

**Vehicle Research and Test Center
2003 Toyota Sienna into
Fixed 40% Left Offset Deformable
Load Cell Barrier at 56.0 km/h
TRC Inc. Test Number: 030604-2**

**Prepared By:
Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319**

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**Prepared For:
Vehicle Research and Test Center
P. O. Box 37
East Liberty, OH 43319**

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Section 1.0

Purpose and Test Procedure

Purpose

This 56.0 km/h (34.8 mph) fixed 40% left offset deformable load cell barrier impact test was conducted for the National Highway Traffic Safety Administration (NHTSA) and Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc.).

The purpose of this test was to evaluate frontal crash protection in a 40% offset frontal barrier impact test. The subject vehicle was a 2003 Toyota Sienna MPV.

Test Procedure

This test was conducted in accordance with VRTC instructions for a vehicle into a fixed 40% left offset deformable load cell barrier test. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; and FMVSS 219, "Windshield Zone Intrusion", performance in an increased speed test mode using 5th percentile female anthropomorphic test devices (dummies).

The test vehicle, a 2003 Toyota Sienna MPV, was instrumented with twelve (12) accelerometers to measure longitudinal, lateral and vertical axis accelerations, and four (4) seat belt load cells. The driver's and passenger's primary airbag signals were monitored with inductive pickups. The vehicle impacted a fixed offset deformable load cell barrier. The vehicle's specified impact velocity range was 55.2 to 56.8 km/h.

The deformable barrier face was offset to the left so that the right edge of the face was 186 millimeters left of the vehicle centerline. The bottom edge of the barrier face was 200 millimeters above the floor. The offset deformable barrier was instrumented with fifty (50) load cells to measure longitudinal forces.

The test vehicle contained two (2) Part 572O small adult female Hybrid III dummies. The dummies were positioned in the front outboard designated seating positions according to FMVSS 208 (December 18, 2001). The driver dummy and the passenger dummy were both belted and were restrained with front single stage airbags.

The driver dummy was instrumented with an array of twelve (12) accelerometers in the head, plus six (6) chest, and three (3) pelvis, accelerometers to measure longitudinal, lateral, and vertical accelerations, and three (3) sternum accelerometers to measure longitudinal acceleration. The driver dummy was also instrumented with upper and lower neck moment and force load cells, lumbar moment and force load cells, left and right femur load cells to measure axial forces, and a chest deflection potentiometer.

The passenger dummy was equipped with three (3) accelerometers in the head, plus three (3) chest, and three (3) pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations. The passenger dummy was also equipped with left and right femur load cells to measure axial forces and a chest deflection potentiometer.

Both dummies were also equipped with THOR-FLX legs, which included upper and lower tibia load cells to measure forces and moments, tibia accelerometers in two axes, foot accelerometers in three axes, a tibia to femur displacement potentiometer at each knee, and three (3) rotary potentiometers at each ankle to measure foot rotations about three axes.

The 206 data channels were digitally sampled and recorded at 12,500 samples per second and processed per SAE J211 March 1995.

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

The barrier test summary data are presented in Section 2.0. The summary of FMVSS 208 data are presented in Section 3.0. The occupant, camera, vehicle, and barrier measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the dummy verification data. Appendix D contains test equipment and instrumentation calibration information. Appendix E contains a copy of the INSIA Report on Structural Measurements. Appendix F contains miscellaneous manufacturer's information.

Section 2.0

Fixed 40% Left Offset Deformable Load Cell Barrier Test Summary

Test Results Summary

This fixed 40% left offset load cell barrier test was conducted by TRC Inc. on June 4, 2003.

The test vehicle, a 2003 Toyota Sienna MPV, was equipped with a 3.0-liter transverse engine, automatic transmission, power steering, power brakes and single stage front airbags. The vehicle's test weight was 1990.4 kg. The vehicle's impact speed was 56.0 km/h. The vehicle impacted 5 mm to the left of the 40% offset target line.

The driver's 36 millisecond Head Injury Criteria (HIC) was 350. The driver's 15 millisecond HIC was 304. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 28.5 g. The driver's maximum chest deflection was 25 mm. The driver's left and right femur maximum axial compressive forces were 1557 N and 542 N, respectively. The driver dummy's upper neck injury calculations were: neck tension-flexion (NTF), 0.1; neck tension-extension (NTE), 0.8; neck compression-flexion (NCF), 0.2 and neck compression-extension (NCE), 0.0. The driver dummy's peak upper neck tension force was 1919 N and peak neck compression force was 49 N.

The right front passenger's 36 millisecond HIC was 302. The passenger's 15 millisecond HIC was 202. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 31.0 g. The passenger's maximum chest deflection was 24 mm. The passenger's left and right femur maximum axial compressive forces were 3008 N and 858 N, respectively. The right front passenger's upper neck injury calculations were: NTF, 0.2; NTE, 0.2; NCF, 0.0 and NCE, 0.2. The right front passenger dummy's peak upper neck tension force was 614 N and peak neck compression force was 274 N.

There was 100.0% windshield periphery retention. There was no penetration through the windshield.

Data Acquisition Explanations

The driver's redundant Y-axis head acceleration data channel, HEDYR1, exceeded full-scale at approximately 102 milliseconds and recorded no useful data after that. The driver's redundant resultant acceleration was also affected.

The driver's left side toepan Z-axis acceleration data channel, LTPZG1, did not return to zero post-test. The driver's left side toepan resultant acceleration was also affected.

The driver's airbag event channel, DABETA, recorded no useful data throughout the test.

Table 1 Crash Test Summary

Test mode:	Fixed 40% left offset load cell barrier			
Test date:	06/04/03			
Test time:	20:50			
Ambient temperature:	21° C			
Vehicle year/make/ model/body style:	2003/Toyota/Sienna/MPV			
Vehicle test weight:	1990.4 kg			
Impact angle ¹ :	0°			
Impact velocity ² :	56.0 km/h			
Maximum static crush ³ :	510 mm			
Number of data channels:	206			
Number of cameras:	High-speed	9	Real-time	1
<u>Dummies:</u>	<u>Driver #416</u>		<u>Passenger #421</u>	
Type:	HIII-5 th Female (Part 572O)		HIII-5 th Female (Part 572O)	
Location:	Left Front		Right Front	
Restraint:	Single stage airbag, 3-point seat belt		Single stage airbag, 3-point seat belt	
<u>Seat track position for test:</u>				
Driver:	1 notch rear of full forward			
Passenger:	Full forward			
<u>Seat back position for test:</u>				
Driver:	18.8°			
Passenger:	20.1°			
<u>Head restraint position for test:</u>				
Driver:	Full down			
Passenger:	Full down			
Steering column position:	Mid			

¹ With respect to tow track centerline.

² Speed trap measurement (± .08 km/h accuracy)

³ Measured without bumper fascia.

Table 2 General Test and Vehicle Parameter Data

Vehicle year/make/ model/body style:	2003/Toyota/Sienna/MPV
VIN:	4T3ZF13C53U550957
Model year:	2003
Body style:	MPV
Color:	White
Engine data:	
Cylinders:	6
Displacement	3.0 liters
Cylinder placement:	V
Engine placement:	Transverse
Transmission data:	<u>3</u> speed, ___ manual, <u>X</u> automatic, <u>X</u> overdrive
Final drive:	<u>X</u> FWD, ___ RWD, ___ 4WD
Date vehicle received:	06/02/03
Odometer reading:	289 miles
Dealer's name and address:	Jeff Wyler Springfield, OH

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	No	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None	Power door locks	Yes

Certification data from vehicle's label:

Vehicle manufactured by:	Toyota Motor Company
Date of manufacture:	12/02
VIN:	4T3ZF13C53U550957
GVWR:	2380 kg (5250 lbs.)
GAWR: Front:	1236 kg (2725 lbs.)
Rear:	1236 kg (2725 lbs.)

Table 2 General Test and Vehicle Parameter Data, Cont'd.

Tires on vehicle (mfr., line, size): Dunlop, SP40, P205/70R15

Tire pressure with maximum capacity vehicle load:

Front: 35 psi (240 kPa)

Rear: 35 psi (240 kPa)

Spare tire (mfr., line, size): Dunlop, SP40, P205/70R15

Type of seats:

Front Bucket

Rear Bucket

Maximum width: 1860 mm

Wheelbase: 2900 mm

Location of "Recommended Tire Pressure" label:

The label was located on Driver's B-pillar.

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

Recommended tire size: P205/70R15

Recommended cold tire pressure:

Front: 35 psi (240 kPa)

Rear: 35 psi (240 kPa)

Vehicle Capacity Data:

Number of Occupants (Designated seating capacity):

Front 2

Mid 2

Rear 3

Total 7

Vehicle capacity weight: 526 kg (1160 lbs.)

Rated cargo/luggage weight¹ 50 kg (110 lbs.)

Test vehicle attitude:

Delivered attitude: LF 750 mm; RF 756 mm; LR 747 mm; RR 747 mm

Fully loaded attitude: LF 740 mm; RF 742 mm; LR 728 mm; RR 725 mm

Pre-test attitude: LF 737 mm; RF 740 mm; LR 732 mm; RR 732 mm

Post-test attitude:² LF 820 mm; RF 736 mm; LR 699 mm; RR 730 mm

¹ Calculated, not on label.

² Left front tire flattened during impact.

Table 2 General Test and Vehicle Parameter Data Cont'd

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

Right front	520.0 kg	Right rear	401.5 kg
Left front	538.5 kg	Left rear	387.0 kg
Total front weight	1058.5 kg	(57.3 % of total vehicle weight)	
Total rear weight	788.5 kg	(42.7 % of total vehicle weight)	
Total delivered weight	1847.0 kg		

Calculation of test vehicle's target test weight:

Total Delivered Weight (UDW) =	1847.0 kg
Rated Cargo/Luggage Weight (RCLW) ¹ =	50 kg
Weight of 2 Part 572O Dummies @ 49 kg each =	98.0 kg
Target test weight =	1995.0 kg

Weight of test vehicle with required dummies and 45.4 kg of cargo weight:

Right front	550.2 kg	Right rear	439.8 kg
Left front	562.6 kg	Left rear	437.8 kg
Total front weight	1112.8 kg	(55.9% of total vehicle weight)	
Total rear weight	877.6 kg	(44.1% of total vehicle weight)	
Total test weight	1990.4 kg	(0.2% under target test weight)	

Weight of ballast secured in vehicle: 11.3 kg behind passenger seat

Components removed to meet target test weight: None

Location of Vehicle's CG: 1279 mm rearward of front wheel centerline

Fuel System Data:

Usable fuel system capacity	79.5 liters (from owner's manual)
Actual test volume:	60.3 liters (93% of usable)

¹ Cargo weight for multipurpose passenger vehicles, trucks, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 136 kilograms, whichever is less.

Table 3 Post-Impact Data

Test number:	030604-2
Test date:	06/04/03
Test time:	2050
Test type:	Fixed 40% left offset deformable load cell barrier
Impact angle:	0°
Ambient temperature at impact area:	21° C
Required impact velocity range:	55.2 to 56.8 km/h

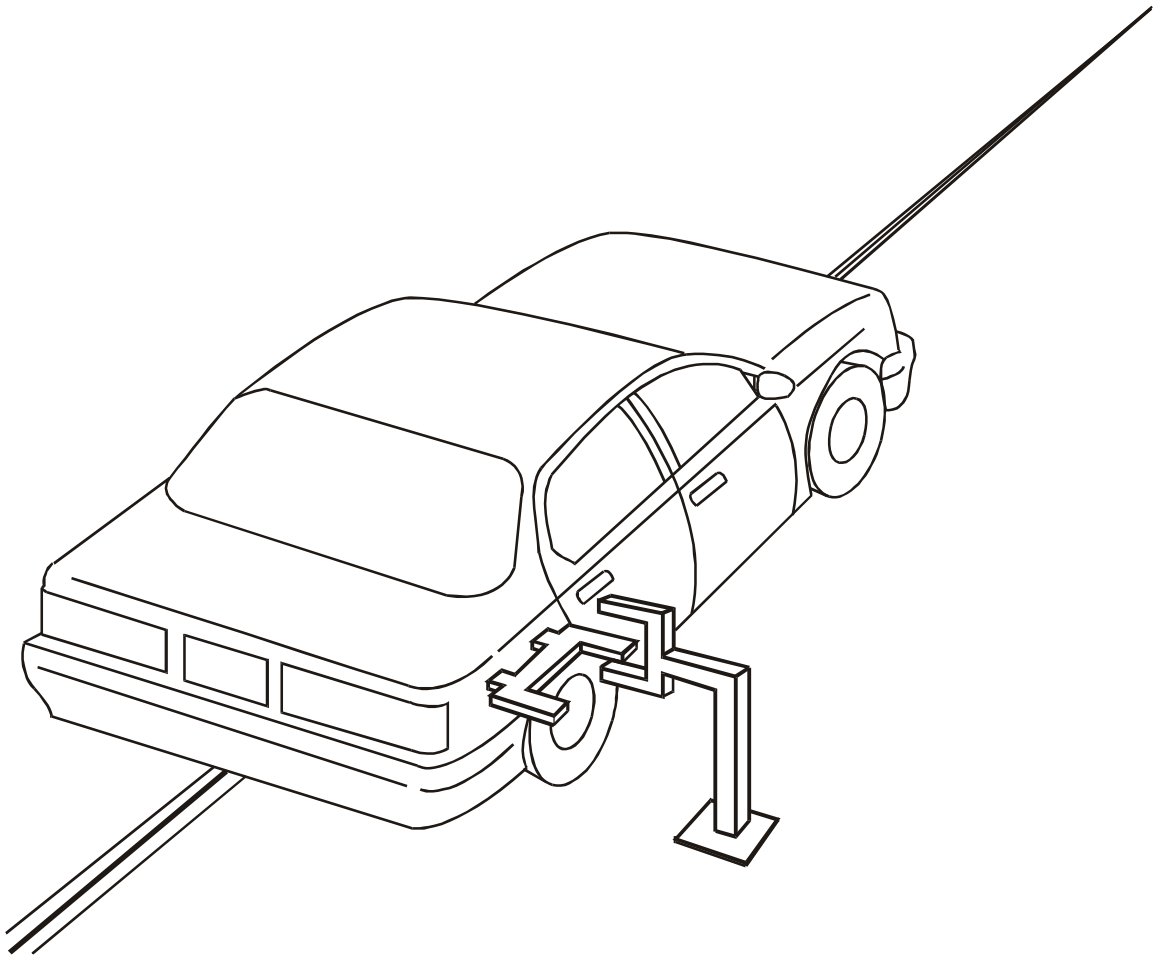
Barrier impact velocity:

Primary:	56.0 km/h
Secondary:	56.0 km/h
Distance from vehicle to barrier:	
Entering velocity trap:	661 mm
Exiting velocity trap:	51 mm

Barrier offset (at right edge of barrier):

Target offset:	186 mm left of vehicle centerline
Impact point variance:	5 mm left
Actual offset:	191 mm left of vehicle centerline

Figure 1 Impact Velocity Measurement System



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

The vanes have 610-millimeter spacing.

Figure 2 Vehicle Accelerometer Placement

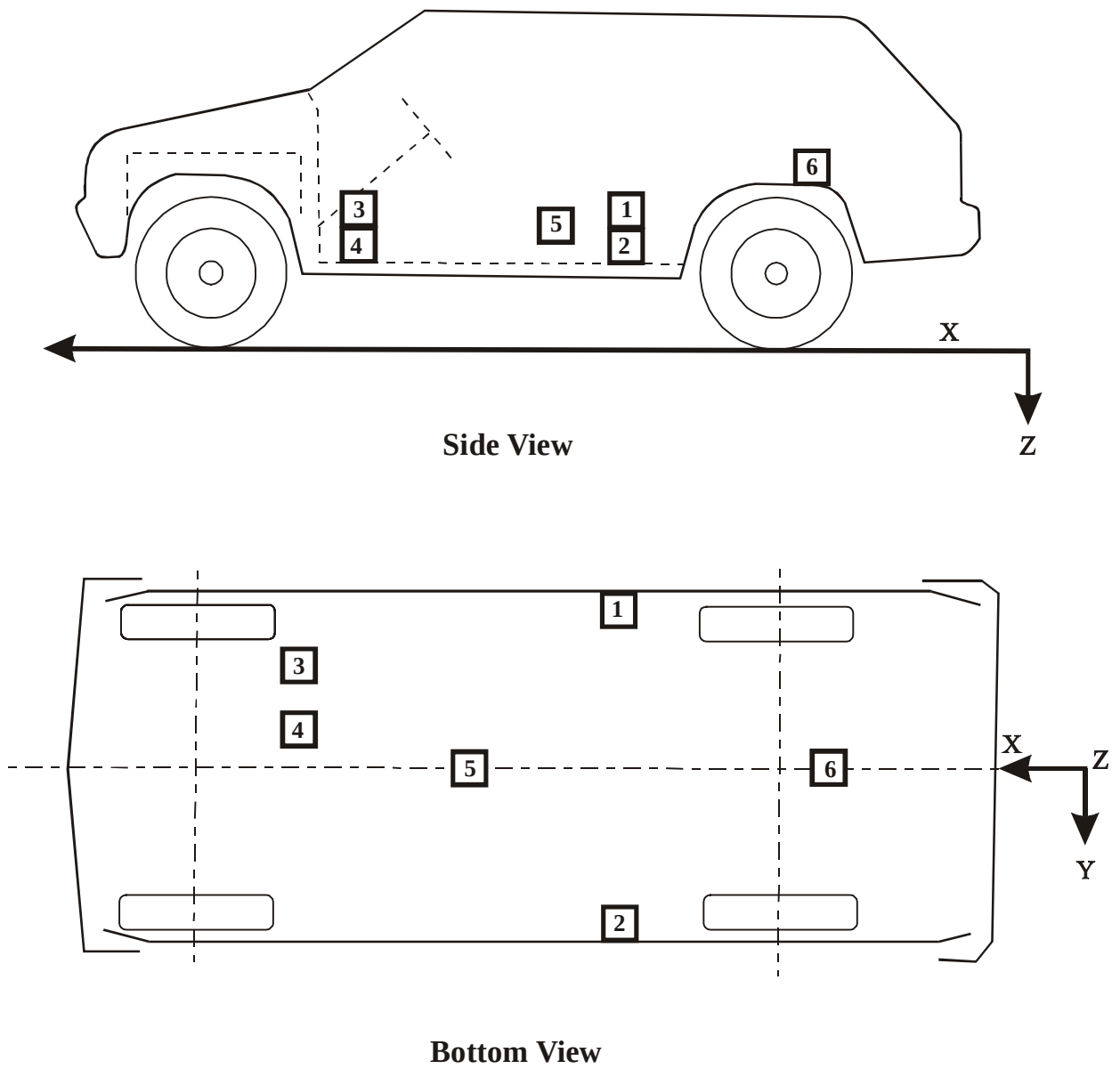


Table 4 Vehicle Accelerometer Locations and Instrumentation Data Summary

TEST NUMBER: 030604-2 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	2990 mm	0 mm	-404 mm				
LONGITUDINAL				1.7 g	@ 199.8 ms	25.1 g	@ 93.4 ms
LATERAL				8.3 g	@ 87.4 ms	4.5 g	@ 116.9 ms
VERTICAL				8.1 g	@ 105.0 ms	5.1 g	@ 61.8 ms
RESULTANT				25.7 g	@ 92.3 ms		
2 REAR DECK VERTICAL	255 mm	0 mm	-551 mm	7.8 g	@ 134.6 ms	8.7 g	@ 99.2 ms
3 LEFT REAR SEAT CROSSMEMBER	2010 mm	-710 mm	-429 mm				
LONGITUDINAL				2.4 g	@ 198.9 ms	26.2 g	@ 106.2 ms
LATERAL				8.2 g	@ 87.8 ms	0.3 g	@ 282.0 ms
VERTICAL				6.8 g	@ 144.9 ms	7.8 g	@ 127.6 ms
RESULTANT				26.3 g	@ 106.1 ms		
4 RIGHT REAR SEAT CROSSMEMBER	2000 mm	710 mm	-427 mm				
LONGITUDINAL				1.3 g	@ 205.4 ms	25.1 g	@ 96.6 ms
LATERAL				6.2 g	@ 84.8 ms	1.7 g	@ 117.7 ms
VERTICAL				3.6 g	@ 75.5 ms	6.0 g	@ 104.6 ms
RESULTANT				25.8 g	@ 92.2 ms		
5 DRIVERS LEFT SIDE TOE PAN	3545 mm	-250 mm	-363 mm				
LONGITUDINAL				1.4 g	@ 199.3 ms	28.6 g	@ 105.4 ms
LATERAL				7.7 g	@ 86.4 ms	10.5 g	@ 120.9 ms
VERTICAL ¹				9.3 g	@ 101.7 ms	31.2 g	@ 45.3 ms
RESULTANT ¹				32.2 g	@ 116.8 ms		

Table 4 Vehicle Accelerometer Locations and Instrumentation Data Summary, Cont'd.

TEST NUMBER: 030604-2 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
6 DRIVERS RIGHT	3534 mm	-455 mm	-360 mm				
SIDE TOE PAN							
LONGITUDINAL				1.3 g	@ 200.0 ms	32.3 g	@ 105.8 ms
LATERAL				8.7 g	@ 121.5 ms	10.2 g	@ 86.5 ms
VERTICAL				21.0 g	@ 100.6 ms	9.2 g	@ 106.0 ms
RESULTANT				33.6 g	@ 105.8 ms		
7 DRIVER SEAT BELT	NA	NA	NA				
LOAD CELLS							
LAP BELT				1498.6 N	@ 118.2 ms	-1.5 N	@ 0.0 ms
SHOULDER BELT				2866.1 N	@ 125.1 ms	-1.2 N	@ 0.0 ms
8 PASSENGER SEAT	NA	NA	NA				
BELT LOAD CELLS							
LAP BELT				1875.0 N	@ 105.0 ms	0.7 N	@ 2.3 ms
SHOULDER BELT				3291.4 N	@ 115.1 ms	0.4 N	@ 0.0 ms

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

¹ See DATA ACQUISITION EXPLANATIONS

Section 3.0

Summary of FMVSS 208, 212 and 219 (partial) Data

Table 5 Dummy Injury Criteria Data

<u>Maximum Acceleration¹</u>								
	Head				Chest			
	X	Y	Z	R	X	Y	Z	R
Driver	-56.4 g	-8.9 g	16.6 g	57.0 g	-29.5 g	7.3 g	-7.2 g	30.0 g
Passenger	-37.9 g	11.3 g	35.0 g	47.7 g	-29.4 g	12.4 g	7.7 g	31.6 g

<u>Maximum Femur Compressive Force</u>		
	Left Femur	Right Femur
Driver	1557 N	542 N
Passenger	3008 N	858 N

<u>Head Injury Criteria²</u>			
36 millisecond			
	HIC	Start Time t ₁	End Time t ₂
Driver	350	81.36 ms	108.24 ms
Passenger	302	100.64 ms	136.64 ms

15 millisecond			
	HIC	Start Time t ₁	End Time t ₂
Driver	304	83.68 ms	98.72 ms
Passenger	202	111.28 ms	126.32 ms

<u>Chest Maximum Resultant Acceleration³</u>			
	Acceleration	Start Time t ₁	End Time t ₂
Driver	28.5 g	87.28 ms	90.24 ms
Passenger	31.0 g	111.35 ms	114.31 ms

Table 5 Dummy Injury Criteria Data, Cont'd.

Maximum Chest Deflection

Driver	25 mm
Passenger	24 mm

Neck Injury Calculations (Nij)²

	NTF	NTE	NCF	NCE
Driver	0.11	0.79	0.17	0.02
Passenger	0.28	0.21	0.01	0.16

Upper Neck Axial Force

	Tension	Compression
Driver	1919 N	49 N
Passenger	614 N	274 N

Tibia Index

	Upper Tibia	Lower Tibia
Driver-left	0.23	0.20
Driver-right	0.52	0.52
Passenger-left	0.64	0.33
Passenger-right	0.24	0.19

¹ See Report Sign Convention in Appendix D.

² As defined in FMVSS No. 208.

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

Table 6 Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver</u>	<u>Passenger</u>
Head	Airbag, head restraint	Airbag, head restraint
Chest	Airbag	Airbag
Abdomen	Lower steering wheel	None
Left knee	Knee bolster	Glove box
Right knee	Knee bolster	Glove box

Door opening:

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

Seat movement:

	<u>Seat back failure</u>	<u>Seat shift</u>
Left Front	None	None
Right Front	None	None
Left Rear	N/A	N/A
Right Rear	N/A	N/A

Glazing damage: Small vertical crack on driver's side.

Other notable impact effects: Left front tire flattened during impact.

Figure 3 FMVSS 212 Test Data

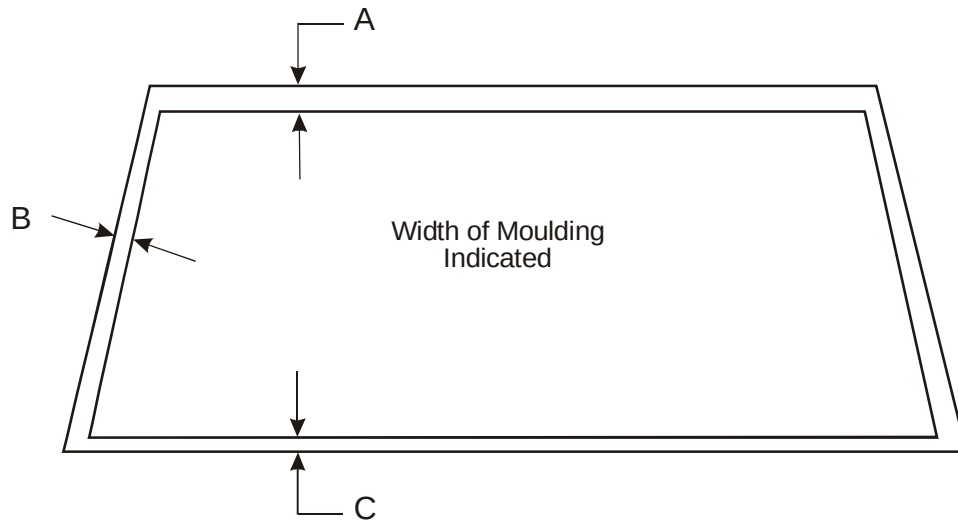
Details of windshield mounting such as retention method, trim type, etc.: Adhesive, rubber and plastic trim.

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

Windshield periphery measurements:

	<u>Pre-test</u>	<u>Post-test</u>	<u>Percent retention</u>
Right side	2270 mm	2270 mm	100.0
Left side	2270 mm	2270 mm	100.0
Total	4540 mm	4540 mm	100.0

A = 20 mm
B = 26 mm
C = 10 mm



Front view of windshield¹

Loss of windshield retention lengths: None

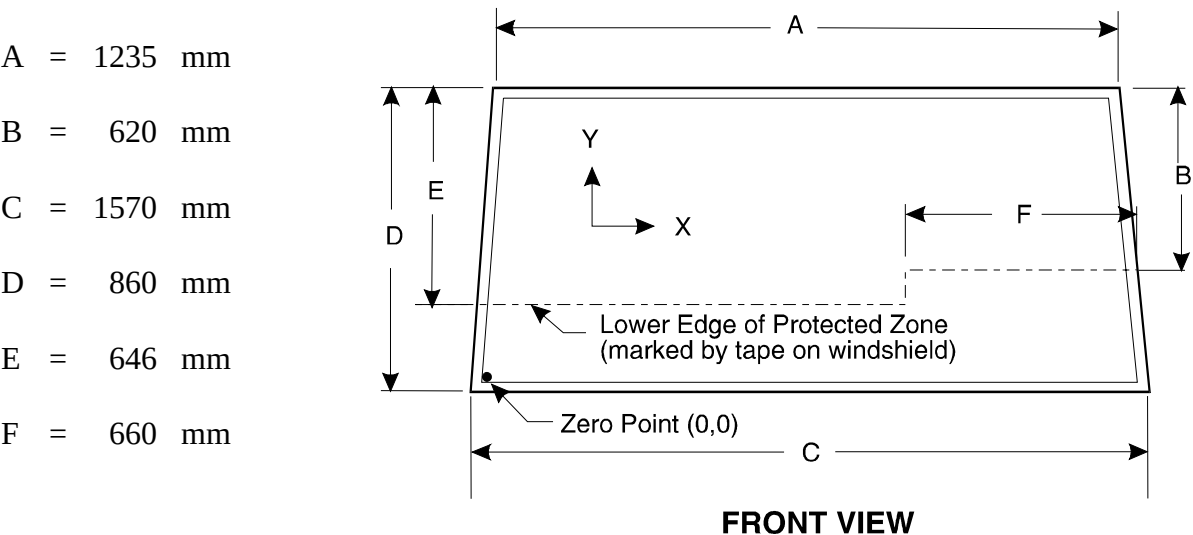
¹ Indicate areas of loss of retention, if any, on windshield diagram.

Figure 4 FMVSS 219 (partial) Test Data

Protected zone lower edge requirement:

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

Windshield measurements:



Method of adhering protected zone template to windshield:

Areas of windshield template penetration greater than 6 mm: None

	Coordinates	
	X	Y
1.	None	None
2.		
3.		

Areas of windshield penetration, below the protected zone, through the inner surface of the windshield: None

1.	None	None
2.		
3.		

Section 4.0

Occupant, Vehicle, Camera, and Barrier Information

Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest contacted the airbag and the torso contacted the lower steering wheel rim. As the head and chest contacted the airbag, the head and neck extended back and to the left and then flexed forward into the airbag. On rebound the dummy's head extended back and contacted the headrest. The dummy came to rest seated upright in the driver's seat.

Right Front Passenger Dummy

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the dashboard. The head and chest impacted the airbag. The dummy rebounded into the seat; the neck extended and the head contacted the head restraint. The dummy came to rest seated upright in the passenger seat.

Figure 5 Dummy Measurement Locations for Front Seat Occupants

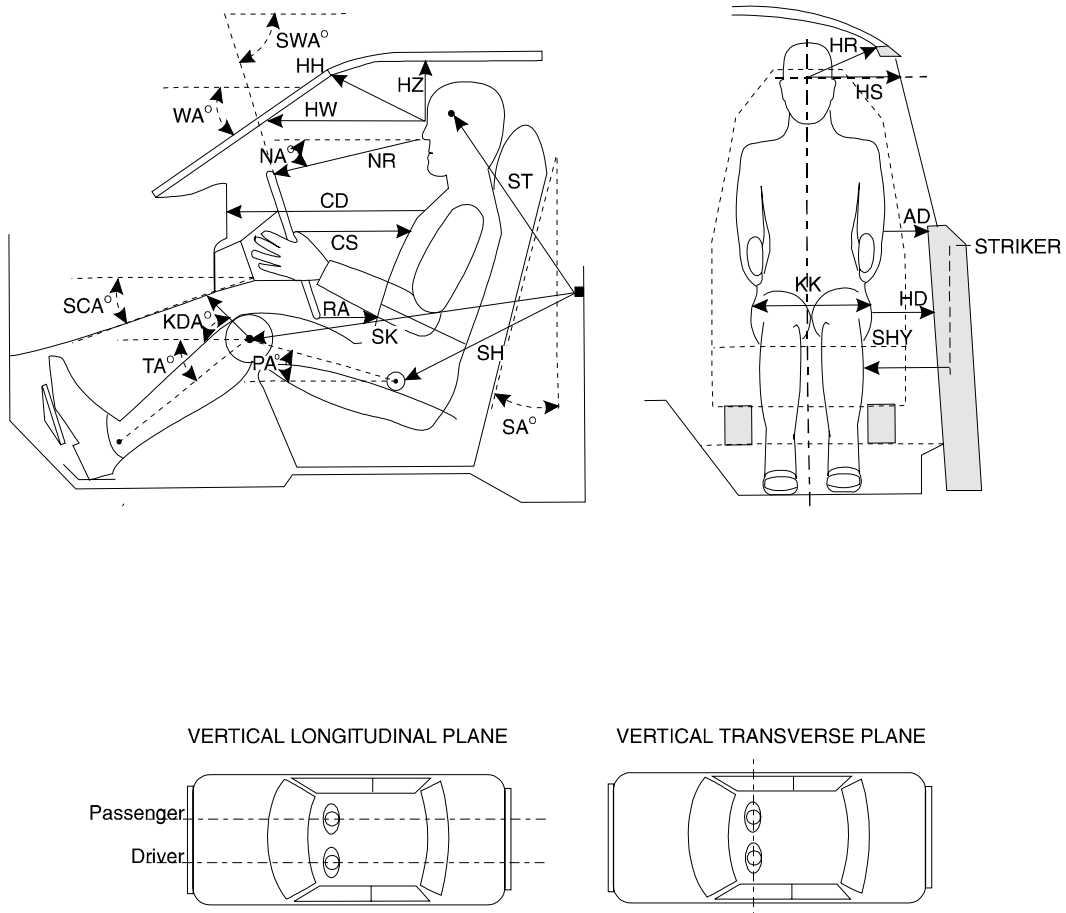


Table 7 Dummy Measurement Data For Front Seat Occupants

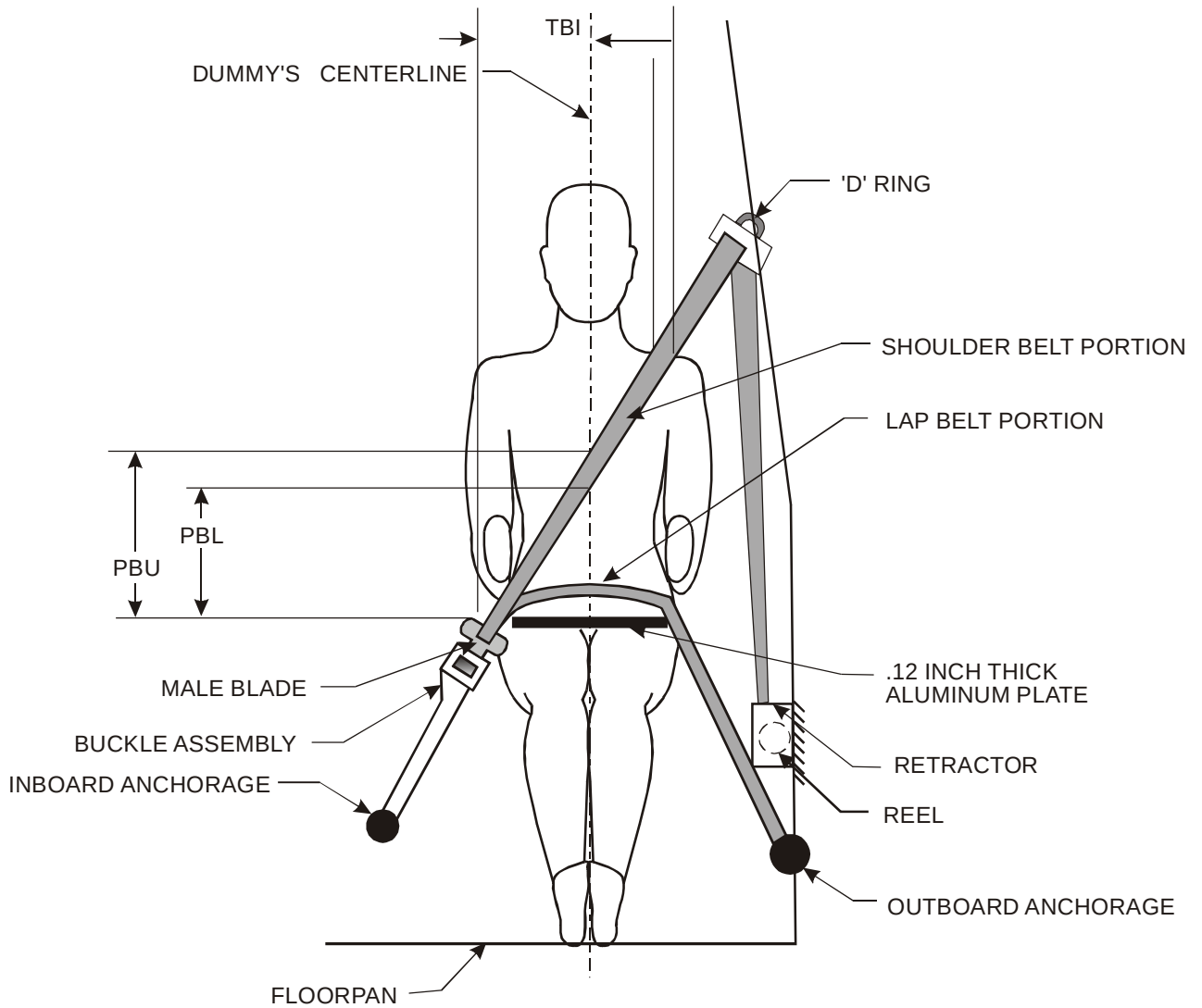
Designation	Type of Measurement	Driver (Serial # 416)	Passenger (Serial # 421)
WA	Windshield angle	28.0°	N/A
SWA	Steering wheel angle	63.2°	N/A
SCA	Steering column angle	26.8°	N/A
SA ¹	Seat back angle	18.8°	20.1°
HZ	Head to roof	265 mm	240 mm
HH	Head to header	311 mm	310 mm
HW	Head to windshield	706 mm	701 mm
HR	Head to side header	299 mm	286 mm
NR	Nose to rim	298 mm	N/A
NA	Nose to rim angle	14.6°	N/A
CD	Chest to dash	449 mm	401 mm
CS	Steering wheel to chest	219 mm	N/A
RA	Rim to abdomen	78 mm	N/A
KDL	Left knee to dash	87 mm	84 mm
KDR	Right knee to dash	94 mm	86 mm
KDA	Outboard knee to dash angle	26.1°	30.9°
PA	Pelvic angle	21.1°	20.6°
TA	Tibia angle	68.4°	57.9°
KK	Knee to knee	182 mm	165 mm
ST ²	Striker to head	556 mm	546 mm
	Striker to head angle	-57.3°	-50.0°
SK ²	Striker to knee	828 mm	846 mm
	Striker to knee angle	3.0°	6.6°
SH ²	Striker to H-point	499 mm	499 mm
	Striker to H-point angle	12.2°	16.1°
SHY	Striker to H-point (Y dir.)	272 mm	293 mm
HS	Head to side window	369 mm	350 mm
HD	H-point to door	188 mm	204 mm
AD	Arm to door	170 mm	177 mm

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

¹ Measured at head restraint.

² A negative angle indicates the measurement point was above the striker.

Figure 6 Vehicle Seat Belt Positioning Data



	Driver Dummy	Passenger Dummy
PBU - Top surface of aluminum plate to belt upper edge	281 mm	258 mm
PBL - Top surface of aluminum plate to belt lower edge	190 mm	170 mm
TBI - Dummy centerline to intersection of upper torso belt and lap belt	286 mm	255 mm

Table 8 Vehicle Structural Measurements^{1,2}

	Elements	Pre-Test
1	Total Length	4920
2	Total Width	1868
3	Bumper Top Height	522
4	Bumper Bottom Height	406
5	Longitudinal Member Top Height	645
6	Longitudinal Member Bottom Height	372
7	Distance Between Longitudinal Members	1068
7'	Longitudinal Member Width	75
8	Engine Top Height	885
9	Engine Bottom Height	200
10	Engine and Gearbox Width	910
11	Front Bumper - Engine Distance	440
12	Front Shock Absorber Fixing Height	870
13	Bonnet Leading Edge Height	781
14	Front Shock Absorber Fixing Width	1150
15	Front Bumper - Front Axle Distance	963
16	Front Axle - A Pillar Distance	440
17	A Pillar - B Pillar Distance	1136
18	B Pillar - Rear Axle Distance	1278
19	B Pillar - C Pillar Distance	1250
20	Roof Sill Bottom Height	1462
21	Roof Sill Top Height	1581
22	Floor Sill Bottom Height	222
23	Floor Sill Top Height	404

All distance measurements are in millimeters.

¹ Taken from INSIA report, “Structural Survey of Cars, Methodology of the Main Resistant Elements in the Car Body”, March 1999. This report is included in Appendix E.

² The vertical measurements from the ground are adjusted based on the test vehicle’s pre-test attitude measurements.

Figure 7 Pre-Test And Post-Test Measurement Points

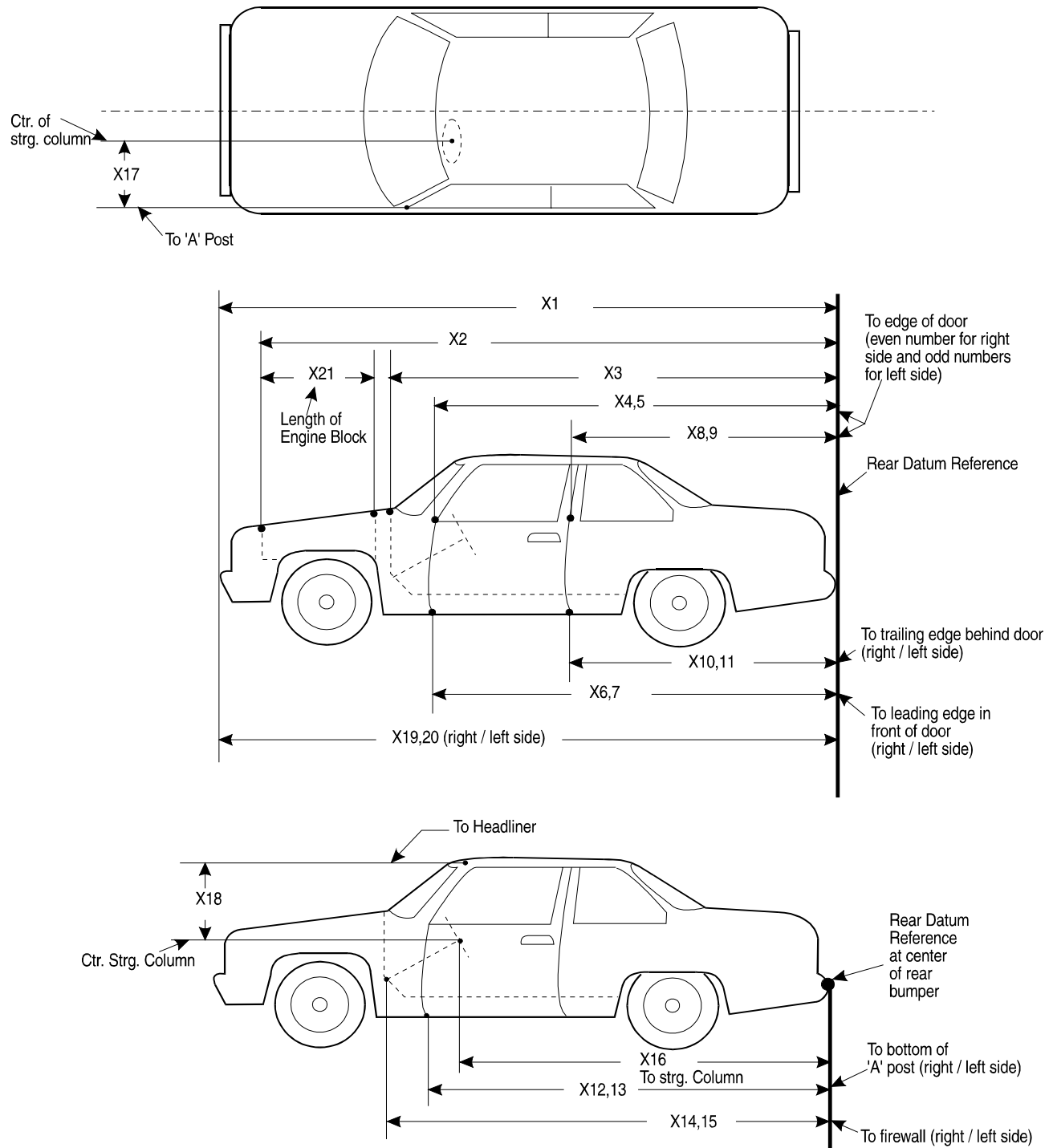


Table 9 Impacted Vehicle Measurements

Test number: 030604-2

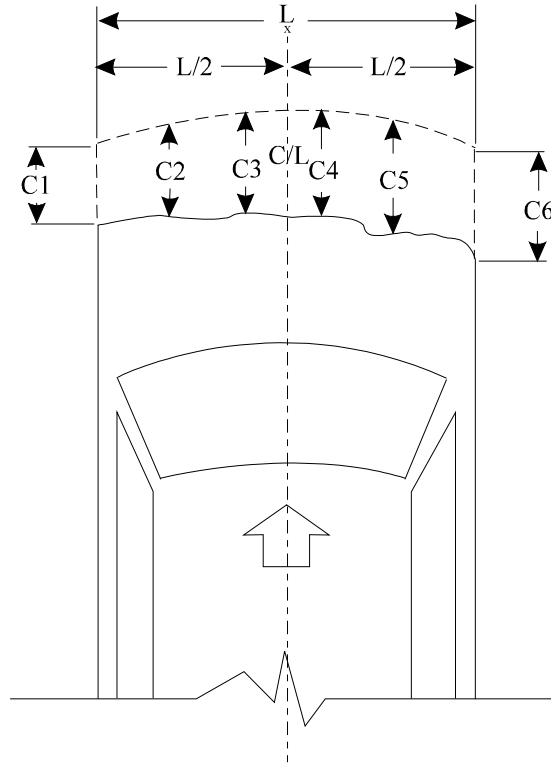
Vehicle year/make/model/body style: 2003/Toyota/Sienna/MPV

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline ¹	4920	4392	528
X2	Rear Surface of Vehicle to Front of Engine Block	4335	4252	83
X3	Rear Surface of Vehicle to Firewall	4063	4062	1
X4	Rear Surface of Veh. to Upper Leading Edge of Right Door	3522	3524	-2
X5	Rear Surface of Veh. to Upper Leading Edge of Left Door	3527	3524	3
X6	Rear Surface of Veh. to Lower Leading Edge of Right Door	3421	3426	-5
X7	Rear Surface of Veh. to Lower Leading Edge of Left Door	3434	3435	-1
X8	Rear Surface of Veh. to Upper Trailing Edge of Right Door	2407	2408	-1
X9	Rear Surface of Veh. to Upper Trailing Edge of Left Door	2409	2408	1
X10	Rear Surface of Veh. to Lower Trailing Edge of Right Door	2428	2432	-4
X11	Rear Surface of Veh. to Lower Trailing Edge of Left Door	2437	2438	-1
X12	Rear Surface of Veh. to Bottom of " A " Post on Right Side	3512	3514	-2
X13	Rear Surface of Veh. to Bottom of " A " Post on Left Side	3510	3510	0
X14	Rear Surface of Vehicle to Firewall - Right Side	4079	4052	27
X15	Rear Surface of Vehicle to Firewall - Left Side	4059	4062	-3
X16	Rear Surface of Vehicle to Steering Wheel Center	3137	3094	43
X17	Center of Steering Column to " A " Post	308	288	20
X18	Center of Steering Column to Headliner	485	477	8
X19	Rear Surface of Vehicle to Right Side of Front Bumper ¹	4749	4716	33
X20	Rear Surface of Vehicle to Left Side of Front Bumper ¹	4749	4237	512
X21	Length of Engine Block	460	460	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3287	3305	-18
CD	Rear Surface of Vehicle to Center of Dash Panel	3300	3295	5
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3307	3321	-14

All distance measurements are in millimeters.

¹ Post-test measurements made without bumper fascia. The difference is affected.

Figure 8 Vehicle Crush



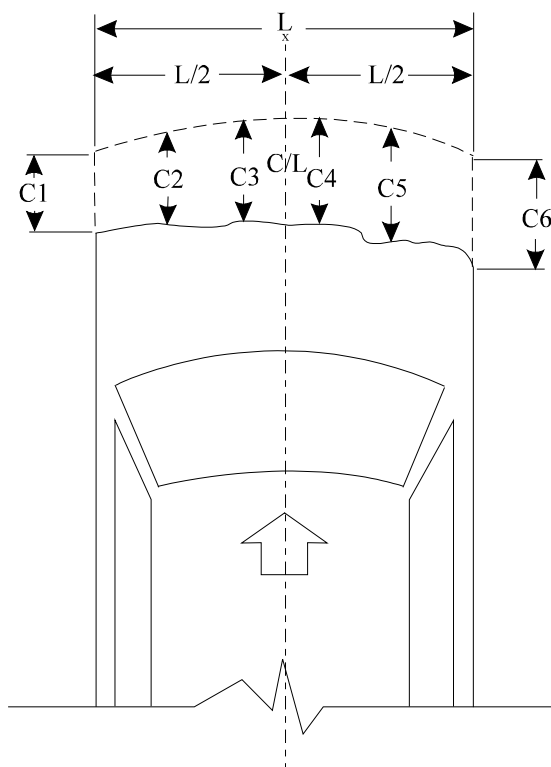
Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 2003 Toyota Sienna
Measured with bumper fascia:

Location	Pre-test	Post-test ¹	Difference ¹
L	1525 mm		
C1	4749 mm	N/A	N/A
C2	4854 mm	N/A	N/A
C3	4901 mm	N/A	N/A
C4	4913 mm	N/A	N/A
C5	4864 mm	N/A	N/A
C6	4749 mm	N/A	N/A
CL	4920 mm	N/A	N/A

¹ Bumper fascia separated during impact.

Figure 8 Vehicle Crush, Cont'd.



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

Vehicle: 2003 Toyota Sienna

Measured to bumper beam without bumper fascia:

Location	Pre-test	Post-test	Difference ¹
L	1322 mm		
C1	4747 mm	4237 mm	510 mm
C2	4787 mm	4222 mm	565 mm
C3	4813 mm	4393 mm	420 mm
C4	4808 mm	4561 mm	247 mm
C5	4781 mm	4681 mm	100 mm
C6	4736 mm	4716 mm	20 mm
CL	4815 mm	4392 mm	423 mm

¹ The difference for points C1-C6 measured without bumper fascia are included in the NHTSA database submission as Damage Profile Distance 1-6.

Table 10 Test Vehicle Frontal Profile Data

Pre-Test Profile							
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper	X	4743 mm	4855 mm	4907 mm	4905 mm	4845 mm	4737 mm
	Y	-761 mm	-455 mm	-150 mm	150 mm	450 mm	753 mm
	Z	-422 mm	-428 mm	-420 mm	-418 mm	-425 mm	-429 mm
Top of Front Bumper	X	4743 mm	4845 mm	4905 mm	4900 mm	4835 mm	4730 mm
	Y	-762 mm	-460 mm	-150 mm	150 mm	452 mm	758 mm
	Z	-560 mm	-560 mm	-555 mm	-555 mm	-558 mm	-565 mm
Center of Grille	X	4642 mm	4745 mm	4824 mm	4819 mm	4738 mm	4633 mm
	Y	-762 mm	-460 mm	-150 mm	150 mm	460 mm	758 mm
	Z	-693 mm	-678 mm	-671 mm	-670 mm	-667 mm	-676 mm
Front of Hood	X	4595 mm	4723 mm	4779 mm	4779 mm	4716 mm	4583 mm
	Y	-705 mm	-455 mm	-150 mm	151 mm	465 mm	705 mm
	Z	-830 mm	-765 mm	-776 mm	-779 mm	-768 mm	-831 mm

Post-Test Profile							
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper ¹	X	N/A	N/A	N/A	N/A	N/A	N/A
	Y	N/A	N/A	N/A	N/A	N/A	N/A
	Z	N/A	N/A	N/A	N/A	N/A	N/A
Top of Front Bumper ¹	X	N/A	N/A	N/A	N/A	N/A	N/A
	Y	N/A	N/A	N/A	N/A	N/A	N/A
	Z	N/A	N/A	N/A	N/A	N/A	N/A
Center of Grille ¹	X	N/A	N/A	N/A	N/A	N/A	N/A
	Y	N/A	N/A	N/A	N/A	N/A	N/A
	Z	N/A	N/A	N/A	N/A	N/A	N/A
Front of Hood	X	4415 mm	4385 mm	4485 mm	4627 mm	4697 mm	4628 mm
	Y	-670 mm	-420 mm	-138 mm	145 mm	450 mm	700 mm
	Z	-900 mm	-818 mm	-708 mm	-737 mm	-780 mm	-895 mm

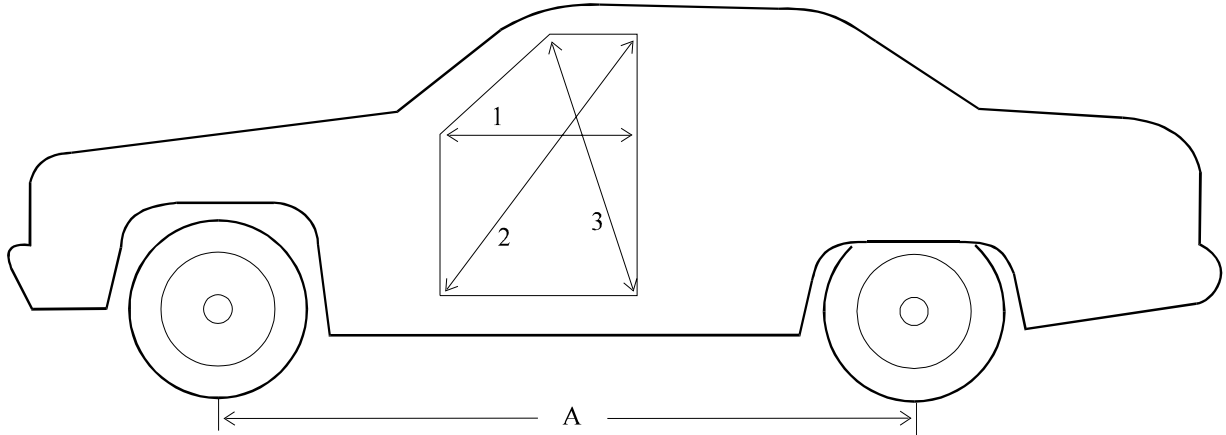
Difference							
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper	X	N/A	N/A	N/A	N/A	N/A	N/A
	Y	N/A	N/A	N/A	N/A	N/A	N/A
	Z	N/A	N/A	N/A	N/A	N/A	N/A
Top of Front Bumper	X	N/A	N/A	N/A	N/A	N/A	N/A
	Y	N/A	N/A	N/A	N/A	N/A	N/A
	Z	N/A	N/A	N/A	N/A	N/A	N/A
Center of Grille	X	N/A	N/A	N/A	N/A	N/A	N/A
	Y	N/A	N/A	N/A	N/A	N/A	N/A
	Z	N/A	N/A	N/A	N/A	N/A	N/A
Front of Hood	X	180 mm	338 mm	294 mm	152 mm	19 mm	-45 mm
	Y	-35 mm	-35 mm	-12 mm	6 mm	15 mm	5 mm
	Z	70 mm	53 mm	-68 mm	-42 mm	12 mm	64 mm

Note: Six points divide the width of the car. Pre-test and post-test measurement references: +X, forward of rear bumper; +Y, rightward from vehicle centerline; +Z, downward from ground level.

¹ Measurement point could not be located post-test.

Figure 9 Vehicle Intrusion Measurements

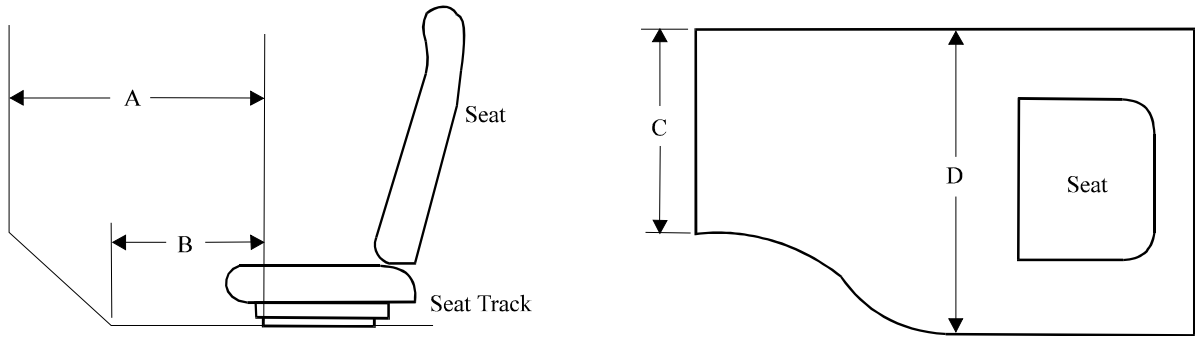
Door Opening Width



Units (mm)	Left			Right		
Measurement	1	2	3	1	2	3
Pre-Test	1100 mm	1490 mm	1185 mm	1100 mm	1495 mm	1180 mm
Post-Test	1100 mm	1490 mm	1185 mm	1100 mm	1495 mm	1180 mm
Difference	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm

Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	2900 mm	2900 mm
Post-Test	2770 mm	2935 mm
Difference	130 mm	-35 mm

Figure 10 Vehicle Intrusion Measurements
Static Footwell Deformation



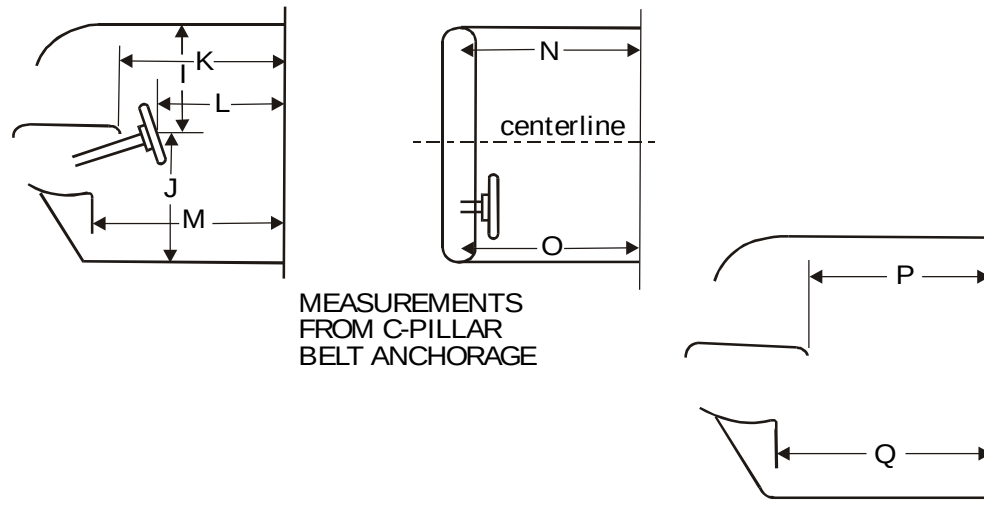
Driver's Side

Measurement	Pre-Test	Post-Test	Difference
A	610 mm	602 mm	8 mm
B	469 mm	469 mm	0 mm
C	460 mm	445 mm	15 mm
D	435 mm	435 mm	0 mm

Passenger's Side

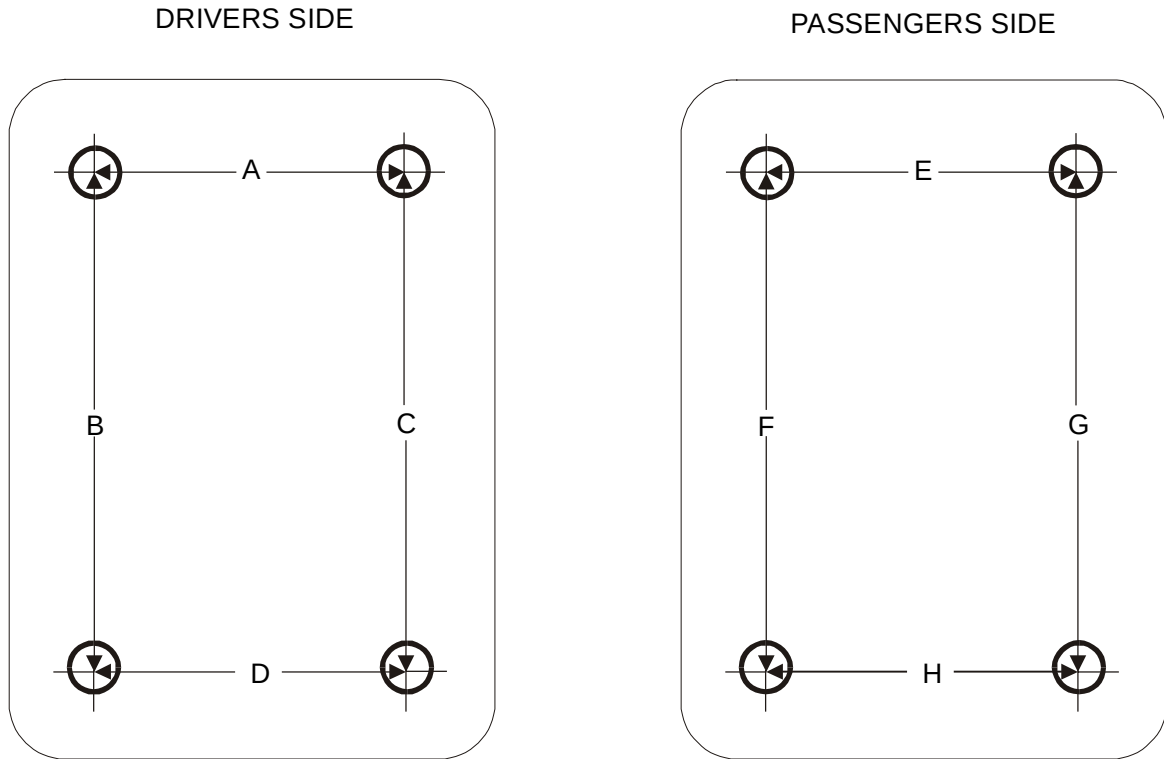
Measurement	Pre-Test	Post-Test	Difference
A	960 mm	602 mm	358 mm
B	460 mm	460 mm	0 mm
C	470 mm	465 mm	5 mm
D	505 mm	495 mm	10 mm

Figure 11 Vehicle Intrusion Measurements
Static Passenger Compartment Intrusion



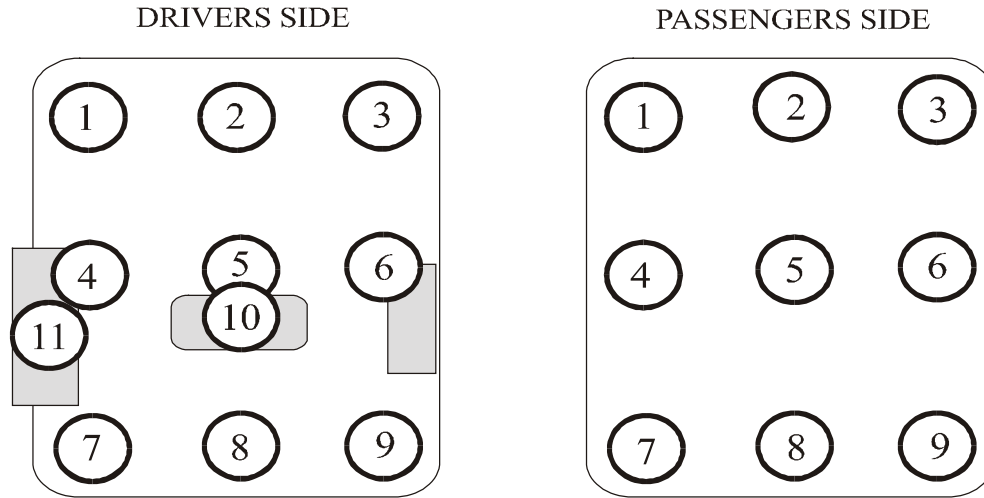
Measurement	Pre-Test	Post-Test	Difference
I	510 mm	470 mm	40 mm
J	715 mm	735 mm	-20 mm
K (driver's side)	1976 mm	1970 mm	6 mm
L	1790 mm	1777 mm	13 mm
M (driver's side)	2100 mm	2095 mm	5 mm
N (passenger's side)	2010 mm	2009 mm	1 mm
O (driver's side)	1975 mm	1961 mm	14 mm
P (passenger's side)	1965 mm	1967 mm	-2 mm
Q (passenger's side)	2145 mm	2150 mm	-5 mm

Figure 12 Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	469 mm	447 mm	22 mm
B	400 mm	400 mm	0 mm
C	440 mm	438 mm	2 mm
D	435 mm	433 mm	2 mm
E	470 mm	466 mm	4 mm
F	446 mm	446 mm	0 mm
G	395 mm	415 mm	-20 mm
H	505 mm	499 mm	6 mm

Figure 13 Toeboard Measurements



Driver Toe Pan							
Pre-Test				Post-Test			
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Difference
1	3429	-613	45	3423	-614	37	Xmm 6 Ymm 1 Zmm 8
2	3530	-398	137	3520	-395	120	10 -3 17
3	3533	-166	136	3523	-166	125	10 0 11
4	3387	-622	135	3384	-623	129	3 1 6
5	3448	-391	200	3444	-391	190	4 0 10
6	3453	-164	192	3451	-164	187	2 0 5
7	3316	-613	200	3315	-614	195	1 1 5
8	3350	-387	237	3349	-389	225	1 2 12
9	3372	-158	241	3368	-159	233	4 1 8
10	3367	-363	39	3330	-369	26	37 6 13
11	3359	-585	173	3358	-586	168	1 1 5

Passenger Toe Pan							
Pre-Test				Post-Test			
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Difference
1	3546	197	122	3540	192	125	Xmm 6 Ymm 5 Zmm -3
2	3532	428	124	3530	423	130	2 5 -6
3	3422	634	21	3422	630	26	0 4 -5
4	3469	189	188	3465	187	192	4 2 -4
5	3441	422	188	3439	418	192	2 4 -4
6	3379	646	116	3379	642	121	0 4 -5
7	3371	187	236	3370	184	244	1 3 -8
8	3354	422	230	3353	419	236	1 3 -6
9	3309	649	187	3308	646	192	1 3 -5

Reference: +X forward from rear bumper; +Y rightward from vehicle centerline; +Z downward from vehicle reference point

Table 11 Intrusion of Upper Instrument Panel

Driver Instrument Panel - Lower

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
Left	3143	-550	-233	3133	-558	-236	10	8	3
Right	3152	-247	-235	3143	-253	-241	9	6	6

Driver Knees

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
Left	3075	-589	-323	3066	-599	-328	9	10	5
Right	3110	-250	-307	3094	-260	-309	16	10	2

Passenger Knees

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
Left	3106	222	-301	3102	221	-297	4	1	-4
Right	3103	556	-302	3105	553	-299	-2	3	-3

Steering Wheel Center

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
1	2910	-399	-469	2925	-425	-486	-15	26	17

Driver Front Outboard Seat Attachment Bolt

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
1	2843	-633	216	2844	-635	214	-1	2	2

Passenger Front Outboard Seat Attachment Bolt

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
1	2844	639	204	2843	638	207	1	1	-3

Knee intrusions are points measured pre and post, which are located just above where the four knees would be expected to contact the instrument panel.

+X: Forward from rear bumper

+Y: Rightward from centerline

+Z: Downward from vehicle reference point

Table 12 Insurance Institute Measurement Locations and Floor Pan Deformation Data

IIHS Measurement Location Data (in millimeters)

Meas. Loc.*	X-Axis Measurement			Y-Axis Measurement			Z-Axis Measurement		
	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
1	2910	2925	-15	-399	-425	26	-469	-486	17
2	3143	3133	10	-550	-558	8	-233	-236	3
3	3152	3143	9	-247	-253	6	-235	-241	6
4	3367	3330	37	-363	-369	6	39	26	13
5	3515	3464	51	-514	-500	-14	38	19	19
6	3563	3546	17	-357	-356	-1	34	25	9
7	3559	3529	30	-212	-213	1	41	34	7
8	3433	3427	6	-612	-613	1	35	28	7
17	3335	3332	3	-805	-814	9	-473	-478	5
18	2198	2198	0	-865	-865	0	-472	-475	3

Floor Pan Deformation Measurement Data (in millimeters)

Meas. Loc.**	X-Axis Measurement			Y-Axis Measurement			Z-Axis Measurement		
	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
P0	2843	2844	-1	-633	-635	2	216	214	2
P1	3247	3248	-1	-601	-604	3	242	239	3
P2	3259	3259	0	-387	-390	3	239	227	12
P3	3273	3274	-1	-166	-169	3	238	211	27
P4	3083	3083	0	-599	-601	2	249	246	3
P5	3095	3097	-2	-377	-382	5	249	244	5
P6	3105	3107	-2	-164	-167	3	240	233	7
P7	2916	2917	-1	-593	-596	3	248	246	2
P8	2924	2928	-4	-377	-382	5	246	238	8
P9	2929	2930	-1	-155	-158	3	241	242	-1

Pre-test and post-test measurement references: +X, forward of rear bumper; +Y, rightward from vehicle centerline; +Z, downward from ground level.

***Measurement Location Descriptions**

P0 Front Outside Seat Anchor Bolt

- 1 Steering Column-Geometric center of the steering wheel on airbag door.
- 2 Lower Instrument Panel Left-Taken 45 cm above floorpan and 15 cm to the left of the steering wheel center.
- 3 Lower Instrument Panel Right-Taken 45 cm above floorpan and 15 cm to the right of the steering wheel center.
- 4 Brake Pedal-Geometric center of the brake pedal.
- 5 Toeapan Left-Taken 15 cm to the left of the brake pedal center on the same vertical plane on the vehicle toeapan.
- 6 Toeapan Center-Taken directly behind the brake pedal center on the same vertical plane on the vehicle.
- 7 Toeapan Right-Taken 15 cm to the right of the brake pedal center on the same vertical plane on the vehicle.
- 8 Left Footrest-Taken 25 cm to the left of the brake pedal center on the same vertical plane on the vehicle toeapan.
- 17 A-Pillar-Taken on the vehicle exterior at the same vertical coordinate as the base of the left front window.
- 18 B-Pillar-Taken on the vehicle exterior at the same vertical coordinate as the lower A-pillar mark.

****** There is an equal space 3x3 floor pan matrix. Position 1 is floor pan left side forwardmost position; Position 9 is located on the right side rearmost position of the 3x3 grid.

Figure 14 Camera Positions

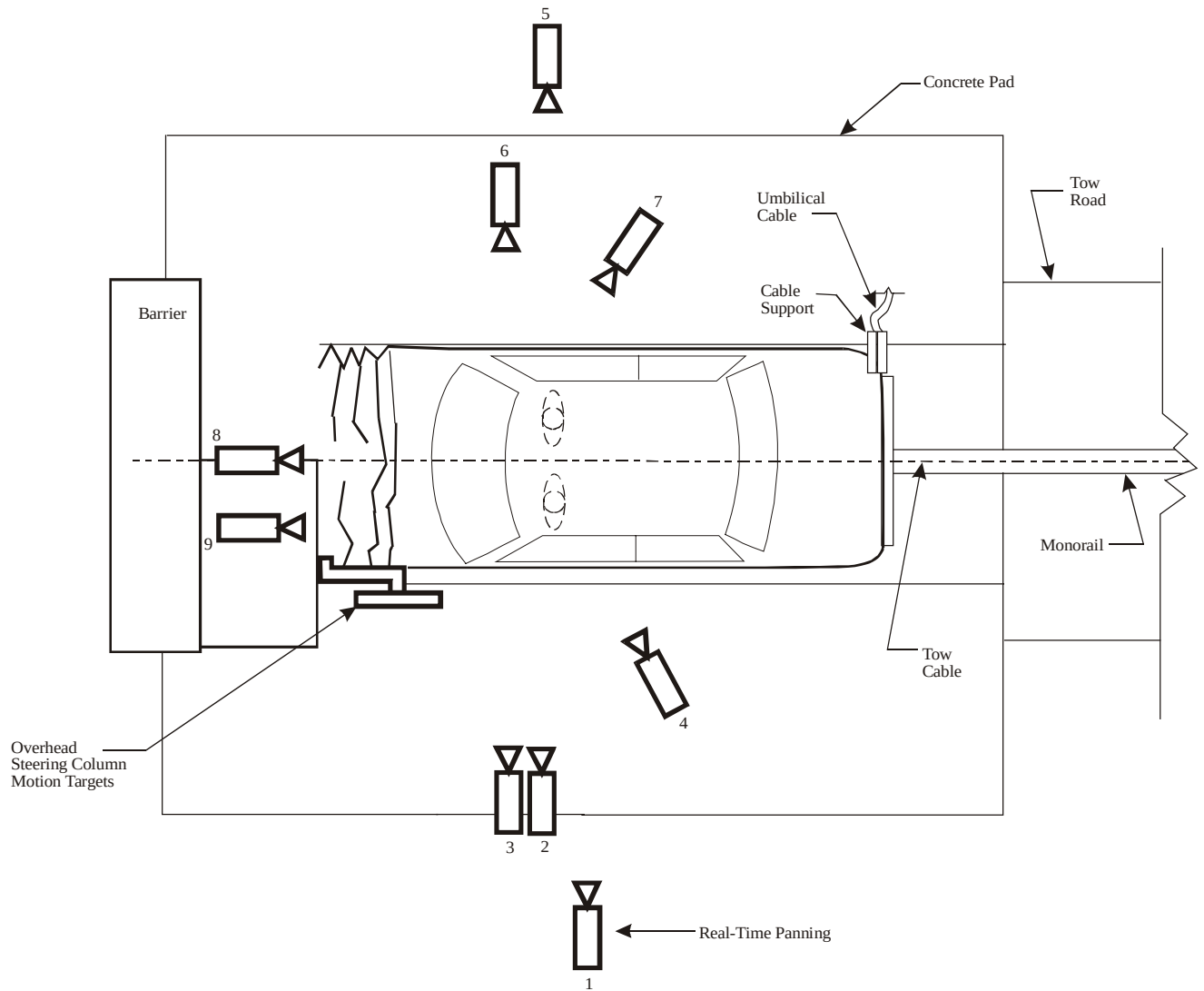


Figure 14 Camera Positions, Cont'd.

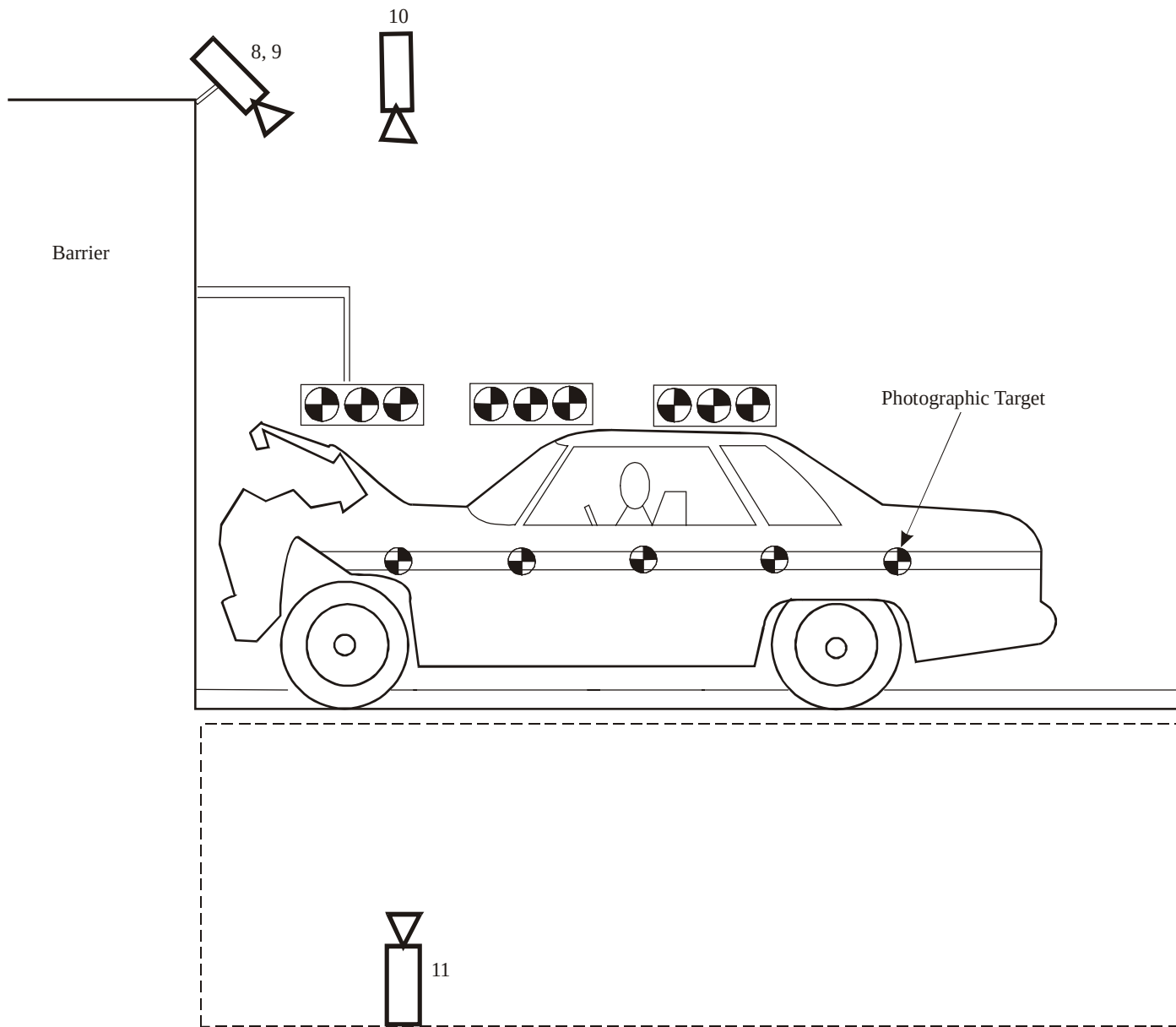
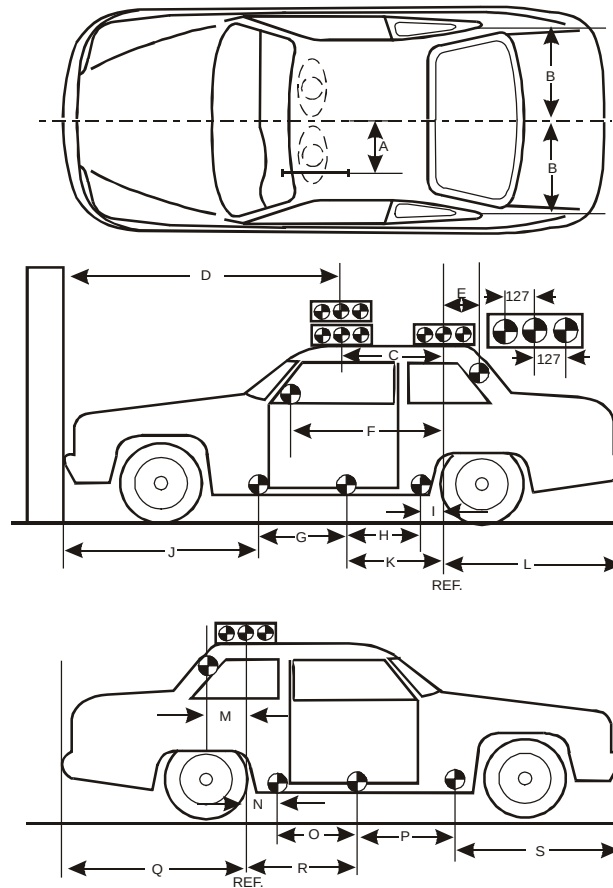


Table 13 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of camera data
1	Panning	Bolex		24	Vehicle dynamics
2	Left side wide	Digital HG	13	1000	Vehicle crush
3	Left side tight	Digital HG	25	1000	Dummy kinematics
4	Driver over shoulder	Digital HG	Zoom	1000	Dummy and airbag
5	Right side wide	Photosonic	13	1000	Dummy kinematics
6	Right side tight	Digital HG	25	1000	Dummy kinematics
7	Passenger over shoulder	Digital HG	25	1000	Dummy and airbag
8	Front through windshield	Digital HG	13	1000	Airbag deployment
9	Driver through windshield	Photosonic	13	1002	Airbag deployment
10	Overhead tight	Photosonic	17	1015	Vehicle dynamics
11	Pit tight	Photosonic	17	1005	Vehicle crush

Figure 15 Vehicle Reference Photo Target Locations



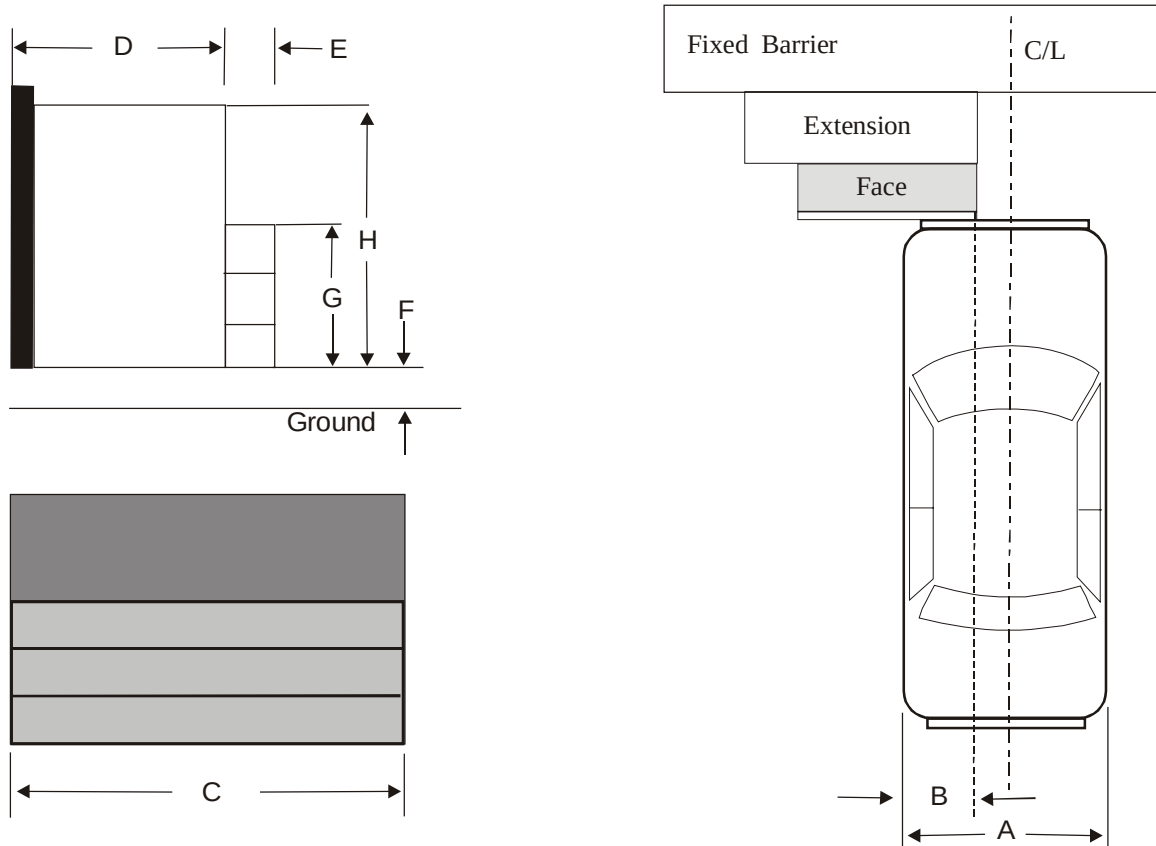
Measurement	Pre-Test
A	Left 440 mm Right 440 mm
B	Left 700 mm Right 700 mm
C	Left 610 mm Right 610 mm
D	357 mm
E	725 mm
F	1173 mm
G	980 mm
H	980 mm
I	-544 mm
J	1246 mm
K	438 mm
L	2085 mm
M	708 mm
N	-531 mm
O	975 mm
P	978 mm
Q	2070 mm
R	439 mm
S	1262 mm

Figure 16 Offset Barrier and Vehicle Orientation

Vehicle: 2003 Toyota Sienna

Barrier Manufacturer: Plascore

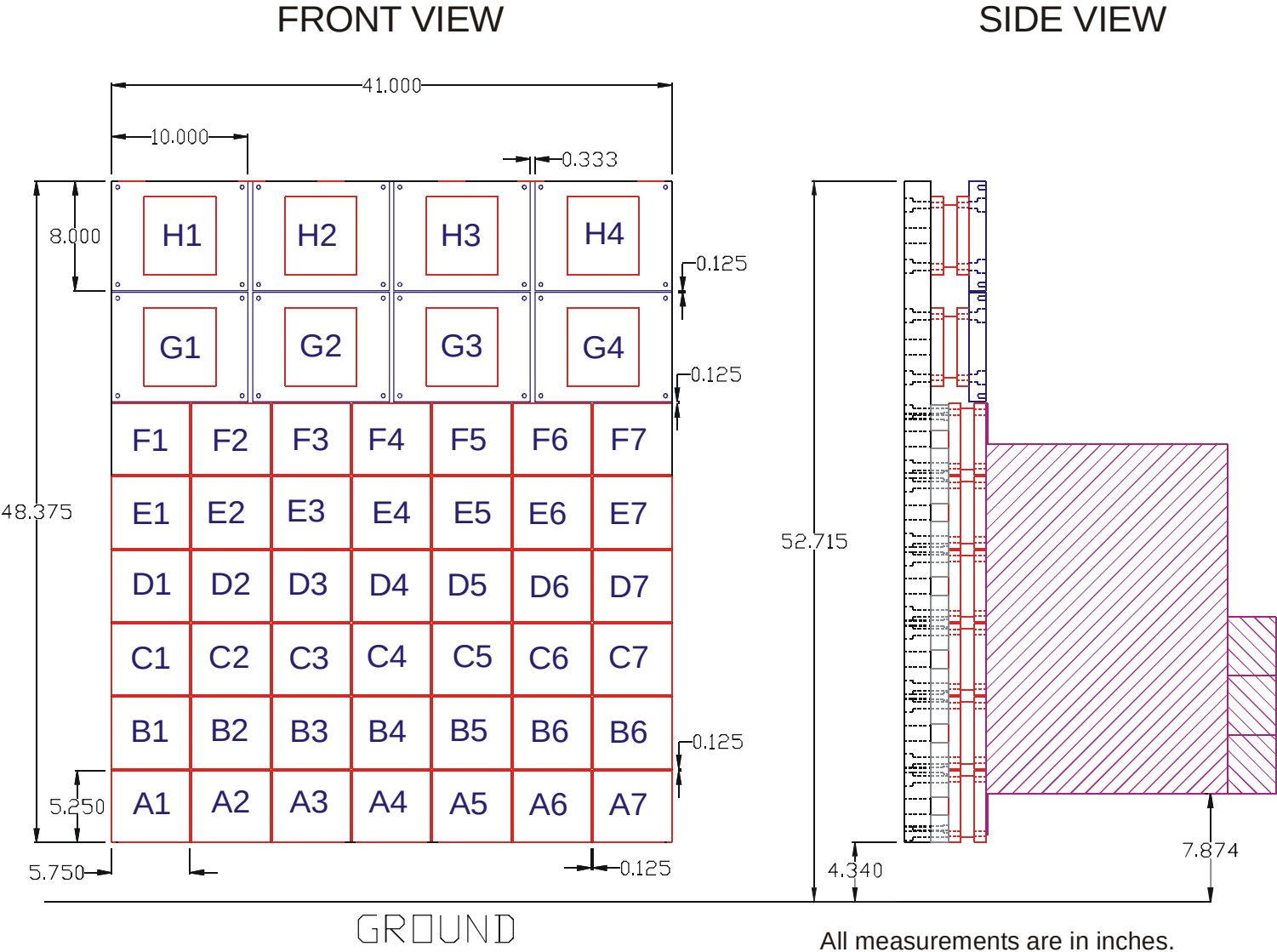
Serial Number: 40B1102-1B 20A1102



A	Total Vehicle Width	<u>1860</u>	mm
B	40% Overlap Distance	<u>744</u>	mm
C	Deformable Face Width	<u>1000</u>	mm
D	Single Stage Honeycomb Depth	<u>453</u>	mm
E	Bumper Element Depth	<u>90</u>	mm
F	Lower Edge Height From Ground	<u>200</u>	mm
G*	Bumper Element Height	<u>330</u>	mm
H	Deformable Barrier Honeycomb Height	<u>650</u>	mm

* The bumper element consists of three 110 mm height blocks of 1.723 MPa honeycomb.

Figure 17 Load Cell Location on Fixed Offset Barrier¹



¹Load cell data is presented as plots in Appendix B.

The diagram illustrates the measurement locations for an offset barrier. It shows a 3D perspective of a structure with six levels, labeled Level 1 to Level 6 from bottom to top. The structure is composed of a series of rectangular blocks. The horizontal dimensions are marked along the top edge of Level 5, ranging from 0 mm to 1000 mm in increments of 100 mm. The vertical dimensions are marked on the right side, showing the height of each level relative to the ground. The total height of the structure is 825 mm. The vertical dimensions for each level are: Level 1 (200 mm), Level 2 (255 mm), Level 3 (365 mm), Level 4 (475 mm), Level 5 (530 mm), and Level 6 (690 mm). The ground is indicated at the base of the structure.

Level 6 - Top stack	825 mm
Level 5 - Mid stack	690 mm
Level 4 - Stack at top of bumper	530 mm
Level 3 - Bumper top	475 mm
Level 2 - Bumper mid	365 mm
Level 1 - Bumper low	255 mm

Table 14 Deformable Barrier Face Profile

Pre-Test			
Index	Xmm	Ymm	Zmm
1	455.6	4.0	624.4
2	455.2	99.3	624.5
3	455.5	199.1	624.2
4	455.6	298.9	624.3
5	455.6	399.1	624.9
6	454.5	499.0	624.9
7	455.1	599.4	624.8
8	454.5	699.0	625.0
9	454.4	798.9	625.3
10	455.4	899.1	625.8
11	454.6	993.7	625.6
12	454.8	3.4	489.0
13	455.4	98.3	489.2
14	455.7	198.6	489.0
15	455.7	298.3	489.3
16	455.5	398.2	488.8
17	455.8	498.5	489.4
18	454.8	598.7	489.2
19	455.0	698.1	489.5
20	455.3	798.6	489.2
21	454.9	899.1	489.4
22	455.7	993.7	489.8

Post-Test			
Index	Xmm	Ymm	Zmm
1	484.8	154.3	486.2
2	437.5	230.5	471.0
3	386.9	308.1	457.7
4	324.0	380.9	463.5
5	261.8	449.6	447.0
6	279.7	517.8	419.8
7	285.7	607.3	414.0
8	261.4	701.2	423.4
9	241.3	796.6	396.2
10	208.9	883.1	362.9
11	142.3	950.0	353.0
12	525.7	153.5	358.2
13	466.8	227.0	348.6
14	392.1	291.7	343.5
15	305.6	340.0	348.2
16	226.0	401.0	344.1
17	208.5	489.0	334.7
18	185.5	586.2	332.2
19	154.0	664.7	355.8
20	153.3	747.0	324.8
21	139.2	834.8	359.6
22	99.9	922.2	356.8

Difference			
Index	Xmm	Ymm	Zmm
1	-29.2	-150.4	138.2
2	17.7	-131.2	153.5
3	68.6	-109.0	166.6
4	131.6	-82.0	160.8
5	193.8	-50.5	177.9
6	174.8	-18.8	205.1
7	169.4	-7.9	210.8
8	193.2	-2.2	201.6
9	213.1	2.3	229.1
10	246.5	16.0	262.9
11	312.3	43.7	272.6
12	-71.0	-150.1	130.8
13	-11.4	-128.6	140.6
14	63.6	-93.1	145.6
15	150.1	-41.7	141.2
16	229.5	-2.8	144.8
17	247.4	9.5	154.6
18	269.3	12.5	157.1
19	301.0	33.4	133.7
20	302.0	51.6	164.4
21	315.7	64.3	129.8
22	355.8	71.5	133.1

Table 14 Deformable Barrier Face Profile Cont'd.

Pre-Test			
Index	Xmm	Ymm	Zmm
23	455.7	2.3	349.0
24	455.4	97.3	347.1
25	455.7	197.4	347.0
26	455.8	297.6	347.2
27	456.0	396.9	347.8
28	456.3	497.0	348.1
29	456.0	597.0	348.6
30	456.5	697.1	348.7
31	456.9	797.6	348.2
32	455.8	896.8	348.3
33	456.7	991.8	349.1
34	546.0	3.2	277.4
35	546.1	98.4	277.4
36	545.9	198.7	277.7
37	545.7	298.3	277.4
38	545.5	398.5	277.1
39	546.3	498.4	276.8
40	546.4	598.0	277.4
41	546.2	698.4	277.1
42	546.5	798.1	276.9
43	546.5	898.0	276.8
44	546.4	993.3	276.9

Post-Test			
Index	Xmm	Ymm	Zmm
23	518.0	127.8	219.5
24	436.0	175.2	221.7
25	353.9	233.0	215.3
26	281.6	298.6	208.7
27	-124.6	517.9	1139.9
28	167.2	451.6	244.1
29	-124.3	518.0	1140.2
30	-124.3	518.0	1140.1
31	-124.4	518.0	1140.2
32	-124.4	518.0	1140.2
33	-124.4	518.0	1140.3
34	566.8	213.8	158.9
35	483.9	259.8	166.8
36	396.8	308.3	175.2
37	316.2	361.9	182.3
38	256.3	442.5	199.2
39	200.3	503.7	216.9
40	138.1	558.8	226.3
41	110.6	654.8	236.3
42	87.1	751.0	245.8
43	77.1	849.4	254.4
44	57.2	935.3	262.4

Difference			
Index	Xmm	Ymm	Zmm
23	-62.3	-125.6	129.5
24	19.4	-78.0	125.4
25	101.8	-35.6	131.6
26	174.2	-1.1	138.5
27	580.6	-121.0	-792.1
28	289.1	45.3	104.0
29	580.4	79.0	-791.6
30	580.9	179.1	-791.4
31	581.3	279.6	-791.9
32	580.1	378.8	-791.9
33	581.1	473.8	-791.2
34	-20.9	-210.6	118.5
35	62.2	-161.3	110.6
36	149.1	-109.5	102.5
37	229.6	-63.6	95.1
38	289.1	-44.1	77.9
39	346.1	-5.2	59.9
40	408.2	39.3	51.1
41	435.6	43.6	40.9
42	459.4	47.1	31.1
43	469.4	48.6	22.4
44	489.2	58.0	14.6

Table 14 Deformable Barrier Face Profile Cont'd.

Pre-Test			
Index	Xmm	Ymm	Zmm
45	546.4	3.2	168.0
46	546.4	98.9	167.7
47	546.1	198.4	167.3
48	546.8	298.6	167.6
49	546.1	398.1	167.1
50	546.2	498.4	166.8
51	546.4	598.7	167.1
52	546.9	698.7	166.8
53	546.6	798.2	166.8
54	546.8	898.8	166.6
55	547.1	993.4	166.4
56	547.8	2.7	57.3
57	546.8	97.7	57.1
58	546.8	198.0	56.7
59	547.0	297.9	56.7
60	546.9	397.4	56.8
61	546.9	497.8	56.5
62	546.9	597.7	56.4
63	547.1	697.9	56.0
64	547.0	797.8	56.2
65	547.2	898.1	56.4
66	547.4	993.2	55.7

Post-Test			
Index	Xmm	Ymm	Zmm
45	563.7	214.2	59.5
46	481.6	263.5	62.6
47	393.4	308.2	65.1
48	335.0	371.9	74.4
49	272.5	451.7	86.3
50	222.0	519.4	95.0
51	177.0	588.6	112.1
52	151.0	662.5	111.4
53	146.3	754.7	111.4
54	135.8	853.8	117.0
55	97.9	937.9	129.6
56	552.3	176.4	-46.7
57	484.3	242.5	-41.0
58	413.5	313.2	-34.8
59	342.9	383.8	-28.2
60	284.4	464.0	-15.8
61	258.6	558.3	11.8
62	194.7	612.9	12.2
63	163.2	691.7	18.8
64	137.2	782.8	34.7
65	106.3	873.6	51.3
66	60.1	952.1	70.3

Difference			
Index	Xmm	Ymm	Zmm
45	-17.3	-211.0	108.5
46	64.8	-164.6	105.1
47	152.7	-109.8	102.2
48	211.9	-73.3	93.2
49	273.6	-53.6	80.8
50	324.2	-20.9	71.8
51	369.4	10.0	55.0
52	395.9	36.2	55.4
53	400.3	43.5	55.5
54	411.0	45.0	49.6
55	449.2	55.5	36.8
56	-4.5	-173.7	104.0
57	62.5	-144.8	98.0
58	133.3	-115.2	91.5
59	204.1	-85.8	84.9
60	262.4	-66.5	72.6
61	288.3	-60.5	44.7
62	352.2	-15.2	44.3
63	383.9	6.2	37.2
64	409.8	15.1	21.5
65	440.9	24.6	5.1
66	487.3	41.0	-14.6

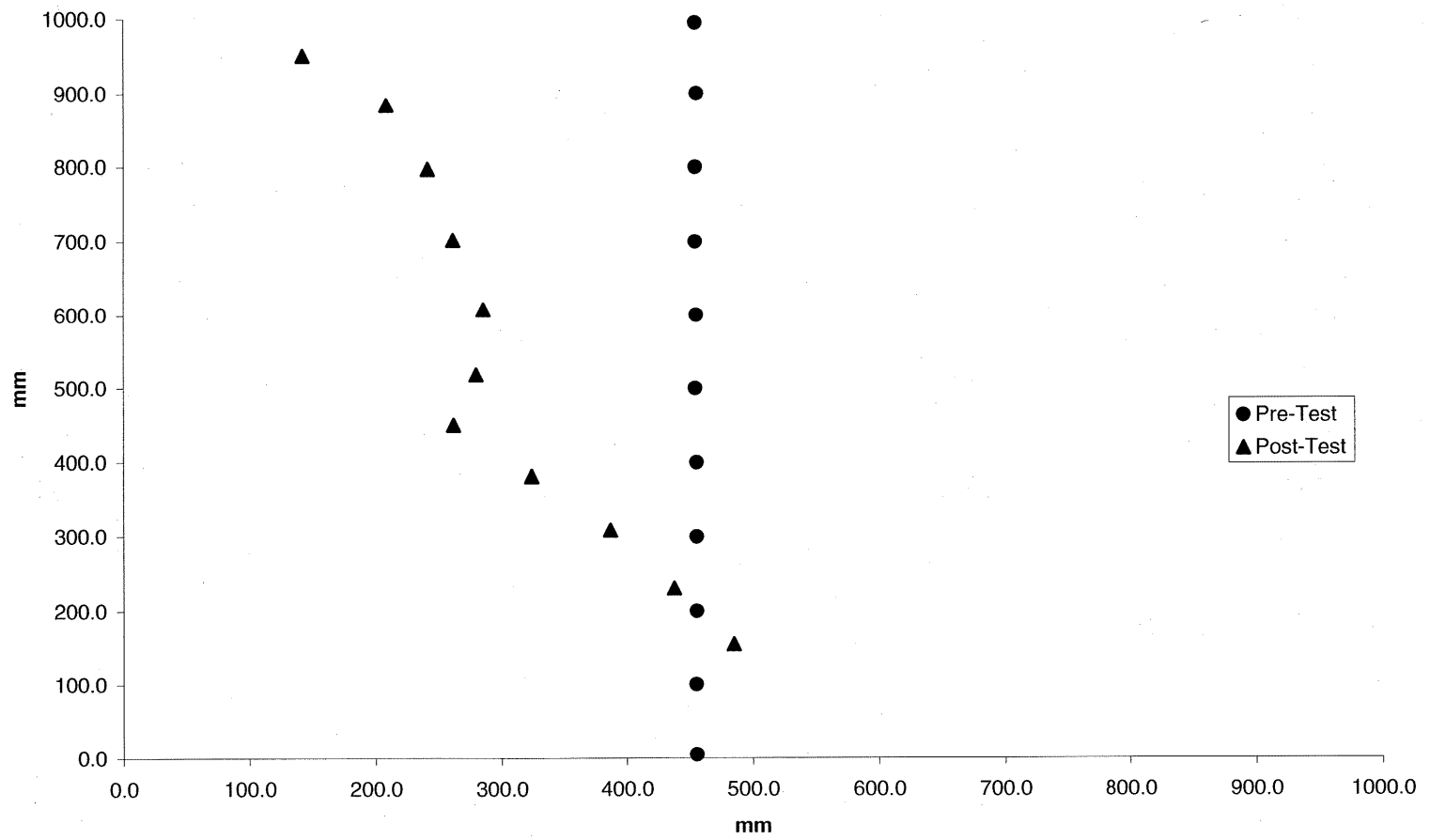
Figure 19 Deformable Barrier Face Profile 1-11

Figure 19 Deformable Barrier Face Profile 12-22

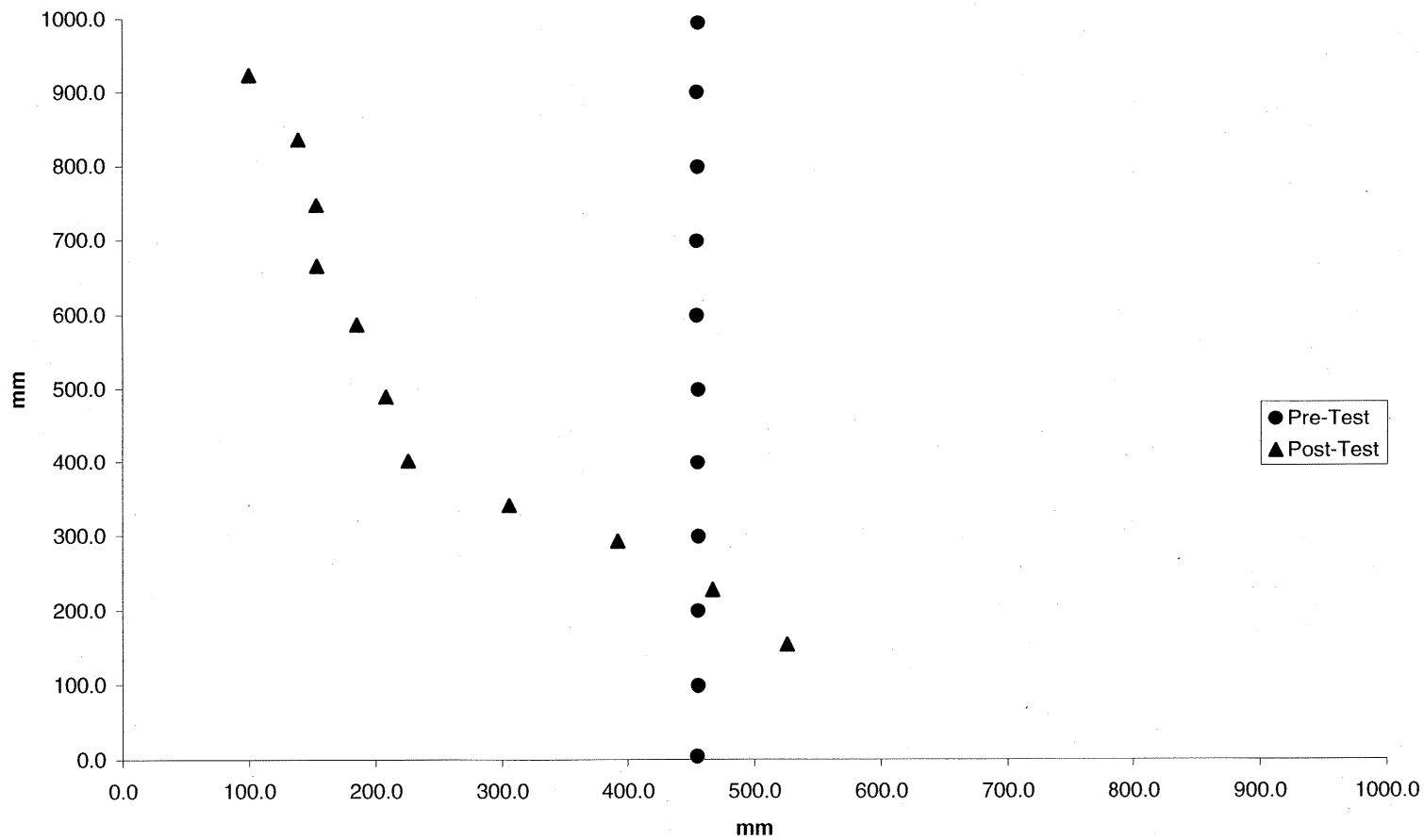


Figure 19 Deformable Barrier Face Profile 23-33

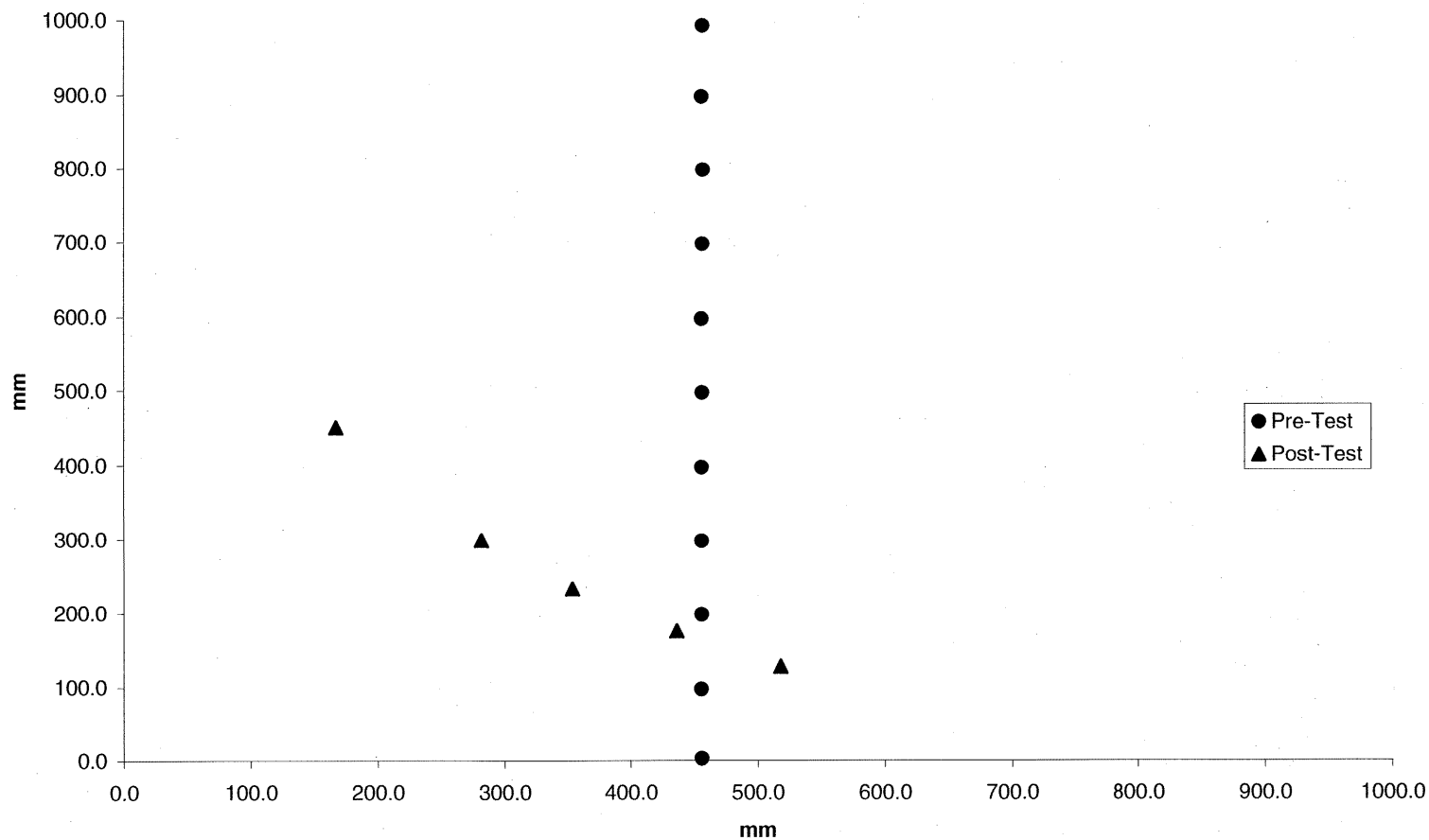


Figure 19 Deformable Barrier Face Profile 34-44

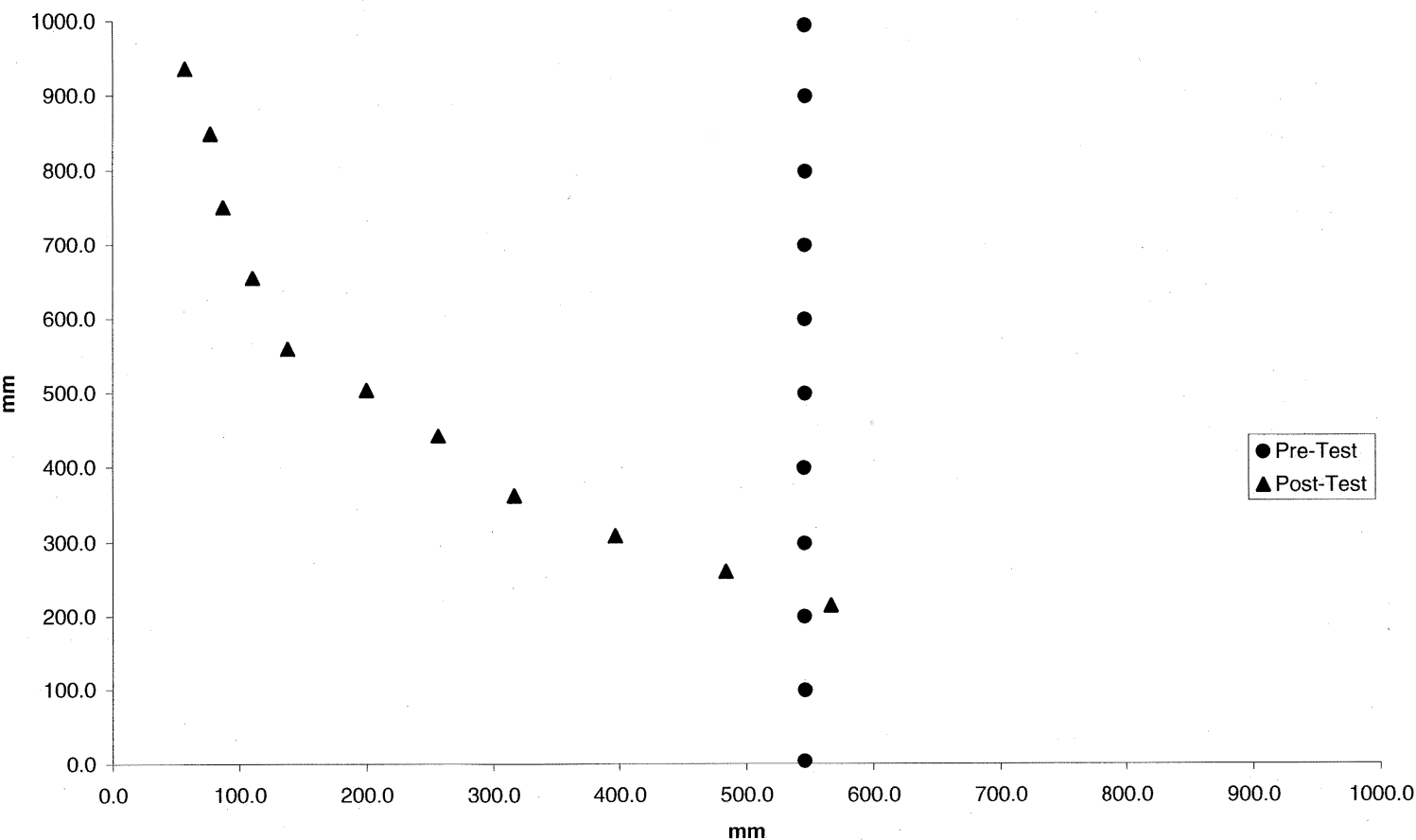


Figure 19 Deformable Barrier Face Profile 45-55

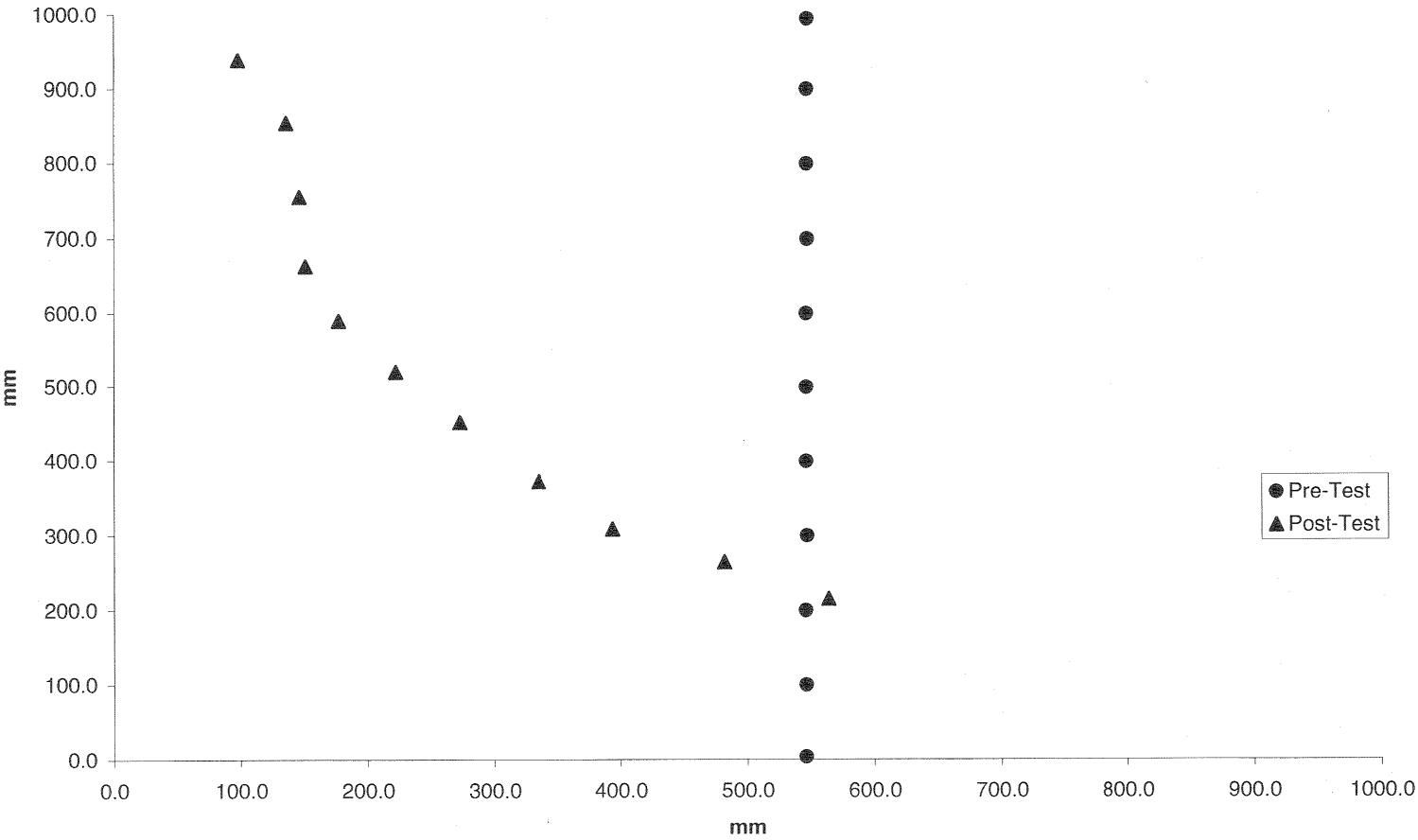
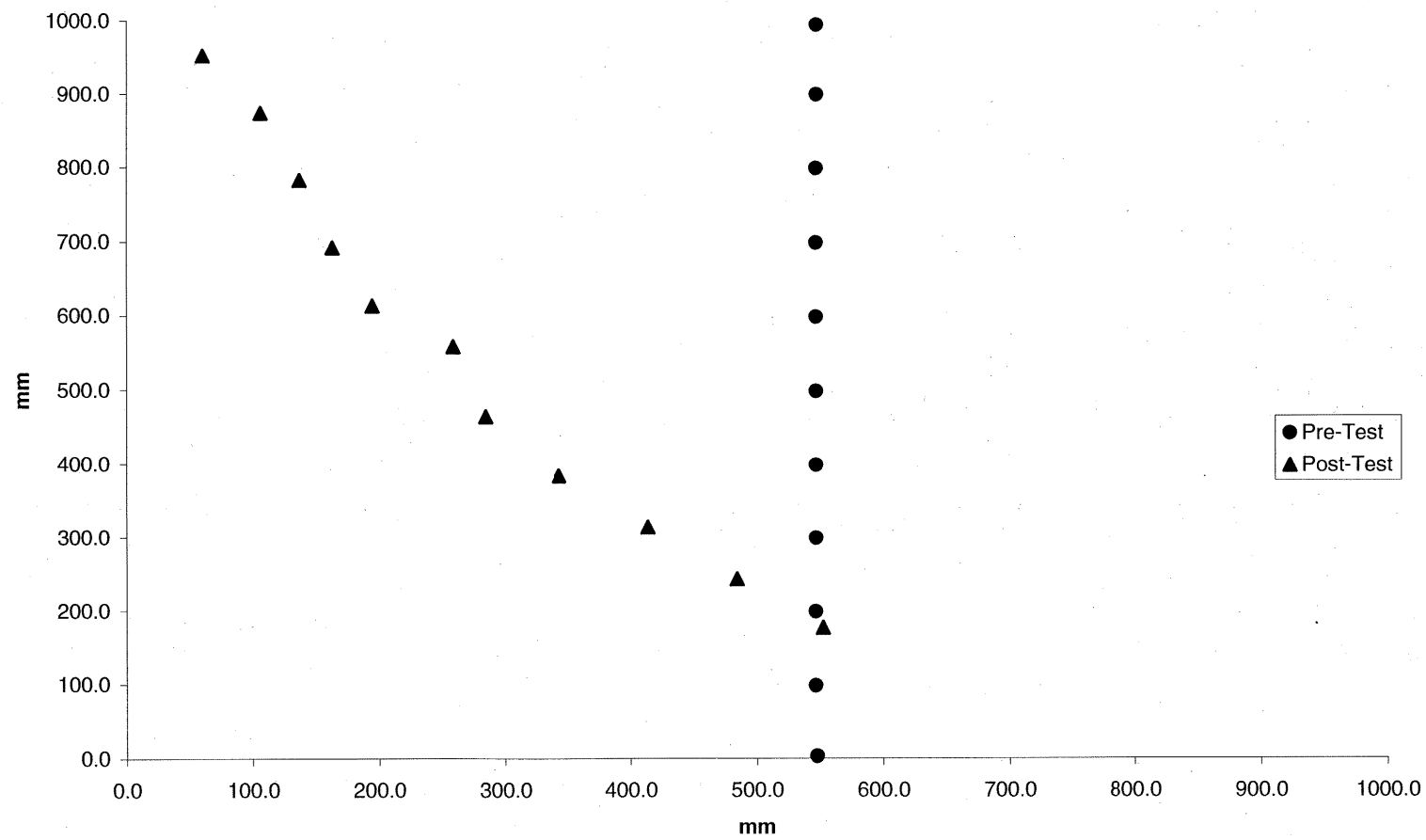


Figure 19 Deformable Barrier Face Profile 56-66



Appendix A

Photographs



Figure A-1 Pre-Test Front View

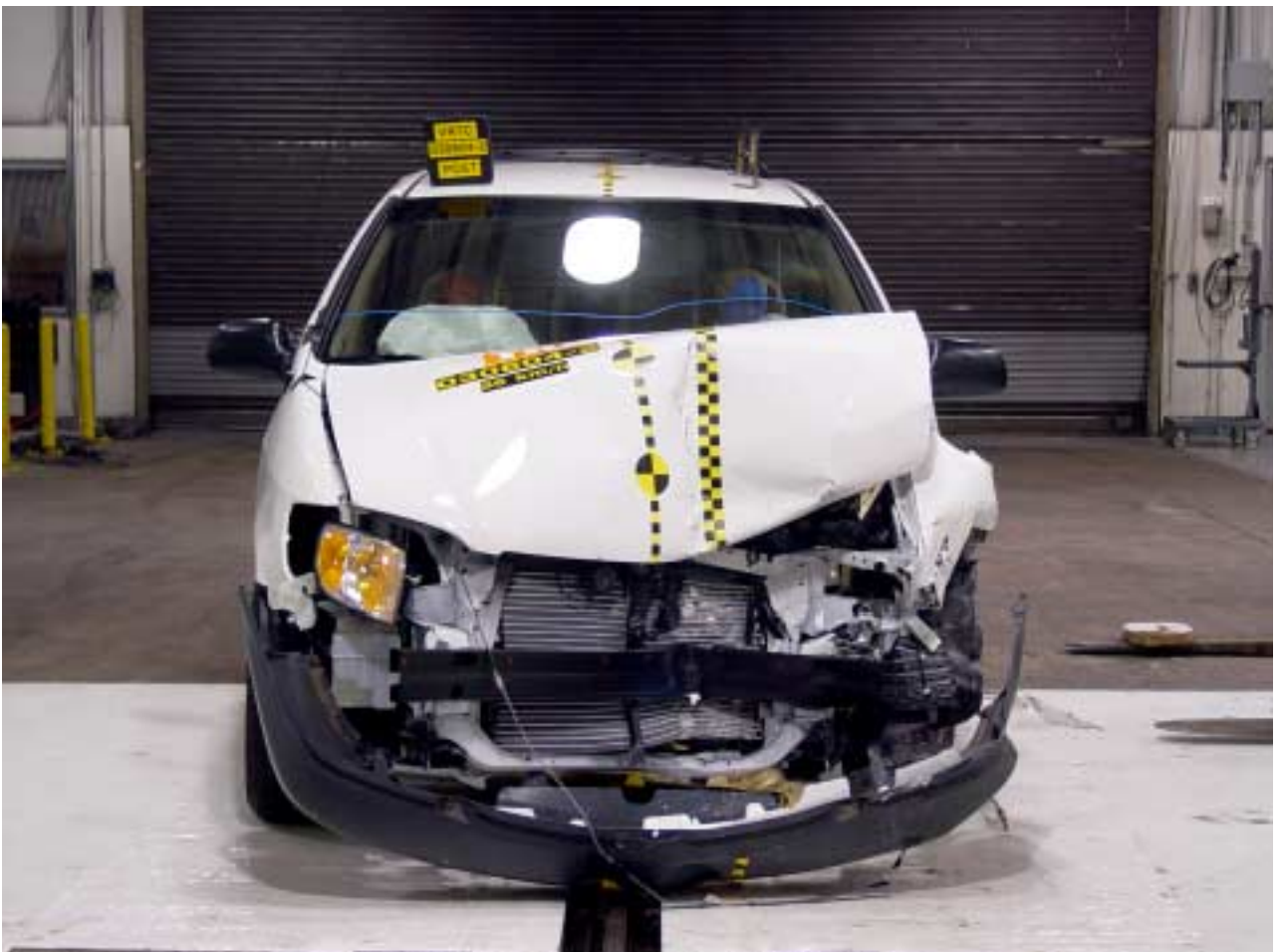


Figure A-2 Post-Test Front View

A-2

030604-2



Figure A-3 Pre-Test Left Front View



Figure A-4 Post-Test Left Front View



Figure A-5 Pre-Test Left Side View



Figure A-6 Post-Test Left Side View



Figure A-7 Pre-Test Left Rear View



Figure A-8 Post-Test Left Rear View



Figure A-9 Pre-Test Rear View



Figure A-10 Post-Test Rear View



Figure A-11 Pre-Test Right Rear View



Figure A-12 Post-Test Right Rear View



Figure A-13 Pre-Test Right Side View



Figure A-14 Post-Test Right Side View



Figure A-15 Pre-Test Right Front View



Figure A-16 Post-Test Right Front View



Figure A-17 Pre-Test Overhead - View 1



Figure A-18 Post-Test Overhead - View 1

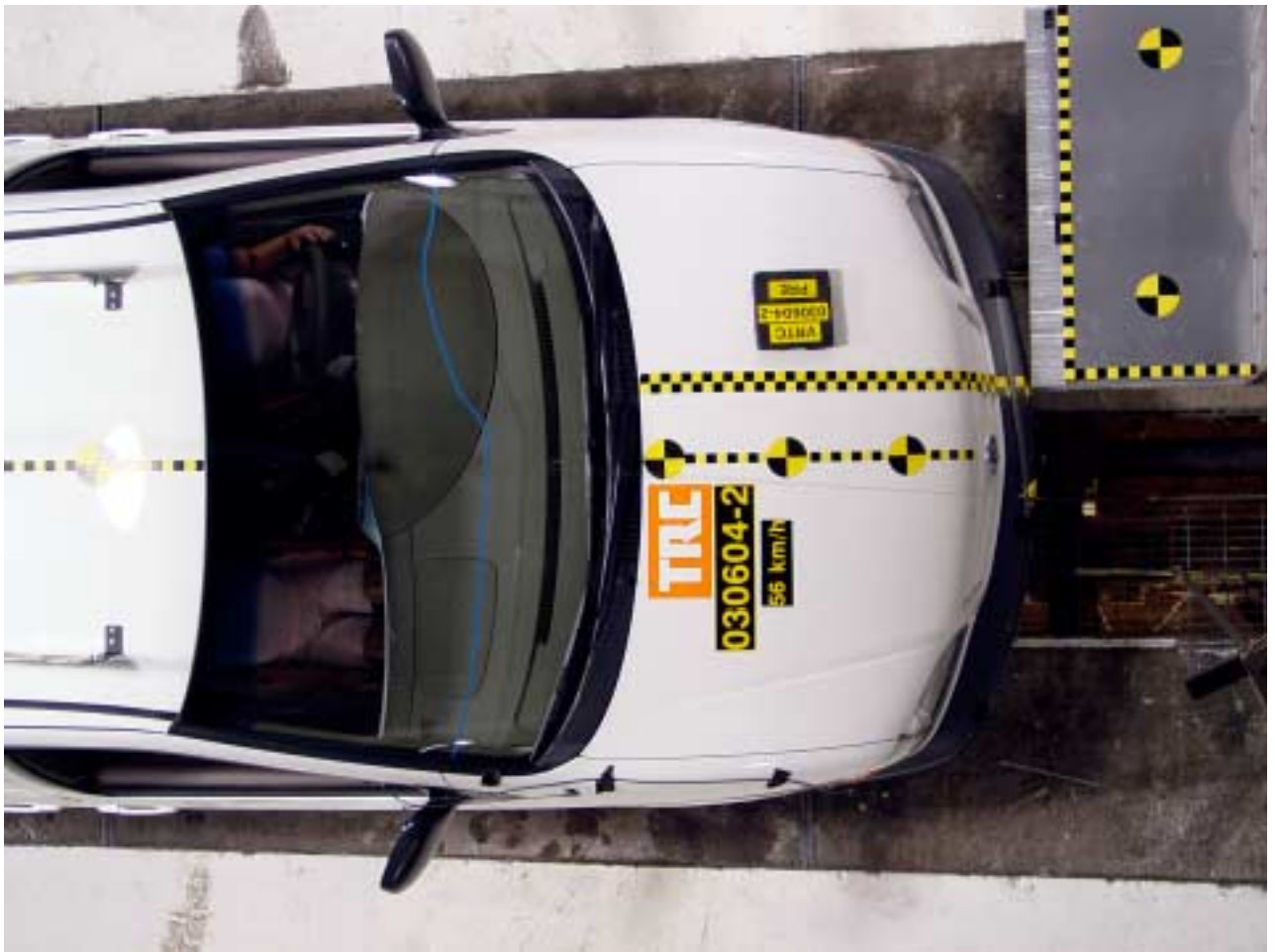


Figure A-19 Pre-Test Overhead - View 2



Figure A-20 Post-Test Overhead - View 2



Figure A-21 Pre-Test Front Underbody View



Figure A-22 Post-Test Front Underbody View

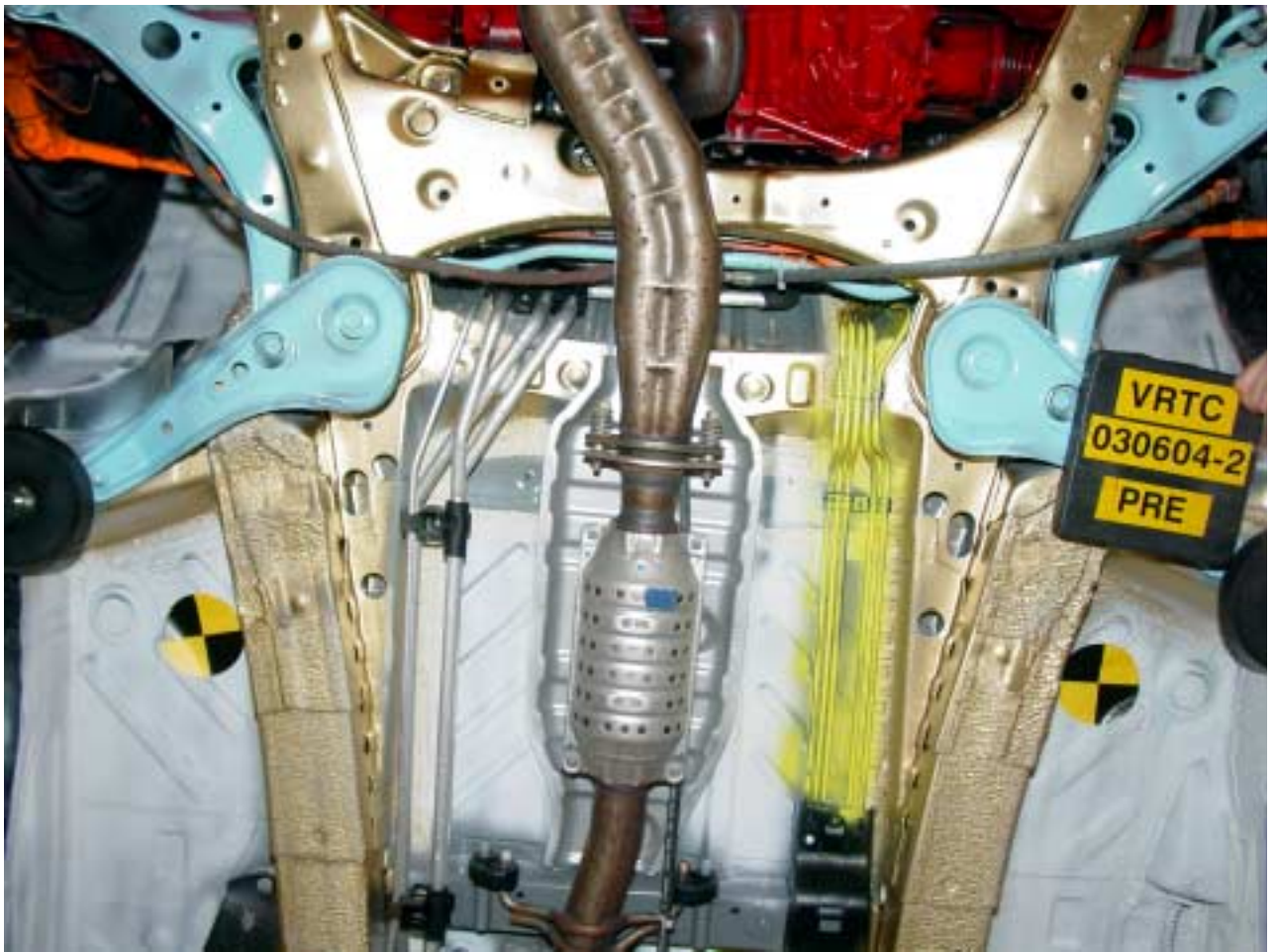


Figure A-23 Pre-Test Front Mid Underbody View

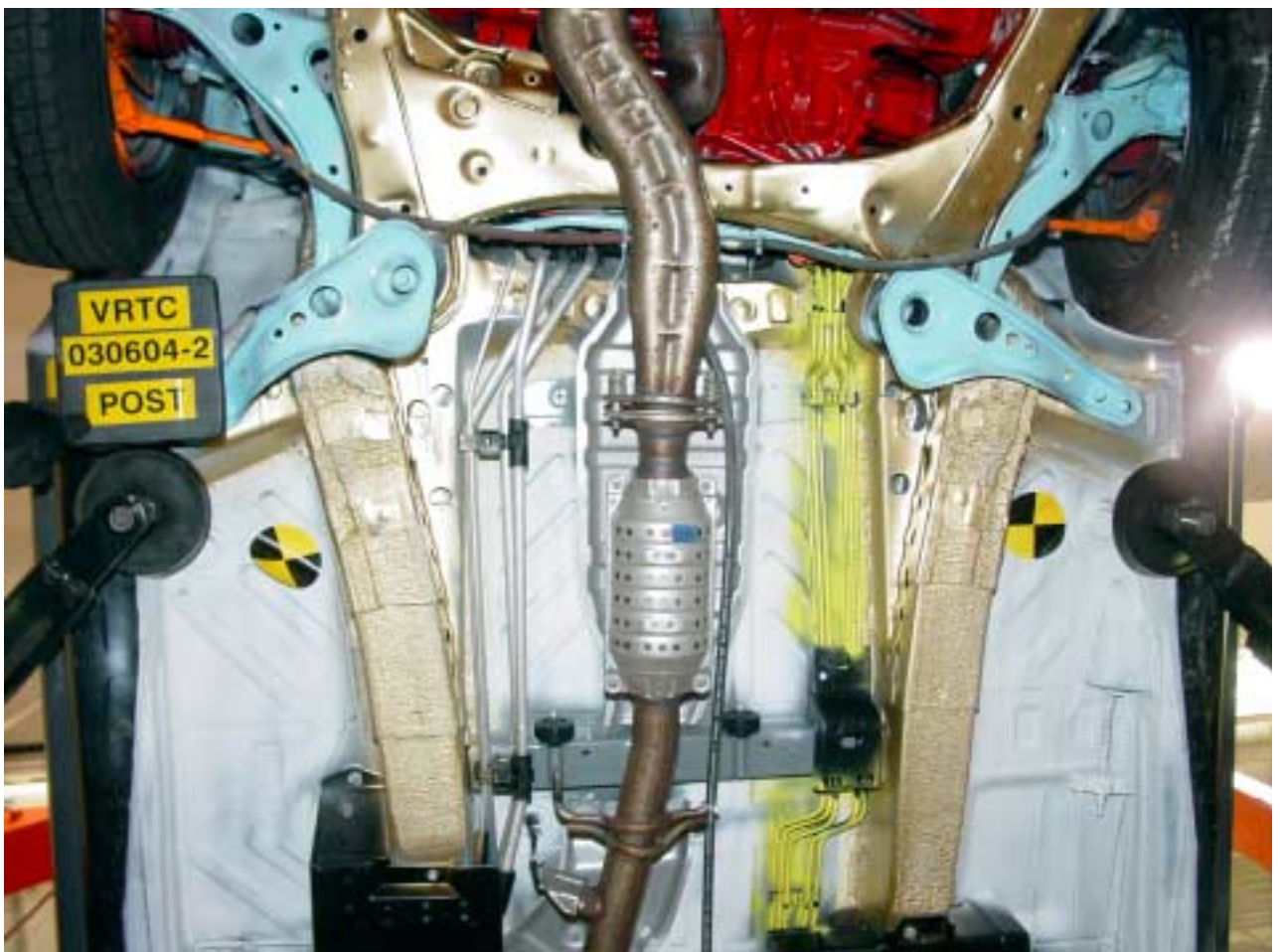


Figure A-24 Post-Test Front Mid Underbody View



Figure A-25 Pre-Test Mid Underbody View



Figure A-26 Post-Test Mid Underbody View



Figure A-27 Pre-Test Rear Mid Underbody View

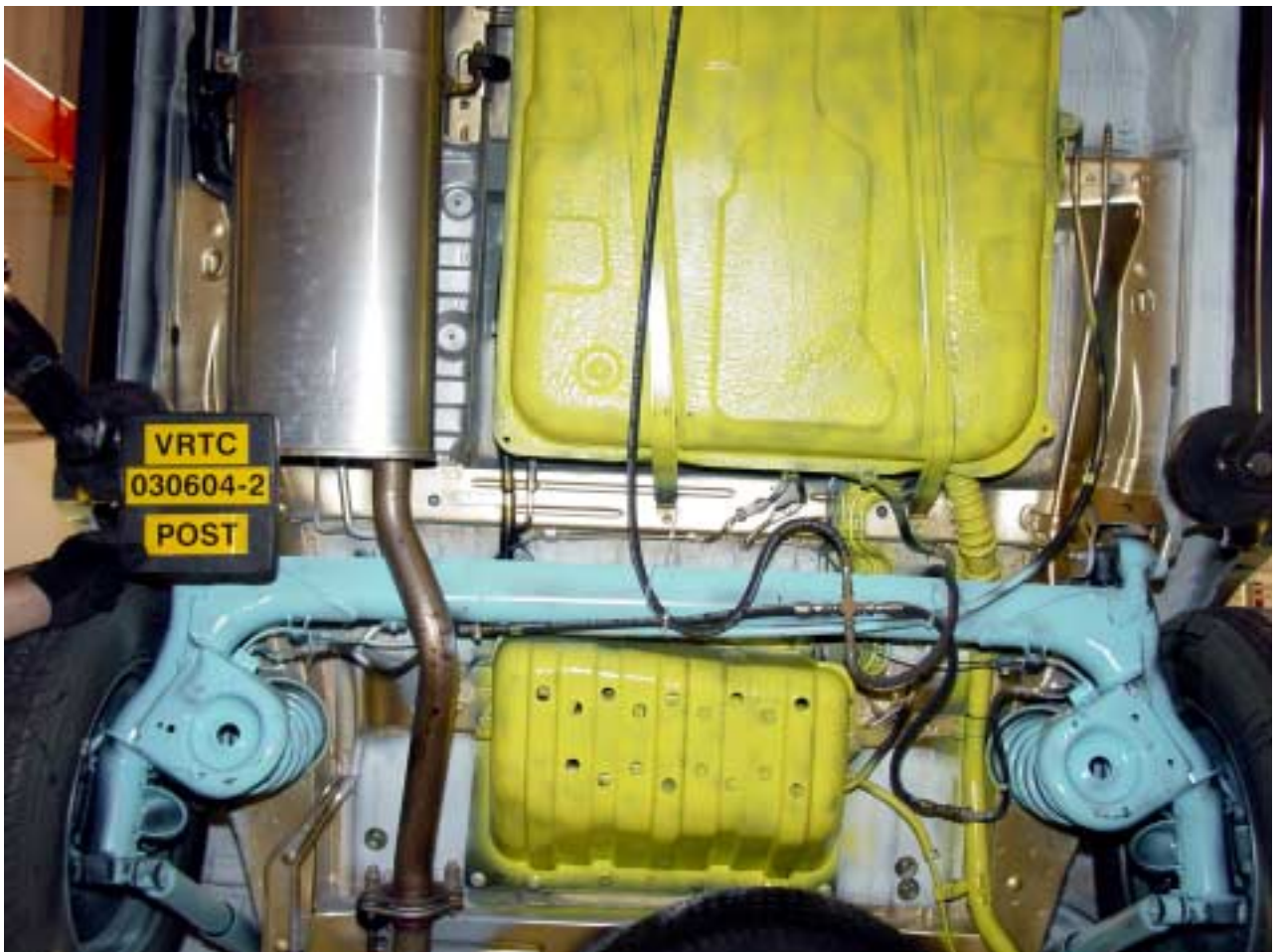


Figure A-28 Post-Test Rear Mid Underbody View



Figure A-29 Pre-Test Rear Underbody View



Figure A-30 Post-Test Rear Underbody View



Figure A-31 Pre-Test Fuel Tank View

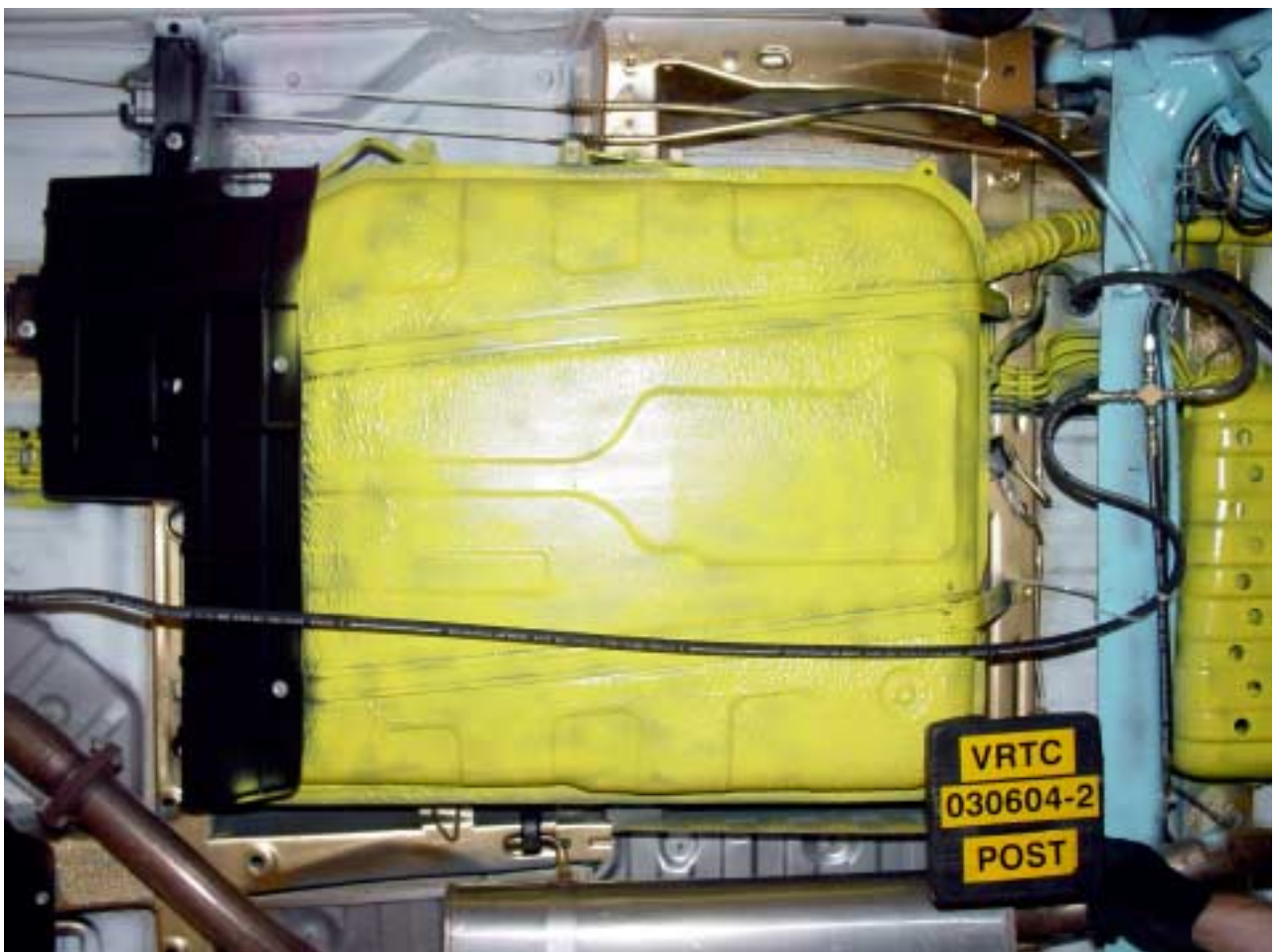


Figure A-32 Post-Test Fuel Tank View



Figure A-33 Pre-Test Fuel Filter View

Intentionally Left Blank



Figure A-34 Pre-Test Engine Compartment View



Figure A-35 Post-Test Engine Compartment View



Figure A-36 Pre-Test Windshield View



Figure A-37 Post-Test Windshield View



Figure A-38 Pre-Test Left Side Angled Windshield View



Figure A-39 Post-Test Left Side Angled Windshield View



Figure A-40 Pre-Test Right Side Angled Windshield View



Figure A-41 Post-Test Right Side Angled Windshield View

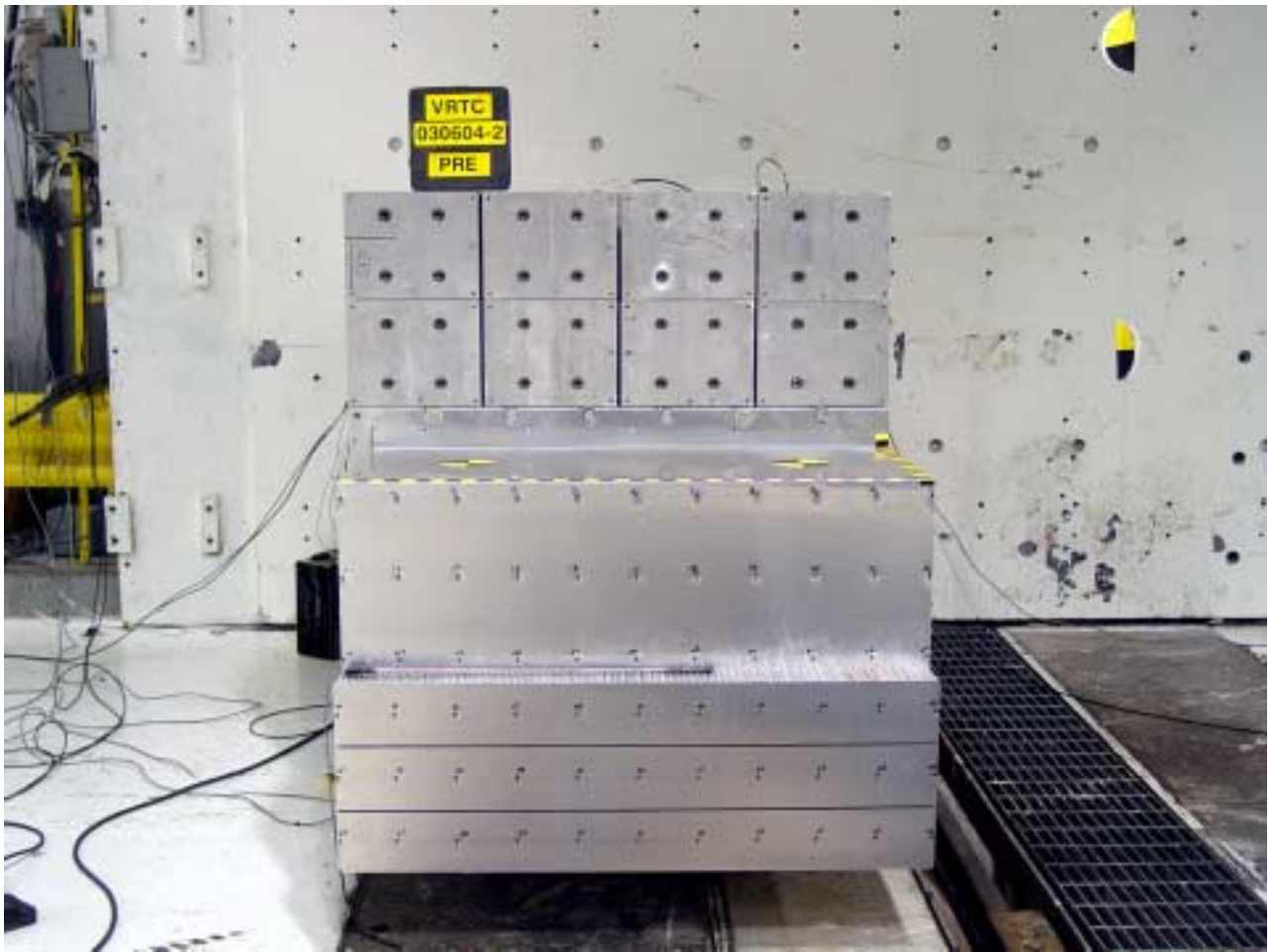


Figure A-42 Pre-Test Front Barrier Face View

Intentionally Left Blank



Figure A-43 Pre-Test Left Side Barrier Face View



Figure A-44 Post-Test Left Side Barrier Face View

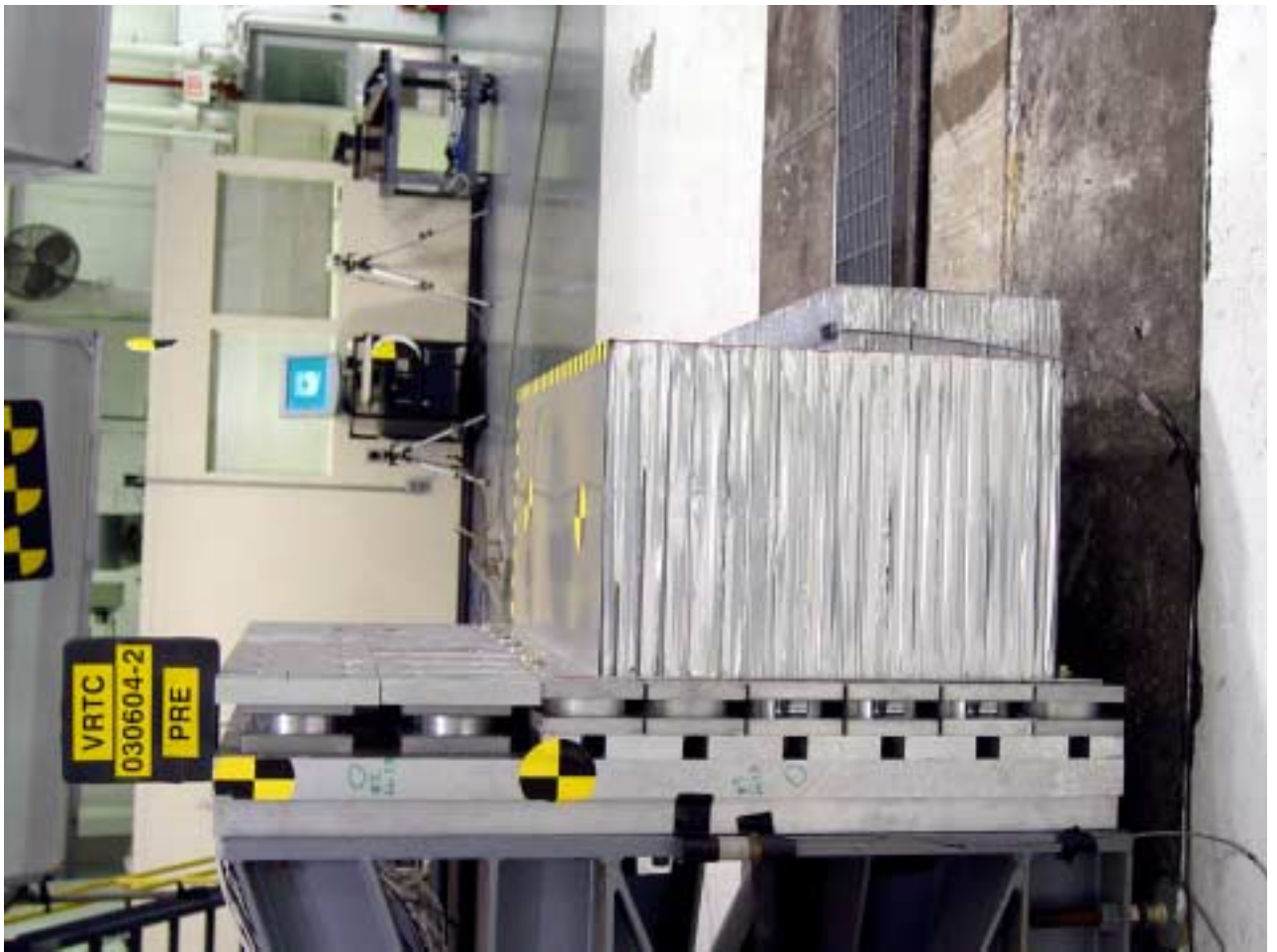


Figure A-45 Pre-Test Right Side Barrier Face View



Figure A-46 Post-Test Right Side Barrier Face View

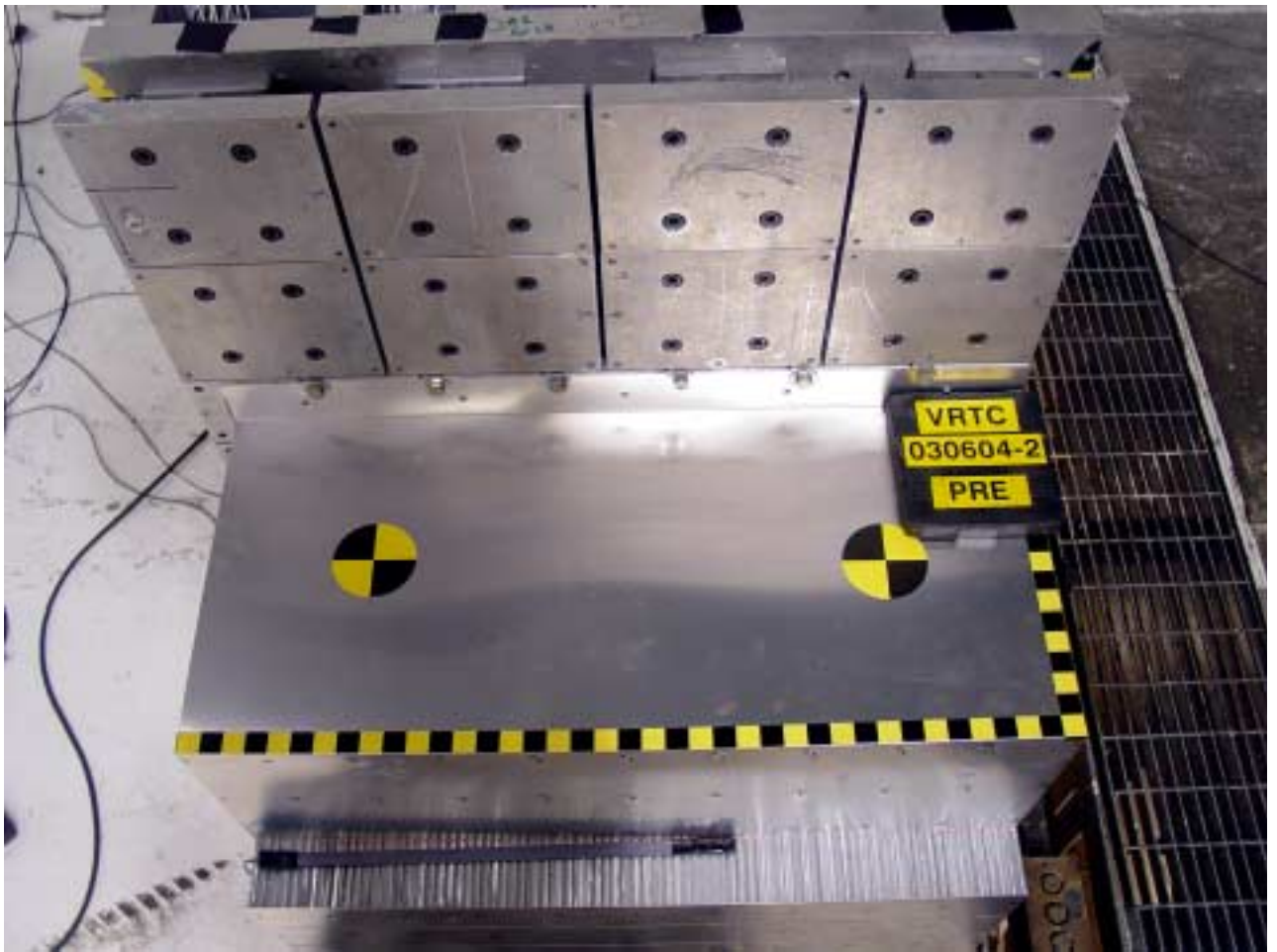


Figure A-47 Pre-Test Overhead Barrier Face View



Figure A-48 Post-Test Overhead Barrier Face View



Figure A-49 Pre-Test Driver and Passenger Dummies Front View



Figure A-50 Post-Test Driver and Passenger Dummies Front View



Figure A-51 Pre-Test Driver Dummy Position - View 1

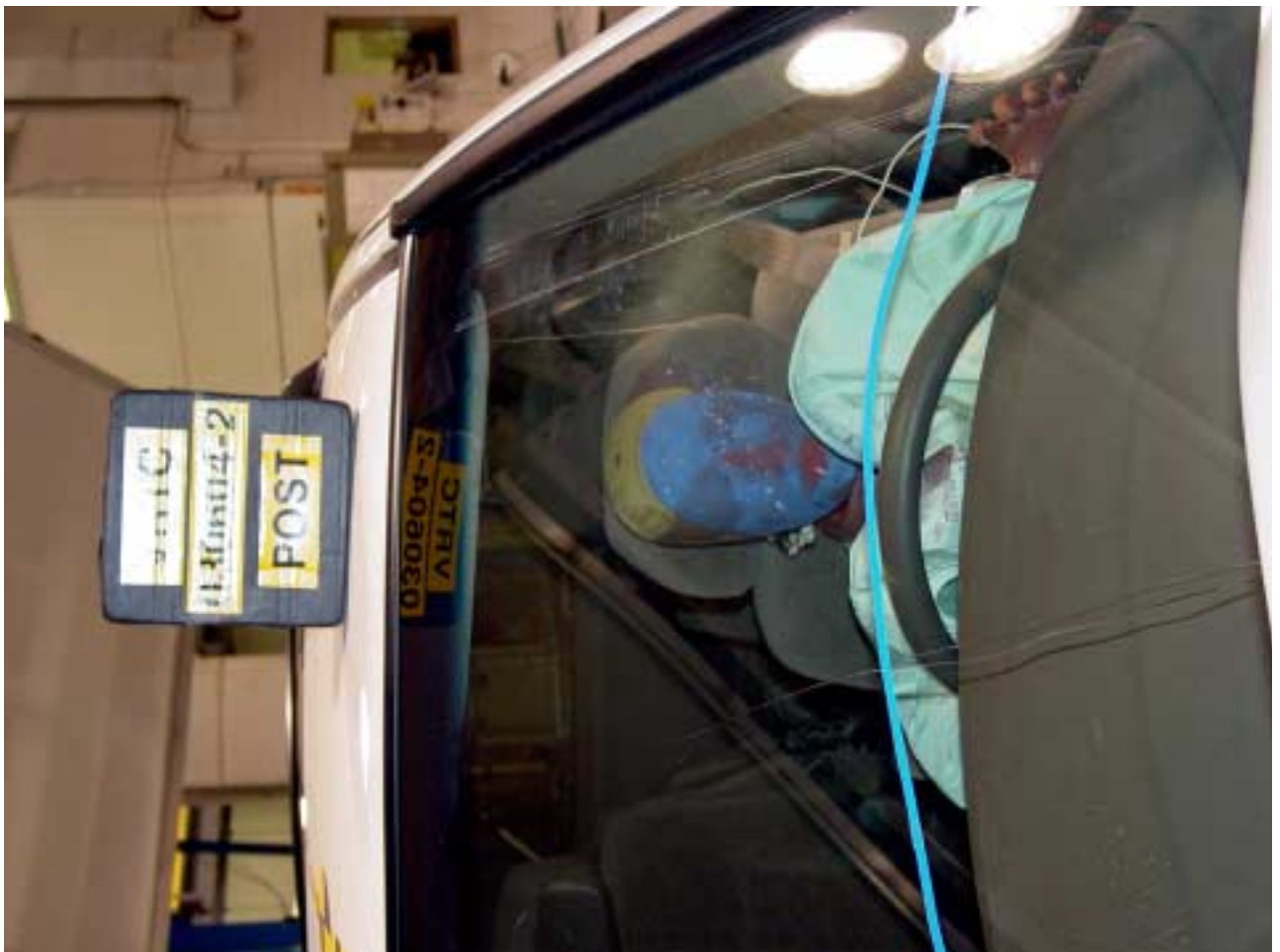


Figure A-52 Post-Test Driver Dummy Position - View 1



Figure A-53 Pre-Test Driver Dummy Position - View 2



Figure A-54 Post-Test Driver Dummy Position - View 2



Figure A-55 Pre-Test Driver Dummy & Vehicle Interior - View 1



Figure A-56 Post-Test Driver Dummy & Vehicle Interior - View 1



Figure A-57 Pre-Test Driver Dummy & Vehicle Interior - View 2



Figure A-58 Post-Test Driver Dummy & Vehicle Interior - View 2



Figure A-59 Pre-Test Passenger Dummy Position - View 1



Figure A-60 Post-Test Passenger Dummy Position - View 1



Figure A-61 Pre-Test Passenger Dummy Position - View 2



Figure A-62 Post-Test Passenger Dummy Position - View 2



Figure A-63 Pre-Test Passenger Dummy & Vehicle Interior - View 1



Figure A-64 Post-Test Passenger Dummy & Vehicle Interior - View 1



Figure A-65 Pre-Test Passenger Dummy & Vehicle Interior - View 2



Figure A-66 Post-Test Passenger Dummy & Vehicle Interior - View 2



Figure A-67 Post-Test Driver Dummy Overall View



Figure A-68 Post-Test Driver Dummy Head Contact - View 1



Figure A-69 Post-Test Driver Dummy Head Contact - View 2



Figure A-70 Post-Test Driver Dummy Head Contact - View 3

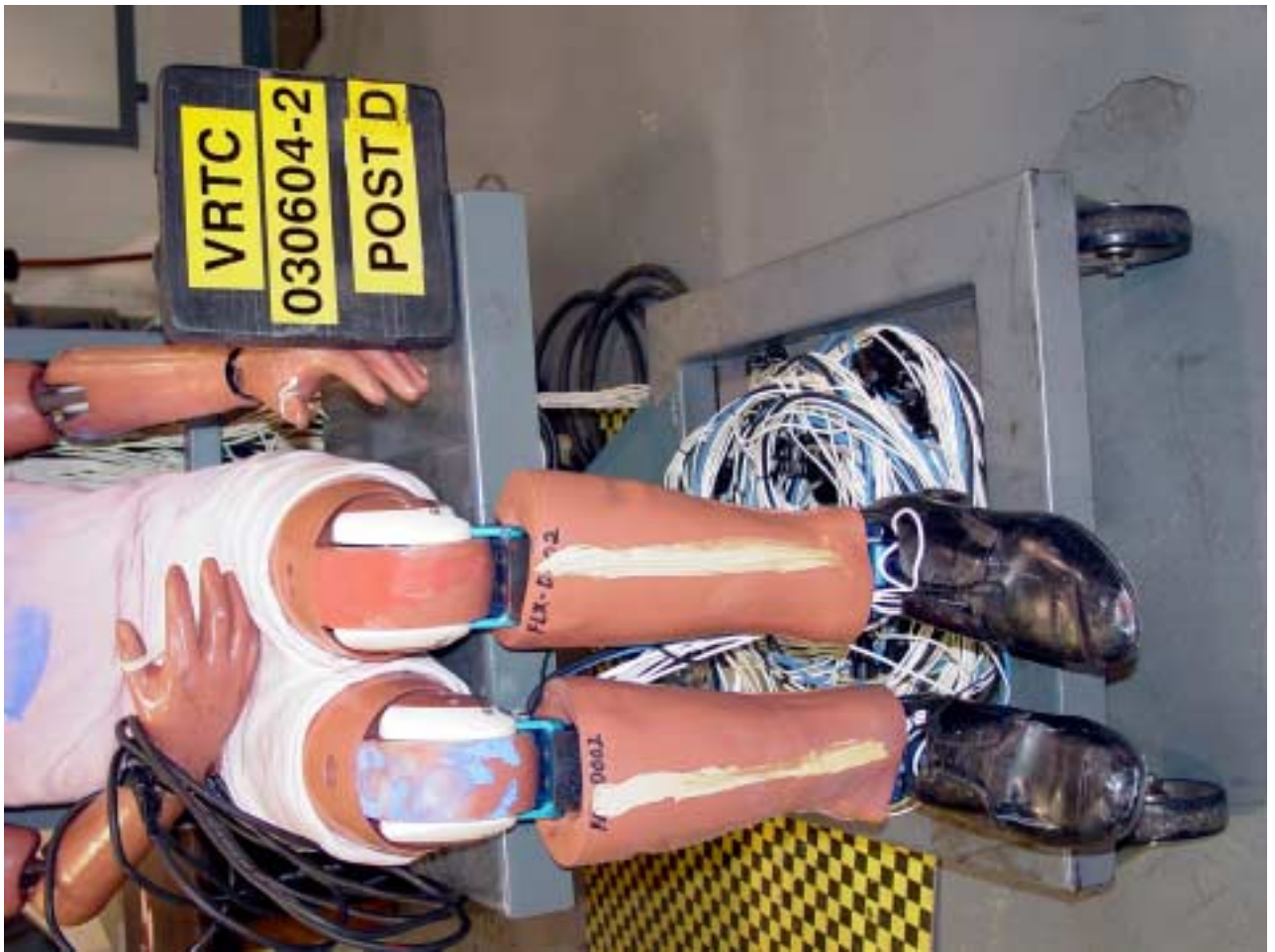


Figure A-71 Post-Test Driver Knee Contact - View 1



Figure A-72 Post-Test Driver Knee Contact - View 2



Figure A-73 Post-Test Passenger Dummy Overall View



Figure A-74 Post-Test Passenger Dummy Head Contact - View 1



Figure A-75 Post-Test Passenger Dummy Head Contact - View 2



Figure A-76 Post-Test Passenger Dummy Head Contact - View 3

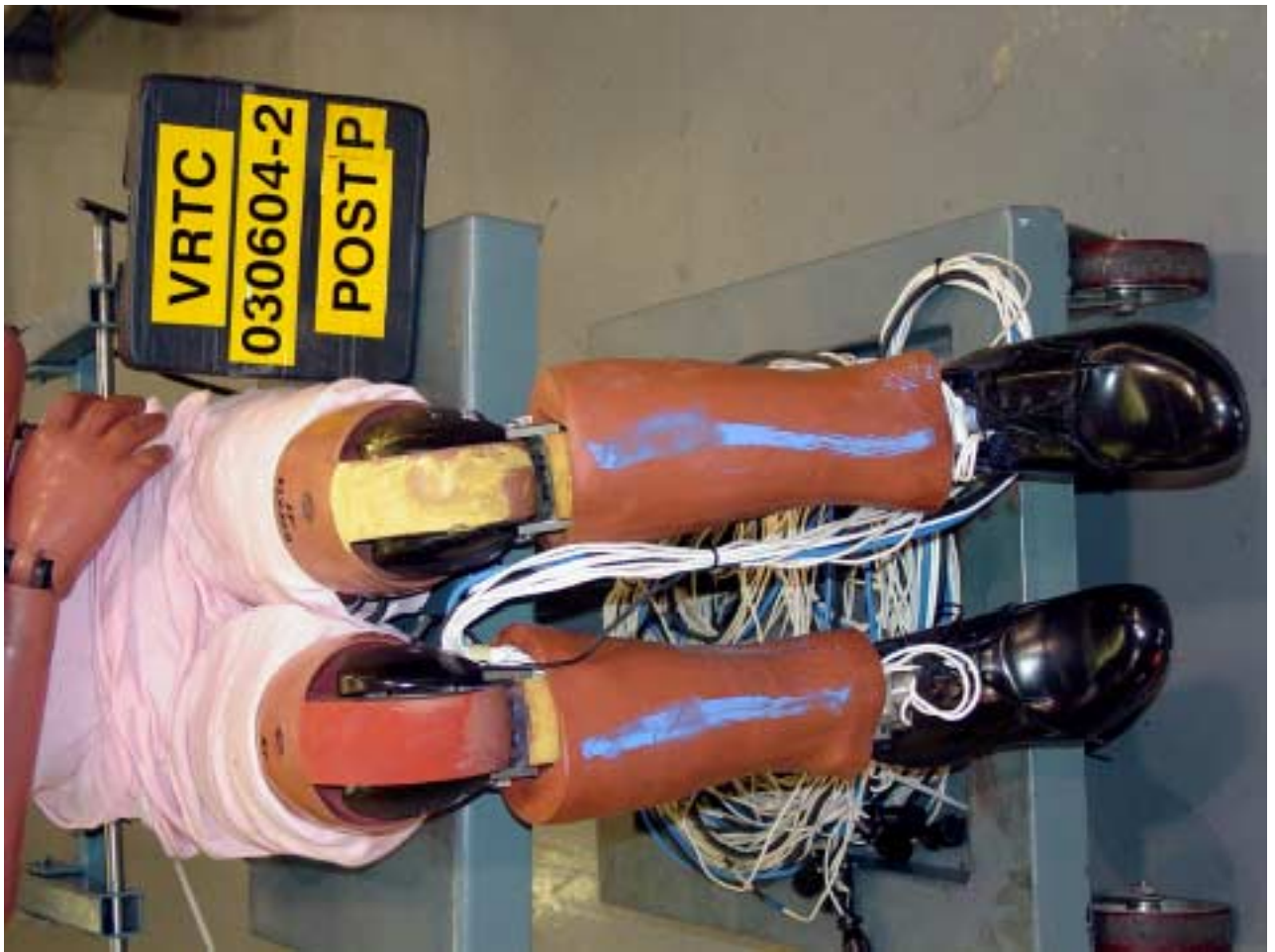


Figure A-77 Post-Test Passenger Dummy Knee Contact - View 1



Figure A-78 Post-Test Passenger Dummy Knee Contact - View 2



Figure A-79 Post-Test Bumper to Rail Attachment View



Figure A-80 Post-Test Wheel/Tire Deformation View



Figure A-81 Post-Test Wheel Well View



Figure A-82 Post-Test Wheel to Rocker Contact View

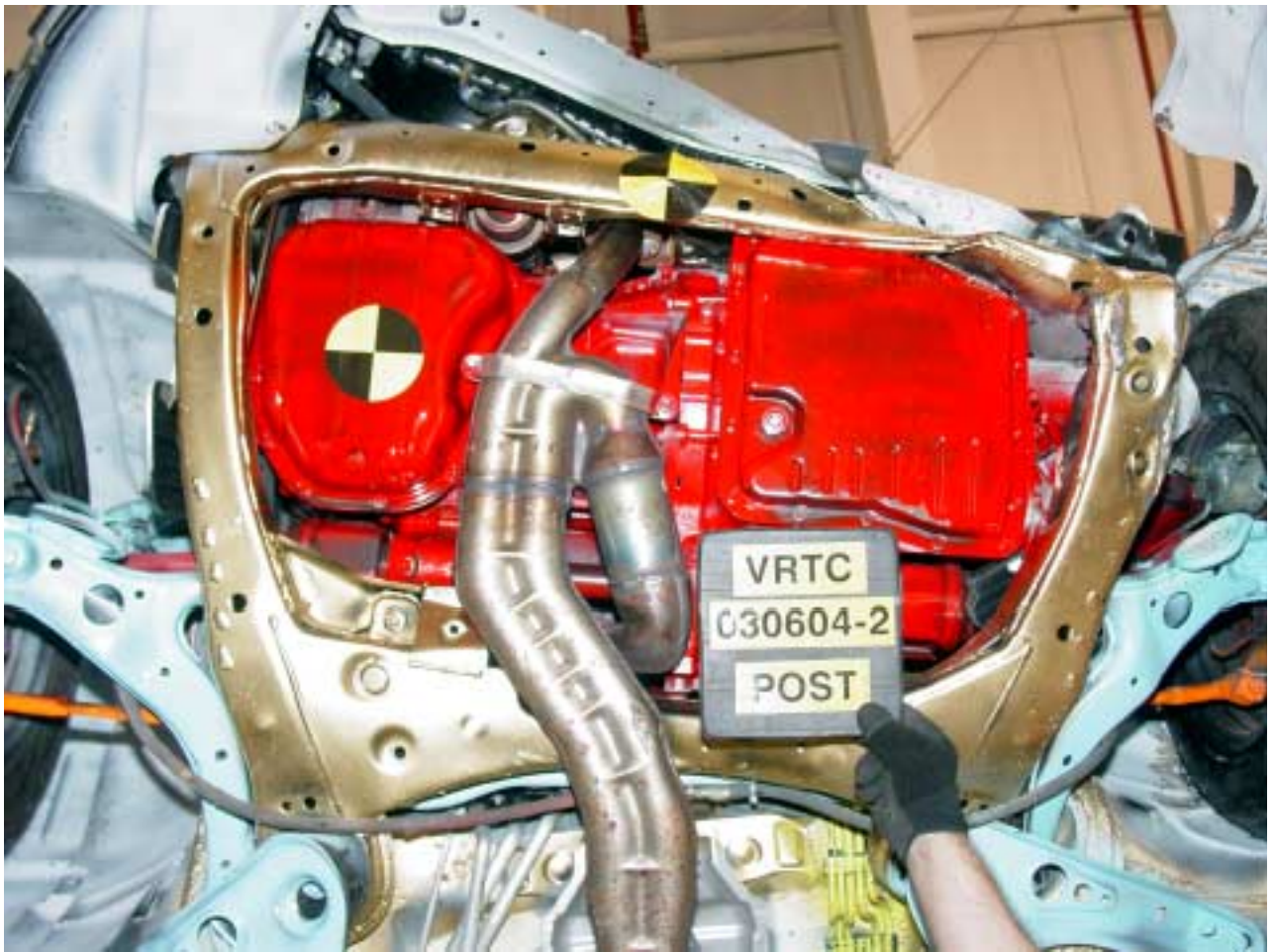


Figure A-83 Post-Test Vehicle Sub-Frame Damage - View 1



Figure A-84 Post-Test Vehicle Sub-Frame Damage - View 2



Figure A-85 Post-Test Vehicle Sub-Frame Damage - View 3



Figure A-86 Post-Test Vehicle Sub-Frame Damage - View 4



Figure A-87 Post-Test Vehicle Roof Deformation - View 1



Figure A-88 Post-Test Vehicle Roof Deformation - View 2



Figure A-89 Post-Test Vehicle Axle-Tube Damage View



Figure A-90 Pre-Test Vehicle Ballast View



Figure A-91 Vehicle Tire Load Label View



Figure A-92 Vehicle Certification Label View

Appendix B

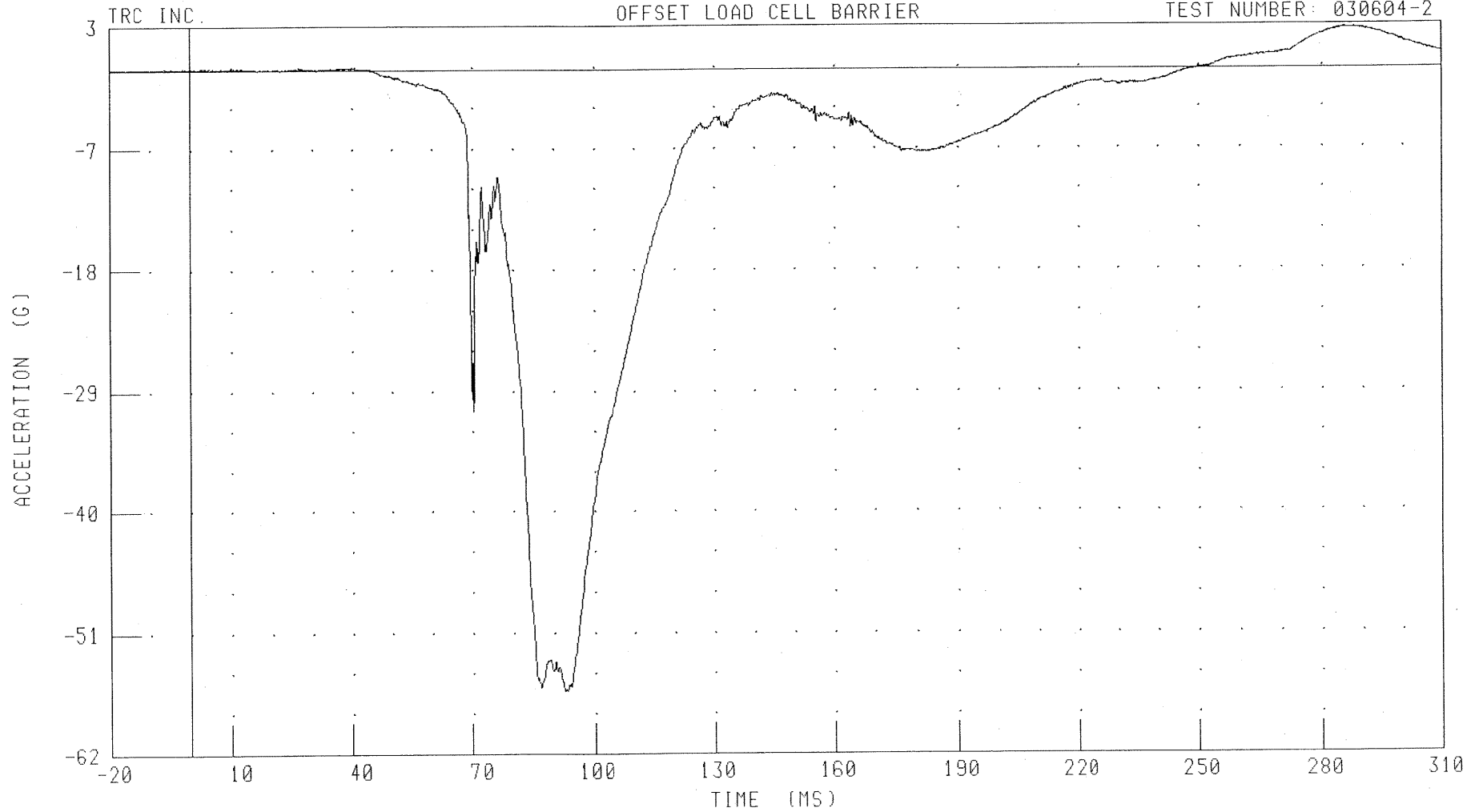
Data Plots

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

PEAK DATA: 3.63 G @ 285.60 MS; -56.44 G @ 93.28 MS

B-2

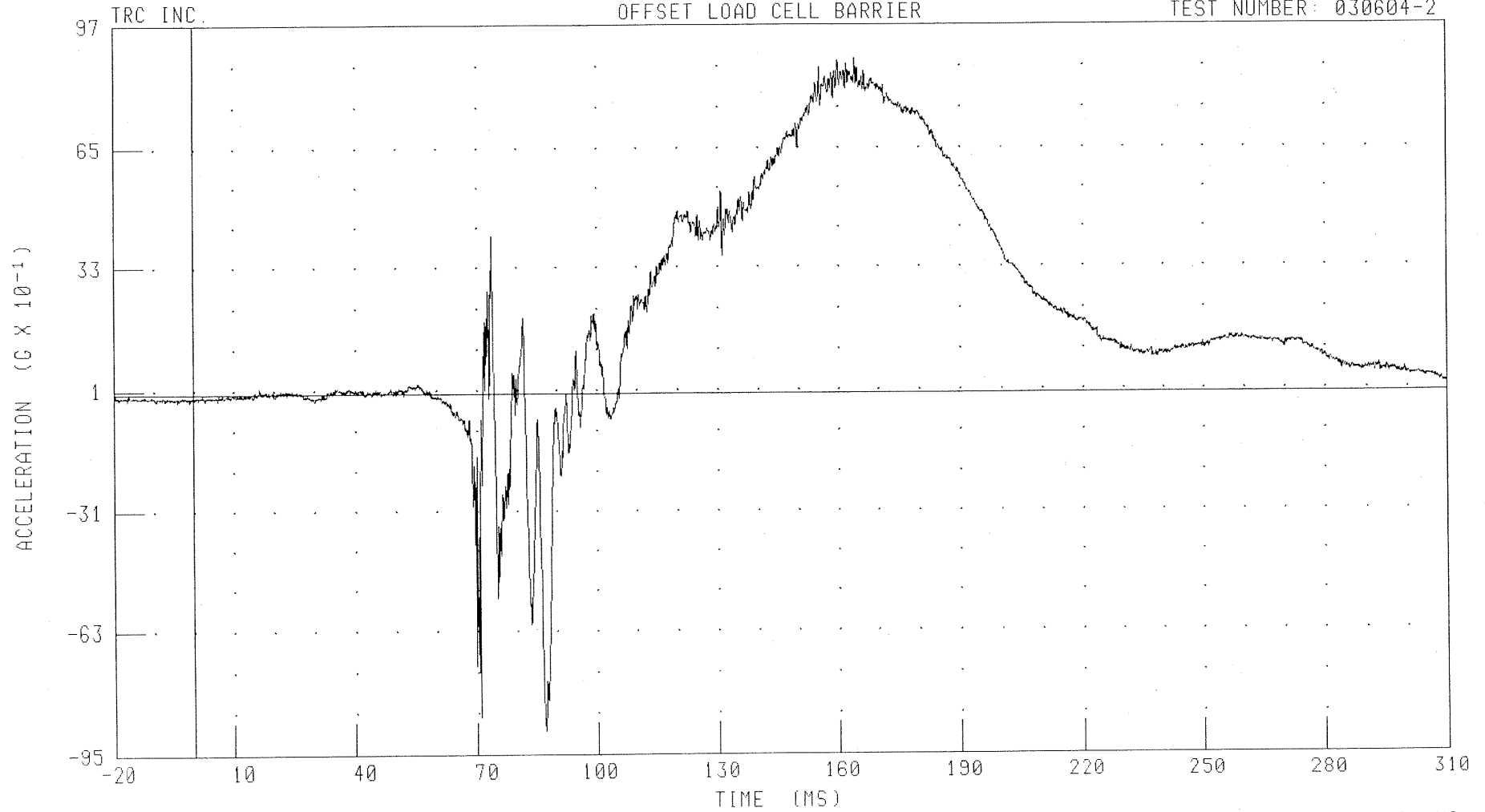
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

