Vehicle Research and Test Center

2003 Lincoln Navigator into Front of

1996 Dodge Neon - 0% Offset, 0 Degrees

TRC Inc. Test Number: 021005

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Section 1.0

Purpose and Test Procedure

Purpose

This 48.3 km/h (30 mph), 0% offset, 0 degrees, vehicle-to-vehicle 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 test mode was defined with both vehicles moving at 48.3 km/h to impact the bullet vehicle into the front of the target, with 0% offset, at an impact angle of 0 degrees. The purpose of this test was to evaluate the aggressiveness of the bullet vehicle, a 2003 Lincoln Navigator MPV, and the vehicle and occupant response of the target vehicle, a 1996 Dodge Neon 4-door sedan, in this vehicle-to-vehicle impact mode.

Test Procedure

This test was conducted in accordance with VRTC instructions for a 0% offset, 0 degrees, vehicle-to-vehicle test. Data was obtained relative to FMVSS 208, "Occupant Crash Protection" (December 18, 2001) performance for the 30 mph test mode.

The target vehicle, a 1996 Dodge Neon, was instrumented with fifteen (15) accelerometers to measure longitudinal, lateral and vertical axis accelerations. The driver's and passenger's airbag signals were monitored with inductive pickups. An event data recorder was installed on the floor behind the driver's seat, however no output from the recorder is included in this report. The vehicle's specified impact velocity range was 47.5 to 49.1 km/h.

The bullet vehicle, a 2003 Lincoln Navigator, was instrumented with fifteen (15) accelerometers to measure longitudinal, lateral and vertical axis accelerations. The driver's and passenger's airbag signals were monitored with inductive pickups. An event data recorder was installed in the center rear of the vehicle near the center of gravity, however no output from the recorder is included in this report. The vehicle's specified impact velocity range was 47.5 to 49.1 km/h.

The bullet vehicle impacted the front of the target, with 0% offset, at an impact angle of 0 degrees. The bullet vehicle's centerline was aligned with the target vehicle's centerline.

One (1) 50th percentile adult male Hybrid III dummy and one (1) 5th percentile adult female Hybrid III dummy were placed in the target vehicle's left front and right front designated seating positions, respectively, according to FMVSS 208 procedures (December 18, 2001). The driver dummy and passenger dummy were both belted and were restrained with front single stage airbags.

The target vehicle's driver dummy was instrumented with six (6) accelerometers in the head, plus six (6) chest, and three (3) pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations (primary and redundant in the head and chest). The driver dummy was also instrumented with upper neck moment and force load cells, a chest deflection

potentiometer, left and right femur axial force load cells, and tibia to femur displacement potentiometers at each knee. The driver dummy was also equipped with THOR-LX legs and with upper and lower tibia load cells to measure forces and moments (other THOR-LX data channels were not recorded).

The target vehicle's passenger dummy was instrumented with six (6) accelerometers in the head, plus six (6) chest, and three (3) pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations (primary and redundant in the head and chest). The passenger dummy was also instrumented with upper and lower neck moment and force load cells, left and right femur axial force load cells, and a chest deflection potentiometer. The passenger dummy was also equipped with THOR-FLX legs, which included upper and lower tibia load cells to measure forces and moments, and a tibia to femur displacement potentiometer at each knee (other THOR-FLX data channels were not recorded).

One (1) 50th percentile adult male Hybrid III dummy and one (1) 5th percentile adult female Hybrid III dummy were placed in the bullet vehicle's front outboard designated seating positions according to FMVSS 208 (December 18, 2001). The driver dummy and passenger dummy were both belted and were restrained with front dual stage airbags.

The bullet vehicle driver dummy was instrumented with three (3) accelerometers in the head, plus three (3) chest, and three (3) pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations. The driver dummy was also instrumented with upper neck moment and force load cells, a chest deflection potentiometer, left and right femur axial force load cells, and a tibia to femur displacement potentiometer at each knee. The driver dummy was also instrumented with THOR-LX legs, which include upper and lower tibia load cells to measure forces and moments (other THOR-LX data channels were not recorded).

The bullet vehicle's passenger dummy was instrumented with six (6) accelerometers in the head, plus six (6) chest and three (3) pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations (primary and redundant in the head and chest). The bullet passenger dummy was also instrumented with upper and lower neck moment and force load cells, left and right femur load cells to measure axial forces, and a chest deflection potentiometer. The

passenger dummy was also equipped with THOR-FLX legs, which included upper and lower tibia load cells to measure forces and moments, and a tibia to femur displacement potentiometer at each knee (other THOR-FLX data channels were not recorded).

The 194 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 fourteen (14) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

The test summary data are presented in Section 2.0. The summary of FMVSS 208 data are presented in Section 3.0. The occupant, camera, and vehicle measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the dummy verification data. Appendix D contains miscellaneous test information. Appendix E contains an INSIA report which was the basis for the Structural Measurements presented in Tables 13 and 18 of this report. Appendix F contain vehicle manufacturer's information.

Section 2.0

Front 0% Offset, 0 Degrees Impact Test Summary

Test Results Summary

This 48.3 km/h 0% offset, 0 degrees, vehicle-to-vehicle impact test was conducted by TRC Inc. on October 5, 2002.

The target test vehicle, a 1996 Dodge Neon 4 door sedan, was equipped with a 2.0-liter transverse engine, automatic transmission, power steering, power brakes, and single stage front airbags. The target vehicle's test weight was 1398.2 kg. The target vehicle's impact speed was 48.3 km/h. The target vehicle sustained 707 mm of static crush during the impact. The bullet test vehicle, a 2003 Lincoln Navigator MPV, was equipped with a 5.4-liter inline engine, automatic transmission, power steering, power brakes, and dual stage front airbags. The bullet vehicle's test weight was 3027.1 kg. The bullet vehicle's impact speed was 48.2 km/h. The bullet vehicle sustained 505 mm of static crush during the impact.

The target vehicle driver dummy's 36-millisecond Head Injury Criteria (HIC) was 1021. The target vehicle driver dummy's 15-millisecond HIC was 736. The target vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 68.1 g. The target vehicle driver dummy's maximum chest deflection was 28 mm. The target vehicle driver dummy's left and right femur maximum axial compressive forces were 7053 N and 6275 N, respectively. The target vehicle driver dummy's upper neck injury calculations were as follows: neck tension-flexion (NTF), 0.29; neck tension-extension (NTE), 0.40; neck compression-flexion (NCF), 0.14; and neck compression-extension (NCE), 0.12. The target vehicle driver dummy's peak upper neck tension force was 1740 N and peak upper neck compression force was 707 N.

The target vehicle right front passenger dummy's 36-millisecond HIC was 830. The target vehicle passenger's 15-millisecond HIC was 645. The target vehicle passenger dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 58.7 g. The target vehicle passenger dummy's maximum chest deflection was 25 mm. The target vehicle passenger dummy's left and right femur maximum axial compressive forces were 4259 N and 4954 N, respectively. The target vehicle right front passenger dummy's upper neck injury calculations were as follows: NTF, 0.18; NTE, 0.82; NCF, 0.08, and NCE, 0.47. The target

vehicle right front passenger dummy's peak upper neck tension force was 1280 N and peak upper neck compression force was 598 N.

The bullet vehicle driver dummy's 36-millisecond HIC was 121. The bullet vehicle driver dummy's 15-millisecond HIC was 62. The bullet vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 26.3 g. The bullet vehicle driver dummy's maximum chest deflection was 24 mm. The bullet vehicle driver dummy's left and right femur maximum axial compressive forces were 1843 N and 1136 N, respectively. The bullet vehicle driver dummy's upper neck injury calculations were as follows: NTF, .16; NTE, 0.17; NCF, 0.10; and NCE, 0.02. The bullet vehicle driver dummy's peak upper neck tension force was 819 N and peak upper neck compression force was 60 N.

The bullet vehicle right front passenger dummy's 36-millisecond HIC was 266. The bullet vehicle passenger dummy's 15-millisecond HIC was 178. The bullet vehicle passenger dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 28.0 g. The bullet vehicle passenger dummy's maximum chest deflection was 20 mm. The bullet vehicle passenger dummy's left and right femur maximum axial compressive forces were 1006 N and 478 N, respectively. The bullet vehicle right front passenger dummy's upper neck injury calculations were as follows: NTF, 0.13; NTE, 0.39; NCF, 0.20; NCE, and 0.35. The bullet vehicle right front passenger dummy's peak upper neck tension force was 670 N and peak upper neck compression force was 709 N.

Data Acquisition Explanations

An anomalous data spike appeared at approximately 0.6 millisecond on one target passenger and several bullet passenger dummy tibia load cell channels and neck load cell channels. It was apparently caused by interference from the strobe light used to indicate time-zero in camera views. None of the calculated peak tibia index values or peak neck injury values (NIJ) were affected. The channels noticeably affected include:

target passenger left upper tibia Z-axis force, TBLZF2
bullet passenger upper neck moment about the Y-axis, NEKYMB
bullet passenger calculated moment about the occipital condyle, NEKOMB
bullet passenger lower neck X-axis shear force, NKLXFB
bullet passenger lower neck Y-axis shear force, NKLYFB
bullet passenger lower neck moment about the Z-axis, NKLZMB
bullet passenger right upper tibia Z-axis force, TBRZFB
bullet passenger right lower tibia Z-axis force, ANRZFB

The bullet vehicle driver's left lower tibia Z-axis force and both X-axis and Y-axis moment data channels, ANLZF1, ANLXMA, and ANLYMA, recorded seven (7) concurrent questionable data spikes at approximately 111 and 190 milliseconds. None of the calculated peak tibia index values were affected.

The target vehicle's center of gravity X-axis, Y-axis, and Z-axis acceleration data channels, VCGXG1, VCGYG1, and VCGZG1, recorded no valid data after approximately 58 milliseconds when the accelerometer mount apparently dislodged. The target vehicle's VCGZG1 accelerometer also exceeded the data acquisition full-scale with a data spike at approximately 38 milliseconds. This affected the resultant acceleration channel calculation, VCGRG1.

The target vehicle's left rear sill X-axis acceleration data channel, LRSXG1, lost data after approximately 61 milliseconds. This affected the calculated resultant acceleration data channel, LRSRG1.

The bullet vehicle's right rear sill X-axis acceleration data channel, RRSXGA, did not return to zero after the impact event. This affected the calculated resultant acceleration data channel, RRSRGA.

Table 1 Crash Test Summary

Test mode:	Front 0% Offset, 0 Degrees	
Test date:	10/5/02	
Test time:	1433	
Ambient temperature:	23° C	
Target vehicle year/make/ model/body style:	1996/Dodge/Neon/4-door sedan	
Target vehicle test weight:	1398.2 kg	
Bullet vehicle year/make/ model/body style:	2003/Lincoln/Navigator/MPV	
Bullet vehicle test weight:	3027.1 kg	
Impact angle[1]:	0°	
Impact velocity[2]:	Target vehicle = 48.3 km/h Bullet vehicle = 48.2 km/h	
Target vehicle maximum static crush:	929 mm (at the bottom of front bumper level)	
Bullet vehicle maximum static crush:	520 mm (at the bottom of front bumper level)	
Total number of data channels:	194	
Number of cameras:	High-speed 14	Real-time 1
Target vehicle dummies:	Driver #168	Passenger #421
Type:	HIII-50 (572E)	HIII-5 (572O)
Location:	Left Front	Right Front
Restraint:	Seat belt, single stage airbag	Seat belt, single stage airbag
Bullet vehicle dummies:	Driver #169	Passenger #416
Type:	HIII-50 (572E)	HIII-5 (572O)
Location:	Left Front	Right Front
Restraint:	Seat belt, dual stage airbag	Seat belt, dual stage airbag

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

Table 1 Crash Test Summary, Cont'd.

Target vehicle seat track position for test:	
Driver:	Mid, 12th notch of 23 notches
Passenger:	Full forward
Target vehicle seat back position for test:	
Driver:	12.3° measured on headrest post
Passenger:	7.7° measured on headrest post
Target vehicle head restraint position for test:	
Driver:	Full up
Passenger:	Full down
Steering column position:	Mid position: 67.5°
Bullet vehicle seat track position for test:	
Driver:	Mid of power seat track
Passenger:	Full forward
Bullet vehicle seat back position for test:	
Driver:	5.0° measured on headrest post
Passenger:	15.9°
Bullet vehicle head restraint position for test:	
Driver:	Full up
Passenger:	Full down
Steering column position:	Mid position: 68.7° (between 72.0° lowest and 65.4° highest)

Table 2 Target General Test and Vehicle Parameter Data

Vehicle year/make/ model/body style:	1996/Dodge/Neon/4-door sedan
VIN:	3B3ES47CXTT210279
Model year:	1996
Body style:	4-door sedan
Color:	Teal green
Engine data:	
Cylinders:	4
Displacement	2.0-liters
Cylinder placement:	straight
Engine placement:	transverse
Transmission data:	_3_ speed, ___ manual, _X_ automatic, ___ overdrive
Final drive:	_X_ FWD, __ RWD, ___ 4WD
Date vehicle received:	10/3/02
Odometer reading:	73257
Dealer's name and address:	Supplied by VRTC

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	No	Anti-skid brake	No
Clock	No	Rear window defroster	Yes
Other	None	Power door locks	Yes

Certification data from vehicle's label:

Vehicle manufactured by:		Chrysler Corporation	
Date of manufacture:		10/95	
VIN:		3B3ES47CXTT210279	
GVWR:		1584 kg	(3490 lbs.)
GAWR:	Front:	887 kg	(1954 lbs.)
	Rear:	731 kg	(1611 lbs.)

