2.66 G @ 162.64 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

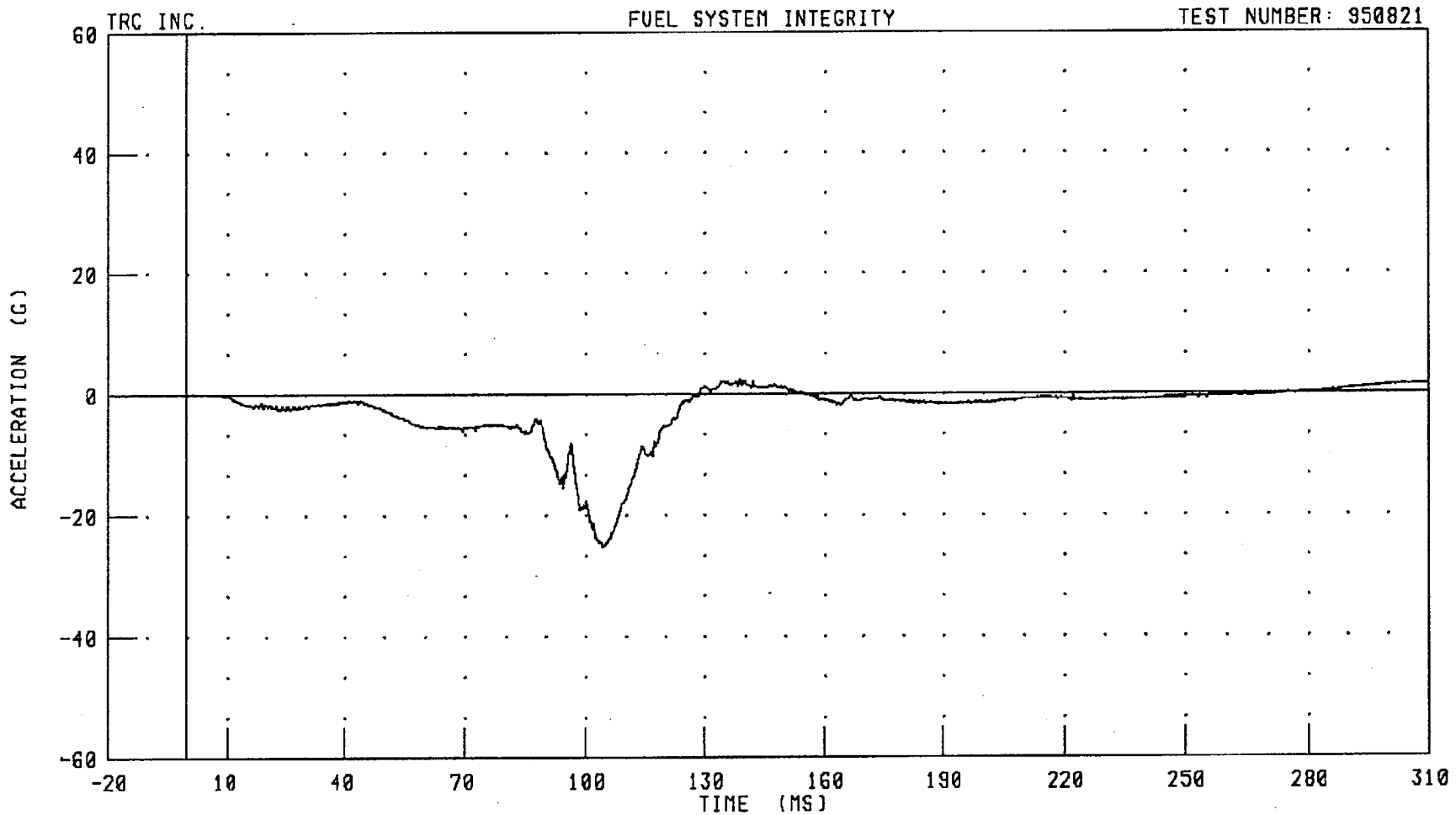
RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: PEVYG2 FILTER: CH. CLASS 1000 PEAK DATA: 3.76 G @ 97.28 MS; -3.88 G @ 125.84 MS

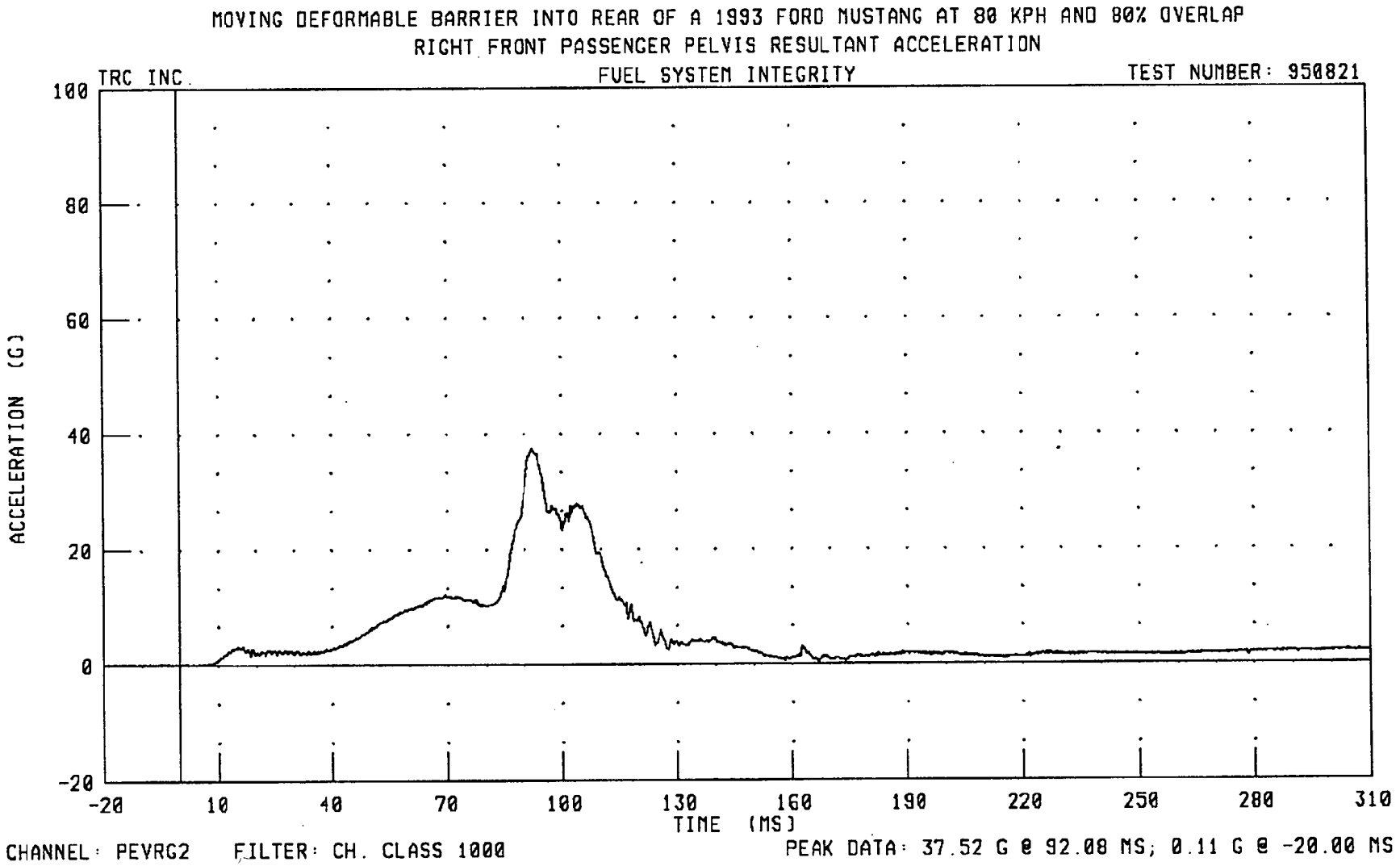
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION



CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

PEAK DATA: 2.37 G @ 138.48 MS; -25.20 G @ 104.08 MS

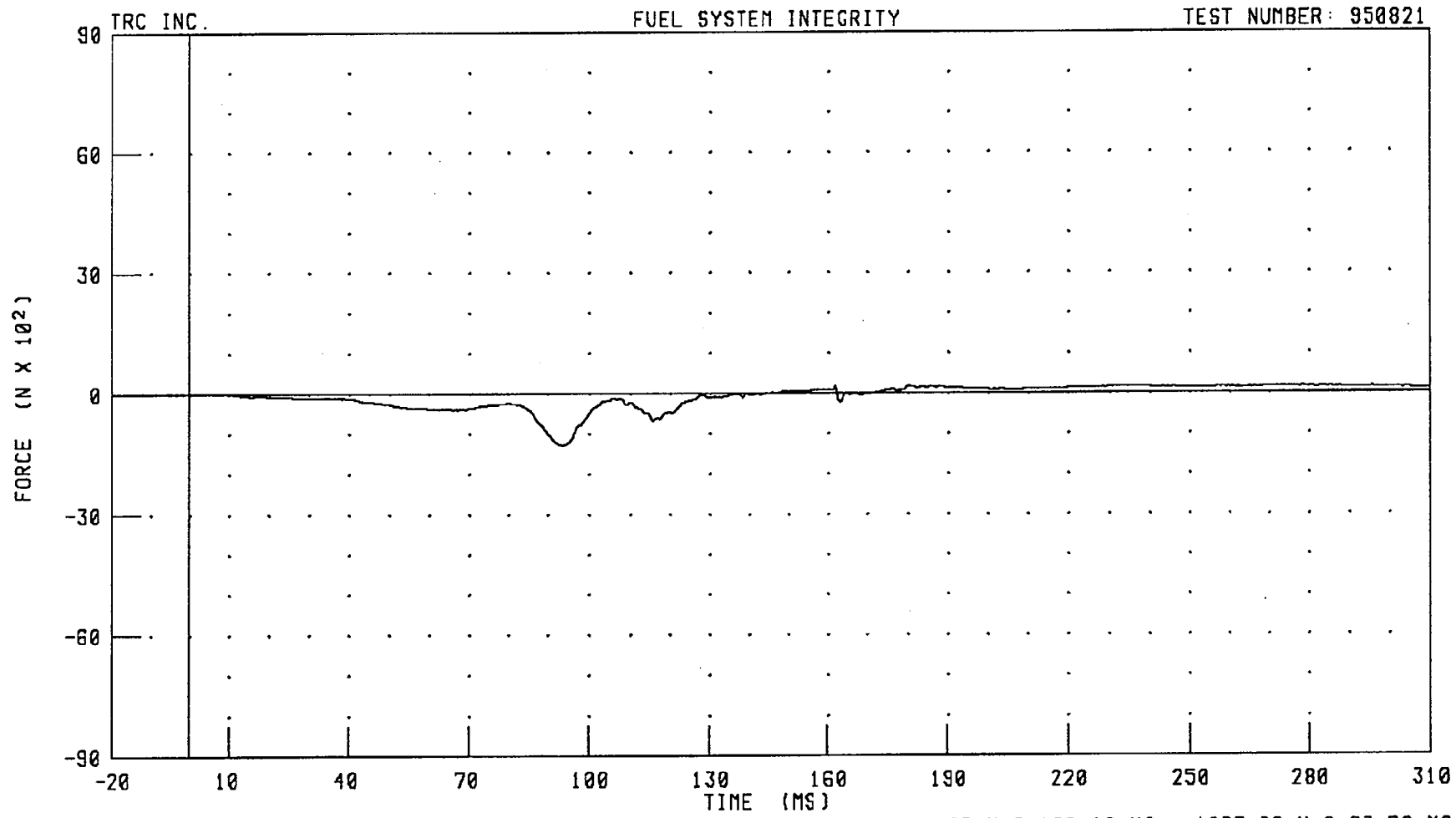
950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION
TRC INC
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
ACCELERATION (G)
100
80
60
40
20
0
-20
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVRG2
FILTER: CH. CLASS 1000
PEAK DATA: 37.52 G @ 92.08 MS; 0.11 G @ -20.00 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

RIGHT FRONT PASSENGER LEFT FEMUR FORCE



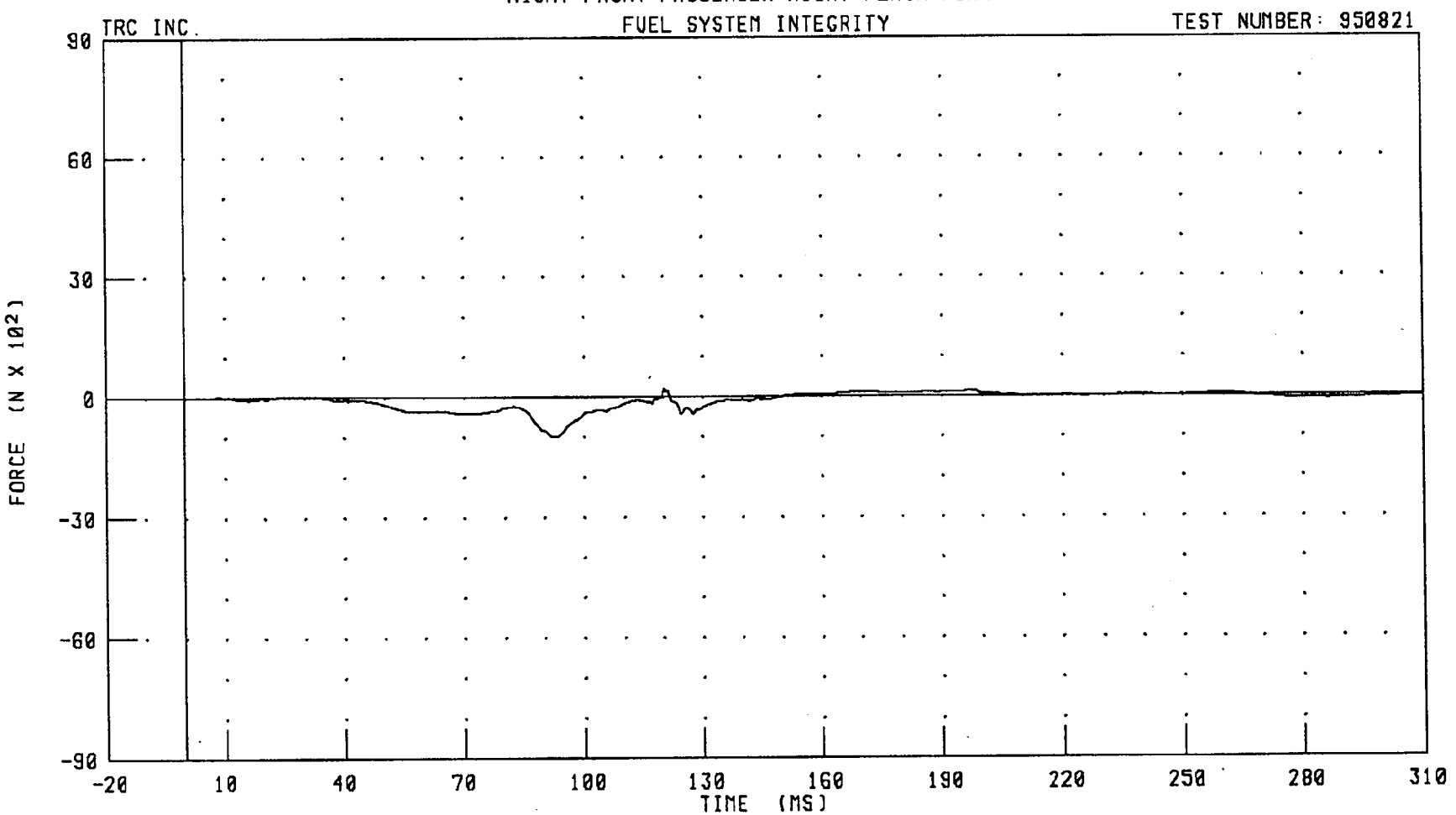
CHANNEL: LFMF2 FILTER: CH. CLASS 600 PEAK DATA: 188.29 N @ 180.16 MS; -1283.20 N @ 93.76 MS

99-8

950821

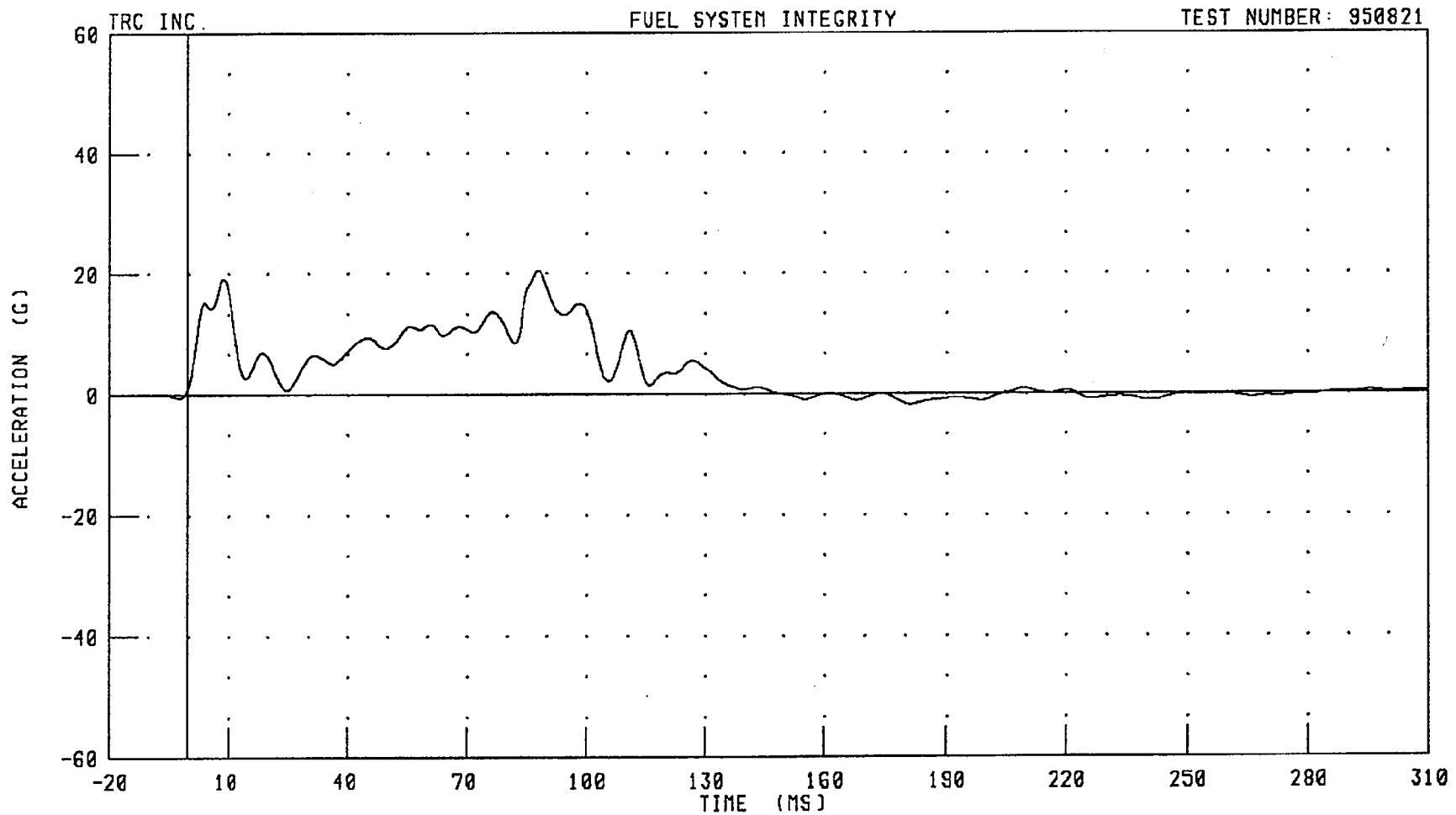
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



CHANNEL: RFMF2 FILTER: CH. CLASS 600 PEAK DATA: 194.58 N @ 120.40 MS; -1001.43 N @ 92.80 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
FRONT SEAT OUTBOARD MOUNTING RAIL X-AXIS ACCELERATION

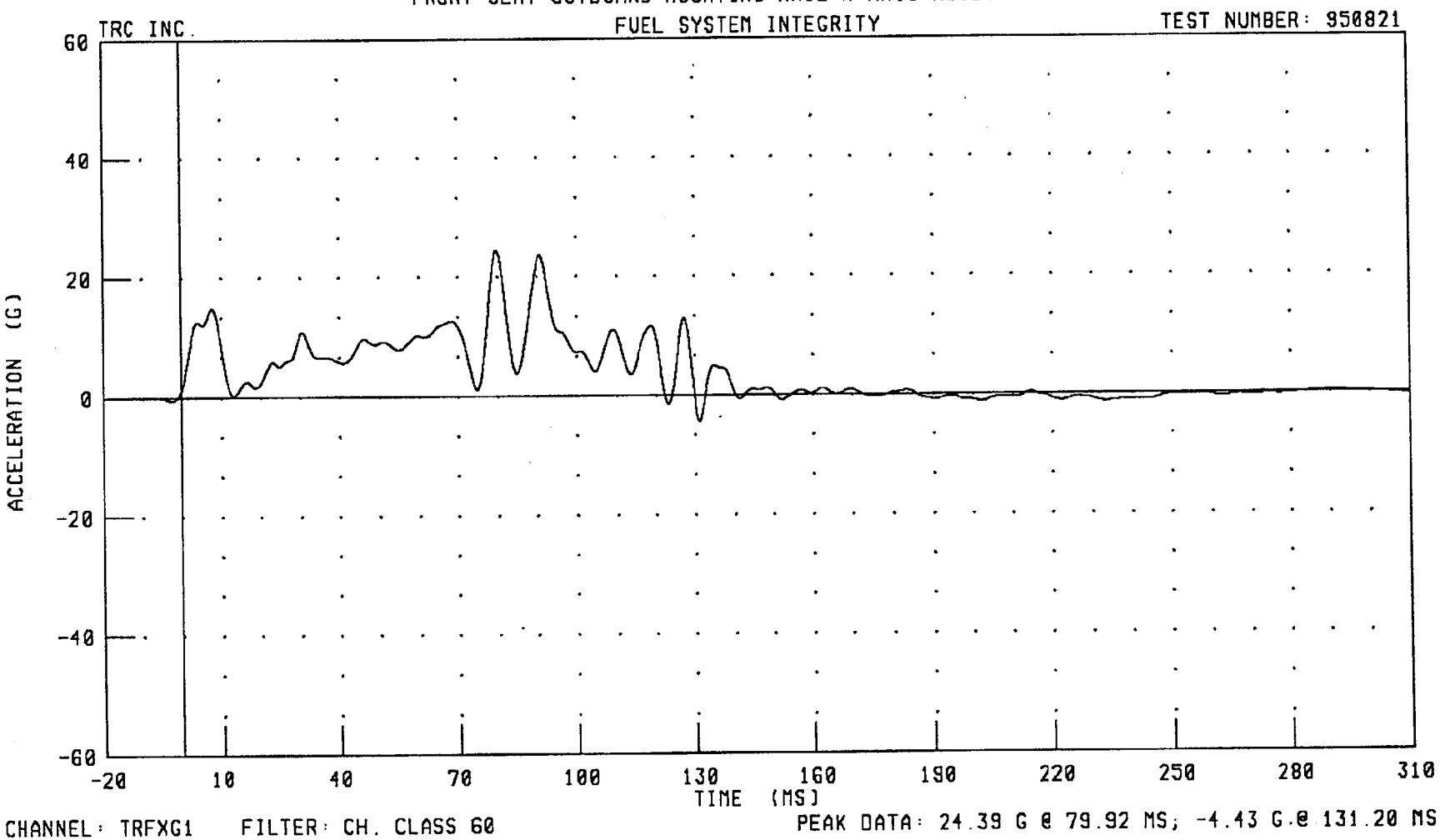


CHANNEL: TLFXG1 FILTER: CH. CLASS 60

PEAK DATA: 20.52 G @ 87.84 MS; -1.78 G @ 181.20 MS

950821

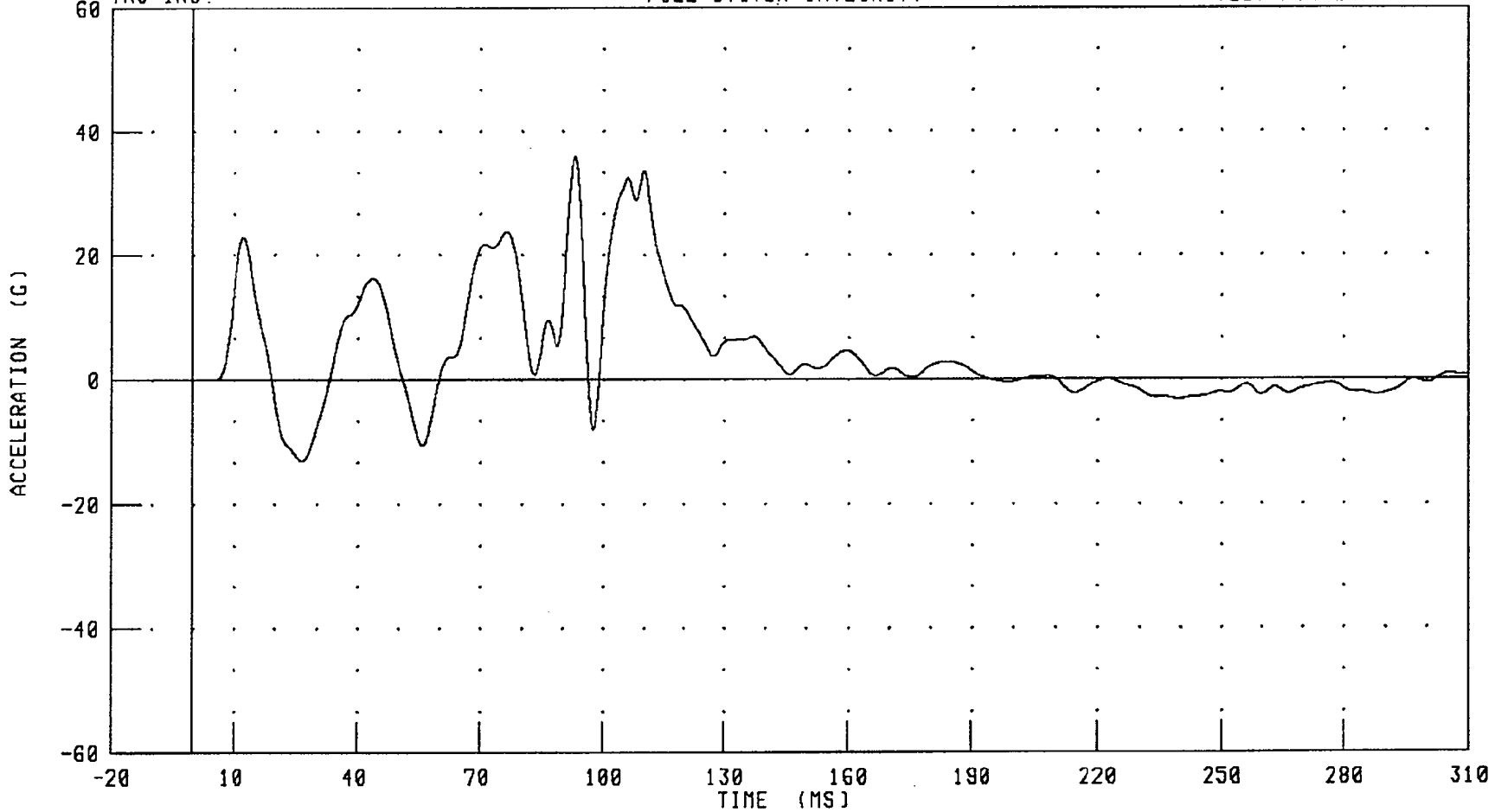
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
FRONT SEAT OUTBOARD MOUNTING RAIL X-AXIS ACCELERATION



MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

FRONT SEAT BACK MID X-AXIS ACCELERATION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



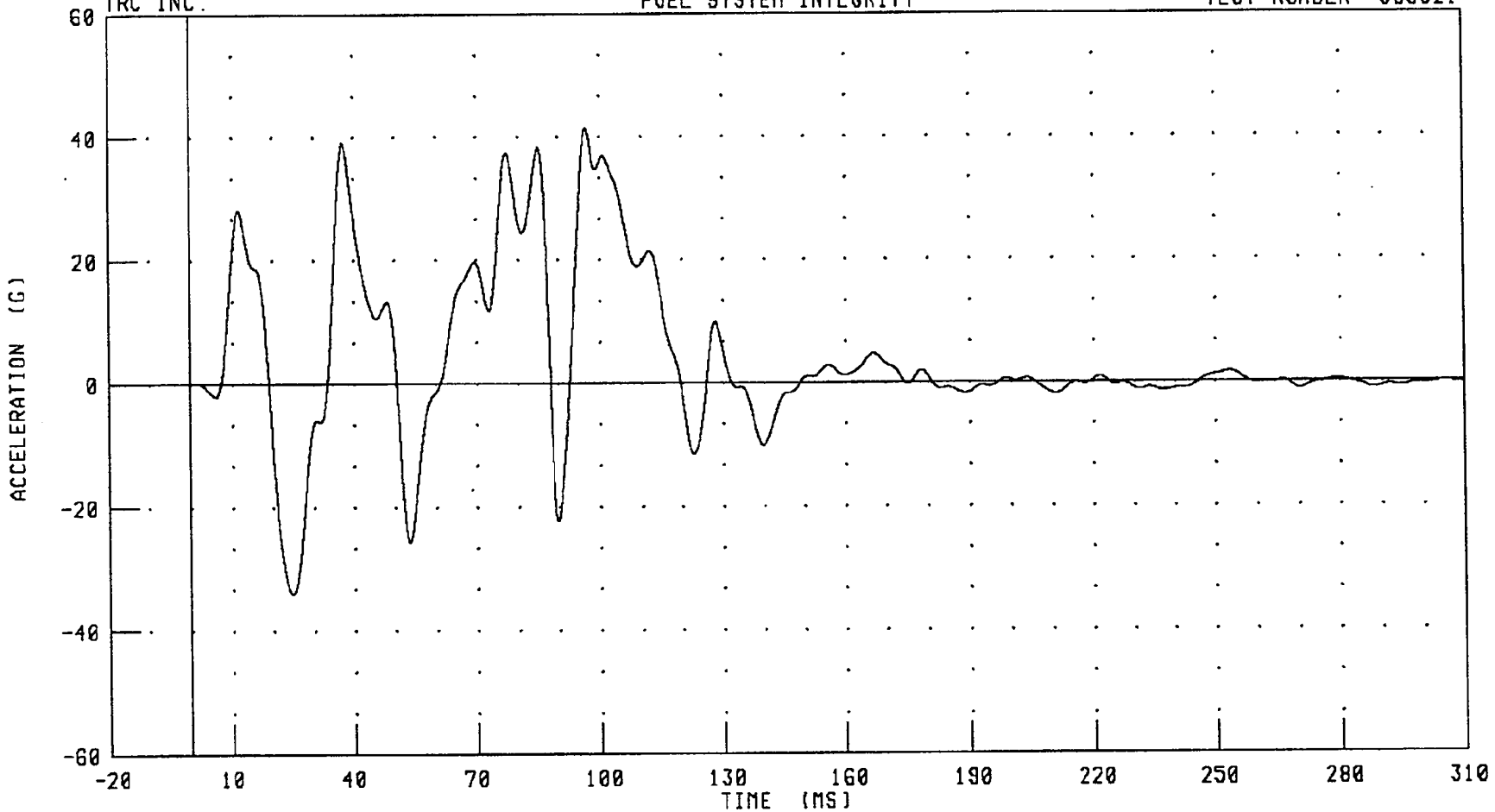
CHANNEL: TLFXG2 FILTER: CH. CLASS 60 PEAK DATA: 35.85 G @ 93.04 MS; -13.04 G @ 26.56 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

FRONT SEAT BACK MID X-AXIS ACCELERATION

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



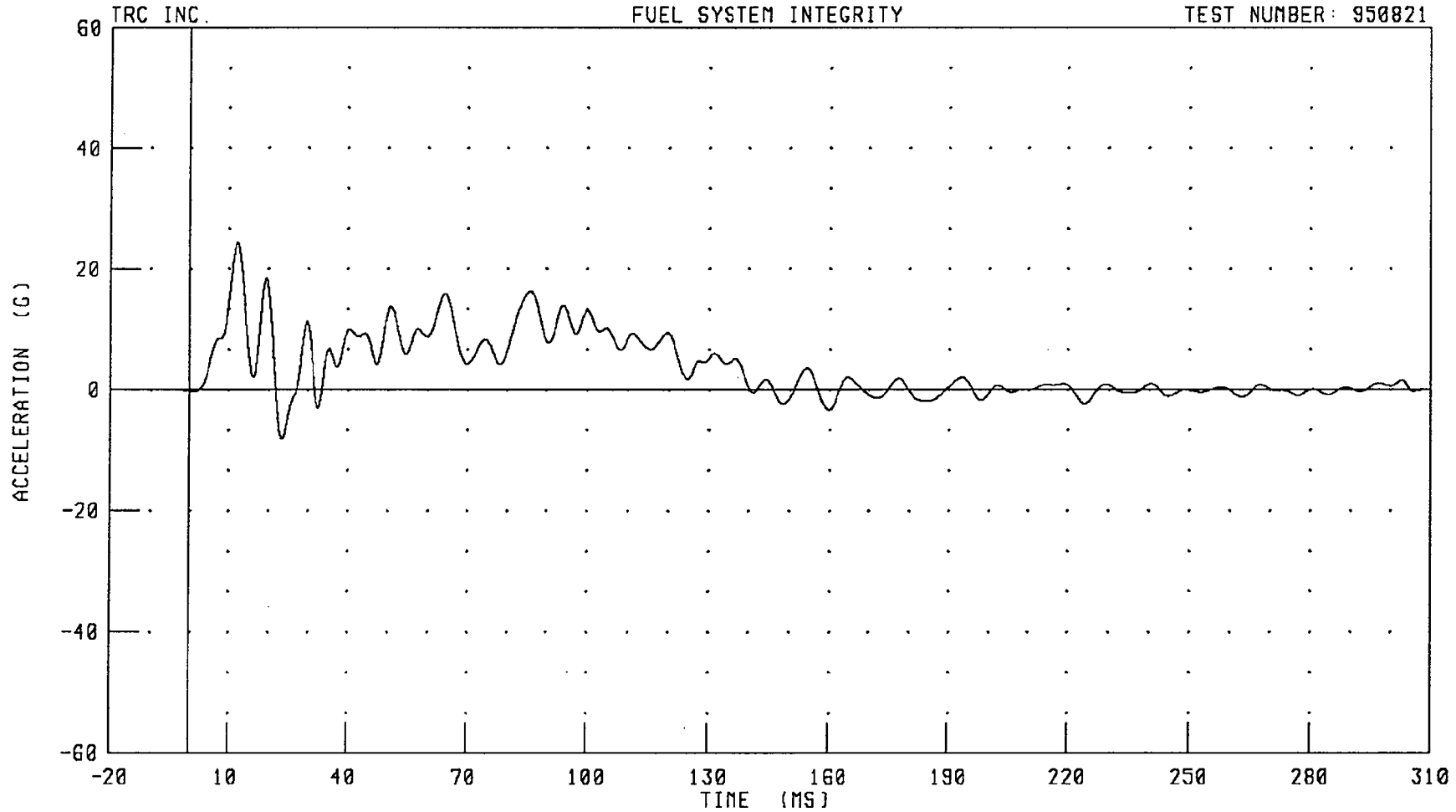
CHANNEL: TRFXG2 FILTER: CH. CLASS 60

PEAK DATA: 41.41 G @ 96.80 MS; -34.04 G @ 24.72 MS

950821

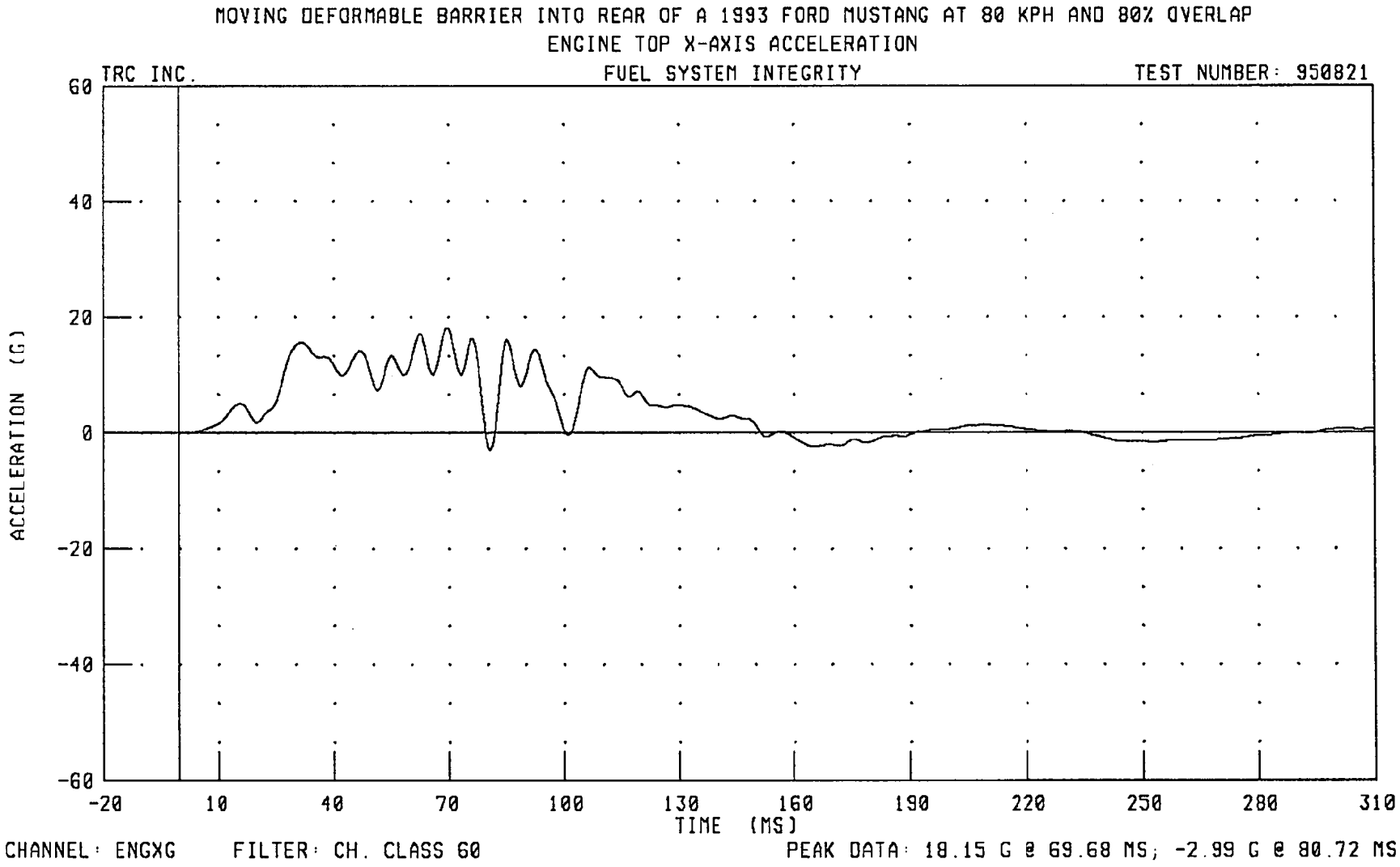
MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

