

**Vehicle Research and Test Center
Moving Barrier into Rear of
2003 Volvo S40 4-door sedan
TRC Inc. Test Number: 031006**

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Section 1.0

Purpose and Test Procedure

Purpose

This 47.3 km/h (30 mph) rear impact test was conducted for the National Highway Traffic Safety Administration (NHTSA)/Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc).

The purpose of this test was to evaluate rear crash protection and occupant response in a rear impact test. The subject vehicle was a 2003 Volvo S40 4-door sedan.

Test Procedure

This test was conducted in accordance with VRTC instructions for a moving barrier into a stationary vehicle test. Data was obtained relative to FMVSS 301, "Fuel System Integrity" (February 28, 2003) performance for the modified rear impact mode using 50th percentile male anthropomorphic test devices (dummies).

The test vehicle, a 2003 Volvo S40, was instrumented with six (6) accelerometers to measure longitudinal, lateral and vertical axis accelerations. The vehicle's door sills and front passengers' seats were instrumented with a magnetohydrodynamic (MHD) sensor to measure rotation rate about the lateral axis. The front passenger's seat back was instrumented with a test device to measure linear displacement. The vehicle was impacted by a FMVSS 301 moving barrier. The moving barrier's specified impact velocity range was 46.5 to 48.1 km/h.

The test vehicle contained two (2) Part 572E 50th percentile male Hybrid III dummies. The dummies were positioned in the right front and left rear outboard designated seating positions according to the FMVSS 208 laboratory procedure TP-208-12 Appendix A. The right front passenger dummy and the left rear passenger dummy were both belted. Both dummies' seat belts were instrumented with load cells to measure lap belt and shoulder belt forces and with potentiometers to measure spool out.

Both dummies were instrumented with head, chest, and pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations; chest deflection potentiometers; left and right femur load cells to measure axial forces; and upper and lower neck load cells to measure longitudinal, lateral, and vertical forces moments. The dummies were also instrumented with head and chest rotation rate sensors to measure rotation rate about the lateral axis.

The moving barrier was instrumented with five (5) accelerometers to measure longitudinal, lateral, and vertical axis accelerations.

The 75 data channels were digitally sampled and recorded at 12,500 samples per second and processed per SAE J211 March 1995.

The crash event was recorded by one (1) real-time panning motion picture camera and nine (9) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

The rear impact test summary data are presented in Section 2.0. The summary of FMVSS 301 data are presented in Section 3.0. The occupant, camera, and vehicle 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 verification data. Appendix D contains miscellaneous test information.

Section 2.0

Impact Test Summary

Test Results Summary

This rear impact test was conducted by TRC Inc. on October 6, 2003.

The test vehicle, a 2003 Volvo S40 4-door sedan, was equipped with a 1.9-liter 4-cylinder engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1571.6 kg. The vehicle's fuel system contained 56.0 liters of Stoddard for the test. The vehicle's maximum static crush was 402 mm.

The right front passenger's 36 ms Head Injury Criteria (HIC) was 155. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 16.1 g. The right front passenger's maximum chest deflection was 2 mm. The right front passenger's left and right femur maximum axial compression forces were 517 N and 568 N, respectively (See Data Acquisition Explanations). The right front passenger's neck injury criteria (NIJ) were: tension-extension 0.10, tension-flexion 0.27, compression-extension 0.00 and compression-flexion 0.03.

The left rear passenger's 36 ms HIC was 94. The left rear passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 24.8 g. The left rear passenger's maximum chest deflection was 1 mm. The left rear passenger's left and right femur maximum axial compression forces were 1058 N and 989 N, respectively. The left rear passenger's NIJ were: tension-extension 0.26, tension-flexion 0.20, compression-extension 0.25 and compression-flexion 0.11.

A static rollover test was not performed following the impact by decision of the COTR.

Data Acquisition Explanations

The right front passenger's lower neck Y-axis force channel, NKLYF2, recorded a questionable data spike at approximately 0 milliseconds.

The right front passenger's right femur Z-axis force channel, RFMZ2, recorded questionable data throughout the test.

The vehicle's rear deck X-, Y-, and Z-axis acceleration channels, RDKXG1, RDKYG1, and RDKZG1, recorded questionable data throughout the test. The vehicle's rear deck calculated velocity and displacement results were also affected.

Table 1 Crash Test Summary

Test type:	Rear impact	
Test date:	10/06/03	
Test time:	17:28	
Ambient temperature:	17° C	
Vehicle:	2003 Volvo S40 4-door sedan	
Vehicle test weight:	1571.6 kg	
Impact angle: ¹	180°	
Impact velocity: ²	Primary = 47.1 km/h Secondary = 47.1 km/h	
Maximum static crush:	402 mm	
Dummies:	Front passenger #202	Rear Passenger #206
Type:	HIII 50 th Male (Part 572E)	HIII 50 th Male (Part 572E)
Location:	Right front	Left rear
Restraint:	3-point seat belt	3-point seat belt
Number of data channels:	75	
Number of cameras:		
High-speed	9	
Real-time	1	

¹ With respect to tow track centerline.

² Speed trap measurement ($\pm$.08 km/h accuracy)

Table 2 Test Vehicle Information

Vehicle manufacturer:	Volvo Car Corporation		
Make/model:	Volvo/S40		
VIN:	YV1VS29563F941538		
Model year:	2003		
Body style:	4-door sedan		
Color:	Silver		
Engine data:			
Type:	Straight		
Cylinders:	4		
Displacement:	1.9 liters		
Transmission data:	<u> 5 </u> Speed,	<u> </u> Manual,	<u> X </u> Automatic,
	<u> X </u> FWD,	<u> </u> RWD,	<u> </u> 4WD
Date vehicle received:	10/01/2003		
Odometer reading:	250		
Dealer's name and address:	Vehicle supplied by VRTC		

Accessories:

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

Certification data from vehicle's label:

Vehicle manufactured by:	Volvo Car Corporation
Date of manufacture:	07/02
VIN:	YV1V529563F941538
GVWR:	3920 lbs.
GAWR: Front:	2090 lbs.
Rear:	1870 lbs.

Table 2 Test Vehicle Information, Cont'd.

Tires on vehicle (mfr., line, size): Michelin MXV4, 195/60R15

Tire pressure with maximum
capacity vehicle load:

Front:	350 kPa
Rear:	350 kPa

Spare tire (mfr., line, size): Michelin Temporary 125/90R15

Type of seats:	Front:	Bucket
	Rear:	Bench

Type of front seat backs: Power adjustable

Maximum width: 1715 mm

Wheelbase: 2560 mm

Location of "Recommended Tire Pressure" label:

The label was located inside the vehicle fuel door.

Data from vehicle's "Recommended Tire Pressure" label:

Recommended tire size: 195/60R15

Recommended cold

tire pressure:	Front:	39 psi
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tire pressure:	Rear:	36 psi
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Seating capacity:	Front:	2
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	Rear:	3
--	-------	---

	Total:	5
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Vehicle capacity weight: 375 kg (826 lbs)

Test vehicle attitude:

Delivered attitude:	LF	678 mm;	RF	681 mm;	LR	675 mm;	RR	675 mm
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Fully loaded attitude	LF	658 mm;	RF	661 mm;	LR	635 mm;	RR	635 mm
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Pre-test attitude:	LF	642 mm;	RF	652 mm;	LR	630 mm;	RR	641 mm
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Post-test attitude:	LF	638 mm;	RF	651 mm;	LR	656 mm;	RR	679 mm
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Table 2 Test Vehicle Information, Cont'd.

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

Right front	409.0	kg	Right rear	266.0	kg
Left front	424.5	kg	Left rear	274.0	kg
Total front weight	833.5	kg	(60.7 % of total vehicle weight)		
Total rear weight	540.0	kg	(39.3 % of total vehicle weight)		
Total delivered weight	1373.5	kg			

Calculation of test vehicle's target test weight:

Total Delivered Weight (UDW) =	1373.5 kg
Vehicle Capacity Weight =	375.0 kg
Rated Cargo/Luggage Weight (RCLW ¹) =	35.0 kg
Weight of 2 Part 572E Dummies @ 76 kg each =	98.0 kg
Target test weight =	1560.5 kg

Weight of test vehicle with required dummies and 46.1 kg of cargo weight:

Right front	442.6	kg	Right rear	324.0	kg
Left front	466.6	kg	Left rear	338.4	kg
Total front weight	909.2	kg	(57.9% of total vehicle weight)		
Total rear weight	662.4	kg	(42.1% of total vehicle weight)		
Total test weight	1571.6	kg	(0.7% above target test weight)		

Weight of ballast secured in vehicle: 0 kg

Components removed to meet target test weight: Front fascia, intake manifold, fuel injection, headlights, rearview mirrors, radiator and fan, air conditioning system, alternator, passenger front window with motor and frame, starter, power steering, speakers, fender well liners.

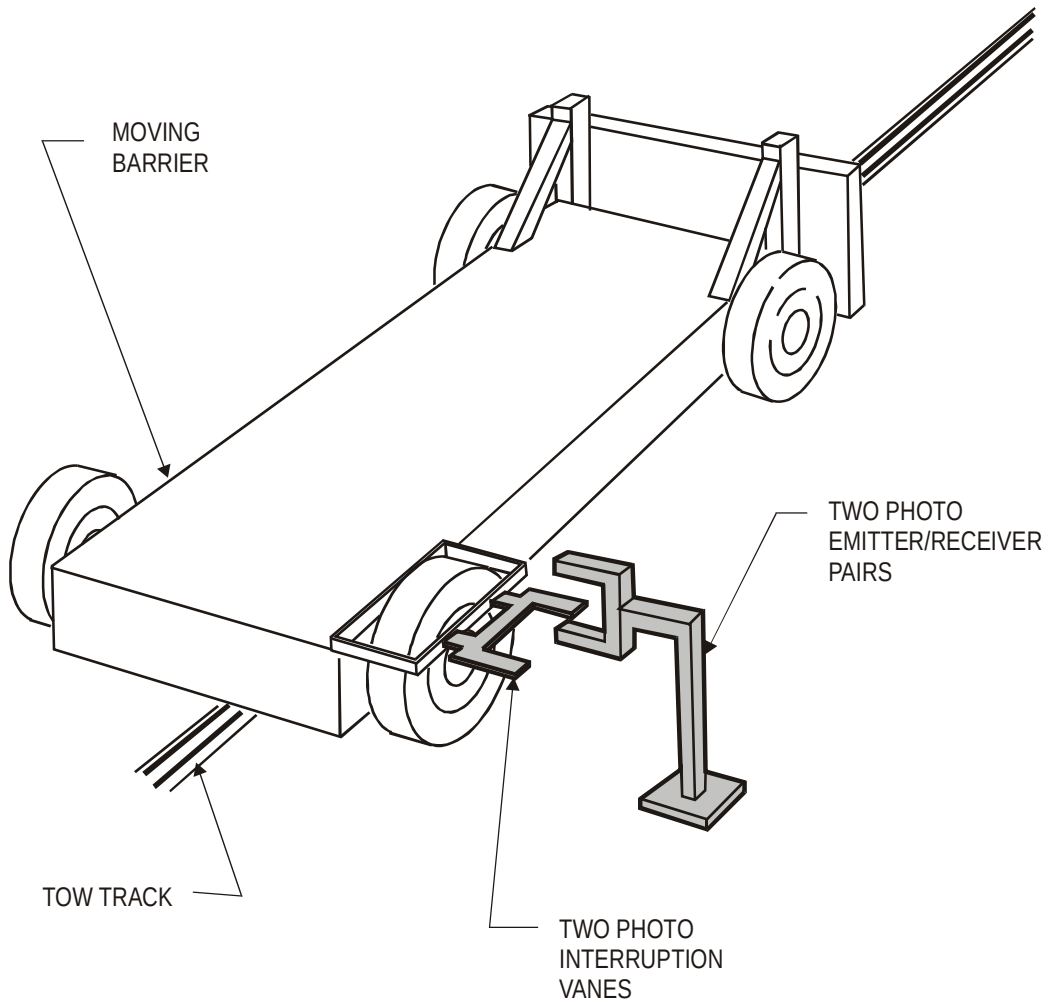
Location of Vehicle's CG: 1079 mm rearward of front wheel centerline.

Fuel System Data

Usable fuel system capacity	60.1 liters (from Owner's Manual)
Actual test volume	56.0 liters

¹ RCLW = Vehicle Capacity Weight – (68 kg x designated seating capacity)

Figure 1 Impact Velocity Measurement System



The final vane clears the final emitter/receiver pair 50 mm before impact.

The vanes have 610 mm spacing.

Figure 2 Vehicle Accelerometer Placement

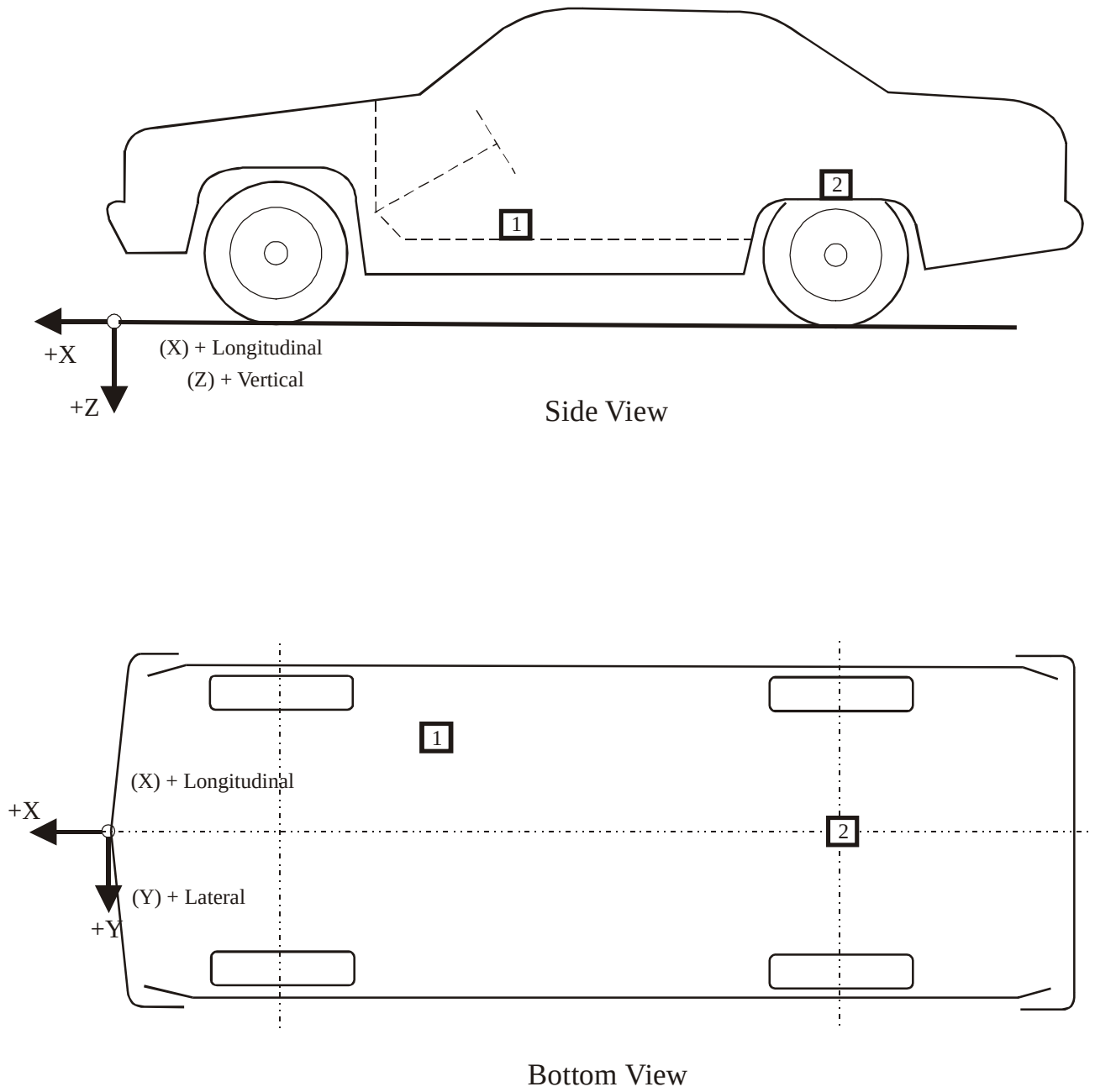


Table 3 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 031006 No. LOCATION	X	Y	Z	POSITIVE DIRECTION			NEGATIVE DIRECTION	
1 LEFT FRONT OCCUPANT COMPARTMENT	-1953 mm	-340 mm	-268 mm					
LONGITUDINAL				19.4 g	@	6.4 ms	1.0 g	@ 147.5 ms
LATERAL				9.9 g	@	9.7 ms	8.2 g	@ 13.4 ms
VERTICAL				10.5 g	@	8.6 ms	10.7 g	@ 13.6 ms
RESULTANT				20.5 g	@	6.5 ms		
2 REAR FLOORPAN AOVE AXLE	-3300 mm	2 mm	-490 mm					
LONGITUDINAL ¹				411.5 g	@	19.9 ms	248.3 g	@ 24.2 ms
LATERAL ¹				253.6 g	@	23.7 ms	45.4 g	@ 32.2 ms
VERTICAL ¹				109.5 g	@	22.6 ms	59.6 g	@ 43.0 ms
RESULTANT ¹				416.1 g	@	20.0 ms		

REFERENCE: X: + FORWARD FROM FRONT BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + DOWNWARD FROM GROUND LEVEL

For acceleration data sign convention see Report Sign Convention in Appendix D.

¹ See DATA ACQUISITION EXPLANATIONS on page 2-3

Table 4 Post-Impact Dummy/Vehicle Data

Visible dummy contact points:

	<u>Right Front Passenger</u>	<u>Left Rear Passenger</u>
Head	Head restraint	Head restraint
Chest	None	None
Abdomen	None	None
Left knee	None	None
Right knee	None	None

Door opening:

	<u>Left</u>	<u>Right</u>
Front	Easy	Easy
Rear	Easy	Easy

Seat back failure:

Right Front Passenger	Reclined
Left Rear Passenger	N/A

Seat track shift:

Right Front Passenger	None
Left Rear Passenger	N/A

<u>Glazing damage:</u>	Rear window shattered
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<u>Other notable impact effects:</u>	None
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Table 5 Dummy Injury Criteria Data

	<u>Maximum Acceleration¹</u>							
	Head				Chest			
	X	Y	Z	R	X	Y	Z	R
RF Passenger	33.8 g	4.6 g	21.3 g	34.6 g	14.0 g	-1.6 g	8.3 g	16.3 g
LR Passenger	26.2 g	2.8 g	21.6 g	30.6 g	25.5 g	-1.9 g	-1.0 g	25.5 g

	<u>Maximum Femur Compressive Force</u>	
	Left Femur	Right Femur
RF Passenger ⁴	517 N	568 N
LR Passenger	1058 N	989 N

	<u>Head Injury Criteria²</u>		
	36 millisecond		
	HIC	Time t ₁	Time t ₂
RF Passenger	155	106.7 ms	142.7 ms
LR Passenger	94	52.3 ms	87.9 ms

	15 millisecond		
	HIC	Time t ₁	Time t ₂
RF Passenger	94	119.1 ms	134.1 ms
LR Passenger	60	60.4 ms	75.4 ms

	<u>Chest Maximum Resultant Acceleration³</u>		
	Acceleration	Time t ₁	Time t ₂
RF Passenger	16.1 g	83.2 ms	86.2 ms
LR Passenger	24.8 g	42.9 ms	45.9 ms

Table 5 Dummy Injury Criteria Data, Cont'd.

Maximum Chest Deflection

RF Passenger	2 mm
LR Passenger	1 mm

Neck Injury Calculations (Nij)²

	NTF	NTE	NCF	NCE
RF Passenger	0.27	0.10	0.03	0.00
LR Passenger	0.20	0.26	0.11	0.25

Upper Neck Axial Force

	Neck Tension	Neck Compression
RF Passenger	1303 N	148 N
LR Passenger	1158 N	329 N

¹ See Report Sign Convention in Appendix D.

² As defined in FMVSS No. 208.

³ Defined as equal to or exceeding 0.003 sec. duration.

⁴ See Data Acquisition Explanation in Section 2.0.

Section 3.0

Summary of FMVSS 301 Data

Table 6 Fuel System Data

Vehicle year/make/ model/body style:	2003/Volvo/S40/4-door
Fuel system capacity:	60.1 liters (from owner's manual)
Usable capacity:	60.1 liters
Test volume range:	55.3 liters to 56.5 liters (92% to 94% of usable)
Actual test volume:	56.0 liters
Test fluid type:	Stoddard
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple
Did electric fuel pump operate with ignition switch "on" and the engine not operating?	No
Details of fuel system:	Fuel tank is located under vehicle 2nd row seat area. Fuel filler neck is located in the left rear quarter panel. Fuel filler cap is on the end of the fuel filler neck. Fuel lines are located forward at the top of the tank, inside the forward left frame rail.

Section 4.0

Vehicle, Occupant, and Camera Measurements

Dummy Kinematic Summary

Right Front Passenger Dummy

Upon impact, the right front passenger seat reclined and the dummy translated into the seat back. The dummy's head contacted the headrest. The dummy rebounded forward and came to rest seated in the right front passenger seat.

Left Rear Passenger Dummy

Upon impact, the left rear passenger dummy translated into the seat back. The dummy's head contacted the headrest. The dummy came to rest seated upright in the left rear passenger seat.

Figure 3 Pre-Test And Post-Test Measurement Points

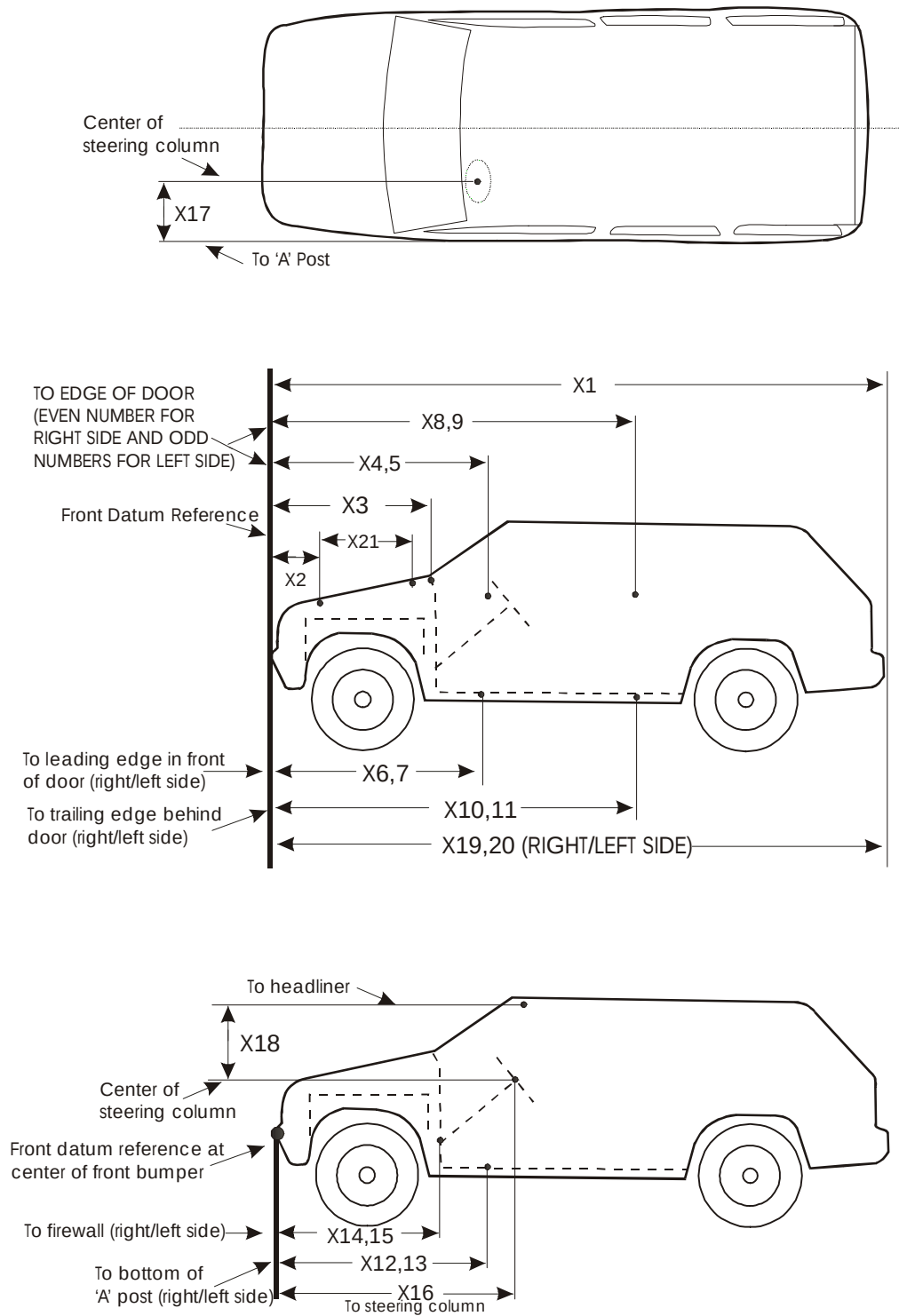


Table 7 Impacted Vehicle Measurements

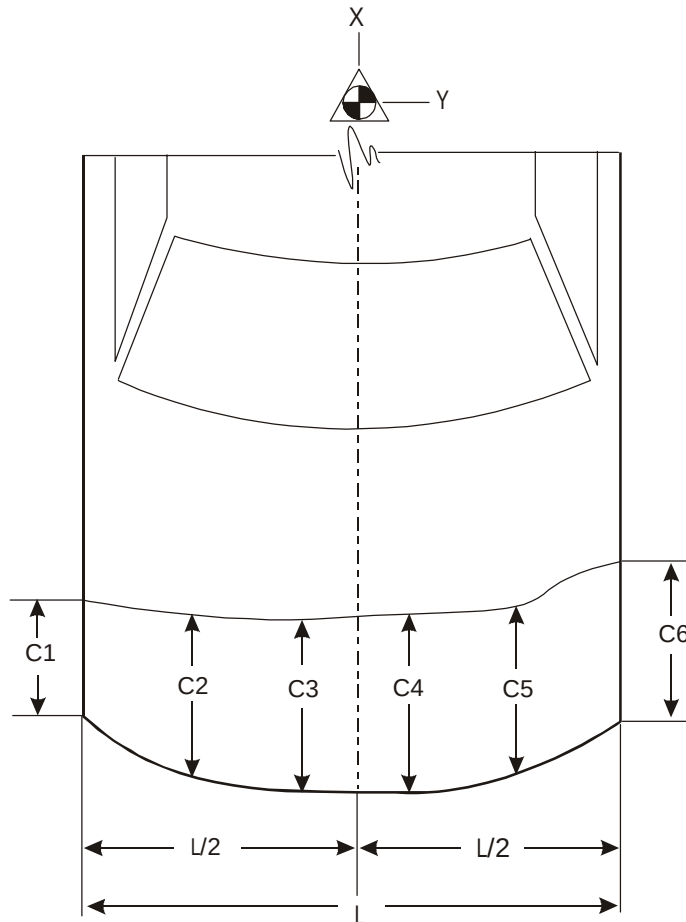
Vehicle Make/Model: 2003 Volvo S40 4-door

Test Number: 031006

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4500	4077	423
X2	Front Surface of Vehicle to Front of Engine Block	557	557	0
X3	Front Surface of Vehicle to Firewall	1084	1084	0
X4	Front Surface of Vehicle to Upper Leading Edge of Right Door	1410	1443	-33
X5	Front Surface of Vehicle to Upper Leading Edge of Left Door	1414	1419	-5
X6	Front Surface of Vehicle to Lower Leading Edge of Right Door	1430	1431	-1
X7	Front Surface of Vehicle to Lower Leading Edge of Left Door	1430	1419	11
X8	Front Surface of Vehicle to Upper Trailing Edge of Right Door	1640	1412	228
X9	Front Surface of Vehicle to Upper Trailing Edge of Left Door	2442	2438	4
X10	Front Surface of Vehicle to Lower Trailing Edge of Right Door	1640	1424	216
X11	Front Surface of Vehicle to Lower Trailing Edge of Left Door	2440	2419	21
X12	Front Surface of Vehicle to Bottom of " A " Post on Right Side	1415	1413	2
X13	Front Surface of Vehicle to Bottom of " A " Post on Left Side	1405	1406	-1
X14	Front Surface of Vehicle to Firewall-Right Side	1145	1145	0
X15	Front Surface of Vehicle to Firewall-Left Side	1152	1152	0
X16	Front Surface of Vehicle to Steering Wheel Center	1842	1845	-3
X17	Center of Steering Column to " A " Post	307	309	-2
X18	Center of Steering Column to Headliner	430	430	0
X19	Front Surface of Vehicle to Right Side of Rear Bumper	4410	4041	369
X20	Front Surface of Vehicle to Left Side of Rear Bumper	4405	4008	397
X21	Length of Engine Block	500	500	0

All measurements are in millimeters.

Figure 4 Vehicle Crush



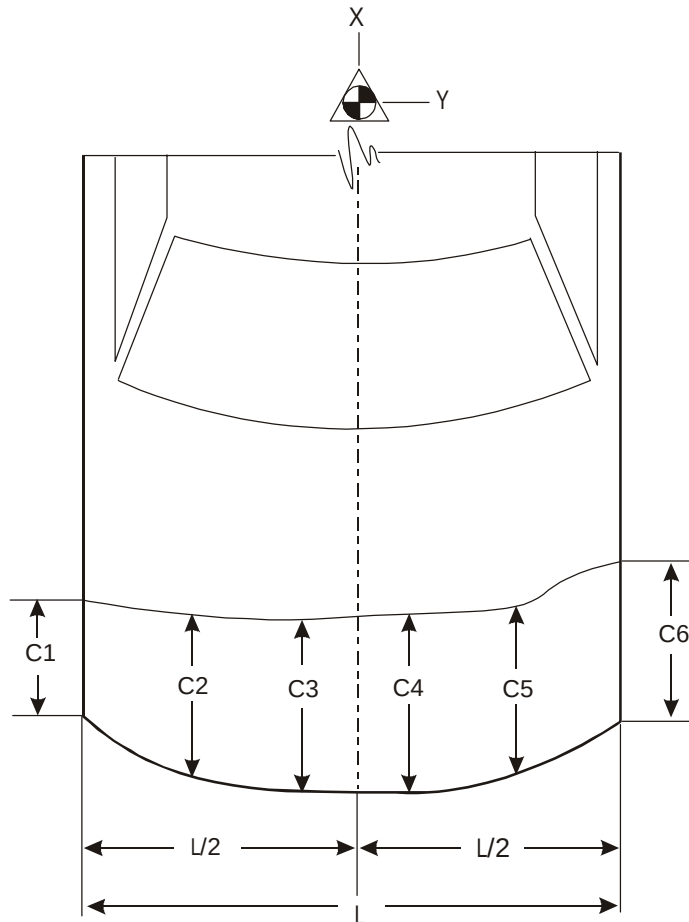
Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 2003 Volvo S40 4-door sedan
Measured with bumper fascia:

Location	Pre-test	Post-test	Difference
L	1320 mm		
C1	4405 mm	4008 mm	397 mm
C2	4465 mm	4070 mm	395 mm
C3	4496 mm	4094 mm	405 mm
C4	4498 mm	4102 mm	396 mm
C5	4472 mm	4105 mm	367 mm
C6	4410 mm	4041 mm	369 mm
CL	4500 mm	4077 mm	423 mm

¹ The differences for points C1-C6, measured with the bumper fascia, are included in the NHTSA database submission as Damage Profile Distance 1-6.

Figure 4 Vehicle Crush, Cont'd.



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

Vehicle: 2003 Volvo S40 4-door sedan

Measured to bumper beam without bumper fascia:

Location	Pre-test	Post-test	Difference
L	1315 mm		
C1	4355 mm	3888 mm	467 mm
C2	4396 mm	3918 mm	478 mm
C3	4426 mm	3954 mm	472 mm
C4	4428 mm	3962 mm	466 mm
C5	4404 mm	3947 mm	457 mm
C6	4350 mm	3894 mm	456 mm
CL	4427 mm	3956 mm	471 mm

Figure 5 Dummy Measurement Locations for Occupants

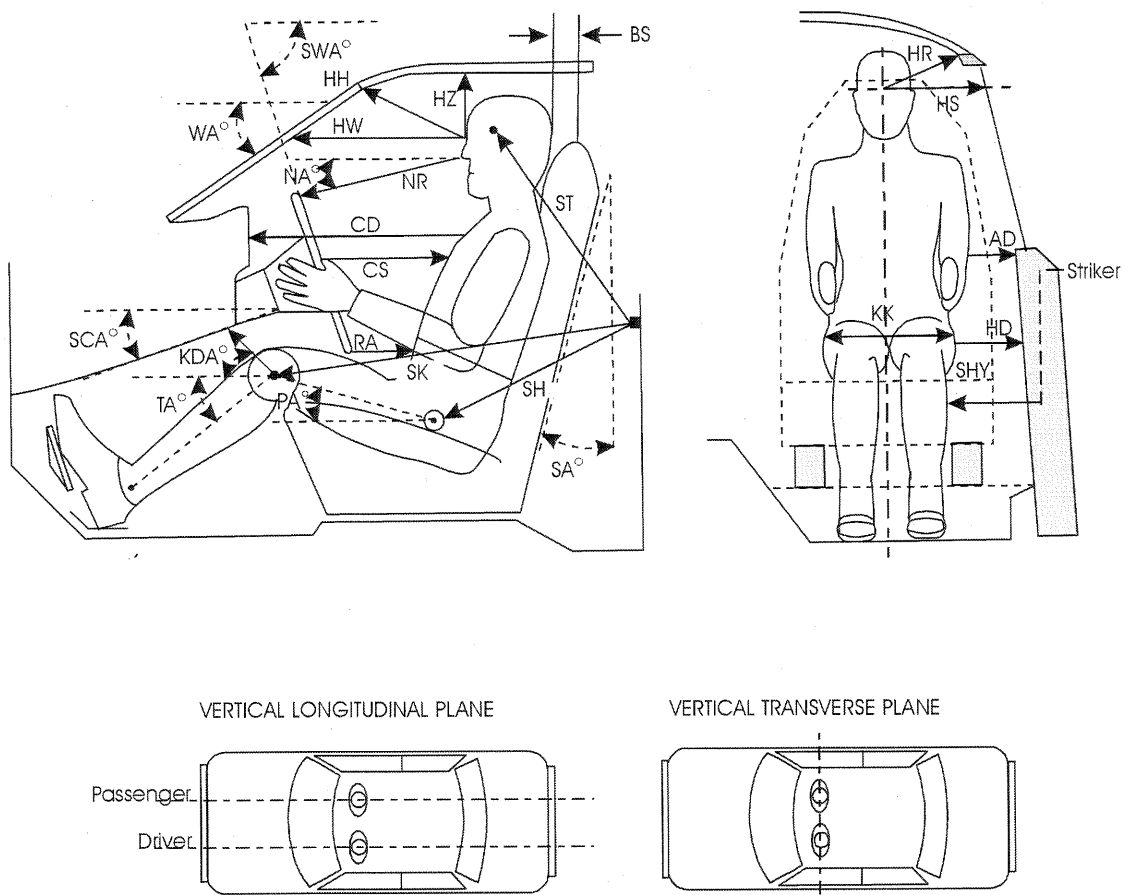


Table 8 Dummy Measurement Data

Designation	Type of Measurement	Front Passenger (Serial #202)	Rear Passenger (Serial #206)
WA	Windshield angle	28.3°	28.3°
SWA	Steering wheel angle	N/A	N/A
SCA	Steering column angle	N/A	N/A
SA	Seat back angle	16°	30.5°
HZ	Head to roof	172 mm	146 mm
HH	Head to header	334 mm	N/A mm
HW	Head to windshield	569 mm	N/A mm
HR	Head to side header	225 mm	223 mm
NR	Nose to rim	N/A	N/A
NA	Nose to rim angle	N/A	N/A
CD	Chest to dash	516 mm	N/A
CS	Steering wheel to chest	N/A	N/A
RA	Rim to abdomen	N/A	N/A
KDL	Left knee to dash	181 mm	N/A
KDR	Right knee to dash	186 mm	N/A
KDA	Outboard knee to dash angle	28.6°	N/A
PA	Pelvic angle	24.2°	21.7°
TA	Tibia angle	44.2°	48.7°
KK	Knee to knee	270 mm	275 mm
ST	Striker to head	541 mm	422 mm
	Striker to head angle ¹	-88°	-71.4°
SK	Striker to knee	588 mm	636 mm
	Striker to knee angle ¹	-5.1°	8.3°
SH	Striker to H-point	230 mm	380 mm
	Striker to H-point angle ¹	17.7°	32.5°
SHY	Striker to H-point (Y dir.)	216 mm	210 mm
HS	Head to side window	311 mm	292 mm
HD	H-point to door	124 mm	136 mm
AD	Arm to door	113 mm	83 mm
BS	Backset	70 mm	76 mm

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

¹ A negative angle indicates that the measurement point was located above the striker.

Table 9 Seat Data

P2 DATA:

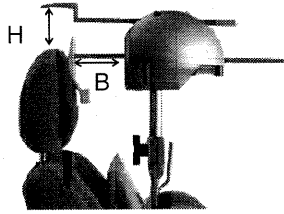
HEAD RESTRAINT	YES	NO	DETAILS			
Fixed:	<u>X</u>	<u>-</u>	Volvo Whiplash Injury Prevention System (WHIPS)			
Vertical Adjustment:	<u>-</u>	<u>X</u>				
Vertical Locks:	<u>-</u>	<u>X</u>				
Fore-Aft Adjustment:	<u>-</u>	<u>X</u>				
Fore-Aft Locks:	<u>-</u>	<u>X</u>				
SEATBACK RECLINE TYPE	YES	NO	DETAILS			
Fixed:	<u>-</u>	<u>X</u>				
Power:	<u>X</u>	<u>-</u>				
Lever (with detents):	<u>-</u>	<u>X</u>				
Lever (infinite)	<u>-</u>	<u>X</u>				
Lever (ratchet)	<u>-</u>	<u>X</u>				
Rotary Knob:	<u>X</u>	<u>-</u>				
Pivot Locks on Both Sides:	<u>X</u>	<u>-</u>				
LUMBAR ADJUSTMENT	YES	NO	DETAILS			
Fixed:	<u>-</u>	<u>X</u>				
Adjustable:	<u>X</u>	<u>-</u>				
			Placed in retracted position for ICBC measurements and test.			
BOLSTER ADJUSTMENT	YES	NO	DETAILS			
Fixed:	<u>X</u>	<u>-</u>				
Adjustable:	<u>-</u>	<u>X</u>				
			Placed in full open for ICBC measurements and test.			
SEAT CUSHION TYPE	YES	NO	DETAILS			
Cushion moves vertically independently of seat back:	<u>-</u>	<u>X</u>				
SEAT CUSHION FORE-AFT	YES	NO	DETAILS			
Fixed:	<u>-</u>	<u>X</u>	Travel: <u>220</u> mm First Detent: <u>-</u> Last Detent: <u>-</u> Travel: <u>-</u> mm Travel: <u>-</u> mm			
Power:	<u>-</u>	<u>X</u>				
Manual-Detents:	<u>-</u>	<u>X</u>				
Manual-Infinite:	<u>X</u>	<u>-</u>				
SEAT CUSHION VERTICAL	YES	NO	DETAILS			
Fixed:	<u>-</u>	<u>X</u>				
Power:	<u>-</u>	<u>X</u>				
Manual-Detents	<u>X</u>	<u>-</u>				
Manual-Infinite	<u>-</u>	<u>X</u>				
SEAT TEST POSITION						
Seat Cushion Fore-aft:	<u>at mid-track position</u>					
Seat Cushion Vertical:	<u>Non-adjustable</u>					
Seat Back:	<u>25 degree torso angle as set with H-point machine</u>					
Head Restraint:	<u>Fixed</u>					

Table 9 Seat Data, Cont'd.

P4 DATA:

HEAD RESTRAINT	YES	NO	DETAILS
Fixed:	-	X	
Vertical Adjustment:	X	-	
Vertical Locks:	X	-	
Fore-Aft Adjustment:	-	X	
Fore-Aft Locks:	-	X	
SEATBACK RECLINE TYPE	YES	NO	DETAILS
Fixed:	X	-	
Power:	-	X	
Lever (with detents):	-	X	
Lever (infinite)	-	X	
Lever (ratchet)	-	X	
Rotary Knob:	-	X	
Pivot locks on Both Sides:	-	X	
LUMBAR ADJUSTMENT	YES	NO	DETAILS
Fixed:	-	X	
Adjustable:	-	X	
BOLSTER ADJUSTMENT	YES	NO	DETAILS
Fixed:	X	-	
Adjustable:	-	X	Placed in full open for ICBC measurements and test.
SEAT CUSHION TYPE	YES	NO	DETAILS
Cushion moves vertically independently of seat back:	-	X	
SEAT CUSHION FORE-AFT	YES	NO	DETAILS
Fixed:	-	X	
Power:	-	X	Travel: - mm
Manual-Detents:	-	X	First Detent: - Last Detent: - Travel: - mm
Manual-Infinite:	-	X	Travel: - mm
SEAT CUSHION VERTICAL	YES	NO	DETAILS
Fixed:	-	X	
Power:	-	X	
Manual-Detents	-	X	
Manual-Infinite	-	X	
SEAT TEST POSITION			
Seat Cushion Fore-aft:	Non-adjustable		
Seat Cushion Vertical:	Non-adjustable		
Seat Back:	31 degree torso angle with the H-point machine		
Head Restraint:	Full-up position		

Table 10 ICBC Measurements



P2 DATA:

ICBC MEASUREMENTS

HEAD RESTRAINT POSITION (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line from Pivot (mm)
Fixed / Fixed:	35	19	25.0	792

HEAD RESTRAINT POSITION – CONFIGURED FOR TEST (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line from Pivot (mm)
Fixed / Fixed:	NA	NA	25.0	792

Head restraint positioning details: None

P4 DATA:

ICBC MEASUREMENTS

HEAD RESTRAINT POSITION (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line from Pivot (mm)
Adjustable / Fixed:	25	70	31.0	776

Head restraint positioning details: Full down position

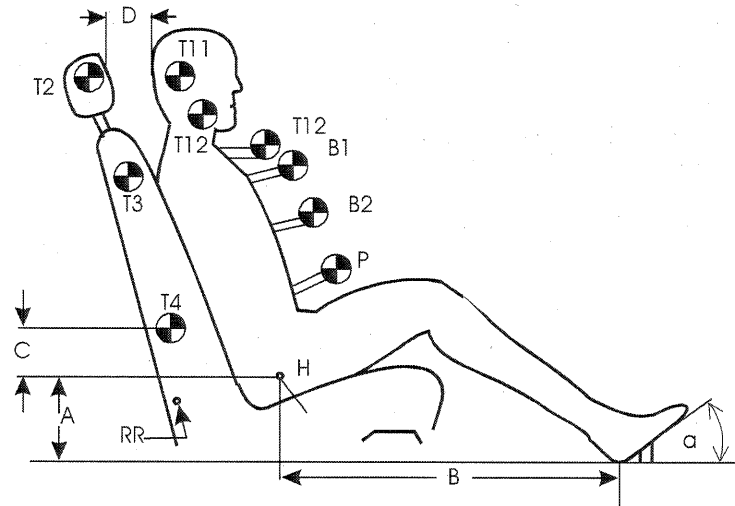
Adjustable / Fixed:	20	3	31.0	778
---------------------	----	---	------	-----

Head restraint positioning details: Full up position

HEAD RESTRAINT POSITION – CONFIGURED FOR TEST (vertical/fore-aft)	B (mm, backset)	H (mm, height)	Torso Angle (deg)	Height Along Torso Line from Pivot (mm)
Adjustable / Fixed:	20	3	31.0	778

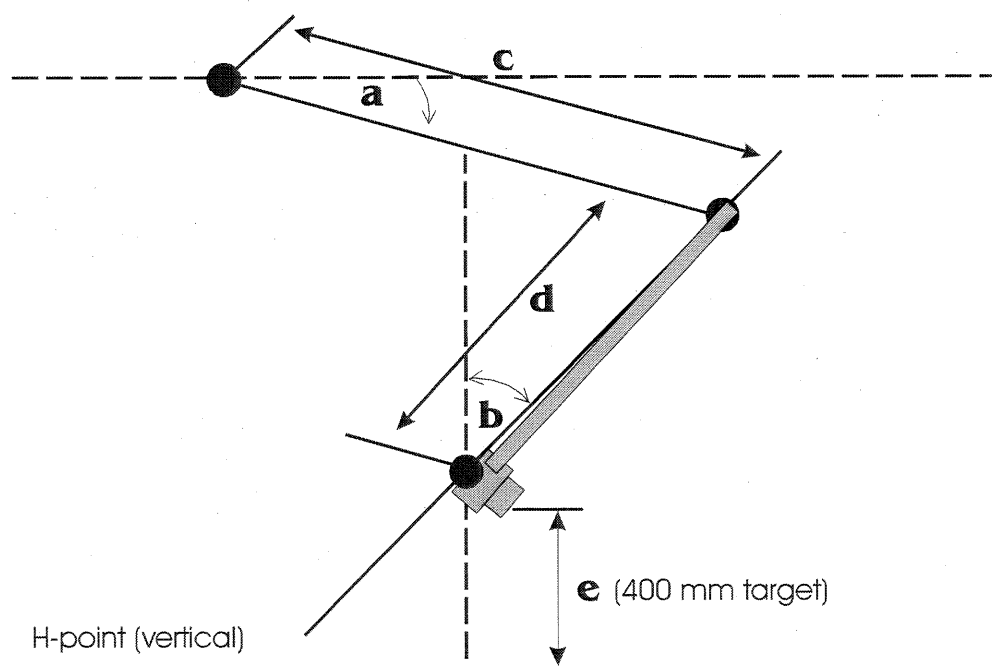
Head restraint positioning details: Full up position

Figure 6 Dummy Targeting Measurements



Parameter	Dummy Position (#)	Vertical Distance (mm)	Dist. to Side Camera (mm)
Target T2 to T3	2	245	914.4
Target T3 to T4	2	290	812.8
Target T4 to Orig. (on center console)	2	40	787.4
Target on Arm	2	N/A	825.5
Target on Head CG	2	N/A	927.1
Centerline of Seat	2	N/A	1016.0
Target on Head Restraint	4	N/A	838.2
Target on Arm	4	N/A	812.8
Target on Head CG	4	N/A	914.4
Centerline of Seat	4	N/A	1003.3
Target on Door Panel	4	N/A	1295.4

Figure 7 Volvo Rear Impact Measurement Device Measurements



DIMENSION	Position 2 LEFT	Position 2 RIGHT
a (degrees from horizontal)	1.8	1.9
b (degrees from vertical)	24.6	25.5
c (mm)	662	655
d (mm)	340	345
e (mm, target = 400)	356	355
f (mm, MHD to rotary pot)	365	365

SEATBACK ANGLE	PRE (Degree)	POST (Degree)
Left MHD Bracket (from horizontal)	22.0	29.3
Right MHD Bracket (from horizontal)	21.0	31.6
Front Sill*	(-) 0.8	
Rear Sill*	(-) 1.4	

* From horizontal, positive front of sill higher than rear.

Figure 8 Camera Positions

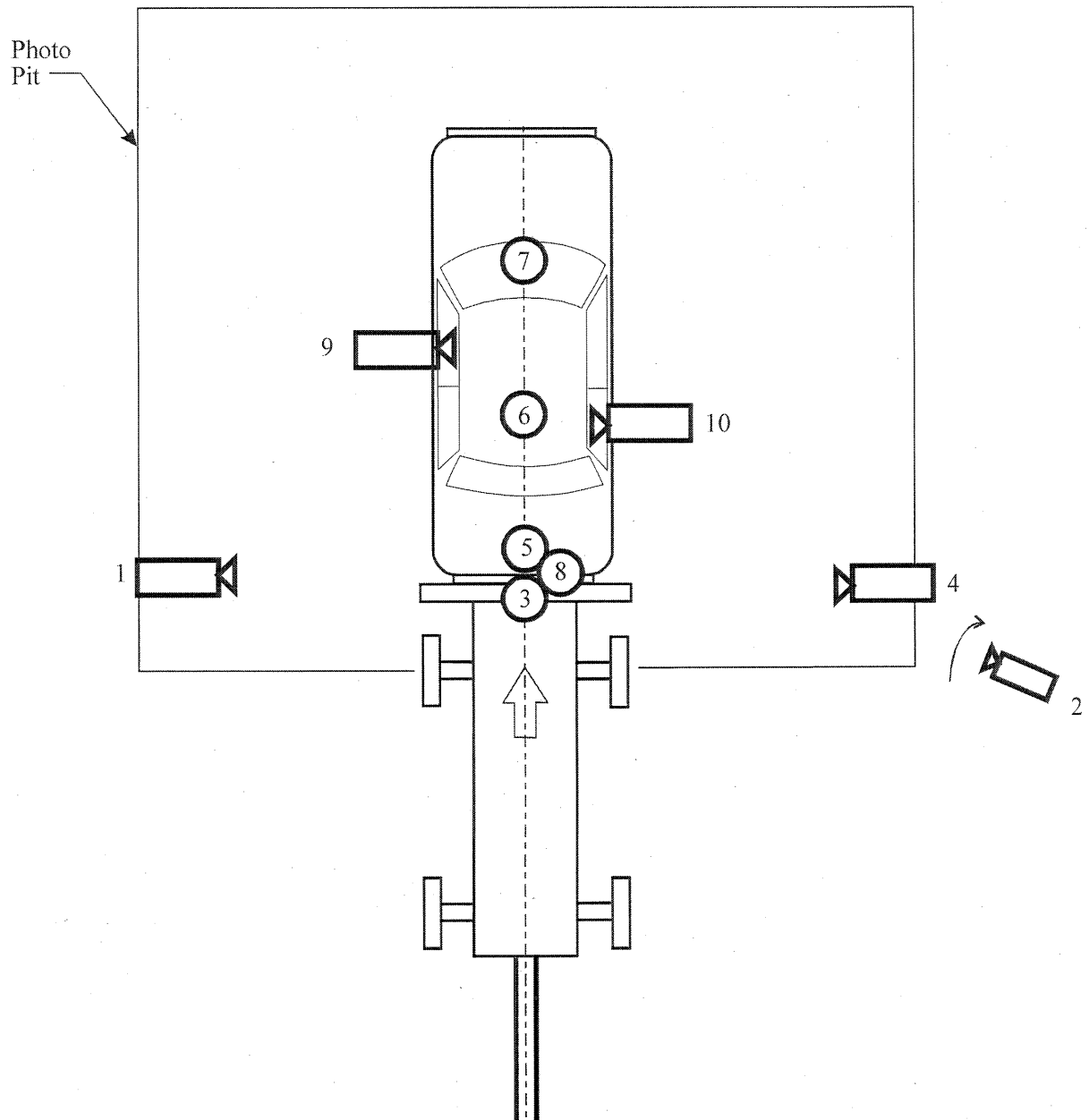


Table 11 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (frames/s)	Purpose of Camera Data
1	Left wide	Digital HG	27	1000	Vehicle crush
2	Real time panning	Bolex	Zoom	24	Vehicle dynamics
3	Onboard cart	Digital HG	8	1000	Vehicle crush
4	Right wide	Digital HG	Zoom	1000	Vehicle crush
5	Pit rear	Digital HG	13	1000	Vehicle dynamics
6	Pit mid	Digital HG	13	1000	Vehicle dynamics
7	Pit front	Digital HG	13	1000	Vehicle dynamics
8	Overhead	Digital HG	20	1000	Vehicle crush
9	Onboard front passenger	Digital HG	7.5	1000	Dummy kinematics
10	Onboard rear passenger	Digital HG	5	1000	Dummy kinematics

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 Side Overall View

Intentionally Left Blank



Figure A-6 Pre-Test Left Side View



Figure A-7 Post-Test Left Side View



Figure A-8 Pre-Test Left Rear Three-Quarter View



Figure A-9 Post-Test Left Rear Three-Quarter View



Figure A-10 Pre-Test Rear View



Figure A-11 Post-Test Rear View



Figure A-12 Pre-Test Right Rear Three-Quarter View



Figure A-13 Post-Test Right Rear Three-Quarter View



Figure A-14 Pre-test Right Side Overall View

Intentionally Left Blank



Figure A-15 Pre-Test Right Side View



Figure A-16 Post-Test Right Side View



Figure A-17 Pre-Test Right Front Three-Quarter View



Figure A-18 Post-Test Right Front Three-Quarter View



Figure A-19 Pre-Test Overhead - View 1



Figure A-20 Pre-Test Overhead - View 2

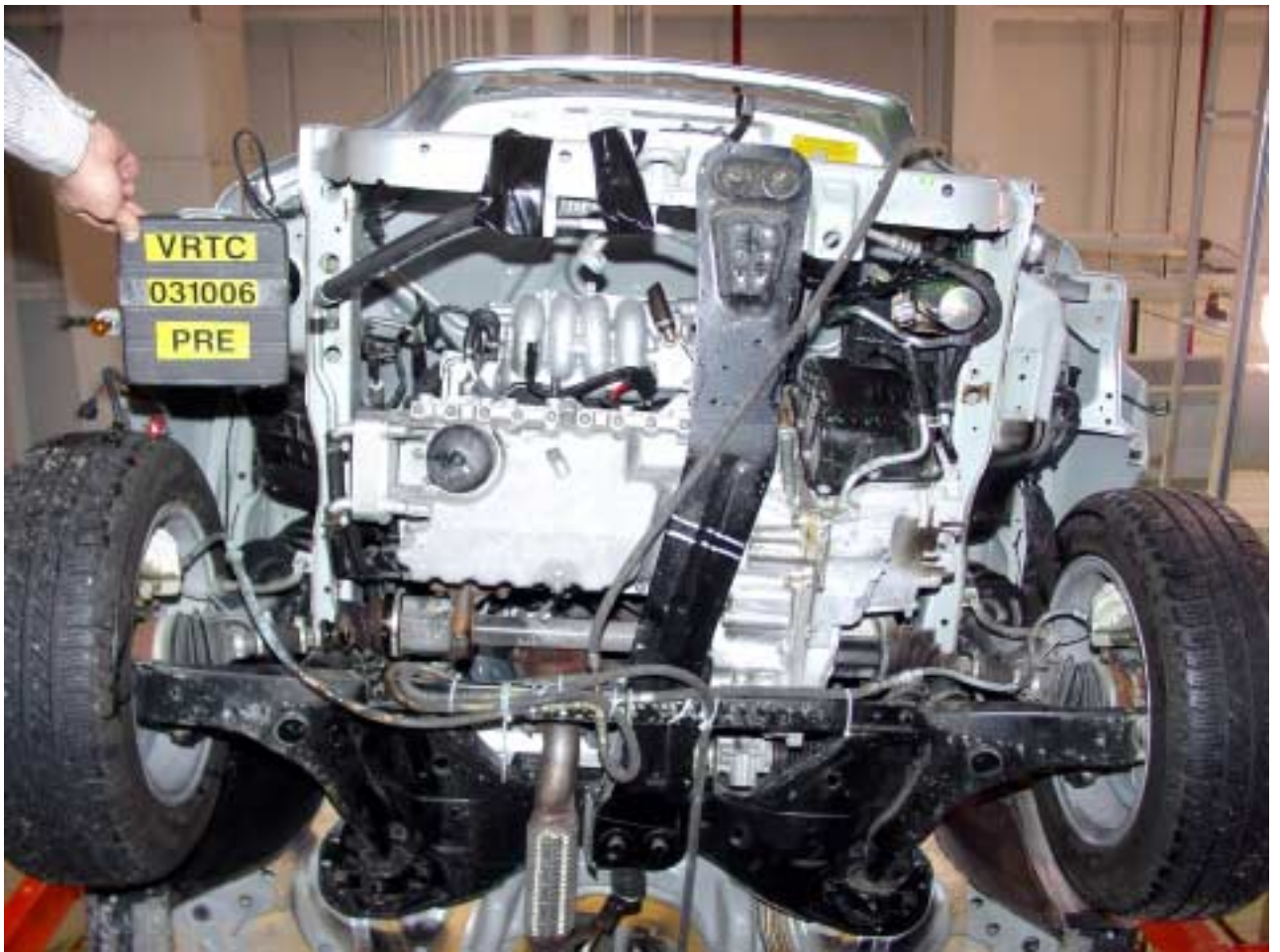


Figure A-21 Pre-Test Front Underbody View

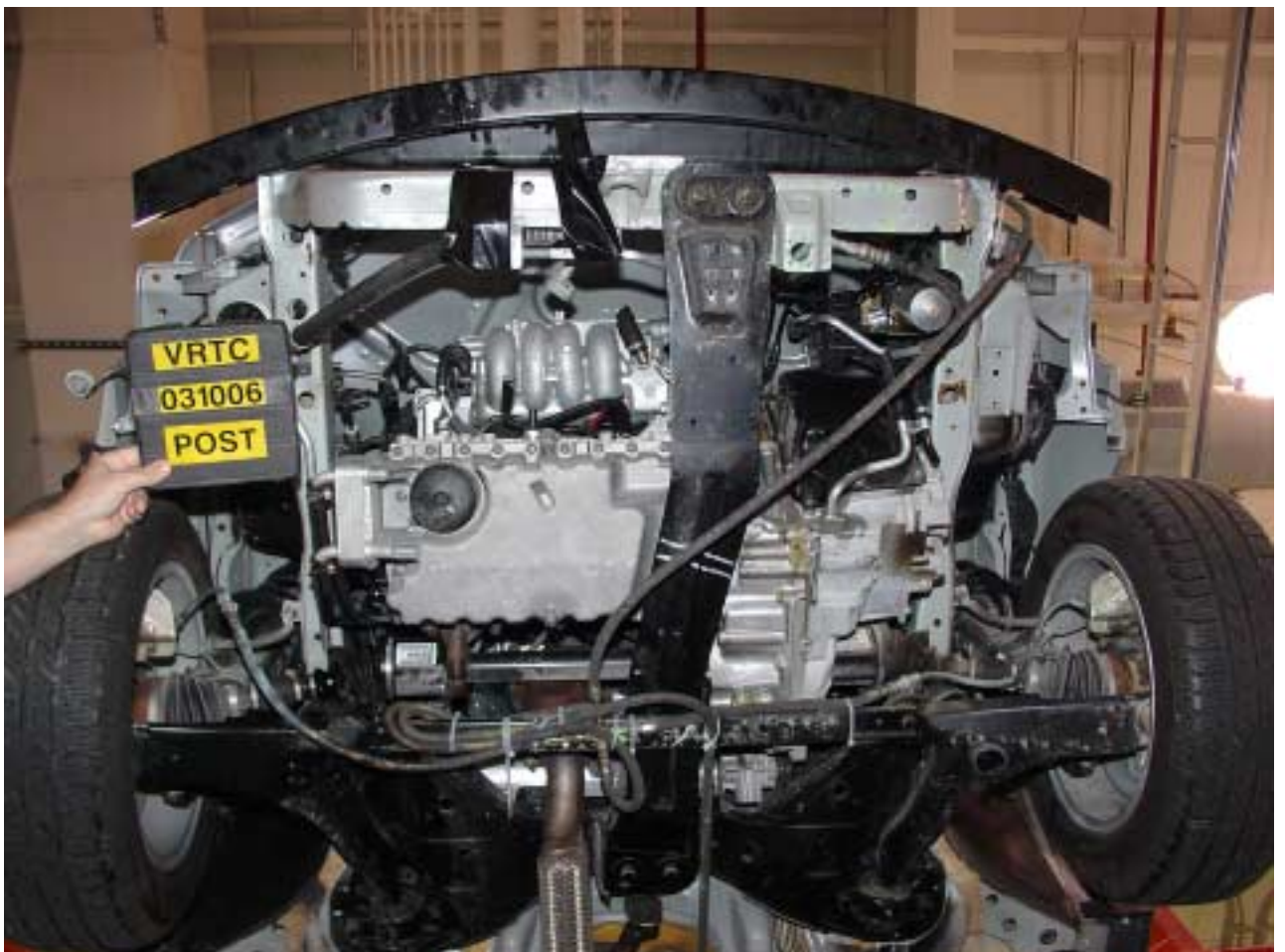


Figure A-22 Post-Test Front Underbody View



Figure A-23 Pre-Test Mid Front Underbody View



Figure A-24 Post-Test Mid Front Underbody View



Figure A-25 Pre-Test Mid Underbody View



Figure A-26 Post-Test Mid Underbody View



Figure A-27 Pre-Test Mid Rear Underbody View



Figure A-28 Post-Test Mid Rear Underbody View



Figure A-29 Pre-Test Rear Underbody View



Figure A-30 Post-Test Rear Underbody View



Figure A-31 Pre-Test Fuel Tank View



Figure A-32 Post-Test Fuel Tank View



Figure A-33 Pre-Test Fuel Filler Neck View



Figure A-34 Post-Test Fuel Filler Neck View



Figure A-35 Pre-Test Fuel Filler Cap View



Figure A-36 Post-Test Fuel Filler Cap View



Figure A-37 Pre-Test Right Front Passenger Dummy - View 1



Figure A-38 Post-Test Right Front Passenger Dummy - View 1



Figure A-39 Pre-Test Right Front Passenger Dummy - View 2



Figure A-40 Post-Test Right Front Passenger Dummy - View 2



Figure A-41 Pre-Test Right Front Passenger Dummy - View 3



Figure A-42 Post-Test Right Front Passenger Dummy - View 3

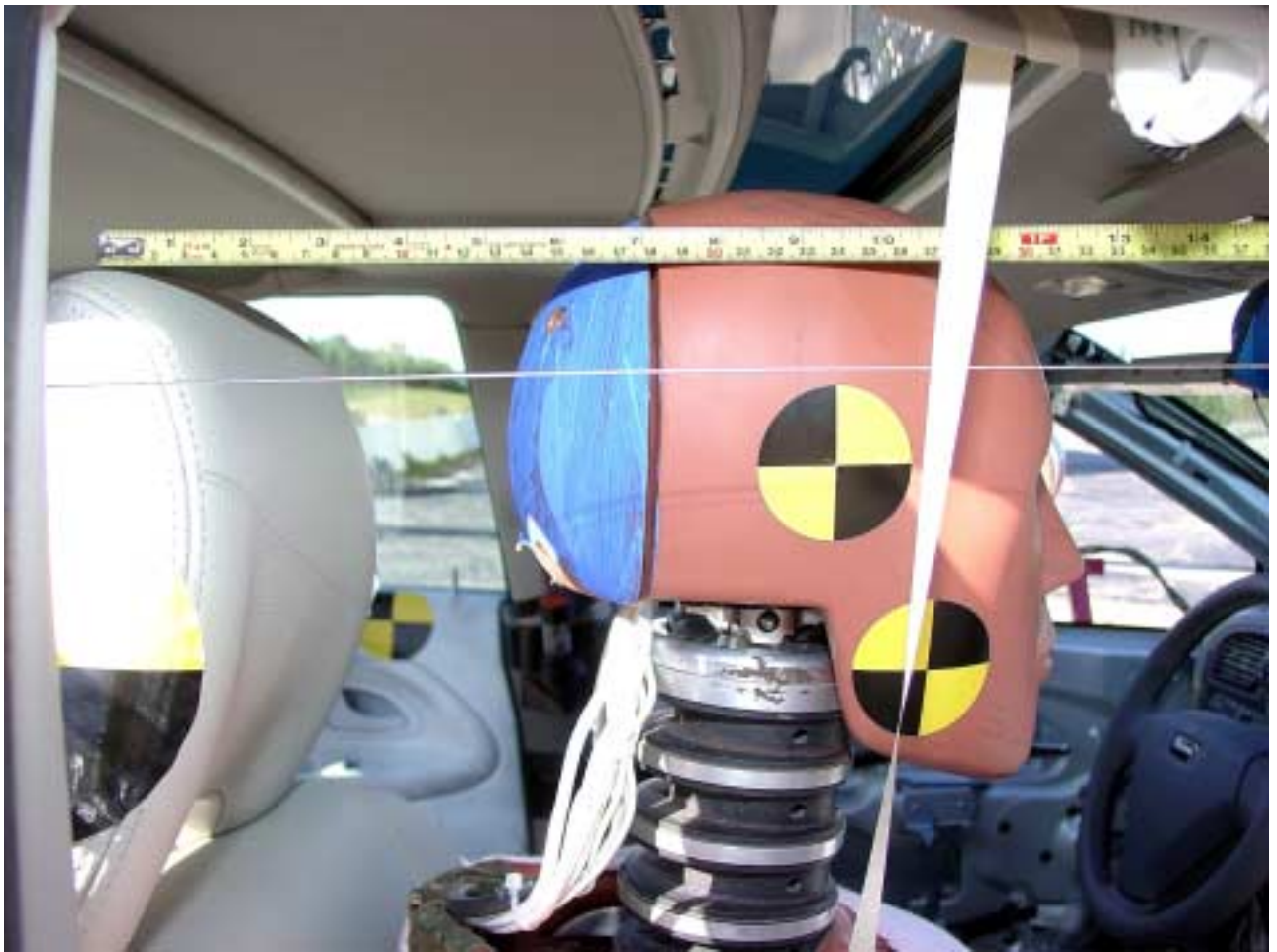


Figure A-43 Pre-Test Right Front Passenger Dummy - View 4



Figure A-44 Post-Test Right Front Passenger Dummy - View 4



Figure A-45 Post-Test Right Front Passenger Dummy Overall - View 1



Figure A-46 Post-Test Right Front Passenger Dummy Overall - View 2



Figure A-47 Post-Test Right Front Passenger Dummy Head Contact View



Figure A-48 Post-Test Right Front Passenger Seat View



Figure A-49 Pre-Test Left Rear Passenger Dummy - View 1



Figure A-50 Post-Test Left Rear Passenger Dummy - View 1



Figure A-51 Pre-Test Left Rear Passenger Dummy - View 2



Figure A-52 Post-Test Left Rear Passenger Dummy - View 2



Figure A-53 Pre-Test Left Rear Passenger Dummy - View 3



Figure A-54 Post-Test Left Rear Passenger Dummy - View 3



Figure A-55 Pre-Test Left Rear Passenger Dummy - View 4



Figure A-56 Post-Test Left Rear Passenger Dummy - View 4



Figure A-57 Post-Test Left Rear Passenger Overall Dummy - View 1



Figure A-58 Post-Test Left Rear Passenger Overall Dummy - View 2



Figure A-59 Post-Test Left Rear Passenger Dummy Head Contact View



Figure A-60 Post-Test Left Rear Passenger Seat - View 1



Figure A-61 Post-Test Left Rear Passenger Seat - View 2

Intentionally Left Blank



Figure A-62 Vehicle Certification Label View



Figure A-63 Vehicle Tire Pressure Label View



Figure A-64 Pre-Test Barrier View



Figure A-65 Post-Test Barrier View

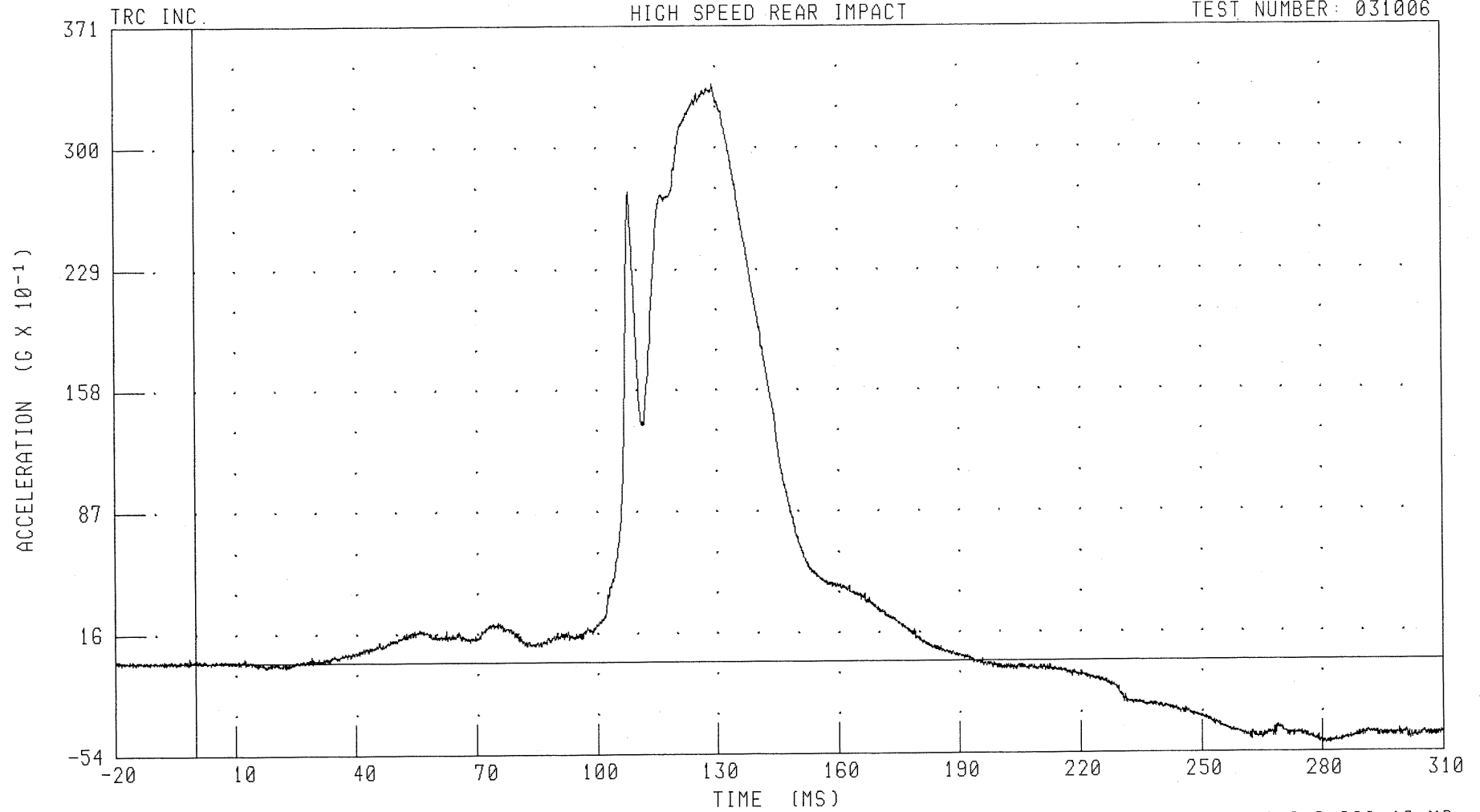
Appendix B

Data Plots

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDXG2

FILTER: CH. CLASS 1000

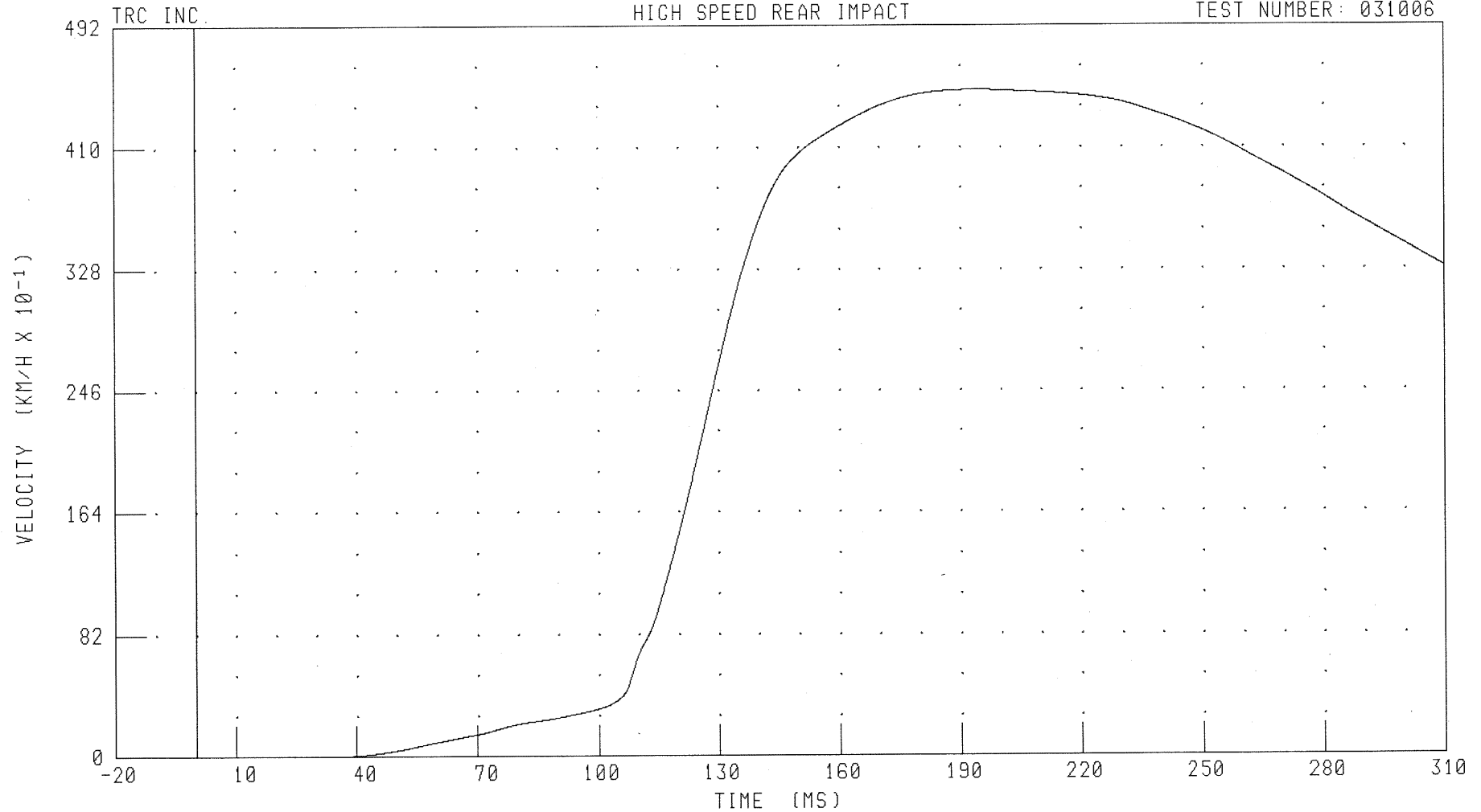
PEAK DATA: 33.82 G @ 129.44 MS; -4.91 G @ 280.16 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER HEAD X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDXV2 FILTER: CH. CLASS 180

PEAK DATA: 44.82 KM/H @ 193.68 MS; -0.06 KM/H @ 27.36 MS

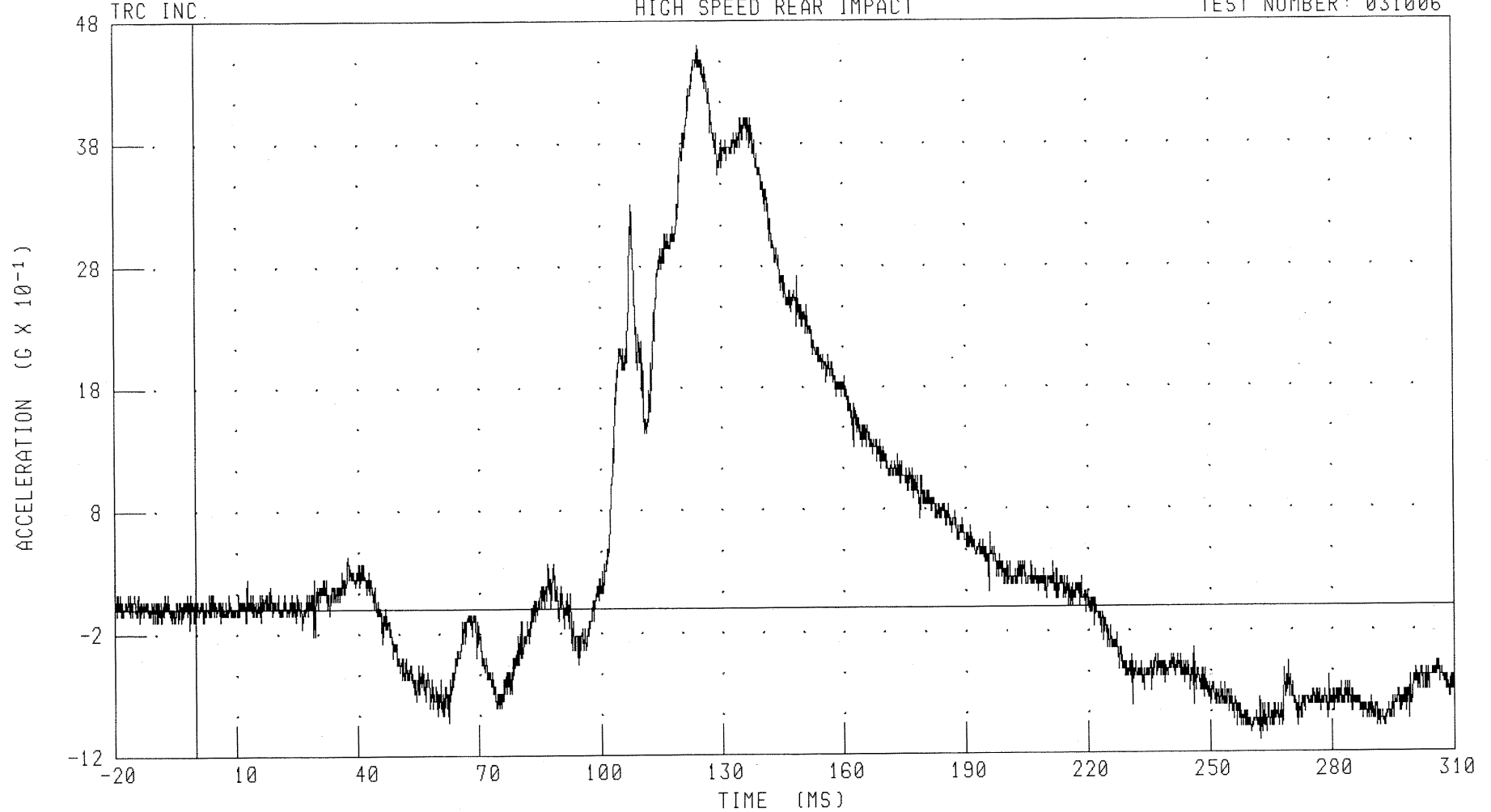
B-3

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDYG2

FILTER: CH. CLASS 1000

PEAK DATA: 4.60 G @ 124.56 MS; -1.10 G @ 262.48 MS

B-4

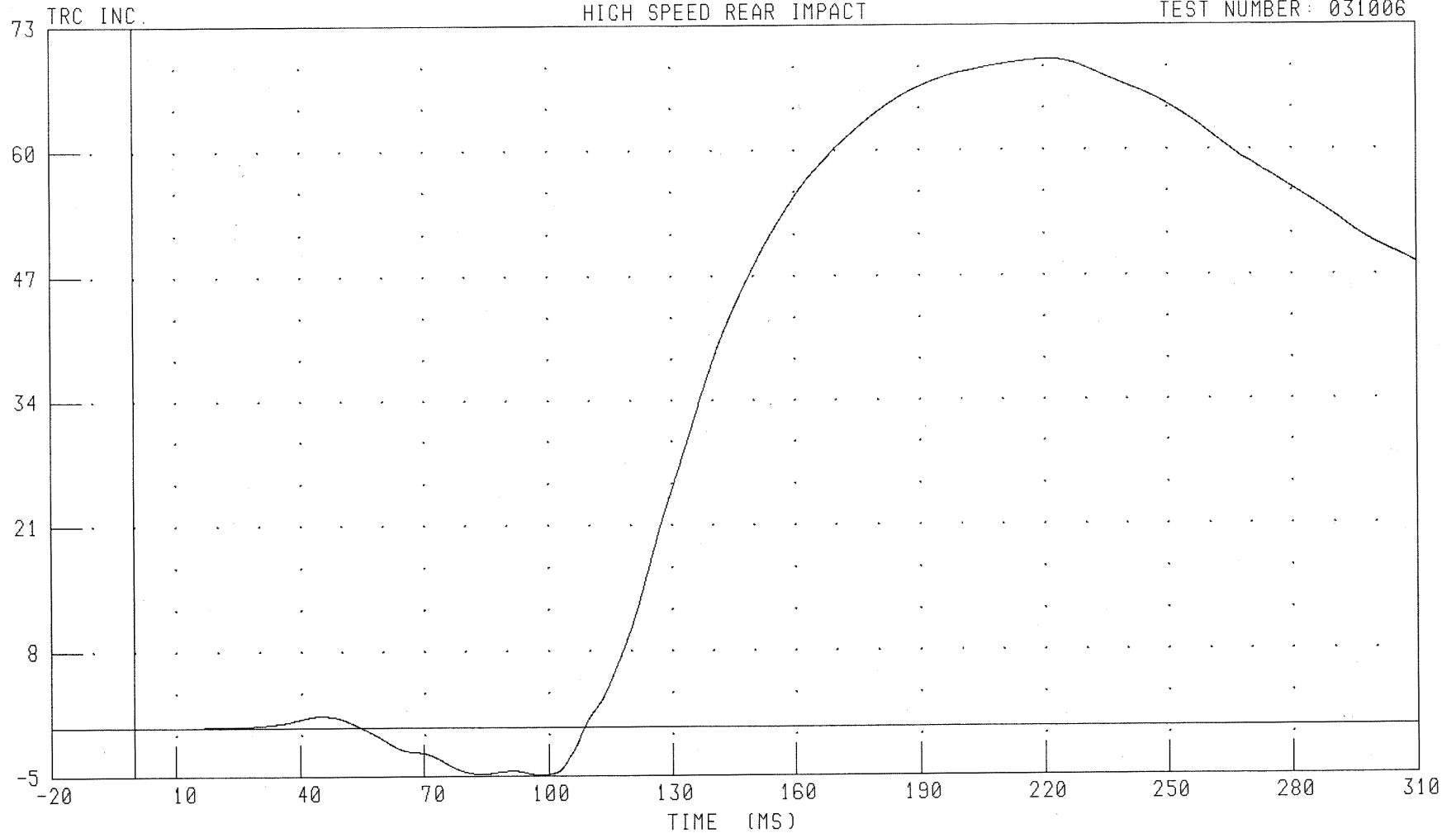
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER HEAD Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDYV2

FILTER: CH. CLASS 180

PEAK DATA: 6.94 KM/H @ 221.60 MS; -0.49 KM/H @ 98.16 MS

B-5

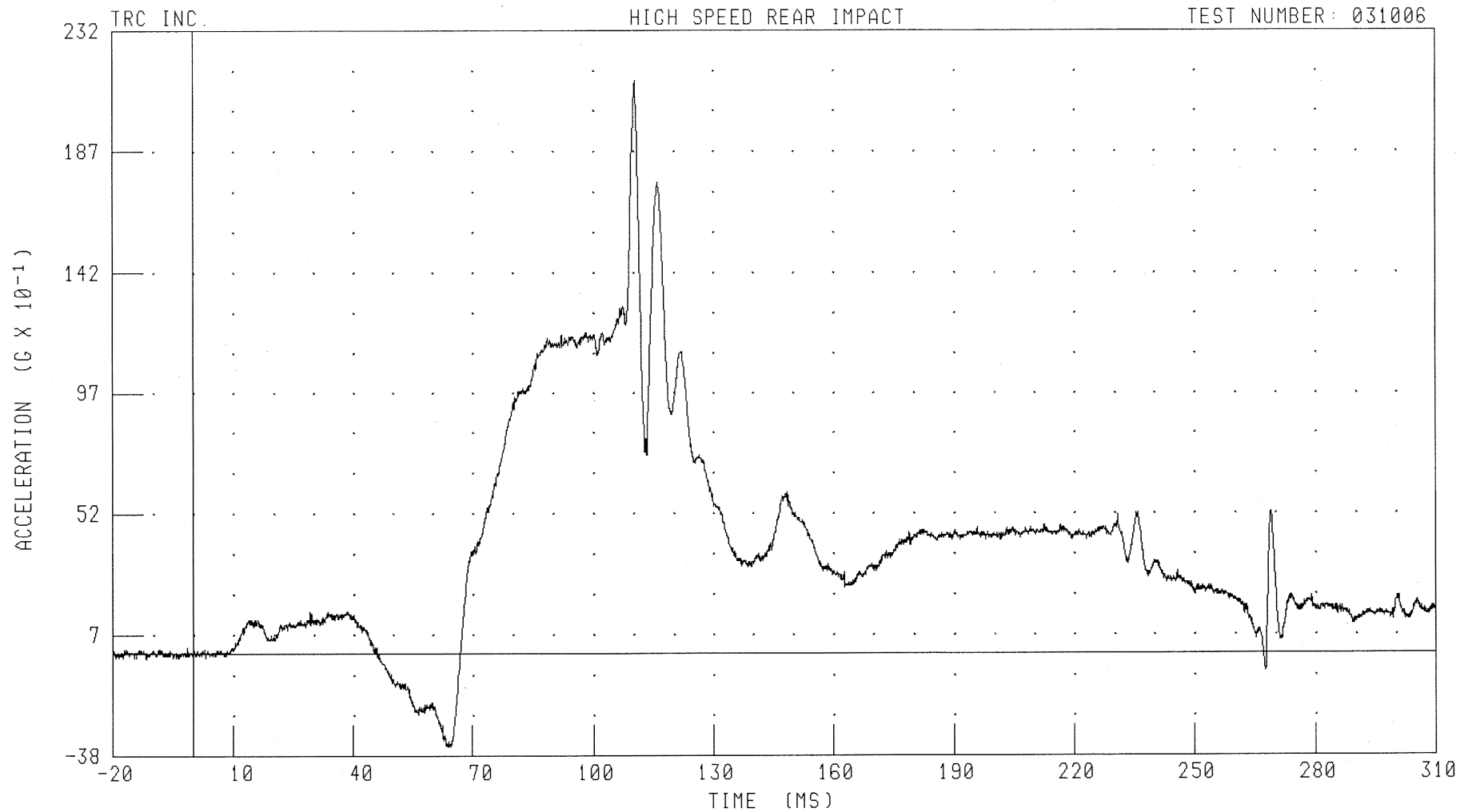
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

PEAK DATA: 21.33 G @ 110.40 MS; -3.48 G @ 63.84 MS

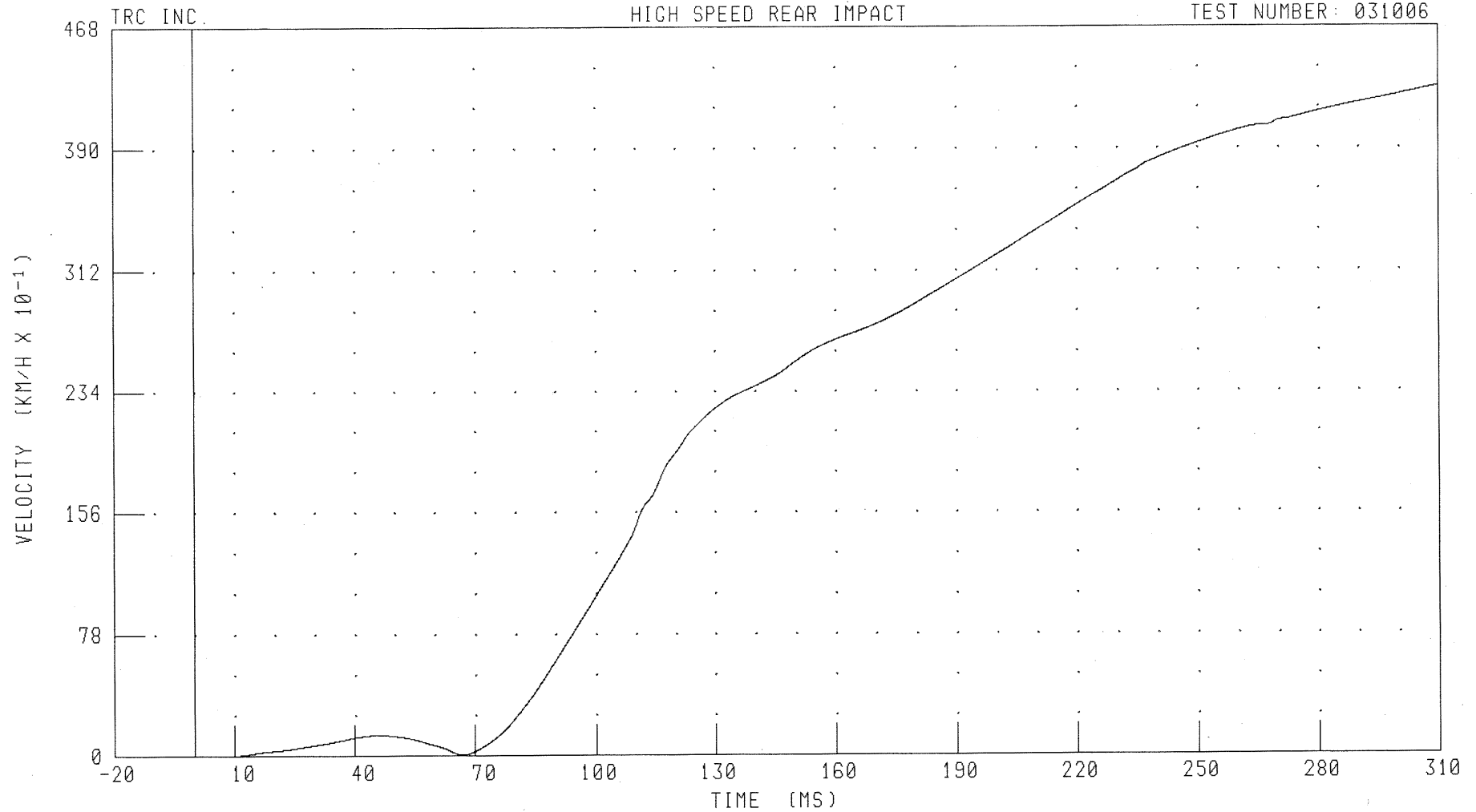
B-6

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER HEAD Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



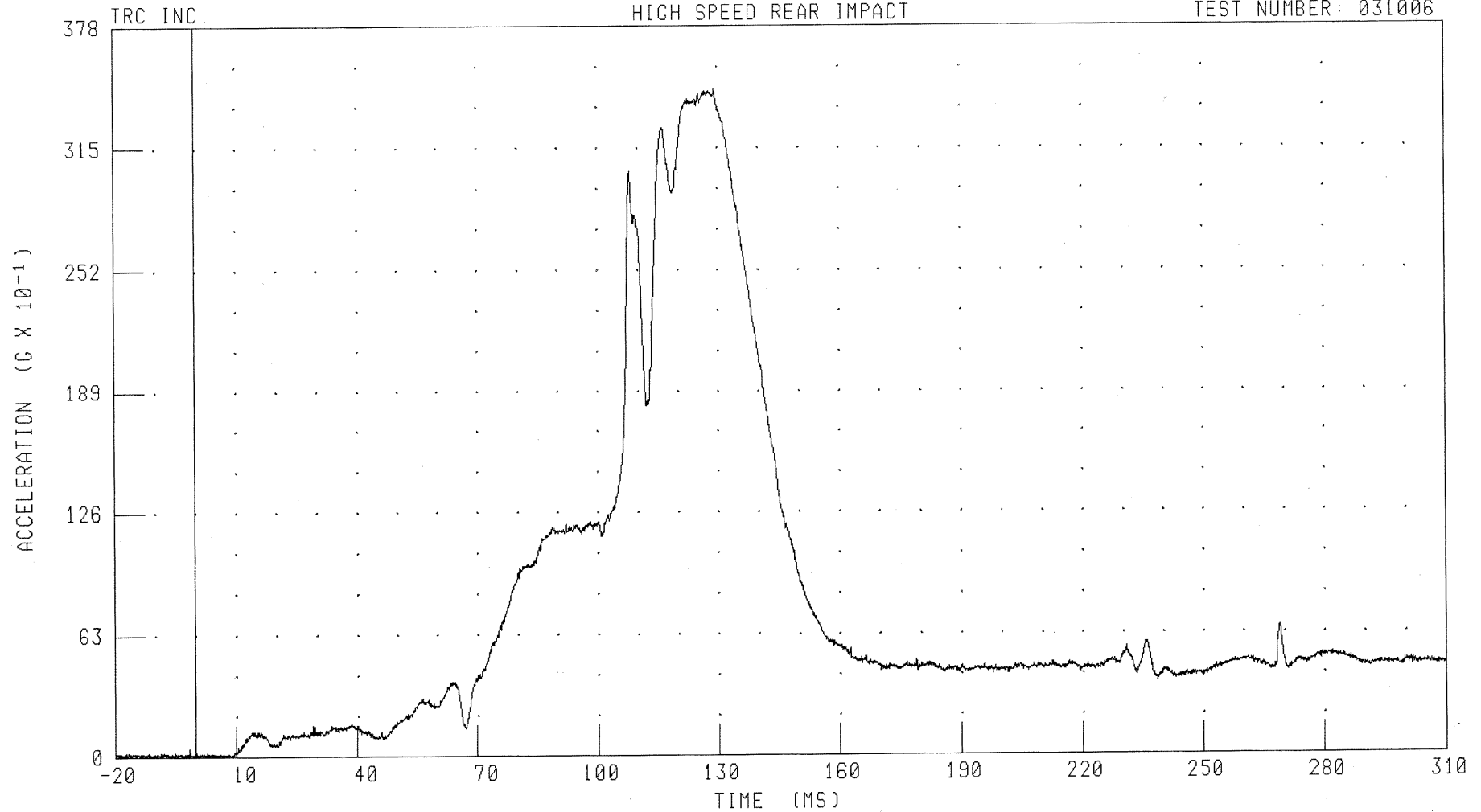
CHANNEL: HEDZV2 FILTER: CH. CLASS 180

PEAK DATA: 42.96 KM/H @ 310.00 MS; 0.00 KM/H @ 1.68 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDRG2

FILTER: CH. CLASS 1000

PEAK DATA: 34.56 G @ 129.44 MS; 0.02 G @ -19.28 MS

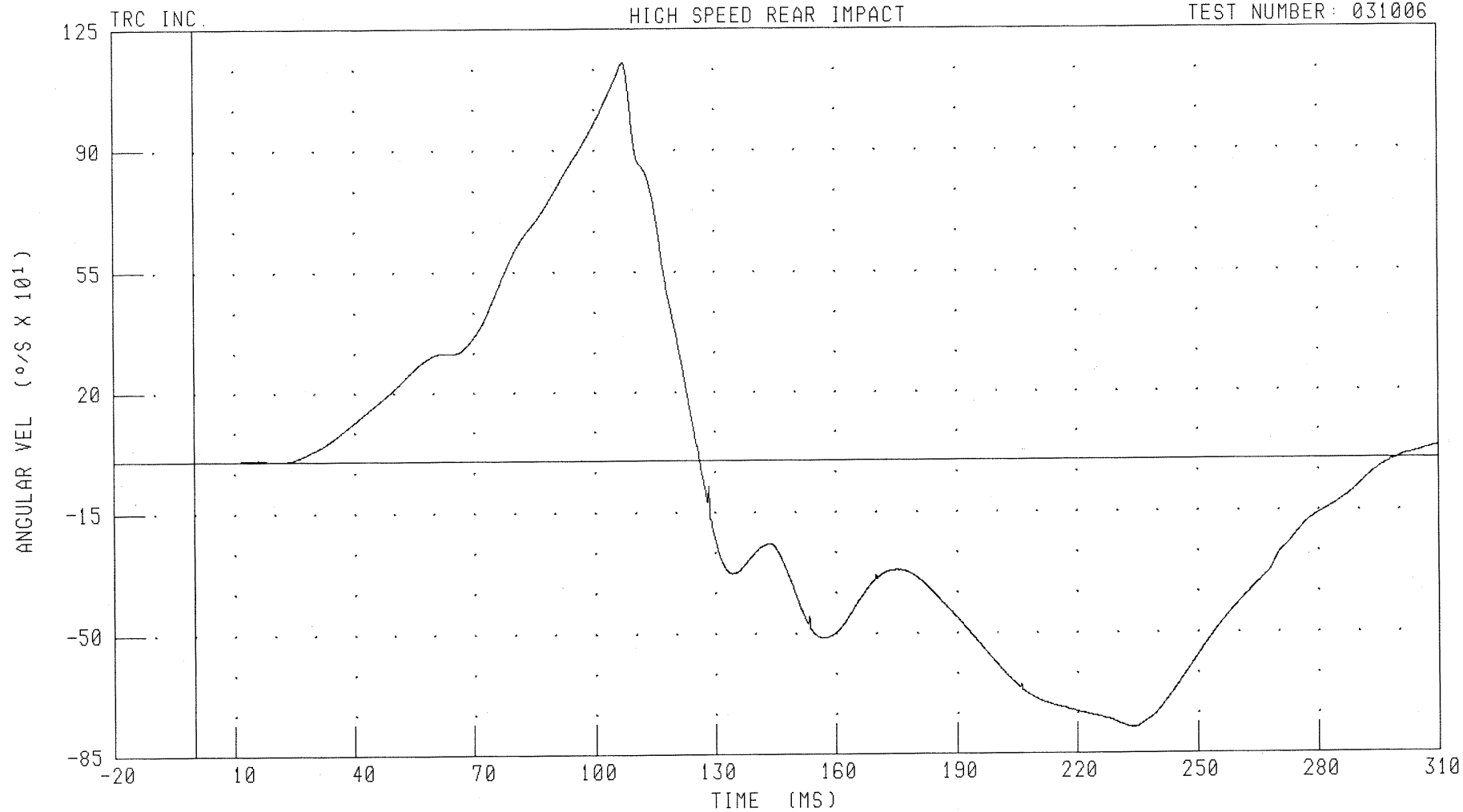
B-8

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER HEAD Y-AXIS ANGULAR VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



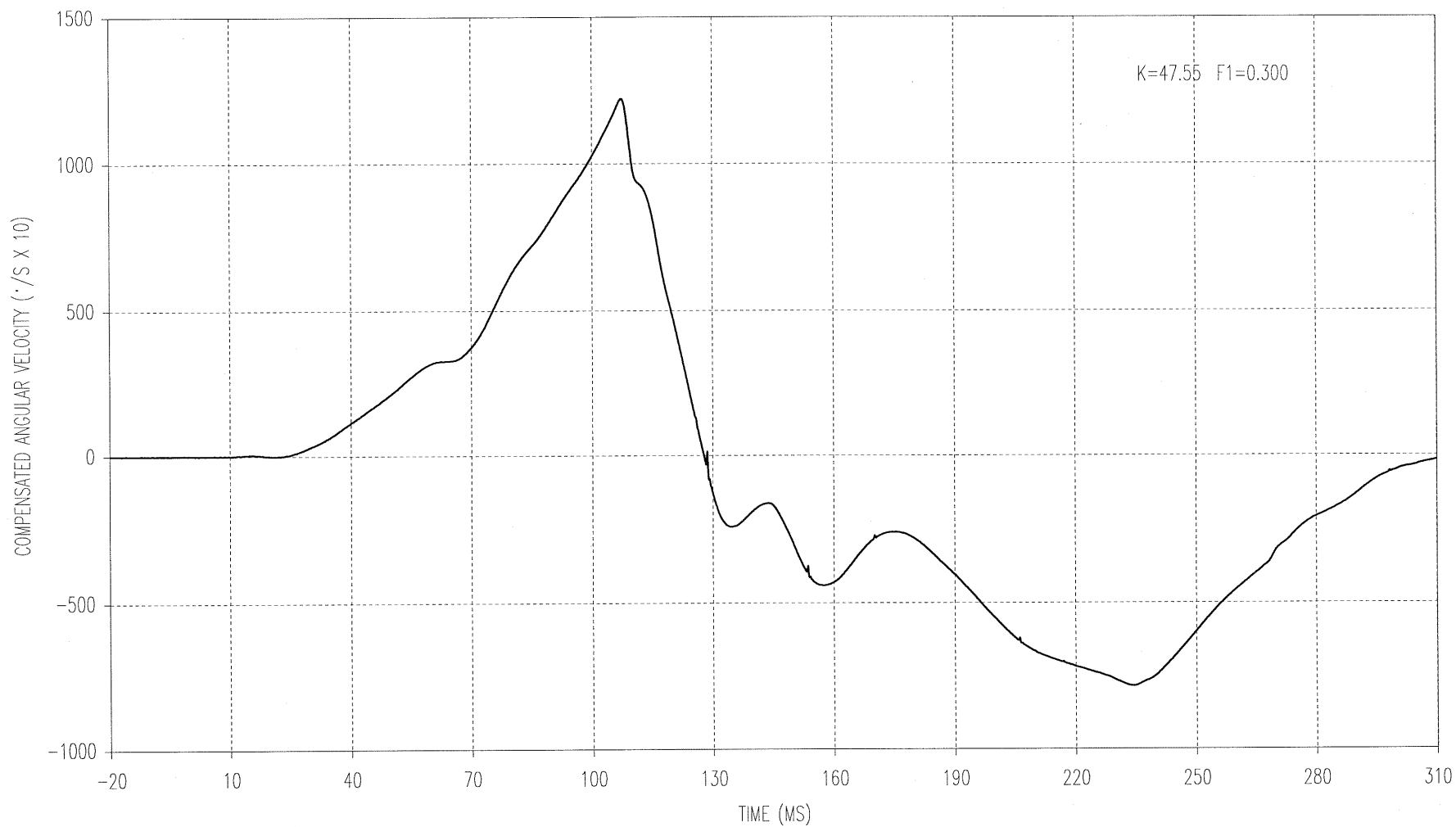
CHANNEL: HEDYV2

FILTER: CH. CLASS 1000

PEAK DATA: 1152.65 $^{\circ}/S$ @ 107.28 MS; -775.43 $^{\circ}/S$ @ 233.60 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER HEAD Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDYV2

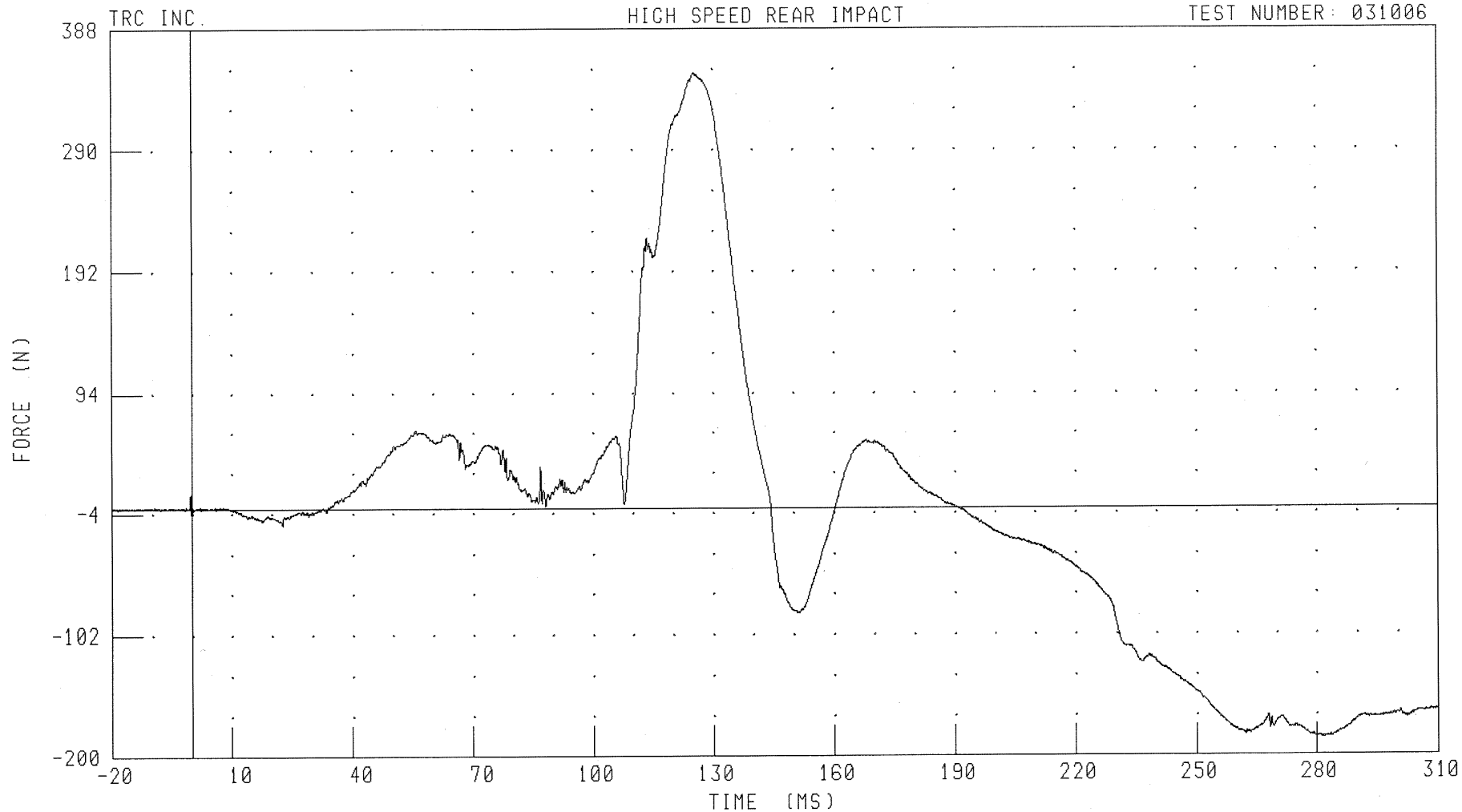
B-10

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER UPPER NECK X-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