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

Tires on vehicle (mfr., line, size): Uniroyal, Tiger Paw, P185/65R14

Tire pressure with maximum capacity vehicle load:

Front:	35 psi
Rear:	35 psi

Spare tire (mfr., line, size): Goodyear, Temporary, T11570D14

Type of seats:

Front	Bucket
Rear	Bench

Maximum width: 1710 mm

Wheelbase: 2645 mm

Location of "Recommended Tire Pressure" label:

The label was located on left front door.

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

Recommended tire size: P16580R13

Recommended cold tire pressure:

Front:	32 psi	(220 kPa)
Rear:	32 psi	(220 kPa)

Vehicle Capacity Data:

Number of Occupants (Designated seating capacity):

Front	2
Rear	3
Total	5

Vehicle capacity weight: 392 kg (865 lbs.); by calculation

Rated cargo/luggage weight 52 kg (115 lbs.)

Test vehicle attitude:

Delivered attitude:	LF	650 mm;	RF	640 mm;	LR	675 mm;	RR	665 mm
Fully loaded attitude:	LF	635 mm;	RF	628 mm;	LR	650 mm;	RR	645 mm
Pre-test attitude:	LF	630 mm;	RF	637 mm;	LR	615 mm;	RR	625 mm
Post-test attitude:	LF	660 mm;	RF	656 mm;	LR	623 mm;	RR	617 mm

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

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

Right front	383.5 kg	Right rear	201.5 kg
Left front	374.5 kg	Left rear	212.5 kg
Total front weight	758.0 kg	(64.7 % of total vehicle weight)	
Total rear weight	414.0 kg	(35.3 % of total vehicle weight)	
Total delivered weight	1172.0 kg		

Calculation of test vehicle's target test weight:

Total Delivered Weight (UDW) =	1172.0 kg
Rated Cargo/Luggage Weight (RCLW)[1] =	52.0 kg
Weight of 1 Part 572O Dummy @ 49 kg and	
1 Part 572E Dummy @ 76 kg =	125.0 kg
Target test weight =	1349.0 kg

Weight of test vehicle with required dummies and 101.2 kg of cargo weight:

Right front	396.2 kg	Right rear	287.2 kg
Left front	417.6 kg	Left rear	297.2 kg
Total front weight	813.8 kg	(58.2% of total vehicle weight)	
Total rear weight	584.4 kg	(41.8% of total vehicle weight)	
Total test weight	1398.2 kg	(4.6% over target test weight)	

Weight of ballast secured in vehicle: 0 kg

Components removed to meet target test weight: Exhaust, rear bumper beam, and side door glass, rear interior, and fuel.

Location of Vehicle's CG: 1106 mm rearward of front wheel centerline

Fuel System Data:

Usable fuel system capacity	42.4 liters (from manufacturer's information)
Actual test volume:[2]	0 liters (0% 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.

[2] Fuel removed to achieve test weight.

Table 3 Bullet General Test and Vehicle Parameter Data

Vehicle year/make/ model/body style:	2003/Lincoln/Navigator/MPV
VIN:	5LMFU28R43LJ08727
Model year:	2003
Body style:	MPV
Color:	Mineral Grey
Engine data:	
Cylinders:	8
Displacement	5.4 liters
Cylinder placement:	V
Engine placement:	inline
Transmission data:	_4_ speed, ___ manual, _X_ automatic, ___ overdrive
Final drive:	__ FWD, __ RWD, _X_ 4WD
Date vehicle received:	9/24/02
Odometer reading:	87
Dealer's name and address:	Bob Townsend Ford Lincoln Mercury 2343 W. Michigan Street Sidney, Ohio 45365

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	Yes	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:		Ford Motor Company	
Date of manufacture:		06/02	
VIN:		5LMFU28R43LJ08727	
GVWR:		3379 kg	(7450 lbs.)
GAWR:	Front:	1564 kg	(3450 lbs.)
	Rear:	1872 kg	(4128 lbs.)

Table 3 Bullet General Test and Vehicle Parameter Data, Cont'd.

Tires on vehicle (mfr., line, size): Michelin, Pilot LTX, P275/65R18SL114H

Tire pressure with maximum capacity vehicle load:

Front:	35 psi	(241 kPa)
Rear:	35 psi	(241 kPa)

Spare tire (mfr., line, size): Michelin, Pilot LTX, P275/65R18SL114H

Type of seats:

Front	Bucket
Rear	Bucket

Maximum width: 2000 mm

Wheelbase: 3030 mm

Location of "Recommended Tire Pressure" label:

The label was located on driver side B-pillar.

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

Recommended tire size: P275/65R18SL114H

Recommended cold tire pressure:

Front:	35 psi	(241 kPa)
Rear:	35 psi	(241 kPa)

Vehicle Capacity Data (not on label):

Number of Occupants (Designated seating capacity from seat belt count):

Front	2
Mid	2
Rear	3
Total	7

Vehicle capacity weight: 576.5 kg (261.4 lbs.); by calculation

Rated cargo/luggage weight 100.5 kg (221.6 lbs.); by calculation

Test vehicle attitude:

Delivered attitude:	LF	870 mm;	RF	866 mm;	LR	867 mm;	RR	867 mm
Fully loaded attitude:	LF	857 mm;	RF	856 mm;	LR	845 mm;	RR	845 mm
Pre-test attitude:	LF	823 mm;	RF	839 mm;	LR	821 mm;	RR	833 mm
Post-test attitude:	LF	807 mm;	RF	808 mm;	LR	829 mm;	RR	845 mm

Table 3 Bullet General Test and Vehicle Parameter Data Cont'd

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

Right front	702.5 kg	Right rear	688.5 kg
Left front	729.5 kg	Left rear	682.0 kg
Total front weight	1432.0 kg	(51.1 % of total vehicle weight)	
Total rear weight	1370.5 kg	(48.9 % of total vehicle weight)	
Total delivered weight	2802.5 kg		

Calculation of test vehicle's target test weight:

Total Delivered Weight (UDW) =	2802.5 kg
Rated Cargo/Luggage Weight (RCLW)[1] =	100.5 kg
Weight of 1 Part 572O Dummy @ 49 kg and	
1 Part 572E Dummy @ 76 kg =	125.0 kg
Target test weight =	3028.0 kg

Weight of test vehicle with required dummies and 99.6 kg of cargo weight:

Right front	767.0 kg	Right rear	722.0 kg
Left front	770.6 kg	Left rear	767.5 kg
Total front weight	1537.6 kg	(50.8% of total vehicle weight)	
Total rear weight	1489.5 kg	(49.2% of total vehicle weight)	
Total test weight	3027.1 kg	(0.03% under target test weight)	

Weight of ballast secured in vehicle: 74.8 kg shot in engine

Components removed to meet target test weight: Rear hatch and bumper trim

Location of Vehicle's CG: 1491 mm rearward of front wheel centerline

Fuel System Data:

Usable fuel system capacity	106 liters (from owner's manual)
Actual test volume:	98.4 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 4 Post-Impact Data

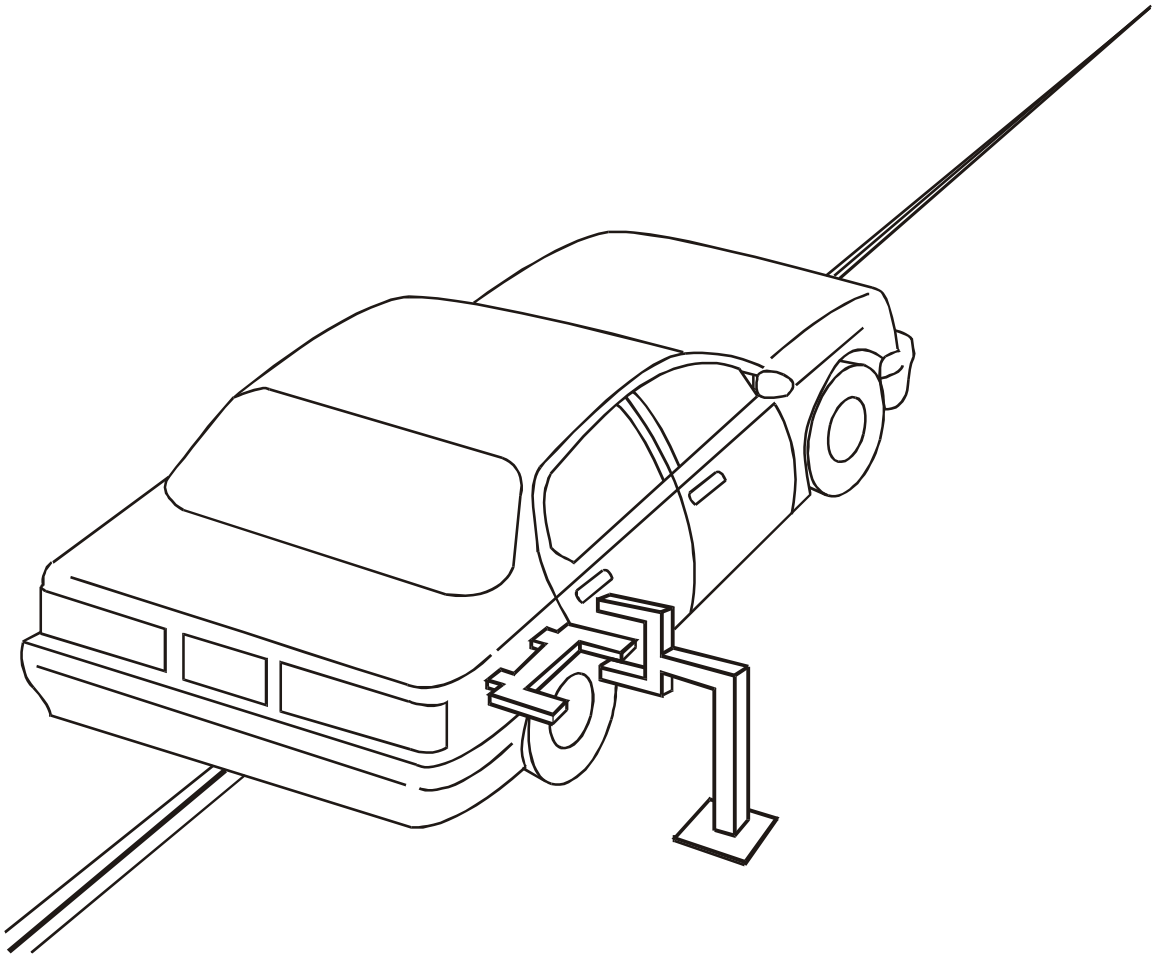
Test number:	021005
Test date:	10/05/02
Test time:	1433
Test type:	Car to Car, 0% Offset, 0 Degrees
Impact angle:	0°
Ambient temperature at impact area:	23° C
Impact velocity:	
Target vehicle:	48.3 km/h
Bullet vehicle:	48.2 km/h
Required impact velocity range:	47.5 to 49.1 km/h

Distance from each vehicle to intended impact point:

Entering velocity trap:	661 mm
Exiting velocity trap:	51 mm

Impact point:	10 mm right of intended impact point (referenced to target vehicle coordinate system)

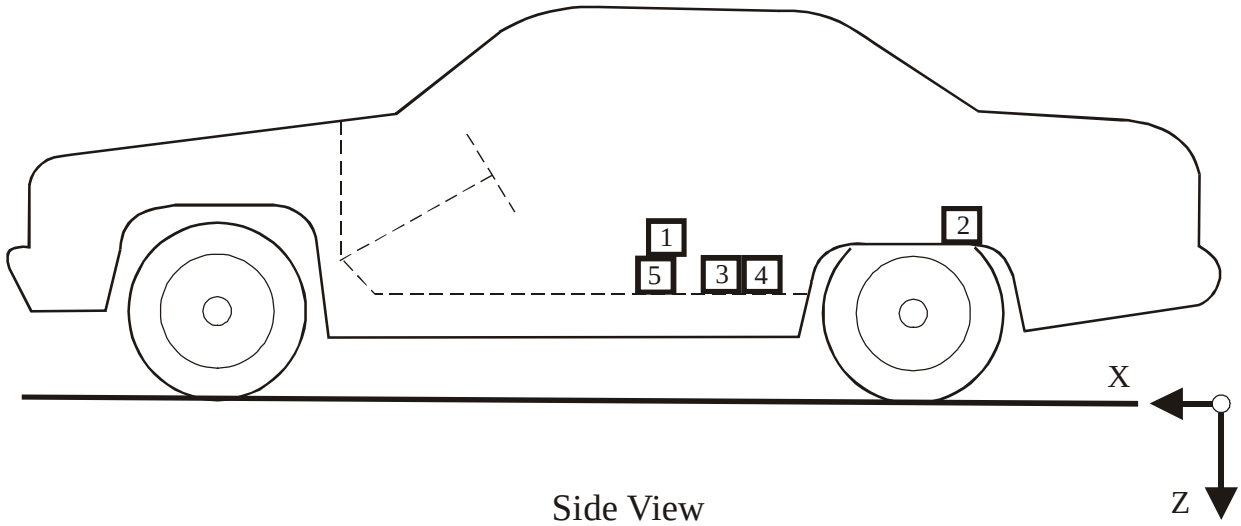
Figure 1 Impact Velocity Measurement System



