

Report Number: 214-TRC-03-019

Safety Compliance Testing For FMVSS 214

Side Impact Protection

Indicant

Volvo Gothenburg Sweden

2004 Volvo S40 4-door

NHTSA Number: C45900

Transportation Research Center Inc.

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Test Date: April 29, 2004

Final Report: May 12, 2004

**U. S. Department Of Transportation
National Highway Traffic Safety Administration
Enforcement**

Office of Vehicle Safety Compliance

400 Seventh Street, S. W.

Room No. 6111 (NVS-220)

Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-02-D-11114. This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

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5-12-04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: _____

Acceptance Date: _____

1. Report No. 214-TRC-03-019	2. Government Accession No.	3. Recipient's Catalog No.																														
4. Title and Subtitle Final Report of FMVSS 214 Indicant Compliance Side Impact Testing of a 2004 Volvo S40 4-door, NHTSA No.: C45900	5. Report Date May 12, 2004	6. Performing Organization Code TRC Inc.																														
	8. Performing Organization Report No. 040429-1																															
7. Author(s) Walter Dudek, Project Manager Transportation Research Center Inc.	10. Work Unit No. (TRAIS)																															
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319	11. Contract or Grant No. DTNH22-02-D-11114																															
	13. Type of Report and Period Covered Final Report April - May 2004																															
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance 400 Seventh Street, S.W. Room 6111 (NVS-220) Washington, DC 20590	14. Sponsoring Agency Code NVS-220																															
	15. Supplemental Notes																															
16. Abstract This 56/28 km/h 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject vehicle, a 2004 Volvo S40 4-door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-06 (except the test was conducted 8 km/h (5 mph) faster than the standard specifies) to determine FMVSS 214 Side Impact Protection compliance. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on April 29, 2004. The impact velocity of the Moving Deformable Barrier (MDB) was 61.7 km/h, and the ambient temperature at the struck (Driver's side) side of the target vehicle at the time of impact was 21° C. The target vehicle's post-test maximum crush was 319 mm at Level 2. The test or target vehicle's performance is given below (with FIR filter): <table border="0"> <thead> <tr> <th></th> <th><u>Front SID HIII</u></th> <th></th> <th><u>Rear SID HIII</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td><u>38.3</u></td> <td>g's</td> <td><u>57.2</u></td> <td>g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td><u>44.7</u></td> <td>g's</td> <td><u>55.7</u></td> <td>g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td><u>60.5</u></td> <td>g's</td> <td><u>56.7</u></td> <td>g's</td> </tr> <tr> <td>Thoracic Trauma Index, (TTI):</td> <td><u>52.6</u></td> <td>g's</td> <td><u>57.0</u></td> <td>g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td><u>60.5</u></td> <td>g's</td> <td><u>54.7</u></td> <td>g's</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.				<u>Front SID HIII</u>		<u>Rear SID HIII</u>		Left Upper Rib Acceleration:	<u>38.3</u>	g's	<u>57.2</u>	g's	Left Lower Rib Acceleration:	<u>44.7</u>	g's	<u>55.7</u>	g's	Lower Spine Acceleration:	<u>60.5</u>	g's	<u>56.7</u>	g's	Thoracic Trauma Index, (TTI):	<u>52.6</u>	g's	<u>57.0</u>	g's	Pelvis Acceleration (PEV):	<u>60.5</u>	g's	<u>54.7</u>	g's
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17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID HIII)	18. Distribution Statement <u>Copies of this report are available from:</u> NHTSA Technical Information Services (TIS) Room 5108 (NPO-230), 400 Seventh Street, S.W. Washington, DC 20590 Telephone No. (202) 366-4946 Attn: Robert Hornicle																															
19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. Number of Pages 369																														
		22. Price																														

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Section 1

Purpose and Test Procedure

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-11114. The purpose of this test was to evaluate side impact protection in a 2004 Volvo S40 4-door. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 2001) (except the test was conducted 8 km/h (5 mph) faster than the standard specifies).

Section 2

Summary of Side Impact Test

A 2004 Volvo S40 4-door was impacted on the driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 61.7 km/h (38.3 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on April 29, 2004. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SID HIIIs) are included in Appendix A.

Two restrained Side Impact Dummies (SID HIIIs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-06, dated July 2001). Both SID HIII dummies were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID HIIIs were instrumented with the following accelerometers:

1. Head (HED) triaxial and redundant accelerometers (X, Y, and Z-directions)
2. Neck (NEK) triaxial force and moment load cells (X, Y, and Z-directions)
3. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
4. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
5. Lower Thoracic Spine (T₁₂) uniaxial and redundant accelerometer (Y-direction)
6. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact dummy (SID HIII) configuration and verification test data can be found in Appendix C. A total of 71 channels of data were recorded. Appendix B contains the vehicle, MDB, and dummy response data traces.

The following tables summarize the results of the test:

Injury Criteria	Front SID HIII	Rear SID HIII
TTI (g)	52.6	57.0
PEV (g)	60.5	54.7

Head Injury Criteria (HIC)

Injury Criteria	Front SID HIII	Rear SID HIII
HIC	140	379
t ₁ (ms)	32.40	44.16
t ₂ (ms)	64.88	63.68
Average Acceleration t ₁ - t ₂ (g)	28.4	51.8

HIC is as defined in FMVSS 208. The maximum time interval t₁ to t₂ is 36 ms.

Neck Injury Criteria

Maximum Values	Front SID HIII	Rear SID HIII
Neck X-axis Force (N)	-505	92
Neck Y-axis Force (N)	478	-818
Neck Z-axis Force (N)	588	-1397
Moment About X-axis (Nm) ¹	-22	-72
Moment About Y-axis (Nm)	37	12
Moment About Z-axis (Nm)	29	-20

¹ Calculated about the occipital condyle with the following formula: $M_{occ} = M_x + 0.01778F_y$.

Data Acquisition Explanations

The vehicle's left lower A-pillar Y-axis acceleration channel, LLAYG1, recorded questionable data throughout the test. The velocity was also affected.

The vehicle's left middle A-pillar Y-axis acceleration channel, LMAYG1, recorded questionable data throughout the test. The velocity was also affected.

The moving barrier's left side contact switch channel, MDBL1, did not record an event signal.

Section 3

Summary of Test Results

Data Sheet 1

General Test Vehicle Parameter Data

Test Vehicle Information:

Vehicle Year/Make/Model: 2004 Volvo S40
Vehicle Body Style/Color: 4-door/Red VIN: YV1MS382542010420
Vehicle NHTSA No.: C45900 Build Date: 02/04
Engine Data: 5 Cylinders; CID; 2.4 Liters; cc
Placement: - Longitudinal; or X Lateral; or - Horizontal
Transmission: 5 Speed; - Manual; X Automatic; - Overdrive
Final Drive: - RWD; X FWD; - Four-Wheel Drive
Odometer Reading: 4 miles
Options: X A/C; X Power steering; X Pwr. brakes; X Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity)* 248 kPa Front; 248 kPa Rear
Recommended Tire Size: 205/55R16
Tires on Test Vehicle: 205/55R16 Manufacturer: Michelin, Energy MXV4

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd seat; 5 Total
Type of Front Seats: X Bucket; - Bench; - Split bench
Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob
Vehicle Max. Capacity Loading = 431 kg (A)
No. of Occupants x 68.04 kg. = 340 kg (B)
Vehicle Cargo Capacity (A-B) = 91 kg

Test Vehicle Delivered Weight With Maximum Fluids:

Left Front	=	<u>448.0</u> kg	Left Rear	=	<u>287.5</u> kg
Right Front	=	<u>425.5</u> kg	Right Rear	=	<u>297.0</u> kg
Total Front	=	<u>873.5</u> kg	Total Rear	=	<u>584.5</u> kg
Front % of Total Weight	=	<u>59.9</u> %	Rear % of Total Weight	=	<u>40.1</u> %
Total Weight	=	<u>1458.0</u> kg			

* Tire pressure used in test.

Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Calculation Of Vehicle's Target Test Weight:

Total Test Vehicle Delivered Weight With Max. Fluids = 1458.0 kg (A)

Maximum Cargo Carrying Capacity of Test Vehicle = 90.7 kg (B)

Weight of Instrumented Side Impact Dummies (2 X 84.0 kg) = 168.0 kg (C)

Test Vehicle Target Weight: = 1716.7 kg (A+B+C)

Fully Loaded Test Vehicle (UDW + 2 SID HIII s + Cargo):

Left Front = 502.0 kg Left Rear = 421.0 kg

Right Front = 428.0 kg Right Rear = 387.5 kg

Total Front = 930.0 kg Total Rear = 808.5 kg

Front % of Total Weight = 53.5 % Rear % of Total Weight = 46.5 %

Total Weight = 1738.5 kg

As Tested Weight of Test Vehicle (2 SID HIII s + Cargo + Equipment & Instrumentation):

Left Front = 489.0 kg Left Rear = 401.2 kg

Right Front = 440.5 kg Right Rear = 379.0 kg

Total Front = 929.5 kg Total Rear = 780.2 kg

Front % of Total Weight = 54.4 % Rear % of Total Weight = 45.6 %

Total Weight = 1709.7 kg

Test Vehicle Attitude (all dimensions in millimeters):

As Delivered	Fully Loaded	Ready For Test
Right Front <u>683</u>	Right Front <u>665</u>	Right Front <u>670</u>
Left Front <u>678</u>	Left Front <u>648</u>	Left Front <u>655</u>
Right Rear <u>696</u>	Right Rear <u>652</u>	Right Rear <u>660</u>
Left Rear <u>680</u>	Left Rear <u>636</u>	Left Rear <u>650</u>

Test Vehicle Wheelbase: 2640 mm

C.G. = 1204 mm rearward of front wheel centerline

Total Vehicle Length:

Right Side = 4366 mm

Left Side = 4354 mm

Centerline = 4460 mm

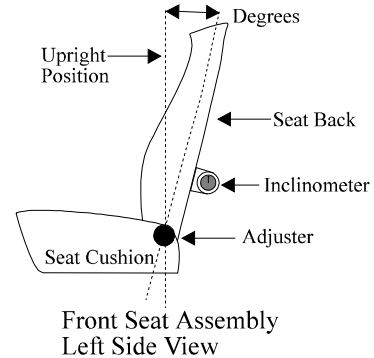
Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Front Seat Cushion Placement: Seat positioned to mid way of travel; 17th of 33 detents
(full forward as detent #1)

Total Length of Fore/Aft Adjustment Travel: 220 mm

Total Number of Adjustment Positions or Detents: 33

Front Seat Back Adjustment Position: The seat back was adjusted to 17.1° measured at the
center of the seat back

Seat Back Torso Angle: 17.1 degrees

Second Position Seat Placement: Fixed

Total Length Of Fore/Aft Adjustment Travel: N/A mm

Seat Back Adjustment Position: Fixed

Adjustable Steering Column Position: Middle of geometric range of travel

Window Positions:

Right Front: Open

Right Rear: Open

Left Front: Closed

Left Rear: Closed

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent In Fuel Tank:

64.4 liters (fuel tank usable capacity)

56.8 liters used in test (manufacturer's stated capacity for testing to FMVSS 301 requirements)

Location of Impact Point On Test Vehicle Side To Be Impacted:

Wheelbase = 2640 millimeters

Intended impact point is 380 millimeters rearward of front axle centerline
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 378 millimeters rearward of front axle centerline

Data Sheet 2

Test Vehicle Summary of Results

Vehicle Year/Make/Model: 2004/Volvo/S40

Body Style: 4-door

VIN: YV1MS382542010420

NHTSA No.: C45900

Build Date: 2/04

Test Date: 04/29/04

Vehicle Overall Length = 4460 mm

Overall Width = 1770 mm

Vehicle Test Weight (Pre-Test):

Left Front = 489.0 kg Left Rear = 401.2 kg

Right Front = 440.5 kg Right Rear = 379.0 kg

Total Front = 929.5 kg Total Rear = 780.2 kg

Total Weight = 1709.7 kg

Wheelbase = 2640 mm

Longitudinal C.G. From Center Of Front Axle = 1204 mm

Impact Angle With Respect To Impactor = 90 degrees

Impact Point:

Actual Impact Point is 2 mm left of nominal impact ref. line (Lateral)

Actual Impact Point is 7 mm up from nominal impact point (Vertical)

Maximum Exterior Static Crush:

1. Level 1 (230 mm above ground) = 220 mm

2. Level 2 (500 mm above ground) = 319 mm

3. Level 3 (667 mm above ground) = 288 mm

4. Level 4 (950 mm above ground) = 225 mm

5. Level 5 (1370 mm above ground) = 125 mm

Maximum Post-Test Intrusion = 319 mm

Occupants:

Front Passenger

Rear Passenger

Dummy Identification 059

055

Restraints Used 3-pt seat belt, airbags (front,
side, head curtain)

3-pt seat belt, side
curtain airbag

Instrumentation:

Number of Vehicle Data Channels: = 21

Number of Cameras: Onboard = 3 Offboard = 8 Total = 11

Data Sheet 3

Moving Deformable Barrier(MDB) Summary

MDB Face Manufacturer And Serial Number:

Plascore, 213B0104 161B0204

Position Of Impactor (MDB) On Monorail:

Crabbed 27° to the left

MDB Specifications:

Overall Width of Framework Carriage = 1251 mm

Overall Length of MDB (Incl. honeycomb impact face) = 4014 mm

Wheelbase of Framework Carriage = 2591 mm

Track of Framework Carriage (Front & Rear) = 1881 mm

C.G. Location Rearward of Front Axle = 1111 mm

MDB Weight:

Left Front = 449.2 kg Left Rear = 227.6 kg

Right Front = 326.6 kg Right Rear = 354.8 kg

Total Front = 775.8 kg Total Rear = 582.4 kg

Total MDB Weight = 1358.2 kg

Impact Angle (MDB C/L to Target Vehicle C/L) = 90 degrees

Impact Speed = 61.7 km/h

Maximum Static Crush of Honeycomb Impact Face:

1. Row A at Center of Bumper Level = 211 millimeters

2. Row B at Top of Bumper Level = 150 millimeters

3. Row C at Mid Level = 150 millimeters

4. Row D at Top of Stack Level = 172 millimeters

Instrumentation:

Number of MDB Data Channels = 5

Data Sheet 4

Post-Test Observations

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Visible Dummy Contact Points:

	<u>Left Front SID HIII</u>	<u>Left Rear SID HIII</u>
Head:	<u>Side curtain airbag</u>	<u>Side curtain airbag, side header</u>
Upper Torso:	<u>Side torso airbag, door panel</u>	<u>Side curtain airbag, door panel</u>
Lower Torso:	<u>Side torso airbag</u>	<u>Door panel</u>
Left Knee:	<u>Door panel</u>	<u>Door panel</u>
Right Knee:	<u>None</u>	<u>None</u>

Door Opening:

	<u>Left Side</u>	<u>Right Side</u>
Front:	<u>Tools required</u>	<u>Easy</u>
Rear:	<u>Tools required</u>	<u>Easy</u>

MDB Distance From Target Impact Point:

Vertical: 7 mm up from target

Horizontal: 2 mm left from target

Arm Rest Locations:

Front: 220 mm below the bottom of the window

Rear: 252 mm below the bottom of the window

Seat Movement:

Front: None

Rear: None

Glazing Damage:

Windshield: None

Window: Left side windows broken.

Pillar Separation: No

Sill Separation: No

Other Notable Impact Effects:

None

Section 4

Occupant and Vehicle Information

Data Sheet 5

SID HIII Instrumentation Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

TEST NUMBER: 040429

DRIVER DUMMY SERIAL NUMBER: 059

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	6.1 g	@ 226.1 ms	15.3 g	@ 53.4 ms
LATERAL	31.6 g	@ 42.8 ms	4.8 g	@ 202.7 ms
VERTICAL	16.7 g	@ 44.1 ms	4.1 g	@ 81.6 ms
RESULTANT	36.2 g	@ 44.1 ms		
HIC 36	140	from 32.4 to 64.9 ms		

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	6.9 g	@ 223.8 ms	15.1 g	@ 53.4 ms
LATERAL	32.3 g	@ 42.8 ms	4.8 g	@ 204.0 ms
VERTICAL	16.6 g	@ 43.8 ms	4.4 g	@ 81.0 ms
RESULTANT	36.9 g	@ 43.3 ms		
HIC 36	144	from 32.3 to 64.1 ms		

NECK FORCE

X-AXIS SHEAR	269.8 N	@ 224.7 ms	504.6 N	@ 52.1 ms
Y-AXIS SHEAR	477.6 N	@ 46.3 ms	165.9 N	@ 177.4 ms
Z-AXIS AXIAL	588.3 N	@ 166.8 ms	518.1 N	@ 63.8 ms

NECK MOMENT

ABOUT X-AXIS	5.9 N-m	@ 113.8 ms	30.3 N-m	@ 44.7 ms
ABOUT Y-AXIS	37.0 N-m	@ 99.8 ms	37.0 N-m	@ 50.8 ms
ABOUT Z-AXIS	29.1 N-m	@ 72.0 ms	9.5 N-m	@ 187.4 ms
OCCIPITAL COND	6.5 N-m	@ 113.8 ms	22.2 N-m	@ 29.8 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	38.3 g	@ 20.0 ms	4.9 g	@ 8.8 ms
LATERAL (R)	40.4 g	@ 20.0 ms	5.2 g	@ 8.8 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	44.7 g	@ 21.3 ms	7.9 g	@ 76.9 ms
LATERAL (R)	45.6 g	@ 21.3 ms	8.1 g	@ 76.9 ms
TTI d (P)	52.6			
TTI d (R)	52.8			

LOWER SPINE ACCELERATION

LATERAL (P)	60.5 g	@ 23.8 ms	10.5 g	@ 60.0 ms
LATERAL (R)	59.9 g	@ 23.8 ms	10.9 g	@ 60.0 ms

PELVIS ACCELERATION

LATERAL (P)	60.5 g	@ 25.0 ms	15.3 g	@ 63.8 ms
LATERAL (R)	60.2 g	@ 25.0 ms	15.2 g	@ 63.8 ms

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 5 (Continued)

SID HIII Instrumentation Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

TEST NUMBER: 040429

PASSENGER DUMMY SERIAL NUMBER: 055

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	6.6 g	@ 51.3 ms	13.5 g	@ 60.1 ms
LATERAL	66.9 g	@ 53.6 ms	7.4 g	@ 161.3 ms
VERTICAL	5.4 g	@ 90.6 ms	23.6 g	@ 59.4 ms
RESULTANT	67.5 g	@ 53.6 ms		
HIC 36	379 from 44.2 to 63.7 ms			

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	6.7 g	@ 51.4 ms	13.8 g	@ 60.1 ms
LATERAL	67.3 g	@ 53.1 ms	7.3 g	@ 156.0 ms
VERTICAL	5.5 g	@ 90.6 ms	23.0 g	@ 58.9 ms
RESULTANT	67.7 g	@ 53.1 ms		
HIC 36	374 from 44.1 to 63.8 ms			

NECK FORCE

X-AXIS SHEAR	92.2 N	@ 61.0 ms	86.7 N	@ 206.6 ms
Y-AXIS SHEAR	26.9 N	@ 301.7 ms	817.8 N	@ 65.9 ms
Z-AXIS AXIAL	290.9 N	@ 92.4 ms	1397.1 N	@ 59.4 ms

NECK MOMENT

ABOUT X-AXIS	10.2 N-m	@ 70.0 ms	64.1 N-m	@ 55.5 ms
ABOUT Y-AXIS	12.3 N-m	@ 82.2 ms	11.2 N-m	@ 141.1 ms
ABOUT Z-AXIS	13.3 N-m	@ 80.9 ms	20.5 N-m	@ 181.6 ms
OCCIPITAL COND	4.4 N-m	@ 125.2 ms	71.6 N-m	@ 55.8 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	57.2 g	@ 39.4 ms	6.3 g	@ 11.2 ms
LATERAL (R)	56.5 g	@ 39.4 ms	7.1 g	@ 95.6 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	55.7 g	@ 38.8 ms	12.2 g	@ 95.6 ms
LATERAL (R)	51.1 g	@ 38.8 ms	15.7 g	@ 88.1 ms
TTI d (P)	57.0			
TTI d (R)	56.5			

LOWER SPINE ACCELERATION

LATERAL (P)	56.7 g	@ 45.6 ms	7.6 g	@ 100.0 ms
LATERAL (R)	56.5 g	@ 45.0 ms	7.7 g	@ 100.0 ms

PELVIS ACCELERATION

LATERAL (P)	54.7 g	@ 39.4 ms	4.6 g	@ 108.8 ms
LATERAL (R)	54.5 g	@ 39.4 ms	4.6 g	@ 108.8 ms

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

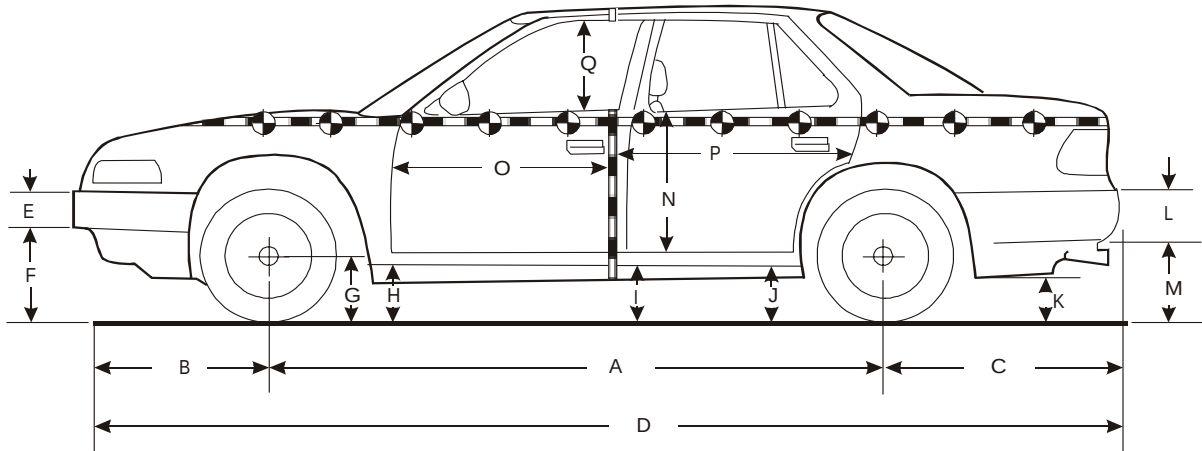
LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 6

Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



Left Side View

Note: All dimensions are in millimeters with tolerance of ± 3 mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2640	2640	2640	0
B	830	830	820	10
C	990	990	990	0
D	4460	4460	4444	16
E	135	135	135	0
F	375	373	390	-17
G	300	300	300	0
H	179	164	166	-2
I	176	151	164	-13
J1	175	138	133	5
J2	199	157	169	-12
K	265	209	218	-9
L	144	144	144	0
M	385	320	335	-15
N	700	700	625	75
O	747	747	742	5
P	1260	1260	1200	60
Q	415	415	465	-50
R	4366	4366	4368	-2
S	4354	4354	4350	4
T	1150	1150	1068	82

D = Length at centerline

T = Width at B-pillar

E&L = Bumper Thickness

J1 = To Pinch Weld

R = Right Side Length

J2 = To Sill

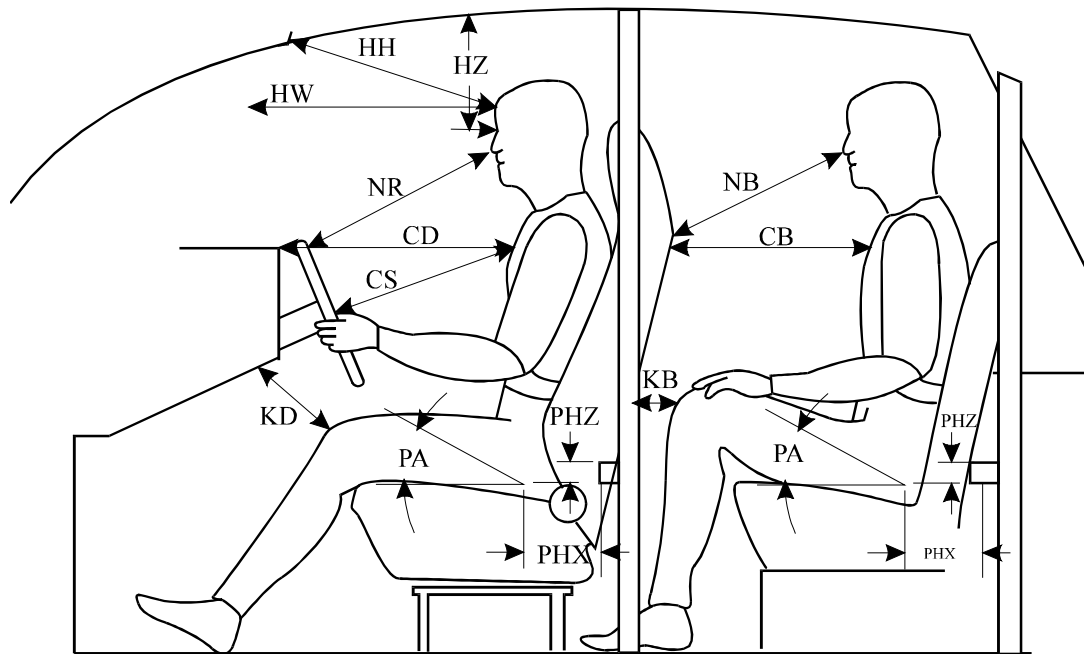
S = Left Side Length

Data Sheet 7

SID HIII Longitudinal Clearance Dimensions

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



Left Side View

Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID HIII #059	Left Rear Pass. SID HIII #055
HH	401	N/A
HW	630	N/A
HZ	191	140
NR/NB	476	680
CD/CB	560	540
CS	361	N/A
KDL(KDA°)/KBL(KBA°)	113/(25.9°)	130/(20.2°)
KDR(KDA°)/KBR(KBA°)	115/(40.0°)	111/(22.0°)
PA°	23.9°	24.4°
PHX	173	160
PHZ	129	250

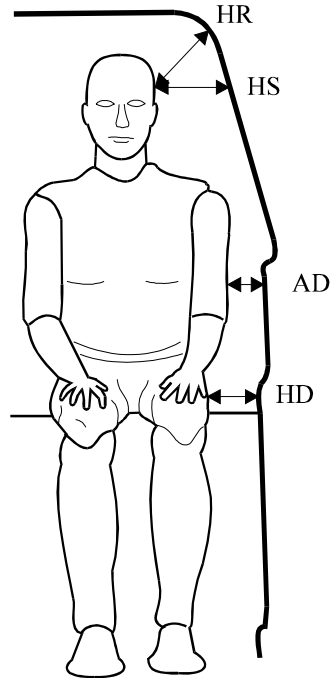
Note: 2-door vehicle shown. Rear dummy PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Data Sheet 8

SID HIII Lateral Clearance Dimensions

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID HIII #059	Left Rear Pass. SID HIII #055
HR	210	200
HS	345	350
AD*	Lower: 68 Upper: 102	Lower: 110 Upper: 99
HD	158	152

* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID HIII arm segment to the closest part of the vehicle side.

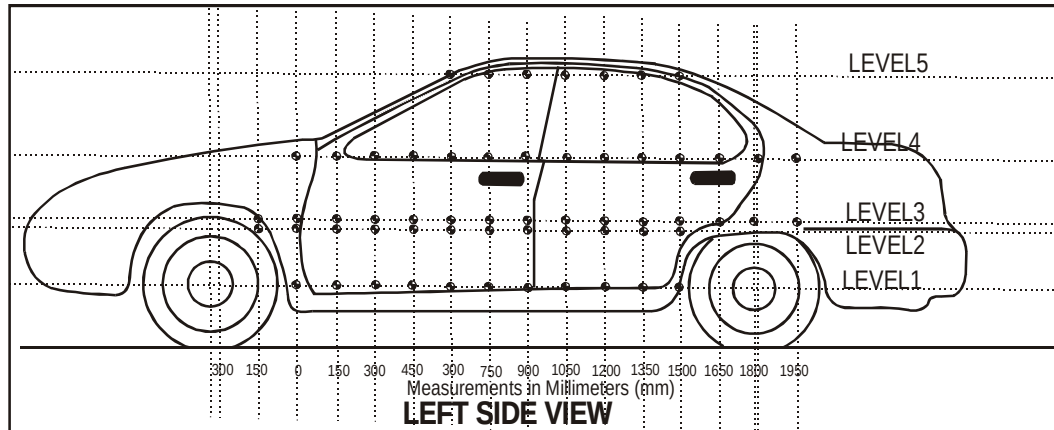
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID HIII arm segment to the closest part of the vehicle side.

Data Sheet 9

Vehicle Side Measurements

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



Level 5 - Window Top

Level 4 - Window Sill

Level 3 - Mid-Door

Level 2 - Occupant H-Point

Level 1 - Axle Centerline Height or Sill Top Height

Measurements Are Taken When The Vehicle Is In The “As Tested” Configuration.

Measurements along the vertical 750 mm line shown above:

Level 5 @ Window Top	=	<u>1370</u>	mm
Level 4 @ Window Sill	=	<u>950</u>	mm
Level 3 @ Mid Door	=	<u>667</u>	mm
Level 2 @ Occupant H-Point	=	<u>500</u>	mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>230</u>	mm

Data Sheet 10

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Location	Height		(mm) From Impact Point													
			-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750
Level 1 Side Sill	230	Pre	---	---	---	---	---	---	---	---	593	600	599	605	606	615
		Post	---	---	---	---	---	---	---	---	685	703	711	825	739	751
		Crush	---	---	---	---	---	---	---	---	92	103	112	220	133	136
Level 2 H-Point	500	Pre	---	---	630	565	---	---	---	---	553	564	563	568	570	572
		Post	---	---	730	660	---	---	---	---	685	763	825	854	863	865
		Crush	---	---	100	95	---	---	---	---	132	199	262	286	293	293
Level 3 Mid-Door	667	Pre	---	---	---	597	554	531	534	543	560	563	562	560	562	563
		Post	---	---	---	695	655	630	640	670	697	734	780	805	834	829
		Crush	---	---	---	98	101	99	106	127	137	171	218	245	272	266
Level 4 Window Sill	950	Pre	---	---	---	784	738	705	678	660	645	643	630	628	620	625
		Post	---	---	---	882	840	803	775	755	747	753	748	750	763	765
		Crush	---	---	---	98	102	98	97	95	102	110	118	122	143	140
Level 5 Window Top	1370	Pre	---	---	---	---	---	---	---	---	---	---	---	---	---	845
		Post	---	---	---	---	---	---	---	---	---	---	---	---	---	930
		Crush	---	---	---	---	---	---	---	---	---	---	---	---	---	85

Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Location	Height		(mm) From Impact Point												
			900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
Level 1 Side Sill	230	Pre	620	625	630	632	637	650	655	---	---	---	---	---	---
		Post	764	767	768	751	739	717	695	---	---	---	---	---	---
		Crush	144	142	138	119	102	67	40	---	---	---	---	---	---
Level 2 H-Point	500	Pre	574	597	583	585	590	595	605	---	---	---	---	---	660
		Post	881	892	894	904	884	841	760	---	---	---	---	---	690
		Crush	307	295	311	319	294	246	155	---	---	---	---	---	30
Level 3 Mid-Door	667	Pre	567	568	573	575	582	590	595	598	---	---	---	625	667
		Post	833	840	853	861	870	858	793	693	---	---	---	660	695
		Crush	266	272	280	286	288	268	198	95	---	---	---	35	28
Level 4 Window Sill	950	Pre	625	625	622	620	625	630	635	640	650	660	672	685	707
		Post	780	764	821	837	850	849	815	739	698	715	720	725	735
		Crush	155	139	199	217	225	219	180	99	48	55	48	40	28
Level 5 Window Top	1370	Pre	827	825	825	817	825	833	850	870	---	---	---	---	---
		Post	918	922	930	940	950	920	918	932	---	---	---	---	---
		Crush	91	97	105	123	125	87	68	62	---	---	---	---	---

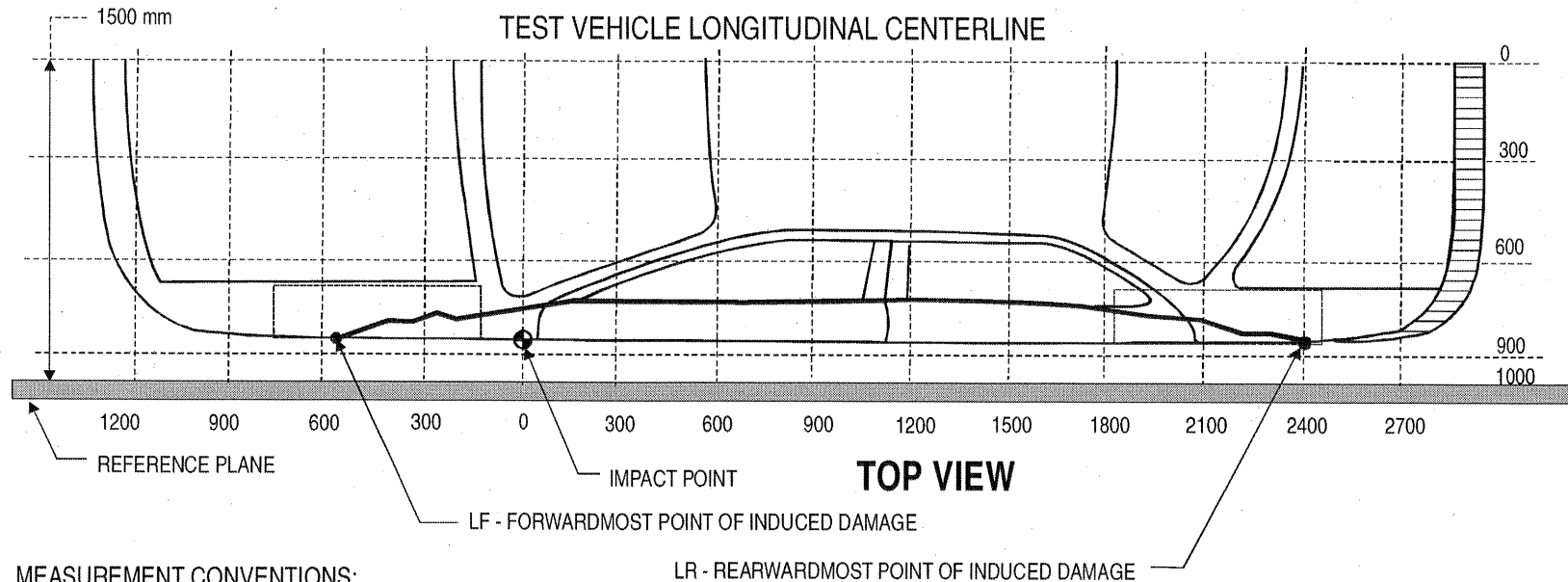
Data Sheet 11

Vehicle Damage Profile Distances

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

NOTE: All measurements are in millimeters (mm) and should be accurate to plus or minus 3mm.



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-)

Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

DPD Measurements	Post-Test (mm)	Pre-Test (mm)	Static Crush (mm)
6: LF = -150 mm (Level 3)	670	543	127
5: 300 mm (Level 2)	825	563	262
4: 750 mm (Level 2)	865	572	293
3: 1050 mm (Level 2)	892	597	295
2: 1500 mm (Level 2)	884	590	294
1: LR = 1950 mm (Level 4)	739	640	99

Full length of induced damage was 2100 mm.

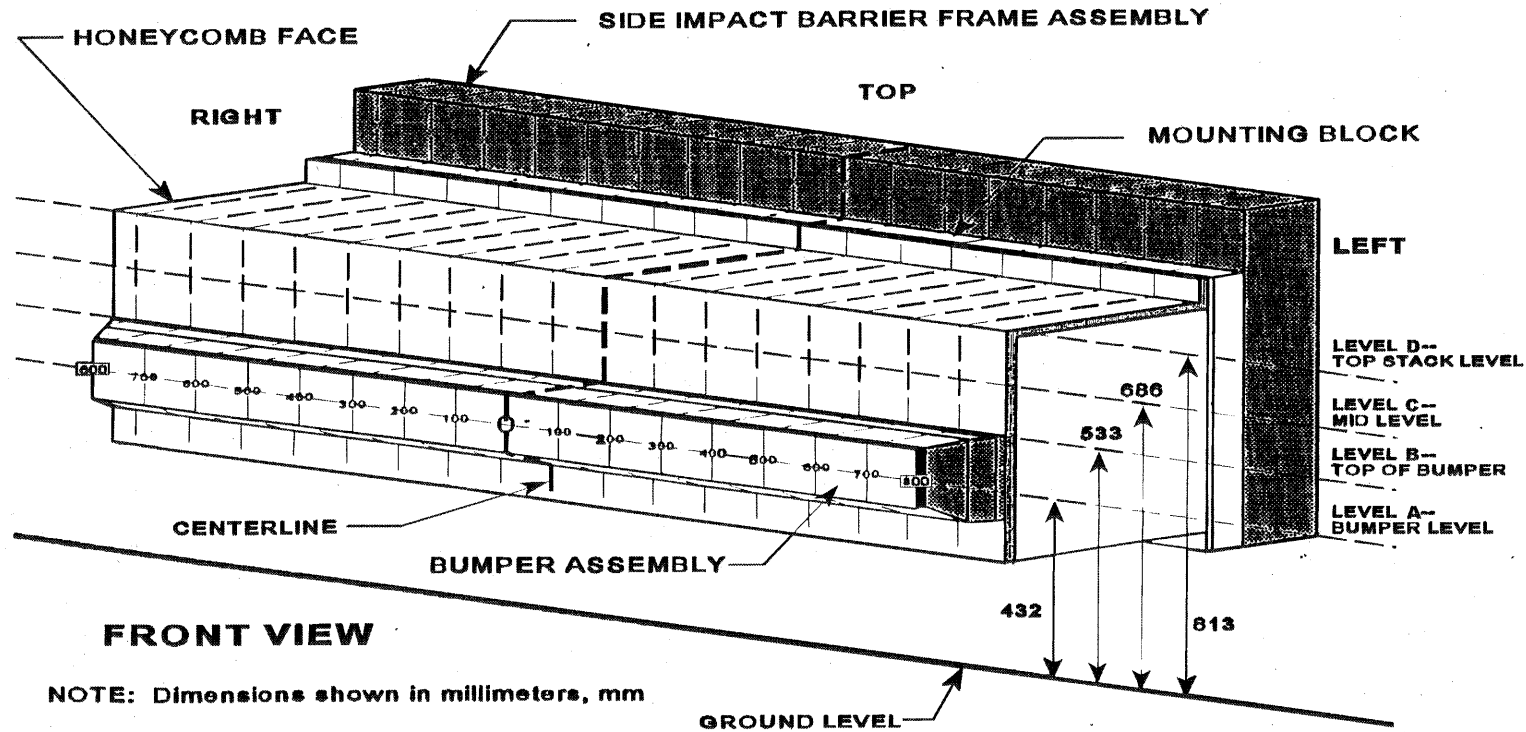
Data Sheet 12

Exterior Static Crush For Impactor Face

(Grid as looking at MDB from front)

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



NOTE: Dimensions shown in millimeters, mm

Data Sheet 12 (Continued)
Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

		Distance Right of Center (mm)										Distance Left of Center (mm)							
Location	Height At CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800	
Top Stack Level - Level D	812	-54	-23	-15	-25	-39	-75	-55	-59	-56	-38	-38	-43	-52	-70	-90	-124	-172	
Mid Level Level C	683	-69	-29	-24	-25	-32	-56	-52	-34	-22	-18	-17	-21	-28	-44	-82	-120	-150	
Top Bumper Level-Level B ¹	558	-120	-91	-71	-61	-56	-62	-64	-67	-69	-67	-69	-72	-75	-79	-90	-114	-150	
Mid Bumper Level - Level A	432	-211	-178	-143	-126	-117	-115	-112	-113	-113	-110	-111	-113	-115	-121	-136	-168	-195	

All measurements are in millimeters and have a tolerance of ± 3 mm.

¹ Pre- and post-test Top Bumper measurements are collected at 560 mm to reduce the number of inaccessible measurement points caused by bumper element deformation post-test.

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Deformable Barrier Face Profile

Level D - Top Stack

Pre-Test

Index	Xmm	Ymm	Zmm
1	-385	797	-50
2	-384	698	-50
3	-384	598	-50
4	-384	498	-49
5	-384	398	-49
6	-385	298	-48
7	-384	198	-48
8	-384	98	-47
9	-385	-2	-47
10	-385	-101	-47
11	-385	-201	-47
12	-385	-301	-46
13	-385	-402	-46
14	-385	-501	-46
15	-385	-602	-45
16	-385	-702	-45
17	-385	-802	-45

Post-Test

Index	Xmm	Ymm	Zmm
1	-330	744	-88
2	-362	651	-91
3	-370	552	-93
4	-359	453	-94
5	-345	354	-95
6	-310	261	-97
7	-330	164	-97
8	-325	64	-100
9	-329	-36	-98
10	-347	-133	-84
11	-346	-232	-83
12	-341	-332	-77
13	-333	-431	-68
14	-315	-529	-63
15	-295	-627	-56
16	-261	-720	-53
17	-213	-807	-50

Difference

Index	Xmm	Ymm	Zmm
1	-54	53	38
2	-23	46	41
3	-15	46	43
4	-25	45	45
5	-39	44	47
6	-75	37	49
7	-55	33	49
8	-59	34	53
9	-56	35	51
10	-38	32	38
11	-38	31	36
12	-43	31	31
13	-52	29	22
14	-70	27	17
15	-90	25	11
16	-124	18	8
17	-172	5	6

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Deformable Barrier Face Profile Cont'd.

Level C - Mid Level

Pre-Test

Index	Xmm	Ymm	Zmm
18	-384	799	-178
19	-384	700	-178
20	-384	599	-178
21	-384	499	-177
22	-384	399	-177
23	-384	299	-177
24	-384	199	-176
25	-384	99	-176
26	-384	-1	-176
27	-384	-101	-175
28	-384	-201	-175
29	-384	-301	-174
30	-384	-400	-174
31	-384	-501	-174
32	-384	-600	-173
33	-385	-702	-173
34	-384	-800	-173

Post-Test

Index	Xmm	Ymm	Zmm
18	-315	746	-214
19	-355	655	-219
20	-360	555	-220
21	-359	455	-221
22	-352	355	-223
23	-329	259	-223
24	-332	159	-221
25	-350	60	-216
26	-362	-39	-212
27	-367	-139	-207
28	-367	-239	-202
29	-363	-340	-196
30	-356	-440	-191
31	-340	-539	-186
32	-302	-630	-183
33	-265	-724	-179
34	-234	-815	-176

Difference

Index	Xmm	Ymm	Zmm
18	-69	54	37
19	-29	45	41
20	-24	44	42
21	-25	44	44
22	-32	44	46
23	-56	41	47
24	-52	40	45
25	-34	39	41
26	-22	38	37
27	-18	38	32
28	-17	38	27
29	-21	39	22
30	-28	40	17
31	-44	38	12
32	-82	30	10
33	-120	22	6
34	-150	15	3

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Deformable Barrier Face Profile Cont'd.

Level B - Top of Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
35	-384	798	-303
36	-383	697	-303
37	-383	597	-303
38	-383	497	-302
39	-383	397	-302
40	-384	297	-302
41	-384	197	-301
42	-384	97	-301
43	-384	-3	-301
44	-384	-103	-300
45	-384	-204	-300
46	-384	-303	-300
47	-384	-404	-300
48	-384	-504	-300
49	-384	-602	-300
50	-384	-703	-299
51	-384	-803	-298

Post-Test

Index	Xmm	Ymm	Zmm
35	-264	748	-306
36	-293	653	-323
37	-312	554	-330
38	-322	455	-333
39	-327	353	-331
40	-322	254	-328
41	-319	146	-327
42	-317	51	-321
43	-315	-45	-314
44	-317	-146	-310
45	-315	-247	-305
46	-312	-346	-301
47	-309	-446	-299
48	-305	-546	-295
49	-295	-647	-292
50	-271	-744	-284
51	-234	-832	-295

Difference

Index	Xmm	Ymm	Zmm
35	-120	50	3
36	-91	44	21
37	-71	43	27
38	-61	42	31
39	-56	44	29
40	-62	43	27
41	-64	51	26
42	-67	46	19
43	-69	43	13
44	-67	43	10
45	-69	43	6
46	-72	43	1
47	-75	43	-1
48	-79	43	-4
49	-90	44	-8
50	-114	42	-15
51	-150	29	-3

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Deformable Barrier Face Profile Cont'd.

Level A - Mid Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
52	-477	792	-432
53	-486	696	-431
54	-486	596	-431
55	-486	496	-430
56	-486	396	-430
57	-487	295	-429
58	-486	196	-429
59	-487	95	-429
60	-487	-4	-427
61	-486	-104	-429
62	-486	-204	-428
63	-486	-305	-428
64	-486	-404	-428
65	-486	-504	-427
66	-486	-603	-426
67	-486	-704	-426
68	-476	-802	-426

Post-Test

Index	Xmm	Ymm	Zmm
52	-266	728	-448
53	-308	639	-459
54	-342	545	-467
55	-360	447	-468
56	-369	347	-466
57	-372	248	-462
58	-374	147	-458
59	-373	47	-455
60	-373	-52	-452
61	-376	-152	-450
62	-375	-252	-445
63	-373	-352	-442
64	-371	-451	-439
65	-365	-551	-434
66	-350	-649	-428
67	-318	-745	-420
68	-281	-835	-411

Difference

Index	Xmm	Ymm	Zmm
52	-211	64	17
53	-178	57	28
54	-143	50	36
55	-126	49	38
56	-117	48	36
57	-115	47	33
58	-112	48	29
59	-113	48	26
60	-113	48	24
61	-110	48	21
62	-111	48	18
63	-113	47	15
64	-115	48	11
65	-121	47	7
66	-136	46	1
67	-168	41	-6
68	-195	32	-15

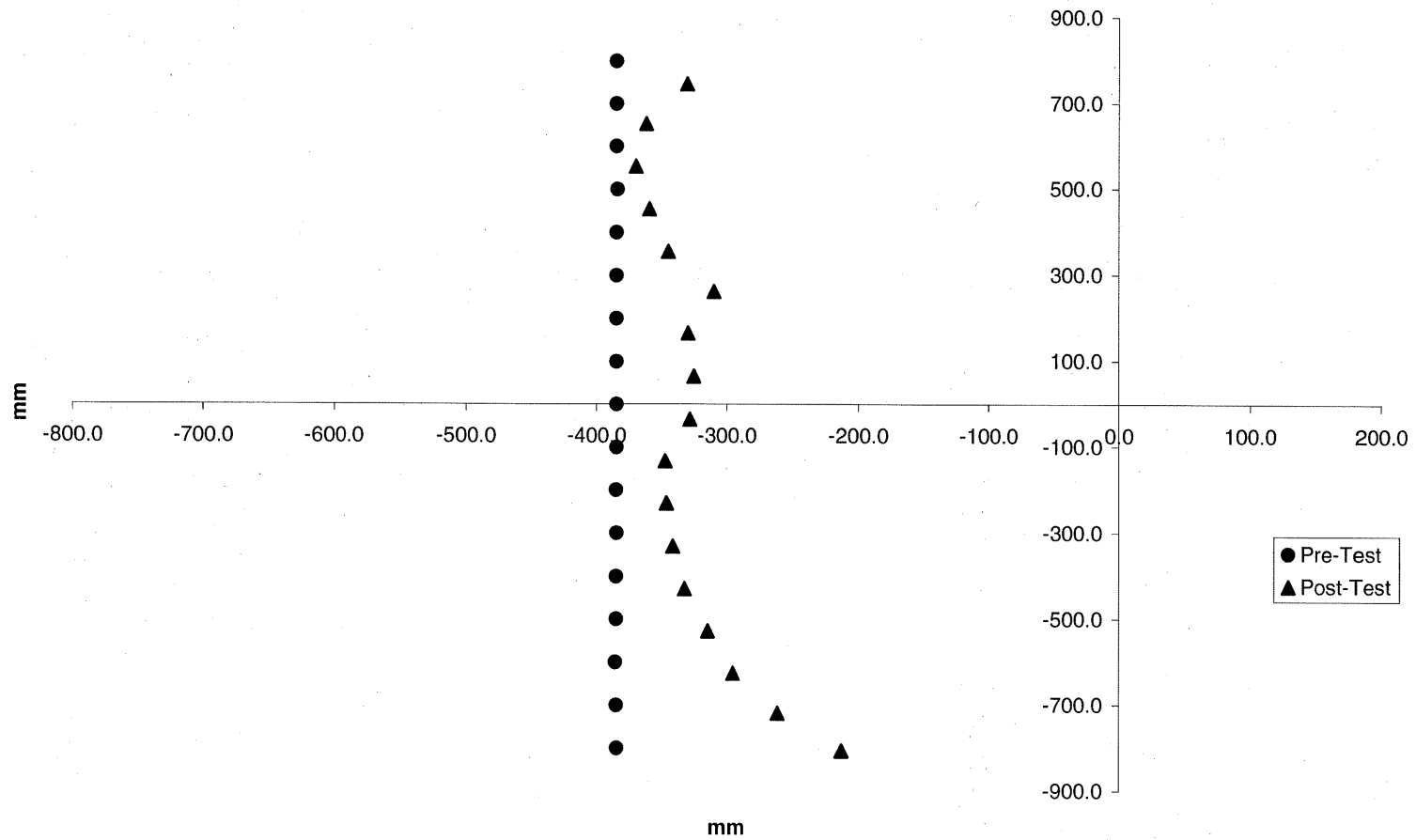
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Level D - Deformable Barrier Face Profile 1-17



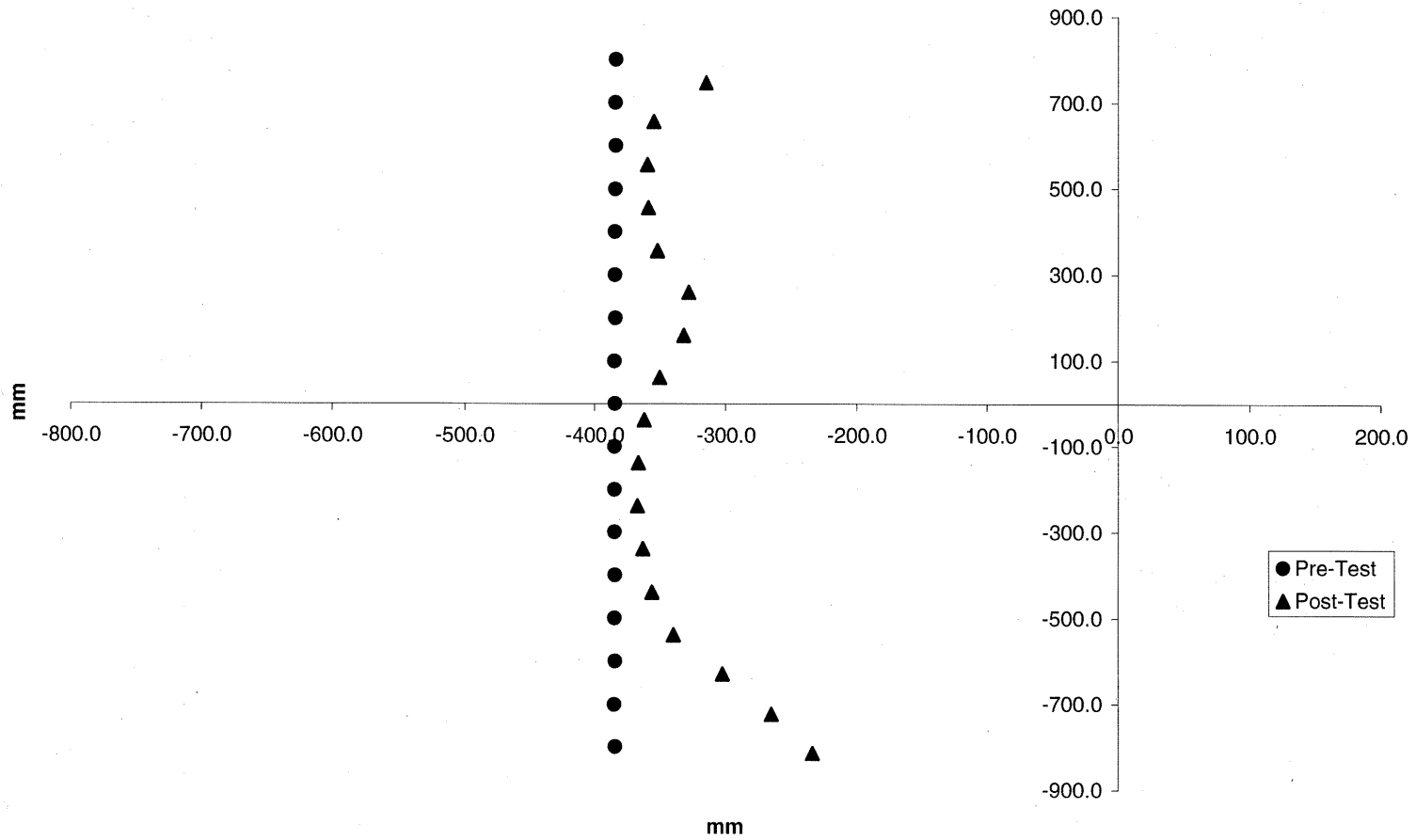
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Level C - Deformable Barrier Face Profile 18-34



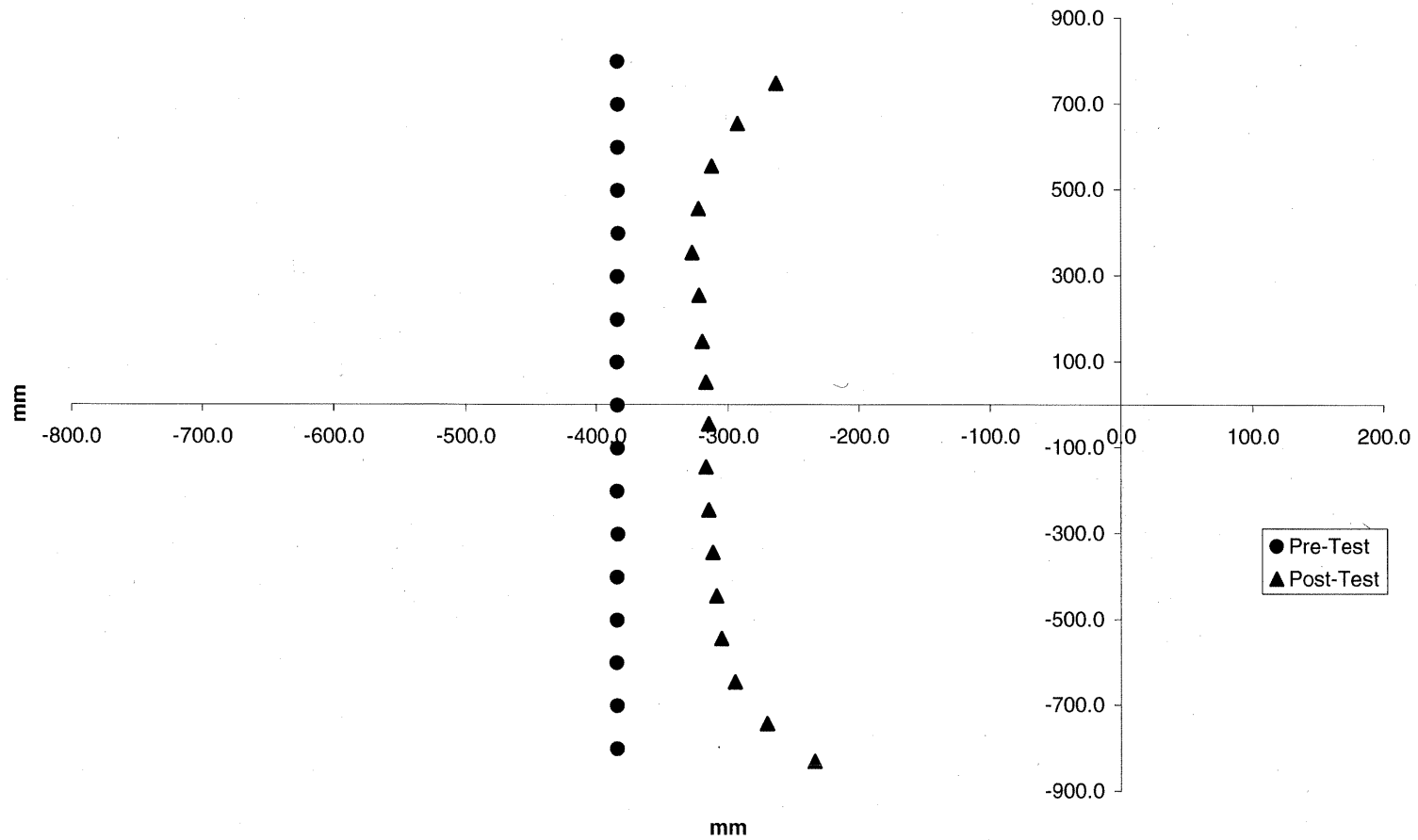
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Level B - Deformable Barrier Face Profile 35-51



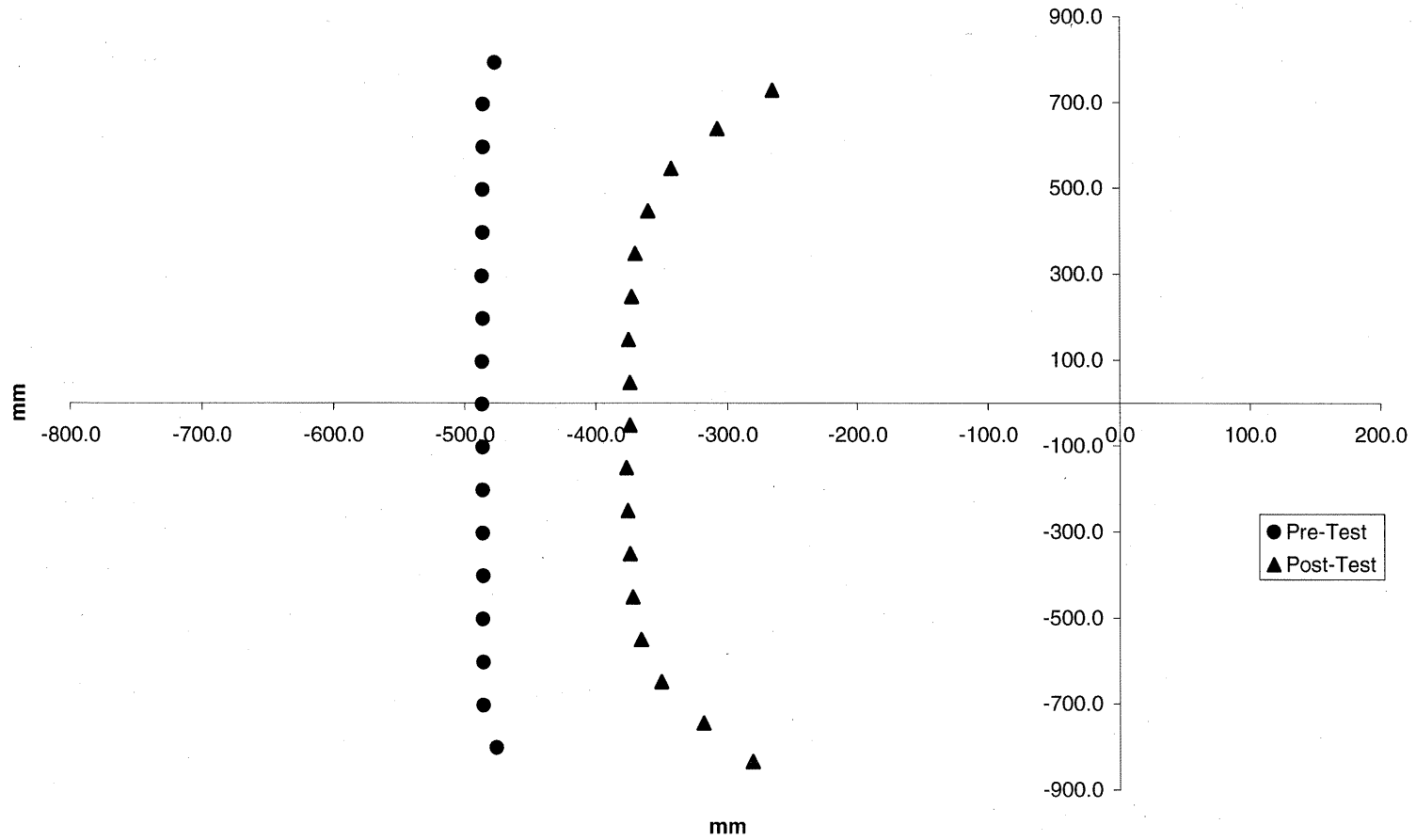
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

Level A - Deformable Barrier Face Profile 52-68

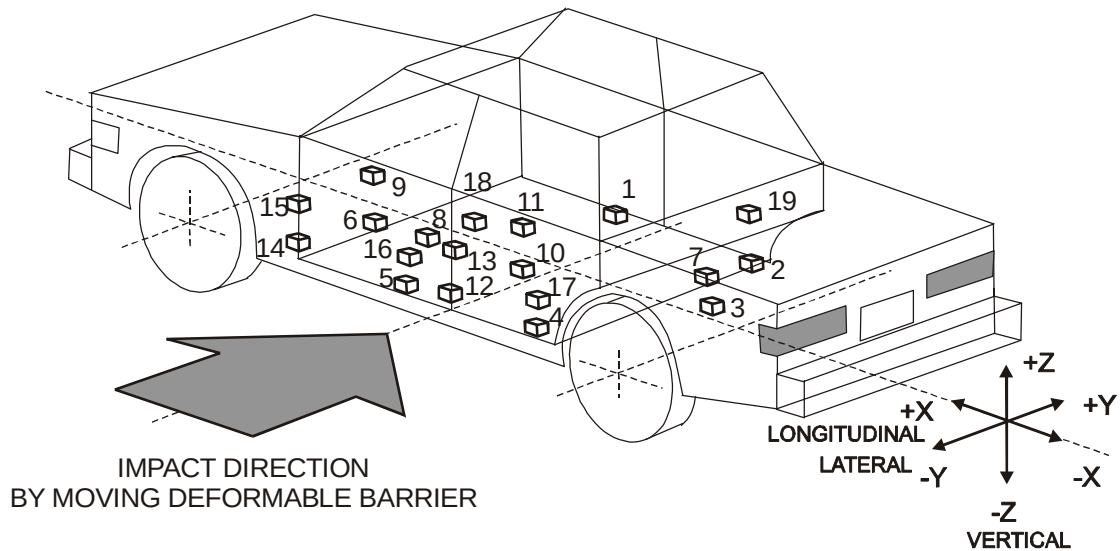


Data Sheet 13

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



- 1-Right Front Side Sill
- 2-Right Side Sill at Rear Seat
- 3-Rear Floorpan above Axle
- 4-Left Side Sill at Rear Seat
- 5-Left Front Side Sill
- 6-Left Front Door on Centerline¹
- 7-Right Rear Occupant Compartment
- 8-Left Front Door Mid Rear¹
- 9-Left Front Door Upper Centerline¹

- 10-Left Rear Door Mid Rear¹
- 11-Left Rear Door Upper Centerline¹
- 12-Left Side Lower B-pillar
- 13-Left Side Middle B-pillar
- 14-Left Side Lower A-pillar
- 15-Left Side Middle A-pillar
- 16-Left Side Front Seat Track at H-point
- 17-Left Rear Seat Track at H-point
- 18-Vehicle Center of Gravity

¹ Door mounted accelerometers were not included in this program.

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

TEST NUMBER: 040429

TEST NUMBER: 040429 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 RIGHT SIDE SILL AT FRONT SEAT	2495 mm	660 mm	-268 mm				
LONGITUDINAL				6.4 g	@ 30.4 ms	9.2 g	@ 11.3 ms
LATERAL				24.4 g	@ 6.2 ms	2.8 g	@ 125.2 ms
VERTICAL				4.2 g	@ 51.7 ms	6.2 g	@ 23.5 ms
RESULTANT				24.7 g	@ 6.2 ms		
2 RIGHT SIDE SILL AT REAR SEAT	1550 mm	660 mm	-259 mm				
LONGITUDINAL				6.4 g	@ 30.4 ms	8.4 g	@ 15.9 ms
LATERAL				28.9 g	@ 7.6 ms	2.9 g	@ 124.3 ms
VERTICAL				9.7 g	@ 35.2 ms	4.6 g	@ 22.6 ms
RESULTANT				29.1 g	@ 7.6 ms		
3 REAR FLOORPAN ABOVE AXLE	760 mm	0 mm	-422 mm				
LONGITUDINAL				2.3 g	@ 38.7 ms	6.6 g	@ 12.4 ms
LATERAL				26.2 g	@ 7.0 ms	2.0 g	@ 102.3 ms
VERTICAL				11.9 g	@ 39.3 ms	7.5 g	@ 56.9 ms
RESULTANT				26.5 g	@ 7.0 ms		
4 LEFT SIDE SILL AT REAR SEAT	1600 mm	-660 mm	-247 mm				
LATERAL				93.1 g	@ 5.5 ms	61.3 g	@ 10.0 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data SummaryVehicle: 2004 Volvo S40 4-doorNHTSA No.: C45900

TEST NUMBER: 040429

No. LOCATION

X

Y

Z

POSITIVE
DIRECTIONNEGATIVE
DIRECTION

5 LEFT SIDE SILL AT FRONT SEAT LATERAL	2428 mm	-660 mm	-264 mm	39.5 g	@	3.8 ms	24.8 g	@	8.1 ms
7 RIGHT REAR OCCUPANT COMPARTMENT LATERAL	1510 mm	580 mm	-241 mm	28.5 g	@	6.6 ms	2.5 g	@	125.2 ms
12 LEFT LOWER B-POST LATERAL	1785 mm	-715 mm	-425 mm	183.9 g	@	5.0 ms	30.6 g	@	9.8 ms
13 LEFT MIDDLE B-POST LATERAL	1755 mm	-690 mm	-684 mm	209.9 g	@	5.3 ms	30.8 g	@	27.7 ms
14 LEFT LOWER A-POST LATERAL ¹	2770 mm	-790 mm	-463 mm	---	---		---	---	
15 LEFT MIDDLE A-POST LATERAL ¹	2765 mm	-790 mm	-765 mm	---	---		---	---	
16 LEFT FRONT SEAT TRACK LATERAL	2265 mm	-555 mm	-301 mm	30.0 g	@	5.4 ms	17.2 g	@	47.1 ms
17 LEFT REAR SEAT TRACK LATERAL	1127 mm	-556 mm	-339 mm	26.4 g	@	6.2 ms	1.9 g	@	124.8 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

TEST NUMBER: 040429 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
18 VEHICLE CENTER OF GRAVITY	2100 mm	20 mm	-462 mm				
LONGITUDINAL				24.4 g	@ 21.7 ms	35.1 g	@ 26.2 ms
LATERAL				79.8 g	@ 20.6 ms	36.6 g	@ 25.7 ms
VERTICAL				37.9 g	@ 23.0 ms	20.2 g	@ 26.8 ms
RESULTANT				82.4 g	@ 20.6 ms		

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

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

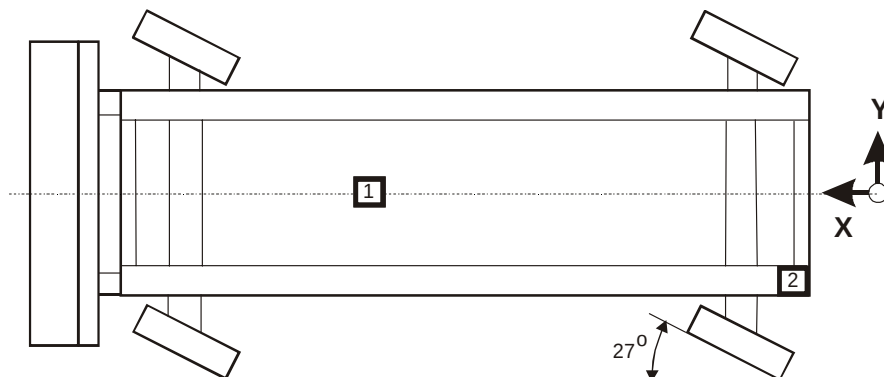
¹ See DATA ACQUISITION EXPLANATIONS on page 2-3

Data Sheet 14

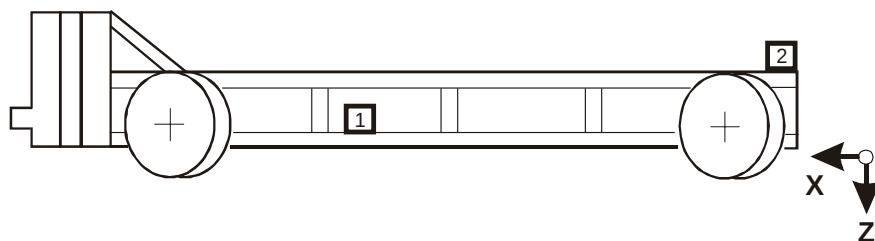
MDB Accelerometer Locations and Data Summary

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



TOP VIEW



SIDE VIEW

Accel. No.	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X*	Y*	Z*	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1	MDB Center of Gravity	1855	0	-520				
	Longitudinal X				2.5	111.6	25.5	32.0
	Lateral Y				1.7	105.2	9.4	13.4
	Vertical Z				4.8	15.2	5.0	95.0
	Resultant R				25.9	32.0		
2	Rear Frame Member	412	-677	-625				
	Longitudinal X				2.2	136.9	25.1	30.0
	Lateral Y				3.4	15.6	1.6	57.5

*Reference: X = Rear Bumper (+ Forward)

Y = Vehicle Centerline (+ To Right)

Z = Ground Level (+ Down)

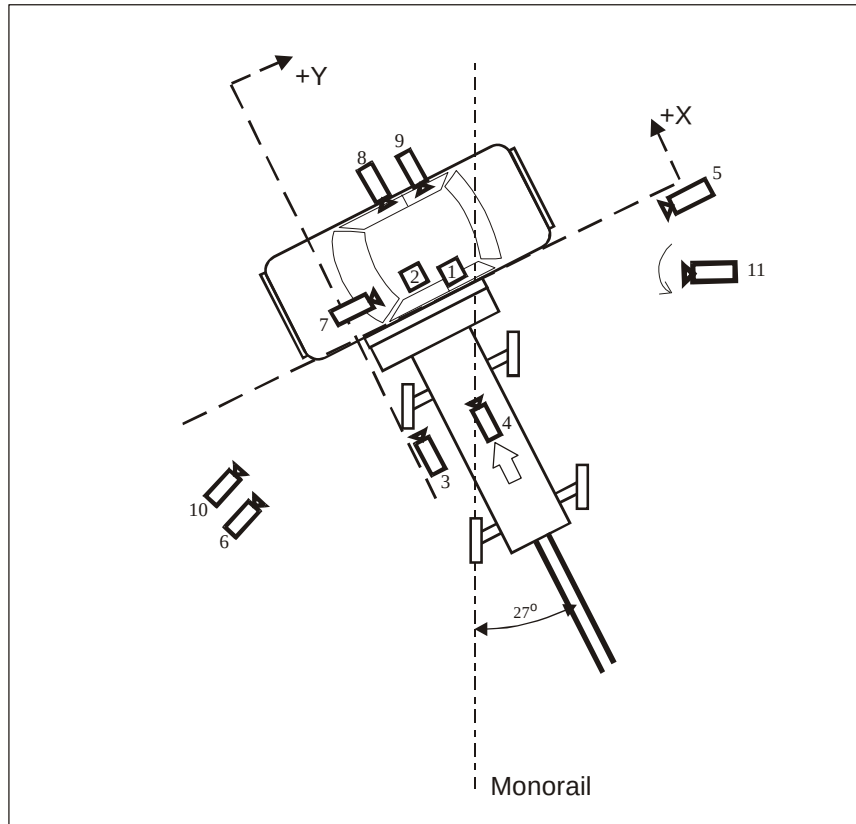
All measurements accurate to within ± 3 mm.

Data Sheet 15

High-Speed Camera Locations and Data Summary

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900



Camera Number	Location	Location, mm			Angle (deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Overhead wide	250	2150	-5750	-80.3	8.5	335
2	Overhead tight	370	1800	-5750	-86.6	25	1002
3	Onboard MDB left side	-1750	-40	-720	-0.1	13	950
4	Onboard MDB center	-2480	830	-1353	-5.5	25	1000
5	Right side of MDB	0	11350	-1090	-1.7	13	1017
6	Left side of MDB	-2300	-4350	-940	-1.4	13	1007
7	Onboard vehicle front	2600	550	-1210	-9.0	8	1010
8	Onboard side front door	1580	700	-1010	2.2	8	1007
9	Onboard side rear door	1580	1660	-1080	-2.9	8	1012
10	Digital overall event	-550	-450	-990	-1.0	13	1000
11	Real-time Panning-Video	N/A	N/A	N/A	N/A	Zoom	30

+X: Forward (referenced to MDB) from impact point

+Y: Rightward (referenced to MDB) from impact point

+Z: Downward from ground level

Section 5

Vehicle Fuel System Integrity

Data Sheet 16

FMVSS 301 Fuel System Integrity Data

NHTSA No.: C45900

Test Date: 04/29/04

Vehicle Year/Make/Model/Body Style: 2004 Volvo S40 4-door

Test Vehicle Impact Type :

- ☐ Frontal (48.28 km/h)
☐ Oblique (48.28 km/h) with ____° barrier face
first contacting the (driver/passenger) side
☐ Rear Moving Barrier (48.28 km/h)
☐ Lateral Moving Barrier (32.19 km/h)
☒ Side Impact Moving Deformable Barrier
(61.7 km/h) contacting the Driver's side

Fuel Spillage Measurement:

1. From impact until vehicle motion ceases
2. For five-minute period after vehicle motion ceases
3. For next 25 minutes.

Actual	Maximum Allowed
g	28 g
g	142 g
g	28 g/1 minute

Solvent Spillage Details :

None

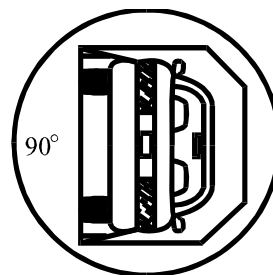
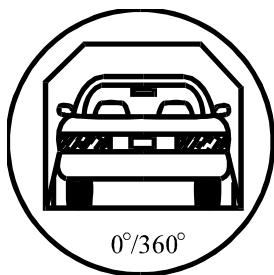
Data Sheet 17

FMVSS 301 Rollover Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

0 - 90 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

Total 6 minutes 30 seconds

Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

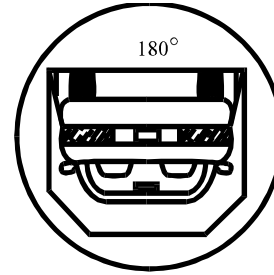
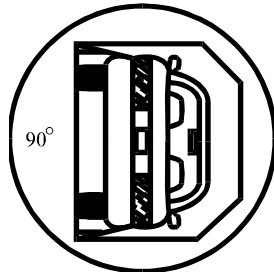
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

90 - 180 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

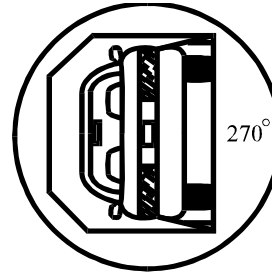
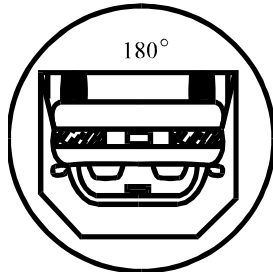
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

180 - 270 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>30</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
Total	<u>6</u>	minutes	<u>30</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

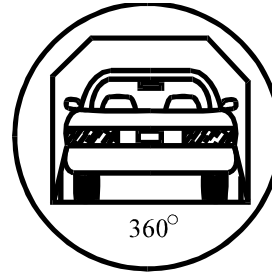
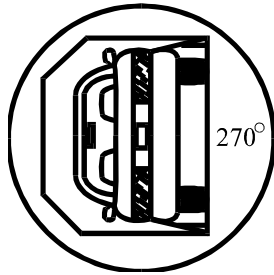
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2004 Volvo S40 4-door

NHTSA No.: C45900

270 - 360 Degrees



1. Determination Of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

Appendix A

Photographs

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Figure A-1 Pre-Test Front View of Test Vehicle
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Figure A-2 Post-Test Front View of Test Vehicle



Figure A-3 Pre-Test Impacted Side View of Test Vehicle
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Figure A-4 Post-Test Impacted Side View of Test Vehicle
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Figure A-5 Pre-Test Rear View of Test Vehicle
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Figure A-6 Post-Test Rear View of Test Vehicle
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Figure A-7 Pre-Test Frontal View of Impactor Face
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Figure A-8 Post-Test Frontal View of Impactor Face
A-11

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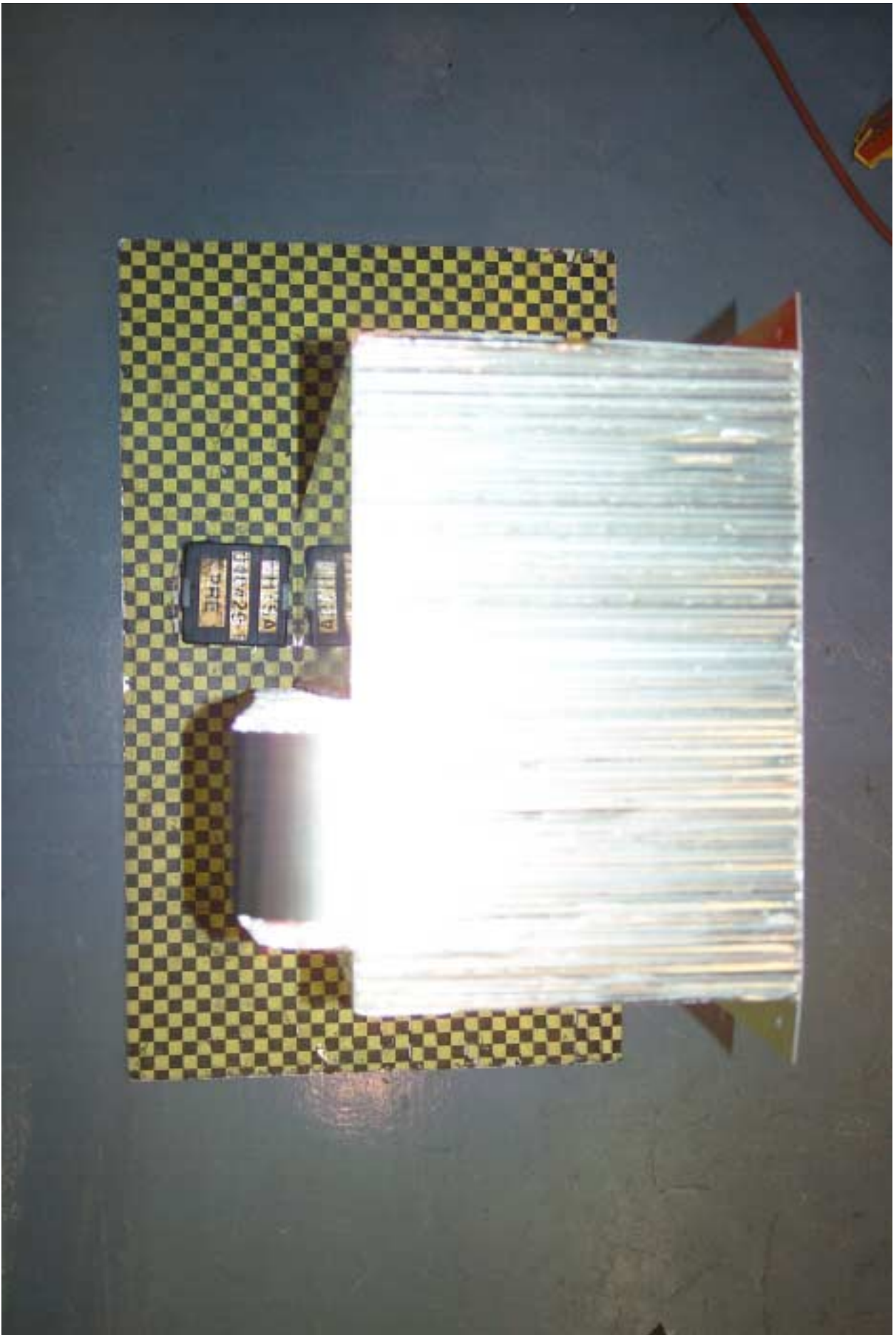


Figure A-9 Pre-Test Left Side View of Impactor Face



Figure A-10 Post-Test Left Side View of Impactor Face



Figure A-11 Pre-Test Right Side View of Impactor Face

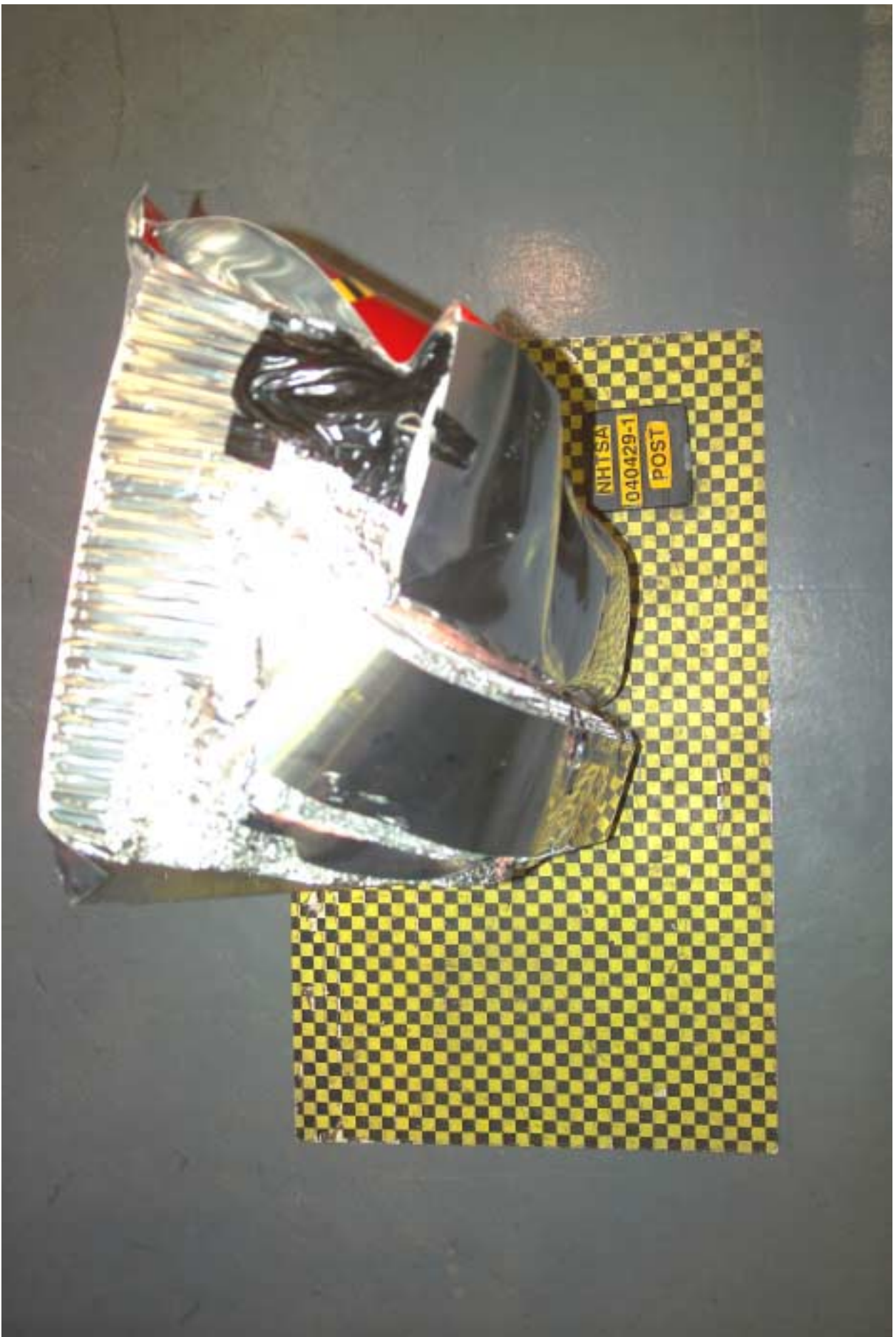


Figure A-12 Post-Test Right Side View of Impactor Face



Figure A-13 Pre-Test Top View of Impactor Face
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Figure A-14 Post-Test Top View of Impactor Face
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Figure A-15 Pre-Test View of MDB Showing Contact Switches in Place
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Figure A-16 Pre-Test Overhead View of MDB Aligned with Vehicle



Figure A-17 Post-Test Overhead View of Vehicle



Figure A-18 Pre-Test Right Occupant Compartment View of Front SID HIII

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Figure A-19 Post-Test Right Occupant Compartment View of Front SID HIII
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Figure A-20 Pre-Test Right Occupant Compartment View of Rear SID HIII

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Figure A-21 Post-Test Right Occupant Compartment View of Rear SID HII
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Figure A-22 Pre-Test Left View of Front SID HIII

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Figure A-23 Post-Test Left View of Front SID HMI
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Figure A-24 Pre-Test Left View of Front SID HIII and Belt Position
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Figure A-25 Pre-Test View of Front SID HIII and Door Clearance



Figure A-26 Pre-Test View of Front SID HIII and Door Clearance





Figure A-28 Post-Test Left View of Rear SID HIII
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Figure A-29 Pre-Test Left of Rear SID HIII and Belt Position
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Figure A-30 Pre-Test View of Rear SID HIII and Door Clearance



Figure A-31 Post-Test View of Rear SID HIII and Door Clearance



Figure A-32 Pre-Test Interior of Front Door
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Figure A-33 Post-Test Interior of Front Door Showing SID HIII Impact Locations



Figure A-34 Post-Test Front SID HIII Contact - View 1

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Figure A-35 Post-Test Front SID HIII Contact - View 2
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Figure A-36 Pre-Test Interior of Rear Panel
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Figure A-37 Post-Test Interior of Rear Panel Showing SID HIII Impact Locations
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Figure A-38 Post-Test Rear SID HIII Contact - View 1
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Figure A-39 Post-Test Rear SID HIII Contact - View 2
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Figure A-40 Post-Test Rear SID HIII Contact - View 3
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Figure A-41 Pre-Test Left Side View of MDB With Impactor Face in Position
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Figure A-42 Pre-Test Primary Impact Point View
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Figure A-43 Post-Test Primary Impact Point View
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Figure A-44 Pre-Test Right Side View of MDB With Impactor Face in Position
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Figure A-45 Pre-Test Secondary Impact Point View
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Figure A-46 Post-Test Secondary Impact Point View
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Figure A-47 Vehicle Certification Label View
A-50

SYSTEM TO MALFUNCTION AND CHECK ENGINE LAMP TO ILLUMINATE.
SEE OWNERS MANUAL

VOLVO

30640301

VEHICLE CAPACITY WEIGHT	OCCUPANTS			COLD TIRE PRESSURE		PSI
	FRT	RR	TOTAL	FRONT	REAR	
MAX LOAD	950	LB	2 3 5	36	36	
RECOMMENDED FOR FUEL ECONOMY						

OPTIONAL PRESSURE						
TIRE SIZE	205/55R16	2	1	3	30 30	PSI

IF TIRES ARE HOT FROM DRIVING ADD 4 PSI (28kPa) TO THESE RECOMMENDED PRESSURES

125/85 16 SIZE SPARE TIRE INFLATION PRESSURE 61 PSI

SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION.

0532655

VOLVO

3514949

Figure A-48 Vehicle Recommended Tire Pressure Label View



Figure A-49 Impact Event
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Figure A-50 Pre-Test Fuel Cap
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Figure A-51 Post-Test Fuel Cap
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Figure A-52 FMVSS 301 Rollover View at 90°
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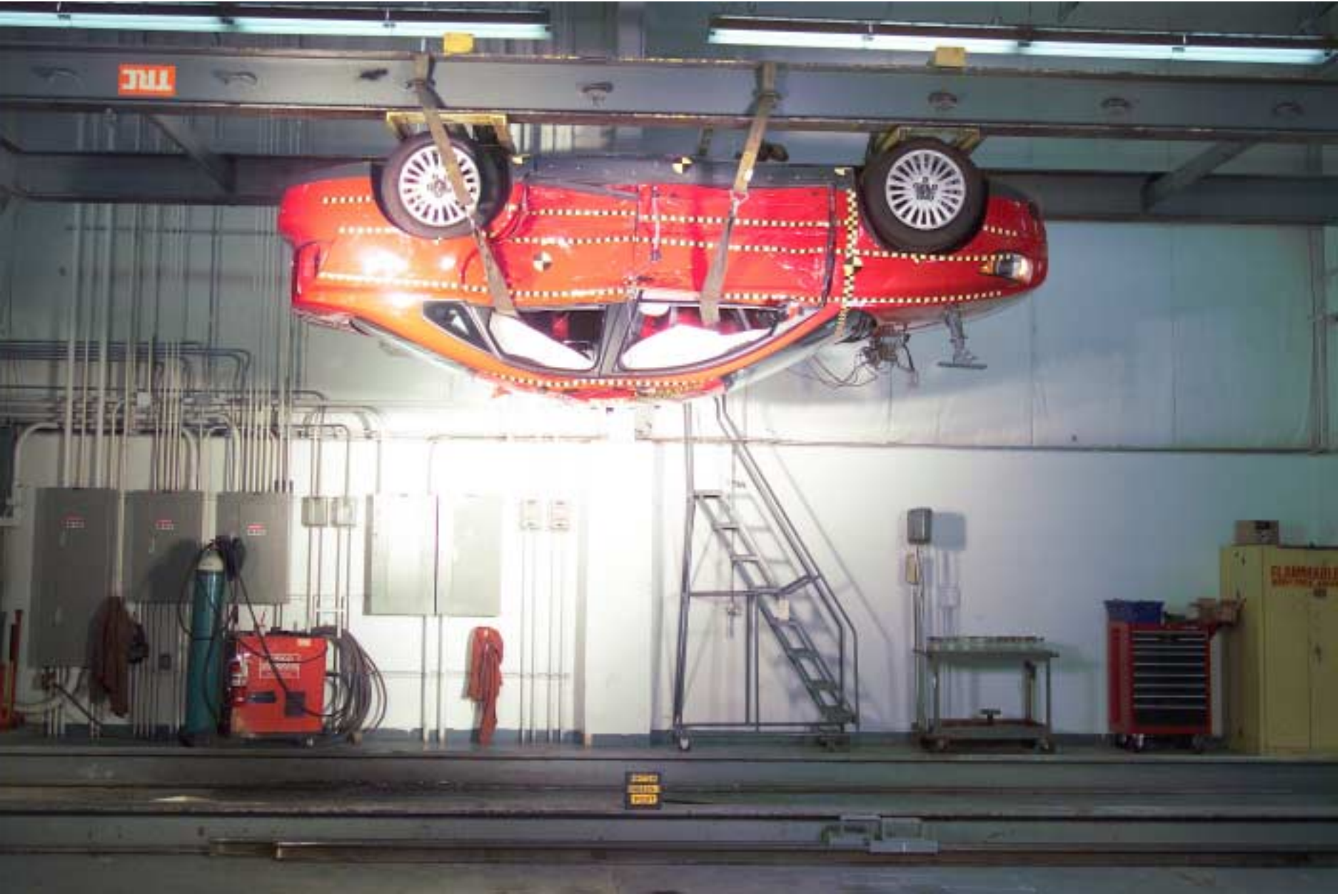


Figure A-53 FMVSS 301 Rollover View at 180°
A-56

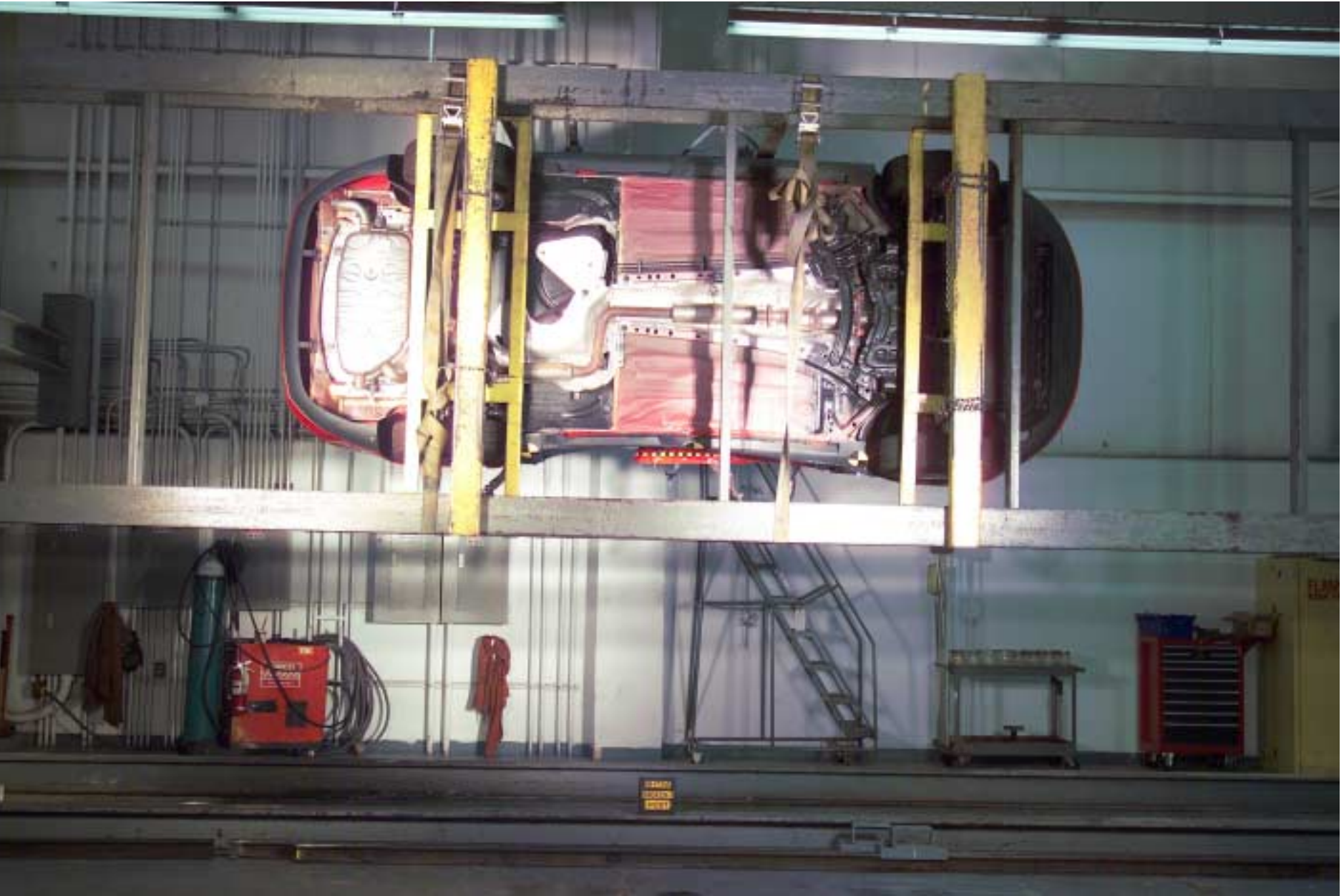


Figure A-54 FMVSS 301 Rollover View at 270°
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Figure A-55 Post-Test Side Curtain Airbag Deployment - View 1
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Figure A-56 Post-Test Side Curtain Airbag Deployment - View 2
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Appendix B

Data Plots

Table of Data Plots

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

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3	Driver Head Y-Axis Acceleration	B-13
4	Driver Head Y-Axis Velocity	B-14
5	Driver Head Z-Axis Acceleration	B-15
6	Driver Head Z-Axis Velocity	B-16
7	Driver Head Resultant Acceleration	B-17
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9	Driver Neck Y-Axis Shear Force	B-19
10	Driver Neck Z-Axis Axial Force	B-20
11	Driver Neck Moment about X Axis	B-21
12	Driver Neck Moment about Y Axis	B-22
13	Driver Neck Moment about Z Axis	B-23
14	Driver Neck Occipital Condyle Moment about X Axis	B-24
15	Driver Upper Rib Y-Axis Acceleration	B-25
16	Driver Upper Rib Y-Axis Velocity	B-26
17	Driver Lower Rib Y-Axis Acceleration	B-27
18	Driver Lower Rib Y-Axis Velocity	B-28
19	Driver Lower Spine Y-Axis Acceleration	B-29
20	Driver Lower Spine Y-Axis Velocity	B-30
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22	Driver Pelvis Y-Axis Velocity	B-32
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Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

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38	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-48
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Table of Data Plots (Continued)

Driver and Passenger Dummy Redundant Instrumentation Plots

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

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59	Driver Lower Spine Y-Axis Redundant Acceleration	B-70
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61	Driver Pelvis Y-Axis Redundant Acceleration	B-72
62	Driver Pelvis Y-Axis Redundant Velocity	B-73
63	Left Rear Passenger Head X-Axis Redundant Acceleration	B-74
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66	Left Rear Passenger Head Y-Axis Redundant Velocity	B-77
67	Left Rear Passenger Head Z-Axis Redundant Acceleration	B-78
68	Left Rear Passenger Head Z-Axis Redundant Velocity	B-79
69	Left Rear Passenger Head Resultant Redundant Acceleration	B-80
70	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-81
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Driver and Passenger Dummy Redundant Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

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72	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-83
73	Left Rear Passenger Lower Rib Y-Axis Redundant Velocity	B-84
74	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-85
75	Left Rear Passenger Lower Spine Y-Axis Redundant Velocity	B-86
76	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-87
77	Left Rear Passenger Pelvis Y-Axis Redundant Velocity	B-88

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Test Vehicle Instrumentation Plots
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

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78	Right Side Sill at Front Seat X-Axis Acceleration	B-90
79	Right Side Sill at Front Seat X-Axis Velocity	B-91
80	Right Side Sill at Front Seat Y-Axis Acceleration	B-92
81	Right Side Sill at Front Seat Y-Axis Velocity	B-93
82	Right Side Sill at Front Seat Z-Axis Acceleration	B-94
83	Right Side Sill at Front Seat Z-Axis Velocity	B-95
84	Right Side Sill at Front Seat Resultant Acceleration	B-96
85	Right Side Sill at Rear Seat X-Axis Acceleration	B-97
86	Right Side Sill at Rear Seat X-Axis Velocity	B-98
87	Right Side Sill at Rear Seat Y-Axis Acceleration	B-99
88	Right Side Sill at Rear Seat Y-Axis Velocity	B-100
89	Right Side Sill at Rear Seat Z-Axis Acceleration	B-101
90	Right Side Sill at Rear Seat Z-Axis Velocity	B-102
91	Right Side Sill at Rear Seat Resultant Acceleration	B-103
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95	Rear Floorpan Above Axle Y-Axis Velocity	B-107
96	Rear Floorpan Above Axle Z-Axis Acceleration	B-108
97	Rear Floorpan Above Axle Z-Axis Velocity	B-109
98	Rear Floorpan Above Axle Resultant Acceleration	B-110
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Test Vehicle Instrumentation Plots (Continued)
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

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104	Left Side Sill at Rear Seat Y-Axis Displacement	B-116
105	Right Rear Occupant Compartment Y-Axis Acceleration	B-117
106	Right Rear Occupant Compartment Y-Axis Velocity	B-118
107	Right Rear Occupant Compartment Y-Axis Displacement	B-119
108	Left Lower A-Post Y-Axis Acceleration	B-120
109	Left Lower A-Post Y-Axis Velocity	B-121
110	Left Middle A-Post Y-Axis Acceleration	B-122
111	Left Middle A-Post Y-Axis Velocity	B-123
112	Left Lower B-Post Y-Axis Acceleration	B-124
113	Left Lower B-Post Y-Axis Velocity	B-125
114	Left Middle B-Post Y-Axis Acceleration	B-126
115	Left Middle B-Post Y-Axis Velocity	B-127
116	Left Front Seat Track Y-Axis Acceleration	B-128
117	Left Front Seat Track Y-Axis Velocity	B-129
118	Left Rear Seat Track Y-Axis Acceleration	B-130
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120	Vehicle Center of Gravity X-Axis Acceleration	B-132
121	Vehicle Center of Gravity X-Axis Velocity	B-133
122	Vehicle Center of Gravity Y-Axis Acceleration	B-134
123	Vehicle Center of Gravity Y-Axis Velocity	B-135
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125	Vehicle Center of Gravity Z-Axis Velocity	B-137
126	Vehicle Center of Gravity Resultant Acceleration	B-138

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 MDB Instrumentation Plots
 Acceleration Data - Filter Class 60
 Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
127	MDB Center of Gravity X-Axis Acceleration	B-140
128	MDB Center of Gravity X-Axis Velocity	B-141
129	MDB Center of Gravity Y-Axis Acceleration	B-142
130	MDB Center of Gravity Y-Axis Velocity	B-143
131	MDB Center of Gravity Z-Axis Acceleration	B-144
132	MDB Center of Gravity Z-Axis Velocity	B-145
133	MDB Center of Gravity Resultant Acceleration	B-146
134	MDB Left Rear X-Axis Acceleration	B-147
135	MDB Left Rear X-Axis Velocity	B-148
136	MDB Left Rear Y-Axis Acceleration	B-149
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Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered

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141	Driver Lower Rib Y-Axis Acceleration	B-155
142	Driver Lower Spine Y-Axis Acceleration	B-156
143	Driver Pelvis Y-Axis Acceleration	B-157
144	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-158
145	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-159
146	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-160
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148	Driver Upper Rib Y-Axis Redundant Acceleration	B-162
149	Driver Lower Rib Y-Axis Redundant Acceleration	B-163
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151	Driver Pelvis Y-Axis Redundant Acceleration	B-165
152	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-166
153	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-167
154	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-168
155	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-169

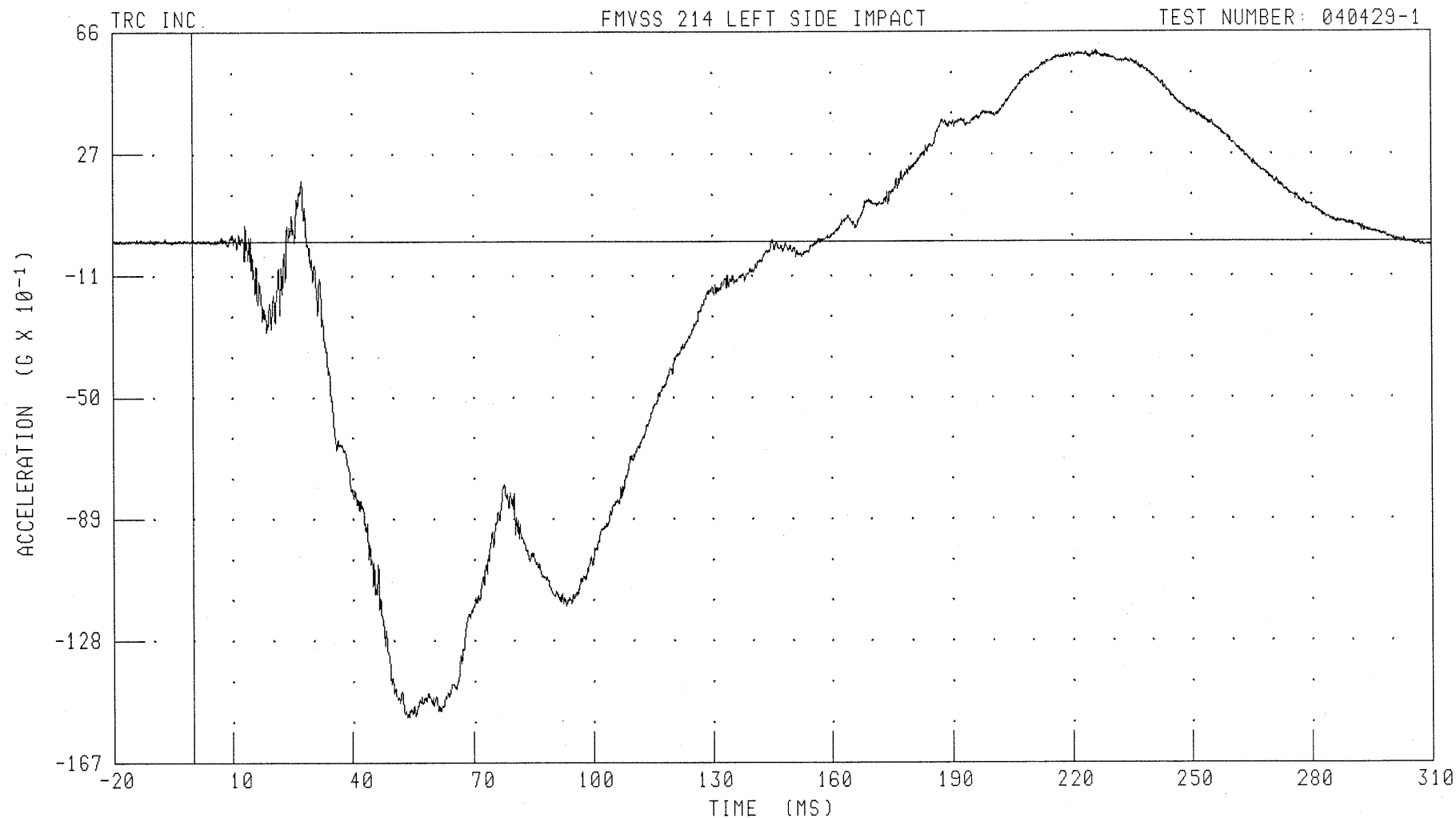
Driver and Passenger Dummy Instrumentation Plots

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 6.12 G @ 226.08 MS; -15.26 G @ 53.44 MS

B-11

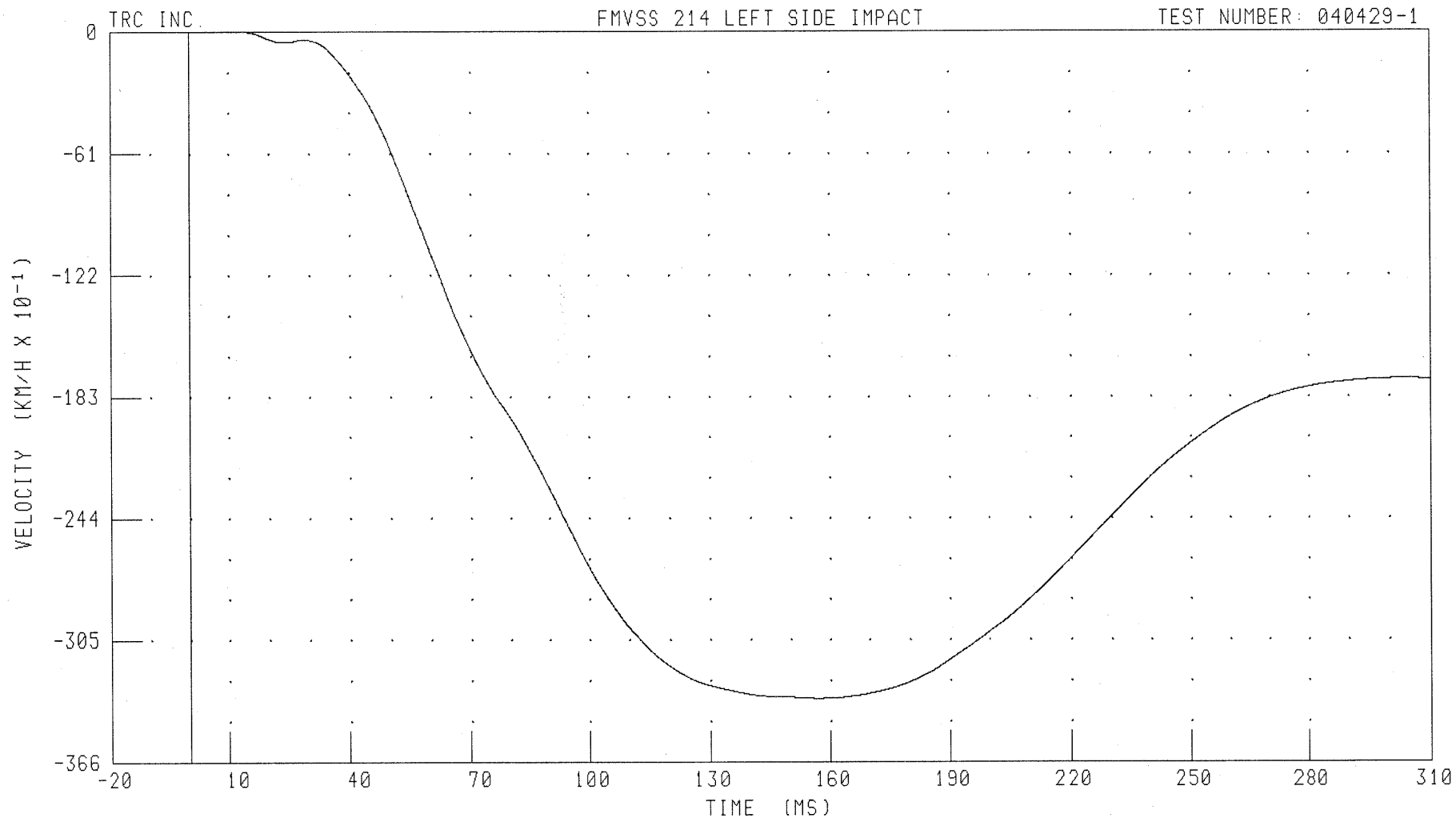
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXV1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 KM/H @ 12.56 MS, -33.43 KM/H @ 156.72 MS

B-12

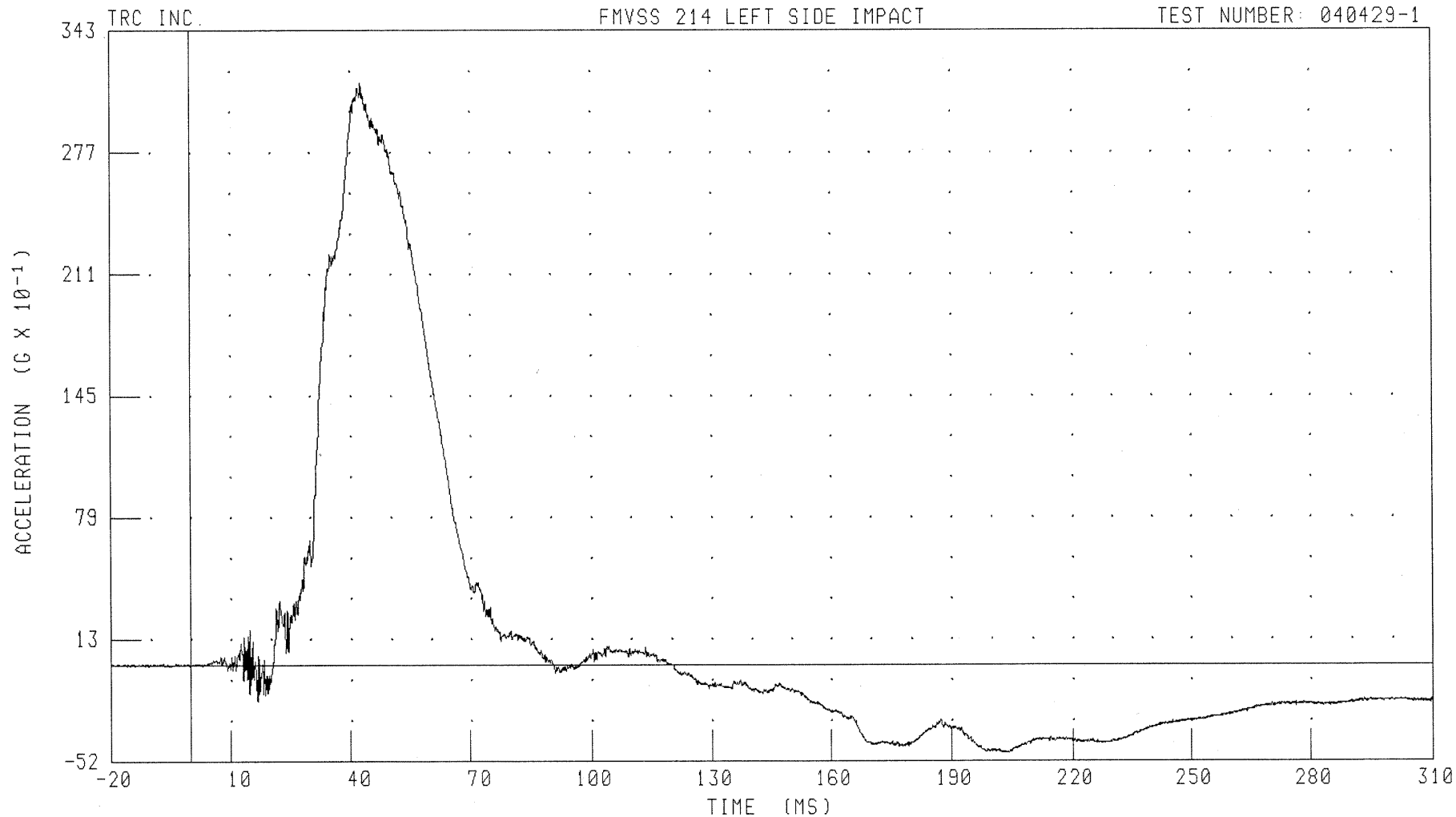
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