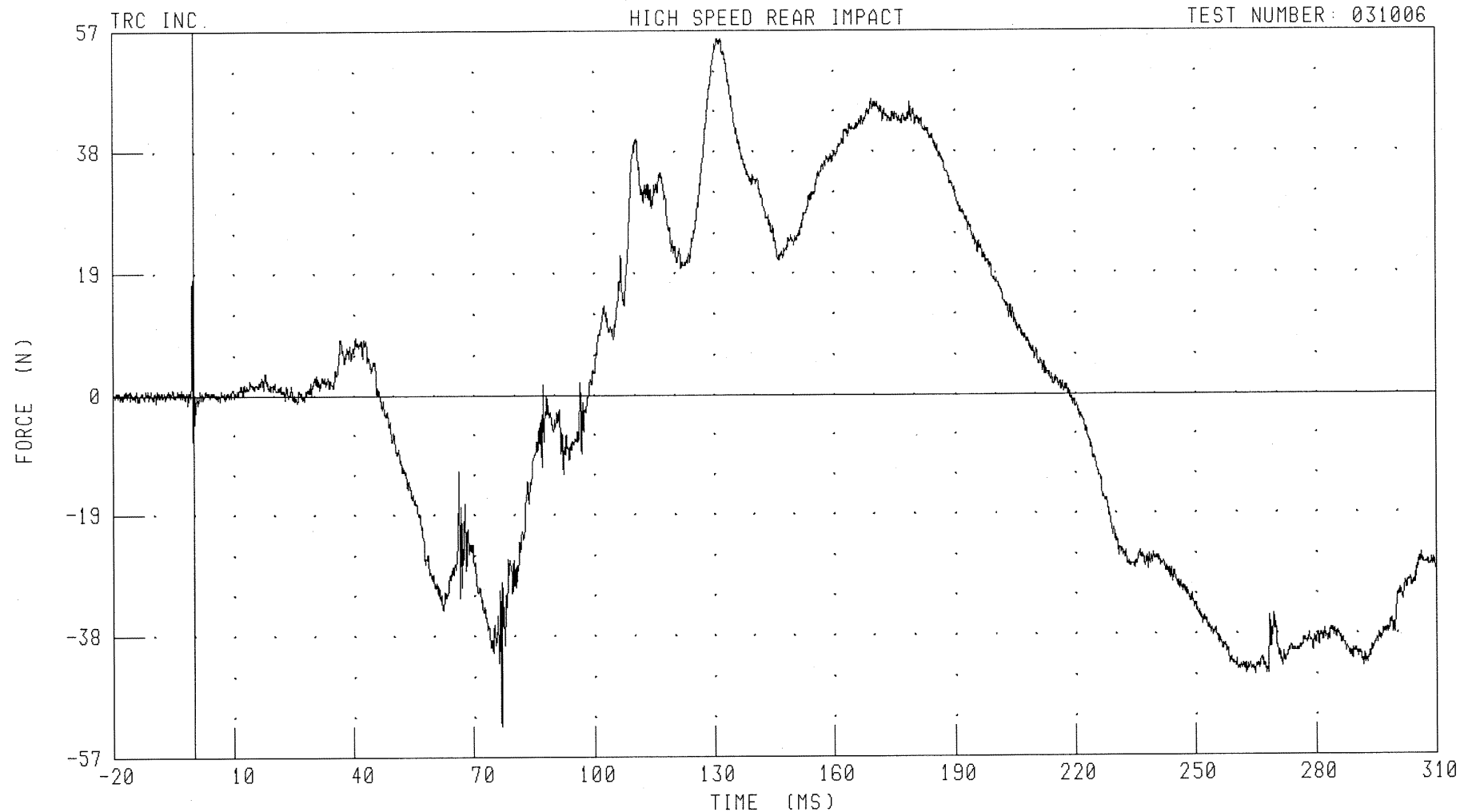
PEAK DATA: 352.29 N @ 125.52 MS; -185.95 N @ 281.20 MS

B-11

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER UPPER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 031006



CHANNEL: NEKYF2

FILTER: CH. CLASS 1000

PEAK DATA: 55.76 N @ 130.80 MS; -52.23 N @ 76.88 MS

B-12

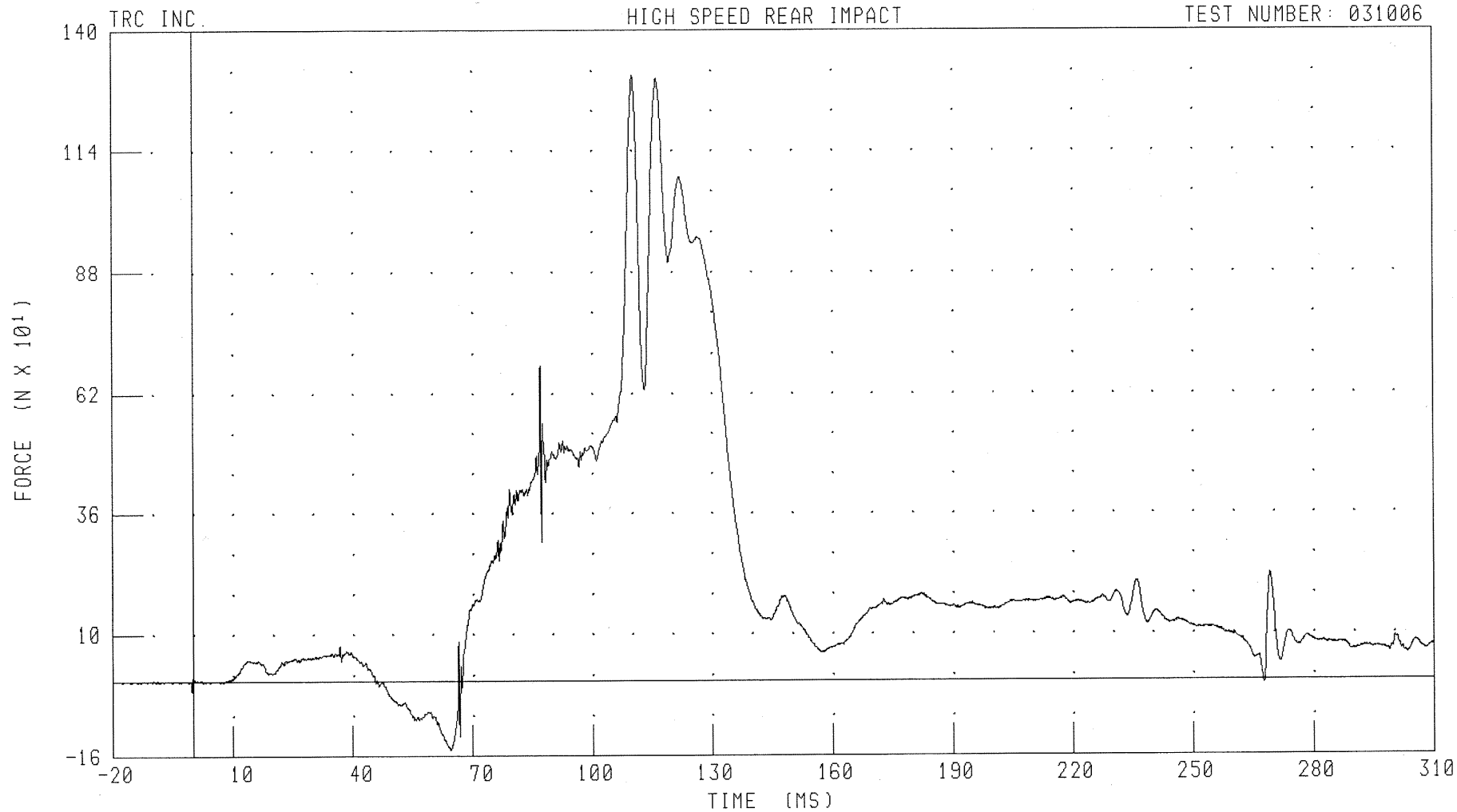
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER UPPER NECK Z-AXIS AXIAL FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

PEAK DATA: 1302.64 N @ 110.32 MS; -148.08 N @ 64.48 MS

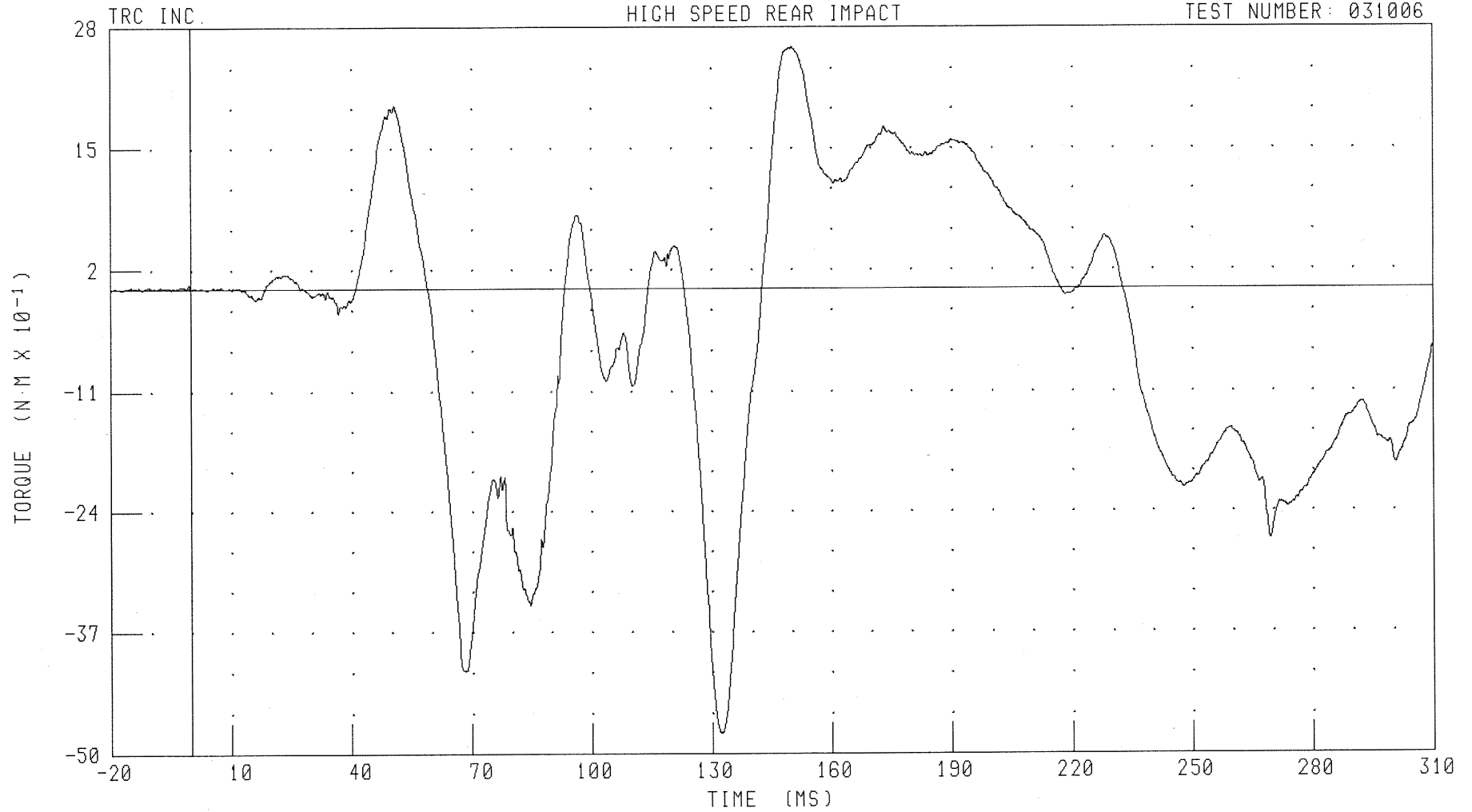
B-13

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT X AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKXM2 FILTER: CH. CLASS 600

PEAK DATA: 2.59 N·M @ 150.24 MS; -4.78 N·M @ 132.16 MS

B-14

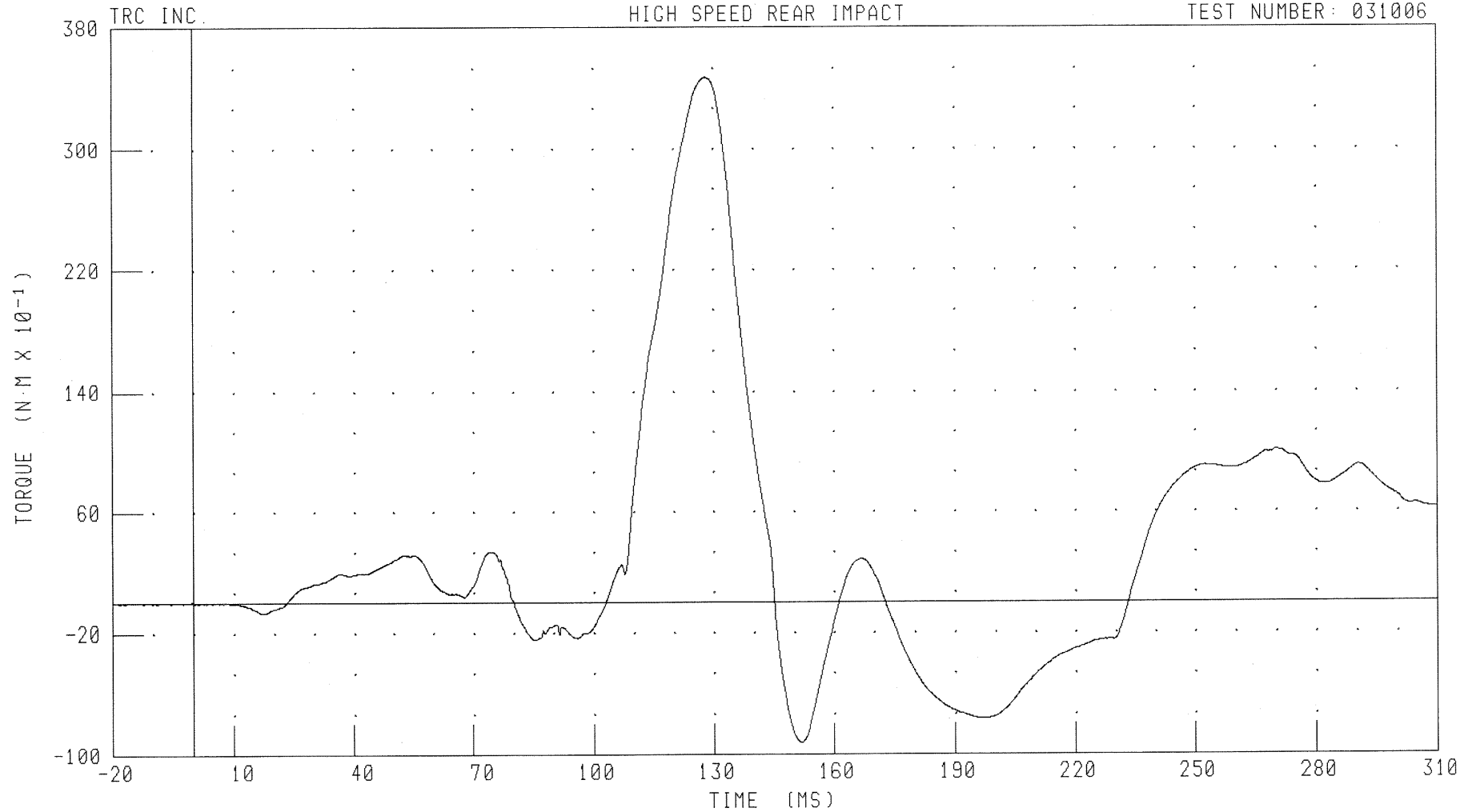
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT Y AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKYM2 FILTER: CH. CLASS 600

PEAK DATA: 34.74 N·M @ 128.24 MS; -9.19 N·M @ 151.92 MS

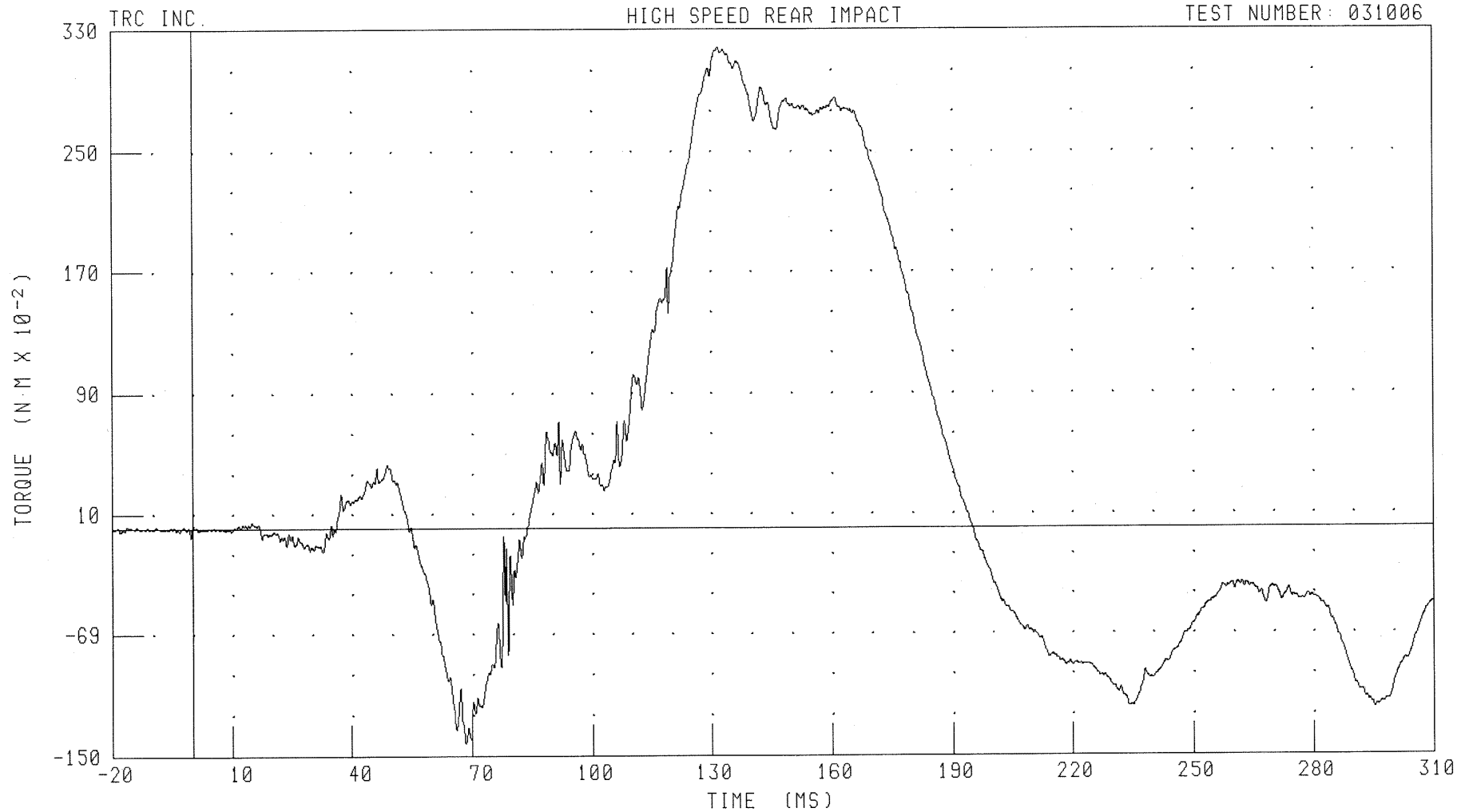
B-15

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT Z AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

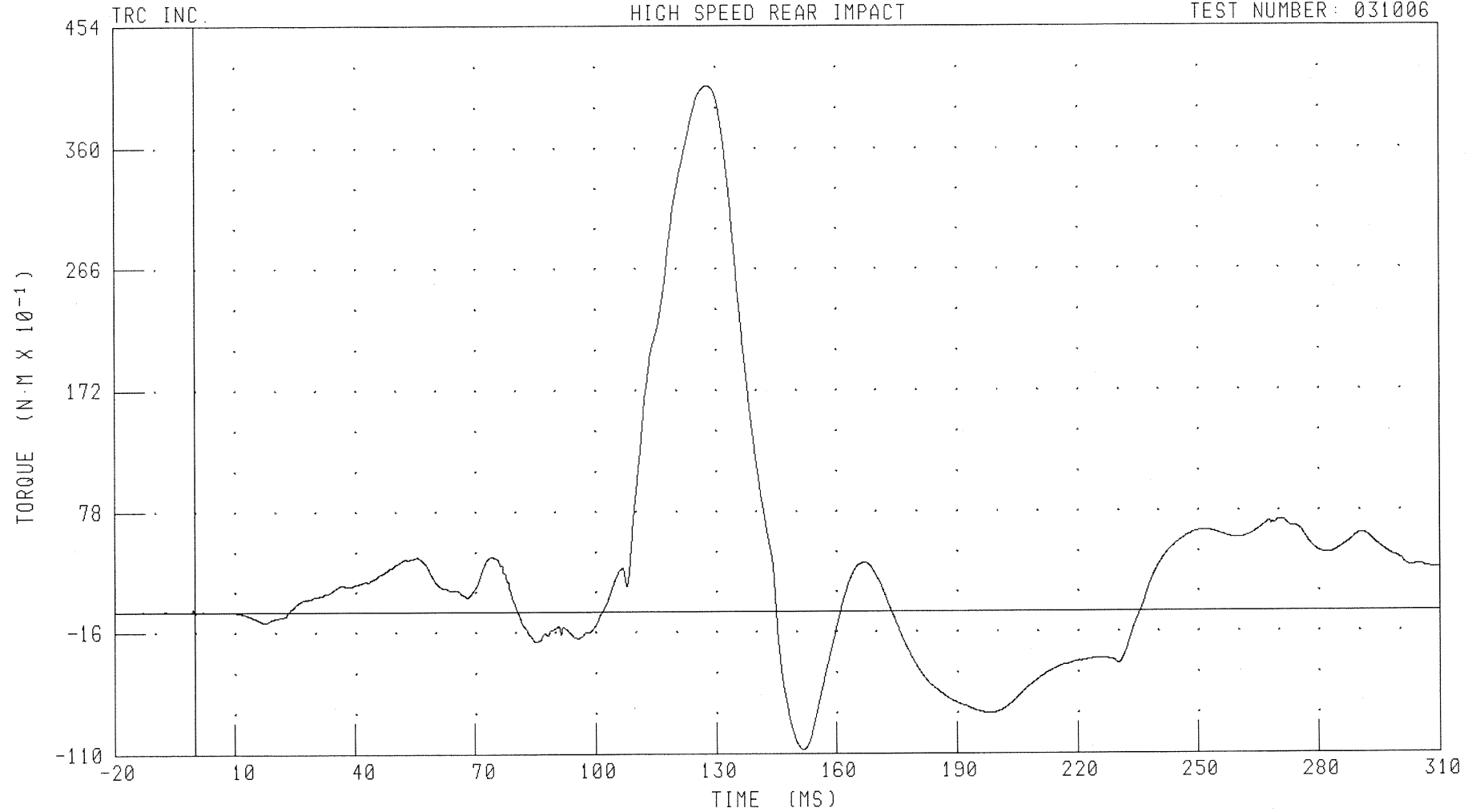


CHANNEL: NEKZM2 FILTER: CH. CLASS 600

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKOM2 FILTER: CH. CLASS 600

B-17

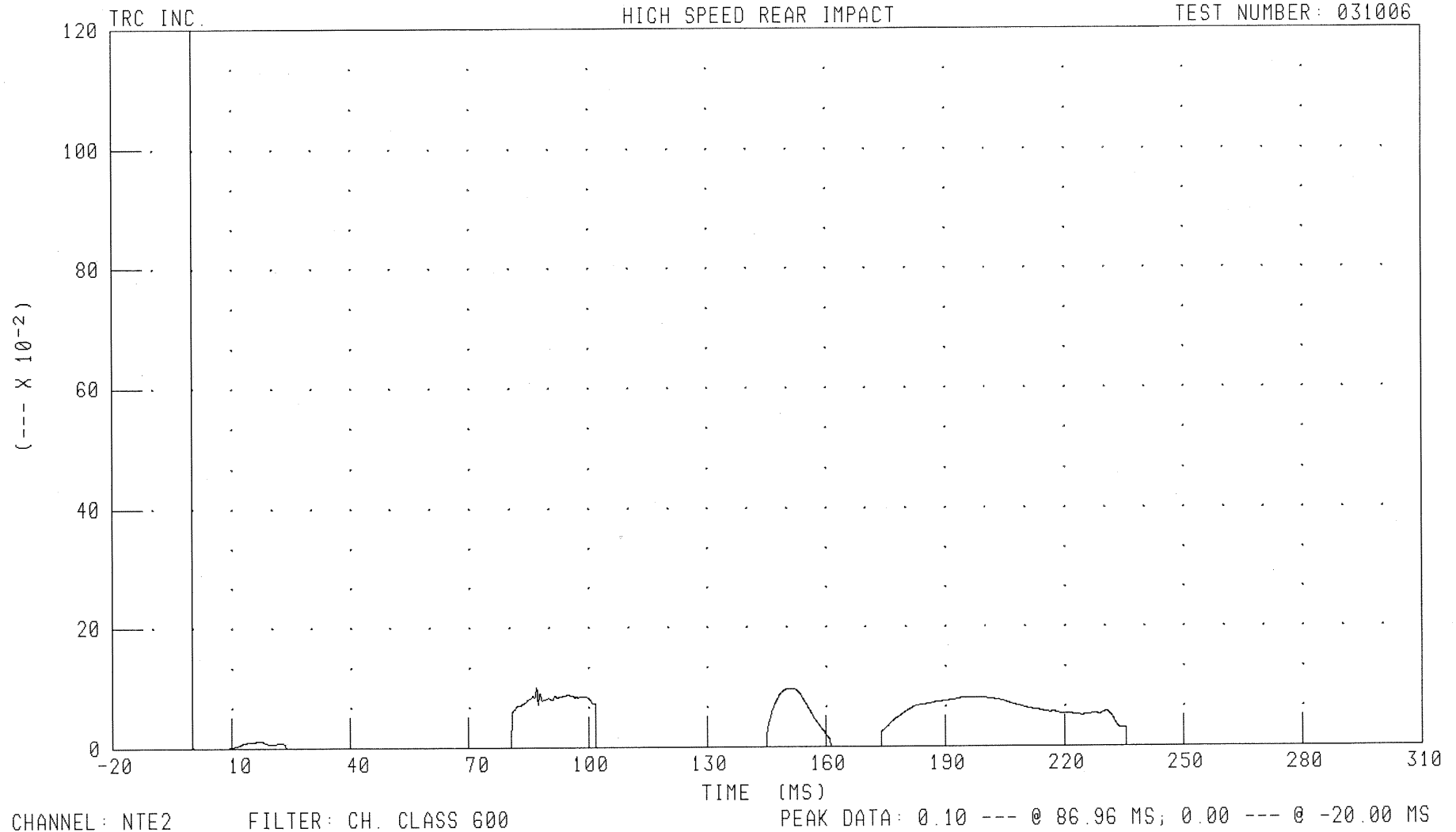
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER NECK TENSION/EXTENSION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



B-18

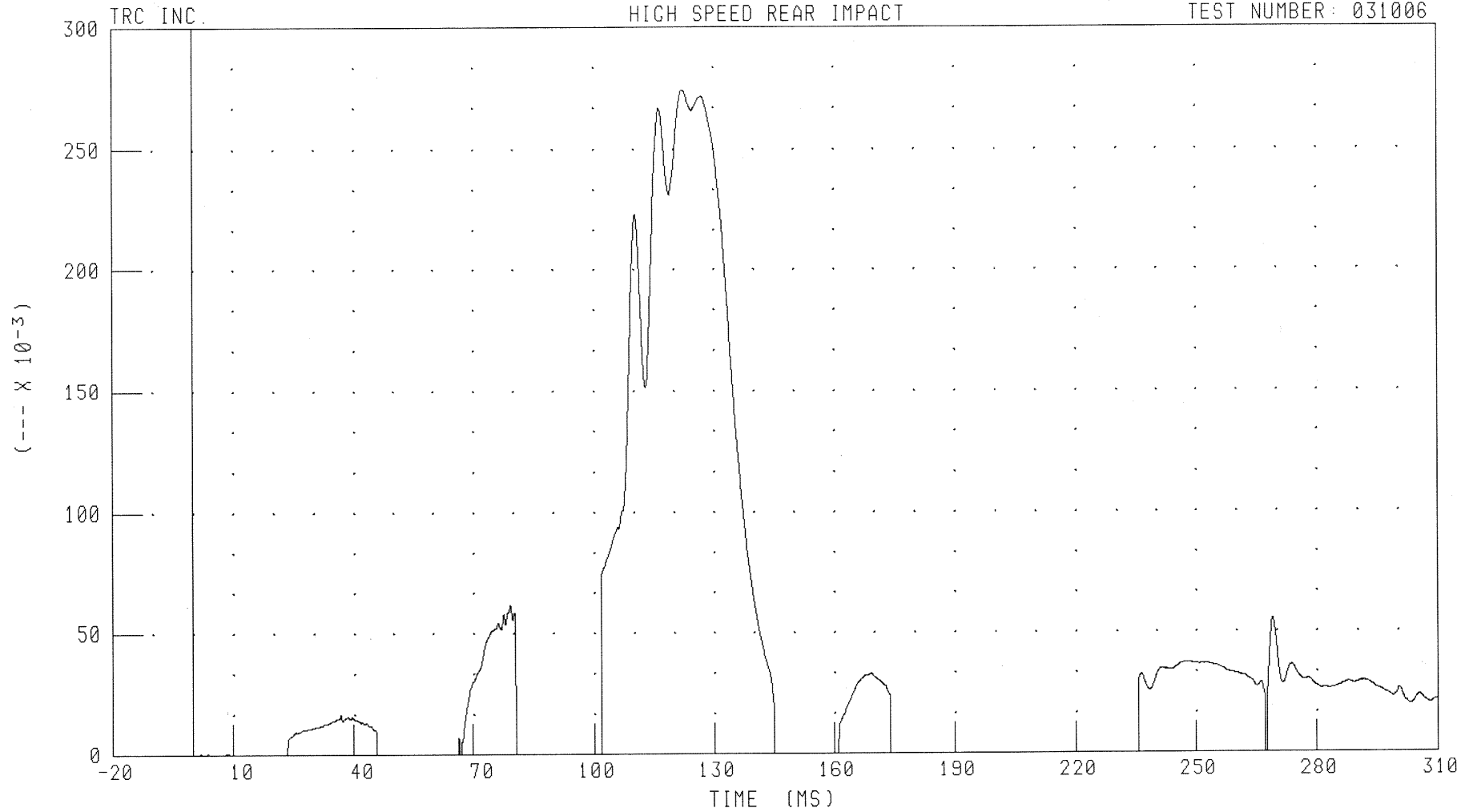
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER NECK TENSION/FLEXION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NTF2

FILTER: CH. CLASS 600

PEAK DATA: 0.27 --- @ 122.40 MS; 0.00 --- @ -19.68 MS

B-19

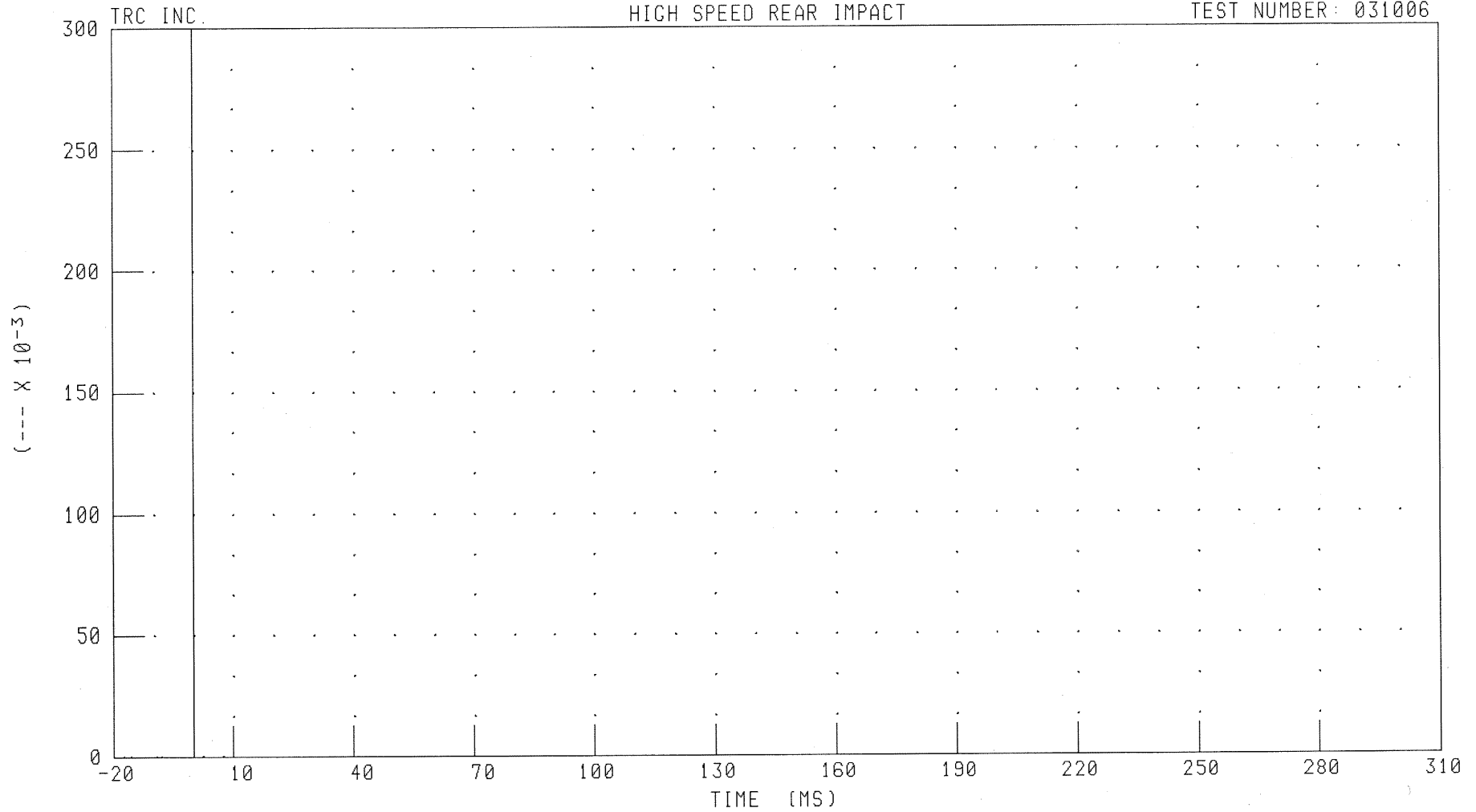
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER NECK COMPRESSION/EXTENSION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NCE2

FILTER: CH. CLASS 600

PEAK DATA: 0.00 --- @ 2.48 MS; 0.00 --- @ -20.00 MS

B-20

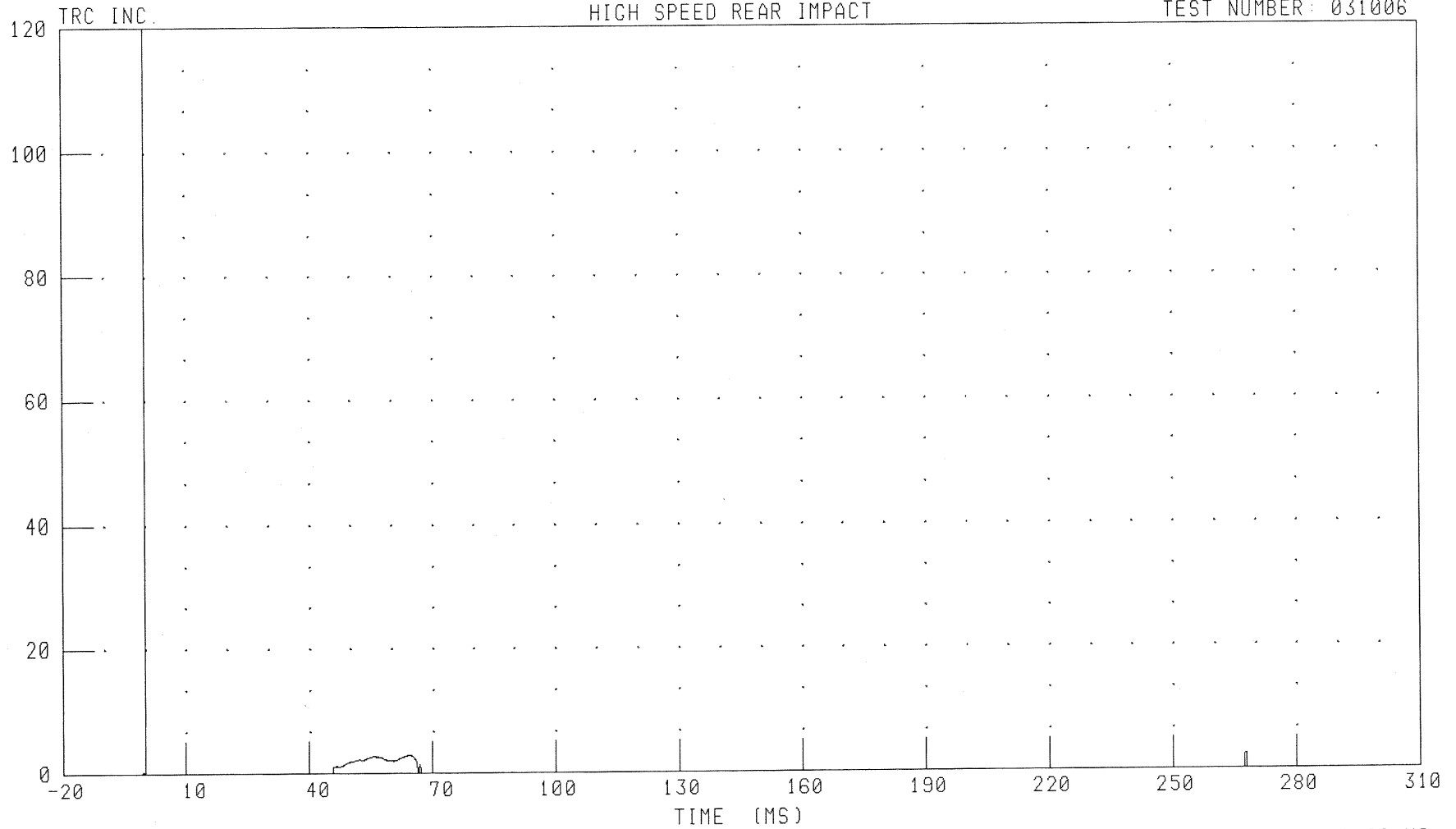
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER NECK COMPRESSION/FLEXION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NCF2

FILTER: CH. CLASS 600

PEAK DATA: 0.03 --- @ 64.48 MS; 0.00 --- @ -20.00 MS

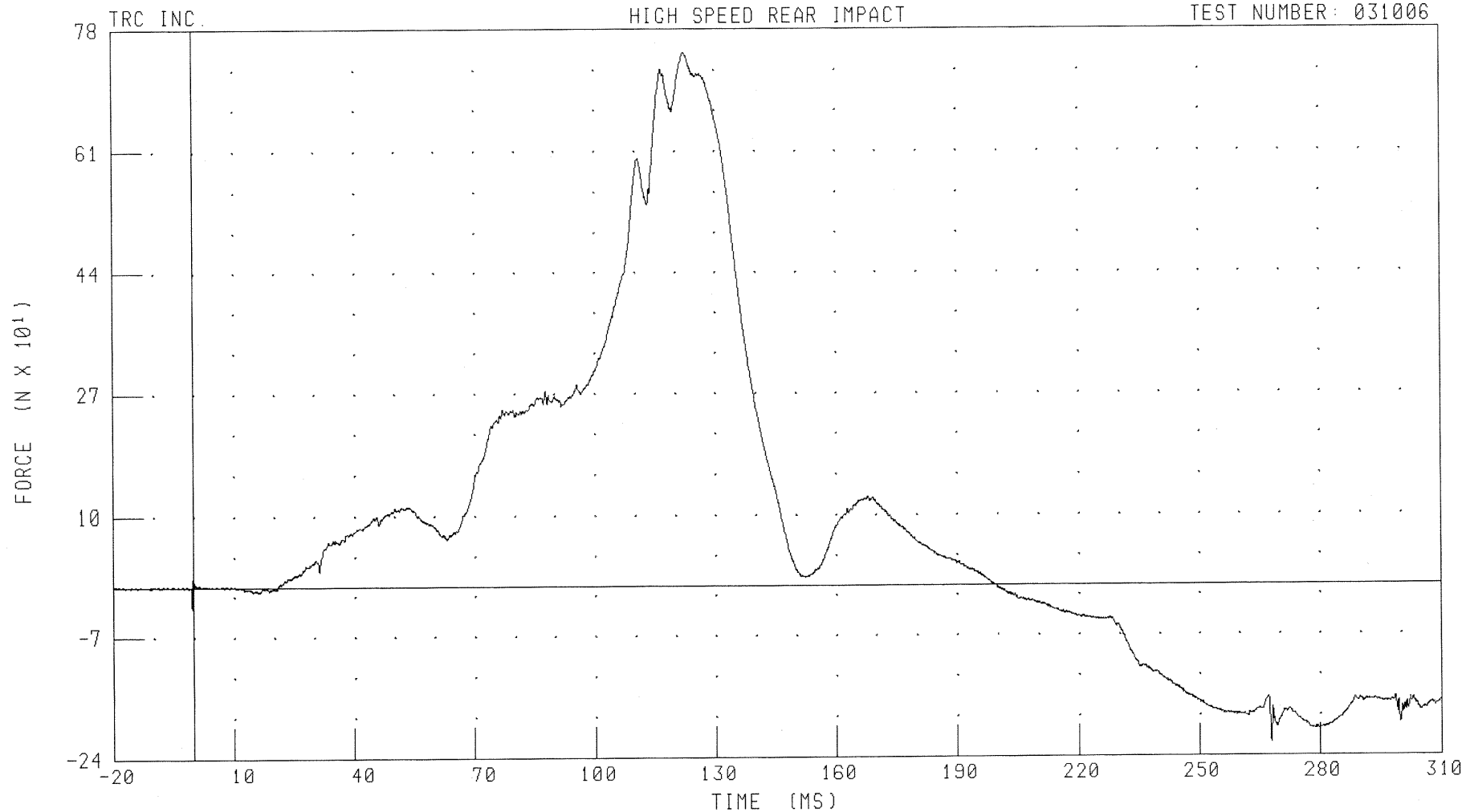
B-21

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LOWER NECK X-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLXF2 FILTER: CH. CLASS 1000

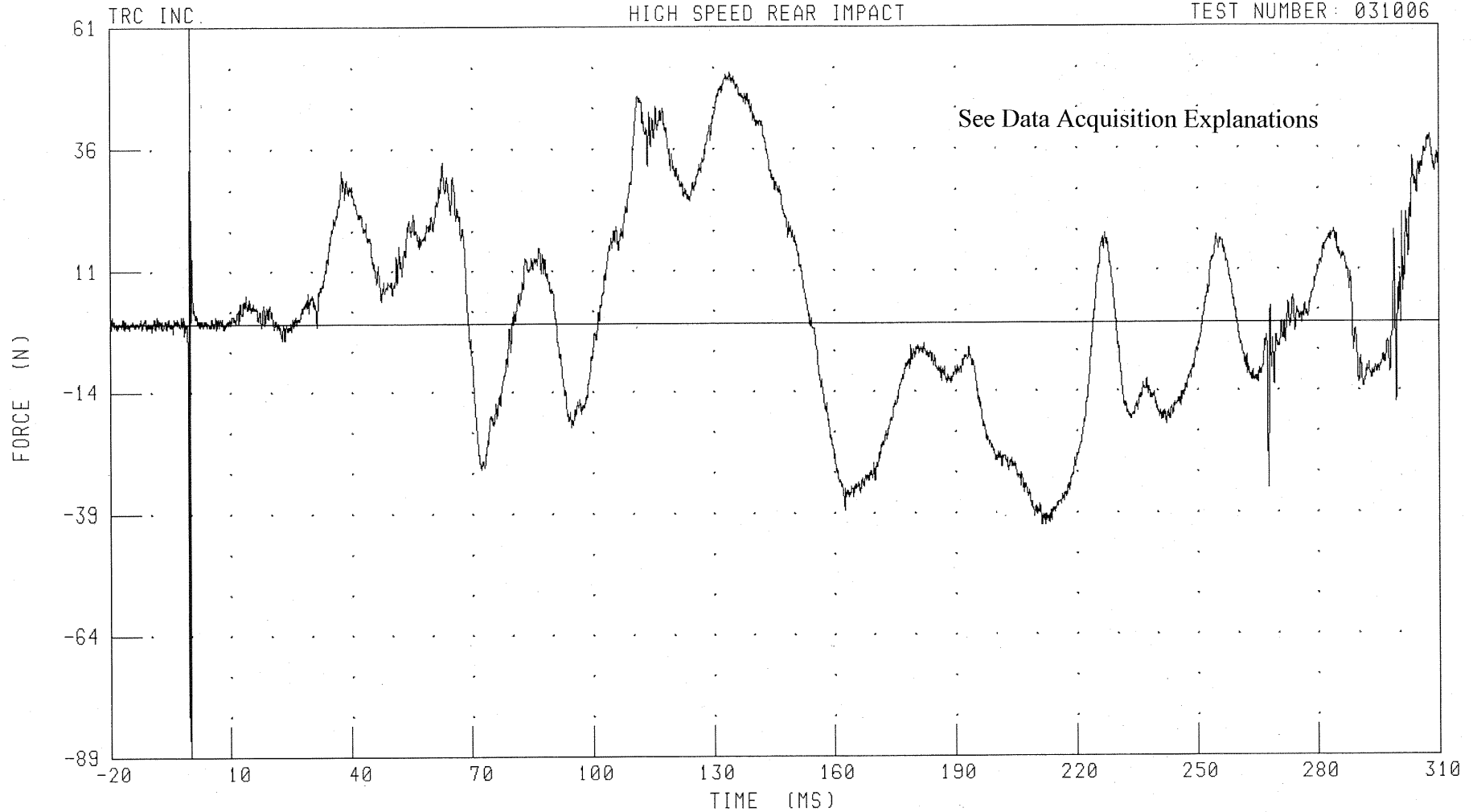
PEAK DATA: 747.59 N @ 122.48 MS; -220.78 N @ 267.92 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LOWER NECK Y-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

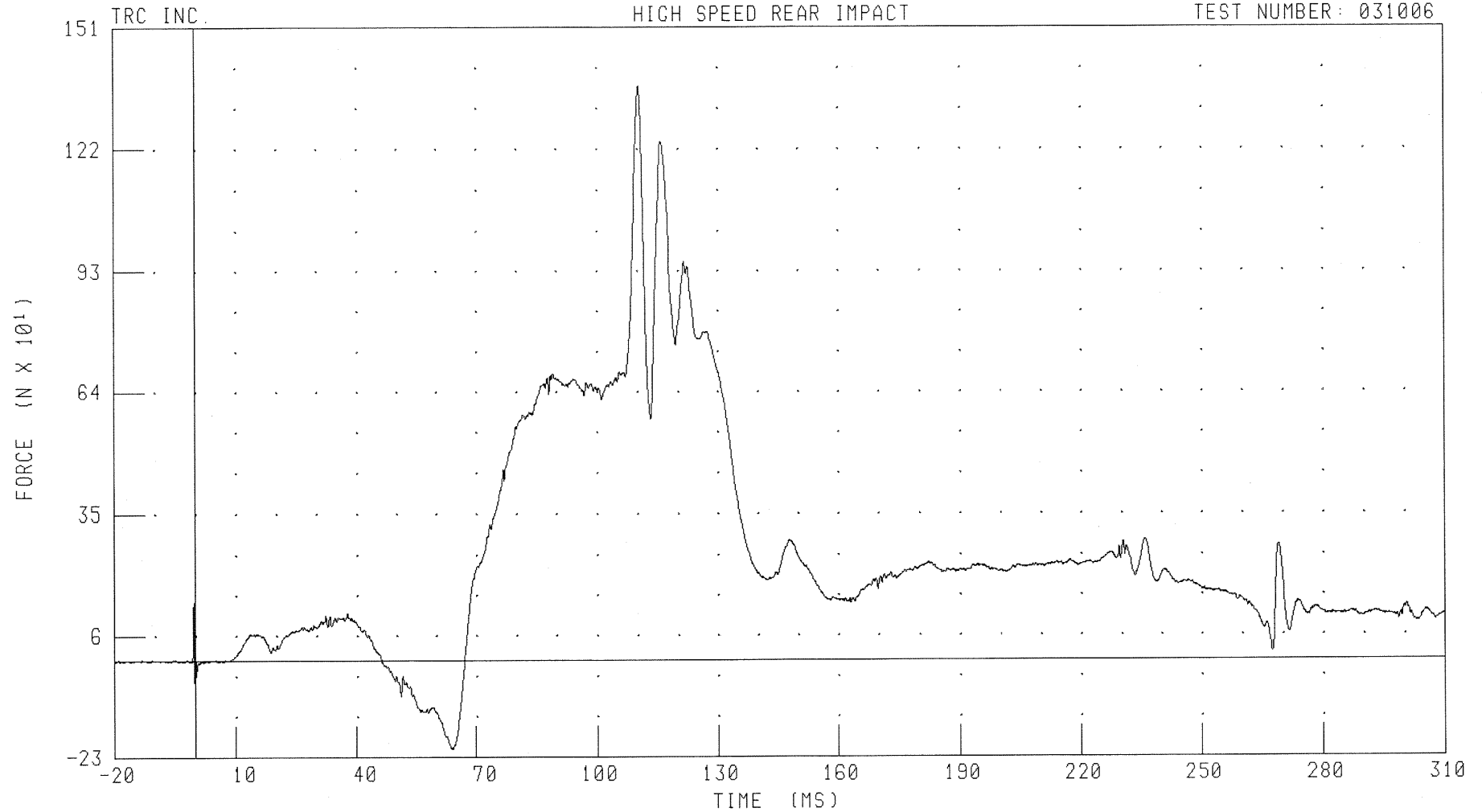
TEST NUMBER: 031006

See Data Acquisition Explanations



47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LOWER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 031006



CHANNEL: NKLZF2 FILTER: CH. CLASS 1000

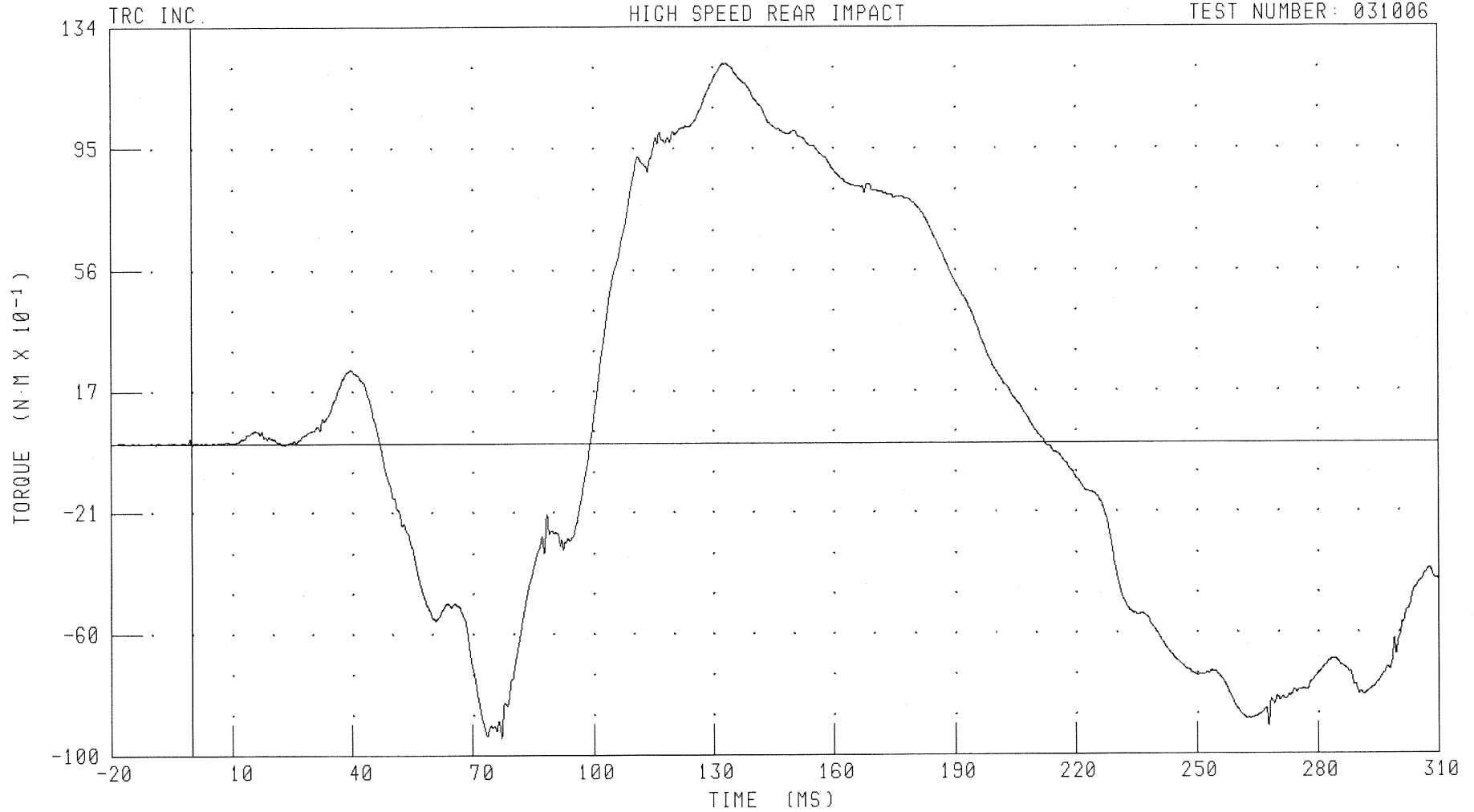
B-24

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT X AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



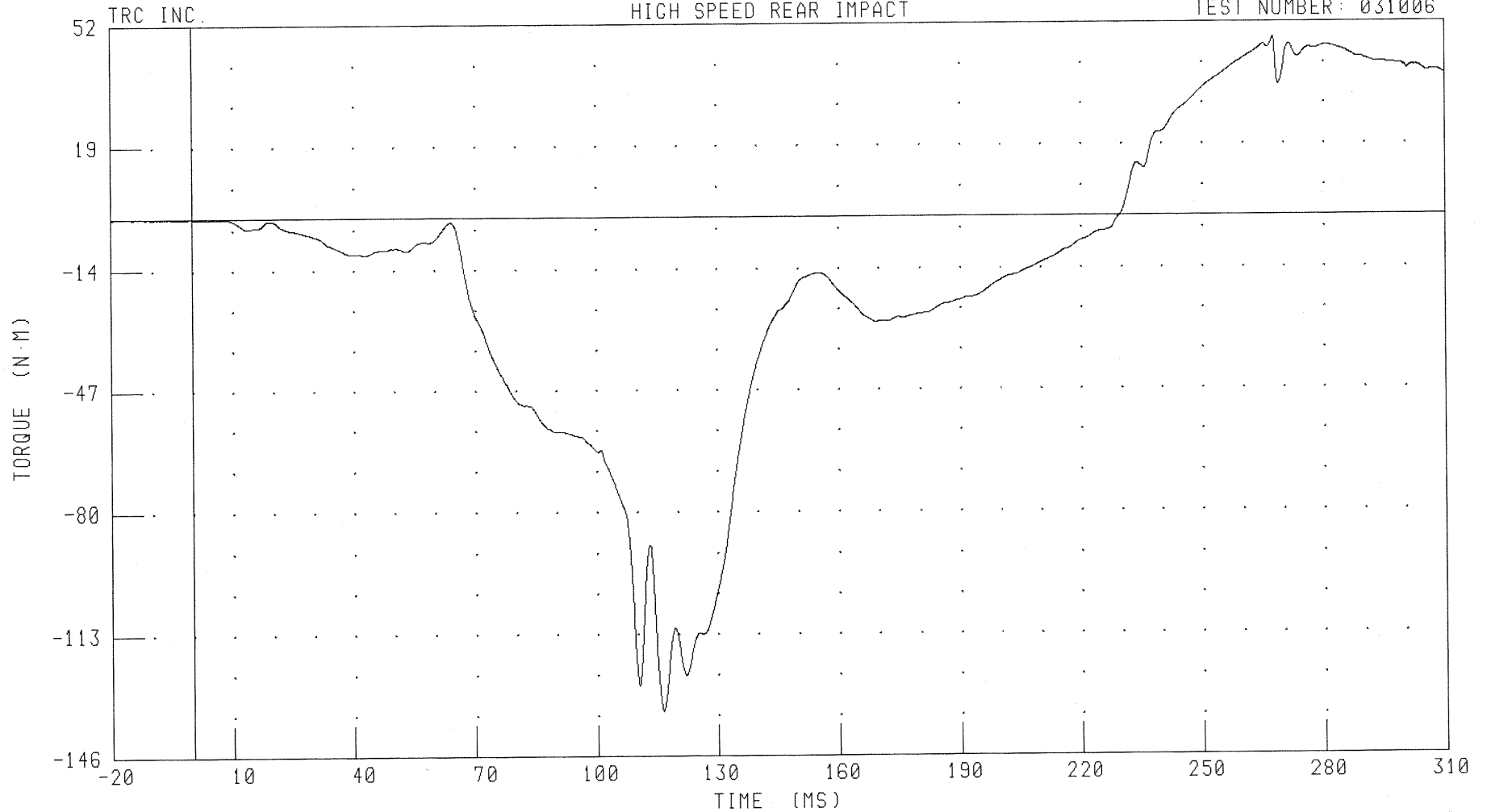
CHANNEL: NKLXM2 FILTER: CH. CLASS 600

PEAK DATA: 12.21 N·M @ 133.52 MS; -9.45 N·M @ 77.04 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT Y AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLYM2

FILTER: CH. CLASS 600

PEAK DATA: 47.80 N·M @ 267.68 MS; -133.94 N·M @ 116.40 MS

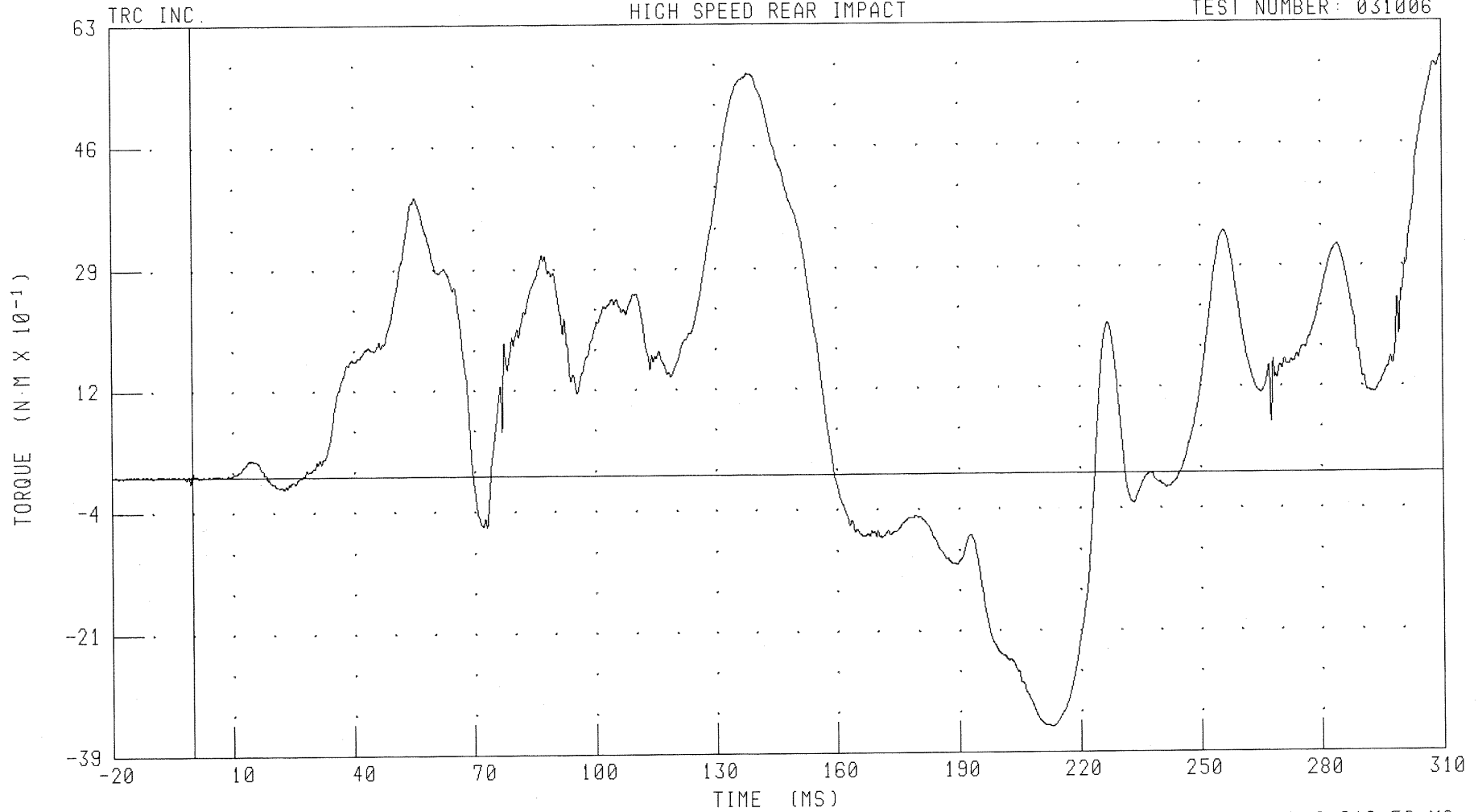
B-26

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT Z AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLZM2 FILTER: CH. CLASS 600

B-27

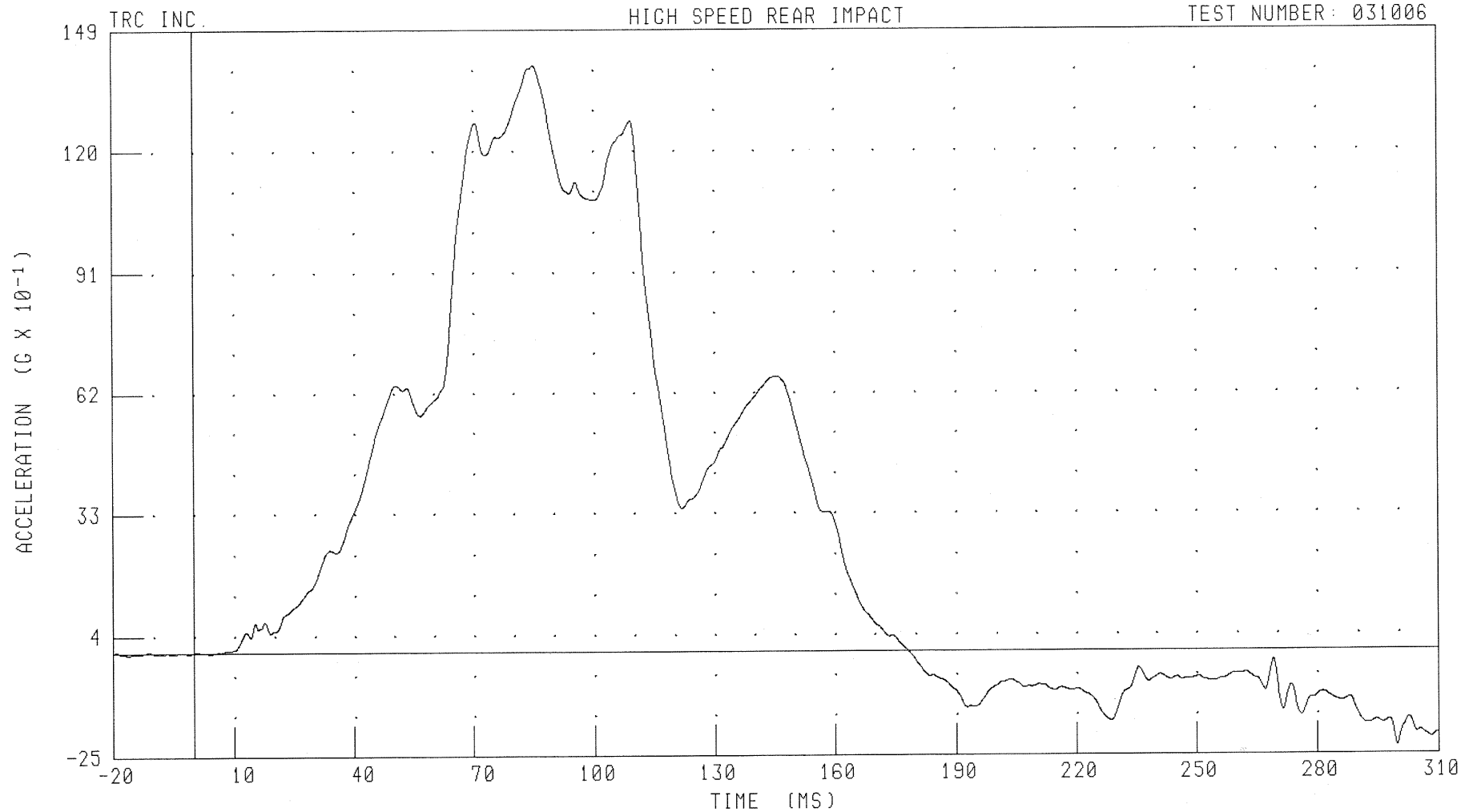
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTXG2 FILTER: CH. CLASS 180

PEAK DATA: 14.04 G @ 85.12 MS; -2.31 G @ 299.60 MS

B-28

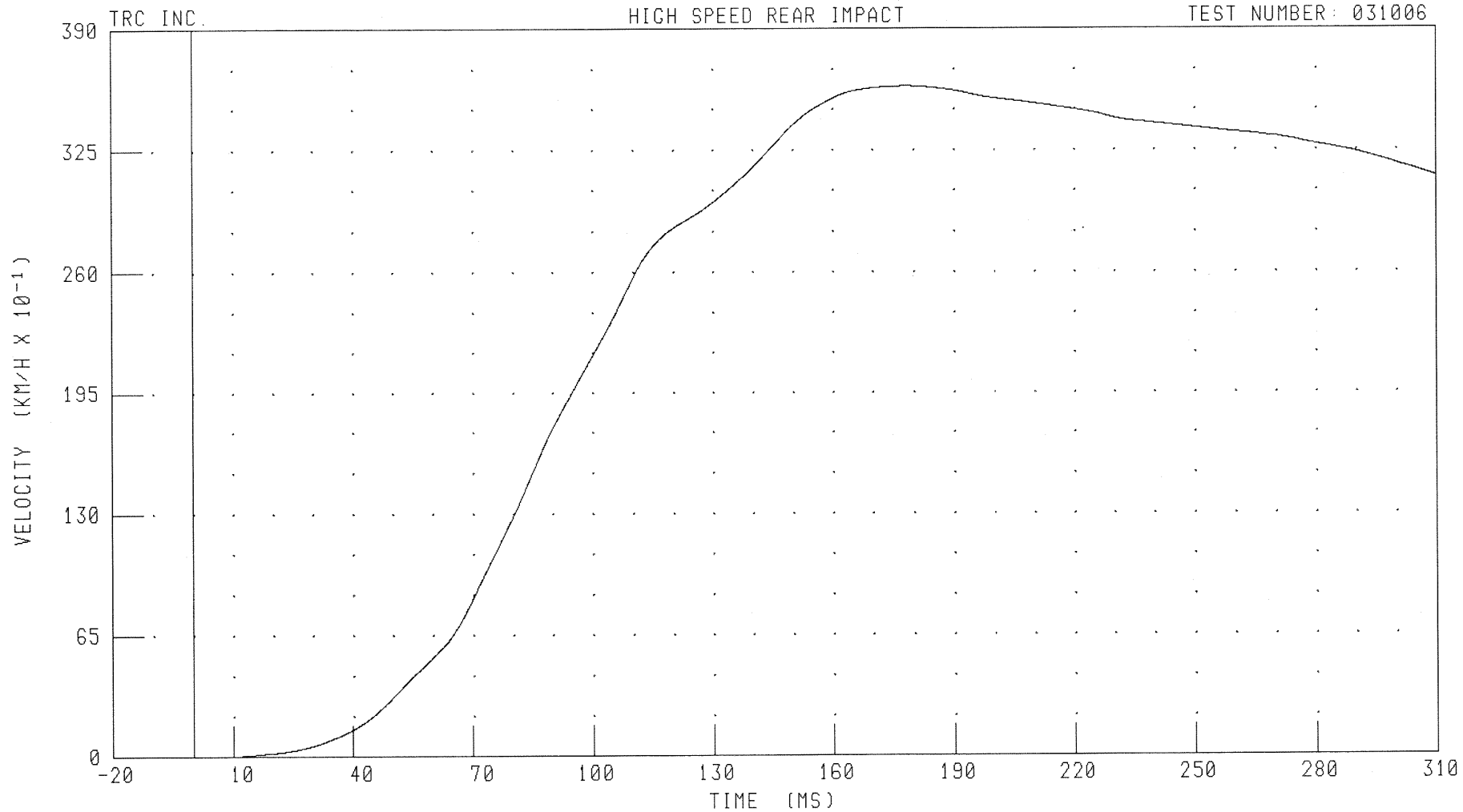
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER CHEST X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTXV2

FILTER: CH. CLASS 180

PEAK DATA: 35.91 KM/H @ 178.32 MS; 0.00 KM/H @ 0.00 MS

B-29

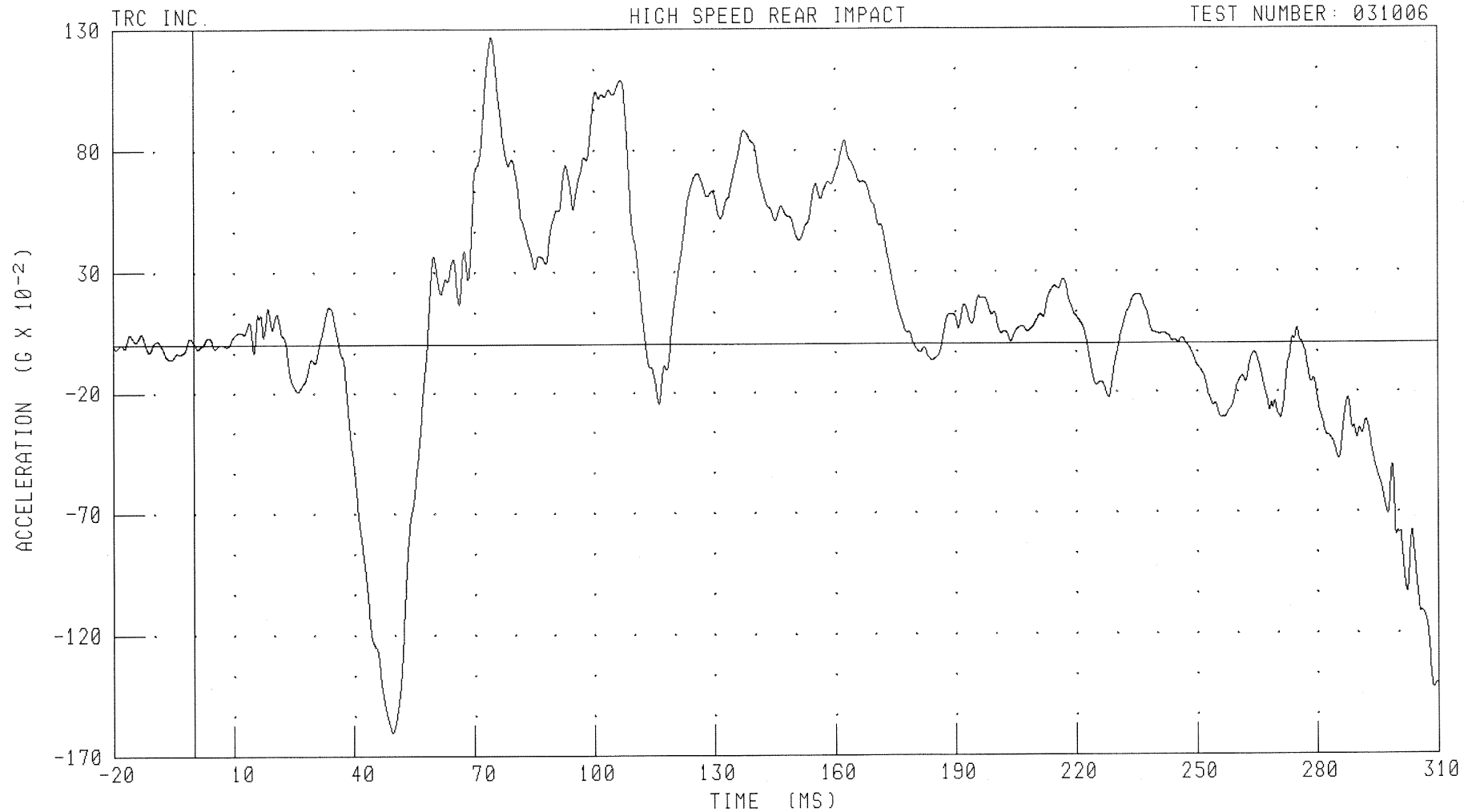
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 1.27 G @ 74.40 MS; -1.60 G @ 49.52 MS

B-30

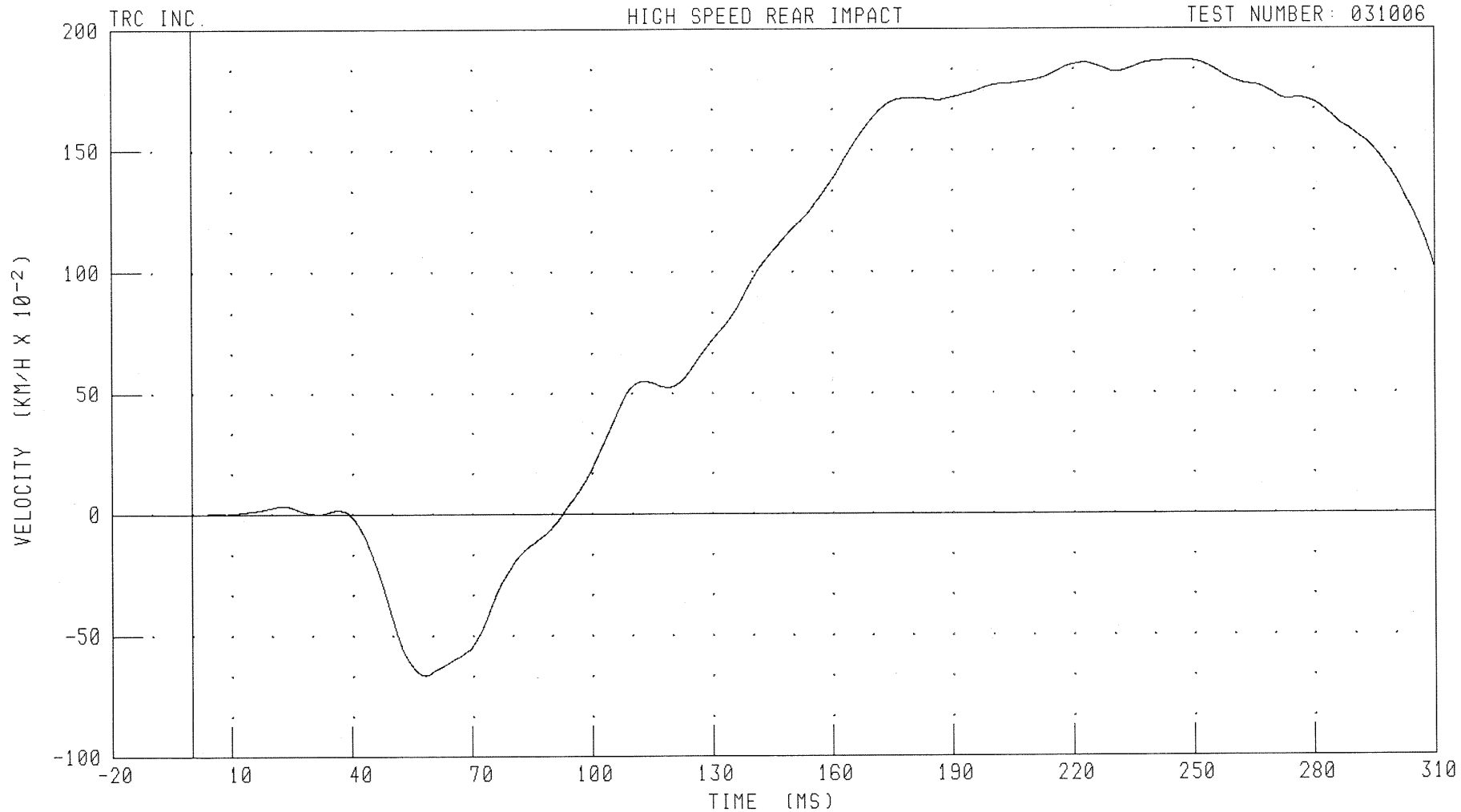
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER CHEST Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTYV2

FILTER: CH. CLASS 180

PEAK DATA: 1.87 KM/H @ 247.36 MS; -0.66 KM/H @ 58.32 MS

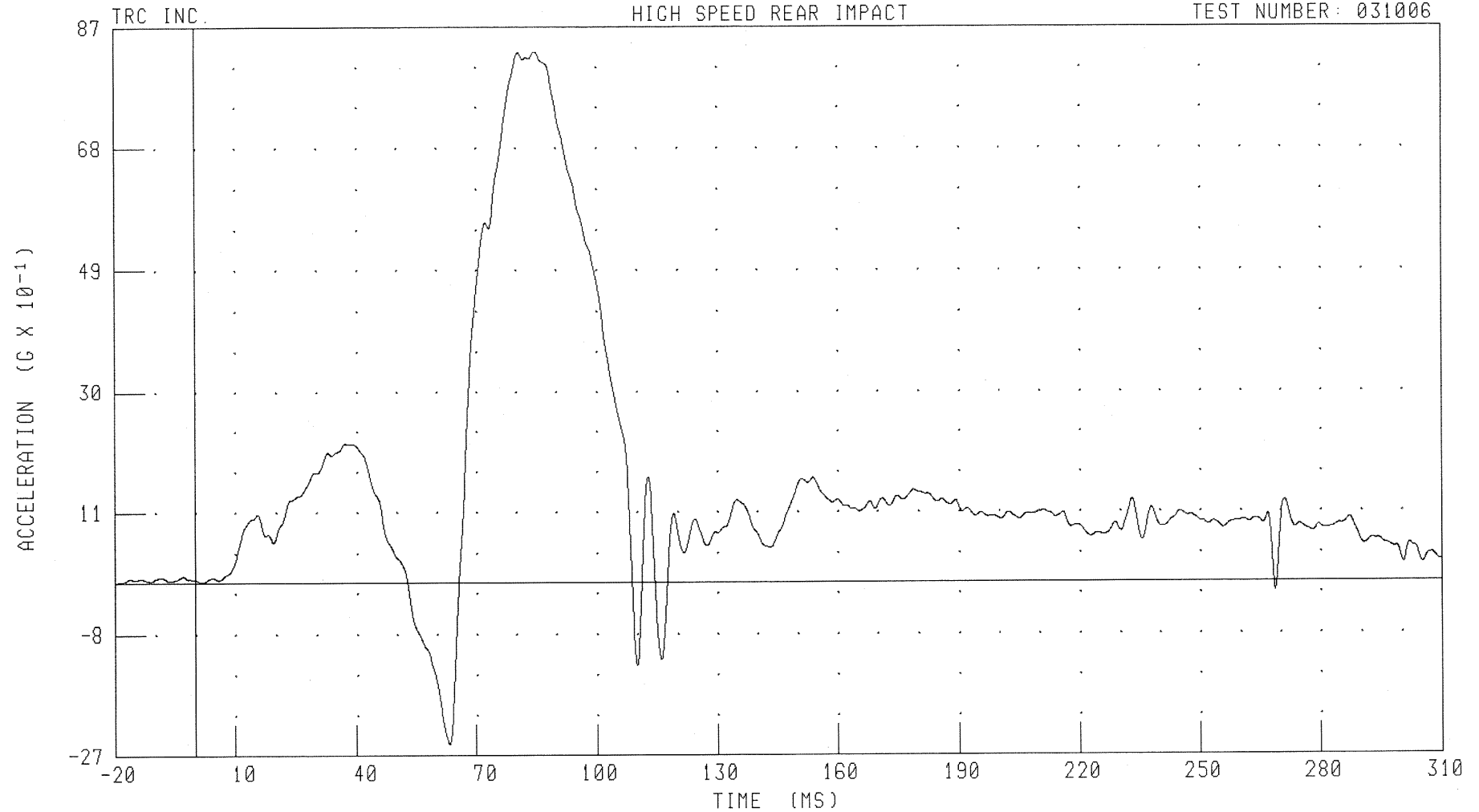
B-31

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTZG2

FILTER: CH. CLASS 180

PEAK DATA: 8.31 G @ 84.96 MS; -2.53 G @ 63.12 MS

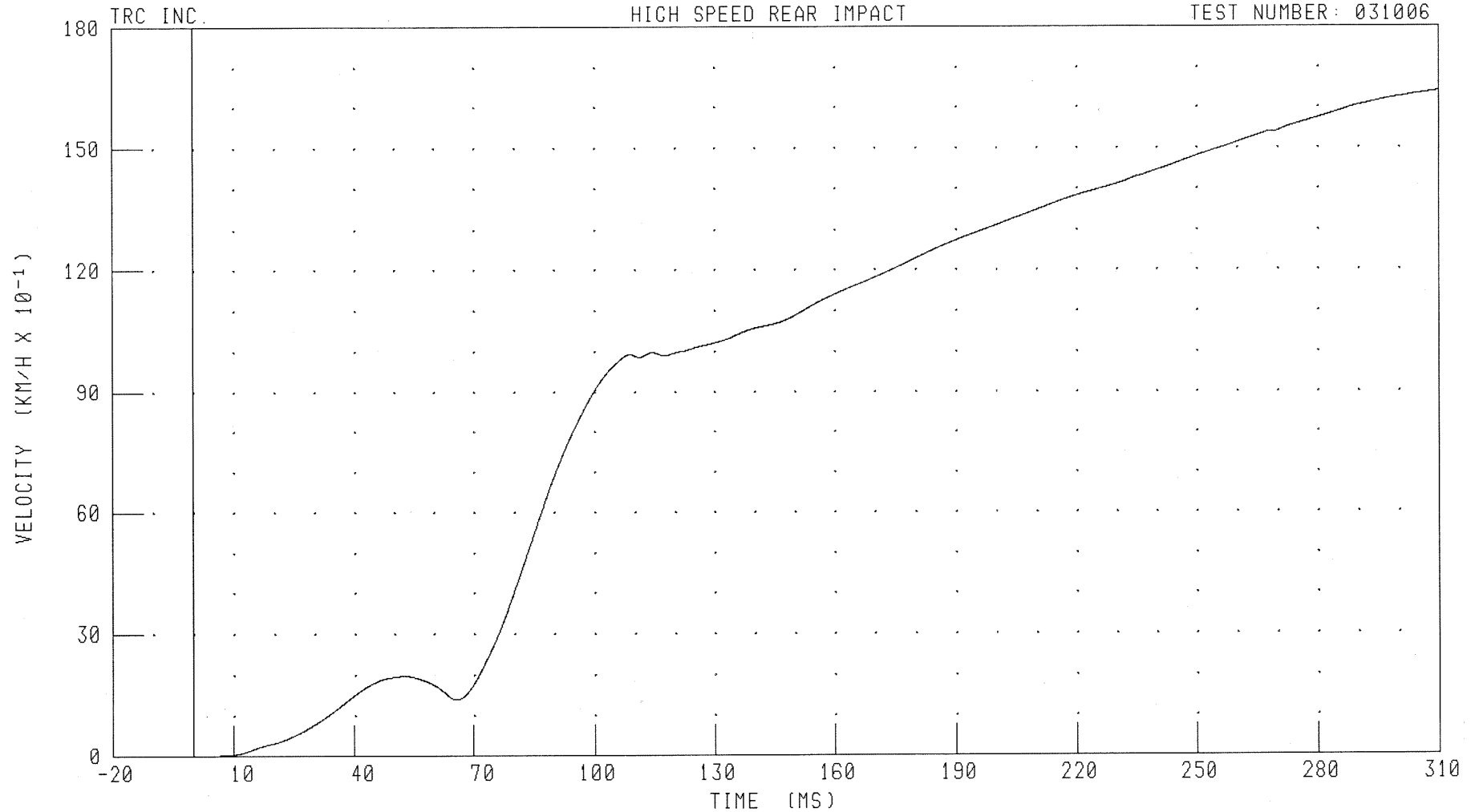
B-32

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER CHEST Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTZV2 FILTER: CH. CLASS 180

PEAK DATA: 16.40 KM/H @ 310.00 MS; 0.00 KM/H @ 0.00 MS

B-33

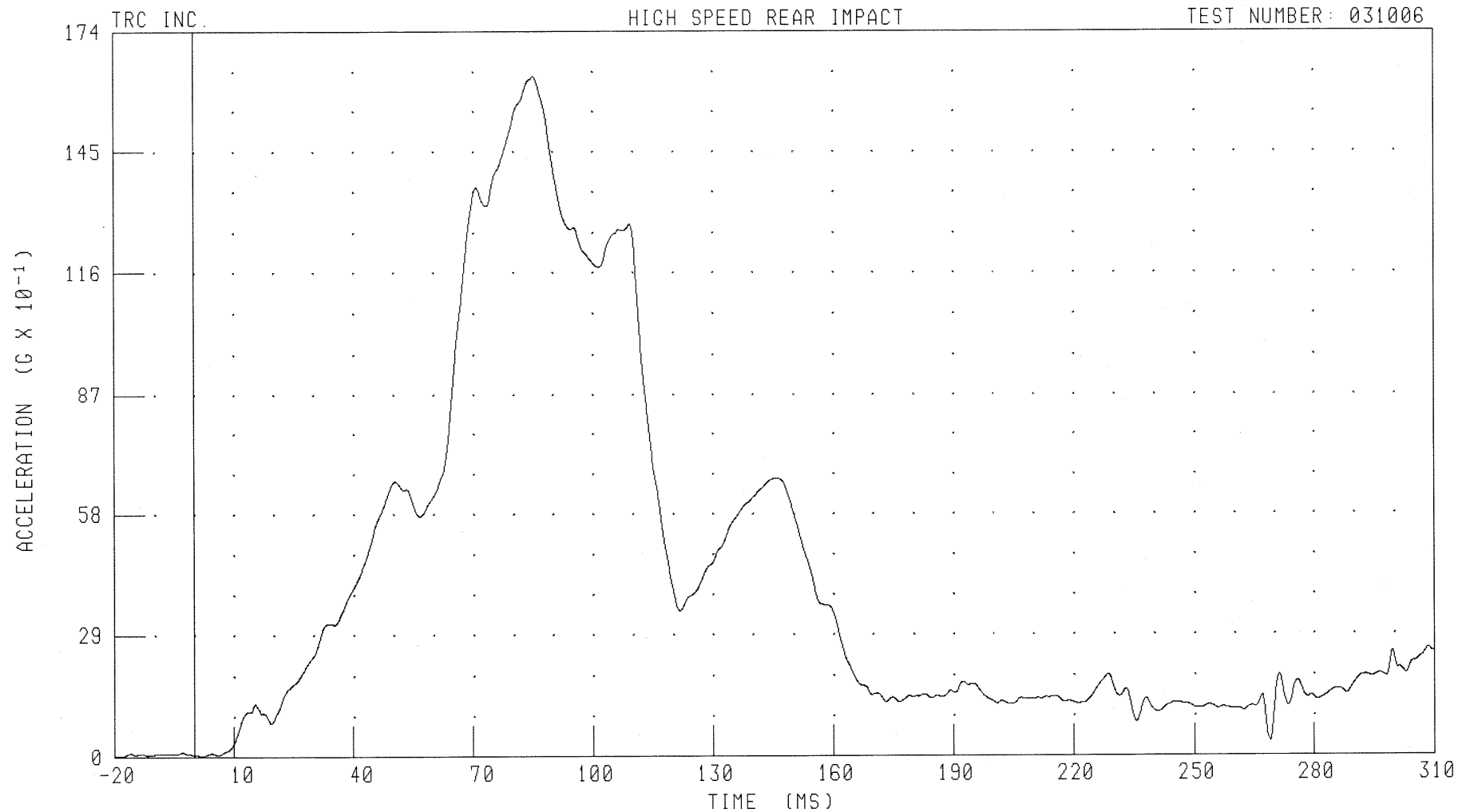
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTRG2

FILTER: CH. CLASS 180

PEAK DATA: 16.32 G @ 85.12 MS; 0.00 G @ -20.00 MS

B-34

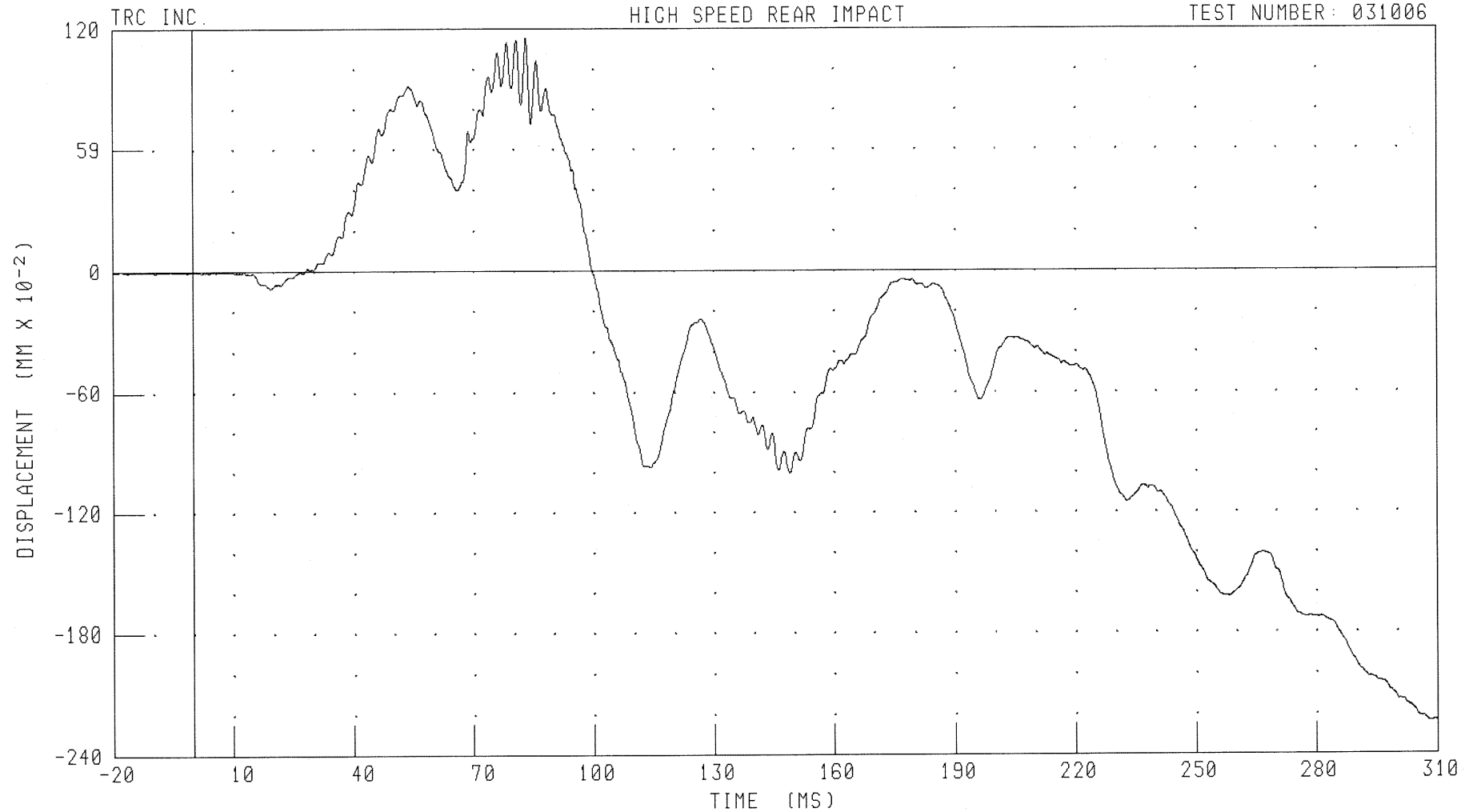
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER CHEST X-AXIS DEFLECTION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTXD2

FILTER: CH. CLASS 600

PEAK DATA: 1.16 MM @ 83.28 MS; -2.24 MM @ 307.84 MS

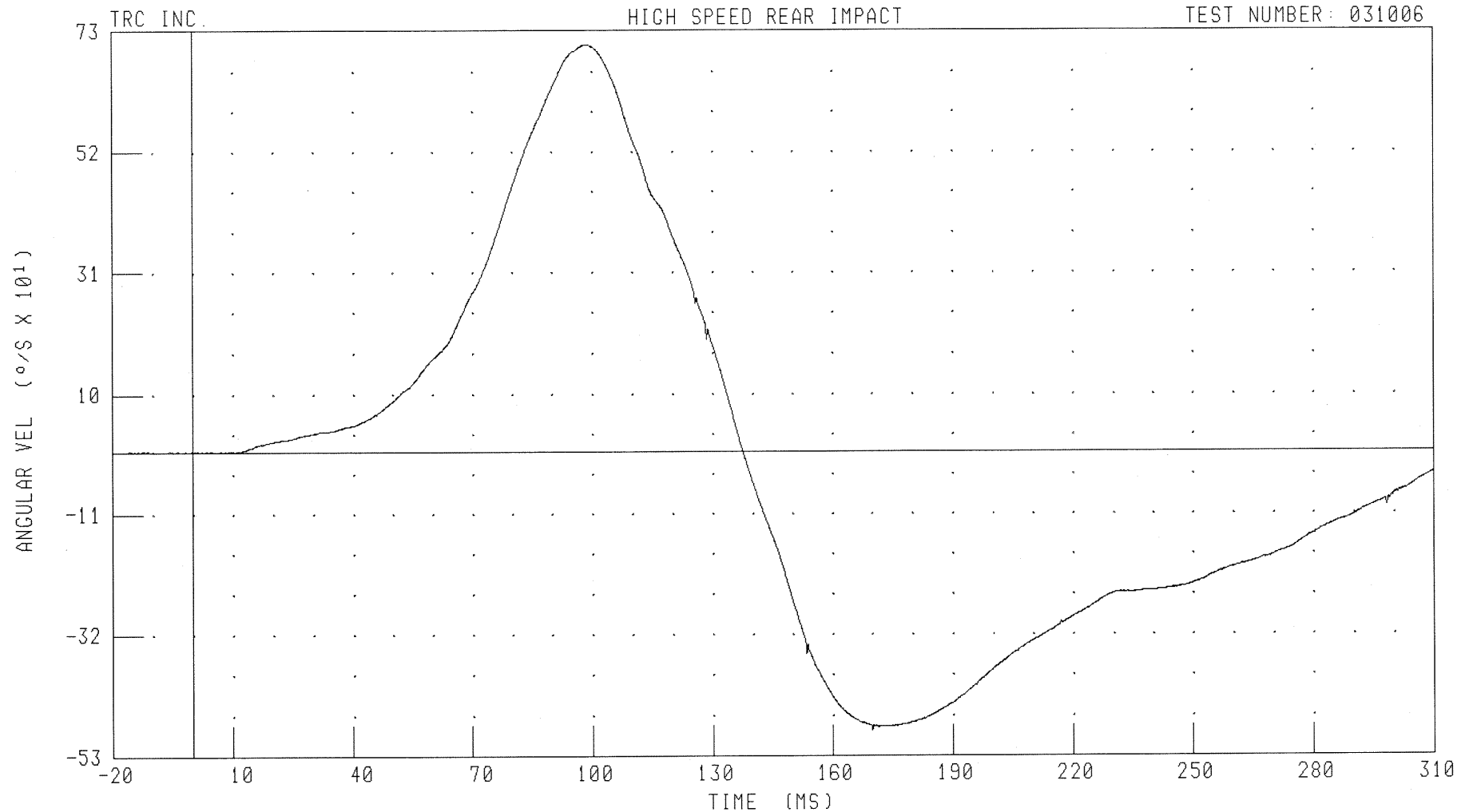
B-35

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER CHEST Y-AXIS ANGULAR VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTYV2 FILTER: CH. CLASS 1000

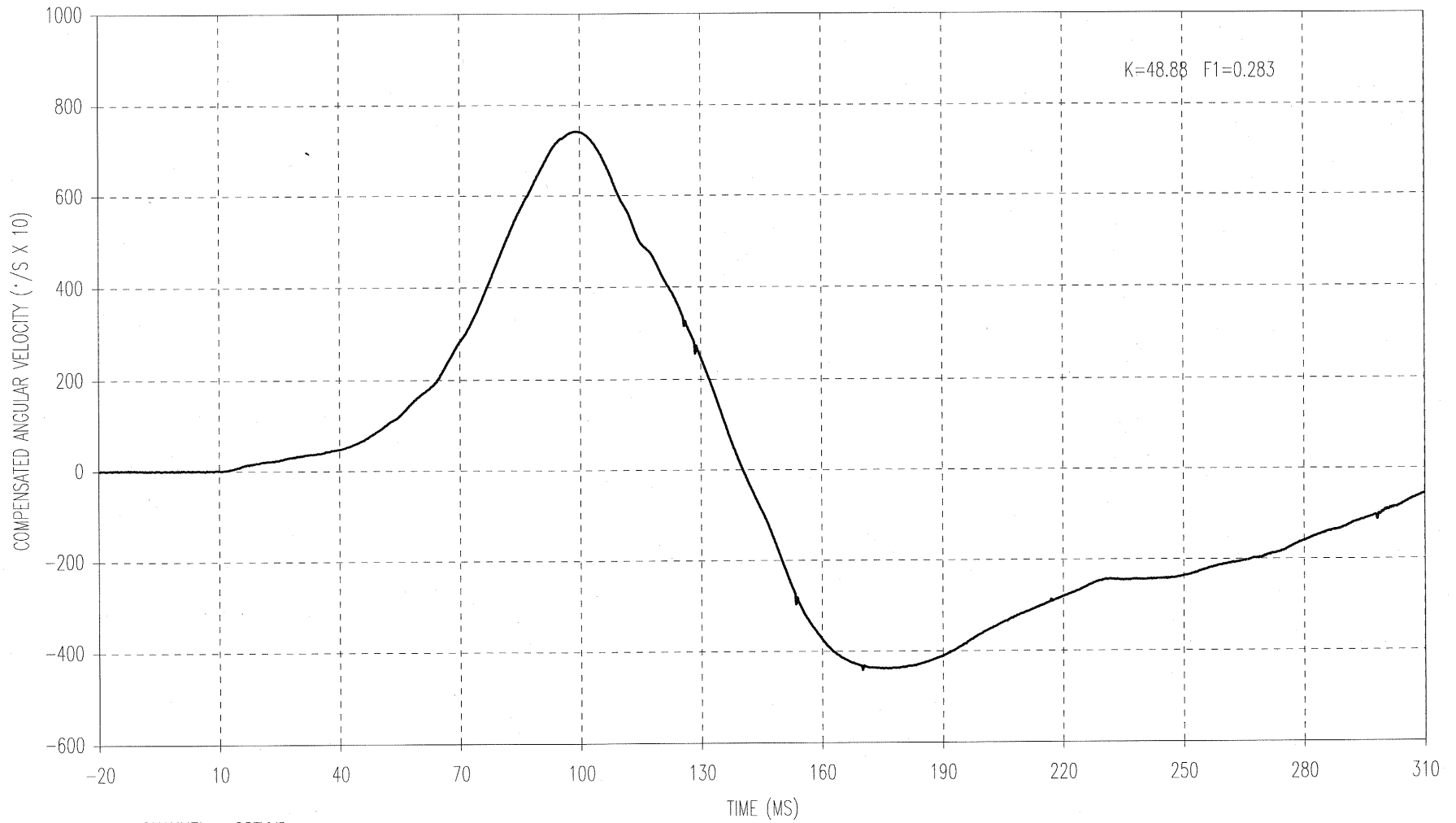
PEAK DATA: 706.04 °/S @ 98.64 MS; -486.36 °/S @ 170.08 MS

B-36

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER CHEST Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

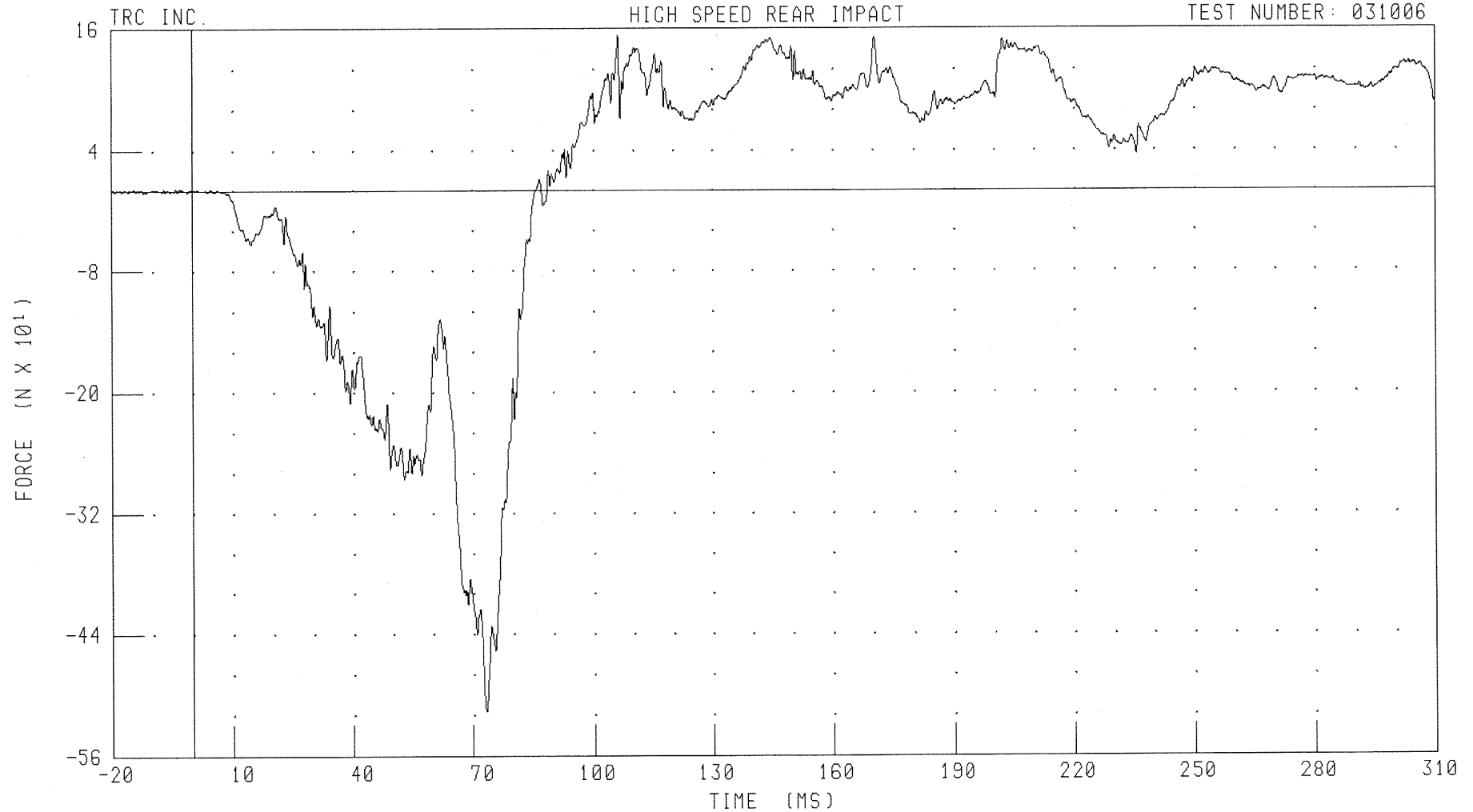


47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER LEFT FEMUR Z-AXIS FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFMZF2 FILTER: CH. CLASS 600

PEAK DATA: 152.95 N @ 106.32 MS; -516.75 N @ 73.28 MS

B-38

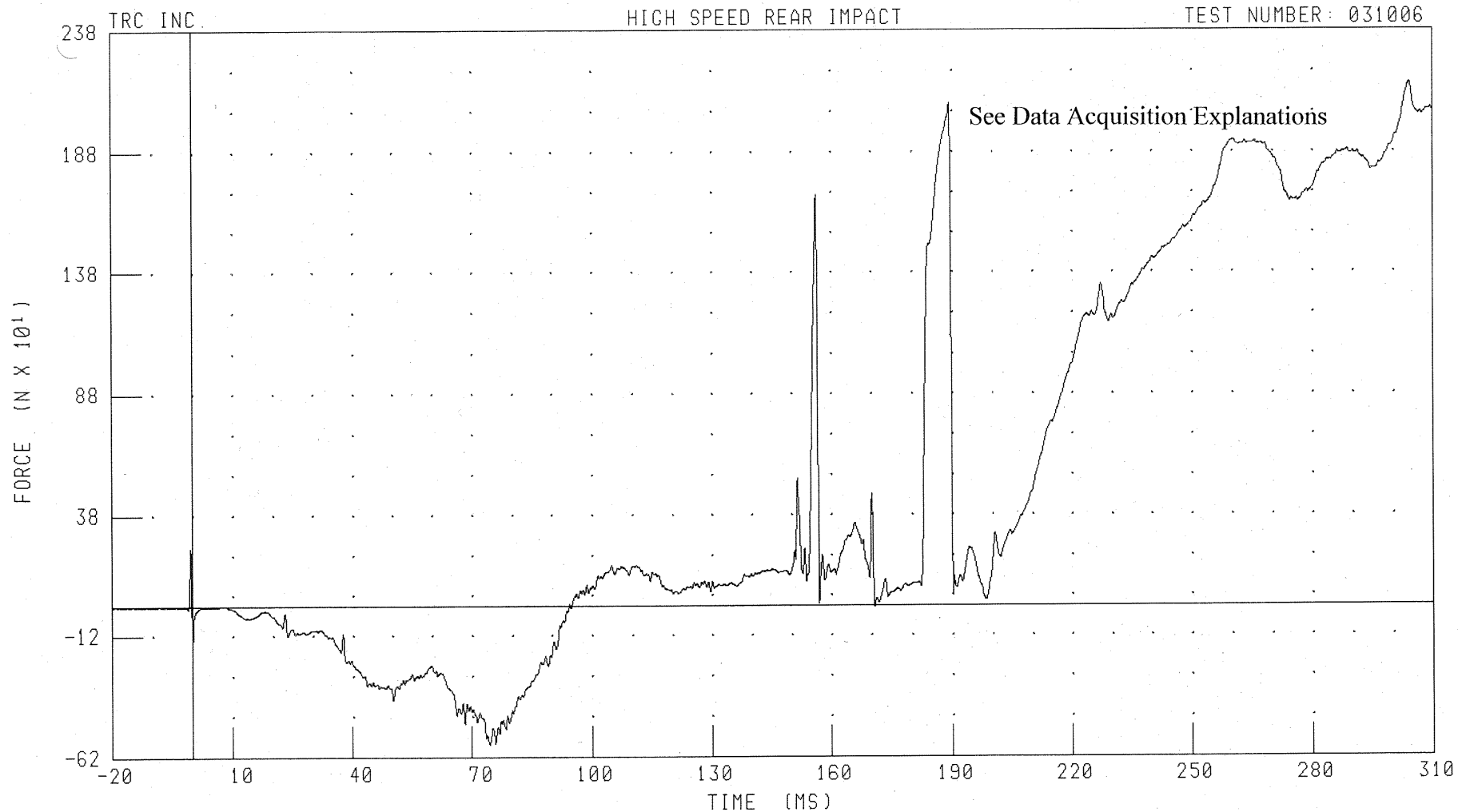
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER RIGHT FEMUR Z-AXIS FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RFMZ F2 FILTER: CH. CLASS 600