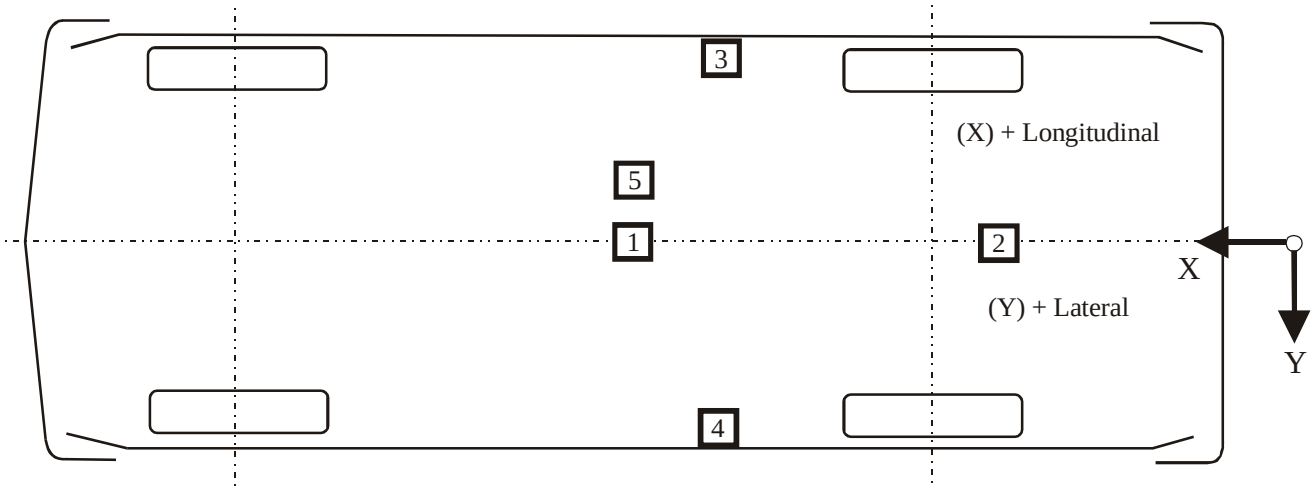
The final vane clears the final emitter/receiver pair approximately 51 millimeters before impact.

The vanes have 610-millimeter spacing.

Figure 2 Target Vehicle Accelerometer Placement



Side View



Bottom View

Table 5 Target Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 021005 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	1888 mm	0 mm	-370 mm				
LONGITUDINAL[1]				35.8 g	@ 79.7 ms	88.6 g	@ 58.2 ms
LATERAL[1]				29.2 g	@ 81.8 ms	52.0 g	@ 75.9 ms
VERTICAL[1]				149.6 g	@ 79.8 ms	63.6 g	@ 64.4 ms
RESULTANT[1]				153.8 g	@ 79.8 ms		
2 REAR DECK	NA	NA	NA				
LONGITUDINAL				2.7 g	@ 131.7 ms	43.8 g	@ 68.0 ms
LATERAL				8.4 g	@ 72.2 ms	7.0 g	@ 56.2 ms
VERTICAL				19.5 g	@ 57.8 ms	33.6 g	@ 62.6 ms
RESULTANT				43.8 g	@ 68.0 ms		
3 LEFT REAR SILL	NA	NA	NA				
LONGITUDINAL[1]				----	@ ----	----	@ ----
LATERAL				16.0 g	@ 31.4 ms	50.7 g	@ 66.3 ms
VERTICAL				26.0 g	@ 93.0 ms	21.4 g	@ 49.8 ms
RESULTANT[1]				----	@ ----		
4 RIGHT REAR SILL	NA	NA	NA				
LONGITUDINAL				5.6 g	@ 91.0 ms	37.8 g	@ 74.8 ms
LATERAL				10.2 g	@ 45.6 ms	9.2 g	@ 59.0 ms
VERTICAL				18.2 g	@ 60.9 ms	10.9 g	@ 87.0 ms
RESULTANT				38.0 g	@ 74.9 ms		

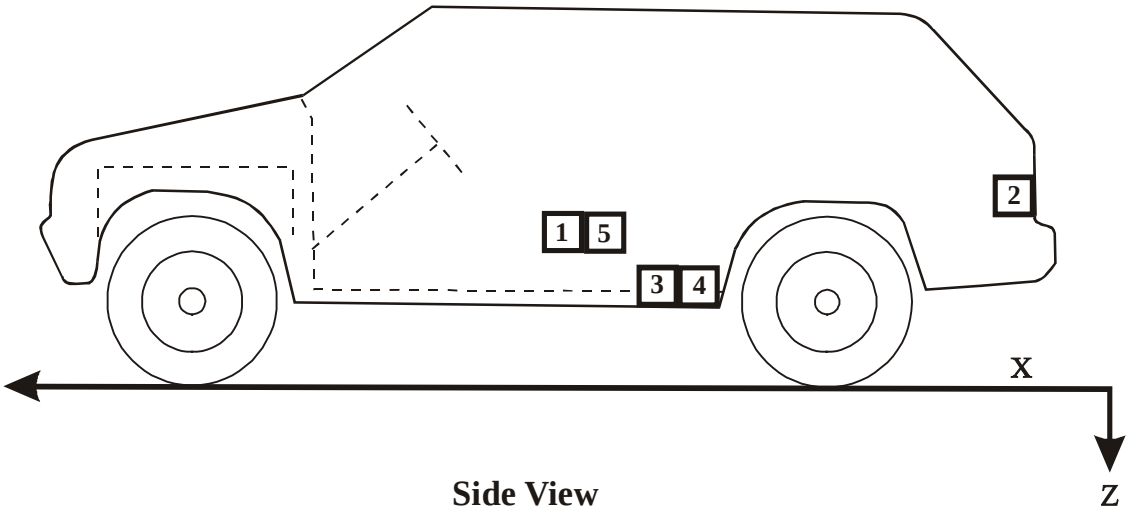
Table 5 Target Vehicle Accelerometer Locations and Data Summary, Cont'd.

TEST NUMBER: 021005 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
5 EDR PLATE	1926 mm	-230 mm	-192 mm				
LONGITUDINAL				3.5 g	@ 89.4 ms	74.1 g	@ 56.1 ms
LATERAL				30.2 g	@ 56.3 ms	20.2 g	@ 61.0 ms
VERTICAL				16.8 g	@ 56.8 ms	31.0 g	@ 64.9 ms
RESULTANT				81.5 g	@ 56.2 ms		

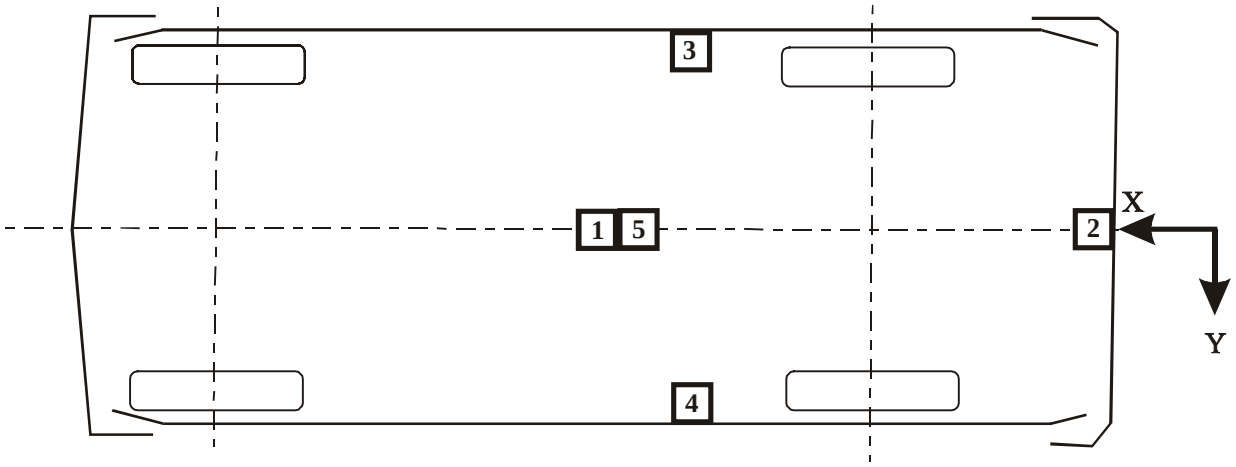
REFERENCE: X: + FORWARD OF REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + DOWNWARD FROM GROUND LEVEL

[1] See DATA ACQUISITION EXPLANATIONS

Figure 3 Bullet Vehicle Accelerometer Placement



Side View



Bottom View

Table 6 Bullet Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 021005 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	2760 mm	0 mm	-710 mm				
LONGITUDINAL				1.1 g	@ 216.6 ms	19.2 g	@ 36.6 ms
LATERAL				1.7 g	@ 48.1 ms	3.1 g	@ 79.7 ms
VERTICAL				7.1 g	@ 40.6 ms	7.5 g	@ 65.4 ms
RESULTANT				19.4 g	@ 36.7 ms		
2 REAR DECK	NA	NA	NA				
LONGITUDINAL				1.1 g	@ 197.8 ms	24.9 g	@ 28.6 ms
LATERAL				2.5 g	@ 24.4 ms	3.6 g	@ 29.1 ms
VERTICAL				14.9 g	@ 48.2 ms	17.8 g	@ 28.9 ms
RESULTANT				30.7 g	@ 28.8 ms		
3 LEFT REAR SILL	NA	NA	NA				
LONGITUDINAL				0.8 g	@ 204.2 ms	19.3 g	@ 33.9 ms
LATERAL				3.3 g	@ 47.8 ms	5.7 g	@ 38.9 ms
VERTICAL				8.5 g	@ 18.6 ms	5.3 g	@ 53.6 ms
RESULTANT				20.2 g	@ 34.1 ms		
4 RIGHT REAR SILL	NA	NA	NA				
LONGITUDINAL[1]				0.3 g	@ 1.3 ms	43.4 g	@ 36.6 ms
LATERAL				4.3 g	@ 47.8 ms	4.9 g	@ 39.5 ms
VERTICAL				7.0 g	@ 19.1 ms	5.2 g	@ 28.4 ms
RESULTANT[1]				43.4 g	@ 36.6 ms		

Table 6 Bullet Vehicle Accelerometer Locations and Data Summary, Cont'd.

TEST NUMBER: 021005 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
5 EDR PLATE	2474 mm	-5 mm	-664 mm				
LONGITUDINAL				2.0 g	@ 191.5 ms	23.5 g	@ 28.7 ms
LATERAL				15.6 g	@ 47.6 ms	12.6 g	@ 41.9 ms
VERTICAL				14.3 g	@ 54.2 ms	16.9 g	@ 62.6 ms
RESULTANT				23.9 g	@ 28.7 ms		

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

[1] See DATA ACQUISITION EXPLANATIONS

Section 3.0

Summary of FMVSS 208 Data

Table 7 Target Vehicle Dummy Injury Criteria Data

Maximum Acceleration[1]

	Head				Chest			
	X	Y	Z	R	X	Y	Z	R
Driver	84.2 g	24.1 g	27.2 g	85.9 g	-68.3g	8.7 g	-21.8 g	70.6 g
Passenger	-80.1 g	22.9 g	23.3 g	83.1 g	-57.9 g	-17.2 g	-25.0 g	59.7 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	7053 N	6275 N
Passenger	4259 N	4954 N

Head Injury Criteria[2]

36 millisecond

	HIC	Start Time t_1	End Time t_2
Driver	1021	56.16 ms	91.04 ms
Passenger	830	52.16 ms	83.52 ms

15 millisecond

	HIC	Start Time t_1	End Time t_2
Driver	736	70.64 ms	85.68 ms
Passenger	645	57.84 ms	72.88 ms

Chest Maximum Resultant Acceleration[3]

	Acceleration	Start Time t_1	End Time t_2
Driver	68.1 g	78.41 ms	81.37 ms
Passenger	58.7 g	61.79 ms	64.75 ms

Table 7 Target Vehicle Dummy Injury Criteria Data, Cont'd.