PEAK DATA: 31.58 G @ 42.80 MS; -4.78 G @ 202.72 MS

B-13

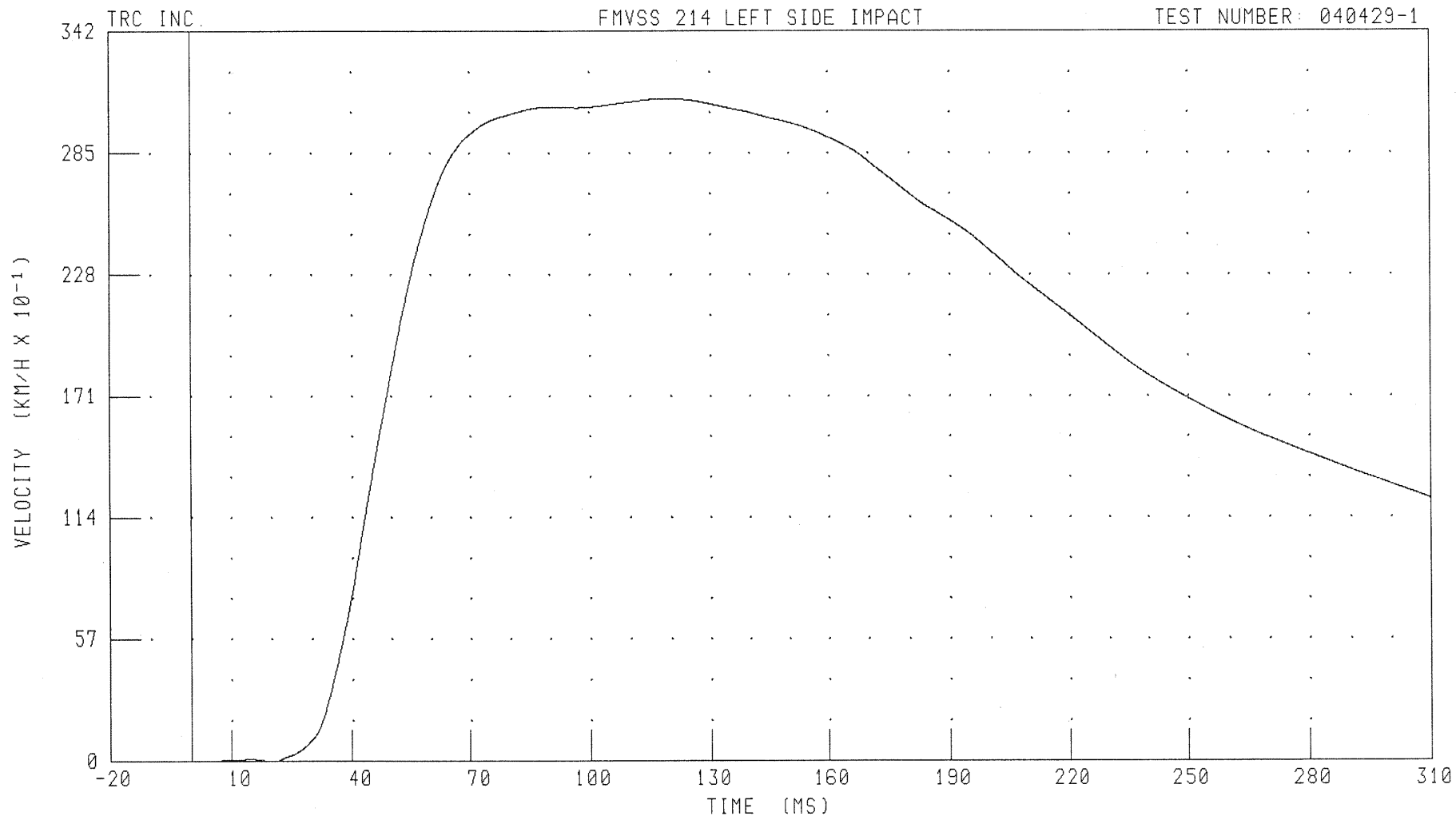
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYV1

FILTER: CH. CLASS 180

PEAK DATA: 31.05 KM/H @ 120.00 MS; -0.05 KM/H @ 20.48 MS

B-14

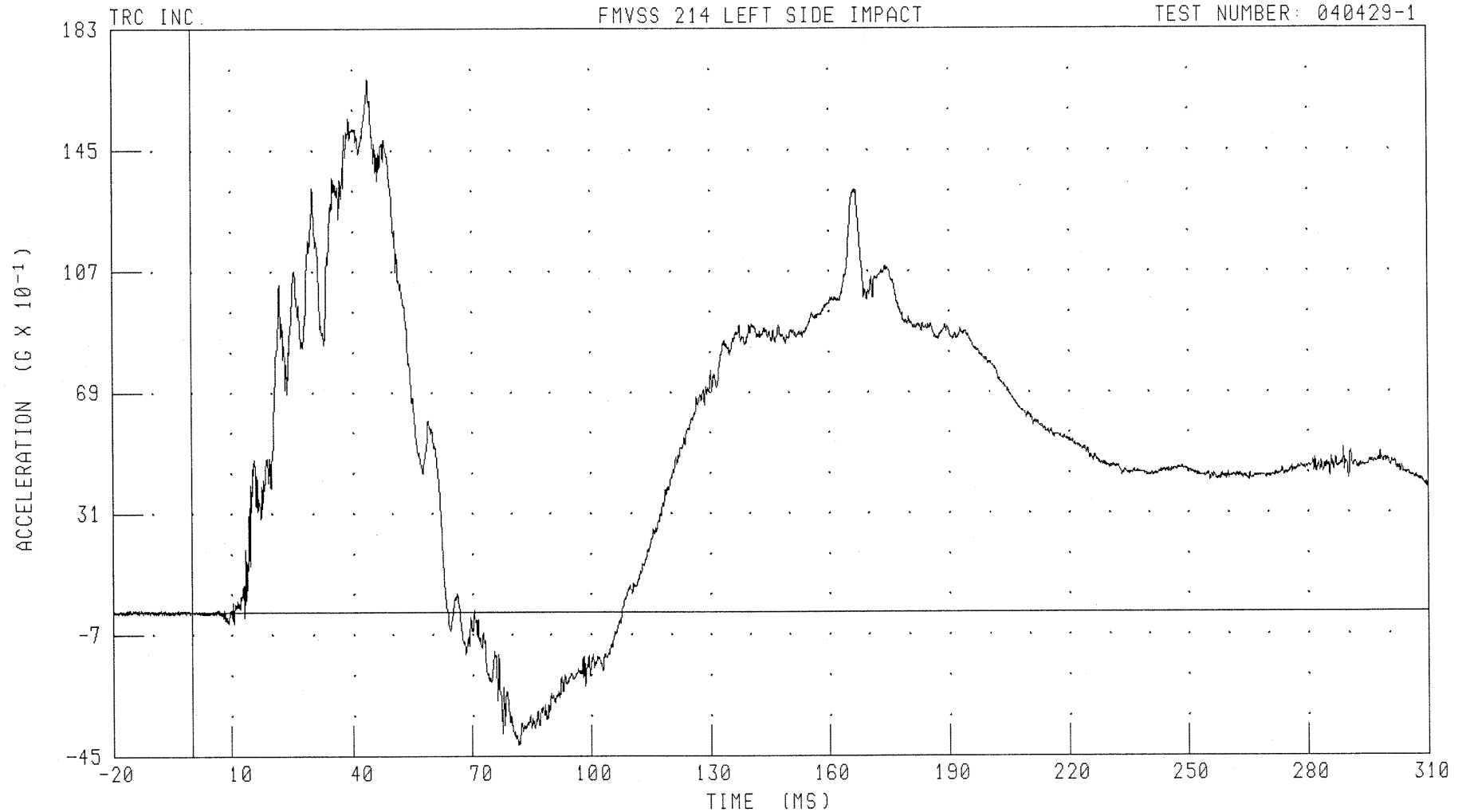
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 16.72 G @ 44.08 MS; -4.14 G @ 81.60 MS

B-15

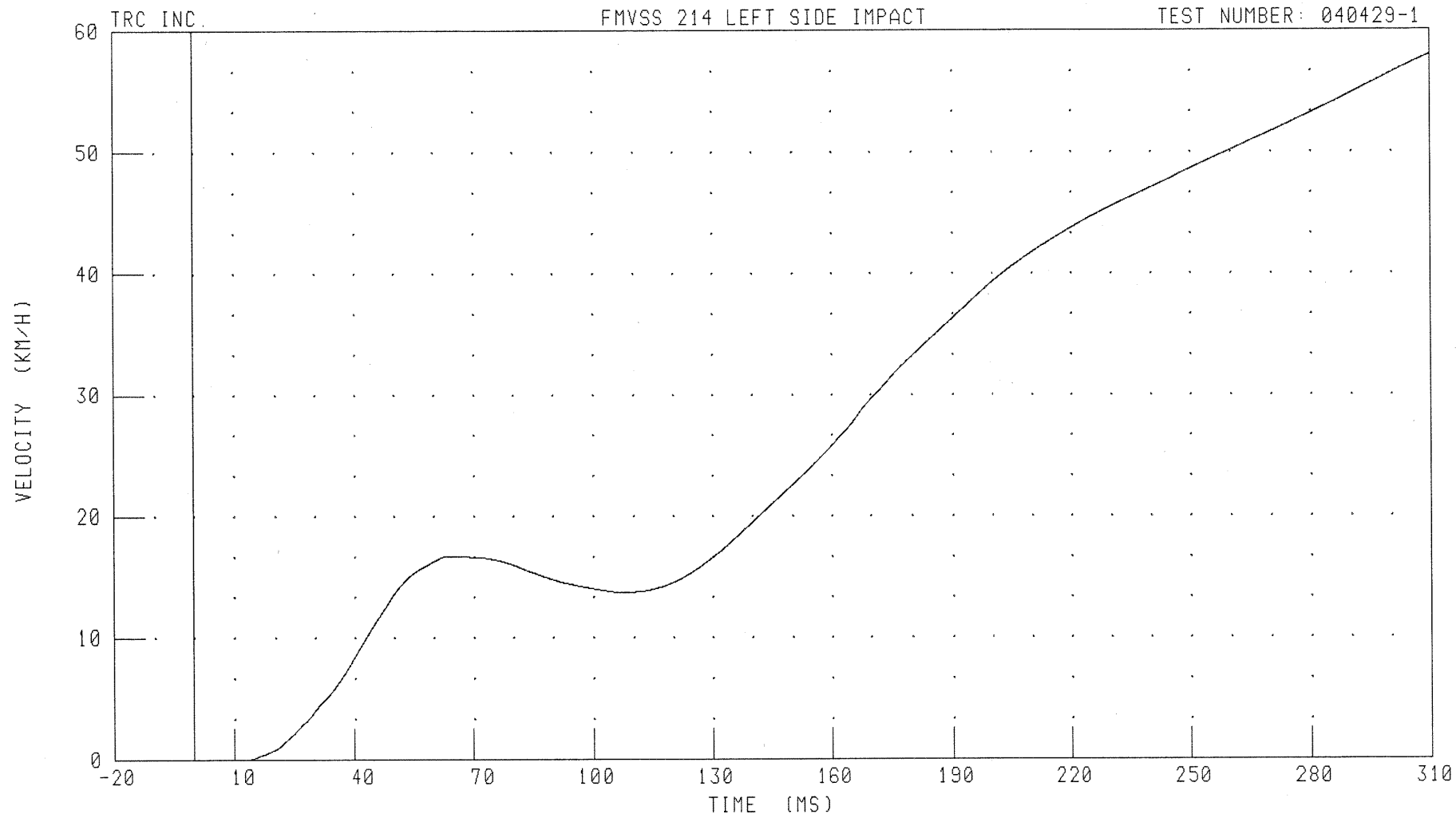
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZV1 FILTER: CH. CLASS 180

PEAK DATA: 57.99 KM/H @ 310.00 MS; -0.02 KM/H @ 10.40 MS

B-16

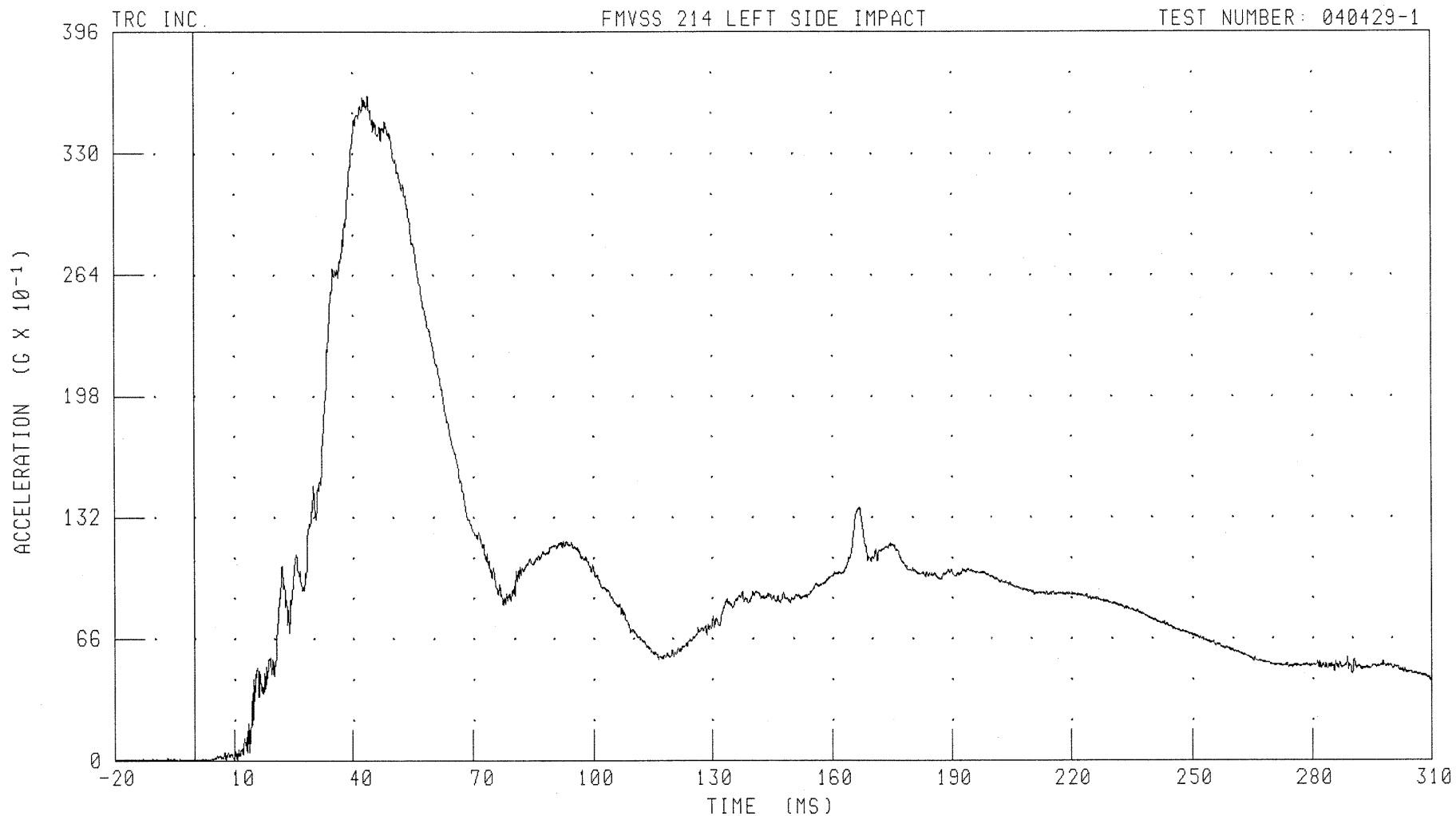
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 36.16 G @ 44.08 MS; 0.01 G @ -18.64 MS

B-17

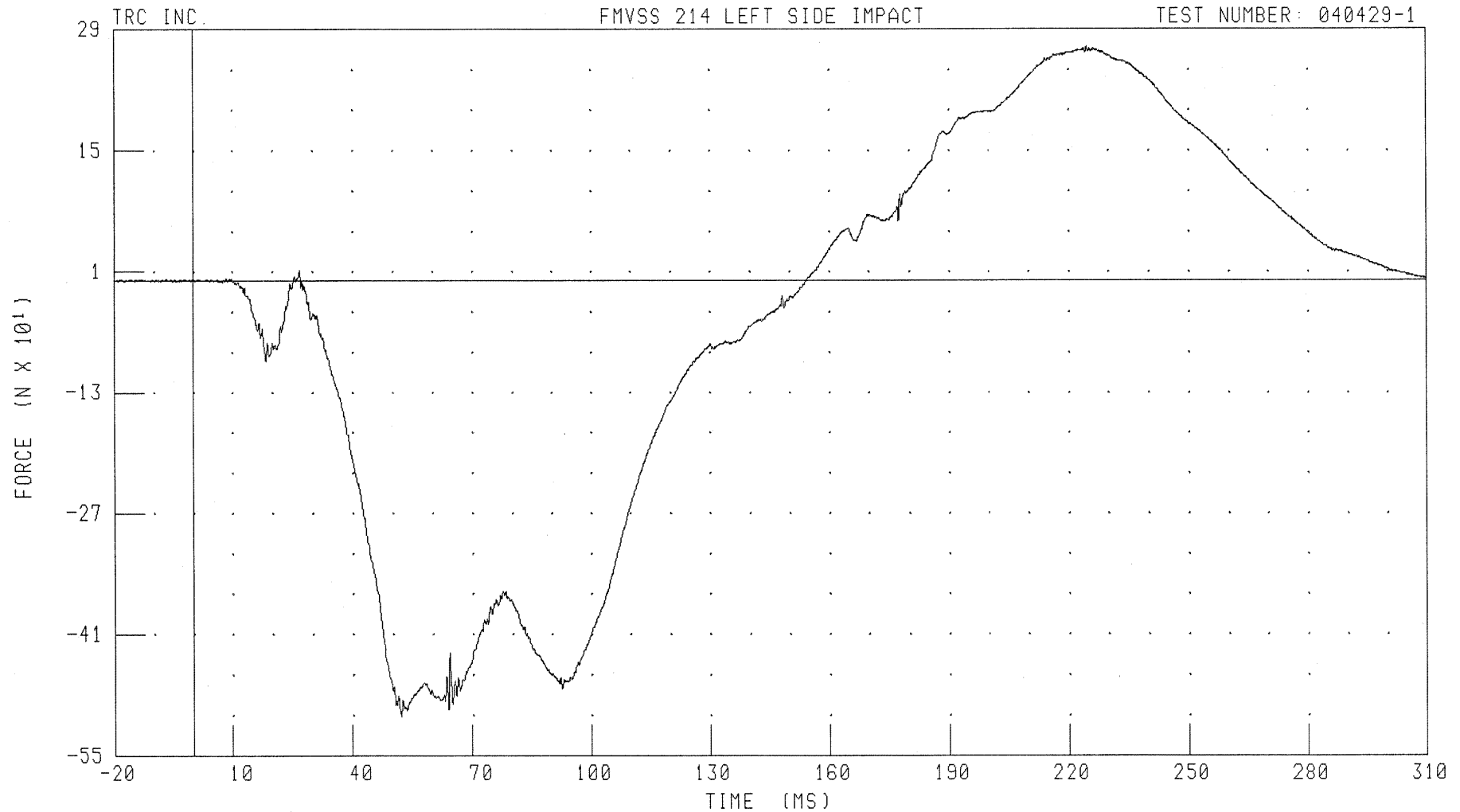
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER NECK X-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

PEAK DATA: 269.80 N @ 224.72 MS; -504.57 N @ 52.08 MS

B-18

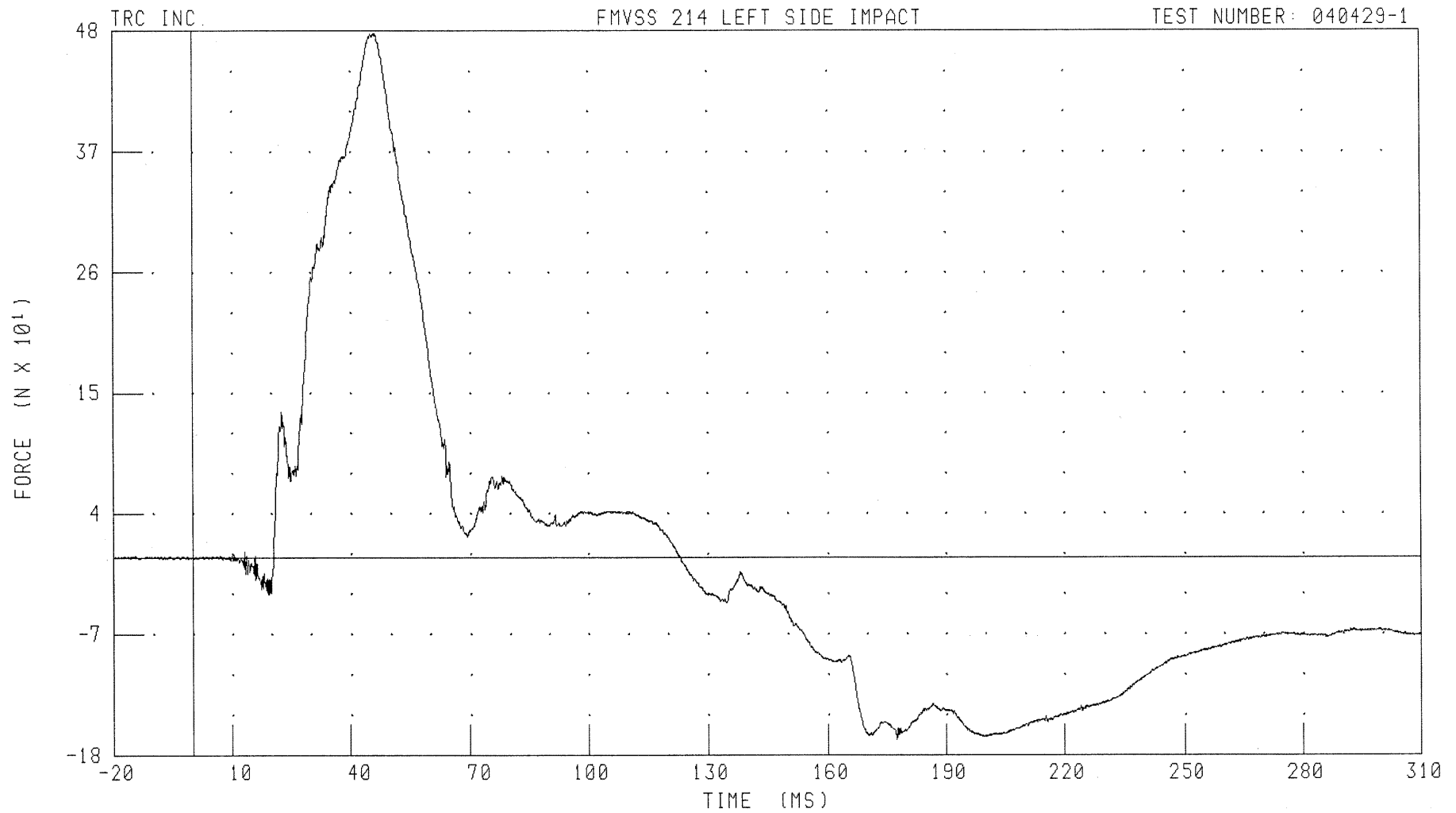
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER NECK Y-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 477.64 N @ 46.32 MS, -165.92 N @ 177.44 MS

B-19

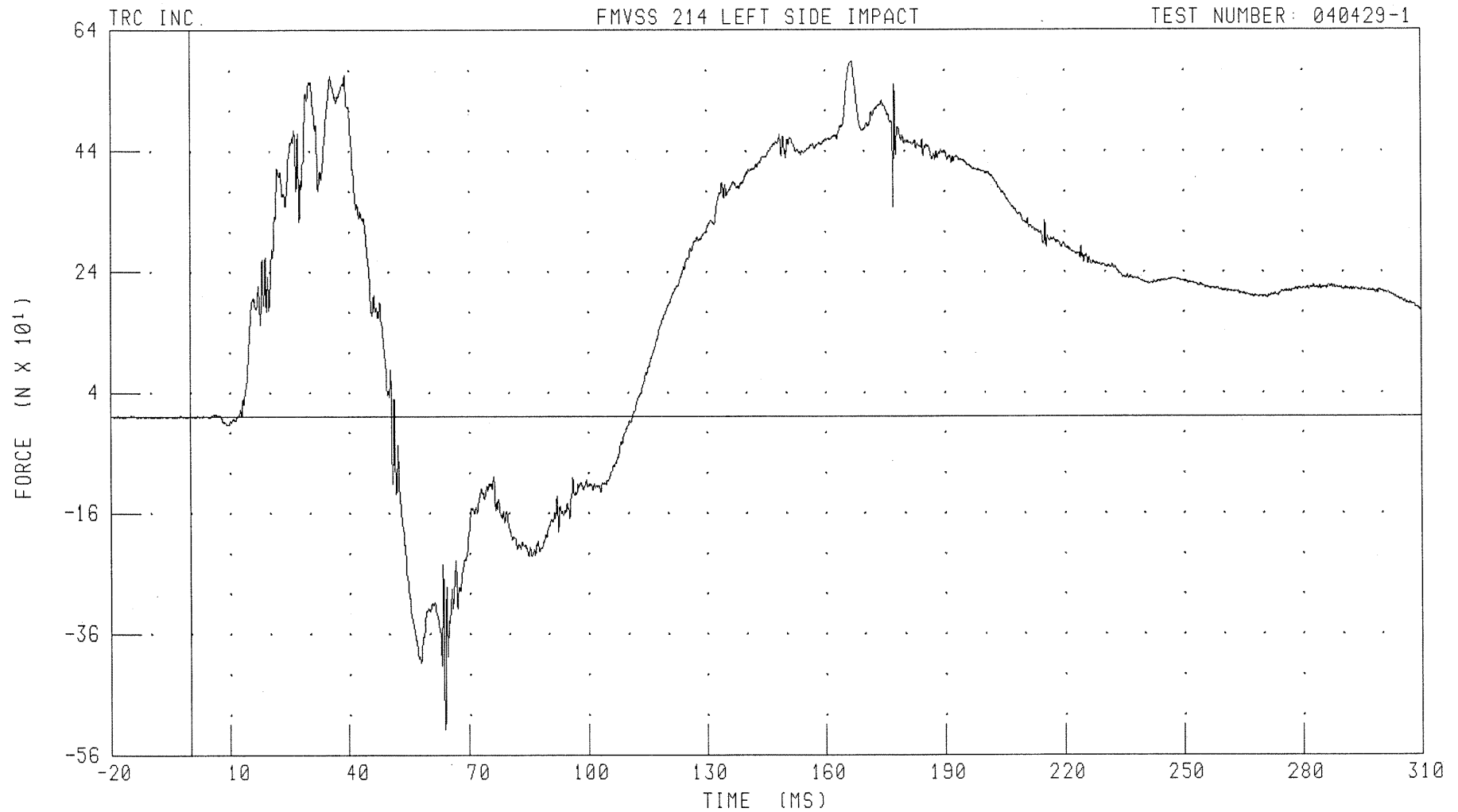
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER NECK Z-AXIS AXIAL FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 588.26 N @ 166.80 MS; -518.08 N @ 63.84 MS

B-20

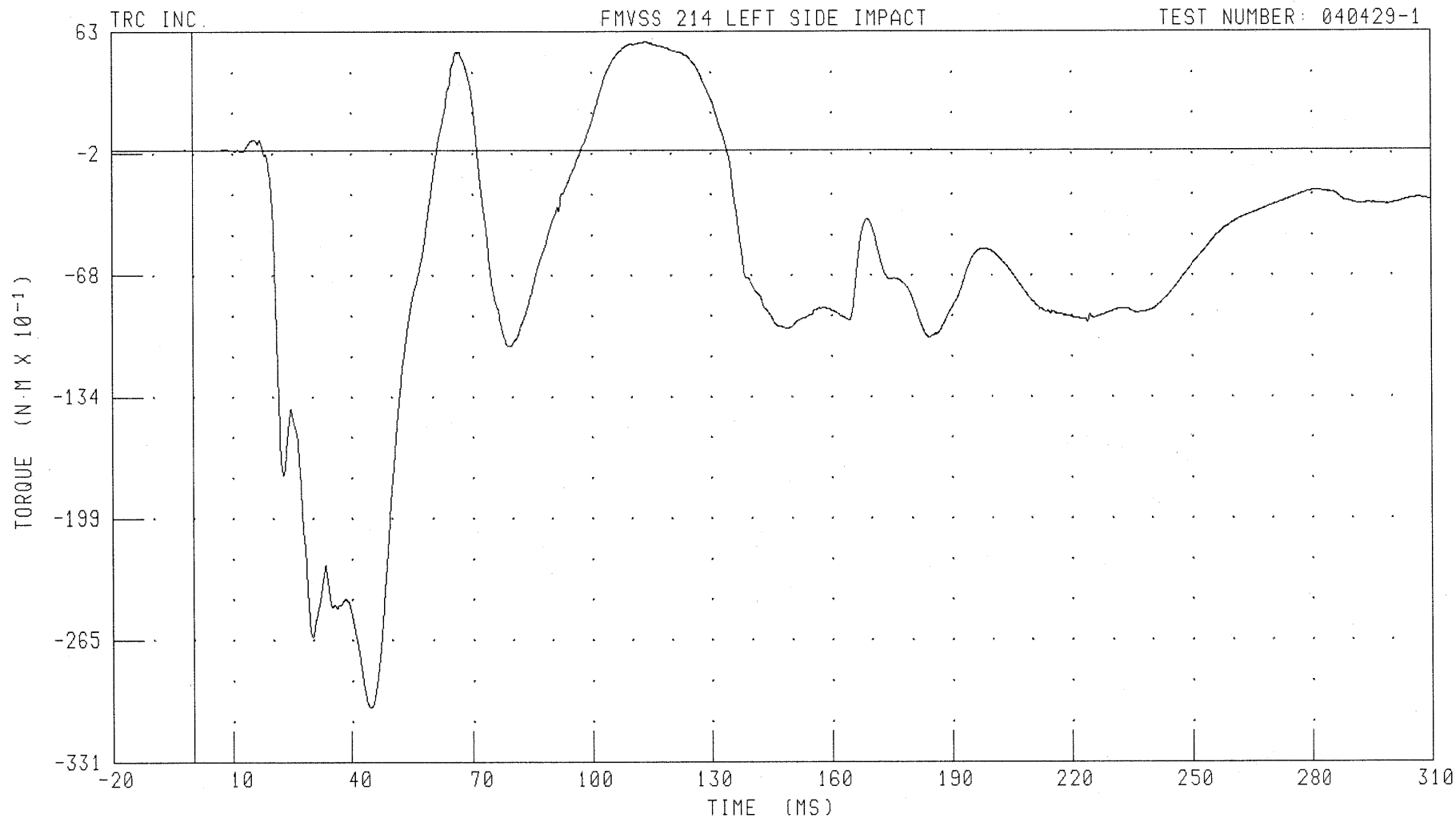
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER NECK MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKXM1 FILTER: CH. CLASS 600

PEAK DATA: 5.86 N·M @ 113.84 MS; -30.27 N·M @ 44.72 MS

B-21

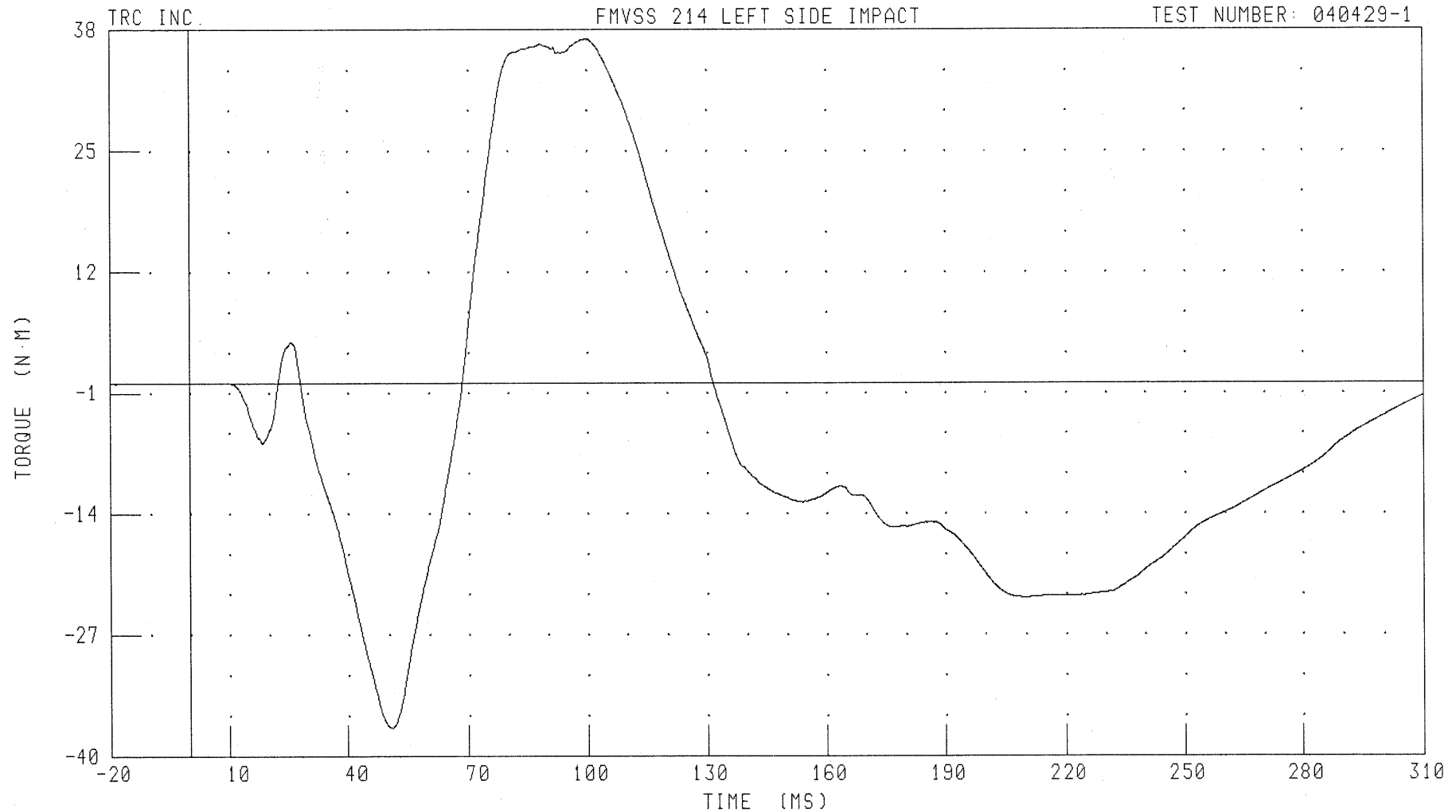
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER NECK MOMENT ABOUT Y AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA: 37.00 N·M @ 99.84 MS, -37.00 N·M @ 50.80 MS

B-22

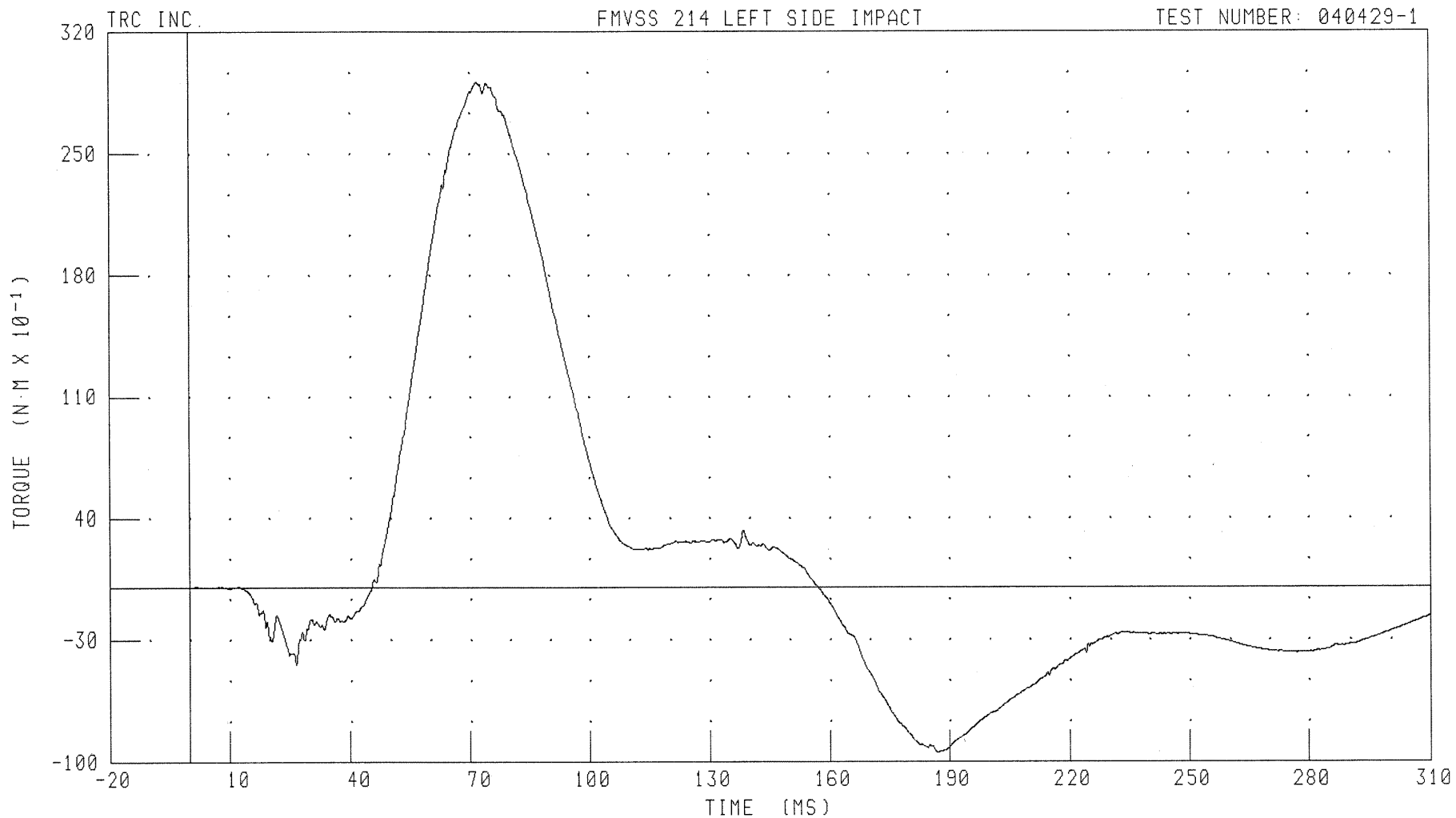
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER NECK MOMENT ABOUT Z AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKZM1

FILTER: CH. CLASS 600

PEAK DATA: 29.12 N·M @ 72.00 MS; -9.46 N·M @ 187.36 MS

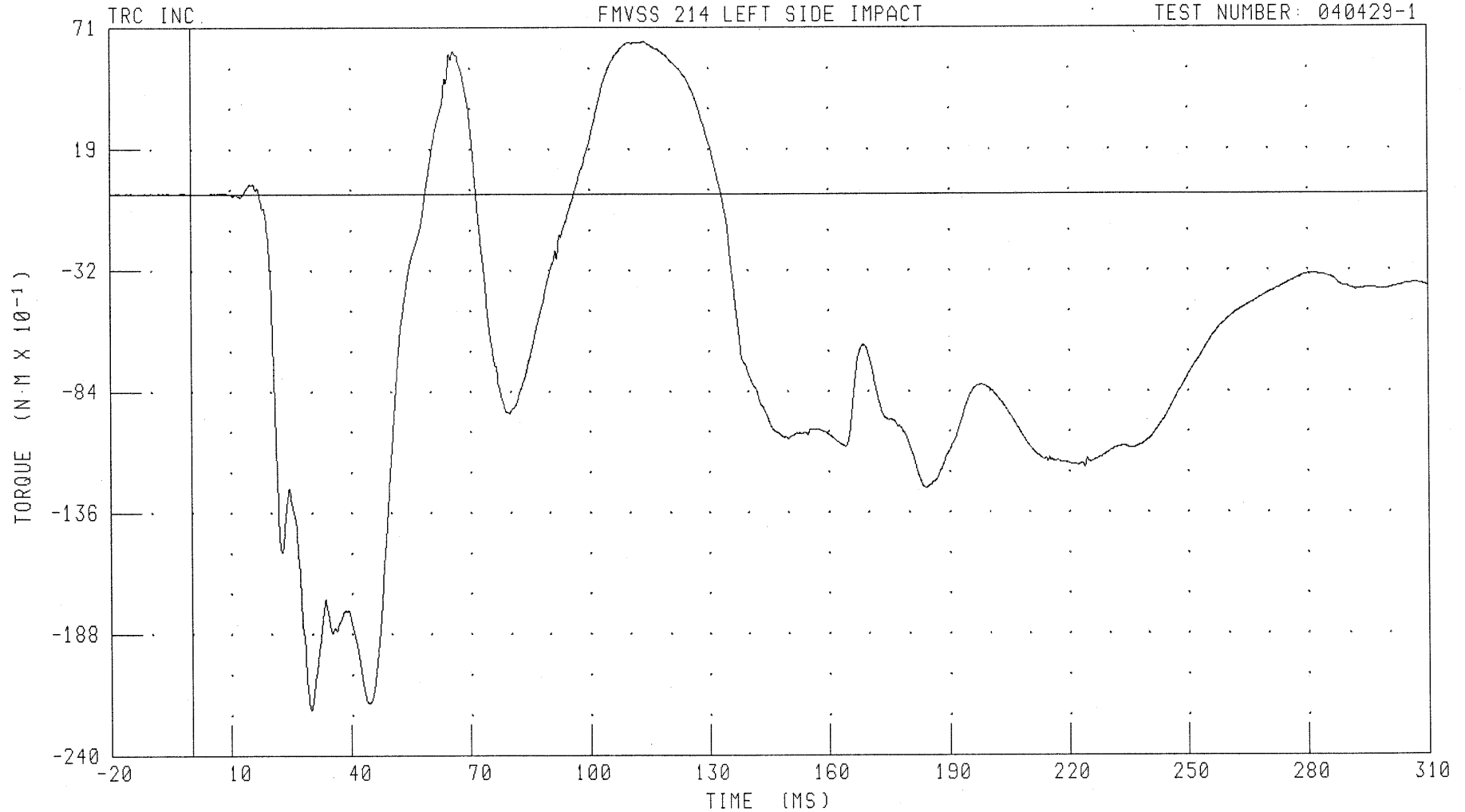
B-23

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NK0XM1 FILTER: CH. CLASS 600

PEAK DATA: 6.50 N·M @ 113.84 MS; -22.16 N·M @ 29.76 MS

B-24

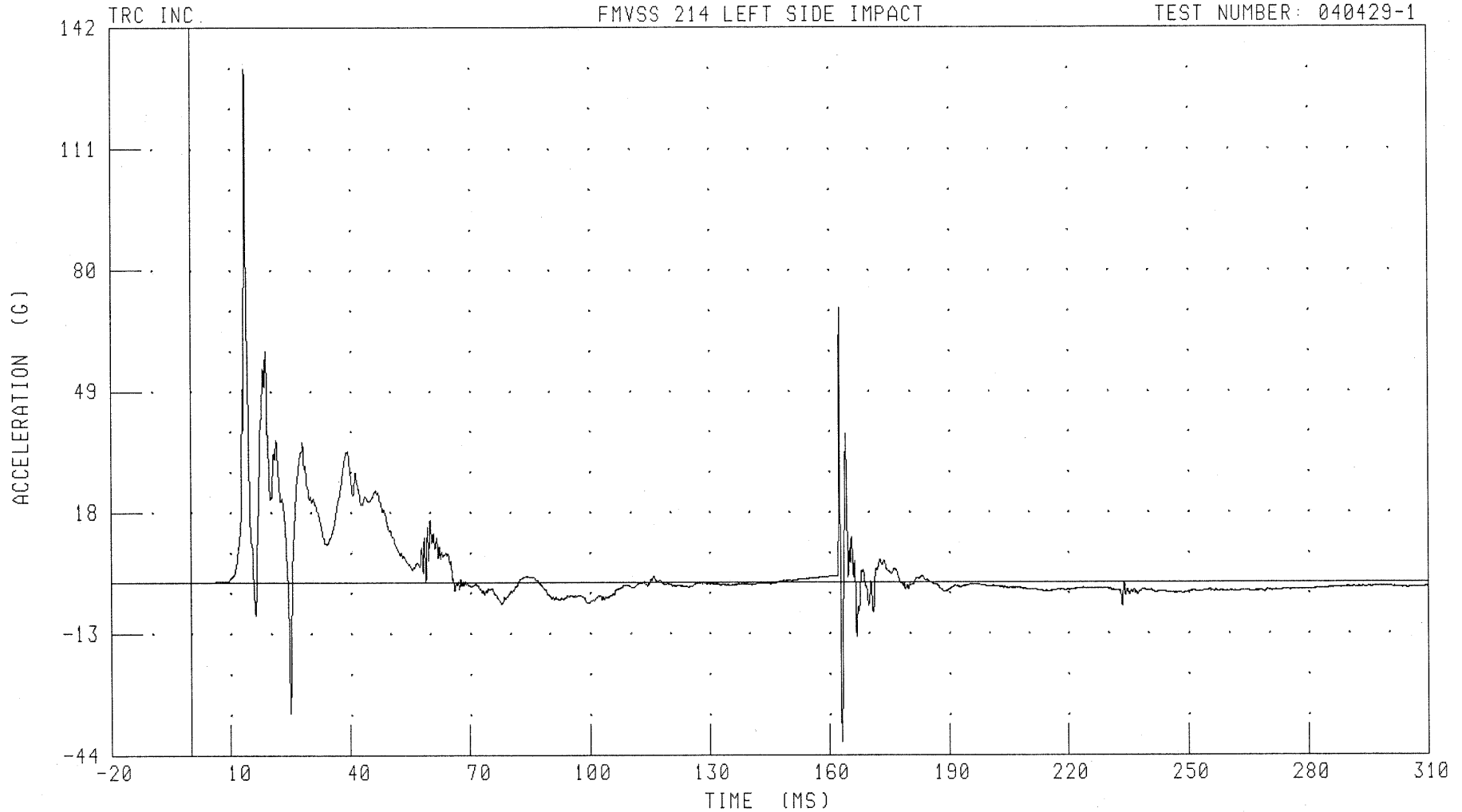
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYG1 FILTER: CH. CLASS 1000

PEAK DATA: 131.58 G @ 13.60 MS; -40.68 G @ 163.36 MS

B-25

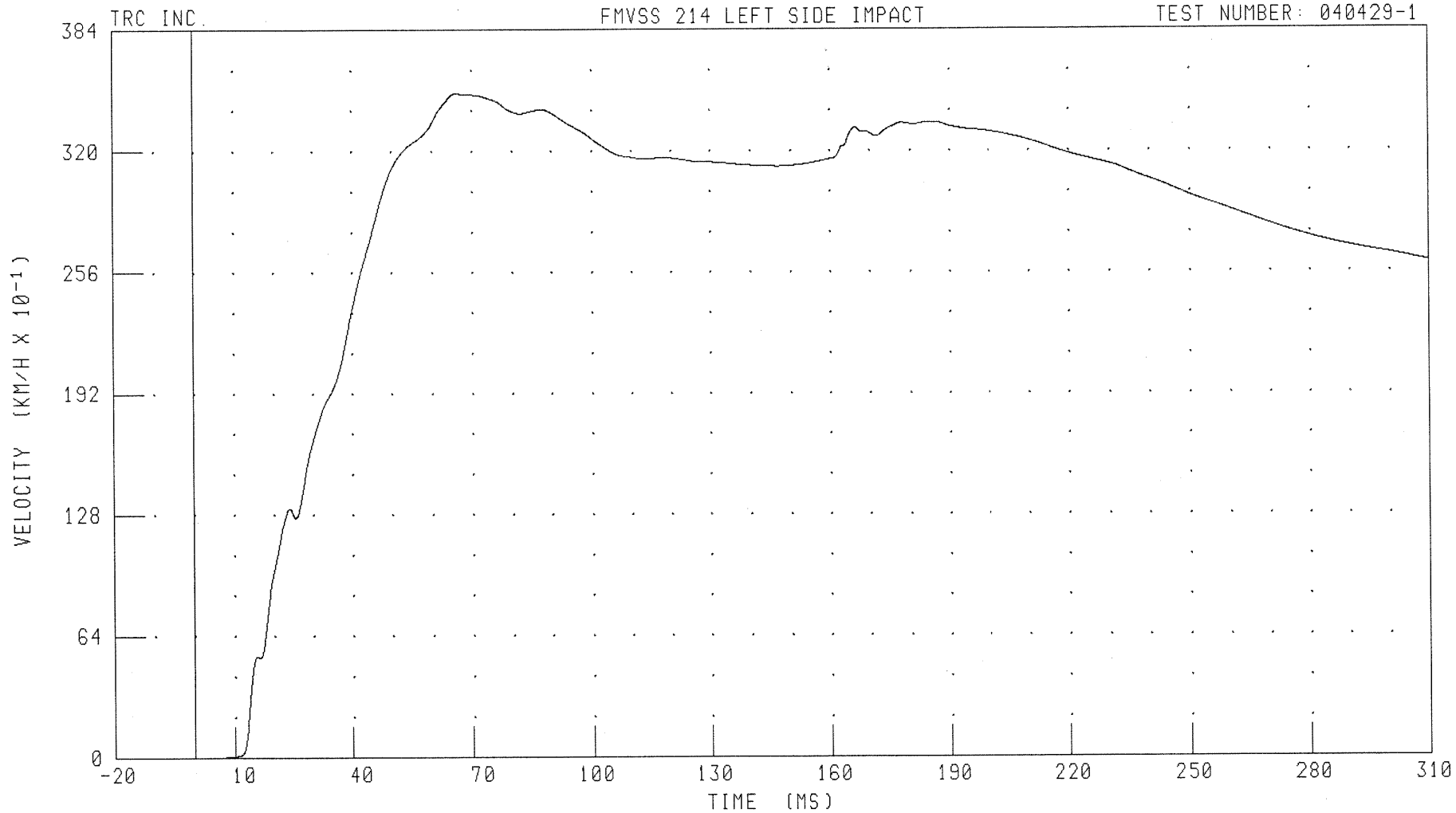
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER UPPER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYV1 FILTER: CH. CLASS 180

PEAK DATA: 35.04 KM/H @ 66.08 MS; 0.00 KM/H @ 0.24 MS

B-26

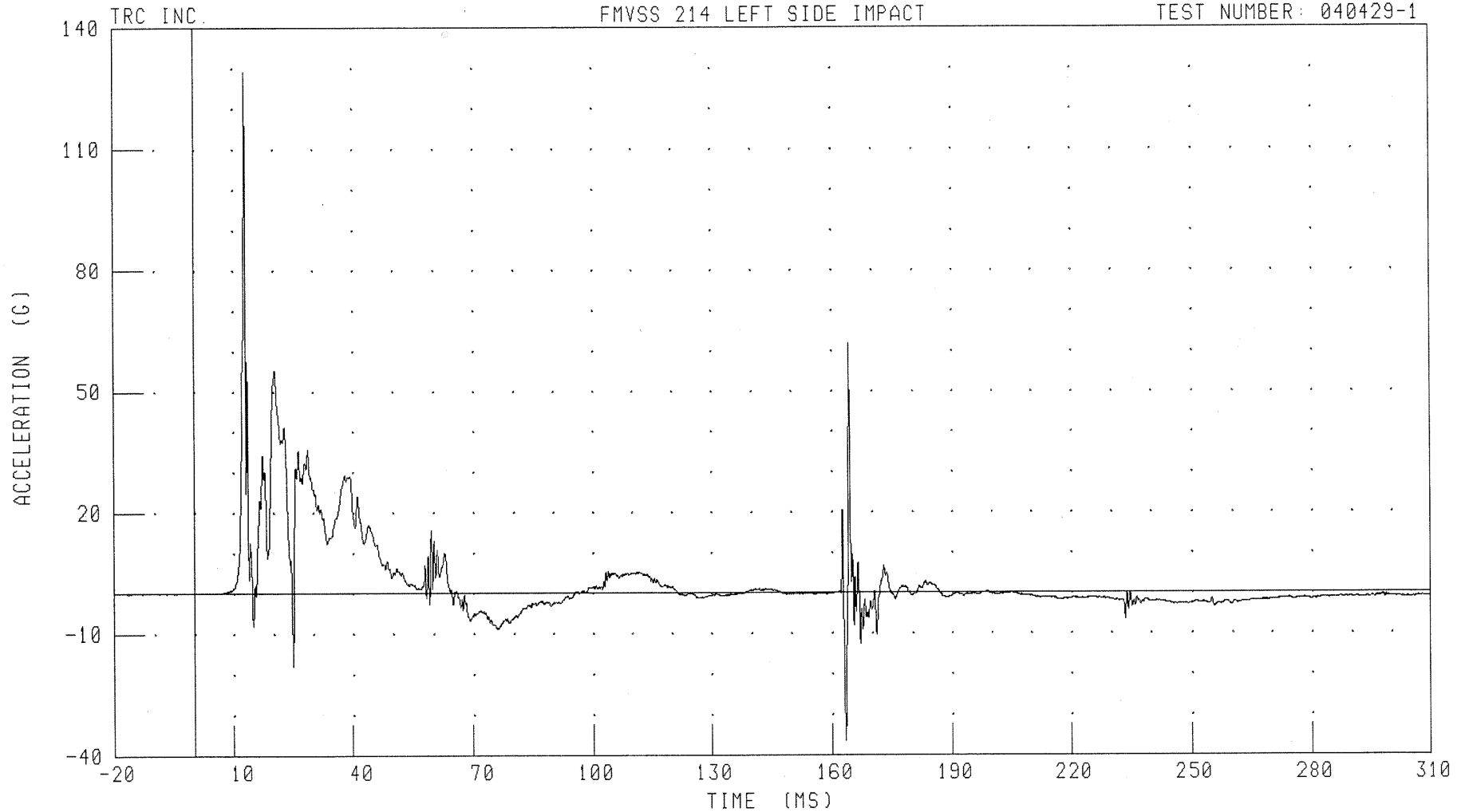
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYG1 FILTER: CH. CLASS 1000

PEAK DATA: 129.05 G @ 13.04 MS; -36.44 G @ 163.36 MS

B-27

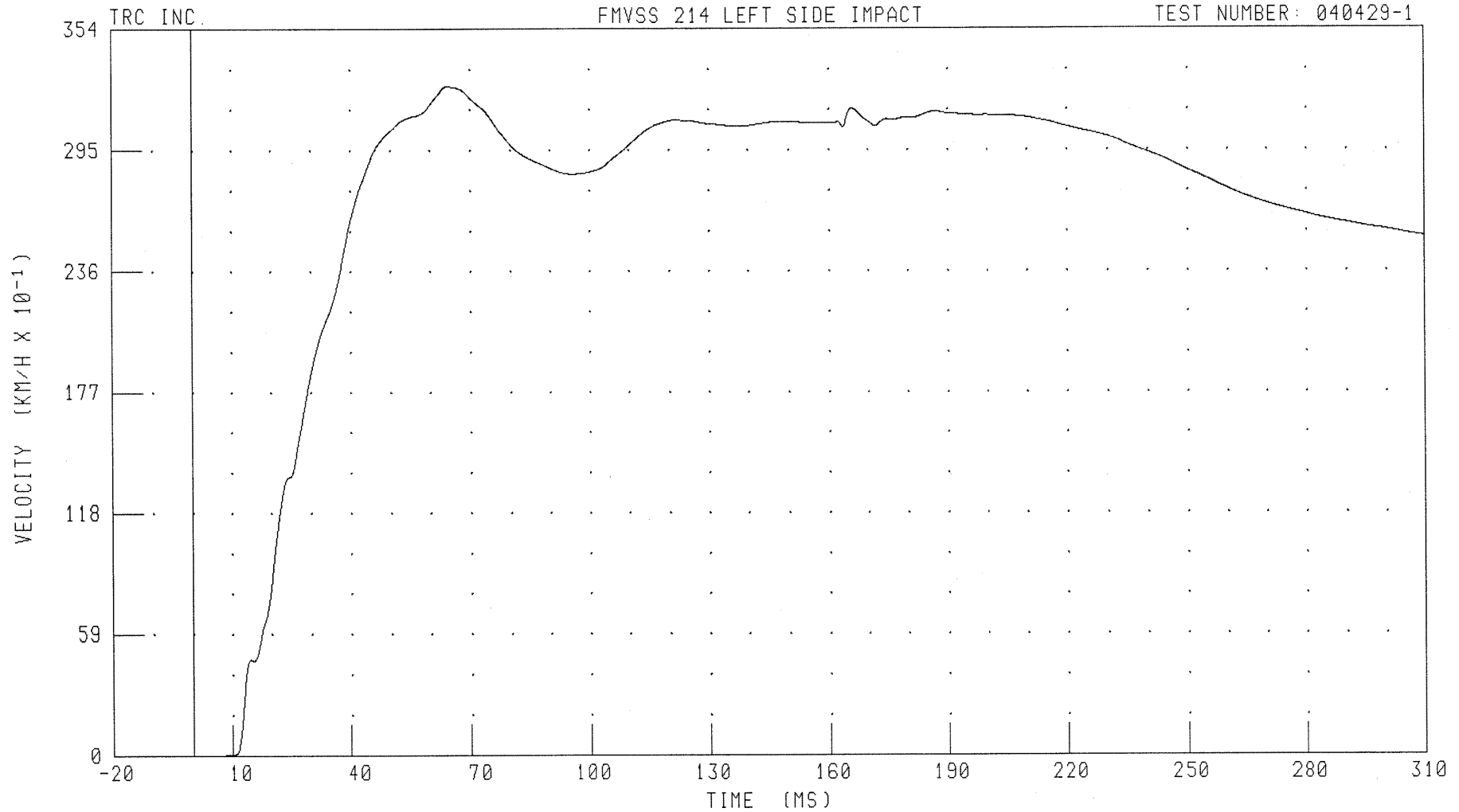
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYV1 FILTER: CH. CLASS 180

PEAK DATA: 32.61 KM/H @ 64.48 MS; 0.00 KM/H @ 0.00 MS

B-28

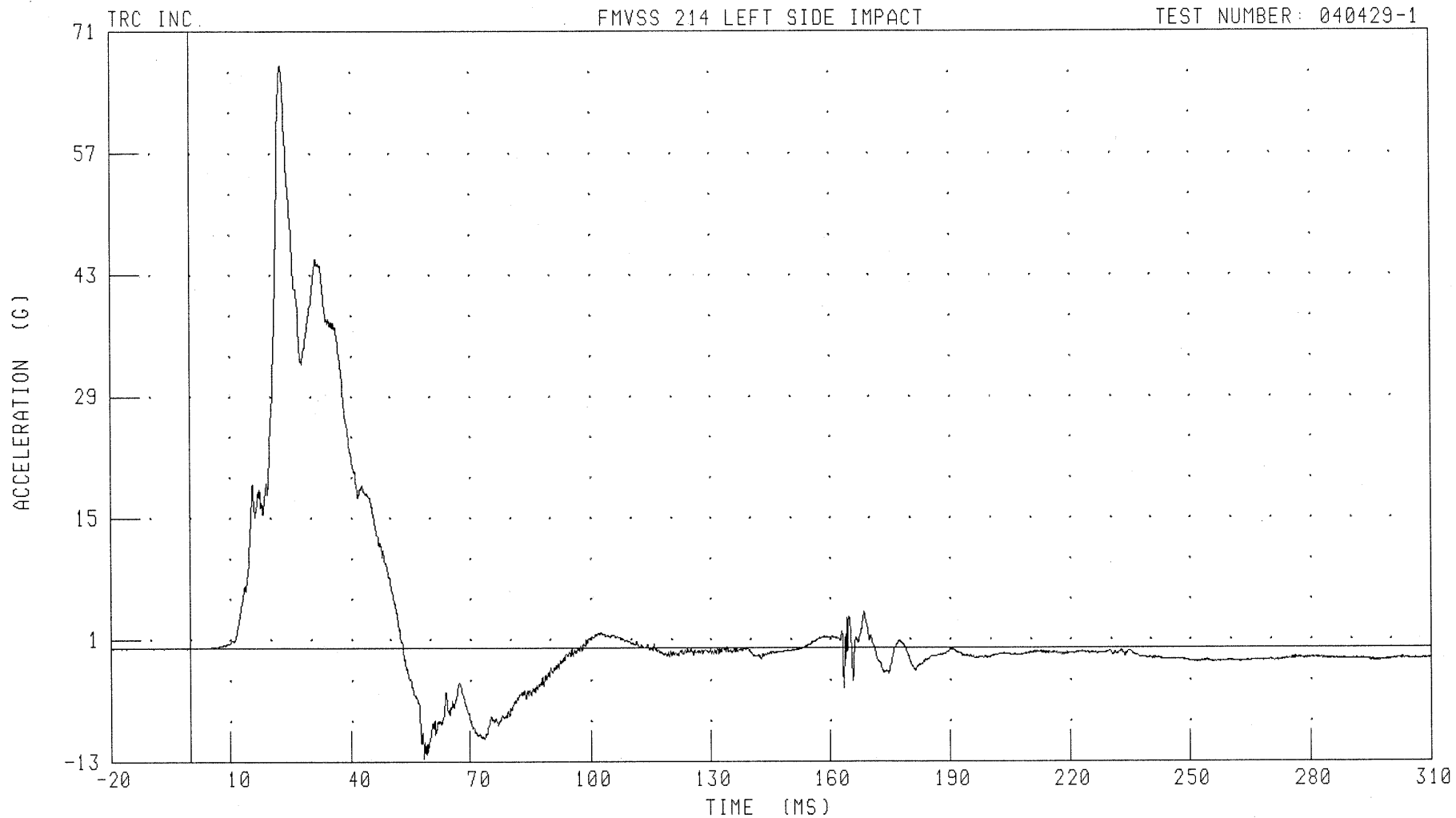
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YG1 FILTER: CH. CLASS 1000

PEAK DATA: 67.15 G @ 22.80 MS; -12.66 G @ 58.48 MS

B-29

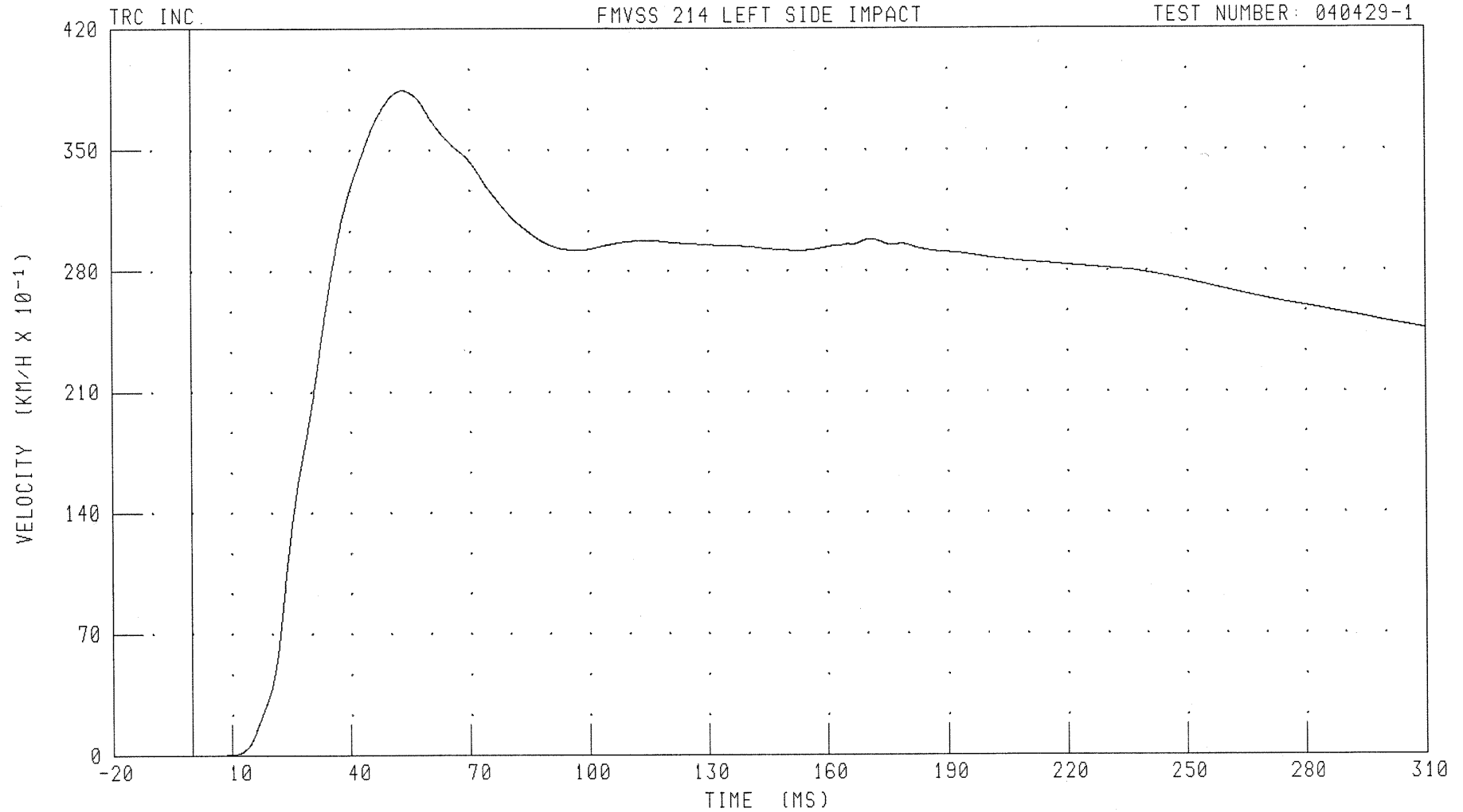
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER SPINE Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YV1 FILTER: CH. CLASS 180

PEAK DATA: 38.44 KM/H @ 53.28 MS; 0.00 KM/H @ 0.24 MS

B-30

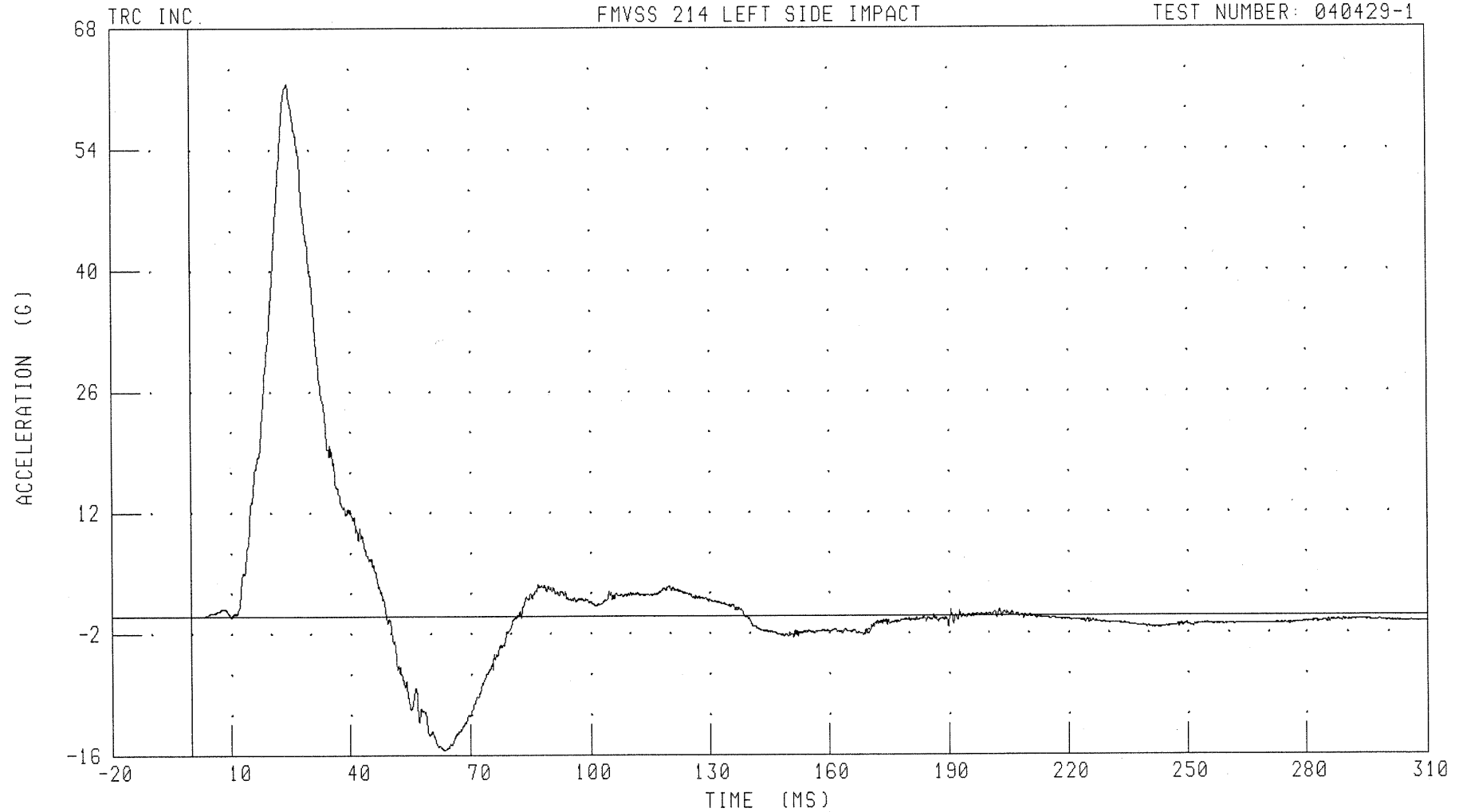
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

PEAK DATA: 61.66 G @ 24.64 MS; -15.43 G @ 63.28 MS

B-31

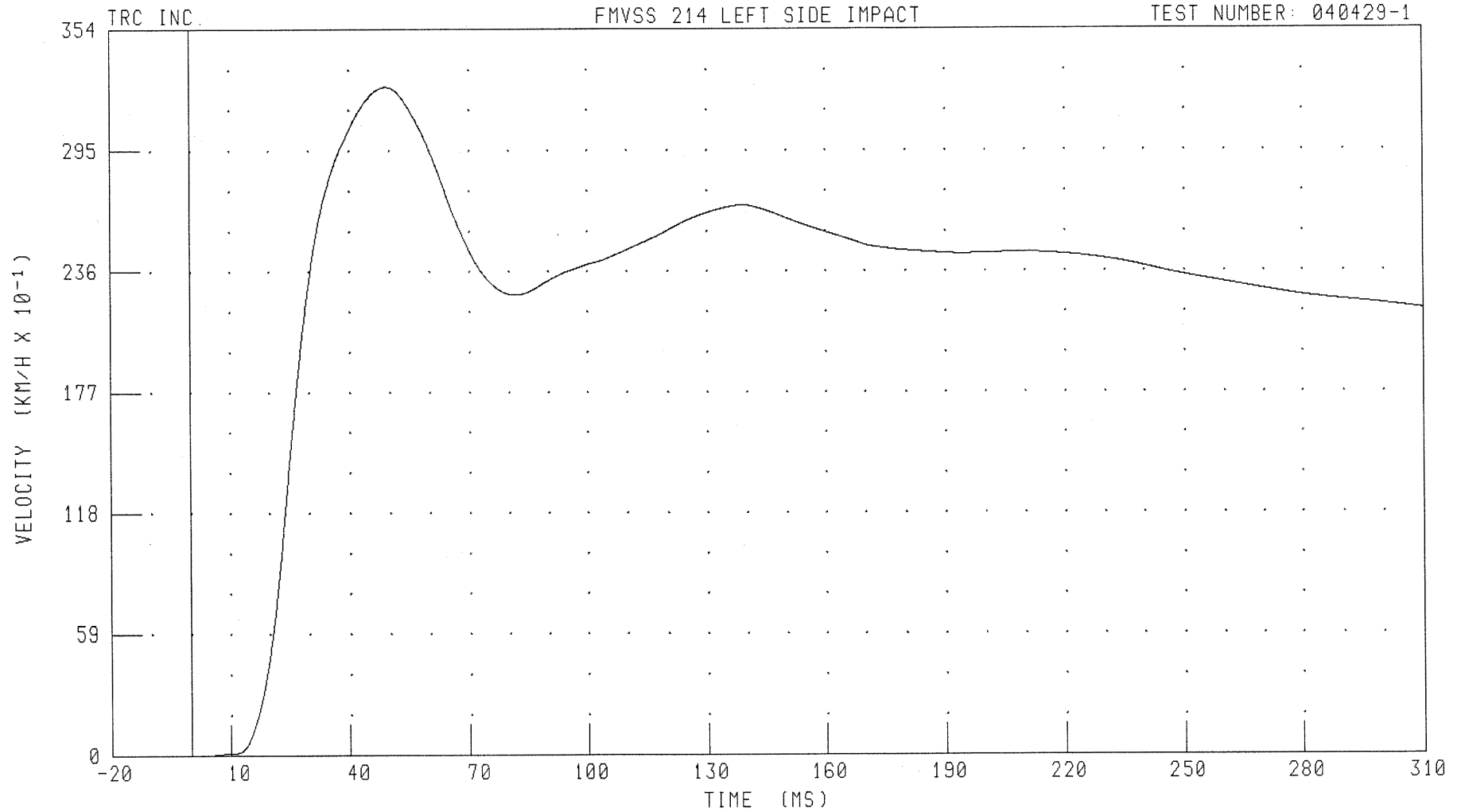
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYV1

FILTER: CH. CLASS 180

PEAK DATA: 32.60 KM/H @ 49.20 MS; 0.00 KM/H @ 0.16 MS

B-32

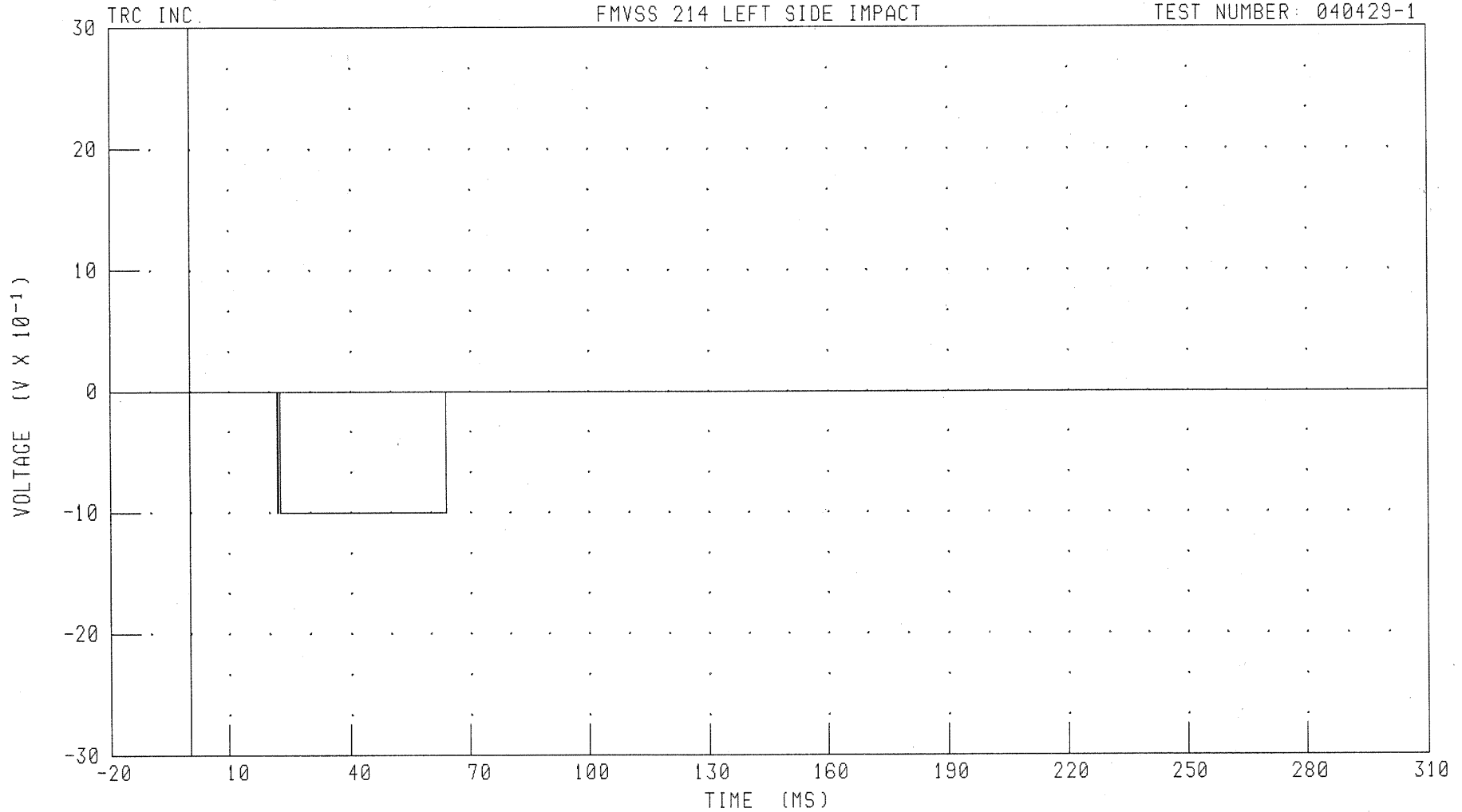
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVET1 FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 310.00 MS; -1.00 V @ 22.24 MS

B-33

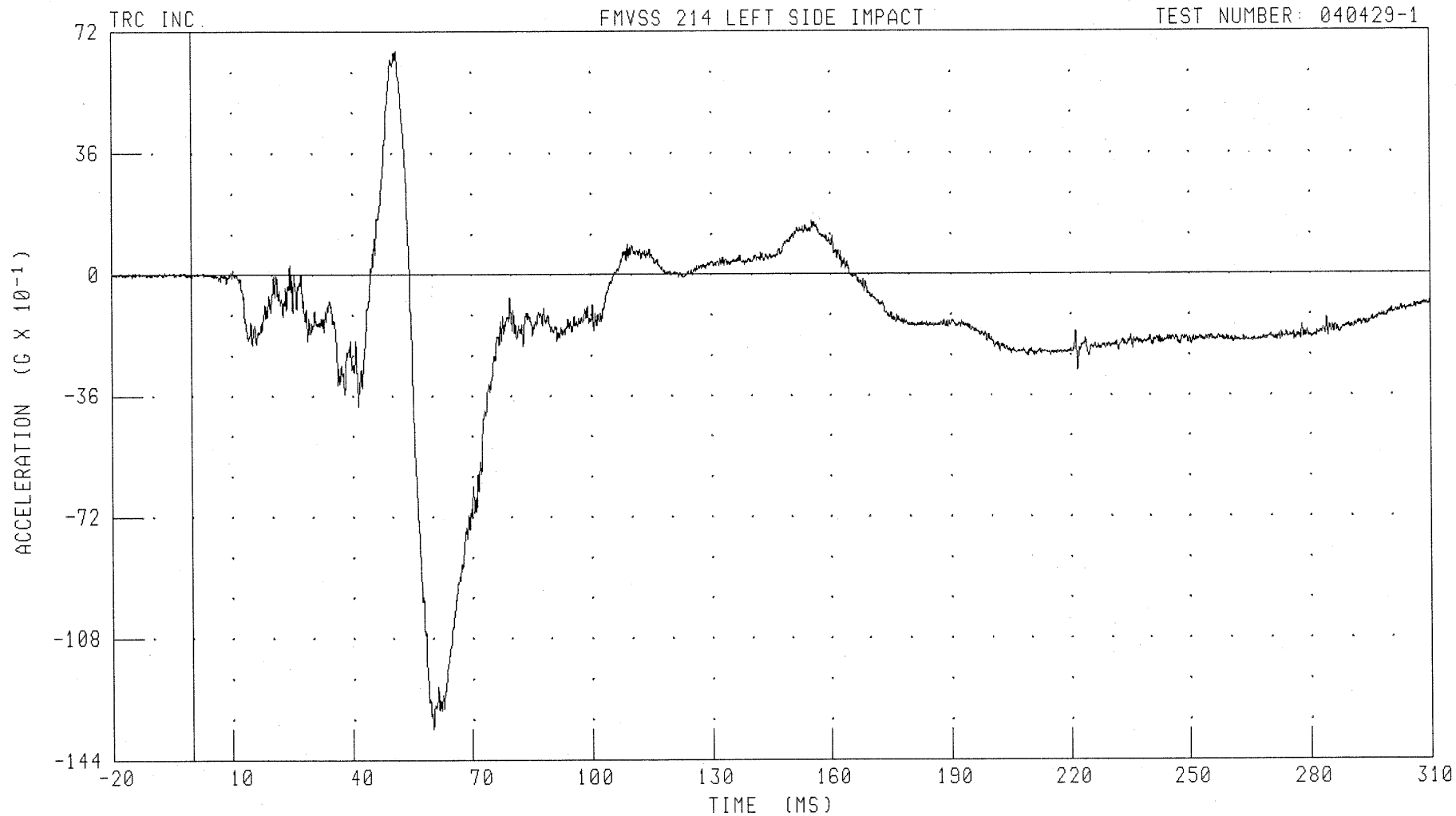
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXC4 FILTER: CH. CLASS 1000

PEAK DATA: 6.63 G @ 51.28 MS; -13.49 G @ 60.08 MS

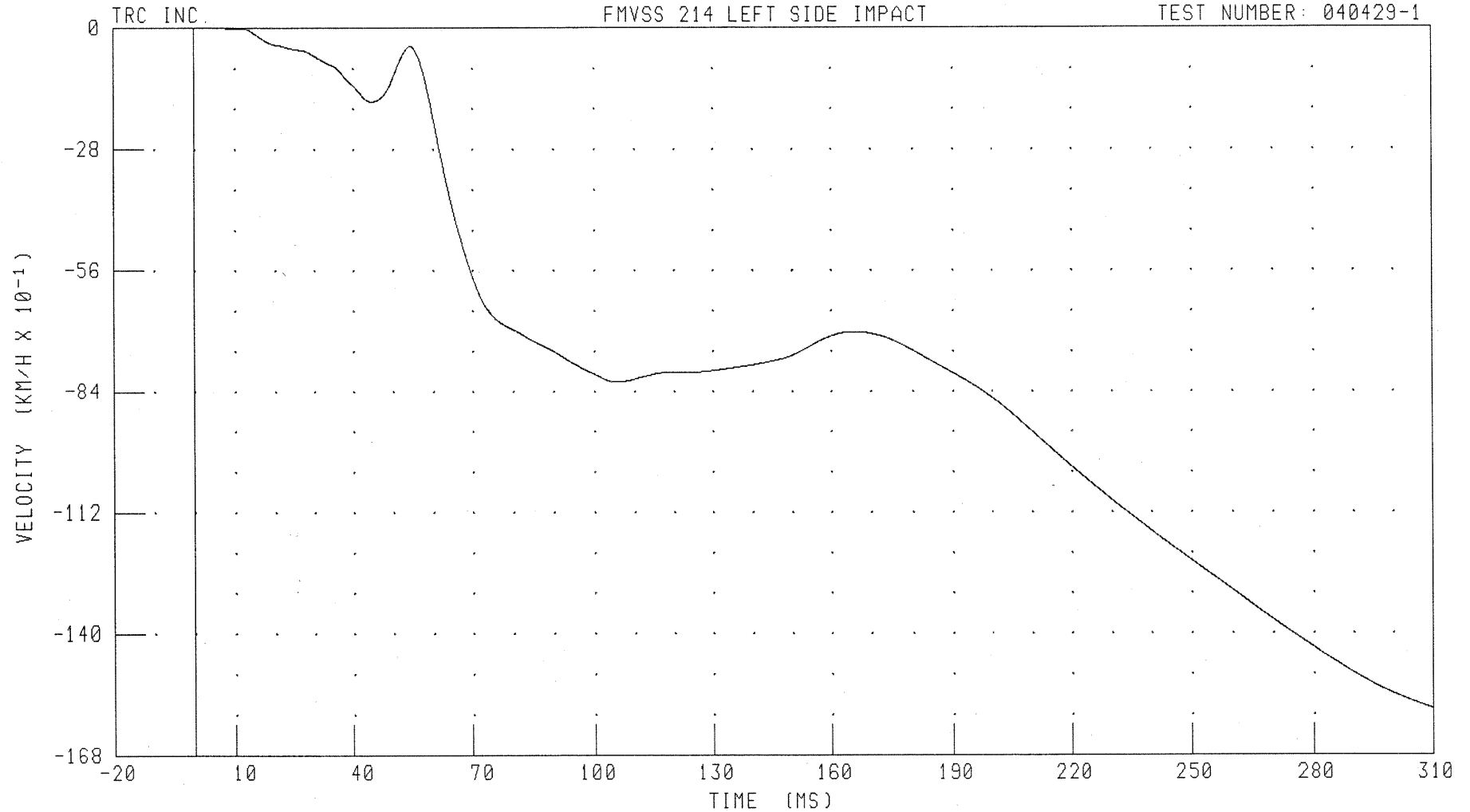
B-34

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER HEAD X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXV4 FILTER: CH. CLASS 180

PEAK DATA: 0.00 KM/H @ 4.00 MS; -15.74 KM/H @ 310.00 MS

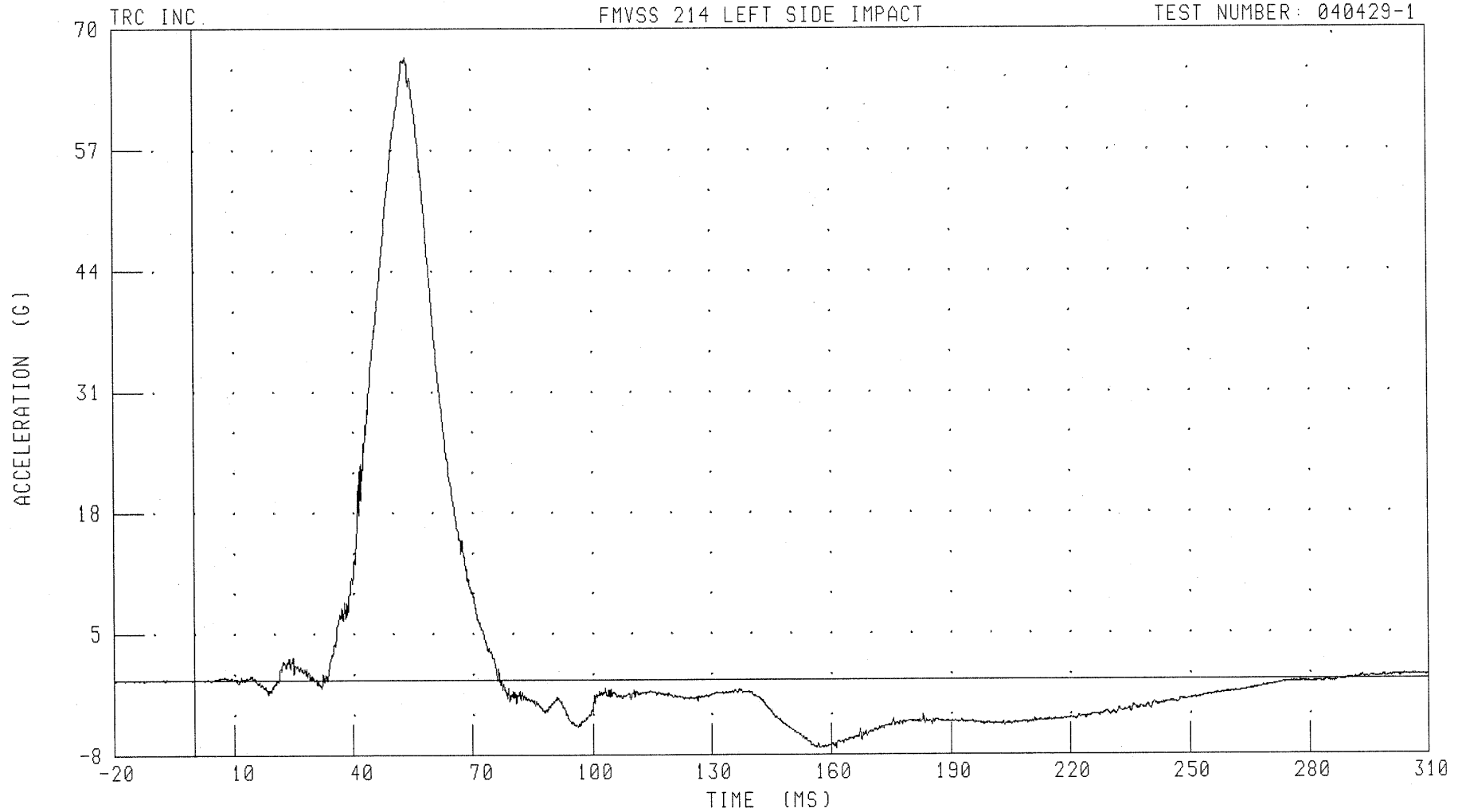
B-35

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYG4 FILTER: CH. CLASS 1000

PEAK DATA: 66.89 G @ 53.60 MS; -7.36 G @ 161.28 MS

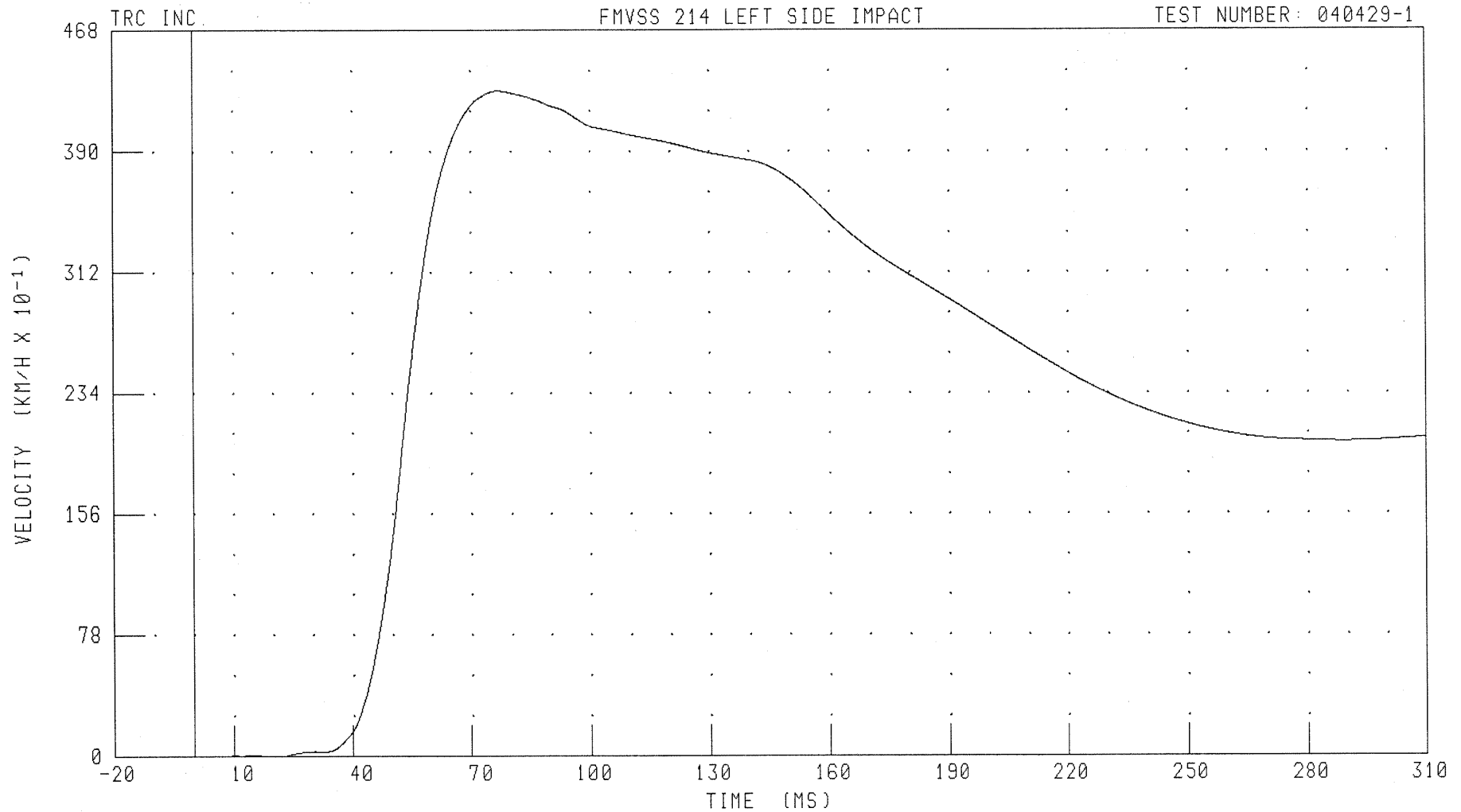
B-36

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER HEAD Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYV4 FILTER: CH. CLASS 180

PEAK DATA: 42.90 KM/H @ 76.88 MS; -0.09 KM/H @ 20.88 MS

B-37

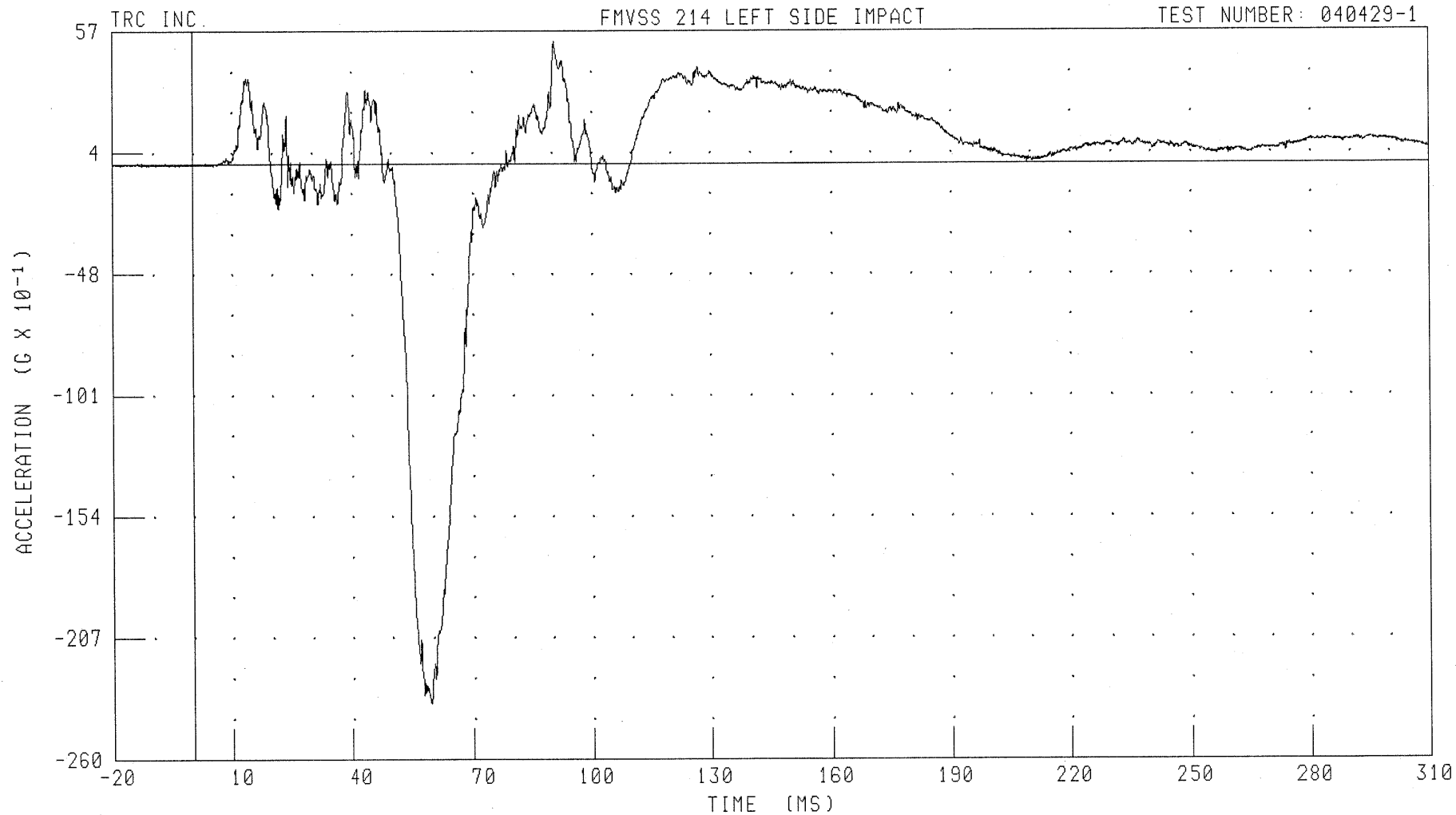
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZG4 FILTER: CH. CLASS 1000

PEAK DATA: 5.35 G @ 90.64 MS; -23.59 G @ 59.36 MS

B-38

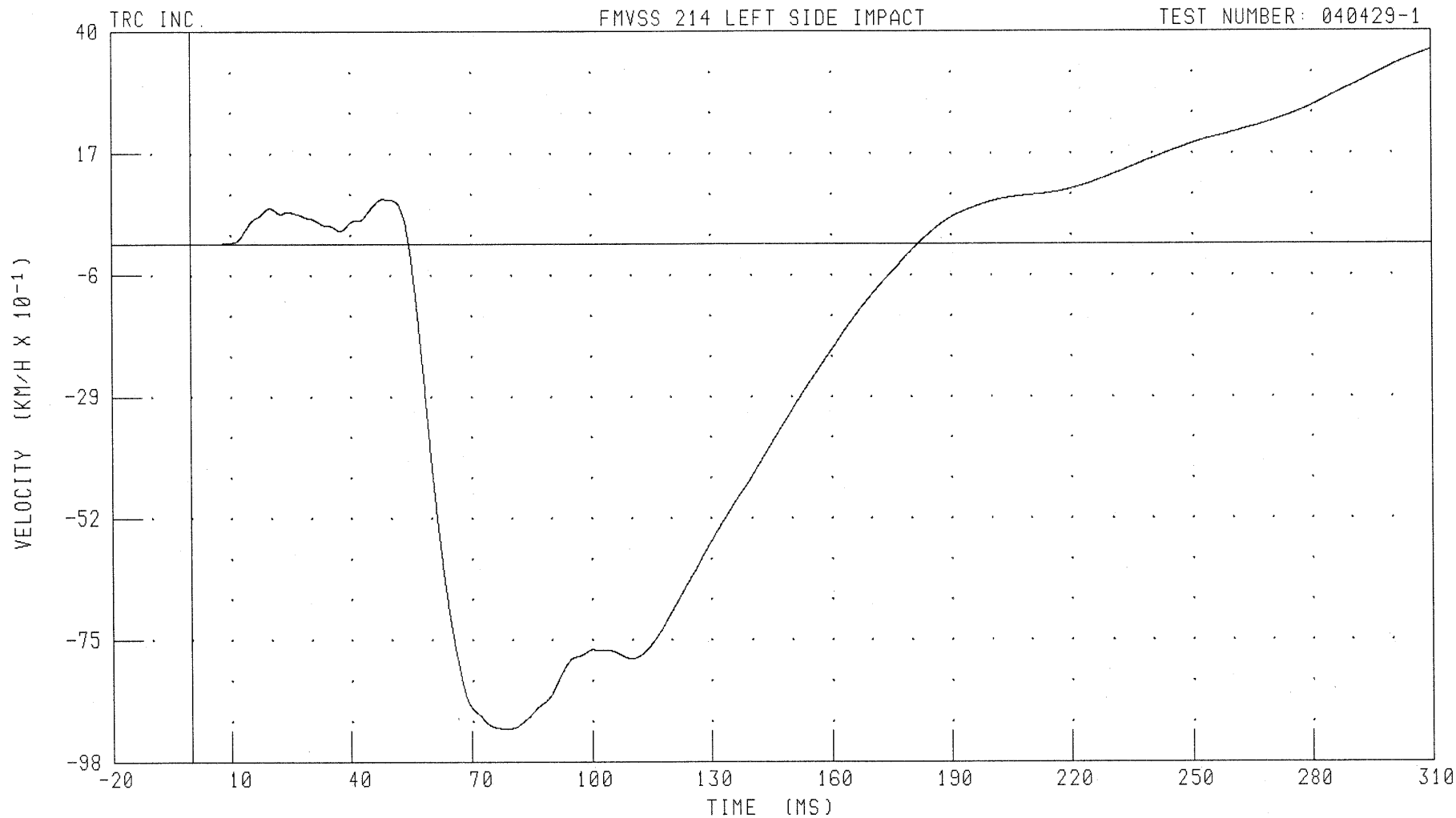
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZV4 FILTER: CH. CLASS 180

PEAK DATA: 3.64 KM/H @ 310.00 MS; -9.18 KM/H @ 78.32 MS

B-39

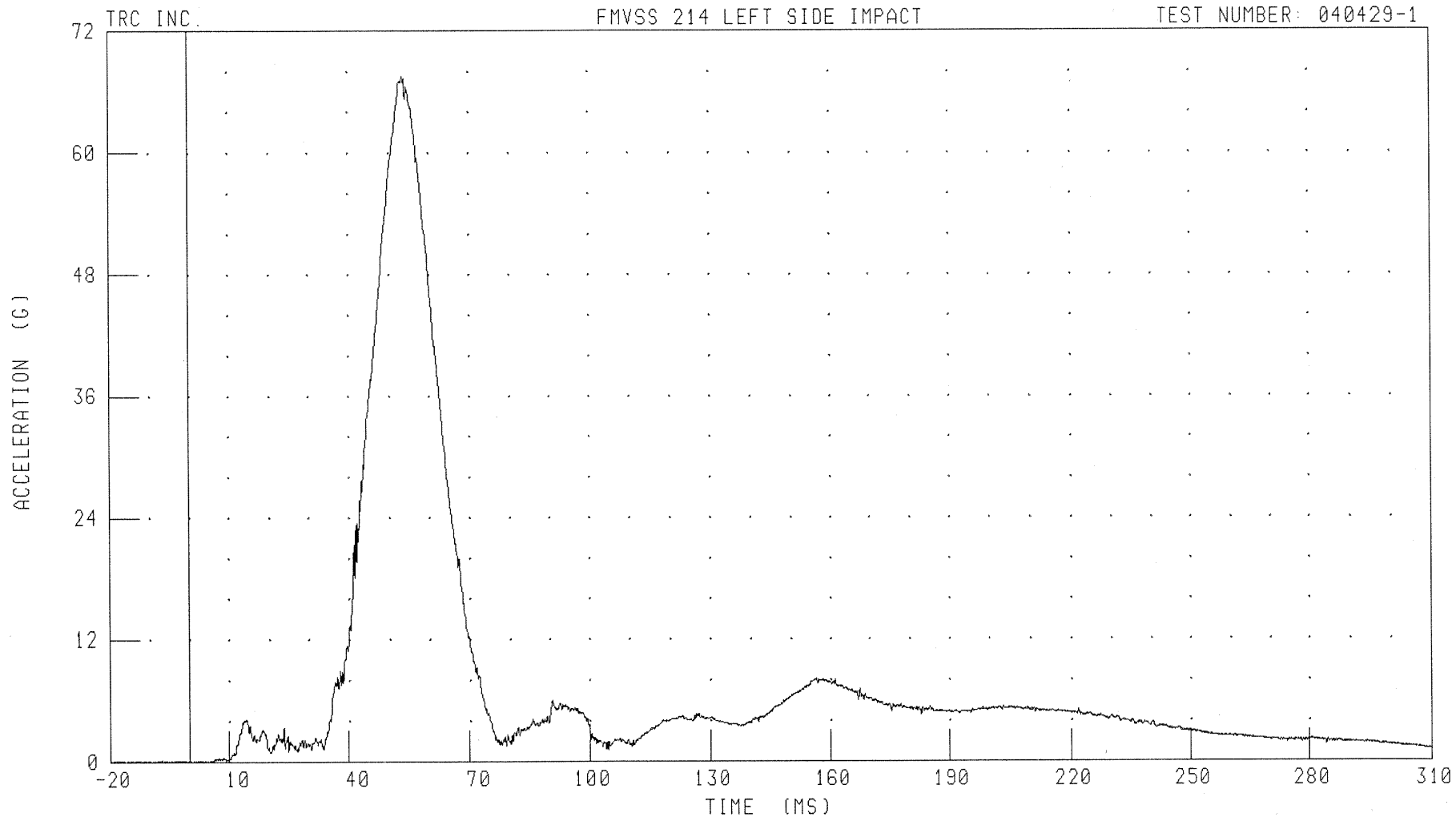
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDRG4 FILTER: CH. CLASS 1000

PEAK DATA: 67.55 G @ 53.60 MS; 0.01 G @ -19.12 MS

B-40

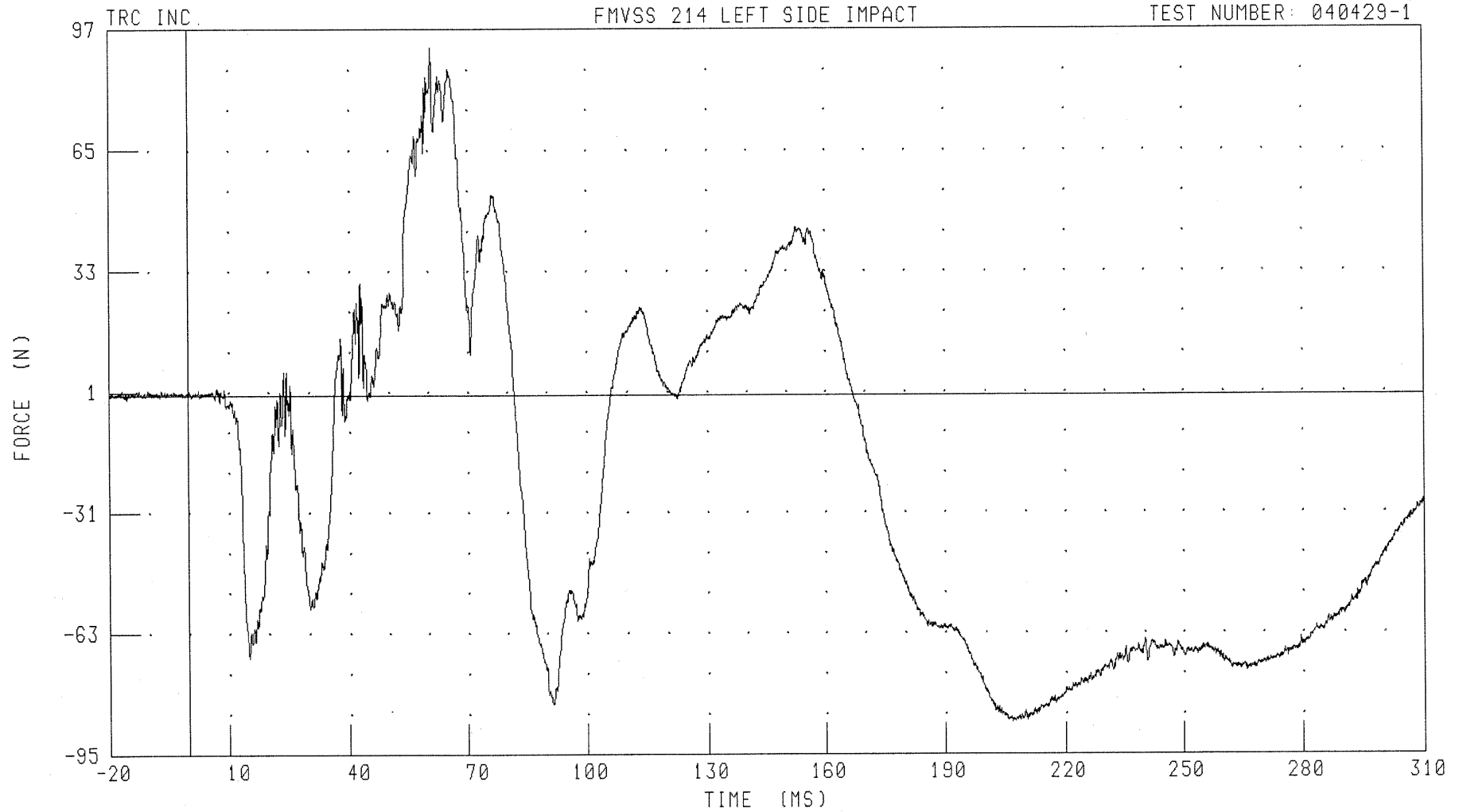
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER NECK X-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKXF4 FILTER: CH. CLASS 1000

PEAK DATA: 92.25 N @ 60.96 MS; -86.67 N @ 206.64 MS

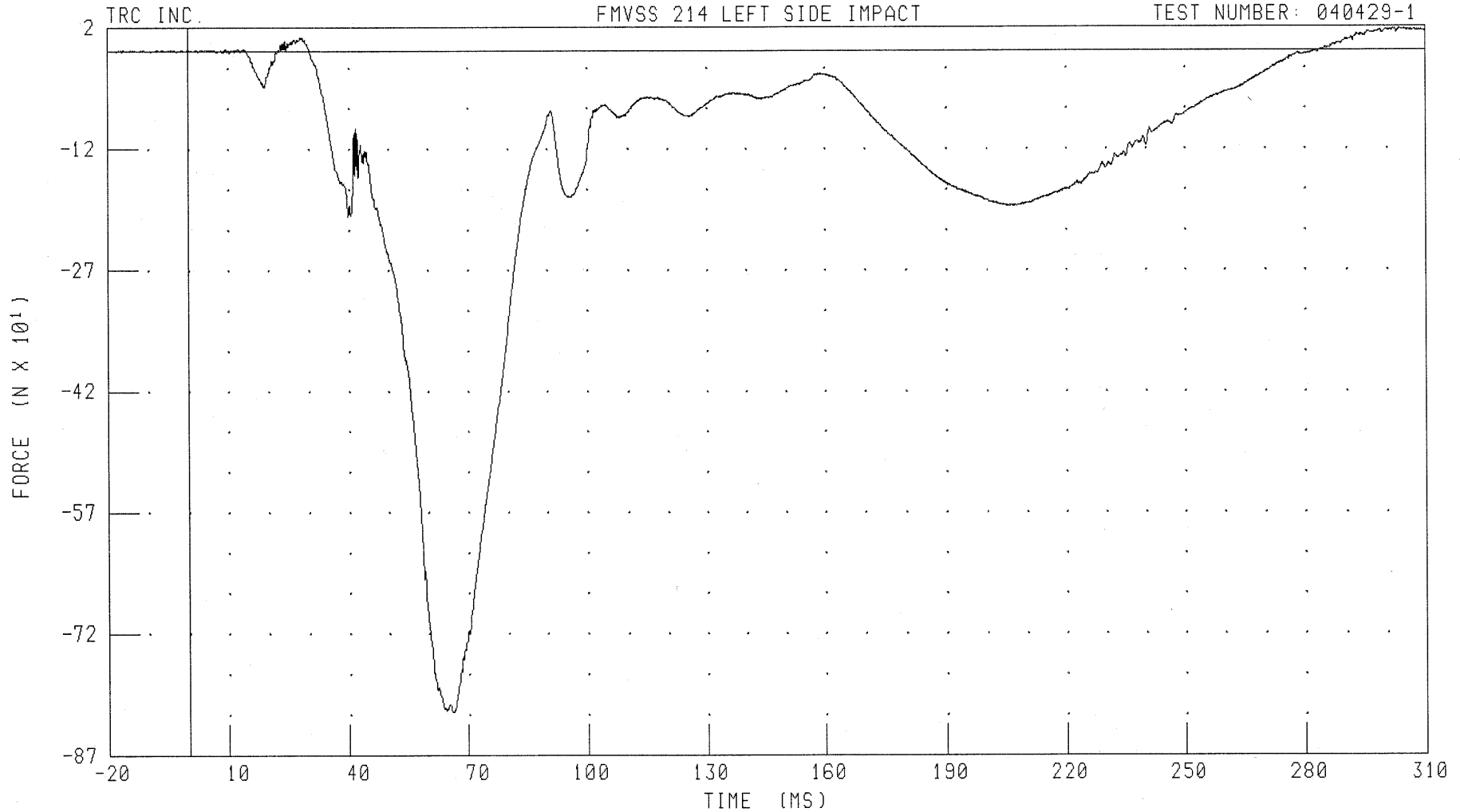
B-41

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER NECK Y-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKYF4 FILTER: CH. CLASS 1000