PEAK DATA: 2163.20 N @ 304.08 MS, -567.68 N @ 74.40 MS

B-39

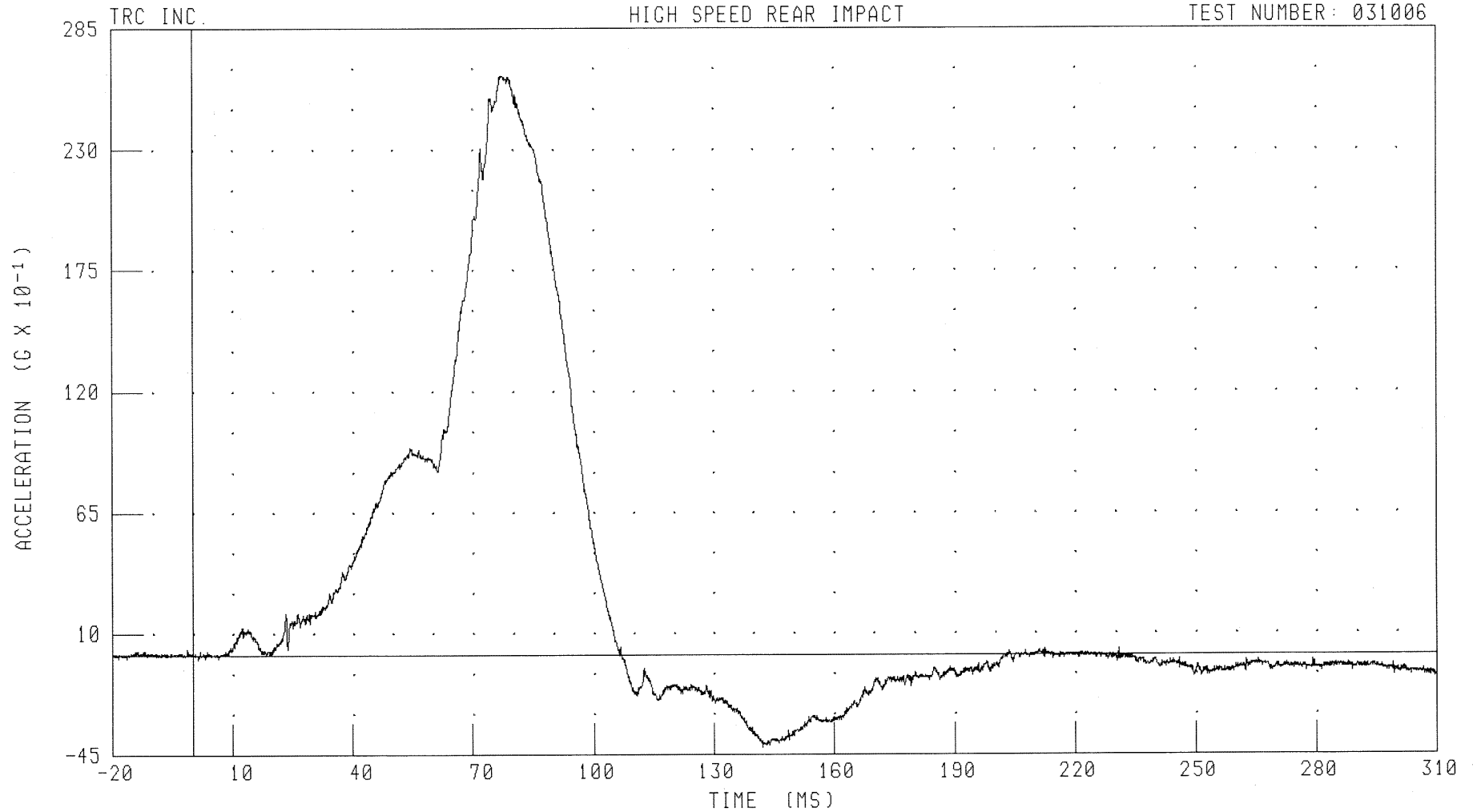
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

PEAK DATA: 26.31 G @ 76.88 MS; -4.16 G @ 142.32 MS

B-40

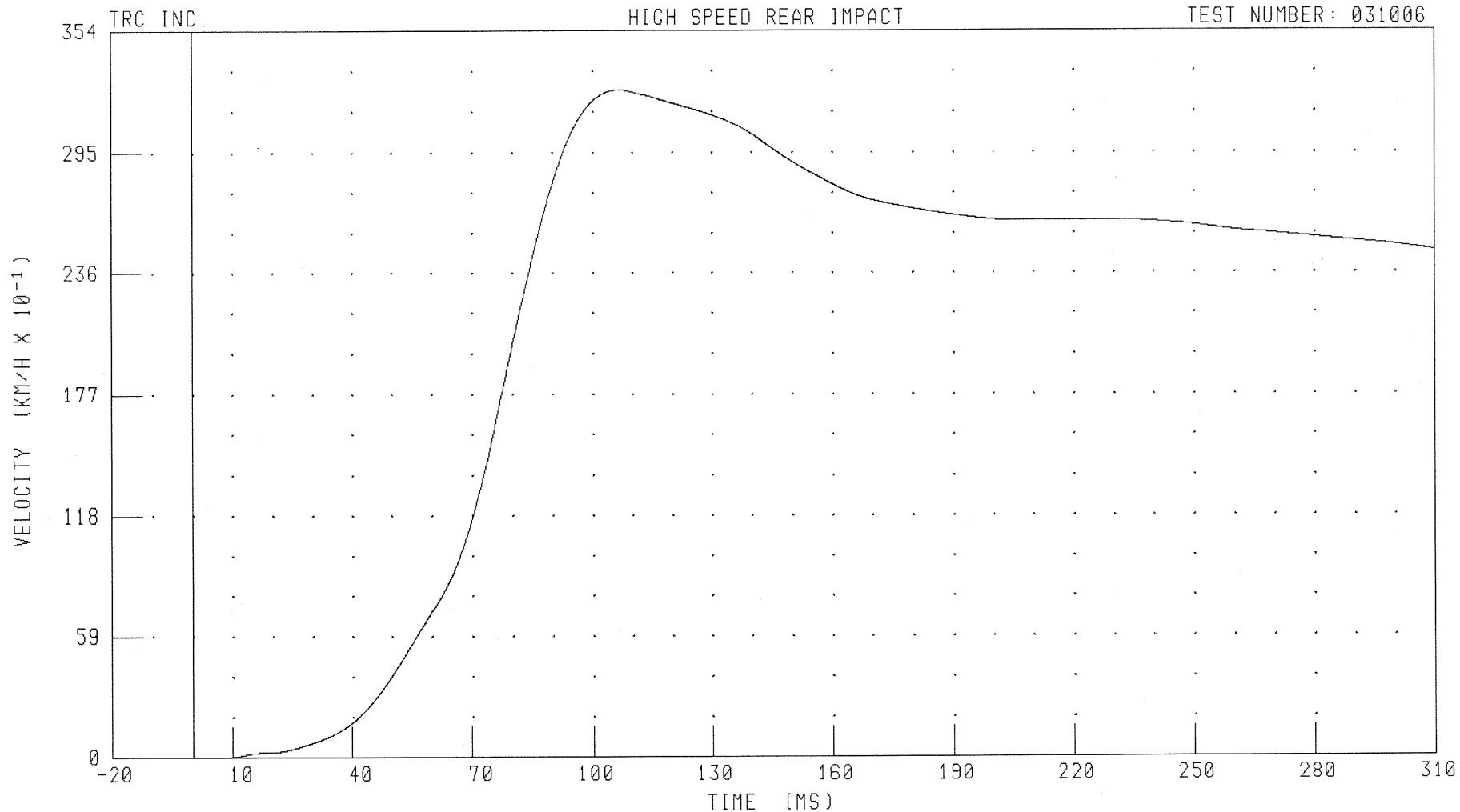
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVXV2 FILTER: CH. CLASS 180

PEAK DATA: 32.50 KM/H @ 106.88 MS; 0.00 KM/H @ 0.00 MS

B-41

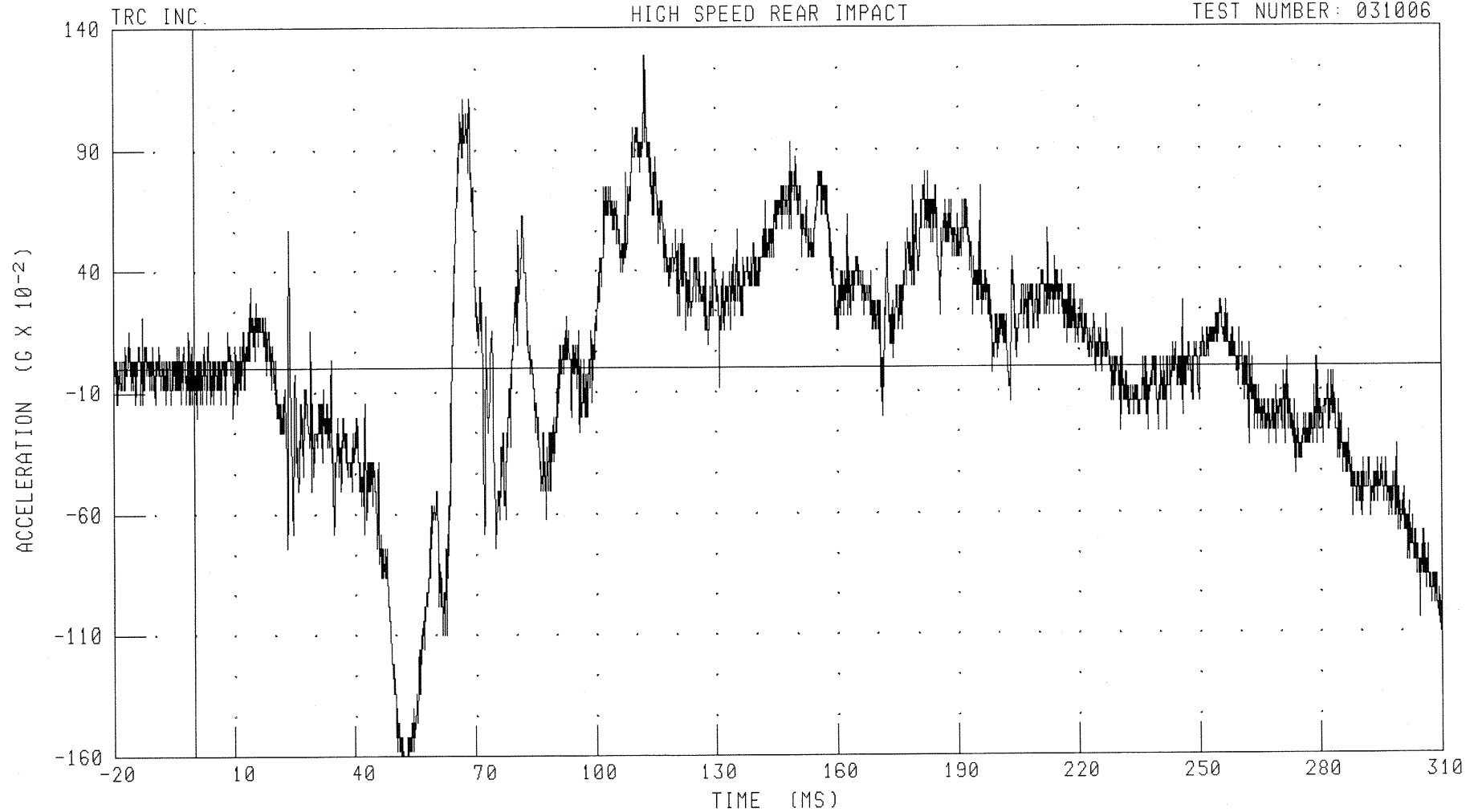
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVYG2

FILTER: CH. CLASS 1000

PEAK DATA: 1.29 G @ 112.32 MS; -1.70 G @ 52.08 MS

B-42

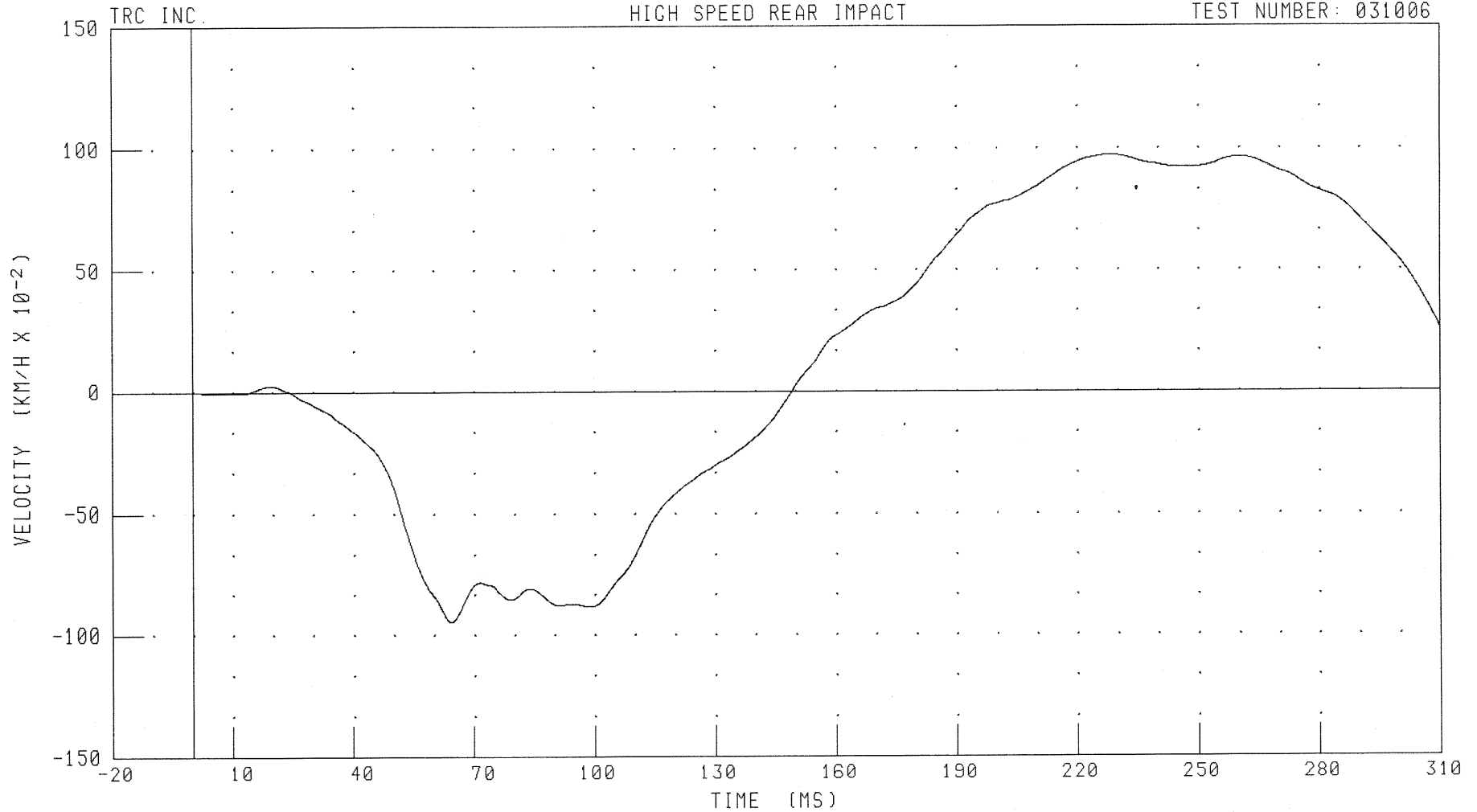
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVYV2 FILTER: CH. CLASS 180

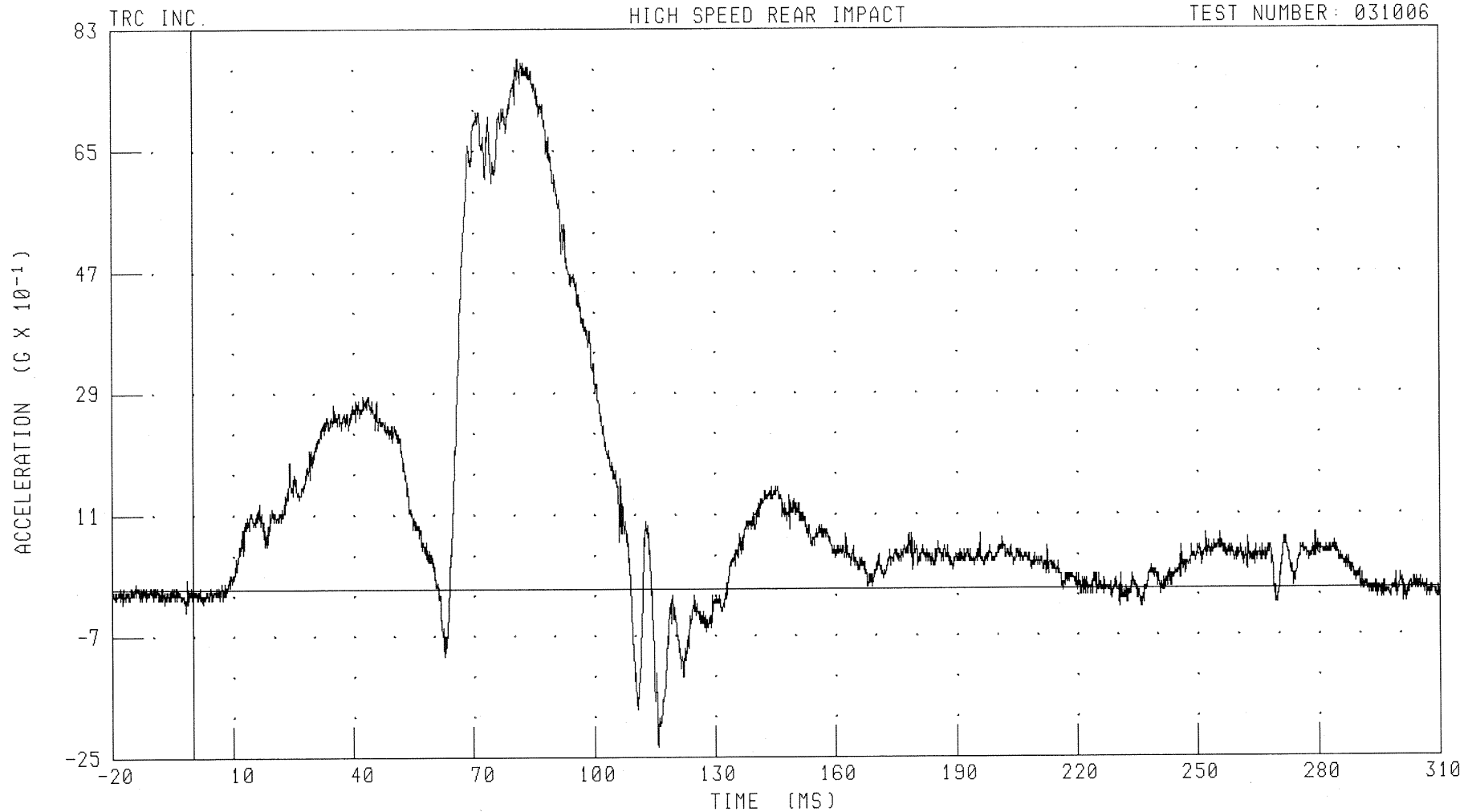
B-43

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION

TEST NUMBER: 031006



CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

PEAK DATA: 7.86 G @ 81.12 MS; -2.36 G @ 115.76 MS

B-44

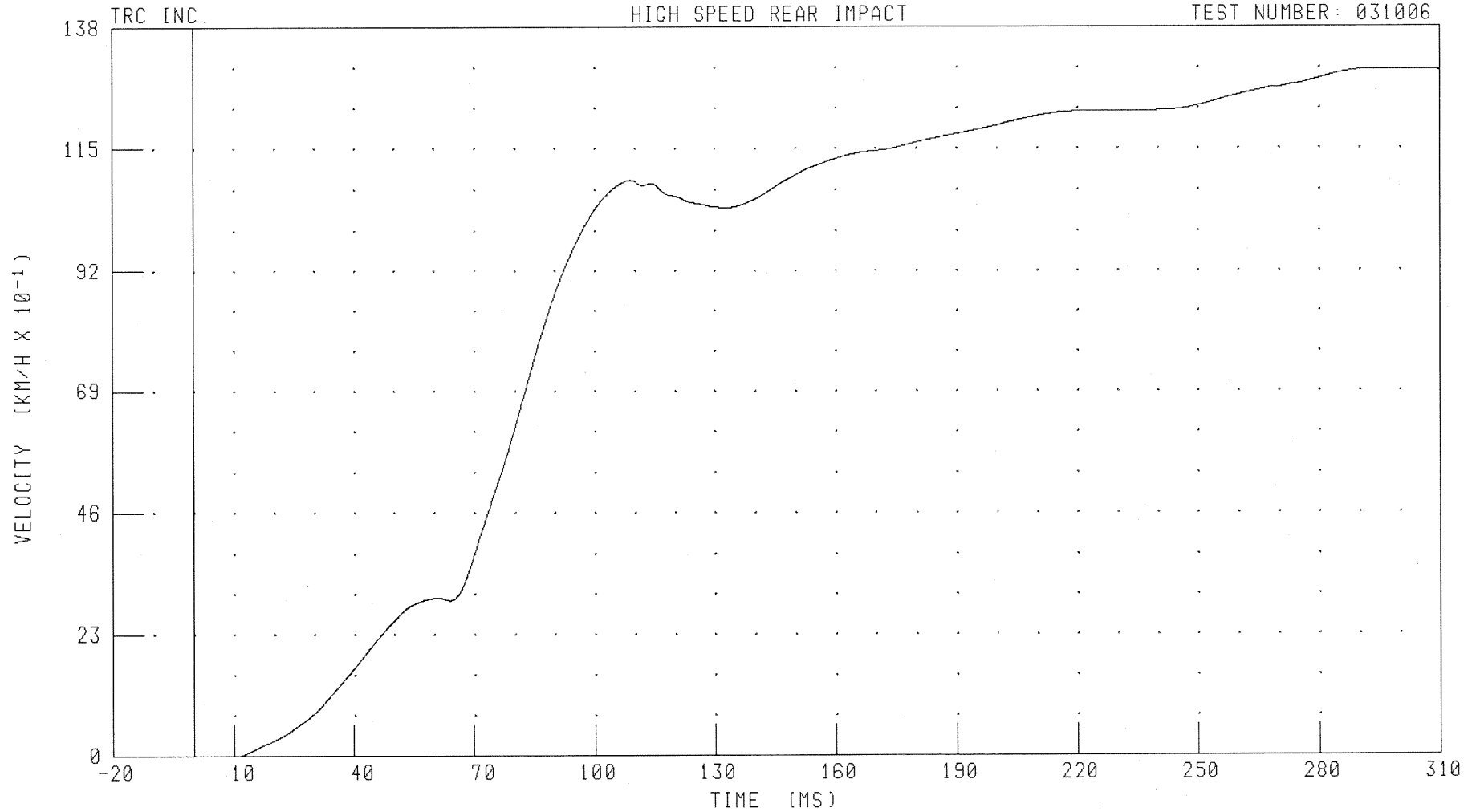
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVZV2

FILTER: CH. CLASS 180

PEAK DATA: 12.98 KM/H @ 292.48 MS; -0.02 KM/H @ 8.16 MS

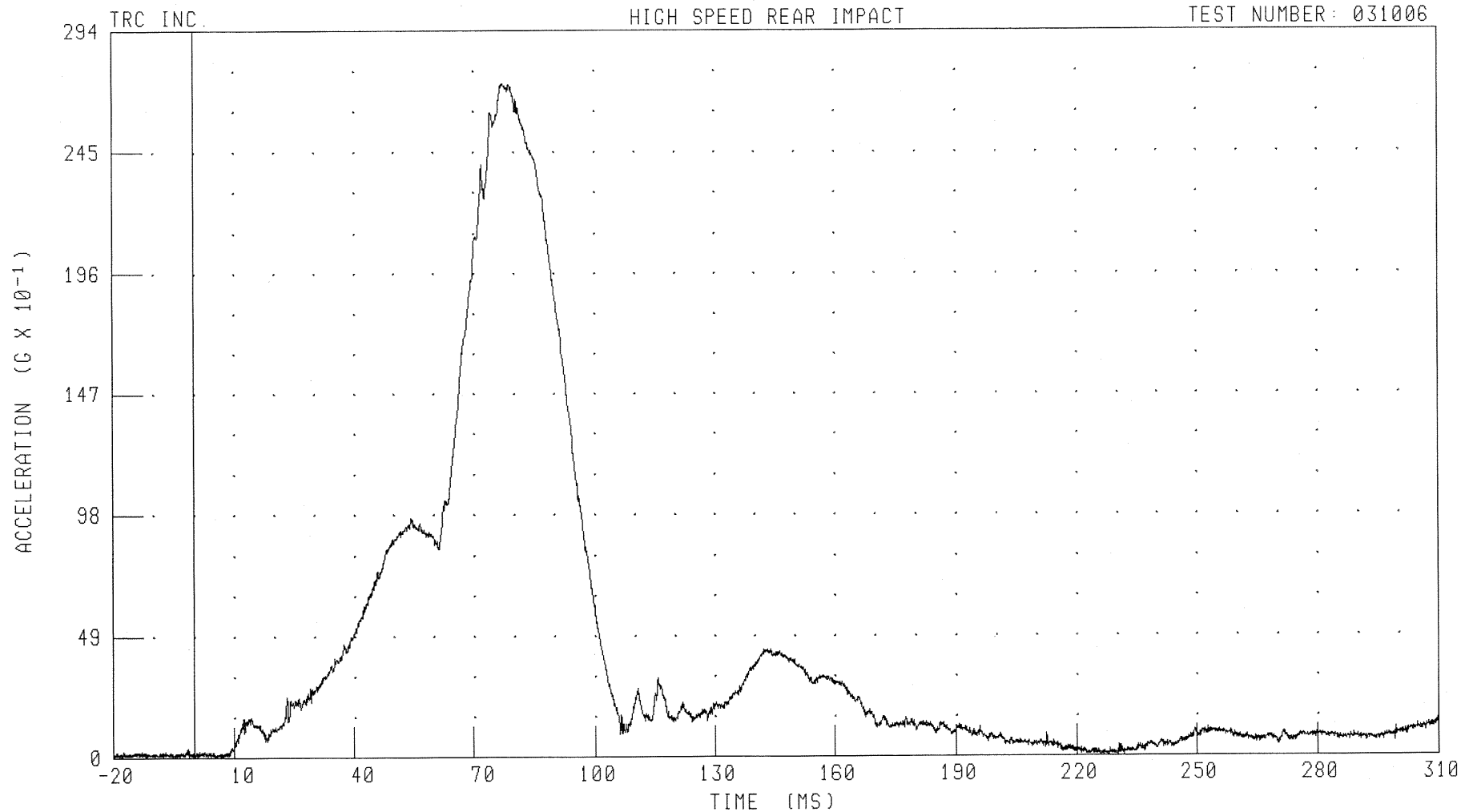
B-45

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION

TEST NUMBER: 031006



CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

PEAK DATA: 27.27 G @ 77.36 MS; 0.04 G @ -19.76 MS

B-46

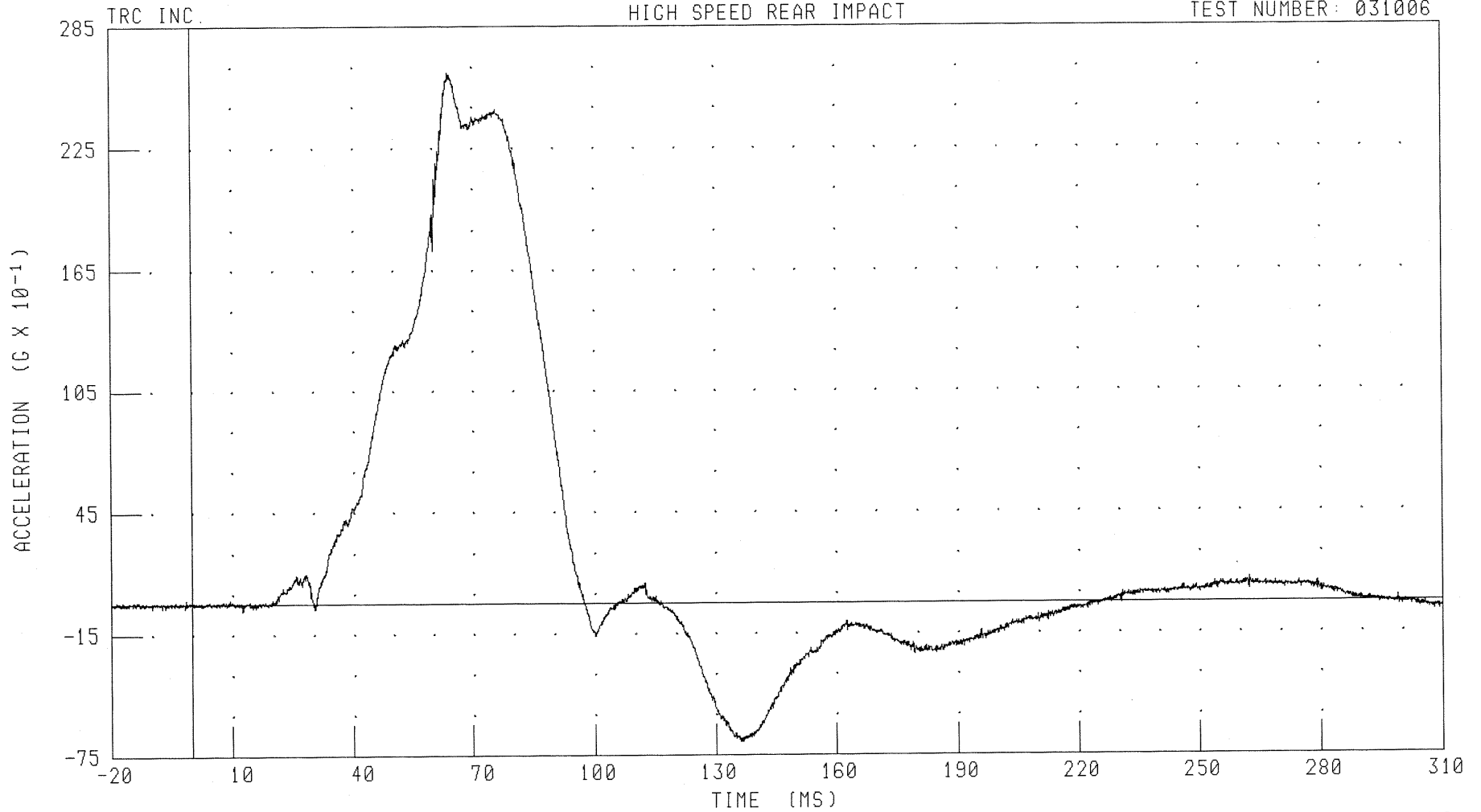
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDXC4

FILTER: CH. CLASS 1000

PEAK DATA: 26.24 G @ 64.16 MS; -6.82 G @ 136.16 MS

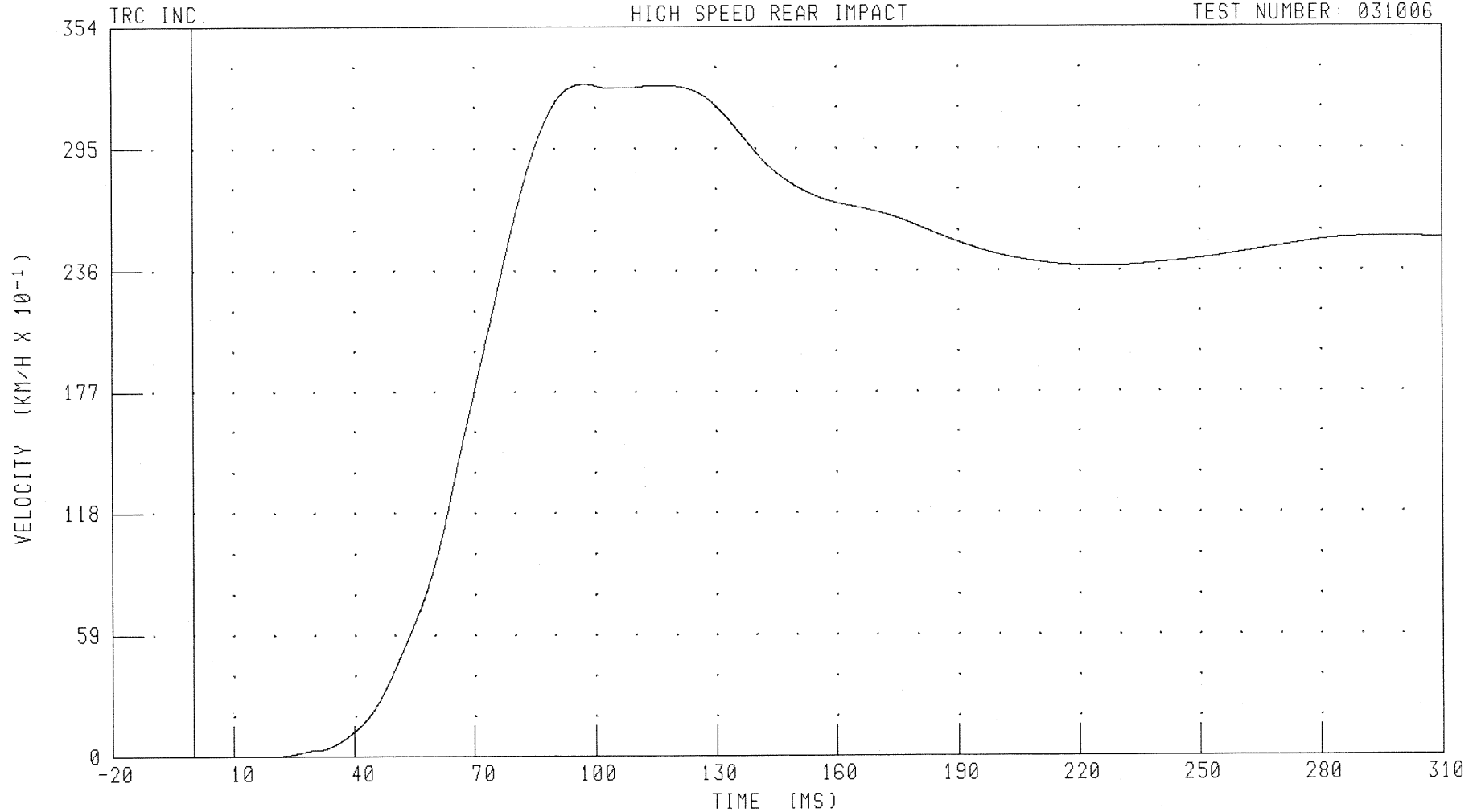
B-47

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER HEAD X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDXV4 FILTER: CH. CLASS 180

PEAK DATA: 32.60 KM/H @ 97.52 MS; 0.00 KM/H @ 16.64 MS

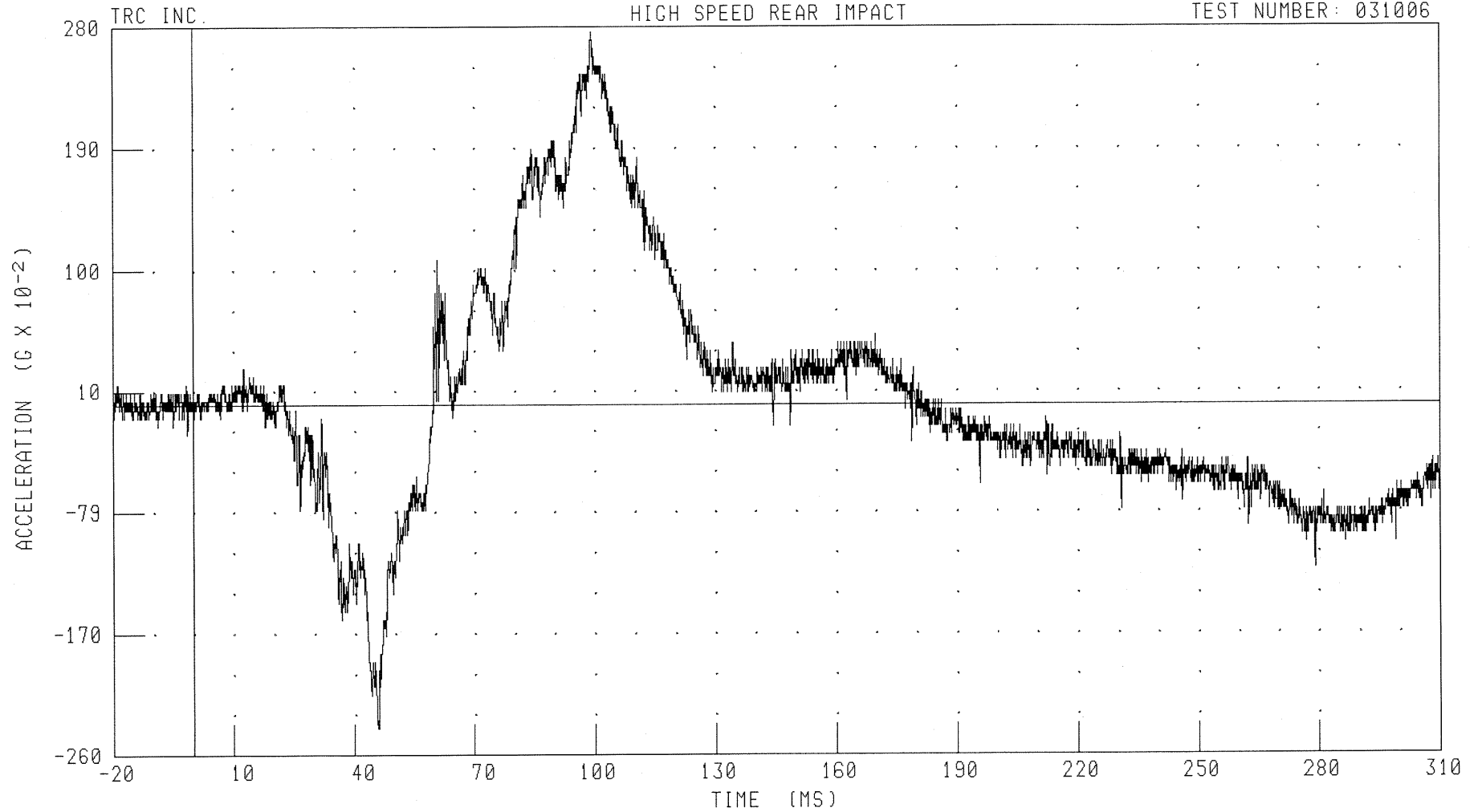
B-48

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDYG4 FILTER: CH. CLASS 1000

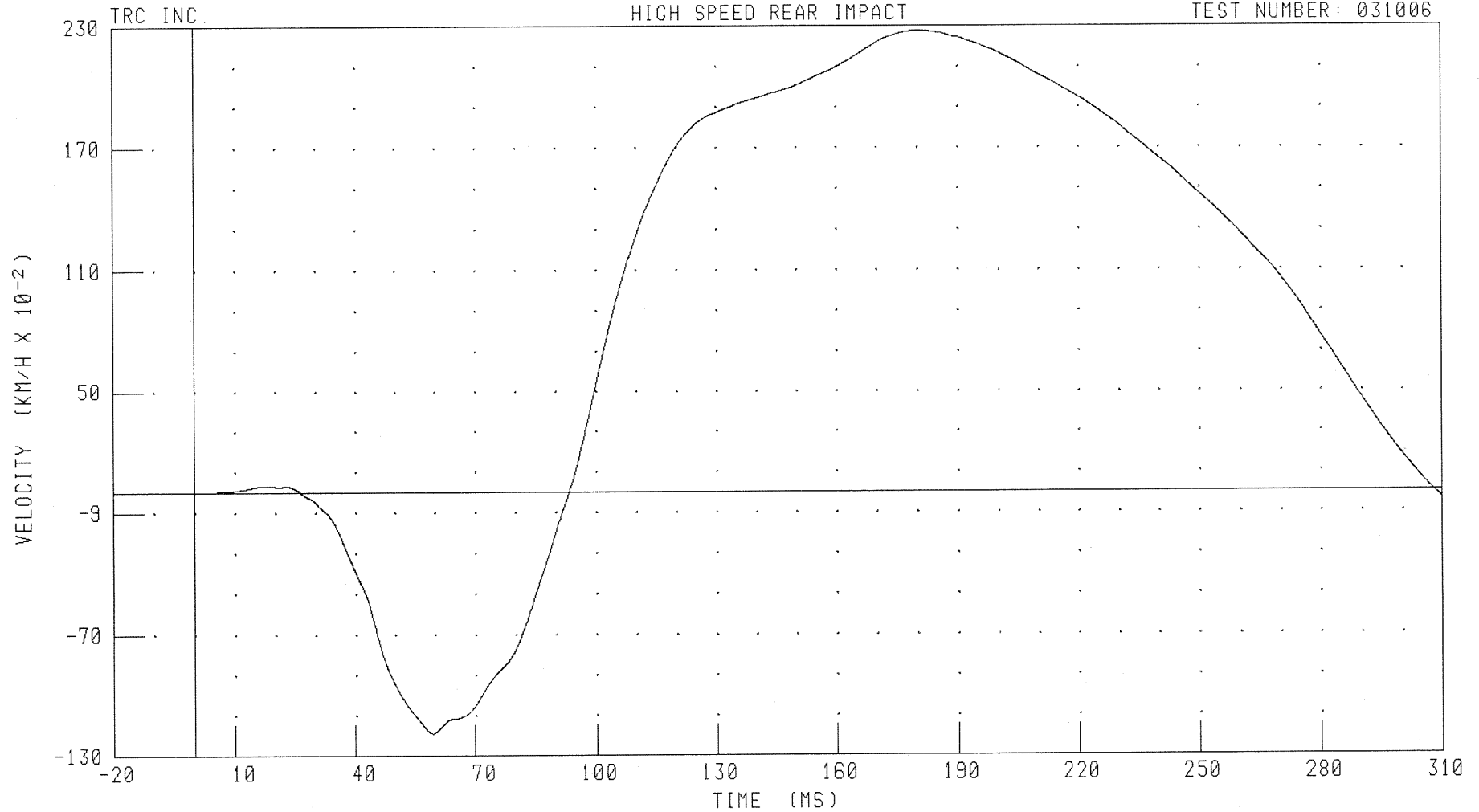
B-49

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER HEAD Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDYV4

FILTER: CH. CLASS 180

PEAK DATA: 2.28 KM/H @ 180.88 MS; -1.19 KM/H @ 59.44 MS

B-50

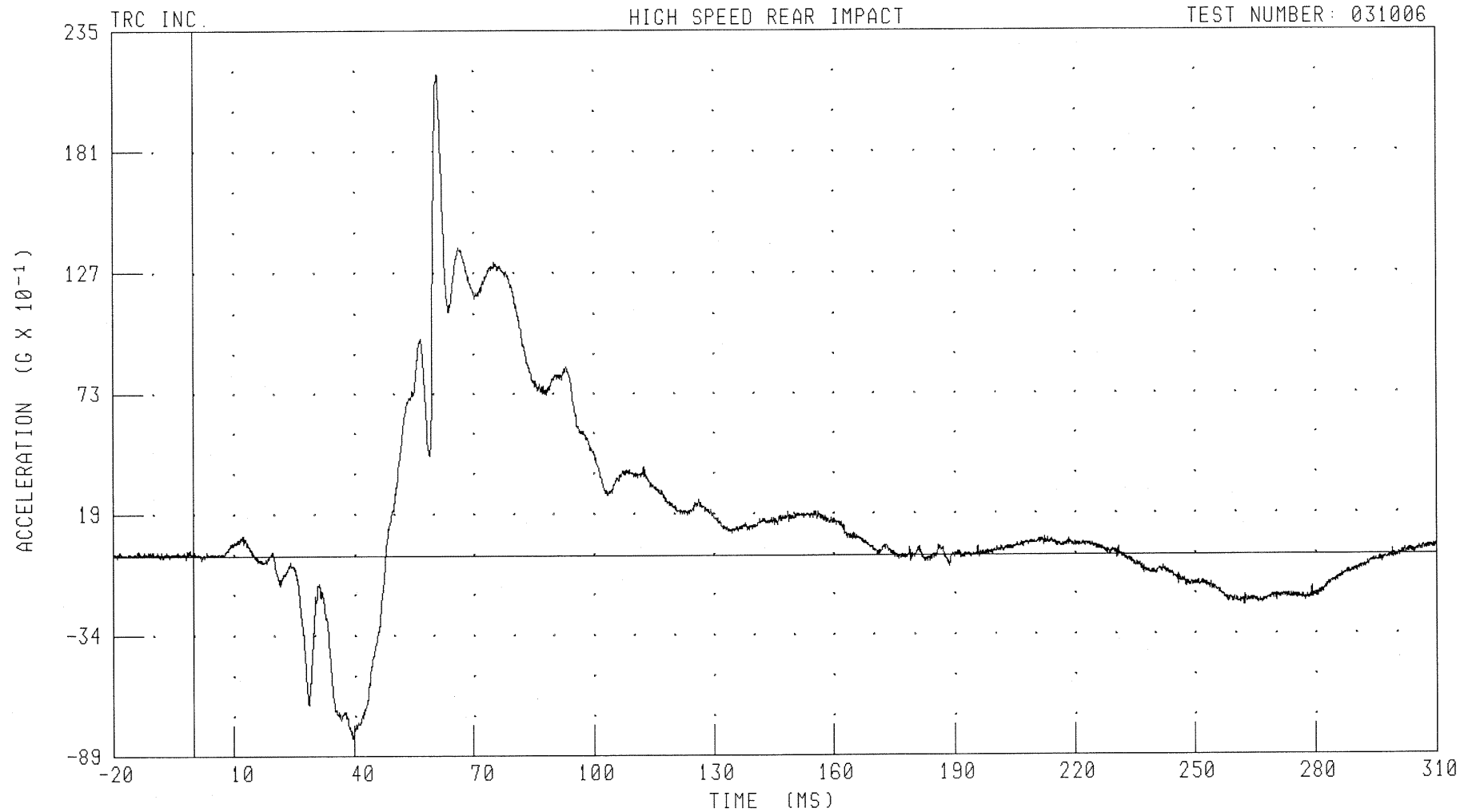
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDZG4 FILTER: CH. CLASS 1000

PEAK DATA: 21.55 G @ 61.04 MS; -8.12 G @ 39.52 MS

B-51

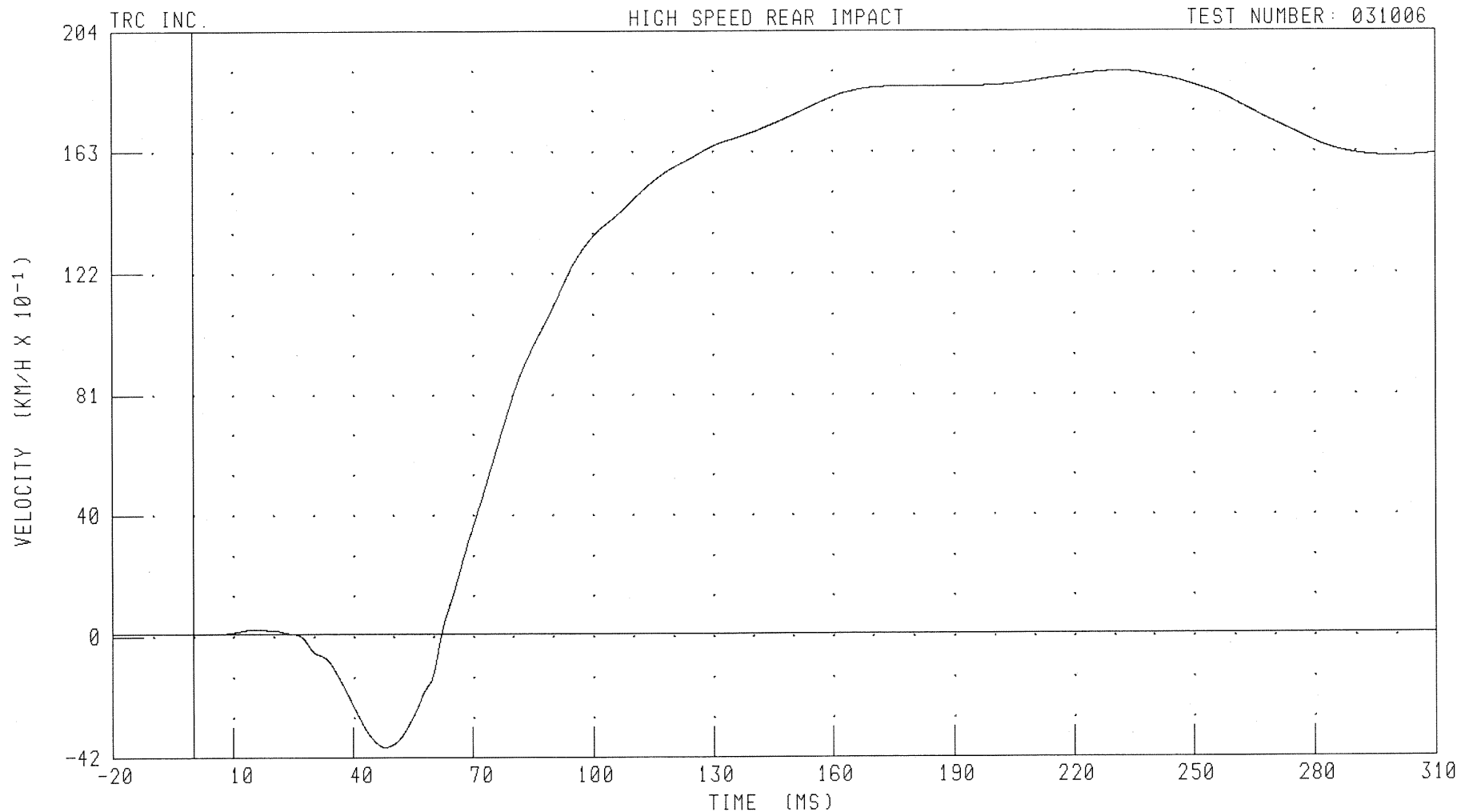
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER HEAD Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDZV4 FILTER: CH. CLASS 180

PEAK DATA: 19.02 KM/H @ 231.68 MS; -3.85 KM/H @ 48.00 MS

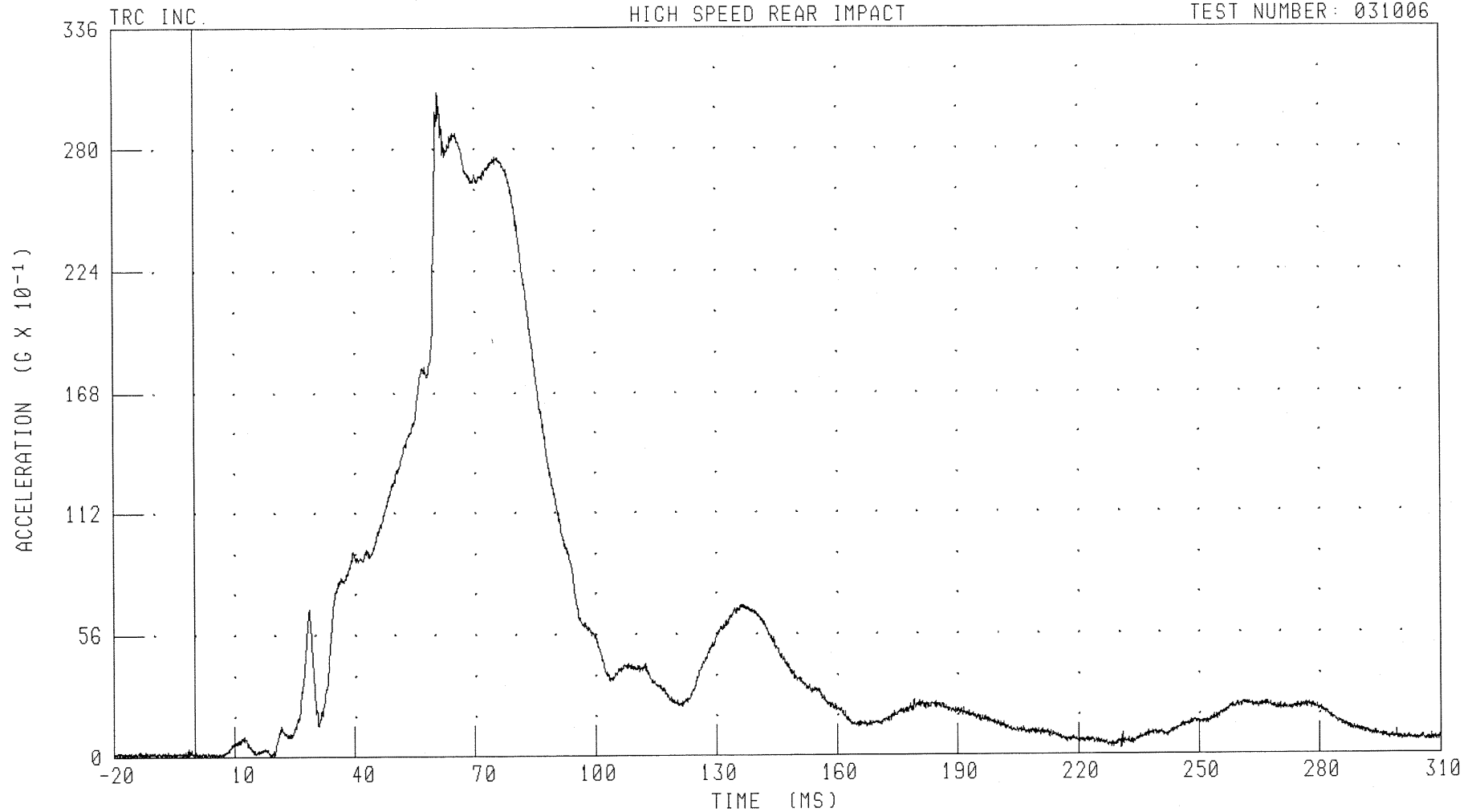
B-52

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: HEDRG4 FILTER: CH. CLASS 1000

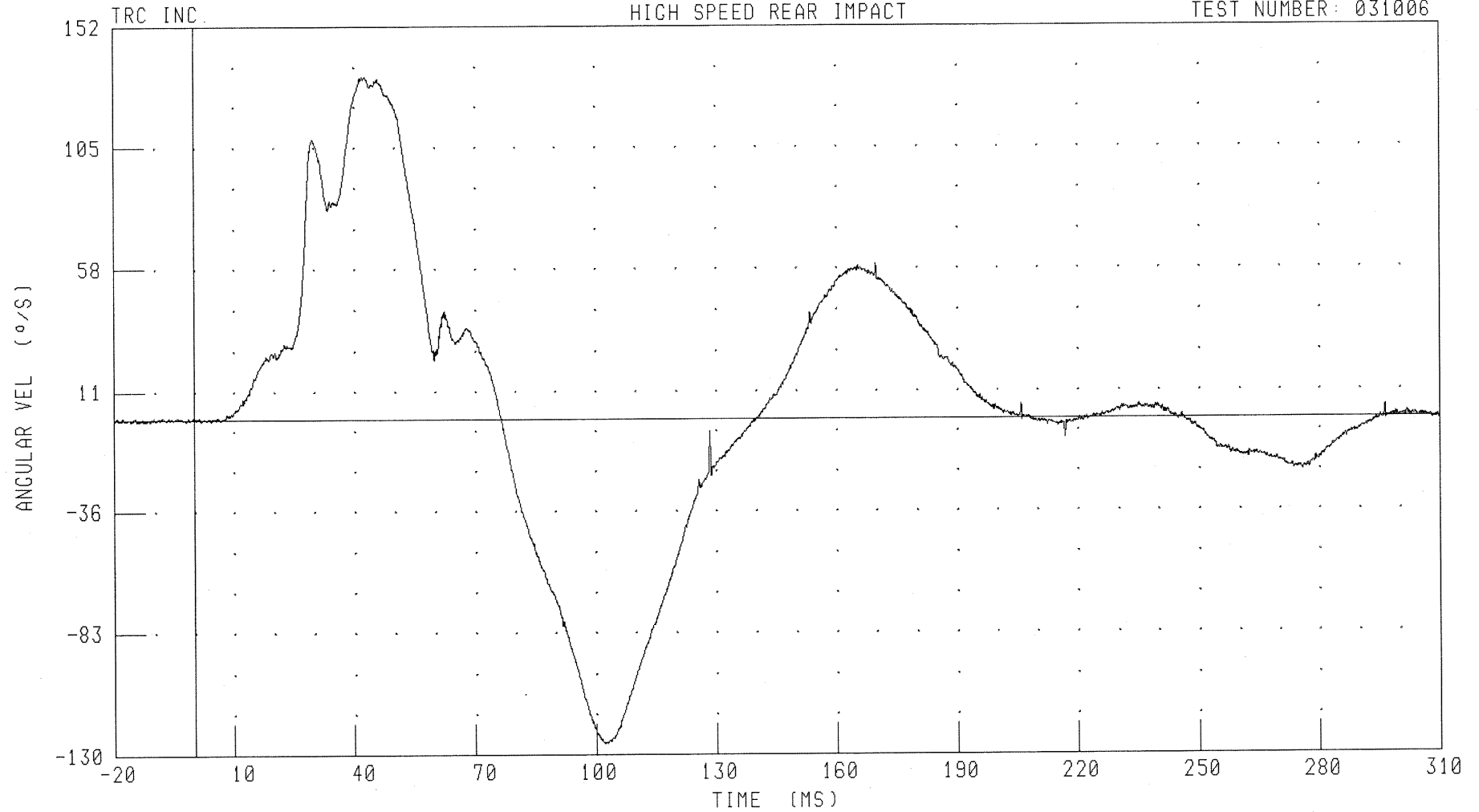
PEAK DATA: 30.63 G @ 61.04 MS; 0.03 G @ -19.92 MS

B-53

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER HEAD Y-AXIS ANGULAR VELOCITY

TEST NUMBER: 031006



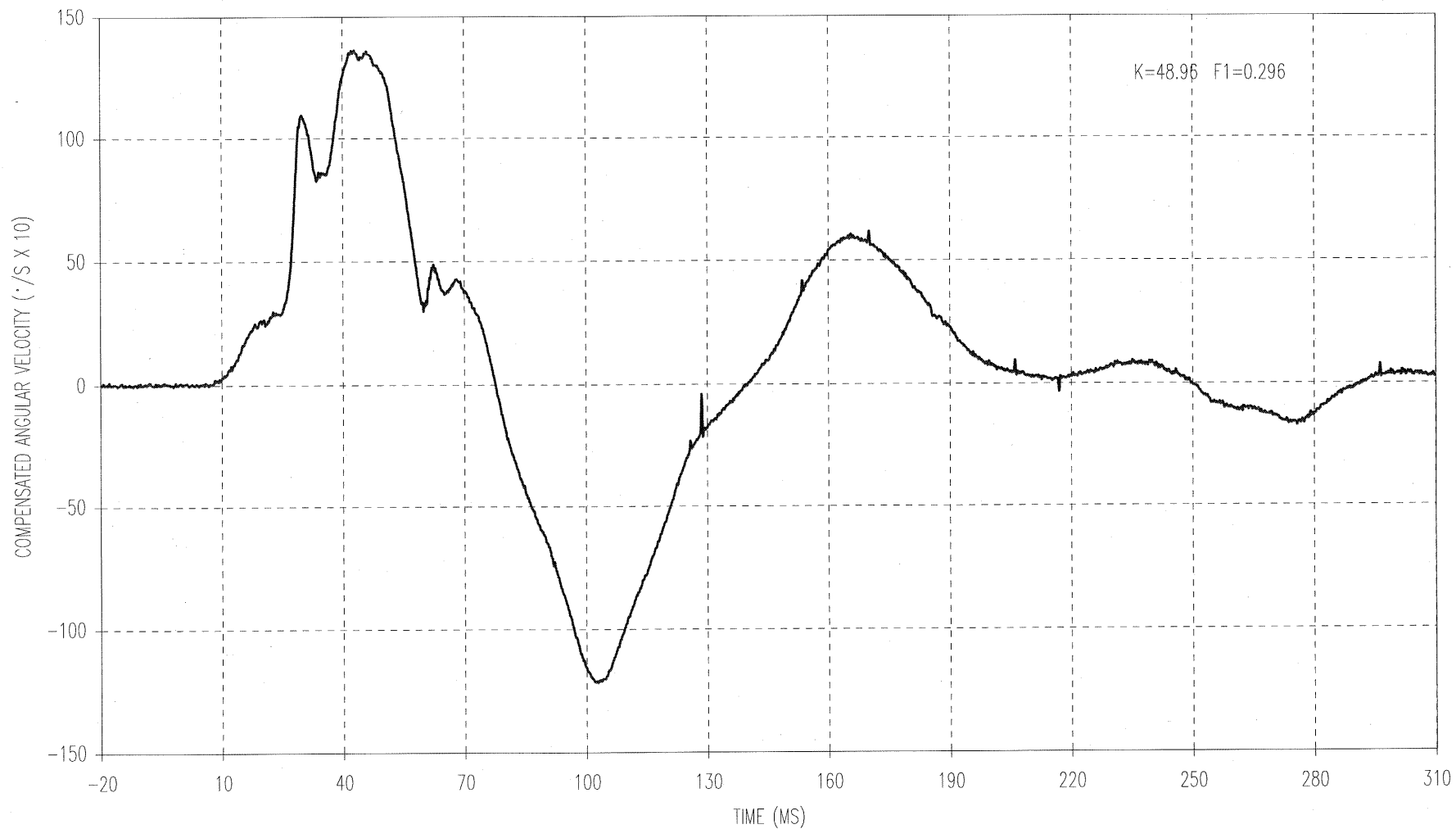
CHANNEL: HEDYV4 FILTER: CH. CLASS 1000

B-54

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER HEAD Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



B-55

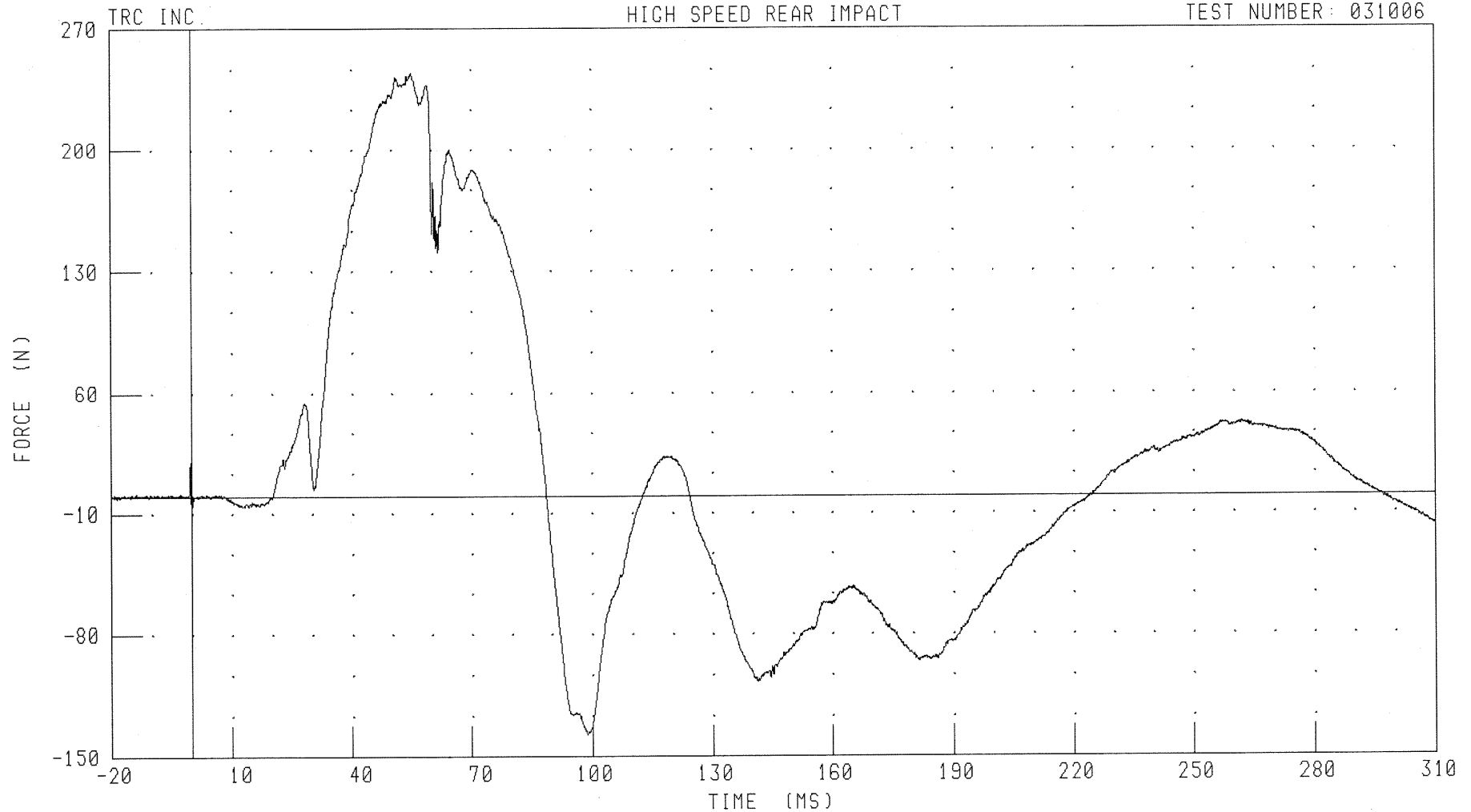
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER UPPER NECK X-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKXF4 FILTER: CH. CLASS 1000

PEAK DATA: 244.67 N @ 55.12 MS; -137.44 N @ 98.88 MS

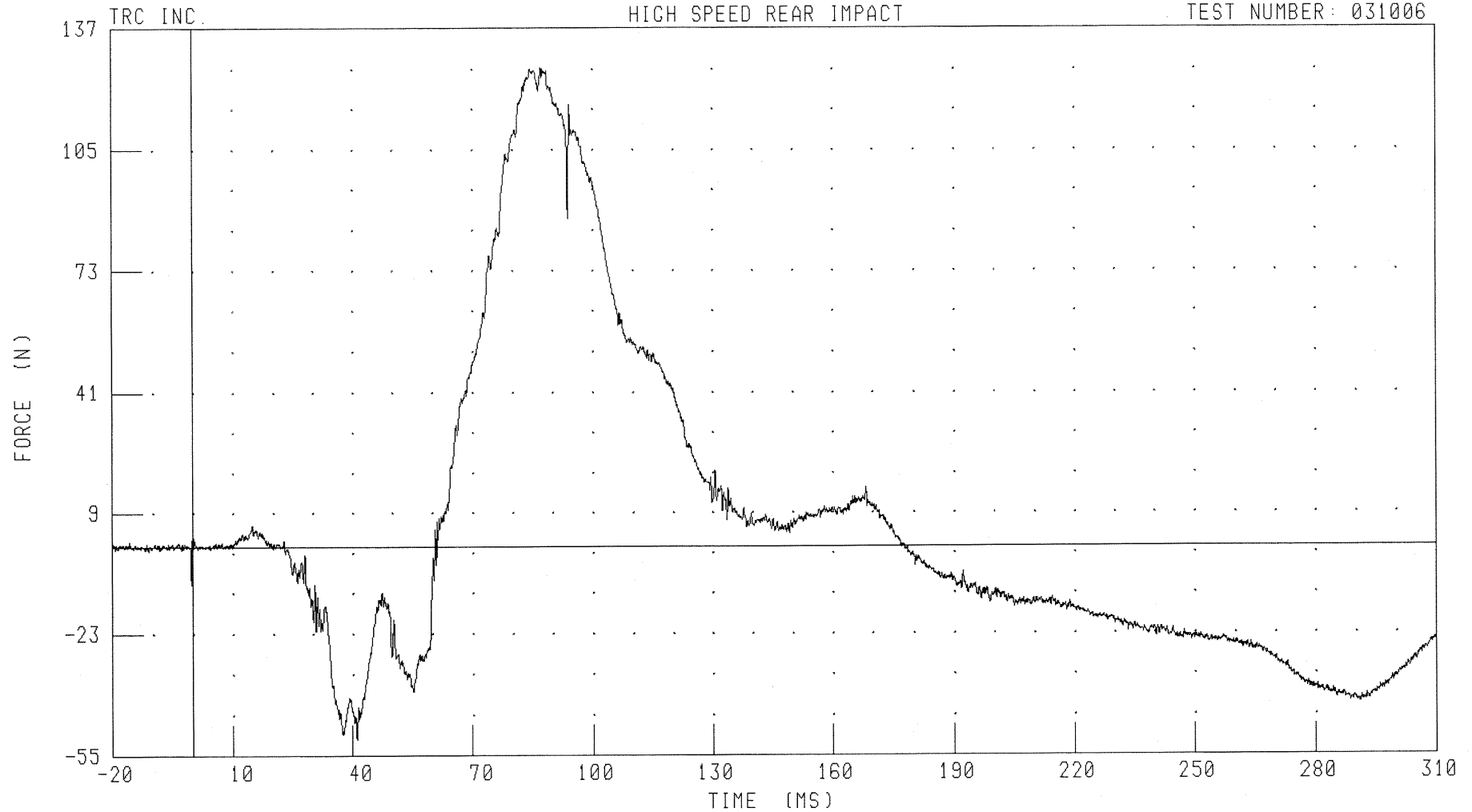
B-56

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER UPPER NECK Y-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKYF4 FILTER: CH. CLASS 1000

PEAK DATA: 126.69 N @ 87.12 MS; -50.57 N @ 41.12 MS

B-57

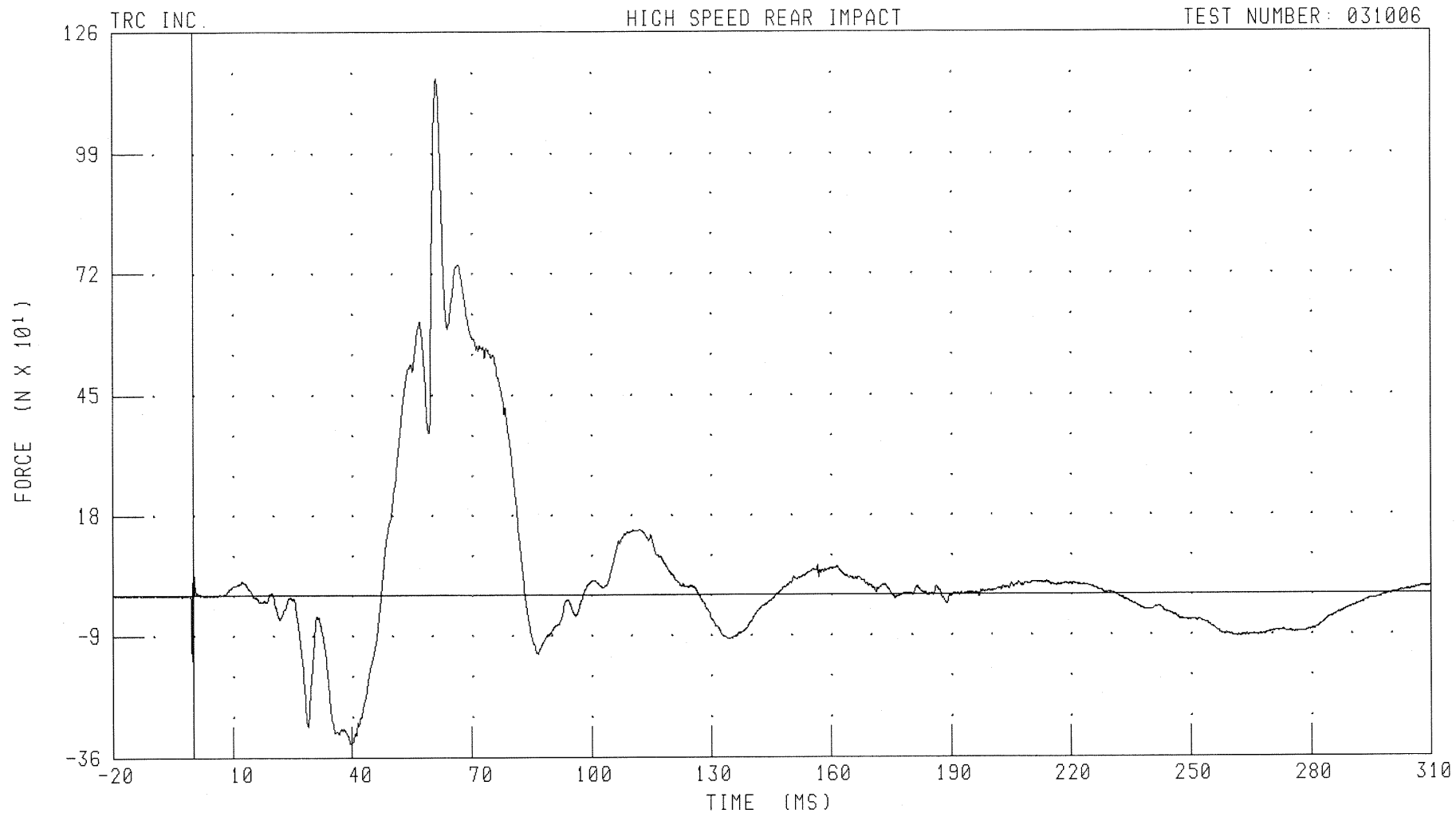
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER UPPER NECK Z-AXIS AXIAL FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKZF4 FILTER: CH. CLASS 1000

PEAK DATA: 1158.34 N @ 61.12 MS; -328.77 N @ 39.52 MS

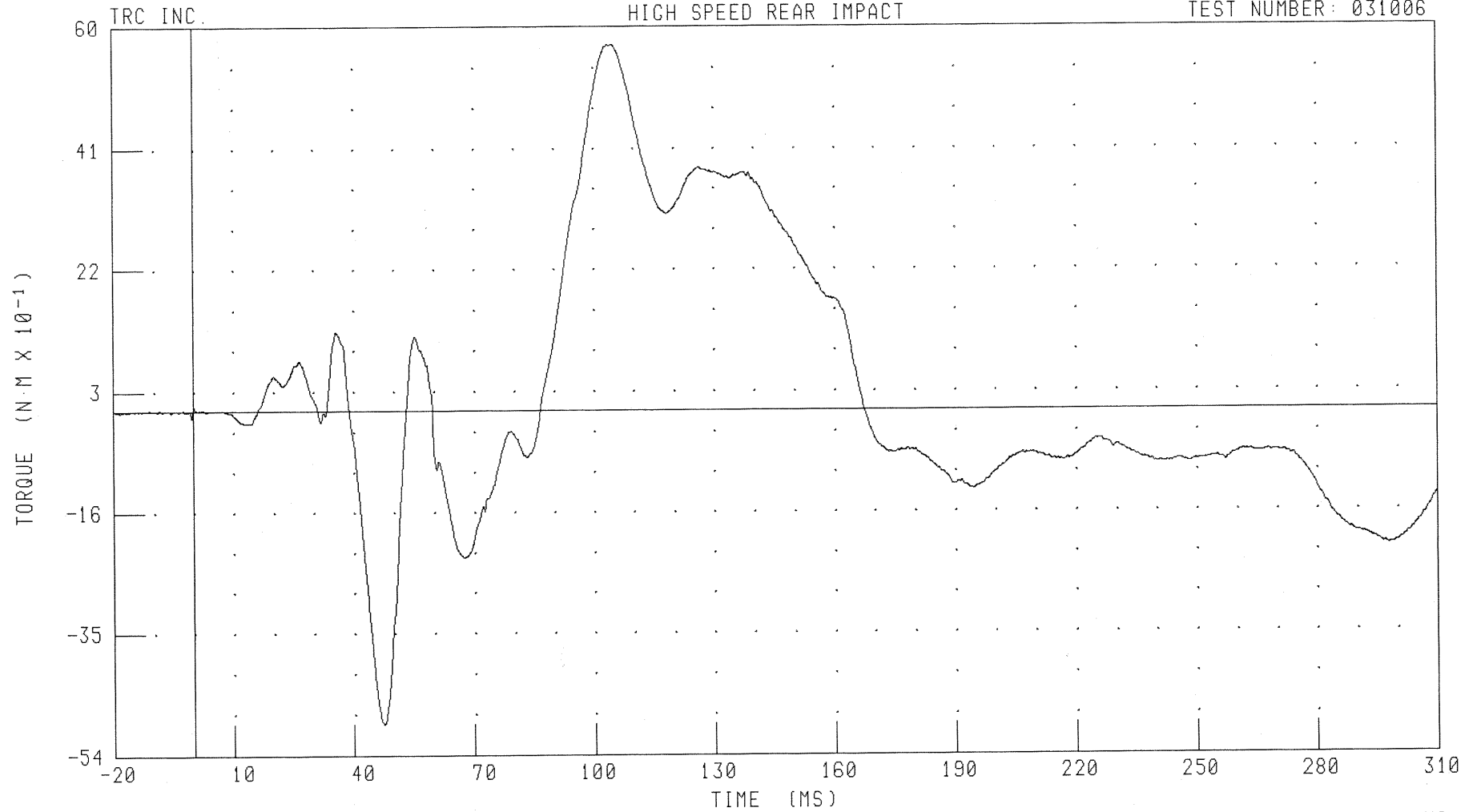
B-58

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER UPPER NECK MOMENT ABOUT X AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKXM4 FILTER: CH. CLASS 600

PEAK DATA: 5.72 N·M @ 104.88 MS; -4.91 N·M @ 47.44 MS

B-59

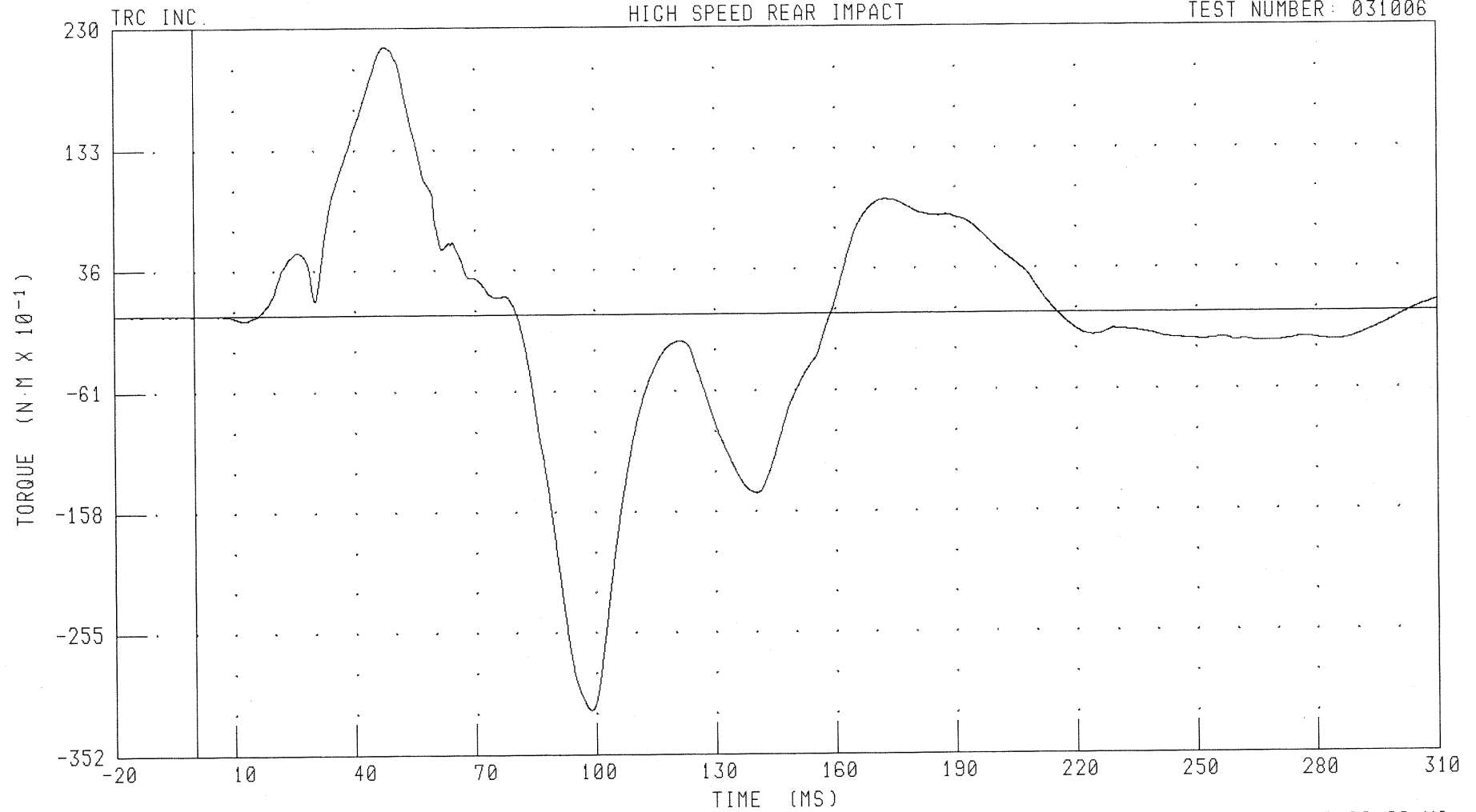
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER UPPER NECK MOMENT ABOUT Y AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKYM4 FILTER: CH. CLASS 600

PEAK DATA: 21.47 N·m @ 48.00 MS; -31.73 N·m @ 98.80 MS

B-60

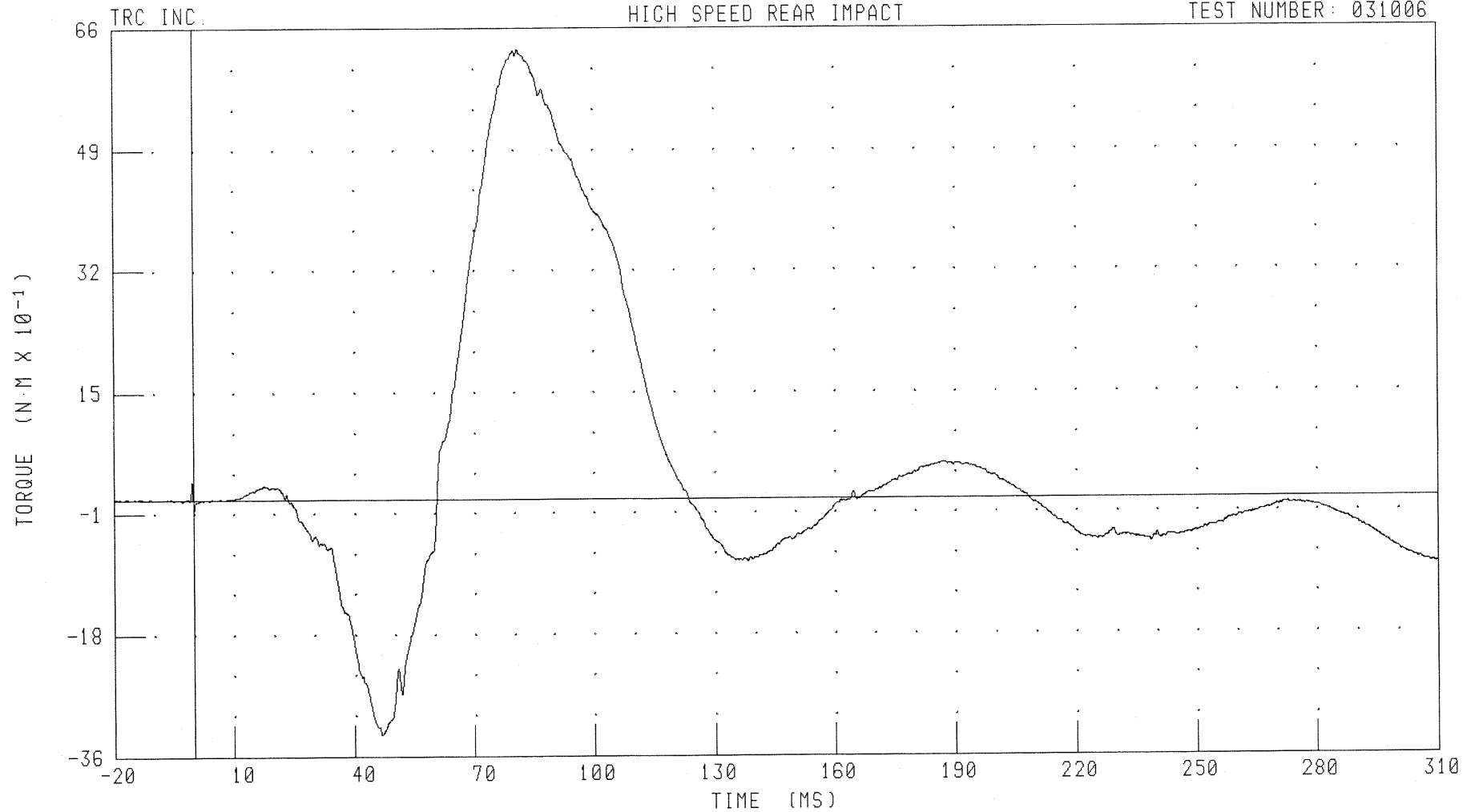
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER UPPER NECK MOMENT ABOUT Z AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKZM4

FILTER: CH. CLASS 600

PEAK DATA: 6.30 N·M @ 81.20 MS; -3.30 N·M @ 46.72 MS

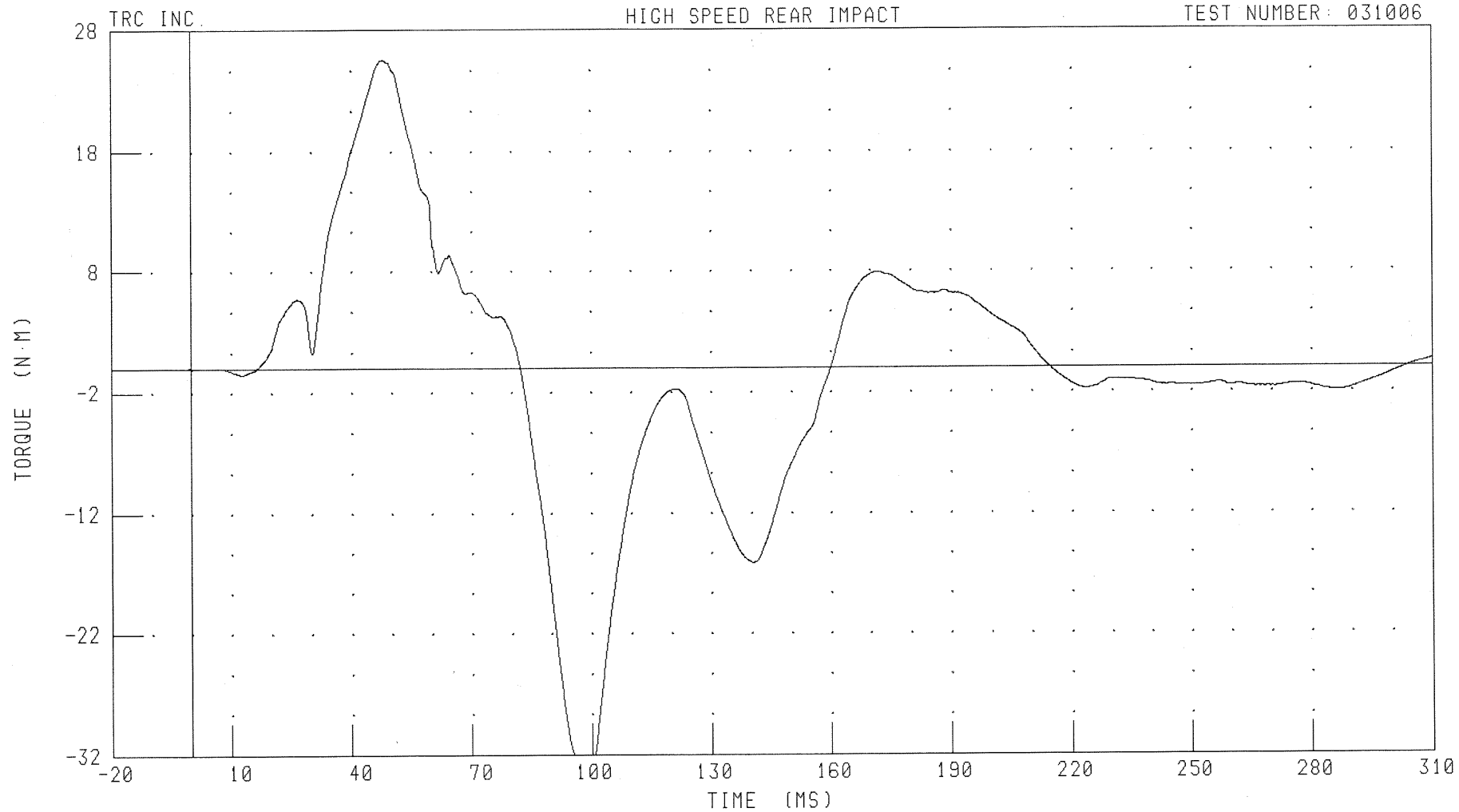
B-61

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NEKOM4 FILTER: CH. CLASS 600

PEAK DATA: 25.53 N·M @ 48.08 MS; -34.16 N·M @ 98.80 MS

B-62

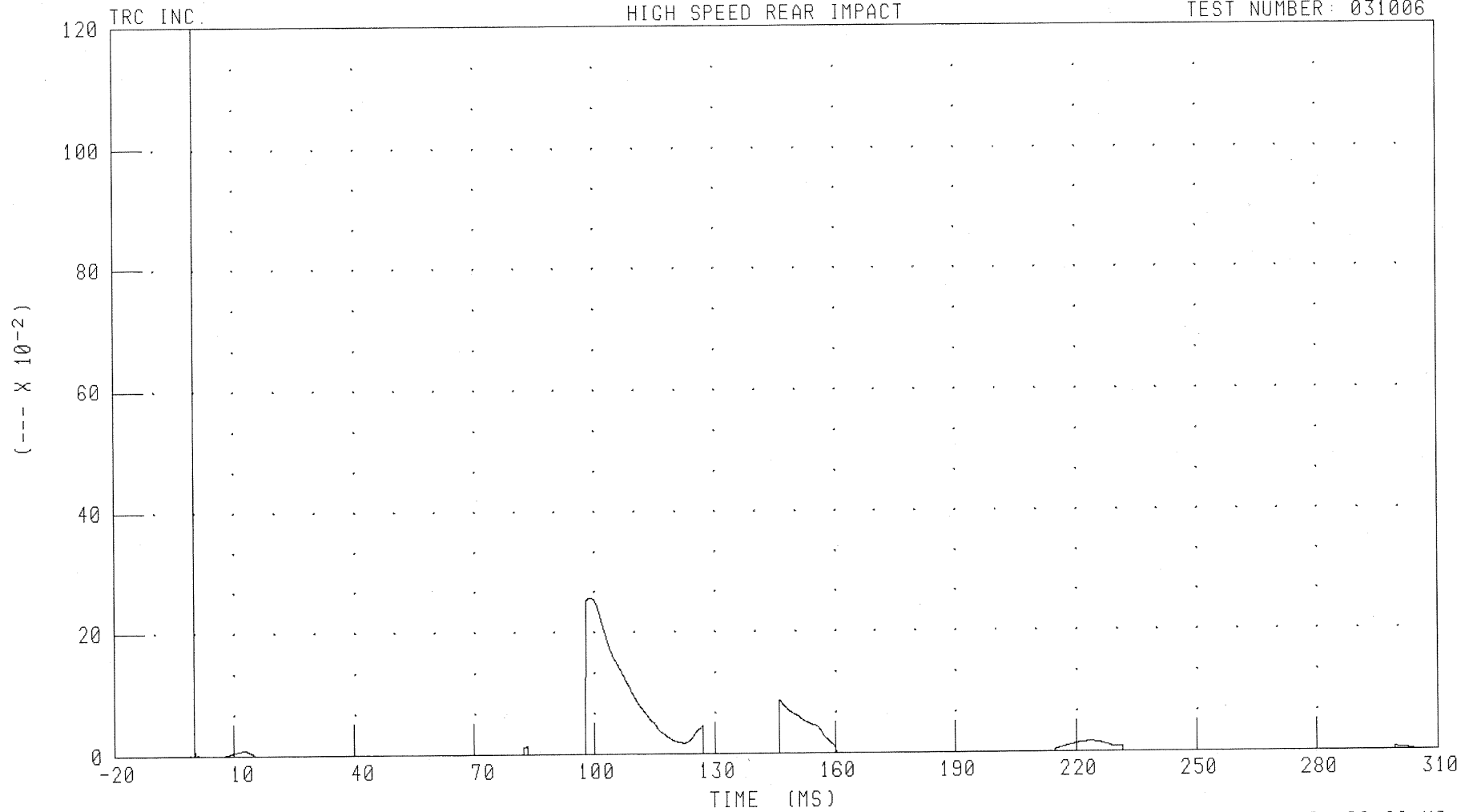
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER NECK TENSION/EXTENSION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NTE4

FILTER: CH. CLASS 600

PEAK DATA: 0.26 --- @ 99.04 MS; 0.00 --- @ -20.00 MS

B-63

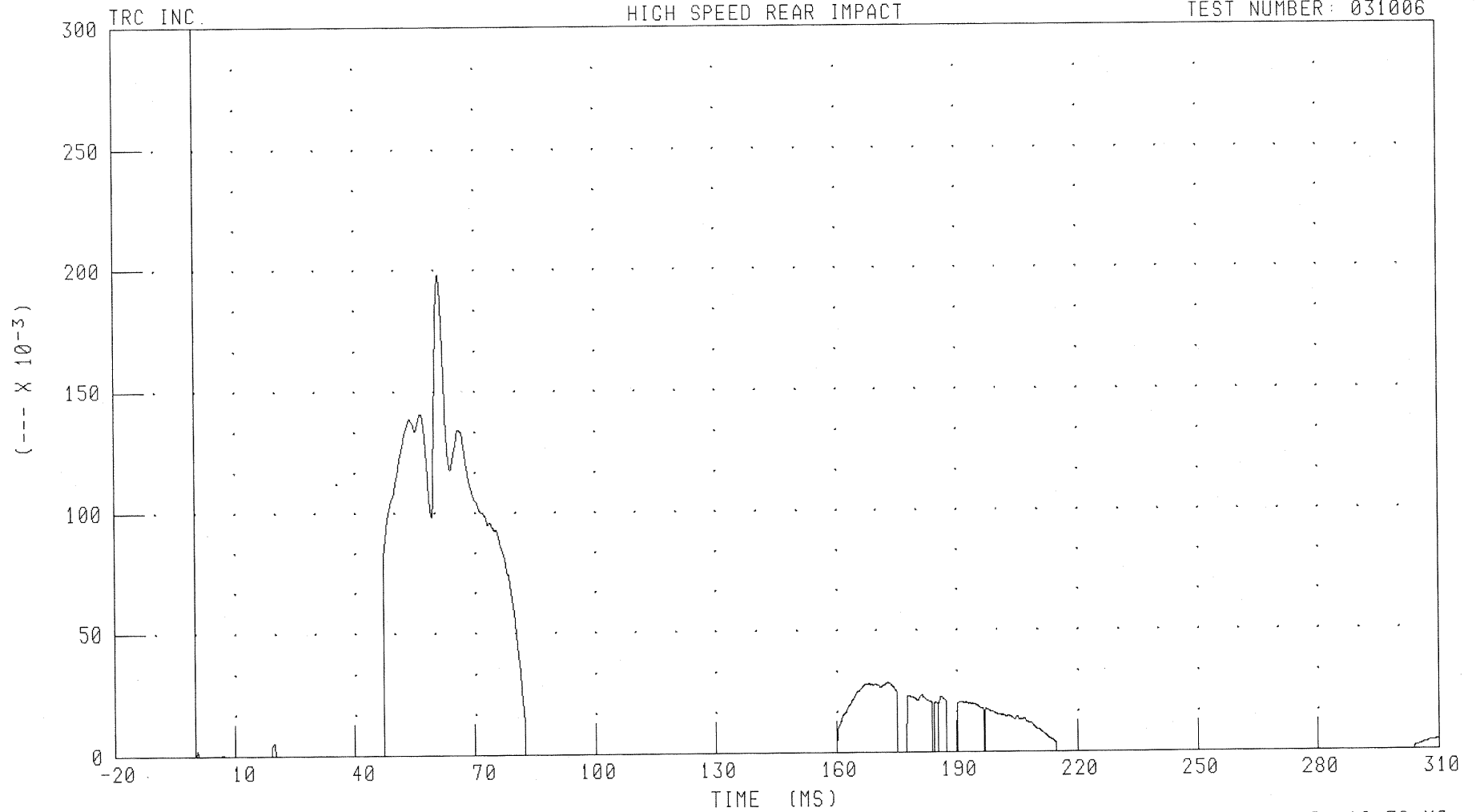
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER NECK TENSION/FLEXION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NTF4

FILTER: CH. CLASS 600

PEAK DATA: 0.20 --- @ 61.12 MS; 0.00 --- @ -19.52 MS

B-64

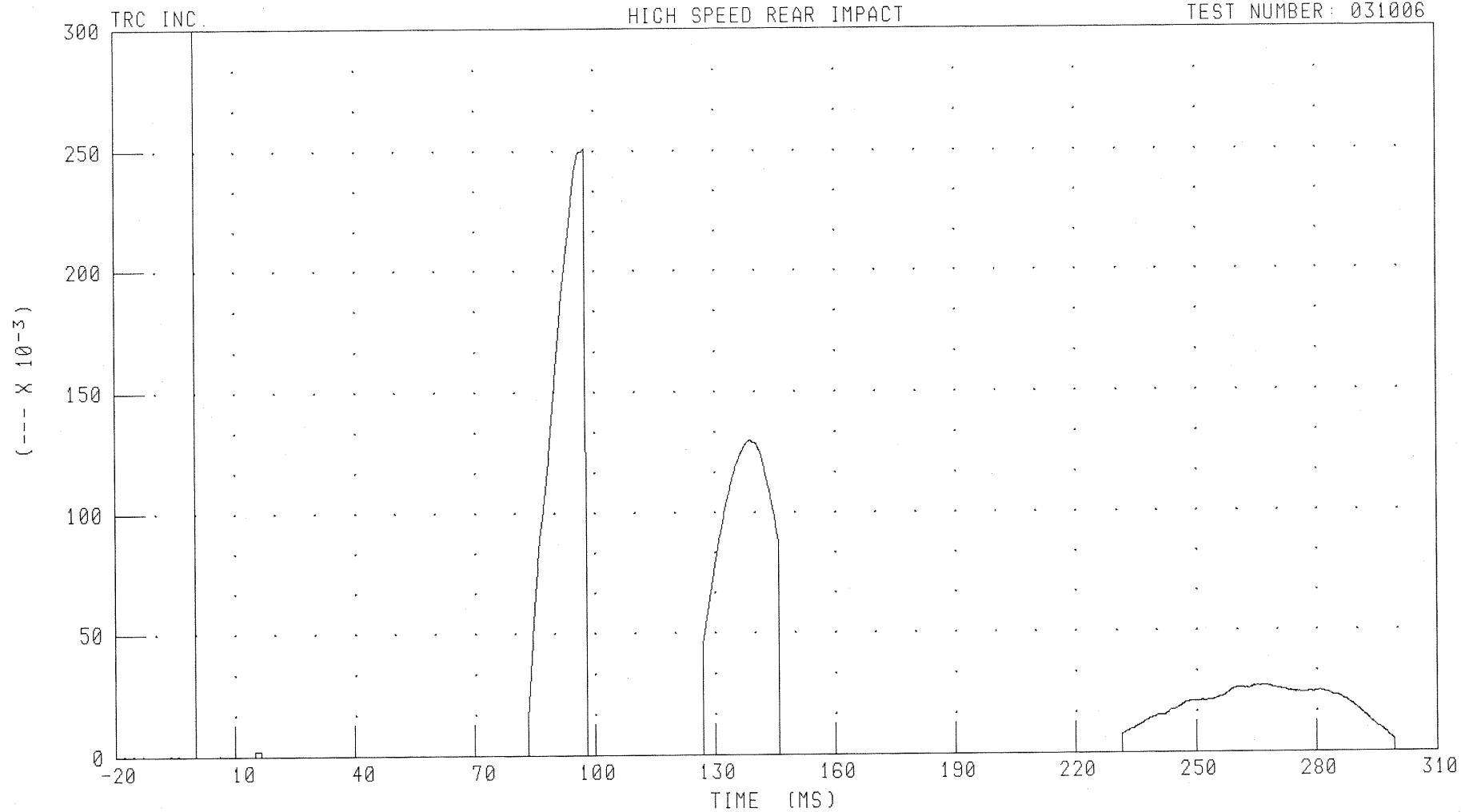
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER NECK COMPRESSION/EXTENSION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NCE4

FILTER: CH. CLASS 600

PEAK DATA: 0.25 --- @ 97.84 MS; 0.00 --- @ -20.00 MS

B-65

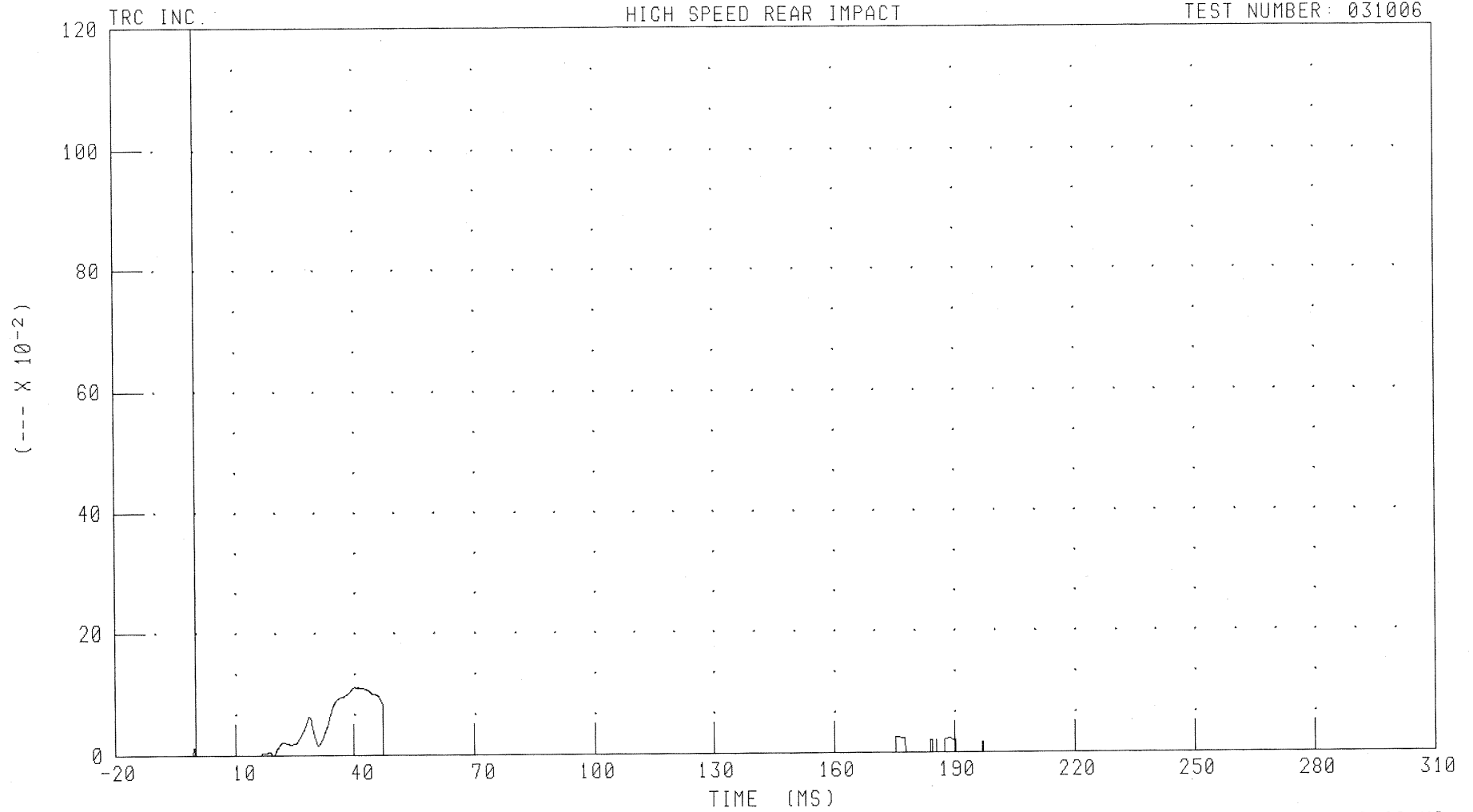
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER NECK COMPRESSION/FLEXION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NCF4

FILTER: CH. CLASS 600

PEAK DATA: 0.11 --- @ 40.24 MS; 0.00 --- @ -20.00 MS

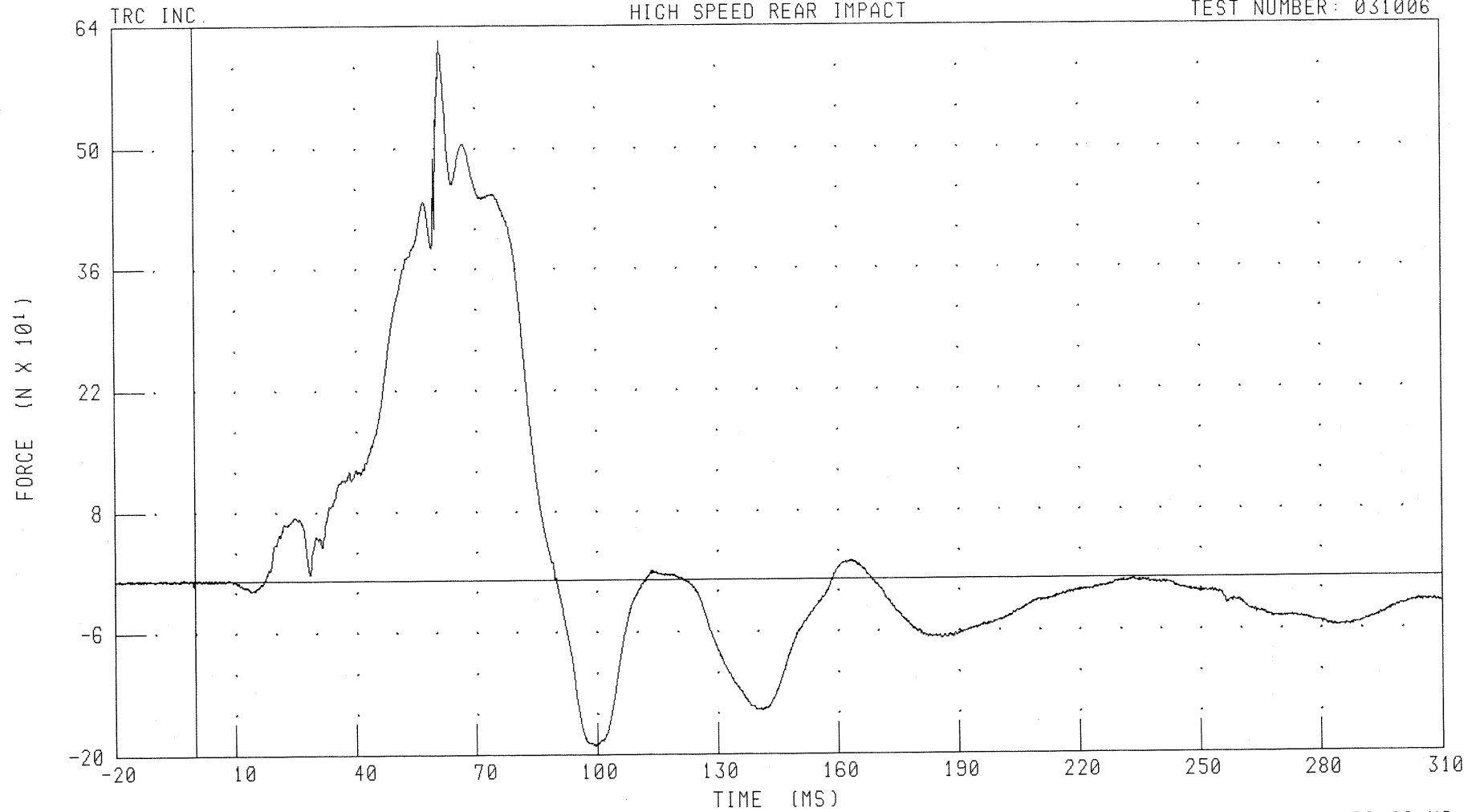
B-66

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER LOWER NECK X-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLXF4 FILTER: CH. CLASS 1000

PEAK DATA: 623.56 N @ 61.20 MS; -190.71 N @ 99.68 MS

B-67

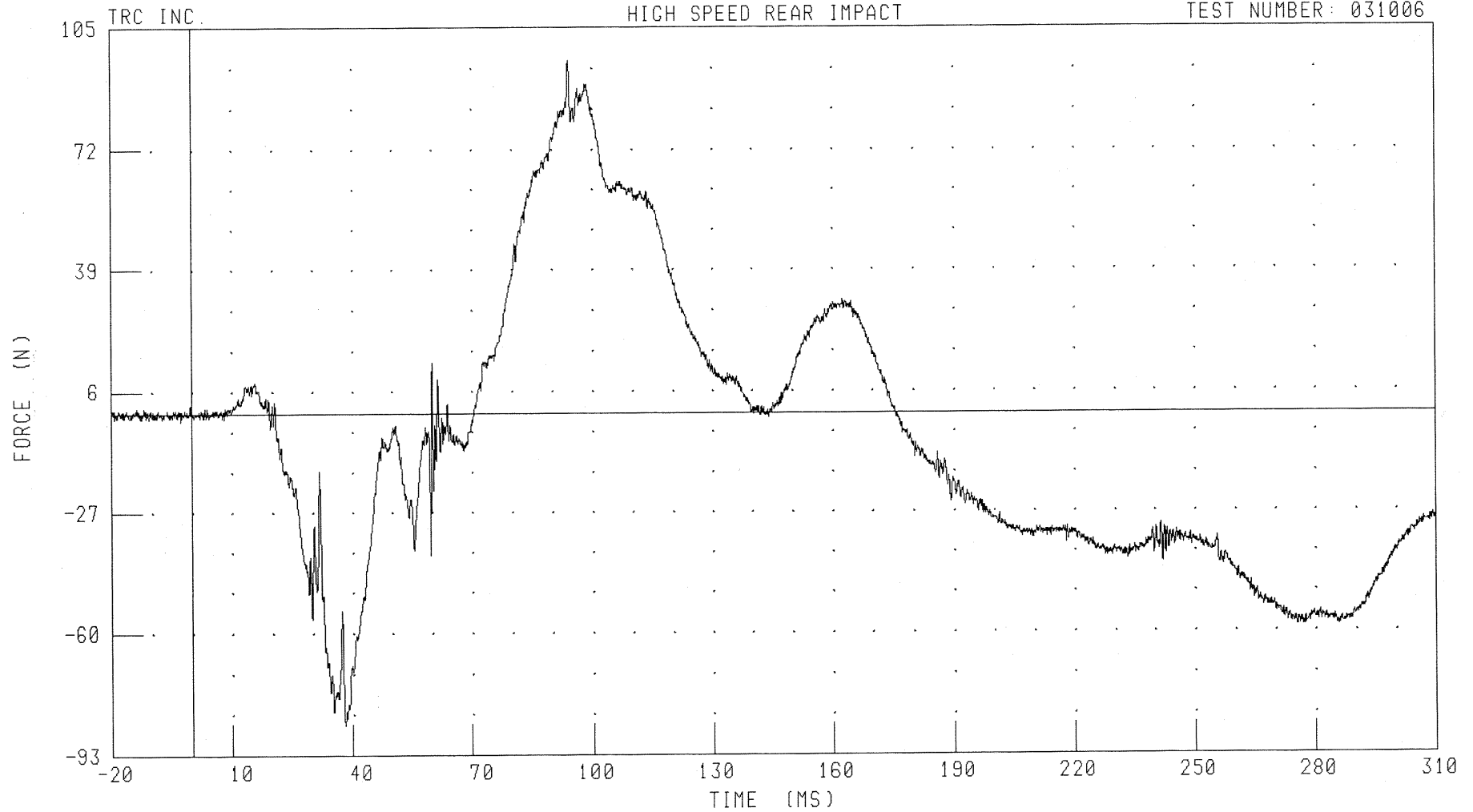
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER LOWER NECK Y-AXIS SHEAR FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLYF4 FILTER: CH. CLASS 1000

PEAK DATA: 96.22 N @ 94.16 MS; -84.95 N @ 38.08 MS

B-68

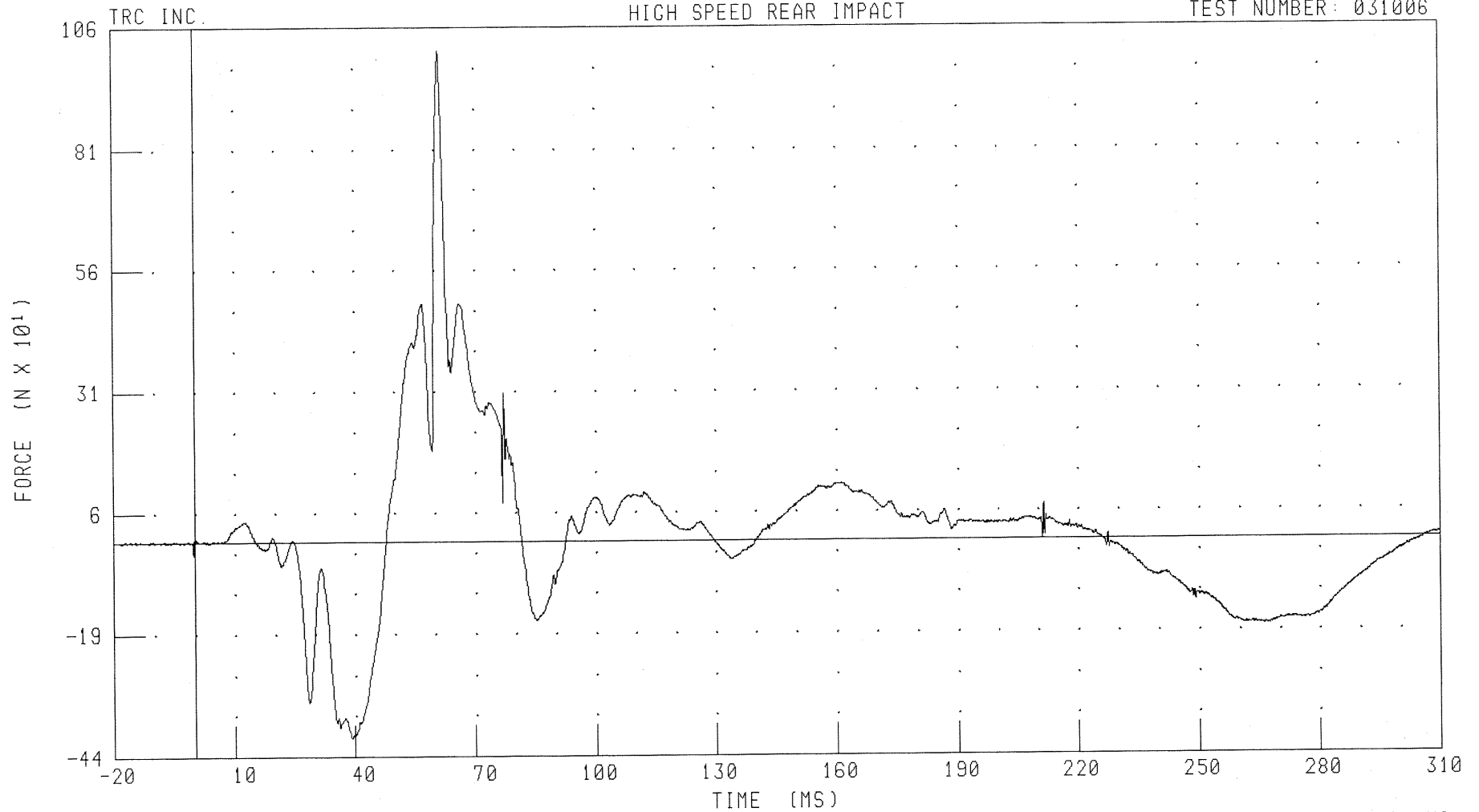
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER LOWER NECK Z-AXIS AXIAL FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLZF4 FILTER: CH. CLASS 1000

PEAK DATA: 1012.29 N @ 61.36 MS; -402.96 N @ 39.20 MS

B-69

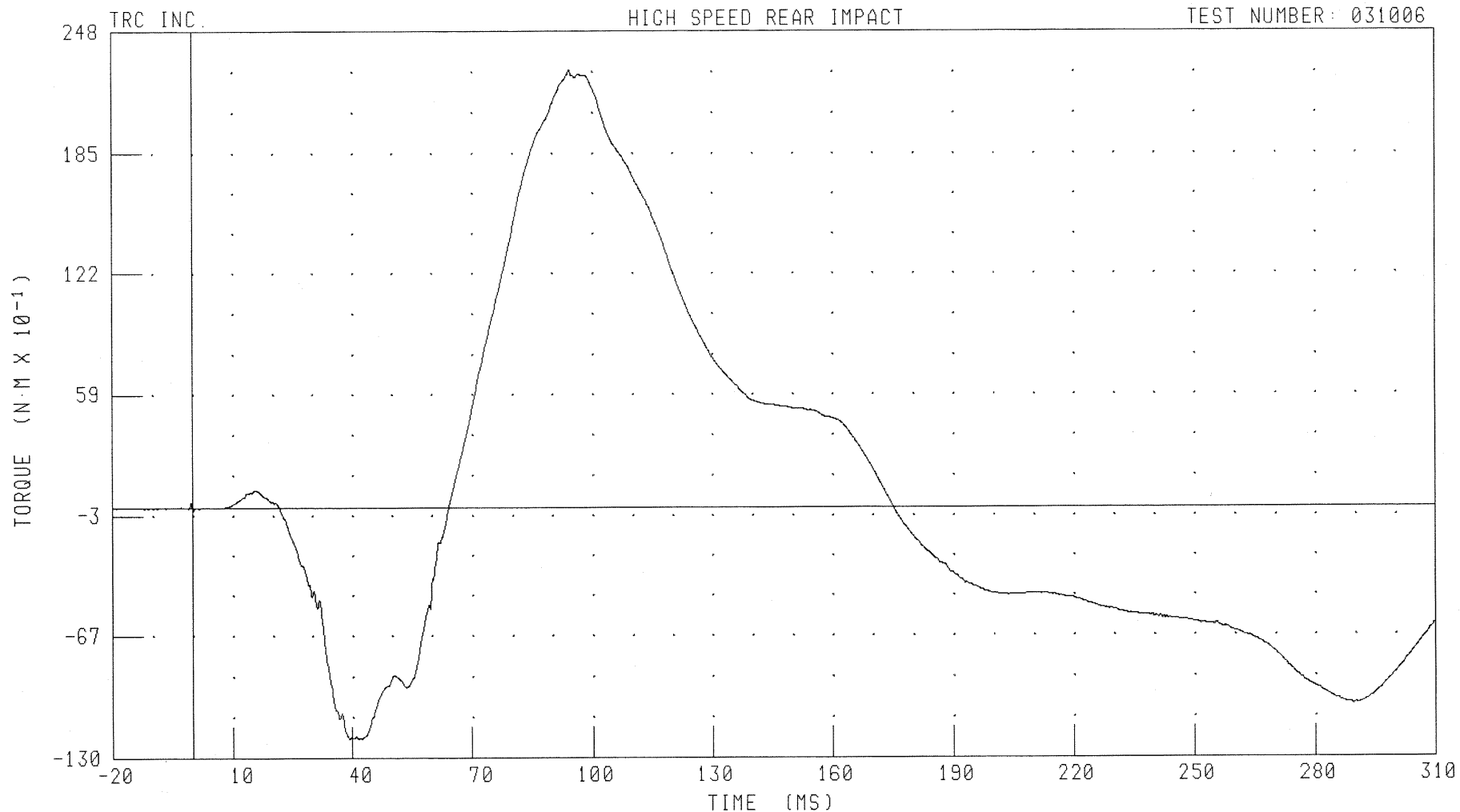
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40.