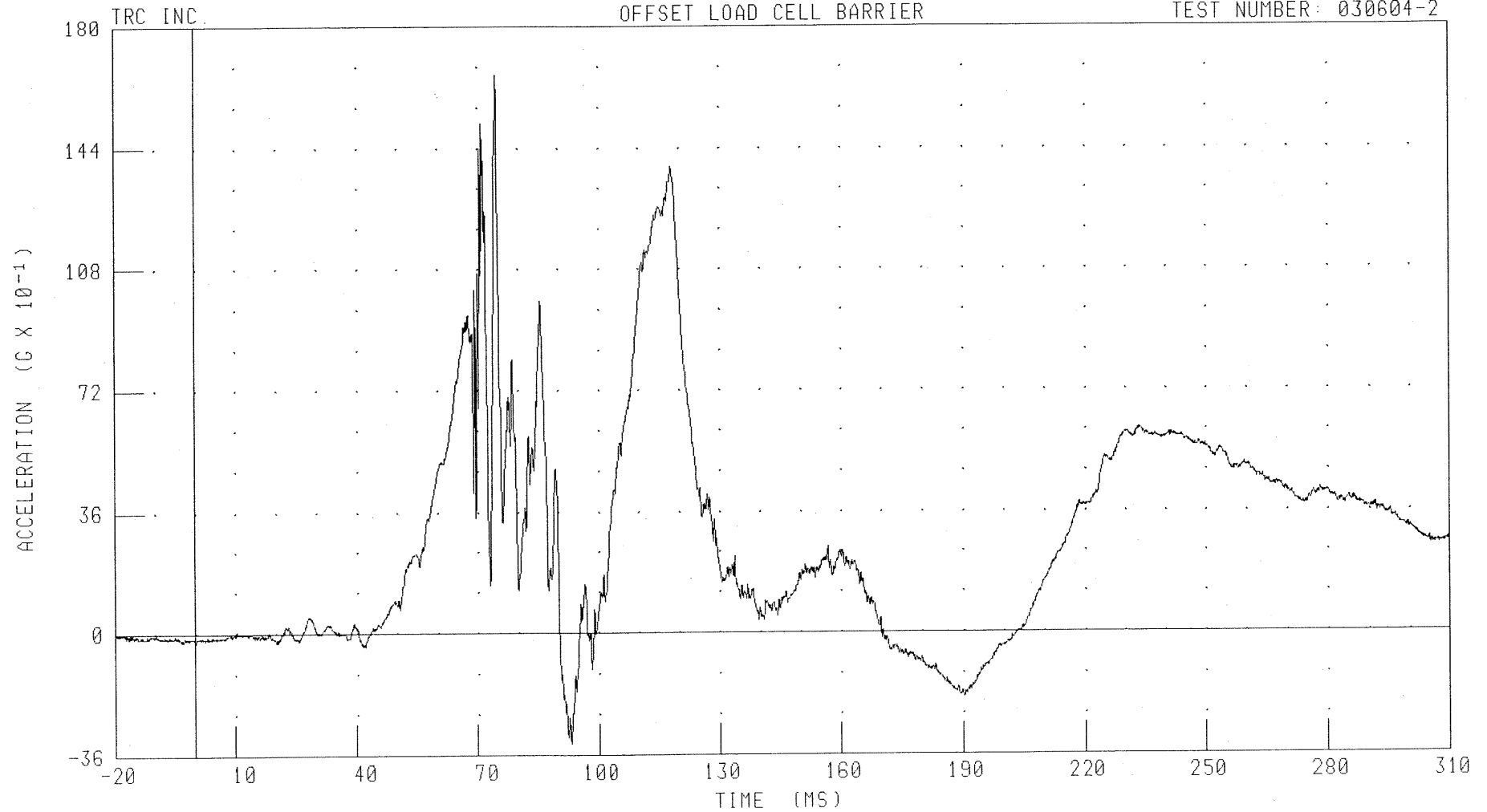
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2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 16.57 G @ 74.80 MS; -3.27 G @ 93.20 MS

B-4

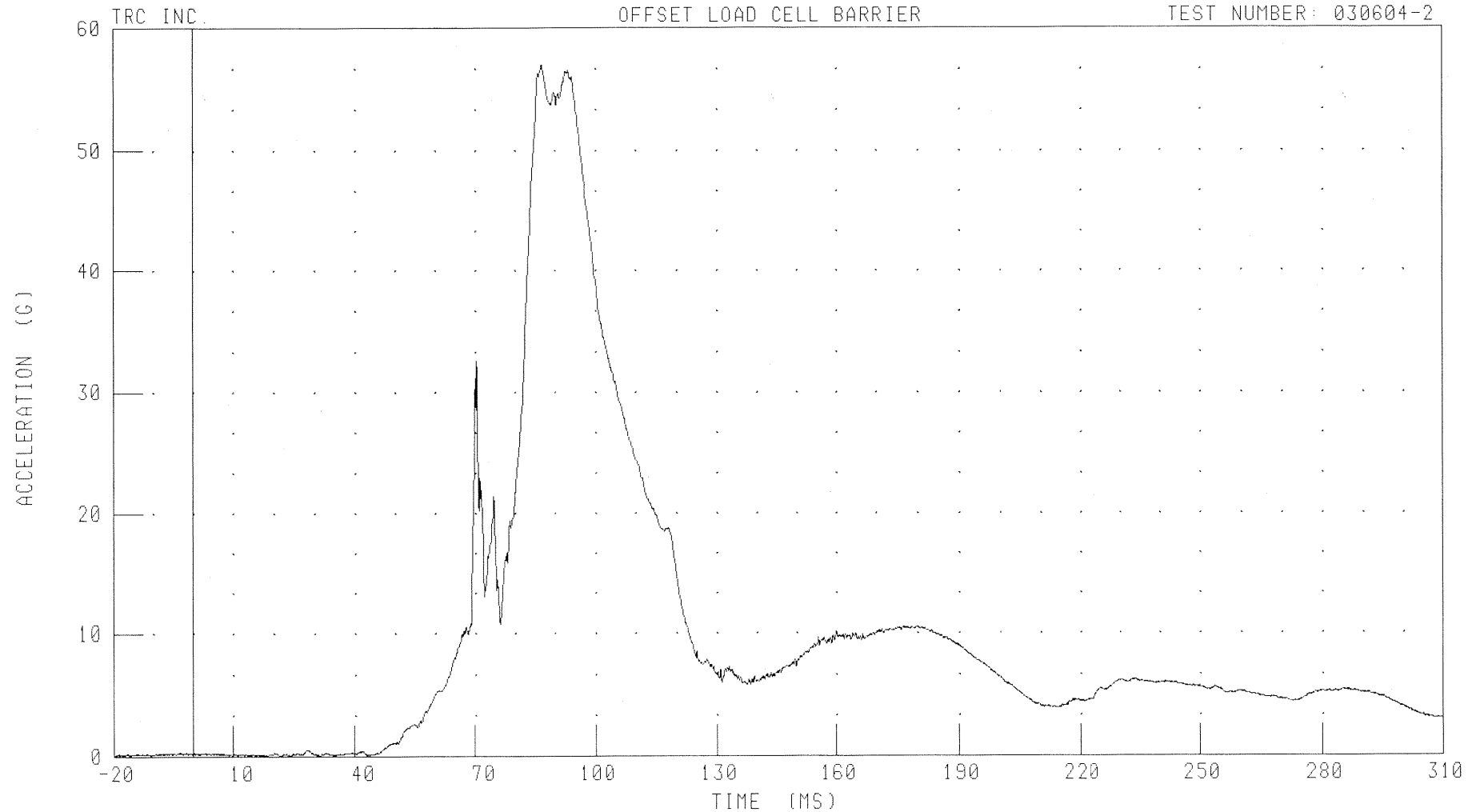
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 57.00 G @ 86.72 MS; 0.02 G @ -16.32 MS

B-5

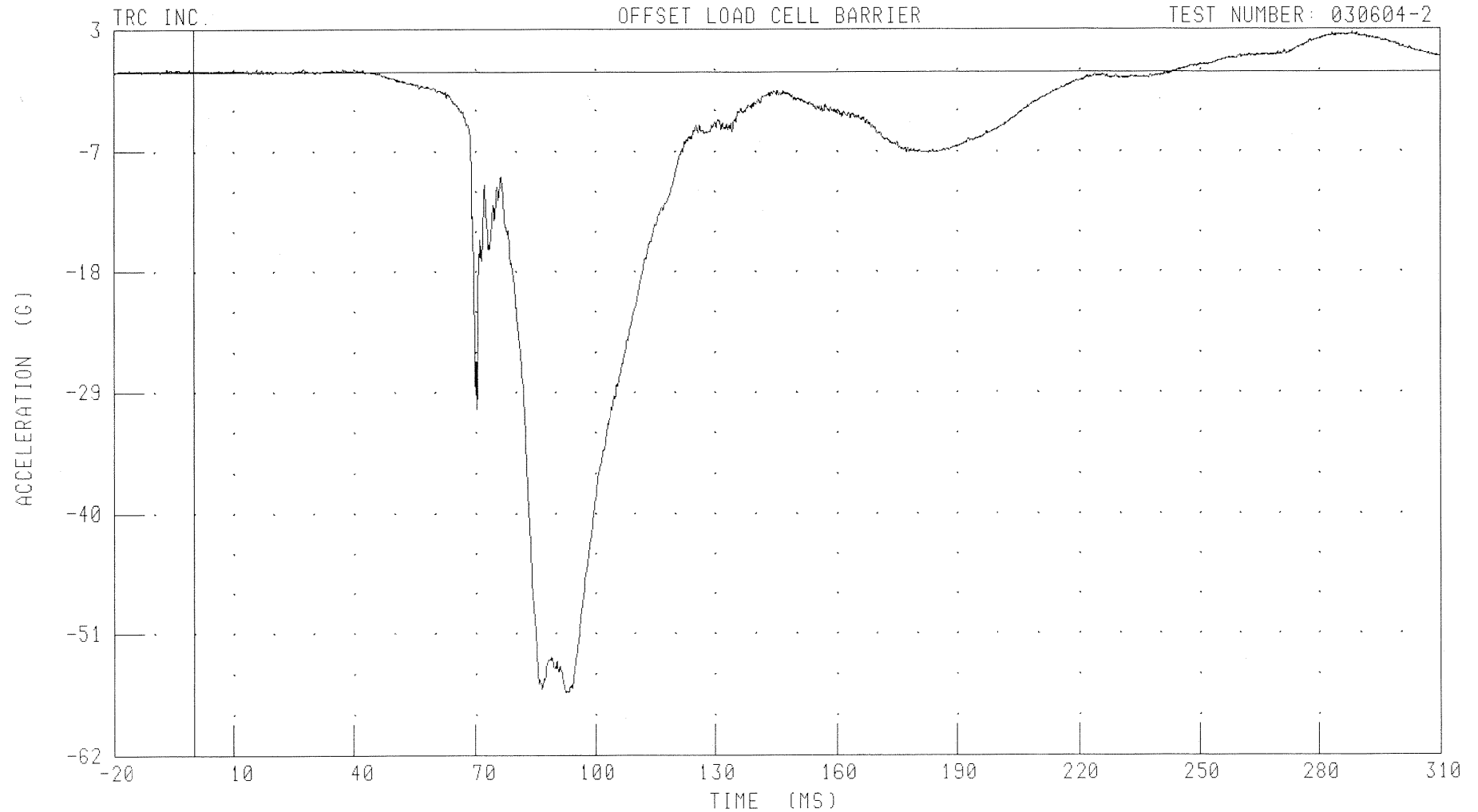
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD X-AXIS ACCELERATION REDUNDANT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDXR1 FILTER: CH. CLASS 1000

PEAK DATA: 3.61 G @ 288.16 MS; -56.46 G @ 92.56 MS

B-6

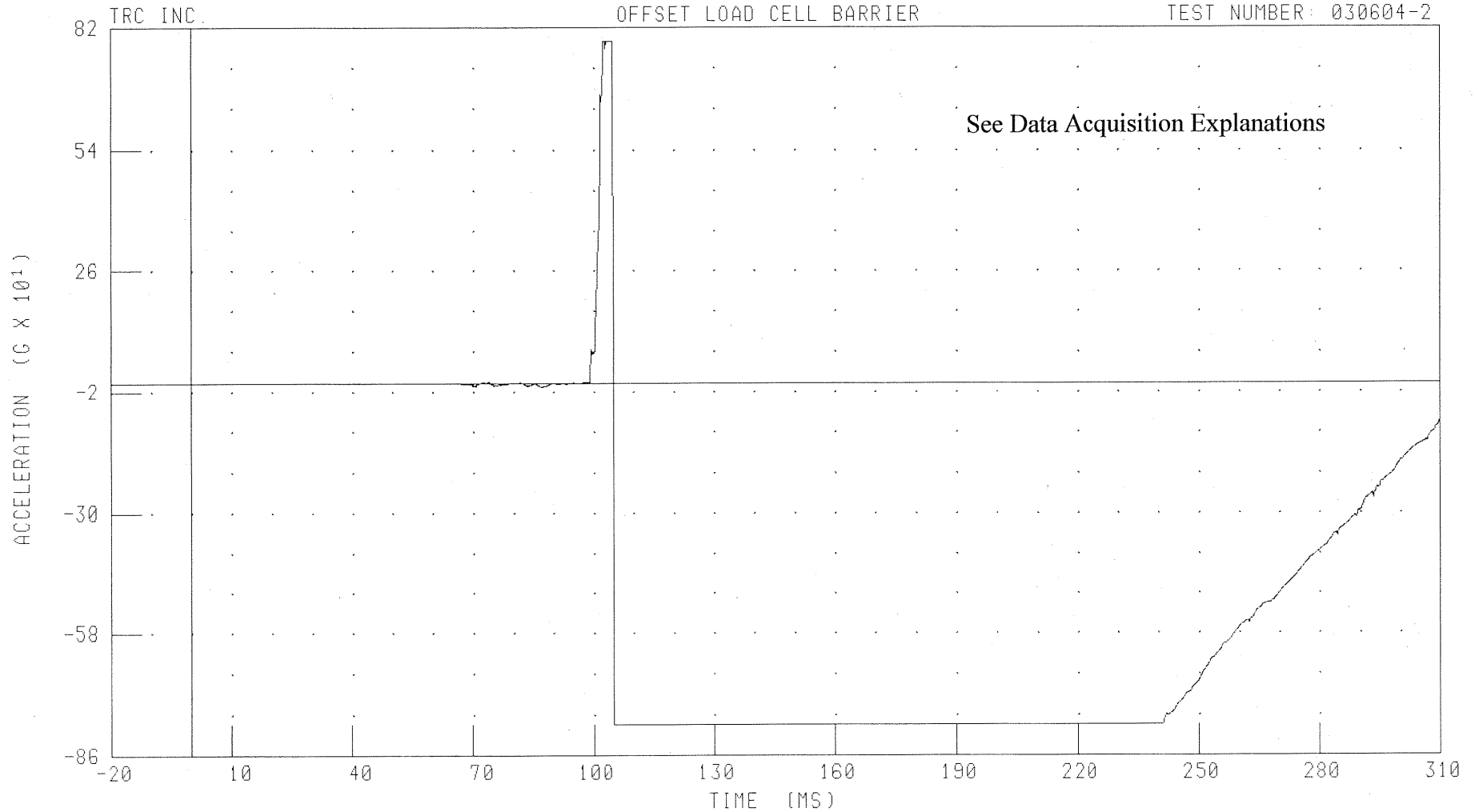
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Y-AXIS ACCELERATION REDUNDANT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FEDYR1 FILTER: CH. CLASS 1000

PEAK DATA: 789.26 G @ 102.48 MS, -789.06 G @ 105.28 MS

B-7

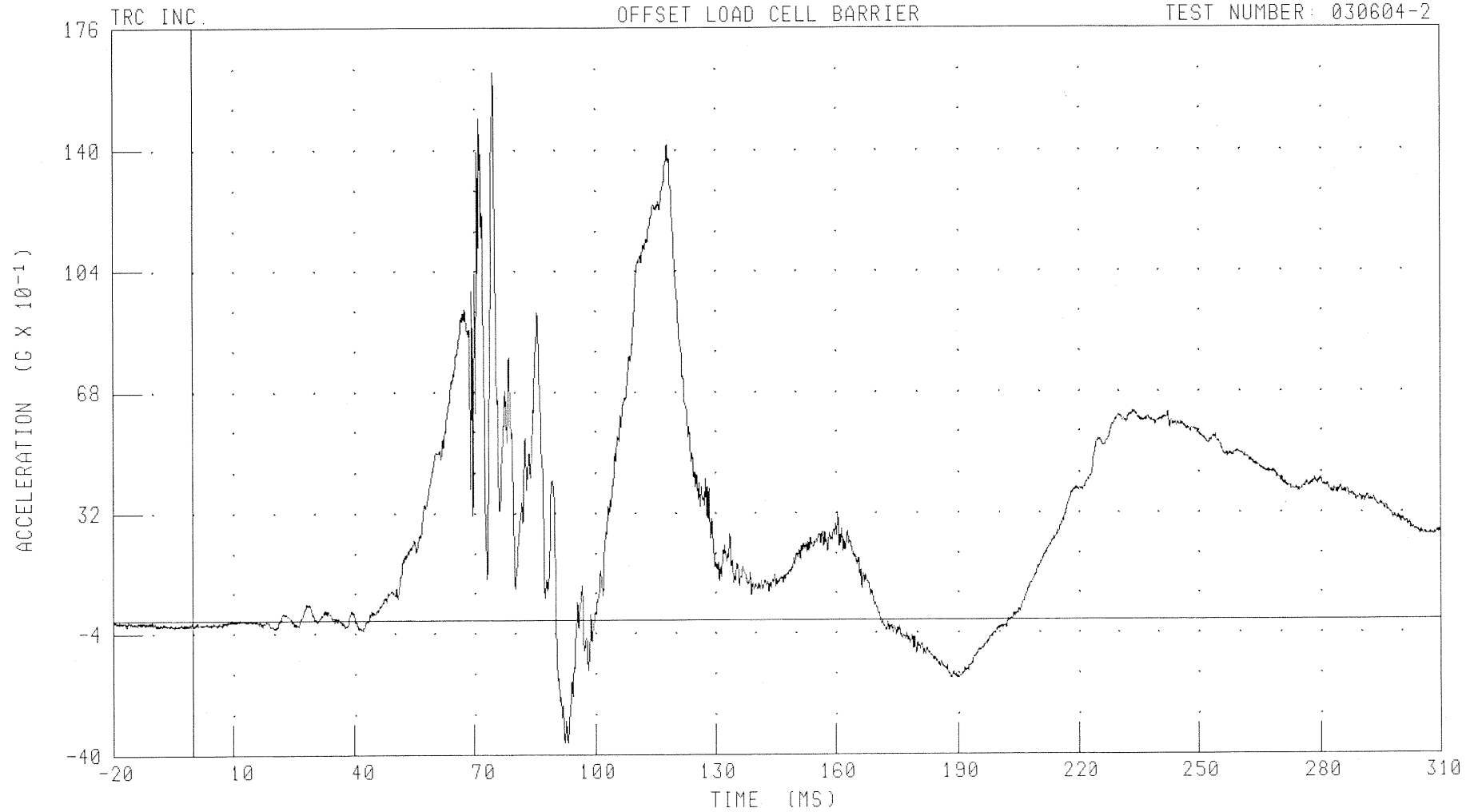
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Z-AXIS ACCELERATION REDUNDANT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDZR1 FILTER: CH. CLASS 1000

PEAK DATA: 16.31 G @ 74.80 MS; -3.65 G @ 92.48 MS

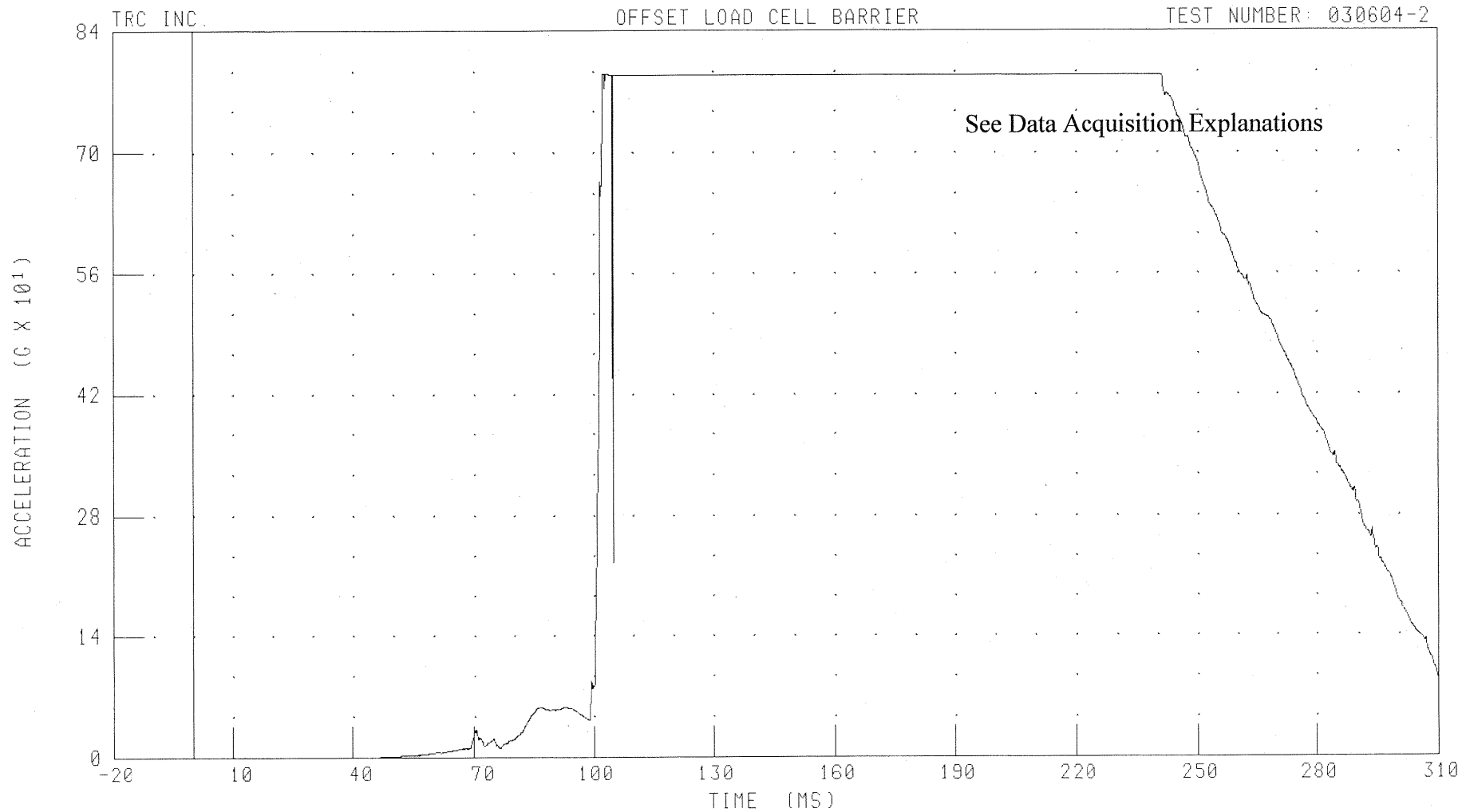
B-8

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER HEAD RESULTANT ACCELERATION REDUNDANT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDRR1 FILTER: CH. CLASS 1000

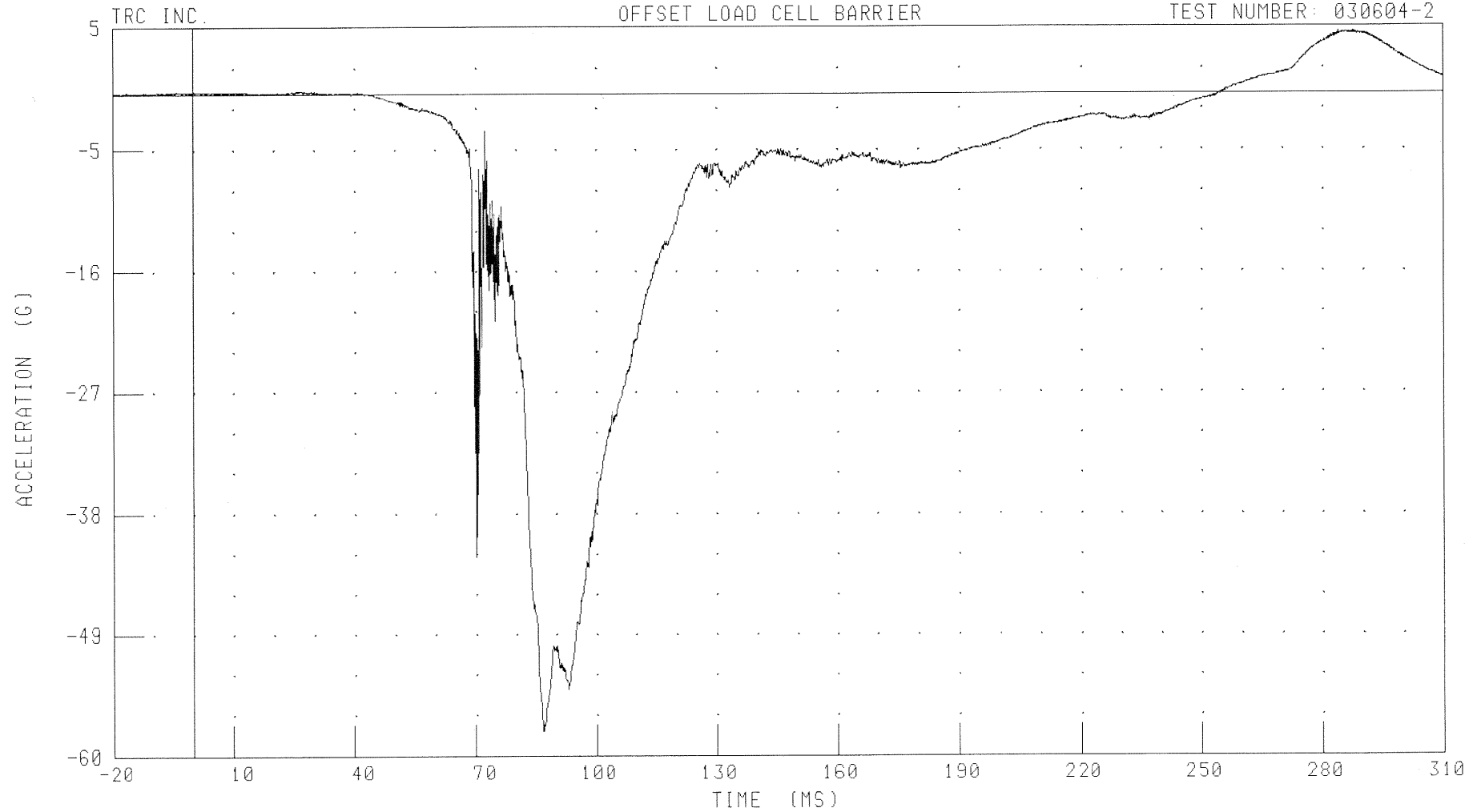
PEAK DATA: 790.00 G @ 102.48 MS; 0.02 G @ 14.00 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD X-AXIS (LT) ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HD1XC1 FILTER: CH. CLASS 1000

PEAK DATA: 5.43 G @ 284.00 MS; -57.96 G @ 86.72 MS

B-10

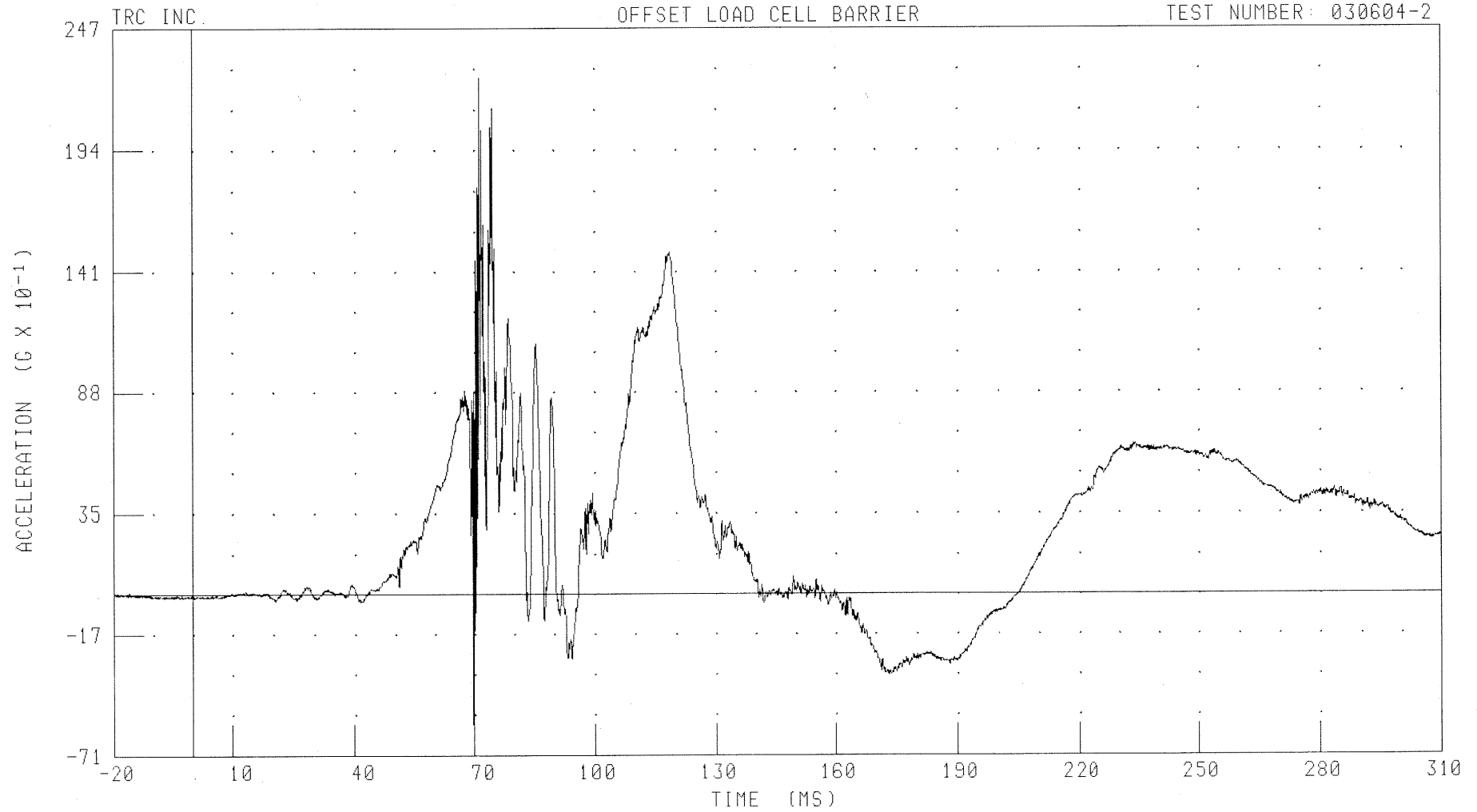
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Z-AXIS (LT) ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HD1ZG1 FILTER: CH. CLASS 1000

B-11

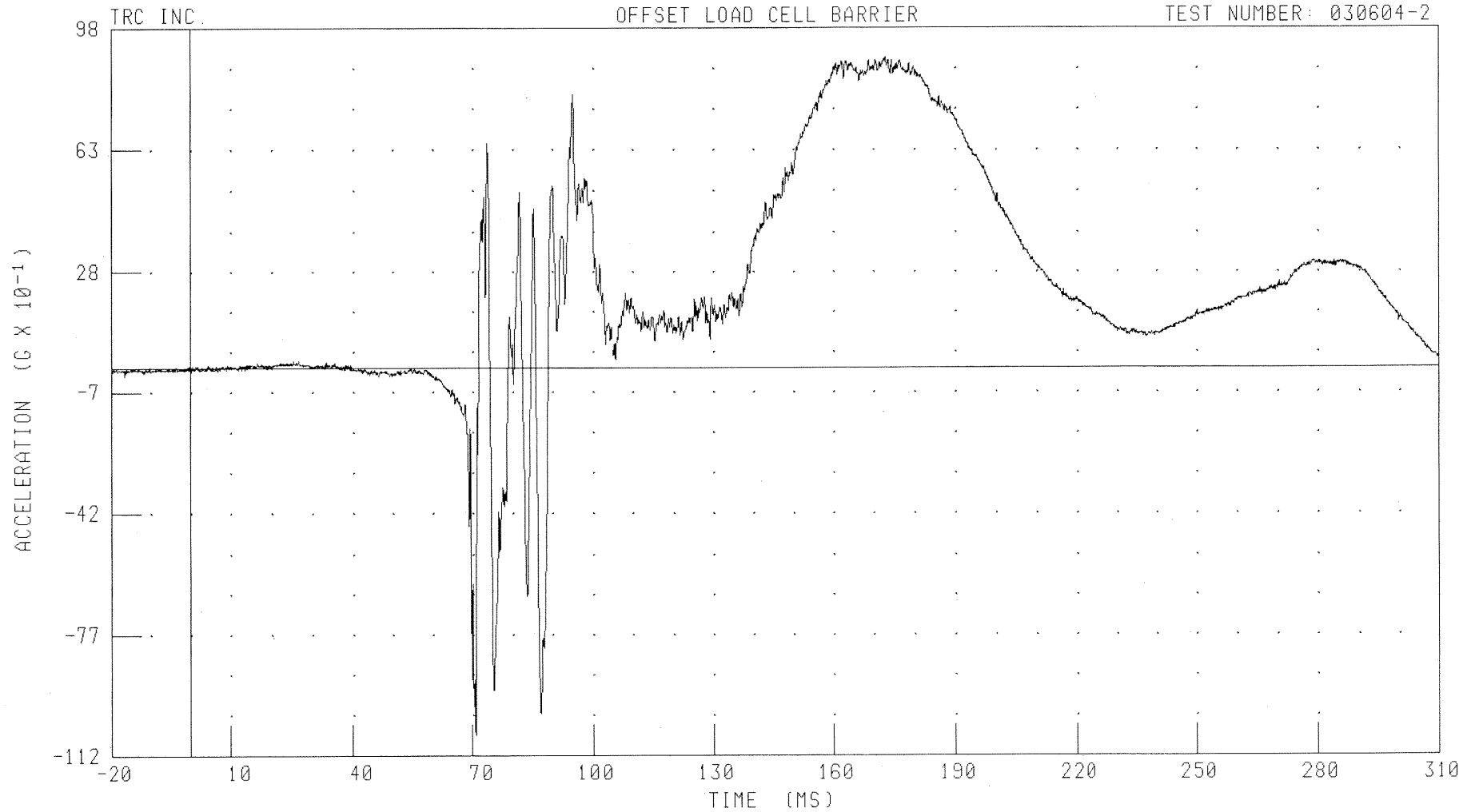
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Y-AXIS (FT) ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HD2YG1 FILTER: CH. CLASS 1000

PEAK DATA: 8.95 G @ 172.96 MS; -10.61 G @ 70.80 MS

B-12

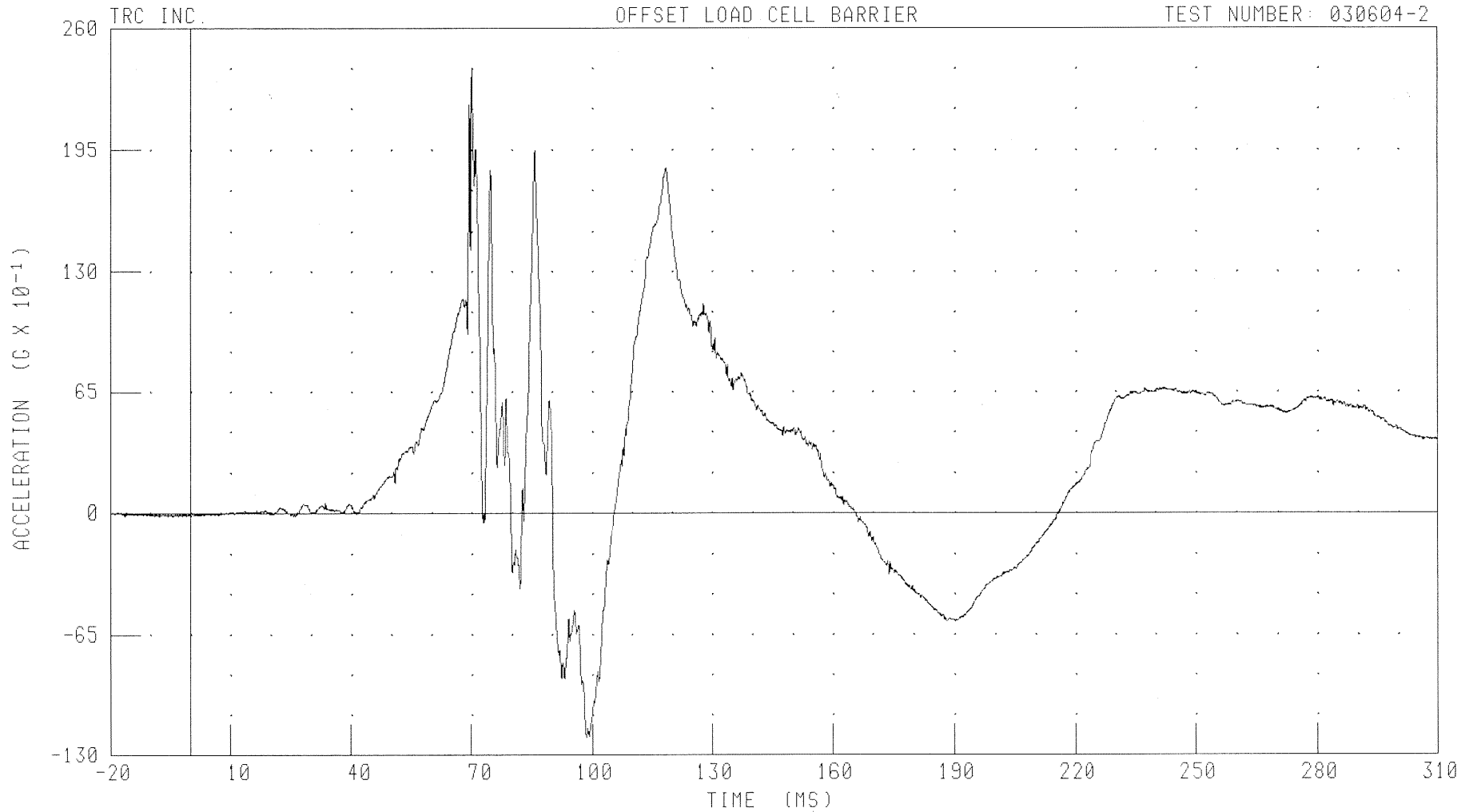
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Z-AXIS (FT) ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HD2ZG1 FILTER: CH. CLASS 1000

PEAK DATA: 23.83 G @ 70.08 MS, -12.07 G @ 98.56 MS

B-13

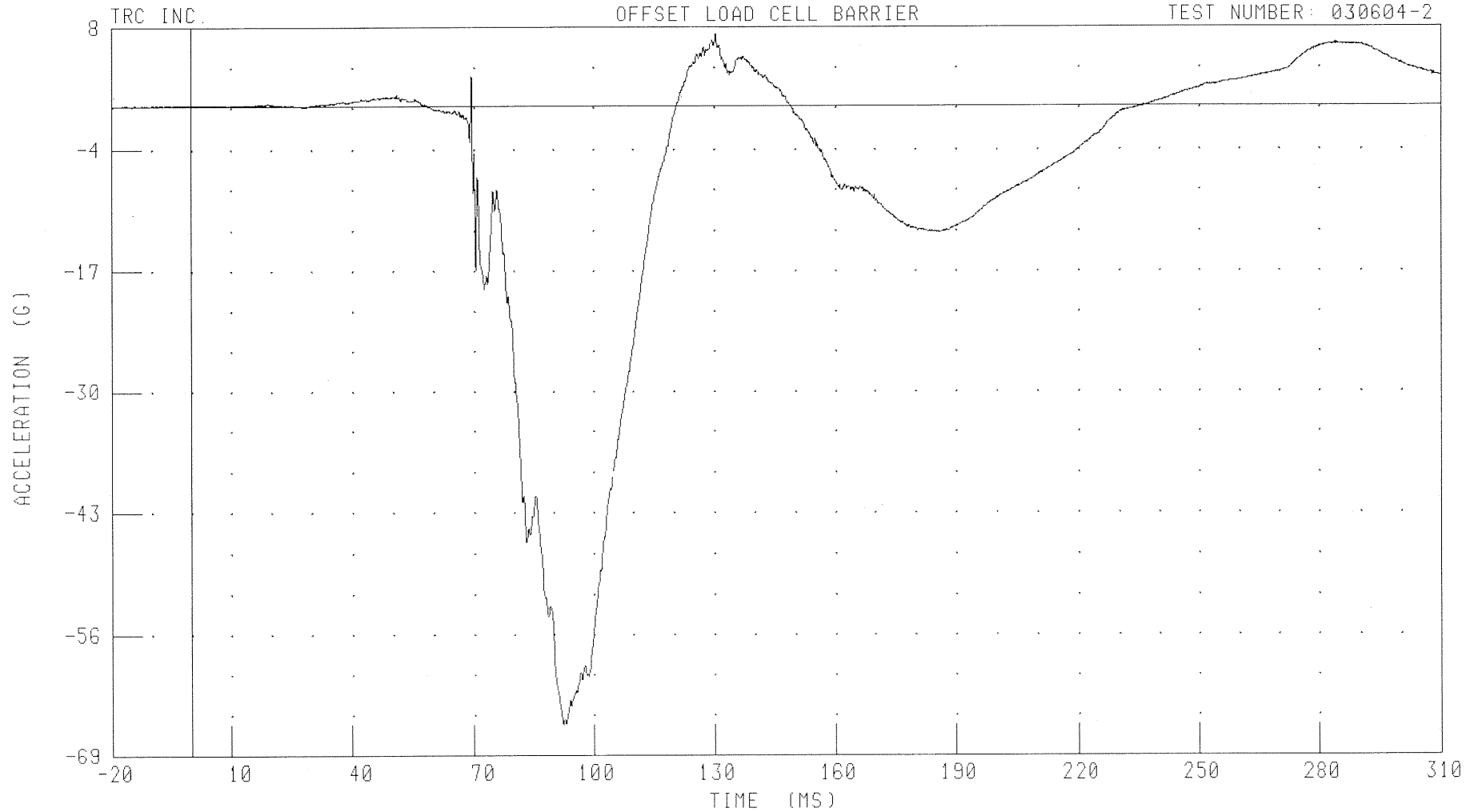
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD X-AXIS (TP) ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HD3XG1 FILTER: CH. CLASS 1000

PEAK DATA: 7.76 G @ 130.40 MS; -66.17 G @ 92.40 MS

B-14

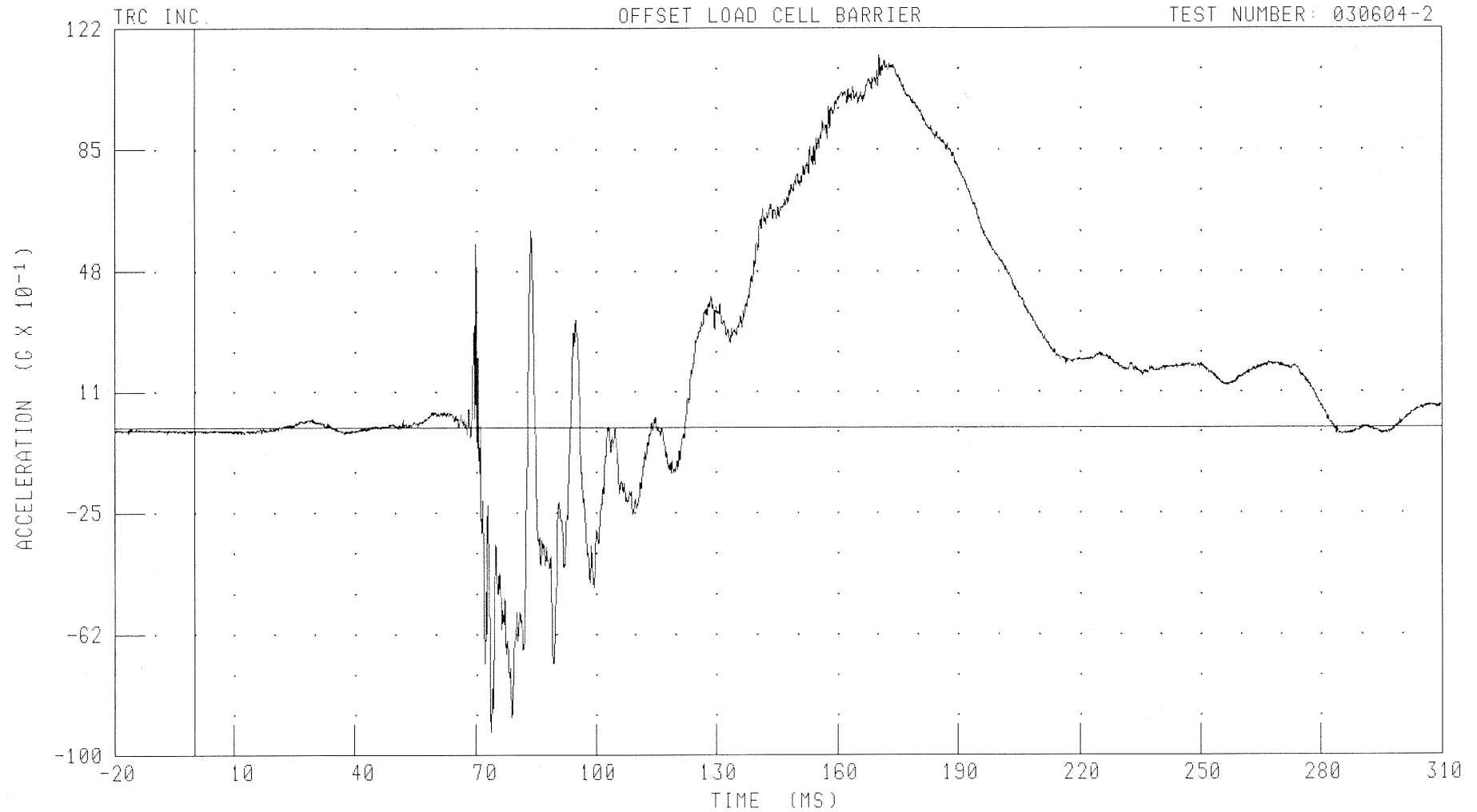
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER HEAD Y-AXIS (TP) ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HD3YG1 FILTER: CH. CLASS 1000

B-15

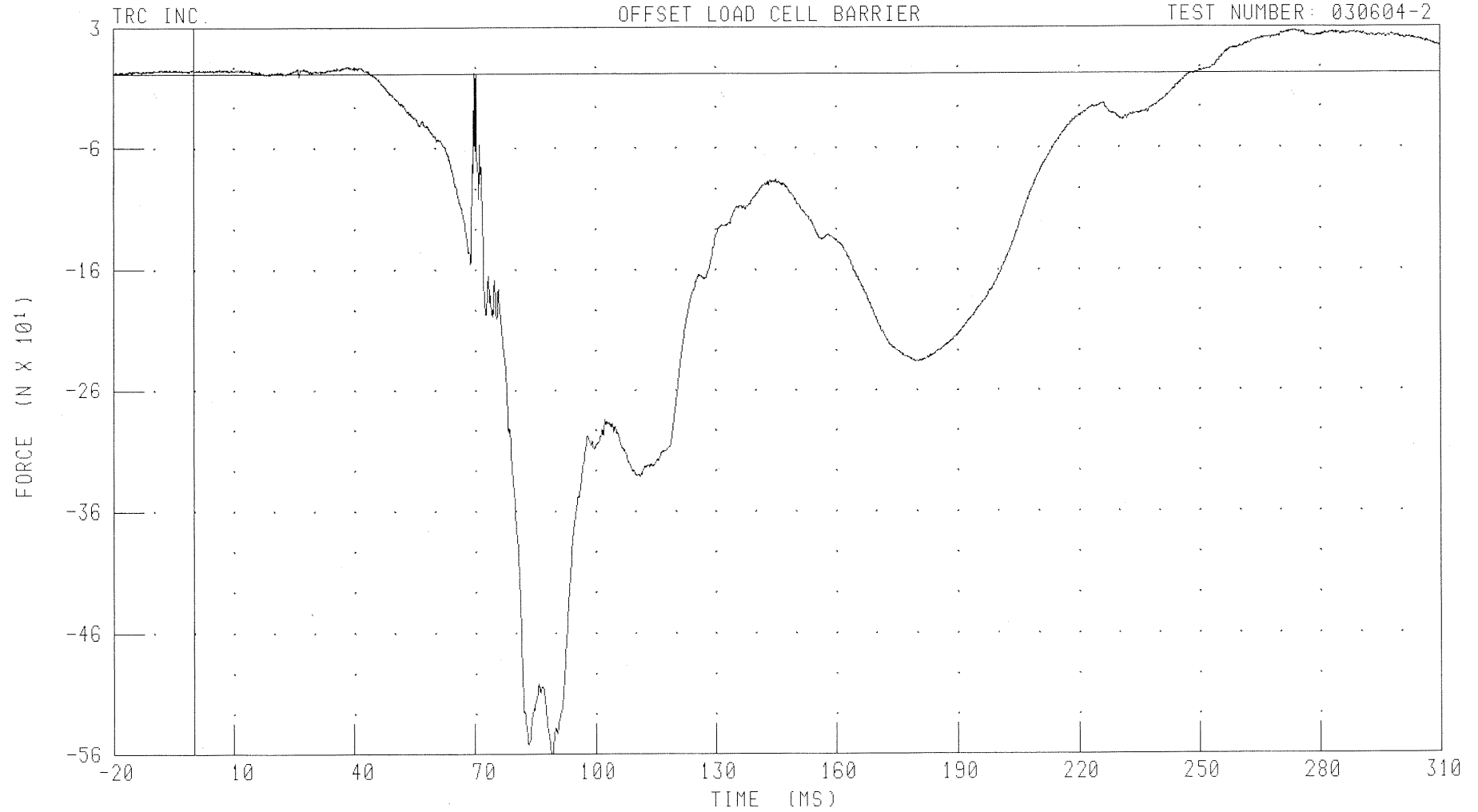
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK X-AXIS SHEAR FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

PEAK DATA: 36.20 N @ 273.84 MS; -563.46 N @ 89.20 MS

B-16

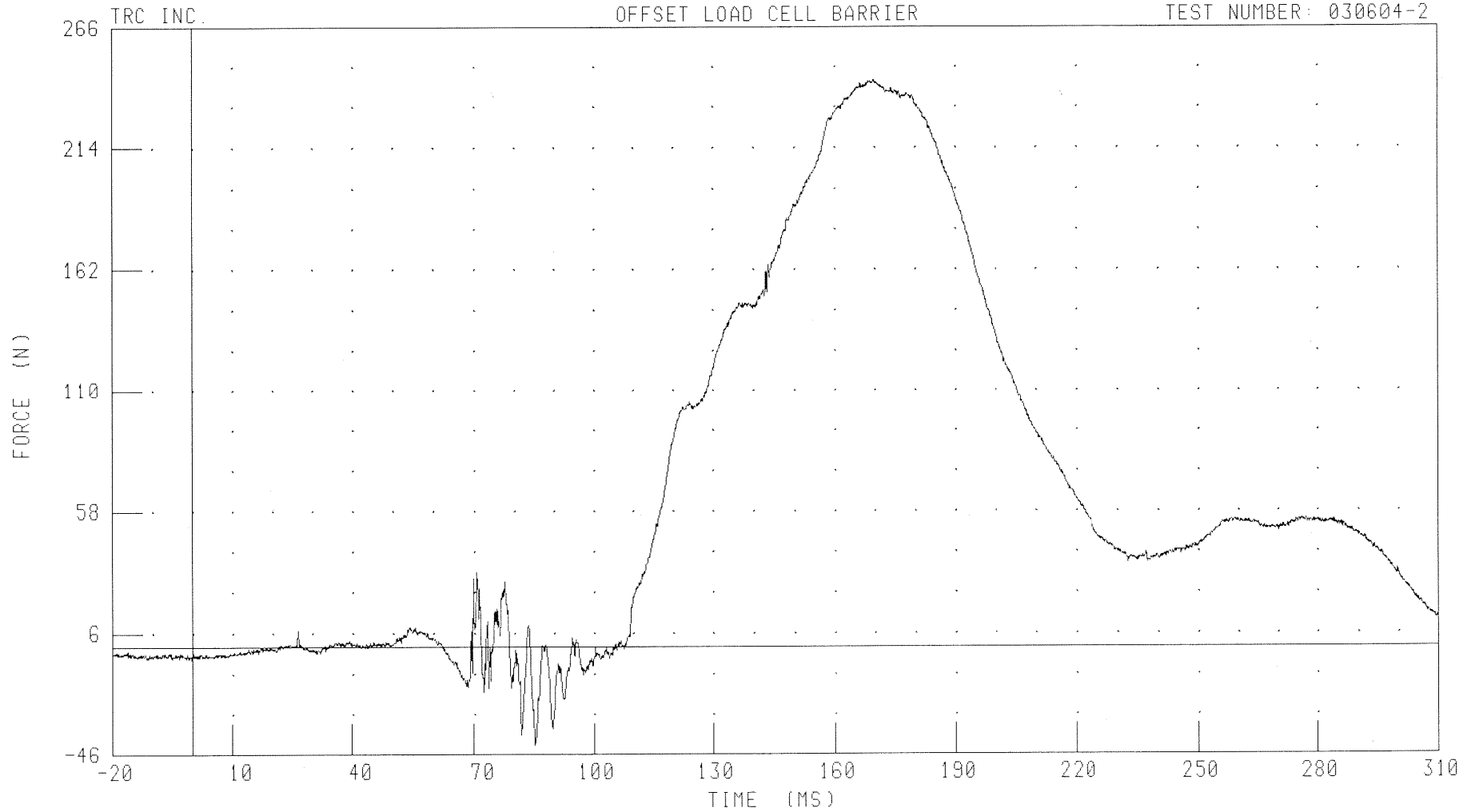
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK Y-AXIS SHEAR FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 242.88 N @ 169.68 MS; -42.22 N @ 85.20 MS

B-17

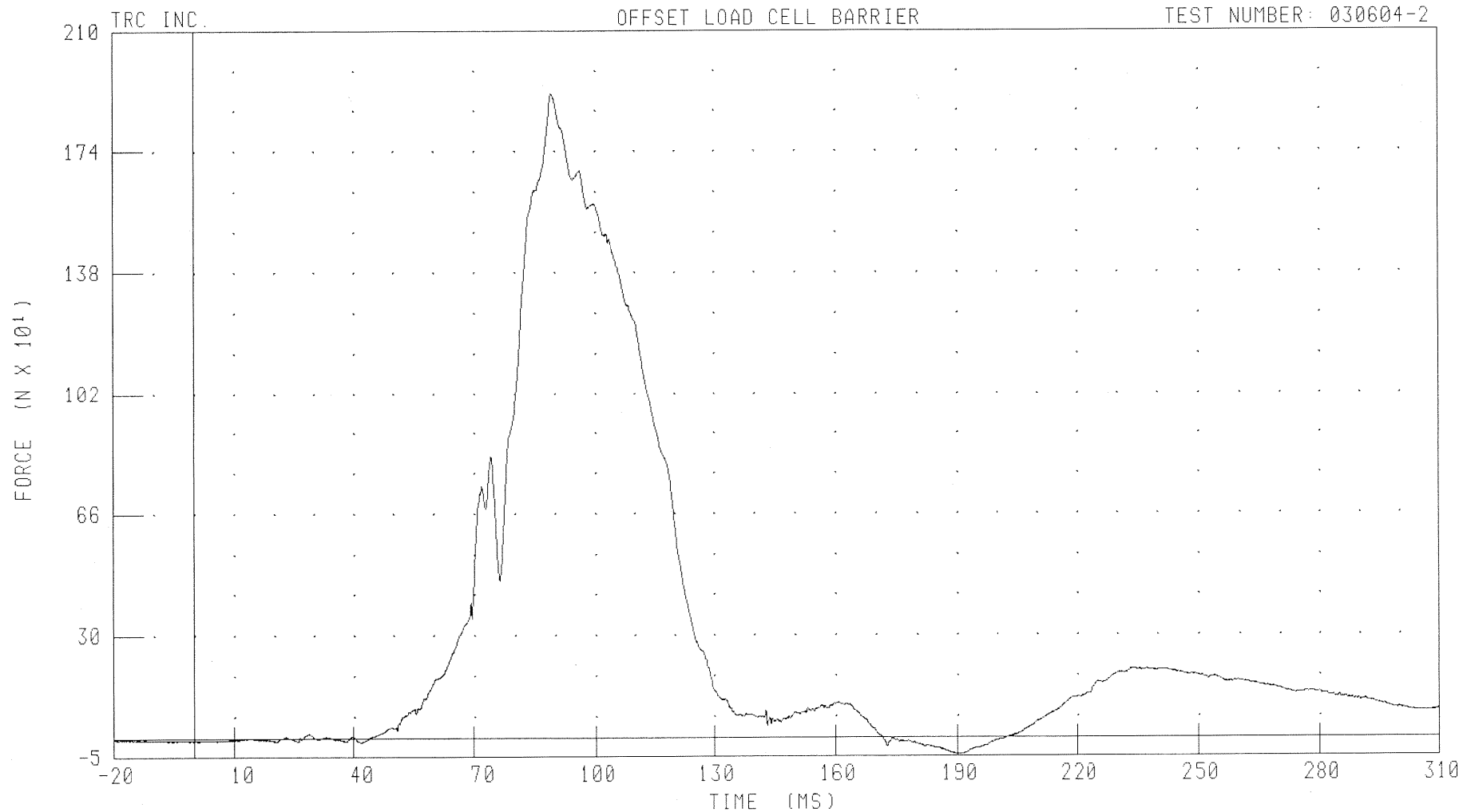
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK Z-AXIS AXIAL FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 1918.78 N @ 89.28 MS; -49.03 N @ 189.92 MS

B-18

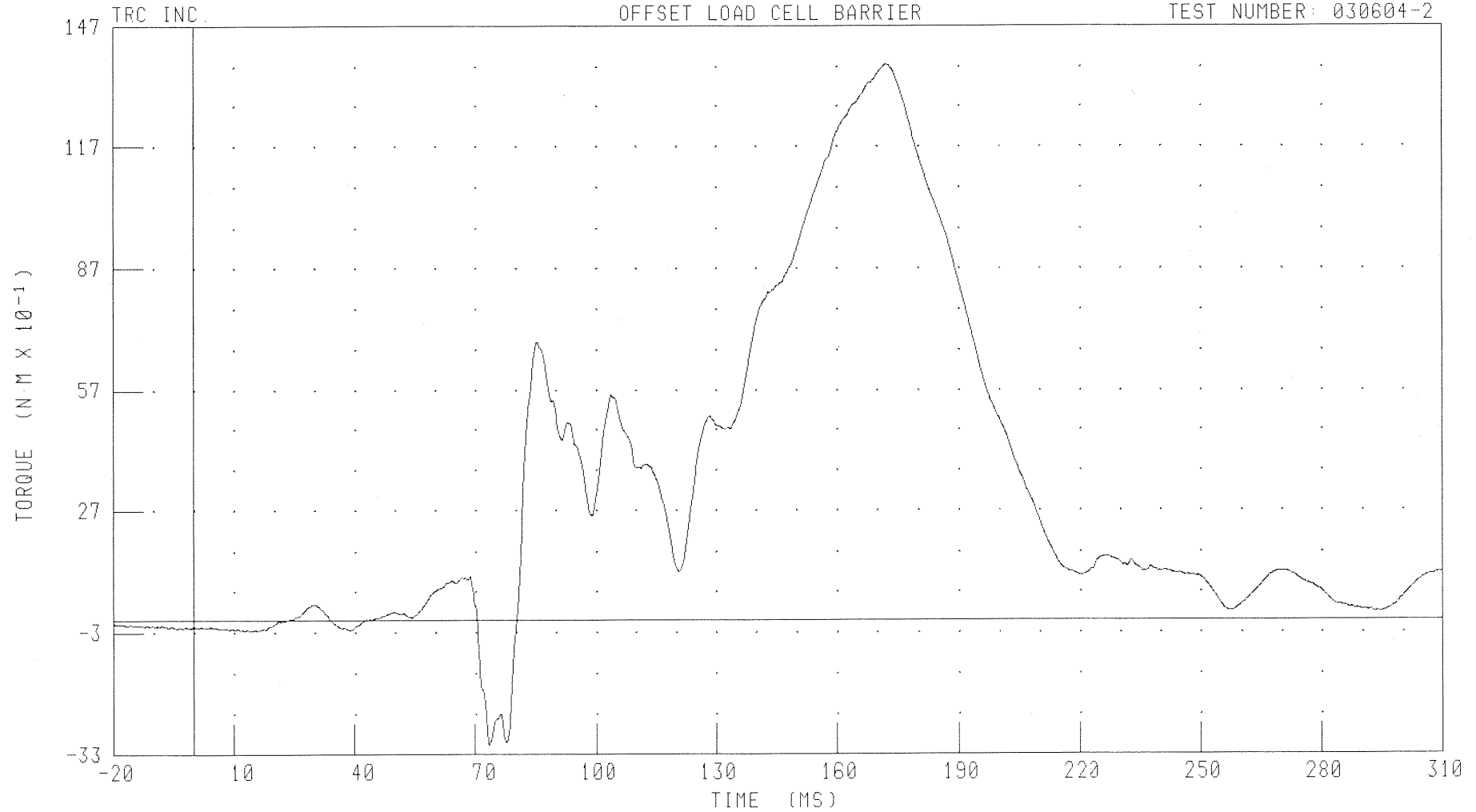
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKXM1 FILTER: CH. CLASS 600

PEAK DATA: 13.76 N·M @ 172.16 MS; -3.07 N·M @ 73.36 MS

B-19

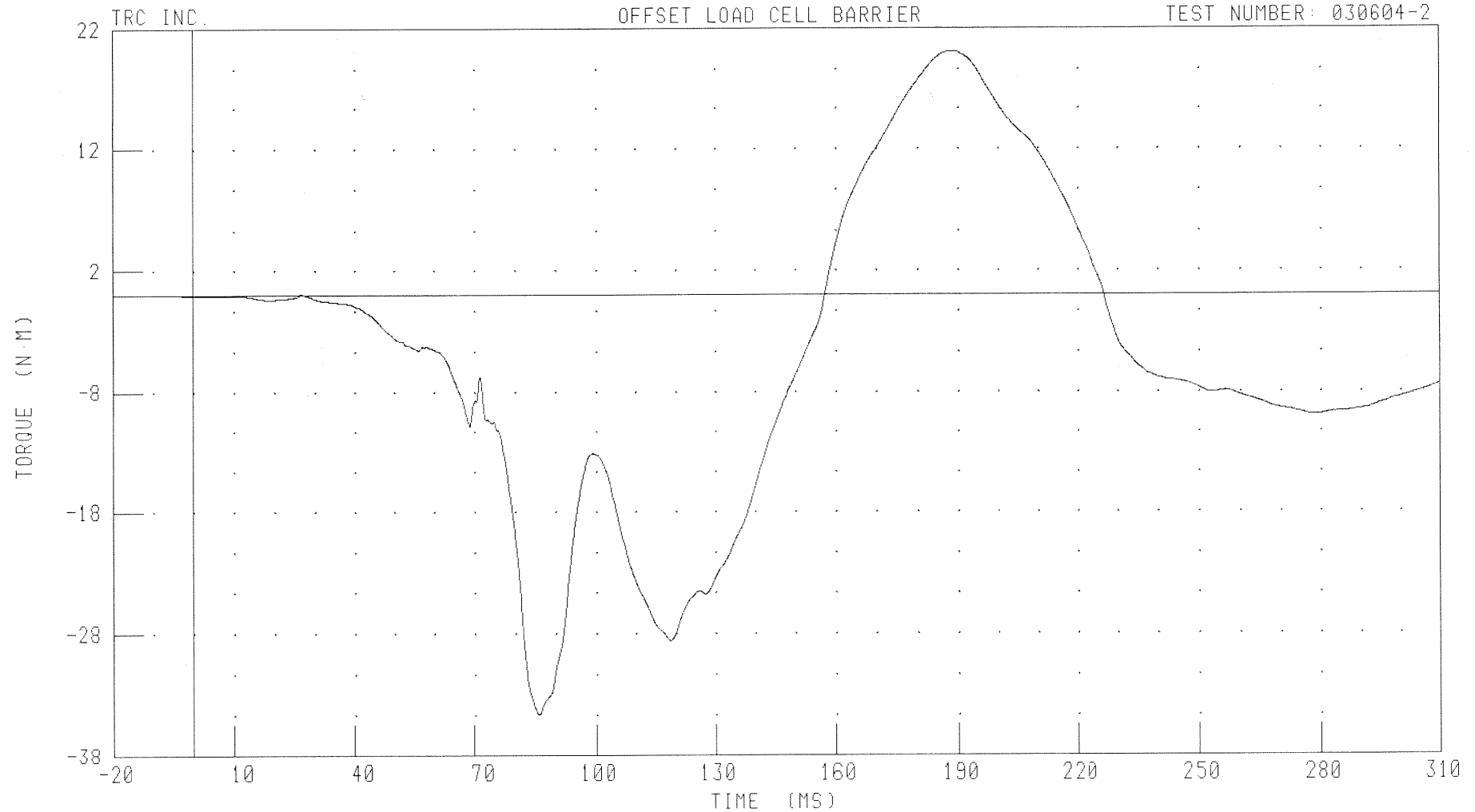
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKYM1

FILTER: CH. CLASS 600

PEAK DATA: 20.11 N·M @ 188.08 MS; -34.62 N·M @ 85.92 MS

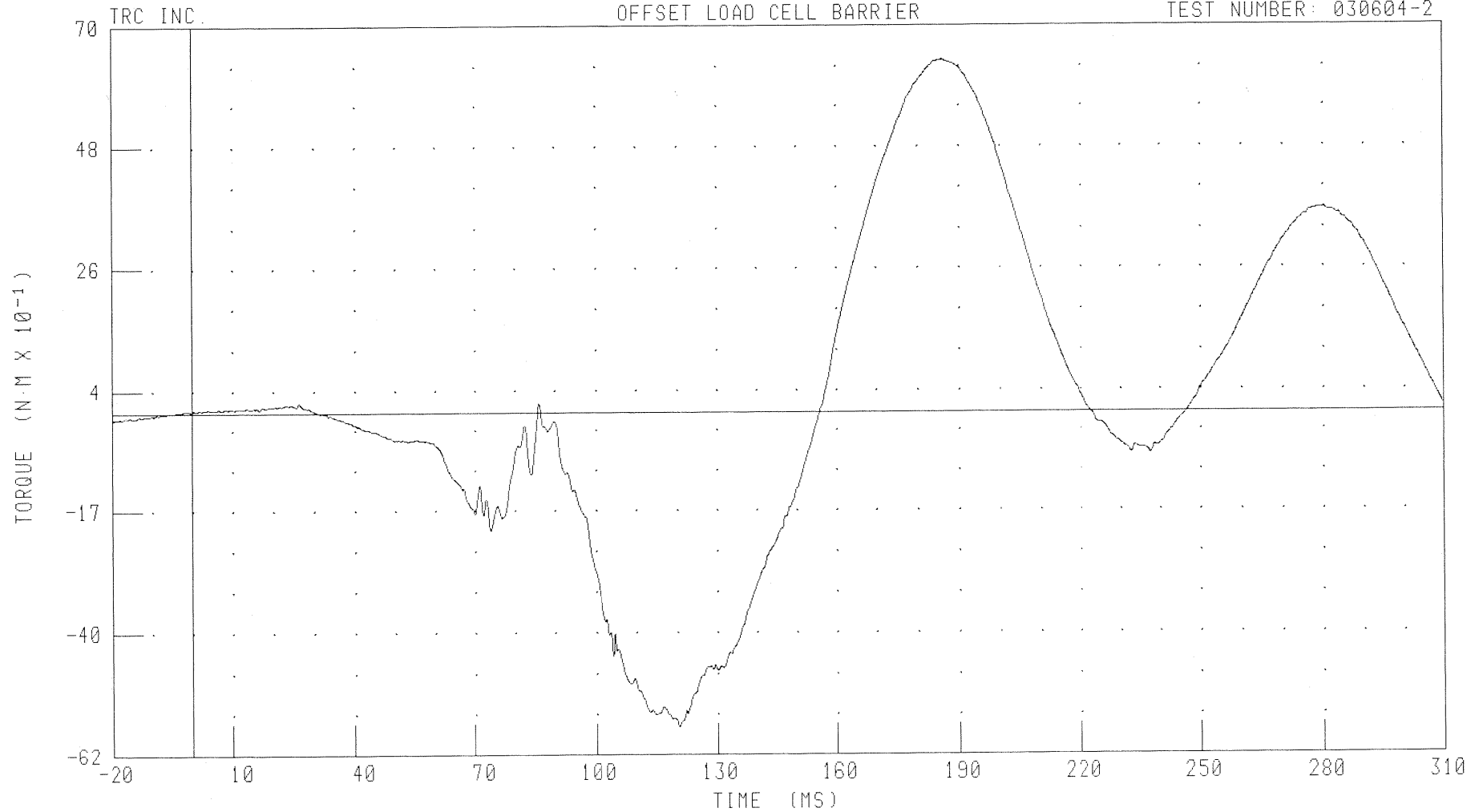
B-20

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER NECK MOMENT ABOUT Z AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKZM1 FILTER: CH. CLASS 600

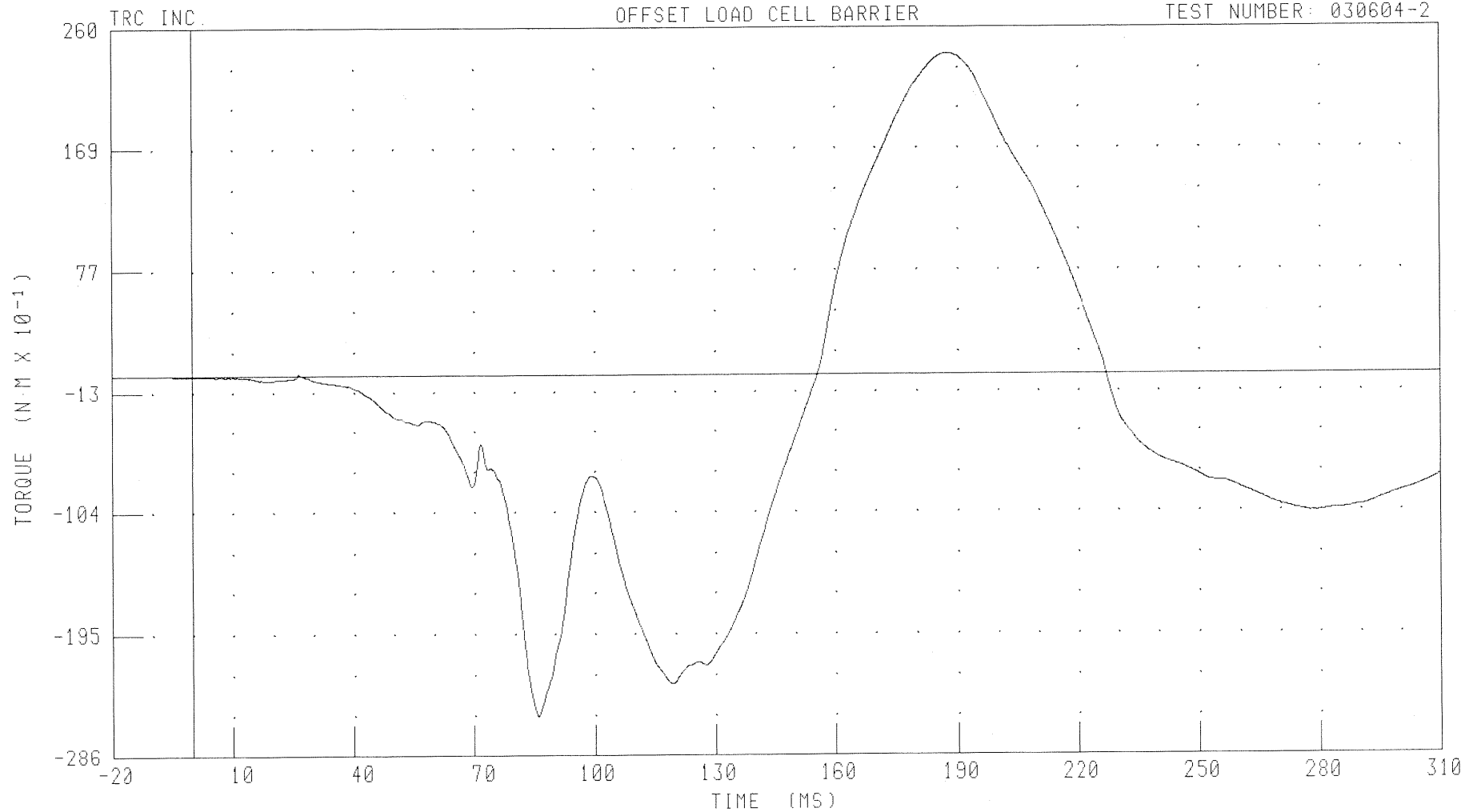
PEAK DATA: 6.38 N·M @ 186.16 MS; -5.70 N·M @ 120.48 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKOM1 FILTER: CH. CLASS 600

PEAK DATA: 24.04 N·M @ 187.92 MS; -25.65 N·M @ 85.92 MS

B-22

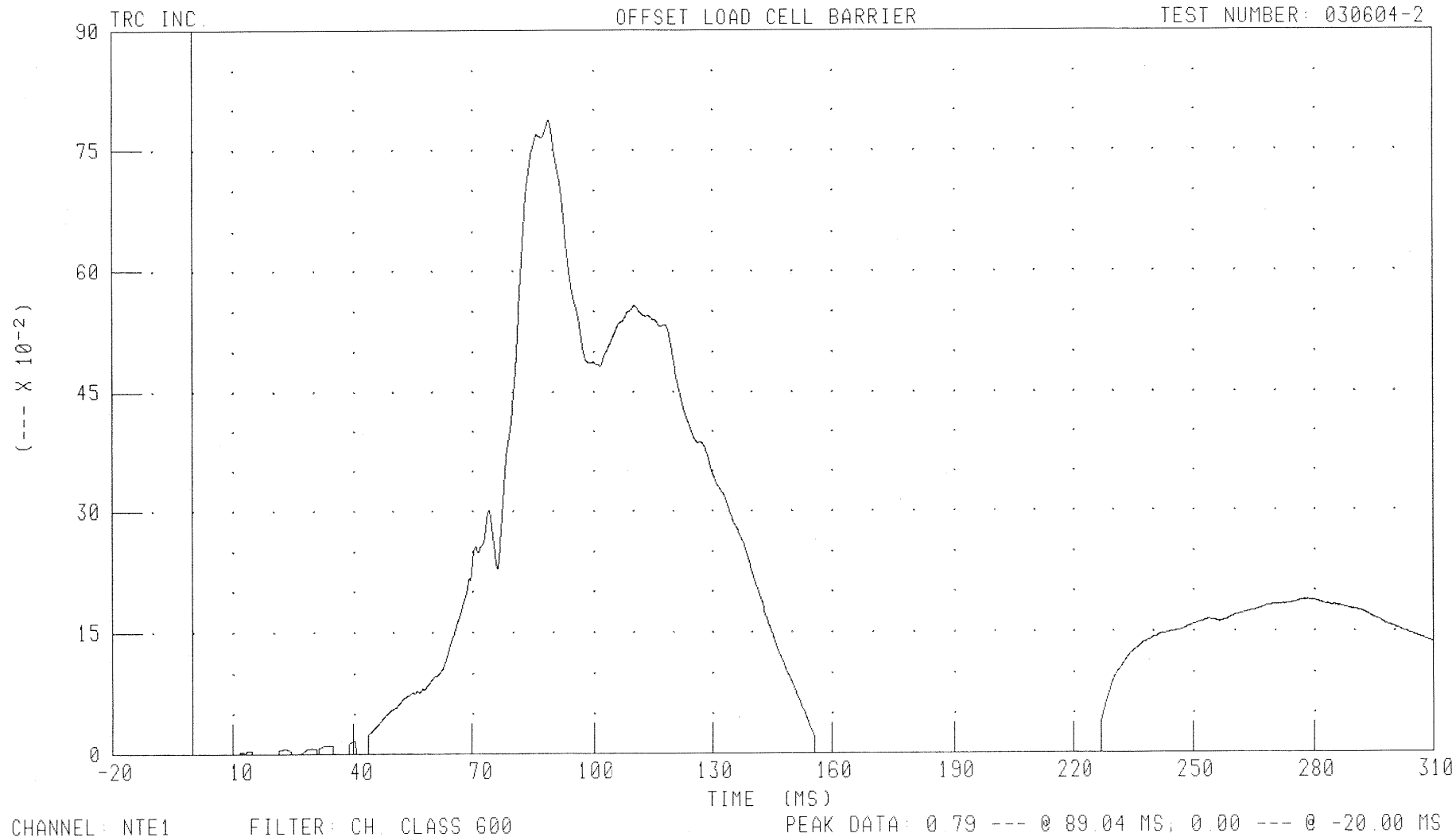
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NIJ TENSION/EXTENSION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-23

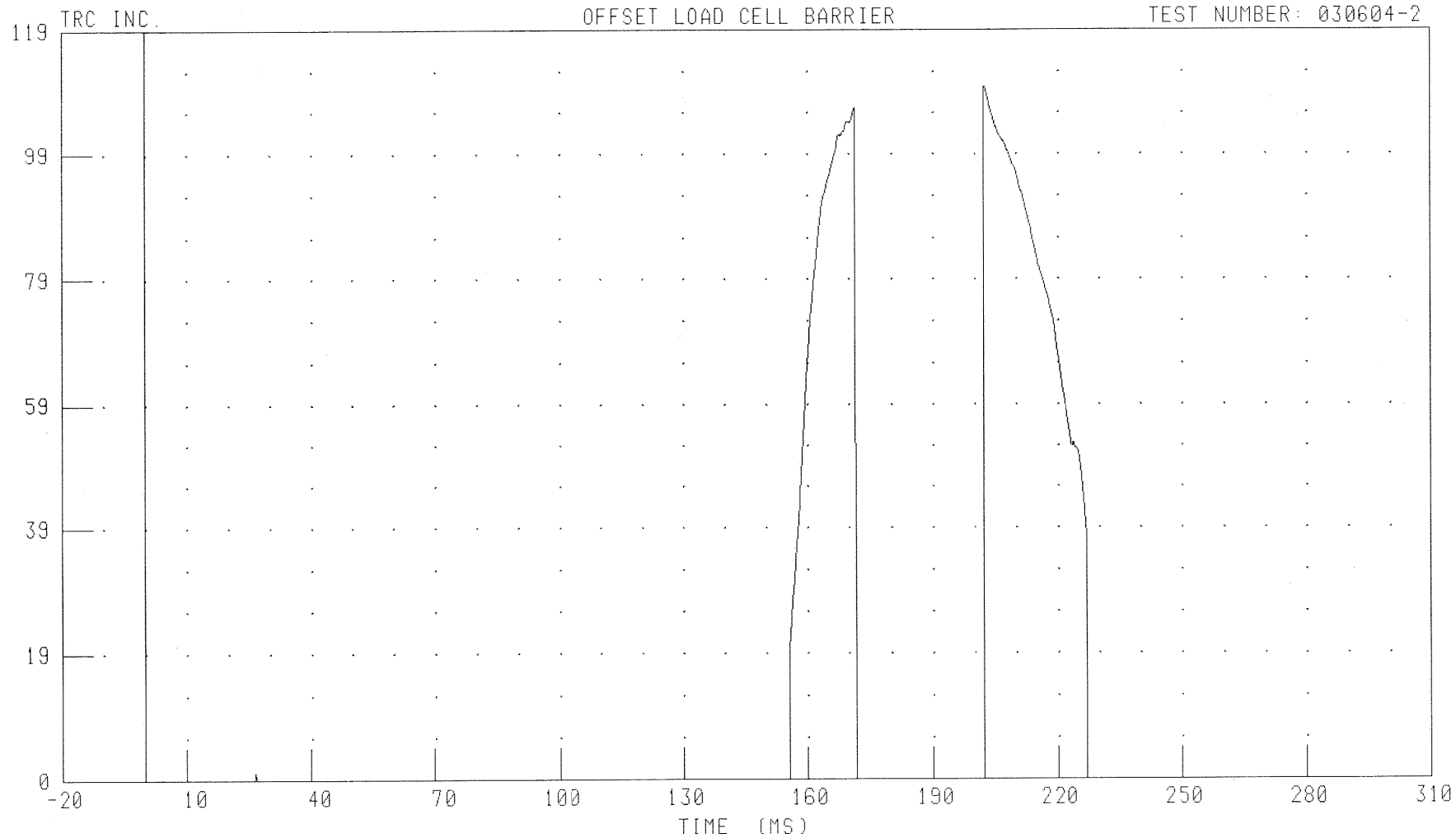
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NIJ TENSION/FLEXION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NTF1

FILTER: CH. CLASS 600

B-24

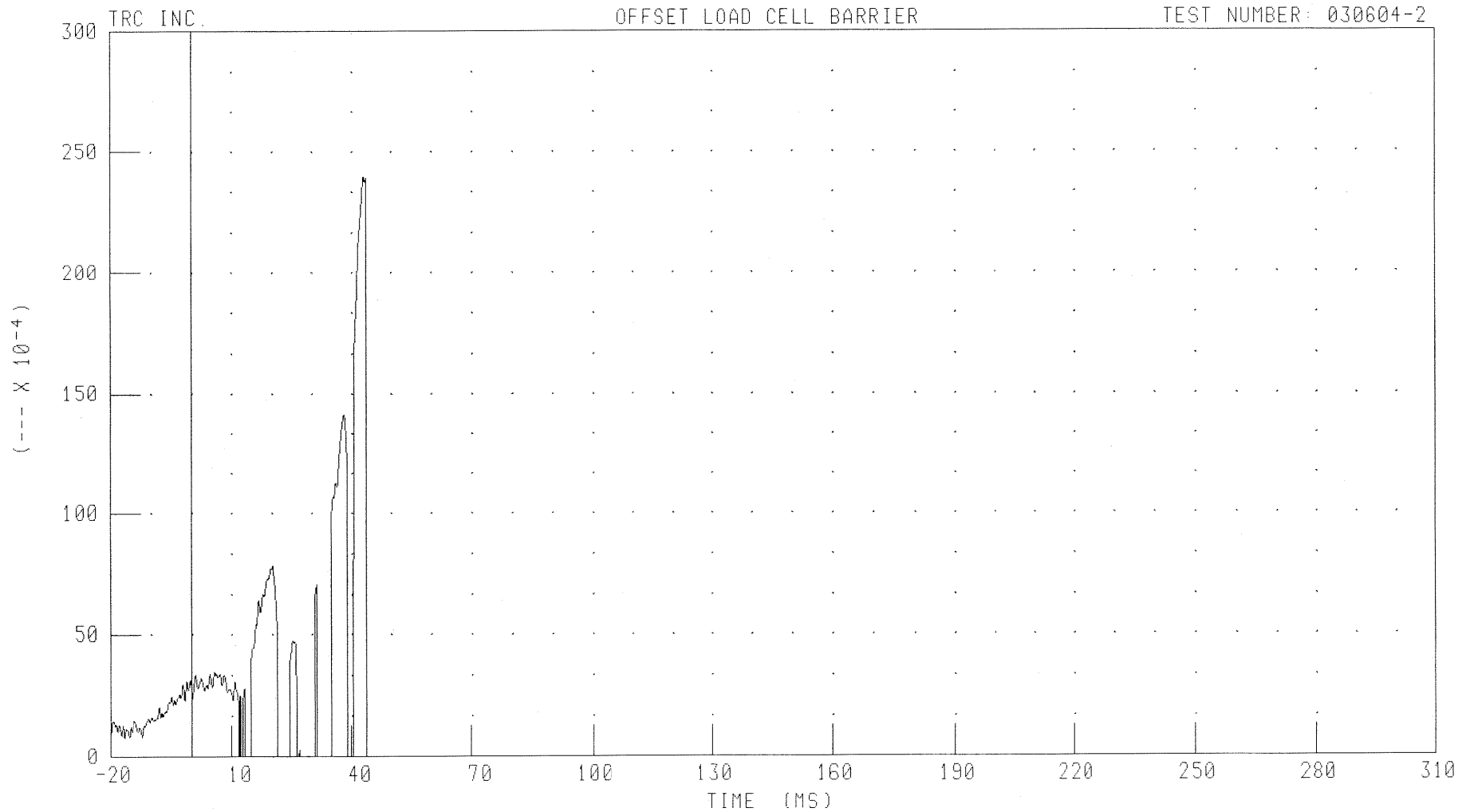
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NIJ COMPRESSION/EXTENSION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NCE1

FILTER: CH. CLASS 600

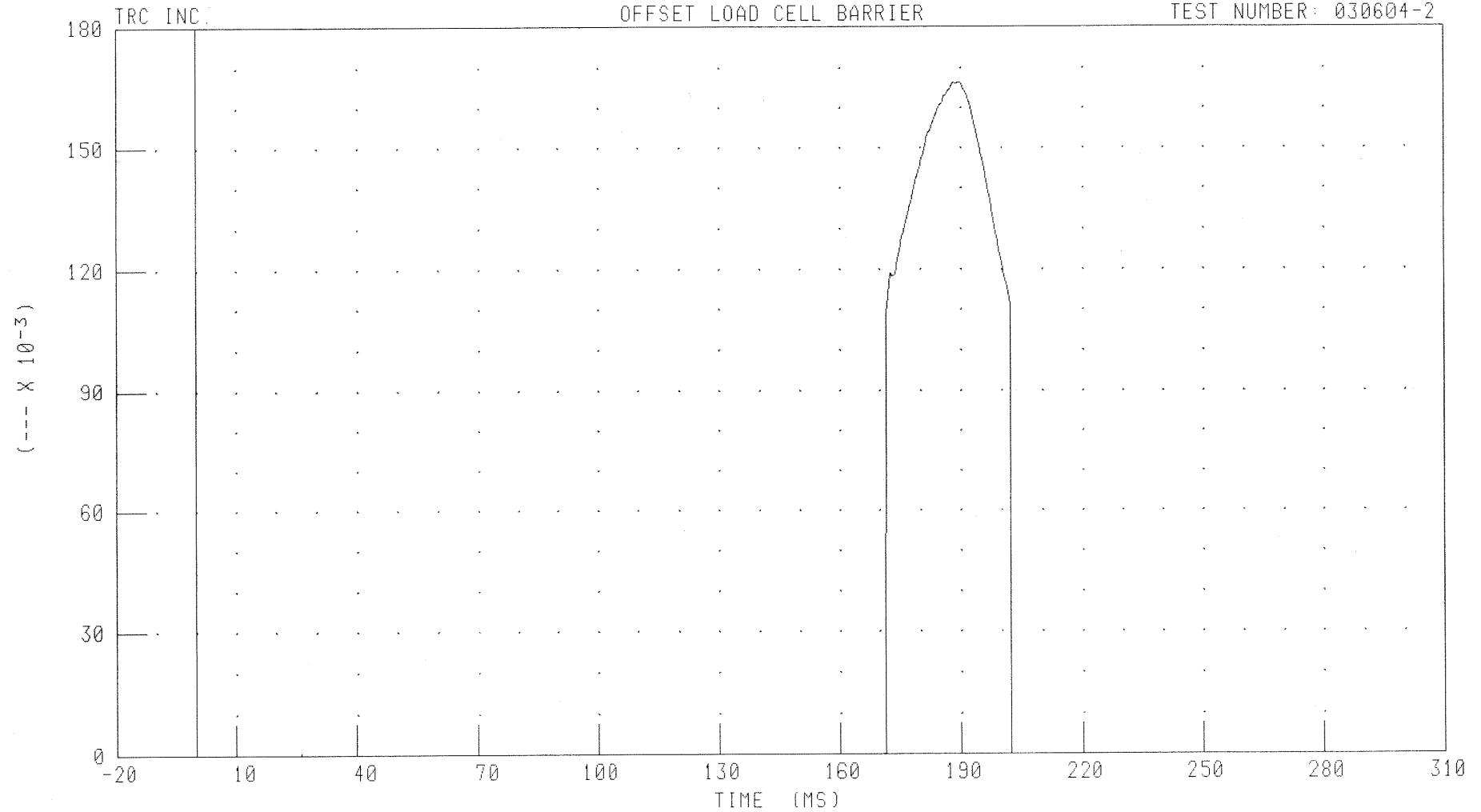
PEAK DATA: 0.02 --- @ 43.04 MS; 0.00 --- @ 11.68 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NIJ COMPRESSION/FLEXION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NCF1

FILTER: CH. CLASS 600

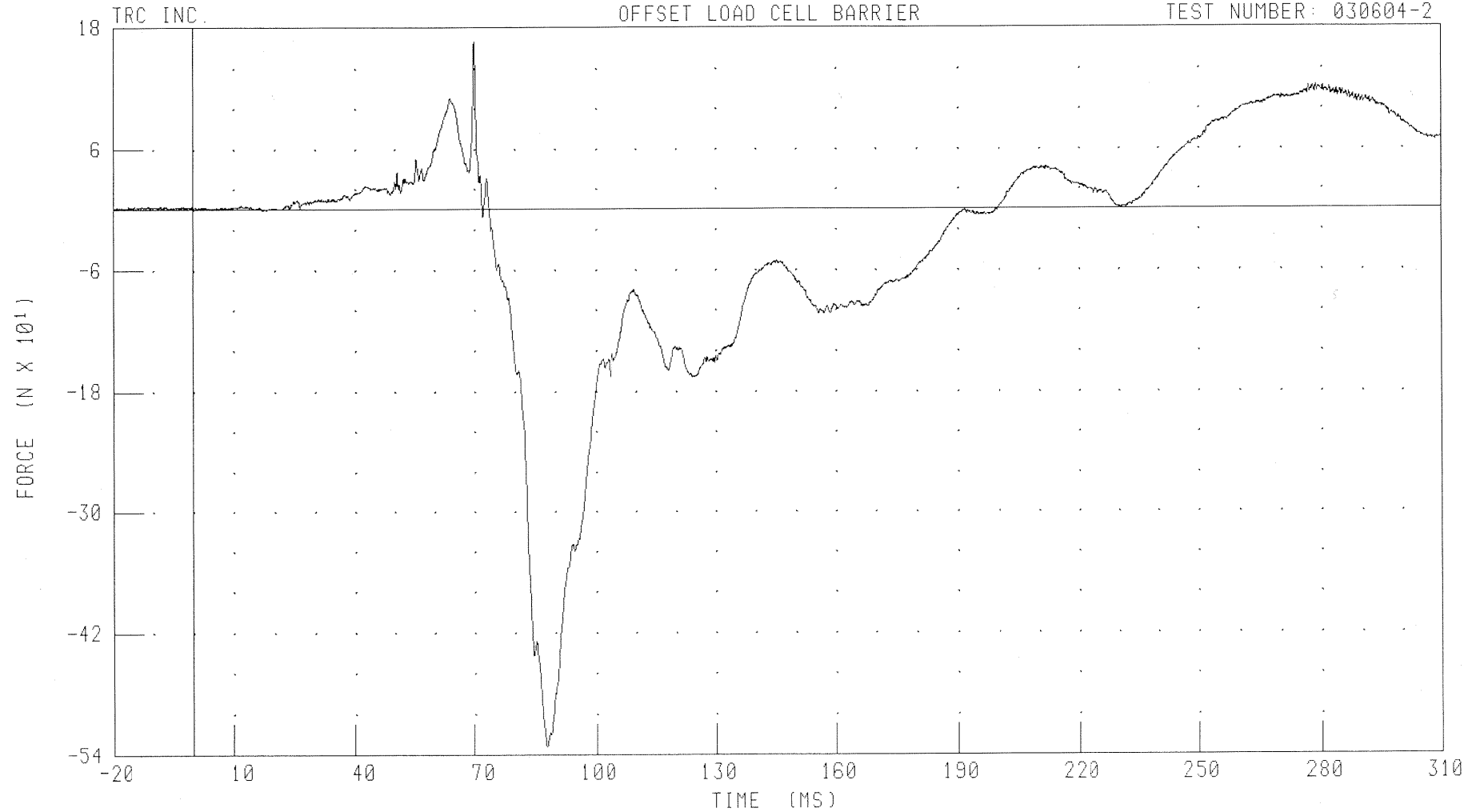
PEAK DATA: 0.17 --- @ 189.84 MS; 0.00 --- @ -20.00 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK LOWER X-AXIS SHEAR FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NKLXF1 FILTER: CH. CLASS 1000

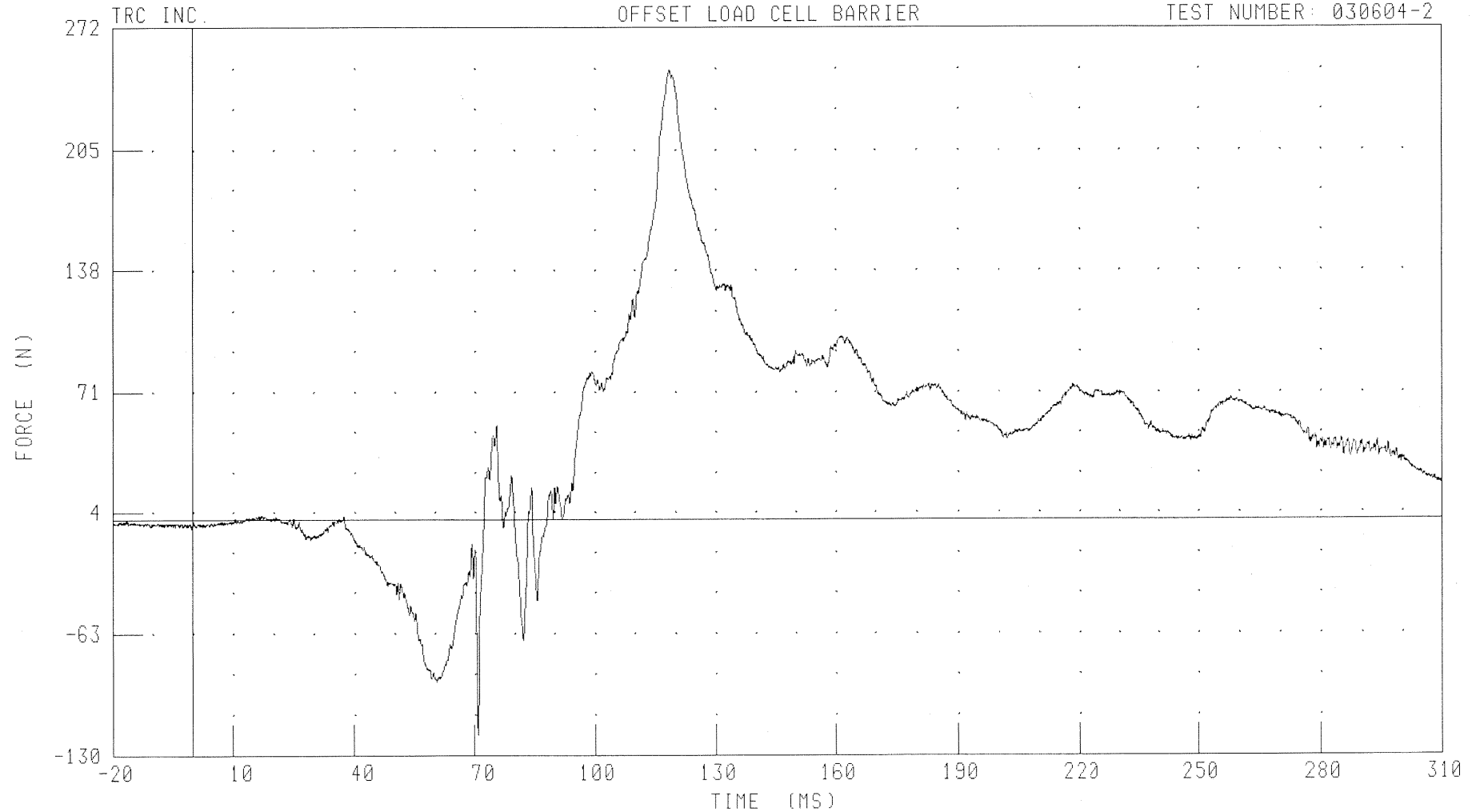
PEAK DATA: 166.43 N @ 70.08 MS, -532.08 N @ 87.84 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK LOWER Y-AXIS SHEAR FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NKLYF1 FILTER: CH. CLASS 1000

PEAK DATA: 248.61 N @ 118.72 MS, -118.91 N @ 70.80 MS

B-28

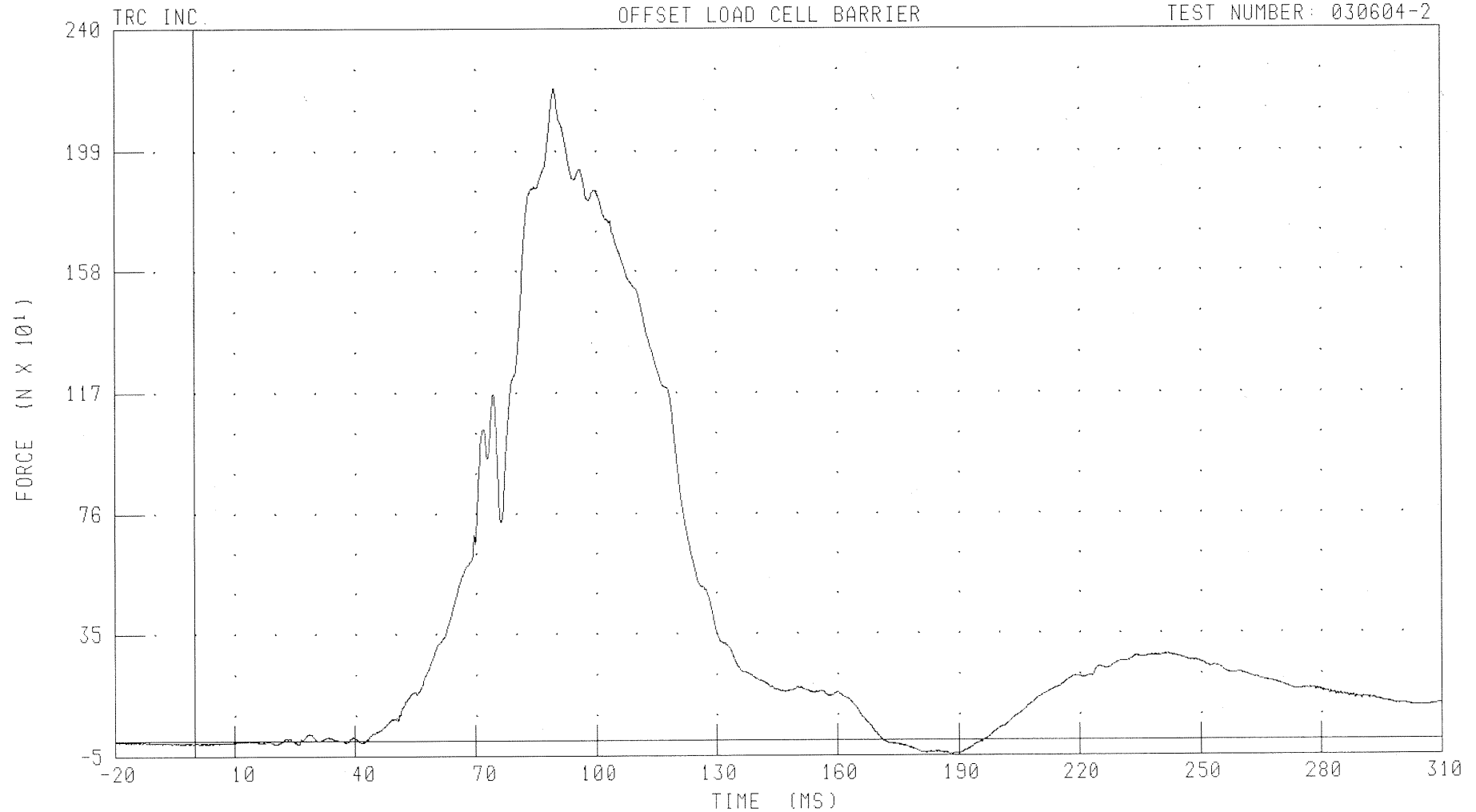
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK LOWER Z-AXIS AXIAL FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NKLZF1 FILTER: CH. CLASS 1000

PEAK DATA: 2209.23 N @ 89.60 MS; -46.97 N @ 188.24 MS

B-29

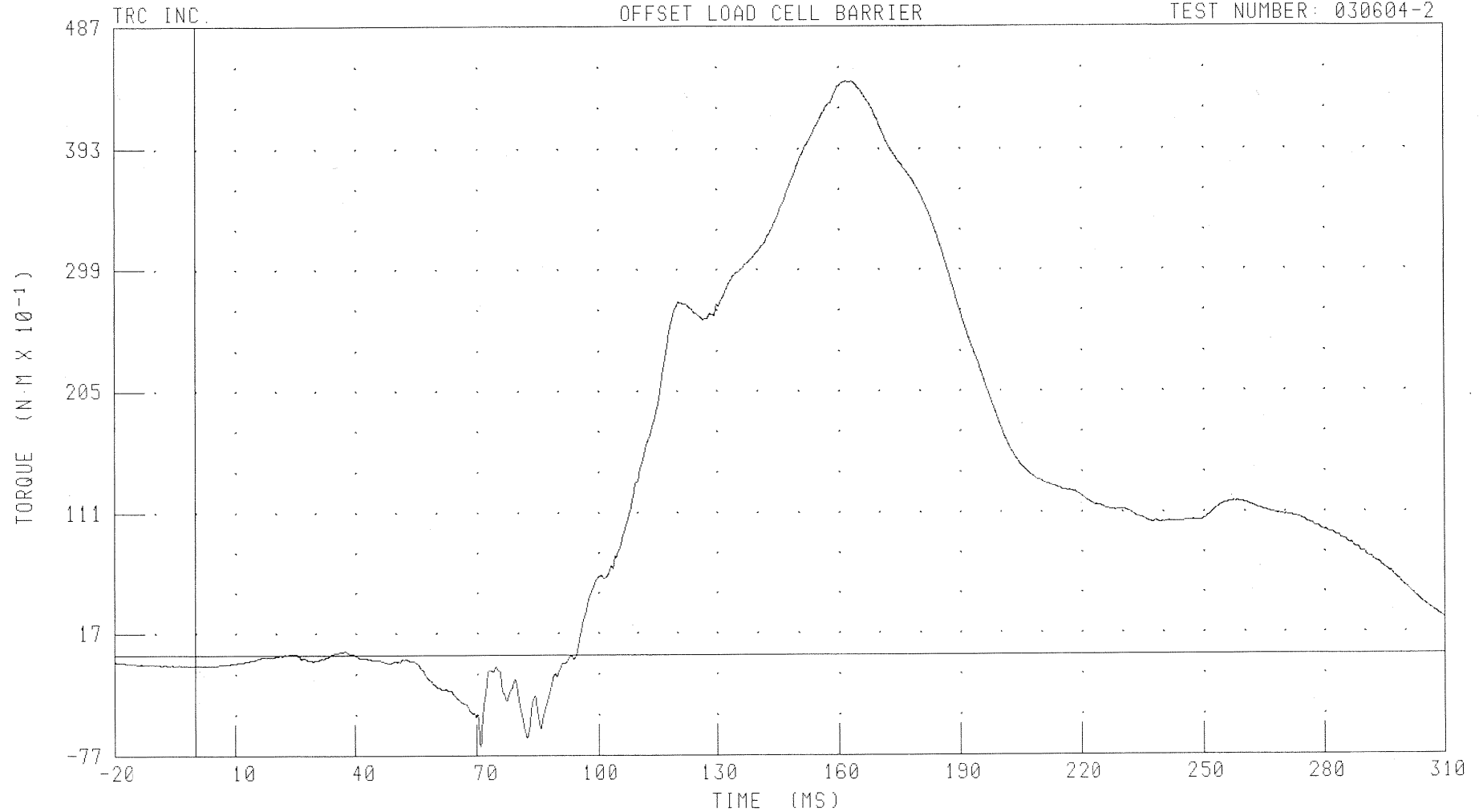
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK LOWER MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NKLXM1 FILTER: CH. CLASS 600

PEAK DATA: 44.48 N·M @ 162.00 MS; -7.01 N·M @ 70.88 MS

B-30

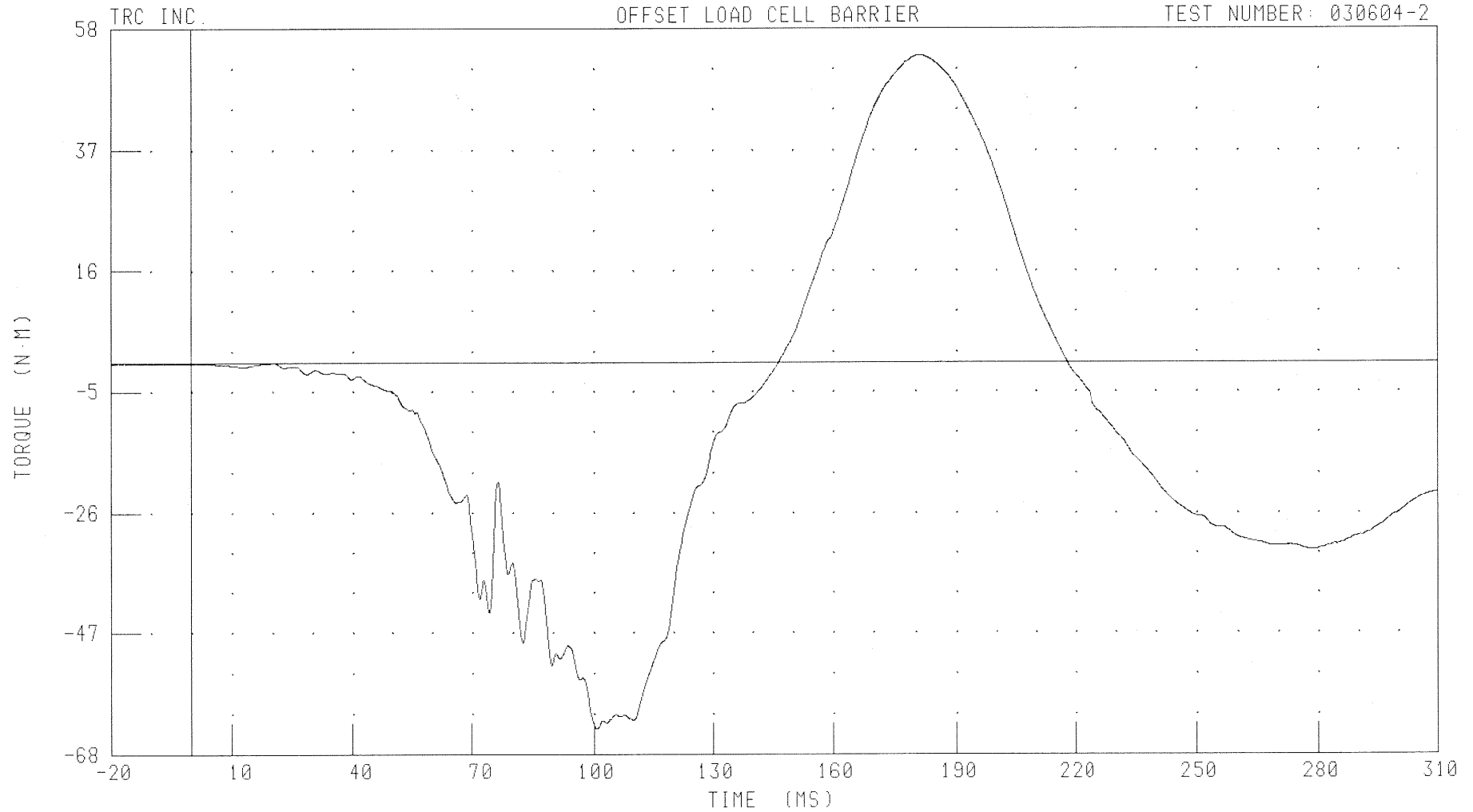
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK LOWER MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NKLYM1 FILTER: CH. CLASS 600

PEAK DATA: 53.28 N·M @ 181.68 MS; -63.62 N·M @ 100.80 MS

B-31

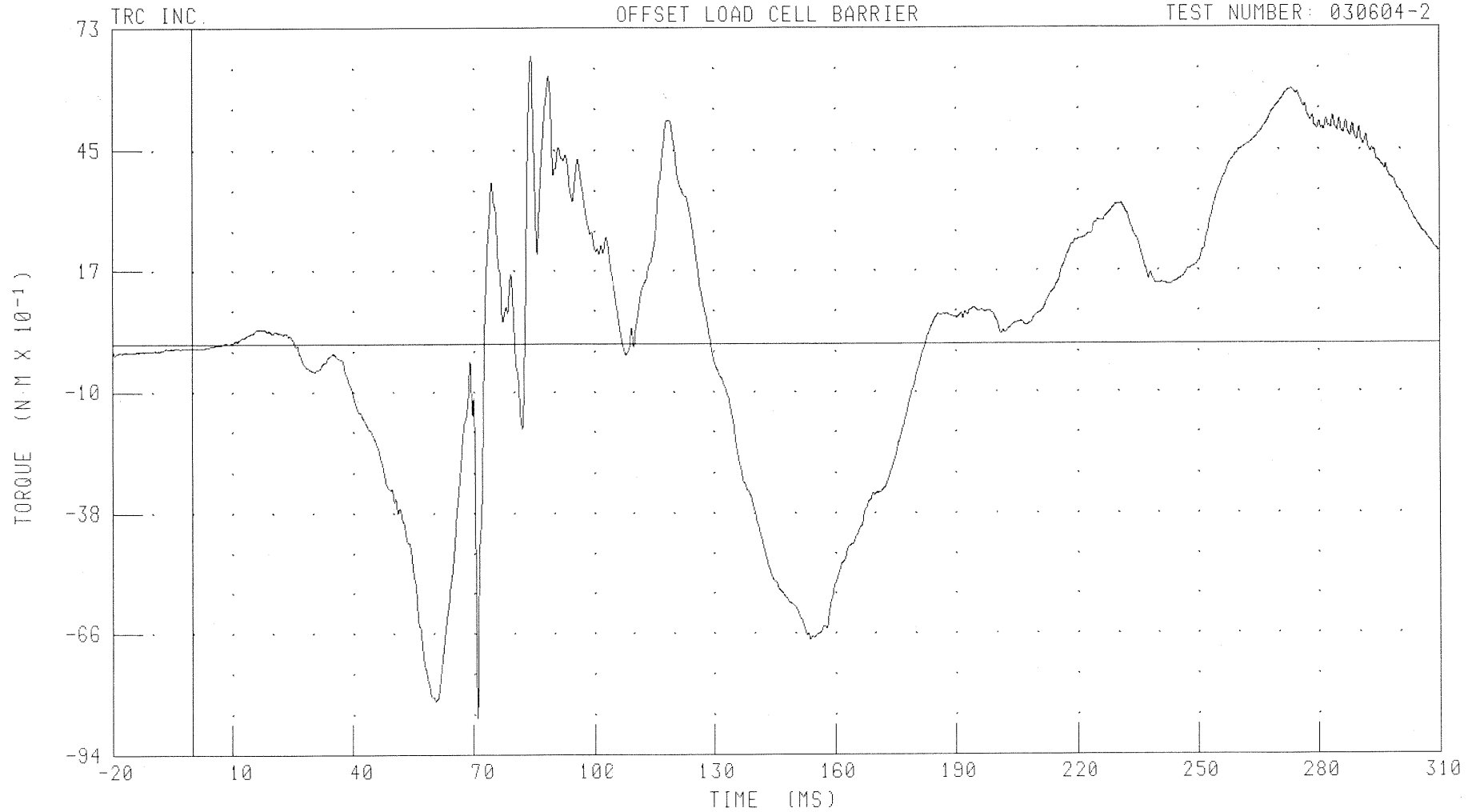
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER NECK LOWER MOMENT ABOUT Z AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NKLZM1 FILTER: CH. CLASS 600

B-32

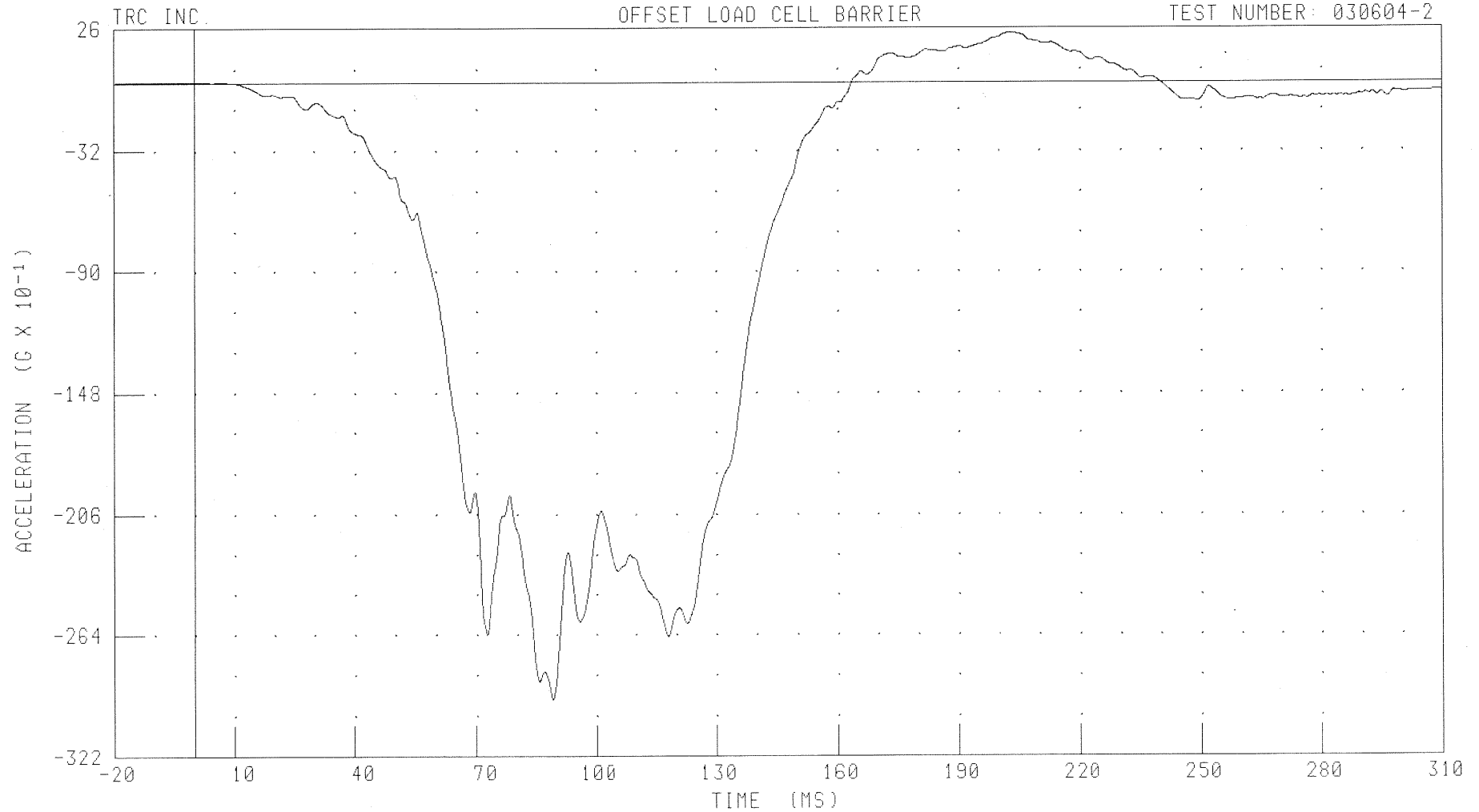
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTXC1 FILTER: CH. CLASS 180

PEAK DATA: 2.38 G @ 202.72 MS; -29.50 G @ 89.04 MS

B-33

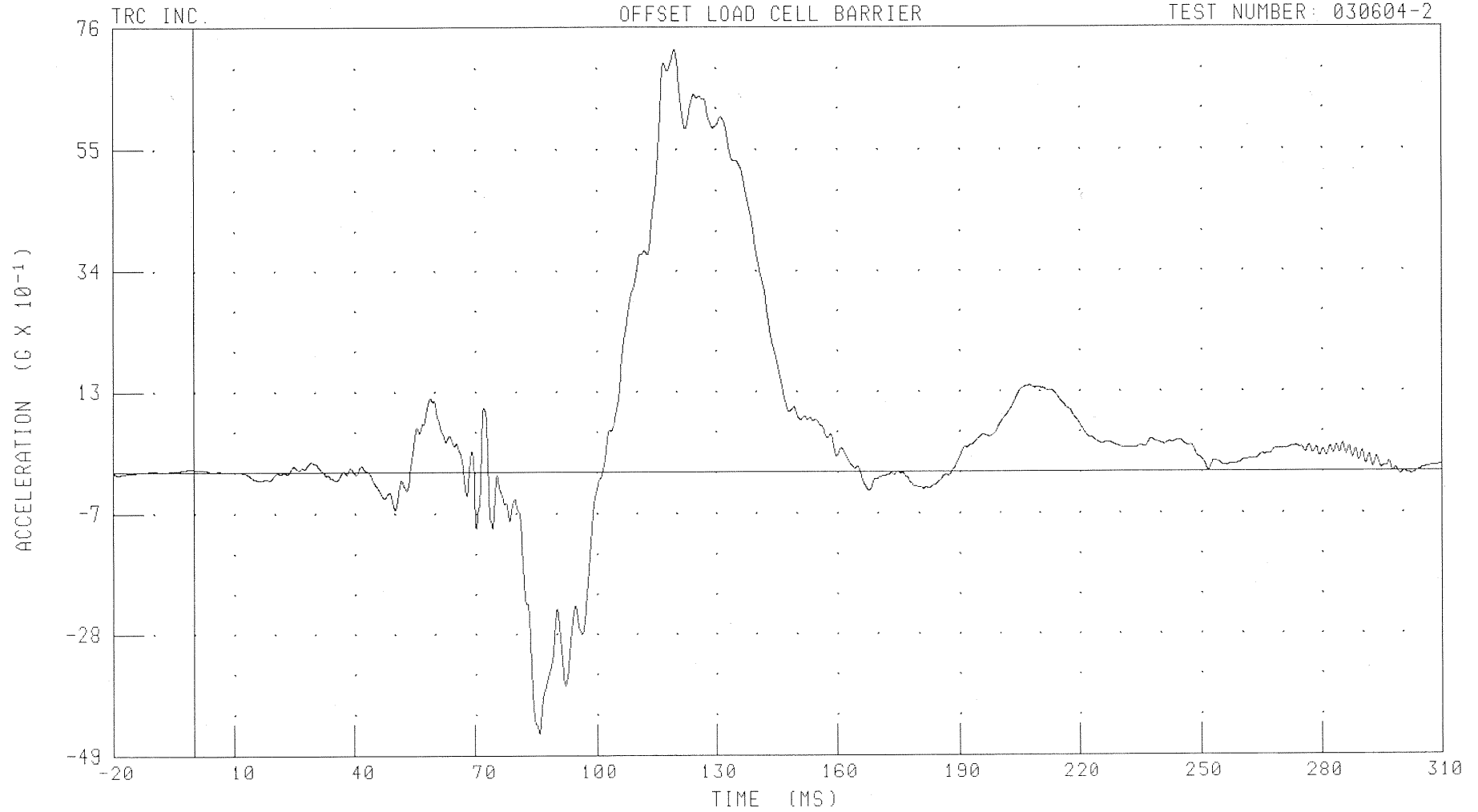
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTYG1 FILTER: CH. CLASS 180

PEAK DATA: 7.32 G @ 119.76 MS; -4.53 G @ 85.84 MS

B-34

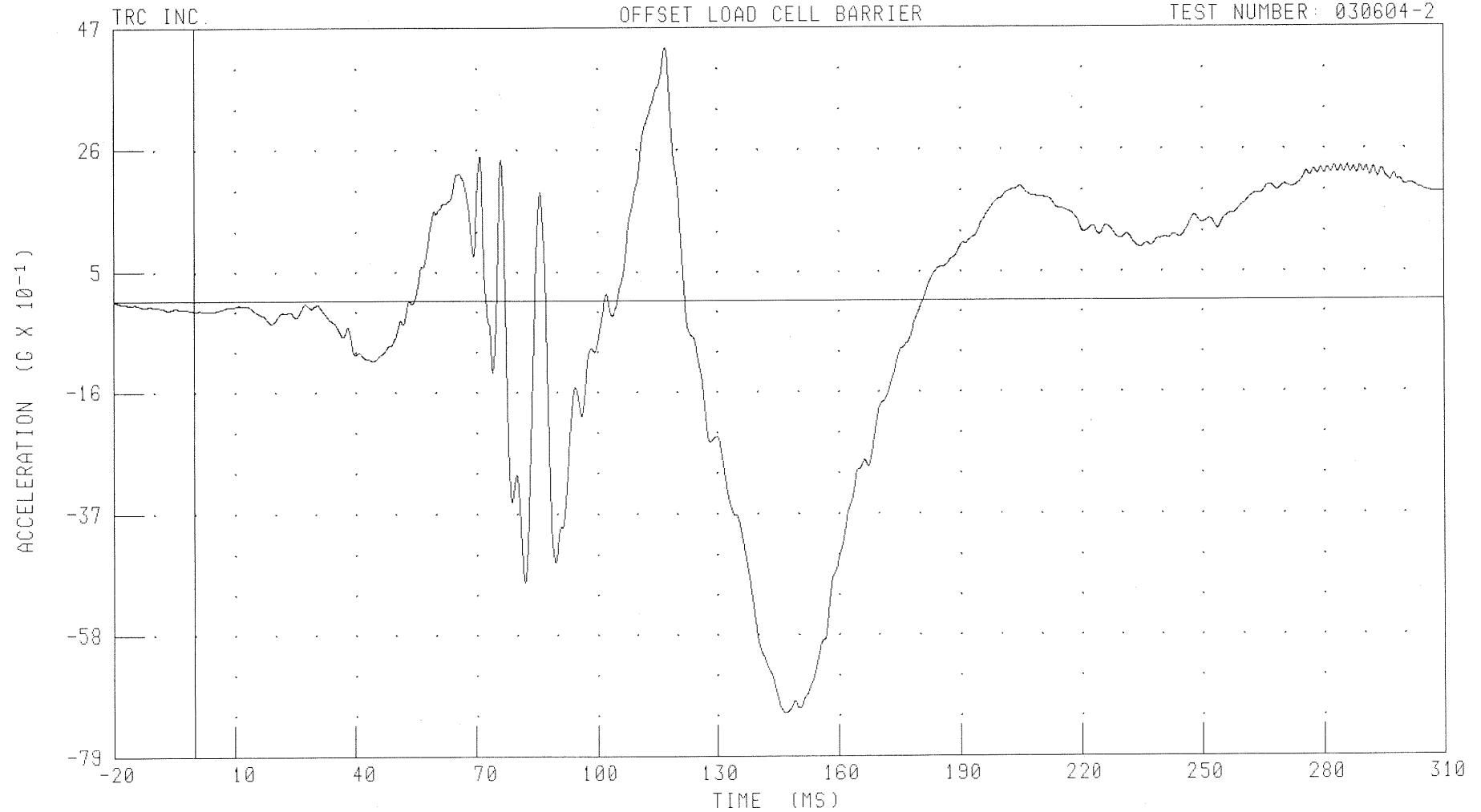
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTZG1

FILTER: CH. CLASS 180

PEAK DATA: 4.36 G @ 117.28 MS; -7.15 G @ 146.56 MS

B-35

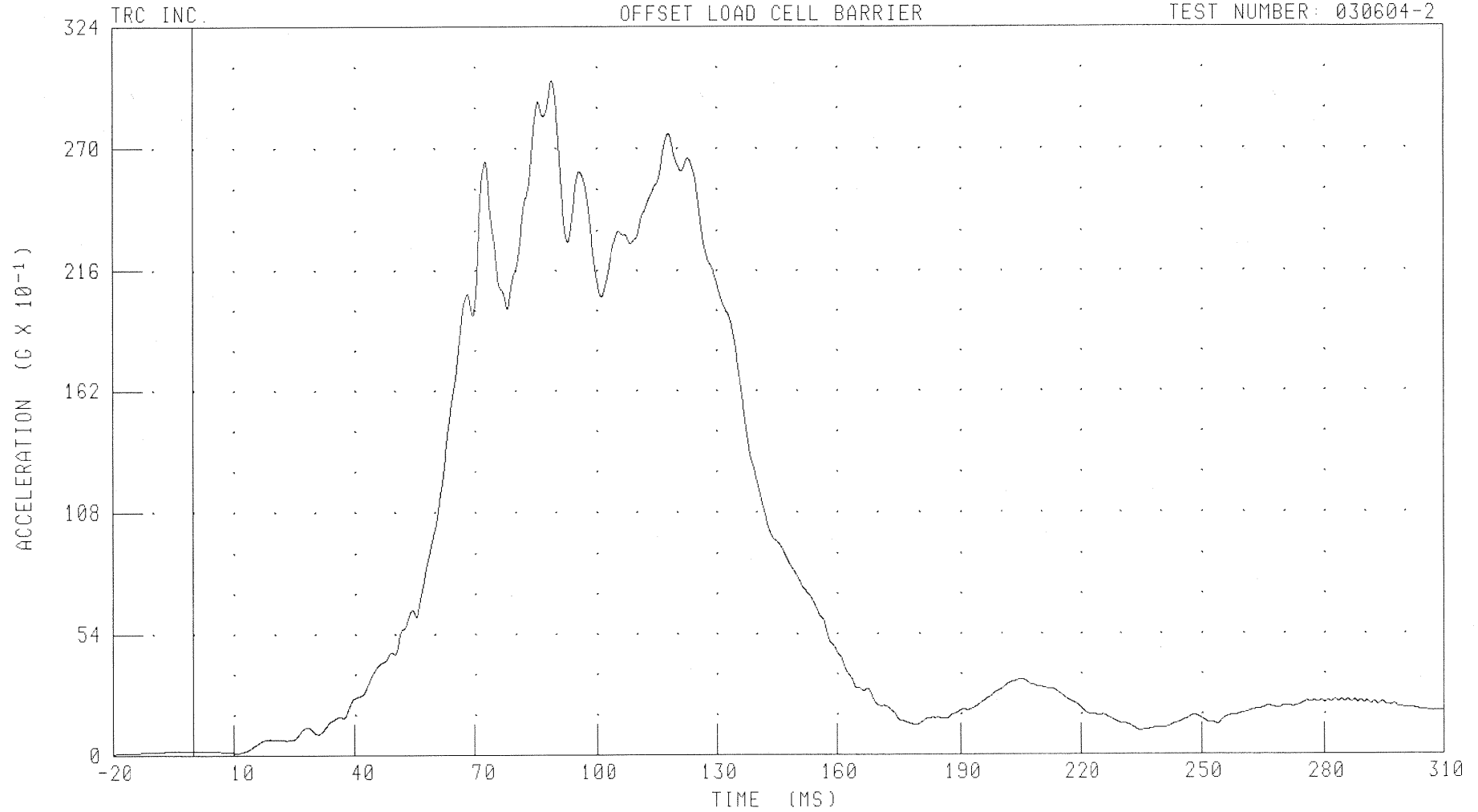
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTRG1

FILTER: CH. CLASS 180

PEAK DATA: 29.98 G @ 89.12 MS; 0.00 G @ -20.00 MS

B-36

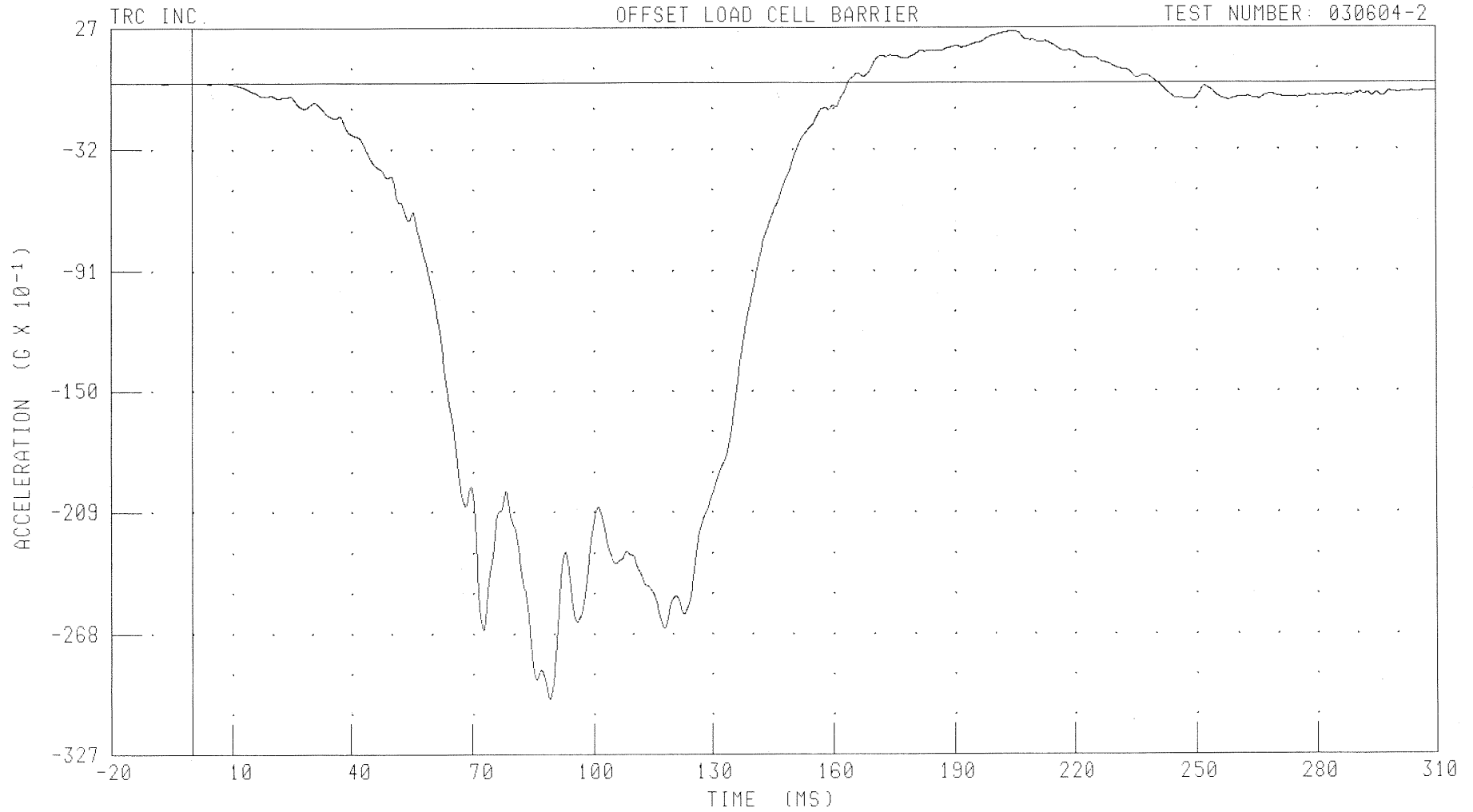
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST X-AXIS REDUNDANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTXR1

FILTER: CH. CLASS 180

PEAK DATA: 2.52 G @ 204.32 MS; -29.99 G @ 89.04 MS

B-37

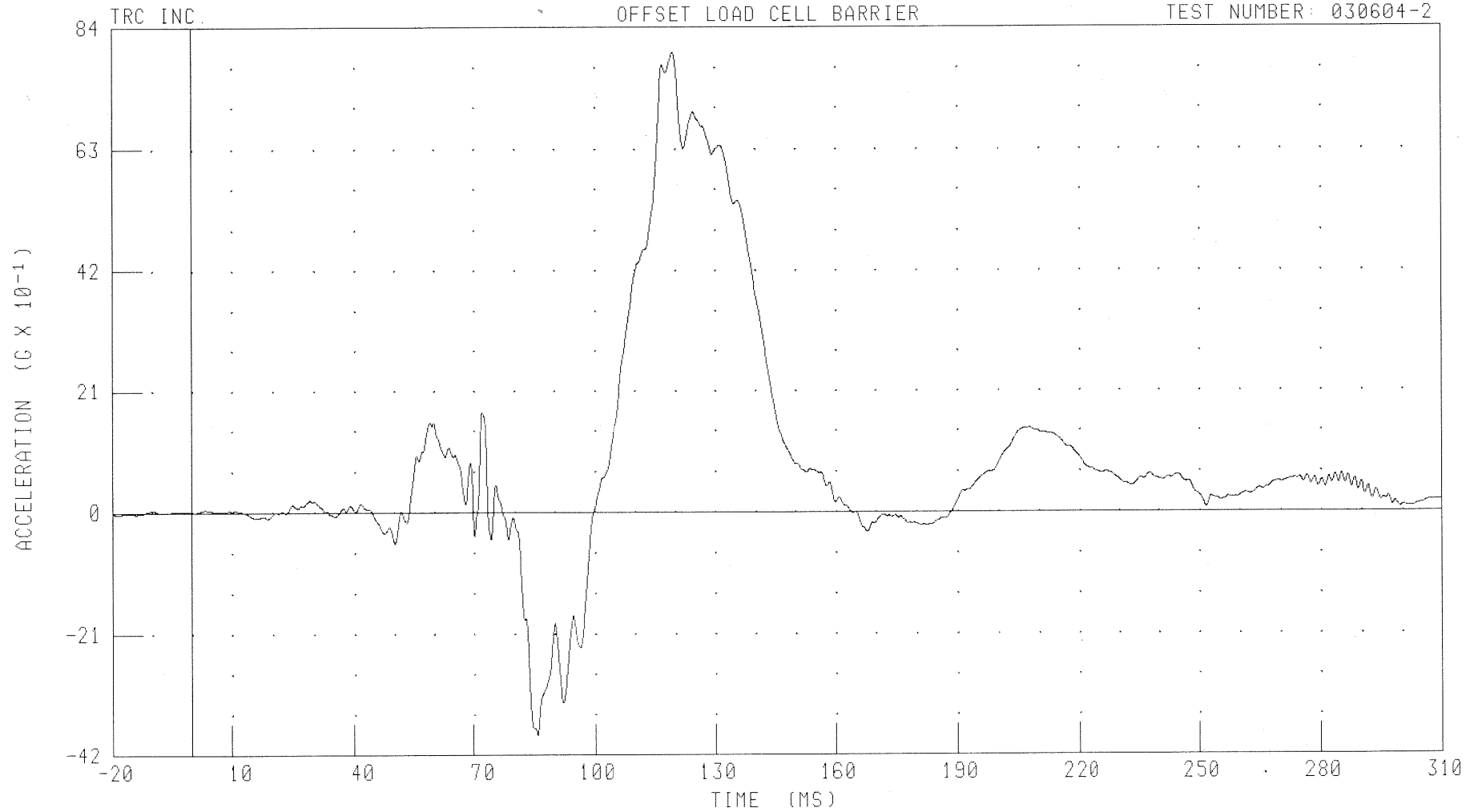
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST Y-AXIS REDUNDANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTYR1 FILTER: CH. CLASS 180

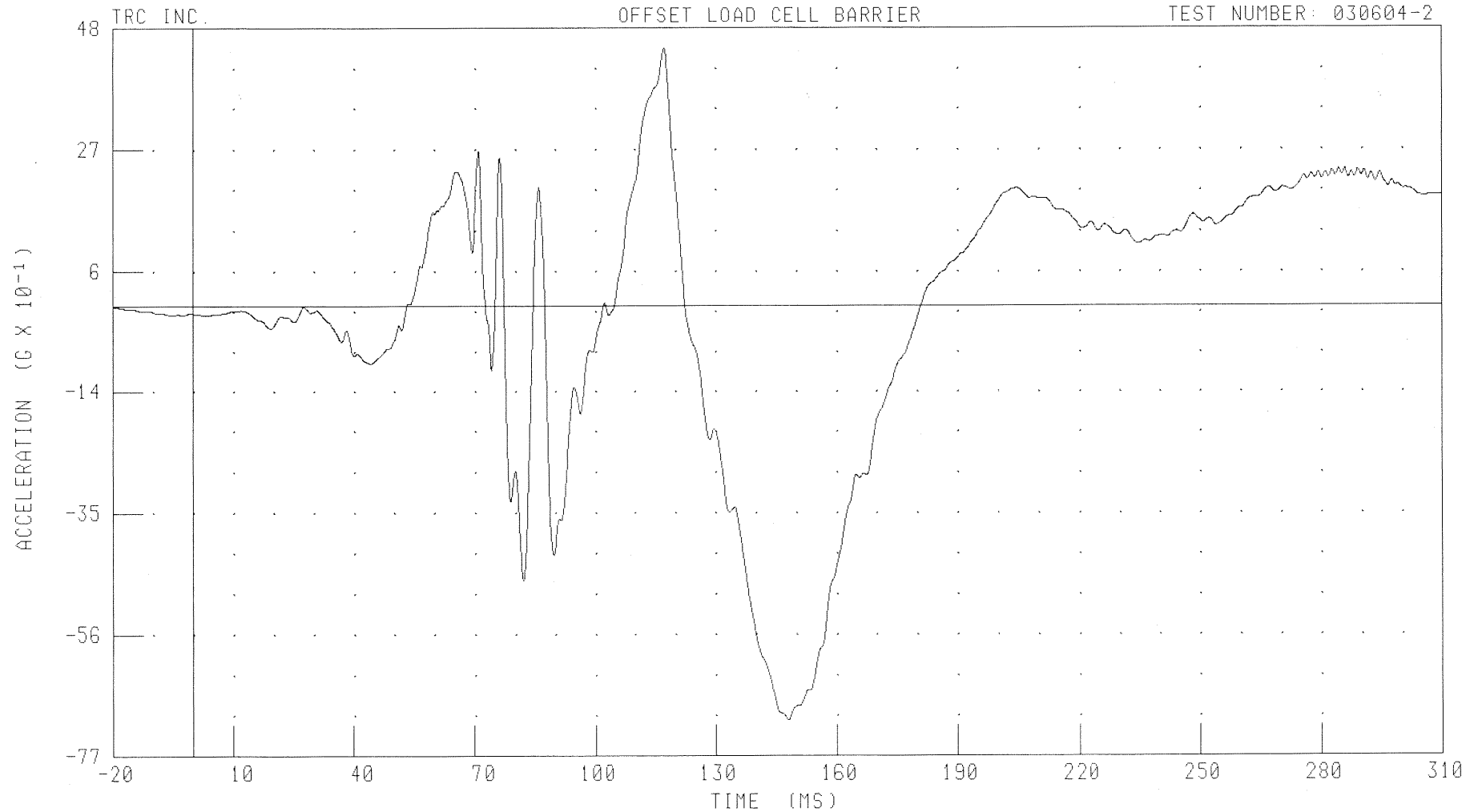
PEAK DATA: 7.96 G @ 119.60 MS, -3.86 G @ 85.76 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST Z-AXIS REDUNDANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTZR1 FILTER: CH. CLASS 180

B-39

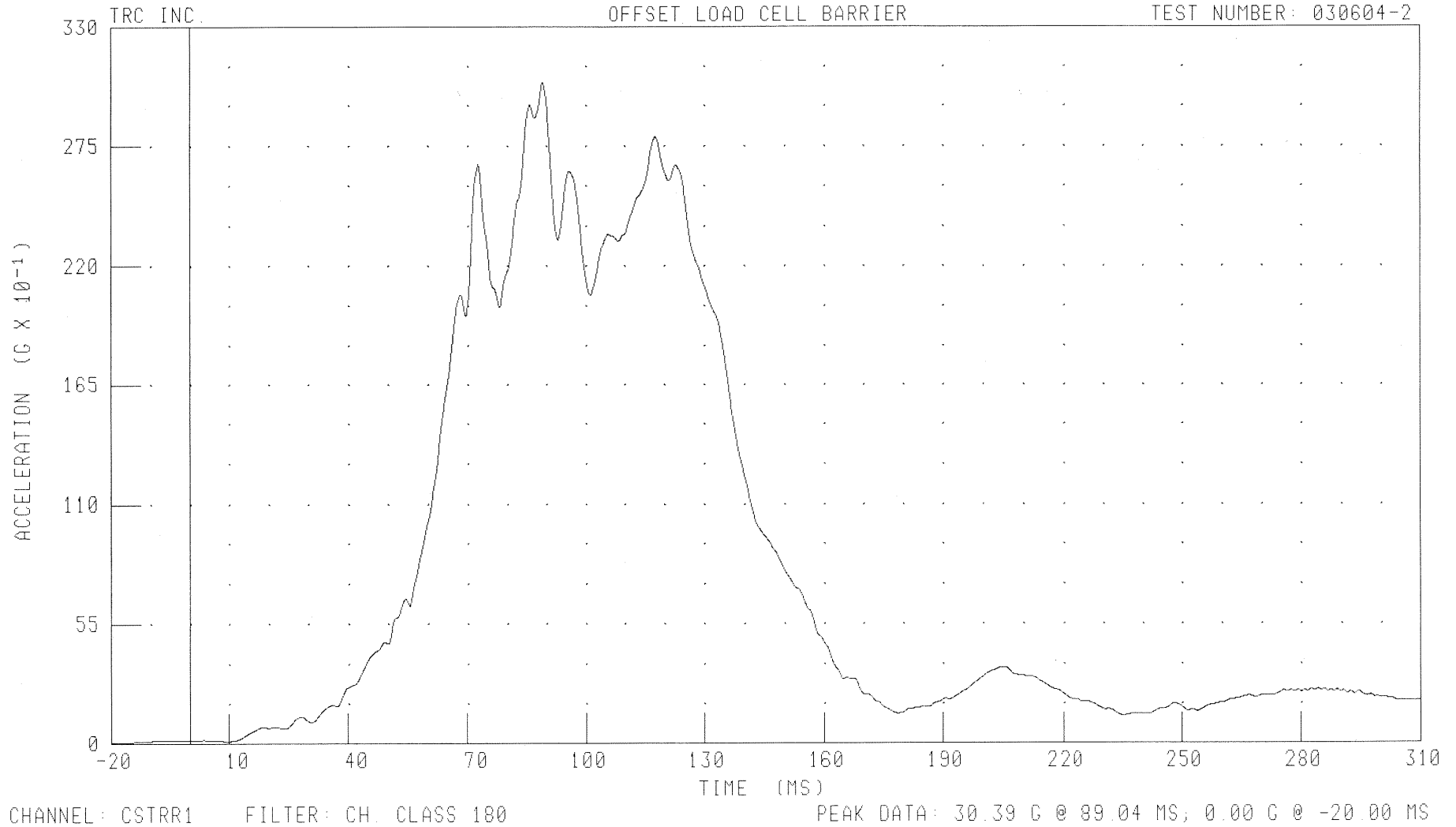
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST REDUNDANT RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-40

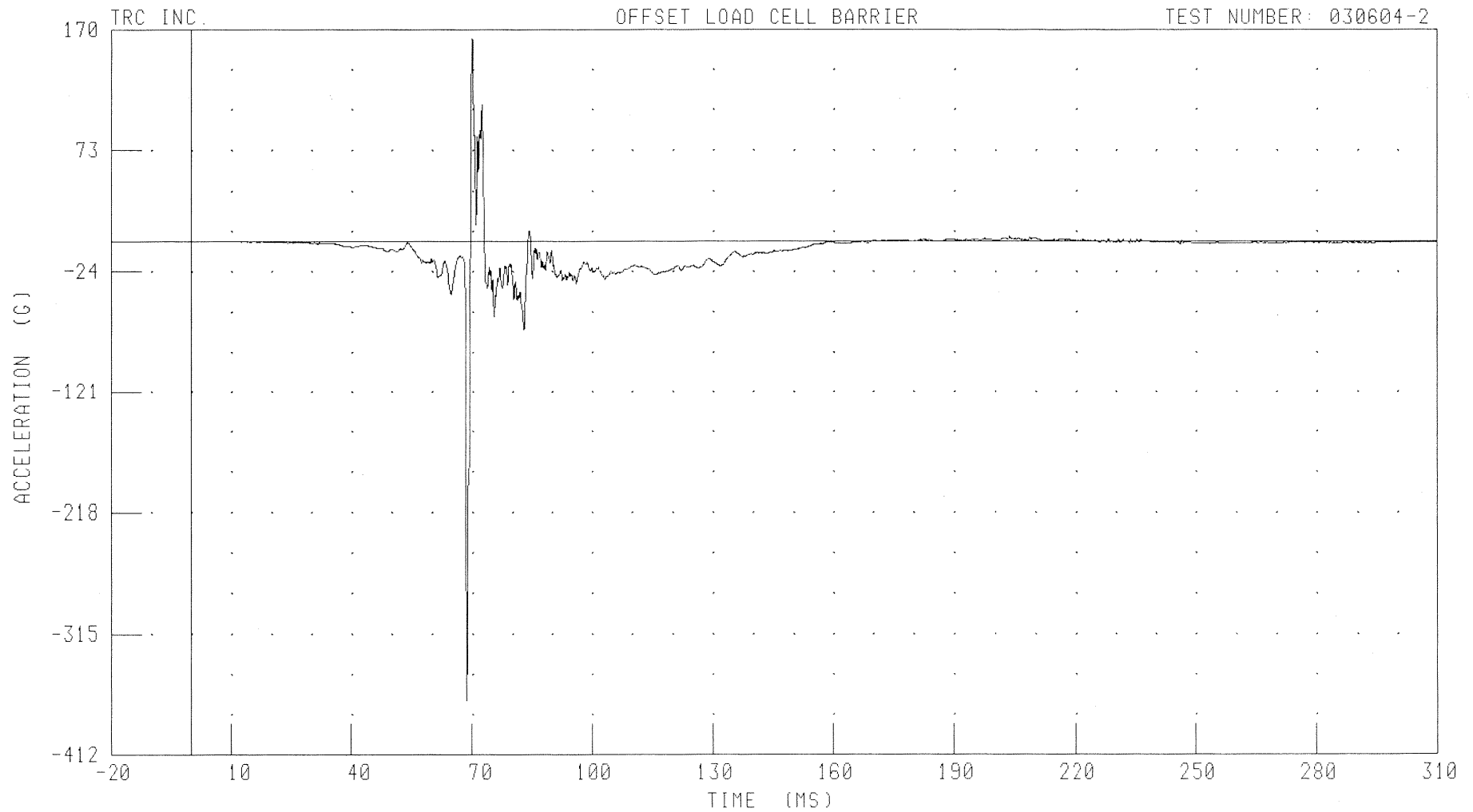
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER STERNUM UPPER X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: STUXG1 FILTER: CH. CLASS 1000

PEAK DATA: 162.73 G @ 70.00 MS; -368.24 G @ 68.72 MS

B-41

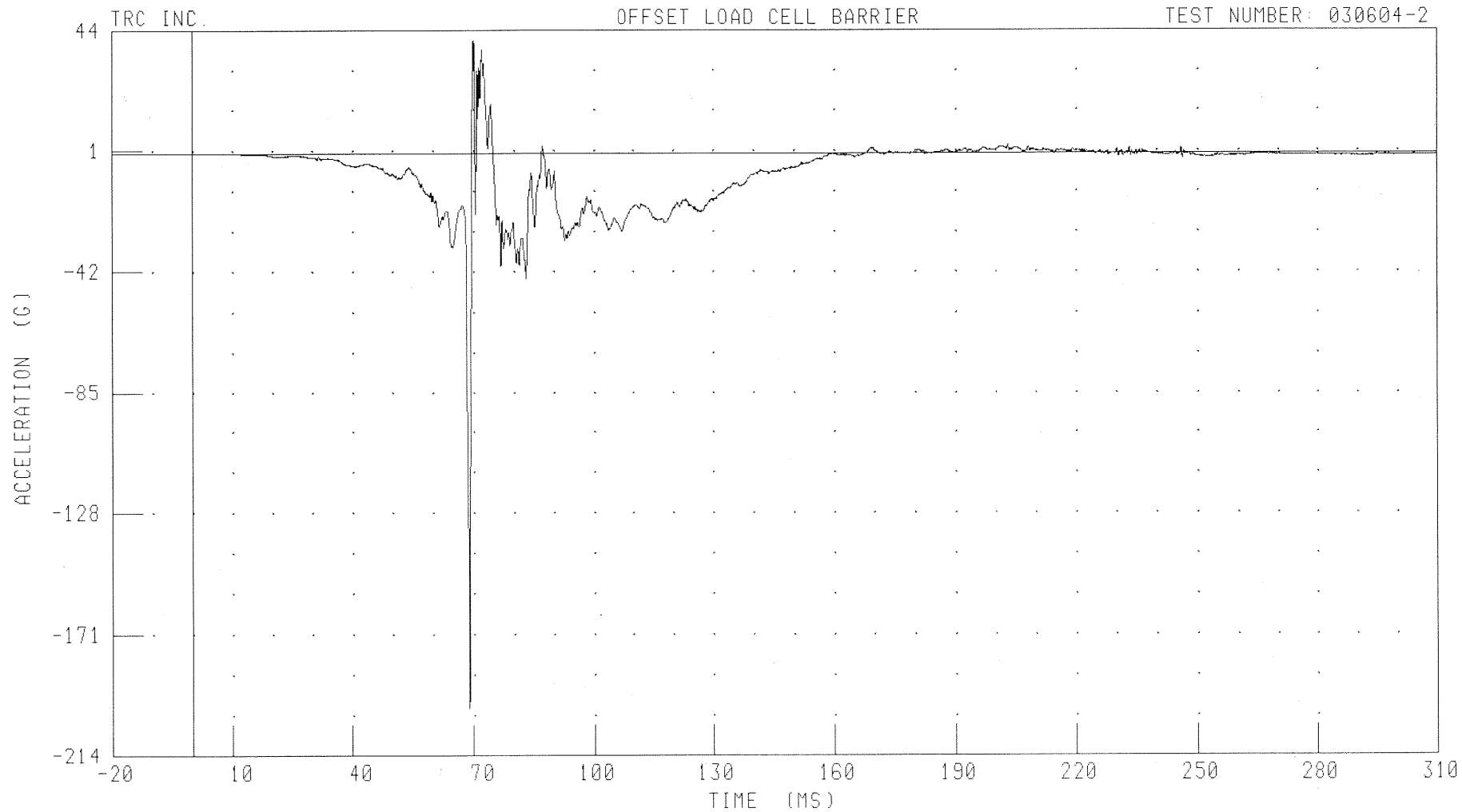
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER STERNUM MID X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: STMXG1 FILTER: CH. CLASS 1000

PEAK DATA: 40.30 G @ 70.24 MS; -197.13 G @ 68.96 MS

B-42

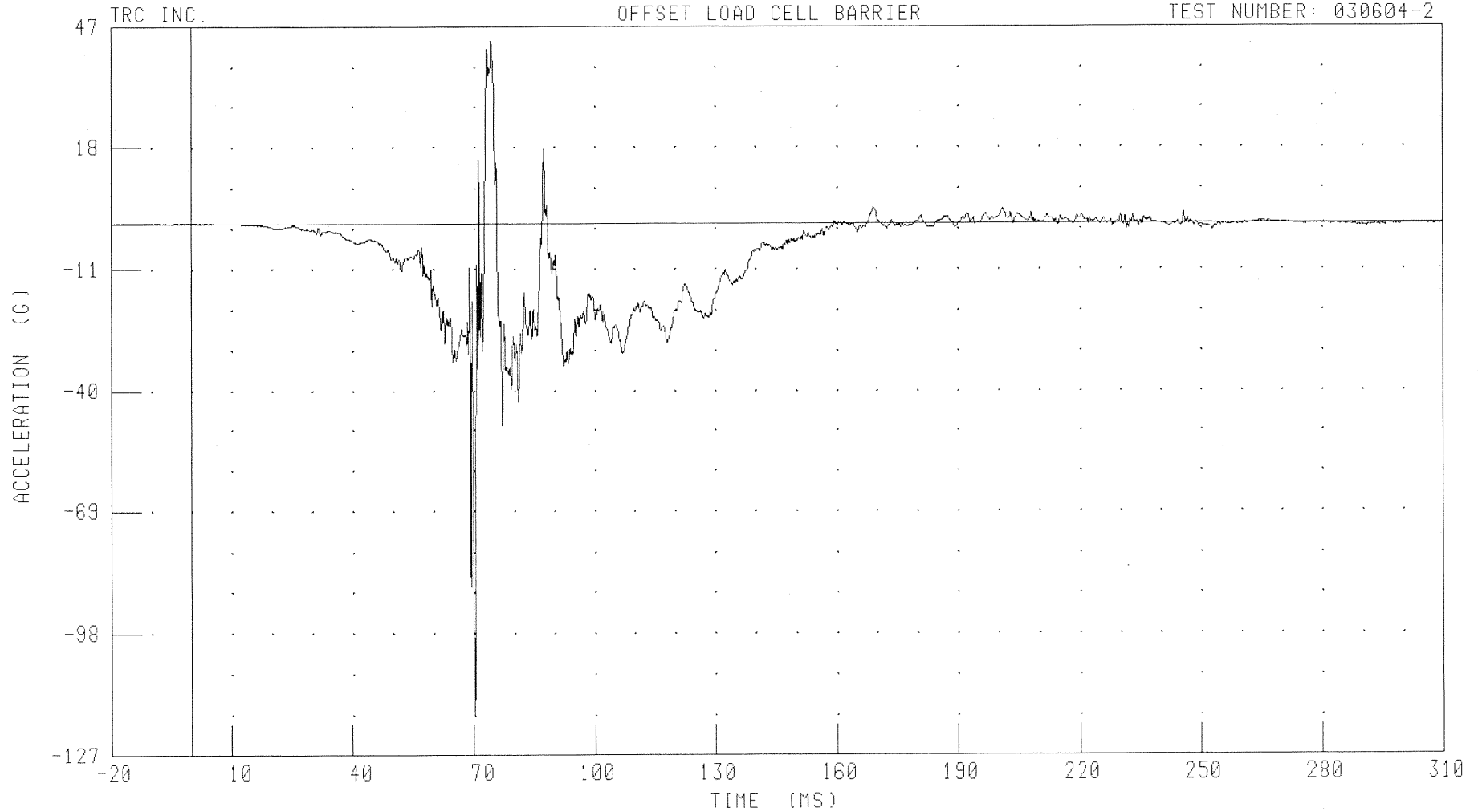
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER STERNUM LOWER X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: STLXC1 FILTER: CH. CLASS 1000

B-43

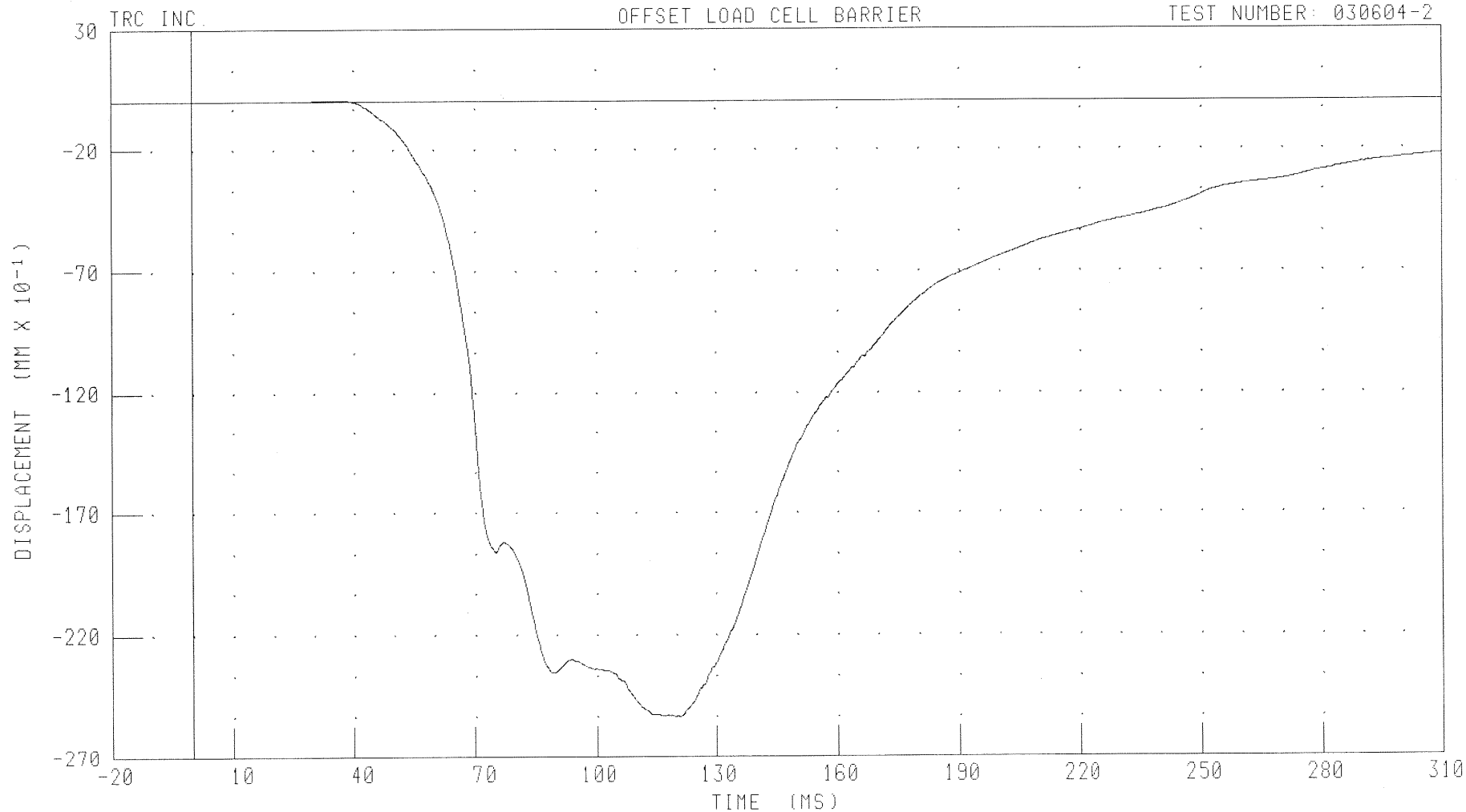
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER CHEST DEFLECTION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTXD1

FILTER: CH. CLASS 600

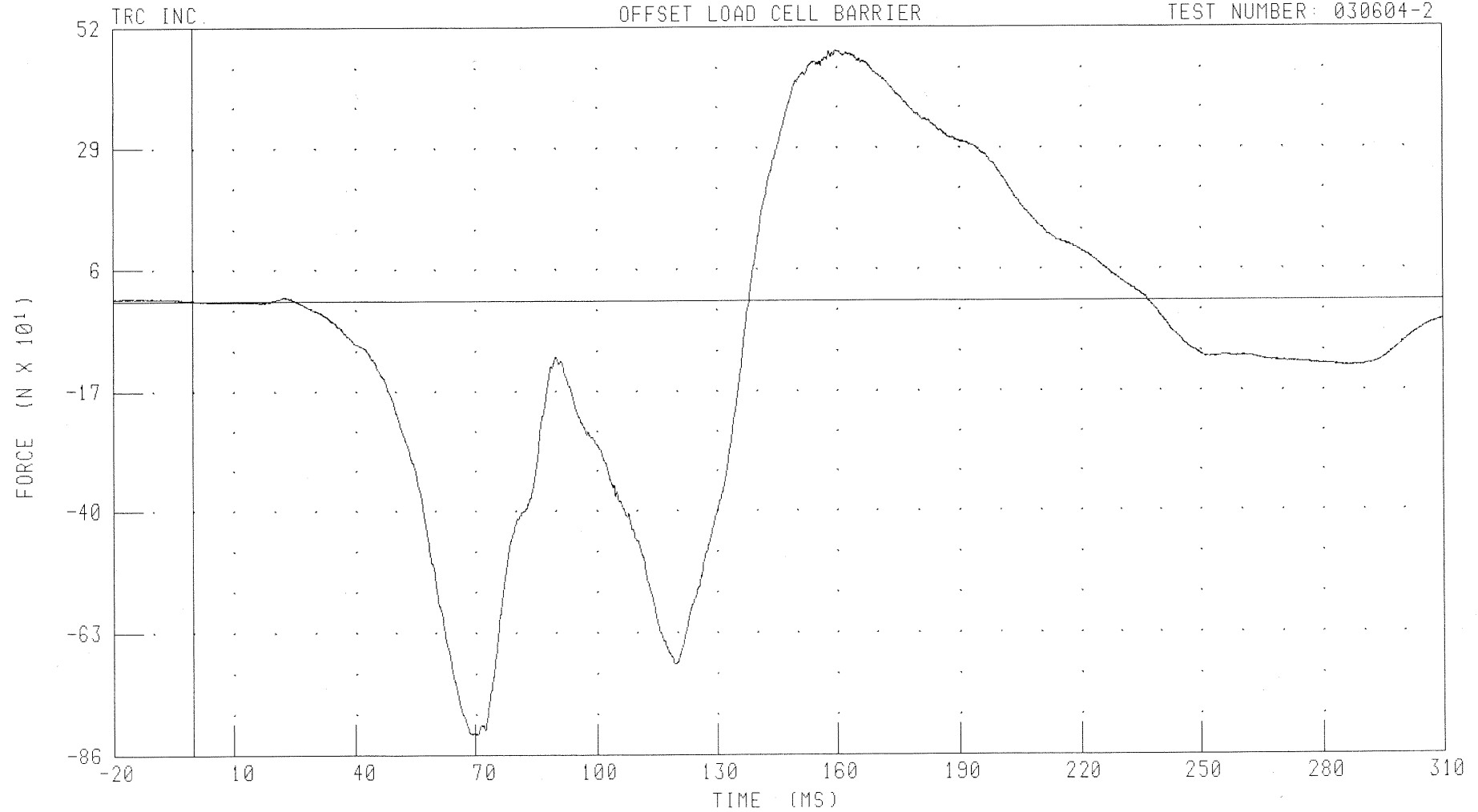
PEAK DATA: 0.06 MM @ 32.88 MS, -25.36 MM @ 119.84 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LUMBAR X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LMBXF1