PEAK DATA: 26.87 N @ 301.68 MS; -817.81 N @ 65.92 MS

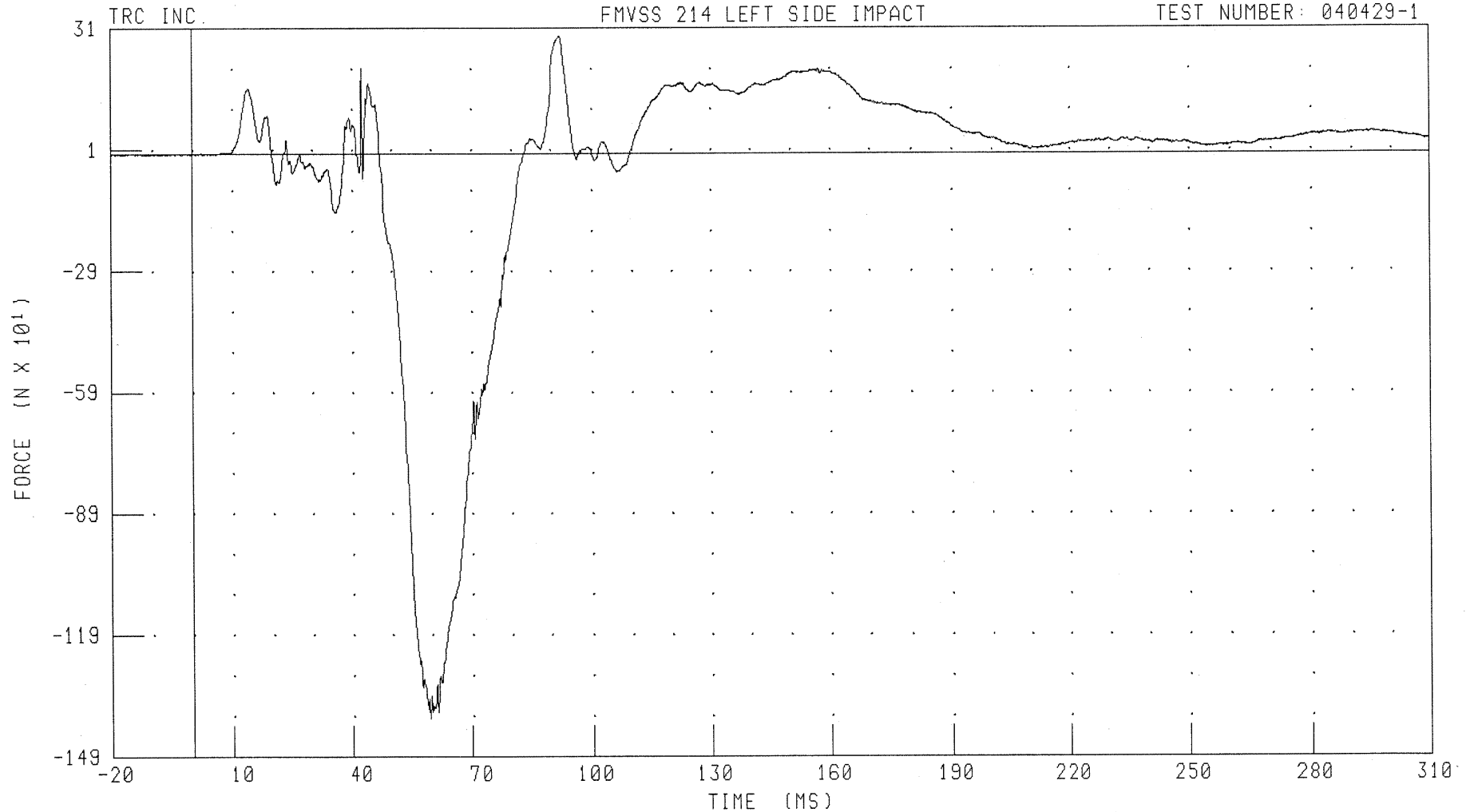
B-42

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER NECK Z-AXIS AXIAL FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKZF4 FILTER: CH. CLASS 1000

PEAK DATA: 290.86 N @ 92.40 MS; -1397.10 N @ 59.44 MS

B-43

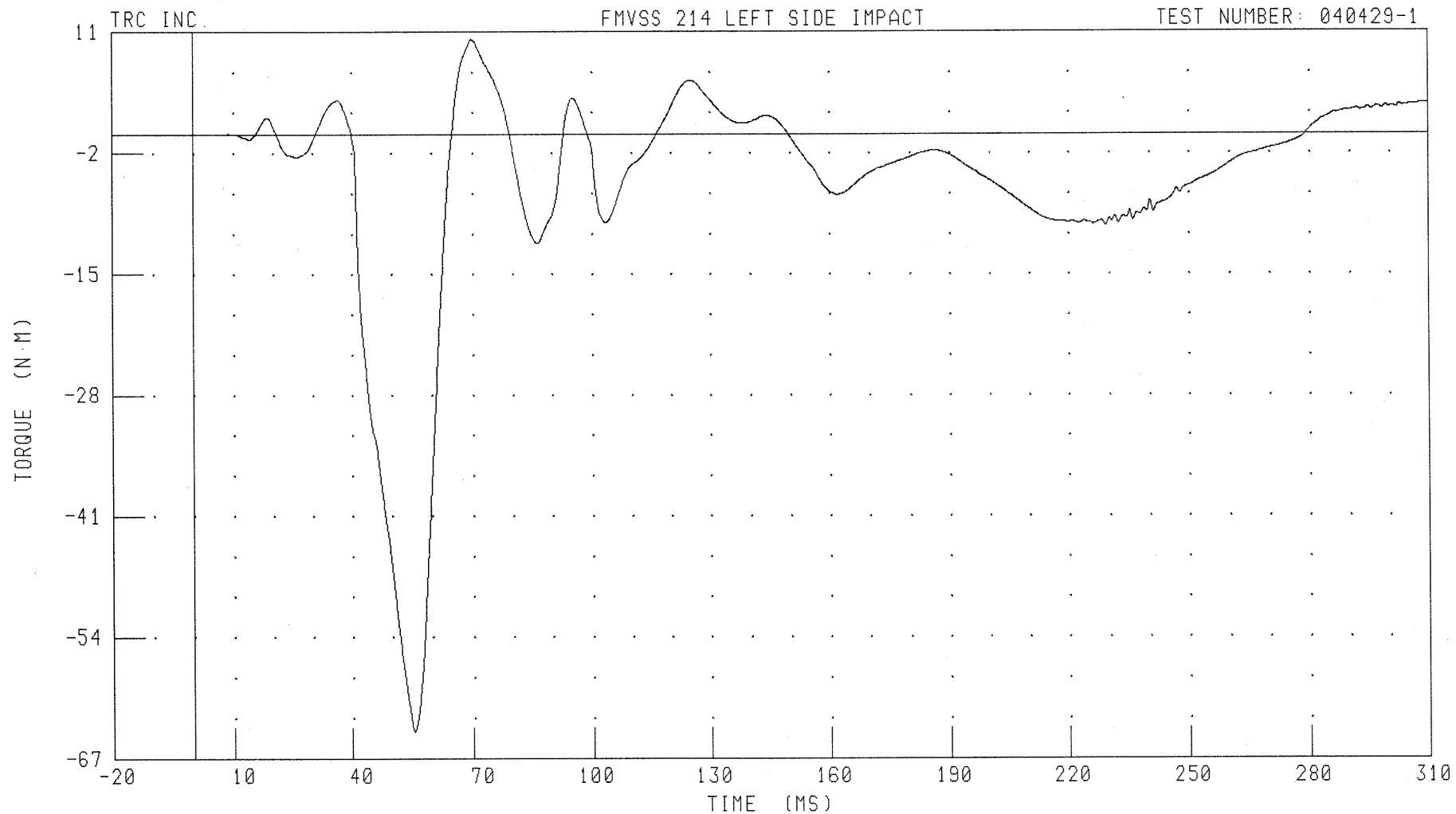
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER NECK MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKXM4 FILTER: CH. CLASS 600

PEAK DATA: 10.21 N·M @ 70.00 MS; -64.11 N·M @ 55.52 MS

B-44

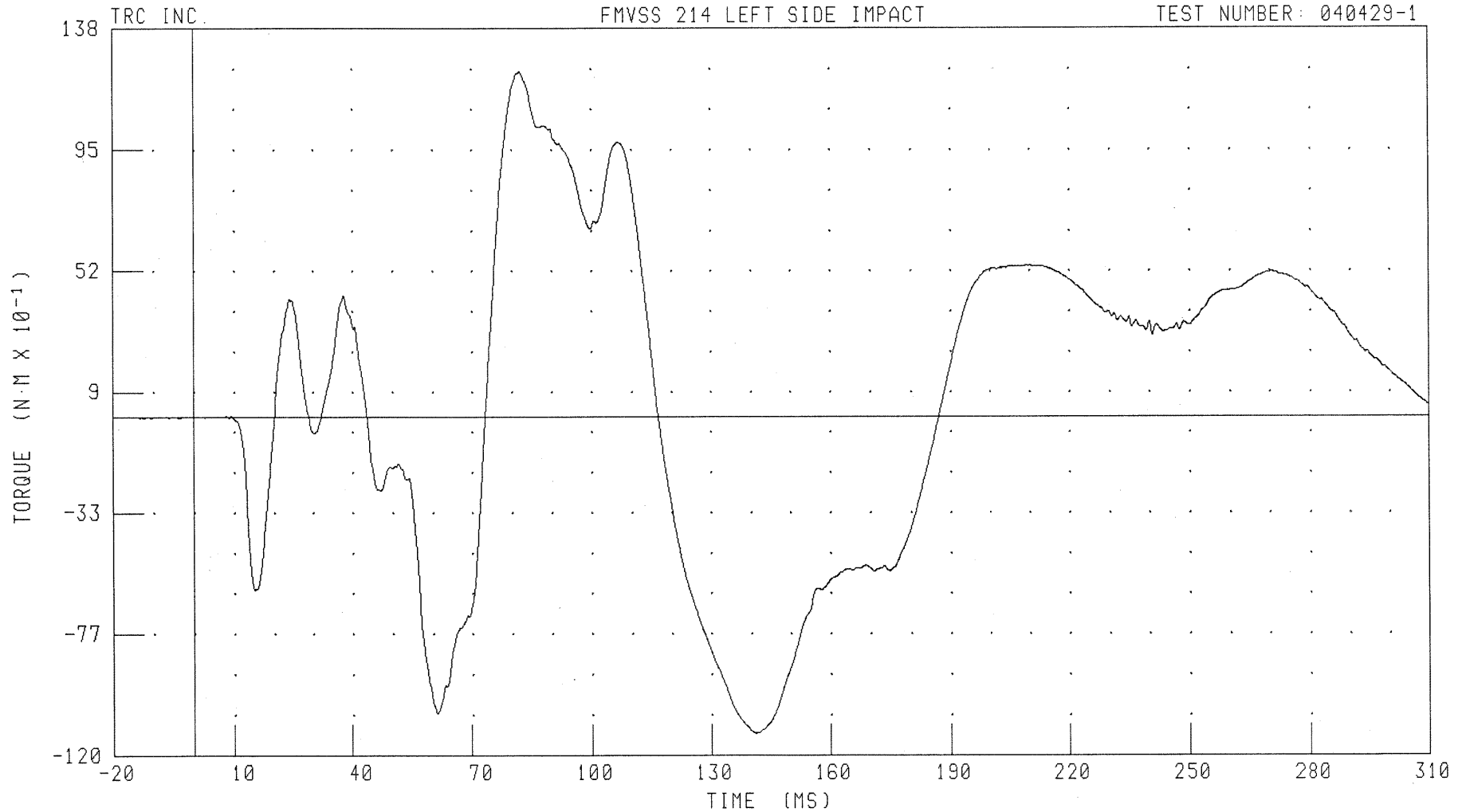
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER NECK MOMENT ABOUT Y AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKYM4

FILTER: CH. CLASS 600

PEAK DATA: 12.27 N·M @ 82.16 MS; -11.23 N·M @ 141.12 MS

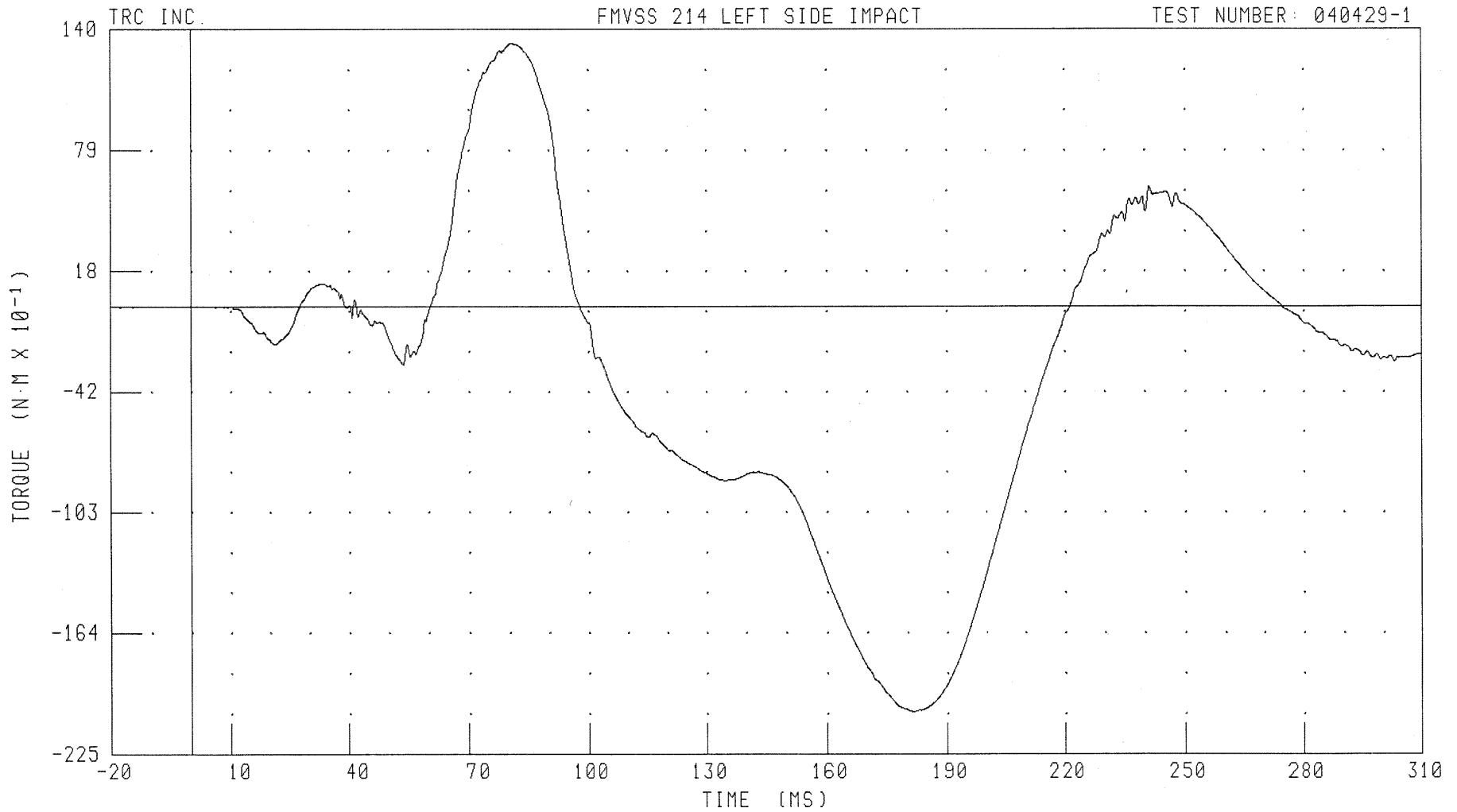
B-45

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER NECK MOMENT ABOUT Z AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NEKZM4 FILTER: CH. CLASS 600

PEAK DATA: 13.31 N·M @ 80.88 MS; -20.47 N·M @ 181.60 MS

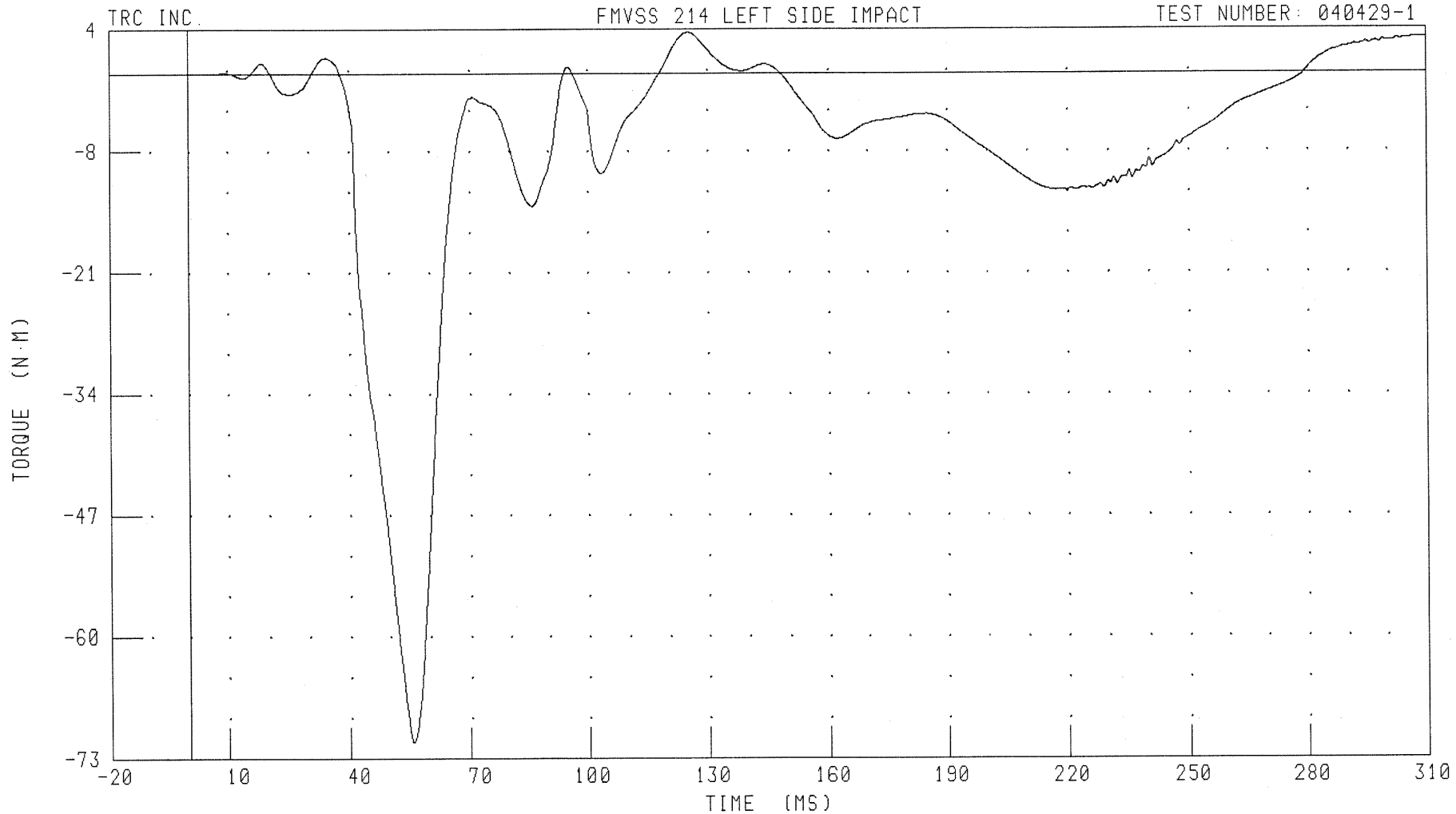
B-46

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: NK0XM4

FILTER: CH. CLASS 600

PEAK DATA: 4.36 N·m @ 125.20 MS; -71.59 N·m @ 55.76 MS

B-47

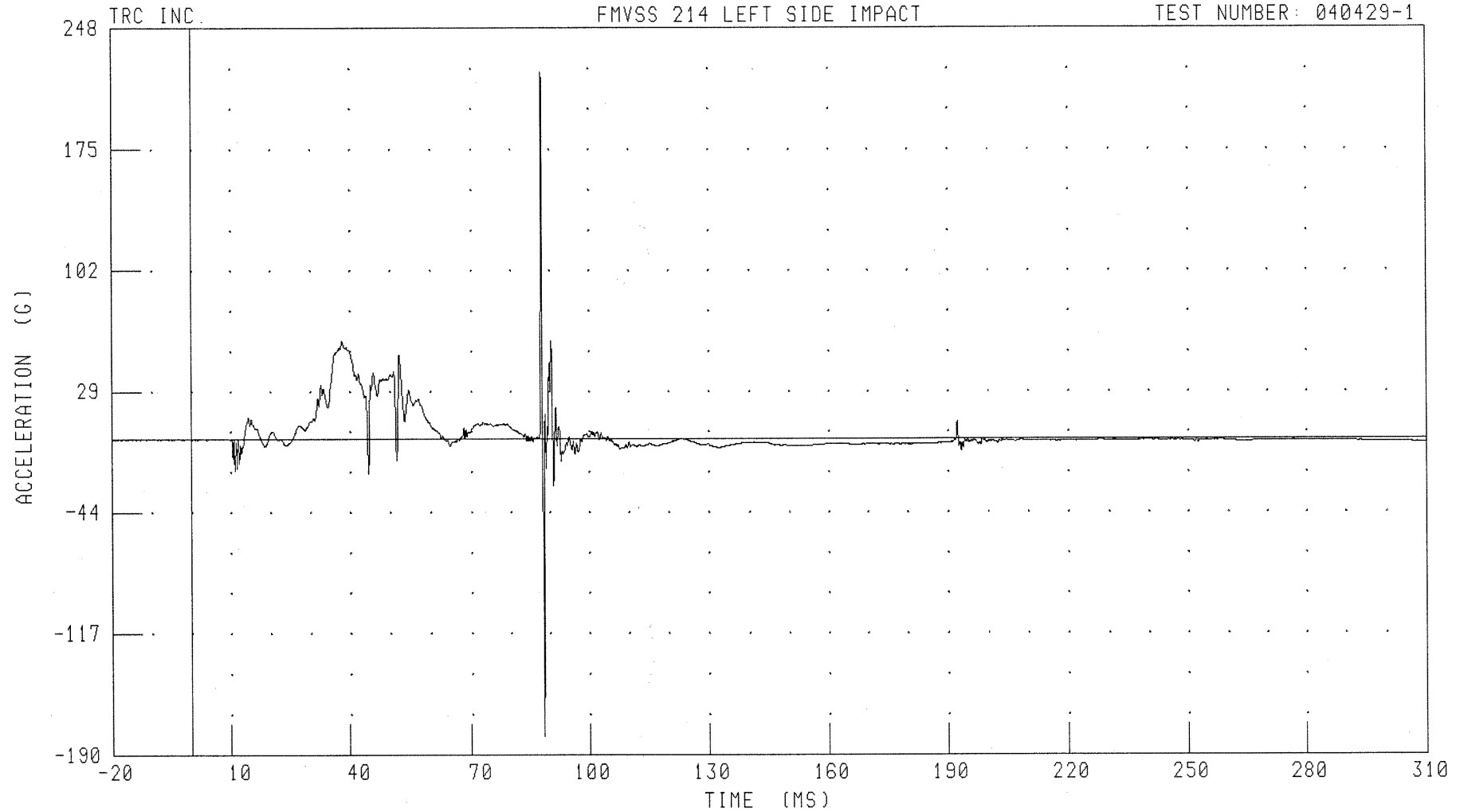
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYG4 FILTER: CH. CLASS 1000

PEAK DATA: 221.66 G @ 88.00 MS; -179.11 G @ 88.48 MS

B-48

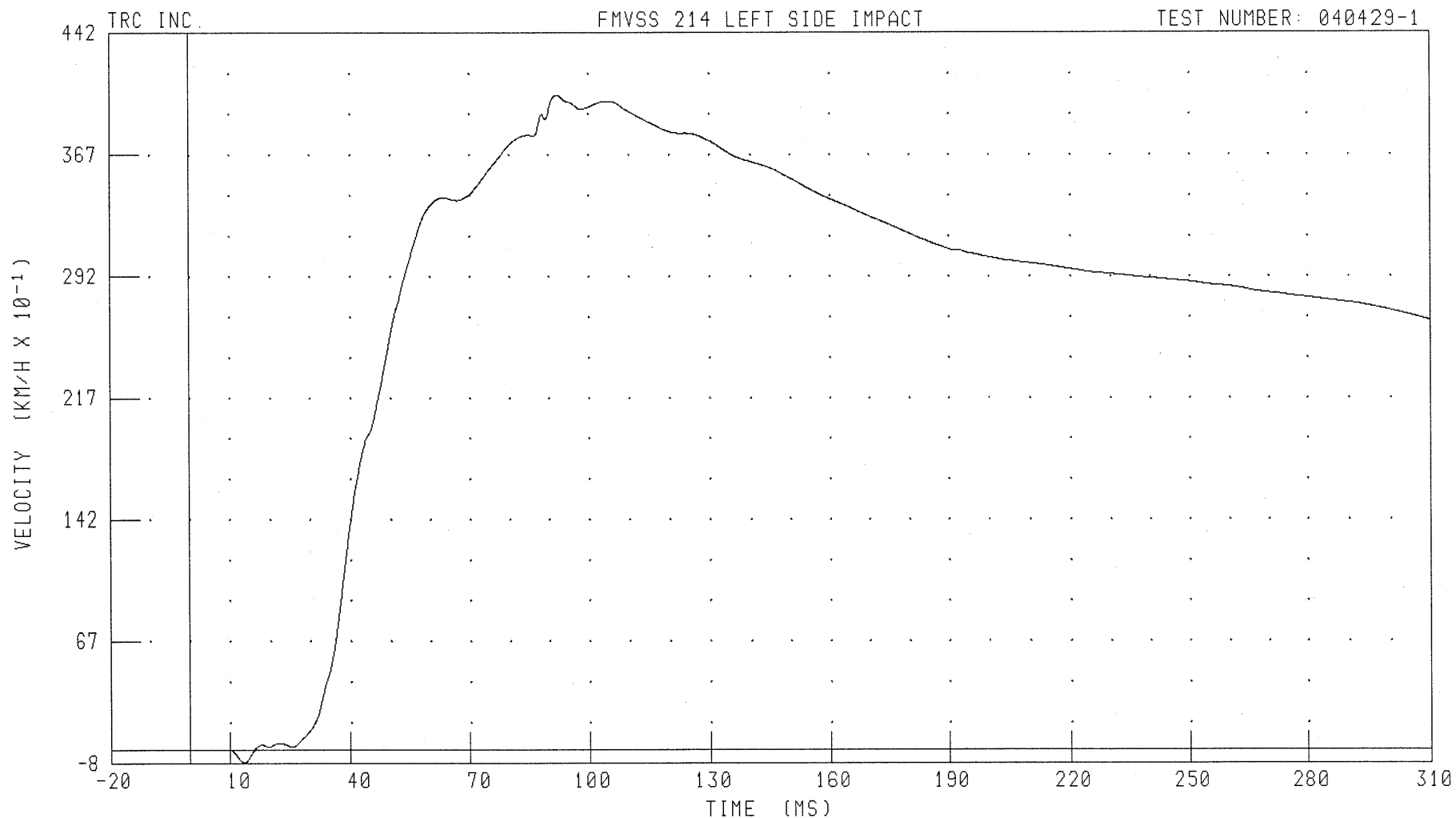
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER UPPER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYV4 FILTER: CH. CLASS 180

PEAK DATA: 40.35 KM/H @ 92.40 MS; -0.76 KM/H @ 13.44 MS

B-49

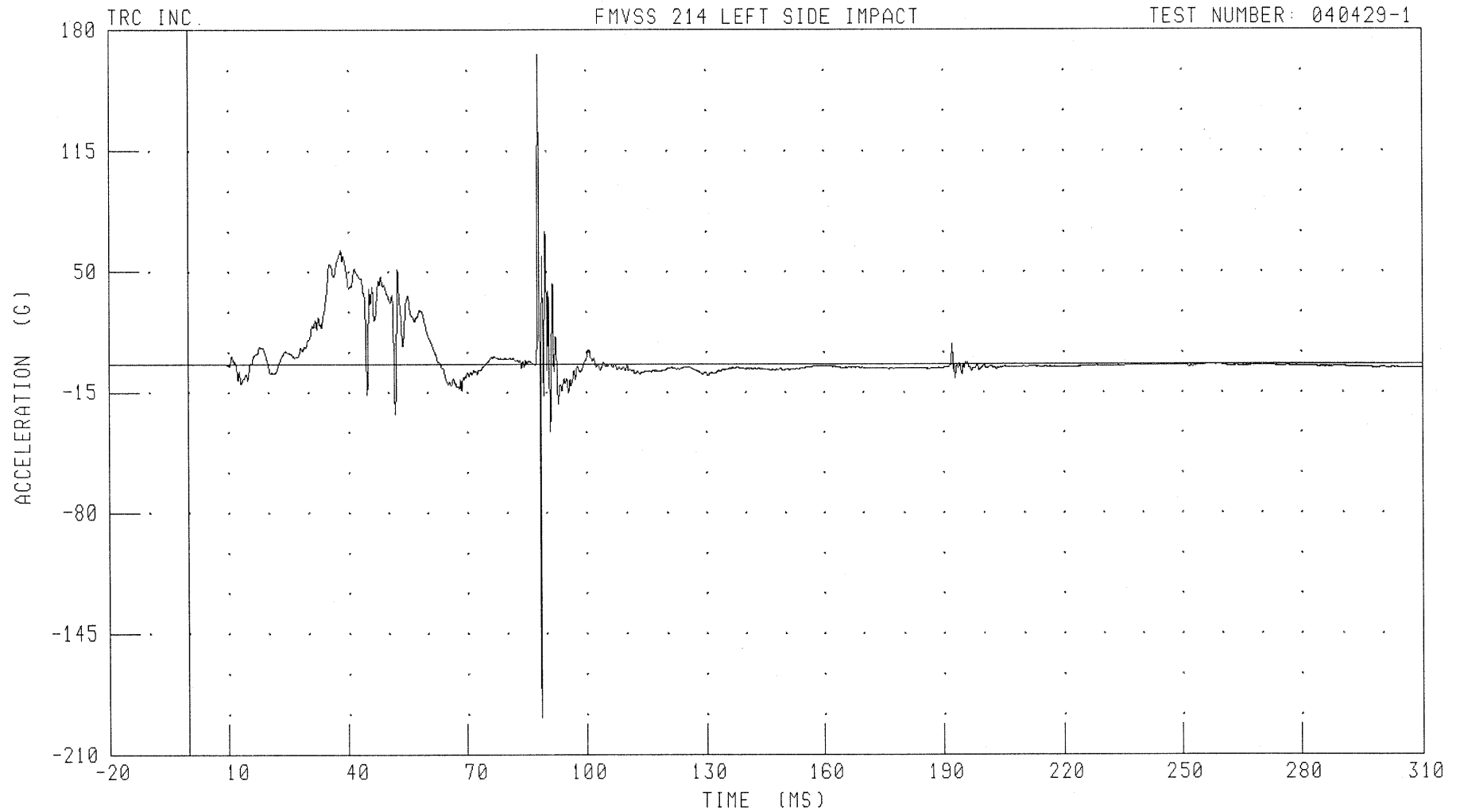
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYG4 FILTER: CH. CLASS 1000

B-50

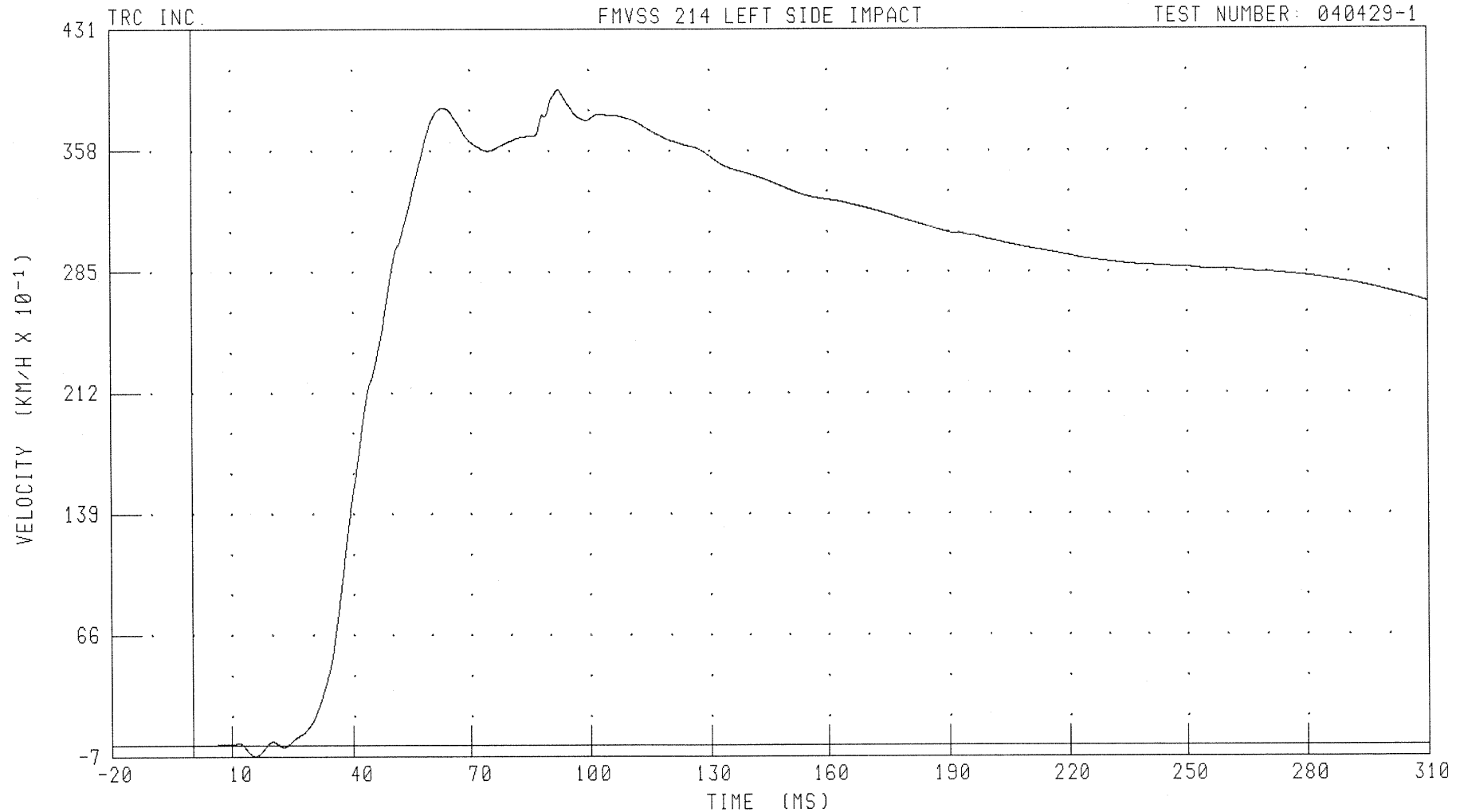
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYV4 FILTER: CH. CLASS 180

PEAK DATA: 39.47 KM/H @ 92.56 MS; -0.68 KM/H @ 15.76 MS

B-51

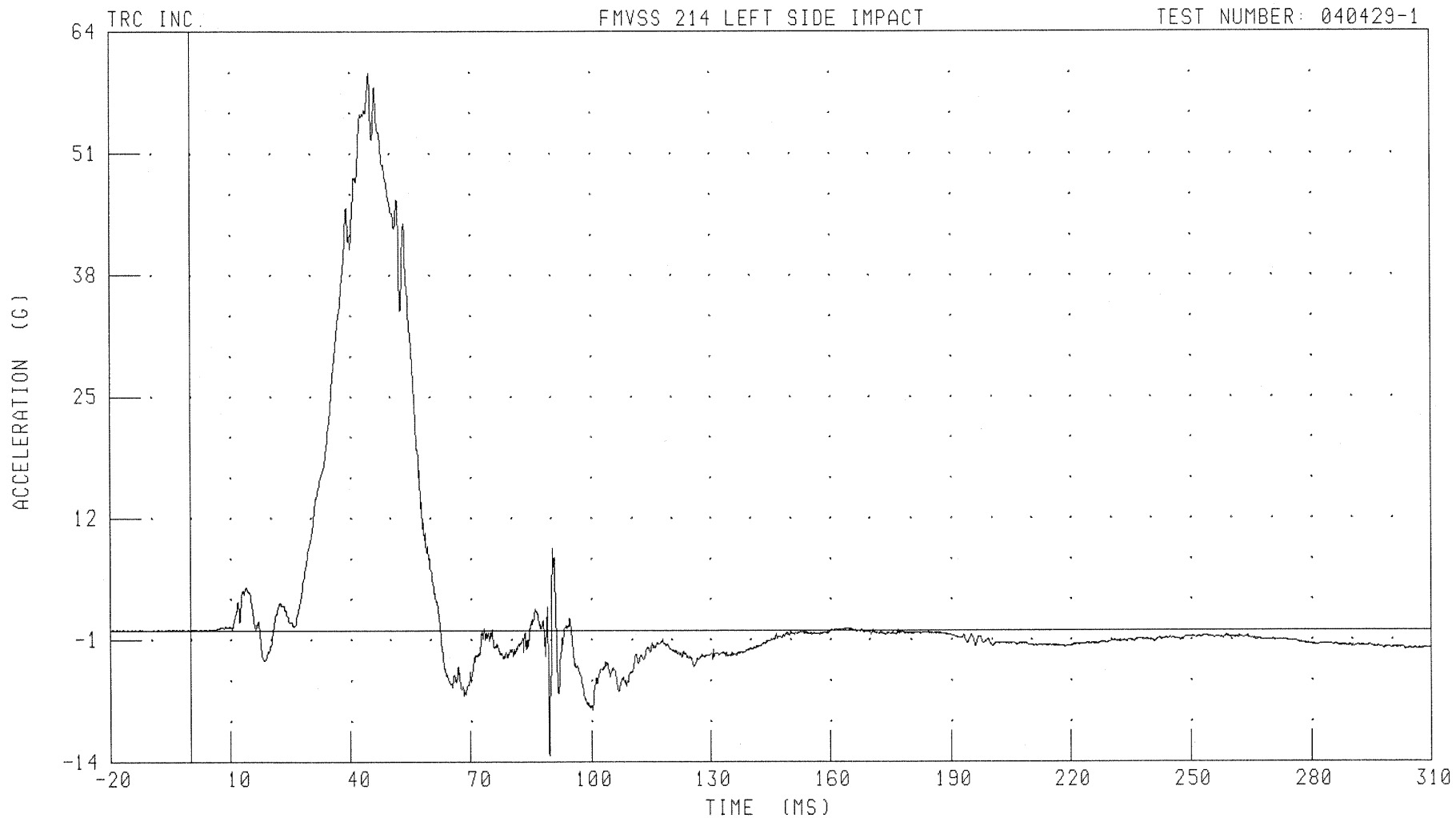
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YG4 FILTER: CH. CLASS 1000

PEAK DATA: 59.61 G @ 44.88 MS; -13.32 G @ 89.60 MS

B-52

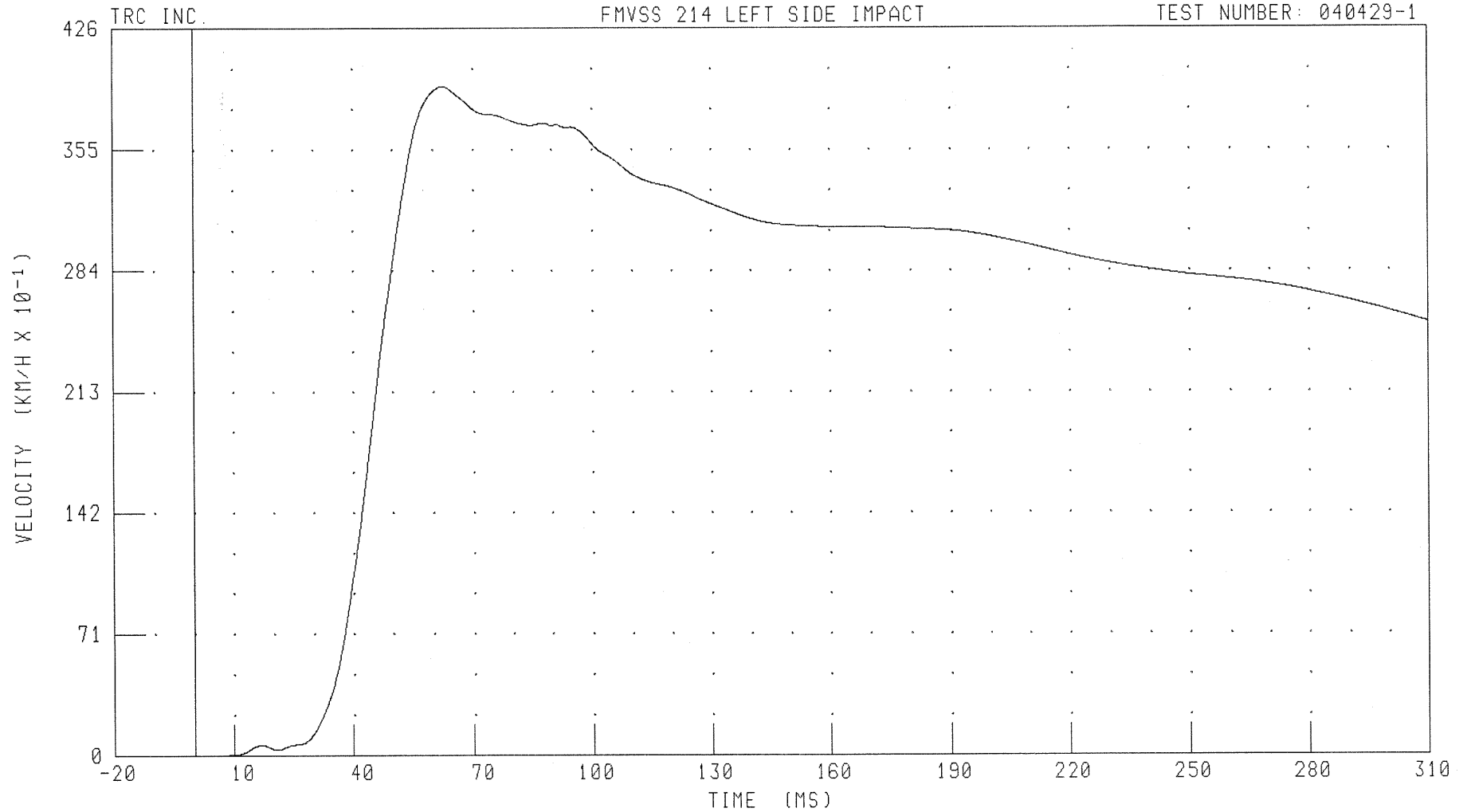
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YV4 FILTER: CH. CLASS 180

PEAK DATA: 39.21 KM/H @ 62.56 MS; 0.00 KM/H @ 0.00 MS

B-53

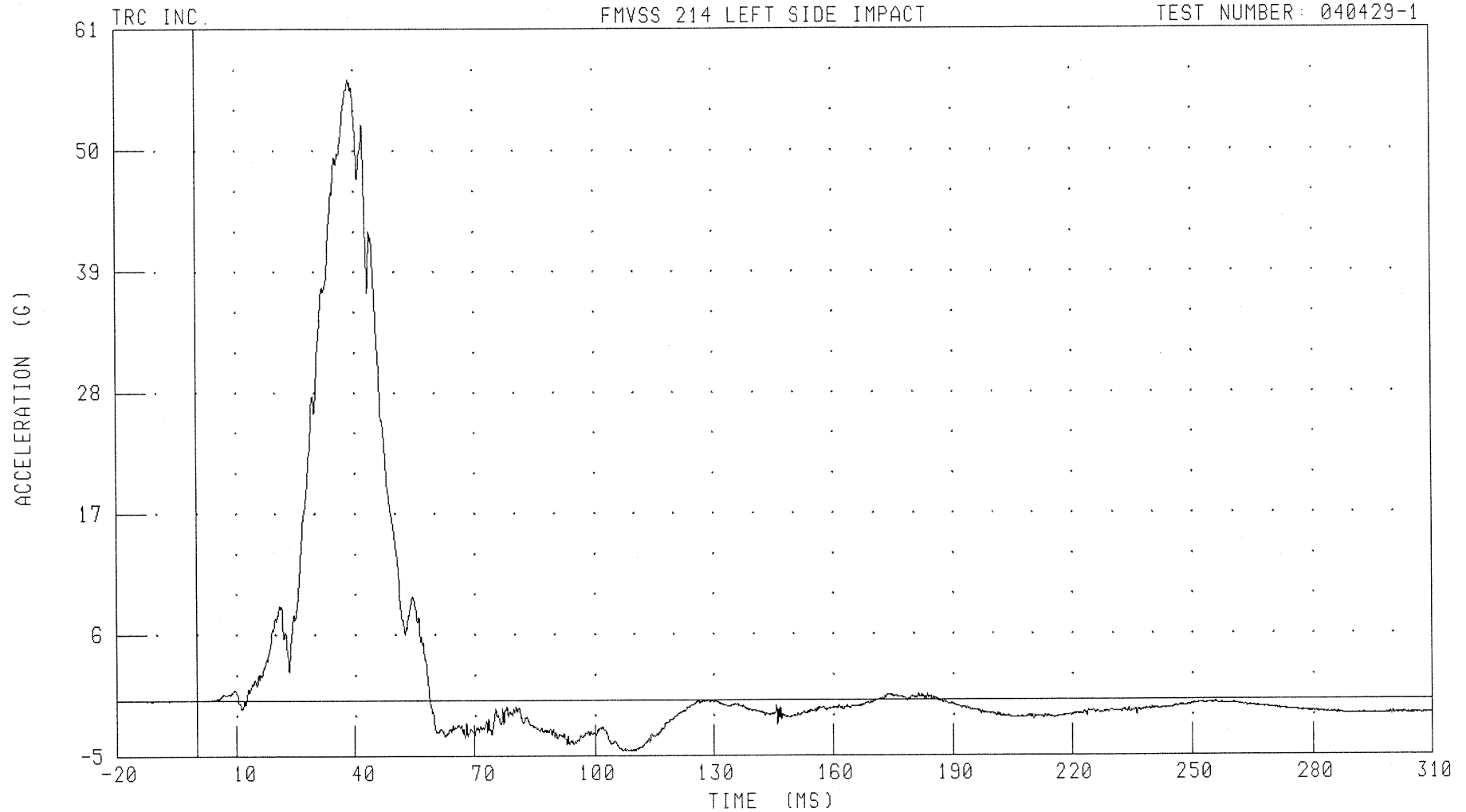
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYG4 FILTER: CH. CLASS 1000

PEAK DATA: 56.41 G @ 38.88 MS; -4.59 G @ 108.48 MS

B-54

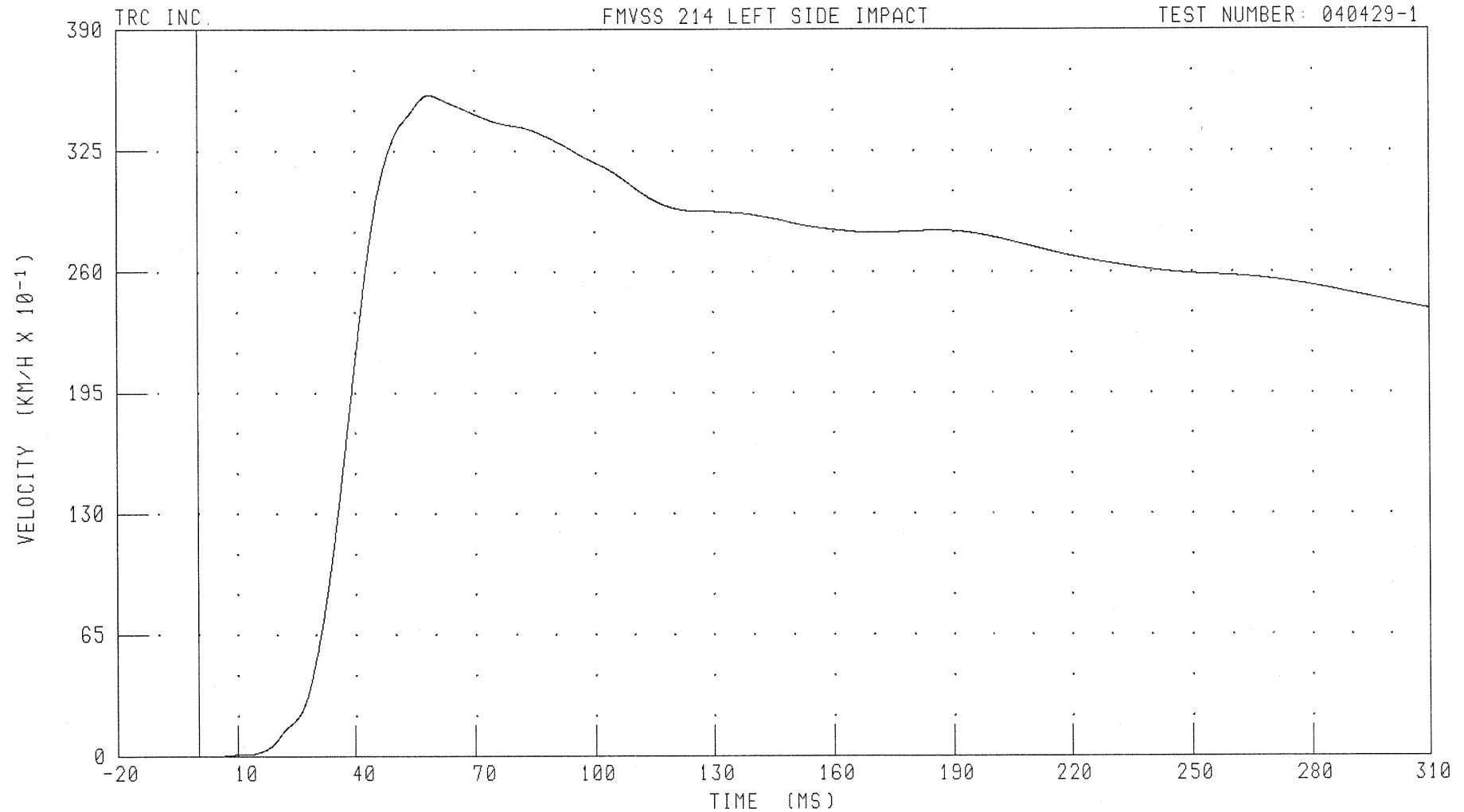
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYV4 FILTER: CH. CLASS 180

PEAK DATA: 35.50 KM/H @ 58.80 MS; 0.00 KM/H @ 0.00 MS

B-55

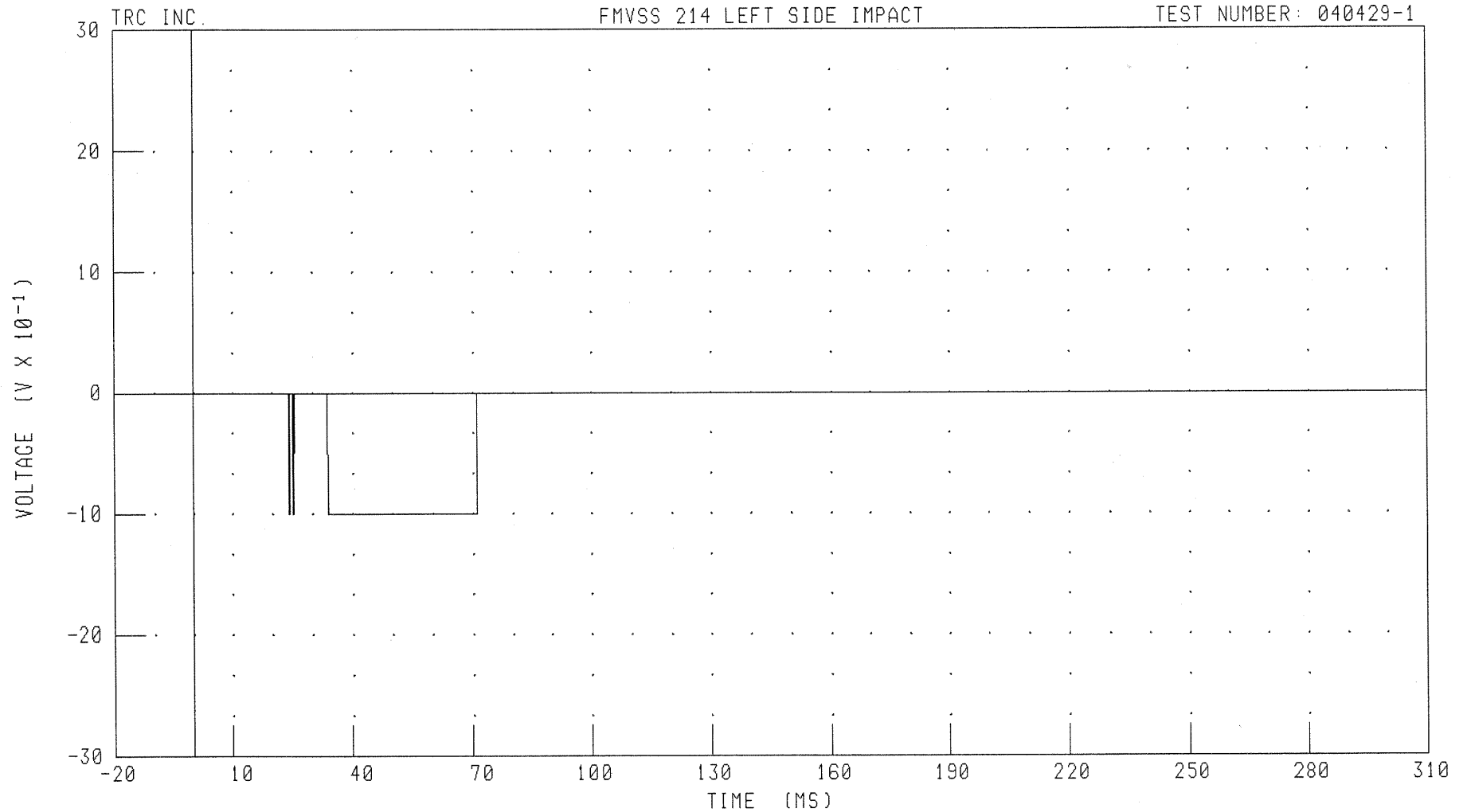
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER SHOULDER CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: SHLET4 FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 310.00 MS; -1.00 V @ 24.24 MS

B-56

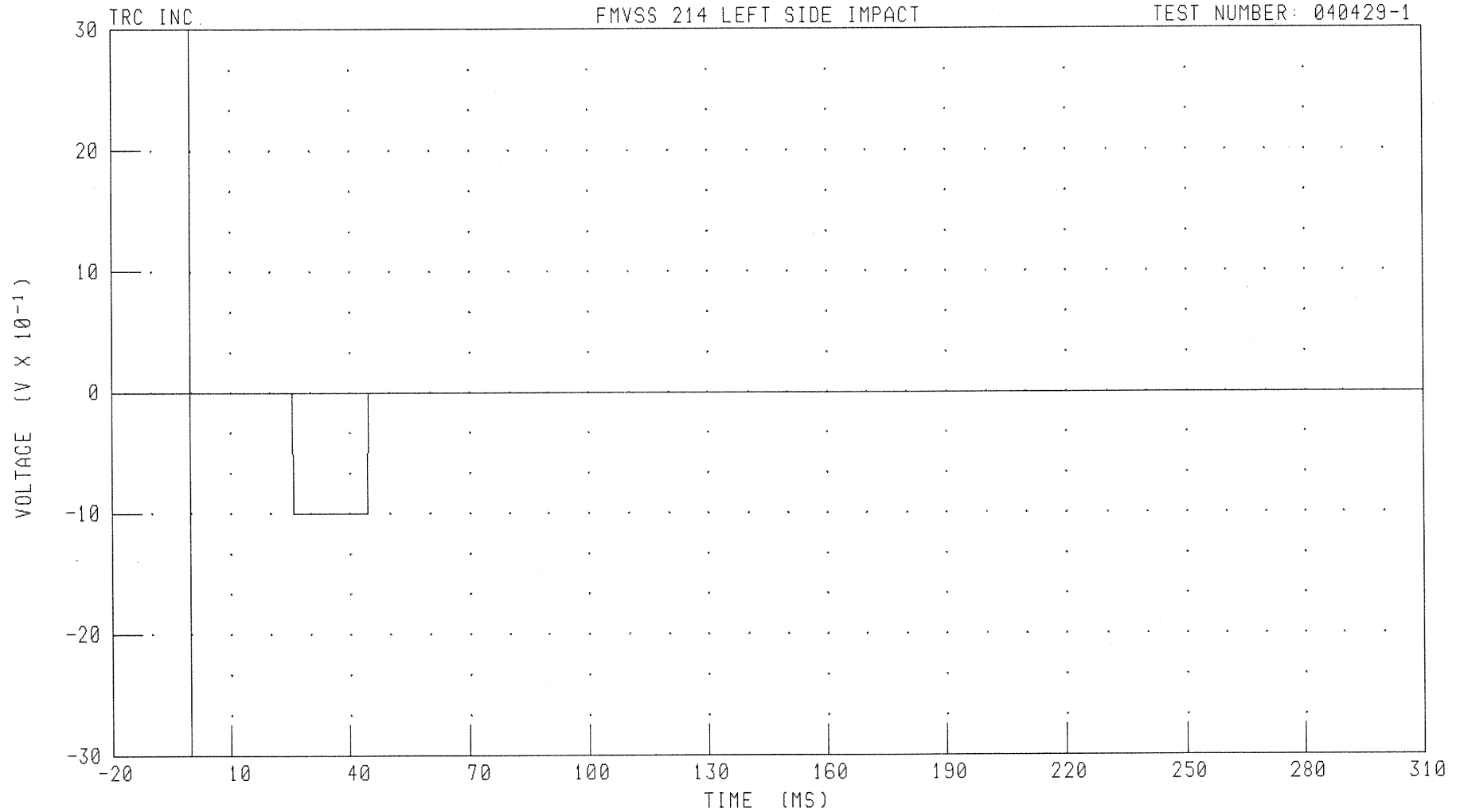
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVET4

FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 310.00 MS; -1.00 V @ 25.84 MS

B-57

040429-1

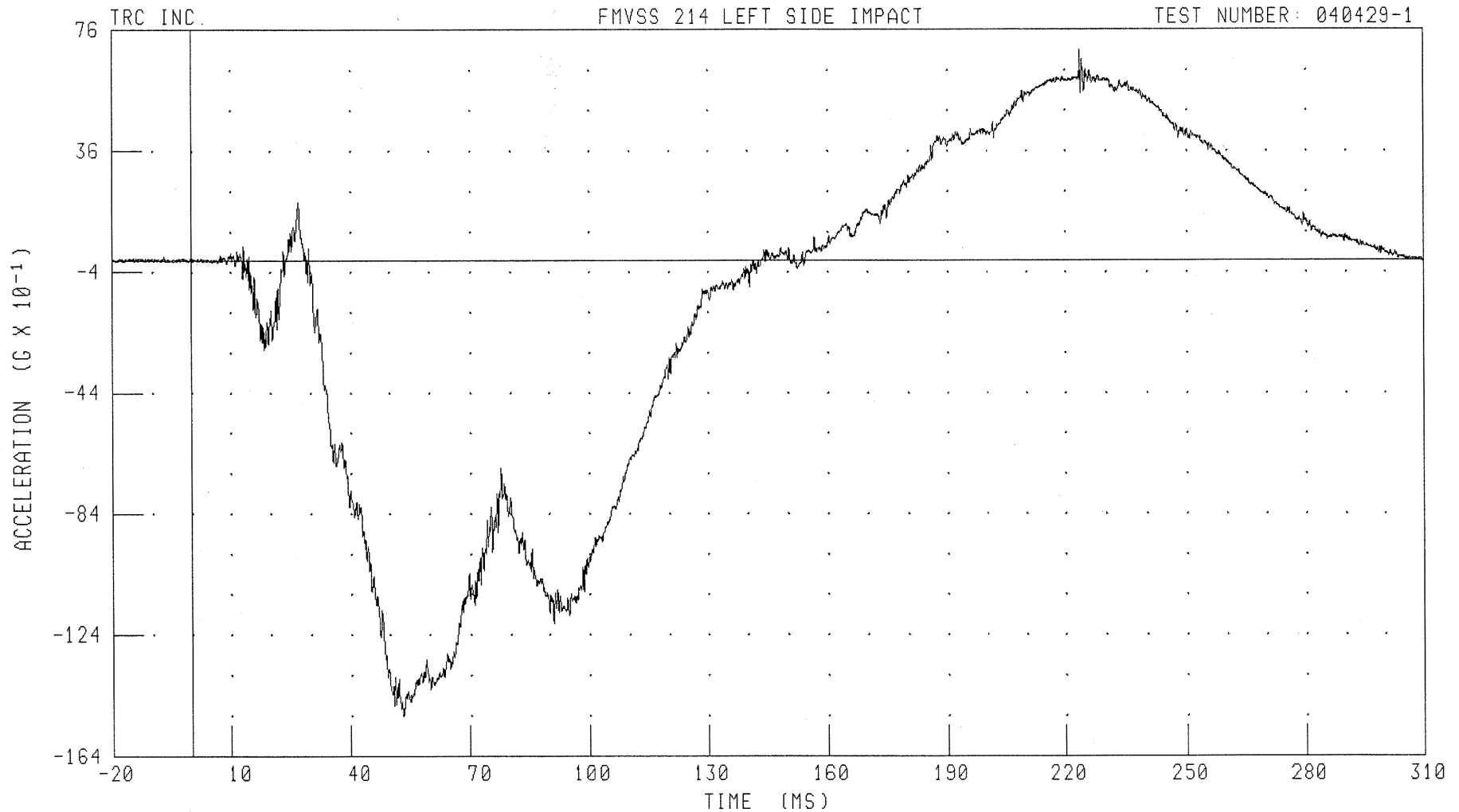
Driver and Passenger Dummy Redundant Instrumentation Plots

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD X-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXR1 FILTER: CH. CLASS 1000

PEAK DATA: 6.94 G @ 223.84 MS; -15.08 G @ 53.44 MS

B-59

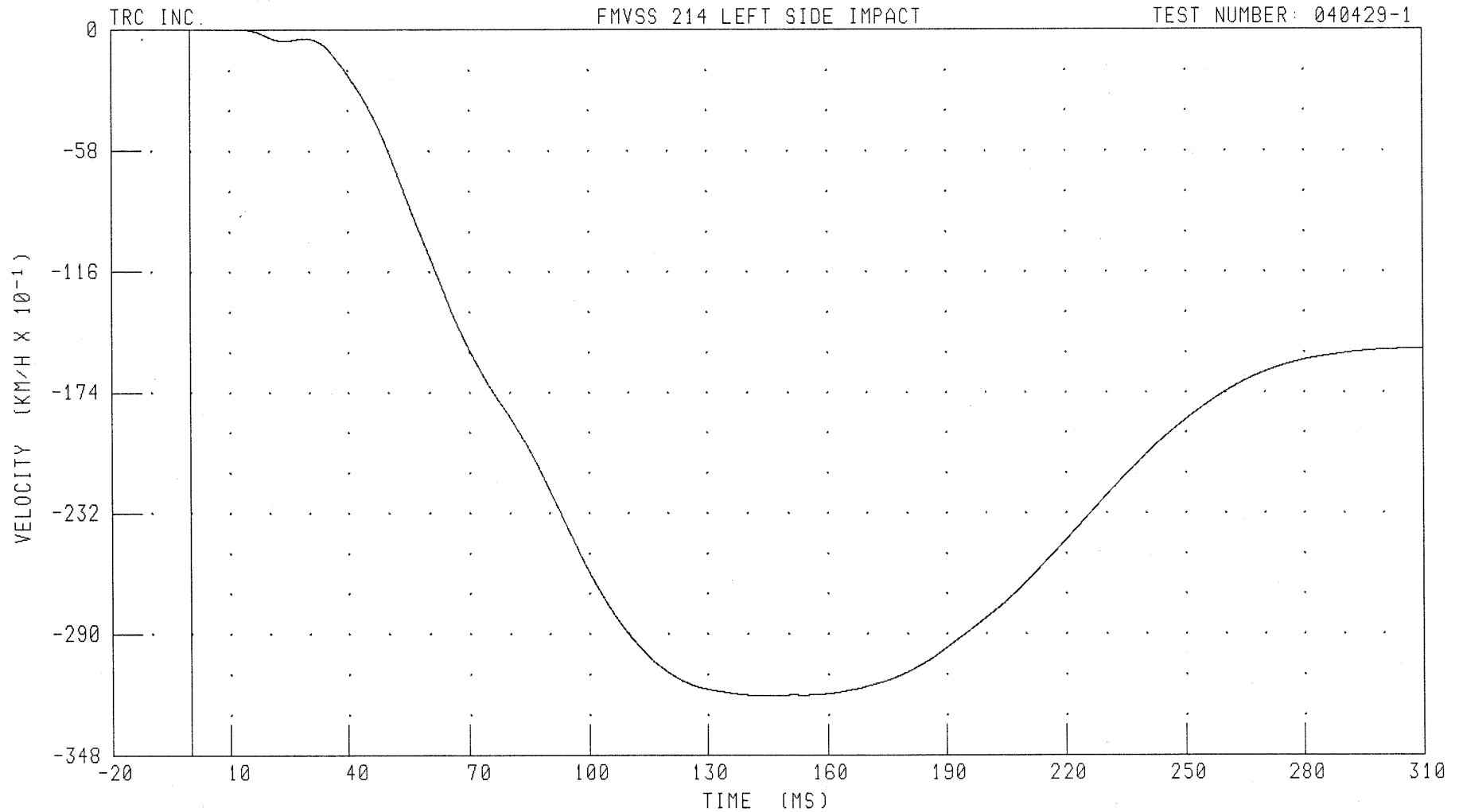
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD X-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXVI FILTER: CH. CLASS 180

PEAK DATA: 0.01 KM/H @ 12.64 MS; -31.97 KM/H @ 143.92 MS

B-60

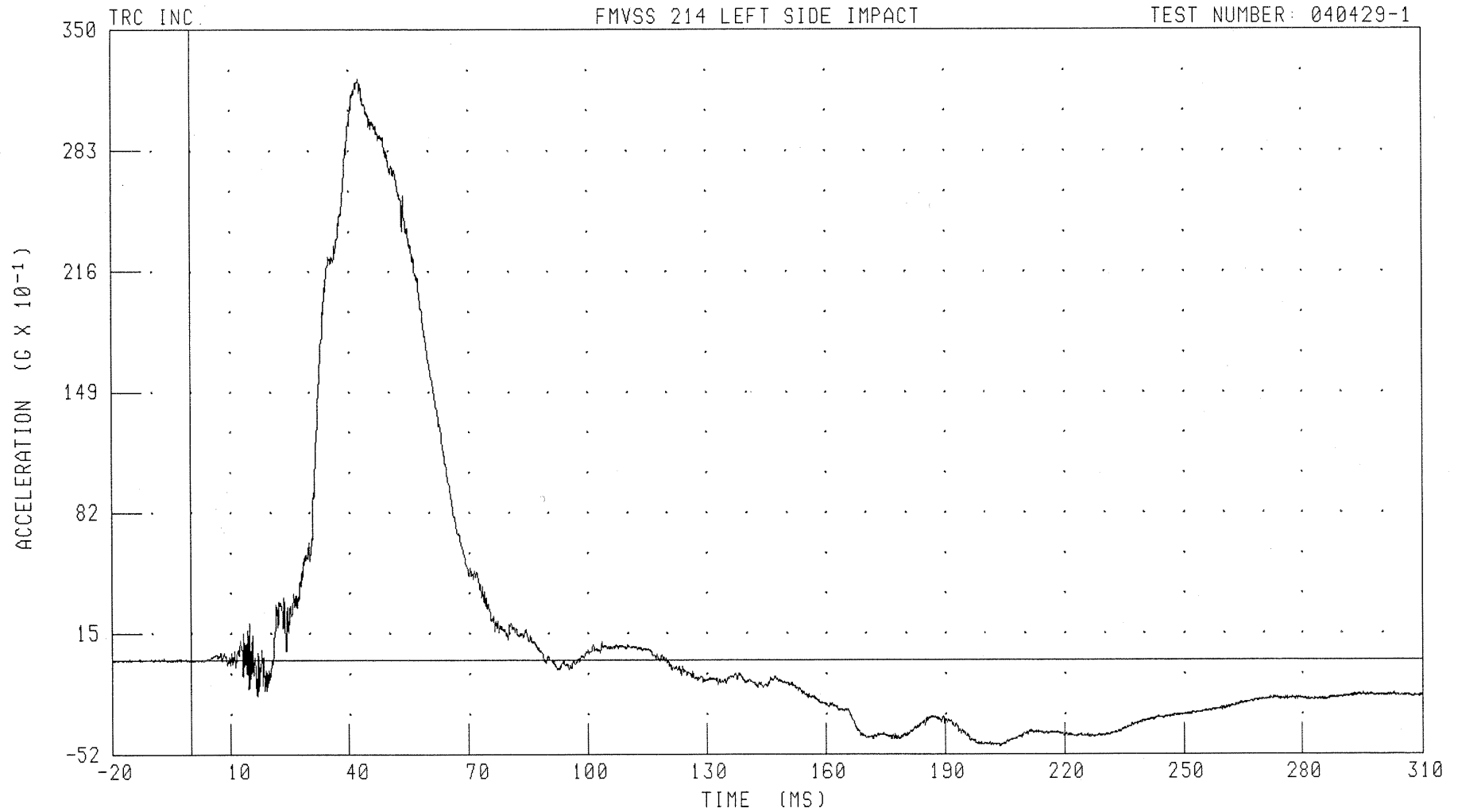
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYR1 FILTER: CH. CLASS 1000

PEAK DATA: 32.27 G @ 42.80 MS; -4.76 G @ 204.00 MS

B-61

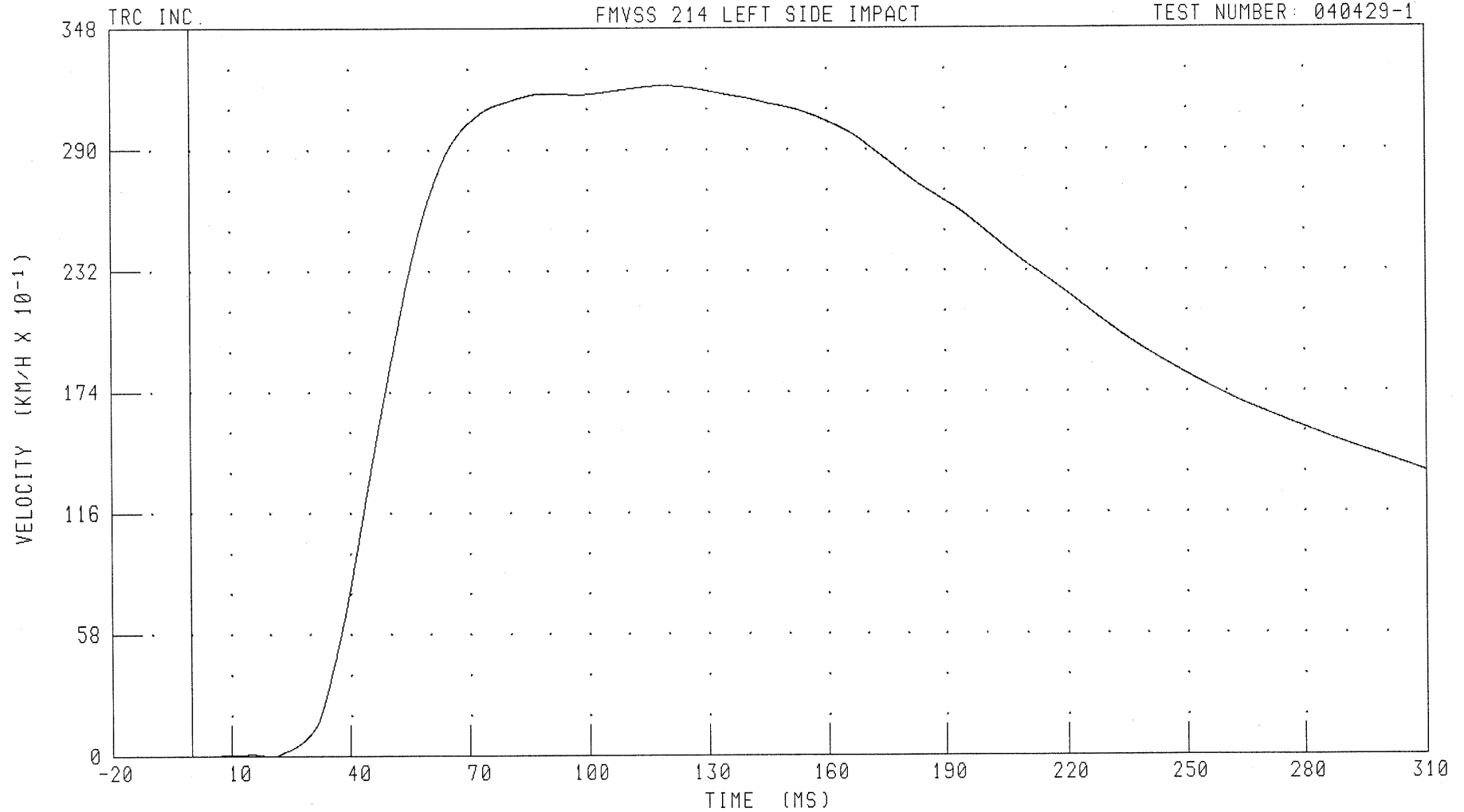
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER HEAD Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYVI FILTER: CH. CLASS 180

PEAK DATA: 32.05 KM/H @ 120.00 MS; -0.05 KM/H @ 20.48 MS

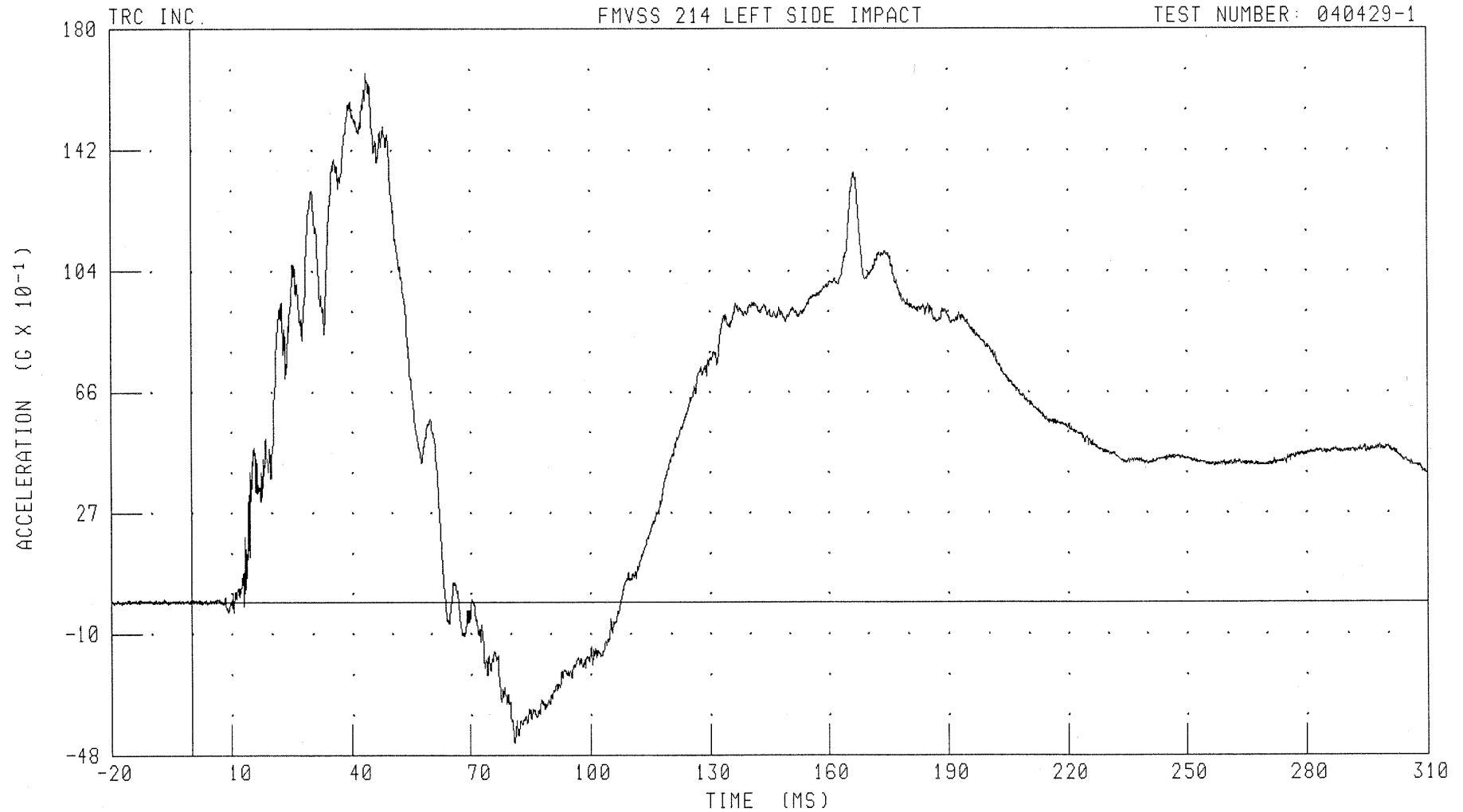
B-62

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
DRIVER HEAD Z-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZR1 FILTER: CH. CLASS 1000

PEAK DATA: 16.61 G @ 43.76 MS; -4.40 G @ 80.96 MS

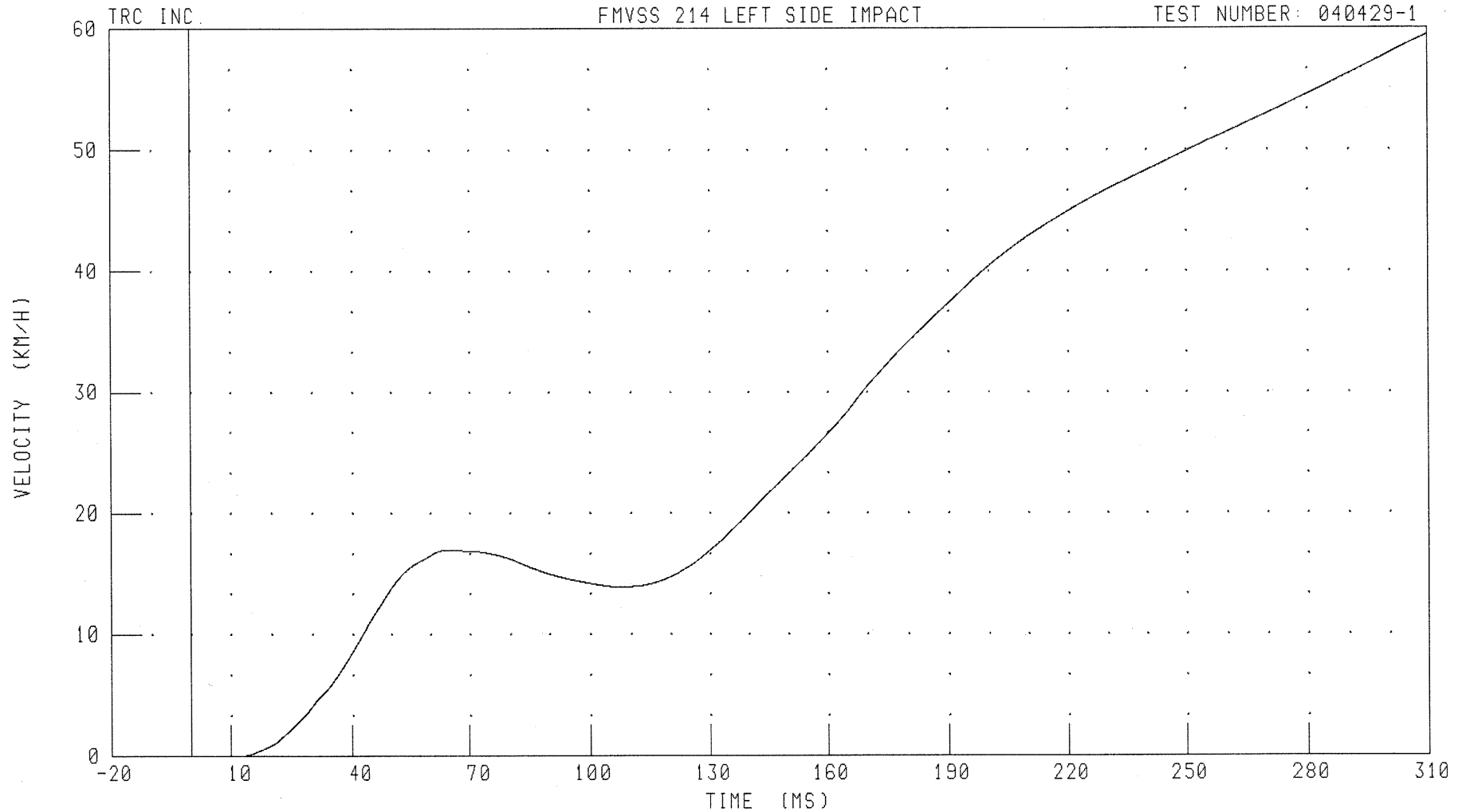
B-63

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
DRIVER HEAD Z-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZVI FILTER: CH. CLASS 180

PEAK DATA: 59.47 KM/H @ 310.00 MS; -0.01 KM/H @ 10.40 MS

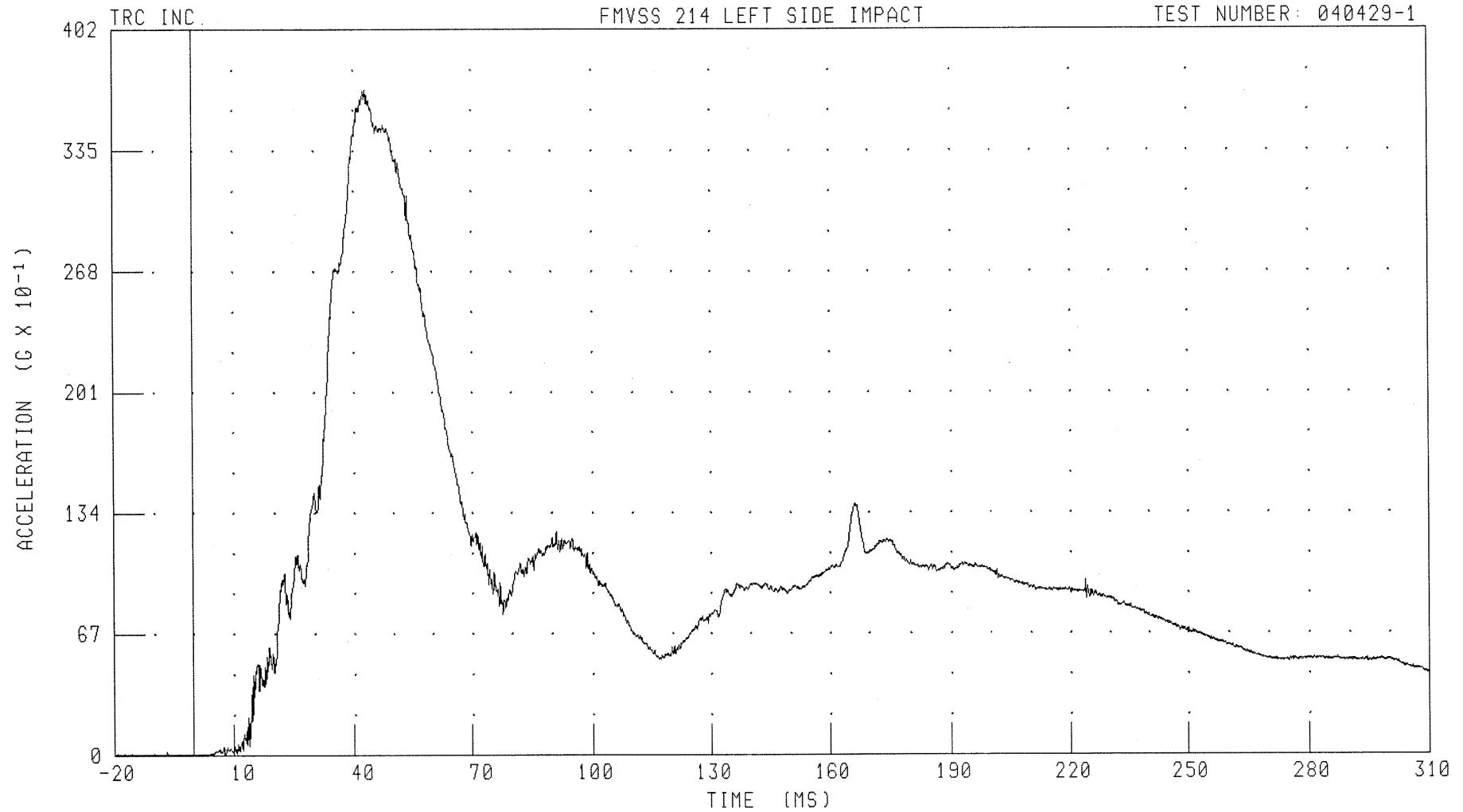
B-64

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
DRIVER HEAD RESULTANT REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDRR1 FILTER: CH. CLASS 1000

PEAK DATA: 36.87 G @ 43.28 MS; 0.01 G @ -19.44 MS

B-65

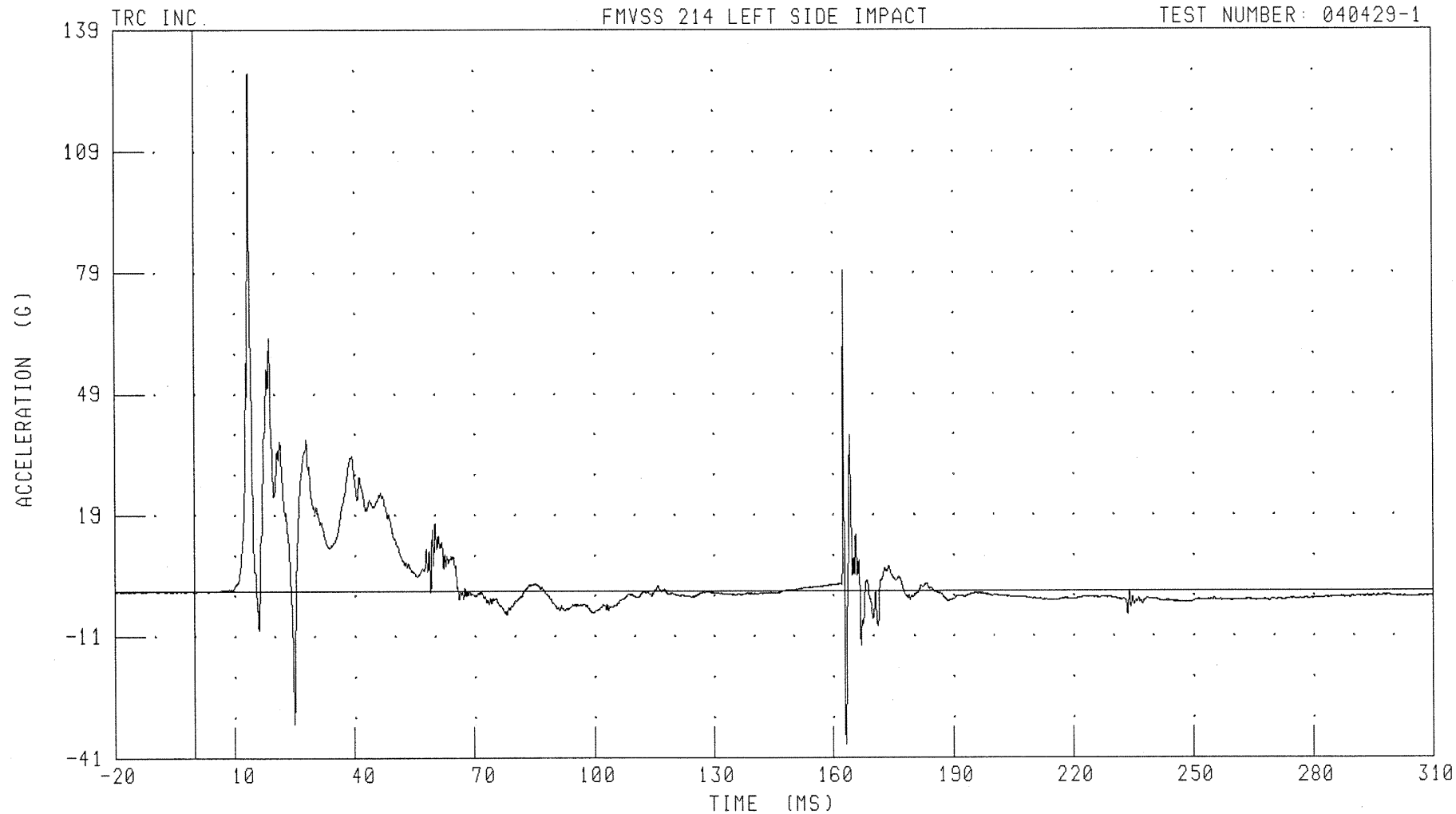
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYR1 FILTER: CH. CLASS 1000

PEAK DATA: 128.40 G @ 13.68 MS; -37.81 G @ 163.28 MS

B-66

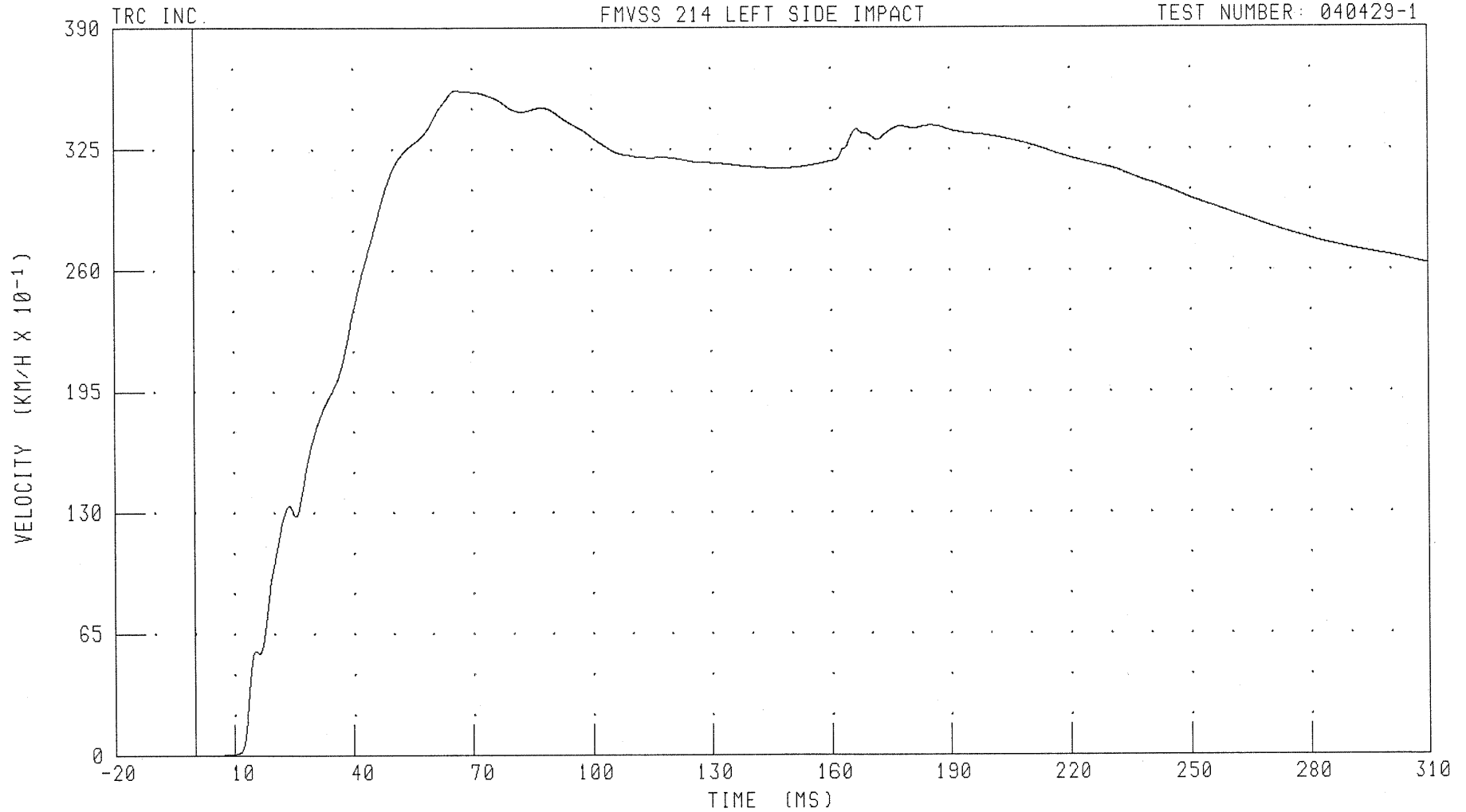
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER UPPER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYVI FILTER: CH. CLASS 180

PEAK DATA: 35.65 KM/H @ 66.16 MS; 0.00 KM/H @ 0.00 MS

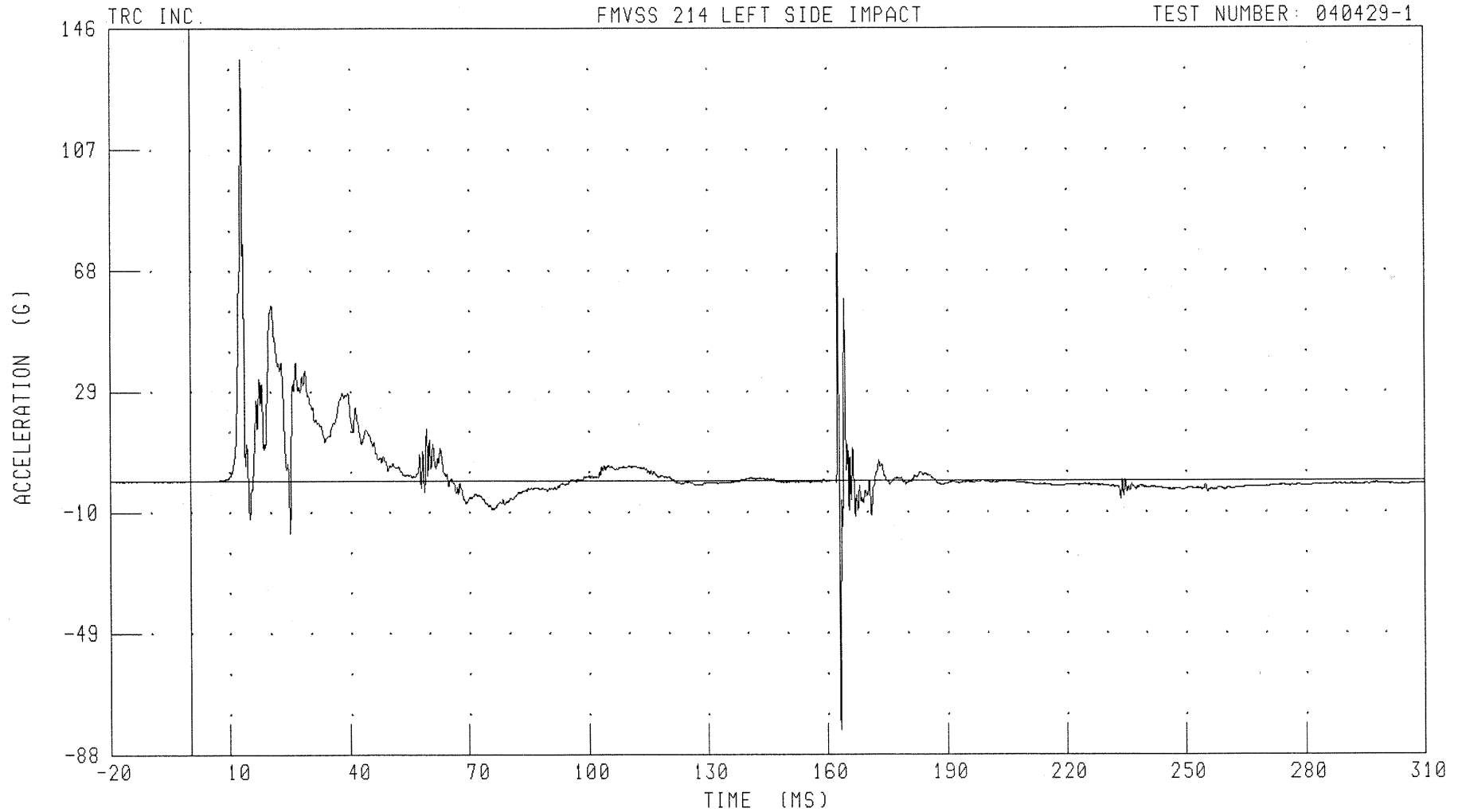
B-67

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYR1 FILTER: CH. CLASS 1000

PEAK DATA: 136.33 G @ 13.04 MS; -80.26 G @ 163.28 MS

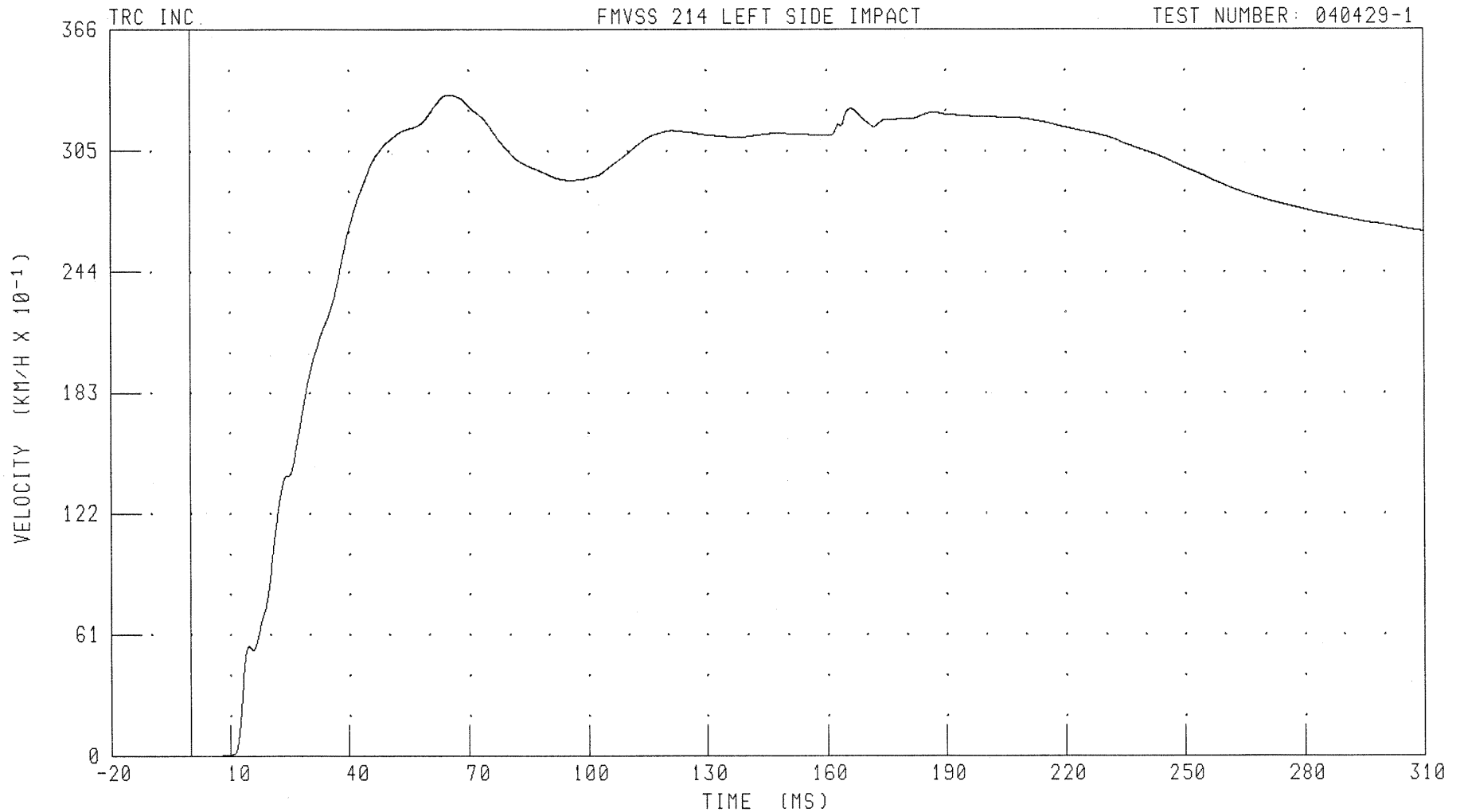
B-68

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
DRIVER LOWER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYVI

FILTER: CH. CLASS 180

PEAK DATA: 33.30 KM/H @ 65.36 MS; 0.00 KM/H @ 0.00 MS

B-69

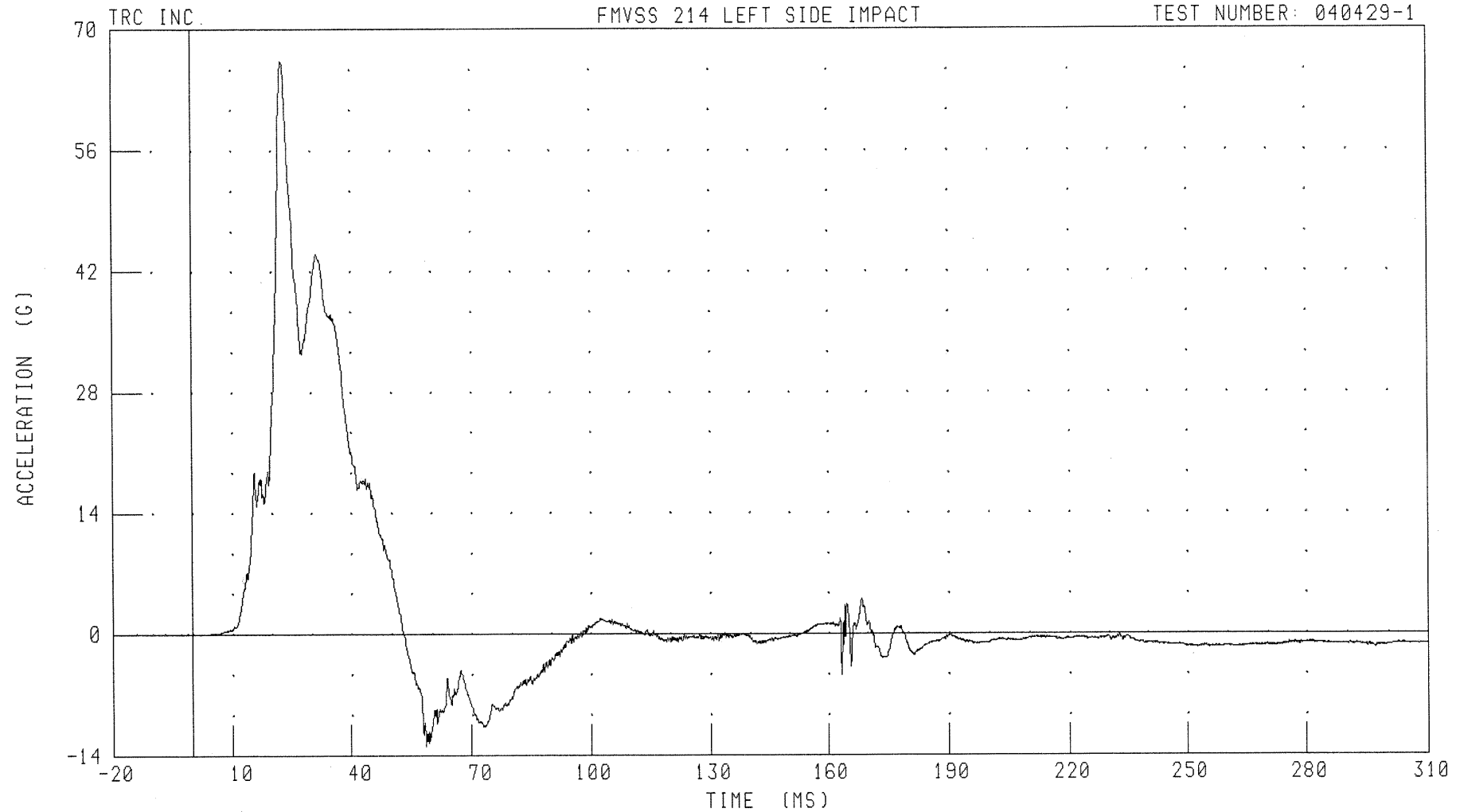
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YR1

FILTER: CH. CLASS 1000

PEAK DATA: 66.36 G @ 22.64 MS; -12.90 G @ 58.48 MS

B-70

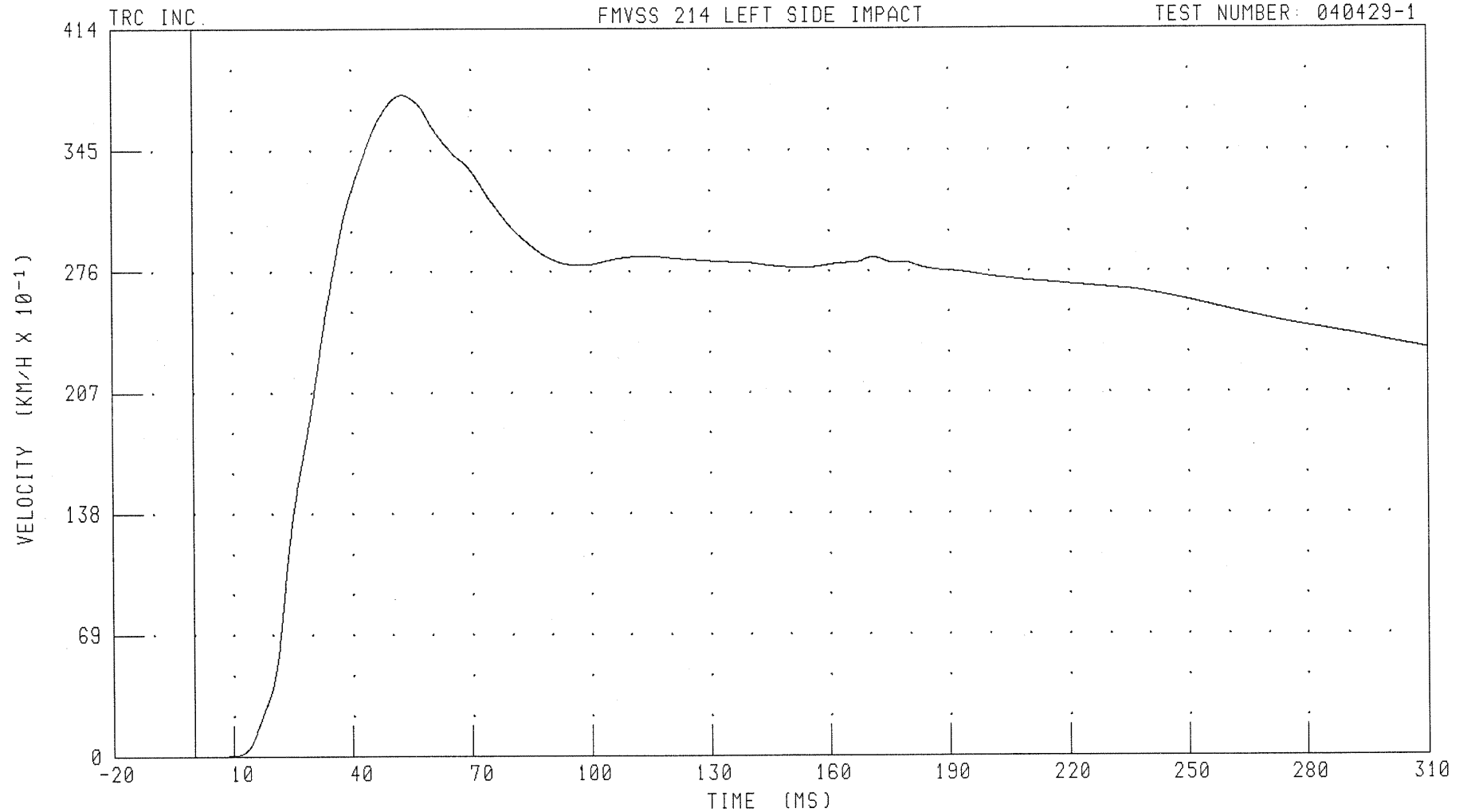
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YVI FILTER: CH. CLASS 180

PEAK DATA: 37.66 KM/H @ 52.96 MS; 0.00 KM/H @ 0.00 MS

B-71

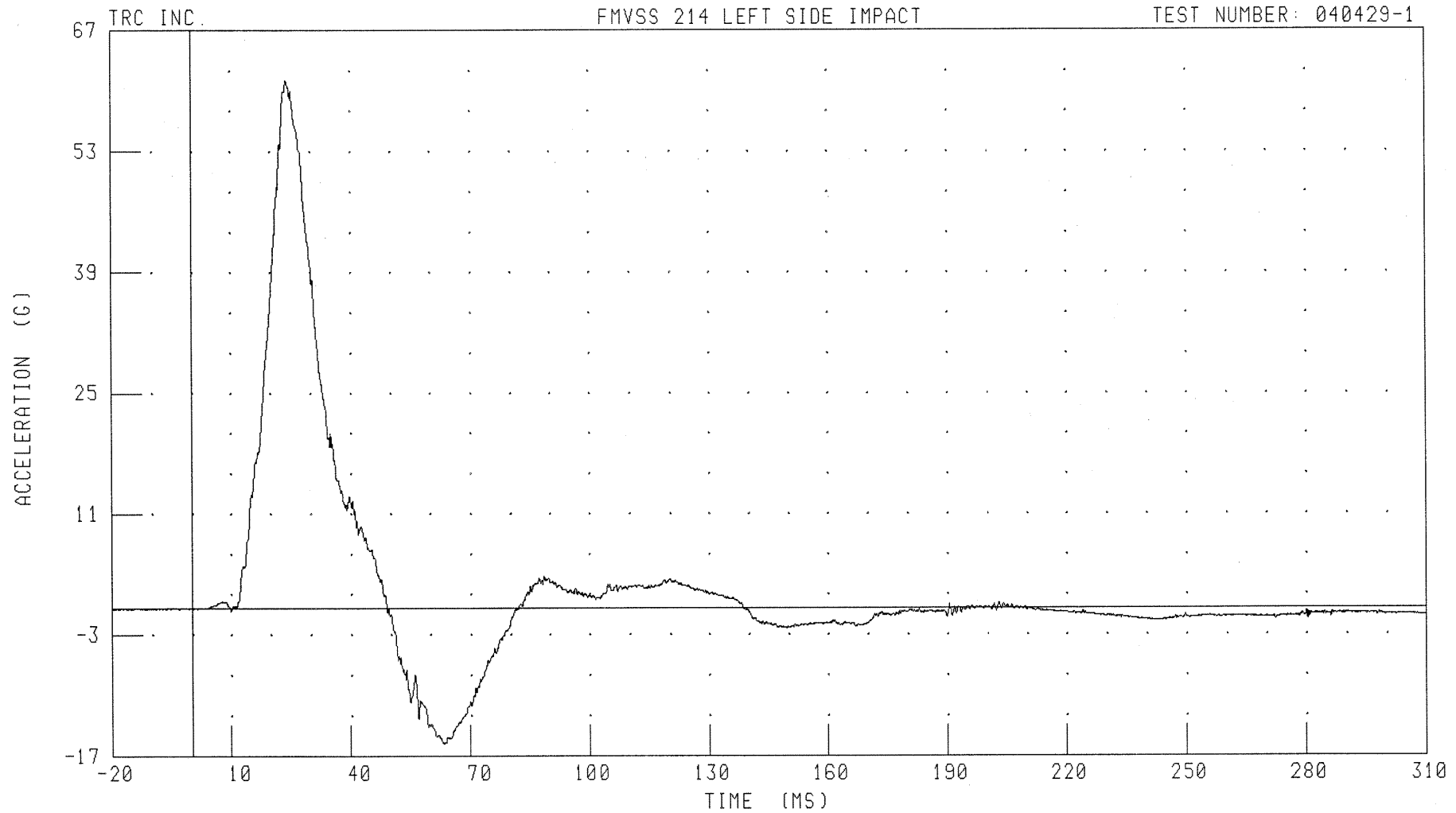
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYR1 FILTER: CH. CLASS 1000