Maximum Chest Deflection

Driver	28 mm
Passenger	25 mm

Neck Injury Calculations (Nij)[2]

	NTF	NTE	NCF	NCE
Driver	0.29	0.40	0.14	0.12
Passenger	0.18	0.82	0.08	0.47

Upper Neck Axial Force

	Tension	Compression
Driver	1740 N	707 N
Passenger	1280 N	598 N

Tibia Index

	Upper Tibia	Lower Tibia
Driver-left	0.69	0.76
Driver-right	1.33	1.32
Passenger-left	0.57	0.56
Passenger-right	0.62	0.68

[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 8 Bullet Vehicle Dummy Injury Criteria Data

Maximum Acceleration[1]

	Head				Chest			
	X	Y	Z	R	X	Y	Z	R
Driver	-29.1 g	-2.9 g	16.2 g	29.2 g	-26.1 g	-2.0 g	-11.8 g	26.5 g
Passenger	-42.5 g	-24.6 g	17.0 g	46.5 g	-28.0 g	-5.2 g	-9.8 g	28.2 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	1843 N	1136 N
Passenger	1006 N	478 N

Head Injury Criteria[2]

36 millisecond

	HIC	Start Time t_1	End Time t_2
Driver	121	75.36 ms	111.36 ms
Passenger	266	71.28 ms	107.28 ms

15 millisecond

	HIC	Start Time t_1	End Time t_2
Driver	62	89.92 ms	104.96 ms
Passenger	178	86.72 ms	101.76 ms

Chest Maximum Resultant Acceleration[3]

	Acceleration	Start Time t_1	End Time t_2
Driver	26.3 g	69.52 ms	72.48 ms
Passenger	28.0 g	65.96 ms	68.92 ms

Table 8 Bullet Vehicle Dummy Injury Criteria Data, Cont'd.

Maximum Chest Deflection

Driver	24 mm
Passenger	20 mm

Upper Neck Injury Calculations (Nij)[2]

	NTF	NTE	NCF	NCE
Driver	0.16	0.17	0.10	0.02
Passenger	0.13	0.39	0.20	0.35

Upper Neck Axial Force

	Tension	Compression
Driver	819 N	60 N
Passenger	670 N	709 N

Tibia Index

	Upper Tibia	Lower Tibia
Driver-left	0.21	0.28
Driver-right	0.19	0.17
Passenger-left	0.21	0.43
Passenger-right	0.40	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 9 Target Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	Driver	Passenger
Head	Airbag, head restraint, seatback	Airbag, head restraint, seatback, shoulder belt
Chest	Airbag	Airbag
Abdomen	None	None
Left knee	Knee bolster	Knee bolster
Right knee	Knee bolster	Knee bolster

Door opening:

	Left	Right
Front	N/A	N/A
Rear	Easy	Easy

Seat movement:

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

Glazing damage: The front windshield cracked all over.

Other notable impact effects: Movement ceased with the front ends of the two vehicles engaged.

Table 10 Bullet Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	Driver	Passenger
Head	Airbag, head restraint	Airbag, seatback, head restraint
Chest	Airbag	Airbag
Abdomen	None	None
Left knee	Knee bolster	Knee bolster
Right knee	Knee bolster	Knee bolster

Door opening:

	Left	Right
Front	Easy	Easy
Rear	Easy	Easy

Seat movement:

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

Glazing damage: None

Other notable impact effects: Movement ceased with the front ends of the two vehicles engaged.

Section 4.0

Occupant, Camera, and Vehicle Information

Target Vehicle Dummy Kinematic Summary

Driver Dummy

Upon impact, the target driver dummy translated forward and downward with the head and chest going into the airbag. The knees contacted the dash panel. The dummy's neck went into extension and, with the airbag in the dummy's face, the back of the head contacted the upper seatback and the head restraint. The dummy came to rest seated lower in the driver's seat, leaning forward.

Right Front Passenger Dummy

Upon impact, the target passenger dummy translated forward and the head and chest contacted the airbag. The knees contacted the dash panel. As the dummy went further forward into the airbag, the neck went into sharp extension and the dummy was pushed downward and rearward into the seat. The dummy's head contacted the upper seatback, the head restraint and the shoulder belt. The dummy came to rest seated somewhat lower in the passenger seat, leaning slightly forward.

Bullet Vehicle Dummy Kinematic Summary

Driver Dummy

Upon impact, the bullet driver dummy translated forward with the head and neck flexing forward as the head and chest contact the airbag. The knees contacted the dash panel. The head and neck straightened and then extended slightly on rebound. The back of the driver dummy's head contacted the head restraint. The dummy came to rest seated upright in the driver's seat.

Right Front Passenger Dummy

Upon impact, the bullet passenger dummy translated forward with the head and neck rotating face leftward as the head and chest contacted the airbag. The knees contacted the dash panel. The dummy rebounded into the seatback with the head contacting the left side of the passenger seatback and head restraint. The dummy came to rest seated in the passenger seat, leaning to the left.

Figure 4 Vehicle Dummy Measurement Locations for Front Seat Occupants

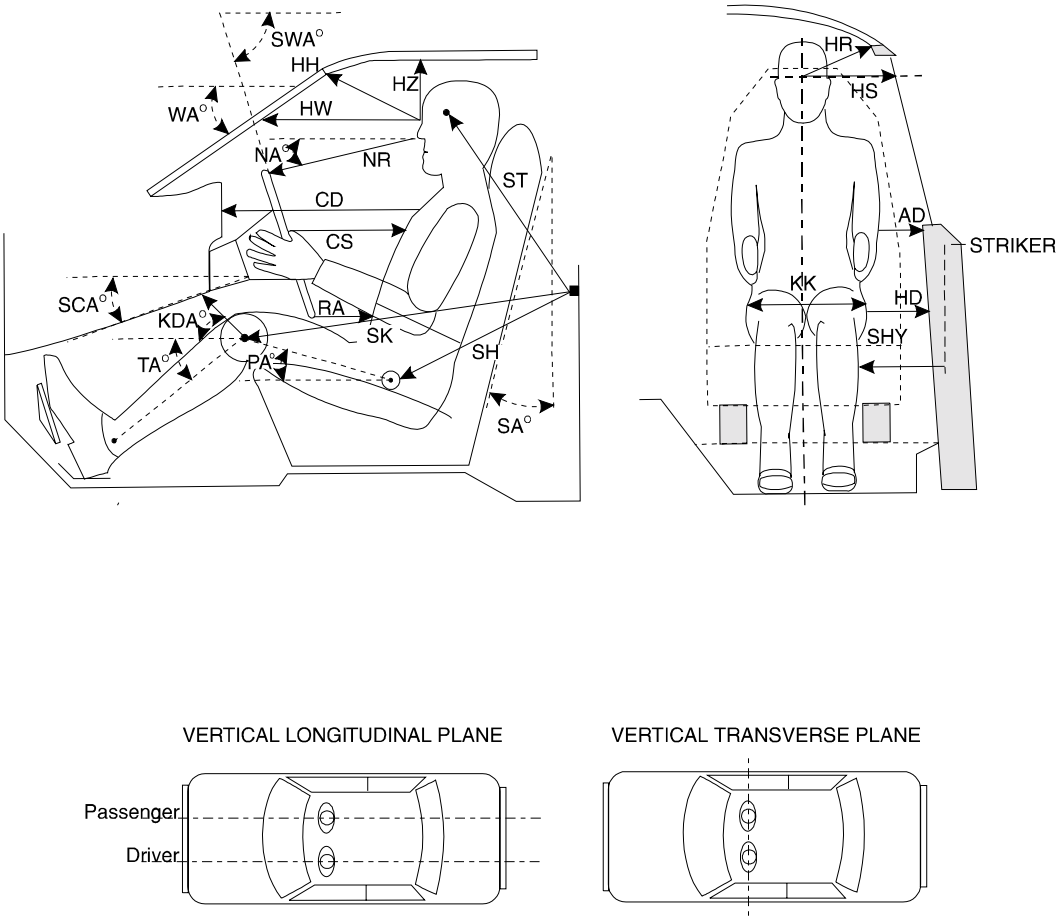


Table 11 Target Vehicle Dummy Measurement Data For Front Seat Occupants

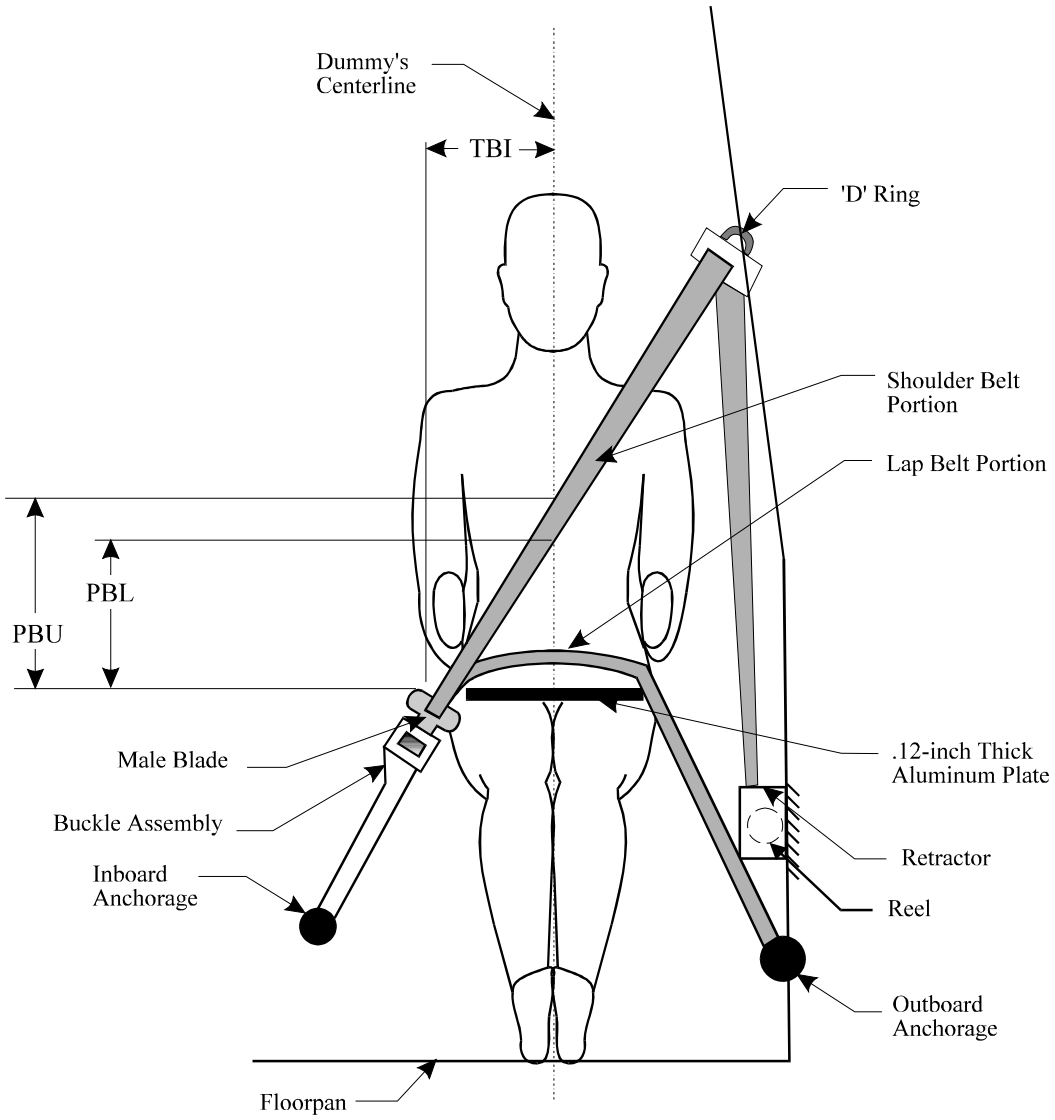
Designation	Type of Measurement	Driver (Serial # 168)	Passenger (Serial # 421)
WA	Windshield angle	26.5°	N/A
SWA	Steering wheel angle	22.9°	N/A
SCA	Steering column angle	67.1°	N/A
SA	Seat back angle[2]	12.3°	7.7°
HZ	Head to roof	205 mm	203 mm
HH	Head to header	321 mm	260 mm
HW	Head to windshield	525 mm	560 mm
HR	Head to side header	235 mm	236 mm
NR	Nose to rim	360 mm	N/A
NA	Nose to rim angle	11.5°	N/A
CD	Chest to dash	527 mm	322 mm
CS	Steering wheel to chest	298 mm	N/A
RA	Rim to abdomen	180 mm	N/A
KDL	Left knee to dash	138 mm	88 mm
KDR	Right knee to dash	136 mm	82 mm
KDA	Outboard knee to dash angle	27.7°	56.2°
PA	Pelvic angle	23.8°	21.7°
TA	Tibia angle	43.9°	51.4°
KK	Knee to knee	335 mm	265 mm
ST[1]	Striker to head	536 mm	501 mm
	Striker to head angle	-89.0°	-71.3°
SK[1]	Striker to knee	558 mm	698 mm
	Striker to knee angle	-5.7°	-4.7°
SH[1]	Striker to H-point	238 mm	376 mm
	Striker to H-point angle	27.1°	10.7°
SHY	Striker to H-point (Y dir.)	230 mm	256 mm
HS	Head to side window	297 mm	293 mm
HD	H-point to door	103 mm	175 mm
AD	Arm to door	80 mm	54 mm

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

[1] A negative angle indicates the measurement point was above the striker.

[2] Measured on headrest post.