RADIATOR SUPPORT X-AXIS ACCELERATION

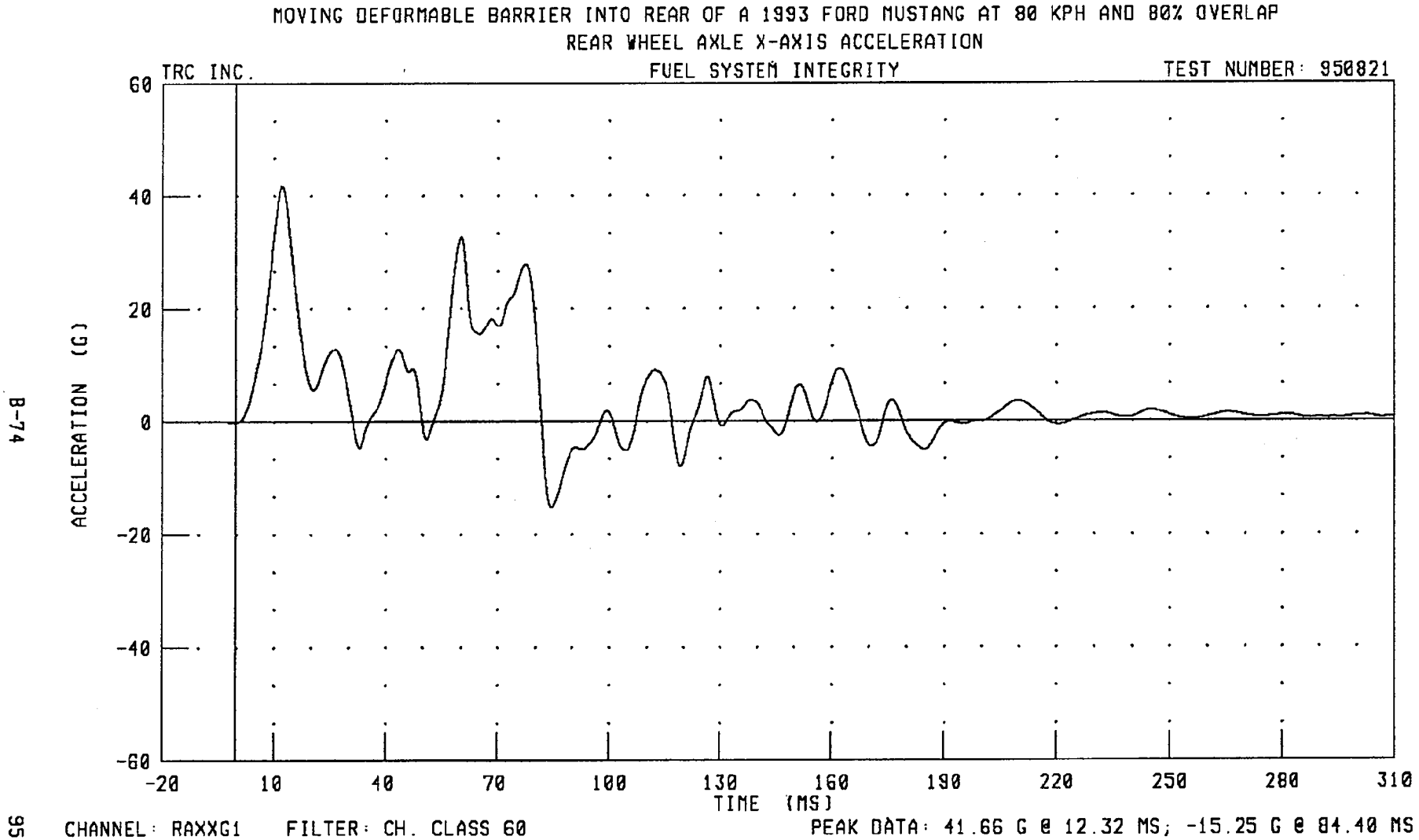


CHANNEL: FFCXG FILTER: CH. CLASS 60 PEAK DATA: 24.32 G @ 12.24 MS; -8.13 G @ 23.52 MS

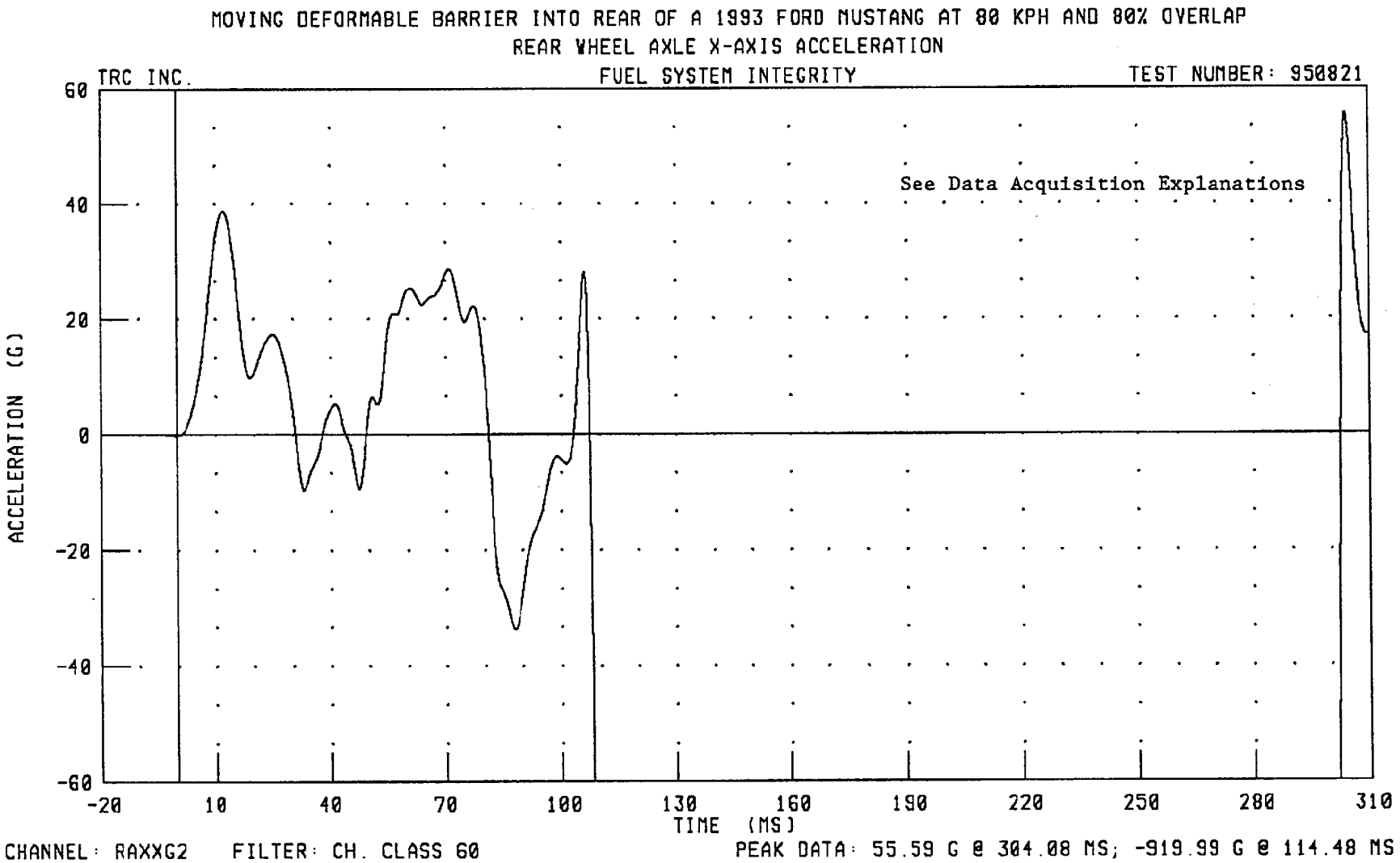
950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
ENGINE TOP X-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ENGXG
FILTER: CH. CLASS 60
PEAK DATA: 18.15 G @ 69.68 MS; -2.99 G @ 80.72 MS

950821

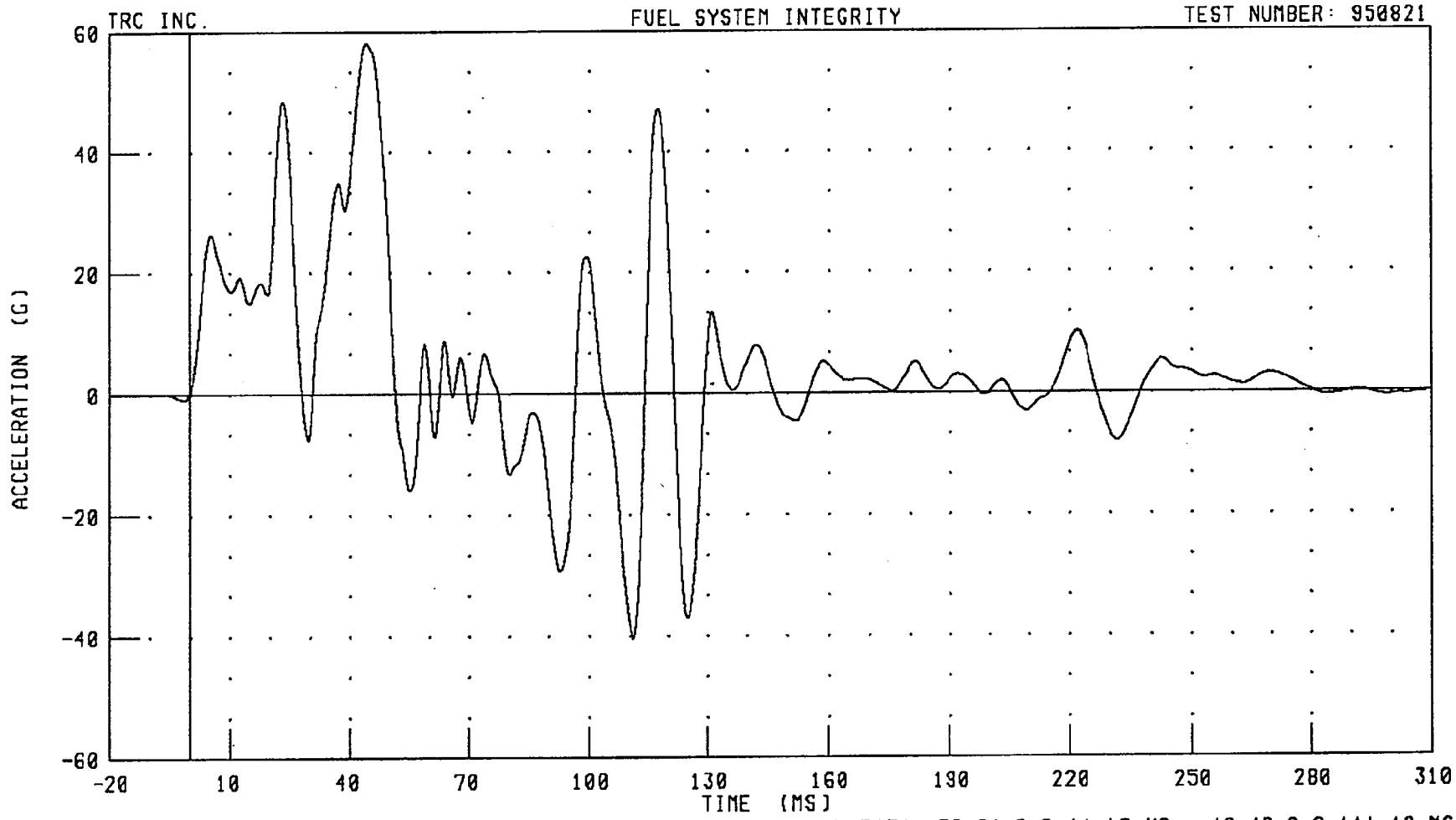

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
REAR WHEEL AXLE X-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
60
40
20
0
-20
-40
-60
ACCELERATION (G)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RAXXG1
FILTER: CH. CLASS 60
PEAK DATA: 41.66 G @ 12.32 MS; -15.25 G @ 84.40 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
REAR WHEEL AXLE X-AXIS ACCELERATION
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
See Data Acquisition Explanations
ACCELERATION (G)
60
40
20
0
-20
-40
-60
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RAXXG2
FILTER: CH. CLASS 60
PEAK DATA: 55.59 G @ 304.08 MS; -919.99 G @ 114.48 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
PACKAGE SHELF X-AXIS ACCELERATION



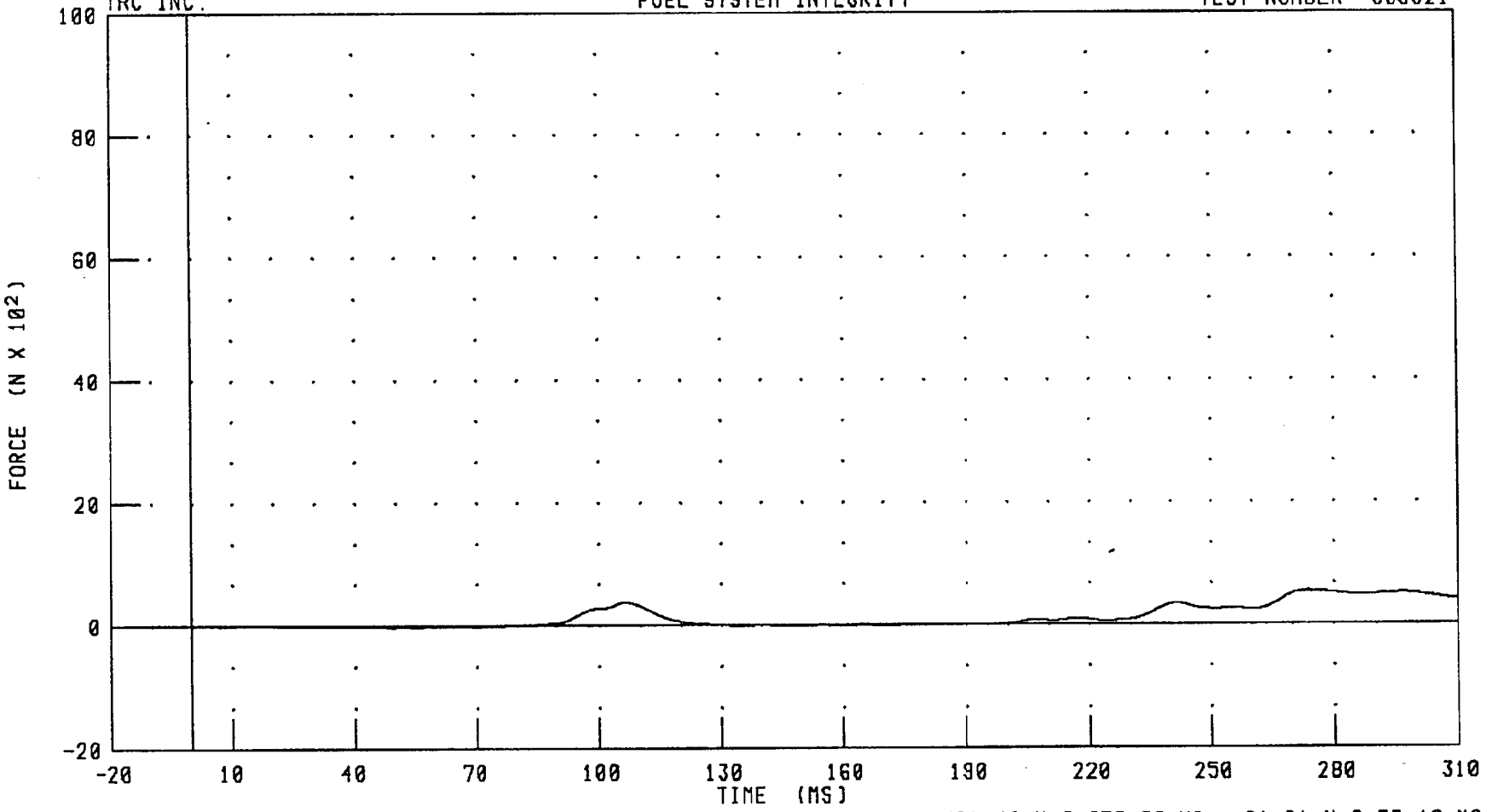
CHANNEL: TCRXG FILTER: CH. CLASS 60 PEAK DATA: 58.04 G @ 44.16 MS; -40.46 G @ 111.12 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

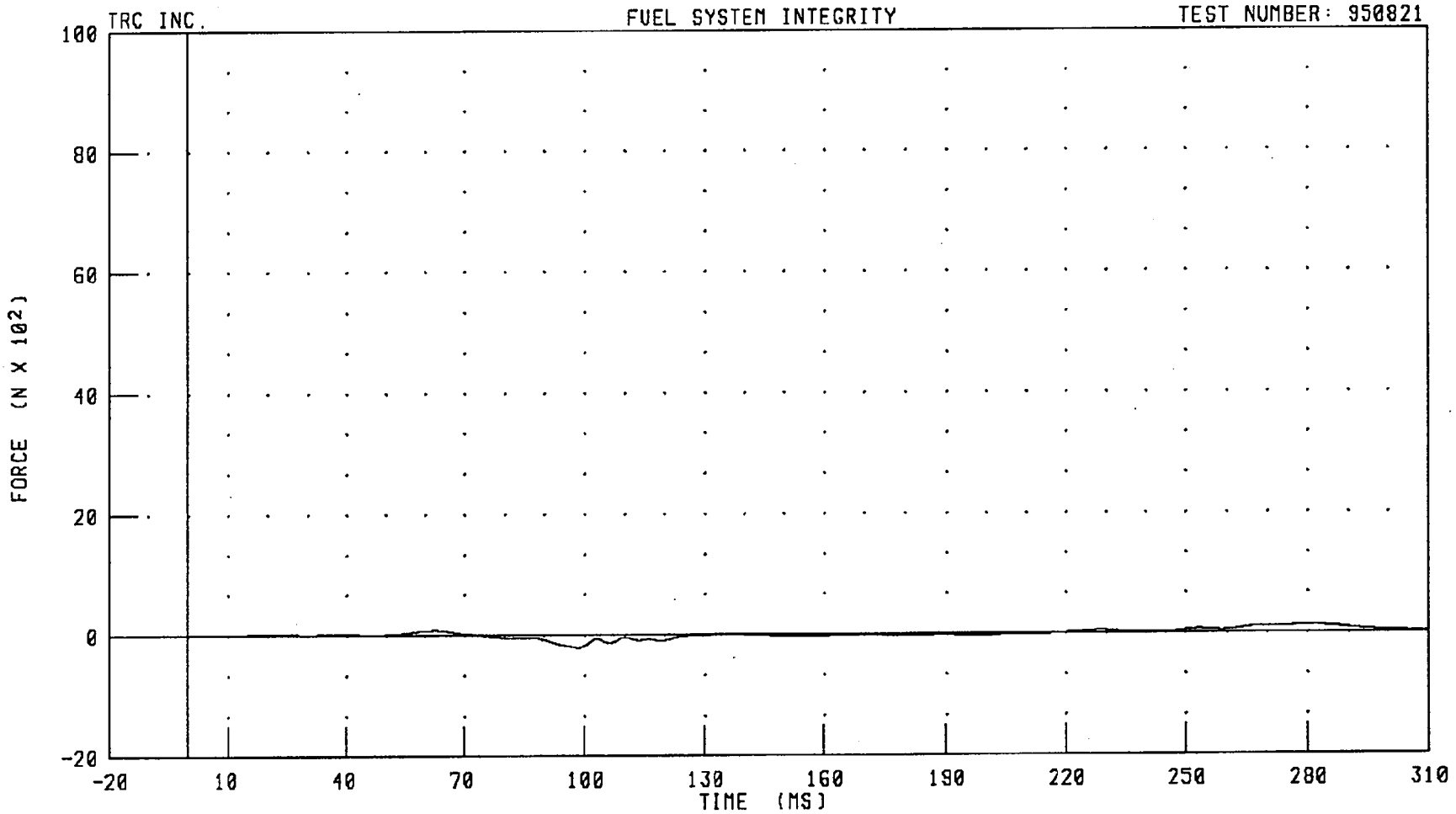
DRIVER SHOULDER BELT FORCE

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: SHBF1 FILTER: CH. CLASS 60 PEAK DATA: 538.40 N @ 273.92 MS; -21.91 N @ 55.12 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
DRIVER LAP BELT OUTBOARD FORCE



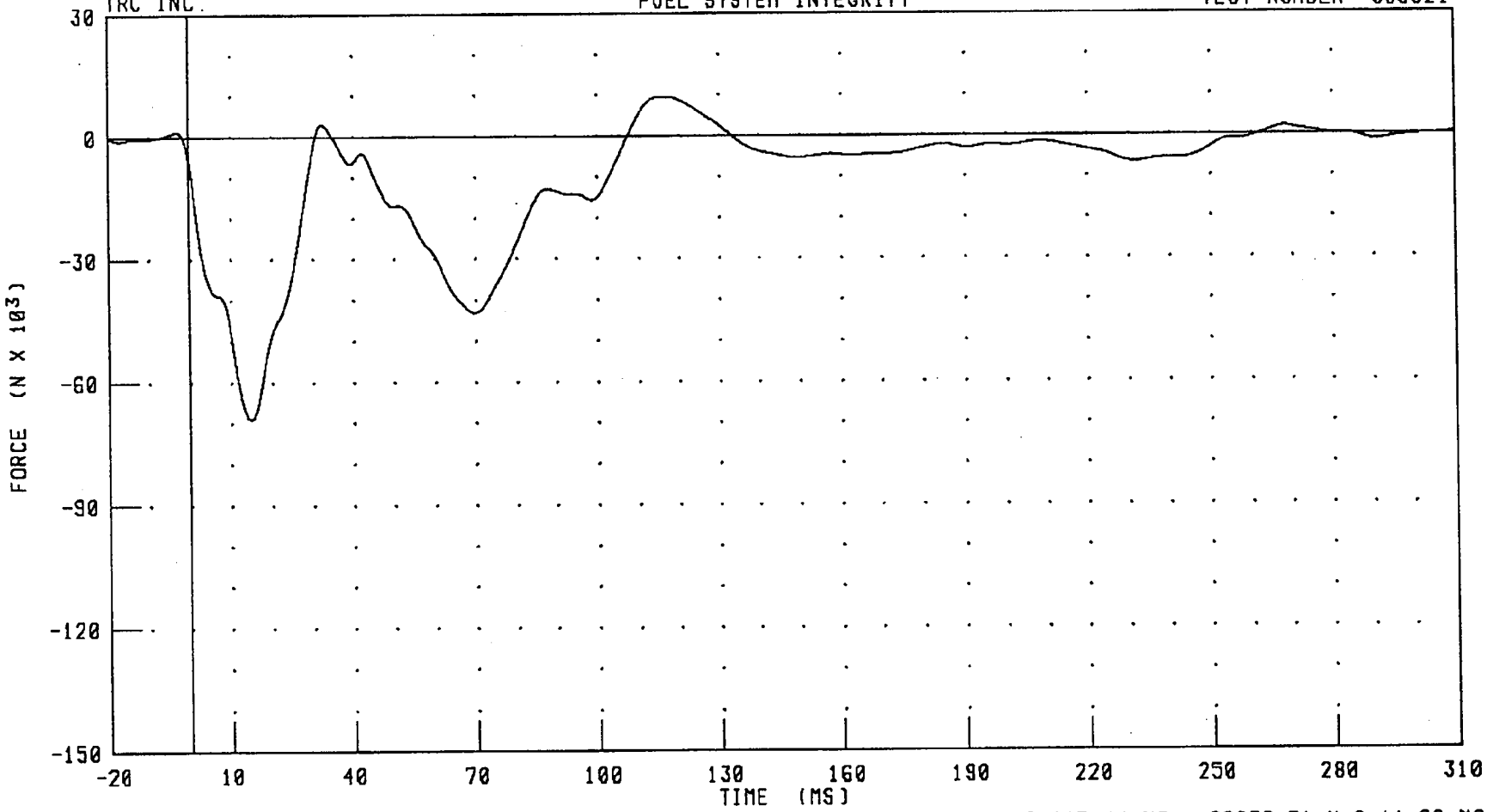
CHANNEL: LBOF1 FILTER: CH. CLASS 60 PEAK DATA: 118.76 N @ 280.40 MS; -210.03 N @ 98.48 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

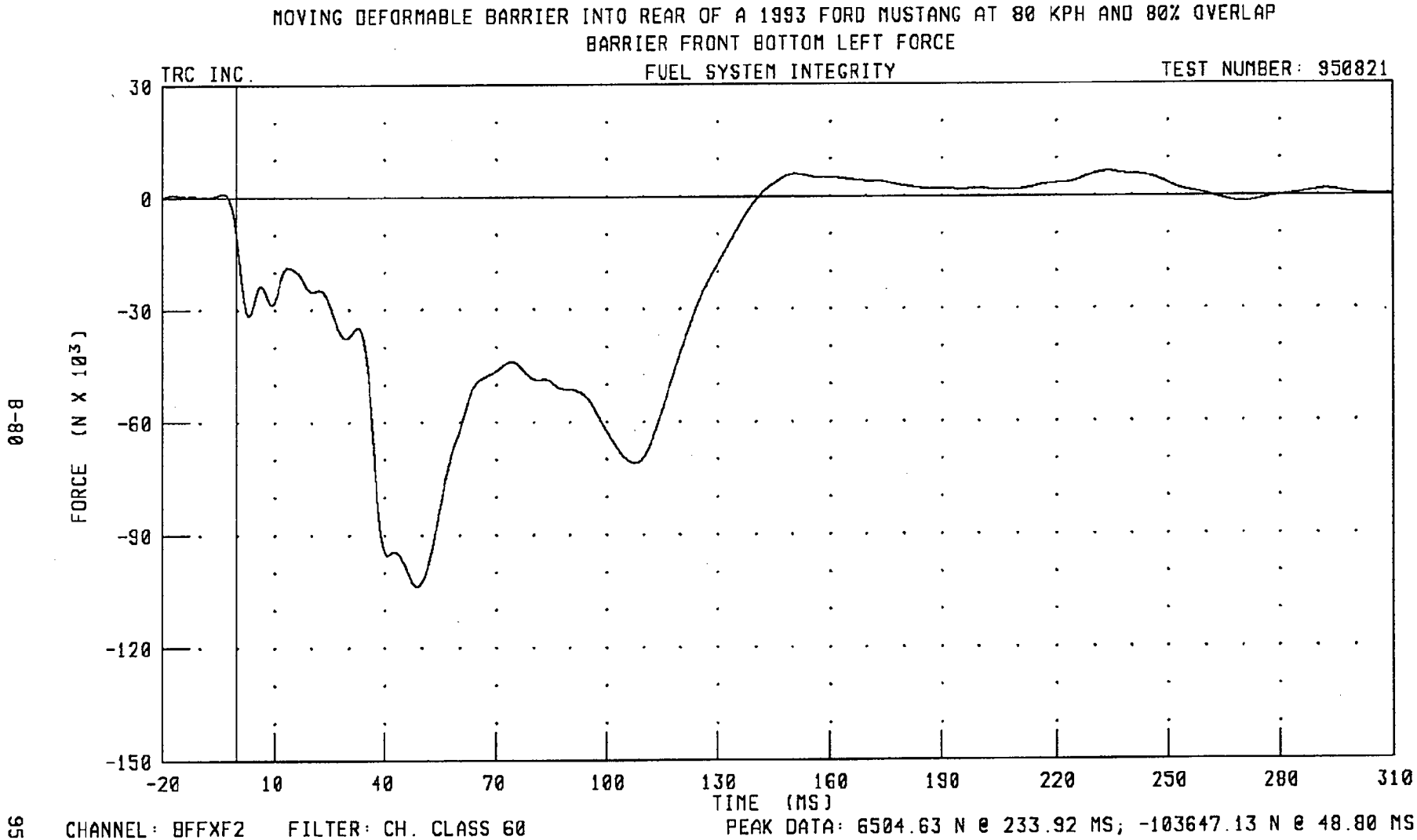
BARRIER FRONT TOP LEFT FORCE

TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821

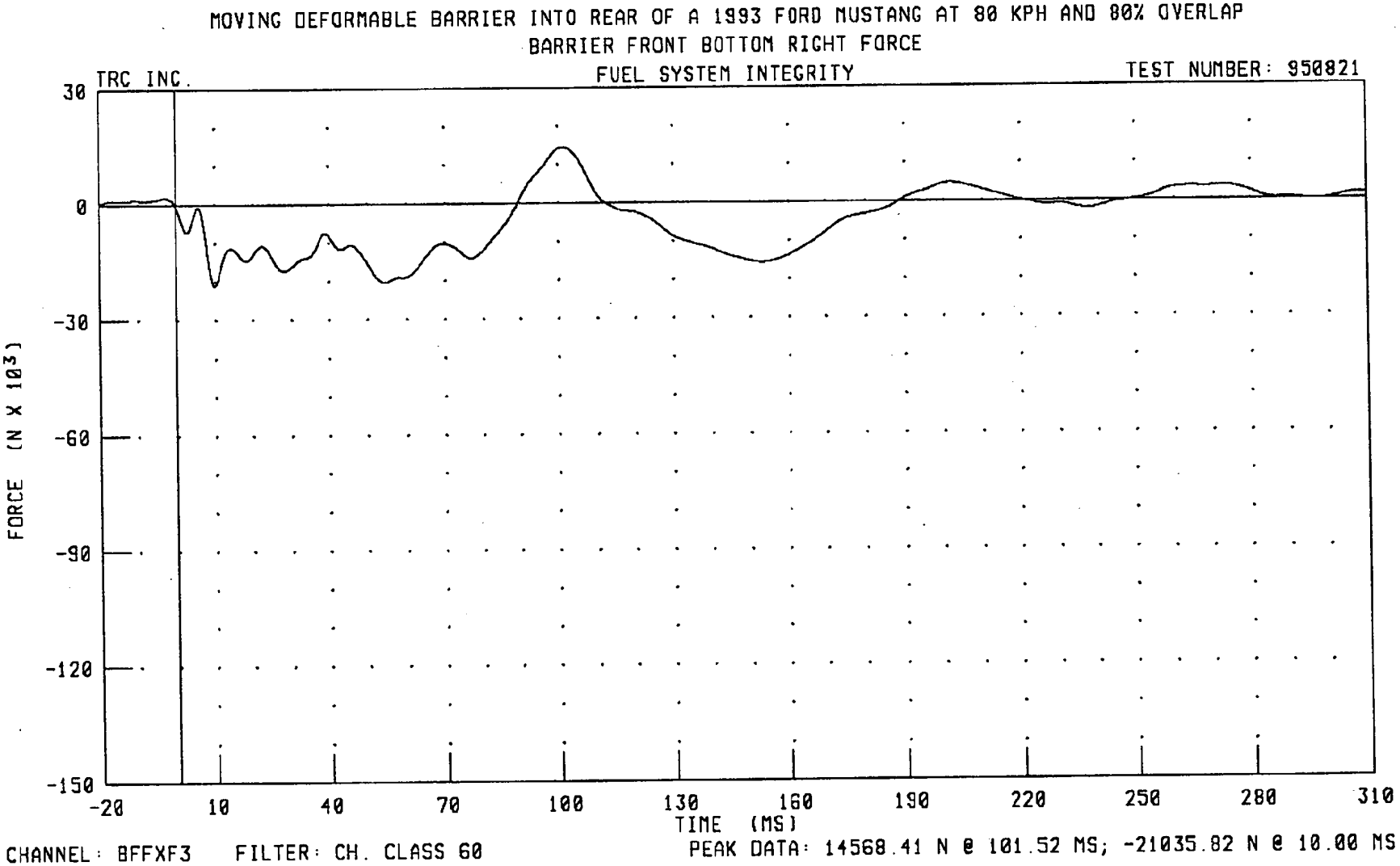


CHANNEL: BFFXF1 FILTER: CH. CLASS 60 PEAK DATA: 9487.73 N @ 115.44 MS; -69032.51 N @ 14.96 MS

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
BARRIER FRONT BOTTOM LEFT FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
30
0
-30
-60
-90
-120
-150
FORCE (N X 10³)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BFFXF2
FILTER: CH. CLASS 60
PEAK DATA: 6504.63 N @ 233.92 MS; -103647.13 N @ 48.80 MS

950821

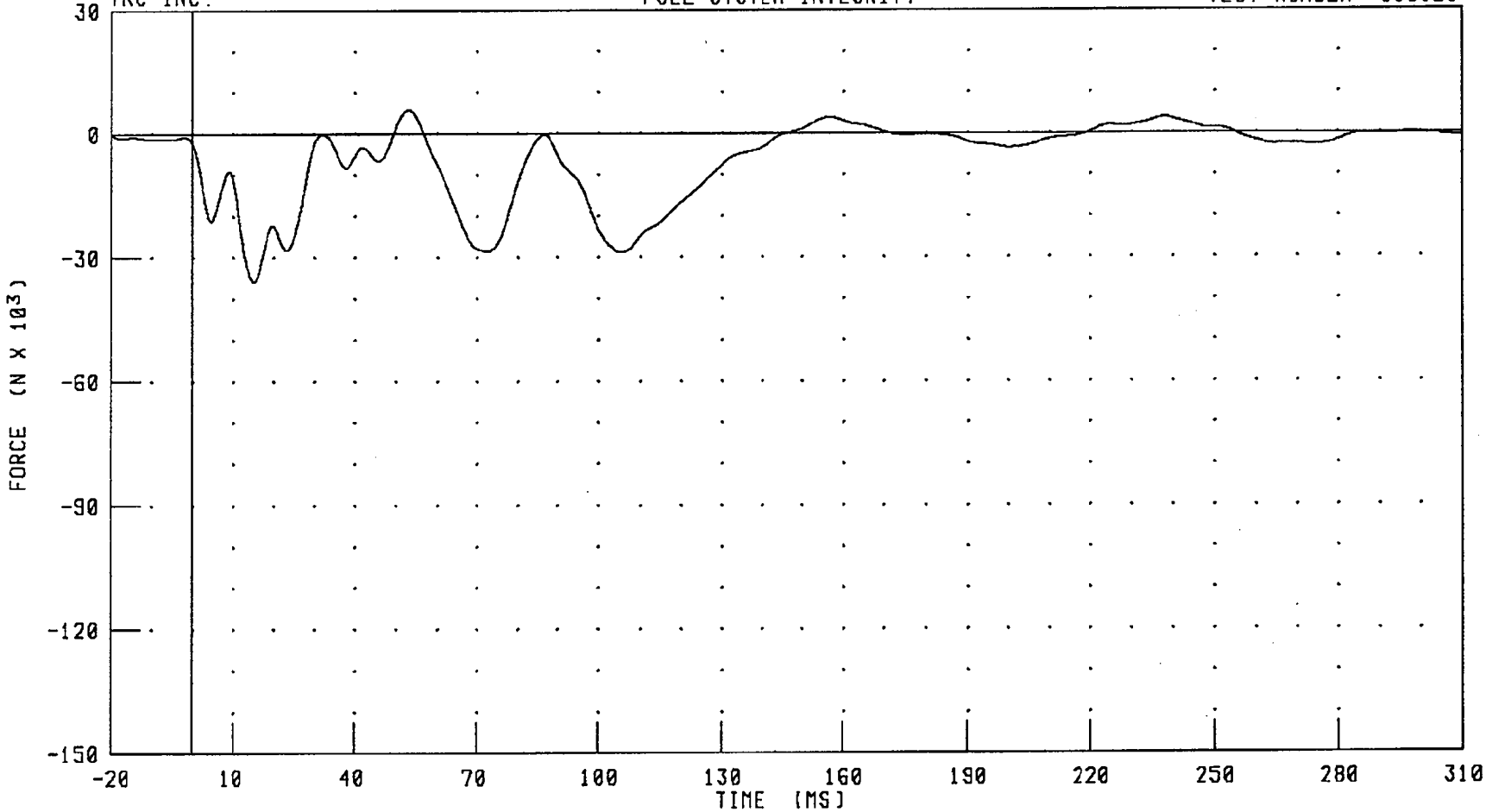

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
BARRIER FRONT BOTTOM RIGHT FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
30
0
-30
-60
-90
-120
-150
FORCE (N X 10³)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BFFXF3
FILTER: CH. CLASS 60
PEAK DATA: 14568.41 N @ 101.52 MS; -21035.82 N @ 10.00 MS