PEAK DATA: 61.20 G @ 24.24 MS; -15.58 G @ 63.20 MS

B-72

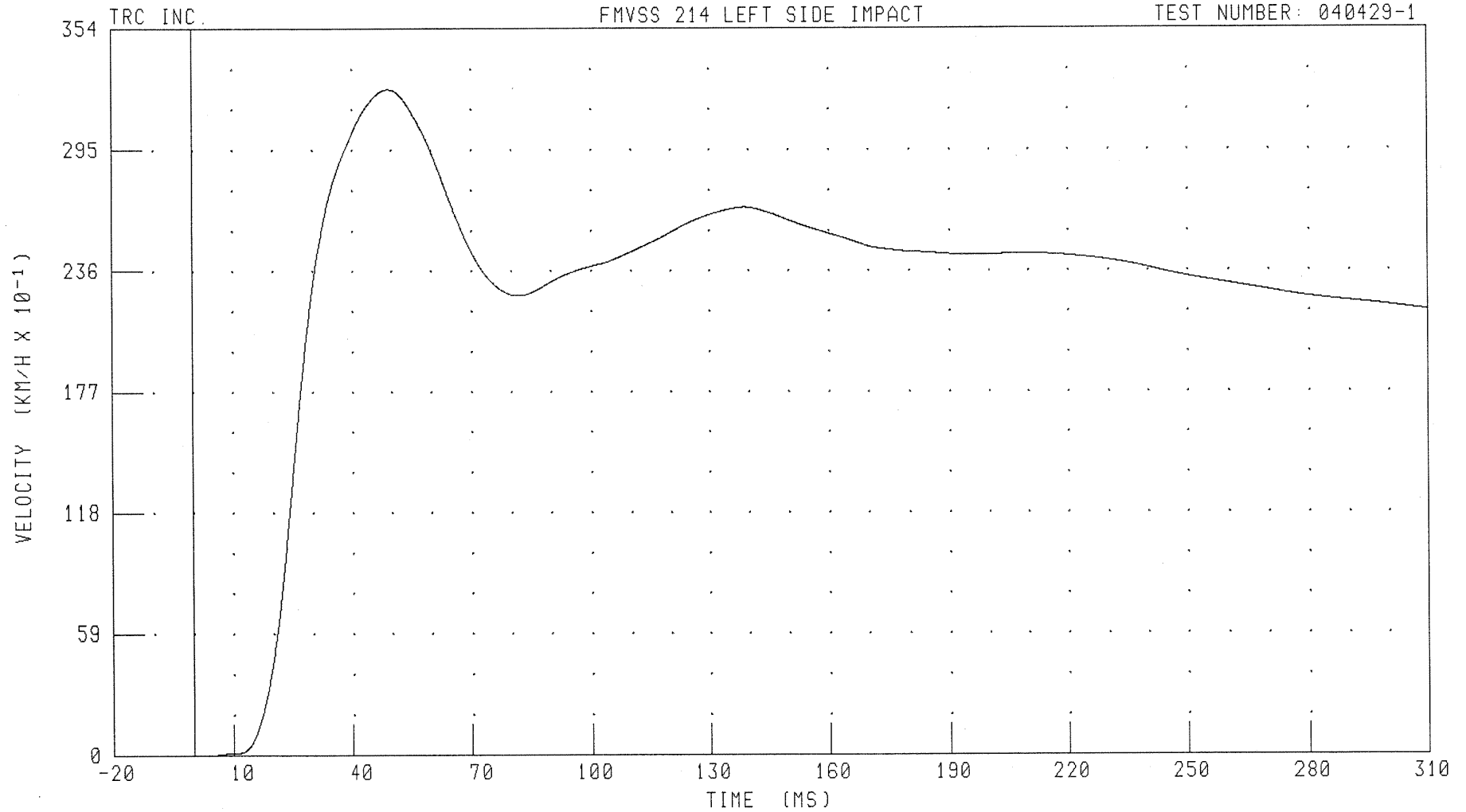
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYVI FILTER: CH. CLASS 180

PEAK DATA: 32.45 KM/H @ 49.28 MS; 0.00 KM/H @ 0.00 MS

B-73

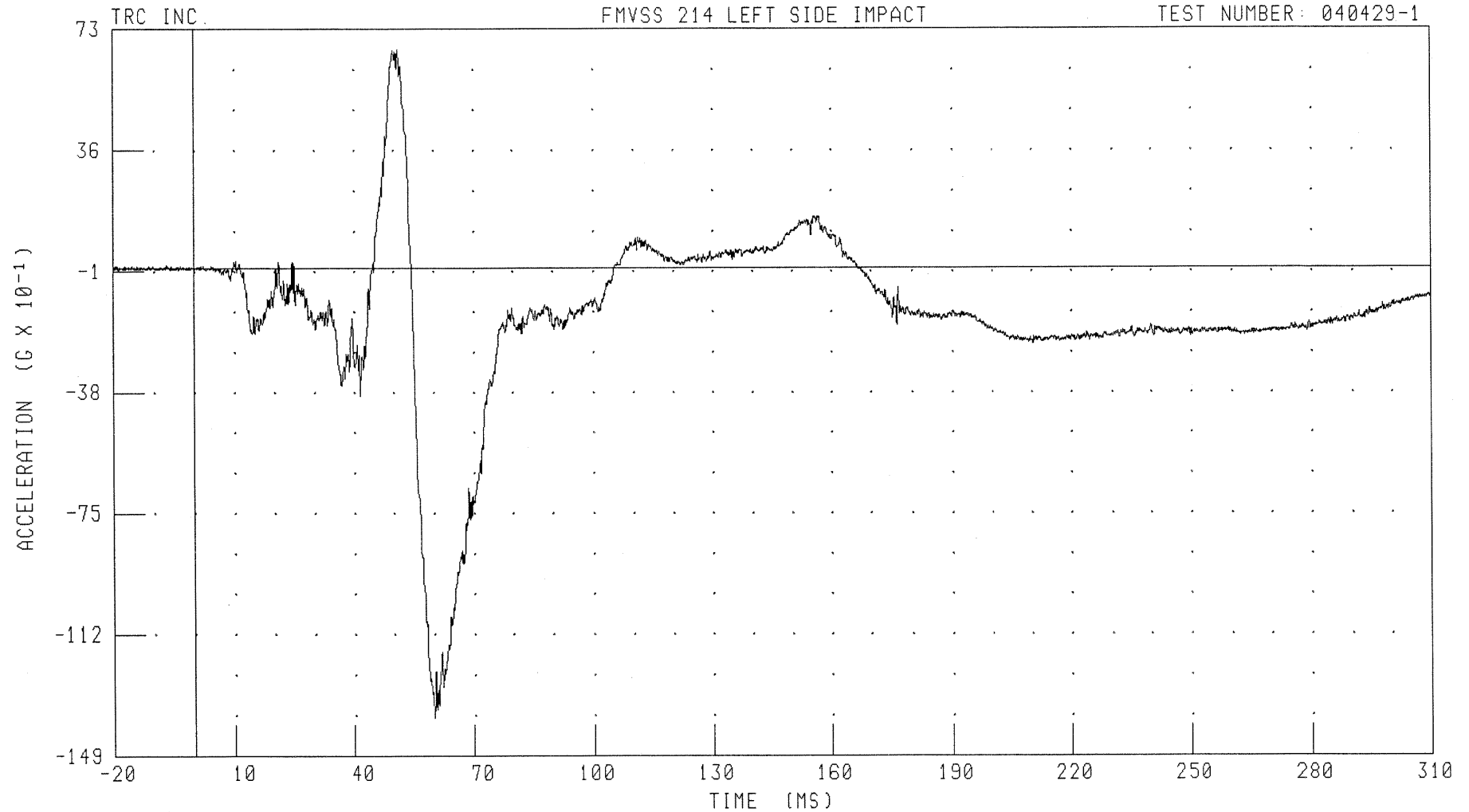
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXR4 FILTER: CH. CLASS 1000

PEAK DATA: 6.69 G @ 51.36 MS; -13.75 G @ 60.08 MS

B-74

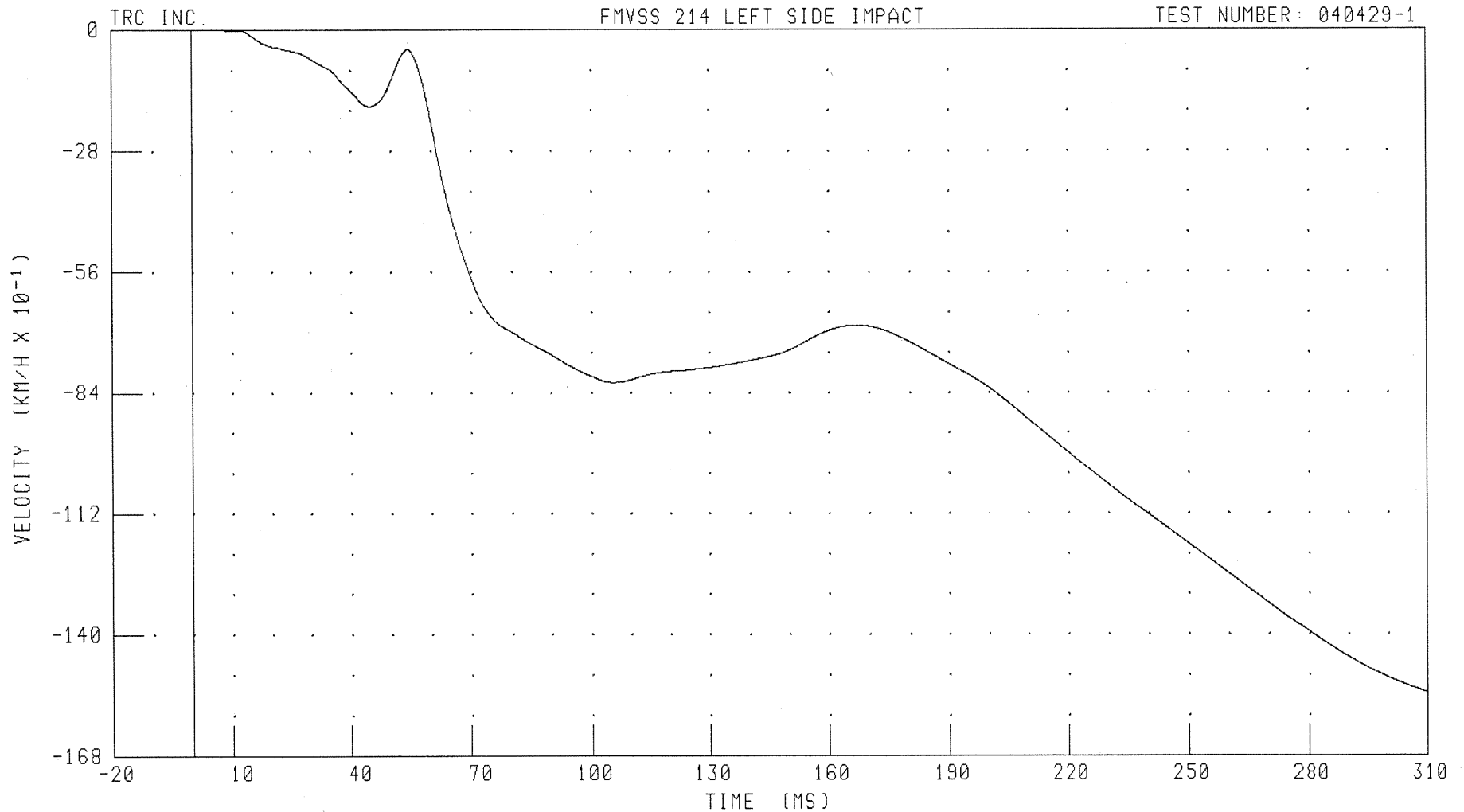
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDXVJ

FILTER: CH. CLASS 180

PEAK DATA: 0.00 KM/H @ 4.88 MS; -15.36 KM/H @ 310.00 MS

B-75

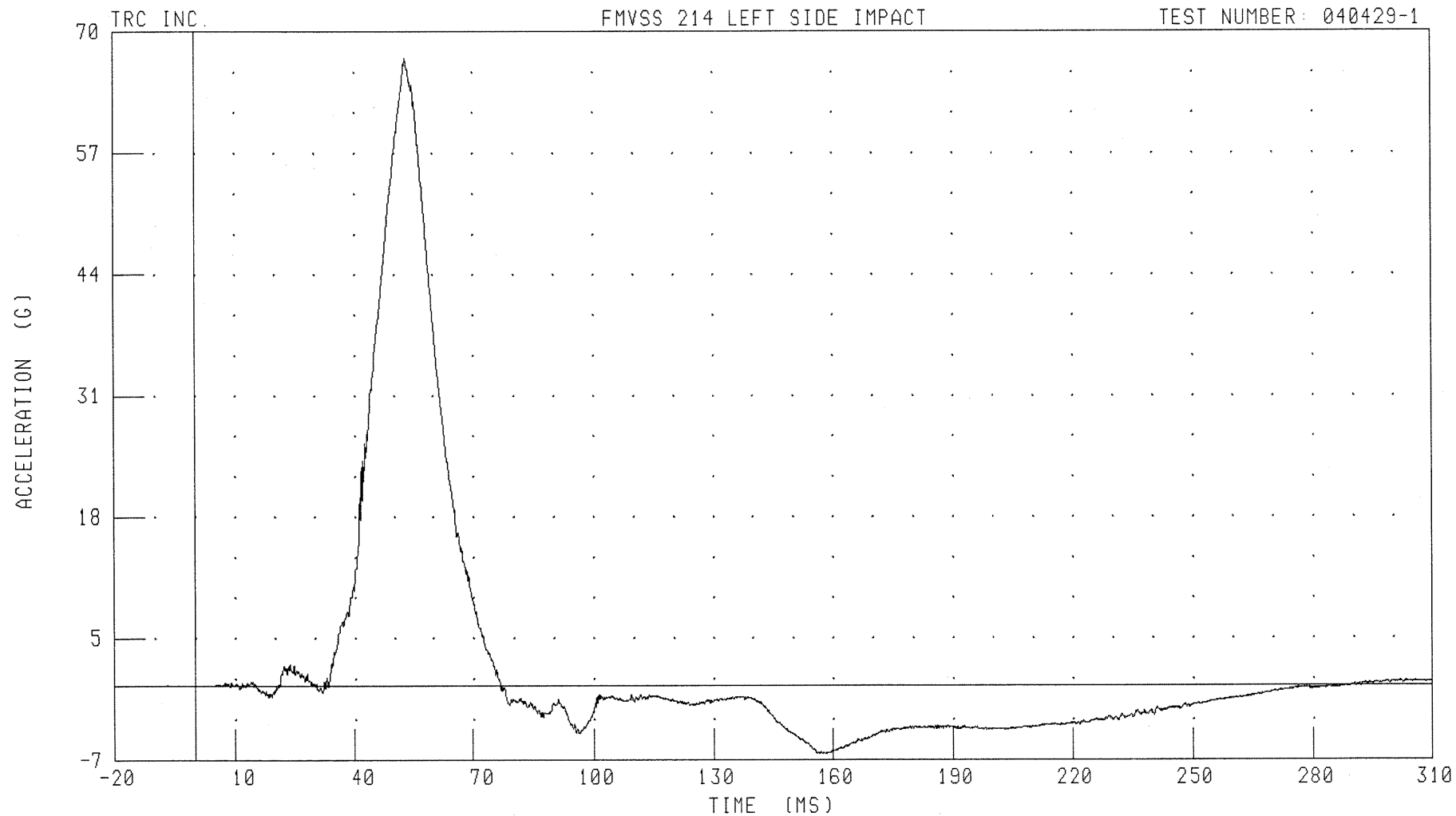
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYR4 FILTER: CH. CLASS 1000

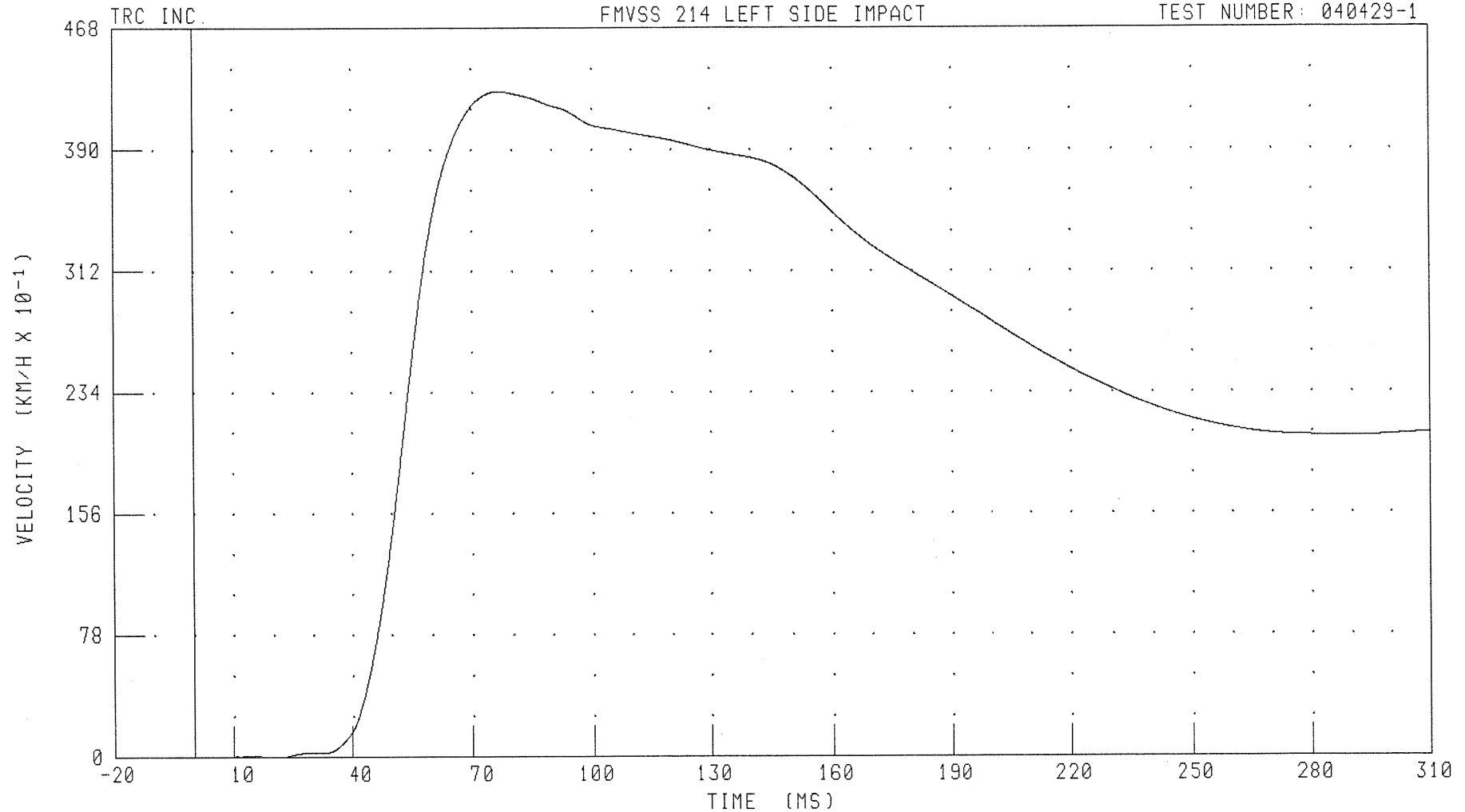
PEAK DATA: 67.25 G @ 53.12 MS; -7.27 G @ 156.00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDYVJ

FILTER: CH. CLASS 180

PEAK DATA: 42.75 KM/H @ 76.96 MS; -0.08 KM/H @ 20.80 MS

B-77

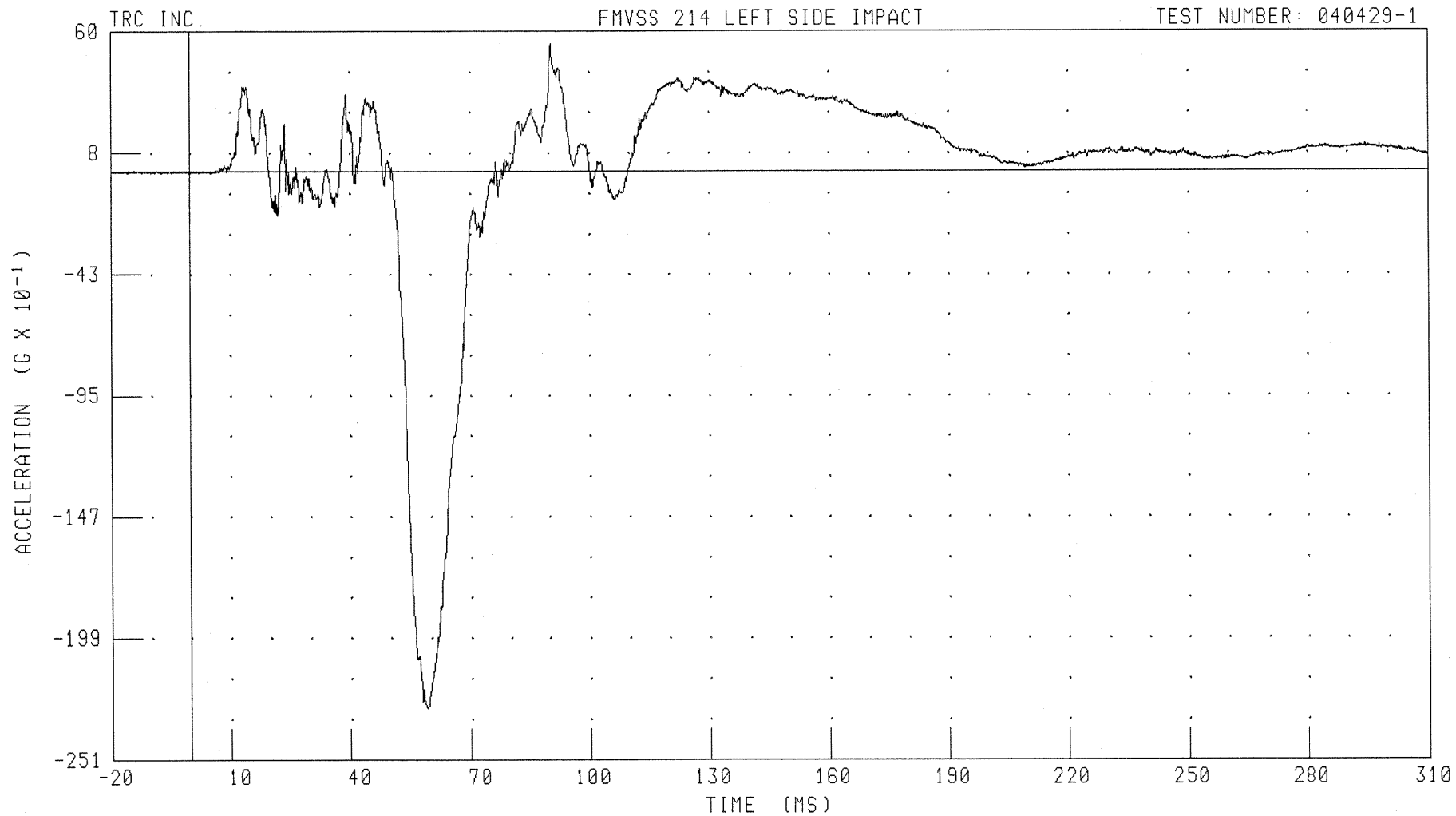
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZR4 FILTER: CH. CLASS 1000

PEAK DATA: 5.47 G @ 90.64 MS; -23.02 G @ 58.88 MS

B-78

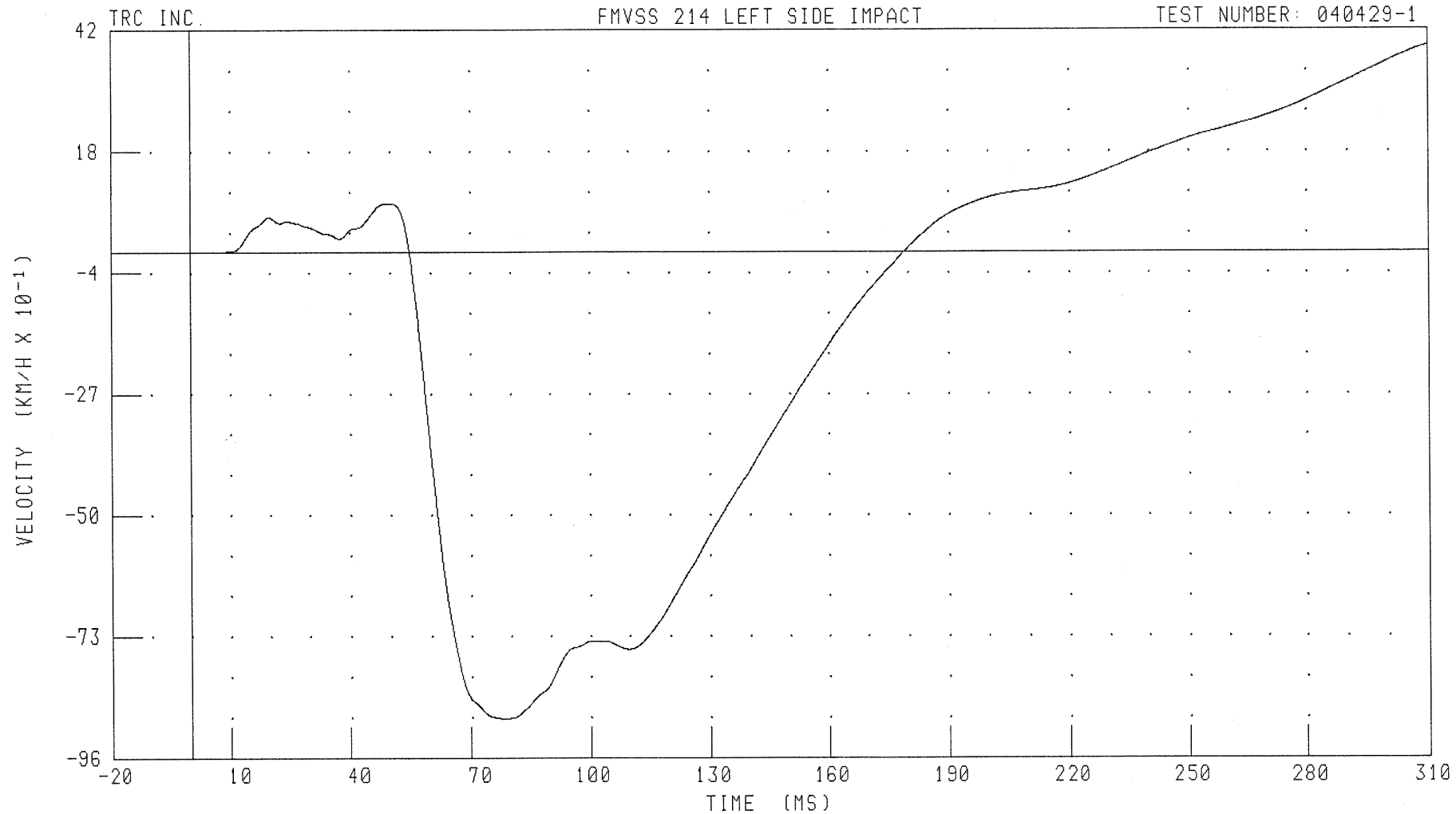
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDZVJ

FILTER: CH. CLASS 180

PEAK DATA: 3.91 KM/H @ 310.00 MS; -8.86 KM/H @ 78.32 MS

B-79

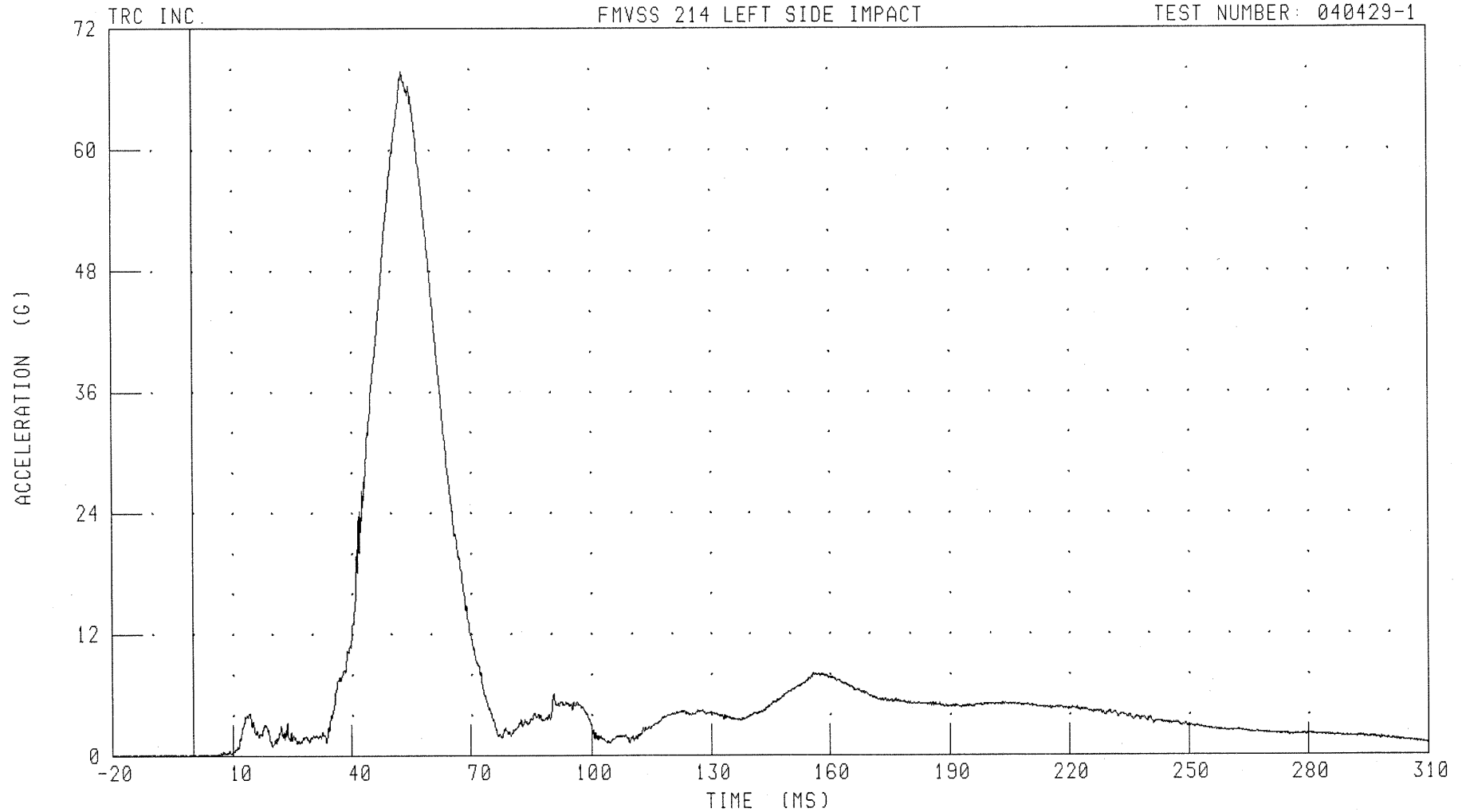
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER HEAD RESULTANT REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: HEDRR4 FILTER: CH. CLASS 1000

PEAK DATA: 67.71 G @ 53.12 MS; 0.01 G @ -17.60 MS

B-80

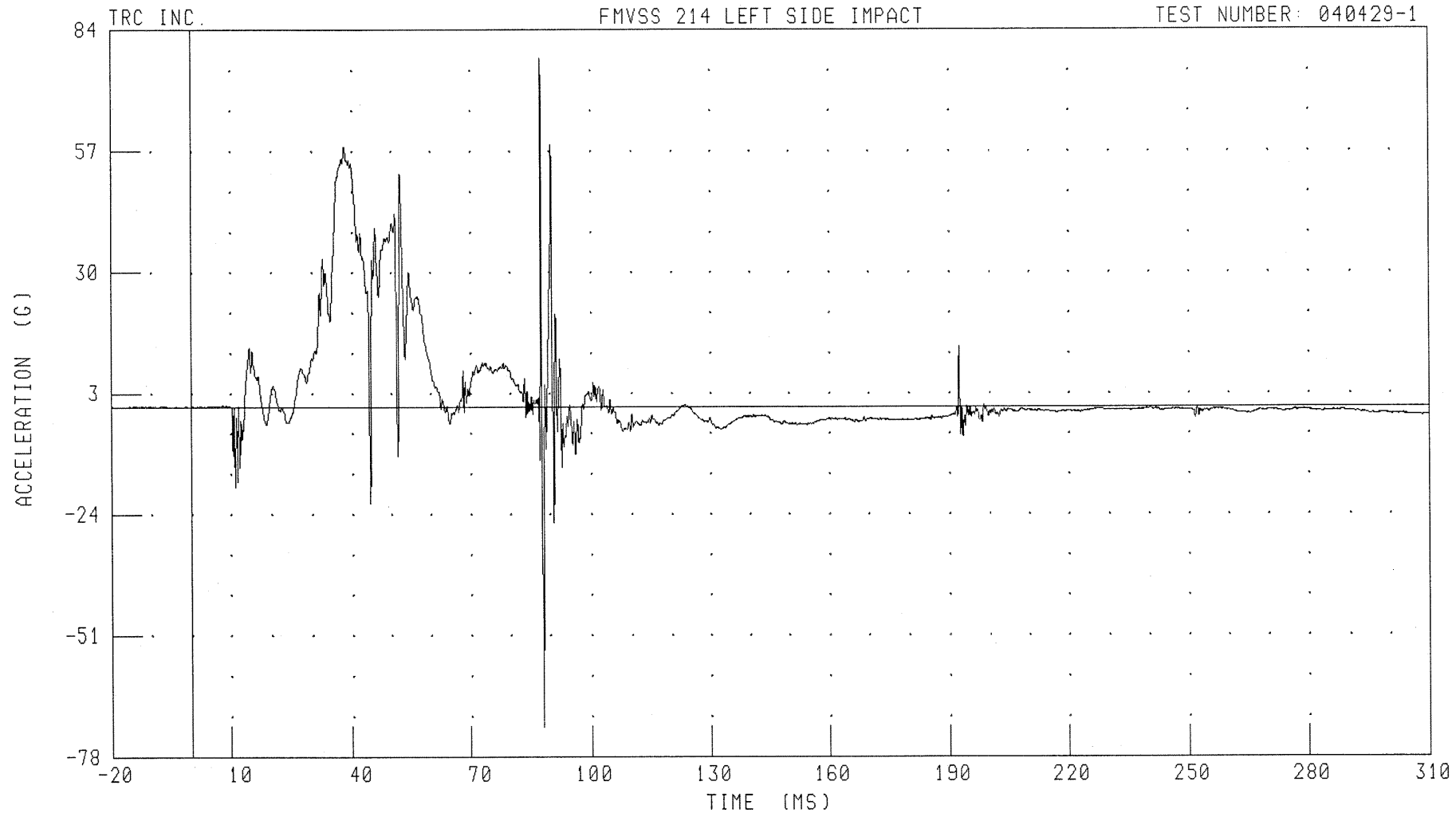
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYR4 FILTER: CH. CLASS 1000

PEAK DATA: 77.66 G @ 88.00 MS; -71.30 G @ 88.40 MS

B-81

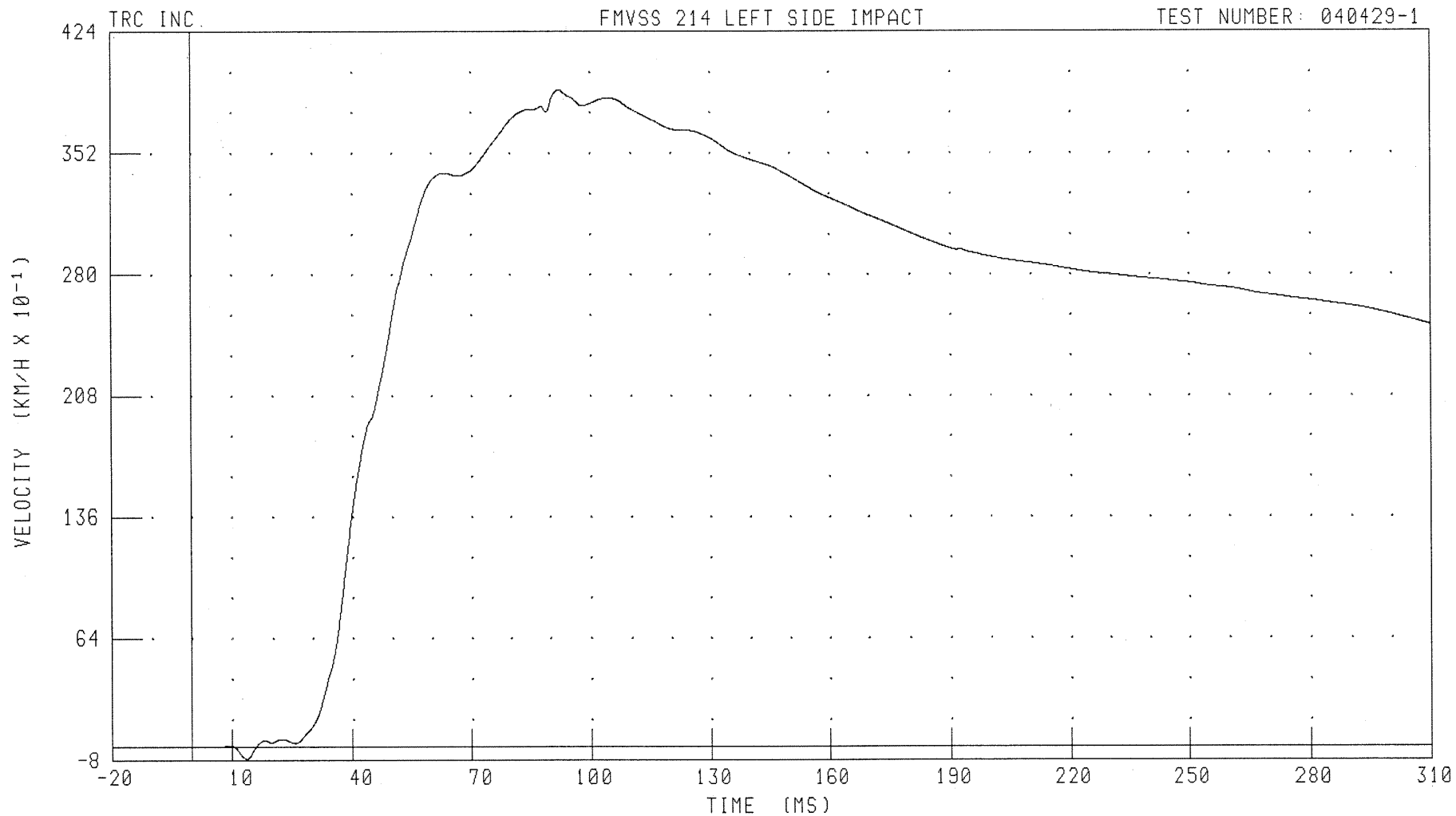
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYVJ

FILTER: CH. CLASS 180

PEAK DATA: 38.94 KM/H @ 92.48 MS; -0.73 KM/H @ 13.44 MS

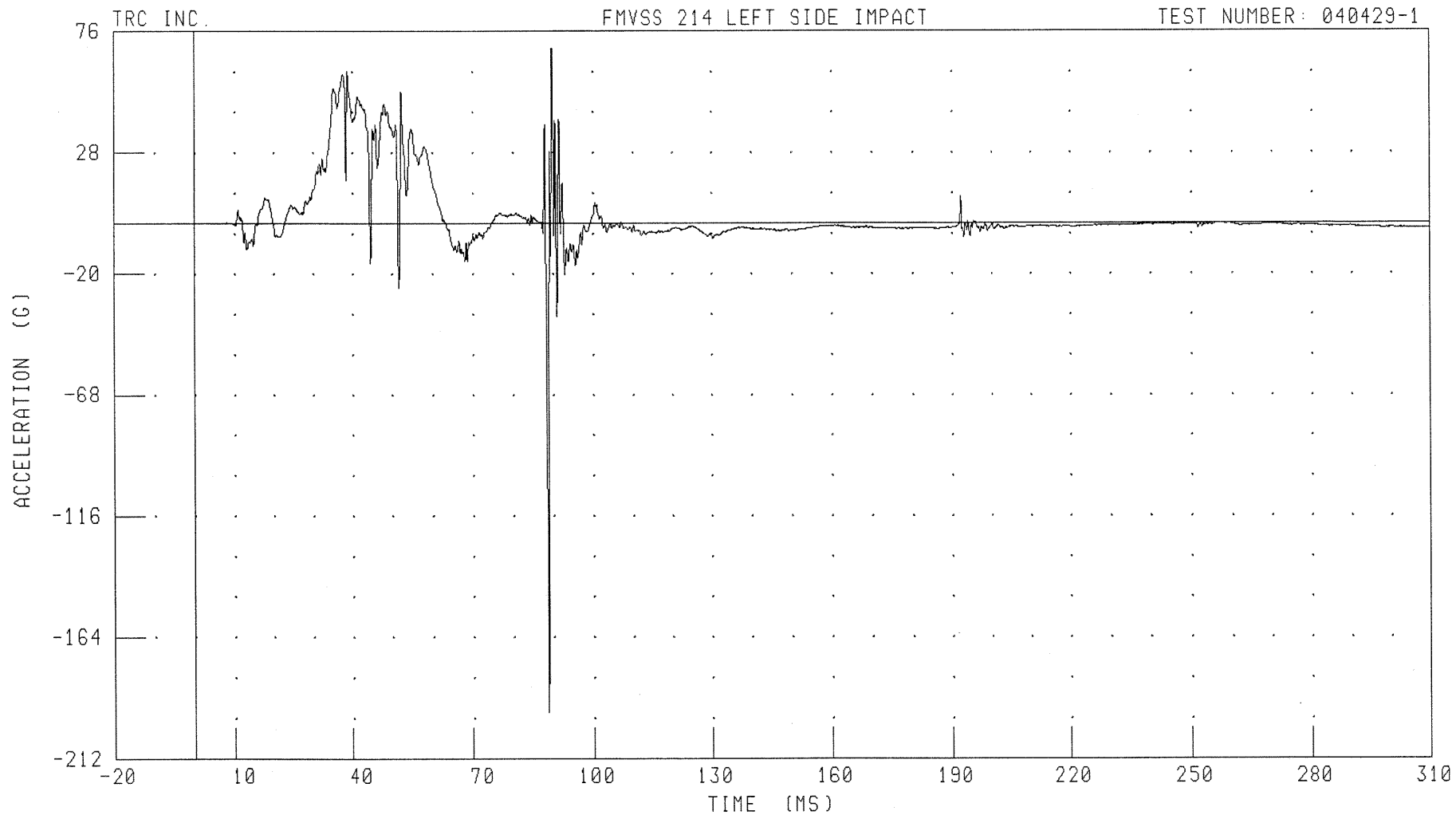
B-82

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYR4 FILTER: CH. CLASS 1000

PEAK DATA: 69.31 G @ 89.76 MS; -193.75 G @ 88.80 MS

B-83

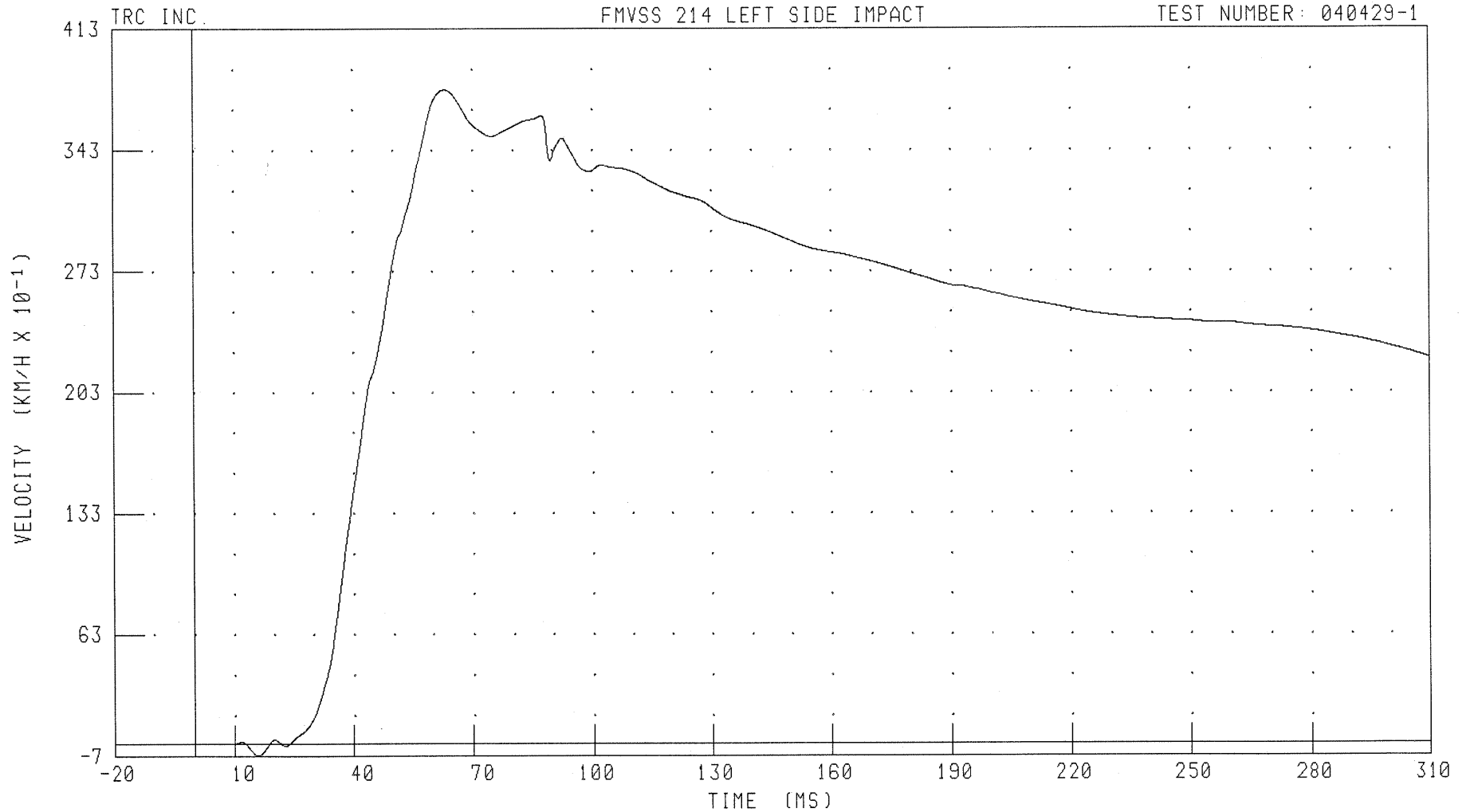
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYVJ FILTER: CH. CLASS 180

PEAK DATA: 37.79 KM/H @ 63.28 MS; -0.66 KM/H @ 15.76 MS

B-84

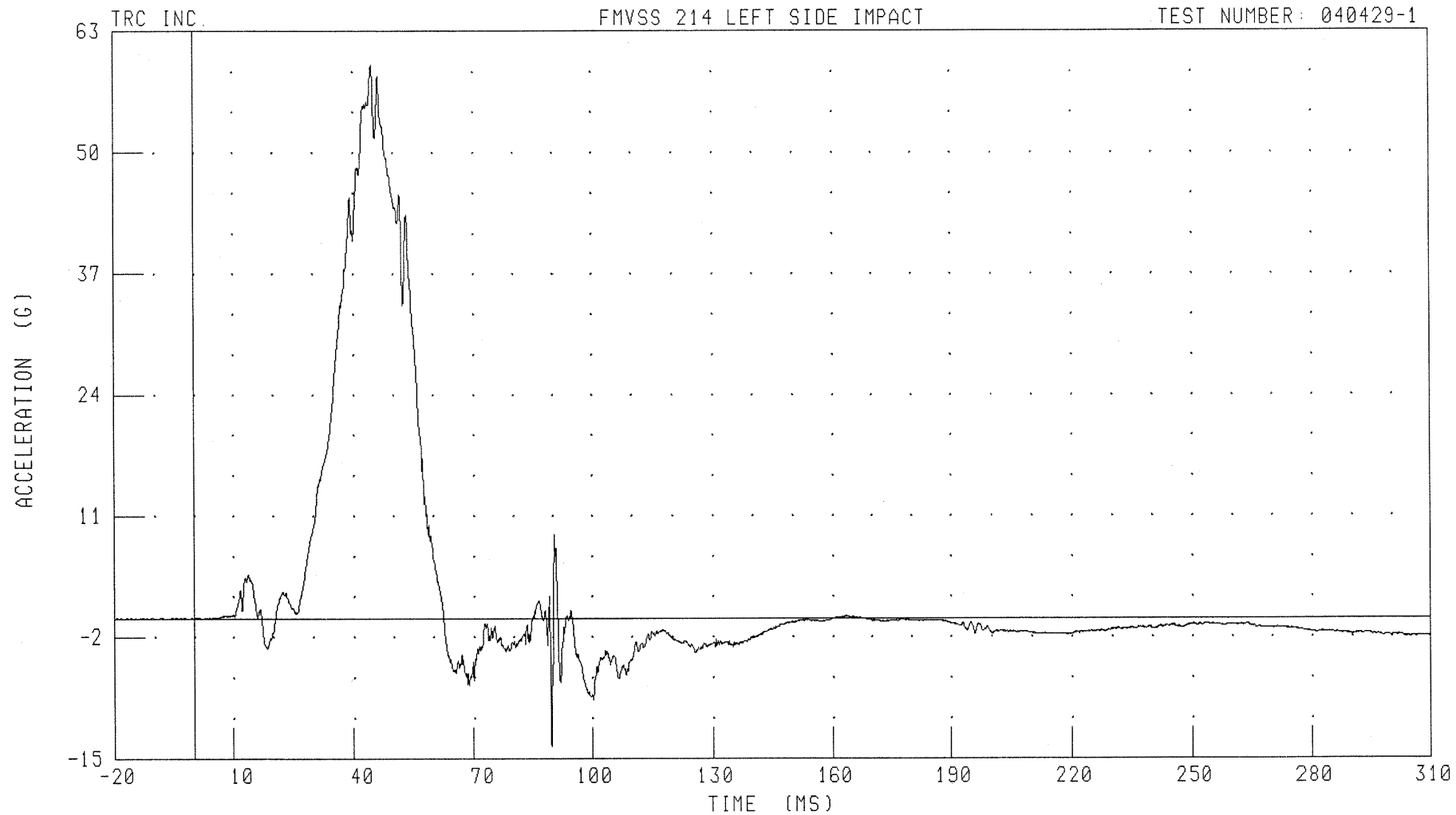
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YR4 FILTER: CH. CLASS 1000

PEAK DATA: 59.42 G @ 44.88 MS; -13.70 G @ 89.60 MS

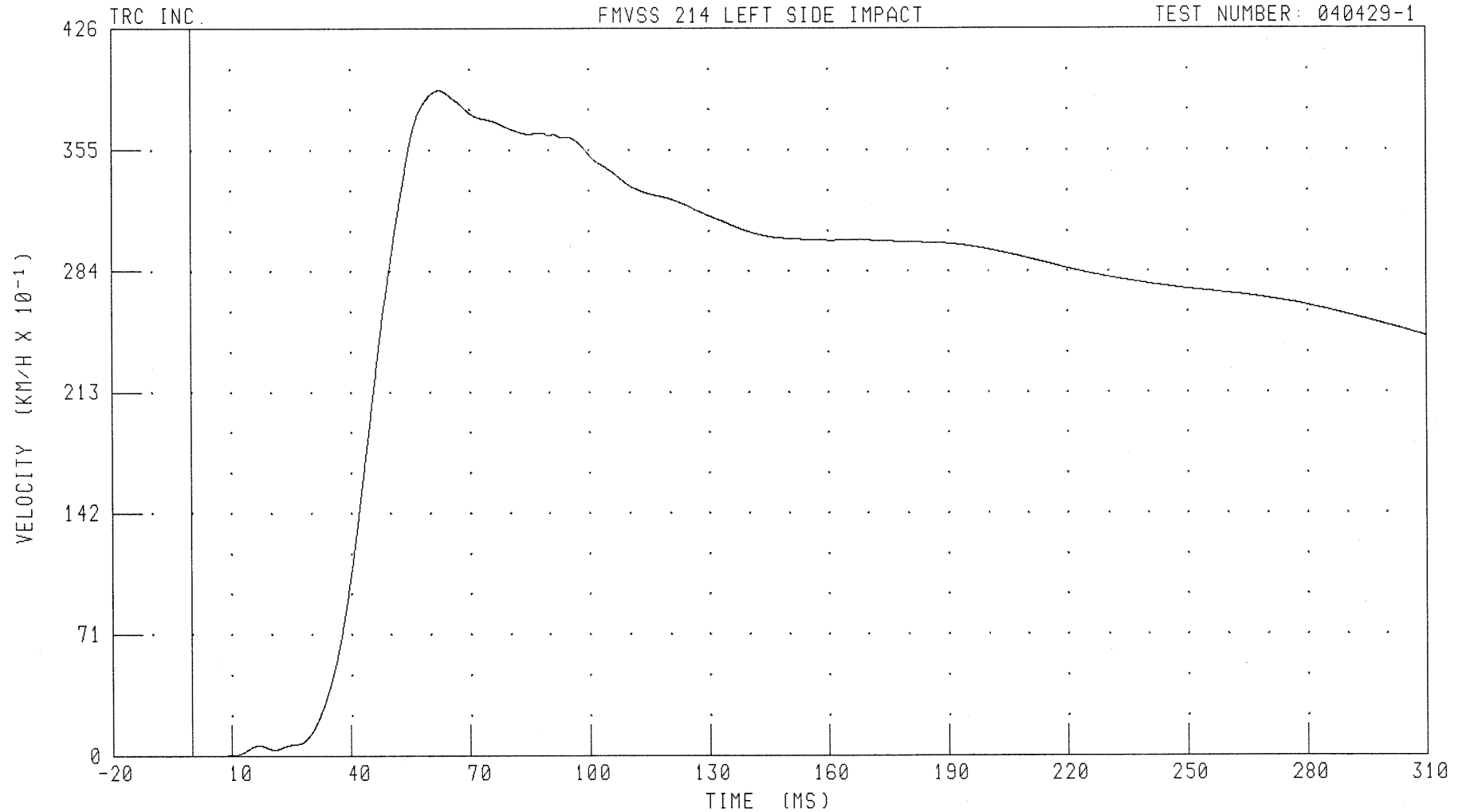
B-85

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YVJ FILTER: CH. CLASS 180

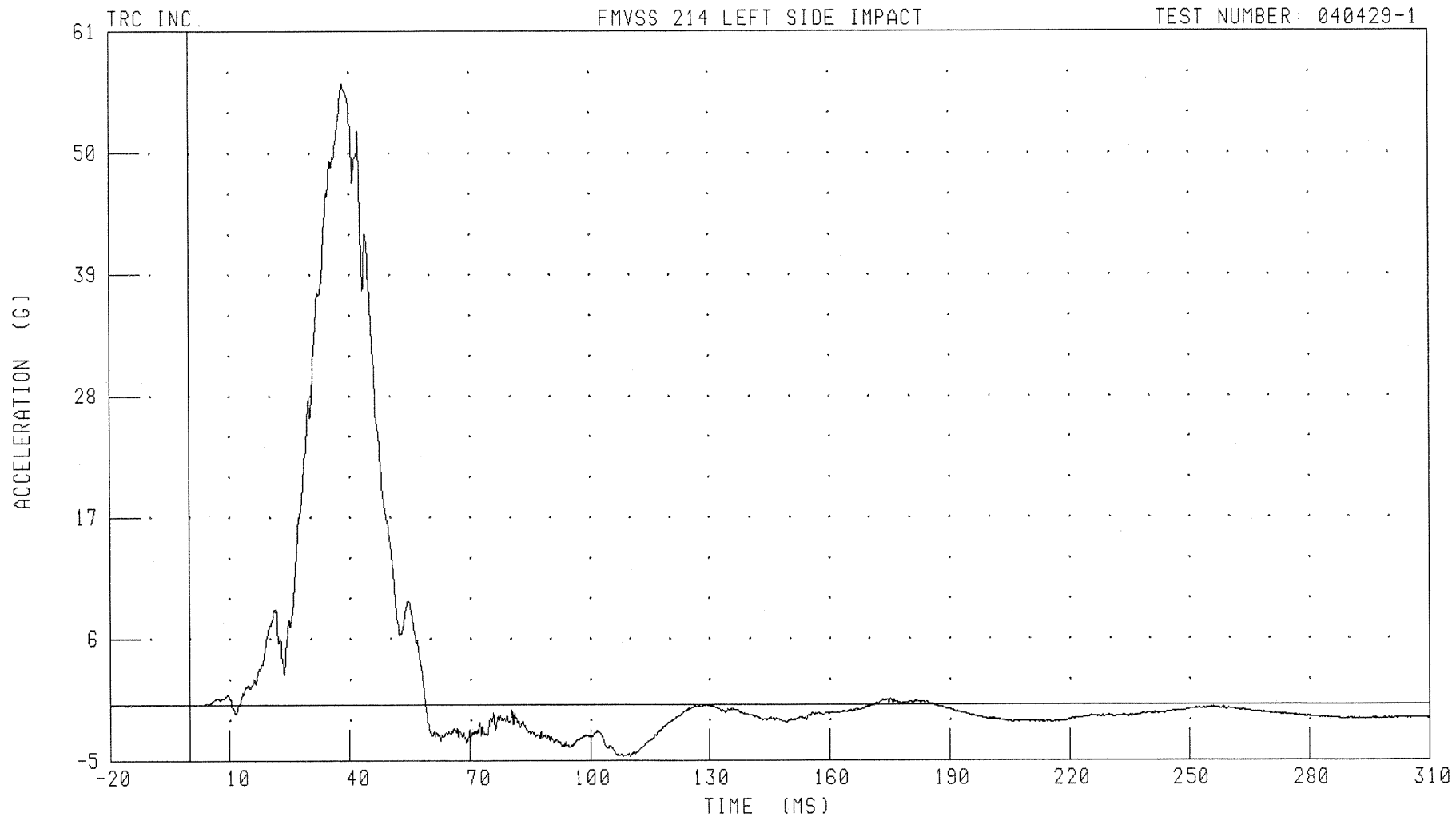
PEAK DATA: 38.99 KM/H @ 62.48 MS; 0.00 KM/H @ 0.00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYR4 FILTER: CH. CLASS 1000

PEAK DATA: 56.28 G @ 38.48 MS; -4.62 G @ 108.16 MS

B-87

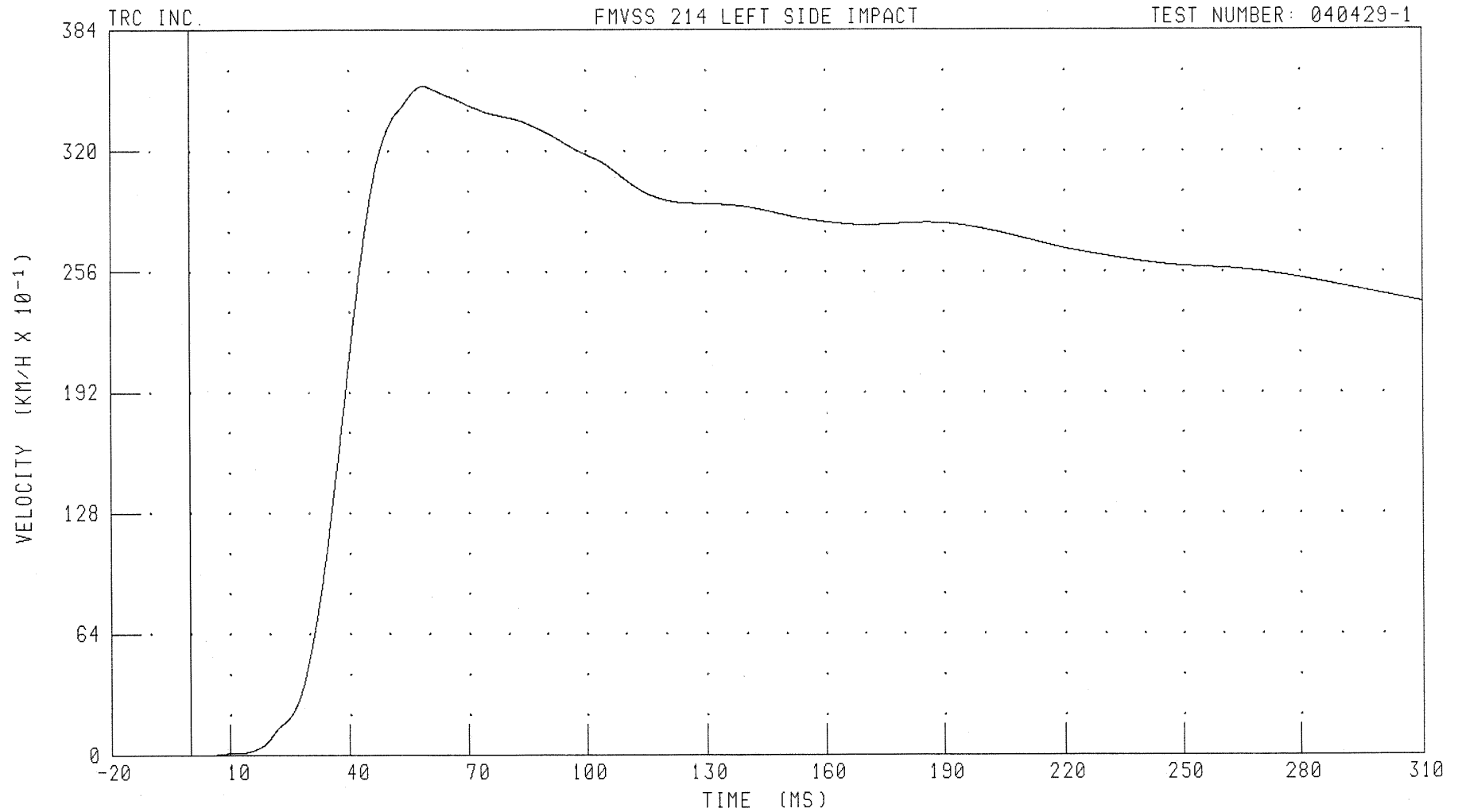
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYVJ

FILTER: CH. CLASS 180

PEAK DATA: 35.43 KM/H @ 58.80 MS; 0.00 KM/H @ 0.00 MS

B-88

040429-1

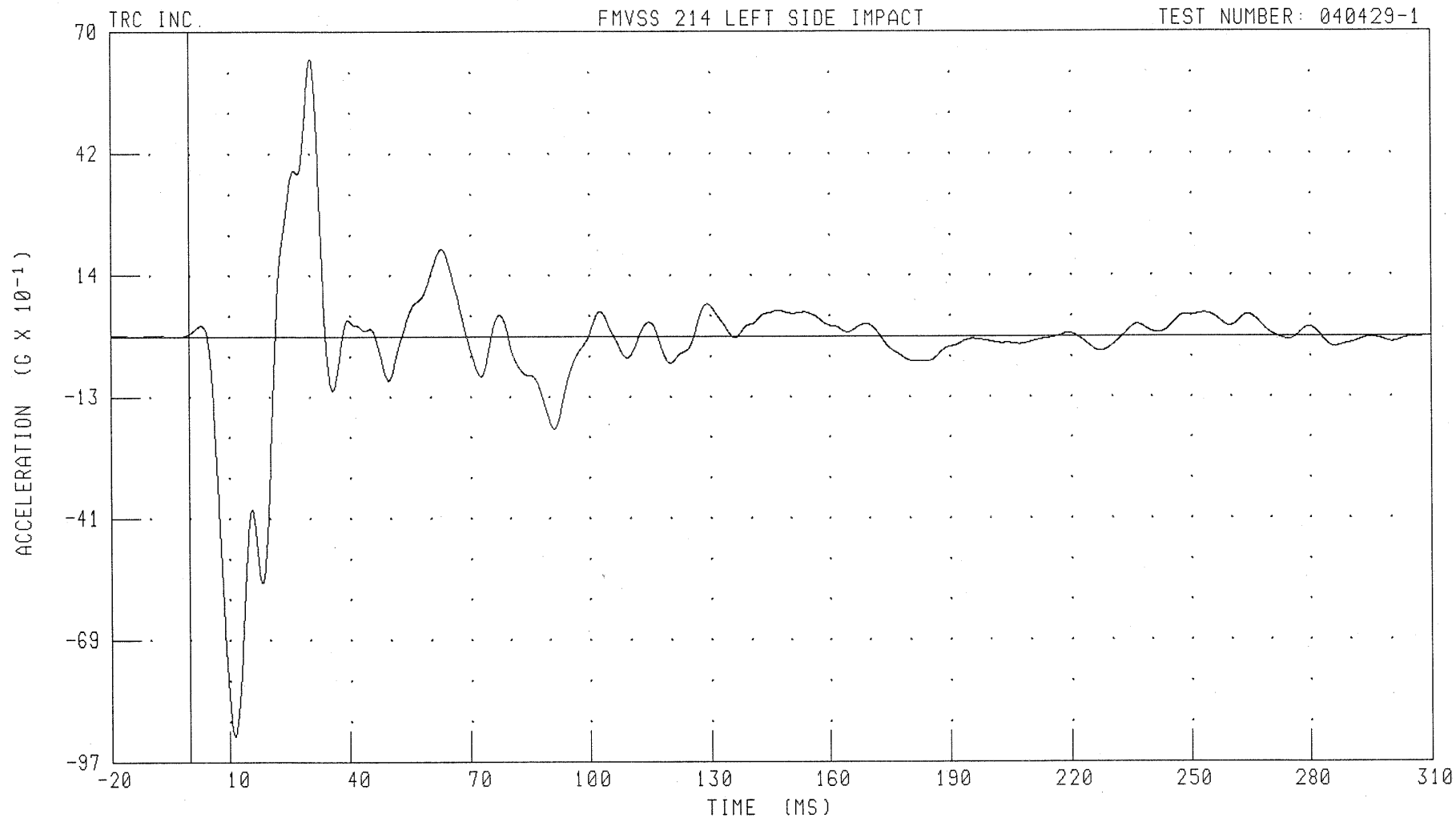
Test Vehicle Instrumentation Plots

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT FRONT SEAT X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 6.38 G @ 30.40 MS; -9.20 G @ 11.28 MS

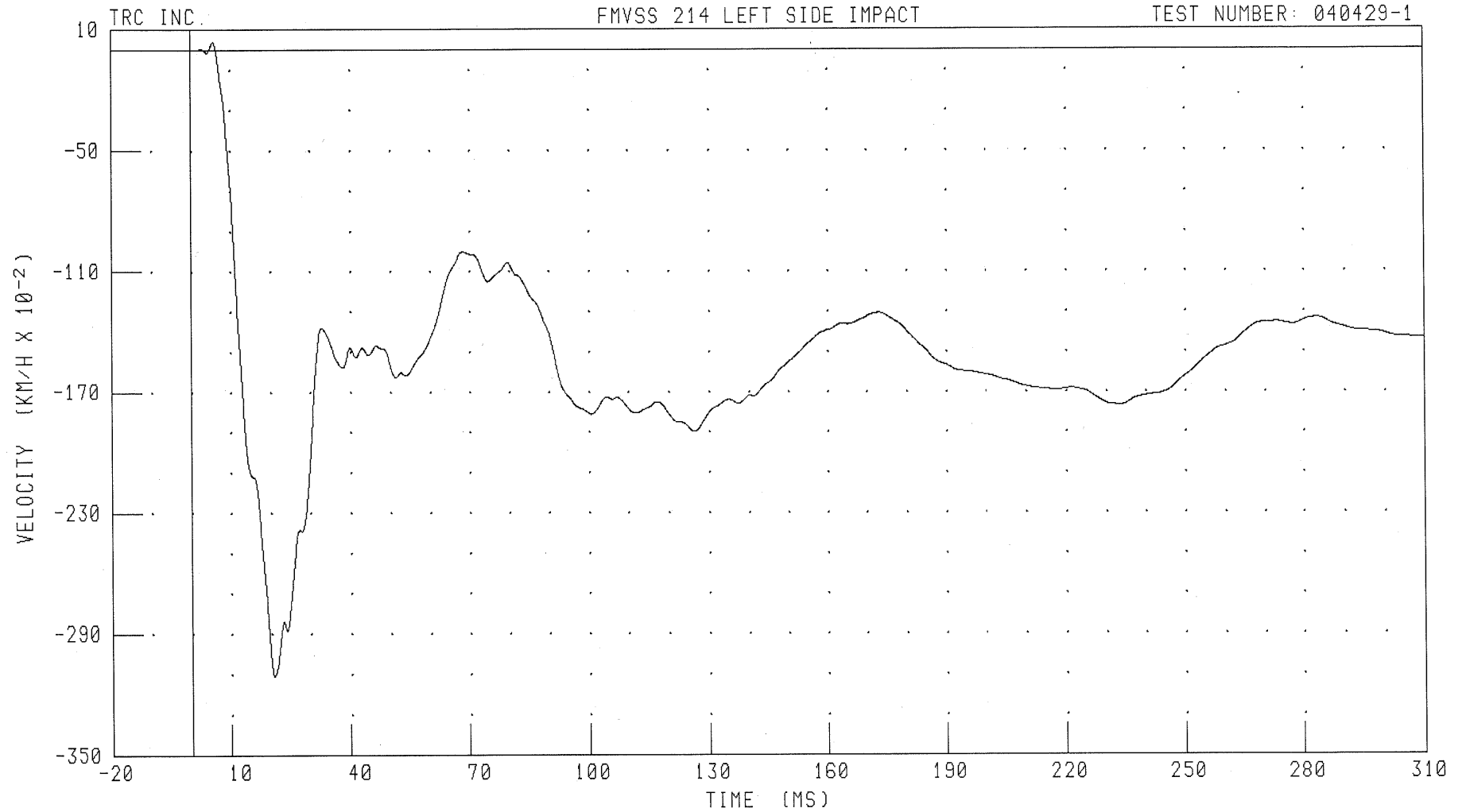
B-90

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
RIGHT SIDE SILL AT FRONT SEAT X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 0.04 KM/H @ 5.84 MS; -3.11 KM/H @ 20.72 MS

B-91

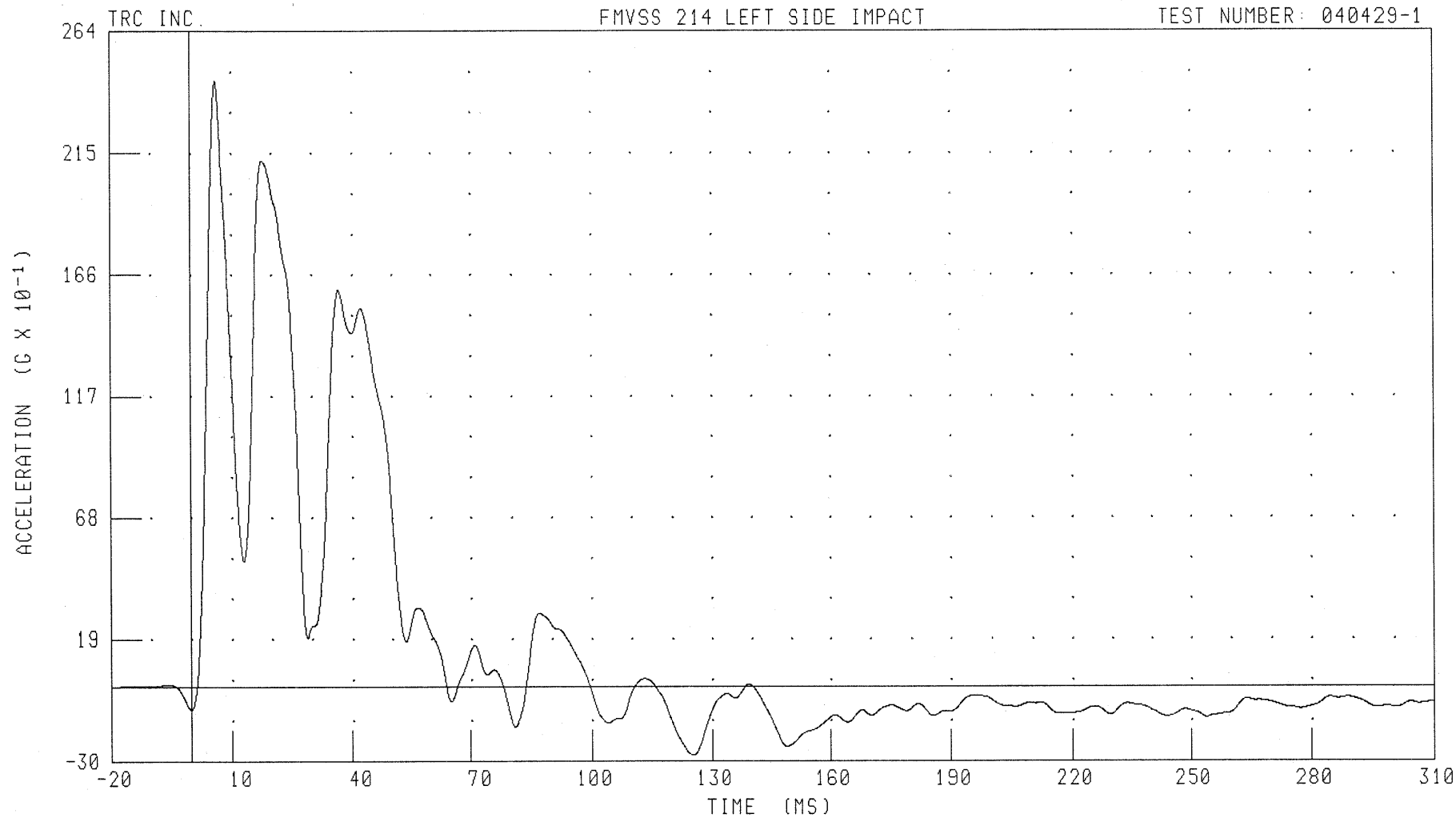
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSYG1 FILTER: CH. CLASS 60

PEAK DATA: 24.43 G @ 6.16 MS; -2.77 G @ 125.20 MS

B-92

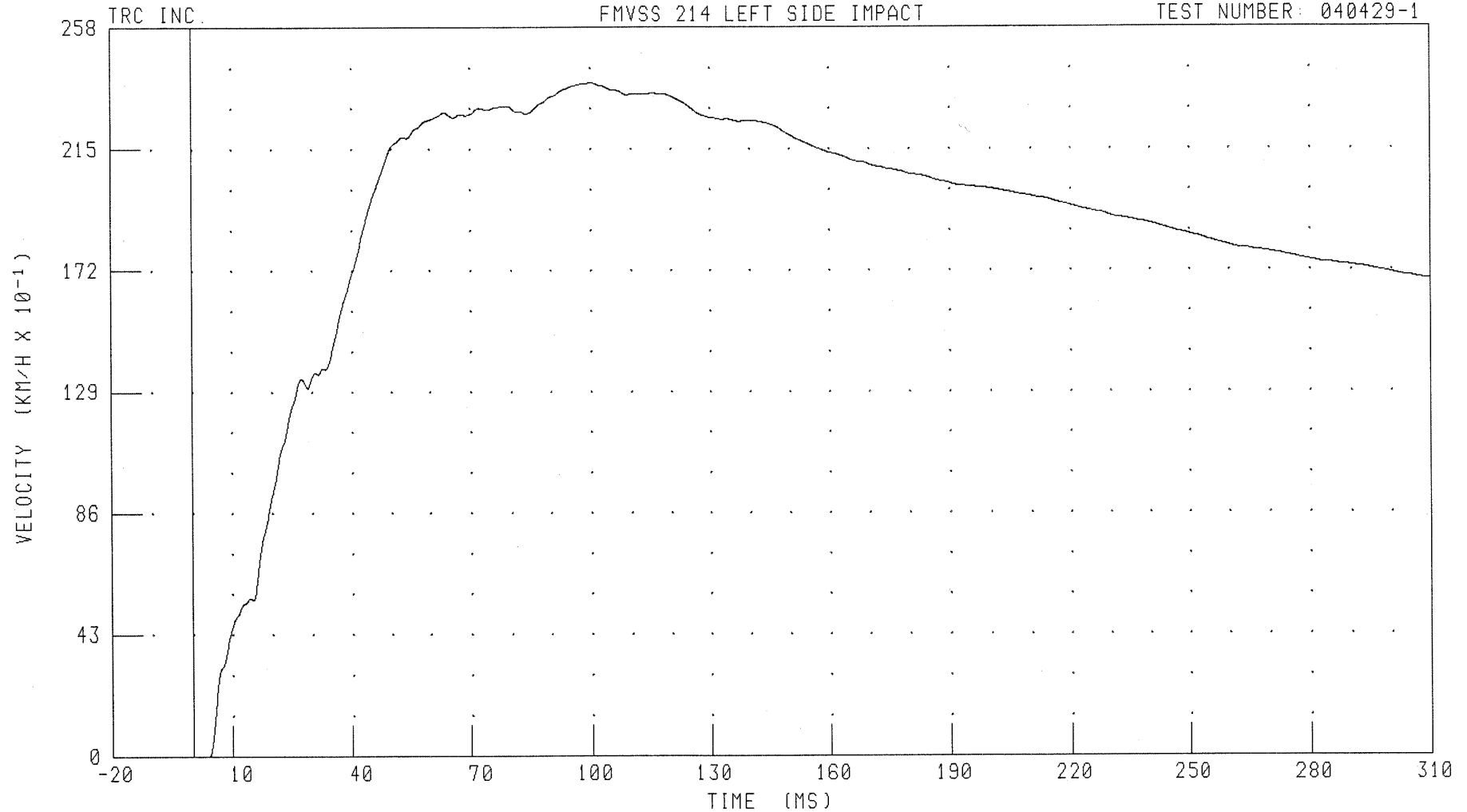
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSYV1

FILTER: CH. CLASS 180

PEAK DATA: 23.84 KM/H @ 100.24 MS; -0.02 KM/H @ 3.52 MS

B-93

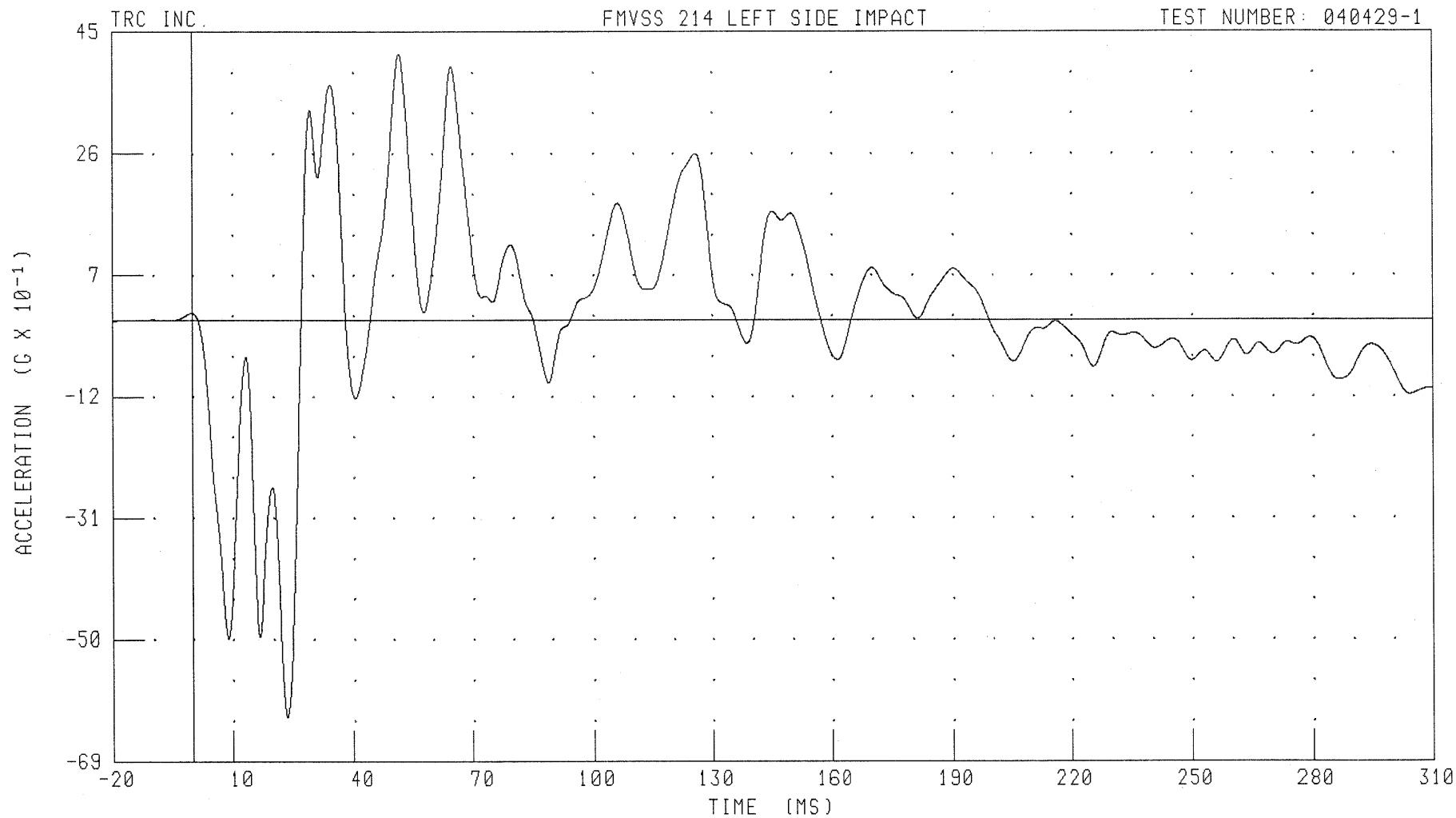
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT FRONT SEAT Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSZG1 FILTER: CH. CLASS 60

PEAK DATA: 4.16 G @ 51.68 MS; -6.21 G @ 23.52 MS

B-94

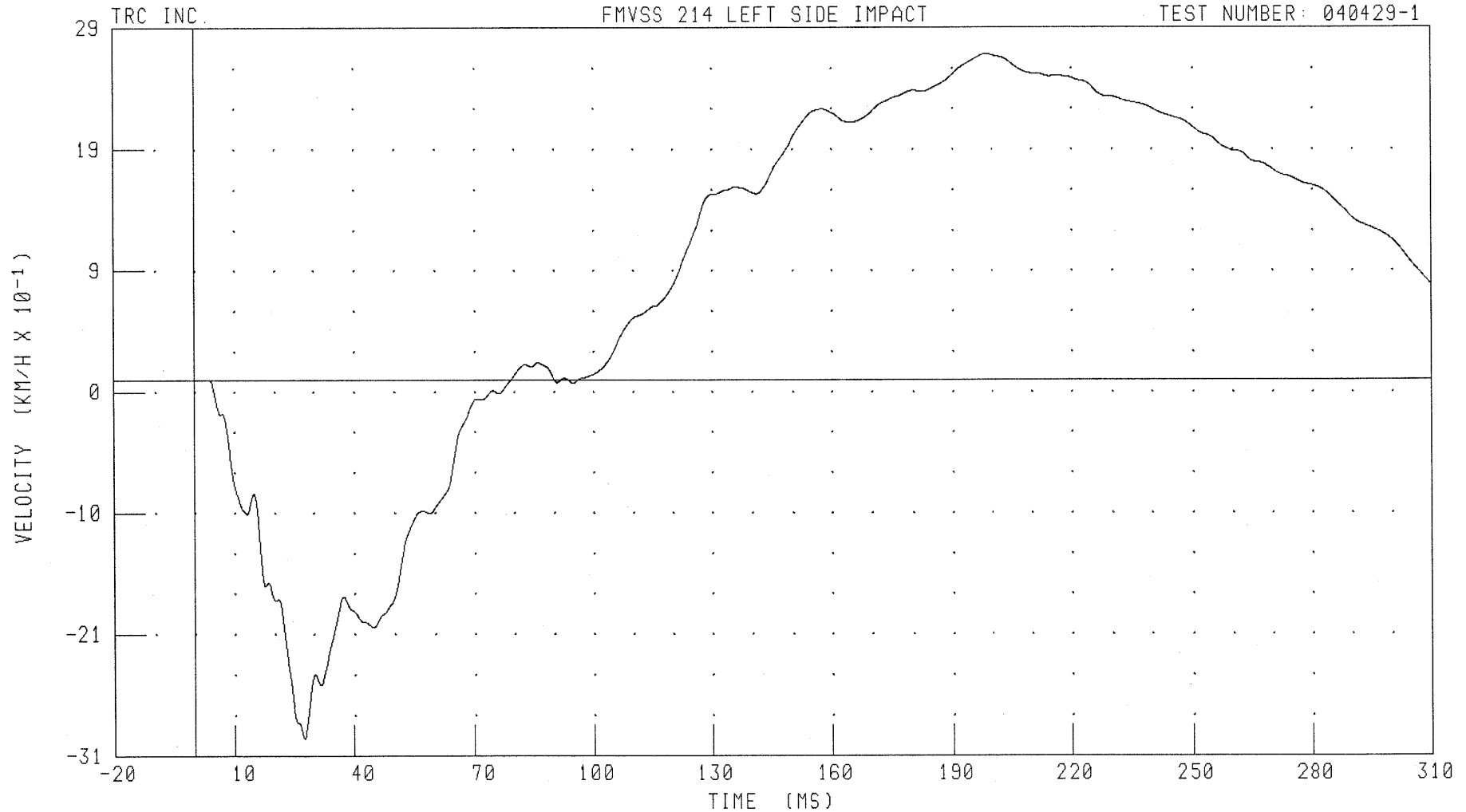
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT FRONT SEAT Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSZV1 FILTER: CH. CLASS 180

PEAK DATA: 2.68 KM/H @ 198.72 MS; -2.96 KM/H @ 27.52 MS

B-95

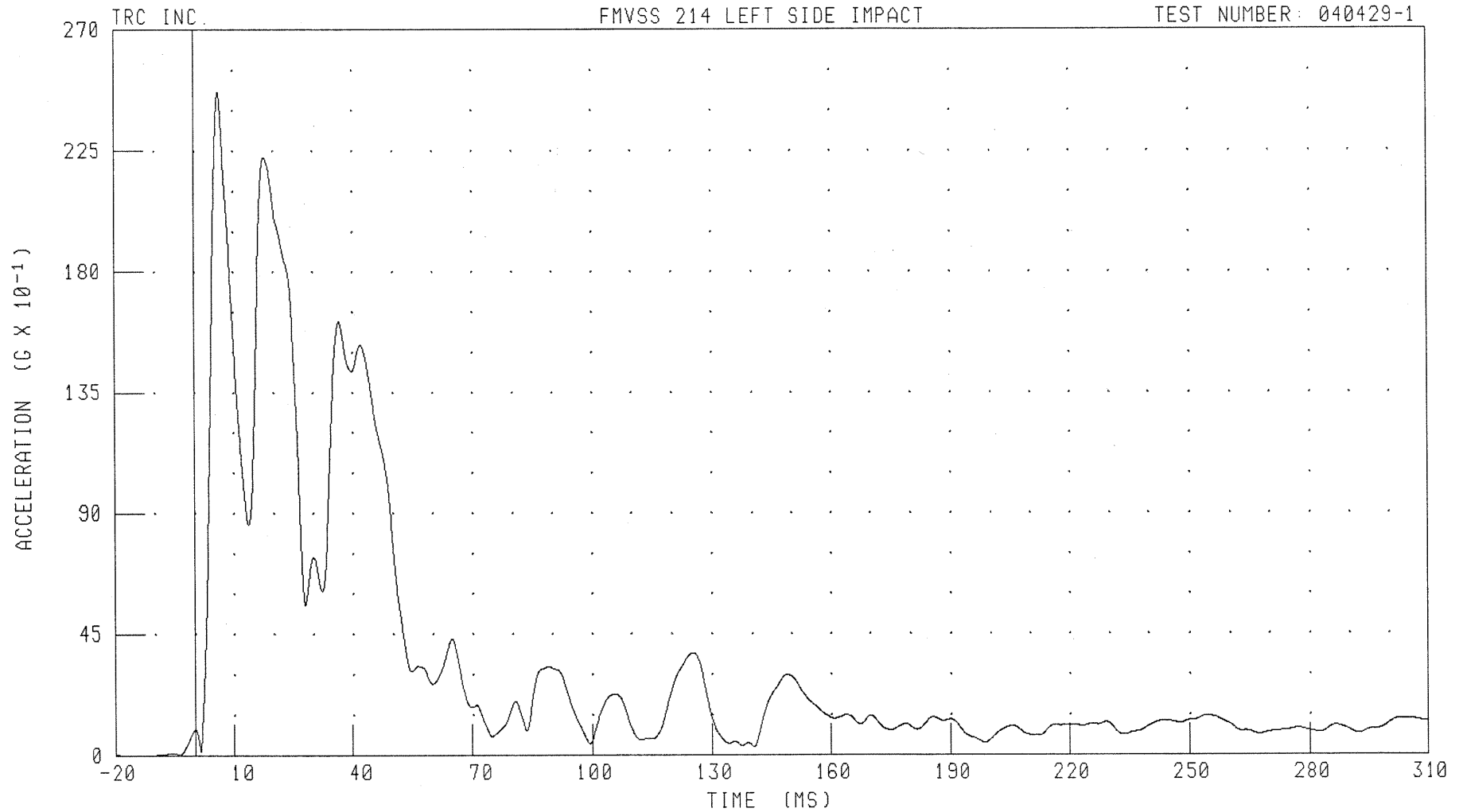
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RFSRG1 FILTER: CH. CLASS 60

PEAK DATA: 24.70 G @ 6.24 MS; 0.00 G @ -12.08 MS

B-96

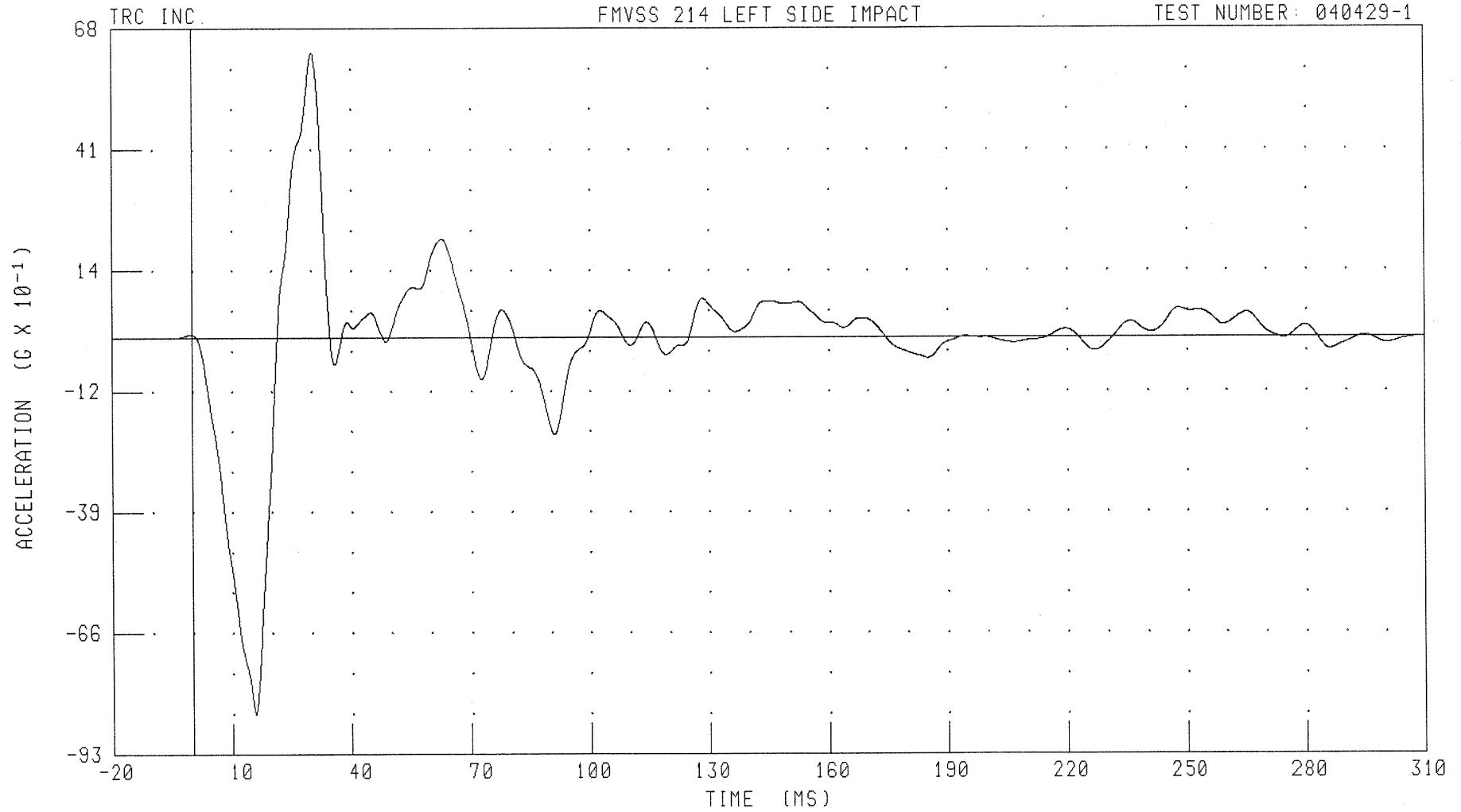
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT REAR SEAT X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 6.36 G @ 30.40 MS; -8.42 G @ 15.92 MS

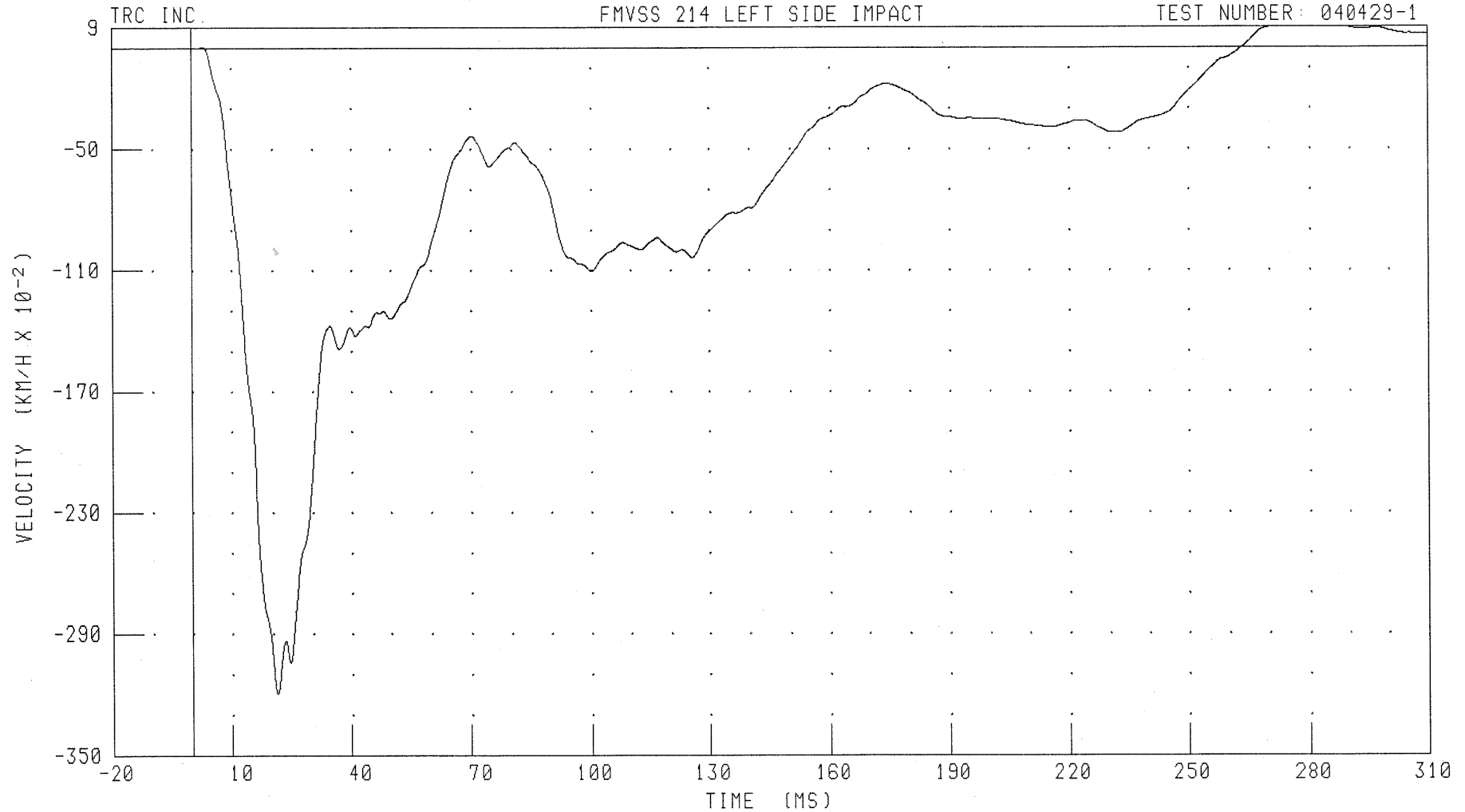
B-97

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
RIGHT SIDE SILL AT REAR SEAT X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 0.15 KM/H @ 283.68 MS; -3.20 KM/H @ 21.12 MS

B-98

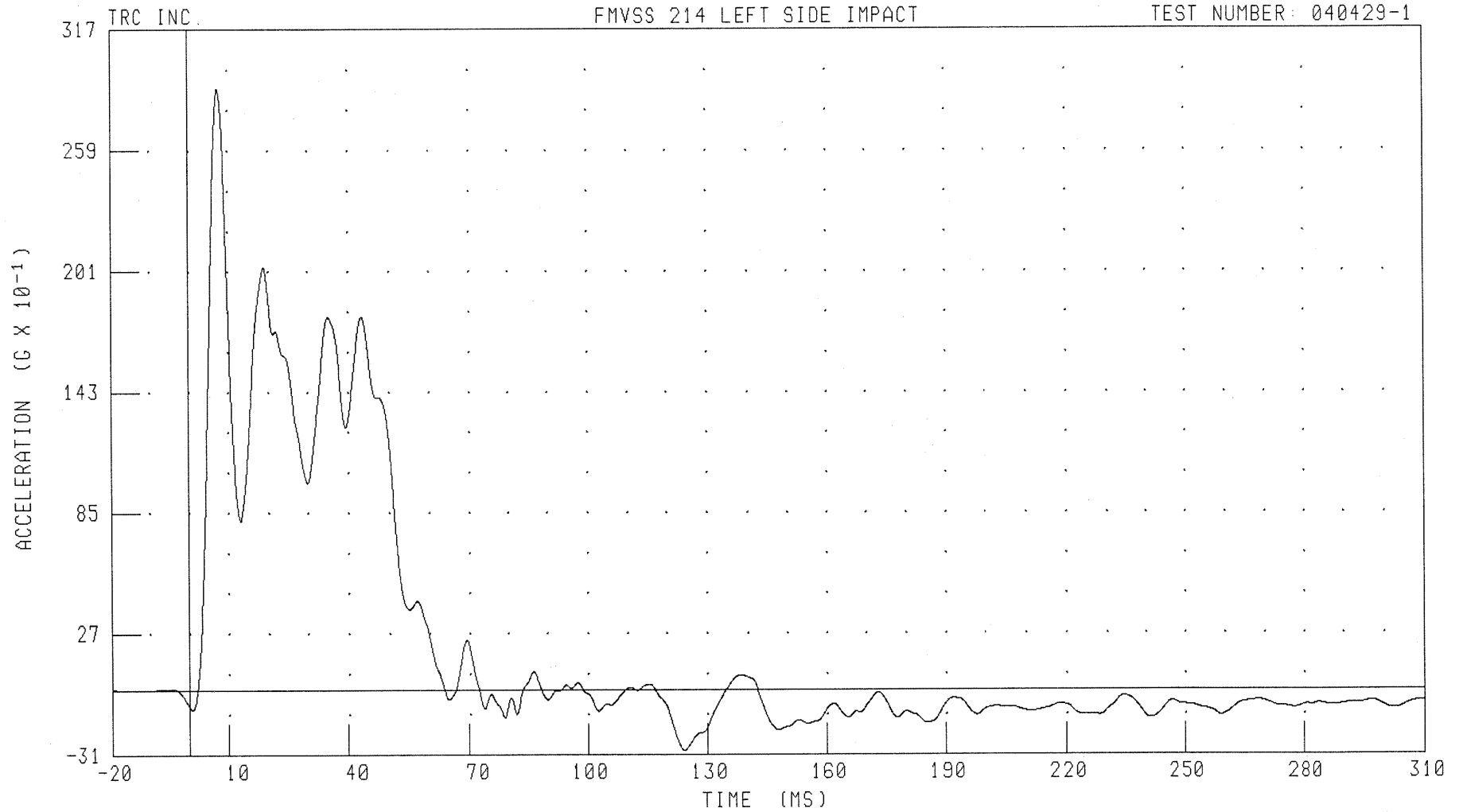
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSYG1

FILTER: CH. CLASS 60

PEAK DATA: 28.85 G @ 7.60 MS; -2.90 G @ 124.32 MS

B-99

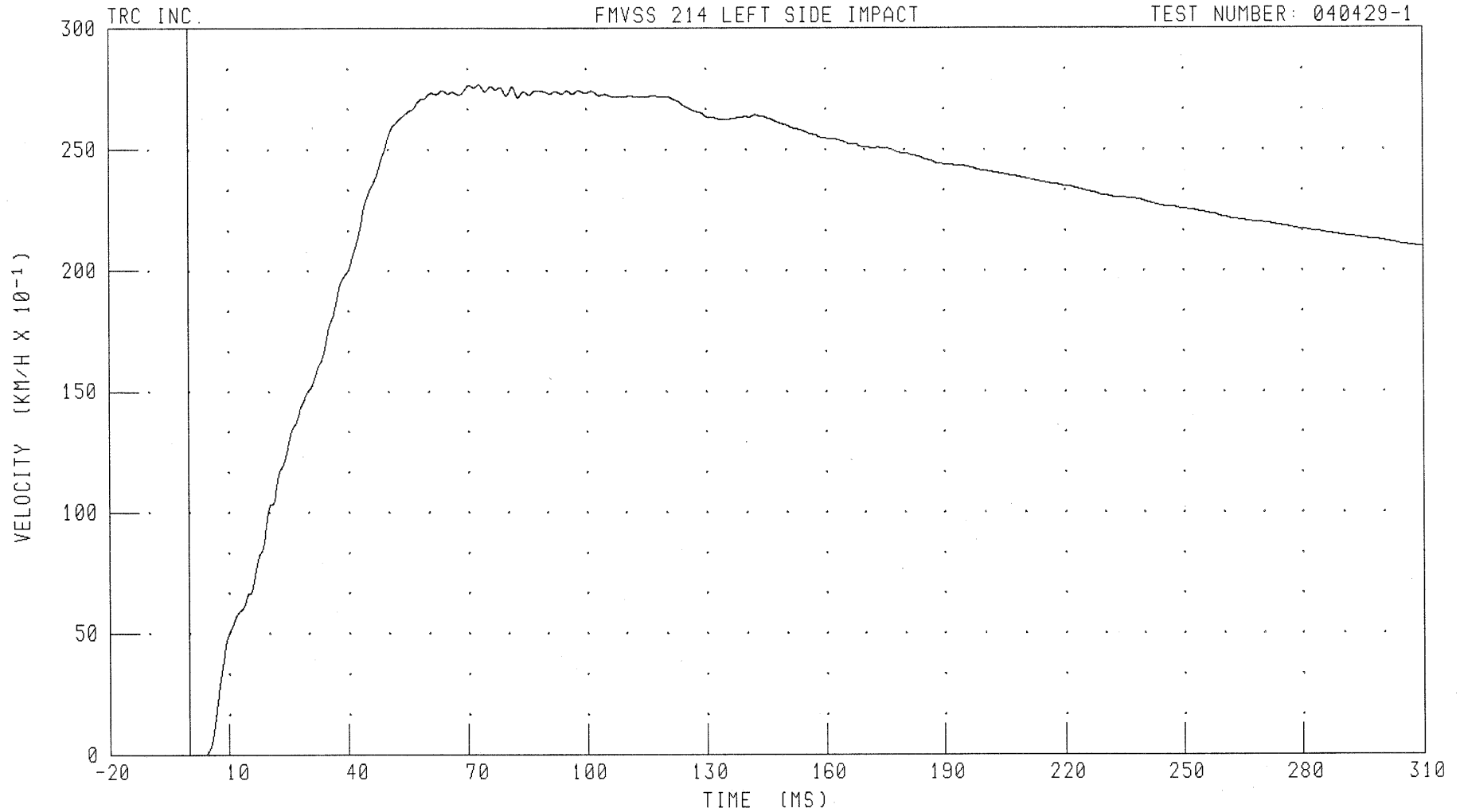
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSYV1

FILTER: CH. CLASS 180

PEAK DATA: 27.67 KM/H @ 73.04 MS; 0.00 KM/H @ 3.60 MS

B-100

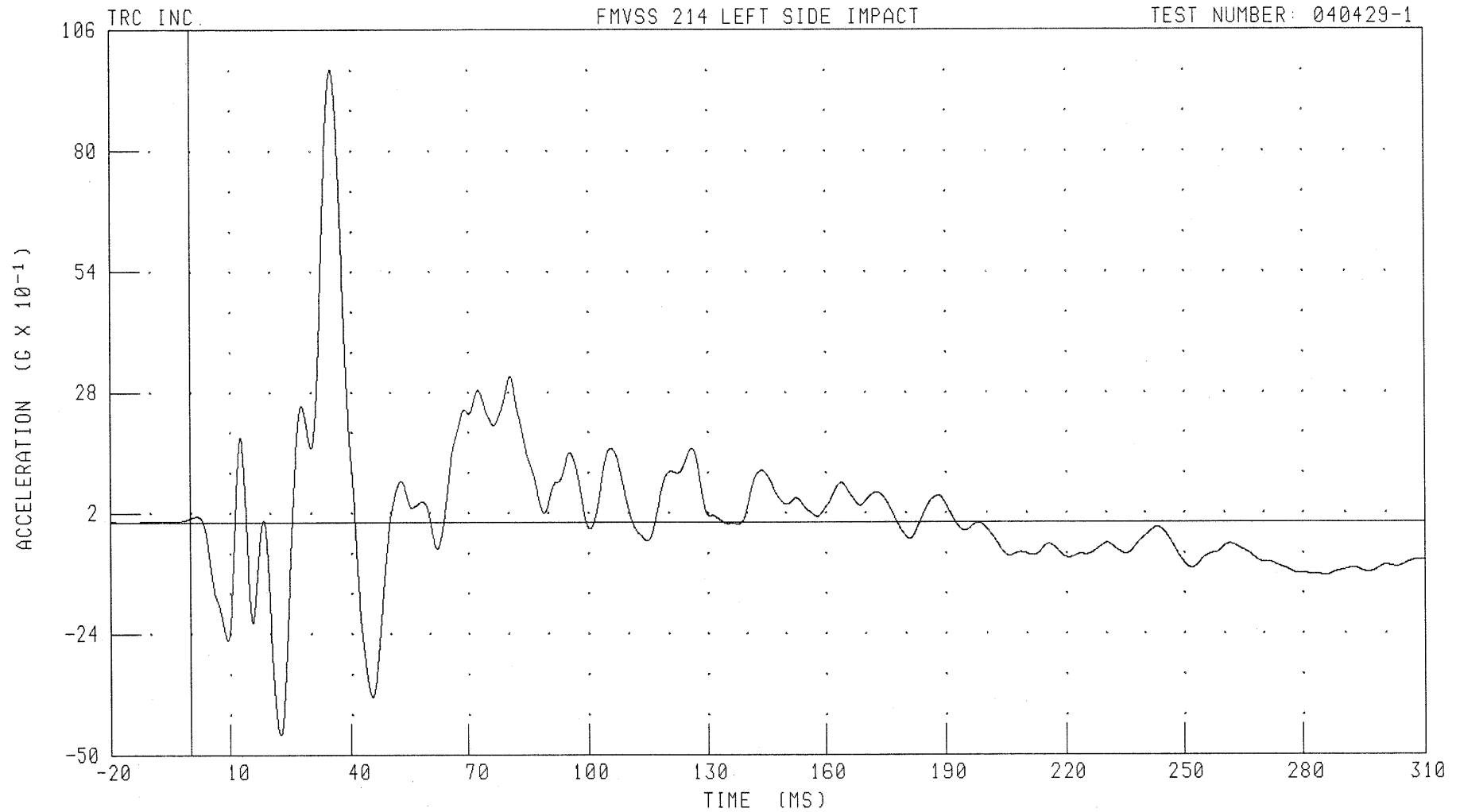
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT REAR SEAT Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSZG1 FILTER: CH. CLASS 60

PEAK DATA: 9.74 G @ 35.20 MS; -4.57 G @ 22.56 MS

B-101

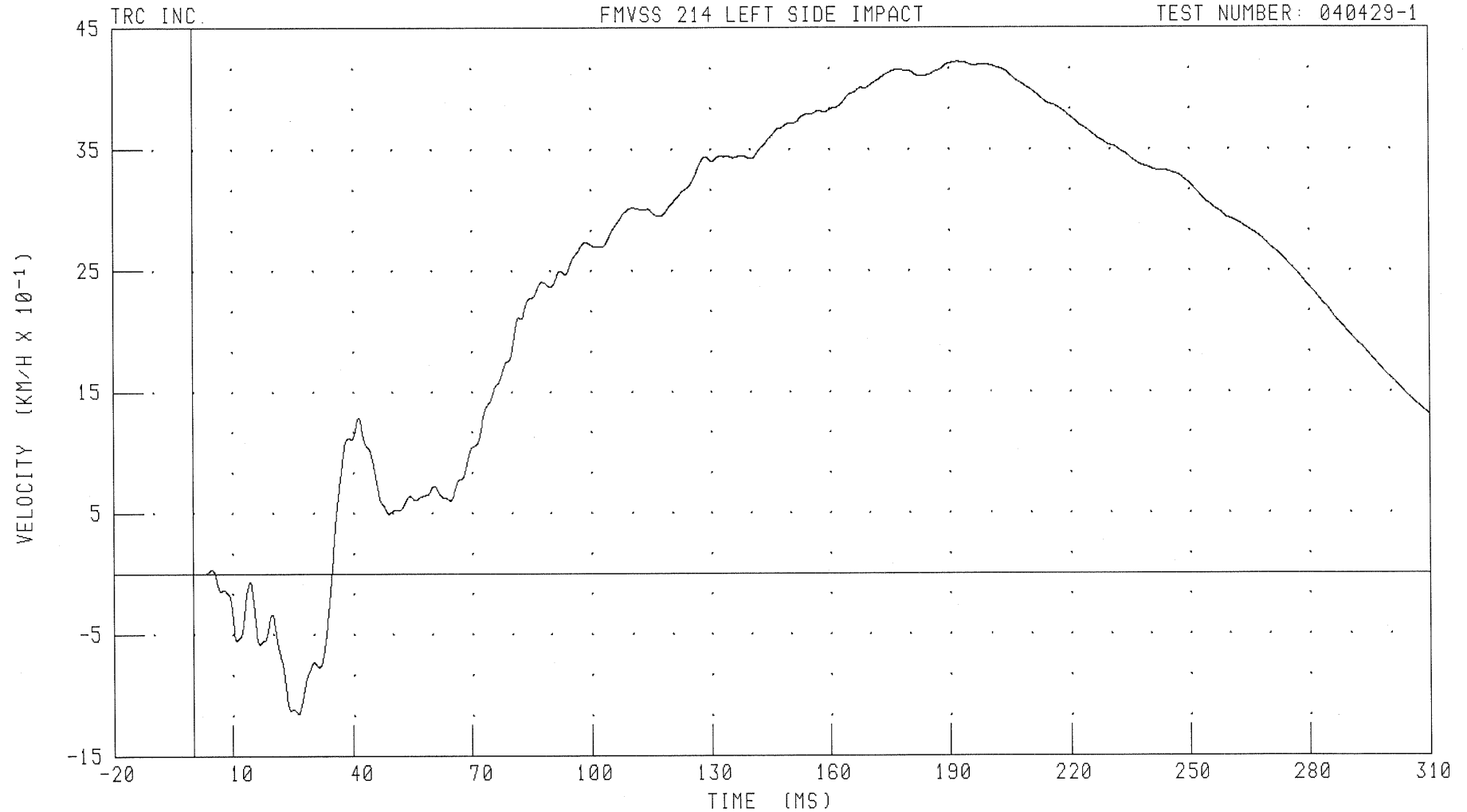
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT REAR SEAT Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSZV1 FILTER: CH. CLASS 180