LEFT REAR PASSENGER LOWER NECK MOMENT ABOUT X AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLXM4 FILTER: CH. CLASS 600

PEAK DATA: 22.80 N·M @ 94.32 MS; -12.05 N·M @ 42.32 MS

B-70

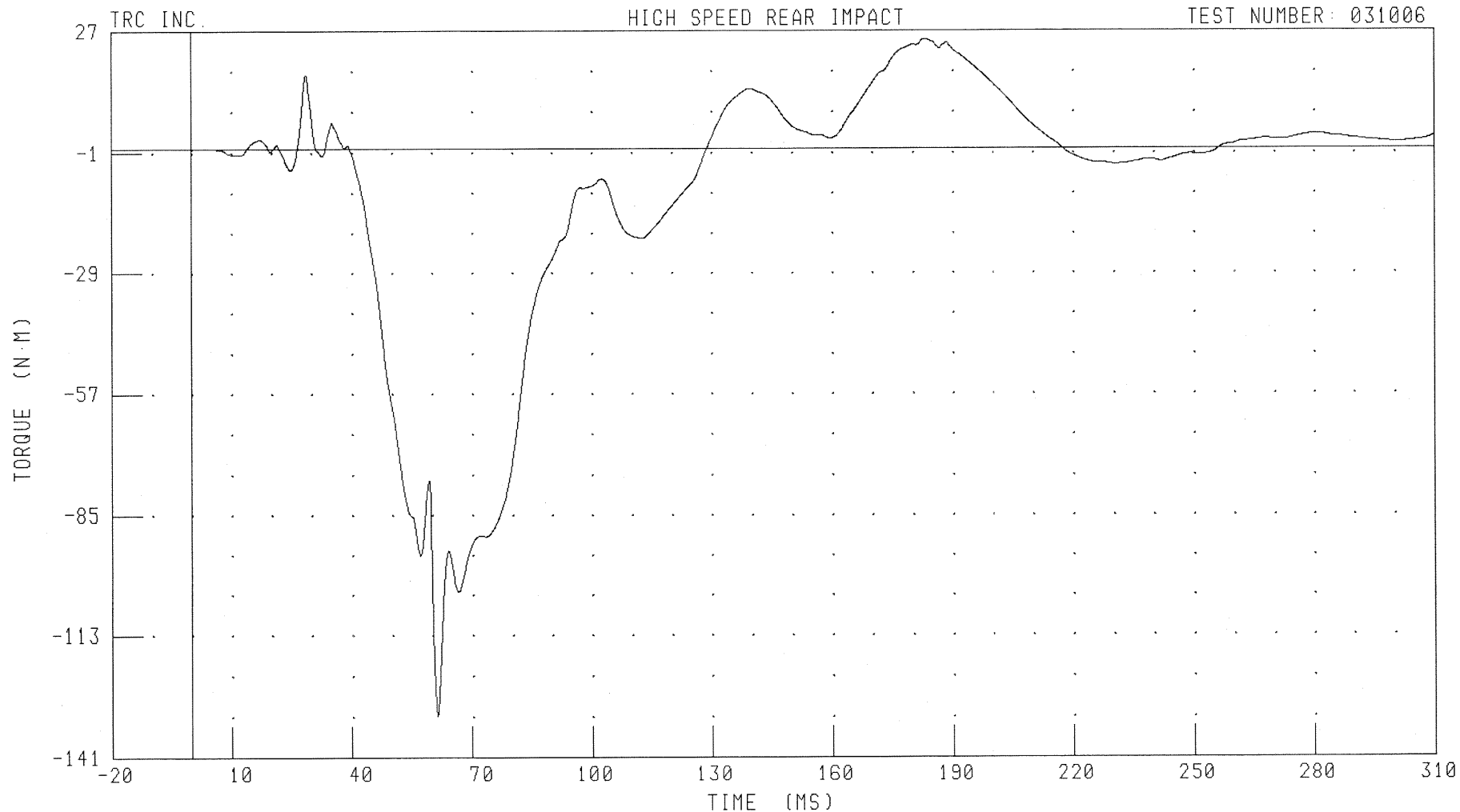
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER LOWER NECK MOMENT ABOUT Y AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLYM4 FILTER: CH. CLASS 600

B-71

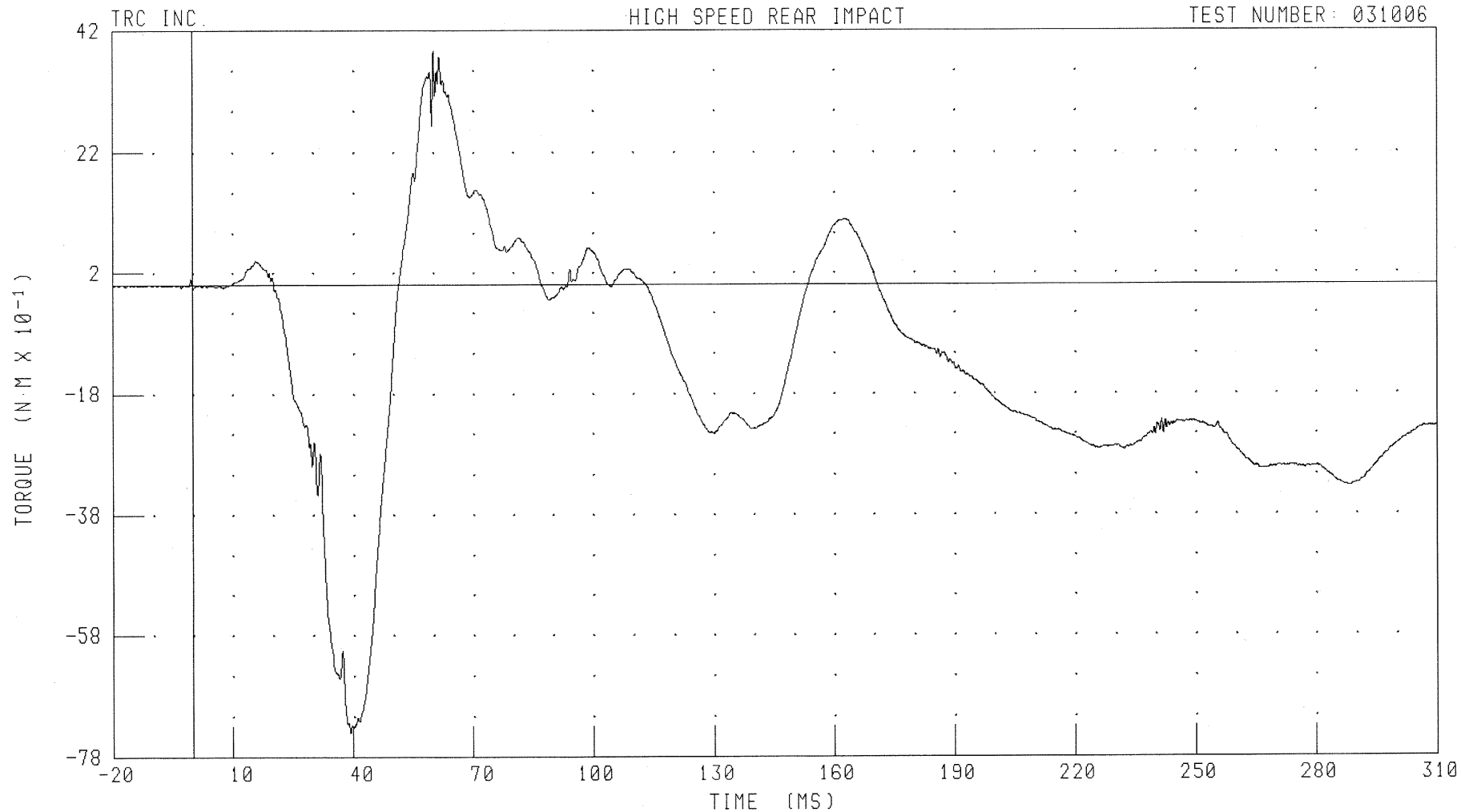
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER LOWER NECK MOMENT ABOUT Z AXIS

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: NKLZM4 FILTER: CH. CLASS 600

PEAK DATA: 3.86 N·M @ 60.16 MS; -7.40 N·M @ 39.28 MS

B-72

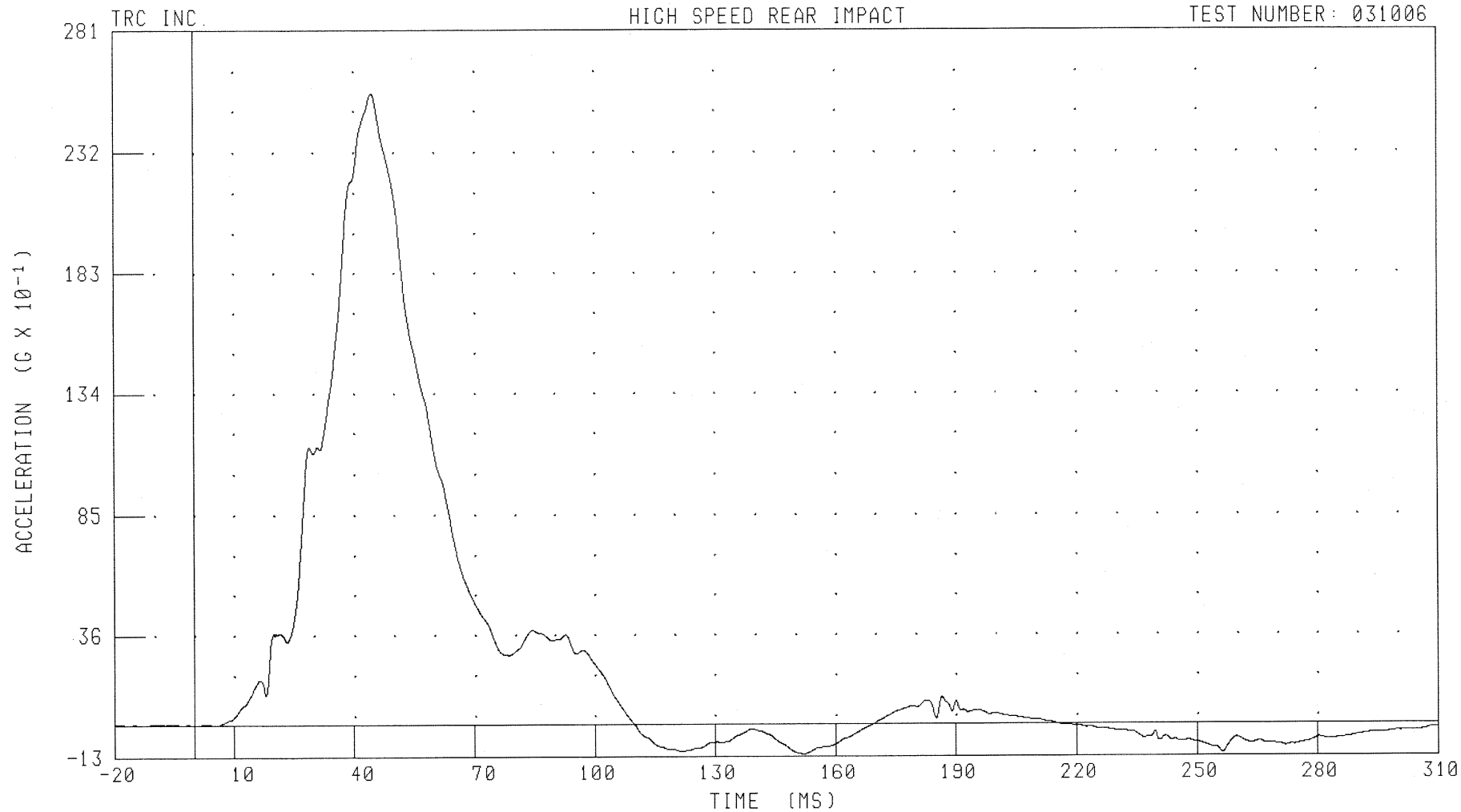
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER CHEST X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTXG4 FILTER: CH. CLASS 180

PEAK DATA: 25.53 G @ 44.56 MS; -1.21 G @ 152.00 MS

B-73

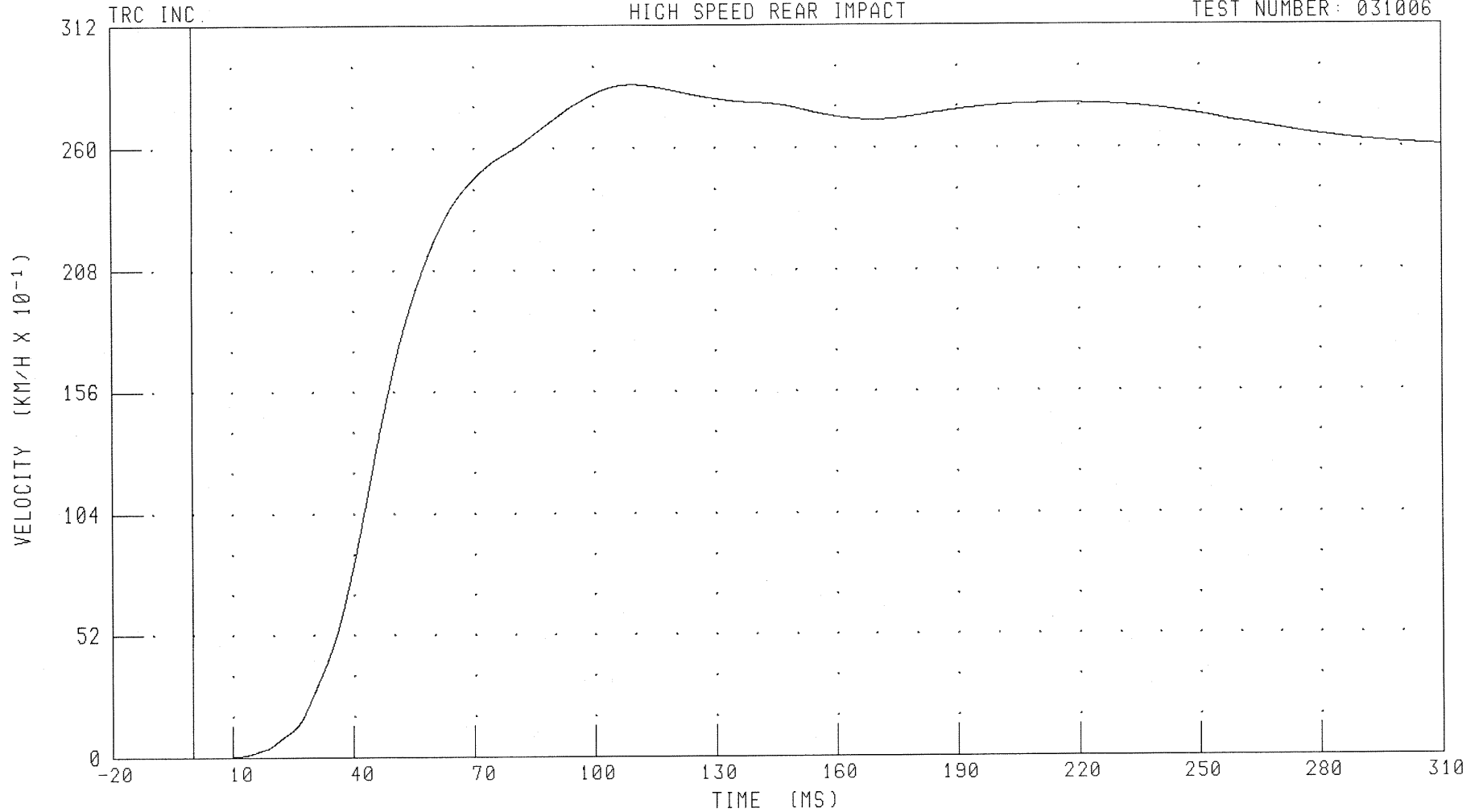
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER CHEST X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTXV4 FILTER: CH. CLASS 180

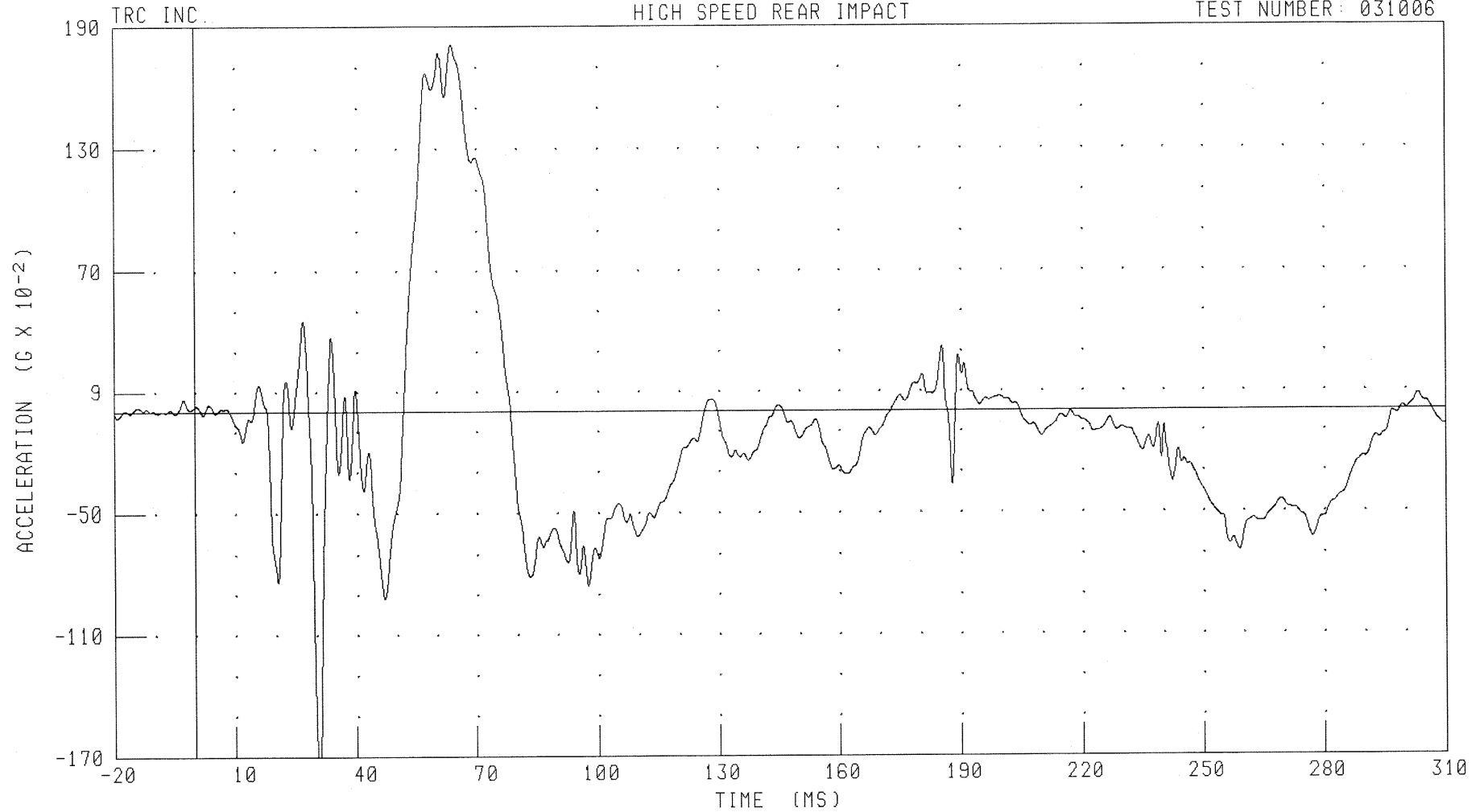
PEAK DATA: 28.68 KM/H @ 109.84 MS; 0.00 KM/H @ 1.44 MS

B-74

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER CHEST Y-AXIS ACCELERATION

TEST NUMBER: 031006



CHANNEL: CSTYG4 FILTER: CH. CLASS 180

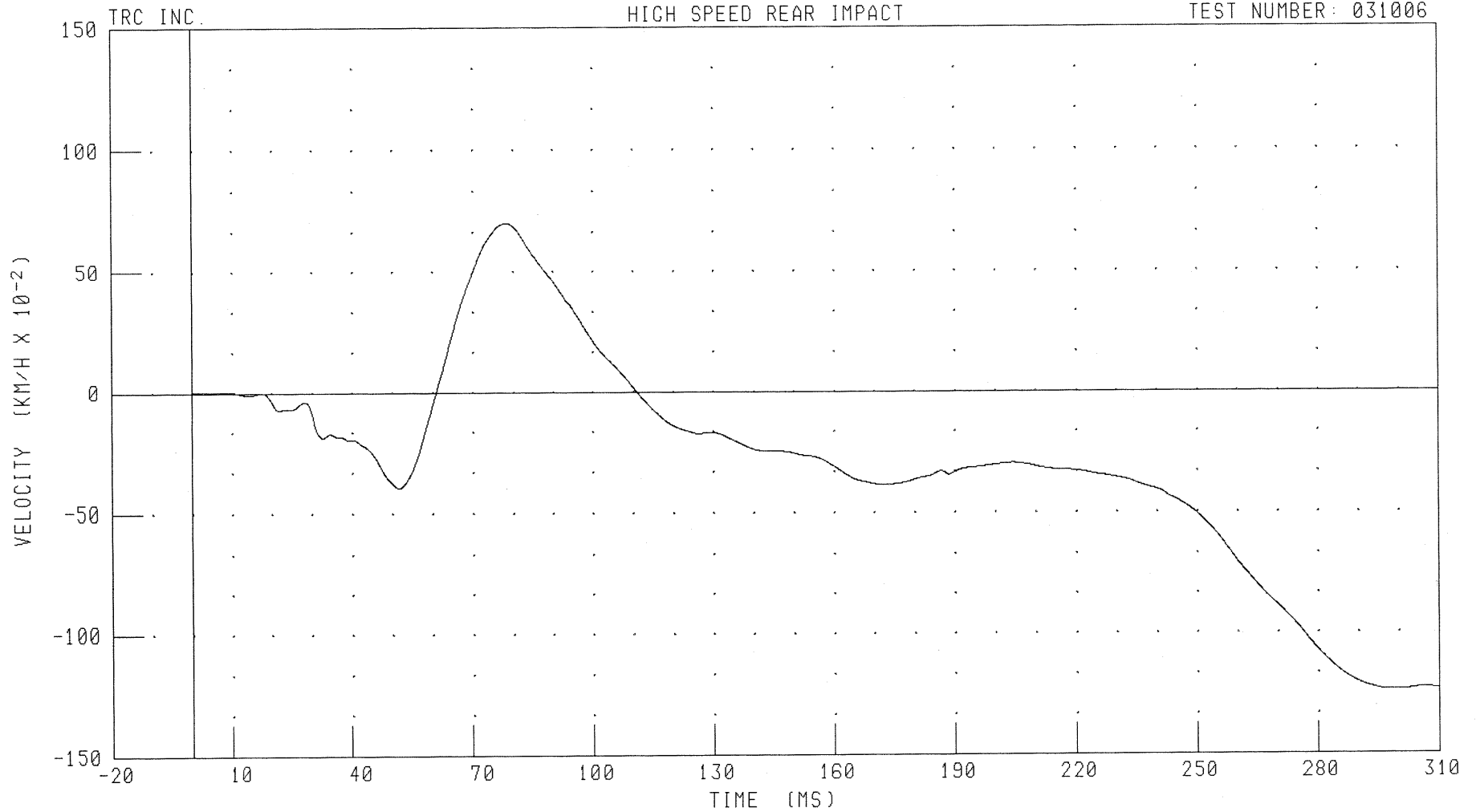
B-75

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER CHEST Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTYV4 FILTER: CH. CLASS 180

PEAK DATA: 0.70 KM/H @ 78.48 MS; -1.24 KM/H @ 298.72 MS

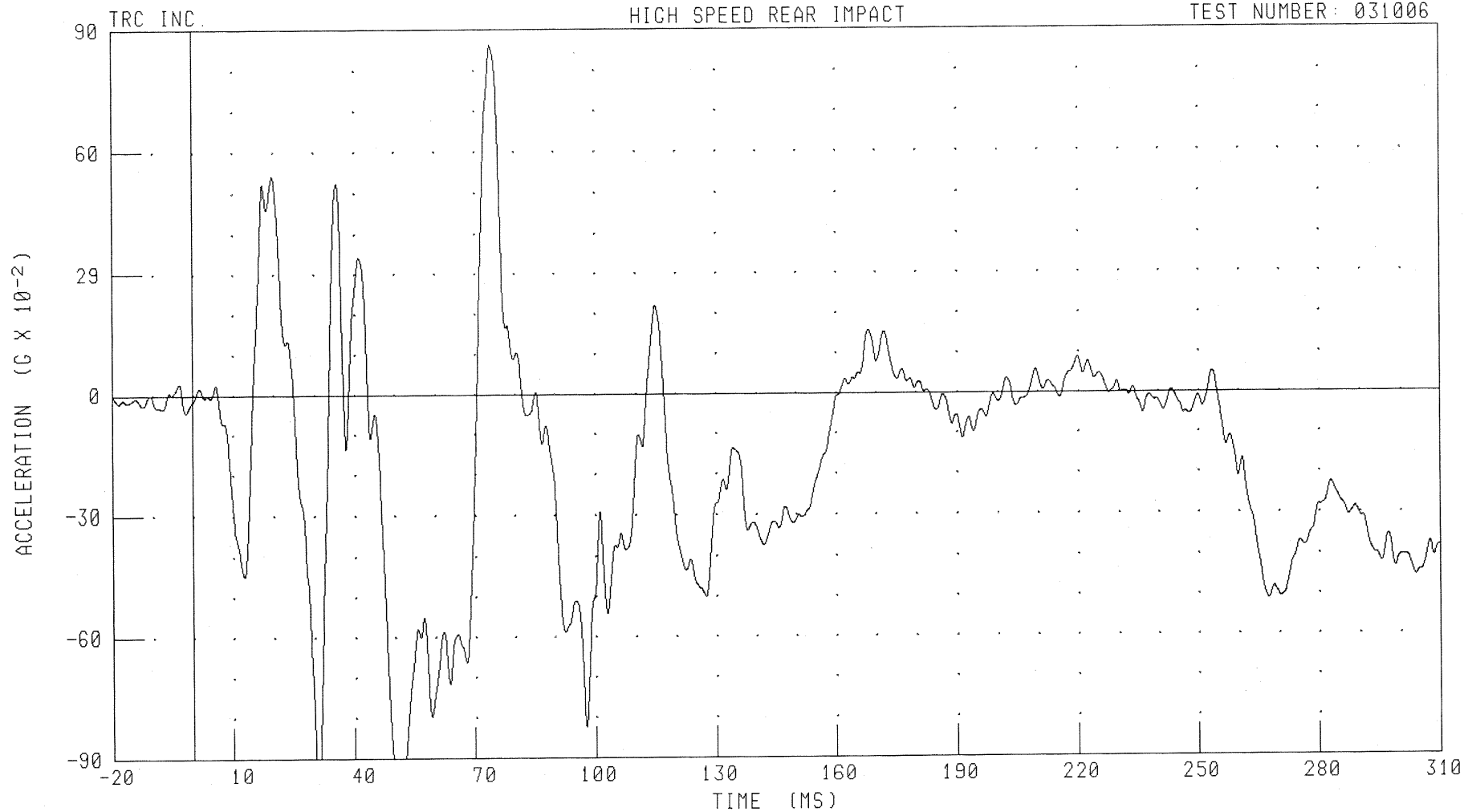
B-76

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER CHEST Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTZG4

FILTER: CH. CLASS 180

PEAK DATA: 0.86 G @ 74.24 MS; -1.03 G @ 51.28 MS

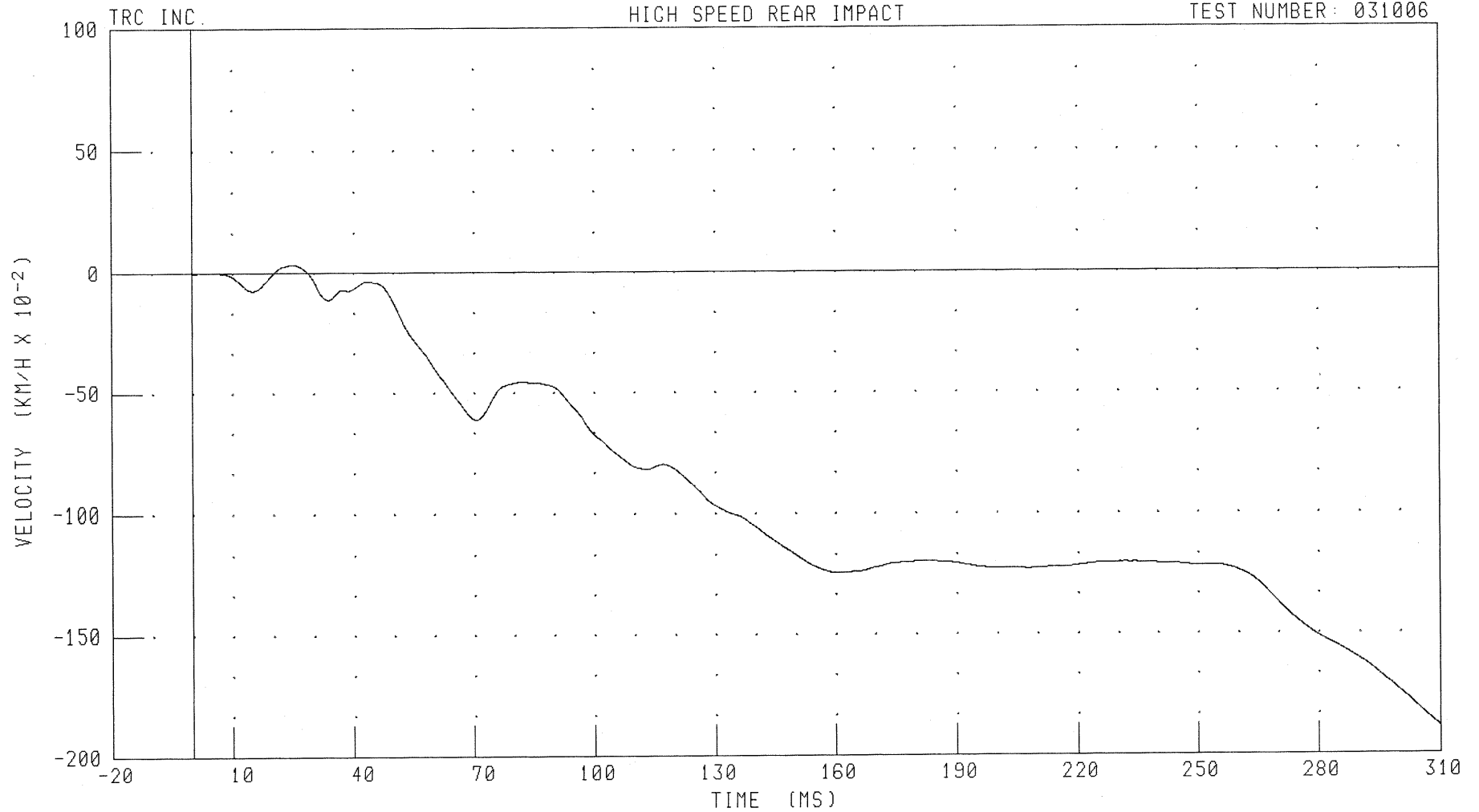
B-77

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER CHEST Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTZV4 FILTER: CH. CLASS 180

PEAK DATA: 0.04 KM/H @ 25.04 MS; -1.89 KM/H @ 310.00 MS

B-78

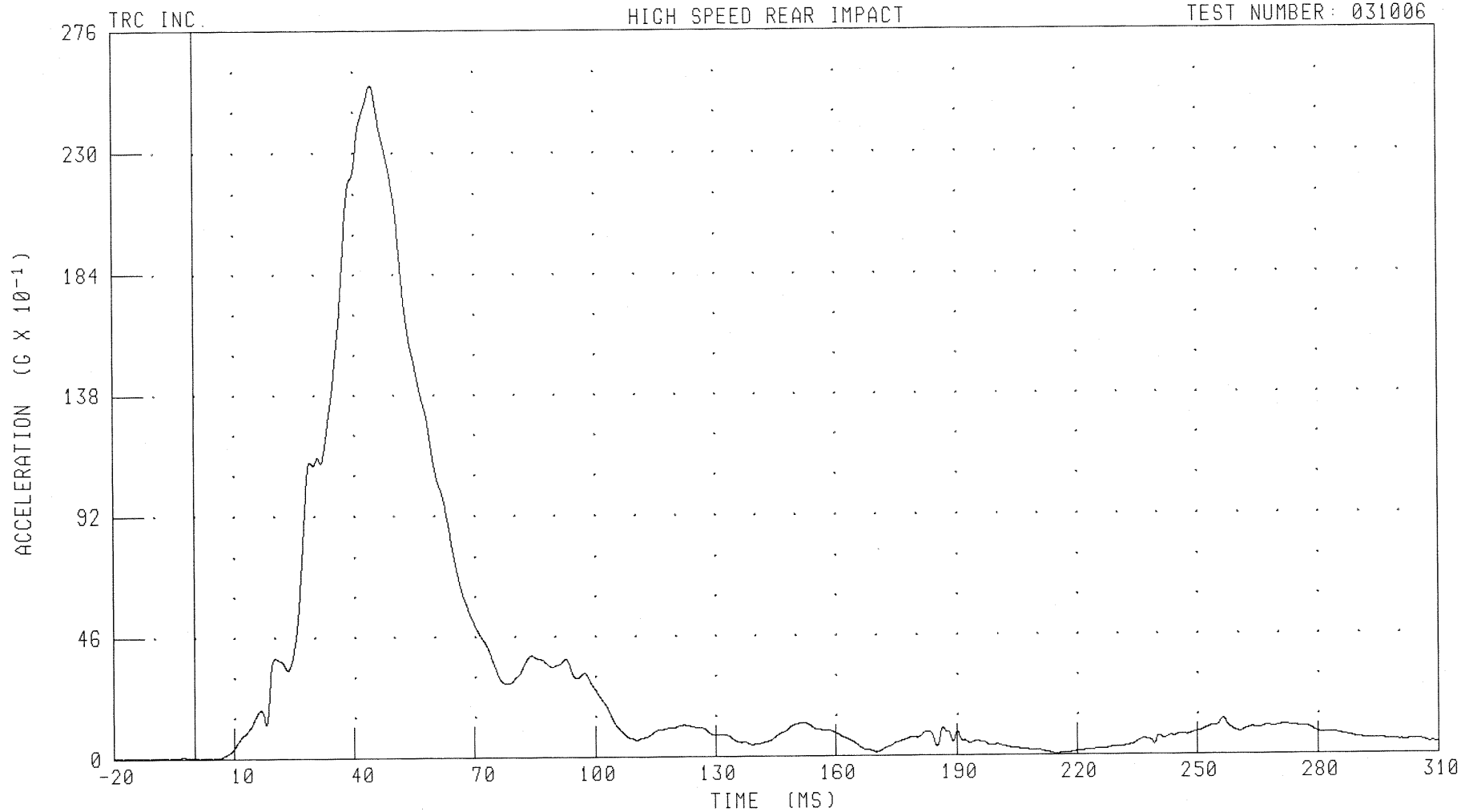
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER CHEST RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTRG4

FILTER: CH. CLASS 180

PEAK DATA: 25.54 G @ 44.56 MS; 0.00 G @ -20.00 MS

B-79

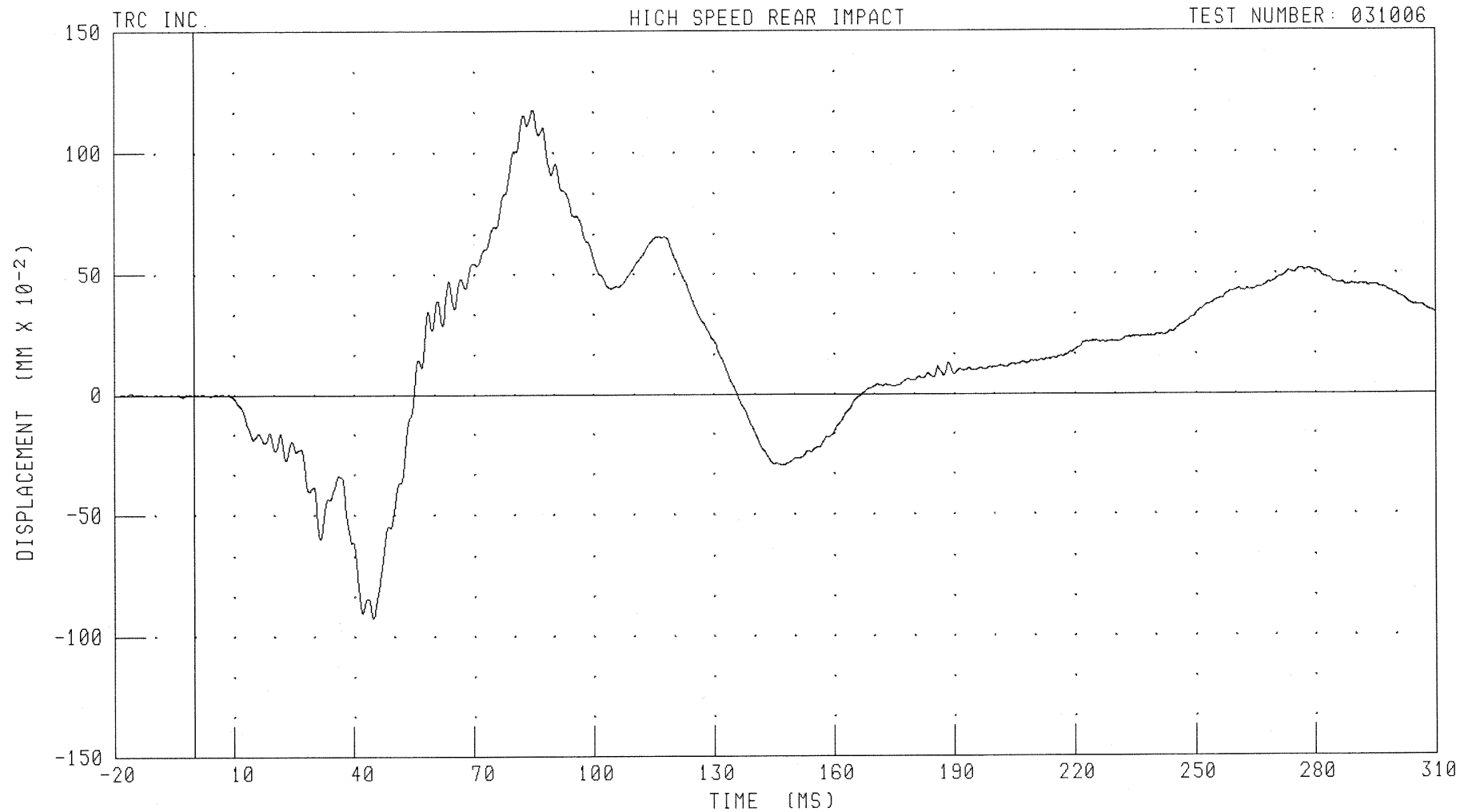
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER CHEST X-AXIS DEFLECTION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: CSTXD4

FILTER: CH. CLASS 600

PEAK DATA: 1.17 MM @ 84.80 MS; -0.92 MM @ 44.80 MS

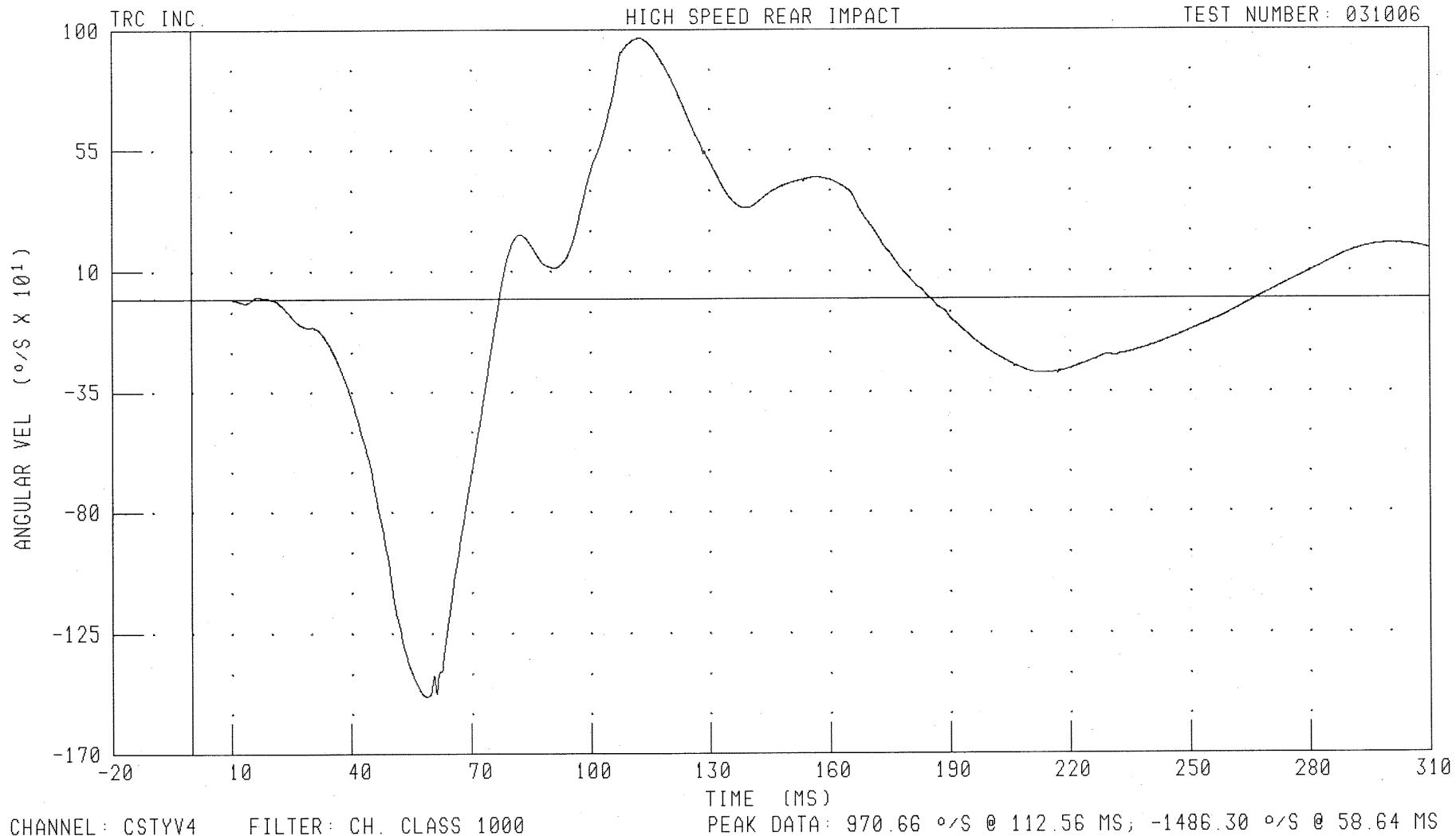
B-80

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER CHEST Y-AXIS ANGULAR VELOCITY

TEST NUMBER: 031006

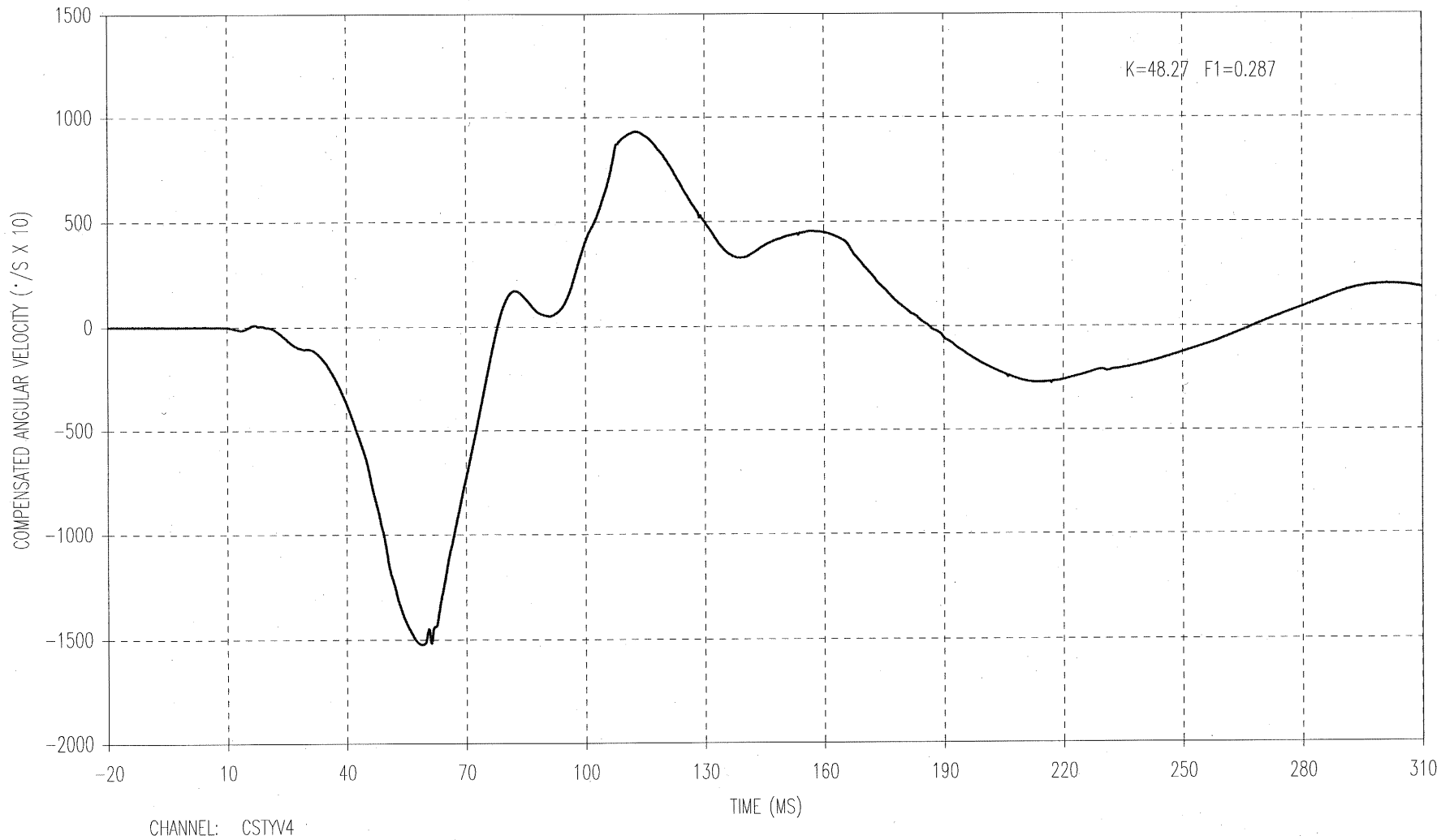


B-81

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER CHEST Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



B-82

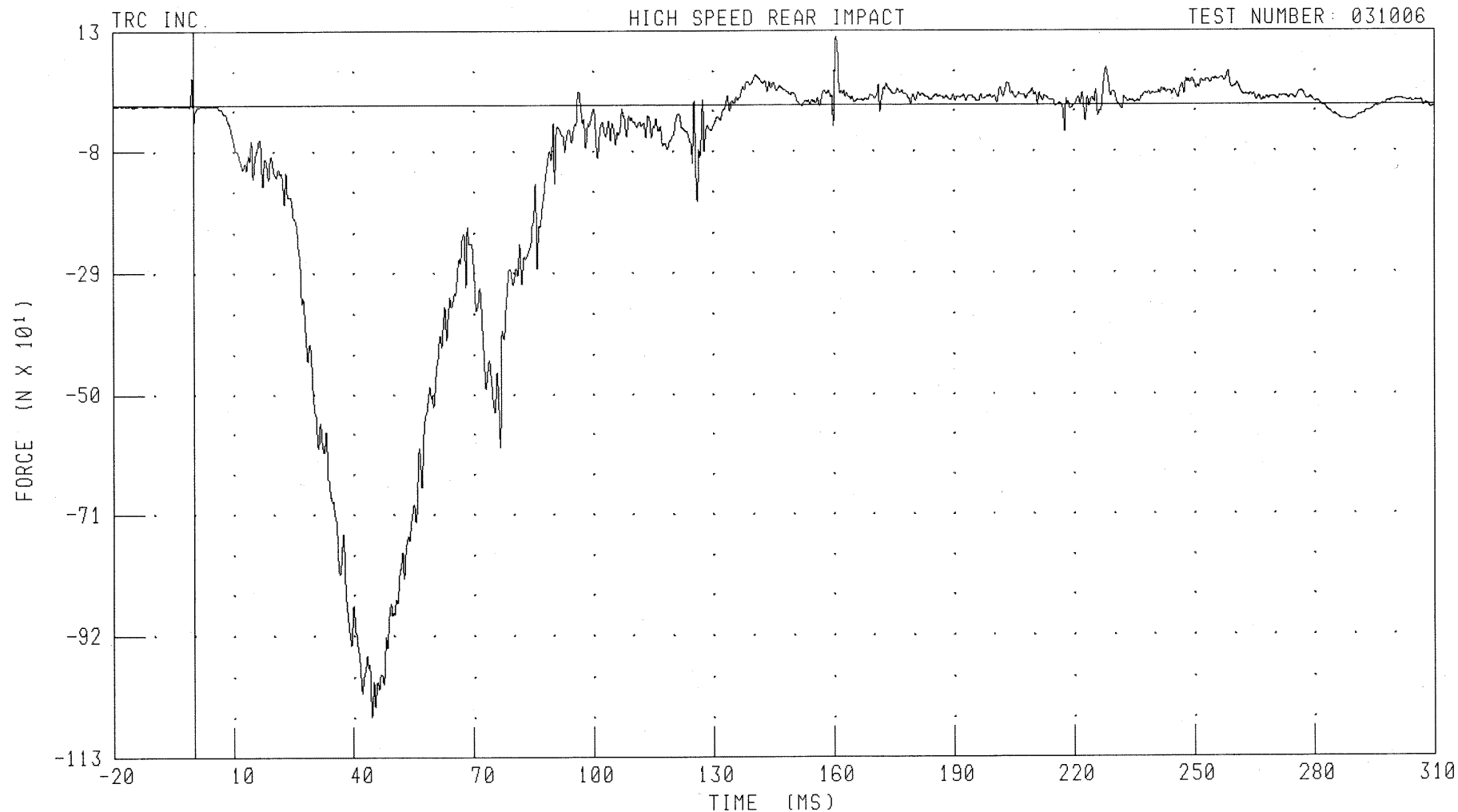
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER LEFT FEMUR Z-AXIS FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFMZF4 FILTER: CH. CLASS 600

PEAK DATA: 118.97 N @ 160.72 MS; -1058.19 N @ 44.56 MS

B-83

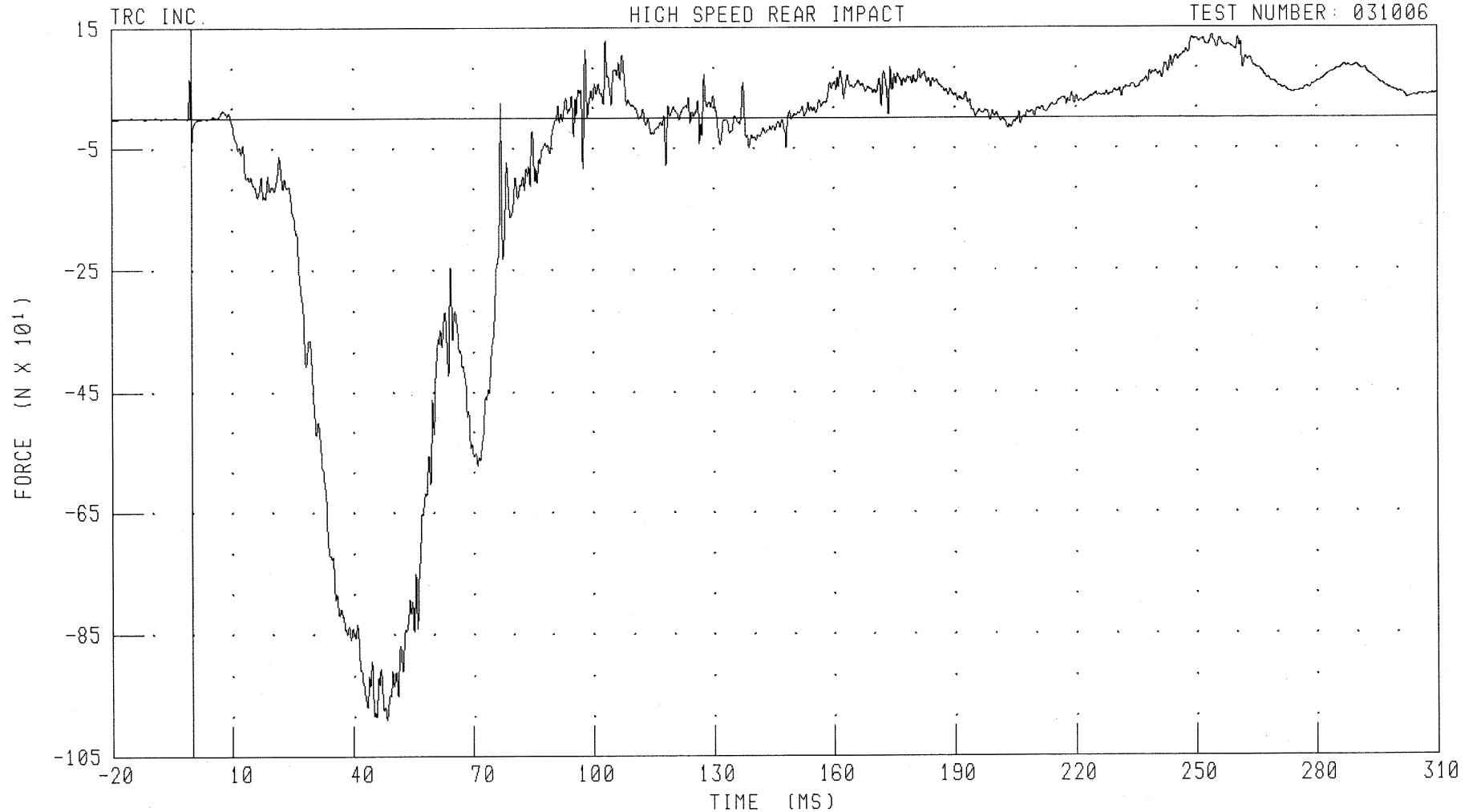
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER RIGHT FEMUR Z-AXIS FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RFMZ4 FILTER: CH. CLASS 600

PEAK DATA: 137.37 N @ 254.08 MS; -988.55 N @ 48.32 MS

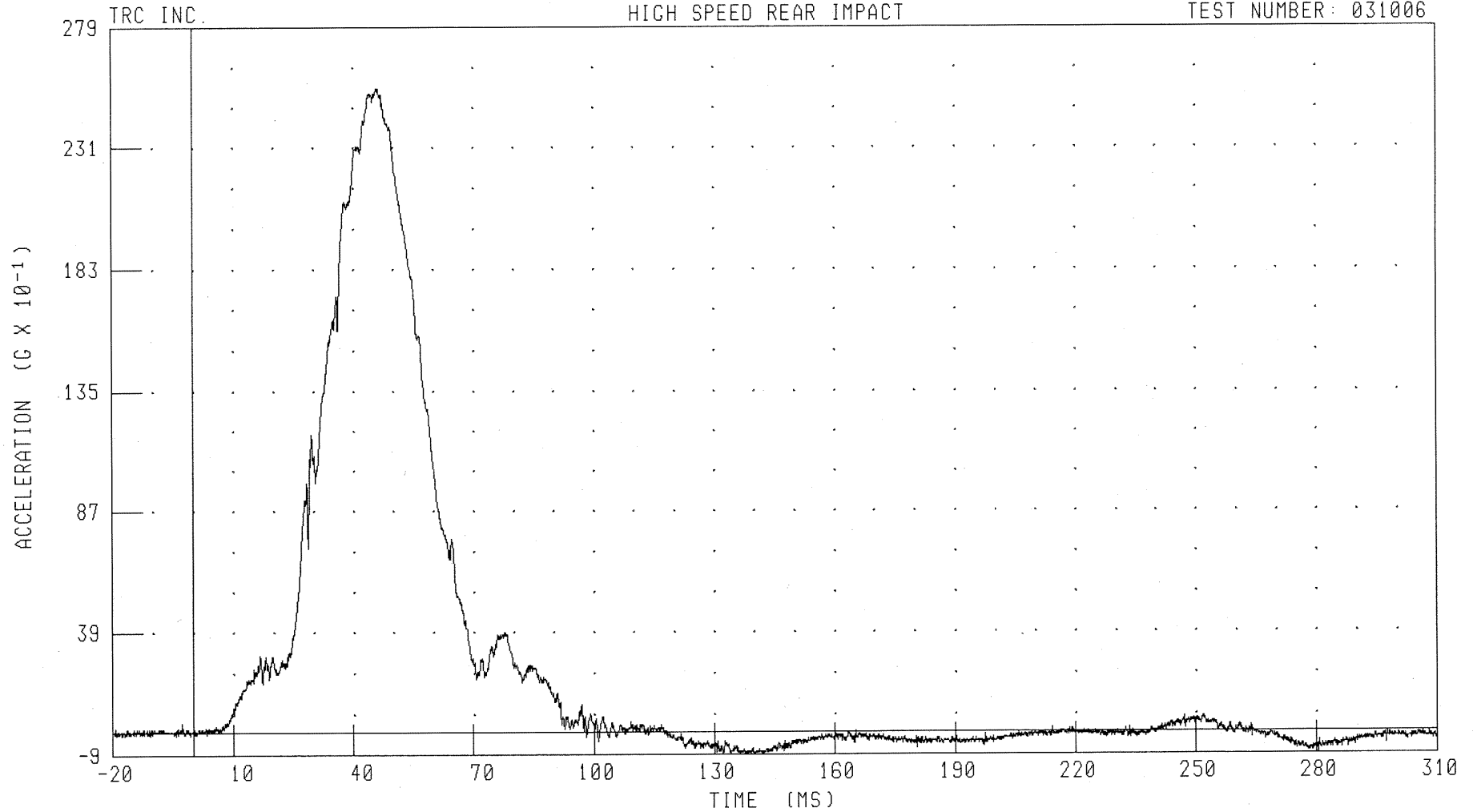
B-84

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER PELVIS X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVXG4 FILTER: CH. CLASS 1000

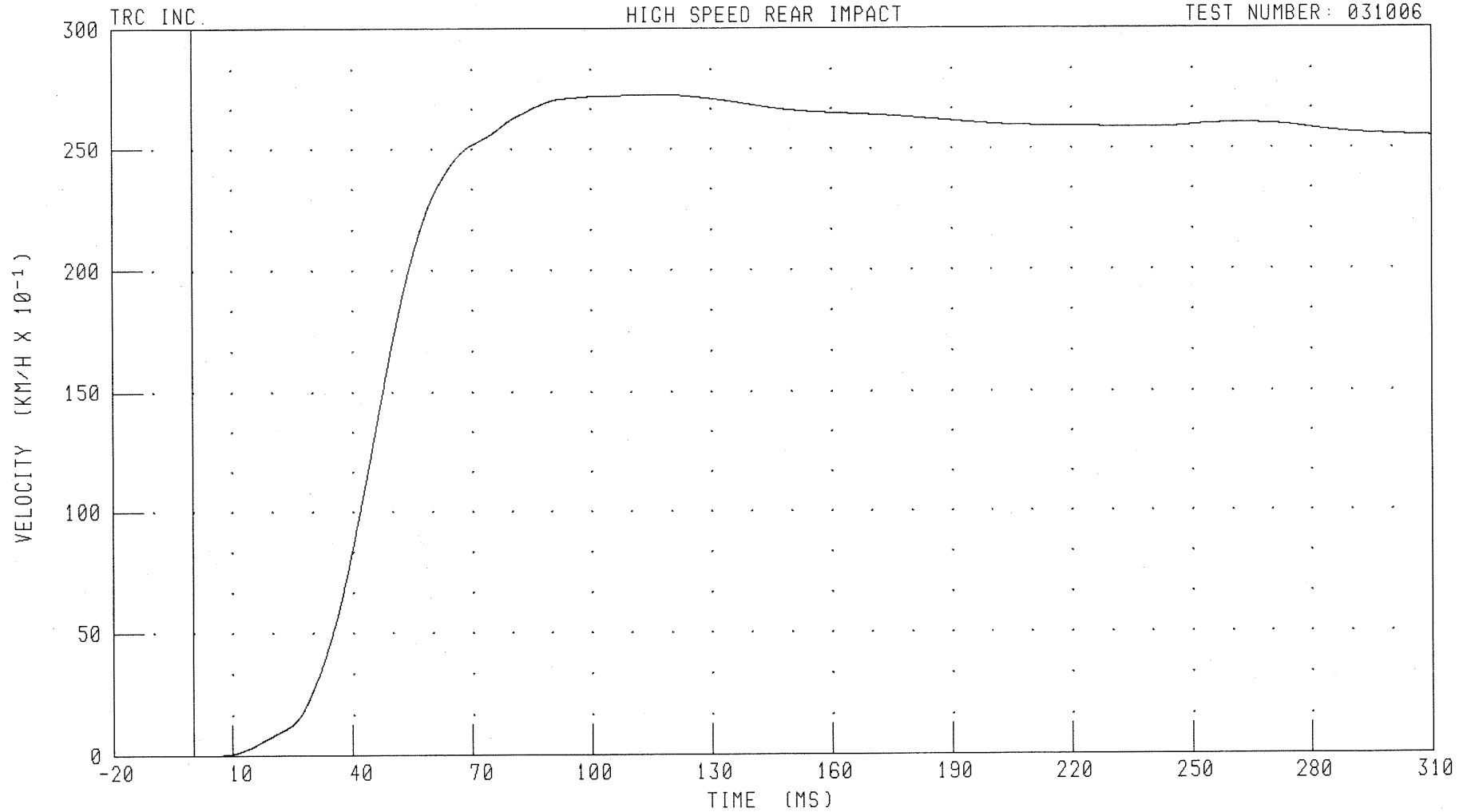
PEAK DATA: 25.46 G @ 46.08 MS; -0.89 G @ 132.16 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER PELVIS X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVXV4 FILTER: CH. CLASS 180

PEAK DATA: 27.28 KM/H @ 117.76 MS; 0.00 KM/H @ 1.04 MS

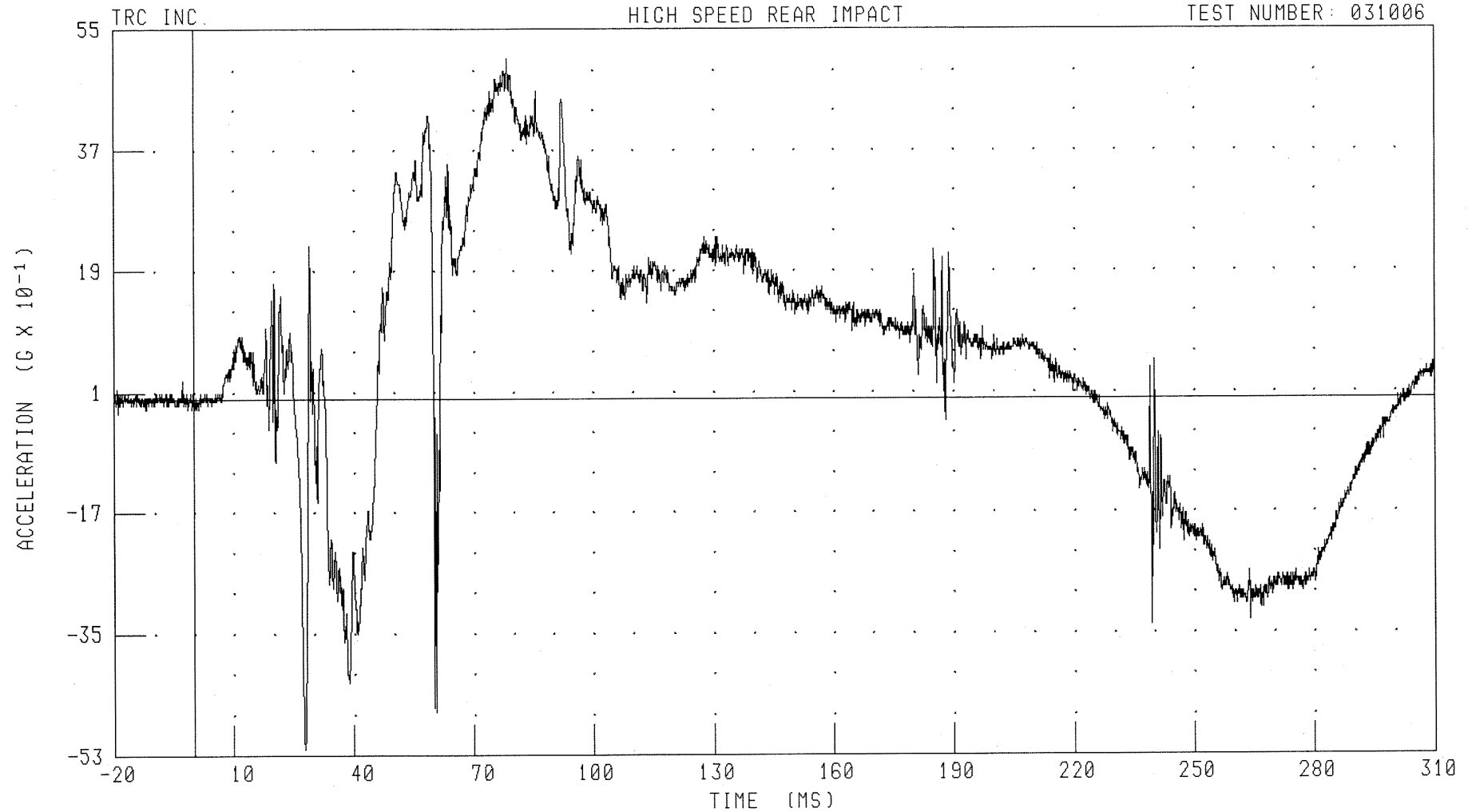
B-86

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVYG4 FILTER: CH. CLASS 1000

PEAK DATA: 5.08 G @ 78.48 MS; -5.21 G @ 27.60 MS

B-87

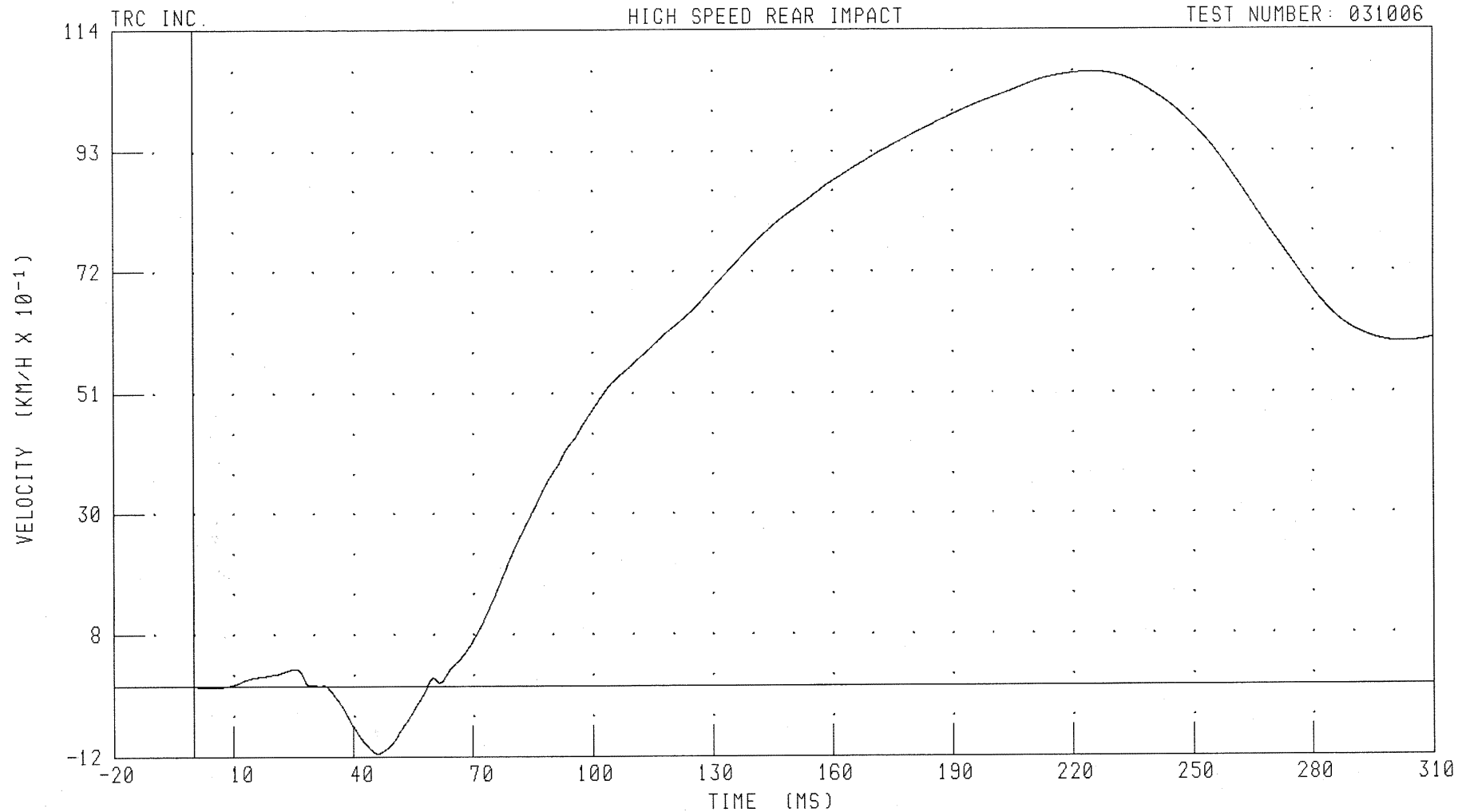
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVYV4 FILTER: CH. CLASS 180

PEAK DATA: 10.68 KM/H @ 225.04 MS; -1.14 KM/H @ 45.92 MS

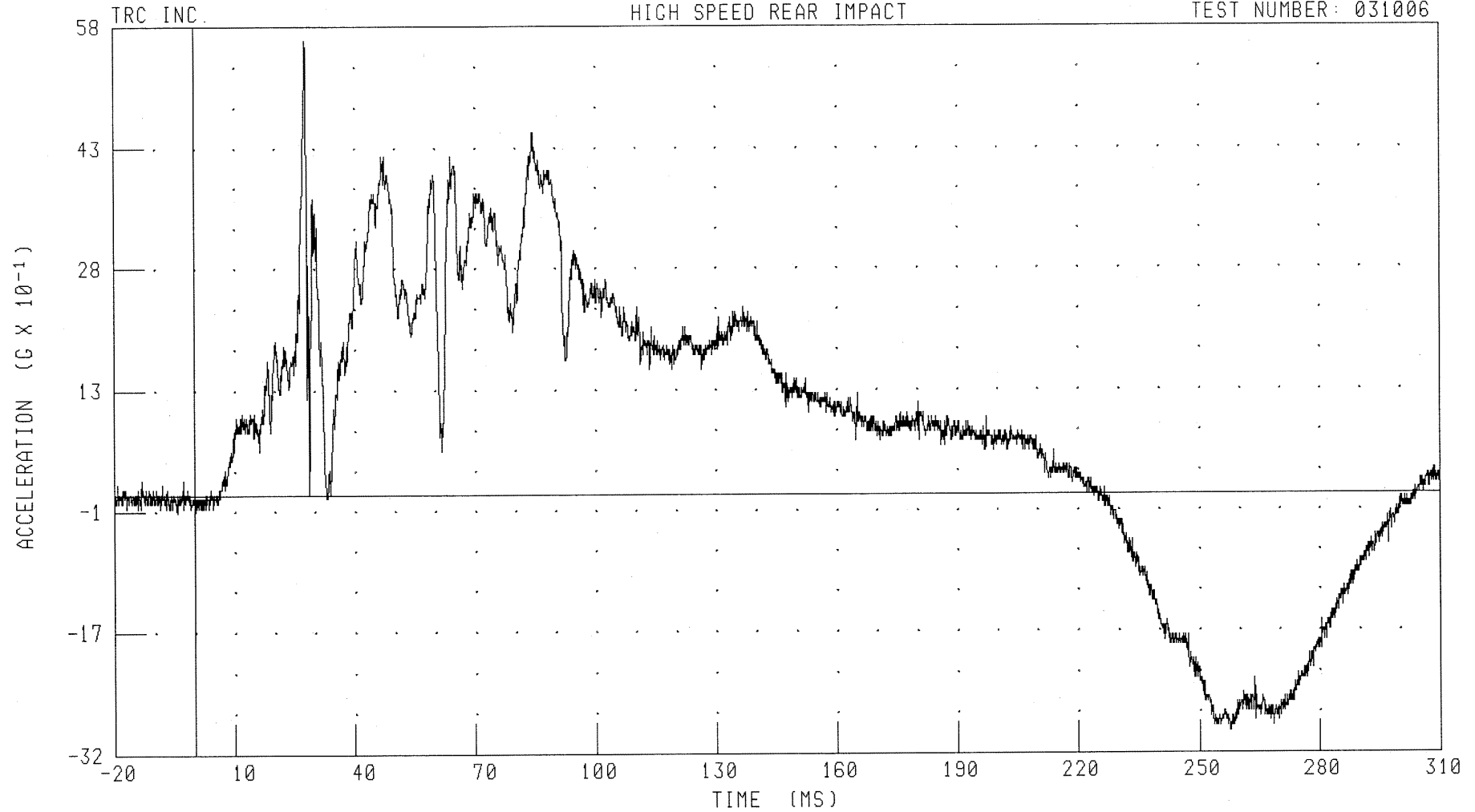
B-88

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER PELVIS Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVZG4 FILTER: CH. CLASS 1000

PEAK DATA: 5.62 G @ 27.76 MS; -2.93 G @ 257.68 MS

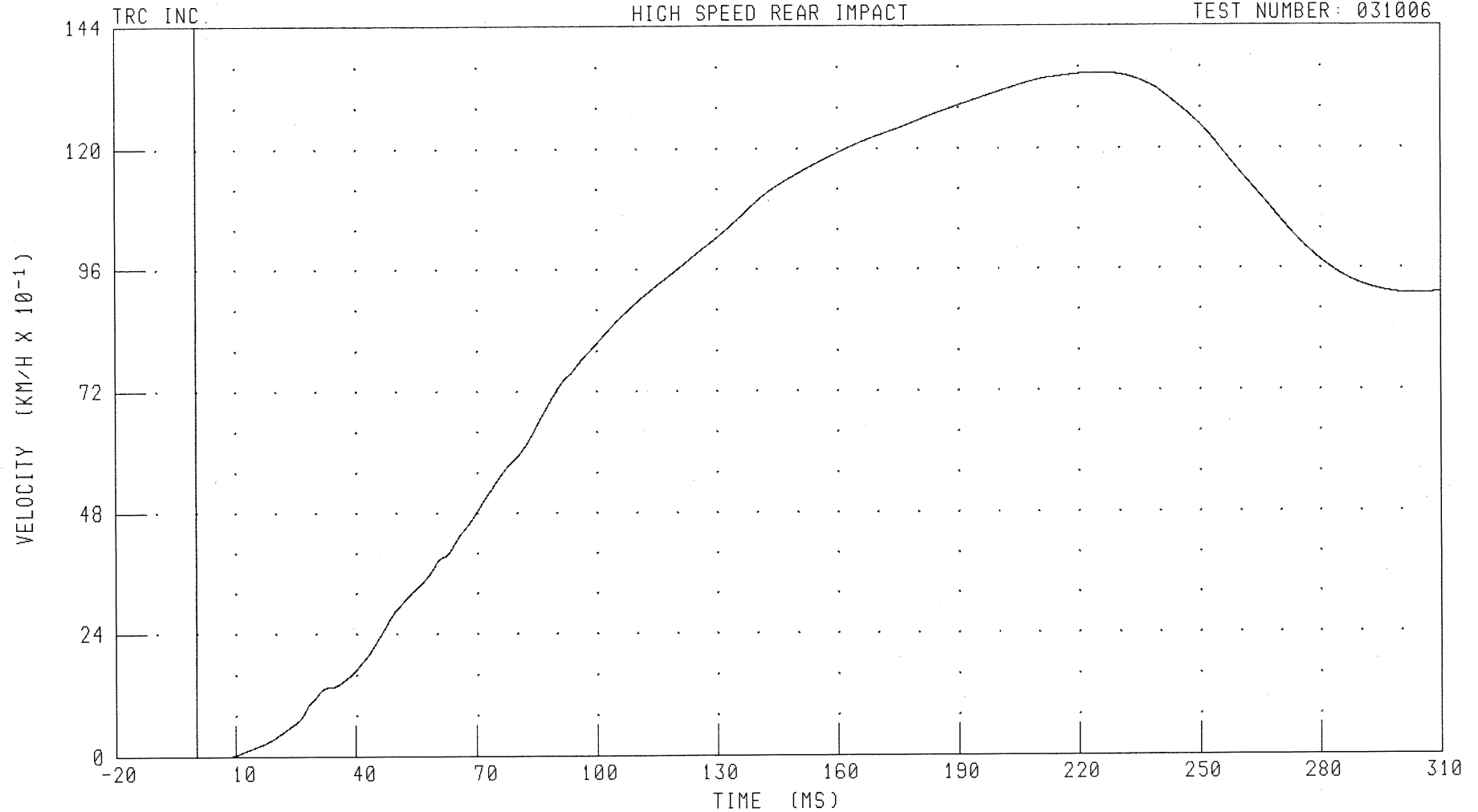
B-89

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER PELVIS Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVZV4 FILTER: CH. CLASS 180

PEAK DATA: 13.48 KM/H @ 225.12 MS; -0.01 KM/H @ 6.08 MS

B-90

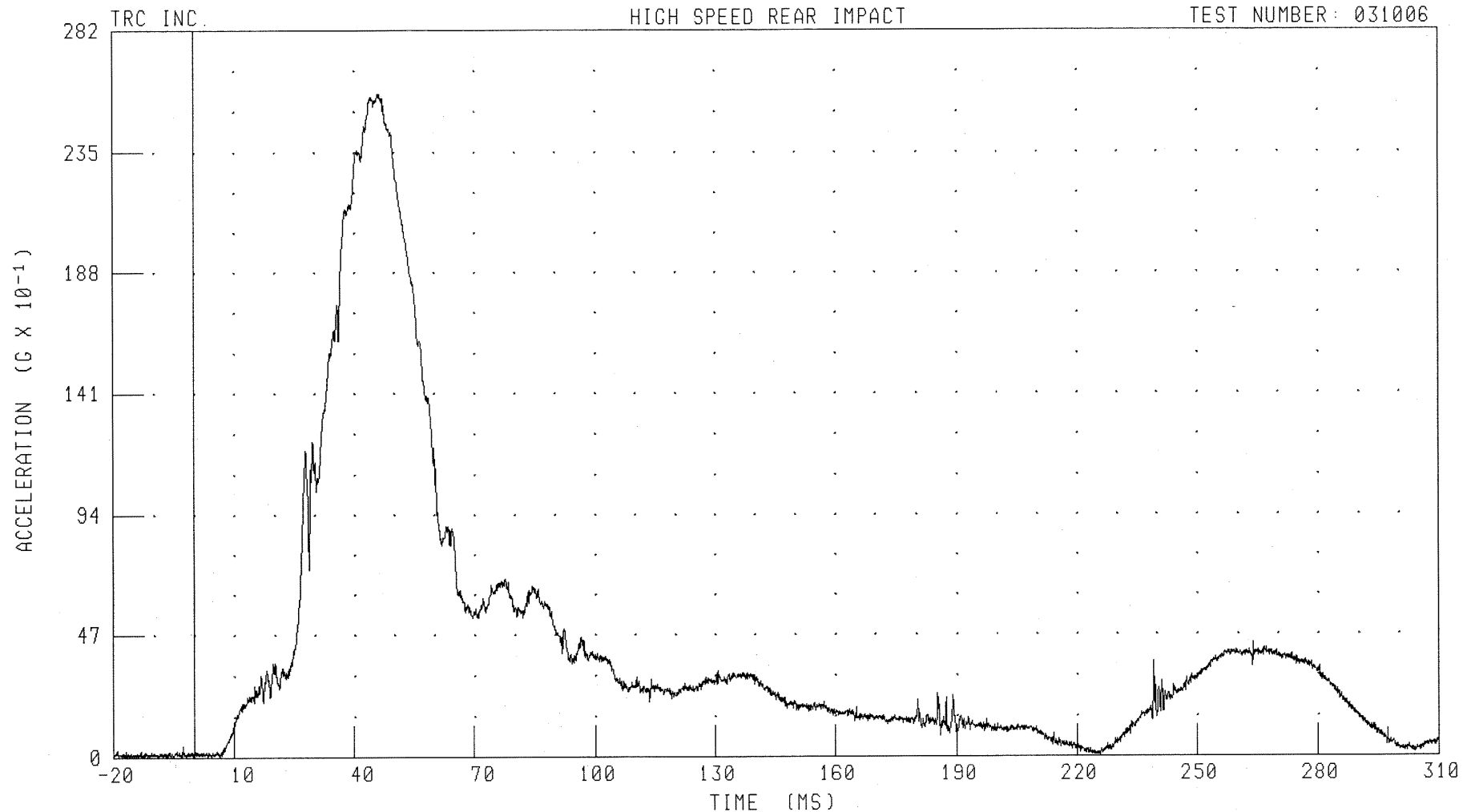
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER PELVIS RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: PEVRG4

FILTER: CH. CLASS 1000

PEAK DATA: 25.76 G @ 46.40 MS; 0.04 G @ -18.08 MS

B-91

031006

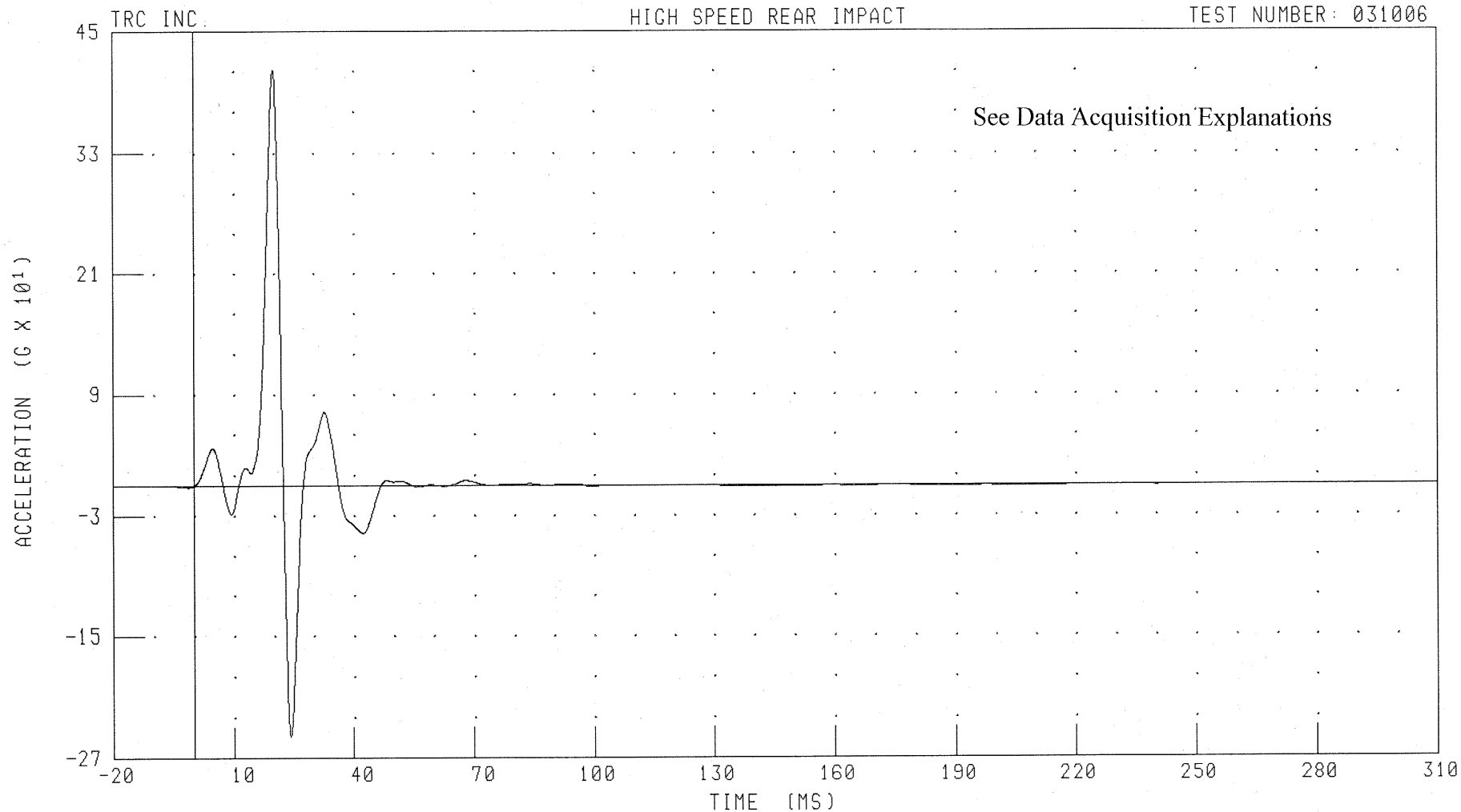
47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

REAR FLOORPAN ABOVE AXLE X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKXG1

FILTER: CH. CLASS 60

PEAK DATA: 411.52 G @ 19.92 MS; -248.28 G @ 24.16 MS

B-92

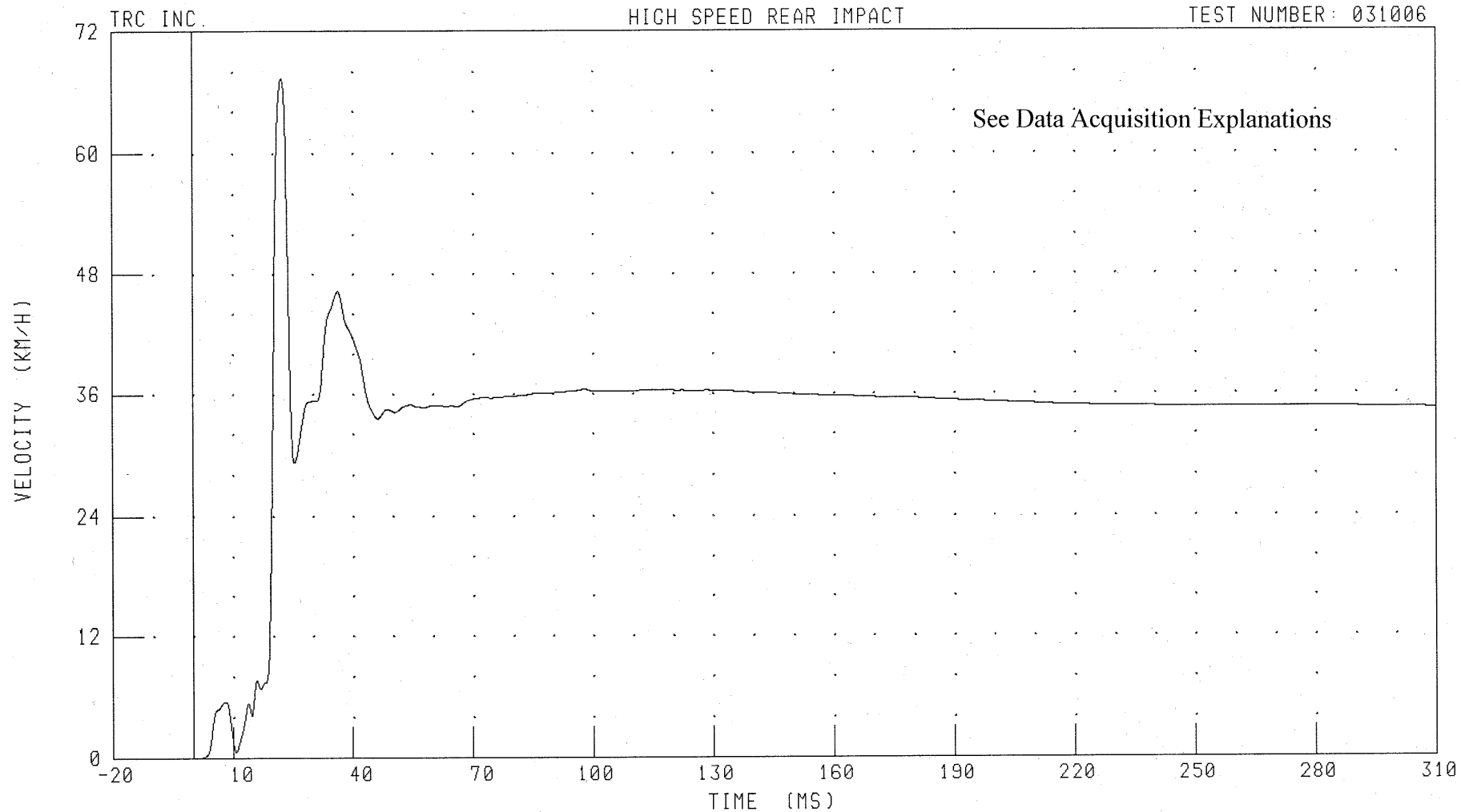
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

REAR FLOORPAN ABOVE AXLE X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RDKXV1

FILTER: CH. CLASS 180

PEAK DATA: 67.30 KM/H @ 22.32 MS; 0.00 KM/H @ 1.12 MS

B-93

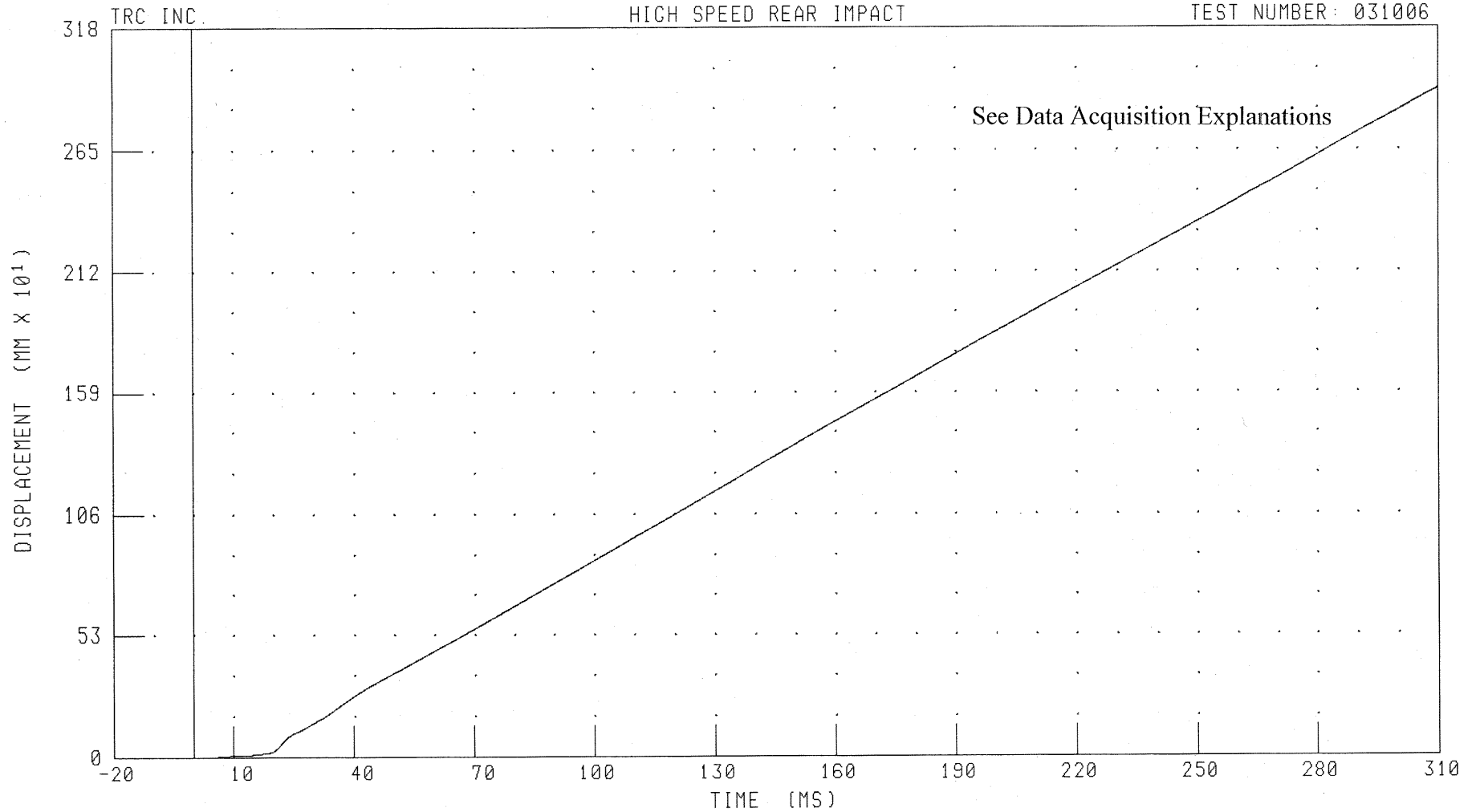
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
REAR FLOORPAN ABOVE AXLE X-AXIS DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKXD1 FILTER: CH. CLASS 180