FILTER: CH. CLASS 1000

PEAK DATA: 475.48 N @ 159.76 MS; -822.10 N @ 70.56 MS

B-45

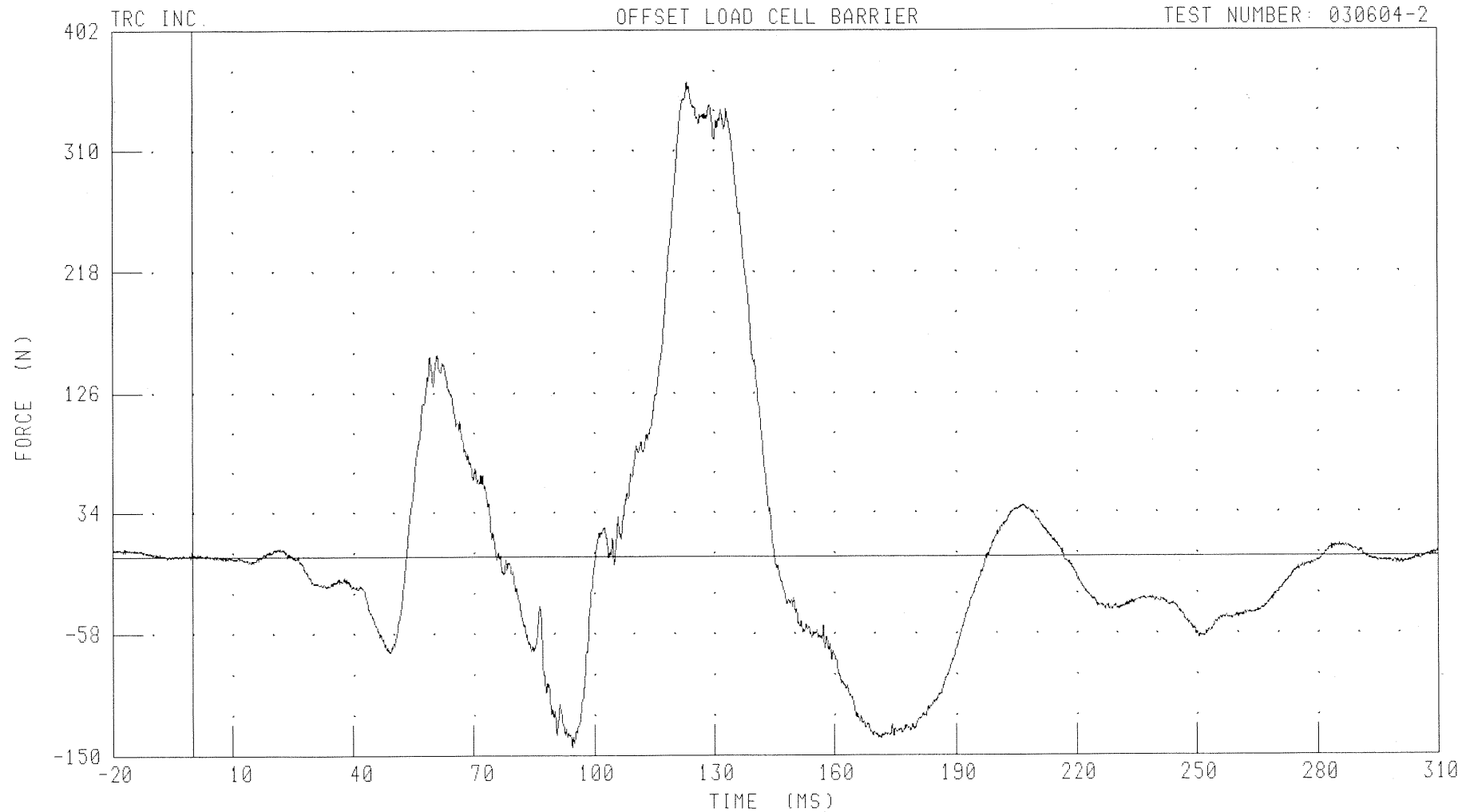
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LUMBAR Y-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LM BYF1 FILTER: CH. CLASS 1000

PEAK DATA: 362.77 N @ 123.36 MS; -143.71 N @ 94.48 MS

B-46

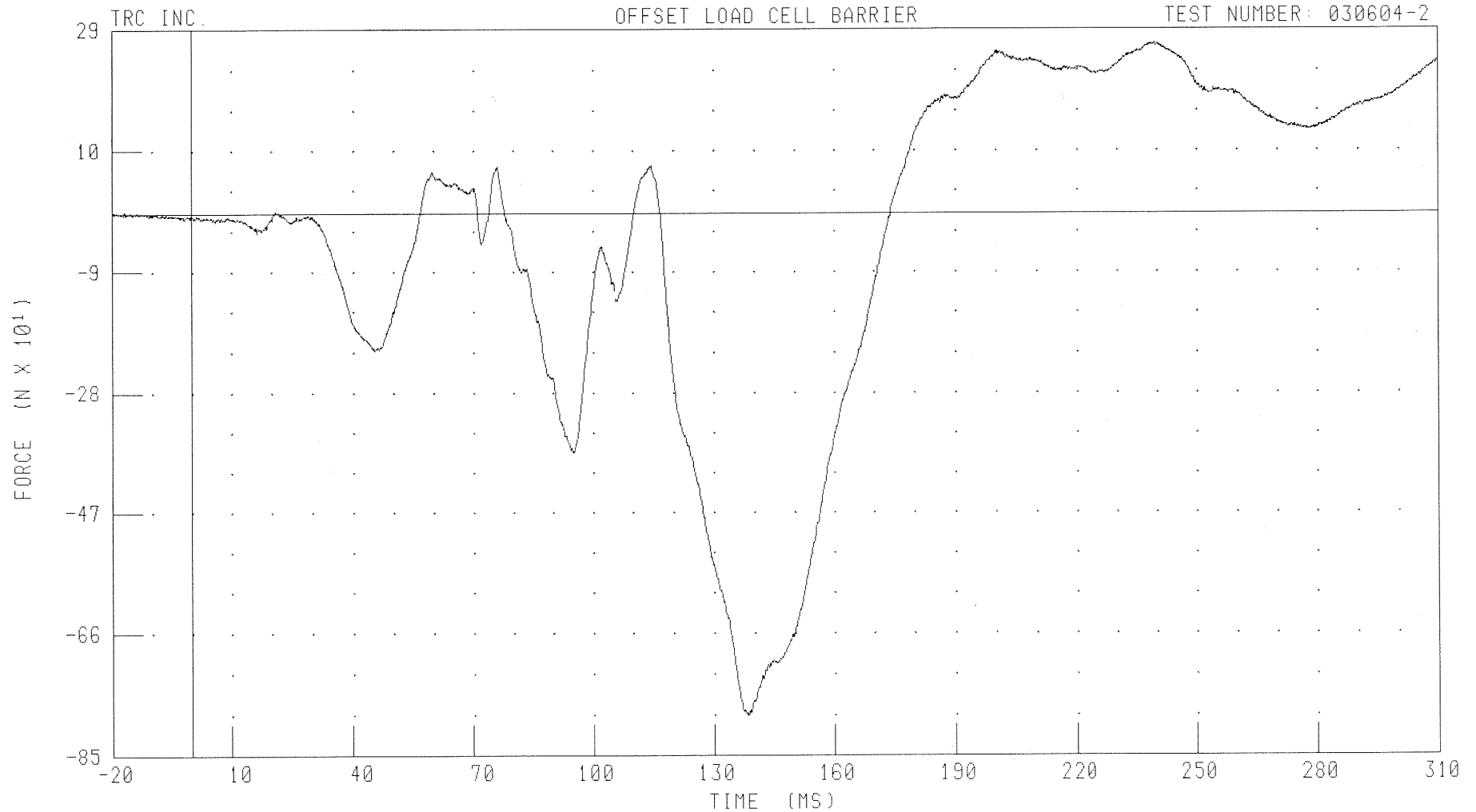
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LUMBAR Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LMBZF1 FILTER: CH. CLASS 1000

PEAK DATA: 269.67 N @ 239.44 MS; -787.43 N @ 138.48 MS

B-47

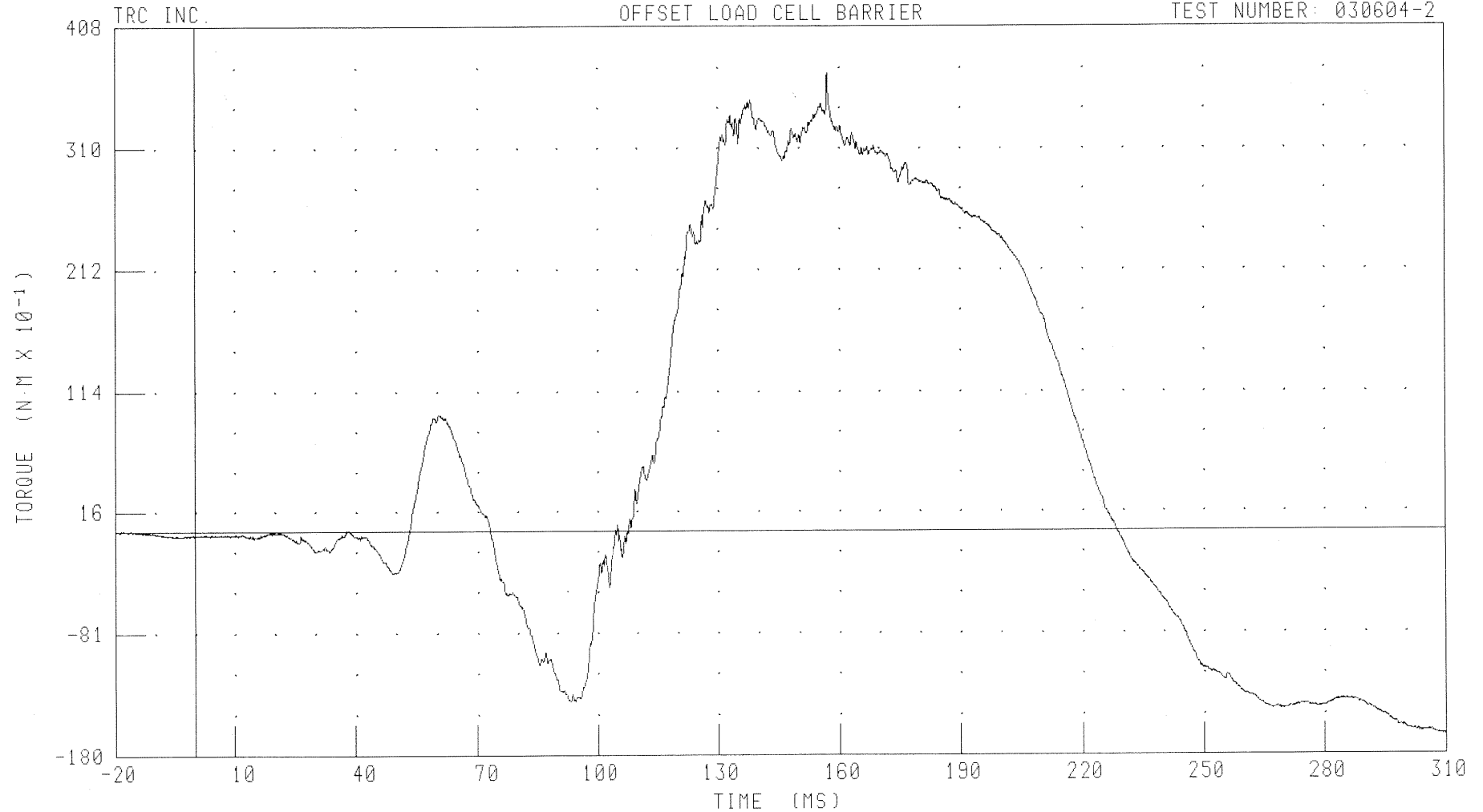
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LUMBAR X-AXIS MOMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LMBXM1 FILTER: CH. CLASS 1000

PEAK DATA: 37.11 N·M @ 157.20 MS; -16.45 N·M @ 309.76 MS

B-48

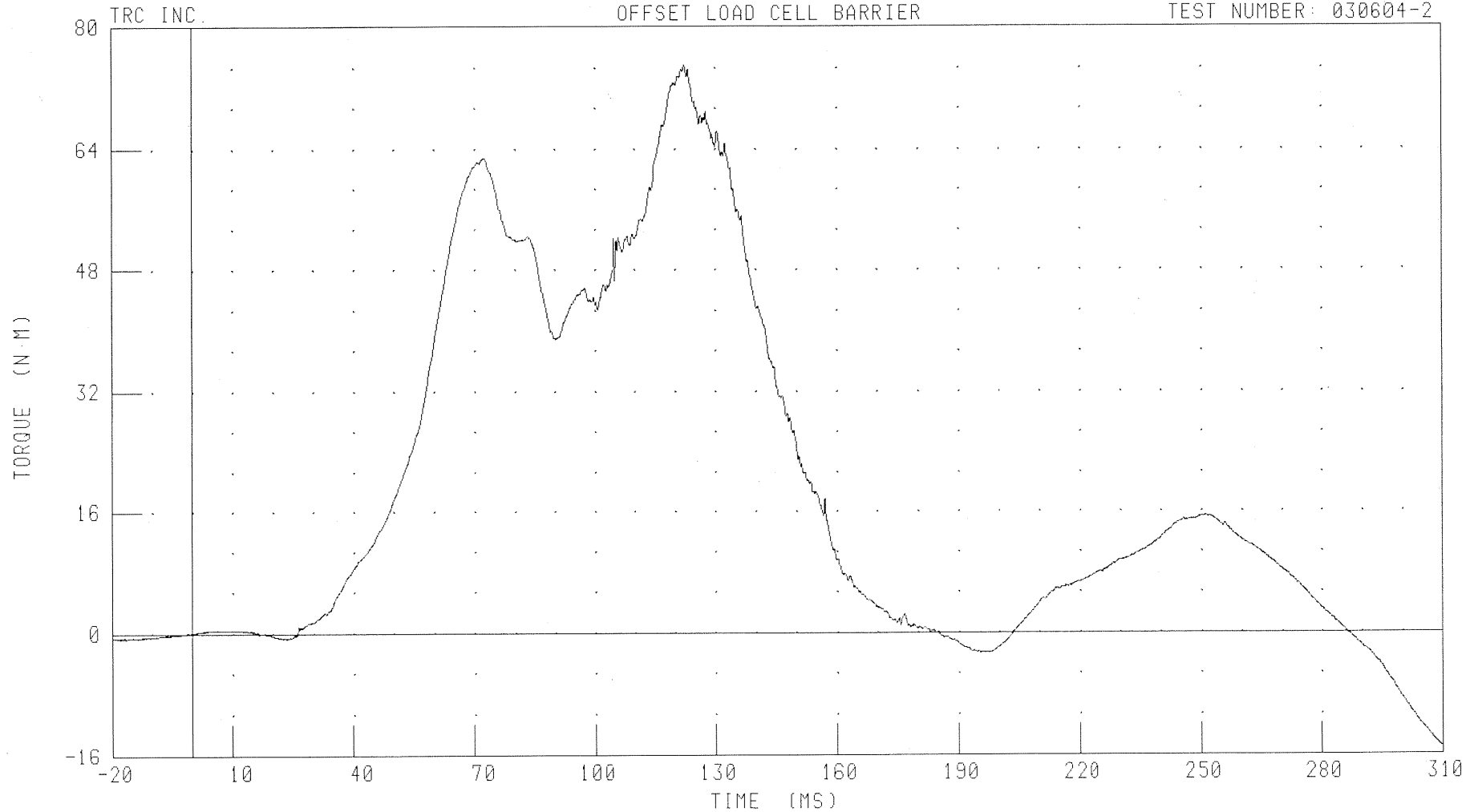
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LUMBAR Y-AXIS MOMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LMBYM1 FILTER: CH. CLASS 1000

PEAK DATA: 74.97 N·M @ 122.48 MS; -15.08 N·M @ 310.00 MS

B-49

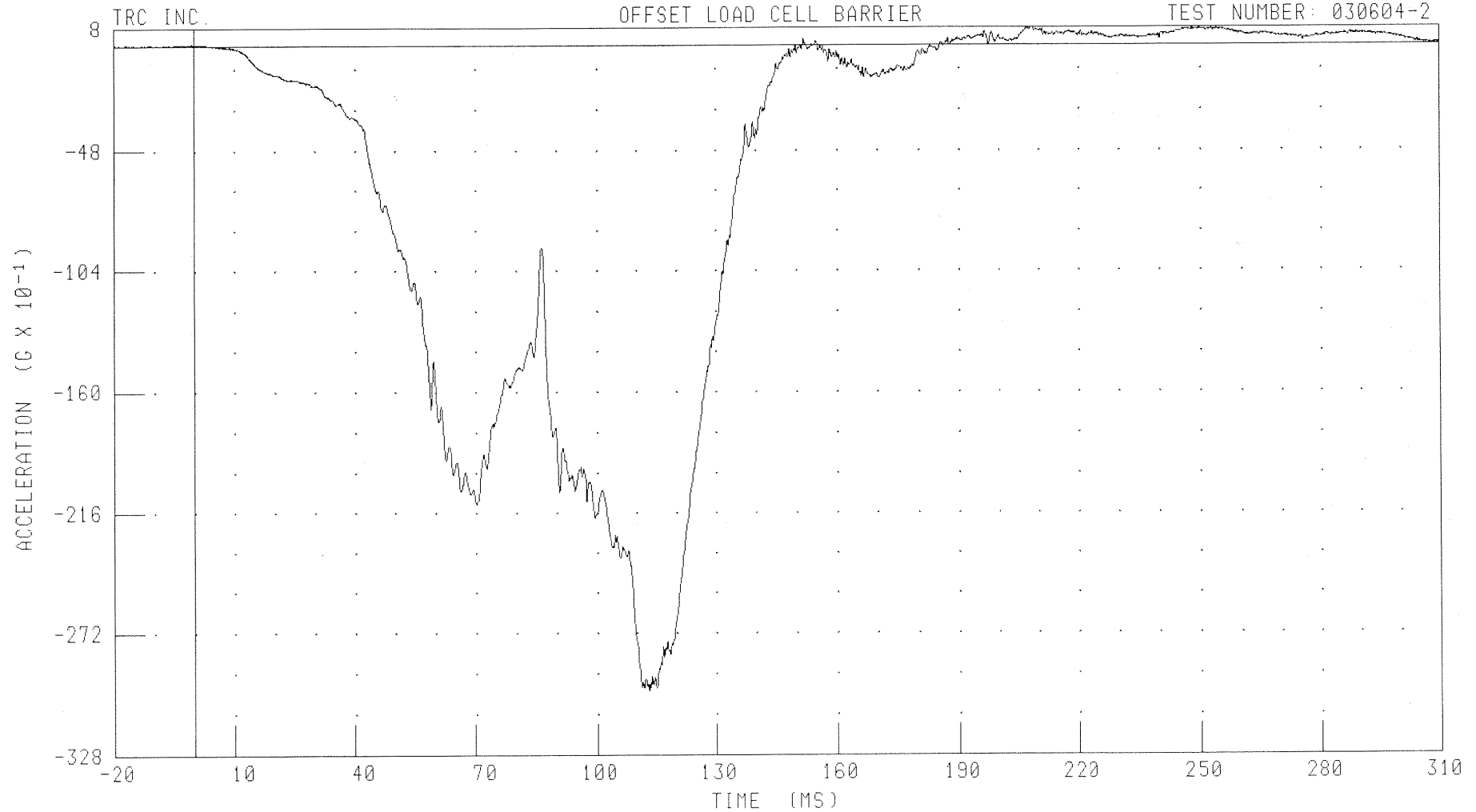
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER PELVIS X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

PEAK DATA: 0.82 G @ 208.56 MS; -29.85 G @ 113.20 MS

B-50

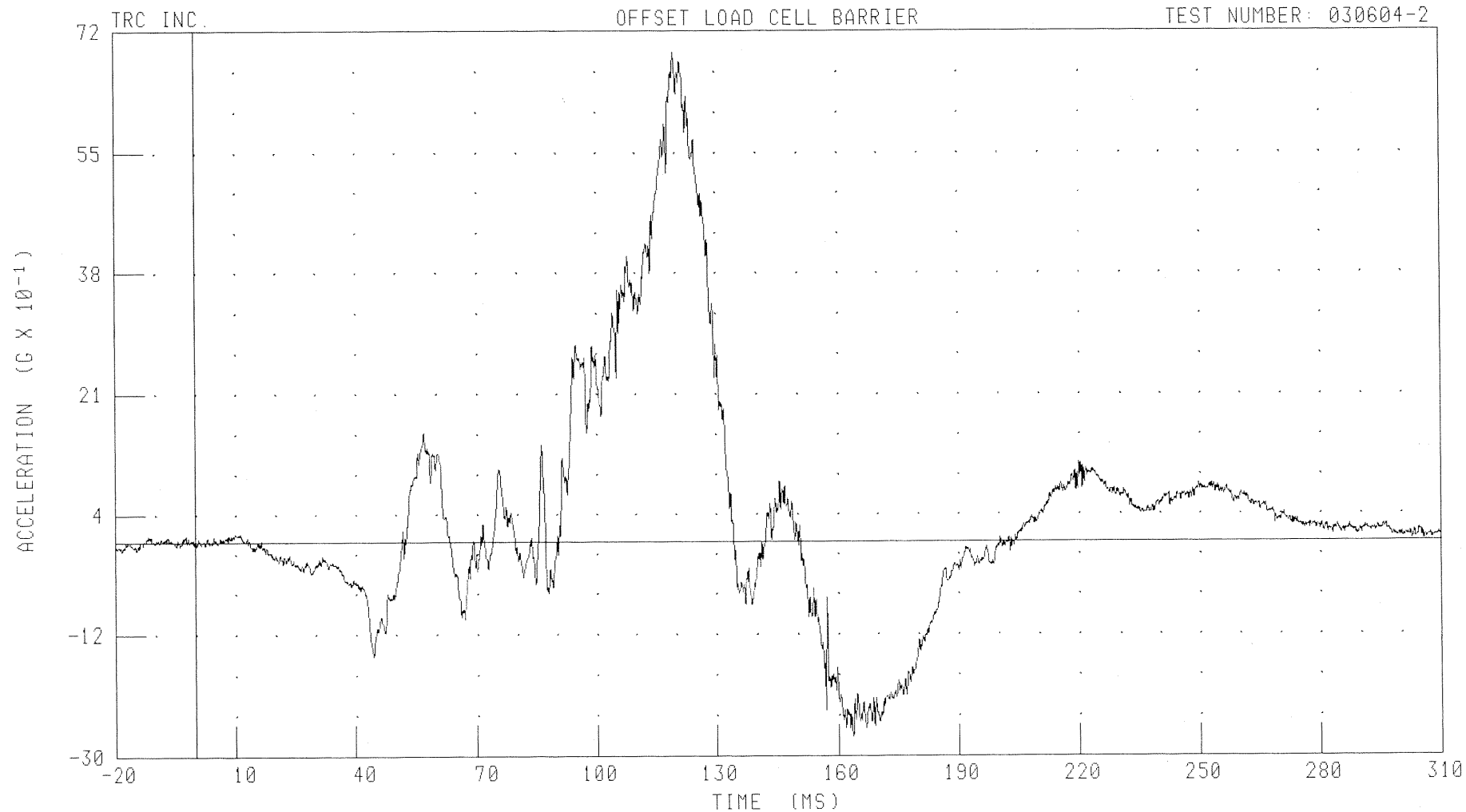
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER PELVIS Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

PEAK DATA: 6.89 G @ 119.92 MS; -2.73 G @ 163.68 MS

B-51

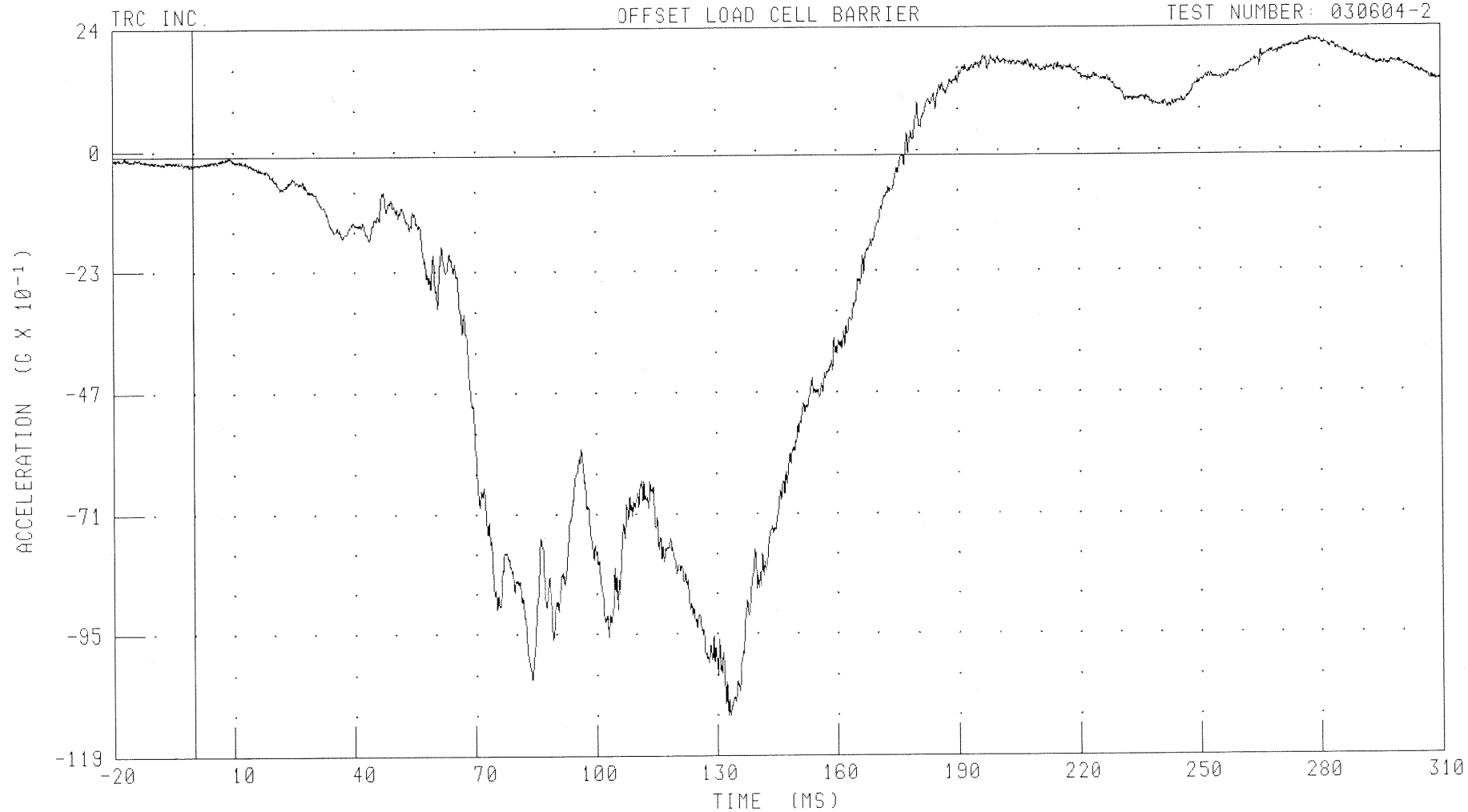
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER PELVIS Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

PEAK DATA: 2.28 G @ 277.52 MS; -11.11 G @ 132.80 MS

B-52

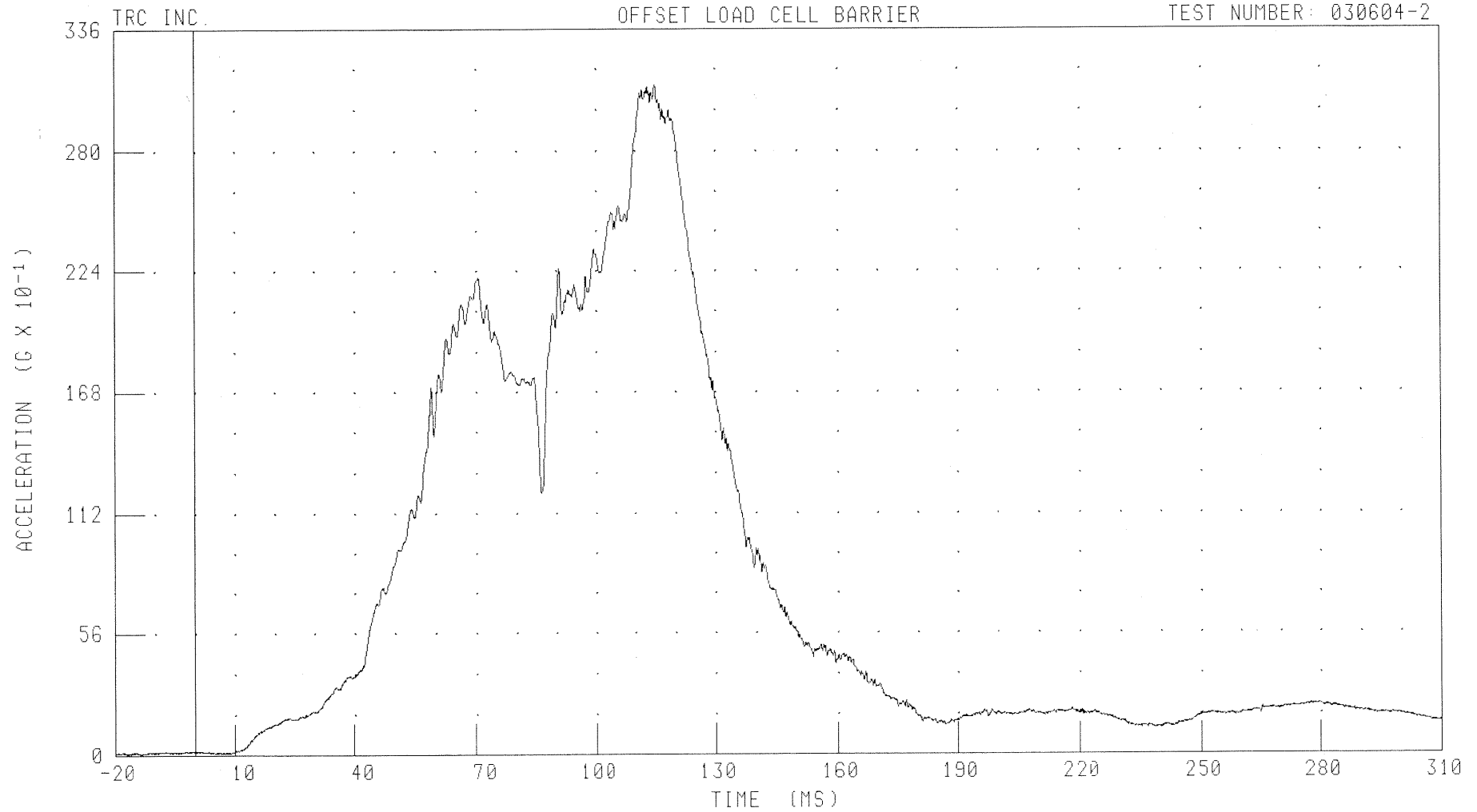
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER PELVIS RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

PEAK DATA: 31.00 G @ 115.12 MS; 0.03 G @ -13.28 MS

B-53

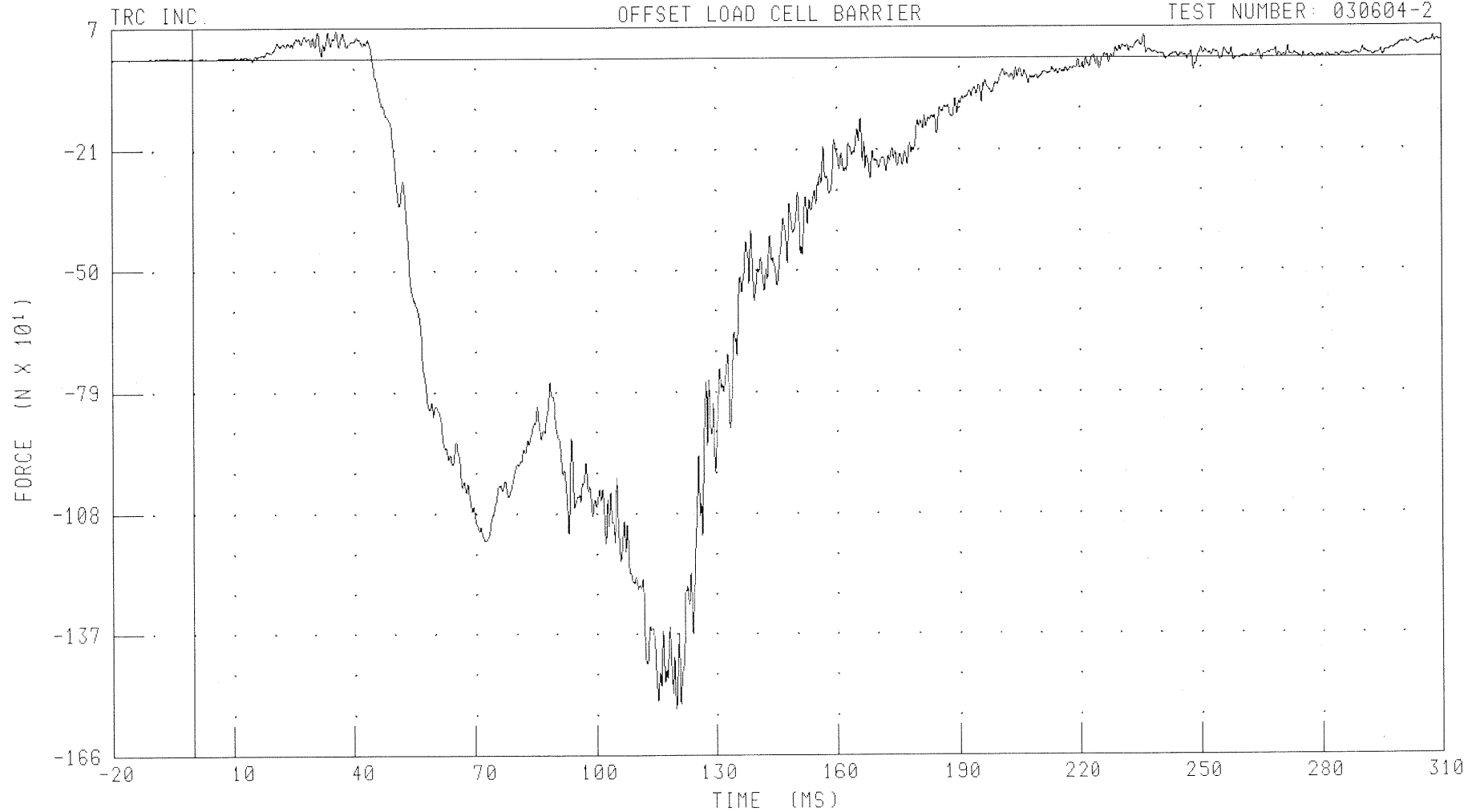
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT FEMUR Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LFMZF1 FILTER: CH. CLASS 600

PEAK DATA: 65.76 N @ 35.84 MS; -1557.03 N @ 119.92 MS

B-54

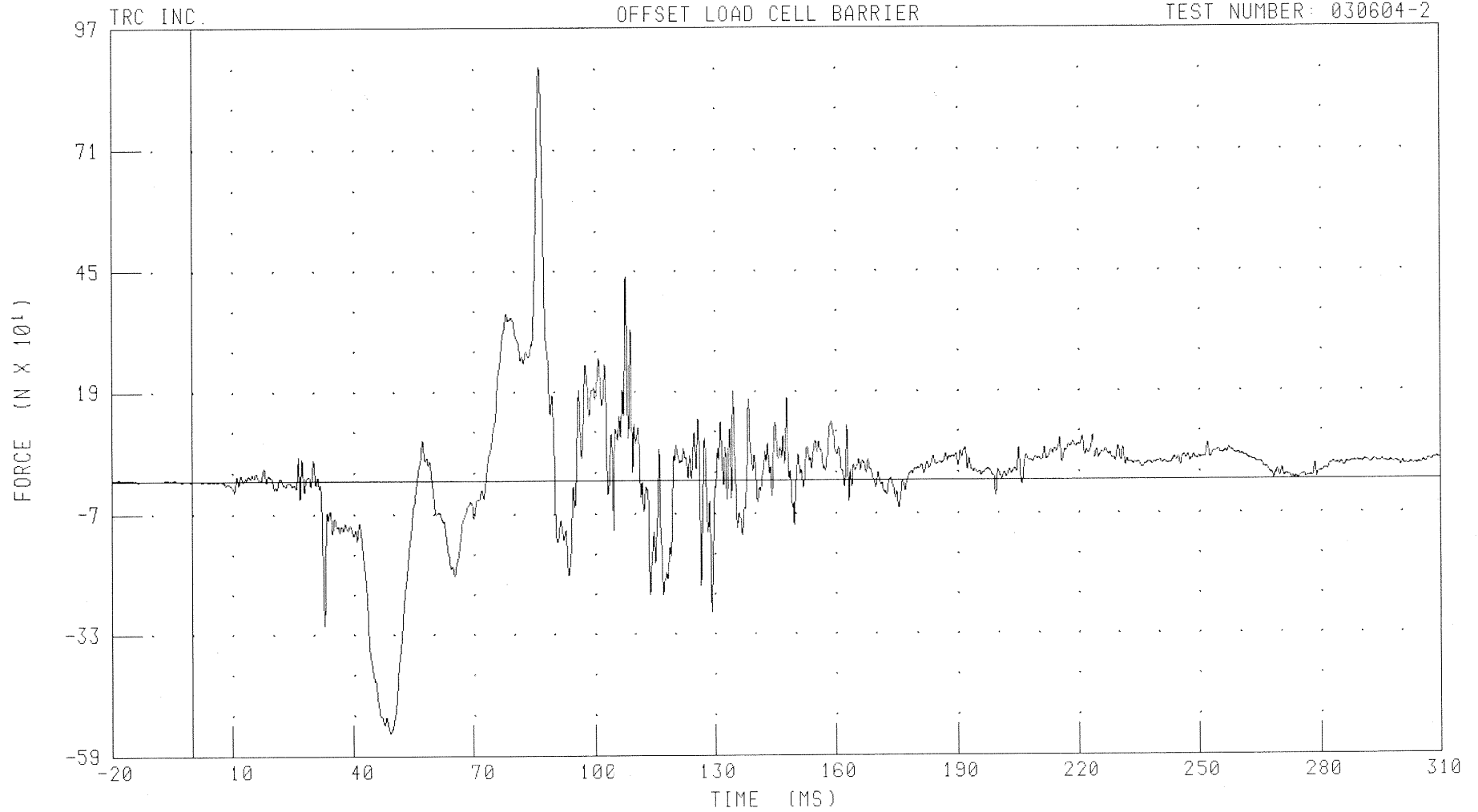
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FEMUR Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RFMZFI FILTER: CH. CLASS 600

B-55

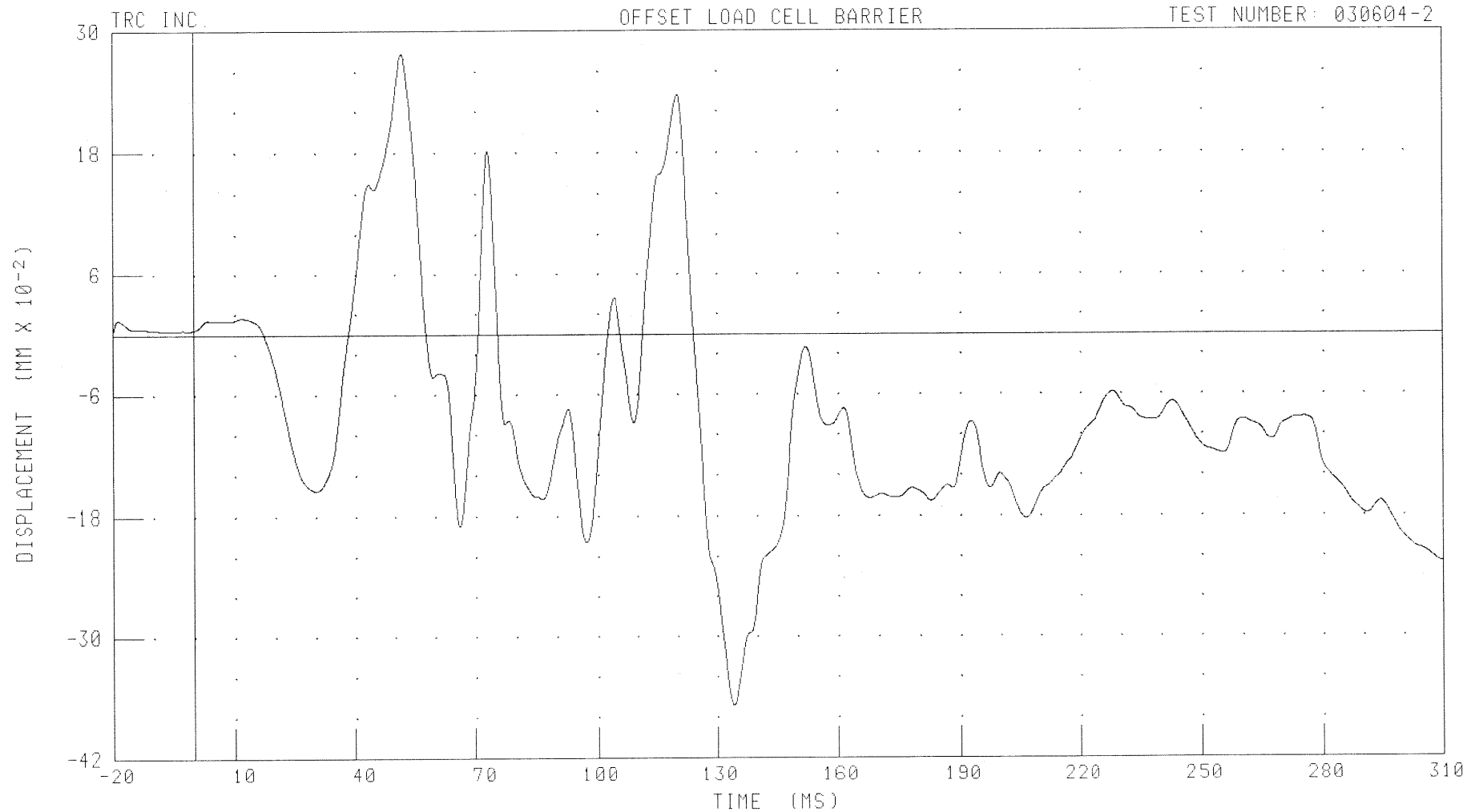
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT TIBIA TO FEMUR DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: KNLXD1

FILTER: CH. CLASS 180

B-56

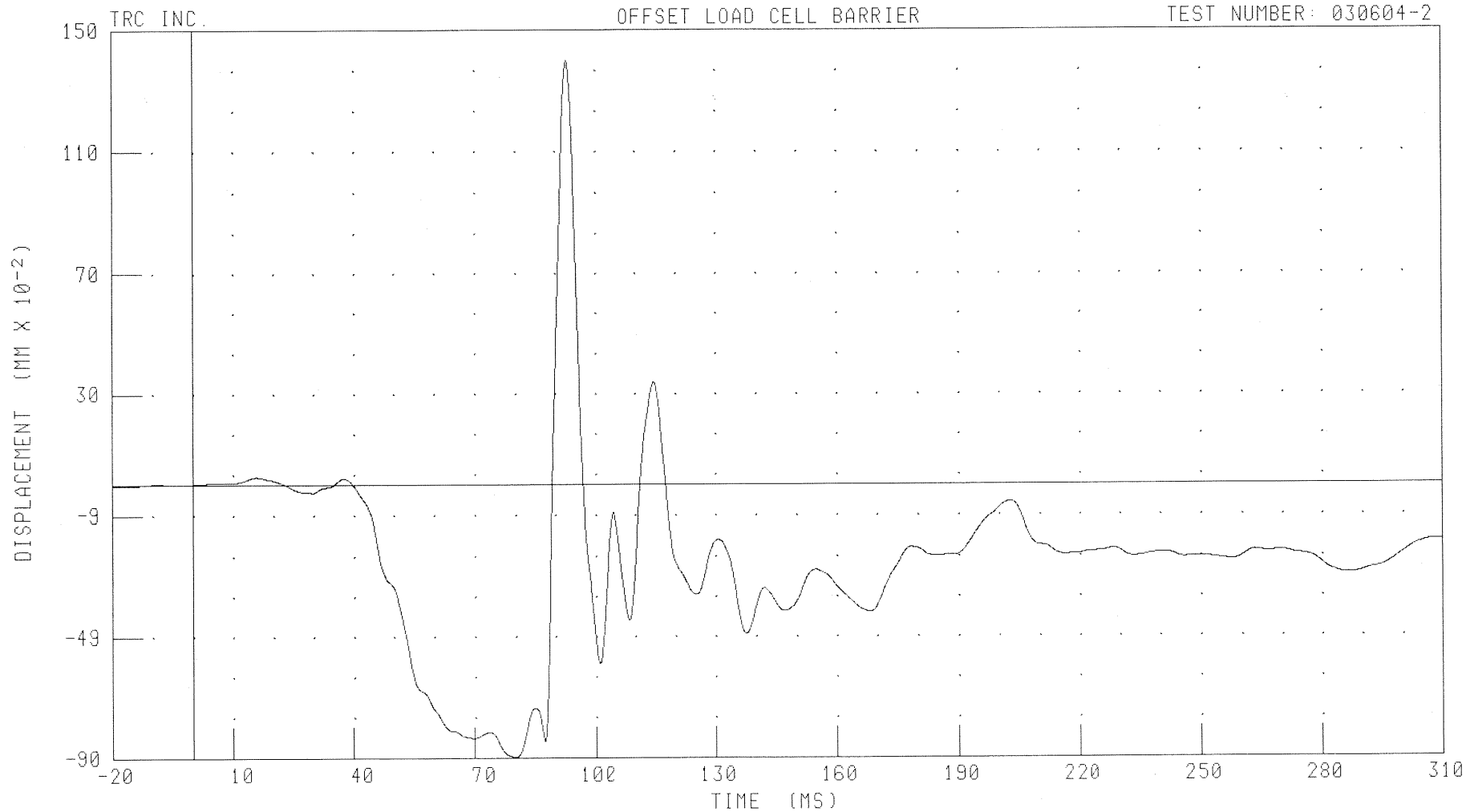
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT TIBIA TO FEMUR DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: KNRXD1 FILTER: CH. CLASS 180

PEAK DATA: 1.40 MM @ 92.96 MS, -0.90 MM @ 79.92 MS

B-57

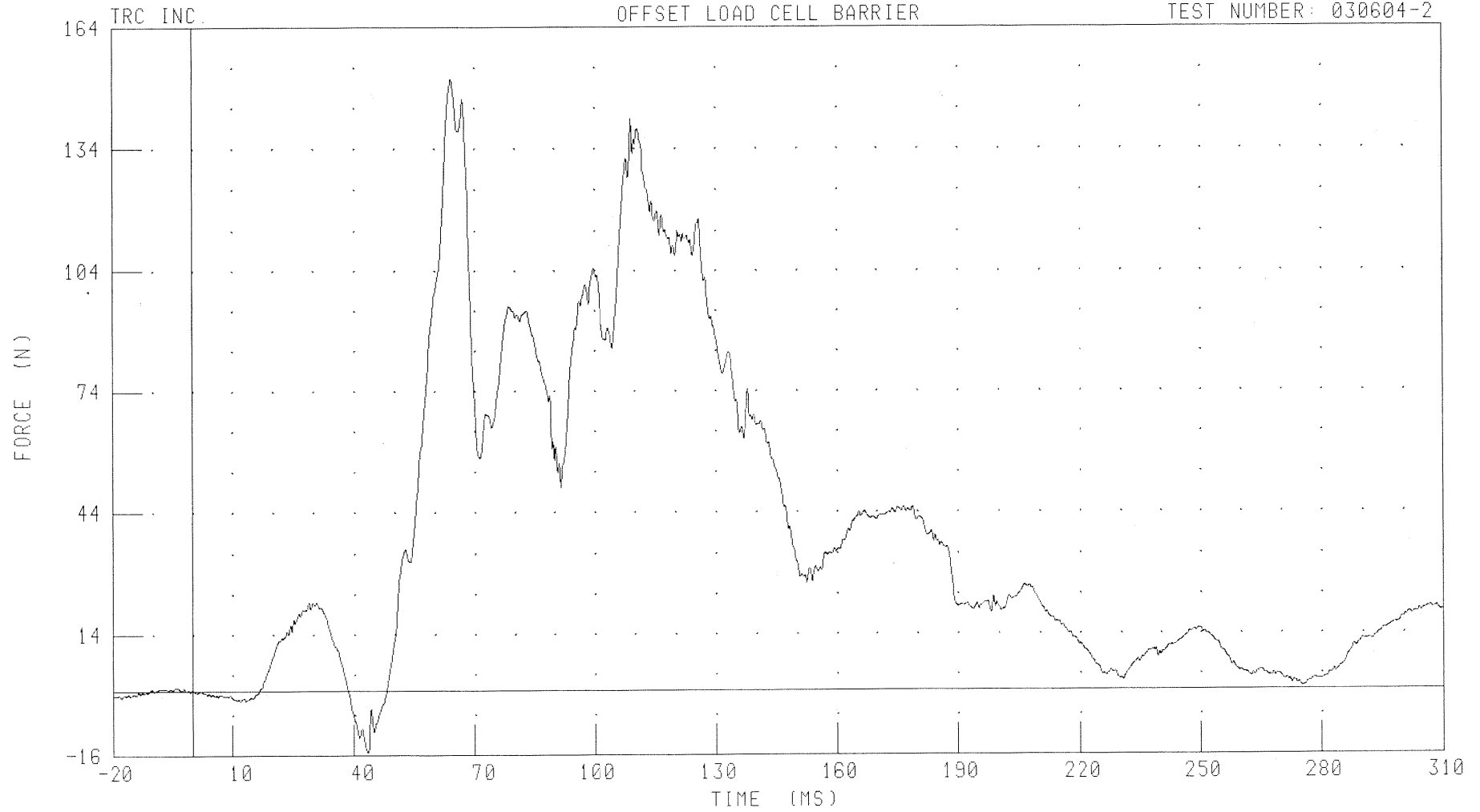
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT UPPER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLXF1 FILTER: CH. CLASS 600

PEAK DATA: 151.19 N @ 64.24 MS; -15.22 N @ 43.36 MS

B-58

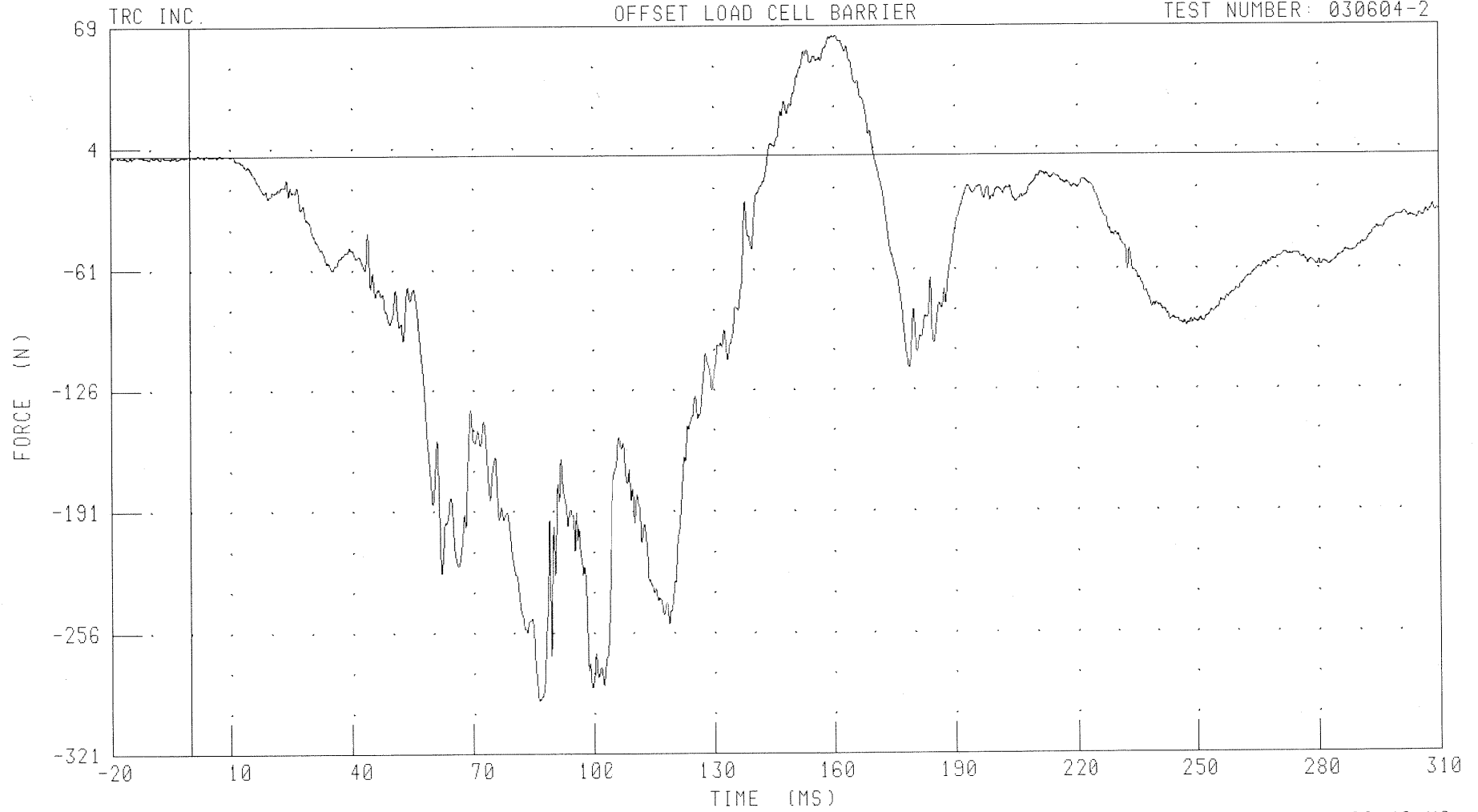
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT UPPER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLZF1

FILTER: CH. CLASS 600

PEAK DATA: 63.49 N @ 160.80 MS; -292.27 N @ 86.48 MS

B-59

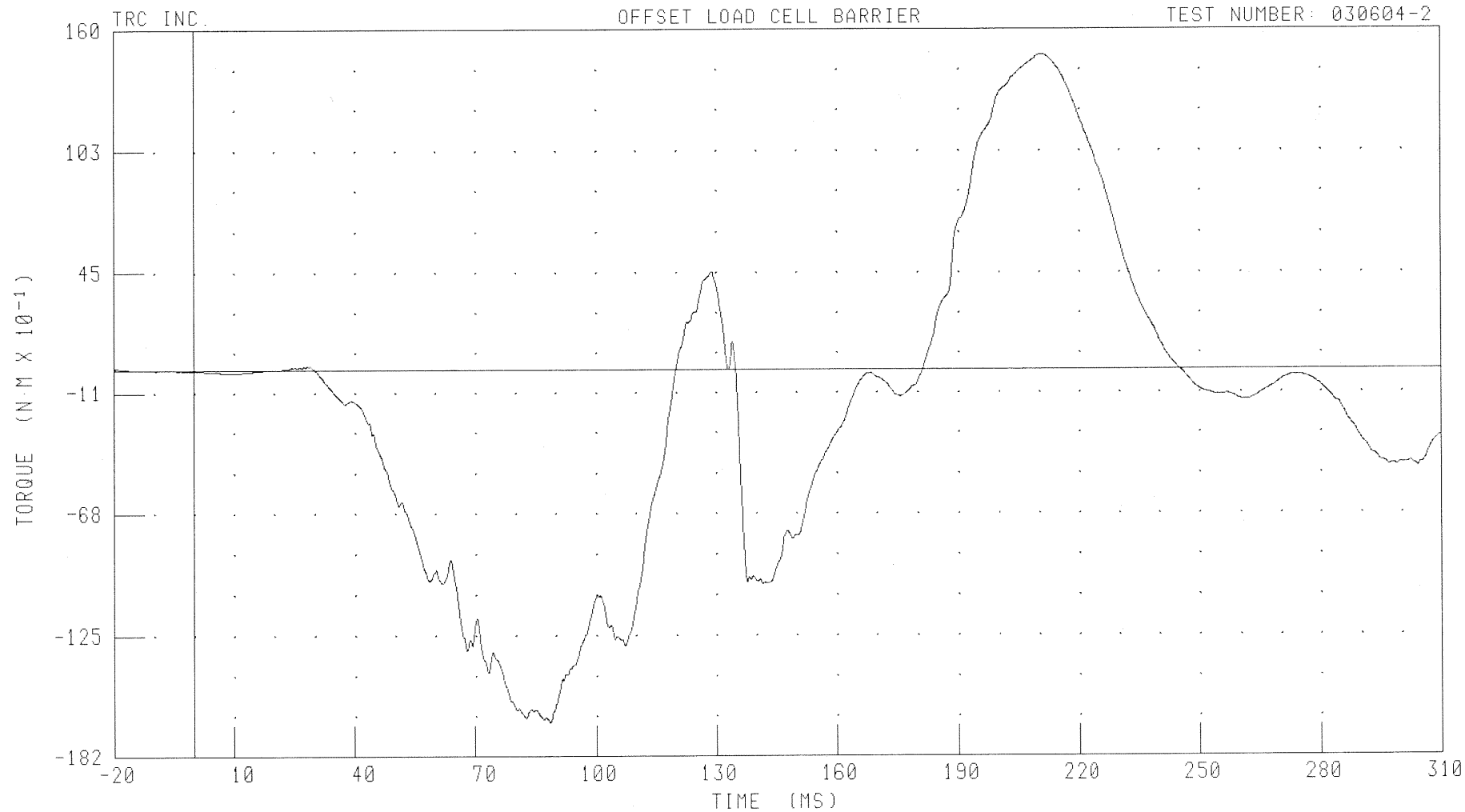
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLXM1

FILTER: CH. CLASS 600

PEAK DATA: 14.81 N-M @ 211.12 MS; -16.59 N-M @ 88.56 MS

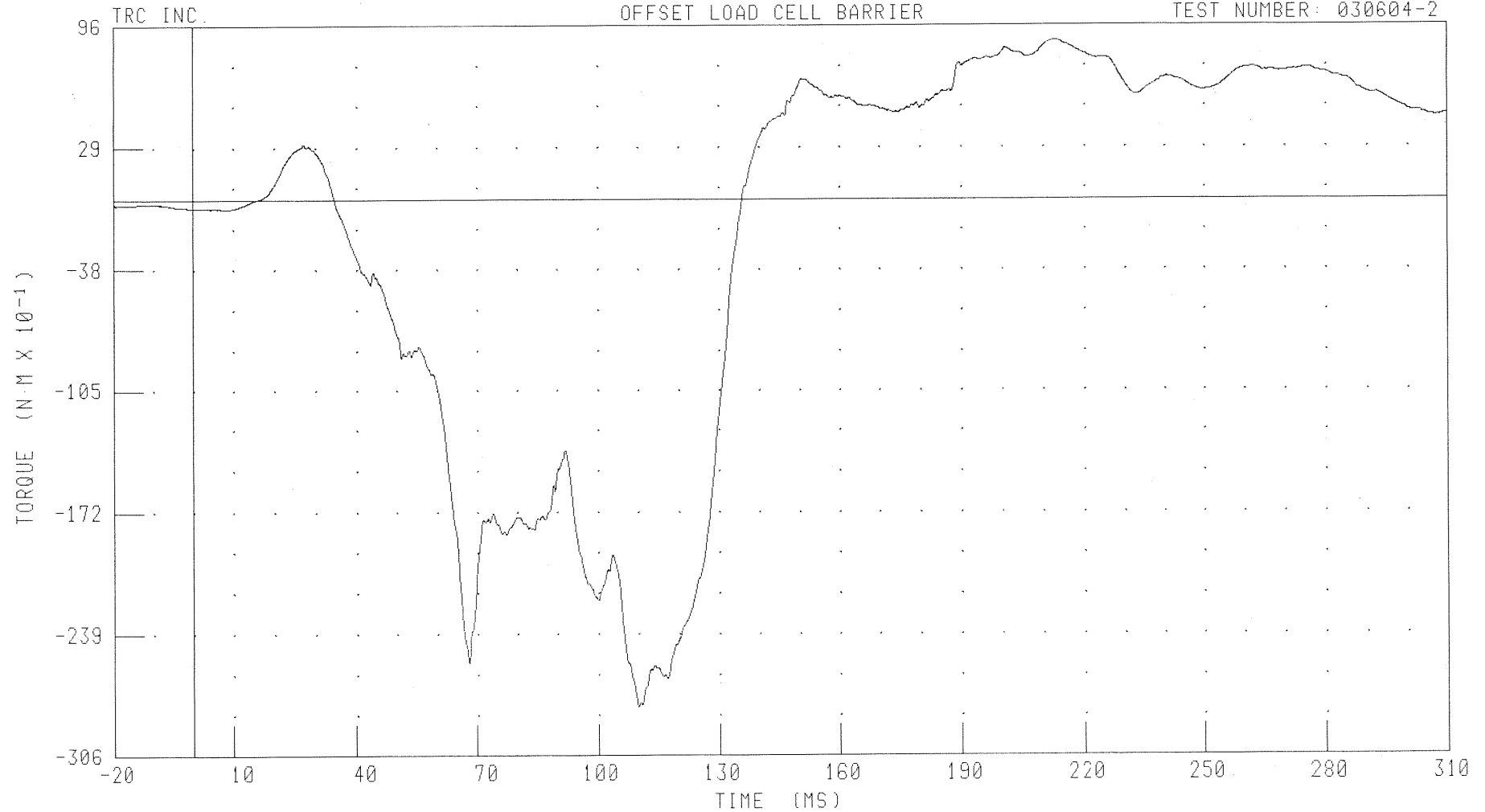
B-60

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLYM1 FILTER: CH. CLASS 600

PEAK DATA: 8.75 N·M @ 212.88 MS; -27.93 N·M @ 110.08 MS

B-61

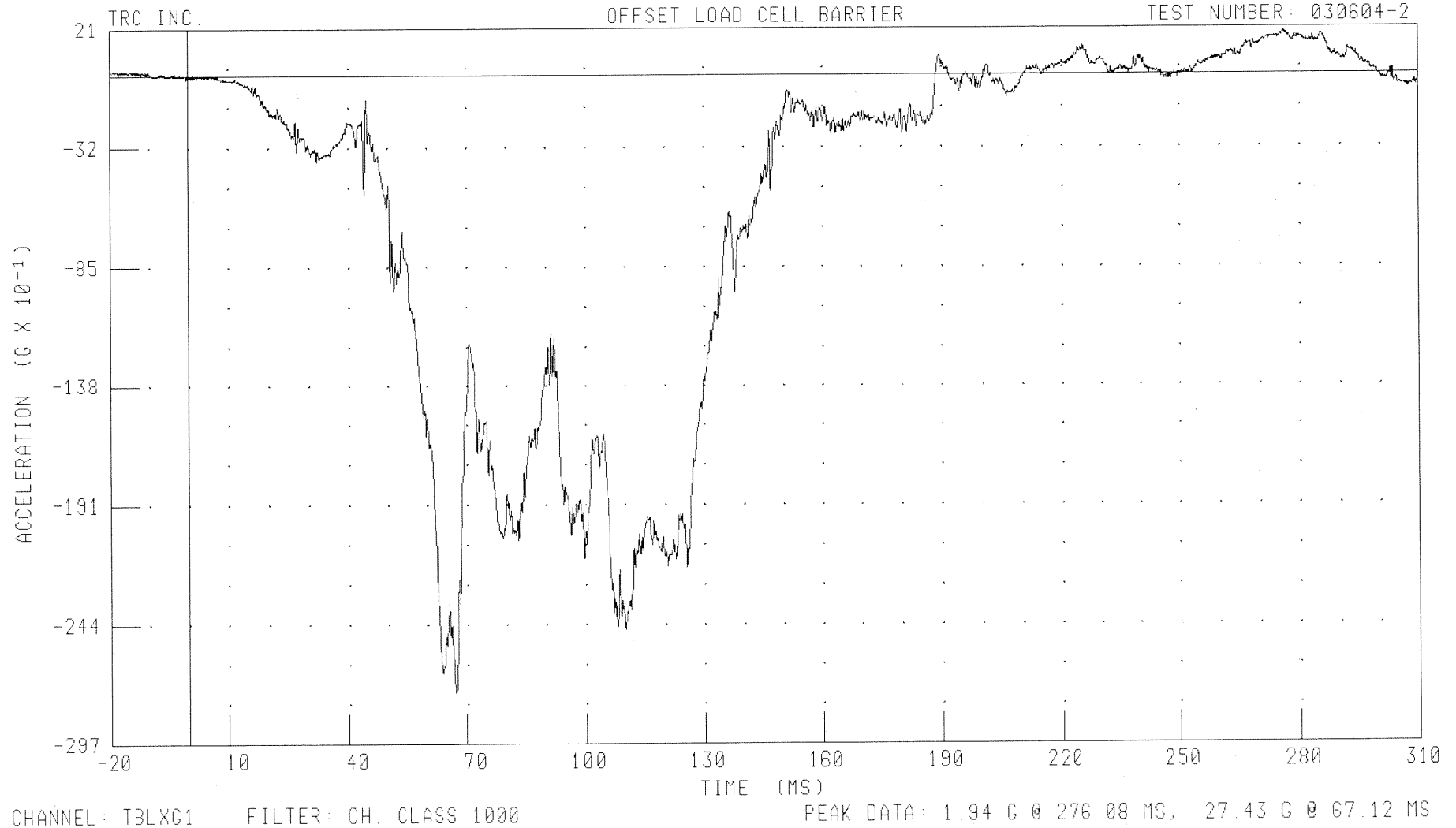
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT TIBIA X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



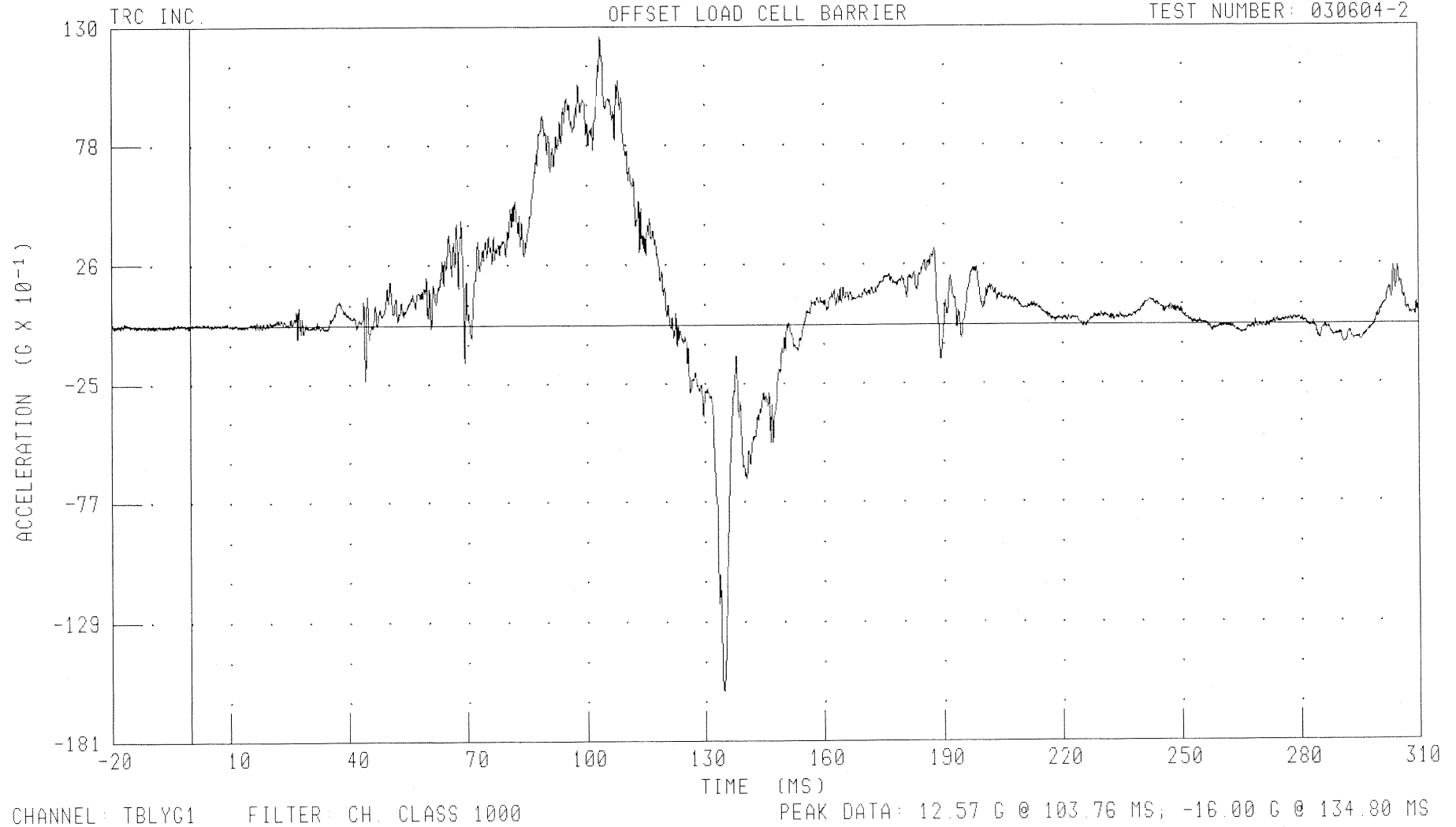
B-62

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER LEFT TIBIA Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-63

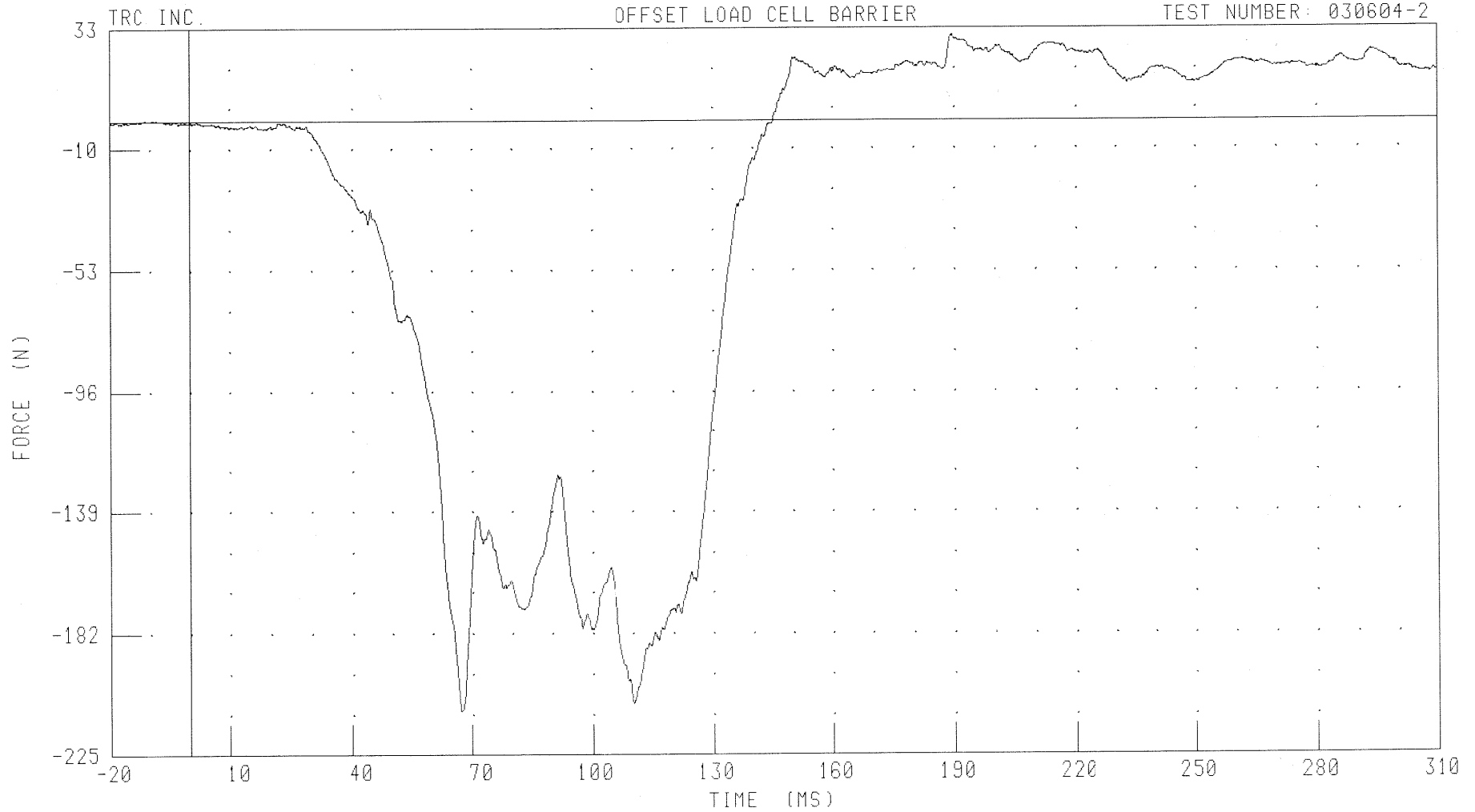
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT LOWER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLXF1 FILTER: CH. CLASS 600

PEAK DATA: 30.43 N @ 189.60 MS; -209.42 N @ 67.28 MS

B-64

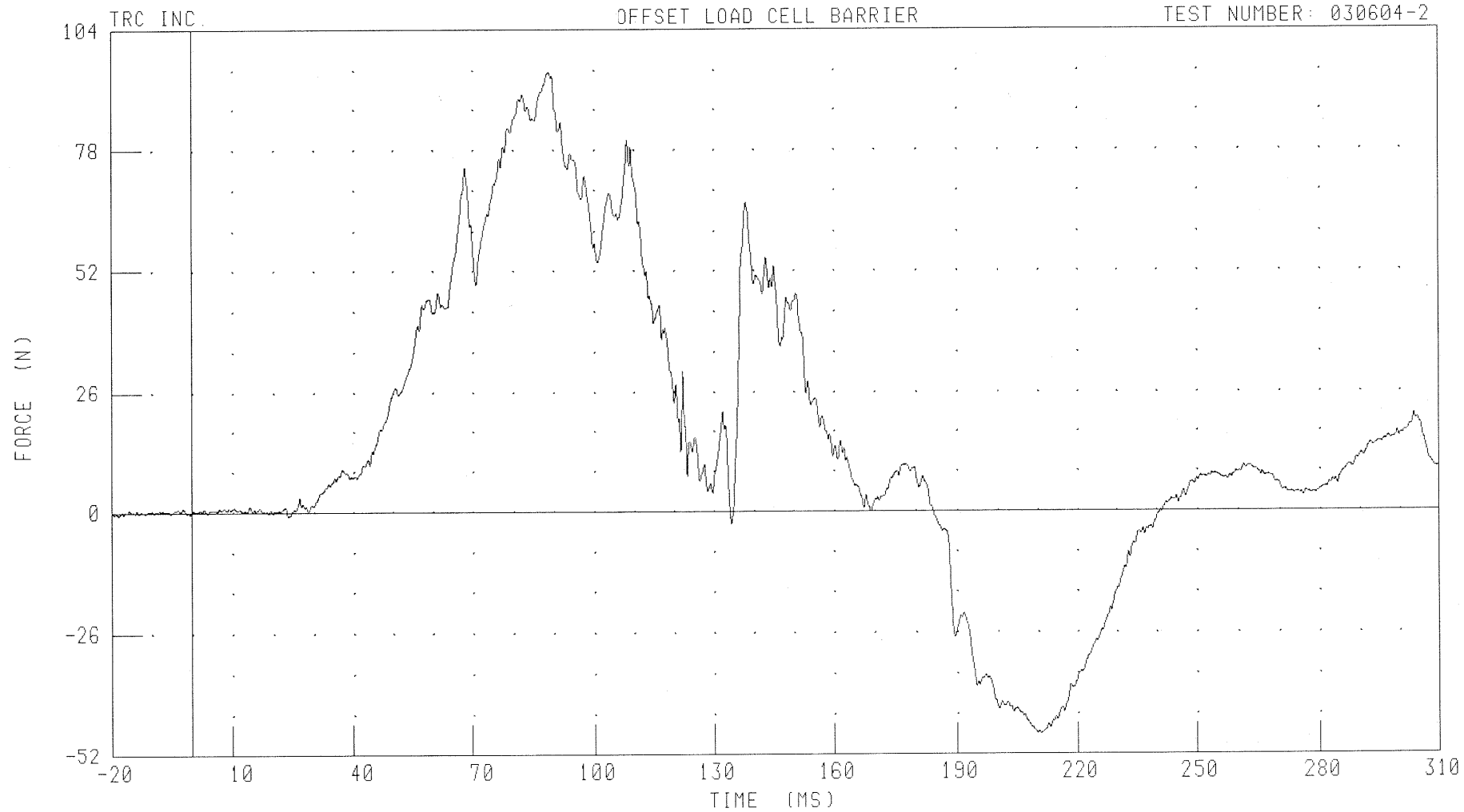
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT LOWER TIBIA Y-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLYF1 FILTER: CH. CLASS 600

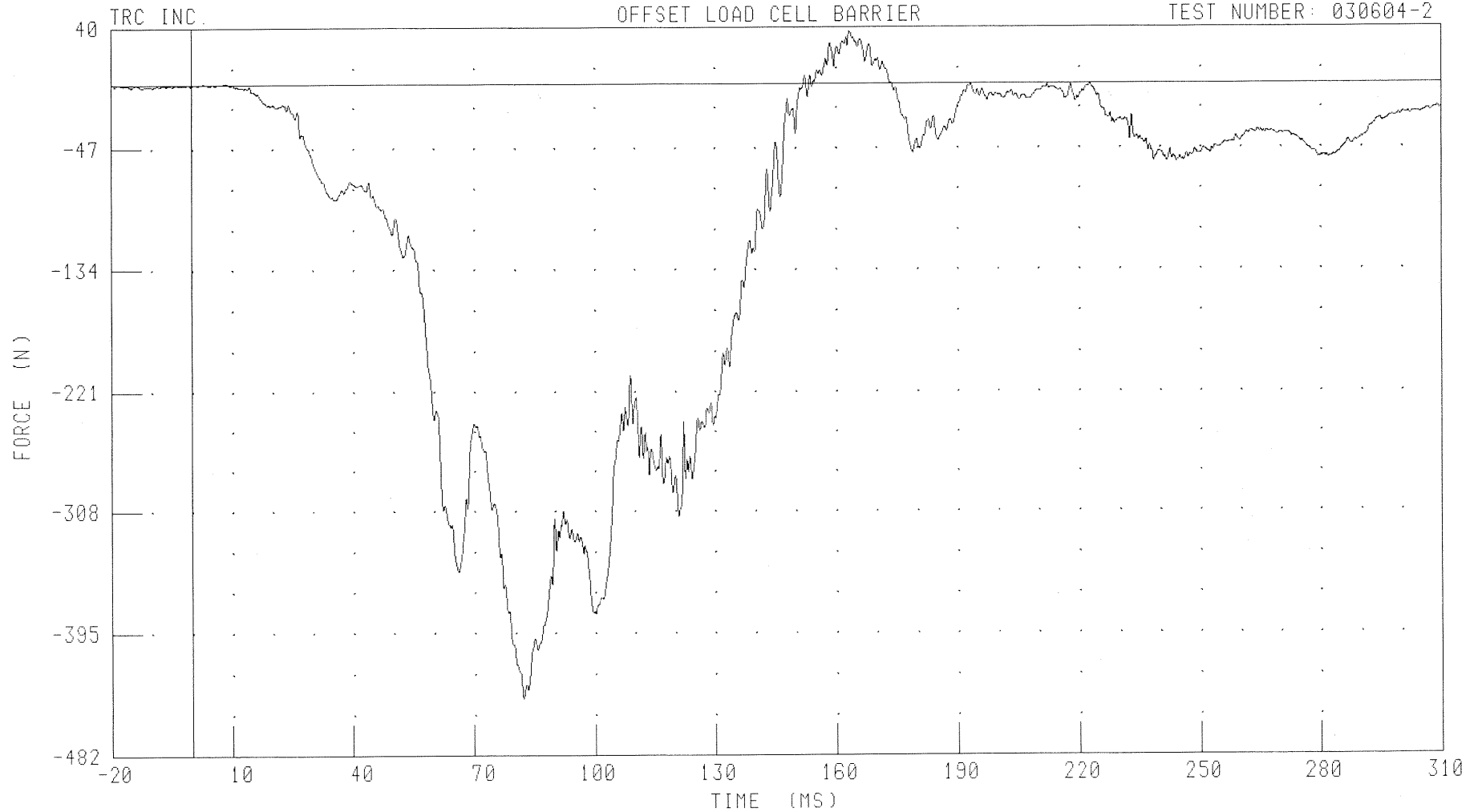
PEAK DATA: 94.93 N @ 89.04 MS; -47.58 N @ 210.64 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT LOWER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLZF1 FILTER: CH. CLASS 600

PEAK DATA: 37.12 N @ 163.44 MS; -441.66 N @ 82.08 MS

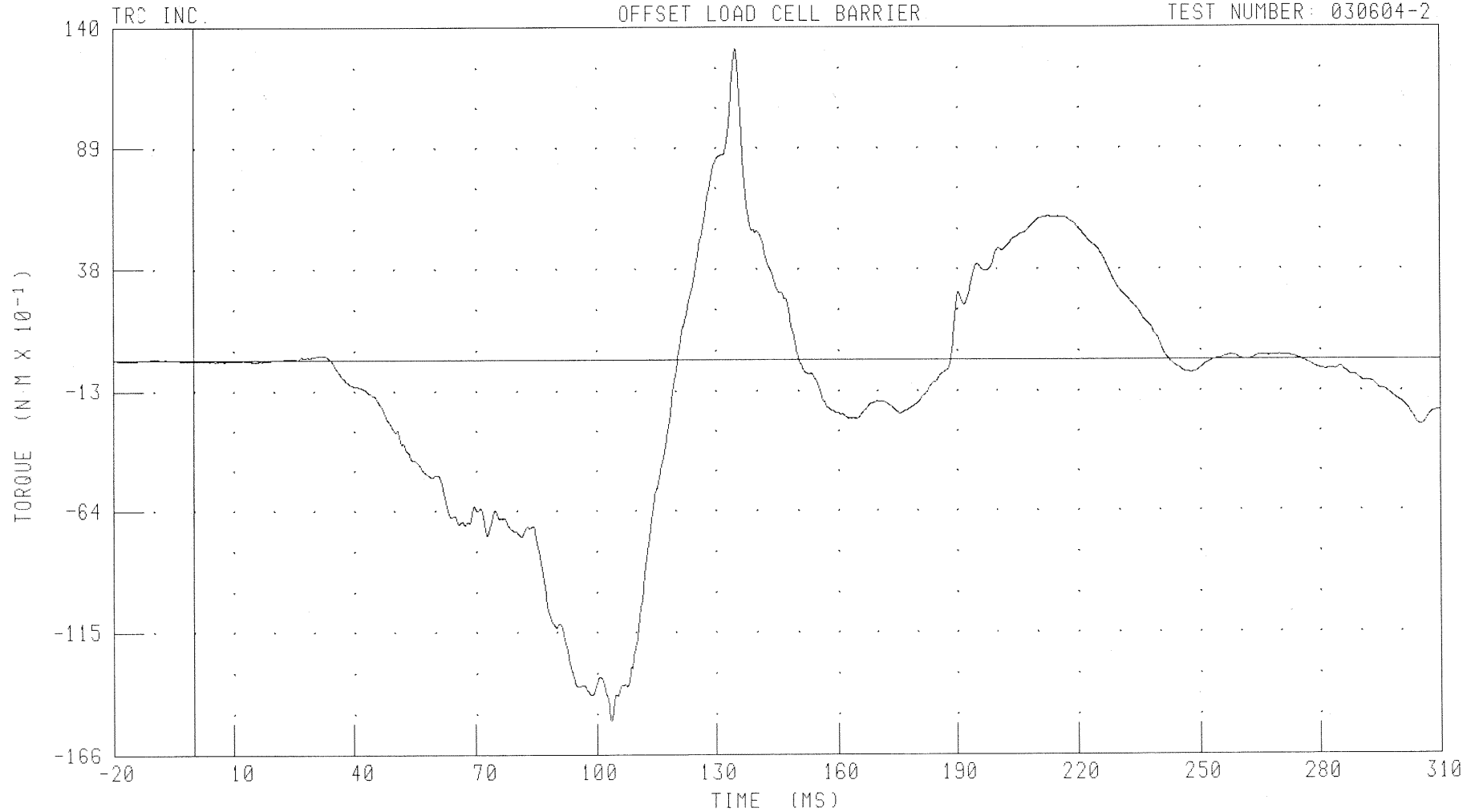
B-66

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER LEFT LOWER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLXM1 FILTER: CH. CLASS 600

PEAK DATA: 13.08 N·M @ 134.96 MS; -15.19 N·M @ 103.68 MS

B-67

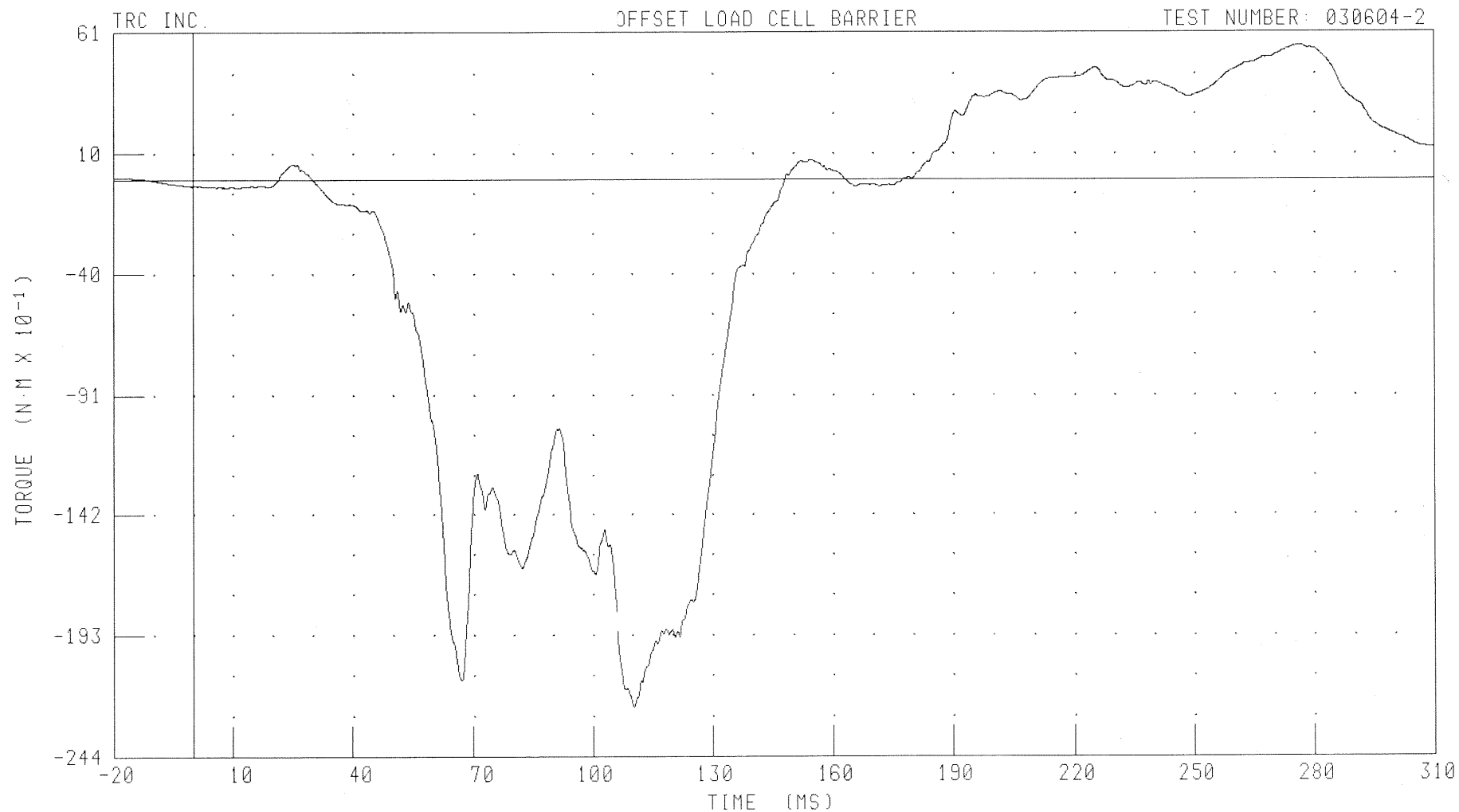
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLYM1

FILTER: CH. CLASS 600

PEAK DATA: 5.67 N·M @ 276.00 MS; -22.34 N·M @ 110.48 MS

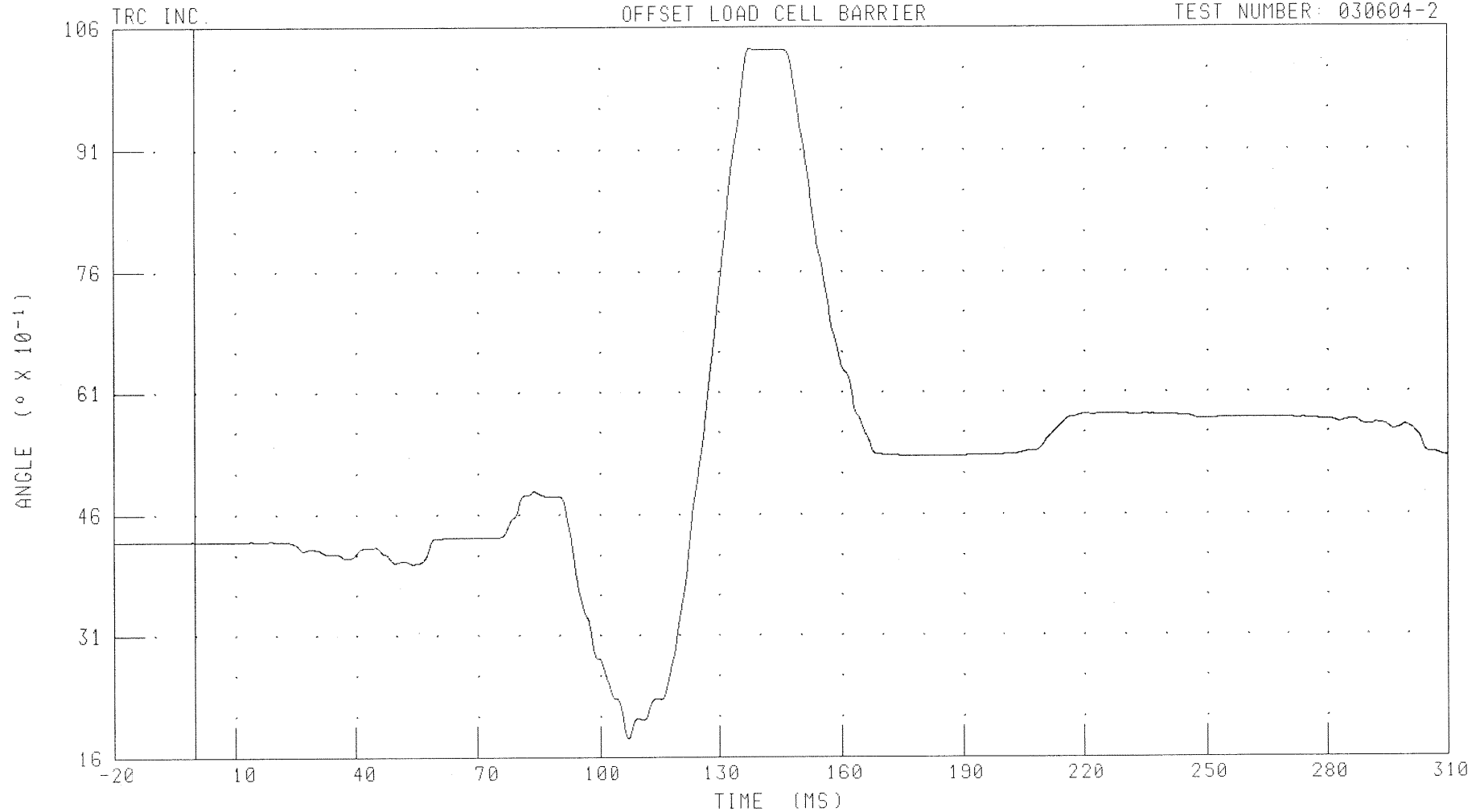
B-68

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER LEFT FOOT TO ANKLE X-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLXD1

FILTER: CH. CLASS 180

PEAK DATA: 10.34 ° @ 137.84 MS; 1.82 ° @ 107.20 MS

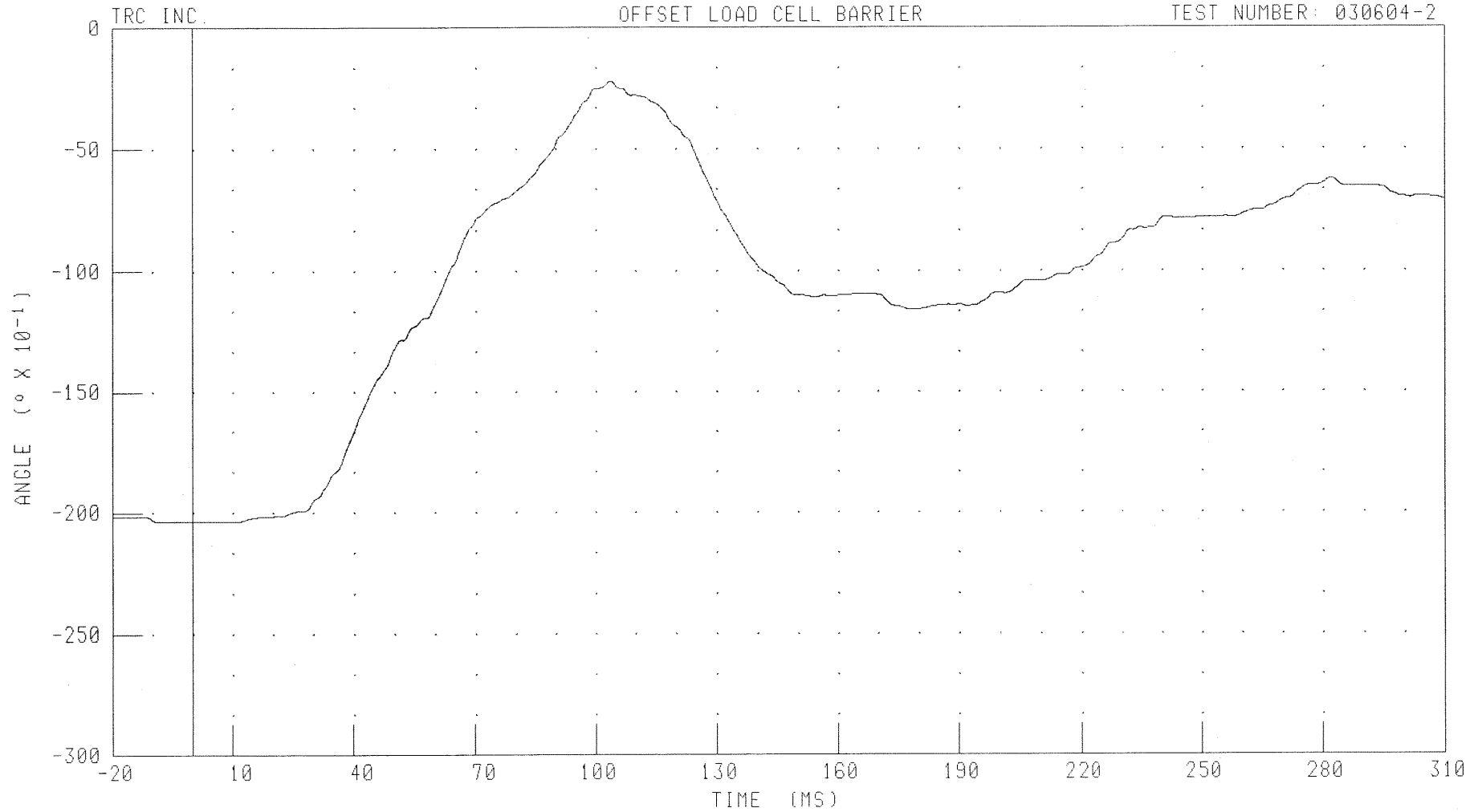
B-69

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER LEFT FOOT TO ANKLE Y-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLYD1 FILTER: CH. CLASS:180

PEAK DATA: -2.22 ° @ 103.68 MS; -20.40 ° @ -8.48 MS

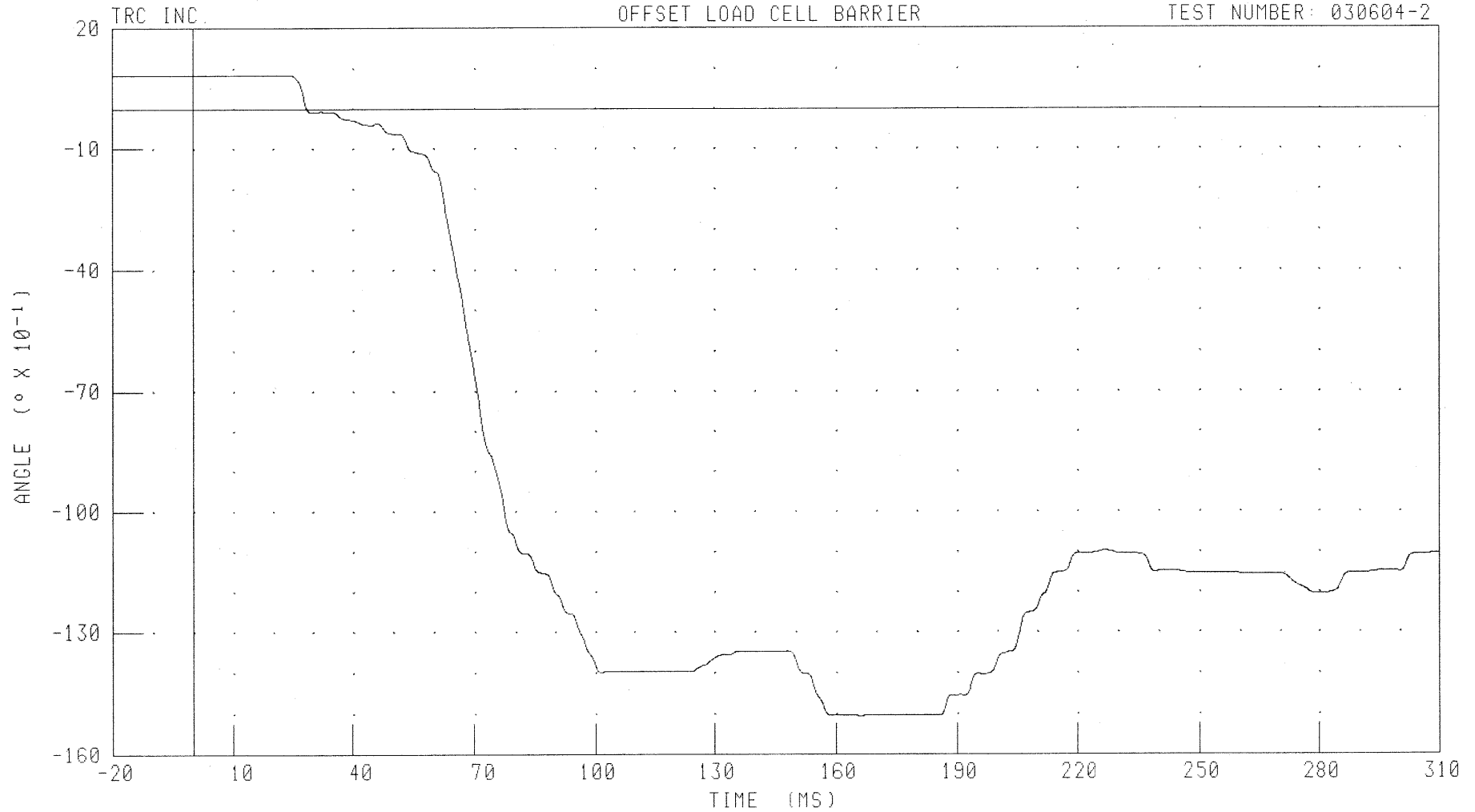
B-70

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER LEFT FOOT TO ANKLE Z-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLZD1 FILTER: CH CLASS 100

PEAK DATA: 0.85 ° @ -5.84 MS; -15.05 ° @ 166.16 MS

B-71

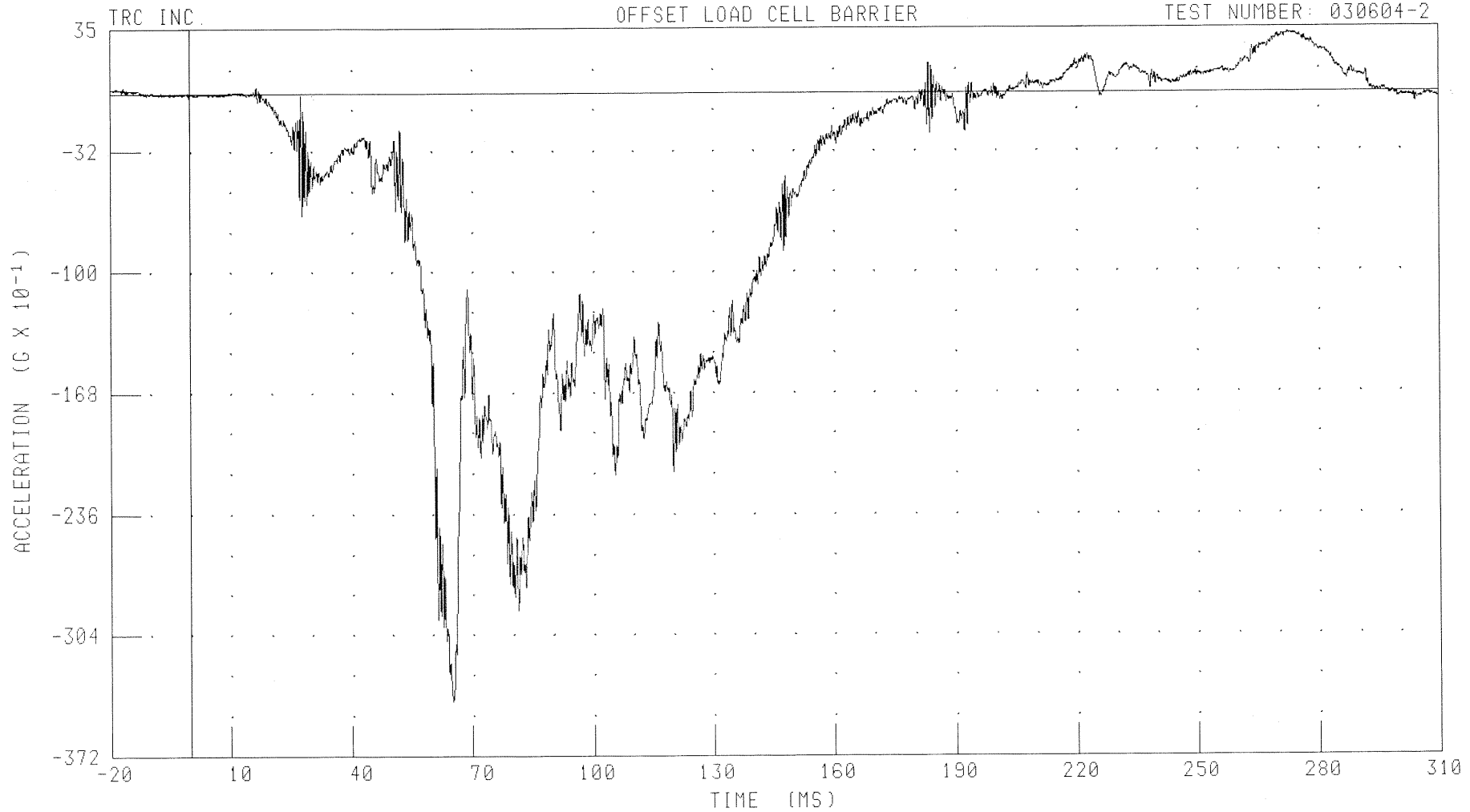
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT FOOT X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLXG1 FILTER: CH. CLASS 1000

PEAK DATA: 3.33 G @ 272.40 MS; -34.14 G @ 65.04 MS

B-72

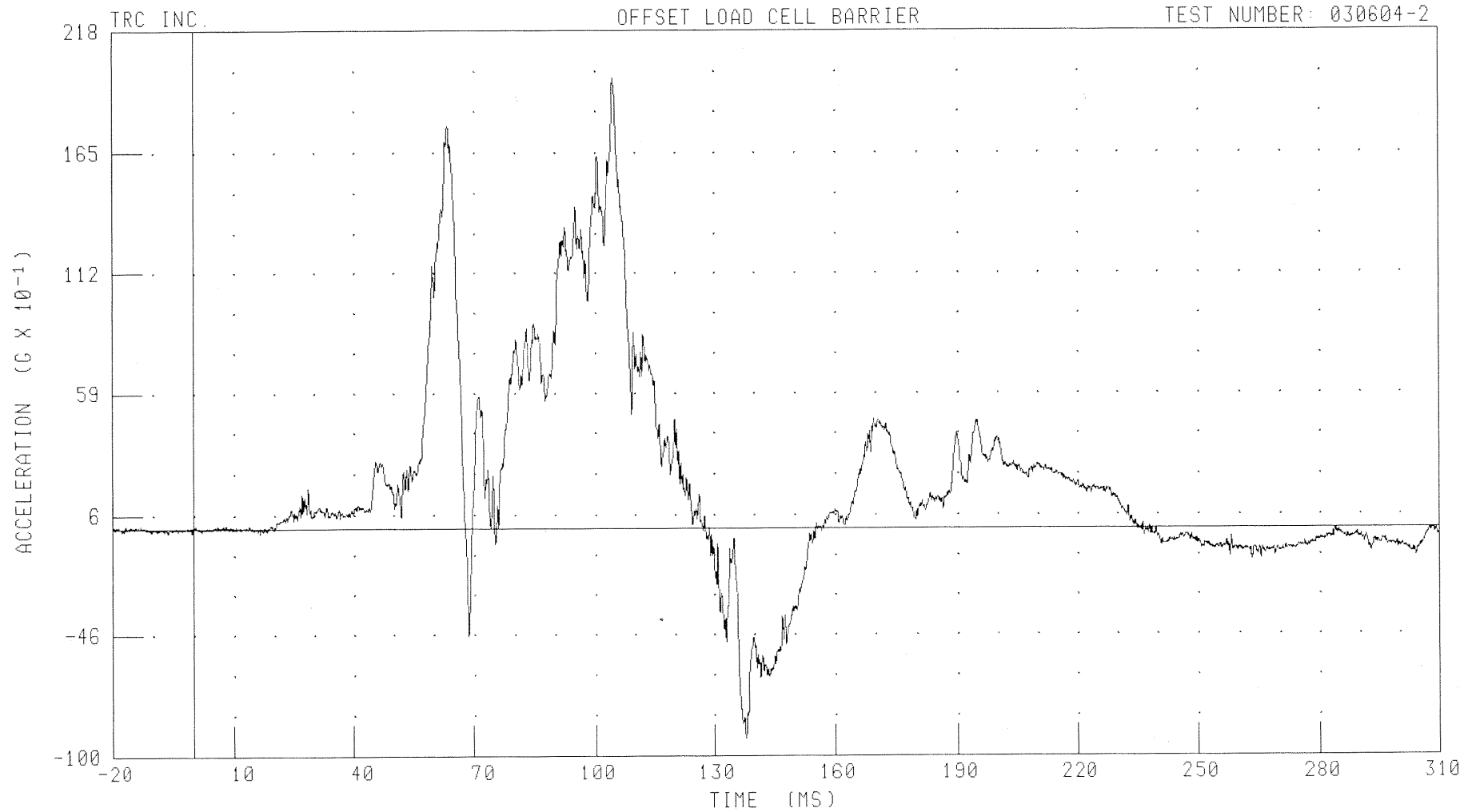
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT FOOT Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLYG1 FILTER: CH. CLASS 1000

B-73

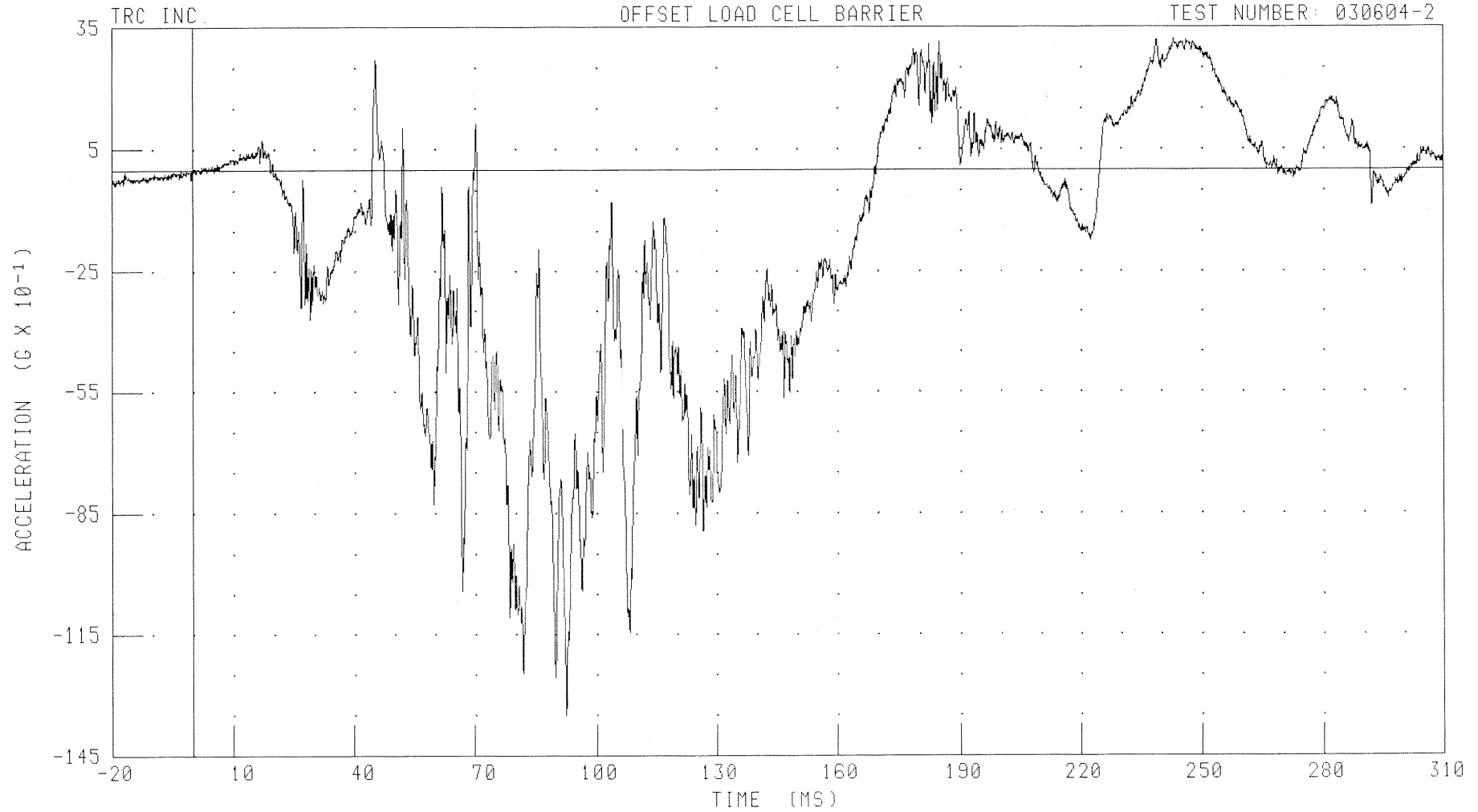
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT FOOT Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLZG1 FILTER: CH. CLASS 1000

B-74

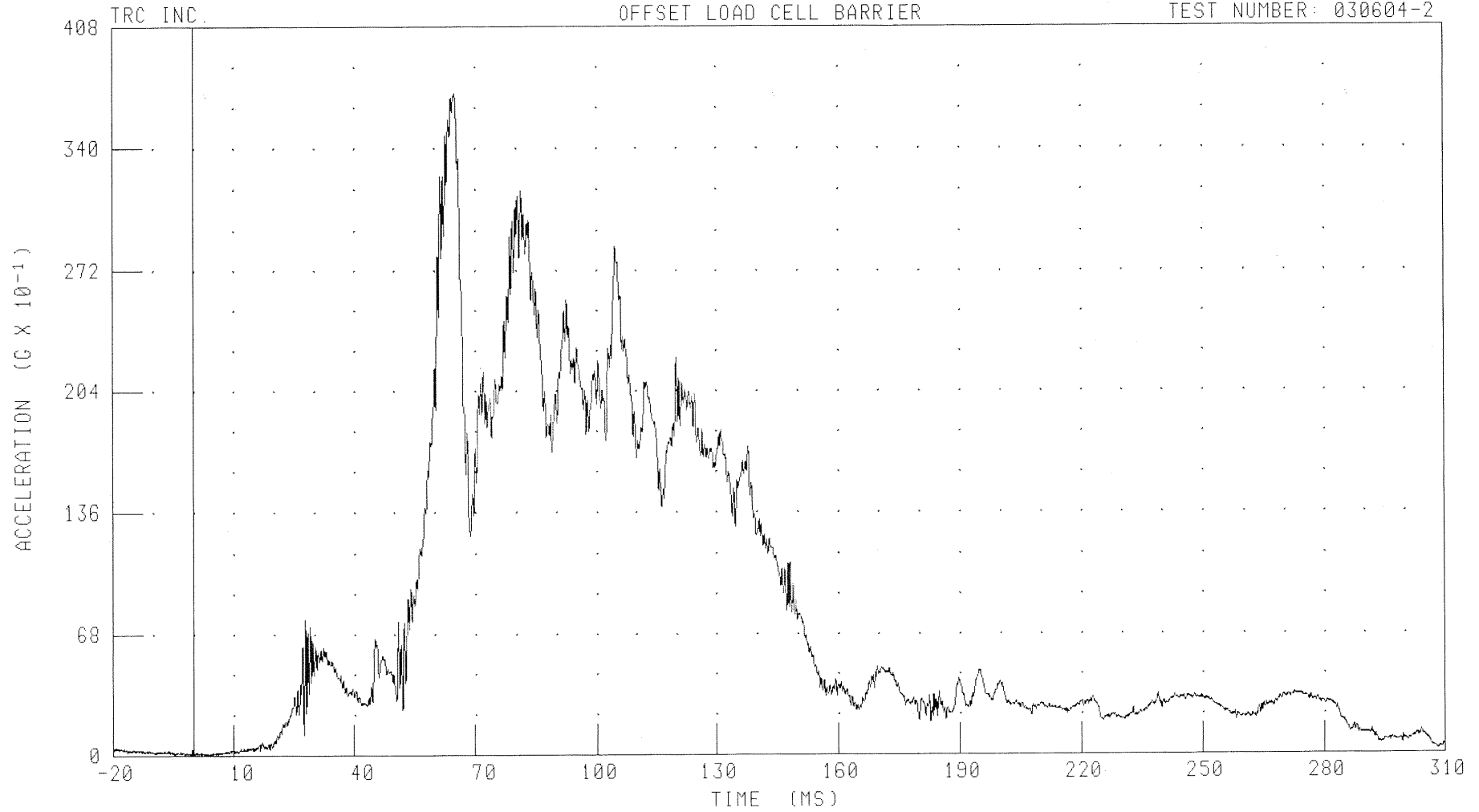
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LEFT FOOT RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLRG1 FILTER: CH. CLASS 1000

PEAK DATA: 37.09 G @ 65.04 MS; 0.03 G @ 0.08 MS

B-75

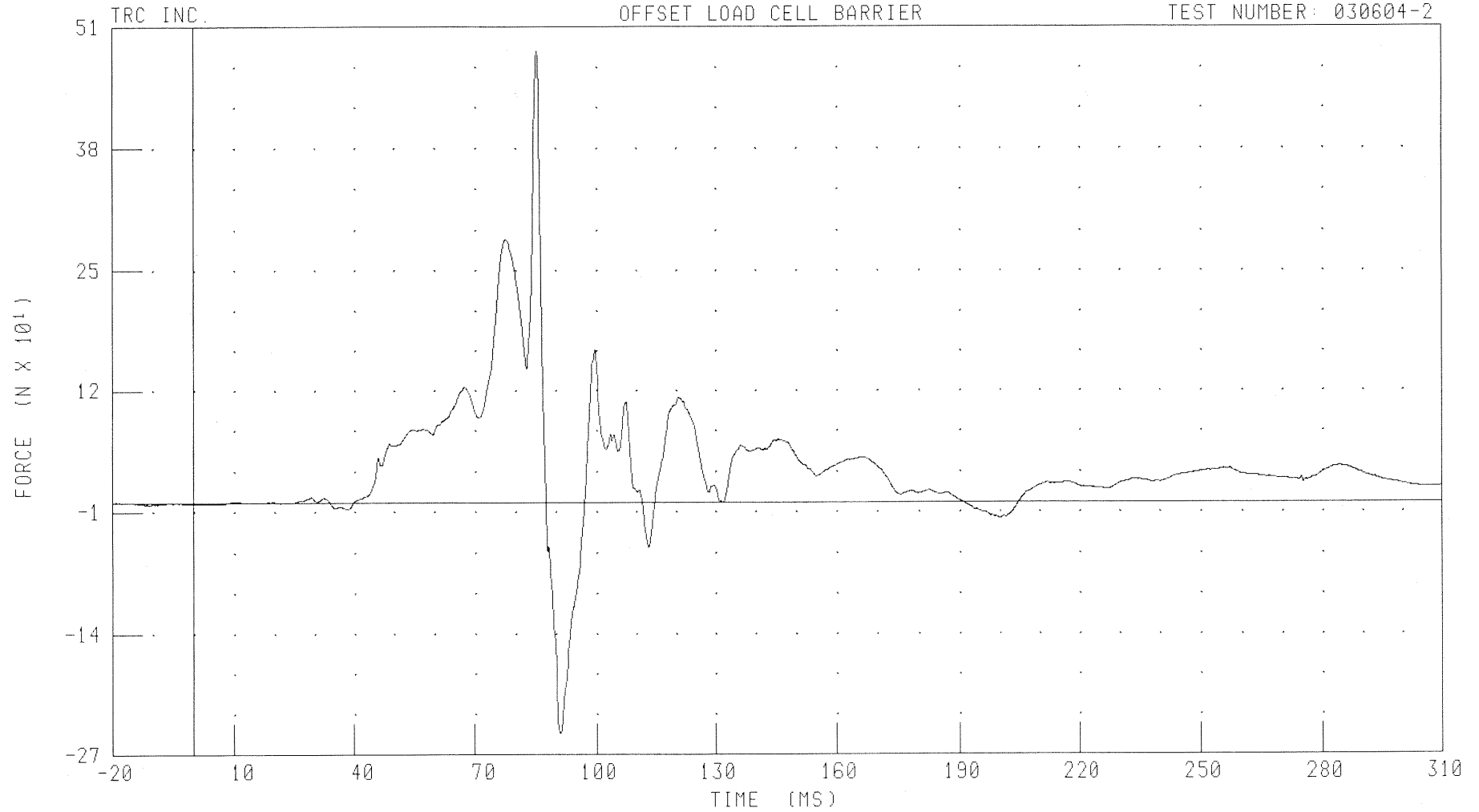
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT UPPER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRXF1

FILTER: CH. CLASS 600

PEAK DATA: 483.70 N @ 85.36 MS, -247.20 N @ 91.12 MS

B-76

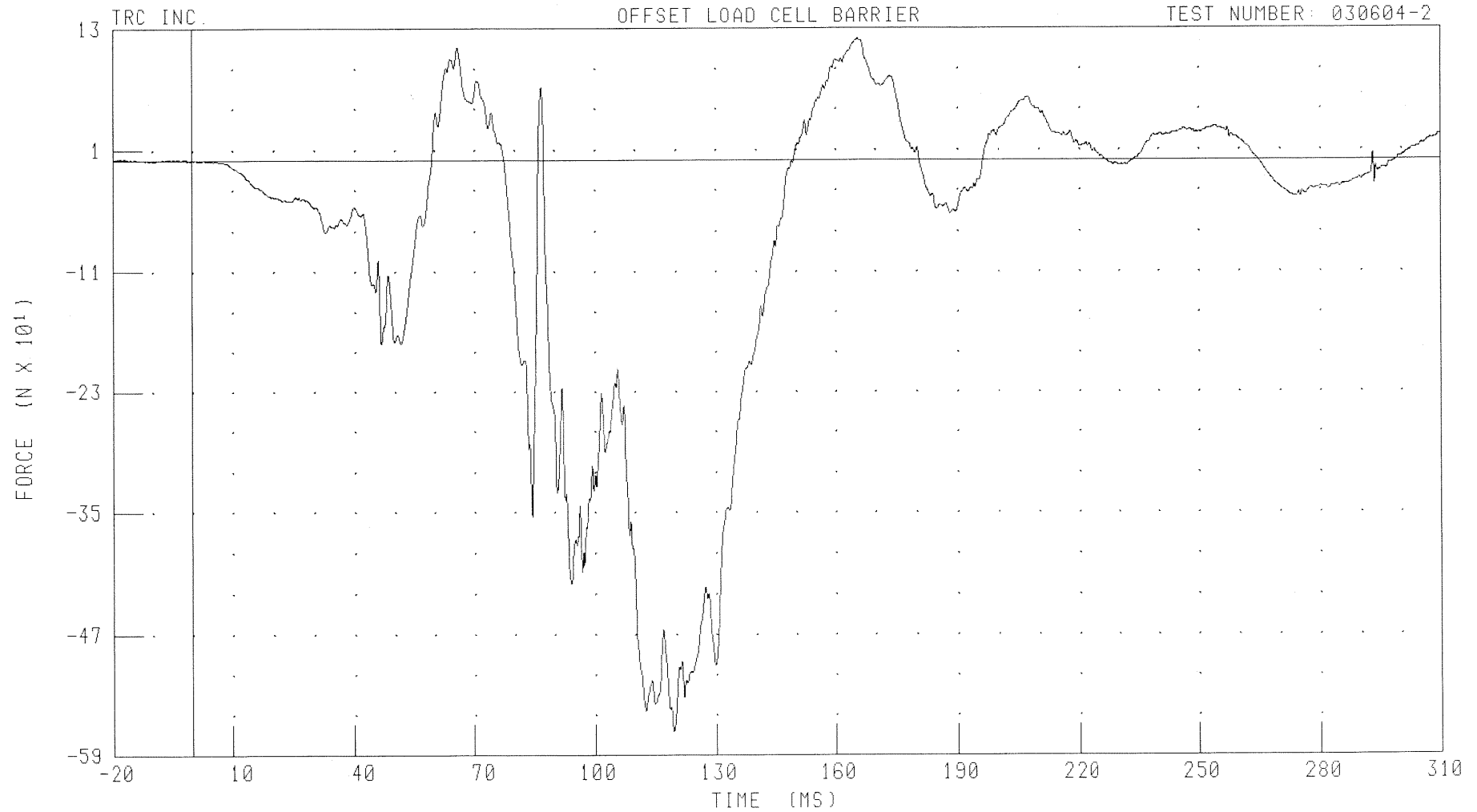
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT UPPER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRZF1 FILTER: CH. CLASS 600

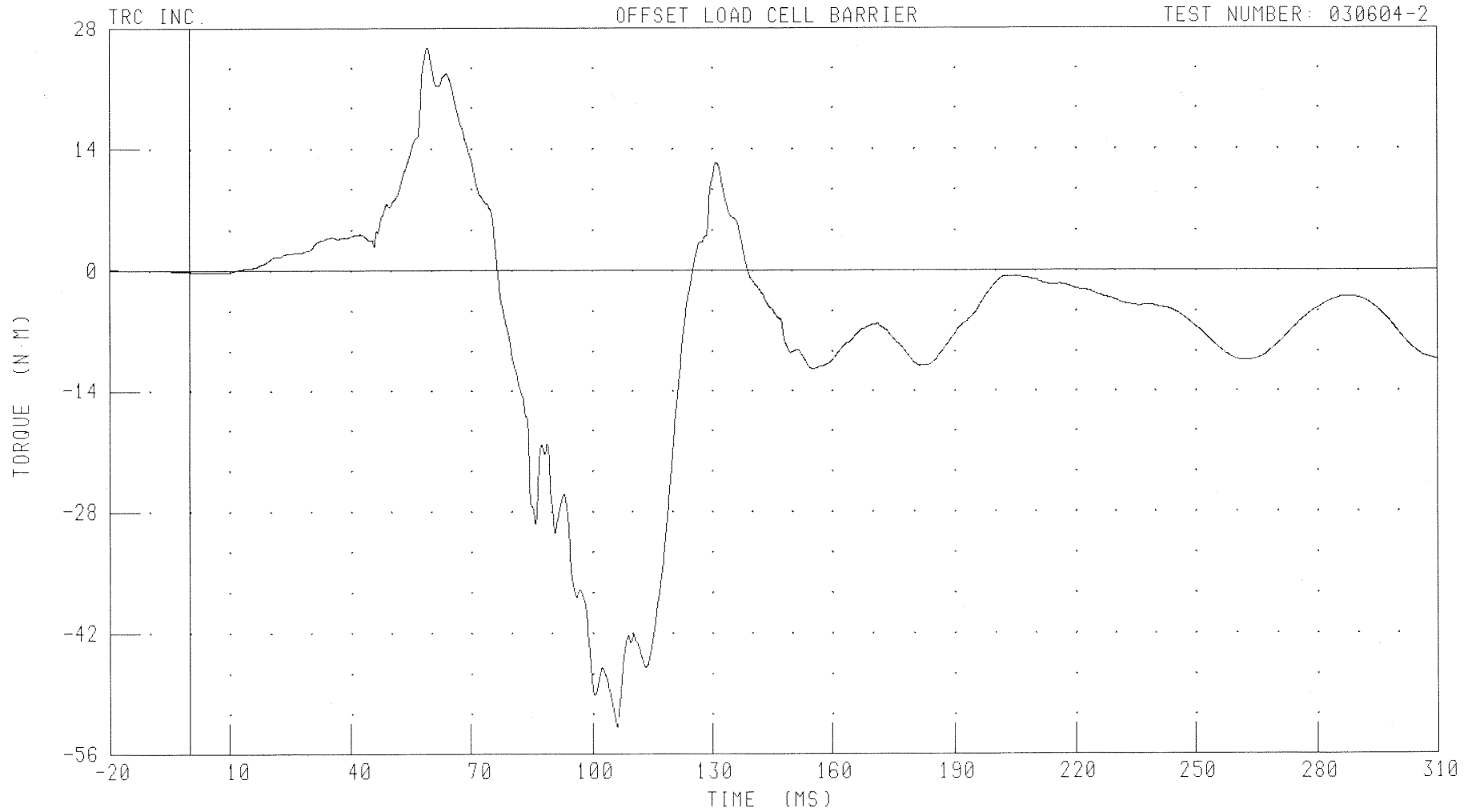
B-77

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRXM1

FILTER: CH. CLASS 600

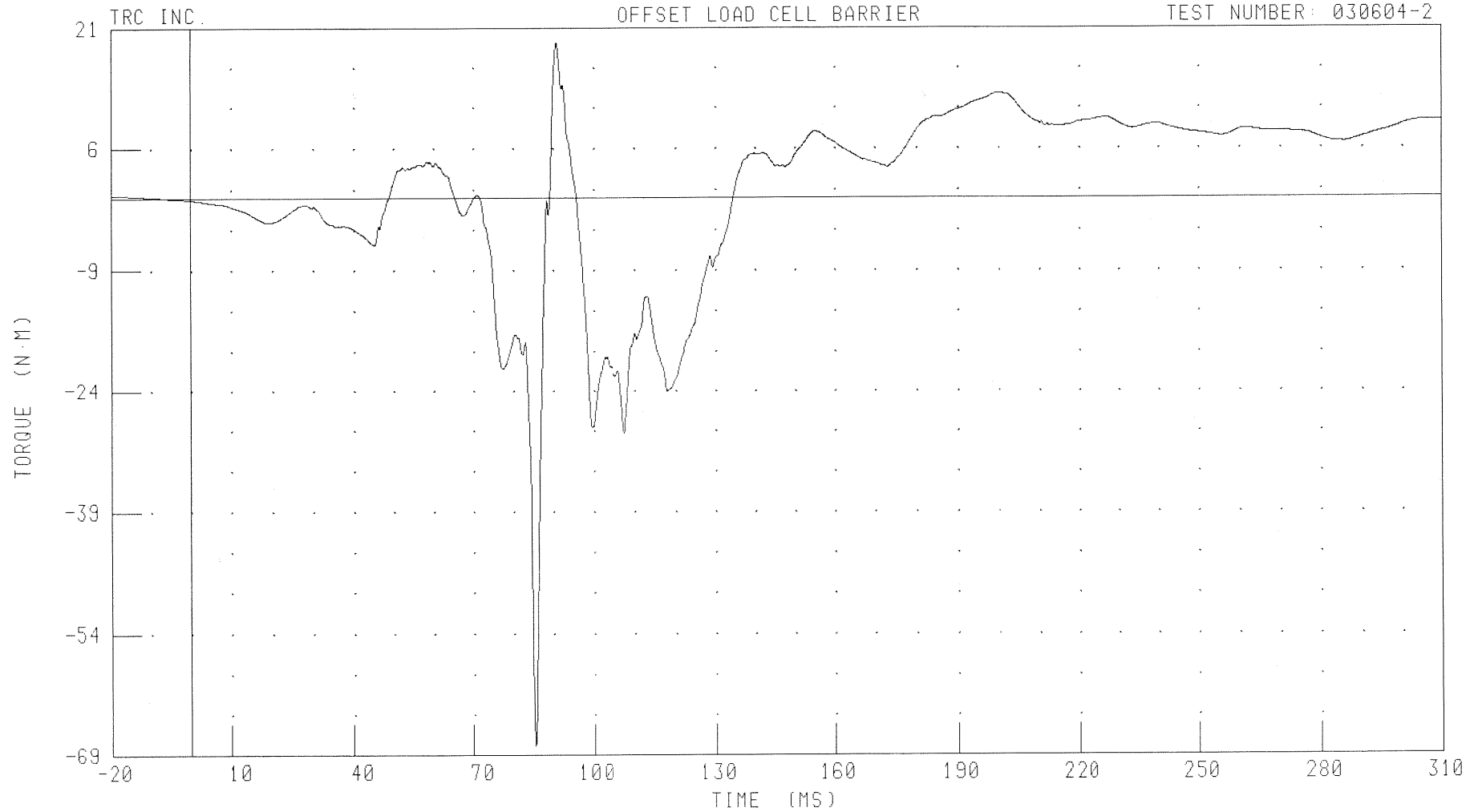
PEAK DATA: 25.65 N·M @ 59.12 MS; -52.87 N·M @ 106.16 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRYM1

FILTER: CH. CLASS 600

PEAK DATA: 19.18 N·M @ 90.80 MS; -67.84 N·M @ 85.44 MS

B-79

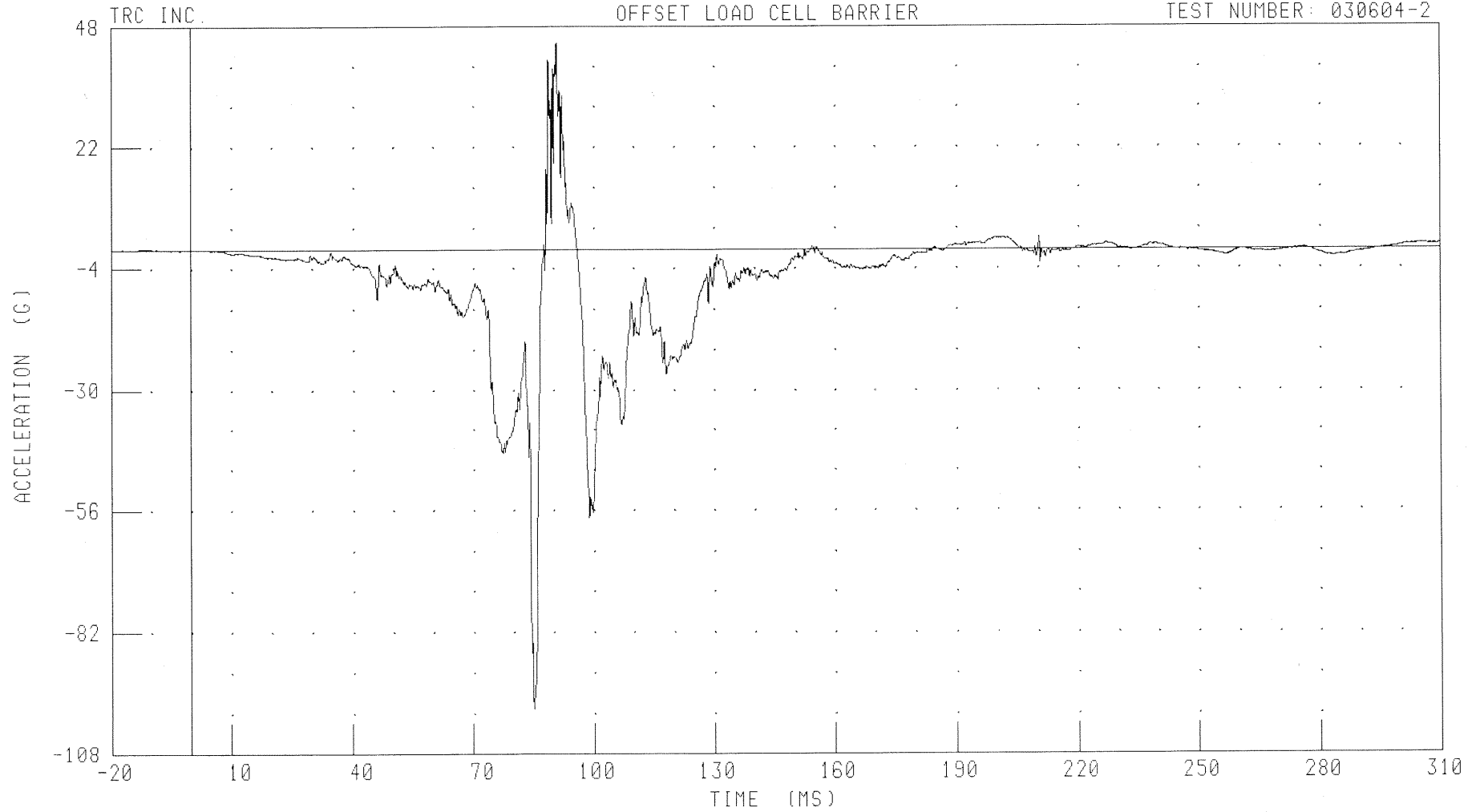
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT TIBIA X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRXG1 FILTER: CH. CLASS 1000

PEAK DATA: 44.50 G @ 90.88 MS; -98.24 G @ 85.04 MS

B-80

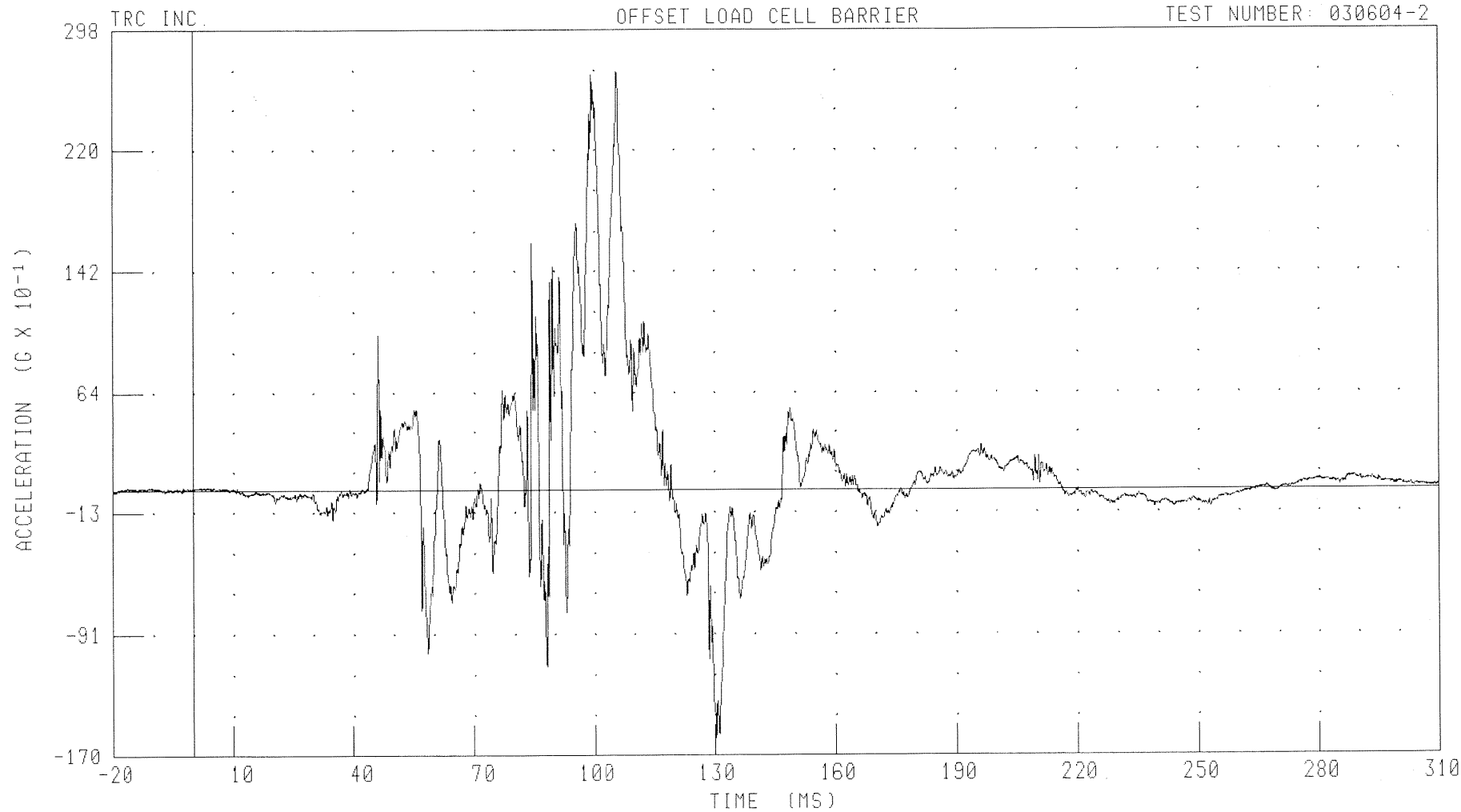
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT TIBIA Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRYG1 FILTER: CH. CLASS 1000

PEAK DATA: 27.13 G @ 105.76 MS; -15.86 G @ 130.40 MS

B-81

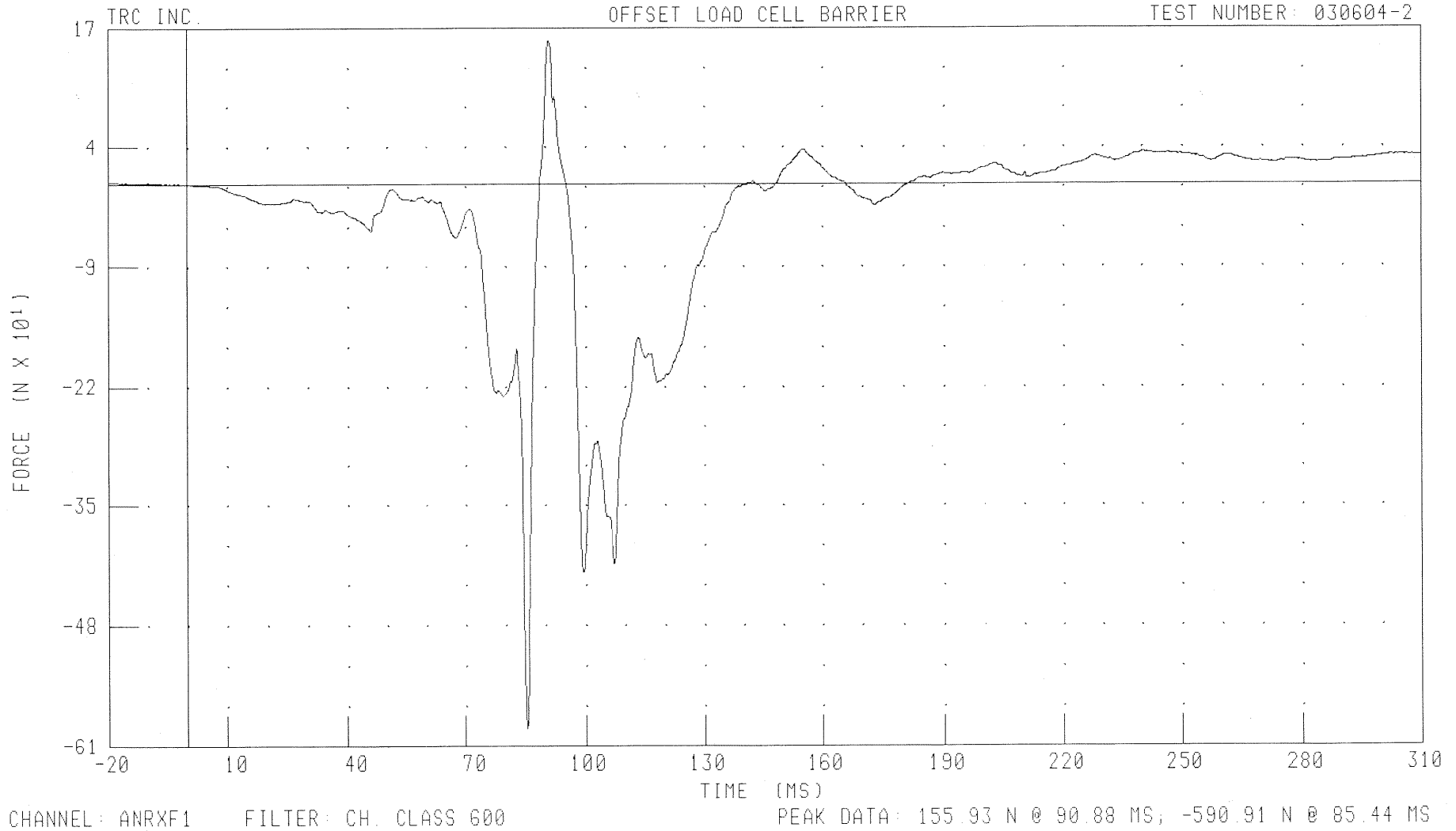
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT LOWER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-82

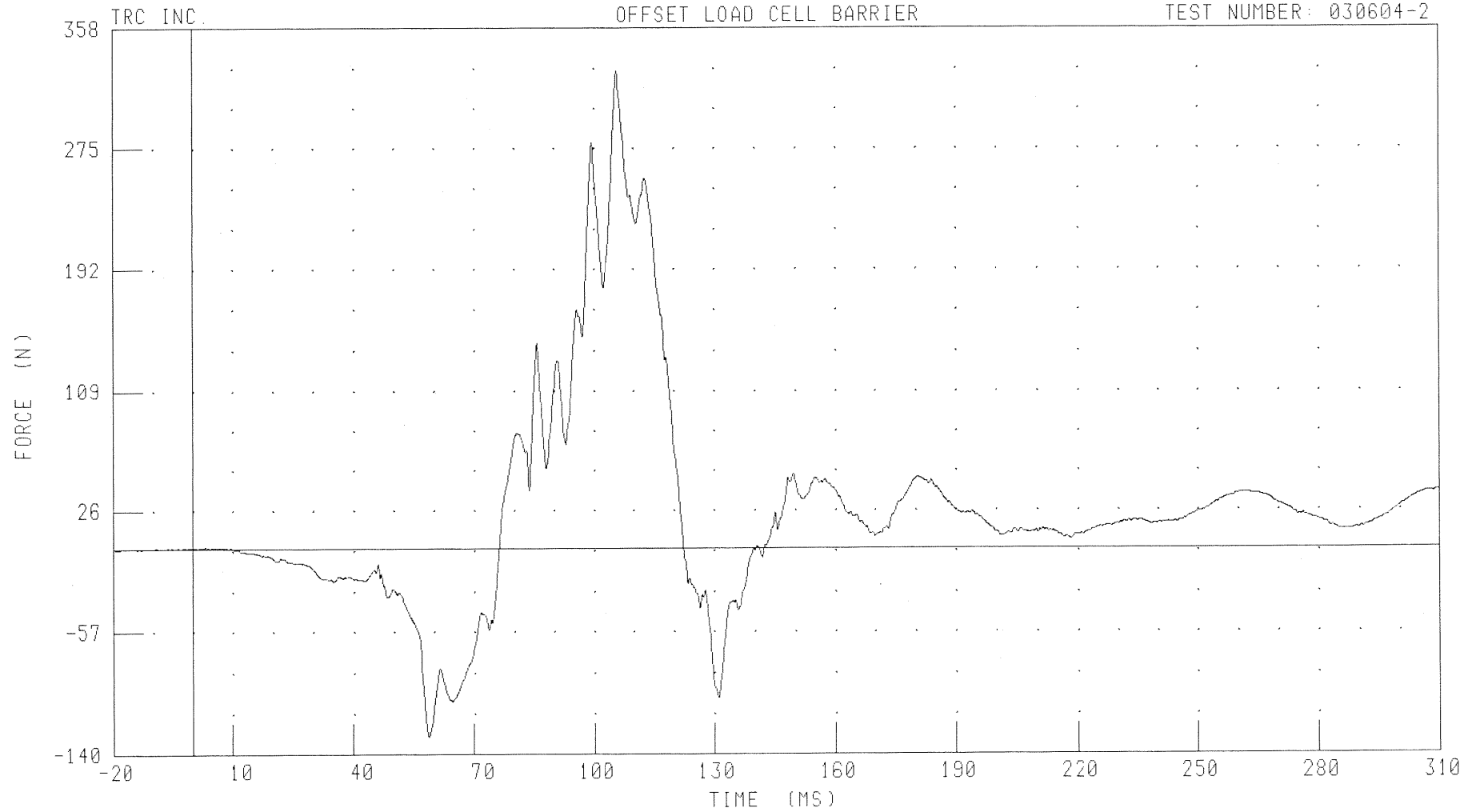
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT LOWER TIBIA Y-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRYF1 FILTER: CH. CLASS 600

B-83

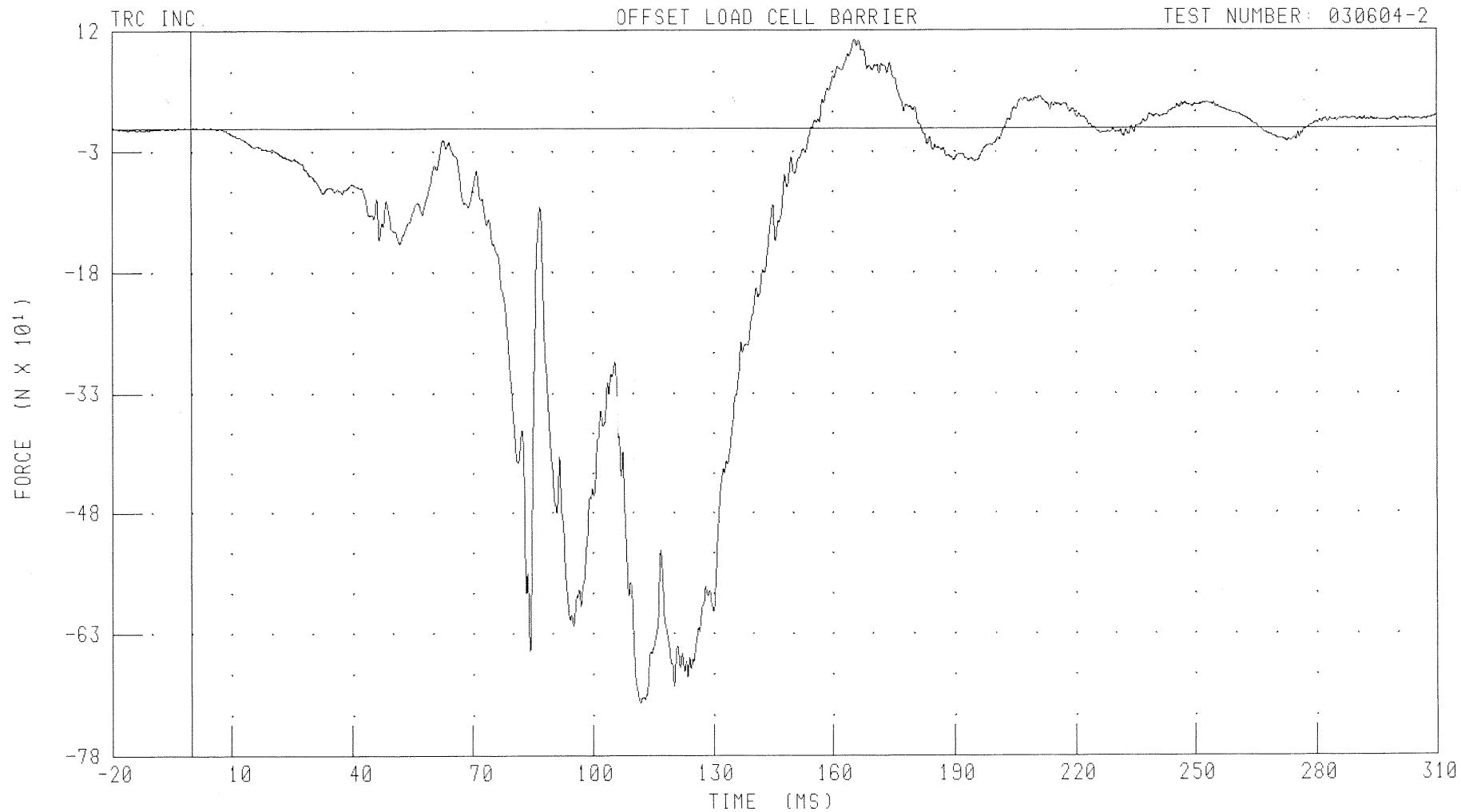
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



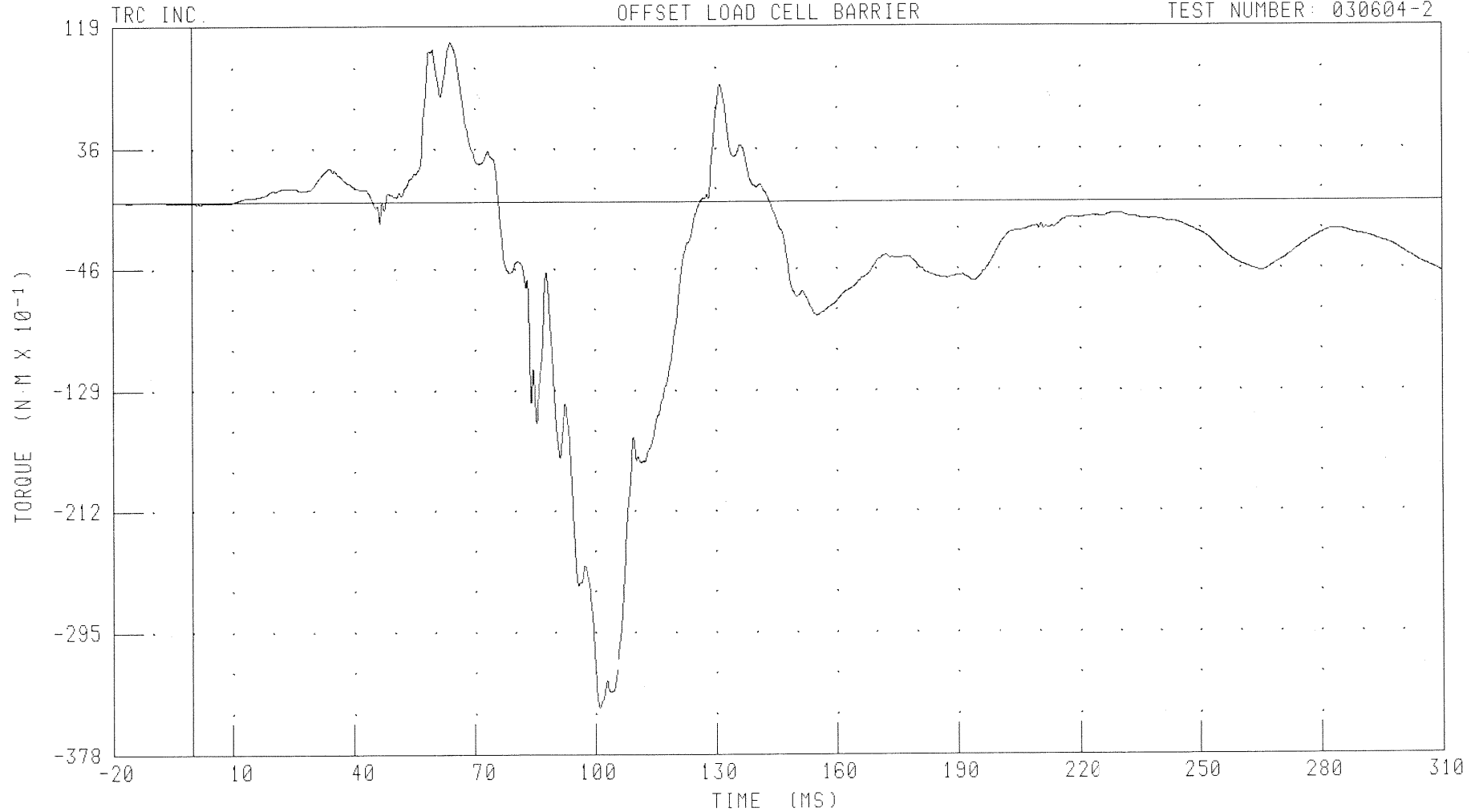
CHANNEL: ANRZF1 FILTER: CH. CLASS 600

PEAK DATA: 109.15 N @ 165.60 MS; -715.43 N @ 111.84 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRXM1 FILTER: CH. CLASS 600

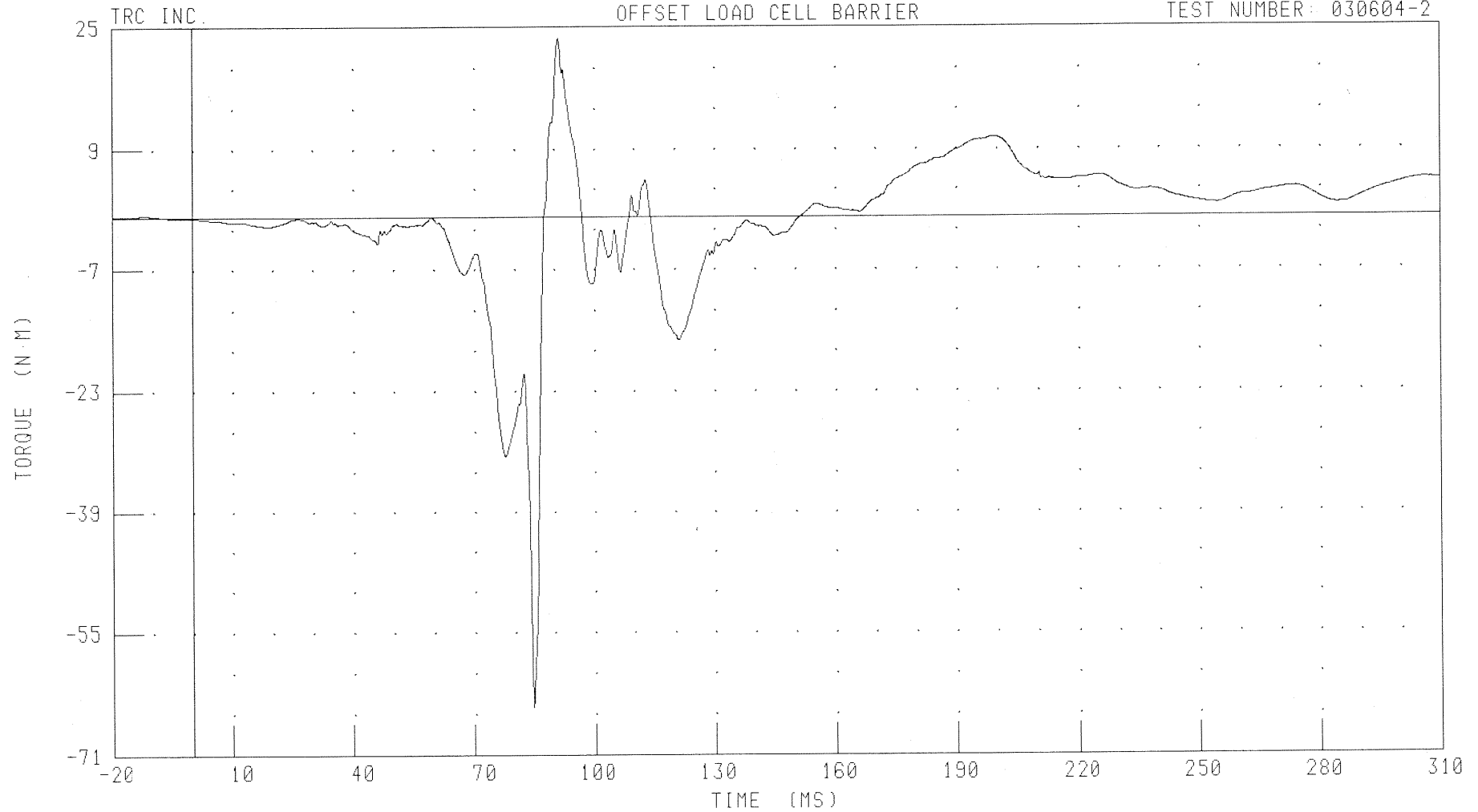
PEAK DATA: 10.93 N·M @ 64.08 MS; -34.67 N·M @ 101.12 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRYM1

FILTER: CH. CLASS 600

PEAK DATA: 23.55 N·M @ 91.12 MS; -64.82 N·M @ 84.64 MS

B-86

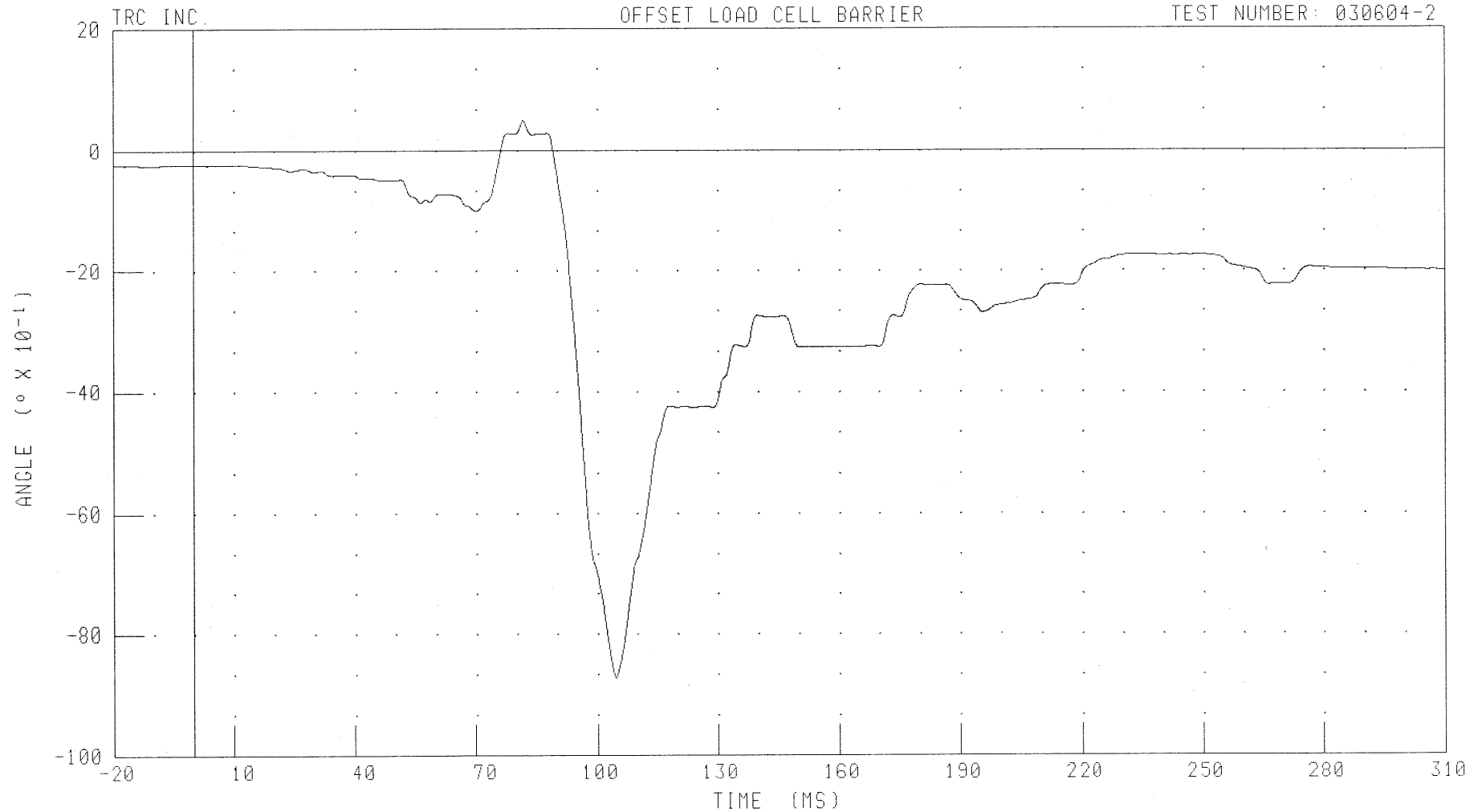
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT TO ANKLE X-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.50 ° @ 81.76 MS; -8.73 ° @ 104.64 MS

B-87

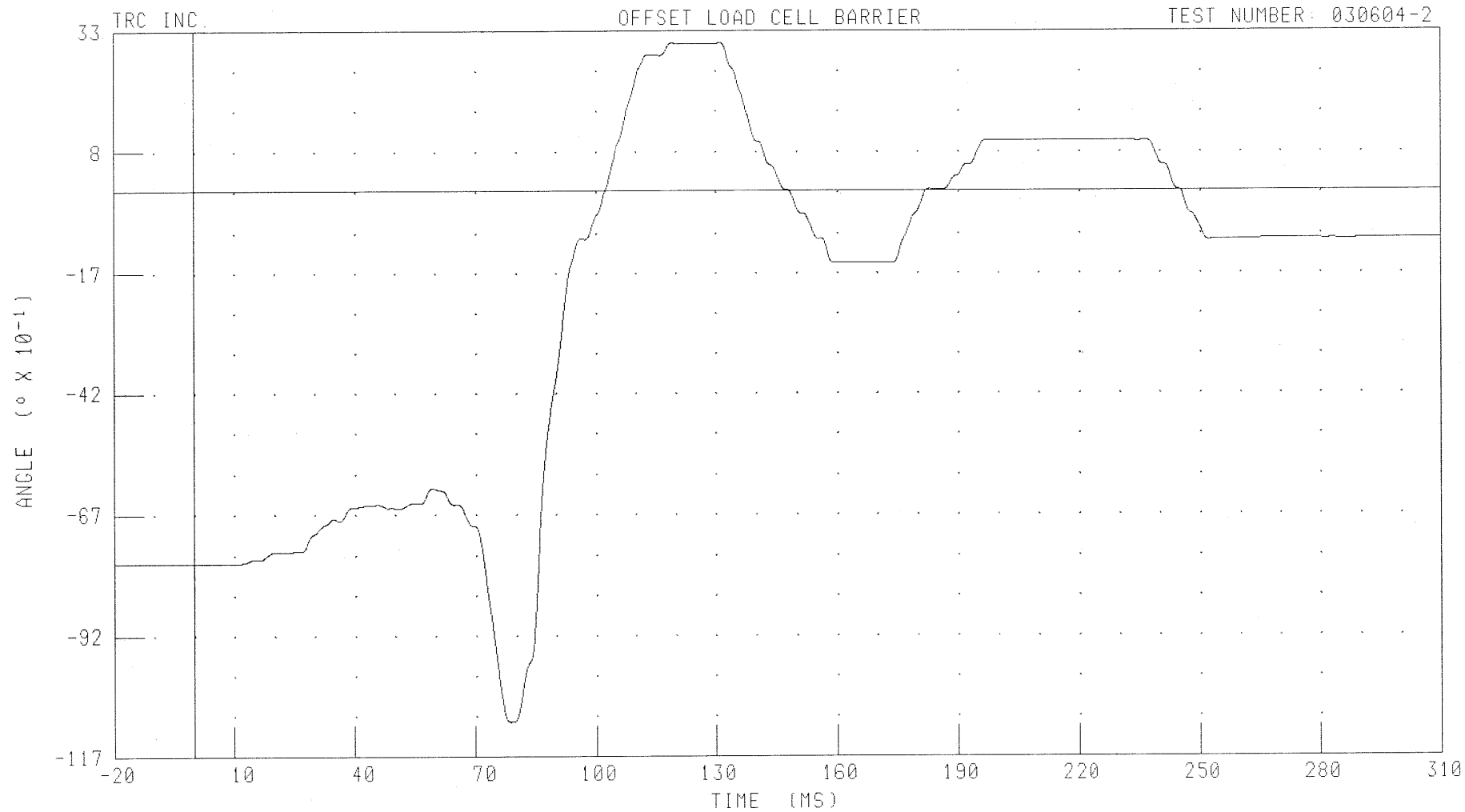
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT TO ANKLE Y-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRYD1

FILTER: CH CLASS 180

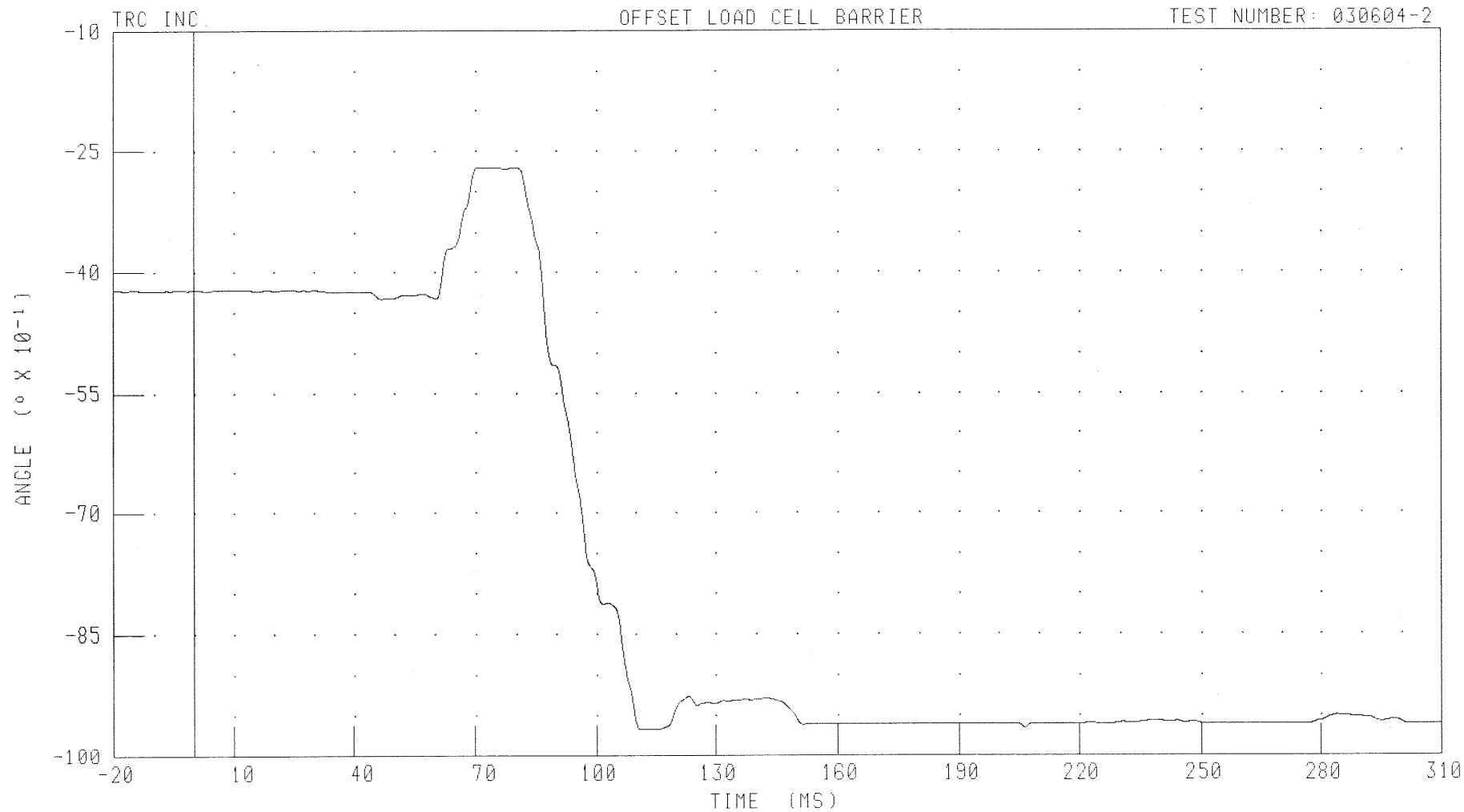
PEAK DATA 3.05 ° @ 131.20 MS; -10.99 ° @ 78.56 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT TO ANKLE Z-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRZD1 FILTER: CH. CLASS 180

PEAK DATA: -2.71 ° @ 70.56 MS; -9.67 ° @ 114.32 MS

B-89

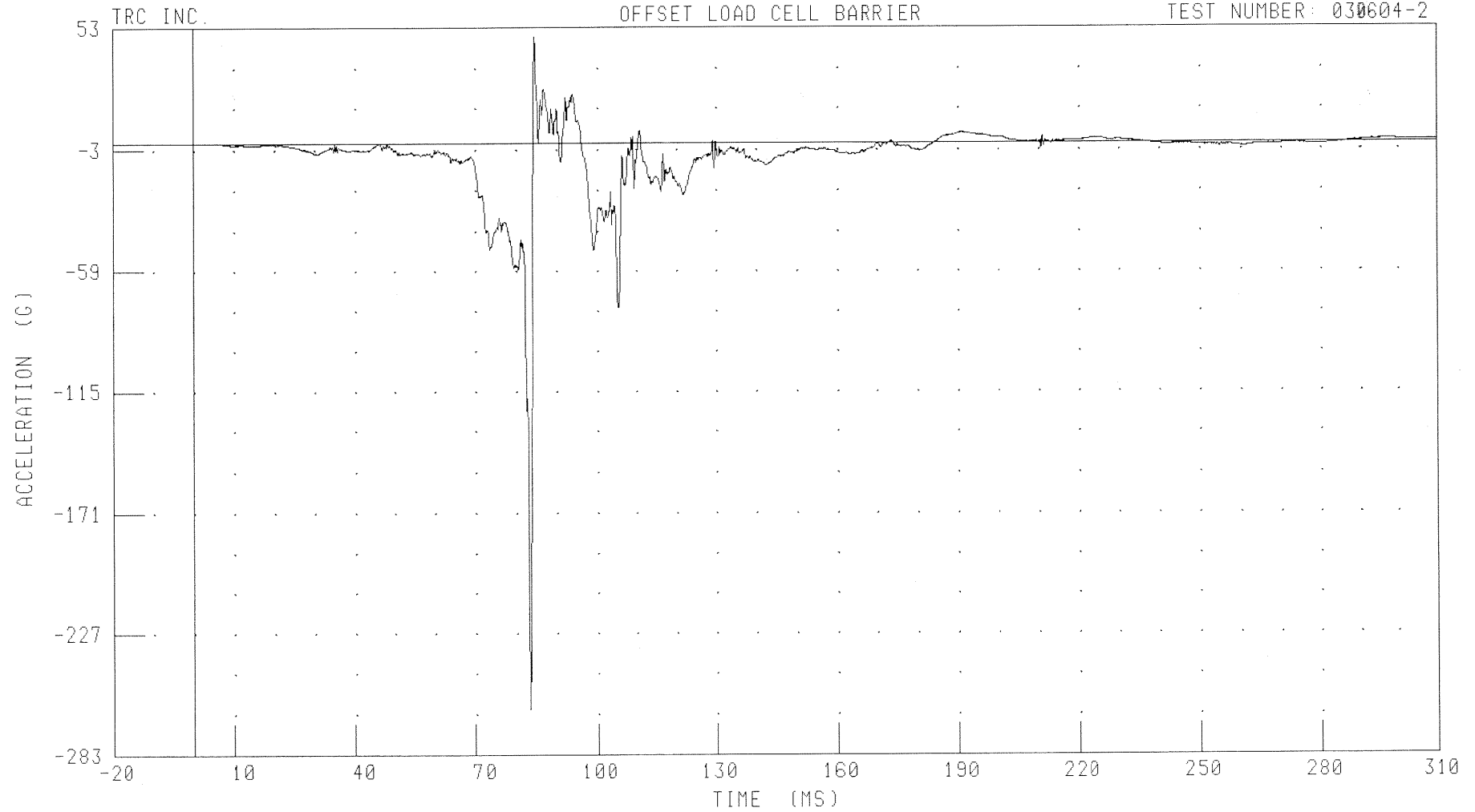
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRXG1 FILTER: CH. CLASS 1000