Figure 5 Target Vehicle Seat Belt Positioning Data



	Driver Dummy	Passenger Dummy
PBU - Top surface of aluminum plate to belt upper edge	301 mm	260 mm
PBL - Top surface of aluminum plate to belt lower edge	225 mm	180 mm
TBI - Dummy centerline to intersection of upper torso belt and lap belt	225 mm	220 mm

Table 12 Bullet Vehicle Dummy Measurement Data For Front Seat Occupants

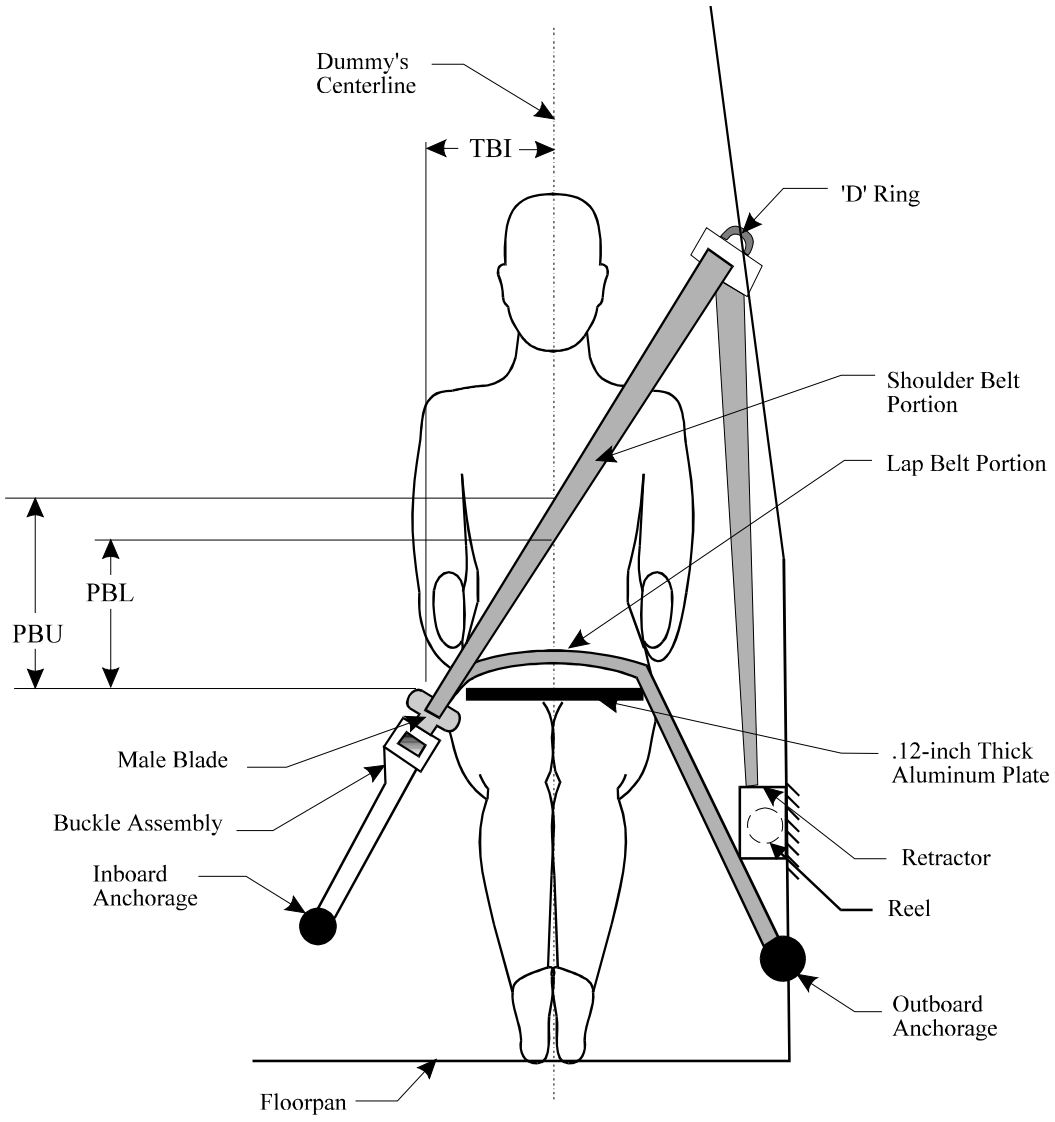
Designation	Type of Measurement	Driver (Serial # 169)	Passenger (Serial # 416)
WA	Windshield angle	33.9°	N/A
SWA	Steering wheel angle	21.0°	N/A
SCA	Steering column angle	69.0°	N/A
SA	Seat back angle	5.0°[2]	15.9°
HZ	Head to roof	220 mm	302 mm
HH	Head to header	407 mm	368 mm
HW	Head to windshield	597 mm	615 mm
HR	Head to side header	238 mm	290 mm
NR	Nose to rim	372 mm	N/A
NA	Nose to rim angle	14.1°	N/A
CD	Chest to dash	542 mm	420 mm
CS	Steering wheel to chest	295 mm	N/A
RA	Rim to abdomen	196 mm	N/A
KDL	Left knee to dash	151 mm	123 mm
KDR	Right knee to dash	147 mm	125 mm
KDA	Outboard knee to dash angle	16.9°	28.5°
PA	Pelvic angle	23.7°	21.7°
TA	Tibia angle	57.1°	57.3°
KK	Knee to knee	280 mm	260 mm
ST[1]	Striker to head	654 mm	597 mm
	Striker to head angle	-79.2°	-66.6°
SK[1]	Striker to knee	632 mm	698 mm
	Striker to knee angle	-8.2°	-2.5°
SH[1]	Striker to H-point	246 mm	363 mm
	Striker to H-point angle	9.7°	2.4°
SHY	Striker to H-point (Y dir.)	250 mm	276 mm
HS	Head to side window	365 mm	350 mm
HD	H-point to door	106 mm	128 mm
AD	Arm to door	112 mm	152 mm

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

[1] A negative angle indicates the measurement point was above the striker.

[2] Measured on headrest post.

Figure 6 Bullet Vehicle Seat Belt Positioning Data



	Driver Dummy	Passenger Dummy
PBU - Top surface of aluminum plate to belt upper edge	320 mm	289 mm
PBL - Top surface of aluminum plate to belt lower edge	243 mm	199 mm
TBI - Dummy centerline to intersection of upper torso belt and lap belt	277 mm	220 mm

Figure 7 Target and Bullet Vehicle Pre-Test Front Centerline Profiles

Bullet Vehicle		Target Vehicle	
X, mm	Z, mm	X, mm	Z, mm
5087	-1103	2641	-656
5112	-1086	2939	-645
5138	-1066	3236	-621
5167	-1024	4236	-543
5181	-949	4285	-527
5174	-757	4315	-515
5189	-713	4341	-458
5237	-695	4331	-375
5265	-666	4310	-235
5269	-608		
5273	-482		
5273	-312		

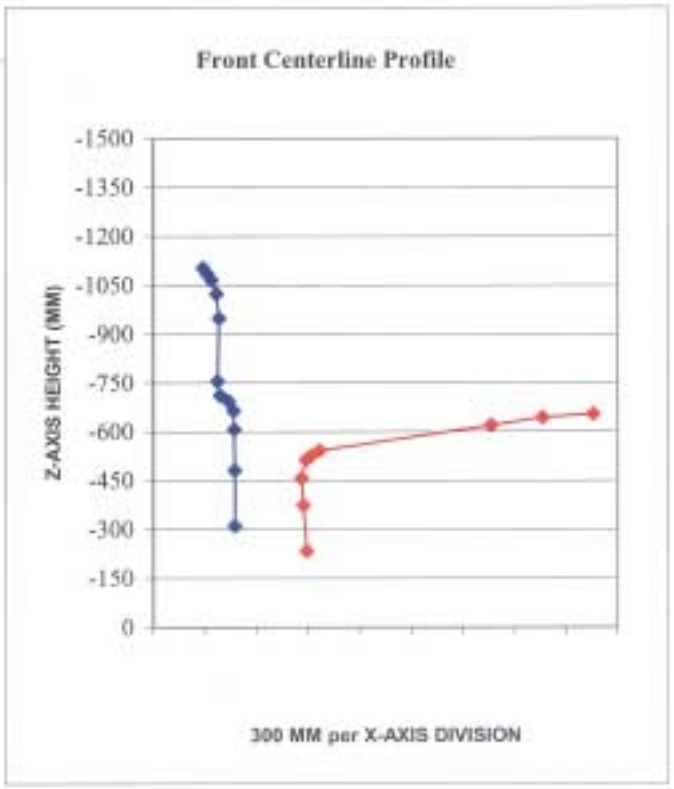


Table 13 Target Vehicle Structural Measurements[1,2]

	Elements	Pre-Test
1	Total Length	4341
2	Total Width	1710
3	Bumper Top Height	555
4	Bumper Bottom Height	219
5	Longitudinal Member Top Height	528
6	Longitudinal Member Bottom Height	322
7	Distance Between Longitudinal Members	1075
7´	Longitudinal Member Width	65
8	Engine Top Height	748
9	Engine Bottom Height	146
10	Engine and Gearbox Width	650
11	Front Bumper - Engine Distance	475
12	Front Shock Absorber Fixing Height	748
13	Bonnet Leading Edge Height	623
14	Front Shock Absorber Fixing Width	1100
15	Front Bumper - Front Axle Distance	840
16	Front Axle - A Pillar Distance	560
17	A Pillar - B Pillar Distance	930
18	B Pillar - Rear Axle Distance	1145
19	B Pillar - C Pillar Distance	1275
20	Roof Sill Bottom Height	1180
21	Roof Sill Top Height	1200
22	Floor Sill Bottom Height	249
23	Floor Sill Top Height	278

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] These structural measurements, except total length, total width, and front bumper to front axle, are taken from a different 1996 Dodge Neon. The vertical measurements from the ground are adjusted based on the test vehicle's pre-test attitude measurements.

Figure 8 Target Vehicle Pre-Test And Post-Test Measurement Points

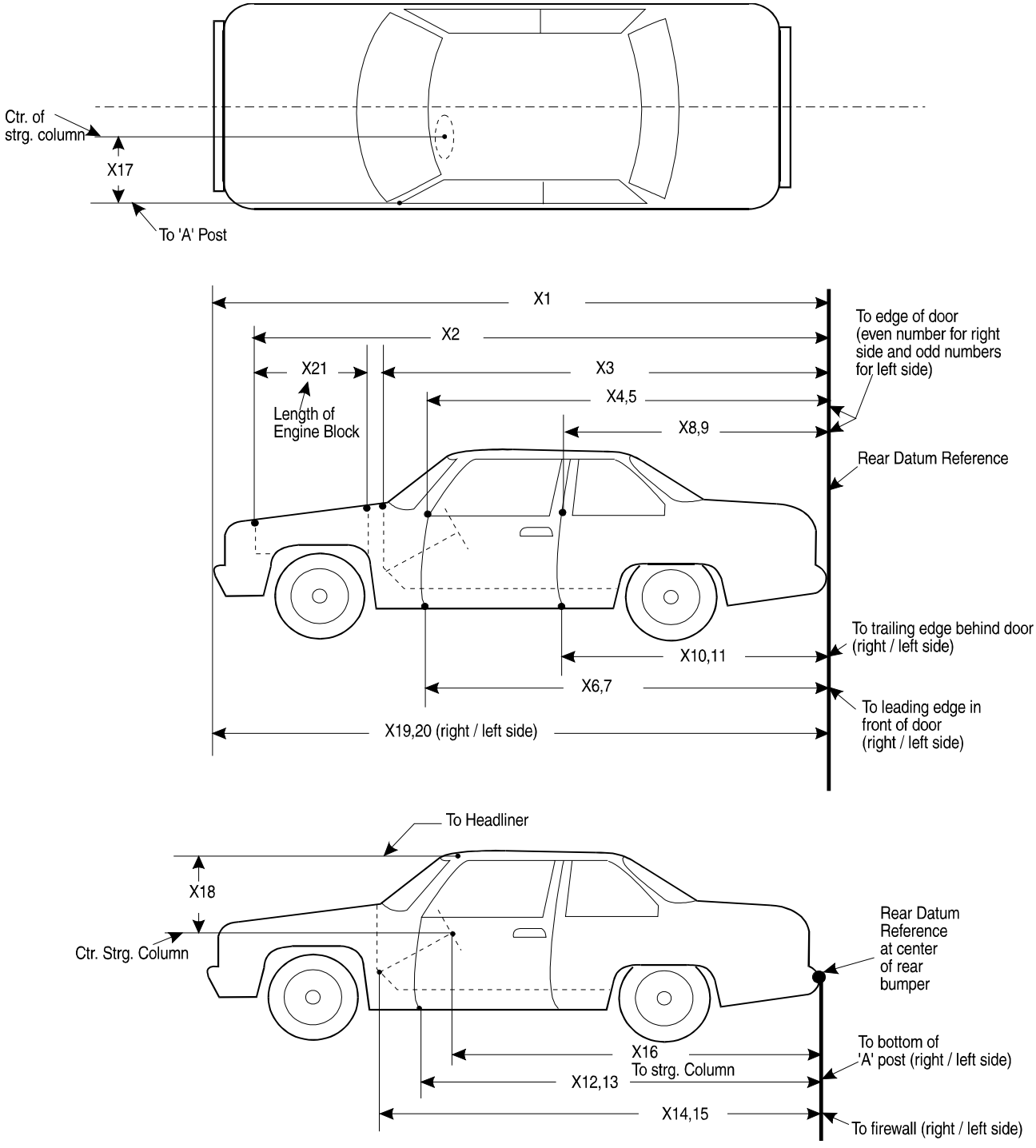


Table 14 Target Vehicle Impacted Measurements

Test number: 021005

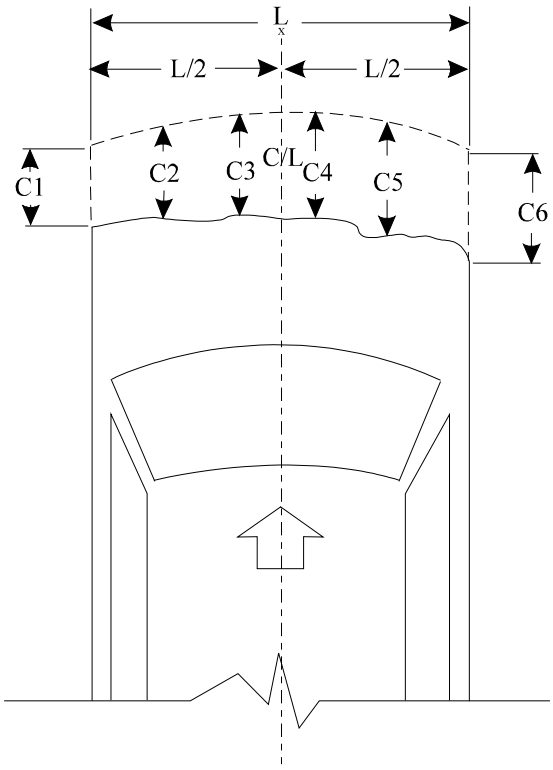
Vehicle year/make/model/body style: 1996/Dodge/Neon/4-door sedan