PEAK DATA: 4.22 KM/H @ 192.24 MS; -1.15 KM/H @ 26.16 MS

B-102

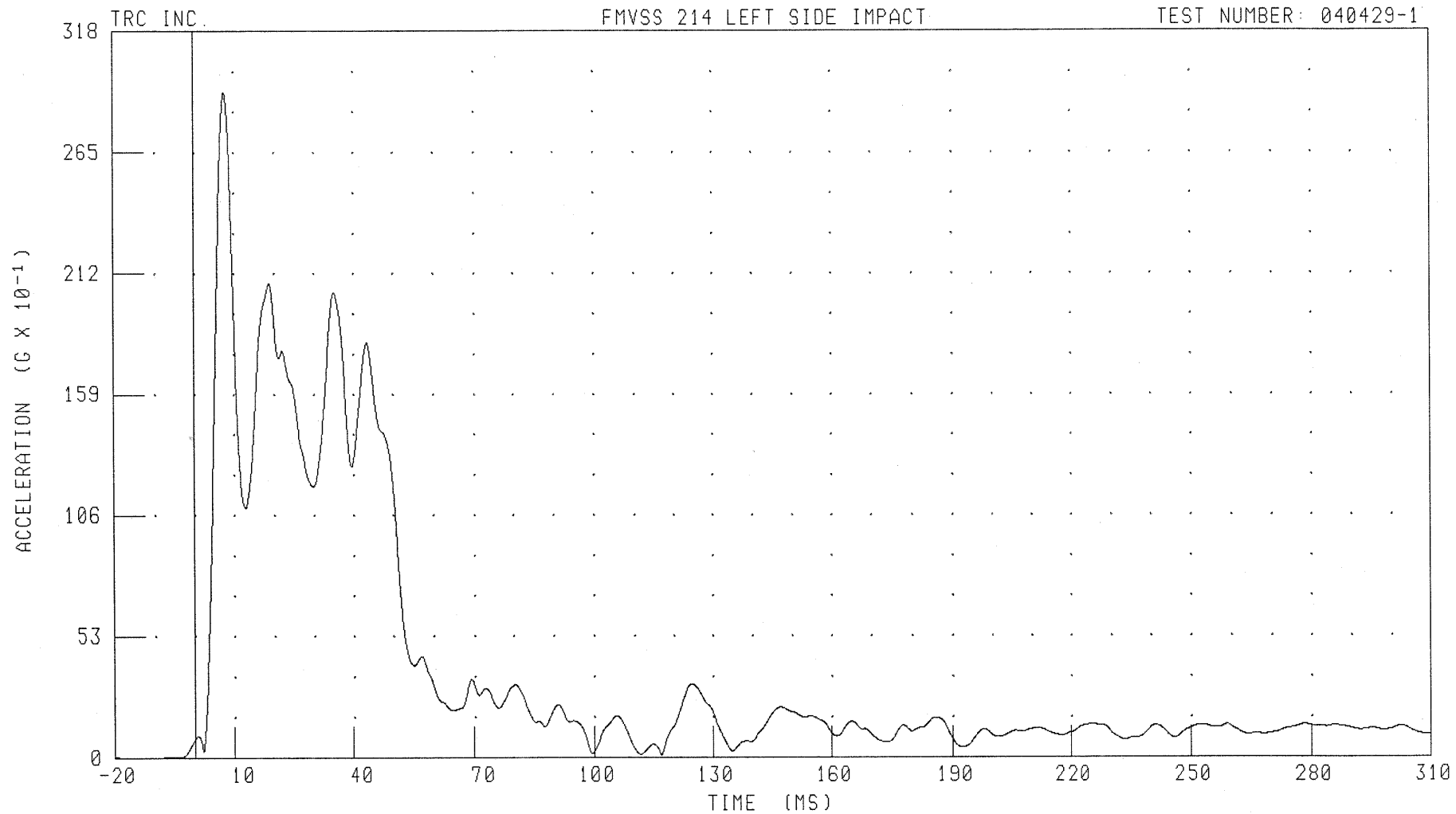
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRSRG1 FILTER: CH. CLASS 60

PEAK DATA: 29.13 G @ 7.60 MS; 0.01 G @ -12.56 MS

B-103

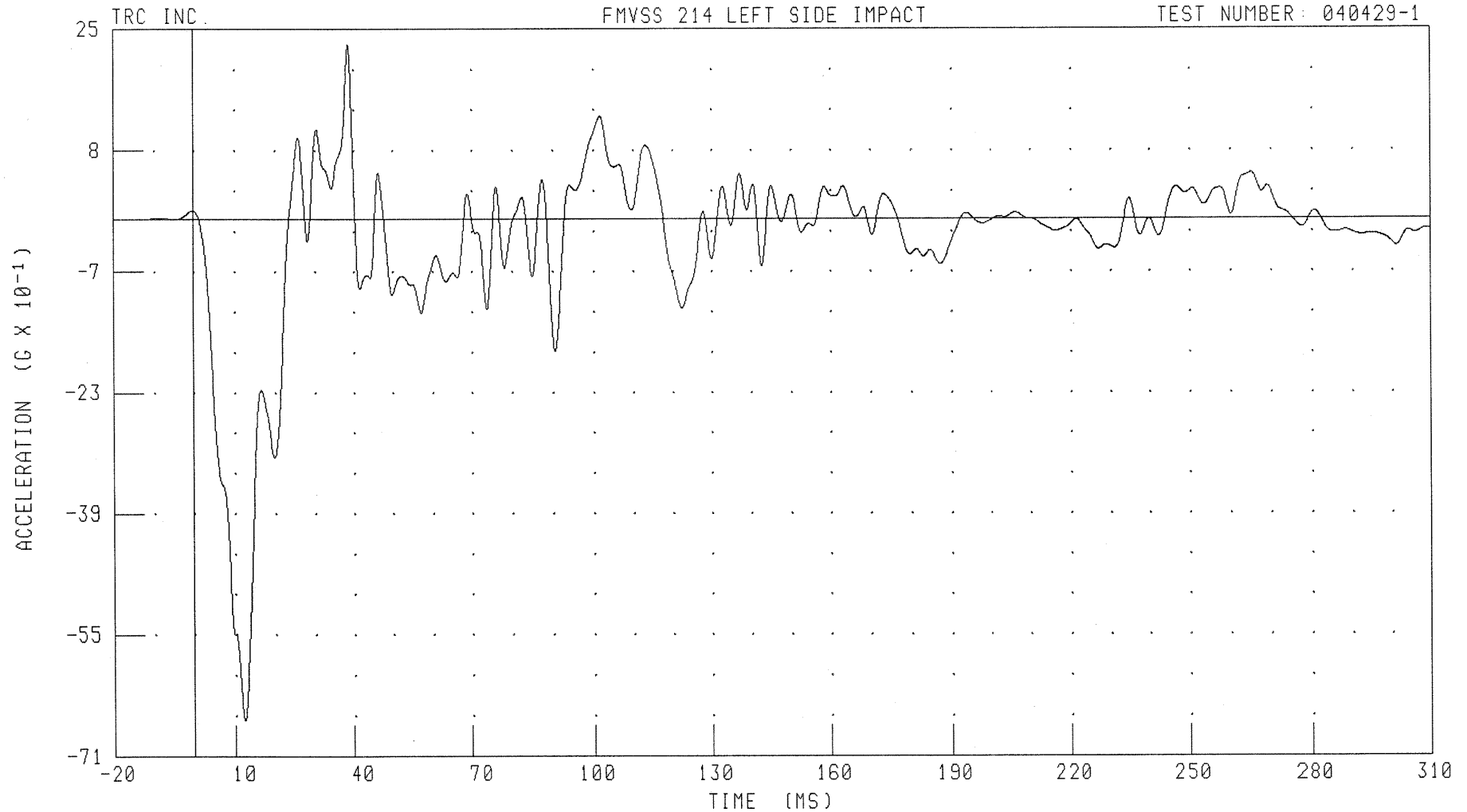
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

REAR FLOORPAN ABOVE AXLE X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RDKXG1

FILTER: CH. CLASS 60

PEAK DATA: 2.29 G @ 38.72 MS; -6.63 G @ 12.40 MS

B-104

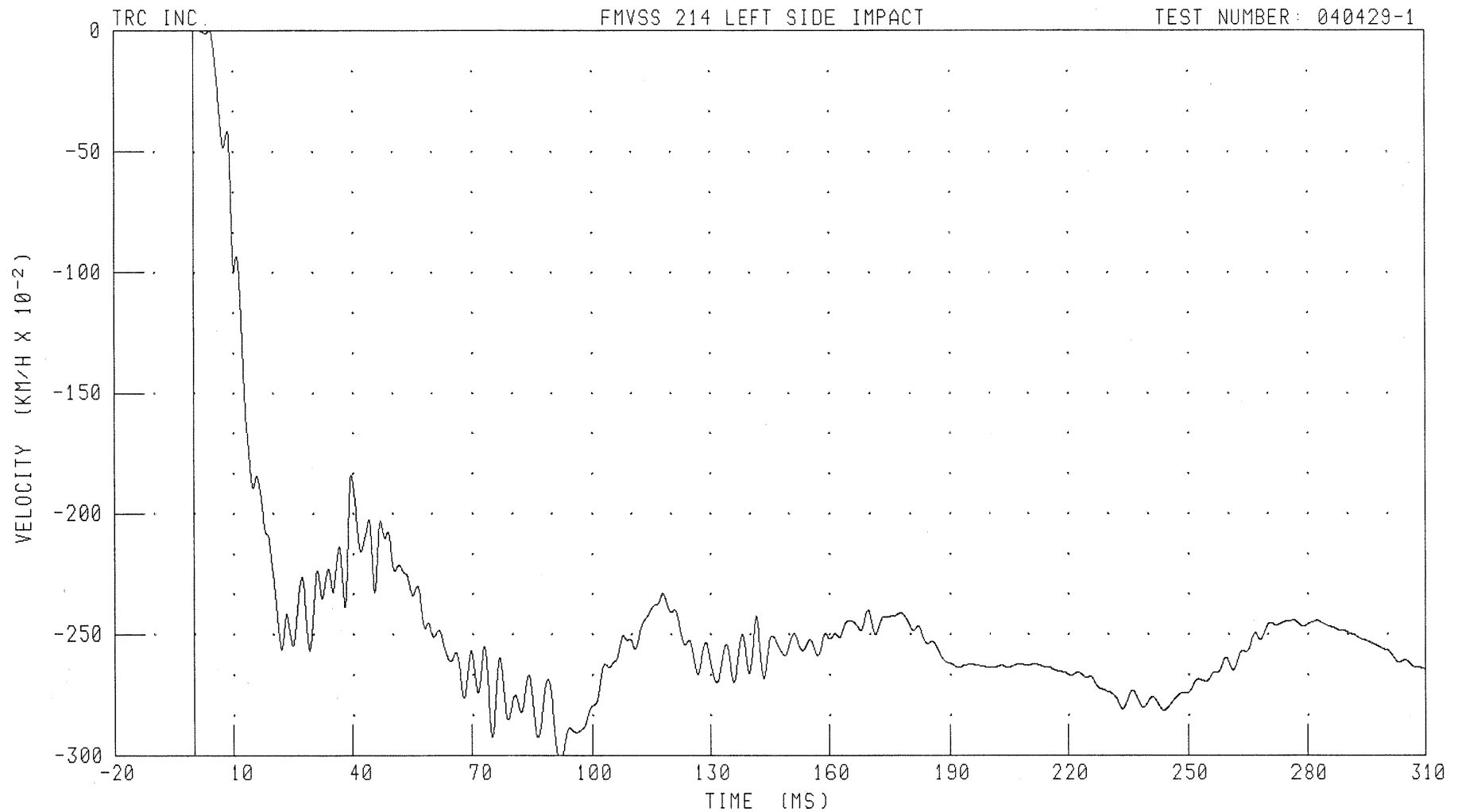
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

REAR FLOORPAN ABOVE AXLE X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



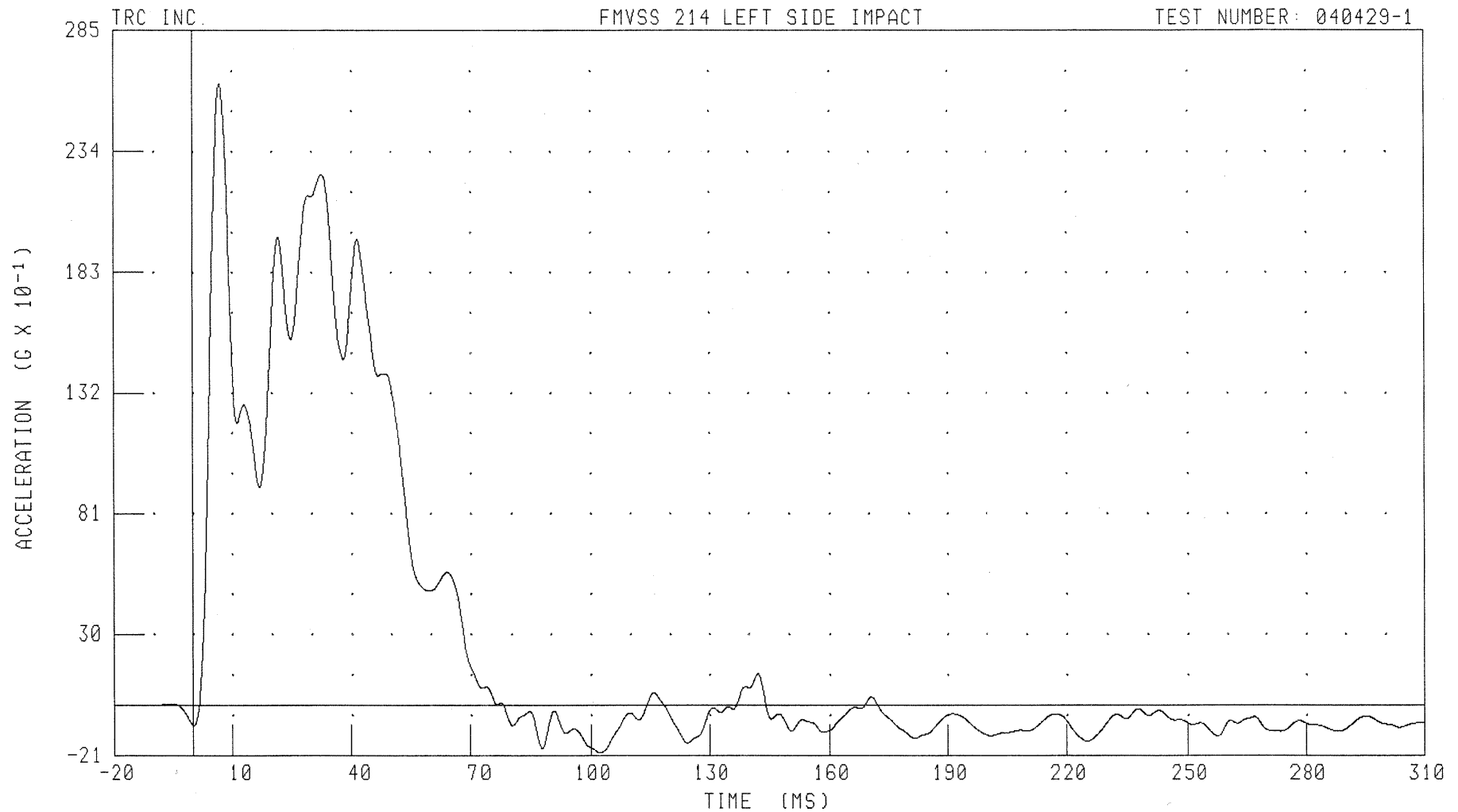
CHANNEL: RDKXV1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 KM/H @ 0.80 MS; -3.03 KM/H @ 92.00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
REAR FLOORPAN ABOVE AXLE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RDKYG1 FILTER: CH. CLASS 60

PEAK DATA: 26.24 G @ 7.04 MS; -1.98 G @ 102.32 MS

B-106

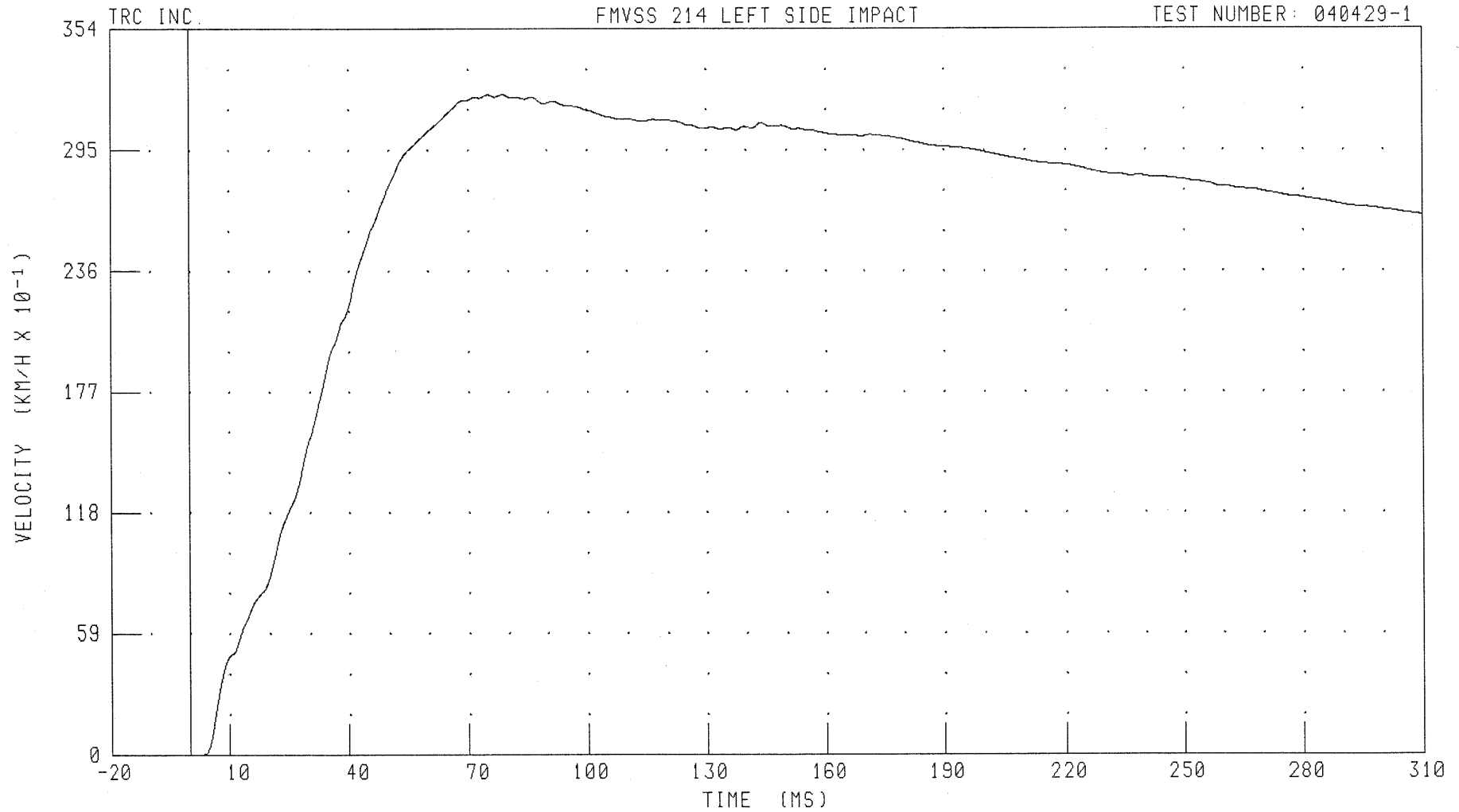
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

REAR FLOORPAN ABOVE AXLE Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RDKYV1 FILTER: CH. CLASS 180

PEAK DATA: 32.21 KM/H @ 78.80 MS; 0.00 KM/H @ 0.00 MS

B-107

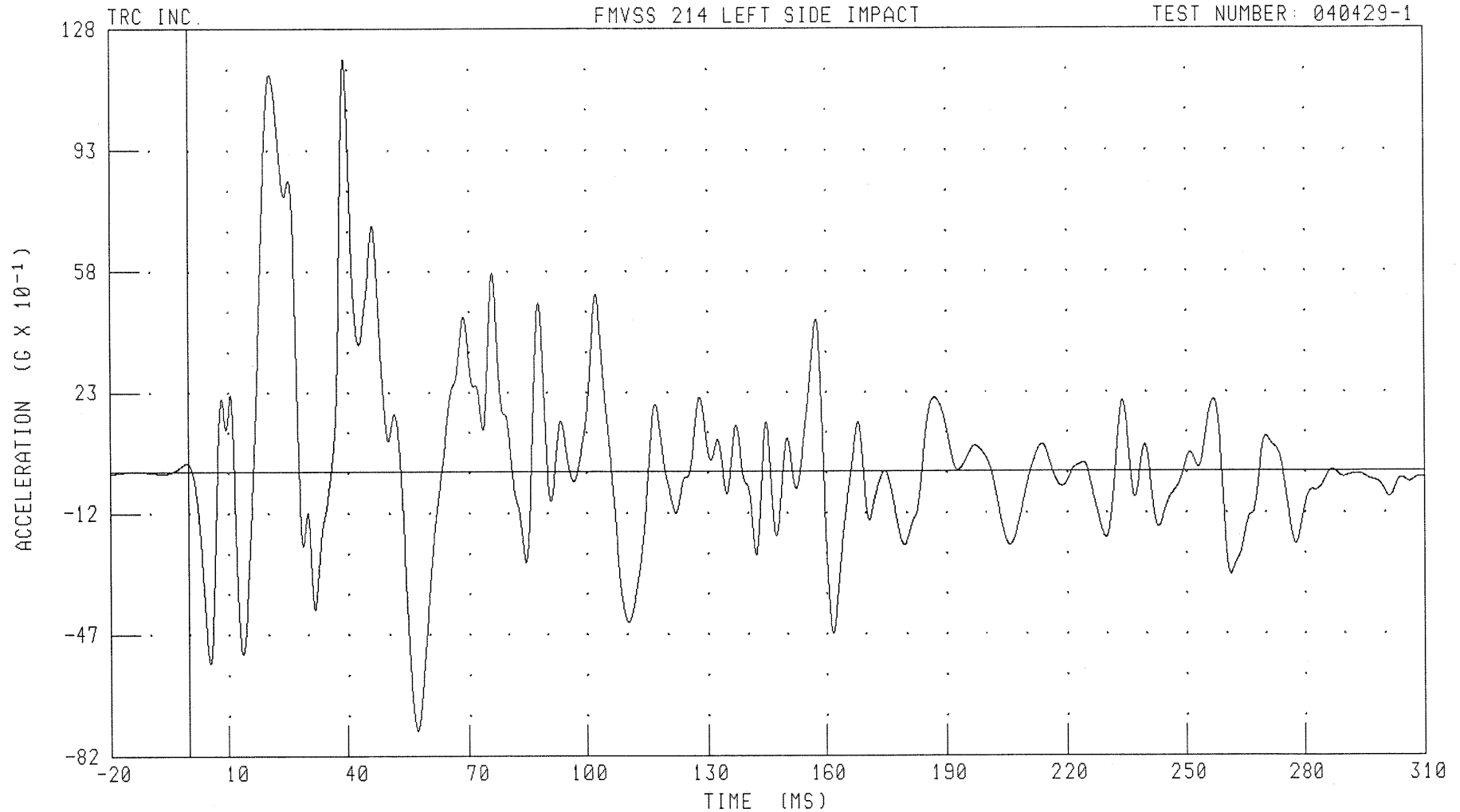
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

REAR FLOORPAN ABOVE AXLE Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RDKZG1 FILTER: CH. CLASS 60

PEAK DATA: 11.92 G @ 39.28 MS; -7.48 G @ 56.88 MS

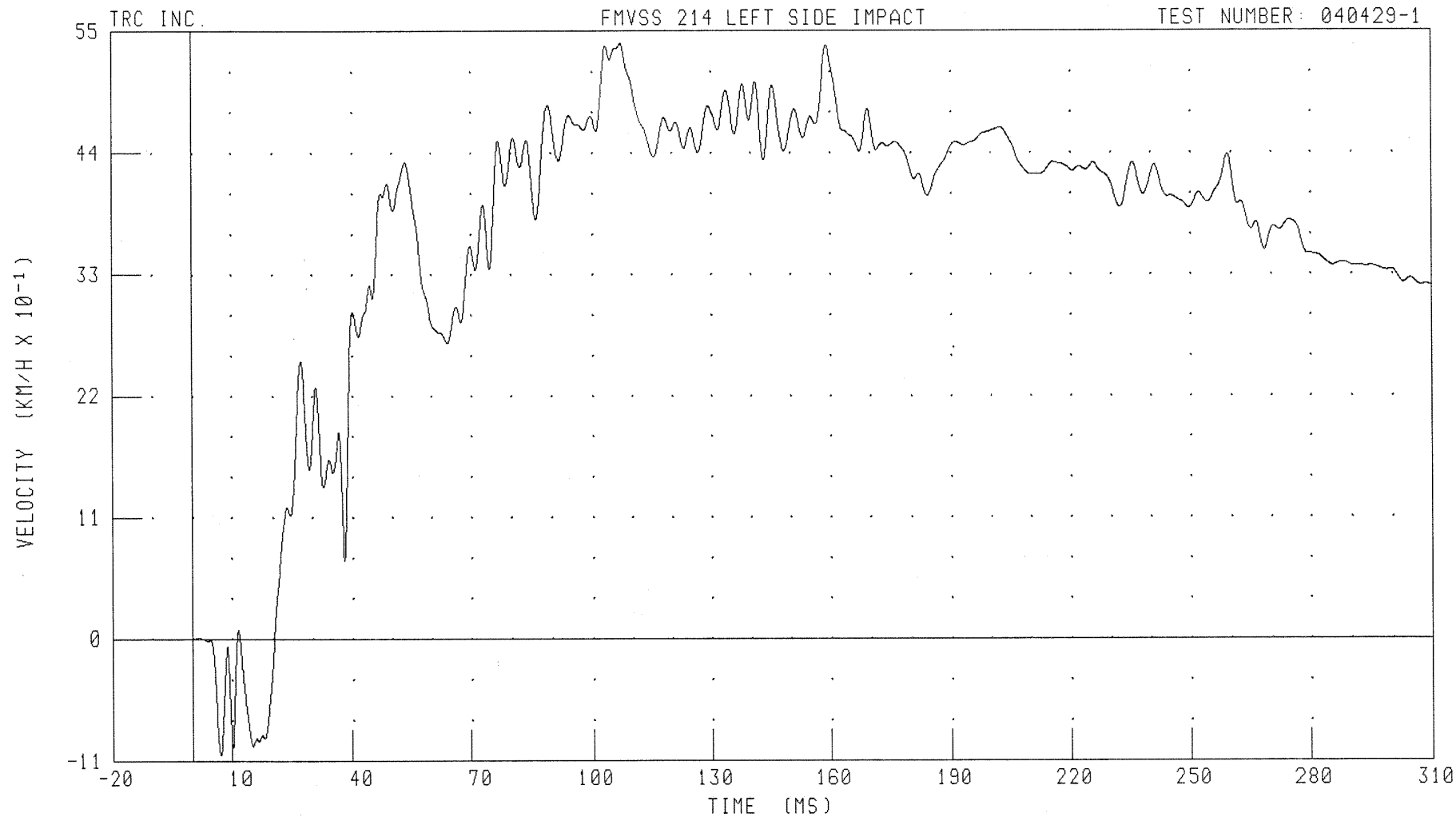
B-108

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
REAR FLOORPAN ABOVE AXLE Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RDKZV1 FILTER: CH. CLASS 180

PEAK DATA: 5.39 KM/H @ 107.52 MS; -1.05 KM/H @ 6.96 MS

B-109

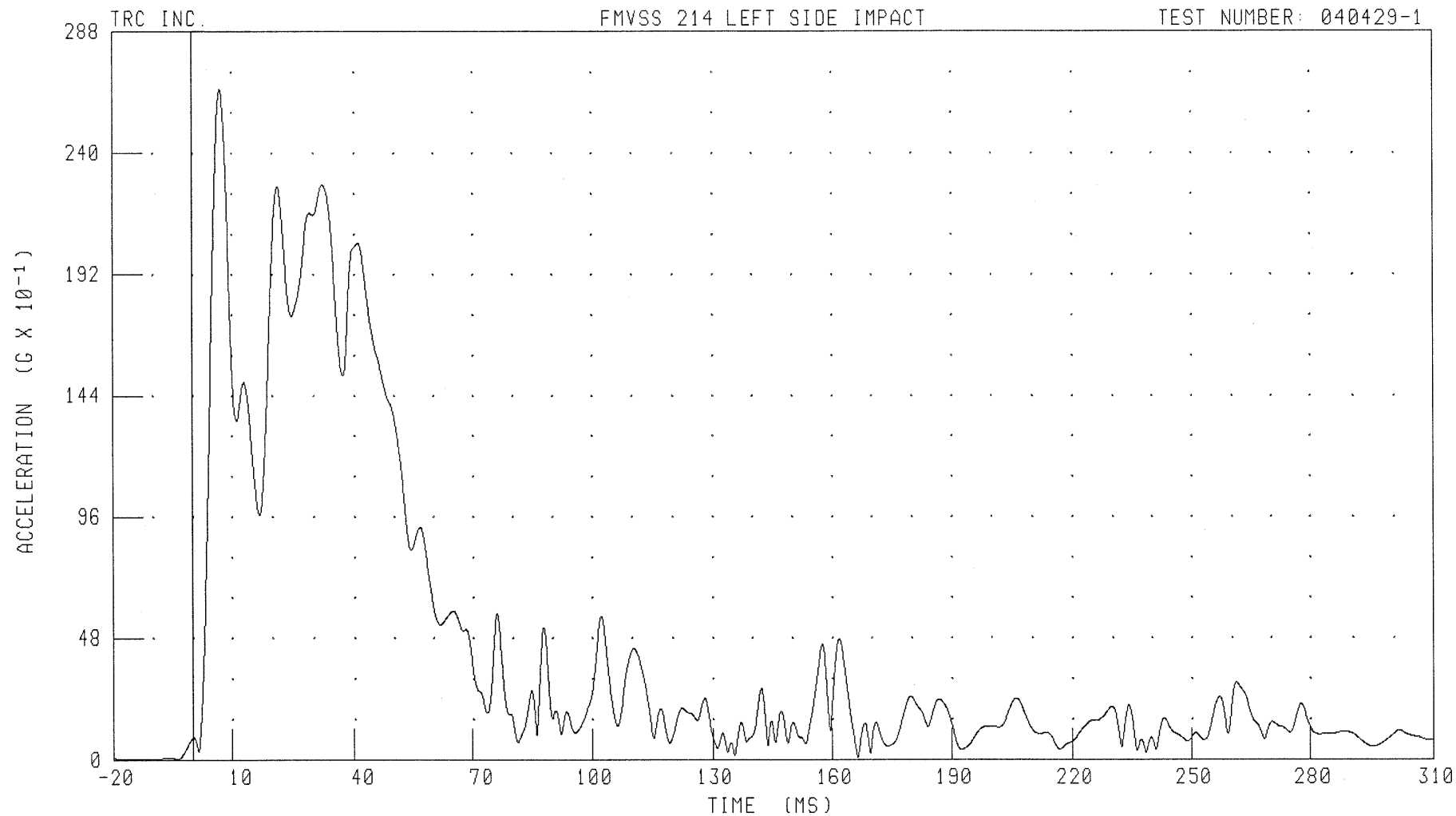
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



B-110

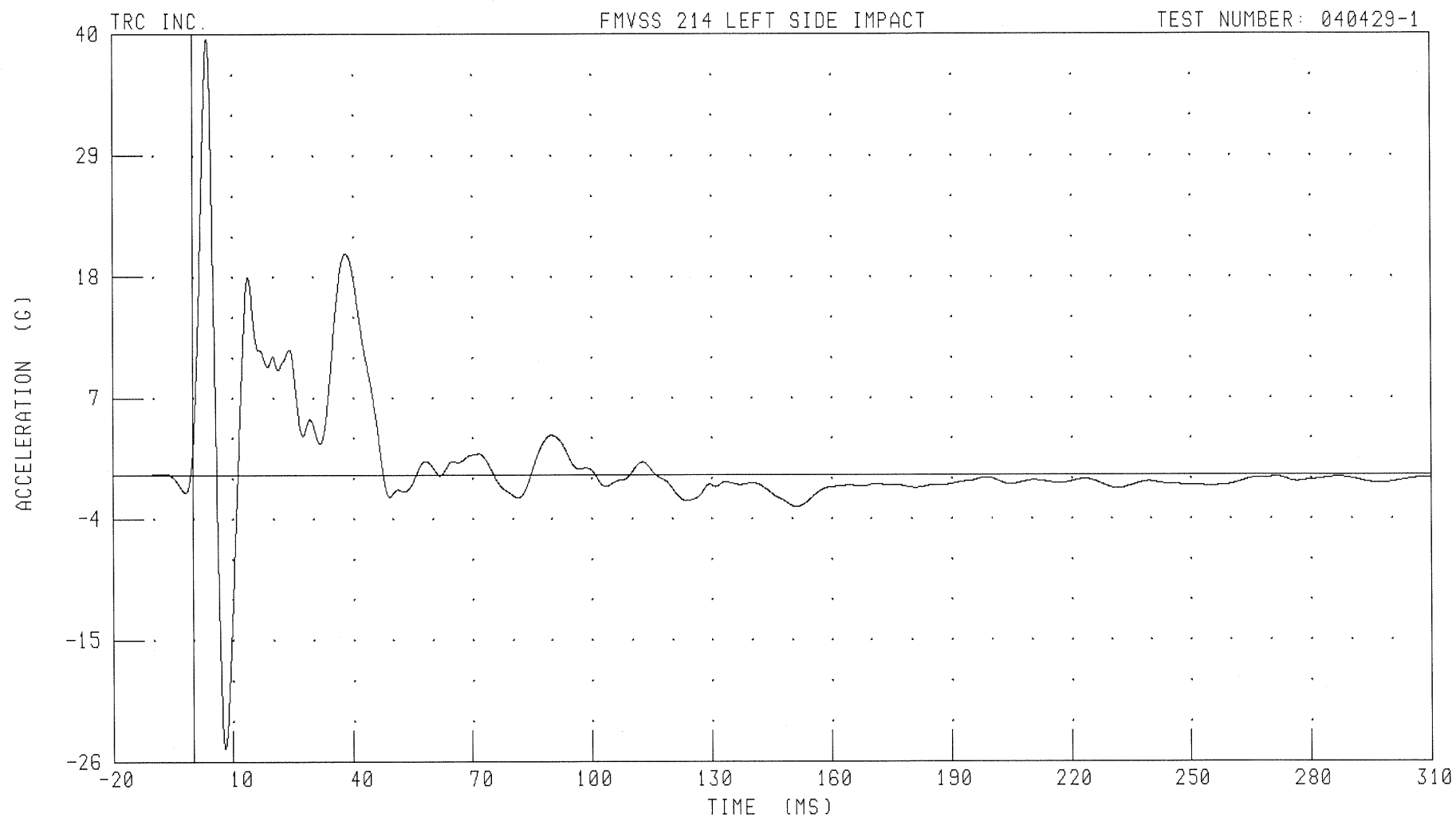
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LFSYG1 FILTER: CH. CLASS 60

PEAK DATA: 39.55 G @ 3.84 MS; -24.83 G @ 8.08 MS

B-1111

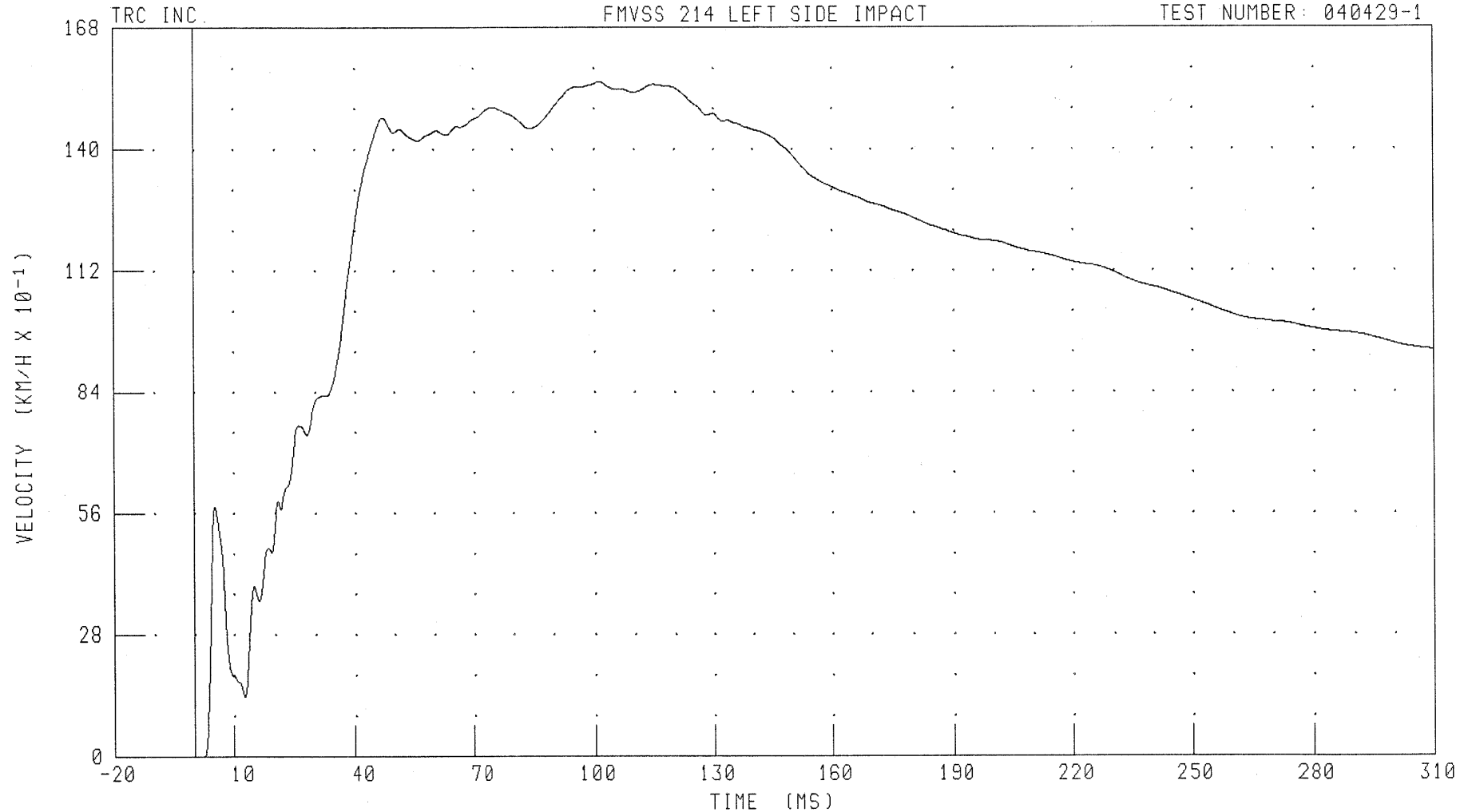
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LFSYV1 FILTER: CH. CLASS 180

PEAK DATA: 15.55 KM/H @ 101.44 MS; -0.04 KM/H @ 2.16 MS

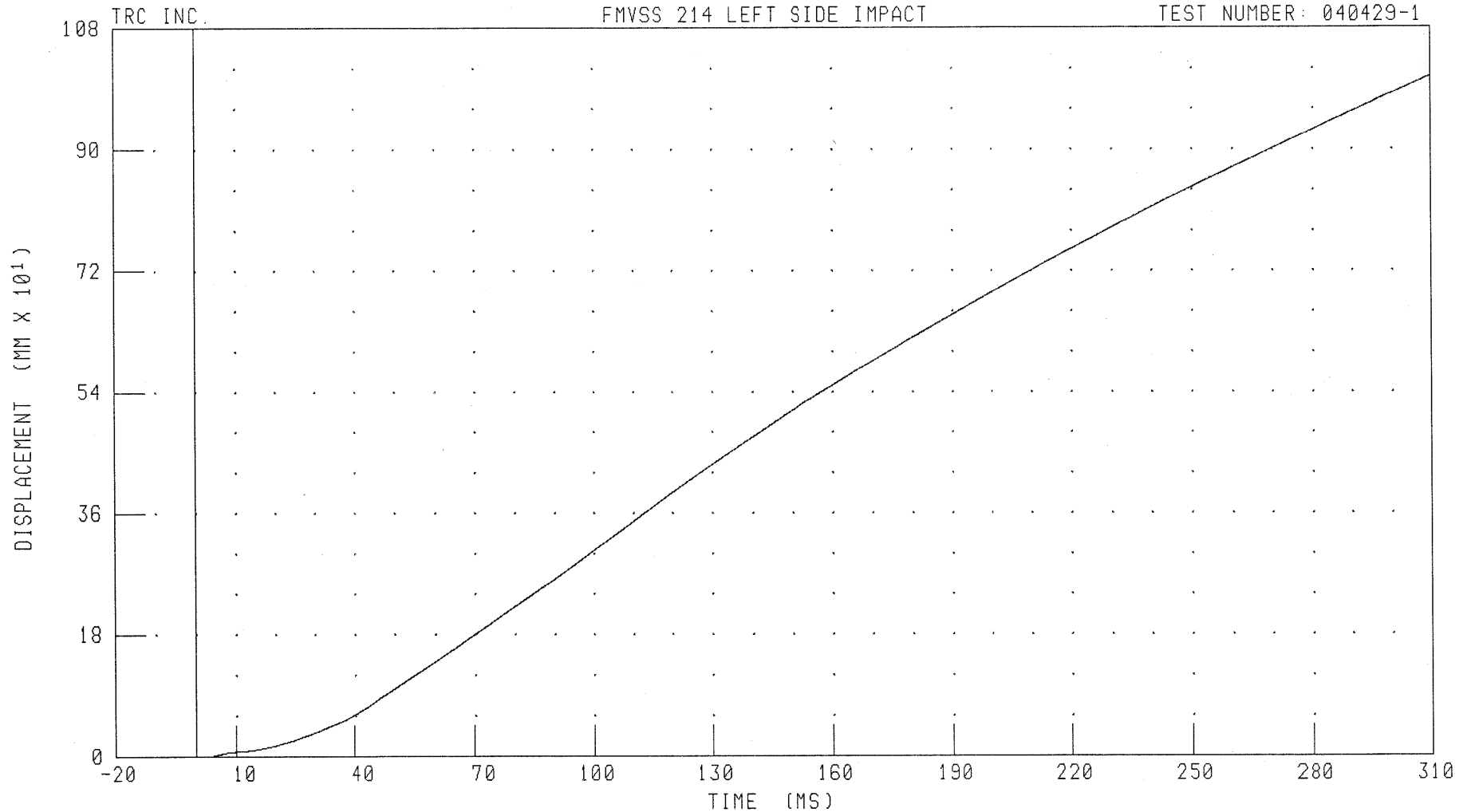
B-112

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT SIDE SILL AT FRONT SEAT Y-AXIS DISPLACEMENT

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LFSYD1 FILTER: CH. CLASS 180

PEAK DATA: 1008.26 MM @ 310.00 MS; -0.01 MM @ 2.56 MS

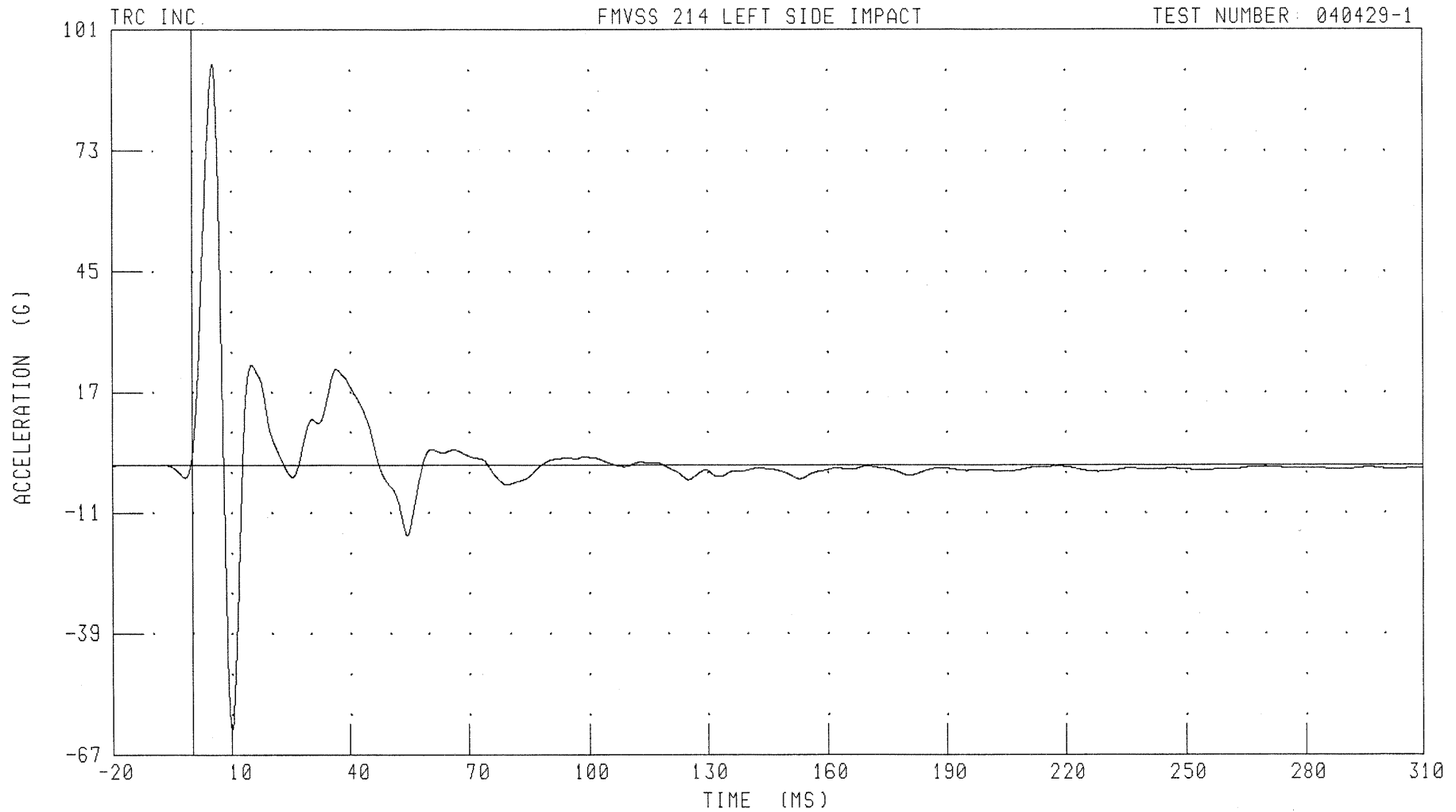
B-113

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 93.05 G @ 5.52 MS; -61.29 G @ 10.00 MS

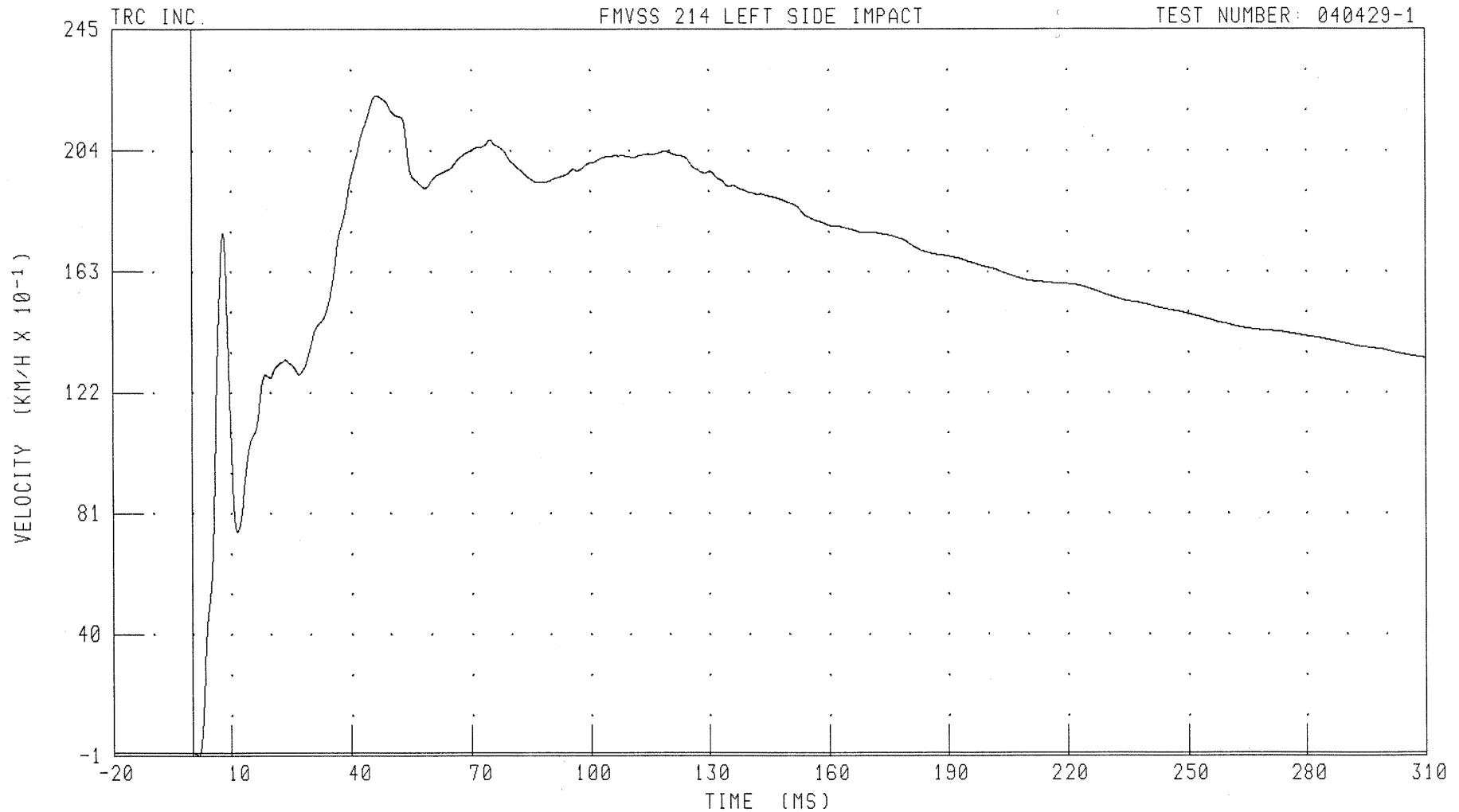
B-114

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 22.27 KM/H @ 46.64 MS; -0.10 KM/H @ 1.52 MS

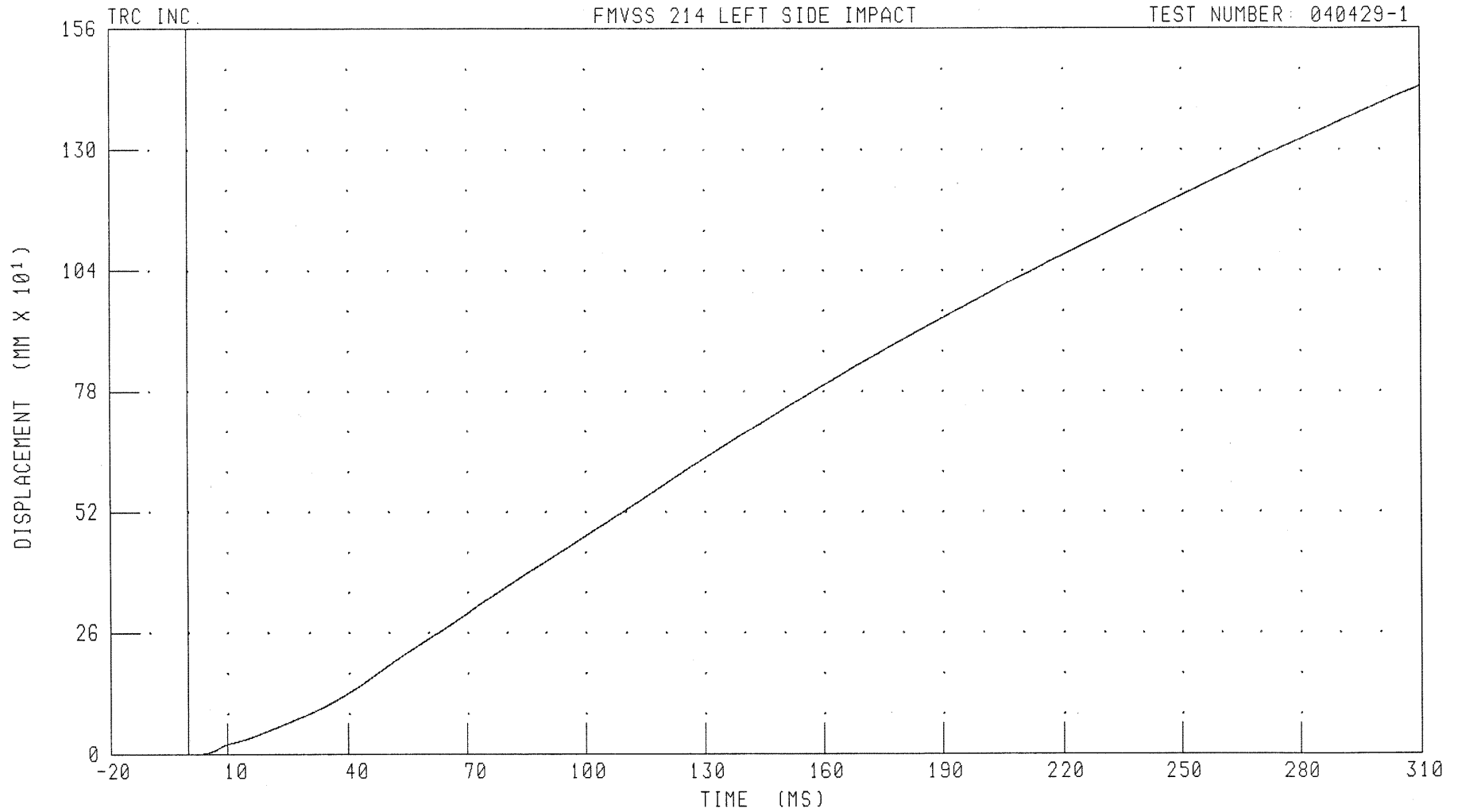
B-115

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT SIDE SILL AT REAR SEAT Y-AXIS DISPLACEMENT

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 1435.61 MM @ 310.00 MS; -0.03 MM @ 2.00 MS

B-116

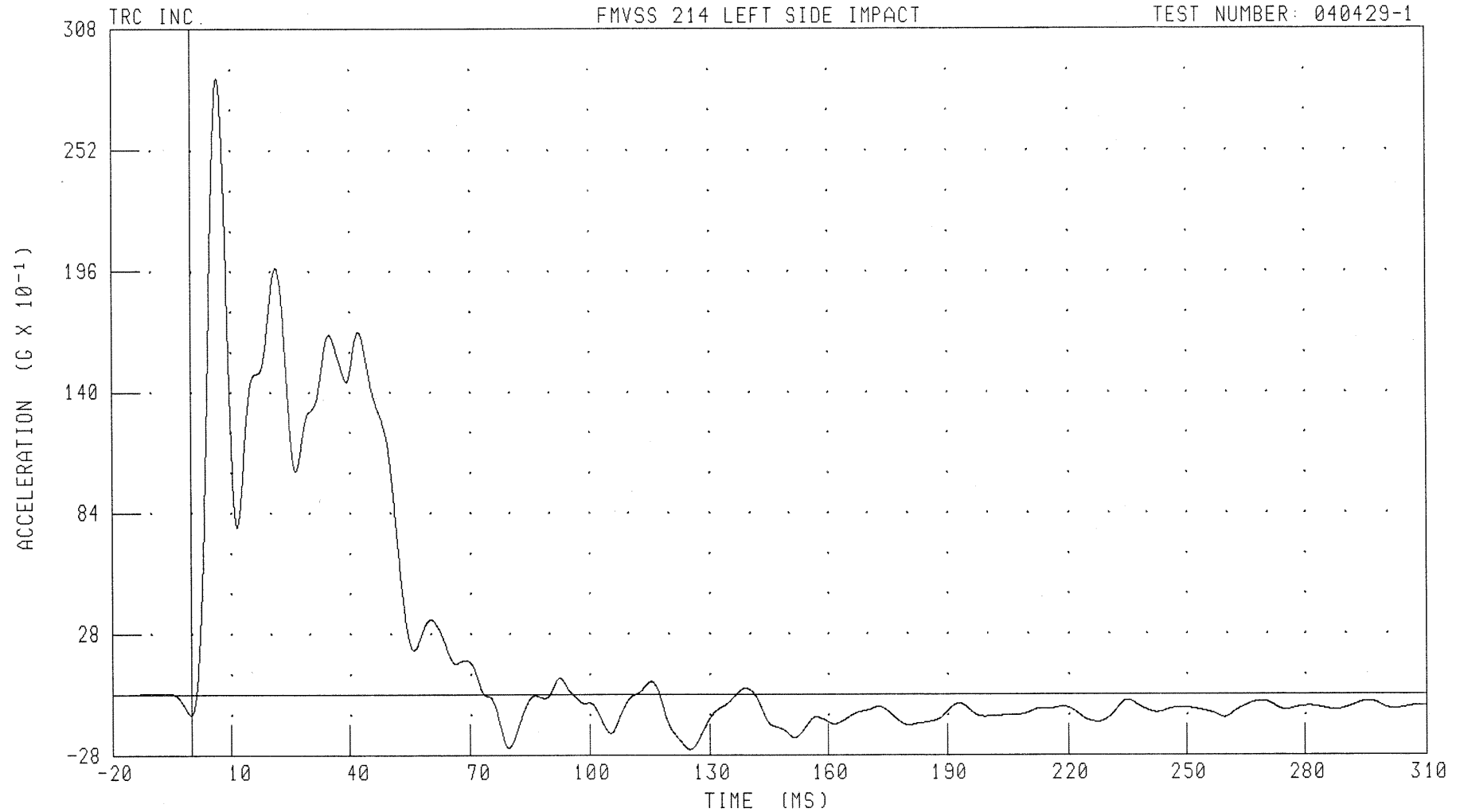
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRTYG1

FILTER: CH. CLASS 60

PEAK DATA: 28.54 G @ 6.64 MS; -2.55 G @ 125.20 MS

B-117

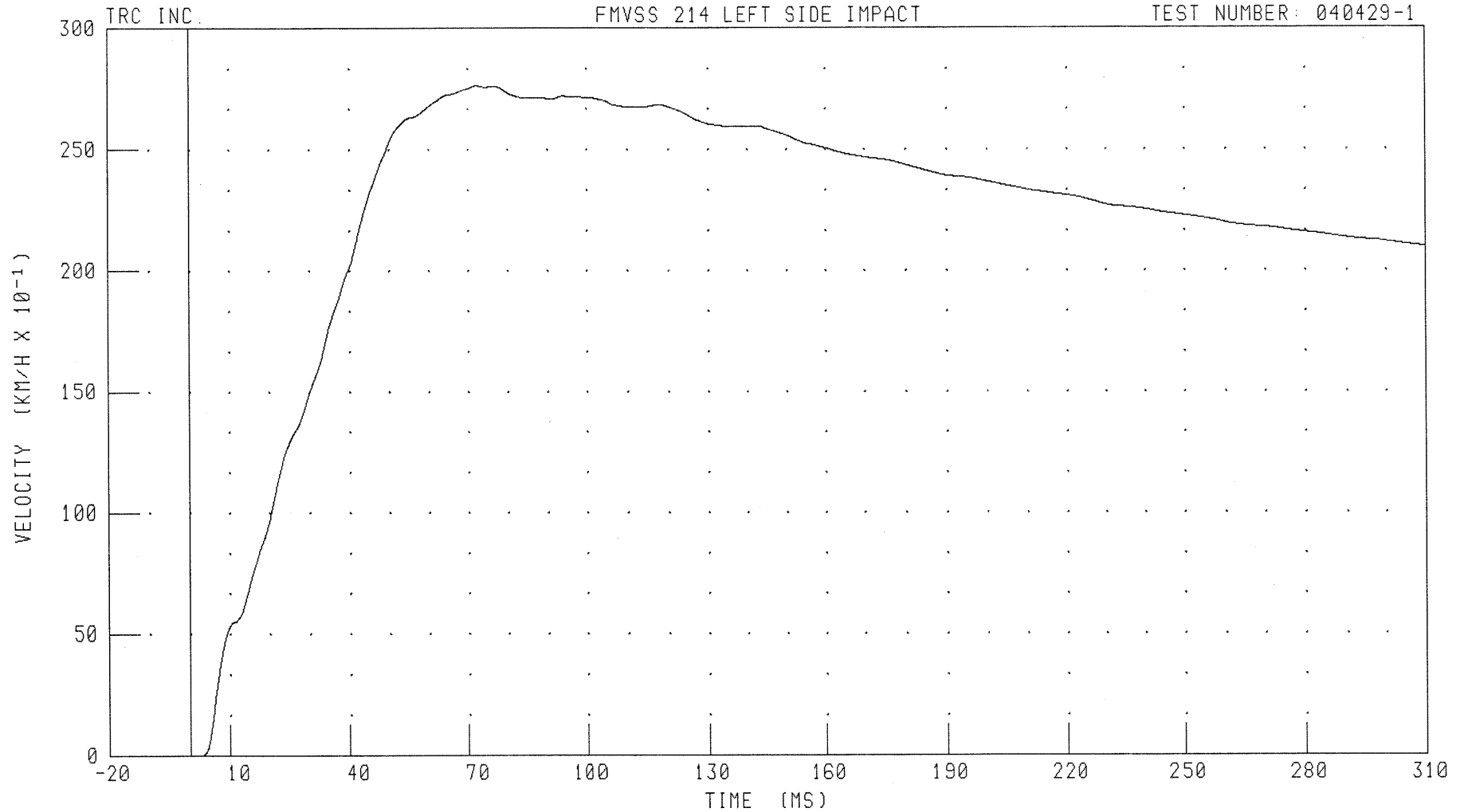
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRTYV1

FILTER: CH. CLASS 180

PEAK DATA: 27.63 KM/H @ 72.40 MS; -0.01 KM/H @ 2.64 MS

B-118

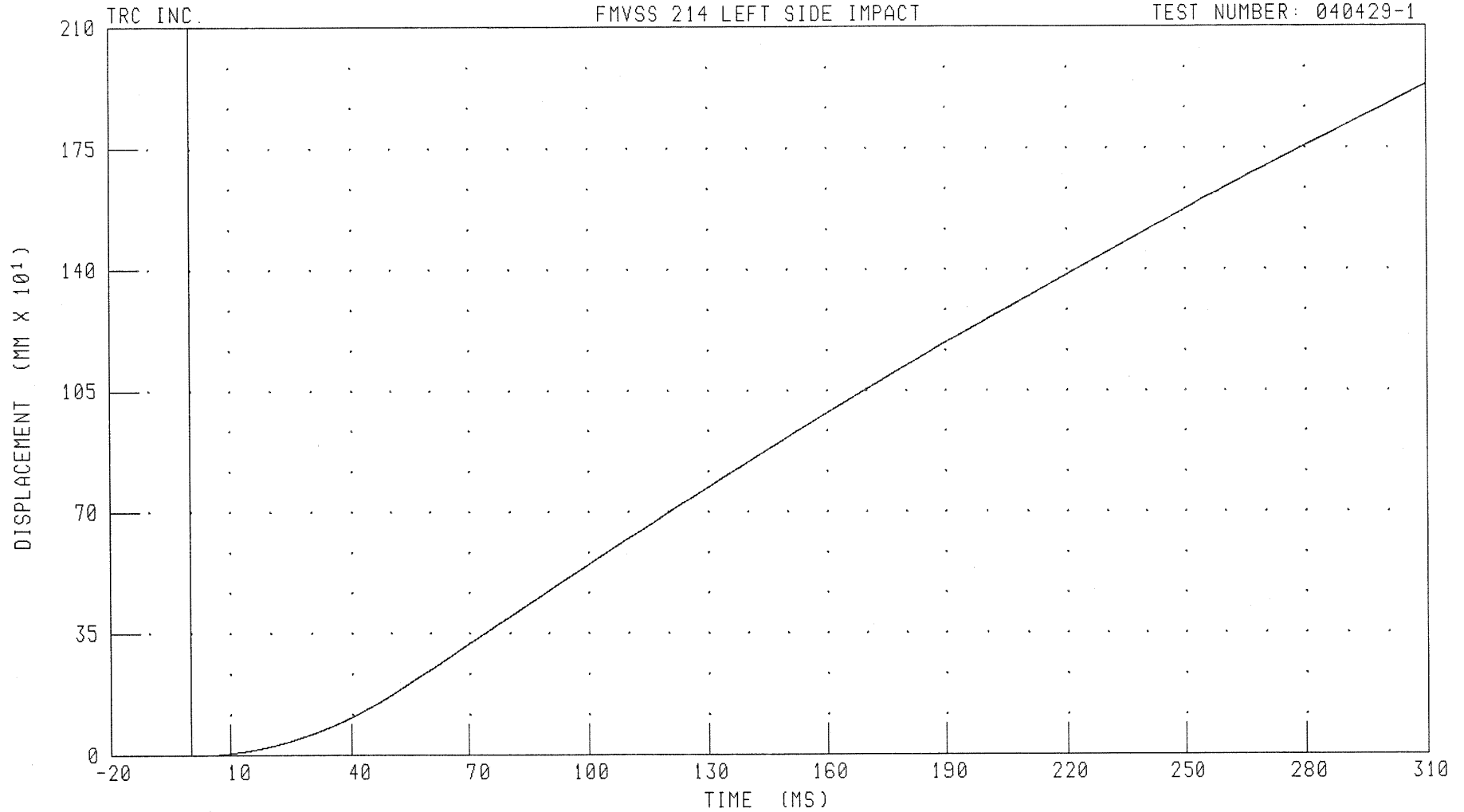
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS DISPLACEMENT

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: RRTYD1 FILTER: CH. CLASS 180

PEAK DATA: 1932.58 MM @ 310.00 MS; 0.00 MM @ 3.04 MS

B-119

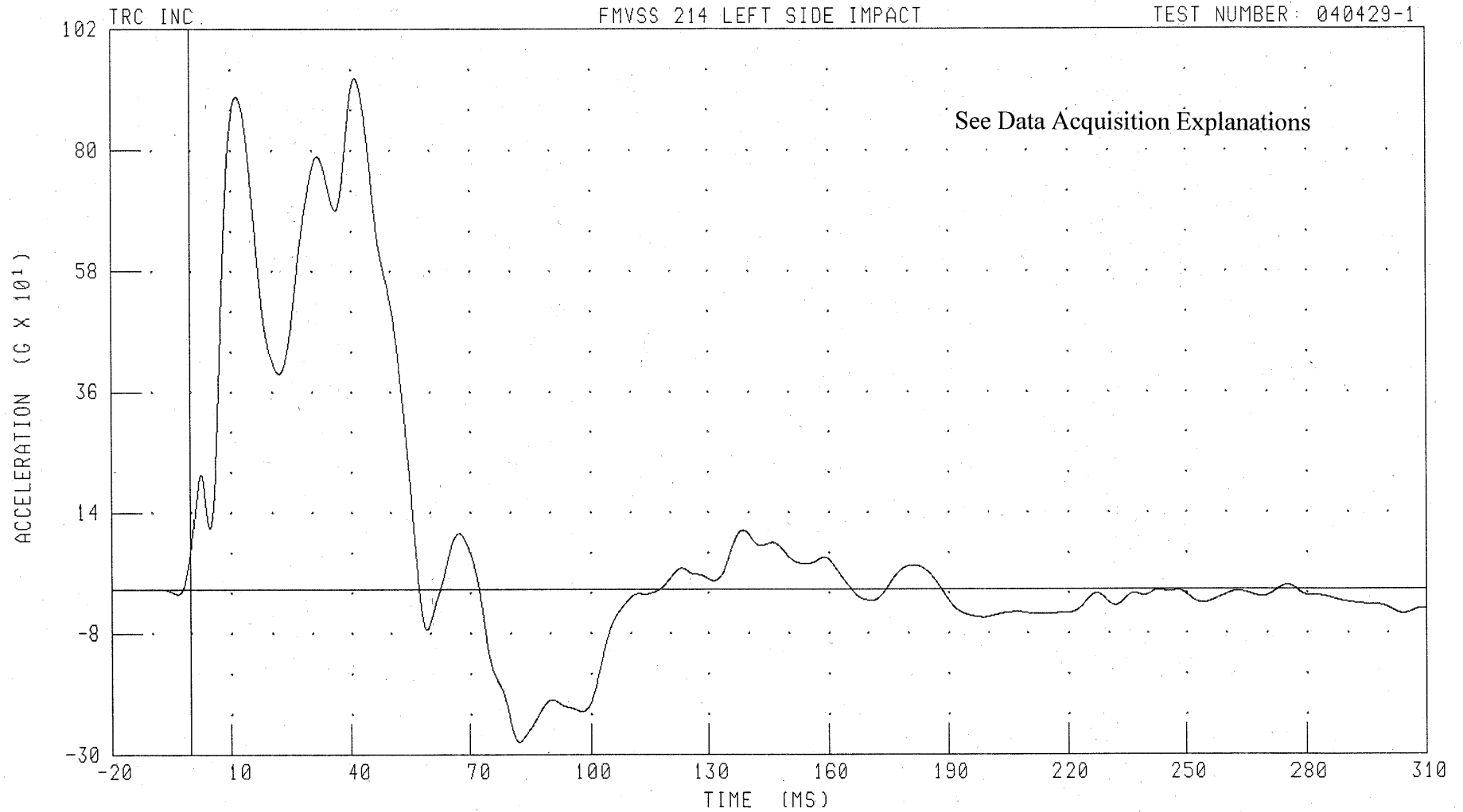
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT LOWER A-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLAYG1 FILTER: CH. CLASS 60

PEAK DATA: 930.42 G @ 41.20 MS; -277.58 G @ 82.32 MS

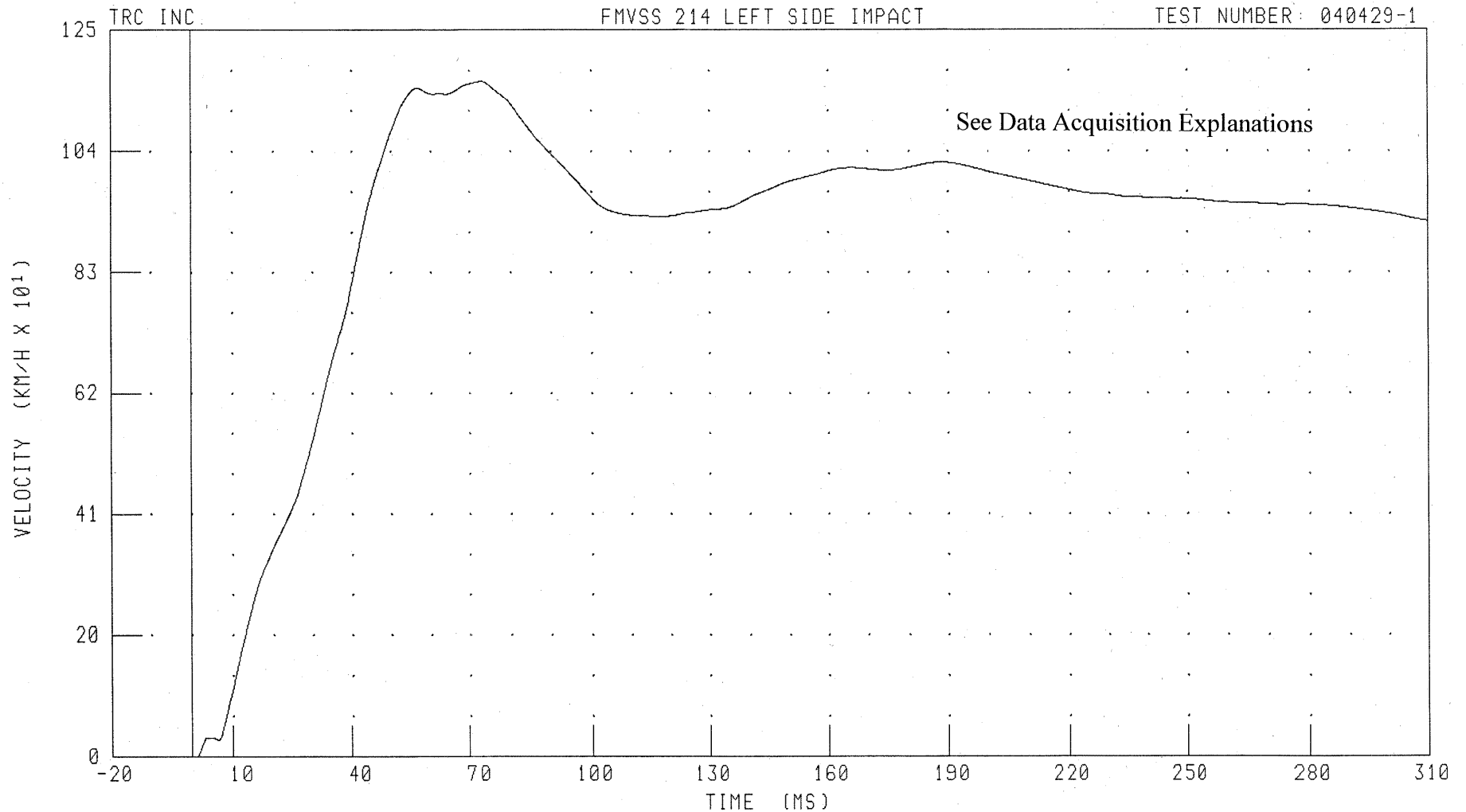
B-120

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT LOWER A-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLAYV1 FILTER: CH. CLASS 180

PEAK DATA: 1170.59 KM/H @ 73.04 MS; -0.63 KM/H @ 0.96 MS

B-121

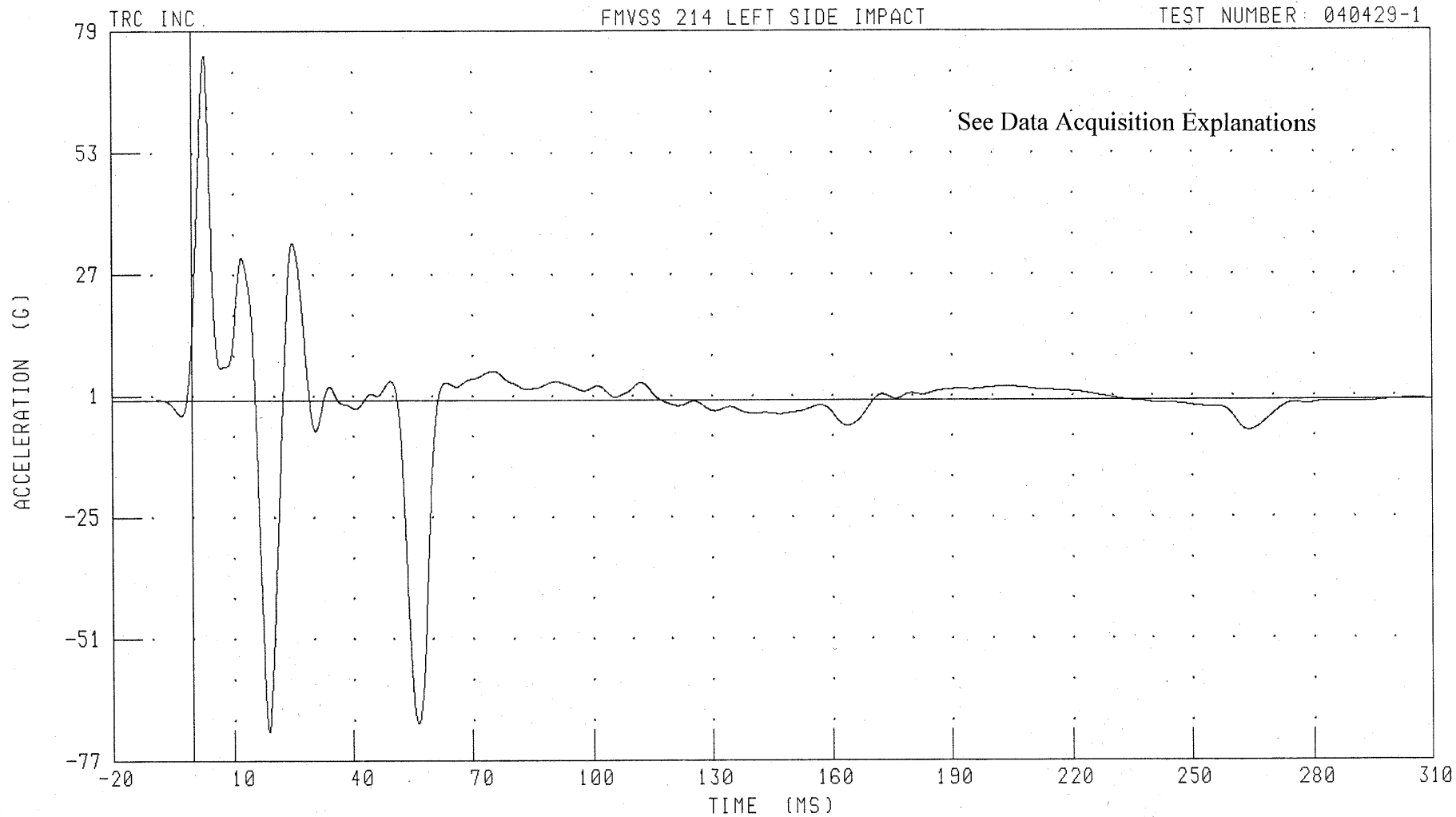
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT MIDDLE A-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LMAYG1 FILTER: CH. CLASS 60

PEAK DATA: 73.85 G @ 2.88 MS, -70.86 G @ 18.64 MS

B-122

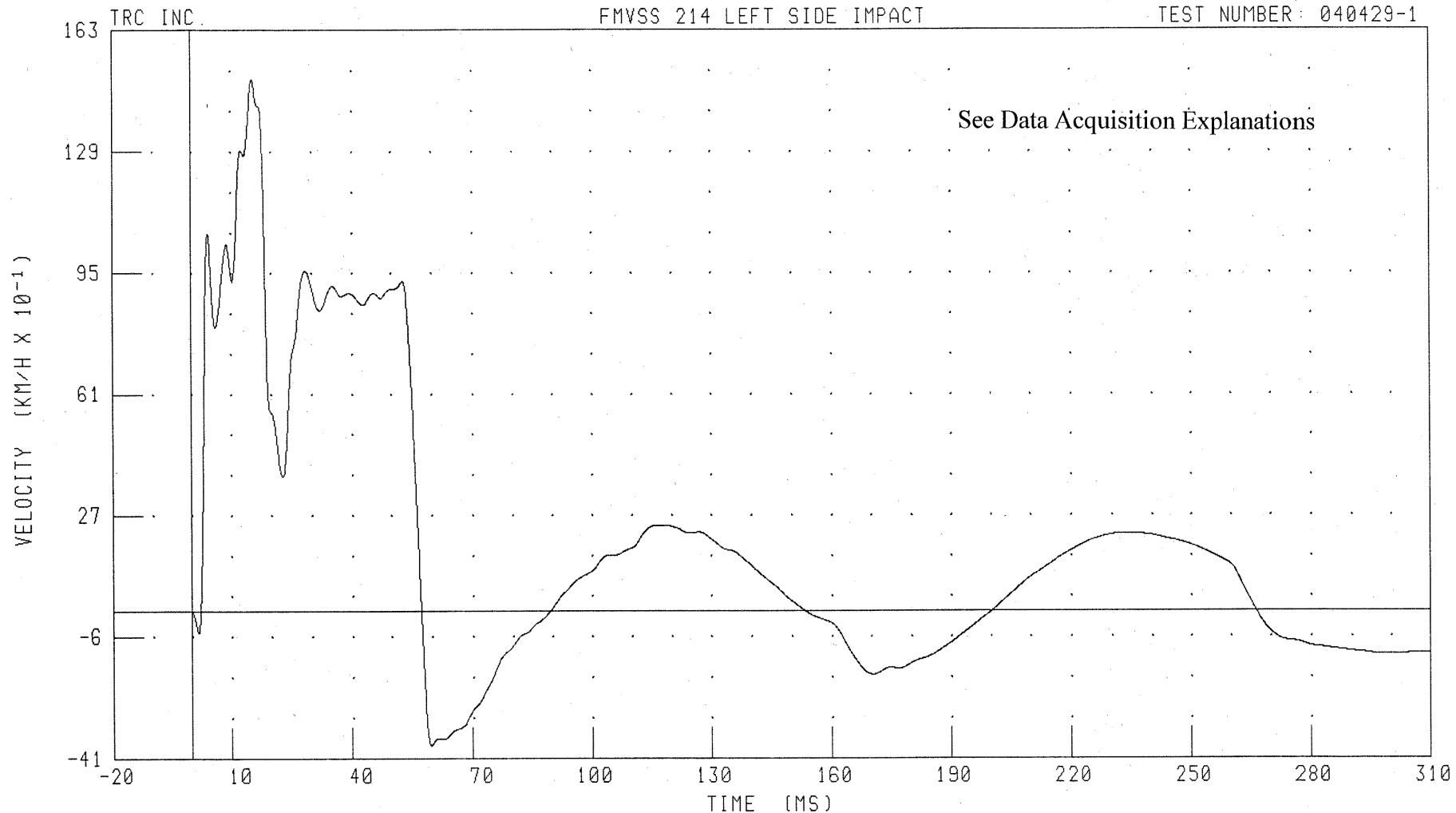
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT MIDDLE A-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LMAYV1

FILTER: CH. CLASS 180

PEAK DATA: 14.92 KM/H @ 15.44 MS, -3.75 KM/H @ 59.68 MS

B-123

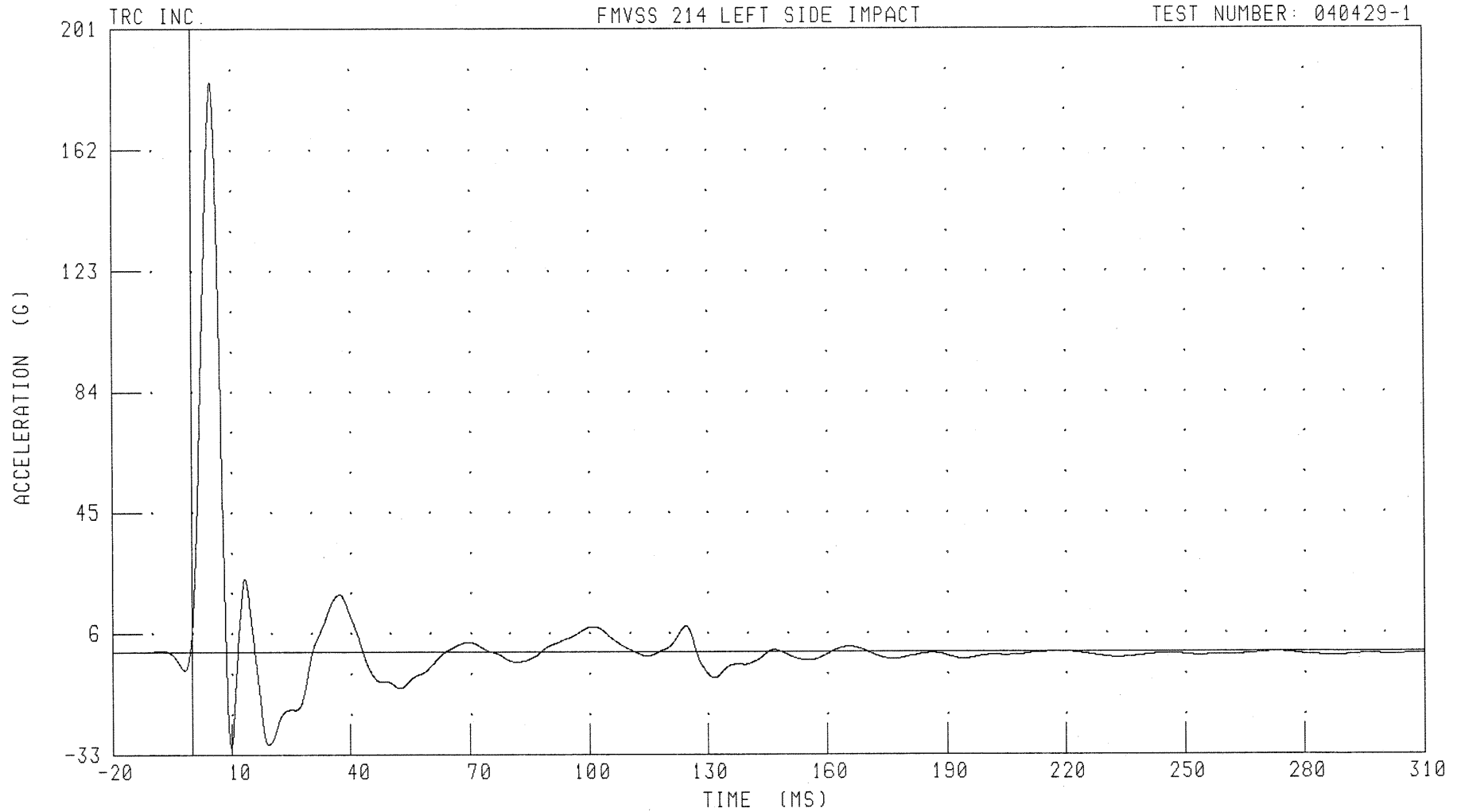
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT LOWER B-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLBYG1 FILTER: CH. CLASS 60

PEAK DATA: 183.93 G @ 4.96 MS; -30.62 G @ 9.84 MS

B-124

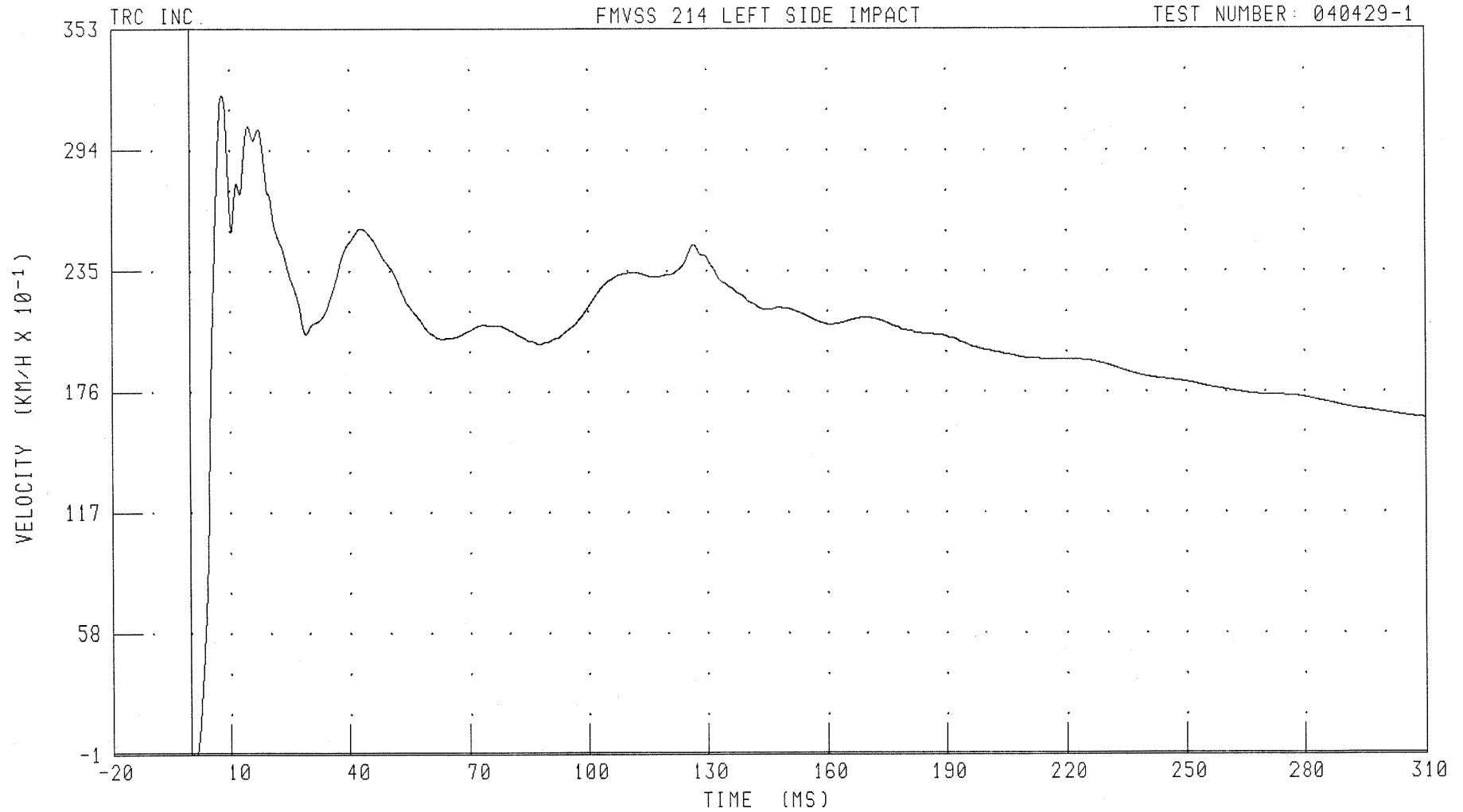
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT LOWER B-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLBYV1

FILTER: CH. CLASS 180

PEAK DATA: 32.07 KM/H @ 8.00 MS; -0.12 KM/H @ 1.12 MS

B-125

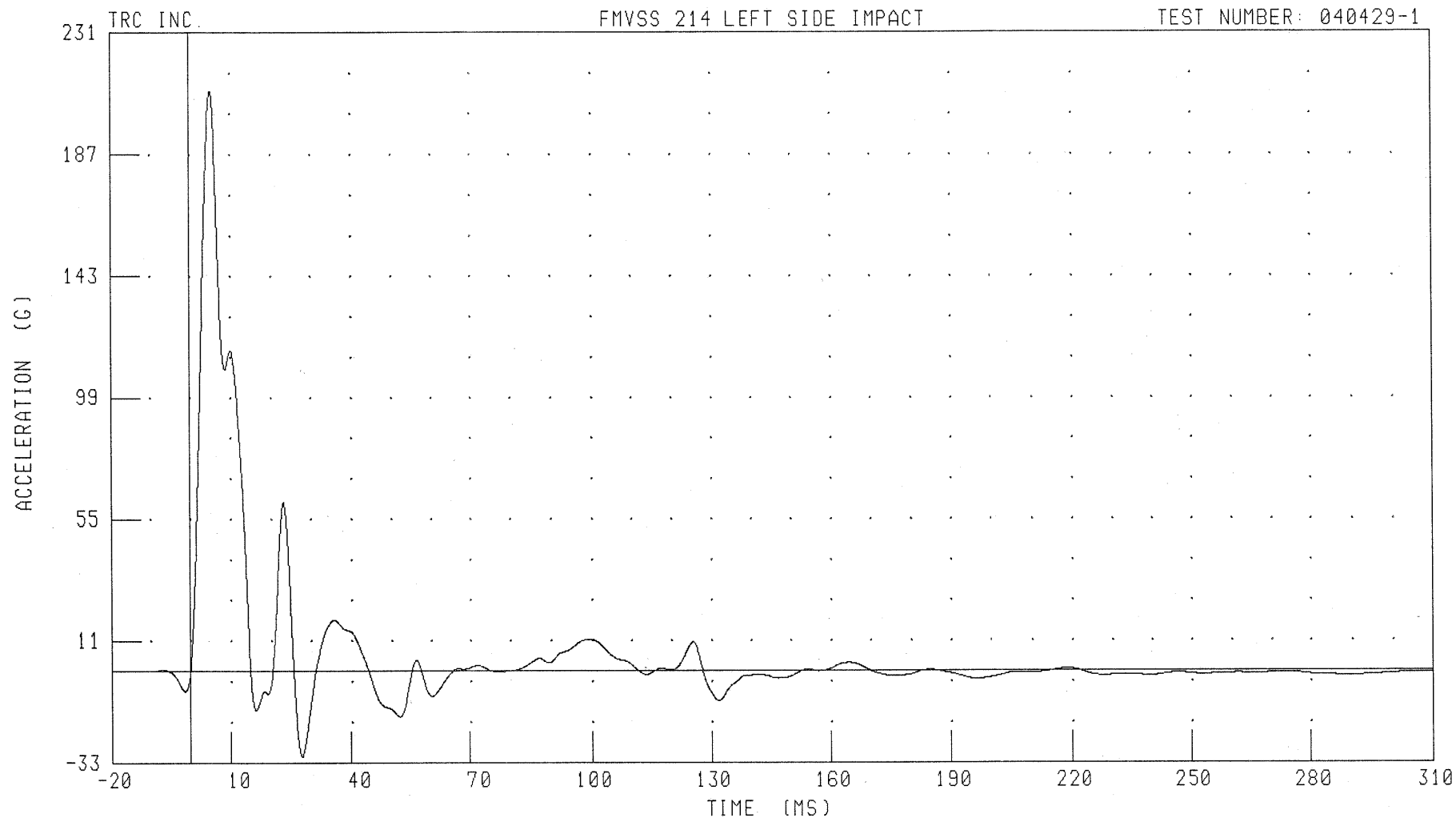
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT MIDDLE B-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LMBYG1

FILTER: CH. CLASS 60

PEAK DATA: 209.92 G @ 5.28 MS, -30.78 G @ 27.68 MS

B-126

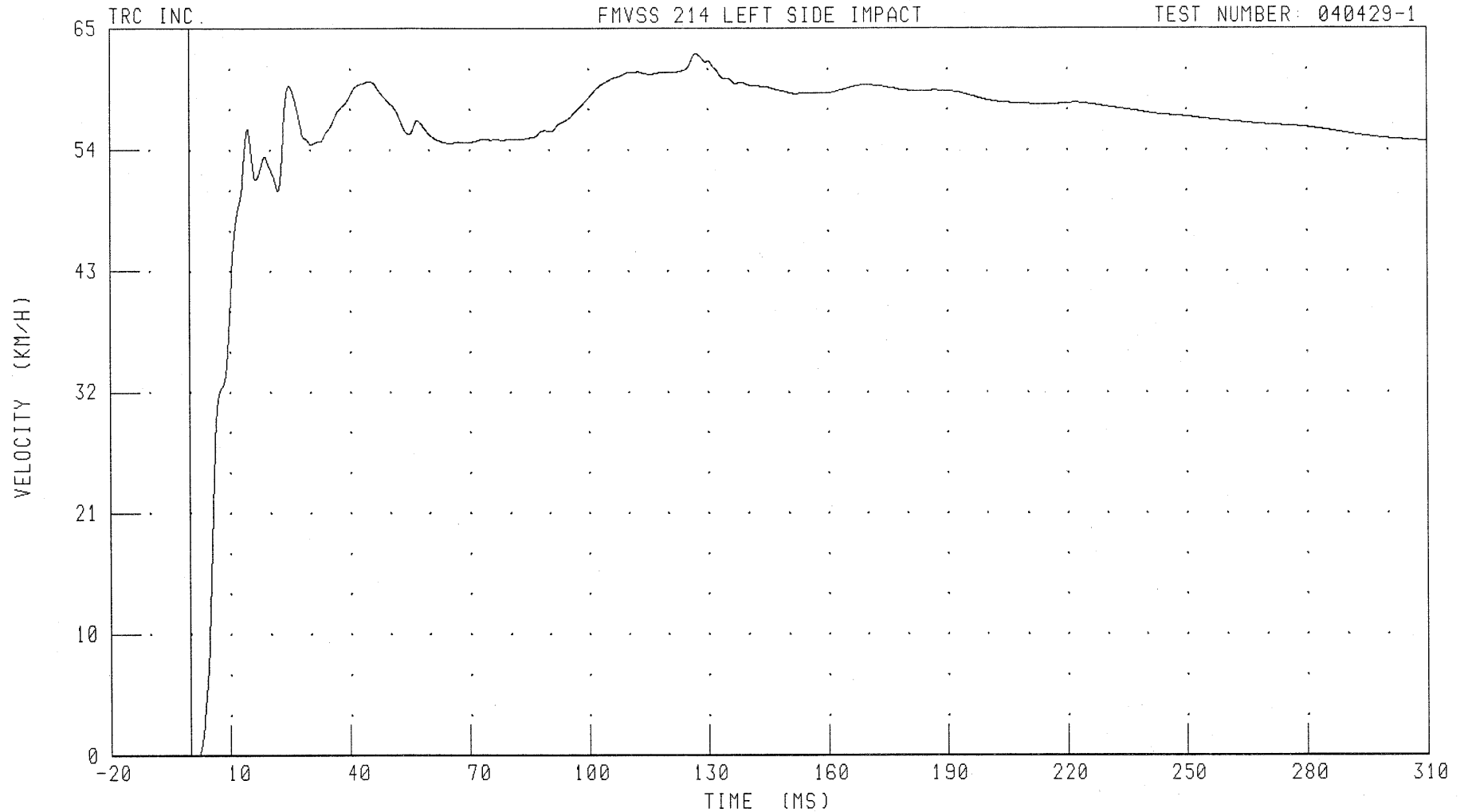
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT MIDDLE B-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LM BYV1

FILTER: CH. CLASS 180

PEAK DATA: 63.62 KM/H @ 127.12 MS; -0.11 KM/H @ 1.68 MS

B-127

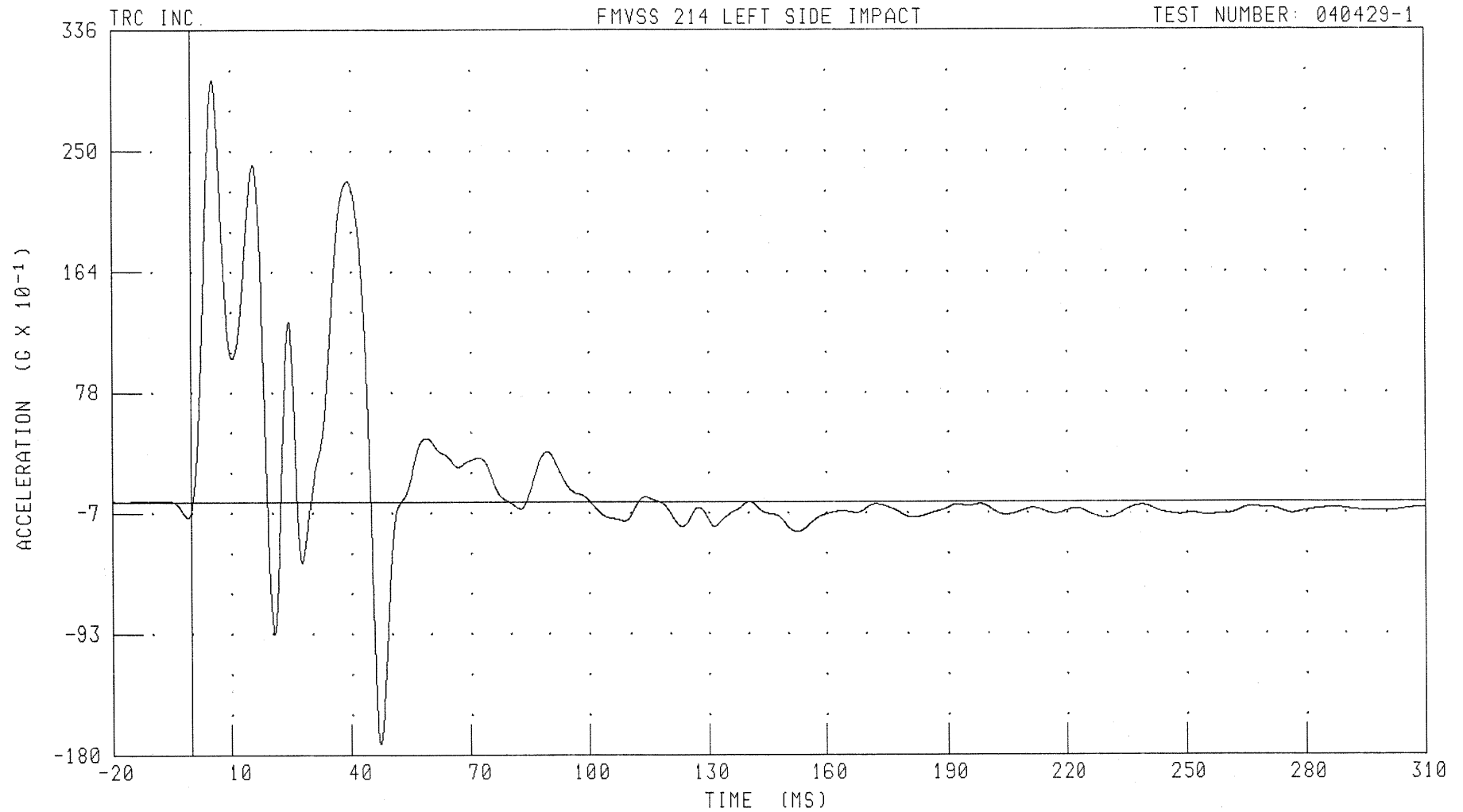
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT FRONT SEAT TRACK Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LFTYG1

FILTER: CH. CLASS 60

PEAK DATA: 30.04 G @ 5.44 MS; -17.24 G @ 47.12 MS

B-128

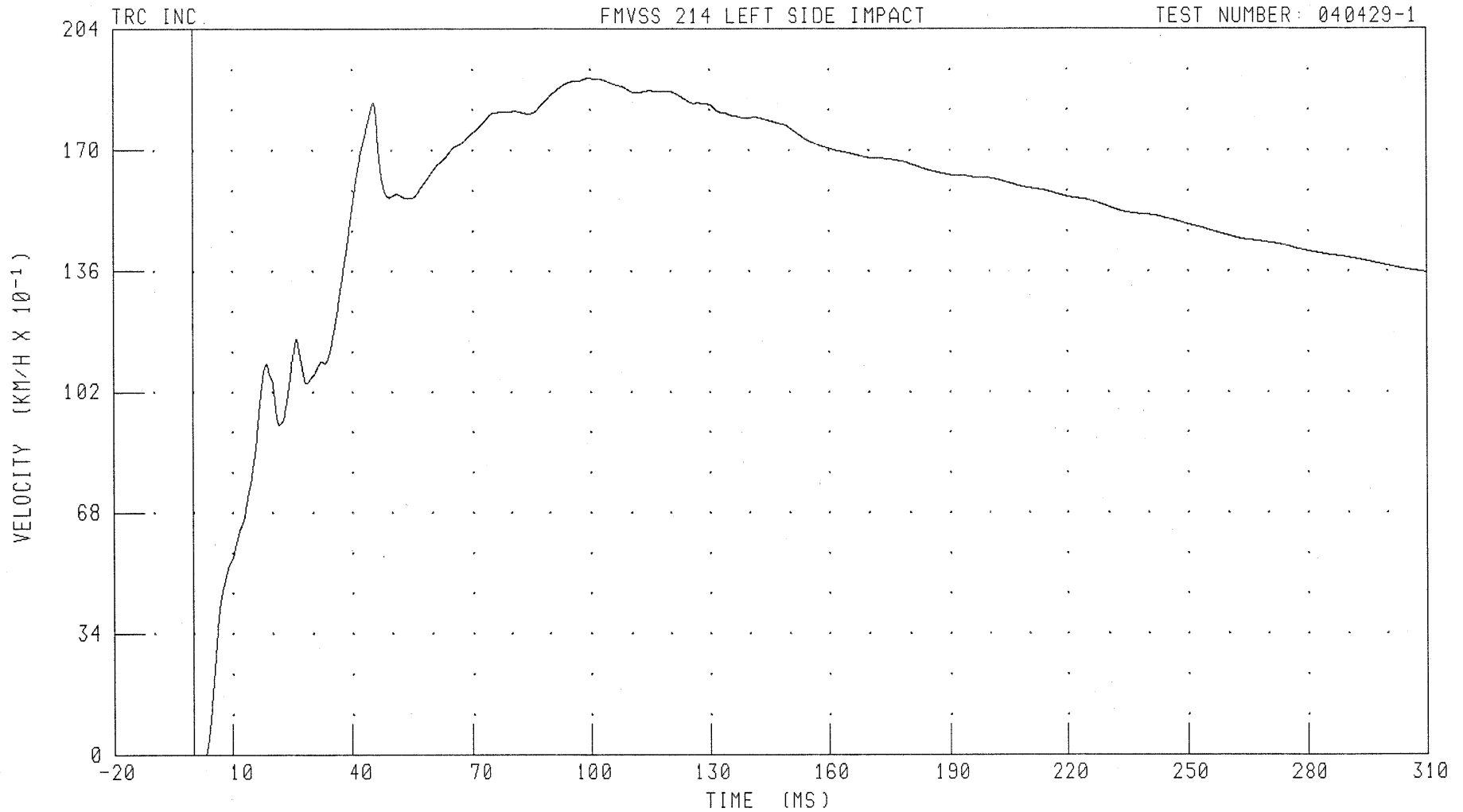
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT FRONT SEAT TRACK Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LFTYV1 FILTER: CH. CLASS 180

PEAK DATA: 19.02 KM/H @ 99.76 MS; -0.03 KM/H @ 2.48 MS

B-129

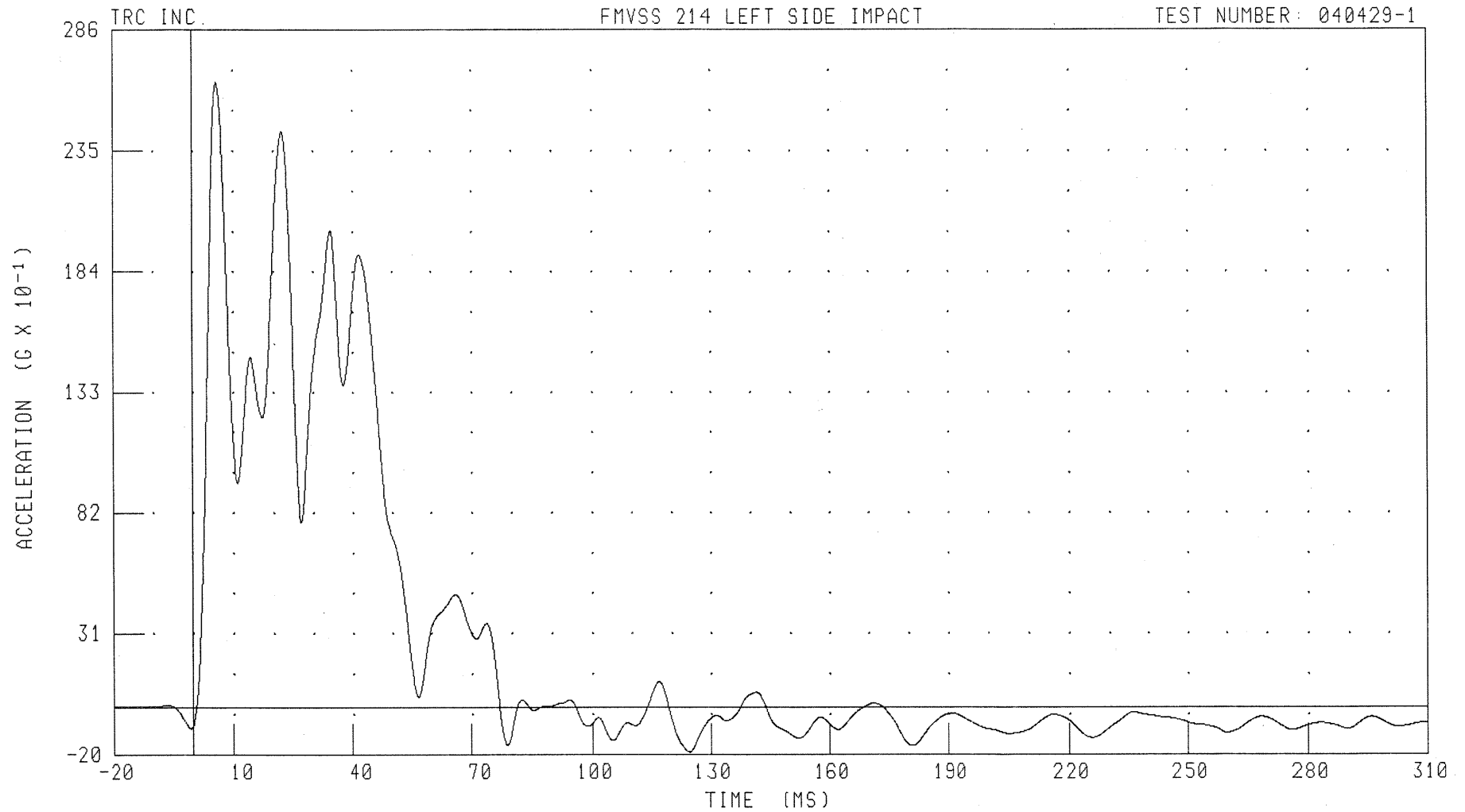
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR SEAT TRACK Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRTYG1 FILTER: CH. CLASS 60

PEAK DATA: 26.39 G @ 6.16 MS; -1.90 G @ 124.80 MS

B-130

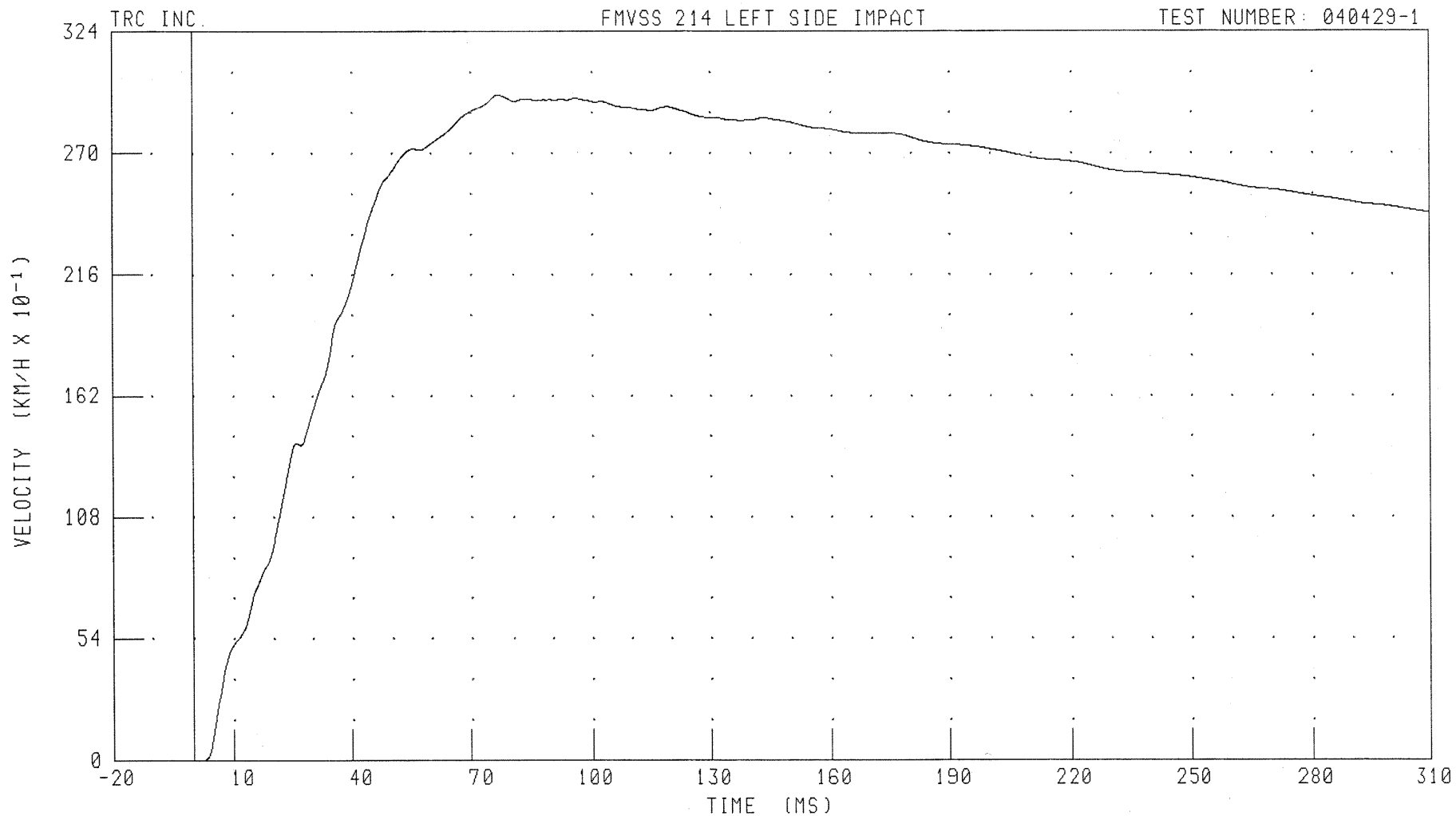
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR SEAT TRACK Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRTYV1 FILTER: CH. CLASS 180