PEAK DATA: 2911.96 MM @ 310.00 MS; 0.00 MM @ 1.52 MS

B-94

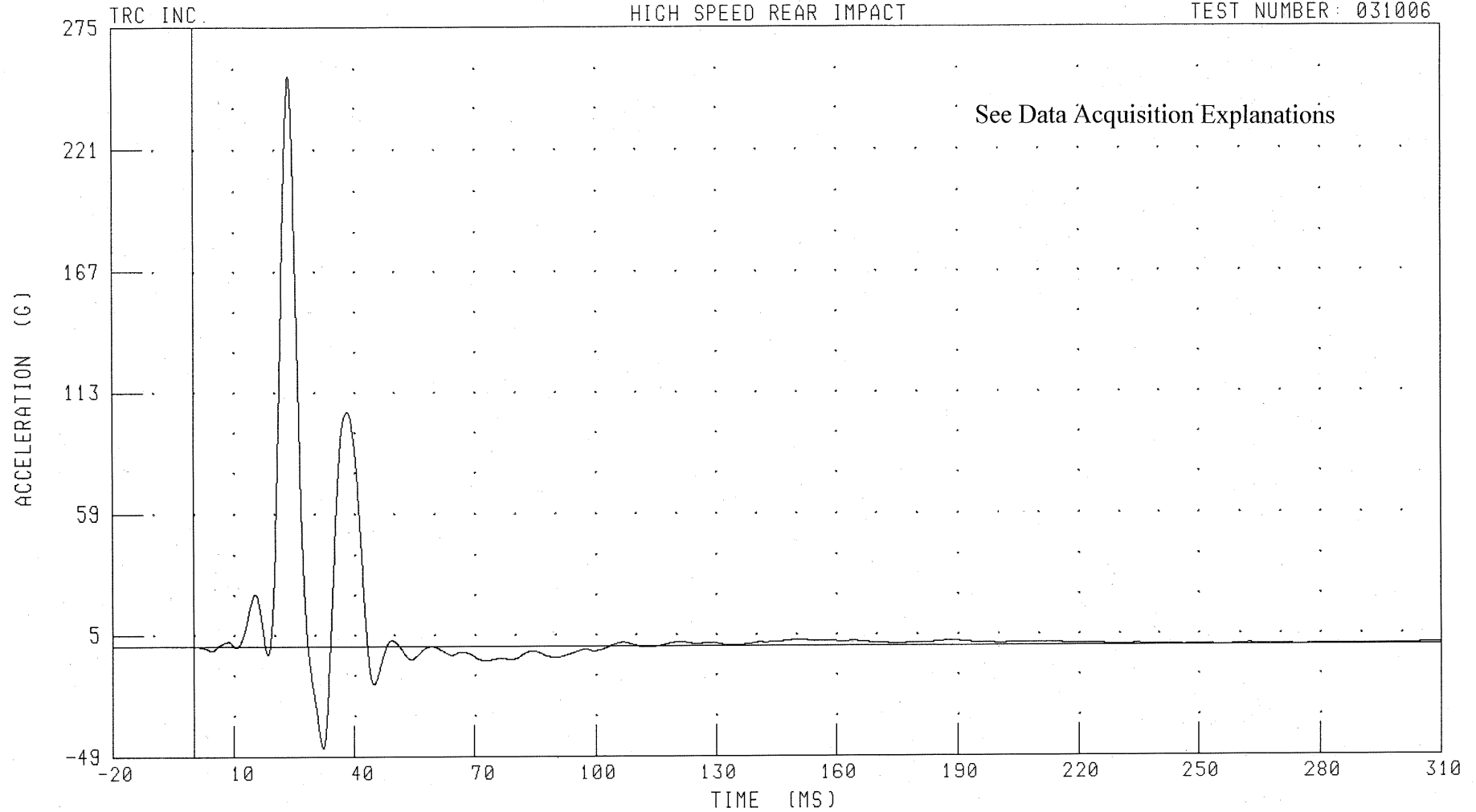
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
REAR FLOORPAN ABOVE AXLE Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKYG1 FILTER: CH. CLASS 60

PEAK DATA: 253.55 G @ 23.68 MS, -45.36 G @ 32.16 MS

B-95

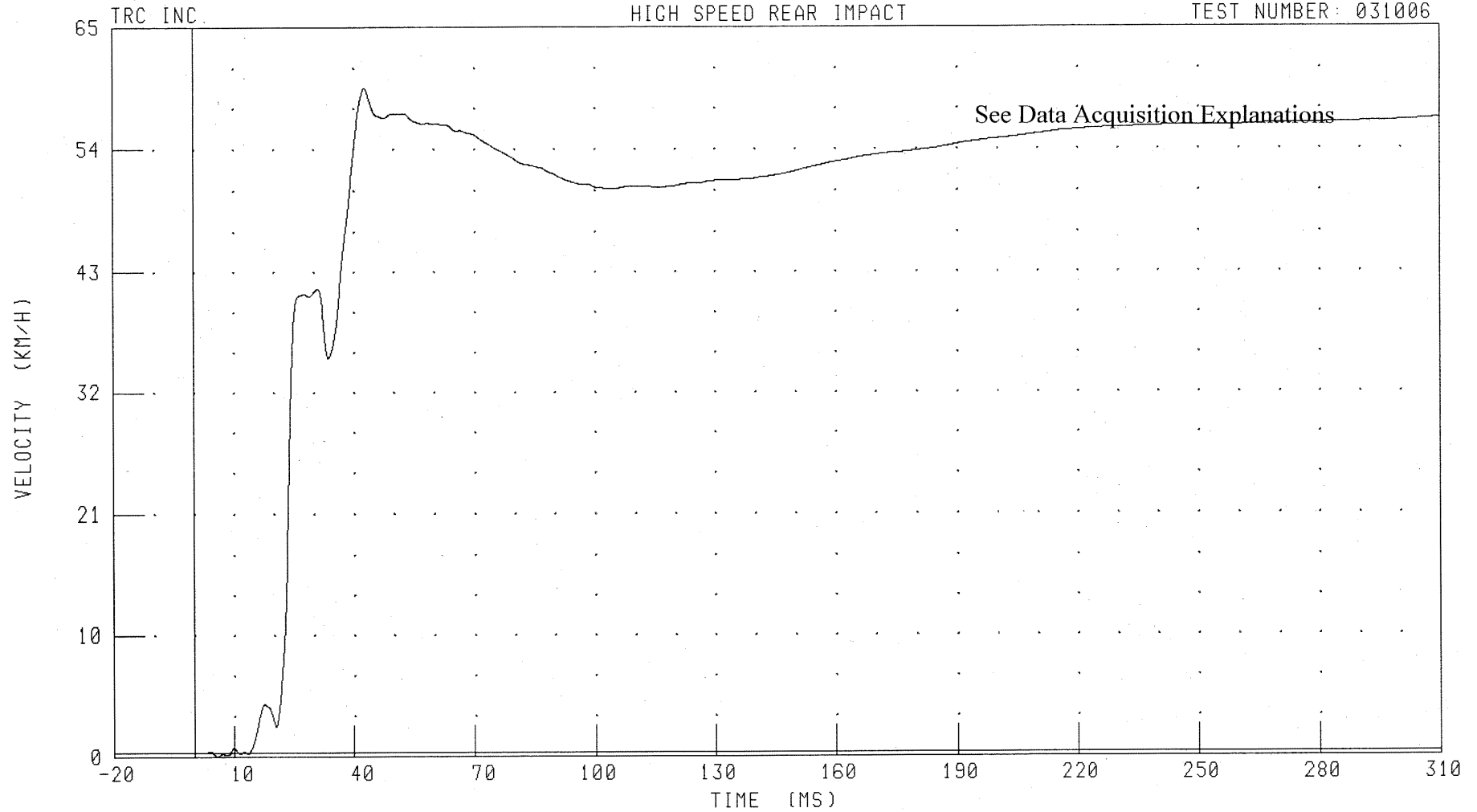
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

REAR FLOORPAN ABOVE AXLE Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RDKYV1 FILTER: CH. CLASS 180

PEAK DATA: 60.15 KM/H @ 42.88 MS, -0.38 KM/H @ 5.68 MS

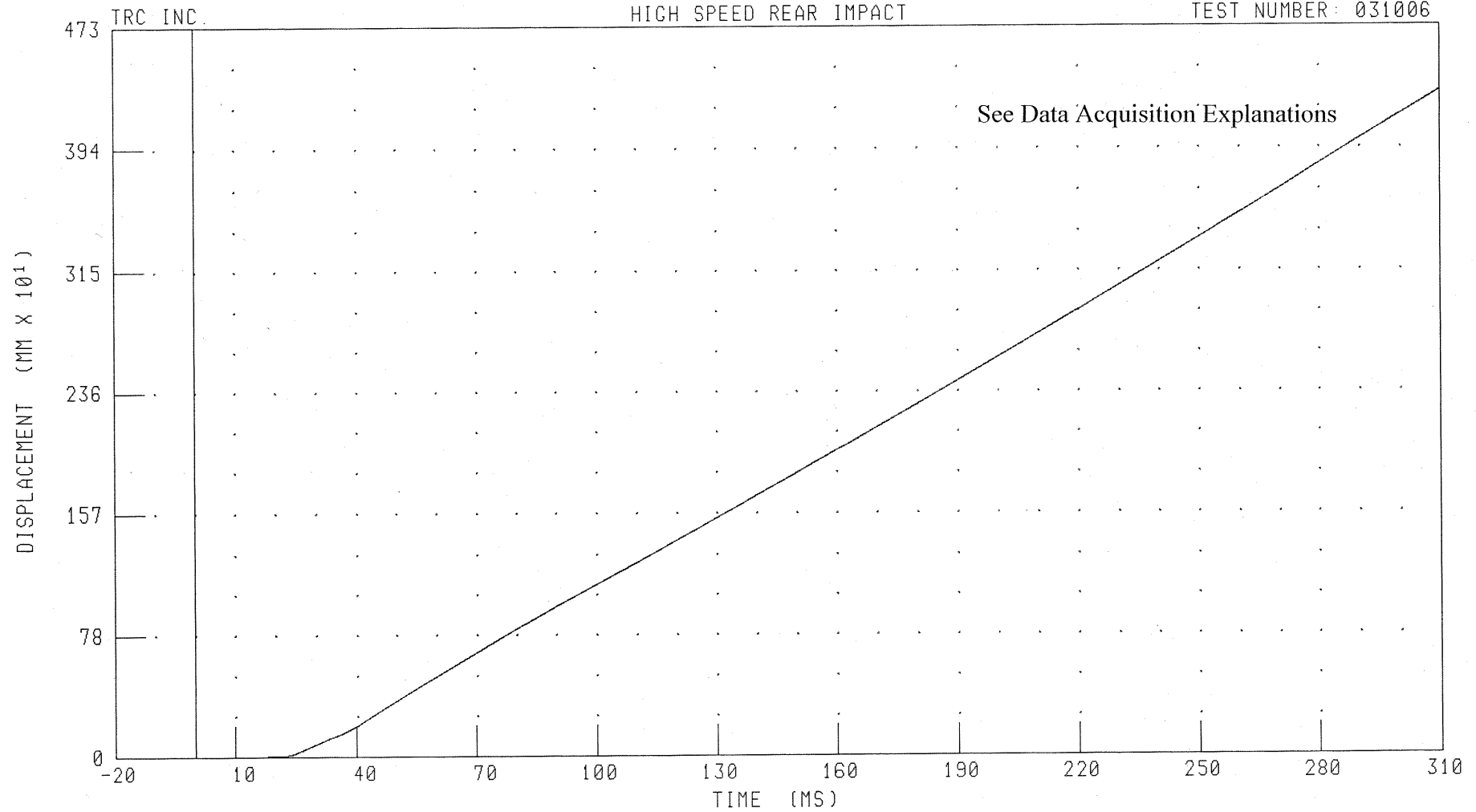
B-96

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
REAR FLOORPAN ABOVE AXLE Y-AXIS DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RDKYD1 FILTER: CH. CLASS 180

PEAK DATA: 4319.00 MM @ 310.00 MS; -0.28 MM @ 8.96 MS

B-97

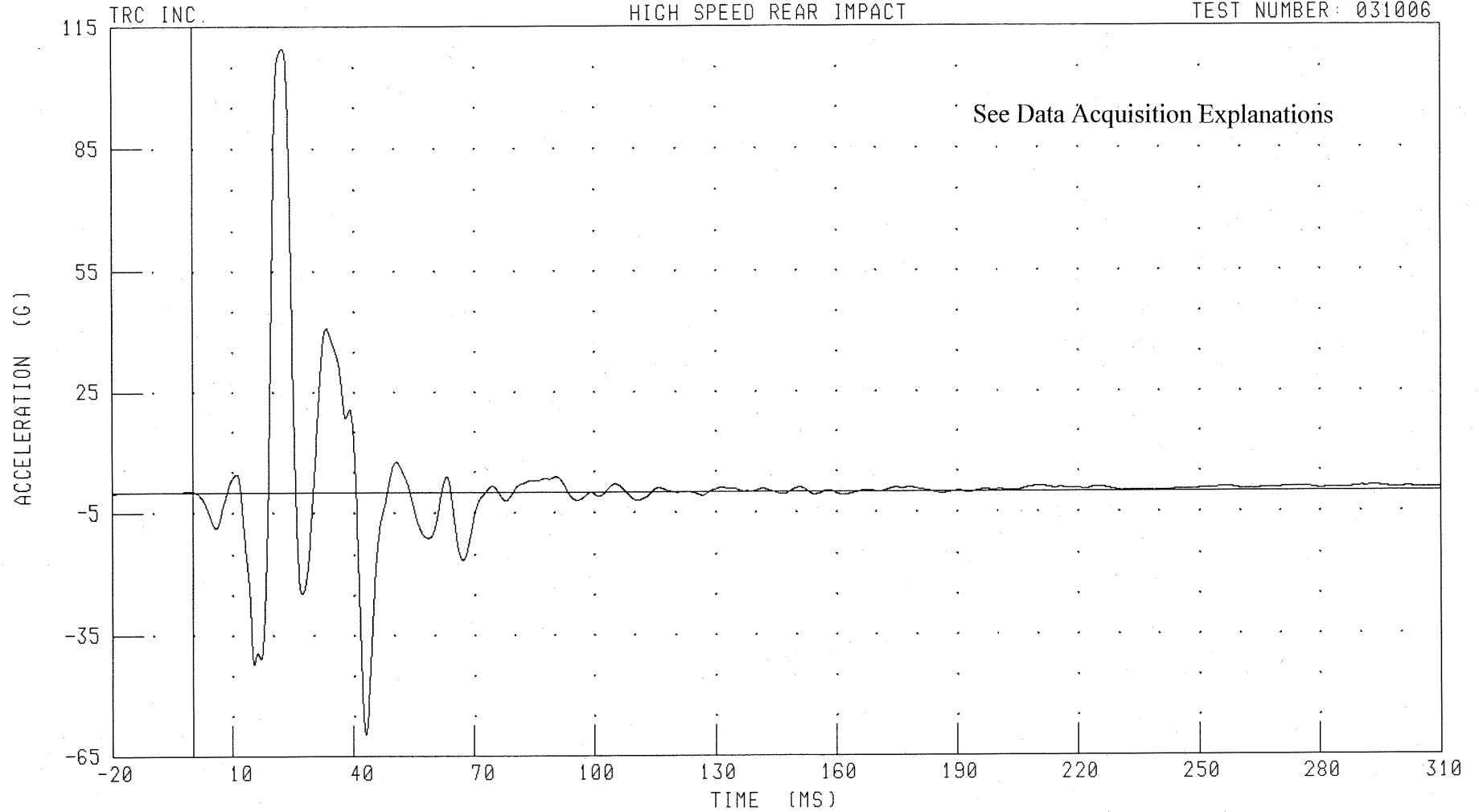
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
REAR FLOORPAN ABOVE AXLE Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKZG1 FILTER: CH. CLASS 60

PEAK DATA: 109.45 G @ 22.56 MS; -59.61 G @ 43.04 MS

B-98

031006

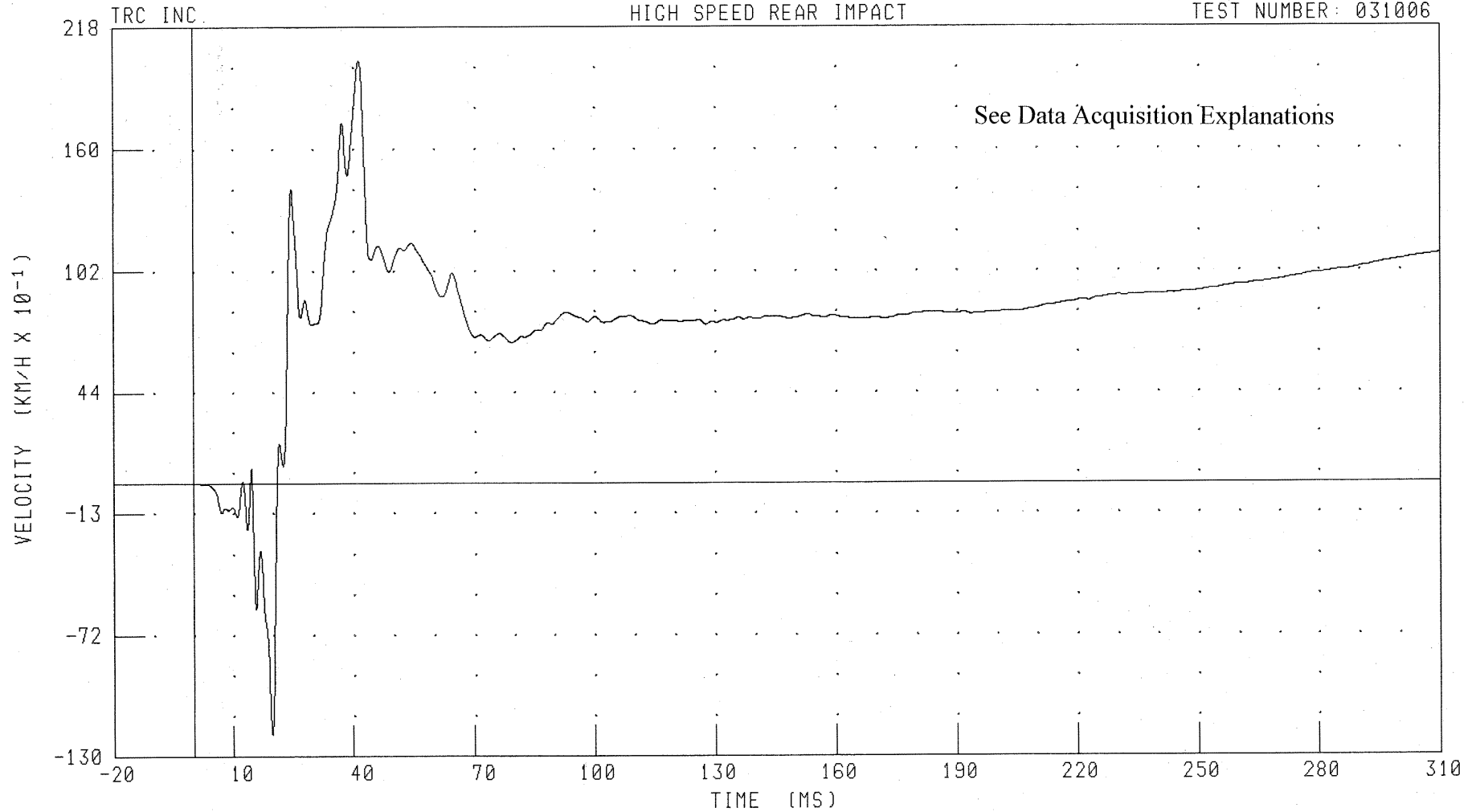
47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

REAR FLOORPAN ABOVE AXLE Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKZV1

FILTER: CH. CLASS 180

PEAK DATA: 20.19 KM/H @ 41.52 MS; -11.95 KM/H @ 19.76 MS

B-99

031006

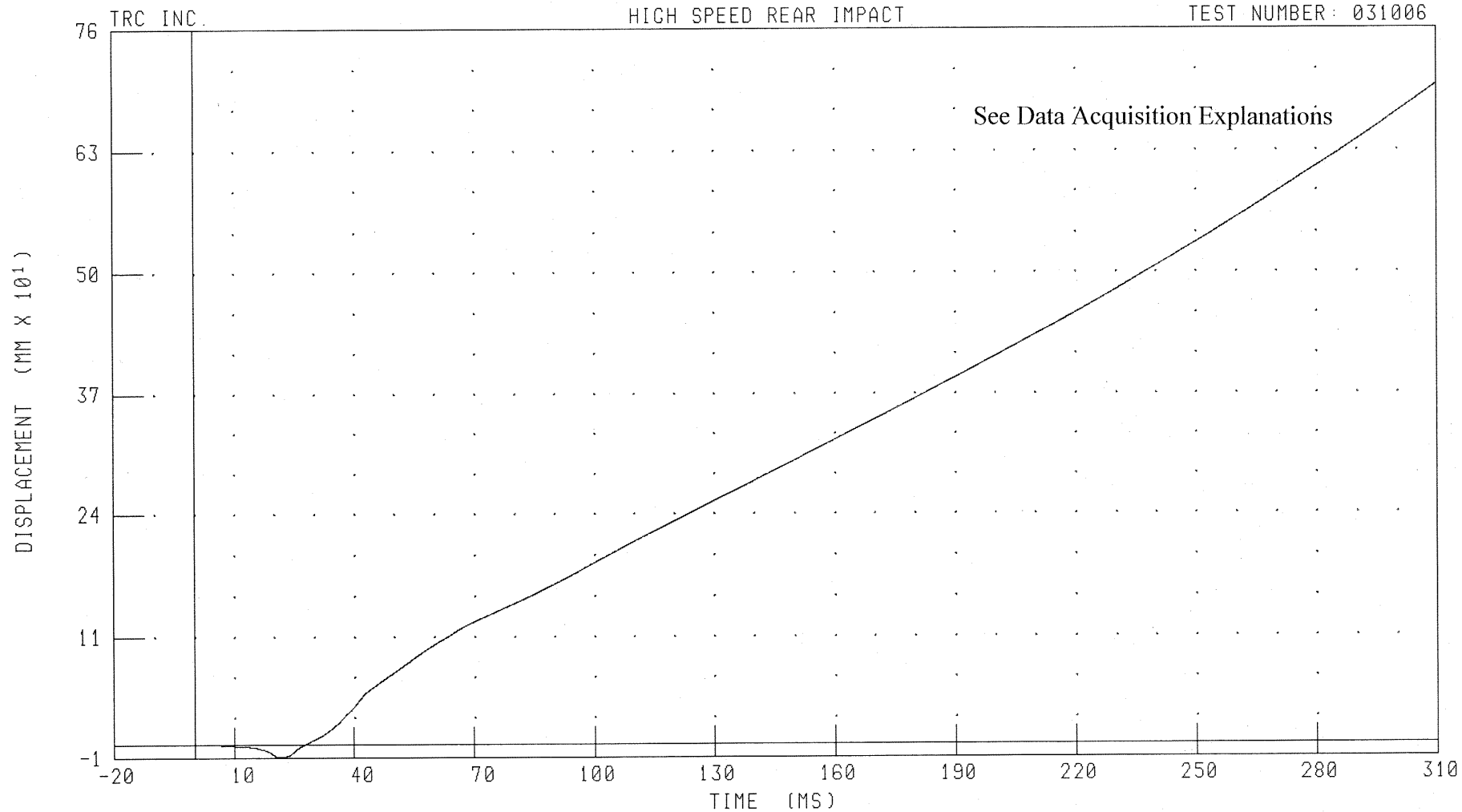
47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

REAR FLOORPAN ABOVE AXLE Z-AXIS DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKZD1 FILTER: CH. CLASS 180

PEAK DATA: 705.59 MM @ 310.00 MS; -13.21 MM @ 21.12 MS

B-100

031006

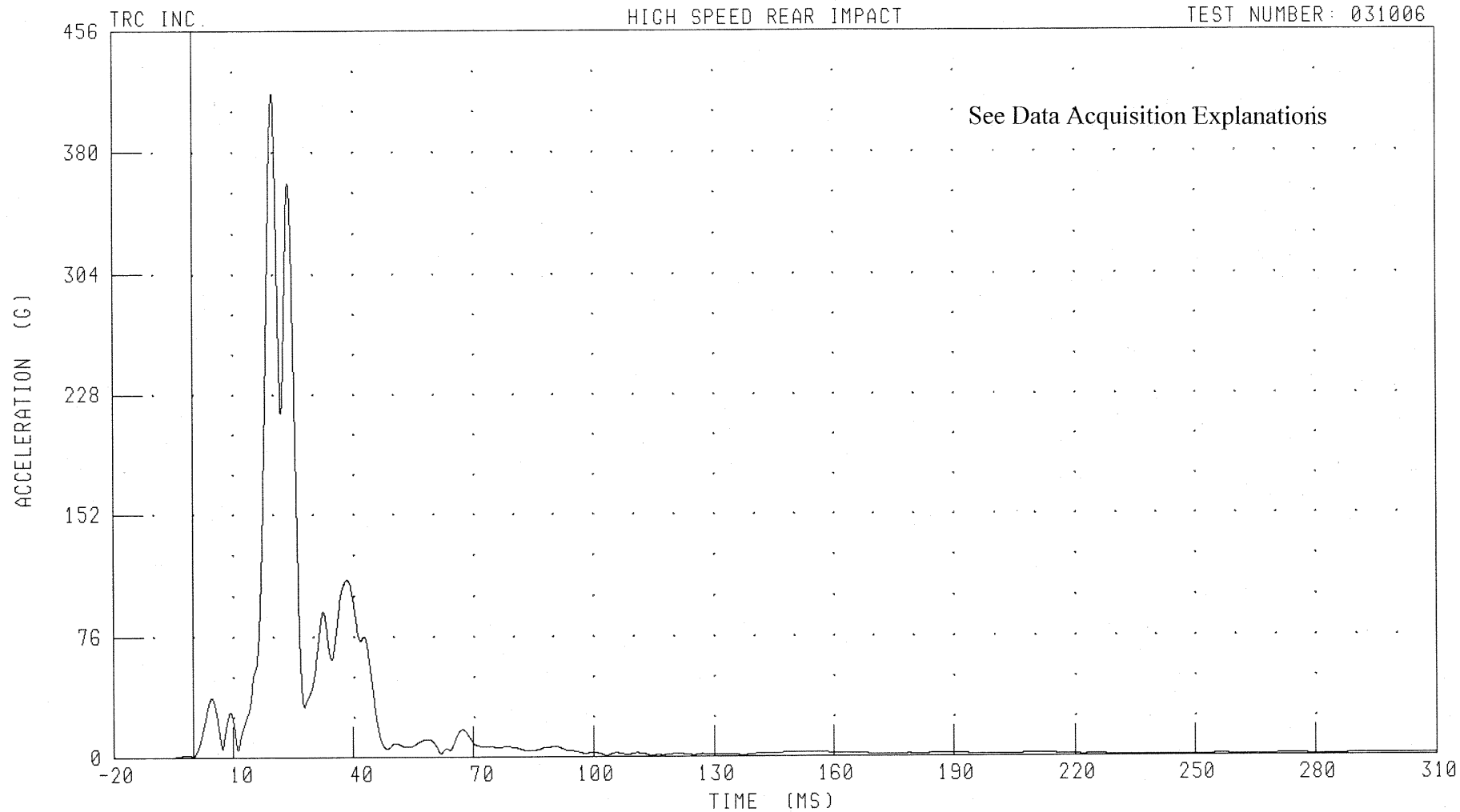
47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

REAR FLOORPAN ABOVE AXLE RESULTANT Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006

See Data Acquisition Explanations



CHANNEL: RDKRG1 FILTER: CH. CLASS 60

PEAK DATA: 416.13 G @ 20.00 MS; 0.01 G @ -16.88 MS

B-101

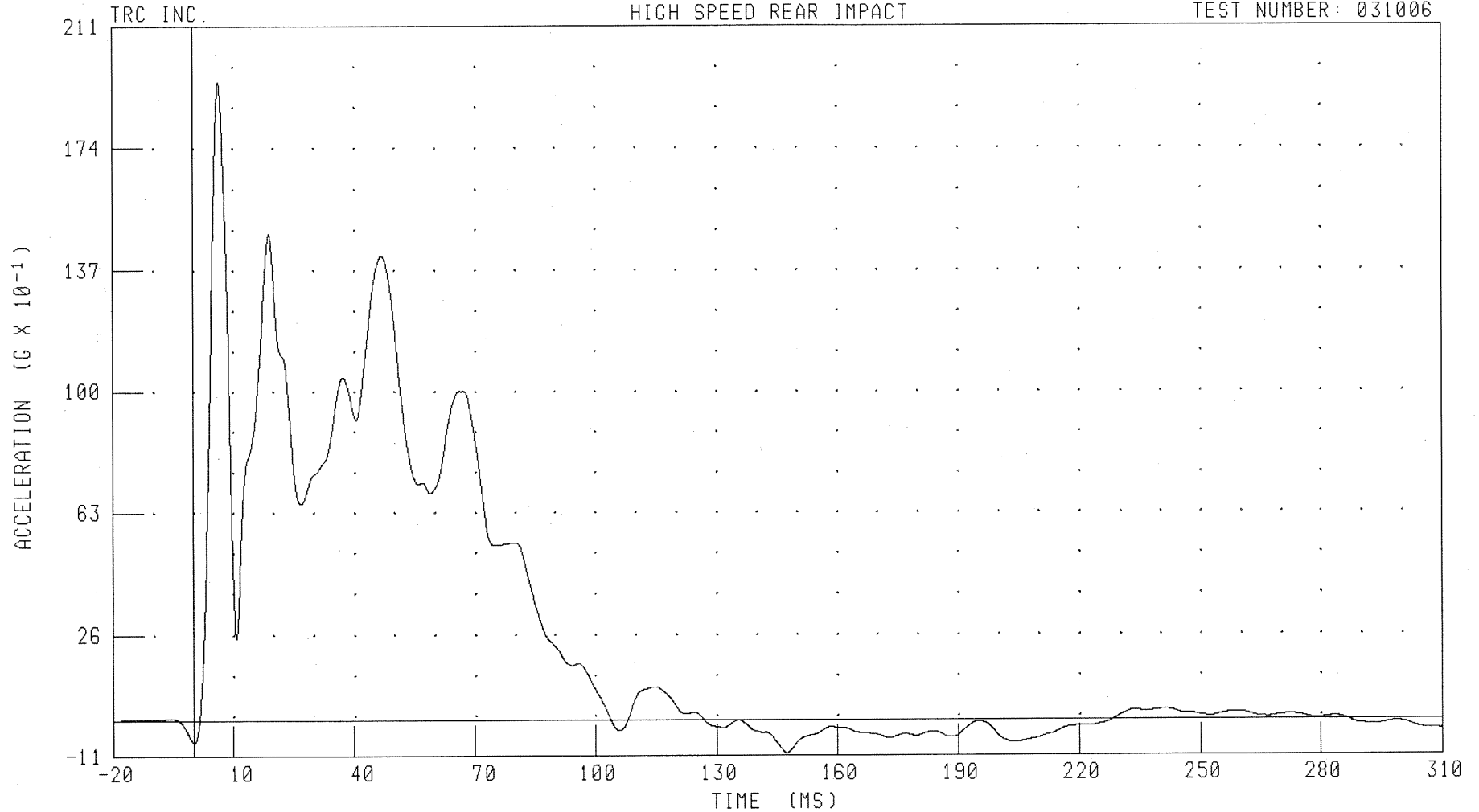
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT FRONT OCCUPANT COMPARTMENT X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTXG1 FILTER: CH. CLASS 60

PEAK DATA: 19.41 G @ 6.40 MS; -1.04 G @ 147.52 MS

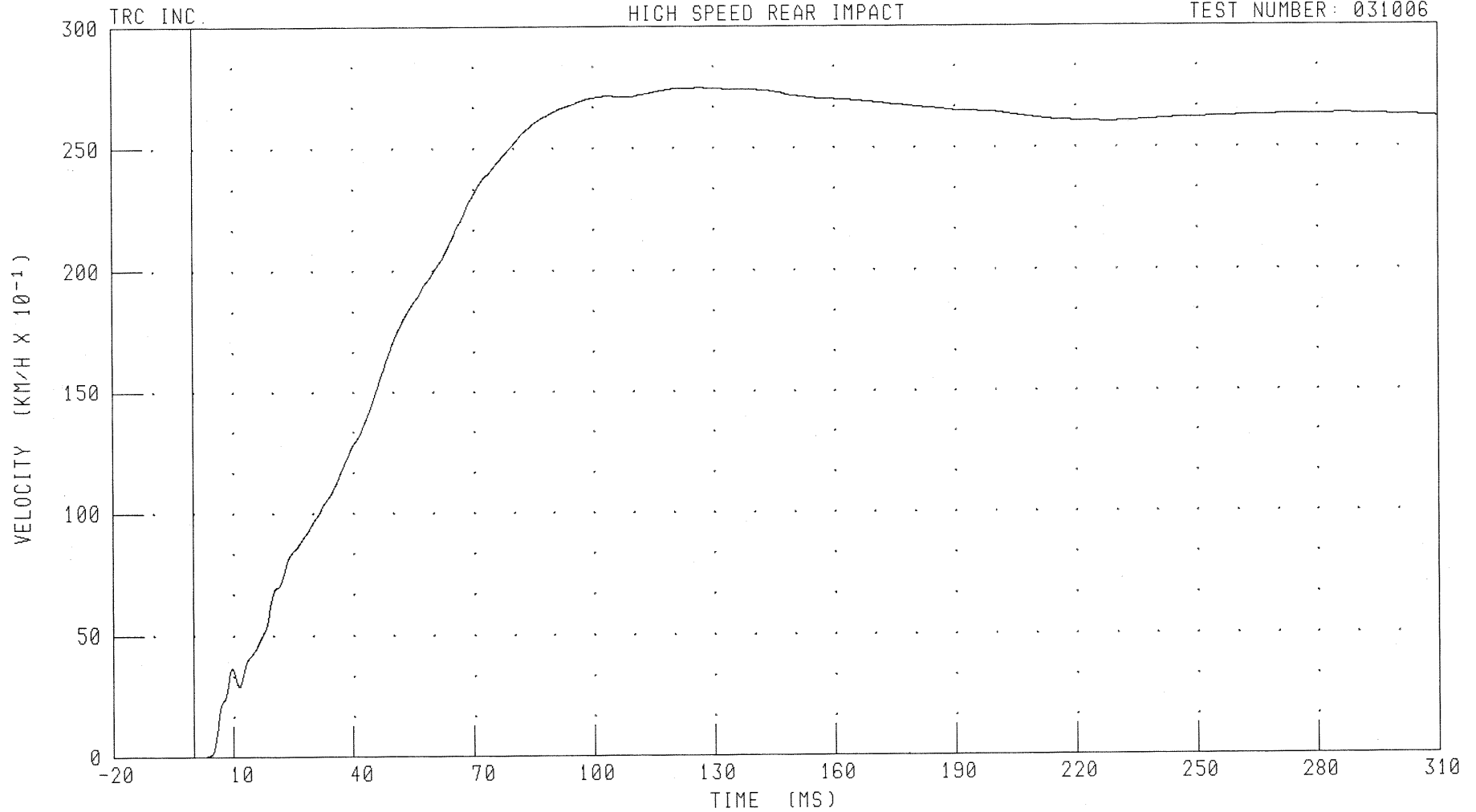
B-102

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT FRONT OCCUPANT COMPARTMENT X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTXV1

FILTER: CH. CLASS 180

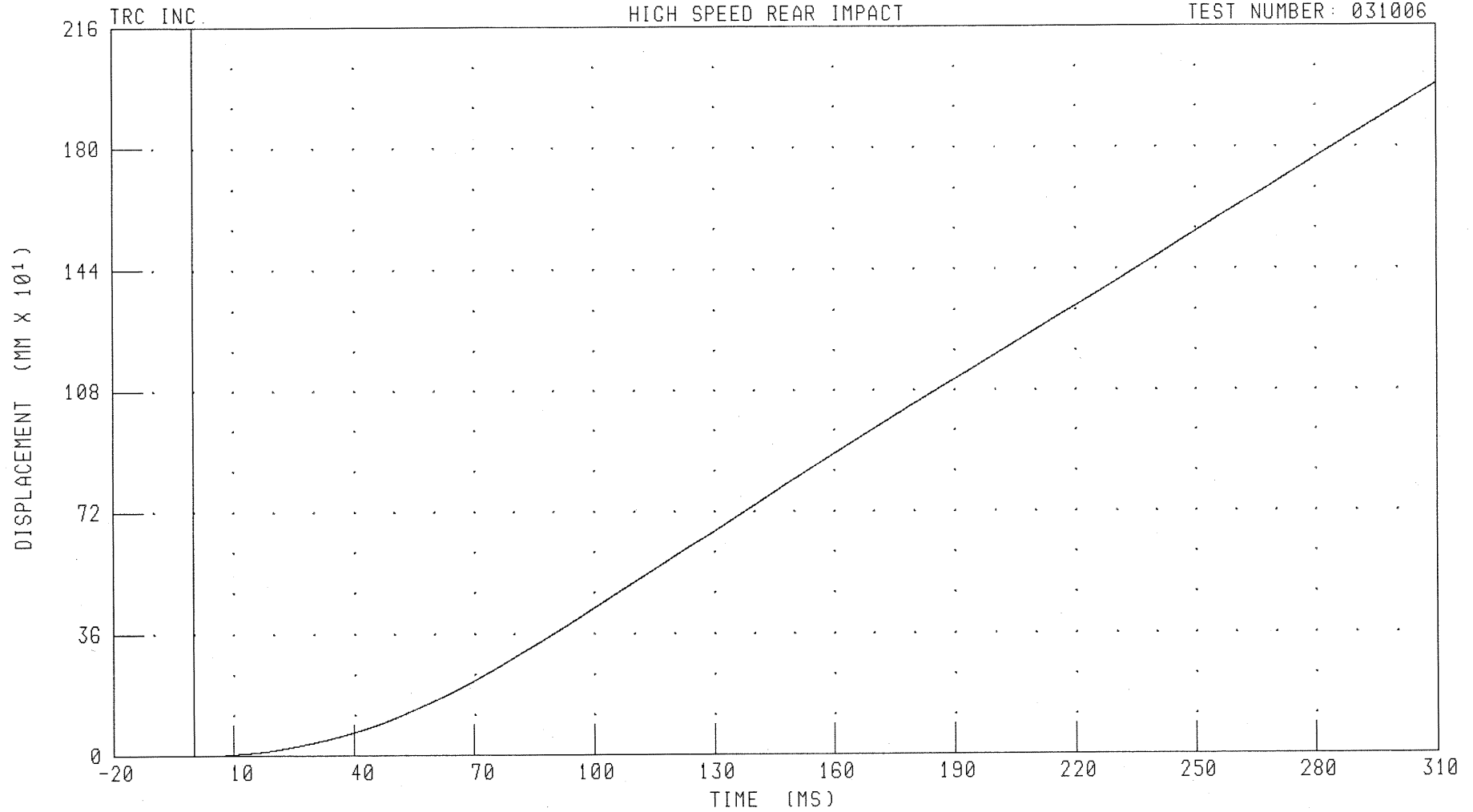
PEAK DATA: 27.46 KM/H @ 126.48 MS; 0.00 KM/H @ 0.00 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT FRONT OCCUPANT COMPARTMENT X-AXIS DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTXD1 FILTER: CH. CLASS 180

PEAK DATA: 1986.47 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

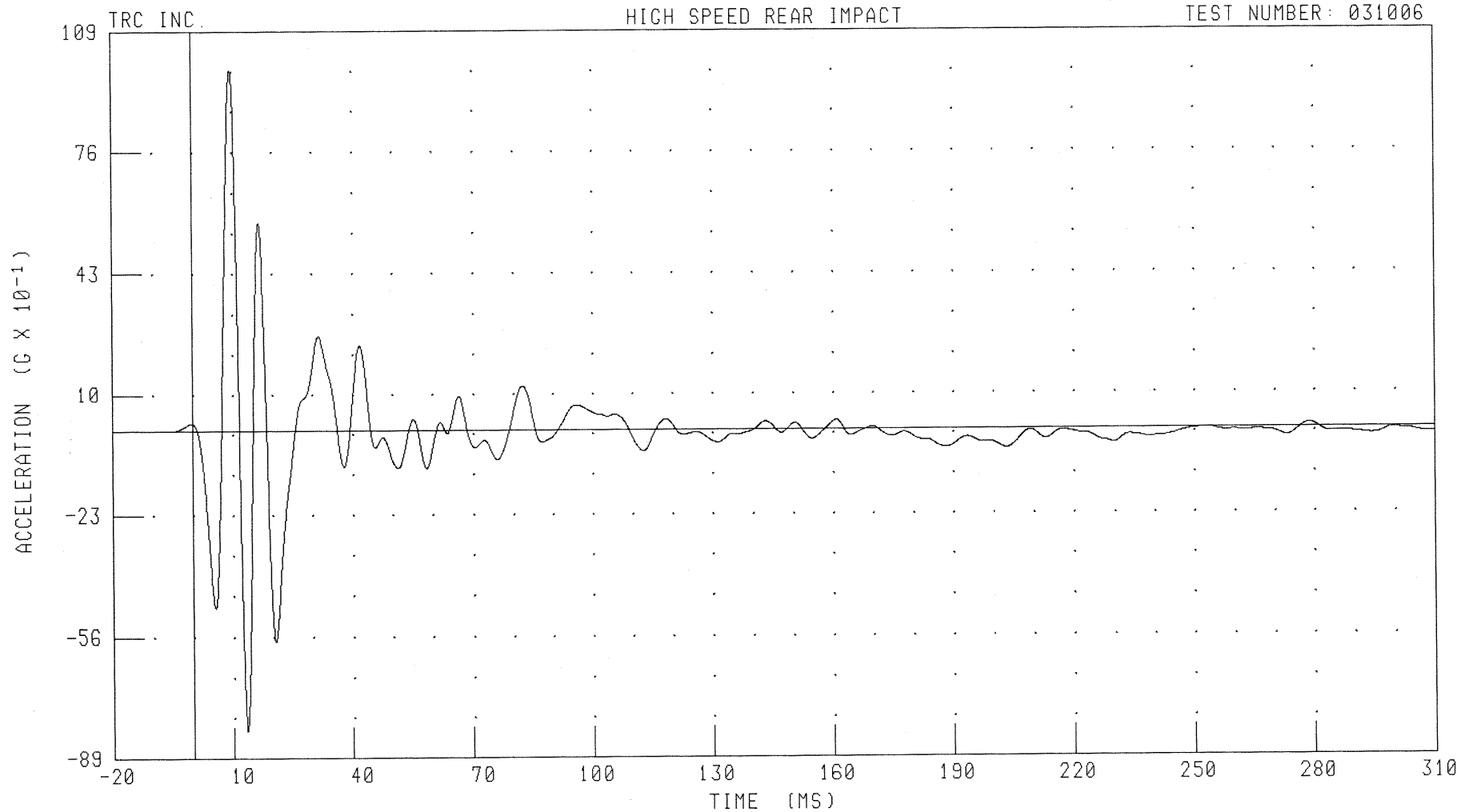
B-104

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT FRONT OCCUPANT COMPARTMENT Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTYG1 FILTER: CH. CLASS 60

PEAK DATA: 9.85 G @ 9.68 MS; -8.16 G @ 13.44 MS

B-105

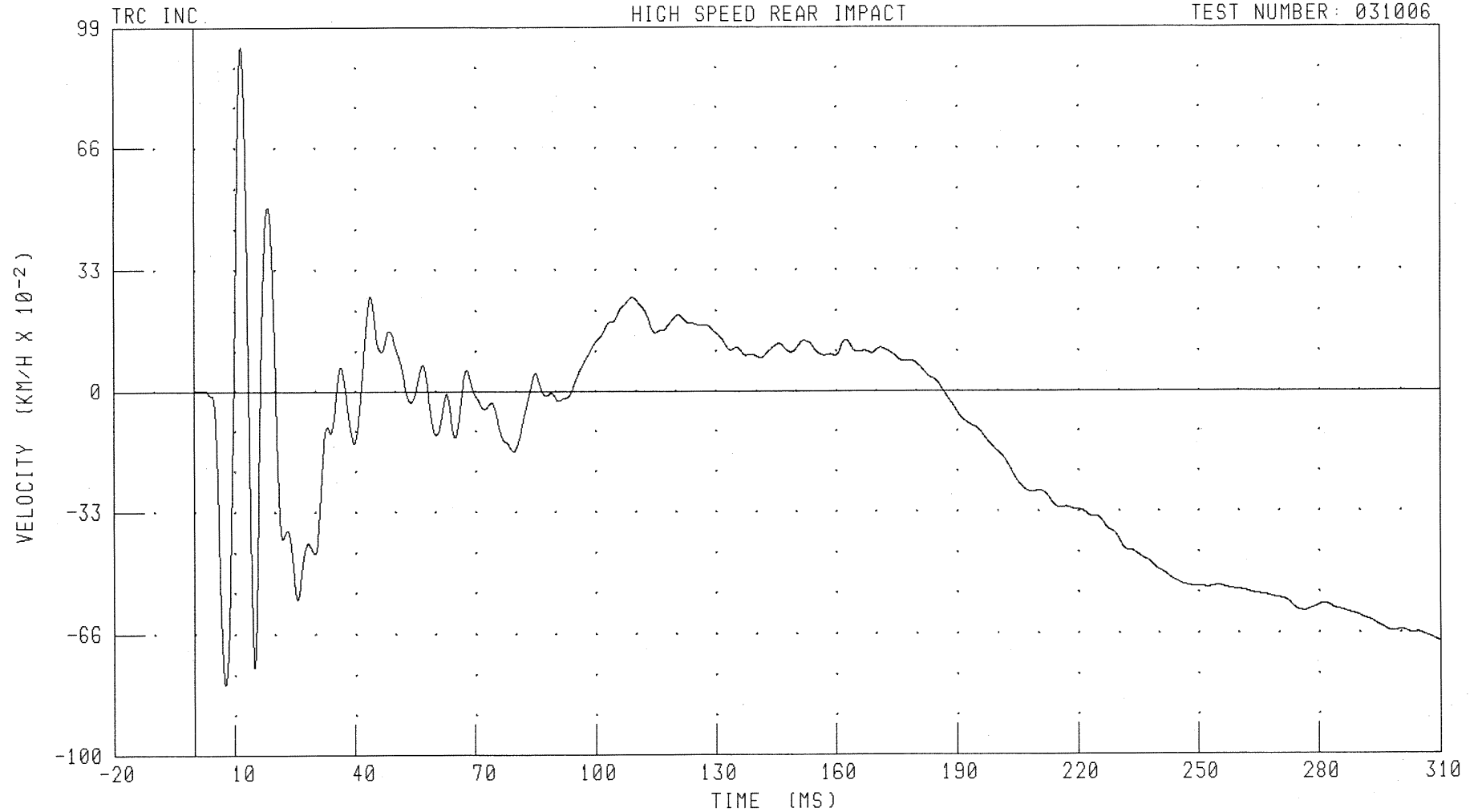
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT FRONT OCCUPANT COMPARTMENT Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTYV1 FILTER: CH. CLASS 180

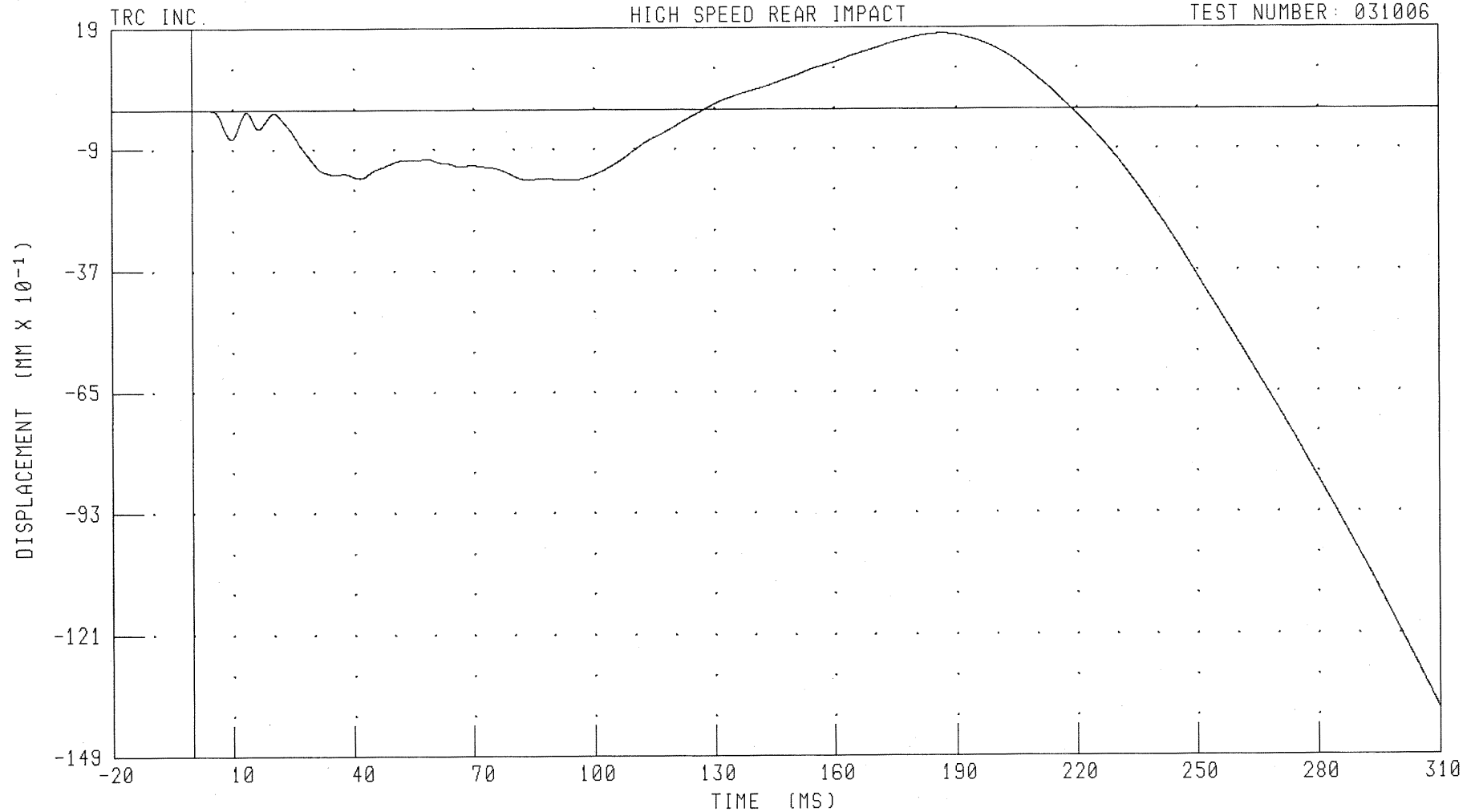
B-106

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT FRONT OCCUPANT COMPARTMENT Y-AXIS DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTYD1 FILTER: CH. CLASS 180

PEAK DATA: 1.76 MM @ 186.80 MS; -13.86 MM @ 310.00 MS

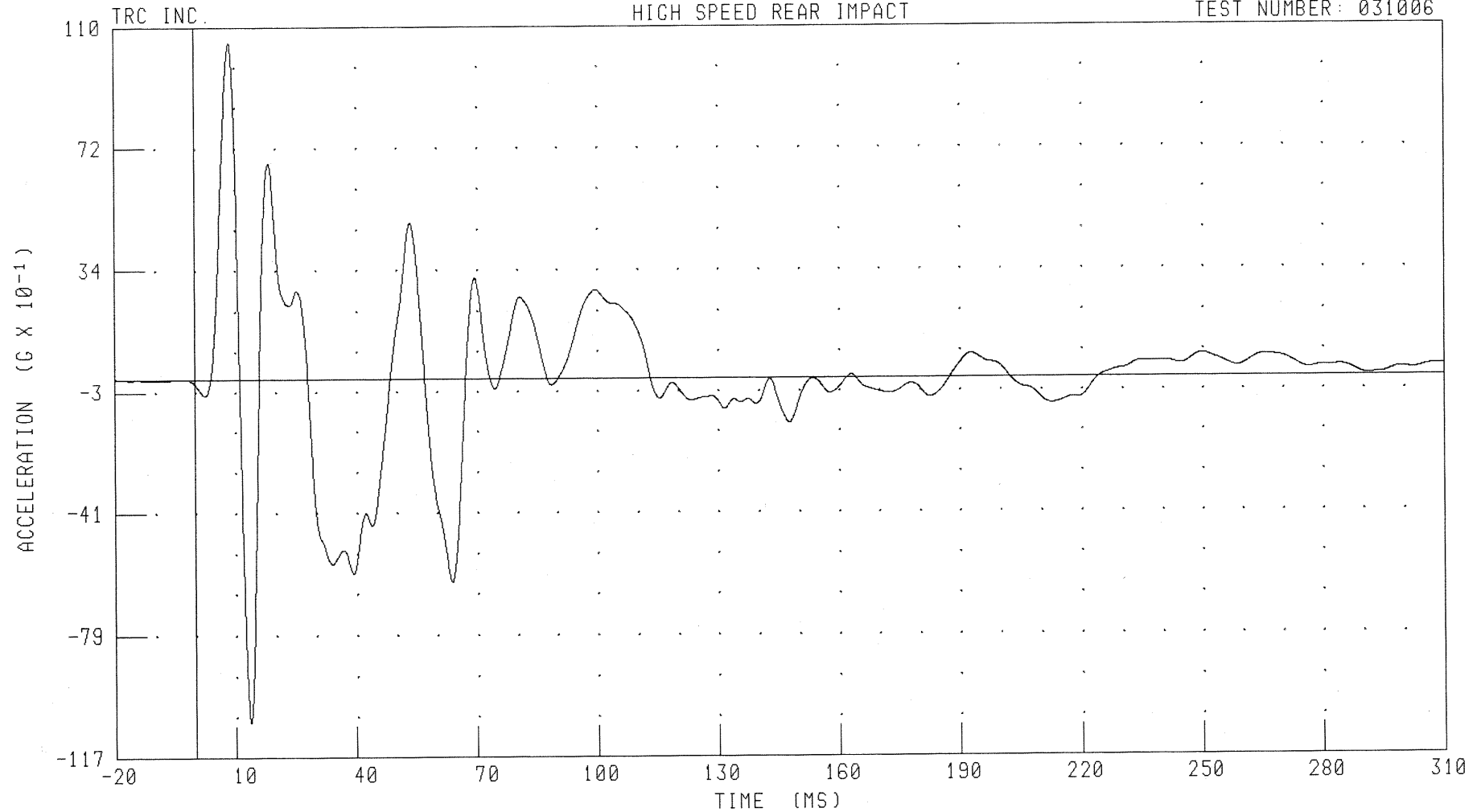
B-107

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT FRONT OCCUPANT COMPARTMENT Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTZG1

FILTER: CH. CLASS 60

PEAK DATA: 10.52 G @ 8.64 MS; -10.71 G @ 13.60 MS

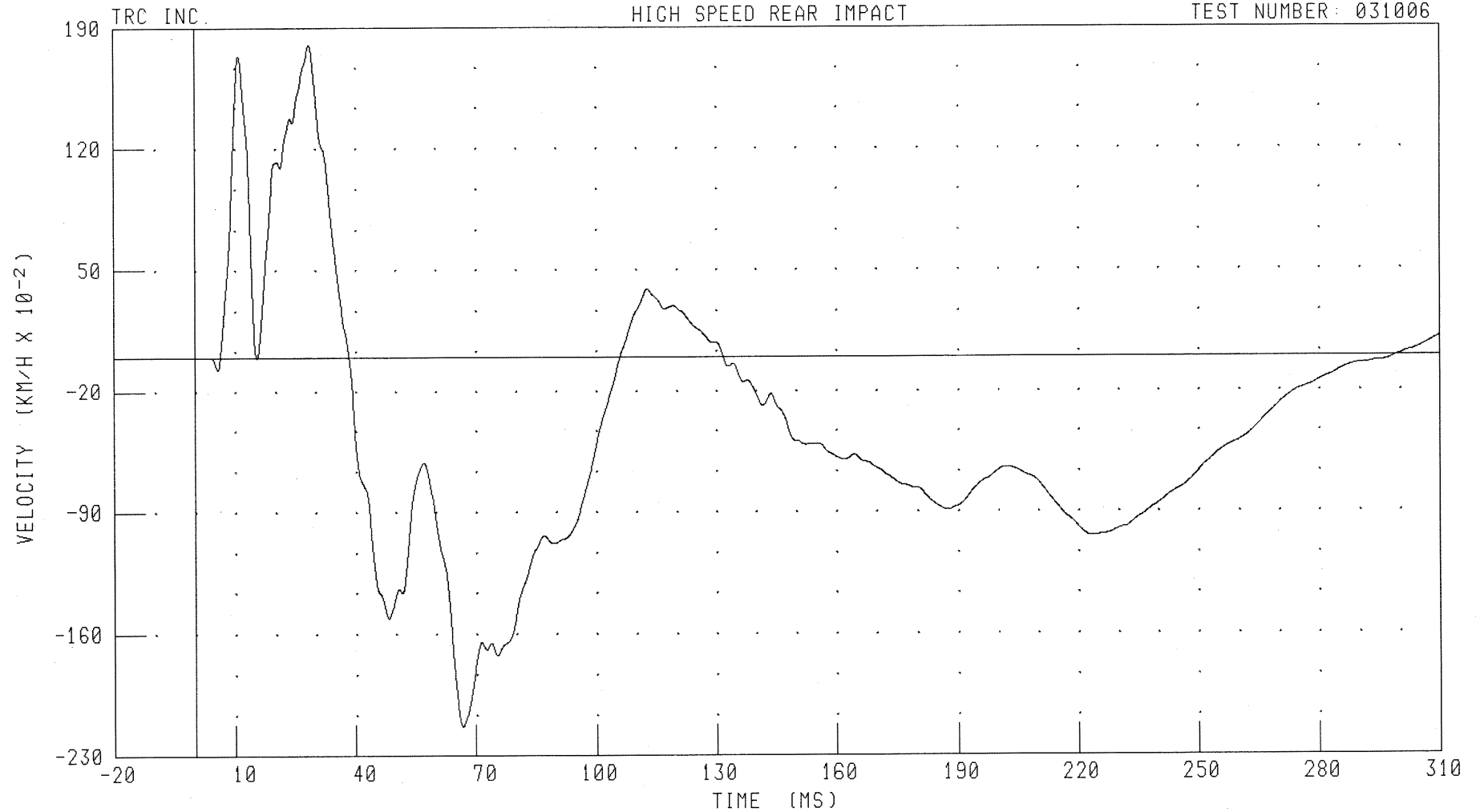
B-108

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT FRONT OCCUPANT COMPARTMENT Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.80 KM/H @ 28.64 MS; -2.13 KM/H @ 66.72 MS

B-109

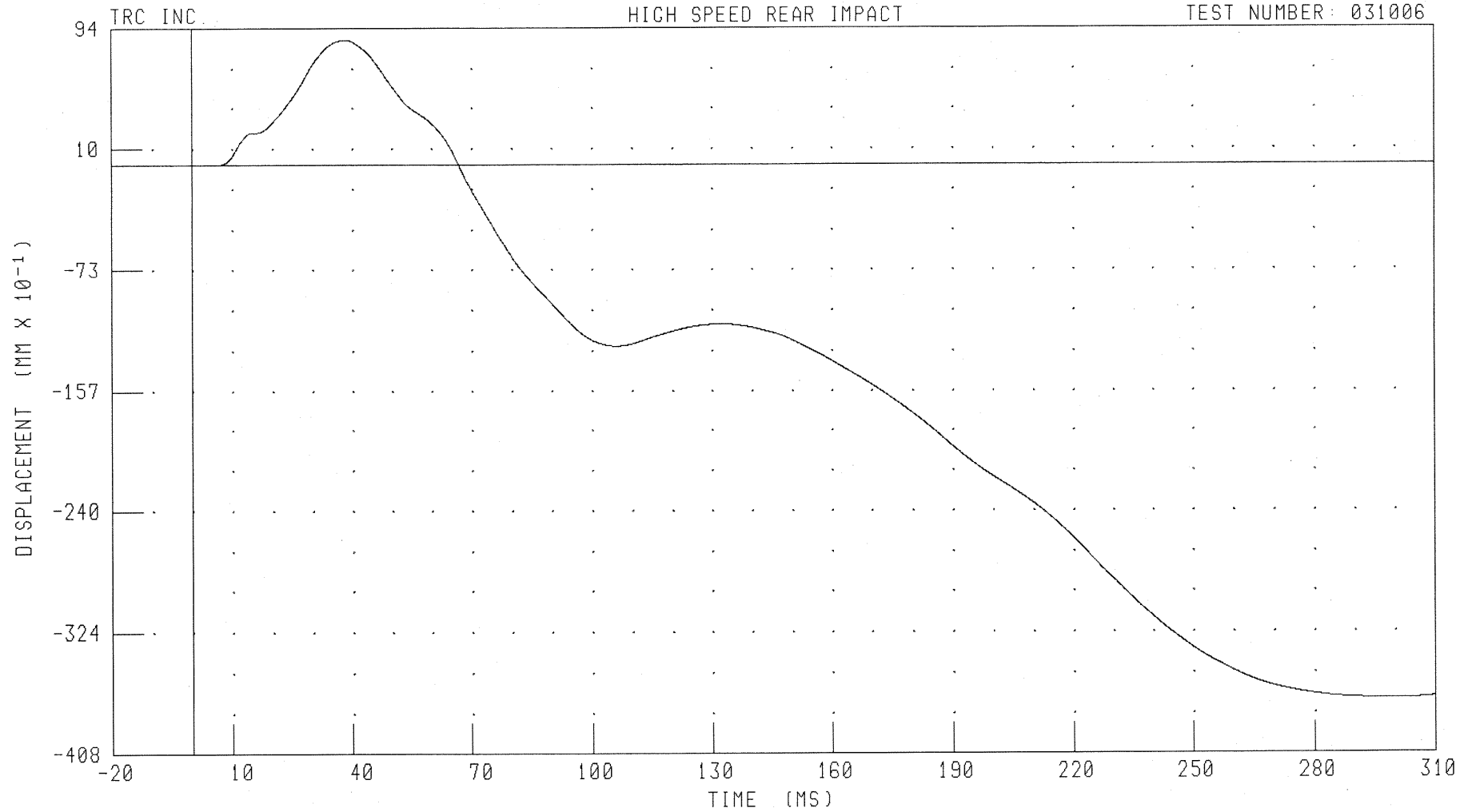
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT FRONT OCCUPANT COMPARTMENT Z-AXIS DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTZD1 FILTER: CH. CLASS 180

PEAK DATA: 8.68 MM @ 38.48 MS; -37.16 MM @ 299.28 MS

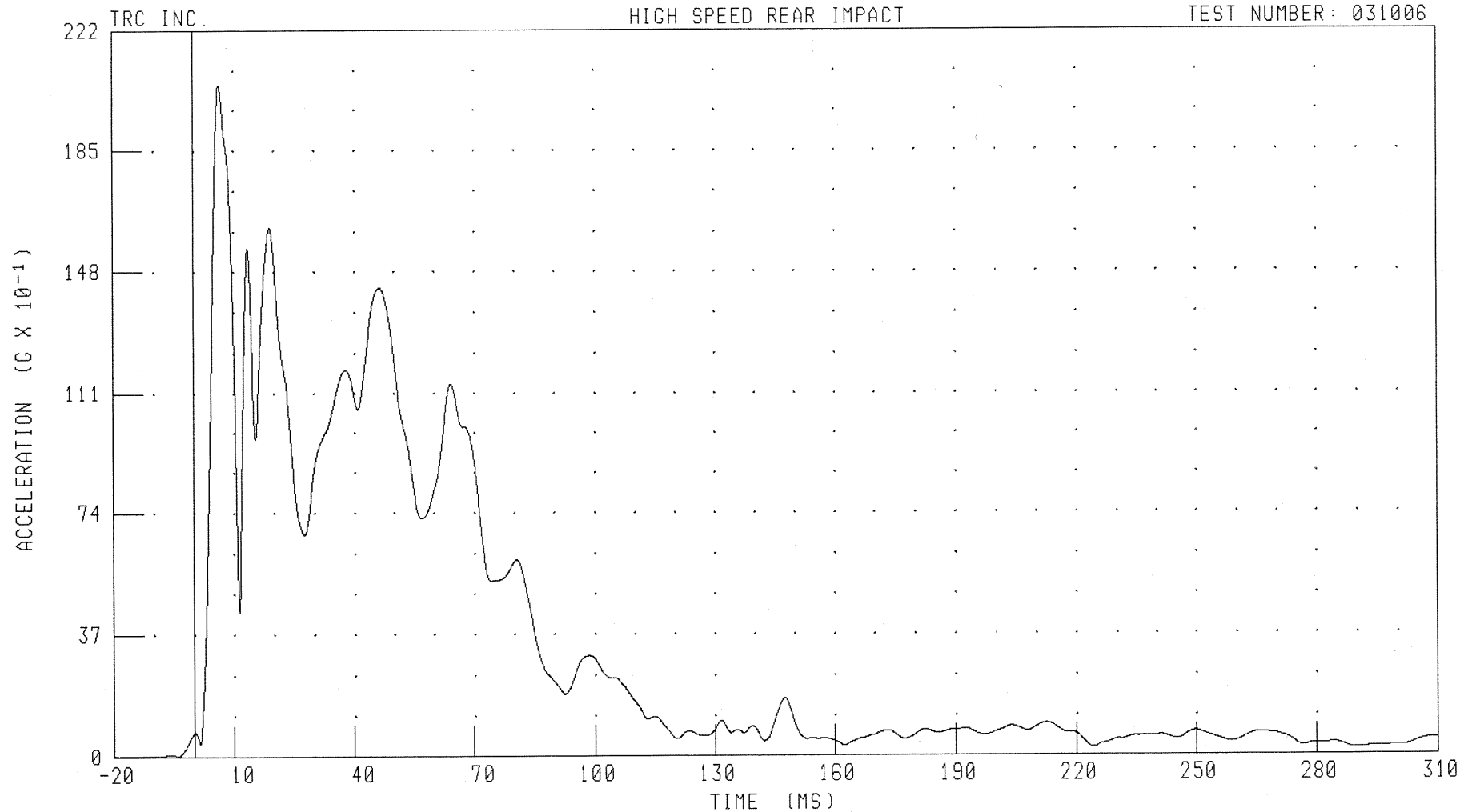
B-110

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT FRONT OCCUPANT COMPARTMENT RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LFTRG1 FILTER: CH. CLASS 60

B-111

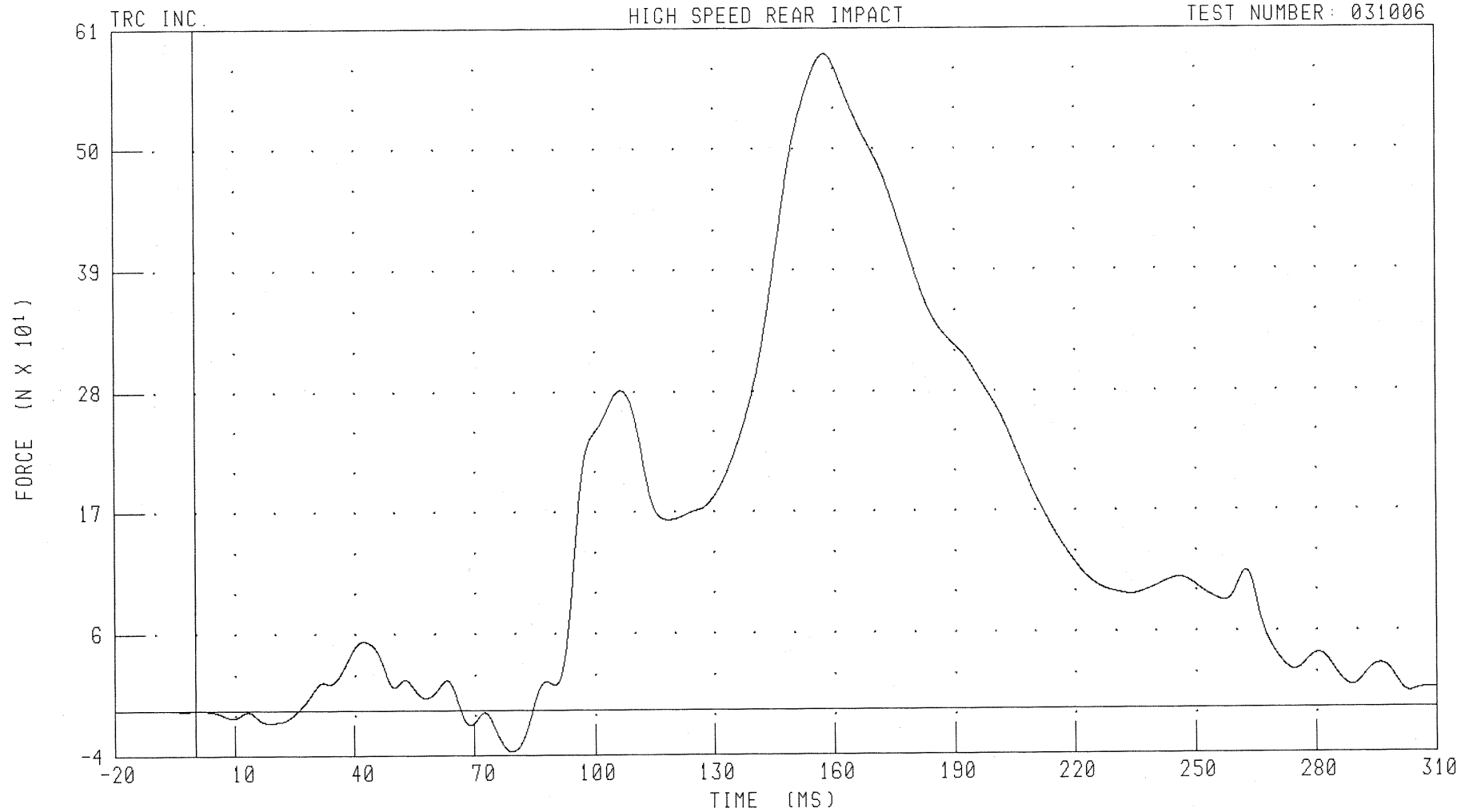
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER LAP BELT FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LBOF2

FILTER: CH. CLASS 60

PEAK DATA: 595.68 N @ 157.92 MS; -37.67 N @ 79.28 MS

B-112

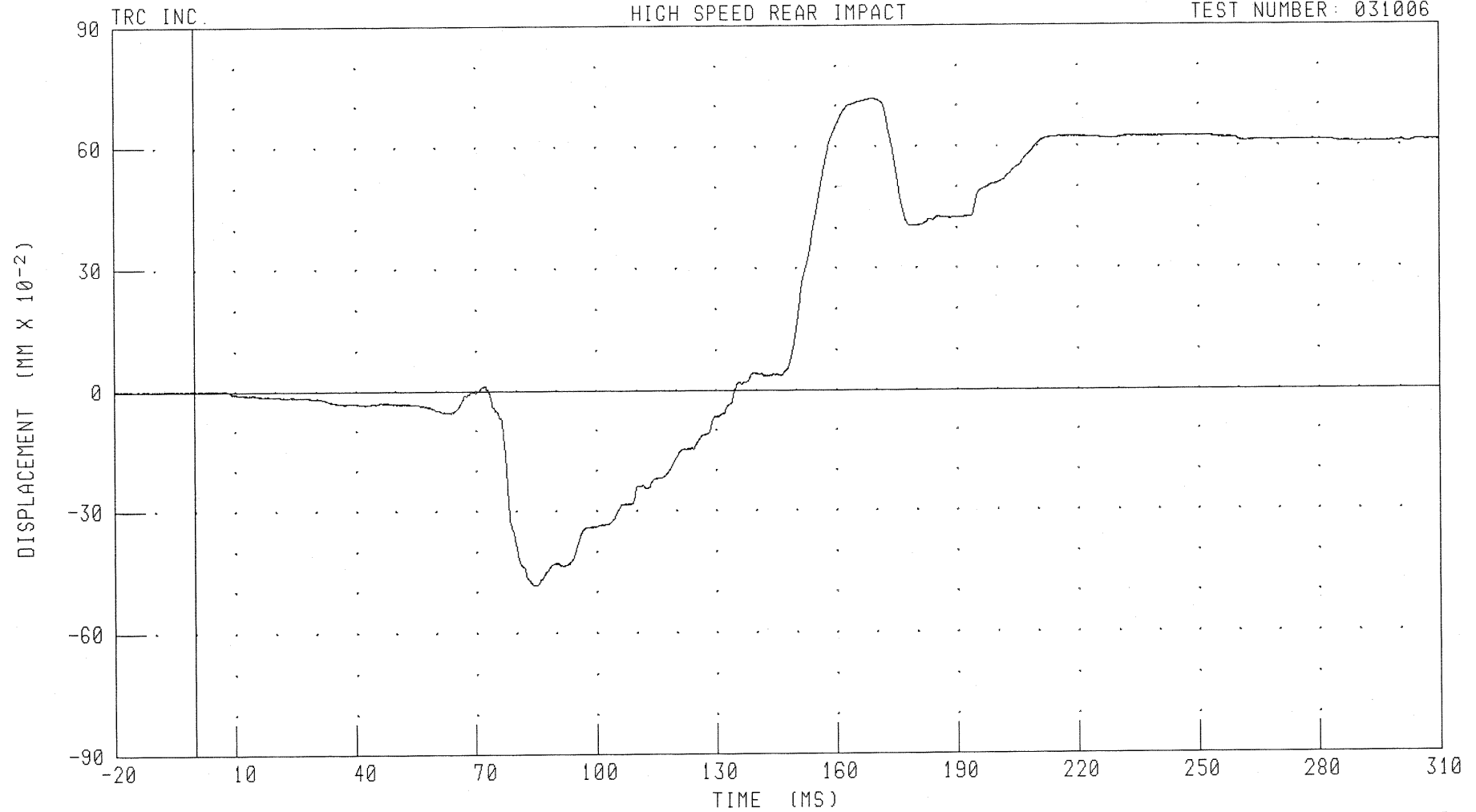
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER BELT SPOOL OUT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: SPOOL2 FILTER: CH. CLASS 1000

PEAK DATA: 0.72 MM @ 169.12 MS; -0.48 MM @ 85.12 MS

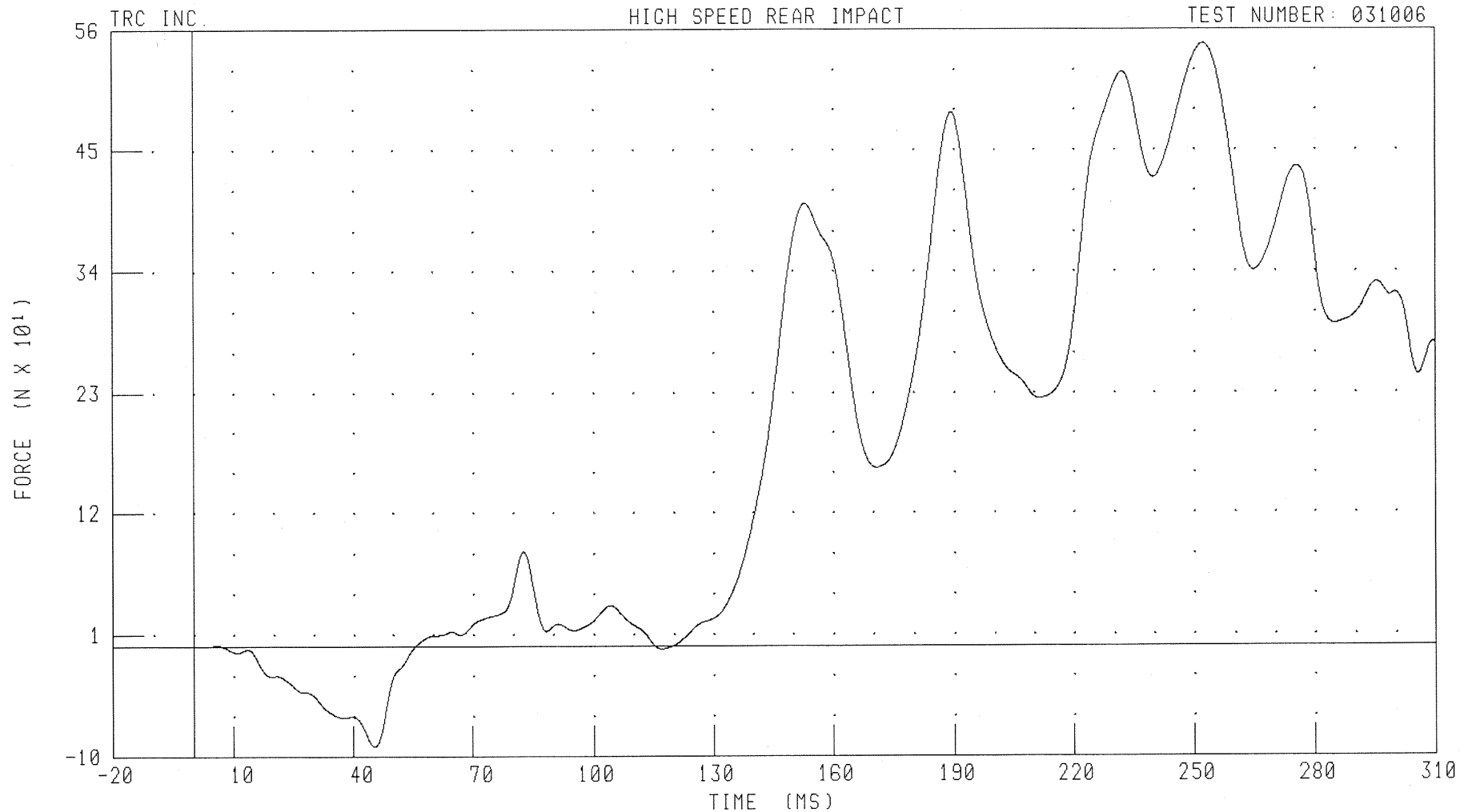
B-113

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER SHOULDER BELT FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: SHBF2

FILTER: CH. CLASS 60

PEAK DATA: 546.79 N @ 252.24 MS; -91.13 N @ 45.28 MS

B-114

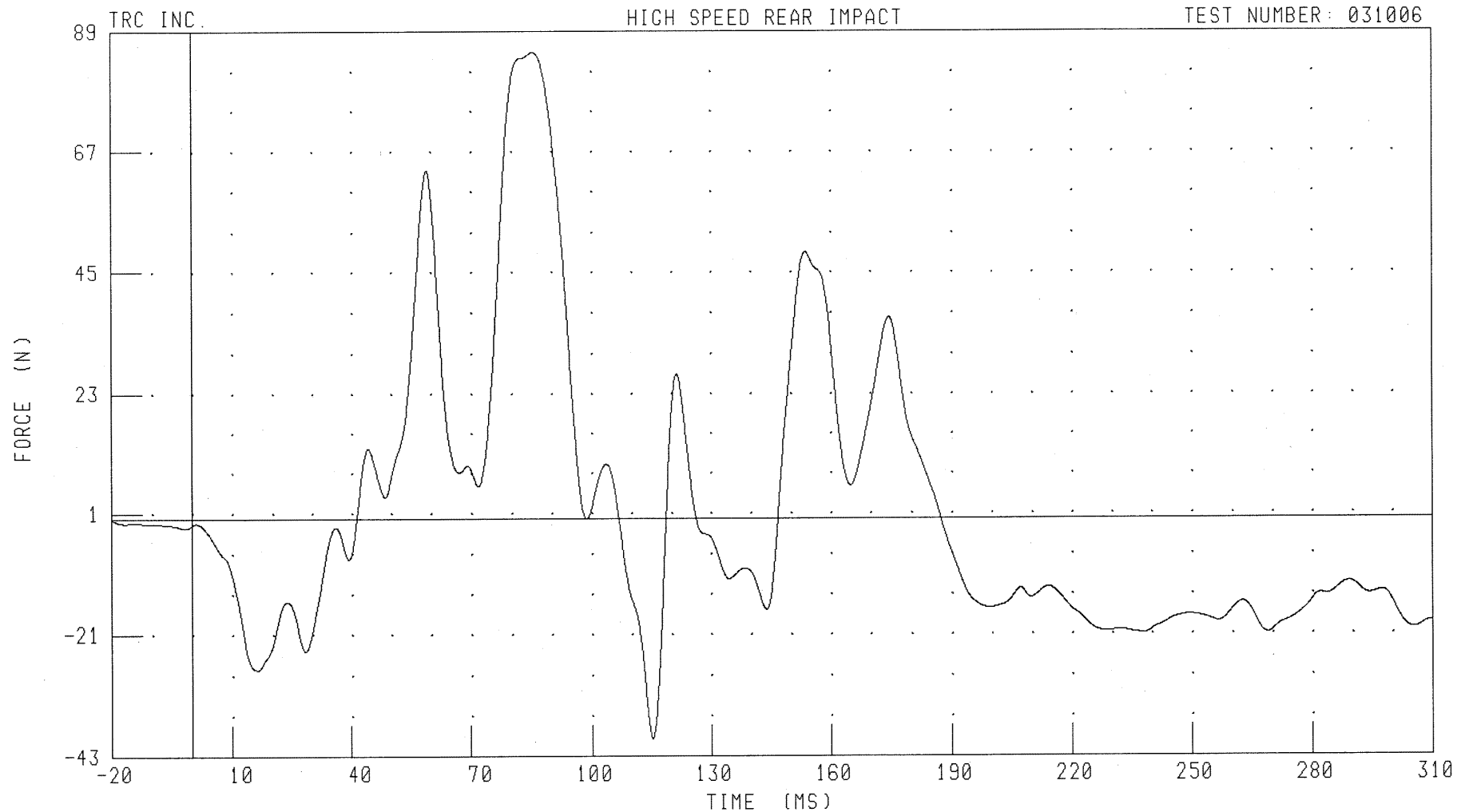
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER LAP BELT FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LBOF4

FILTER: CH. CLASS 60

PEAK DATA: 85.19 N @ 85.44 MS; -39.78 N @ 115.20 MS

B-115

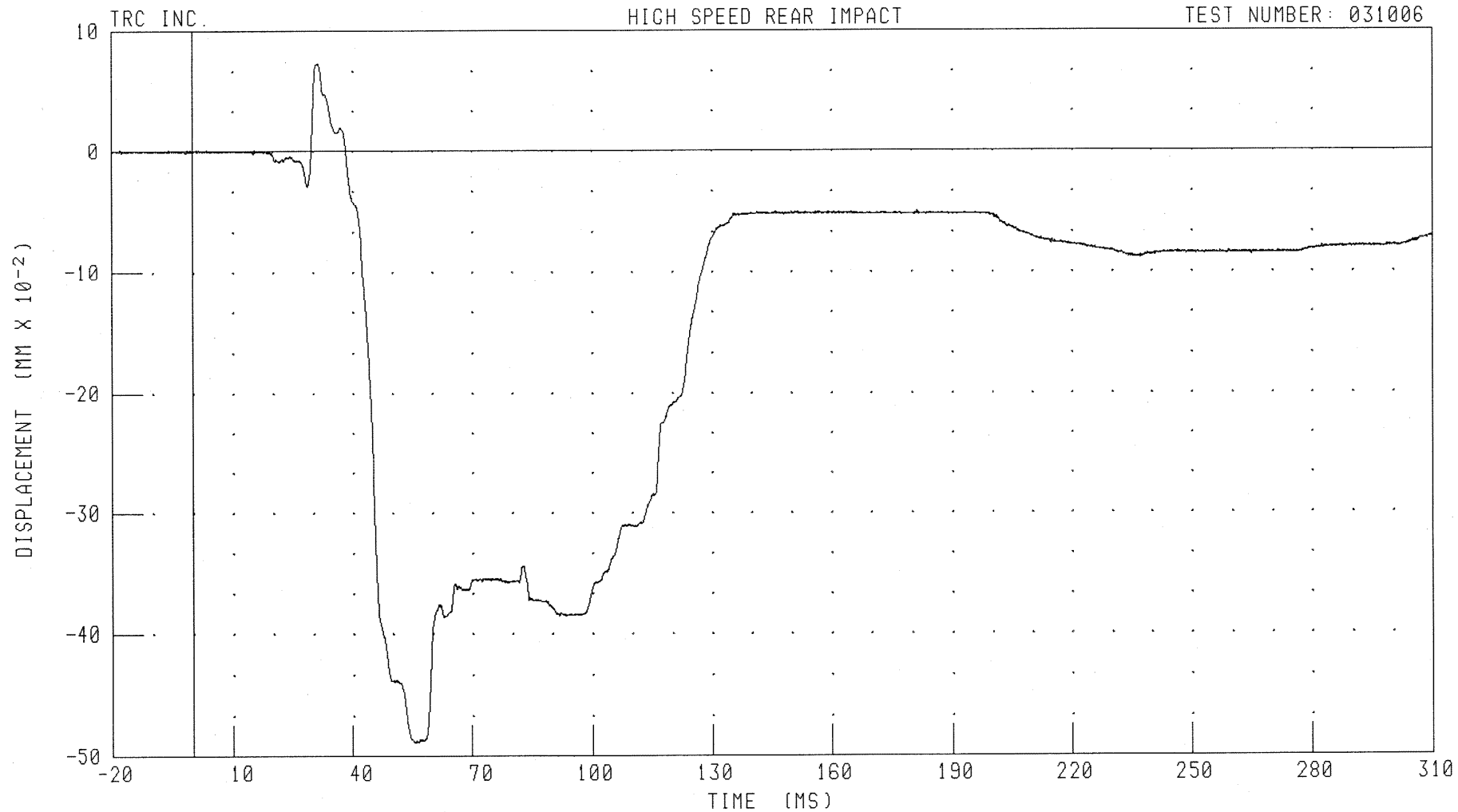
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER BELT SPOOL OUT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: SPOOL4 FILTER: CH. CLASS 1000

PEAK DATA: 0.07 MM @ 31.44 MS; -0.49 MM @ 56.40 MS

B-116

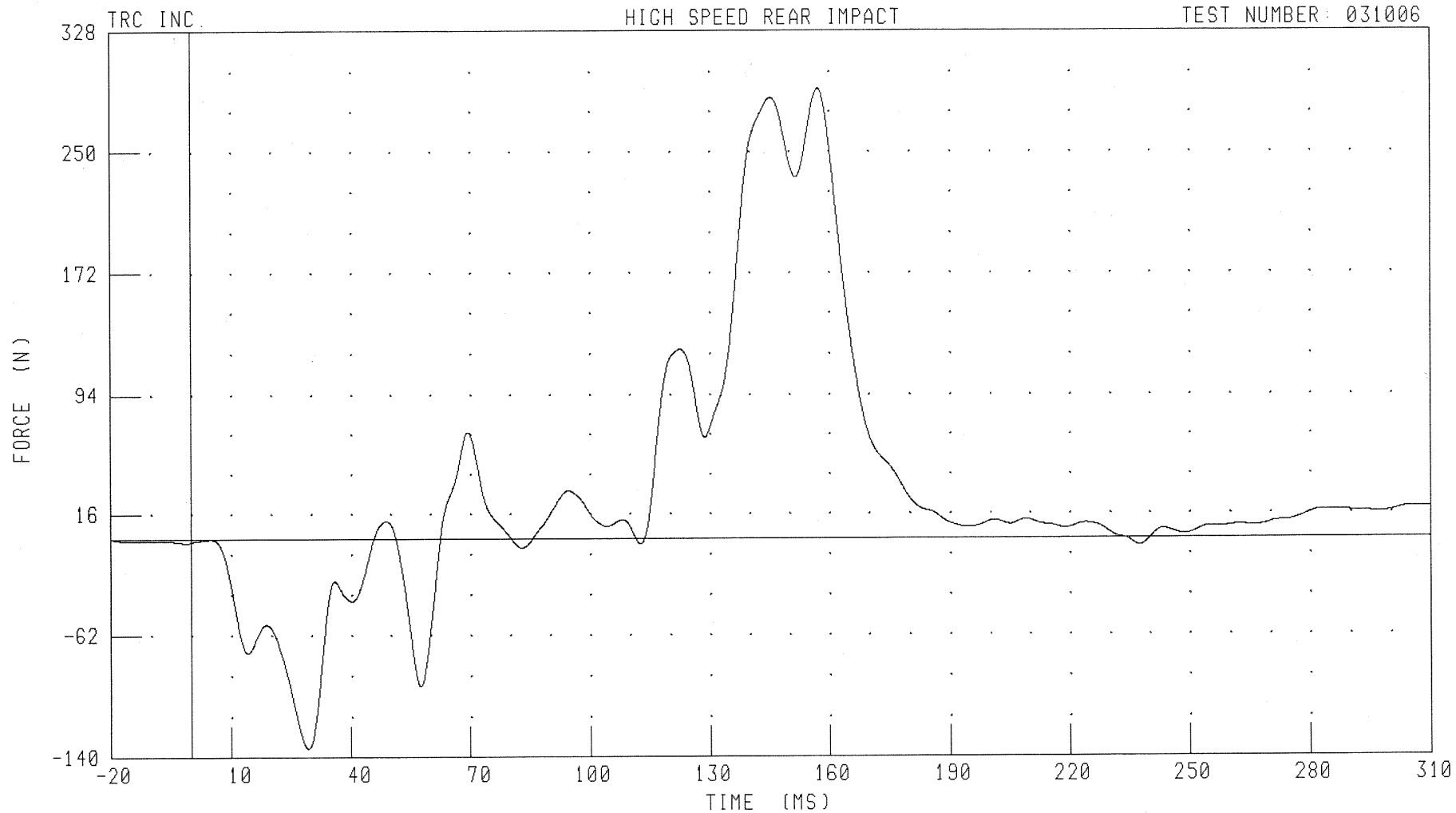
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

LEFT REAR PASSENGER SHOULDER BELT FORCE

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: SHBF4

FILTER: CH. CLASS 60

PEAK DATA: 290.97 N @ 157.36 MS; -134.69 N @ 29.20 MS

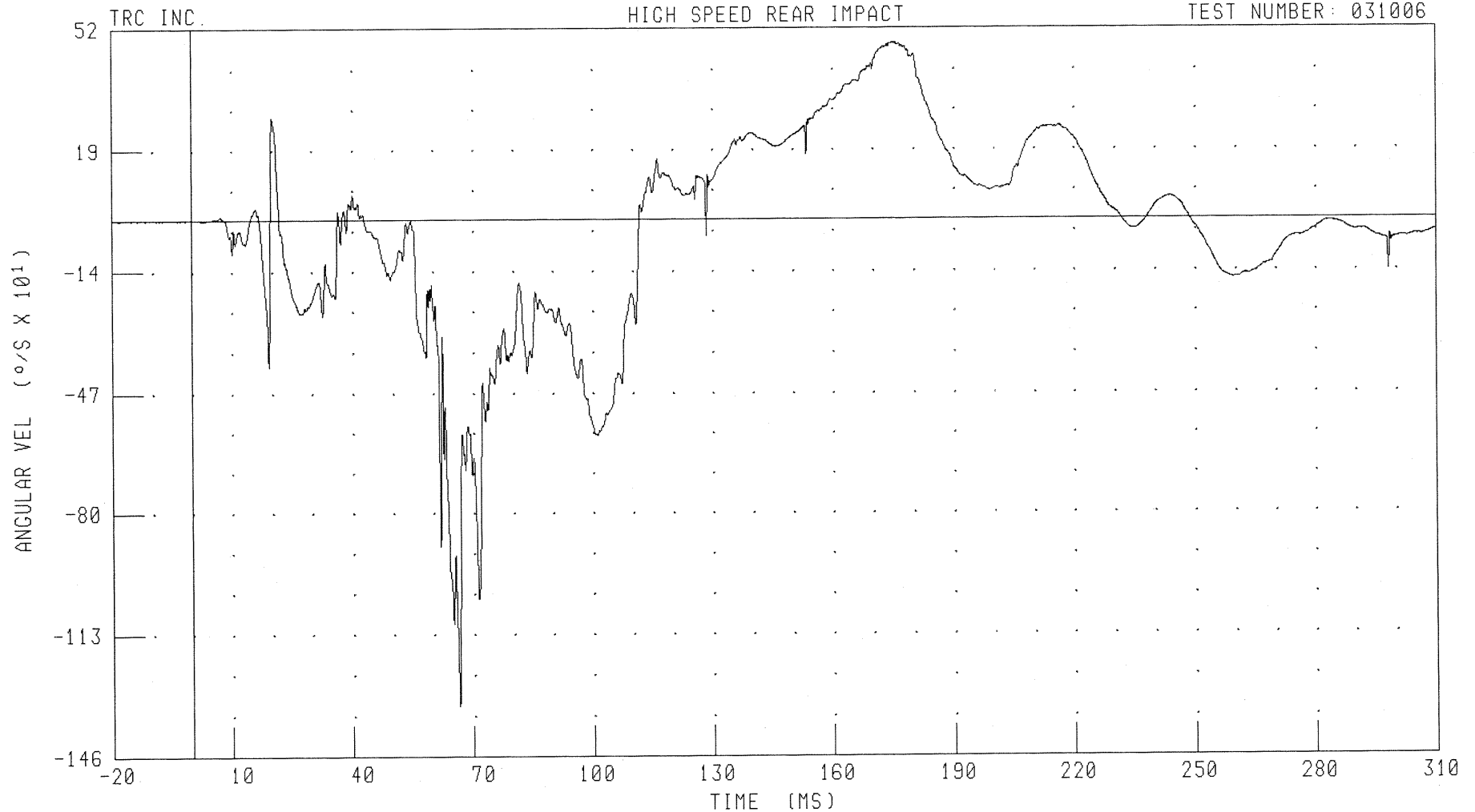
B-117

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER SEAT BACK LEFT Y-AXIS ANGULAR VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LANGV2 FILTER: CH. CLASS 1000

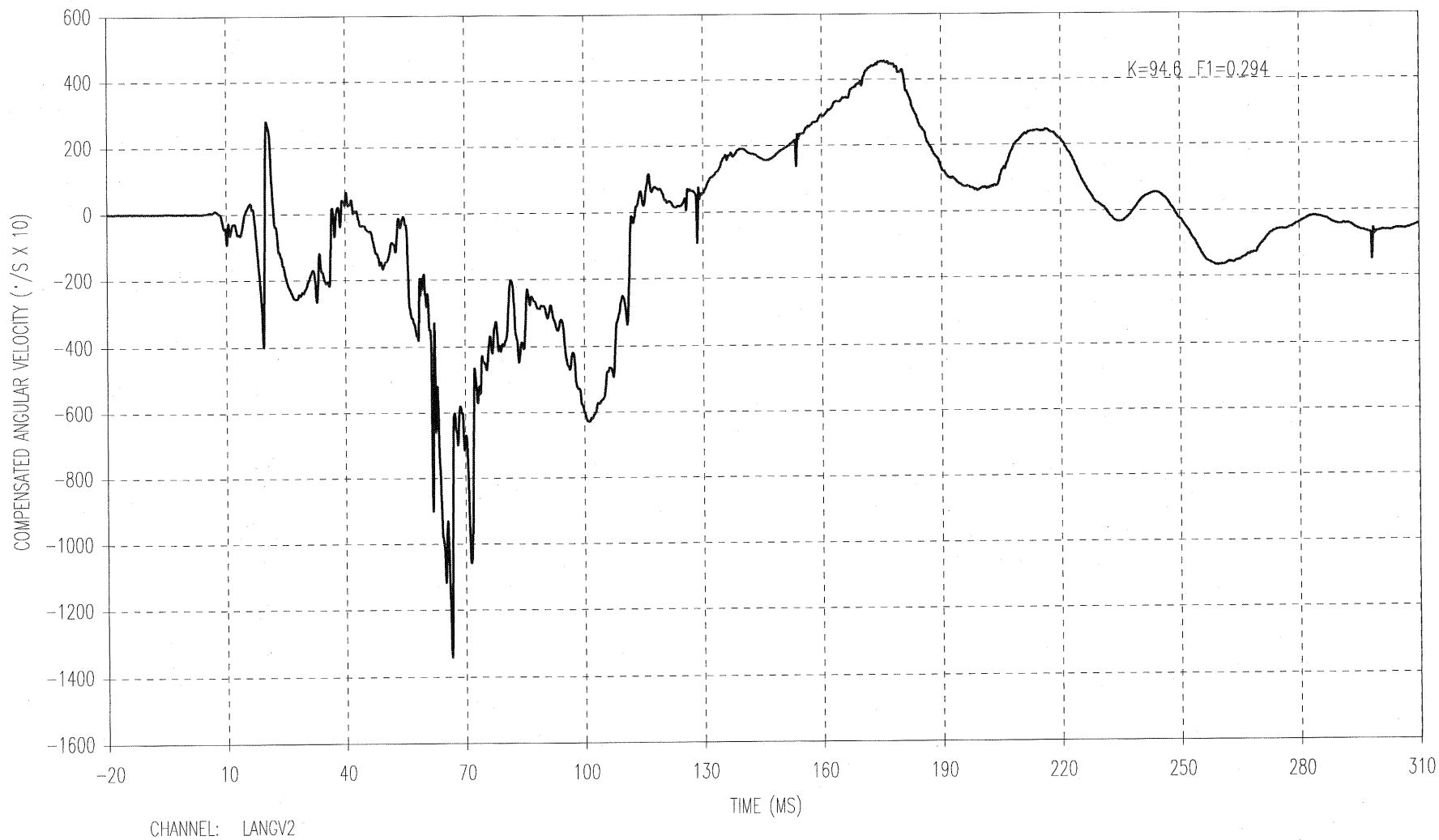
PEAK DATA: 481.61 $^{\circ}/S$ @ 175.68 MS; -1323.82 $^{\circ}/S$ @ 66.40 MS

B-118

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER SEAT BACK LEFT Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



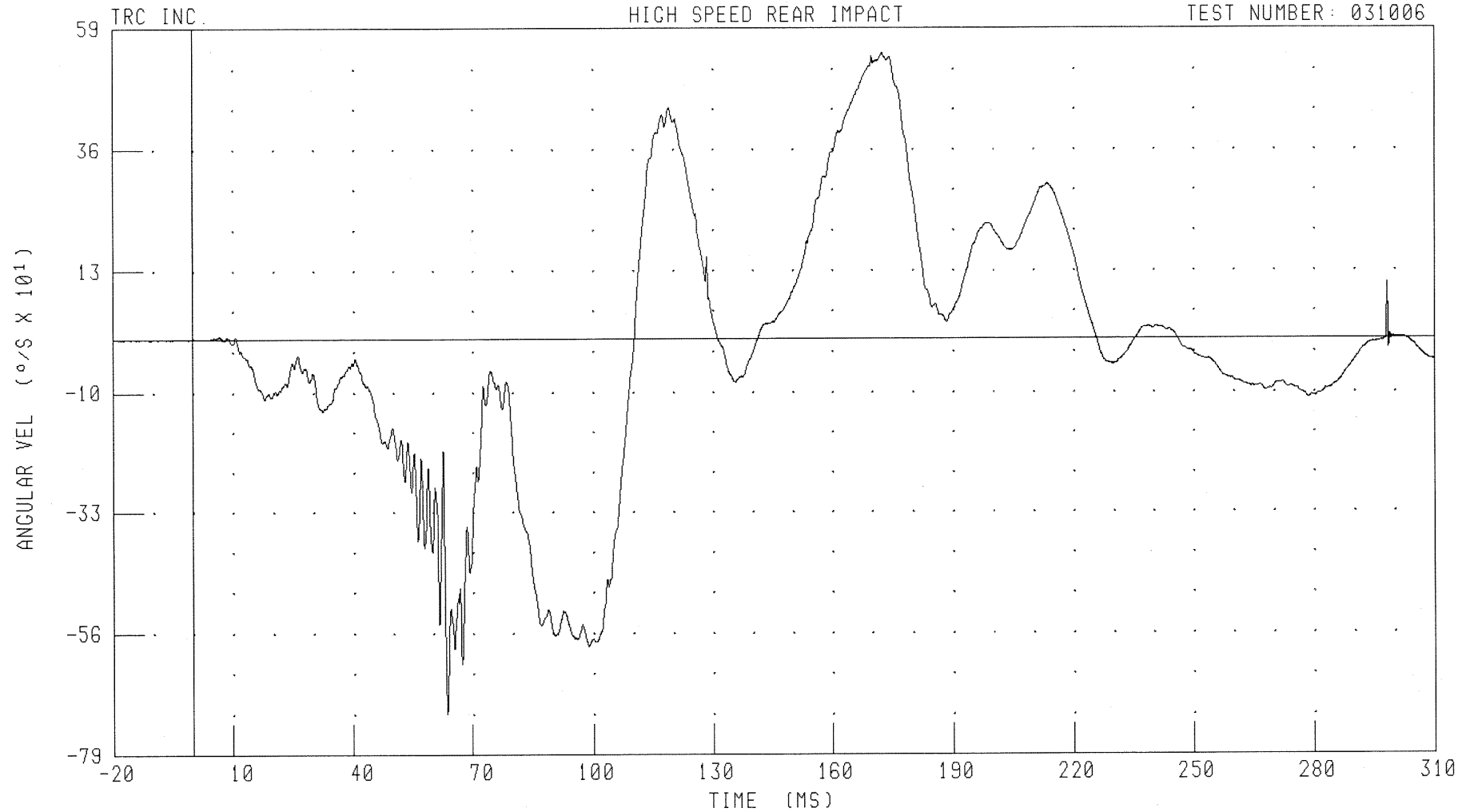
B-119

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER SEAT BACK RIGHT Y-AXIS ANGULAR VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RANGV2 FILTER: CH. CLASS 1000

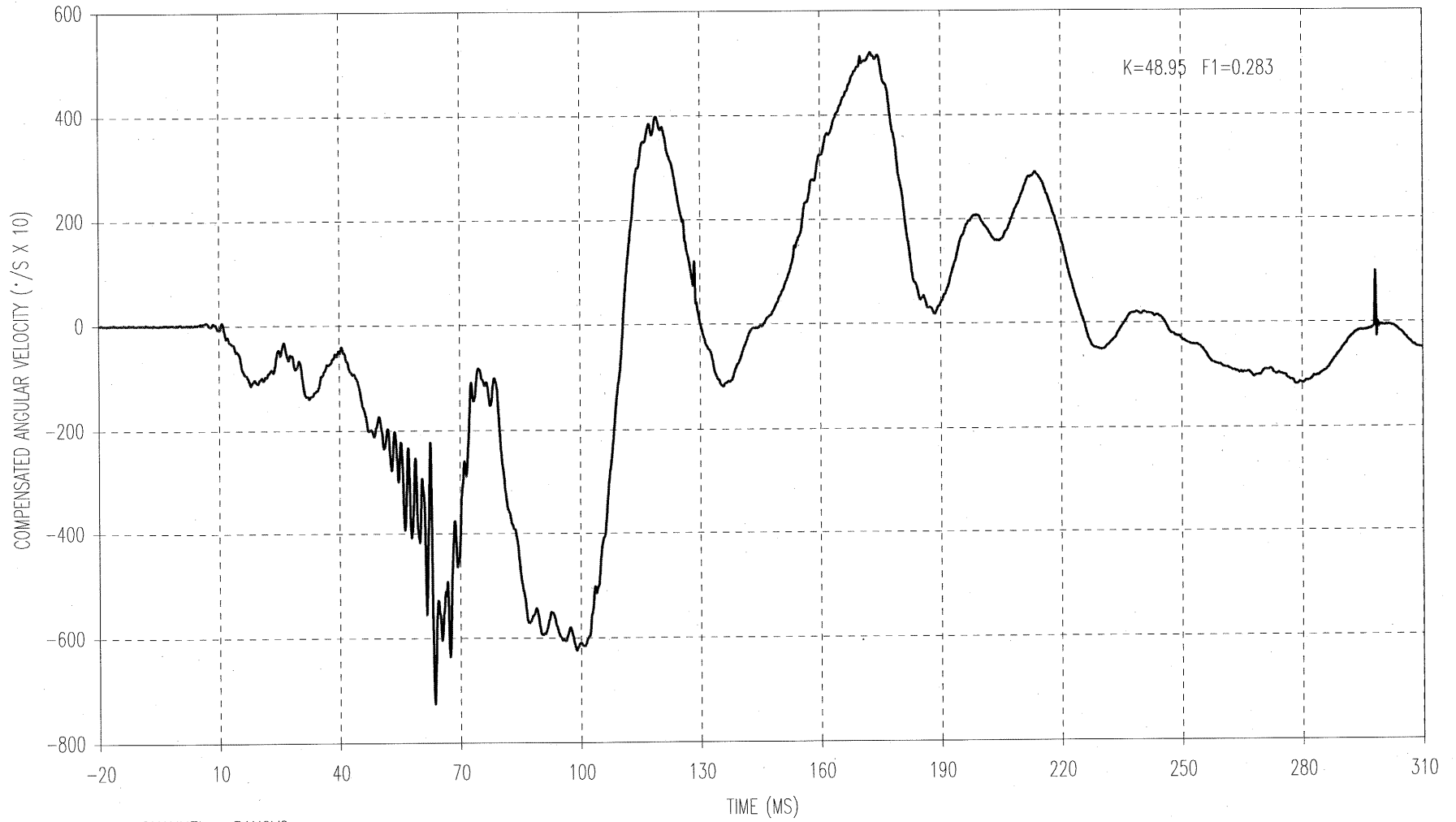
PEAK DATA: 543.41 °/S @ 172.56 MS; -712.04 °/S @ 63.60 MS