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4341	3760	581
X2	Rear Surface of Vehicle to Front of Engine Block	3696	3301	395
X3	Rear Surface of Vehicle to Firewall	3341	3065	276
X4	Rear Surface of Veh. to Upper Leading Edge of Right Door	2953	---[1]	---[1]
X5	Rear Surface of Veh. to Upper Leading Edge of Left Door	2943	---[1]	---[1]
X6	Rear Surface of Veh. to Lower Leading Edge of Right Door	3014	---[1]	---[1]
X7	Rear Surface of Veh. to Lower Leading Edge of Left Door	3011	---[1]	---[1]
X8	Rear Surface of Veh. to Upper Trailing Edge of Right Door	1980	---[1]	---[1]
X9	Rear Surface of Veh. to Upper Trailing Edge of Left Door	1972	---[1]	---[1]
X10	Rear Surface of Veh. to Lower Trailing Edge of Right Door	1986	---[1]	---[1]
X11	Rear Surface of Veh. to Lower Trailing Edge of Left Door	1986	---[1]	---[1]
X12	Rear Surface of Veh. to Bottom of " A " Post on Right Side	2992	2803	189
X13	Rear Surface of Veh. to Bottom of " A " Post on Left Side	3004	2809	195
X14	Rear Surface of Vehicle to Firewall - Right Side	3296	3043	253
X15	Rear Surface of Vehicle to Firewall - Left Side	3341	3135	206
X16	Rear Surface of Vehicle to Steering Wheel Center	2586	2366	220
X17	Center of Steering Column to " A " Post	296	277	19
X18	Center of Steering Column to Headliner	427	550	-123
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4216	3827	389
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4211	3591	620
X21	Length of Engine Block	440	440	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2721	2553	168
CD	Rear Surface of Vehicle to Center of Dash Panel	2714	2477	237
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2716	2526	190

All distance measurements are in millimeters.

[1] Outer door panel separated during impact.

Figure 9 Target Vehicle Crush

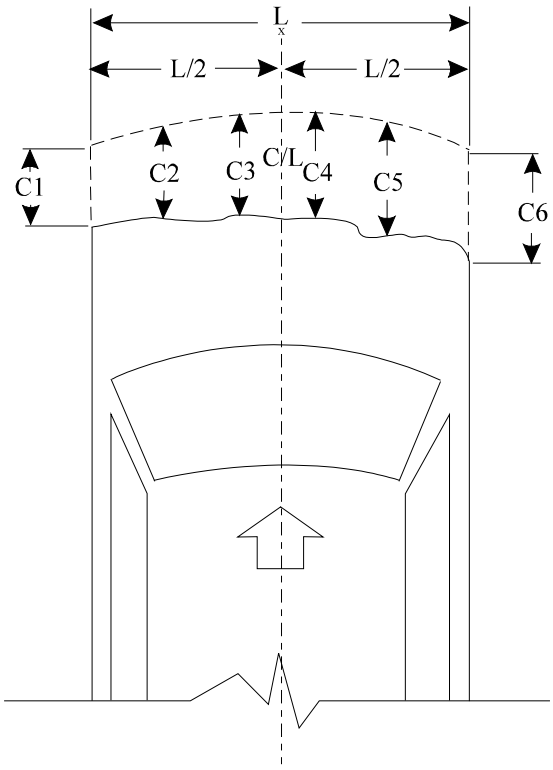


Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 1996 Dodge Neon
Measured with bumper fascia:

Location	Pre-test	Post-test	Difference
L	1320 mm		
C1	4211 mm	3591 mm	620 mm
C2	4311 mm	3604 mm	707 mm
C3	4341 mm	3718 mm	623 mm
C4	4341 mm	3780 mm	561 mm
C5	4316 mm	3805 mm	511 mm
C6	4216 mm	3827 mm	389 mm
CL	4341 mm	3760 mm	581 mm

Figure 9 Target 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: 1996 Dodge Neon
Measured to bumper beam without bumper fascia:

Location	Pre-test	Post-test	Difference
L[1]	1265 mm		
C1[1]	4168 mm	3436 mm	732 mm
C2	4221 mm	3502 mm	719 mm
C3	4256 mm	3613 mm	643 mm
C4	4256 mm	3666 mm	590 mm
C5	4226 mm	3676 mm	550 mm
C6[1]	4176 mm	3697 mm	479 mm
CL[1]	4256 mm	3646 mm	610 mm

[1] C1 and C6 measurement points moved inboard to catch bumper beam for without fascia measurements.

Table 15 Target 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	4201 mm	4304 mm	4331 mm	4334 mm	4301 mm	4209 mm
	Y	-653 mm	-390 mm	-124 mm	132 mm	395 mm	651 mm
	Z	-270 mm	-275 mm	-270 mm	-270 mm	-270 mm	-367 mm
Top of Front Bumper	X	4181 mm	4281 mm	4341 mm	4321 mm	4208 mm	4186 mm
	Y	-650 mm	-391 mm	-124 mm	137 mm	399 mm	660 mm
	Z	-510 mm	-510 mm	-515 mm	-512 mm	-515 mm	-505 mm
Center of Grille	X	4116 mm	4201 mm	4231 mm	4229 mm	4201 mm	4106 mm
	Y	-647 mm	-390 mm	-125 mm	132 mm	392 mm	655 mm
	Z	-605 mm	-580 mm	-565 mm	-565 mm	-580 mm	-615 mm
Front of Hood	X	4031 mm	4201 mm	4231 mm	4229 mm	4191 mm	4036 mm
	Y	-686 mm	-385 mm	-122 mm	138 mm	400 mm	685 mm
	Z	-677 mm	-610 mm	-607 mm	-613 mm	-610 mm	-673 mm

		Post-Test Profile					
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper	X	3572 mm	3579 mm	3690 mm	3760 mm	3798 mm	3862 mm
	Y	-659 mm	-460 mm	-193 mm	63 mm	327 mm	585 mm
	Z	-363 mm	-398 mm	-410 mm	-425 mm	-453 mm	-482 mm
Top of Front Bumper	X	3583 mm	3600 mm	3692 mm	3750 mm	3771 mm	3777 mm
	Y	-666 mm	-449 mm	-185 mm	72 mm	332 mm	590 mm
	Z	-494 mm	-533 mm	-549 mm	-568 mm	-693 mm	609 mm
Center Of Grille	X	---[1]	---[1]	3643 mm	3717 mm	---[1]	---[1]
	Y	---[1]	---[1]	-177 mm	85 mm	---[1]	---[1]
	Z	---[1]	---[1]	-634 mm	-644 mm	---[1]	---[1]
Front of Hood	X	3502 mm	3610 mm	3681 mm	3711 mm	3710 mm	3619 mm
	Y	-665 mm	-418 mm	-156 mm	102 mm	365 mm	630 mm
	Z	-752 mm	-582 mm	-583 mm	-603 mm	-622 mm	-771 mm

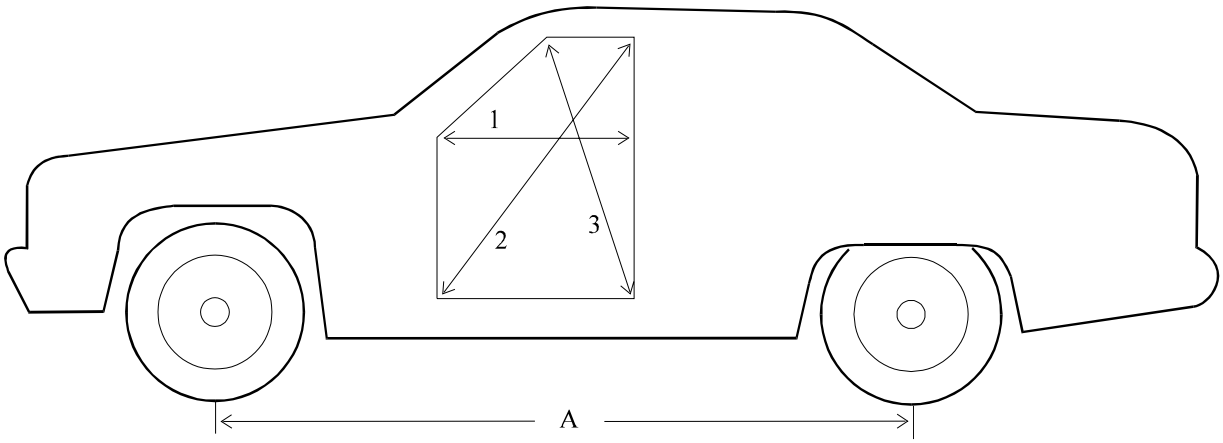
		Difference					
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper	X	929 mm	725 mm	641 mm	574 mm	503 mm	347 mm
	Y	6 mm	70 mm	69 mm	69 mm	68 mm	66 mm
	Z	93 mm	123 mm	140 mm	155 mm	183 mm	115 mm
Top of Front Bumper	X	598 mm	681 mm	649 mm	571 mm	437 mm	409 mm
	Y	16 mm	58 mm	61 mm	65 mm	67 mm	70 mm
	Z	-16 mm	23 mm	34 mm	56 mm	178 mm	104 mm
Center of Grille	X	---[1]	---[1]	588 mm	512 mm	---[1]	---[1]
	Y	---[1]	---[1]	52 mm	47 mm	---[1]	---[1]
	Z	---[1]	---[1]	69 mm	79 mm	---[1]	---[1]
Front of Hood	X	529 mm	591 mm	550 mm	518 mm	481 mm	417 mm
	Y	-21 mm	33 mm	34 mm	36 mm	35 mm	55 mm
	Z	75 mm	-28 mm	-24 mm	-10 mm	12 mm	98 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 points destroyed during impact.