PEAK DATA: 48.77 G @ 84.72 MS; -262.12 G @ 83.36 MS

B-90

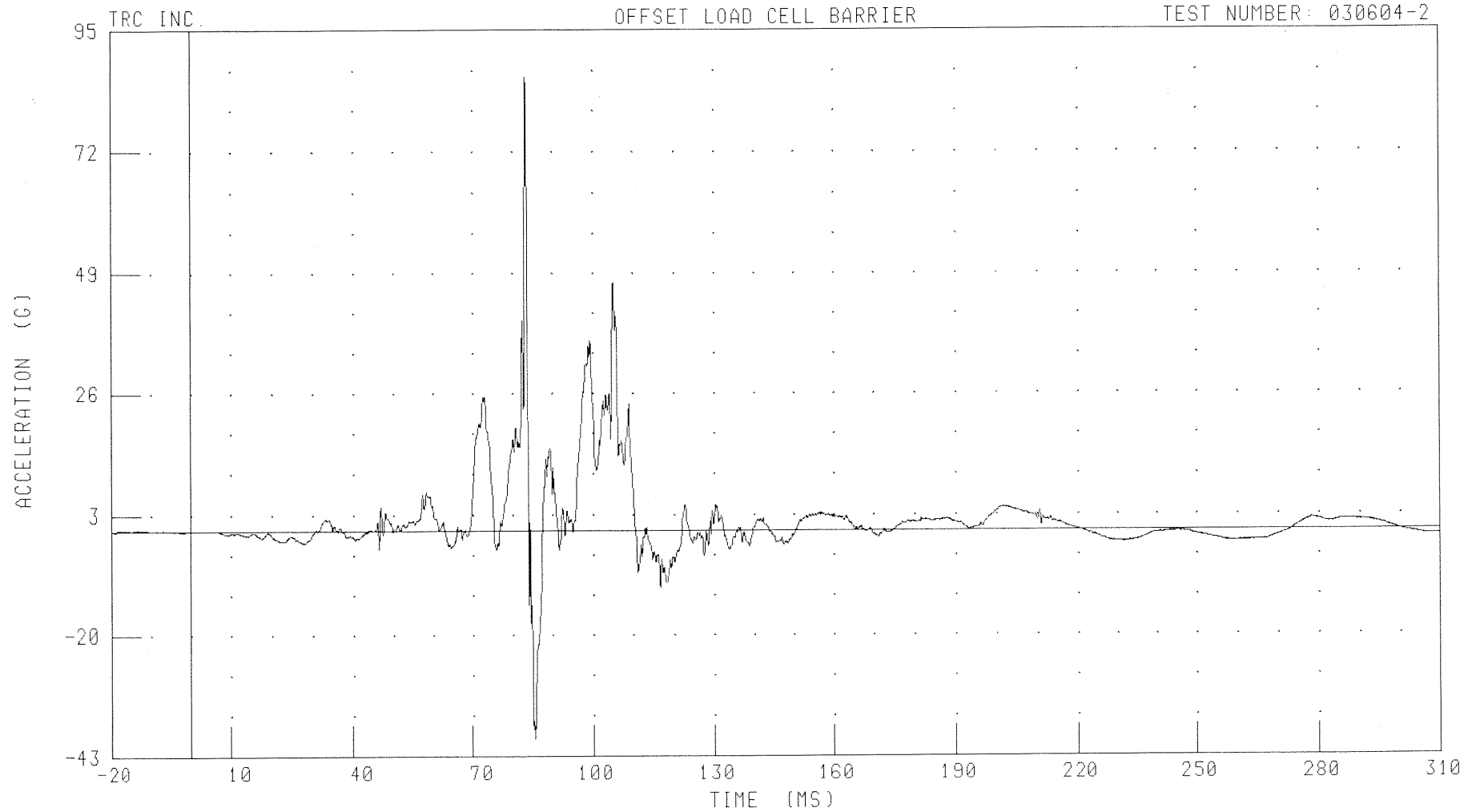
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRYG1

FILTER: CH. CLASS 1000

PEAK DATA: 86.02 G @ 83.44 MS; -39.68 G @ 85.60 MS

B-91

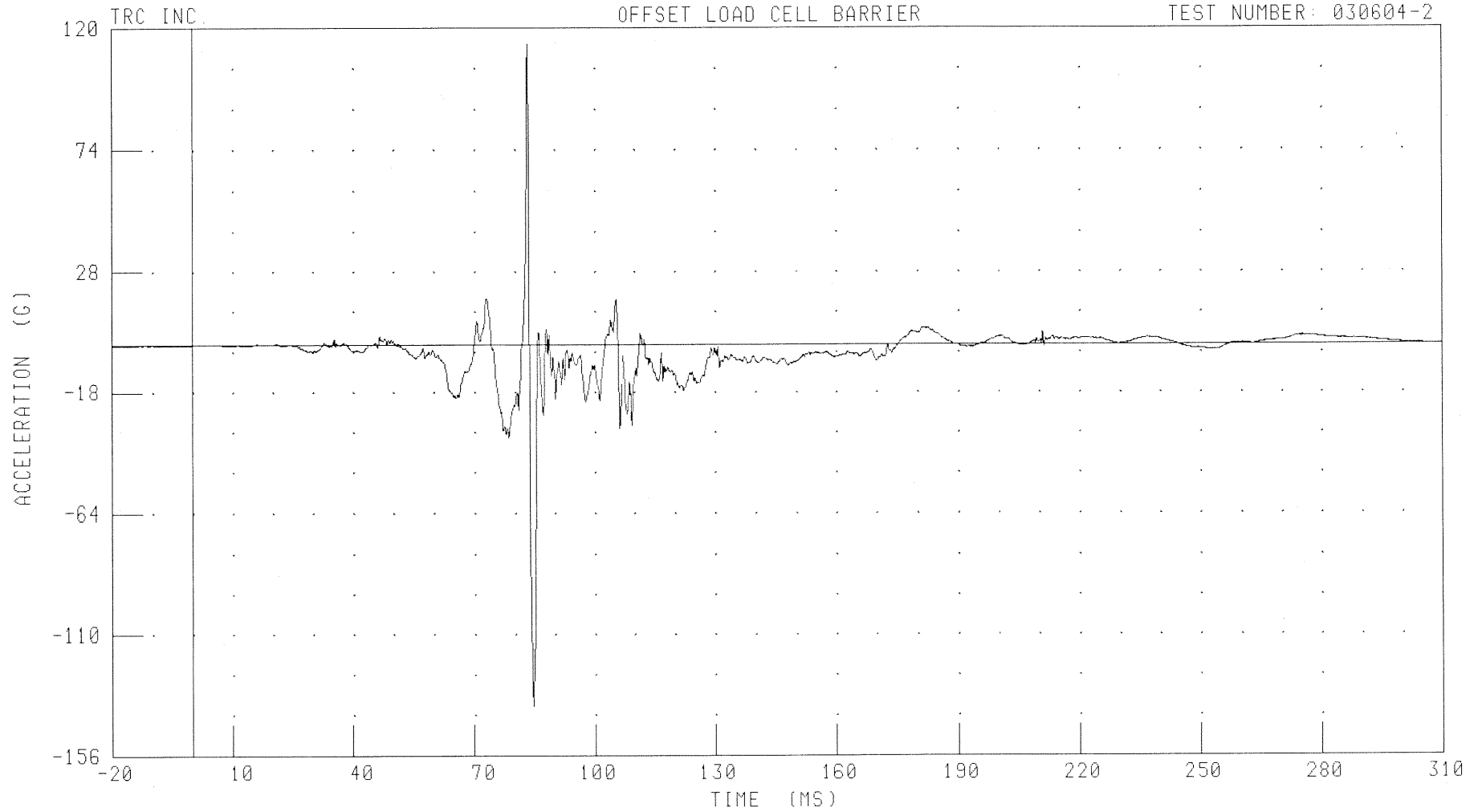
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRZG1 FILTER: CH. CLASS 1000

B-92

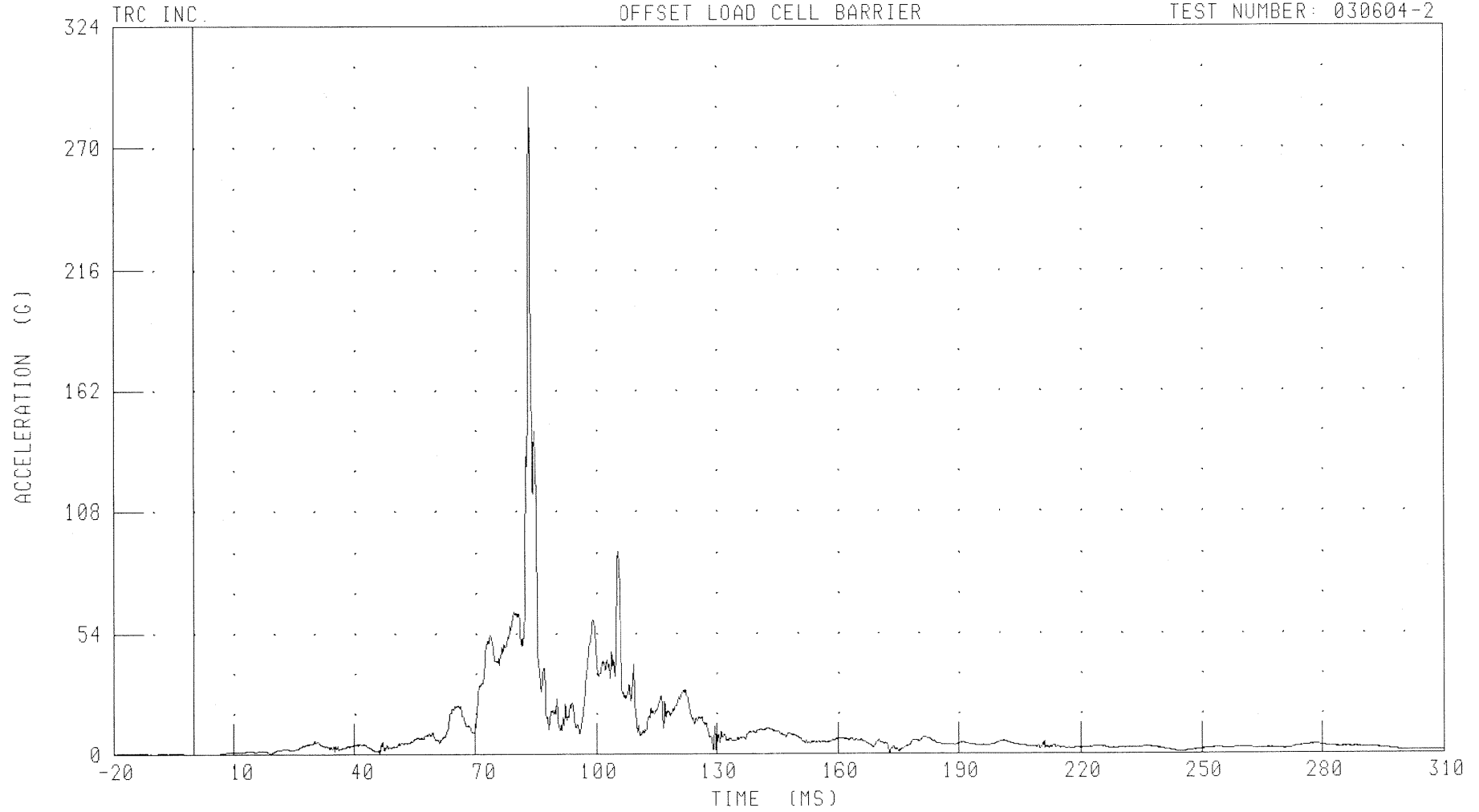
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER RIGHT FOOT RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-93

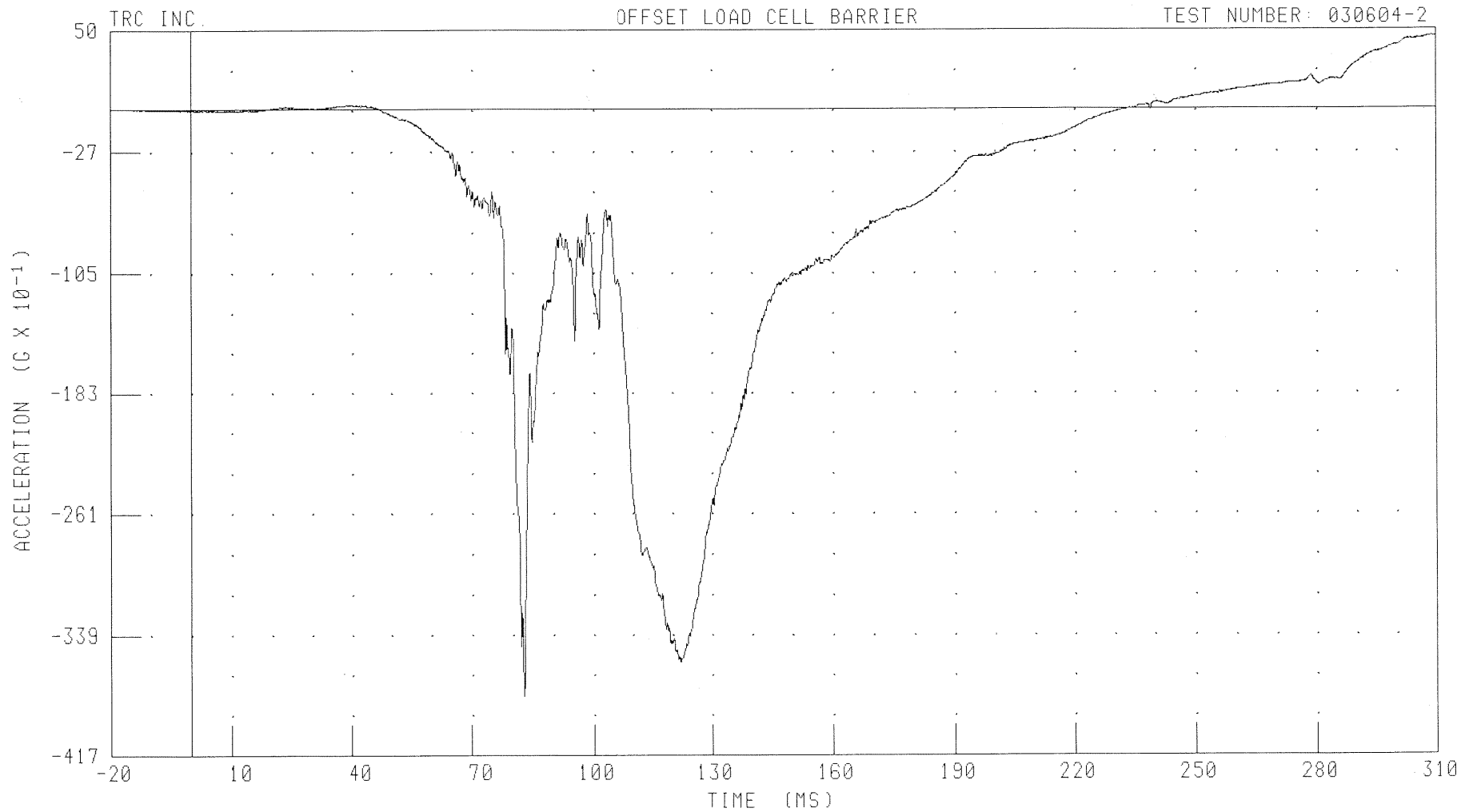
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER HEAD X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

B-94

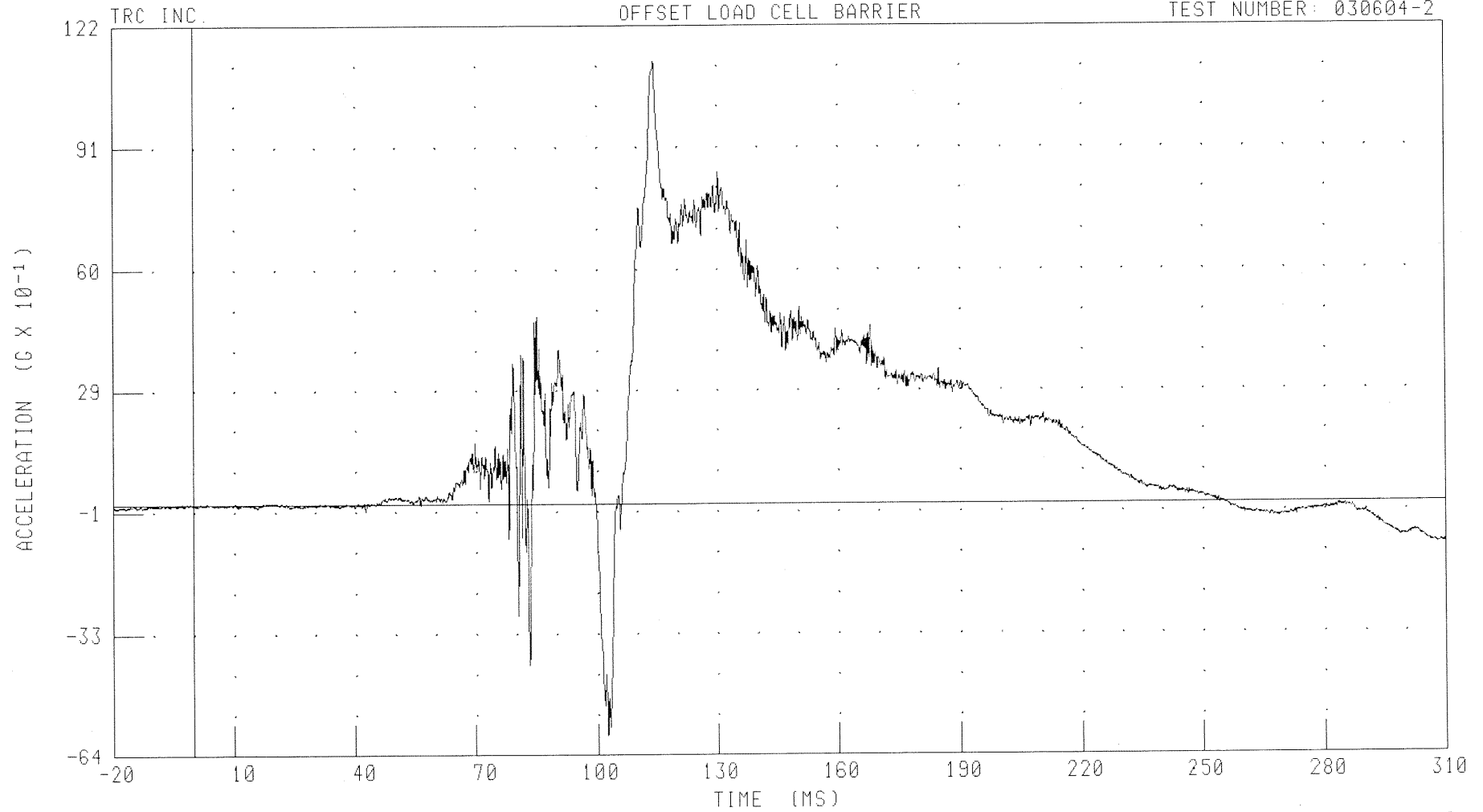
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER HEAD Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDYC2 FILTER: CH. CLASS 1000

PEAK DATA: 11.30 G @ 114.40 MS; -5.90 G @ 102.48 MS

B-95

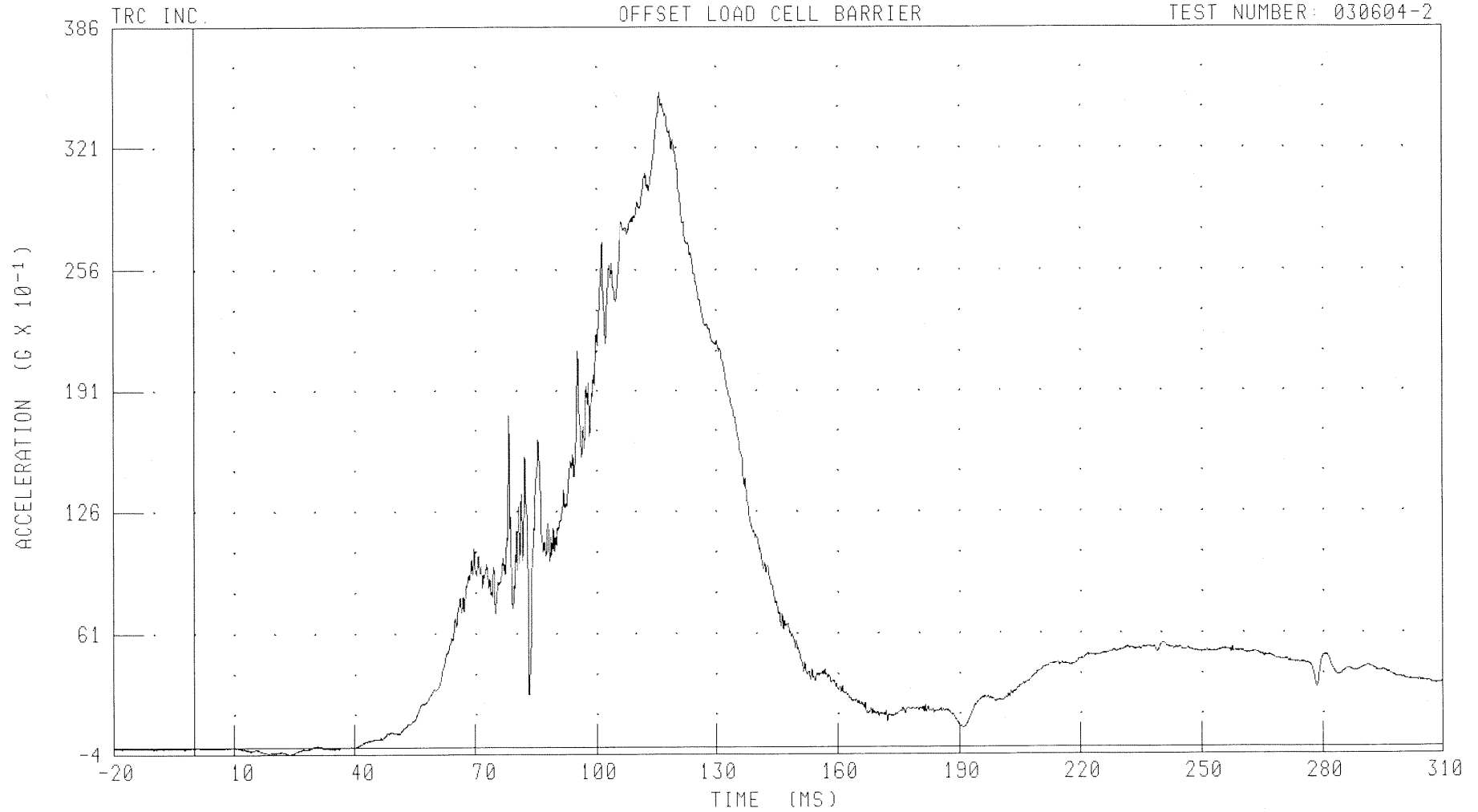
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER HEAD Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

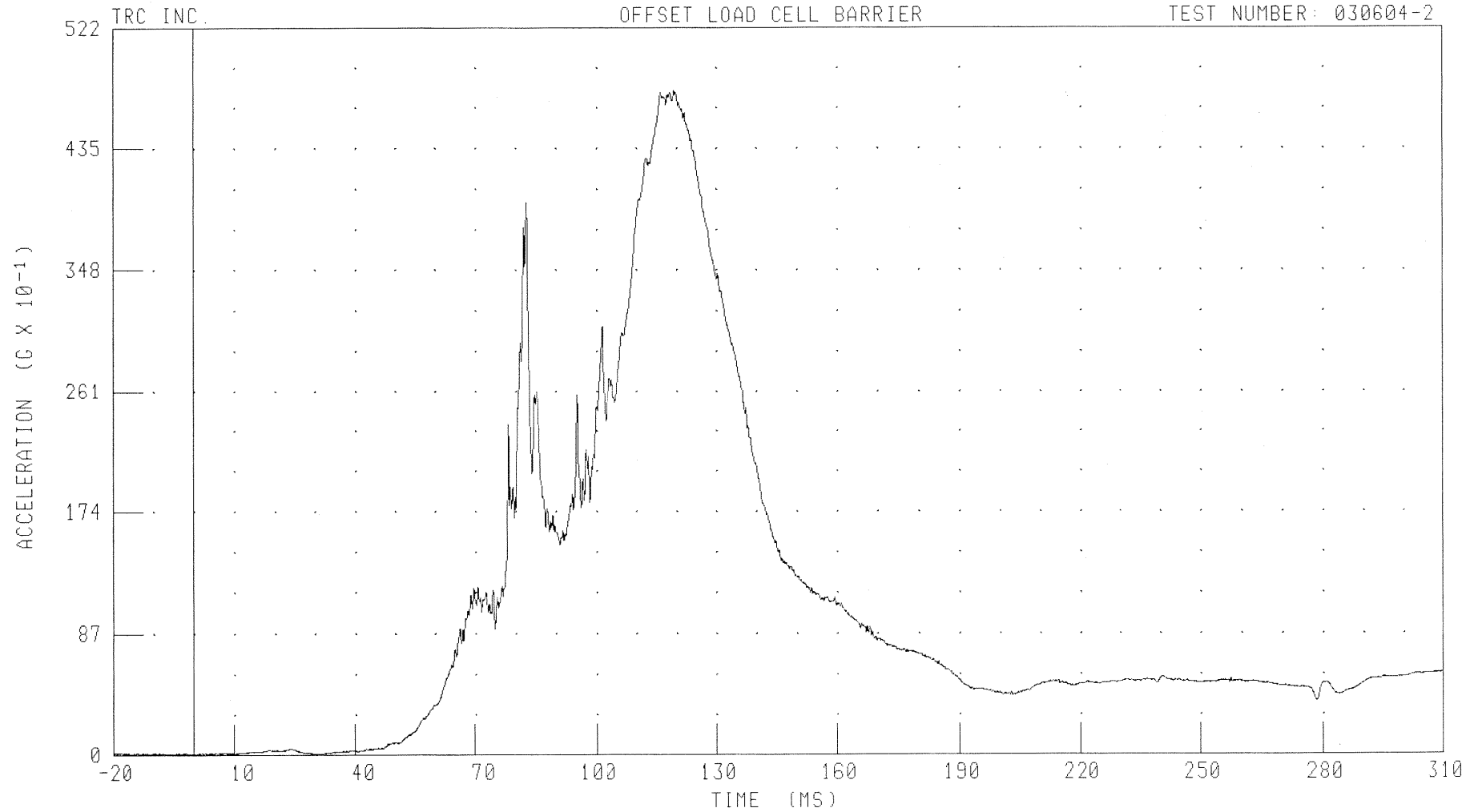
PEAK DATA: 35.04 G @ 116.08 MS; -0.42 G @ 24.00 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER HEAD RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

PEAK DATA: 47.68 G @ 119.52 MS; 0.05 G @ -6.56 MS

B-97

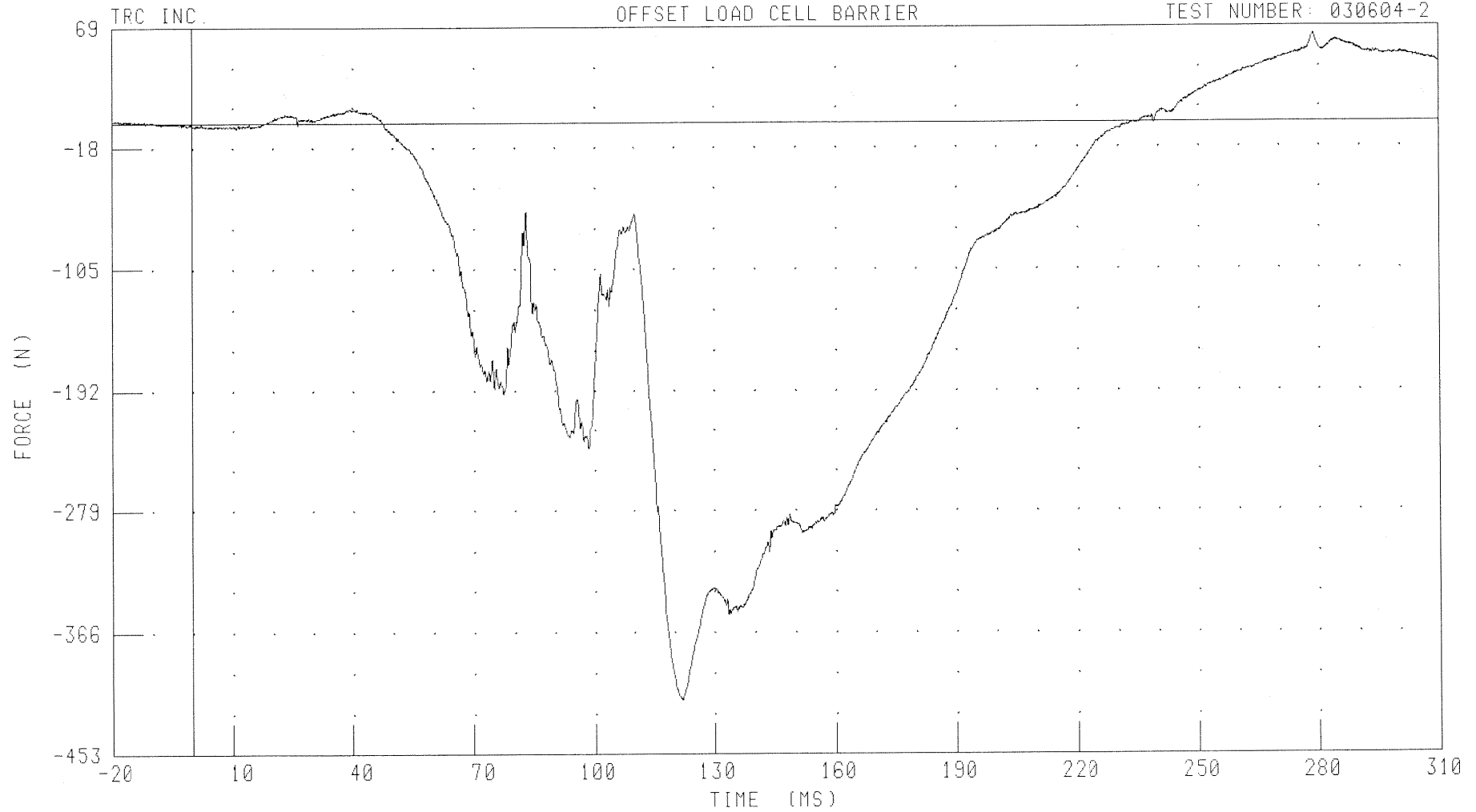
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NECK X-AXIS SHEAR FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

PEAK DATA: 63.21 N @ 278.72 MS; -413.78 N @ 122.00 MS

B-98

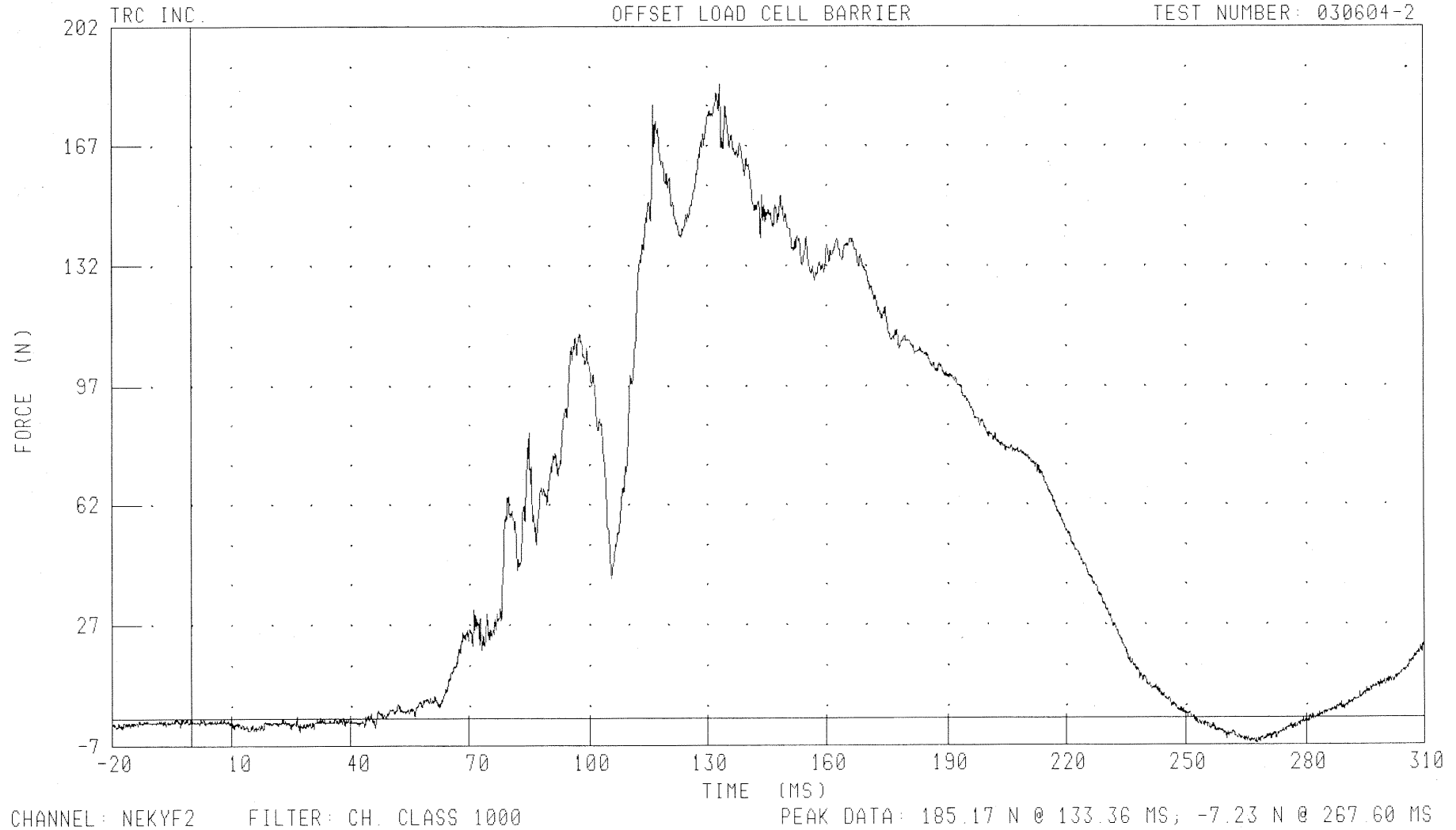
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NECK Y-AXIS SHEAR FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



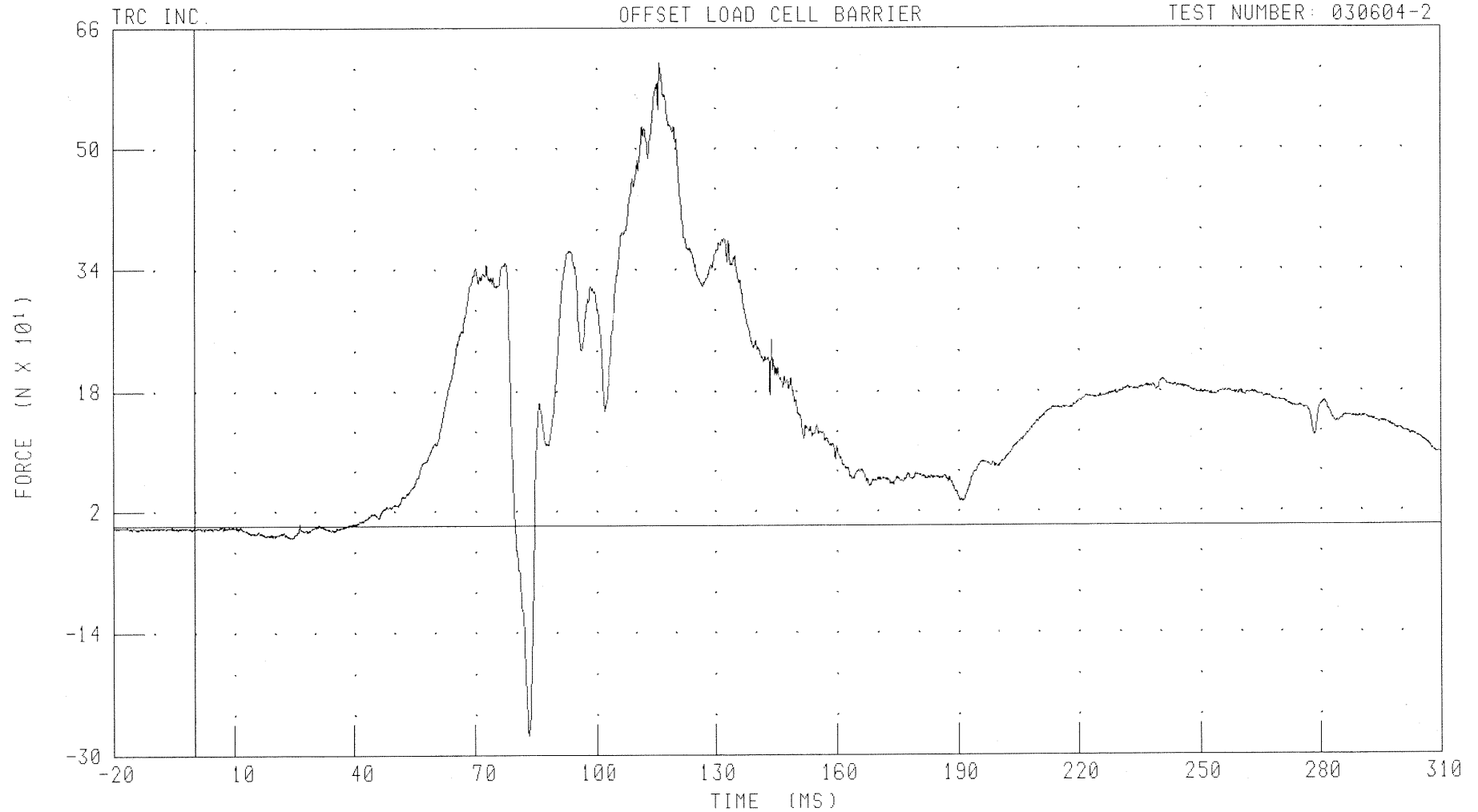
B-99

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 030604-2



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

PEAK DATA: 613.83 N @ 116.08 MS, -274.01 N @ 83.04 MS

B-100

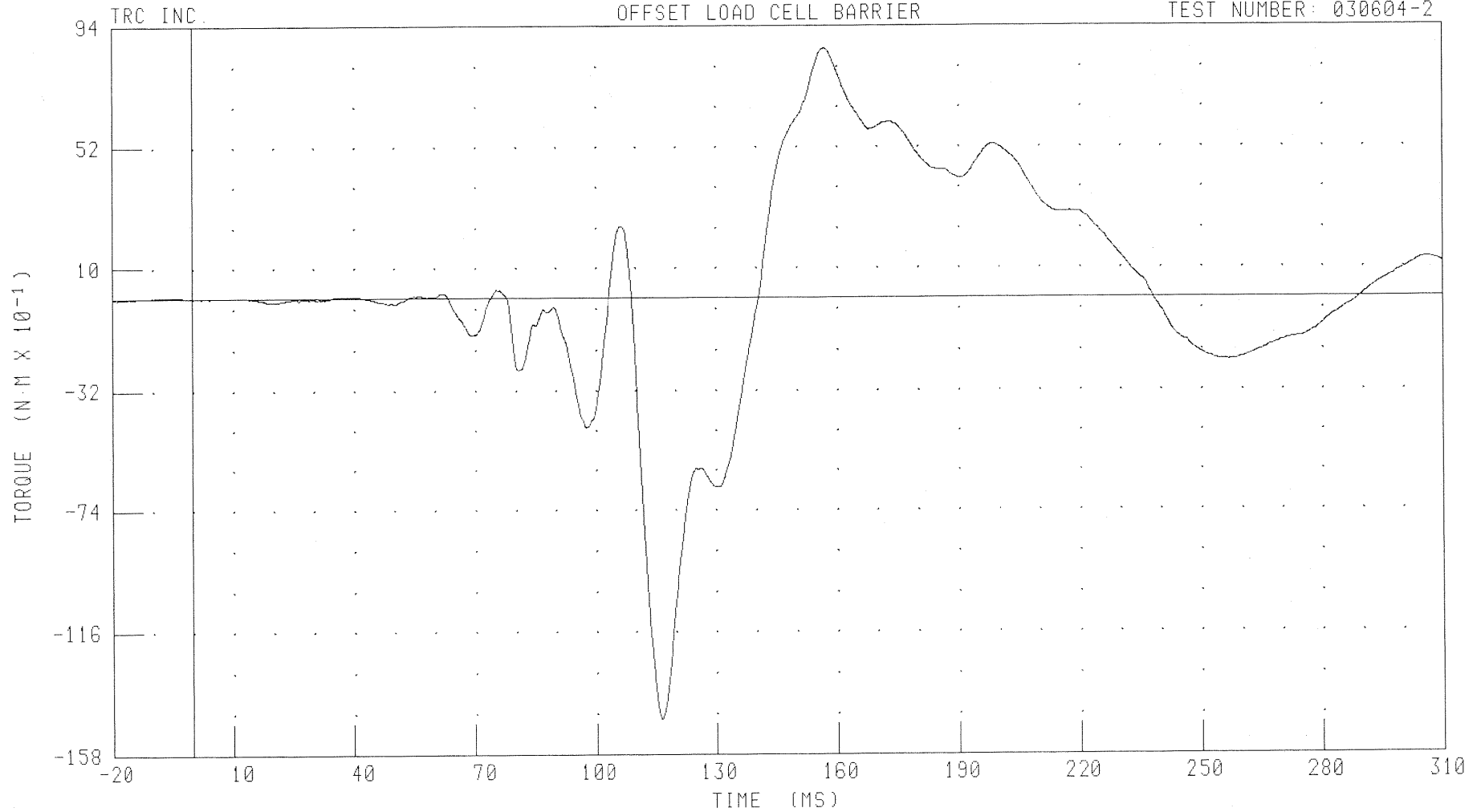
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NECK MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKXM2 FILTER: CH. CLASS 600

PEAK DATA: 8.63 N·M @ 157.04 MS; -14.61 N·M @ 116.56 MS

B-101

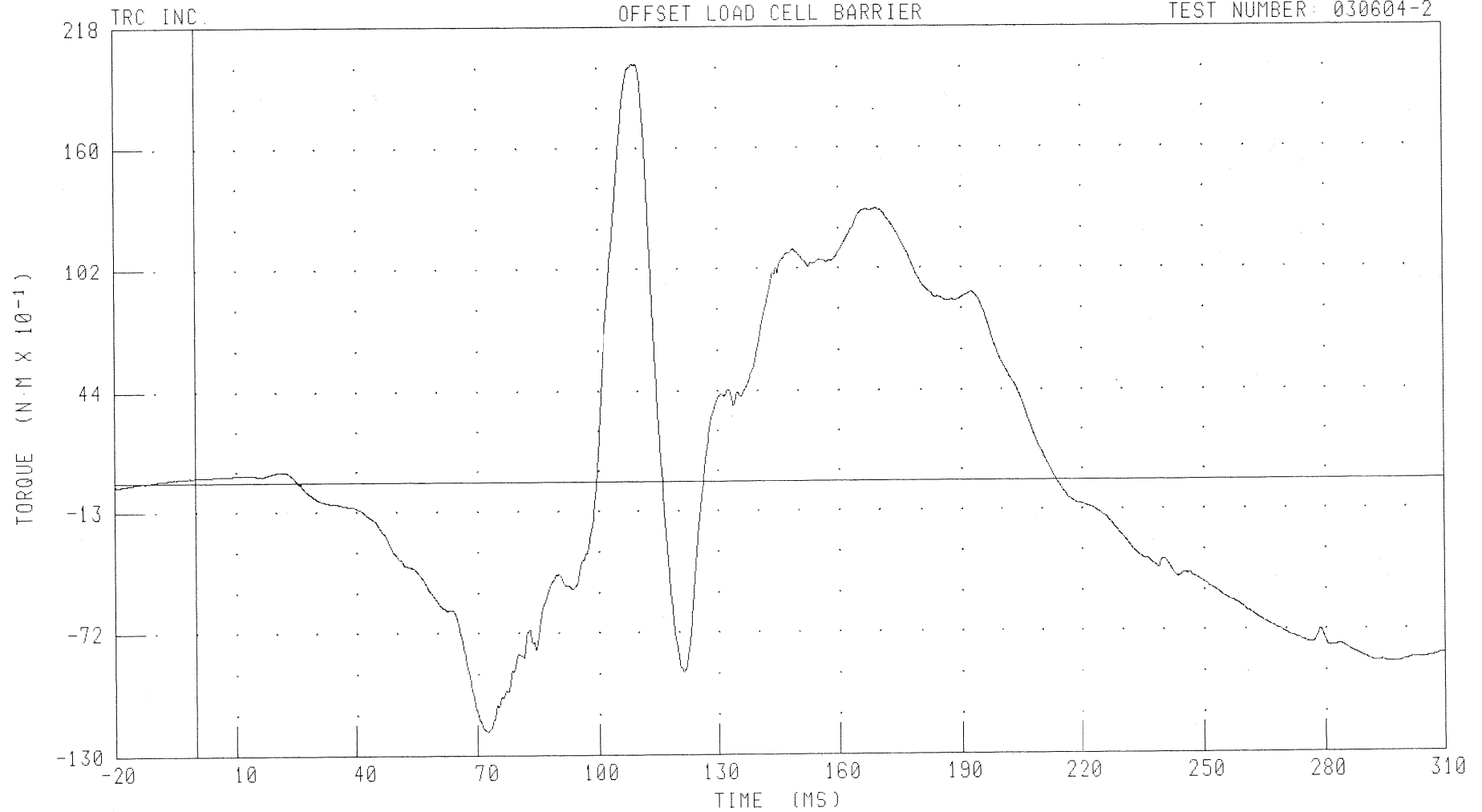
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NECK MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKYM2 FILTER: CH. CLASS 600

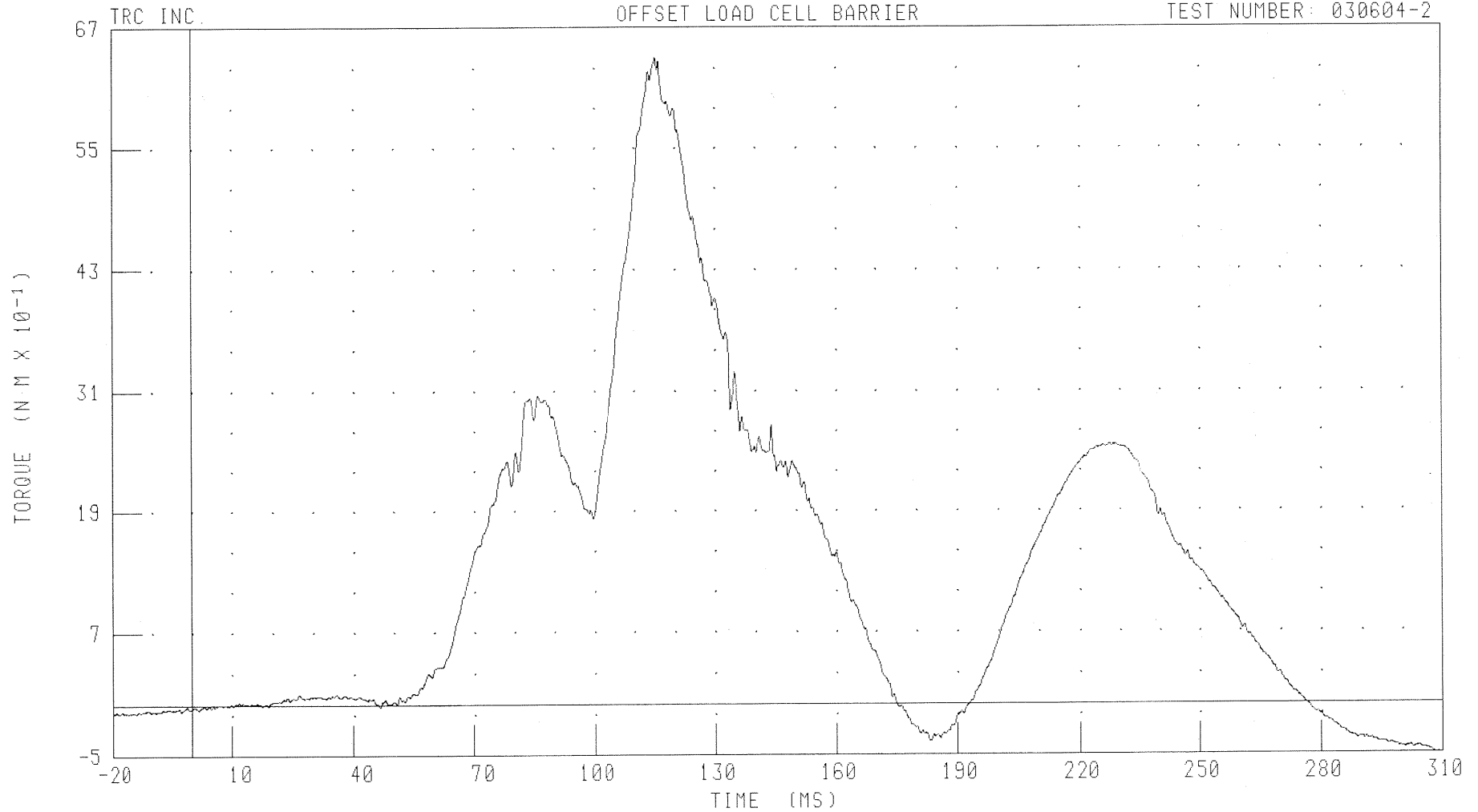
B-102

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
PASSENGER NECK MOMENT ABOUT Z AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKZM2 FILTER: CH. CLASS 600

PEAK DATA: 6.41 N·M @ 115.44 MS; -0.53 N·M @ 309.68 MS

B-103

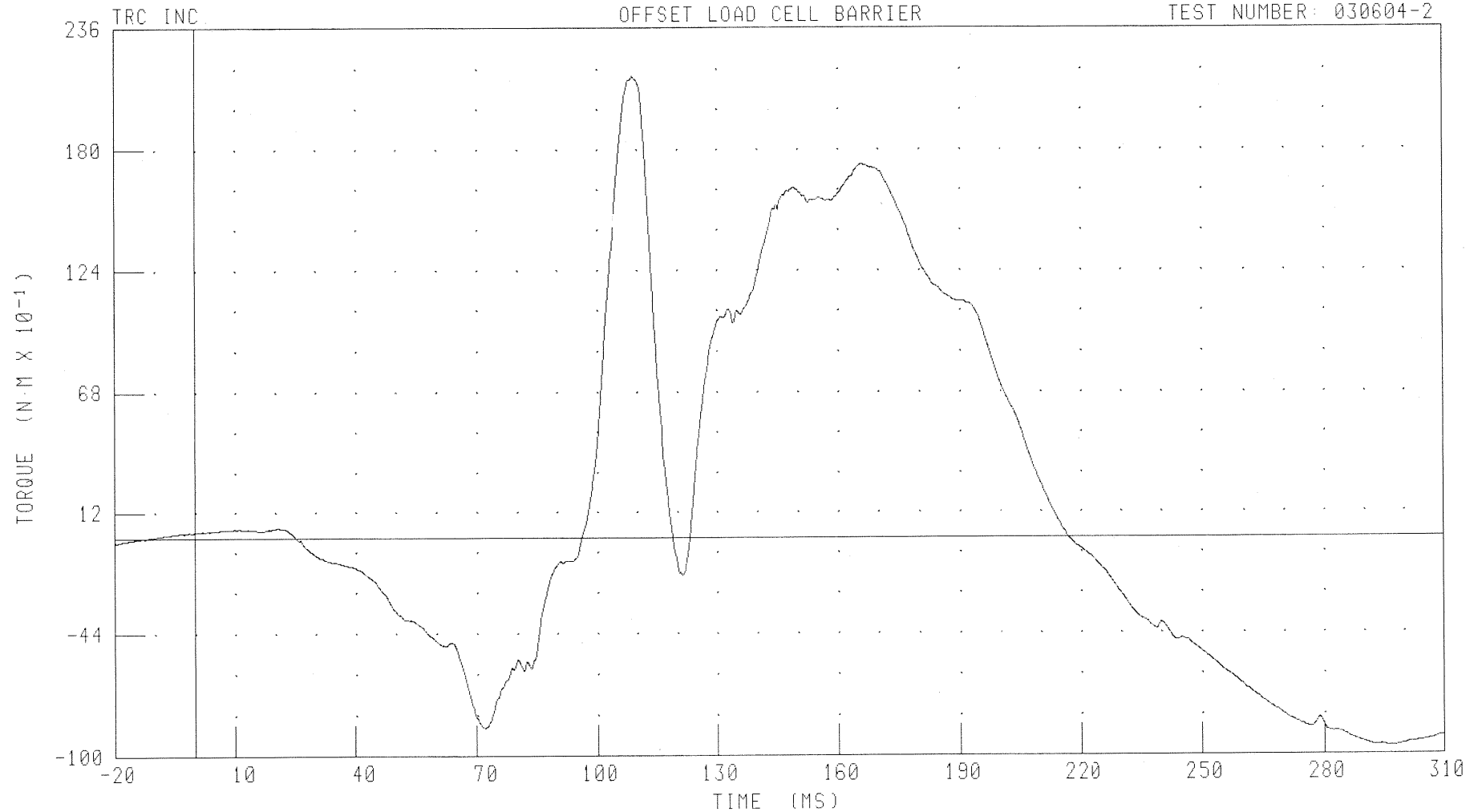
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NEKOM2

FILTER: CH. CLASS 600

PEAK DATA: 21.41 N·m @ 109.04 ms; -9.63 N·m @ 296.80 ms

B-104

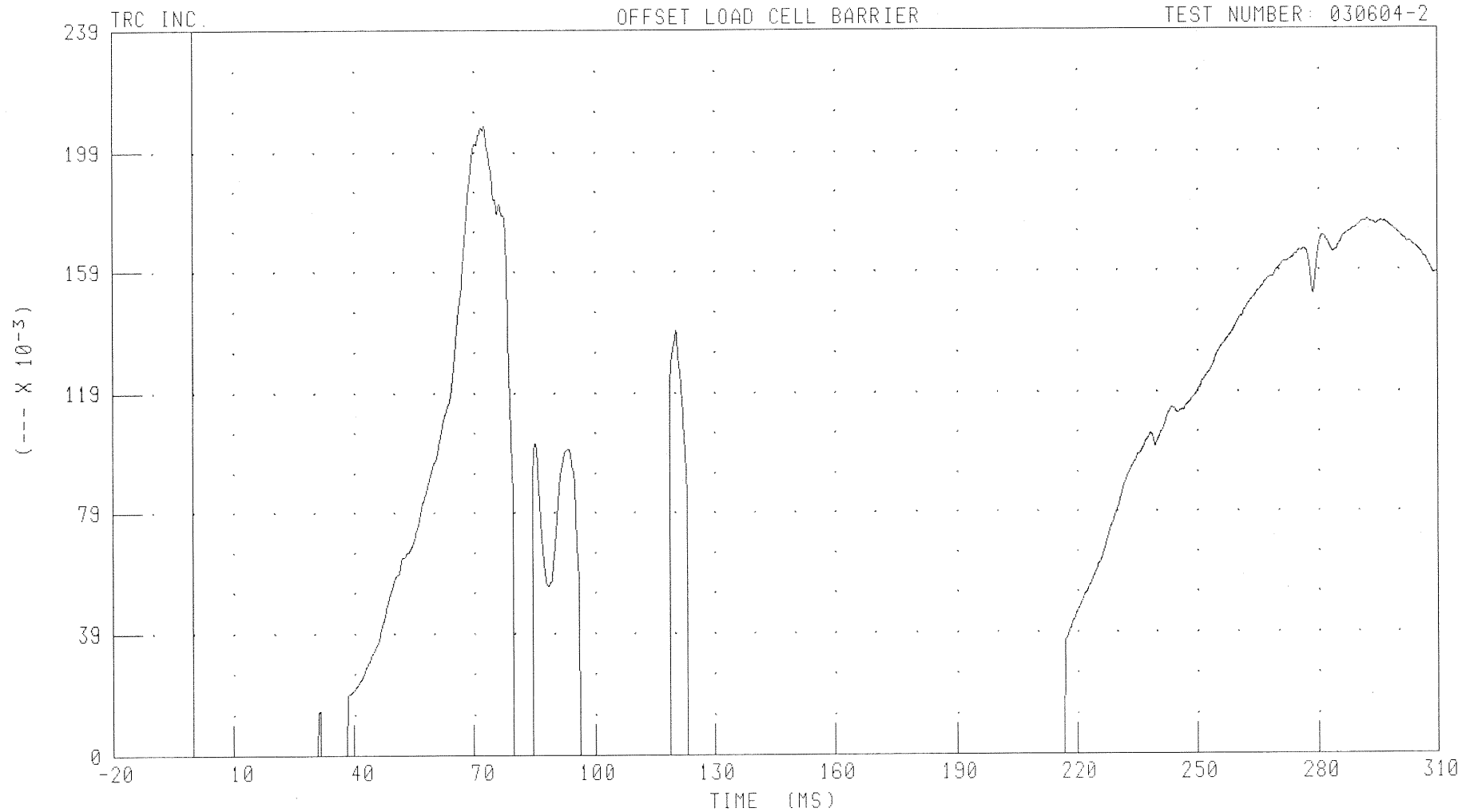
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NIJ TENSION/EXTENSION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NTE2

FILTER: CH. CLASS 600

PEAK DATA: 0.21 --- @ 72.72 MS; 0.00 --- @ -20.00 MS

B-105

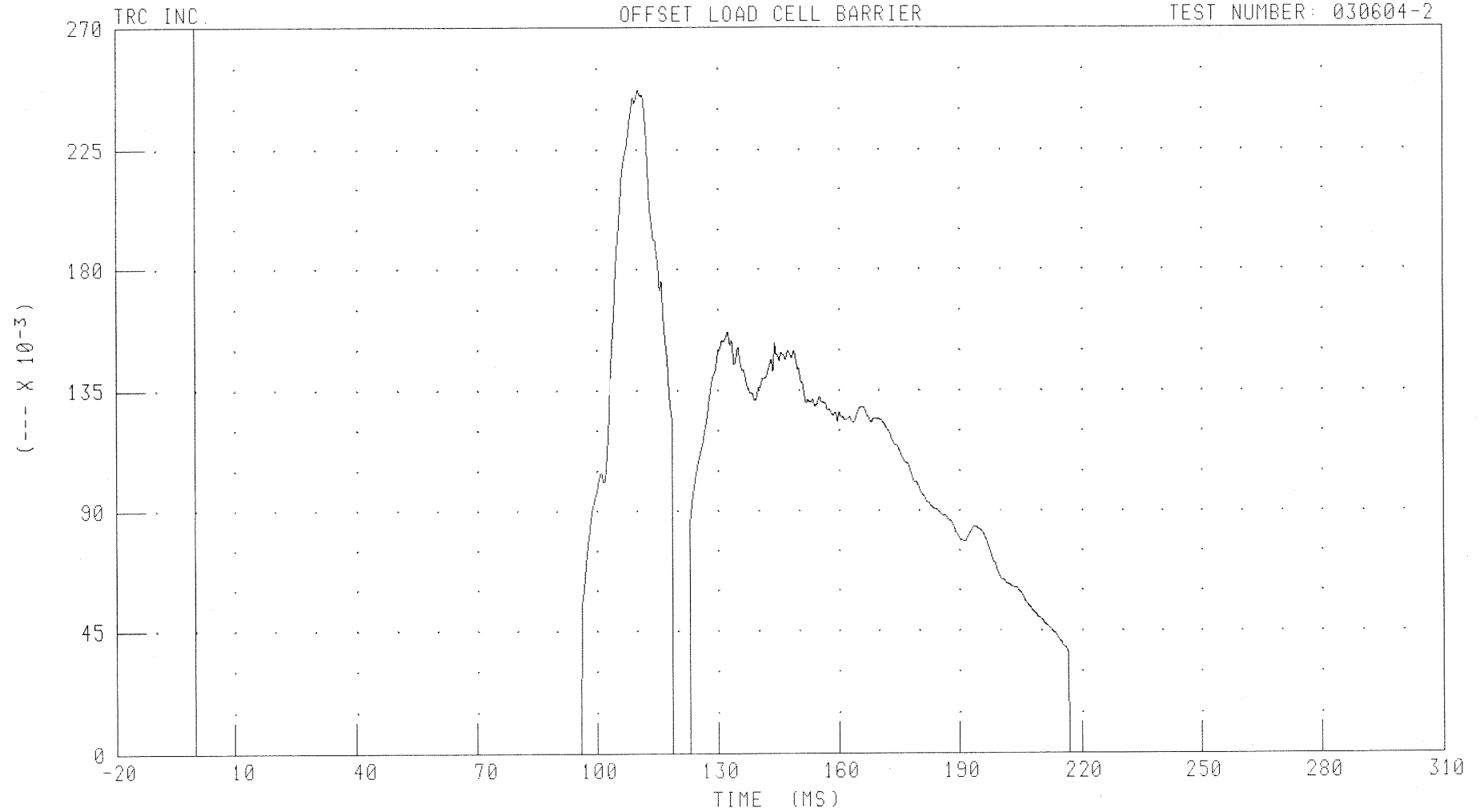
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NIJ TENSION/FLEXION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: NTF2 FILTER: CH. CLASS 600

PEAK DATA: 0.25 --- @ 110.48 MS, 0.00 --- @ -20.00 MS

B-106

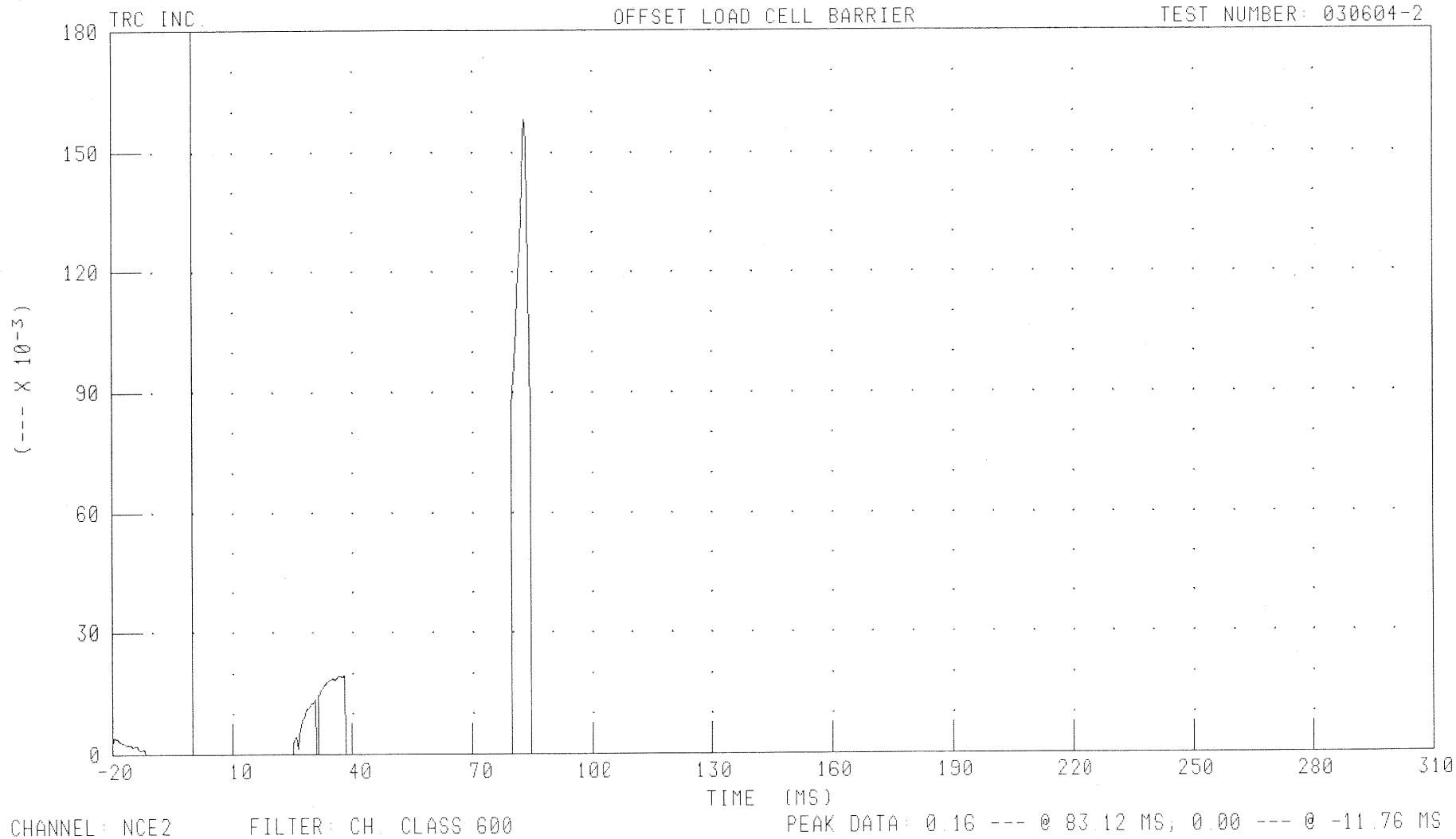
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NIJ COMPRESSION/EXTENSION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-107

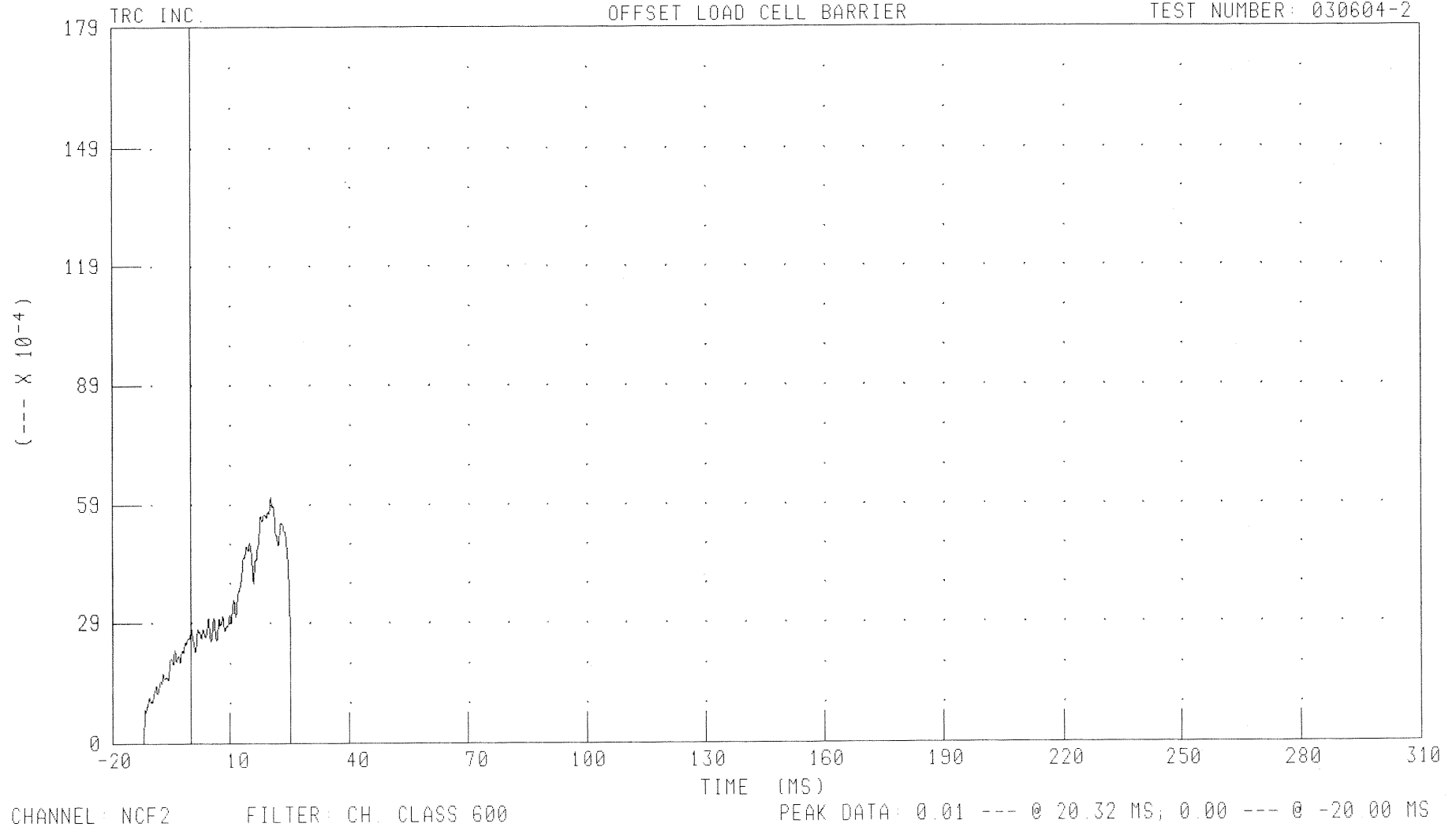
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER NIJ COMPRESSION/FLEXION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-108

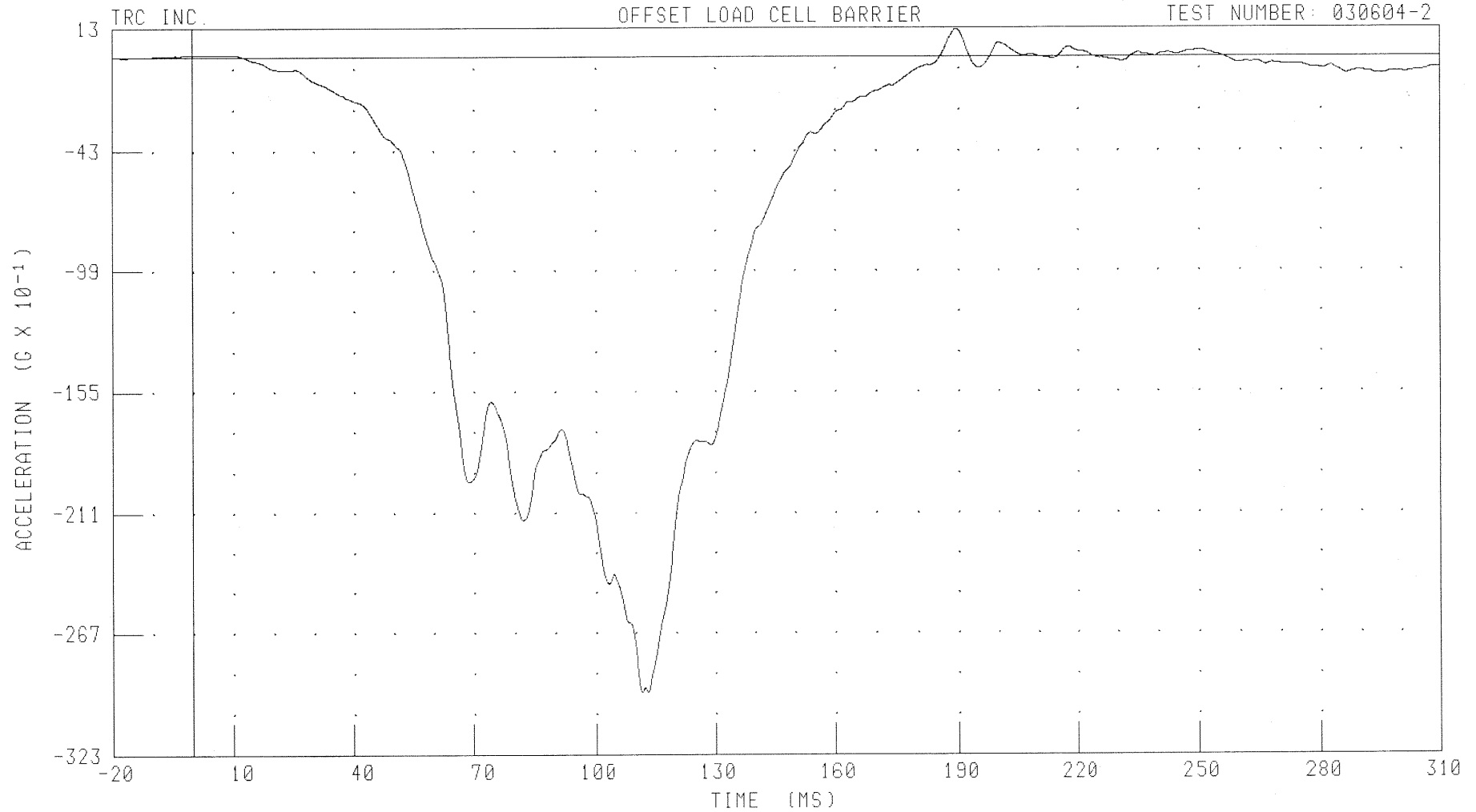
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER CHEST X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTXG2

FILTER: CH. CLASS 180

PEAK DATA: 1.24 G @ 189.60 MS; -29.43 G @ 113.12 MS

B-109

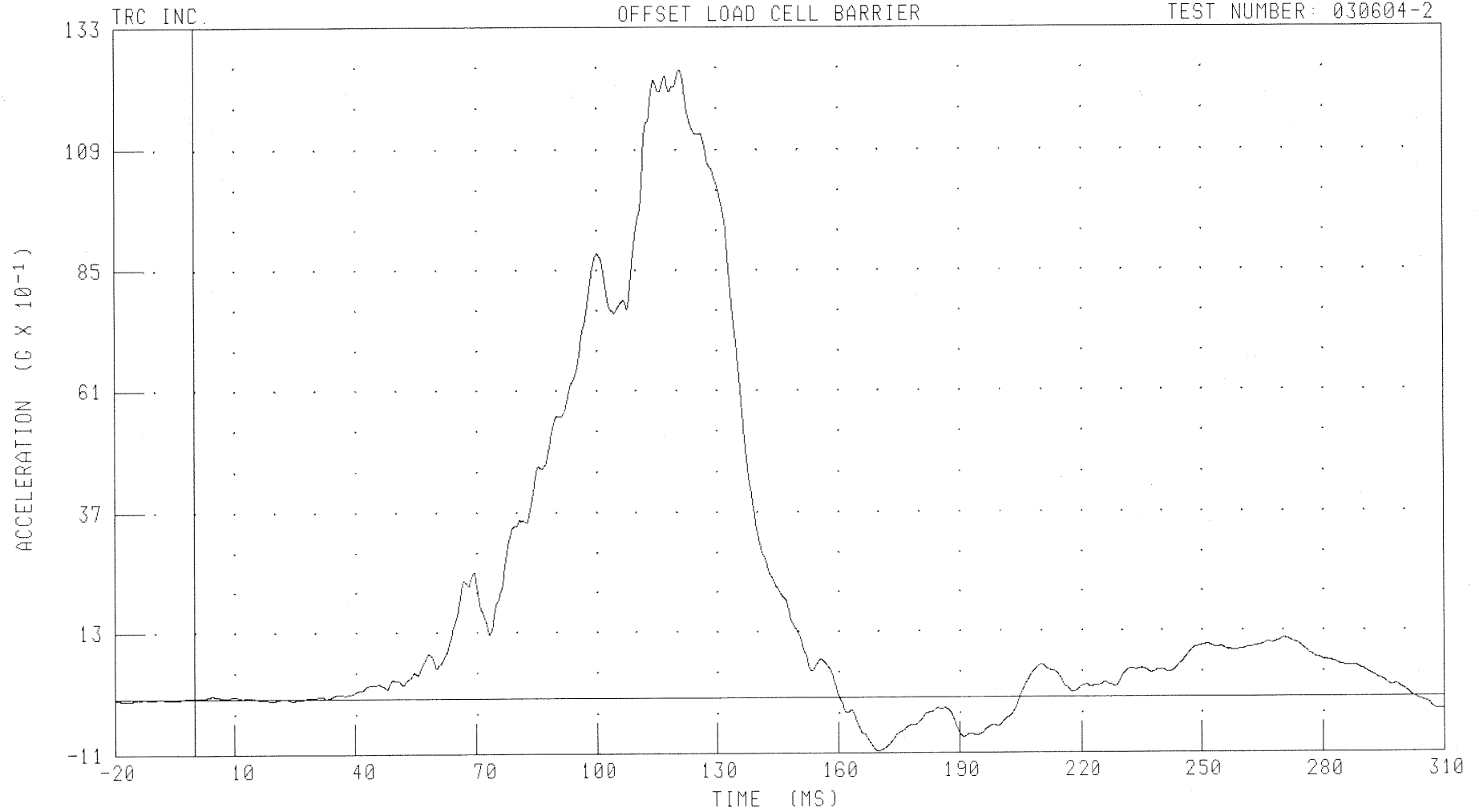
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER CHEST Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTYG2

FILTER: CH. CLASS 180

PEAK DATA: 12.44 G @ 121.20 MS; -1.07 G @ 169.92 MS

B-110

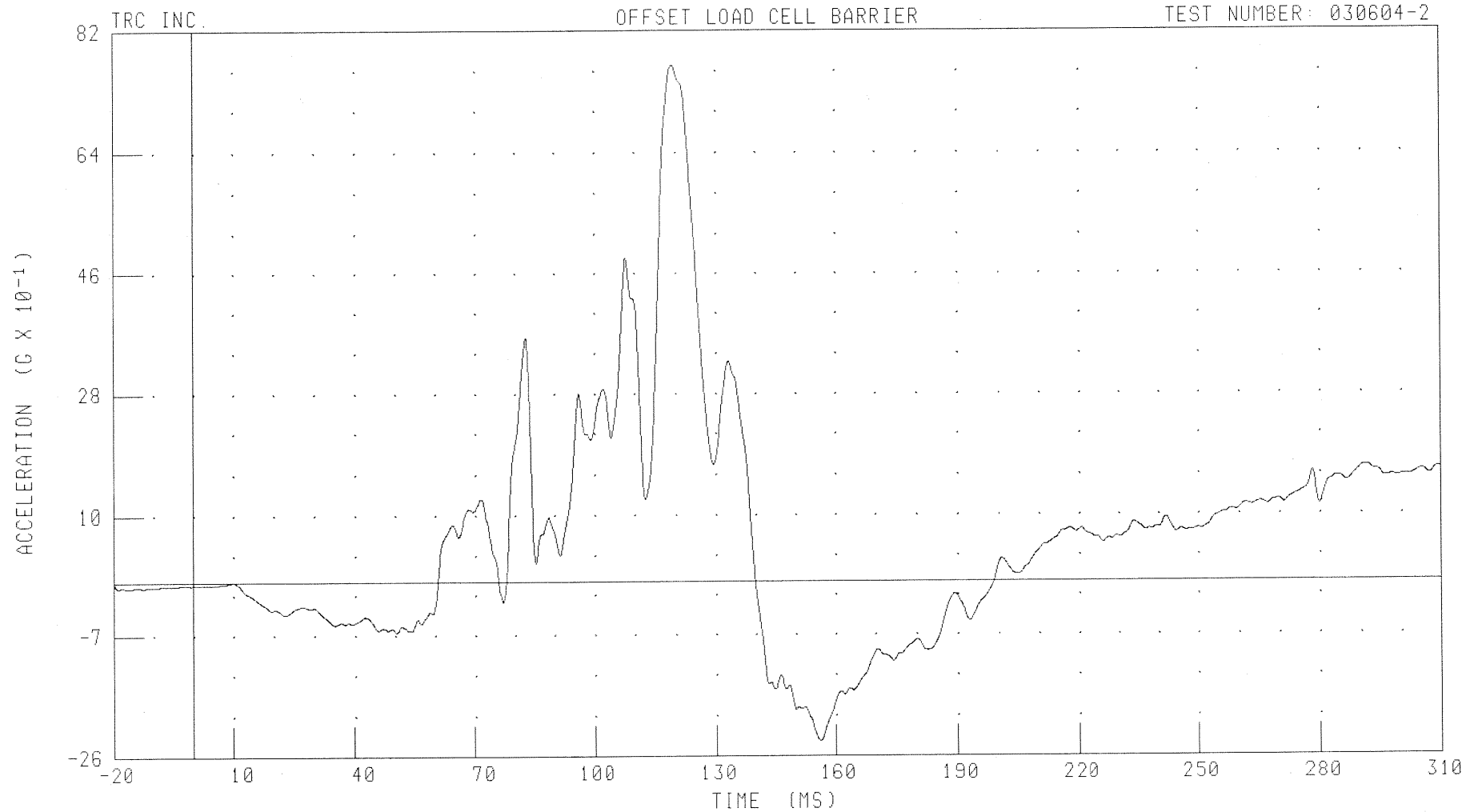
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER CHEST Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTZG2

FILTER: CH. CLASS 180

PEAK DATA: 7.69 G @ 119.52 MS; -2.38 G @ 156.24 MS

B-111

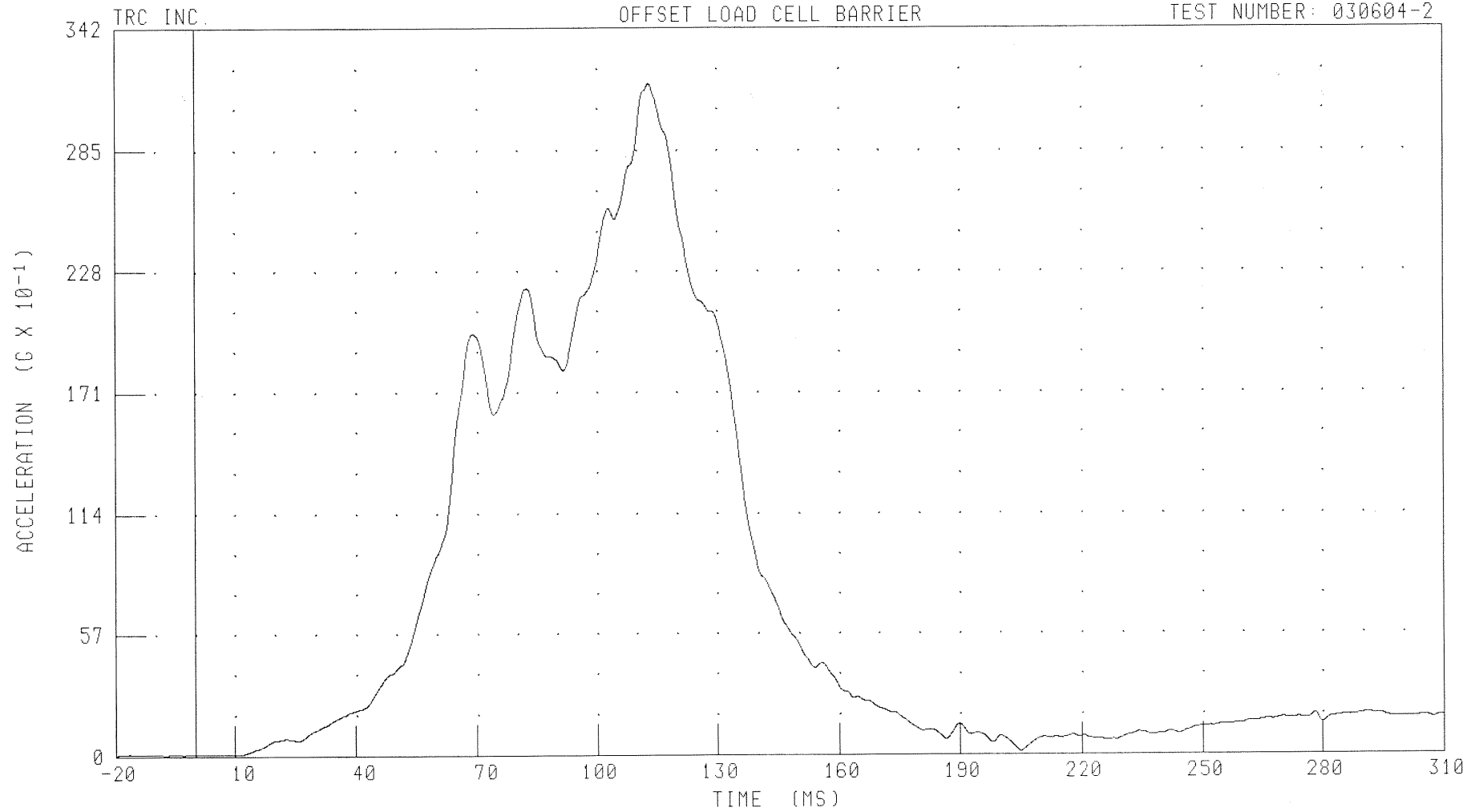
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER CHEST RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTRG2 FILTER: CH. CLASS 180

B-112

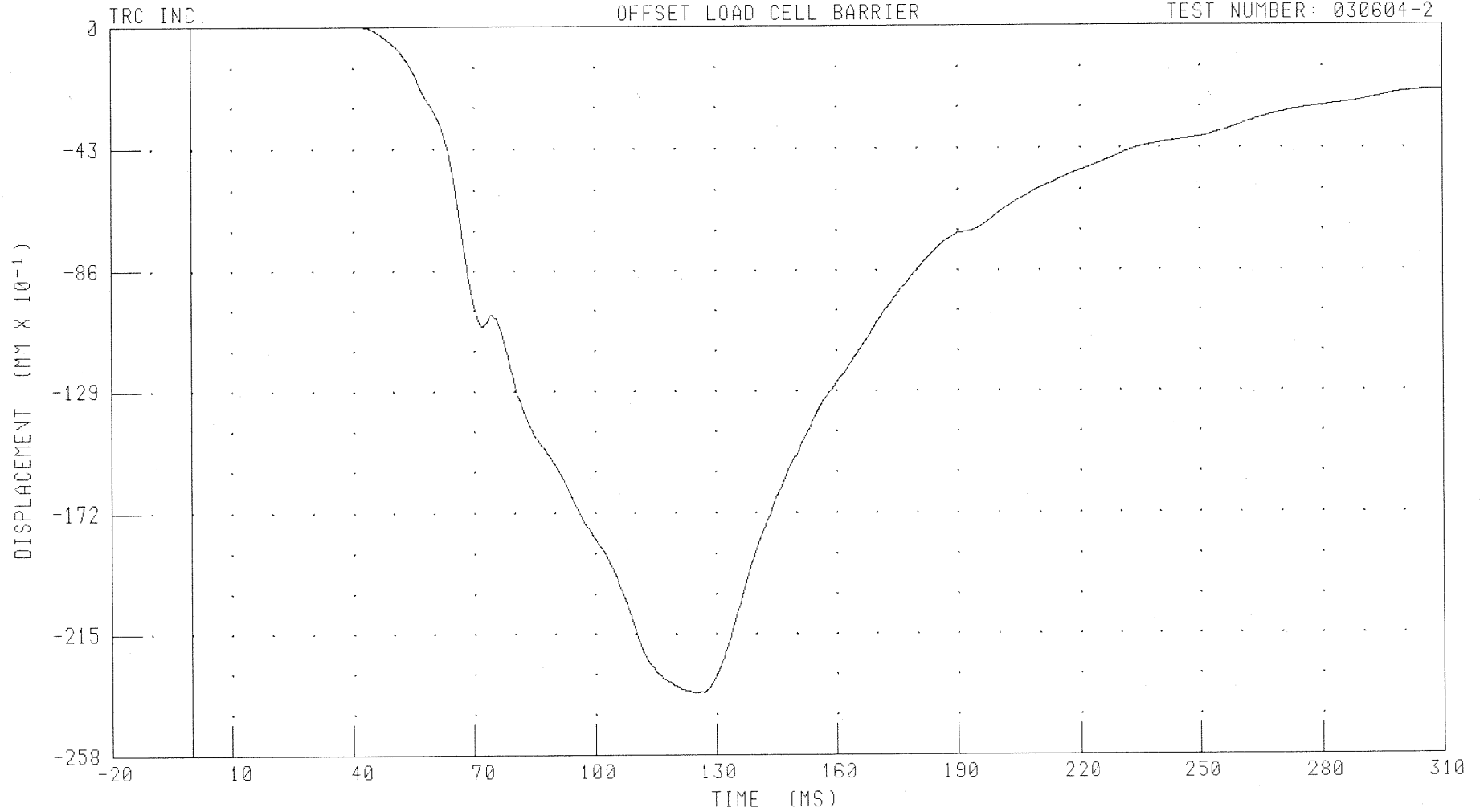
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER CHEST DEFLECTION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: CSTXD2 FILTER: CH. CLASS 600

PEAK DATA: 0.03 MM @ 39.84 MS; -23.62 MM @ 125.28 MS

B-113

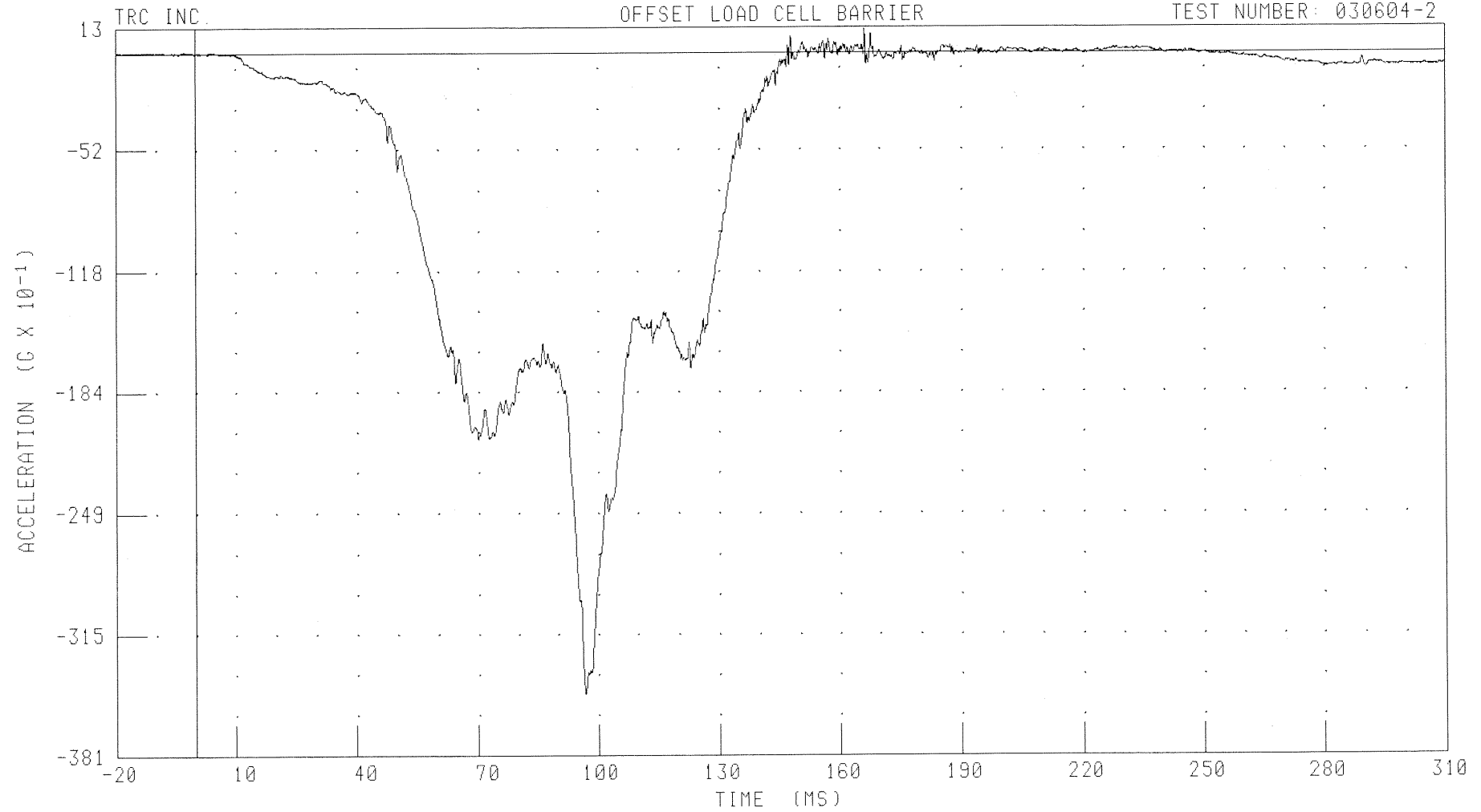
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER PELVIS X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

PEAK DATA: 1.28 G @ 166.48 MS; -34.86 G @ 96.88 MS

B-114

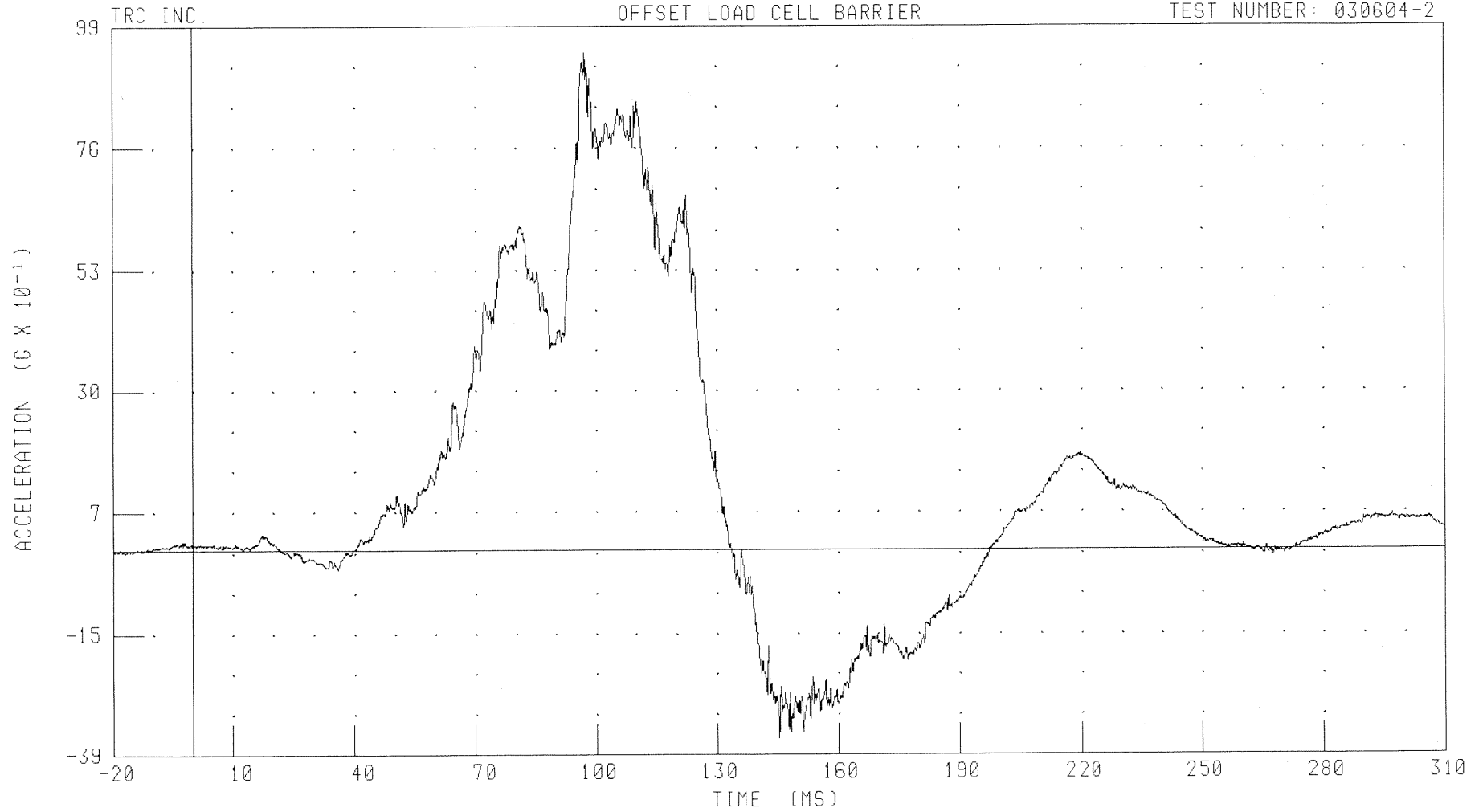
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER PELVIS Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

PEAK DATA: 9.39 G @ 97.36 MS, -3.59 G @ 145.36 MS

B-115

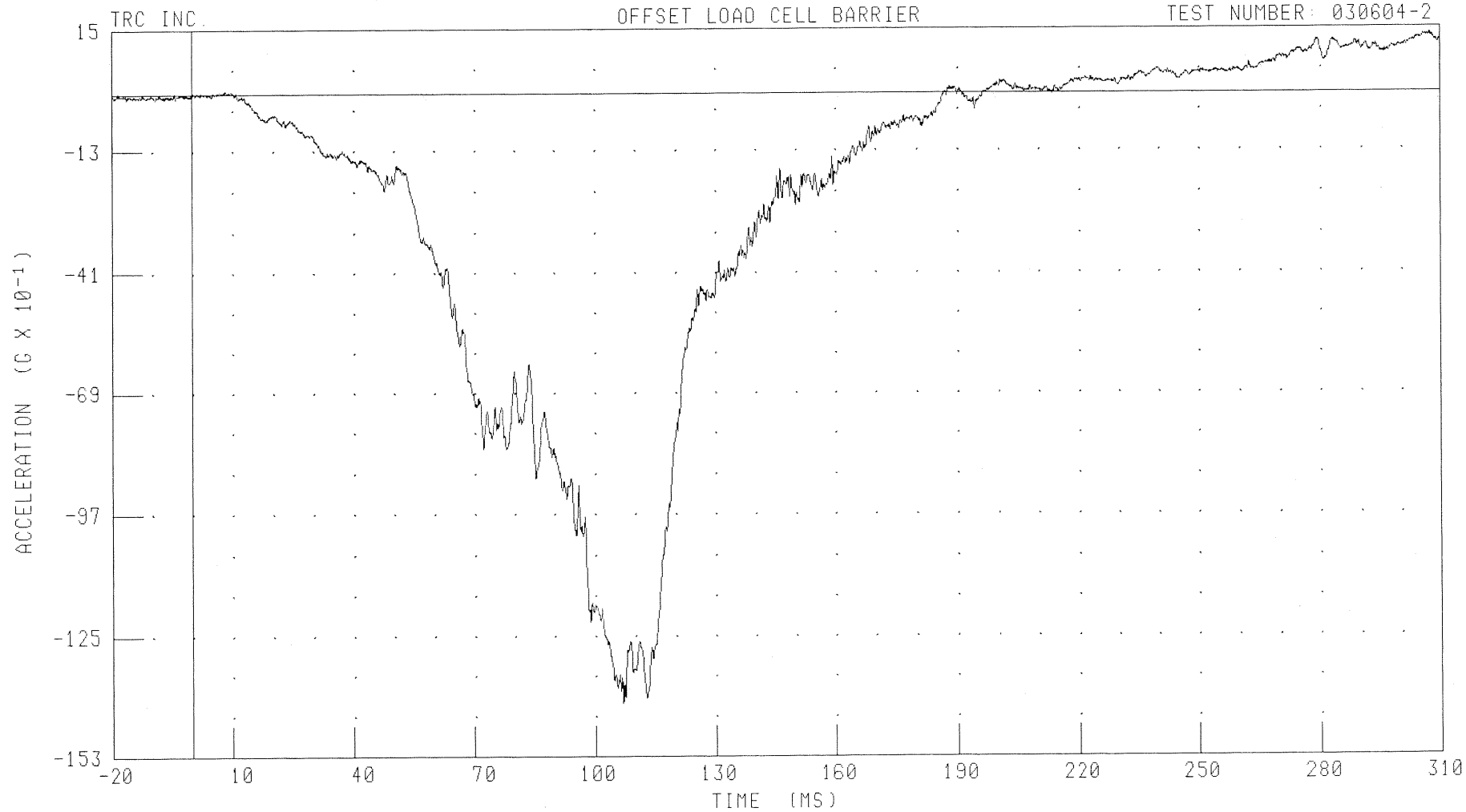
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER PELVIS Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVZG2

FILTER: CH. CLASS 1000

PEAK DATA: 1.37 G @ 307.20 MS; -14.08 G @ 107.04 MS

B-116

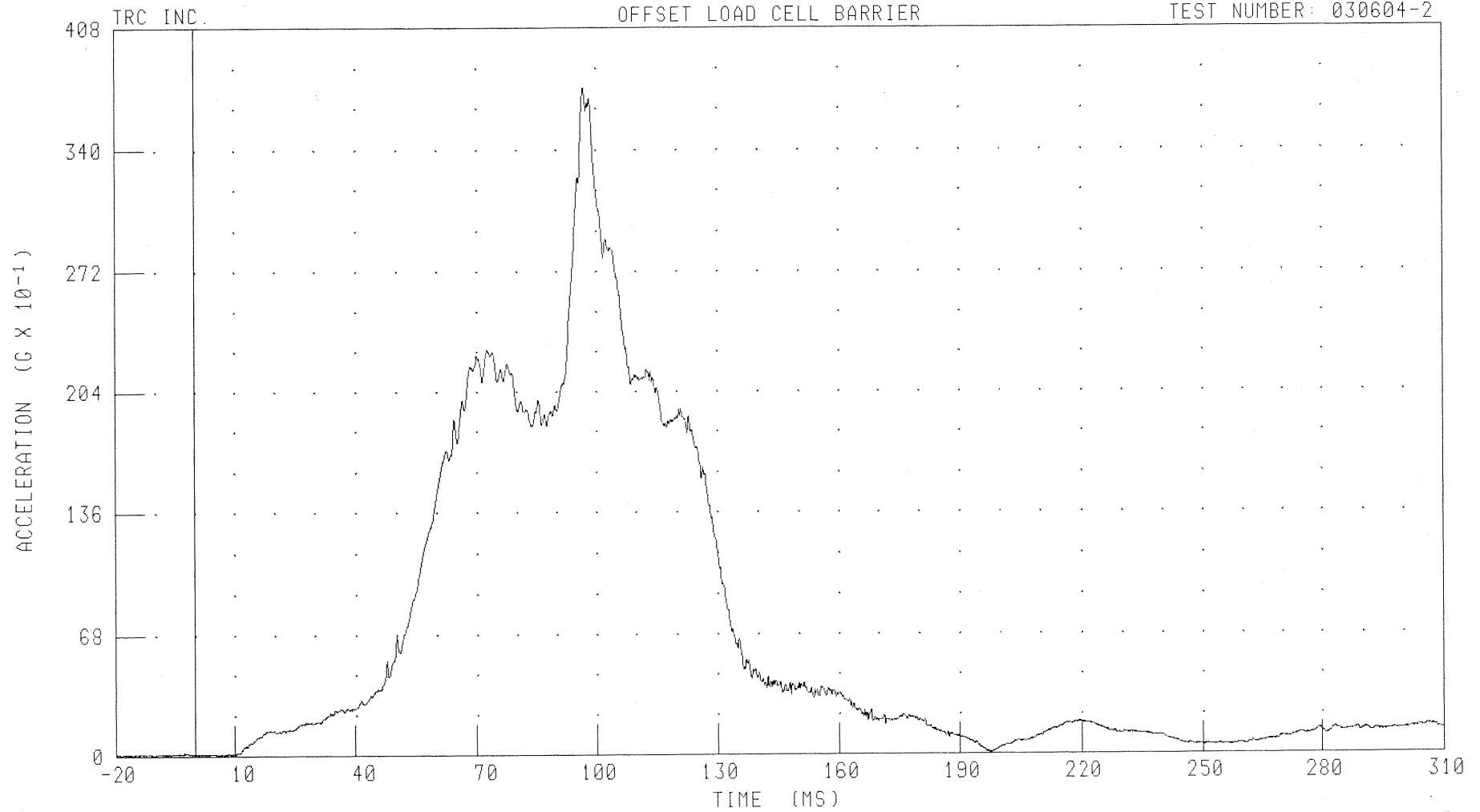
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER PELVIS RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PEVRG2

FILTER: CH. CLASS 1000

PEAK DATA: 37.43 G @ 96.88 MS, 0.02 G @ -18.56 MS

B-117

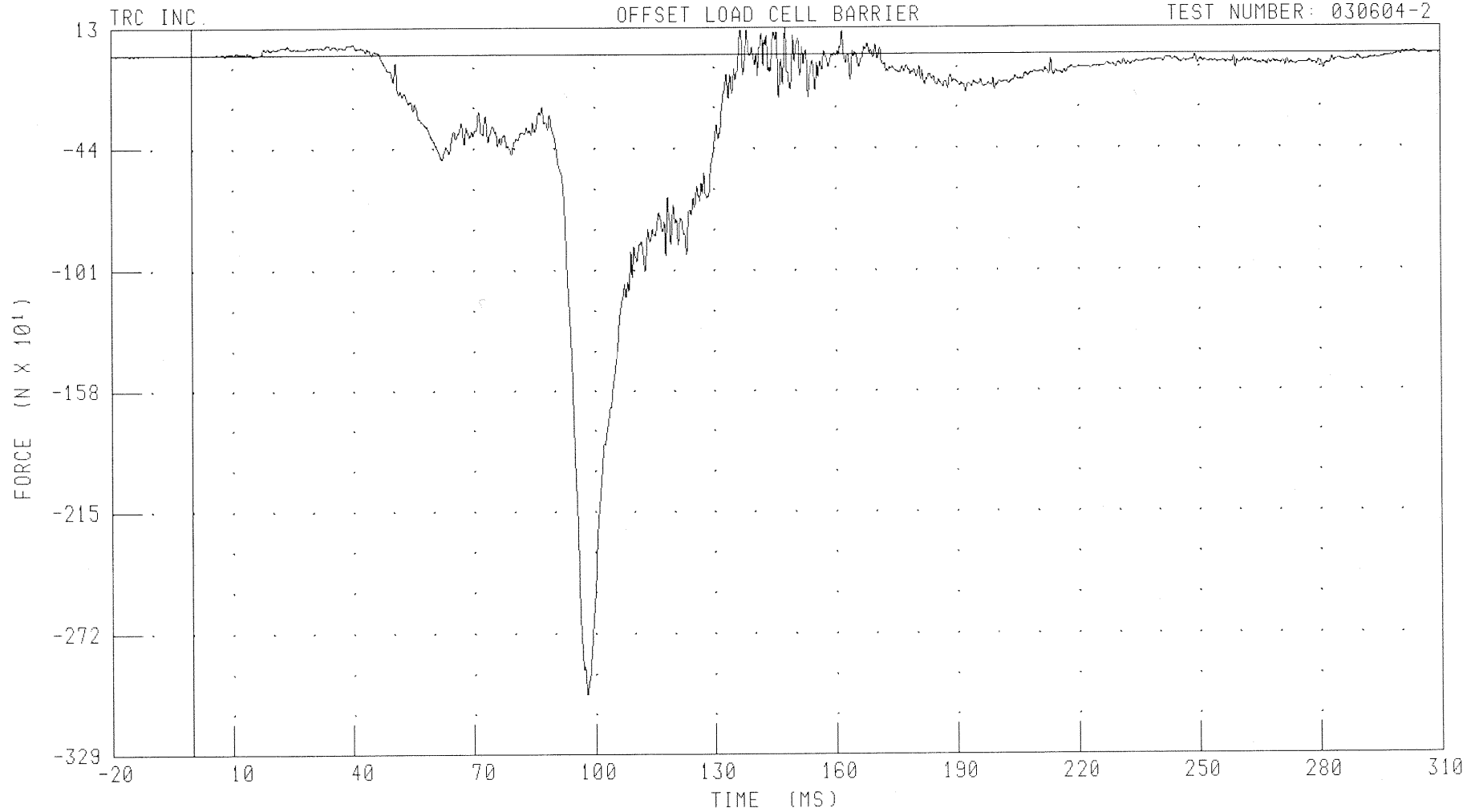
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FEMUR Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LFMZF2 FILTER: CH. CLASS 600

PEAK DATA: 126.43 N @ 147.84 MS; -3007.94 N @ 98.00 MS

B-118

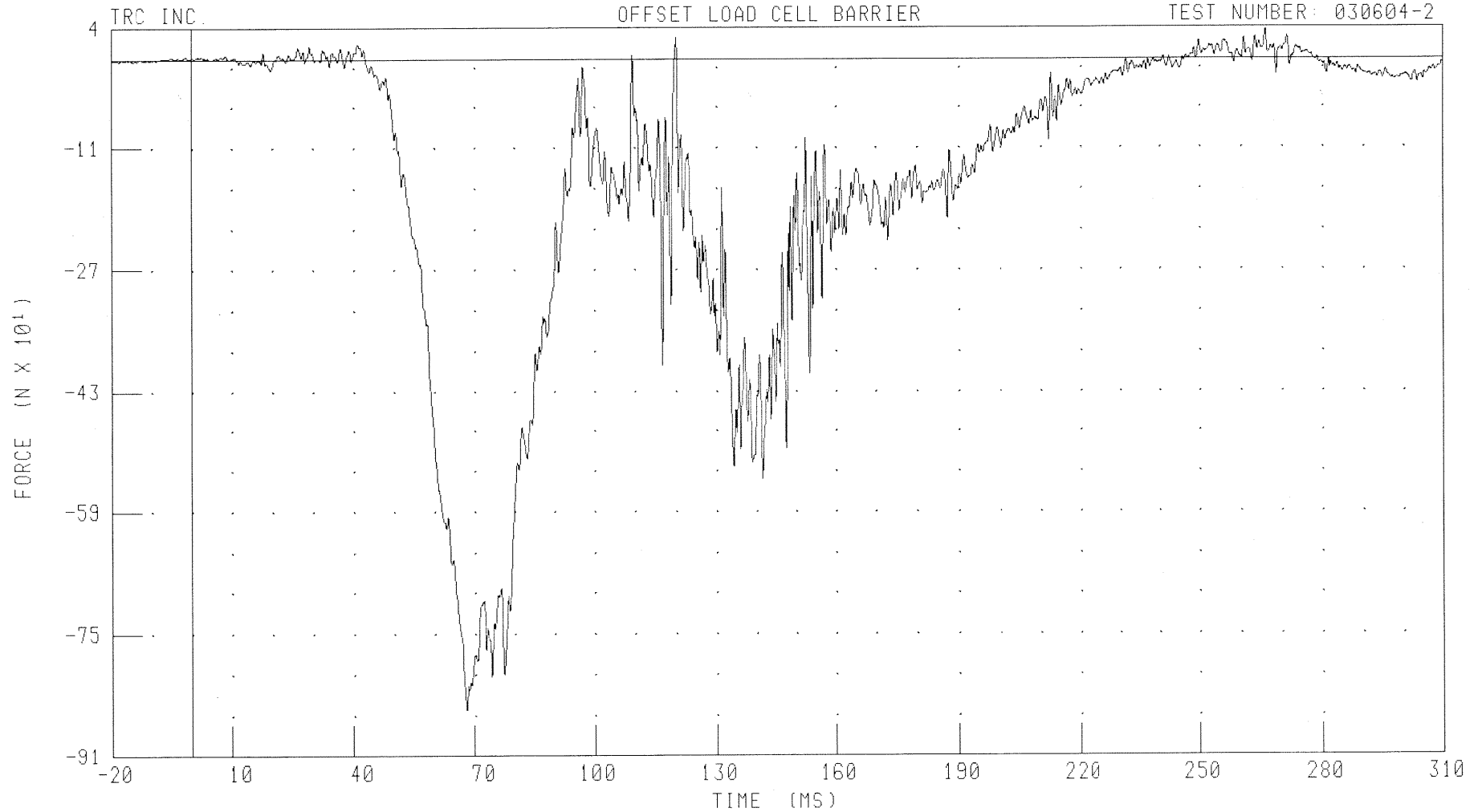
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FEMUR Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RFMZ F2 FILTER: CH. CLASS 600

PEAK DATA: 38.52 N @ 266.08 MS; -857.64 N @ 67.92 MS

B-119

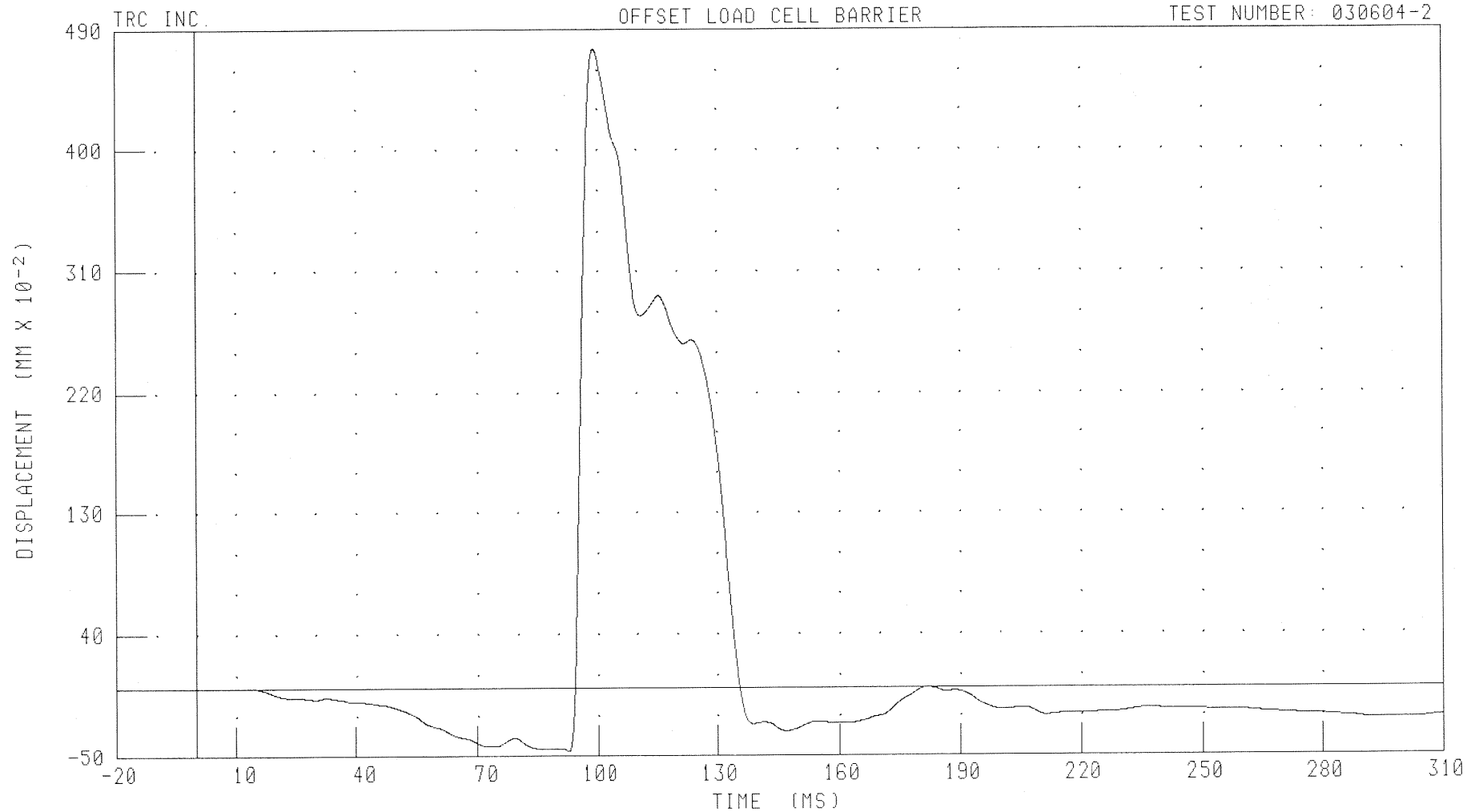
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT TIBIA TO FEMUR DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: KNLXD2 FILTER: CH. CLASS 180

PEAK DATA: 4.76 MM @ 99.20 MS; -0.47 MM @ 92.56 MS

B-120

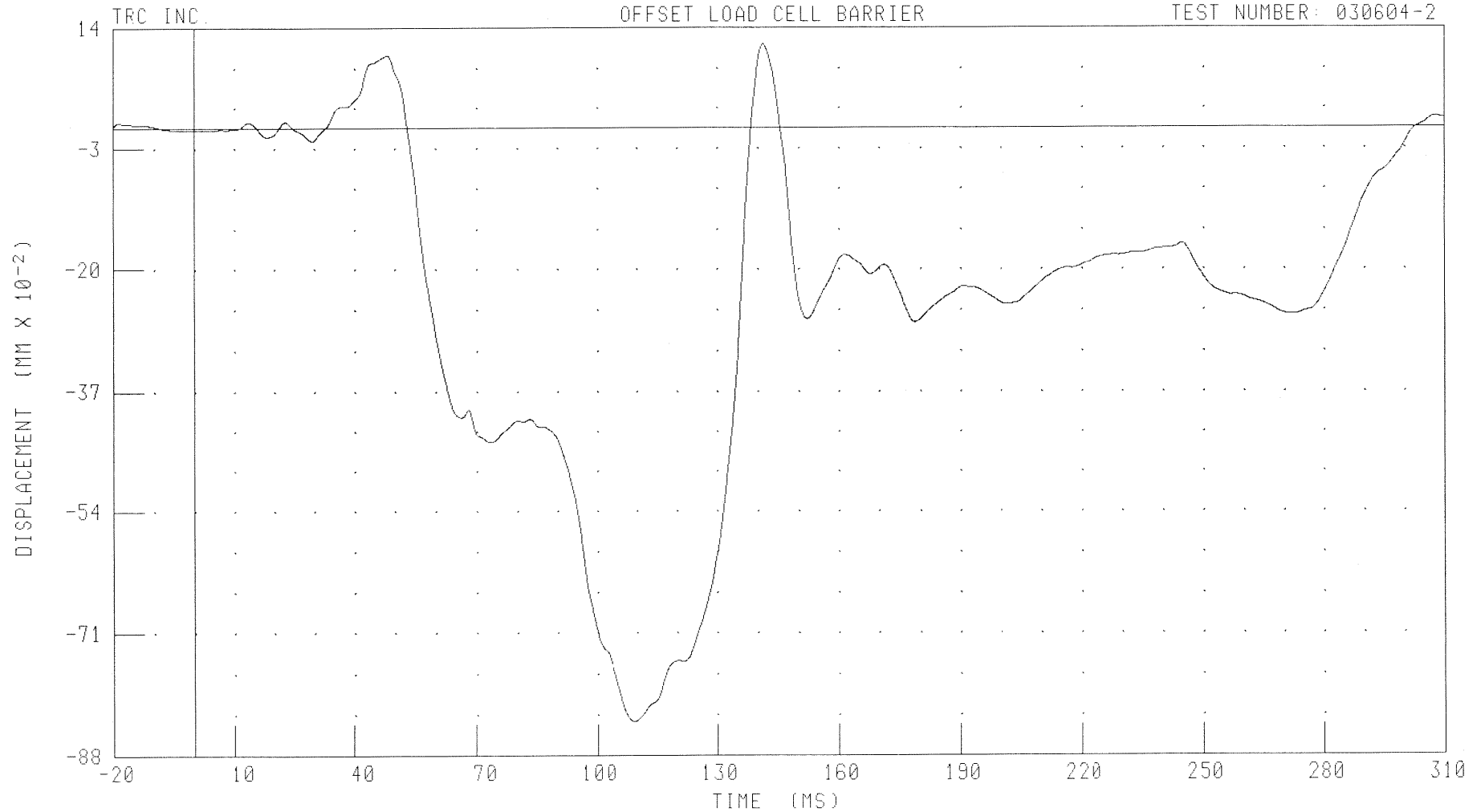
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT TIBIA TO FEMUR DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: KNRXD2

FILTER: CH. CLASS 180

PEAK DATA: 0.12 MM @ 141.28 MS; -0.83 MM @ 109.36 MS

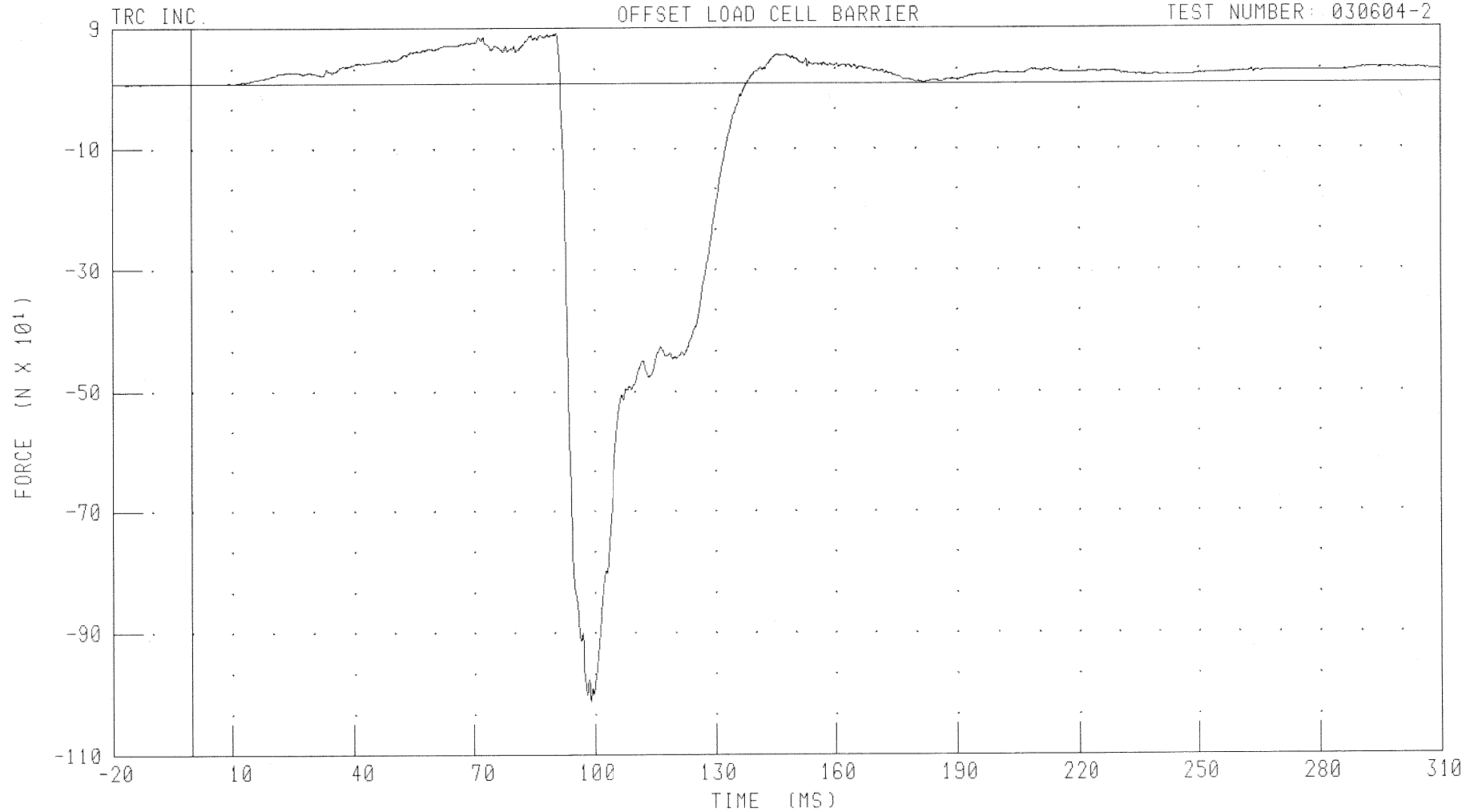
B-121

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
PASSENGER LEFT UPPER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLXF2 FILTER: CH. CLASS 600

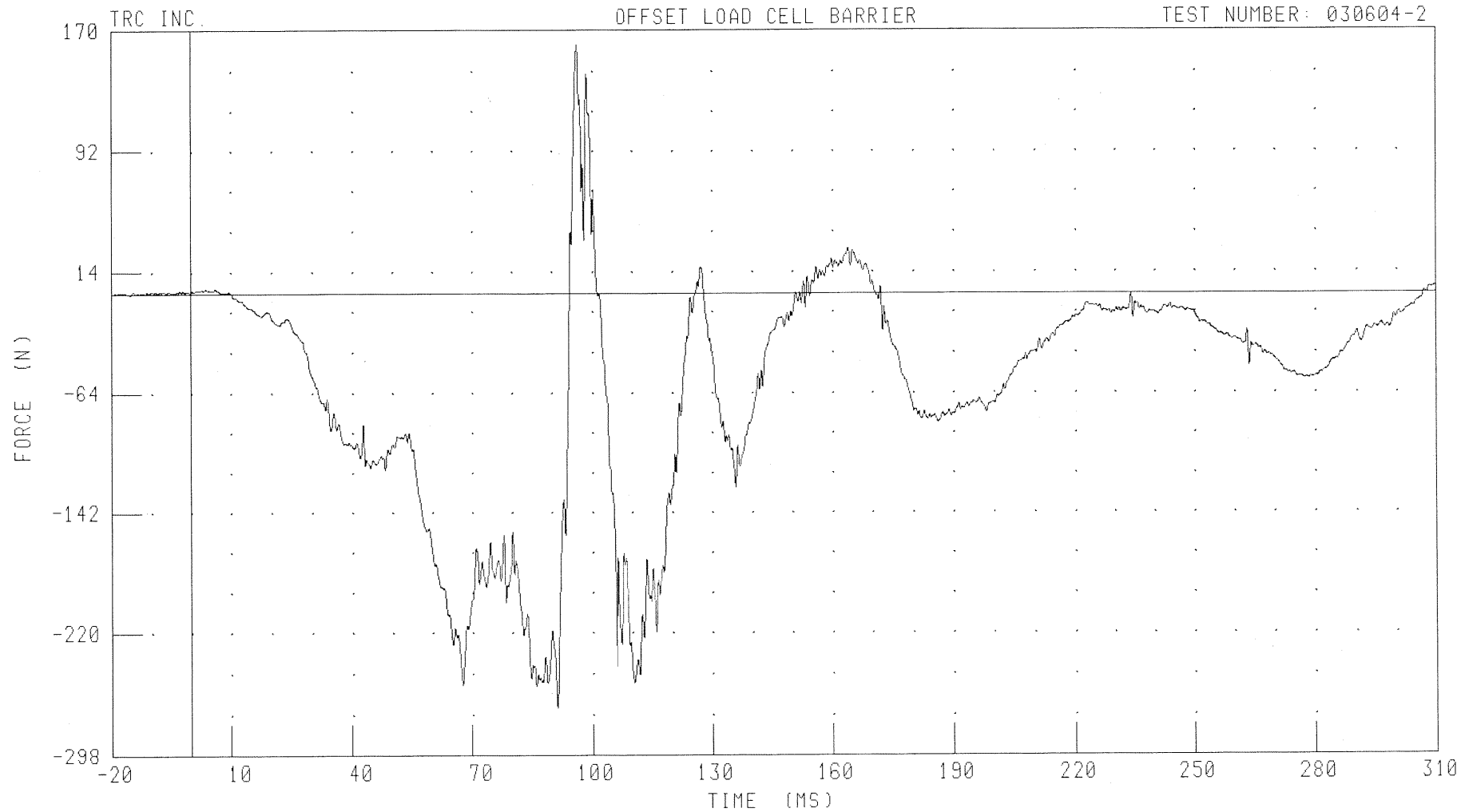
PEAK DATA: 83.00 N @ 90.72 MS; -1020.88 N @ 99.04 MS

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT UPPER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLZF2 FILTER: CH. CLASS 600

PEAK DATA: 161.10 N @ 96.32 MS; -267.39 N @ 91.36 MS

B-123

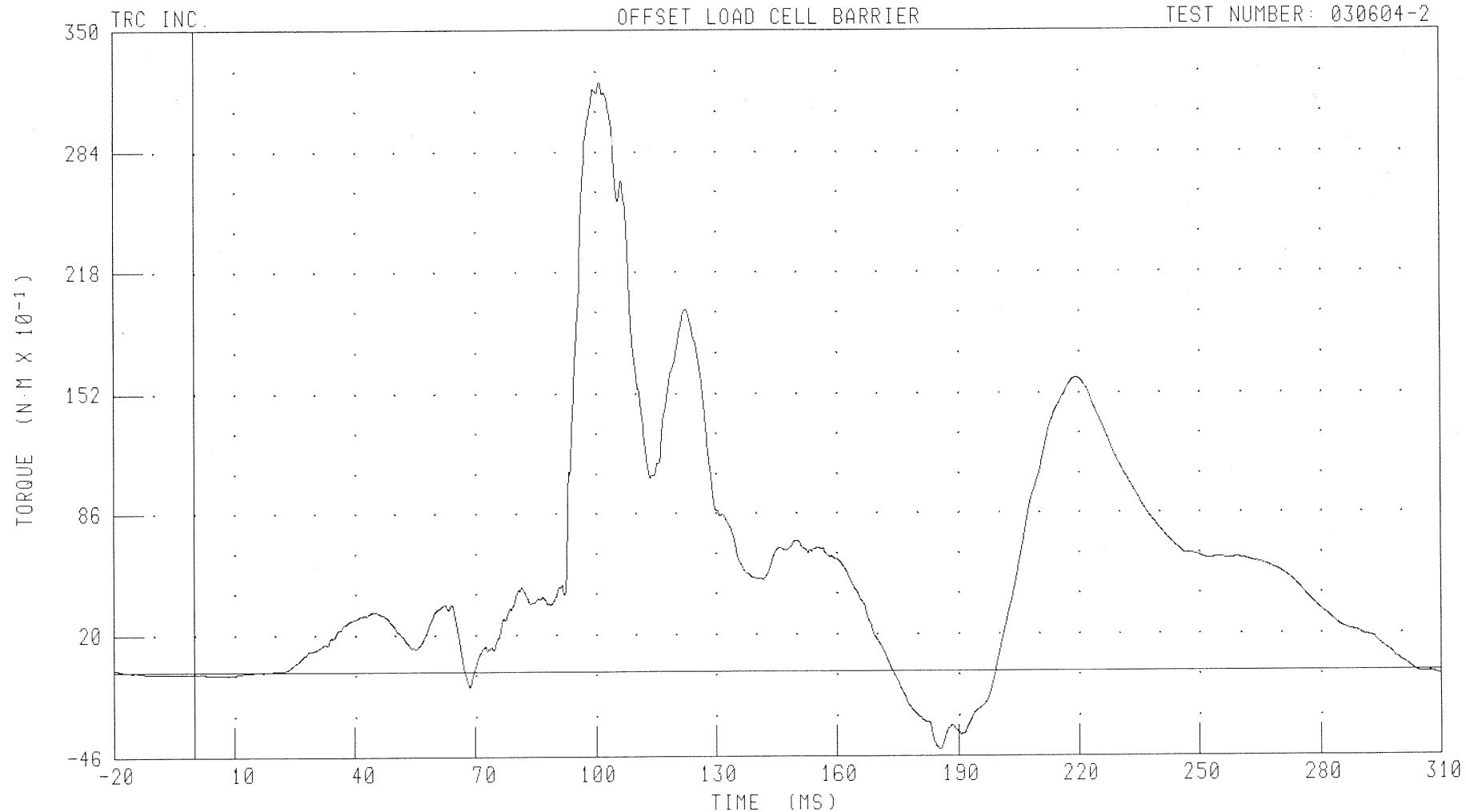
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLXM2

FILTER: CH. CLASS 600

PEAK DATA: 32.23 N·M @ 101.12 MS; -4.23 N·M @ 185.44 MS

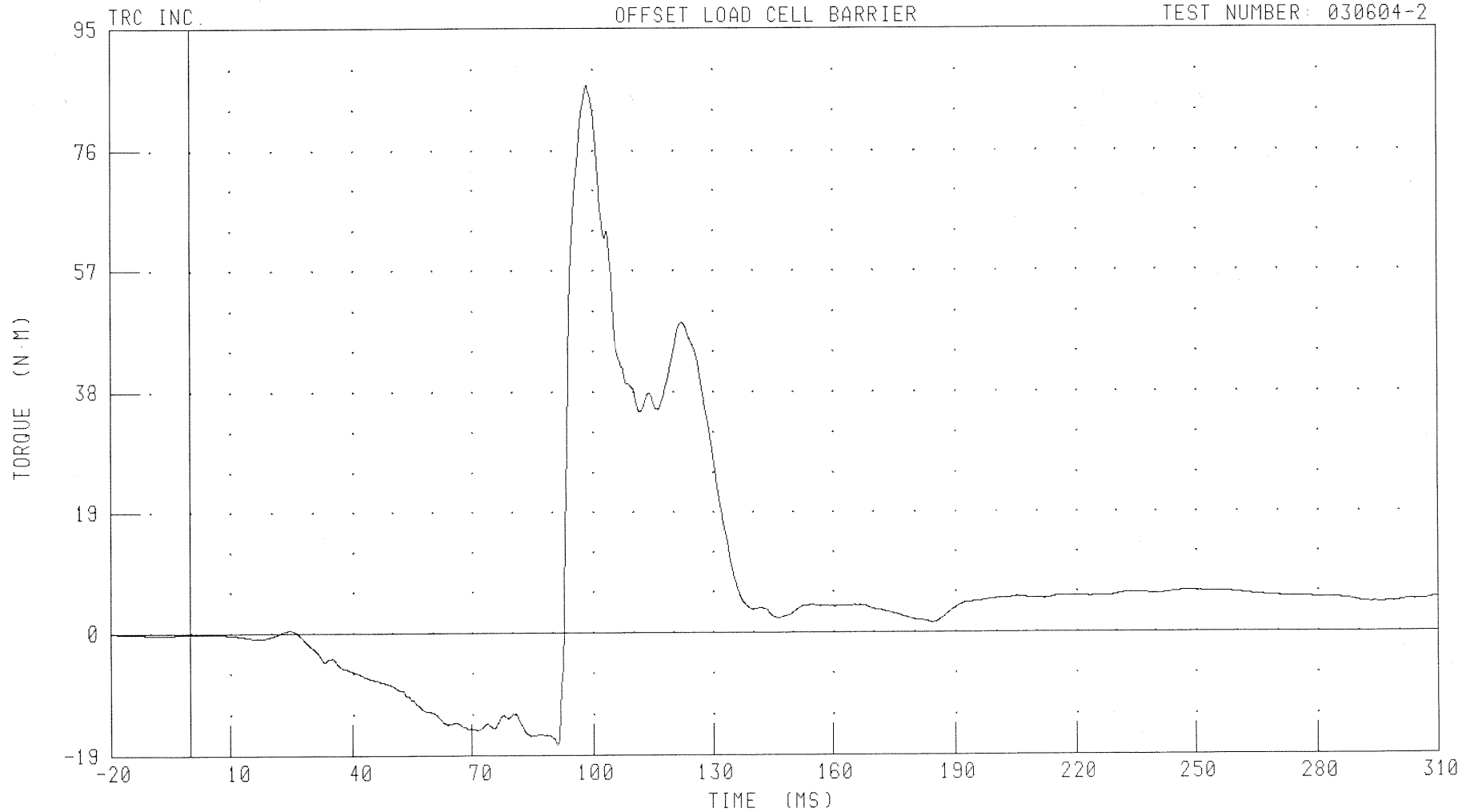
B-124

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2

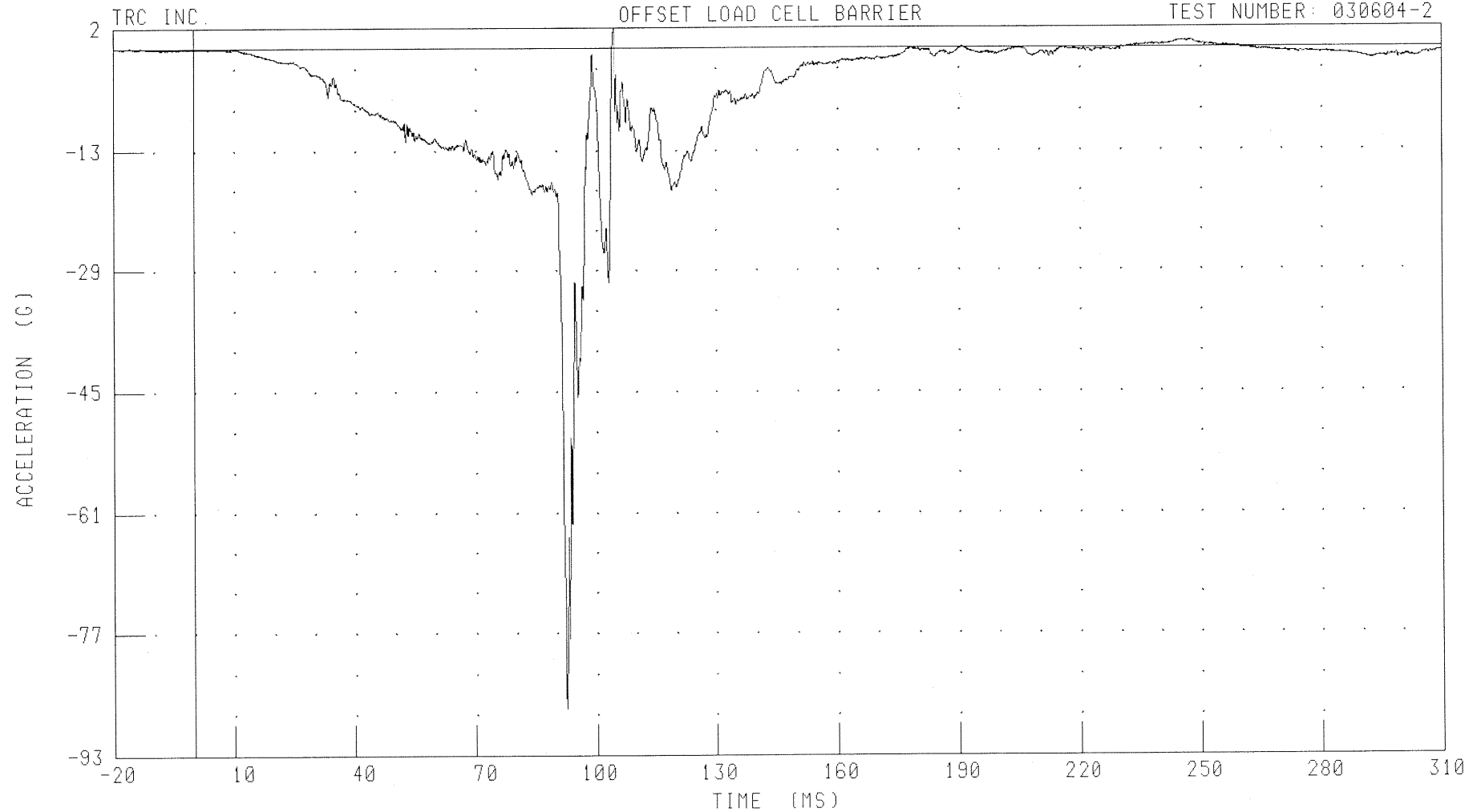


CHANNEL: TBLYM2 FILTER: CH. CLASS 600

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT TIBIA X-AXIS ACCELERATION

TEST NUMBER: 030604-2



CHANNEL: TBLXG2 FILTER: CH. CLASS 1000

PEAK DATA: 2.54 G @ 104.40 MS; -87.20 G @ 92.40 MS

B-126

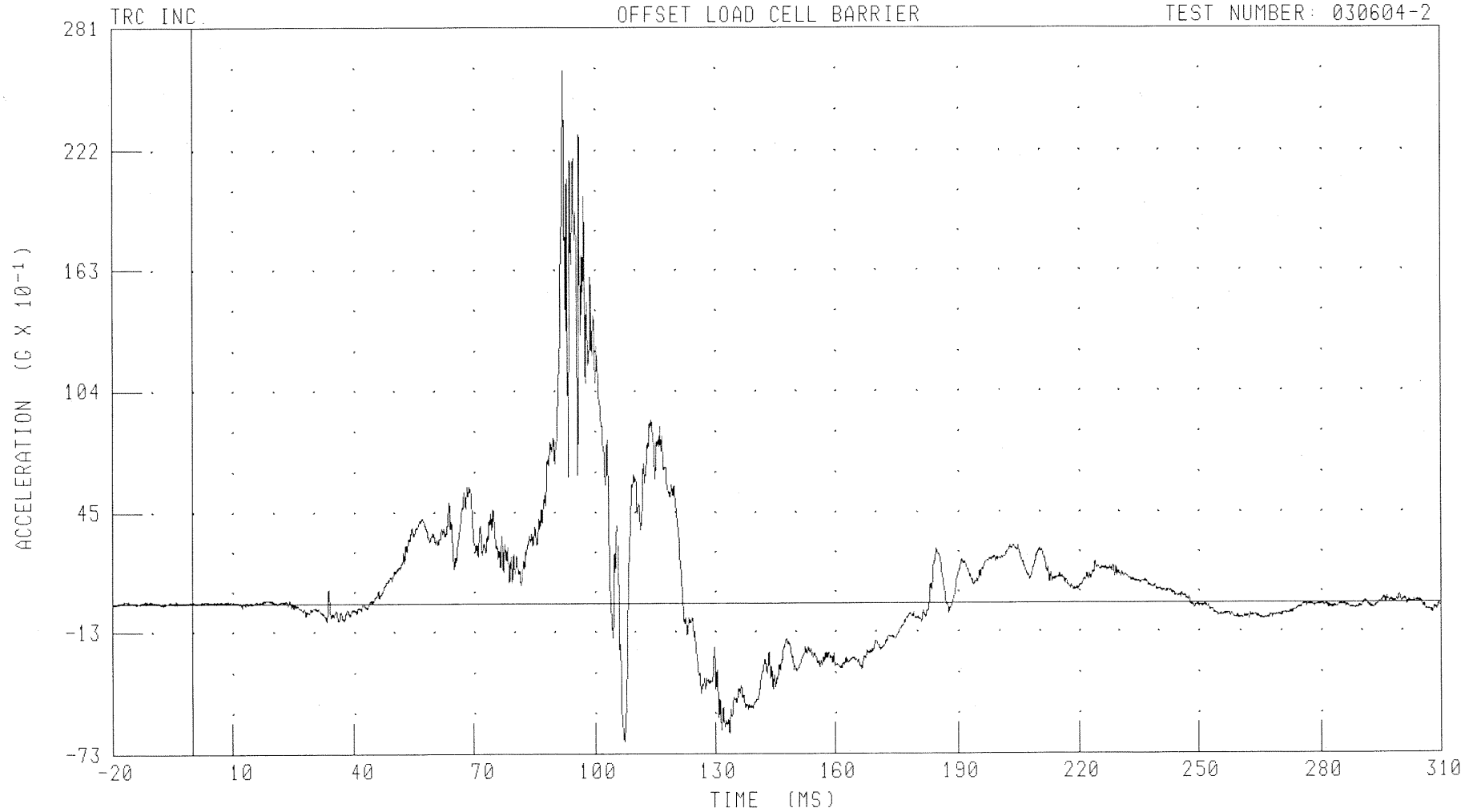
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT TIBIA Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBLYG2 FILTER: CH. CLASS 1000

B-127

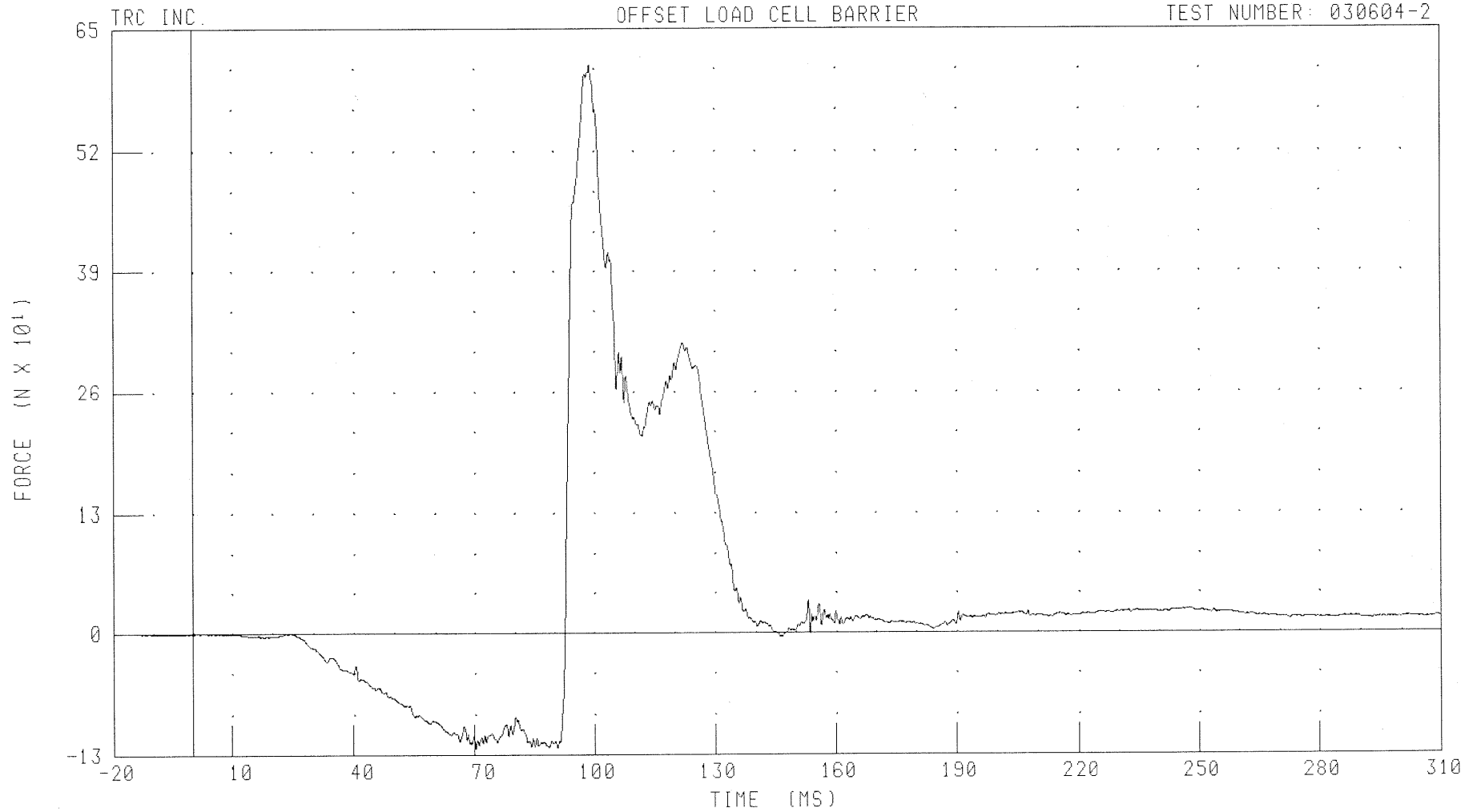
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT LOWER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLXF2 FILTER: CH. CLASS 600

PEAK DATA: 610.15 N @ 99.04 MS; -123.36 N @ 70.32 MS

B-128

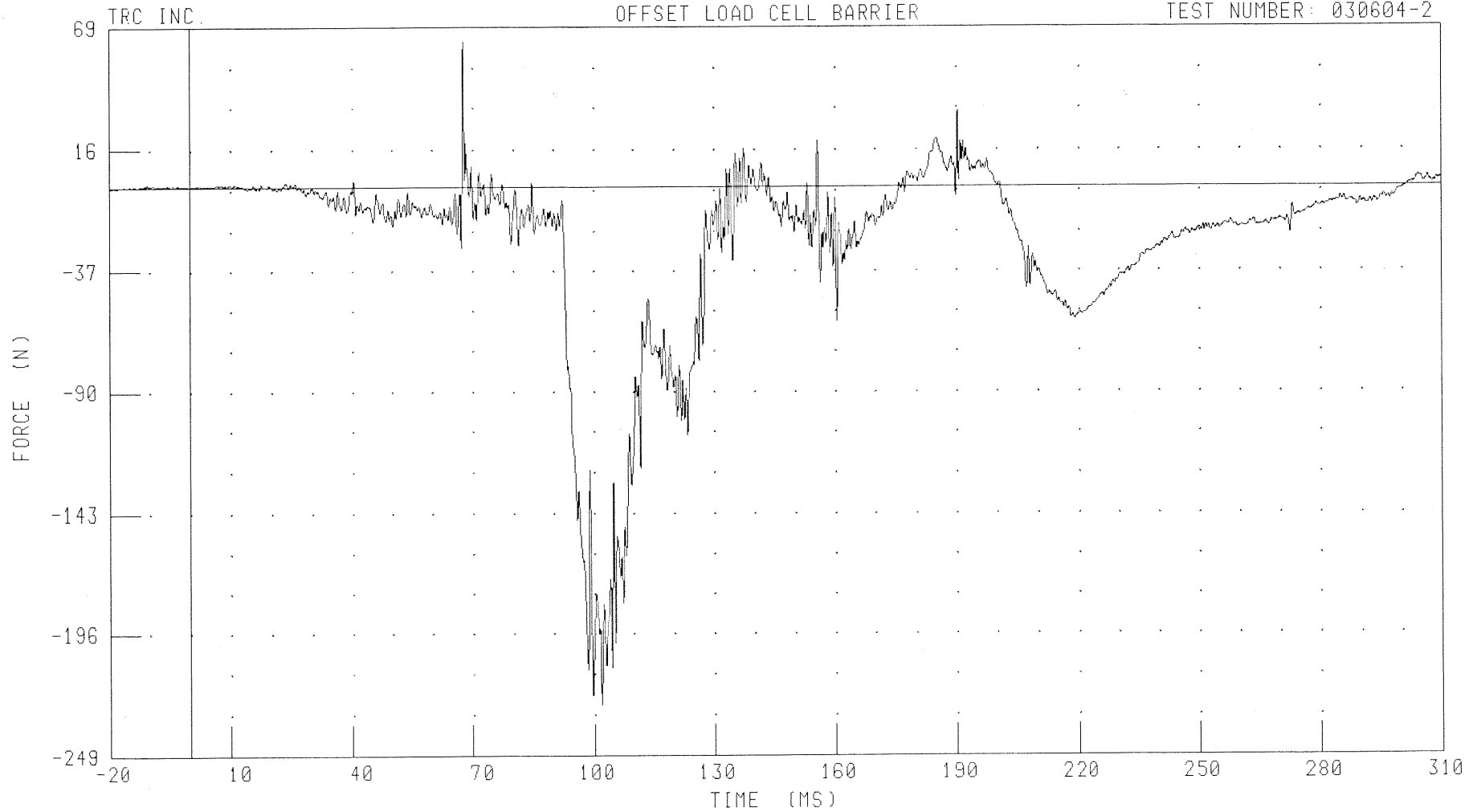
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT LOWER TIBIA Y-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLYF2 FILTER: CH. CLASS 600

B-129

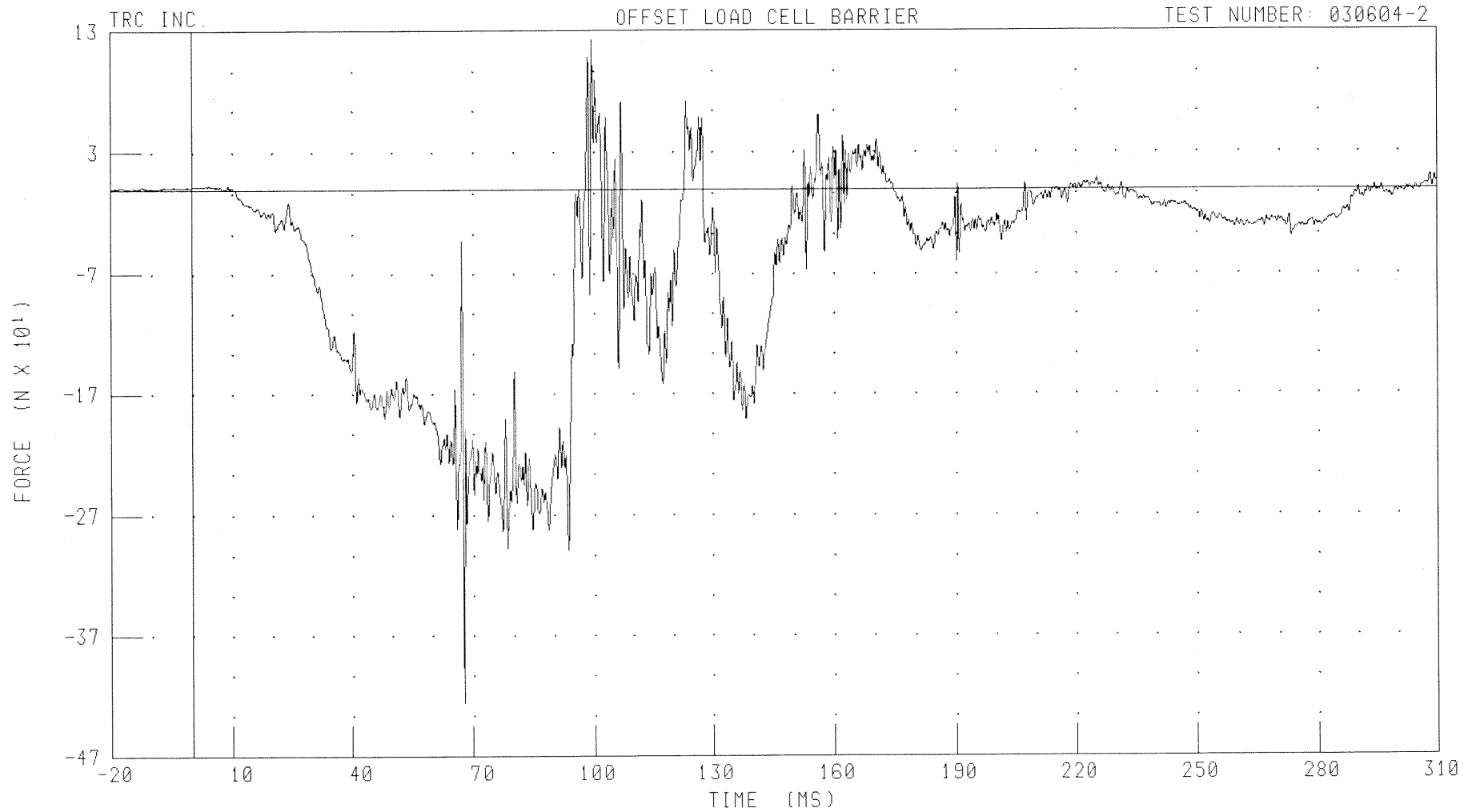
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT LOWER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLZF2 FILTER: CH. CLASS 600

B-130

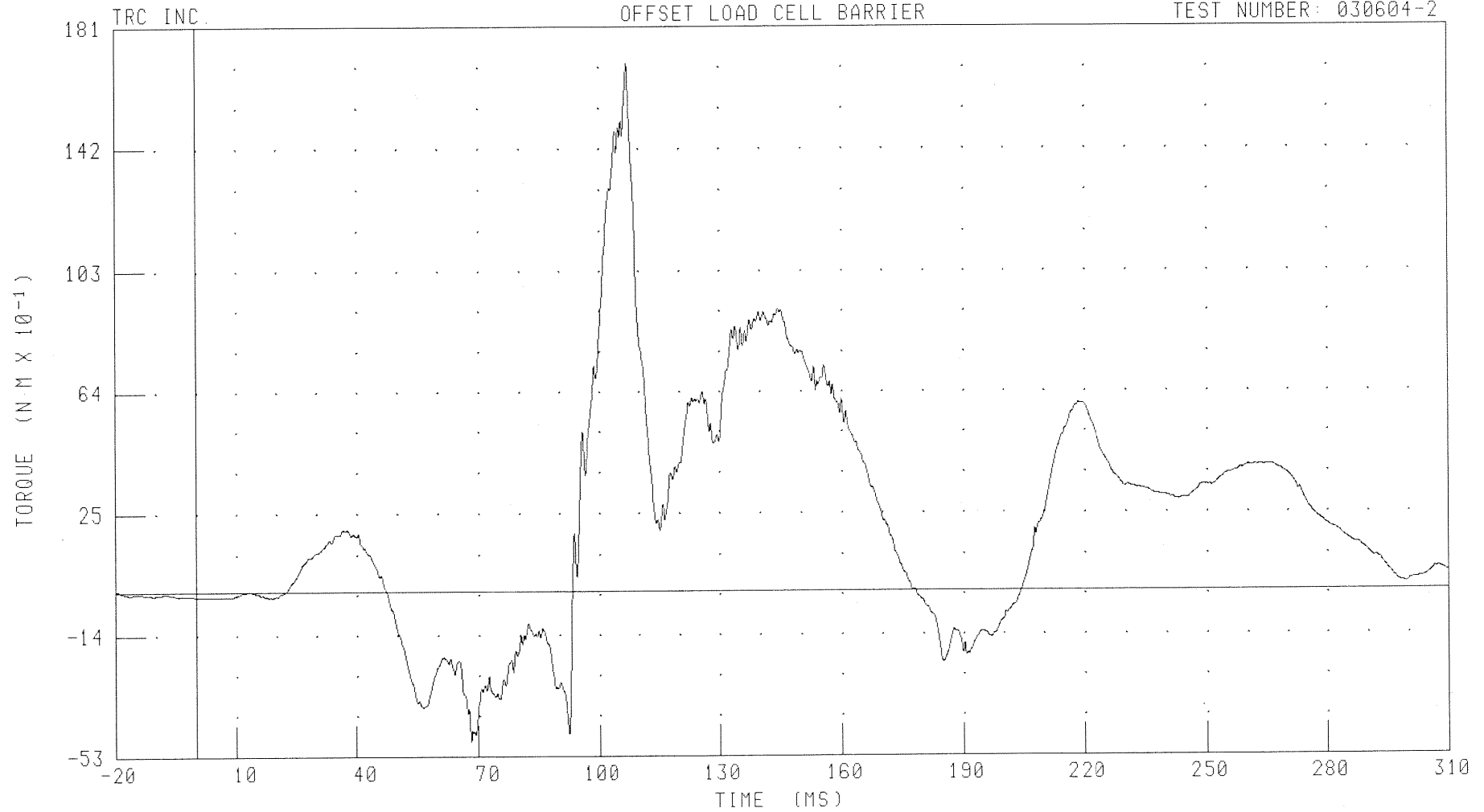
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT LOWER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLXM2

FILTER: CH. CLASS 600

PEAK DATA: 16.91 N·M @ 107.28 MS; -4.85 N·M @ 68.16 MS

B-131

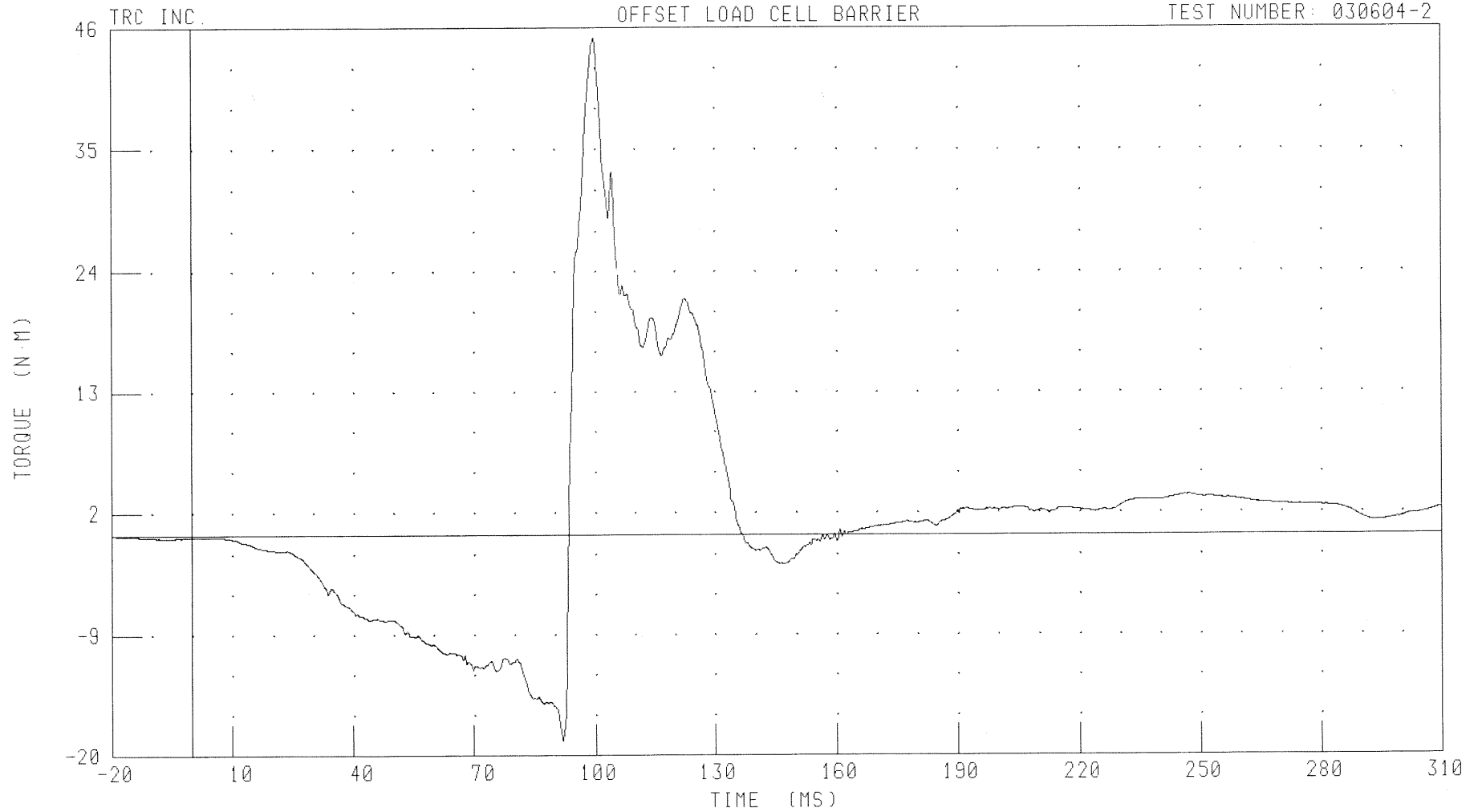
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANLYM2 FILTER: CH. CLASS 600

B-132

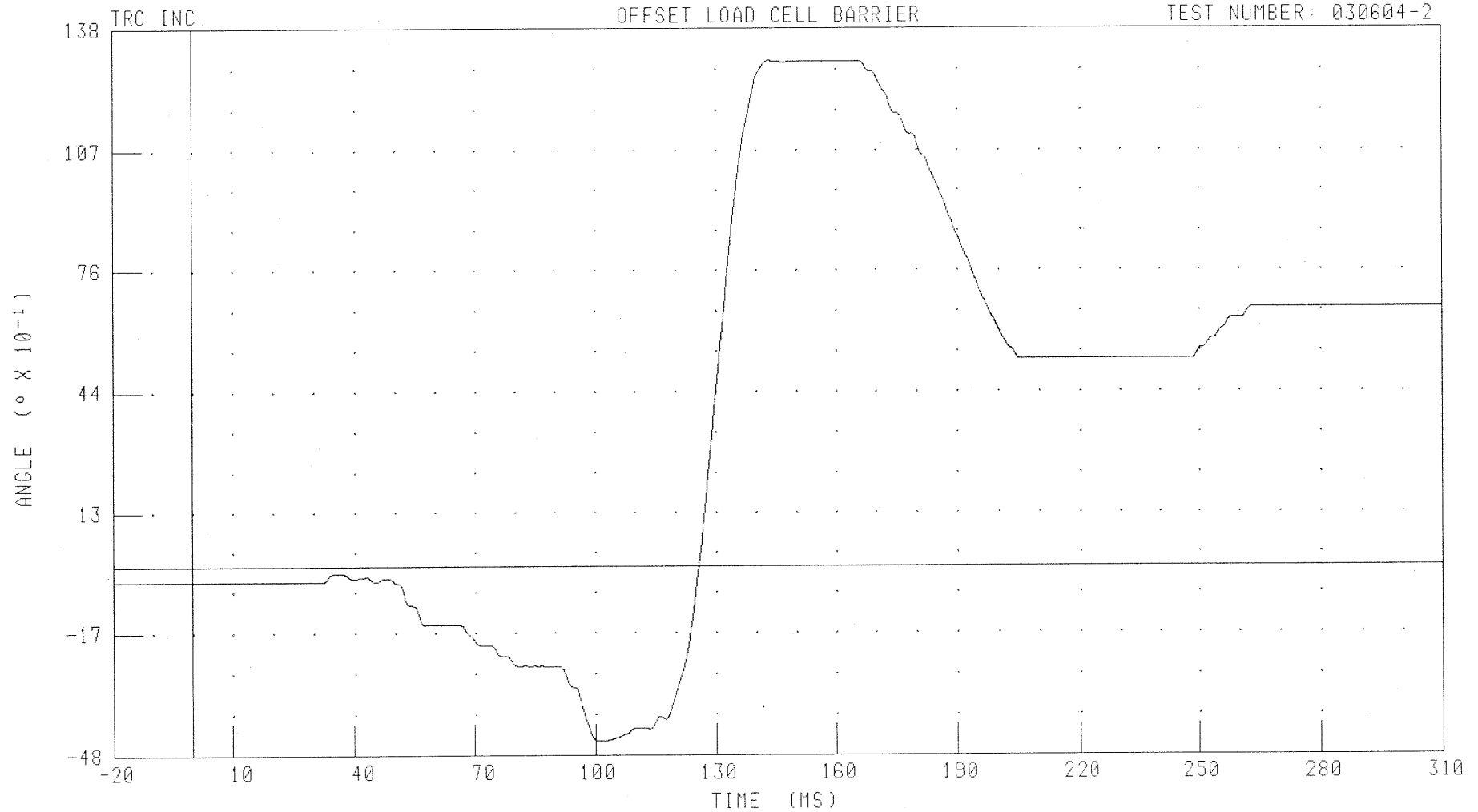
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT TO ANKLE X-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLXD2 FILTER: CH. CLASS 180

PEAK DATA: 12.98 ° @ 143.28 MS; -4.44 ° @ 102.00 MS

B-133

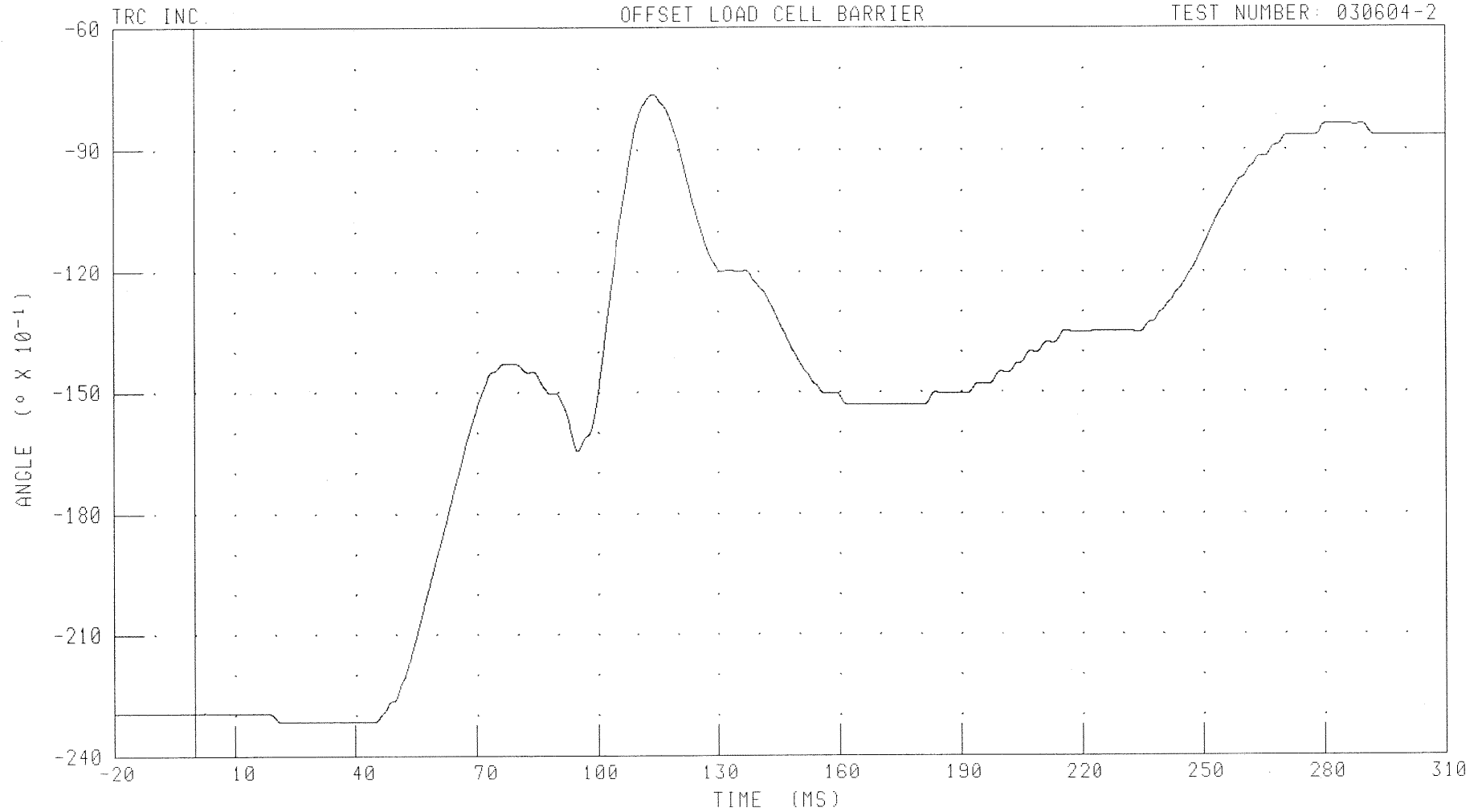
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT TO ANKLE Y-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLYD2 FILTER: CH. CLASS 180

PEAK DATA: -7.64 ° @ 114.16 MS, -23.17 ° @ 21.60 MS

B-134

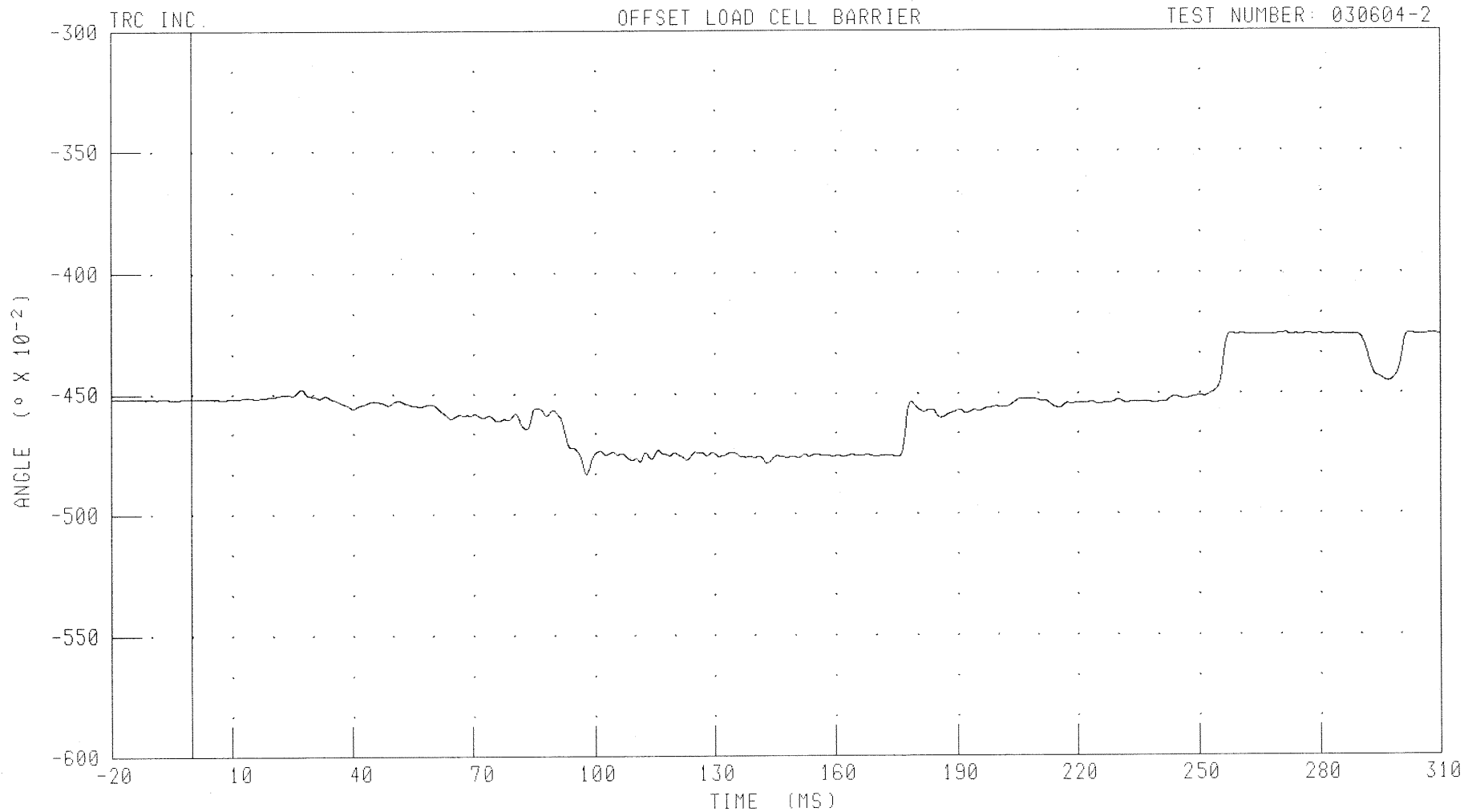
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT TO ANKLE Z-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLZD2 FILTER: CH. CLASS 180