B-120

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER SEAT BACK RIGHT Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



B-121

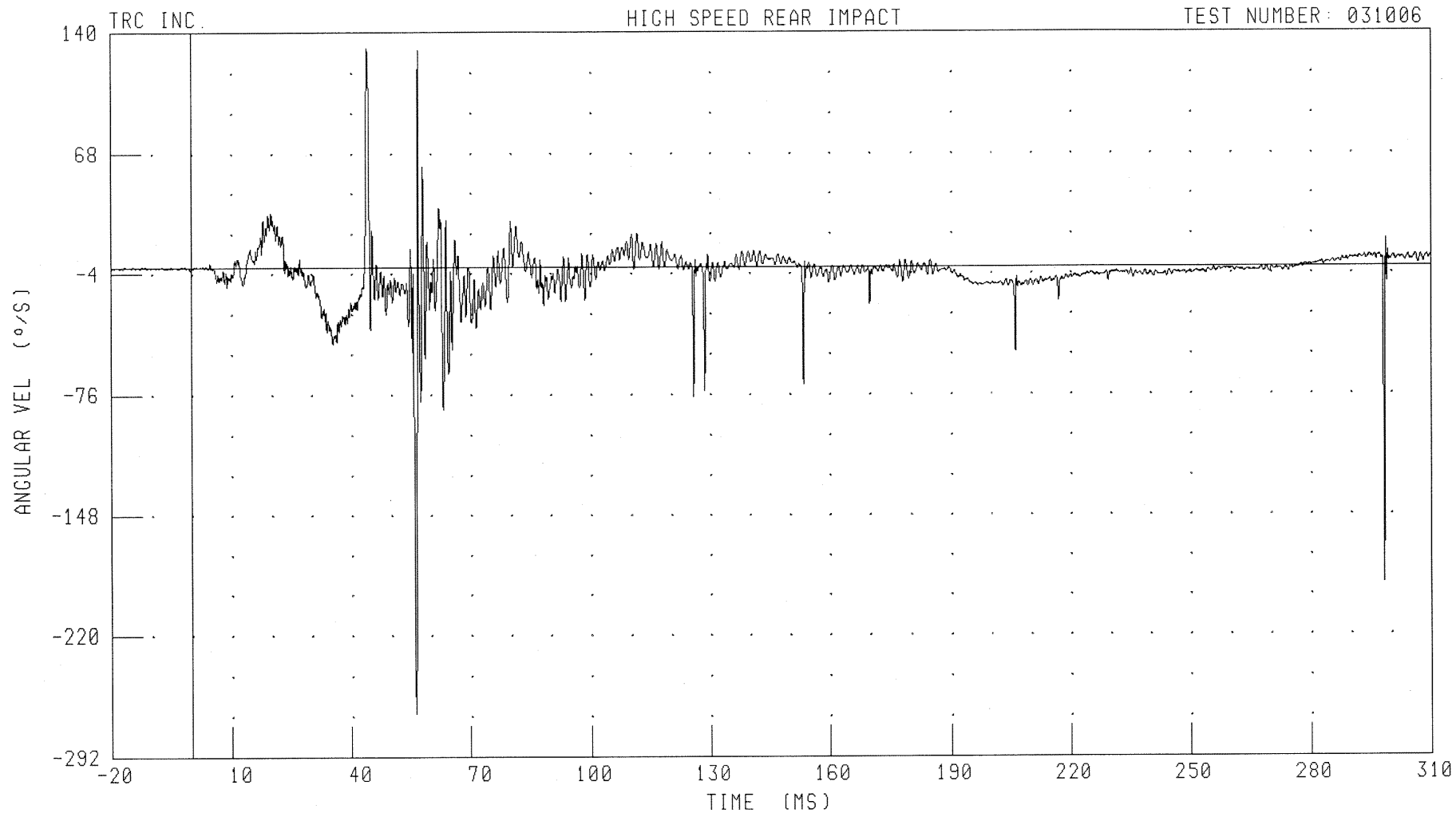
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

RIGHT FRONT PASSENGER DOOR SILL Y-AXIS ANGULAR VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



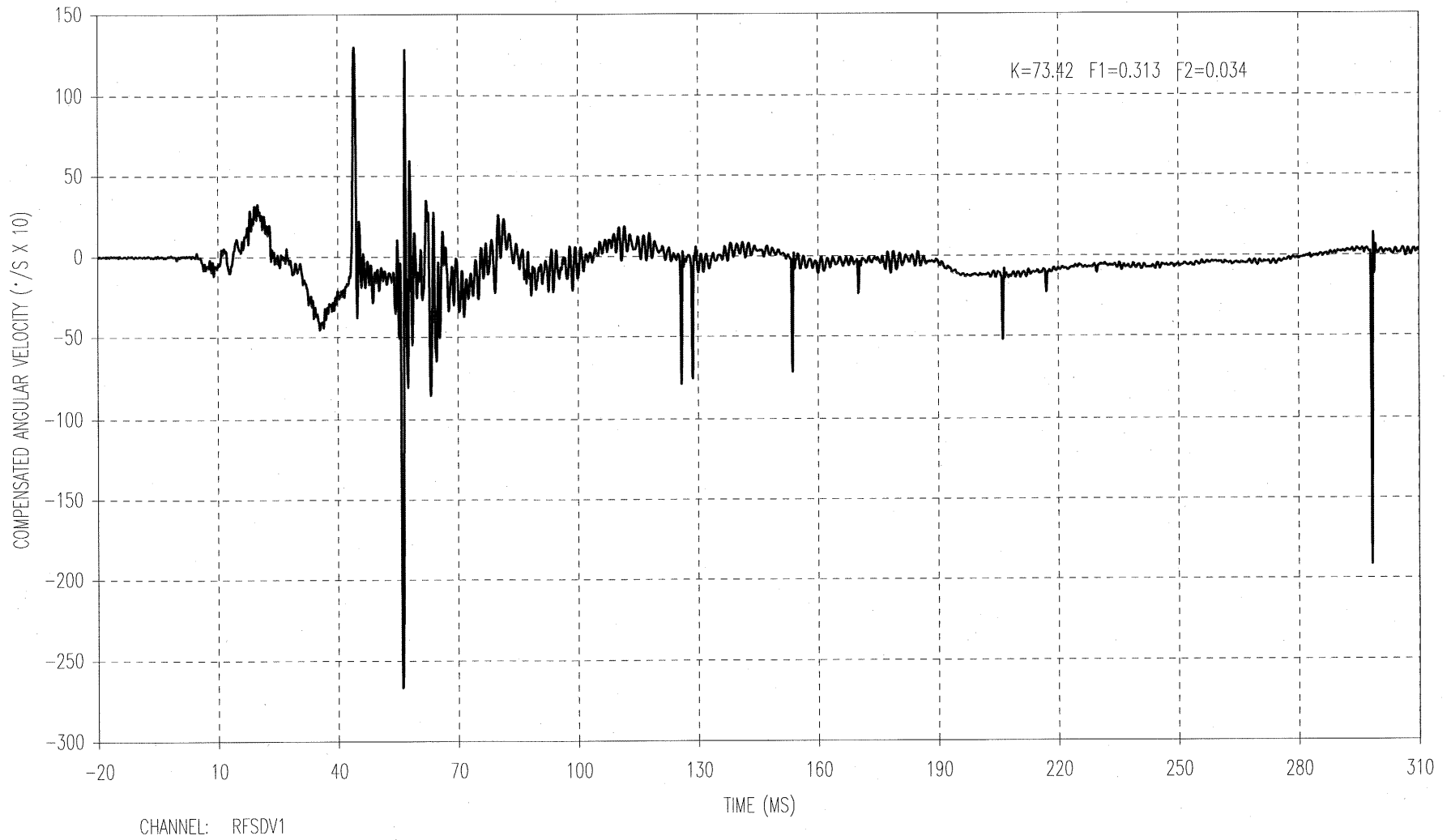
CHANNEL: RFSDV1 FILTER: CH. CLASS 1000

B-122

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER DOOR SILL Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA
HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



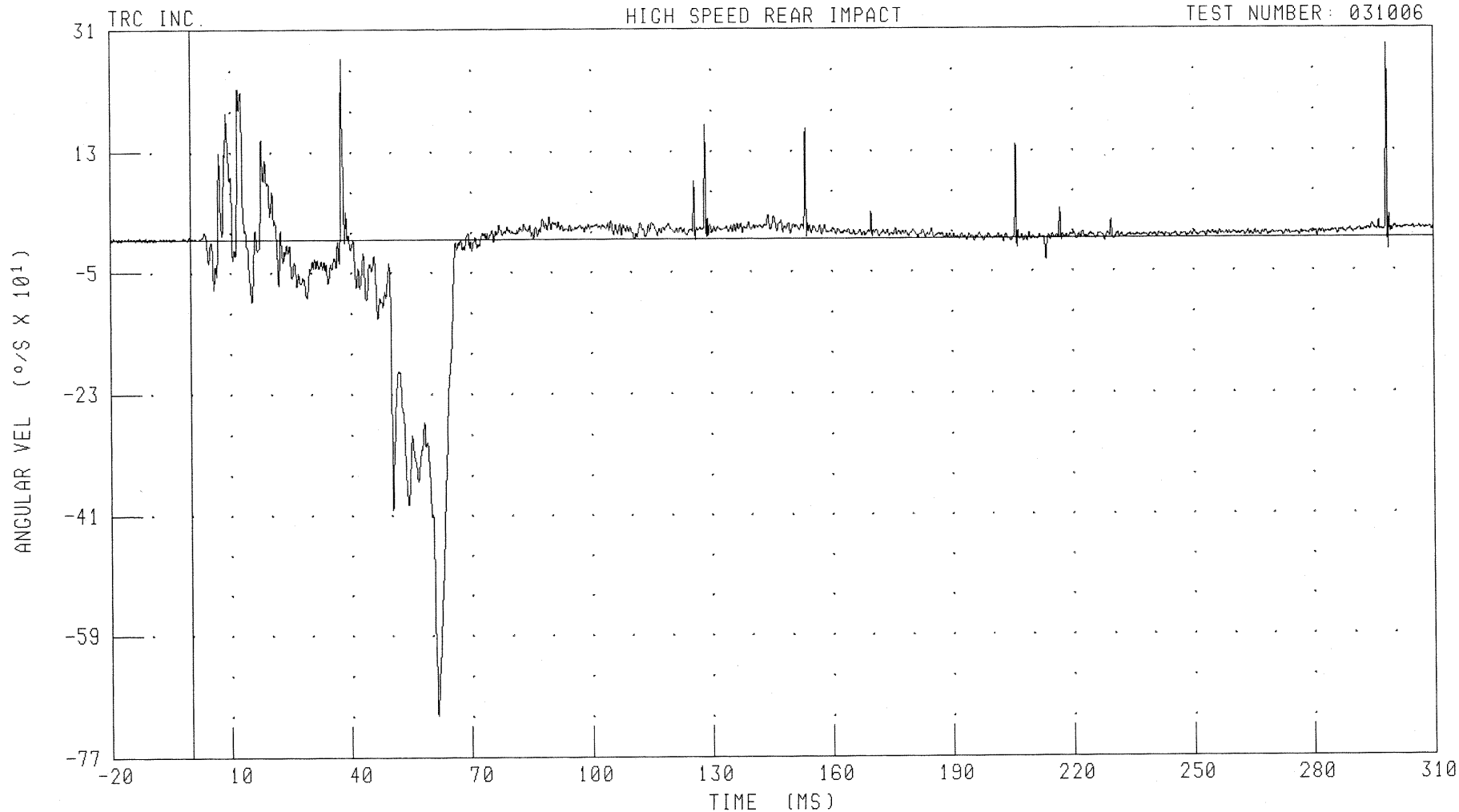
B-123

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER DOOR SILL Y-AXIS ANGULAR VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



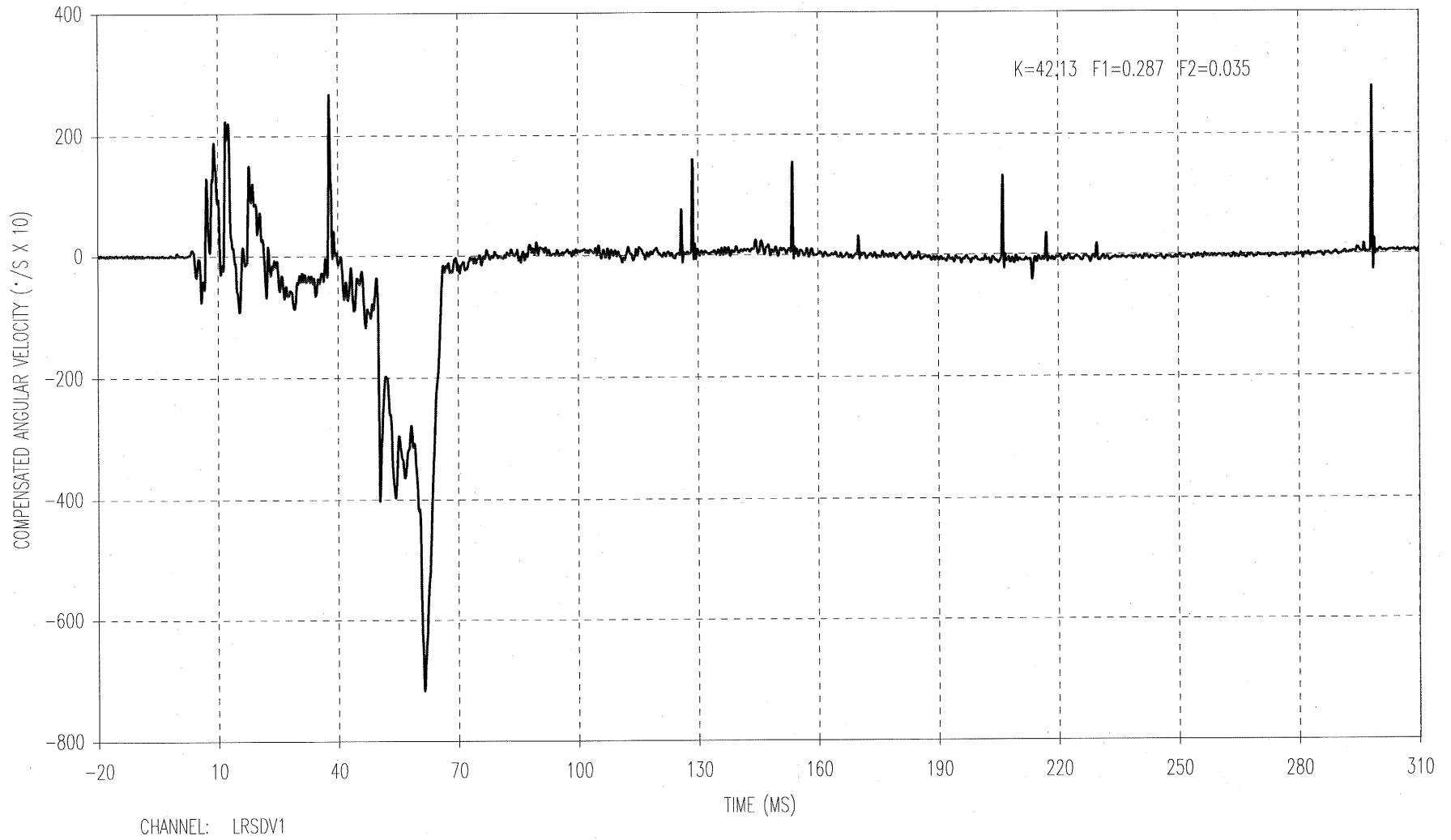
CHANNEL: LRSDV1 FILTER: CH. CLASS 1000

B-124

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
LEFT REAR PASSENGER DOOR SILL Y-AXIS ANGULAR VELOCITY - COMPENSATED DATA.
HIGH SPEED REAR IMPACT

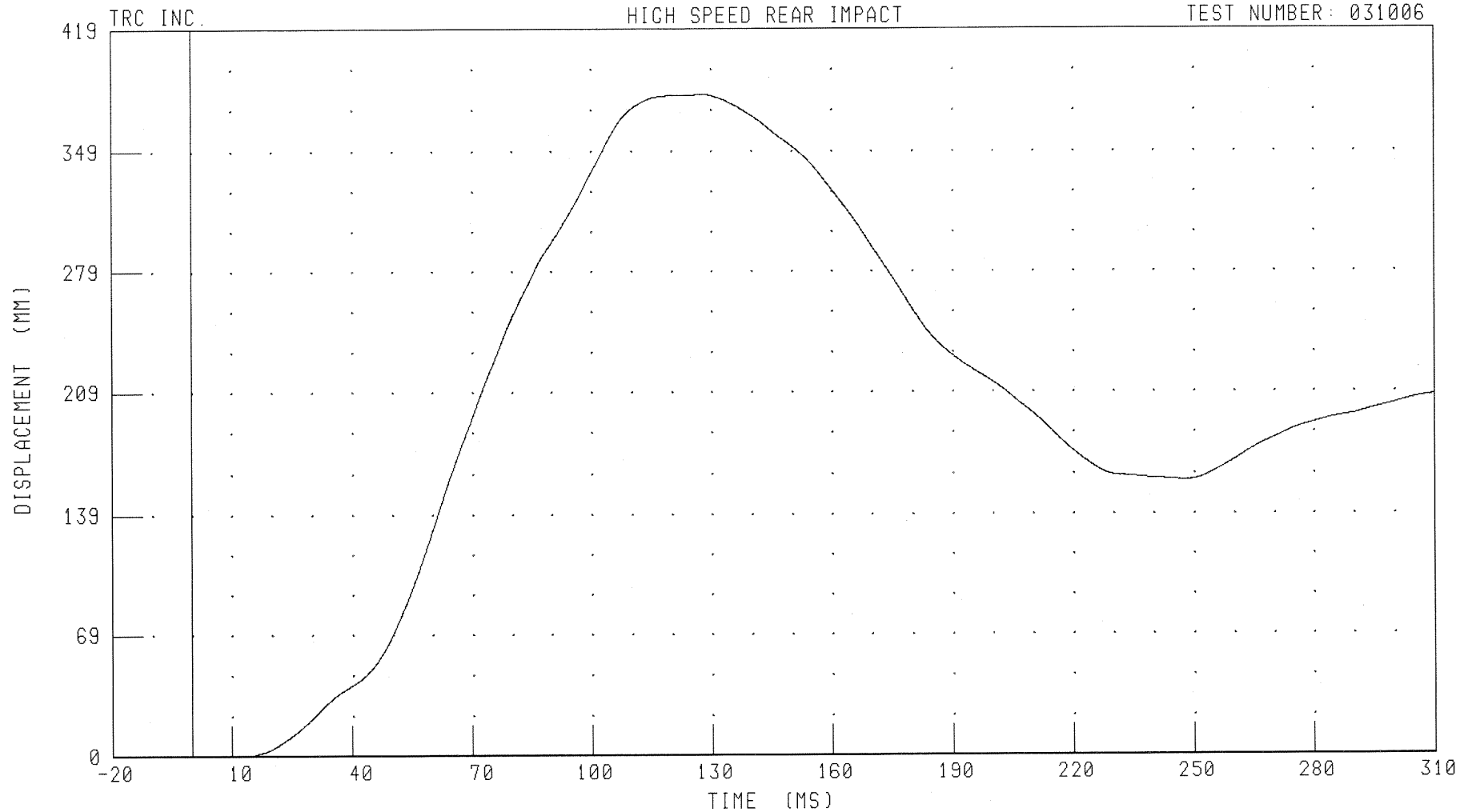
TEST NUMBER: 031006



47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER LEFT SEATBACK LINEAR DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LLIND2 FILTER: CH. CLASS 1000

PEAK DATA: 381.97 MM @ 127.60 MS; -0.49 MM @ 12.80 MS

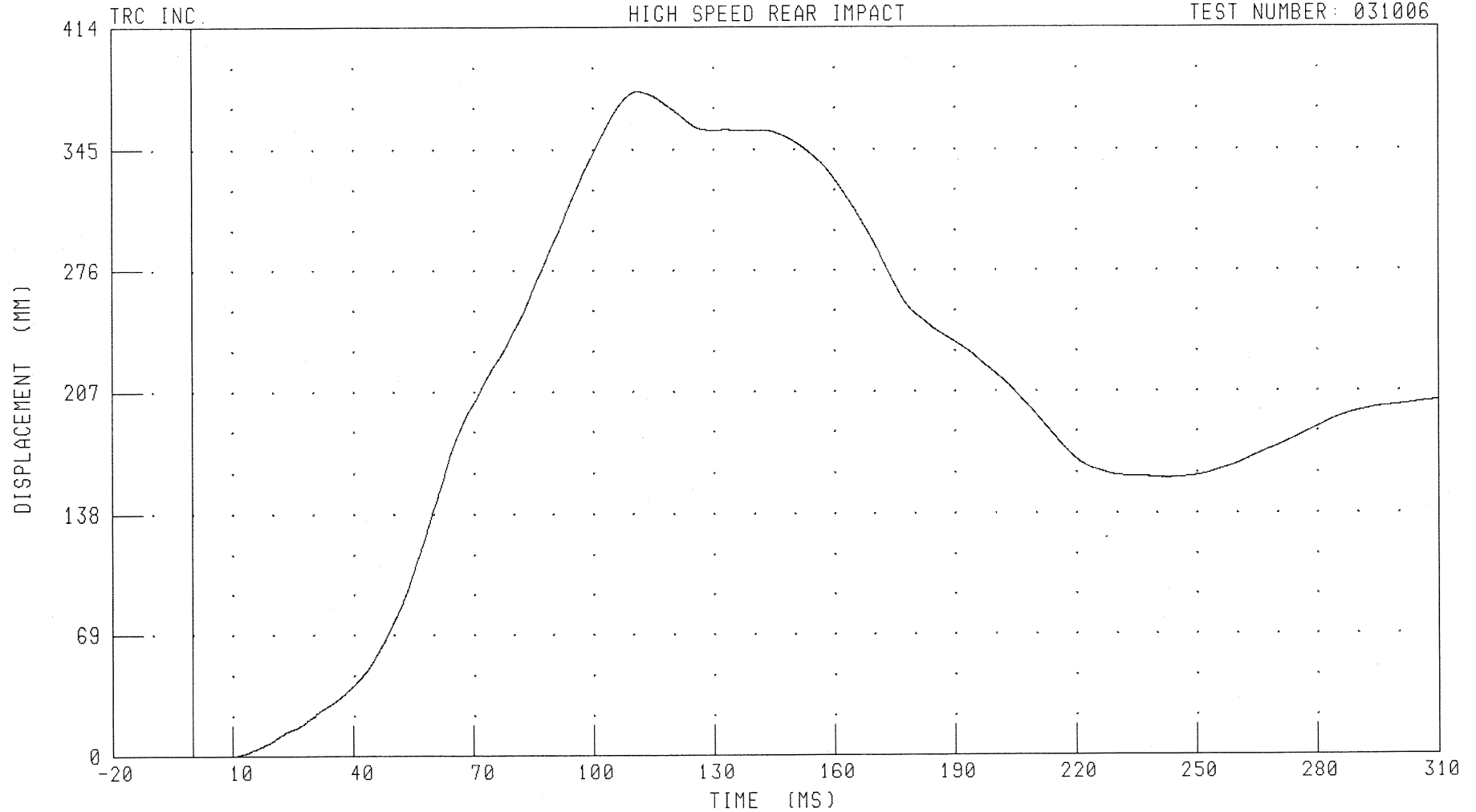
B-126

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
RIGHT FRONT PASSENGER RIGHT SEATBACK LINEAR DISPLACEMENT

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: RLIND2 FILTER: CH. CLASS 1000

PEAK DATA: 377.26 MM @ 111.12 MS; -0.06 MM @ -17.52 MS

B-127

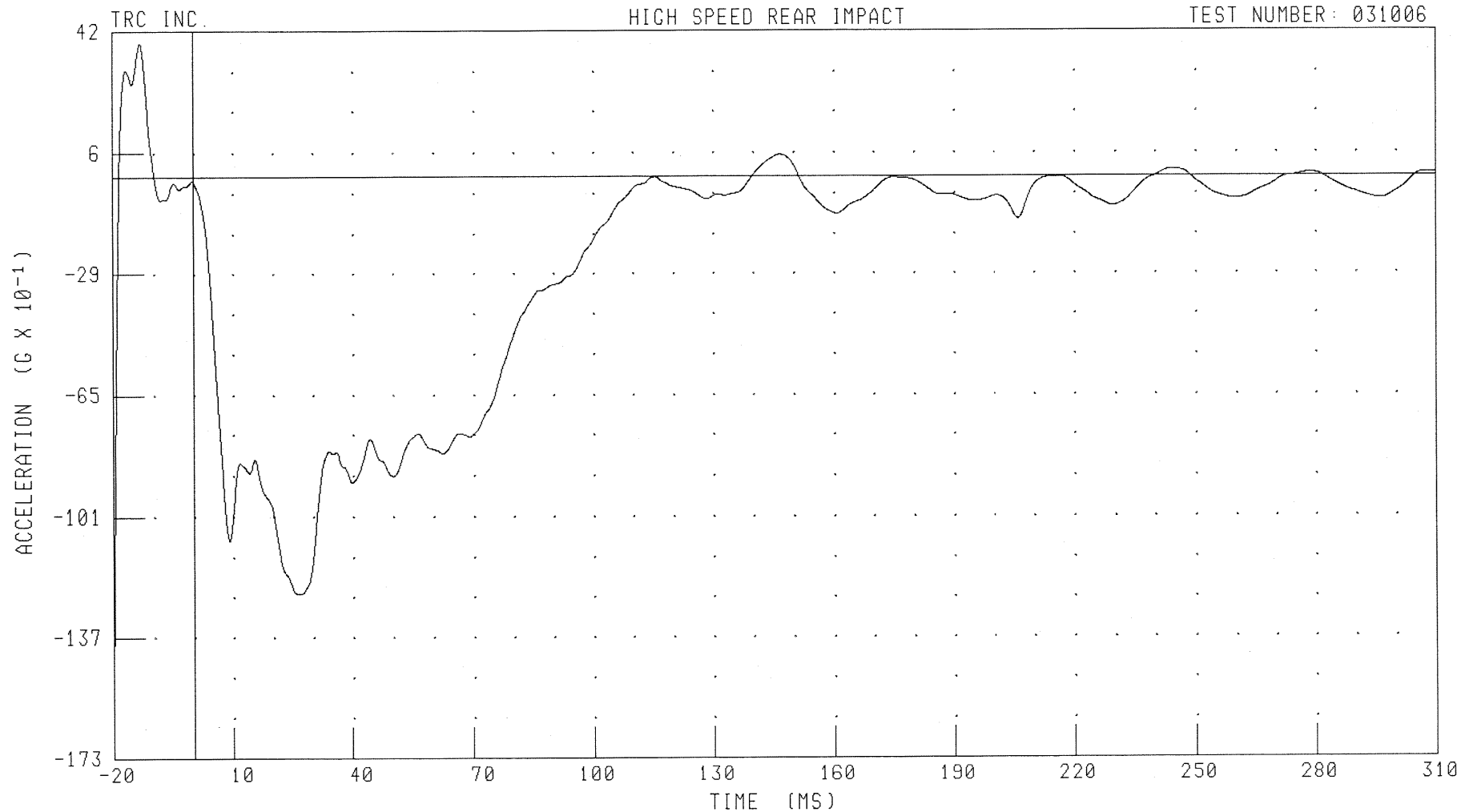
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 3.95 G @ -13.20 MS; -15.74 G @ -20.00 MS

B-128

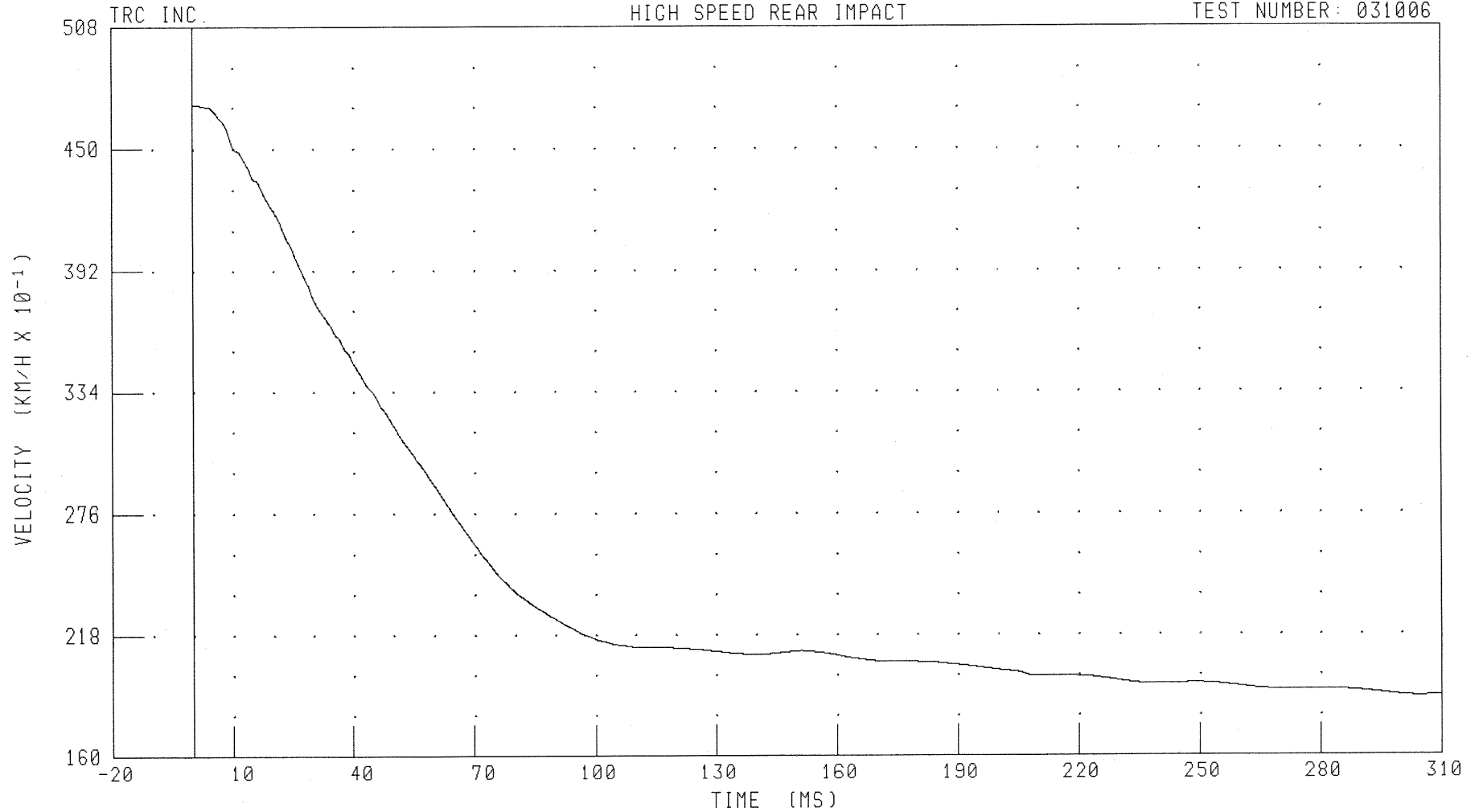
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 47.10 KM/H @ 0.16 MS; 18.81 KM/H @ 304.32 MS

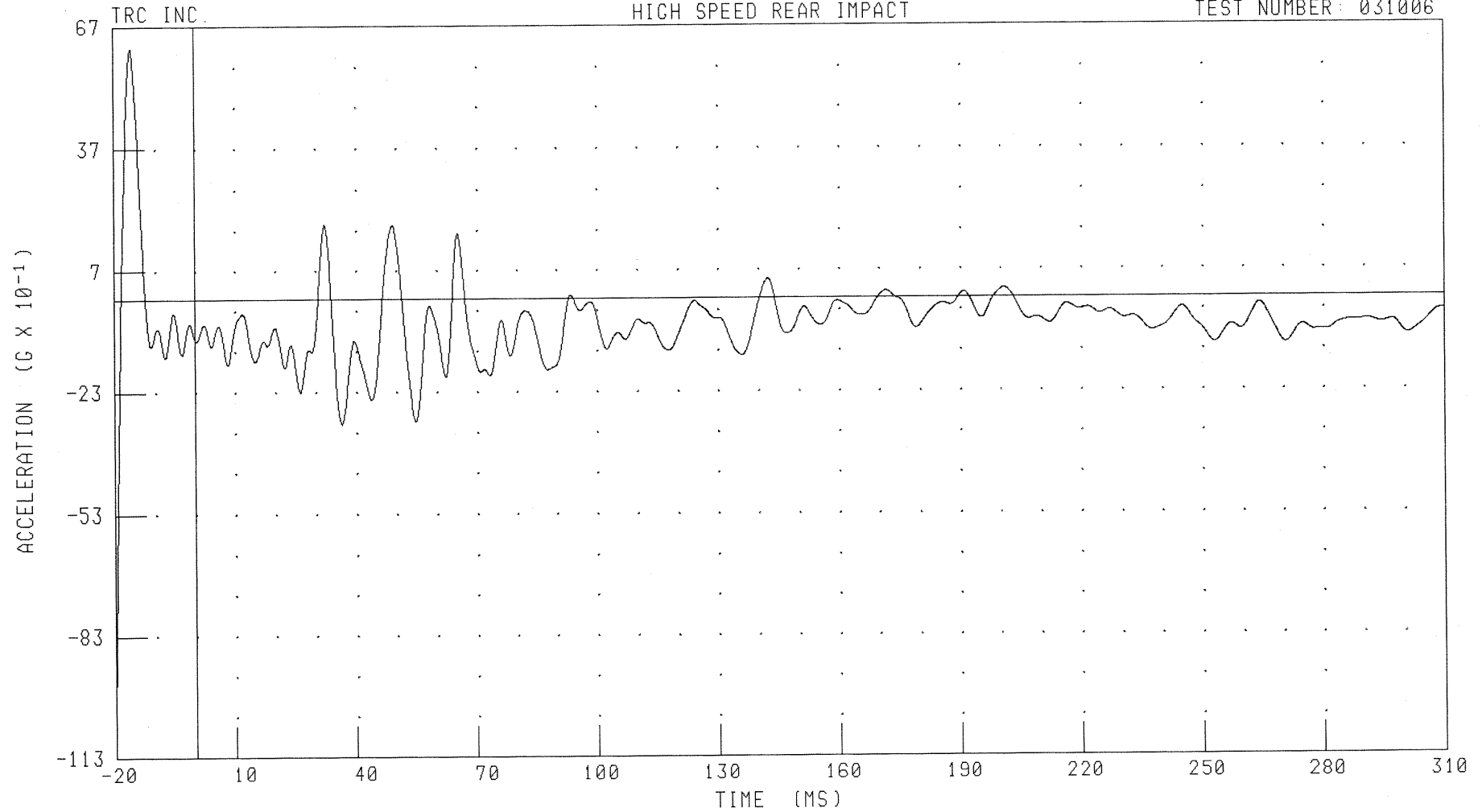
B-129

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGYG1

FILTER: CH. CLASS 60

PEAK DATA: 6.17 G @ -15.92 MS; -10.47 G @ -20.00 MS

B-130

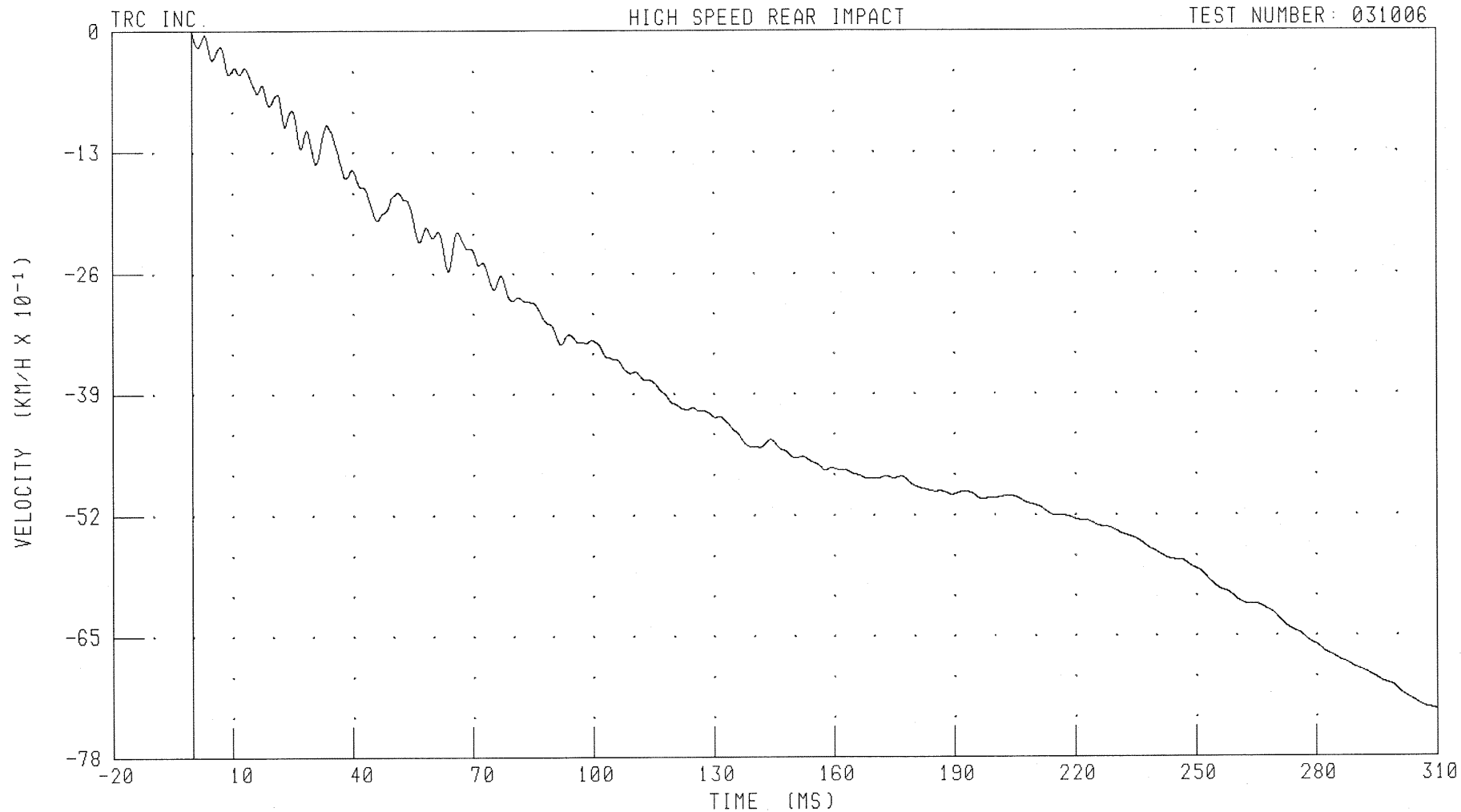
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGYV1

FILTER: CH. CLASS 180

PEAK DATA: 0.00 KM/H @ 0.00 MS; -7.30 KM/H @ 310.00 MS

B-131

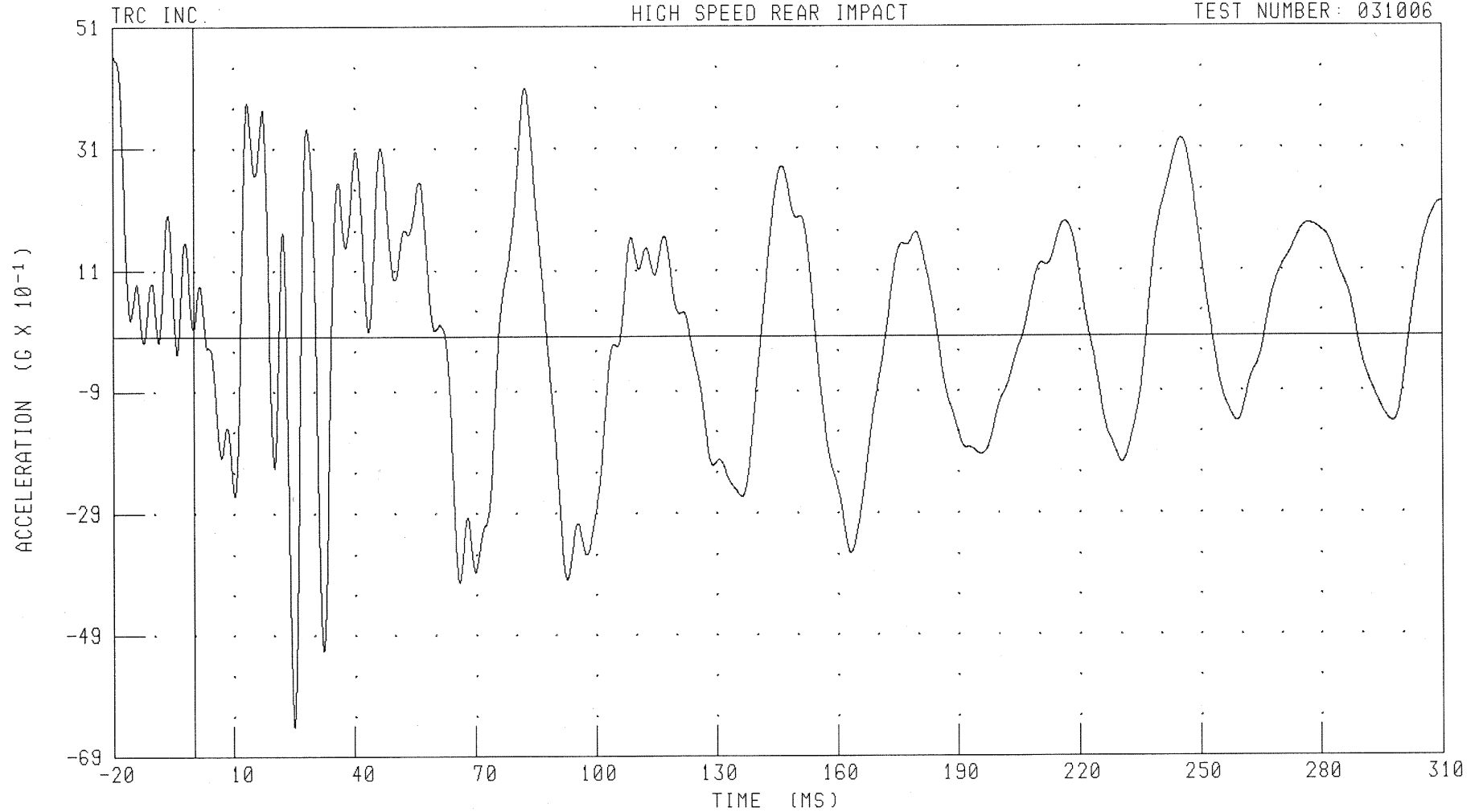
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER CENTER OF GRAVITY Z-AXIS ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGZG1

FILTER: CH. CLASS 60

PEAK DATA: 4.67 G @ -20.00 MS; -6.41 G @ 25.12 MS

B-132

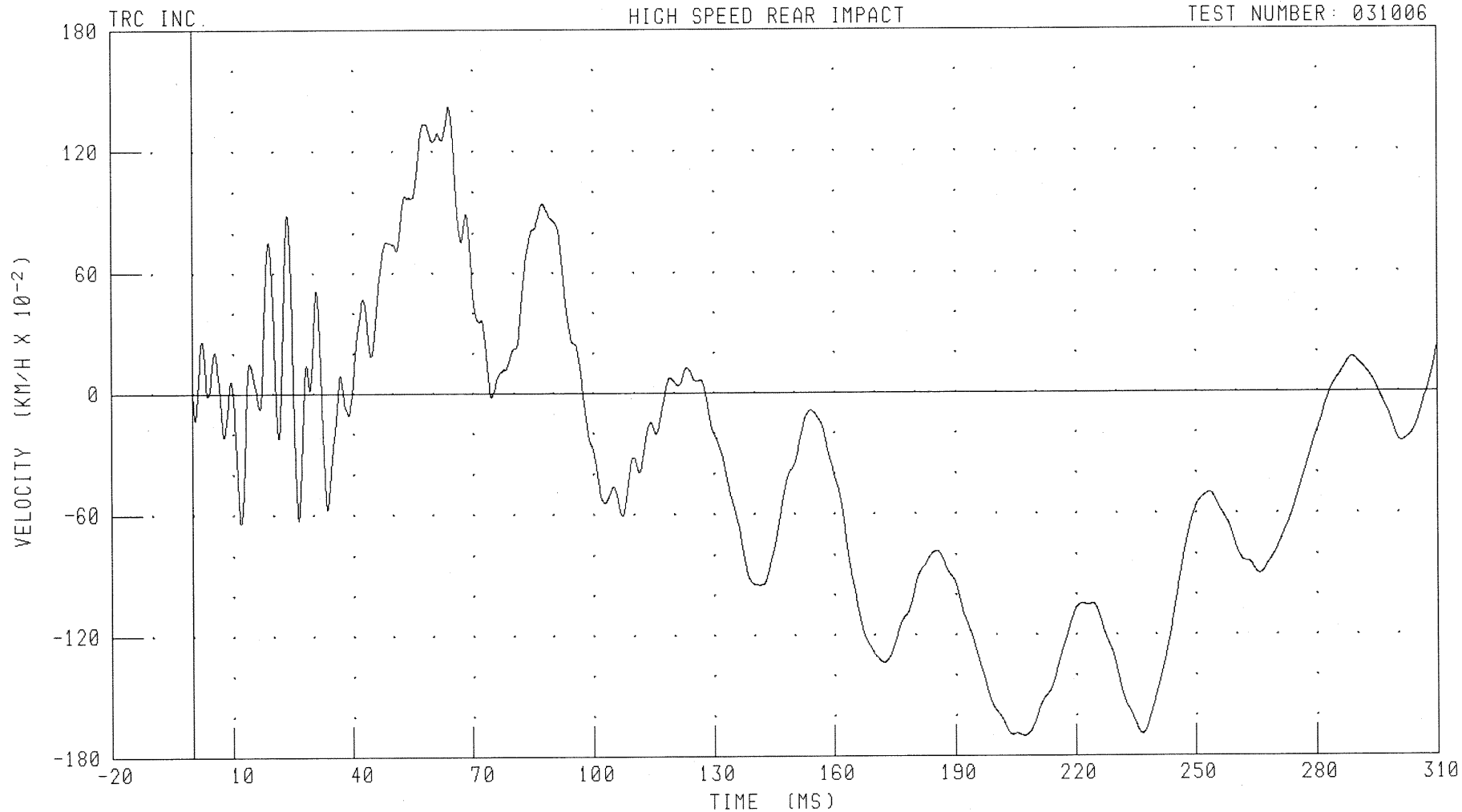
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER CENTER OF GRAVITY Z-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGZV1

FILTER: CH. CLASS 180

PEAK DATA: 1.42 KM/H @ 64.24 MS; -1.70 KM/H @ 207.12 MS

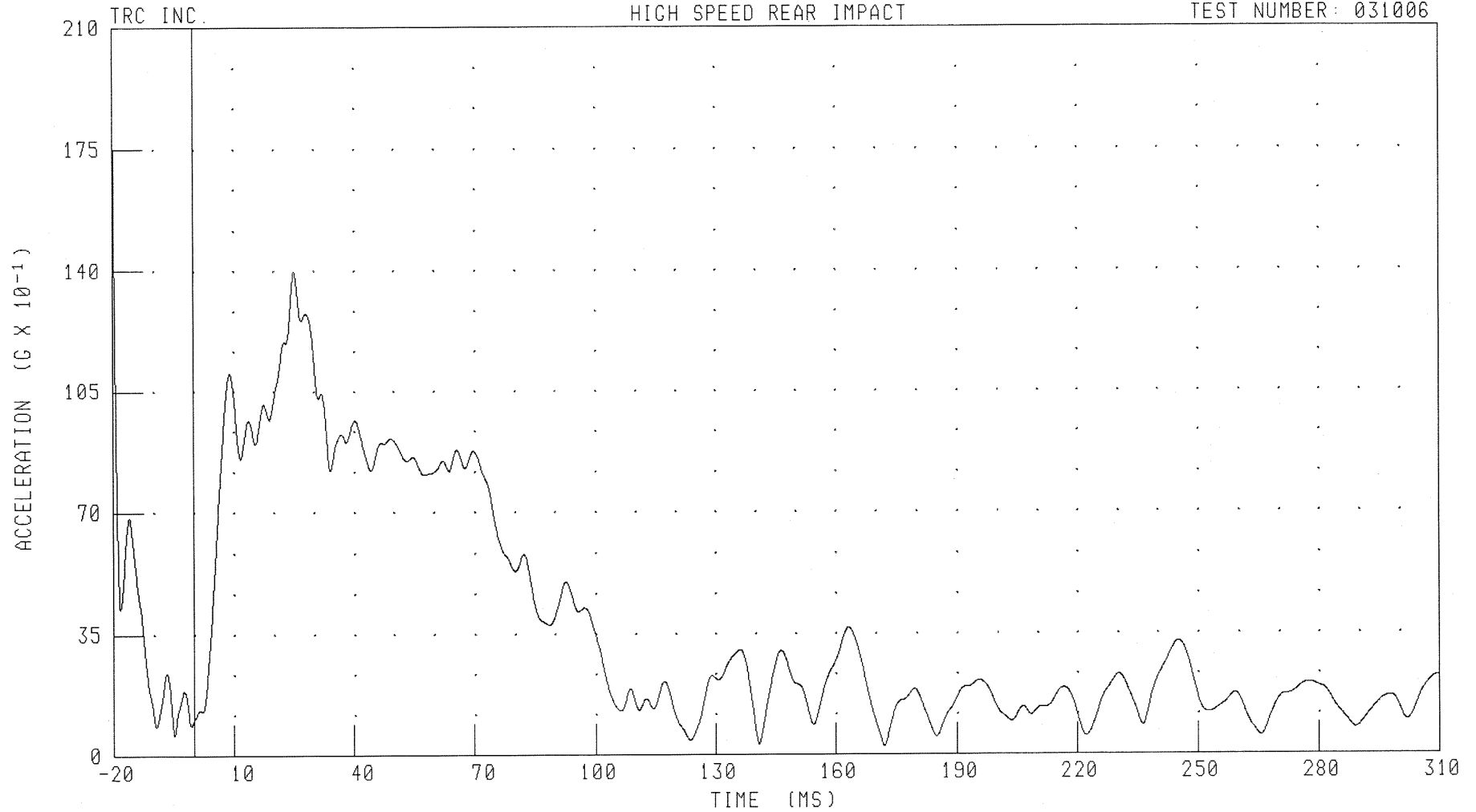
B-133

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: BCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 19.47 G @ -20.00 MS; 0.25 G @ 172.08 MS

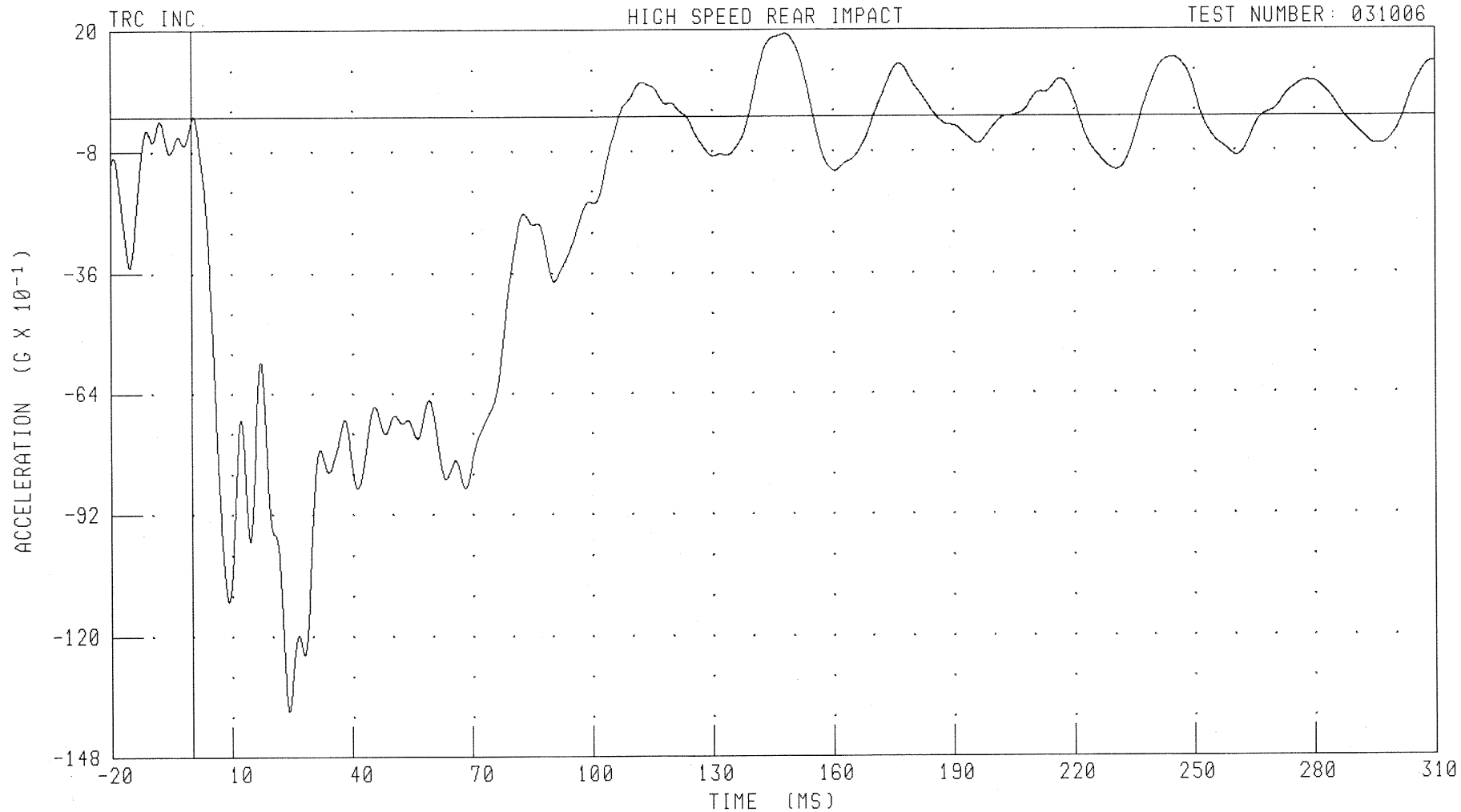
B-134

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER LEFT REAR X-AXIS ACCELERATION

TEST NUMBER: 031006



CHANNEL: LRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.90 G @ 148.24 MS; -13.75 G @ 24.16 MS

B-135

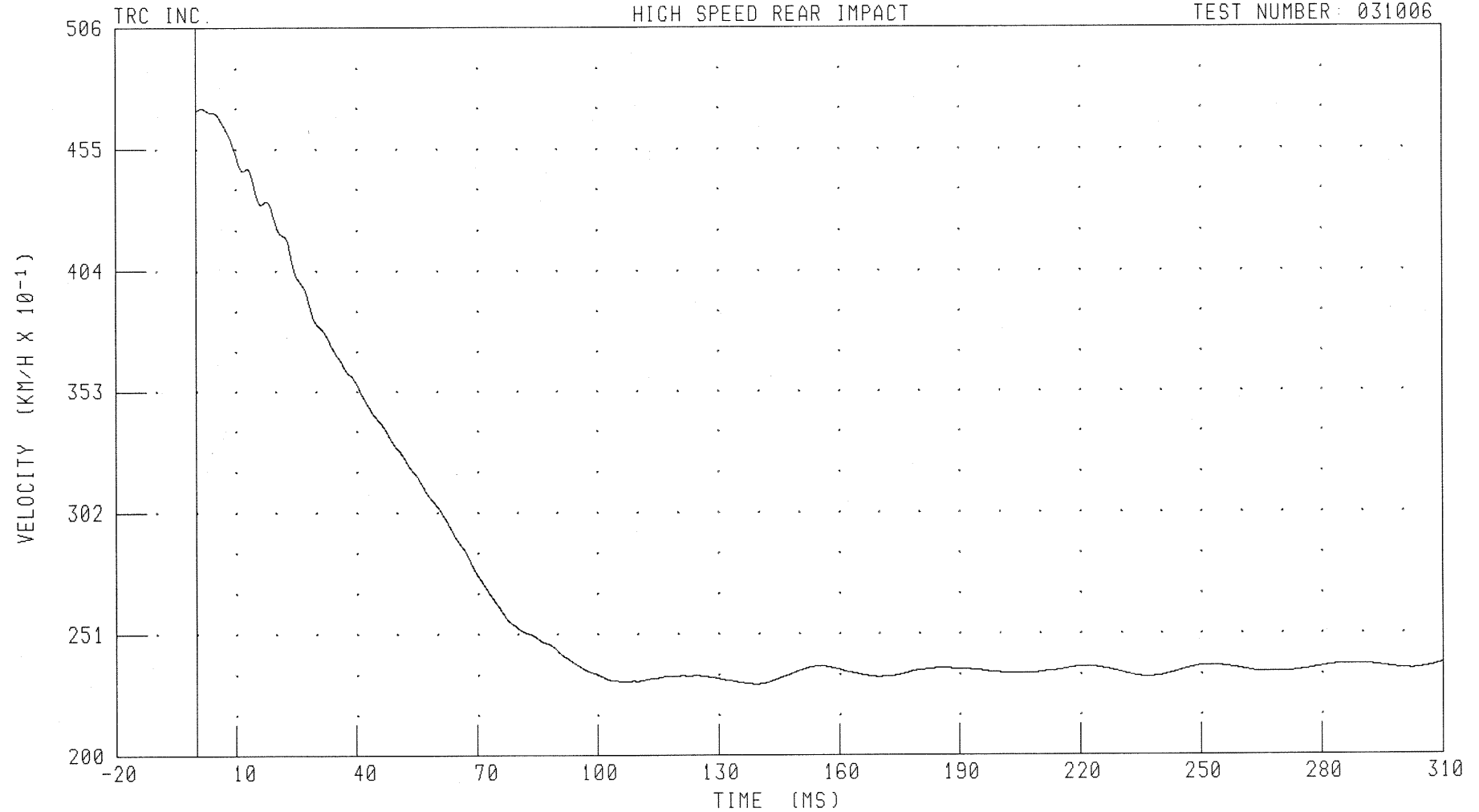
031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER LEFT REAR X-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LRRXV1

FILTER: CH. CLASS 180

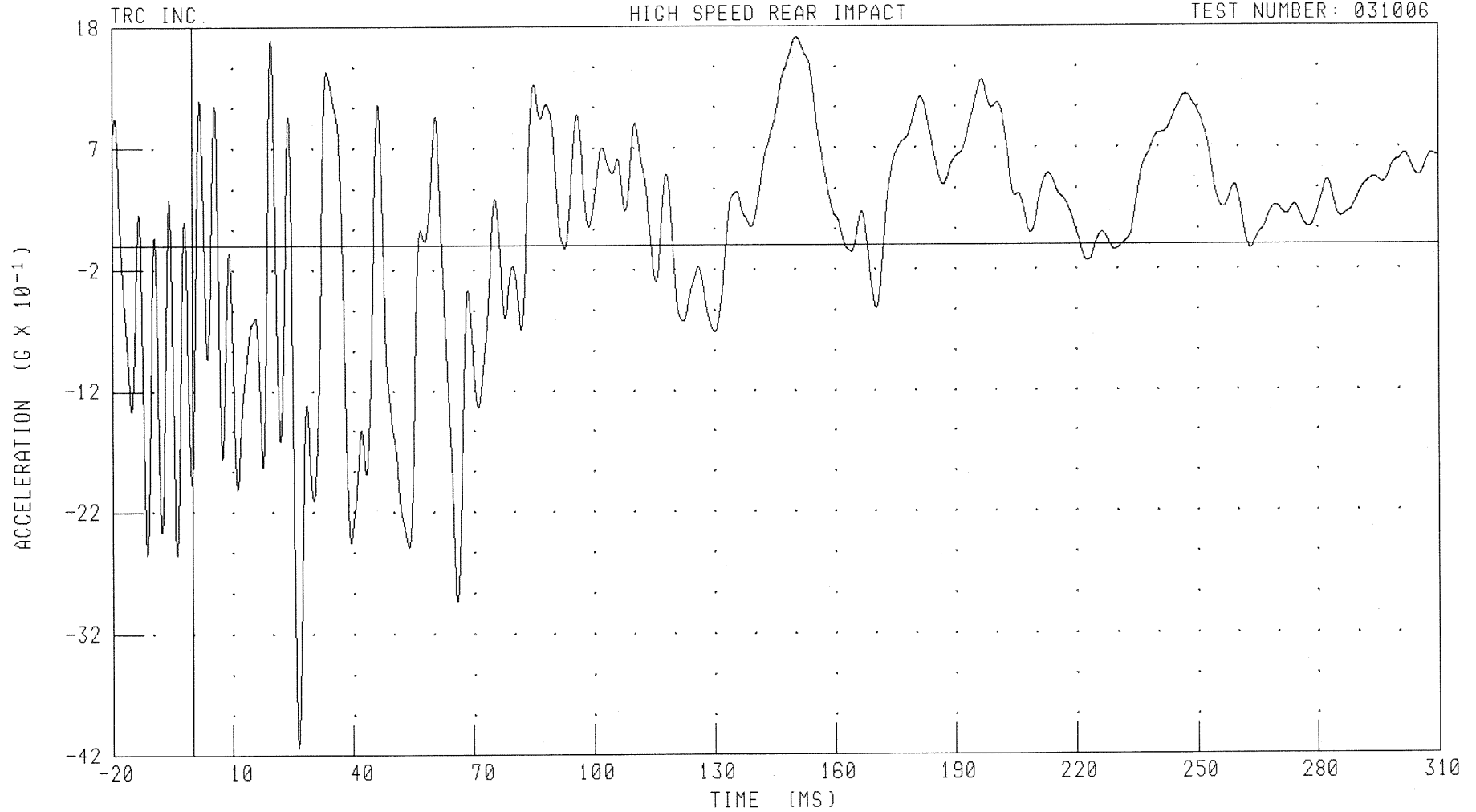
PEAK DATA: 47.22 KM/H @ 1.52 MS; 22.99 KM/H @ 139.44 MS

B-136

031006

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40
MOVING BARRIER LEFT REAR Y-AXIS ACCELERATION

TEST NUMBER: 031006



CHANNEL: LRRYG1

FILTER: CH. CLASS 60

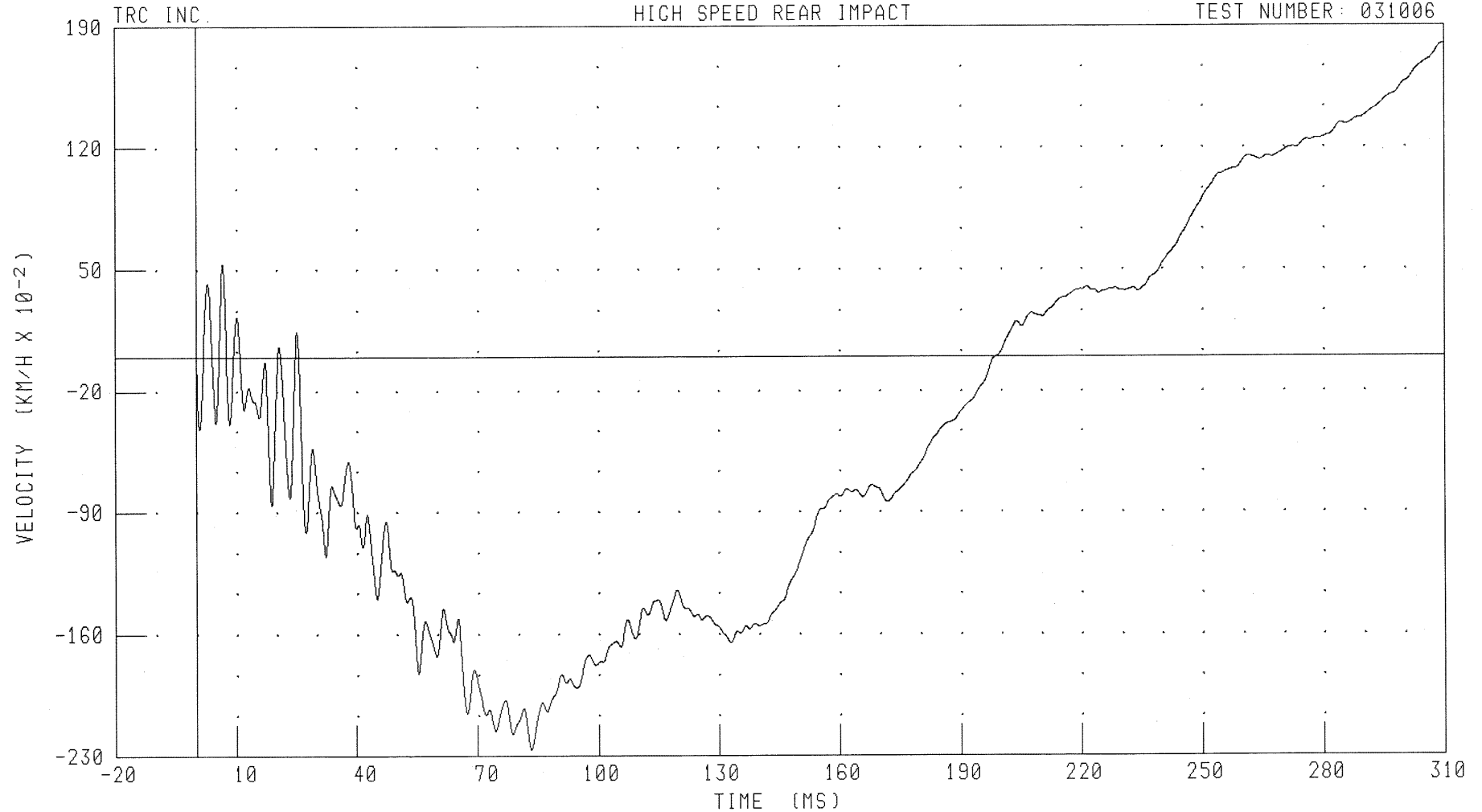
PEAK DATA: 1.71 G @ 150.64 MS; -4.14 G @ 26.48 MS

47.3 KPH REAR IMPACT (MOVING BARRIER) INTO 2003 VOLVO S40

MOVING BARRIER LEFT REAR Y-AXIS VELOCITY

HIGH SPEED REAR IMPACT

TEST NUMBER: 031006



CHANNEL: LRRYV1

FILTER: CH. CLASS 180

PEAK DATA: 1.80 KM/H @ 310.00 MS; -2.26 KM/H @ 83.28 MS

B-138

031006

Appendix C

Dummy Certification Data

Pre-Test Calibration

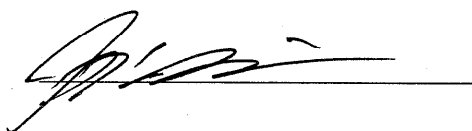
Right Front Passenger Dummy S/N 202

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 202 Calibration No. 18

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	515	Yes
C	H-Point Height	83.8 - 88.9	85	Yes
D	H-Point From Seatback	134.6 - 139.7	136	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	89	Yes
F	Thigh Clearance	139.7 - 154.9	153	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	43	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	195	Yes
K	Buttock Knee Length	579.1 - 604.5	593	Yes
L	Popliteal Height	429.3 - 454.7	437	Yes
M	Knee Pivot Height	485.1 - 500.4	491	Yes
N	Buttock Popliteal Length	452.1 - 477.5	460	Yes
O	Chest Depth	213.4 - 228.6	221	Yes
P	Foot Length	251.5 - 266.7	263	Yes
V	Shoulder Breadth	421.6 - 436.9	431	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	991	Yes
Z	Waist Circumference	835.7 - 866.1	845	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician

Approved




Transportation Research Center Inc.

572E Head Drop Test

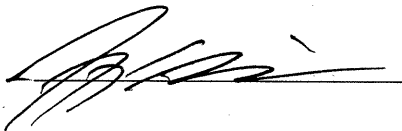
HIH 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

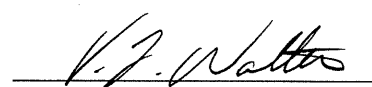
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Peak Resultant Acceleration	225 - 275 g	257.8 g	Yes
Peak Lateral Acceleration	15 g Max	-3.0 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



10.03.2003 07:42:20 615

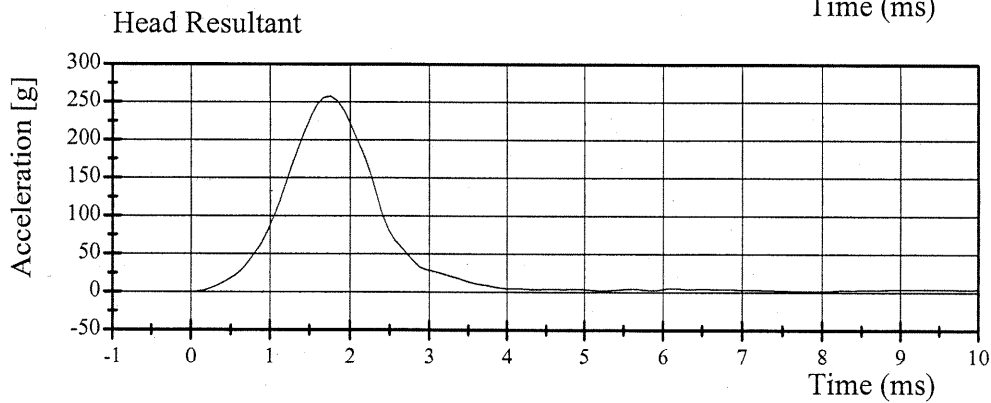
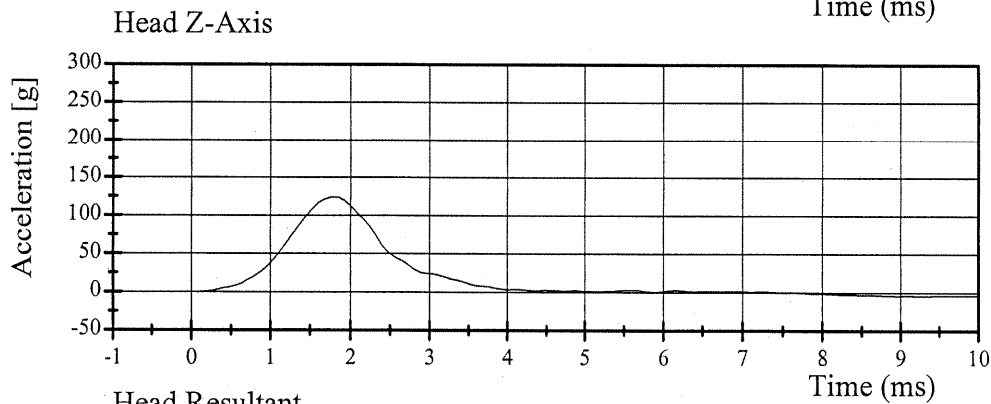
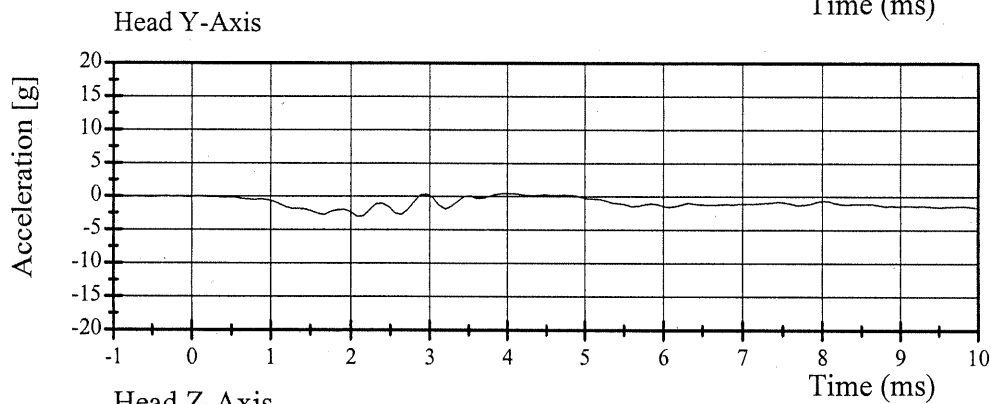
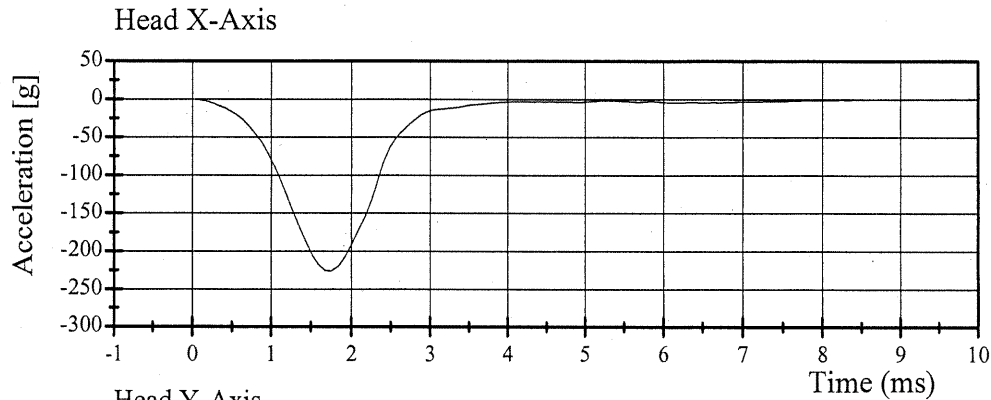


Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003



10.03.2003 07:42:21 615



Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

HIH 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

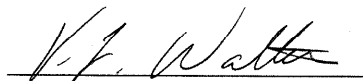
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Impact Velocity	6.89 - 7.13 m/s	6.97 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	24.21 g	Yes
20 ms	17.60 - 22.60 g	21.36 g	Yes
30 ms	12.50 - 18.50 g	17.63 g	Yes
Max Pendulum Deceleration	29.00 g	24.89 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	17.57 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	34 - 42 ms	37.68 ms	Yes
D Plane Rotation			
Max	64 - 78 °	71.53 °	Yes
Time	57 - 64 ms	60.16 ms	Yes
Moment About Occipital Condyle			
Max	88.1 - 108.5 N·m	98.99 N·m	Yes
Time	47 - 58 ms	50.32 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	113 - 128 ms	117.28 ms	Yes
Positive Moment-Time Curve			
Decay Time To Zero	97 - 107 ms	100.32 ms	Yes

Comments:

Technician



Approved



10.03.2003 08:19:49 499



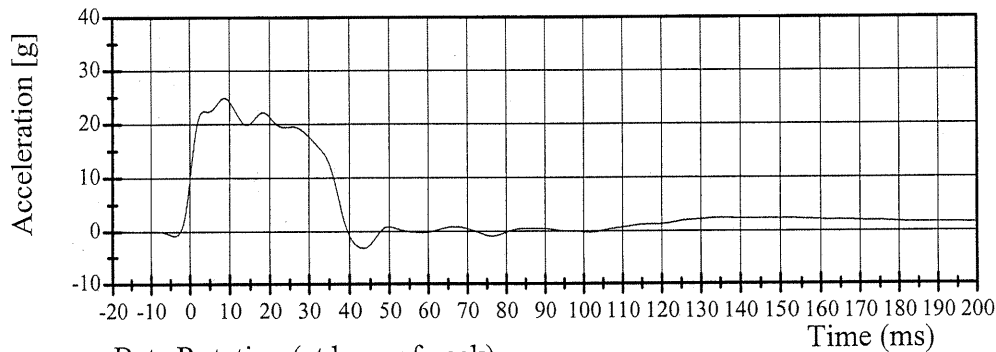
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Pendulum Deceleration

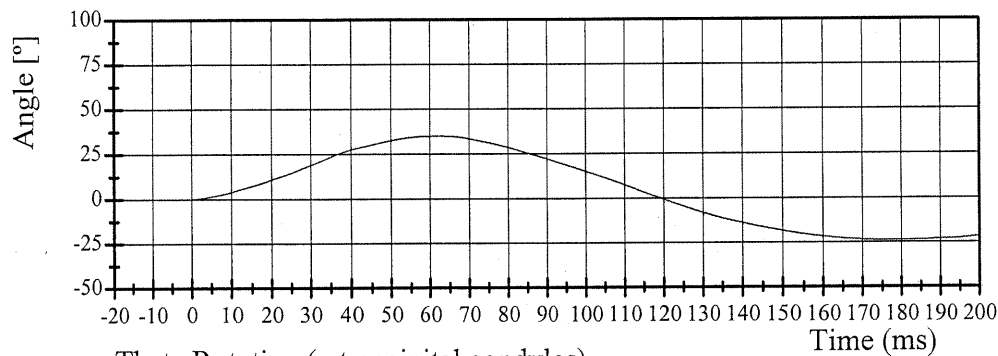


Filter Class: 60

Max: 24.9 g at 8.7 ms

Min: -3.1 g at 43.3 ms

Beta Rotation (at base of neck)

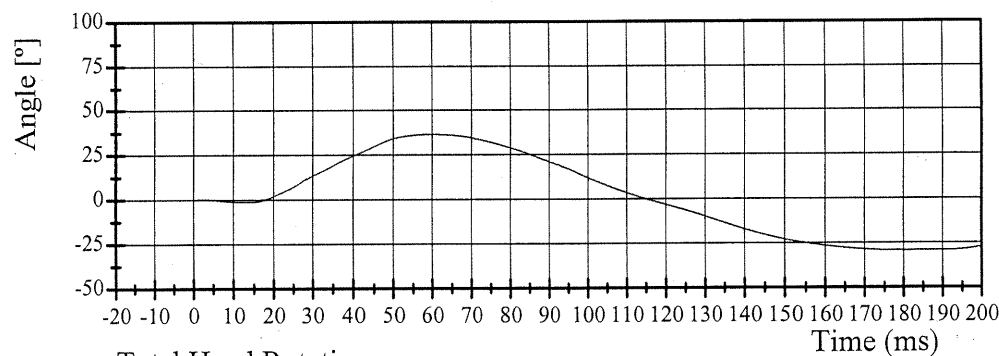


Filter Class: 60

Max: 35.0 ° at 61.8 ms

Min: -23.7 ° at 176.6 ms

Theta Rotation (at occipital condyles)

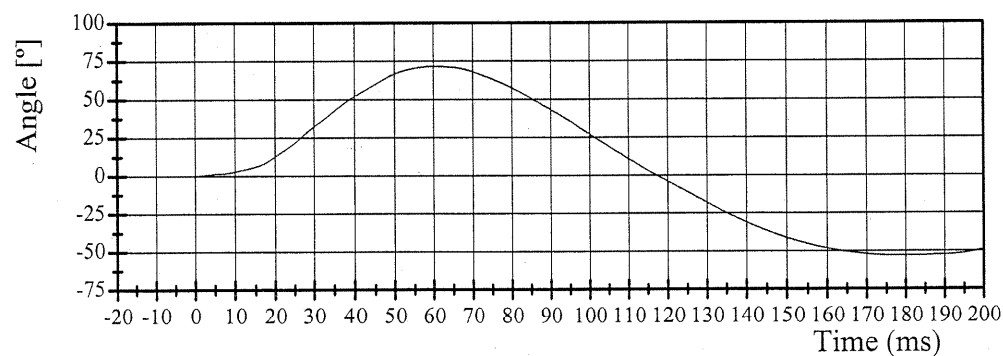


Filter Class: 60

Max: 36.6 ° at 59.5 ms

Min: -29.2 ° at 180.8 ms

Total Head Rotation



Filter Class: 60

Max: 71.5 ° at 60.2 ms

Min: -52.9 ° at 179.5 ms

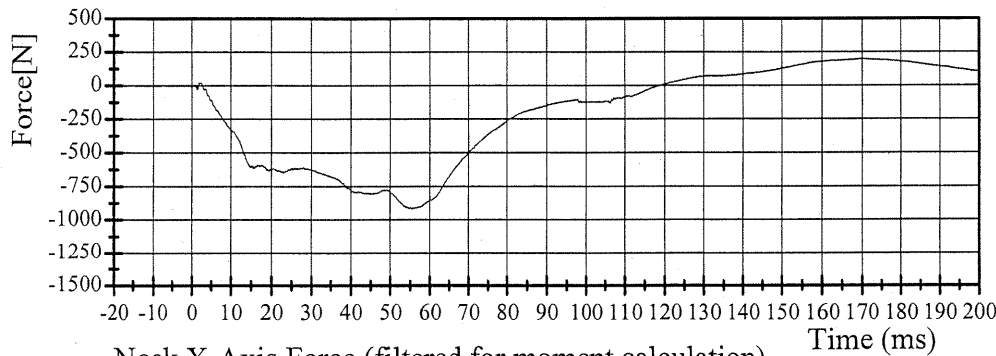
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Neck X-Axis Force

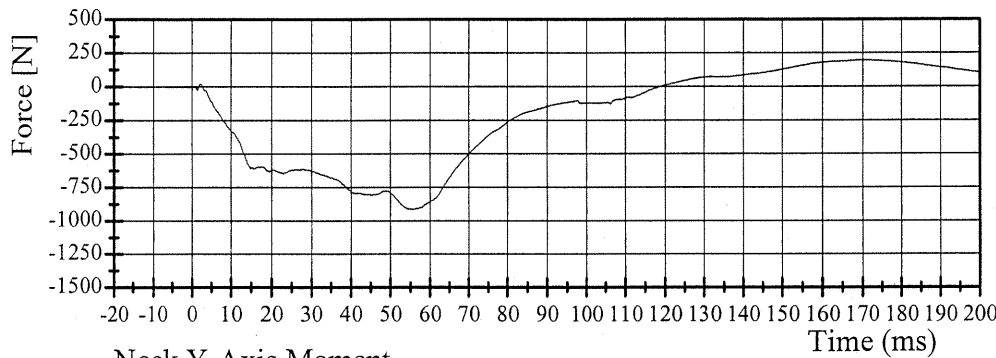


Filter Class: 1000

Max: 196.8 N at 170.9 ms

Min: -916.0 N at 55.5 ms

Neck X-Axis Force (filtered for moment calculation)

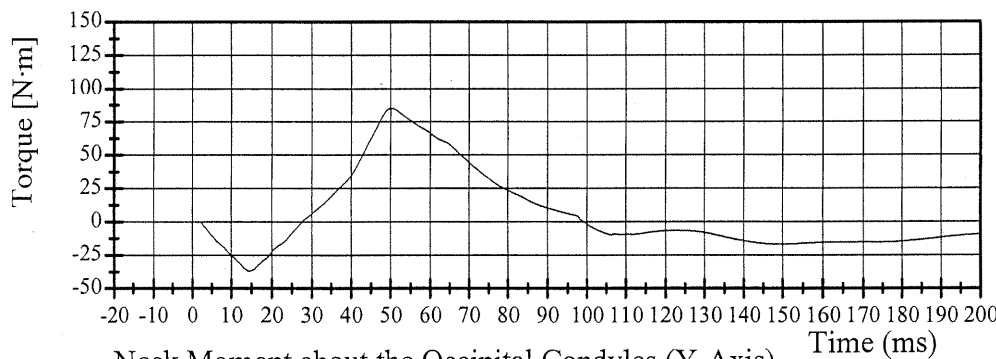


Filter Class: 600

Max: 196.3 N at 170.8 ms

Min: -915.4 N at 55.5 ms

Neck Y-Axis Moment

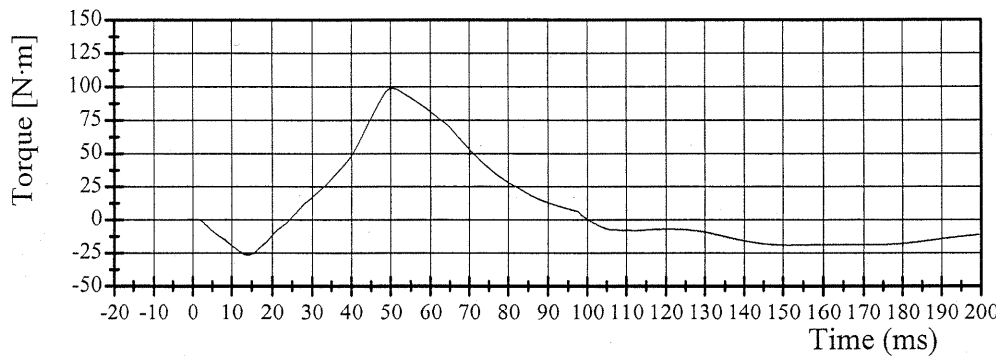


Filter Class: 600

Max: 84.9 N·m at 50.1 ms

Min: -36.9 N·m at 14.5 ms

Neck Moment about the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 99.0 N·m at 50.3 ms

Min: -26.6 N·m at 14.2 ms



Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

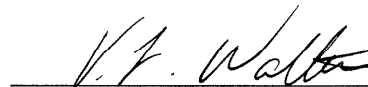
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.02 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	17.97 g	Yes
20 ms	14.00 - 19.00 g	17.06 g	Yes
30 ms	11.00 - 16.00 g	14.33 g	Yes
Max Pendulum Deceleration	22.00 g	18.82 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	14.28 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	38 - 46 ms	40.88 ms	Yes
D Plane Rotation			
Max	81 - 106 °	96.34 °	Yes
Time	72 - 82 ms	78.48 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-66.26 N·m	Yes
Time	65 - 79 ms	74.24 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	147 - 174 ms	160.56 ms	Yes
Negative Moment-Time Curve			
Decay Time To Zero	120 - 148 ms	145.12 ms	Yes

Comments:

Technician



Approved



10.03.2003 08:50:51 587



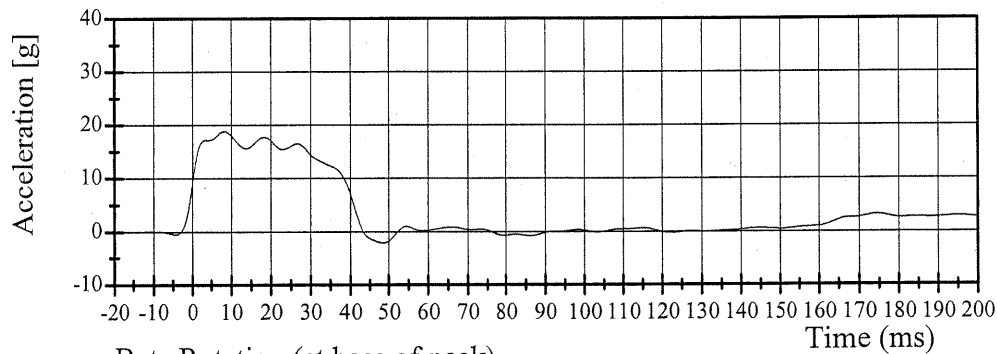
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Pendulum Deceleration

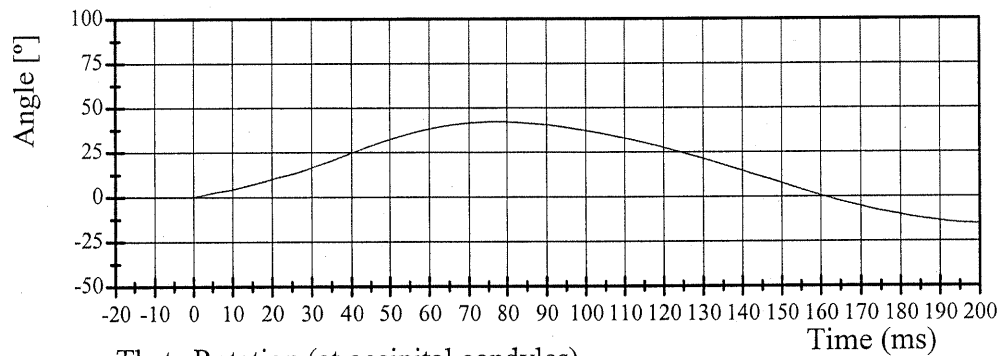


Filter Class: 60

Max: 18.8 g at 8.2 ms

Min: -2.1 g at 48.6 ms

Beta Rotation (at base of neck)

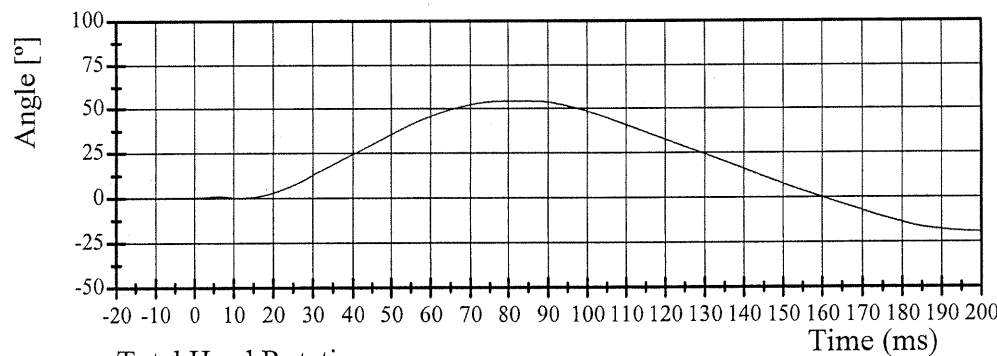


Filter Class: 60

Max: 42.2 ° at 77.1 ms

Min: -15.5 ° at 204.1 ms

Theta Rotation (at occipital condyles)

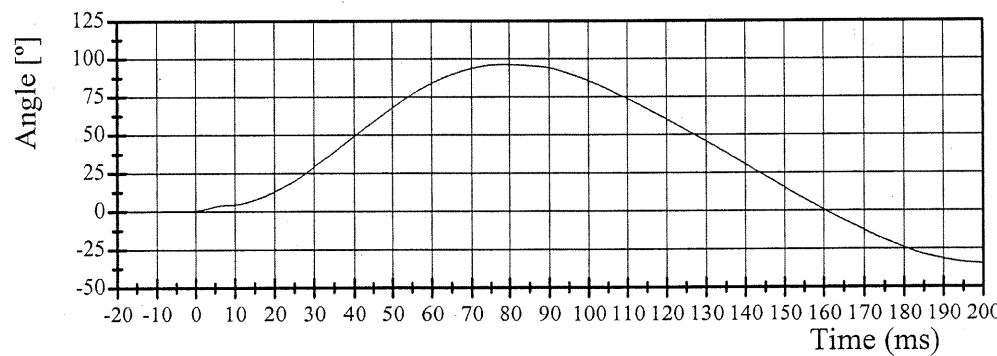


Filter Class: 60

Max: 54.2 ° at 80.6 ms

Min: -19.4 ° at 204.2 ms

Total Head Rotation



Filter Class: 60

Max: 96.3 ° at 78.5 ms

Min: -34.9 ° at 204.1 ms

10.10.2003 10:00:43 587



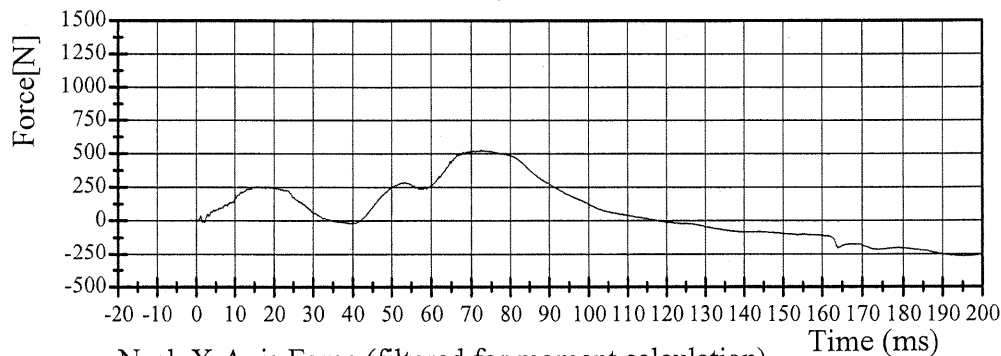
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Neck X-Axis Force

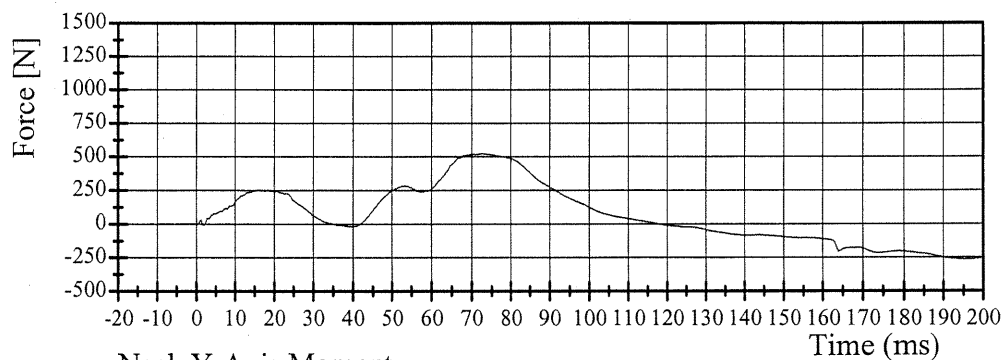


Filter Class: 1000

Max: 528.6 N at 72.6 ms

Min: -266.2 N at 195.4 ms

Neck X-Axis Force (filtered for moment calculation)

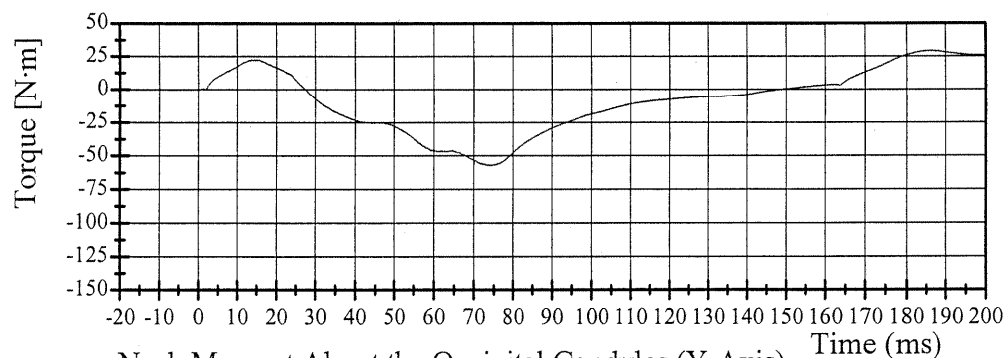


Filter Class: 600

Max: 525.5 N at 72.6 ms

Min: -265.5 N at 195.4 ms

Neck Y-Axis Moment

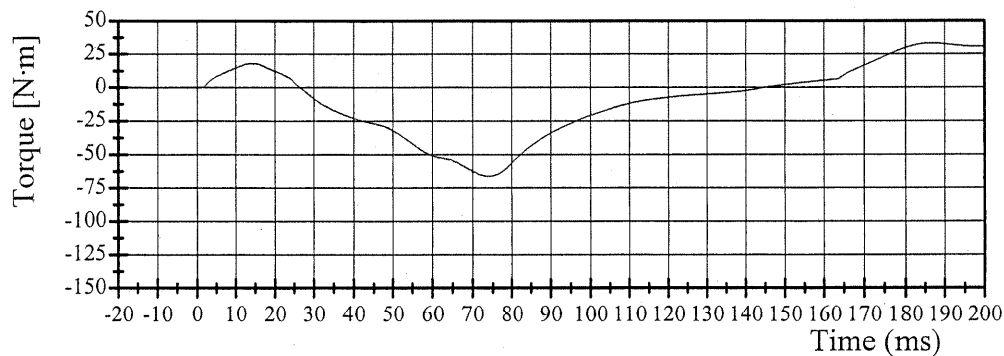


Filter Class: 600

Max: 29.3 N·m at 185.8 ms

Min: -57.1 N·m at 74.2 ms

Neck Moment About the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 33.3 N·m at 186.7 ms

Min: -66.3 N·m at 74.2 ms

Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

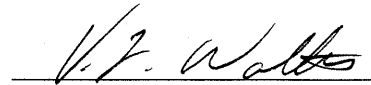
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	22 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.65 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-68.5 mm	Yes
Maximum Resistive Force	5160 - 5894 N	5801 N	Yes
Internal Hysteresis	69 - 85 %	71 %	Yes

Comments:

Technician



Approved



10.03.2003 13:41:37 959



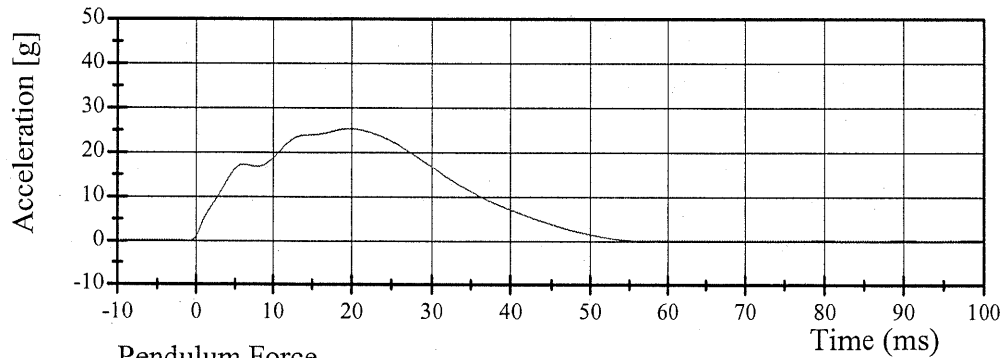
Transportation Research Center Inc.

572E Thorax Test

HHH 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Pendulum Deceleration

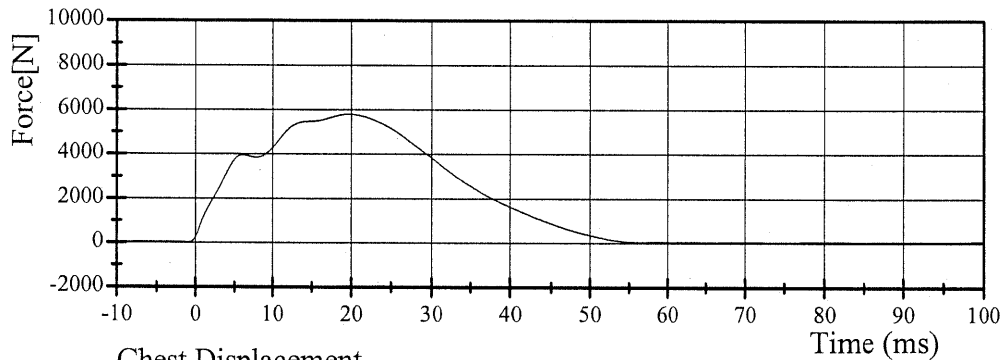


Filter Class: 180

Max: 25.3 g at 19.7 ms

Min: -0.0 g at -75.9 ms

Pendulum Force

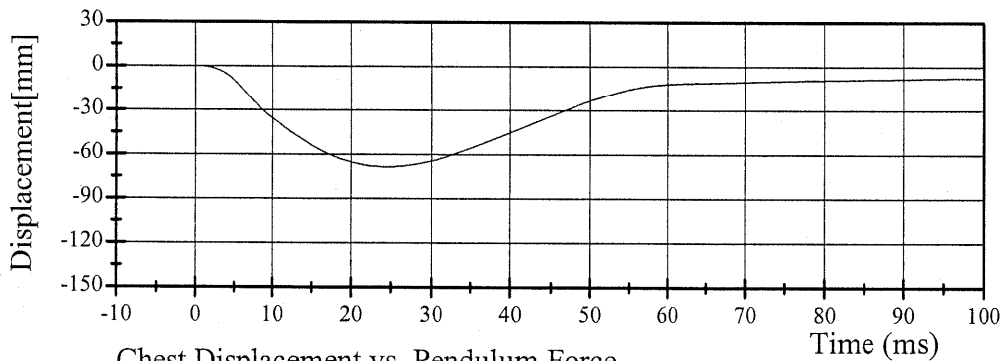


Filter Class: 180

Max: 5800.5 N at 19.7 ms

Min: -6.1 N at -75.9 ms

Chest Displacement

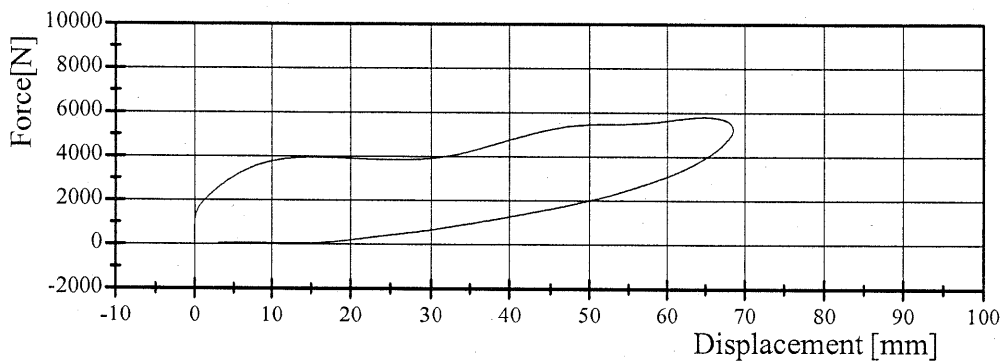


Filter Class: 180

Max: 0.0 mm at 0.3 ms

Min: -68.5 mm at 24.6 ms

Chest Displacement vs. Pendulum Force



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 202L
Test Number: 202C18

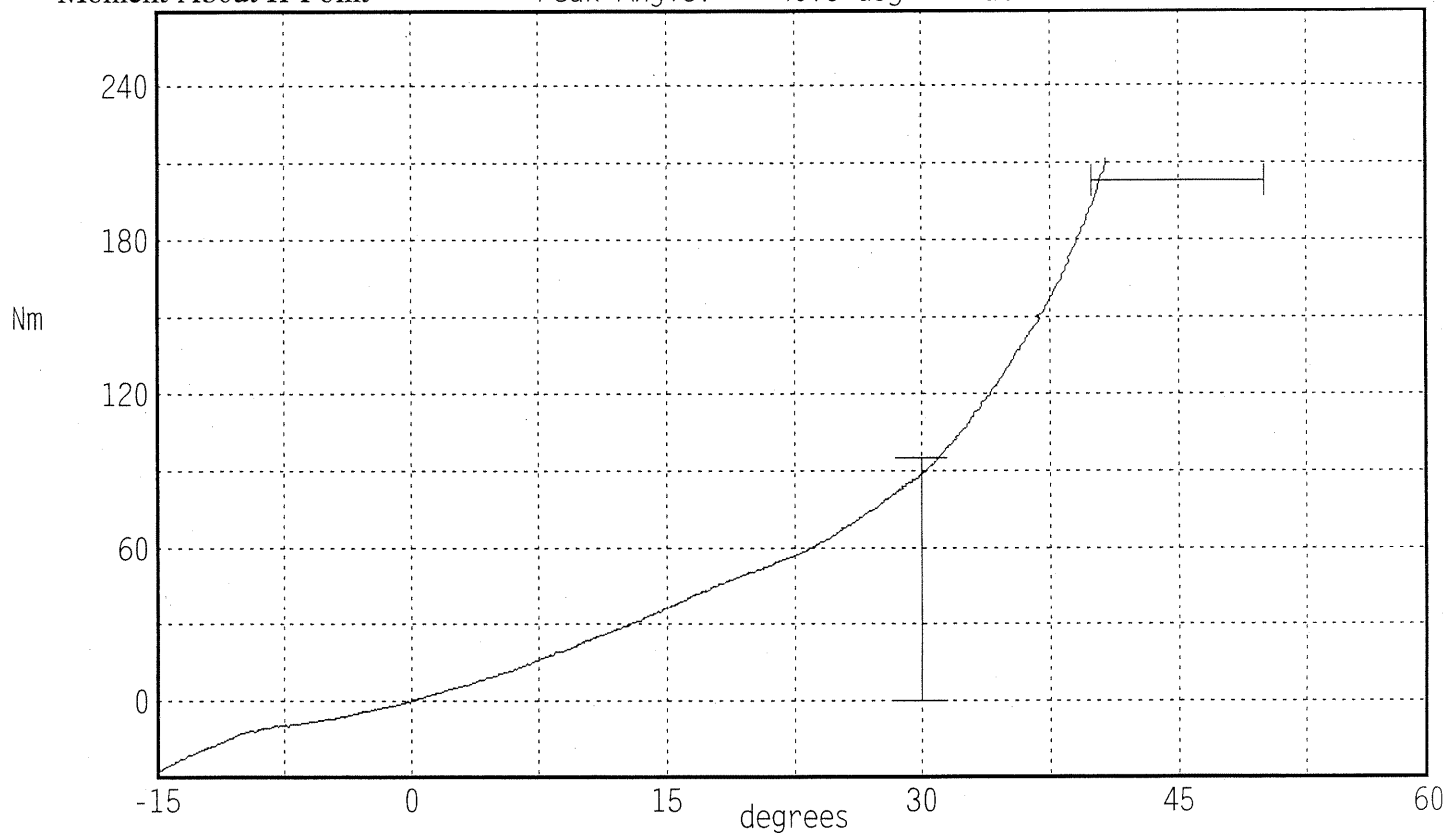
Date: 10/03/2003
Time: 08:36

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.7 °C	Pass
Humidity	10 - 70	20 %	Pass
Moment at 30 deg	<= 94.9	88.7 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	40.5 deg	Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass

Peak Moment: 211.4 Nm at 40.8 deg
Peak Angle: 40.8 deg at 211.4 Nm

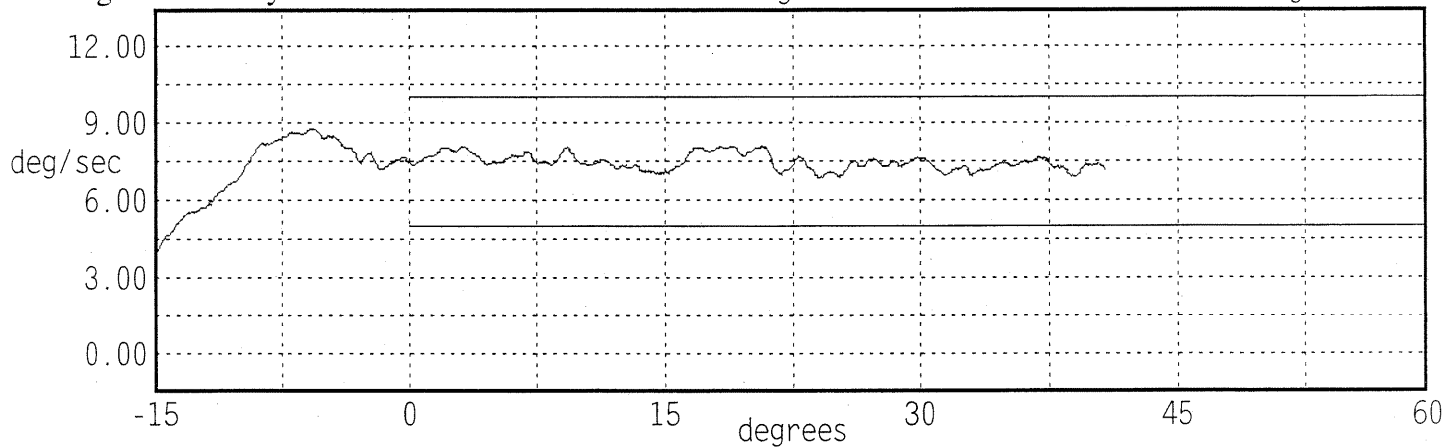
Moment About H-Point



Angular Velocity

Max: 8.1 deg/sec

Min: 6.8 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 202R
Test Number: 202C18

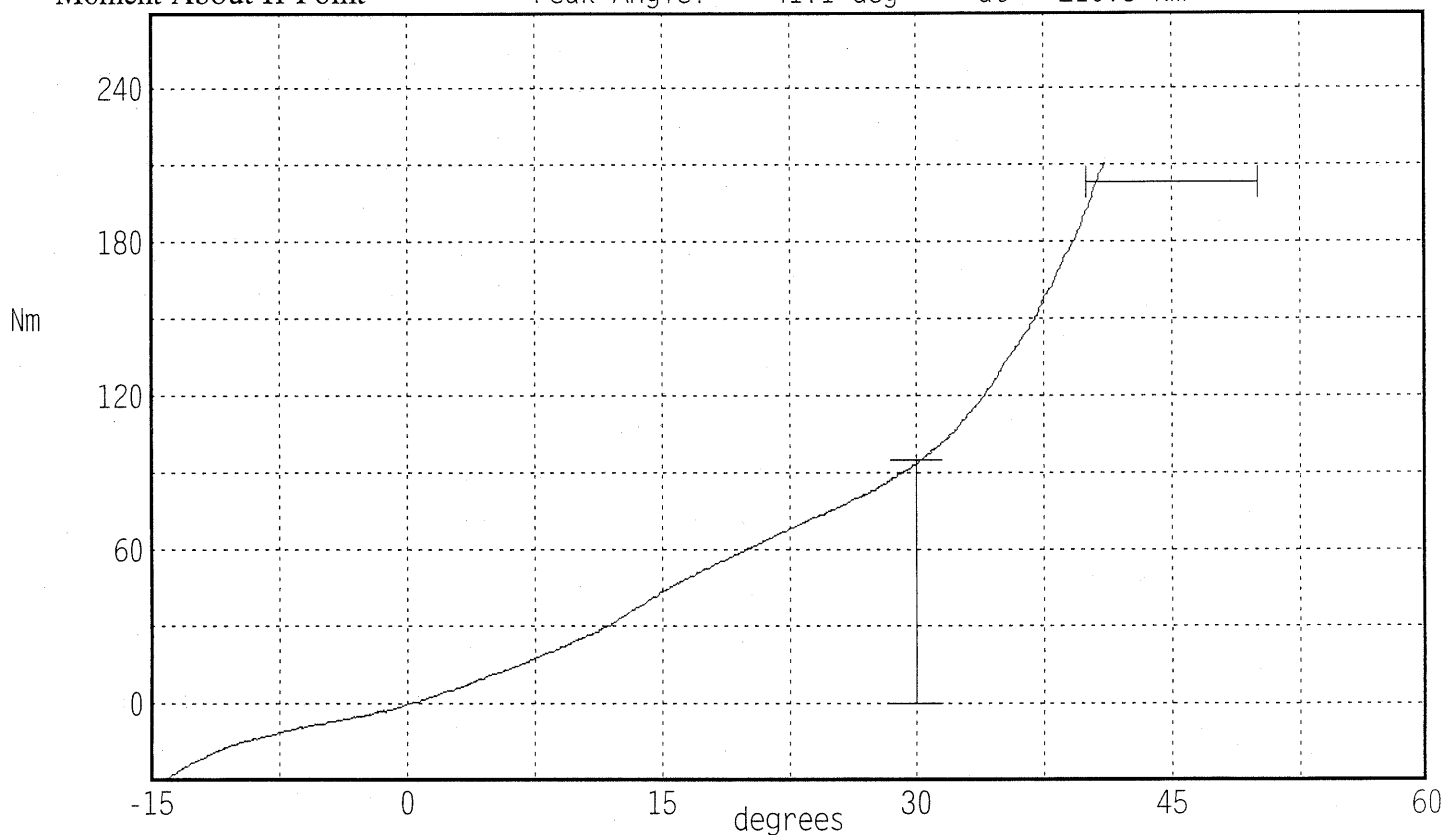
Date: 10/03/2003
Time: 08:31

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	20 % Pass
Moment at 30 deg	<= 94.9	93.6 Nm Pass
Angle at 203 Nm	40.0 - 50.0	40.7 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Peak Moment: 210.5 Nm at 41.1 deg
Peak Angle: 41.1 deg at 210.5 Nm

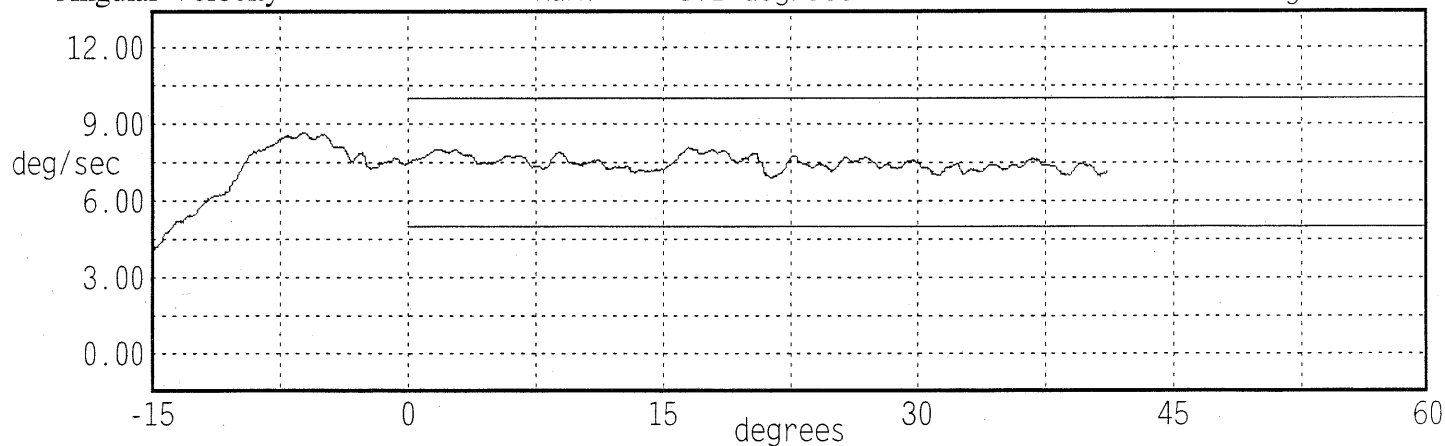
Moment About H-Point



Angular Velocity

Max: 8.1 deg/sec

Min: 6.9 deg/sec



Transportation Research Center Inc.