Figure 10 Target Vehicle Intrusion Measurements

Door Opening Width

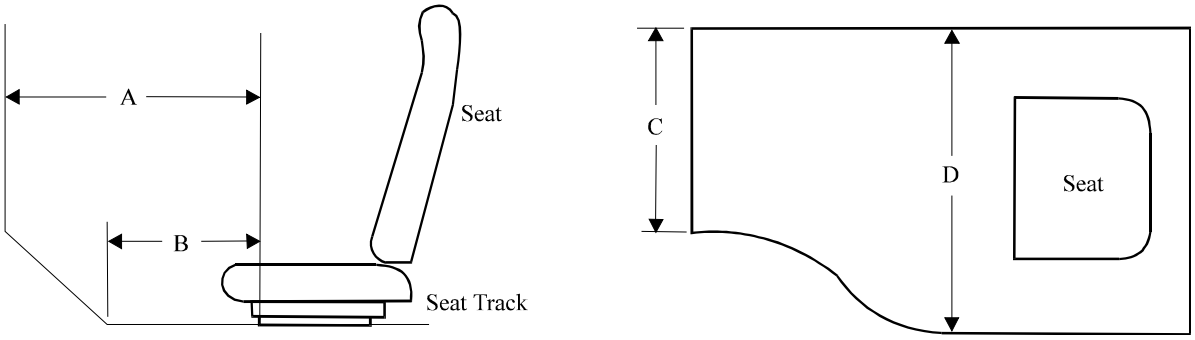


Units (mm)	Left			Right		
Measurement	1	2	3	1	2	3
Pre-Test	931 mm	1410 mm	990 mm	935 mm	1425 mm	986 mm
Post-Test	749 mm	1447 mm	1108 mm	749 mm	1436 mm	1098 mm
Difference	182 mm	-37 mm	-118 mm	186 mm	-11 mm	-112 mm

Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	2645 mm	2645 mm
Post-Test	2375 mm	2438 mm
Difference	270 mm	207 mm

Figure 11 Target Vehicle Intrusion Measurements

Static Footwell Deformation



Driver's Side

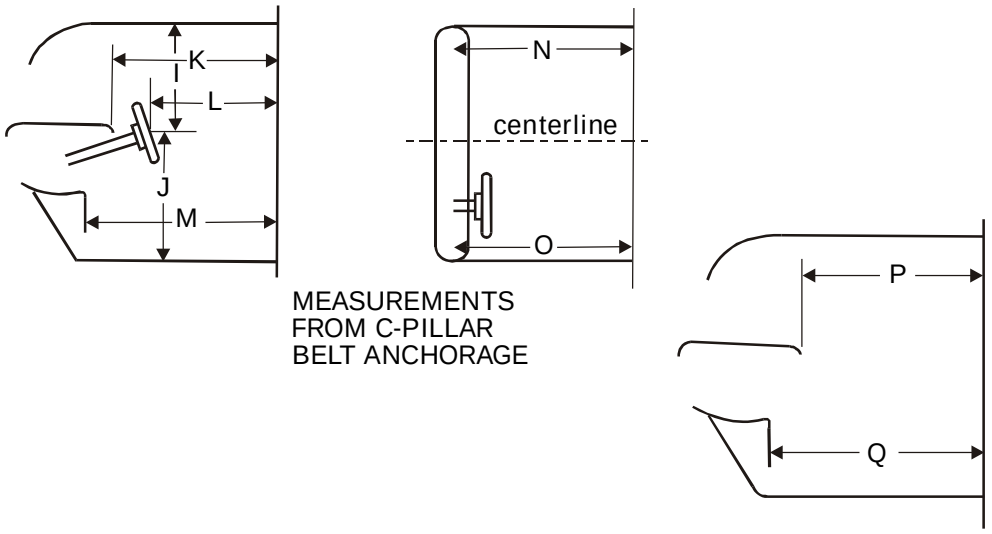
Measurement	Pre-Test	Post-Test	Difference
A	820 mm	635 mm	185 mm
B	592 mm	523 mm	69 mm
C	396 mm	386 mm	10 mm
D	355 mm	352 mm	3 mm

Passenger's Side

Measurement	Pre-Test	Post-Test	Difference
A	815 mm	633 mm	182 mm
B	596 mm	543 mm	53 mm
C	374 mm	357 mm	17 mm
D	402 mm	403 mm	-1 mm

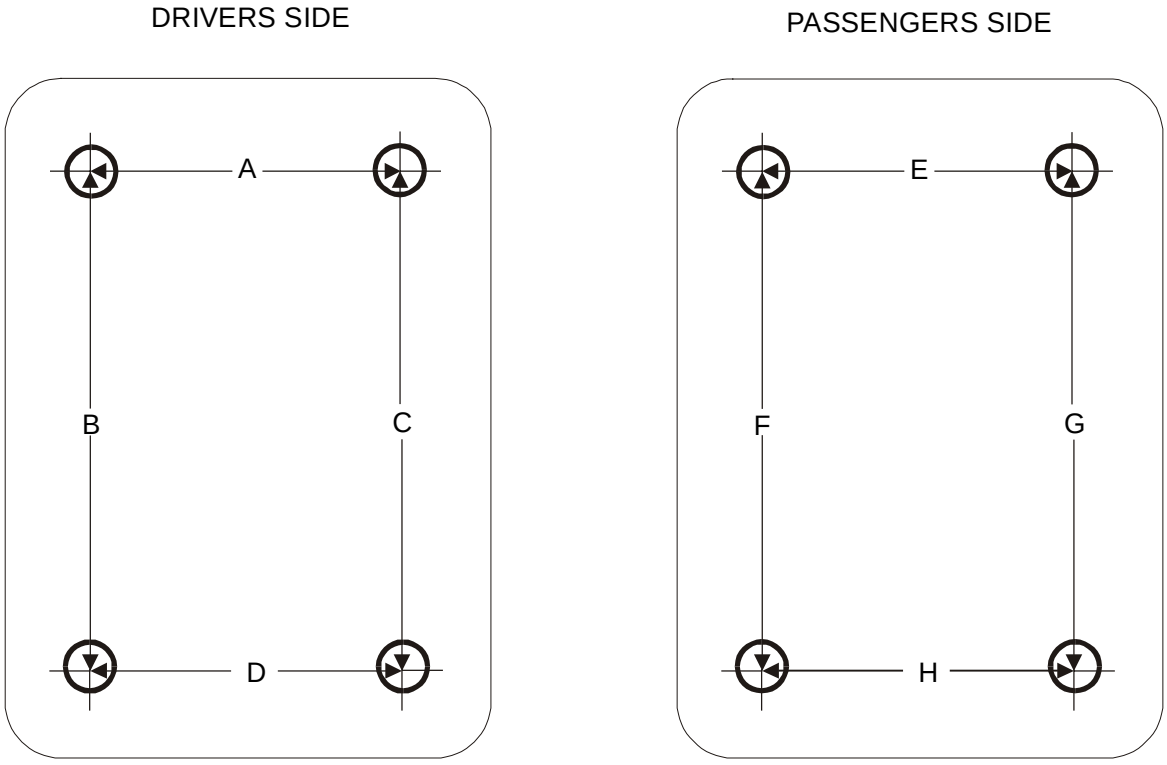
Figure 12 Target Vehicle Intrusion Measurements

Static Passenger Compartment Intrusion



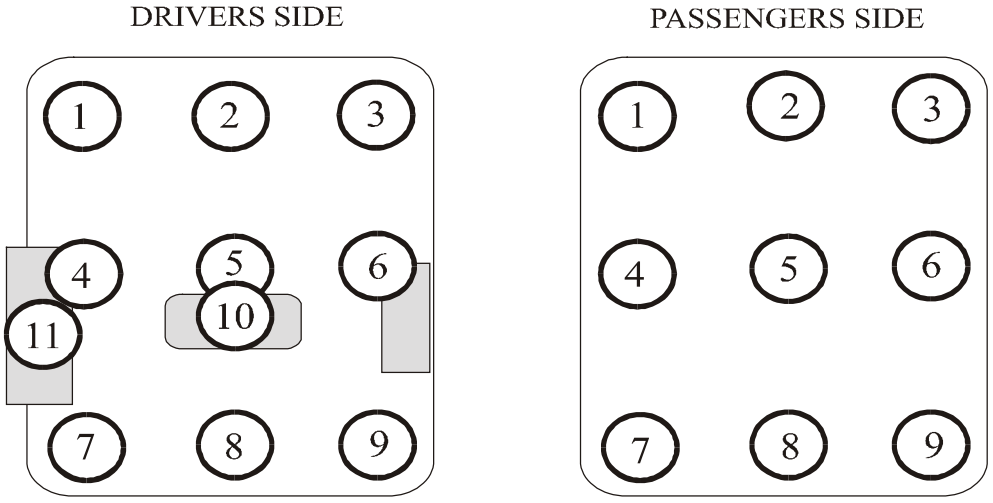
Measurement	Pre-Test	Post-Test	Difference
I	416 mm	530 mm	-114 mm
J	625 mm	712 mm	-87 mm
K (driver's side)	1531 mm	1385 mm	146 mm
L	1255 mm	1081 mm	174 mm
M (driver's side)	1605 mm	1409 mm	196 mm
N (passenger's side)	1402 mm	1239 mm	163 mm
O (driver's side)	1411 mm	1205 mm	206 mm
P (passenger's side)	1540 mm	1384 mm	156 mm
Q (passenger's side)	1602 mm	1350 mm	252 mm

Figure 13 Target Vehicle Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	396 mm	386 mm	10 mm
B	455 mm	410 mm	45 mm
C	445 mm	372 mm	73 mm
D	355 mm	352 mm	3 mm
E	374 mm	357 mm	17 mm
F	412 mm	316 mm	96 mm
G	432 mm	410 mm	22 mm
H	402 mm	403 mm	-1 mm

Figure 14 Target Vehicle Toeboard Measurements



Driver's Side Toeboard Measurements in Millimeters

Toeboard Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3221	-431	-298	2973	-437	-282	248	6	-16
2	3215	-324	-305	2969	-302	-275	246	-22	-30
3	3220	-199	-310	2967	-215	-260	253	16	-50
4	3154	-432	-225	2926	-440	-240	228	8	15
5	3153	-322	-220	2931	-302	-247	222	-20	27
6	3165	-204	-247	2978	-198	-245	187	-6	-2
7	3085	-429	-190	2944	-439	-146	141	10	-44
8	3091	-327	-195	2909	-304	-141	182	-23	-54
9	3100	-207	-187	2954	-180	-131	146	-27	-56
10	3094	-348	-390	2894	-340	-398	200	-8	8
11	3161	-576	-367	2961	-587	-359	200	11	-8

Passenger's Side Toeboard Measurements in Millimeters

Toeboard Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3221	241	-291	3041	248	-304	180	-7	13
2	3221	305	-288	3029	342	-304	192	-37	16
3	3225	435	-292	3012	439	-313	213	-4	21
4	3141	246	-250	2994	231	-219	157	15	-31
5	3145	307	-239	2970	326	-246	185	-19	7
6	3143	451	-233	2953	435	-245	200	16	12
7	3091	249	-214	2964	210	-169	127	39	-45
8	3085	331	-206	2947	312	-160	138	19	-46
9	3090	462	-195	2945	417	-176	145	45	-19

Reference: +X forward from rear bumper; +Y rightward from centerline; +Z downward from ground level

Table 16 Target Vehicle Intrusion of Upper Instrument Panel

Pre-Test	X	Y	Z
Driver Left Knee	2801	-487	-605
Driver Right Knee	2798	-227	-607
Passenger Left Knee	2853	234	-577
Passenger Right Knee	2857	444	-584

Post-Test	X	Y	Z
Driver Left Knee	2654	-466	-564
Driver Right Knee	2662	-214	-589
Passenger Left Knee	2755	242	-570
Passenger Right Knee	2726	445	-550

Difference	X	Y	Z
Driver Left Knee	147	-21	-41
Driver Right Knee	136	-13	-18
Passenger Left Knee	98	-8	-7
Passenger Right Knee	131	-1	-34

All measurements are in millimeters.

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

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

Table 17 Target Vehicle Insurance Institute Measurement Locations and Floor Pan Deformation Data

IIHS Measurement Location Data (in millimeters)

Meas.	X-Axis Measurement			Y-Axis Measurement			Z-Axis Measurement		
Loc.*	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
1	2527	2431	96	-362	-378	16	---[1]	-778	---[1]
2	2777	2664	113	-511	-505	-6	-628	-570	-58
3	2779	2645	134	-198	-190	-8	-636	-604	-32
4	3094	2894	200	-348	-340	-8	-390	-398	8
5	3154	2926	228	-432	-440	8	-225	-240	15
6	3153	2931	222	-322	-302	-20	-220	-247	27
7	3165	2978	187	-204	-198	-6	-247	-245	-2
8	3161	2961	200	-576	-587	11	-367	-359	-8
17	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
18	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]

Floor Pan Deformation Measurement Data (in millimeters)

Meas.	X-Axis Measurement			Y-Axis Measurement			Z-Axis Measurement		
Loc.**	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
P0	2404	2426	-22	-518	-585	67	-202	-250	48
P1	2989	2843	146	-539	-557	18	-170	-116	-54
P2	2986	2814	172	-369	-385	16	-170	-108	-62
P3	2987	2780	207	-231	-250	19	-170	-115	-55
P4	2833	2709	124	-555	-541	-14	-182	-56	-126
P5	2828	2681	169	-381	-385	4	-186	-84	-102
P6	2825	2659	166	-239	-245	6	-187	-79	-108
P7	2648	2557	91	-552	-528	-24	-173	-106	-67
P8	2654	2528	126	-393	-380	-13	-188	-69	-119
P9	2657	2526	131	-239	-235	-4	-173	-28	-145

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

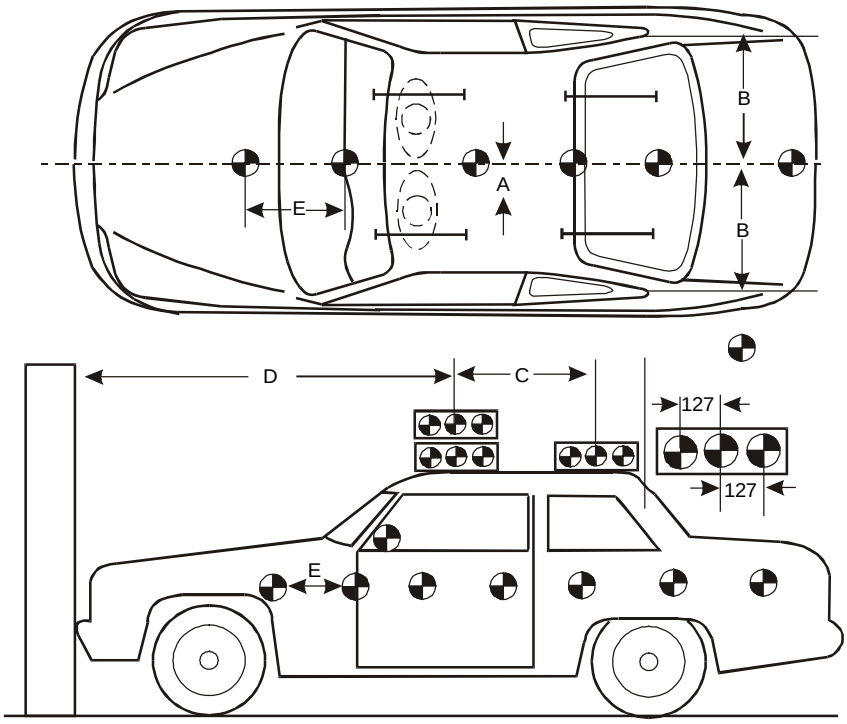
* Measurement Location Descriptions

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 Toepan Left - Taken 15 cm to the left of the brake pedal center on the same vertical plane on the vehicle toepan.
6 Toepan Center - Taken directly behind the brake pedal center on the same vertical plane on the vehicle.
7 Toepan Right - Taken 15 cm to the right of the brake pedal center on the same vertical plane on the vehicle toepan.
8 Left Footrest - Taken 25 cm to the left of the brake pedal center on the same vertical plane on the vehicle toepan.
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 spaced 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.