950821

MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP

BARRIER FRONT TOP RIGHT FORCE

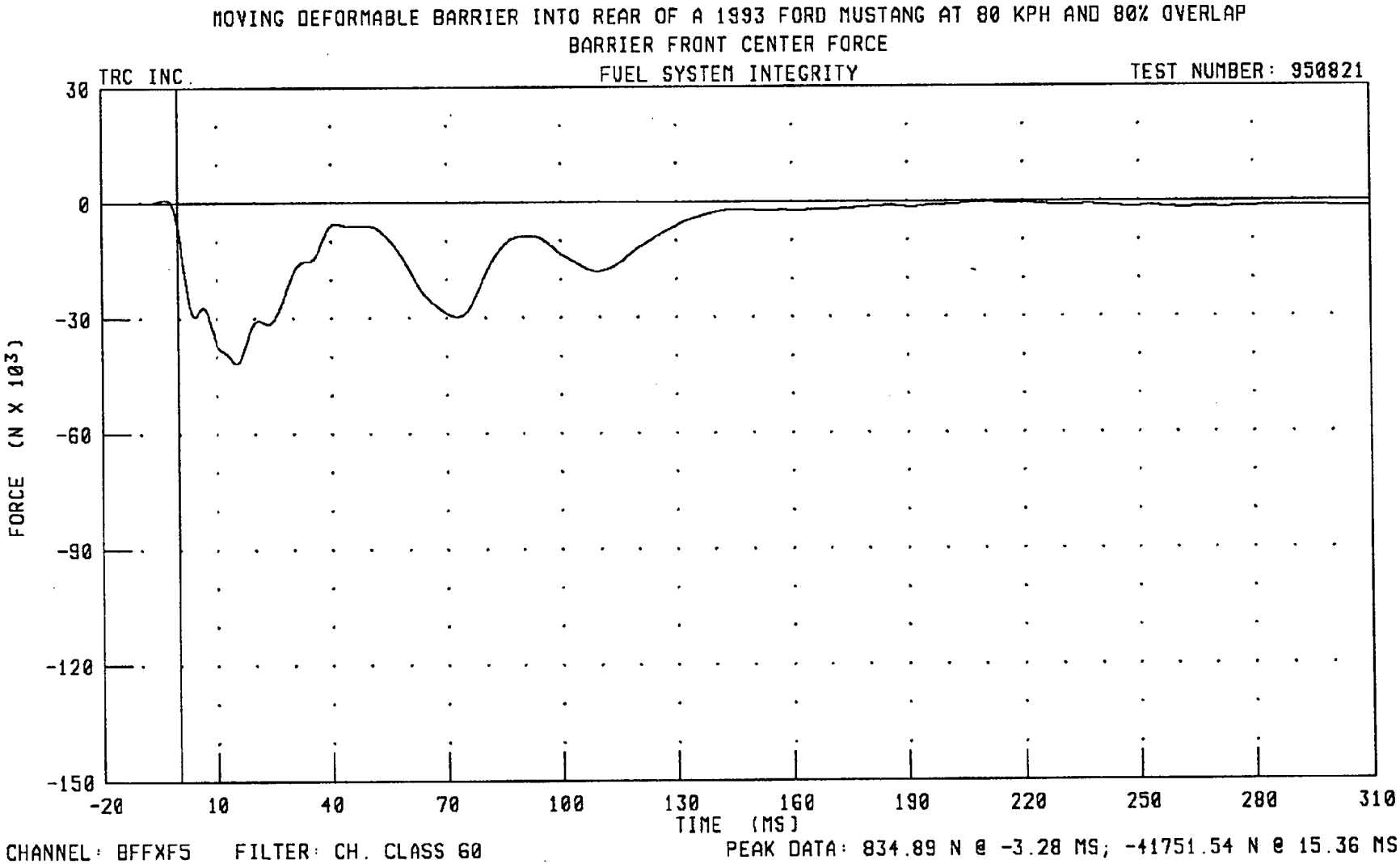
TRC INC. FUEL SYSTEM INTEGRITY TEST NUMBER: 950821



CHANNEL: BFFXF4 FILTER: CH. CLASS 60 PEAK DATA: 5762.21 N @ 53.04 MS; -35867.30 N @ 15.28 MS

8-82

950821


MOVING DEFORMABLE BARRIER INTO REAR OF A 1993 FORD MUSTANG AT 80 KPH AND 80% OVERLAP
BARRIER FRONT CENTER FORCE
TRC INC.
FUEL SYSTEM INTEGRITY
TEST NUMBER: 950821
30
0
-30
-60
-90
-120
-150
FORCE (N X 10³)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: BFFXF5
FILTER: CH. CLASS 60
PEAK DATA: 834.89 N @ -3.28 MS; -41751.54 N @ 15.36 MS

950821

Appendix C

Dummy Calibration Information

Pre-Test Calibration

Serial Number 34

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
34 VECTOR

TRC INC. TEST NO: 34C1ED1 572E SN34 EXT.DIMENSION CAL01 11-JUL-95

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	991. MM
WAIST CIRCUMFERENCE	(Z)	836 - 866 MM	856. MM
CHEST DEPTH	(O)	213 - 229 MM	218. MM
H-POINT HEIGHT	(C)	84 - 89 MM	86. MM
H-POINT FROM SEATBACK	(D)	135 - 140 MM	137. MM
SKULL CAP TO BACKLINE	(H)	41 - 46 MM	43. MM
TOTAL SITTING HEIGHT	(A)	879 - 889 MM	884. MM
THIGH CLEARANCE	(F)	140 - 155 MM	155. MM
BUTTOCK KNEE LENGTH	(K)	579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH	(N)	452 - 478 MM	472. MM
POPLITEAL HEIGHT	(L)	429 - 455 MM	439. MM
KNEE PIVOT HEIGHT	(M)	485 - 500 MM	498. MM
FOOT LENGTH	(P)	252 - 267 MM	254. 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	427. MM
SHOULDER PIVOT HEIGHT	(B)	506 - 521 MM	513. MM
ELBOW REST HEIGHT	(J)	191 - 211 MM	208. MM
SHOULDER-ELBOW LENGTH	(I)	330 - 345 MM	335. MM
BACK OF ELBOW TO WRIST PIVOT	(G)	290 - 305 MM	295. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet RUN NUMBER: 071295.1424

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

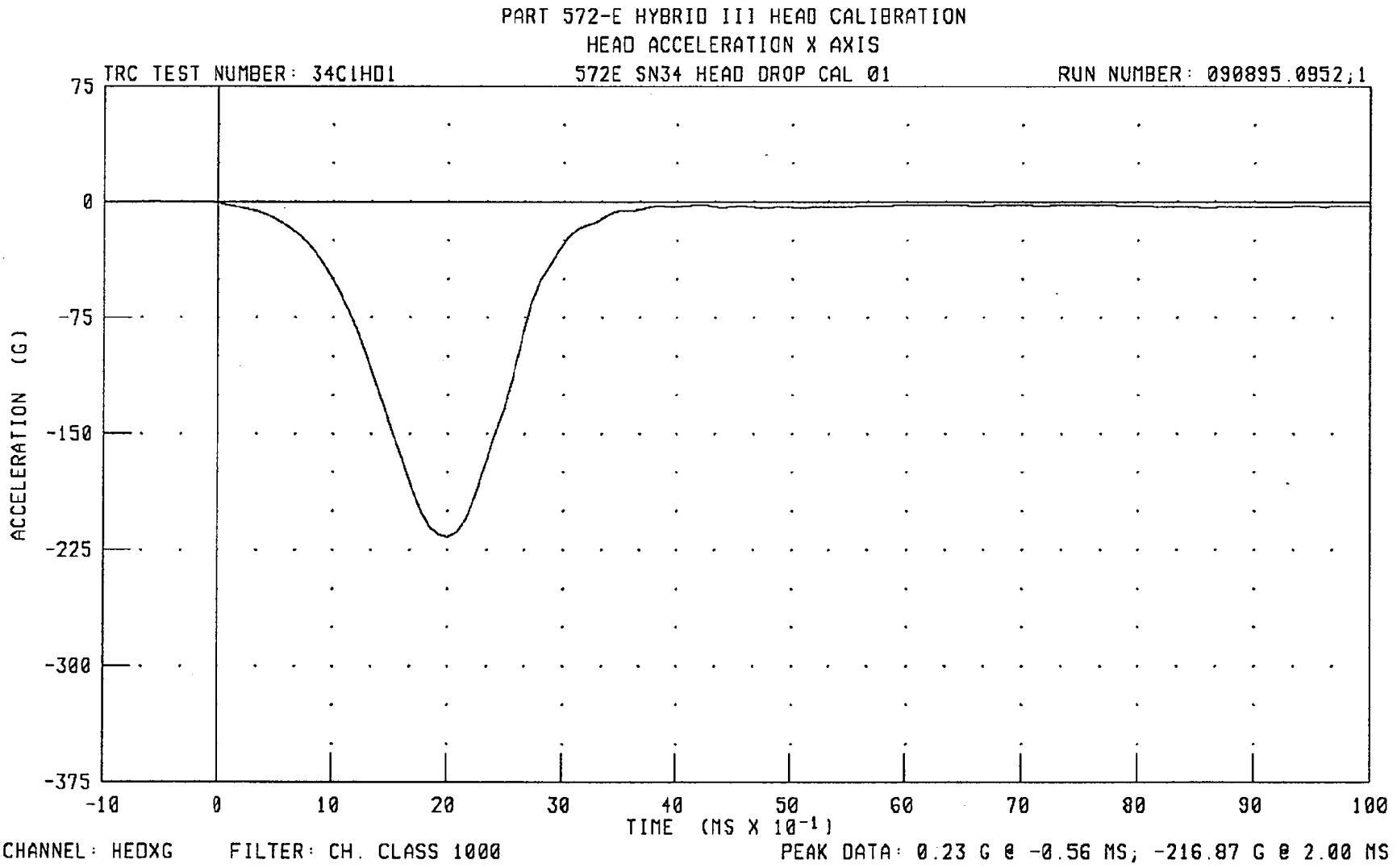
HYBRID III 11-JUL-95

TRC INC. TEST NO: 34C1HD1 572E SN34 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	252.75 G
PEAK LATERAL ACCELERATION	15 G MAX	3.52 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

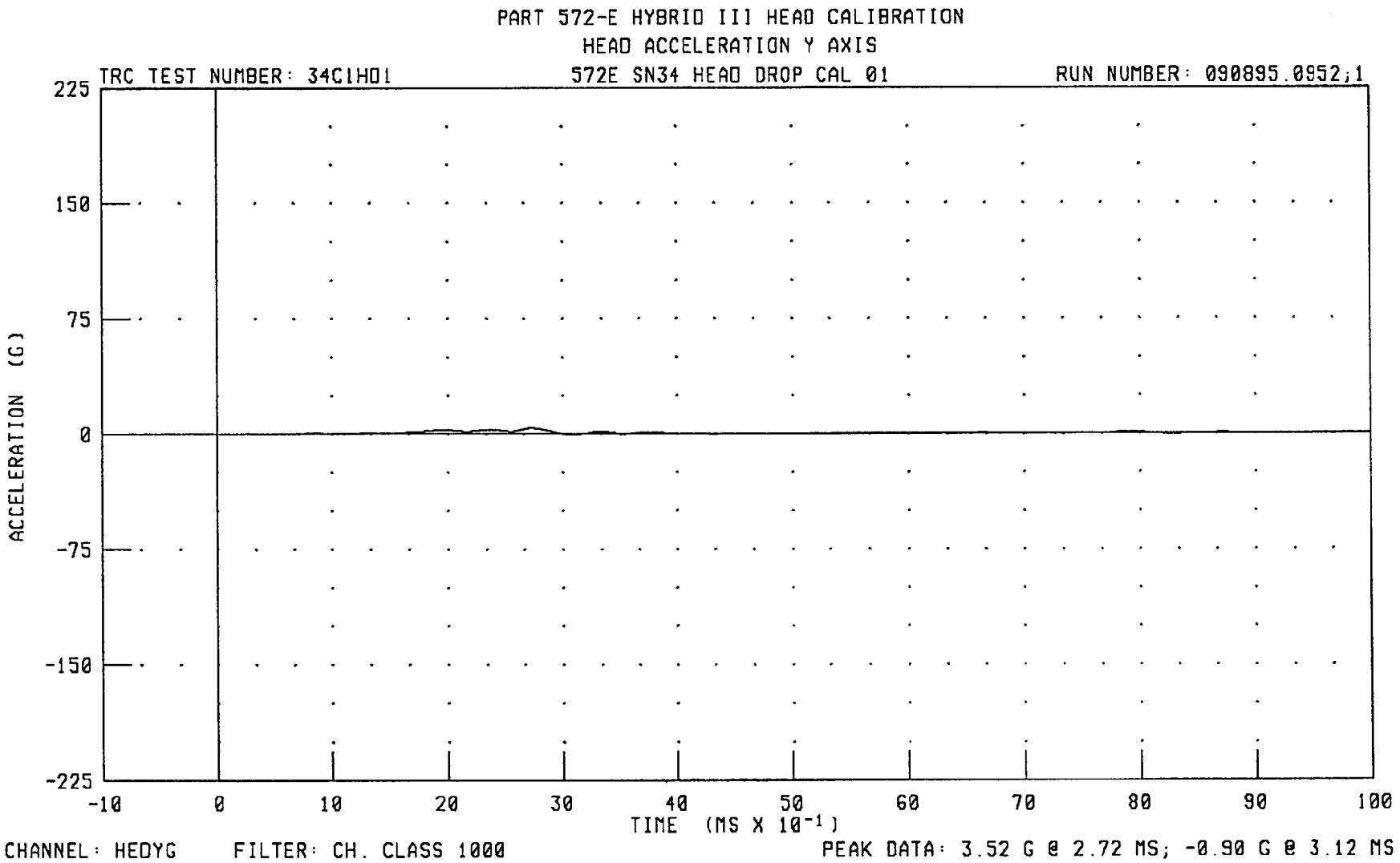
TEST MEETS SPECIFICATIONS

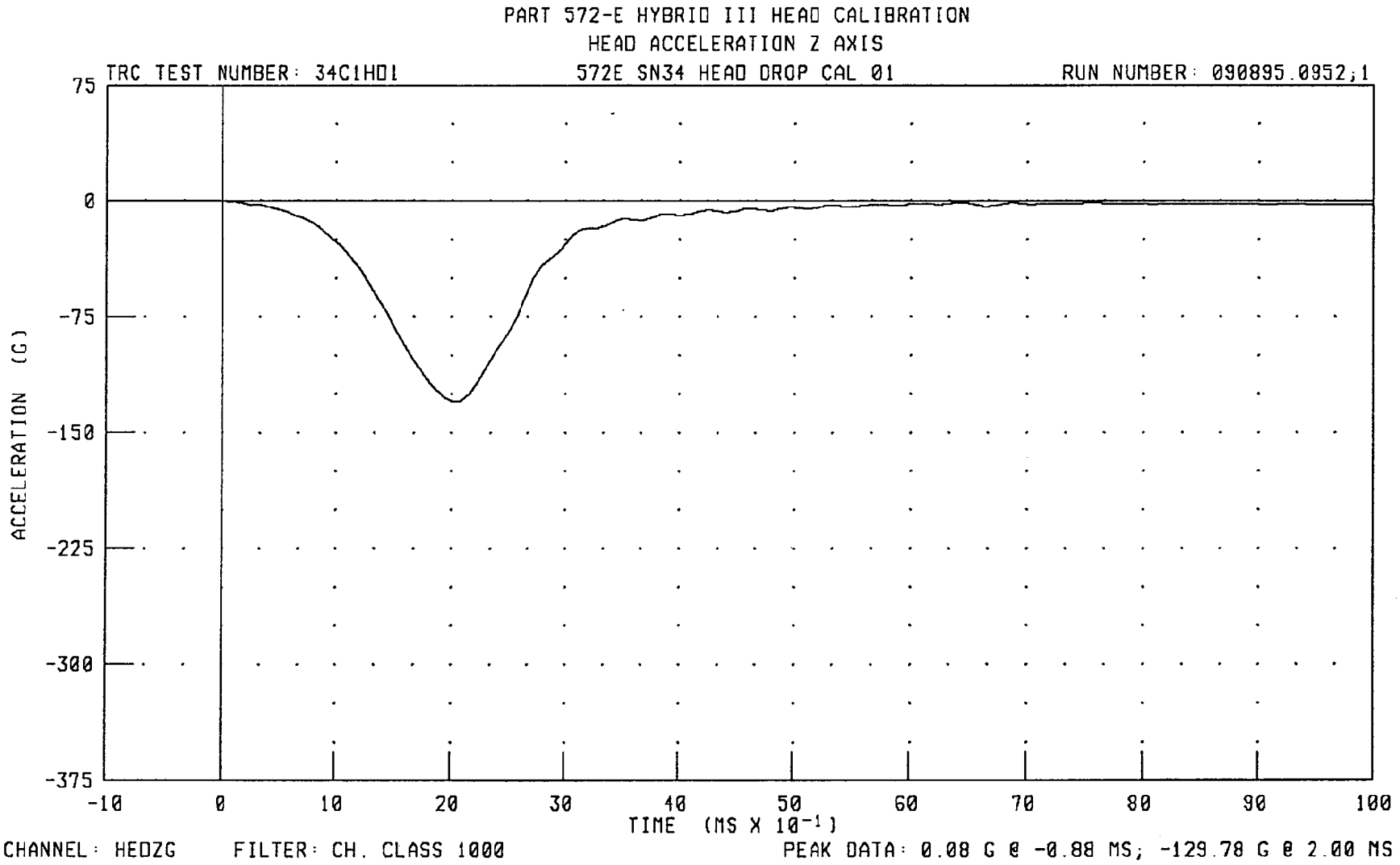
TECHNICIAN Chas. Mirault RUN NUMBER: 071195.0807;1


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS
TRC TEST NUMBER: 34C1HD1
572E SN34 HEAD DROP CAL 01
RUN NUMBER: 090895.0952;1
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: 0.23 G @ -0.56 MS; -216.87 G @ 2.00 MS

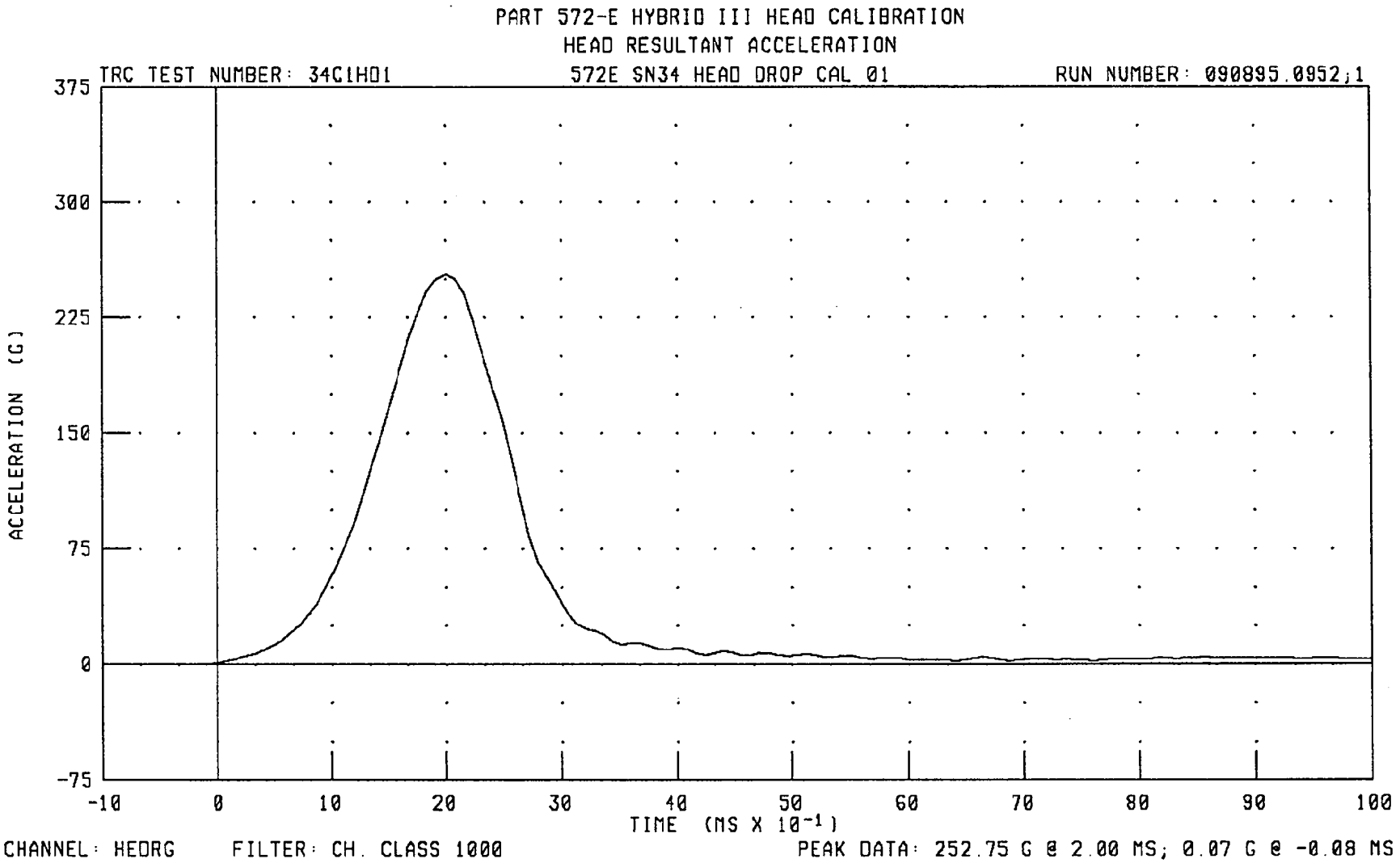
C-5

950821


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS
TRC TEST NUMBER: 34C1H01
572E SN34 HEAD DROP CAL 01
RUN NUMBER: 090895.0952;1
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: 3.52 G @ 2.72 MS; -0.90 G @ 3.12 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 34C1HD1
572E SN34 HEAD DROP CAL 01
RUN NUMBER: 090895.0952;1
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: 0.08 G @ -0.88 MS; -129.78 G @ 2.00 MS

950821


PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
TRC TEST NUMBER: 34C1H01
572E SN34 HEAD DROP CAL 01
RUN NUMBER: 090895.0952;1
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: 252.75 G @ 2.00 MS; 0.07 G @ -0.08 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

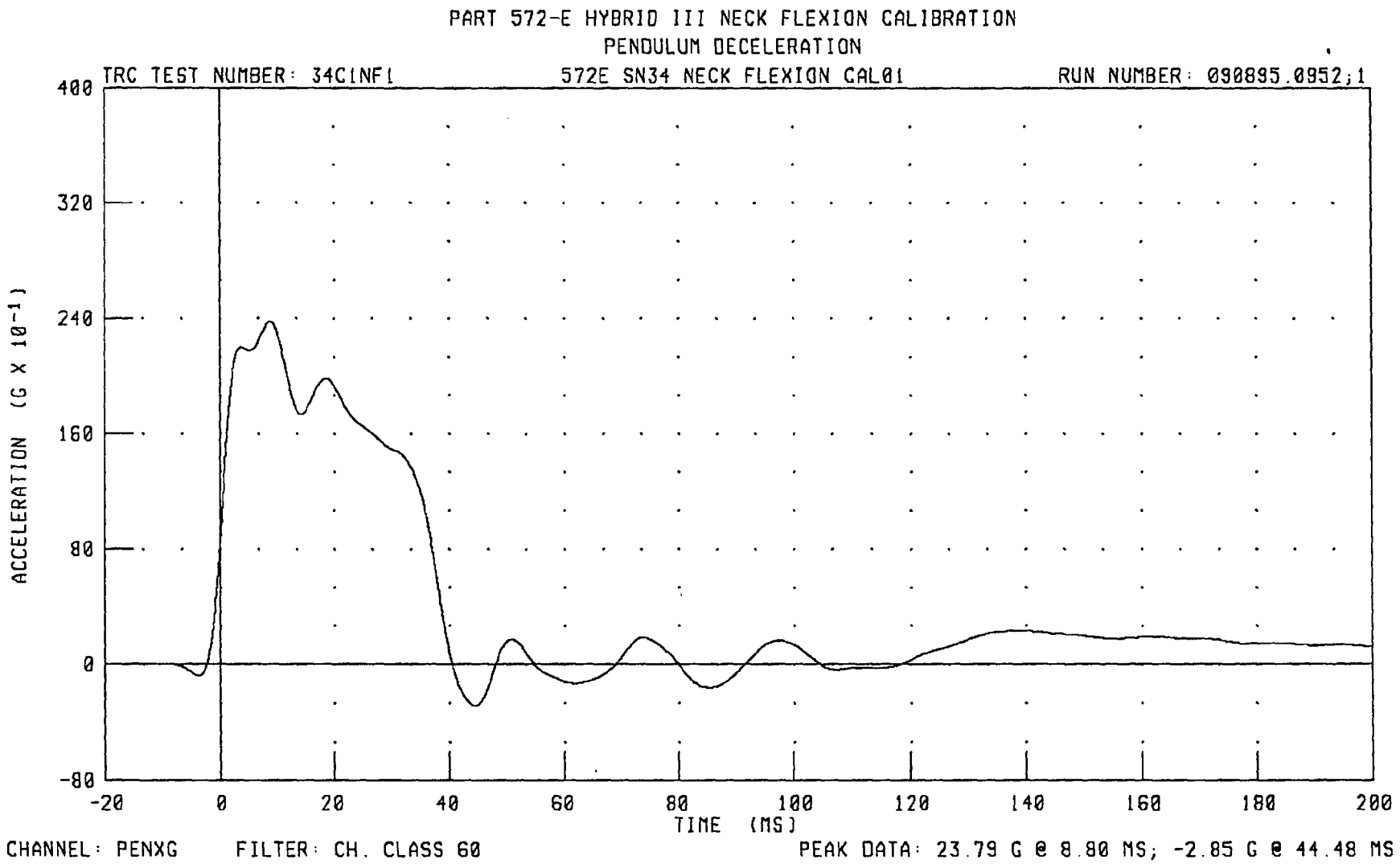
HYBRID III 11-JUL-95

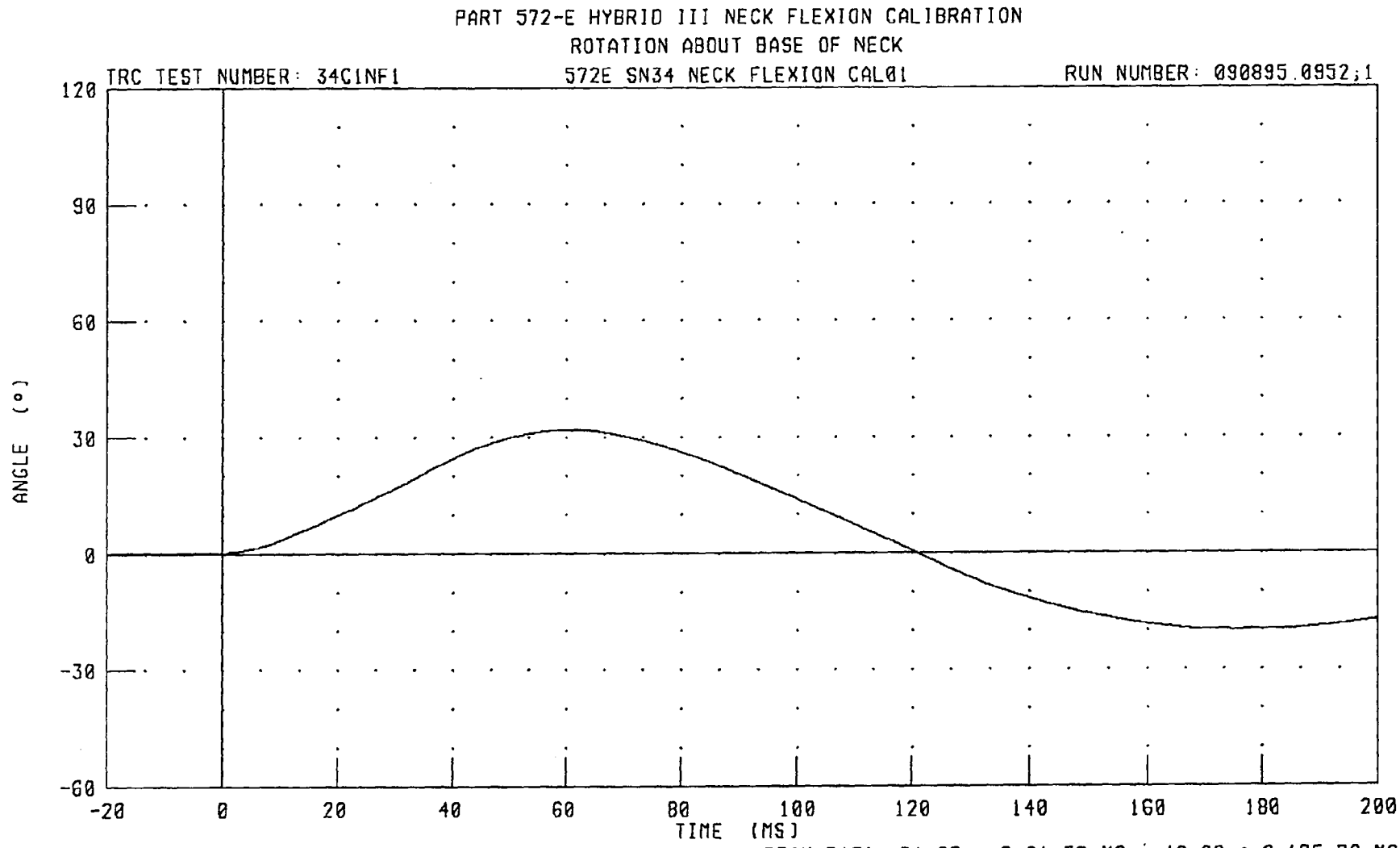
TRC INC. TEST NO: 34C1NF1 572E SN34 NECK FLEXION CAL01

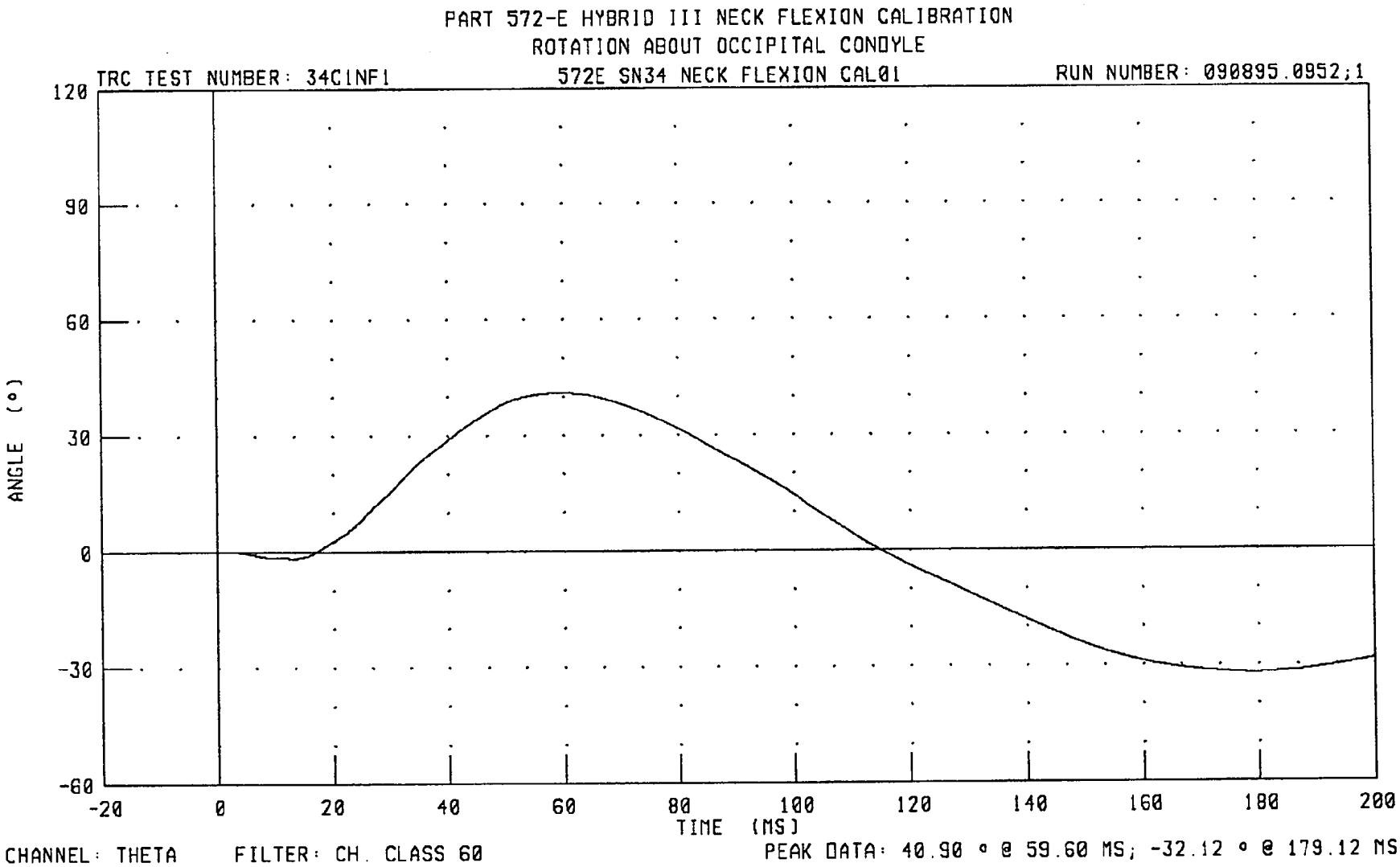
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.98 G
	20 MS	17.60 - 22.60 G	19.34 G
	30 MS	12.50 - 18.50 G	14.91 G
MAX PENDULUM G		29 G MAX	23.79 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	14.89 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	38.16 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	72.72 DEG.
	TIME	57 - 64 MS	60.24 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	90.00 NM
	TIME	47 - 58 MS	51.60 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	117.76 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.44 MS

TEST MEETS SPECIFICATIONS

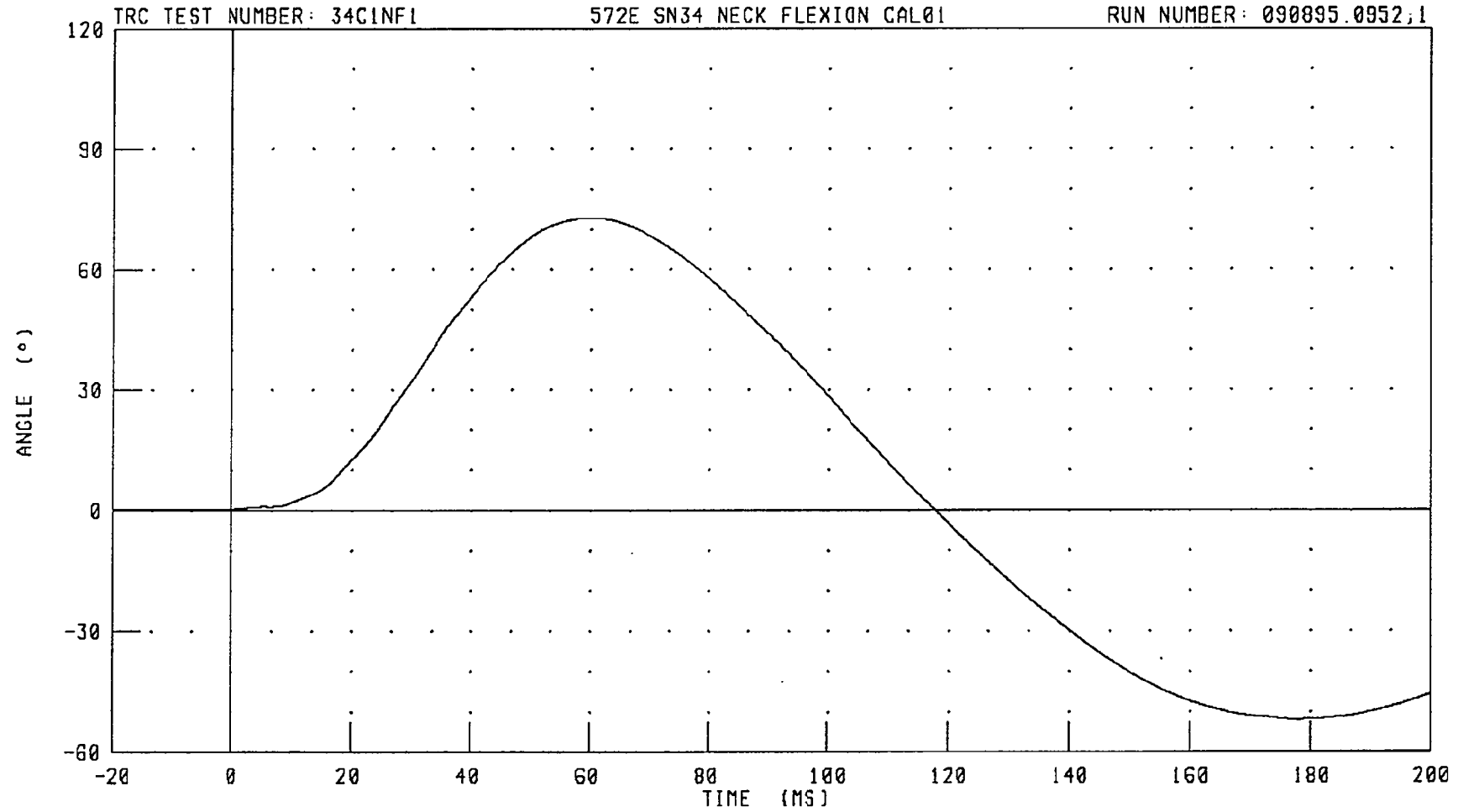
TECHNICIAN Chas. Middlet RUN NUMBER: 071195.1004;1


PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 34CINF1
572E SN34 NECK FLEXION CAL01
RUN NUMBER: 090895.0952;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: 23.79 G @ 8.80 MS; -2.85 G @ 44.48 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 34C1NF1
572E SN34 NECK FLEXION CAL01
RUN NUMBER: 090895.0952;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: 31.85 ° @ 61.52 MS; -19.92 ° @ 175.76 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 34CINF1
572E SN34 NECK FLEXION CAL01
RUN NUMBER: 090895.0952;1
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 40.90 ° @ 59.60 MS; -32.12 ° @ 179.12 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 72.73 ° @ 60.24 MS; -51.93 ° @ 177.44 MS

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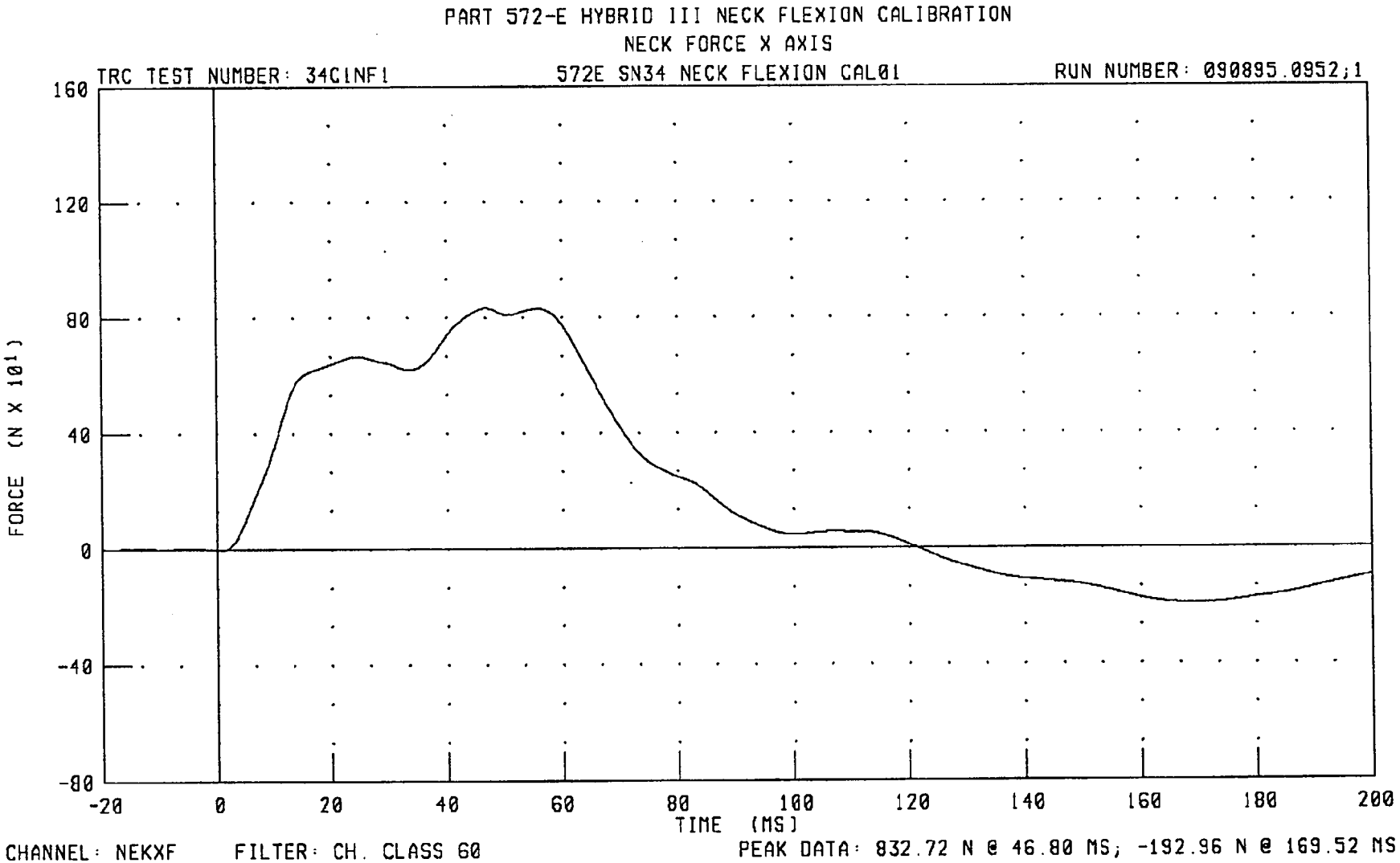
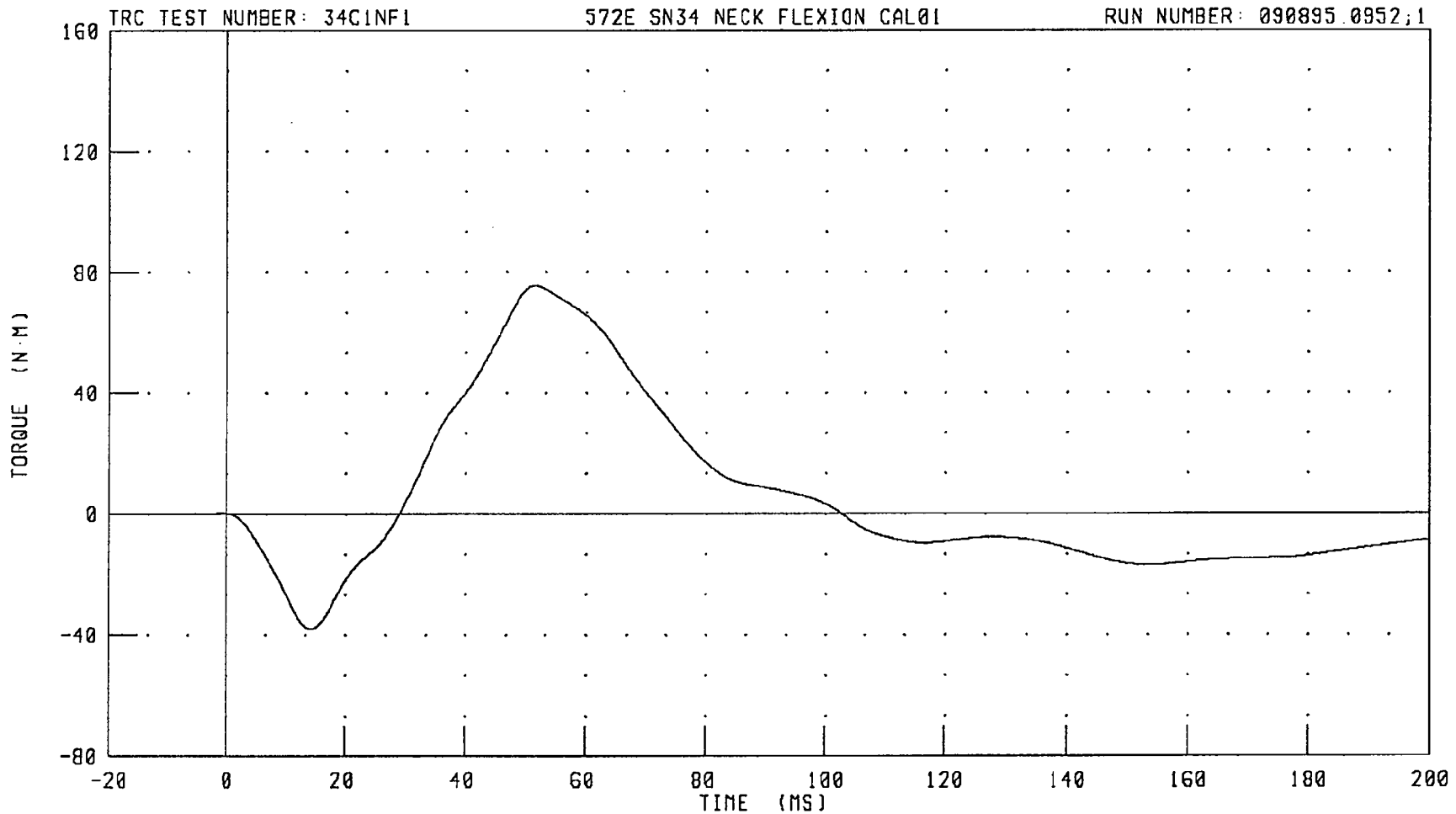

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 34C1NF1
572E SN34 NECK FLEXION CAL01
RUN NUMBER: 090895.0952;1
160
120
80
40
0
-40
-80
FORCE (N X 10¹)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKXF
FILTER: CH. CLASS 60
PEAK DATA: 832.72 N @ 46.80 MS; -192.96 N @ 169.52 MS

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



CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 75.60 N·M @ 51.52 MS; -37.99 N·M @ 14.32 MS

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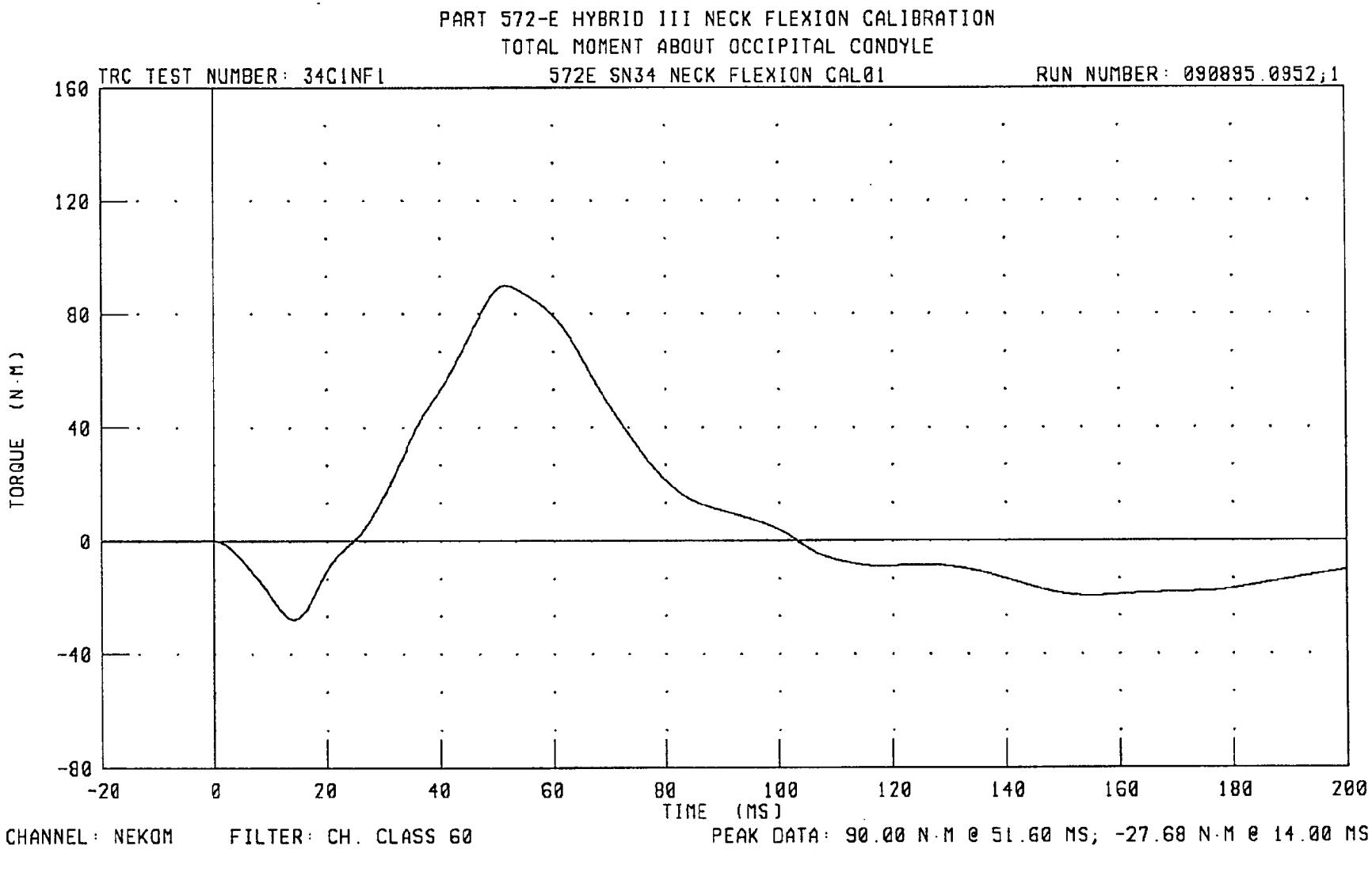

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 34C1NF1
572E SN34 NECK FLEXION CAL01
RUN NUMBER: 090895.0952;1
160
120
80
40
0
-40
-80
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 90.00 N-M @ 51.60 MS; -27.68 N-M @ 14.00 MS

TRANSPORTATION RESEARCH CENTER INC.

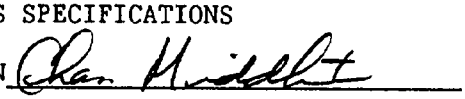
NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

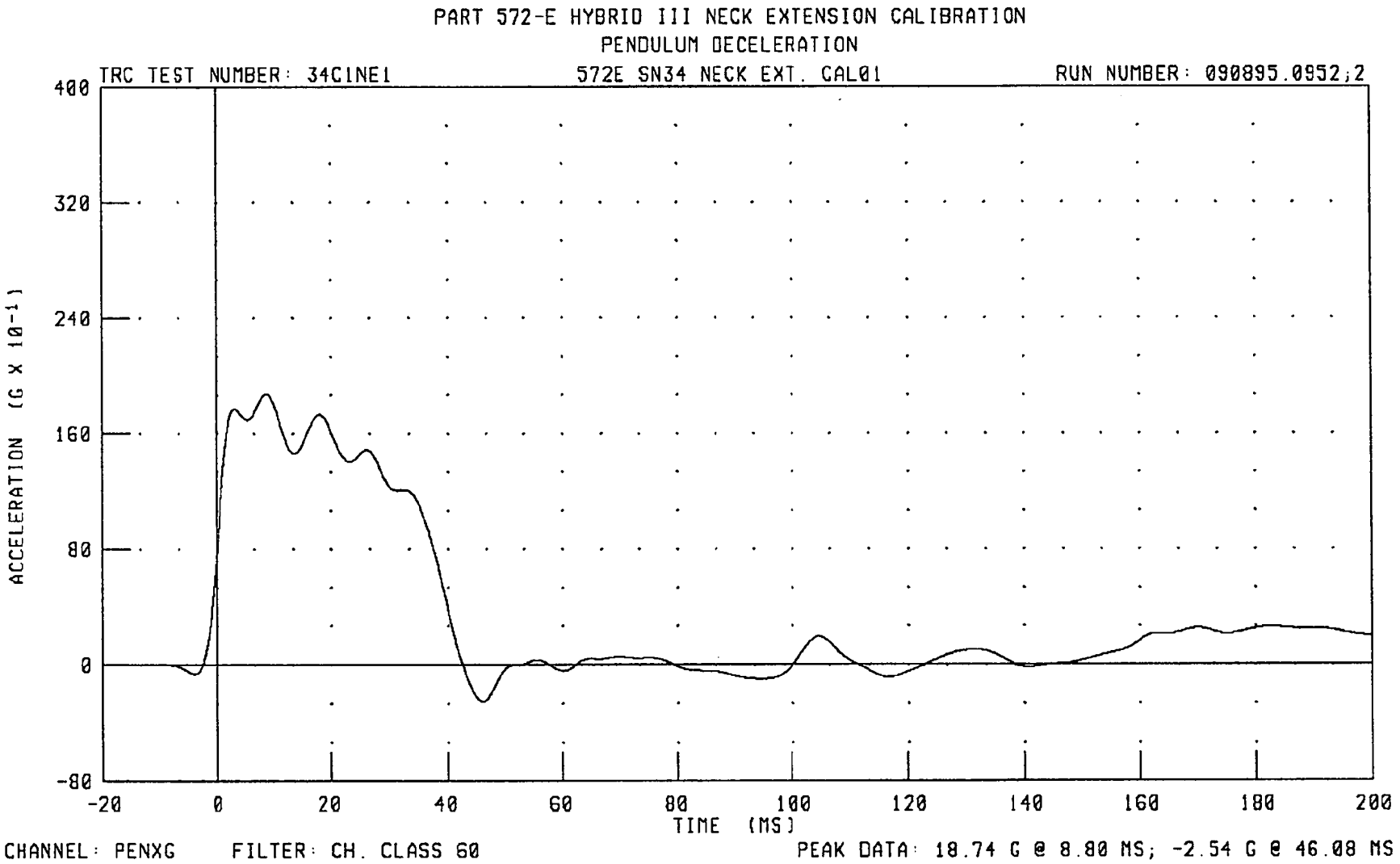
HYBRID III 11-JUL-95

TRC INC. TEST NO: 34C1NE1 572E SN34 NECK EXT. CAL01

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.10 G
	20 MS	14.00 - 19.00 G	16.16 G
	30 MS	11.00 - 16.00 G	12.32 G
MAX PENDULUM G		22 G MAX	18.73 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	12.28 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.36 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	97.53 DEG.
	TIME	72 - 82 MS	74.80 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-71.59 NM
	TIME	65 - 79 MS	69.76 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	154.56 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	142.80 MS

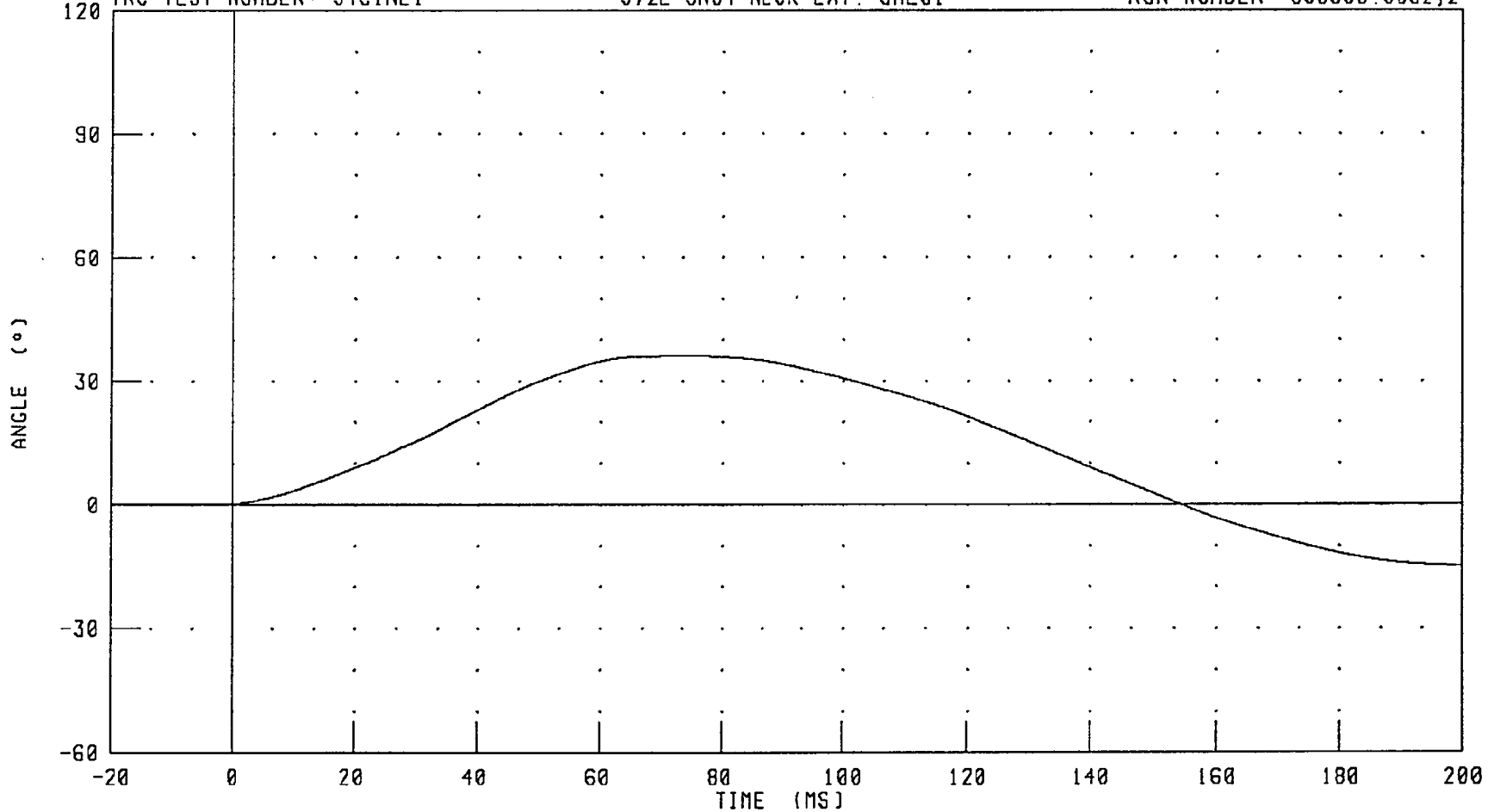
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 071195.1058;2


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 34CINE1
572E SN34 NECK EXT. CAL01
RUN NUMBER: 090895.0952;2
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: 18.74 G @ 8.80 MS; -2.54 G @ 46.08 MS

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

TRC TEST NUMBER: 34C1NE1 572E SN34 NECK EXT. CAL01 RUN NUMBER: 090895.0952;2



CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 36.08 ° @ 73.76 MS; -14.89 ° @ 200.00 MS

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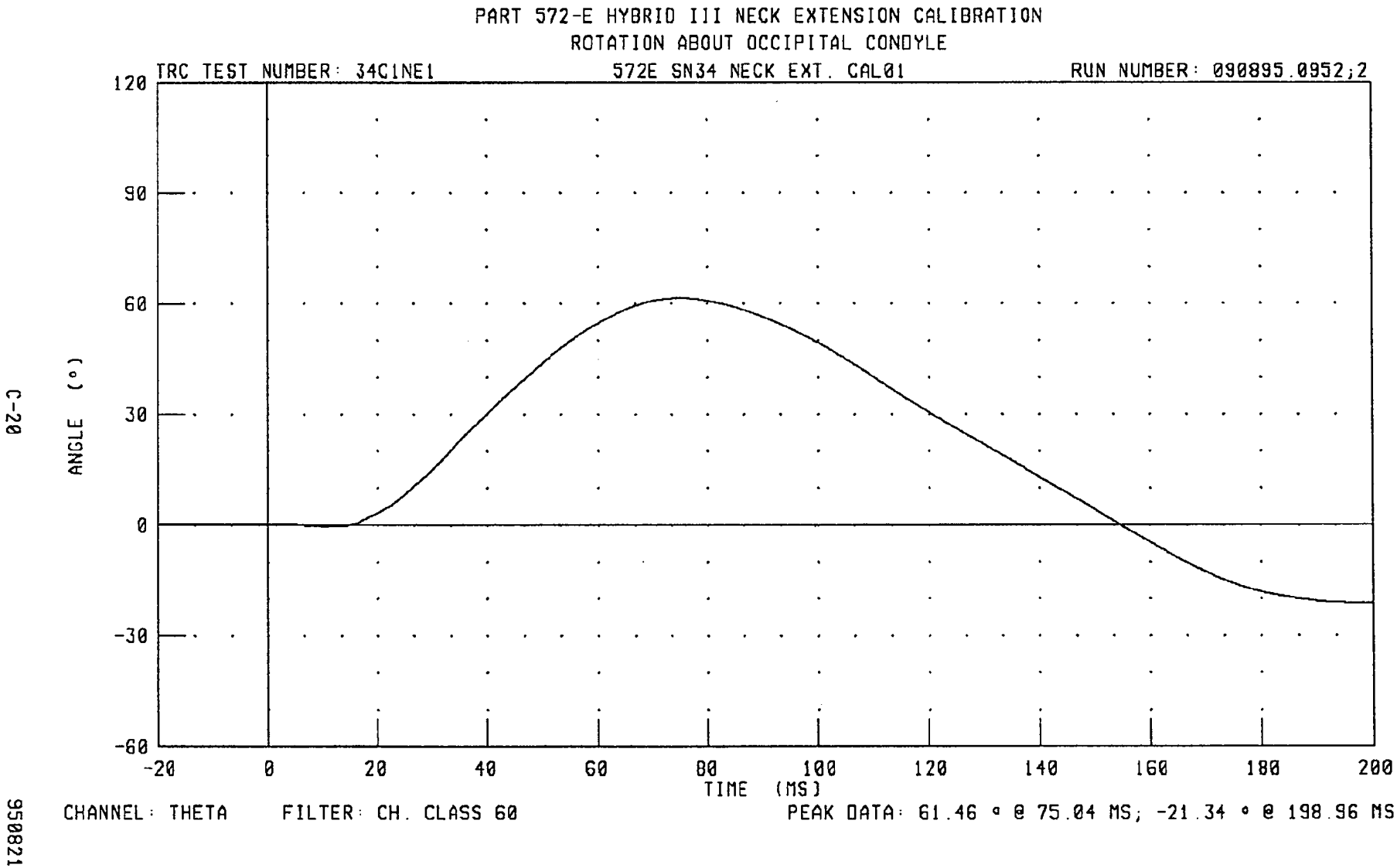
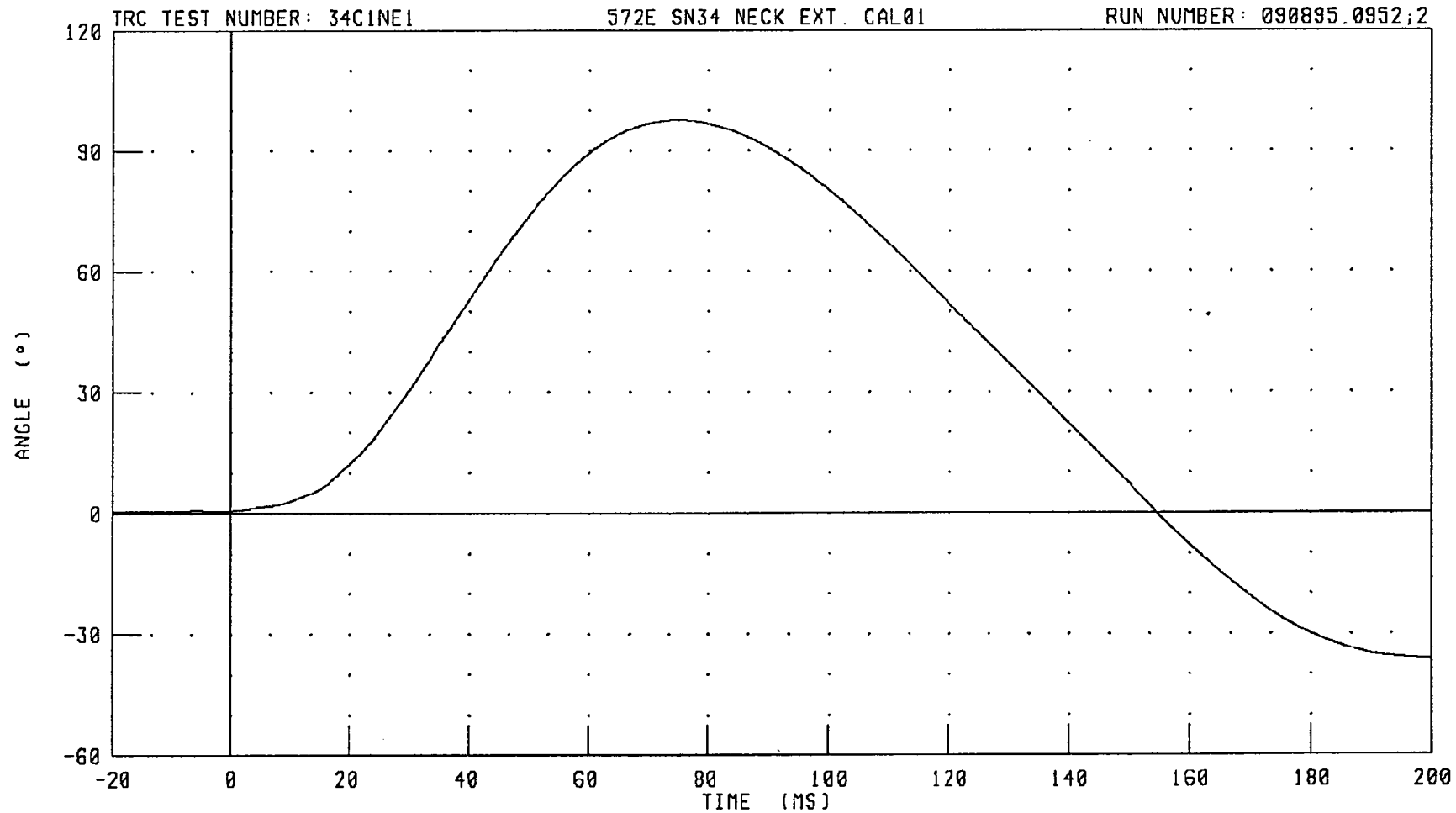
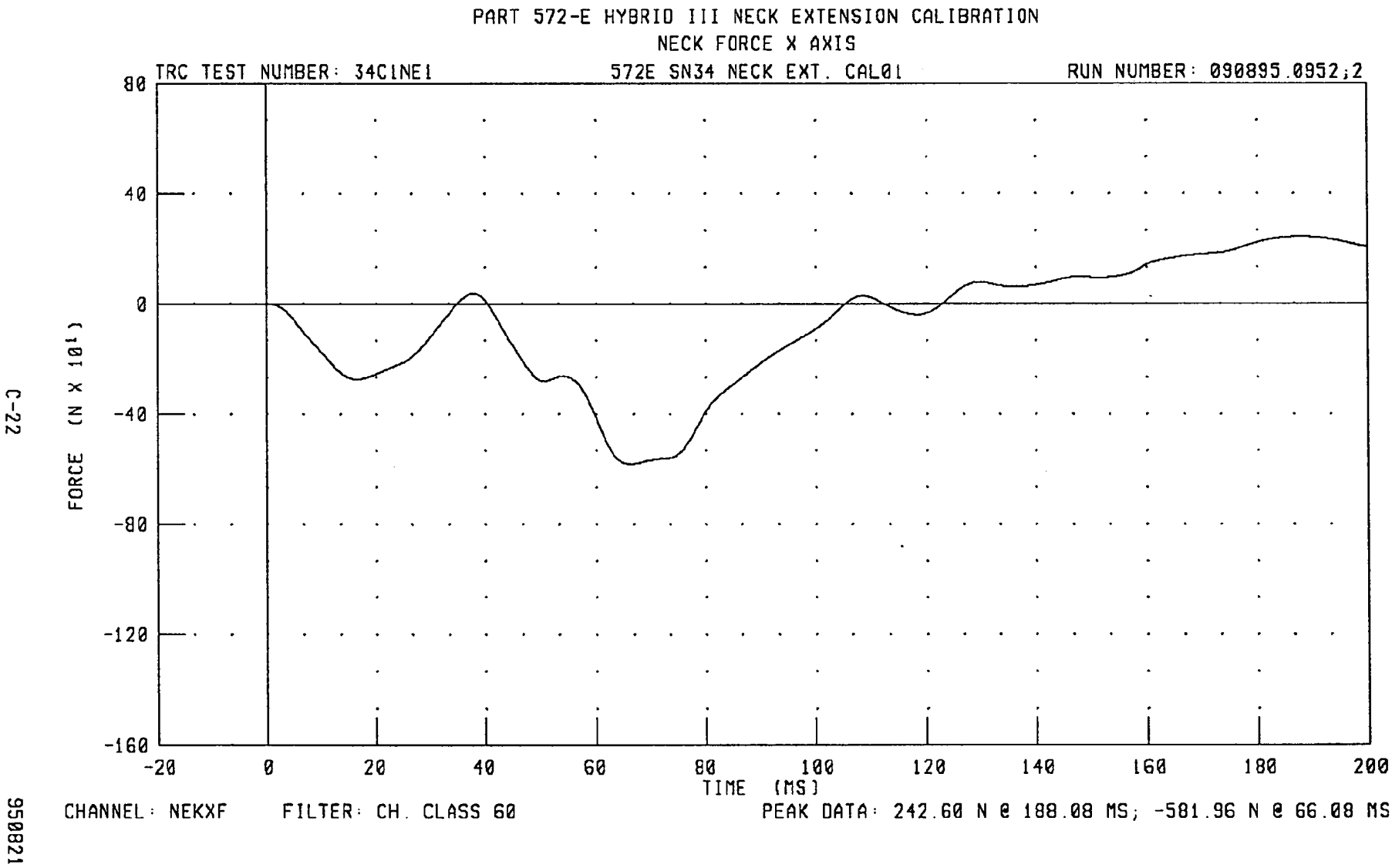
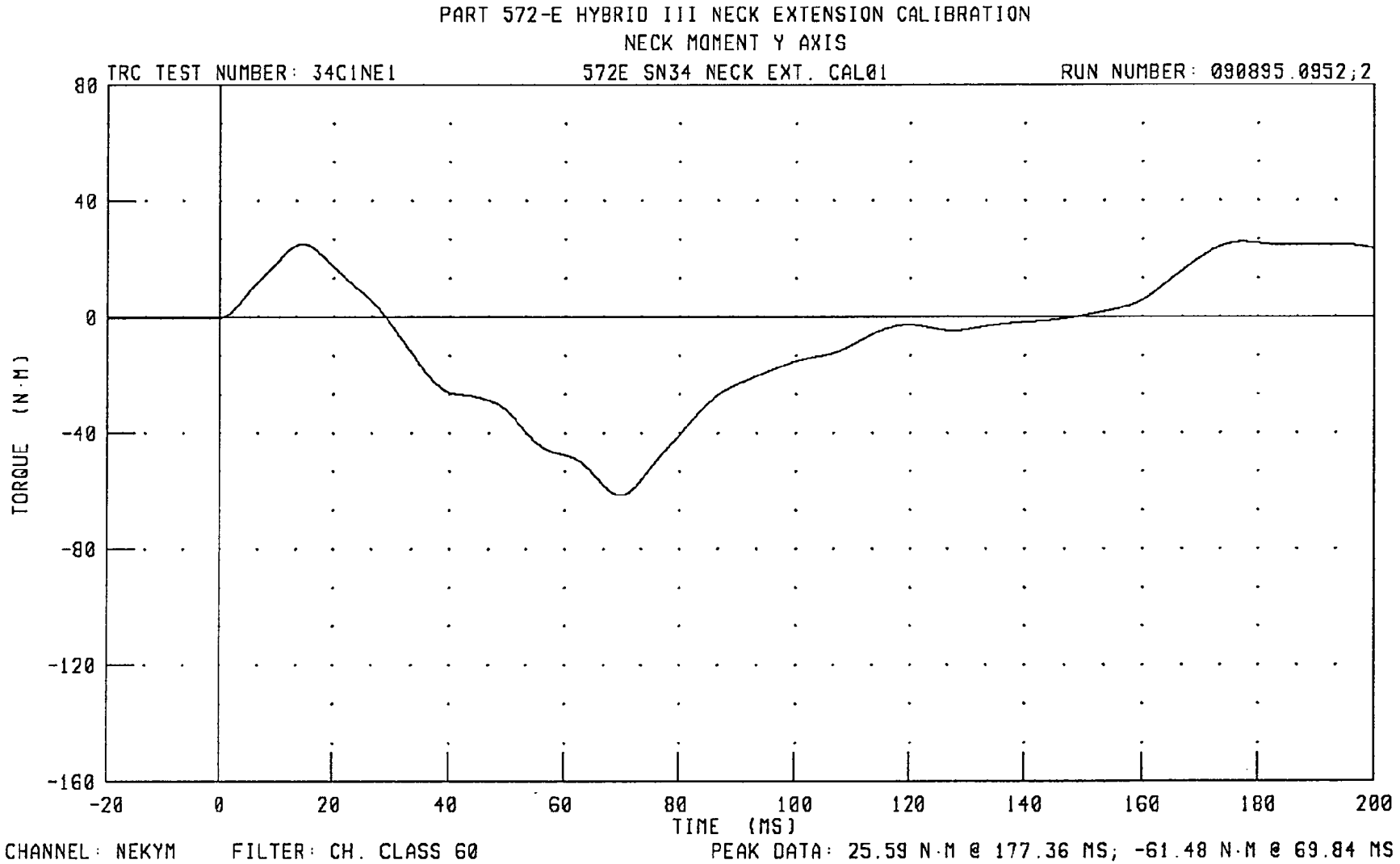