PEAK DATA: -4.25 ° @ 271.20 MS, -4.84 ° @ 97.84 MS

B-135

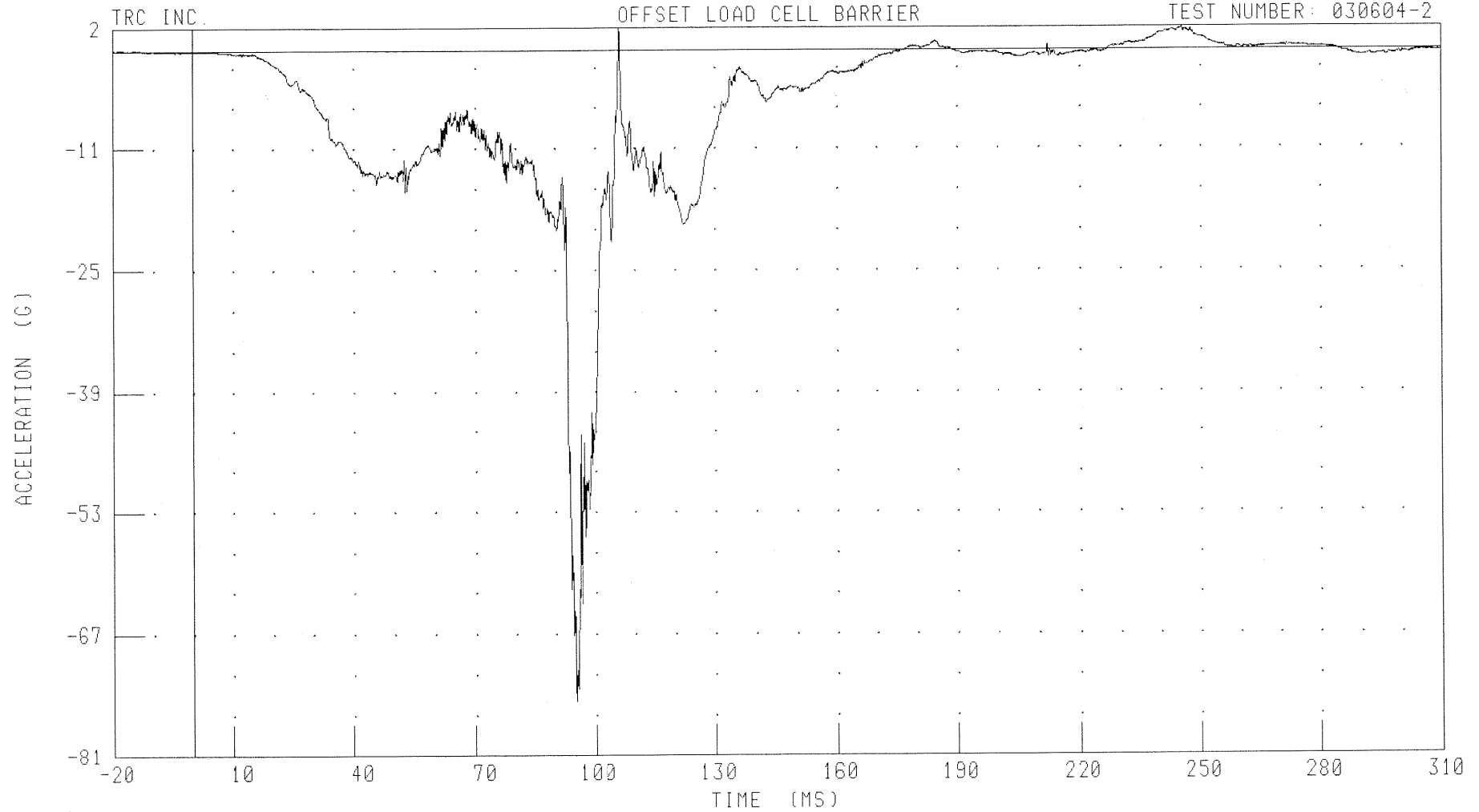
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLXG2 FILTER: CH. CLASS 1000

PEAK DATA: 2.45 G @ 106.32 MS; -75.16 G @ 95.20 MS

B-136

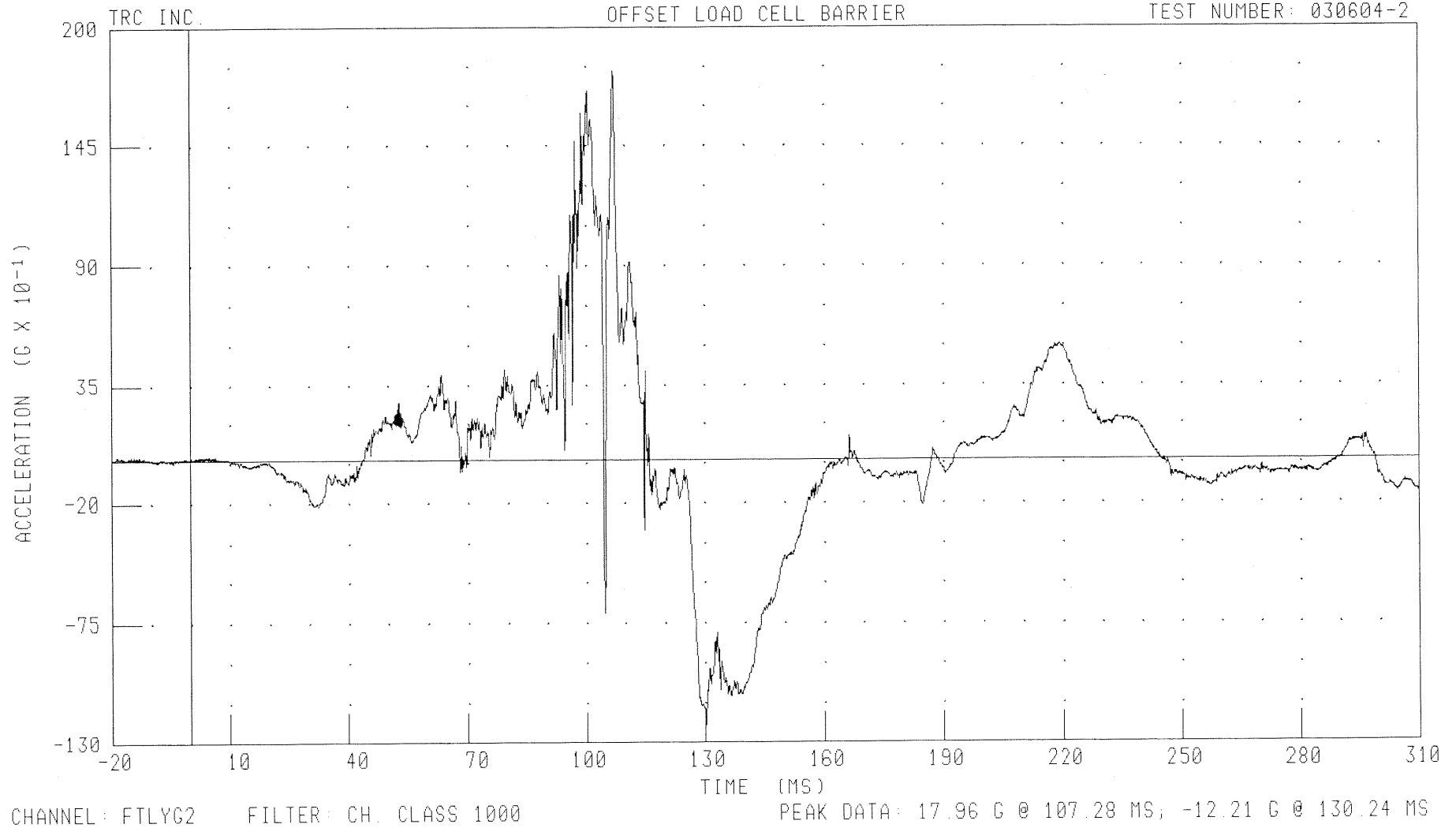
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-137

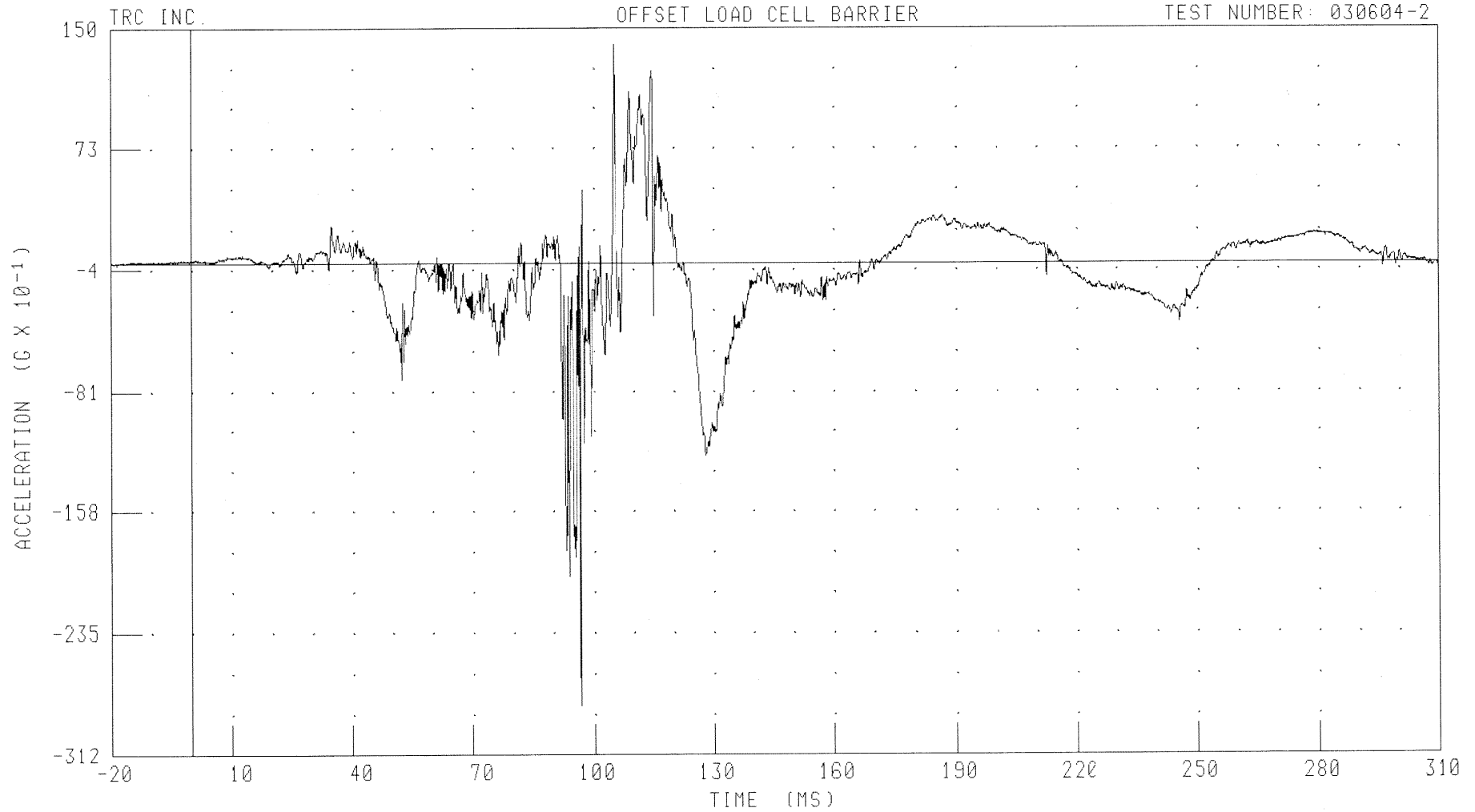
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLZG2 FILTER: CH. CLASS 1000

PEAK DATA: 13.99 G @ 105.20 MS; -28.11 G @ 96.72 MS

B-138

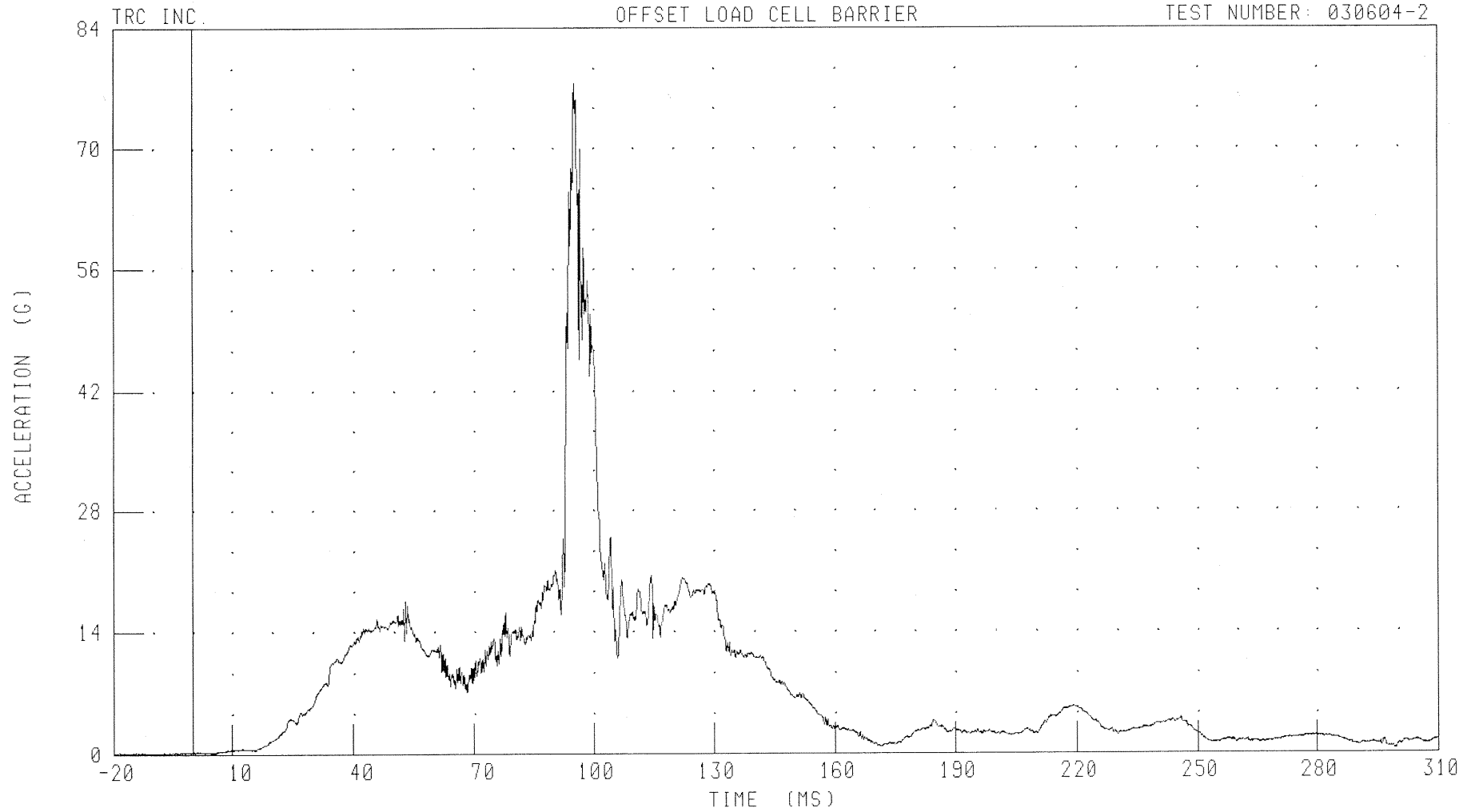
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LEFT FOOT RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTLRG2 FILTER: CH. CLASS 1000

PEAK DATA: 77.65 G @ 95.20 MS; 0.02 G @ -16.64 MS

B-139

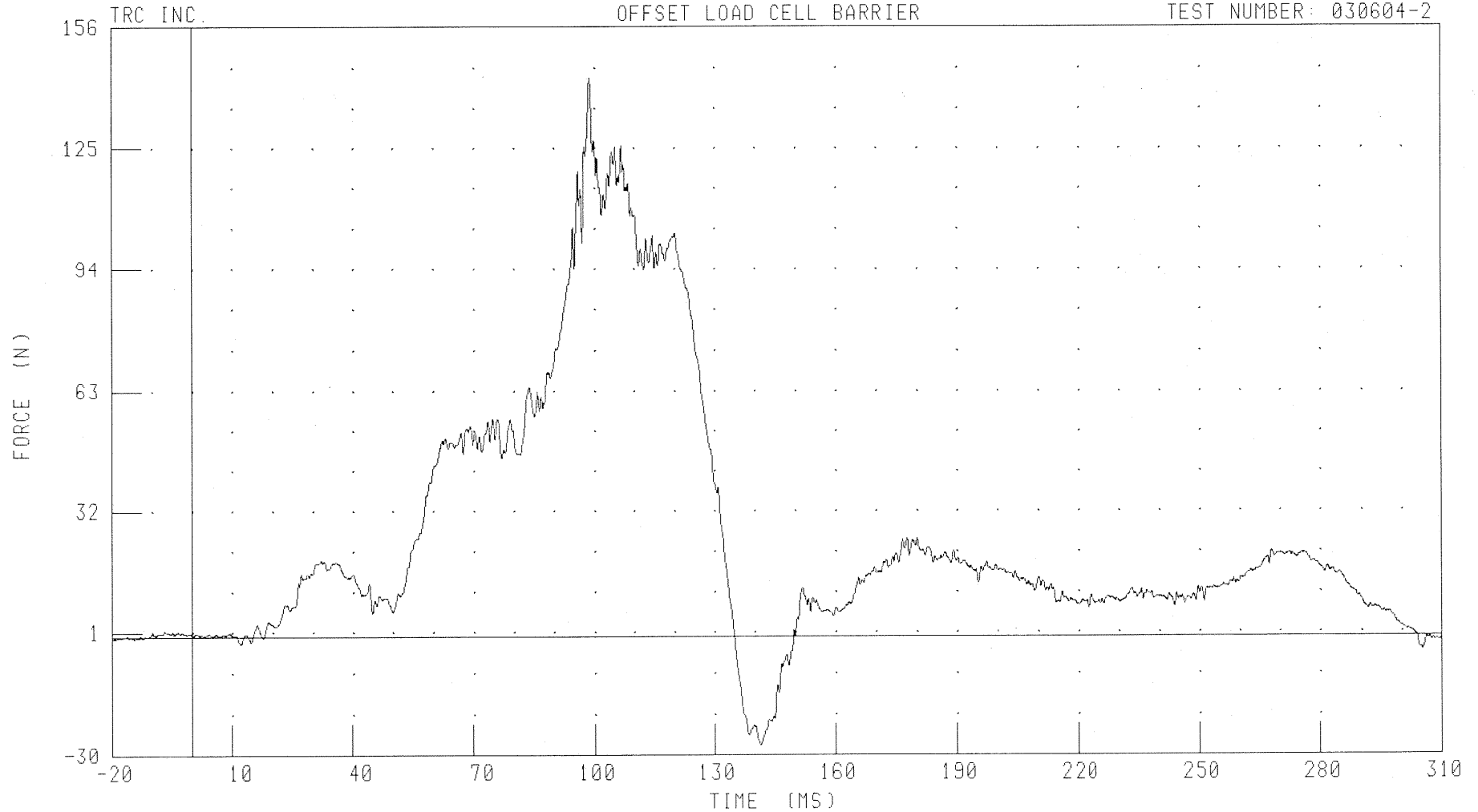
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT UPPER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRXF2

FILTER: CH. CLASS 600

PEAK DATA: 143.20 N @ 98.80 MS; -27.69 N @ 141.52 MS

B-140

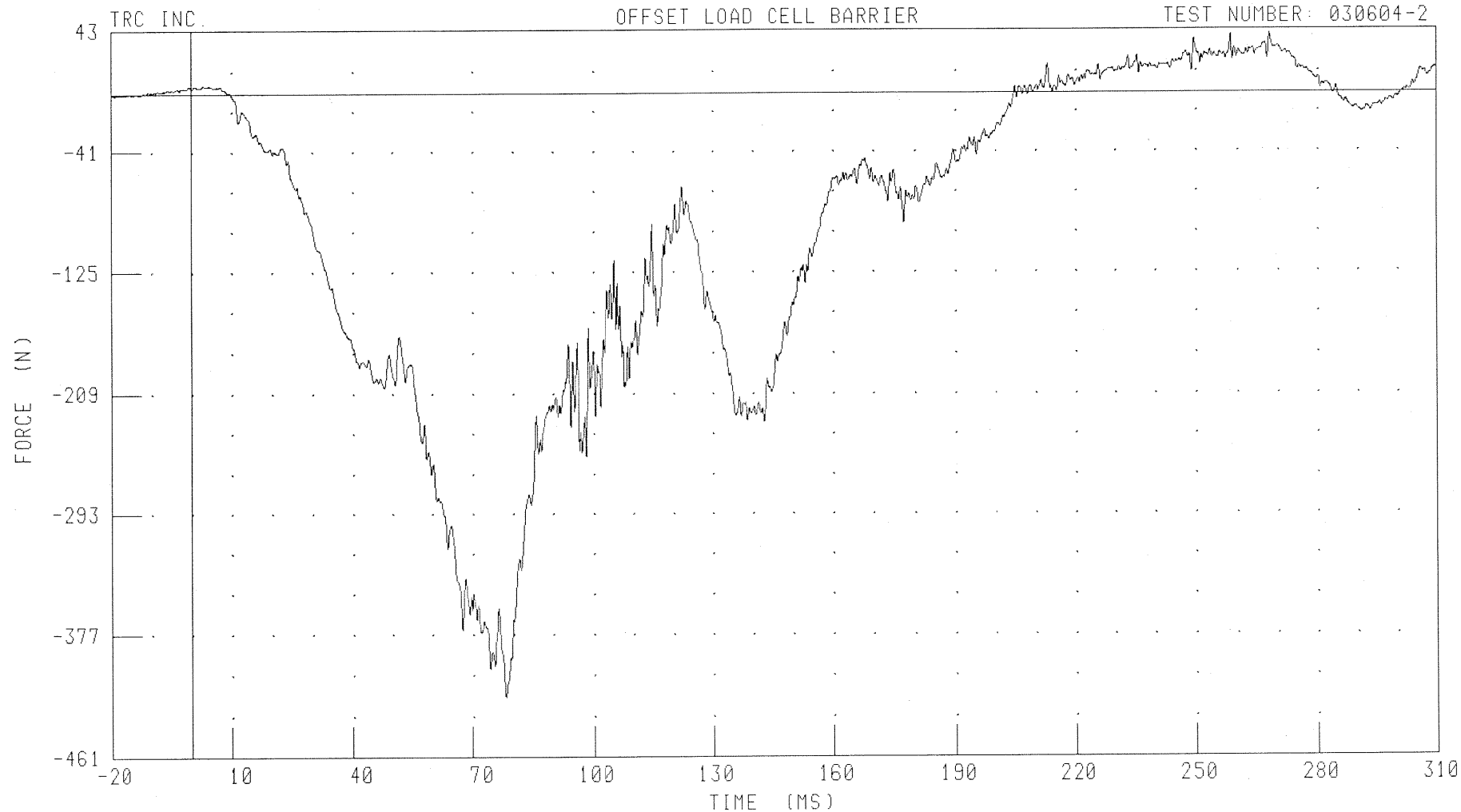
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT UPPER TIBIA Z-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRZF2

FILTER: CH. CLASS 600

PEAK DATA: 40.00 N @ 268.08 MS; -419.70 N @ 78.16 MS

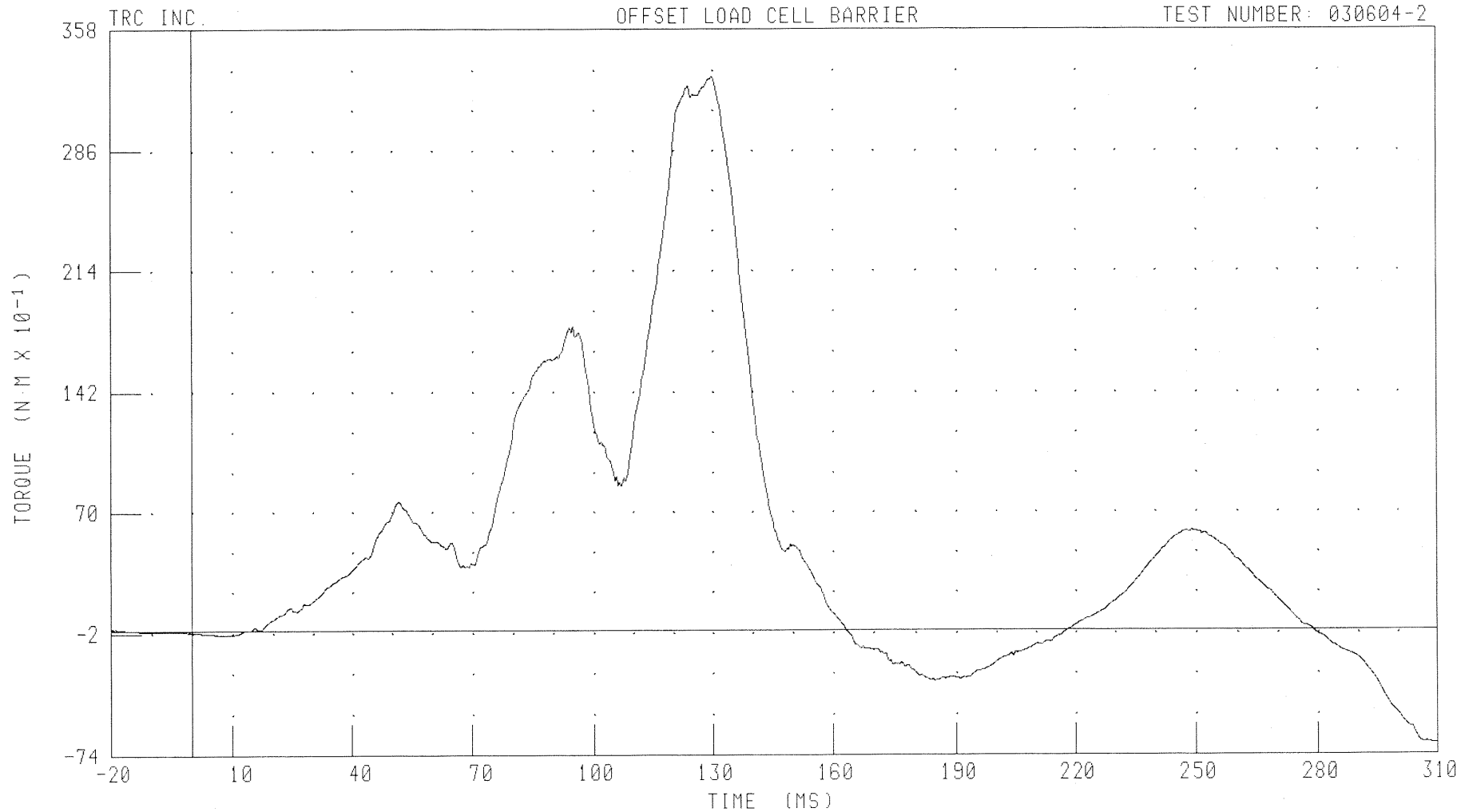
B-141

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRXM2 FILTER: CH. CLASS 600

PEAK DATA: 33.04 N·M @ 129.92 MS; -6.75 N·M @ 309.12 MS

B-142

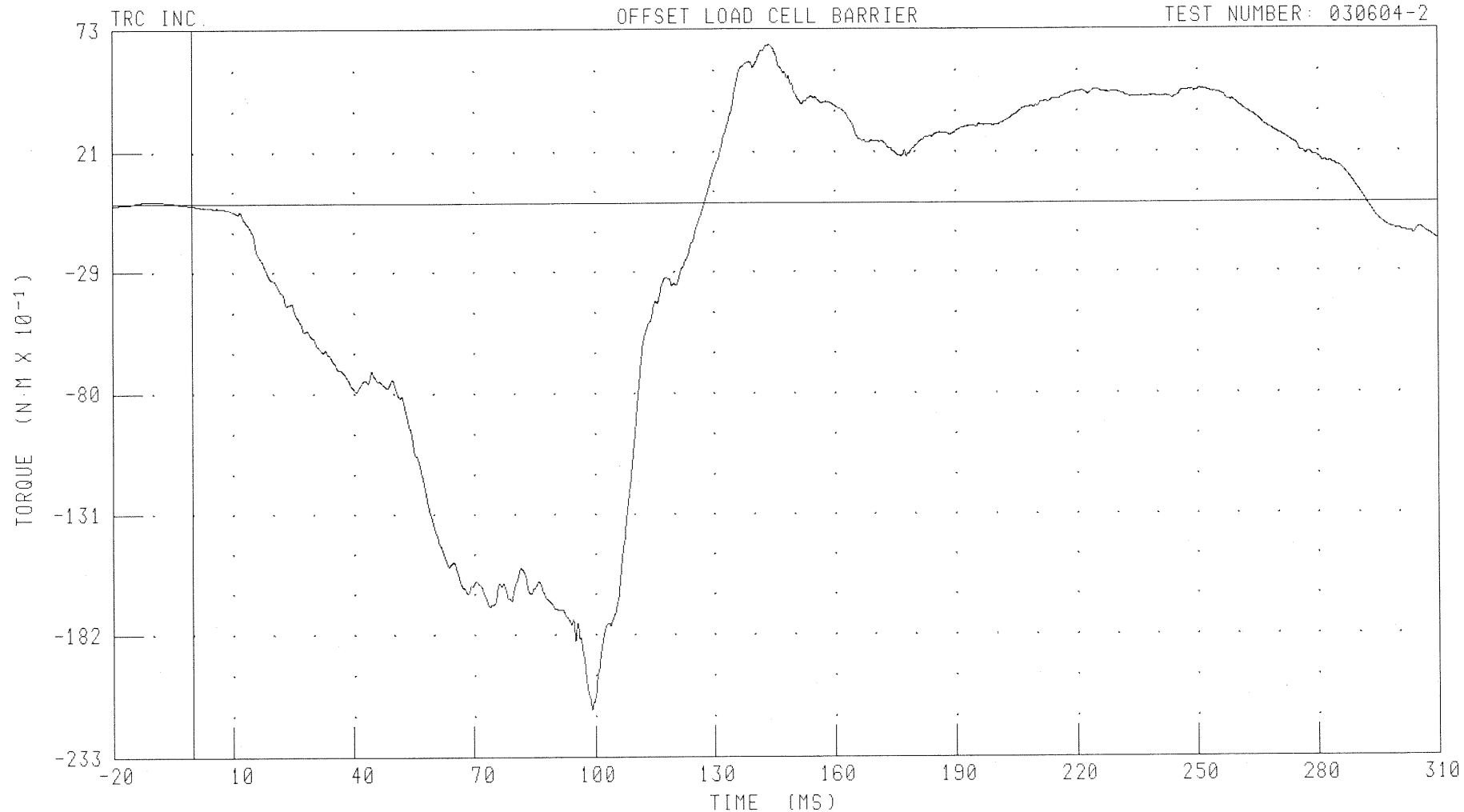
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRYM2 FILTER: CH. CLASS 600

PEAK DATA: 6.66 N·M @ 144.08 MS, -21.35 N·M @ 99.20 MS

B-143

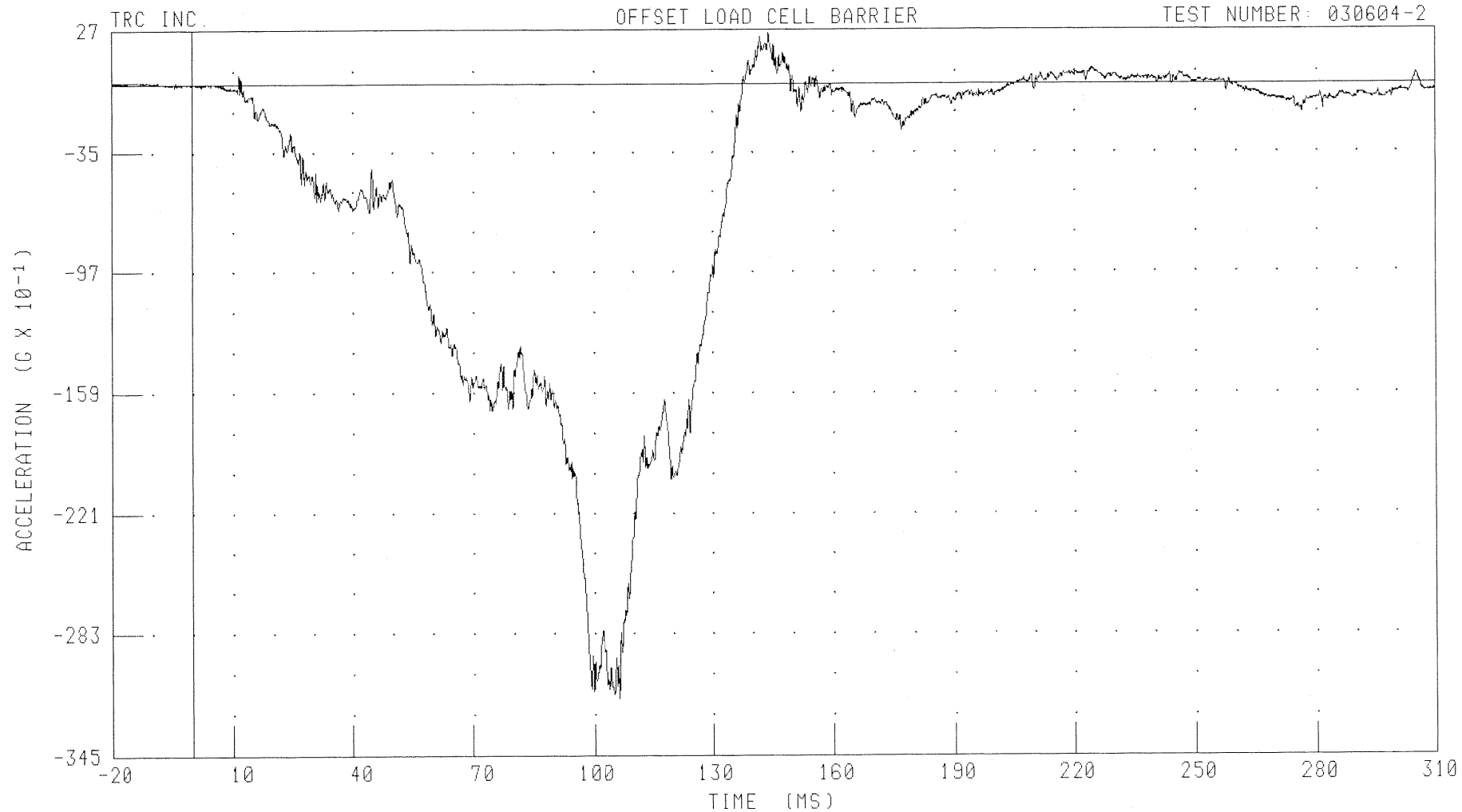
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT TIBIA X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRXG2 FILTER: CH. CLASS 1000

B-144

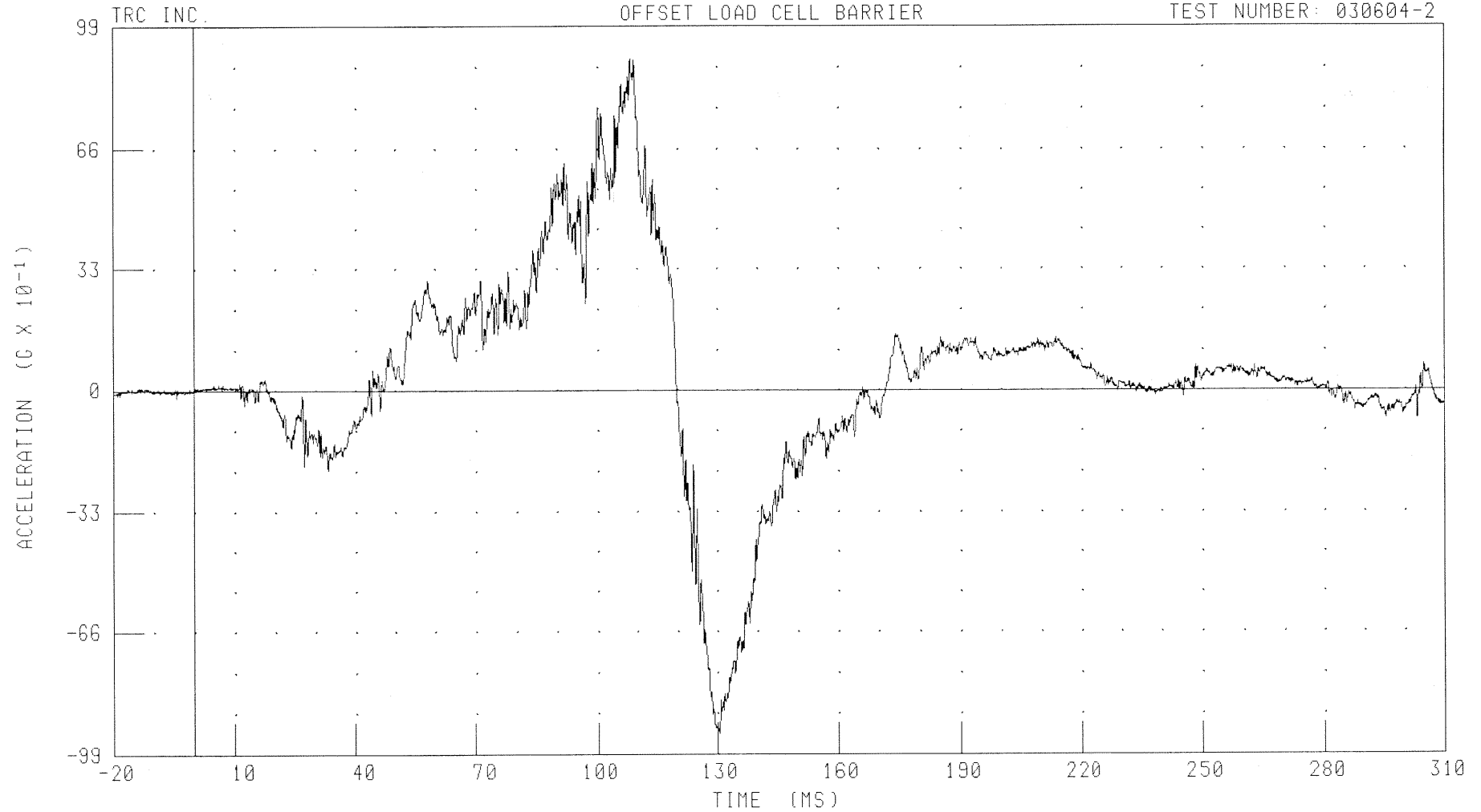
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT TIBIA Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: TBRYG2 FILTER: CH. CLASS 1000

PEAK DATA: 9.02 G @ 108.40 MS; -9.34 G @ 130.48 MS

B-145

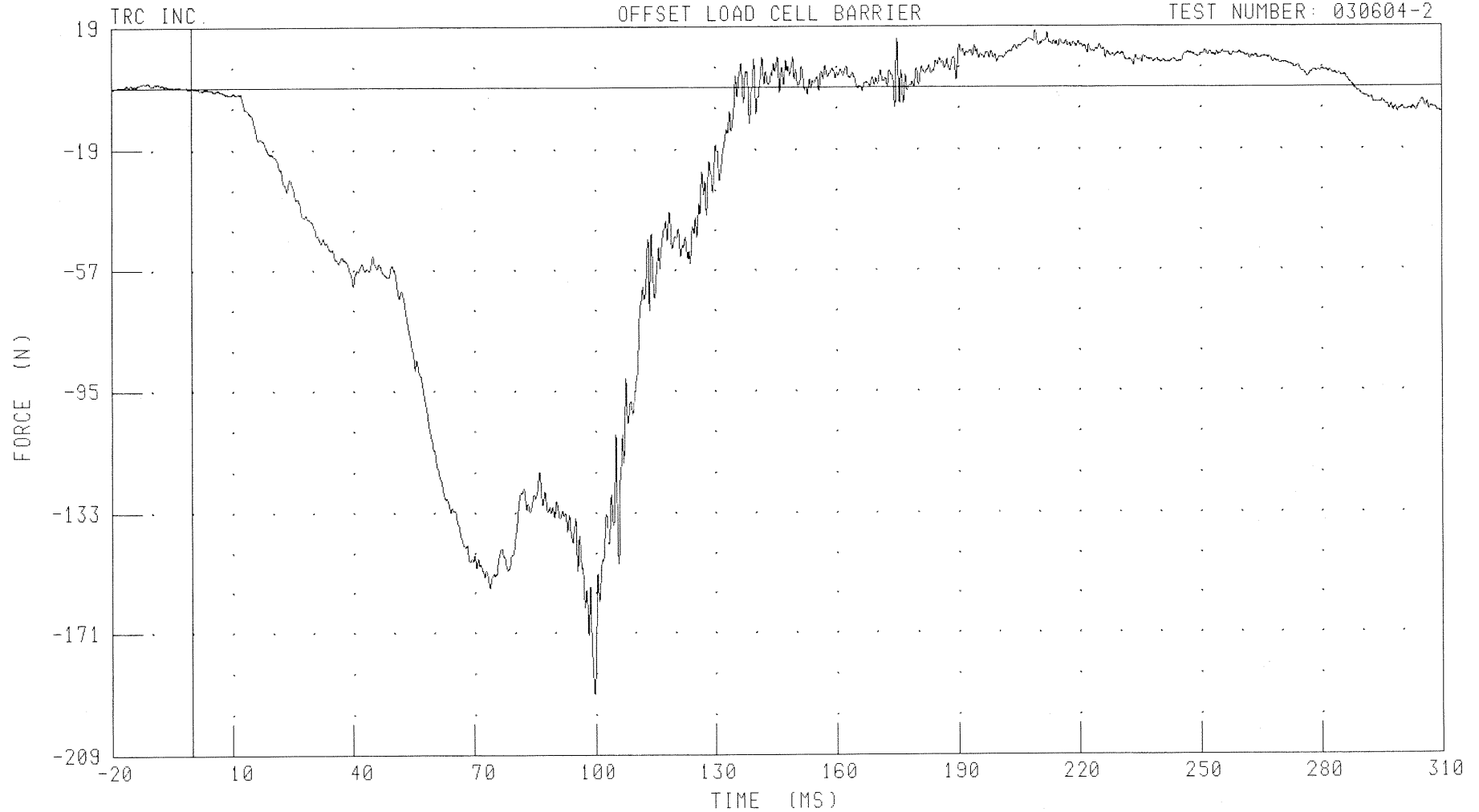
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT LOWER TIBIA X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRXF2 FILTER: CH. CLASS 600

B-146

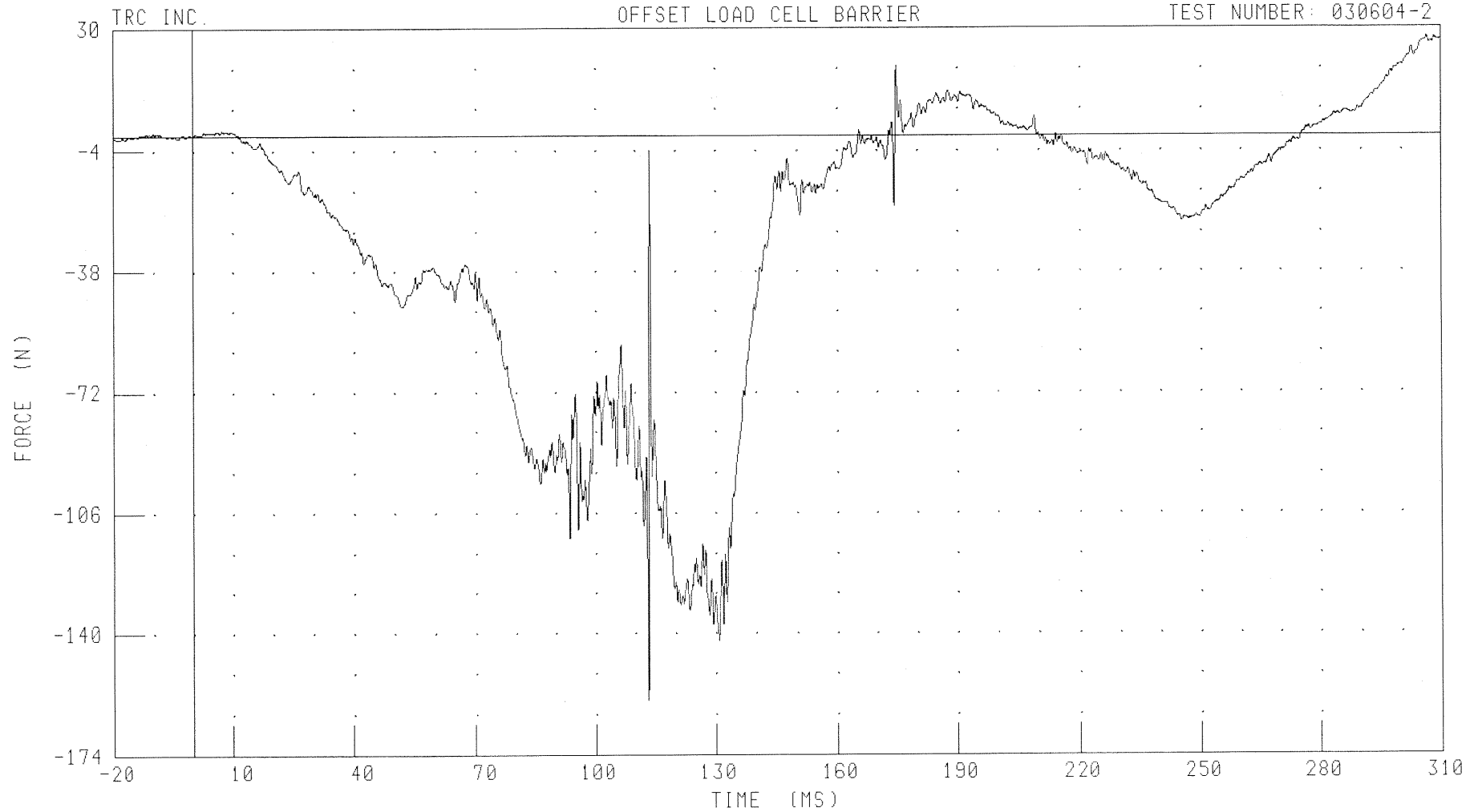
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT LOWER TIBIA Y-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRYF2 FILTER: CH. CLASS 600

PEAK DATA: 27.43 N @ 306.48 MS; -158.64 N @ 113.36 MS

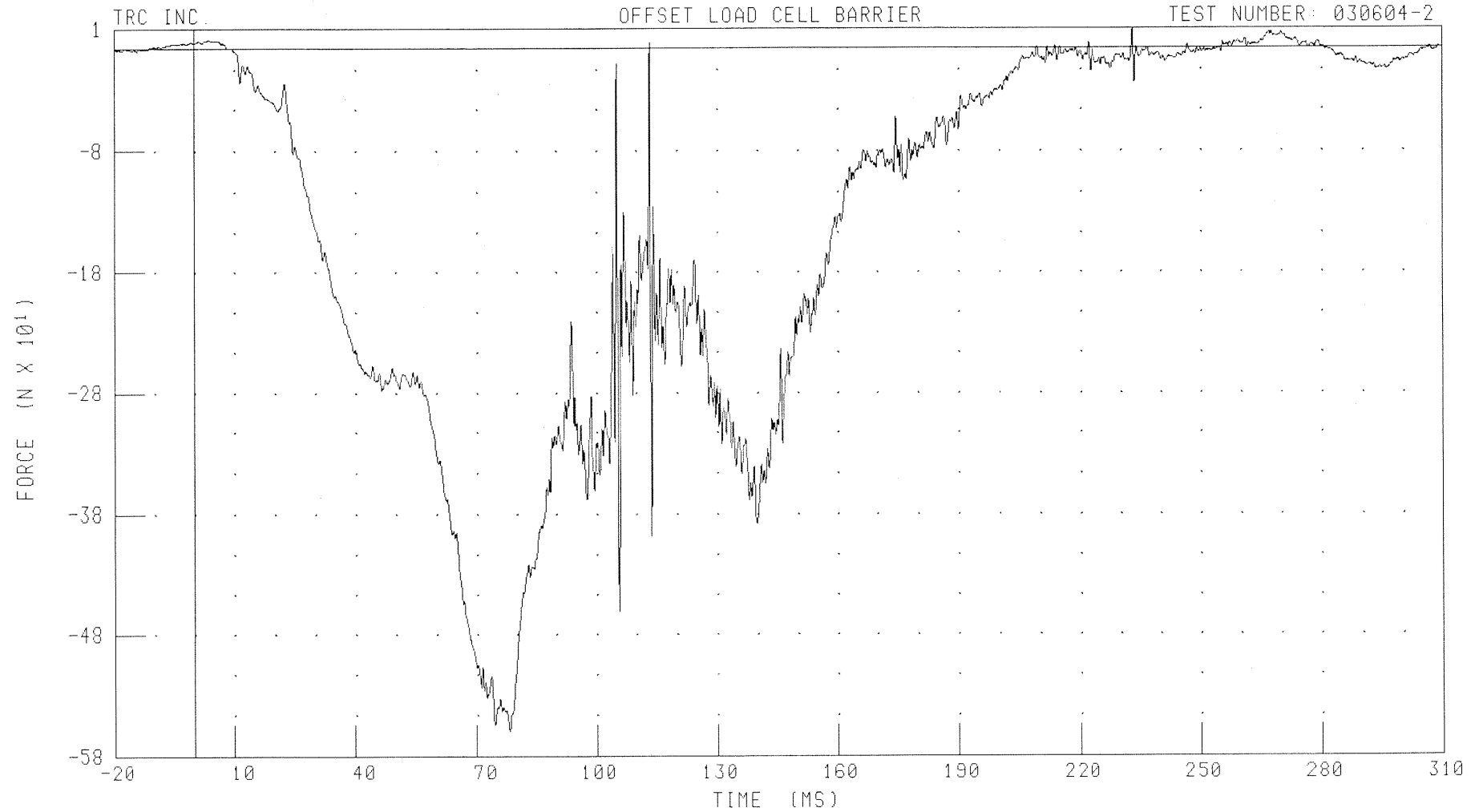
B-147

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 030604-2



CHANNEL: ANRZF2 FILTER: CH. CLASS 600

B-148

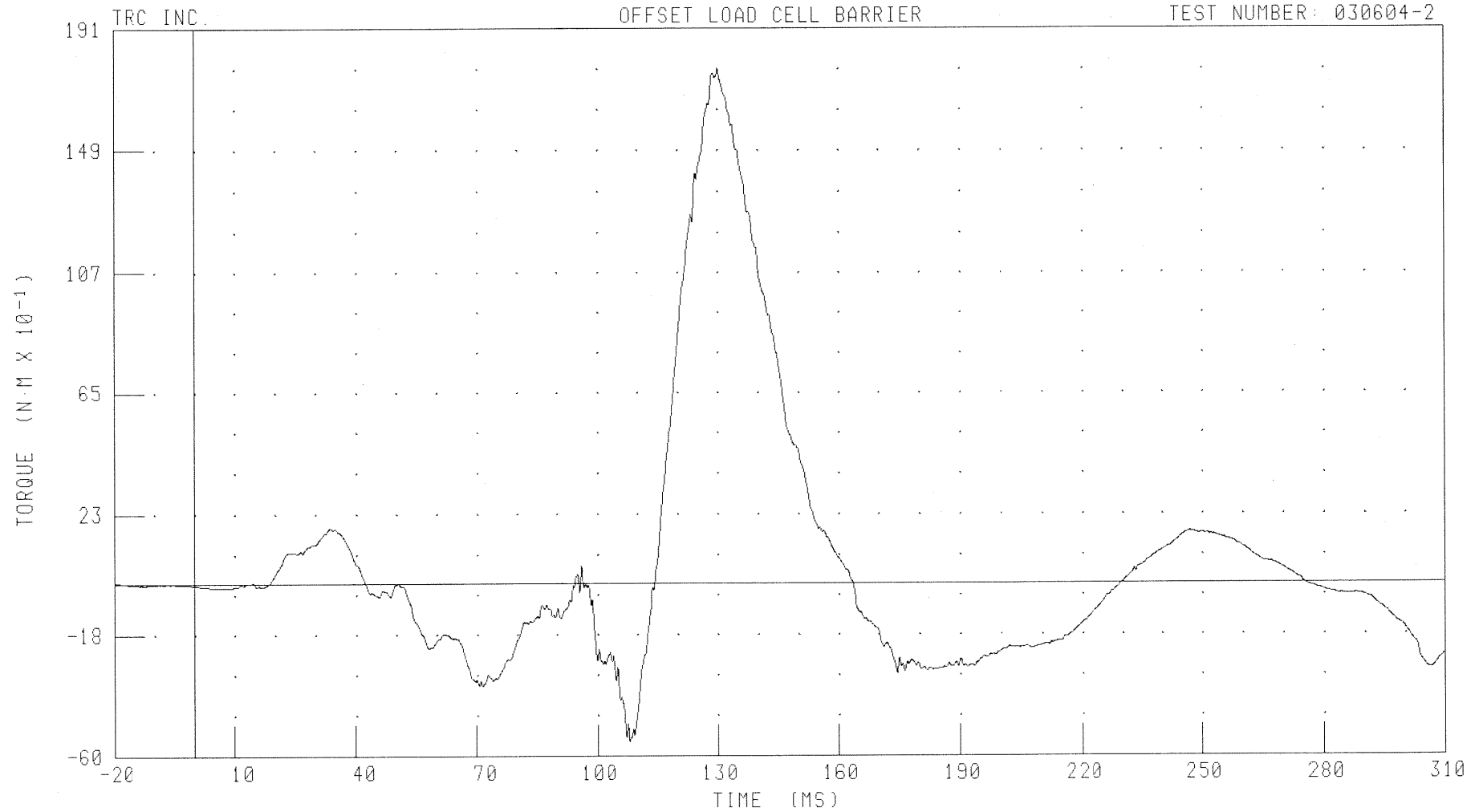
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRXM2

FILTER: CH. CLASS 600

PEAK DATA: 17.75 N·M @ 130.24 MS, -5.50 N·M @ 108.24 MS

B-149

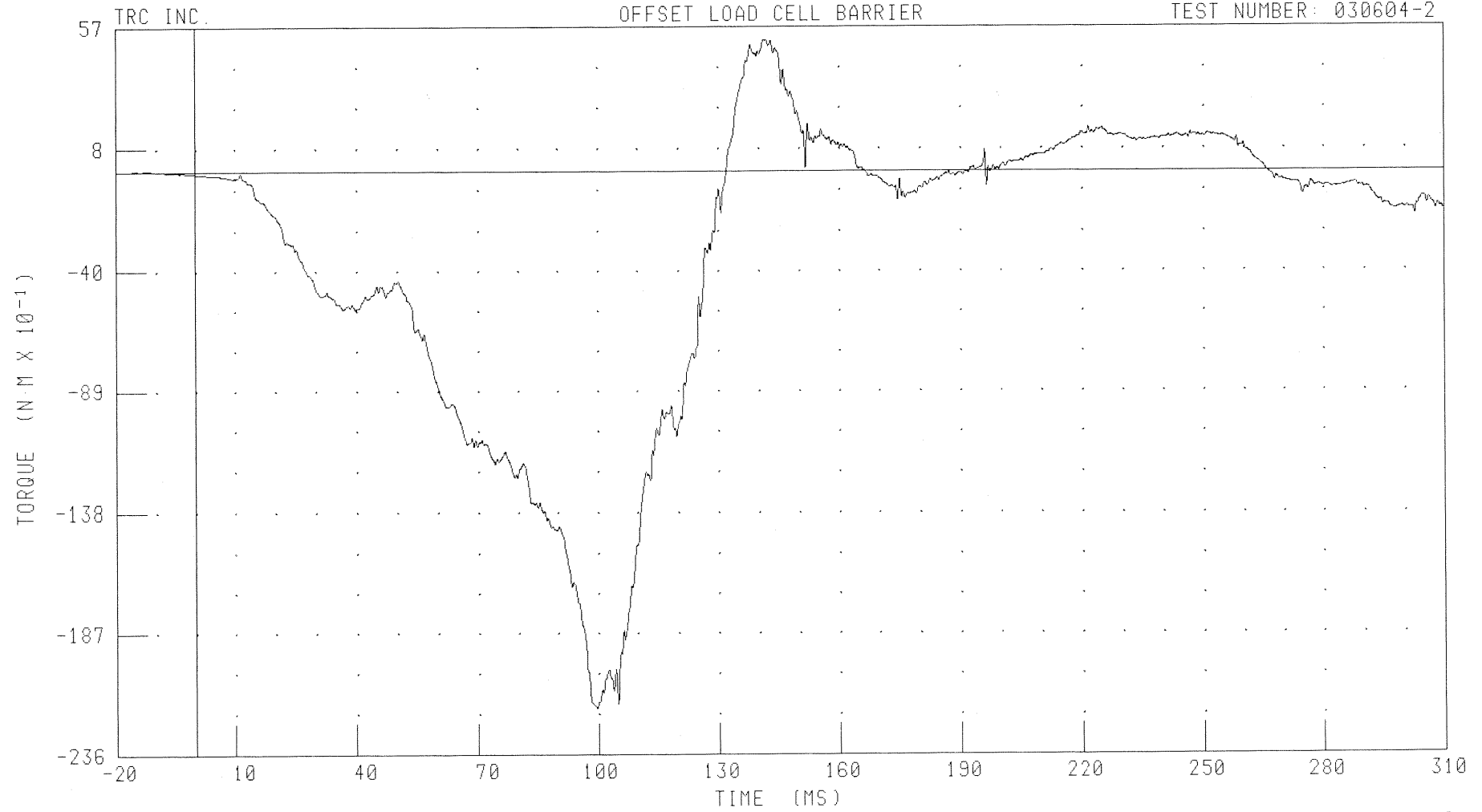
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: ANRYM2 FILTER: CH. CLASS 600

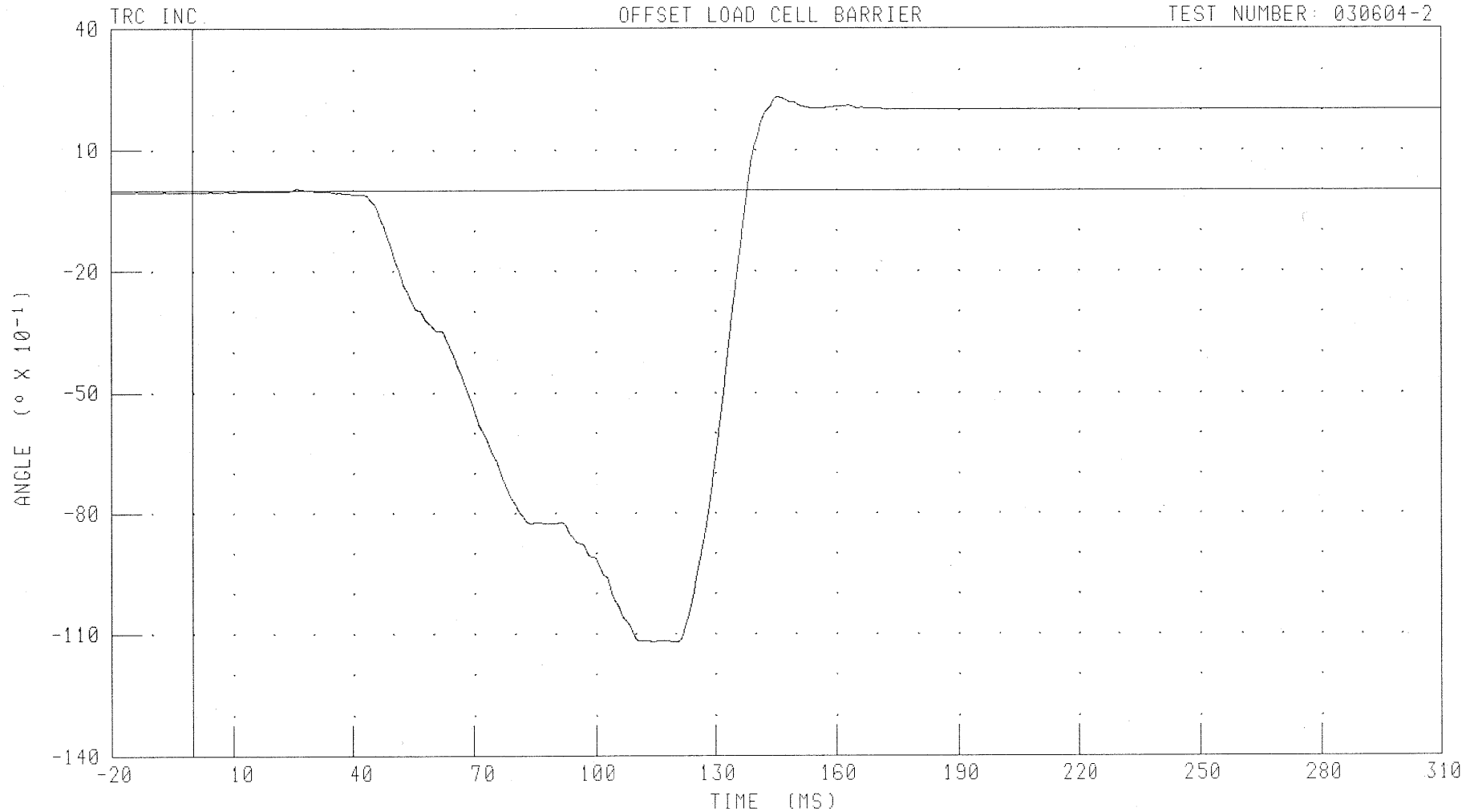
B-150

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
PASSENGER RIGHT FOOT TO ANKLE X-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRXD2

FILTER: CH. CLASS 180

PEAK DATA: 2.32 $^{\circ}$ @ 145.68 MS; -11.20 $^{\circ}$ @ 114.64 MS

B-151

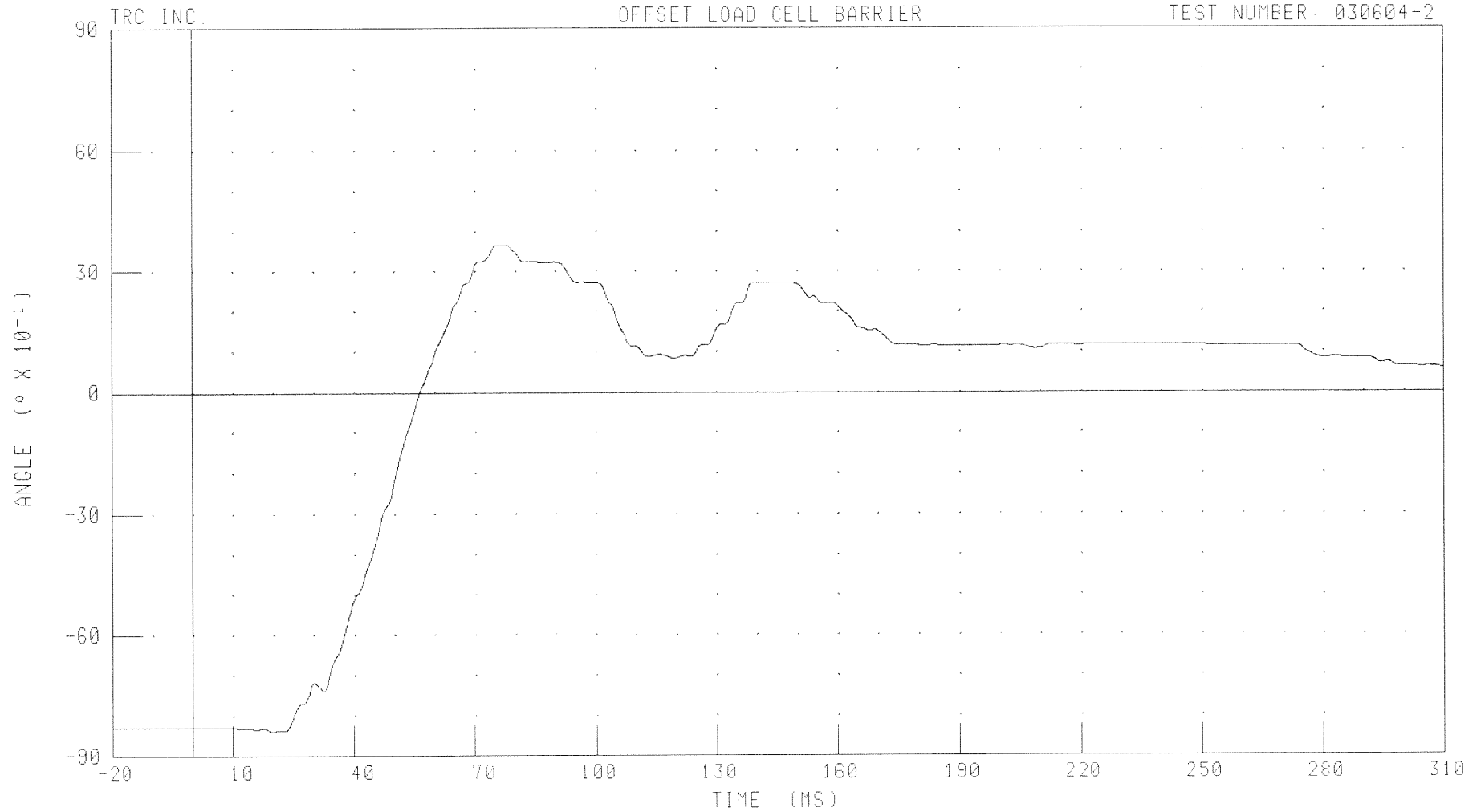
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FOOT TO ANKLE Y-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRYD2 FILTER: CH CLASS 180

PEAK DATA: 3.66 ° @ 75.52 MS; -8.39 ° @ 19.92 MS

B-152

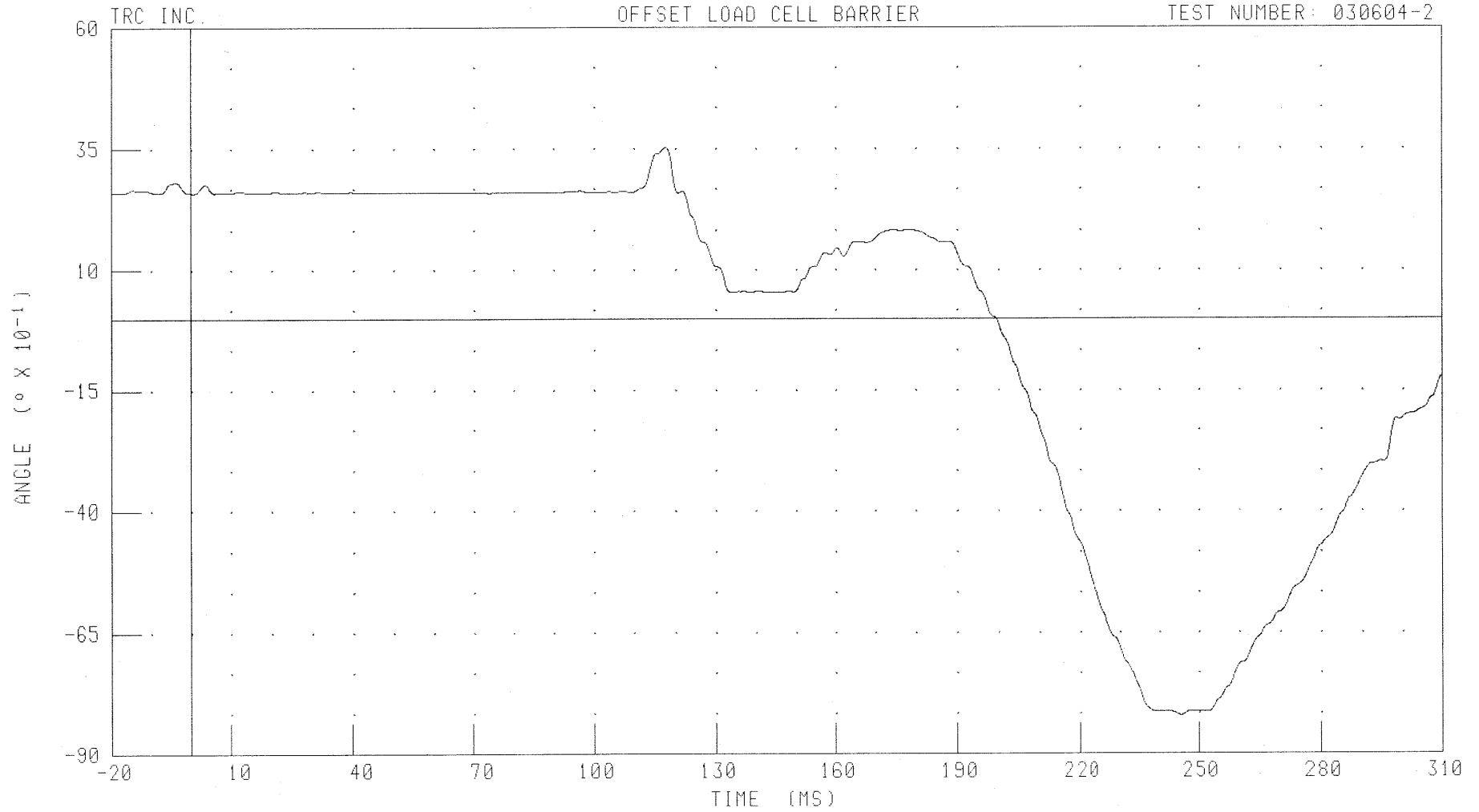
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FOOT TO ANKLE Z-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRZD2 FILTER: CH. CLASS 180

PEAK DATA: 3.53 ° @ 117.76 MS, -8.21 ° @ 245.44 MS

B-153

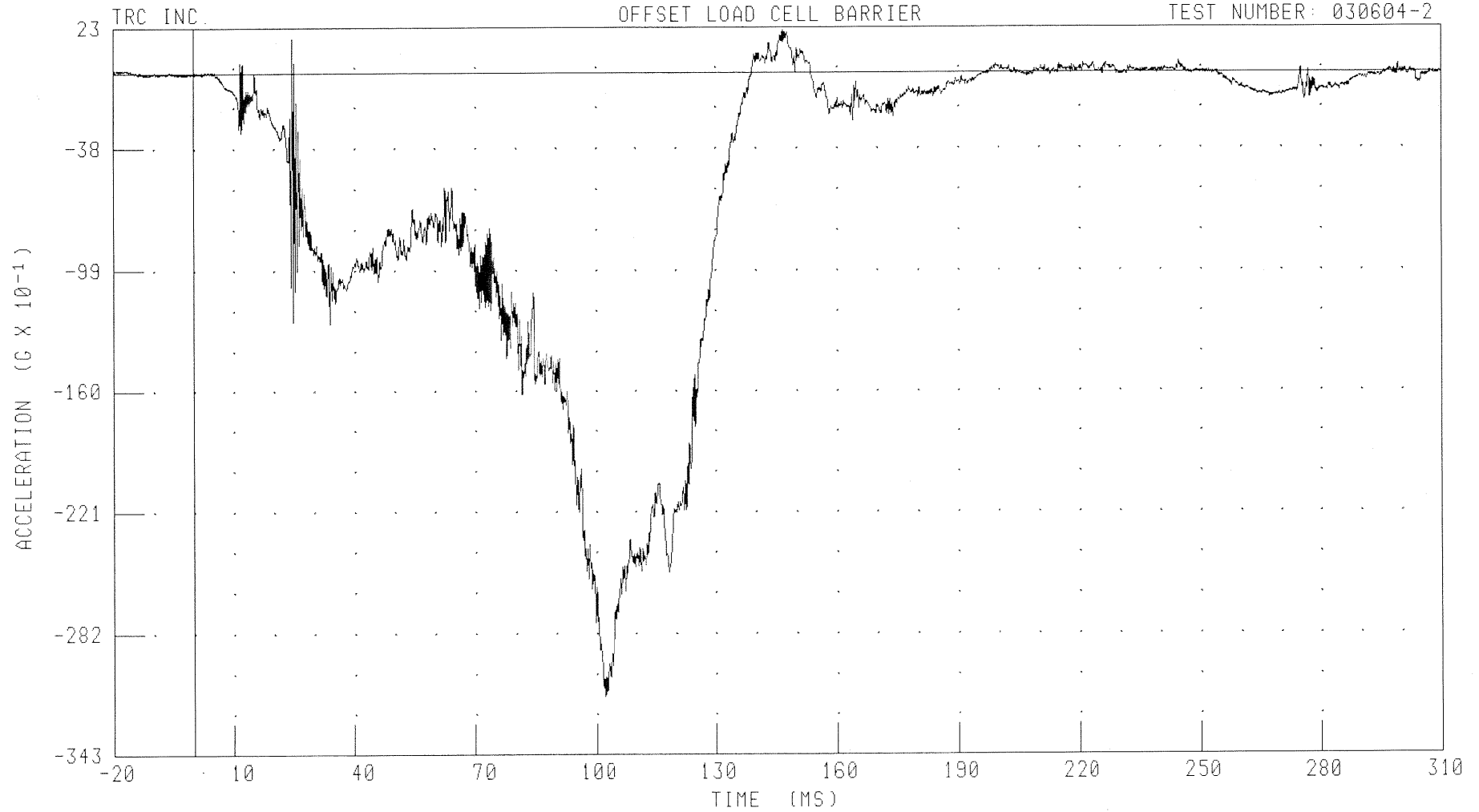
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FOOT X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



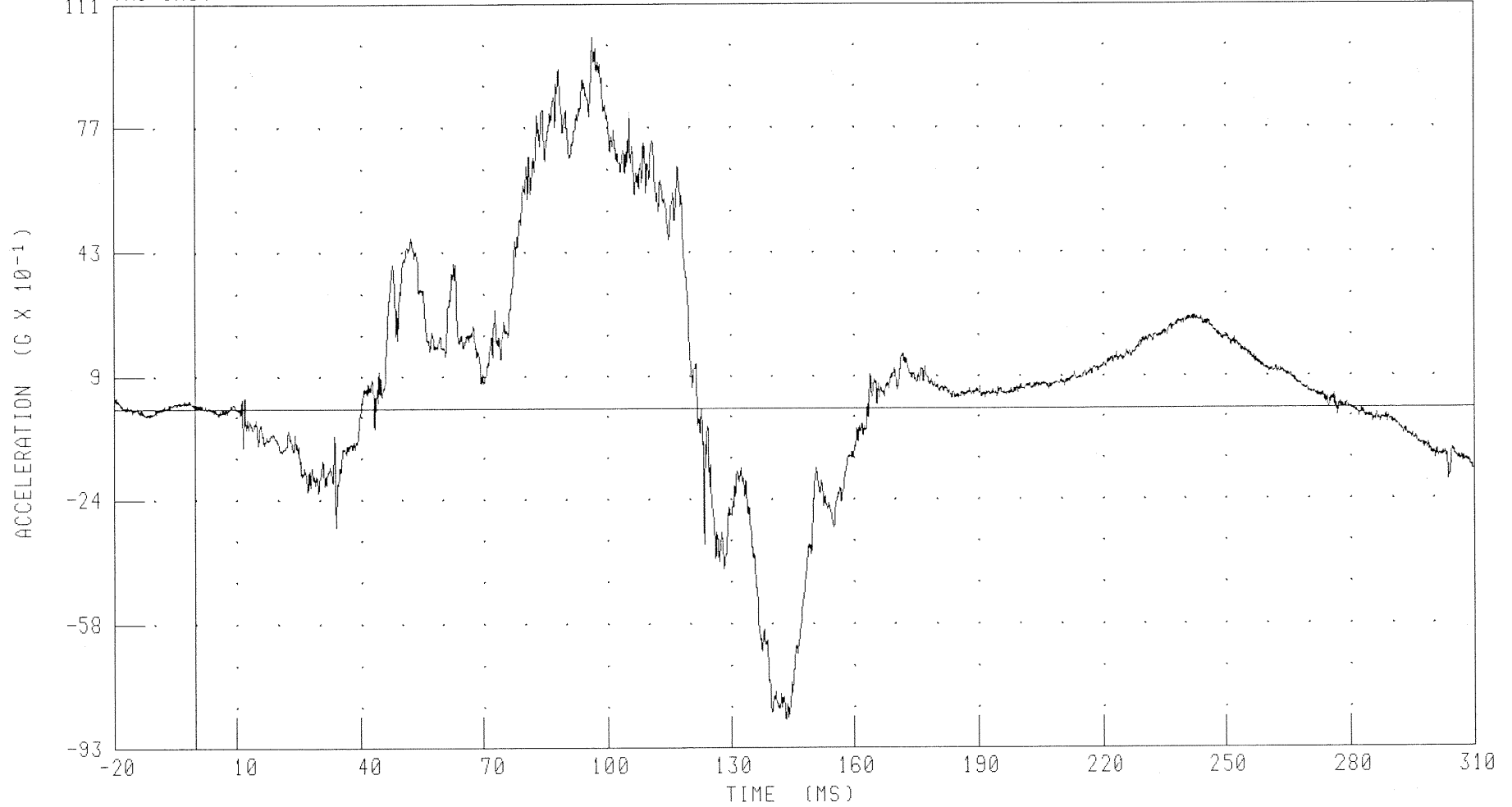
2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FOOT Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2

TRC INC.



CHANNEL: FTRYG2

FILTER: CH. CLASS 1000

PEAK DATA: 10.19 G @ 96.56 MS; -8.54 G @ 143.44 MS

B-155

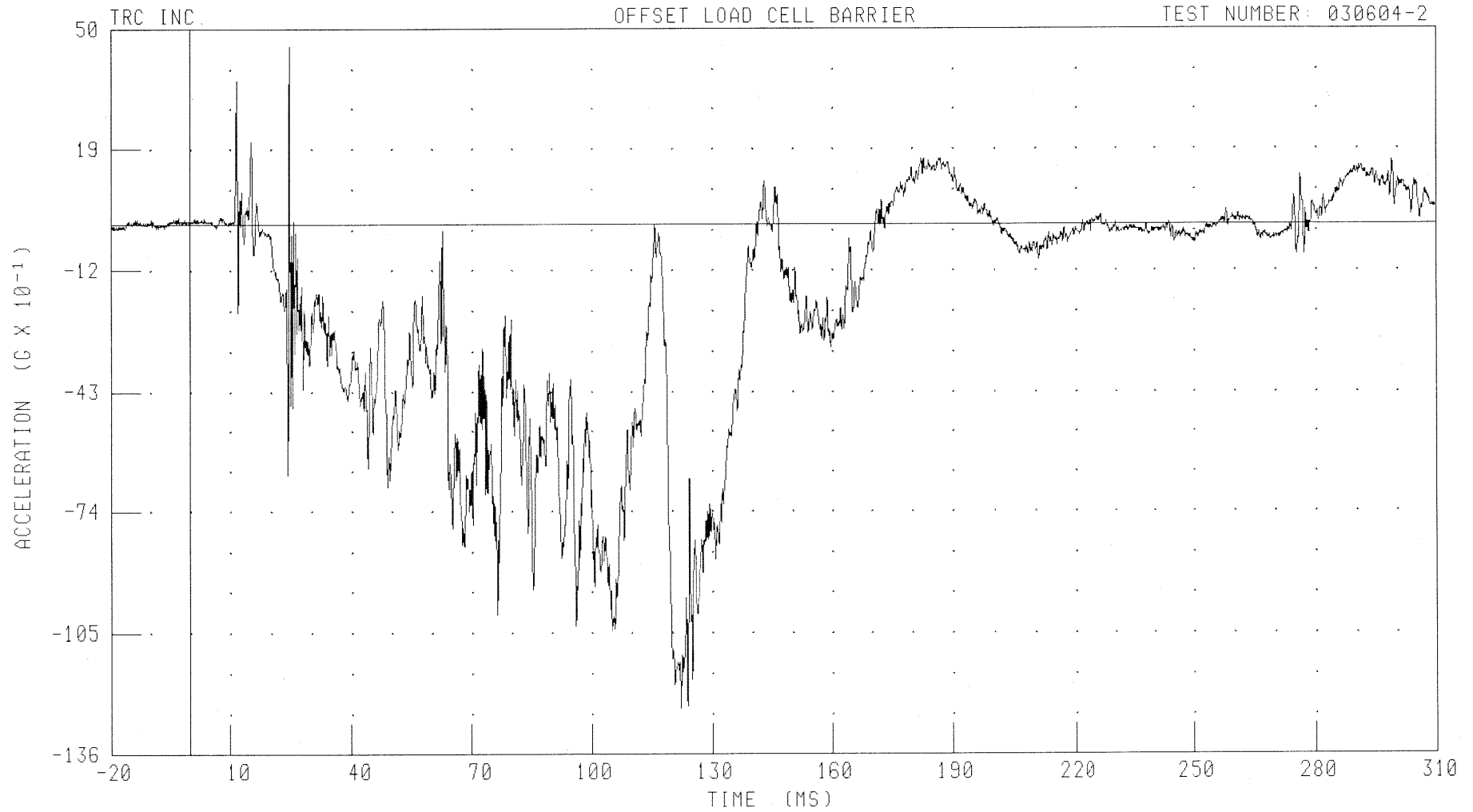
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FOOT Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: FTRZG2 FILTER: CH. CLASS 1000

PEAK DATA: 4.56 G @ 24.56 MS; -12.41 G @ 122.24 MS

B-156

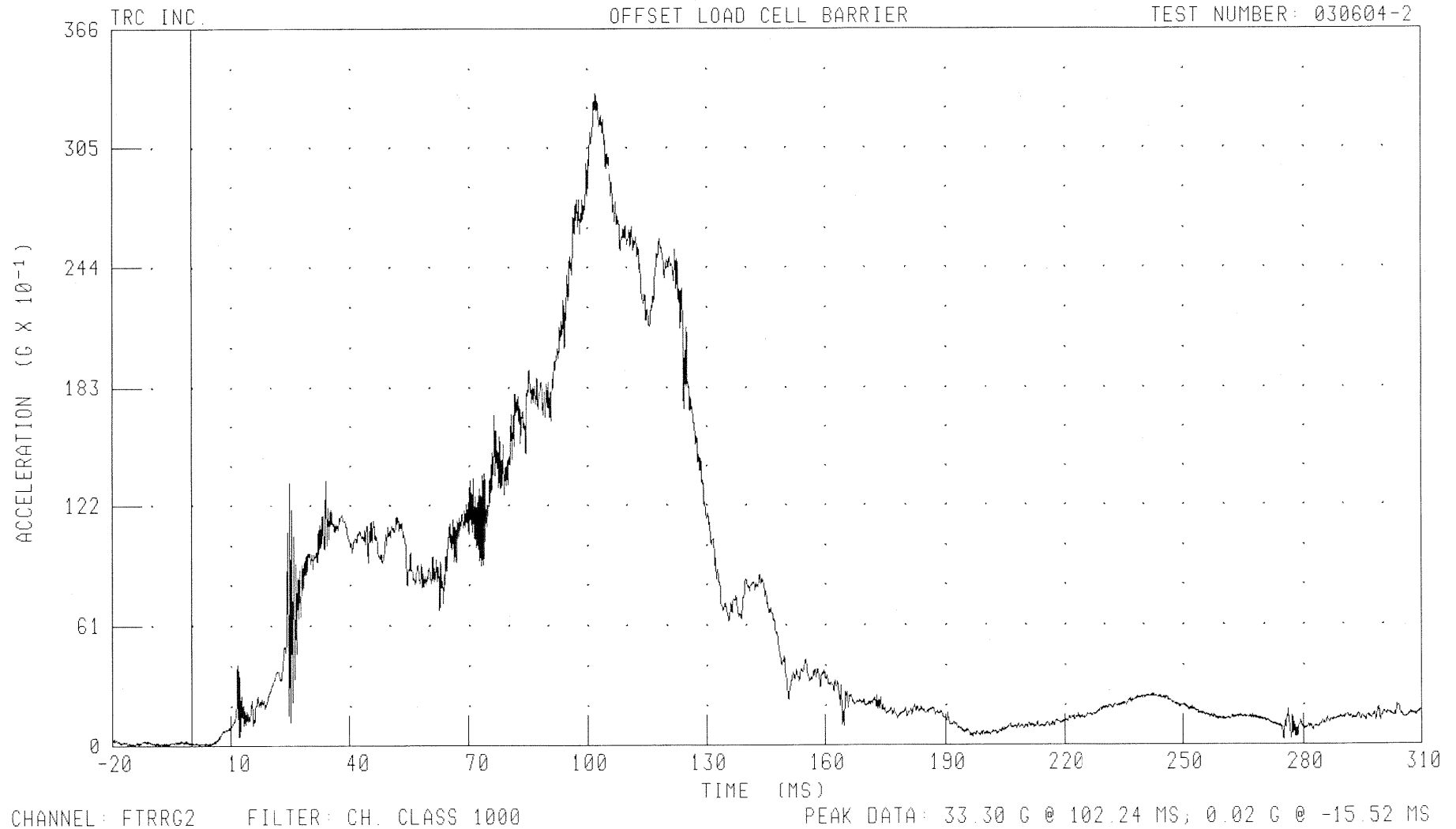
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER RIGHT FOOT RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-157

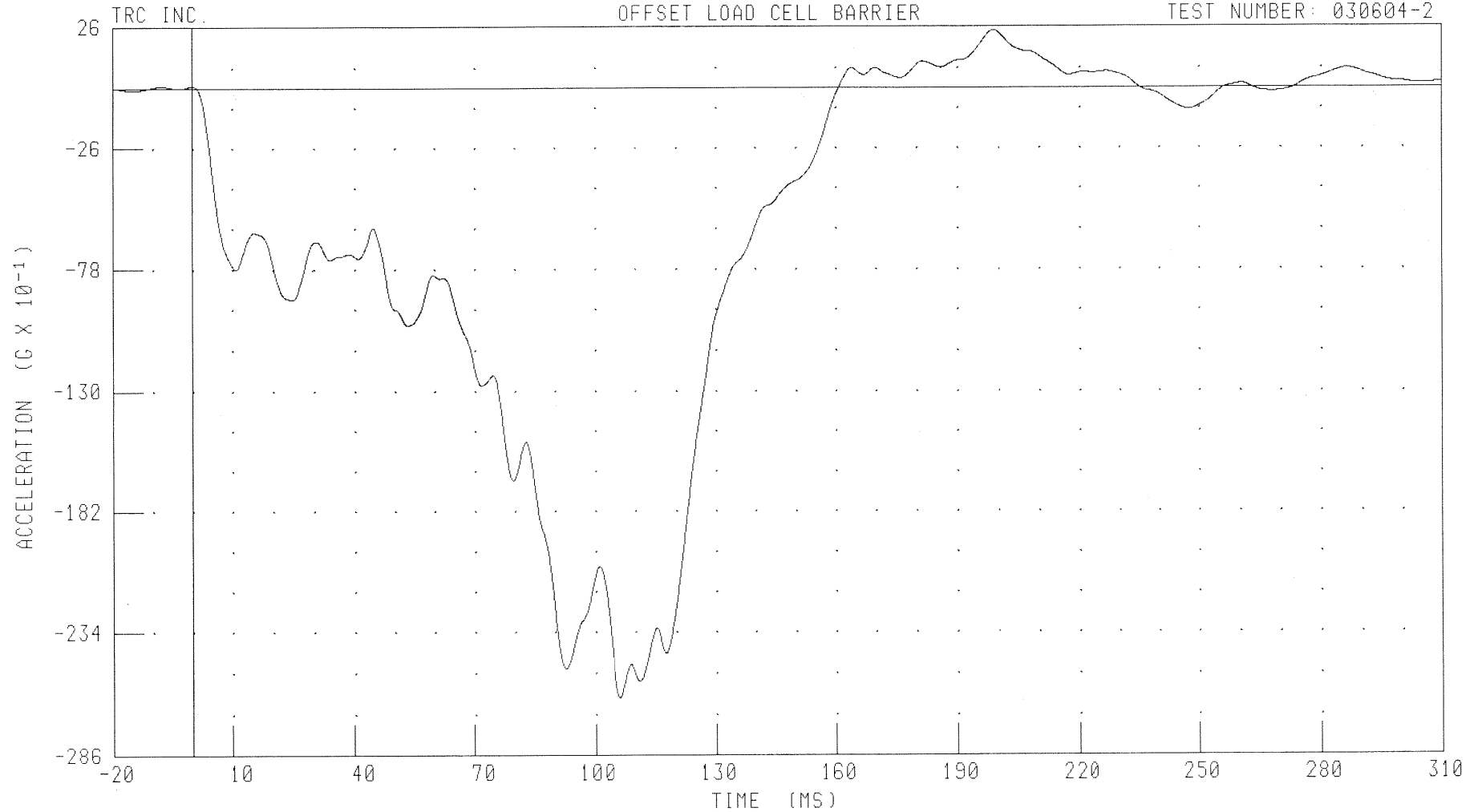
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

LEFT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LRXXG1

FILTER: CH. CLASS 60

PEAK DATA: 2.44 G @ 198.88 MS; -26.17 G @ 106.16 MS

B-158

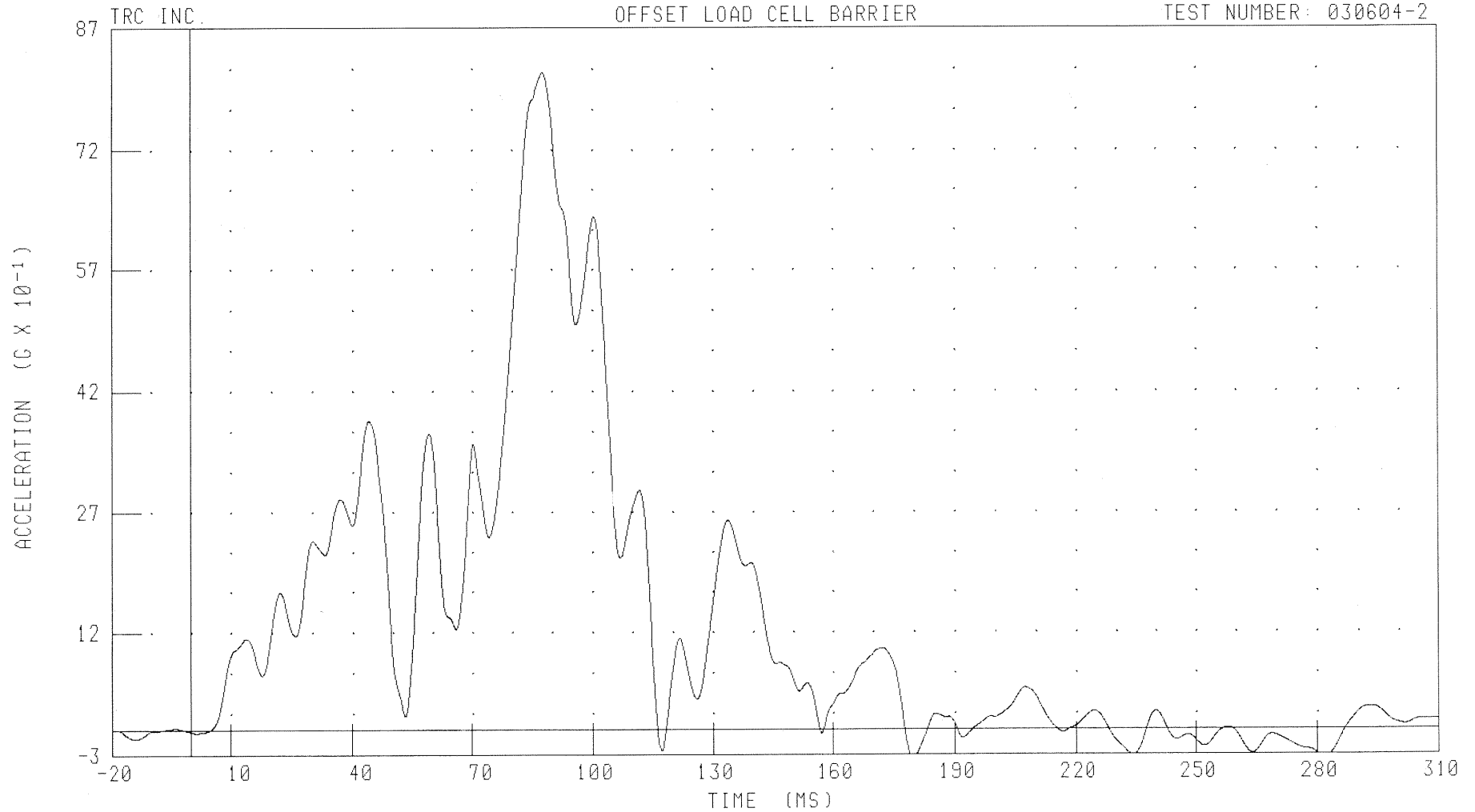
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

LEFT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LRXYG1 FILTER: CH. CLASS 60

PEAK DATA: 8.15 G @ 87.76 MS; -0.33 G @ 282.00 MS

B-159

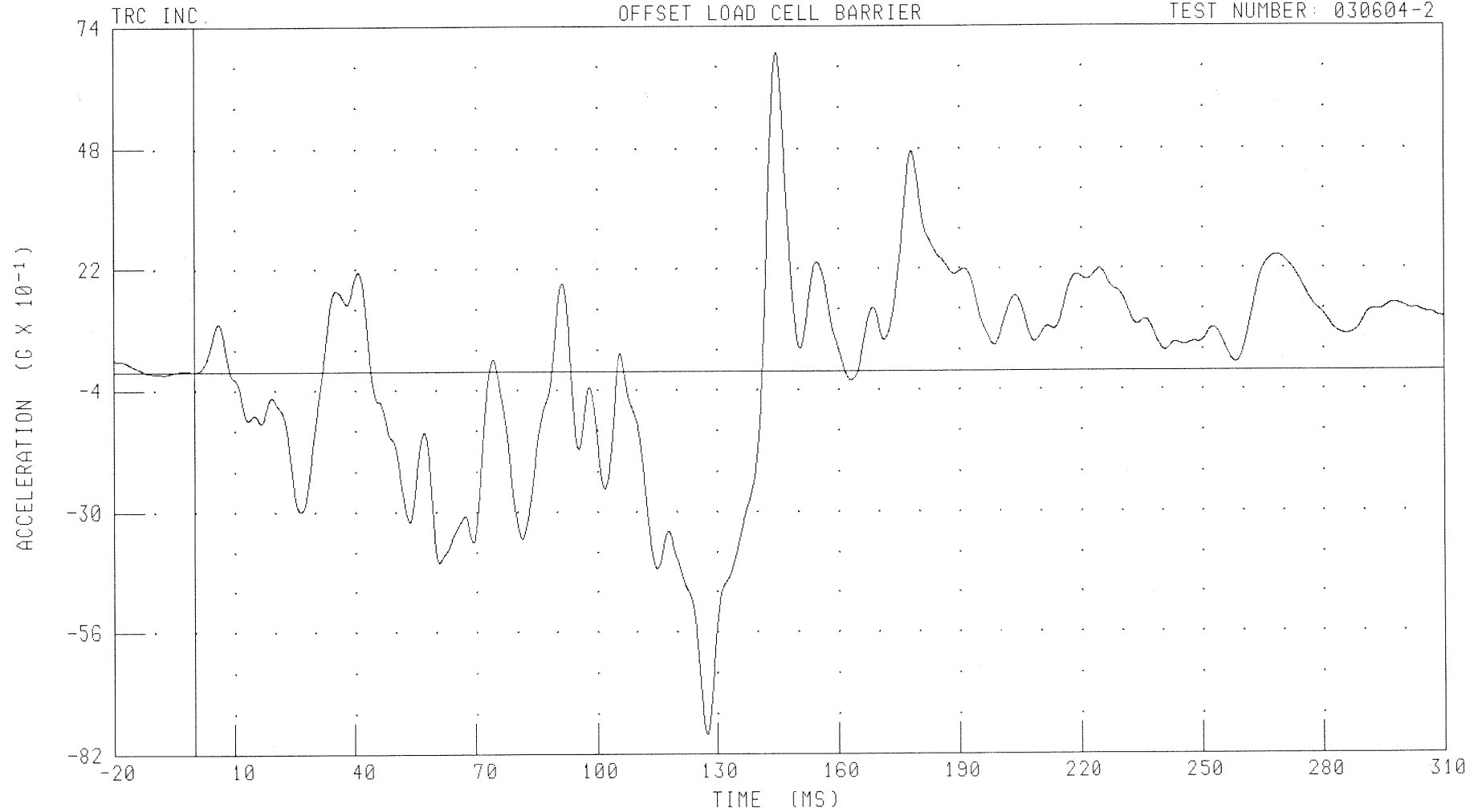
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

LEFT REAR SEAT CROSSMEMBER Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LRXZG1 FILTER: CH. CLASS 60

B-160

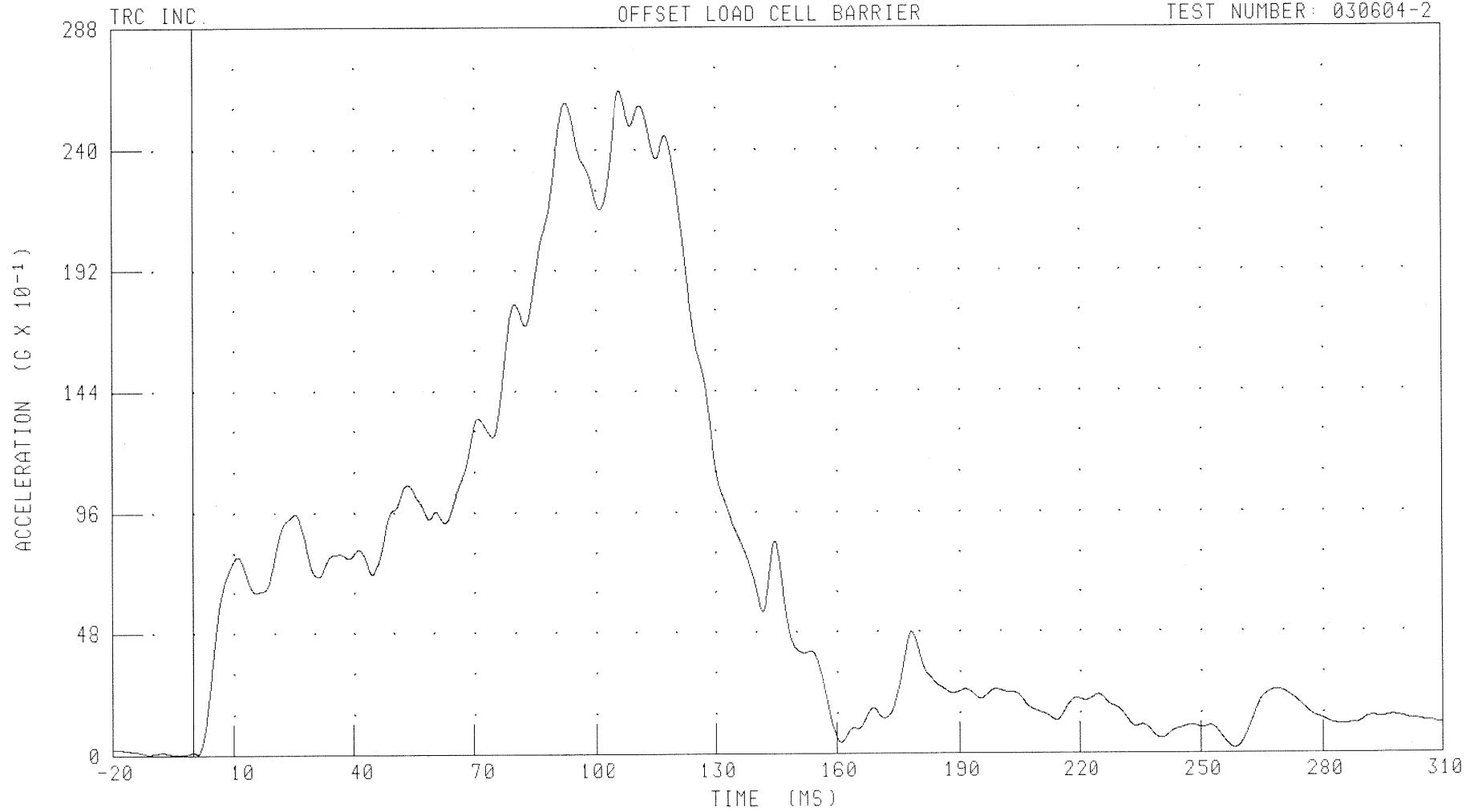
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

LEFT REAR SEAT CROSSMEMBER RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LRXRG1

FILTER: CH. CLASS 60

PEAK DATA: 26.28 G @ 106.08 MS; 0.03 G @ -4.08 MS

B-161

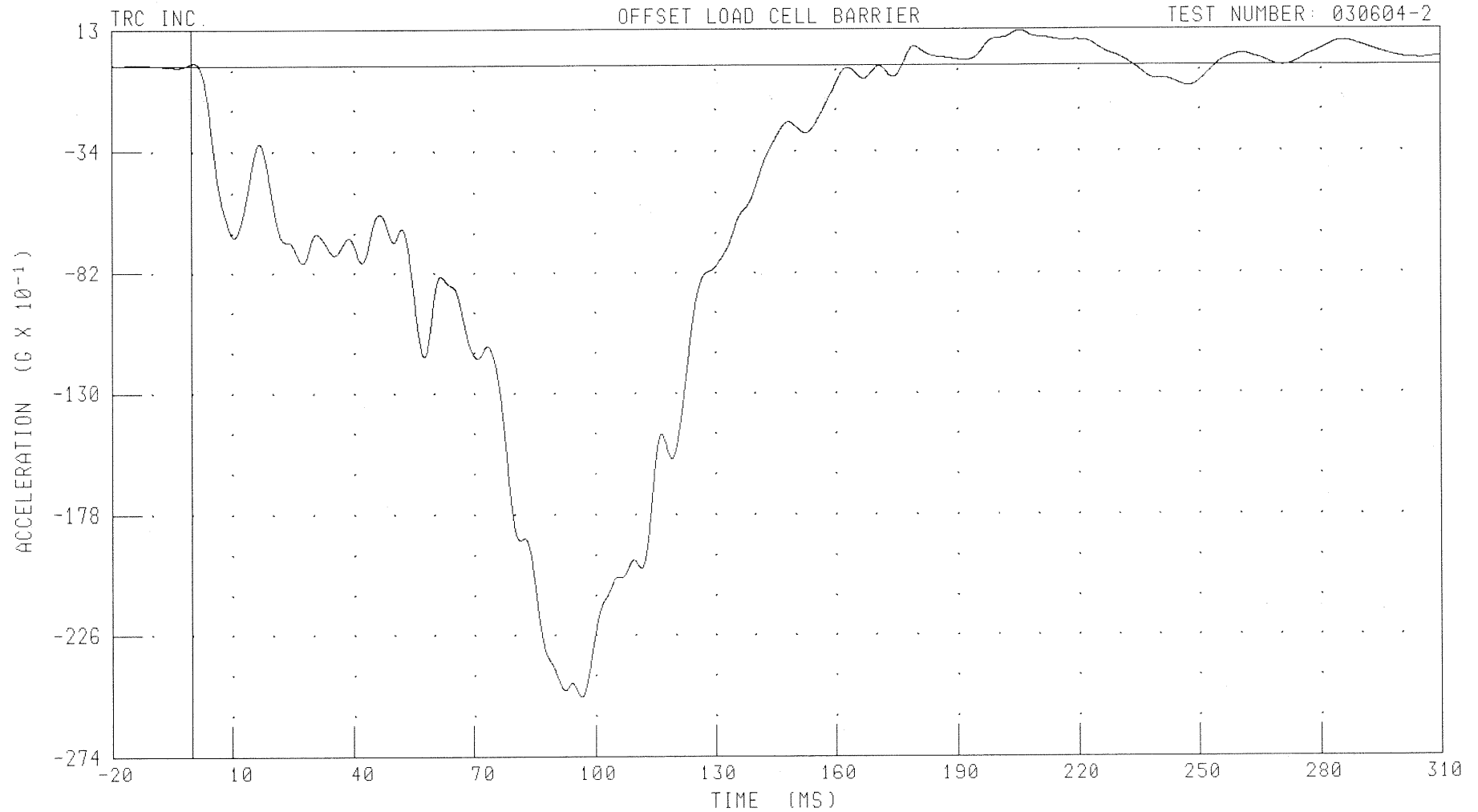
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

RIGHT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RRXXG1

FILTER: CH. CLASS 60

PEAK DATA: 1.35 G @ 205.44 MS; -25.07 G @ 96.64 MS

B-162

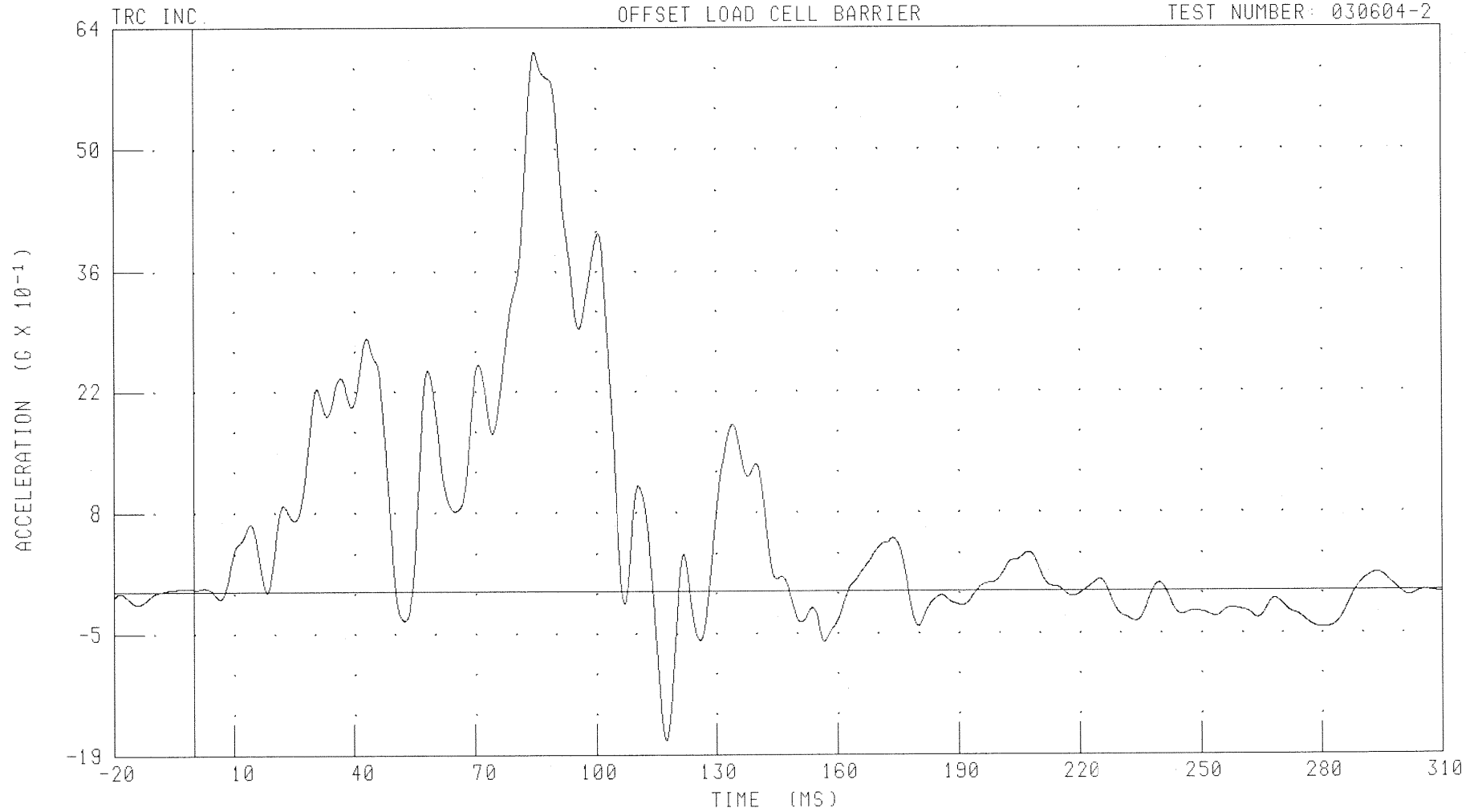
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

RIGHT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RRXYG1

FILTER: CH. CLASS 60

PEAK DATA: 6.22 G @ 84.80 MS; -1.74 G @ 117.68 MS

B-163

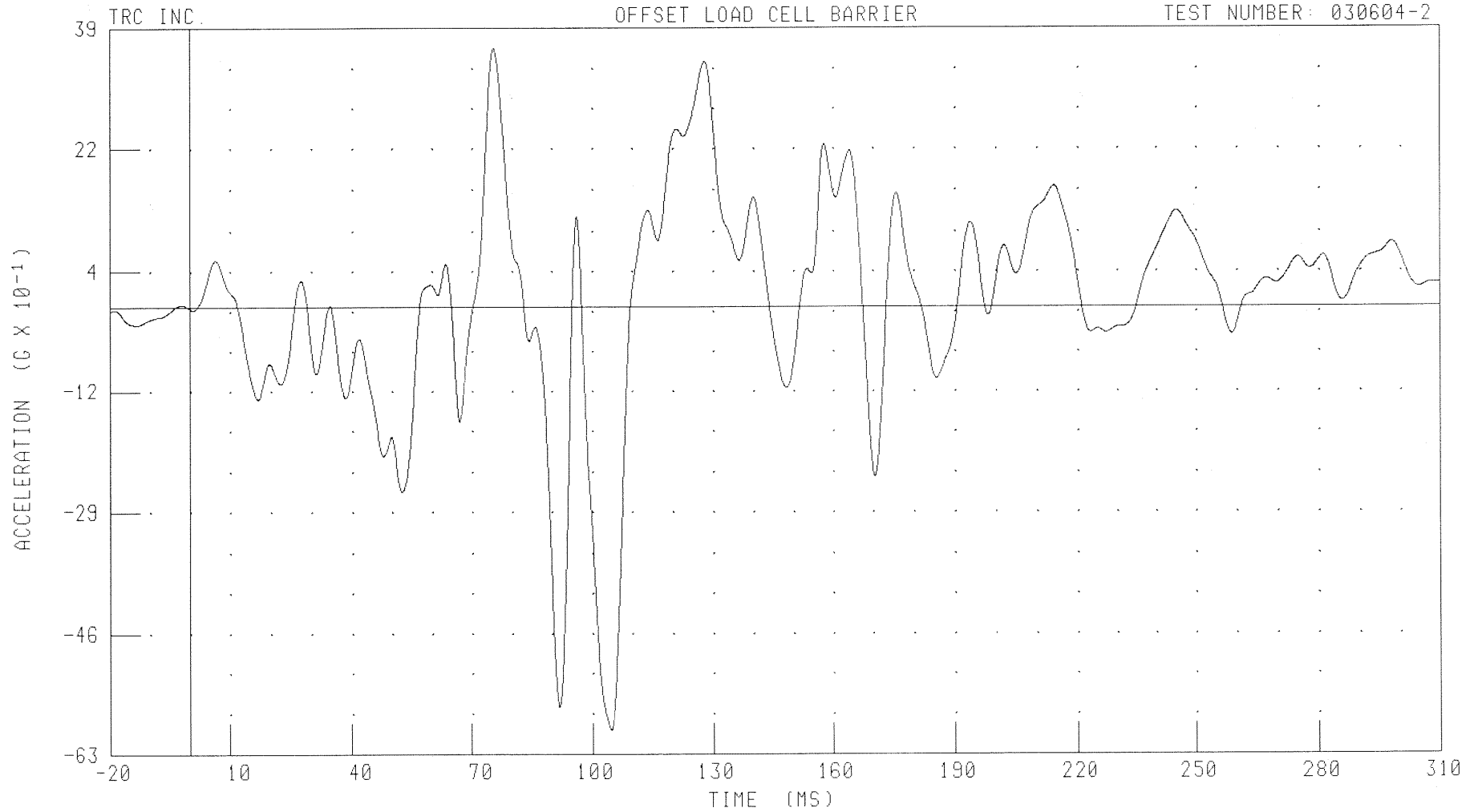
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

RIGHT REAR SEAT CROSSMEMBER Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RRXZG1

FILTER: CH. CLASS 60

PEAK DATA: 3.62 G @ 75.52 MS, -5.97 G @ 104.64 MS

B-164

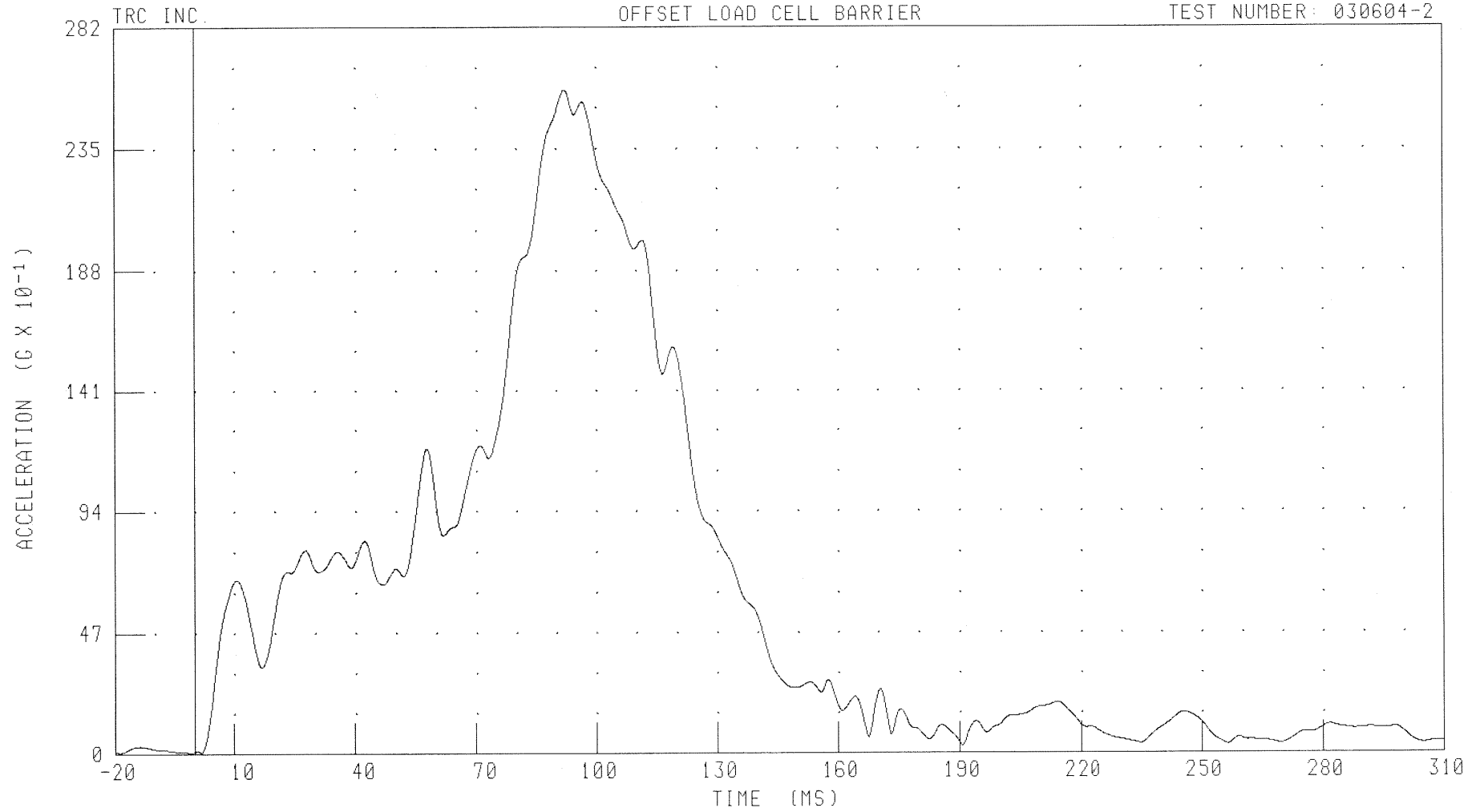
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

RIGHT REAR SEAT CROSSMEMBER RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RRXRG1 FILTER: CH. CLASS 60

PEAK DATA: 25.76 G @ 92.16 MS; 0.03 G @ -1.04 MS

B-165

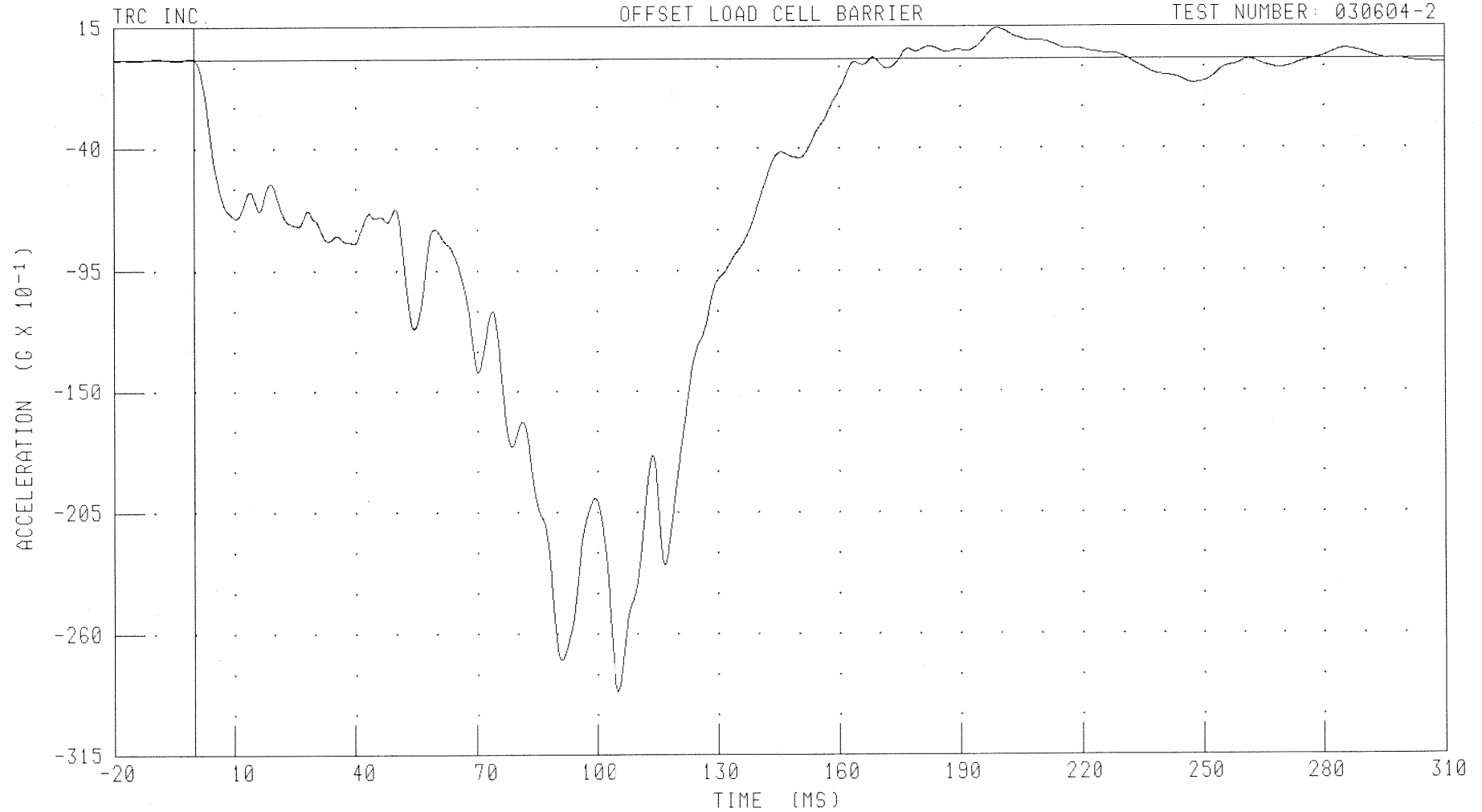
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS LEFT SIDE TOE PAN X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LTPXC1

FILTER: CH. CLASS 60

PEAK DATA: 1.42 G @ 199.28 MS; -28.60 G @ 105.36 MS

B-166

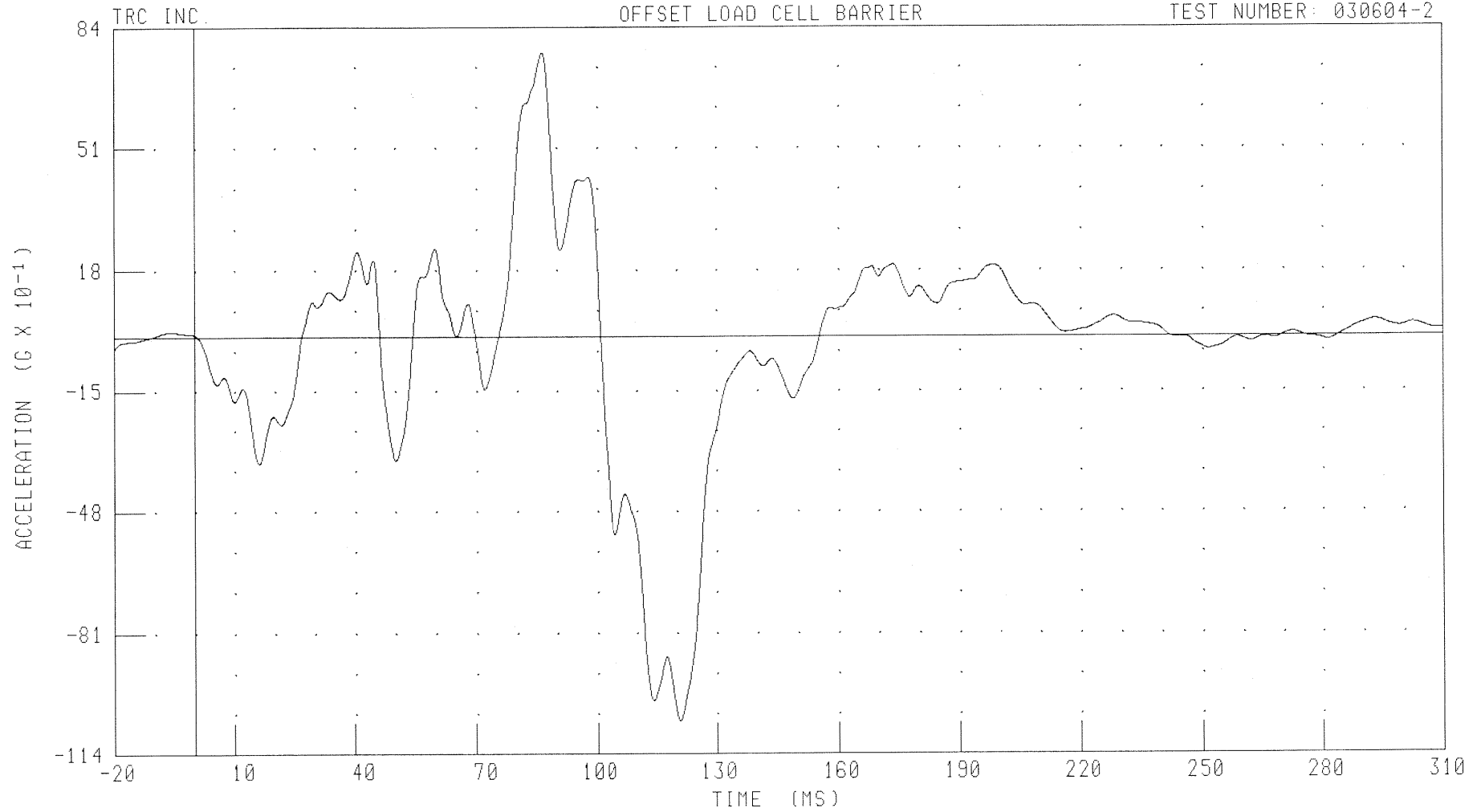
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS LEFT SIDE TOE PAN Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LTPYG1

FILTER: CH. CLASS 60

PEAK DATA: 7.69 G @ 86.40 MS, -10.51 G @ 120.88 MS

B-167

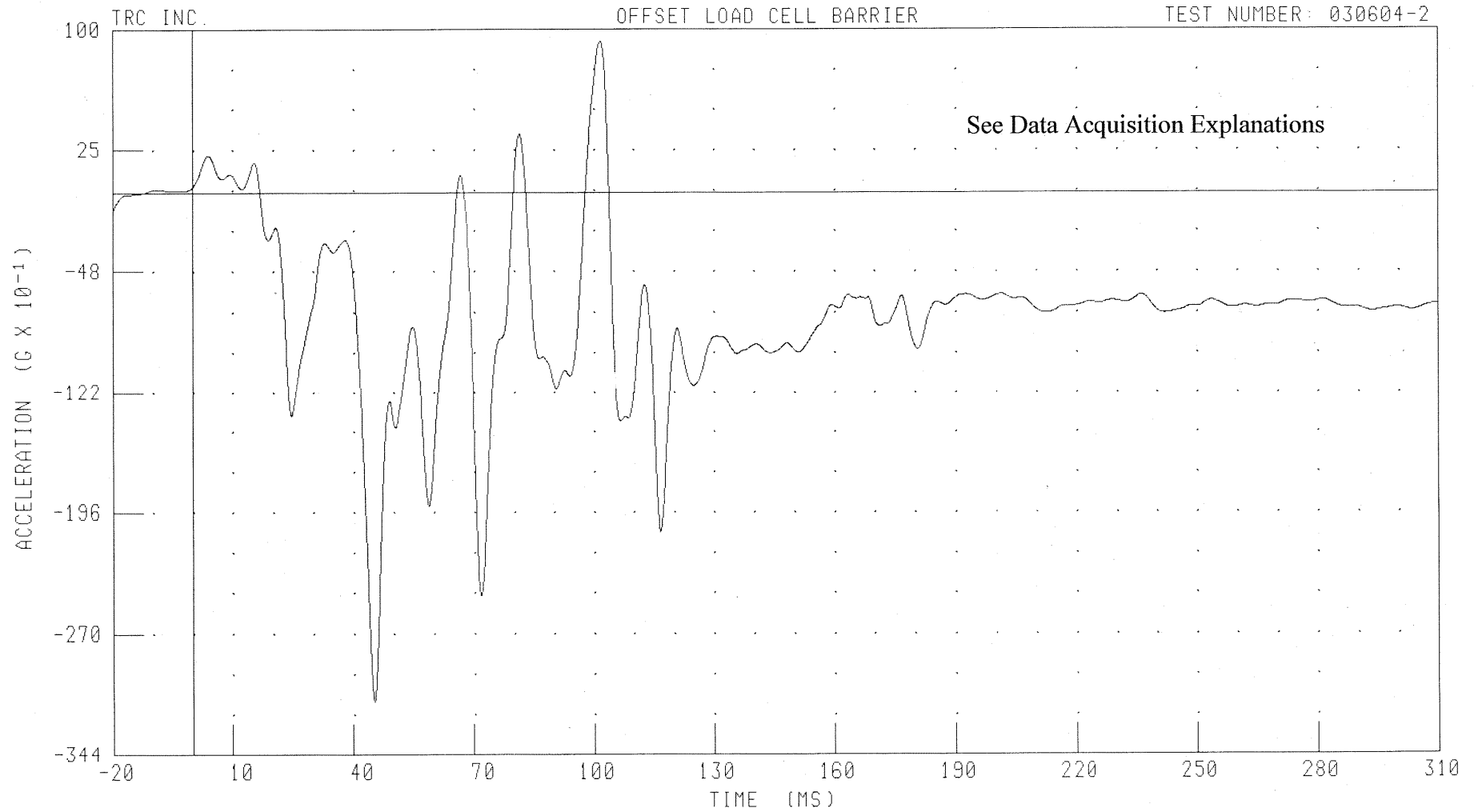
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS LEFT SIDE TOE PAN Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LTPZG1 FILTER: CH. CLASS 60

PEAK DATA: 9.29 G @ 101.68 MS; -31.18 G @ 45.28 MS

B-168

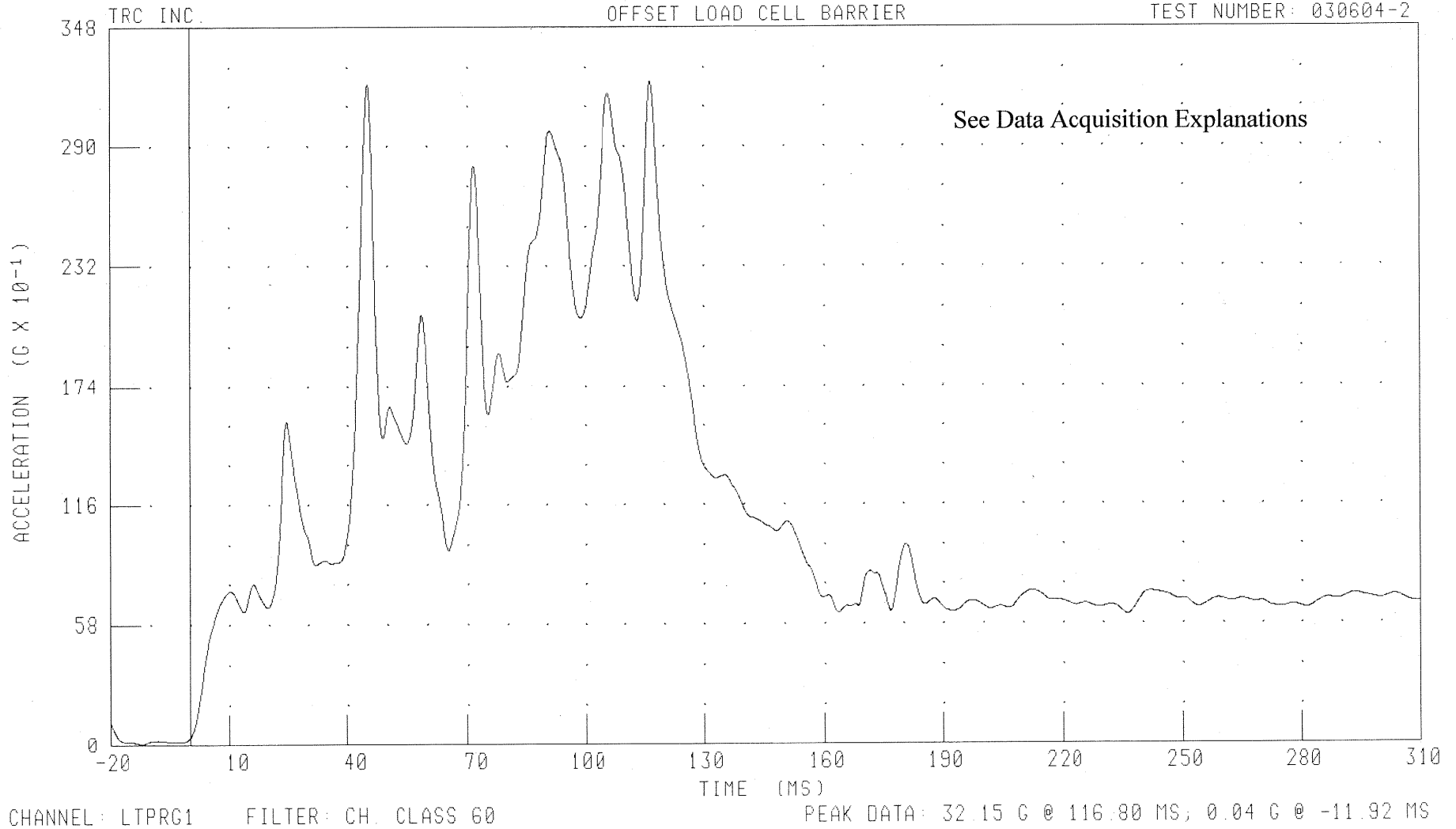
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS LEFT SIDE TOE PAN RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-169

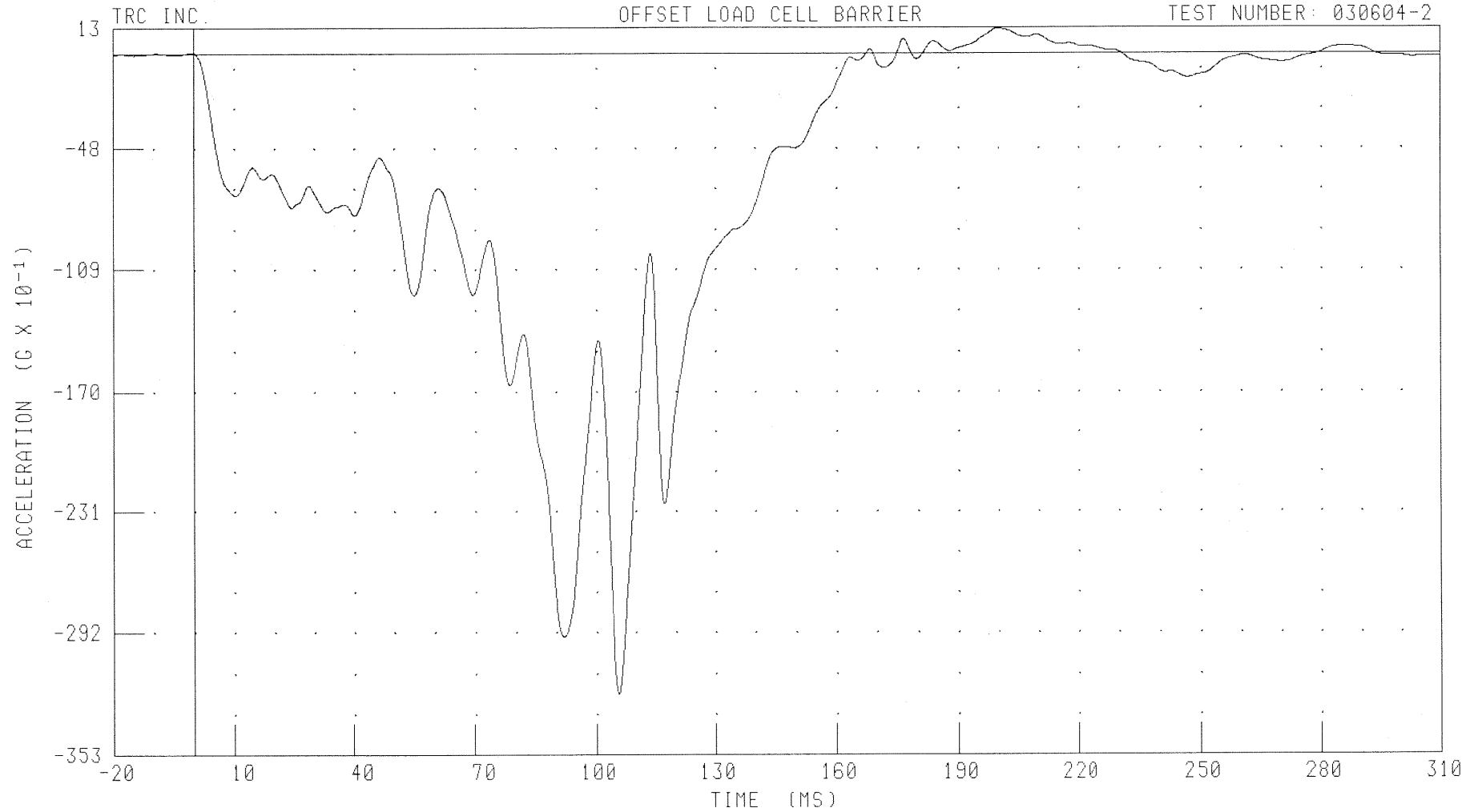
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS RIGHT SIDE TOE PAN X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RTPXG1

FILTER: CH. CLASS 60

PEAK DATA: 1.26 G @ 200.00 MS; -32.27 G @ 105.84 MS

B-170

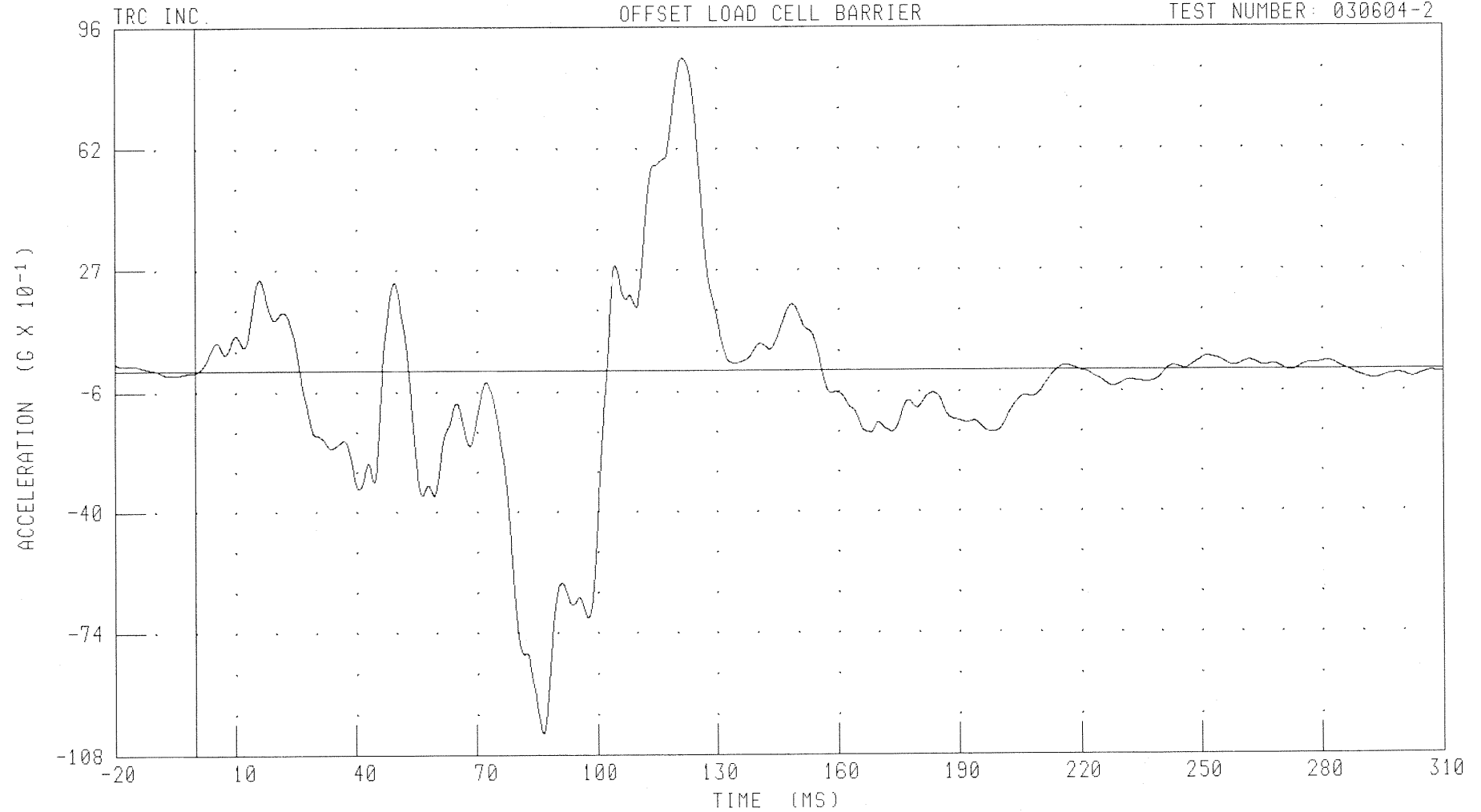
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS RIGHT SIDE TOE PAN Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RTPYG1

FILTER: CH. CLASS 60

PEAK DATA: 8.74 G @ 121.52 MS; -10.20 G @ 86.48 MS

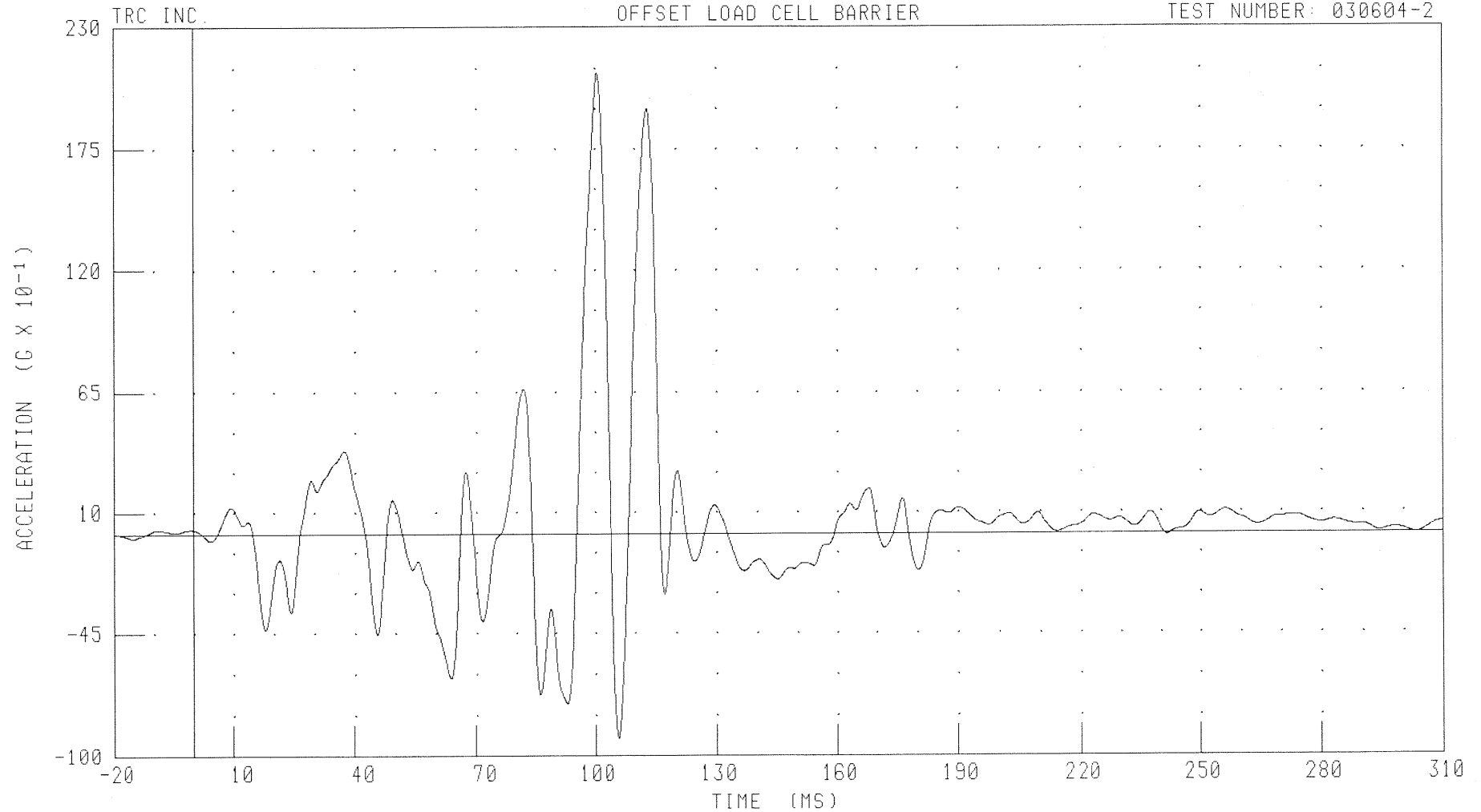
B-171

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
DRIVERS RIGHT SIDE TOE PAN Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: RTPZG1

FILTER: CH. CLASS 60

PEAK DATA: 20.96 G @ 100.64 MS; -9.23 G @ 106.00 MS

B-172

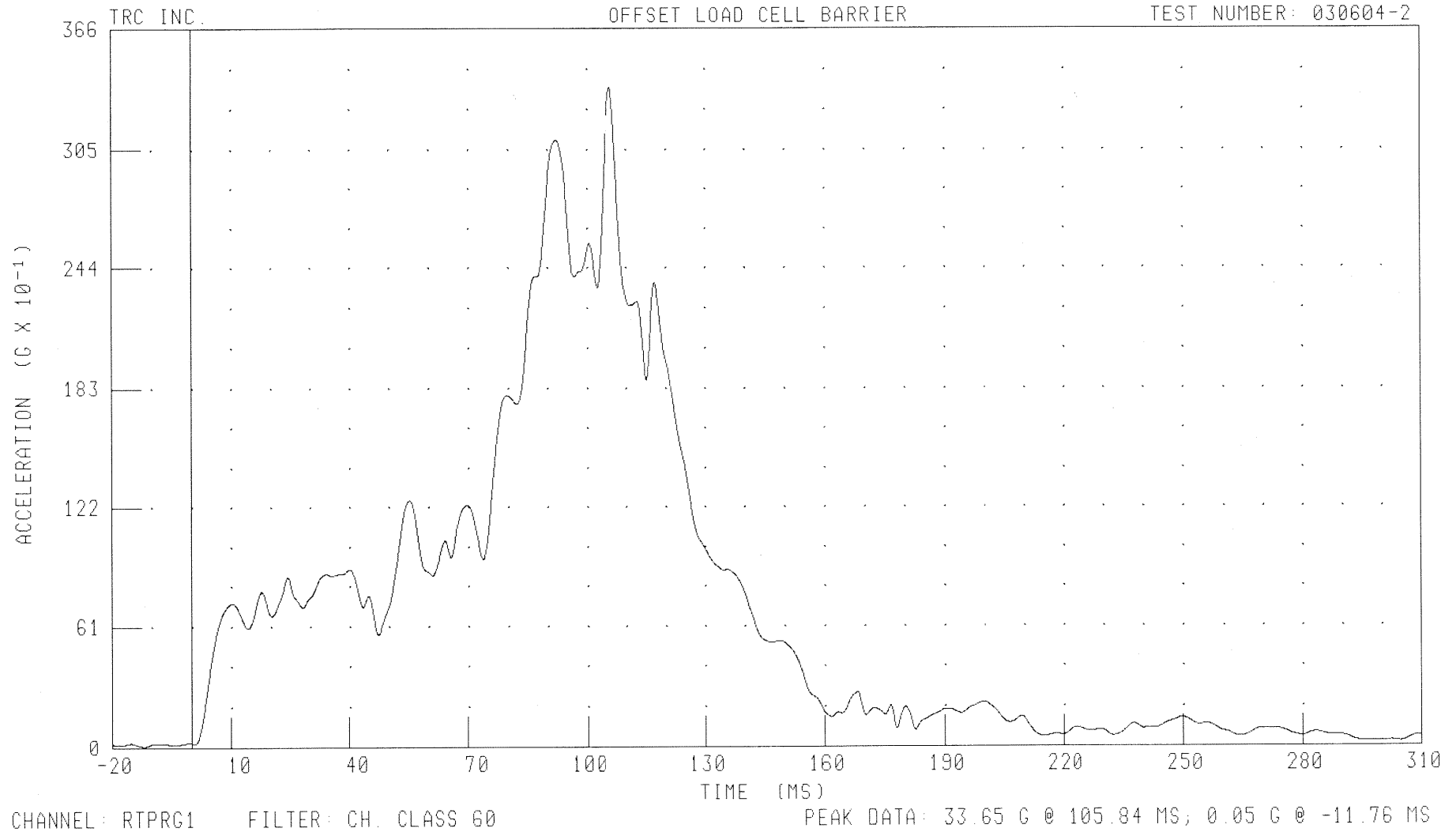
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVERS RIGHT SIDE TOE PAN RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-173

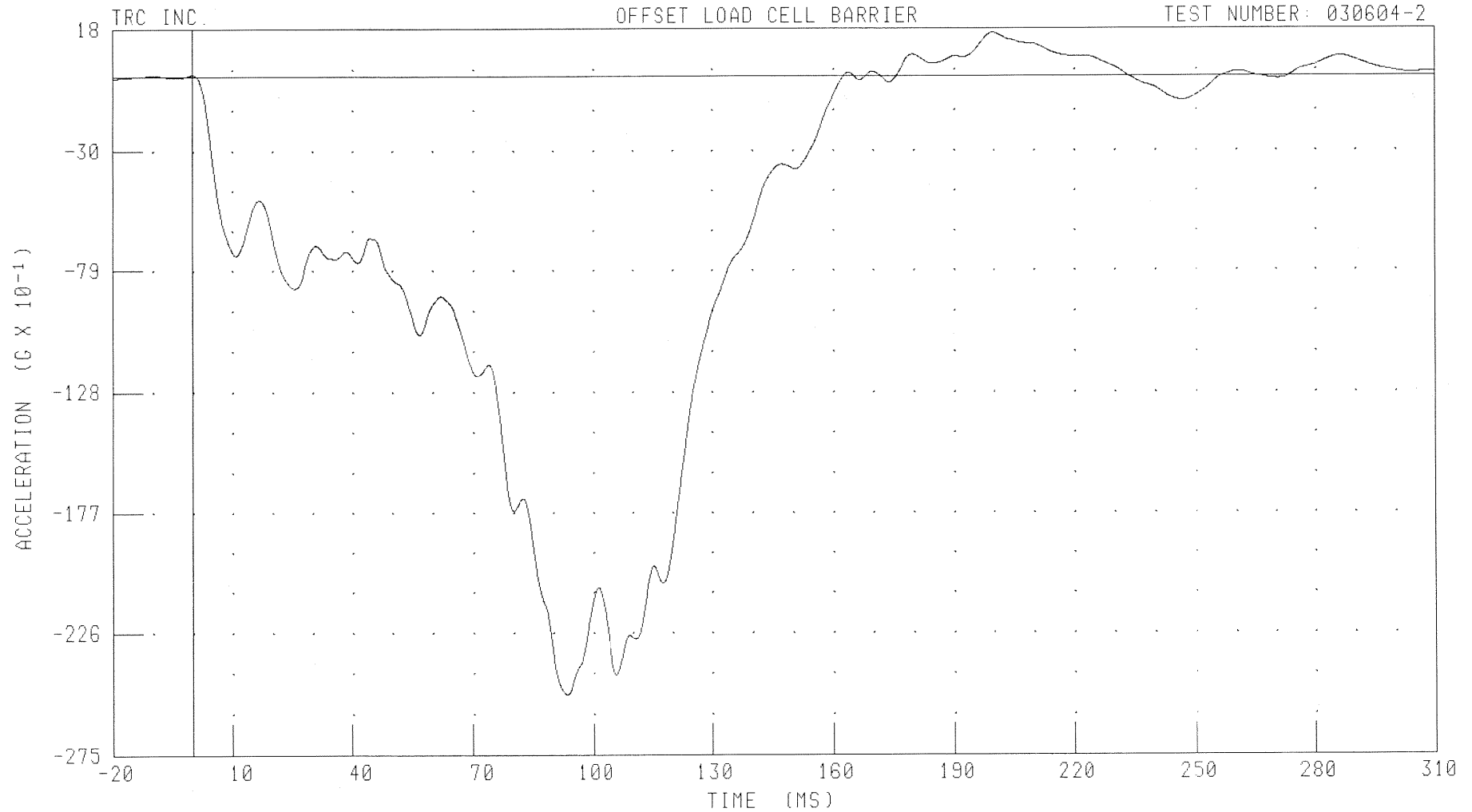
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGXG1

FILTER: CH. CLASS 60

PEAK DATA: 1.73 G @ 199.76 MS, -25.10 G @ 93.44 MS

B-174

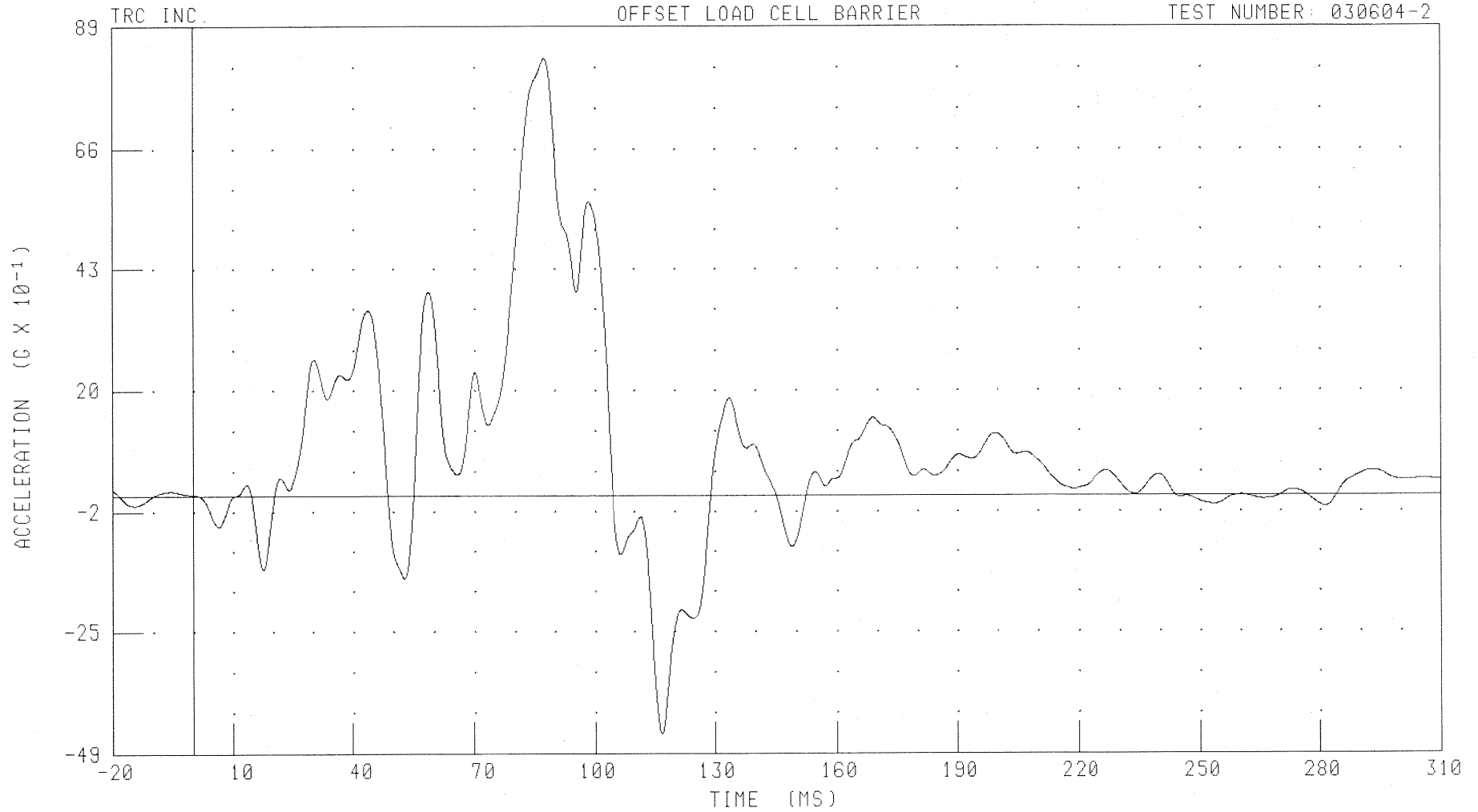
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 8.30 G @ 87.36 MS, -4.54 G @ 116.88 MS

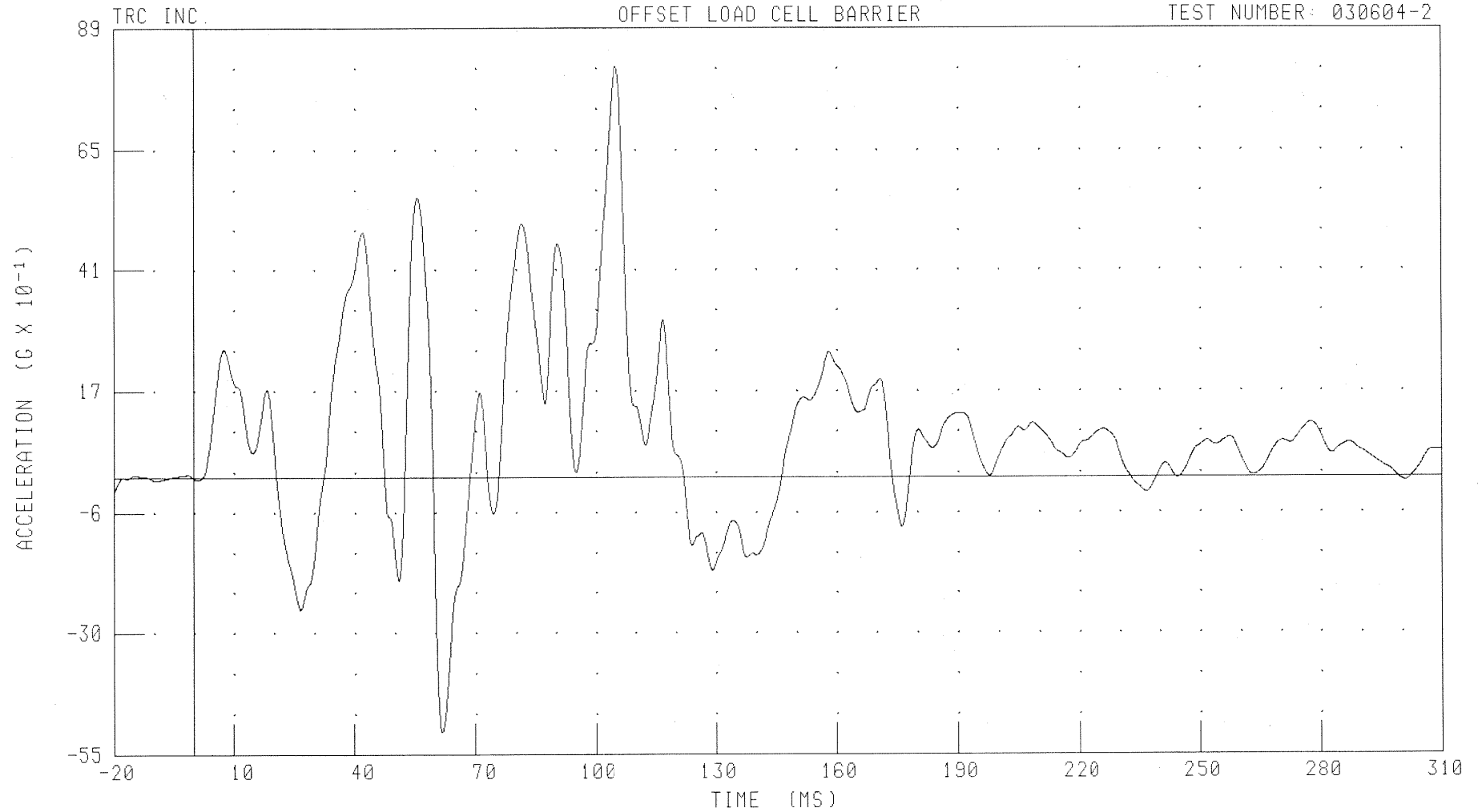
B-175

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGZG1 FILTER: CH. CLASS 60

B-176

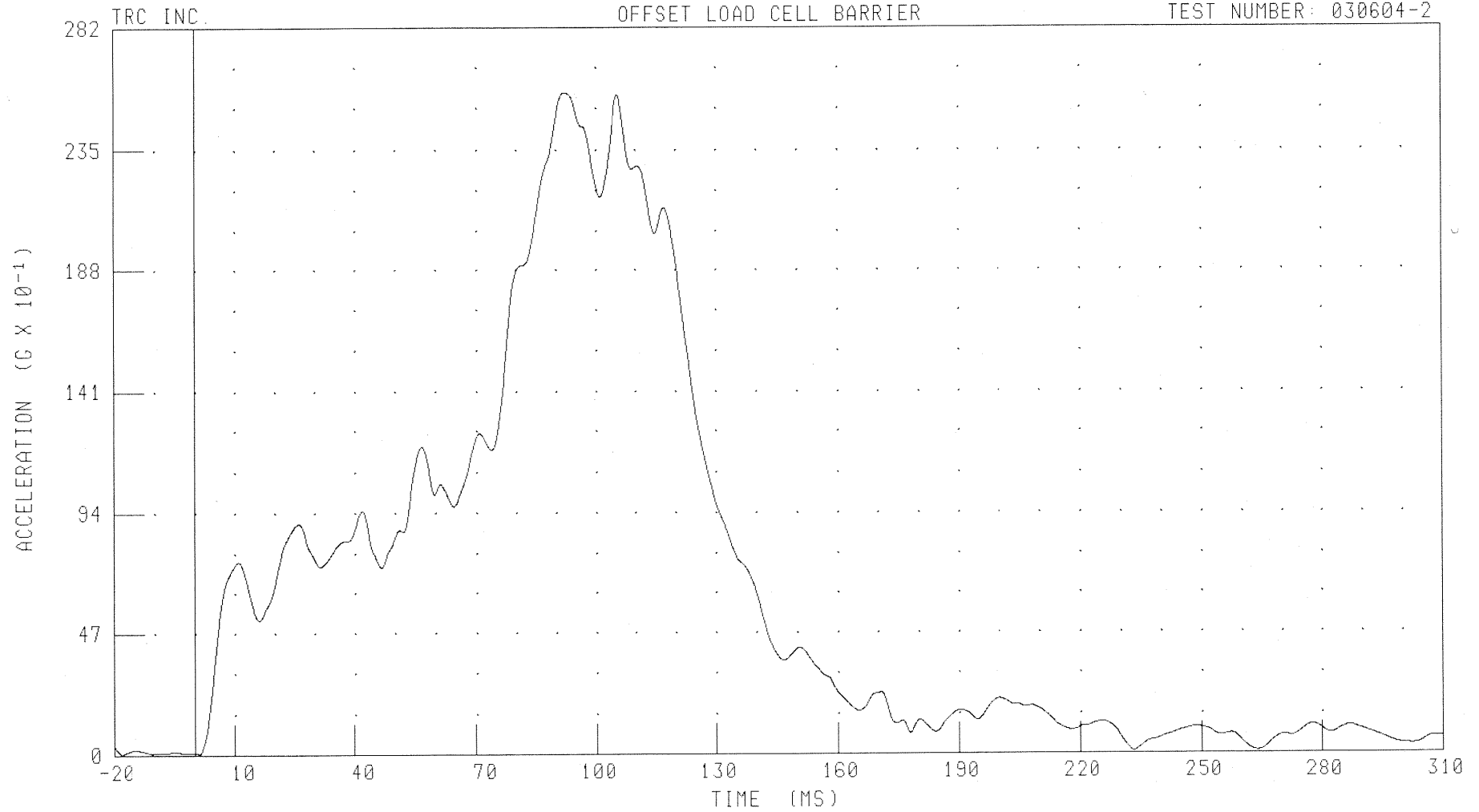
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 25.68 G @ 92.32 MS; 0.04 G @ 1.12 MS

B-177

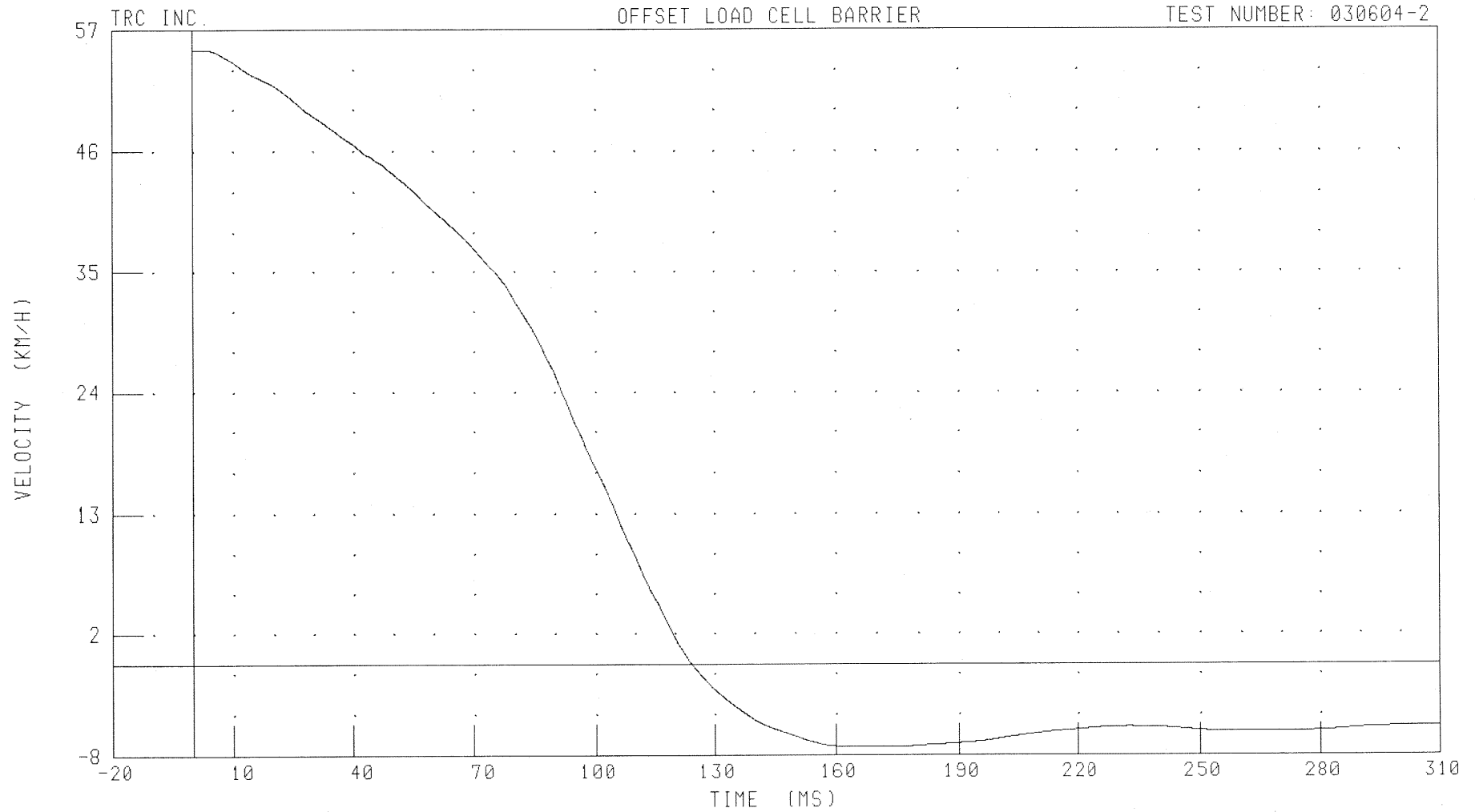
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 56.00 KM/H @ 0.00 MS; -7.47 KM/H @ 167.84 MS

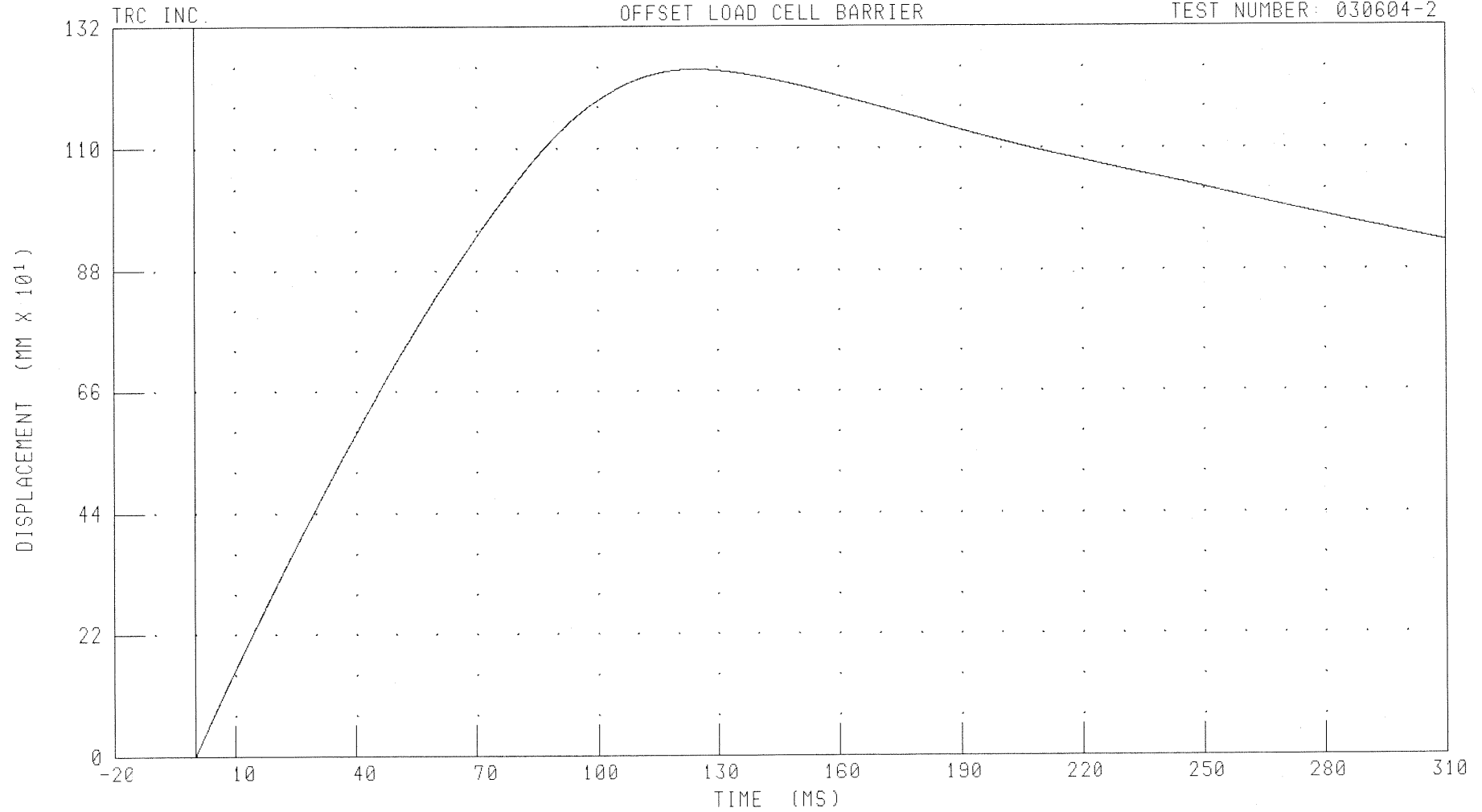
B-178

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGXD1

FILTER: CH. CLASS 180

PEAK DATA: 124.11 MM @ 124.32 MS; 0.00 MM @ 0.00 MS

B-179

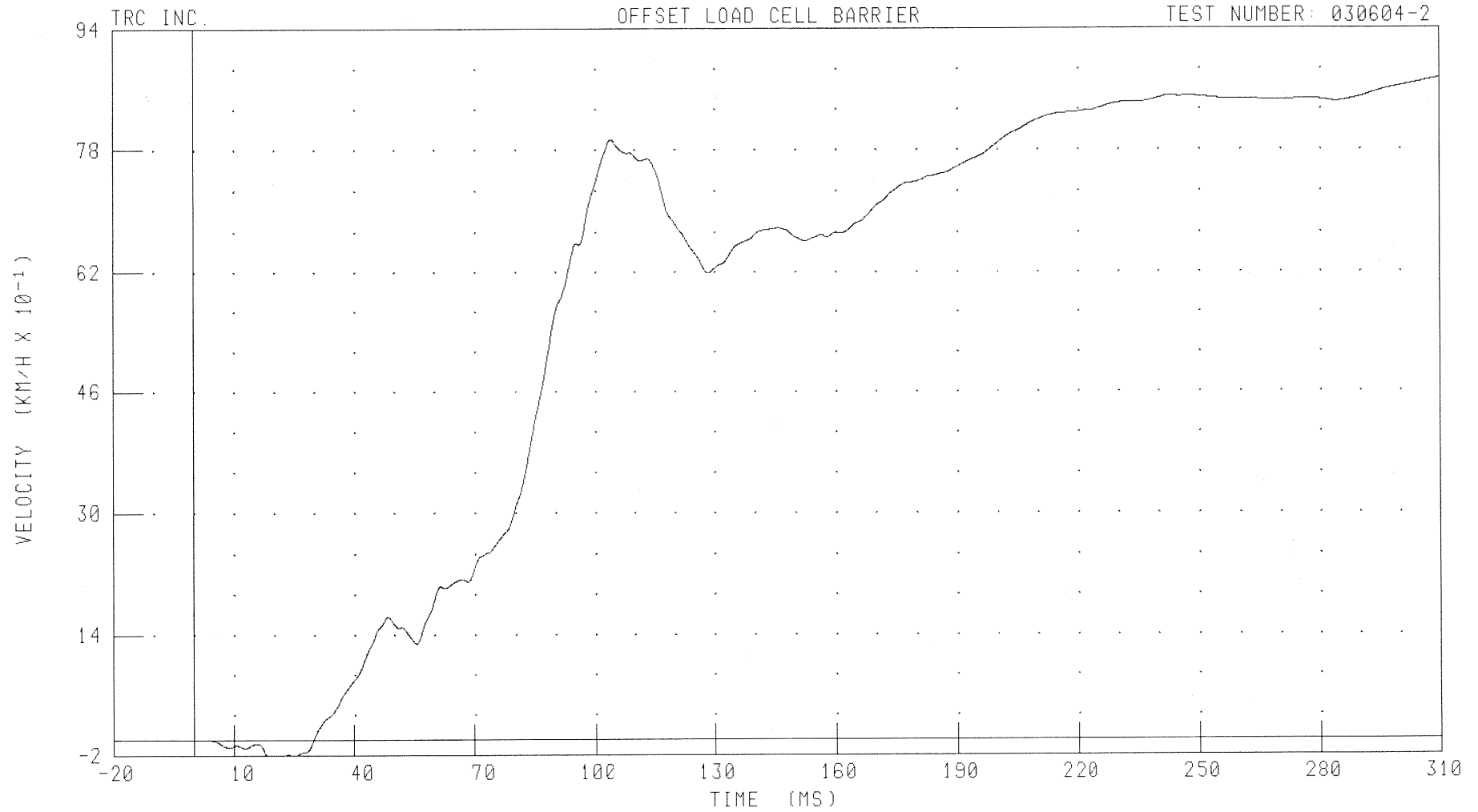
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGYV1 FILTER: CH. CLASS 180

B-180

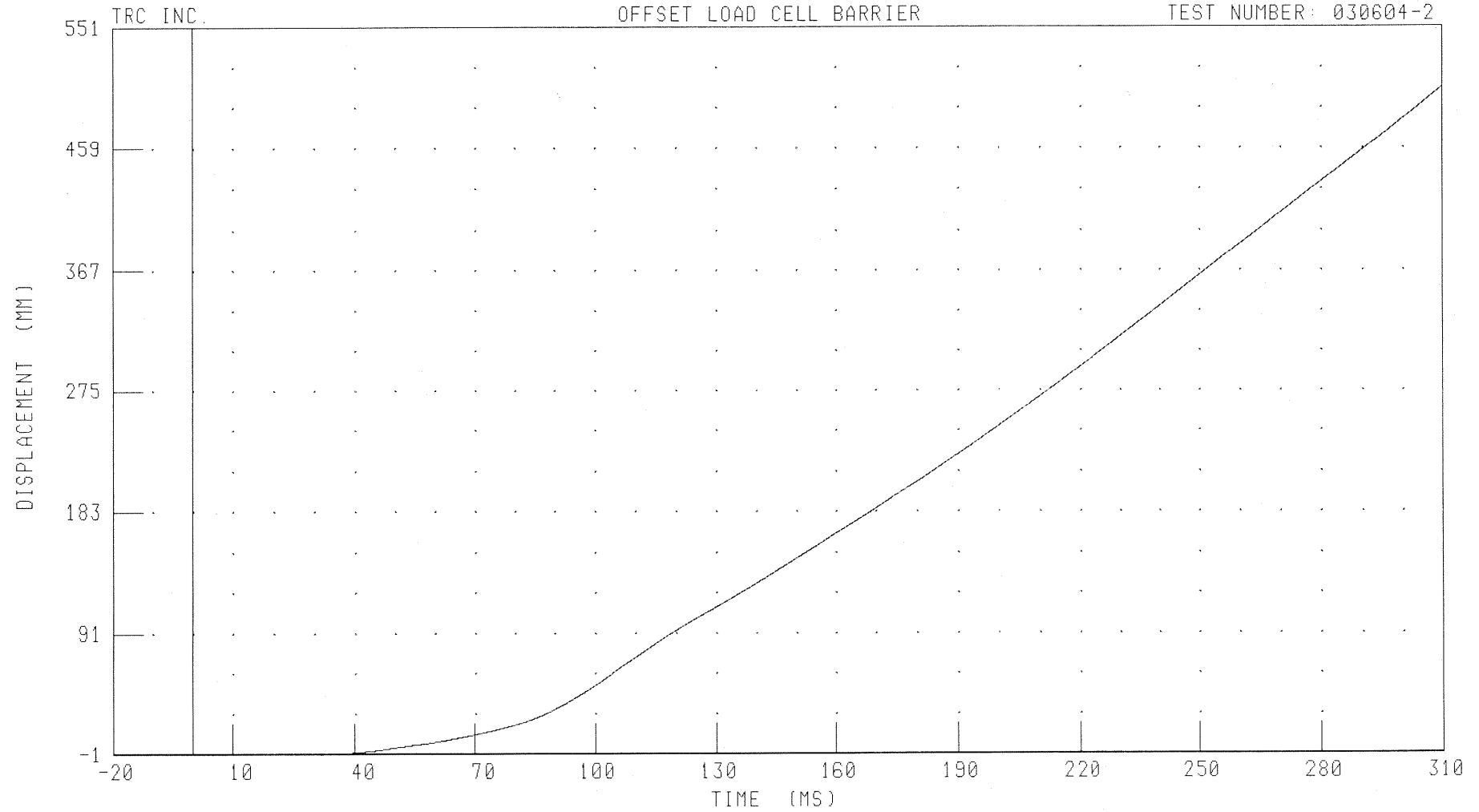
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGYD1

FILTER: CH. CLASS 180

PEAK DATA: 505.04 MM @ 310.00 MS, -0.92 MM @ 29.84 MS

B-181

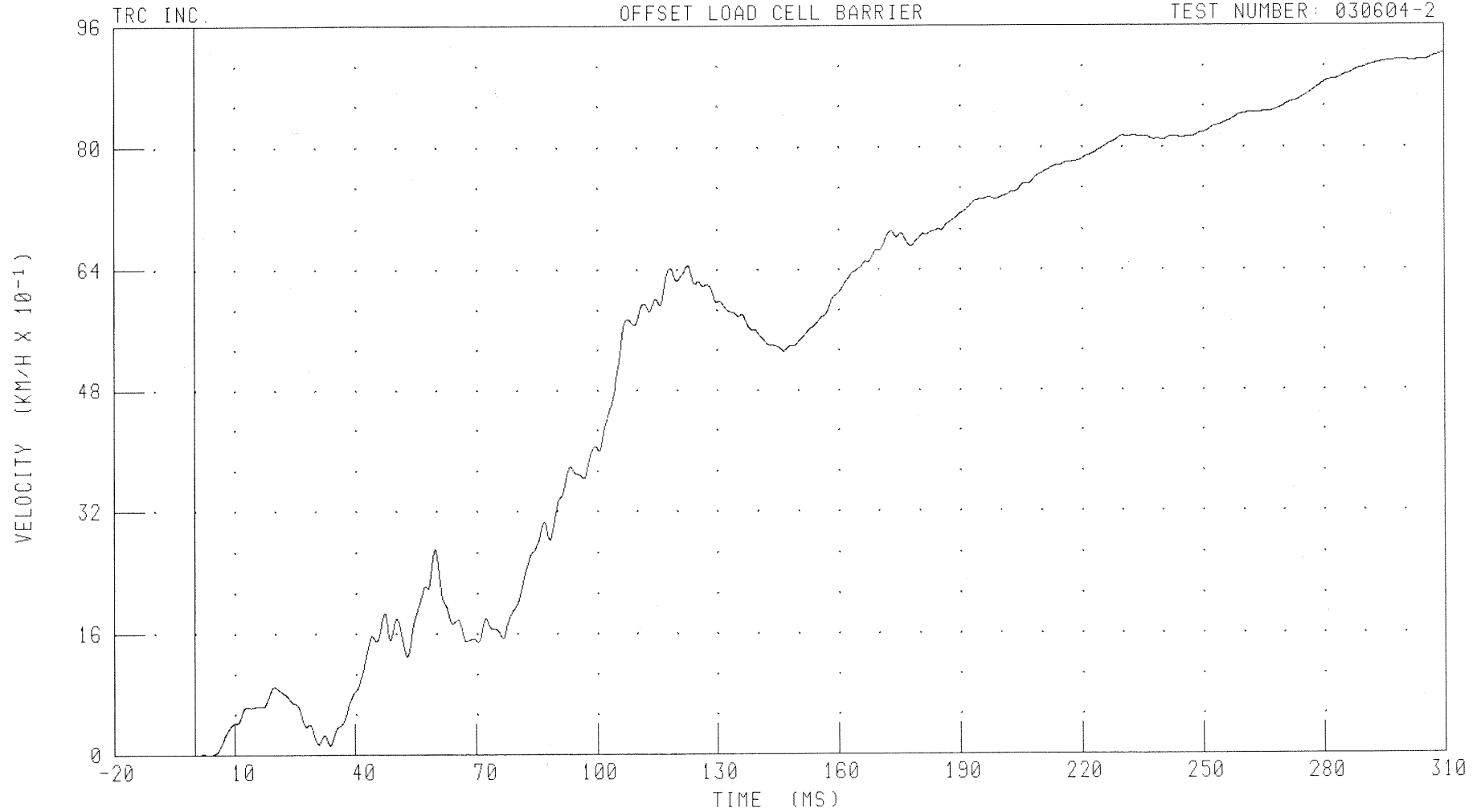
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 9.23 KM/H @ 310.00 MS; -0.01 KM/H @ 3.60 MS

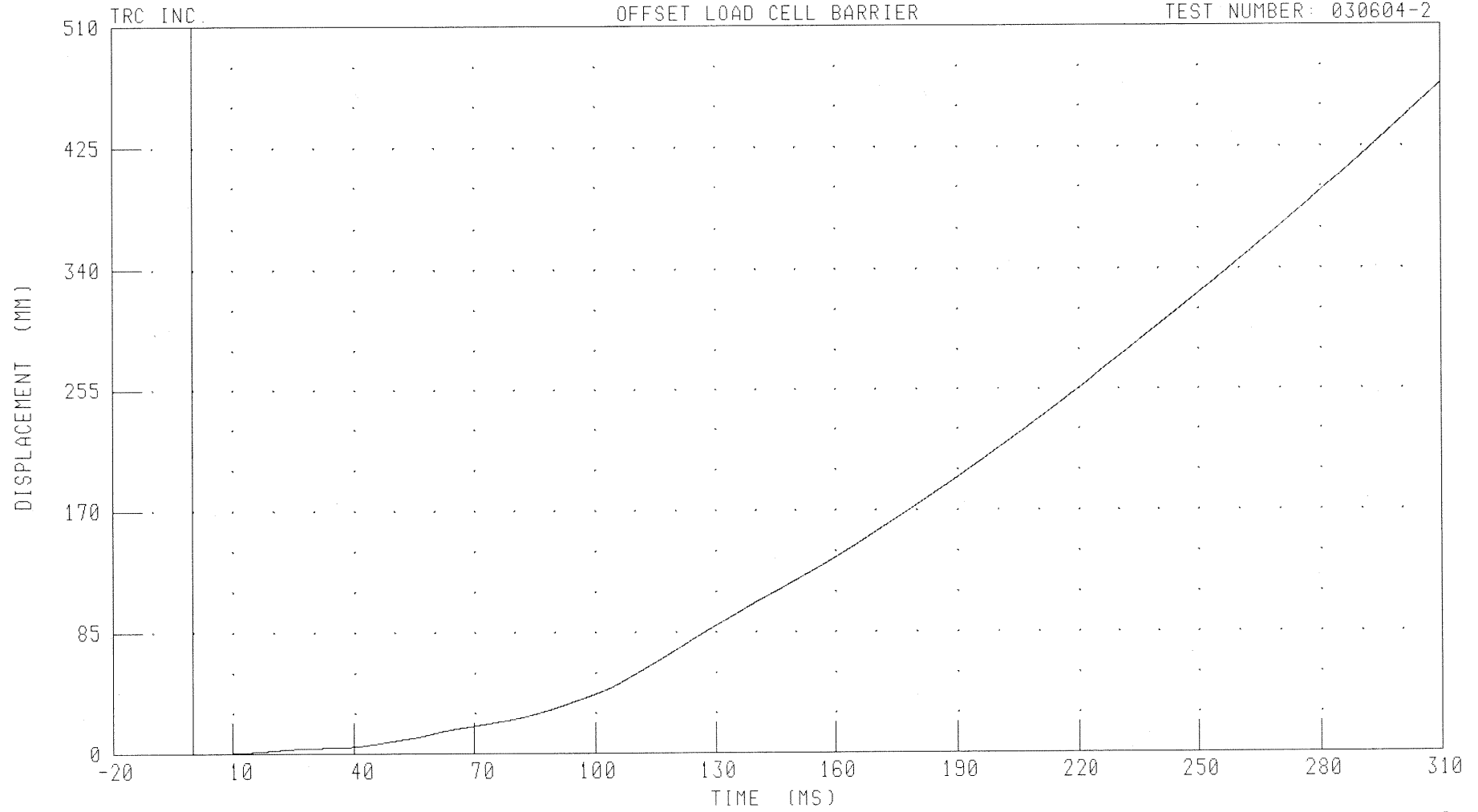
B-182

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H
VEHICLE CENTER OF GRAVITY Z-AXIS DISPLACEMENT

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: VCGZD1

FILTER: CH. CLASS 180

PEAK DATA: 468.80 MM @ 310.00 MS; 0.00 MM @ 4.32 MS

B-183

030604-2

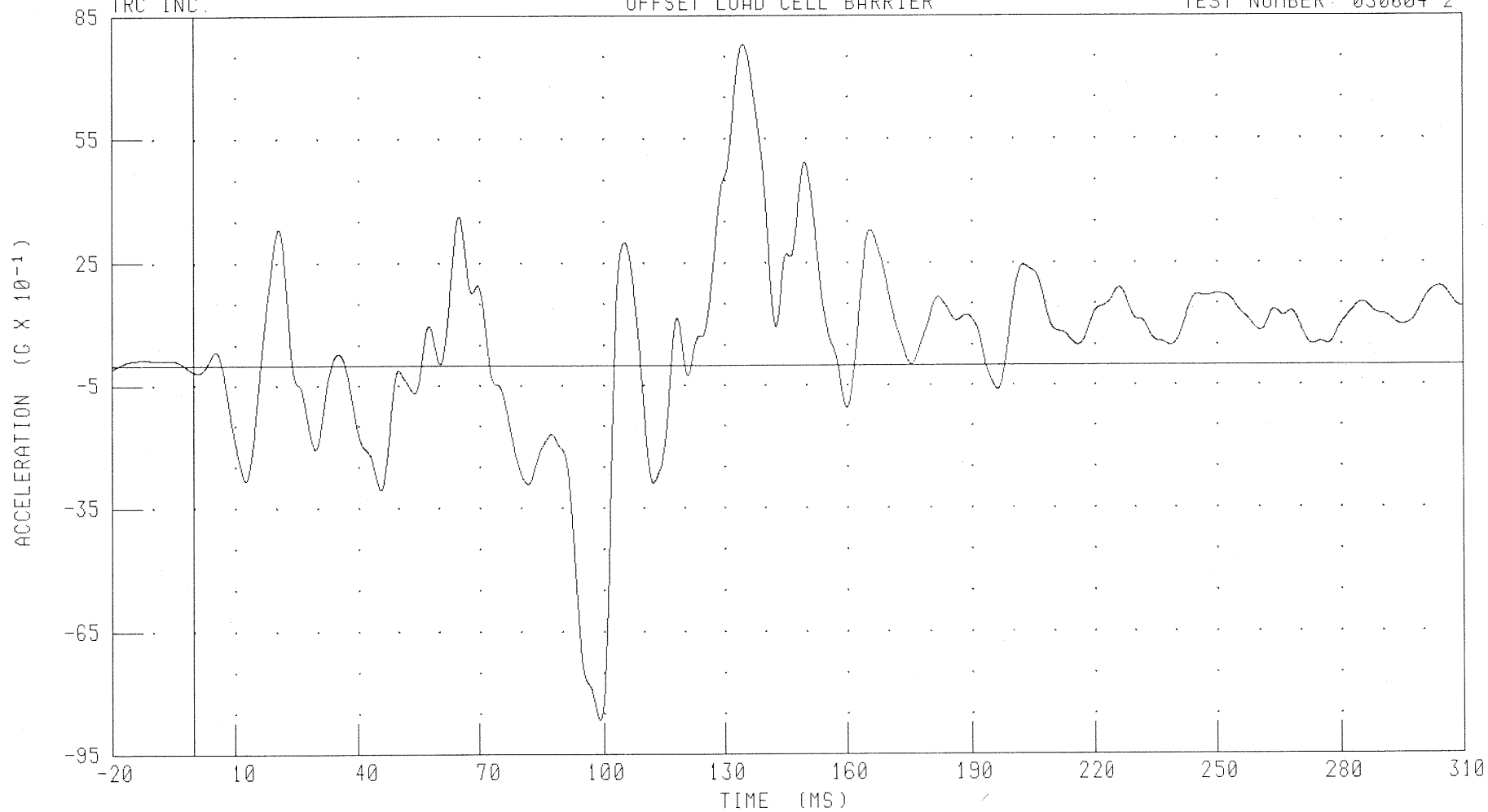
2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

REAR DECK Z-AXIS ACCELERATION

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2

TRC INC.