572E Left Knee Test

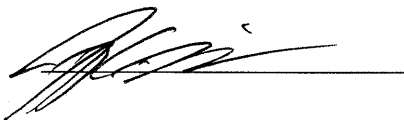
HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

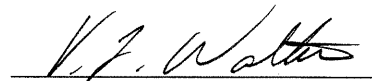
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5526 N	Yes

Comments:

Technician



Approved



10.03.2003 11:31:39 2094



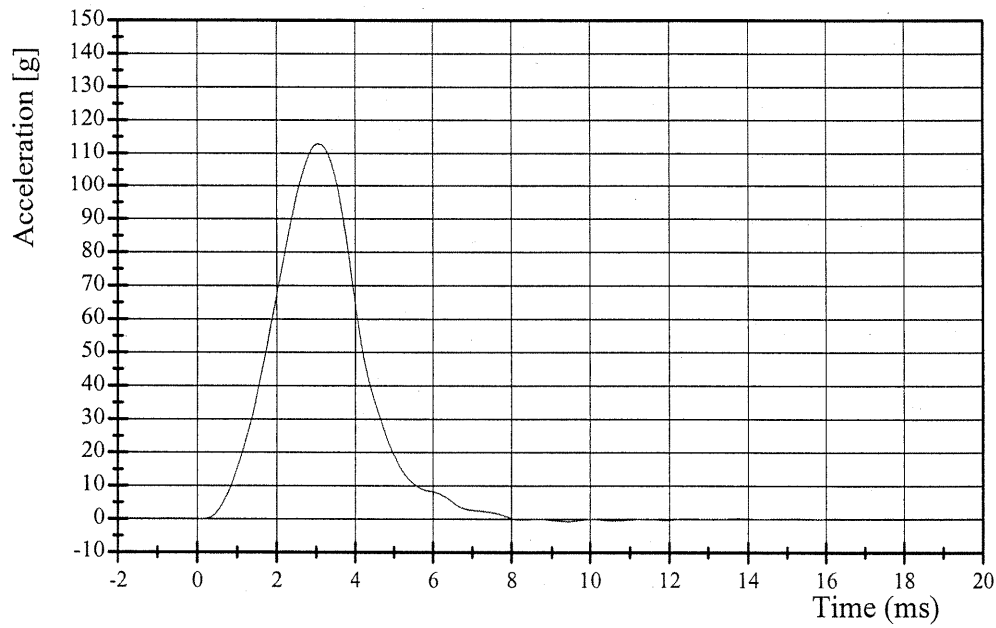
Transportation Research Center Inc.

572E Left Knee Test

HHH 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Pendulum Deceleration

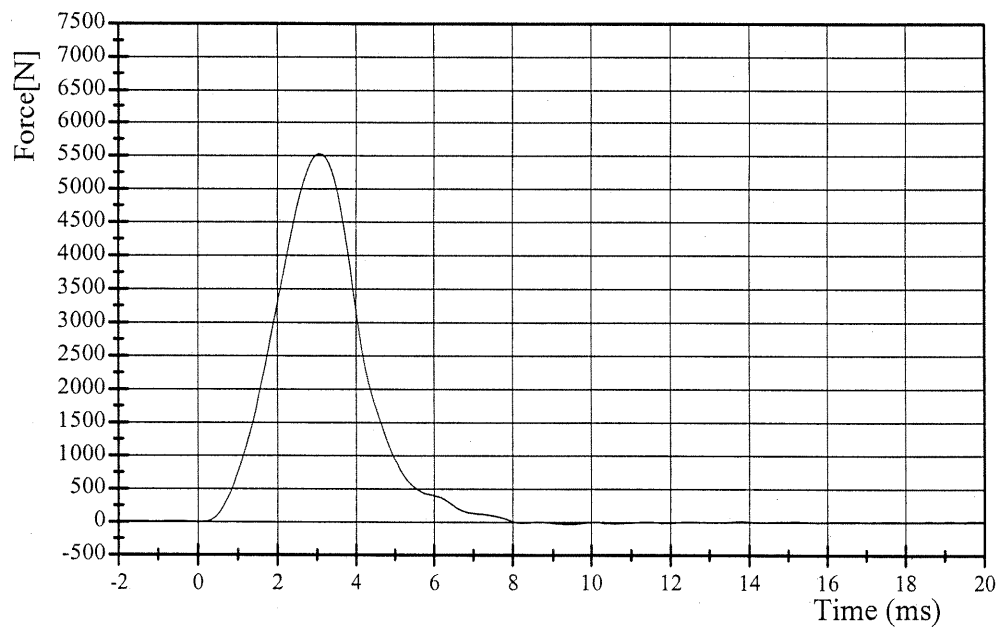


Filter Class: 600

Max: 112.9 g at 3.0 ms

Min: -0.7 g at 9.4 ms

Pendulum Force



Filter Class: 600

Max: 5526.3 N at 3.0 ms

Min: -33.9 N at 9.4 ms

10.03.2003 11:31:40 2094



Transportation Research Center Inc.

572E Right Knee Test

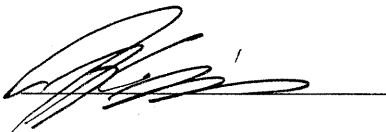
HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

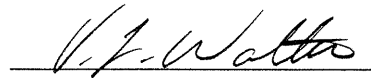
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5509 N	Yes

Comments:

Technician



Approved



10.03.2003 11:34:01 2095



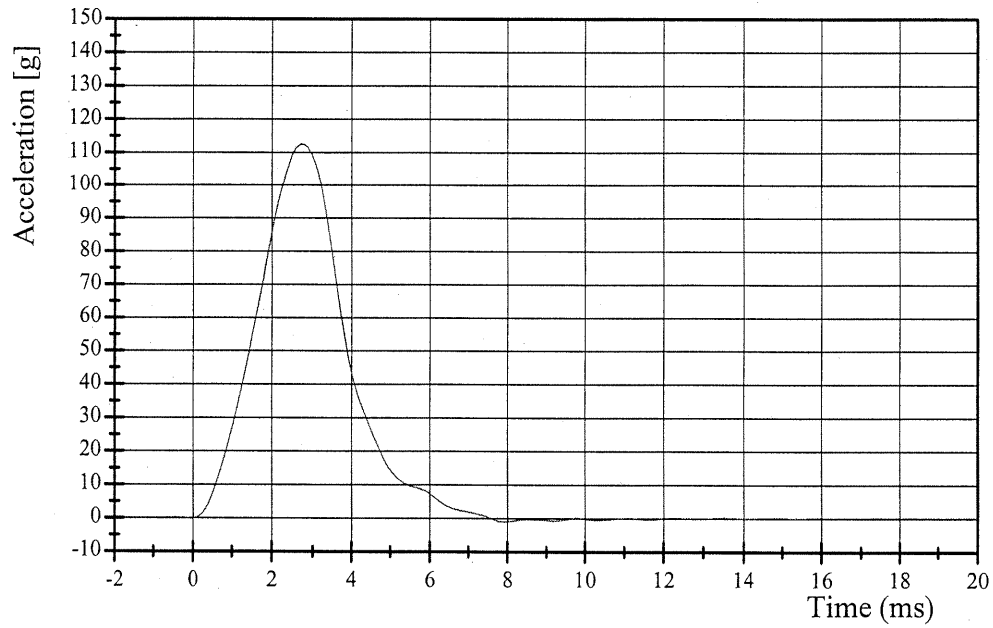
Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 202 Calibration No. 18 - 1

Test Date 10/03/2003

Pendulum Deceleration

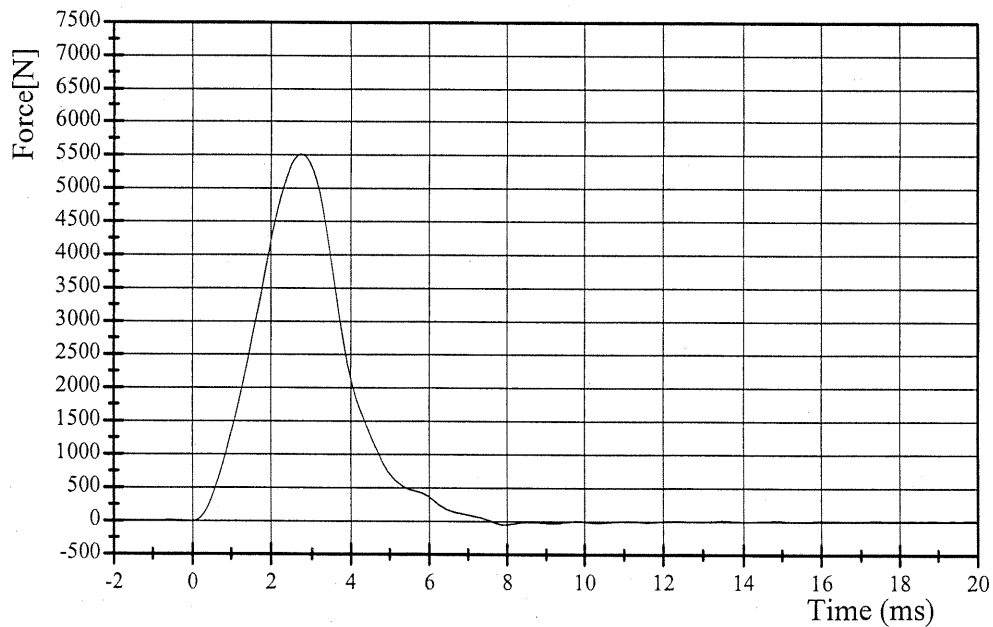


Filter Class: 600

Max: 112.6 g at 2.7 ms

Min: -1.1 g at 7.9 ms

Pendulum Force



Filter Class: 600

Max: 5508.8 N at 2.7 ms

Min: -51.6 N at 7.9 ms

10.03.2003 11:34:01 2095



Pre-Test Calibration

Left Rear Passenger Dummy S/N 206

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 206 Calibration No. 16

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	881	Yes
B	Shoulder Pivot Height	505.5 - 520.7	508	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	89	Yes
F	Thigh Clearance	139.7 - 154.9	147	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	290	Yes
H	Skull Cap To Backline	40.6 - 45.7	43	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	335	Yes
J	Elbow Rest Height	190.5 - 210.8	198	Yes
K	Buttock Knee Length	579.1 - 604.5	591	Yes
L	Popliteal Height	429.3 - 454.7	441	Yes
M	Knee Pivot Height	485.1 - 500.4	497	Yes
N	Buttock Popliteal Length	452.1 - 477.5	471	Yes
O	Chest Depth	213.4 - 228.6	220	Yes
P	Foot Length	251.5 - 266.7	252	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	103	Yes
Y	Chest Circumference	970.3 - 1000.8	990	Yes
Z	Waist Circumference	835.7 - 866.1	855	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

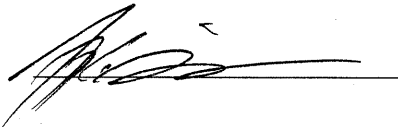
HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Peak Resultant Acceleration	225 - 275 g	233.9 g	Yes
Peak Lateral Acceleration	15 g Max	-3.7 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



10.03.2003 07:53:19 611

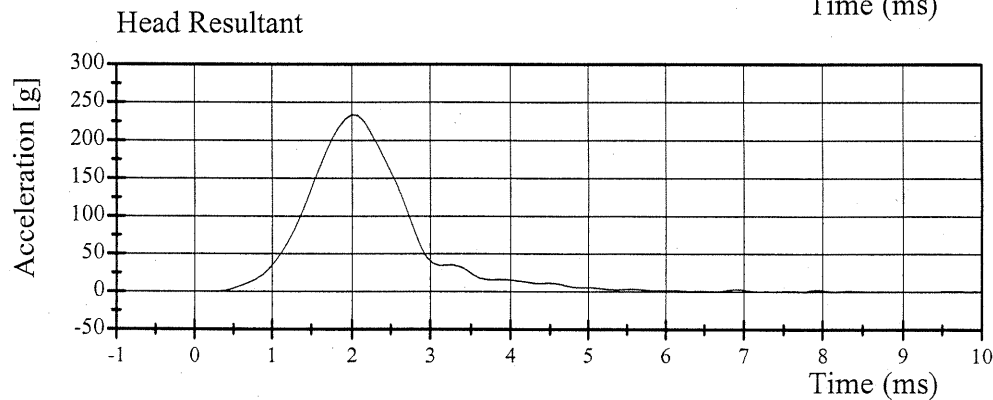
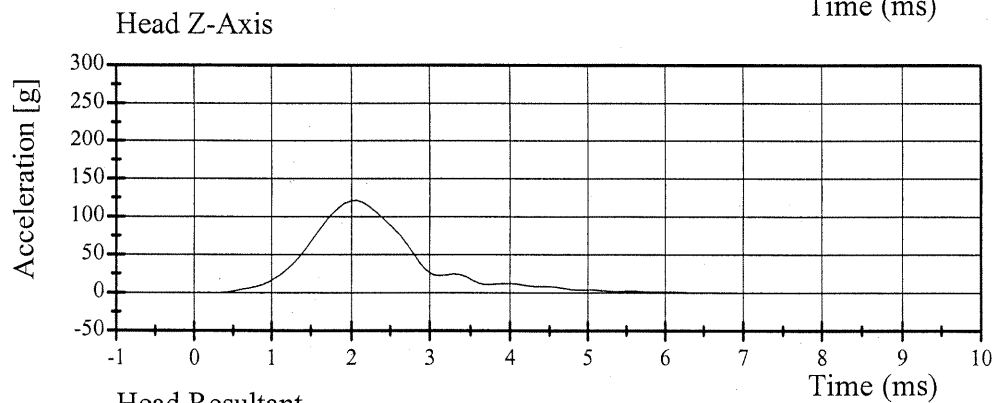
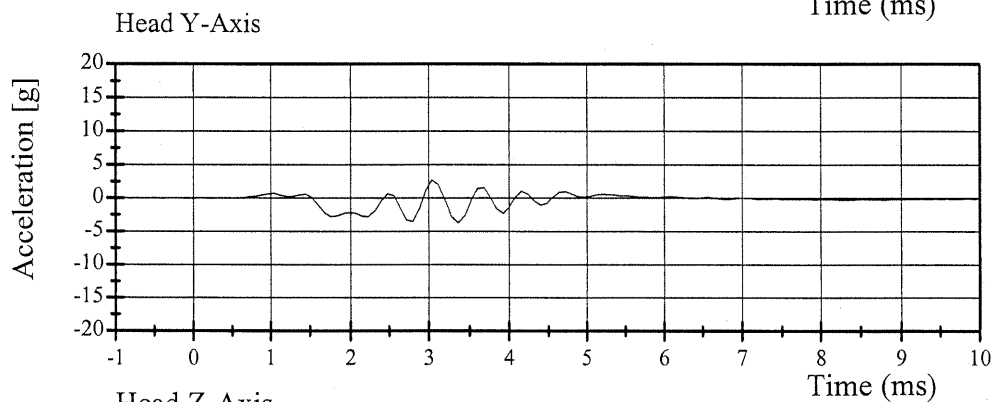
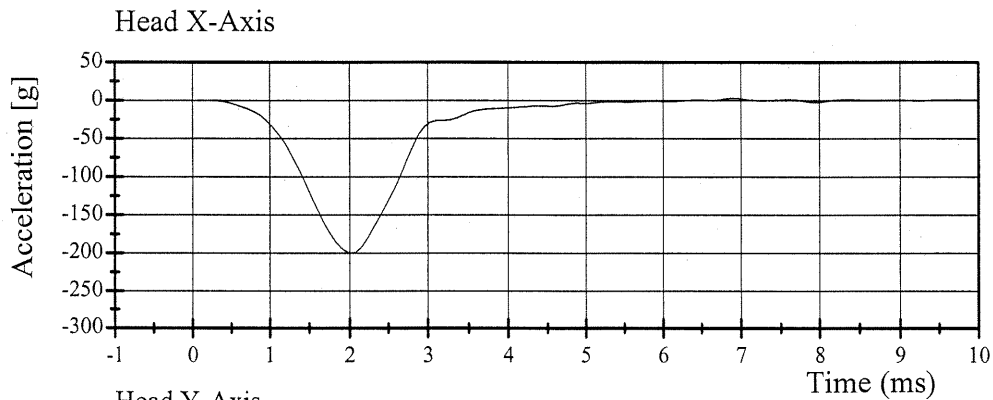


Transportation Research Center Inc.

572E Head Drop Test

HHH 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003



10.03.2003 07:53:20 611



Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

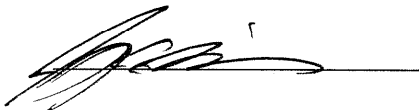
HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

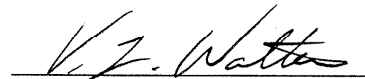
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	25.45 g	Yes
20 ms	17.60 - 22.60 g	22.56 g	Yes
30 ms	12.50 - 18.50 g	18.10 g	Yes
Max Pendulum Deceleration	29.00 g	27.13 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	18.01 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	34 - 42 ms	34.48 ms	Yes
D Plane Rotation			
Max	64 - 78 °	73.86 °	Yes
Time	57 - 64 ms	60.88 ms	Yes
Moment About Occipital Condyle			
Max	88.1 - 108.5 N·m	97.36 N·m	Yes
Time	47 - 58 ms	47.52 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	113 - 128 ms	116.40 ms	Yes
Positive Moment-Time Curve			
Decay Time To Zero	97 - 107 ms	101.04 ms	Yes

Comments:

Technician



Approved



10.03.2003 09:53:55 502



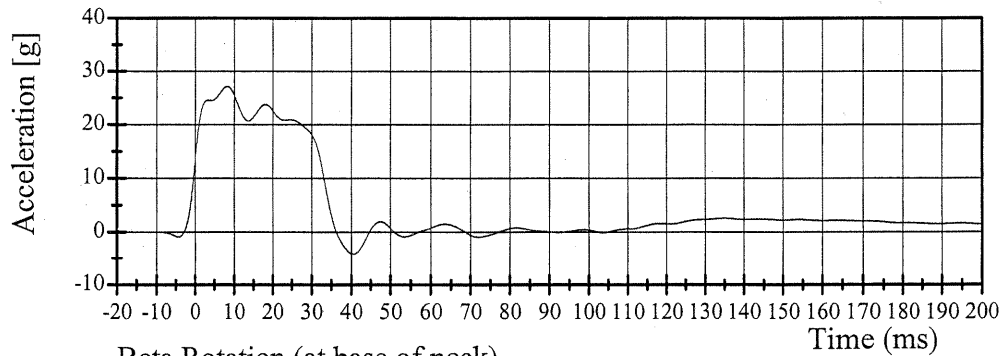
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Pendulum Deceleration

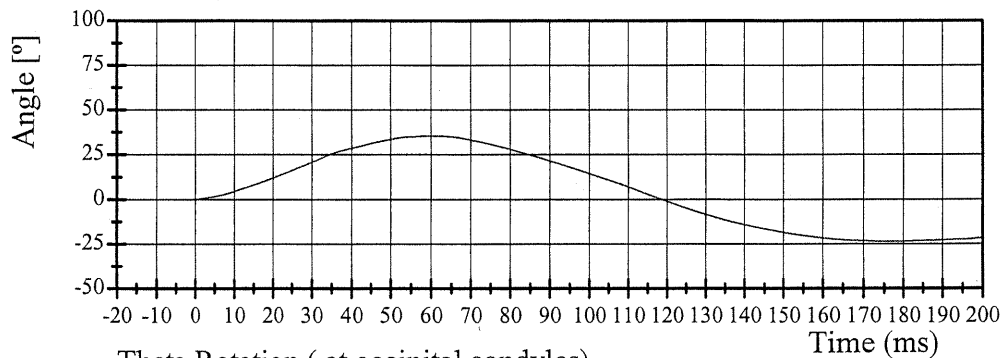


Filter Class: 60

Max: 27.1 g at 8.2 ms

Min: -4.1 g at 40.5 ms

Beta Rotation (at base of neck)

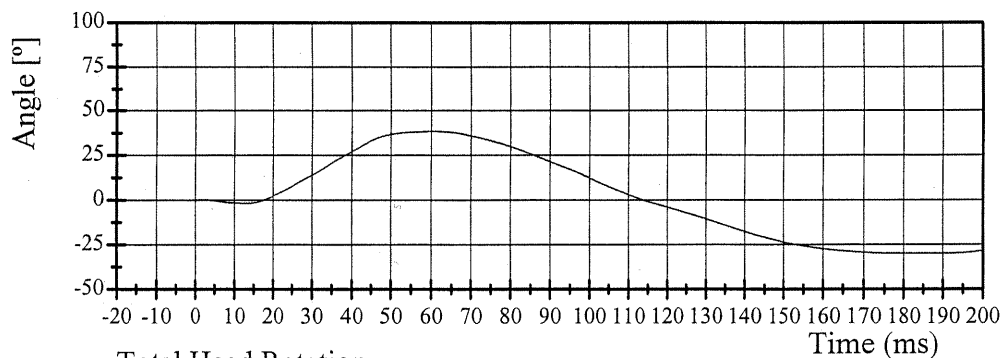


Filter Class: 60

Max: 35.4 ° at 61.5 ms

Min: -23.5 ° at 176.6 ms

Theta Rotation (at occipital condyles)

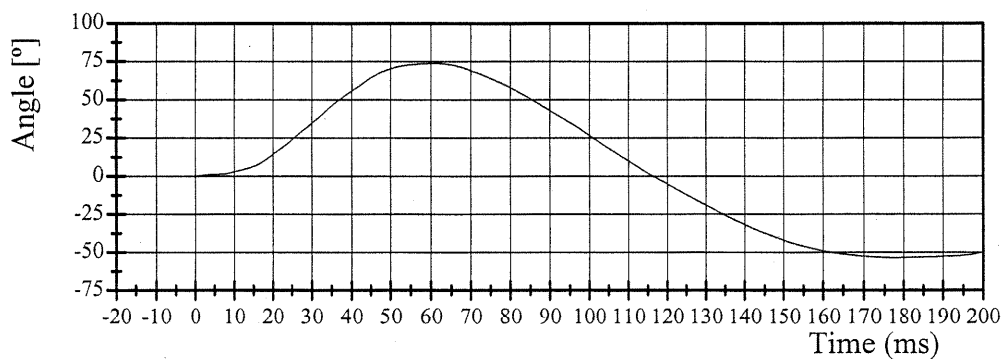


Filter Class: 60

Max: 38.5 ° at 60.6 ms

Min: -29.9 ° at 180.7 ms

Total Head Rotation



Filter Class: 60

Max: 73.9 ° at 60.9 ms

Min: -53.4 ° at 177.7 ms

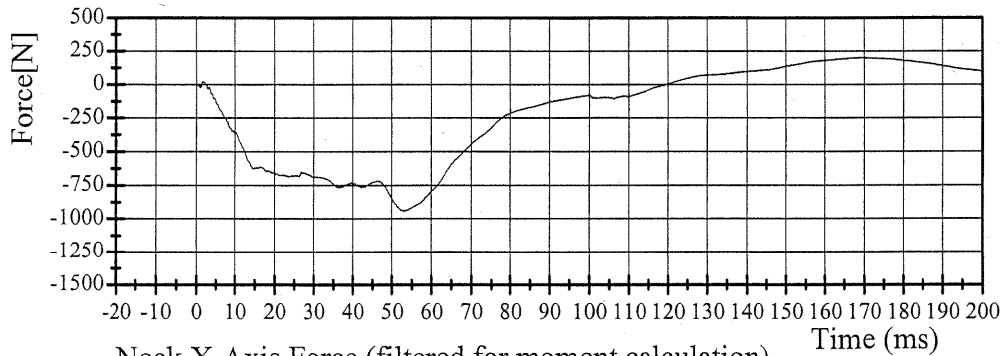
Transportation Research Center Inc.

572E Neck Flexion Test

HIH 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Neck X-Axis Force

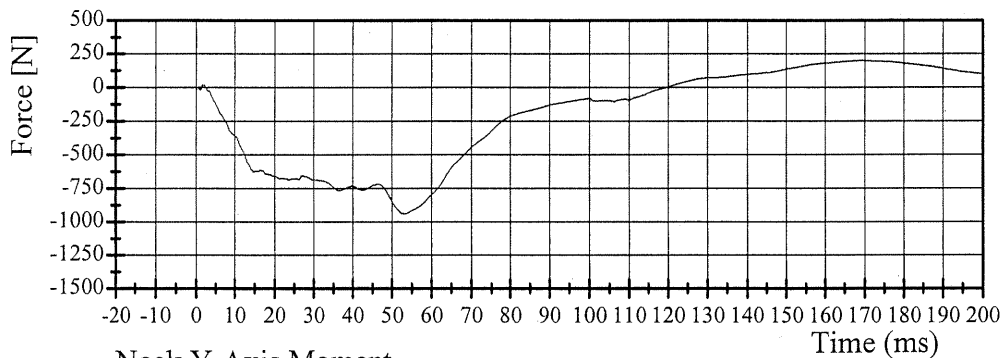


Filter Class: 1000

Max: 199.7 N at 168.6 ms

Min: -941.4 N at 53.1 ms

Neck X-Axis Force (filtered for moment calculation)

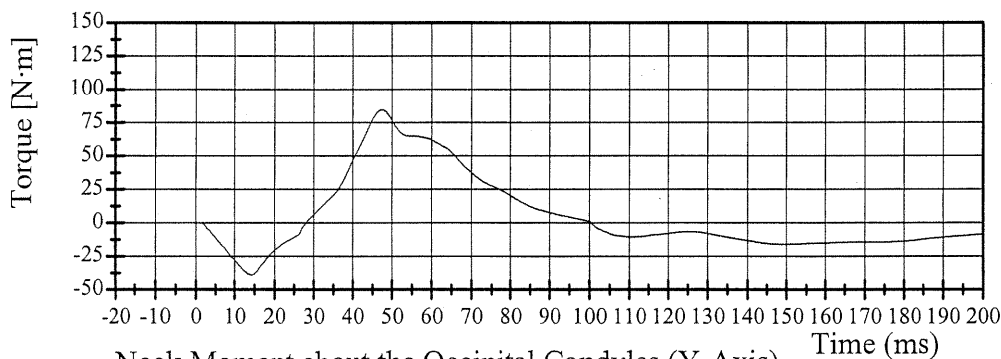


Filter Class: 600

Max: 199.3 N at 168.8 ms

Min: -940.7 N at 53.1 ms

Neck Y-Axis Moment

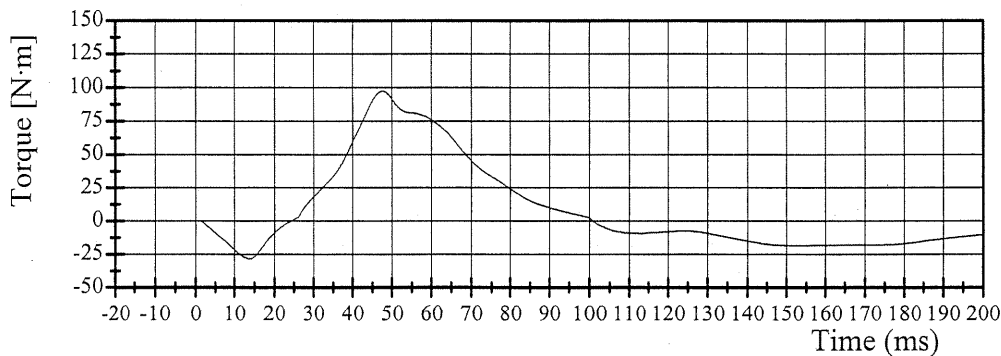


Filter Class: 600

Max: 84.4 N·m at 47.4 ms

Min: -39.1 N·m at 14.2 ms

Neck Moment about the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 97.4 N·m at 47.5 ms

Min: -28.4 N·m at 13.4 ms

Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.02 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	18.79 g	Yes
20 ms	14.00 - 19.00 g	17.82 g	Yes
30 ms	11.00 - 16.00 g	15.01 g	Yes
Max Pendulum Deceleration	22.00 g	19.37 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	14.97 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	38 - 46 ms	39.28 ms	Yes
D Plane Rotation			
Max	81 - 106 °	98.12 °	Yes
Time	72 - 82 ms	76.80 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-67.27 N·m	Yes
Time	65 - 79 ms	72.16 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	147 - 174 ms	158.80 ms	Yes
Negative Moment-Time Curve			
Decay Time To Zero	120 - 148 ms	145.68 ms	Yes

Comments:

Technician



Approved



10.03.2003 10:33:45 585



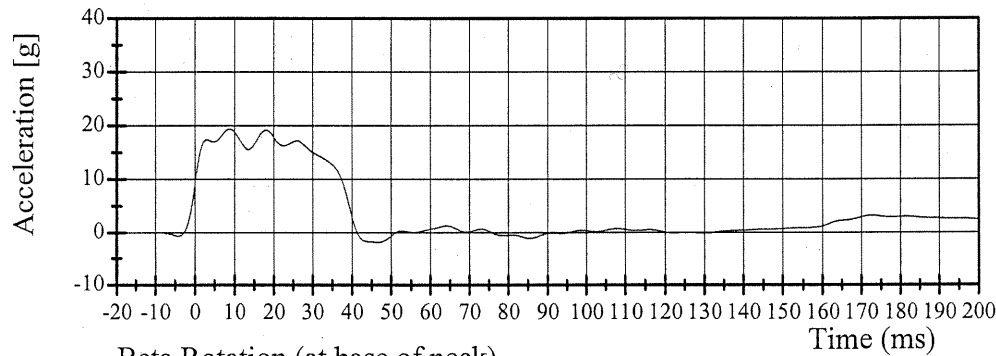
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Pendulum Deceleration

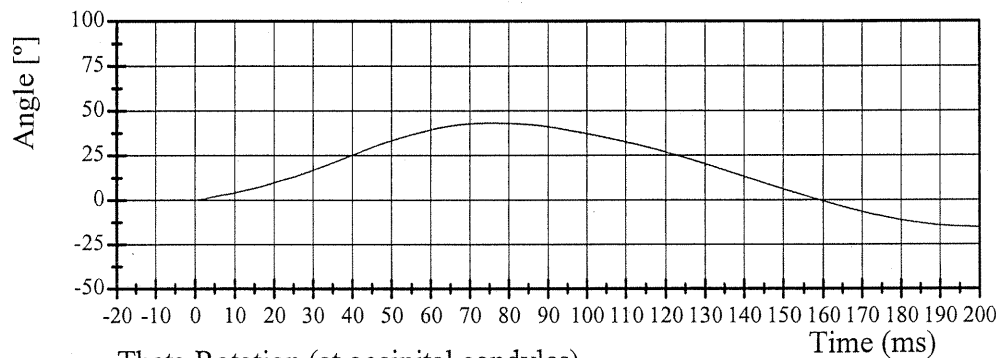


Filter Class: 60

Max: 19.4 g at 8.7 ms

Min: -1.8 g at 46.6 ms

Beta Rotation (at base of neck)

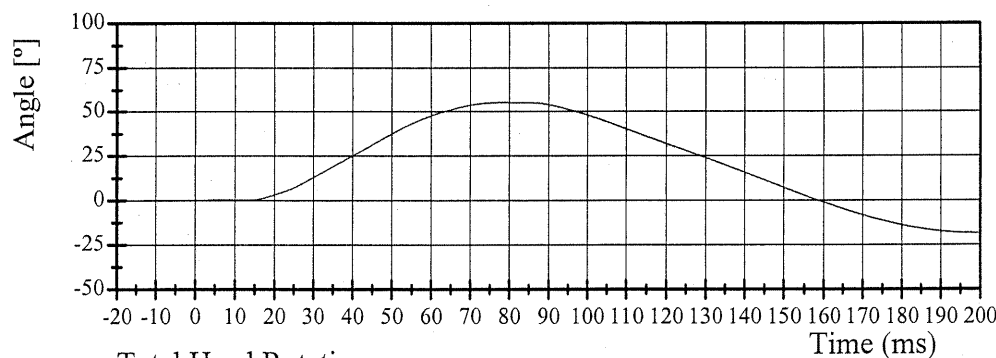


Filter Class: 60

Max: 43.2 ° at 75.4 ms

Min: -15.4 ° at 201.8 ms

Theta Rotation (at occipital condyles)

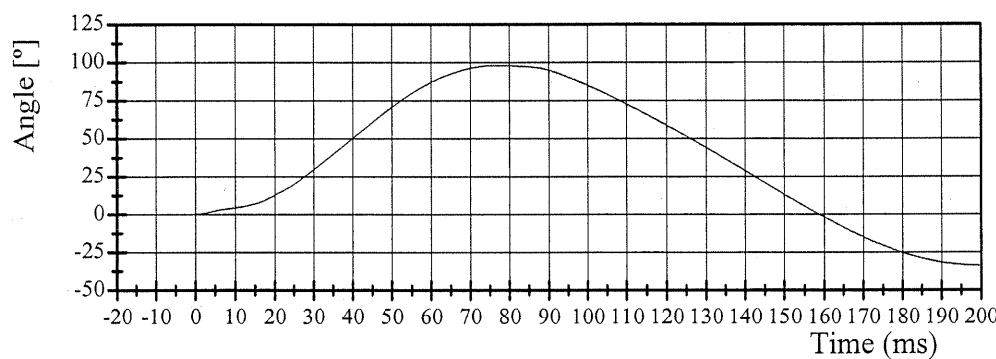


Filter Class: 60

Max: 55.0 ° at 78.2 ms

Min: -18.5 ° at 202.1 ms

Total Head Rotation



Filter Class: 60

Max: 98.1 ° at 76.8 ms

Min: -33.9 ° at 201.9 ms

10.10.2003 09:42:16 585



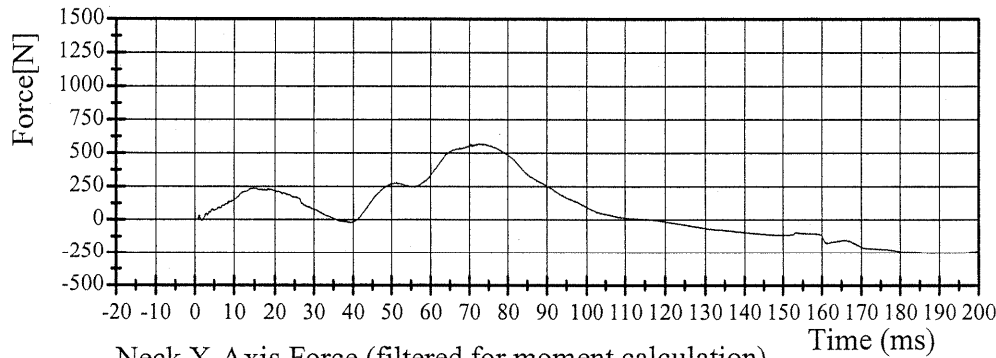
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Neck X-Axis Force

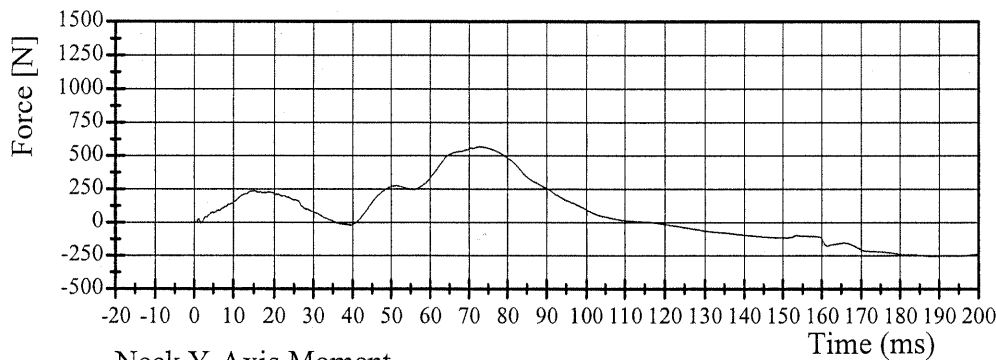


Filter Class: 1000

Max: 567.9 N at 72.6 ms

Min: -254.3 N at 188.6 ms

Neck X-Axis Force (filtered for moment calculation)

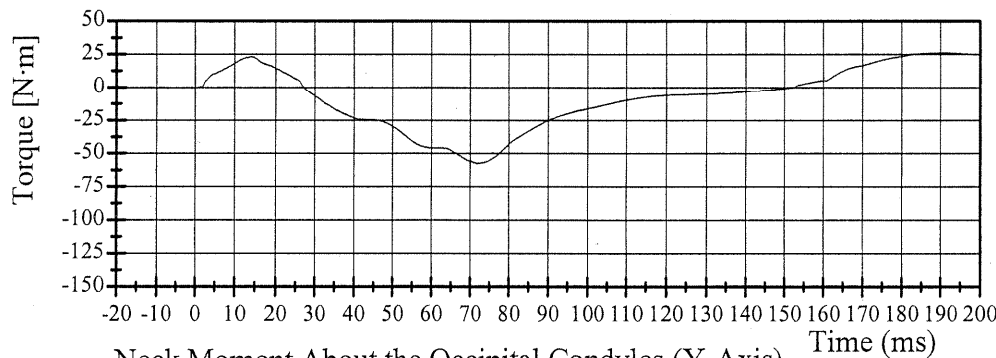


Filter Class: 600

Max: 567.7 N at 72.7 ms

Min: -253.9 N at 188.5 ms

Neck Y-Axis Moment

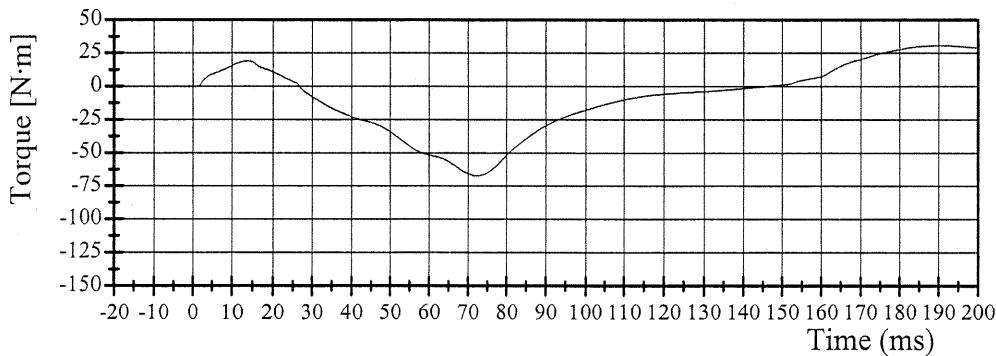


Filter Class: 600

Max: 26.4 N·m at 191.1 ms

Min: -57.3 N·m at 72.0 ms

Neck Moment About the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 30.8 N·m at 190.6 ms

Min: -67.3 N·m at 72.2 ms



Transportation Research Center Inc.

572E Thorax Test

HIH 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

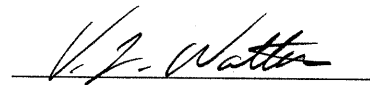
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.65 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-67.6 mm	Yes
Maximum Resistive Force	5160 - 5894 N	5754 N	Yes
Internal Hysteresis	69 - 85 %	70 %	Yes

Comments:

Technician



Approved



10.03.2003 13:07:59 962



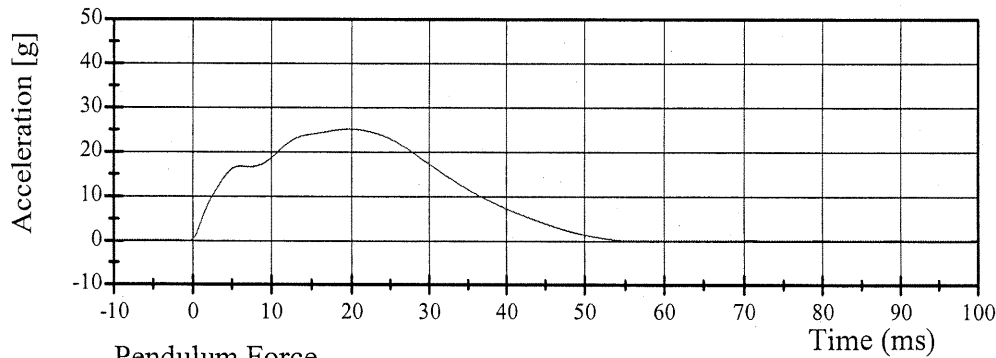
Transportation Research Center Inc.

572E Thorax Test

HIH 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Pendulum Deceleration

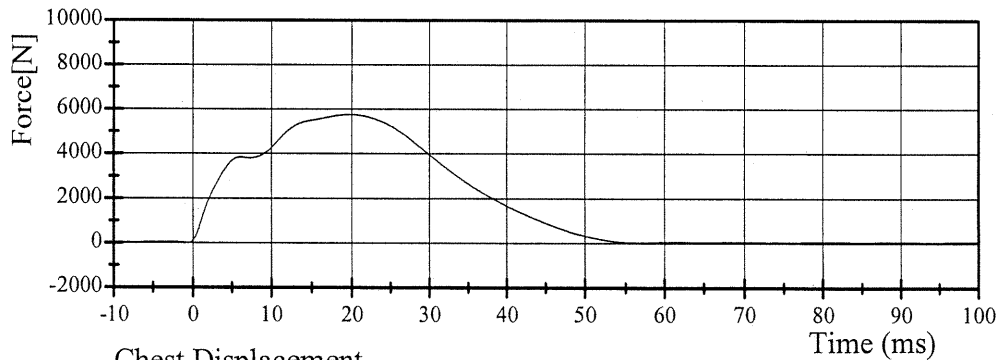


Filter Class: 180

Max: 25.1 g at 19.8 ms

Min: -0.1 g at -76.9 ms

Pendulum Force

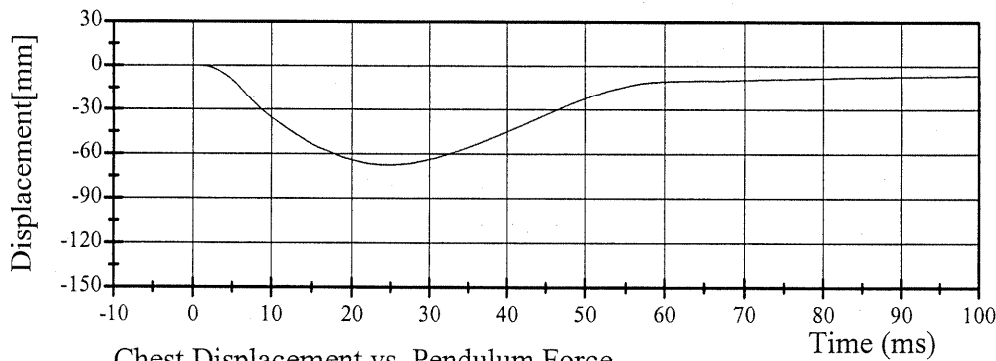


Filter Class: 180

Max: 5753.7 N at 19.8 ms

Min: -12.2 N at -76.9 ms

Chest Displacement

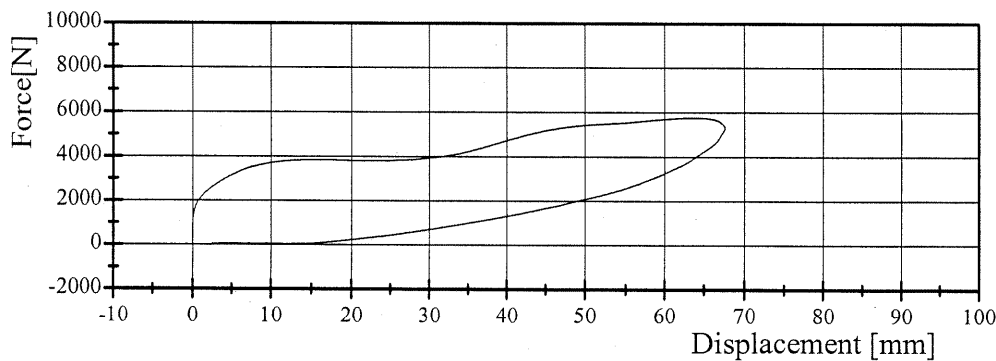


Filter Class: 180

Max: 0.0 mm at 0.5 ms

Min: -67.6 mm at 24.7 ms

Chest Displacement vs. Pendulum Force



Transportation Research Center Inc

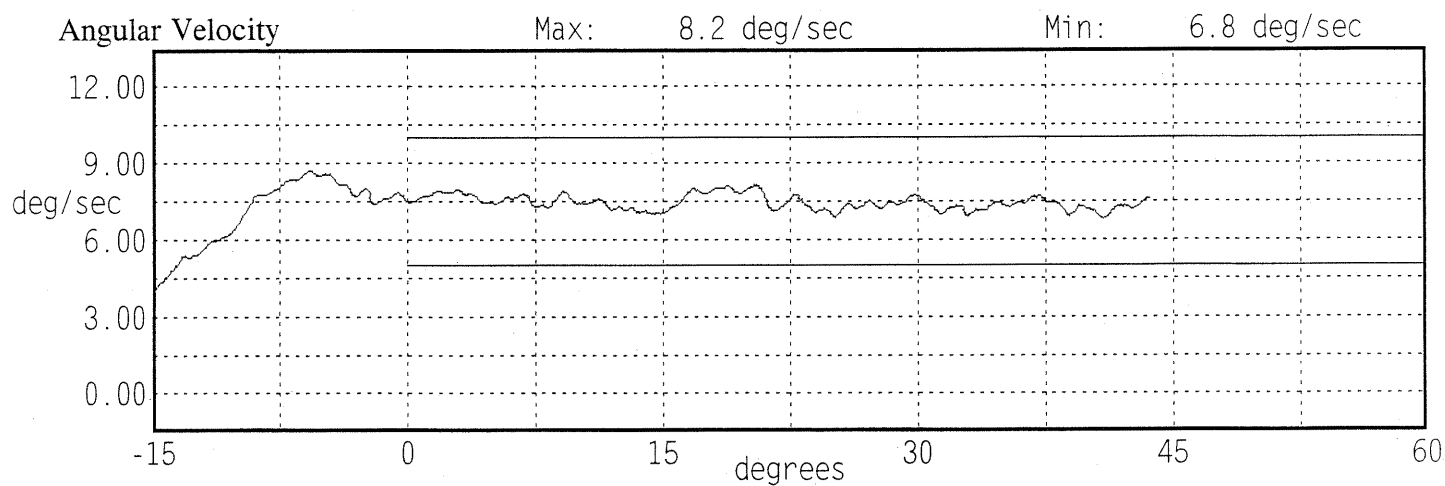
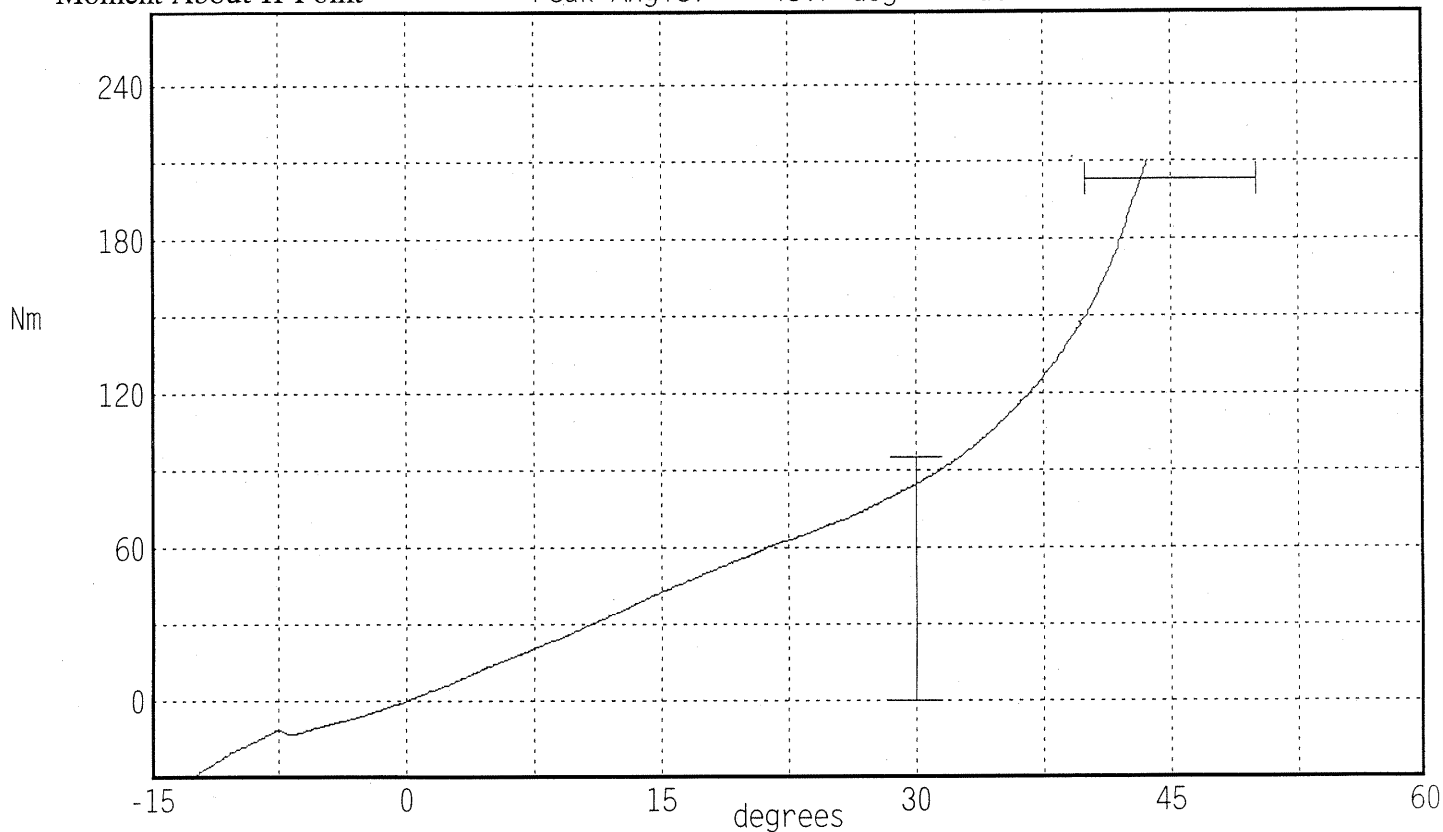
Hybrid III Hip Range of Motion

Serial Number: 206L
Test Number: 206C16
Comments:

Date: 10/03/2003
Time: 11:40

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	21 % Pass
Moment at 30 deg	<= 94.9	84.8 Nm Pass
Angle at 203 Nm	40.0 - 50.0	43.3 deg Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec Pass

Moment About H-Point
Peak Moment: 210.0 Nm at 43.7 deg
Peak Angle: 43.7 deg at 210.0 Nm



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 206R
Test Number: 206C16

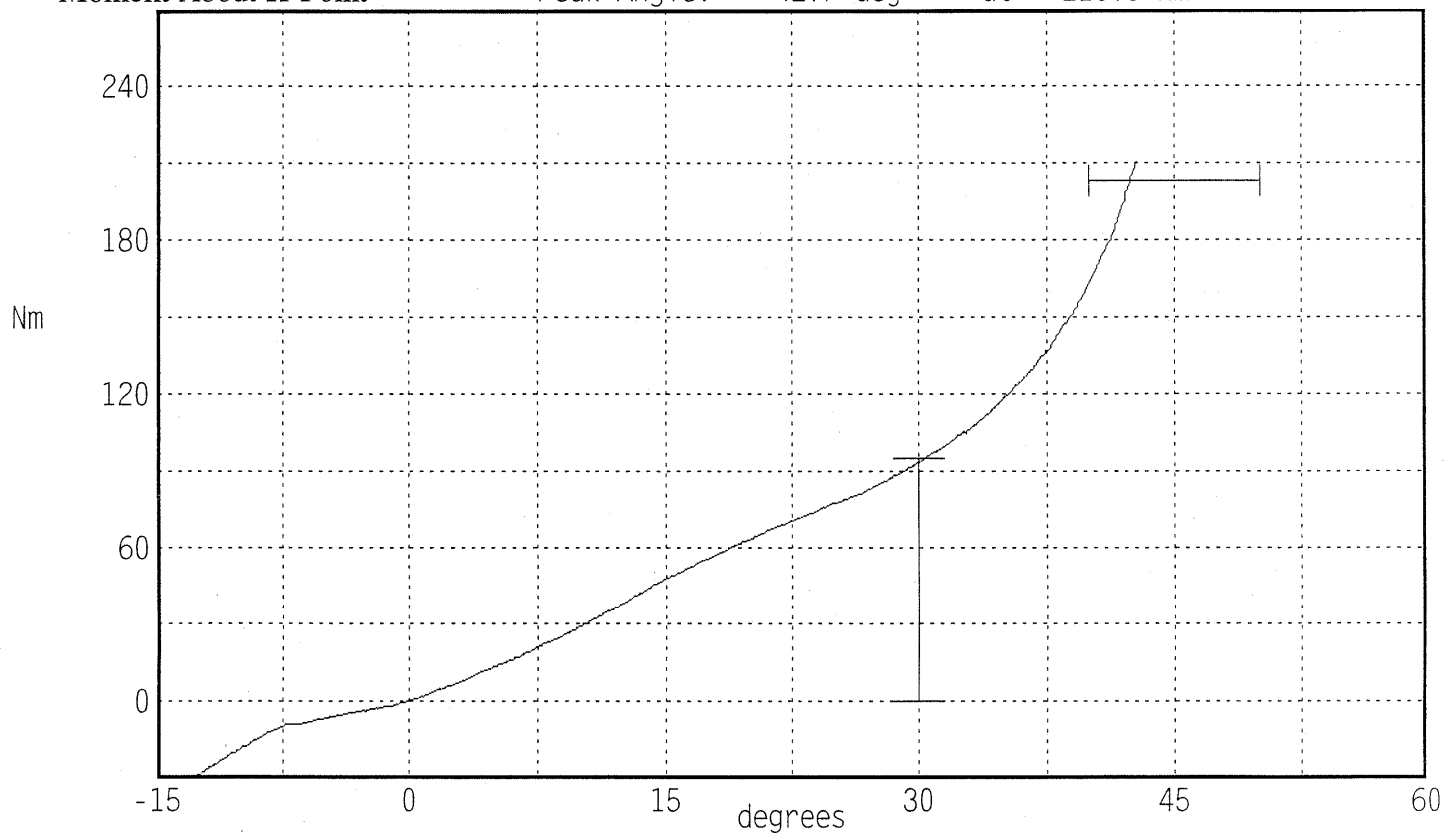
Date: 10/03/2003
Time: 11:55

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.7 °C	Pass
Humidity	10 - 70	21 %	Pass
Moment at 30 deg	<= 94.9	93.5 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	42.4 deg	Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec	Pass

Peak Moment: 210.5 Nm at 42.7 deg
Peak Angle: 42.7 deg at 210.5 Nm

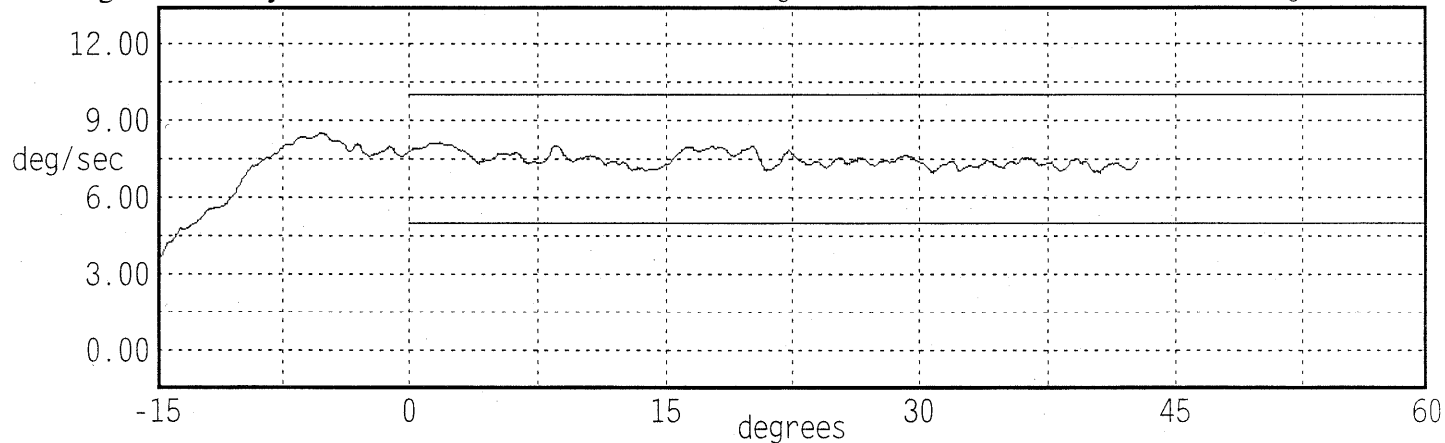
Moment About H-Point



Angular Velocity

Max: 8.1 deg/sec

Min: 7.0 deg/sec



Transportation Research Center Inc.

572E Left Knee Test

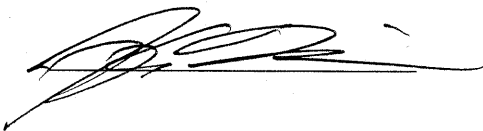
HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

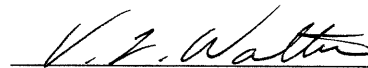
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5423 N	Yes

Comments:

Technician



Approved



10.03.2003 11:26:37 2098



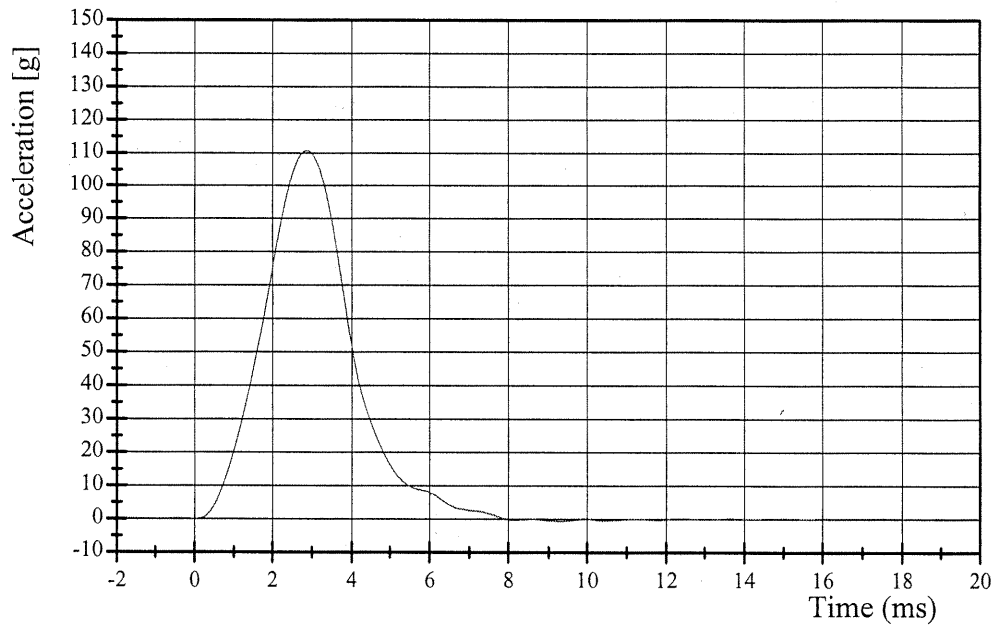
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Pendulum Deceleration

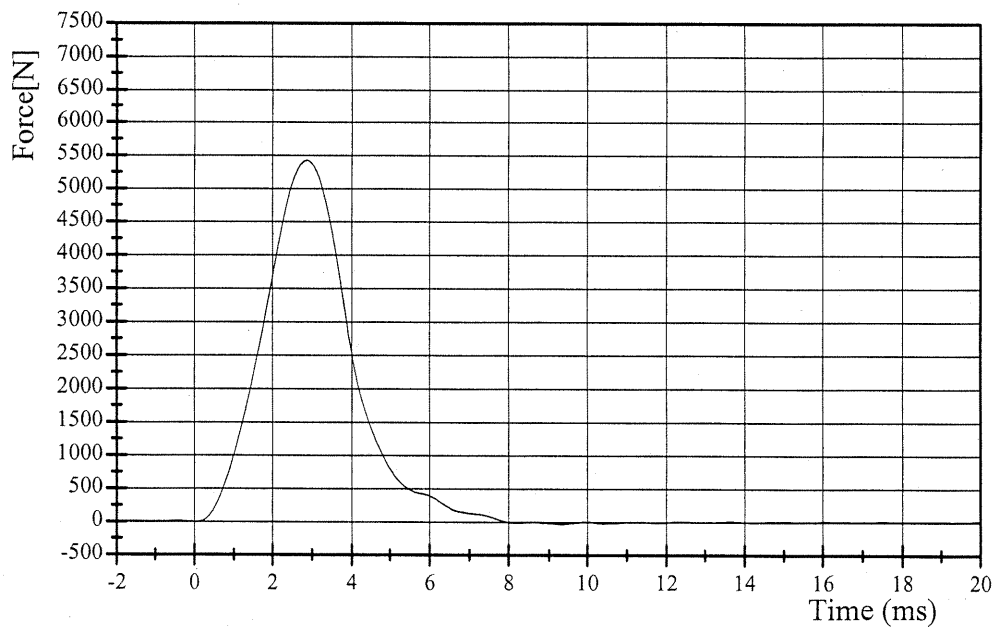


Filter Class: 600

Max: 110.8 g at 2.9 ms

Min: -0.7 g at 9.4 ms

Pendulum Force



Filter Class: 600

Max: 5423.2 N at 2.9 ms

Min: -32.8 N at 9.4 ms

Transportation Research Center Inc.

572E Right Knee Test

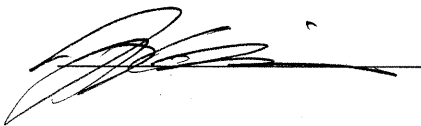
HIII 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

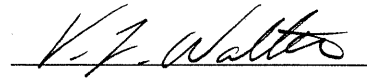
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	21 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5577 N	Yes

Comments:

Technician



Approved



10.03.2003 11:12:30 2102



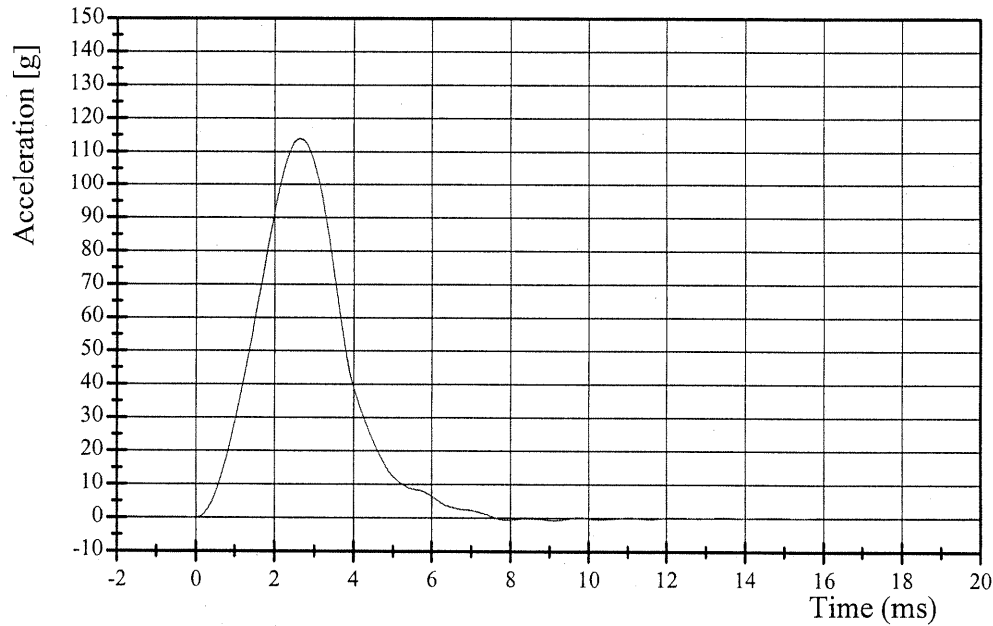
Transportation Research Center Inc.

572E Right Knee Test

HHH 50th Male Serial No. 206 Calibration No. 16 - 1

Test Date 10/03/2003

Pendulum Deceleration

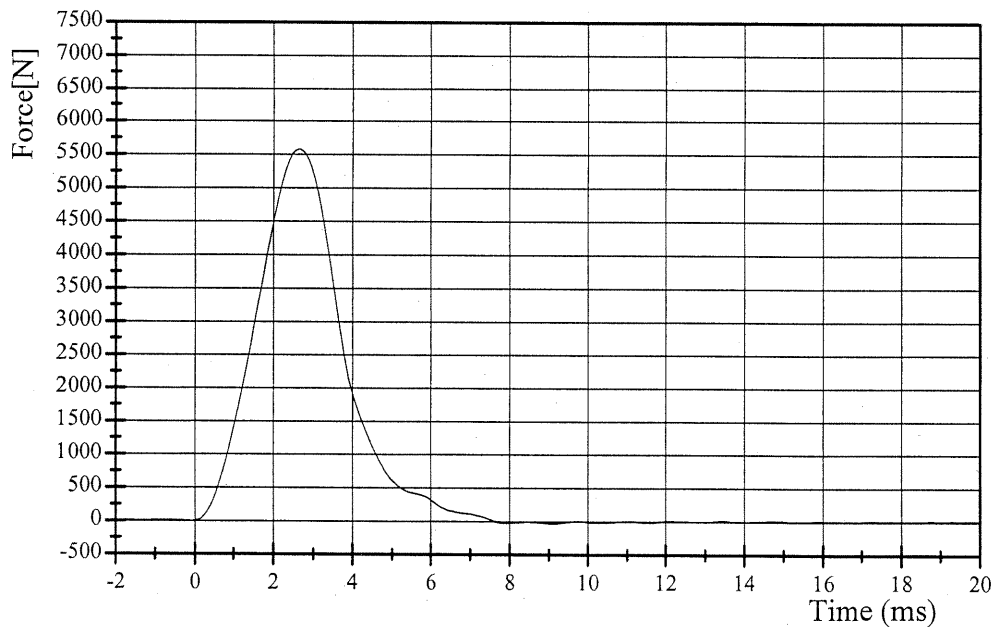


Filter Class: 600

Max: 114.0 g at 2.6 ms

Min: -0.7 g at 9.1 ms

Pendulum Force



Filter Class: 600

Max: 5577.4 N at 2.6 ms

Min: -33.6 N at 9.1 ms

10.03.2003 11:12:31 2102



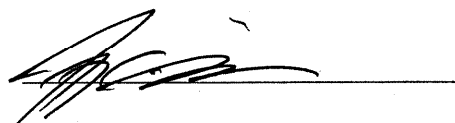
Post-Test Calibration

Right Front Dummy S/N 202

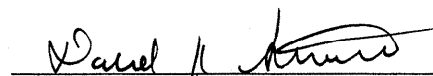
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 202 Calibration No. 19

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	879	Yes
B	Shoulder Pivot Height	505.5 - 520.7	514	Yes
C	H-Point Height	83.8 - 88.9	85	Yes
D	H-Point From Seatback	134.6 - 139.7	136	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	89	Yes
F	Thigh Clearance	139.7 - 154.9	154	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	295	Yes
H	Skull Cap To Backline	40.6 - 45.7	43	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	196	Yes
K	Buttock Knee Length	579.1 - 604.5	594	Yes
L	Popliteal Height	429.3 - 454.7	438	Yes
M	Knee Pivot Height	485.1 - 500.4	490	Yes
N	Buttock Popliteal Length	452.1 - 477.5	460	Yes
O	Chest Depth	213.4 - 228.6	220	Yes
P	Foot Length	251.5 - 266.7	263	Yes
V	Shoulder Breadth	421.6 - 436.9	432	Yes
W	Foot Breadth	91.4 - 106.7	97	Yes
Y	Chest Circumference	970.3 - 1000.8	991	Yes
Z	Waist Circumference	835.7 - 866.1	847	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/15/2003

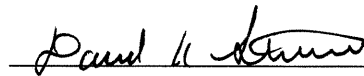
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Resultant Acceleration	225 - 275 g	243.4 g	Yes
Peak Lateral Acceleration	15 g Max	-5.4 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



10.15.2003 13:42:21 614



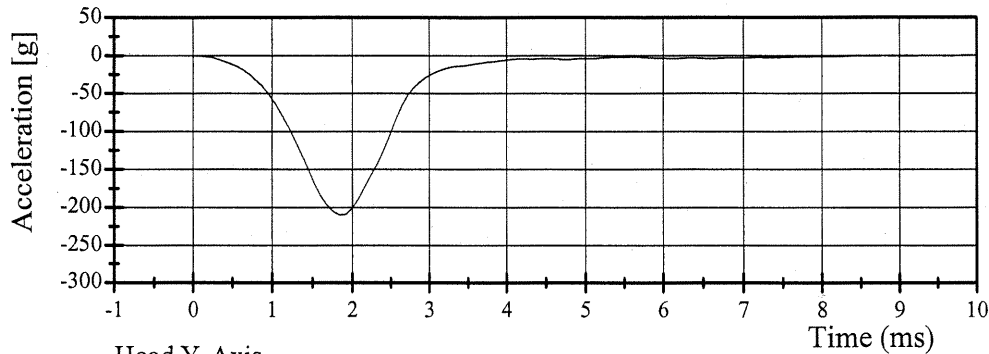
Transportation Research Center Inc.

572E Head Drop Test

IIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/15/2003

Head X-Axis

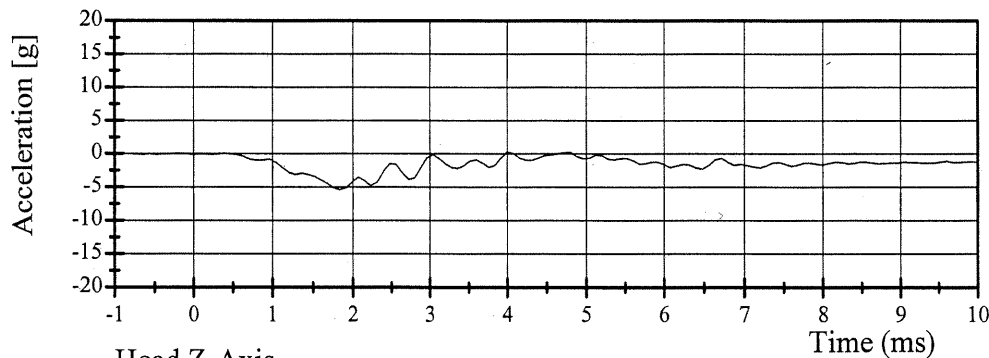


Filter Class: 1000

Max: 0.5 g at 10.0 ms

Min: -209.7 g at 1.8 ms

Head Y-Axis

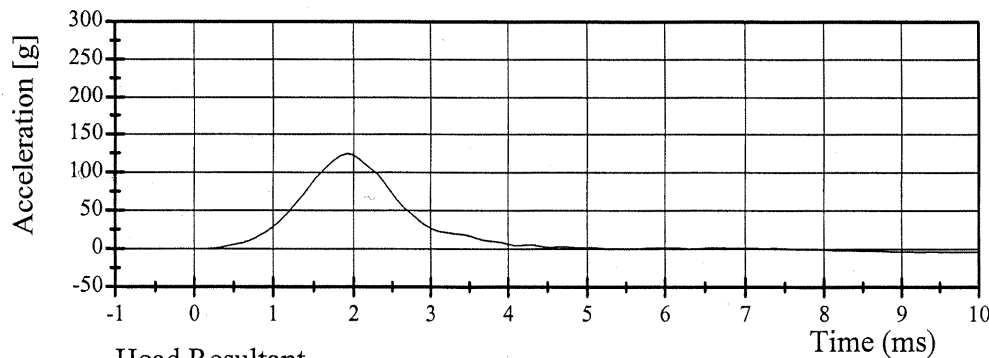


Filter Class: 1000

Max: 0.3 g at 4.0 ms

Min: -5.4 g at 1.8 ms

Head Z-Axis

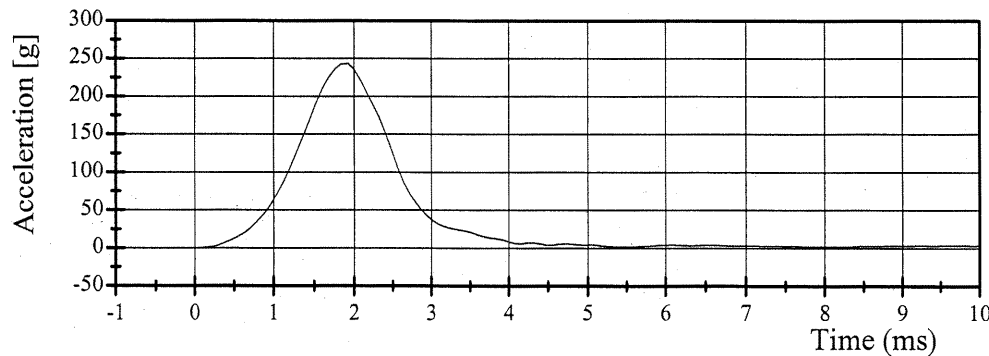


Filter Class: 1000

Max: 124.9 g at 1.9 ms

Min: -3.8 g at 9.6 ms

Head Resultant



Filter Class: 1000

Max: 243.4 g at 1.9 ms

Min: 0.0 g at 2.4 ms

10.15.2003 13:42:22 614



Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

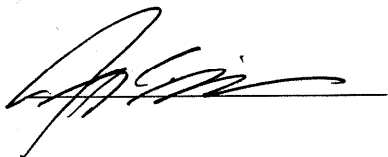
HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

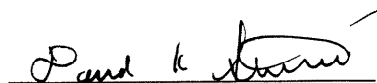
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	24.55 g	Yes
20 ms	17.60 - 22.60 g	21.56 g	Yes
30 ms	12.50 - 18.50 g	16.53 g	Yes
Max Pendulum Deceleration	29.00 g	25.92 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	16.46 g	Yes
Deceleration-Time Curve Decay Time To 5g	34 - 42 ms	36.96 ms	Yes
D Plane Rotation			
Max	64 - 78 °	66.60 °	Yes
Time	57 - 64 ms	58.64 ms	Yes
Moment About Occipital Condyle			
Max	88.1 - 108.5 N·m	99.51 N·m	Yes
Time	47 - 58 ms	49.76 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	113 - 128 ms	118.24 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	97 - 107 ms	99.36 ms	Yes

Comments:

Technician



Approved



10.16.2003 10:28:14 502



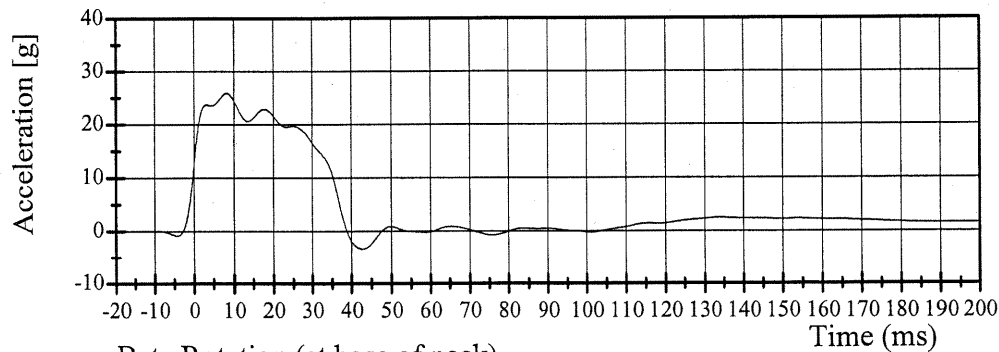
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

Pendulum Deceleration

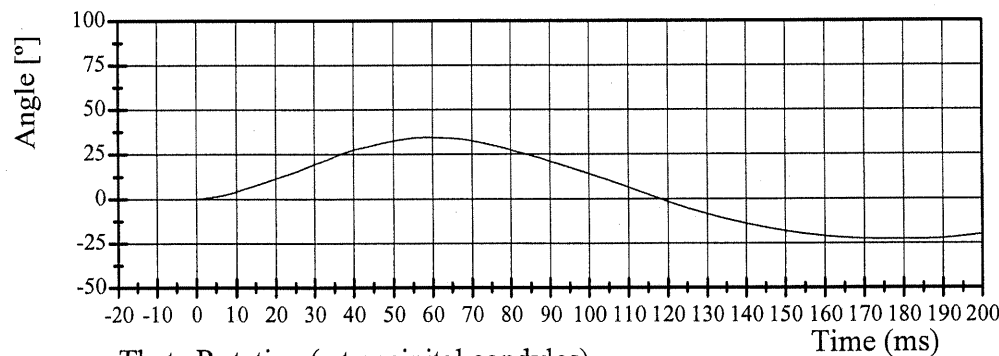


Filter Class: 60

Max: 25.9 g at 8.2 ms

Min: -3.3 g at 42.8 ms

Beta Rotation (at base of neck)

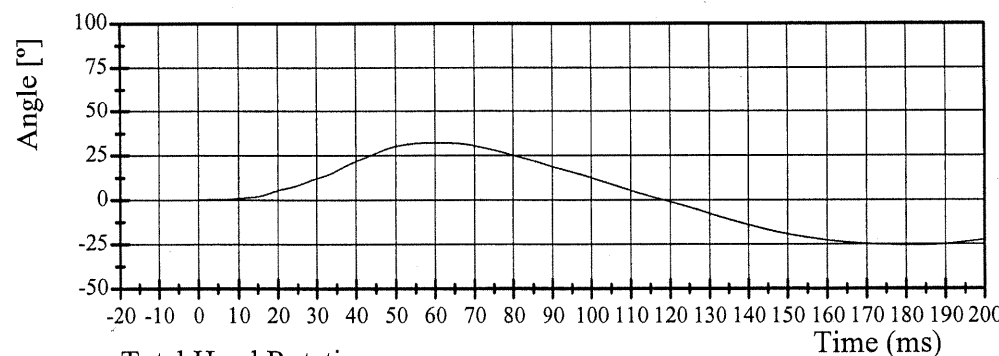


Filter Class: 60

Max: 34.5 ° at 58.8 ms

Min: -22.6 ° at 176.3 ms

Theta Rotation (at occipital condyles)

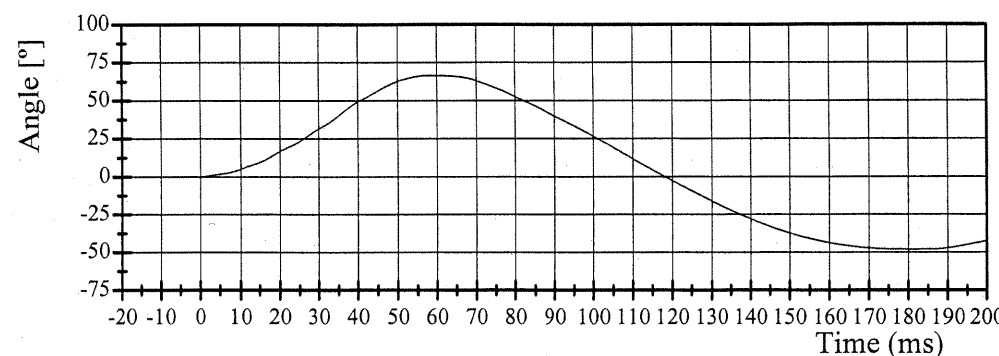


Filter Class: 60

Max: 32.1 ° at 58.2 ms

Min: -25.4 ° at 182.0 ms

Total Head Rotation



Filter Class: 60

Max: 66.6 ° at 58.6 ms

Min: -48.0 ° at 180.6 ms

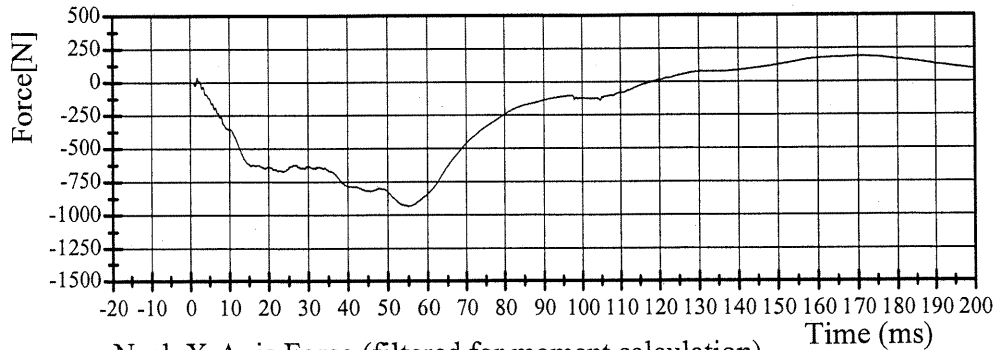
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

Neck X-Axis Force

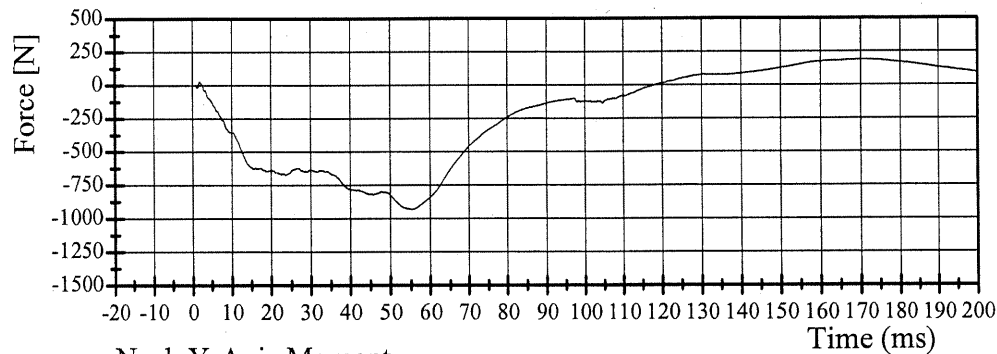


Filter Class: 1000

Max: 189.1 N at 169.8 ms

Min: -931.5 N at 55.0 ms

Neck X-Axis Force (filtered for moment calculation)

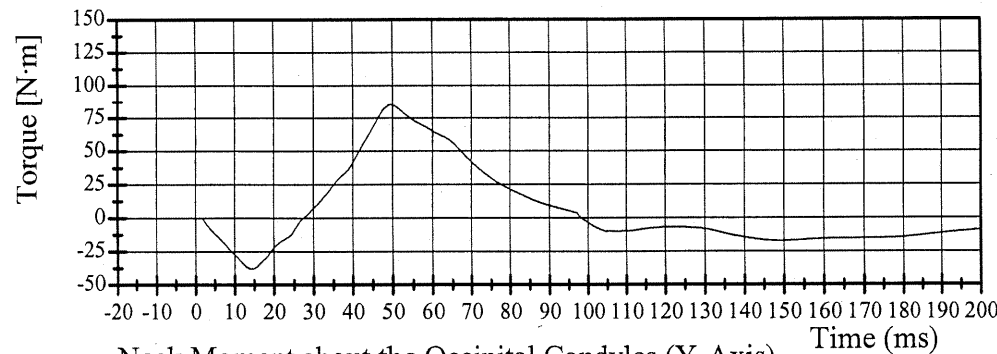


Filter Class: 600

Max: 189.1 N at 170.1 ms

Min: -931.4 N at 55.1 ms

Neck Y-Axis Moment

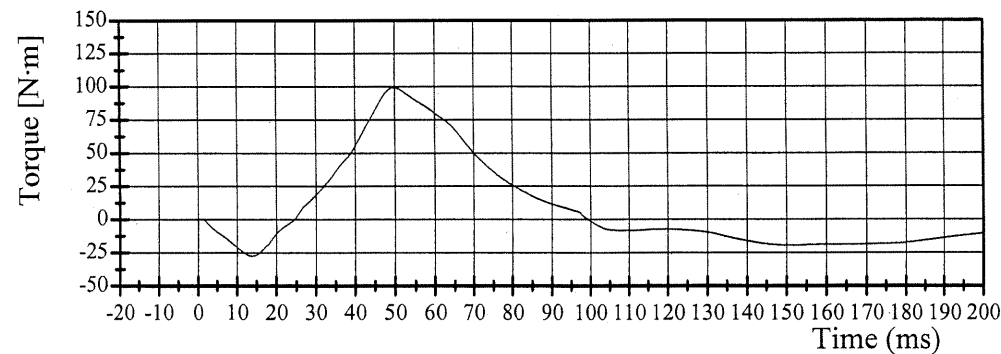


Filter Class: 600

Max: 85.1 N·m at 49.5 ms

Min: -38.0 N·m at 14.2 ms

Neck Moment about the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 99.5 N·m at 49.8 ms

Min: -27.5 N·m at 13.8 ms

Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

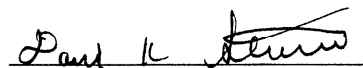
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.02 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	18.80 g	Yes
20 ms	14.00 - 19.00 g	16.13 g	Yes
30 ms	11.00 - 16.00 g	13.57 g	Yes
Max Pendulum Deceleration	22.00 g	19.26 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	13.51 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	38 - 46 ms	43.28 ms	Yes
D Plane Rotation			
Max	81 - 106 °	90.36 °	Yes
Time	72 - 82 ms	81.68 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-62.99 N·m	Yes
Time	65 - 79 ms	75.44 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	147 - 174 ms	161.36 ms	Yes
Negative Moment-Time Curve			
Decay Time To Zero	120 - 148 ms	146.96 ms	Yes

Comments:

Technician



Approved



10.16.2003 10:58:22 575



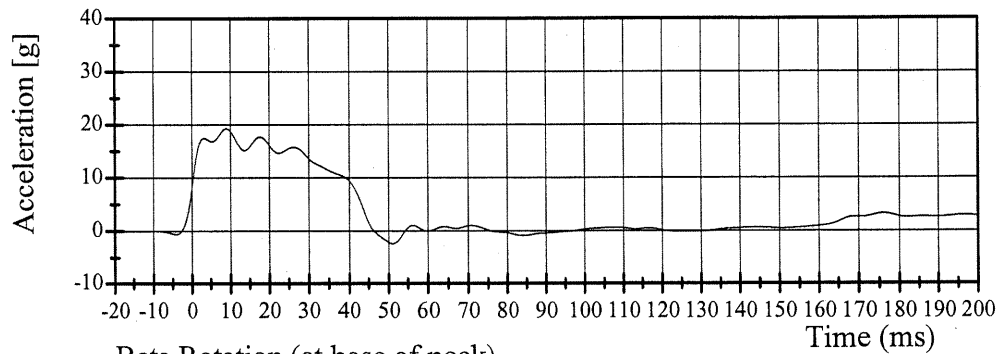
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

Pendulum Deceleration

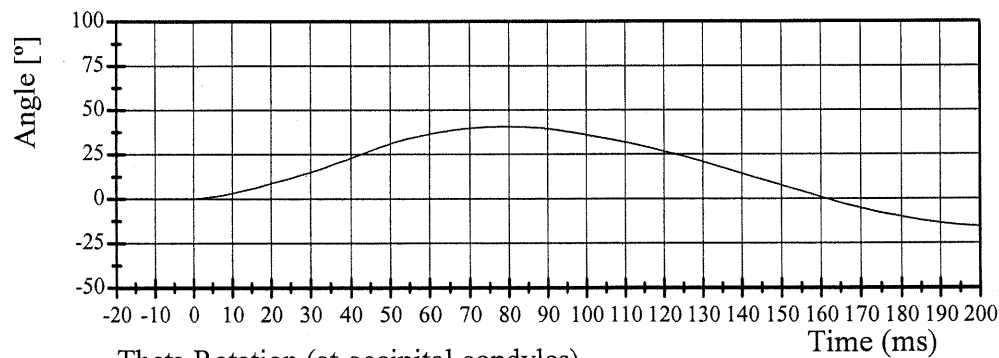


Filter Class: 60

Max: 19.3 g at 9.0 ms

Min: -2.4 g at 51.0 ms

Beta Rotation (at base of neck)

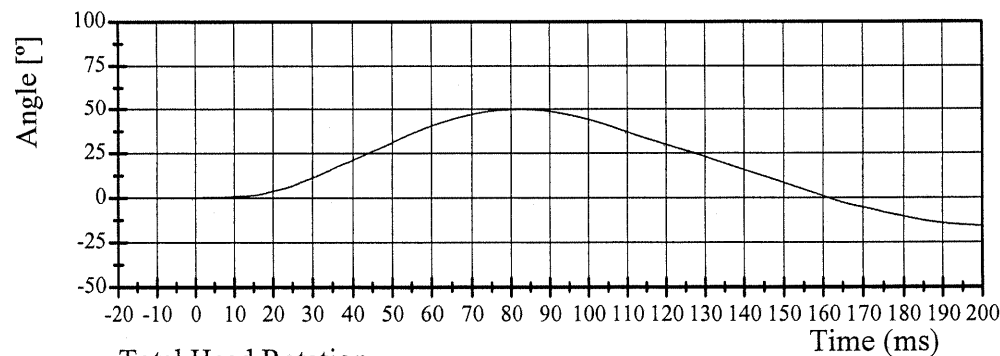


Filter Class: 60

Max: 40.6 ° at 78.9 ms

Min: -15.9 ° at 205.2 ms

Theta Rotation (at occipital condyles)

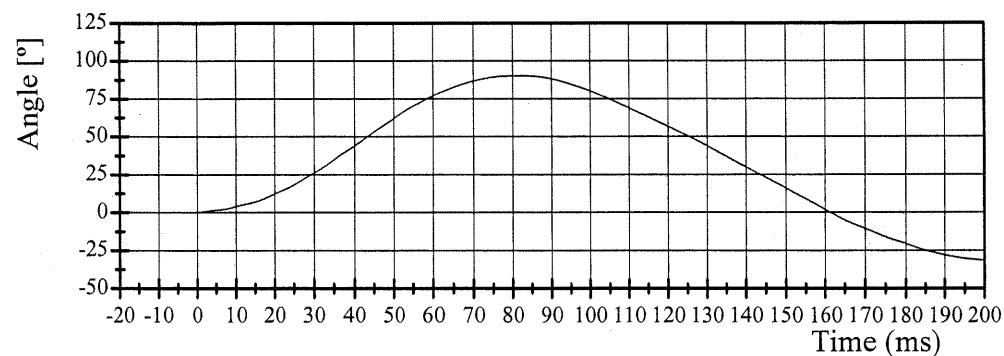


Filter Class: 60

Max: 49.9 ° at 82.7 ms

Min: -15.8 ° at 203.0 ms

Total Head Rotation



Filter Class: 60

Max: 90.4 ° at 81.7 ms

Min: -31.8 ° at 204.4 ms

10.16.2003 10:58:23 575



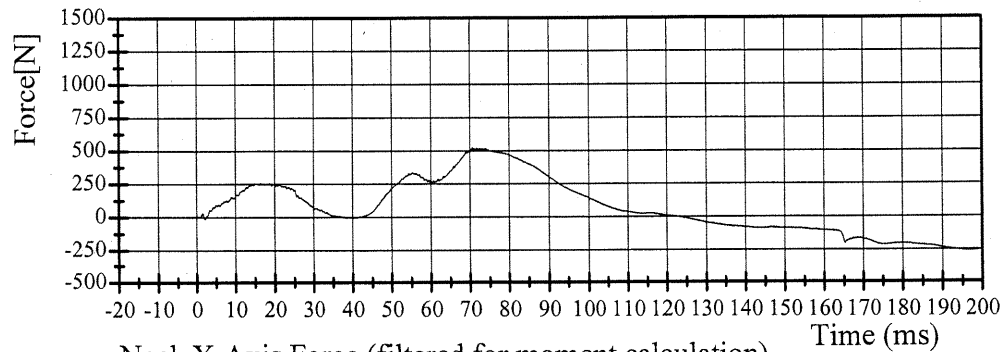
Transportation Research Center Inc.

572E Neck Extension Test

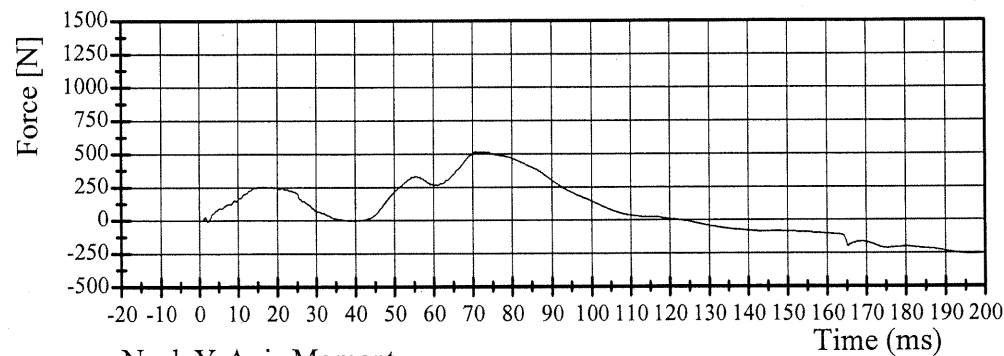
HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

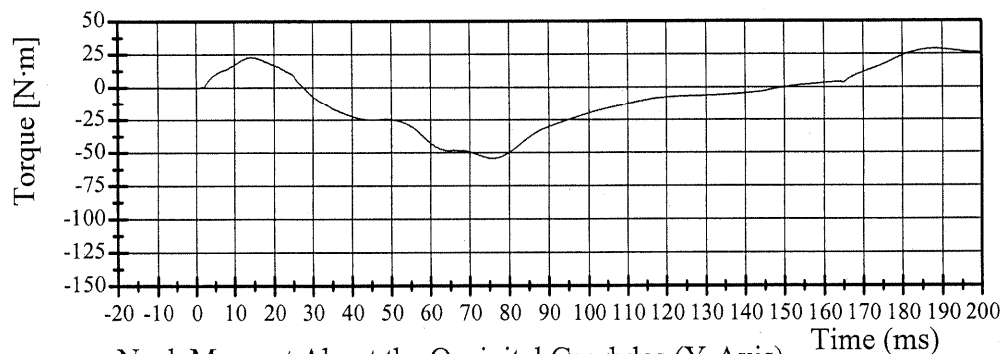
Neck X-Axis Force



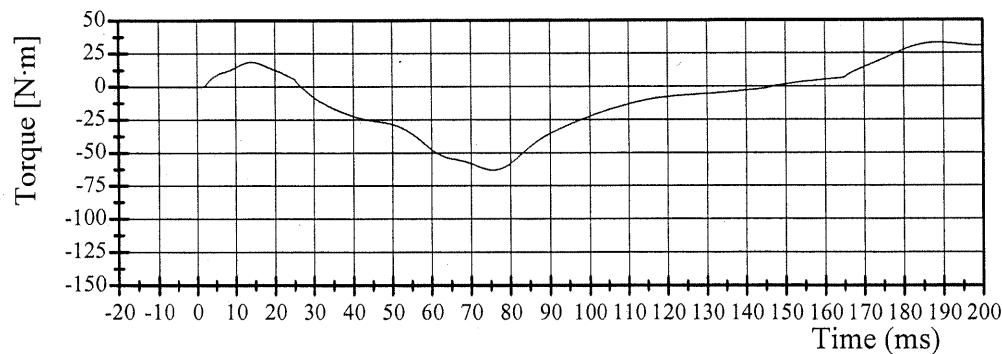
Neck X-Axis Force (filtered for moment calculation)



Neck Y-Axis Moment



Neck Moment About the Occipital Condyles (Y-Axis)



10.16.2003 10:58:24 575



Transportation Research Center Inc.