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 34C1NE1
572E SN34 NECK EXT. CAL01
RUN NUMBER: 090895.0952;2
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 61.46 ° @ 75.04 MS; -21.34 ° @ 198.96 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION



950821


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 34C1NE1
572E SN34 NECK EXT. CAL01
RUN NUMBER: 090895.0952;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: 242.60 N @ 188.08 MS; -581.96 N @ 66.08 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 34C1NE1
572E SN34 NECK EXT. CAL01
RUN NUMBER: 090895.0952;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: 25.59 N-M @ 177.36 MS; -61.48 N-M @ 69.84 MS

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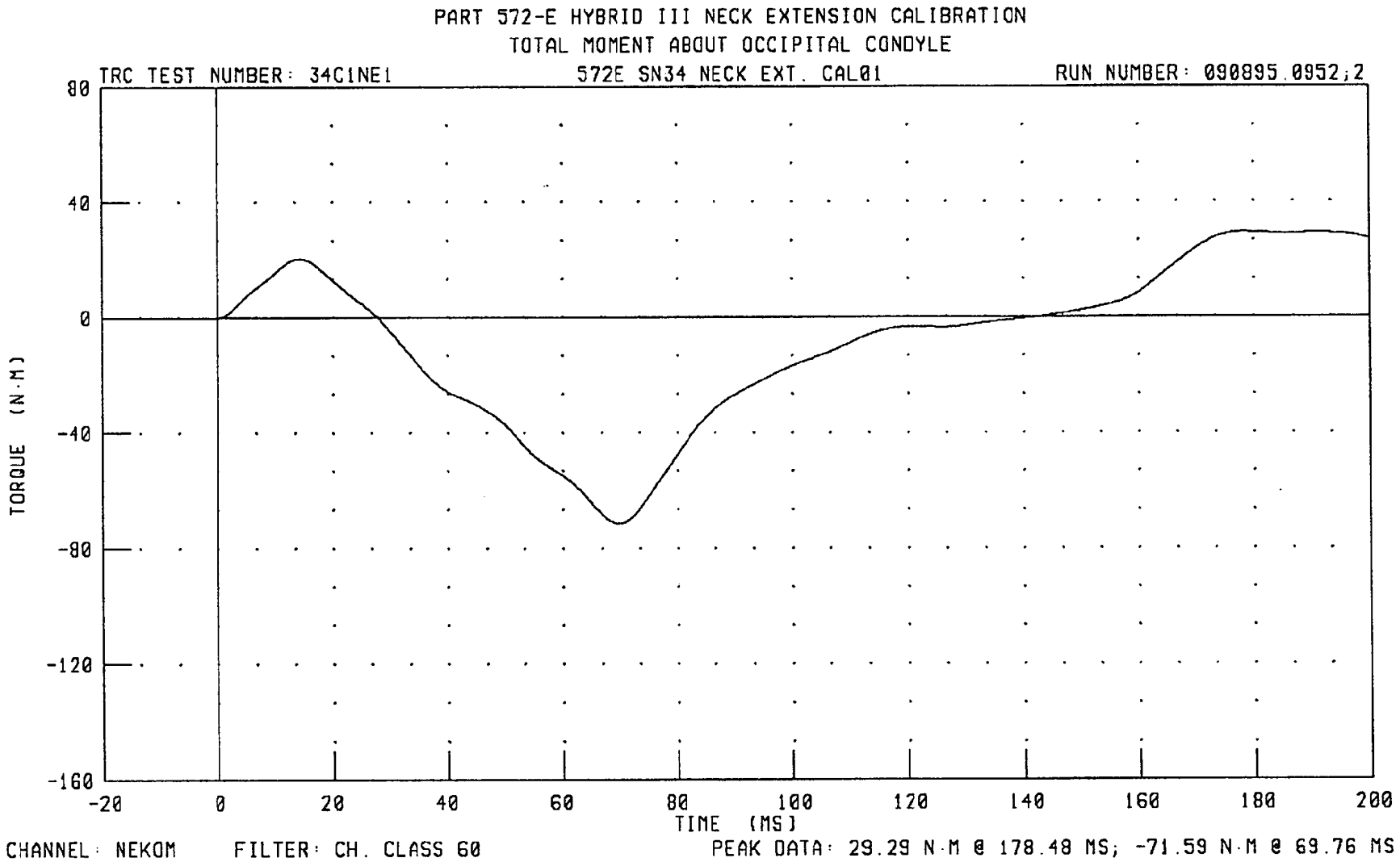

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 34C1NE1
572E SN34 NECK EXT. CAL01
RUN NUMBER: 090895.0952;2
80
40
0
-40
-80
-120
-160
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 29.29 N-M @ 178.48 MS; -71.59 N-M @ 69.76 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 11-JUL-95

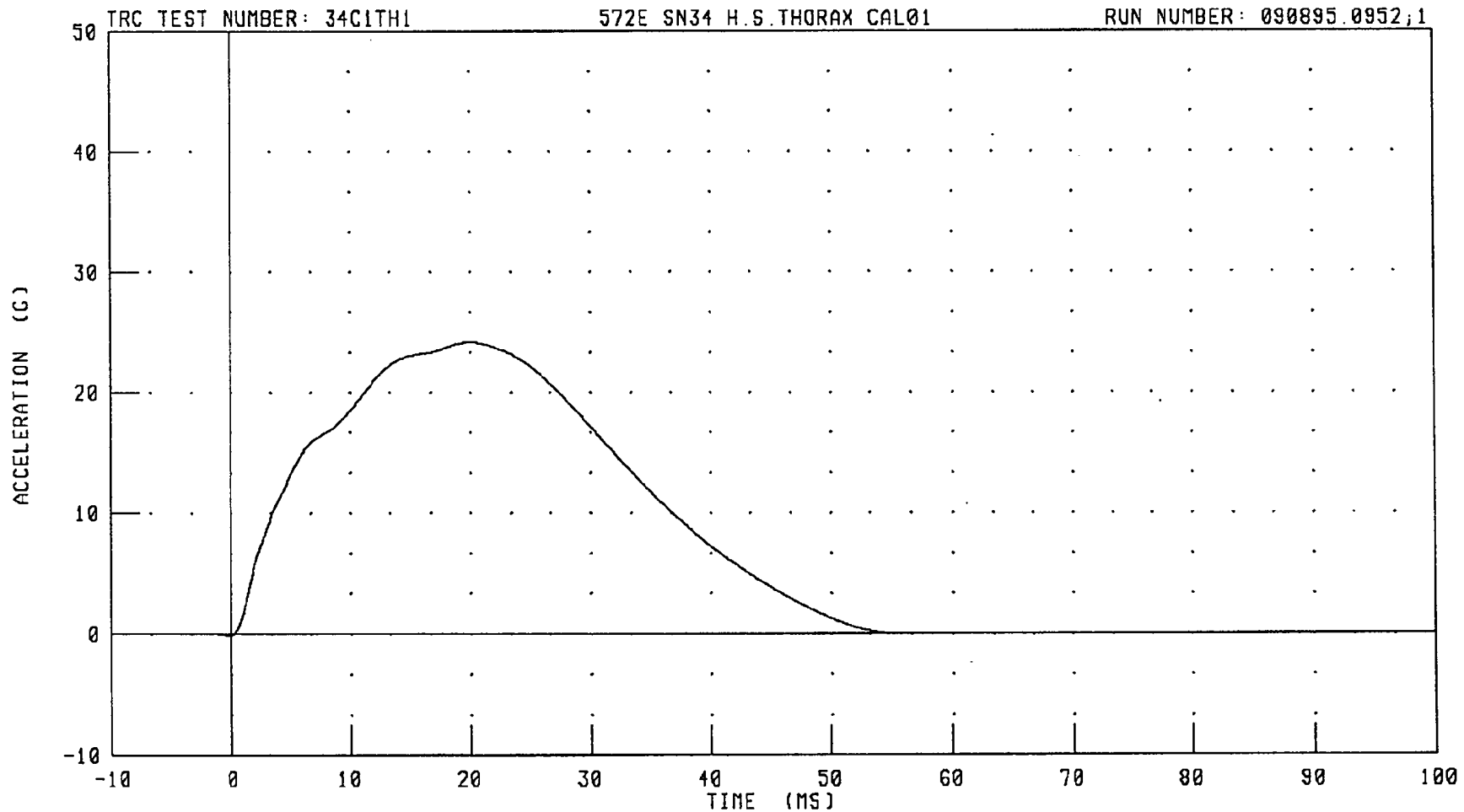
TRC INC. TEST NO: 34C1TH1 572E SN34 H.S.THORAX CAL01

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.65 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	66.4 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5532. N
INTERNAL HYSTERESIS	69% - 85%	73.5%

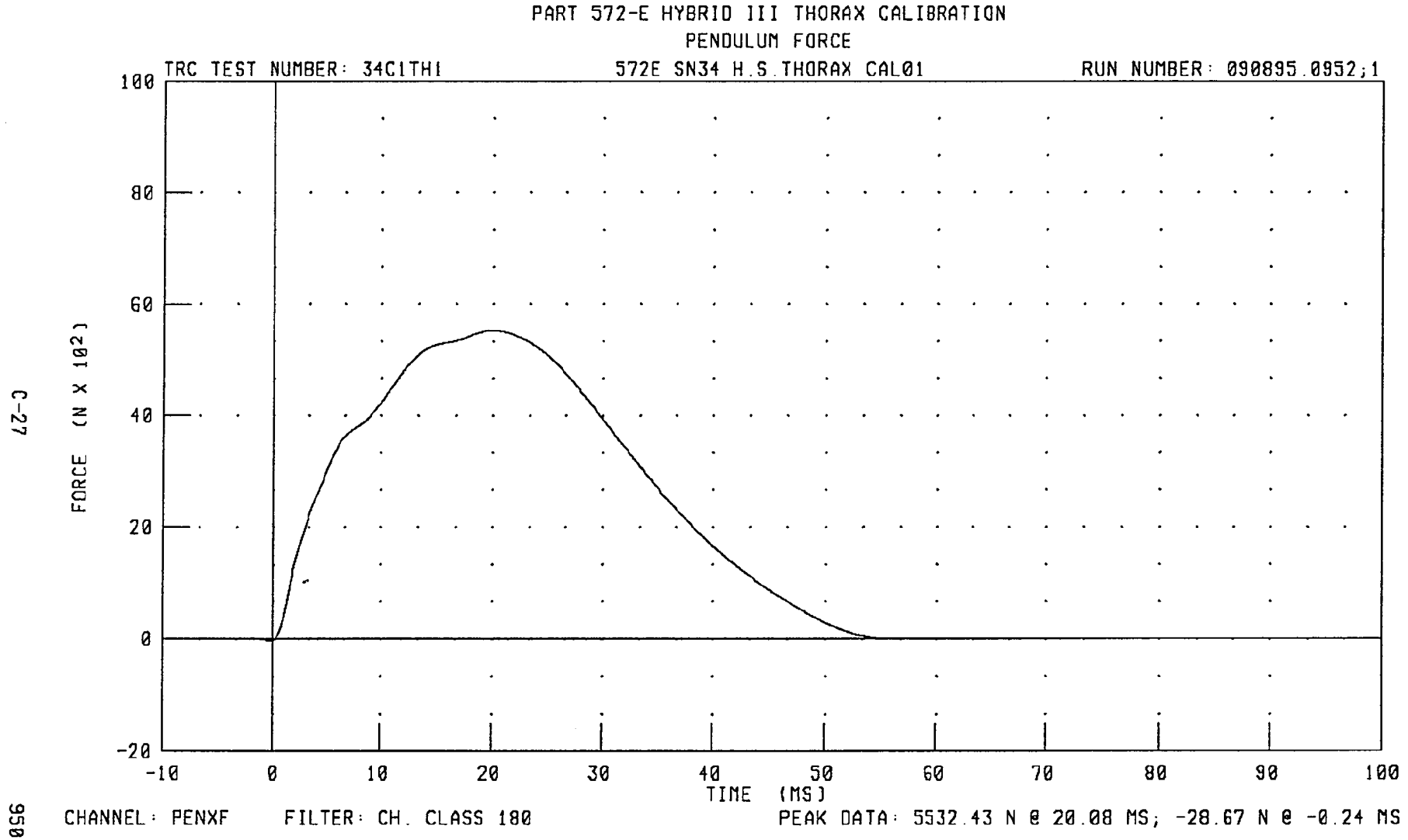
TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet RUN NUMBER: 071195.1502;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 24.15 G @ 20.08 MS; -0.13 G @ -0.24 MS


PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE
TRC TEST NUMBER: 34C1TH1
572E SN34 H.S.THORAX CAL01
RUN NUMBER: 090895.0952;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: 5532.43 N @ 20.08 MS; -28.67 N @ -0.24 MS

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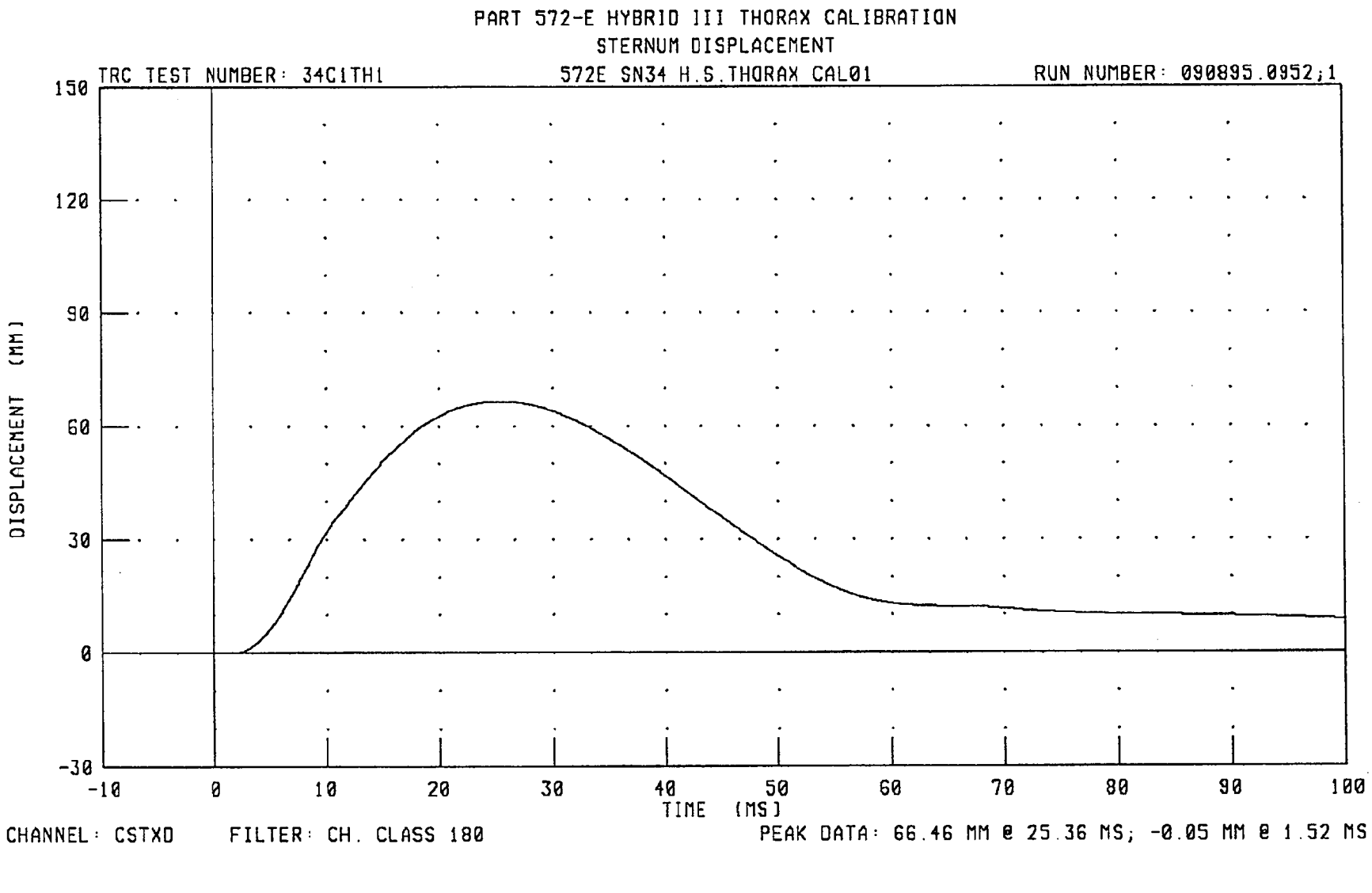
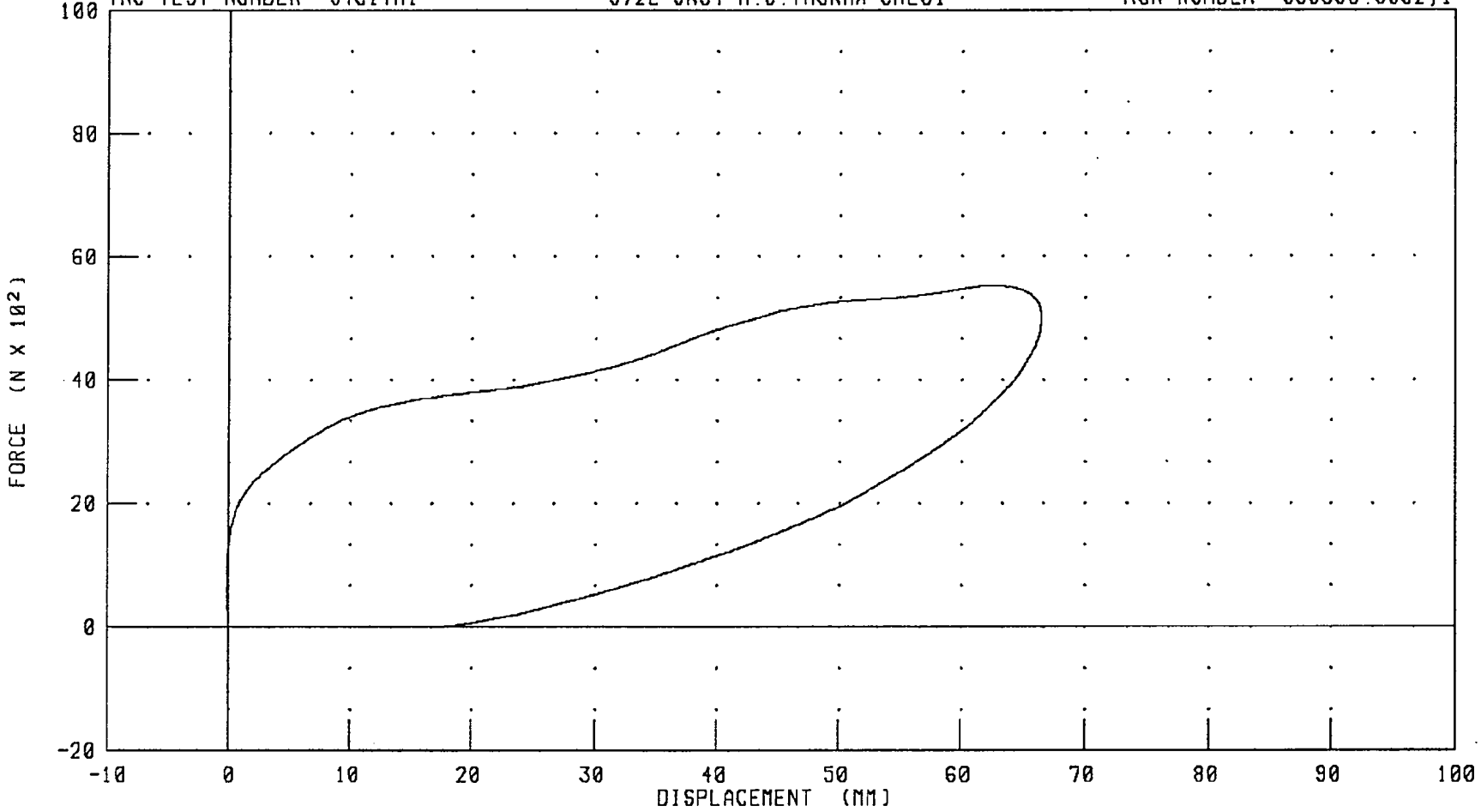

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT
TRC TEST NUMBER: 34C1TH1
572E SN34 H.S.THORAX CAL01
RUN NUMBER: 090895.0952;1
DISPLACEMENT (MM)
150
120
90
60
30
0
-30
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: CSTXD
FILTER: CH. CLASS 180
PEAK DATA: 66.46 MM @ 25.36 MS; -0.05 MM @ 1.52 MS

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

TRC TEST NUMBER: 34C1TH1 572E SN34 H.S.THORAX CAL01 RUN NUMBER: 090895.0952;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 66.46 MM @ 25.36 MS; -0.05 MM @ 1.52 MS
PENXF CH. CLASS 180 5532.43 N @ 20.08 MS; -28.67 N @ -0.24 MS

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TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

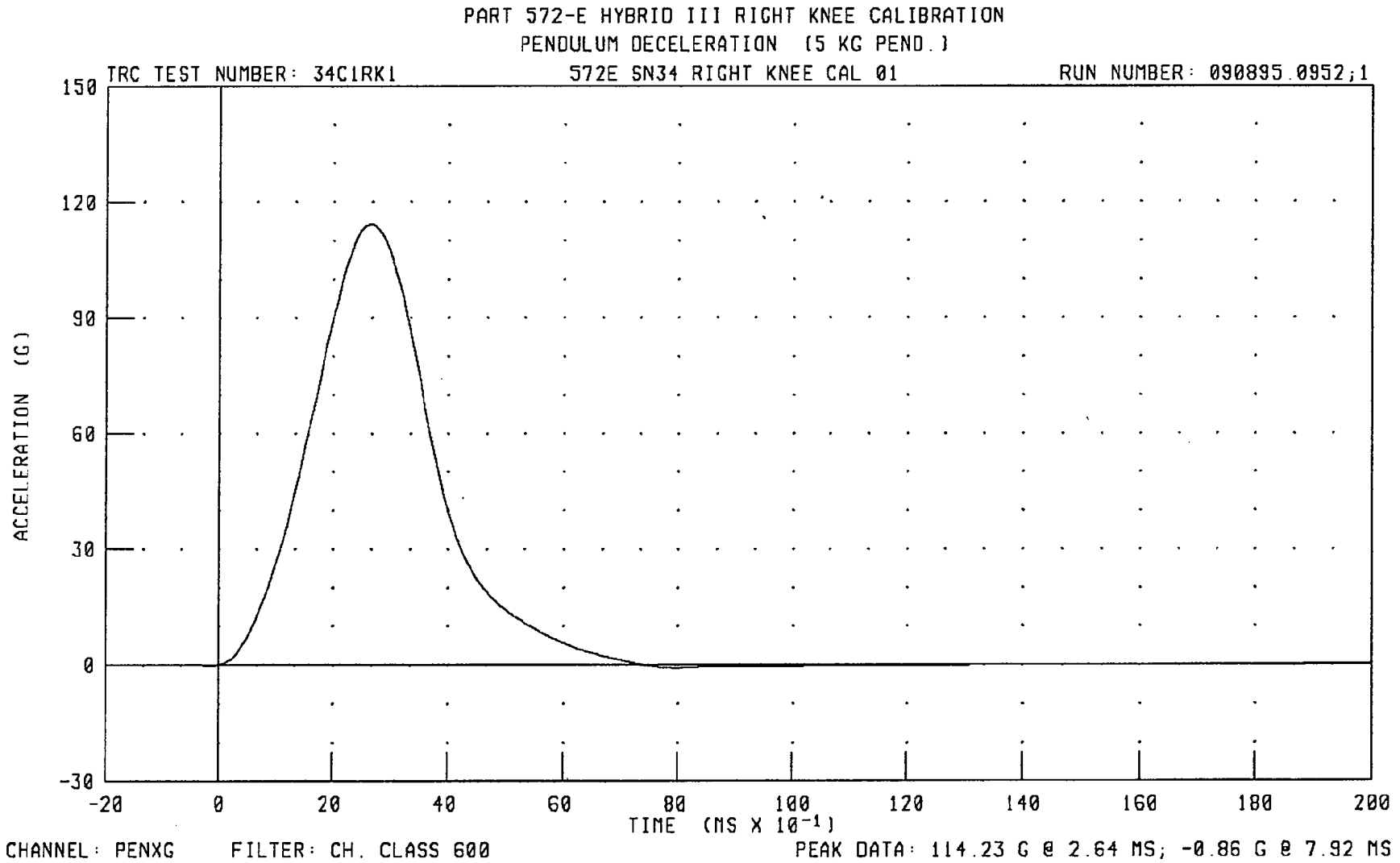
HYBRID III 11-JUL-95

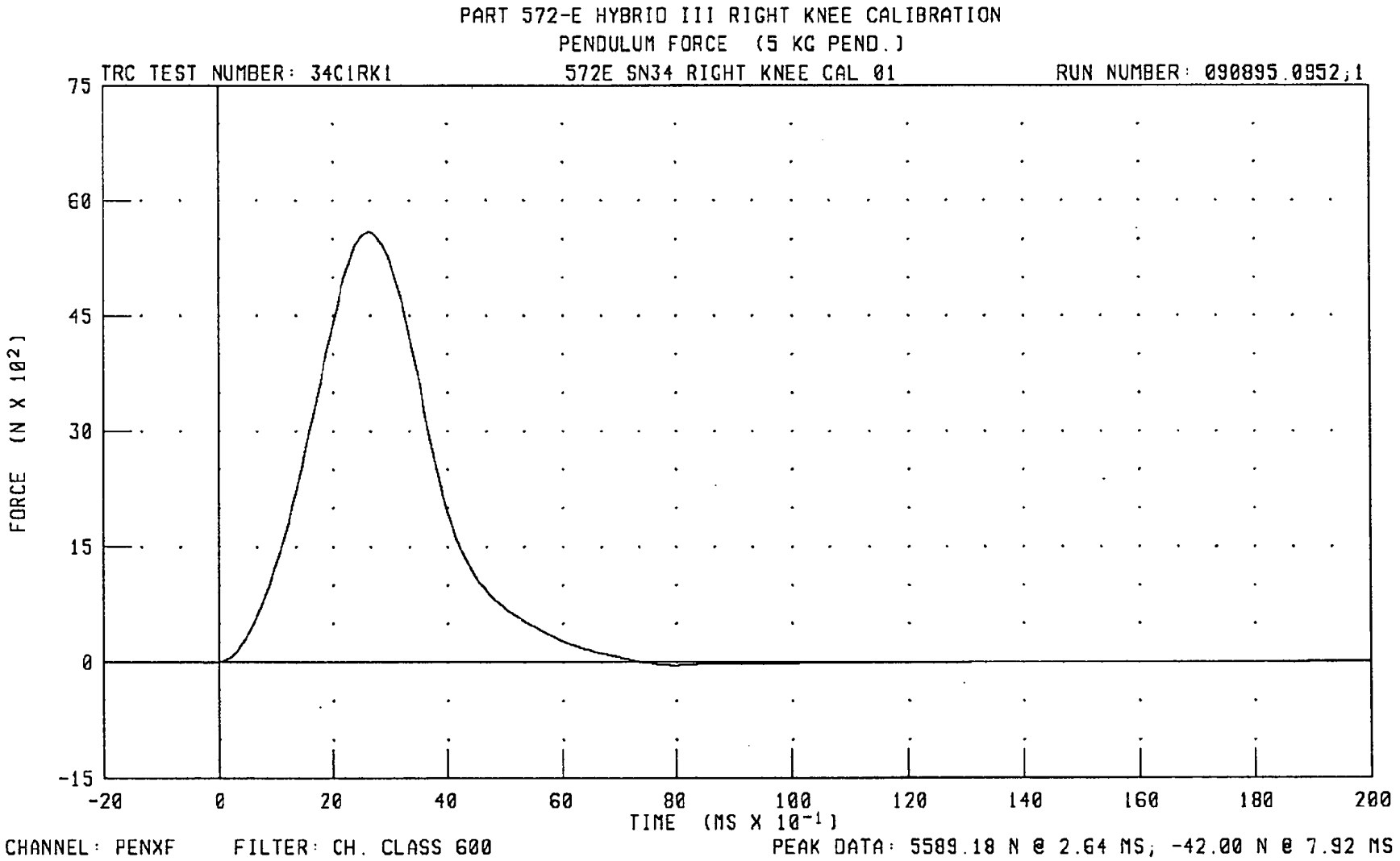
TRC INC. TEST NO: 34C1RK1 572E SN34 RIGHT KNEE CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5589.1 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton RUN NUMBER: 071195.1244;1


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 34C1RK1
572E SN34 RIGHT KNEE CAL 01
RUN NUMBER: 090895.0952;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: 114.23 G @ 2.64 MS; -0.86 G @ 7.92 MS


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 34C1RK1
572E SN34 RIGHT KNEE CAL 01
RUN NUMBER: 090895.0952;1
75
60
45
30
15
0
-15
FORCE (N X 10²)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXF
FILTER: CH. CLASS 600
PEAK DATA: 5589.18 N @ 2.64 MS; -42.00 N @ 7.92 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

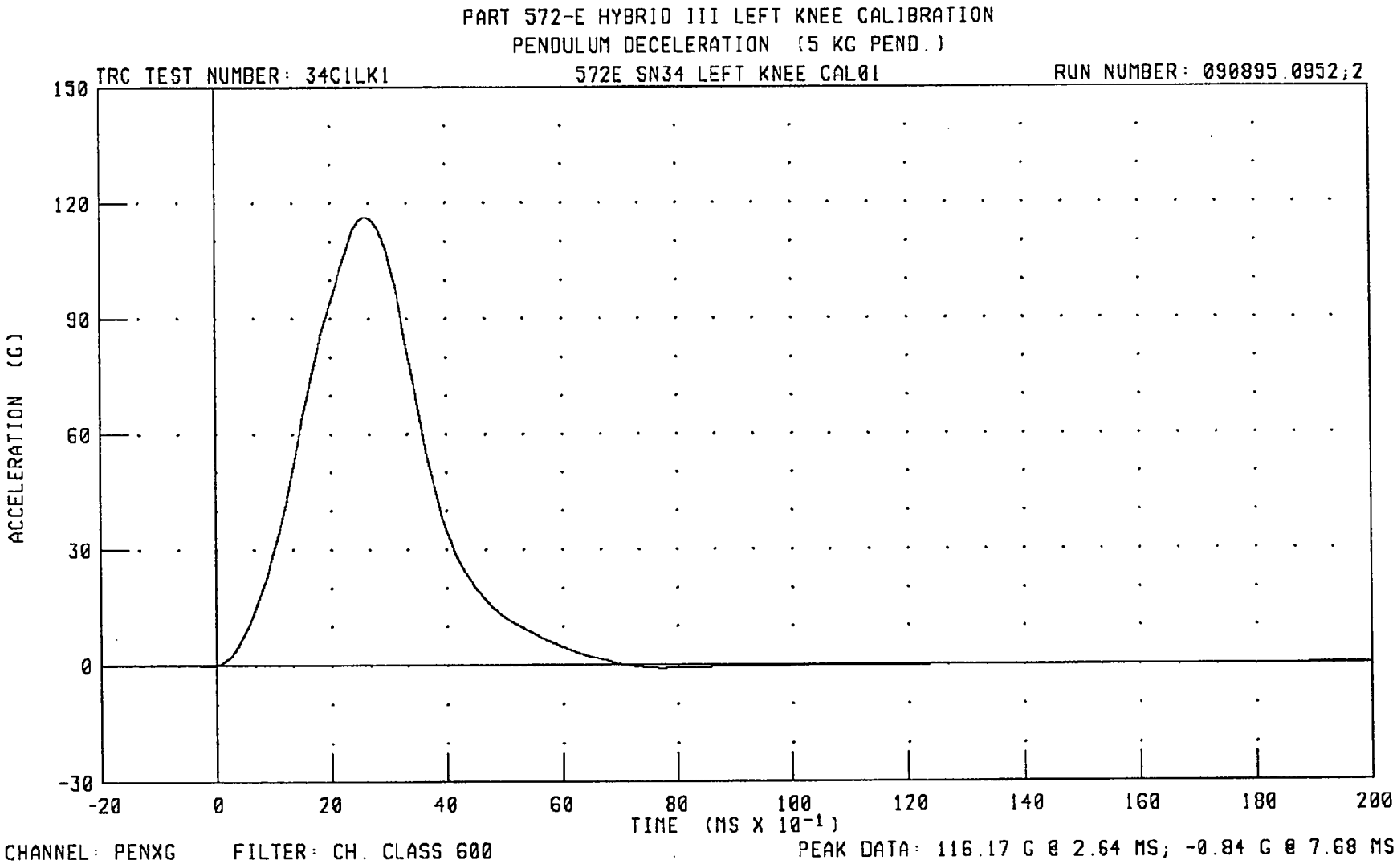
HYBRID III 11-JUL-95

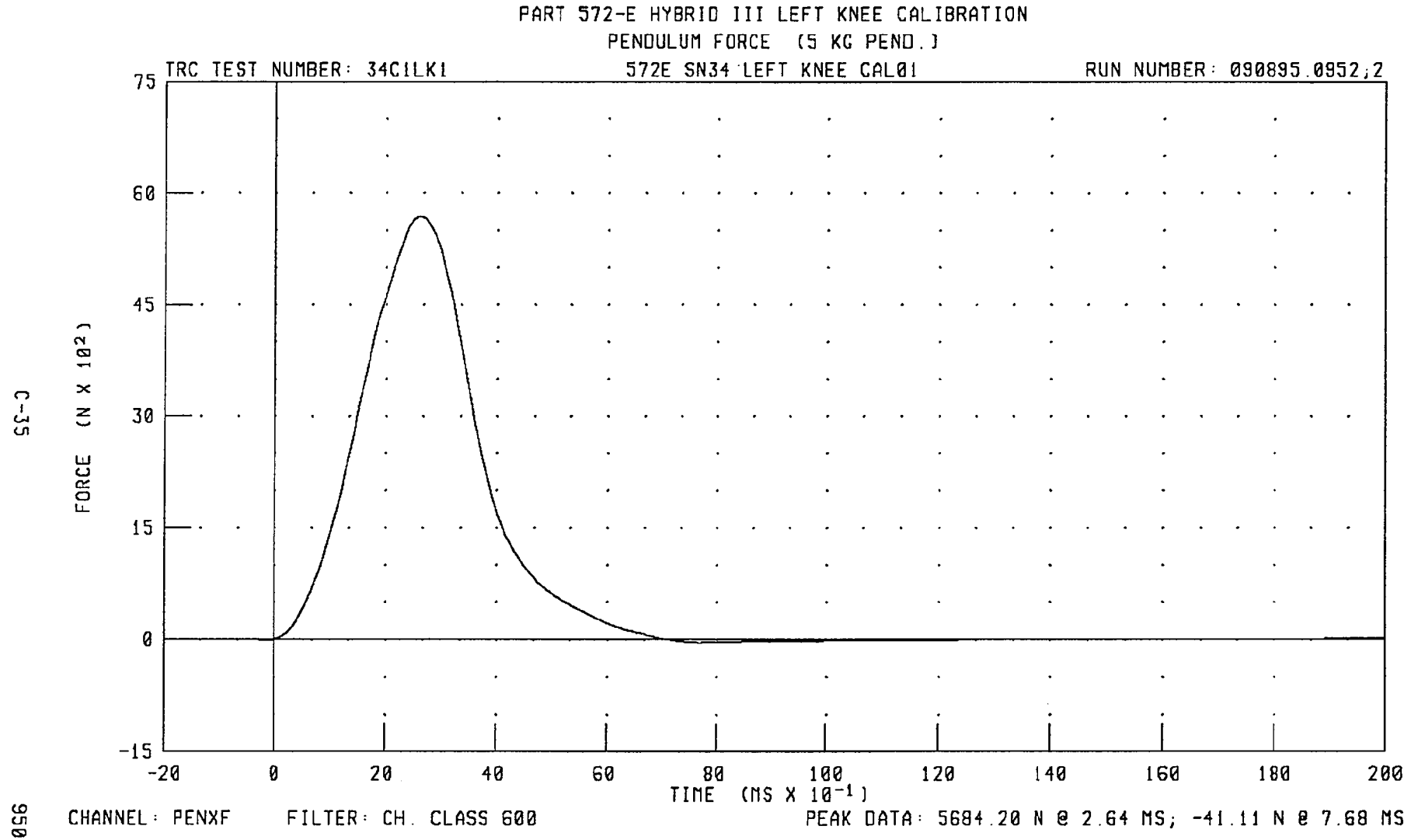
TRC INC. TEST NO: 34C1LK1 572E SN34 LEFT KNEE CAL01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5684.2 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet RUN NUMBER: 071195.1240;2