CHANNEL: RDKZG1 FILTER: CH. CLASS 60

PEAK DATA: 7.78 G @ 134.64 MS; -8.68 G @ 99.20 MS

B-184

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

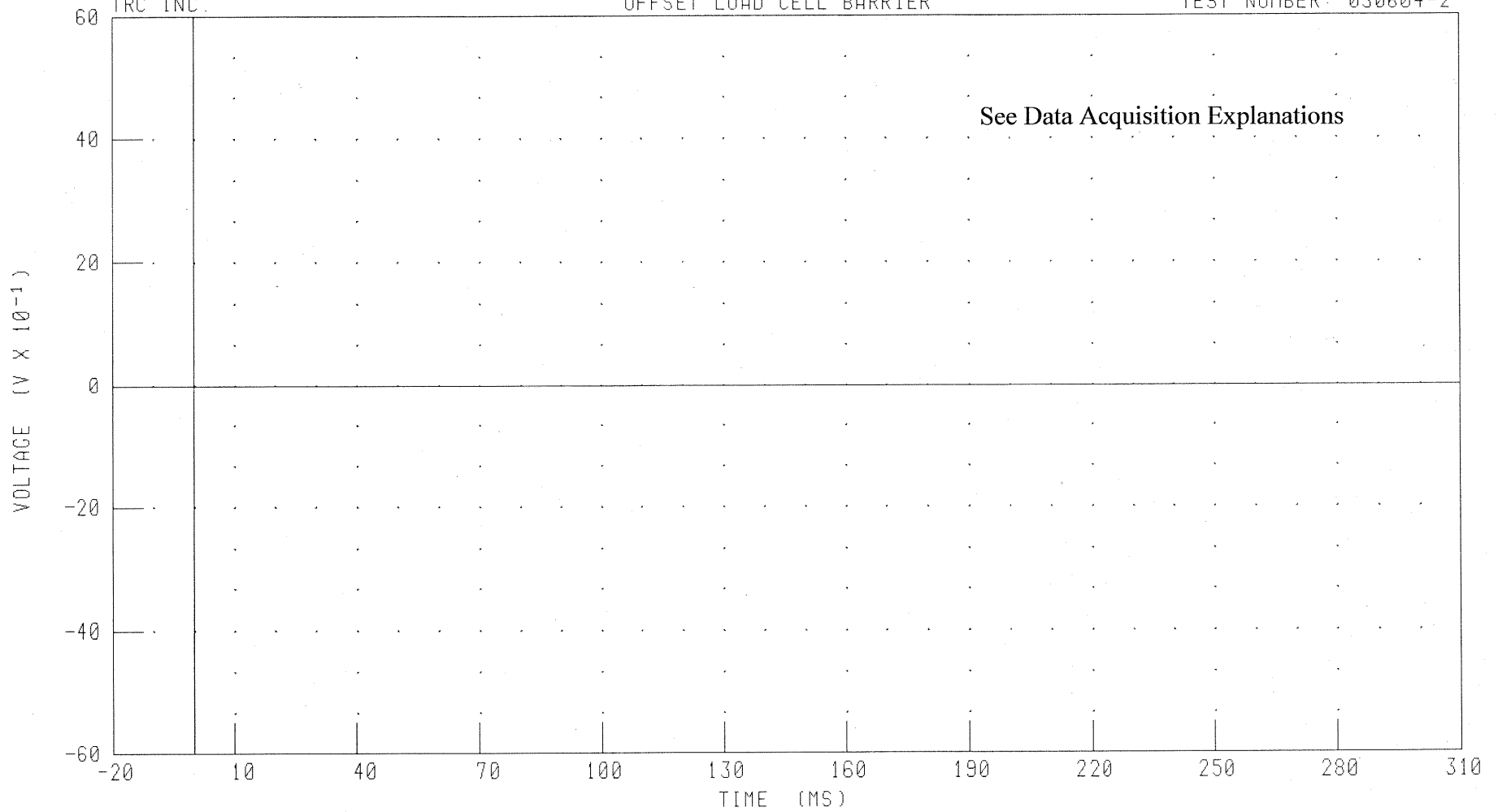
DRIVER AIRBAG EVENT - WIRE A

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2

TRC INC.

See Data Acquisition Explanations



CHANNEL: DABETA FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 157.28 MS, 0.00 V @ 74.16 MS

B-185

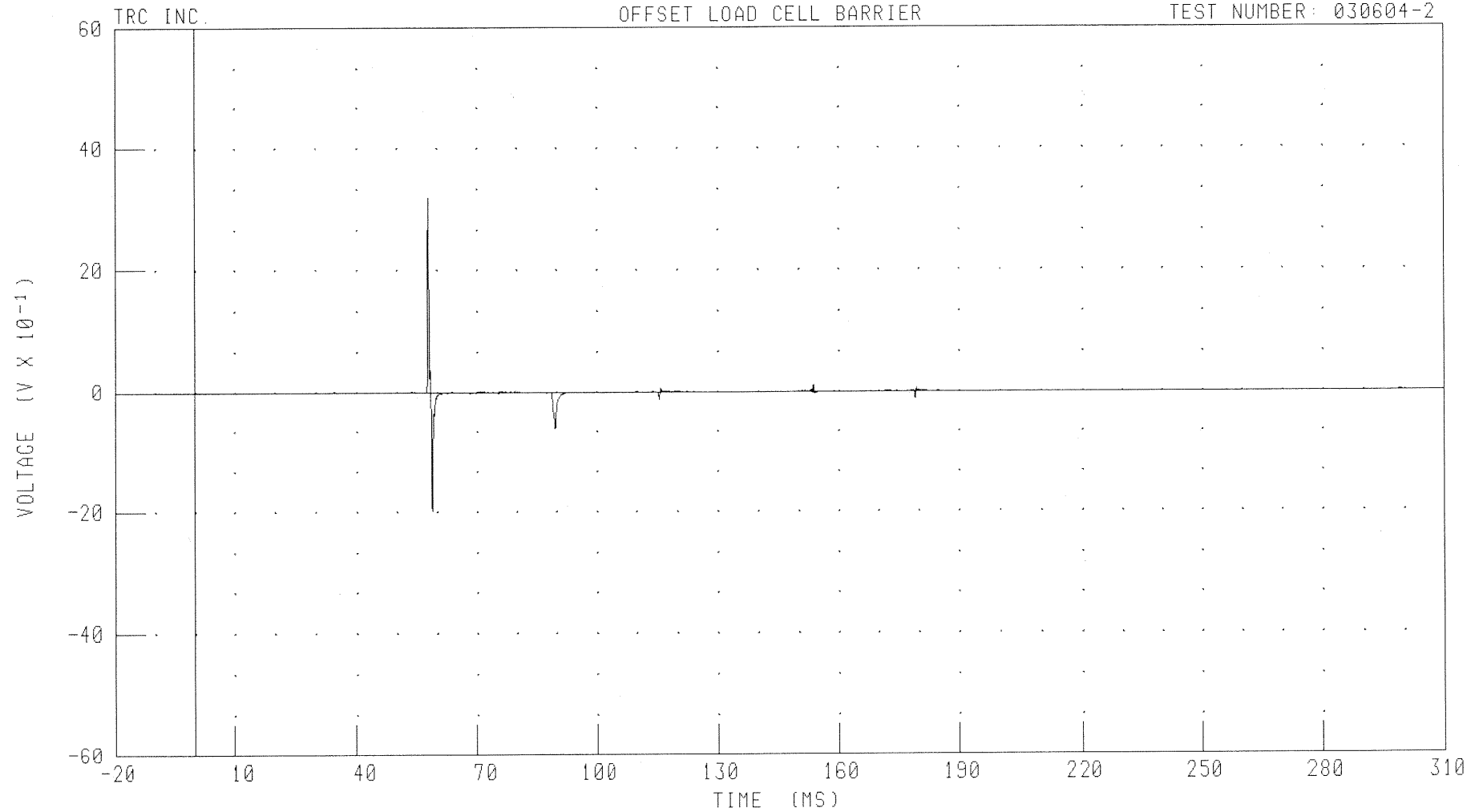
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER AIRBAG EVENT - WIRE A

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: PABETA FILTER: CH. CLASS 1000

PEAK DATA: 3.19 V @ 57.92 MS; -1.99 V @ 58.88 MS

B-186

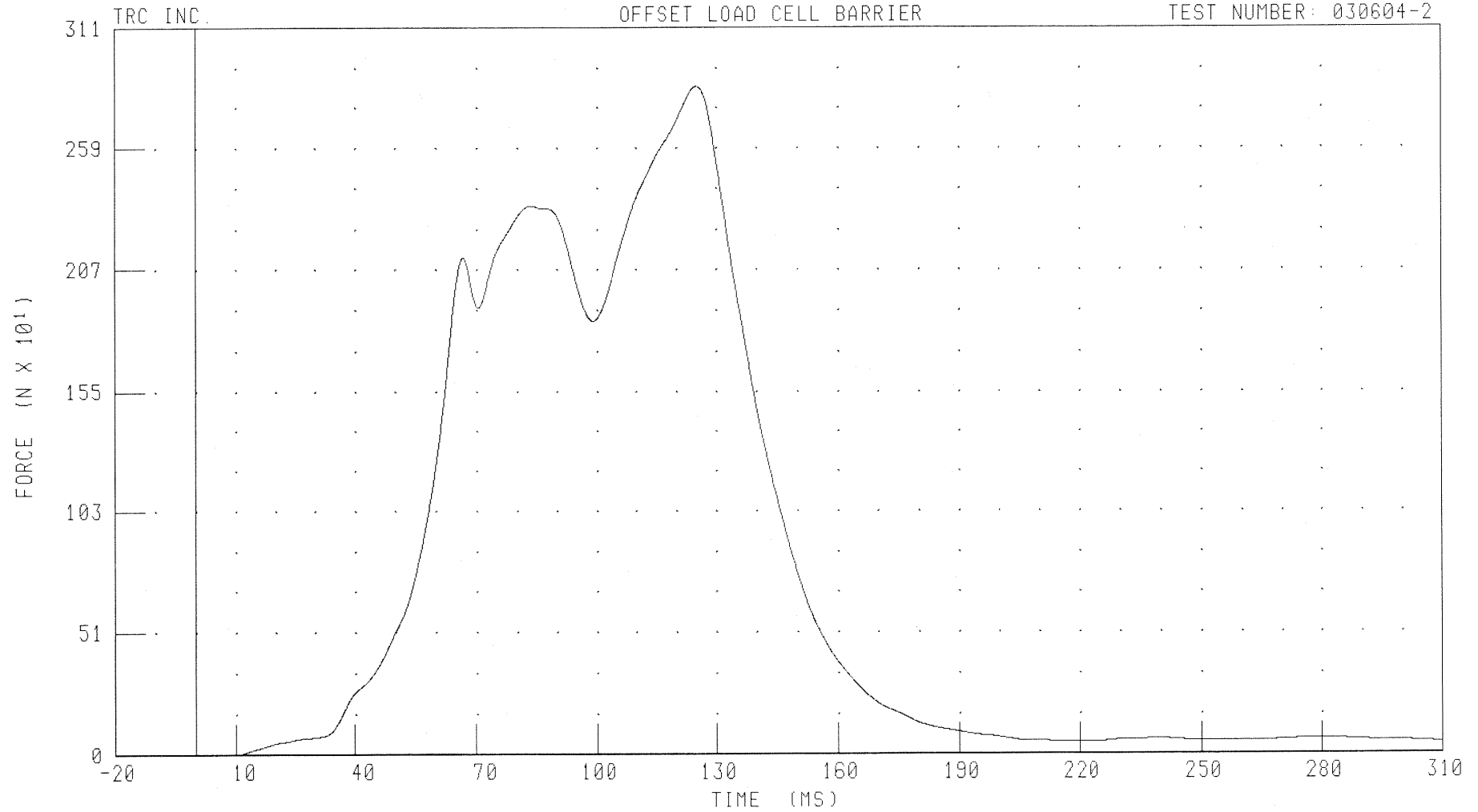
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER SHOULDER BELT FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: SHBF1

FILTER: CH. CLASS 60

PEAK DATA: 2866.08 N @ 125.12 MS; -2.19 N @ -7.12 MS

B-187

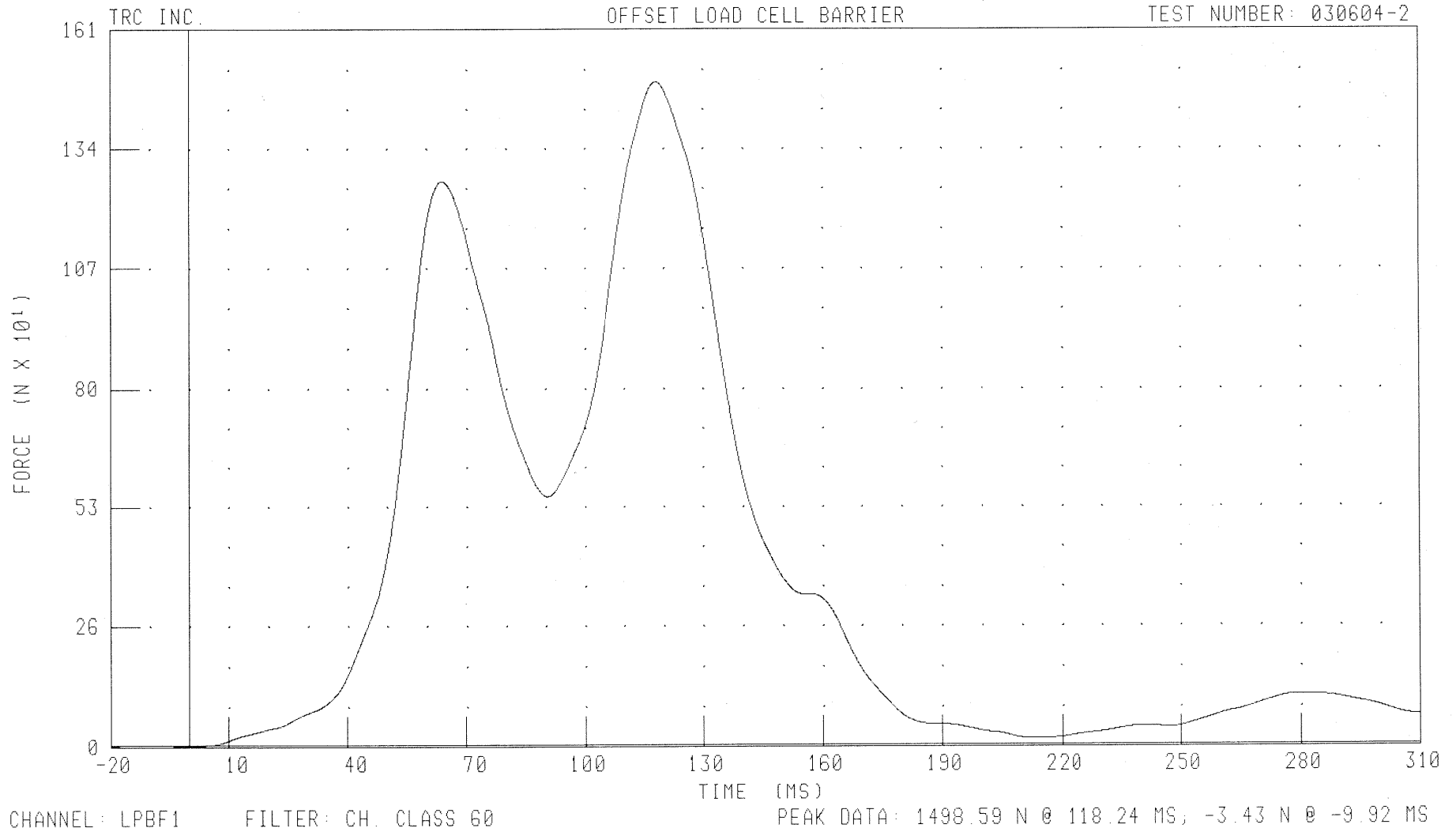
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

DRIVER LAP BELT FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-188

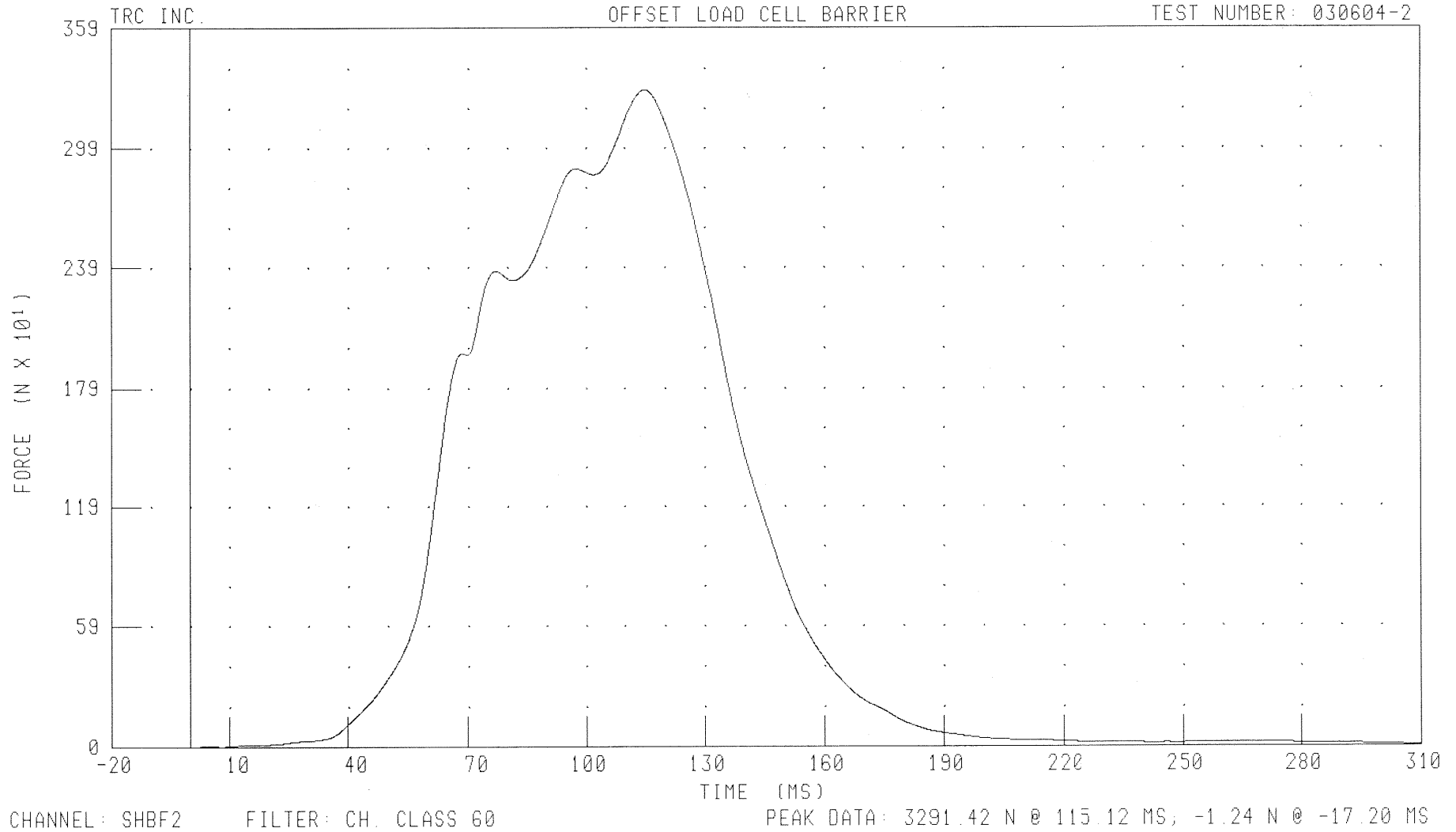
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER SHOULDER BELT FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-189

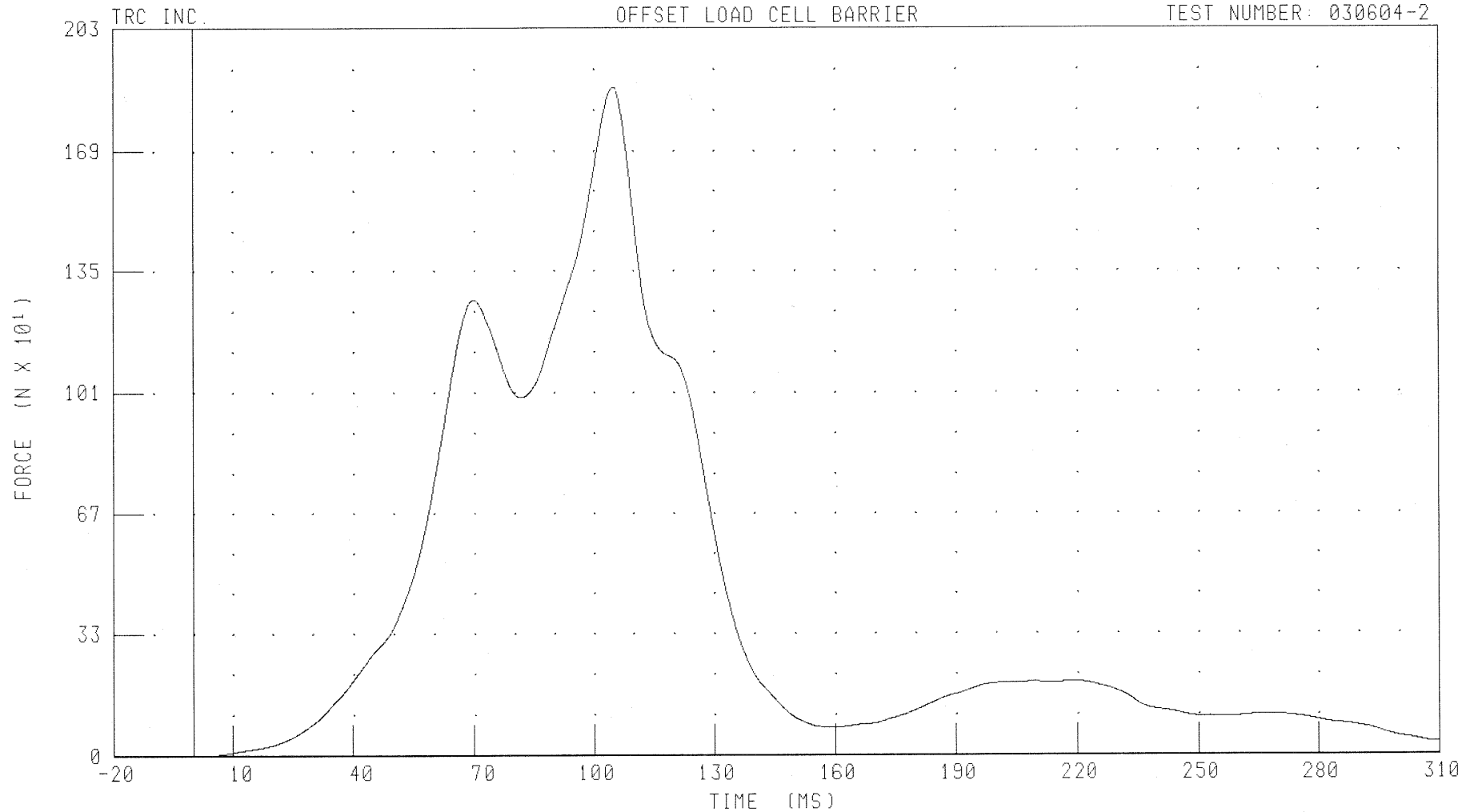
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

PASSENGER LAP BELT FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LPBF2

FILTER: CH. CLASS 60

PEAK DATA: 1875.03 N @ 104.96 MS; -2.81 N @ -16.00 MS

B-190

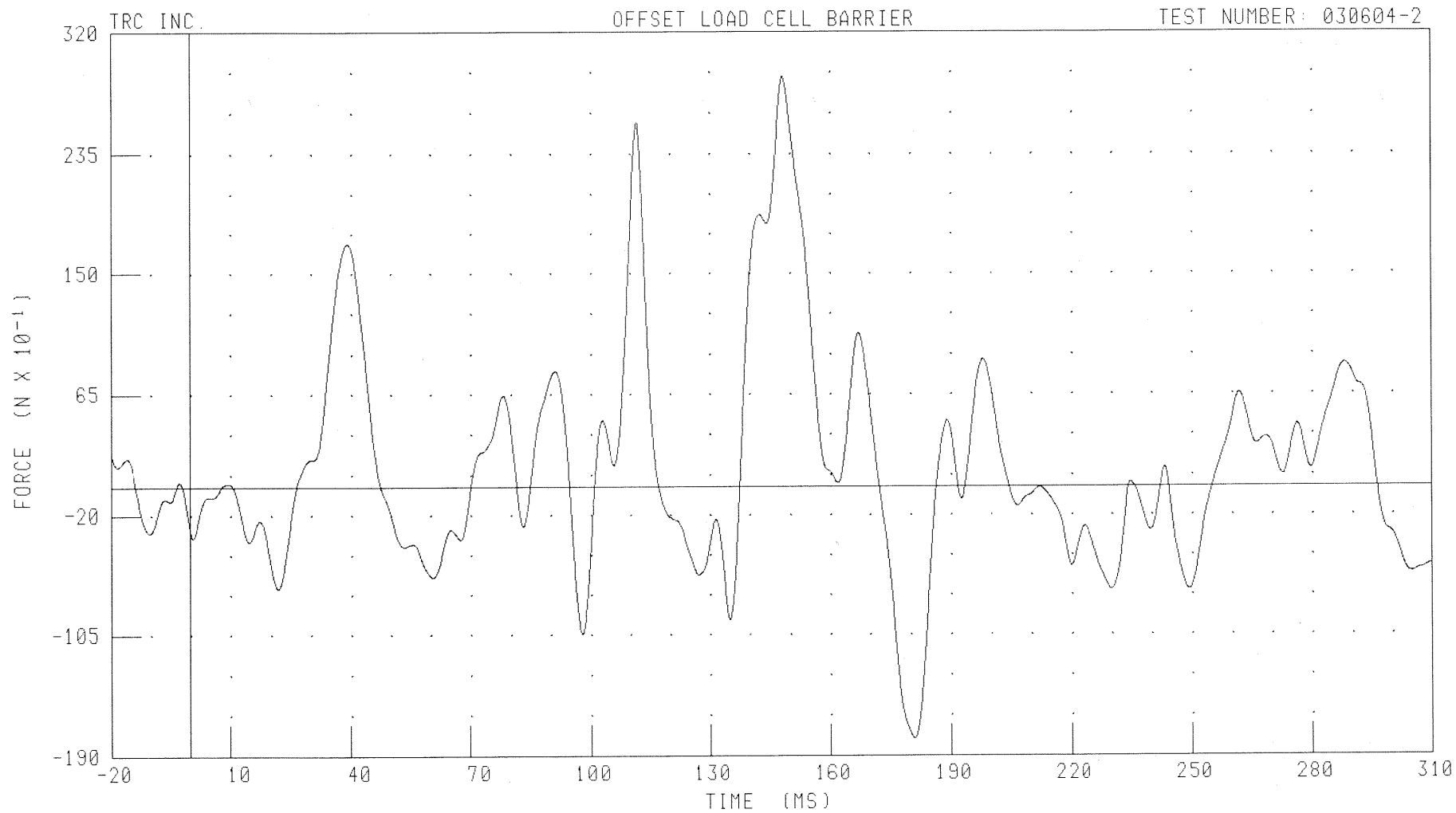
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA1XF

FILTER: CH. CLASS 60

PEAK DATA: 28.84 N @ 148.24 MS; -17.79 N @ 180.96 MS

B-191

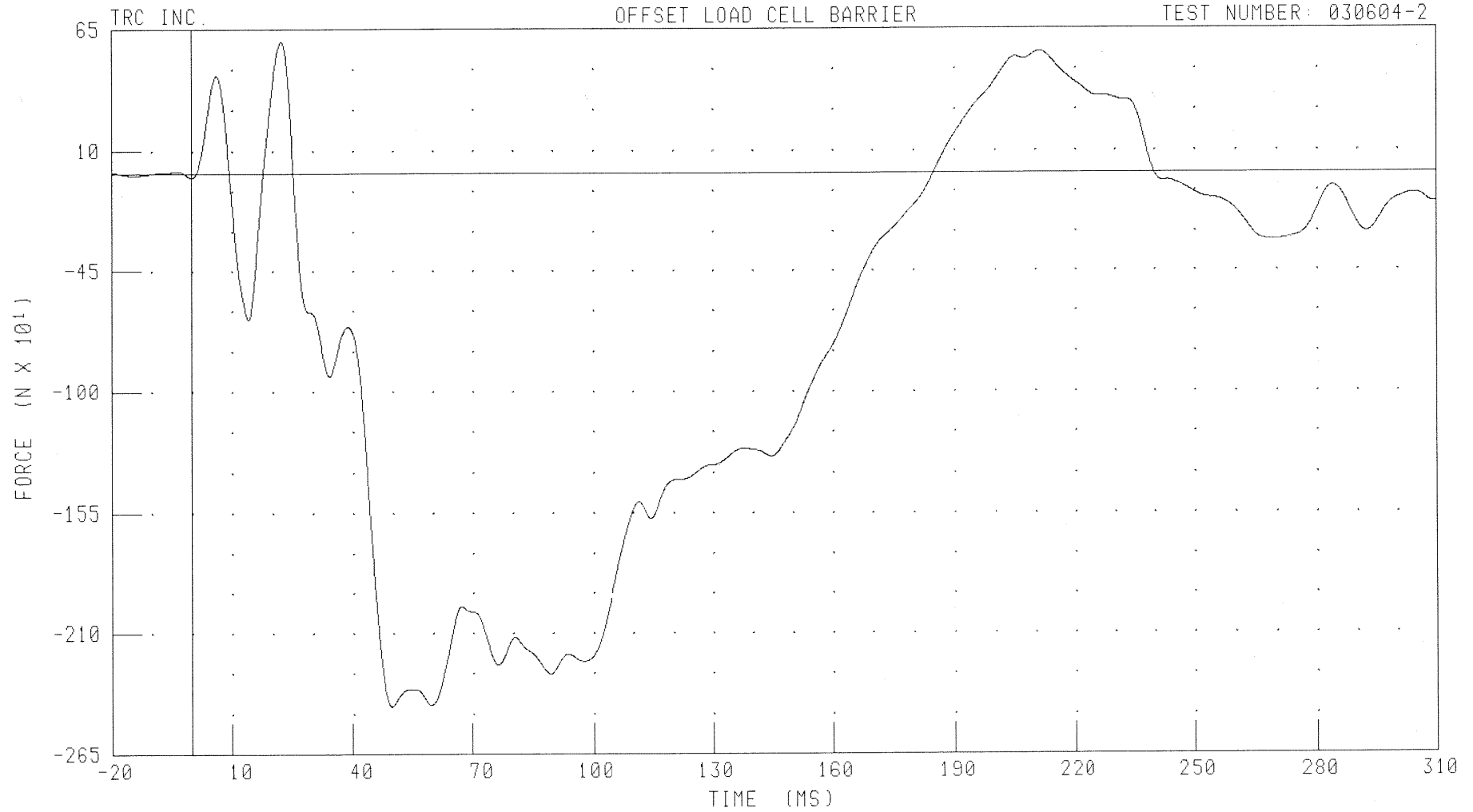
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA2XF FILTER: CH. CLASS 60

PEAK DATA: 595.69 N @ 22.24 MS; -2434.79 N @ 49.68 MS

B-192

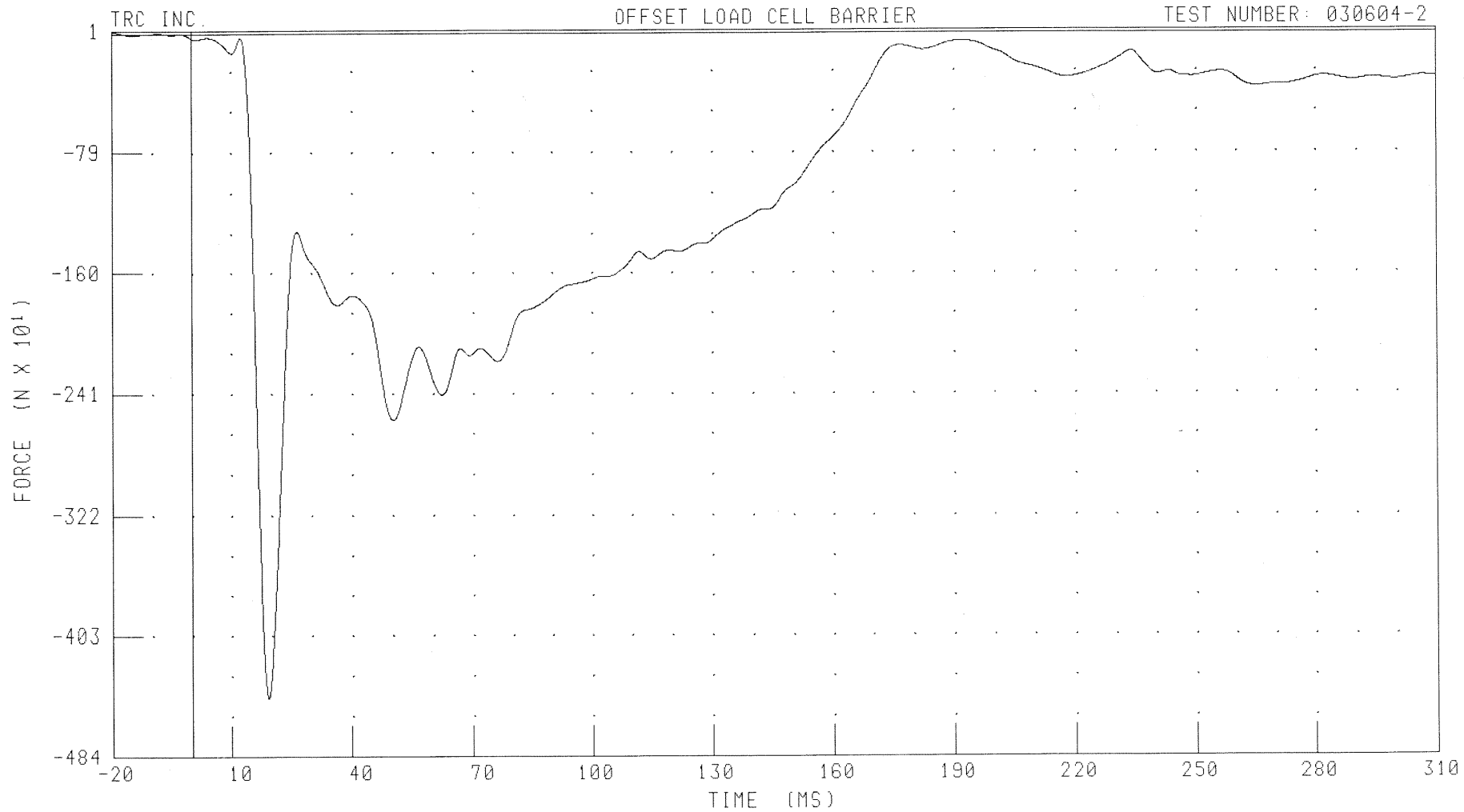
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA3XF FILTER: CH. CLASS 60

PEAK DATA: 15.75 N @ -20.00 MS; -4453.17 N @ 19.28 MS

B-193

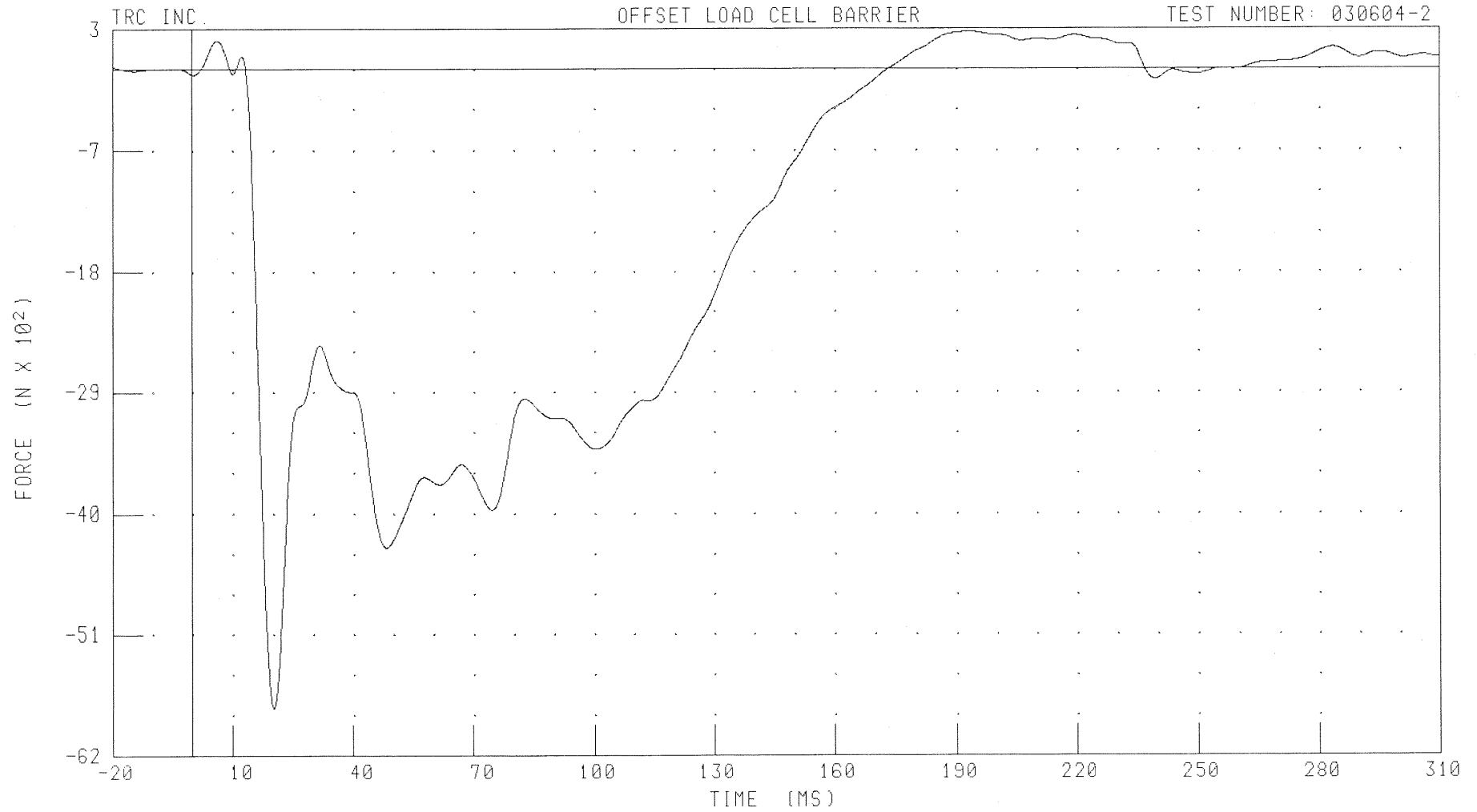
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA4XF FILTER: CH. CLASS 60

B-194

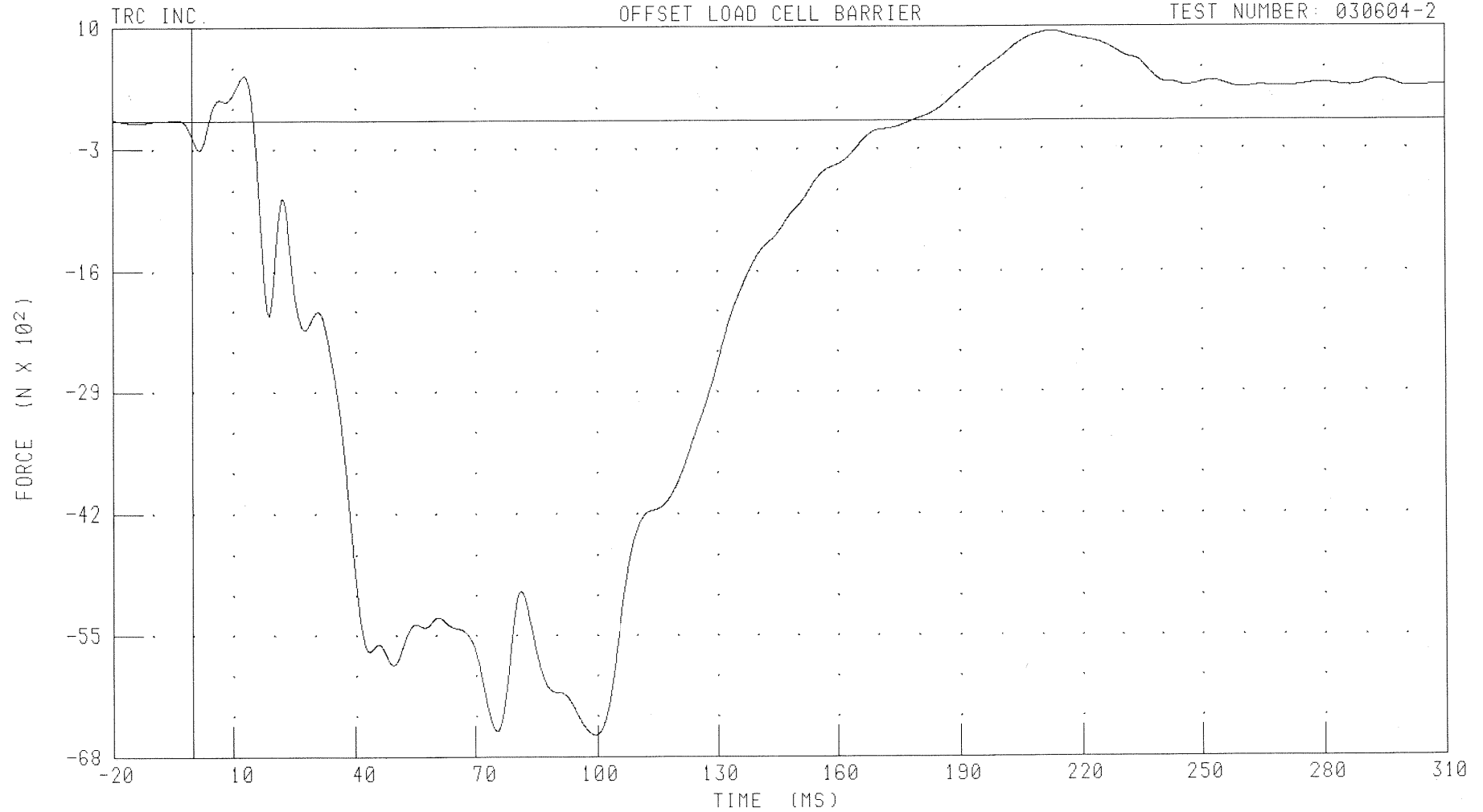
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A5 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA5XF FILTER: CH. CLASS 60

PEAK DATA: 951.14 N @ 212.64 MS; -6570.83 N @ 99.44 MS

B-195

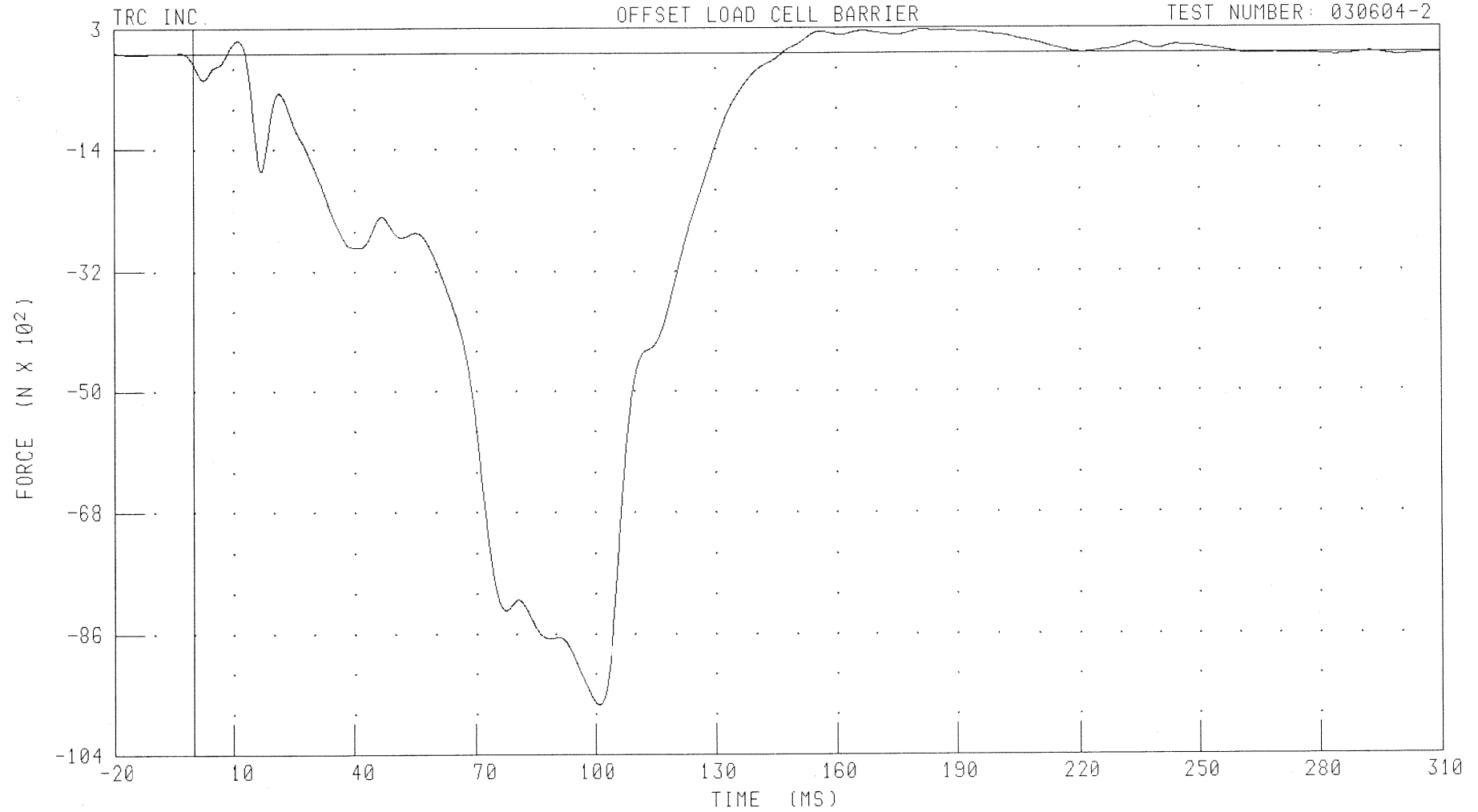
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A6 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA6XF FILTER: CH. CLASS 60

PEAK DATA: 34916 N @ 181.84 MS, -9683.00 N @ 101.04 MS

B-196

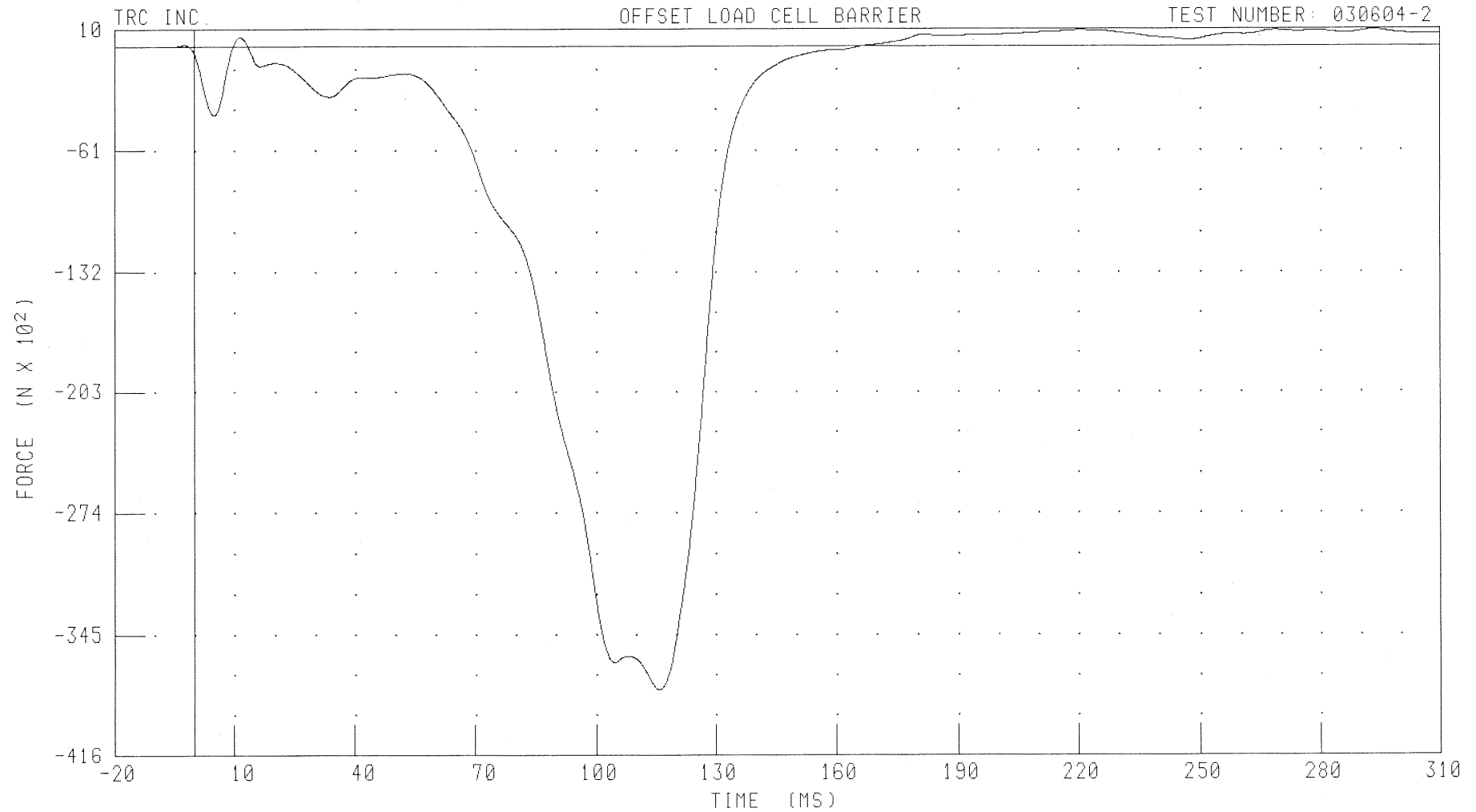
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL A7 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCA7XF FILTER: CH. CLASS 60

PEAK DATA: 945.12 N @ 293.20 MS, -37784.39 N @ 115.92 MS

B-197

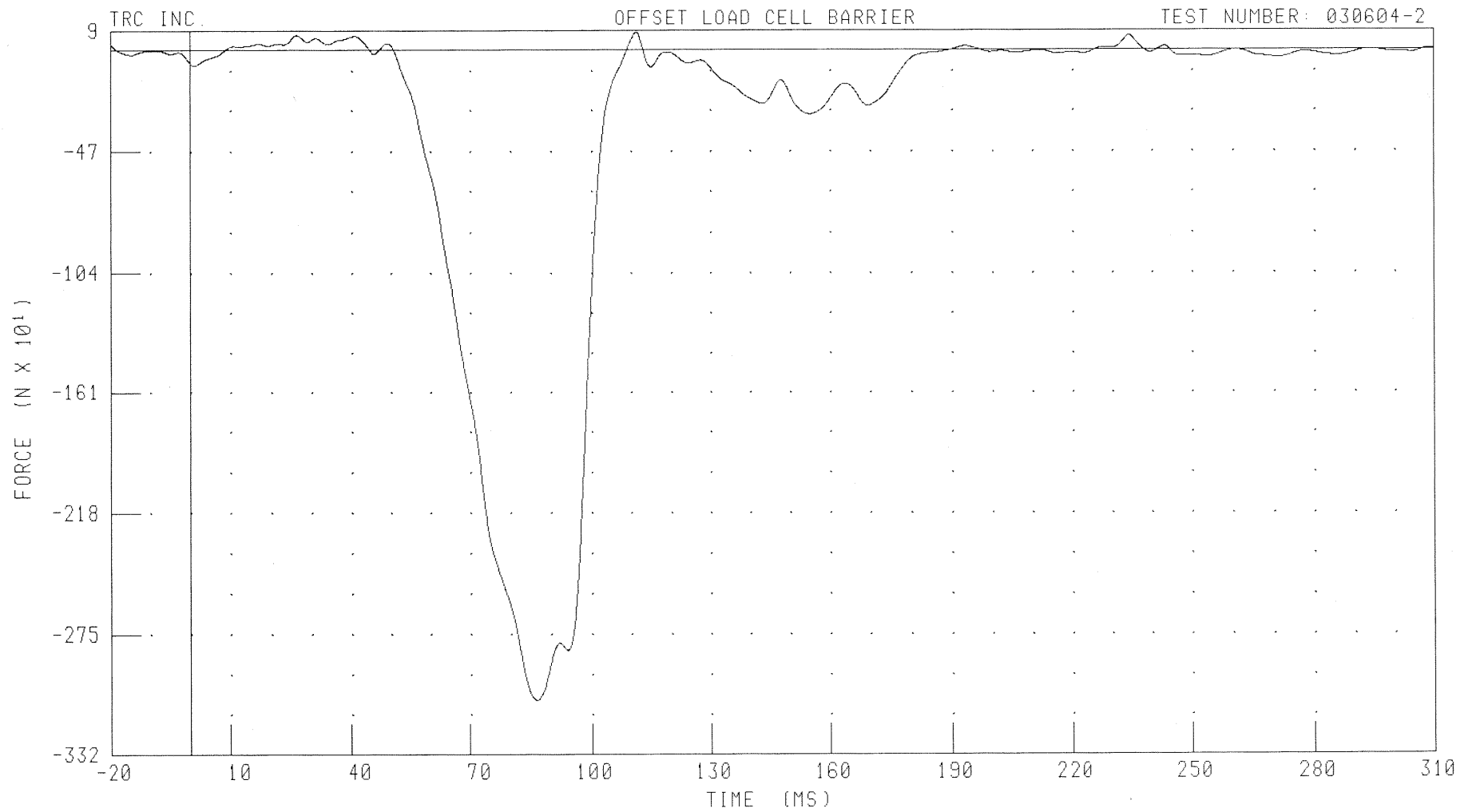
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCB1XF FILTER: CH. CLASS 60

PEAK DATA: 84.30 N @ 111.44 MS, -3071.63 N @ 86.40 MS

B-198

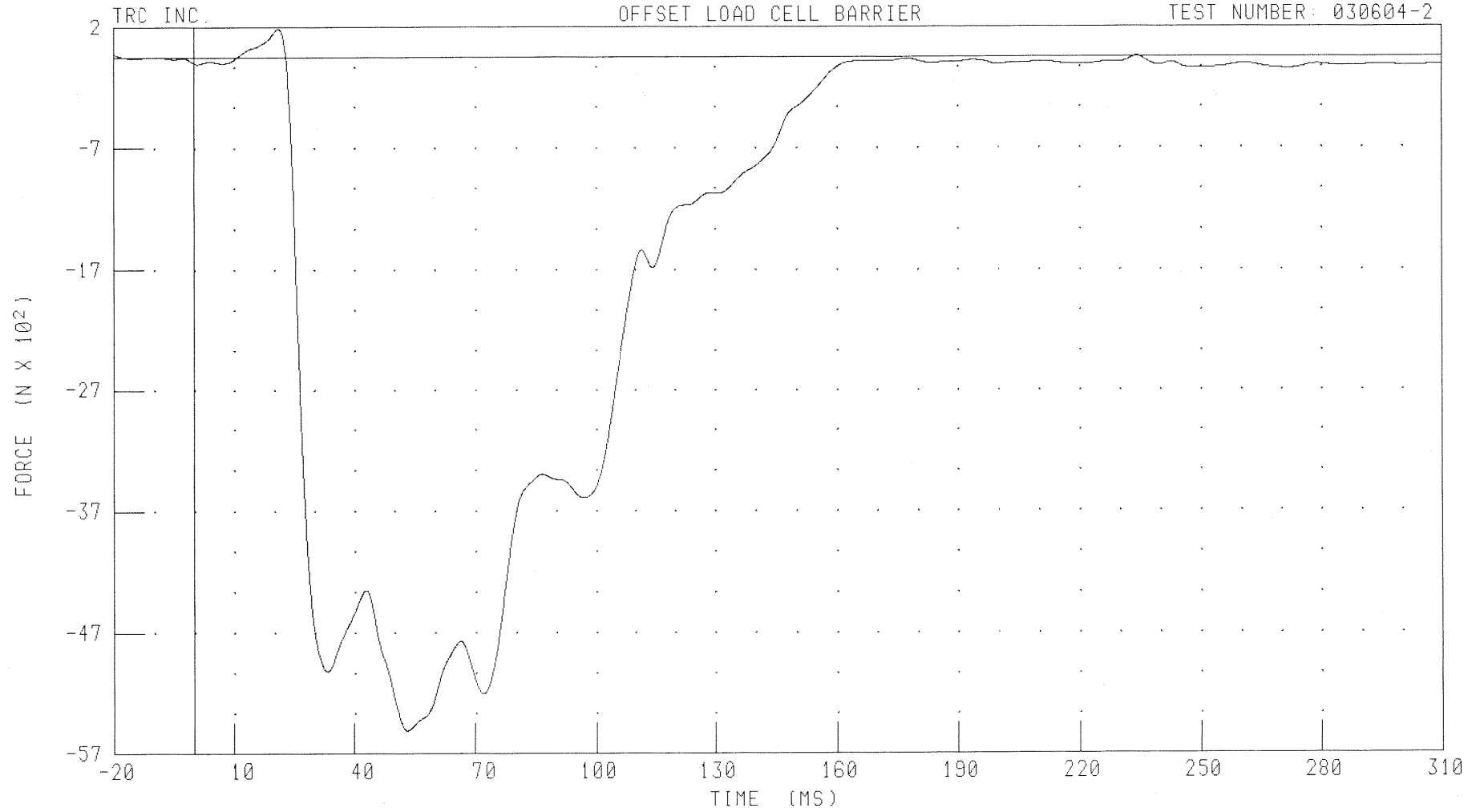
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCB2XF FILTER: CH. CLASS 60

PEAK DATA: 235.12 N @ 21.12 MS; -5561.77 N @ 53.20 MS

B-199

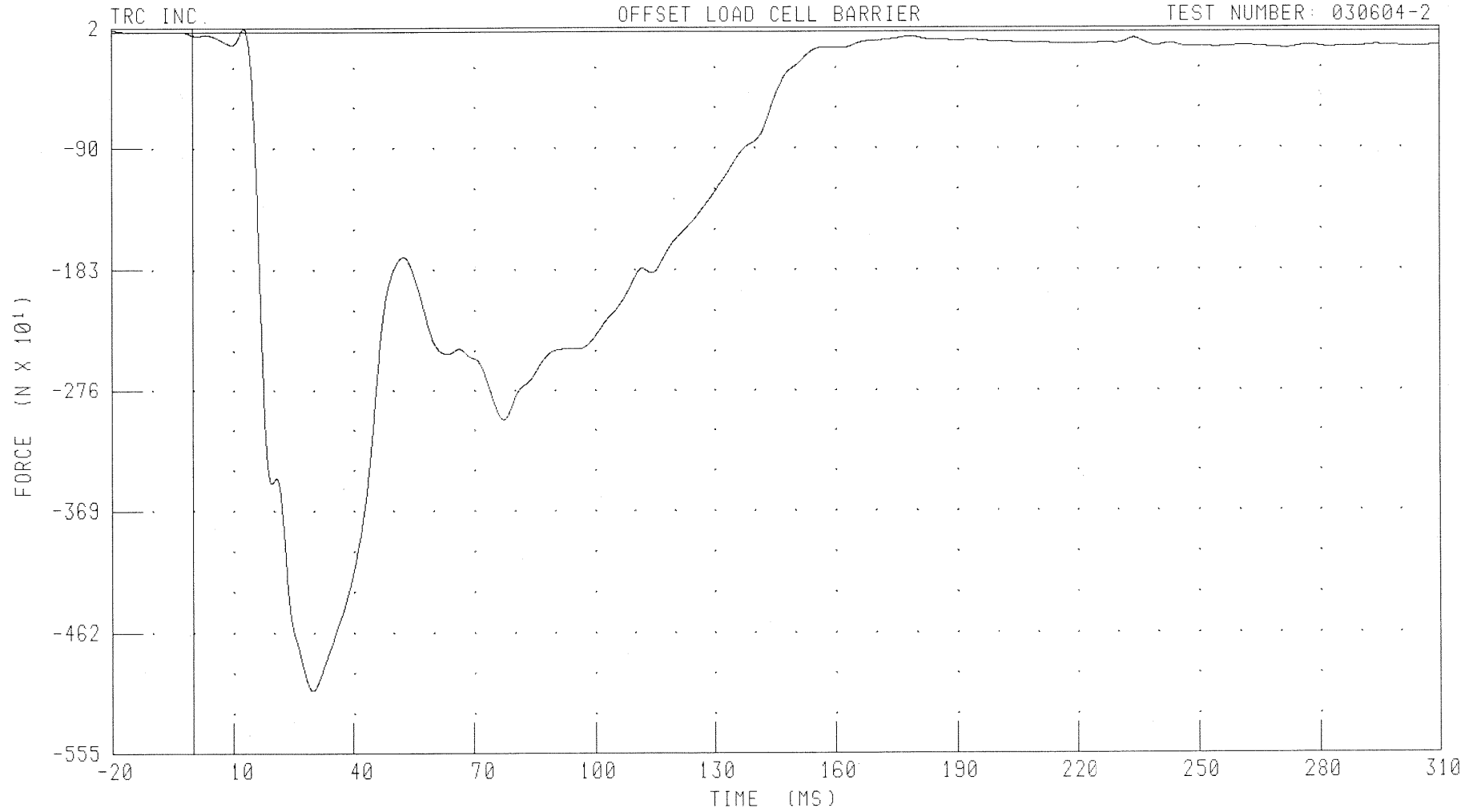
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCB3XF FILTER: CH. CLASS 60

PEAK DATA: 24.97 N @ 12.72 MS; -5069.44 N @ 29.76 MS

B-200

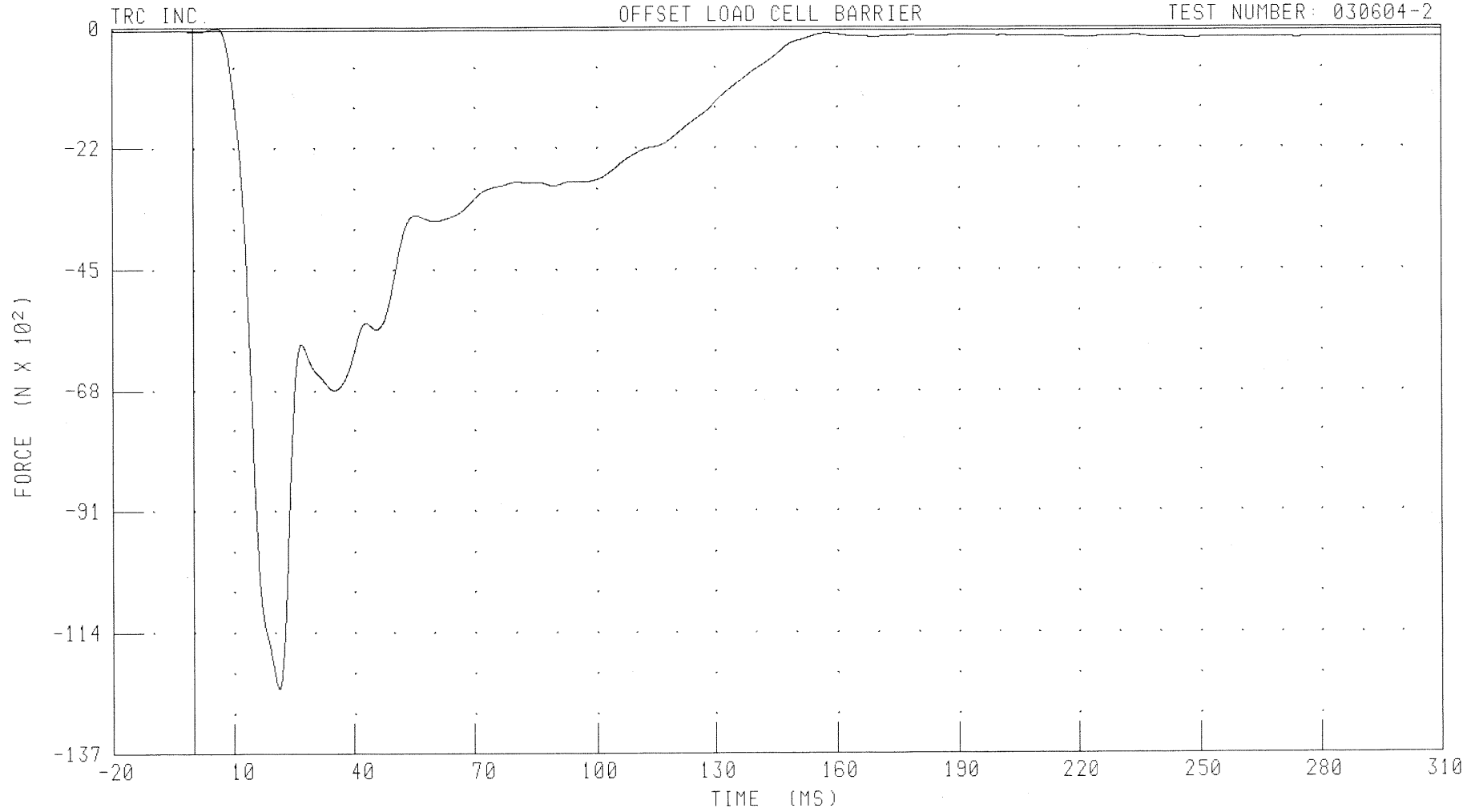
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCB4XF FILTER: CH. CLASS 60

PEAK DATA: 46.54 N @ 5.68 MS; -12508.17 N @ 21.12 MS

B-201

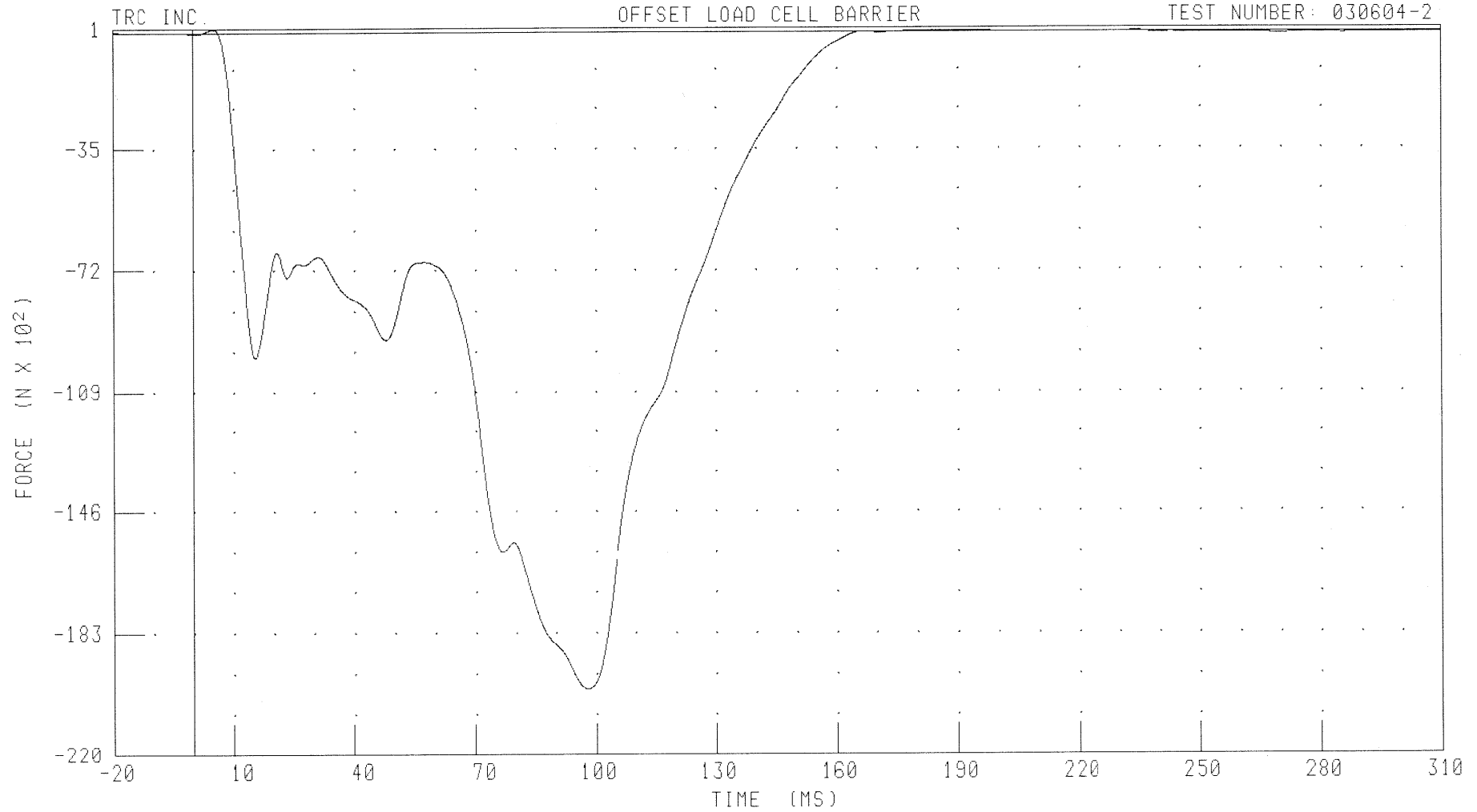
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B5 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-202

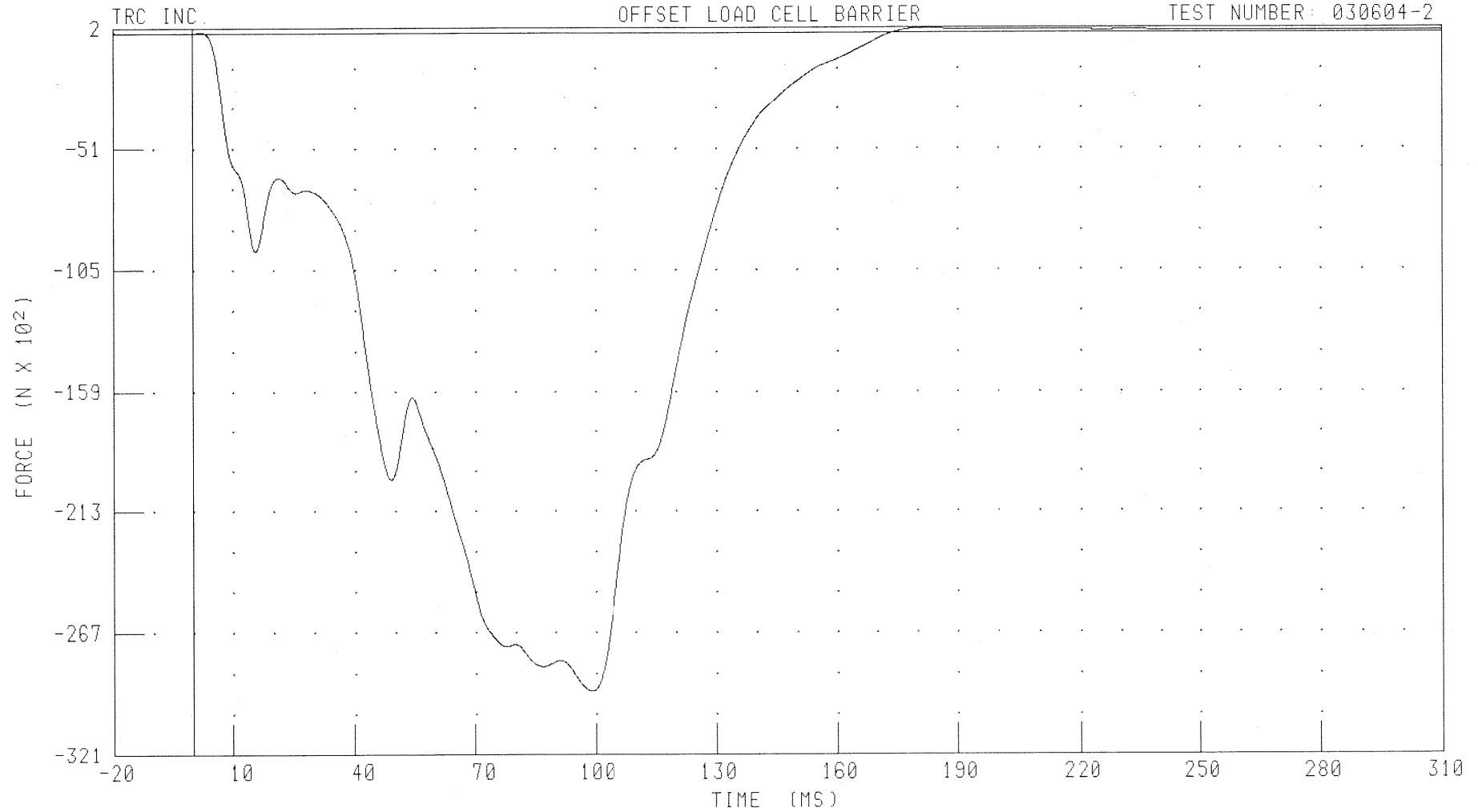
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B6 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCB6XF FILTER: CH. CLASS 60

PEAK DATA: 191 51 N @ 181.04 MS; -29379.64 N @ 99.20 MS

B-203

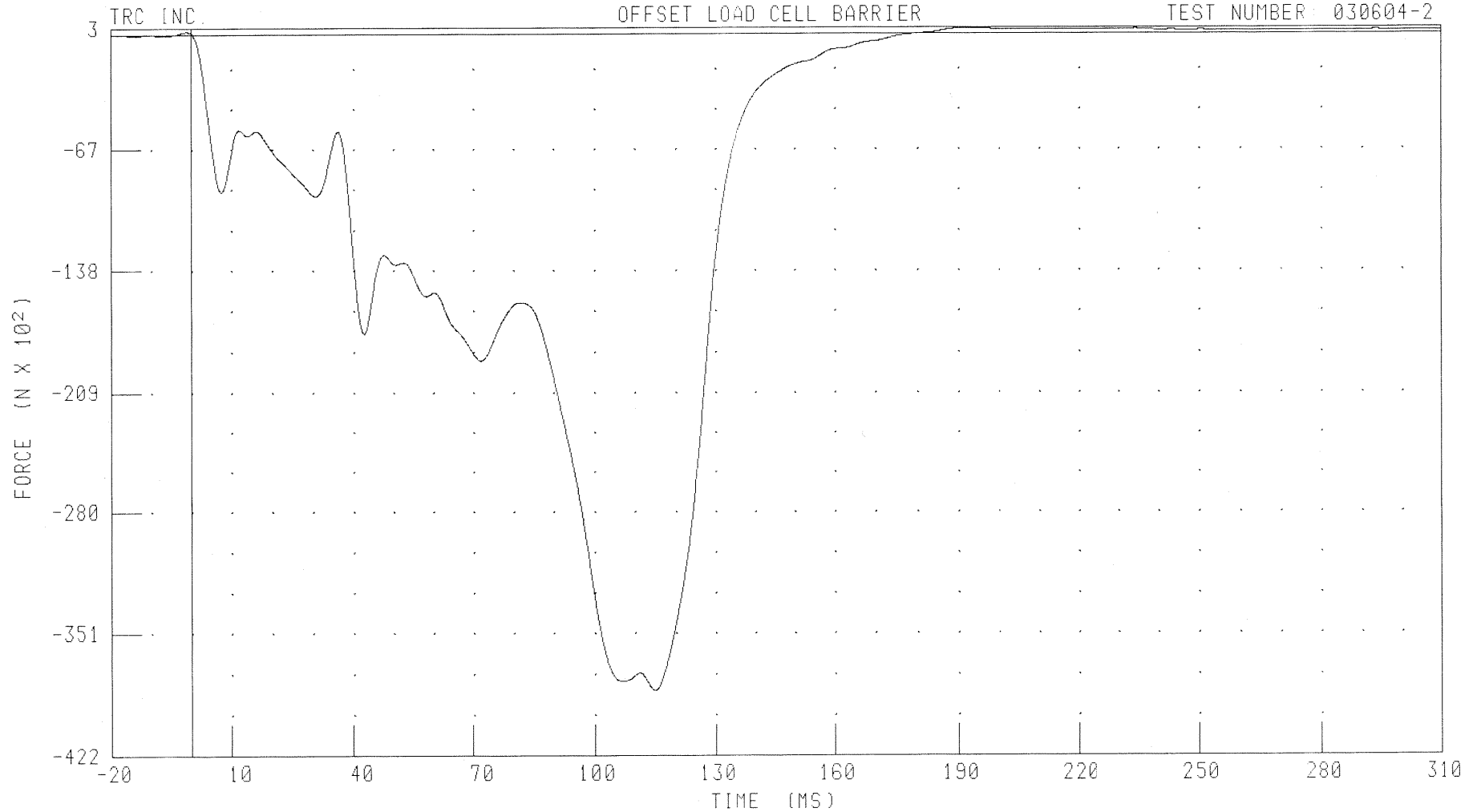
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL B7 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCB7XF FILTER: CH. CLASS 60

PEAK DATA: 340.75 N @ 194.00 MS; -38457.10 N @ 114.96 MS

B-204

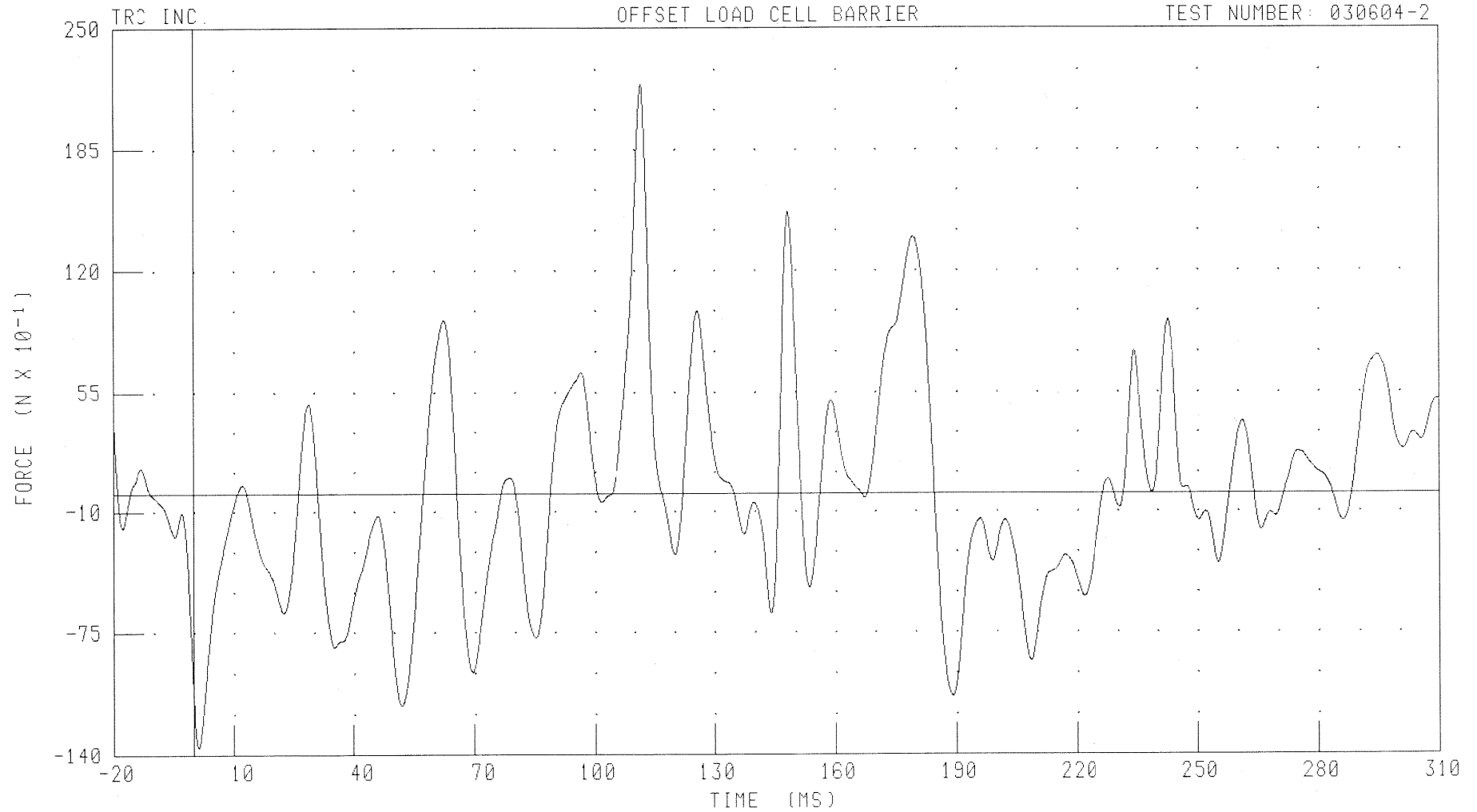
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC1XF FILTER: CH CLASS 60

PEAK DATA: 22.03 N @ 111.76 MS; -13.60 N @ 1.20 MS

B-205

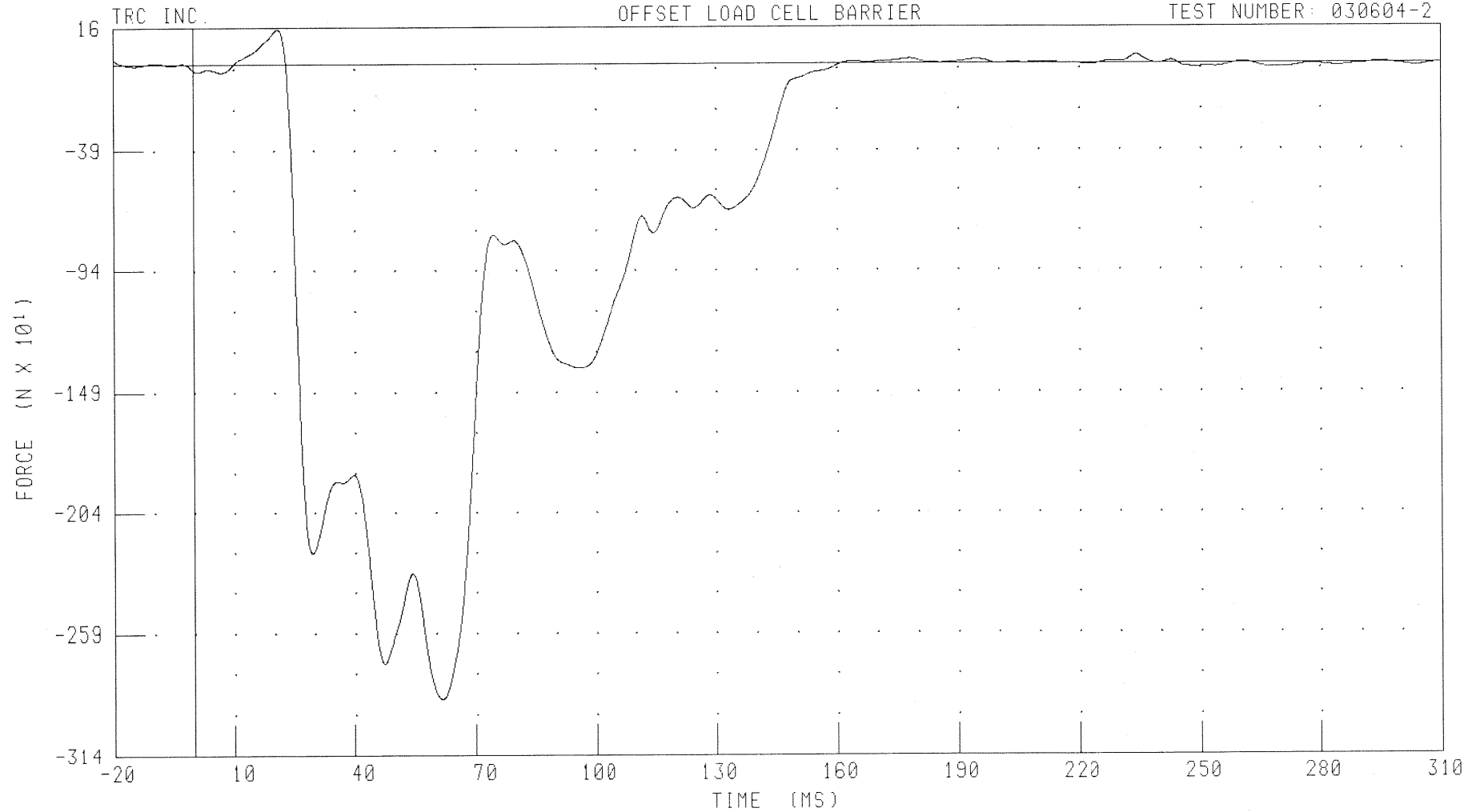
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC2XF

FILTER: CH. CLASS 60

PEAK DATA: 152.88 N @ 21.04 MS; -2889.92 N @ 61.60 MS

B-206

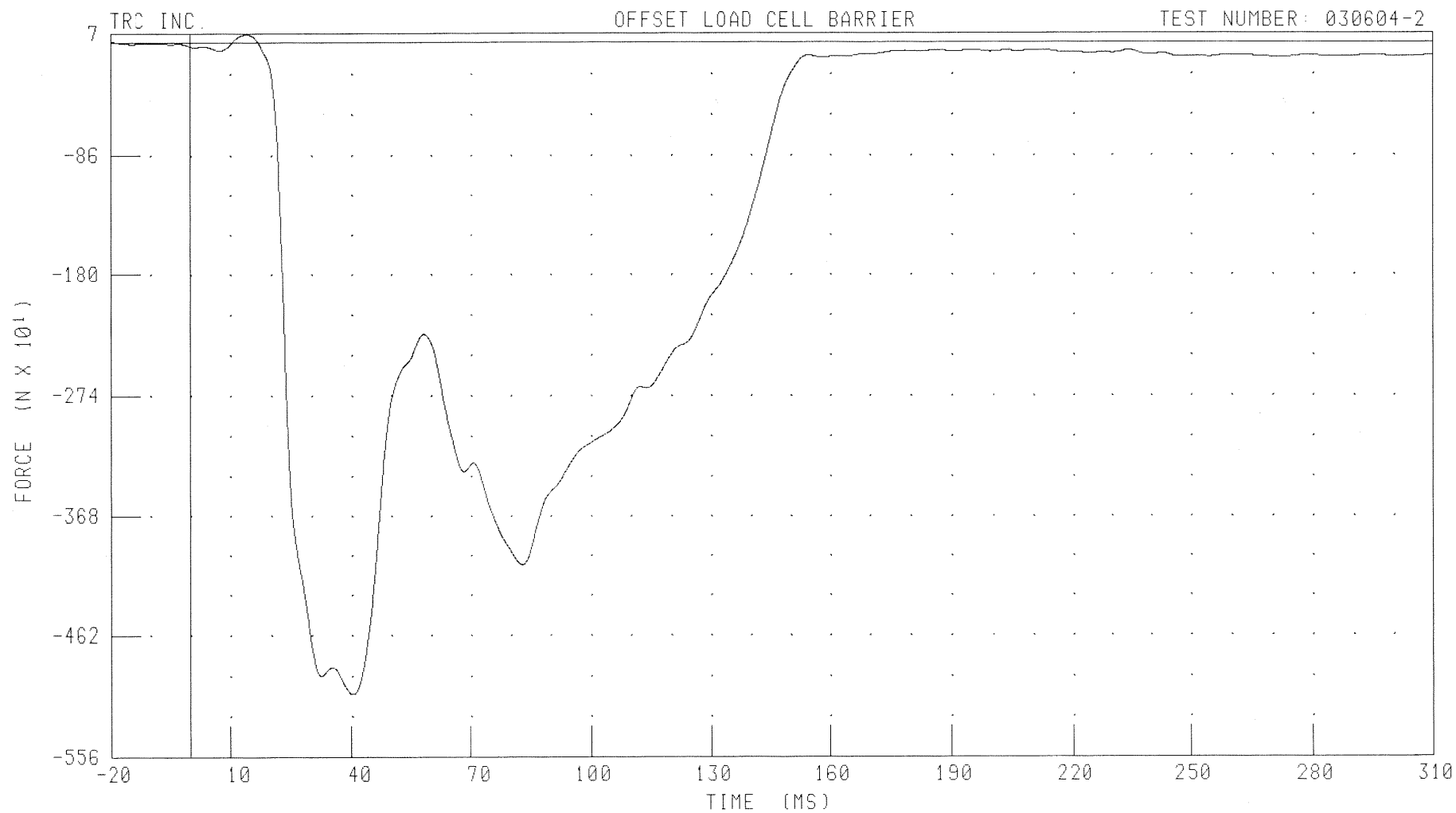
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC3XF FILTER: CH. CLASS 60

PEAK DATA: 65.87 N @ 14.00 MS, -5085.84 N @ 40.32 MS

B-207

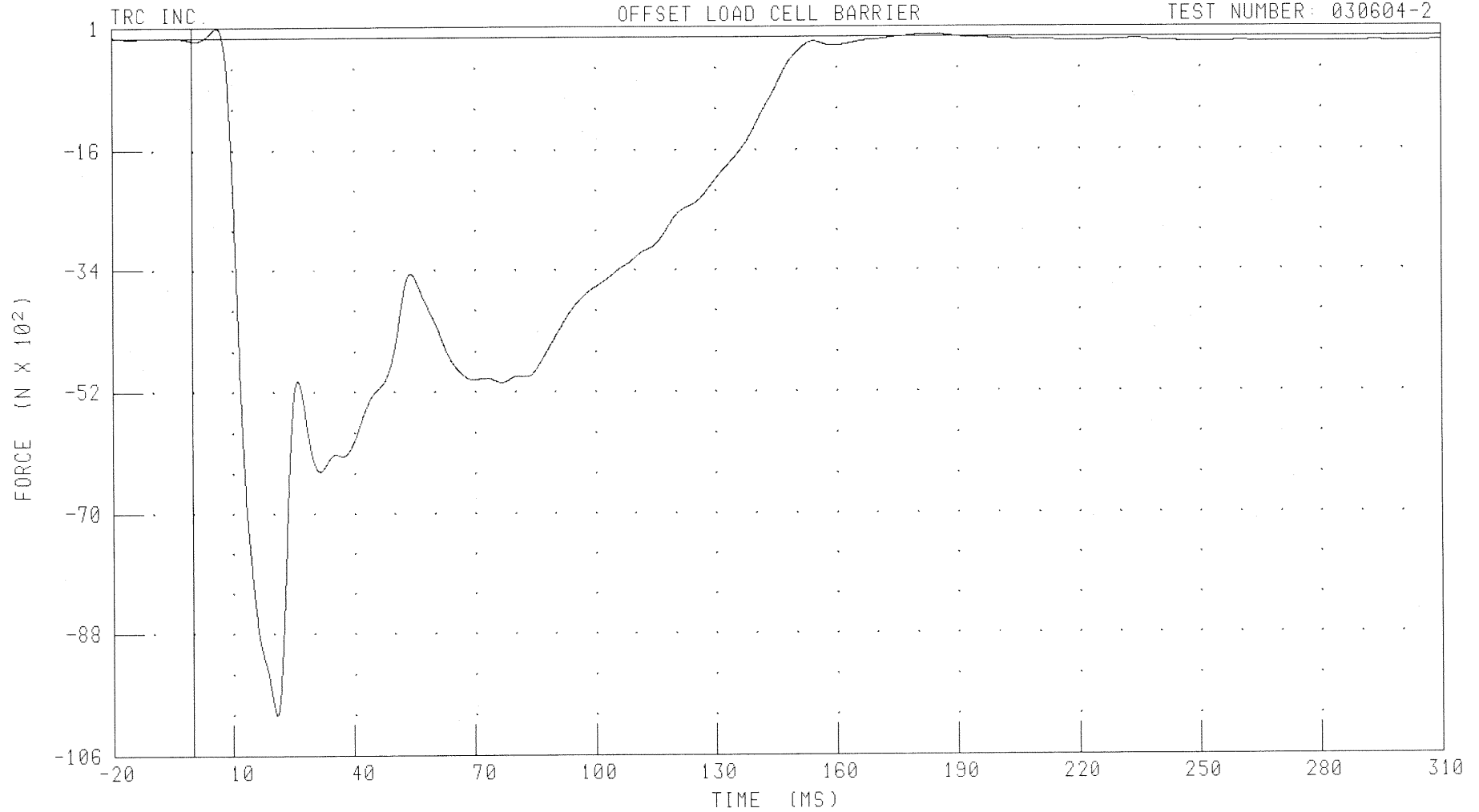
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC4XF FILTER: CH. CLASS 60

PEAK DATA: 141.00 N @ 6.16 MS; -10057.06 N @ 20.88 MS

B-208

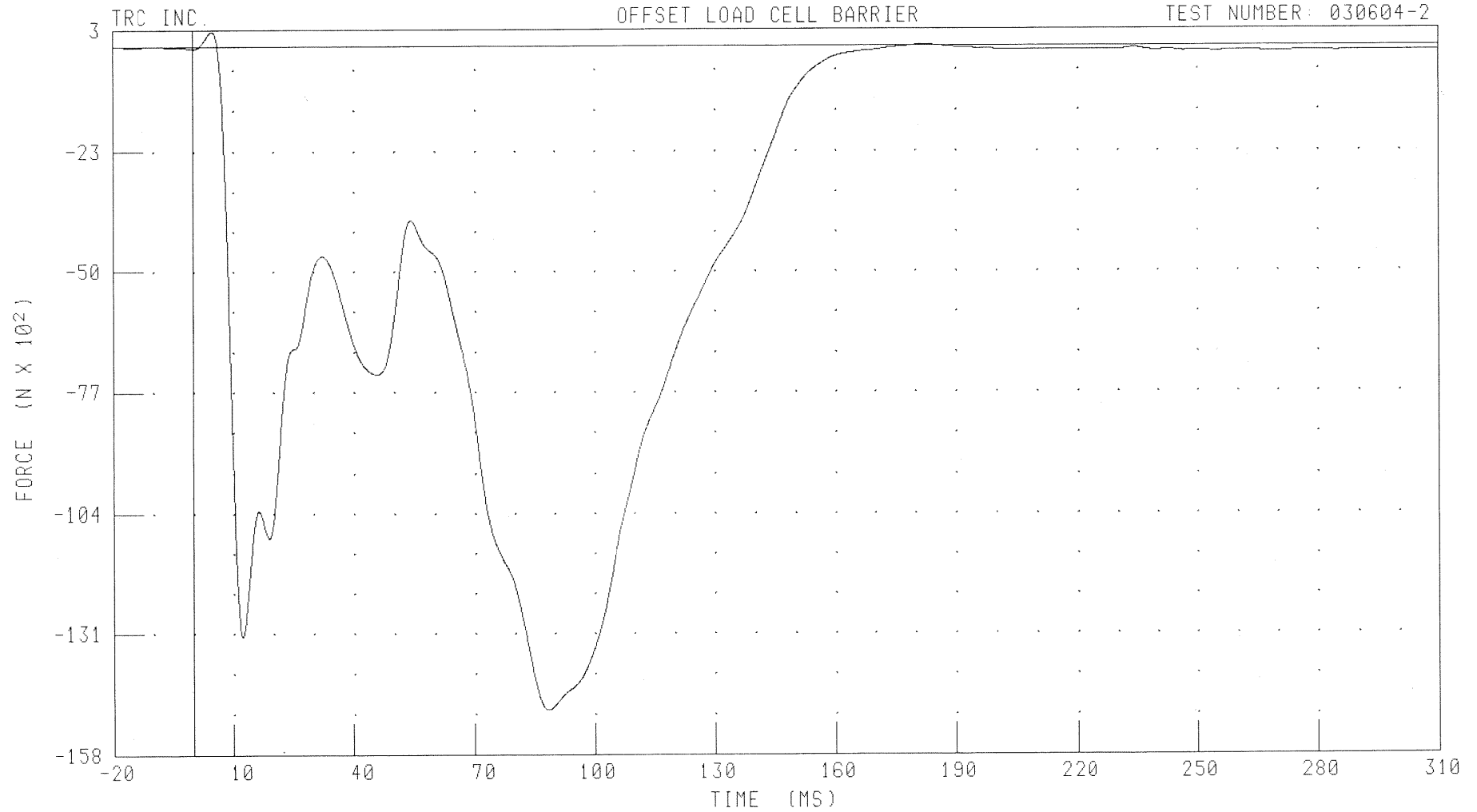
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C5 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC5XF FILTER: CH. CLASS 60

PEAK DATA: 360.29 N @ 4.80 MS; -14818.06 N @ 88.40 MS

B-209

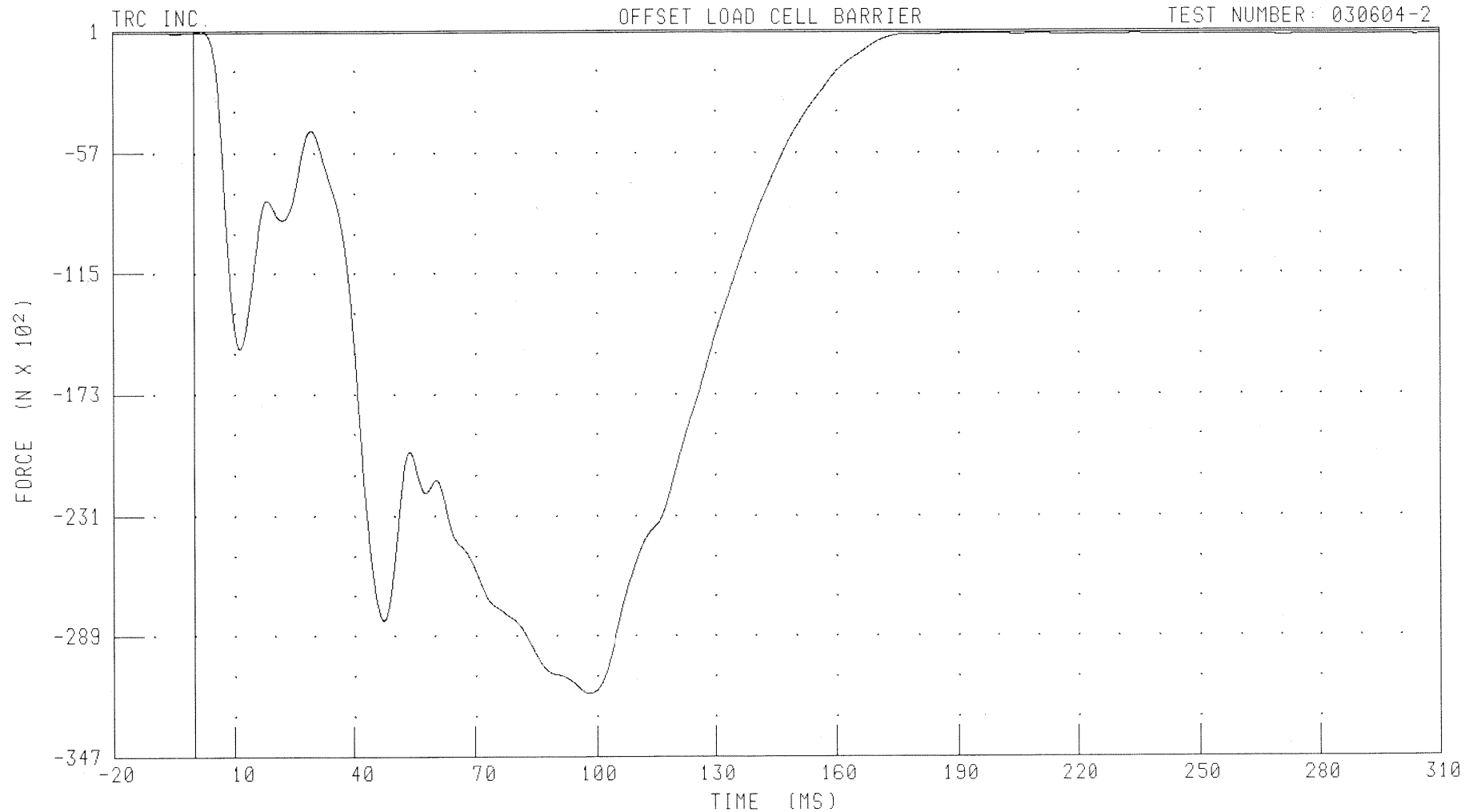
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C6 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC6XF FILTER: CH. CLASS 60

PEAK DATA: 92.45 N @ 1.84 MS, -31683.73 N @ 98.24 MS

B-210

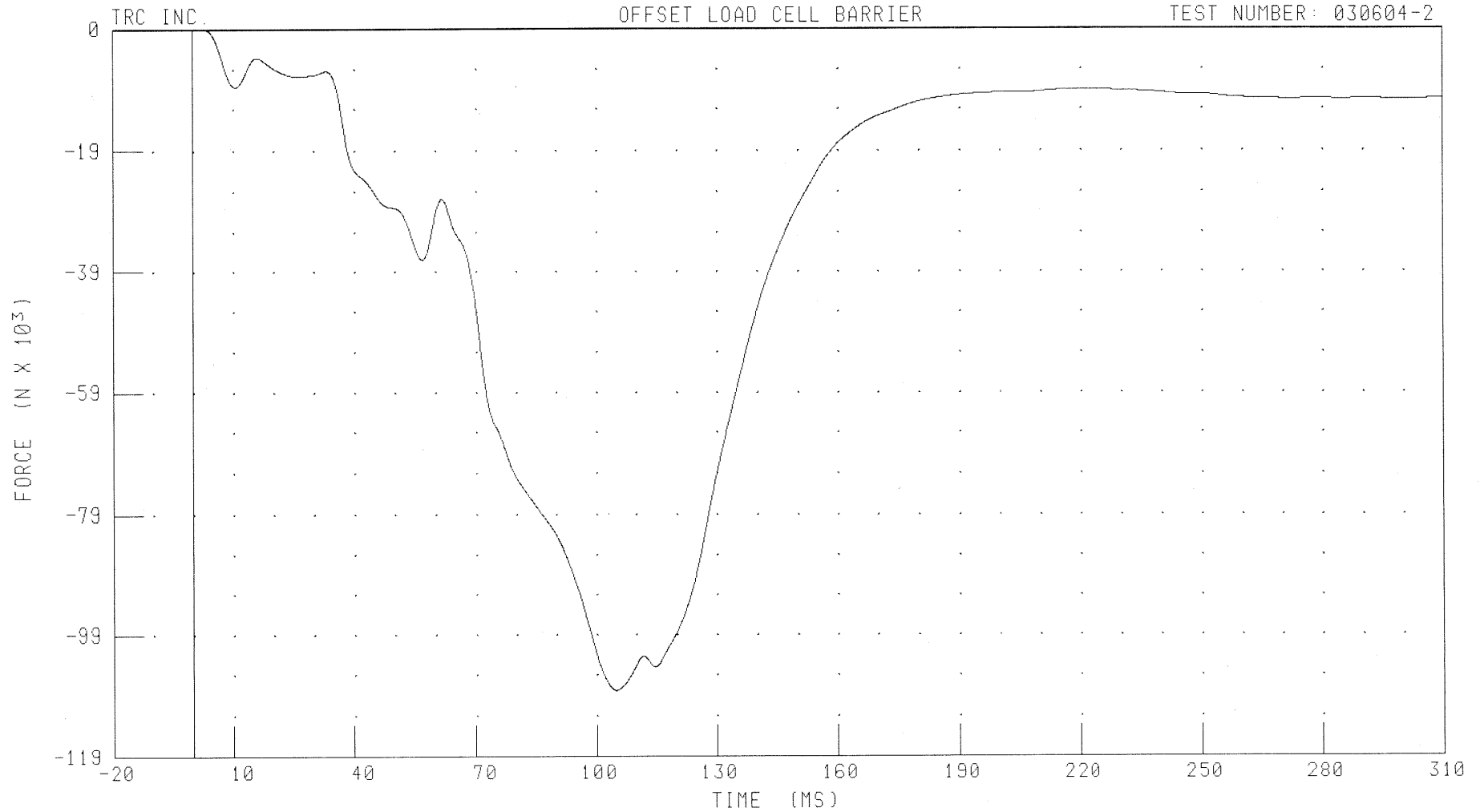
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL C7 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC7XF FILTER: CH. CLASS 60

PEAK DATA: 162.60 N @ 2.32 MS; -108556.85 N @ 104.96 MS

B-211

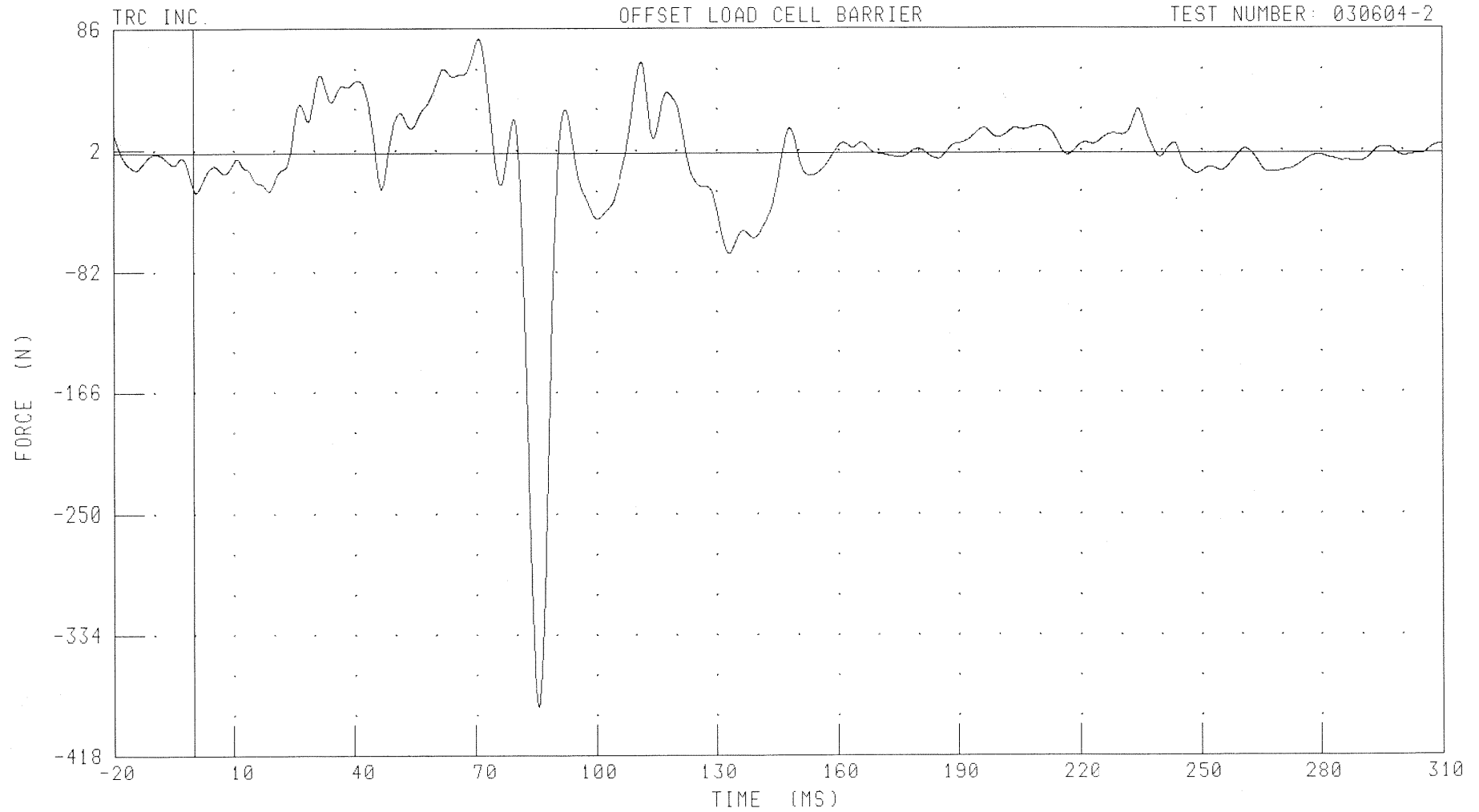
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD1XF FILTER: CH. CLASS 60

PEAK DATA: 78.90 N @ 70.80 MS; -384.41 N @ 85.52 MS

B-212

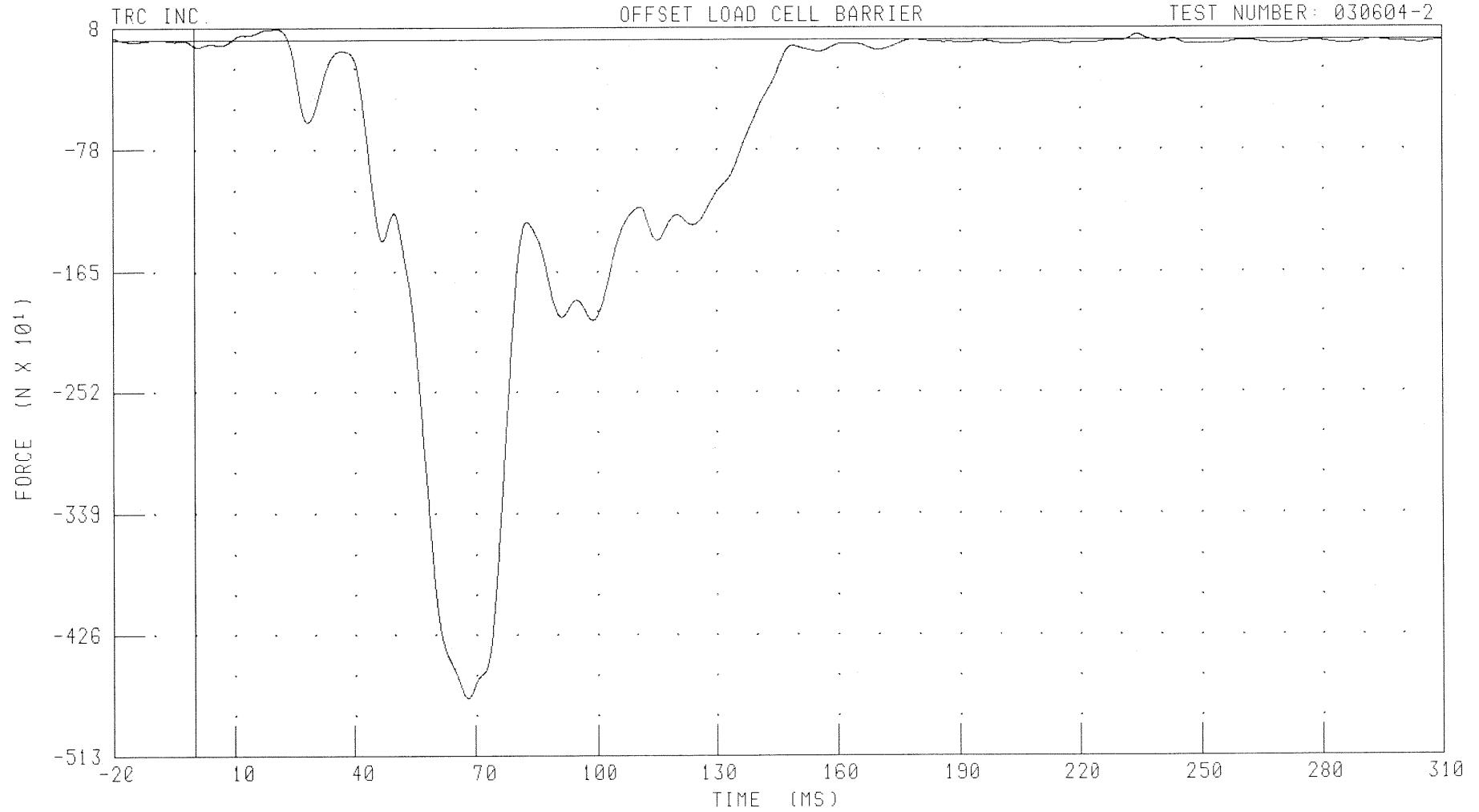
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD2XF FILTER: CH. CLASS 60

PEAK DATA: 79.67 N @ 20.64 MS; -4719.38 N @ 68.00 MS

B-213

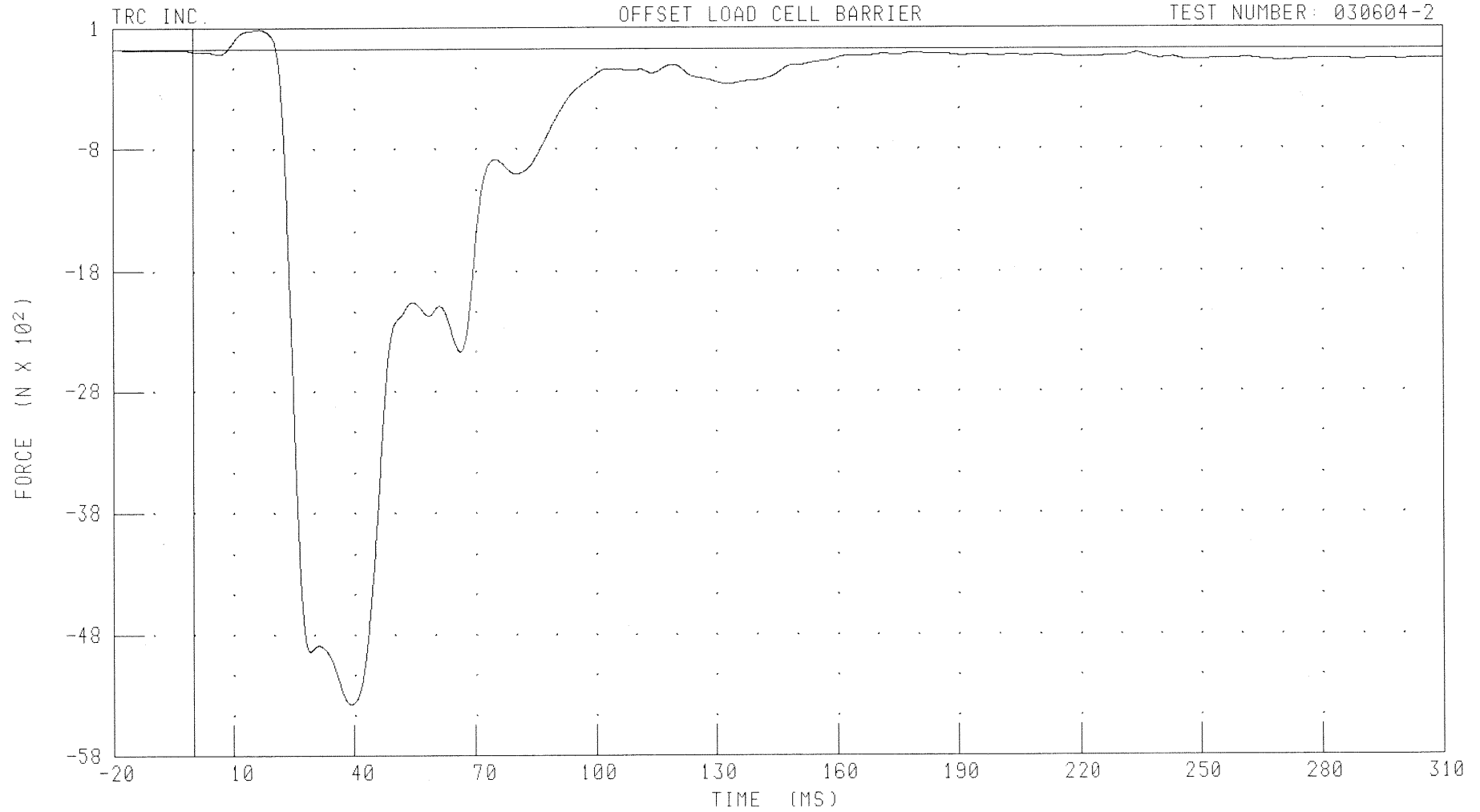
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD3XF FILTER: CH. CLASS 60

PEAK DATA: 16.27 N @ 16.56 MS, -53.97 N @ 39.20 MS

B-214

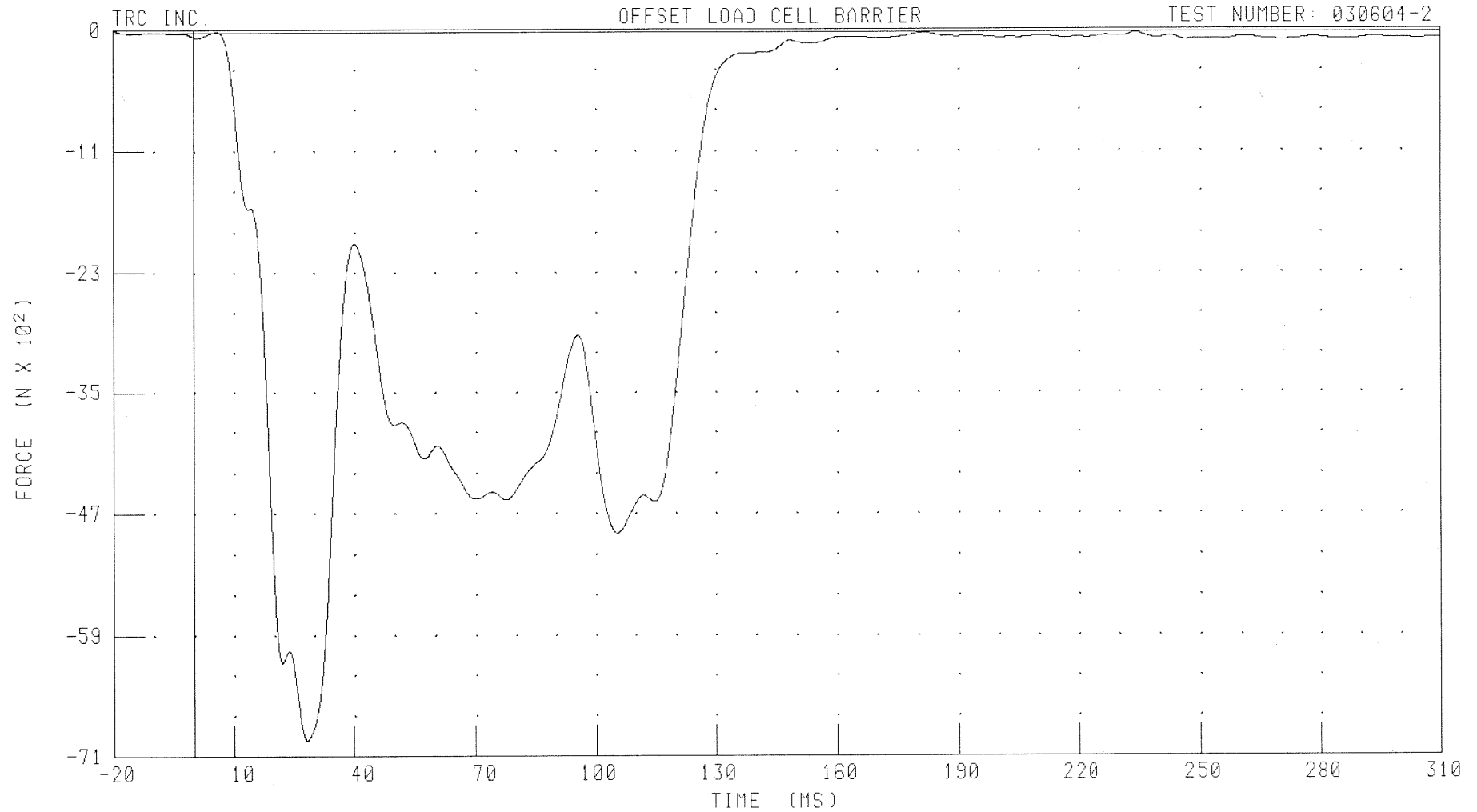
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD4XF FILTER: CH. CLASS 60

PEAK DATA: 24.26 N @ -20.00 MS; -7019.83 N @ 28.24 MS

B-215

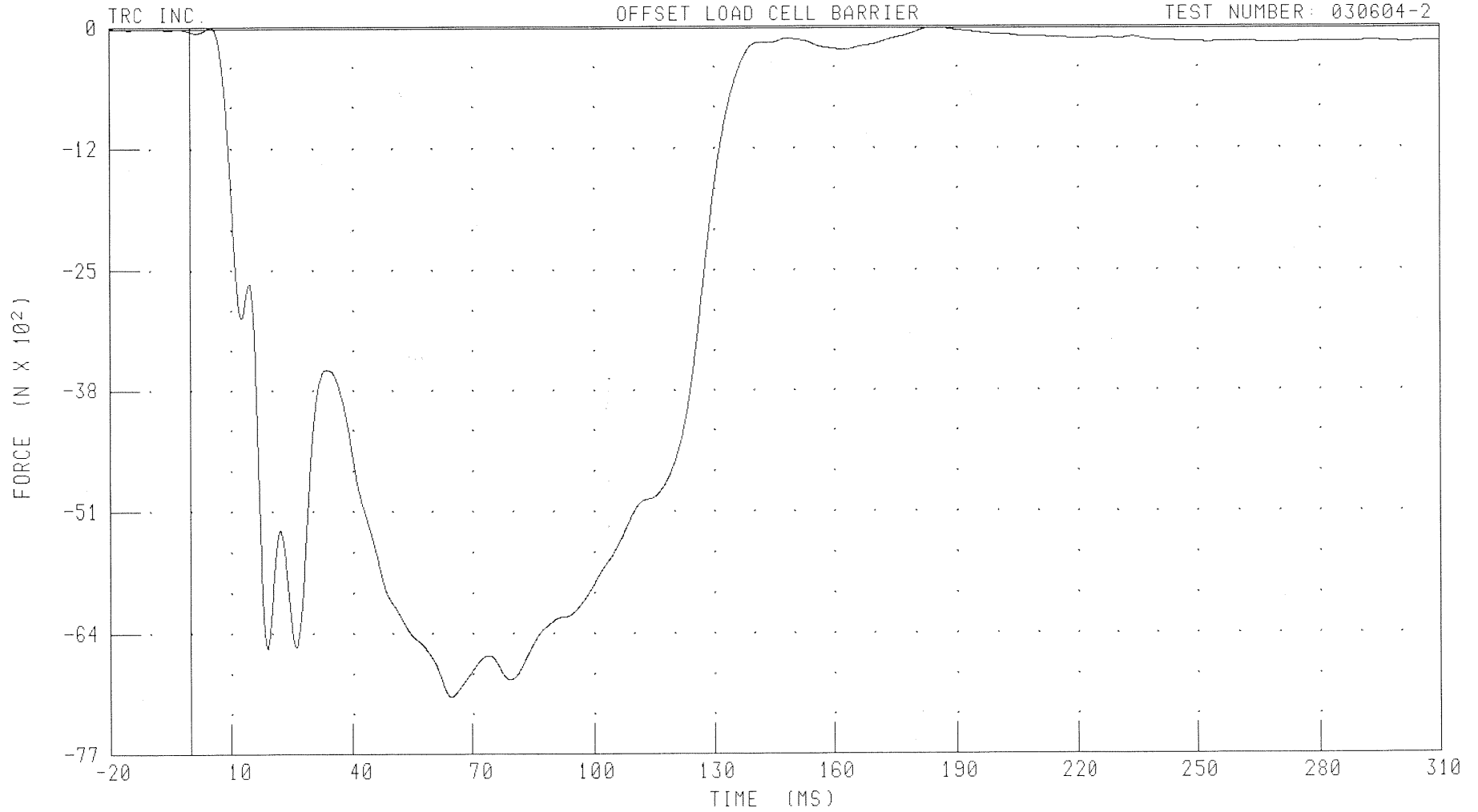
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D5 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD5XF

FILTER: CH. CLASS 60

PEAK DATA: 18.83 N @ 5.12 MS; -7164.79 N @ 64.72 MS

B-216

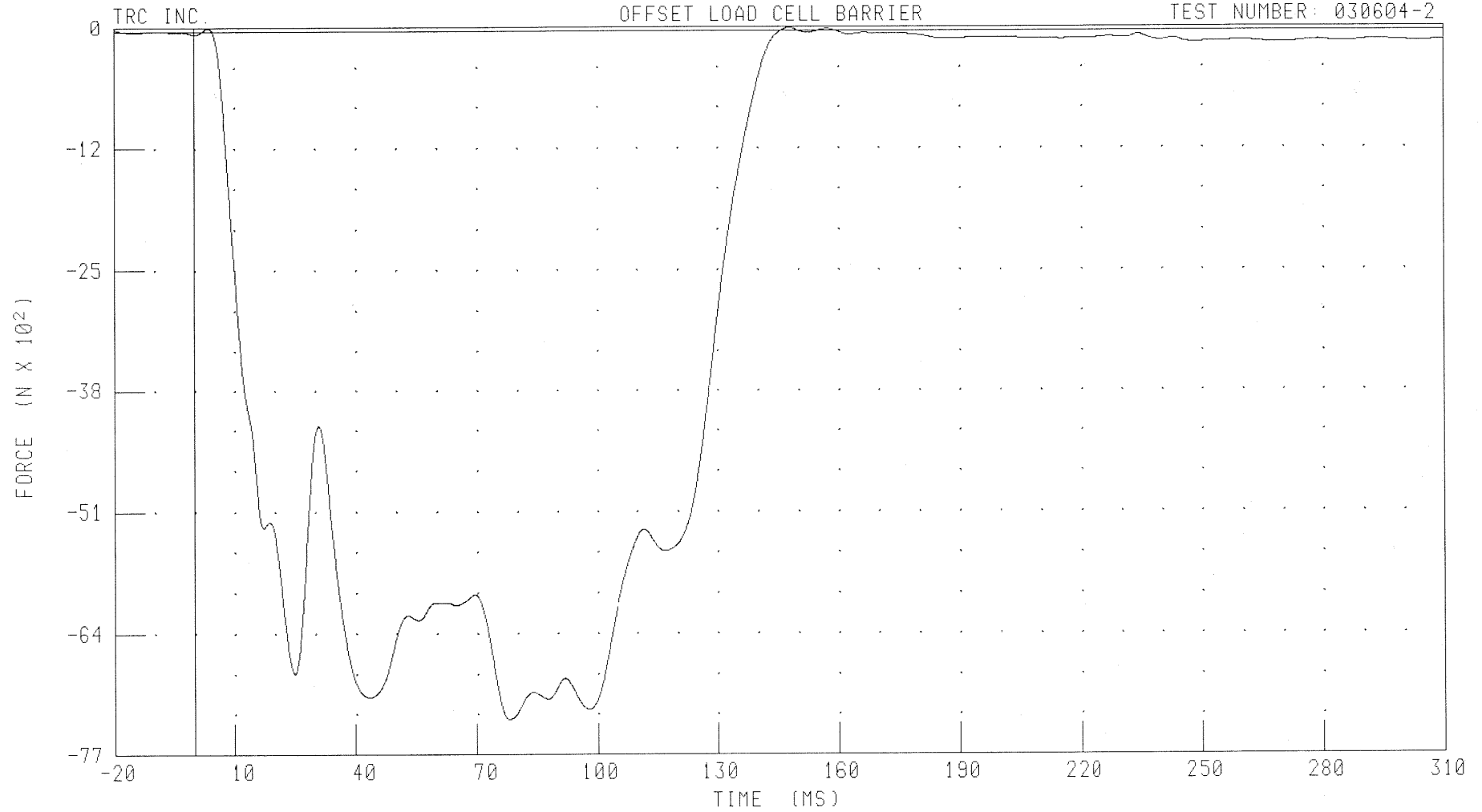
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D6 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD6XF

FILTER: CH. CLASS 60

PEAK DATA: 37.11 N @ 3.60 MS; -7387.81 N @ 78.08 MS

B-217

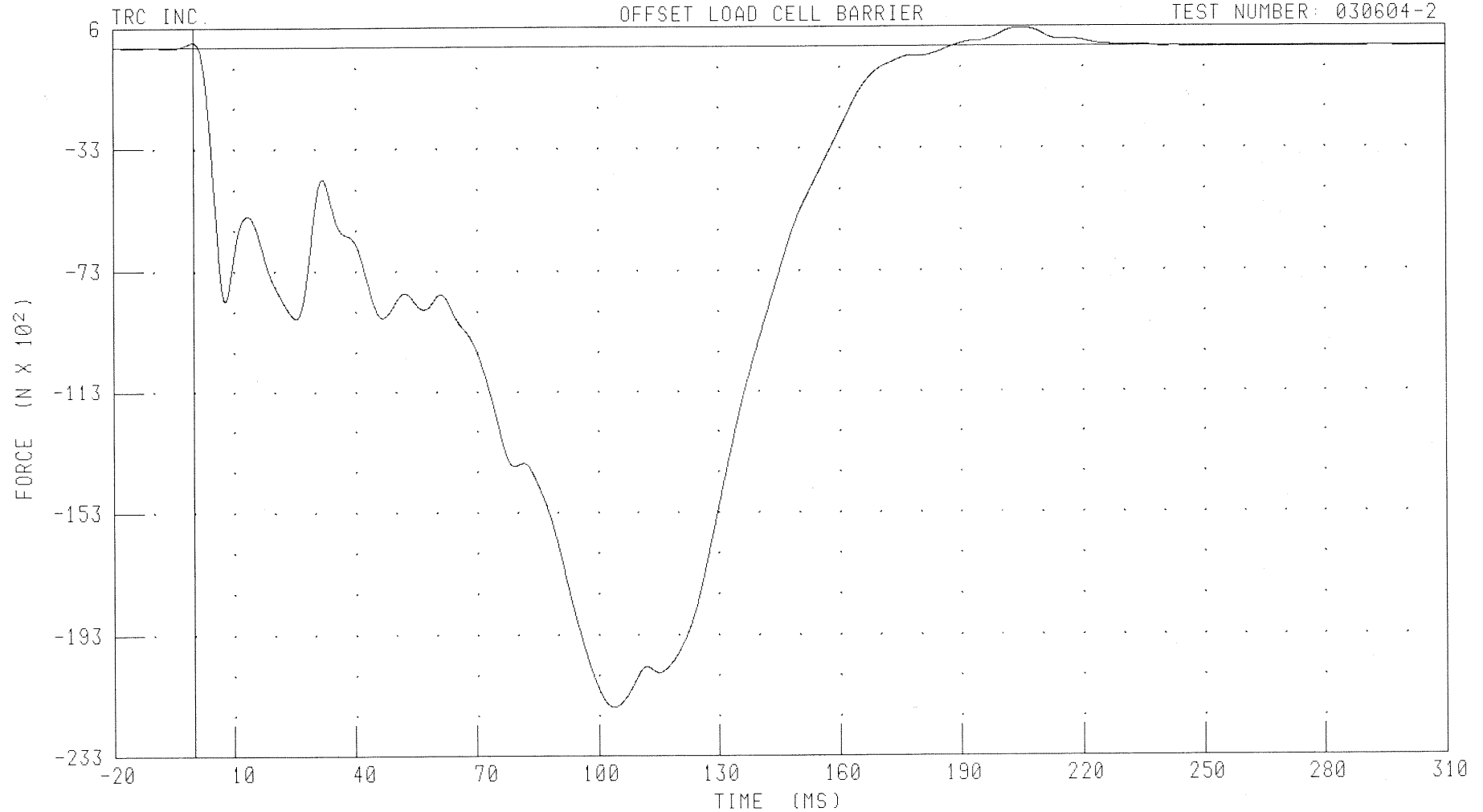
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL D7 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCD7XF

FILTER: CH. CLASS 60

PEAK DATA: 596.93 N @ 204.80 MS; -21734.33 N @ 104.00 MS

B-218

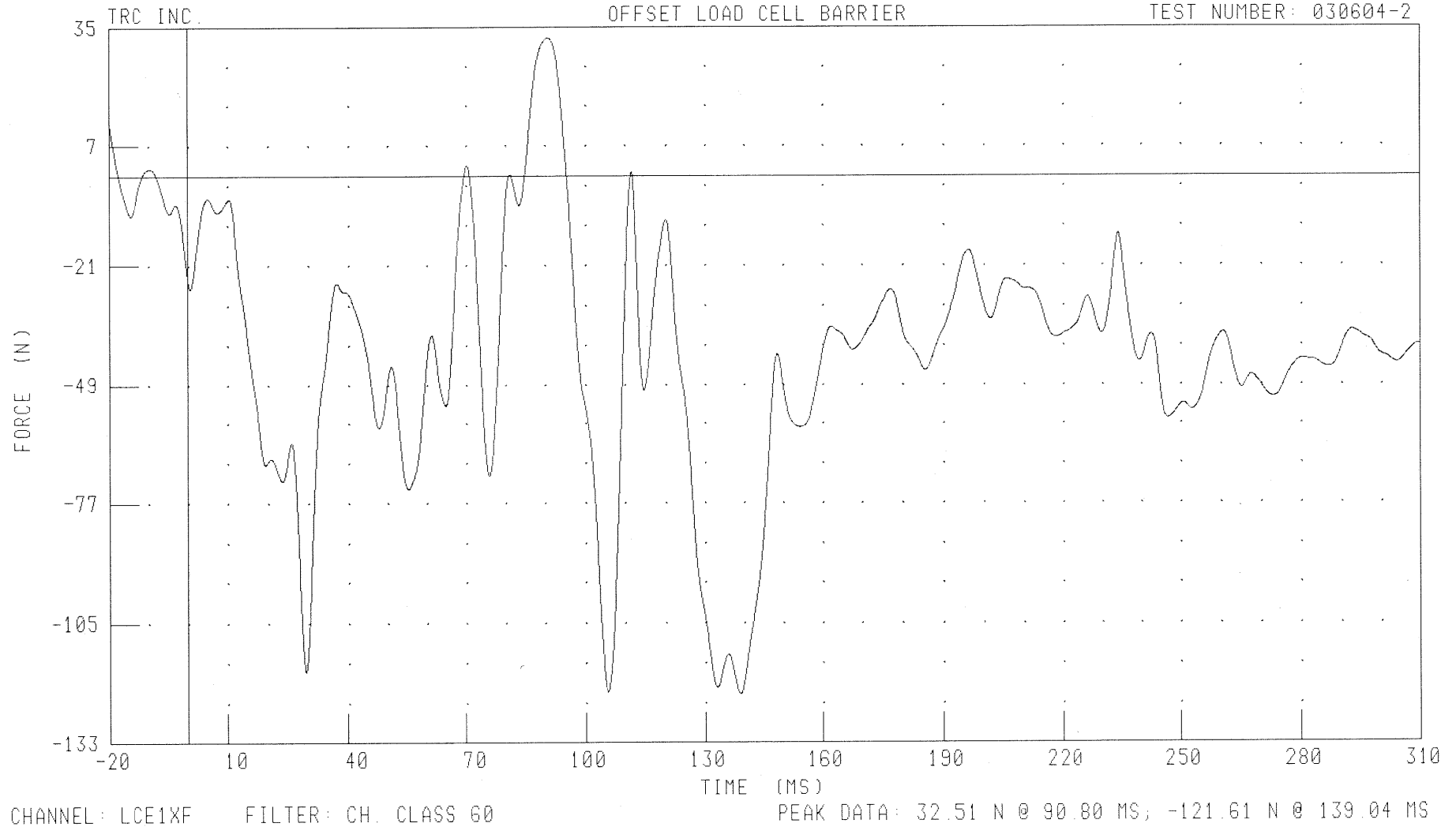
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



B-219

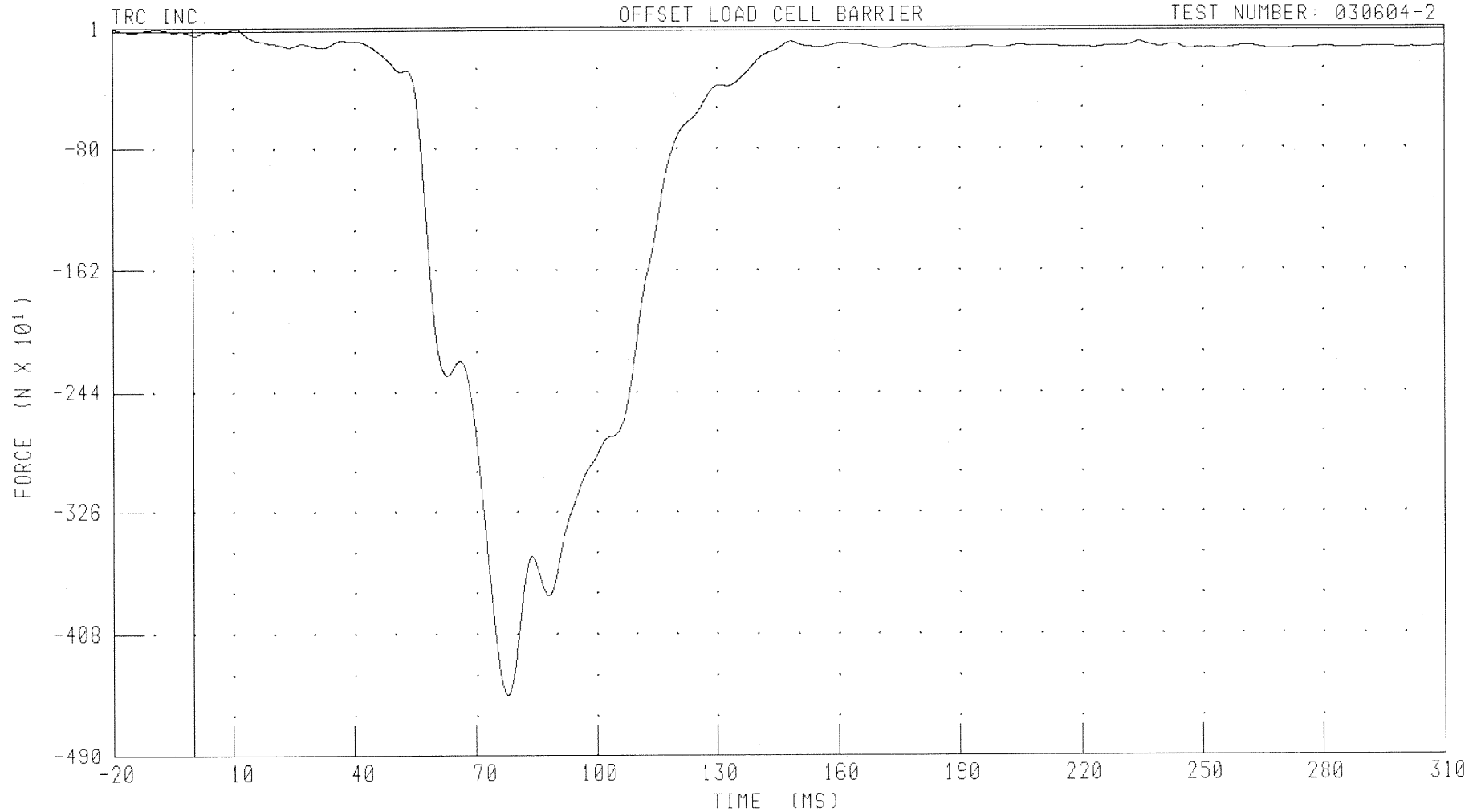
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCE2XF FILTER: CH. CLASS 60

PEAK DATA: 15.06 N @ -20.00 MS; -4495.14 N @ 77.76 MS

B-220

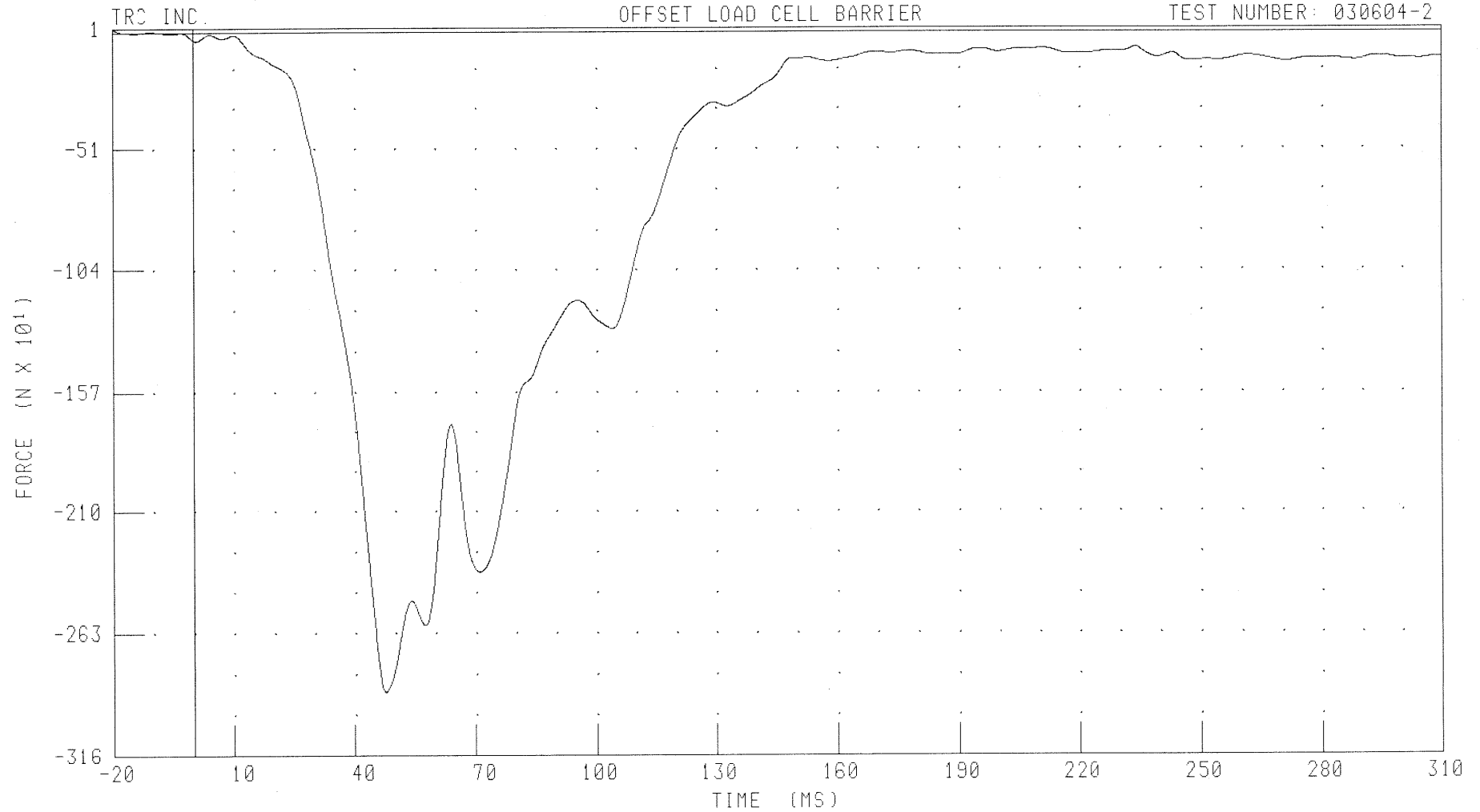
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCE3XF FILTER: CH. CLASS 60

PEAK DATA: 14.06 N @ -20.00 MS; -2890.61 N @ 47.60 MS

B-221

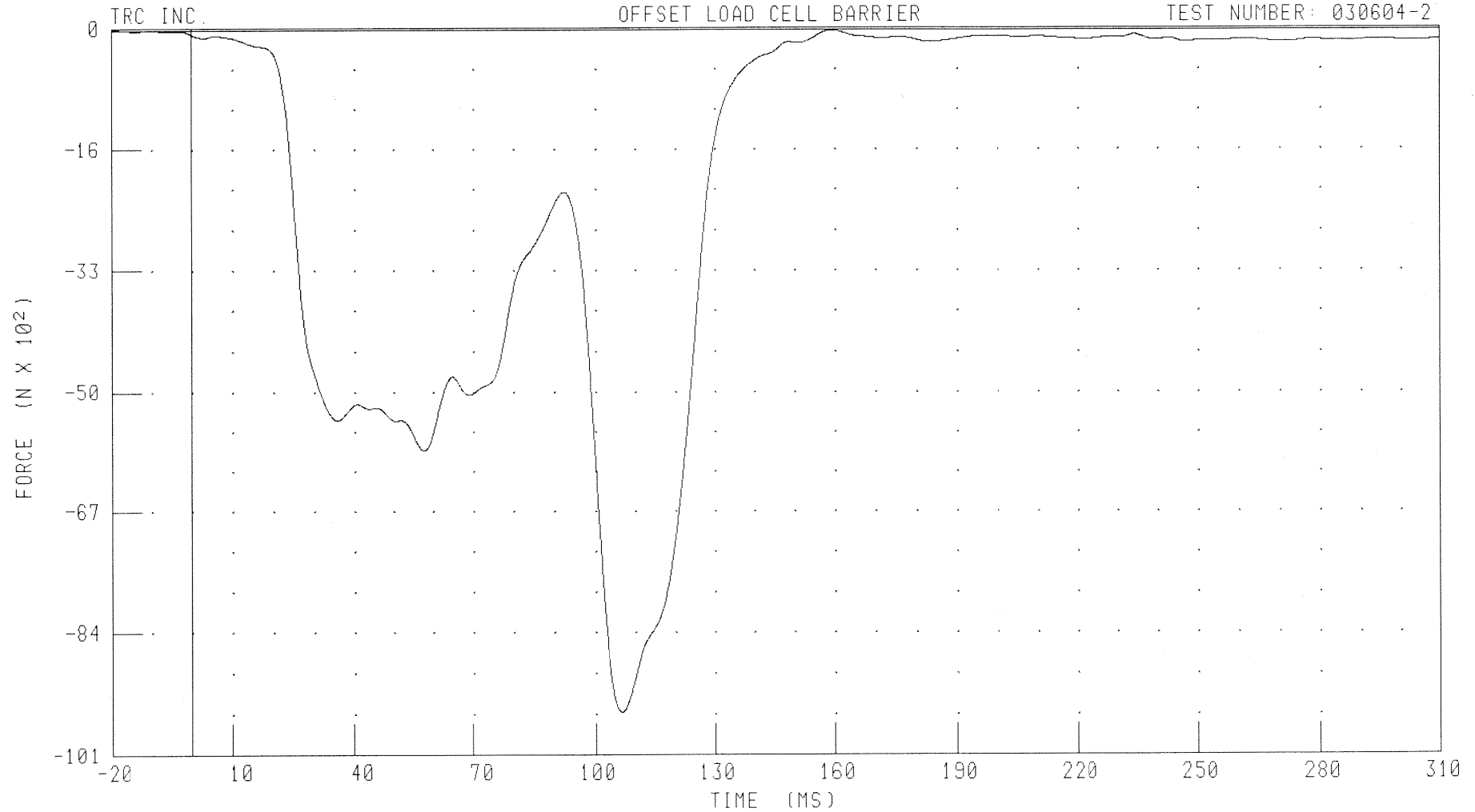
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCE4XF

FILTER: CH. CLASS 60

PEAK DATA: 22.98 N @ -20.00 MS; -9582.77 N @ 106.64 MS

B-222

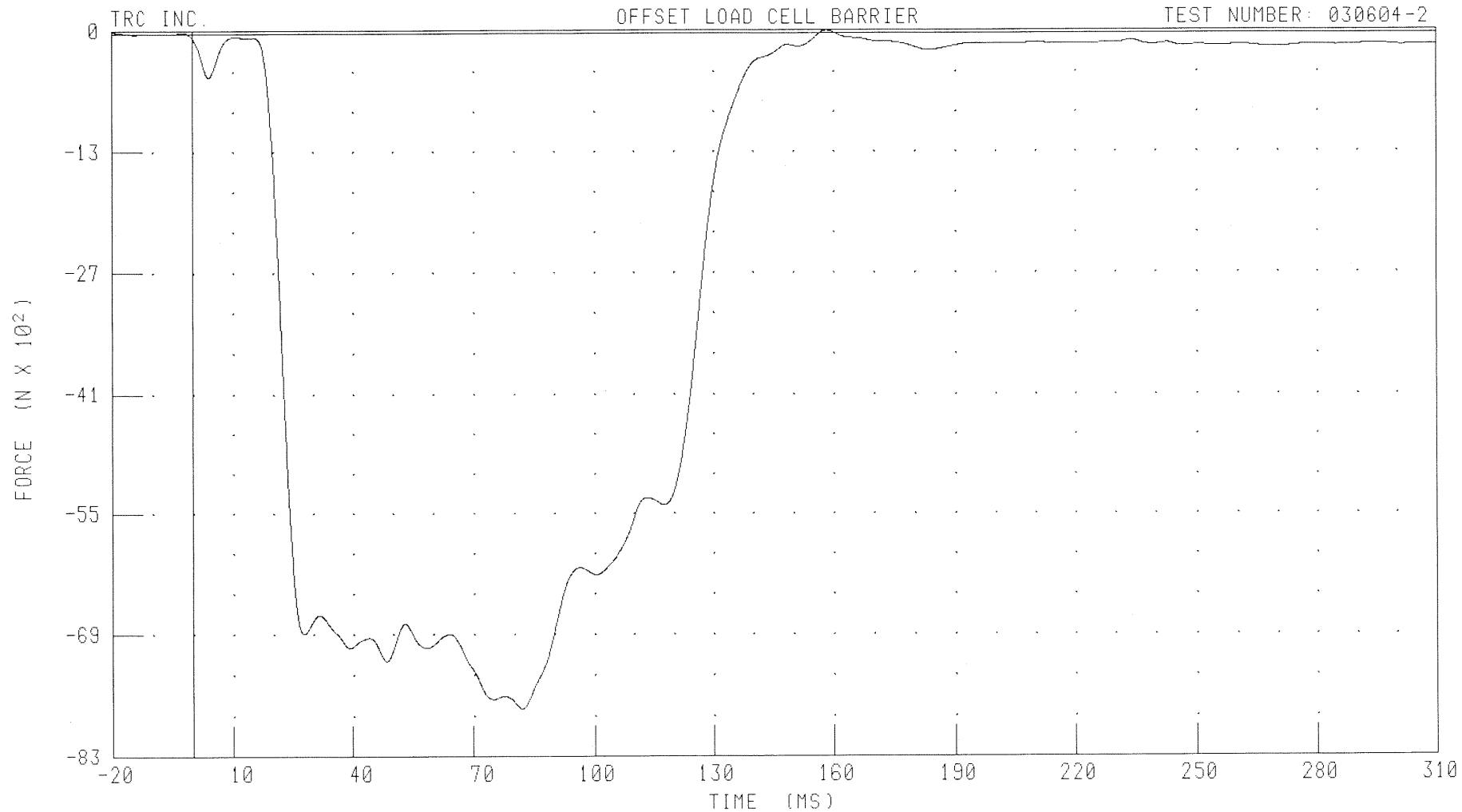
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E5 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCE5XF FILTER: CH. CLASS 60

PEAK DATA: 24.73 N @ 158.40 MS; -7828.75 N @ 82.00 MS

B-223

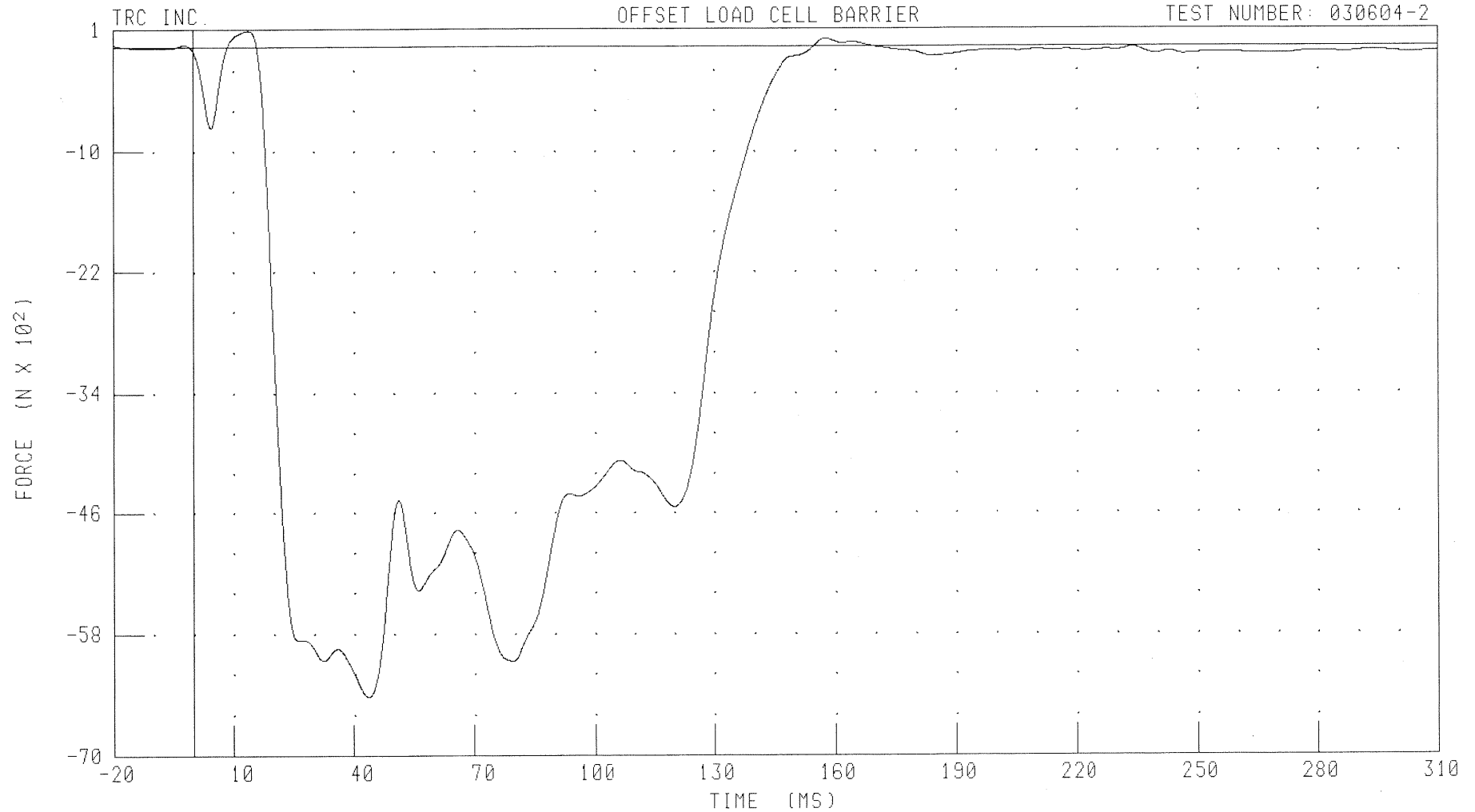
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E6 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCE6XF

FILTER: CH. CLASS 60

PEAK DATA: 157.04 N @ 13.84 MS; -6454.58 N @ 43.68 MS

B-224

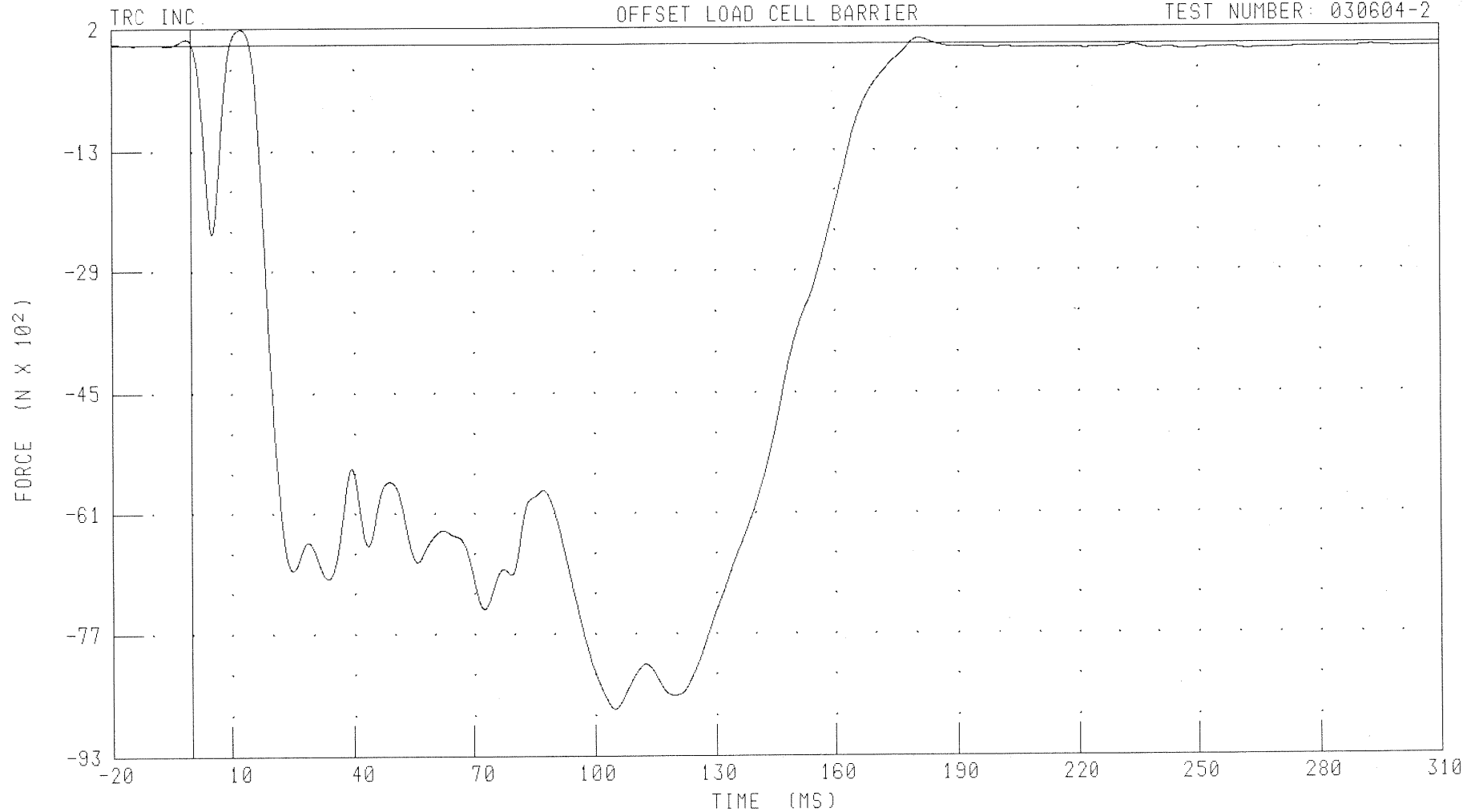
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL E7 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCE7XF FILTER: CH. CLASS 60