PEAK DATA: 29.58 KM/H @ 76.64 MS; 0.00 KM/H @ 0.00 MS

B-131

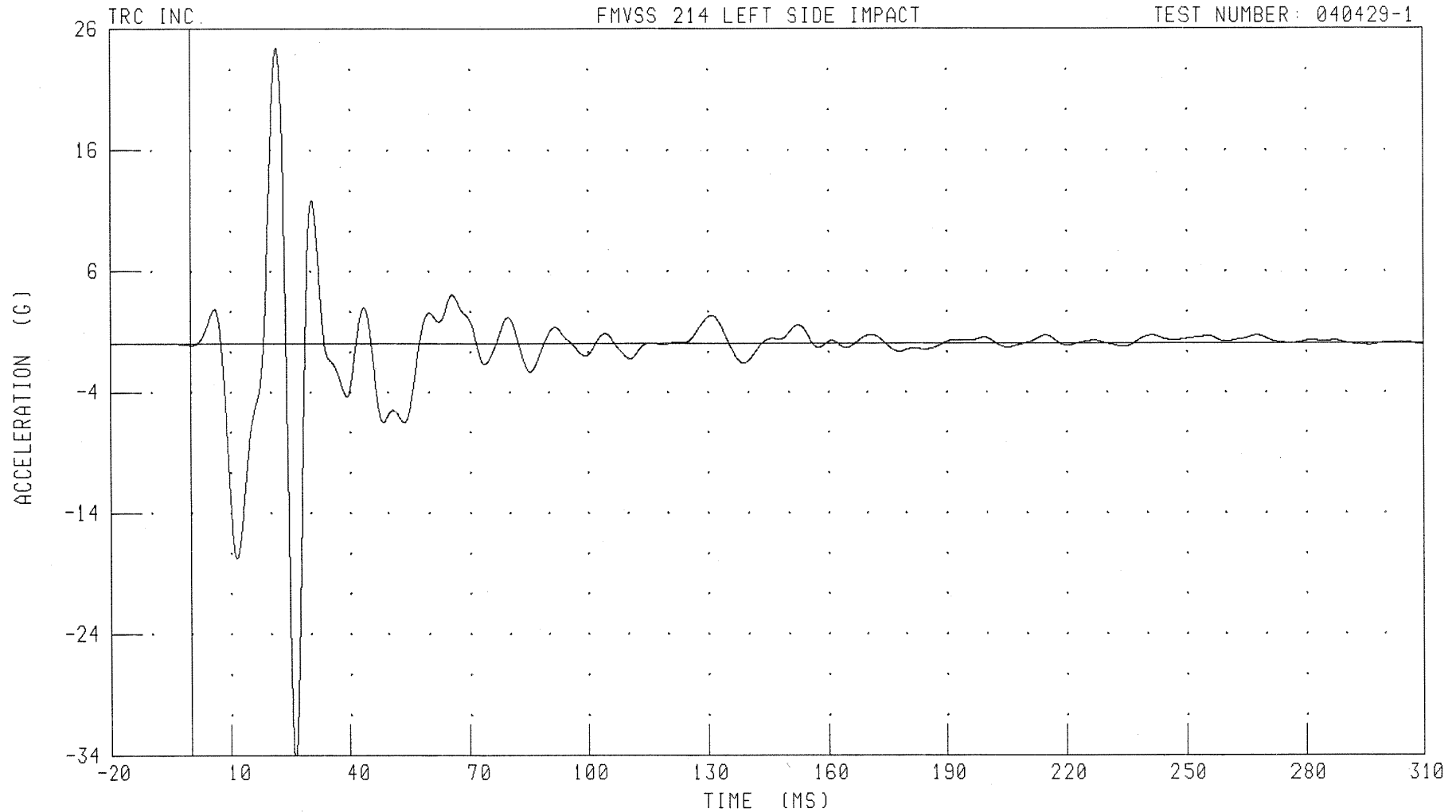
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 24.43 G @ 21.68 MS; -35.05 G @ 26.16 MS

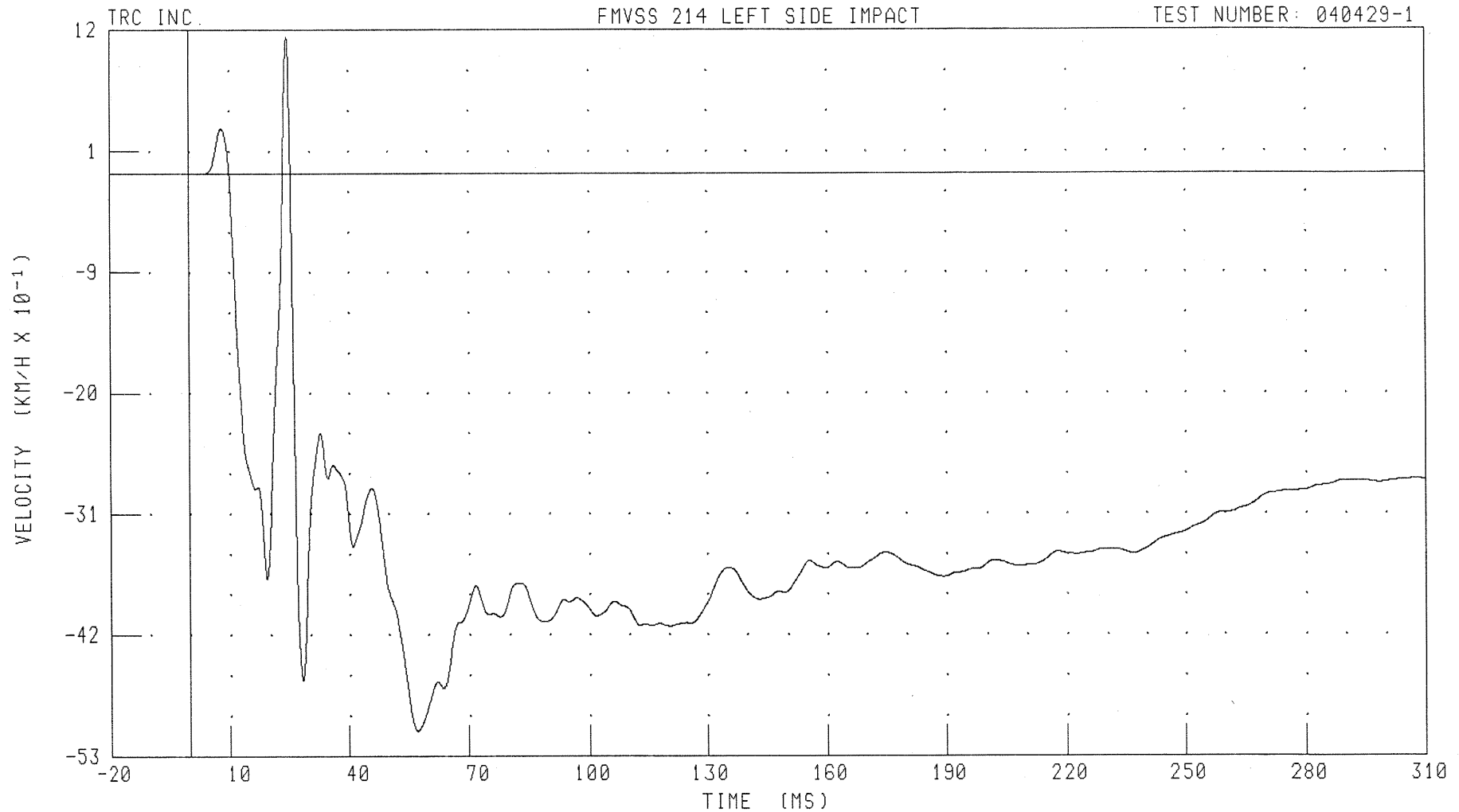
B-132

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGXV1 FILTER: CH. CLASS 100

PEAK DATA: 1.24 KM/H @ 24.40 MS; -5.07 KM/H @ 57.04 MS

B-133

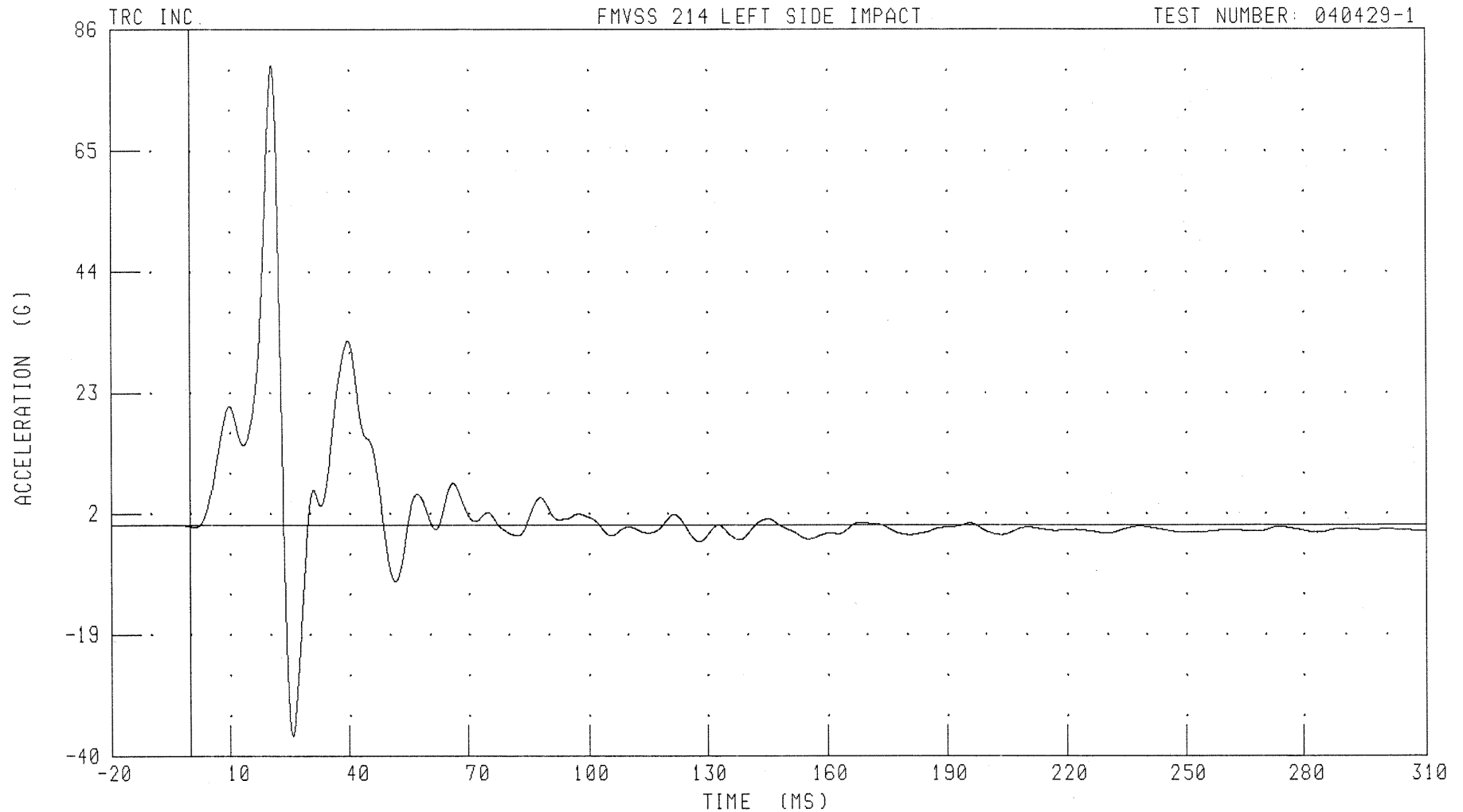
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGYG1

FILTER: CH. CLASS 60

PEAK DATA: 79.78 G @ 20.56 MS; -36.56 G @ 25.68 MS

B-134

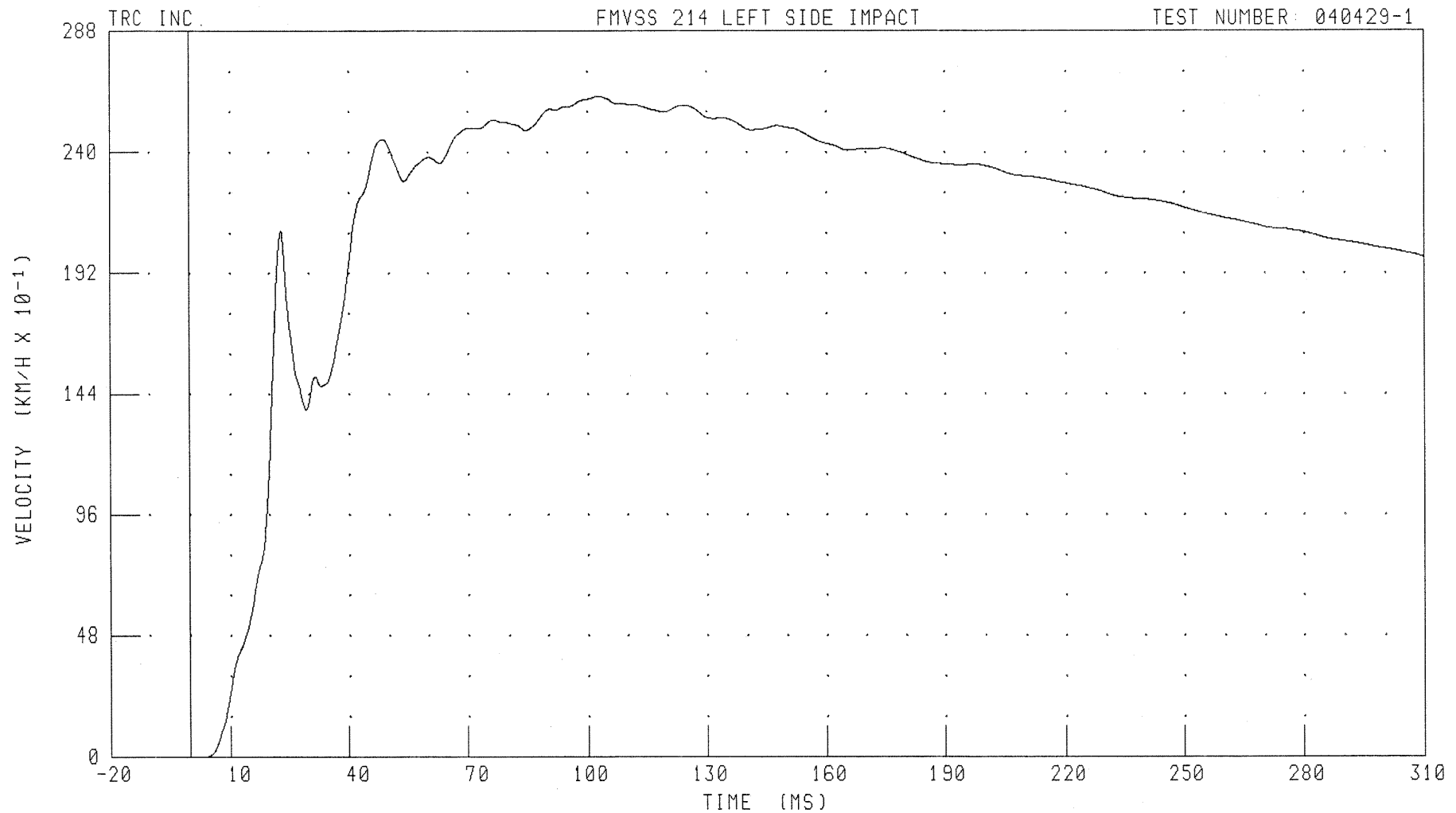
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGYV1

FILTER: CH. CLASS 180

PEAK DATA: 26.22 KM/H @ 103.04 MS; 0.00 KM/H @ 0.00 MS

B-135

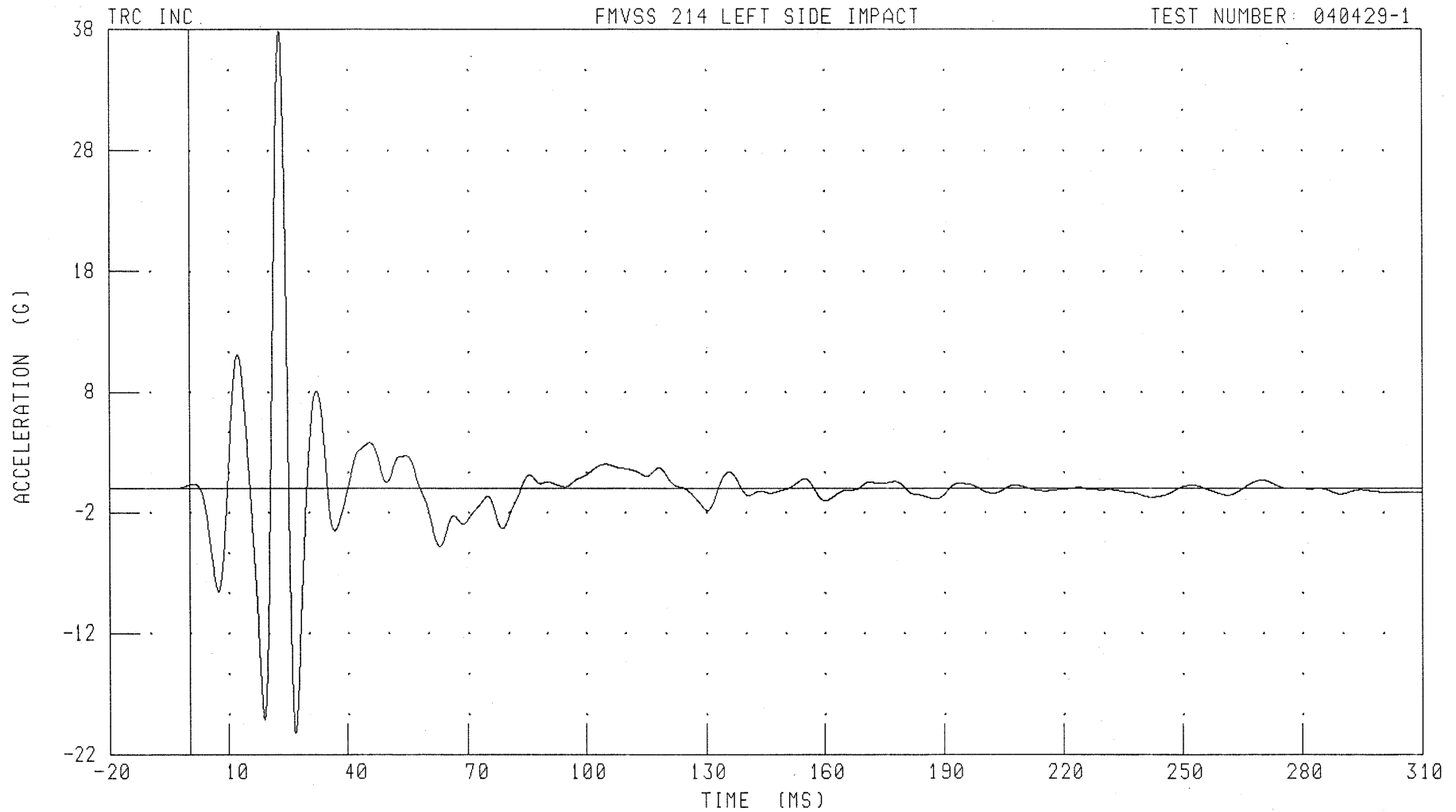
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 37.89 G @ 22.96 MS; -20.24 G @ 26.80 MS

B-136

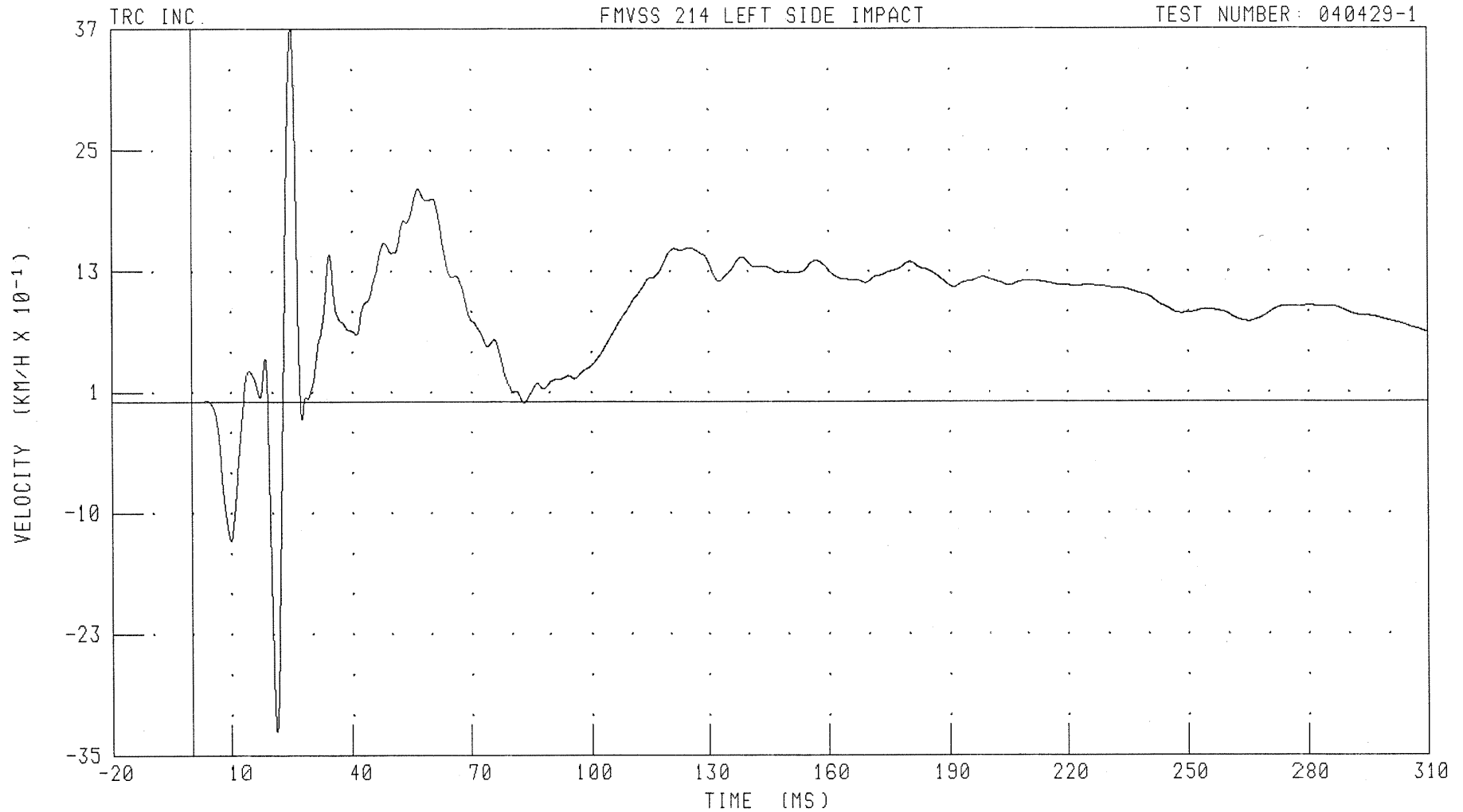
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 3.72 KM/H @ 24.96 MS; -3.27 KM/H @ 21.12 MS

B-137

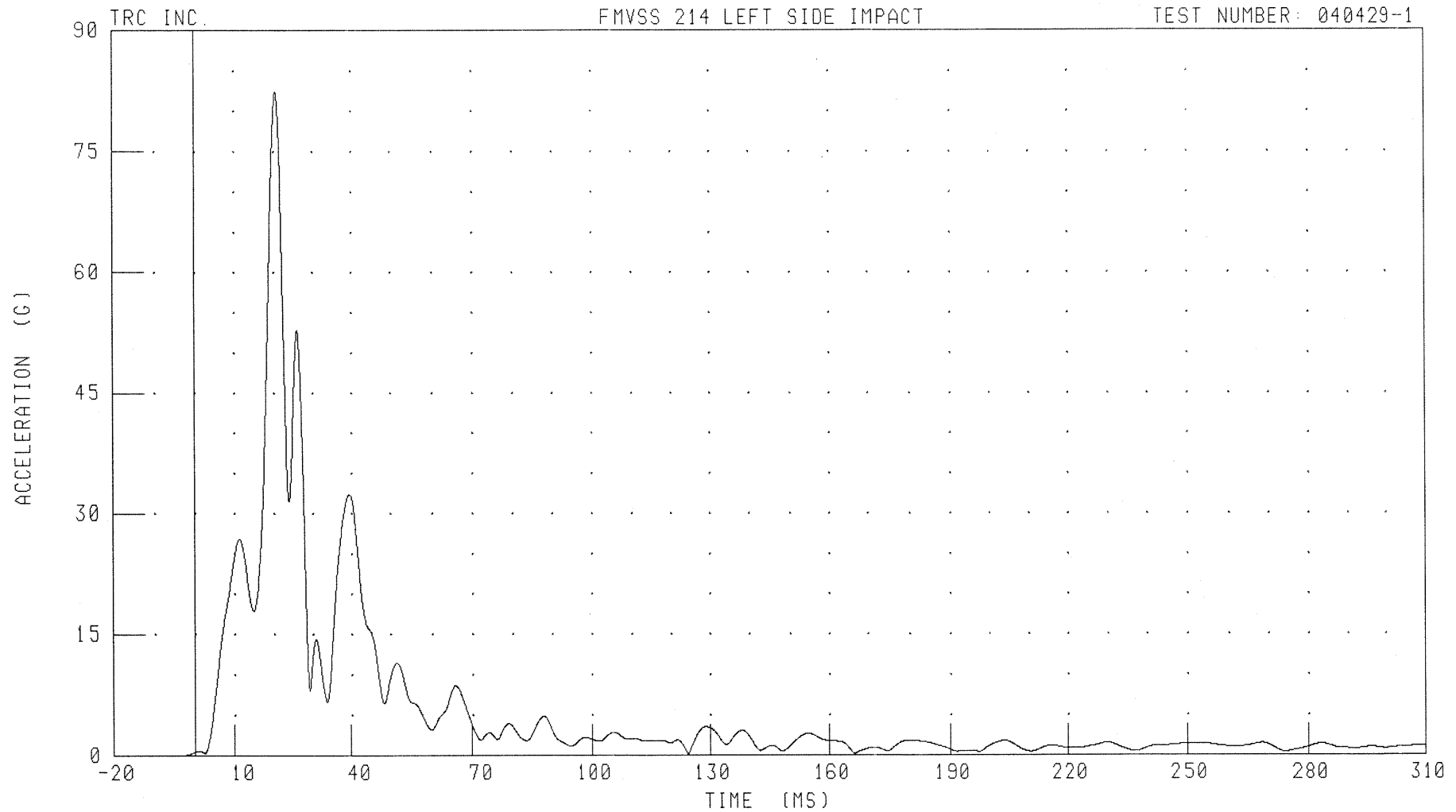
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 82.41 G @ 20.64 MS; 0.00 G @ -18.80 MS

B-138

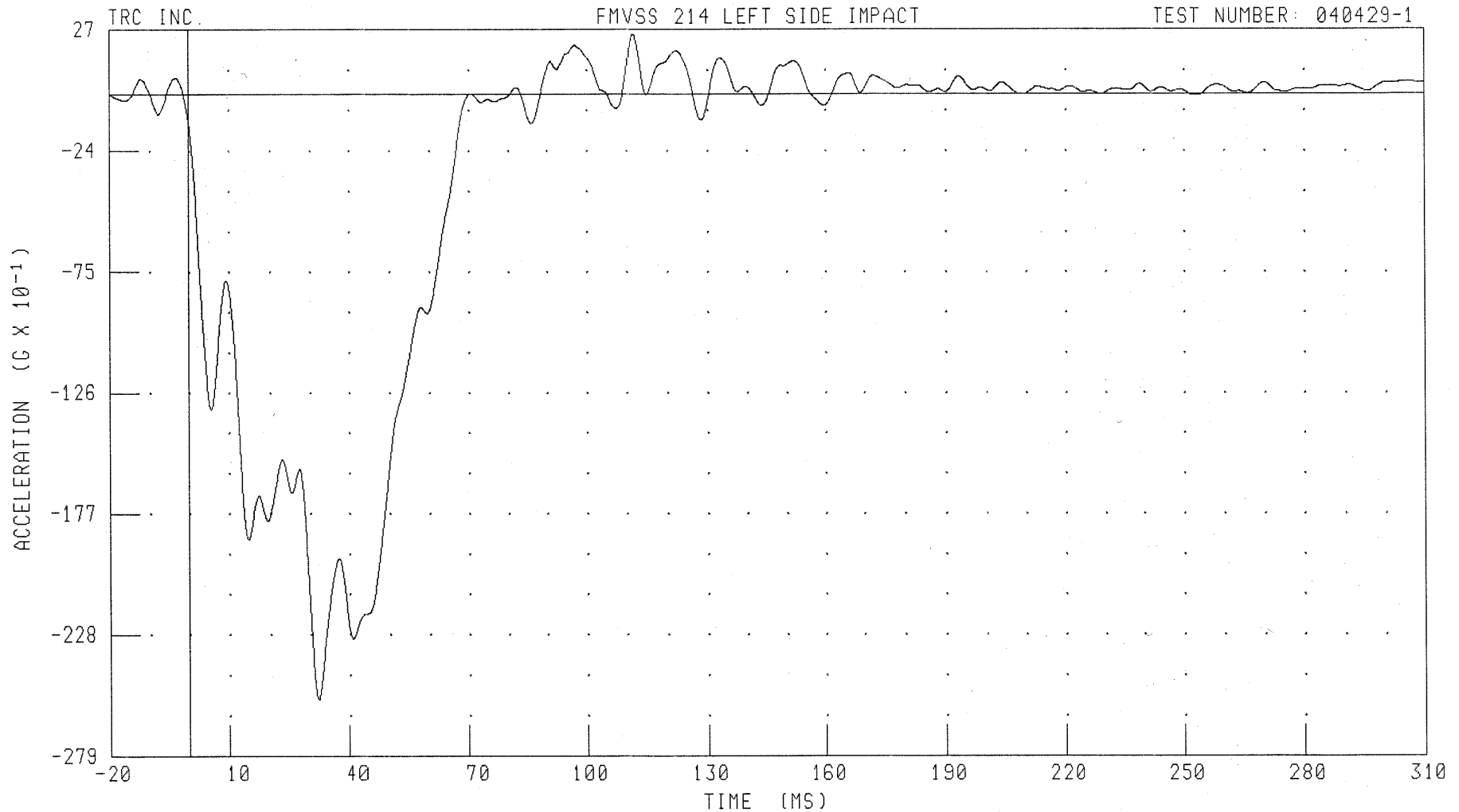
040429-1

MDB Instrumentation Plots

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
MDB CENTER OF GRAVITY X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.51 G @ 111.60 MS; -25.53 G @ 32.00 MS

B-140

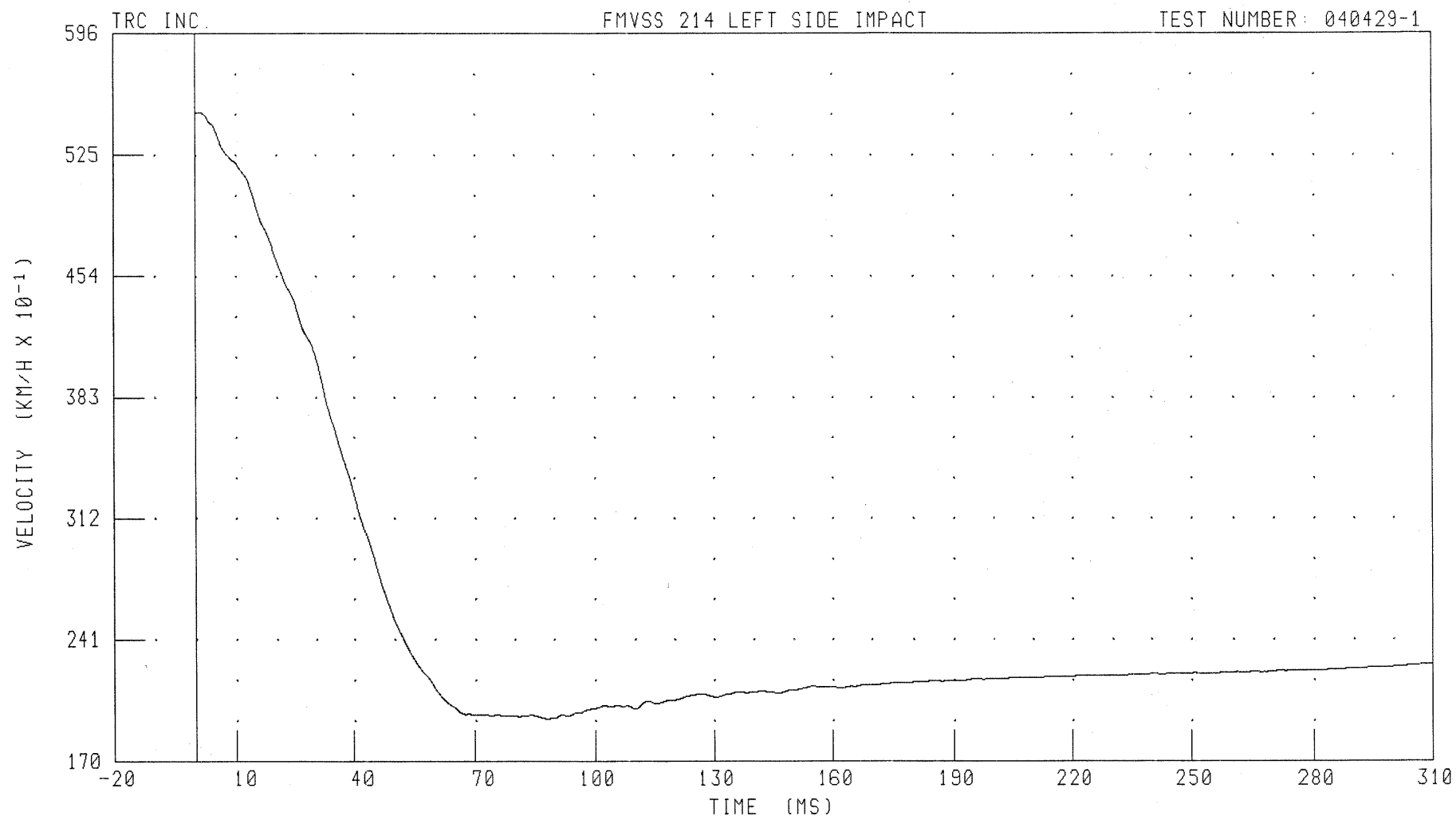
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB CENTER OF GRAVITY X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 55.00 KM/H @ 0.00 MS; 19.48 KM/H @ 88.32 MS

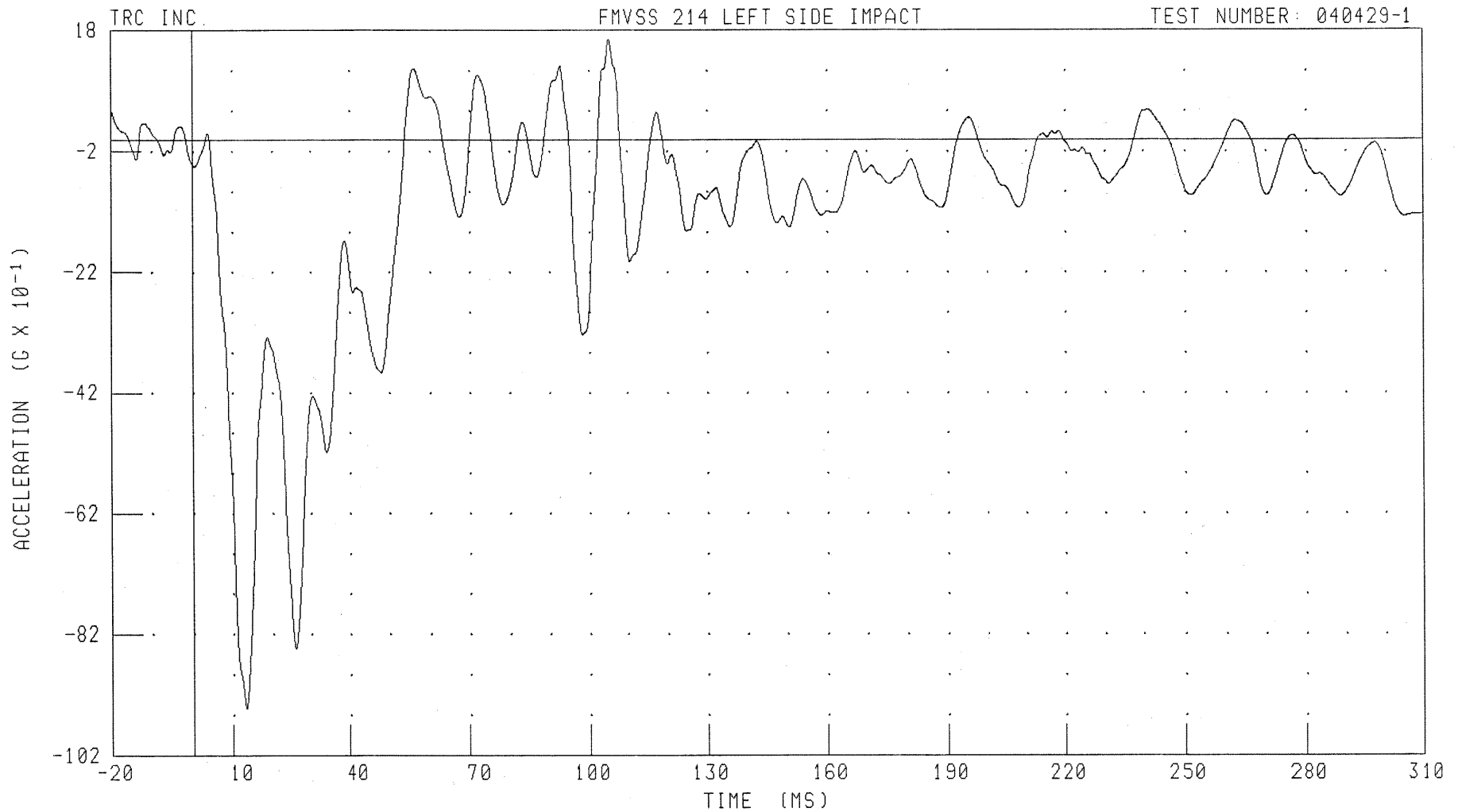
B-141

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
MDB CENTER OF GRAVITY Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 1.65 G @ 105.20 MS; -9.43 G @ 13.36 MS

B-142

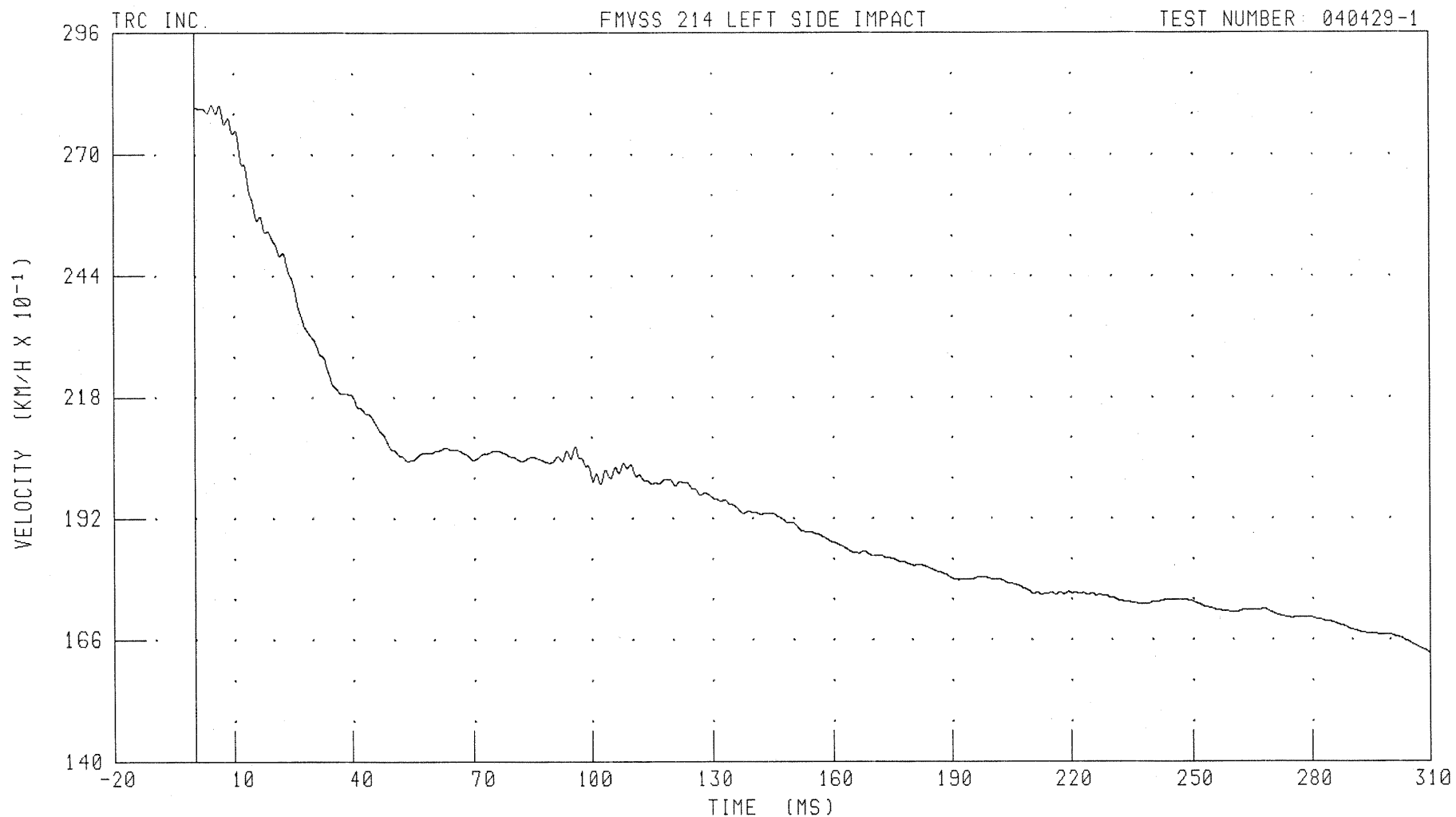
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB CENTER OF GRAVITY Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 28.06 KM/H @ 4.48 MS; 16.30 KM/H @ 310.00 MS

B-143

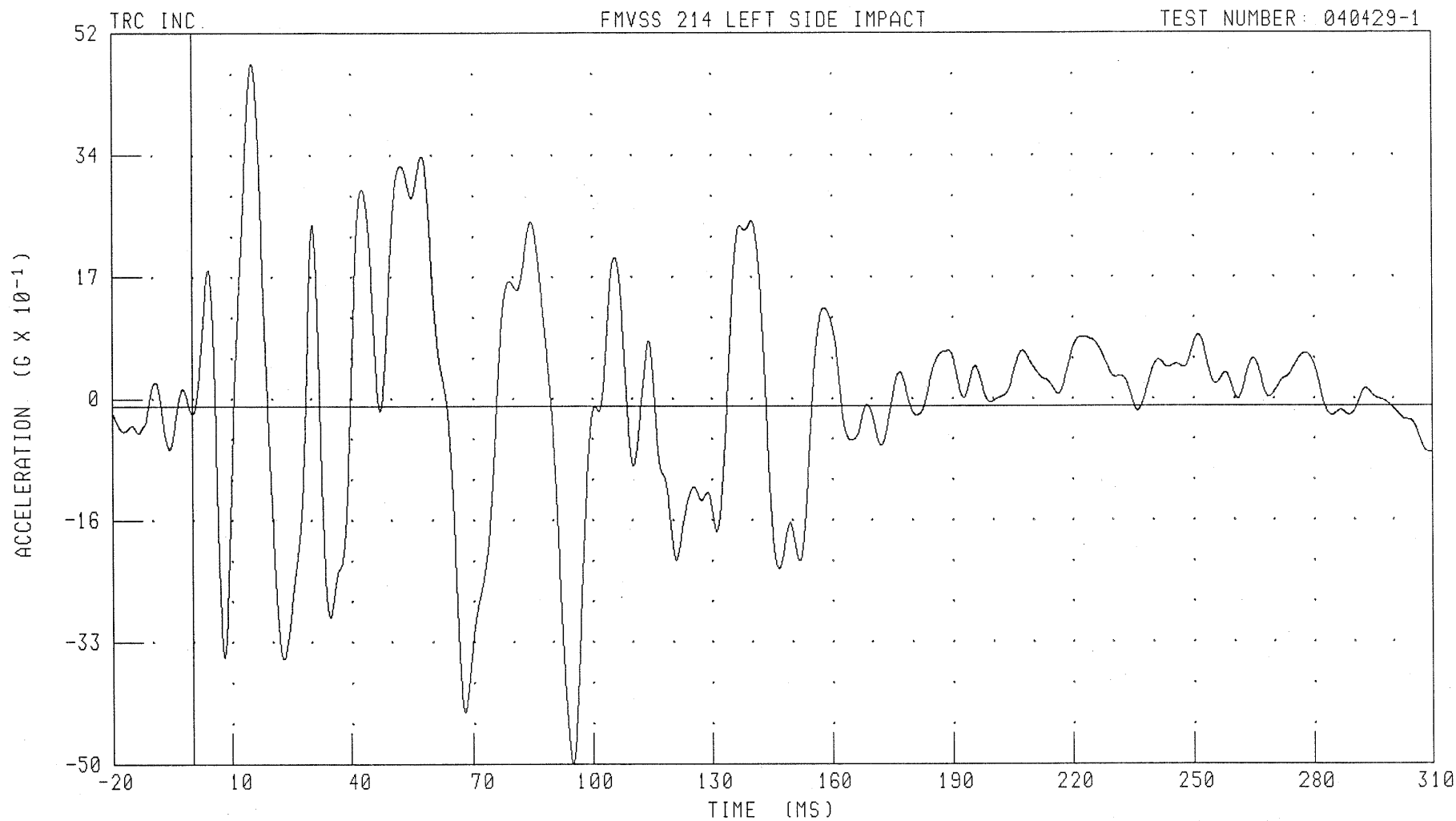
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB CENTER OF GRAVITY Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 4.77 G @ 15.20 MS; -4.99 G @ 95.04 MS

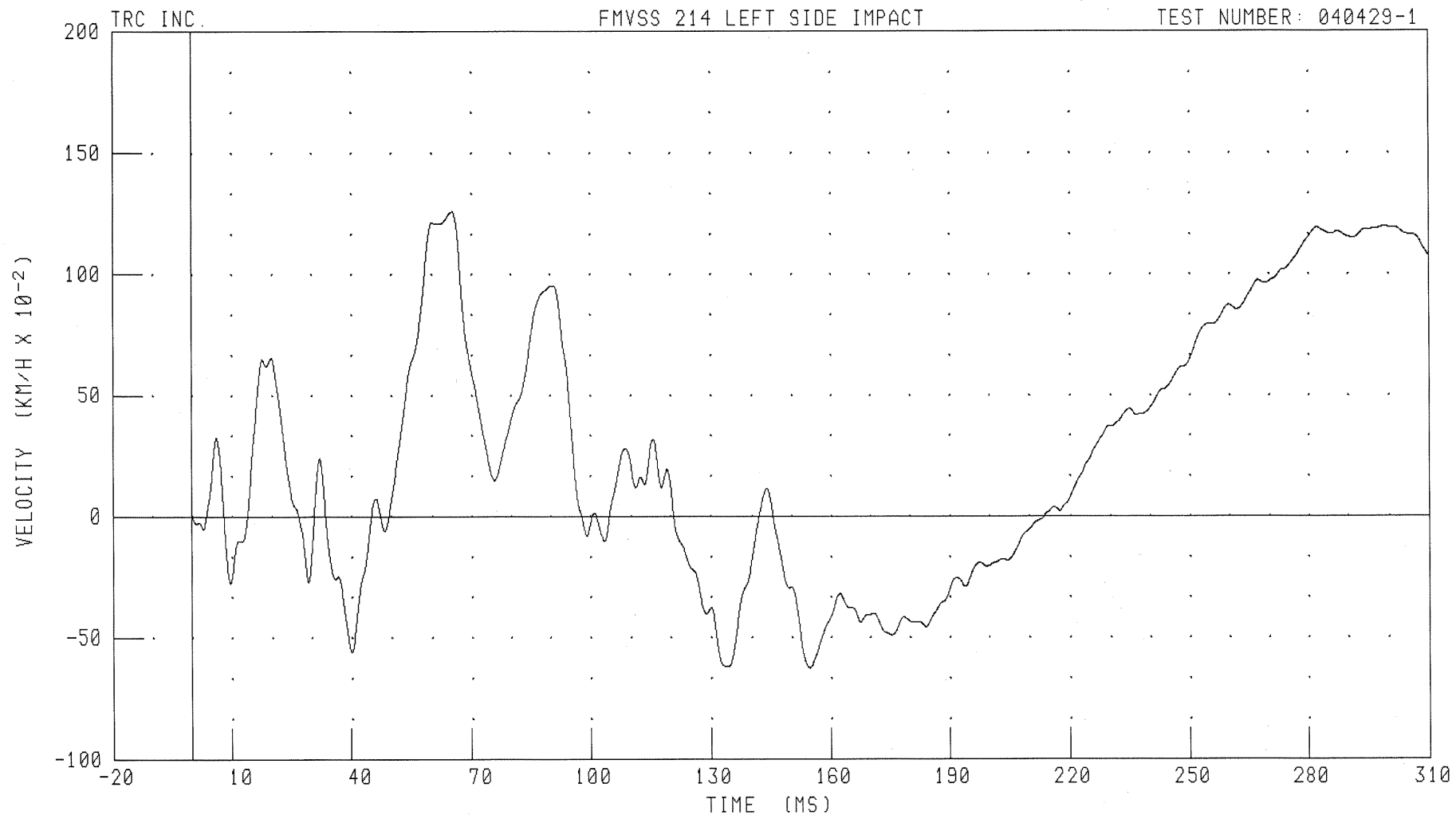
B-144

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
MDB CENTER OF GRAVITY Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.26 KM/H @ 65.36 MS; -0.63 KM/H @ 154.72 MS

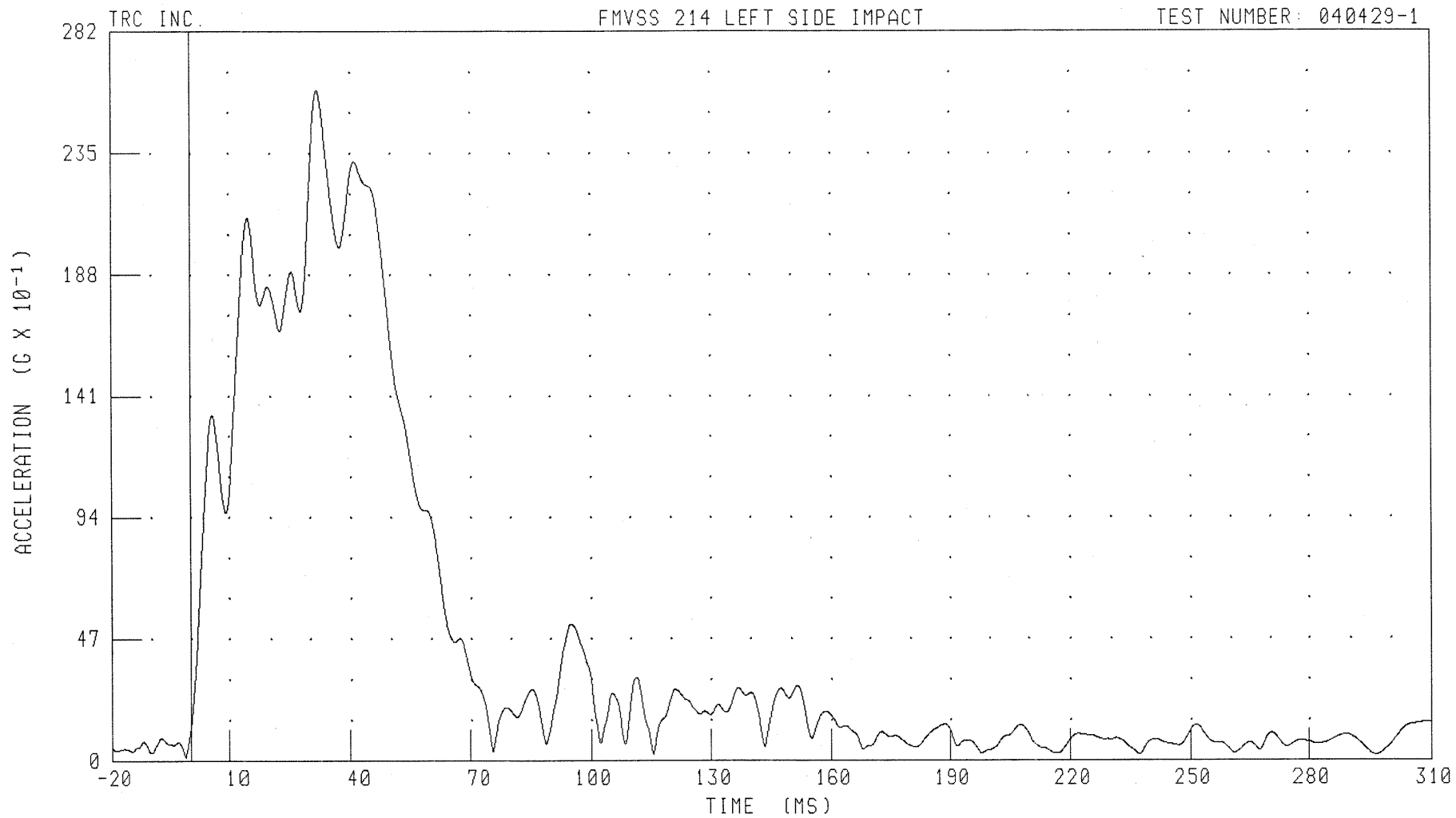
B-145

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
MDB CENTER OF GRAVITY RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: BCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 25.93 G @ 32.00 MS; 0.14 G @ -1.36 MS

B-146

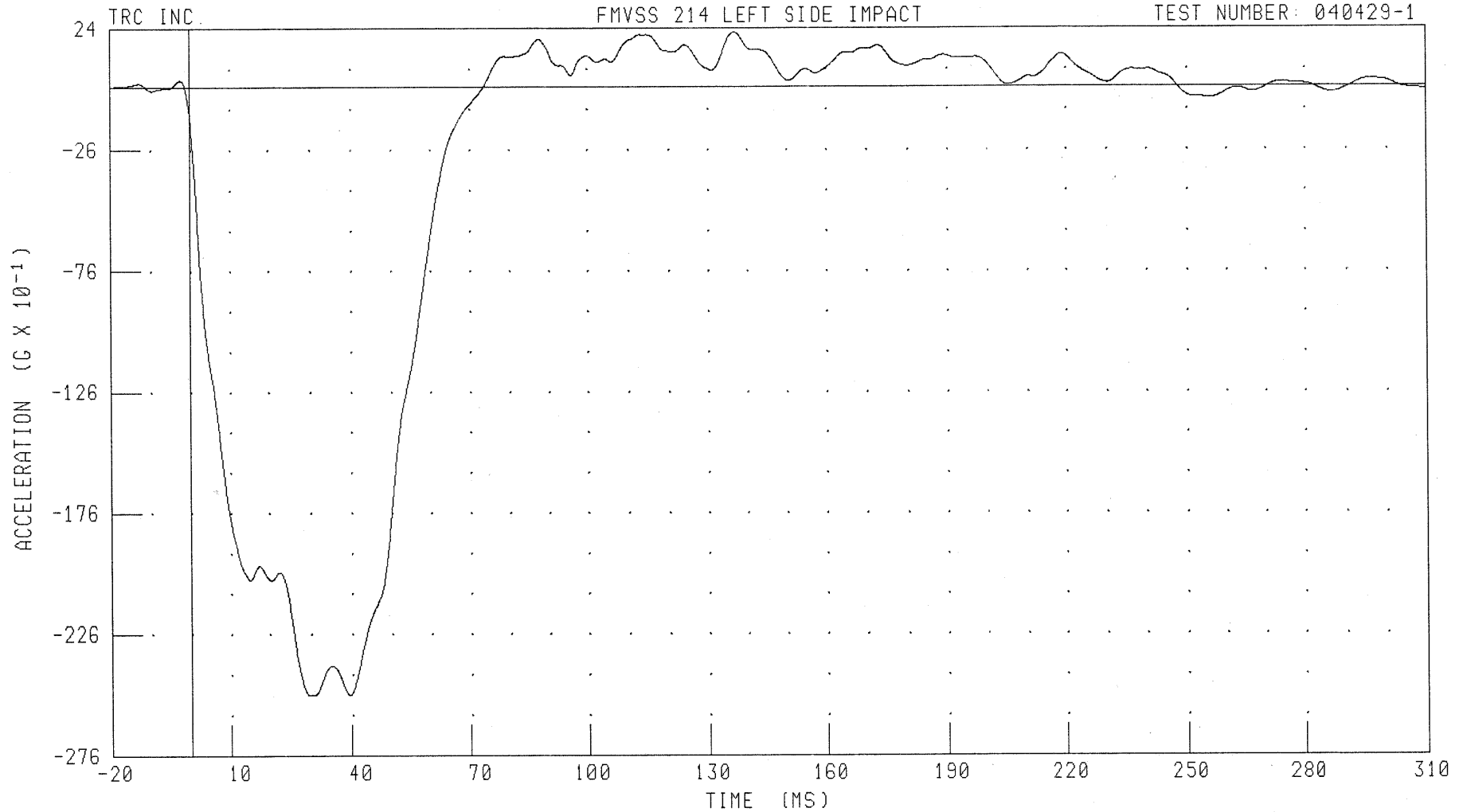
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB LEFT REAR X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.24 G @ 136.88 MS; -25.13 G @ 30.00 MS

B-147

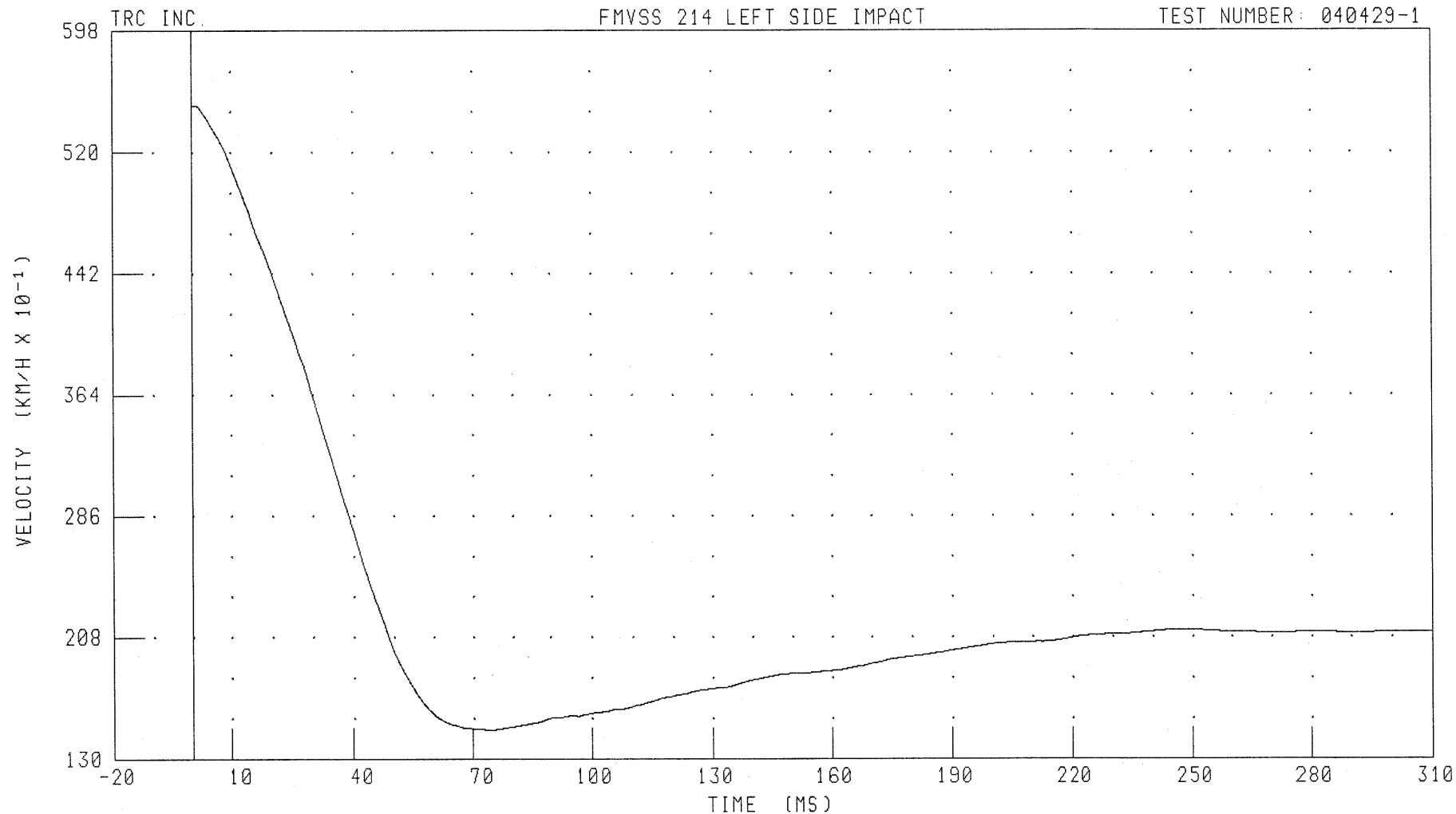
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB LEFT REAR X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRRXV1 FILTER: CH. CLASS 180

PEAK DATA: 55.00 KM/H @ 0.00 MS; 14.86 KM/H @ 74.56 MS

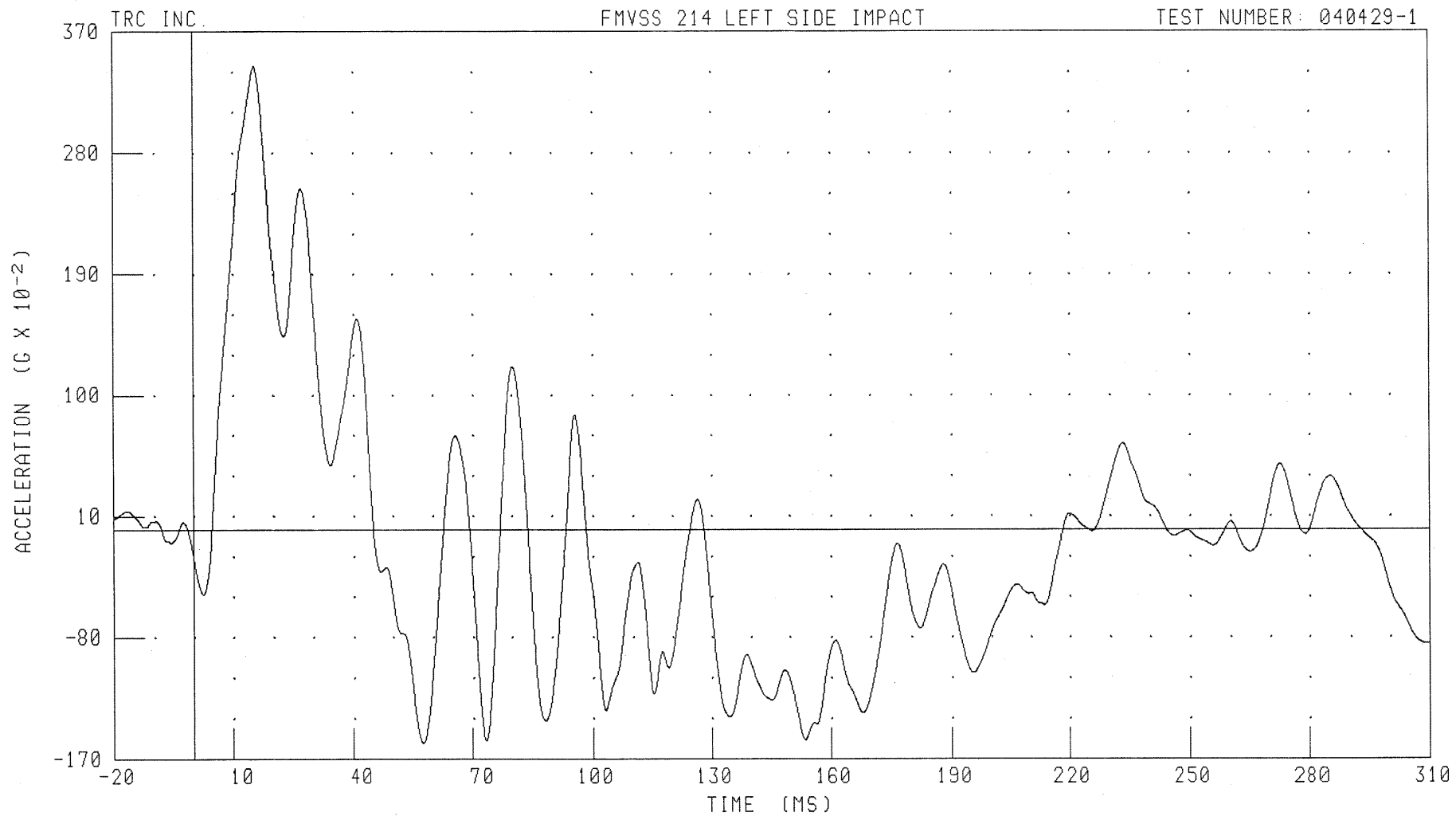
B-148

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
MDB LEFT REAR Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRRYG1 FILTER: CH. CLASS 60

PEAK DATA: 3.44 G @ 15.60 MS; -1.58 G @ 57.52 MS

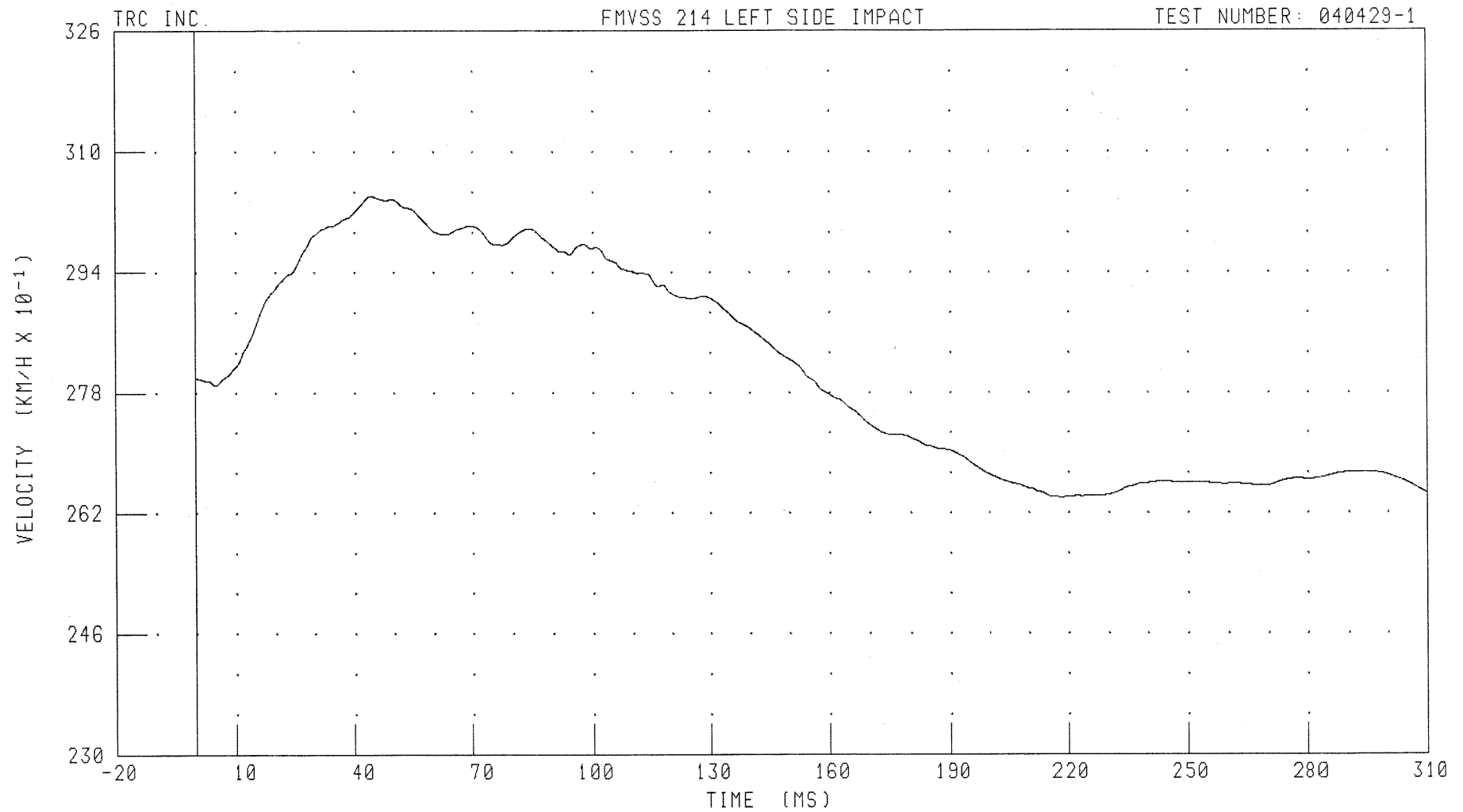
B-149

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
MDB LEFT REAR Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LRRYV1 FILTER: CH. CLASS 180

PEAK DATA: 30.41 KM/H @ 44.48 MS; 26.40 KM/H @ 218.32 MS

B-150

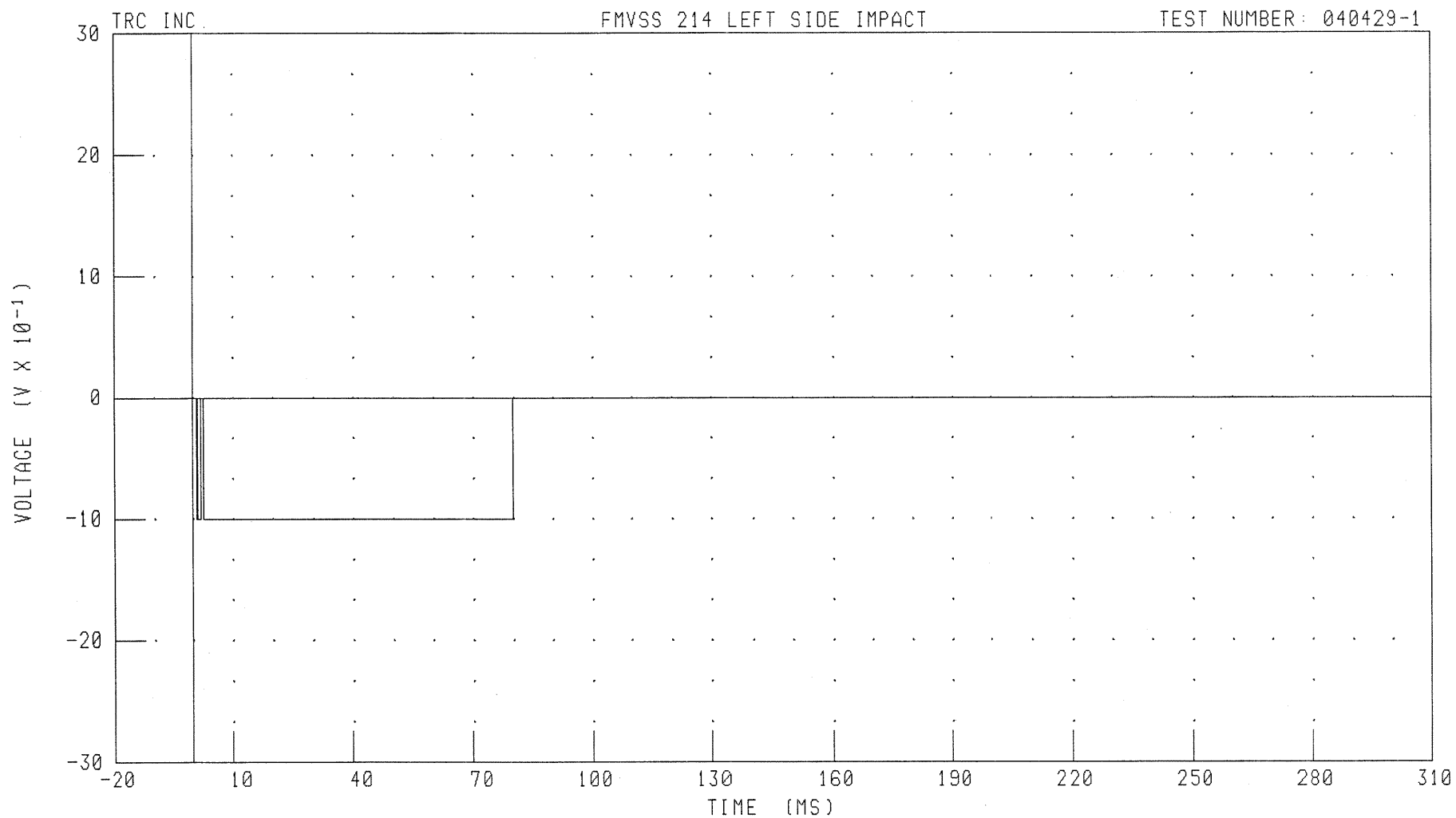
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB RIGHT SIDE CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: MDBR1

FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 310.00 MS, -1.00 V @ 1.12 MS

B-151

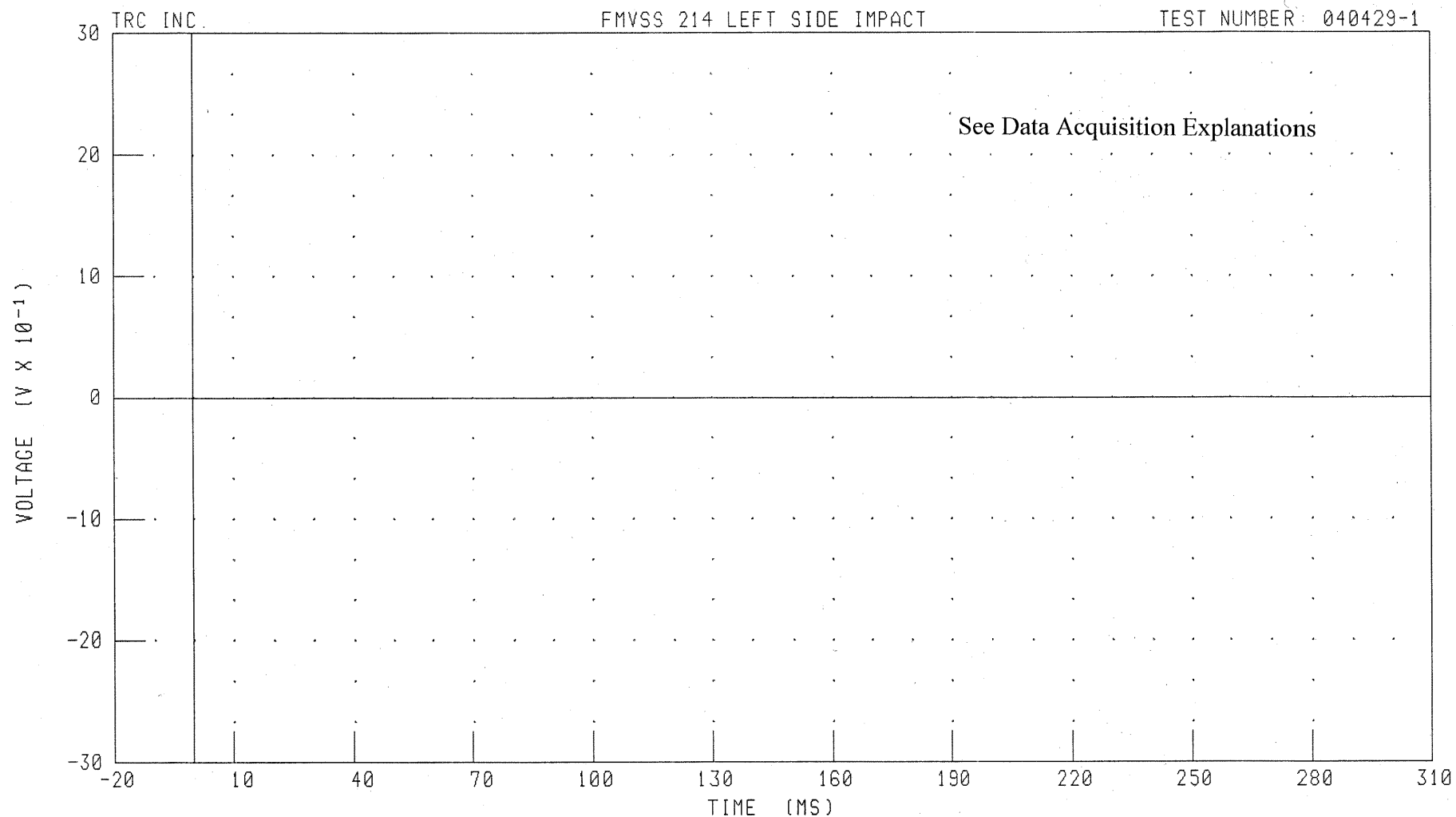
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

MDB LEFT SIDE CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: MDBL1

FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 310.00 MS; 0.00 V @ -20.00 MS

B-152

040429-1

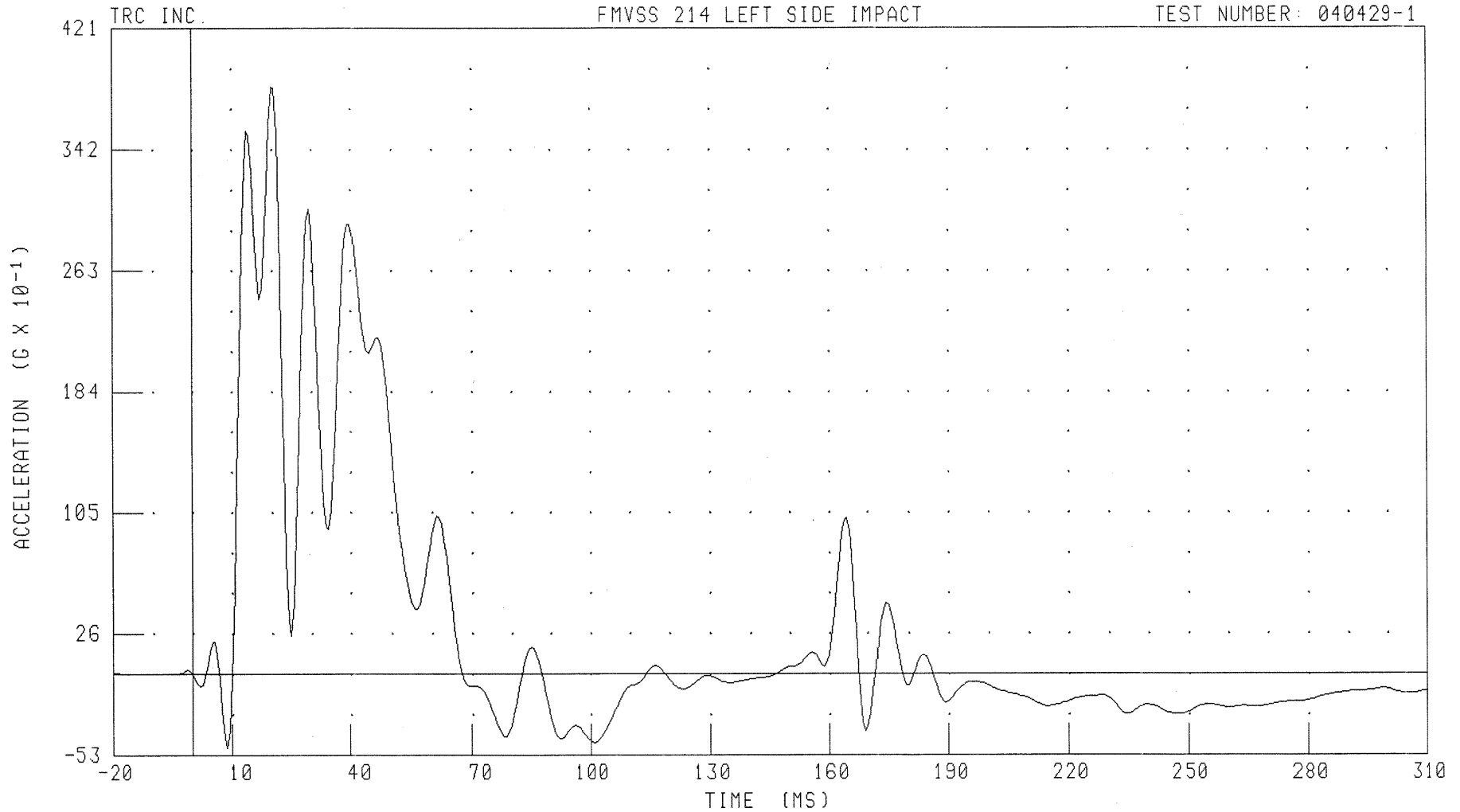
Driver and Passenger Dummy Instrumentation Plots

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYG1 FILTER: FIR 100

PEAK DATA: 38.29 G @ 20.00 MS; -4.86 G @ 8.75 MS

B-154

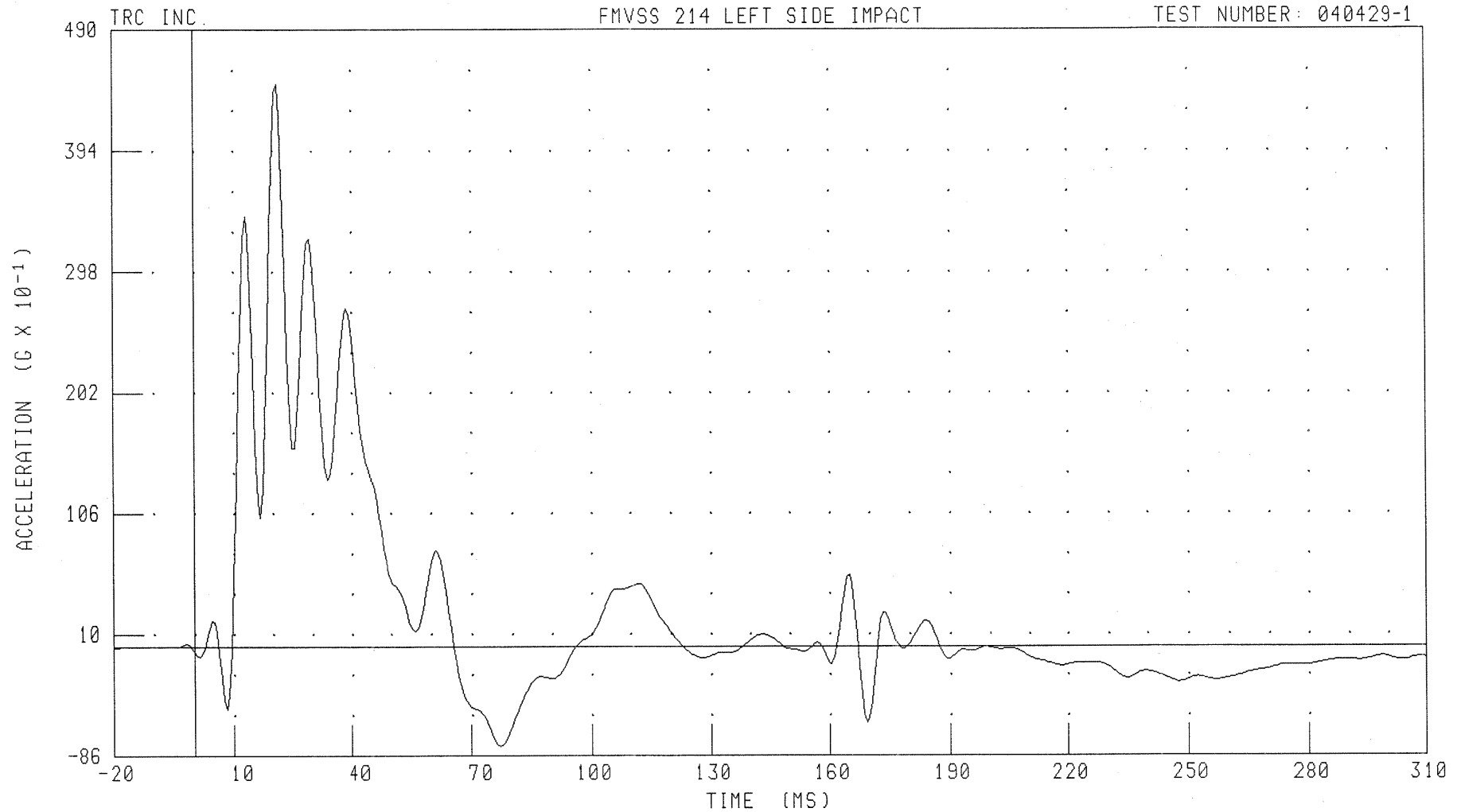
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



B-155

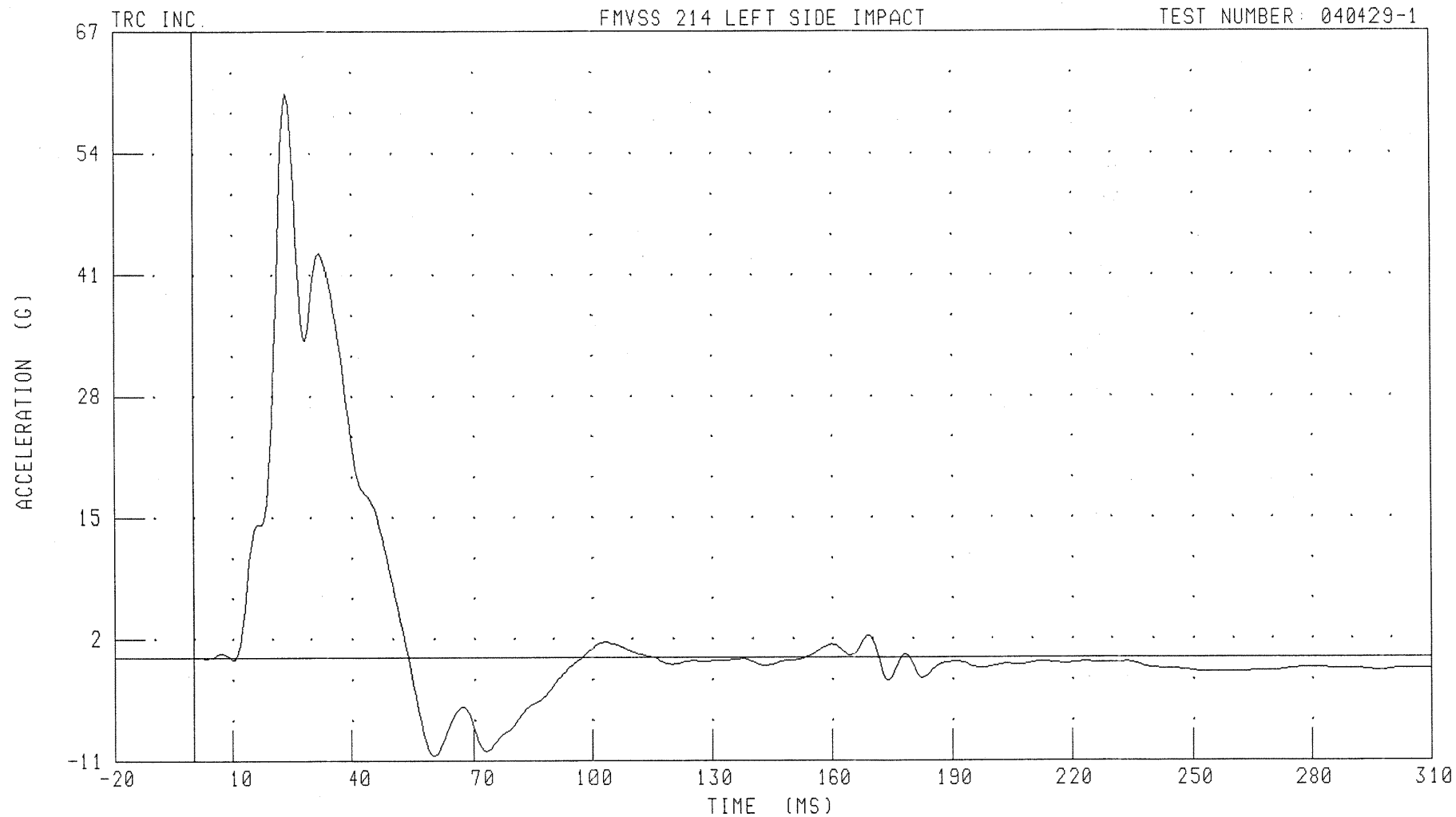
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YG1 FILTER: FIR 100

PEAK DATA: 60.47 G @ 23.75 MS; -10.51 G @ 60.00 MS

B-156

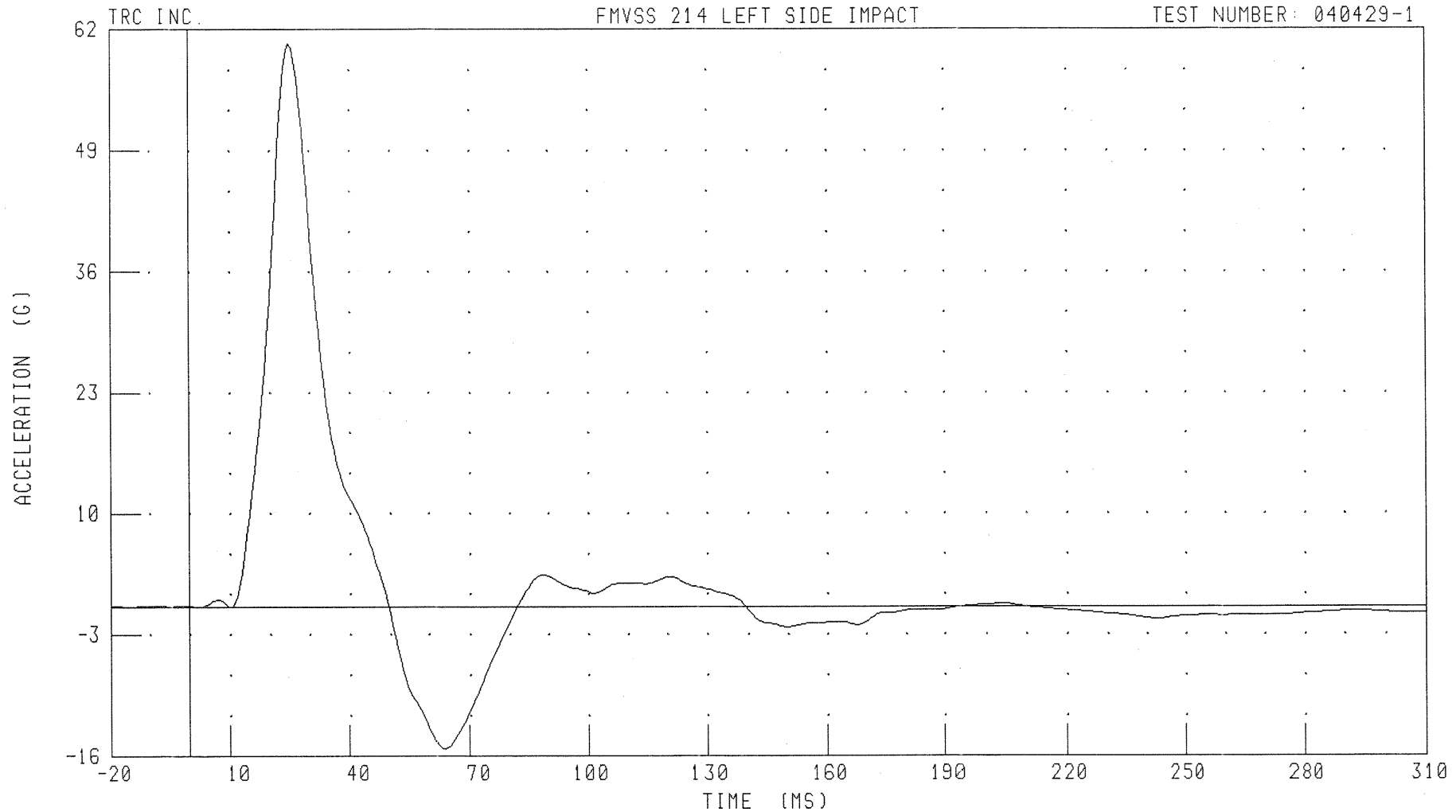
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYG1 FILTER: FIR 100

PEAK DATA: 60.46 G @ 25.00 MS; -15.29 G @ 63.75 MS

B-157

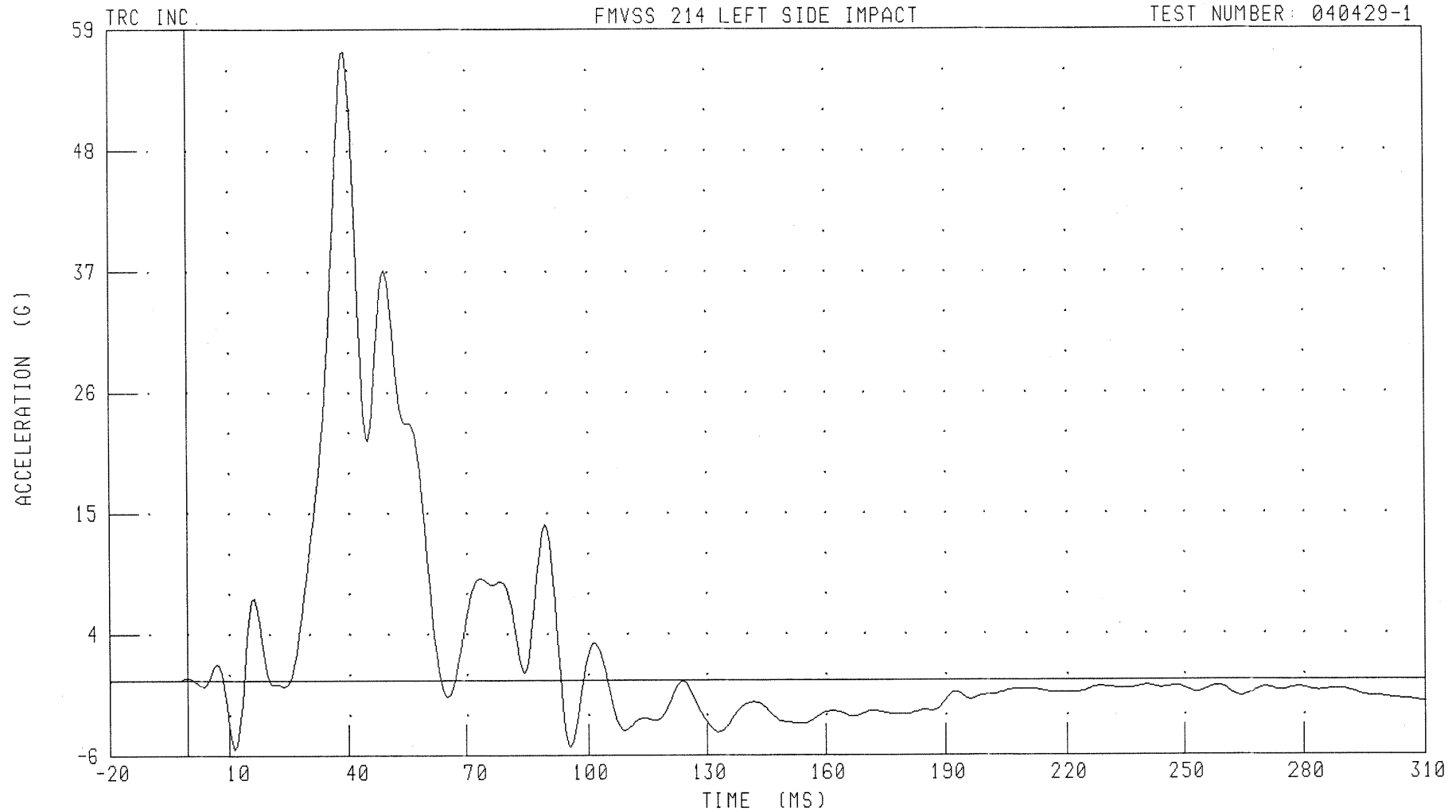
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYG4

FILTER: FIR 100

PEAK DATA: 57.18 G @ 39.38 MS; -6.26 G @ 11.25 MS

B-158

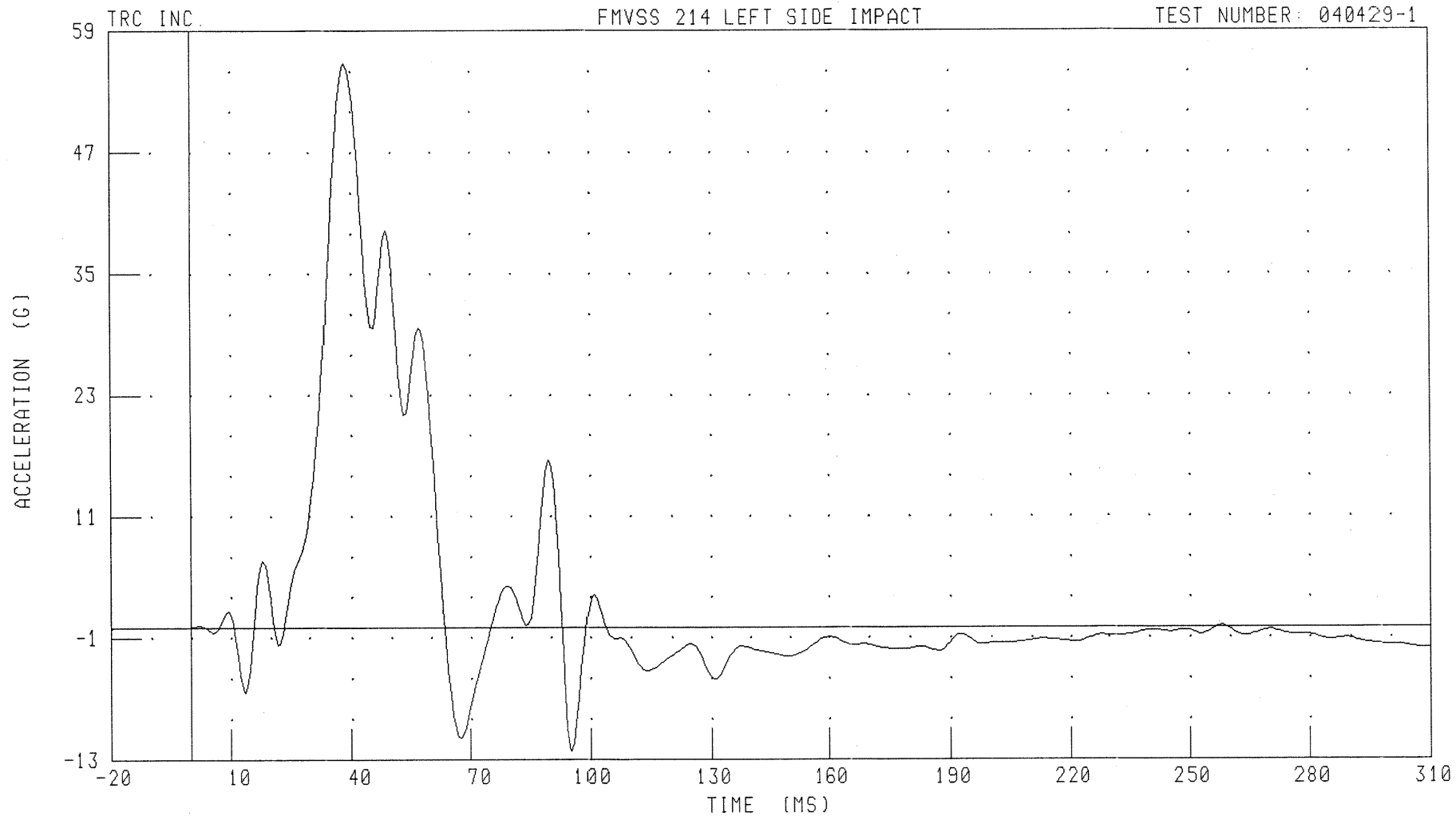
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYG4 FILTER: FIR 100

PEAK DATA: 55.74 G @ 38.75 MS; -12.23 G @ 95.63 MS

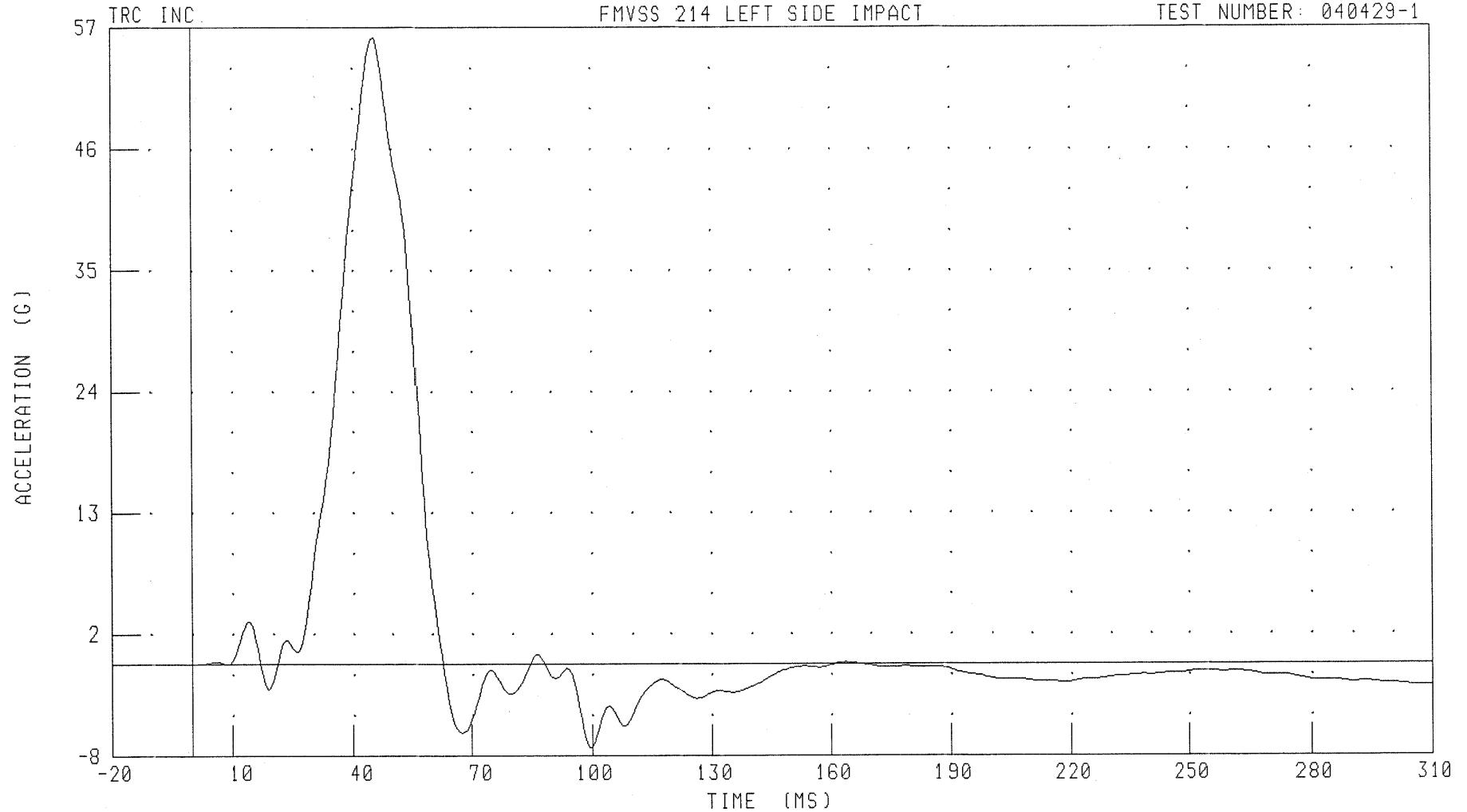
B-159

040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40
LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YG4 FILTER: FIR 100

PEAK DATA: 56.75 G @ 45.62 MS; -7.59 G @ 100.00 MS

B-160

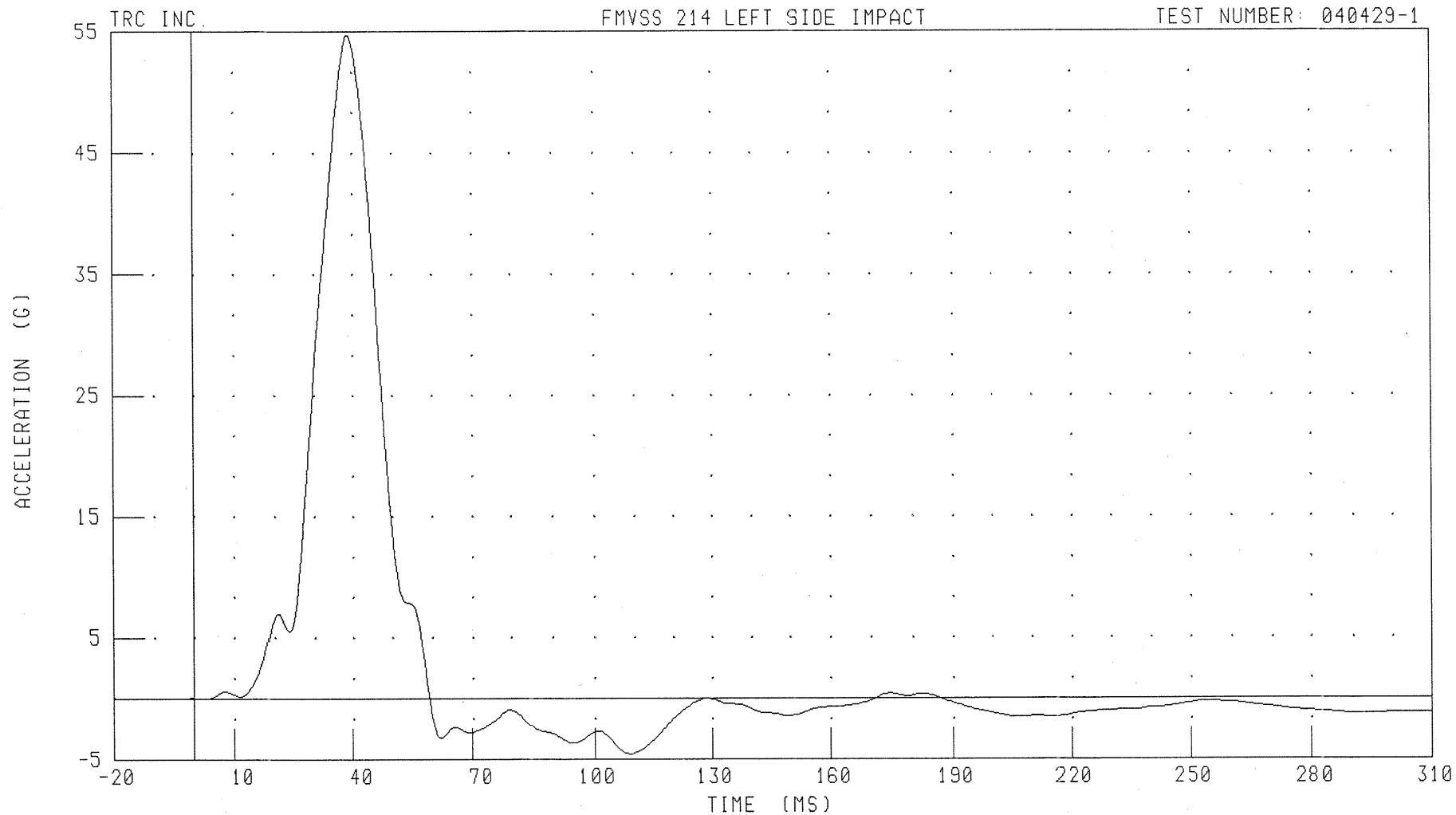
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYG4 FILTER: FIR 100

PEAK DATA: 54.70 G @ 39.38 MS; -4.57 G @ 108.75 MS

B-161

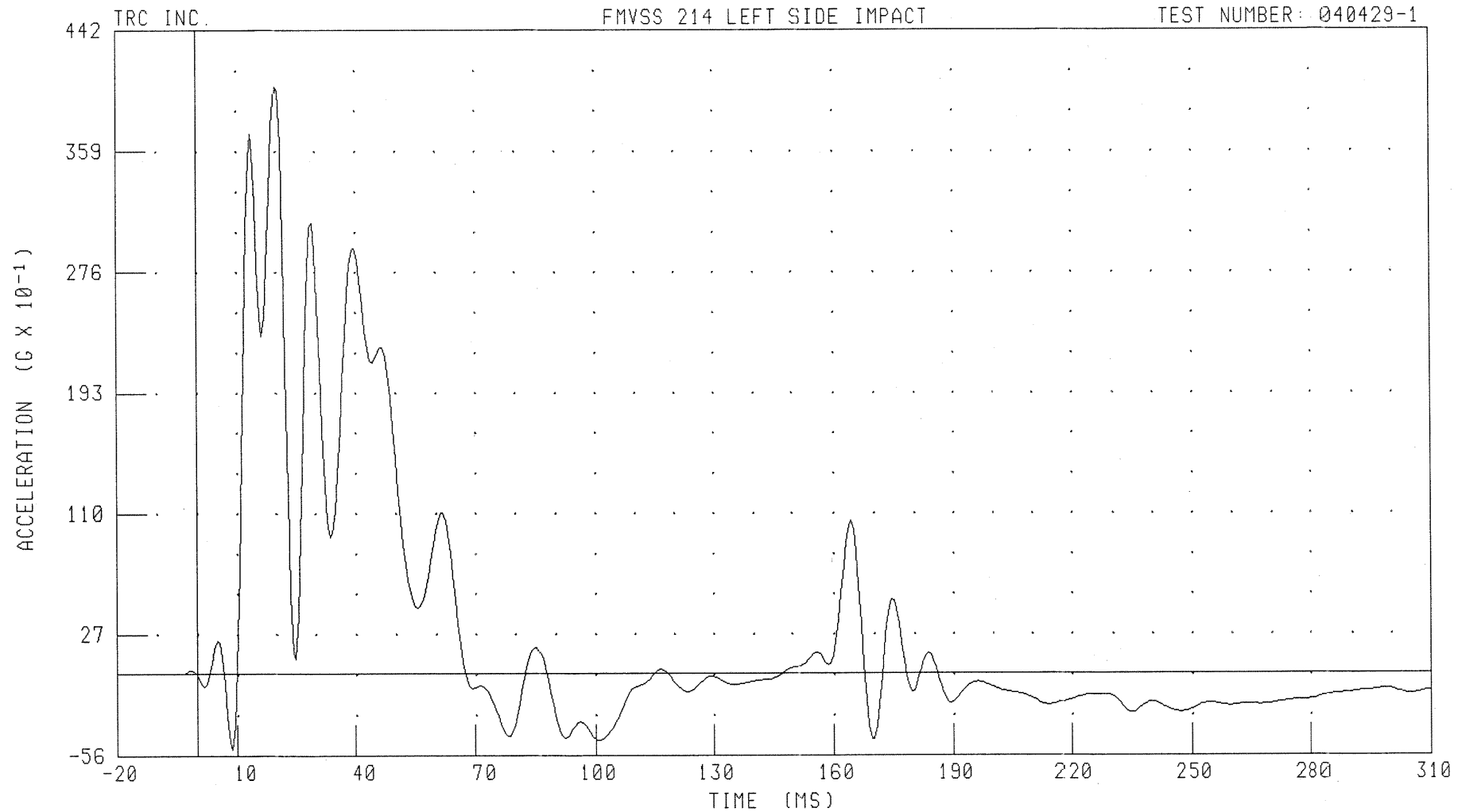
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYR1 FILTER: FIR 100

PEAK DATA: 40.38 G @ 20.00 MS; -5.17 G @ 8.75 MS

B-162

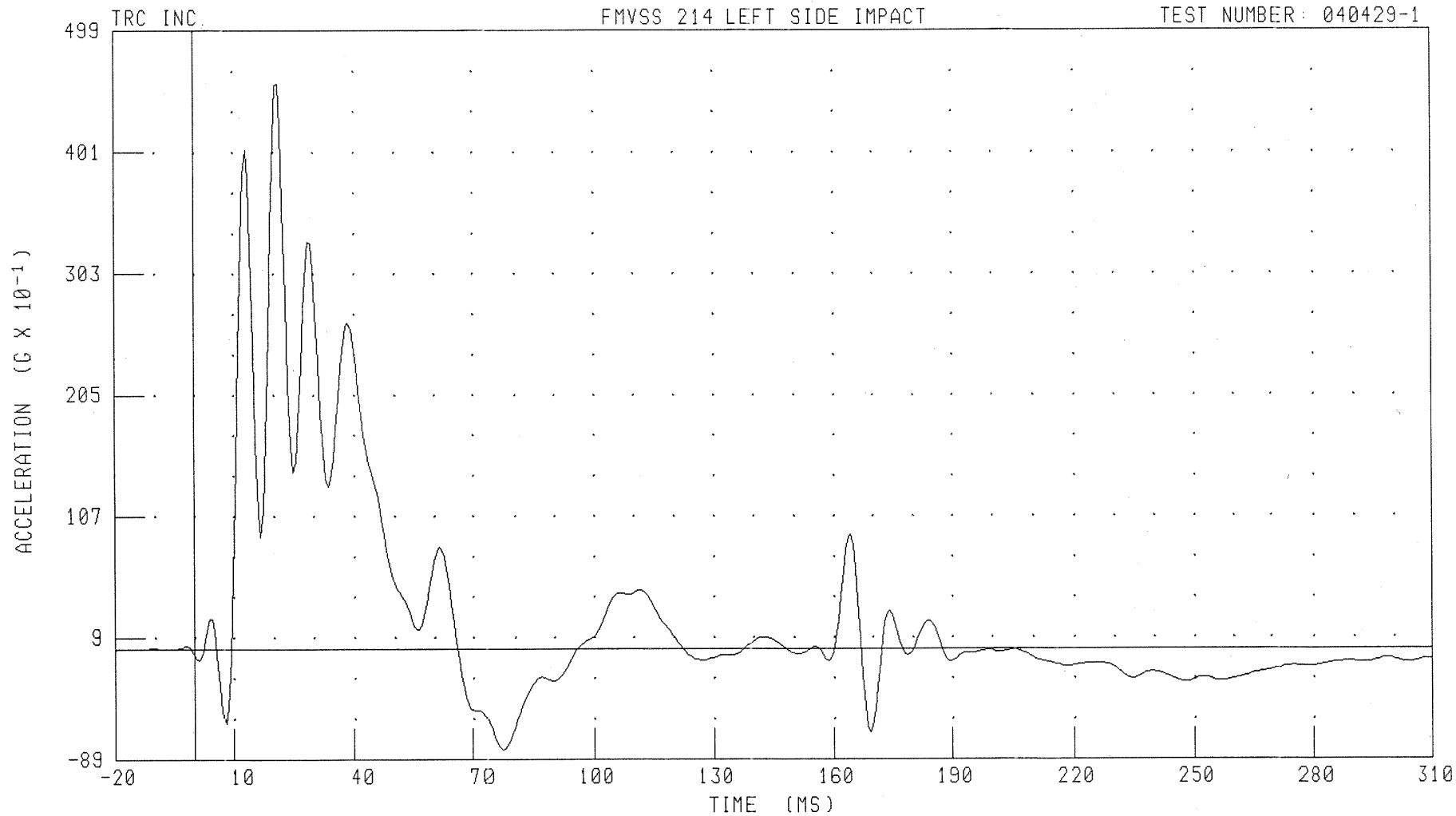
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYR1 FILTER: FIR 100