572E Thorax Test

HHH 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

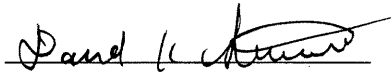
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.61 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-67.2 mm	Yes
Maximum Resistive Force	5160 - 5894 N	5834 N	Yes
Internal Hysteresis	69 - 85 %	71 %	Yes

Comments:

Technician



Approved



10.16.2003 13:11:58 966



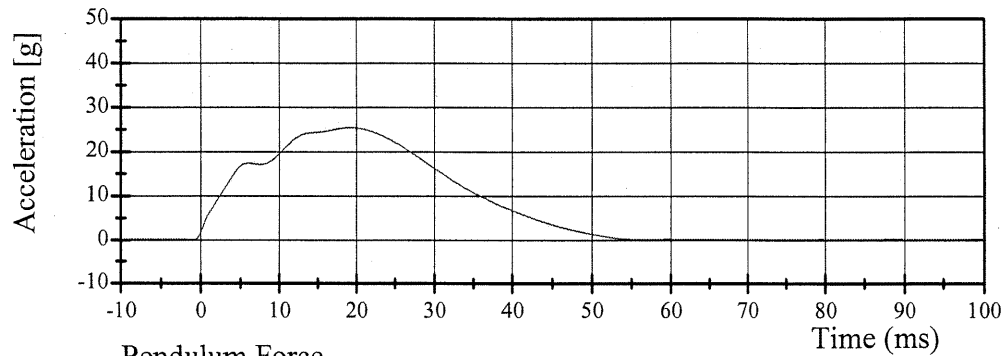
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/16/2003

Pendulum Deceleration

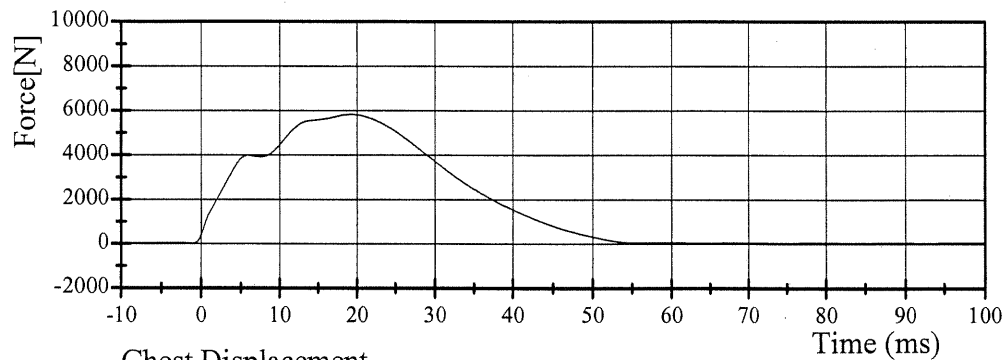


Filter Class: 180

Max: 25.5 g at 19.2 ms

Min: -0.2 g at 314.1 ms

Pendulum Force

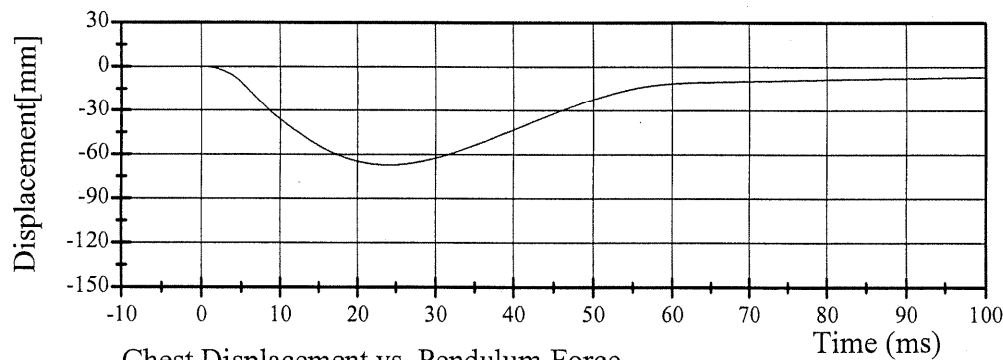


Filter Class: 180

Max: 5834.5 N at 19.2 ms

Min: -48.8 N at 314.1 ms

Chest Displacement

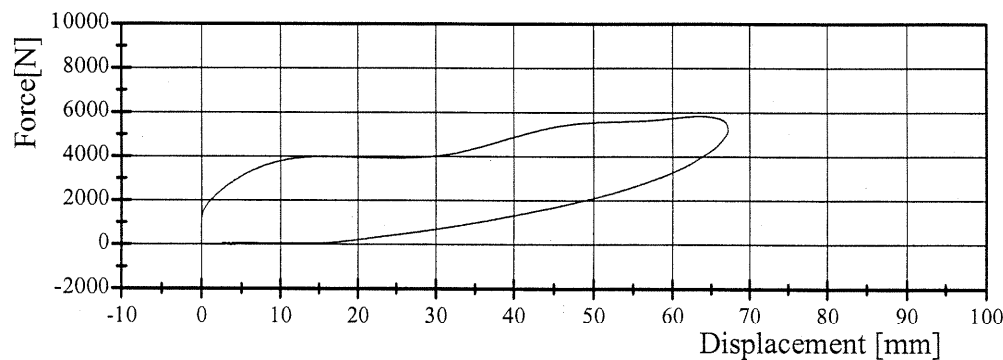


Filter Class: 180

Max: 0.0 mm at 0.2 ms

Min: -67.2 mm at 24.2 ms

Chest Displacement vs. Pendulum Force



10.16.2003 13:11:59 966



Transportation Research Center Inc

Hybrid III Hip Range of Motion

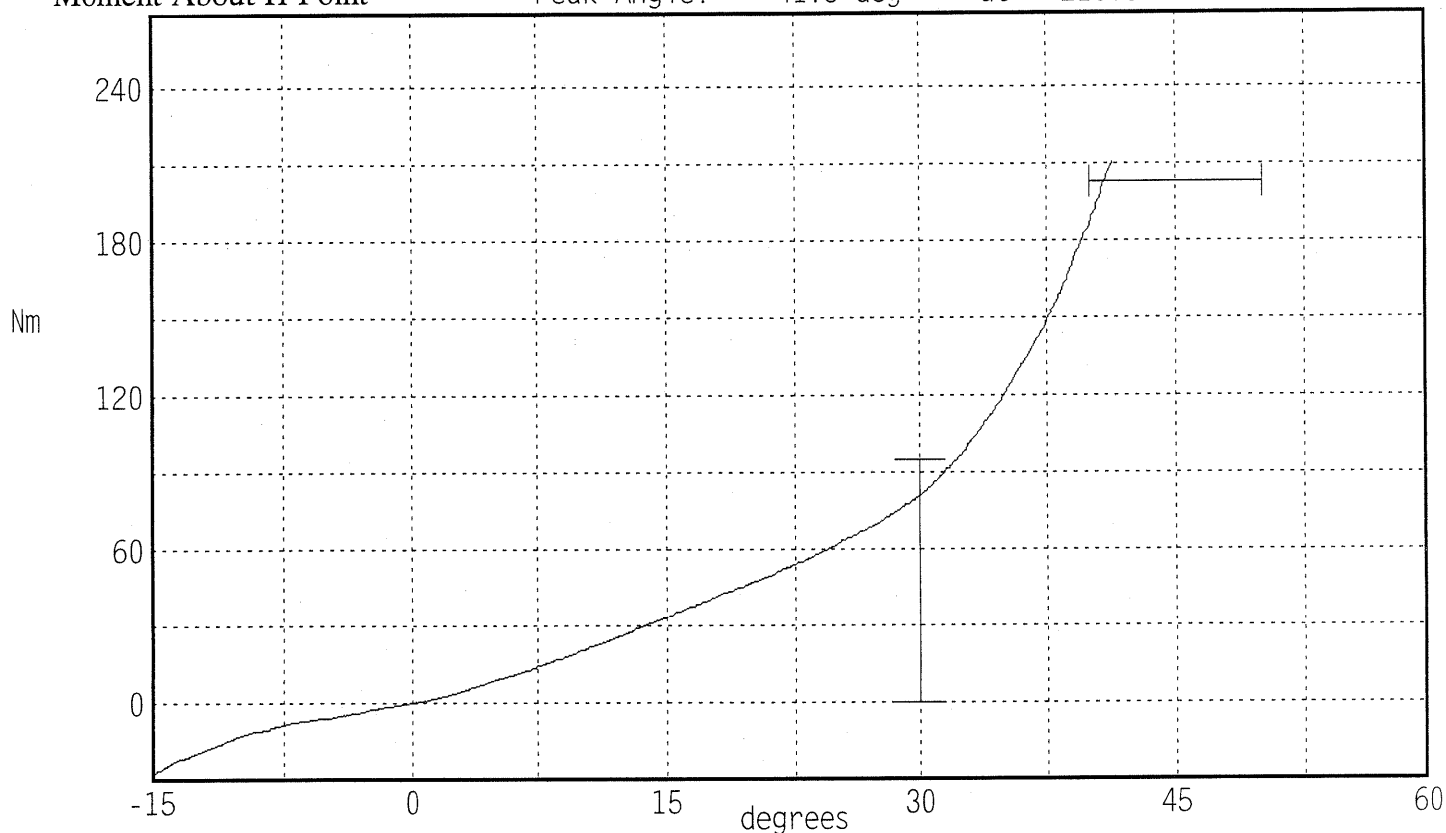
Serial Number: 202L
Test Number: 202C19
Comments:

Date: 10/15/2003
Time: 13:01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.1 °C Pass
Humidity	10 - 70	34 % Pass
Moment at 30 deg	<= 94.9	80.9 Nm Pass
Angle at 203 Nm	40.0 - 50.0	40.9 deg Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec Pass

Peak Moment: 210.5 Nm at 41.3 deg
Peak Angle: 41.3 deg at 210.5 Nm

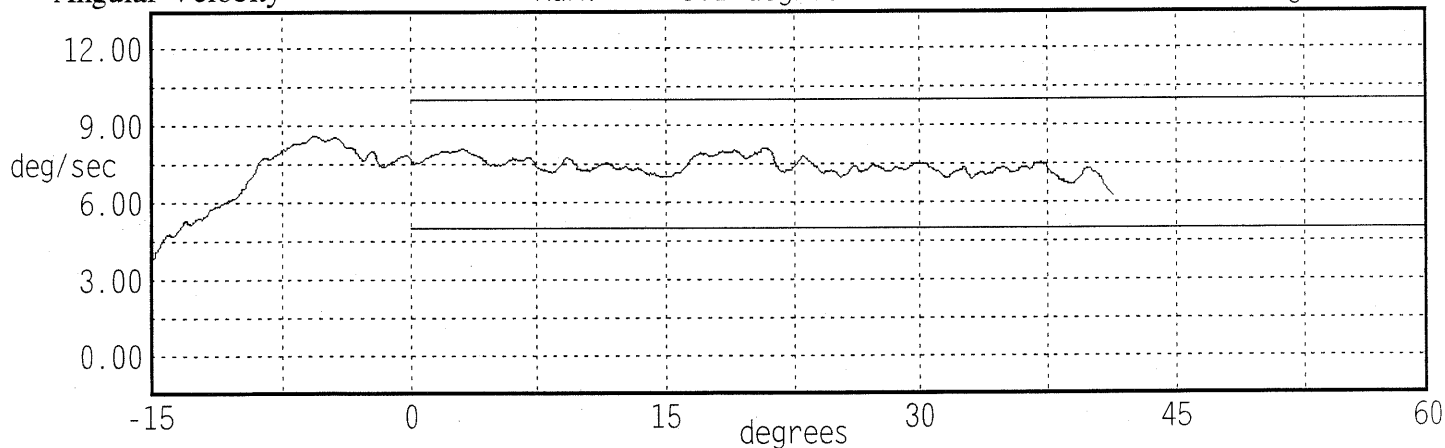
Moment About H-Point



Angular Velocity

Max: 8.1 deg/sec

Min: 6.3 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

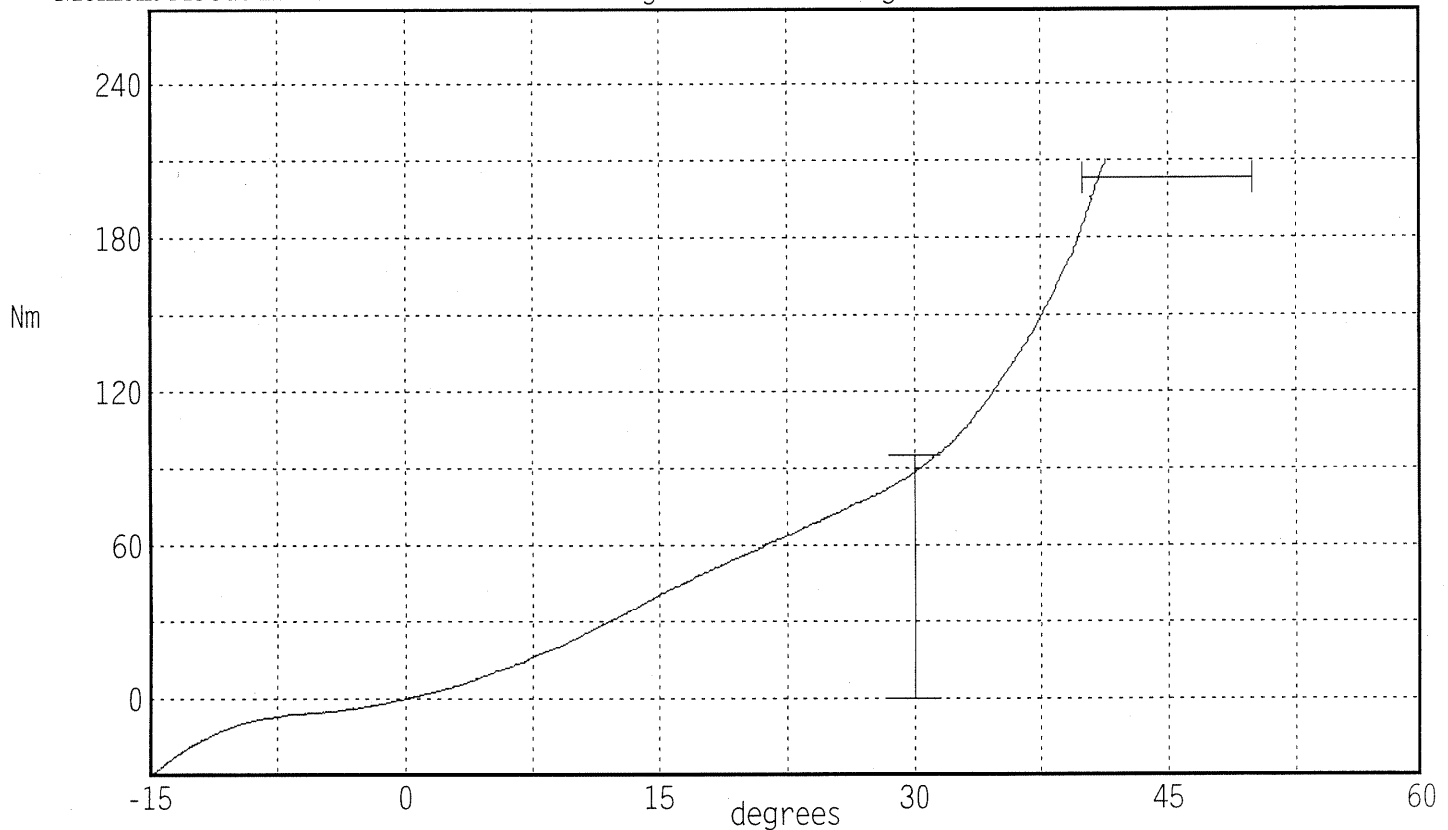
Serial Number: 202R
Test Number: 202C19
Comments:

Date: 10/15/2003
Time: 12:52

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.1 °C Pass
Humidity	10 - 70	34 % Pass
Moment at 30 deg	<= 94.9	88.3 Nm Pass
Angle at 203 Nm	40.0 - 50.0	41.0 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Peak Moment: 210.0 Nm at 41.3 deg
Peak Angle: 41.3 deg at 210.0 Nm

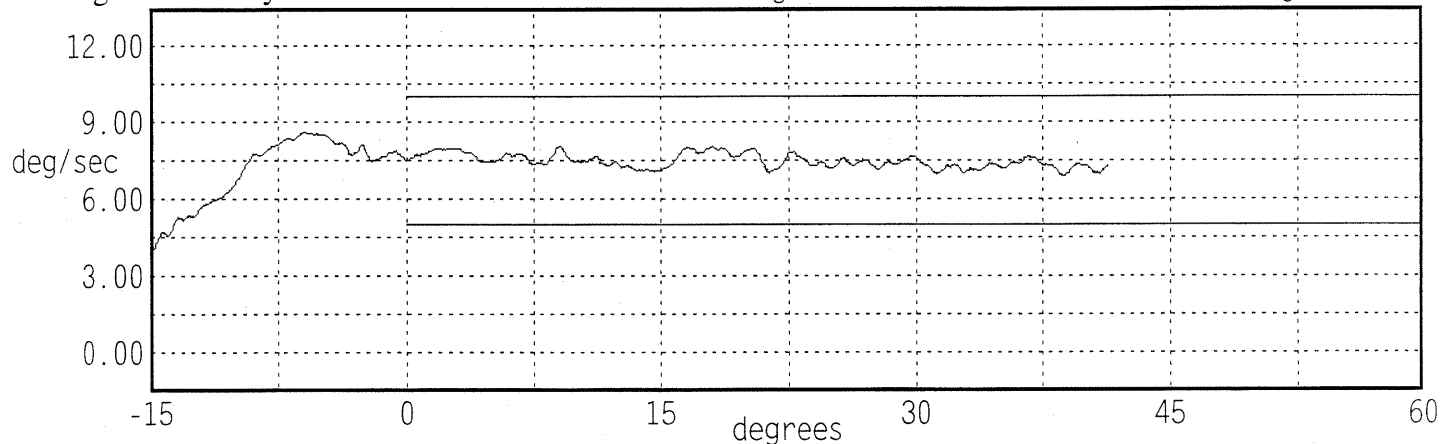
Moment About H-Point



Angular Velocity

Max: 8.0 deg/sec

Min: 6.9 deg/sec



Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/15/2003

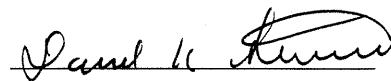
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.13 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5692 N	Yes

Comments:

Technician



Approved



10.15.2003 14:26:50 2106



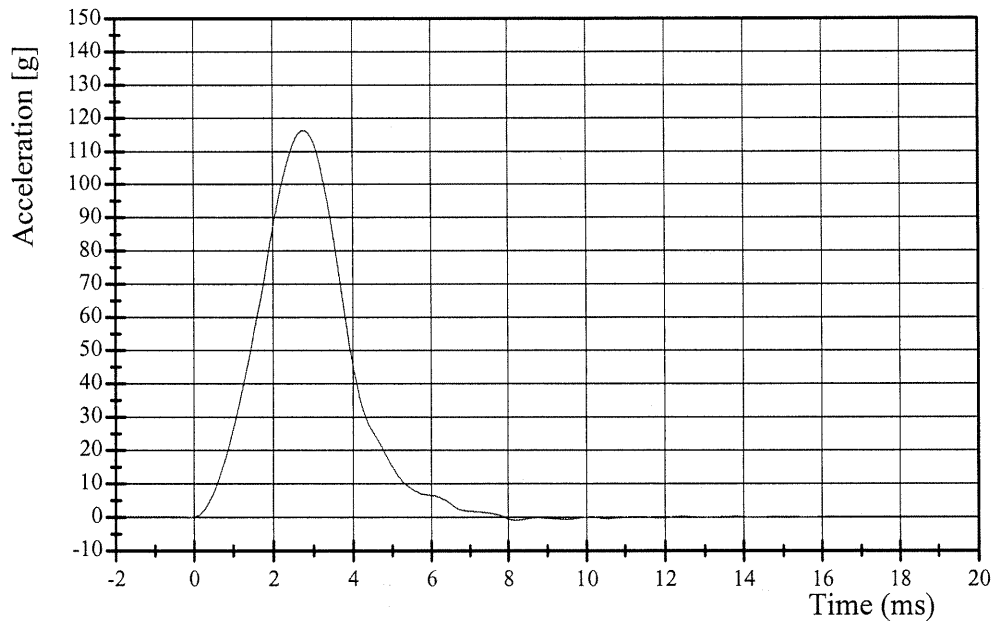
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/15/2003

Pendulum Deceleration

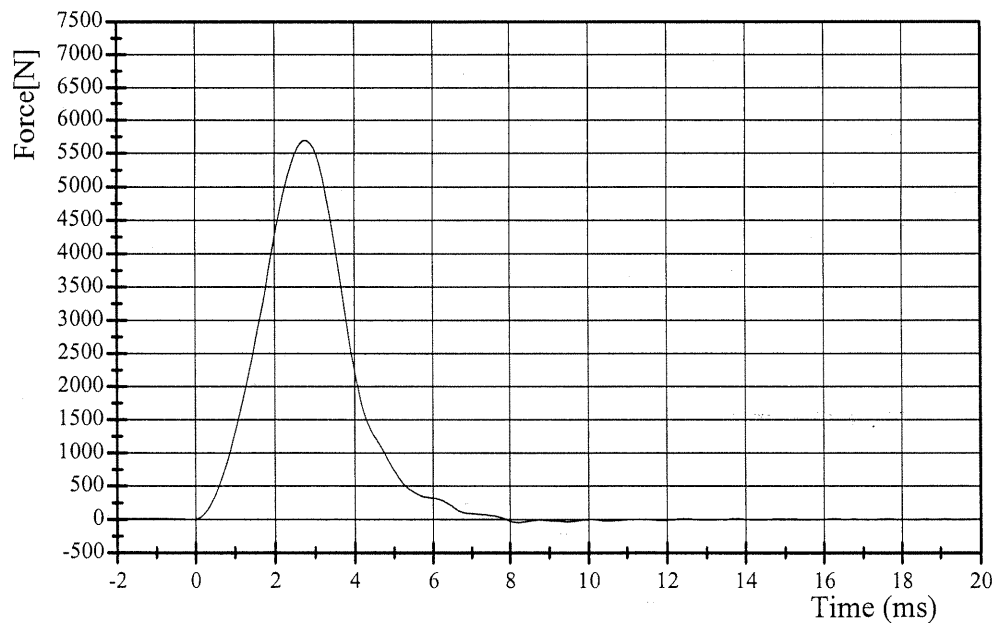


Filter Class: 600

Max: 116.3 g at 2.8 ms

Min: -0.9 g at 8.2 ms

Pendulum Force



Filter Class: 600

Max: 5692.4 N at 2.8 ms

Min: -42.9 N at 8.2 ms

10.15.2003 14:26:50 2106



Transportation Research Center Inc.

572E Right Knee Test

HHH 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/15/2003

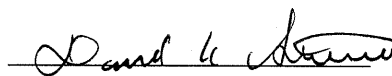
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5374 N	Yes

Comments:

Technician



Approved



10.15.2003 14:29:34 2130



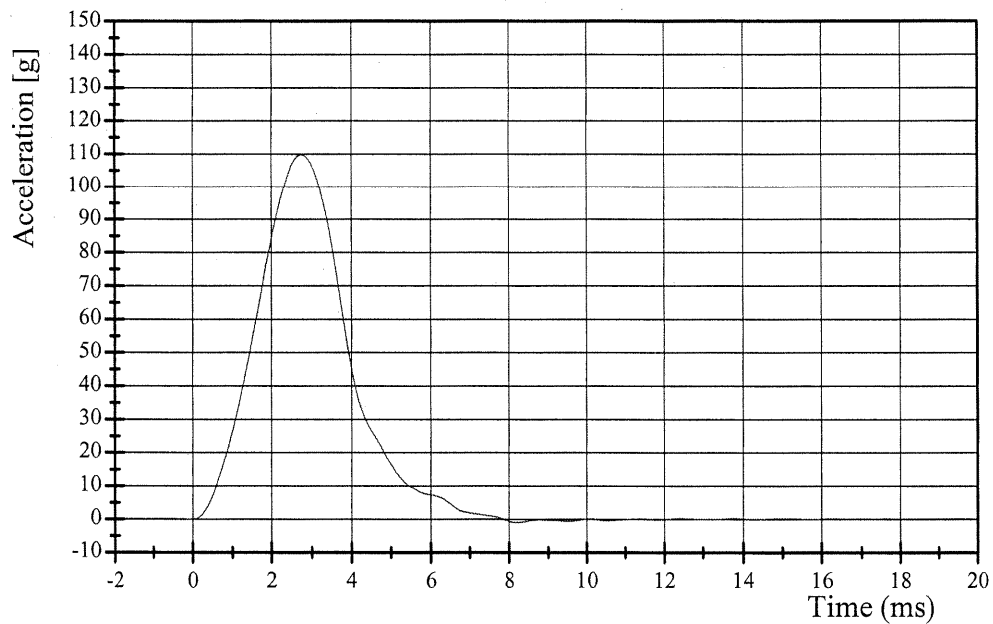
Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 202 Calibration No. 19 - 1

Test Date 10/15/2003

Pendulum Deceleration

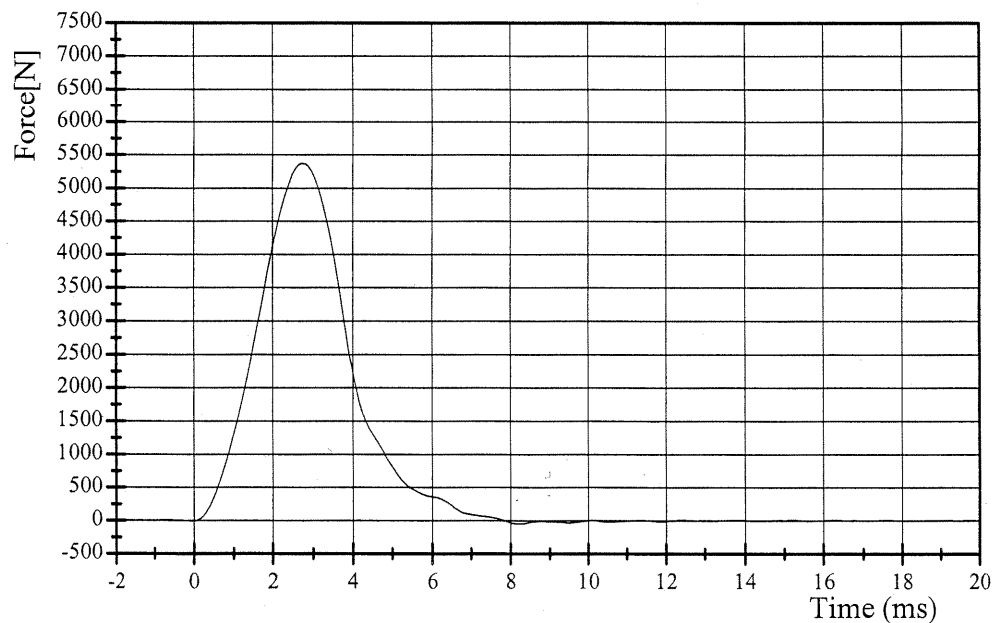


Filter Class: 600

Max: 109.8 g at 2.7 ms

Min: -1.0 g at 8.2 ms

Pendulum Force



Filter Class: 600

Max: 5373.7 N at 2.7 ms

Min: -48.6 N at 8.2 ms

10.15.2003 14:29:35 2130



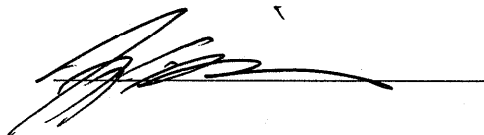
Post-Test Calibration

Left Rear Passenger Dummy S/N 206

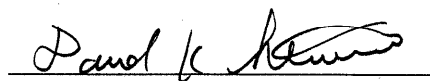
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 206 Calibration No. 17

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	880	Yes
B	Shoulder Pivot Height	505.5 - 520.7	509	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	89	Yes
F	Thigh Clearance	139.7 - 154.9	148	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	291	Yes
H	Skull Cap To Backline	40.6 - 45.7	43	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	334	Yes
J	Elbow Rest Height	190.5 - 210.8	199	Yes
K	Buttock Knee Length	579.1 - 604.5	590	Yes
L	Popliteal Height	429.3 - 454.7	440	Yes
M	Knee Pivot Height	485.1 - 500.4	498	Yes
N	Buttock Popliteal Length	452.1 - 477.5	470	Yes
O	Chest Depth	213.4 - 228.6	221	Yes
P	Foot Length	251.5 - 266.7	252	Yes
V	Shoulder Breadth	421.6 - 436.9	431	Yes
W	Foot Breadth	91.4 - 106.7	102	Yes
Y	Chest Circumference	970.3 - 1000.8	991	Yes
Z	Waist Circumference	835.7 - 866.1	857	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

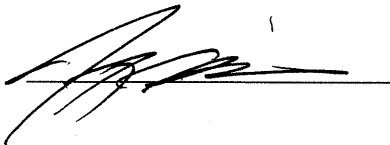
HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

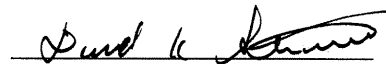
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Peak Resultant Acceleration	225 - 275 g	272.9 g	Yes
Peak Lateral Acceleration	15 g Max	12.8 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



10.14.2003 14:49:44 614

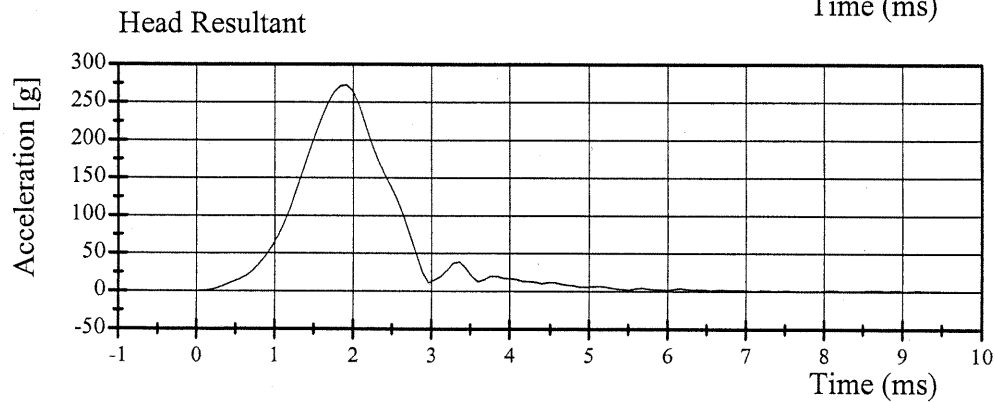
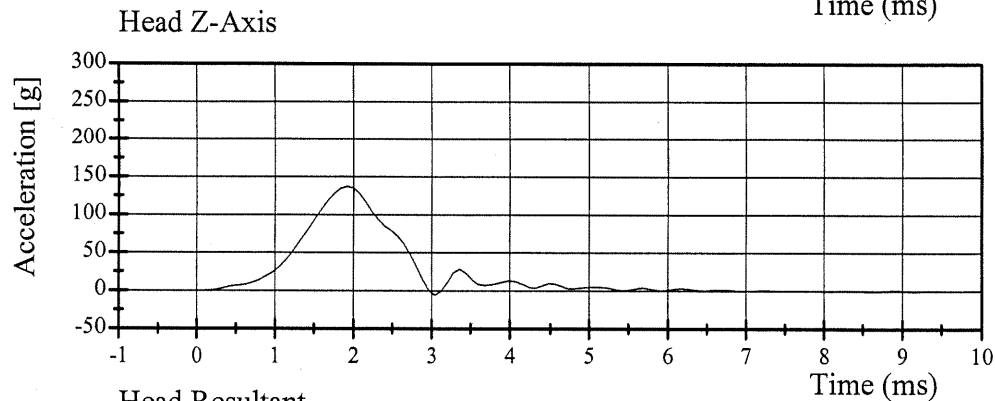
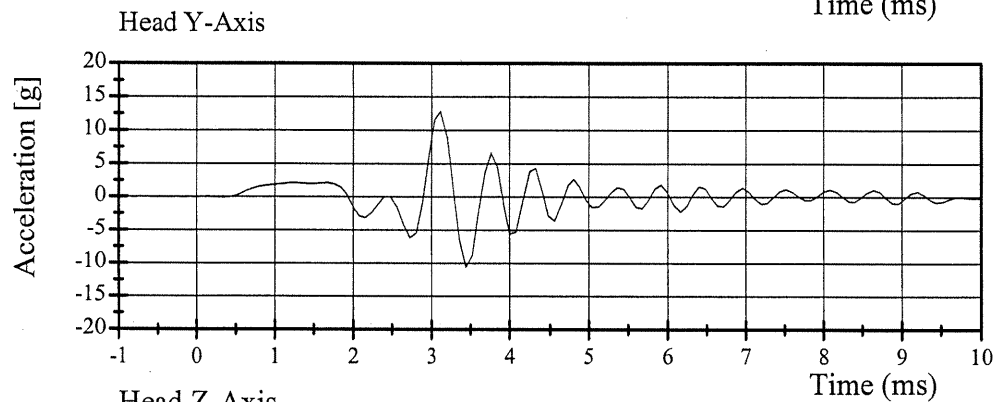
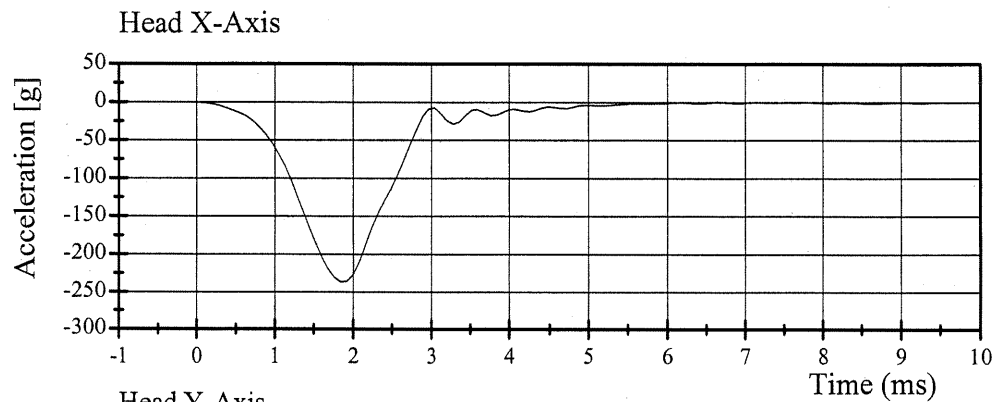


Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003



10.14.2003 14:49:45 614



Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

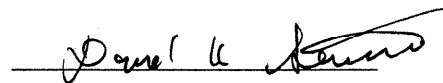
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	25.92 g	Yes
20 ms	17.60 - 22.60 g	22.56 g	Yes
30 ms	12.50 - 18.50 g	17.82 g	Yes
Max Pendulum Deceleration	29.00 g	27.25 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	17.75 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	34 - 42 ms	34.80 ms	Yes
D Plane Rotation			
Max	64 - 78 °	73.67 °	Yes
Time	57 - 64 ms	58.96 ms	Yes
Moment About Occipital Condyle			
Max	88.1 - 108.5 N·m	96.72 N·m	Yes
Time	47 - 58 ms	47.68 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	113 - 128 ms	115.92 ms	Yes
Positive Moment-Time Curve			
Decay Time To Zero	97 - 107 ms	100.48 ms	Yes

Comments:

Technician



Approved



10.14.2003 17:24:56 501



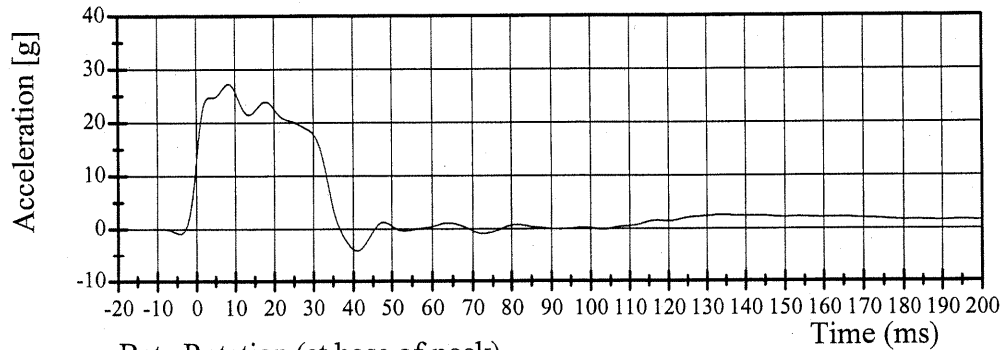
Transportation Research Center Inc.

572E Neck Flexion Test

IIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

Pendulum Deceleration

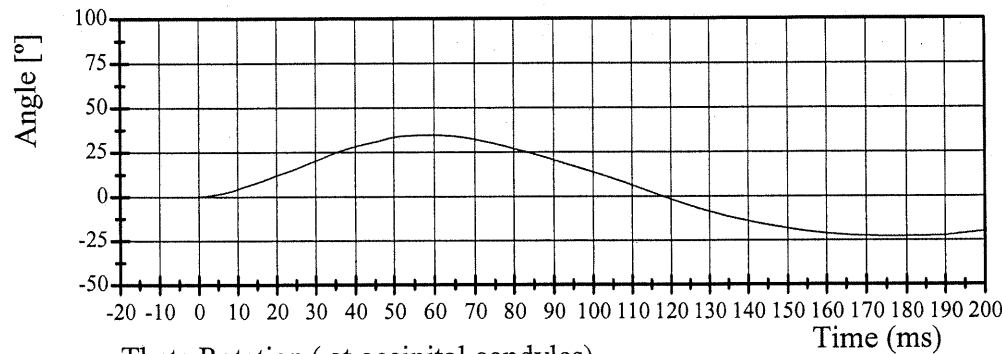


Filter Class: 60

Max: 27.3 g at 8.4 ms

Min: -4.1 g at 41.0 ms

Beta Rotation (at base of neck)

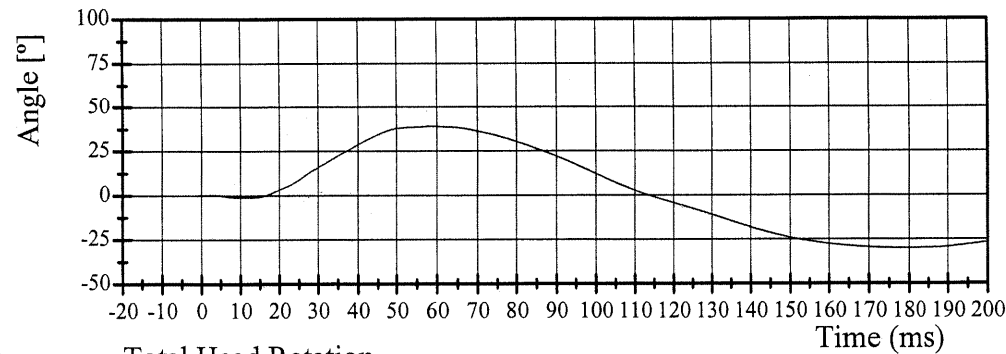


Filter Class: 60

Max: 34.7 ° at 59.0 ms

Min: -22.7 ° at 175.6 ms

Theta Rotation (at occipital condyles)

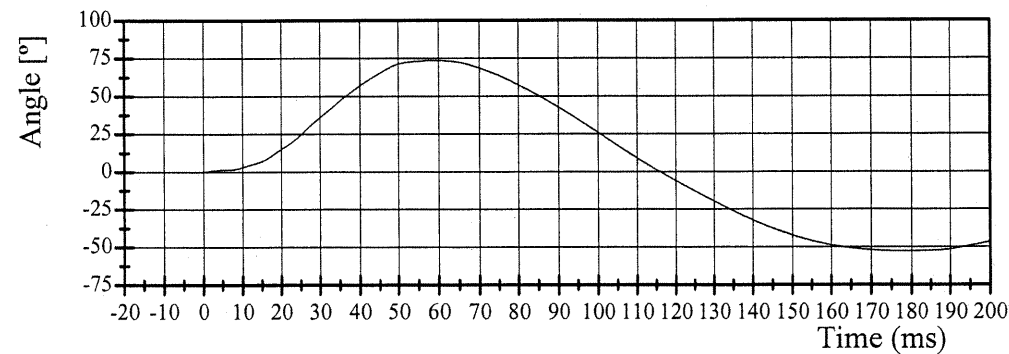


Filter Class: 60

Max: 39.0 ° at 58.9 ms

Min: -30.0 ° at 179.1 ms

Total Head Rotation



Filter Class: 60

Max: 73.7 ° at 59.0 ms

Min: -52.7 ° at 177.9 ms

10.14.2003 17:24:57 501



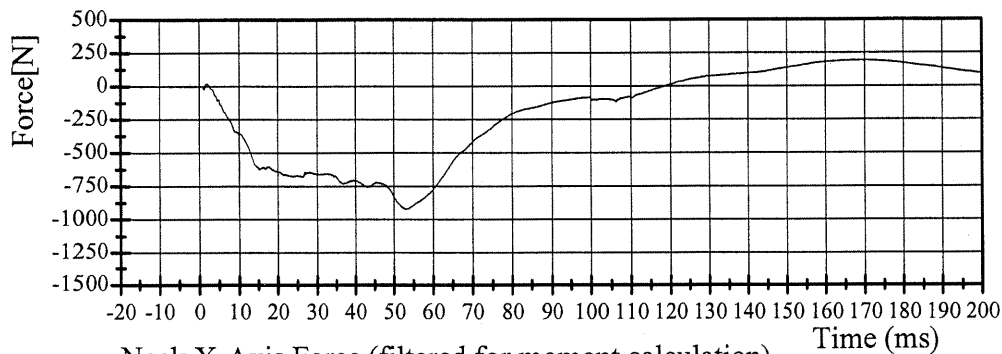
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

Neck X-Axis Force

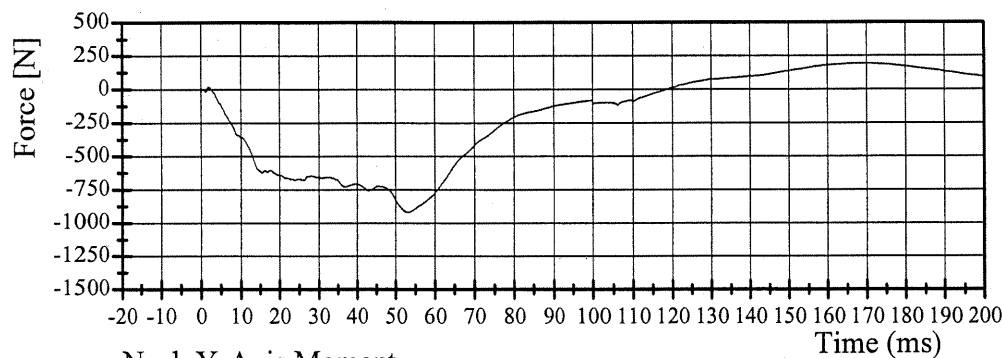


Filter Class: 1000

Max: 193.5 N at 169.6 ms

Min: -919.4 N at 53.3 ms

Neck X-Axis Force (filtered for moment calculation)

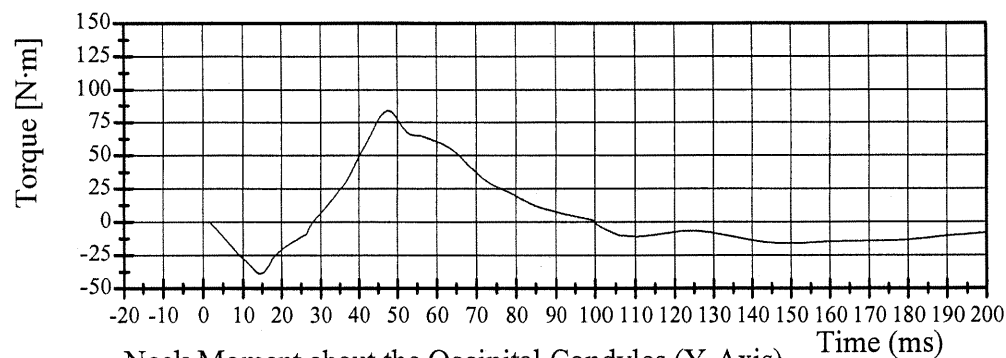


Filter Class: 600

Max: 193.3 N at 169.6 ms

Min: -919.3 N at 53.3 ms

Neck Y-Axis Moment

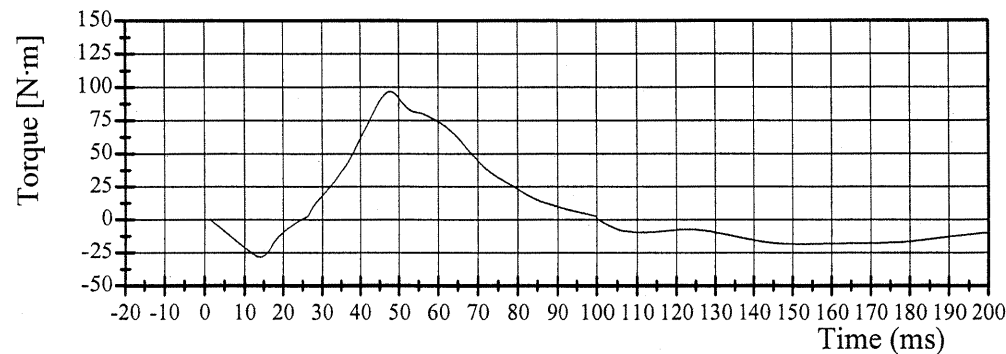


Filter Class: 600

Max: 83.7 N·m at 47.5 ms

Min: -38.8 N·m at 14.3 ms

Neck Moment about the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 96.7 N·m at 47.7 ms

Min: -28.3 N·m at 14.1 ms

Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

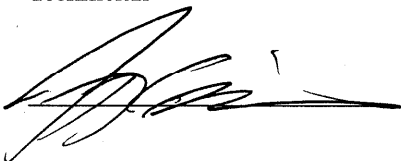
HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

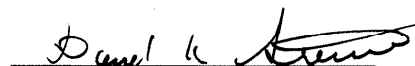
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.02 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	18.69 g	Yes
20 ms	14.00 - 19.00 g	16.71 g	Yes
30 ms	11.00 - 16.00 g	14.01 g	Yes
Max Pendulum Deceleration	22.00 g	19.79 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	13.97 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	38 - 46 ms	40.56 ms	Yes
D Plane Rotation			
Max	81 - 106 °	98.51 °	Yes
Time	72 - 82 ms	79.52 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-68.83 N·m	Yes
Time	65 - 79 ms	73.04 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	147 - 174 ms	158.40 ms	Yes
Negative Moment-Time Curve			
Decay Time To Zero	120 - 148 ms	146.64 ms	Yes

Comments:

Technician



Approved



10.14.2003 17:57:08 579



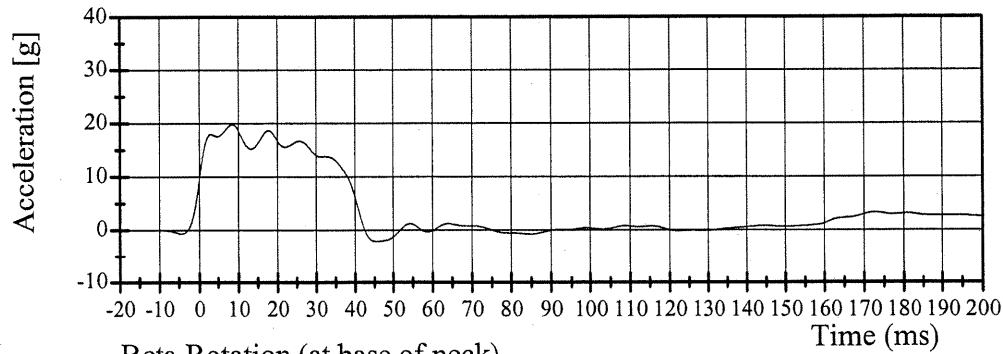
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

Pendulum Deceleration

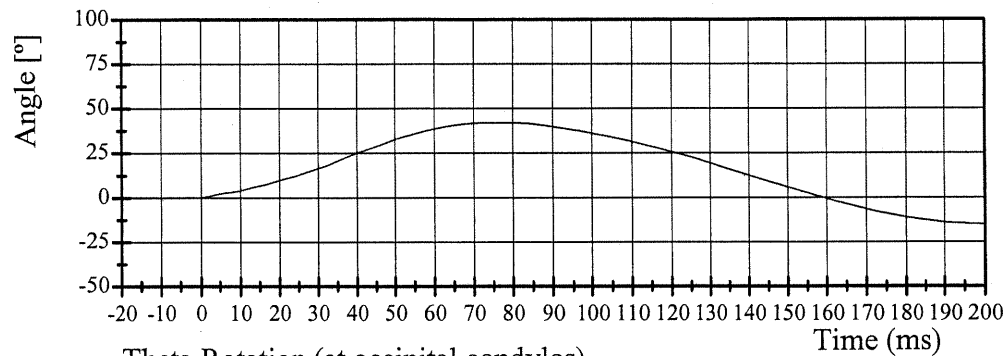


Filter Class: 60

Max: 19.8 g at 8.5 ms

Min: -2.1 g at 45.4 ms

Beta Rotation (at base of neck)

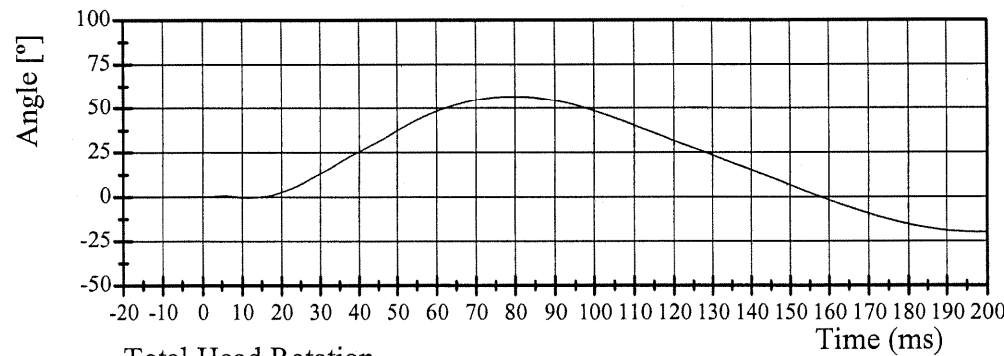


Filter Class: 60

Max: 41.9 ° at 74.6 ms

Min: -15.0 ° at 201.5 ms

Theta Rotation (at occipital condyles)

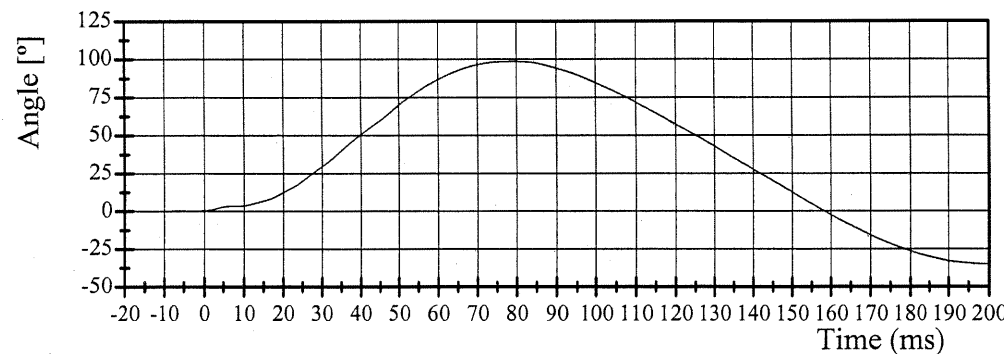


Filter Class: 60

Max: 56.6 ° at 80.4 ms

Min: -20.0 ° at 200.3 ms

Total Head Rotation



Filter Class: 60

Max: 98.5 ° at 79.5 ms

Min: -35.0 ° at 200.7 ms

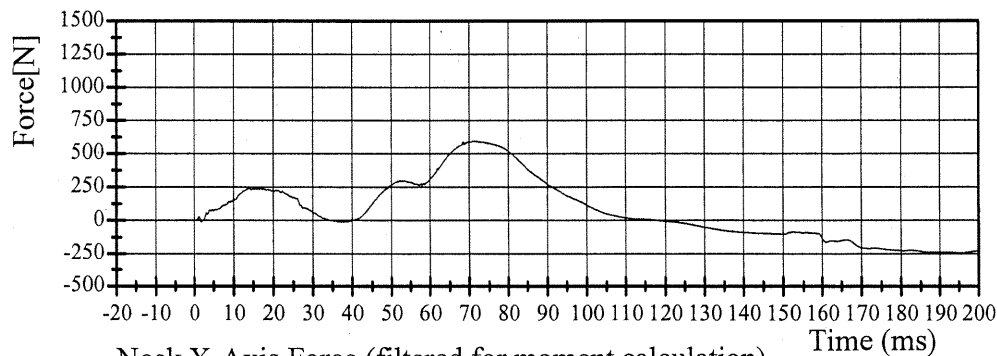
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

Neck X-Axis Force

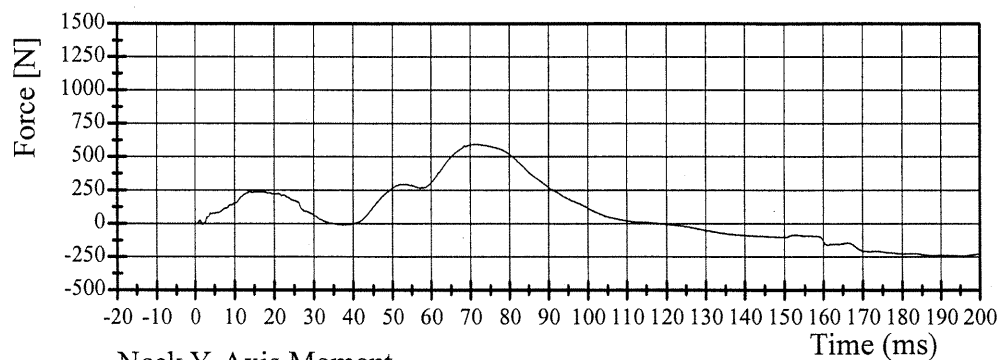


Filter Class: 1000

Max: 594.2 N at 71.4 ms

Min: -242.7 N at 195.0 ms

Neck X-Axis Force (filtered for moment calculation)

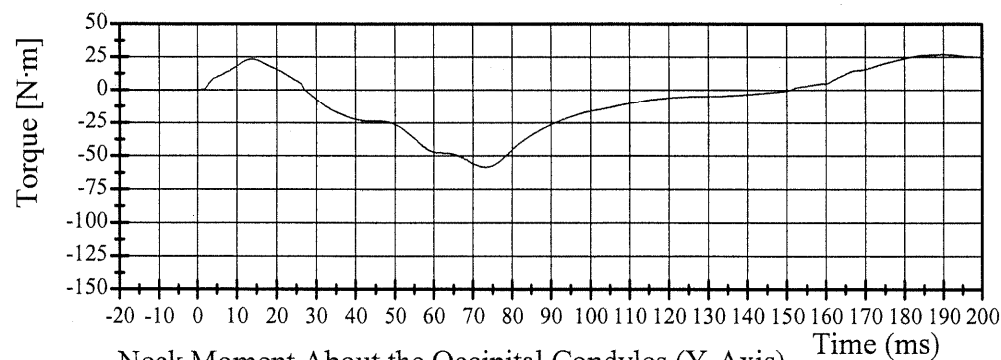


Filter Class: 600

Max: 593.5 N at 71.4 ms

Min: -242.4 N at 195.0 ms

Neck Y-Axis Moment

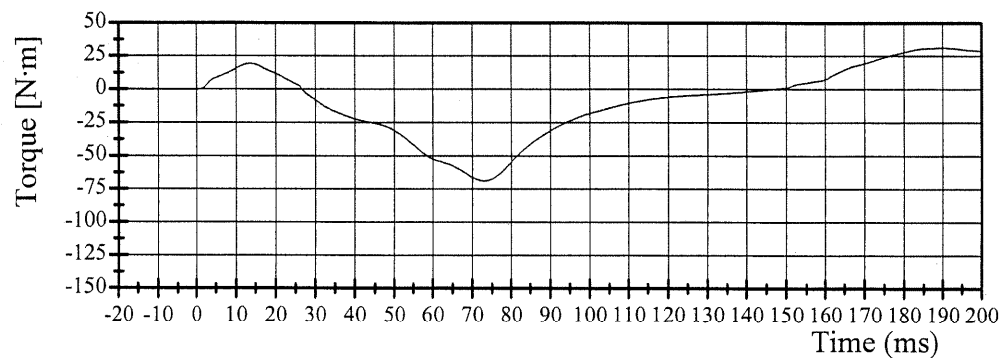


Filter Class: 600

Max: 27.2 N·m at 189.8 ms

Min: -58.5 N·m at 73.1 ms

Neck Moment About the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 31.3 N·m at 189.8 ms

Min: -68.8 N·m at 73.0 ms

10.14.2003 17:57:10 579



Transportation Research Center Inc.

572E Thorax Test

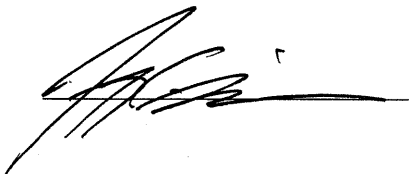
HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/15/2003

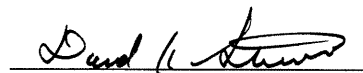
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.65 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-68.9 mm	Yes
Maximum Resistive Force	5160 - 5894 N	5810 N	Yes
Internal Hysteresis	69 - 85 %	70 %	Yes

Comments:

Technician



Approved



10.15.2003 13:29:07 959



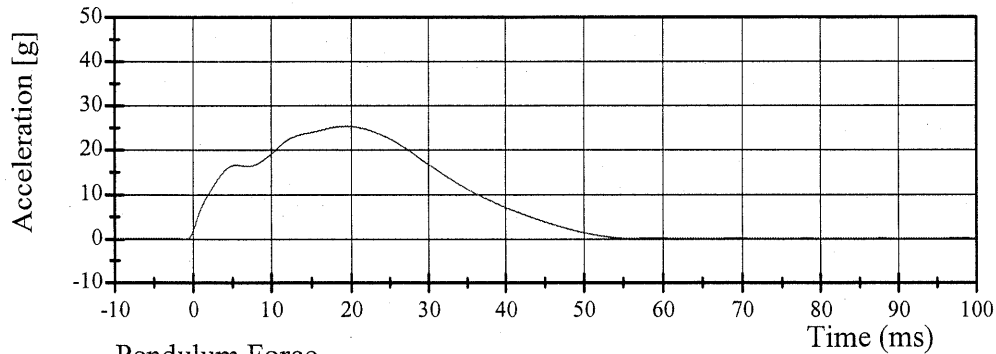
Transportation Research Center Inc.

572E Thorax Test

HHH 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/15/2003

Pendulum Deceleration

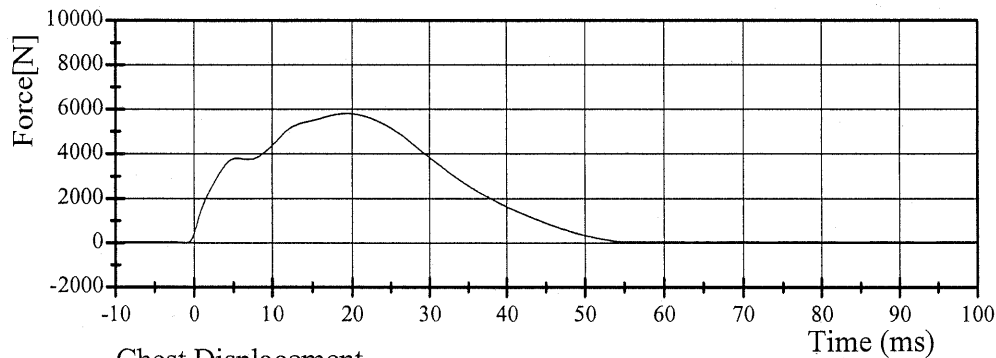


Filter Class: 180

Max: 25.4 g at 19.4 ms

Min: -0.0 g at -73.2 ms

Pendulum Force

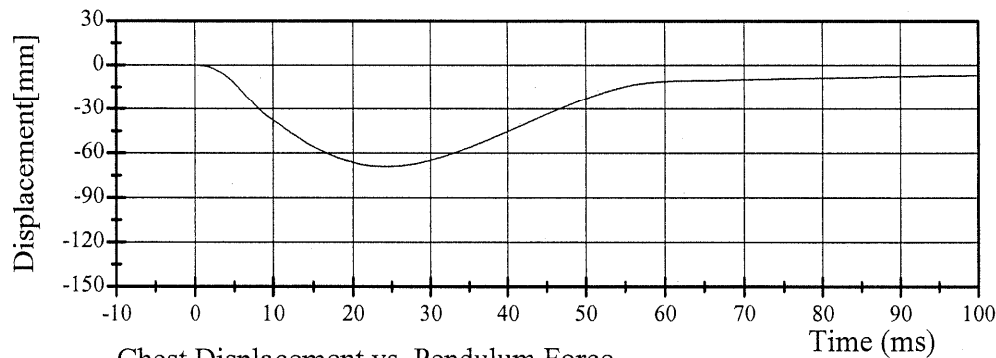


Filter Class: 180

Max: 5809.7 N at 19.4 ms

Min: -8.2 N at -73.2 ms

Chest Displacement

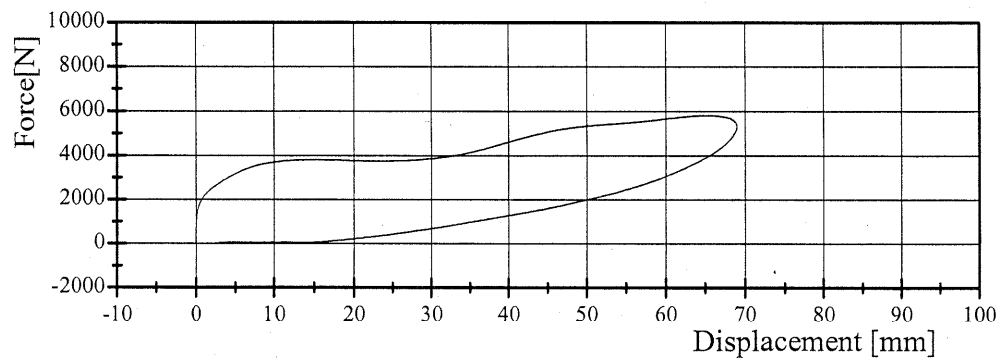


Filter Class: 180

Max: 0.0 mm at -0.1 ms

Min: -68.9 mm at 24.2 ms

Chest Displacement vs. Pendulum Force



10.15.2003 13:29:08 959



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 206L
Test Number: 206C17

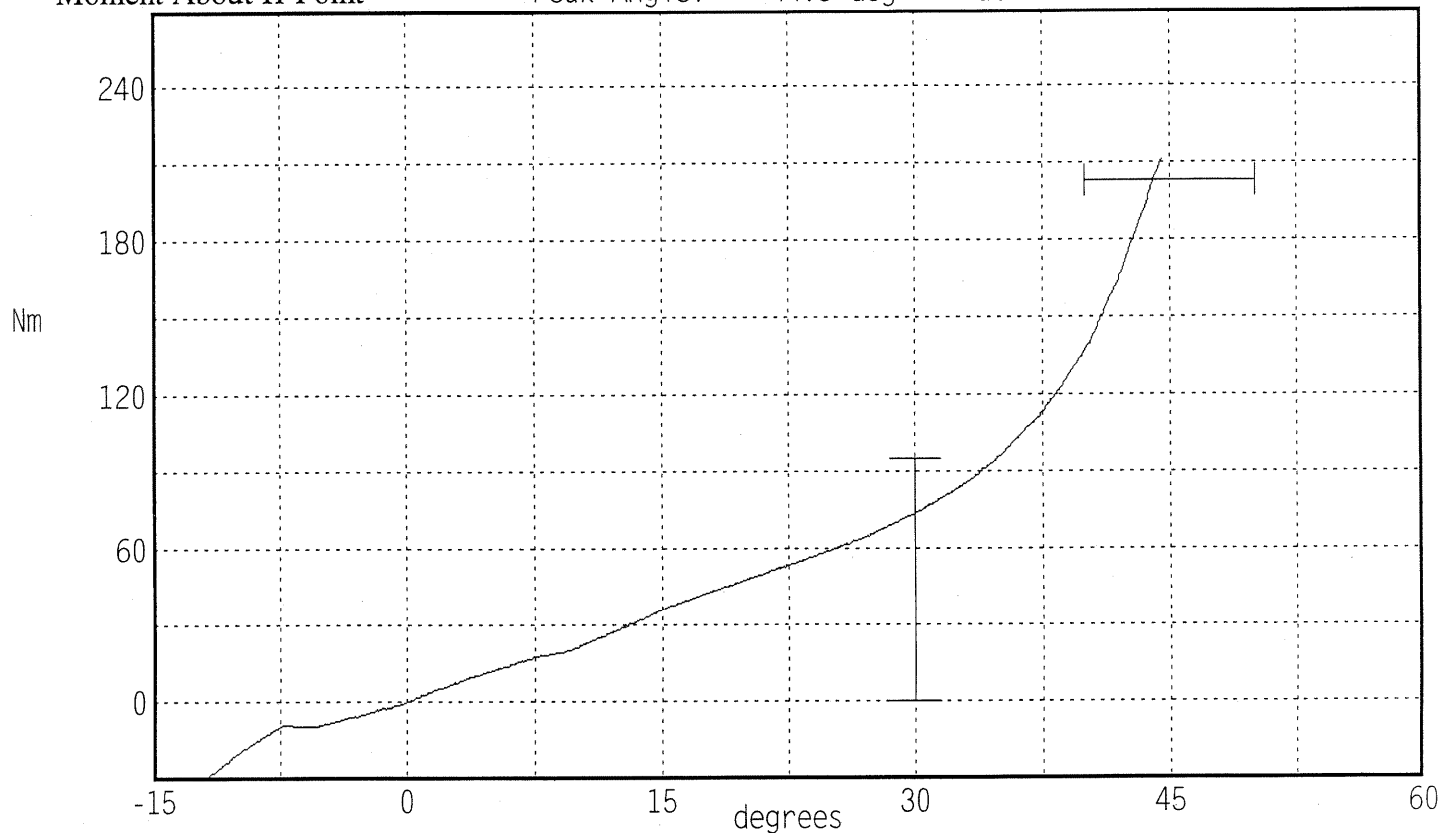
Date: 10/14/2003
Time: 17:44

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.1 °C Pass
Humidity	10 - 70	54 % Pass
Moment at 30 deg	<= 94.9	73.3 Nm Pass
Angle at 203 Nm	40.0 - 50.0	44.1 deg Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec Pass

Peak Moment: 211.0 Nm at 44.5 deg
Peak Angle: 44.5 deg at 211.0 Nm

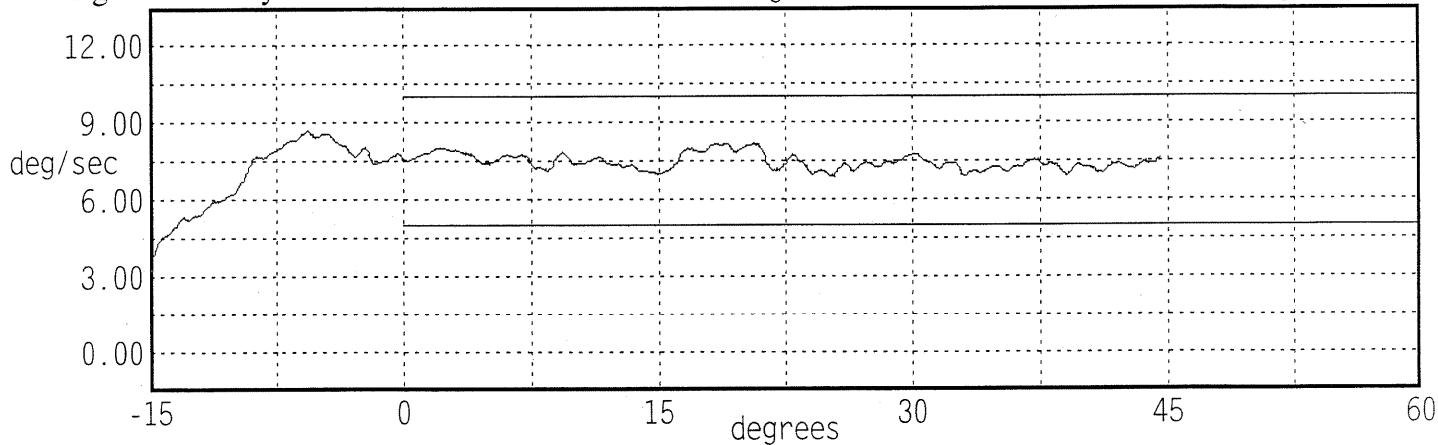
Moment About H-Point



Angular Velocity

Max: 8.2 deg/sec

Min: 6.9 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 206R
Test Number: 206C17

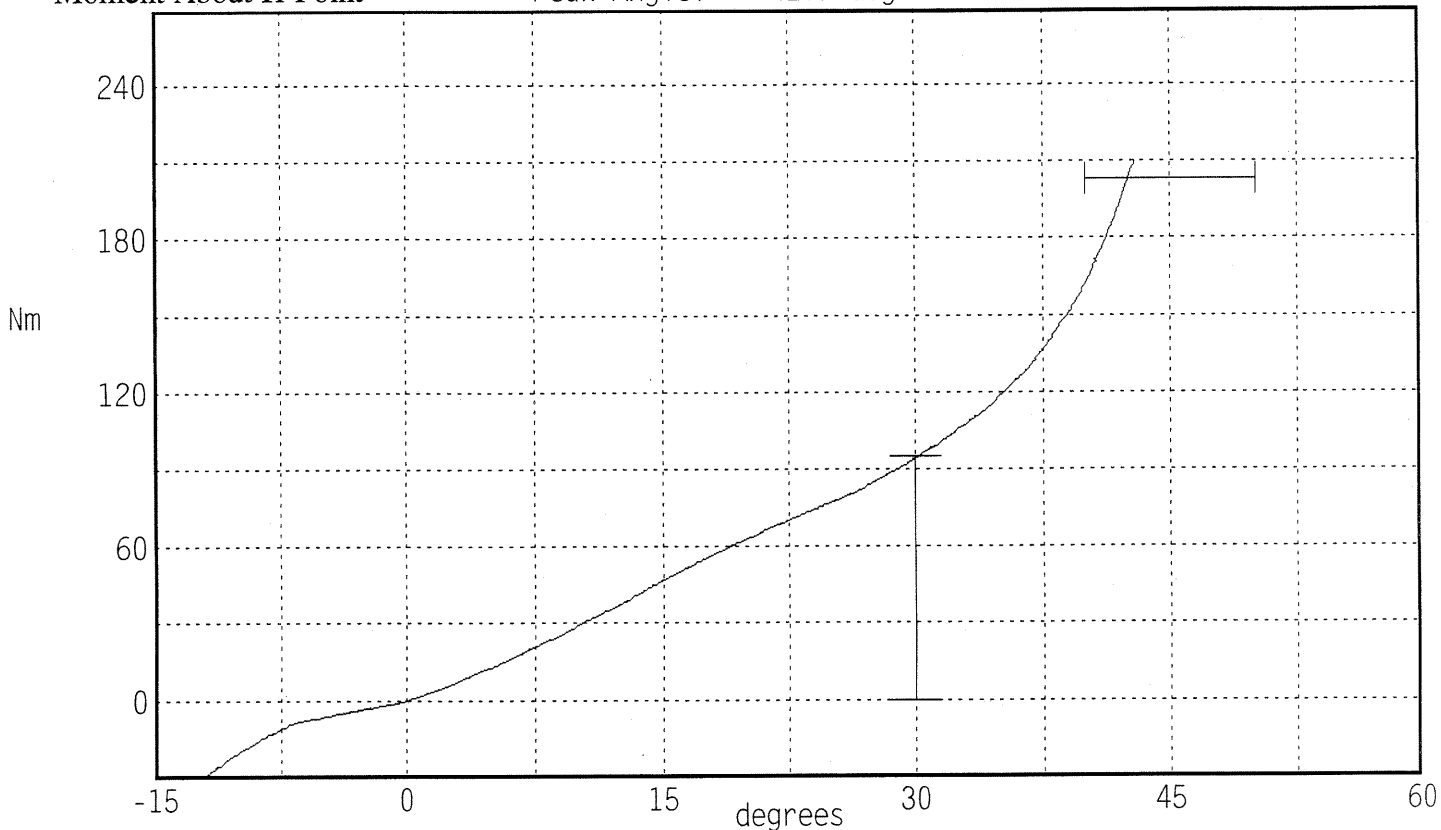
Date: 10/14/2003
Time: 17:37

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.1 °C Pass
Humidity	10 - 70	54 % Pass
Moment at 30 deg	<= 94.9	94.4 Nm Pass
Angle at 203 Nm	40.0 - 50.0	42.6 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Peak Moment: 210.0 Nm at 42.9 deg
Peak Angle: 42.9 deg at 208.5 Nm

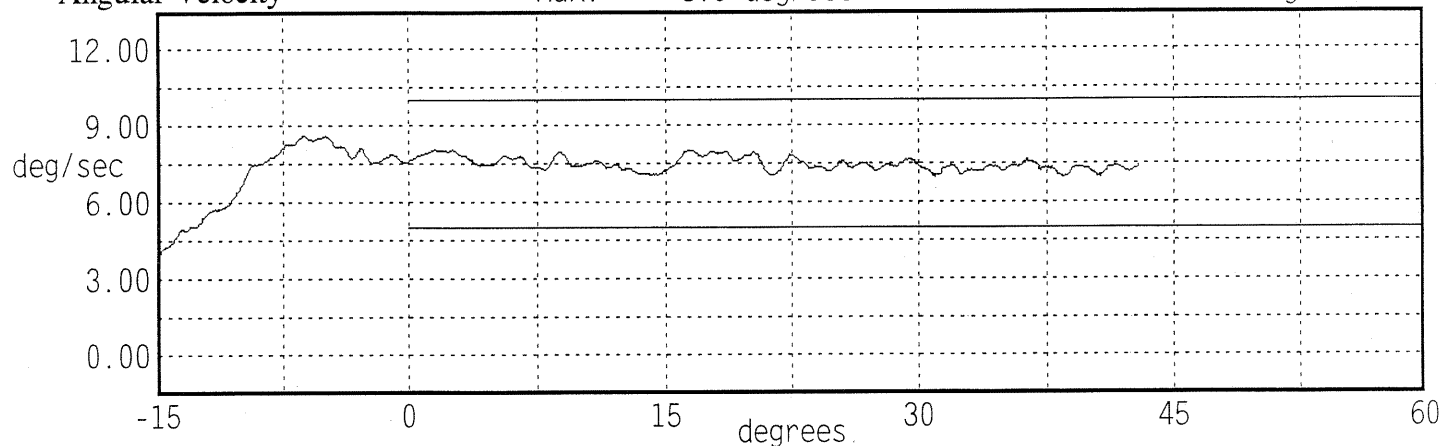
Moment About H-Point



Angular Velocity

Max: 8.0 deg/sec

Min: 7.0 deg/sec



Transportation Research Center Inc.

572E Left Knee Test

HHH 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

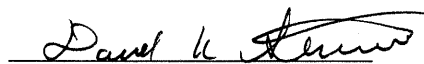
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5107 N	Yes

Comments:

Technician



Approved



10.14.2003 15:29:36 2093



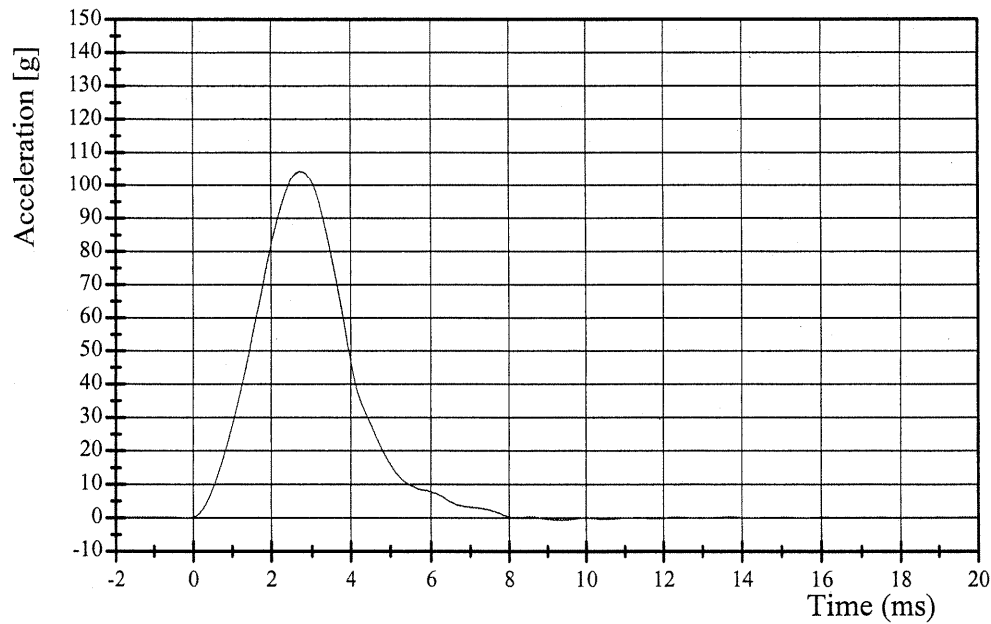
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

Pendulum Deceleration

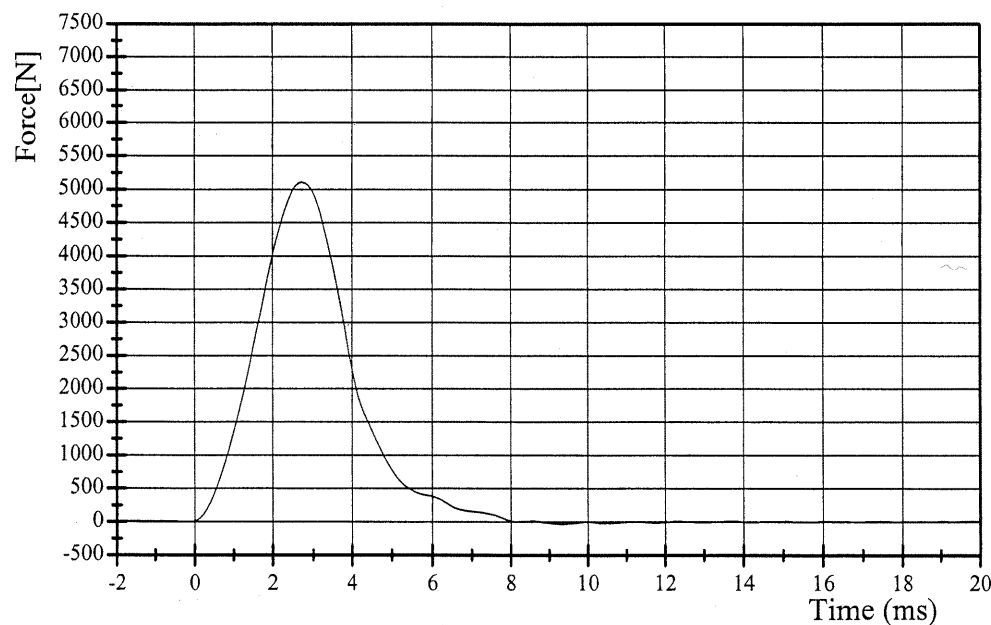


Filter Class: 600

Max: 104.4 g at 2.7 ms

Min: -0.6 g at 9.4 ms

Pendulum Force



Filter Class: 600

Max: 5106.5 N at 2.7 ms

Min: -31.2 N at 9.4 ms

10.14.2003 15:29:37 2093



Transportation Research Center Inc.

572E Right Knee Test

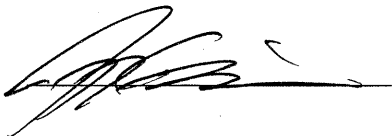
HIII 50th Male Serial No. 206 Calibration No. 17 - 1

Test Date 10/14/2003

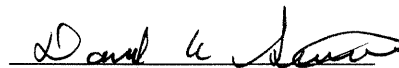
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5218 N	Yes

Comments:

Technician



Approved



10.14.2003 15:32:10 2092

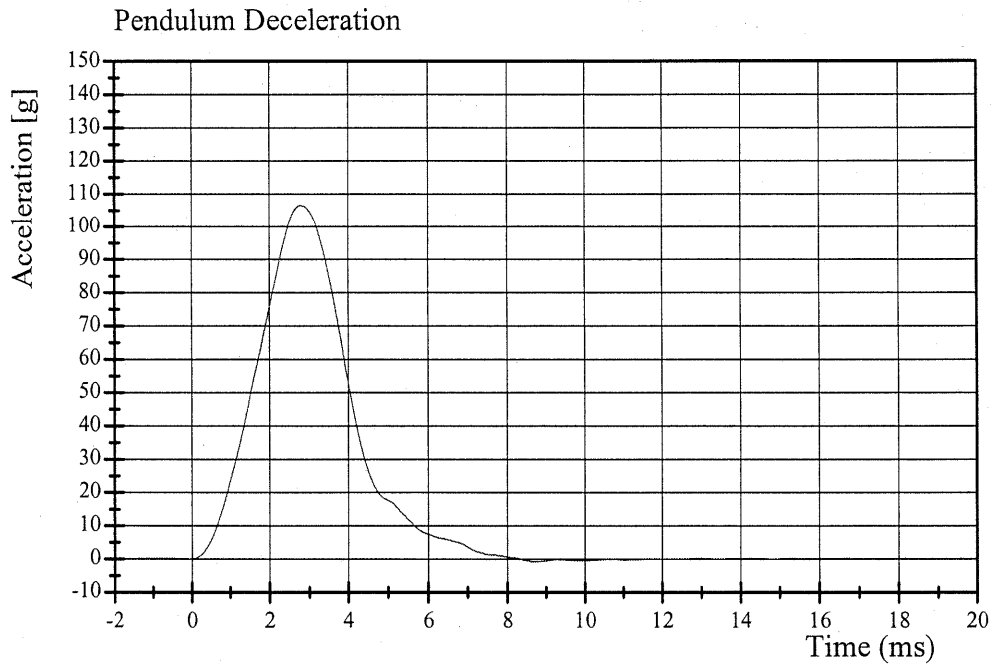


Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 206 Calibration No. 17 - 1

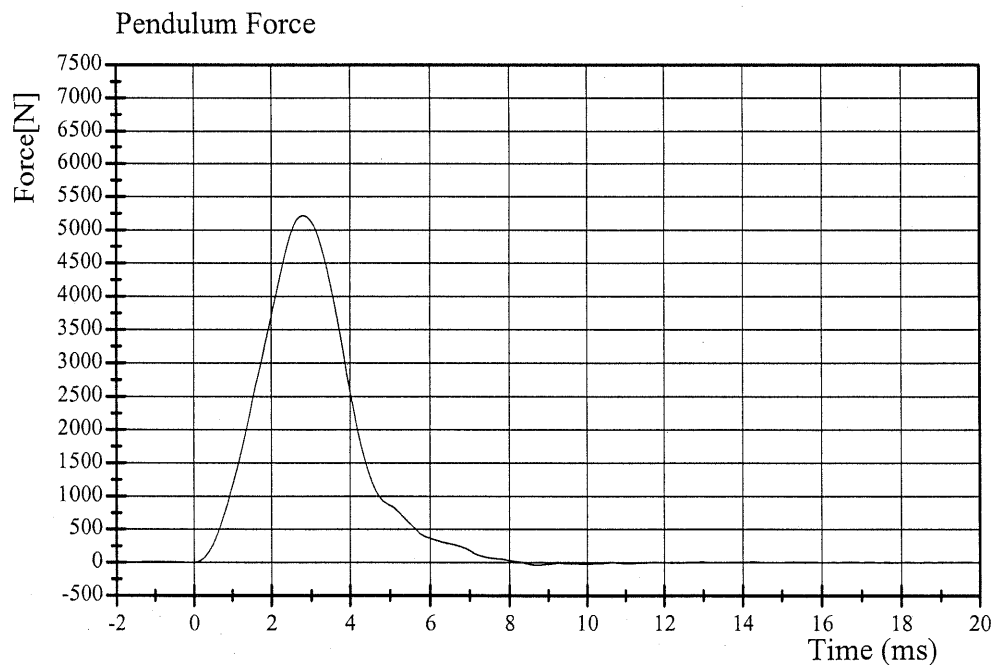
Test Date 10/14/2003



Filter Class: 600

Max: 106.6 g at 2.8 ms

Min: -0.7 g at 8.7 ms



Filter Class: 600

Max: 5217.8 N at 2.8 ms

Min: -36.2 N at 8.7 ms

10.14.2003 15:32:11 2092



Appendix D

Miscellaneous Test Information

Sign Convention
SAE J211 MAR95

Accelerometers:

+X: Forward
+Y: Rightward
+Z: Downward

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)

Rotation potentiometers:

+About the X-axis: Left foot-eversion
Right foot-inversion
+About the Y-axis: Left/right foot-dorsiflexion
+About the Z-axis: Left foot-internal
Right foot-external

Load cells:

+Femur force: Tension
+Seat belt force: Tension
+Barrier force: Tension

Neck load cells:

+X force: Head pushed rearward
+Y force: Head pushed leftward
+Z force: Head pulled upward (tension on neck)
+X moment: Left ear rotating toward left shoulder
+Y moment: Chin rotating toward chest
+Z moment: Chin rotating toward left shoulder

Tibia load cells:

+X force: Ankle forward, knee rearward
+Y force: Ankle rightward, knee leftward
+Z force: Tension
+X moment: Bottom of tibia moving leftward
+Y moment: Bottom of tibia moving rearward

Sign Convention, Cont'd.
SAE J211 MAR95

Lumbar load cells:

+X force:	Chest rearward, pelvis forward
+Y force:	Chest leftward, pelvis rightward
+Z force:	Chest upward, pelvis downward
+X moment:	Left shoulder toward left hip
+Y moment:	Sternum toward front of legs
+Z moment:	Right shoulder forward, left shoulder rearward

Frequency Response Classes
SAE J211 MAR95

<u>Typical Test Measurements</u>	<u>Channel Class</u>
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

Description Of Timing Marks On TRC Inc. High-Speed Film

All TRC Inc. high-speed cameras are equipped with red LEDs which put timing marks on the right edge of the film. TRC Inc. uses a single timing generator to generate the timing for all cameras. This allows the timing marks to be common to all cameras. The timing marks can be used to measure camera speed (frames per second) or to locate a point in time before or after the time-zero event.

The timing marks appear on the film as small red marks on the right edge of the film. Round marks are left by the Photosonic and Stalex cameras while horizontal bars are left by the Hycam, Locam, and Fastax II cameras.

The timing generator puts out a pulse for every millisecond plus it generates additional pulses for hundredths and tenths of seconds. To explain this further, we can use an example of a camera running at 1000 frames per second.

1. Every frame will have **one** LED appear in it. This indicates a *millisecond* pulse.
2. Every ten frames will have **two** LEDs appear in it. These indicate a *millisecond* pulse plus a *hundredth of a second* pulse.
3. Every one hundred frames will have **three** LEDs appear in it. These indicate a *millisecond* pulse, a *hundredth of a second* pulse, and a *tenth of a second* pulse.

To locate time-zero, observe the continuous LED that is visible on the left side of the frame at the beginning of each view. Locate the frame where the left side LED is fully extinguished and reverse 4 frames for the Photosonic cameras; reverse 5 frames for Hycam cameras; reverse 2 frames for Stalex cameras. This frame is time-zero.

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. The polarity column indicates whether a polarity change occurred during data acquisition to conform to J211 MAR95. See Report Sign Convention sheet for description of data output as presented in the report: occasionally channels have been adjusted in post-acquisition processing to conform to J211 MAR95.

Channel Report

10/8/2003 9:19:41 AM

Name of Test 031006

System MINIDAU

Name of DAU DAU6

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
6001	98H13-F16	HEDXG2	Head Accel X	Rr	2030.6179 g	-	8/28/2003	OK 202v	Entran	EGE-73BQ-2000
6002	02A16-A09	HEDYG2	Head Accel Y	Rt	1924.9567 g	+	8/28/2003	OK 202v	Entran	EGE-73B6Q-200
6003	00L13-F11	HEDZG2	Head Accel Z	Up	2063.1850 g	-	8/28/2003	OK 202v	Entran	EGE-73B6Q-200
6004	ARS-06-0033	HEDYV2	Head Angular Vel Y VRTC2	Chn	6169.8425 %s	-	6/23/2003	OK -1	ATA	ARS-06
6005	1716A-0853-FX	NEKXF2	Neck Force X	Hd	8885.1842 N	-	9/30/2003	OK 202v	Denton	1716A
6006	1716A-0853-FY	NEKYF2	Neck Force Y	Hd	8891.1138 N	+	9/30/2003	OK 202v	Denton	1716A
6007	1716A-0853-FZ	NEKZF2	Neck Force Z	Hd	13353.078 N	+	9/30/2003	OK 202v	Denton	1716A
6008	1716A-0853-MX	NEKXM2	Neck Moment X	Rt Ear	282.20084 N·m	-	9/30/2003	OK 202v	Denton	1716A
6009	1716A-0853-MY	NEKYM2	Neck Moment Y	Chn	282.57665 N·m	+	9/30/2003	OK 202v	Denton	1716A
6010	1716A-0853-MZ	NEKZM2	Neck Moment Z	Chn	282.35860 N·m	+	9/30/2003	OK 202v	Denton	1716A
6011	1794A-0121-FX	NKLXF2	Lwr Neck Force X	Hd	13321.299 N	-	9/18/2003	OK 202v	Denton	1794A
6012	1794A-0121-FY	NKLYF2	Lwr Neck Force Y	Hd	13365.853 N	+	9/18/2003	OK 202v	Denton	1794A
6013	1794A-0121-FZ	NKLZF2	Lwr Neck Force Z	Hd	13354.378 N	+	9/18/2003	OK 202v	Denton	1794A
6014	1794A-0121-MX	NKLXM2	Lwr Neck Moment X	Rt Ear	451.40115 N·m	-	9/18/2003	OK 202v	Denton	1794A
6015	1794A-0121-MY	NKLYM2	Lwr Neck Moment Y	Chn	452.02768 N·m	+	9/18/2003	OK 202v	Denton	1794A
6016	1794A-0121-MZ	NKLZM2	Lwr Neck Moment Z	Chn	453.07891 N·m	+	9/18/2003	OK 202v	Denton	1794A
6017	98H13-F15	CSTXG2	Chest Accel X	Fwd	1954.6461 g	+	8/28/2003	OK 202v	Entran	EGE-73BQ-2000
6018	02A16-A20	CSTYG2	Chest Accel Y	Lft	2068.6868 g	-	9/3/2003	OK 202v	Entran	EGE-73B6Q-200
6019	01L26-F06	CSTZG2	Chest Accel Z	Up	2021.7975 g	-	9/3/2003	OK 202v	Entran	EGE-73B6Q-200
6020	14CB1-2847-013	CSTXD2	Chest Deflection X	Strnm	100.03145 mm	+	10/3/2003	OK 202v	Servo	14CB1-2847
6021	ARS-06-0035	CSTYV2	Chest Angular Vel Y VRTC12	Strnm	6001.9640 %s	+	6/23/2003	OK -1	ATA	ARS-06
6022	2430-96662	LFMZG2	Left Femur Force Z 002	Knee	13351.848 N	+	10/3/2003	OK 202v	GSE	2430
6024	2430-96661	RFMZG2	Right Femur Force Z 001	Knee	13346.865 N	+	10/3/2003	OK 202v	GSE	2430
6025	B02A25-N02	PEVXG2	Pelvis Accel X	Rr	1977.1393 g	-	8/28/2003	OK 202v	Entran	EGE-73B6Q-200
6026	00L13-F26	PEVYG2	Pelvis Accel Y	Lft	1957.1865 g	-	8/27/2003	OK 202v	Entran	EGE-73B6Q-200
6027	02A18-N16	PEVZG2	Pelvis Accel Z	Up	2005.3266 g	-	8/28/2003	OK 202v	Entran	EGE-73B6Q-200
6029	98H14-K06	HEDXG4	Head Accel X	Rwd	2036.5950 g	-	9/23/2003	OK 206v	Entran	EGE-73BQ-2000
6030	98H14-K10	HEDYG4	Head Accel Y	Rgt	2040.8163 g	+	9/23/2003	OK 206v	Entran	EGE-73BQ-2000
6031	98H10-F17	HEDZG4	Head Accel Z	Up	2012.4995 g	-	9/23/2003	OK 206v	Entran	EGE-73BQ-2000
6032	ARS-06-0031	HEDYV4	Head Angular Vel Y S230	Chn	5992.1568 %s	-	6/23/2003	OK -1	ATA	ARS-06

D-7

031006

Channel Report

10/8/2003 9:19:41 AM

Name of Test 031006

System MINIDAU

Name of DAU DAU7

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
7001	IF-205-157-FX	NEKXF4	Neck Force X	Hd	8886.4165 N	-	9/23/2003	OK 206v	FTSS	IF-205
7002	IF-205-157-FY	NEKYF4	Neck Force Y	Hd	8908.7851 N	+	9/23/2003	OK 206v	FTSS	IF-205
7003	IF-205-157-FZ	NEKZF4	Neck Force Z	Hd	13339.578 N	+	9/23/2003	OK 206v	FTSS	IF-205
7004	IF-205-157-MX	NEKXM4	Neck Moment X	Rt Ear	282.07751 N	-	9/23/2003	OK 206v	FTSS	IF-205
7005	IF-205-157-MY	NEKYM4	Neck Moment Y	Chn	282.53420 N	+	9/23/2003	OK 206v	FTSS	IF-205
7006	IF-205-157-MZ	NEKZM4	Neck Moment Z	Chn	282.03122 N	+	9/23/2003	OK 206v	FTSS	IF-205
7007	1794A-216-FX	NKLXF4	Lwr Neck Force X	Hd	13361.102 N	-	9/23/2003	OK 206v	Denton	1794A
7008	1794A-216-FY	NKLYF4	Lwr Neck Force Y	Hd	13340.818 N	+	9/23/2003	OK 206v	Denton	1794A
7009	1794A-216-FZ	NKLZF4	Lwr Neck Force Z	Hd	13333.750 N	+	9/23/2003	OK 206v	Denton	1794A
7010	1794A-216-MX	NKLXM4	Lwr Neck Moment X	Rt Ear	452.65806 N·m	-	9/23/2003	OK 206v	Denton	1794A
7011	1794A-216-MY	NKLYM4	Lwr Neck Moment Y	Chn	452.68465 N·m	+	9/23/2003	OK 206v	Denton	1794A
7012	1794A-216-MZ	NKLZM4	Lwr Neck Moment Z	Chn	450.61451 N·m	+	9/23/2003	OK 206v	Denton	1794A
7013	98H10-F07	CSTXG4	Chest Accel X	Fwd	2009.7346 g	+	9/23/2003	OK 206v	Entran	EGE-73BQ-2000
7014	01J02-F05	CSTYG4	Chest Accel Y	Lft	1968.0196 g	-	9/23/2003	OK 206v	Entran	EGE-73B6Q-200
7015	01J02-F10	CSTZG4	Chest Accel Z	Up	2027.8833 g	-	9/23/2003	OK 206v	Entran	EGE-73B6Q-200
7016	14CB1-2847-206	CSTXD4	Chest Deflection X	Strnm	100.14767 mm	+	10/1/2003	OK 206v	Servo	14CB1-2847
7017	ARS-06-0027	CSTYV4	Chest Angular Vel Y SJ3	Strnm	6021.6748 %/s	+	6/23/2003	OK -1	ATA	ARS-06
7018	2430-717	LFMZ4	Left Femur Force Z 2017	Knee	13335.021 N	+	9/26/2003	OK 206v	GSE	2430
7019	2430-744	RFMZ4	Right Femur Force Z 2018	Knee	13334.022 N	+	9/26/2003	OK 206v	GSE	2430
7020	03E03D30-N19	PEVXG4	Pelvis Accel X	Rr	2026.3584 g	-	9/23/2003	OK 206v	Entran	EGE-73B6Q-200
7021	98H10-F10	PEVYG4	Pelvis Accel Y	Lft	1994.0800 g	-	9/2/2003	OK 206v	Entran	EGE-73BQ-2000
7022	01J02-F03	PEVZG4	Pelvis Accel Z	Up	1932.5130 g	-	9/23/2003	OK 206v	Entran	EGE-73B6Q-200
7024	P14832	RDKXG1	RR FLOORPAN ABOVE AXLE	RR	1957.1865 g	-	9/15/2003	OK -1	Endevco	7264C-2K-2-180
7025	P28322	RDKYG1	R FLOORPAN ABOVE AXLE	LT	1931.9296 g	-	6/18/2003	OK -1	Endevco	7264C-2K-2-180
7026	P28265	RDKZG1	RR FLOORPAN ABOVE AXLE	UP	1960.7843 g	-	6/19/2003	OK -1	Endevco	7264C-2K-2-180
7027	P24190	LFTXG1	LT FR OCCUPANT COMP.	RR	1976.5287 g	-	8/15/2003	OK -1	Endevco	7264C-2K-2-180
7028	P22081	LFTYG1	LT FR OCCUPANT COMP.	LT	1964.3953 g	-	8/15/2003	OK -1	Endevco	7264C-2K-2-180
7029	P22083	LFTZG1	LT FR OCCUPANT COMP.	UP	2001.2507 g	-	8/15/2003	OK -1	Endevco	7264C-2K-2-180
7030	3419T-806	LBOF2	RT FR PASS LAP BELT	152	15592.618 N	+	6/2/2003	OK -1	Lebow	3419T
7031	ST3	SPOOL2	RT FR PASS BELT SPOOL		12.309319 mm	+	6/18/2001	--- -1	Bourns	205141410
7032	3419T-807	SHBF2	RT FR PASS SHOULDER	S19	15562.035 N	+	10/8/2002	--- -1	Lebow	3419T

D-8

031006

Channel Report

10/8/2003 9:19:42 AM

Name of Test 031006

System MINIDAU

Name of DAU DAU8

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
8001	3419T-236	LBOF4	RR PASS. LAP BELT	519	15609.055	N	+ 10/3/2003	OK -1	Lebow	3419T
8002	2091	SPOOL4	RR PASS. BELT SPOOL OUT		12.409112	mm	+ 6/18/2001	--- -1	Bourns	205141410
8003	3419T-130	SHBF4	RR PASS SHOULDER BELT	P12	15622.086	N	+ 10/3/2003	OK -1	Lebow	3419T
8004	ARS-06-0032	LANGV2	LT FR PASS. SEAT BACK	Seatbk	5914.8387	%s	+ 6/23/2003	OK -1	ATA	ARS-06
8005	ARS-06-0034	RANGV2	RT FR PASS. SEAT BACK	Seatbk	5993.3812	%s	- 6/23/2003	OK -1	ATA	ARS-06
8006	ARS-01-167	RFSDV1	RT FR PASS. DOOR SILL ANG	Veh	3996.6528	%s	- 8/15/2002	--- -1	ATA	ARS-01
8007	ARS-01-173	LRSDV1	LT RR PASS. DOOR SILL ANG	Veh	4977.1672	%s	+ 8/15/2002	--- -1	ATA	ARS-01
8008	162-3405H-0265	LLIND2	PASS LT SEATBACK LINEAR	Seatbk	1108.9566	mm	+ 5/29/2003	OK -1	Space Age	162-3405H
8009	162-3405H-0268	RLIND2	PASS RT SEATBACK LINEAR	Seatbk	1112.0805	mm	+ 7/8/2003	OK -1	Space Age	162-3405H

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031006

Channel Report

10/8/2003 9:19:42 AM

Name of Test 031006

System MINIDAU

Name of DAU DAU9

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
9001	EVENT	EVENT	EVENT		5.12	V	+ 10/15/2002	OK -1	TRC	Event
9002	P28109	BCGXG1	MB CG X-AXIS	RR	1995.2612	g	- 7/19/2003	OK -1	Endevco	7264C-2K-2-180
9003	P27554	BCGYG1	MB CG Y-AXIS	LT	1994.1577	g	- 7/18/2003	OK -1	Endevco	7264C-2K-2-180
9004	P27976	BCGZG1	MB CG Z-AXIS	UP	2001.9550	g	- 7/18/2003	OK -1	Endevco	7264C-2K-2-180
9005	P28119	LRRXG1	MB LT RR X-AXIS	FWD	2002.5971	g	+ 7/18/2003	OK -1	Endevco	7264C-2K-2-180
9006	P28081	LRRYG1	MB LT RR Y-AXIS	RT	1994.5150	g	+ 7/19/2003	OK -1	Endevco	7264C-2K-2-180

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031006

Dummy	202v	Type	HIH 50th	Description	VRTC - 202v HYBRID III 50TH ICAL'd 6-23-03 (DKS 10-13-03)J211					
Chsnam	Location		Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip
HEDXG	Head Accel X		EGE-73BQ-200	98H13-F16	Entran	0.01801 g	2000	8/28/2003	Rwd	1
HEDYG	Head Accel Y		EGE-73B6Q-20	02A16-A09	Entran	0.02046 g	2000	8/28/2003	Rgt	0
HEDZG	Head Accel Z		EGE-73B6Q-20	00L13-F11	Entran	0.02068 g	2000	8/28/2003	Up	1
HD1XG	Head (LT) Accel X		EGE-73B6Q-20	00L20-A23	Entran	0.01891 g	2000	8/28/2003	Fwd	0
HD1ZG	Head (LT) Accel Z		EGE-73B6Q-20	00L13-F25	Entran	0.02097 g	2000	8/28/2003	Up	1
HD2YG	Head (FT) Accel Y		EGE-73B6Q-20	B02A18-N21	Entran	0.02461 g	2000	8/28/2003	Lft	1
HD2ZG	Head (FT) Accel Z		EGE-73B6Q-20	00L13-F27	Entran	0.01939 g	2000	8/28/2003	Up	1
HD3XG	Head (TP) Accel X		EGE-73B6Q-20	B02A18-N23	Entran	0.02021 g	2000	8/28/2003	Fwd	0
HD3YG	Head (TP) Accel Y		EGE-73B6Q-20	00L13-F05	Entran	0.02383 g	2000	8/28/2003	Lft	1
HEDYV	Head Angular Vel Y	VRTC2	ARS-06	ARS-06-0033	ATA SENSORS	0.08298429 %/s	11500	6/23/2003	Chn to Strnm (CCW)	1
NEKXF	Neck Force X		1716A	1716A-0853-FX	Denton	0.000190808 N	8896.4	9/30/2003	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y		1716A	1716A-0853-FY	Denton	0.000181658 N	8896.4	9/30/2003	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z		1716A	1716A-0853-FZ	Denton	0.000095619 N	13344.6	9/30/2003	Hd Up,Cst Dn	0
NEKXM	Neck Moment X		1716A	1716A-0853-MX	Denton	0.005890619 N	282.5	9/30/2003	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y		1716A	1716A-0853-MY	Denton	0.005901947 N	282.5	9/30/2003	Chn to Strnm	0
NEKZM	Neck Moment Z		1716A	1716A-0853-MZ	Denton	0.008317876 N	282.5	9/30/2003	Chn to Lt Shld	0
NKLXF	Lwr Neck Force X		1794A	1794A-0121-FX	Denton	0.000141304 N	13344.6	9/18/2003	Hd Fd,Cst Rr	1
NKLYF	Lwr Neck Force Y		1794A	1794A-0121-FY	Denton	0.000139805 N	13344.6	9/18/2003	Hd Lt,Cst Rt	0
NKLZF	Lwr Neck Force Z		1794A	1794A-0121-FZ	Denton	0.000062038 N	13344.6	9/18/2003	Hd Up,Cst Dn	0
NKLXM	Lwr Neck Moment X		1794A	1794A-0121-MX	Denton	0.003806195 N	452	9/18/2003	Rt Ear to Rt Shld	1
NKLYM	Lwr Neck Moment Y		1794A	1794A-0121-MY	Denton	0.003701549 N	452	9/18/2003	Chn to Strnm	0
NKLZM	Lwr Neck Moment Z		1794A	1794A-0121-MZ	Denton	0.009113274 N	452	9/18/2003	Chn to Lt Shld	0
CSTXG	Chest Accel X		EGE-73BQ-200	98H13-F15	Entran	0.01871 g	2000	8/28/2003	Fwd	0
CSTYG	Chest Accel Y		EGE-73B6Q-20	02A16-A20	Entran	0.0225 g	2000	9/3/2003	Lft	1
CSTZG	Chest Accel Z		EGE-73B6Q-20	01L26-F06	Entran	0.01948 g	2000	9/3/2003	Up	1
CSTYV	Chest Angular Vel Y	VRTC12	ARS-06	ARS-06-0035	ATA SENSORS	0.08530541 %/s	11500	6/23/2003	Strnm Away Frm Legs	0

Monday, October 13, 2003 202v

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/		Fullscal	Caldat	Pos Output	Flip
CSTXD	Chest Deflection X	14CB1-2847	14CB1-2847-0137	Servo	1.1502	m	100	10/3/2003	Strnm Away Frm Spn	0
PEVXG	Pelvis Accel X	EGE-73B6Q-20	B02A25-N02	Entran	0.01992	g	2000	8/28/2003	Rr	1
PEVYG	Pelvis Accel Y	EGE-73B6Q-20	00L13-F26	Entran	0.0218	g	2000	8/27/2003	Lft	1
PEVZG	Pelvis Accel Z	EGE-73B6Q-20	02A18-N16	Entran	0.01964	g	2000	8/28/2003	Up	1
LFMZF	Left Femur Force Z 002	2430	2430-96662	GSE	0.00006555	N	13344	10/3/2003	Knee Fd,Pel Rr	0
RFMZF	Right Femur Force Z 001	2430	2430-96661	GSE	0.000066254	N	13344	10/3/2003	Knee Fd,Pel Rrxt	0

D-12

031006

D-13

031006

Dummy	206v	Type	HIH 50th	Description	VRTC - 206v HYBRID HI 50TH.ICAL'd 6-23-03 (DKS 10-06-03)J211						
Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/		Fullscal	Caldat	Pos Output	Flip	
HEDXG	Head Accel X	EGE-73BQ-200	98H14-K06	Entran	0.02095	g	2000	9/23/2003	Rwd	1	
HEDYG	Head Accel Y	EGE-73BQ-200	98H14-K10	Entran	0.01792	g	2000	9/23/2003	Rgt	0	
HEDZG	Head Accel Z	EGE-73BQ-200	98H10-F17	Entran	0.01957	g	2000	9/23/2003	Up	1	
HEDYV	Head Angular Vel Y S230	ARS-06	ARS-06-0031	ATA SENSORS	0.085445026	%/s	11500	6/23/2003	Chn to Strnm (CCW)	1	
NEKXF	Neck Force X	IF-205	IF-205-157-FX	FTSS	0.000188905	N	8896	9/23/2003	Hd Fd,Cst Rr	1	
NEKYF	Neck Force Y	IF-205	IF-205-157-FY	FTSS	0.000179598	N	8896	9/23/2003	Hd Lt,Cst Rt	0	
NEKZF	Neck Force Z	IF-205	IF-205-157-FZ	FTSS	0.000094537	N	13344	9/23/2003	Hd Up,Cst Dn	0	
NEKXM	Neck Moment X	IF-205	IF-205-157-MX	FTSS	0.005990442	N	282.5	9/23/2003	Rt Ear to Rt Shld	1	
NEKYM	Neck Moment Y	IF-205	IF-205-157-MY	FTSS	0.005922124	N	282.5	9/23/2003	Chn to Strnm	0	
NEKZM	Neck Moment Z	IF-205	IF-205-157-MZ	FTSS	0.008483186	N	282.5	9/23/2003	Chn to Lt Shld	0	
NKLXF	Lwr Neck Force X	1794A	1794A-216-FX	Denton	0.000140367	N	13344.6	9/23/2003	Hd Fd,Cst Rr	1	
NKLYF	Lwr Neck Force Y	1794A	1794A-216-FY	Denton	0.000138052	N	13344.6	9/23/2003	Hd Lt,Cst Rt	0	
NKLZF	Lwr Neck Force Z	1794A	1794A-216-FZ	Denton	0.000069816	N	13344.6	9/23/2003	Hd Up,Cst Dn	0	
NKLXM	Lwr Neck Moment X	1794A	1794A-216-MX	Denton	0.003860398	N	452	9/23/2003	Rt Ear to Rt Shld	1	
NKLYM	Lwr Neck Moment Y	1794A	1794A-216-MY	Denton	0.003745133	N	452	9/23/2003	Chn to Strnm	0	
NKLZM	Lwr Neck Moment Z	1794A	1794A-216-MZ	Denton	0.009237611	N	452	9/23/2003	Chn to Lt Shld	0	
CSTXG	Chest Accel X	EGE-73BQ-200	98H10-F07	Entran	0.02123	g	2000	9/23/2003	Fwd	0	
CSTYG	Chest Accel Y	EGE-73B6Q-20	01J02-F05	Entran	0.02168	g	2000	9/23/2003	Lft	1	
CSTZG	Chest Accel Z	EGE-73B6Q-20	01J02-F10	Entran	0.02104	g	2000	9/23/2003	Up	1	
CSTYV	Chest Angular Vel Y SJ3	ARS-06	ARS-06-0027	ATA SENSORS	0.085026178	%/s	11500	6/23/2003	Strnm Away Frm Legs	0	
CSTXD	Chest Deflection X	14CB1-2847	14CB1-2847-206	Servo	1.1361	m	100	10/1/2003	Strnm Away Frm Spn	0	
PEVXG	Pelvis Accel X	EGE-73B6Q-20	03E03D30-N19	Entran	0.02297	g	2000	9/23/2003	Rr	1	
PEVYG	Pelvis Accel Y	EGE-73BQ-200	98H10-F10	Entran	0.01834	g	2000	9/2/2003	Lft	1	
PEVZG	Pelvis Accel Z	EGE-73B6Q-20	01J02-F03	Entran	0.02038	g	2000	9/23/2003	Up	1	
LFMZG	Left Femur Force Z 2017	2430	2430-717	GSE	0.000067956	N	13344	9/26/2003	Knee Fd,Pel Rr	0	
RFMZG	Right Femur Force Z 2018	2430	2430-744	GSE	0.000070976	N	13344	9/26/2003	Knee Fd,Pel Rr	0	

Tuesday, October 07, 2003

REAR IMPACT (MOVING BARRIER) / 031006