B-225

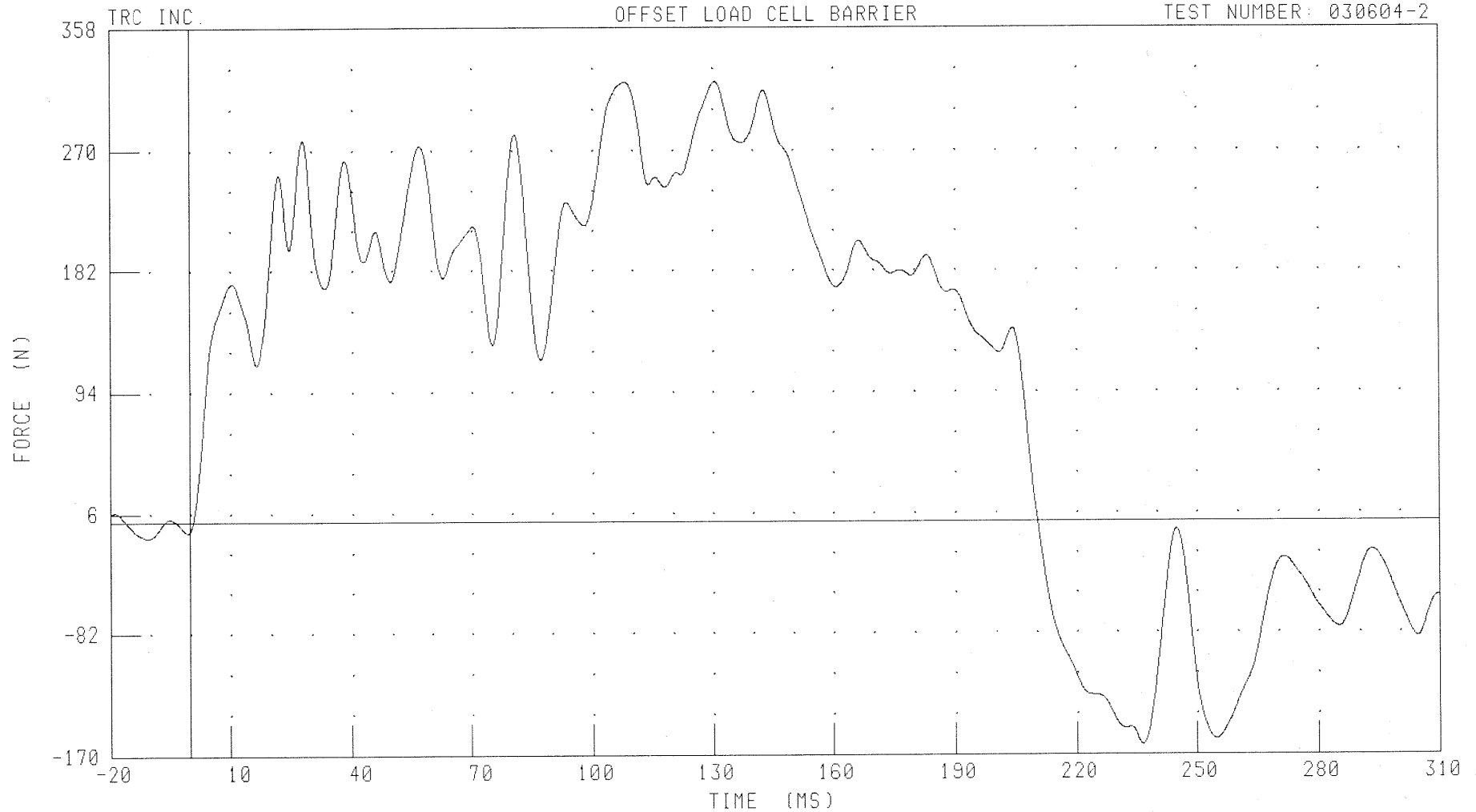
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF1XF FILTER: CH. CLASS 60

PEAK DATA: 319.11 N @ 130.72 MS; -162.99 N @ 236.48 MS

B-226

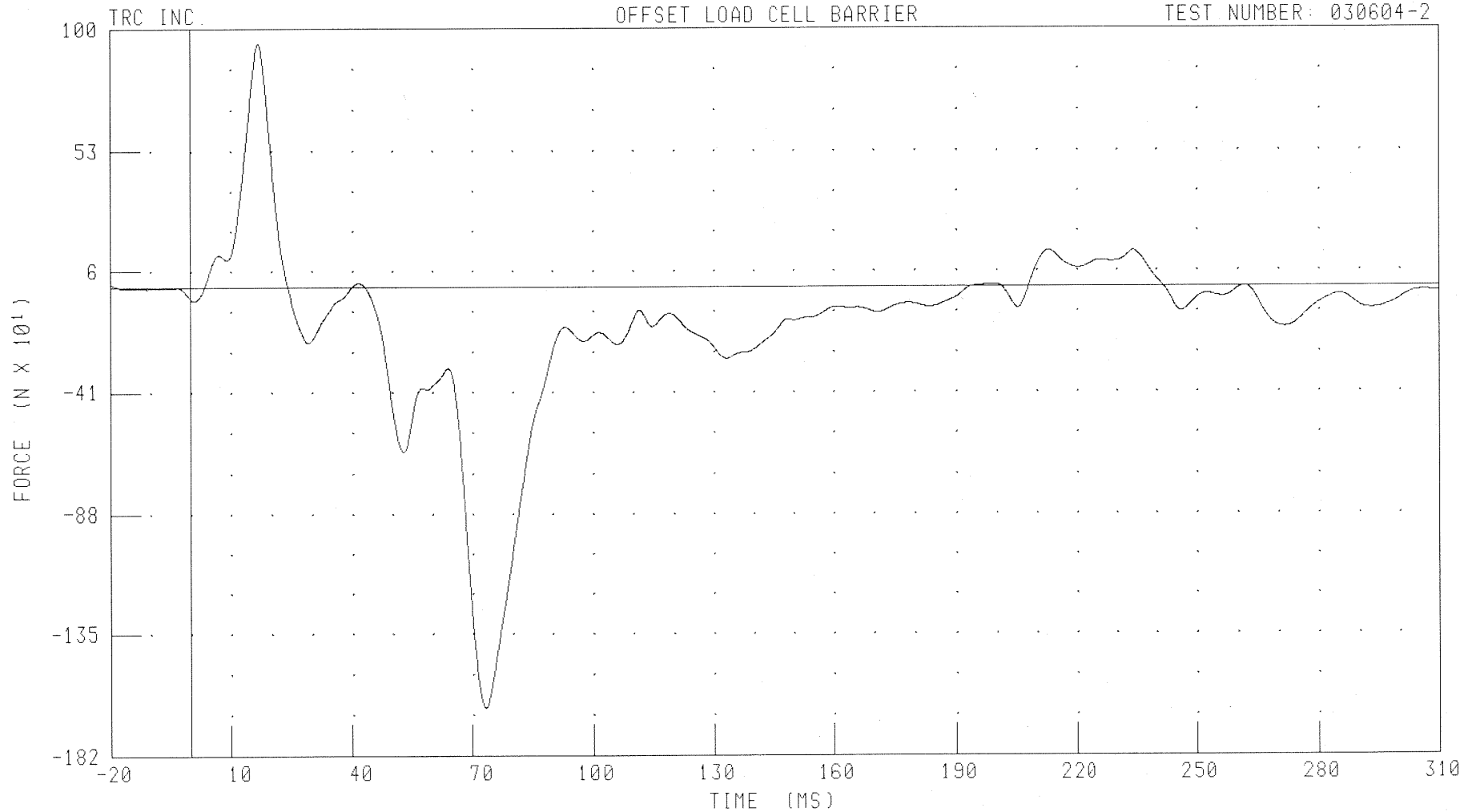
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF2XF FILTER: CH. CLASS 60

PEAK DATA: 941.05 N @ 16.88 MS, -1635.80 N @ 73.28 MS

B-227

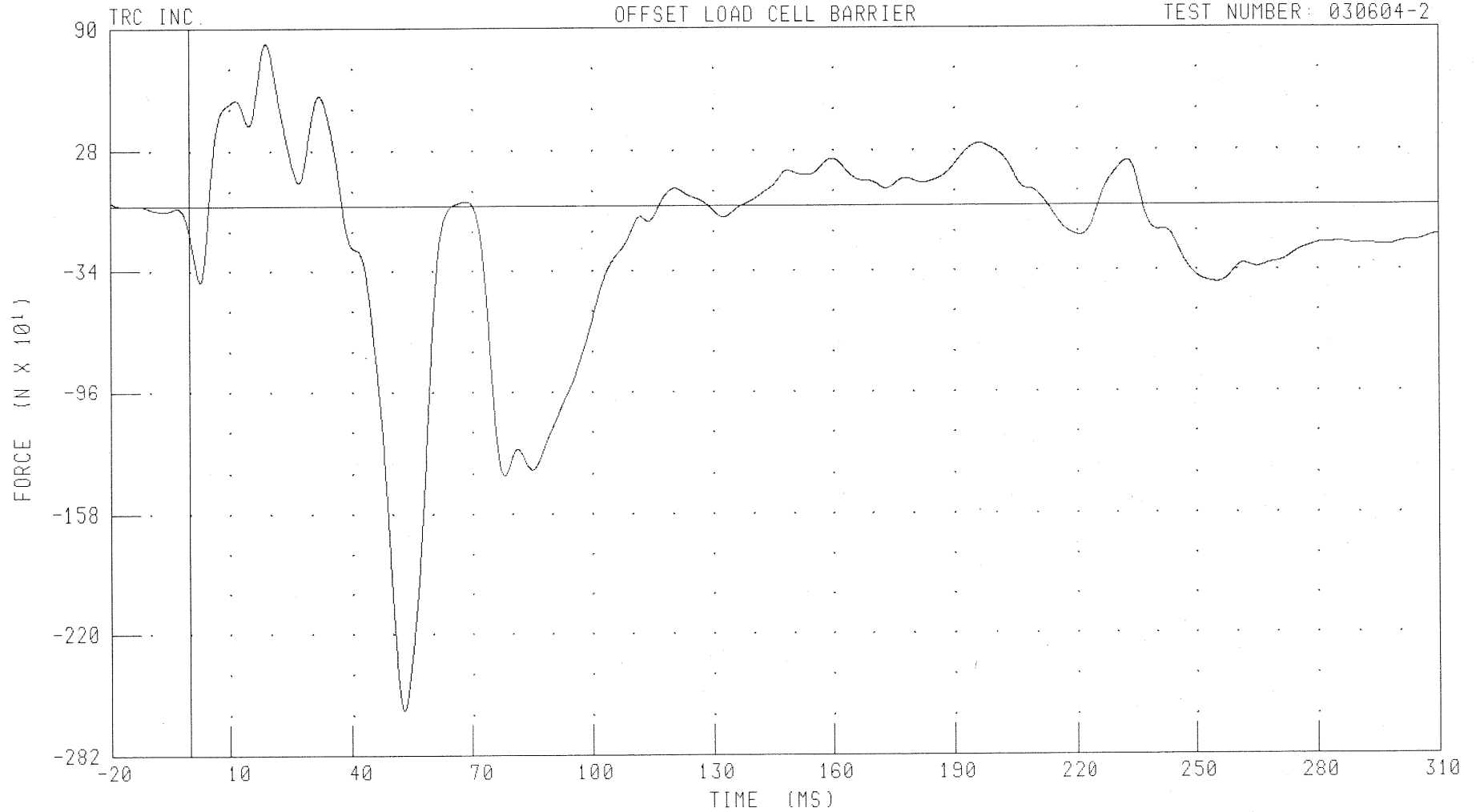
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF3XF FILTER: CH. CLASS 60

PEAK DATA: 826.17 N @ 18.96 MS, -2590.03 N @ 52.80 MS

B-228

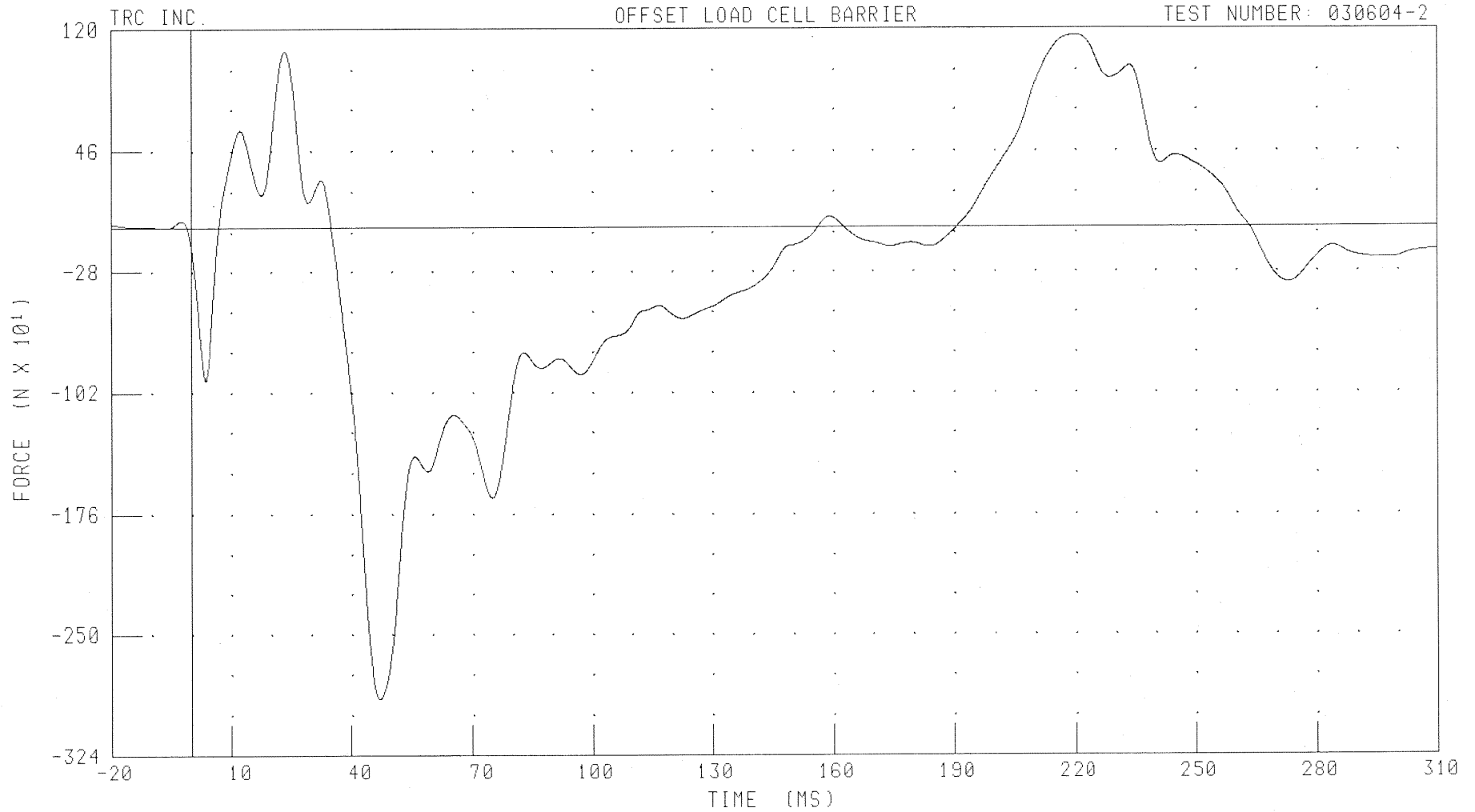
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF4XF FILTER: CH. CLASS 60

PEAK DATA: 1158.52 N @ 220.08 MS; -2897.24 N @ 46.96 MS

B-229

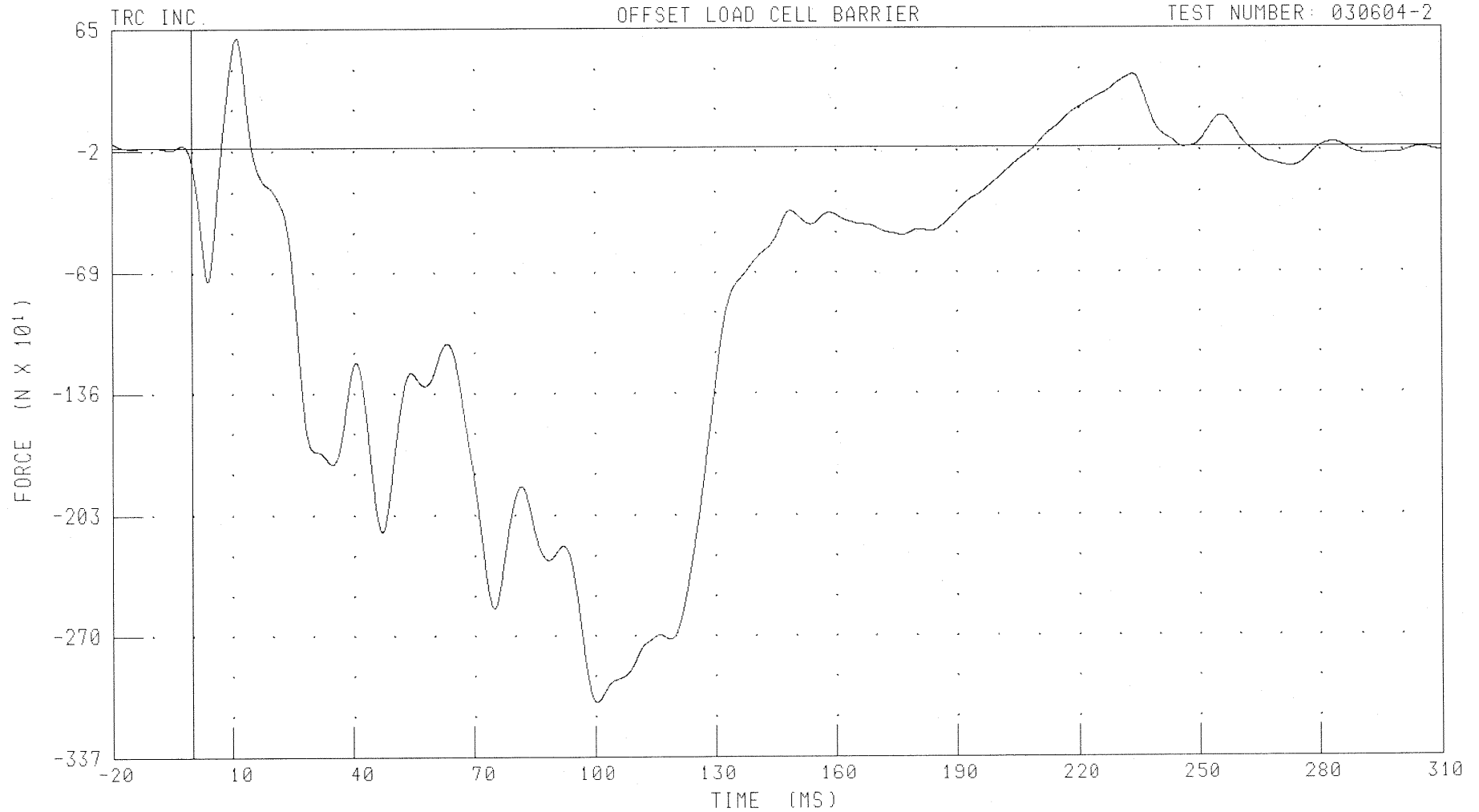
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F5 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF5XF FILTER: CH. CLASS 60

PEAK DATA: 599.04 N @ 11.20 MS; -3072.13 N @ 100.48 MS

B-230

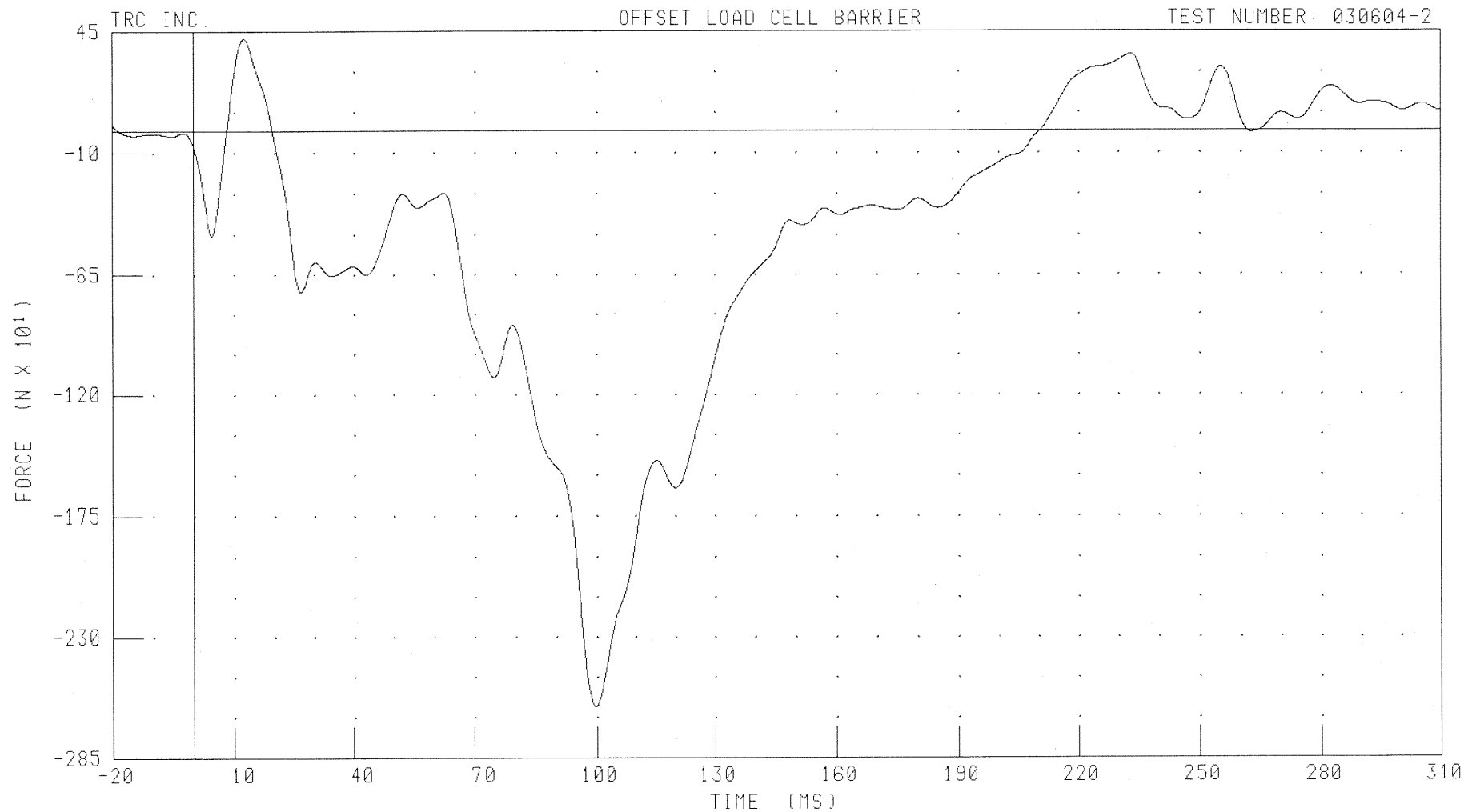
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F6 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF6XF

FILTER: CH. CLASS 60

PEAK DATA: 417.47 N @ 12.40 MS, -2618.71 N @ 99.68 MS

B-231

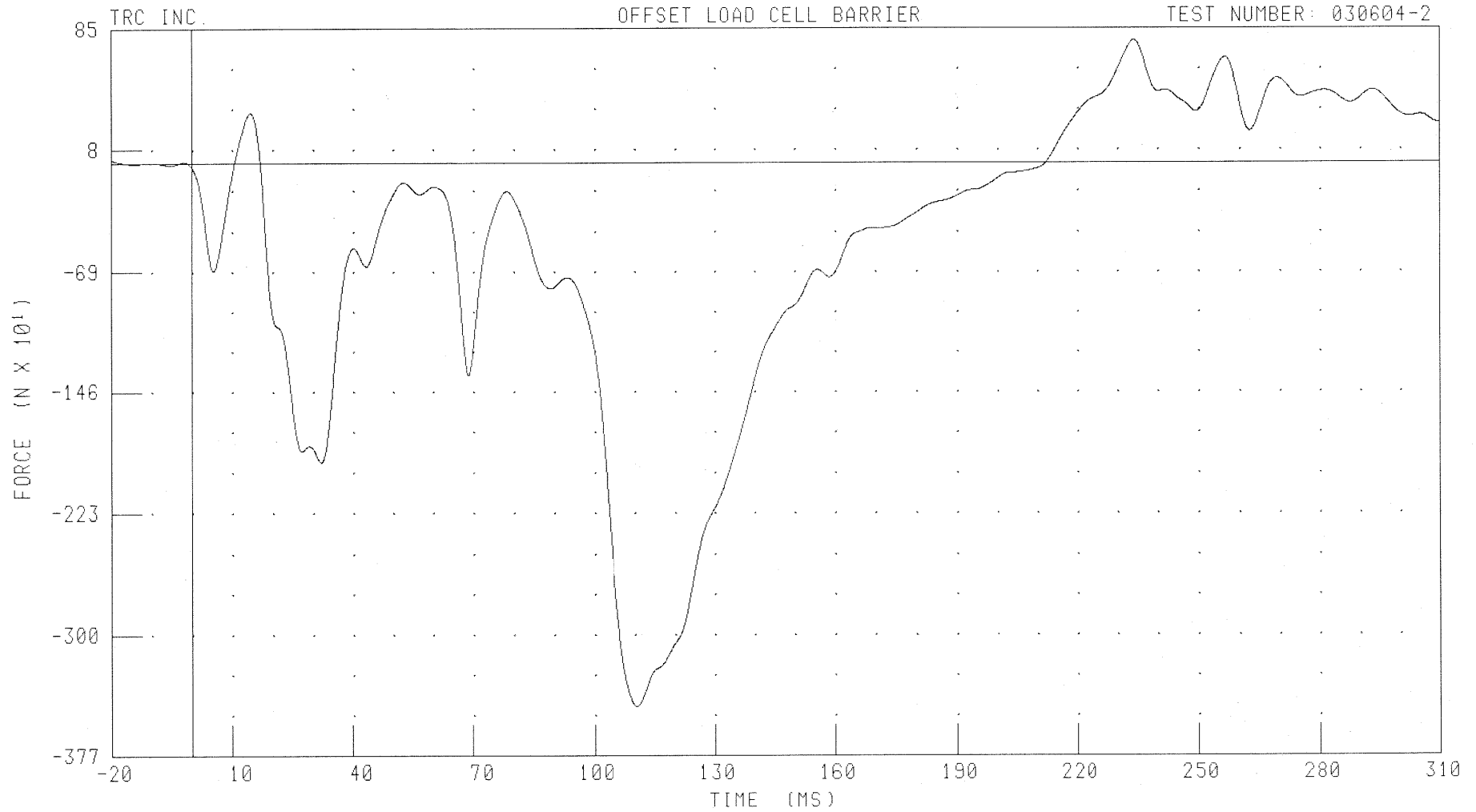
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL F7 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCF7XF FILTER: CH. CLASS 60

PEAK DATA: 773.97 N @ 234.16 MS; -3459.02 N @ 110.56 MS

B-232

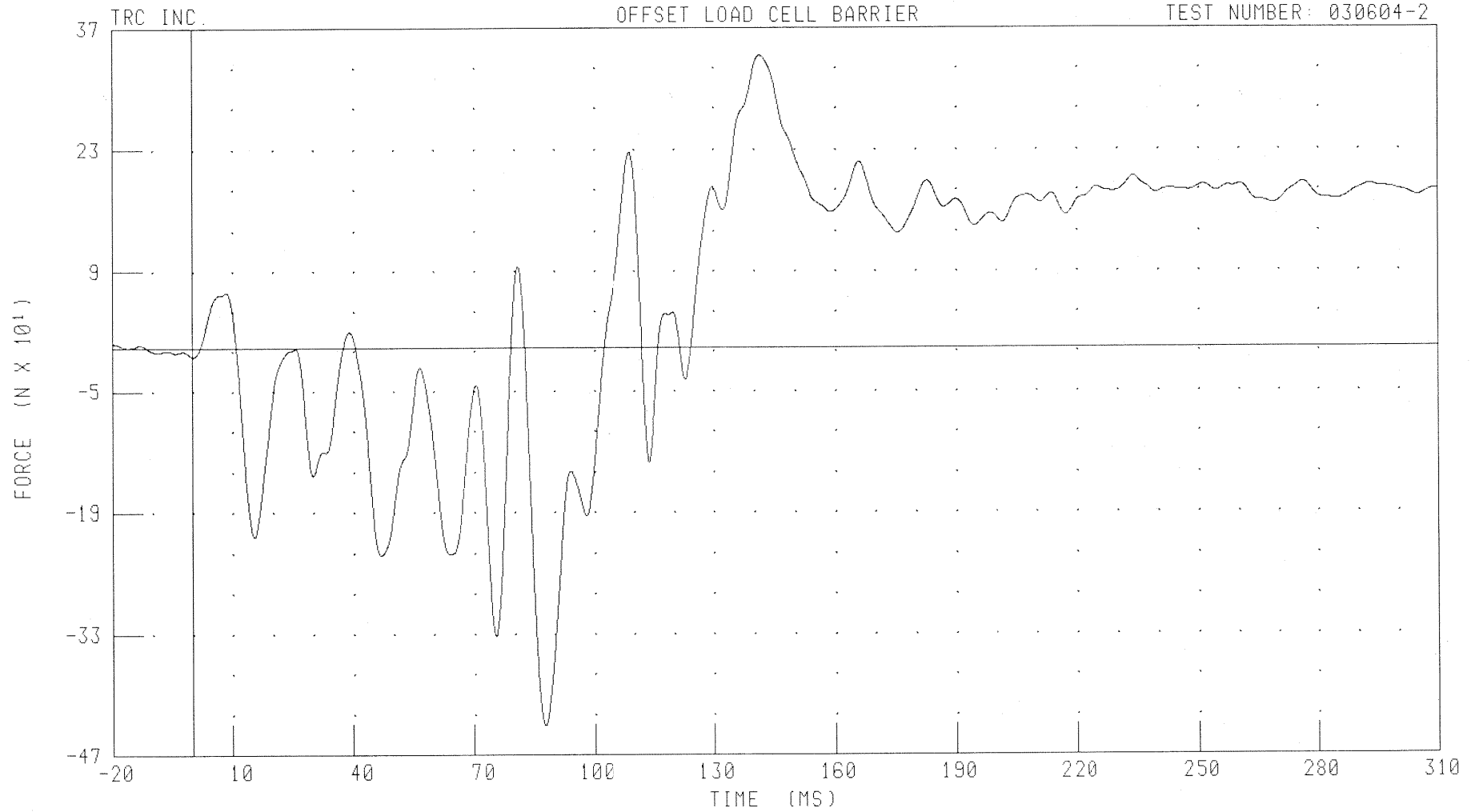
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL G1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCC1XF FILTER: CH. CLASS 60

PEAK DATA: 337.95 N @ 141.52 MS, -436.31 N @ 87.60 MS

B-233

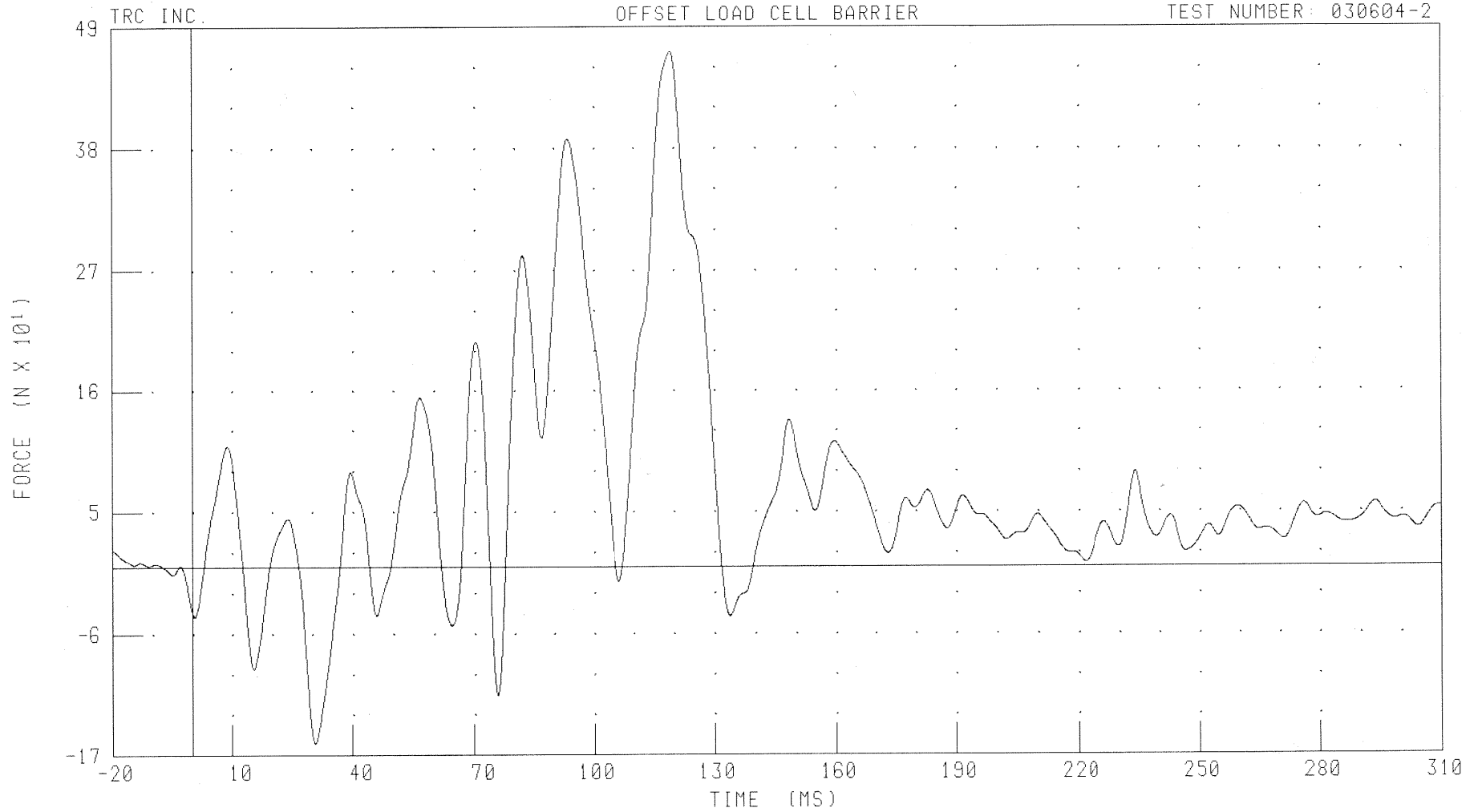
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL G2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCG2XF FILTER: CH. CLASS 60

PEAK DATA: 467.34 N @ 119.36 MS; -159.44 N @ 30.80 MS

B-234

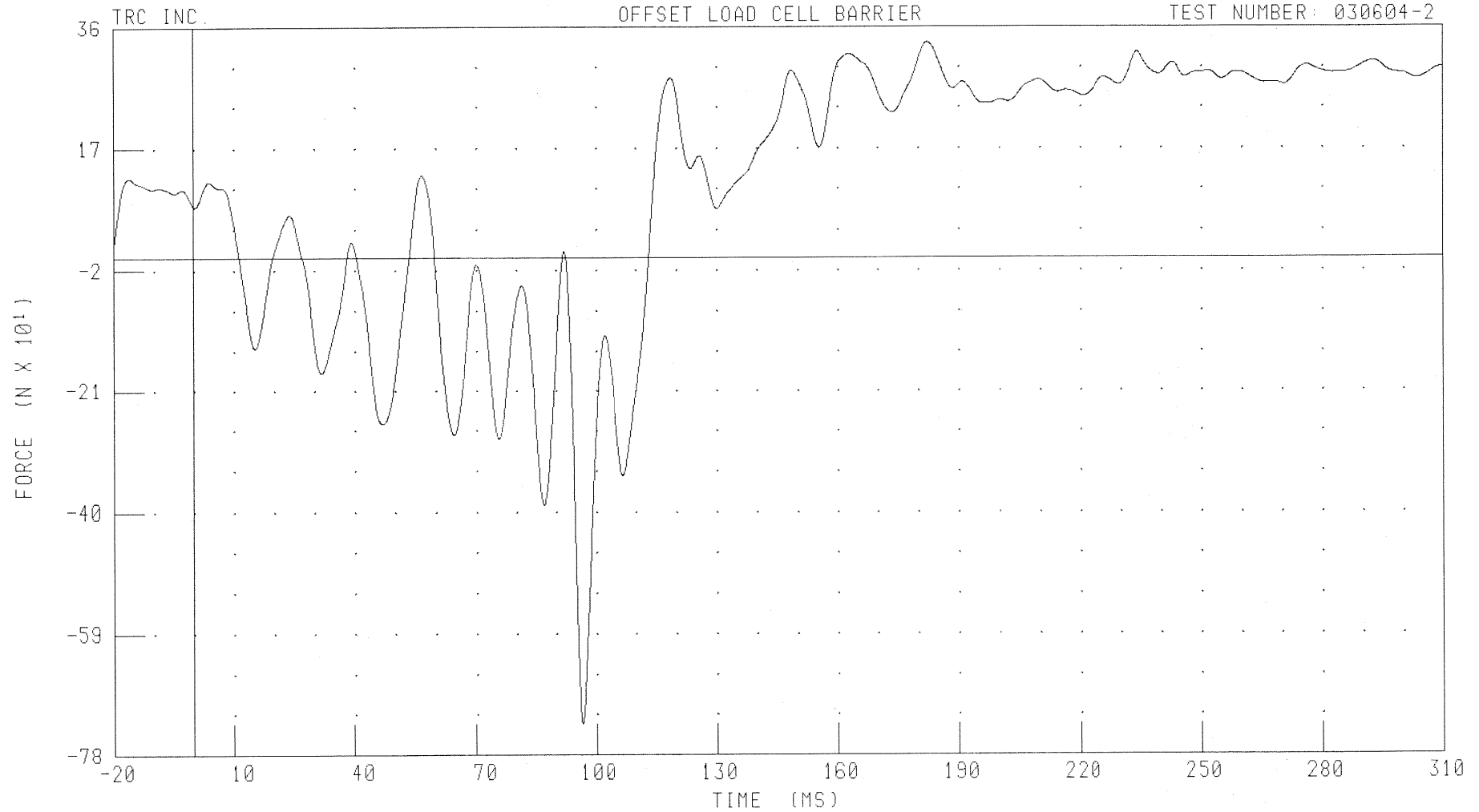
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL G3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCG3XF FILTER: CH. CLASS 60

PEAK DATA: 335.43 N @ 182.40 MS, -731.27 N @ 96.64 MS

B-235

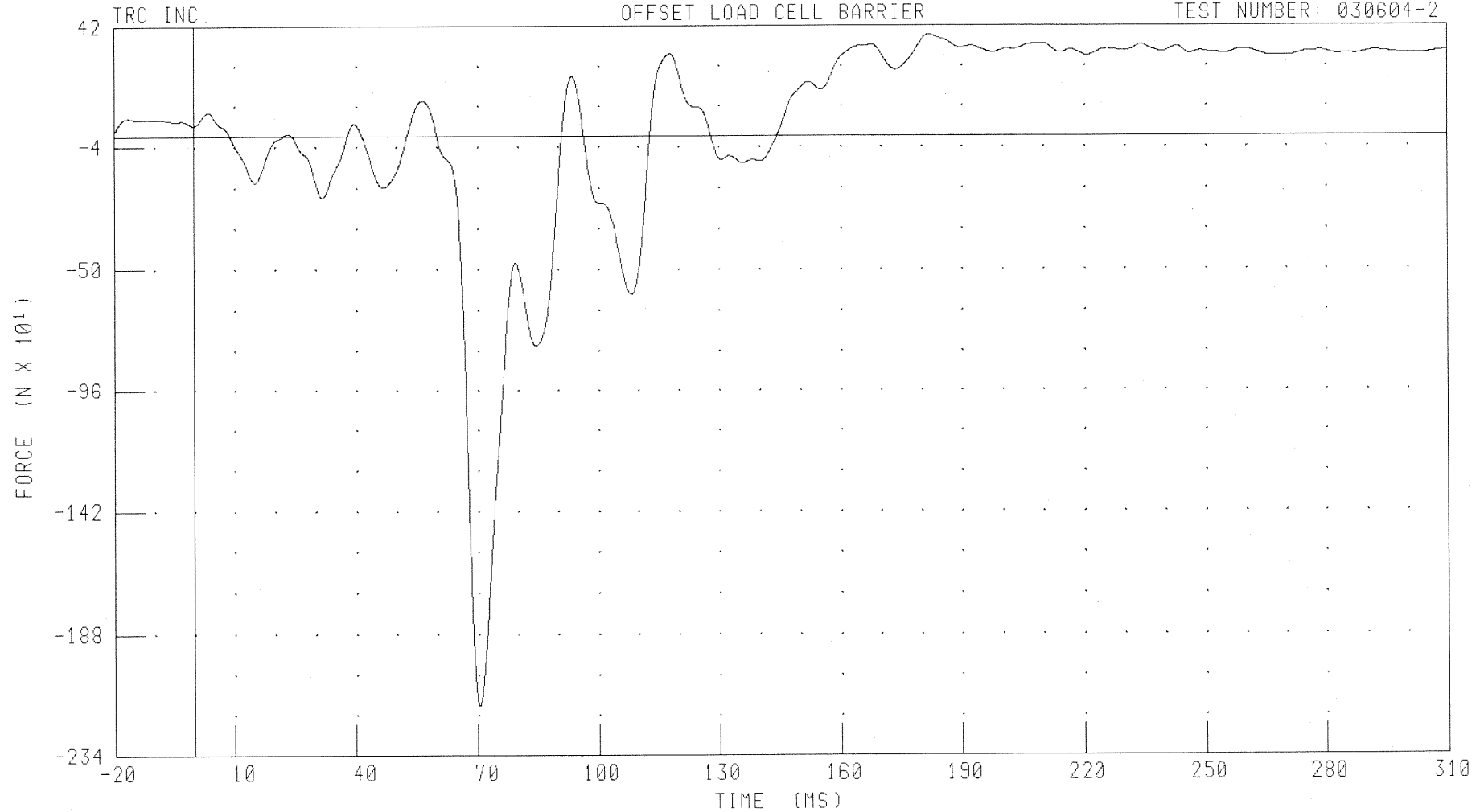
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL G4 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCG4XF

FILTER: CH. CLASS 60

B-236

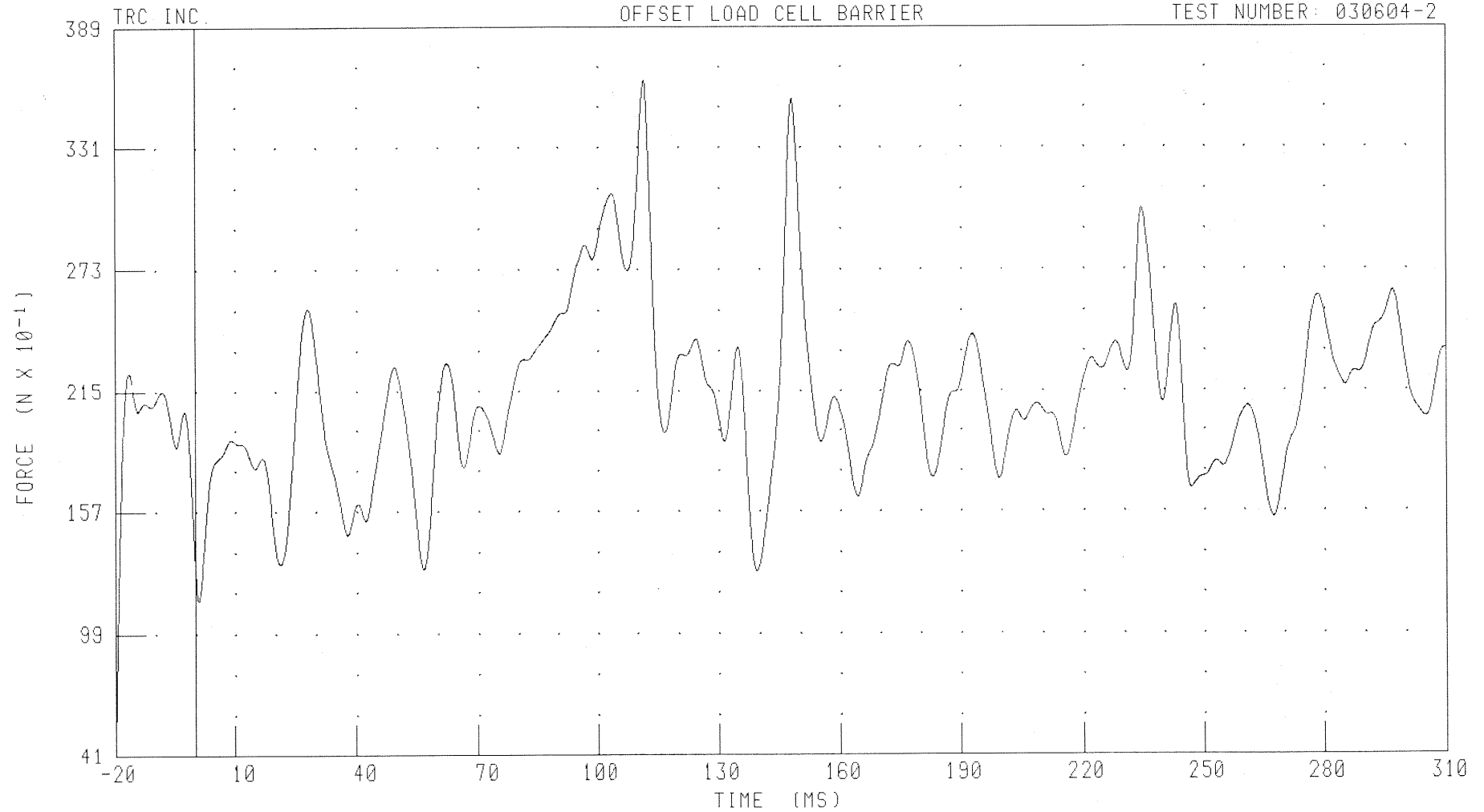
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL H1 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCH1XF

FILTER: CH. CLASS 60

PEAK DATA: 36.31 N @ 111.68 MS; 4.57 N @ -20.00 MS

B-237

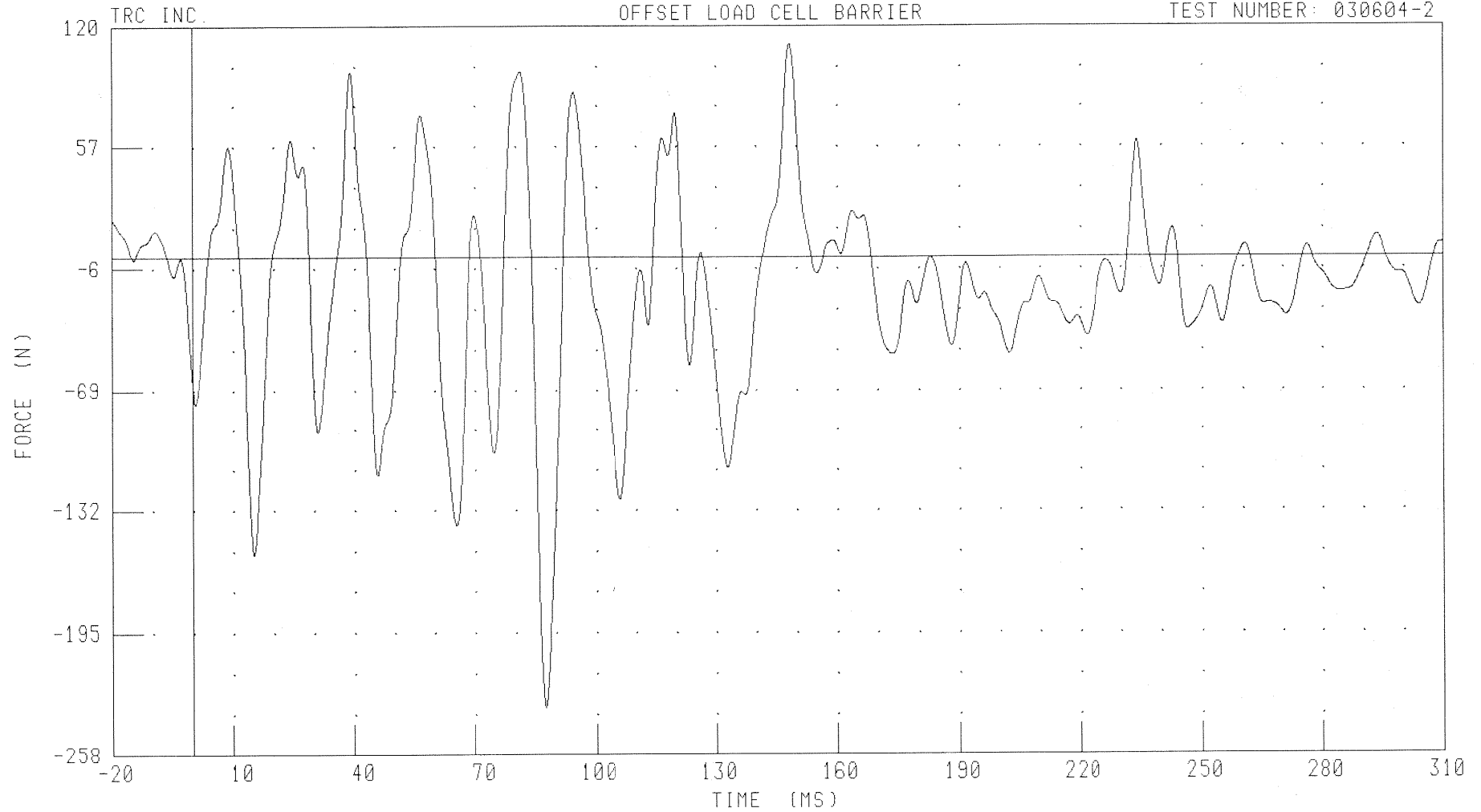
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL H2 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCH2XF

FILTER: CH. CLASS 60

PEAK DATA: 110.71 N @ 148.40 MS; -233.26 N @ 87.44 MS

B-238

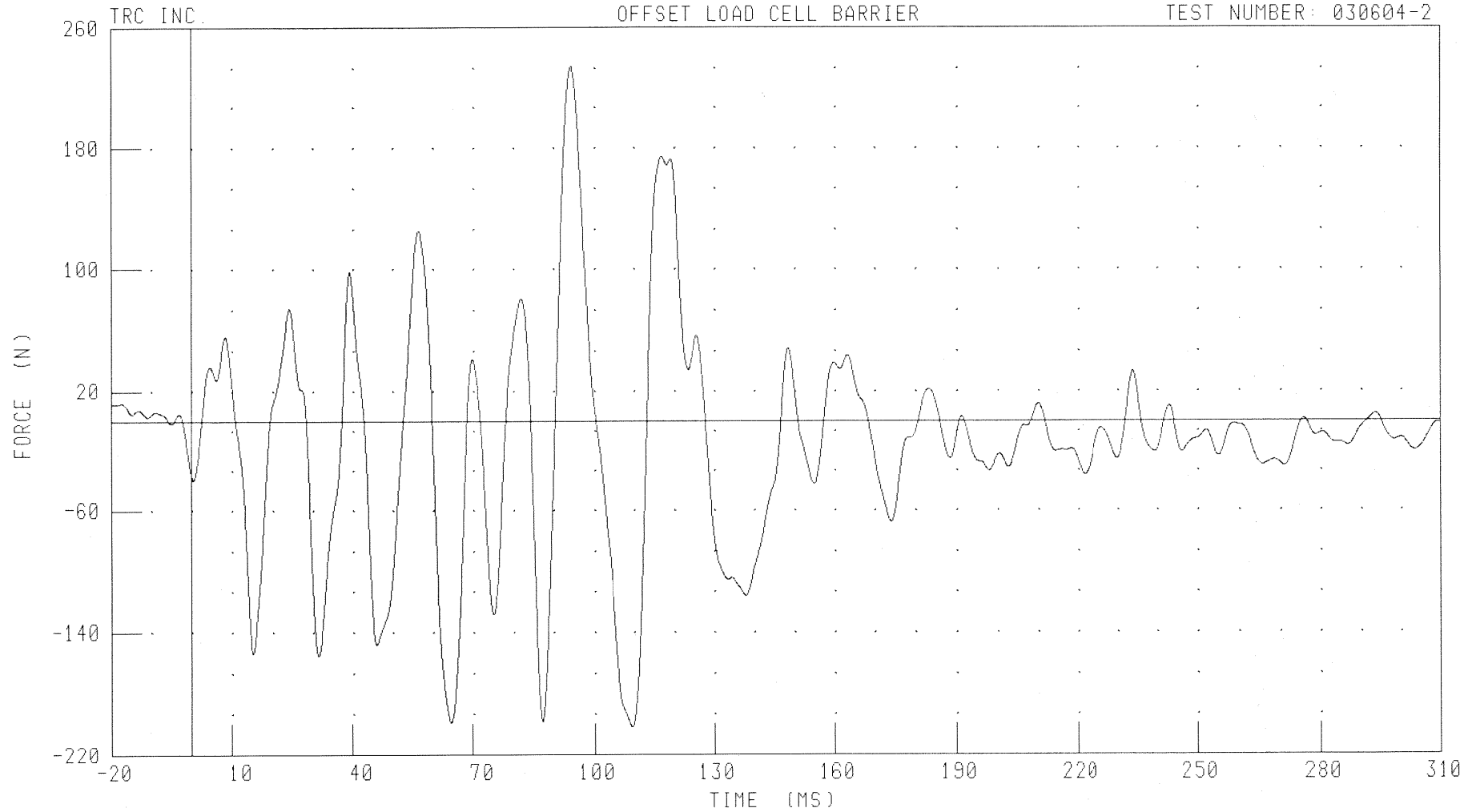
030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL H3 X-AXIS FORCE

OFFSET LOAD CELL BARRIER

TEST NUMBER: 030604-2



CHANNEL: LCH3XF FILTER: CH. CLASS 60

PEAK DATA: 234.62 N @ 94.24 MS, -201.93 N @ 109.52 MS

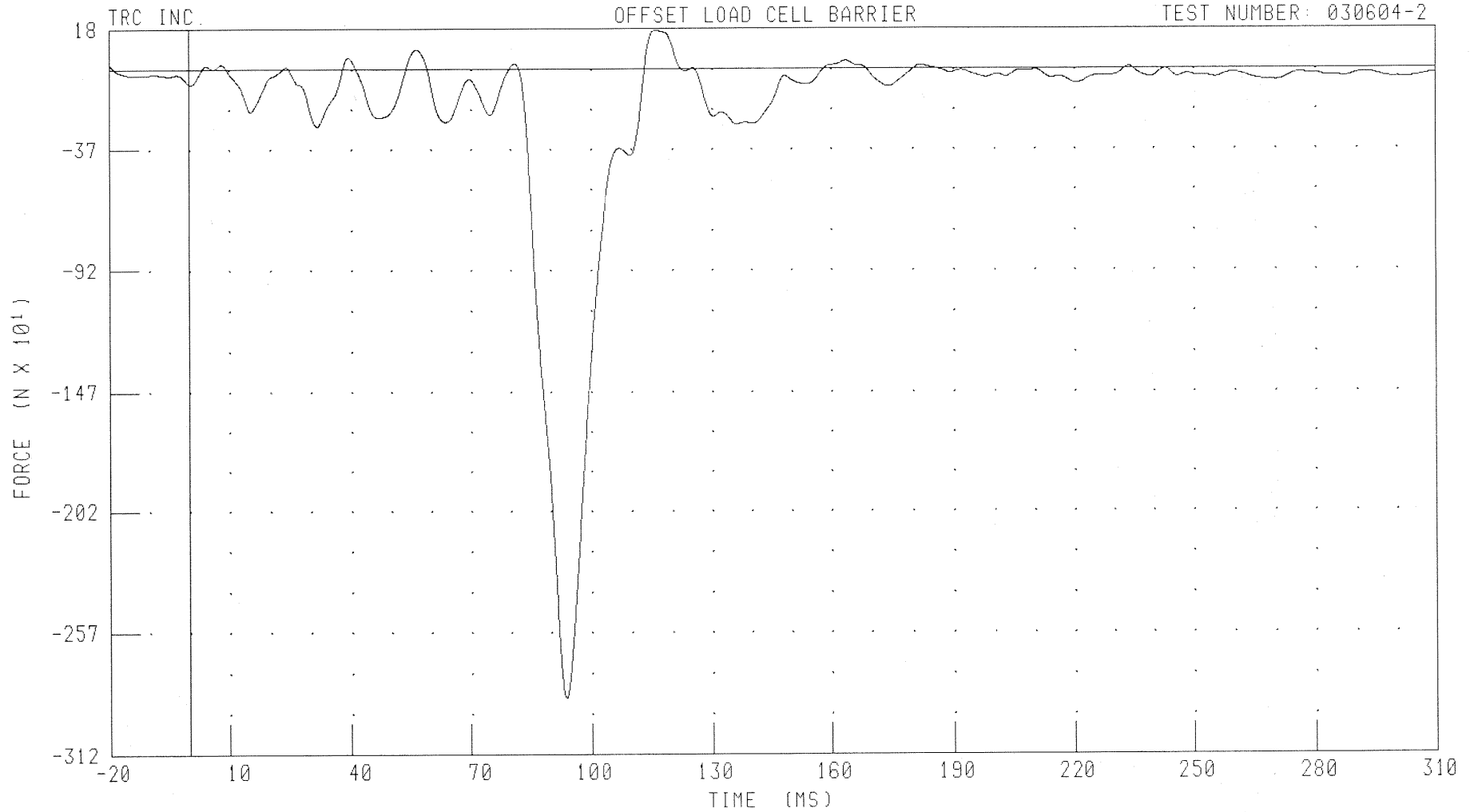
B-239

030604-2

2003 TOYOTA SIENNA INTO 40% LEFT OFFSET LOAD CELL BARRIER AT 56 KM/H

BARRIER LOAD CELL H4 X-AXIS FORCE

TEST NUMBER: 030604-2



CHANNEL: LCH4XF FILTER: CH. CLASS 60

B-240

030604-2

Appendix C

Dummy Configuration and Performance Verification Data

Pre-Test Dummy Configuration and Performance Verification Data

Driver Dummy S/N: 416

Transportation Research Center Inc.
5720 HIII 5th Female Dummy
External Dimensions
Serial No. 416 Calibration No. 20

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	785	Yes
B	Shoulder Pivot Height	431.8 - 457.2	446	Yes
C	Hip Pivot Height	81.3 - 86.3	83	Yes
D	Hip Pivot from Backline	144.8 - 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	75	Yes
F	Thigh Clearance	119.4 - 134.6	129	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	251	Yes
H	Head Back to Backline	43.2 - 48.2	47	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	288	Yes
J	Elbow Rest Height	182.8 - 203.2	195	Yes
K	Buttock Knee Length	520.7 - 546.1	545	Yes
L	Popliteal Height	355.6 - 376.0	360	Yes
M	Knee Pivot Height	393.7 - 419.1	401	Yes
N	Buttock Popliteal Height	414.0 - 439.4	430	Yes
O	Chest Depth without Jacket	175.3 - 190.5	184	Yes
P	Foot Length	218.5 - 233.7	227	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	466	Yes
S	Head Breadth	137.1 - 147.3	141	Yes
T	Head Depth	177.8 - 188.0	187	Yes
U	Hip Breadth	299.7 - 314.9	305	Yes
V	Shoulder Breadth	350.5 - 365.7	364	Yes
W	Foot Breadth	78.8 - 94.0	93	Yes
X	Head Circumference	528.3 - 548.7	545	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	874	Yes
Z	Waist Circumference	759.5 - 789.9	782	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	346	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician



Approved




Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

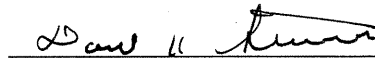
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Resultant Acceleration	250 - 300 g	250.4 g	Yes
Peak Lateral Acceleration	15 g Max	5.8 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



05.20.2003 10:17:10 607



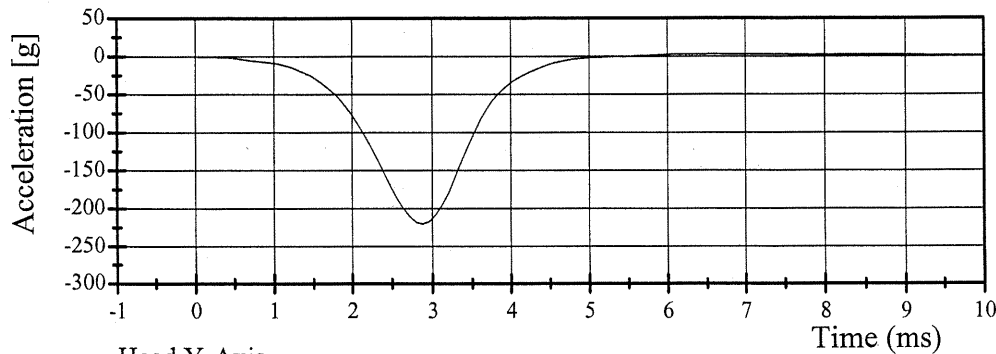
Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

Head X-Axis

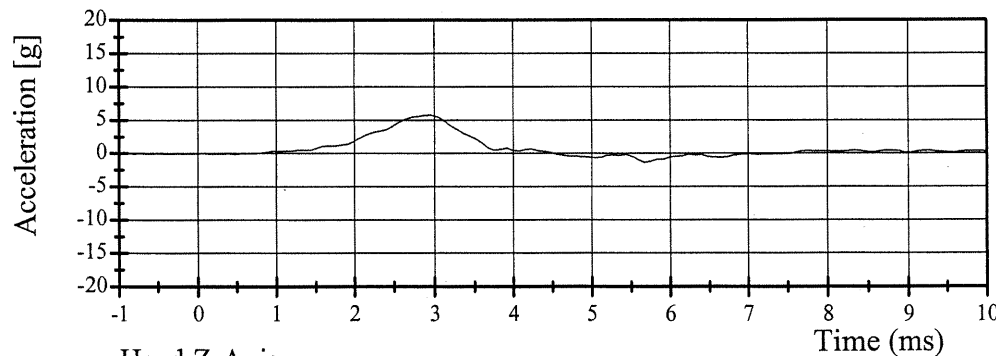


Filter Class: 1000

Max: 3.3 g at 6.6 ms

Min: -220.4 g at 2.9 ms

Head Y-Axis

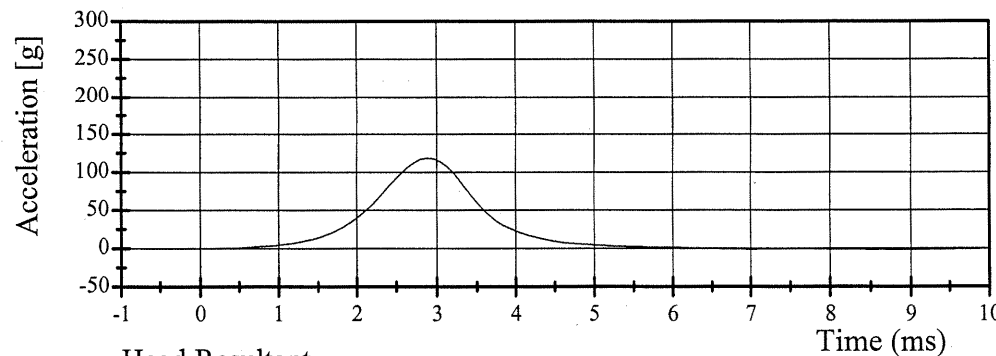


Filter Class: 1000

Max: 5.8 g at 3.0 ms

Min: -1.3 g at 5.7 ms

Head Z-Axis

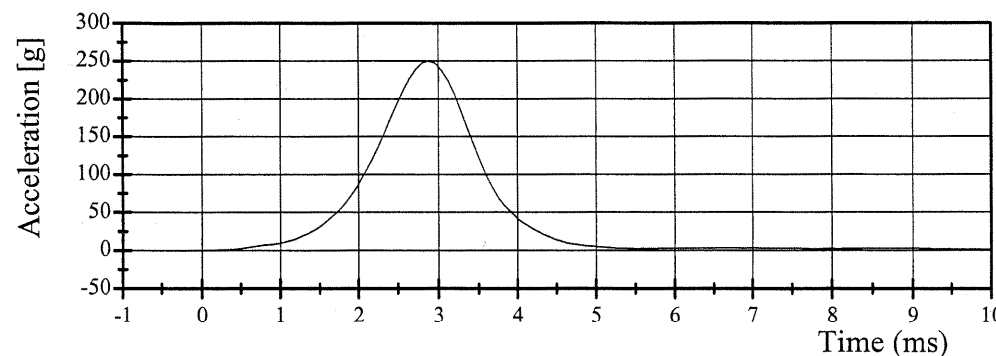


Filter Class: 1000

Max: 118.7 g at 2.9 ms

Min: -1.6 g at 8.6 ms

Head Resultant



Filter Class: 1000

Max: 250.4 g at 2.9 ms

Min: 0.0 g at 0.2 ms

Transportation Research Center Inc.

5720 Neck Flexion Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 05/20/2003

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	7.10 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.10 - 2.50 m/s	2.48 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.85 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.94 m/s	Yes
Peak D Plane Rotation	77 - 91 °	78.1 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	78.47 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	87.44 ms	Yes

Comments:

Technician



Approved



05.20.2003 11:17:59 494



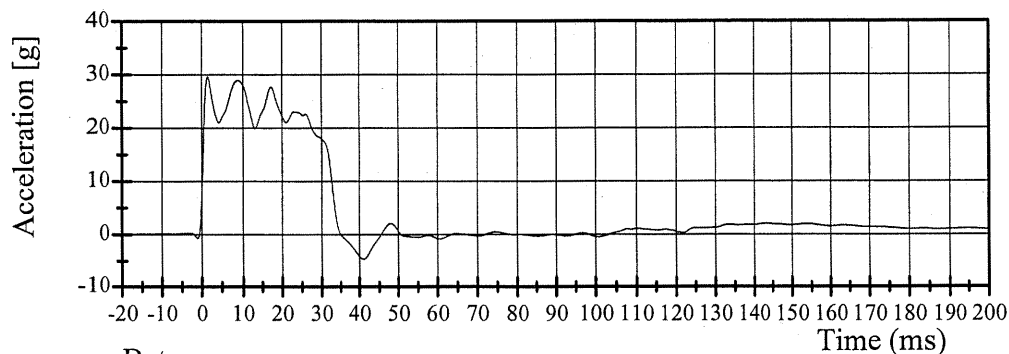
Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 05/20/2003

Pendulum Deceleration

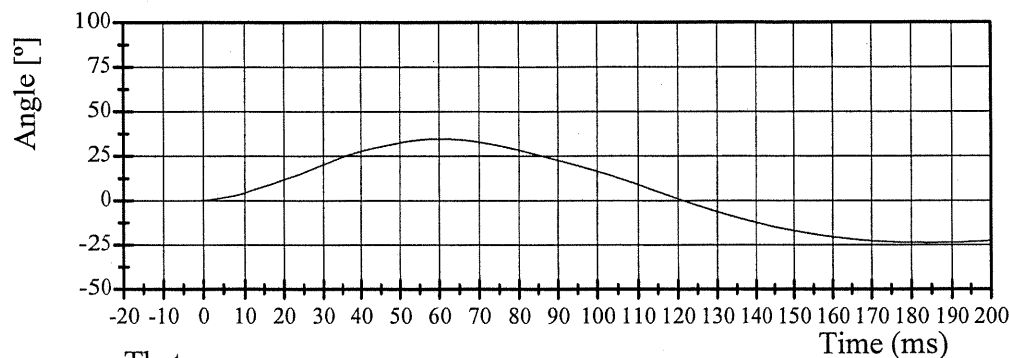


Filter Class: 180

Max: 29.6 g at 1.6 ms

Min: -4.6 g at 41.1 ms

Beta

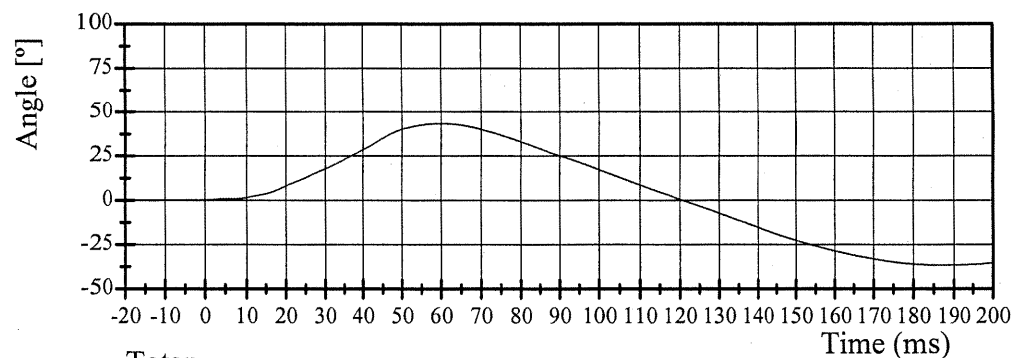


Filter Class: 60

Max: 34.7 ° at 60.0 ms

Min: -23.6 ° at 184.8 ms

Theta

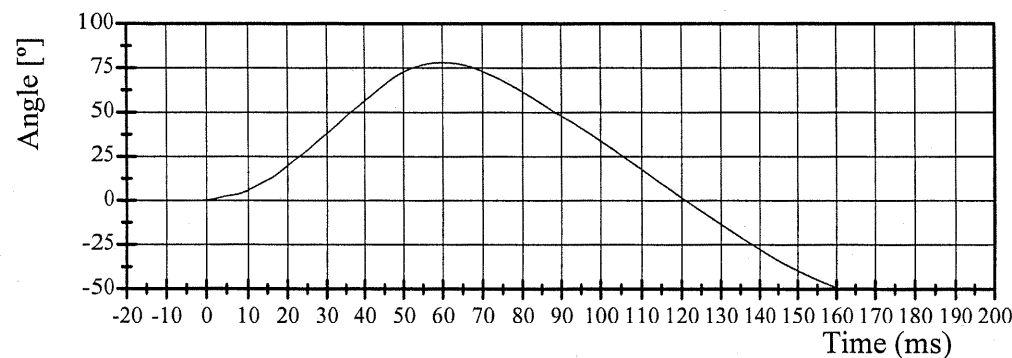


Filter Class: 60

Max: 43.4 ° at 60.0 ms

Min: -36.5 ° at 186.7 ms

Totan



Filter Class: 60

Max: 78.1 ° at 60.0 ms

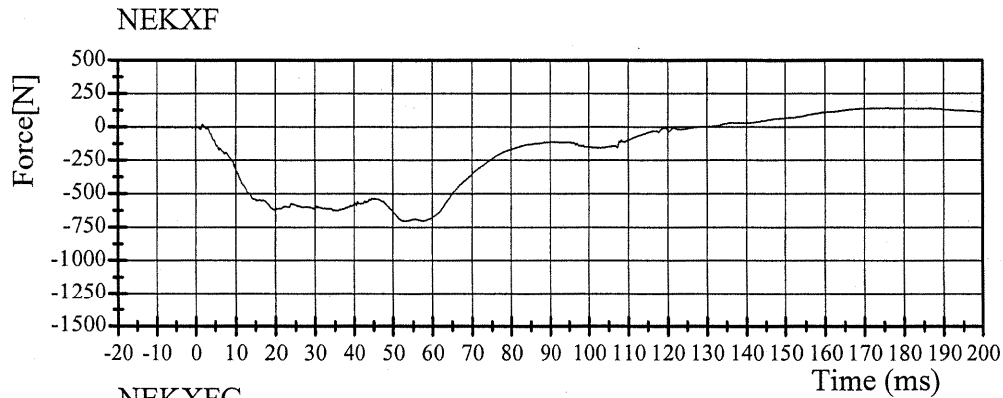
Min: -60.2 ° at 186.5 ms

Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

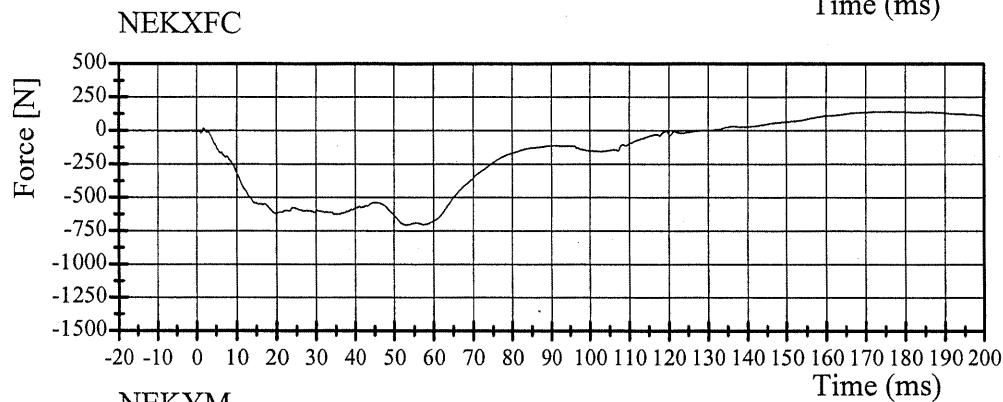
Test Date 05/20/2003



Filter Class: 1000

Max: 142.6 N at 175.8 ms

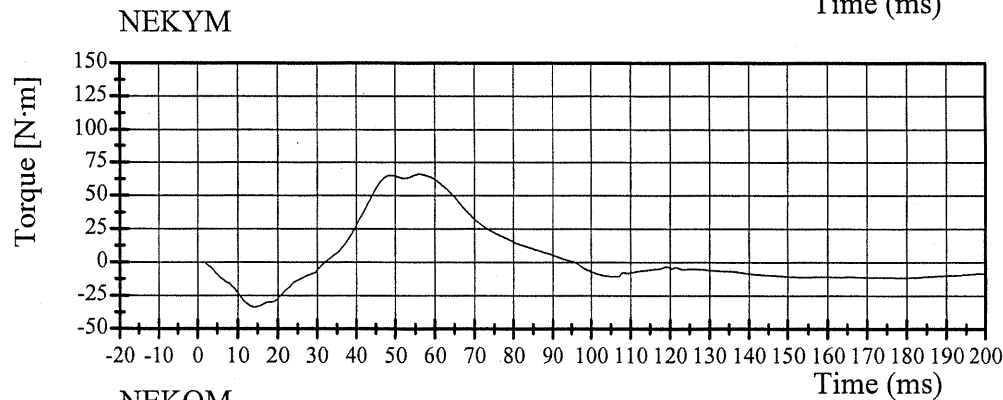
Min: -706.0 N at 53.0 ms



Filter Class: 600

Max: 142.0 N at 175.9 ms

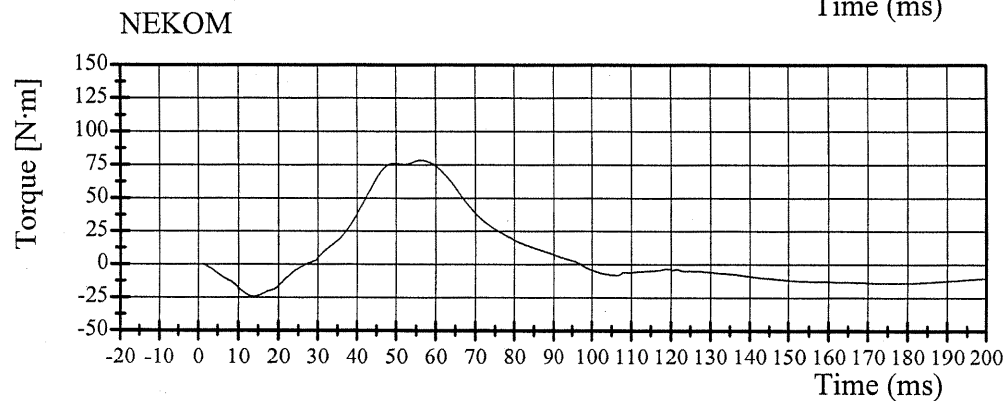
Min: -705.1 N at 53.0 ms



Filter Class: 600

Max: 66.2 N·m at 55.9 ms

Min: -33.9 N·m at 14.2 ms



Filter Class: 600

Max: 78.5 N·m at 56.1 ms

Min: -24.4 N·m at 13.9 ms

Transportation Research Center Inc.

5720 Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

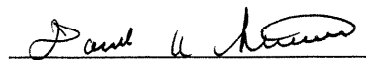
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.08 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.50 - 1.90 m/s	1.81 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.53 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.10 m/s	Yes
Peak D Plane Rotation	99 - 114 °	103.7 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-59.06 N·m	Yes
Negative Moment Decay Time To -10 N·m	94 - 114 ms	103.68 ms	Yes

Comments:

Technician



Approved



05.20.2003 11:49:31 582



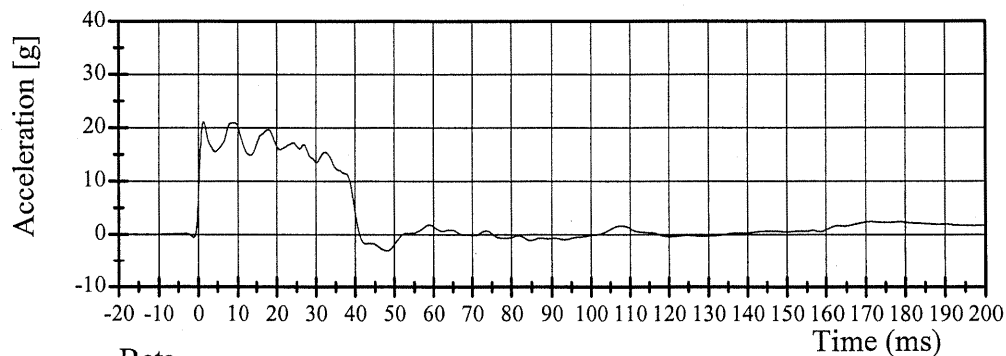
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

Pendulum Deceleration

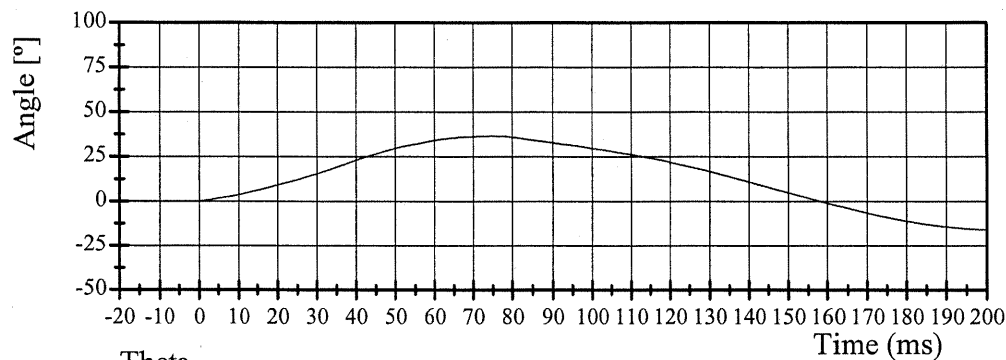


Filter Class: 180

Max: 21.1 g at 1.4 ms

Min: -3.0 g at 48.1 ms

Beta

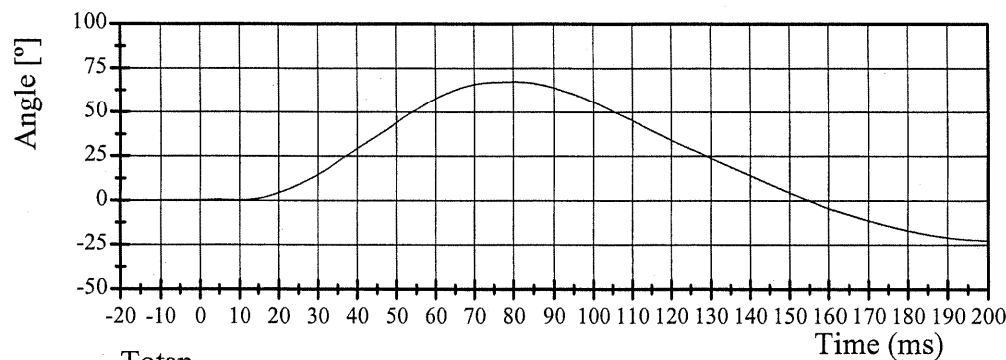


Filter Class: 60

Max: 36.6 ° at 75.0 ms

Min: -16.5 ° at 207.6 ms

Theta

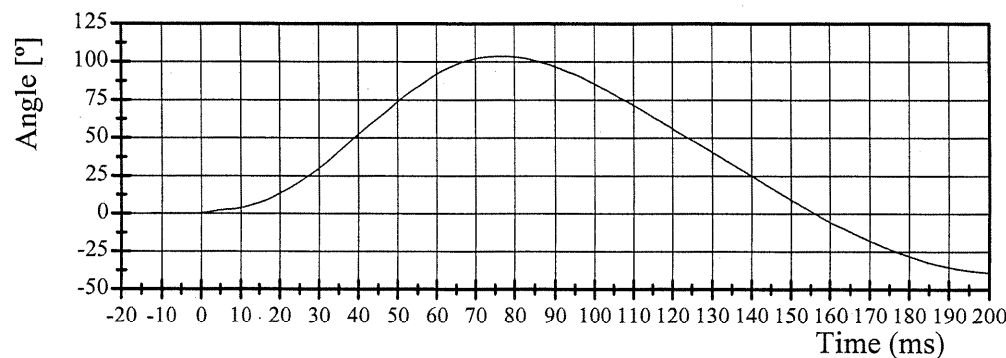


Filter Class: 60

Max: 67.3 ° at 80.4 ms

Min: -22.9 ° at 204.6 ms

Totan



Filter Class: 60

Max: 103.7 ° at 76.9 ms

Min: -39.3 ° at 206.0 ms

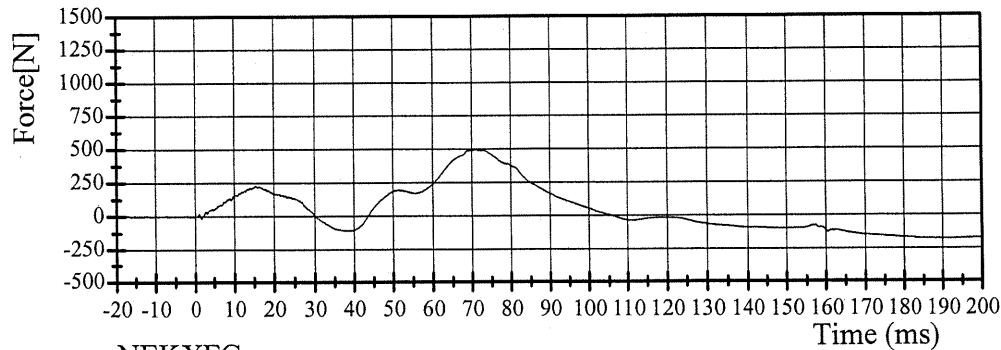
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

NEKXF

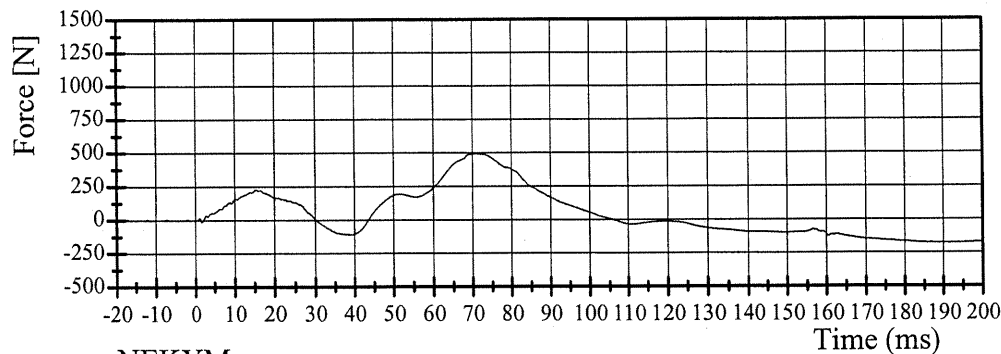


Filter Class: 1000

Max: 497.1 N at 71.0 ms

Min: -178.0 N at 189.6 ms

NEKXFC

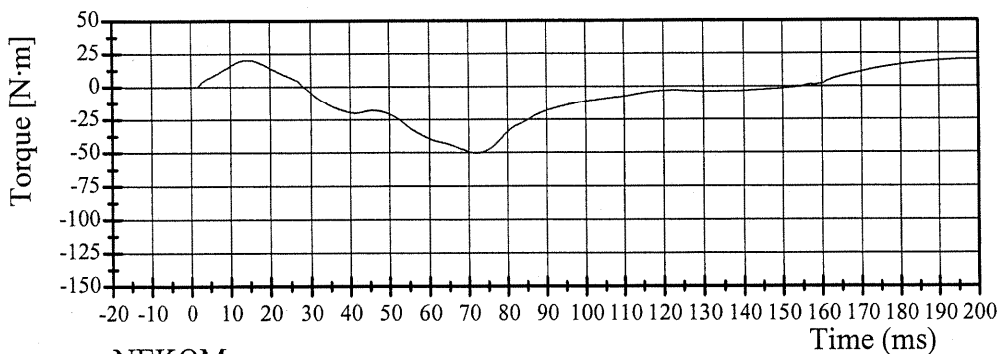


Filter Class: 600

Max: 496.3 N at 71.0 ms

Min: -177.4 N at 191.6 ms

NEKYM

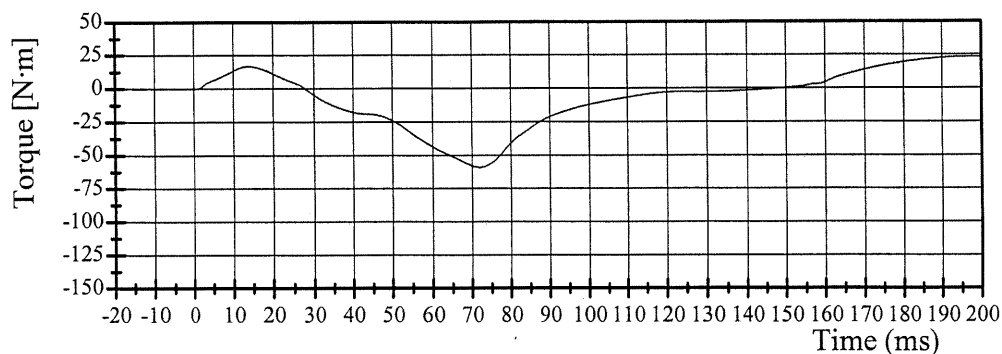


Filter Class: 600

Max: 20.4 N·m at 14.2 ms

Min: -50.3 N·m at 72.1 ms

NEKOM



Filter Class: 600

Max: 23.4 N·m at 197.6 ms

Min: -59.1 N·m at 72.0 ms

Transportation Research Center Inc.

5720 Thorax Test

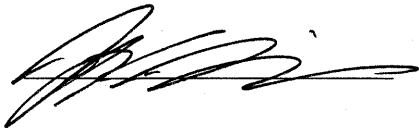
HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

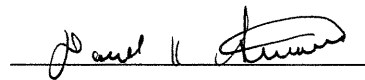
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.60 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-54.0 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4119 N	Yes
Peak Force Between 18 mm and 50 mm	4600 N	4050 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician



Approved



05.20.2003 15:01:19 970



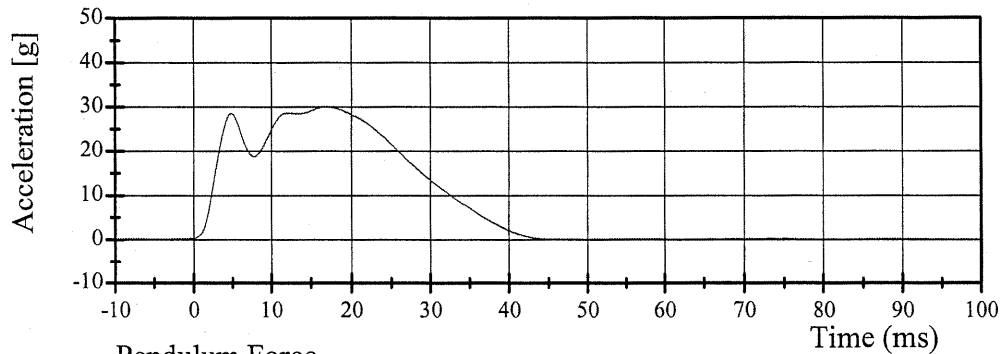
Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 1

Test Date 05/20/2003

Pendulum Deceleration

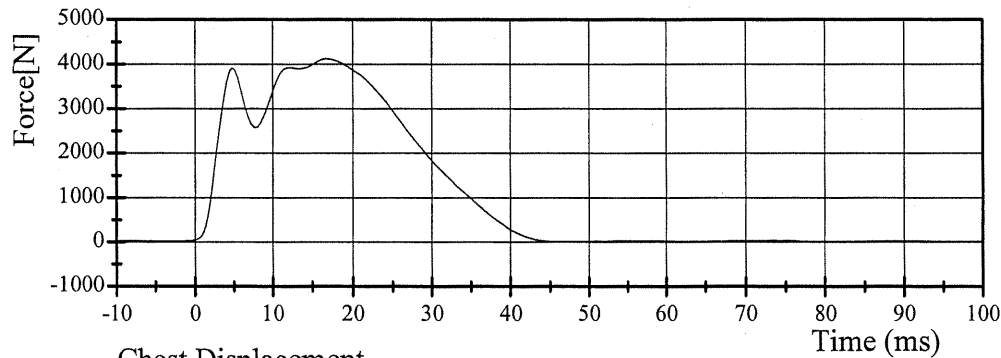


Filter Class: 180

Max: 30.1 g at 16.7 ms

Min: -0.1 g at 865.4 ms

Pendulum Force

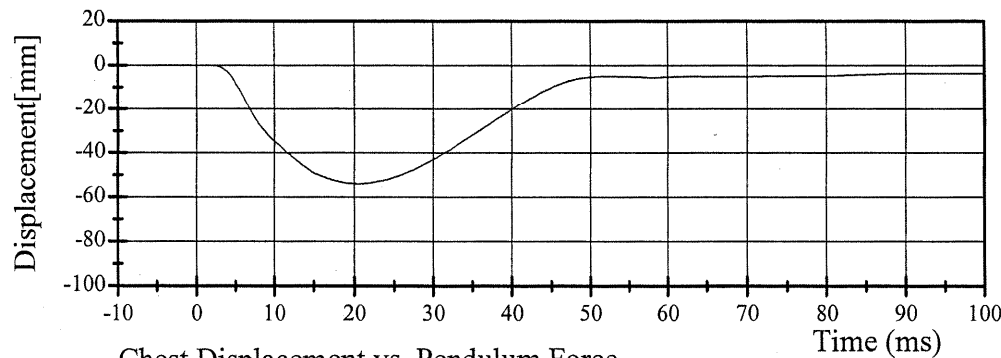


Filter Class: 180

Max: 4118.8 N at 16.7 ms

Min: -11.6 N at 865.4 ms

Chest Displacement

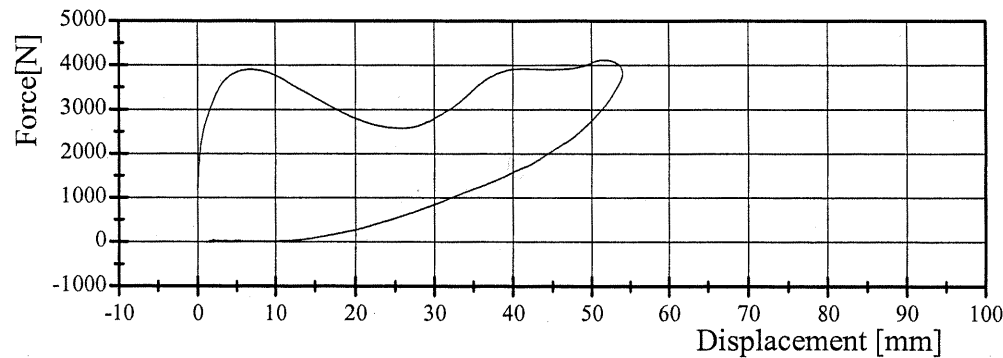


Filter Class: 600

Max: 0.0 mm at -43.4 ms

Min: -54.0 mm at 20.6 ms

Chest Displacement vs. Pendulum Force



05.20.2003 15:01:20 970



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 20-May-03

TRC, INC.

TEST NO: 416C20TF1

572 O SN416 TORSO FLEX CAL 20

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2° C	21.7 ° C
RELATIVE HUMIDITY	10 – 70 %	50 %
INITIAL ANGLE OF UNSUPPORTRED DUMMY	<= 20° REFERENCED TO VERTICAL	16.0 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	372.2 N
RETURN ANGLE		20.8 °
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	4.8 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN



Transportation Research Center Inc.

5720 Left Knee Slider Test

HHH 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

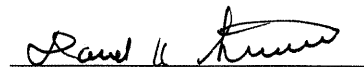
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-13.5 mm	Yes

Comments:

Technician



Approved



06.03.2003 07:41:14 1654



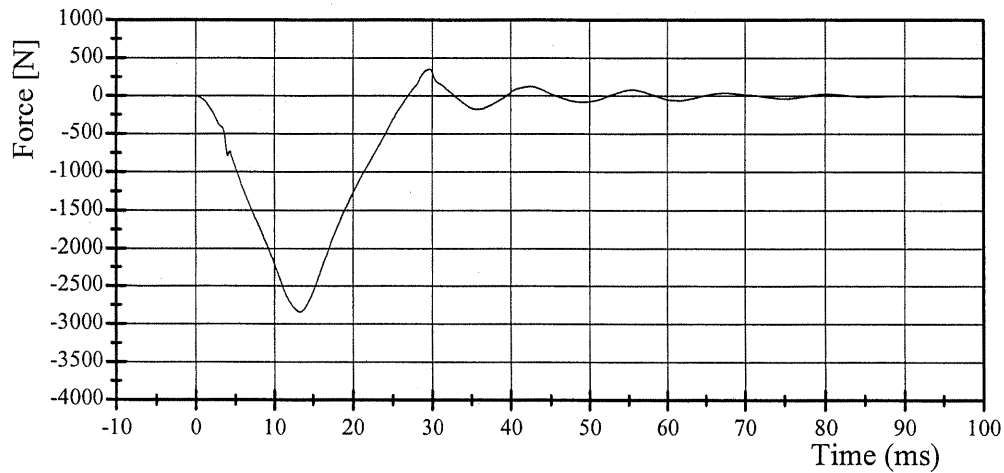
Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

Femur Force

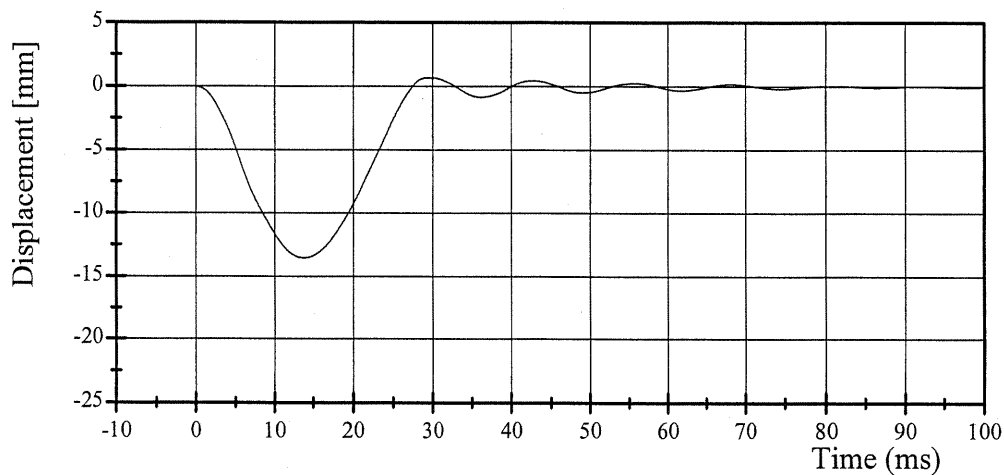


Filter Class: 600

Max: 352.7 N at 29.7 ms

Min: -2842.0 N at 13.4 ms

Tibia Displacement

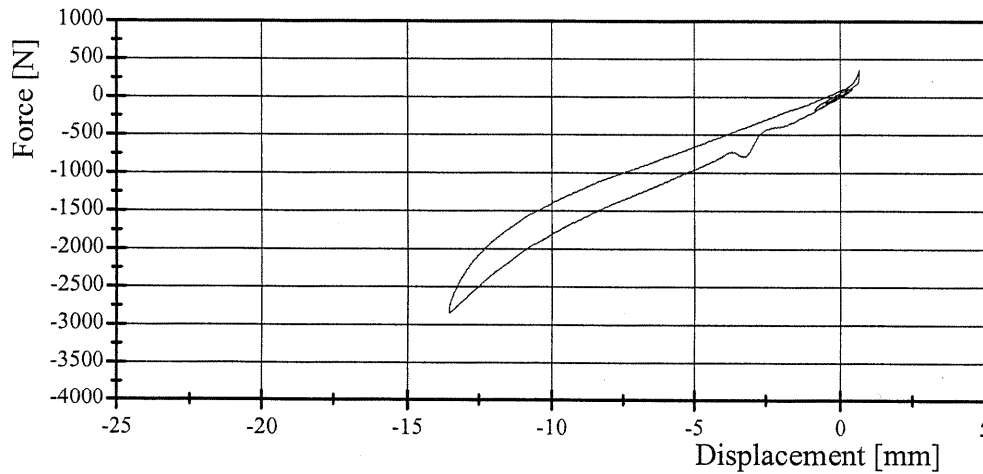


Filter Class: 180

Max: 0.7 mm at 29.8 ms

Min: -13.5 mm at 13.8 ms

Femur Force vs Tibia Displacement



06.03.2003 07:41:15 1654



Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

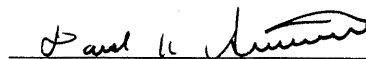
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.75 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-12.8 mm	Yes

Comments:

Technician



Approved



06.03.2003 07:27:54 1654



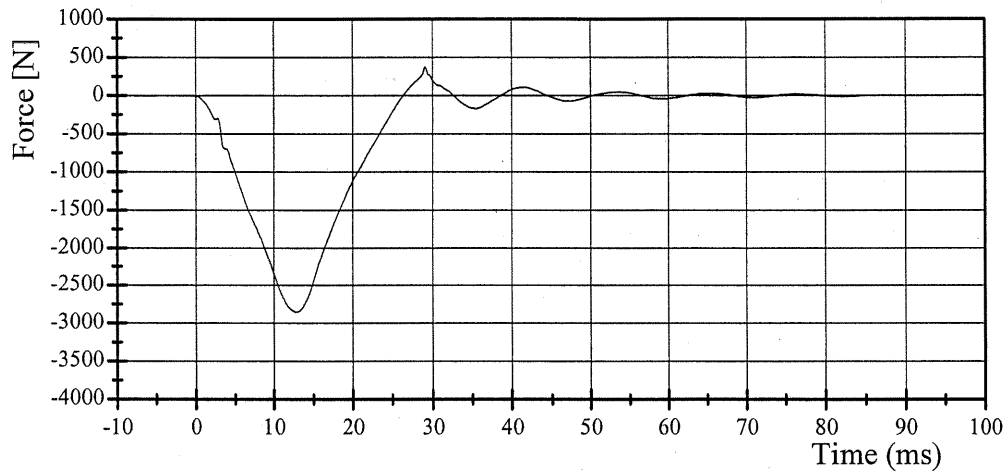
Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

Femur Force

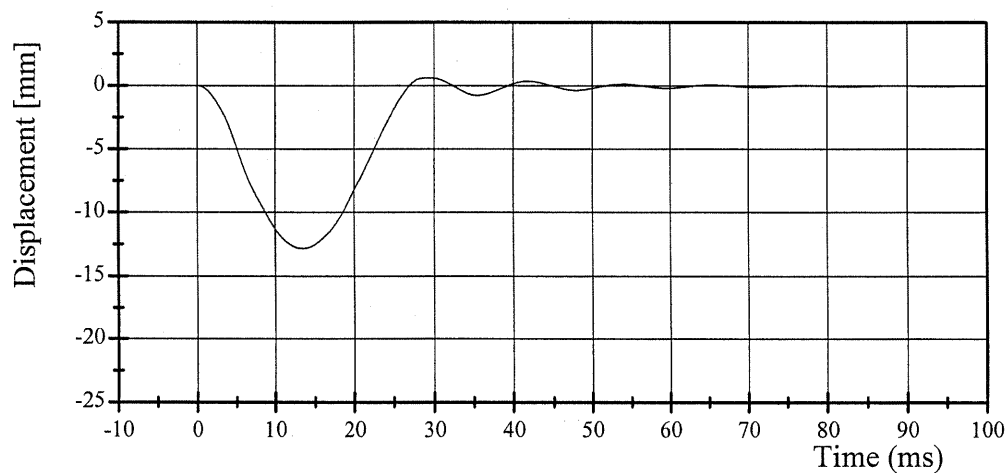


Filter Class: 600

Max: 372.6 N at 29.0 ms

Min: -2853.5 N at 12.8 ms

Tibia Displacement

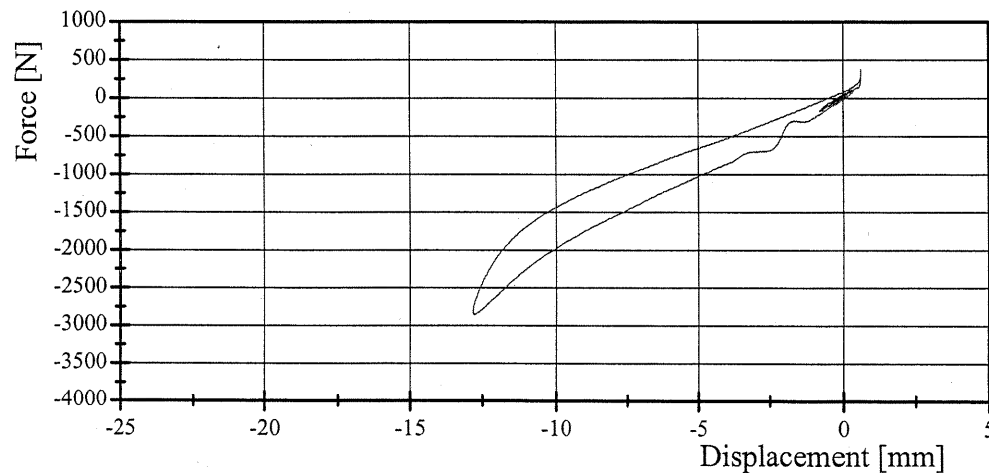


Filter Class: 180

Max: 0.6 mm at 29.3 ms

Min: -12.8 mm at 13.4 ms

Femur Force vs Tibia Displacement



06.03.2003 07:27:55 1654



Transportation Research Center Inc.

5720 Left Knee Test

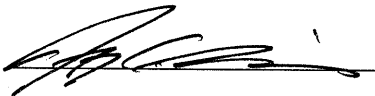
HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

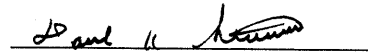
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.13 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3716 N	Yes

Comments:

Technician



Approved



06.03.2003 08:09:40 1783

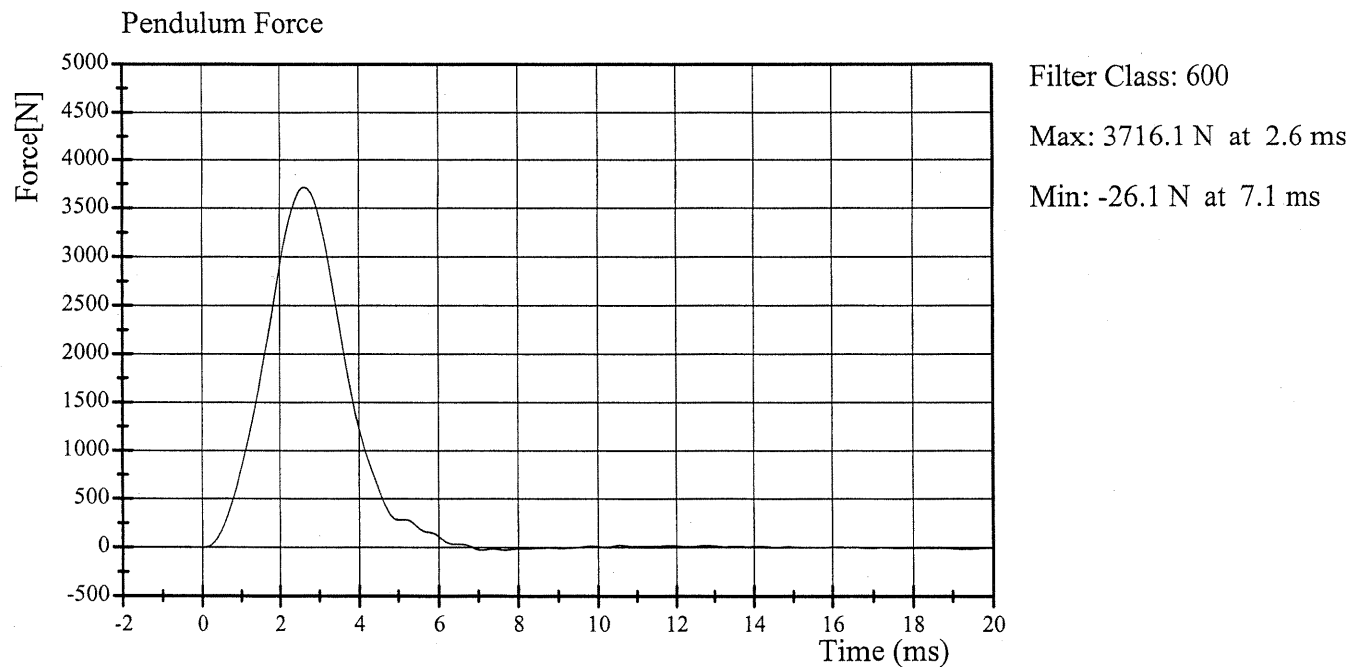
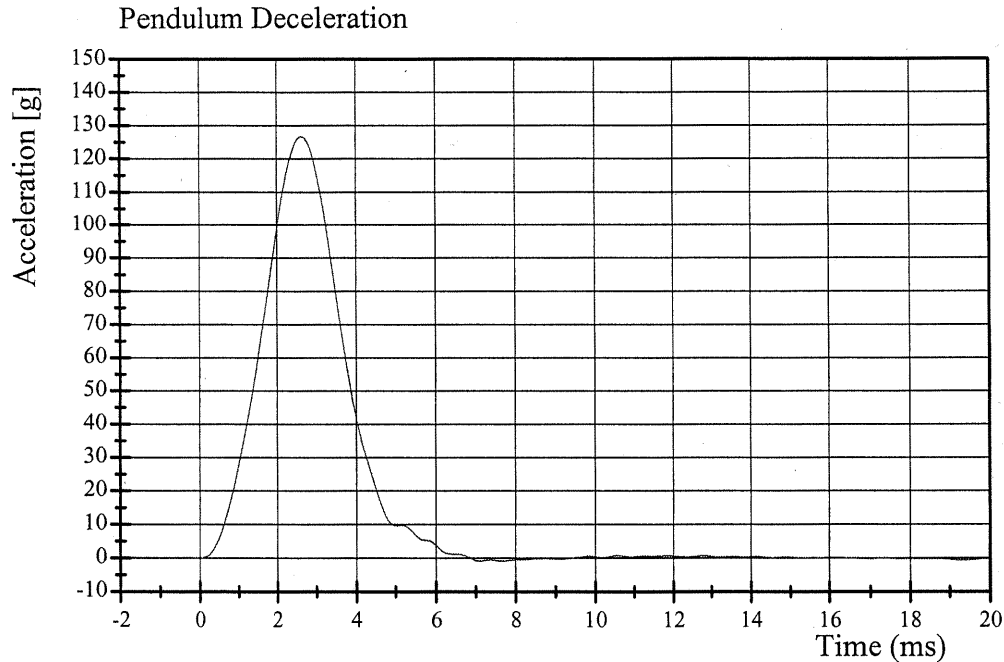


Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003



06.03.2003 08:09:41 1783



Transportation Research Center Inc.

5720 Right Knee Test

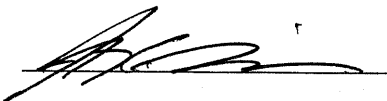
HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

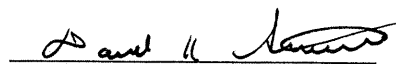
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3547 N	Yes

Comments:

Technician



Approved



06.03.2003 08:15:04 1788



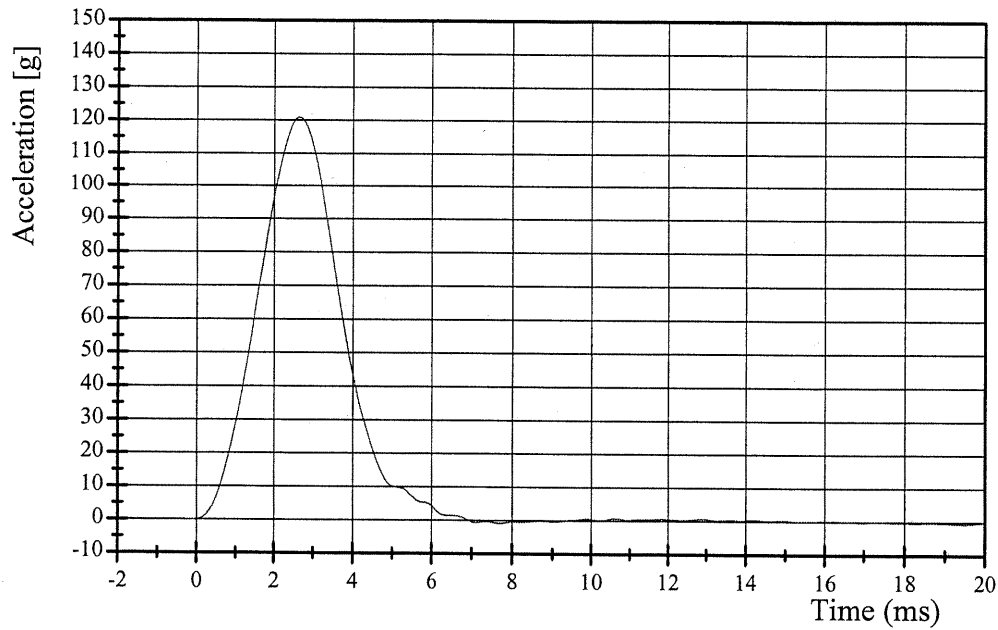
Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 2

Test Date 06/03/2003

Pendulum Deceleration

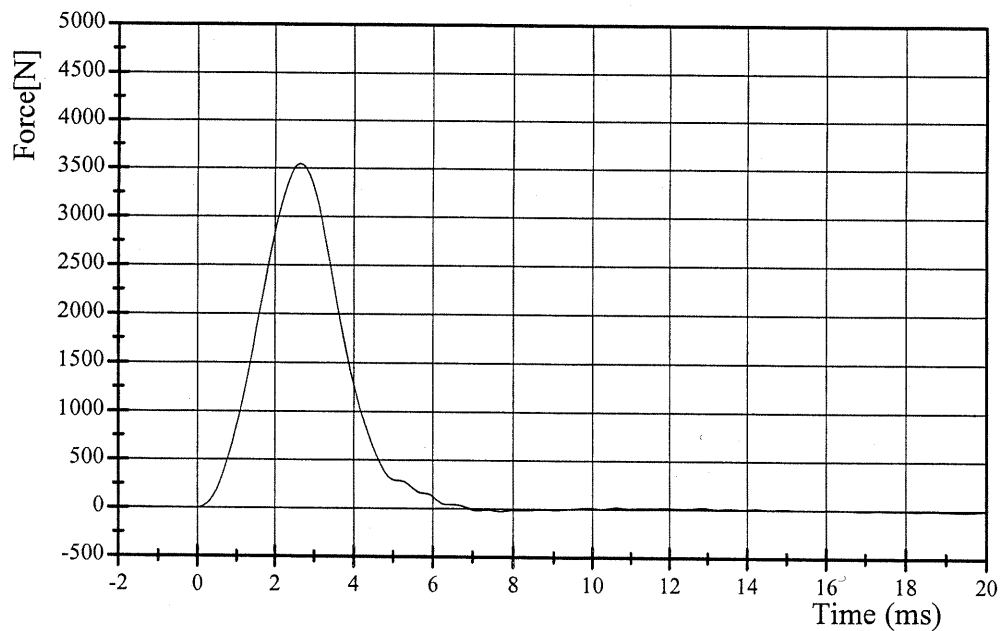


Filter Class: 600

Max: 121.0 g at 2.6 ms

Min: -0.8 g at 7.7 ms

Pendulum Force



Filter Class: 600

Max: 3546.5 N at 2.6 ms

Min: -24.9 N at 7.7 ms

Pre-Test Dummy Configuration and Performance Verification Data

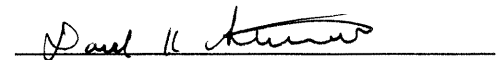
Passenger Dummy S/N: 421

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 421 Calibration No. 16

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	774.7 - 800.1 mm	791 mm	Yes
Shoulder Pivot Height	B	431.8 - 457.2 mm	447 mm	Yes
Hip Pivot Height	C	81.3 - 86.3 mm	83 mm	Yes
Hip Pivot from Backline	D	144.8 - 149.8 mm	146 mm	Yes
Shoulder Pivot from Backline	E	68.6 - 83.8 mm	81 mm	Yes
Thigh Clearance	F	119.4 - 134.6 mm	125 mm	Yes
Back of Elbow to Wrist Pivot	G	243.9 - 259.1 mm	244 mm	Yes
Head Back to Backline	H	43.2 - 48.2 mm	45 mm	Yes
Shoulder to Elbow Length	I	276.8 - 297.2 mm	293 mm	Yes
Elbow Rest Height	J	182.8 - 203.2 mm	197 mm	Yes
Buttock Knee Length	K	520.7 - 546.1 mm	524 mm	Yes
Popliteal Height	L	355.6 - 376.0 mm	363 mm	Yes
Knee Pivot Height	M	393.7 - 419.1 mm	411 mm	Yes
Buttock Popliteal Height	N	414.0 - 439.4 mm	424 mm	Yes
Chest Depth without Jacket	O	175.3 - 190.5 mm	180 mm	Yes
Foot Length	P	218.5 - 233.7 mm	229 mm	Yes
Buttock to Knee Pivot Length	R	457.2 - 482.6 mm	473 mm	Yes
Head Breadth	S	137.1 - 147.3 mm	144 mm	Yes
Head Depth	T	177.8 - 188.0 mm	179 mm	Yes
Hip Breadth	U	299.7 - 314.9 mm	310 mm	Yes
Shoulder Breadth	V	350.5 - 365.7 mm	356 mm	Yes
Foot Breadth	W	78.8 - 94.0 mm	90 mm	Yes
Head Circumference	X	528.3 - 548.7 mm	544 mm	Yes
Chest Circumference with Jacket	Y	850.9 - 881.3 mm	877 mm	Yes
Waist Circumference	Z	759.5 - 789.9 mm	774 mm	Yes
Reference Location for Chest Circumferenc	AA	332.7 - 358.1 mm	345 mm	Yes
Reference Location for Waist Circumferenc	BB	160.0 - 170.2 mm	165 mm	Yes

Technician

Approved

Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Peak Resultant Acceleration	250 - 300 g	253.7 g	Yes
Peak Lateral Acceleration	15 g Max	5.9 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



06.02.2003 13:07:34 608



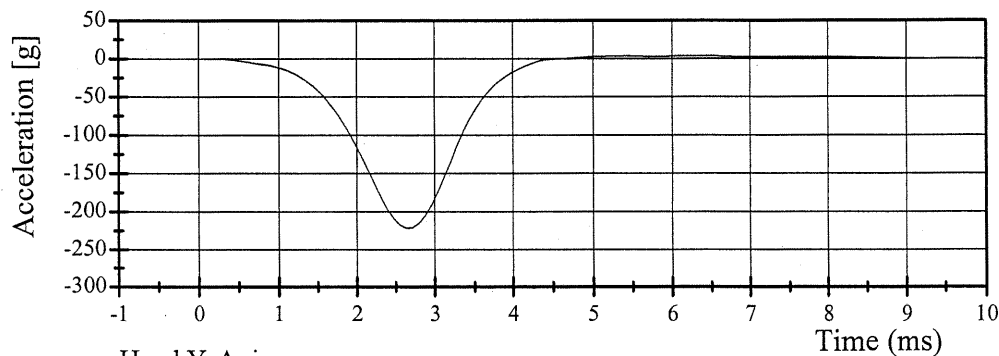
Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

Head X-Axis

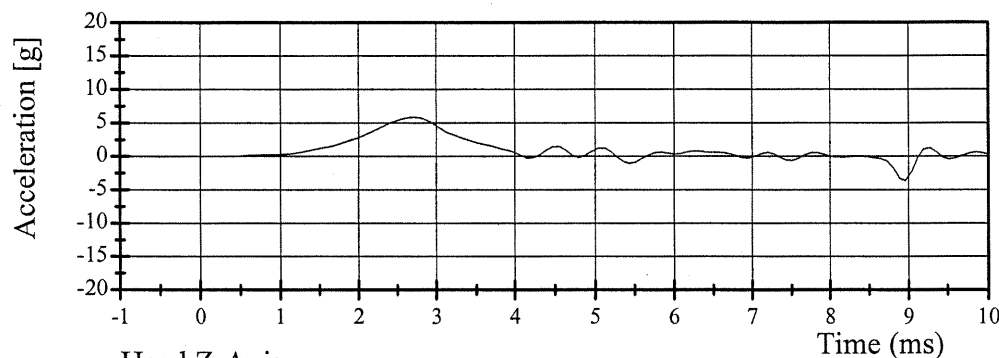


Filter Class: 1000

Max: 4.0 g at 6.4 ms

Min: -221.7 g at 2.6 ms

Head Y-Axis

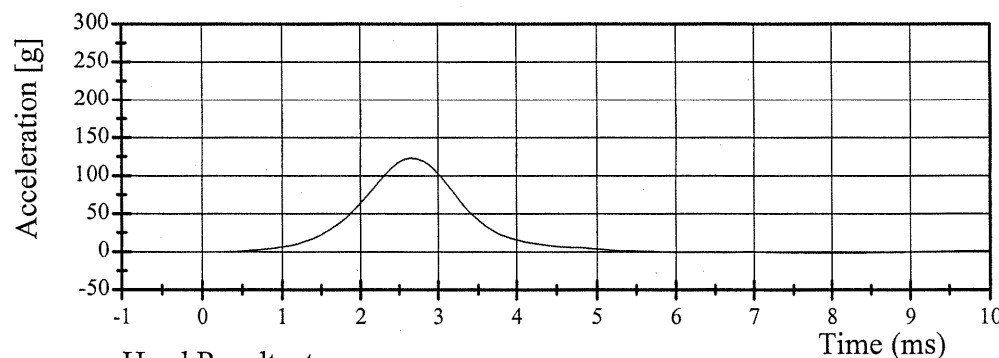


Filter Class: 1000

Max: 5.9 g at 2.7 ms

Min: -3.7 g at 9.0 ms

Head Z-Axis

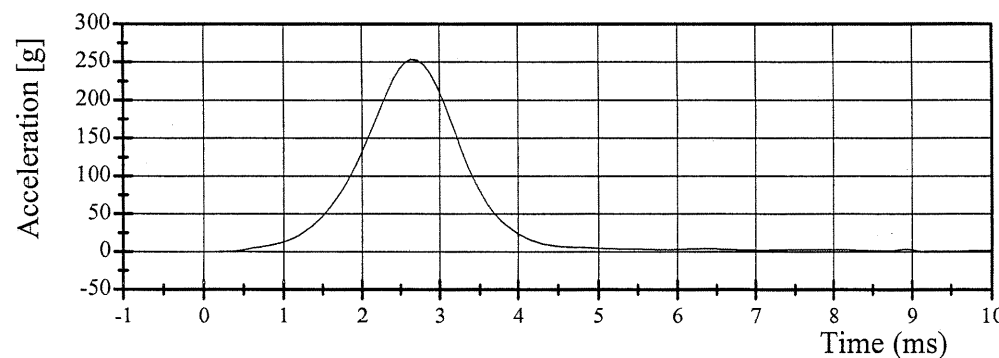


Filter Class: 1000

Max: 123.3 g at 2.6 ms

Min: -1.5 g at 8.1 ms

Head Resultant



Filter Class: 1000

Max: 253.7 g at 2.6 ms

Min: 0.0 g at 1.3 ms

Transportation Research Center Inc.

5720 Neck Flexion Test - 6 Channel Transducer

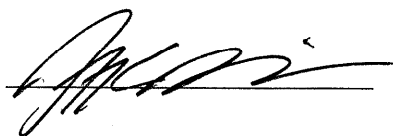
HIII 5th Female Serial No. 421 Calibration No. 16 - 2

Test Date 06/02/2003

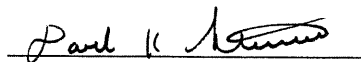
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.10 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.10 - 2.50 m/s	2.47 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.83 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.88 m/s	Yes
Peak D Plane Rotation	77 - 91 °	83.6 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	69.96 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	91.28 ms	Yes

Comments:

Technician



Approved



06.02.2003 12:04:51 488



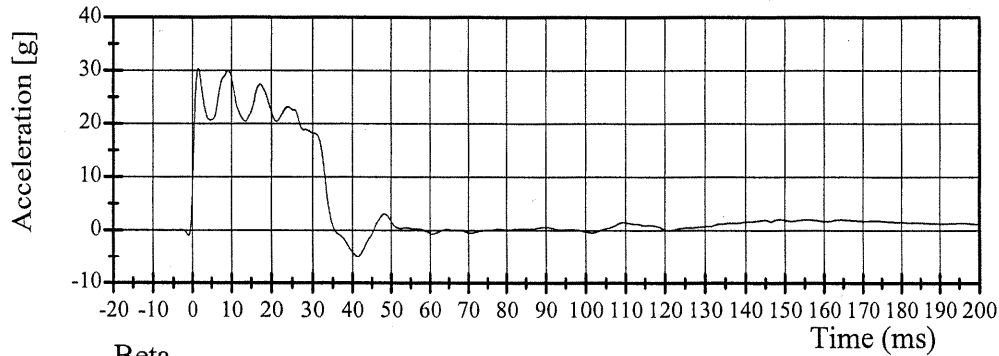
Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 2

Test Date 06/02/2003

Pendulum Deceleration

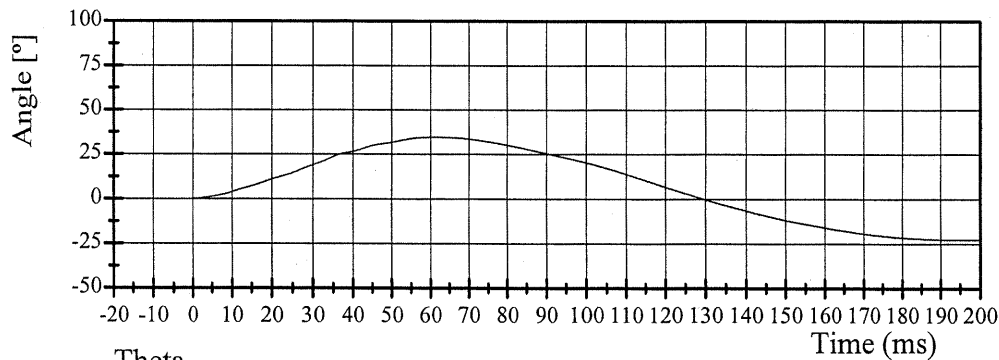


Filter Class: 180

Max: 30.3 g at 1.6 ms

Min: -4.9 g at 41.4 ms

Beta

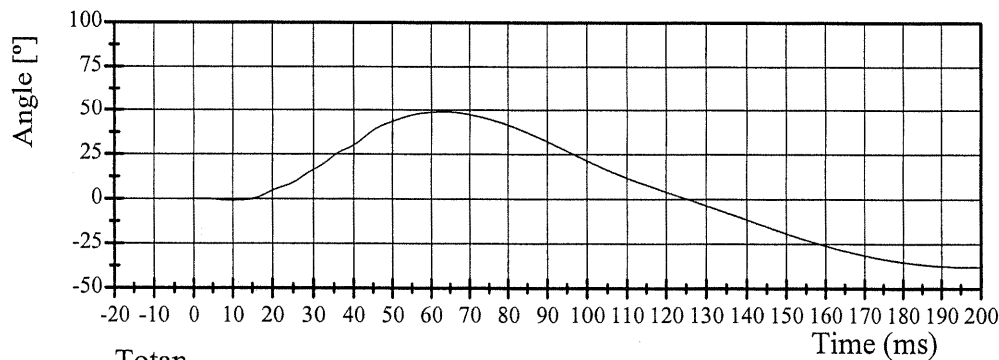


Filter Class: 60

Max: 34.6 ° at 61.3 ms

Min: -22.7 ° at 196.5 ms

Theta

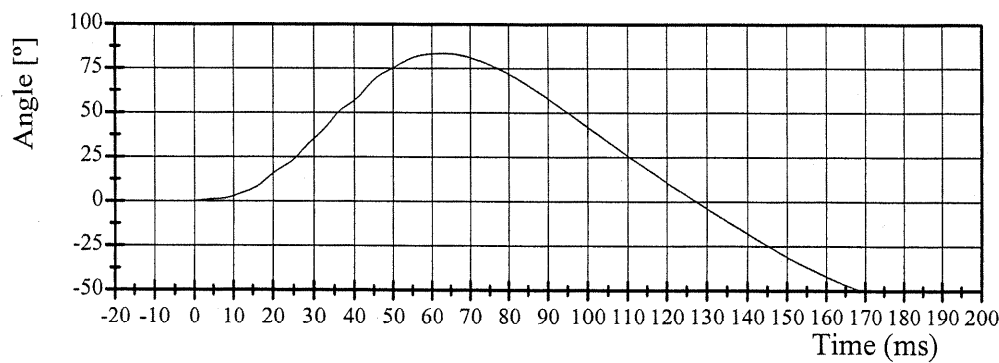


Filter Class: 60

Max: 49.0 ° at 63.4 ms

Min: -37.9 ° at 200.4 ms

Totan



Filter Class: 60

Max: 83.6 ° at 63.0 ms

Min: -60.5 ° at 199.8 ms

06.02.2003 12:04:52 488

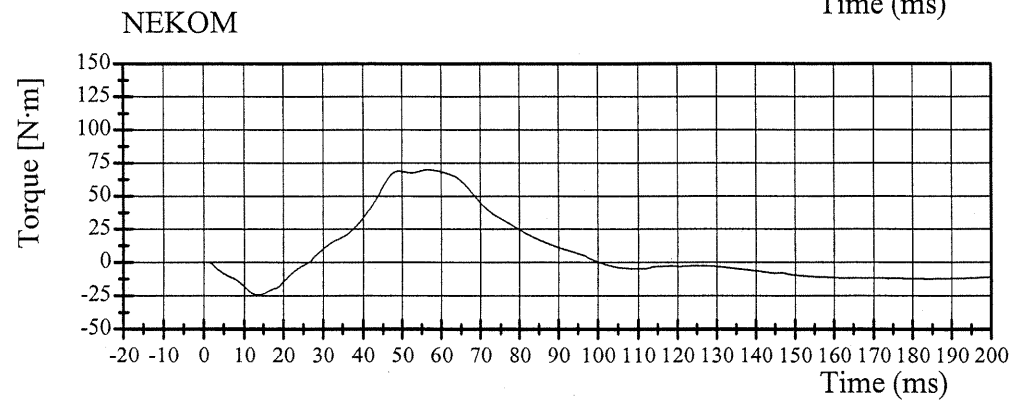
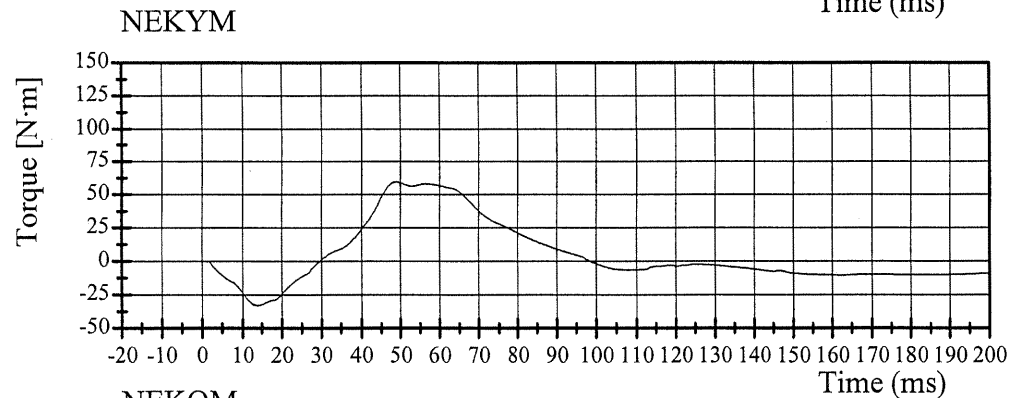
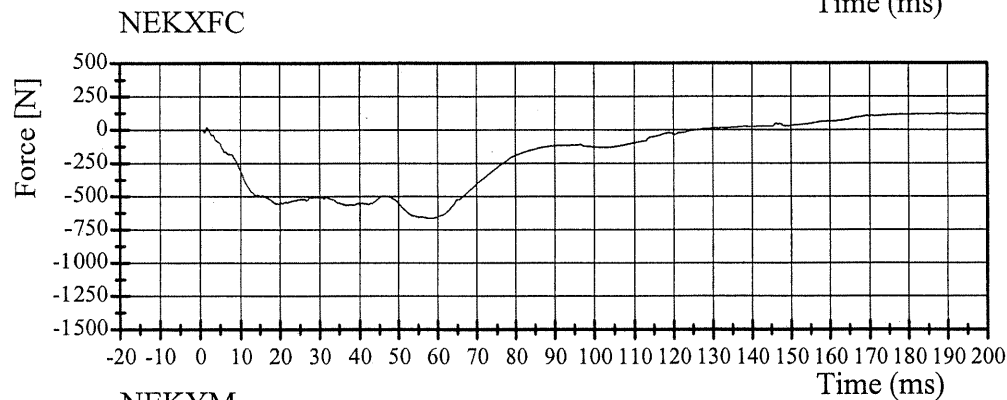
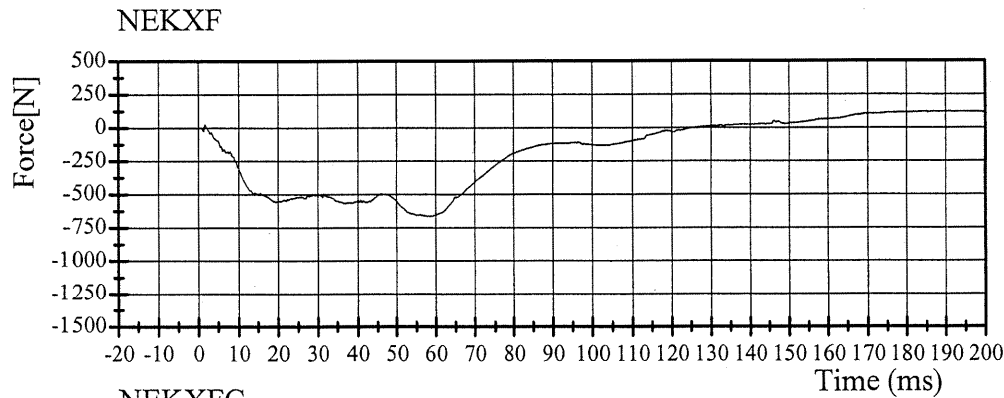


Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 2

Test Date 06/02/2003



06.02.2003 12:04:53 488



Transportation Research Center Inc.

5720 Neck Extension Test - 6 Channel Transducer

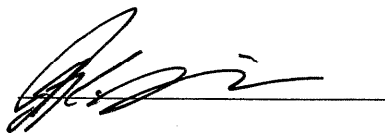
HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

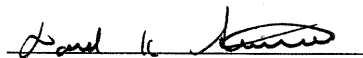
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.15 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.50 - 1.90 m/s	1.83 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.59 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.28 m/s	Yes
Peak D Plane Rotation	99 - 114 °	108.3 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-63.02 N·m	Yes
Negative Moment Decay Time To -10 N·m	94 - 114 ms	105.28 ms	Yes

Comments:

Technician



Approved



06.02.2003 12:39:49 565



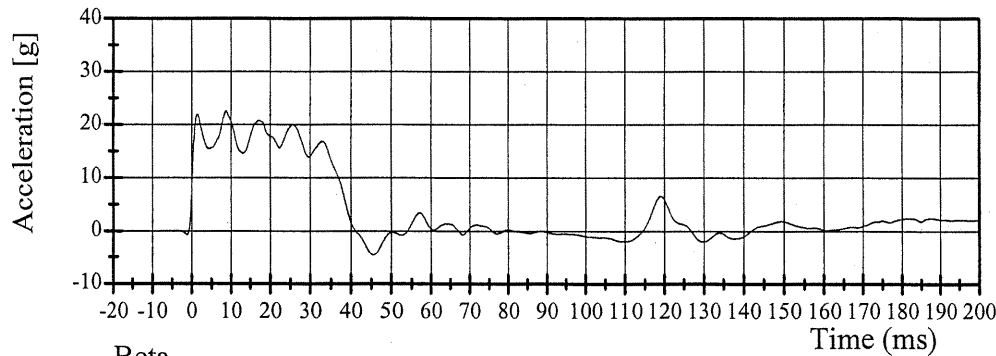
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

Pendulum Deceleration

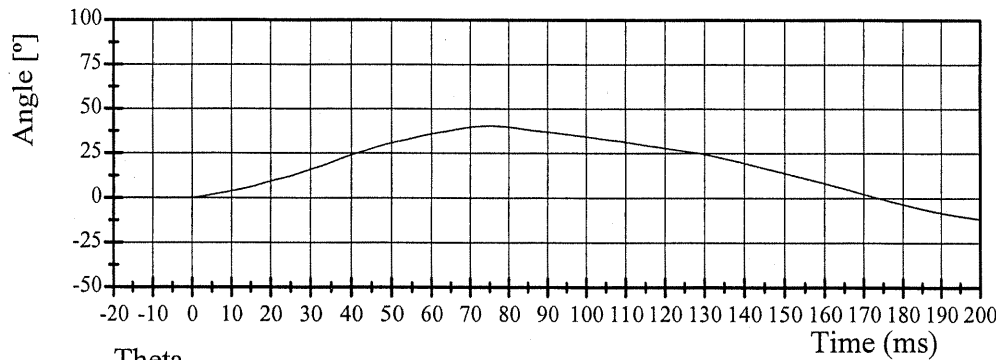


Filter Class: 180

Max: 22.5 g at 8.7 ms

Min: -4.6 g at 45.5 ms

Beta

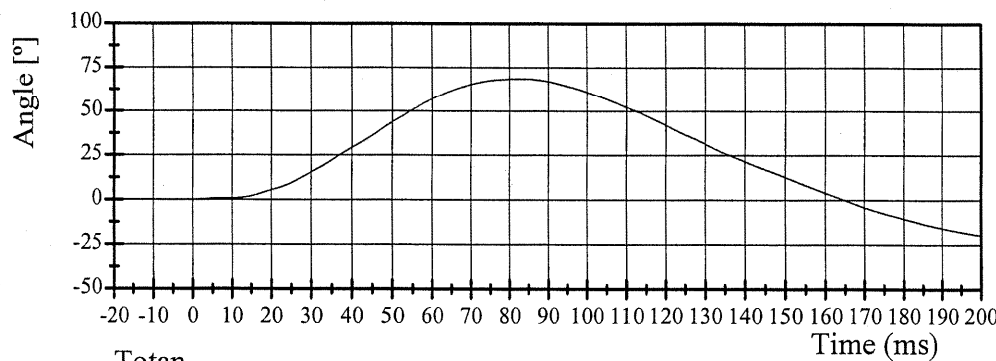


Filter Class: 60

Max: 40.3 ° at 75.2 ms

Min: -14.3 ° at 220.0 ms

Theta

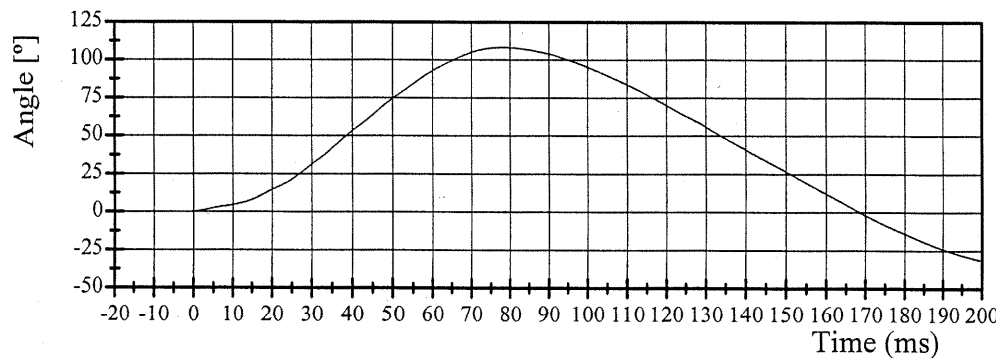


Filter Class: 60

Max: 68.6 ° at 83.0 ms

Min: -22.3 ° at 217.4 ms

Totan



Filter Class: 60

Max: 108.3 ° at 78.7 ms

Min: -36.5 ° at 218.4 ms

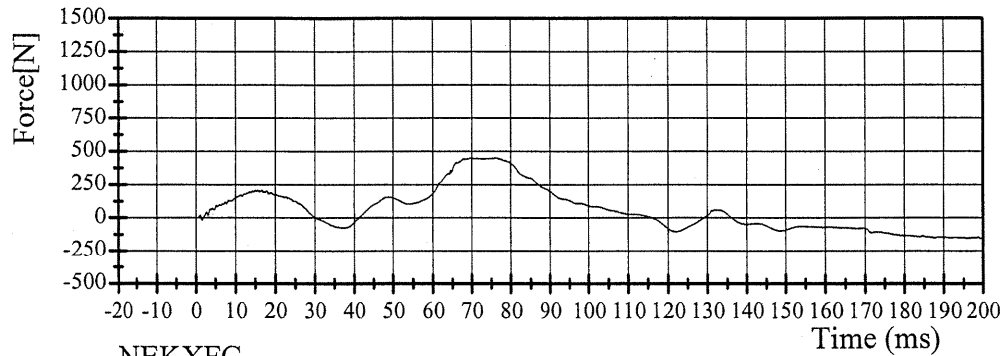
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

NEKXF

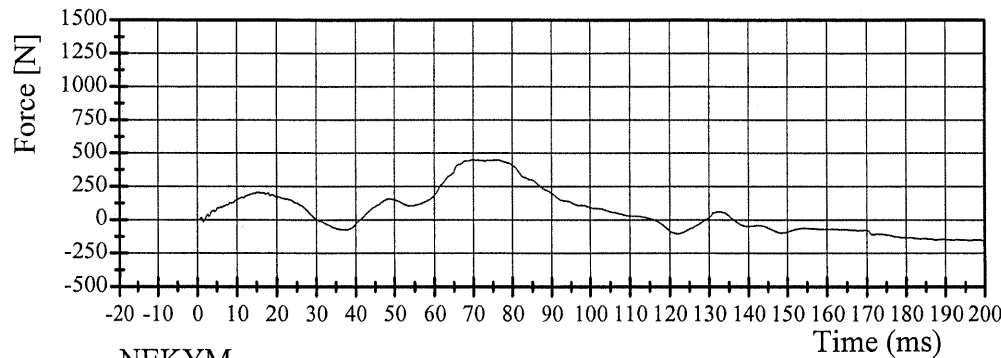


Filter Class: 1000

Max: 450.9 N at 69.7 ms

Min: -158.4 N at 209.7 ms

NEKXFC

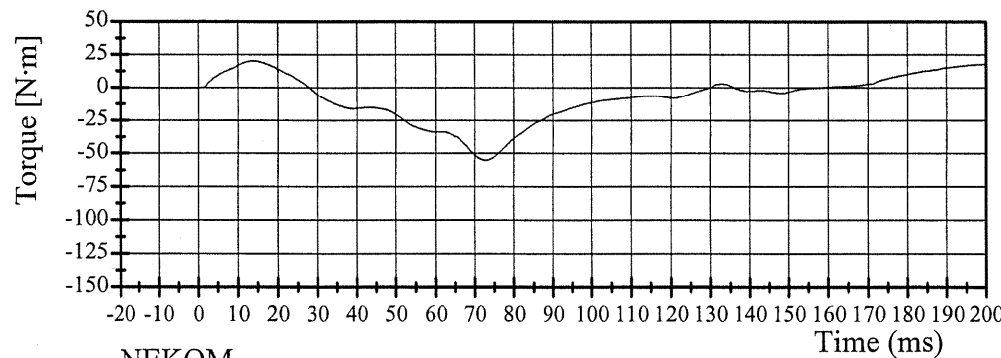


Filter Class: 600

Max: 450.1 N at 69.8 ms

Min: -158.1 N at 209.8 ms

NEKYM

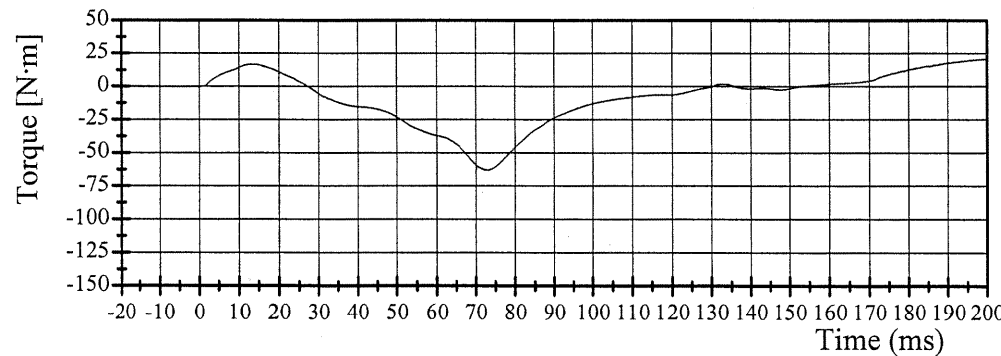


Filter Class: 600

Max: 20.3 N·m at 14.2 ms

Min: -55.1 N·m at 72.9 ms

NEKOM



Filter Class: 600

Max: 21.1 N·m at 204.4 ms

Min: -63.0 N·m at 72.9 ms

Transportation Research Center Inc.

5720 Thorax Test

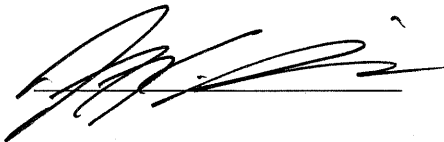
HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

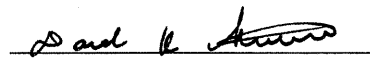
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.71 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-54.9 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4221 N	Yes
Peak Force Between 18 mm and 50 mm	4600 N	4119 N	Yes
Internal Hysteresis	69 - 85 %	70 %	Yes

Comments:

Technician



Approved



06.02.2003 08:17:18 1001



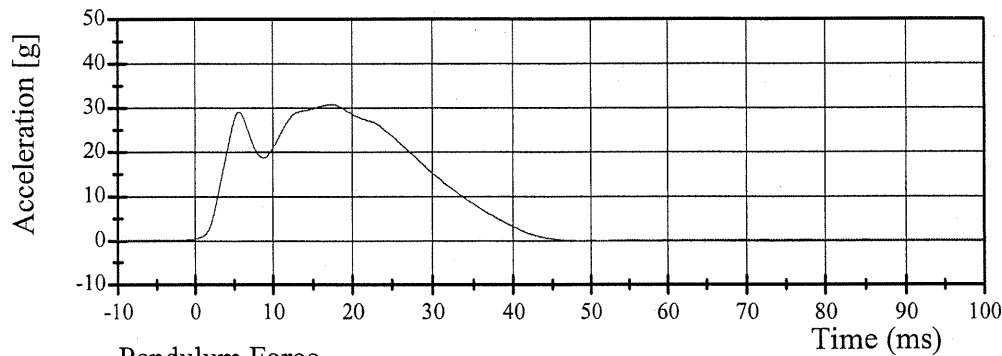
Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

Pendulum Deceleration

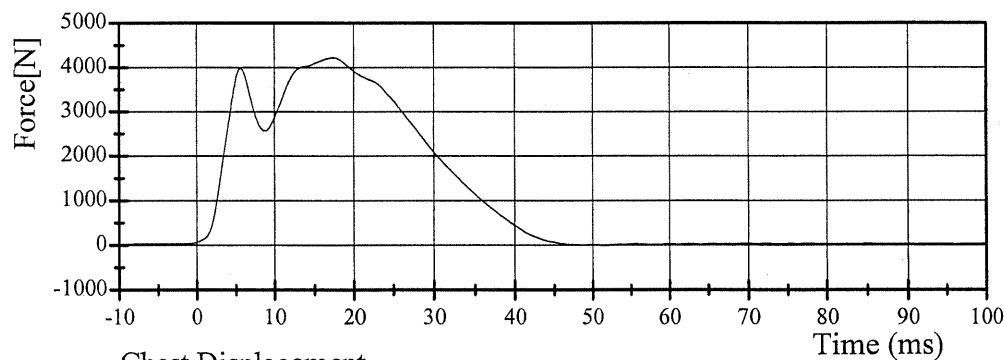


Filter Class: 180

Max: 30.8 g at 17.3 ms

Min: -3.4 g at 184.3 ms

Pendulum Force

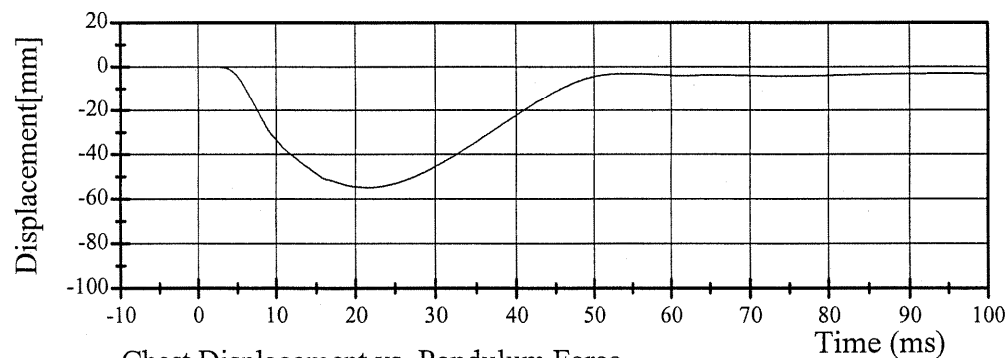


Filter Class: 180

Max: 4221.3 N at 17.3 ms

Min: -471.3 N at 184.3 ms

Chest Displacement

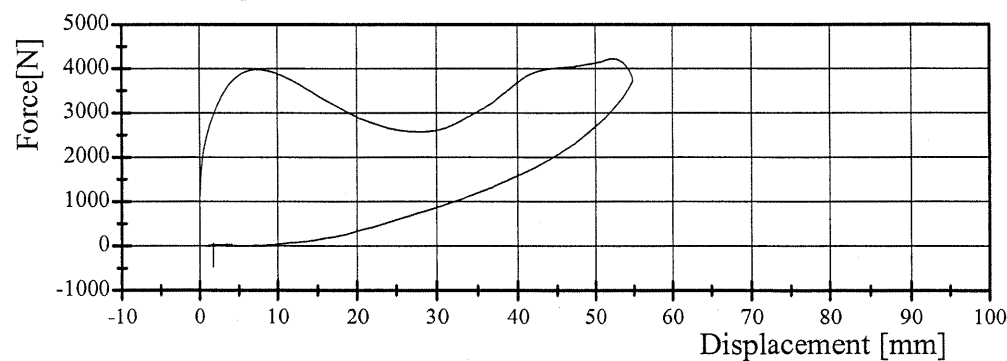


Filter Class: 600

Max: 0.0 mm at -44.6 ms

Min: -54.9 mm at 21.8 ms

Chest Displacement vs. Pendulum Force



06.02.2003 08:17:19 1001



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 02-Jun-03

TRC, INC.

TEST NO: 421C16TF1

5720 SN421 TORSO FLEX CAL 16

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2° C	21.1 ° C
RELATIVE HUMIDITY	10 – 70 %	33 %
INITIAL ANGLE OF UNSUPPORTED DUMMY	<= 20° REFERENCED TO VERTICAL	16.6 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	330.0 N
RETURN ANGLE		21.7 °
DIFFERENCE BETWEEN RETURN ANGLE & INITIAL ANGLE	+/- 8 ° OF INITIAL ANGLE	5.1 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN 

Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

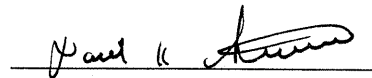
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.75 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.4 mm	Yes

Comments:

Technician



Approved



06.02.2003 14:41:51 1657

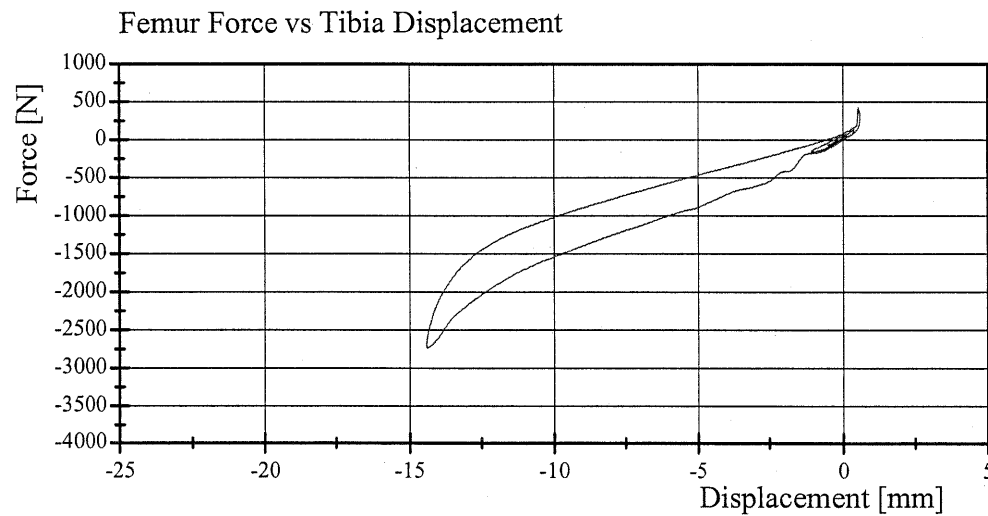
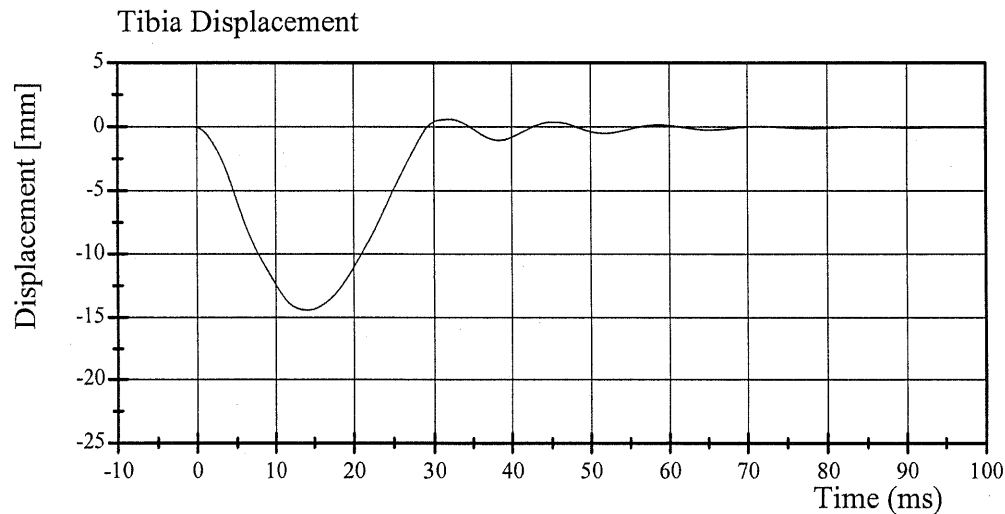
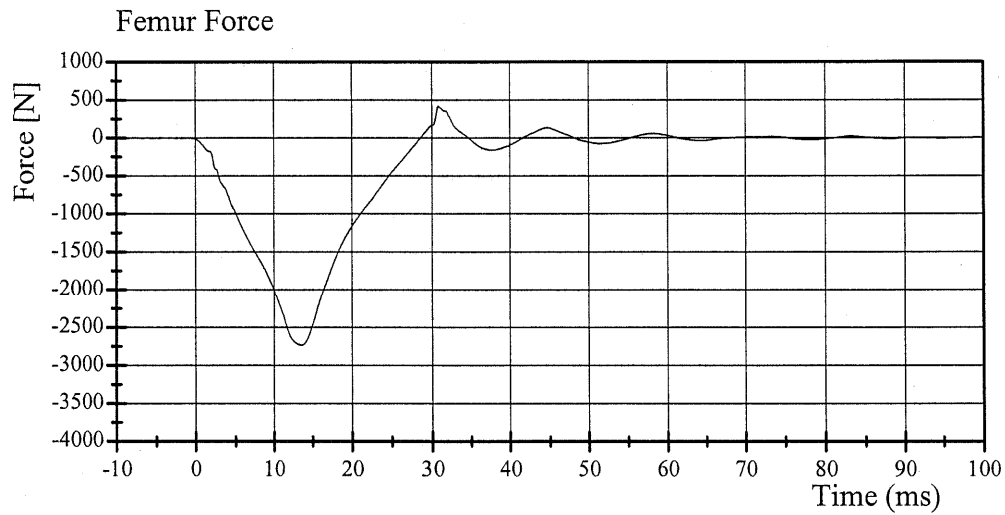


Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003



06.02.2003 14:41:52 1657



Transportation Research Center Inc.

5720 Right Knee Slider Test

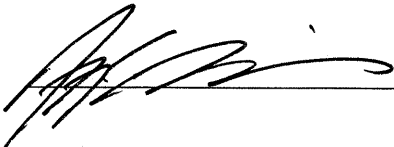
HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.75 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.7 mm	Yes

Comments:

Technician



Approved



06.02.2003 14:57:59 1656

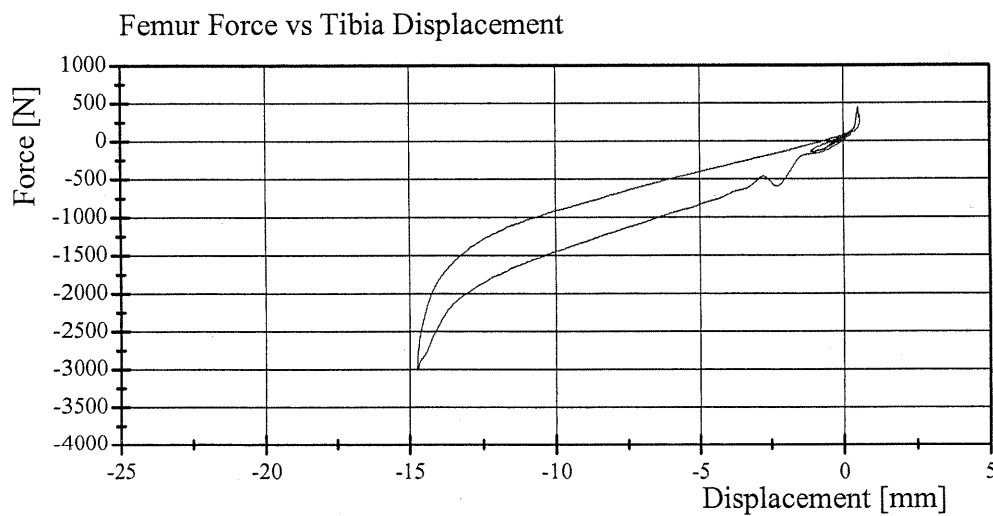
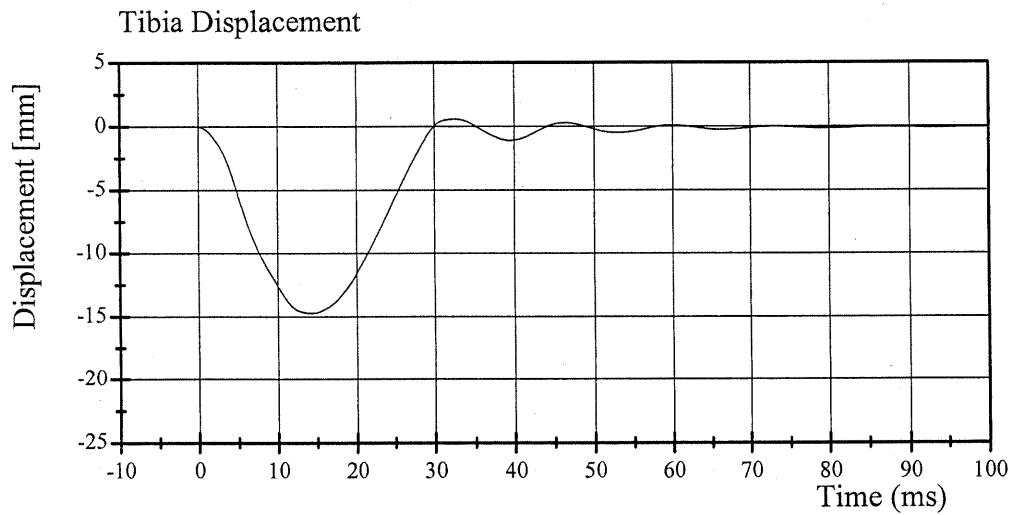
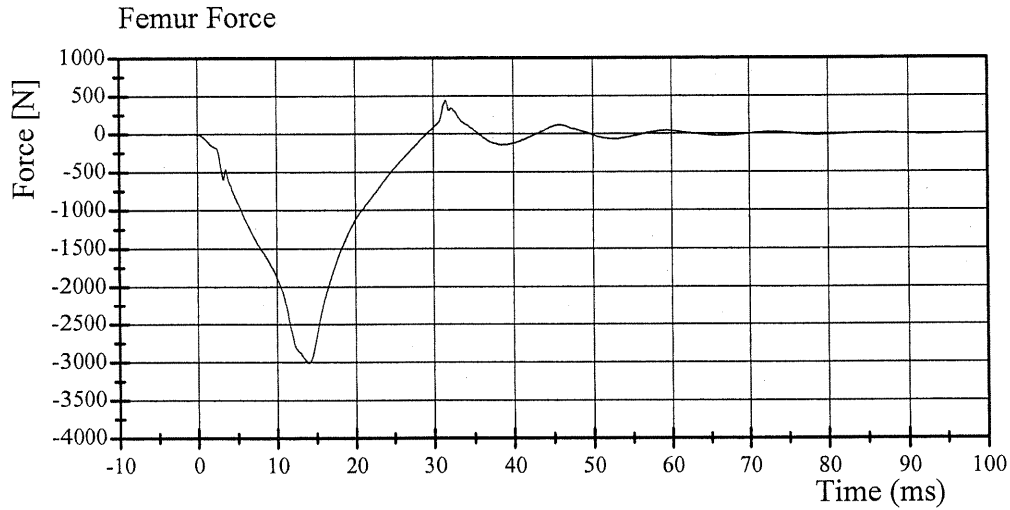


Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/02/2003



06.02.2003 14:58:00 1656



Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/03/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3693 N	Yes

Comments:

Technician



Approved



06.03.2003 08:29:53 1805



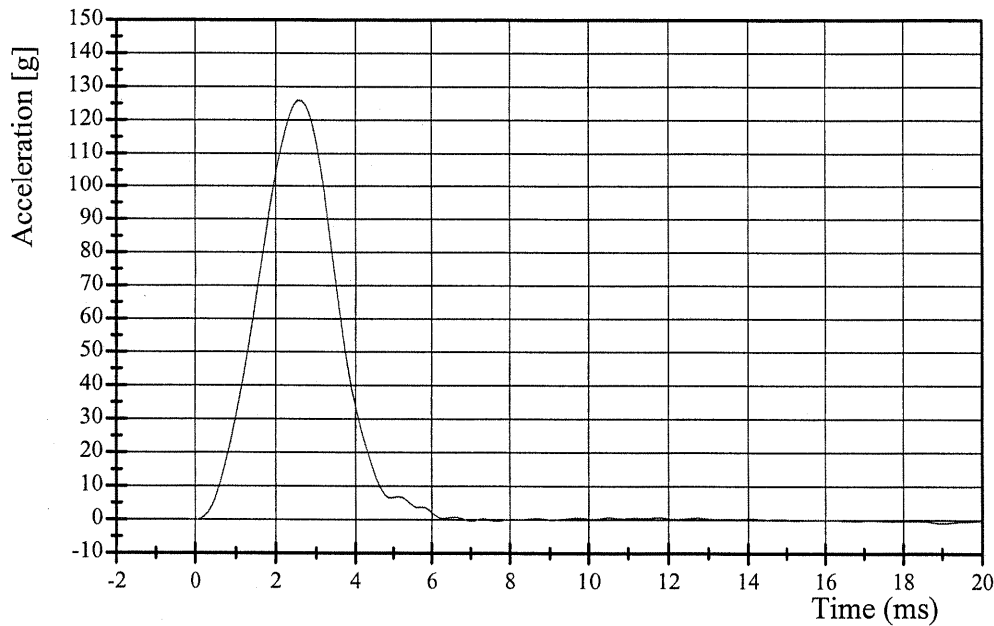
Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/03/2003

Pendulum Deceleration

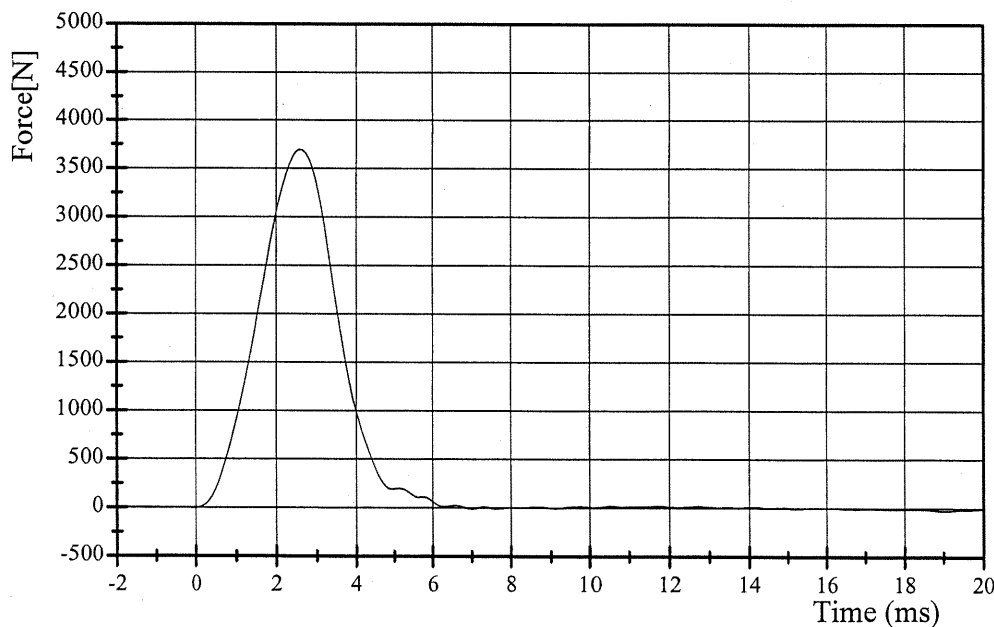


Filter Class: 600

Max: 125.9 g at 2.6 ms

Min: -0.9 g at 19.0 ms

Pendulum Force



Filter Class: 600

Max: 3692.9 N at 2.6 ms

Min: -26.6 N at 19.0 ms

Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/03/2003

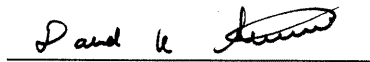
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3517 N	Yes

Comments:

Technician



Approved



06.03.2003 08:27:04 1809



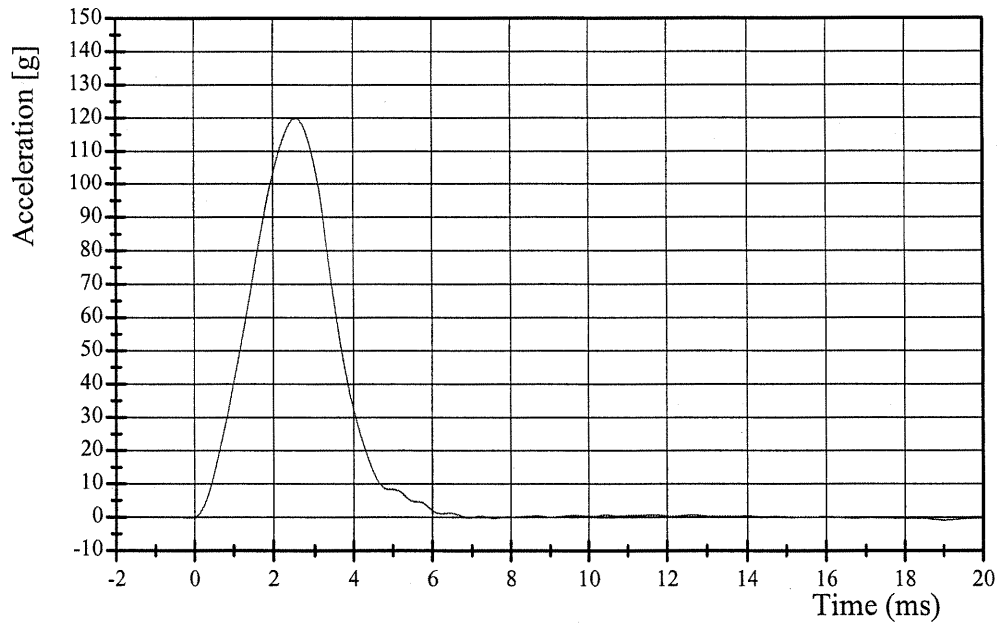
Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 16 - 1

Test Date 06/03/2003

Pendulum Deceleration

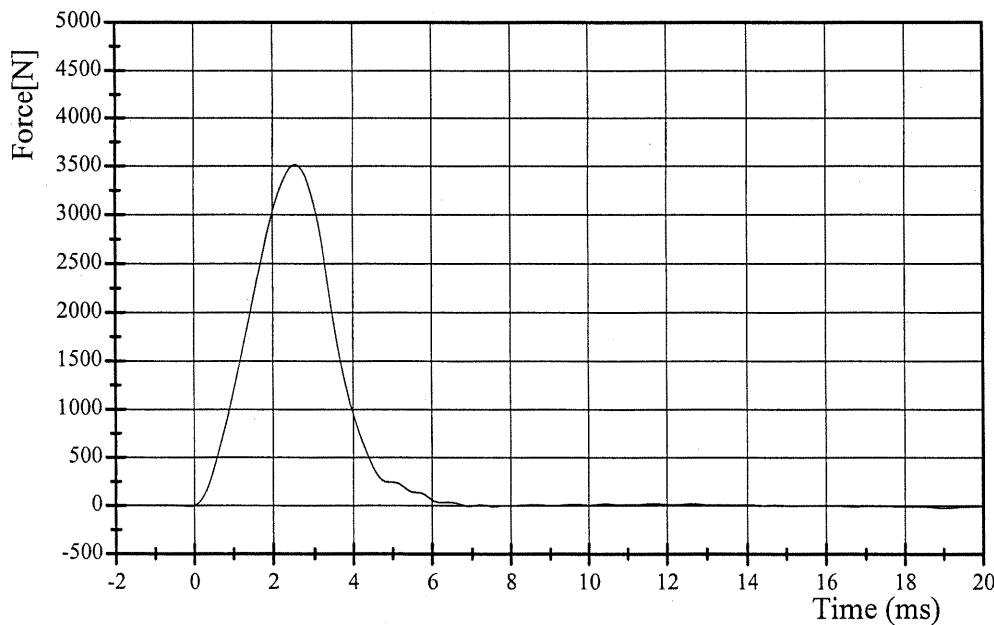


Filter Class: 600

Max: 119.9 g at 2.6 ms

Min: -0.8 g at 19.0 ms

Pendulum Force



Filter Class: 600

Max: 3517.1 N at 2.6 ms

Min: -24.5 N at 19.0 ms

06.03.2003 08:27:05 1809



Post-Test Dummy Configuration and Performance Verification Data

Driver Dummy S/N: 416

Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 3

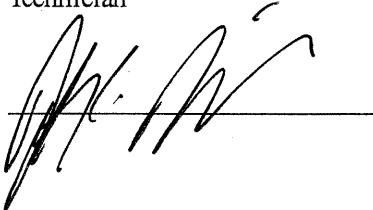
Test Date 06/06/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-13.3 mm	Yes

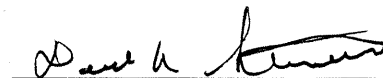
Comments:

Post Cal On Thor Left Leg.