PEAK DATA: 45.64 G @ 21.25 MS; -8.13 G @ 76.88 MS

B-163

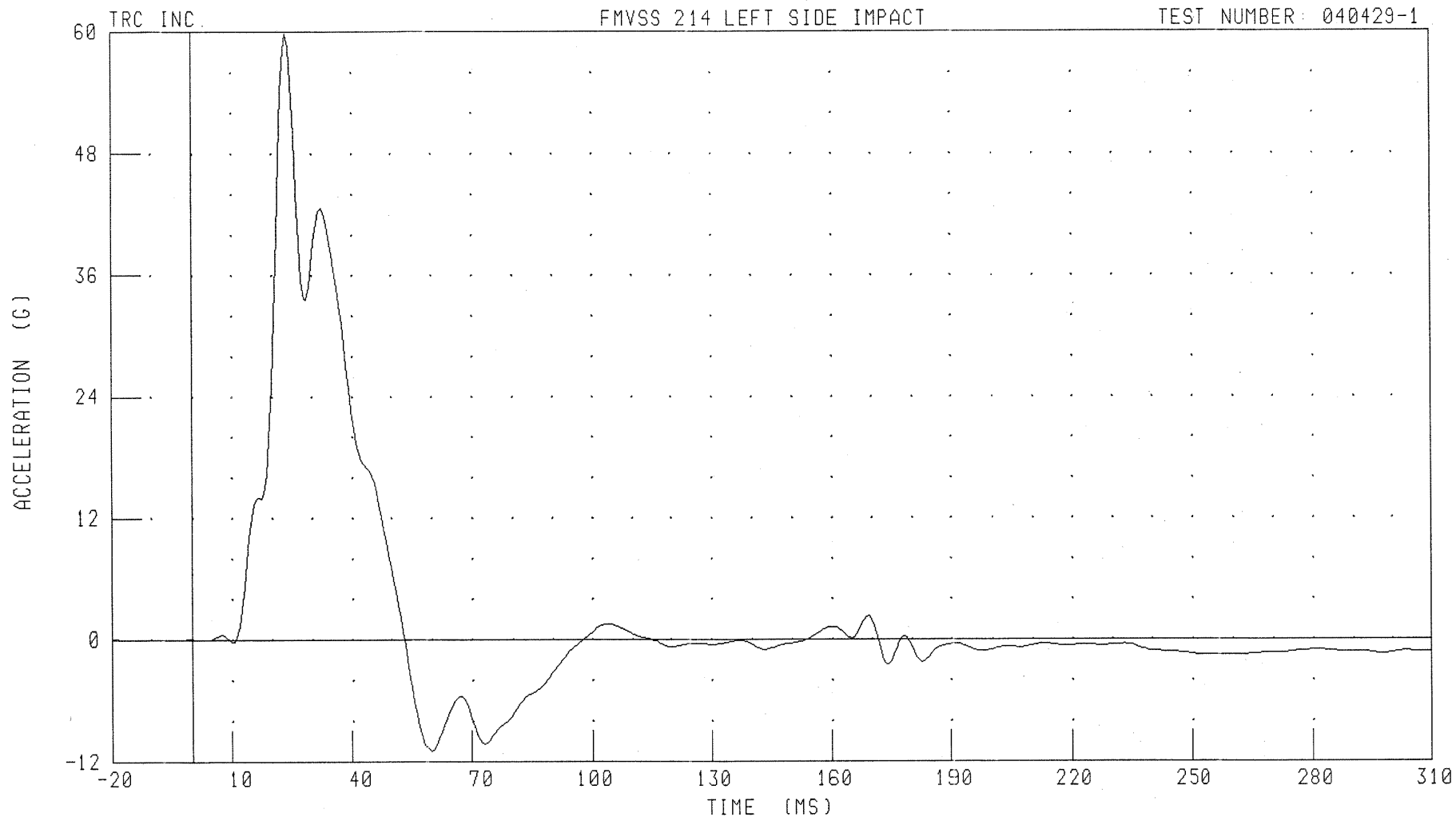
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YR1 FILTER: FIR 100

PEAK DATA: 59.87 G @ 23.75 MS; -10.95 G @ 60.00 MS

B-164

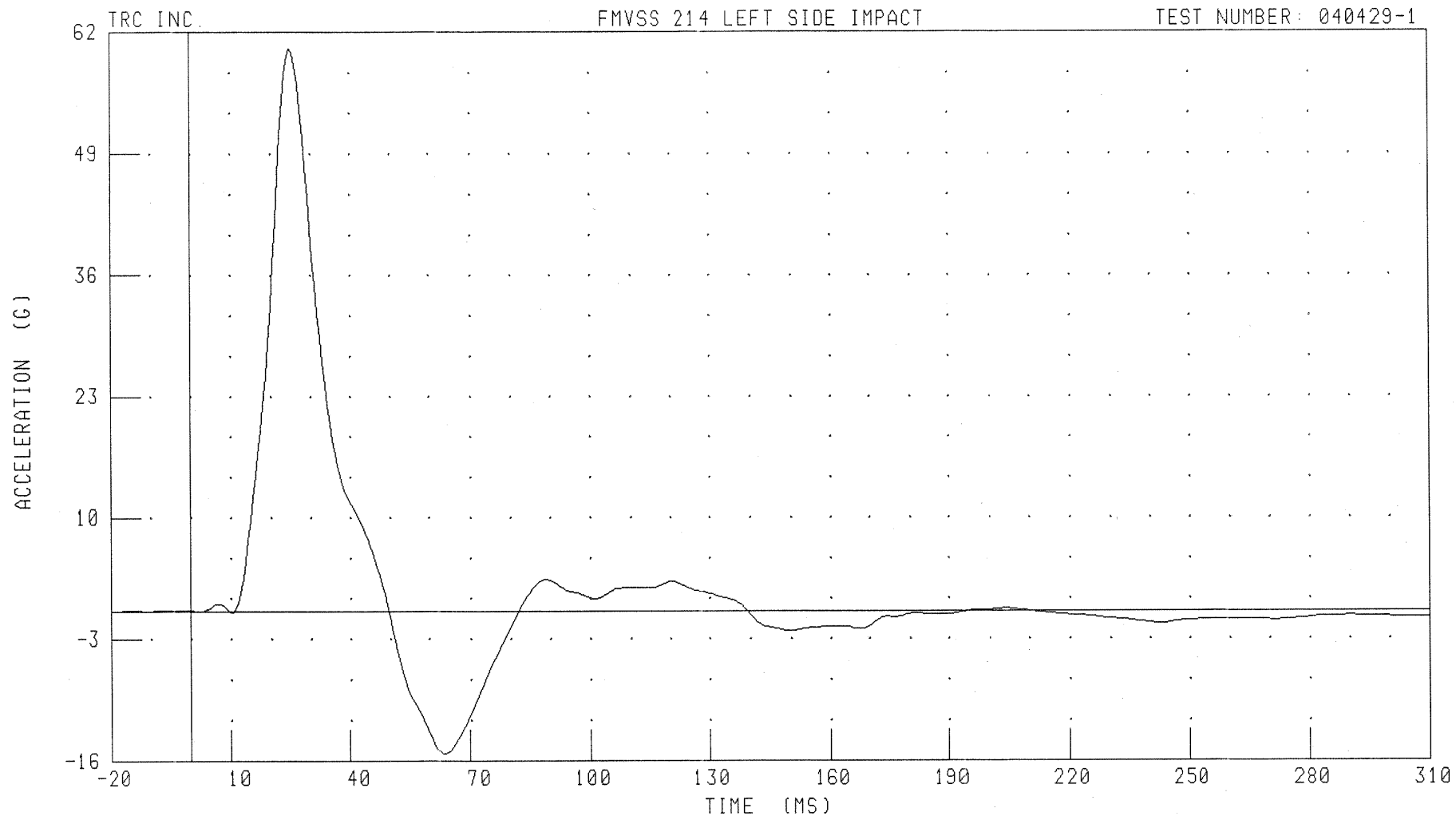
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

DRIVER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYR1

FILTER: FIR 100

PEAK DATA: 60.24 G @ 25.00 MS; -15.24 G @ 63.75 MS

B-165

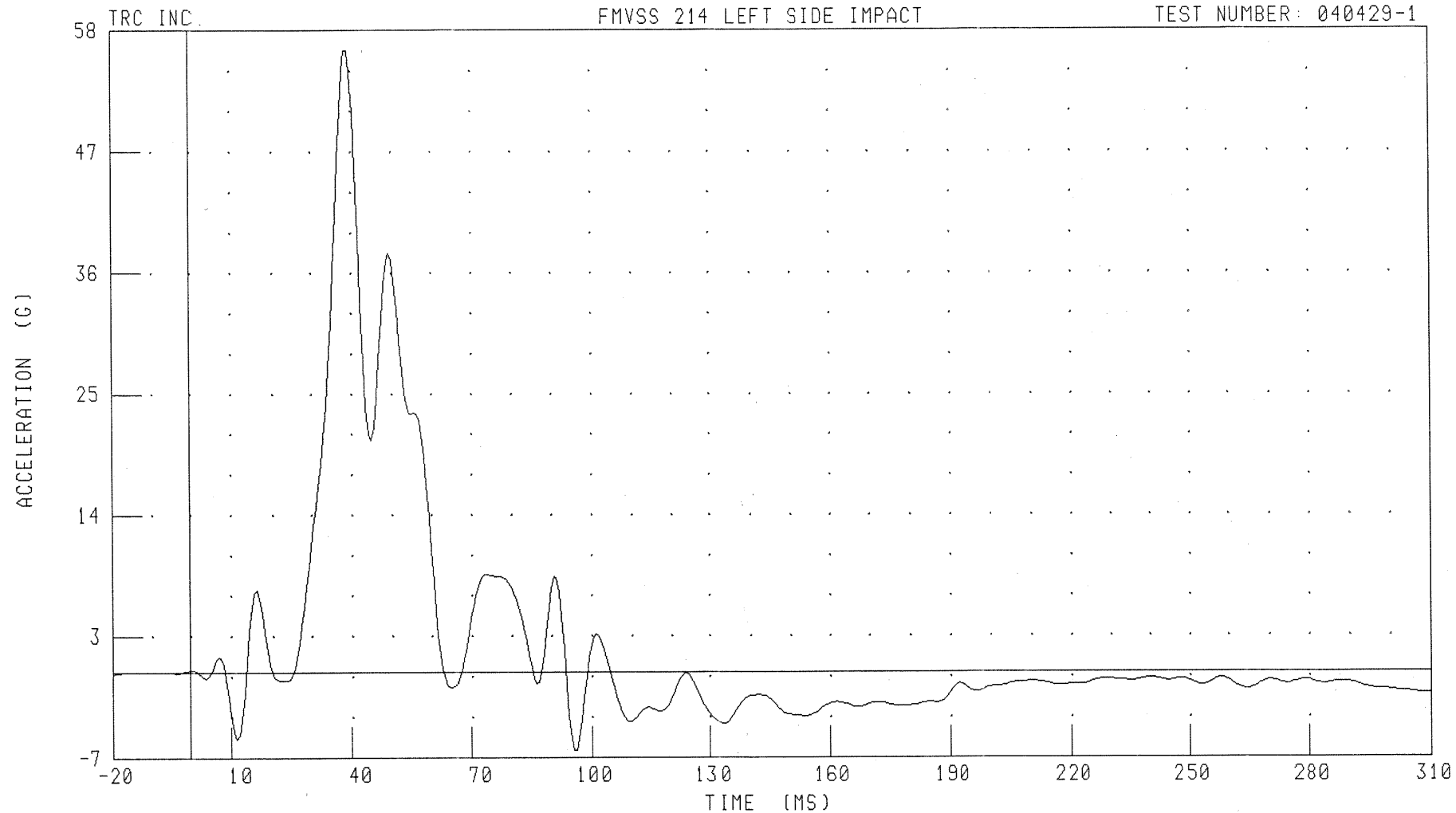
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LURYR4 FILTER: FIR 100

PEAK DATA: 56.48 G @ 39.38 MS; -7.08 G @ 95.63 MS

B-166

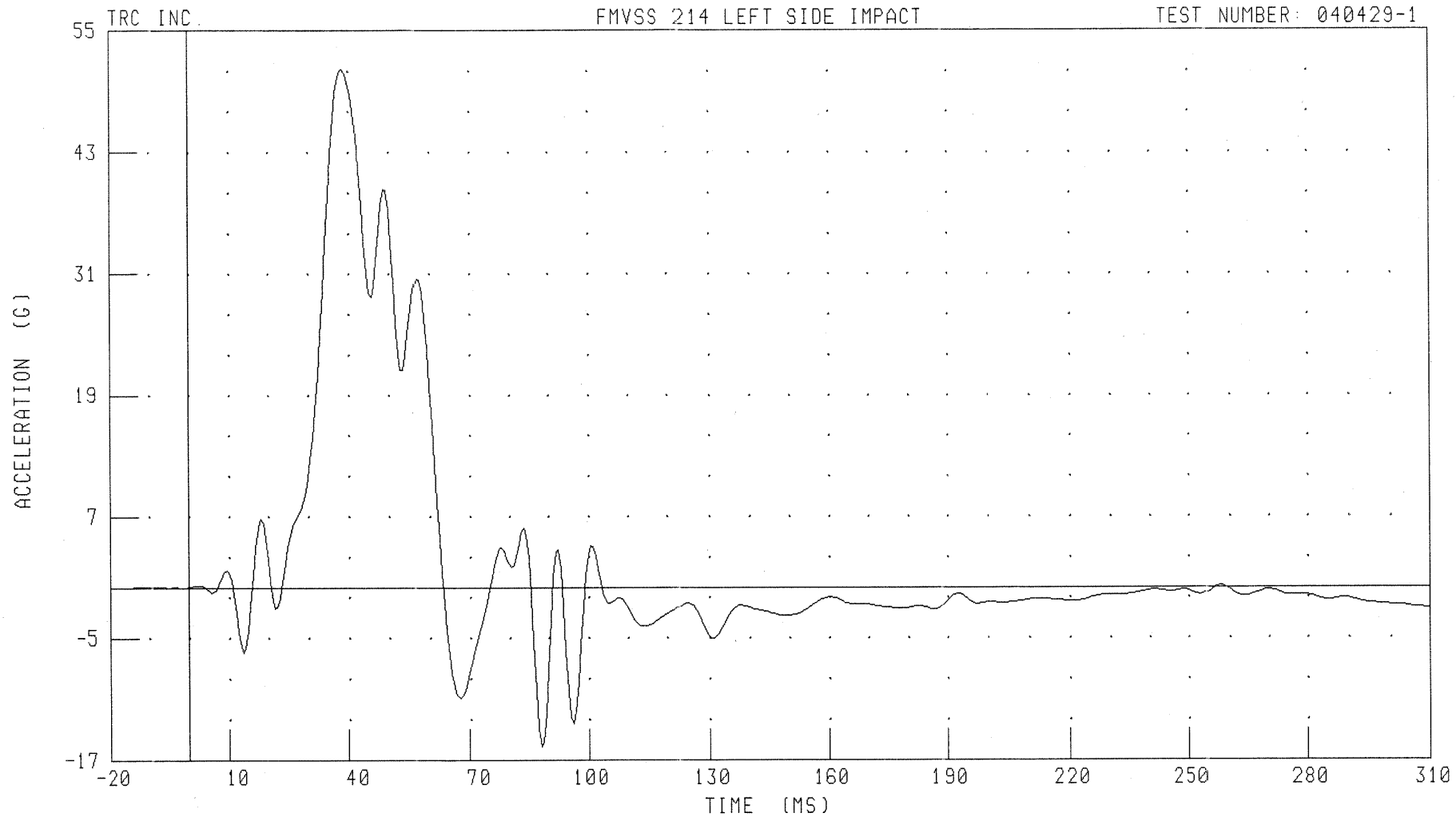
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: LLRYR4 FILTER: FIR 100

PEAK DATA: 51.13 G @ 38.75 MS; -15.68 G @ 88.13 MS

B-167

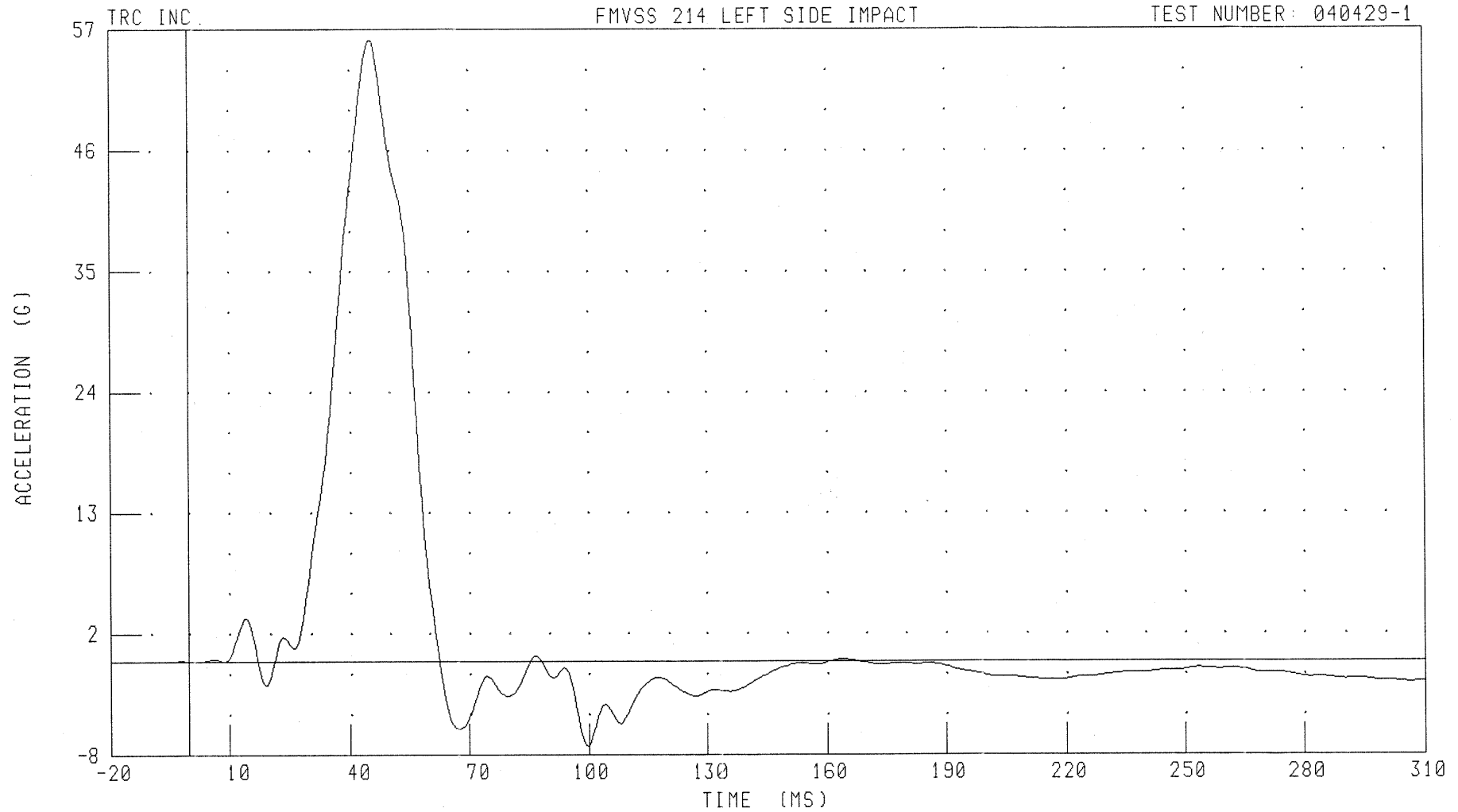
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: T12YR4 FILTER: FIR 100

PEAK DATA: 56.50 G @ 45.00 MS; -7.73 G @ 100.00 MS

B-168

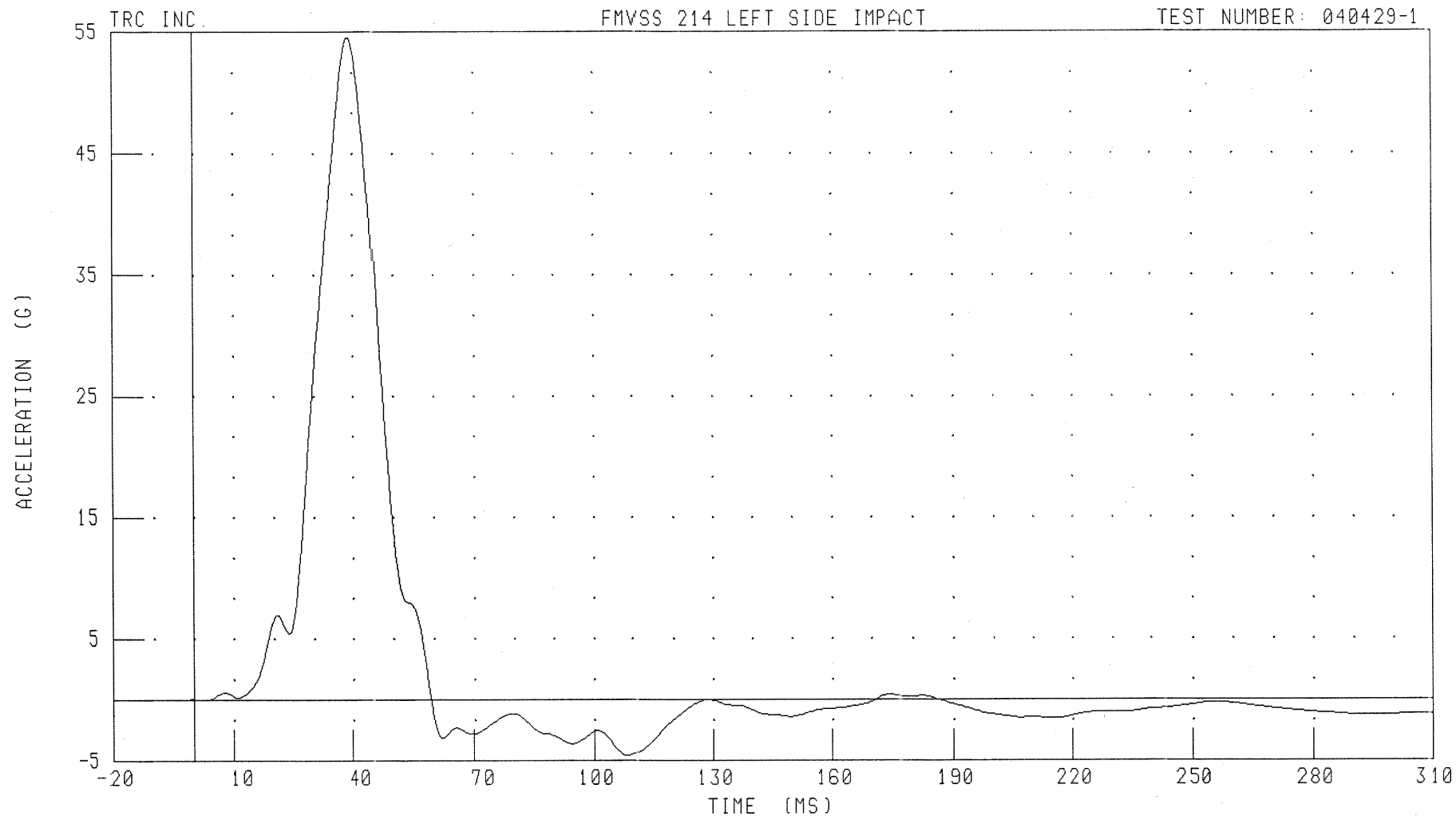
040429-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 VOLVO S40

LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 040429-1



CHANNEL: PEVYR4 FILTER: FIR 100

PEAK DATA: 54.53 G @ 39.38 MS; -4.58 G @ 108.75 MS

B-169

040429-1

Appendix C

SID HIII Configuration and Performance Verification Data

Summary
SID HIII Pre-Test and Post-Test Calibration
Configured For Left Side Impact

Date: 03/22/04-05/12/04 TRC Inc. Test Number: S/N 059 & S/N 055
Laboratory Technician: V. Olivieri & V. Watters

Test Parameter	Specification	SID HIII 059		SID HIII 055	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH - Seated Height (mm)	889-909	907	907	909	908
RH - Rib Height (mm)	502-520	508	508	507	510
HP - Hip Pivot Height (mm)	99 ref	99.1	99.1	99.1	99.1
KH - Knee Pivot from Back Line (mm)	511-526	523	523	525	525
KV - Knee Pivot to Floor (mm)	490-505	495	495	491	491
HW - Hip Width (mm)	356-391	365	364	365	363
Thorax Impacts					
Temperature (°C)	18.9-25.5	21.9	22.1	21.6	21.2
Relative Humidity (%)	10-70	33	51	38	55
Probe Speed (m/s)	4.27-4.33	4.33	4.31	4.31	4.28
Upper Rib (g's)	37-46	38.4	39.7	40.6	45.8
Lower Rib (g's)	37-46	37.1	37.6	38.8	44.6
Lower Spine (g's)	15-22	21.3	20.6	19.0	19.9
Pelvis Impacts					
Temperature (°C)	18.9-25.5	22.0	22.0	21.7	20.9
Relative Humidity (%)	10-70	35	51	37	51
Probe Speed (m/s)	4.27-4.33	4.29	4.28	4.31	4.31
Pelvis (g's)	40-60	45.6	45.6	46.3	45.9

Calibration Test Results

Pre-Test

SID HIII: 059

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements (was tested on February 23, 2004 for a previous calibration series).
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.
SID/HIII Dummy Pre-Test
External Dimensions
Serial No. 059 Calibration No. 08
Pre-test

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	907 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	508 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	523 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	495 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	365 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	178 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	178 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	0.0 mm	Yes

Technician

Vincent Oliver

Approved

V. J. Walter



Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 059 Calibration No. 08 - 1

Test Date 03/23/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Peak Resultant Acceleration	120 - 150 g	142.0 g	Yes
Peak Longitudinal Acceleration	15 g Max	4.8 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Vincent Oliveri

Approved

V. J. Walto

03.23.2004 18:46:57 608

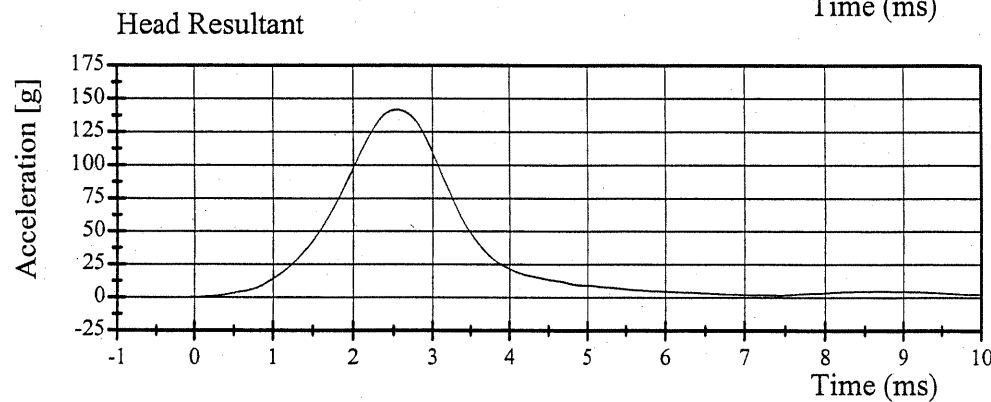
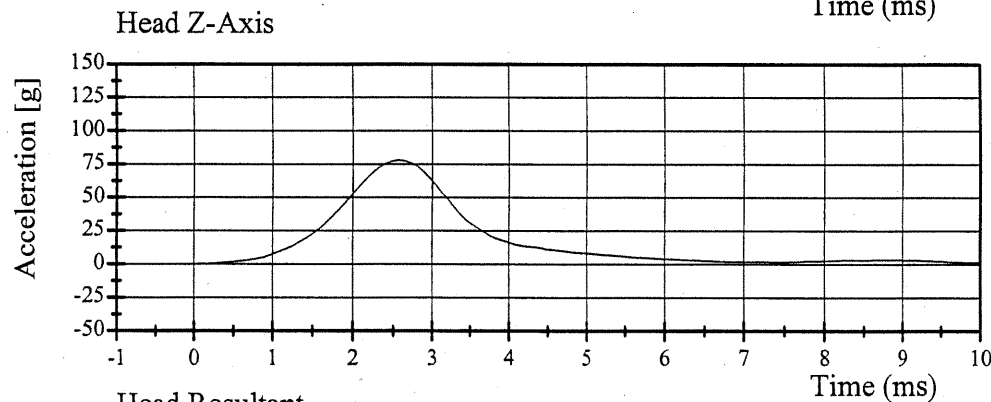
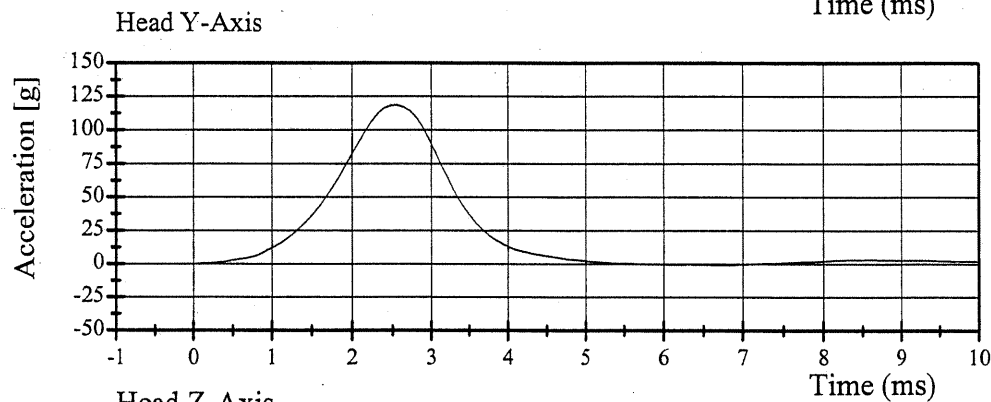
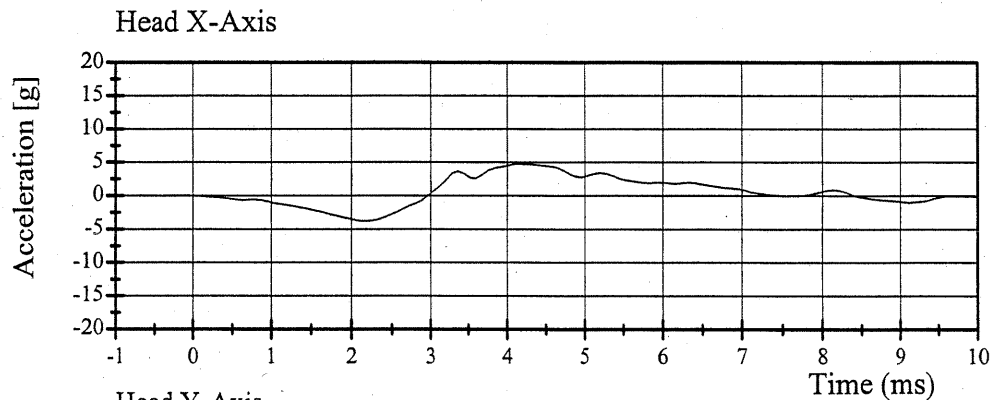


Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 059 Calibration No. 08 - 1

Test Date 03/23/2004



03.23.2004 18:46:58 608



Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 059 Calibration No. 08 - 2

Test Date 03/25/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.96 - 2.55 m/s	2.33 m/s	Yes
20 ms	4.12 - 5.10 m/s	4.62 m/s	Yes
30 ms	5.73 - 7.01 m/s	6.46 m/s	Yes
40 - 70 ms	6.27 - 7.64 m/s	7.19 - 7.29 m/s	Yes
Peak D Plane Rotation	66 - 82 °	71.3 °	Yes
Rotation Decay Time To 0° From Peak Angle	58 - 67 °	60.8 °	Yes
Peak Moment About Occipital Condyles	73.0 - 88.0 N·m	82.1 N·m	Yes
Moment Decay Time To 0 N·m From Peak Moment	49 - 64 ms	58.9 ms	Yes
Time Between Peak Rotation and Peak Moment	2 - 16 ms	11.3 ms	Yes

Comments:

Technician

Vincent Olivier

Approved

V. J. Walter

03.25.2004 18:47:54 518



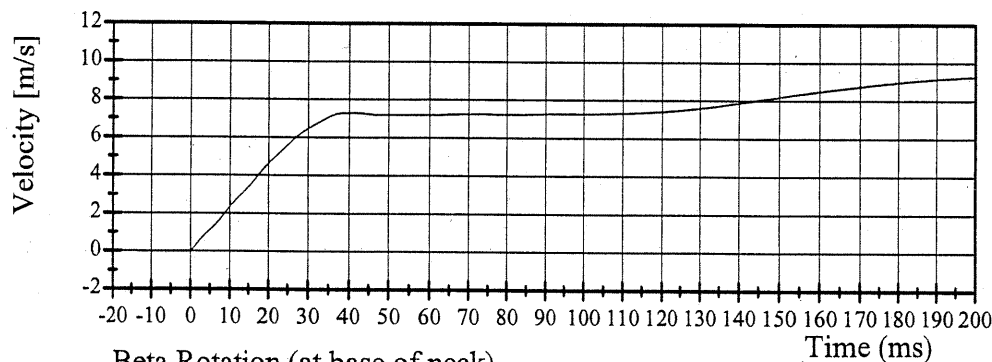
Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 059 Calibration No. 08 - 2

Test Date 03/25/2004

Integrated Pendulum Velocity

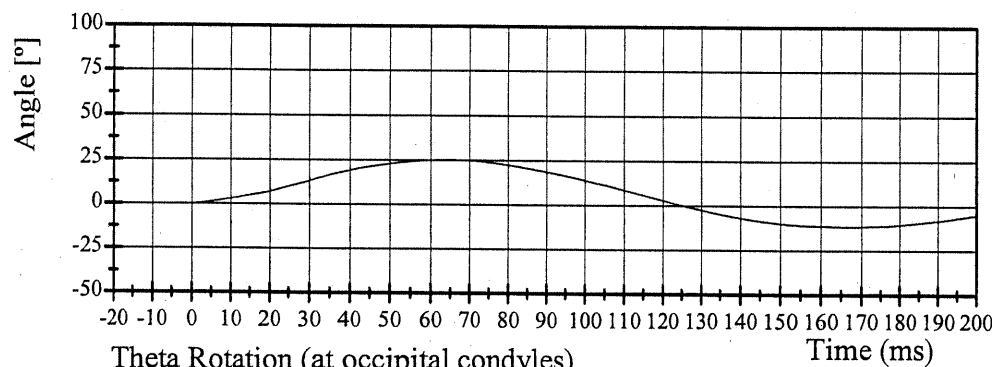


Filter Class: 180

Max: 9.7 m/s at 958.6 ms

Min: -0.0 m/s at -0.8 ms

Beta Rotation (at base of neck)

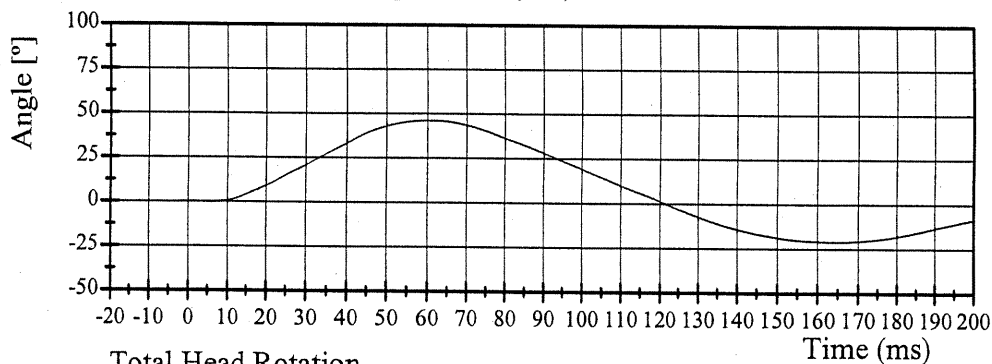


Filter Class: 60

Max: 25.2 ° at 63.8 ms

Min: -11.5 ° at 167.5 ms

Theta Rotation (at occipital condyles)

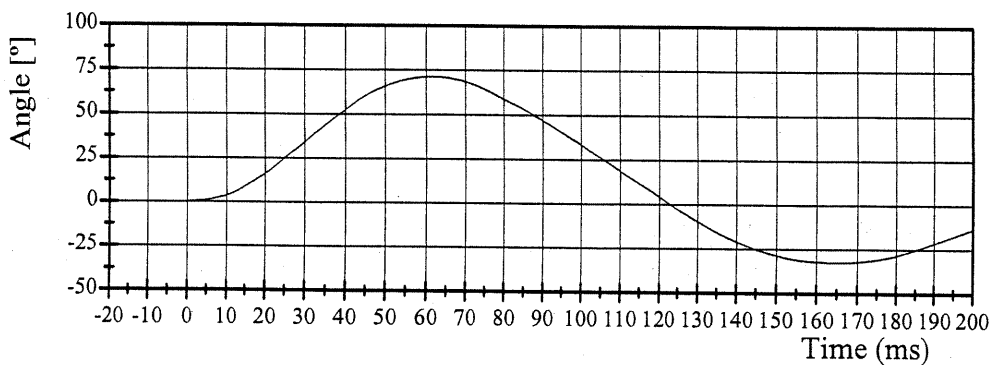


Filter Class: 60

Max: 46.2 ° at 61.2 ms

Min: -20.9 ° at 164.6 ms

Total Head Rotation



Filter Class: 60

Max: 71.3 ° at 62.2 ms

Min: -32.4 ° at 165.9 ms

03.25.2004 18:47:55 518



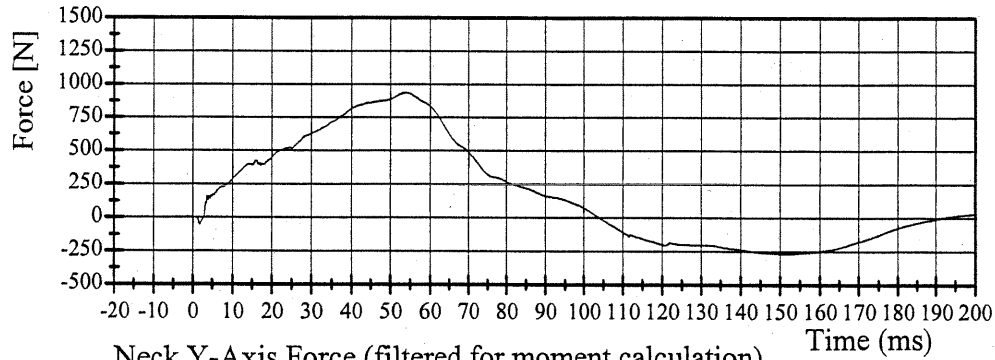
Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 059 Calibration No. 08 - 2

Test Date 03/25/2004

Neck Y-Axis Force

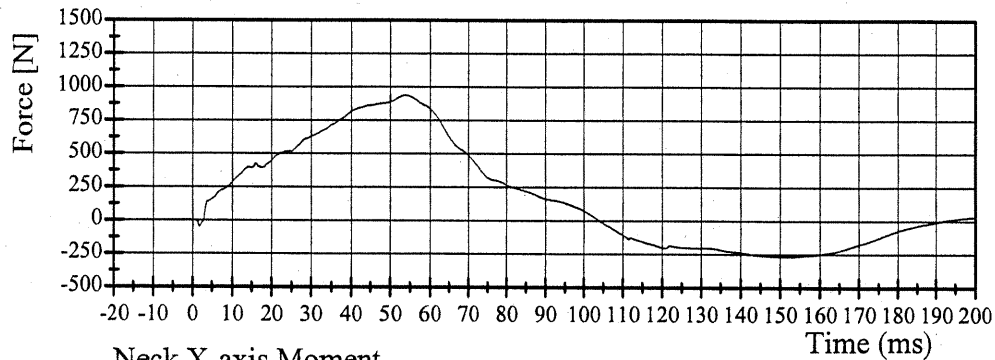


Filter Class: CFC 1000

Max: 938 N at 53.8 ms

Min: -268 N at 152.2 ms

Neck Y-Axis Force (filtered for moment calculation)

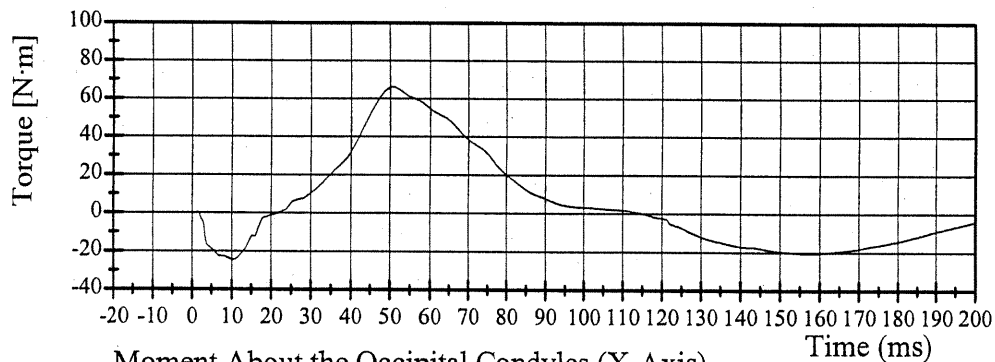


Filter Class: CFC 600

Max: 937 N·m at 53.9 ms

Min: -267 N·m at 152.2 ms

Neck X-axis Moment

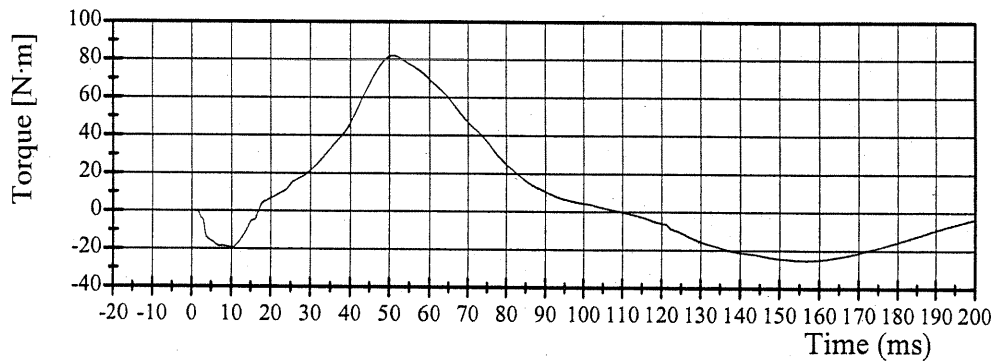


Filter Class: CFC 600

Max: 66.1 N·m at 50.7 ms

Min: -24.5 N·m at 10.5 ms

Moment About the Occipital Condyles (X-Axis)



Filter Class: 600

Max: 82.1 ° at 51.0 ms

Min: -25.1 ° at 156.6 ms

03.25.2004 18:47:56 518



Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 059 Calibration No. 08 - 3

Test Date 04/28/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	21.9 C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.33 m/sec	Yes
Upper Rib Bar Peak Acceleration	37 - 46 g	38.4 g	Yes
Lower Rib Bar Peak Acceleration	37 - 46 g	37.1 g	Yes
Lower Thoracic Spine (T12) Peak Acceleration	15 - 22 g	21.3 g	Yes

Comments:

Pre-test calibration: new rib wrap foam and new arm foam installed.

Technician

Vincent Oliveri

Approved

V. J. Walter

05.04.2004 11:02:26 1140



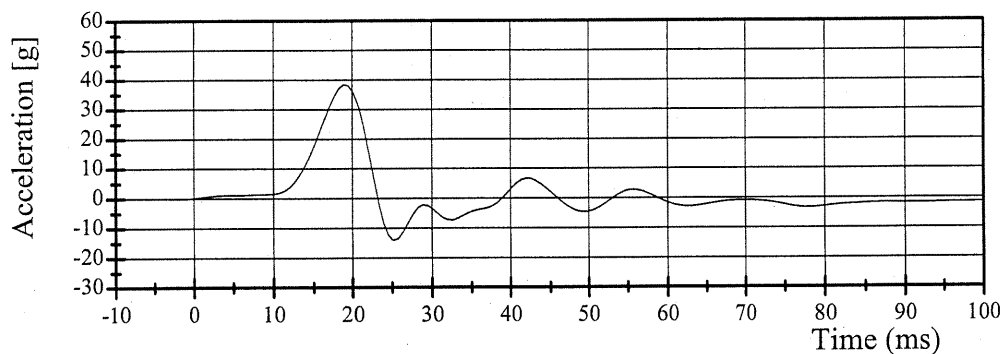
Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 059 Calibration No. 08 - 3

Test Date 04/28/2004

Upper Rib Bar Acceleration

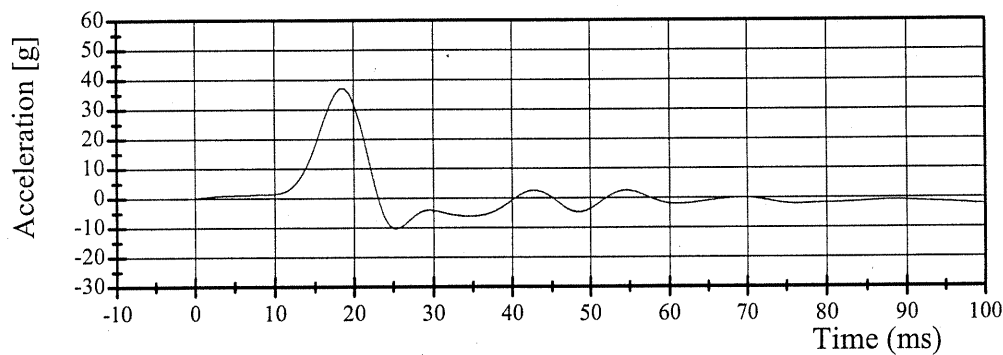


Filter Class: FIR 100

Max: 38.4 g at 18.9 ms

Min: -14.1 g at 25.1 ms

Lower Rib Bar Acceleration

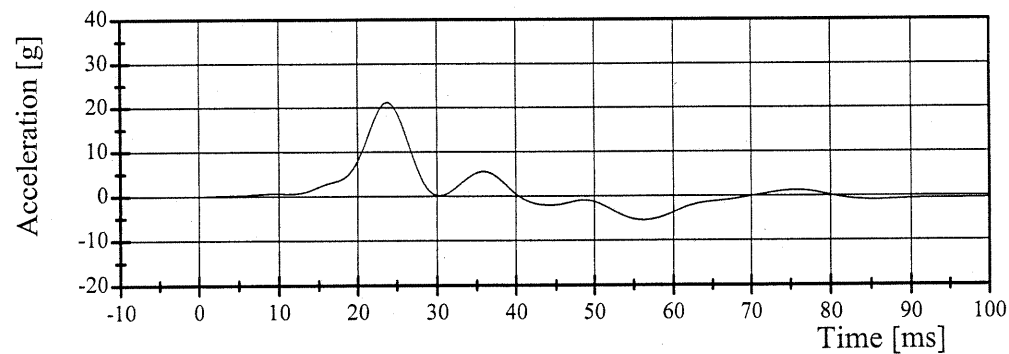


Filter Class: FIR 100

Max: 37.1 g at 18.3 ms

Min: -10.3 g at 25.1 ms

Lower Thoracic Spine (T12) Acceleration



Filter Class: FIR 100

Max: 21.3 g at 23.8 ms

Min: -5.4 g at 56.4 ms

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

23-FEB-04

TRC INC.

572F SN059 DAMPER TEST CAL06

TEST NUMBERS: DP05906A9,DP0596B25,DP05906C3

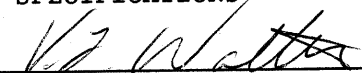
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	22.0 DEG. C
RELATIVE HUMIDITY		10 - 70 %	31.0 %
VELOCITY	FORCE	667 - 925 N	782 N
2.72 M/S	DISPLACEMENT	29.7 - 34.5 MM	29.9 MM
VELOCITY	FORCE	1733 - 2100 N	1920 N
4.27 M/S	DISPLACEMENT	31.6 - 37.2 MM	34.1 MM
VELOCITY	FORCE	3703 - 4402 N	4151 N
6.07 M/S	DISPLACEMENT	33.3 - 39.5 MM	36.0 MM

DAMPER SETTING = 6.5

PRE-TEST CALIBRATION WITH REPLACEMENT DAMPER

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 022304.2044;1

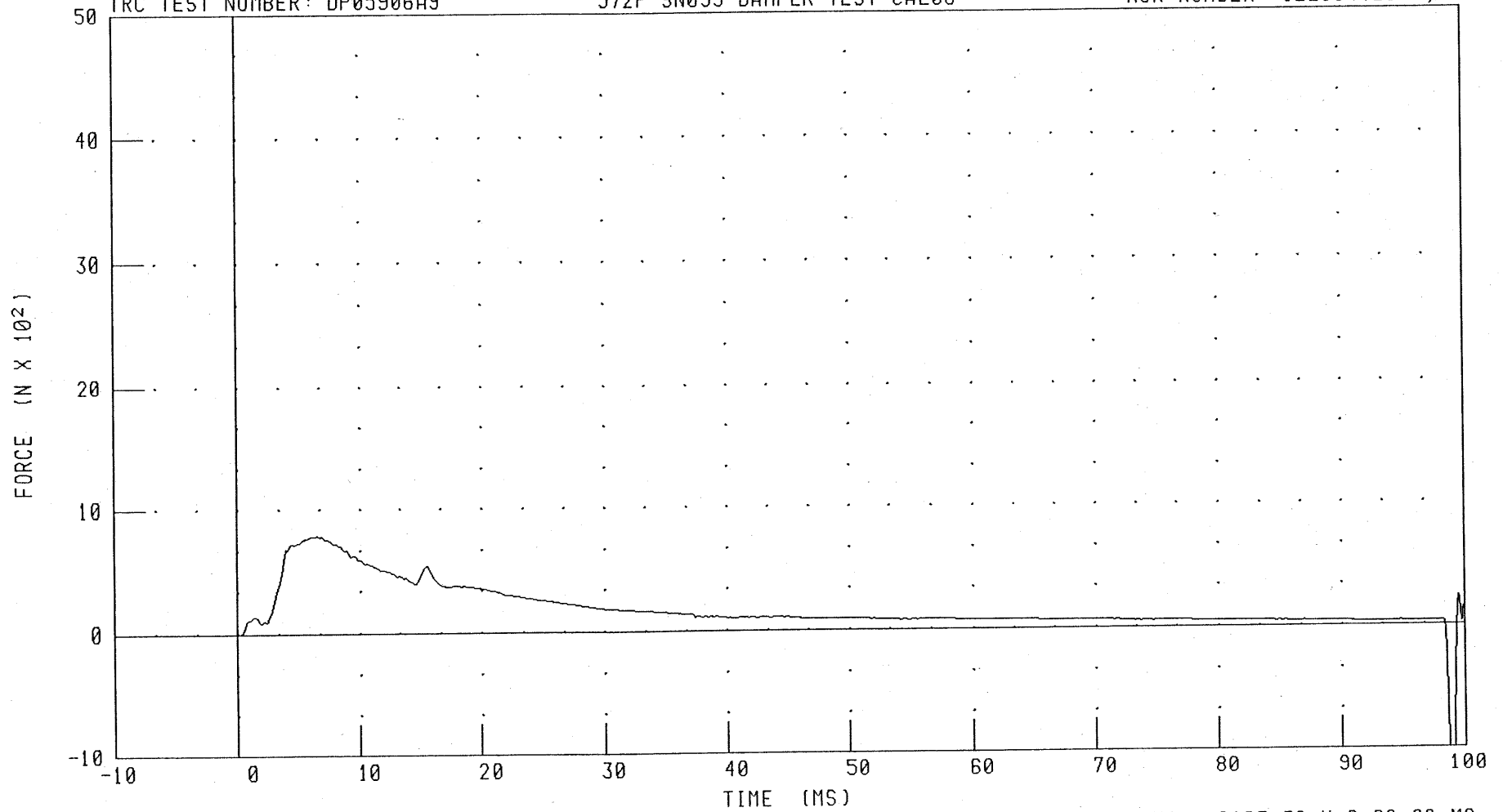
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP05906A9

572F SN059 DAMPER TEST CAL06

RUN NUMBER: 022304.2026;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 781.78 N @ 6.48 MS; -2193.36 N @ 98.88 MS

040429-1

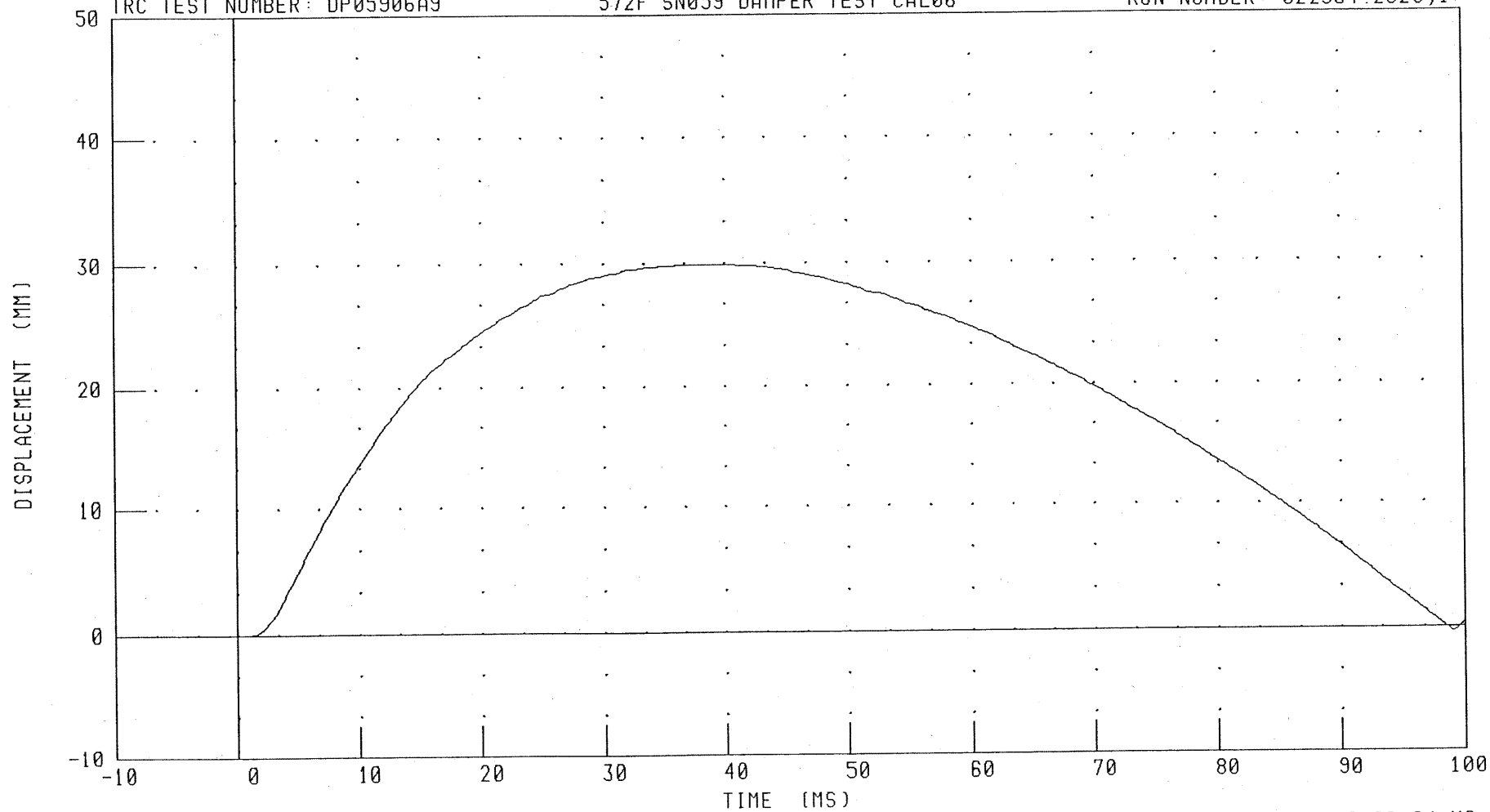
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN059 DAMPER TEST CAL06

RUN NUMBER: 022304.2026;1

TRC TEST NUMBER: DP05906A9



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 29.87 MM @ 37.04 MS; -0.34 MM @ 99.04 MS

C-14

040429-1

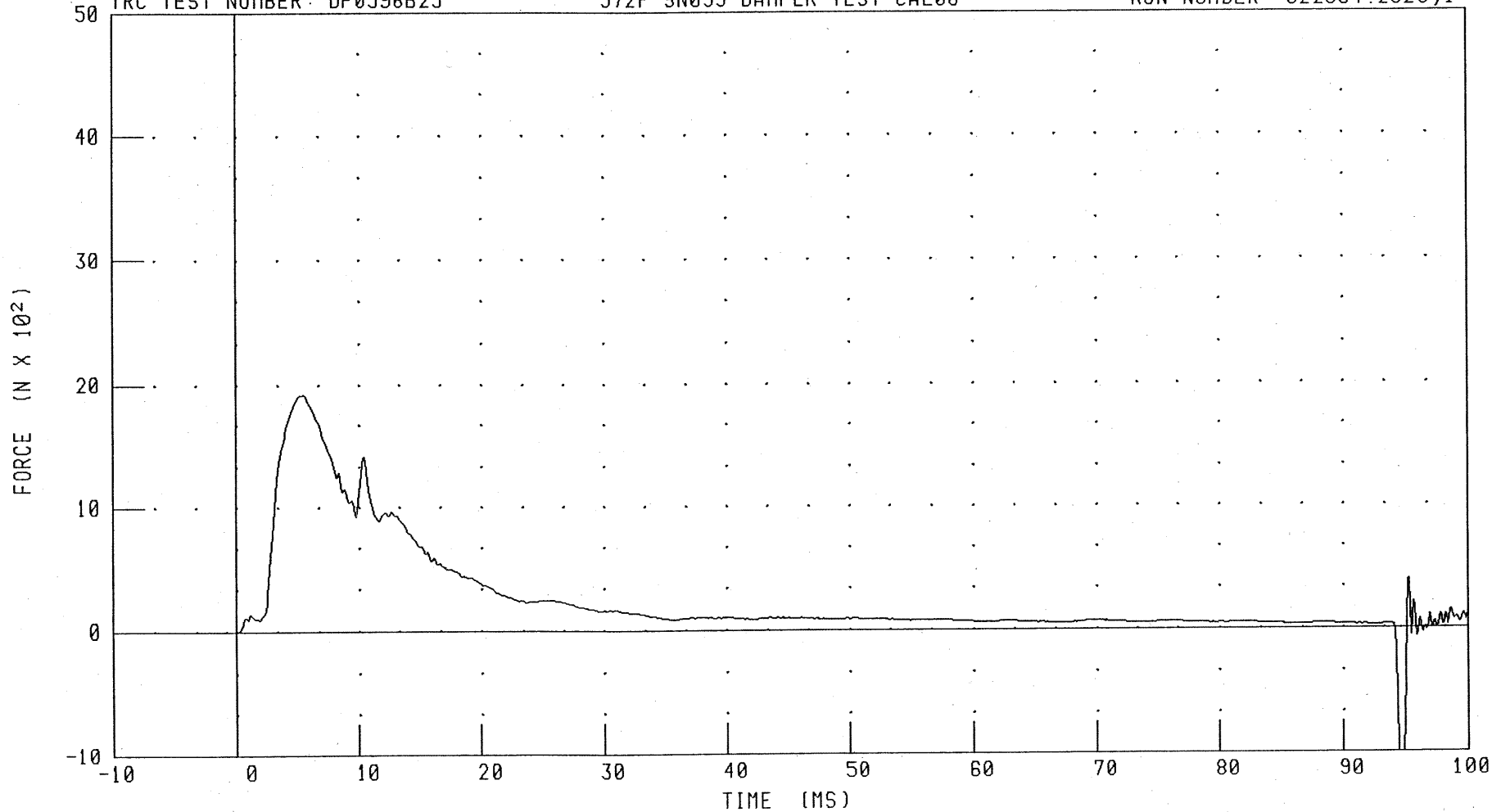
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP0596B25

572F SN059 DAMPER TEST CAL06

RUN NUMBER: 022304.2026;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 1920.19 N @ 5.52 MS; -2109.24 N @ 94.64 MS

040429-1

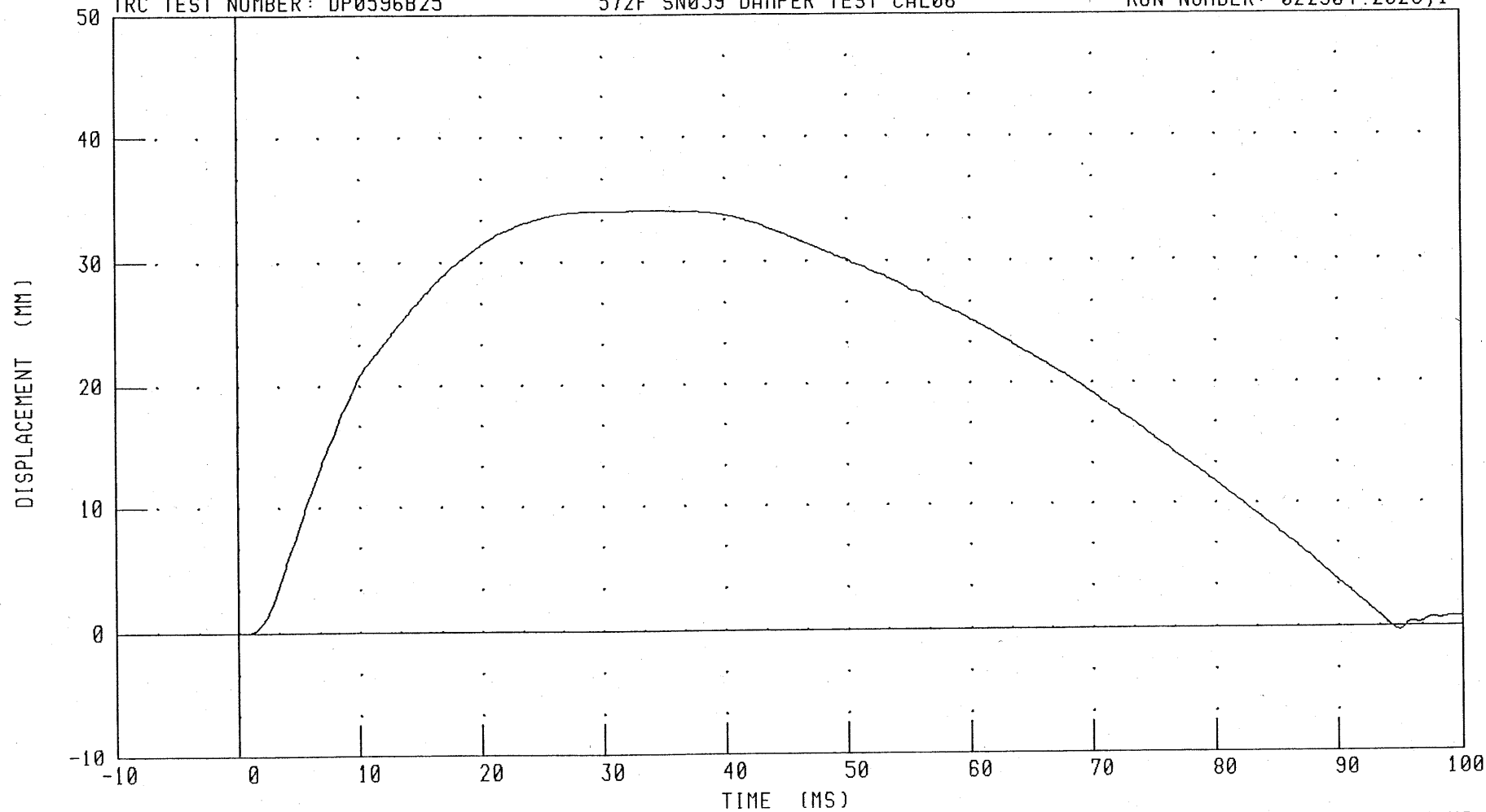
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN059 DAMPER TEST CAL06

RUN NUMBER: 022304.2026;1

TRC TEST NUMBER: DP0596B25



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 34.07 MM @ 32.96 MS; -0.33 MM @ 94.96 MS

C-16

040429-1

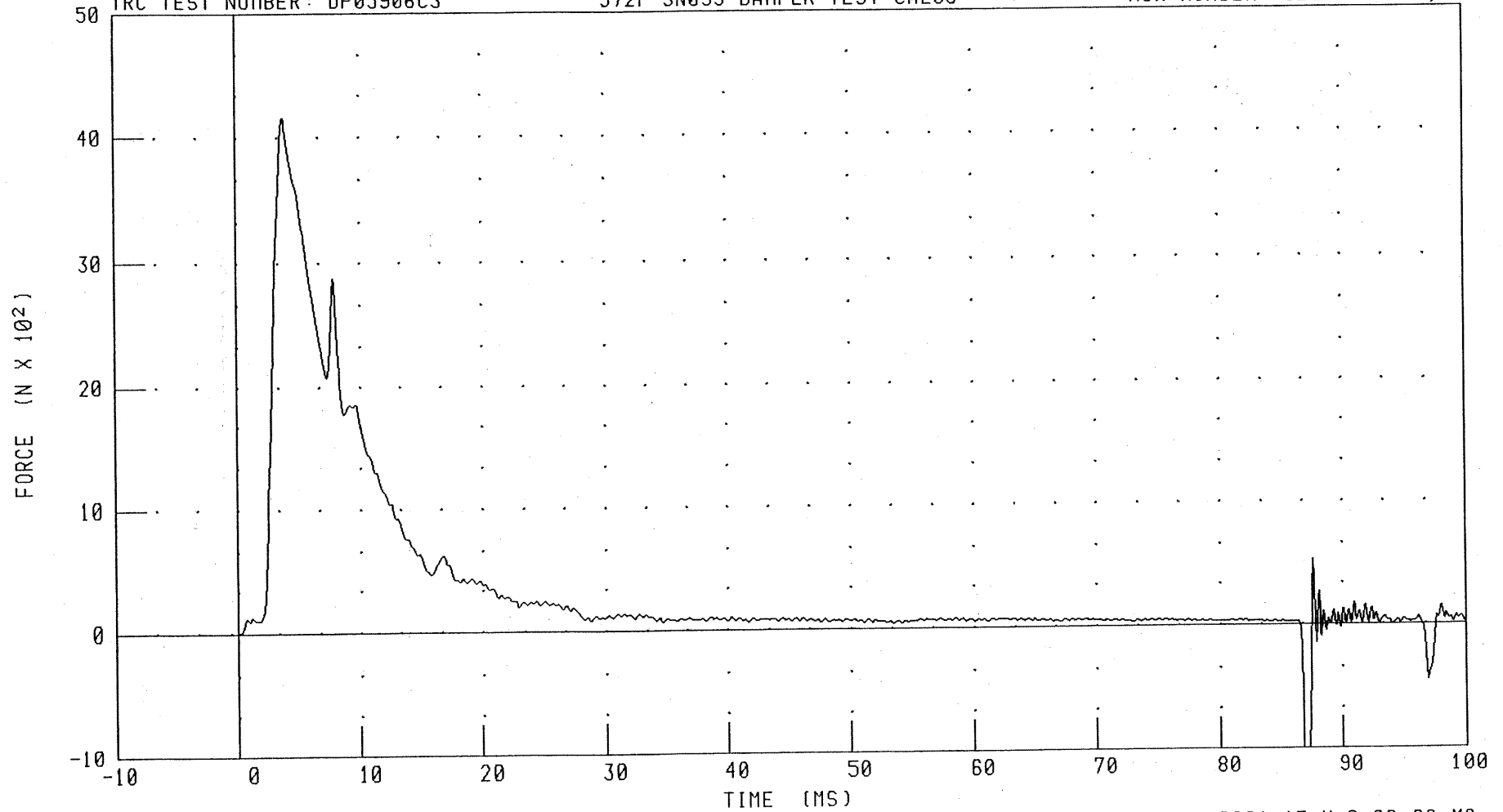
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP05906C3

572F SN059 DAMPER TEST CAL06

RUN NUMBER: 022304.2042;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

040429-1

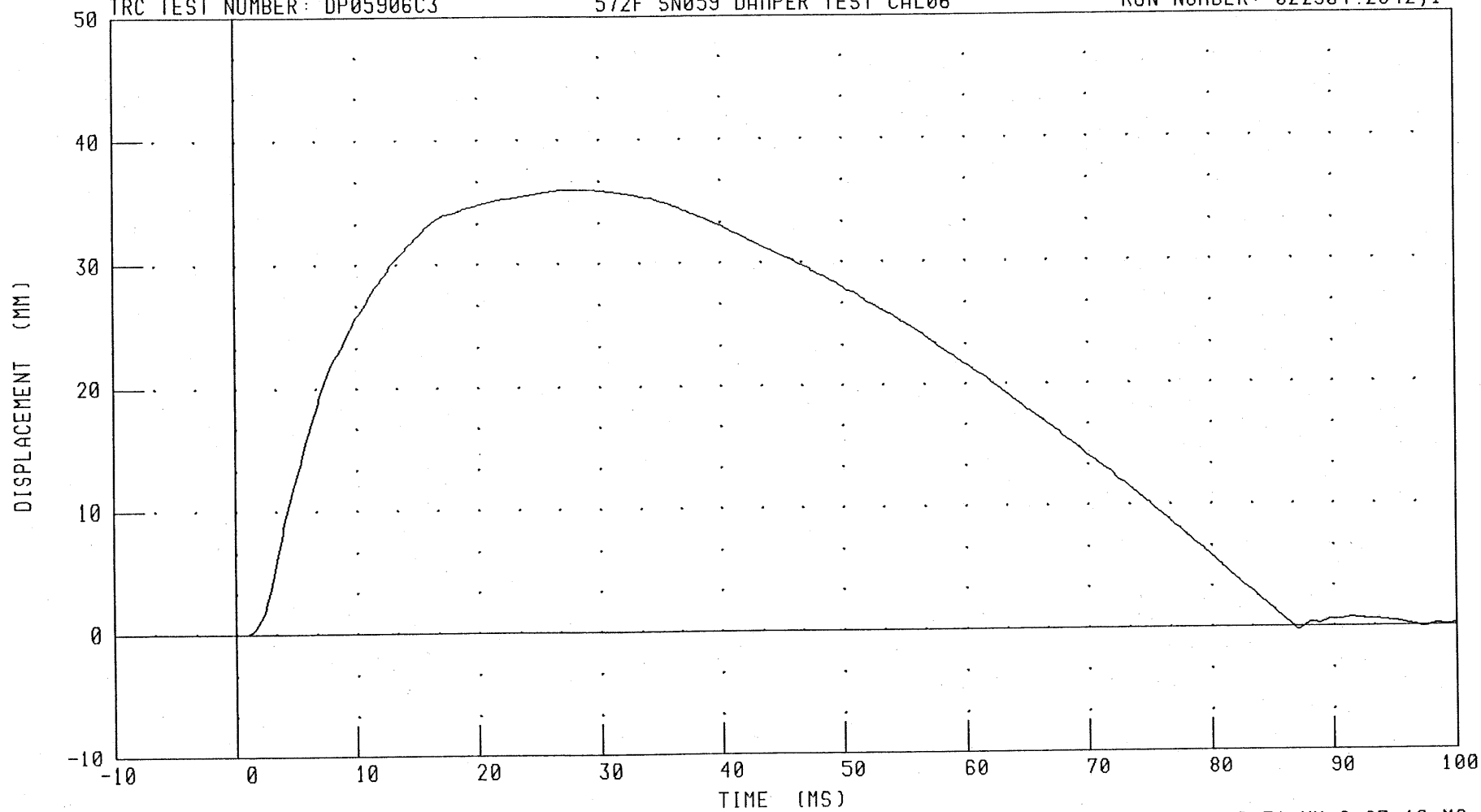
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP05906C3

572F SN059 DAMPER TEST CAL06

RUN NUMBER: 022304.2042;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 35.95 MM @ 28.16 MS; -0.31 MM @ 87.12 MS

040429-1

TRANSPORTATION RESEARCH CENTER INC.

PART 572B LUMBAR FLEXION TEST

SID HIII

CAL DATE: 25-Mar-04

TRC, INC. TEST NO: LF05908-2

572M SN 059 TORSO FLEX CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	22.2 °C
RELATIVE HUMIDITY	10 – 70 %	45 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	137.9 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	191.3 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	258.0 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5.0 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Vincent Oliver

Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 059 Calibration No. 08 - 1

Test Date 03/23/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.7 - 7.9 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician

Vincent Olivier

Approved

V. J. Walter

03.23.2004 18:02:27 1552

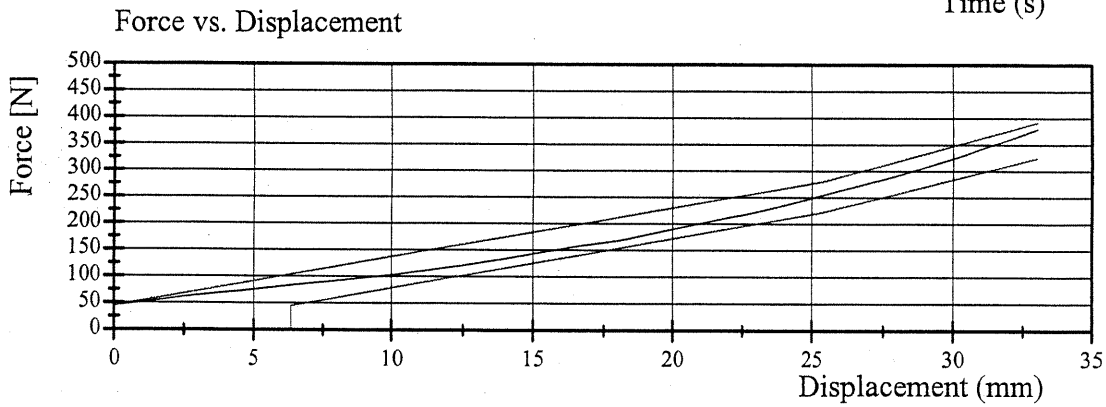
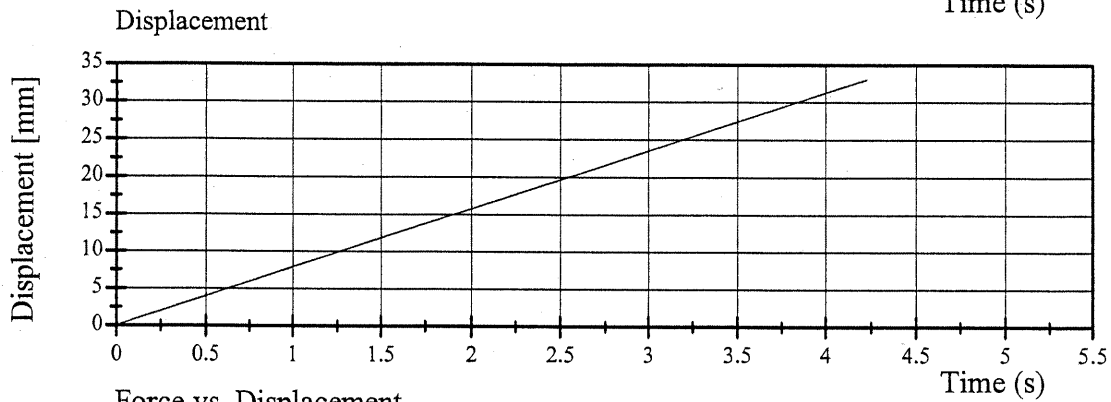
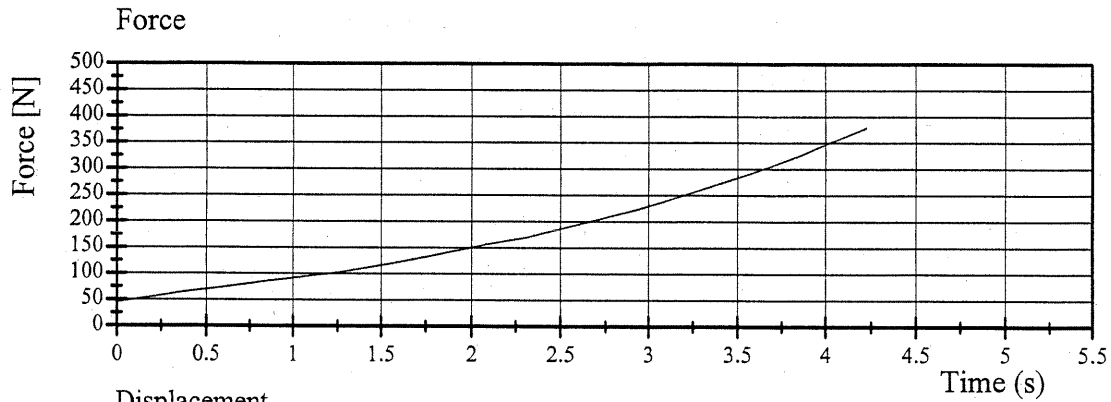


Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 059 Calibration No. 08 - 1

Test Date 03/23/2004



03.23.2004 18:02:28 1552



Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 059 Calibration No. 08 - 3

Test Date 04/28/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	22.0 C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.29 m/sec	Yes
Pelvis Peak Acceleration	40 - 60 g	45.6 g	Yes
Time Above 20 g	3 - 7 ms	6.08 ms	Yes
Unimodal requirement for pelvis acceleration	Yes	Yes	Yes

Comments:

Pre-test calibration.

Technician

Vincent Oliver

Approved

V. J. Walter

05.04.2004 11:04:00 1149

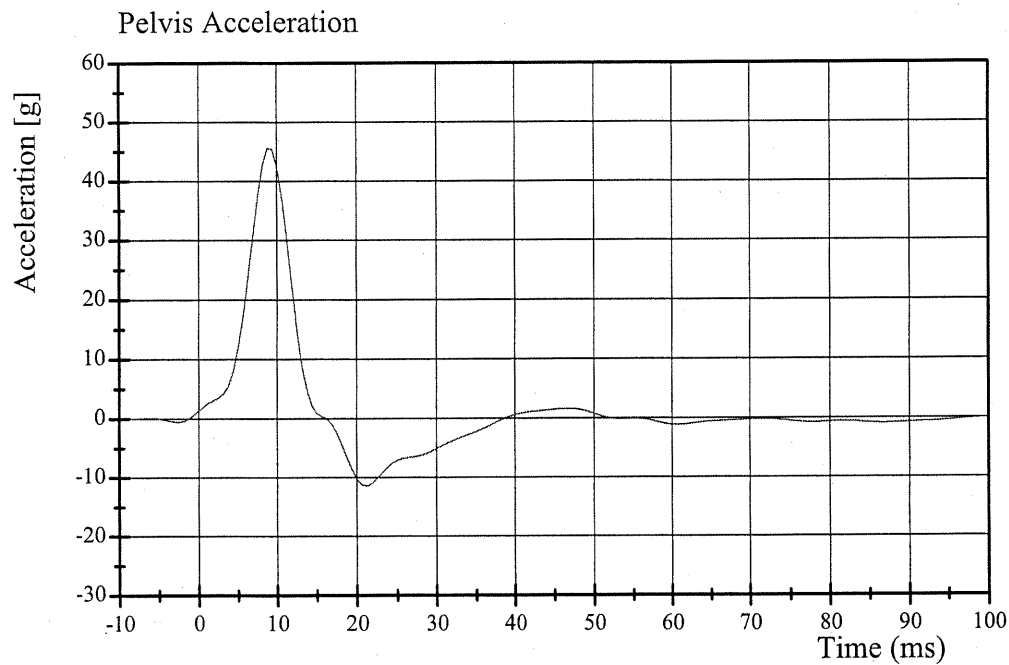


Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 059 Calibration No. 08 - 3

Test Date 04/28/2004



Filter Class: FIR 100

Max: 45.6 g at 8.8 ms

Min: -11.4 g at 21.3 ms

Calibration Test Results

Pre-Test

SID HIII: 055

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements (was tested on March 13, 2004 for a previous calibration series).
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.

SID/HIII Dummy

External Dimensions

Serial No. 055 Calibration No. 13

Date: 3/22/04

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	909 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	507 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	525 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	491 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	365 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	172 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	171 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	1.0 mm	Yes

Technician

Vincent Oliver

Approved

V. F. Walter



Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 055 Calibration No. 13 - 1

Test Date 03/22/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Peak Resultant Acceleration	120 - 150 g	138.0 g	Yes
Peak Longitudinal Acceleration	15 g Max	-12.3 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Vincent Oliver

Approved

V. F. Walter

03.22.2004 18:52:07 611

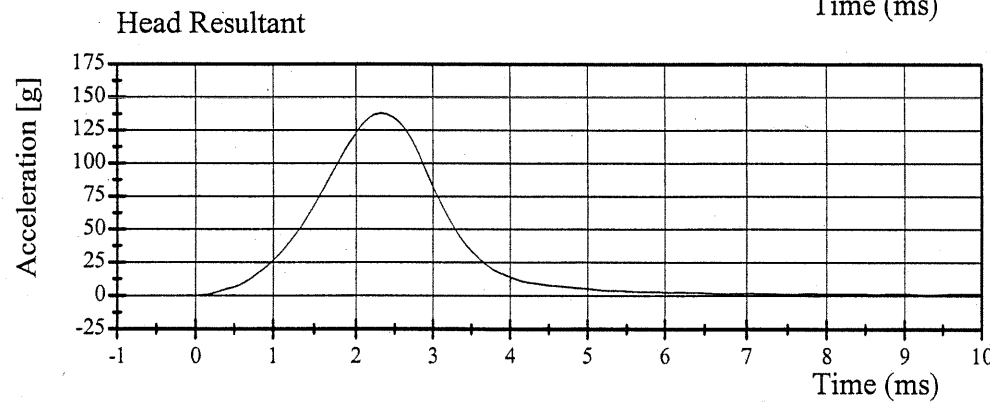
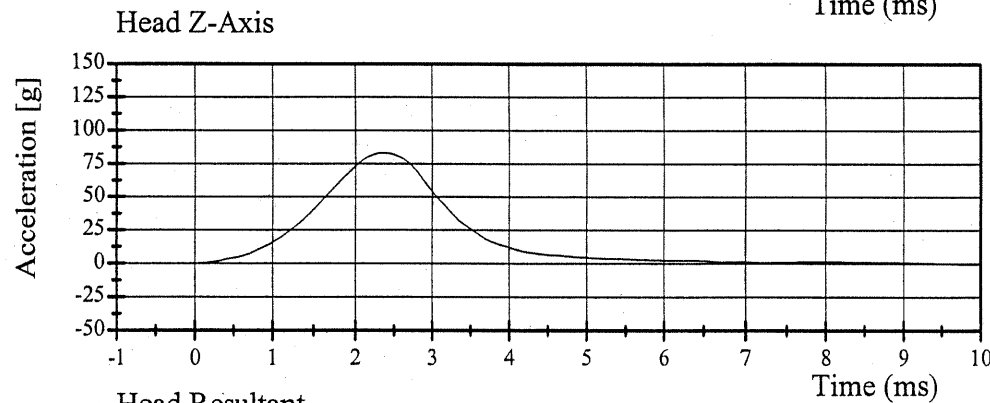
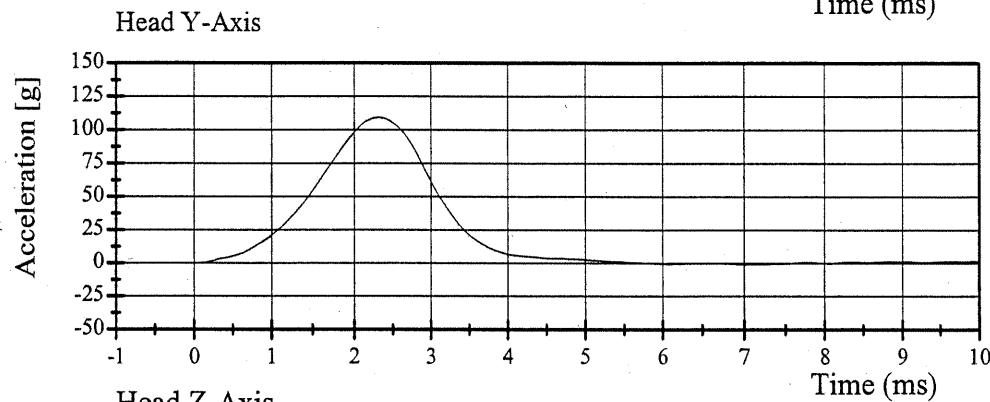
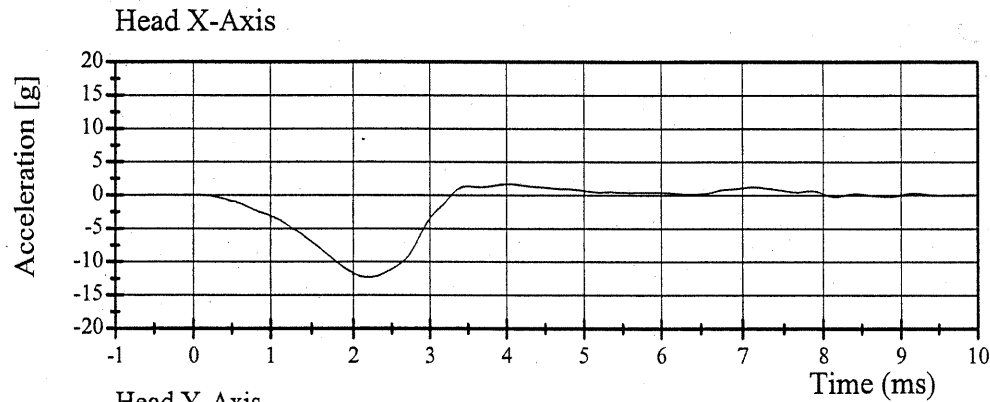


Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 055 Calibration No. 13 - 1

Test Date 03/22/2004



03.22.2004 18:52:08 611



Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 055 Calibration No. 13 - 5

Test Date 03/23/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.06 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.96 - 2.55 m/s	2.26 m/s	Yes
20 ms	4.12 - 5.10 m/s	4.47 m/s	Yes
30 ms	5.73 - 7.01 m/s	6.36 m/s	Yes
40 - 70 ms	6.27 - 7.64 m/s	7.21 - 7.36 m/s	Yes
Peak D Plane Rotation	66 - 82 °	70.8 °	Yes
Rotation Decay Time To 0° From Peak Angle	58 - 67 °	62.6 °	Yes
Peak Moment About Occipital Condyles	73.0 - 88.0 N·m	86.9 N·m	Yes
Moment Decay Time To 0 N·m From Peak Moment	49 - 64 ms	53.8 ms	Yes
Time Between Peak Rotation and Peak Moment	2 - 16 ms	7.0 ms	Yes

Comments:

Technician

Vincent Durie

Approved

V. J. Watts

03.23.2004 13:49:30 516

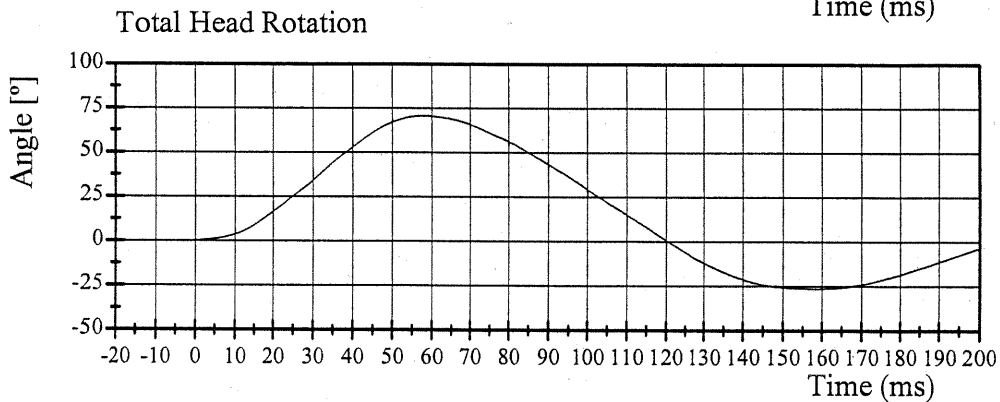
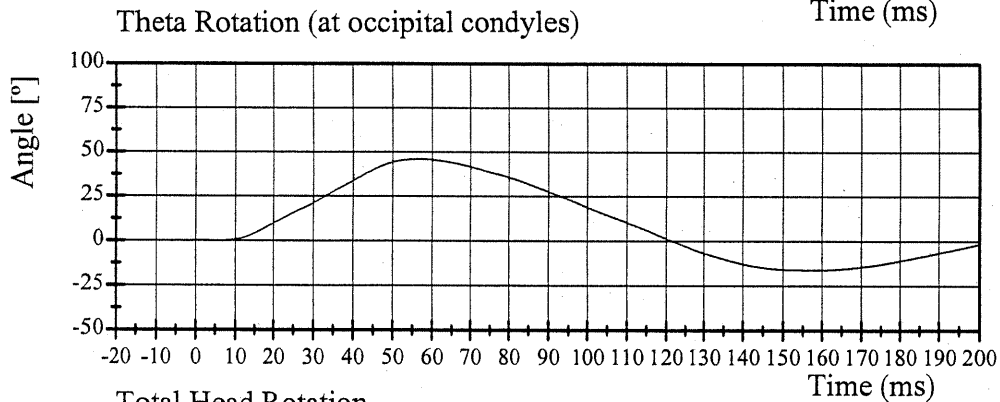
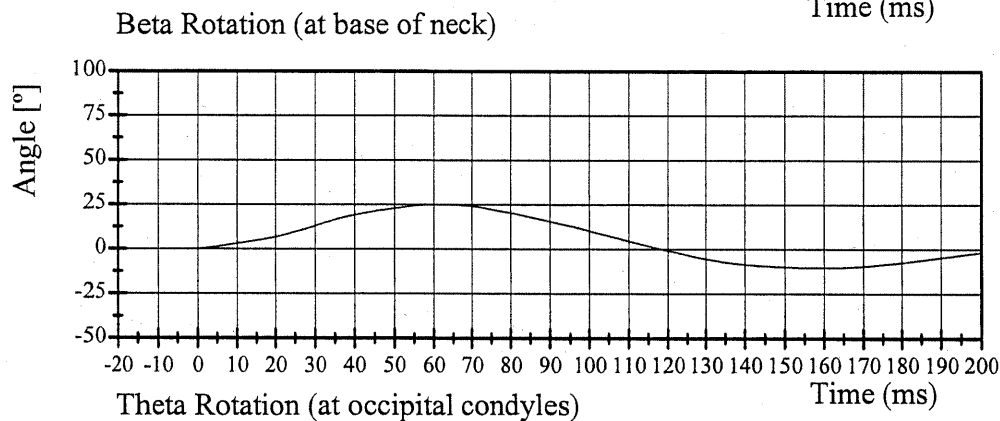
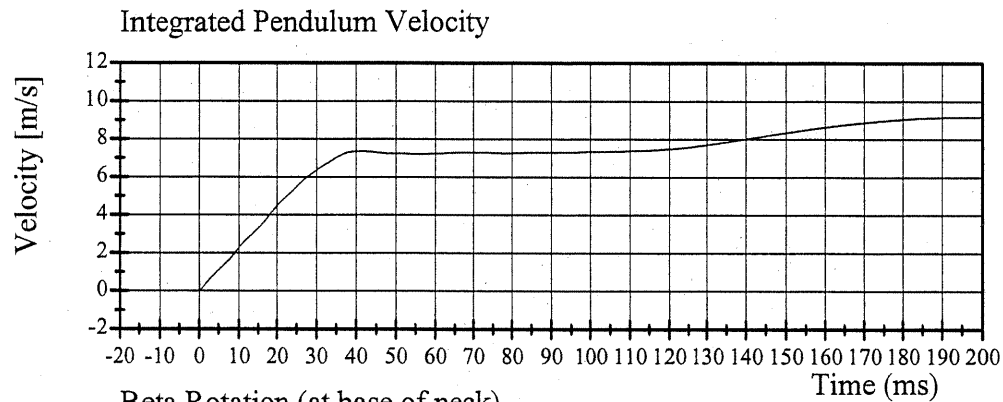


Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 055 Calibration No. 13 - 5

Test Date 03/23/2004



03.23.2004 13:49:31 516



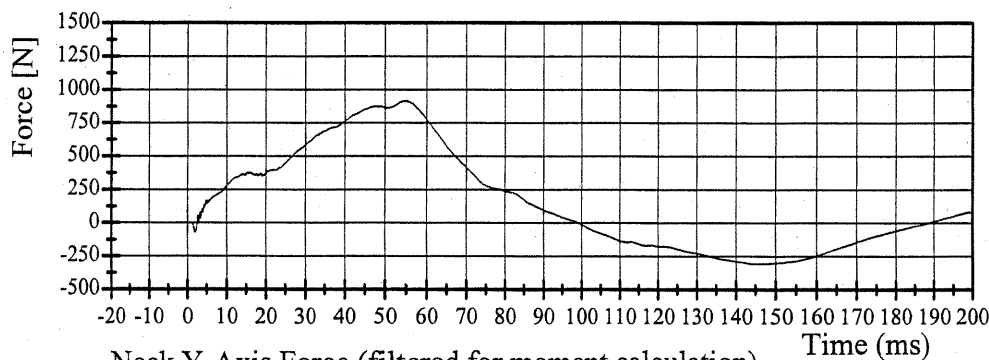
Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 055 Calibration No. 13 - 5

Test Date 03/23/2004

Neck Y-Axis Force

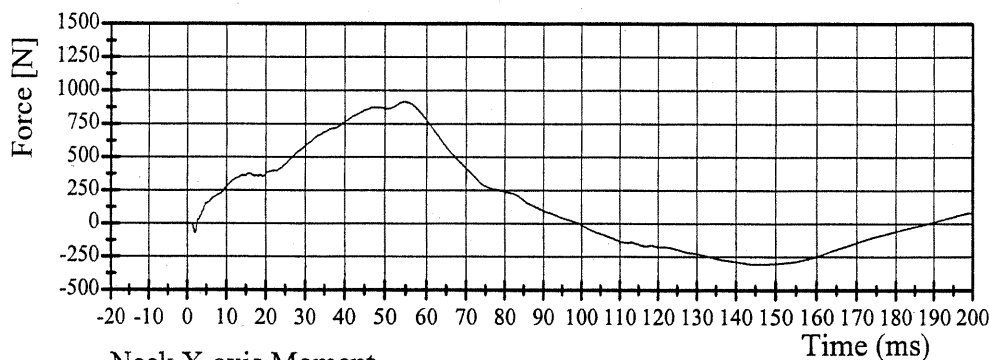


Filter Class: CFC 1000

Max: 916 N at 54.6 ms

Min: -306 N at 146.0 ms

Neck Y-Axis Force (filtered for moment calculation)

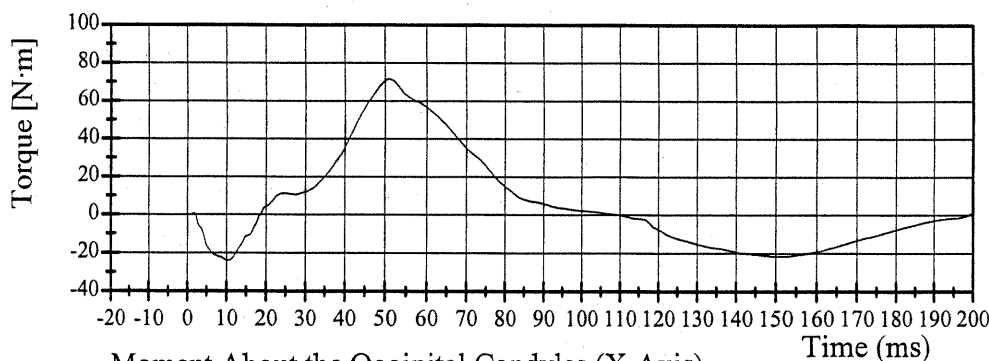


Filter Class: CFC 600

Max: 916 N at 54.6 ms

Min: -306 N at 146.1 ms

Neck X-axis Moment

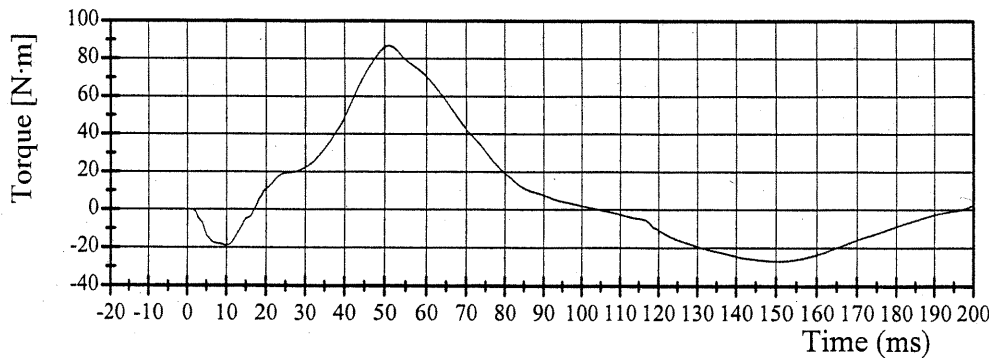


Filter Class: CFC 600

Max: 71.6 N·m at 51.0 ms

Min: -23.8 N·m at 10.6 ms

Moment About the Occipital Condyles (X-Axis)



Filter Class: 600

Max: 86.9 ° at 51.0 ms

Min: -26.9 ° at 150.6 ms

03.23.2004 13:49:32 516



Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 055 Calibration No. 13 - 2

Test Date 04/28/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	21.6 C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.31 m/sec	Yes
Upper Rib Bar Peak Acceleration	37 - 46 g	40.6 g	Yes
Lower Rib Bar Peak Acceleration	37 - 46 g	38.8 g	Yes
Lower Thoracic Spine (T12) Peak Acceleration	15 - 22 g	19.0 g	Yes

Comments:

Pre-test calibration.

Technician

Vincent Oliveri

Approved

J. J. Watter

05.04.2004 11:34:50 1319



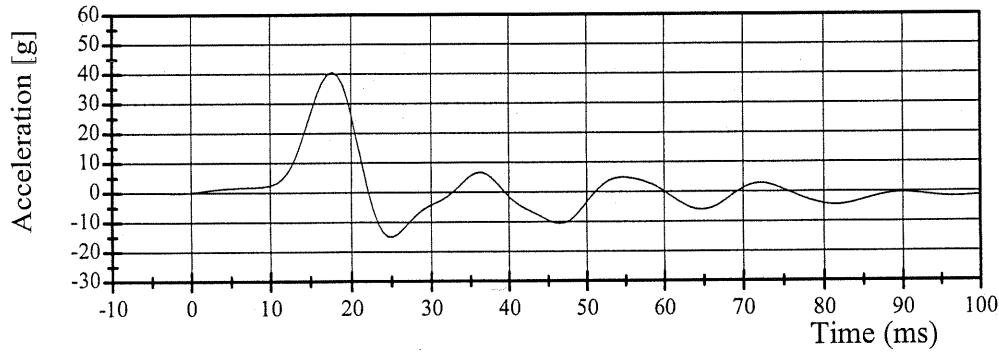
Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 055 Calibration No. 13 - 2

Test Date 04/28/2004

Upper Rib Bar Acceleration

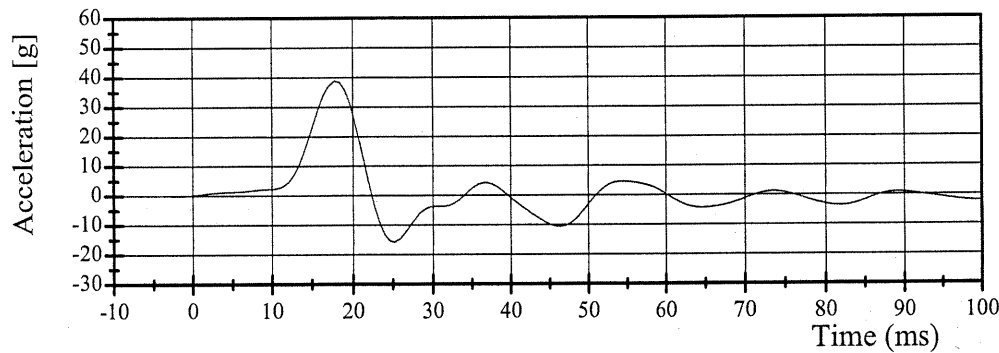


Filter Class: FIR 100

Max: 40.6 g at 17.7 ms

Min: -15.0 g at 25.1 ms

Lower Rib Bar Acceleration

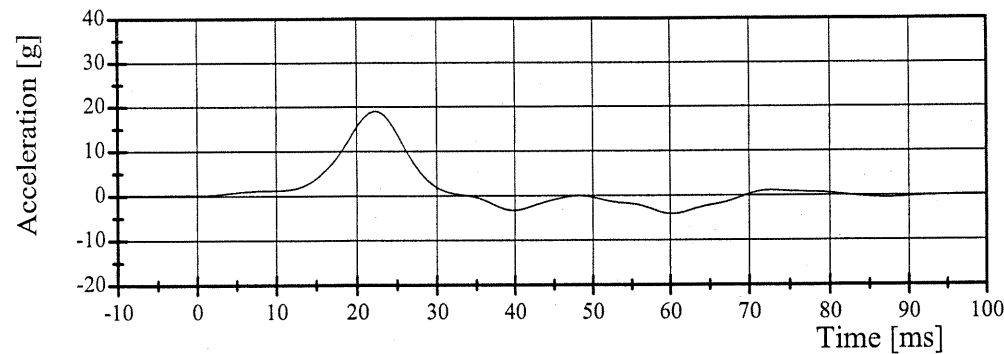


Filter Class: FIR 100

Max: 38.8 g at 17.7 ms

Min: -15.8 g at 25.2 ms

Lower Thoracic Spine (T12) Acceleration



Filter Class: FIR 100

Max: 19.0 g at 22.1 ms

Min: -4.1 g at 60.2 ms

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

13-MAR-04

TRC INC.

572F SN055 DAMPER TEST CAL12

TEST NUMBERS: DP05512A9,DP05512B1,DP05512C7

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	21.0 %
VELOCITY	FORCE	667 - 925 N	771 N
2.72 M/S	DISPLACEMENT	29.7 - 34.5 MM	30.7 MM
VELOCITY	FORCE	1733 - 2100 N	1746 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	34.8 MM
VELOCITY	FORCE	3663 - 4355 N	3769 N
6.05 M/S	DISPLACEMENT	33.2 - 39.5 MM	36.7 MM

DAMPER SETTING = 9.0

REPLACEMENT DAMPER INSTALLED.