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 34C1LK1
572E SN34 LEFT KNEE CAL01
RUN NUMBER: 090895.0952;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: 116.17 G @ 2.64 MS; -0.84 G @ 7.68 MS


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 34C1LK1
572E SN34 LEFT KNEE CAL01
RUN NUMBER: 090895.0952;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: 5684.20 N @ 2.64 MS; -41.11 N @ 7.68 MS

Pre-Test Calibration

Serial Number 35

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
35 VECTOR

TRC INC. TEST NO: 35C1ED1 572E SN35 EXT.DIMENSION CAL01 11-JUL-95

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	988. MM
WAIST CIRCUMFERENCE	(Z)	836 - 866 MM	848. MM
CHEST DEPTH	(O)	213 - 229 MM	218. MM
H-POINT HEIGHT	(C)	84 - 89 MM	86. 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	886. MM
THIGH CLEARANCE	(F)	140 - 155 MM	152. MM
BUTTOCK KNEE LENGTH	(K)	579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH	(N)	452 - 478 MM	475. MM
POPLITEAL HEIGHT	(L)	429 - 455 MM	442. MM
KNEE PIVOT HEIGHT	(M)	485 - 500 MM	500. MM
FOOT LENGTH	(P)	252 - 267 MM	254. MM
FOOT BREADTH	(W)	91 - 107 MM	94. MM
SHOULDER PIVOT FROM BACKLINE	(E)	84 - 94 MM	91. MM
SHOULDER BREADTH	(V)	422 - 437 MM	427. MM
SHOULDER PIVOT HEIGHT	(B)	506 - 521 MM	511. MM
ELBOW REST HEIGHT	(J)	191 - 211 MM	203. MM
SHOULDER-ELBOW LENGTH	(I)	330 - 345 MM	343. MM
BACK OF ELBOW TO WRIST PIVOT	(G)	290 - 305 MM	297. MM

DUMMY MEETS SPECIFICATIONS
TECHNICIAN Chas. Middlet RUN NUMBER: 071295.1437

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 11-JUL-95

TRC INC. TEST NO: 35C1HD1 572E SN35 HEAD DROP CAL 01

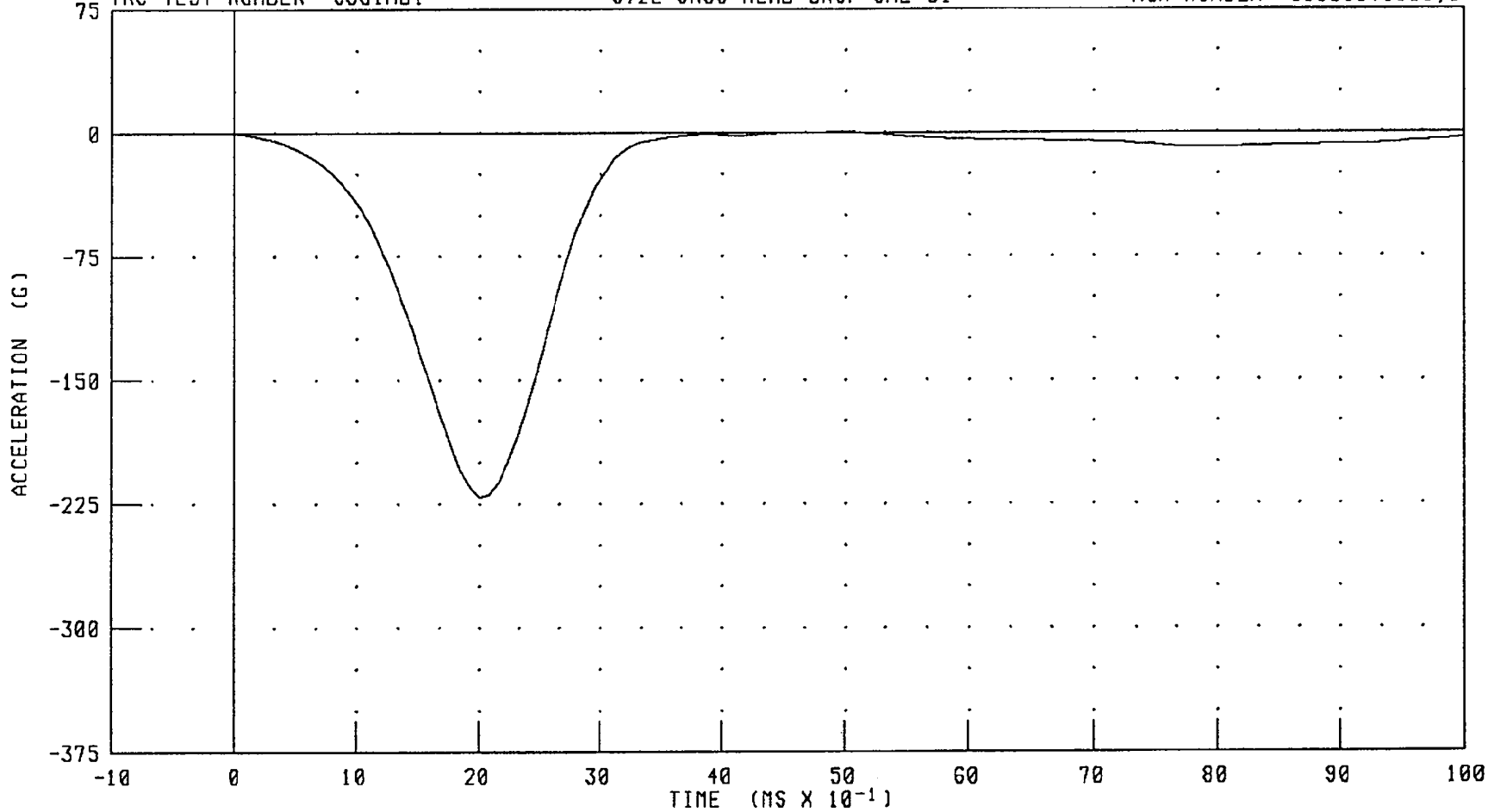
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	256.29 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.97 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas Muddlet RUN NUMBER: 071195.0754;1

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

TRC TEST NUMBER: 35C1H01 572E SN35 HEAD DROP CAL 01 RUN NUMBER: 090895.0956;1



CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 0.71 G @ 4.96 MS; -220.80 G @ 2.00 MS

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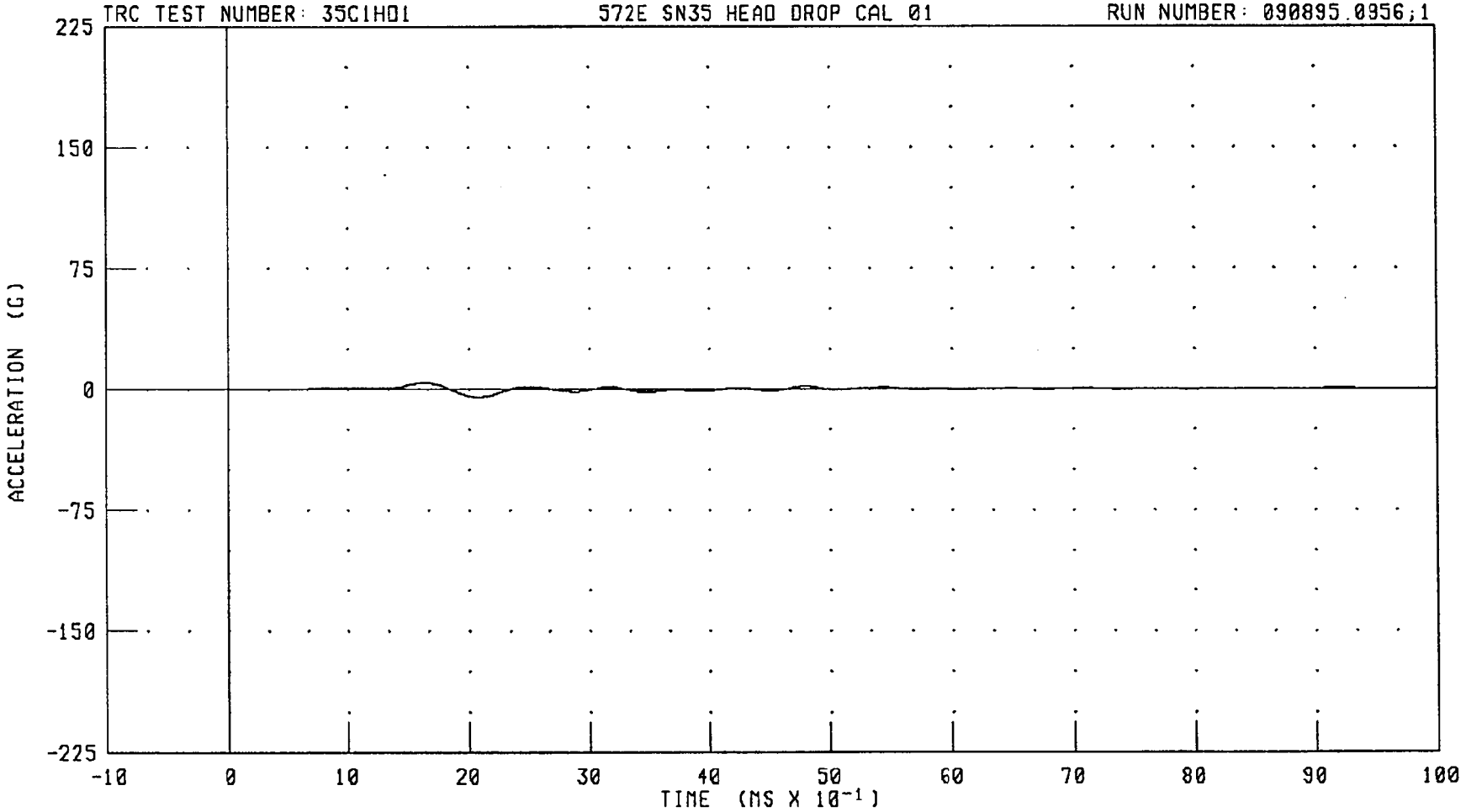
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 35C1HD1 572E SN35 HEAD DROP CAL 01 RUN NUMBER: 090895.0956;1



CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 4.04 G @ 1.60 MS; -4.97 G @ 2.08 MS

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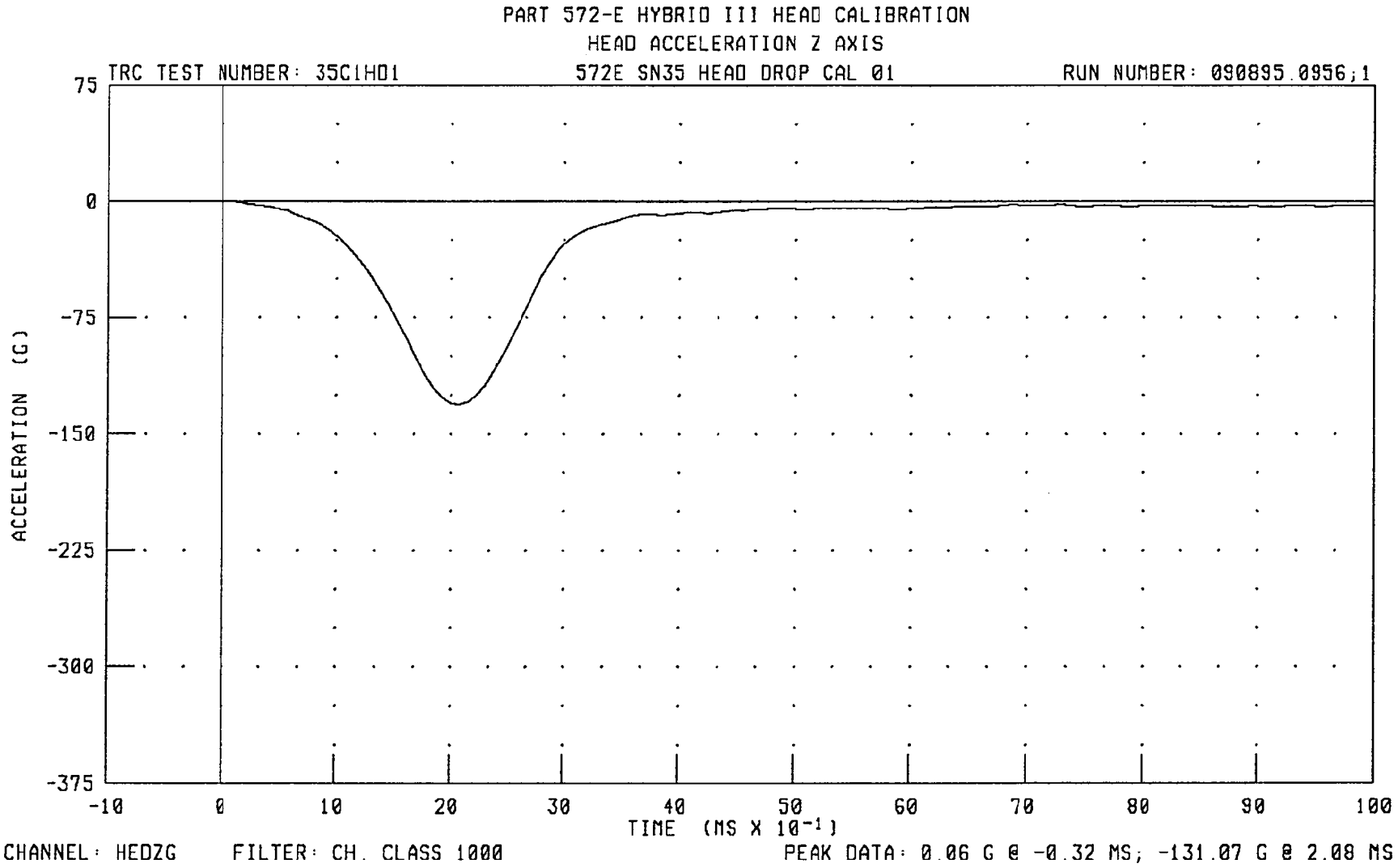
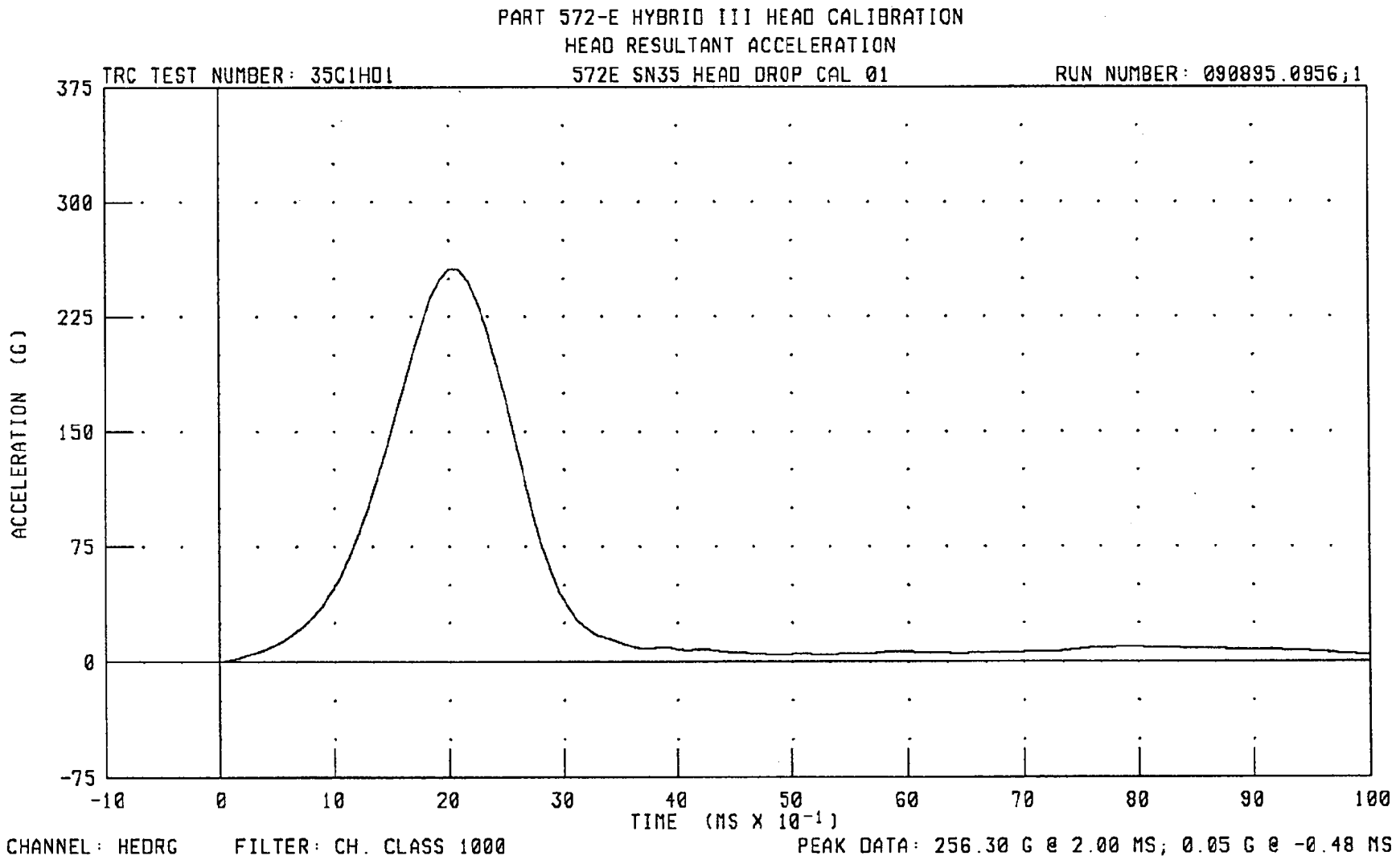

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
TRC TEST NUMBER: 35C1HD1
572E SN35 HEAD DROP CAL 01
RUN NUMBER: 090895.0956;1
75
0
-75
-150
-225
-300
-375
ACCELERATION (G)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10-1)
CHANNEL: HEDZG
FILTER: CH. CLASS 1000
PEAK DATA: 0.06 G @ -0.32 MS; -131.07 G @ 2.08 MS


PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
TRC TEST NUMBER: 35C1HD1
572E SN35 HEAD DROP CAL 01
RUN NUMBER: 090895.0956;1
ACCELERATION (G)
375
300
225
150
75
0
-75
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS X 10⁻¹)
CHANNEL: HEDRG
FILTER: CH. CLASS 1000
PEAK DATA: 256.30 G @ 2.00 MS; 0.05 G @ -0.48 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

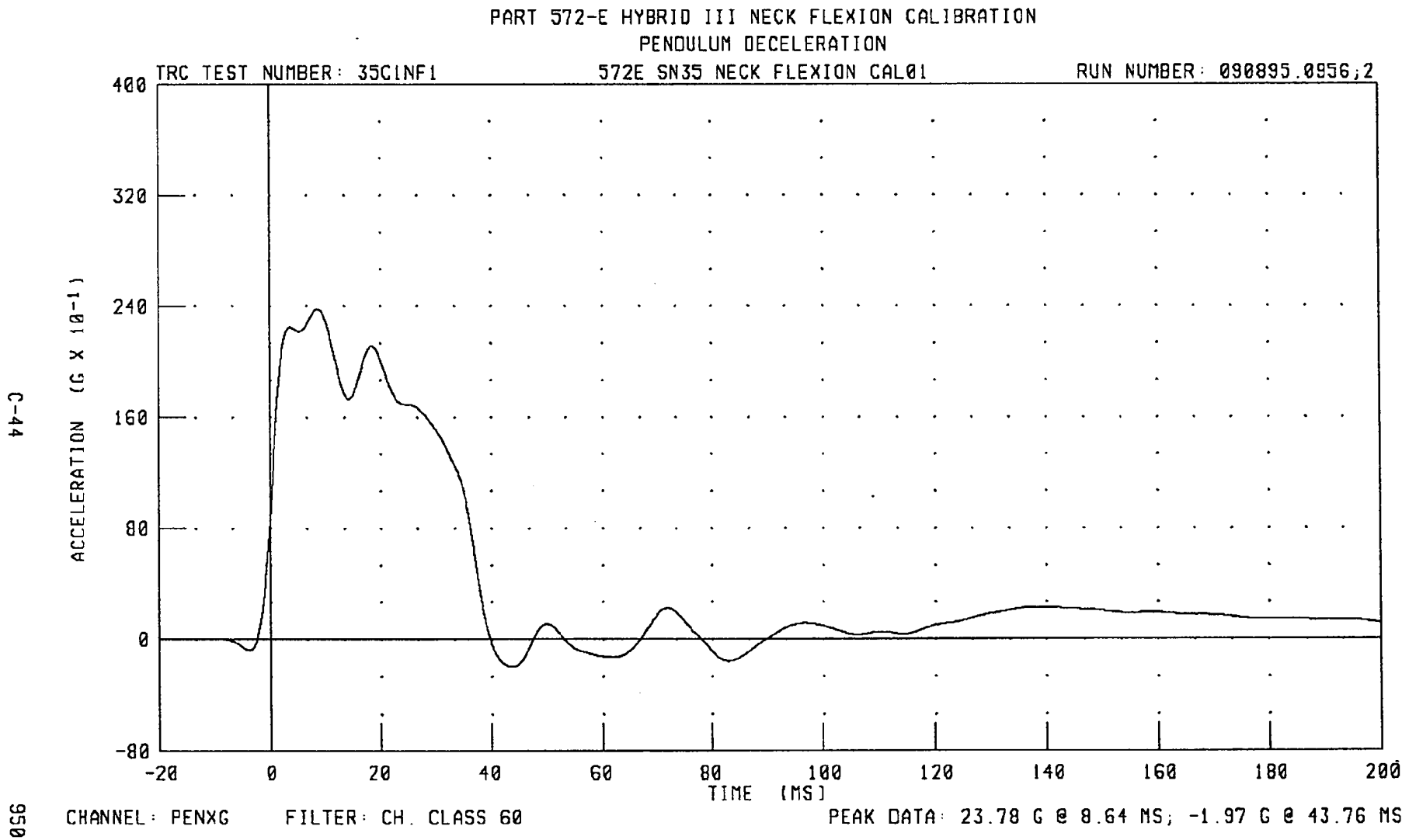
HYBRID III 11-JUL-95

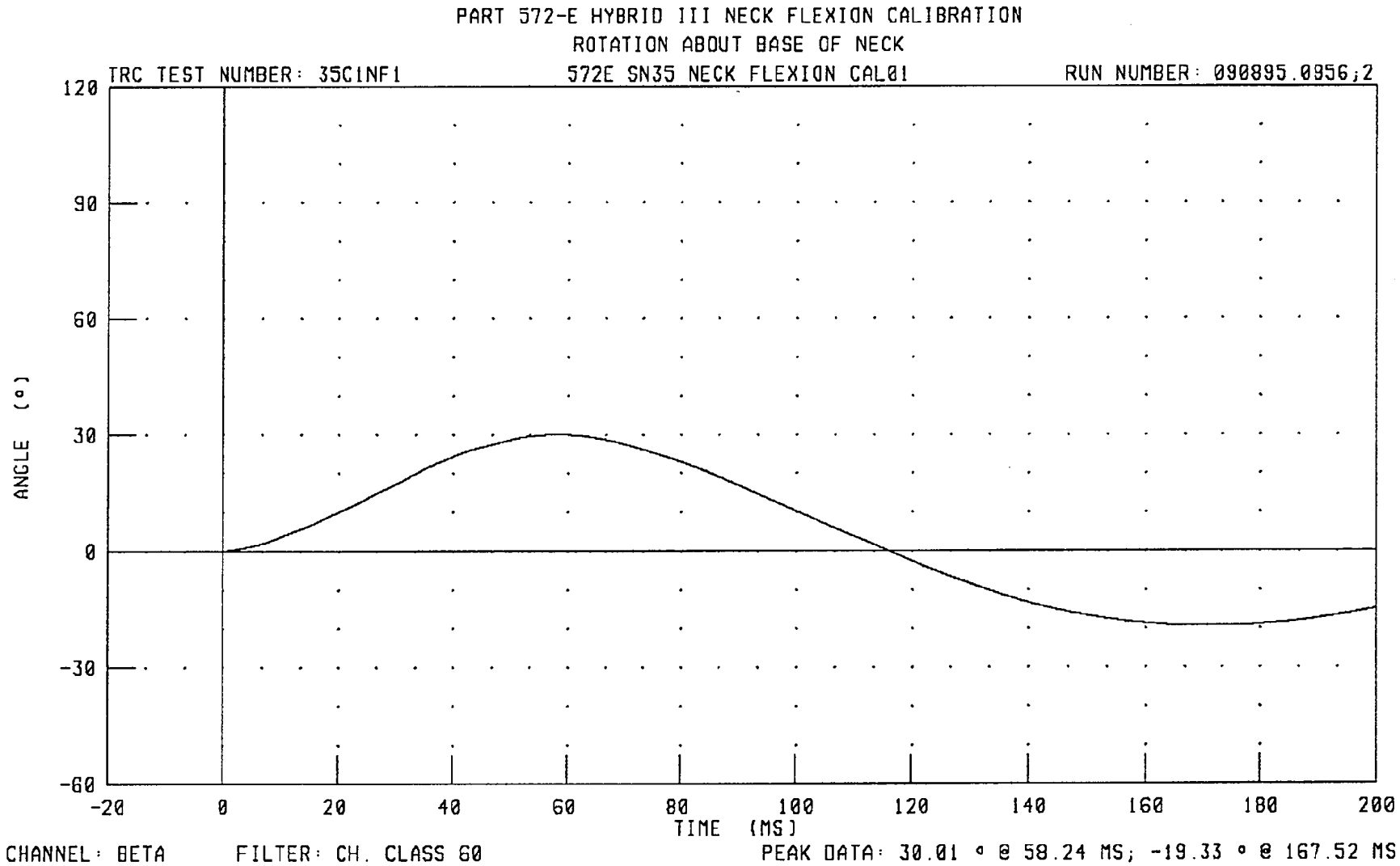
TRC INC. TEST NO: 35C1NF1 572E SN35 NECK FLEXION CAL01

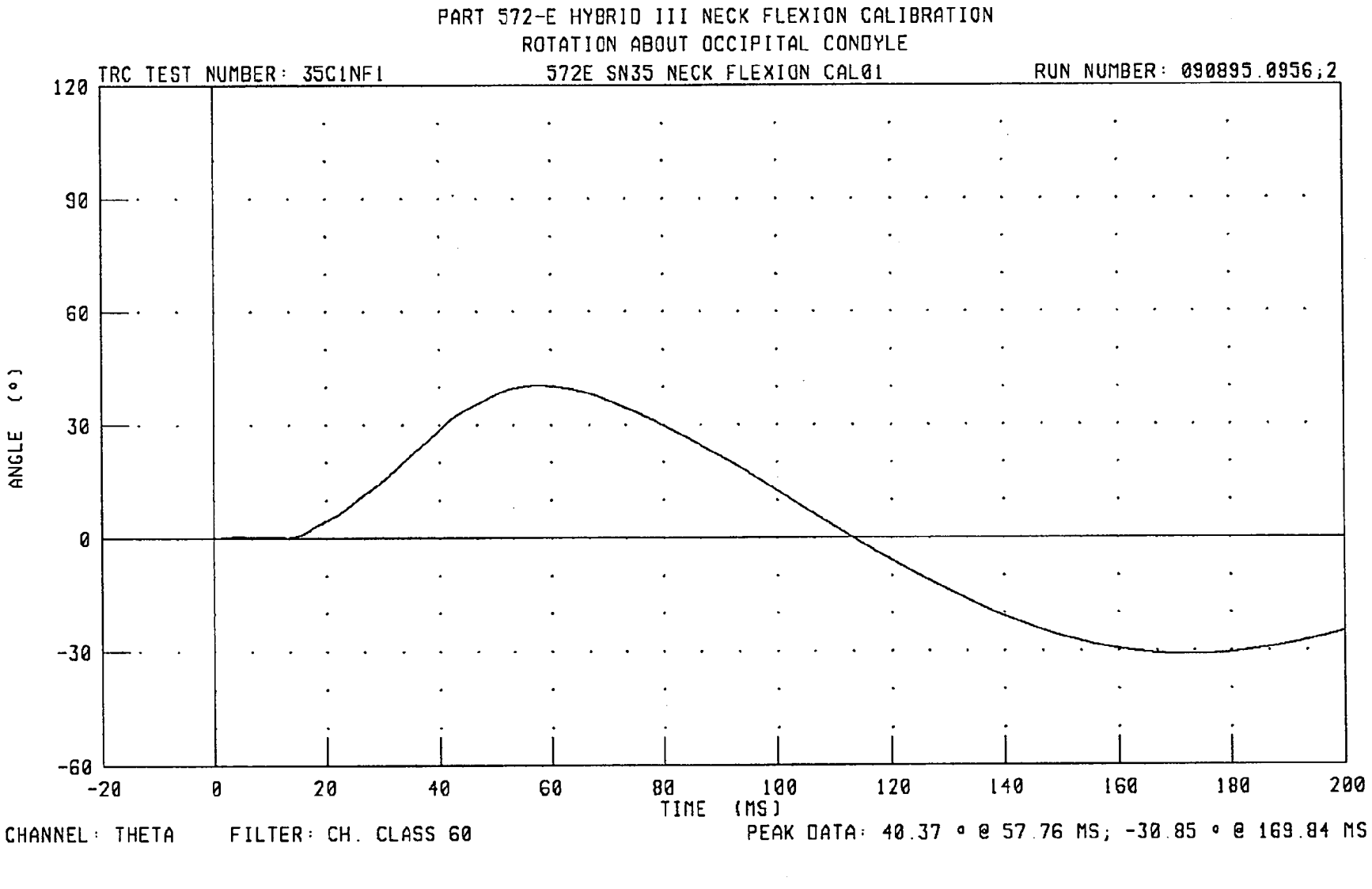
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.98 G
	20 MS	17.60 - 22.60 G	20.12 G
	30 MS	12.50 - 18.50 G	15.08 G
MAX PENDULUM G		29 G MAX	23.77 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.03 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.36 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	70.37 DEG.
	TIME	57 - 64 MS	58.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	96.89 NM
	TIME	47 - 58 MS	50.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.48 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.60 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Mitchell RUN NUMBER: 071195.0843;2

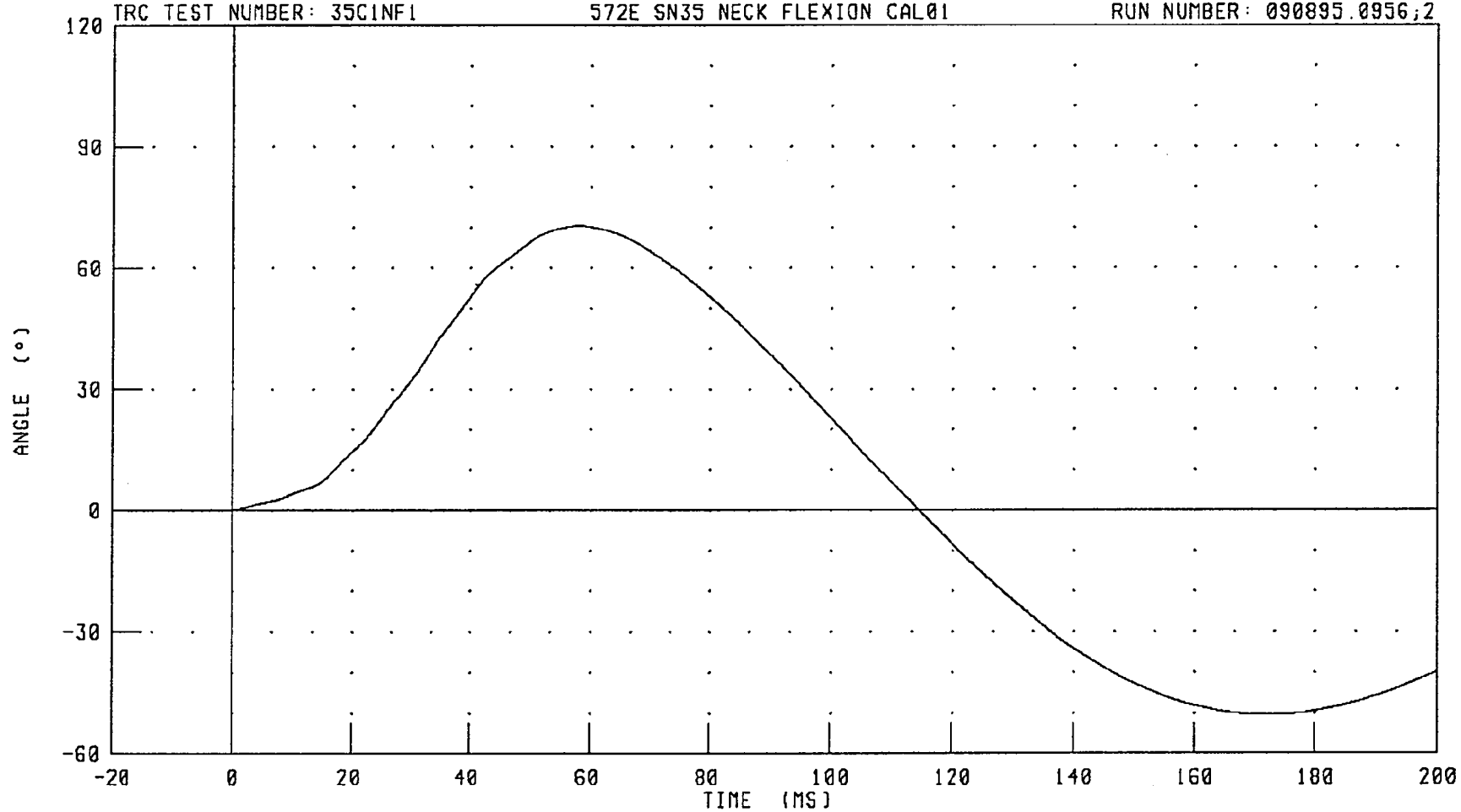

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 35CINF1
572E SN35 NECK FLEXION CAL01
RUN NUMBER: 090895.0956;2
400
320
240
160
80
0
-80
ACCELERATION (G X 10-1)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 60
PEAK DATA: 23.78 G @ 8.64 MS; -1.97 G @ 43.76 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 35C1NF1
572E SN35 NECK FLEXION CAL01
RUN NUMBER: 090895.0956;2
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: 30.01 ° @ 58.24 MS; -19.33 ° @ 167.52 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 35C1NF1
572E SN35 NECK FLEXION CAL01
RUN NUMBER: 090895.0956;2
120
90
60
30
0
-30
-60
ANGLE (°)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: THETA
FILTER: CH. CLASS 60
PEAK DATA: 40.37 ° @ 57.76 MS; -30.85 ° @ 169.84 MS

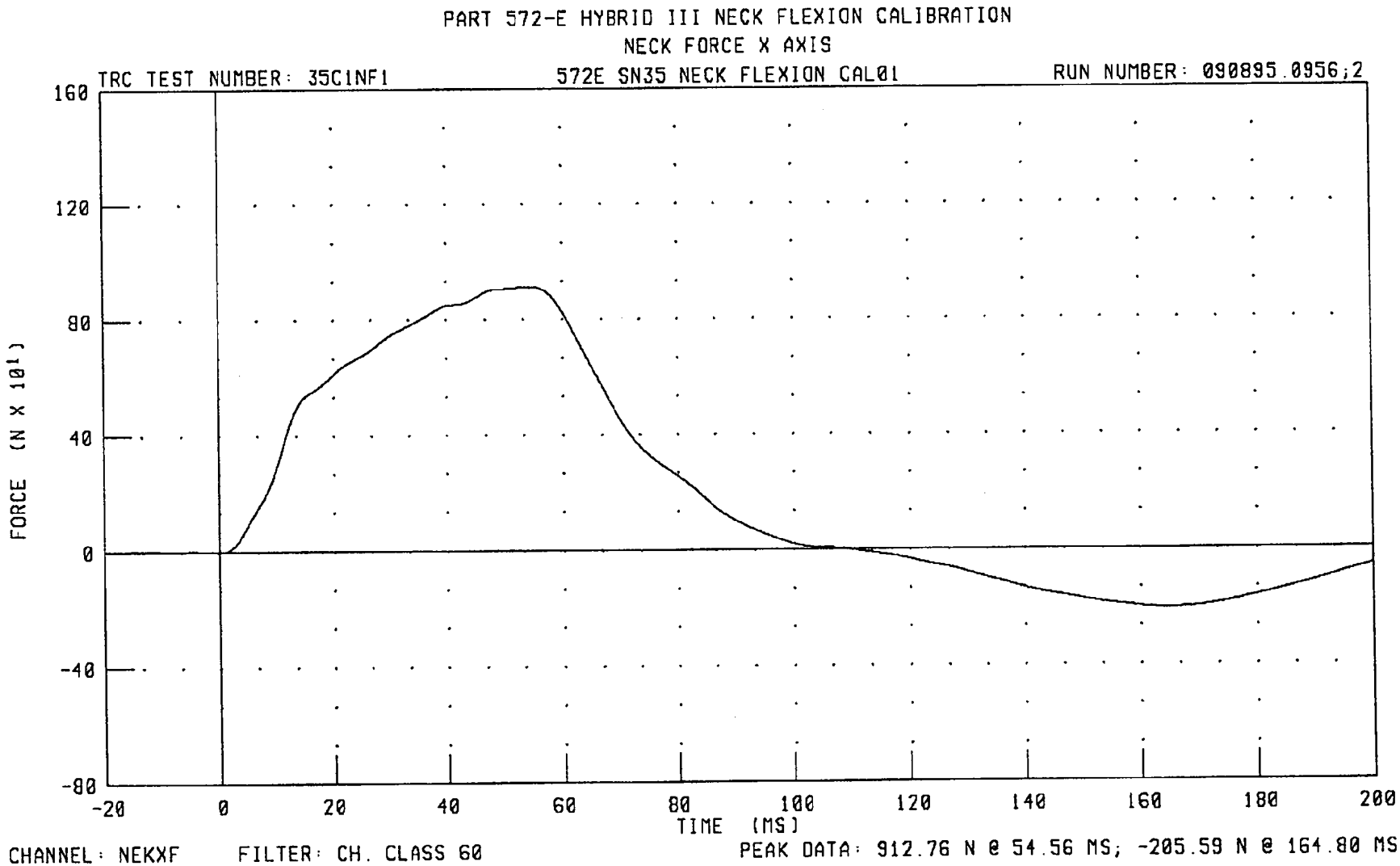
PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION

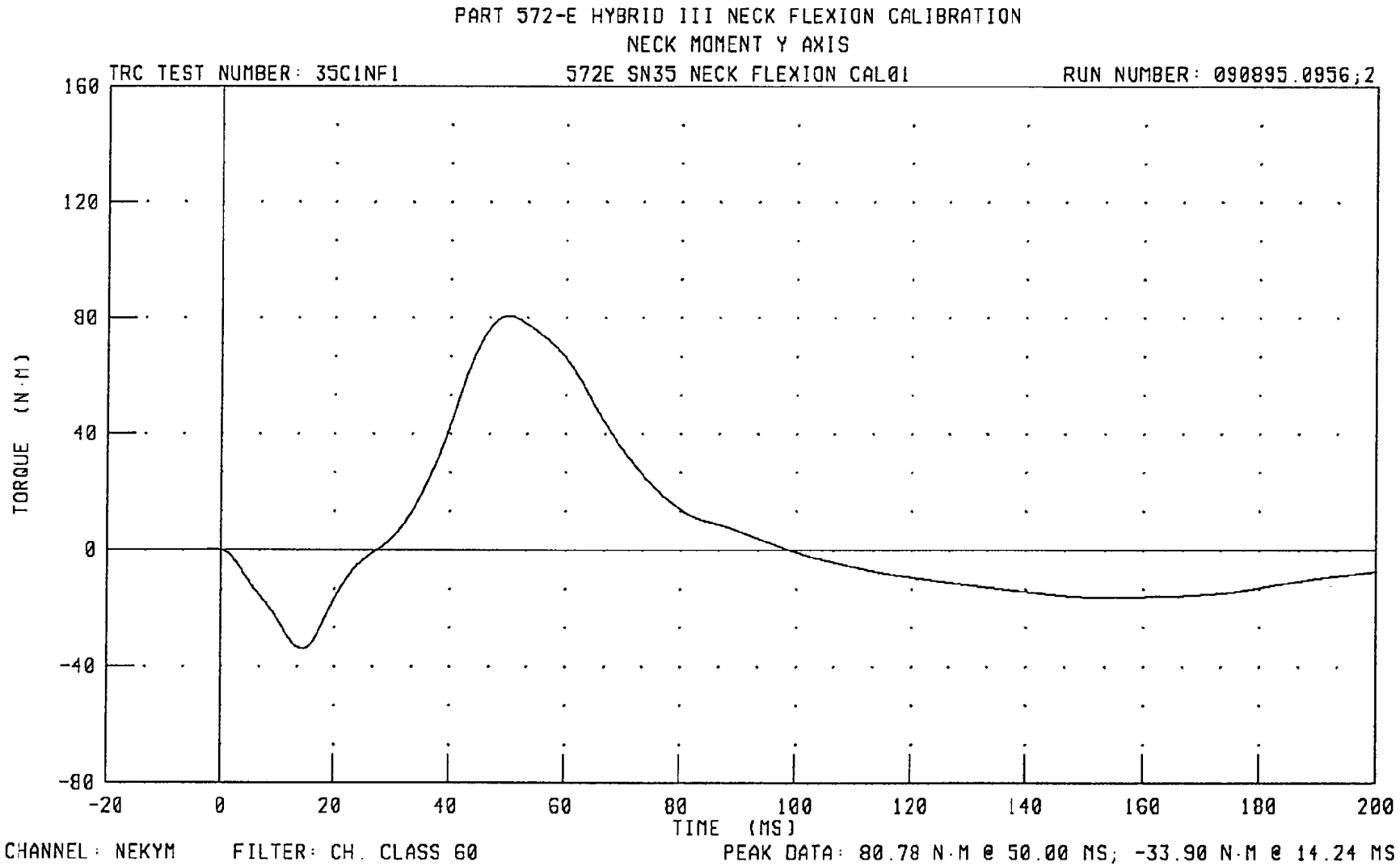
TRC TEST NUMBER: 35C1NF1 572E SN35 NECK FLEXION CAL01 RUN NUMBER: 090895.0956;2

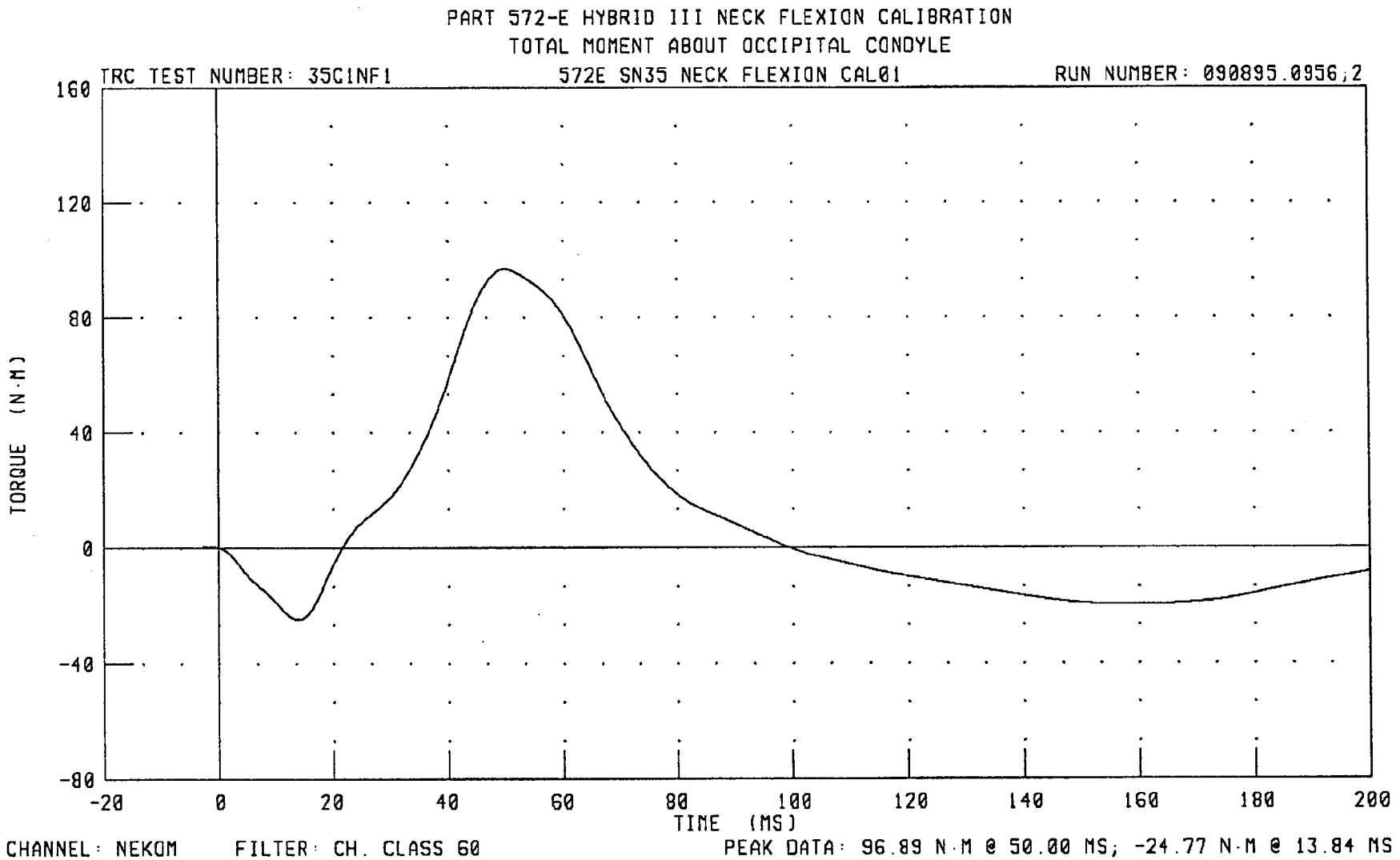


CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 70.38 ° @ 58.00 MS; -50.17 ° @ 169.52 MS

950821


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 35C1NF1
572E SN35 NECK FLEXION CAL01
RUN NUMBER: 090895.0956;2
160
120
80
40
0
-40
-80
FORCE (N X 10¹)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKXF
FILTER: CH. CLASS 60
PEAK DATA: 912.76 N @ 54.56 MS; -205.59 N @ 164.80 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 35C1NF1
572E SN35 NECK FLEXION CAL01
RUN NUMBER: 090895.0956;2
160
120
80
40
0
-40
-80
TORQUE (N·M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKYM
FILTER: CH. CLASS 60
PEAK DATA: 80.78 N·M @ 50.00 MS; -33.90 N·M @ 14.24 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 35C1NF1
572E SN35 NECK FLEXION CAL01
RUN NUMBER: 090895.0956;2
TORQUE (N-M)
160
120
80
40
0
-40
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 60
PEAK DATA: 96.89 N-M @ 50.00 MS; -24.77 N-M @ 13.84 MS

950821

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

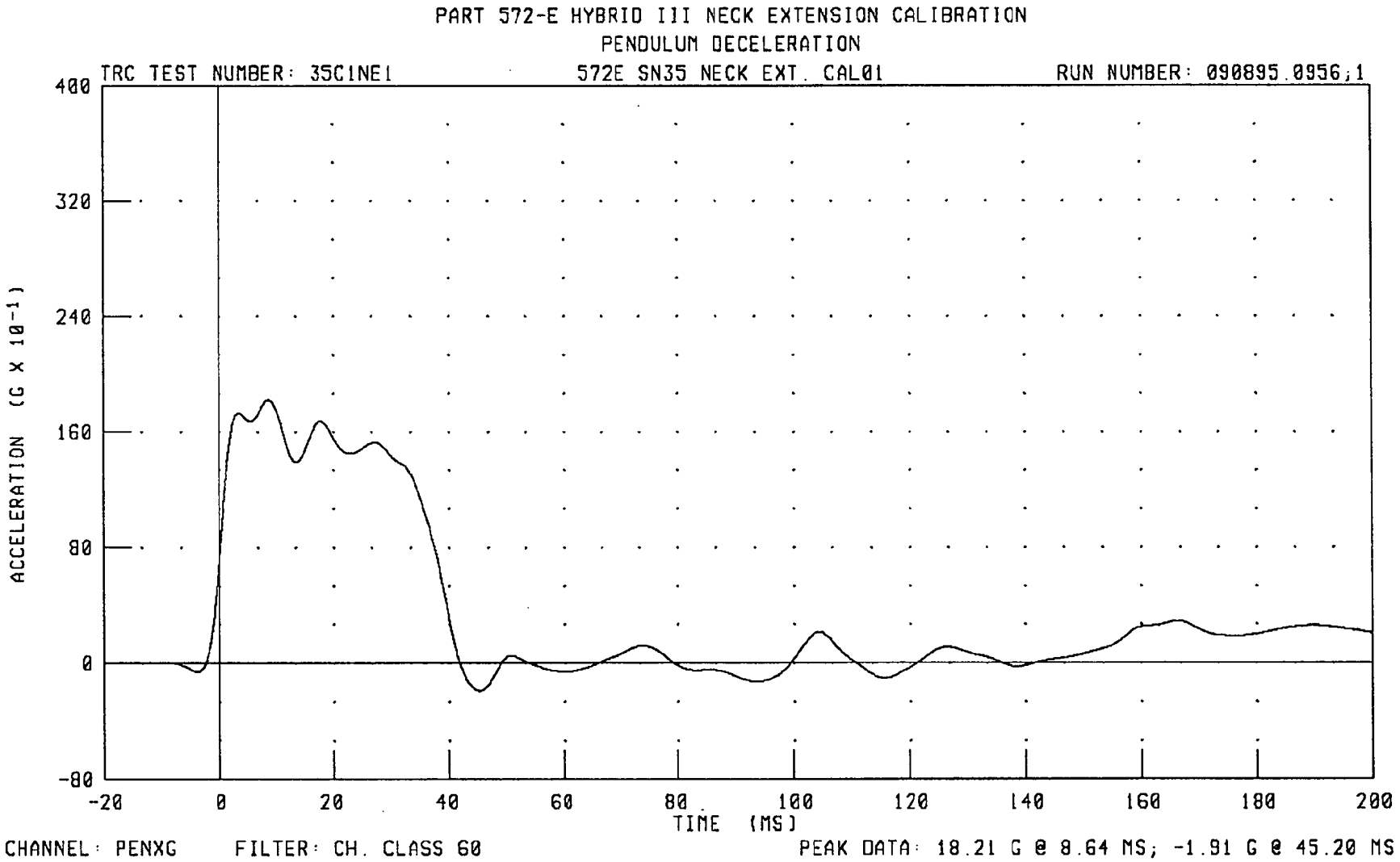
HYBRID III 11-JUL-95

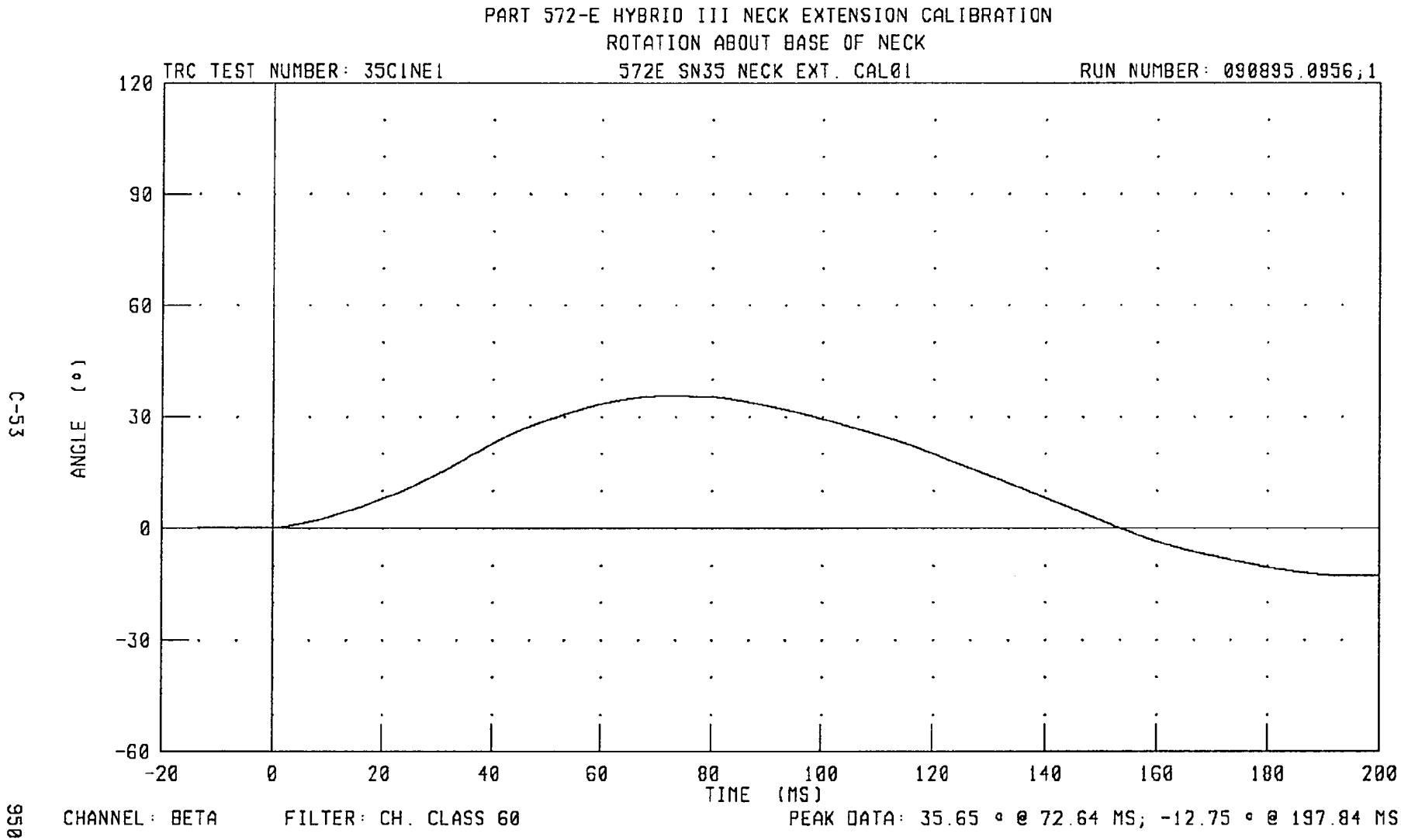
TRC INC. TEST NO: 35C1NE1 572E SN35 NECK EXT. CAL01

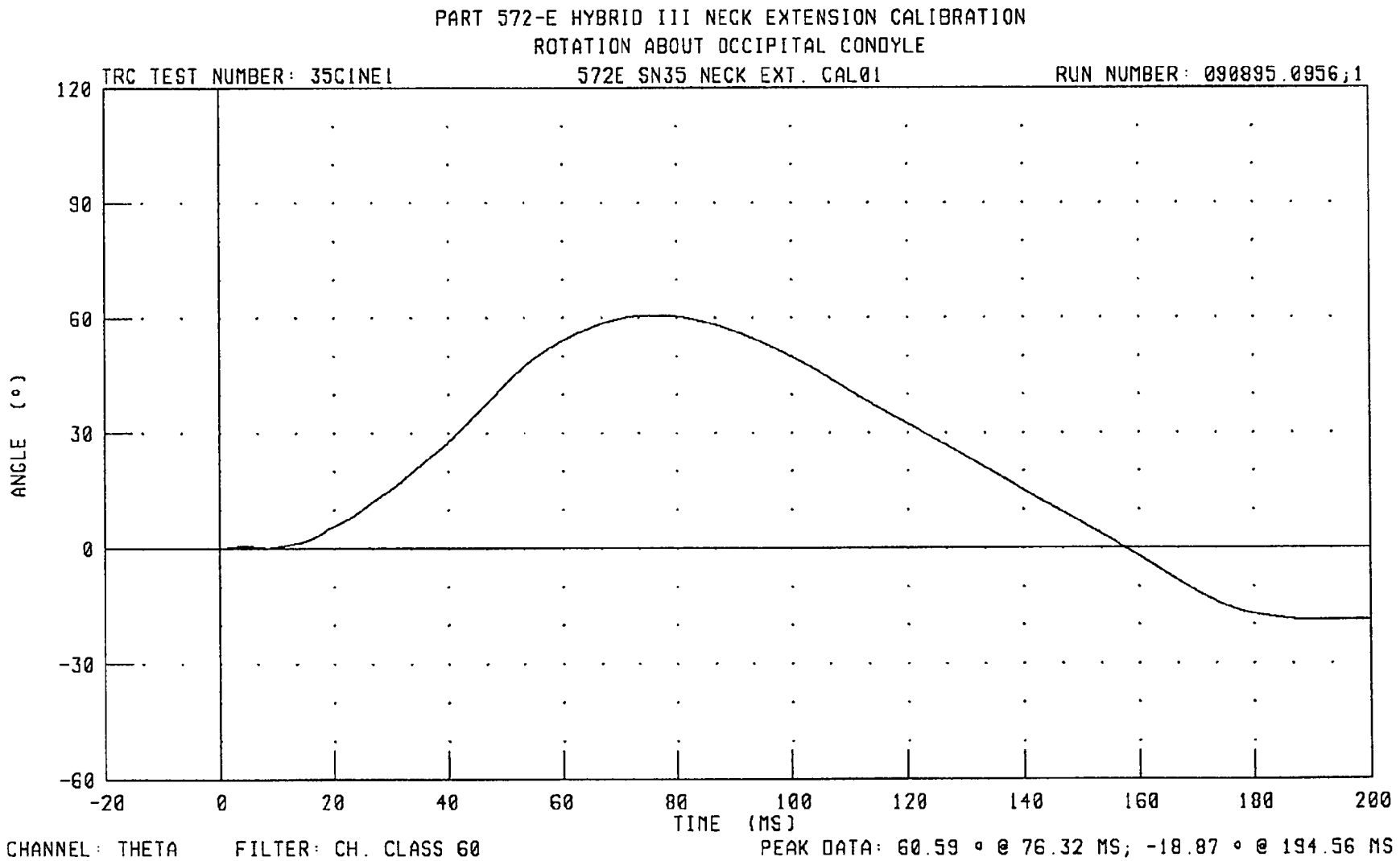
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.48 G
	20 MS	14.00 - 19.00 G	15.59 G
	30 MS	11.00 - 16.00 G	14.31 G
MAX PENDULUM G		22 G MAX	18.20 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.27 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.04 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	96.12 DEG.
	TIME	72 - 82 MS	74.08 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-65.59 NM
	TIME	65 - 79 MS	69.76 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.00 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	134.80 MS

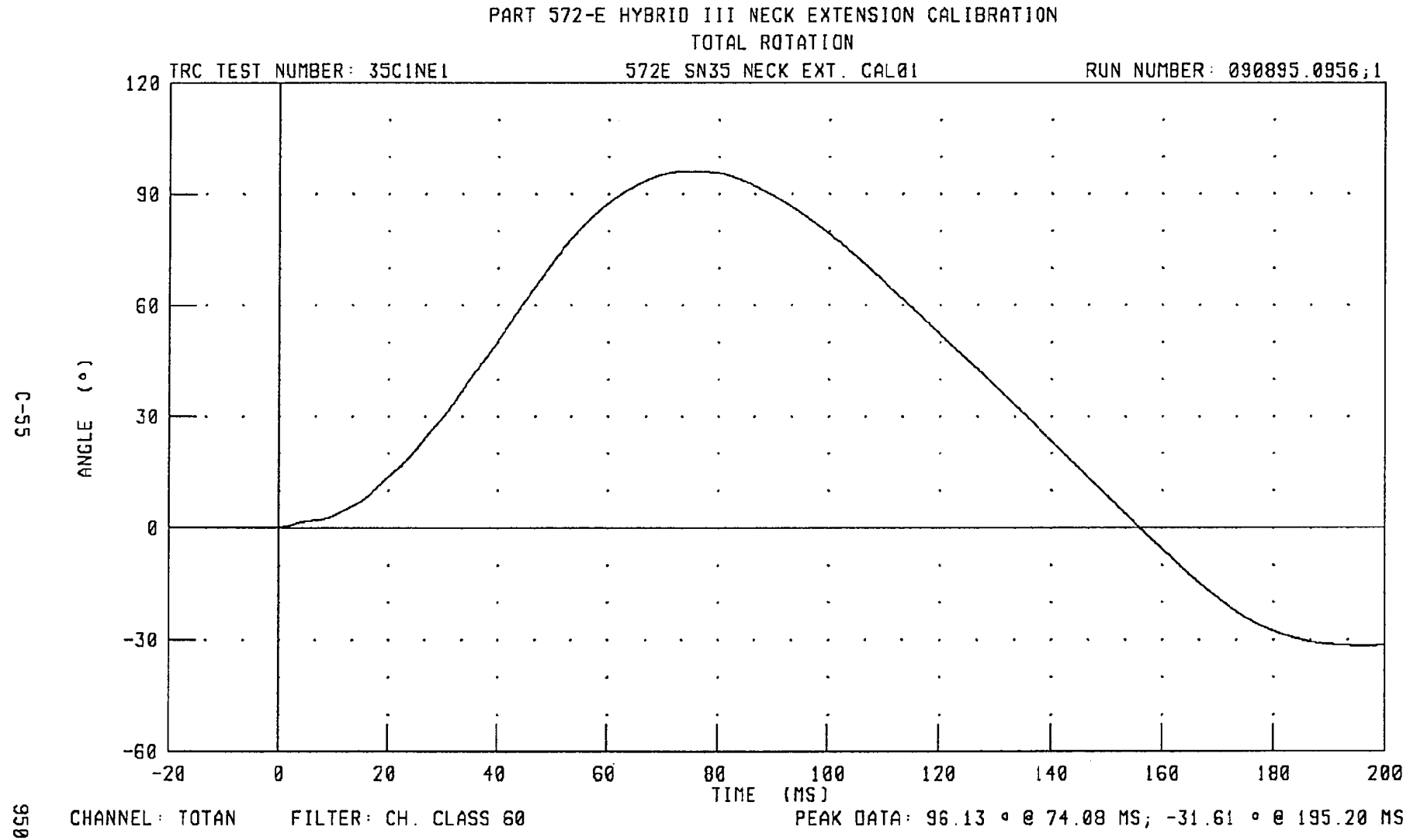
TEST MEETS SPECIFICATIONS

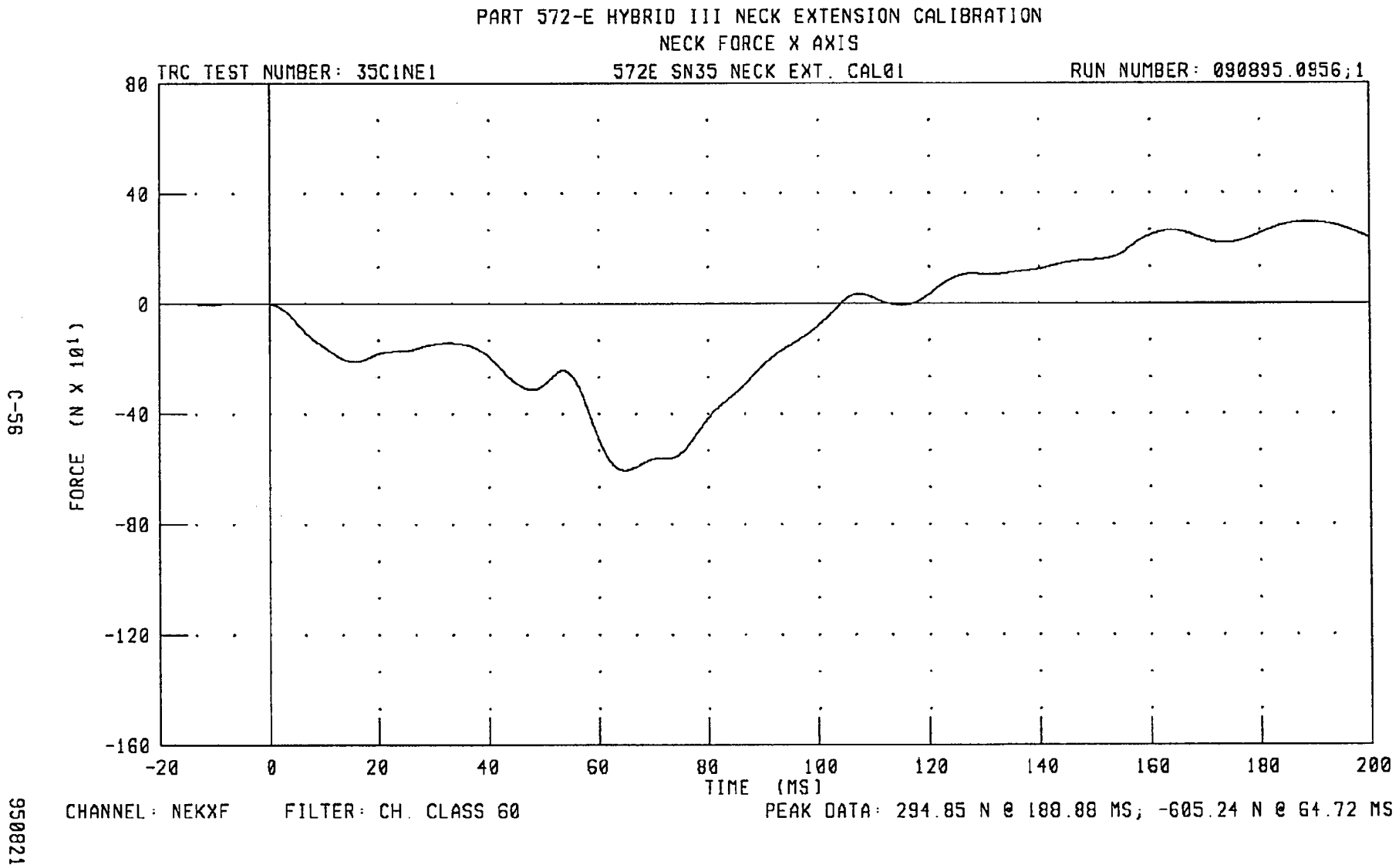
TECHNICIAN Chas. Middlet RUN NUMBER: 071195.0855;1


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 35CINE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;1
400
320
240
160
80
0
-80
ACCELERATION (G X 10-1)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 60
PEAK DATA: 18.21 G @ 8.64 MS; -1.91 G @ 45.20 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK
TRC TEST NUMBER: 35C1NE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;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: 35.65 ° @ 72.64 MS; -12.75 ° @ 197.84 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 35CINE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;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: 60.59 ° @ 76.32 MS; -18.87 ° @ 194.56 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION
TRC TEST NUMBER: 35C1NE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;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: 96.13 ° @ 74.08 MS; -31.61 ° @ 195.20 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 35CINE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;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: 294.85 N @ 188.88 MS; -605.24 N @ 64.72 MS

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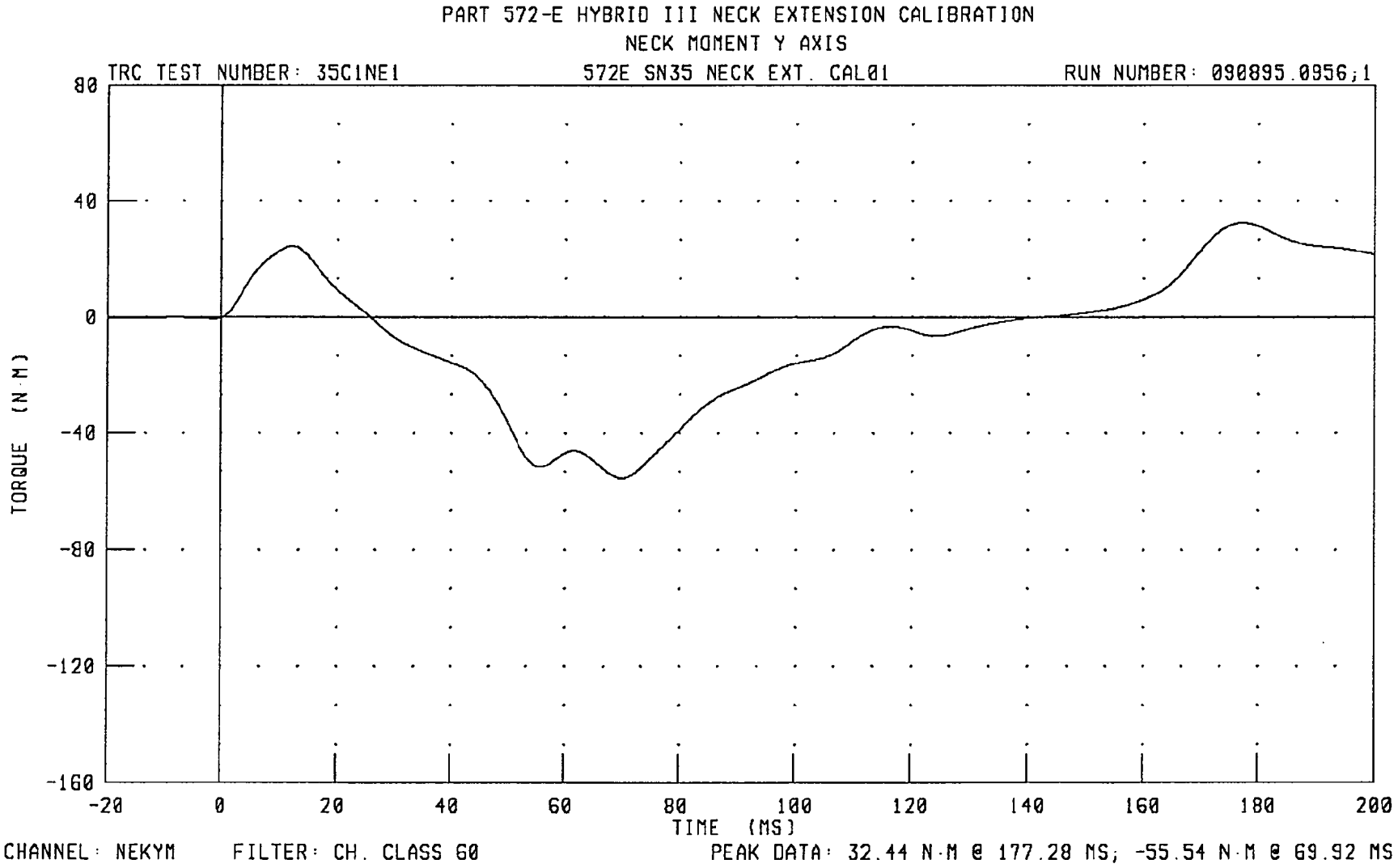
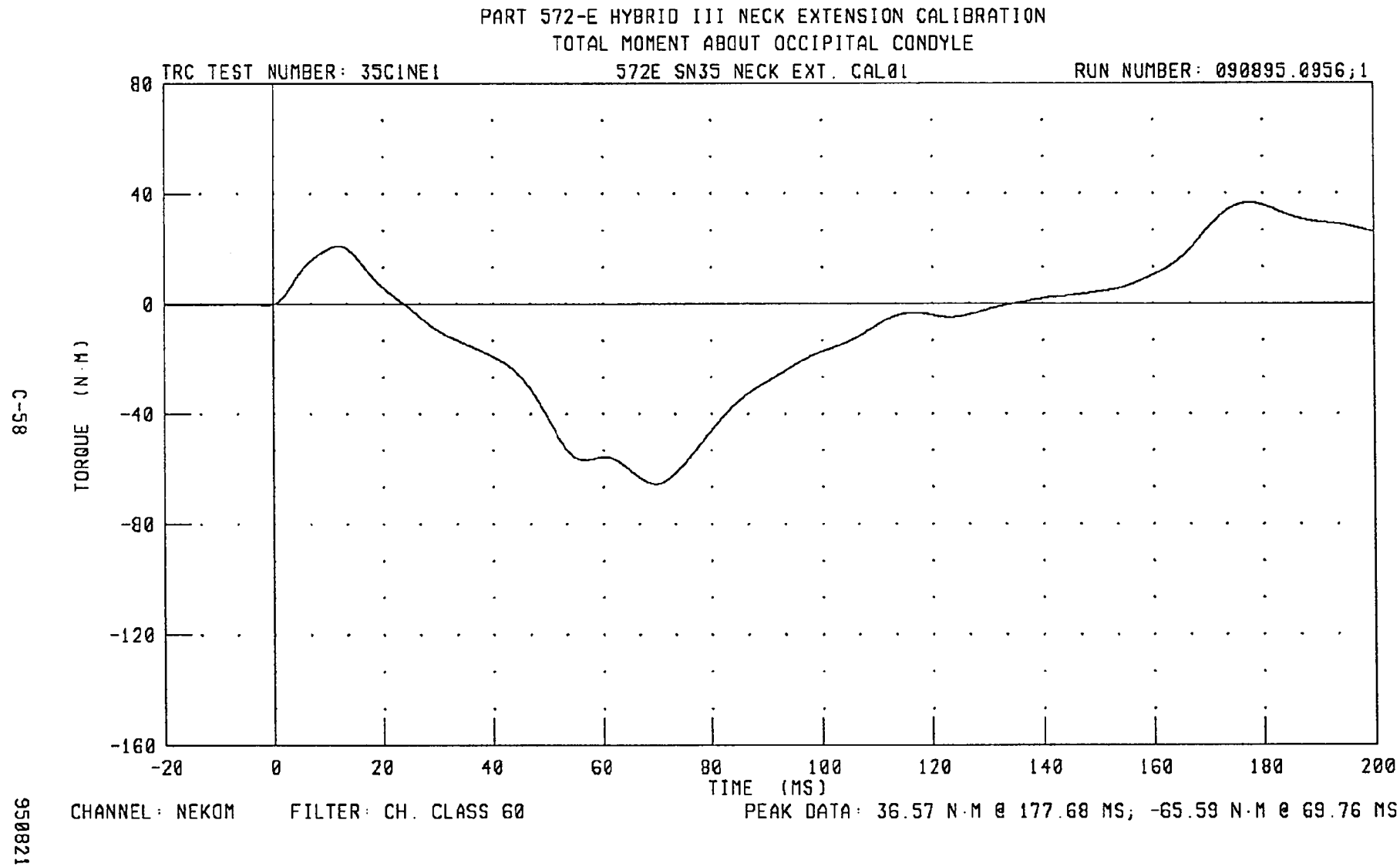
950821