Technician



Approved



06.06.2003 08:11:58 1125



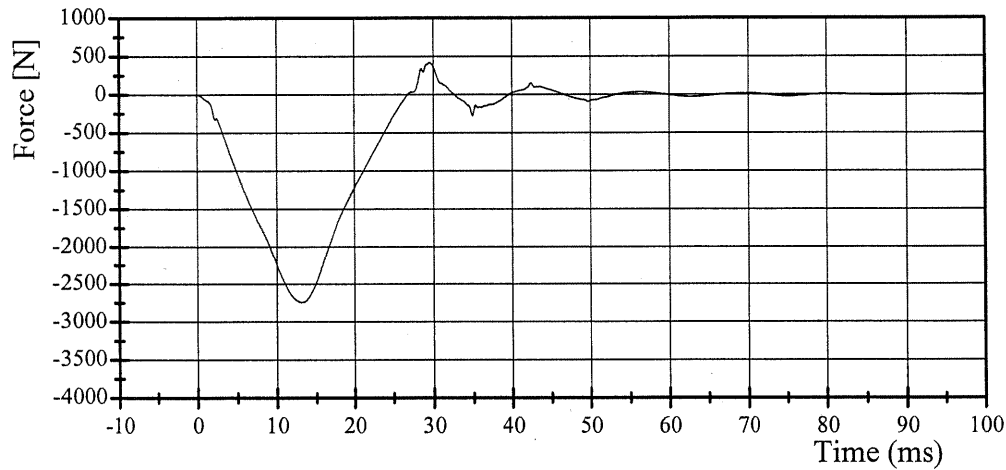
Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 3

Test Date 06/06/2003

Femur Force

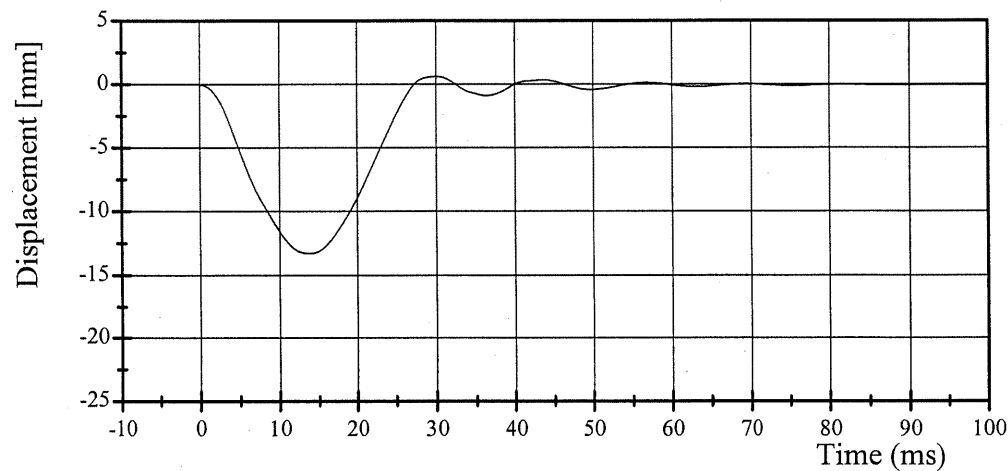


Filter Class: 600

Max: 417.8 N at 29.5 ms

Min: -2741.1 N at 13.1 ms

Tibia Displacement

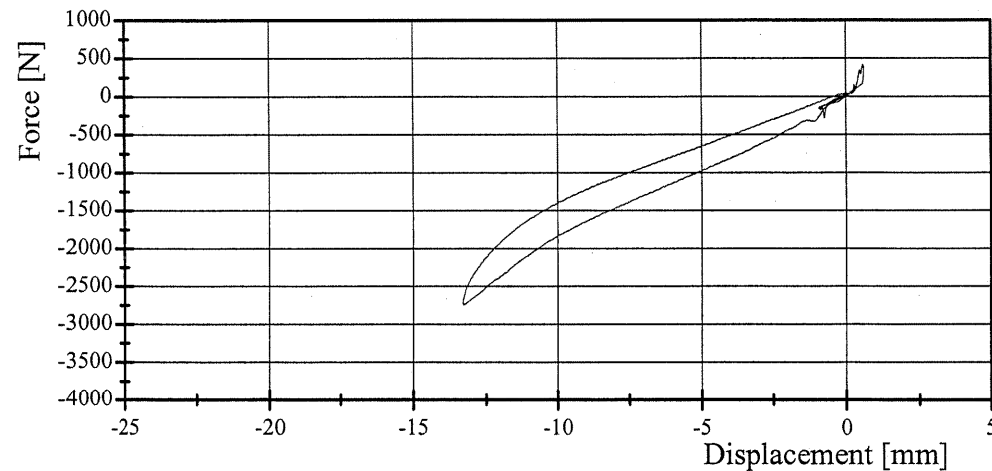


Filter Class: 180

Max: 0.6 mm at 30.1 ms

Min: -13.3 mm at 13.7 ms

Femur Force vs Tibia Displacement



06.06.2003 08:11:59 1125



Transportation Research Center Inc.

5720 Right Knee Slider Test

HHH 5th Female Serial No. 416 Calibration No. 20 - 3

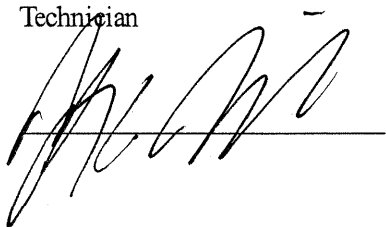
Test Date 06/06/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-12.7 mm	Yes

Comments:

Post Cal On Thor Right Leg.

Technician



Approved



06.06.2003 07:56:17 1124

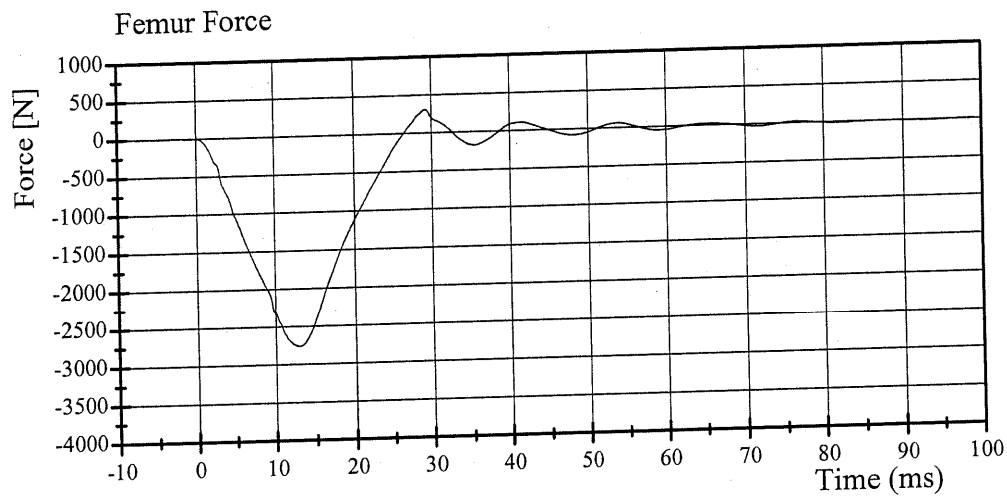


Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 3

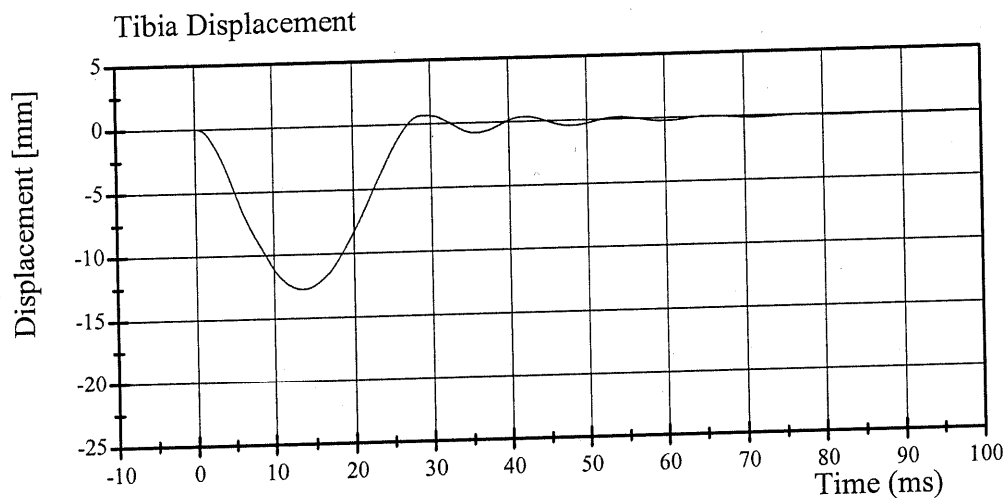
Test Date 06/06/2003



Filter Class: 600

Max: 307.1 N at 29.2 ms

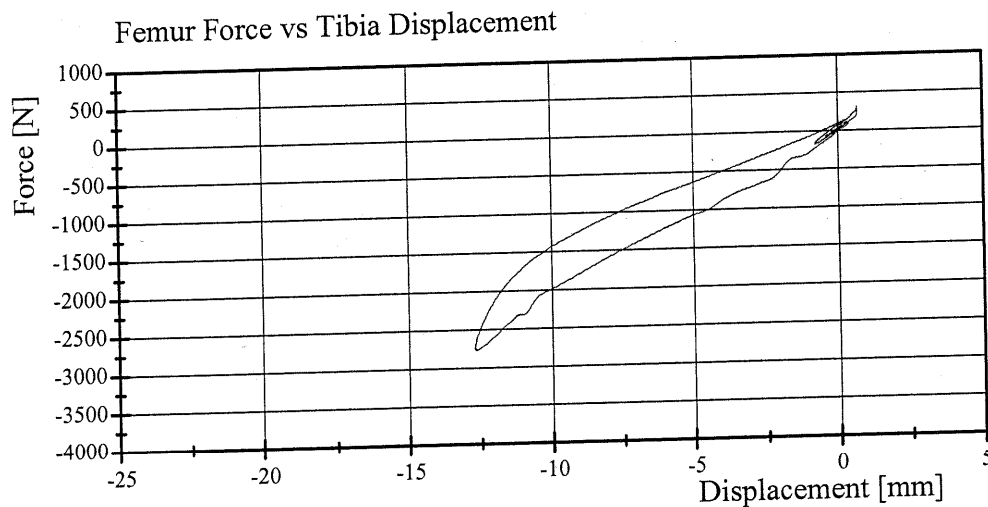
Min: -2762.1 N at 12.9 ms



Filter Class: 180

Max: 0.7 mm at 29.4 ms

Min: -12.7 mm at 13.5 ms



06.06.2003 07:55:55 1124



Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 3

Test Date 06/06/2003

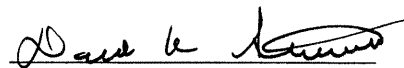
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3671 N	Yes

Comments:

Technician



Approved



06.06.2003 09:28:50 1757



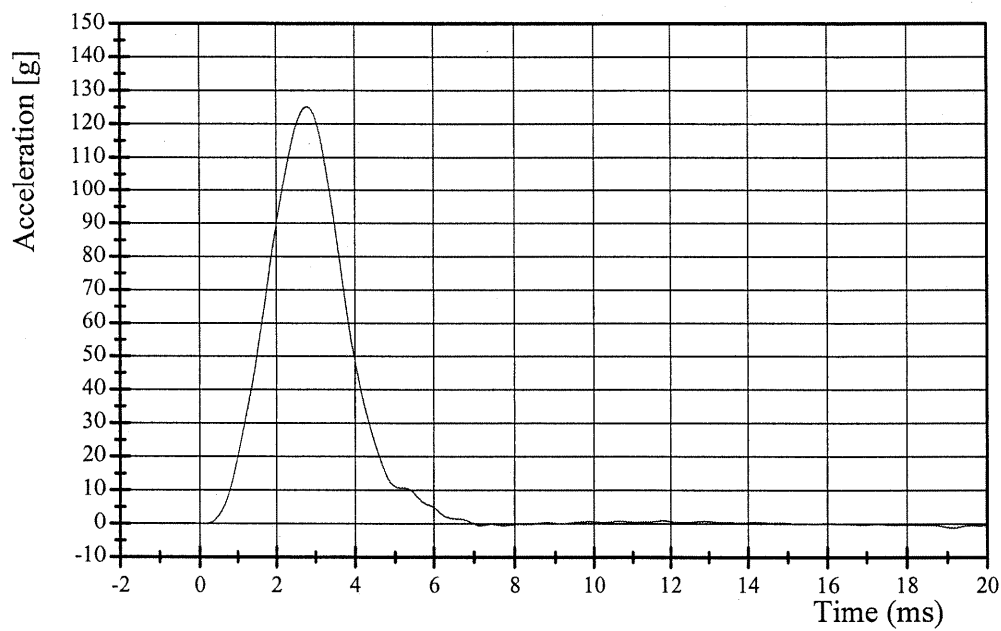
Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 3

Test Date 06/06/2003

Pendulum Deceleration

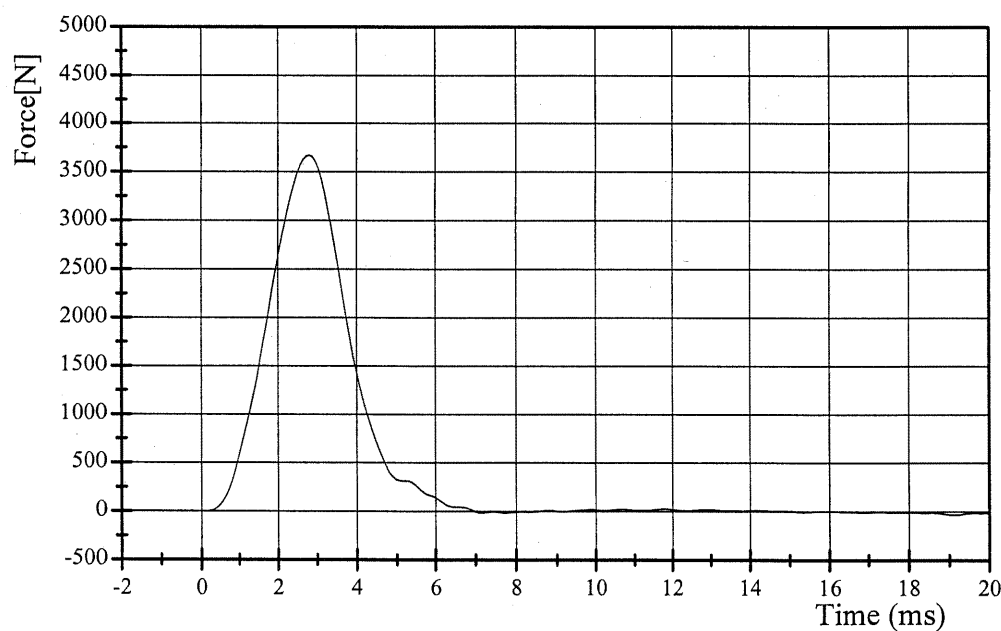


Filter Class: 600

Max: 125.2 g at 2.8 ms

Min: -1.2 g at 19.1 ms

Pendulum Force



Filter Class: 600

Max: 3670.7 N at 2.8 ms

Min: -34.0 N at 19.1 ms

06.06.2003 09:28:51 1757



Transportation Research Center Inc.

5720 Right Knee Test

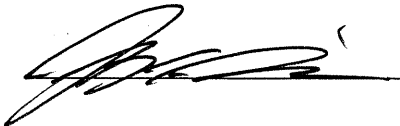
HIII 5th Female Serial No. 416 Calibration No. 20 - 3

Test Date 06/06/2003

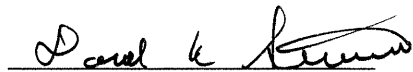
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3704 N	Yes

Comments:

Technician



Approved



06.06.2003 09:26:38 1762



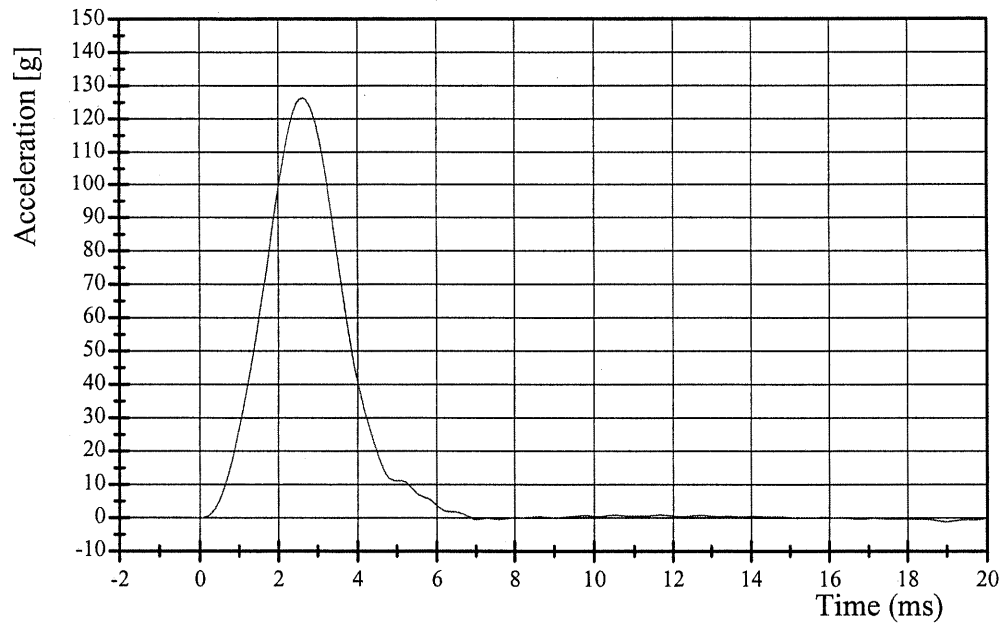
Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 20 - 3

Test Date 06/06/2003

Pendulum Deceleration

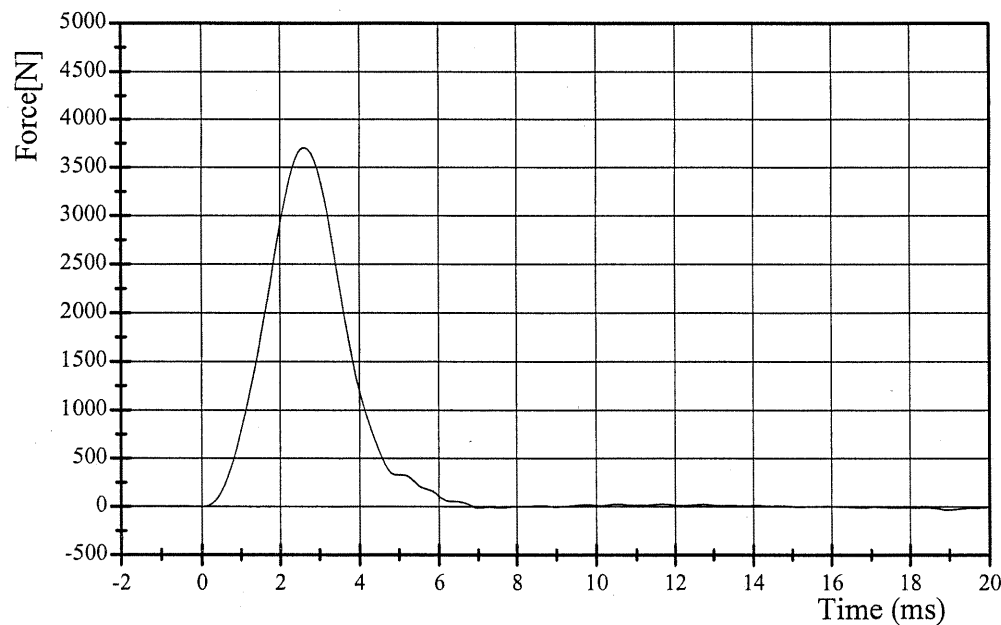


Filter Class: 600

Max: 126.3 g at 2.6 ms

Min: -1.1 g at 19.0 ms

Pendulum Force



Filter Class: 600

Max: 3704.0 N at 2.6 ms

Min: -33.0 N at 19.0 ms

Post-Test Dummy Configuration and Performance Verification Data

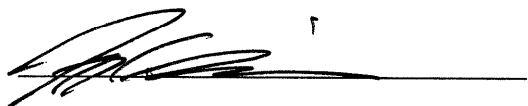
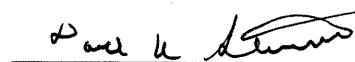
Passenger Dummy S/N: 421

Transportation Research Center Inc.
5720 HIII 5th Dummy
External Dimensions
Serial No. 421 Calibration No. 17

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	774.7 - 800.1 mm	792 mm	Yes
Shoulder Pivot Height	B	431.8 - 457.2 mm	446 mm	Yes
Hip Pivot Height	C	81.3 - 86.3 mm	83 mm	Yes
Hip Pivot from Backline	D	144.8 - 149.8 mm	147 mm	Yes
Shoulder Pivot from Backline	E	68.6 - 83.8 mm	82 mm	Yes
Thigh Clearance	F	119.4 - 134.6 mm	127 mm	Yes
Back of Elbow to Wrist Pivot	G	243.9 - 259.1 mm	246 mm	Yes
Head Back to Backline	H	43.2 - 48.2 mm	45 mm	Yes
Shoulder to Elbow Length	I	276.8 - 297.2 mm	291 mm	Yes
Elbow Rest Height	J	182.8 - 203.2 mm	198 mm	Yes
Buttock Knee Length	K	520.7 - 546.1 mm	525 mm	Yes
Popliteal Height	L	355.6 - 376.0 mm	361 mm	Yes
Knee Pivot Height	M	393.7 - 419.1 mm	408 mm	Yes
Buttock Popliteal Height	N	414.0 - 439.4 mm	421 mm	Yes
Chest Depth without Jacket	O	175.3 - 190.5 mm	181 mm	Yes
Foot Length	P	218.5 - 233.7 mm	229 mm	Yes
Buttock to Knee Pivot Length	R	457.2 - 482.6 mm	474 mm	Yes
Head Breadth	S	137.1 - 147.3 mm	146 mm	Yes
Head Depth	T	177.8 - 188.0 mm	181 mm	Yes
Hip Breadth	U	299.7 - 314.9 mm	311 mm	Yes
Shoulder Breadth	V	350.5 - 365.7 mm	354 mm	Yes
Foot Breadth	W	78.8 - 94.0 mm	91 mm	Yes
Head Circumference	X	528.3 - 548.7 mm	545 mm	Yes
Chest Circumference with Jacket	Y	850.9 - 881.3 mm	876 mm	Yes
Waist Circumference	Z	759.5 - 789.9 mm	773 mm	Yes
Reference Location for Chest Circumferenc	AA	332.7 - 358.1 mm	345 mm	Yes
Reference Location for Waist Circumferenc	BB	160.0 - 170.2 mm	165 mm	Yes

Technician

Approved

Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

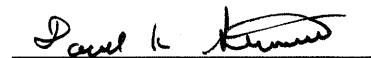
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	49 %	Yes
Peak Resultant Acceleration	250 - 300 g	259.4 g	Yes
Peak Lateral Acceleration	15 g Max	6.0 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



06.09.2003 10:13:02 608

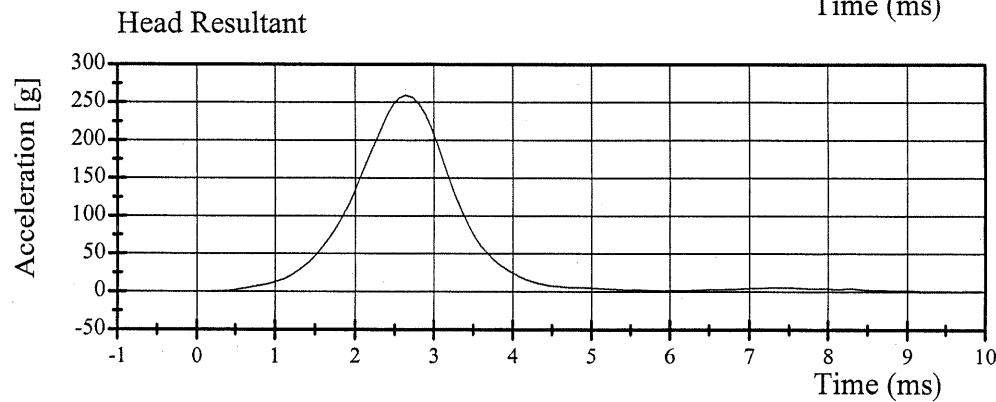
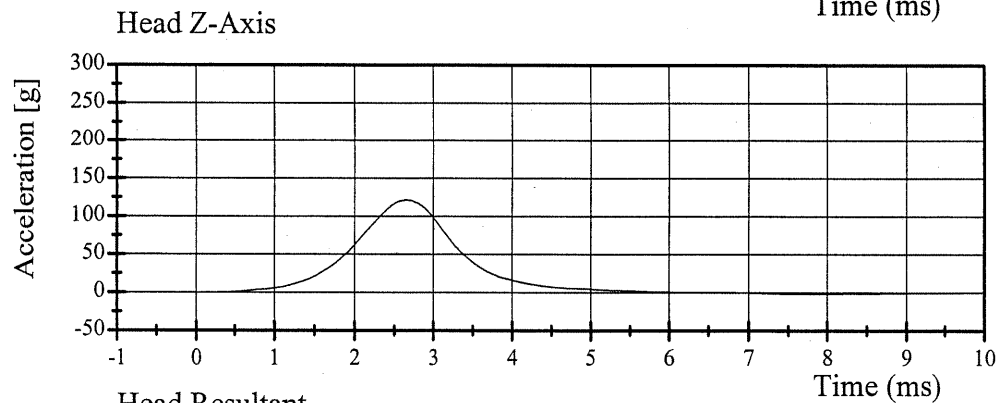
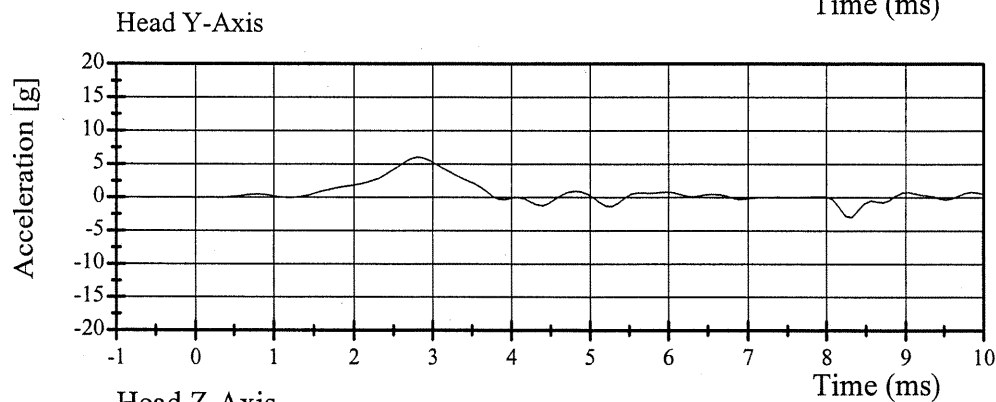
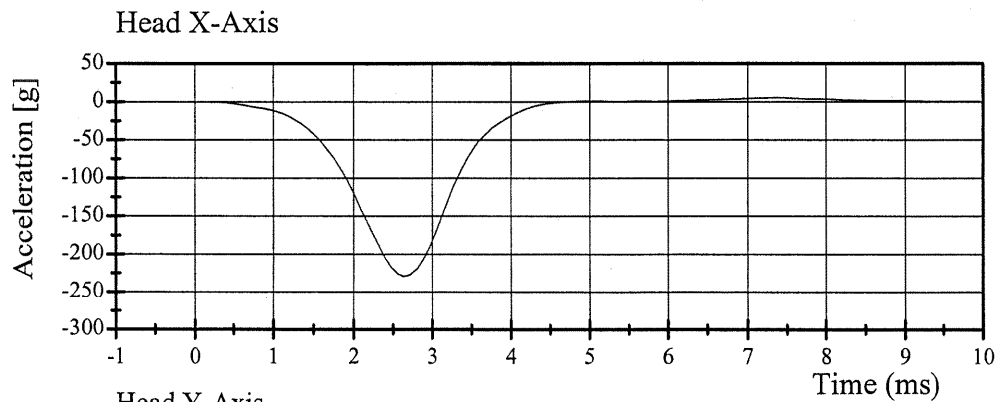


Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003



06.09.2003 10:13:03 608



Transportation Research Center Inc.

5720 Neck Flexion Test - 6 Channel Transducer

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

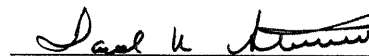
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.06 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.10 - 2.50 m/s	2.49 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.85 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.96 m/s	Yes
Peak D Plane Rotation	77 - 91 °	82.7 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	69.09 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	90.48 ms	Yes

Comments:

Technician



Approved



06.09.2003 09:10:49 495



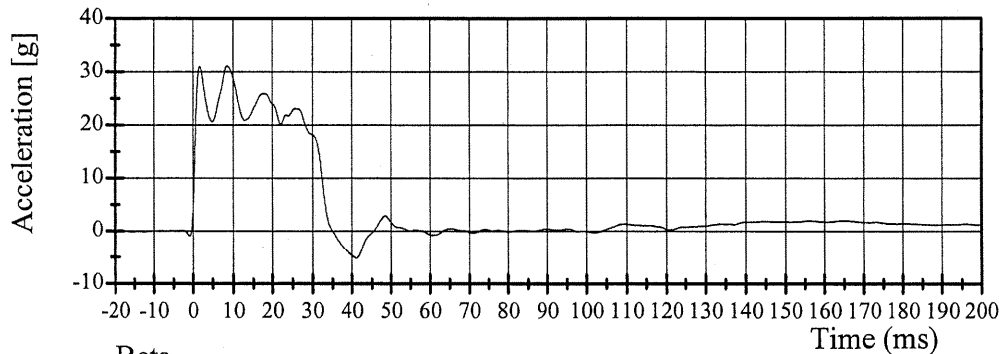
Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

Pendulum Deceleration

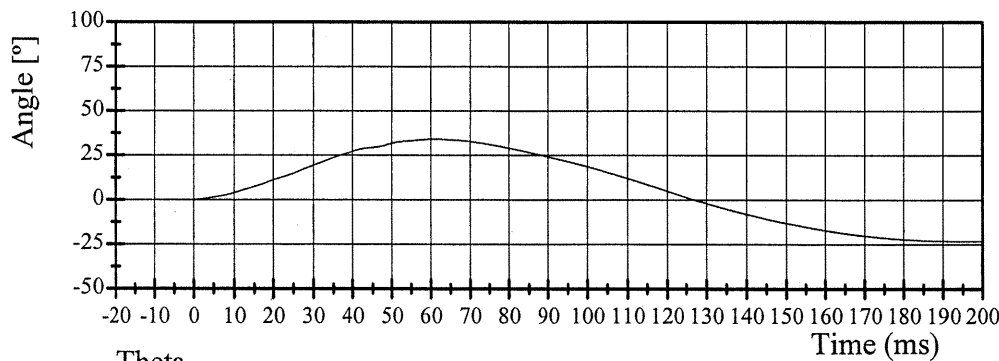


Filter Class: 180

Max: 31.1 g at 8.6 ms

Min: -5.2 g at 41.1 ms

Beta

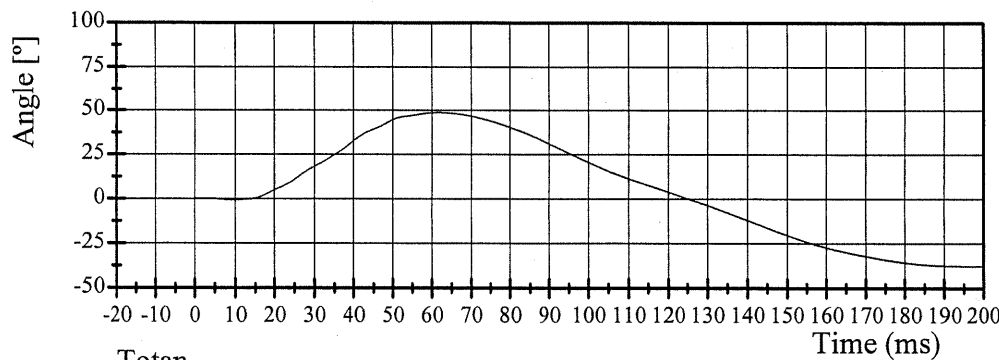


Filter Class: 60

Max: 34.1 ° at 60.8 ms

Min: -23.2 ° at 194.8 ms

Theta

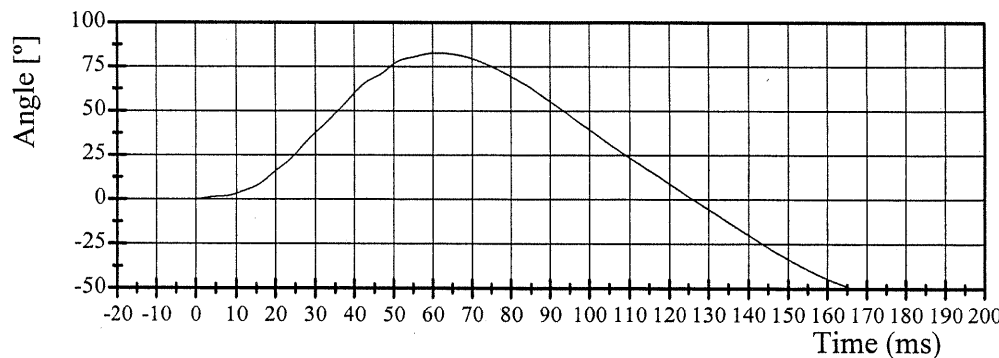


Filter Class: 60

Max: 48.7 ° at 61.8 ms

Min: -37.6 ° at 196.6 ms

Totan



Filter Class: 60

Max: 82.7 ° at 61.3 ms

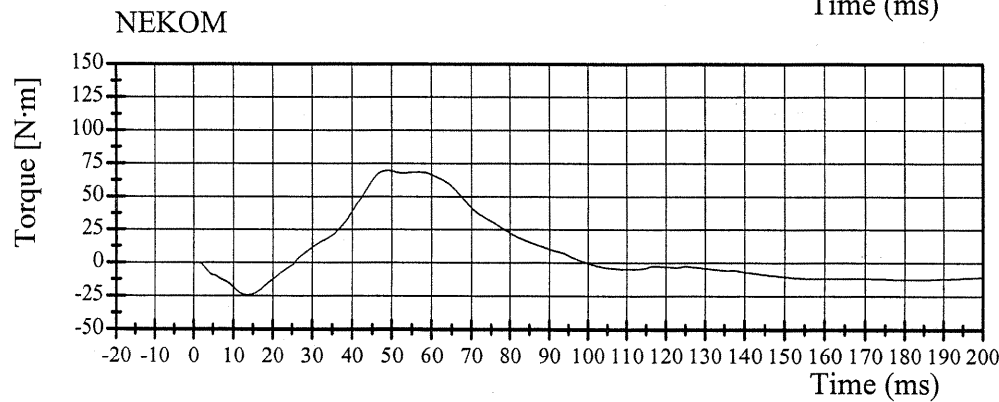
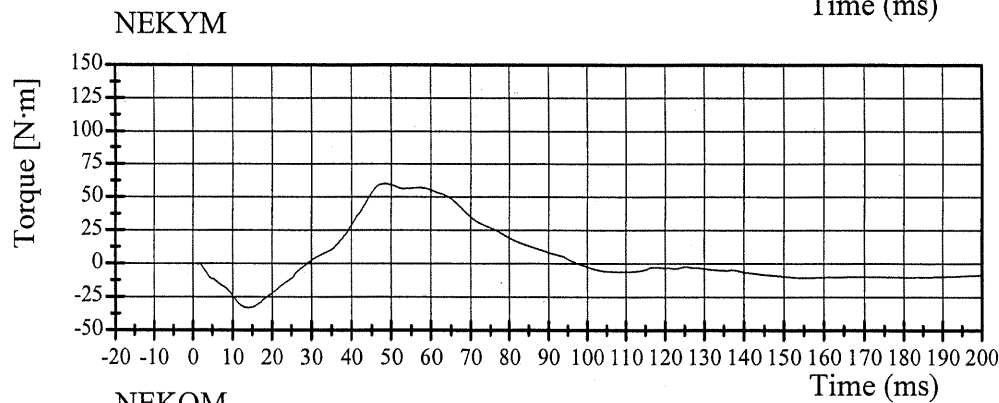
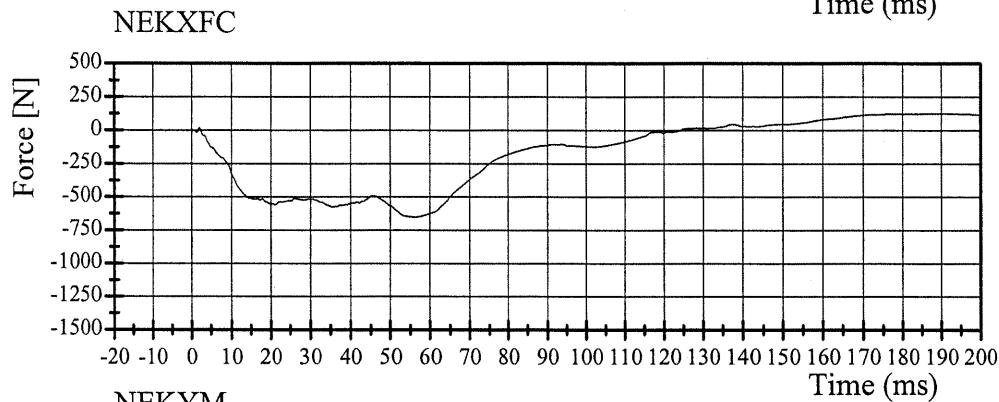
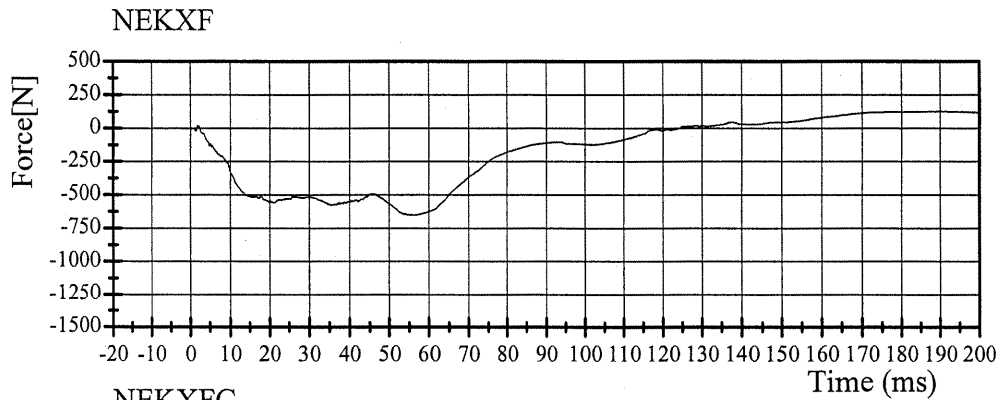
Min: -60.8 ° at 195.4 ms

Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003



06.09.2003 09:10:51 495



Transportation Research Center Inc.

5720 Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

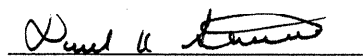
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.08 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.50 - 1.90 m/s	1.78 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.53 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.24 m/s	Yes
Peak D Plane Rotation	99 - 114 °	111.5 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-61.64 N·m	Yes
Negative Moment Decay Time To -10 N·m	94 - 114 ms	105.68 ms	Yes

Comments:

Technician



Approved



06.09.2003 09:55:57 576



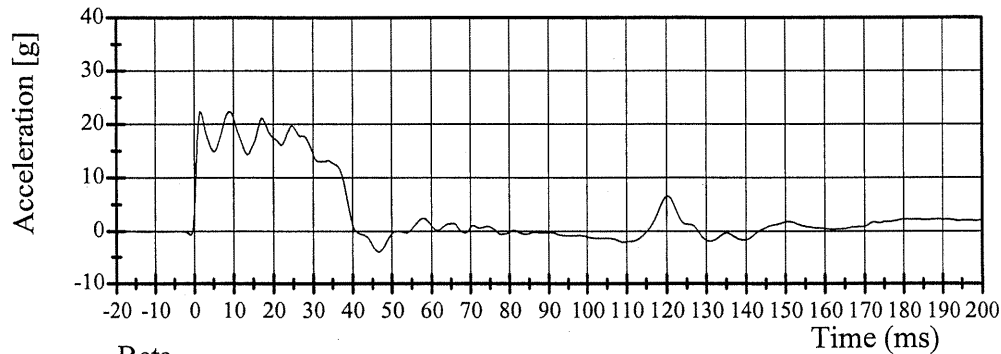
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

Pendulum Deceleration

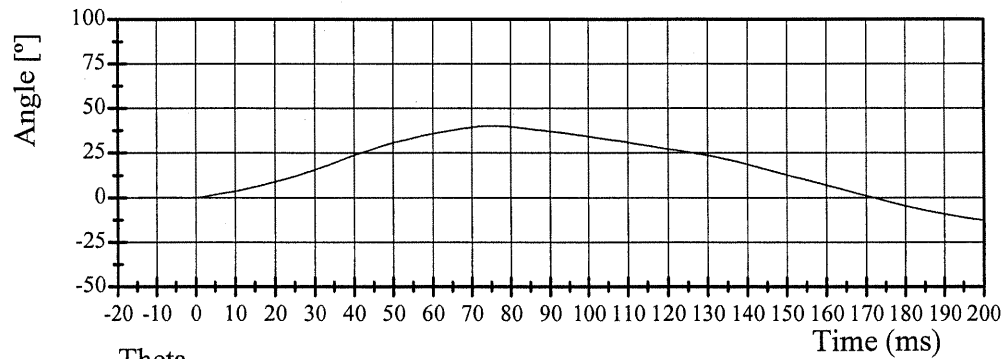


Filter Class: 180

Max: 22.4 g at 9.0 ms

Min: -4.1 g at 46.7 ms

Beta

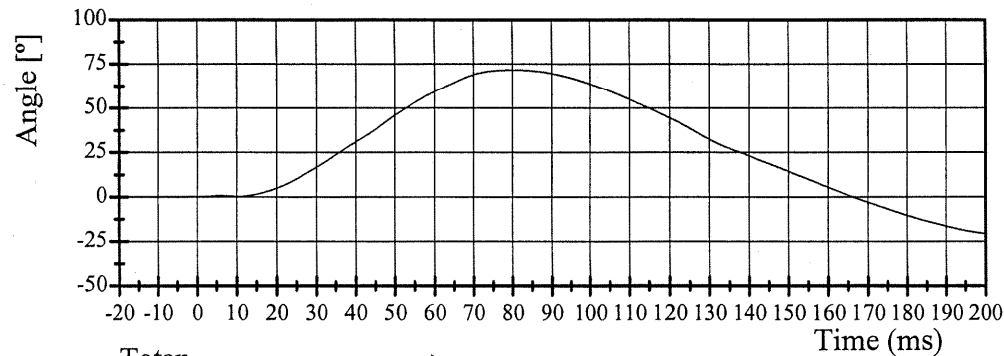


Filter Class: 60

Max: 40.1 ° at 75.0 ms

Min: -14.8 ° at 217.4 ms

Theta

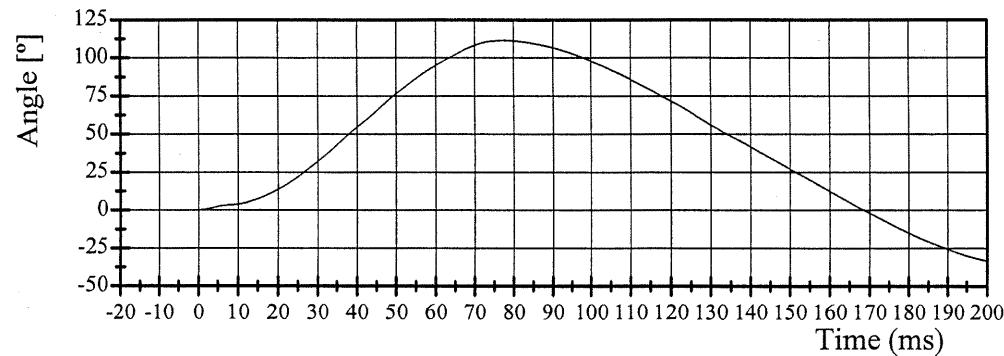


Filter Class: 60

Max: 71.6 ° at 80.6 ms

Min: -22.7 ° at 214.9 ms

Totan



Filter Class: 60

Max: 111.5 ° at 77.8 ms

Min: -37.4 ° at 216.6 ms

06.09.2003 09:55:58 576

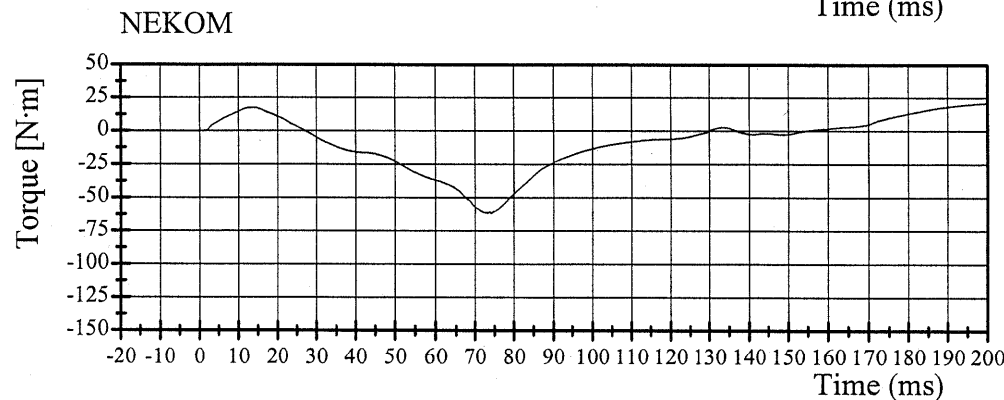
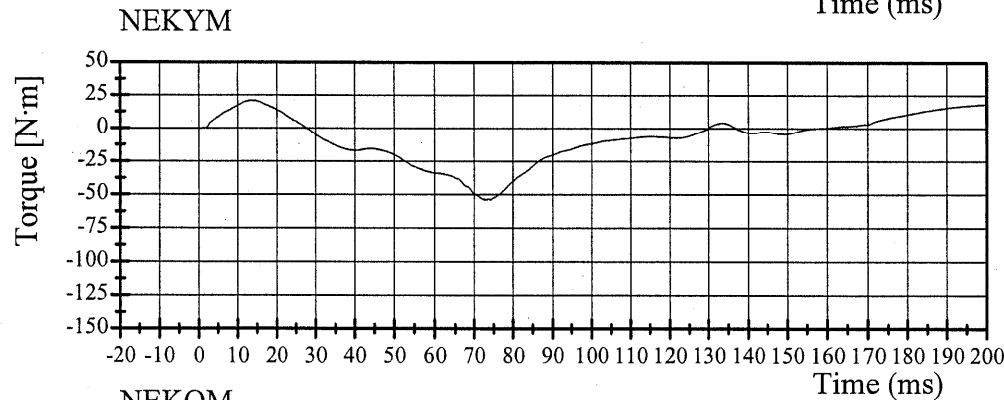
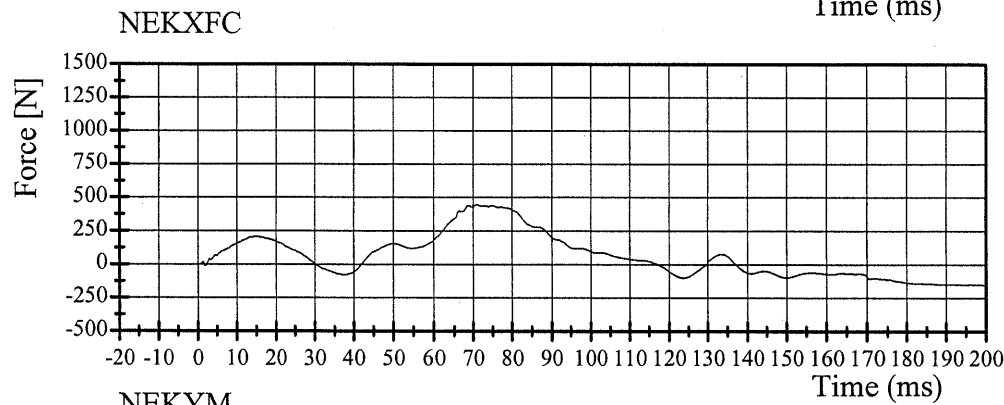
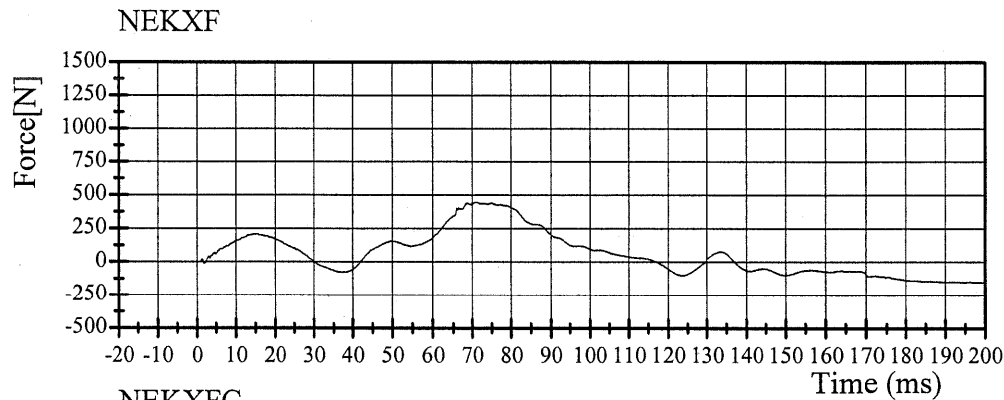


Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003



06.09.2003 09:55:59 576



Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.74 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-54.6 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4202 N	Yes
Peak Force Between 18 mm and 50 mm	4600 N	4071 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician



Approved



06.09.2003 12:41:08 963



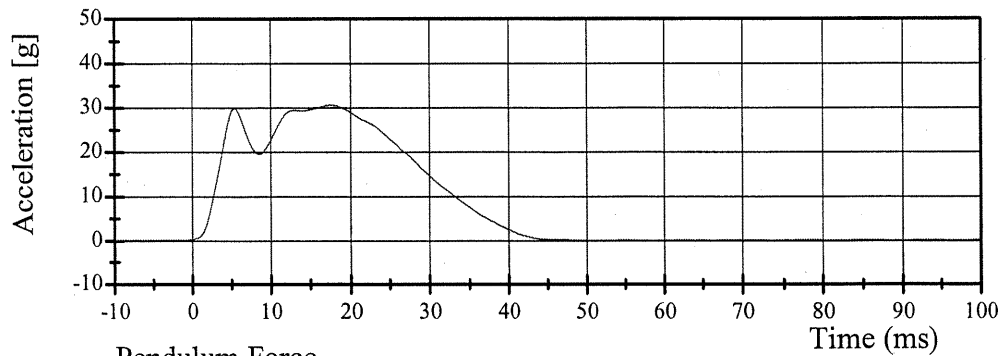
Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/09/2003

Pendulum Deceleration

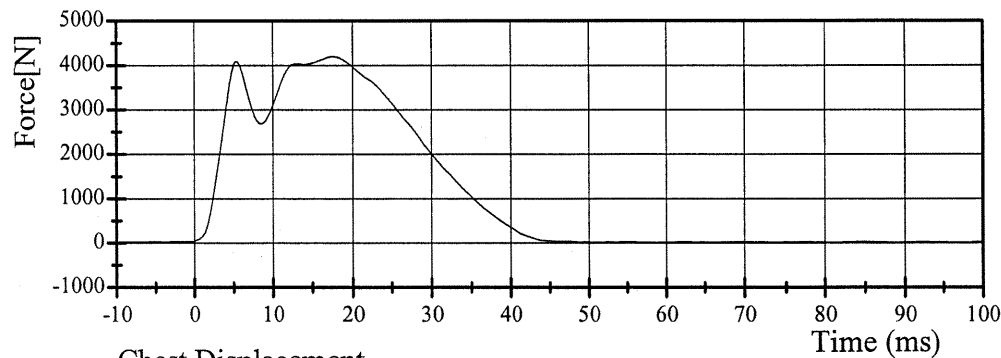


Filter Class: 180

Max: 30.7 g at 17.5 ms

Min: -0.8 g at 161.1 ms

Pendulum Force

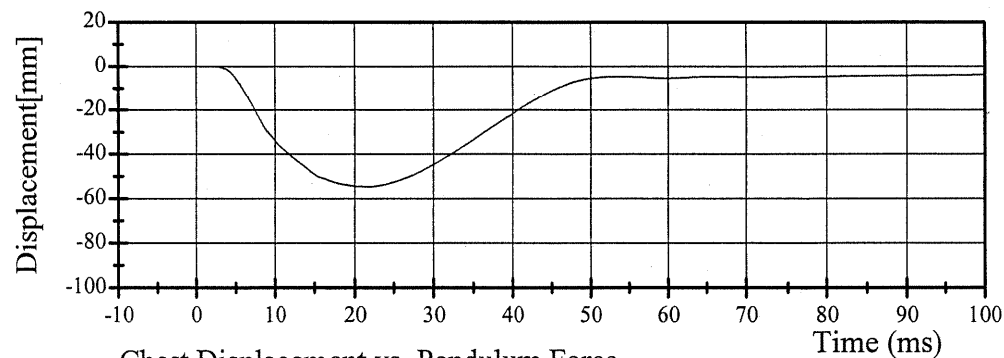


Filter Class: 180

Max: 4201.5 N at 17.5 ms

Min: -115.9 N at 161.1 ms

Chest Displacement

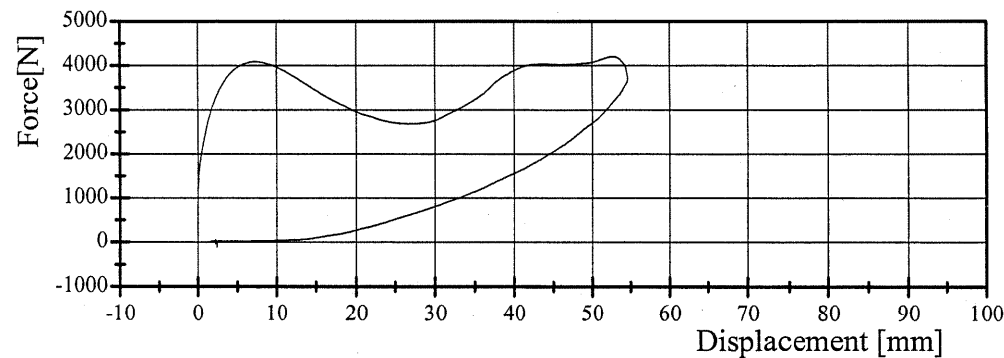


Filter Class: 600

Max: 0.0 mm at -12.9 ms

Min: -54.6 mm at 21.8 ms

Chest Displacement vs. Pendulum Force



06.09.2003 12:41:09 963



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 09-Jun-03

TRC, INC. TEST NO: 421C17TF1 5720 SN421 TORSO FLEX CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2° C	21.7 ° C
RELATIVE HUMIDITY	10 – 70 %	49 %
INITIAL ANGLE OF UNSUPPORTED DUMMY	<= 20° REFERENCED TO VERTICAL	17.1 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	377.5 N
RETURN ANGLE		21.1 °
DIFFERENCE BETWEEN RETURN ANGLE & INITIAL ANGLE	+/- 8 ° OF INITIAL ANGLE	4.0 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN 

Transportation Research Center Inc.

5720 Left Knee Slider Test

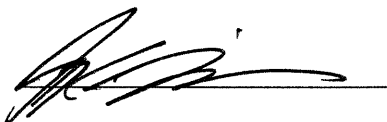
HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003

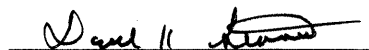
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.5 mm	Yes

Comments:

Technician



Approved



06.09.2003 10:54:45 1117

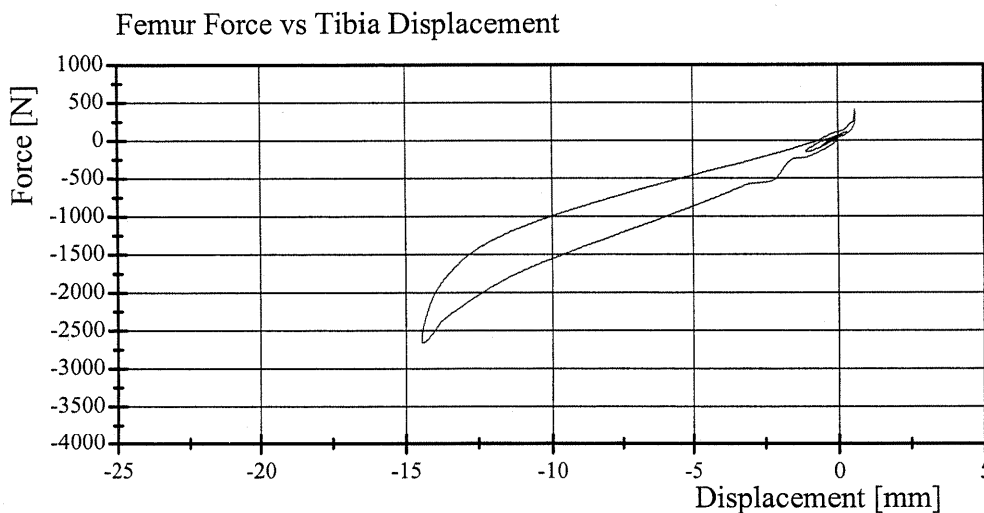
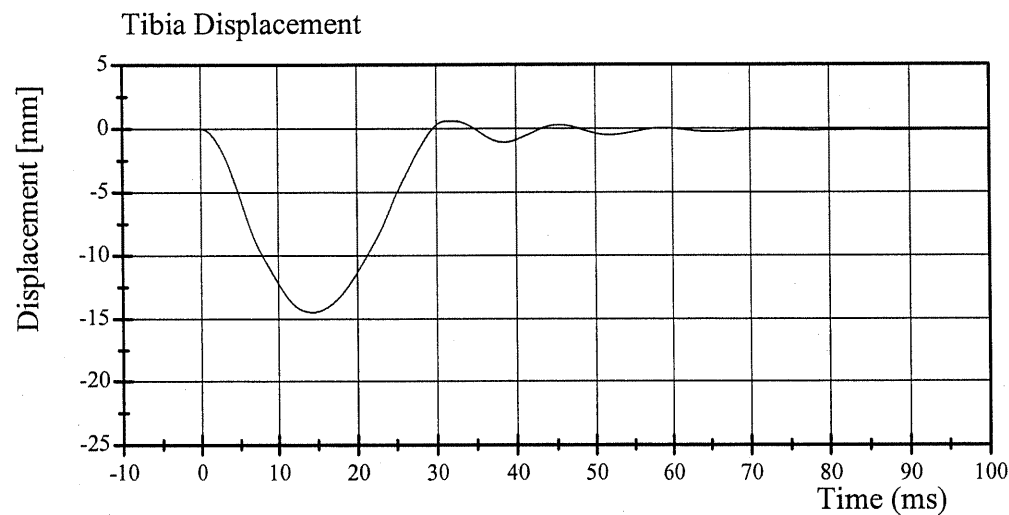
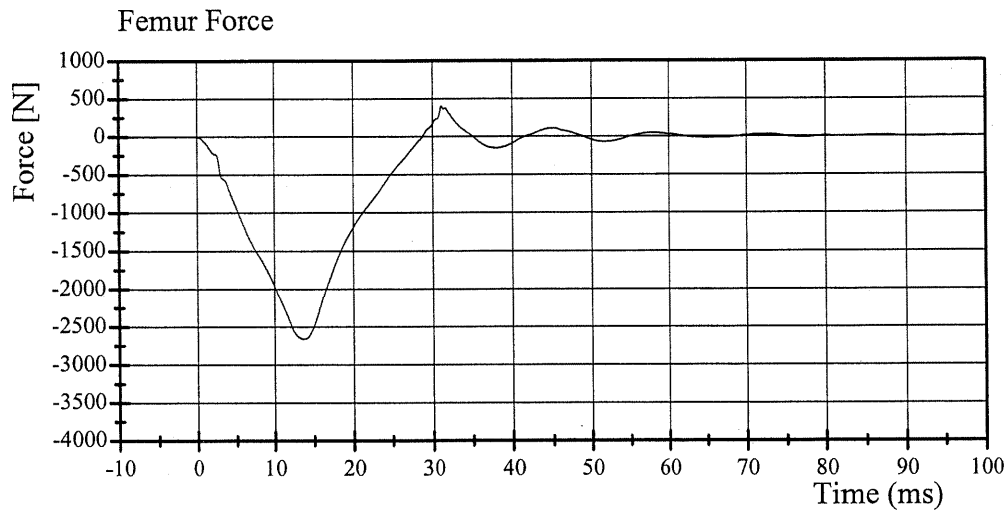


Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003



06.09.2003 10:54:46 1117



Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003

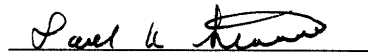
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.9 mm	Yes

Comments:

Technician



Approved



06.09.2003 10:55:17 1115

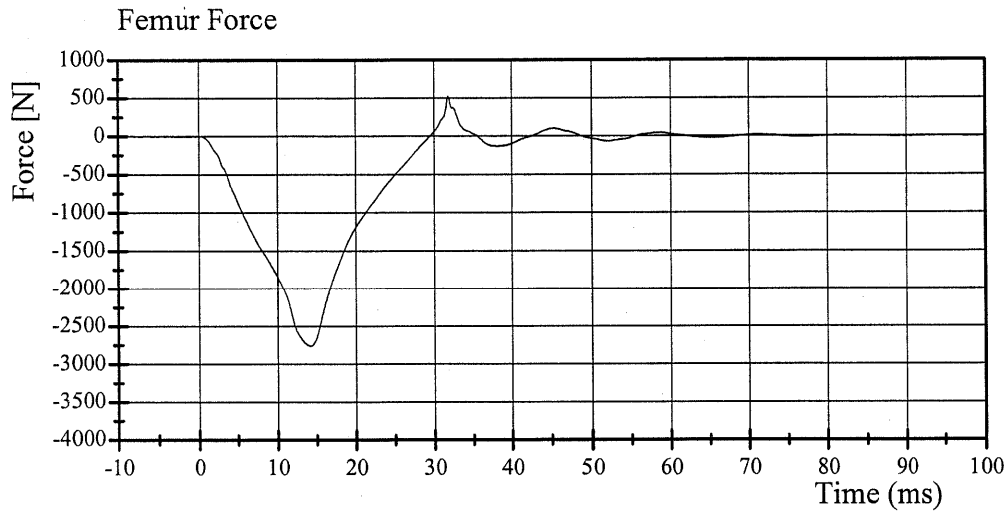


Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

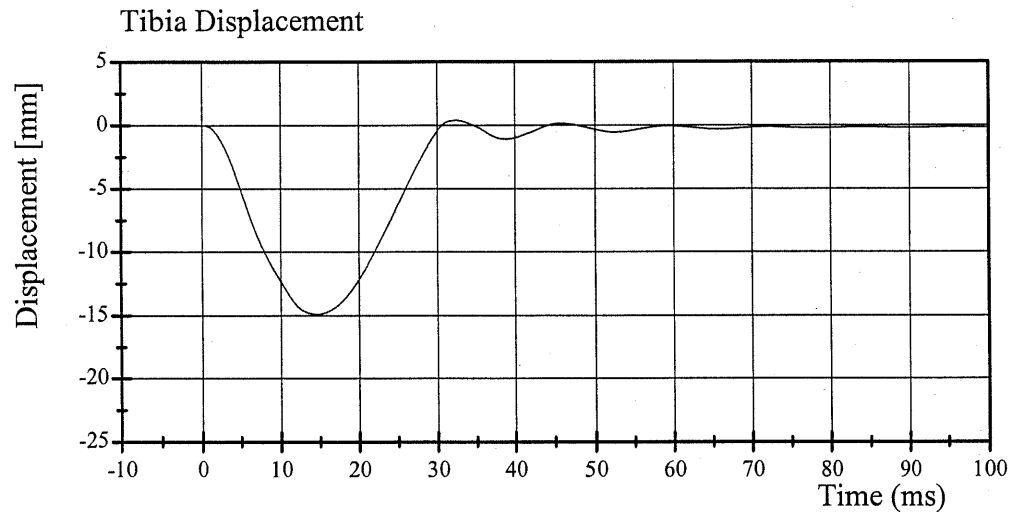
Test Date 06/06/2003



Filter Class: 600

Max: 520.6 N at 31.8 ms

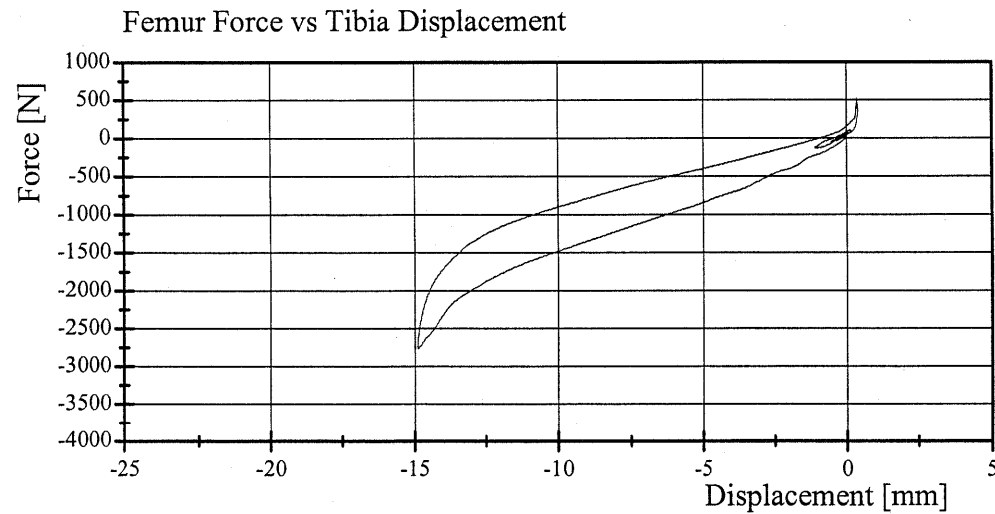
Min: -2761.9 N at 14.2 ms



Filter Class: 180

Max: 0.4 mm at 32.5 ms

Min: -14.9 mm at 14.6 ms



06.09.2003 10:55:18 1115



Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003

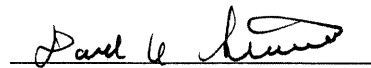
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3467 N	Yes

Comments:

Technician



Approved



06.06.2003 09:21:37 1716

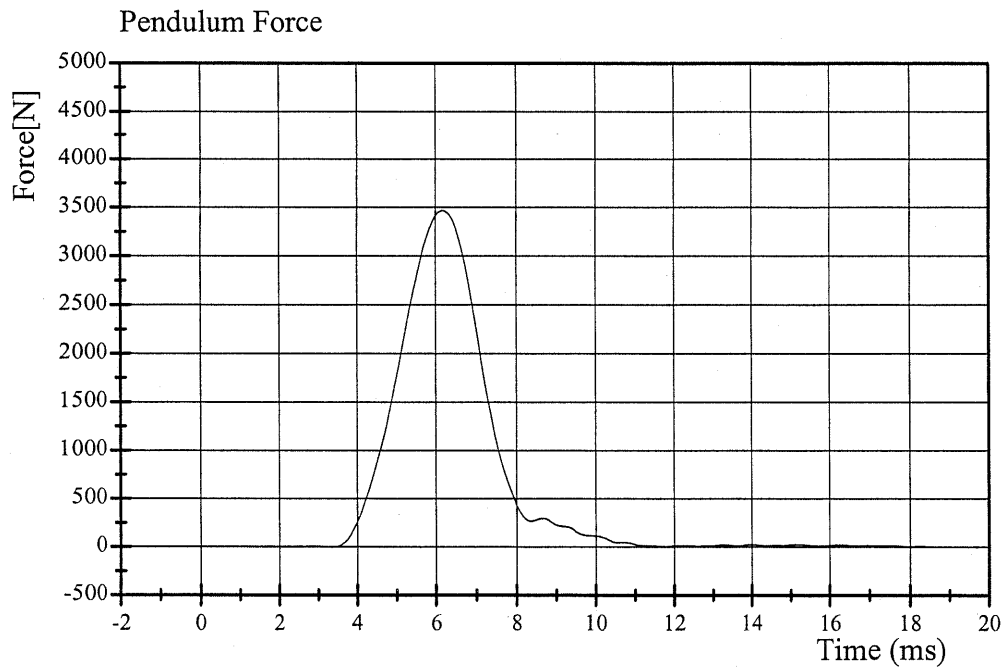
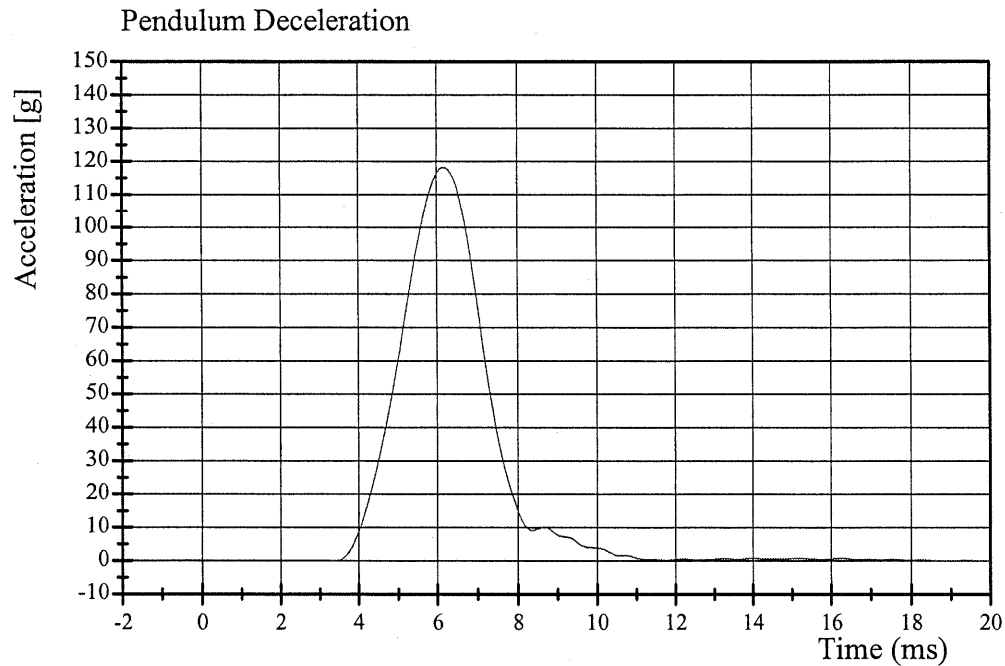


Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003



Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003

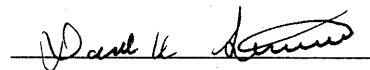
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3729 N	Yes

Comments:

Technician



Approved



06.06.2003 09:23:46 1756



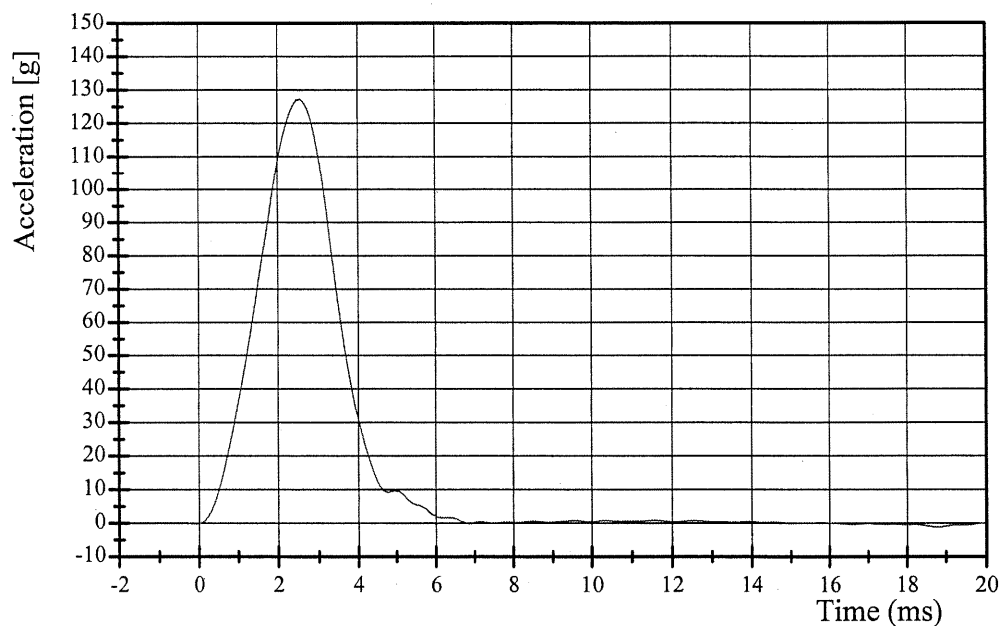
Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 17 - 1

Test Date 06/06/2003

Pendulum Deceleration

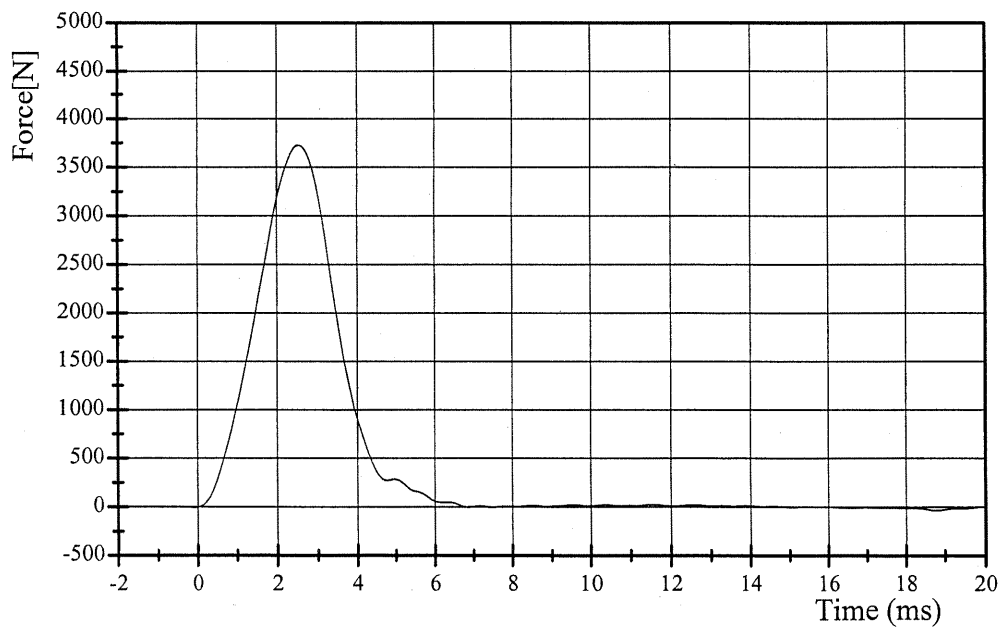


Filter Class: 600

Max: 127.2 g at 2.6 ms

Min: -1.2 g at 18.8 ms

Pendulum Force



Filter Class: 600

Max: 3728.9 N at 2.6 ms

Min: -35.2 N at 18.8 ms

Appendix D

Test Equipment and Instrumentation 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

Description Of Timing Marks On TRC High-Speed Film

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

The timing marks appear on the film as small red marks on the right edge of the film. Round marks are left by the Photosonic cameras.

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

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

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

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

Channel Report

6/6/2003 9:20:54 AM

Name of Test 030604-2

System MINIDAU

Name of DAU DAU6

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
6001	02A02-F02	HEDXG1	Head Accel X	Fwd	812.69841 g	+	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6002	02A18-N10	HEDYG1	Head Accel Y	Lft	810.94779 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6003	02A09-F15	HEDZG1	Head Accel Z	Up	800.87595 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6004	01L26-F02	HEDXR1	Head Accel Red X	Rwd	792.07920 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6005	02A09-F13	HEDYR1	Head Accel Red Y	Lft	789.17352 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6006	02A16-A06	HEDZR1	Head Accel Red Z	Up	795.64879 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6007	02A16-A19	HD1XG1	Head (LT) Accel X	Fwd	812.69841 g	+	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6008	02A16-A22	HD1ZG1	Head (LT) Accel Z	Up	799.96250 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6009	02A18-N04	HD2YG1	Head (FT) Accel Y	Lft	812.18274 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6010	02A18-N20	HD2ZG1	Head (FT) Accel Z	Up	794.83358 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6011	02A09-F01	HD3XG1	Head (TP) Accel X	Fwd	806.45161 g	+	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6012	02A09-F17	HD3YG1	Head (TP) Accel Y	Lft	796.72595 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6013	IF-205-161-FX	NEKXF1	Neck Force X	Hd	8895.2244 N	-	3/18/2003	OK 416v	FTSS	IF-205
6014	IF-205-161-FY	NEKYF1	Neck Force Y	Hd	8905.7086 N	+	3/18/2003	OK 416v	FTSS	IF-205
6015	IF-205-161-FZ	NEKZF1	Neck Force Z	Hd	13328.043 N	+	3/18/2003	OK 416v	FTSS	IF-205
6016	IF-205-161-MX	NEKXM1	Neck Moment X	Rt Ear	282.52581 N·m	-	3/18/2003	OK 416v	FTSS	IF-205
6017	IF-205-161-MY	NEKYM1	Neck Moment Y	Chin	282.68330 N·m	+	3/18/2003	OK 416v	FTSS	IF-205
6018	IF-205-161-MZ	NEKZM1	Neck Moment Z	Chn	282.27859 N·m	+	3/18/2003	OK 416v	FTSS	IF-205
6019	3251-108-FX	NKLXF1	Neck Lwr Force X	Hd	13369.521 N	-	3/19/2003	OK 416v	Denton	3251
6020	3251-108-FY	NKLYF1	Neck Lwr Force Y	Hd	13365.999 N	+	3/19/2003	OK 416v	Denton	3251
6021	3251-108-FZ	NKLZF1	Neck Lwr Force Z	Hd	13345.010 N	+	3/19/2003	OK 416v	Denton	3251
6022	3251-108-MX	NKLXM1	Neck Lwr Moment X	Rt Ear	338.61006 N·m	-	3/19/2003	OK 416v	Denton	3251
6024	3251-108-MY	NKLYM1	Neck Lwr Moment Y	Chn	339.46421 N·m	+	3/19/2003	OK 416v	Denton	3251
6025	3251-108-MZ	NKLZM1	Neck Lwr Moment Z	Chn	180.90416 N·m	+	3/19/2003	OK 416v	Denton	3251
6026	02A16-A04	CSTXG1	Chest Accel X	Fwd	398.73836 g	+	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6027	C02B19-F02	CSTYG1	Chest Accel Y	Lft	399.22649 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6028	C02B19-F06	CSTZG1	Chest Accel Z	Up	401.14388 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6029	B02A25-N08	CSTXR1	Chest Accel Red X	Rwd	399.64094 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6030	01L17-F09	CSTYR1	Chest Accel Red Y	Lft	398.43737 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6031	C02B19-F04	CSTZR1	Chest Accel Red Z	Up	399.72518 g	-	3/18/2003	OK 416v	Entran	EGE-73B6Q-200
6032	B02A09-F08	STUXG1	Sternum Upr Accel X	Fwd	799.00124 g	+	8/1/2002	--- 416v	Entran	EGE-73B6Q-200

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System MINIDAU

Name of DAU DAU8

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Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
8001	02A16-A05	STMXG1	Sternum Mid Accel X	Fwd	801.41499	g	+	3/18/2003	OK	416v	Entran	EGE-73B6Q-200
8002	P25874	STLXG1	Sternum Lwr Accel X	Fwd	803.76766	g	+	3/6/2003	OK	416v	Endevco	7264C-2K-2-180
8003	14CB1-2897-416	CSTXD1	Chest Deflection X 516	Strnm	100.61113	mm	+	3/19/2003	OK	416v	Servo	14CB1-2897
8004	2152-076-FX	LMBXF1	Lumbar Force X	Cst	13333.047	N	-	6/1/2001	---	416v	Denton	2152
8005	2152-076-FY	LMBYF1	Lumbar Force Y	Cst	13319.739	N	+	6/1/2001	---	416v	Denton	2152
8006	2152-076-FZ	LMBZF1	Lumbar Force Z	Cst	17809.292	N	+	6/1/2001	---	416v	Denton	2152
8007	2152-076-MX	LMBXM1	Lumbar Moment X	Rt	678.13736	N-m	-	6/1/2001	---	416v	Denton	2152
8008	2152-076-MY	LMBYM1	Lumbar Moment Y	Strnm	676.93674	N-m	+	6/1/2001	---	416v	Denton	2152
8009	C02B19-F03	PEVXG1	Pelvis Accel X	Rwd	398.27930	g	-	3/18/2003	OK	416v	Entran	EGE-73B6Q-200
8010	02A16-A27	PEVYG1	Pelvis Accel Y	Lft	401.20046	g	-	3/18/2003	OK	416v	Entran	EGE-73B6Q-200
8011	C02B19-F01	PEVZG1	Pelvis Accel Z	Up	401.47416	g	-	3/18/2003	OK	416v	Entran	EGE-73B6Q-200
8012	2430-736	LFMZFI	Left Femur Force Z #8	Knee	13339.425	N	+	3/19/2003	OK	416v	GSE	2430
8013	150-121VR-0226	KNLXD1	Left Knee Displacement	Tib	39.857385	mm	+	5/29/2003	OK	416v	Space Age	150-0121VL
8014	4825J-89-FX	TBLXF1	Left Upr Tibia Force X	Tib	8883.7544	N	+	10/9/2002	OK	416v	Denton	4825J
8015	4825J-89-FZ	TBLZF1	Left Upr Tibia Force Z	Tib	8898.8896	N	+	10/9/2002	OK	416v	Denton	4825J
8016	4825J-89-MX	TBLXM1	Left Upr Tibia Moment X	Ank	281.66809	N-m	+	10/9/2002	OK	416v	Denton	4825J
8017	4825J-89-MY	TBLYM1	Left Upr Tibia Moment Y	Ank	282.57265	N-m	+	10/9/2002	OK	416v	Denton	4825J
8018	98H10-F13	TBLXG1	Left Tibia Accel X	Fwd	1210.2302	g	+	5/13/2003	OK	416v	Entran	EGE-73BQ-2000
8019	98H10-F12	TBLYG1	Left Tibia Accel Y	Rt	1203.2336	g	+	5/13/2003	OK	416v	Entran	EGE-73BQ-2000
8020	4826J-89-FX	ANLXF1	Left Lwr Tibia Force X	Ank	8883.6096	N	+	10/9/2002	OK	416v	Denton	4826J
8021	4826J-89-FY	ANLYF1	Left Lwr Tibia Force Y	Ank	8877.0151	N	+	10/9/2002	OK	416v	Denton	4826J
8022	4826J-89-FZ	ANLZF1	Left Lwr Tibia Force Z	Ank	8902.2949	N	+	10/9/2002	OK	416v	Denton	4826J
8023	4826J-89-MX	ANLXM1	Left Lwr Tibia Moment X	Ank	282.63732	N-m	+	10/9/2002	OK	416v	Denton	4826J
8024	4826J-89-MY	ANLYM1	Left Lwr Tibia Moment Y	Ank	283.17642	N-m	+	10/9/2002	OK	416v	Denton	4826J
8025	7921 0179	FTLXD1	Left Foot Disp. X	Invers	161.80972	°	-	10/15/2002	OK	416v	UNK	T1AKM060
8026	7921 0184	FTLYD1	Left Foot Disp. Y	Dorsif	162.06865	°	+	10/15/2002	OK	416v	UNK	T1AKM060
8027	7921 0183	FTLZD1	Left Foot Disp. Z	Exter	161.73139	°	-	10/15/2002	OK	416v	UNK	T1AKM060
8028	01G25-N04	FTLXG1	Left Foot Accel X	Fwd	1174.7969	g	+	5/13/2003	OK	416v	Entran	EGE-73B6Q-200
8029	00L13-F29	FTLYG1	Left Foot Accel Y	Rt	1200.7504	g	+	5/13/2003	OK	416v	Entran	EGE-73B6Q-200
8030	98H10-F18	FTLZG1	Left Foot Accel Z	Dn	1226.0536	g	+	5/13/2003	OK	416v	Entran	EGE-73BQ-2000
8031	2430-742	RFMZFI	Right Femur Force Z 507	Knee	13353.885	N	+	3/19/2003	OK	416v	GSE	2430
8032	150-121VL-0205	KNRXD1	Right Knee Displacement	Tib	39.915491	mm	+	5/29/2003	OK	416v	Space Age	150-0121VL

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Name of DAU DAU9

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
9001	EVENT	EVENT	EVENT		5.12	V	+ 10/15/2002	OK -1	TRC	Event
9002	6244-02-138-FZ	LCA1XF	Barr. L.C. A1 X-Axis Force		111427.76	N	- 3/3/2003	OK VRTC	Key	6244-02
9003	6244-02-128-FZ	LCA2XF	Barr. L.C. A2 X-Axis Force		111436.37	N	- 3/5/2003	OK VRTC	Key	6244-02
9004	6244-02-149-FZ	LCA3XF	Barr. L.C. A3 X-Axis Force		110996.64	N	- 3/6/2003	OK VRTC	Key	6244-02
9005	6244-02-131-FZ	LCA4XF	Barr. L.C. A4 X-Axis Force		110991.01	N	- 3/3/2003	OK VRTC	Key	6244-02
9006	6244-02-136-FZ	LCA5XF	Barr. L.C. A5 X-Axis Force		110940.07	N	- 2/28/2003	OK VRTC	Key	6244-02
9007	6244-02-102-FZ	LCA6XF	Barr. L.C. A6 X-Axis Force		111000.11	N	- 3/3/2003	OK VRTC	Key	6244-02
9008	6244-02-145-FZ	LCA7XF	Barr. L.C. A7 X-Axis Force		111119.88	N	- 3/5/2003	OK VRTC	Key	6244-02
9009	6244-02-164-FZ	LCB1XF	Barr. L.C. B1 X-Axis Force		111296.60	N	- 4/4/2003	OK VRTC	Key	6244-02
9010	6244-02-114-FZ	LCB2XF	Barr. L.C. B2 X-Axis Force		111185.98	N	- 3/4/2003	OK VRTC	Key	6244-02
9011	6244-02-132-FZ	LCB3XF	Barr. L.C. B3 X-Axis Force		111059.55	N	- 3/4/2003	OK VRTC	Key	6244-02
9012	6244-02-101-FZ	LCB4XF	Barr. L.C. B4 X-Axis Force		111422.84	N	- 2/28/2003	OK VRTC	Key	6244-02
9013	6244-02-140-FZ	LCB5XF	Barr. L.C. B5 X-Axis Force		111135.71	N	- 2/28/2003	OK VRTC	Key	6244-02
9014	6244-02-143-FZ	LCB6XF	Barr. L.C. B6 X-Axis Force		111341.52	N	- 3/3/2003	OK VRTC	Key	6244-02
9015	6244-02-129-FZ	LCB7XF	Barr. L.C. B7 X-Axis Force		111085.94	N	- 3/5/2003	OK VRTC	Key	6244-02
9016	6244-02-159-FZ	LCC1XF	Barr. L.C. C1 X-Axis Force		111069.55	N	- 2/27/2003	OK VRTC	Key	6244-02
9017	6244-02-166-FZ	LCC2XF	Barr. L.C. C2 X-Axis Force		111213.56	N	- 3/12/2003	OK VRTC	Key	6244-02
9018	6244-02-157-FZ	LCC3XF	Barr. L.C. C3 X-Axis Force		111111.11	N	- 3/12/2003	OK VRTC	Key	6244-02
9020	6244-02-137-FZ	LCC4XF	Barr. L.C. C4 X-Axis Force		111452.38	N	- 3/5/2003	OK VRTC	Key	6244-02
9021	6244-02-118-FZ	LCC5XF	Barr. L.C. C5 X-Axis Force		111009.64	N	- 3/5/2003	OK VRTC	Key	6244-02
9022	6244-02-104-FZ	LCC6XF	Barr. L.C. C6 X-Axis Force		111368.72	N	- 2/27/2003	OK VRTC	Key	6244-02
9023	6244-02-160-FZ	LCC7XF	Barr. L.C. C7 X-Axis Force		111392.20	N	- 3/5/2003	OK VRTC	Key	6244-02
9024	6244-02-165-FZ	LCD1XF	Barr. L.C. D1 X-Axis Force		110972.53	N	- 2/27/2003	OK VRTC	Key	6244-02
9025	6244-02-109-FZ	LCD2XF	Barr. L.C. D2 X-Axis Force		111119.93	N	- 3/5/2003	OK VRTC	Key	6244-02
9026	6244-02-144-FZ	LCD3XF	Barr. L.C. D3 X-Axis Force		111080.52	N	- 3/5/2003	OK VRTC	Key	6244-02
9027	6244-02-106-FZ	LCD4XF	Barr. L.C. D4 X-Axis Force		111035.15	N	- 3/5/2003	OK VRTC	Key	6244-02
9028	6244-02-134-FZ	LCD5XF	Barr. L.C. D5 X-Axis Force		111266.03	N	- 3/3/2003	OK VRTC	Key	6244-02
9029	6244-02-111-FZ	LCD6XF	Barr. L.C. D6 X-Axis Force		110979.61	N	- 3/6/2003	OK VRTC	Key	6244-02
9030	6244-02-142-FZ	LCD7XF	Barr. L.C. D7 X-Axis Force		111042.19	N	- 2/27/2003	OK VRTC	Key	6244-02
9031	6244-02-117-FZ	LCE1XF	Barr. L.C. E1 X-Axis Force		111452.38	N	- 2/28/2003	OK VRTC	Key	6244-02
9032	6244-02-122-FZ	LCE2XF	Barr. L.C. E2 X-Axis Force		111235.86	N	- 3/6/2003	OK VRTC	Key	6244-02

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Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
0001	4825J-88-FX	TBRXF1	Right Upr Tibia Force X	Tib	8896.4692	N	+	10/8/2002	OK	416v	Denton	4825J
0002	4825J-88-FZ	TBRZF1	Right Upr Tibia Force Z	Tib	8902.0241	N	+	10/8/2002	OK	416v	Denton	4825J
0003	4825J-88-MX	TBRXM1	Right Upr Tibia Moment X	Ank	282.49324	N·m	+	10/8/2002	OK	416v	Denton	4825J
0004	4825J-88-MY	TBRYM1	Right Upr Tibia Moment Y	Ank	282.96281	N·m	+	10/8/2002	OK	416v	Denton	4825J
0005	00L13-F33	TBRXG1	Right Tibia Accel X	Fwd	1211.4328	g	+	5/13/2003	OK	416v	Entran	EGE-73B6Q-200
0006	01J02-F19	TBRYG1	Right Tibia Accel Y	Rt	1199.7937	g	+	5/13/2003	OK	416v	Entran	EGE-73B6Q-200
0007	4826J-88-FX	ANRXF1	Right Lwr Tibia Force X	Ank	8886.9115	N	+	10/8/2002	OK	416v	Denton	4826J
0008	4826J-88-FY	ANRYF1	Right Lwr Tibia Force Y	Ank	8882.7819	N	+	10/8/2002	OK	416v	Denton	4826J
0009	4826J-88-FZ	ANRZF1	Right Lwr Tibia Force Z	Ank	8904.7225	N	+	10/8/2002	OK	416v	Denton	4826J
0010	4826J-88-MX	ANRXM1	Right Lwr Tibia Moment X	Ank	282.88434	N·m	+	10/8/2002	OK	416v	Denton	4826J
0011	4826J-88-MY	ANRYM1	Right Lwr Tibia Moment Y	Ank	281.83207	N·m	+	10/8/2002	OK	416v	Denton	4826J
0012	7921 0180	FTRXD1	Right Foot Disp. X	Eversi	162.49963	°	-	10/15/2002	OK	416v	UNK	T1AKM060
0013	7921 0181	FTRYD1	Right Foot Disp. Y	Dorsif	161.65531	°	+	10/15/2002	OK	416v	UNK	T1AKM060
0014	7921 0182	FTRZD1	Right Foot Disp. Z	Intern	161.16834	°	-	10/15/2002	OK	416v	UNK	T1AKM060
0015	98H13-F20	FTRXG1	Right Foot Accel X	Fwd	1200.0468	g	+	5/13/2003	OK	416v	Entran	EGE-73BQ-2000
0016	98H13-F19	FTRYG1	Right Foot Accel Y	Rt	1196.2616	g	+	5/13/2003	OK	416v	Entran	EGE-73BQ-2000
0017	00L20-A15	FTRZG1	Right Foot Accel Z	Dn	1212.1212	g	+	5/13/2003	OK	416v	Entran	EGE-73B6Q-200
0018	02I02I16-A13	HEDXG2	Head Accel X	Rr	397.51552	g	-	9/24/2002	OK	421v-	Entran	EGE-73B6Q-200
0019	02I02I16-A08	HEDYG2	Head Accel Y	Lft	400.62597	g	-	9/24/2002	OK	421v-	Entran	EGE-73B6Q-200
0020	02I02I16-A18	HEDZG2	Head Accel Z	Up	399.22027	g	-	9/24/2002	OK	421v-	Entran	EGE-73B6Q-200
0021	IF-205-180-FX	NEKXF2	Neck Force X	Hd	8895.8474	N	-	6/3/2003	OK	421v-	FTSS	IF-205
0022	IF-205-180-FY	NEKYF2	Neck Force Y	Hd	8904.6241	N	+	6/3/2003	OK	421v-	FTSS	IF-205
0023	IF-205-180-FZ	NEKZF2	Neck Force Z	Hd	13345.264	N	+	6/3/2003	OK	421v-	FTSS	IF-205
0024	IF-205-180-MX	NEKXM2	Neck Moment X	Rt Ear	282.58337	N·m	-	6/3/2003	OK	421v-	FTSS	IF-205
0025	IF-205-180-MY	NEKYM2	Neck Moment Y	Chin	282.32972	N·m	+	6/3/2003	OK	421v-	FTSS	IF-205
0026	IF-205-180-MZ	NEKZM2	Neck Moment Z	Chn	282.69732	N·m	+	6/3/2003	OK	421v-	FTSS	IF-205
0027	B02A25-N03	CSTXG2	Chest Accel X	Fwd	401.20046	g	+	8/5/2002	---	421v-	Entran	EGE-73B6Q-200
0028	02A18-N12	CSTYG2	Chest Accel Y	Lft	402.78171	g	-	8/5/2002	---	421v-	Entran	EGE-73B6Q-200
0029	B02A25-N10	CSTZG2	Chest Accel Z	Up	400.45363	g	-	8/5/2002	---	421v-	Entran	EGE-73B6Q-200
0030	14CB1-2897-135	CSTXD2	Chest Deflection X	Strnm	99.823164	mm	+	3/25/2002	---	421v-	Servo	14CB1-2897
0031	AF9K3	PEVXG2	Pelvis Accel X	Rwd	402.51572	g	-	8/5/2002	OK	421v-	Endevco	7264-2000LC
0032	02A16-A26	PEVYG2	Pelvis Accel Y	Lft	398.20806	g	-	8/5/2002	---	421v-	Entran	EGE-73B6Q-200

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System MINIDAU

Name of DAU DAUB

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model	
0001	6244-02-163-FZ	LCE3XF	Barr. L.C. E3 X-Axis Force		111215.06 N	-	2/27/2003	OK	VRTC	Key	6244-02
0003	6244-02-124-FZ	LCE4XF	Barr. L.C. E4 X-Axis Force		111170.55 N	-	3/5/2003	OK	VRTC	Key	6244-02
0004	6244-02-116-FZ	LCE5XF	Barr. L.C. E5 X-Axis Force		111038.82 N	-	2/27/2003	OK	VRTC	Key	6244-02
0005	6244-02-130-FZ	LCE6XF	Barr. L.C. E6 X-Axis Force		111210.30 N	-	3/3/2003	OK	VRTC	Key	6244-02
0006	6244-02-123-FZ	LCE7XF	Barr. L.C. E7 X-Axis Force		111388.42 N	-	3/5/2003	OK	VRTC	Key	6244-02
0007	6244-02-113-FZ	LCF1XF	Barr. L.C. F1 X-Axis Force		111459.15 N	-	3/4/2003	OK	VRTC	Key	6244-02
0008	6244-02-107-FZ	LCF2XF	Barr. L.C. F2 X-Axis Force		111452.72 N	-	3/5/2003	OK	VRTC	Key	6244-02
0009	6244-02-126-FZ	LCF3XF	Barr. L.C. F3 X-Axis Force		111111.35 N	-	3/3/2003	OK	VRTC	Key	6244-02
0010	6244-02-139-FZ	LCF4XF	Barr. L.C. F4 X-Axis Force		110957.99 N	-	2/28/2003	OK	VRTC	Key	6244-02
0011	6244-02-127-FZ	LCF5XF	Barr. L.C. F5 X-Axis Force		111455.92 N	-	3/6/2003	OK	VRTC	Key	6244-02
0012	6244-02-147-FZ	LCF6XF	Barr. L.C. F6 X-Axis Force		111125.45 N	-	3/6/2003	OK	VRTC	Key	6244-02
0013	6244-02-108-FZ	LCF7XF	Barr. L.C. F7 X-Axis Force		111004.15 N	-	3/3/2003	OK	VRTC	Key	6244-02
0014	6244-02-168-FZ	LCG1XF	Barr. L.C. G1 X-Axis Force		111449.71 N	-	2/27/2003	OK	VRTC	Key	6244-02
0015	6244-02-135-FZ	LCG2XF	Barr. L.C. G2 X-Axis Force		110955.08 N	-	3/5/2003	OK	VRTC	Key	6244-02
0016	6244-02-115-FZ	LCG3XF	Barr. L.C. G3 X-Axis Force		111339.92 N	-	2/27/2003	OK	VRTC	Key	6244-02
0017	6244-02-125-FZ	LCG4XF	Barr. L.C. G4 X-Axis Force		111036.31 N	-	3/5/2003	OK	VRTC	Key	6244-02
0018	6244-02-167-FZ	LCH1XF	Barr. L.C. H1 X-Axis Force		111030.44 N	-	2/27/2003	OK	VRTC	Key	6244-02
0020	6244-02-161-FZ	LCH2XF	Barr. L.C. H2 X-Axis Force		110932.96 N	-	2/27/2003	OK	VRTC	Key	6244-02
0021	6244-02-148-FZ	LCH3XF	Barr. L.C. H3 X-Axis Force		111051.19 N	-	3/6/2003	OK	VRTC	Key	6244-02
0022	6244-02-119-FZ	LCH4XF	Barr. L.C. H4 X-Axis Force		111120.56 N	-	3/6/2003	OK	VRTC	Key	6244-02

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Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
0001	02A18-N15	PEVZG2	Pelvis Accel Z	Up	401.14074	g	-	8/5/2002	---	421v-	Entran	EGE-73B6Q-200
0002	2430-739	LFMZ2	Left Femur Force Z S37	Knee	13342.961	N	+	3/18/2002	---	421v-	GSE	2430
0003	150-121VR-1502	KNLXD2	Left Knee Displacement	Tib	40.088068	mm	+	6/2/2003	OK	421v-	Space Age	150-0121VR
0004	4825J-82-FX	TBLXF2	Left Upr Tibia Force X	Tib	8883.1205	N	+	7/16/2002	OK	421v-	Denton	4825J
0005	4825J-82-FZ	TBLZF2	Left Upr Tibia Force Z	Tib	8899.4853	N	+	7/16/2002	OK	421v-	Denton	4825J
0006	4825J-82-MX	TBLXM2	Left Upr Tibia Moment X	Ank	281.82342	N·m	+	7/16/2002	OK	421v-	Denton	4825J
0007	4825J-82-MY	TBLYM2	Left Upr Tibia Moment Y	Ank	282.67104	N·m	+	7/16/2002	OK	421v-	Denton	4825J
0008	01G25-N16	TBLXG2	Left Tibia Accel X	Fwd	1226.8174	g	+	5/13/2003	OK	421v-	Entran	EGE-73B6Q-200
0009	01G18-F02	TBLYG2	Left Tibia Accel Y	Rt	1174.3119	g	+	5/13/2003	OK	421v-	Entran	EGE-73B6Q-200
0010	4826J-82-FX	ANLXF2	Left Lwr Tibia Force X	Ank	8903.7473	N	+	7/16/2002	OK	421v-	Denton	4826J
0011	4826J-82-FY	ANLYF2	Left Lwr Tibia Force Y	Ank	8913.5865	N	+	7/16/2002	OK	421v-	Denton	4826J
0012	4826J-82-FZ	ANLZF2	Left Lwr Tibia Force Z	Ank	8897.3840	N	+	7/16/2002	OK	421v-	Denton	4826J
0013	4826J-82-MX	ANLXM2	Left Lwr Tibia Moment X	Ank	281.89523	N·m	+	7/16/2002	OK	421v-	Denton	4826J
0014	4826J-82-MY	ANLYM2	Left Lwr Tibia Moment Y	Ank	282.42322	N·m	+	7/16/2002	OK	421v-	Denton	4826J
0015	FLX108X	FTLXD2	Left Foot Disp. X	Eversi	162.16125	°	+	7/22/2002	OK	421v-	Contelec	PD210-4B
0016	FLX108Y	FTLYD2	Left Foot Disp. Y	Dorsif	161.60453	°	+	7/22/2002	OK	421v-	Contelec	PD210-4B
0017	FLX108Z	FTLZD2	Left Foot Disp. Z	Intern	160.64468	°	+	7/22/2002	OK	421v-	Contelec	PD210-4B
0018	00L20-A14	FTLXG2	Left Foot Accel X	Fwd	1207.0916	g	+	5/13/2003	OK	421v-	Entran	EGE-73B6Q-200
0019	98H10-F01	FTLYG2	Left Foot Accel Y	Rt	1192.2503	g	+	5/13/2003	OK	421v-	Entran	EGE-73BQ-2000
0020	99H12-F03	FTLZG2	Left Foot Accel Z	Dn	1179.0714	g	+	5/13/2003	OK	421v-	Entran	EGE-73BQE0-20
0021	2430-760	RFMZF2	Right Femur Force Z VRTC 4	Knee	13346.030	N	+	3/18/2002	---	421v-	GSE	2430
0022	150-121VL-1494	KNRXD2	Right Knee Displacement	Tib	40.131965	mm	+	6/2/2003	OK	421v-	Space Age	150-0121VL
0023	4825J-80-FX	TBRXF2	Right Upr Tibia Force X	Tib	8897.8530	N	+	7/16/2002	OK	421v-	Denton	4825J
0024	4825J-80-FZ	TBRZF2	Right Upr Tibia Force Z	Tib	8891.6867	N	+	7/16/2002	OK	421v-	Denton	4825J
0025	4825J-80-MX	TBRXM2	Right Upr Tibia Moment X	Ank	282.67118	N·m	+	7/16/2002	OK	421v-	Denton	4825J
0026	4825J-80-MY	TBRYM2	Right Upr Tibia Moment Y	Ank	282.08905	N·m	+	7/16/2002	OK	421v-	Denton	4825J
0027	99H12-F08	TBRXG2	Right Tibia Accel X	Fwd	1191.1408	g	+	5/13/2003	OK	421v-	Entran	EGE-73BQE0-20
0028	99H30-Z11	TBRYG2	Right Tibia Accel Y	Rt	1186.9986	g	+	5/13/2003	OK	421v-	Entran	EGE-73BQE0-20
0029	4826J-76-FX	ANRXF2	Right Lwr Tibia Force X	Ank	8902.4909	N	+	7/16/2002	OK	421v-	Denton	4826J
0030	4826J-76-FY	ANRYF2	Right Lwr Tibia Force Y	Ank	8899.4437	N	+	7/16/2002	OK	421v-	Denton	4826J
0031	4826J-76-FZ	ANRZF2	Right Lwr Tibia Force Z	Ank	8898.8267	N	+	7/16/2002	OK	421v-	Denton	4826J
0032	4826J-76-MX	ANRXM2	Right Lwr Tibia Moment X	Ank	282.85843	N·m	+	7/16/2002	OK	421v-	Denton	4826J

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Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0001	4826J-76-MY	ANRYM2	Right Lwr Tibia Moment Y	Ank	282.07777	N-m	+ 7/16/2002	OK 421v-	Denton	4826J
0002	FLX107X	FTRXD2	Right Foot Disp. X	Eversi	163.16031	°	- 7/22/2002	OK 421v-	Contelec	PD210-4B
0003	FLX107Y	FTRYD2	Right Foot Disp. Y	Dorsif	160.73496	°	+ 7/22/2002	OK 421v-	Contelec	PD210-4B
0004	FLX107Z	FTRZD2	Right Foot Disp. Z	Exter	161.54100	°	+ 7/22/2002	OK 421v-	Contelec	PD210-4B
0005	01J02-F08	FTRXG2	Right Foot Accel X	Fwd	1218.4383	g	+ 5/13/2003	OK 421v-	Entran	EGE-73B6Q-200
0006	01J02-F16	FTRYG2	Right Foot Accel Y	Rt	1179.7235	g	+ 5/13/2003	OK 421v-	Entran	EGE-73B6Q-200
0007	98H10-F10	FTRZG2	Right Foot Accel Z	Dn	1203.2902	g	+ 5/13/2003	OK 421v-	Entran	EGE-73BQ-2000
0008	P27169	LRXXG1	REAR SEAT X-MEMBER	FWD	997.35078	g	+ 5/7/2003	OK -1	Endevco	7264C-2K-2-180
0009	03D03C27-N11	LRXYG1	REAR SEAT Y-MEMBER	LT	989.37198	g	- 4/3/2003	OK -1	Entran	EGE-73B6Q-200
0010	P27202	LRXZG1	REAR SEAT Z-MEMBER	UP	1000.3907	g	- 5/7/2003	OK -1	Endevco	7264C-2K-2-180
0011	P23380	RRXXG1	REAR SEAT X-MEMBER	FWD	998.08959	g	+ 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0012	P23188	RRXYG1	REAR SEAT Y-MEMBER	LT	999.10236	g	- 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0013	03D03C27-N05	RRXZG1	REAR SEAT Z-MEMBER	UP	989.37198	g	- 4/3/2003	OK -1	Entran	EGE-73B6Q-200
0014	P27472	LTPXG1	DRIVERS LT. SIDE TOE PAN	FWD	1003.6460	g	+ 5/6/2003	OK -1	Endevco	7264C-2K-2-180
0015	P27191	LTPYG1	DRIVERS LT. SIDE TOE PAN	RT	978.59327	g	+ 5/7/2003	OK -1	Endevco	7264C-2K-2-180
0016	P26430	LTPZG1	DRIVERS LT. SIDE TOE PAN	UP	996.49669	g	- 3/20/2003	OK -1	Endevco	7264C-2K-2-180
0017	P25322	RTPXG1	DRIVERS RT. SIDE TOE PAN	FWD	995.95393	g	+ 1/22/2003	OK -1	Endevco	7264C-2K-2-180
0018	P23292	RTPYG1	DRIVERS RT. SIDE TOE PAN	RT	1000.9775	g	+ 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0019	03C03C14-N07	RTPZG1	DRIVERS RT. SIDE TOE PAN	UP	984.61538	g	- 3/24/2003	OK -1	Entran	EGE-73B6Q-200
0020	03C03C14-F24	VCGXG1	VEHICLE CG X-AXIS	FWD	1020.7336	g	+ 3/31/2003	OK -1	Entran	EGE-73B6Q-200
0021	03C03C14-F01	VCGYG1	VEHICLE CG Y-AXIS	LT	1008.8669	g	- 3/28/2003	OK -1	Entran	EGE-73B6Q-200
0022	03C03C14-N24	VCGZG1	VEHICLE CG Z-AXIS	UP	999.02439	g	- 4/21/2003	OK -1	Entran	EGE-73B6Q-200
0023	P21366	RDKZG1	REAR DECK Z-AXIS	UP	998.05068	g	- 11/22/2002	--- -1	Endevco	7264C-2K-2-180
0025	ABFire1	DABETA	DRIVER AIRBAG EVENT -		5.12	V	+ 8/20/2002	OK -1	FLUKE	Y8101A
0027	ABFire3	PABETA	PASSENGER AIRBAG EVENT		5.12	V	+ 8/20/2002	OK -1	FLUKE	Y8101A
0029	615	SHBF1	DRIVER SHOULDER FORCE		13365.343	N	+ 4/3/2003	OK -1	Lebow	3419T
0030	236	LPBF1	DRIVER LAP FORCE		13332.483	N	+ 12/23/2002	OK -1	Lebow	3419T
0031	806	SHBF2	PASSENGER SHOULDER		13365.101	N	+ 6/2/2003	OK -1	Lebow	3419T
0032	805	LPBF2	PASSENGER LAP FORCE		13353.767	N	+ 6/2/2003	OK -1	Lebow	3419T

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Dummy	416v	Type	HYBRID III 5th	Description	VRTC - 416v HYBRID III w/RED.& THOR LEGS ICAL'd 8-1-02 (DKS 6-3-03)J211					
Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip	
HEDXG	Head Accel X	EGE-73B6Q-20	02A02-F02	Entran	0.0252 g	2000	3/18/2003	Fwd	0	
HEDYG	Head Accel Y	EGE-73B6Q-20	02A18-N10	Entran	0.01973 g	2000	3/18/2003	Lft	1	
HEDZG	Head Accel Z	EGE-73B6Q-20	02A09-F15	Entran	0.02131 g	2000	3/18/2003	Up	1	
HEDXR	Head Accel Red X	EGE-73B6Q-20	01L26-F02	Entran	0.0202 g	2000	3/18/2003	Rwd	1	
HEDYR	Head Accel Red Y	EGE-73B6Q-20	02A09-F13	Entran	0.01966 g	2000	3/18/2003	Lft	1	
HEDZR	Head Accel Red Z	EGE-73B6Q-20	02A16-A06	Entran	0.0195 g	2000	3/18/2003	Up	1	
HD1XG	Head (LT) Accel X	EGE-73B6Q-20	02A16-A19	Entran	0.021 g	2000	3/18/2003	Fwd	0	
HD1ZG	Head (LT) Accel Z	EGE-73B6Q-20	02A16-A22	Entran	0.02207 g	2000	3/18/2003	Up	1	
HD2YG	Head (FT) Accel Y	EGE-73B6Q-20	02A18-N04	Entran	0.0197 g	2000	3/18/2003	Lft	1	
HD2ZG	Head (FT) Accel Z	EGE-73B6Q-20	02A18-N20	Entran	0.02013 g	2000	3/18/2003	Up	1	
HD3XG	Head (TP) Accel X	EGE-73B6Q-20	02A09-F01	Entran	0.01984 g	2000	3/18/2003	Fwd	0	
HD3YG	Head (TP) Accel Y	EGE-73B6Q-20	02A09-F17	Entran	0.02073 g	2000	3/18/2003	Lft	1	
NEKXF	Neck Force X	IF-205	IF-205-161-FX	FTSS	0.000186275 N	8896	3/18/2003	Hd Fd,Cst Rr	1	
NEKYF	Neck Force Y	IF-205	IF-205-161-FY	FTSS	0.000183678 N	8896	3/18/2003	Hd Lt,Cst Rt	0	
NEKZF	Neck Force Z	IF-205	IF-205-161-FZ	FTSS	0.000094155 N	13344	3/18/2003	Hd Up,Cst Dn	0	
NEKXM	Neck Moment X	IF-205	IF-205-161-MX	FTSS	0.005903009 N	282.5	3/18/2003	Rt Ear to Rt Shld	1	
NEKYM	Neck Moment Y	IF-205	IF-205-161-MY	FTSS	0.005938407 N	282.5	3/18/2003	Chin to Strnm	0	
NEKZM	Neck Moment Z	IF-205	IF-205-161-MZ	FTSS	0.008475752 N	282.5	3/18/2003	Chn to Lt Shld	0	
NKLXF	Neck Lwr Force X	3251	3251-108-FX	Denton	0.000174073 N	13344.6	3/19/2003	Hd Fd,Cst Rr	1	
NKLYF	Neck Lwr Force Y	3251	3251-108-FY	Denton	0.000173331 N	13344.6	3/19/2003	Hd Lt,Cst Rt	0	
NKLZF	Neck Lwr Force Z	3251	3251-108-FZ	Denton	0.000095916 N	13344.6	3/19/2003	Hd Up,Cst Dn	0	
NKLXM	Neck Lwr Moment X	3251	3251-108-MX	Denton	0.004421239 N	451.9	3/19/2003	Rt Ear to Rt Shld	1	
NKLYM	Neck Lwr Moment Y	3251	3251-108-MY	Denton	0.004260619 N	451.9	3/19/2003	Chn to Strnm	0	
NKLZM	Neck Lwr Moment Z	3251	3251-108-MZ	Denton	0.005350147 N	338.95	3/19/2003	Chn to Lt Shld	0	
CSTXG	Chest Accel X	EGE-73B6Q-20	02A16-A04	Entran	0.02105 g	2000	3/18/2003	Fwd	0	
CSTYG	Chest Accel Y	EGE-73B6Q-20	C02B19-F02	Entran	0.01886 g	2000	3/18/2003	Lft	1	

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Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip
CSTZG	Chest Accel Z	EGE-73B6Q-20	C02B19-F06	Entran	0.01905 g	2000	3/18/2003	Up	1
CSTXR	Chest Accel Red X	EGE-73B6Q-20	B02A25-N08	Entran	0.01971 g	2000	3/18/2003	Rwd	1
CSTYR	Chest Accel Red Y	EGE-73B6Q-20	01L17-F09	Entran	0.01947 g	2000	3/18/2003	Lft	1
CSTZR	Chest Accel Red Z	EGE-73B6Q-20	C02B19-F04	Entran	0.01779 g	2000	3/18/2003	Up	1
STUXG	Sternum Upr Accel X	EGE-73B6Q-20	B02A09-F08	Entran	0.02136 g	2000	8/1/2002	Fwd	0
STMXG	Sternum Mid Accel X	EGE-73B6Q-20	02A16-A05	Entran	0.02203 g	2000	3/18/2003	Fwd	0
STLXG	Sternum Lwr Accel X	EGE-73B6Q-20	02A16-A16	Entran	0.02284 g	2000	3/18/2003	Fwd	0
CSTXD	Chest Deflection X 516	14CB1-2897	14CB1-2897-416	Servo	1.6963 m	100	3/19/2003	Strnm Away Frm Spn	0
LMBXF	Lumbar Force X	2152	2152-076-FX	Denton	0.000144364 N	13344.6	6/1/2001	Cst Fd,Pel Rr	1
LMBYF	Lumbar Force Y	2152	2152-076-FY	Denton	0.000143967 N	13344.6	6/1/2001	Cst Lt,Pel Rt	0
LMBZF	Lumbar Force Z	2152	2152-076-FZ	Denton	0.000058433 N	17793	6/1/2001	Cst Up,Pel Dn	0
LMBXM	Lumbar Moment X	2152	2152-076-MX	Denton	0.002374243 N	677.9	6/1/2001	Rt Shld to Rt Hip	1
LMBYM	Lumbar Moment Y	2152	2152-076-MY	Denton	0.002370998 N	677.9	6/1/2001	Strnm to Frt of Legs	0
PEVXG	Pelvis Accel X	EGE-73B6Q-20	C02B19-F03	Entran	0.01761 g	2000	3/18/2003	Rwd	1
PEVYG	Pelvis Accel Y	EGE-73B6Q-20	02A16-A27	Entran	0.02163 g	2000	3/18/2003	Lft	1
PEVZG	Pelvis Accel Z	EGE-73B6Q-20	C02B19-F01	Entran	0.01962 g	2000	3/18/2003	Up	1
LFMZ	Left Femur Force Z #8	2430	2430-736	GSE	0.000070556 N	13344	3/19/2003	Knee Fd,Pel Rr	0
RFMZ	Right Femur Force Z 507	2430	2430-742	GSE	0.000066105 N	13344	3/19/2003	Knee Fd,Pel Rr	0
KNLXD	Left Knee Displacement	150-0121VL	150-121VR-022653	Space Age	23.356 m	40	5/29/2003	Tib Fd,Hld Fem	0
TBLXF	Left Upr Tibia Force X	4825J	4825J-89-FX	Denton	0.000265591 N	8896.4	10/9/2002	Tib Fd,Knee Rr	0
TBLZF	Left Upr Tibia Force Z	4825J	4825J-89-FZ	Denton	0.000108149 N	8896.4	10/9/2002	Tib Dn,Knee Up	0
TBLXM	Left Upr Tibia Moment X	4825J	4825J-89-MX	Denton	0.010212035 N	282.4	10/9/2002	Ank Lt,Hld Knee	0
TBLYM	Left Upr Tibia Moment Y	4825J	4825J-89-MY	Denton	0.010122477 N	282.4	10/9/2002	Ank Fd,Hld Knee	0
TBLXG	Left Tibia Accel X	EGE-73BQ-200	98H10-F13	Entran	0.01923 g	2000	5/13/2003	Fwd	0
TBLYG	Left Tibia Accel Y	EGE-73BQ-200	98H10-F12	Entran	0.02364 g	2000	5/13/2003	Rt	0
ANLXF	Left Lwr Tibia Force X	4826J	4826J-89-FX	Denton	0.00026317 N	8896.4	10/9/2002	Ank Fd,Knee Rr	0
ANLYF	Left Lwr Tibia Force Y	4826J	4826J-89-FY	Denton	0.000263365 N	8896.4	10/9/2002	Ank Rt,Knee Lft	0
ANLZF	Left Lwr Tibia Force Z	4826J	4826J-89-FZ	Denton	0.000106901 N	8896.4	10/9/2002	Ank Dn,Knee Up	0

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Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip
ANLXM	Left Lwr Tibia Moment X	4826J	4826J-89-MX	Denton	0.01041097 N	282.4	10/9/2002	Ank Lt,Hld Knee	0
ANLYM	Left Lwr Tibia Moment Y	4826J	4826J-89-MY	Denton	0.01039115 N	282.4	10/9/2002	Ank Fd,Hld Knee	0
FTLXD	Left Foot Disp. X	T1AKM060	7921 0179	UNK	3.164210301 °	318	10/15/2002	Inversion	1
FTLYD	Left Foot Disp. Y	T1AKM060	7921 0184	UNK	3.159155007 °	318	10/15/2002	Dorsiflexion	0
FTLZD	Left Foot Disp. Z	T1AKM060	7921 0183	UNK	3.165742713 °	318	10/15/2002	External Rotation	1
FTLXG	Left Foot Accel X	EGE-73B6Q-20	01G25-N04	Entran	0.01981 g	2000	5/13/2003	Fwd	0
FTLYG	Left Foot Accel Y	EGE-73B6Q-20	00L13-F29	Entran	0.02132 g	2000	5/13/2003	Rt	0
FTLZG	Left Foot Accel Z	EGE-73BQ-200	98H10-F18	Entran	0.02088 g	2000	5/13/2003	Dn	0
KNRXd	Right Knee Displacement	150-0121VL	150-121VL-020590	Space Age	23.322 m	40	5/29/2003	Tib Fd,Hld Fem	0
TBRXF	Right Upr Tibia Force X	4825J	4825J-88-FX	Denton	0.000263995 N	8896.4	10/8/2002	Tib Fd,Knee Rr	0
TBRZF	Right Upr Tibia Force Z	4825J	4825J-88-FZ	Denton	0.000107104 N	8896.4	10/8/2002	Tib Dn,Knee Up	0
TBRXM	Right Upr Tibia Moment X	4825J	4825J-88-MX	Denton	0.01041628 N	282.4	10/8/2002	Ank Lt,Hld Knee	0
TBRYM	Right Upr Tibia Moment Y	4825J	4825J-88-MY	Denton	0.010165309 N	282.4	10/8/2002	Ank Fd,Hld Knee	0
TBRXG	Right Tibia Accel X	EGE-73B6Q-20	00L13-F33	Entran	0.02348 g	2000	5/13/2003	Fwd	0
TBRYG	Right Tibia Accel Y	EGE-73B6Q-20	01J02-F19	Entran	0.02246 g	2000	5/13/2003	Rt	0
ANRXF	Right Lwr Tibia Force X	4826J	4826J-88-FX	Denton	0.000266726 N	8896.4	10/8/2002	Ank Fd,Knee Rr	0
ANRYF	Right Lwr Tibia Force Y	4826J	4826J-88-FY	Denton	0.00026685 N	8896.4	10/8/2002	Ank Rt,Knee Lft	0
ANRZF	Right Lwr Tibia Force Z	4826J	4826J-88-FZ	Denton	0.000108486 N	8896.4	10/8/2002	Ank Dn,Knee Up	0
ANRXM	Right Lwr Tibia Moment X	4826J	4826J-88-MX	Denton	0.010522831 N	282.4	10/8/2002	Ank Lt,Hld Knee	0
ANRYM	Right Lwr Tibia Moment Y	4826J	4826J-88-MY	Denton	0.01056212 N	282.4	10/8/2002	Ank Fd,Hld Knee	0
FTRXD	Right Foot Disp. X	T1AKM060	7921 0180	UNK	3.150776304 °	318	10/15/2002	Eversion	1
FTRYD	Right Foot Disp. Y	T1AKM060	7921 0181	UNK	3.167232672 °	318	10/15/2002	Dorsiflexion	0
FTRZD	Right Foot Disp. Z	T1AKM060	7921 0182	UNK	3.17680253 °	318	10/15/2002	Internal Rotation	1
FTRXG	Right Foot Accel X	EGE-73BQ-200	98H13-F20	Entran	0.01855 g	2000	5/13/2003	Fwd	0
FTRYG	Right Foot Accel Y	EGE-73BQ-200	98H13-F19	Entran	0.0214 g	2000	5/13/2003	Rt	0
FTRZG	Right Foot Accel Z	EGE-73B6Q-20	00L20-A15	Entran	0.0192 g	2000	5/13/2003	Dn	0

Dummy	421v-	Type	HYBRID III 5th	Descriptio	VRTC - 421v HYBRID III 5th w/o RED. w/THOR LEGS ICAL'd 3-18-02(DKS 6-3-03)J211						
Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip		
HEDXG	Head Accel X	EGE-73B6Q-20	02I02I16-A13	Entran	0.023 g	2000	9/24/2002	Rr	1		
HEDYG	Head Accel Y	EGE-73B6Q-20	02I02I16-A08	Entran	0.0213 g	2000	9/24/2002	Lft	1		
HEDZG	Head Accel Z	EGE-73B6Q-20	02I02I16-A18	Entran	0.0225 g	2000	9/24/2002	Up	1		
NEKXF	Neck Force X	IF-205	IF-205-180-FX	FTSS	0.000183296 N	8896	6/3/2003	Hd Fd,Cst Rr	1		
NEKYF	Neck Force Y	IF-205	IF-205-180-FY	FTSS	0.000180812 N	8896	6/3/2003	Hd Lt,Cst Rt	0		
NEKZF	Neck Force Z	IF-205	IF-205-180-FZ	FTSS	0.000092004 N	13344	6/3/2003	Hd Up,Cst Dn	0		
NEKXM	Neck Moment X	IF-205	IF-205-180-MX	FTSS	0.005788673 N	282.5	6/3/2003	Rt Ear to Rt Shld	1		
NEKYM	Neck Moment Y	IF-205	IF-205-180-MY	FTSS	0.005597168 N	282.5	6/3/2003	Chin to Strnm	0		
NEKZM	Neck Moment Z	IF-205	IF-205-180-MZ	FTSS	0.008346195 N	282.5	6/3/2003	Chn to Lt Shld	0		
CSTXG	Chest Accel X	EGE-73B6Q-20	B02A25-N03	Entran	0.02163 g	2000	8/5/2002	Fwd	0		
CSTYG	Chest Accel Y	EGE-73B6Q-20	02A18-N12	Entran	0.01926 g	2000	8/5/2002	Lft	1		
CSTZG	Chest Accel Z	EGE-73B6Q-20	B02A25-N10	Entran	0.01967 g	2000	8/5/2002	Up	1		
CSTXD	Chest Deflection X	14CB1-2897	14CB1-2897-1355	Servo	1.70969 m	100	3/25/2002	Strnm Away Frm Spn	0		
LFMZG	Left Femur Force Z S37	2430	2430-739	GSE	0.000067676 N	13344	3/18/2002	Knee Fd,Pel Rr	0		
RFMZG	Right Femur Force Z VRTC 4	2430	2430-760	GSE	0.000067069 N	13344	3/18/2002	Knee Fd,Pel Rr	0		
PEVXG	Pelvis Accel X	7264-2000LC	AF9K3	Endevco	0.0212 g	2000	8/5/2002	Rwd	1		
PEVYG	Pelvis Accel Y	EGE-73B6Q-20	02A16-A26	Entran	0.02009 g	2000	8/5/2002	Lft	1		
PEVZG	Pelvis Accel Z	EGE-73B6Q-20	02A18-N15	Entran	0.01877 g	2000	8/5/2002	Up	1		
KNLXD	Left Knee Displacement	150-0121VR	150-121VR-15021	Space Age	23.2216 m	40	6/2/2003	Tib Fd,Hld Fem	0		
TBLXF	Left Upr Tibia Force X	4825J	4825J-82-FX	Denton	0.000269333 N	8896.4	7/16/2002	Tib Fd,Knee Rr	0		
TBLZF	Left Upr Tibia Force Z	4825J	4825J-82-FZ	Denton	0.000109583 N	8896.4	7/16/2002	Tib Dn,Knee Up	0		
TBLXM	Left Upr Tibia Moment X	4825J	4825J-82-MX	Denton	0.01026407 N	282.5	7/16/2002	Ank Lt,Hld Knee	0		
TBLYM	Left Upr Tibia Moment Y	4825J	4825J-82-MY	Denton	0.0104699 N	282.4	7/16/2002	Ank Fd,Hld Knee	0		
TBLXG	Left Tibia Accel X	EGE-73B6Q-20	01G25-N16	Entran	0.01897 g	2000	5/13/2003	Fwd	0		
TBLYG	Left Tibia Accel Y	EGE-73B6Q-20	01G18-F02	Entran	0.0218 g	2000	5/13/2003	Rt	0		
ANLXF	Left Lwr Tibia Force X	4826J	4826J-82-FX	Denton	0.000264994 N	8896.4	7/16/2002	Ank Fd,Knee Rr	0		

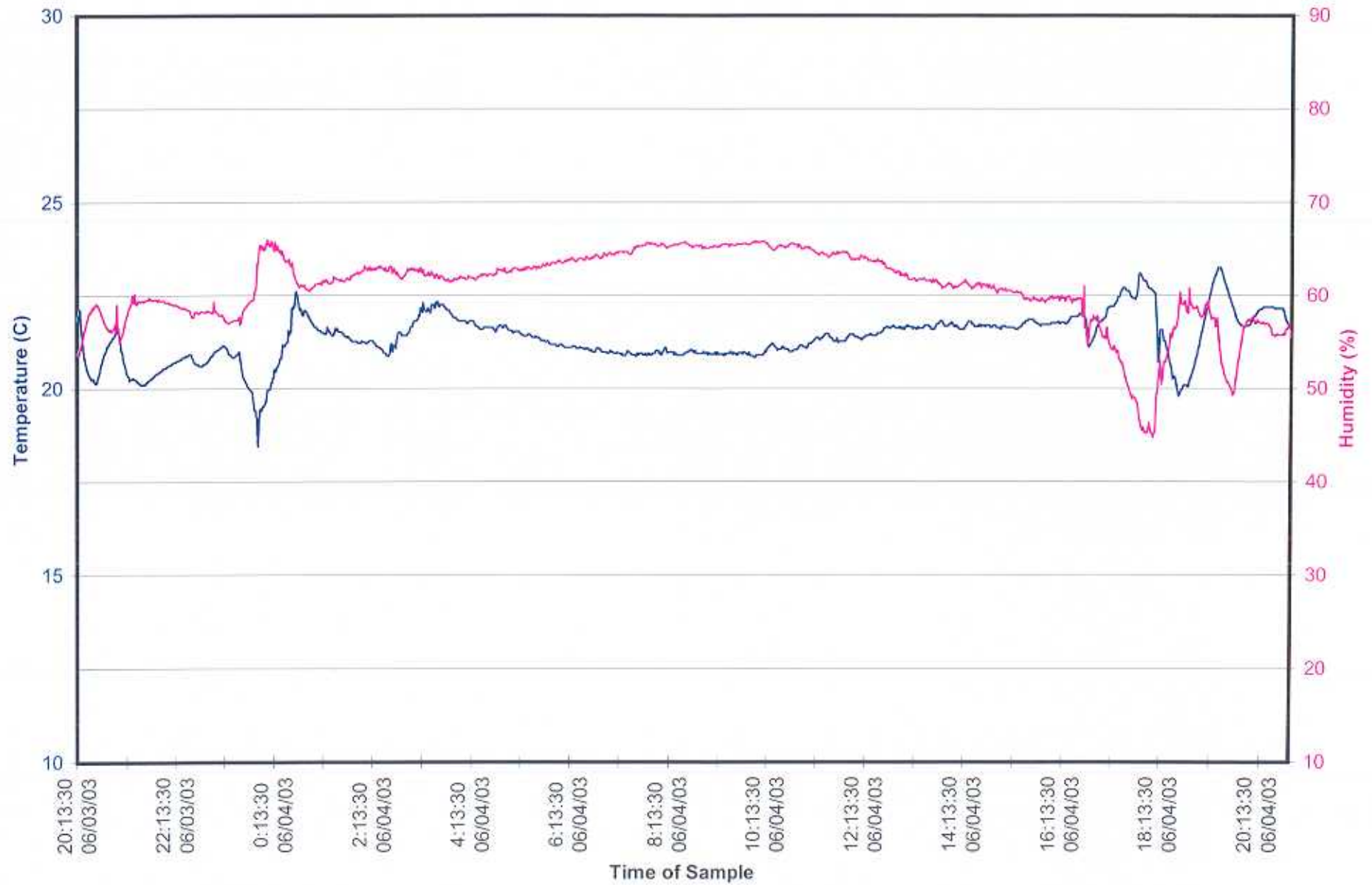
Wednesday, June 04, 2003 421v-

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip
ANLYF	Left Lwr Tibia Force Y	4826J	4826J-82-FY	Denton	0.000265927 N	8896.4	7/16/2002	Ank Rt,Knee Lft	0
ANLZF	Left Lwr Tibia Force Z	4826J	4826J-82-FZ	Denton	0.000108167 N	8896.4	7/16/2002	Ank Dn,Knee Up	0
ANLXM	Left Lwr Tibia Moment X	4826J	4826J-82-MX	Denton	0.010319759 N	282.4	7/16/2002	Ank Lt,Hld Knee	0
ANLYM	Left Lwr Tibia Moment Y	4826J	4826J-82-MY	Denton	0.010127832 N	282.4	7/16/2002	Ank Fd,Hld Knee	0
FTLXD	Left Foot Disp. X	PD210-4B	FLX108X	Contelec	3.157351 °	318	7/22/2002	Eversion	0
FTLYD	Left Foot Disp. Y	PD210-4B	FLX108Y	Contelec	3.168228 °	318	7/22/2002	Dorsiflexion	0
FTLZD	Left Foot Disp. Z	PD210-4B	FLX108Z	Contelec	3.187158 °	318	7/22/2002	Internal Rotation	0
FTLXG	Left Foot Accel X	EGE-73B6Q-20	00L20-A14	Entran	0.01928 g	2000	5/13/2003	Fwd	0
FTLYG	Left Foot Accel Y	EGE-73BQ-200	98H10-F01	Entran	0.01952 g	2000	5/13/2003	Rt	0
FTLZG	Left Foot Accel Z	EGE-73BQE0-	99H12-F03	Entran	0.01888 g	2000	5/13/2003	Dn	0
KNRXD	Right Knee Displacement	150-0121VL	150-121VL-14949	Space Age	23.1962 m	40	6/2/2003	Tib Fd,Hld Fem	0
TBRXF	Right Upr Tibia Force X	4825J	4825J-80-FX	Denton	0.000271424 N	8896.4	7/16/2002	Tib Fd,Knee Rr	0
TBRZF	Right Upr Tibia Force Z	4825J	4825J-80-FZ	Denton	0.000109471 N	8896.4	7/16/2002	Tib Dn,Knee Up	0
TBRXM	Right Upr Tibia Moment X	4825J	4825J-80-MX	Denton	0.010291430 N	282.4	7/16/2002	Ank Lt,Hld Knee	0
TBRYM	Right Upr Tibia Moment Y	4825J	4825J-80-MY	Denton	0.010491501 N	282.4	7/16/2002	Ank Fd,Hld Knee	0
TBRXG	Right Tibia Accel X	EGE-73BQE0-	99H12-F08	Entran	0.01791 g	2000	5/13/2003	Fwd	0
TBRYG	Right Tibia Accel Y	EGE-73BQE0-	99H30-Z11	Entran	0.02054 g	2000	5/13/2003	Rt	0
ANRXF	Right Lwr Tibia Force X	4826J	4826J-76-FX	Denton	0.000262611 N	8896.4	7/16/2002	Ank Fd,Knee Rr	0
ANRYF	Right Lwr Tibia Force Y	4826J	4826J-76-FY	Denton	0.000262701 N	8896.4	7/16/2002	Ank Rt,Knee Lft	0
ANRZF	Right Lwr Tibia Force Z	4826J	4826J-76-FZ	Denton	0.000108763 N	8896.4	7/16/2002	Ank Dn,Knee Up	0
ANRXM	Right Lwr Tibia Moment X	4826J	4826J-76-MX	Denton	0.010402831 N	282.5	7/16/2002	Ank Lt,Hld Knee	0
ANRYM	Right Lwr Tibia Moment Y	4826J	4826J-76-MY	Denton	0.01055292 N	282.5	7/16/2002	Ank Fd,Hld Knee	0
FTRXD	Right Foot Disp. X	PD210-4B	FLX107X	Contelec	3.138018 °	318	7/22/2002	Eversion	1
FTRYD	Right Foot Disp. Y	PD210-4B	FLX107Y	Contelec	3.185368 °	318	7/22/2002	Dorsiflexion	0
FTRZD	Right Foot Disp. Z	PD210-4B	FLX107Z	Contelec	3.169474 °	318	7/22/2002	External Rotation	0
FTRXG	Right Foot Accel X	EGE-73B6Q-20	01J02-F08	Entran	0.02001 g	2000	5/13/2003	Fwd	0
FTRYG	Right Foot Accel Y	EGE-73B6Q-20	01J02-F16	Entran	0.0217 g	2000	5/13/2003	Rt	0
FTRZG	Right Foot Accel Z	EGE-73BQ-200	98H10-F10	Entran	0.0185 g	2000	5/13/2003	Dn	0

LEFT OFFSET DEFORMABLE BARRIER/030604-2

D-19

030604-2



Appendix E

INSIA Report on Structural Measurements

STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY

APARICIO IZQUIERDO, FRANCISCO
PÁEZ AYUSO, FRANCISCO JAVIER

INSIA
Carretera de Valencia, km. 7
Campus Sur de la Universidad Politécnica de Madrid
28031 – MADRID – (SPAIN)

March, 1999

REPORT DOCUMENTATION PAGE**Title:**

STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY

Author(s):

Aparicio Izquierdo, Francisco
Páez Ayuso, Francisco Javier

Performing Organisation name and address:

INSIA – University Institute for Automobile Research
Carretera de Valencia, Km. 7 – Campus Sur de la Universidad Politécnica de Madrid
28031 – Madrid – Spain

Supplementary notes:

Under contract to:

THE EUROPEAN COMMUNITY

Project: "Improvement of Crash Compatibility between Cars"

Contract N°: RO – 97 – SC.1064

Abstract:

The main aim of this working package -*Structural Survey of Cars*- is the reduction of incompatibilities, both structural and geometric, between passenger vehicles and their potential collision partners. The understanding of these incompatibilities needs a previous step for the knowledge of the existing car fleet.

Firstly, it is necessary to select the main resistant elements in the car body. These elements have to be chosen from the point of view of the sort of collision that we want to study, that is to say, frontal and side impacts.

Detailed measurements have been taken from exterior and interior elements, spread to a total number of 74 models selected from the main vehicle manufacturers at Spain. All of them are being sold this year. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars will be defined.

This report shows the methodology followed to get these measurements.

Subject terms:

Crash compatibility, geometric compatibility, resistant elements, measure methodology

Date:

March, 1999

1.- METHODOLOGY.

Detailed measurements have been taken from exterior and interior elements. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars have been defined. These elements are presented in the following figures, and have been divided in two main groups according to the vehicle zones studied in this project.

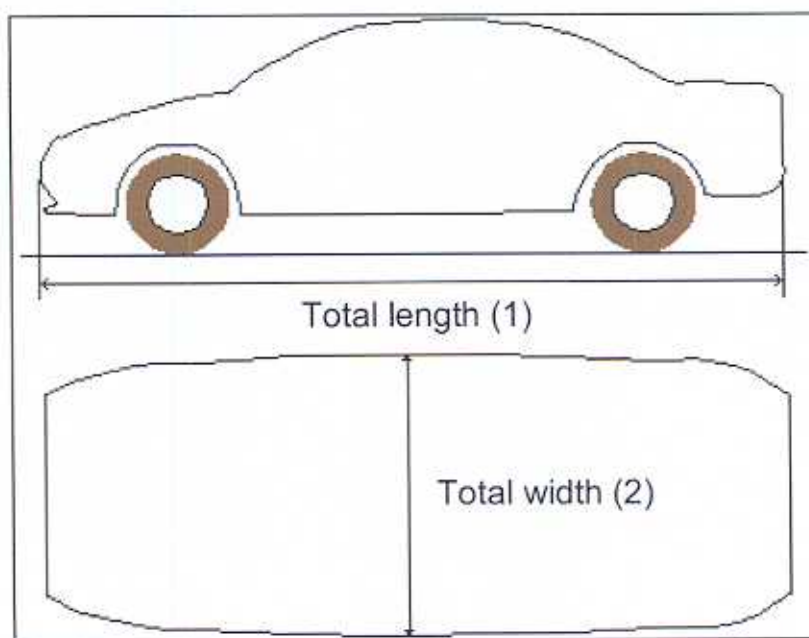


Figure 1.- Definition of the main resistant elements. General dimensions.

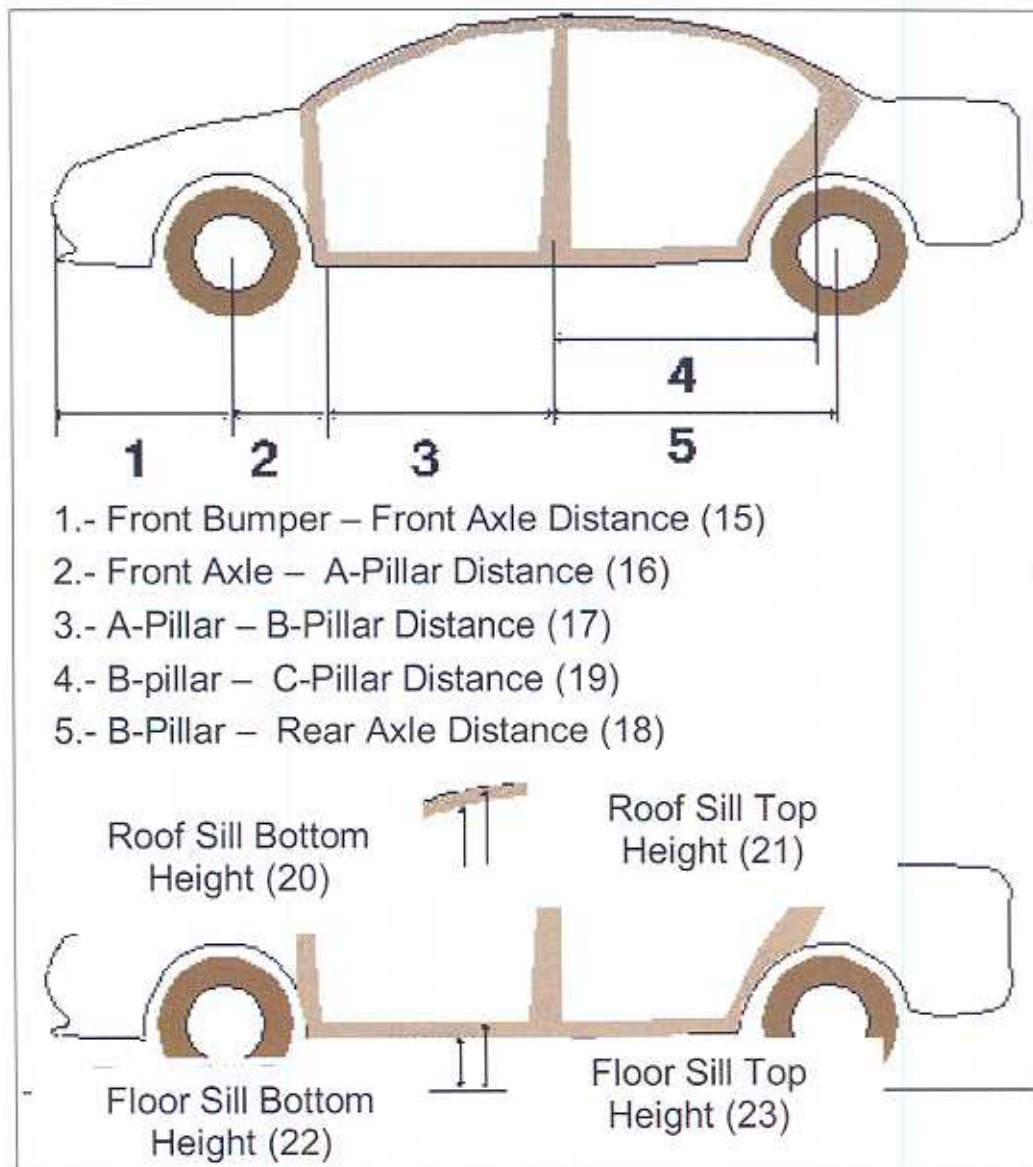


Figure 2.- Definition of the main resistant elements. Side elements.

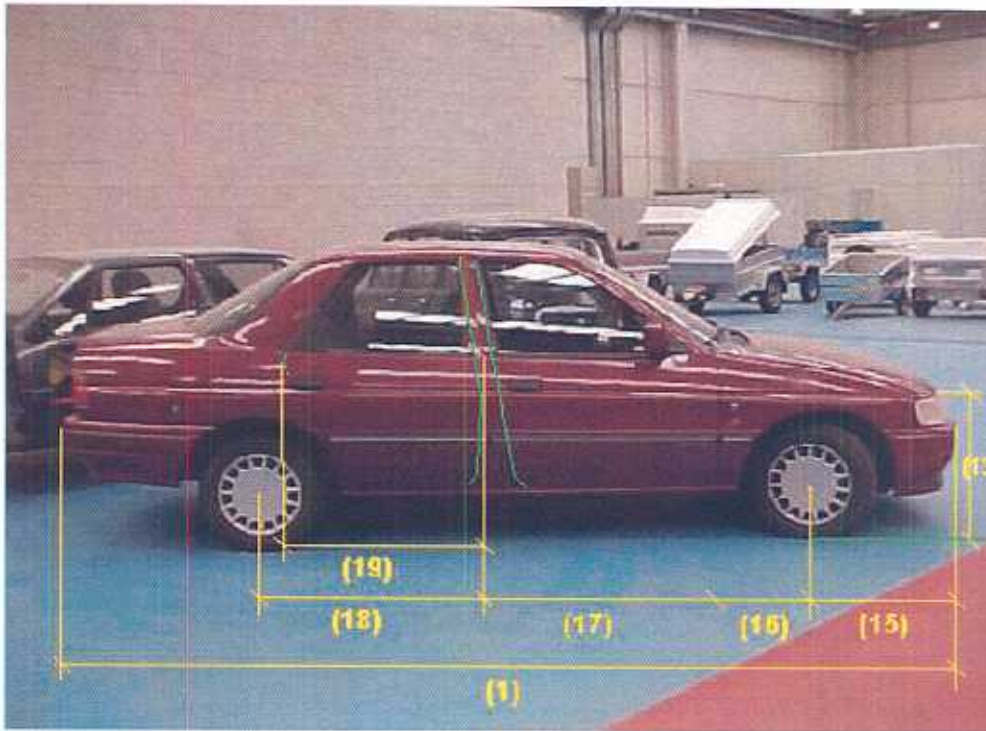
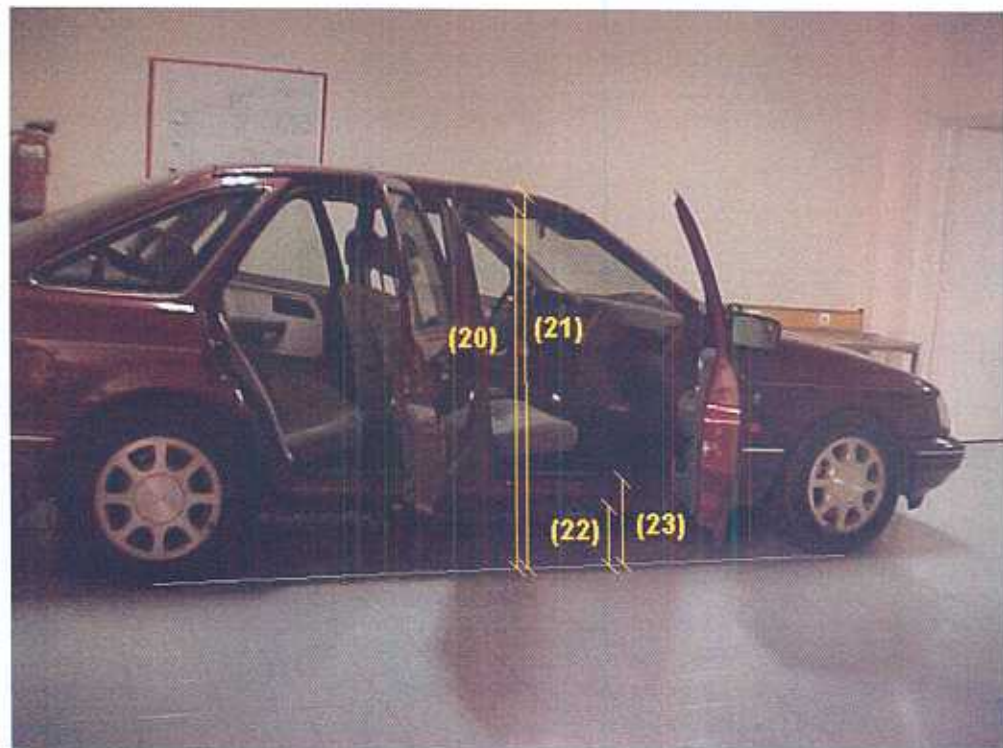


Figure 3.-
Measurements of
the side resistant
elements (outer).

Figure 4.- Measurements
of the side resistant
elements (inner).



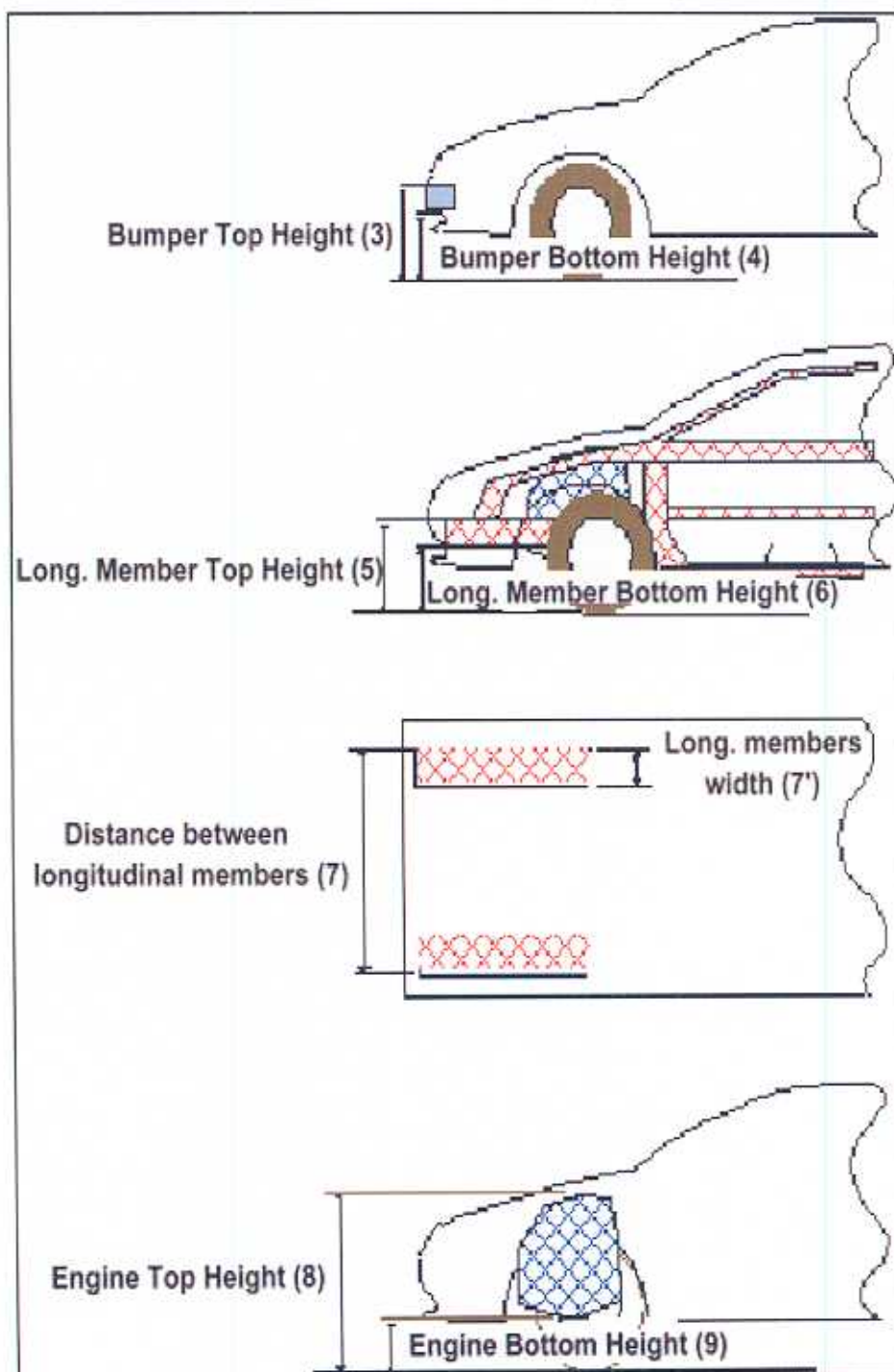


Figure 5.- Definition of the main resistant elements. Front elements.

Figure 6.-
Measurements of the
main resistant elements.
Front elements 1.

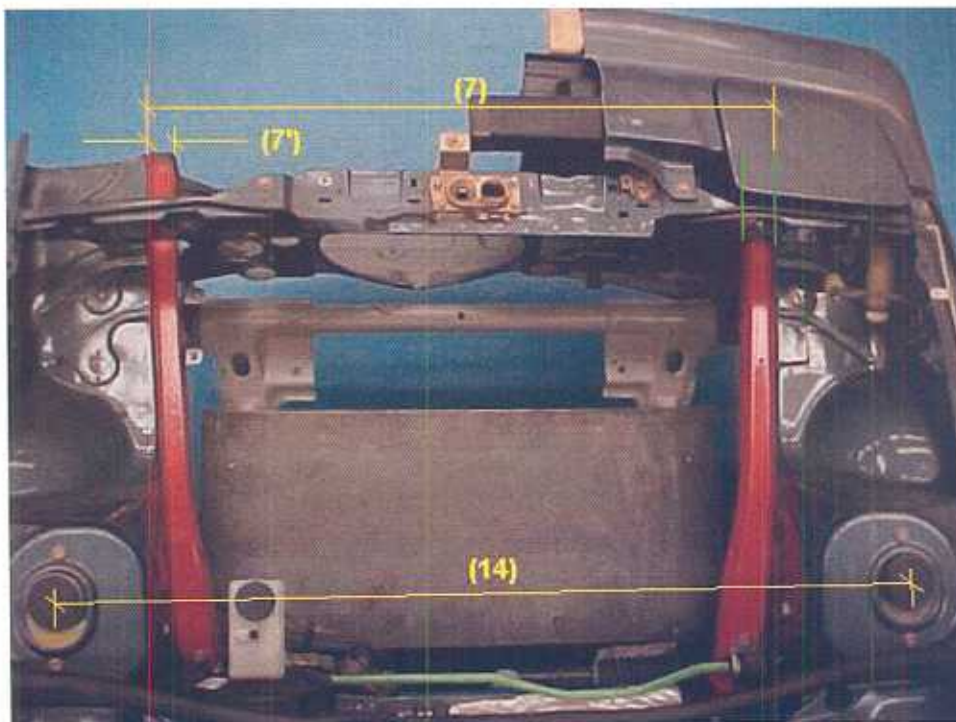
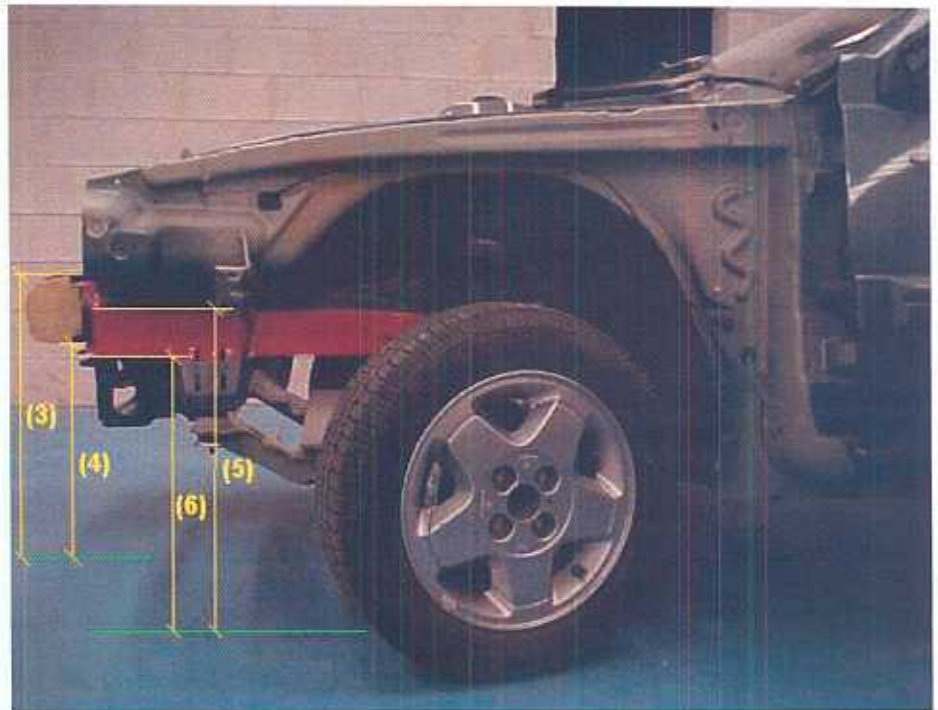


Figure 7.-
Measurements
of the main
resistant
elements. Front
elements 2.

Figure 8.-
Measurements of
the main resistant
elements. Front
elements 3.

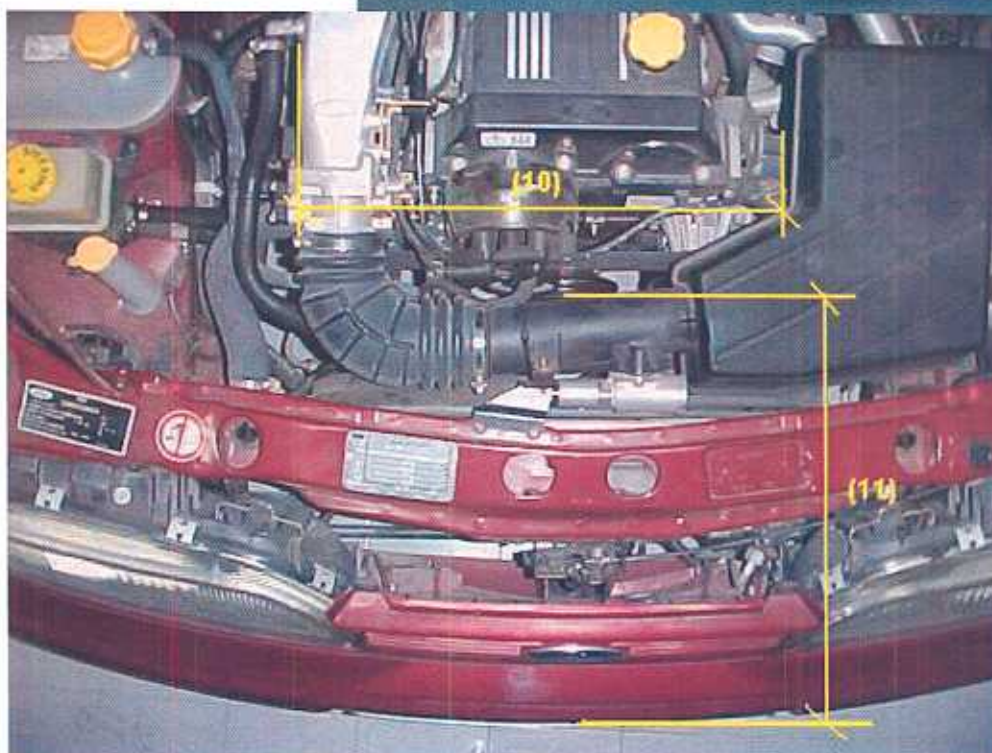
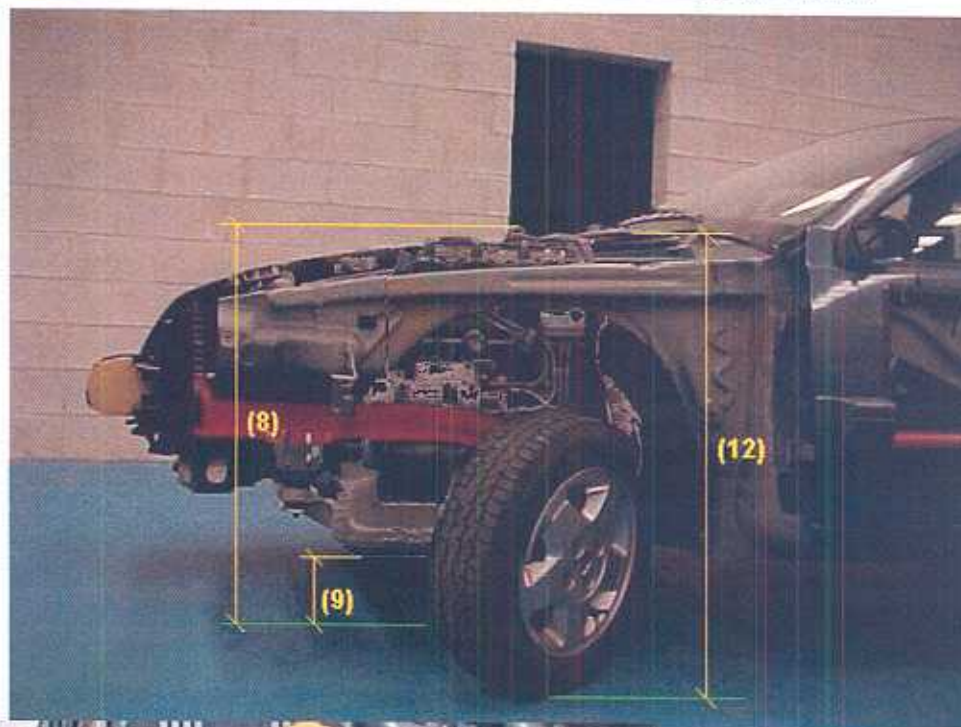


Figure 9.-
Definition of
the main
resistant
elements. Front
elements
(Longitudinal
engine).

The procedure considered to measure these elements is described as follows, where it is indicated the location of these ones in the Excel Sheet (SURVEY.XLS) into brackets:

FRONT ELEMENTS

- **Total Length –(1)- (Side & Front Sheets - C column):** distance between the point in the front bumper further on and the point in the rear bumper further back.
- **Weight (Side & Front Sheets - D column):** mass, including an average driver weight (70 kg), and the fuel tank mass (at half-capacity).
- **Total Width –(2)- (Side & Front Sheets - E column):** distance between the outer side points in a transverse plane of the vehicle (middle plane between the front and rear axles).
- **Bumper bottom height –(4)- (Front Sheet G column):** distance between the ground and the lowest point on the front bumper, being a resistant member (aerodynamic elements under the front bumper are not considered).
- **Bumper top height –(3)- (Front Sheet H column):** distance between the ground and the highest point on the front bumper, being a resistant member (aerodynamic elements are not considered).
- **Longitudinal member top height –(5)- (Front Sheet I column):** distance between the ground and the highest point on the longitudinal members, measured approximately in the front bumper-longitudinal member joint (when accessible).
- **Longitudinal member bottom height –(6)- (Front Sheet J column):** distance between the ground and the lowest point on the longitudinal members, measured approximately in the front bumper-longitudinal member joint.
- **Distance between longitudinal members (Front Sheet K column):** transverse distance between extreme points in longitudinal members, measured approximately in the front bumper-longitudinal member joint.

Depending on the accessibility of these members, the extreme points are the inner points (I) or the outer points (O).

- **Longitudinal member width -7'- (Front Sheet L column):** width of one of the longitudinal members, measured approximately in the front bumper-longitudinal member joint.

- **Engine top height (8) (Front Sheet N column):** distance between the ground and the highest point on the engine that can be a resistant member in case of accident (usually, the highest point on the head, or the highest point of the inlet or exhaust manifolds).
- **Engine bottom height (9) (Front Sheet M column):** distance between the ground and the lowest point on the engine (usually, the lowest point on the crankcase).
- **Engine and Gearbox width (10) (Front Sheet O & P columns):**
 - *Transverse configuration engine:* distance between extreme points in the gearbox-cylinder block unit or others resistant members attached to the cylinder block unit, i.e. fan belts (from a front point of view).
 - *Longitudinal configuration engine:* distance between extreme points in the cylinder block unit (from a front point of view).
- **Front bumper - Engine distance (11) (Front Sheet Q column):** distance between the point in the front bumper further on and the point in the engine further on that is a resistant element, i.e. the further on point of the exhaust manifold placed in the front of the engine.
- **Front shock absorber fixing width (14) (Front Sheet R column):** transverse distance between the front shock absorber - body car joints.
- **Front shock absorber fixing height (12) (Front Sheet S column):** distance between the ground and the front shock absorber-body car joint.
- **Bonnet leading edge height (Front Sheet T column):** distance between the ground and the bonnet edge further on.

SIDE ELEMENTS

- **Front bumper - Front axle distance (15) (Side Sheet G column):** distance between the point in the front bumper further on and the middle point in the front tyre-road contact patch.
- **Front axle - A Pillar distance (16) (Side Sheet H column):** distance between the middle point in the front tyre-road contact patch and the point in the A-pillar further back.
- **A Pillar - B Pillar distance (17) (Side Sheet I column):** distance between the point in the A-pillar further back and the middle point in the B-pillar.
- **B Pillar - C Pillar distance (19) (Side Sheet J column):** distance between the middle point in the B-pillar and the point in the C-pillar further back (only 4/5-door vehicles).
- **B Pillar - Rear axle distance (18) (Side Sheet K column):** distance between the middle point in the B-pillar and the middle point in the rear tyre-road contact patch.
- **Roof sill bottom height (20) (Side Sheet L column):** distance between the ground and the lowest point on the roof sill, measured in the front door middle point.
- **Roof sill top height (21) (Side Sheet M column):** distance between the ground and the highest point on the roof sill (usually located in the sill-roof joint), measured in the front door middle point.
- **Floor sill bottom height (22) (Side Sheet N column):** distance between the ground and the lowest point on the floor sill, measured in the front door middle point.
- **Floor sill top height (23) (Side Sheet O column):** distance between the ground and the highest point on the floor sill, measured in the front door middle point.

NOTE

- N/A: dimension not available.

Appendix F

Manufacturer's Information



STANDARD FEATURES

- MECHANICAL & PERFORMANCE**
- 3.0L V6 24 VALVE VVT-I ENGINE
 - 4-SPEED AUTOMATIC ECT-I TRANS
 - ANTI-LOCK BRAKE SYSTEM (ABS)
 - P205/70R15 ALL-SEASON TIRES
 - FULL-SIZE SPARE TIRE
 - POWER RACK & PINION STEERING
 - INDEPENDENT FRONT SUSPENSION
 - FRONT STABILIZER BAR
 - REAR TORSION BEAM SUSPENSION
 - POWER FR DISC / RR DRUM BRAKES
- SAFETY**
- DR & FR PASSENGER AIRBAGS(SRS)
 - FRONT SEAT BELT PRETENSIONERS & FORCE LIMITERS
 - CHILD PROTECTOR SLIDING DOOR LOCKS
 - LOW TIRE PRESSURE WARNING LT N/A WITH VEHICLE SKID CONTROL
 - DAYTIME RUNNING LIGHTS
 - SIDE IMPACT DOOR BEAMS
- EXTERIOR**

- DRIVER/PASS SIDE SLIDING DOOR
 - DUAL POWER OUTSIDE MIRRORS
 - PROTECTIVE SIDE CLADDING
 - VARIABLE INTERMITTENT WIPERS
 - HEAVY DUTY RR WINDOW DEFOGGER W/TIMER
- COMFORT & CONVENIENCE**
- CLOTH-FACED 7-PASS SEATING
 - MULTI-ADJUST FR CAPT CHAIRS
 - 2ND ROW BENCH SEAT
 - 50/50 SPLIT TUMBLE/SLIDING & REMOVABLE 3RD ROW SEATS
 - POWER WINDOWS AND DOOR LOCKS
 - DUAL LIGHTED VANITY MIRRORS
 - CRUISE CONTROL/DIGITAL CLOCK
 - DLX ETR/CST/CD W/ 4SPKRS
 - TILT WHL W/SATELITE AUD CNTRL
 - AUTO-OFF HEADLAMPS/TACHOMETER
 - PWR SWING RR QTR PRIV GLASS
 - DUAL A/C W/REAR CONTROL PANEL
- * * * FULL TANK OF GAS * * *

SIENNA LE

5-DOOR V6

VIN: 4T3ZF13C53U550957 MODEL/YEAR: 5334A/2003
COLOR: SUPER WHITE /OAK (0040/41)

MANUFACTURER'S SUGGESTED RETAIL PRICE **\$25,755.00**
OPTIONAL EQUIPMENT

FE	50 STATE EMISSIONS	
TO	TOWING PREP PACKAGE INCLUDES:	160.00
	3500 LBS TOWING CAPACITY	
AJ	PWR PASS SIDE SLIDING DOOR	395.00
UN	LE EXTRA VALUE PACKAGE	1,312.00
	INCLUDES:KEYLESS ENTRY,ROOF RACK,MANUAL FOLDING PWR O/S HEATED MIRRORS,CLOTH RR CAPT CHAIRS (REAR #1 SEAT),CARPETED FLOOR/CARGO MATS	

Compare this vehicle to others in the FREE FUEL ECONOMY GUIDE available at the dealer.

CITY MPG

19



HIGHWAY MPG

24

Actual Mileage will vary with options, driving conditions, driving habits and vehicle's condition. Results reported to EPA indicate that the majority of vehicles with these estimates will achieve between

16 and 22 mpg in the city, and between
20 and 28 mpg on the highway.

2003 SIENNA
V6-CYL., 3.0 LITER DISP..
FOUR CAM, VVT-I ENGINE.
4-SPEED AUTOMATIC ECT
TRANSMISSION.

Estimated Annual Fuel Cost:
\$1,107

For Comparison Shopping,
all vehicles classified as

SPEC PURPOSE
have been issued
mileage ratings
ranging from

10 to 25 mpg city
and
13 to 31 mpg
highway.

see www.fueleconomy.gov

DEALER NAME/ADDRESS:
ANDY GLOCKNER TOYOTA
2867 U.S. ROUTE 33
P.O. BOX 1031
PORTSMOUTH

SHIP TO:

0H45662

PORT/PLANT: TMM,GEORGETOWN,KY

34064

Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline, licenses and title fees, applicable federal, state local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price.

DELIVERY, PROCESSING AND HANDLING FEE 510.00

SUB-TOTAL BEFORE DISCOUNT **\$28,132.00**

EXTRA VALUE PACKAGE
MSRP DISCOUNT **-\$1,000.00**

TOTAL **\$27,132.00**

TOYOTA'S LIMITED WARRANTY PROVIDES 36 MONTH/36,000 MILE COMPREHENSIVE COVERAGE, 5 YEAR/60,000 MILE POWERTRAIN COVERAGE, PLUS 5 YEAR BODY PANEL CORROSION PERFORATION WARRANTY. SEE OWNER'S GUIDE FOR DETAILS.

An extended service contract may be available for this vehicle.
Ask dealer for details.

49J826 749

TR01





PLASCORE

OFFSET FRONTAL BARRIER CERTIFICATION

Date: December 5, 2002

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

PURCHASE ORDER INFORMATION

Customer P.O. Number: 021349
Work Order Number: 15211
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: 020A1102

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 248.1 psi +0, -10% psi per DWG #WG11.


Quality Control Representative
Karl D. Zwaanstra



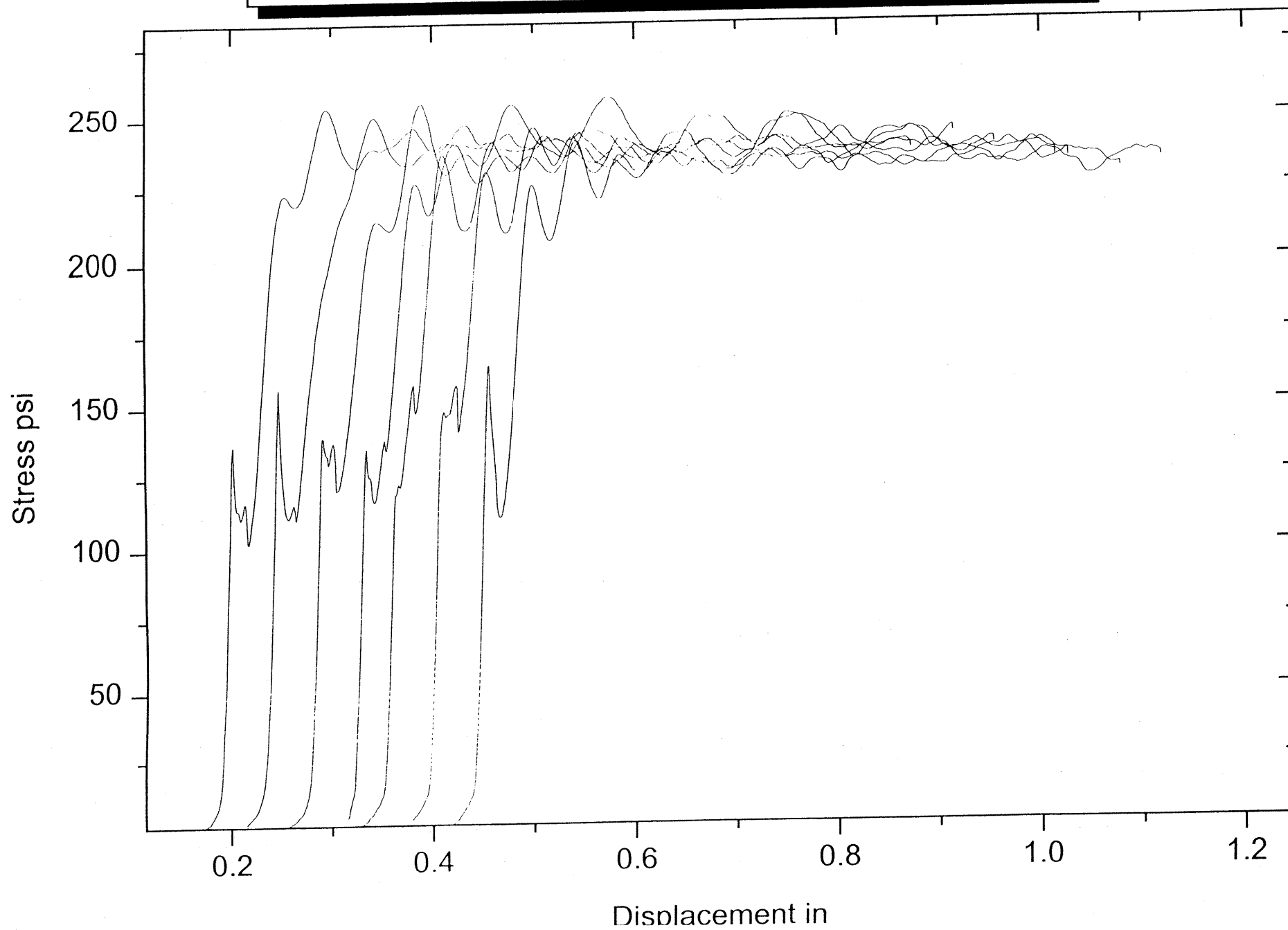
Crush Data

248.1 psi +0, -10% psi per DWG #WG11

Block Number: 020A1102

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	238.74	237.47	237.49
2	241.00	240.59	240.73
3	244.55	246.58	239.87
4	235.43	234.72	234.65
5	237.12	243.77	239.93
6	239.55	236.96	236.62
7	233.01	233.19	232.90

BLOCK # 020A1102 Sample ID: IN327083





PLASCORE

OFFSET FRONTAL BARRIER CERTIFICATION

Date: December 5, 2002

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

PURCHASE ORDER INFORMATION

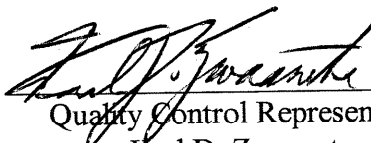
Customer P.O. Number: 021349
Work Order Number: 15211
Quantity: 01 piece

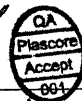
CORE INFORMATION

Core Type: PCGA-1.8-3/4-P-3003-T
Cell Size: 0.750 inches
Density: 1.8 pcf

Unit Number: 040B1102

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 49.59 psi +0, -10% per DWG #WG11.


Quality Control Representative
Karl D. Zwaanstra



Crush Data
49.59 psi +0, -10% psi per DWG #WG11

Block Number: **040B1102**

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	47.96	47.65	47.40
2	49.26	47.26	47.66
3	49.30	49.53	49.26
4	48.15	47.52	48.59
5	45.99	47.35	47.80
6	48.80	48.58	48.00
7	48.30	48.06	48.19

BLOCK # 040B1102 Sample ID: IN327086