TEST MEETS SPECIFICATIONS

TECHNICIAN

V. J. Watter

RUN NUMBER: 031304.2024;1

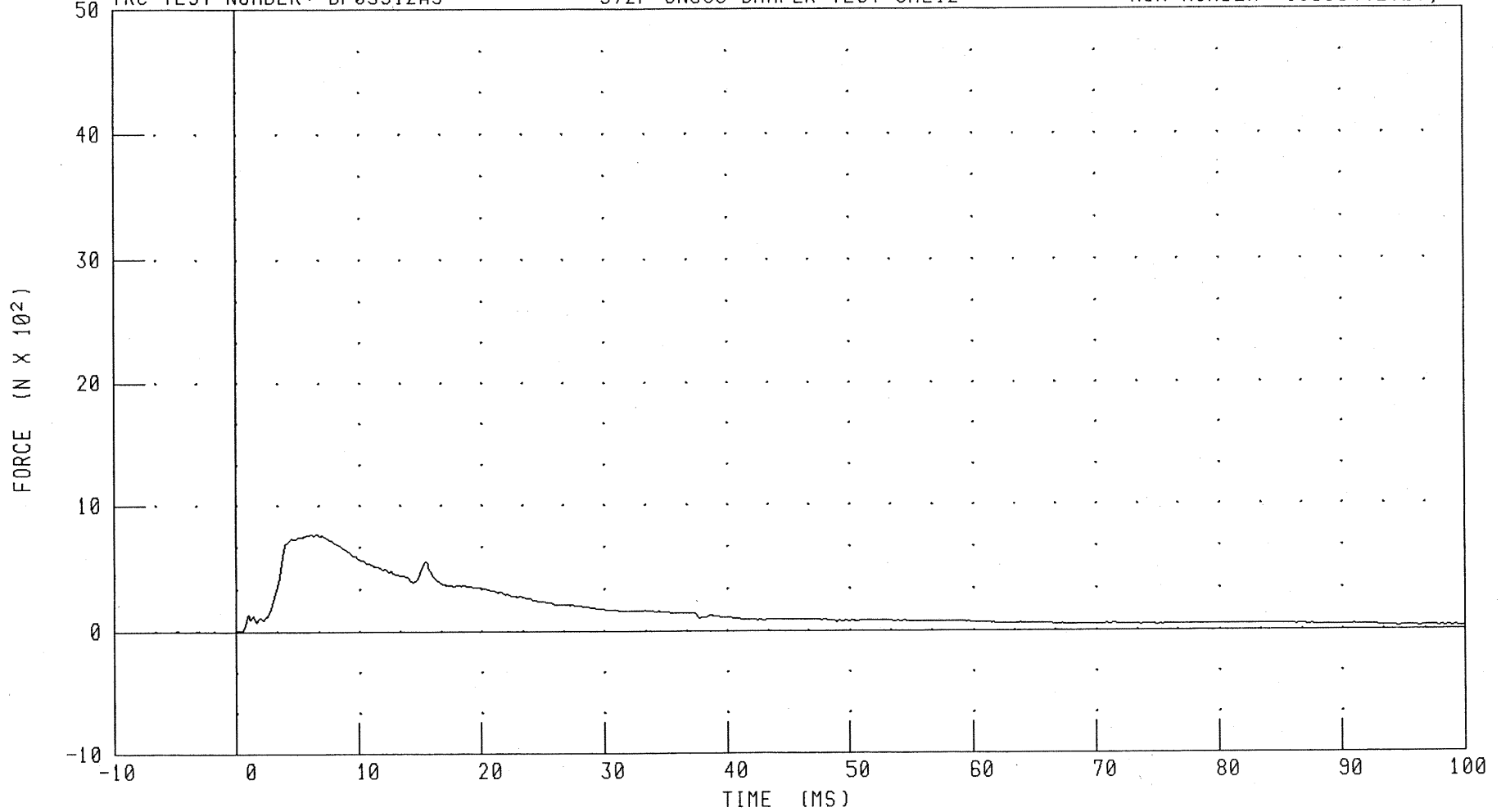
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP05512A9

572F SN055 DAMPER TEST CAL12

RUN NUMBER: 031304.2025;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 771.07 N @ 6.56 MS; -2.23 N @ -5.20 MS

040429-1

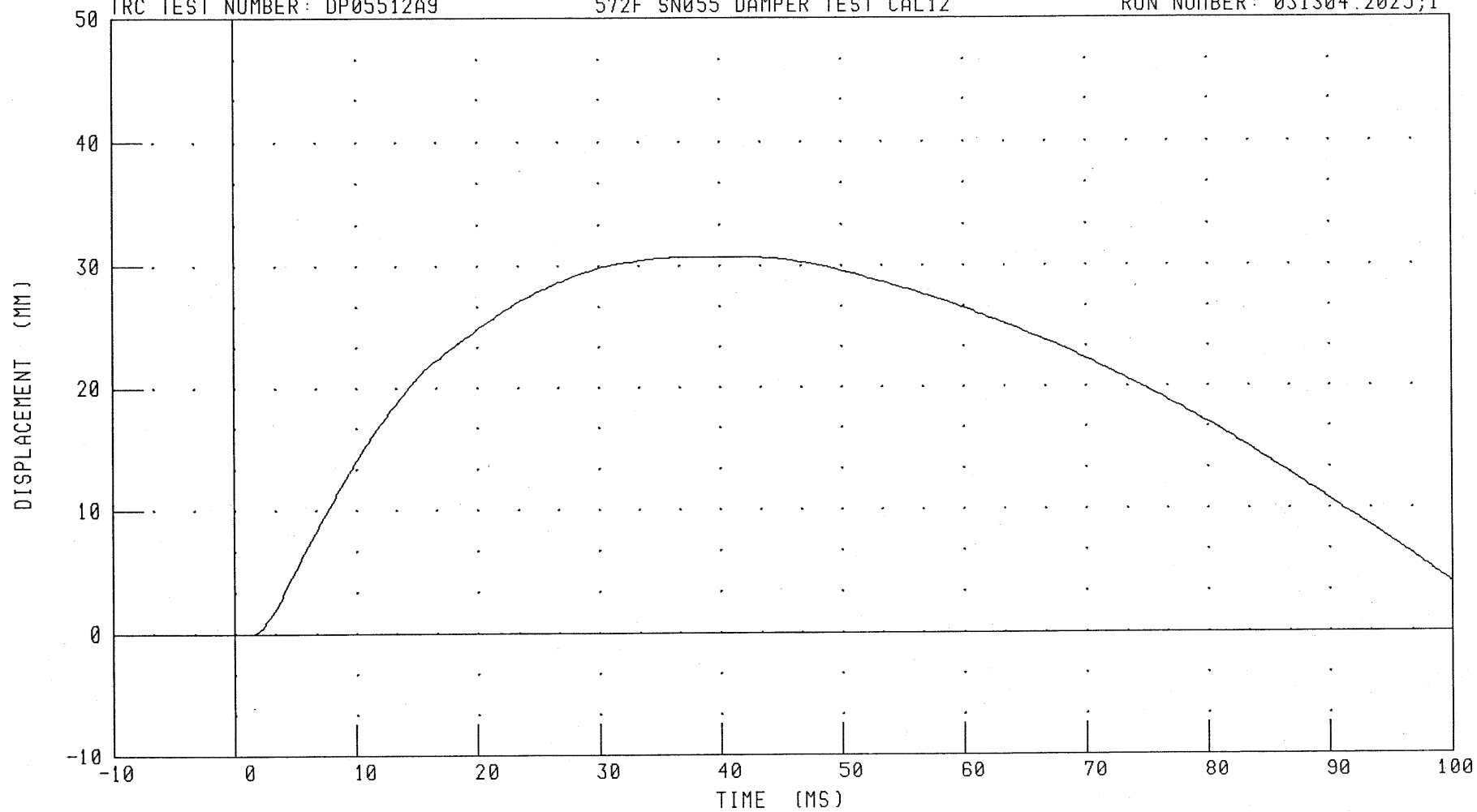
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN055 DAMPER TEST CAL12

RUN NUMBER: 031304.2025;1

TRC TEST NUMBER: DP05512A9



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 30.70 MM @ 37.36 MS; -0.01 MM @ 1.04 MS

040429-1

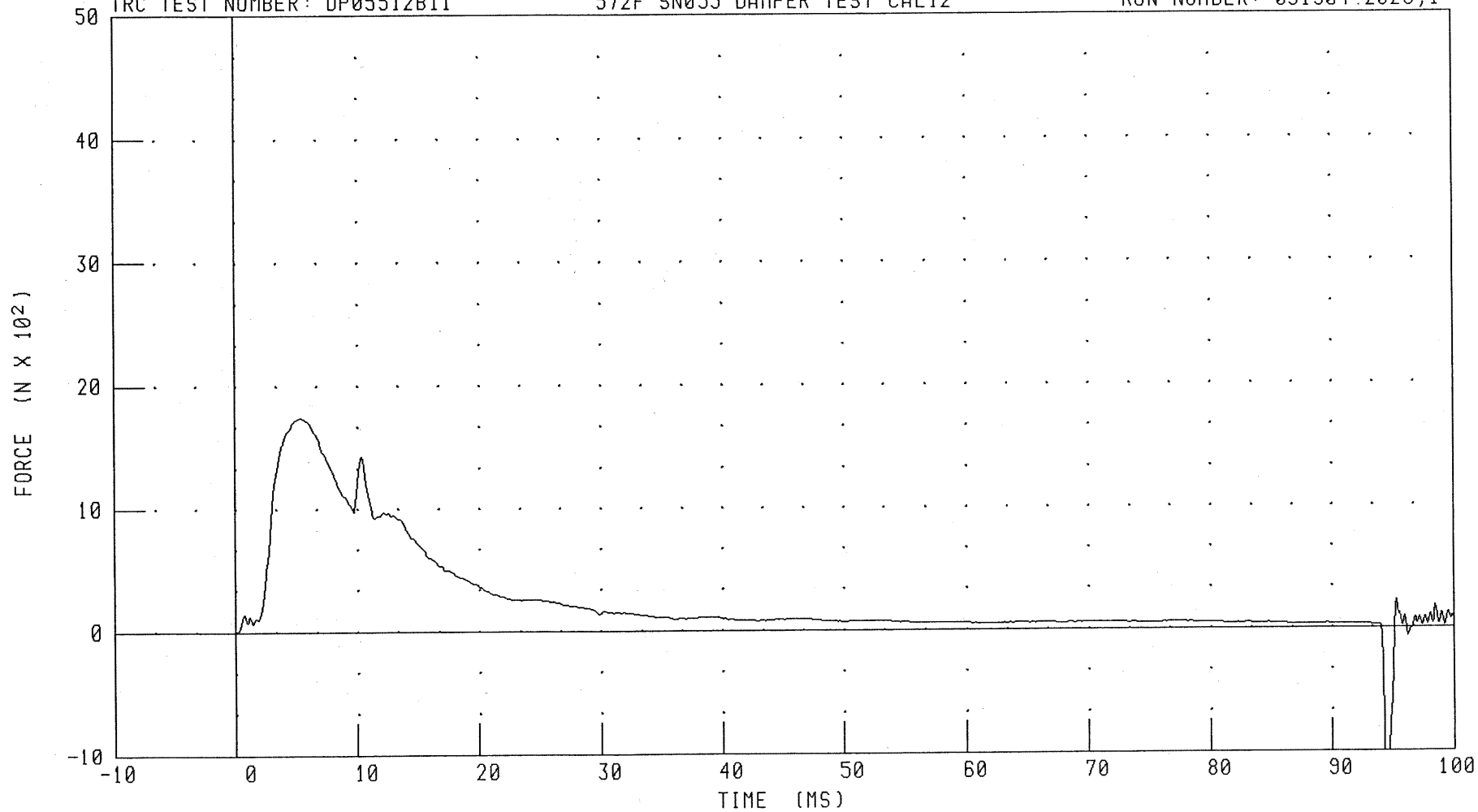
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP05512B11

572F SN055 DAMPER TEST CAL12

RUN NUMBER: 031304.2026;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 1746.07 N @ 5.44 MS; -1982.01 N @ 94.48 MS

040429-1

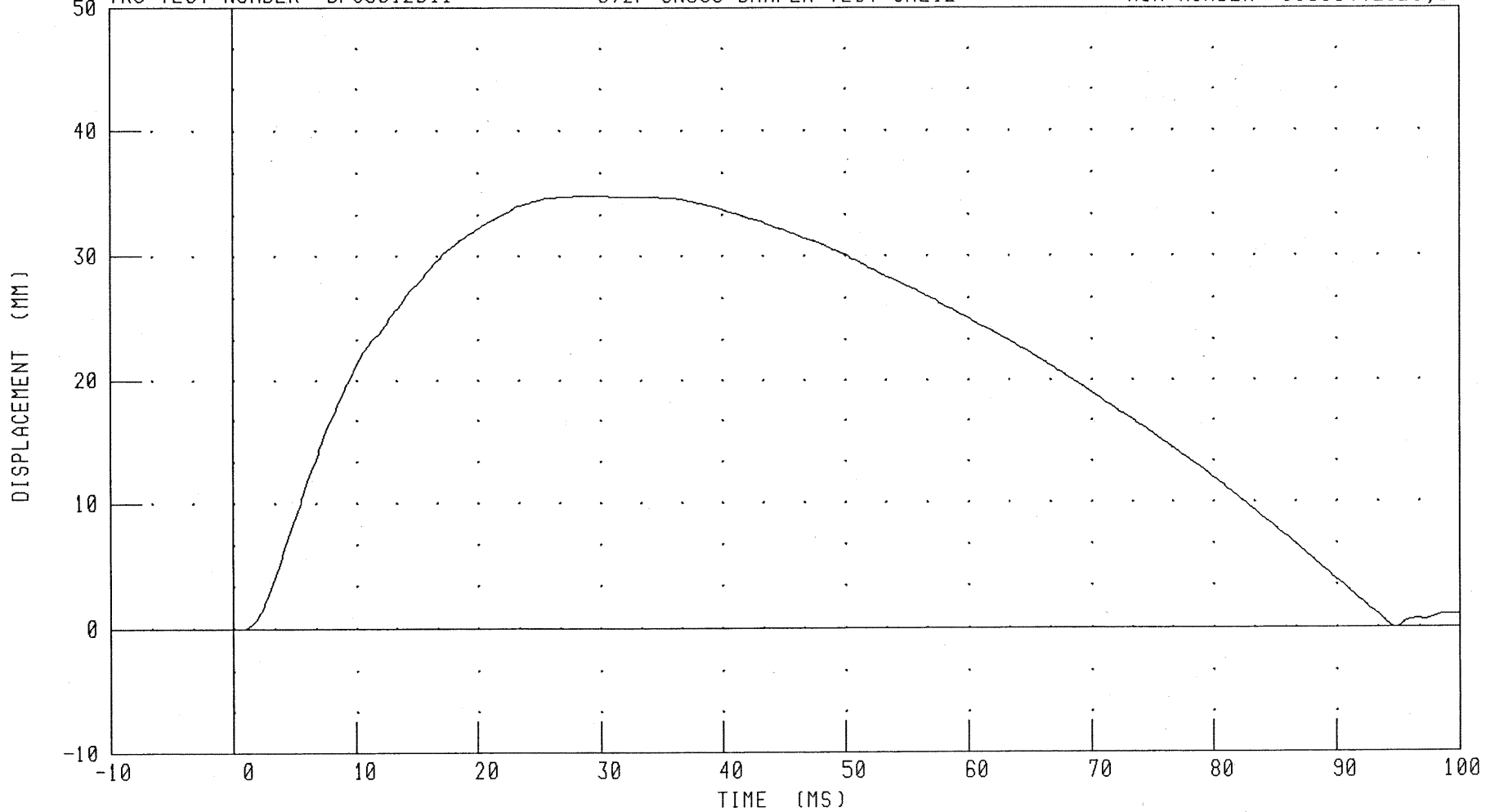
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP05512B11

572F SN055 DAMPER TEST CAL12

RUN NUMBER: 031304.2026;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 34.78 MM @ 29.36 MS; -0.05 MM @ 94.80 MS

040429-1

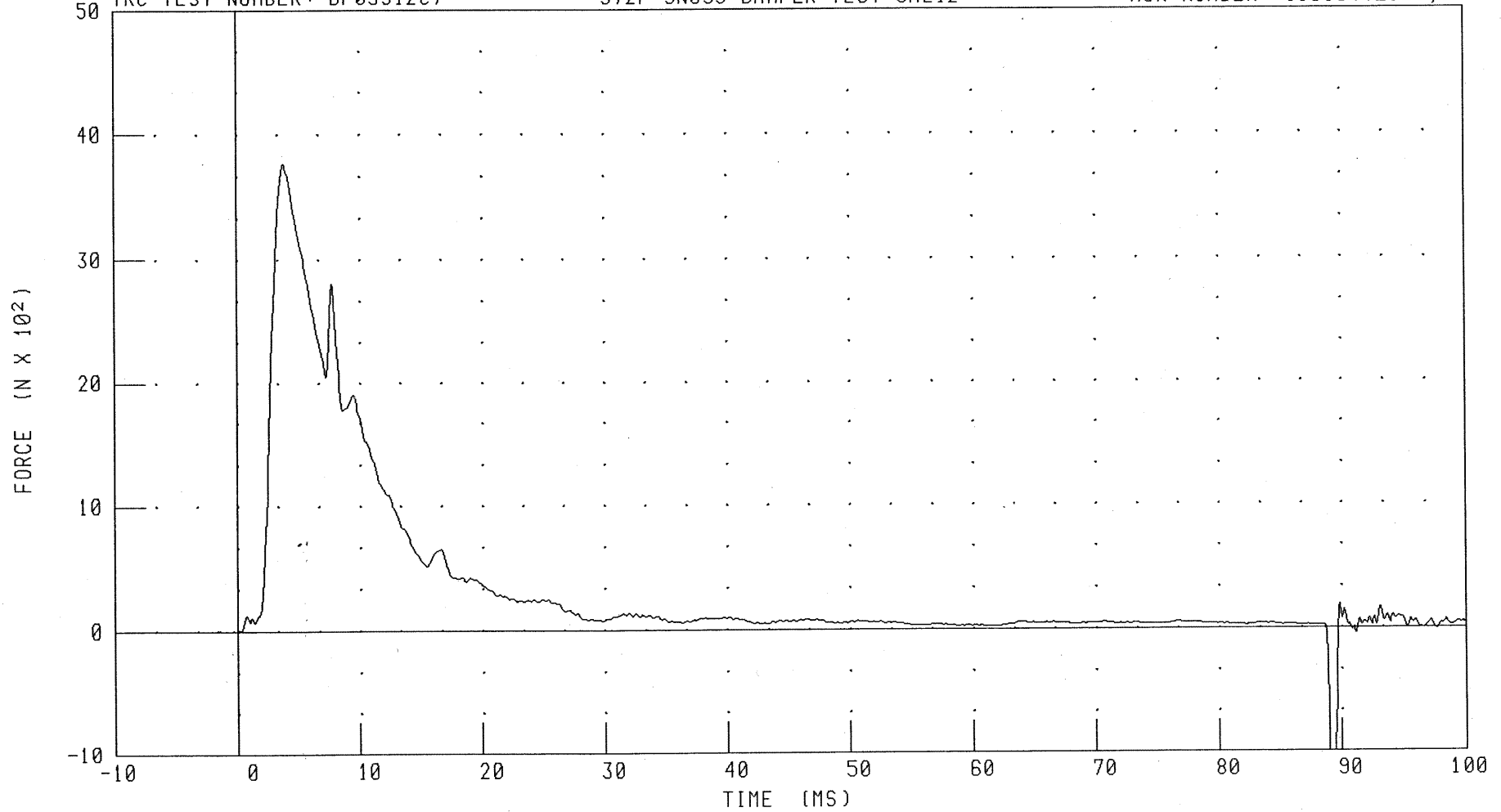
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP05512C7

572F SN055 DAMPER TEST CAL12

RUN NUMBER: 031304.2026;1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

040429-1

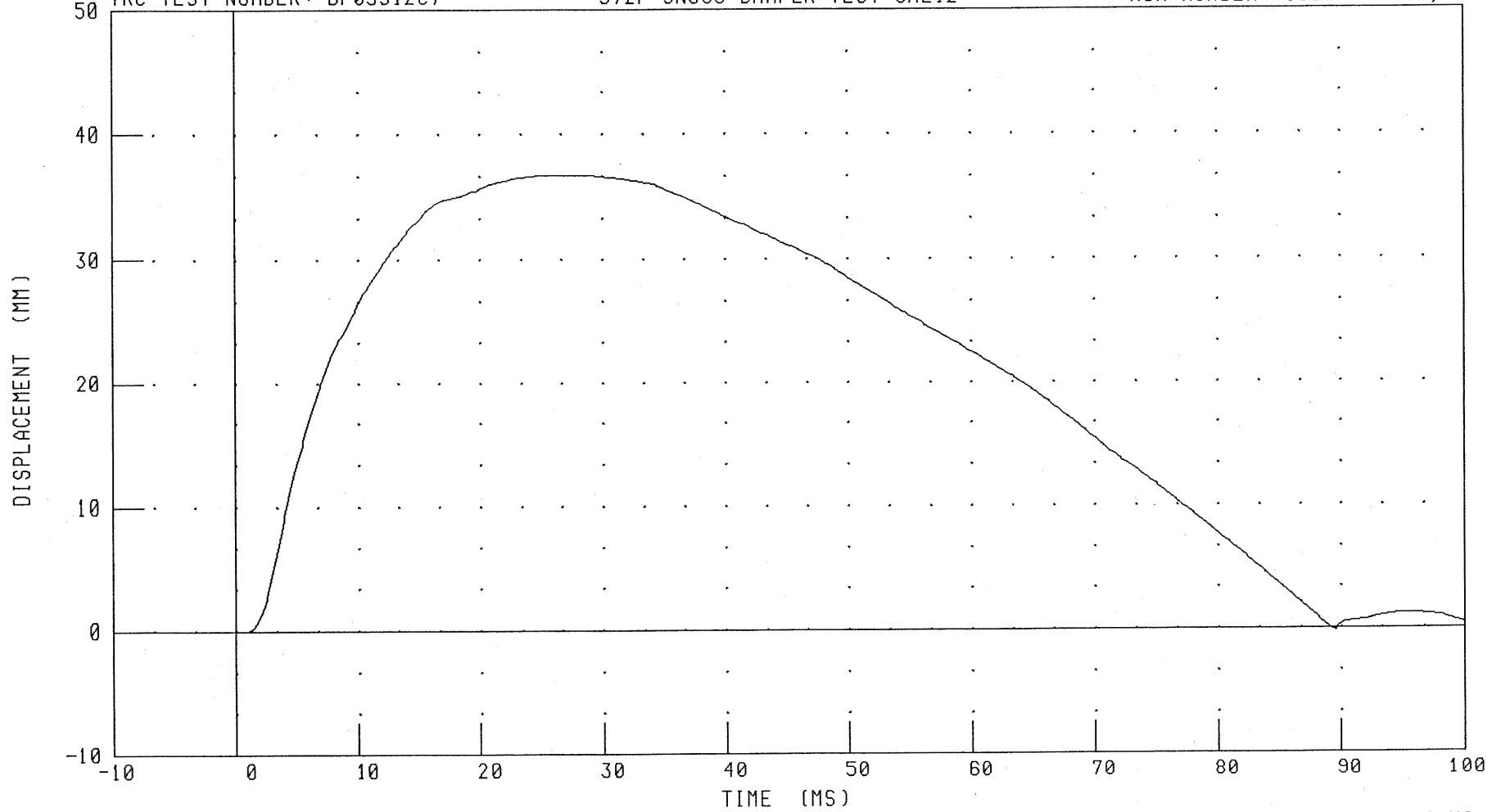
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP05512C7

572F SN055 DAMPER TEST CAL12

RUN NUMBER: 031304.2026;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 36.73 MM @ 26.24 MS; -0.17 MM @ 89.52 MS

040429-1

TRANSPORTATION RESEARCH CENTER INC.

PART 572B LUMBAR FLEXION TEST

SID/HIII

CAL DATE: 26-Mar-04

TRC, INC. TEST NO: 055C13TF1 572M SN 055 TORSO FLEX CAL 13

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	22.0 °C
RELATIVE HUMIDITY	10 – 70 %	49 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	137.9 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	160.1 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	206.8 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	2.5 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Vincent Oliver

Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 055 Calibration No. 13 - 5

Test Date 03/26/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.7 - 7.9 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician

Vincent Olivier

Approved

V. F. Watts

03.26.2004 13:15:36 1769

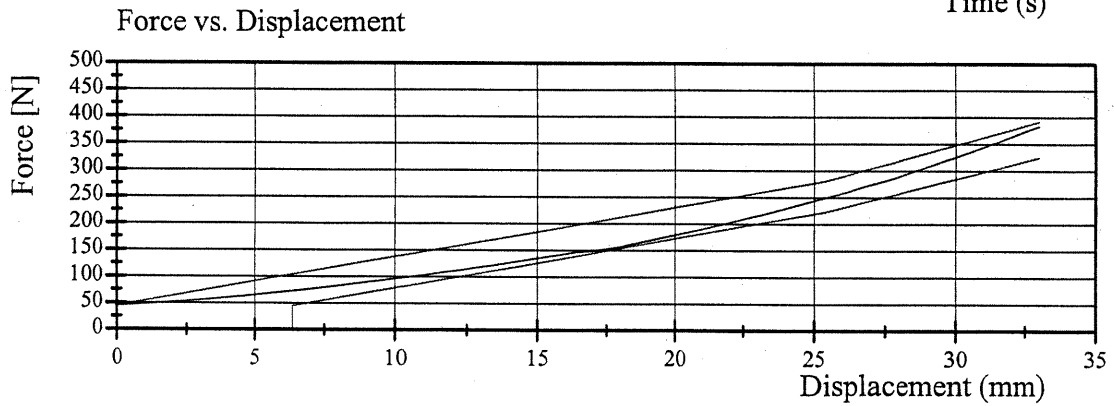
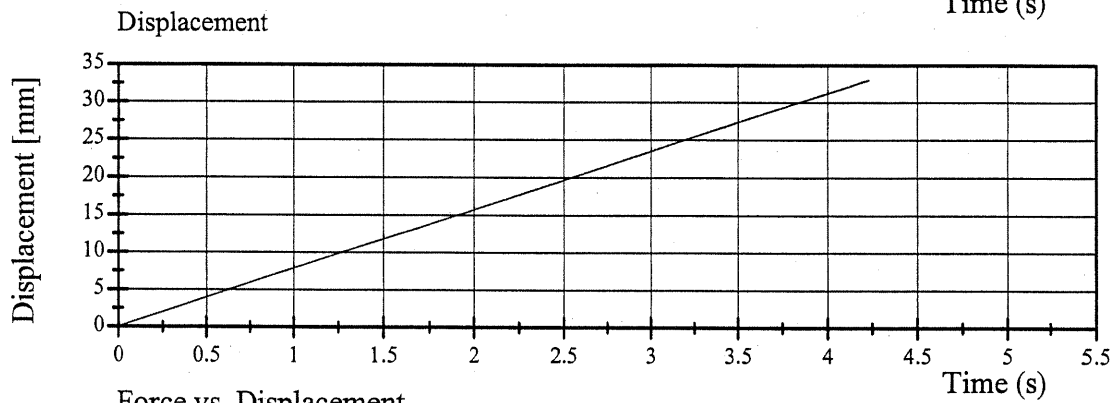
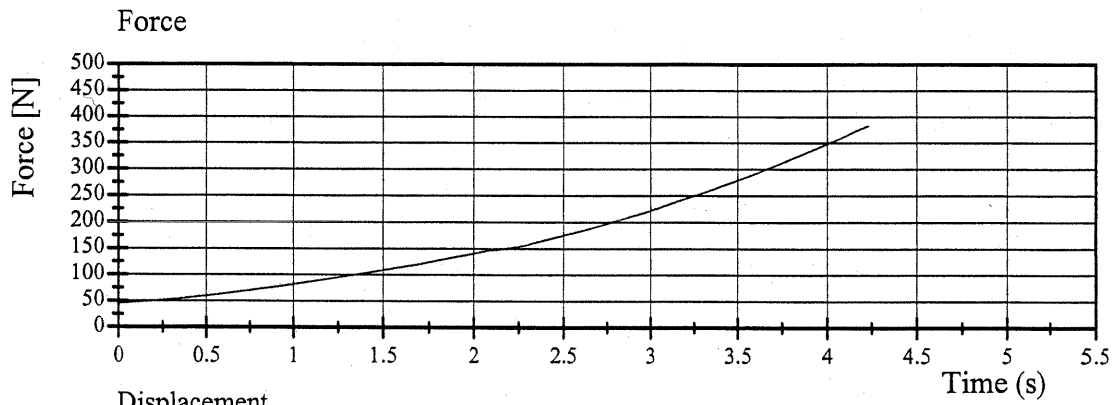


Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 055 Calibration No. 13 - 5

Test Date 03/26/2004



Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 055 Calibration No. 13 - 2

Test Date 04/28/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	21.7 C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.31 m/sec	Yes
Pelvis Peak Acceleration	40 - 60 g	46.3 g	Yes
Time Above 20 g	3 - 7 ms	6.08 ms	Yes
Unimodal requirement for pelvis acceleration	Yes	Yes	Yes

Comments:

Pre-test calibration.

Technician

Vincent Oliver

Approved

V. L. Watter

05.04.2004 11:36:10 1168

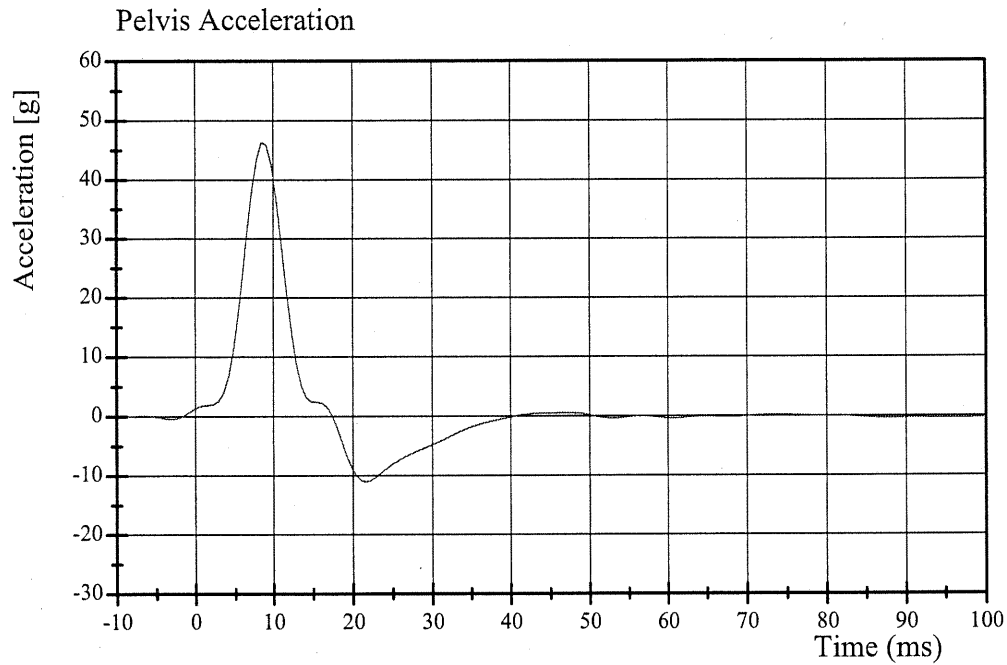


Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 055 Calibration No. 13 - 2

Test Date 04/28/2004



Filter Class: FIR 100

Max: 46.3 g at 8.6 ms

Min: -11.0 g at 21.6 ms

Calibration Test Results

Post-Test

SID HIII: 059

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was not tested at this time.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.
SID/HIII Dummy Pre-Test
External Dimensions
Serial No. 059 Calibration No. 09
05/12/04

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	907 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	508 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	523 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	495 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	364 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	178 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	178 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	0.0 mm	Yes

Technician

Vincent Oliver

Approved

V. F. Watts



Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 059 Calibration No. 09 - 2

Test Date 05/11/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Peak Resultant Acceleration	120 - 150 g	146.9 g	Yes
Peak Longitudinal Acceleration	15 g Max	-5.8 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Vincent Oliveri

Approved

V. J. Walter

05.11.2004 13:22:10 606

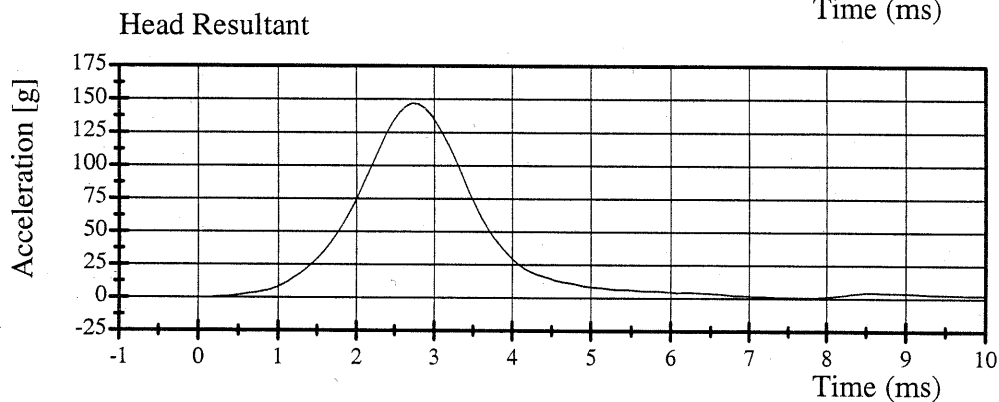
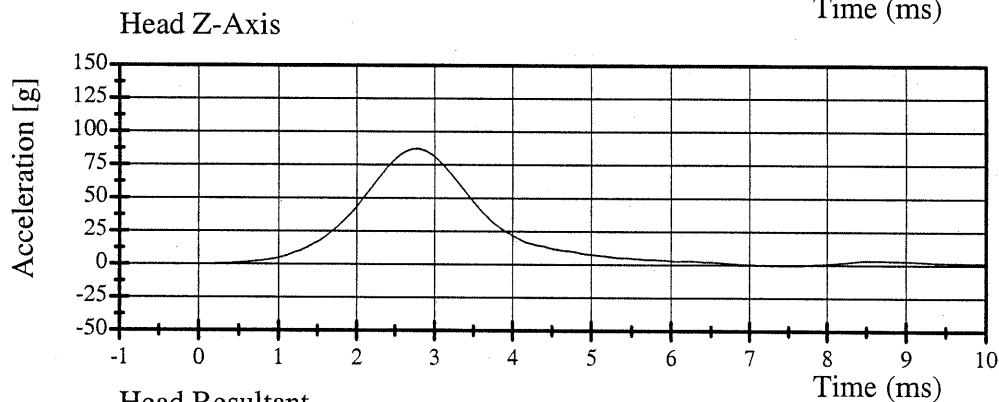
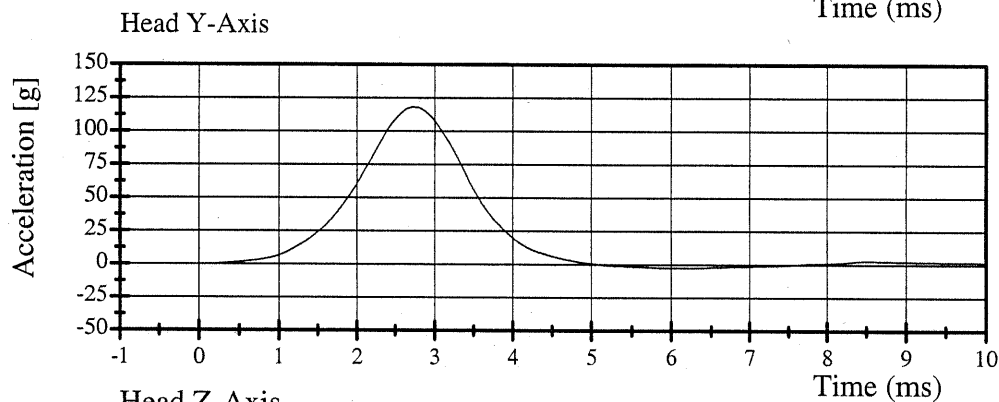
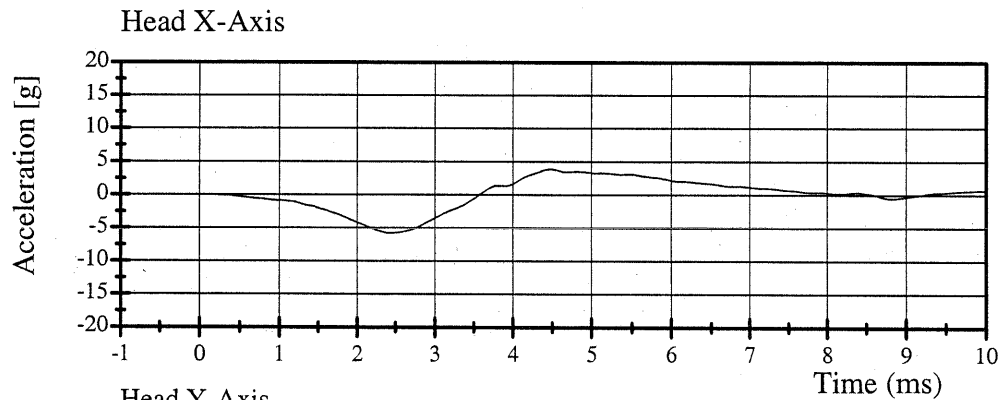


Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 059 Calibration No. 09 - 2

Test Date 05/11/2004



05.11.2004 13:22:11 606



Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 059 Calibration No. 09 - 1

Test Date 05/11/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.96 - 2.55 m/s	2.30 m/s	Yes
20 ms	4.12 - 5.10 m/s	4.58 m/s	Yes
30 ms	5.73 - 7.01 m/s	6.46 m/s	Yes
40 - 70 ms	6.27 - 7.64 m/s	7.25 - 7.37 m/s	Yes
Peak D Plane Rotation	66 - 82 °	71.4 °	Yes
Rotation Decay Time To 0° From Peak Angle	58 - 67 °	63.8 °	Yes
Peak Moment About Occipital Condyles	73.0 - 88.0 N·m	75.5 N·m	Yes
Moment Decay Time To 0 N·m From Peak Moment	49 - 64 ms	62.4 ms	Yes
Time Between Peak Rotation and Peak Moment	2 - 16 ms	13.0 ms	Yes

Test meets specifications.

Comments:

Technician

Vincent Oliver

Approved

V. J. Watts

05.11.2004 15:24:20 517

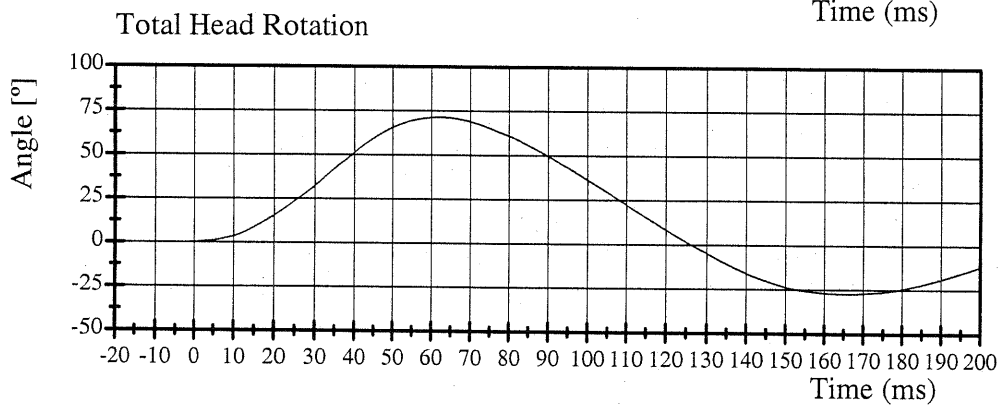
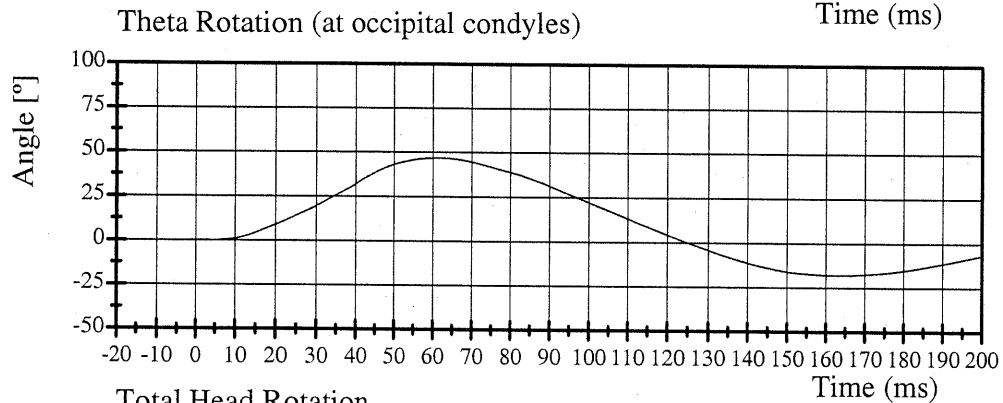
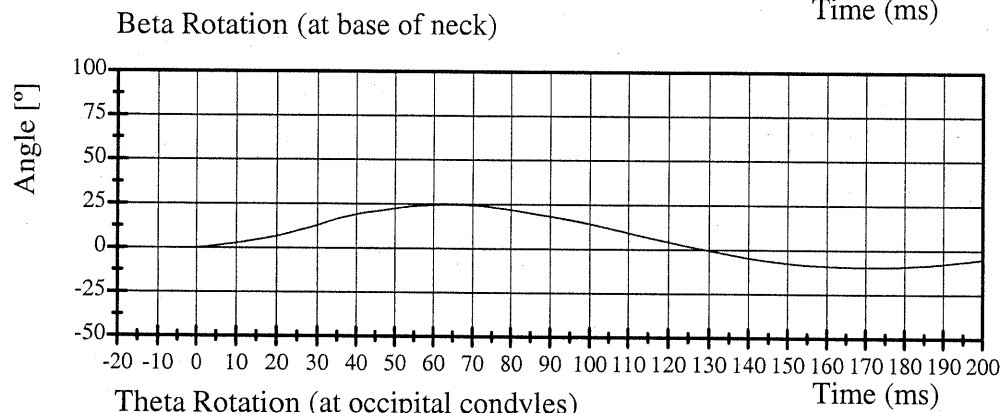
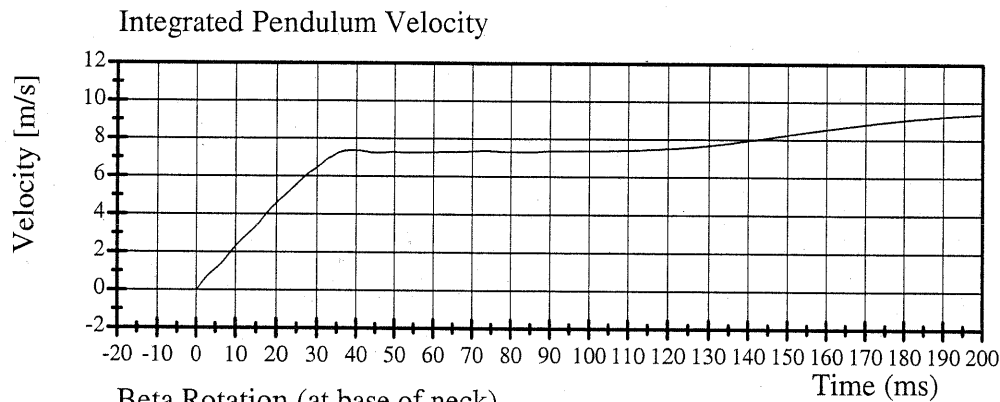


Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 059 Calibration No. 09 - 1

Test Date 05/11/2004



05.11.2004 15:24:21 517



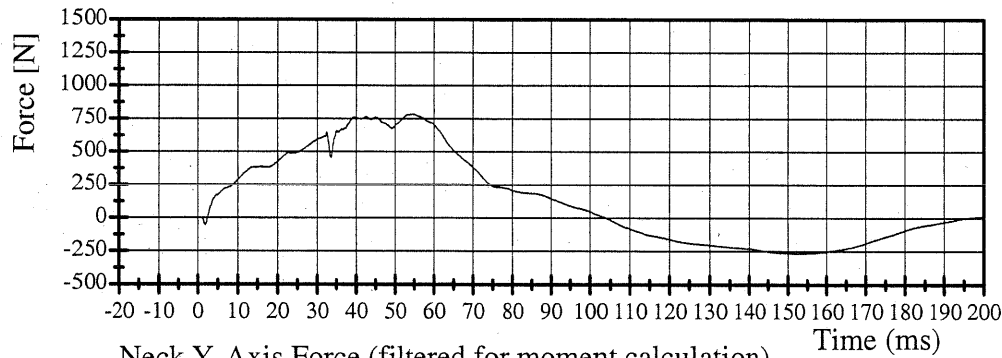
Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 059 Calibration No. 09 - 1

Test Date 05/11/2004

Neck Y-Axis Force

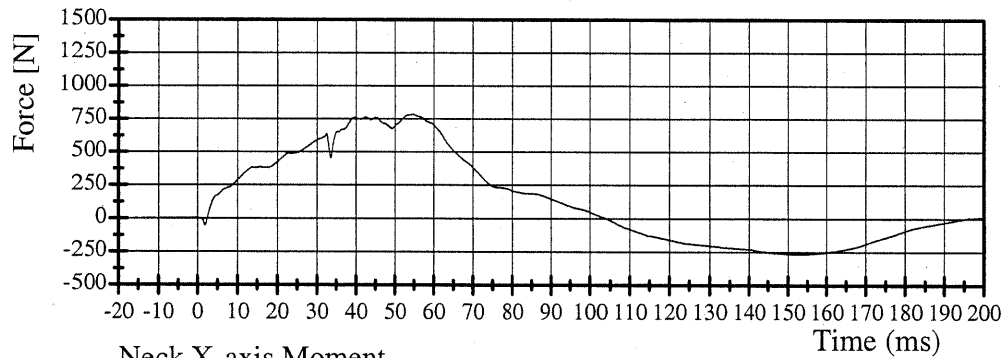


Filter Class: CFC 1000

Max: 784 N at 54.7 ms

Min: -266 N at 152.2 ms

Neck Y-Axis Force (filtered for moment calculation)

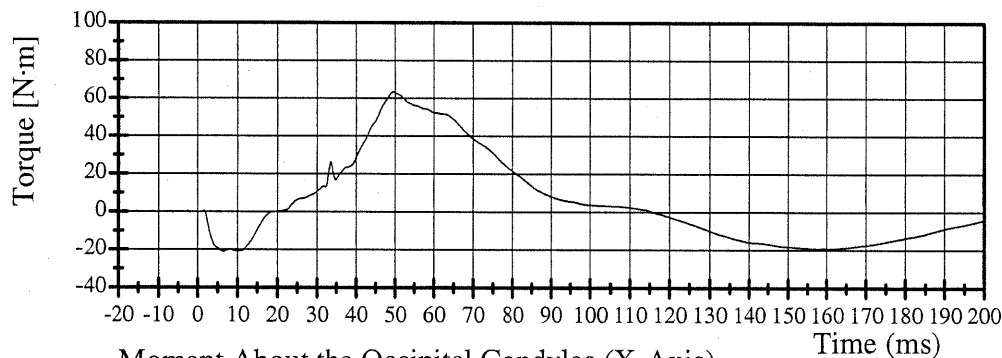


Filter Class: CFC 600

Max: 784 N·m at 54.7 ms

Min: -265 N·m at 152.1 ms

Neck X-axis Moment

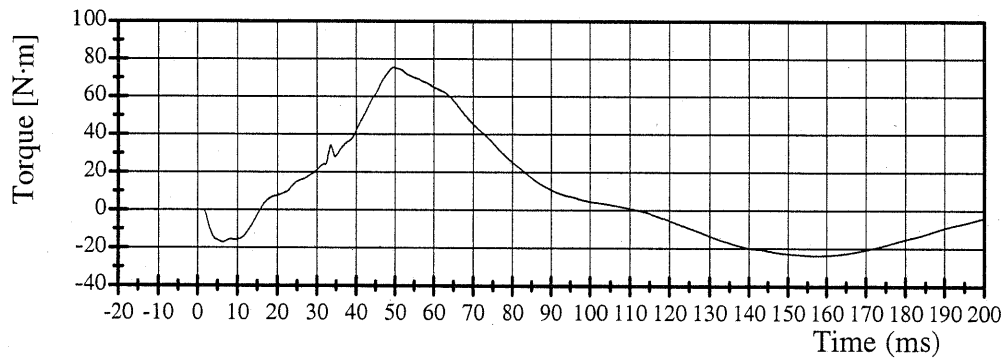


Filter Class: CFC 600

Max: 63.4 N·m at 49.5 ms

Min: -20.9 N·m at 6.4 ms

Moment About the Occipital Condyles (X-Axis)



Filter Class: 600

Max: 75.5 ° at 49.6 ms

Min: -23.7 ° at 157.4 ms

Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 059 Calibration No. 09 - 5

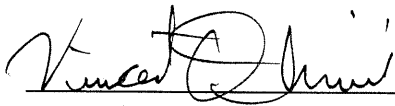
Test Date 05/12/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	22.1 C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.31 m/sec	Yes
Upper Rib Bar Peak Acceleration	37 - 46 g	39.7 g	Yes
Lower Rib Bar Peak Acceleration	37 - 46 g	37.6 g	Yes
Lower Thoracic Spine (T12) Peak Acceleration	15 - 22 g	20.6 g	Yes

Test meets specifications.

Comments:

Technician



Approved



05.12.2004 15:50:47 1033



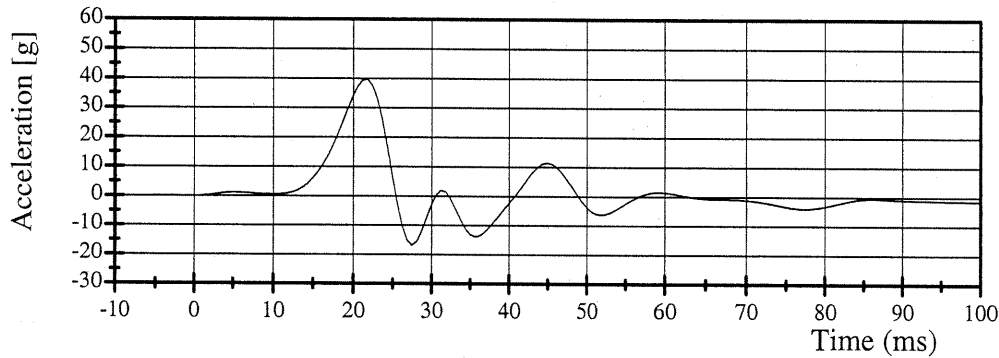
Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 059 Calibration No. 09 - 5

Test Date 05/12/2004

Upper Rib Bar Acceleration

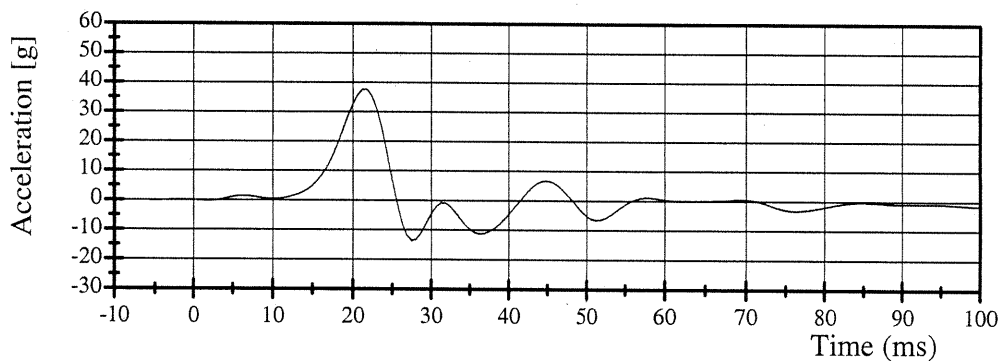


Filter Class: FIR 100

Max: 39.7 g at 21.8 ms

Min: -16.8 g at 27.4 ms

Lower Rib Bar Acceleration

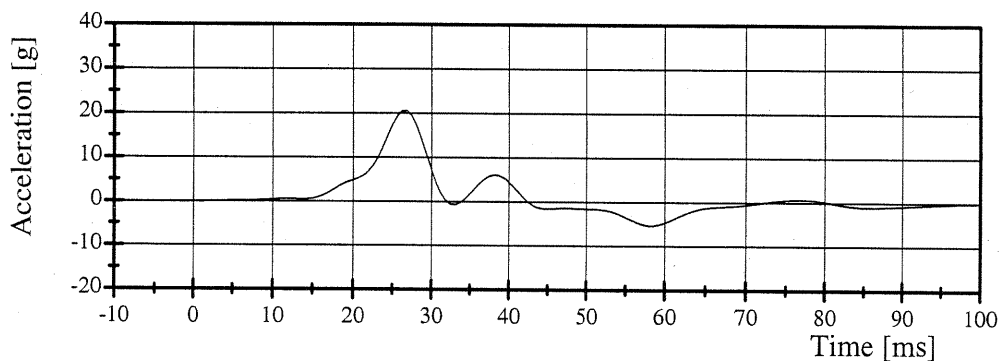


Filter Class: FIR 100

Max: 37.6 g at 21.2 ms

Min: -13.6 g at 27.4 ms

Lower Thoracic Spine (T12) Acceleration



Filter Class: FIR 100

Max: 20.6 g at 26.8 ms

Min: -5.3 g at 58.1 ms

Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 059 Calibration No. 09 - 5

Test Date 05/11/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.7 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Vincent Oliveri

Approved

V. V. Walter

05.11.2004 15:33:29 1228

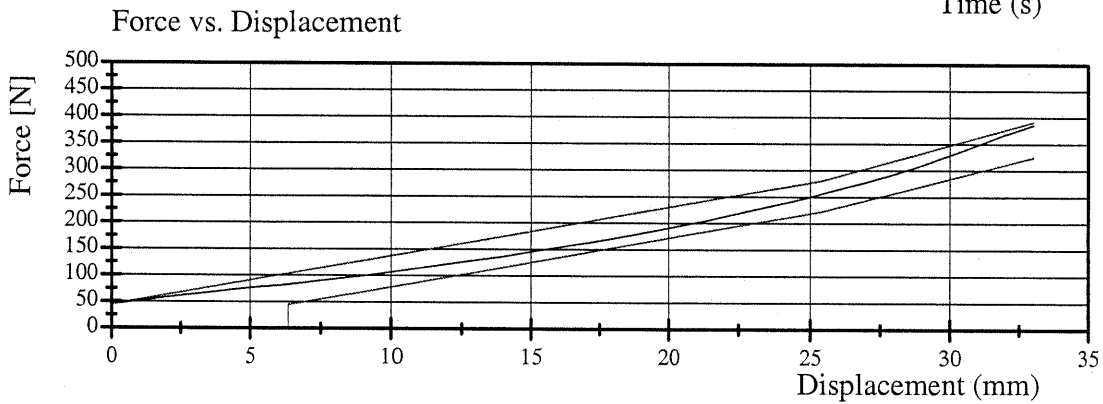
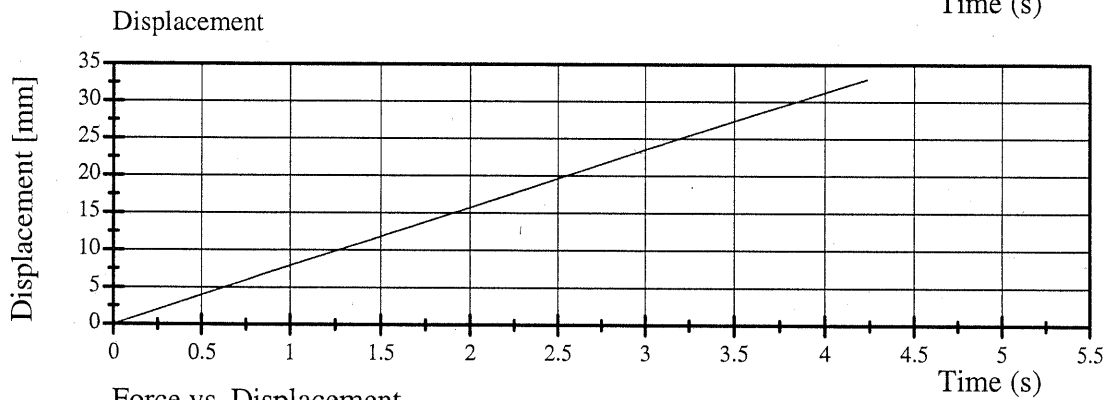
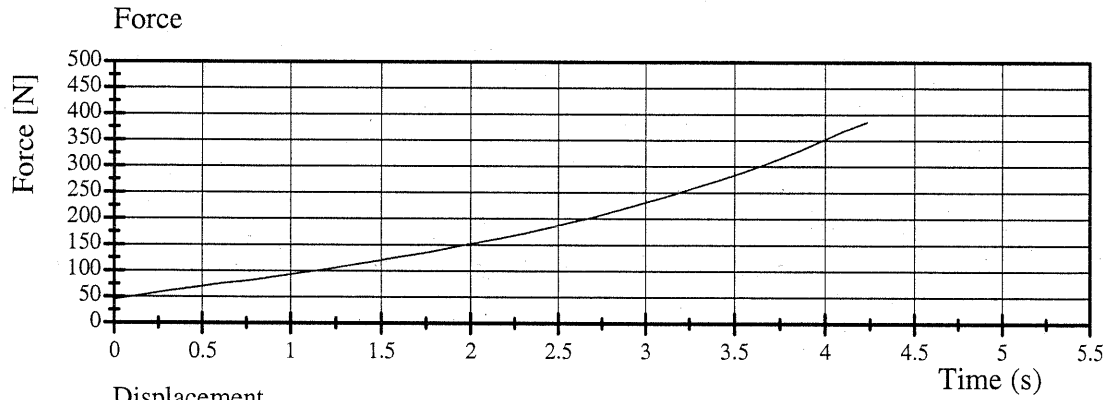


Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 059 Calibration No. 09 - 5

Test Date 05/11/2004



05.11.2004 15:33:30 1228



TRANSPORTATION RESEARCH CENTER INC.

PART 572B LUMBAR FLEXION TEST

SID HIII

CAL DATE: 12-May-04

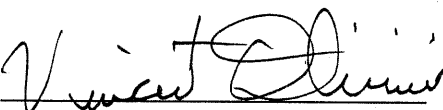
TRC, INC. TEST NO: LF059C09

572M SN 059 TORSO FLEX CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.1 °C
RELATIVE HUMIDITY	10 – 70 %	54 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	120.1 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	177.9 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	231.3 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5.7 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 059 Calibration No. 09 - 1

Test Date 05/12/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	22.0 C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.28 m/sec	Yes
Pelvis Peak Acceleration	40 - 60 g	45.6 g	Yes
Time Above 20 g	3 - 7 ms	6.16 ms	Yes
Unimodal requirement for pelvis acceleration	Yes	Yes	Yes

Comments:

Technician

Vincent Oliveri

Approved

V.J. Walter

05.12.2004 14:06:44 1160

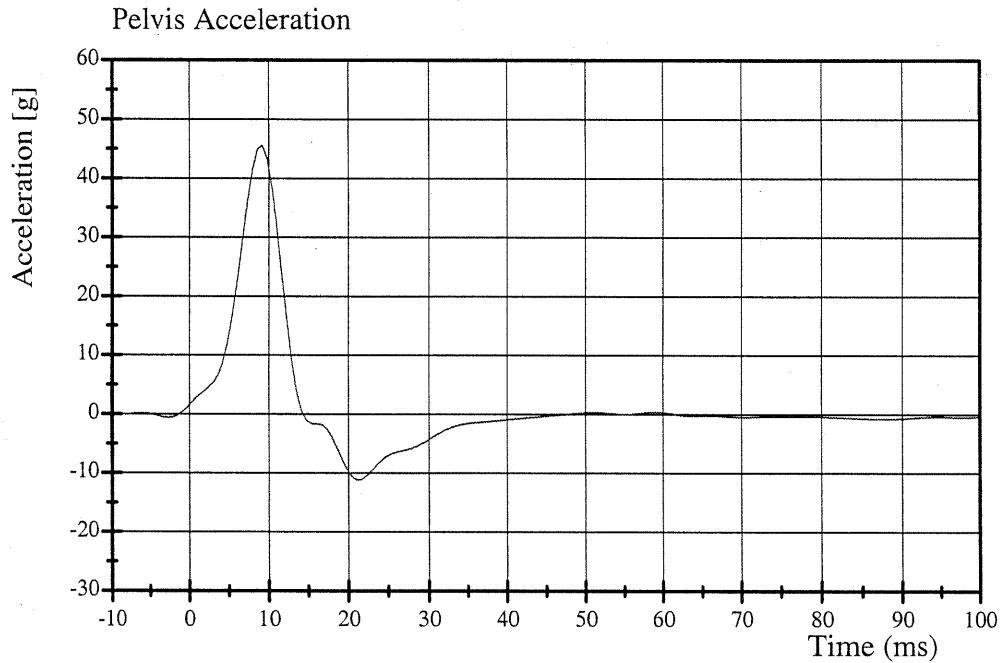


Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 059 Calibration No. 09 - 1

Test Date 05/12/2004



Filter Class: FIR 100

Max: 45.6 g at 9.1 ms

Min: -11.2 g at 21.0 ms

05.12.2004 14:06:45 1160



Calibration Test Results

Post-Test

SID HIII: 055

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was not tested at this time.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.

SID/HIII Dummy

External Dimensions

Serial No. 055 Calibration No. 14

Date: 5/12/04

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	908 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	510 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	525 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	491 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	363 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	174 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	174 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	0.0 mm	Yes

Technician

Vincent D'Amico

Approved

V. J. Walton



Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 055 Calibration No. 14 - 3

Test Date 05/11/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Resultant Acceleration	120 - 150 g	129.9 g	Yes
Peak Longitudinal Acceleration	15 g Max	6.6 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Vincent Olm

Approved

V. F. Walters

05.11.2004 08:18:15 610

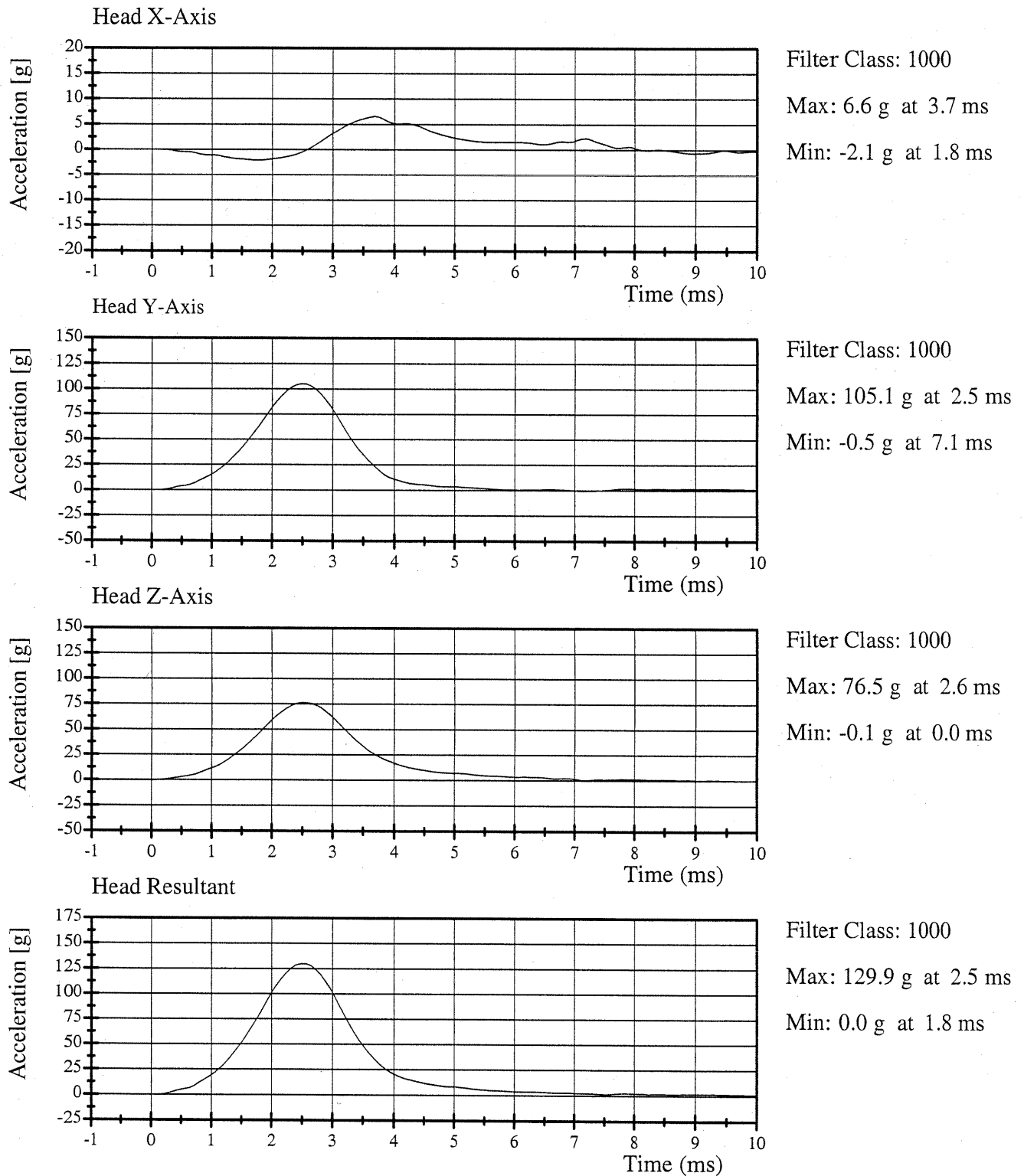


Transportation Research Center Inc.

572M Left Lateral Head Test

SID HIII Serial No. 055 Calibration No. 14 - 3

Test Date 05/11/2004



05.11.2004 08:18:16 610



Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 055 Calibration No. 14 - 1

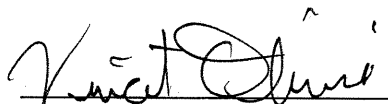
Test Date 05/10/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.06 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.96 - 2.55 m/s	2.28 m/s	Yes
20 ms	4.12 - 5.10 m/s	4.53 m/s	Yes
30 ms	5.73 - 7.01 m/s	6.53 m/s	Yes
40 - 70 ms	6.27 - 7.64 m/s	7.18 - 7.30 m/s	Yes
Peak D Plane Rotation	66 - 82 °	68.2 °	Yes
Rotation Decay Time To 0° From Peak Angle	58 - 67 °	62.4 °	Yes
Peak Moment About Occipital Condyles	73.0 - 88.0 N·m	81.9 N·m	Yes
Moment Decay Time To 0 N·m From Peak Moment	49 - 64 ms	56.8 ms	Yes
Time Between Peak Rotation and Peak Moment	2 - 16 ms	11.1 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



05.10.2004 16:14:32 519

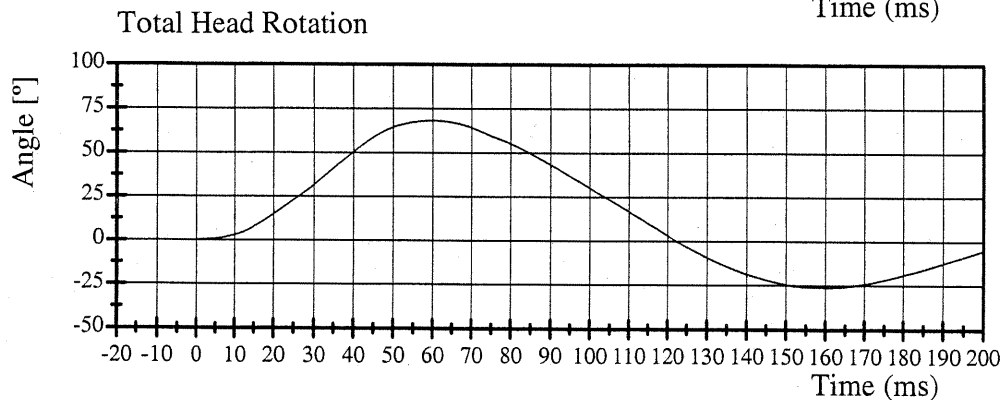
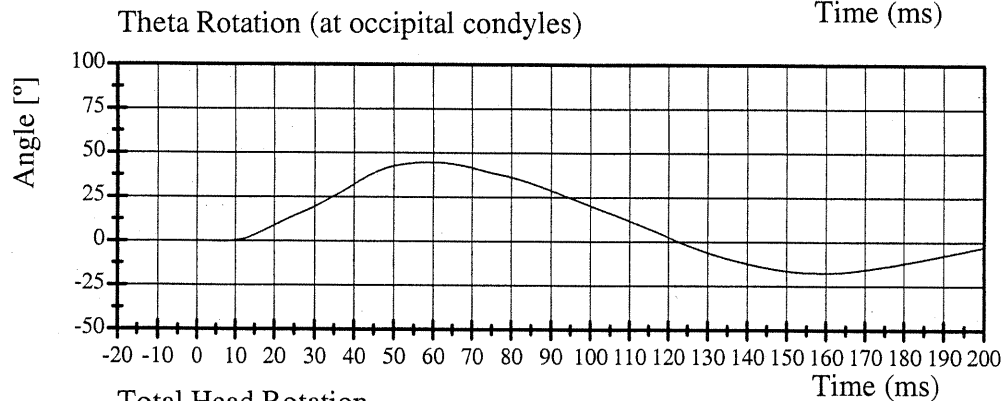
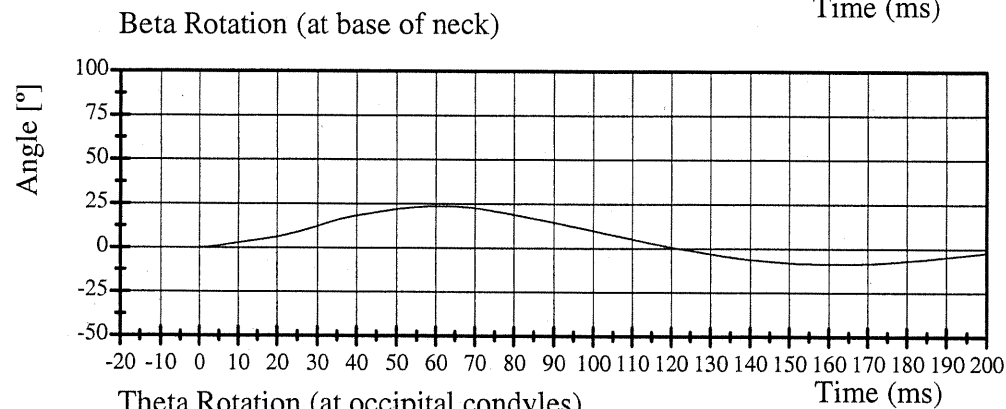
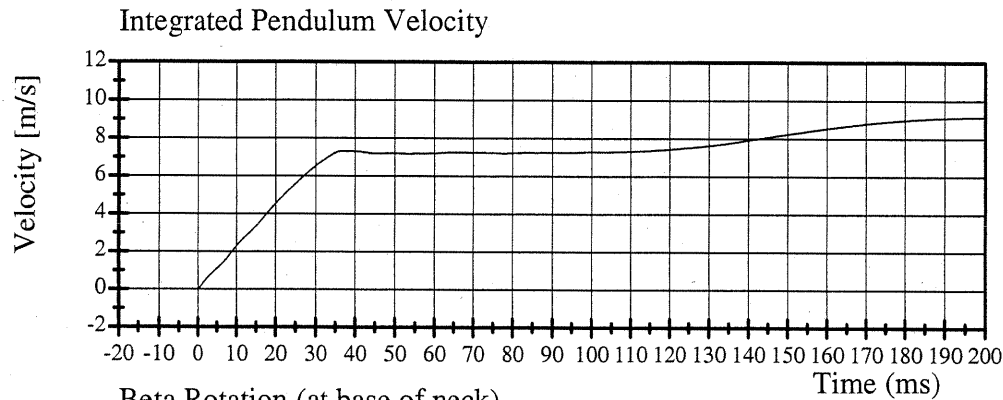


Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/10/2004



05.10.2004 16:14:33 519

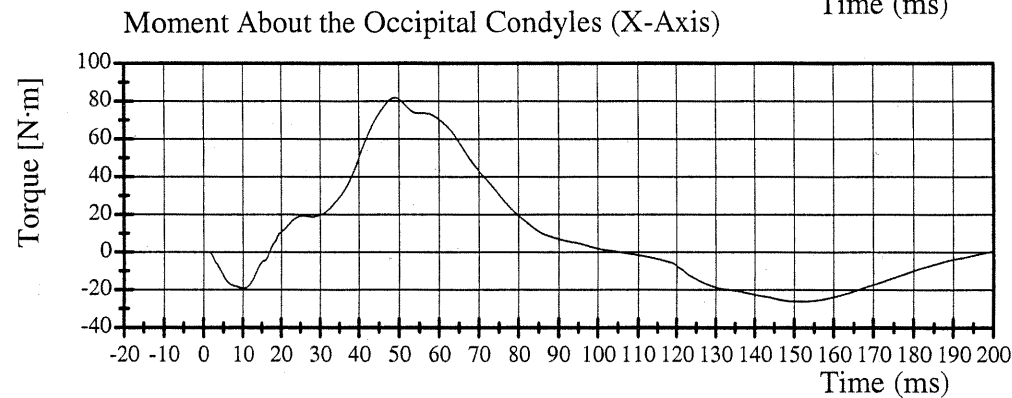
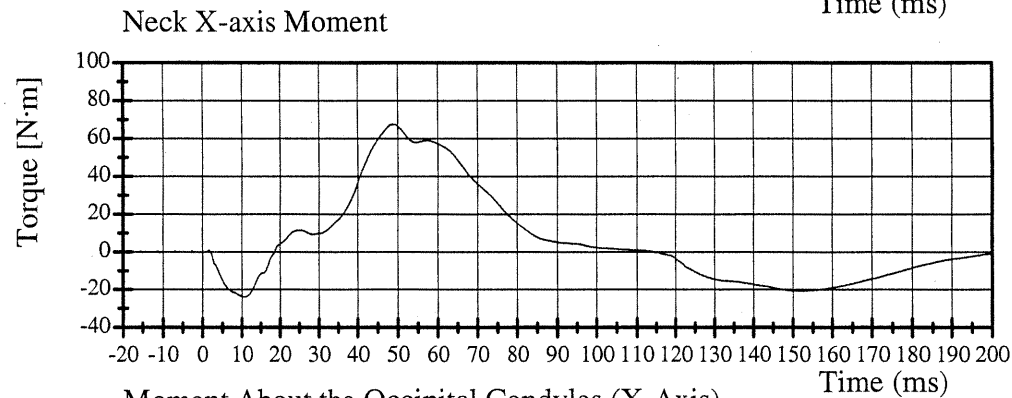
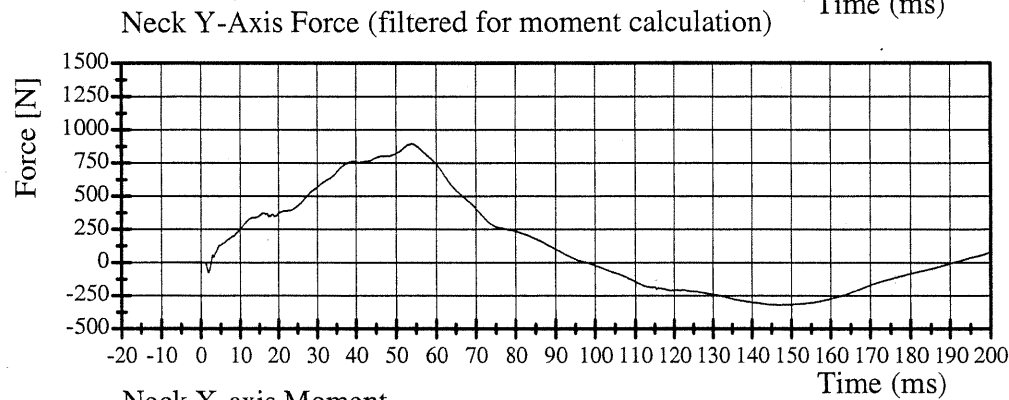
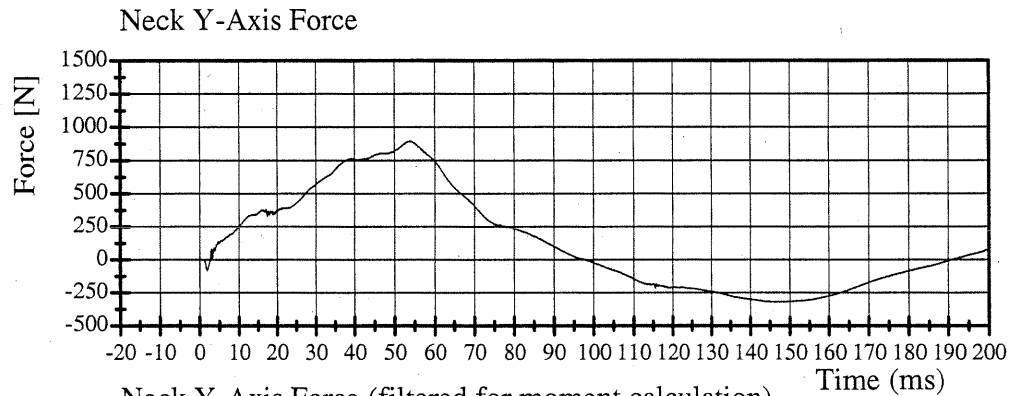


Transportation Research Center Inc.

572M Left Lateral Neck Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/10/2004



Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/12/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	21.2 C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.28 m/sec	Yes
Upper Rib Bar Peak Acceleration	37 - 46 g	45.8 g	Yes
Lower Rib Bar Peak Acceleration	37 - 46 g	44.6 g	Yes
Lower Thoracic Spine (T12) Peak Acceleration	15 - 22 g	19.9 g	Yes

Test meets specifications.

Comments:

Technician

Vincent D. Smith

Approved

V. F. Walton

05.12.2004 11:09:45 1177



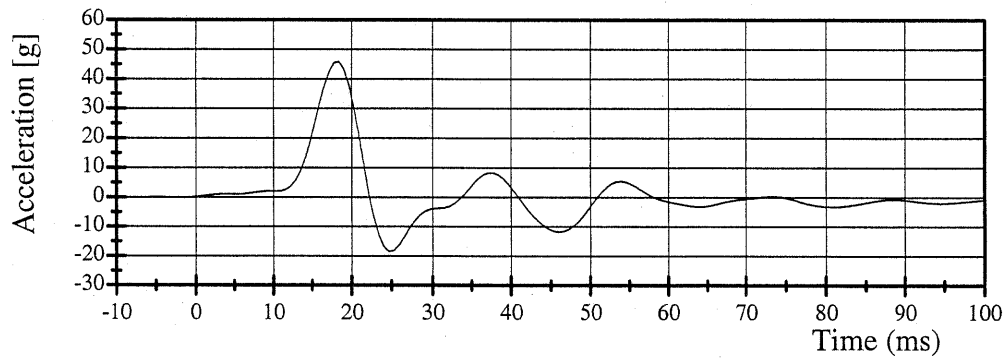
Transportation Research Center Inc.

572F Left Thorax Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/12/2004

Upper Rib Bar Acceleration

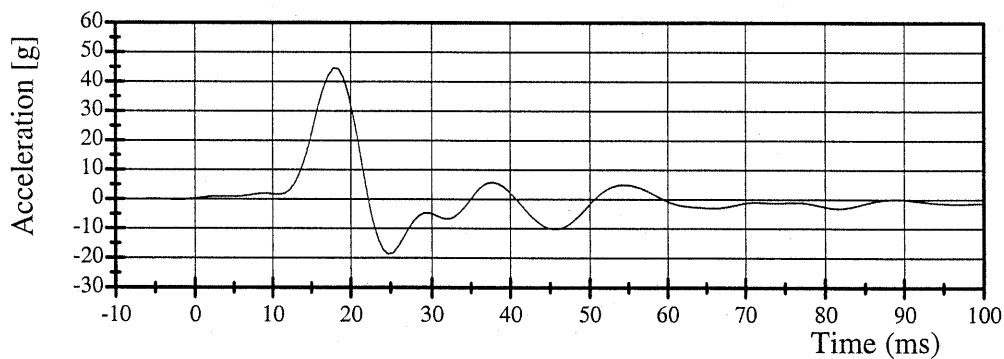


Filter Class: FIR 100

Max: 45.8 g at 18.4 ms

Min: -18.4 g at 24.7 ms

Lower Rib Bar Acceleration

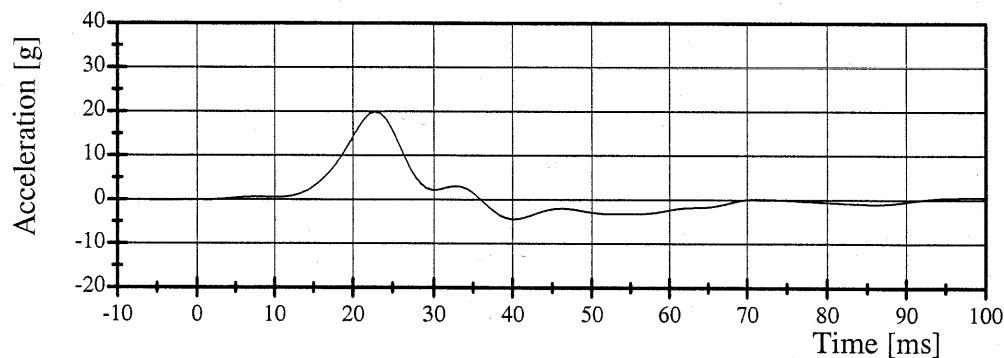


Filter Class: FIR 100

Max: 44.6 g at 17.8 ms

Min: -18.7 g at 24.7 ms

Lower Thoracic Spine (T12) Acceleration



Filter Class: FIR 100

Max: 19.9 g at 22.8 ms

Min: -4.4 g at 40.3 ms

05.12.2004 11:09:46 1177



Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/11/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	20.7 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.7 - 7.9 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Vincent Oliveri

Approved

V. F. Walter

05.11.2004 09:17:44 2024

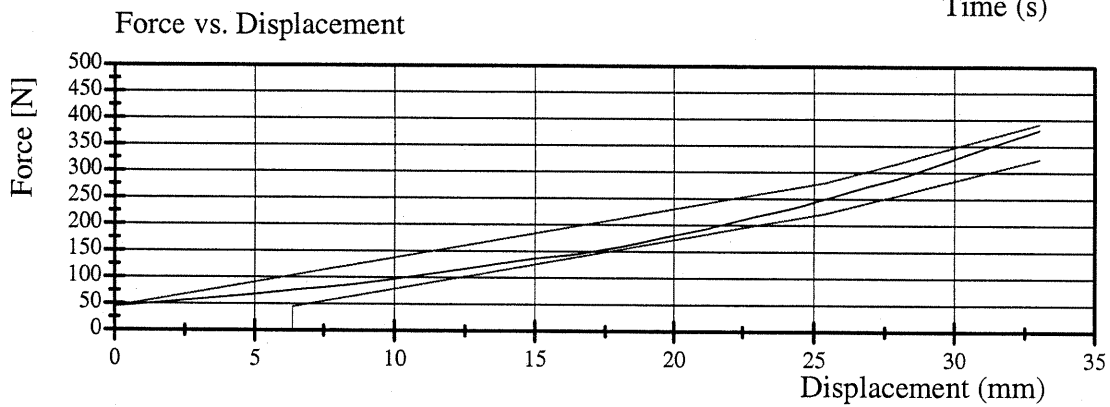
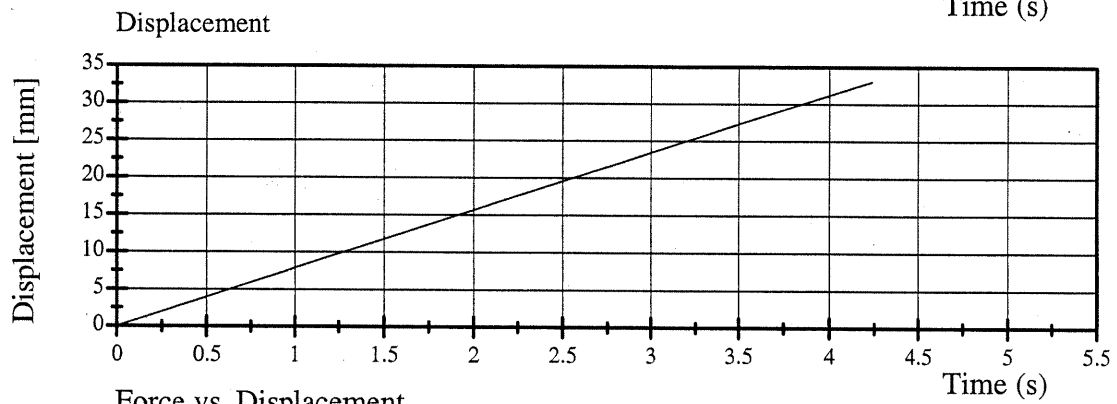
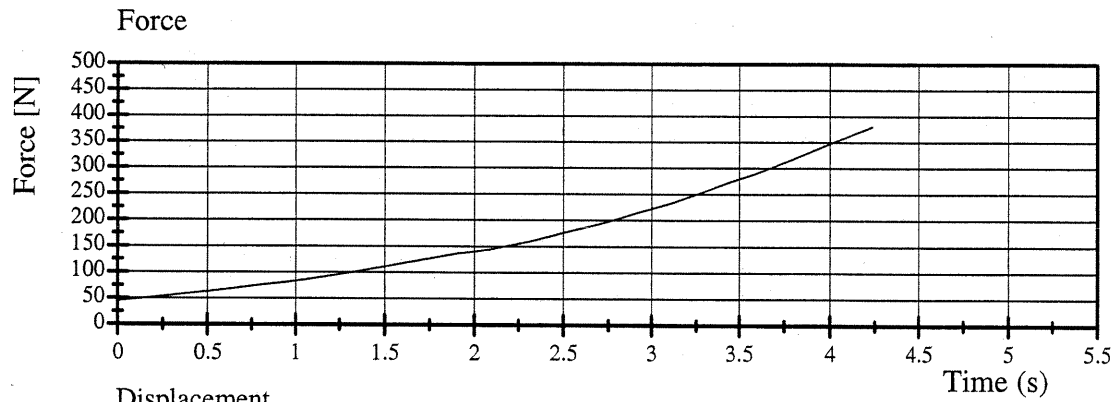


Transportation Research Center Inc.

572B Abdomen Compression Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/11/2004



05.11.2004 09:17:45 2024



TRANSPORTATION RESEARCH CENTER INC.

PART 572B LUMBAR FLEXION TEST

SID/HIII

CAL DATE: 11-May-04

TRC, INC. TEST NO: 055C14TF2 572M SN 055 TORSO FLEX CAL 14

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.4 °C
RELATIVE HUMIDITY	10 – 70 %	50 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	100.0 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	166.8 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	215.7 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	10 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Vincent Oliver

Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/12/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 C	20.9 C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Pendulum Velocity	4.27 - 4.33 m/sec	4.31 m/sec	Yes
Pelvis Peak Acceleration	40 - 60 g	45.9 g	Yes
Time Above 20 g	3 - 7 ms	6.08 ms	Yes
Unimodal requirement for pelvis acceleration	Yes	Yes	Yes

Comments:

Technician

Vincent D. Quinn

Approved

V. F. Walter

05.12.2004 10:48:33 1148

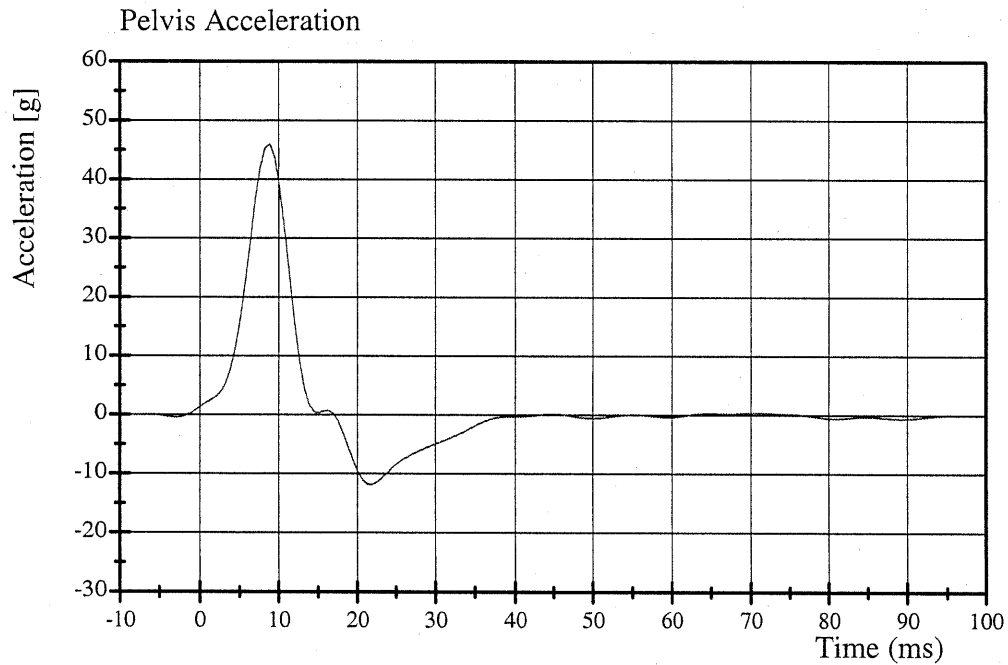


Transportation Research Center Inc.

572F Left Pelvis Test

SID HIII Serial No. 055 Calibration No. 14 - 1

Test Date 05/12/2004



Filter Class: FIR 100

Max: 45.9 g at 8.9 ms

Min: -11.8 g at 21.9 ms

05.12.2004 10:48:33 1148



Type: SID HIII S/N: 059 Mfr: ASTC Test Date: 04/29/04Proj./Seg. No.: 20020455-2080 Test Eng.: John Shultz

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left) N/A	(Right)
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX: Left side configuration		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (30 ft/lbs)	X	
Breakaway Femur Bolts	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge Date: 04/28/04

Type: SID HIII S/N: 055 Mfr: ASTC Test Date: 04/29/04Proj./Seg. No.: 20020455-2080 Test Eng.: John Shultz

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left) N/A	(Right)
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX: Left side configuration		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (30 ft/lbs)	X	
Breakaway Femur Bolts	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge Date: 04/28/04

Type: SID HIII S/N: 059 Mfr: ASTC Test Date: 04/29/04Proj./Seg. No.: 20020455-2080 Test Eng.: John Shultz

ITEM	POST-USE
HEAD:	
Head Skin Condition	*
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX: Left side configuration	
Jacket Condition	X
Arm Foam Condition	X
Damper and Chest Pot Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: * Head skin slipping off back of skull. Re-installed correctly.No other damage.Inspection Completed By: J. ClarridgeDate: 05/07/04

Transportation Research Center Inc.

SID HIII Post-Use Inspection

Type: SID HIII S/N: 055 Mfr: ASTC Test Date: 04/29/04

Proj./Seg. No.: 20020455-2080 Test Eng.: John Shultz

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX: Left side configuration	
Jacket Condition	X
Arm Foam Condition	X
Damper and Chest Pot Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: No damage to report

Inspection Completed By: J.Clarridge

Date: 05/07/04

Appendix D

Test Equipment List and Calibration Information

Sign Convention
SAE J211 MAR95

Accelerometers:

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

Potentiometers:

+Chest longitudinal deflection: Outward
+Chest lateral deflection: Rightward
+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	600
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

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

4/29/2004 7:31:35 AM

Name of Test 040429-1

System MINIDAU

Name of DAU DAU6

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
6001	EVENT	EVENT	EVENT		5.12	V	+ 4/19/2004	OK -1	TRC	Event
6002	P28598	BCGXG1	MDB CG X	FWD	597.57236	g	+ 1/12/2004	OK -1	Endevco	7264C-2K-2-180
6003	P28084	BCGYG1	MDB CG Y	LT	604.98641	g	- 12/26/2003	OK -1	Endevco	7264C-2K-2-180
6004	P29633	BCGZG1	MDB CG Z	UP	606.06060	g	- 12/22/2003	OK -1	Endevco	7264C-2K-2-180
6005	P33751	BSRXG1	MDB LT RR X	FWD	598.26363	g	+ 3/31/2004	OK -1	Endevco	7264C-2K-2-180
6006	P28888	BSRYG1	MDB LT RR Y	RT	603.93738	g	+ 2/6/2004	OK -1	Endevco	7264C-2K-2-180

Channel Report

4/29/2004 7:31:35 AM

Name of Test 040429-1

System MINIDAU

Name of DAU DAU7

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
7001	P33618	HEDXG1	Head Accel X	Rwd	804.42433	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7002	P34287	HEDYG1	Head Accel Y	Lft	792.87650	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7003	P33714	HEDZG1	Head Accel Z	Up	808.08080	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7004	P33531	HEDXR1	Head Accel X Red	Rwd	790.48942	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7005	P34005	HEDYR1	Head Accel Y Red	Lt	791.58936	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7006	P34369	HEDZR1	Head Accel Z Red	Up	799.75007	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7007	1716A-1535-FX	NEKXF1	Neck Force X	Hd	8893.9844	N	- 3/18/2004	OK 059n	Denton	1716A
7008	1716A-1535-FY	NEKYF1	Neck Force Y	Hd	8882.9669	N	+ 3/18/2004	OK 059n	Denton	1716A
7009	1716A-1535-FZ	NEKZF1	Neck Force Z	Hd	13362.563	N	+ 3/18/2004	OK 059n	Denton	1716A
7010	1716A-1535-MX	NEKXM1	Neck Moment X	Rt Ear	282.91216	N-m	- 3/18/2004	OK 059n	Denton	1716A
7011	1716A-1535-MY	NEKYM1	Neck Moment Y	Chn	282.46178	N-m	+ 3/18/2004	OK 059n	Denton	1716A
7012	1716A-1535-MZ	NEKZM1	Neck Moment Z	Chn	282.58715	N-m	+ 3/18/2004	OK 059n	Denton	1716A
7013	P34250	LURYG1	Left Upper Rib Y	Rgt	789.79437	g	+ 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7014	P34017	LURYR1	Left Upper Rib Red Y	Rgt	808.20836	g	+ 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7015	P34139	LLRYG1	Left Lower Rib Y	Rgt	797.20976	g	+ 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7016	P33860	LLRYR1	Left Lower Rib Red Y	Rgt	795.03105	g	+ 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7017	P32979	T12YG1	Lower Spine Y	Lft	397.92333	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7018	P34070	T12YR1	Lower Spine Red Y	Lft	399.87503	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7019	P33508	PEVYG1	Pelvis Accel Y	Lft	401.29480	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7021	P33577	PEVYR1	Pelvis Accel Red Y	Lft	399.46945	g	- 4/19/2004	OK 059n	Endevco	7264C-2K-2-180
7022	P34237	HEDXG4	Head Accel X	Rwd	792.12822	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
7023	P33552	HEDYG4	Head Accel Y	Lft	788.37152	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
7024	P33591	HEDZG4	Head Accel Z	Up	803.61627	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
7025	P34007	HEDXR4	Head Accel X Red	Rwd	806.82015	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
7026	P33556	HEDYR4	Head Accel Y Red	Lt	798.25381	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
7027	P34297	HEDZR4	Head Accel Z Red	Up	804.72777	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
7028	1716-0534-FX	NEKXF4	Neck Force X	Hd	8896.4261	N	- 3/24/2004	OK 055n	Denton	1716
7029	1716-0534-FY	NEKYF4	Neck Force Y	Hd	8908.3759	N	+ 3/24/2004	OK 055n	Denton	1716
7030	1716-0534-FZ	NEKZF4	Neck Force Z	Hd	13360.158	N	+ 3/24/2004	OK 055n	Denton	1716
7031	1716-0534-MX	NEKXM4	Neck Moment X	Rt Ear	282.43632	N-m	- 3/24/2004	OK 055n	Denton	1716
7032	1716-0534-MY	NEKYM4	Neck Moment Y	Chn	282.85920	N-m	+ 3/24/2004	OK 055n	Denton	1716

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040429-1

Channel Report

4/29/2004 7:31:36 AM

Name of Test 040429-1

System MINIDAU

Name of DAU DAU8

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
8001	1716-0534-MZ	NEKZM4	Neck Moment Z	Chn	283.13729	N-m	+ 3/24/2004	OK 055n	Denton	1716
8002	P34348	LURYG4	Left Upper Rib Y	Rgt	802.50783	g	+ 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8003	P31875	LURYR4	Left Upper Rib Red Y	Rgt	788.83308	g	+ 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8004	P34029	LLRYG4	Left Lower Rib Y	Rgt	801.75383	g	+ 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8005	P33541	LLRYR4	Left Lower Rib Red Y	Rgt	810.04967	g	+ 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8006	P34275	T12YG4	Lower Spine Y	Lft	398.18638	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8007	P33847	T12YR4	Lower Spine Red Y	Lft	401.24762	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8008	P34025	PEVYG4	Pelvis Accel Y	Lft	401.78291	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8009	P33878	PEVYR4	Pelvis Accel Red Y	Lft	400.44737	g	- 4/19/2004	OK 055n	Endevco	7264C-2K-2-180
8010	P33107	RFSXG1	RGT SIDE SILL FRNT ST X	FWD	396.41983	g	+ 2/27/2004	OK -1	Endevco	7264C-2K-2-180
8011	P29875	RFSYG1	RGT SIDE SILL FRNT ST Y	LT	987.88299	g	- 12/22/2003	OK -1	Endevco	7264C-2K-2-180
8012	P27961	RFSZG1	RGT SIDE SILL FRNT ST Z	UP	397.59270	g	- 2/6/2004	OK -1	Endevco	7264C-2K-2-180
8013	P33608	RRSXG1	RGT SIDE SILL RR ST X	FWD	402.56319	g	+ 3/31/2004	OK -1	Endevco	7264C-2K-2-180
8014	P33092	RRSYG1	RGT SIDE SILL RR ST Y	LT	1020.9779	g	- 2/27/2004	OK -1	Endevco	7264C-2K-2-180
8015	P24594	RRSZG1	RGT SIDE SILL RR ST Z	UP	402.17741	g	- 1/16/2004	OK -1	Endevco	7264C-2K-2-180
8016	P29727	RDKXG1	RR FLRPAN ABV AXLE X	FWD	1014.8662	g	+ 1/23/2004	OK -1	Endevco	7264C-2K-2-180
8017	P28894	RDKYG1	RR FLRPAN ABV AXLE Y	LT	1000.0390	g	- 2/11/2004	OK -1	Endevco	7264C-2K-2-180
8018	P28891	RDKZG1	RR FLRPAN ABV AXLE Z	UP	974.23602	g	- 2/11/2004	OK -1	Endevco	7264C-2K-2-180
8019	P28320	LRSYG1	LFT SIDE SILL RR ST Y	RT	981.08724	g	+ 4/8/2004	OK -1	Endevco	7264C-2K-2-180
8020	P23186	LFSYG1	LFT SIDE SILL FRNT ST Y	RT	985.22167	g	+ 4/8/2004	OK -1	Endevco	7264C-2K-2-180
8021	P33703	RRTYG1	RGT RR OCP COMP Y	LT	1545.1472	g	- 3/16/2004	OK -1	Endevco	7264C-2K-2-180
8022	P28599	LLBYG1	LFT LOWER B-POST Y	RT	1508.9890	g	+ 2/4/2004	OK -1	Endevco	7264C-2K-2-180
8023	P33131	LUBYG1	LFT MID B-POST Y	RT	1523.5374	g	+ 2/27/2004	OK -1	Endevco	7264C-2K-2-180
8024	P33837	LLAYG1	LFT LOWER A-POST Y	LT	1532.0167	g	- 3/31/2004	OK -1	Endevco	7264C-2K-2-180
8025	P33839	LUAYG1	LFT MID A-POST Y	LT	1459.8956	g	- 3/31/2004	OK -1	Endevco	7264C-2K-2-180
8026	P28926	LFTYG1	LFT FRNT ST TRK Y	RT	1531.4668	g	+ 1/6/2004	OK -1	Endevco	7264C-2K-2-180
8027	P23483	LRTYG1	LFT RR ST TR Y	RT	1522.4501	g	+ 4/8/2004	OK -1	Endevco	7264C-2K-2-180
8028	P33009	VCGXG1	VEH C/G X	FWD	983.19731	g	+ 2/27/2004	OK -1	Endevco	7264C-2K-2-180
8029	P33825	VCGYG1	VEH C/G Y	LT	997.58397	g	- 3/31/2004	OK -1	Endevco	7264C-2K-2-180
8030	P29807	VCGZG1	VEH C/G Z	UP	1005.8148	g	- 2/20/2004	OK -1	Endevco	7264C-2K-2-180

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040429-1

Digital and System Channel Report

2004-04-29 09:57:17

Name of Test		040429-1	System	MINIDAU	Name of DAU	DAU7	descriptio
enable	Channel	Short Name	Type		Data File	Module Type	
Yes	7501	DIG7	dig0		DAT77501	KM3710 Controller	

bit position	bit	short	long	descriptio
MSB = bit 15	0			
bit 14	1	PEVET1	DRIV. PELVIS CONTACT SWITCH	D
bit 13	1	SHLET4	PASS. SHOULDER CONTACT SWITCH	C
bit 12	1	PEVET4	PASS. PELVIS CONTACT SWITCH	B
bit 11	0			
bit 10	0			
bit 09	0			
bit 08	0			
bit 07	0			
bit 06	0			
bit 05	0			
bit 04	0			
bit 03	0			
bit 02	0			
bit 01	0			
LSB = bit 00	0			

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040429-1

Dummy 059n Type SID/H3 Descriptio NHTSA - 059n SID-LEFT IMP. CONFIG. w/RED ACCELS ICAL'd 3-18-04(DKS)

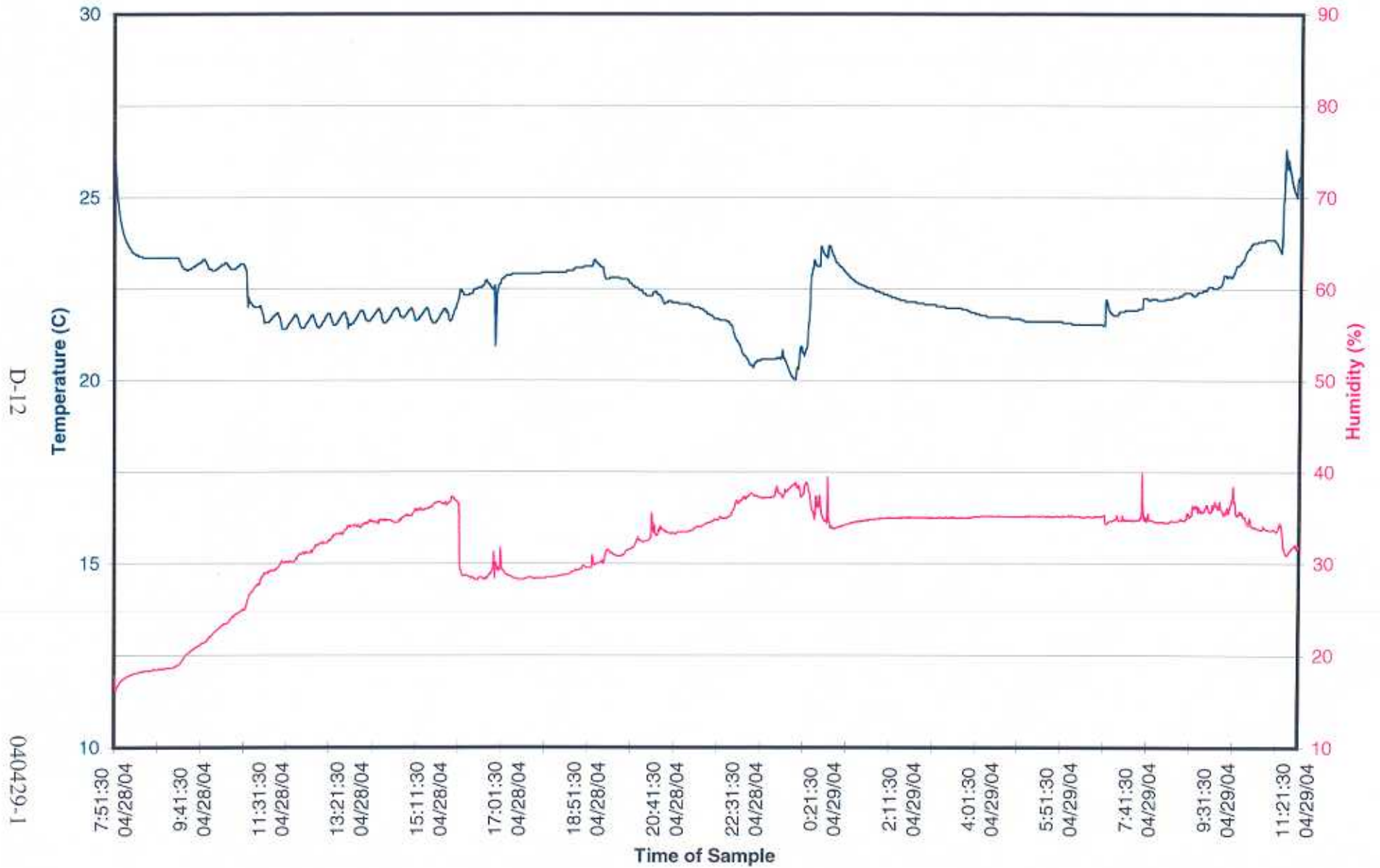
Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip
HEDXG	Head Accel X	7264C-2K-2-18	P33618	Endevco	0.01872 g	2000	4/19/2004	Rwd	1
HEDYG	Head Accel Y	7264C-2K-2-18	P34287	Endevco	0.01845 g	2000	4/19/2004	Lft	1
HEDZG	Head Accel Z	7264C-2K-2-18	P33714	Endevco	0.0192 g	2000	4/19/2004	Up	1
HEDXR	Head Accel X Red	7264C-2K-2-18	P33531	Endevco	0.01905 g	2000	4/19/2004	Rwd	1
HEDYR	Head Accel Y Red	7264C-2K-2-18	P34005	Endevco	0.02156 g	2000	4/19/2004	Lt	1
HEDZR	Head Accel Z Red	7264C-2K-2-18	P34369	Endevco	0.0194 g	2000	4/19/2004	Up	1
NEKXF	Neck Force X	1716A	1716A-1535-FX	Denton	0.0001857 N	8896.4	3/18/2004	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y	1716A	1716A-1535-FY	Denton	0.0001824 N	8896.4	3/18/2004	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z	1716A	1716A-1535-FZ	Denton	0.000093 N	13344.6	3/18/2004	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	1716A	1716A-1535-MX	Denton	0.0058379 N	282.5	3/18/2004	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	1716A	1716A-1535-MY	Denton	0.0056293 N	282.5	3/18/2004	Chn to Strnm	0
NEKZM	Neck Moment Z	1716A	1716A-1535-MZ	Denton	0.0081248 N	282.5	3/18/2004	Chn to Lt Shld	0
LURYG	Left Upper Rib Y	7264C-2K-2-18	P34250	Endevco	0.02401 g	2000	4/19/2004	Rgt	0
LURYR	Left Upper Rib Red Y	7264C-2K-2-18	P34017	Endevco	0.0181 g	2000	4/19/2004	Rgt	0
LLRYG	Left Lower Rib Y	7264C-2K-2-18	P34139	Endevco	0.02007 g	2000	4/19/2004	Rgt	0
LLRYR	Left Lower Rib Red Y	7264C-2K-2-18	P33860	Endevco	0.0184 g	2000	4/19/2004	Rgt	0
T12YG	Lower Spine Y	7264C-2K-2-18	P32979	Endevco	0.01693 g	2000	4/19/2004	Lft	1
T12YR	Lower Spine Red Y	7264C-2K-2-18	P34070	Endevco	0.0194 g	2000	4/19/2004	Lft	1
PEVYG	Pelvis Accel Y	7264C-2K-2-18	P33508	Endevco	0.01797 g	2000	4/19/2004	Lft	1
PEVYR	Pelvis Accel Red Y	7264C-2K-2-18	P33577	Endevco	0.01831 g	2000	4/19/2004	Lft	1

Dummy 055n Type SID/H3 Descriptio NHTSA - 055n SID-LEFT IMP. CONFIG. w/RED ACCELS ICAL'd 3-24-04(DKS)

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip
HEDXG	Head Accel X	7264C-2K-2-18	P34237	Endevco	0.02486 g	2000	4/19/2004	Rwd	1
HEDYG	Head Accel Y	7264C-2K-2-18	P33552	Endevco	0.01968 g	2000	4/19/2004	Lft	1
HEDZG	Head Accel Z	7264C-2K-2-18	P33591	Endevco	0.01991 g	2000	4/19/2004	Up	1
HEDXR	Head Accel X Red	7264C-2K-2-18	P34007	Endevco	0.01923 g	2000	4/19/2004	Rwd	1
HEDYR	Head Accel Y Red	7264C-2K-2-18	P33556	Endevco	0.02138 g	2000	4/19/2004	Lt	1
HEDZR	Head Accel Z Red	7264C-2K-2-18	P34297	Endevco	0.01928 g	2000	4/19/2004	Up	1
NEKXF	Neck Force X	1716	1716-0534-FX	Denton	0.0001912 N	8896.4	3/24/2004	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y	1716	1716-0534-FY	Denton	0.0001854 N	8896.4	3/24/2004	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z	1716	1716-0534-FZ	Denton	0.0000869 N	13344.6	3/24/2004	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	1716	1716-0534-MX	Denton	0.0059436 N	282.5	3/24/2004	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	1716	1716-0534-MY	Denton	0.0056921 N	282.5	3/24/2004	Chn to Strnm	0
NEKZM	Neck Moment Z	1716	1716-0534-MZ	Denton	0.008295 N	282.5	3/24/2004	Chn to Lt Shld	0
LURYG	Left Upper Rib Y	7264C-2K-2-18	P34348	Endevco	0.0319 g	2000	4/19/2004	Rgt	0
LURYR	Left Upper Rib Red Y	7264C-2K-2-18	P31875	Endevco	0.01909 g	2000	4/19/2004	Rgt	0
LLRYG	Left Lower Rib Y	7264C-2K-2-18	P34029	Endevco	0.0206 g	2000	4/19/2004	Rgt	0
LLRYR	Left Lower Rib Red Y	7264C-2K-2-18	P33541	Endevco	0.01859 g	2000	4/19/2004	Rgt	0
T12YG	Lower Spine Y	7264C-2K-2-18	P34275	Endevco	0.02041 g	2000	4/19/2004	Lft	1
T12YR	Lower Spine Red Y	7264C-2K-2-18	P33847	Endevco	0.02502 g	2000	4/19/2004	Lft	1
PEVYG	Pelvis Accel Y	7264C-2K-2-18	P34025	Endevco	0.01874 g	2000	4/19/2004	Lft	1
PEVYR	Pelvis Accel Red Y	7264C-2K-2-18	P33878	Endevco	0.01853 g	2000	4/19/2004	Lft	1

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FMVSS 214 LEFT SIDE IMPACT C45900 / 040429-1





SIDE IMPACTOR BARRIER CERTIFICATION

Date: March 8, 2004

To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

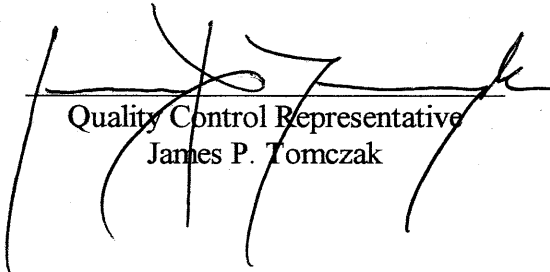
Customer P.O. Number: 028950
Work Order Number: 20290
Quantity: 01 piece

CORE INFORMATION

Core Type: PCGA-1/4-5.2-P-3003-T
Measured Cell Size: 0.250 inches
Measured Density: 5.2 pcf

Unit Number: 213B0104

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 232 – 250 psi as per DWG# DSL-1285.


Quality Control Representative
James P. Tomczak



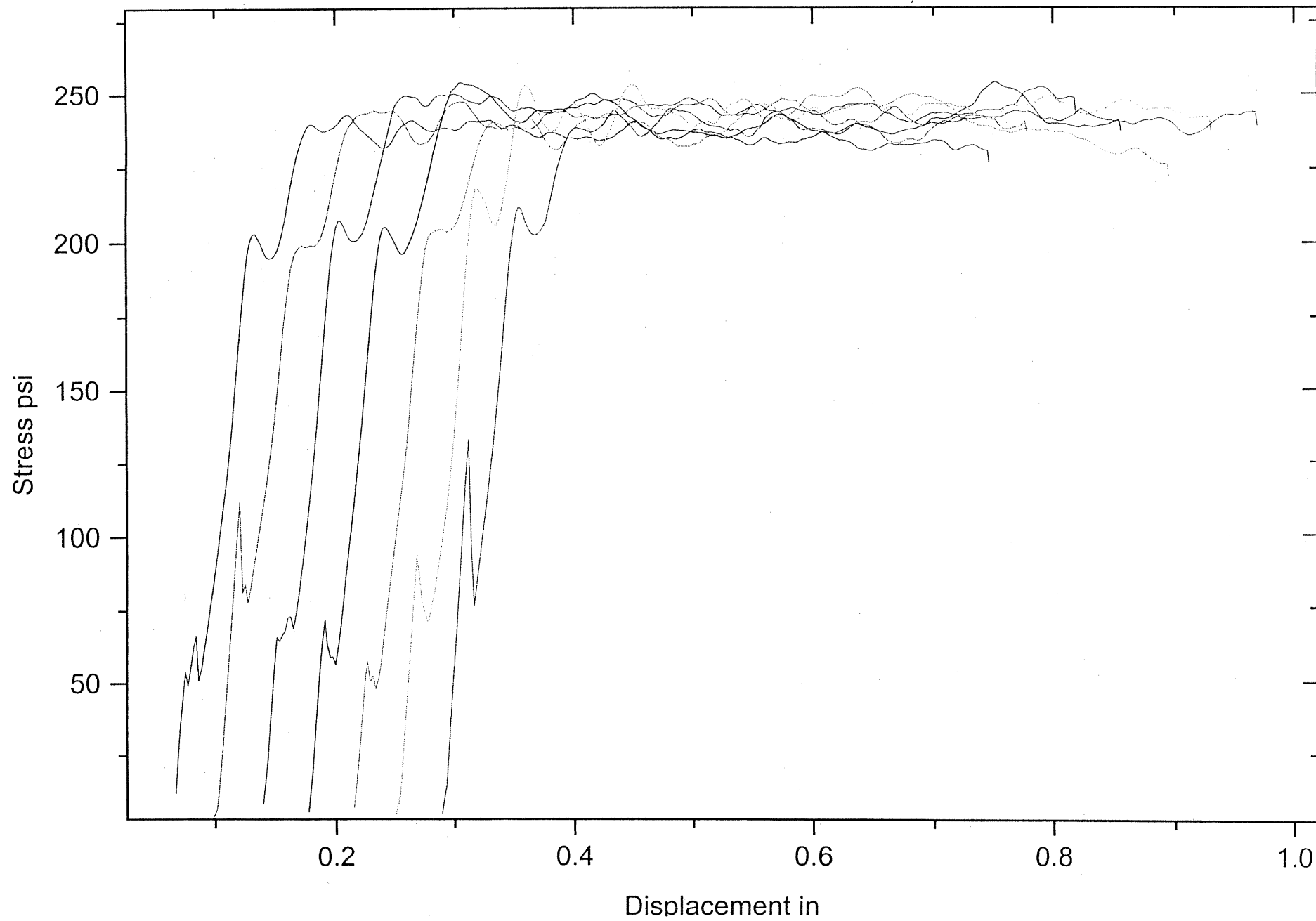


Crush Data
232 - 250 psi per DWG # DSL-1285

Block Number: 213B0104

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	236.92	235.11	233.13
2	242.49	244.93	237.02
3	246.68	244.54	243.07
4	242.76	238.21	238.94
5	240.86	246.77	237.02
6	243.37	244.81	245.95
7	239.88	241.80	241.62

BLOCK # 213B0104 Sample ID: IN229226



D-15

040429-1



SIDE IMPACTOR BARRIER CERTIFICATION

Date: March 8, 2004

To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

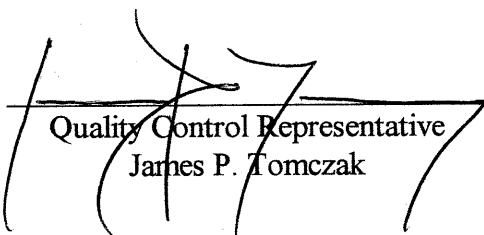
Customer P.O. Number: 028950
Work Order Number: 20290
Quantity: 01 piece

CORE INFORMATION

Core Type: PAMG-3/8-1.6-001-P-5052-T
Measured Cell Size: 0.375 inches
Measured Density: 1.6 pcf

Unit Number: 161B0204

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 45 psi +/- 2.5 psi as per DWG# DSL-1285.


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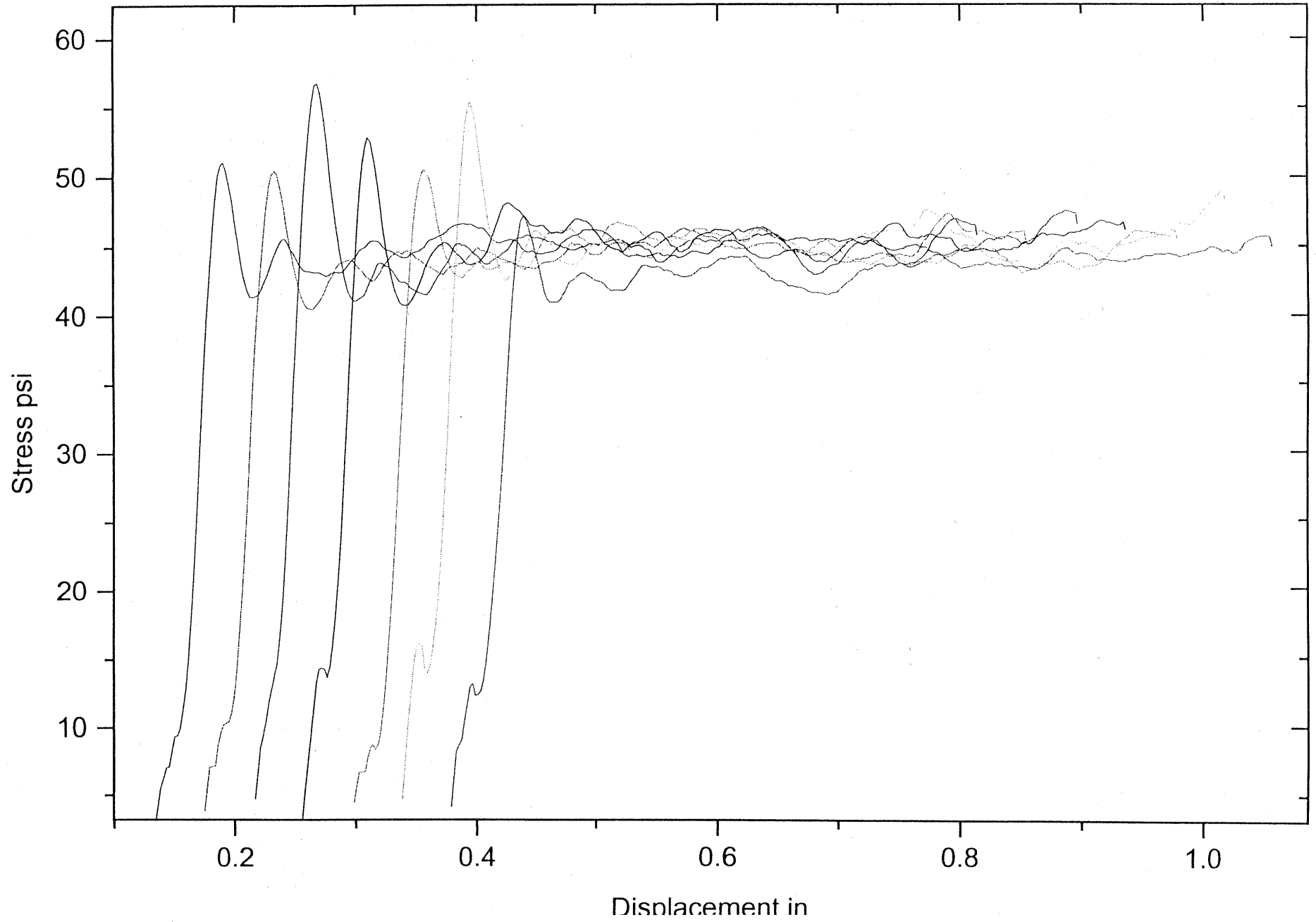


Crush Data
45 psi +/- 2.5 psi per DWG # DSL-1285

Block Number: 161B0204

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	45.29	44.57	44.70
2	44.87	44.86	45.07
3	45.01	44.89	44.85
4	45.58	45.64	44.99
5	45.55	44.25	43.56
6	44.81	45.23	46.41
7	42.81	43.89	44.27

BLOCK # 161B0204 Sample ID: IN229308



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040429-1