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 35C1NE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;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: 32.44 N-M @ 177.28 MS; -55.54 N-M @ 69.92 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 35C1NE1
572E SN35 NECK EXT. CAL01
RUN NUMBER: 090895.0956;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: 36.57 N-M @ 177.68 MS; -65.59 N-M @ 69.76 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 11-JUL-95

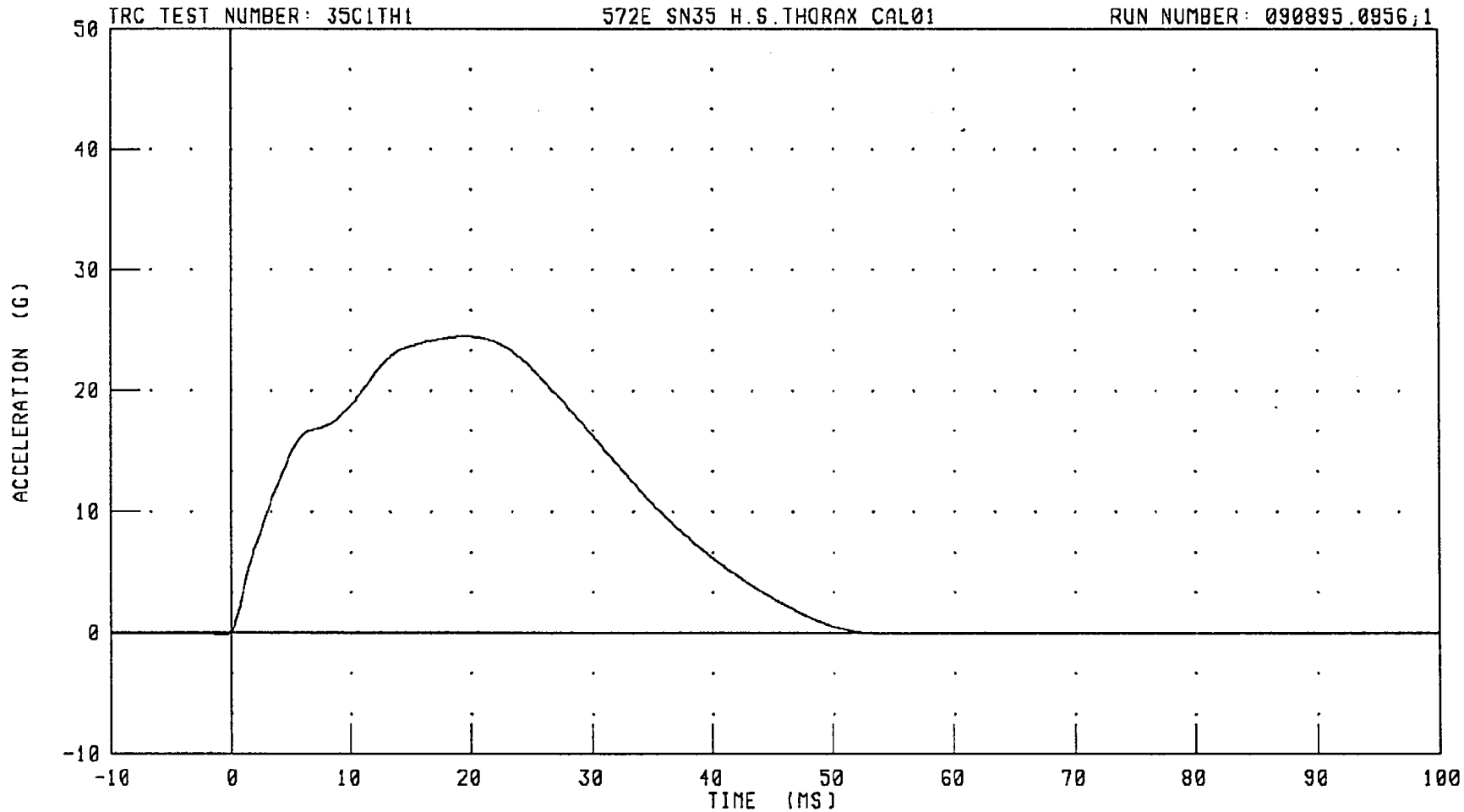
TRC INC. TEST NO: 35C1TH1 572E SN35 H.S.THORAX CAL01

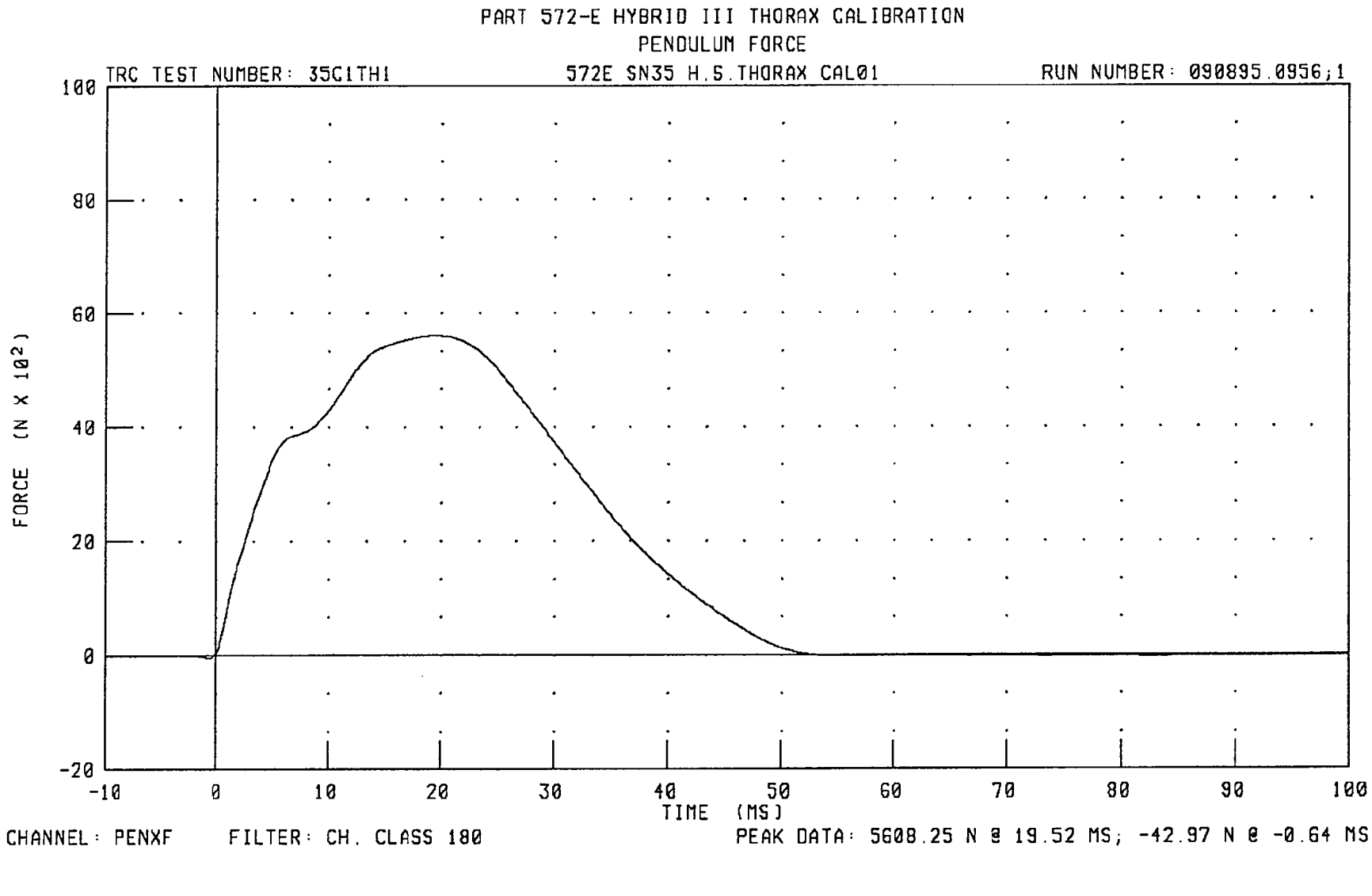
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.4 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	66.7 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5608. N
INTERNAL HYSTERESIS	69% - 85%	73.6%

TEST MEETS SPECIFICATIONS

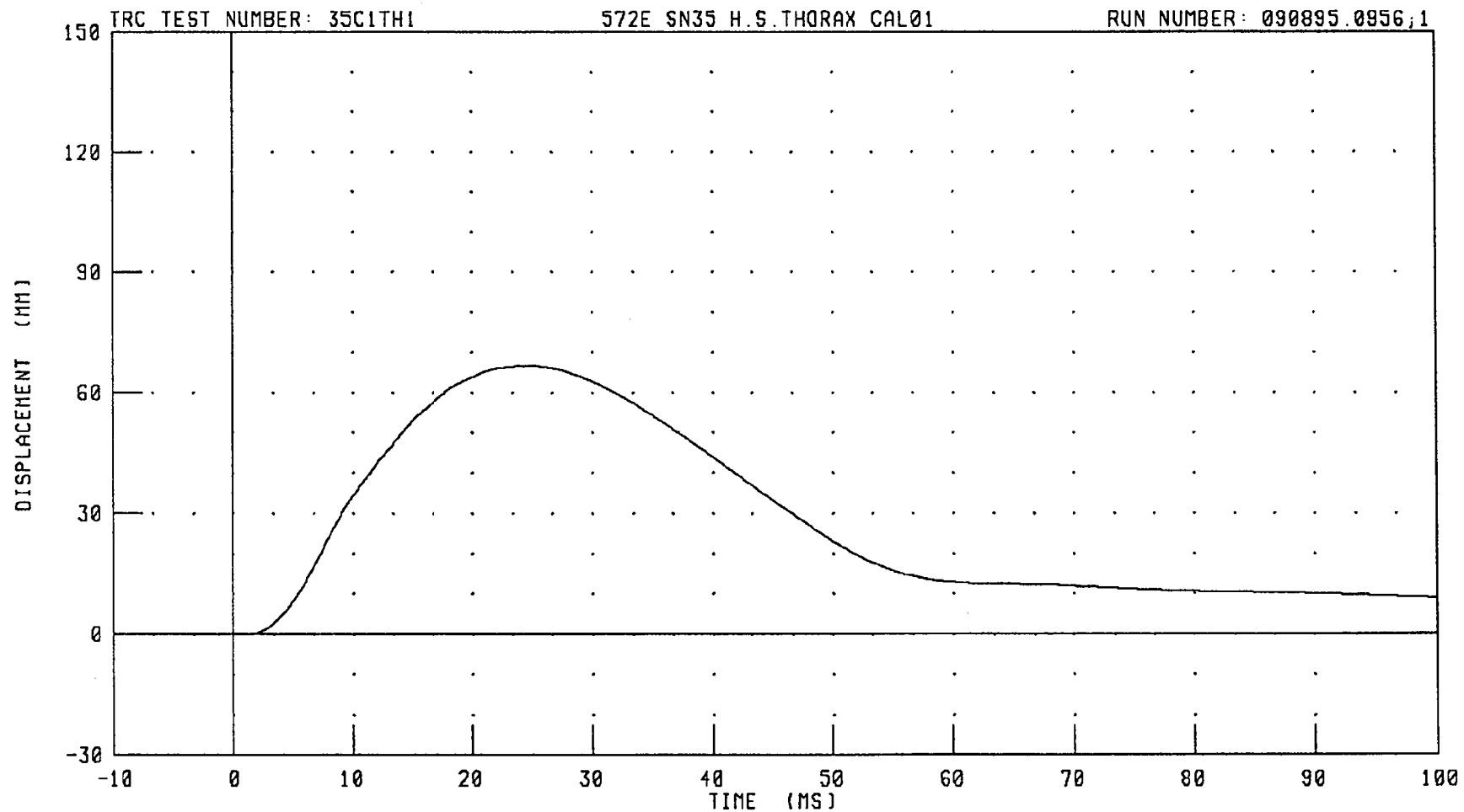
TECHNICIAN _____ RUN NUMBER: 071195.1433;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION



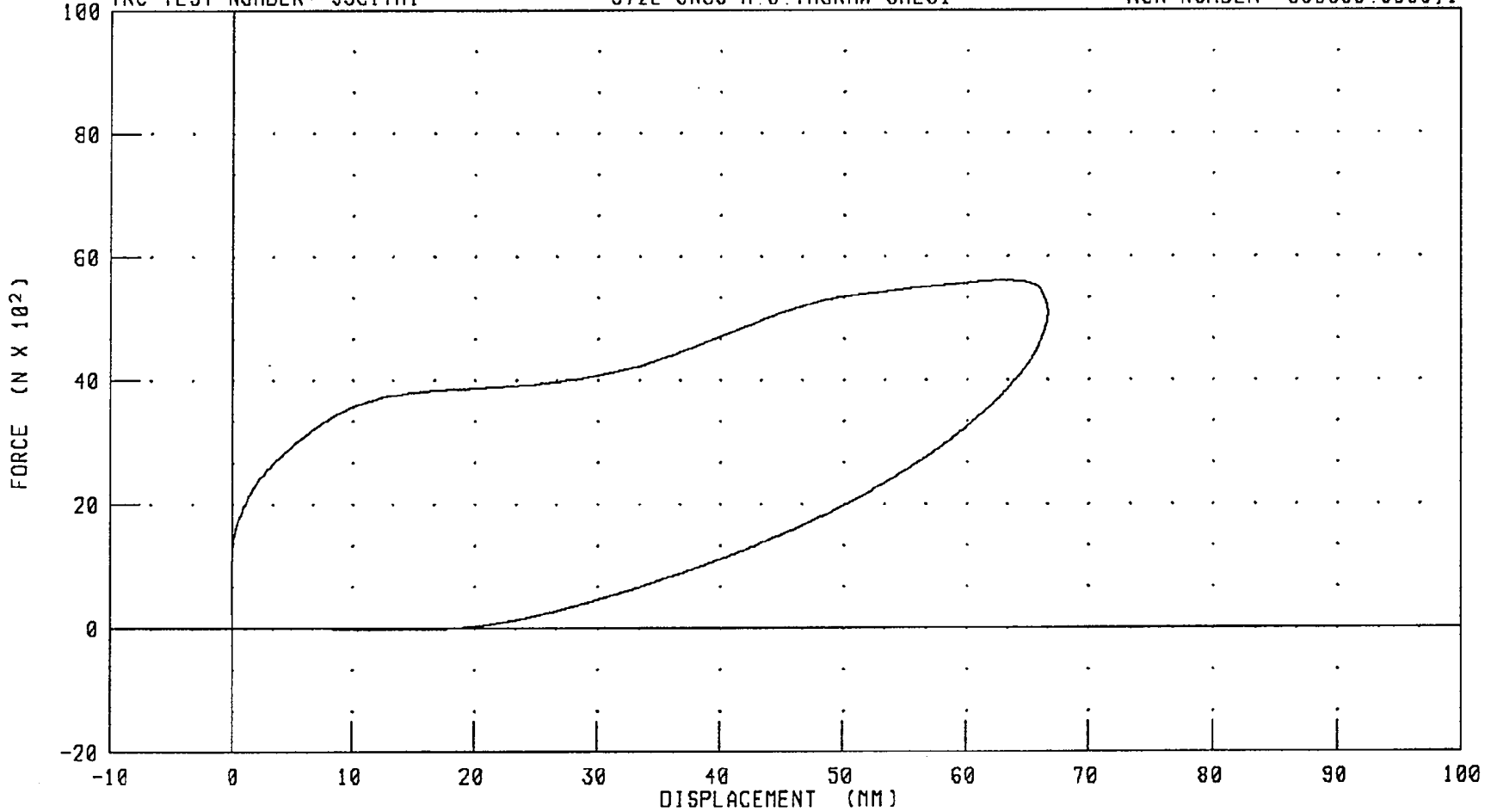

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE
TRC TEST NUMBER: 35C1TH1
572E SN35 H.S.THORAX CAL01
RUN NUMBER: 090895.0956;1
100
80
60
40
20
0
-20
FORCE (N X 10²)
-10
0
10
20
30
40
50
60
70
80
90
100
TIME (MS)
CHANNEL: PENXF
FILTER: CH. CLASS 180
PEAK DATA: 5608.25 N @ 19.52 MS; -42.97 N @ -0.64 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT



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

TRC TEST NUMBER: 35C1TH1 572E SN35 H.S.THORAX CAL01 RUN NUMBER: 090895.0956;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 66.71 MM @ 24.64 MS; -0.05 MM @ 0.96 MS
PENXF CH. CLASS 180 5608.25 N @ 19.52 MS; -42.97 N @ -0.64 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 11-JUL-95

TRC INC. TEST NO: 35C1RK1 572E SN35 RIGHT KNEE CAL 01

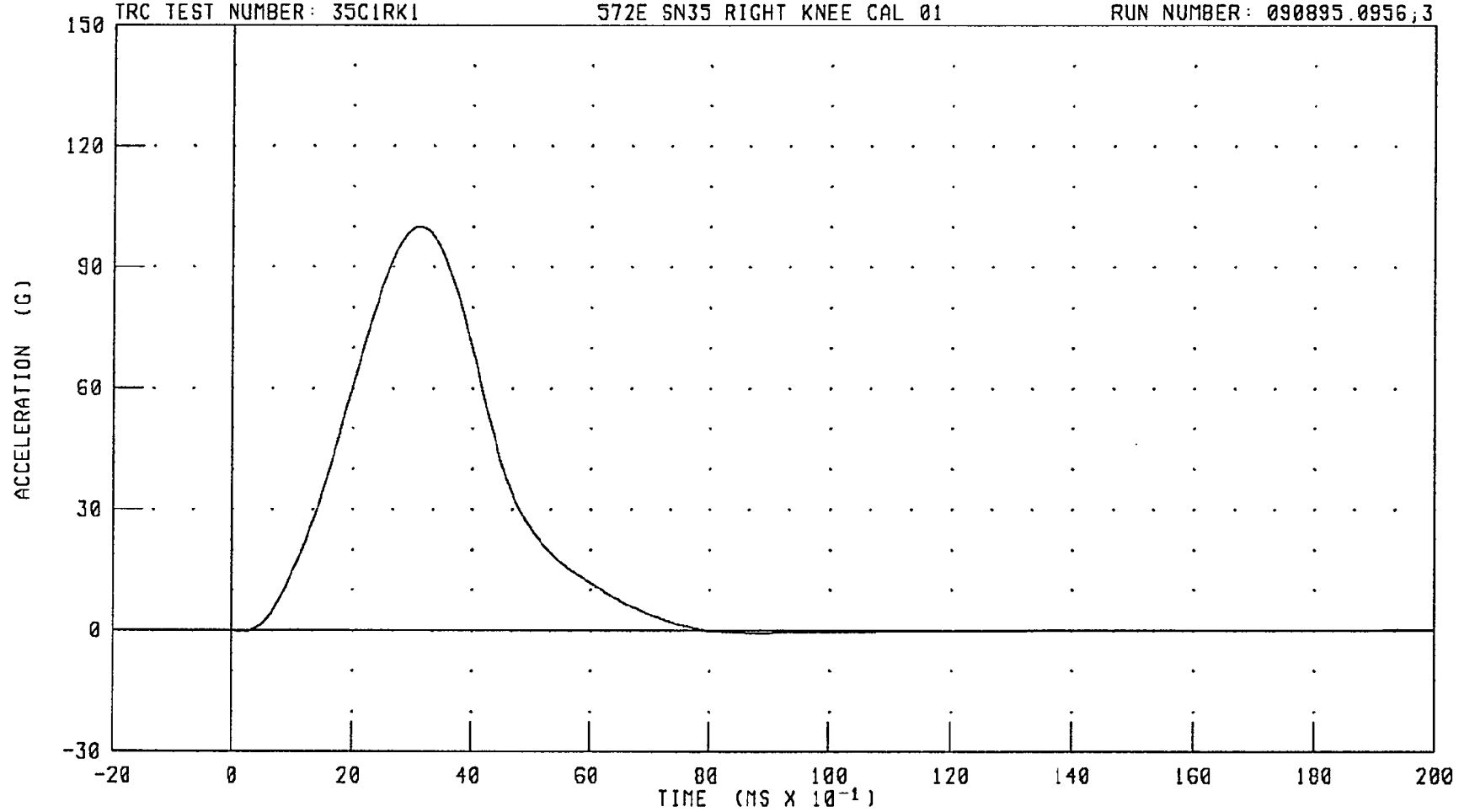
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4893.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas Middlet RUN NUMBER: 071195.1336;3

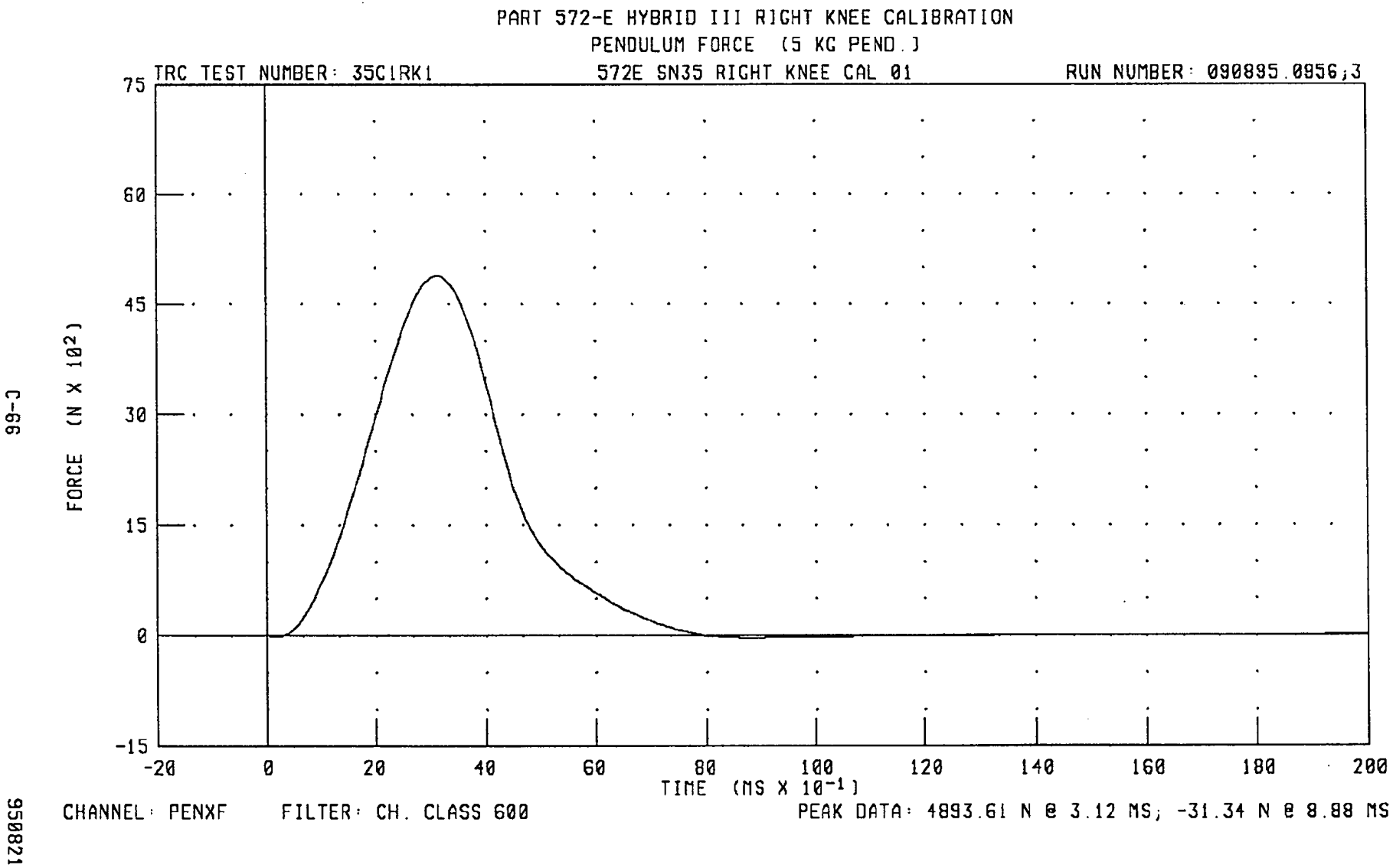
PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)

TRC TEST NUMBER: 35C1RK1 572E SN35 RIGHT KNEE CAL 01 RUN NUMBER: 090895.0956;3



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 100.02 G @ 3.12 MS; -0.64 G @ 8.88 MS

950821


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 35C1RK1
572E SN35 RIGHT KNEE CAL 01
RUN NUMBER: 090895.0956;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: 4893.61 N @ 3.12 MS; -31.34 N @ 8.88 MS

TRANSPORTATION RESEARCH CENTER INC.

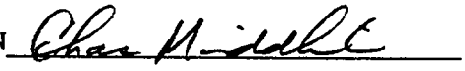
LEFT KNEE IMPACT TEST

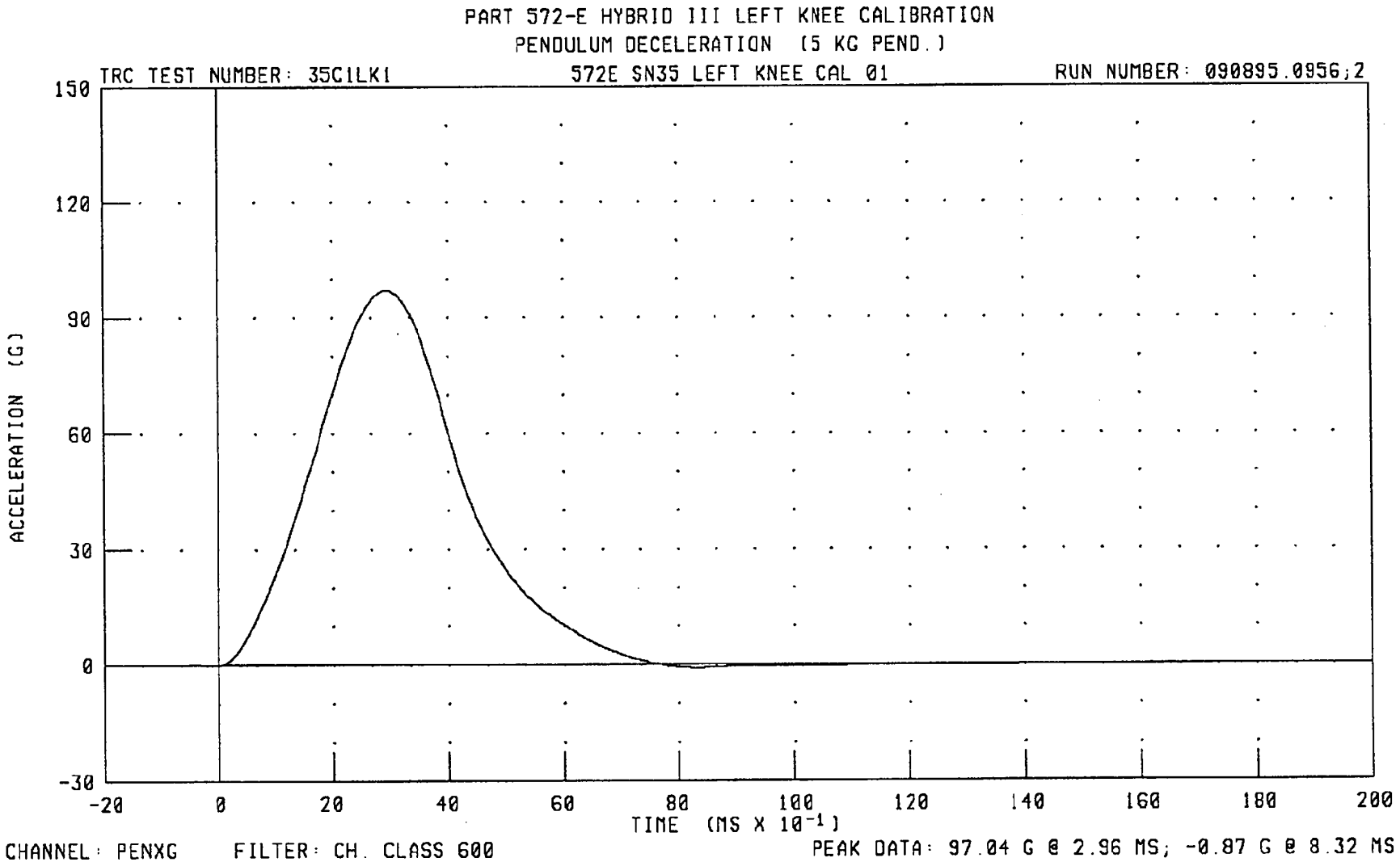
HYBRID III 11-JUL-95

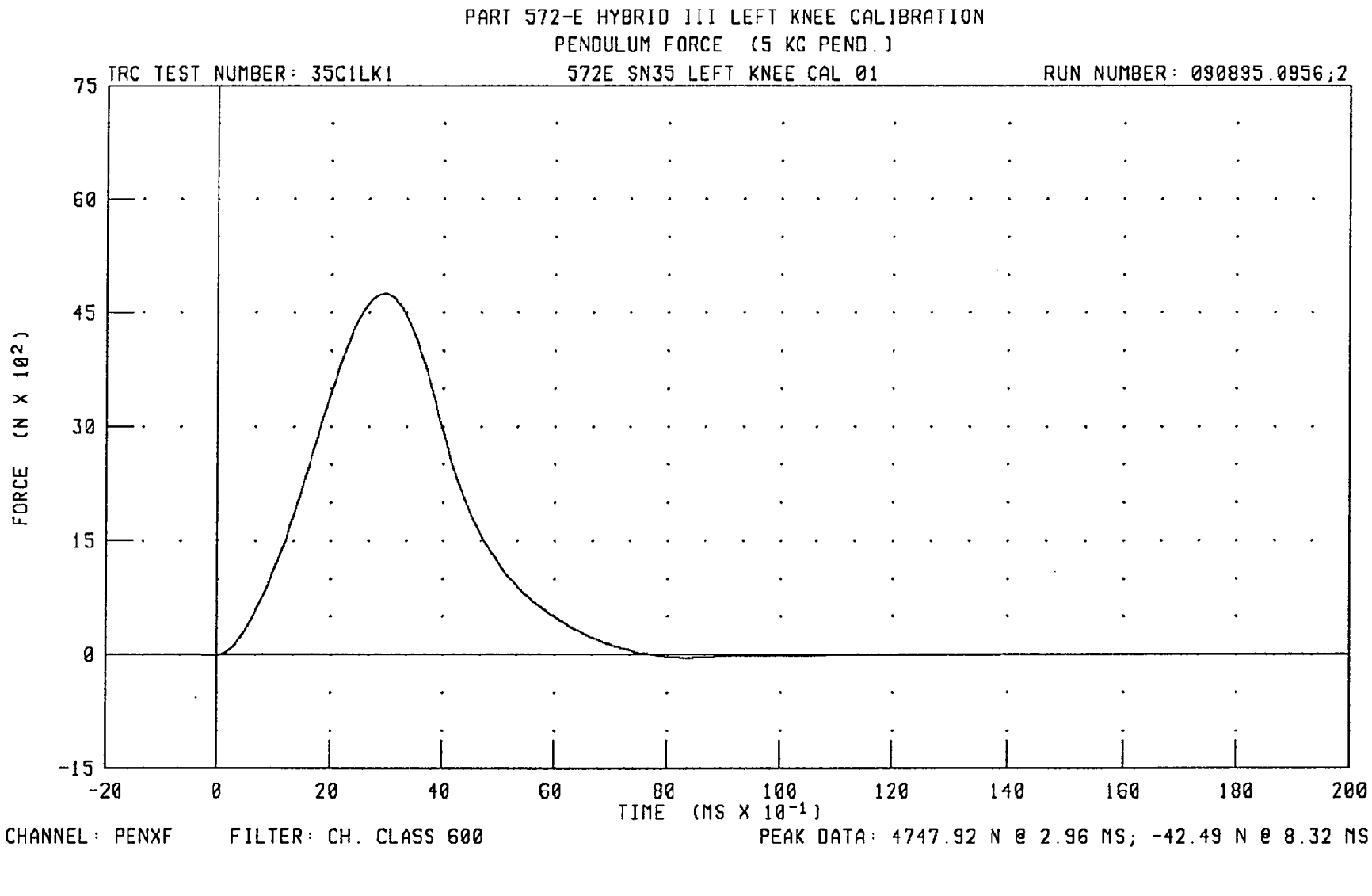
TRC INC. TEST NO: 35C1LK1 572E SN35 LEFT KNEE CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4747.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 071195.1251;2


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 35C1LK1
572E SN35 LEFT KNEE CAL 01
RUN NUMBER: 090895.0956;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: 97.04 G @ 2.96 MS; -0.87 G @ 8.32 MS


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)
TRC TEST NUMBER: 35C1LK1
572E SN35 LEFT KNEE CAL 01
RUN NUMBER: 090895.0956;2
75
60
45
30
15
0
-15
FORCE (N X 10²)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXF
FILTER: CH. CLASS 600
PEAK DATA: 4747.92 N @ 2.96 MS; -42.49 N @ 8.32 MS

Appendix D

Miscellaneous Test Information

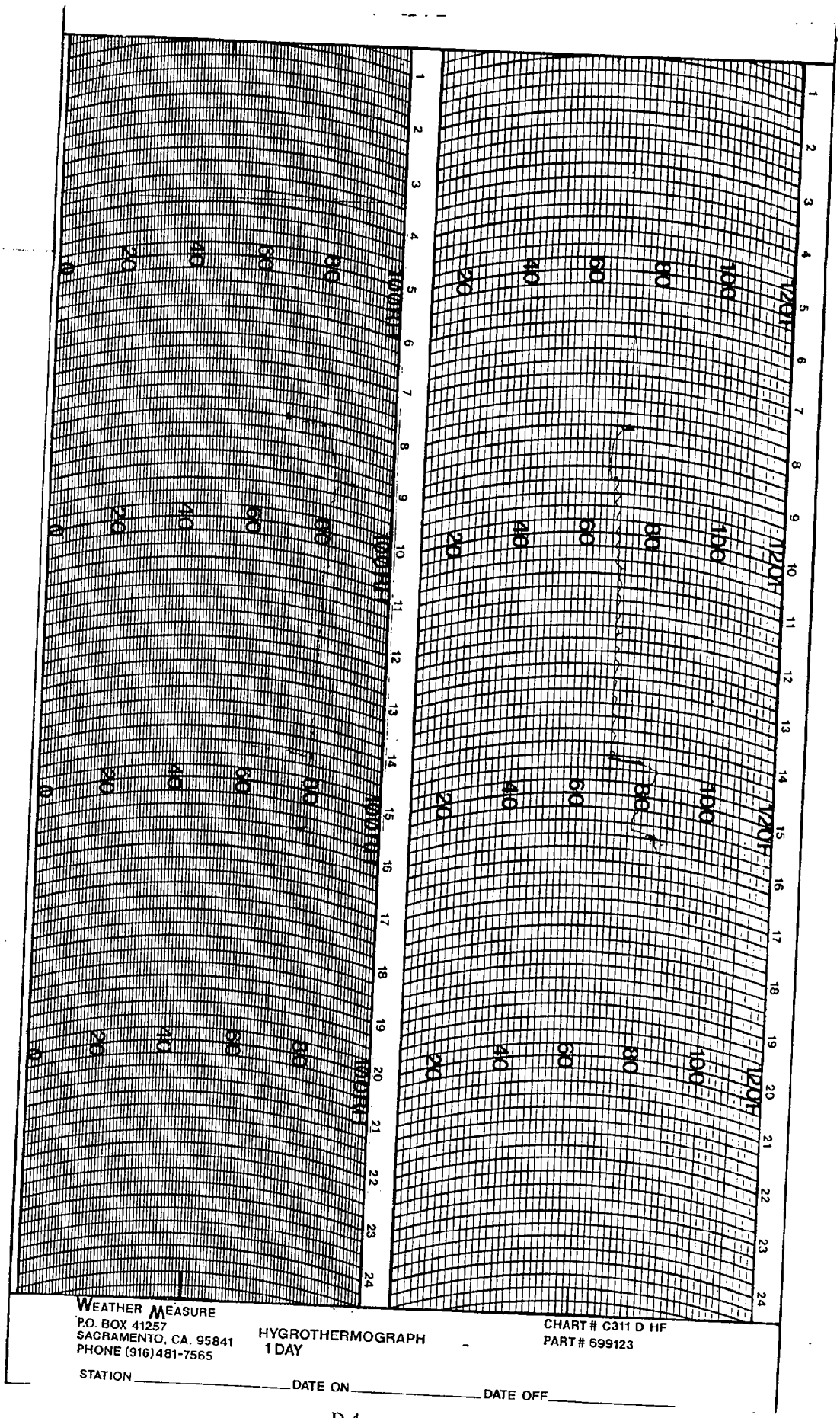
Sign Convention
NHTSA Data Tape Reference Guide

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

Frequency Response Classes

SAE J211 OCT88

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


WEATHER MEASURE
P.O. BOX 41257
SACRAMENTO, CA. 95841
PHONE (916)481-7565
HYGROTHERMOGRAPH
1 DAY
CHART # C311 D HF
PART # 599123
STATION
DATE ON
DATE OFF

950821