[1] Measurement not recorded.

Figure 15 Target Vehicle Reference Photo Target Locations



Measurement	Pre-Test
A	Left 333 mm Right 333 mm
B	Left N/A Right N/A
C	Left 610 mm Right 610 mm
D	N/A
E	300 mm[1]

[1] The first side target is placed 600 mm from front edge of bumper, and others are at 300 mm intervals.

Table 18 Bullet Vehicle Structural Measurements[1,2]

	Elements	Pre-Test
1	Total Length	5269
2	Total Width	2000
3	Bumper Top Height	758
4	Bumper Bottom Height	372
5	Longitudinal Member Top Height	455
6	Longitudinal Member Bottom Height	337
7	Distance Between Longitudinal Members	755
7´	Longitudinal Member Width	90
8	Engine Top Height	1132
9	Engine Bottom Height	229
10	Engine and Gearbox Width	782
11	Front Bumper - Engine Distance	777
12	Front Shock Absorber Fixing Height	749
13	Bonnet Leading Edge Height	1077
14	Front Shock Absorber Fixing Width	612
15	Front Bumper - Front Axle Distance	965
16	Front Axle - A Pillar Distance	706
17	A Pillar - B Pillar Distance	1062
18	B Pillar - Rear Axle Distance	1310
19	B Pillar - C Pillar Distance	1295
20	Roof Sill Bottom Height	1623
21	Roof Sill Top Height	1705
22	Floor Sill Bottom Height	325
23	Floor Sill Top Height	474

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] These structural measurements, except total length, total width, and front bumper to front axle, are taken from a different 2003 Lincoln Navigator. The vertical measurements from the ground are adjusted based on the test vehicle's pre-test attitude measurements.

Figure 16 Bullet Pre-Test And Post-Test Measurement Points

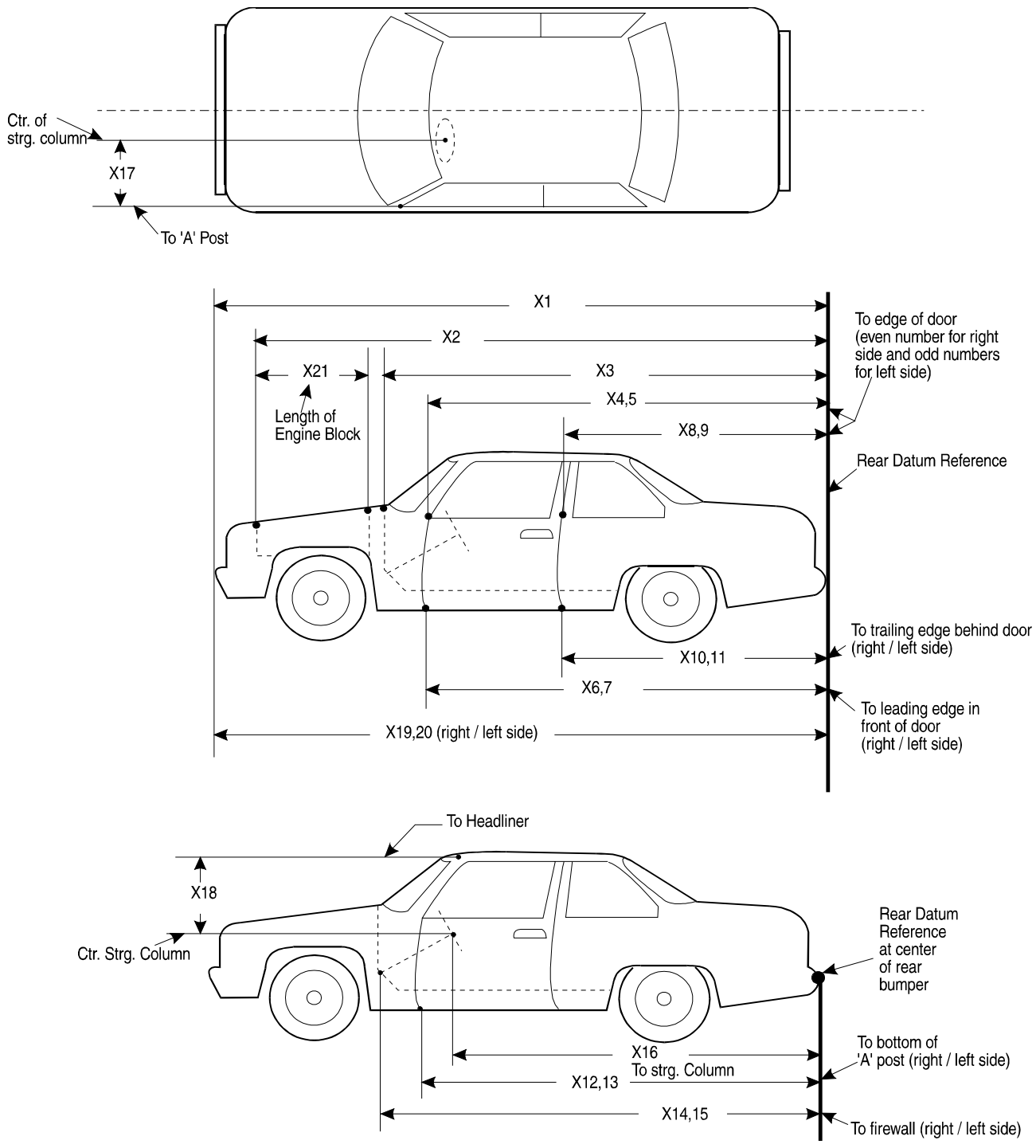


Table 19 Bullet Vehicle Impacted Measurements

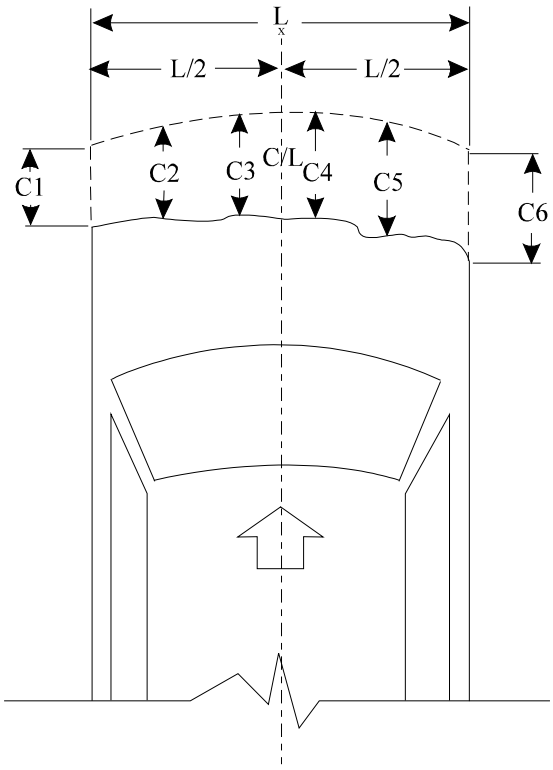
Test number: 021005

Vehicle year/make/model/body style: 2003/Lincoln/Navigator/SUV

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5269	4764	505
X2	Rear Surface of Vehicle to Front of Engine Block	4405	4290	115
X3	Rear Surface of Vehicle to Firewall	4060	3951	109
X4	Rear Surface of Veh. to Upper Leading Edge of Right Door	3664	3666	-2
X5	Rear Surface of Veh. to Upper Leading Edge of Left Door	3664	3662	2
X6	Rear Surface of Veh. to Lower Leading Edge of Right Door	3595	3587	8
X7	Rear Surface of Veh. to Lower Leading Edge of Left Door	3605	3592	13
X8	Rear Surface of Veh. to Upper Trailing Edge of Right Door	2577	2581	-4
X9	Rear Surface of Veh. to Upper Trailing Edge of Left Door	2577	2578	-1
X10	Rear Surface of Veh. to Lower Trailing Edge of Right Door	2569	2562	7
X11	Rear Surface of Veh. to Lower Trailing Edge of Left Door	2577	2561	16
X12	Rear Surface of Veh. to Bottom of " A " Post on Right Side	3630	3635	-5
X13	Rear Surface of Veh. to Bottom of " A " Post on Left Side	3638	3637	1
X14	Rear Surface of Vehicle to Firewall - Right Side	4052	4065	-13
X15	Rear Surface of Vehicle to Firewall - Left Side	4058	4036	22
X16	Rear Surface of Vehicle to Steering Wheel Center	3203	3188	15
X17	Center of Steering Column to " A " Post	315	280	35
X18	Center of Steering Column to Headliner	444	445	-1
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5119	4819	300
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5127	4761	366
X21	Length of Engine Block	500	500	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3389	3400	-11
CD	Rear Surface of Vehicle to Center of Dash Panel	3453	3455	-2
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3394	3397	-3

All distance measurements are in millimeters.

Figure 17 Bullet Vehicle Crush

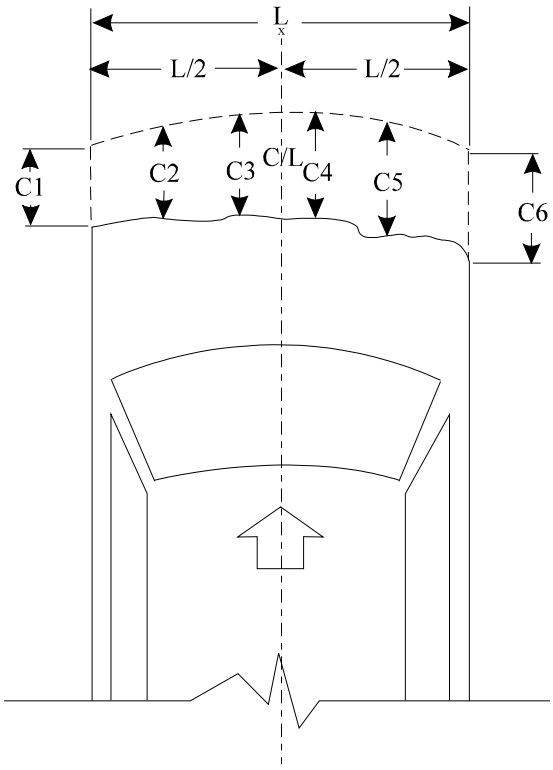


Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 2003 Lincoln Navigator
Measured with bumper fascia:

Location	Pre-test	Post-test	Difference
L	1525 mm		
C1	5127 mm	4761 mm	366 mm
C2	5224 mm	4830 mm	394 mm
C3	5269 mm	4764 mm	505 mm
C4	5269 mm	4794 mm	475 mm
C5	5234 mm	4840 mm	394 mm
C6	5119 mm	4819 mm	300 mm
CL	5269 mm	4764 mm	505 mm

Figure 17 Bullet 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 Lincoln Navigator
Measured to bumper beam without bumper fascia:

Location	Pre-test	Post-test	Difference
L[1]	1420 mm		
C1[1]	5084 mm	4729 mm	355 mm
C2	5204 mm	4781 mm	423 mm
C3	5244 mm	4819 mm	425 mm
C4	5244 mm	4856 mm	388 mm
C5	5204 mm	4883 mm	321 mm
C6[1]	5094 mm	4821 mm	273 mm
CL	5244 mm	4834 mm	410 mm

[1] C1 and C6 measurement points moved inboard to catch bumper beam for without fascia measurements.

Table 20 Bullet 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	5101 mm	5224 mm	5269 mm	5269 mm	5234 mm	5109 mm
	Y	-801 mm	-448 mm	-147 mm	150 mm	455 mm	801 mm
	Z	-565 mm	-605 mm	-595 mm	-600 mm	-609 mm	-562 mm
Top of Front Bumper	X	5075 mm	5191 mm	5236 mm	5236 mm	5202 mm	5094 mm
	Y	-748 mm	-444 mm	-146 mm	150 mm	452 mm	762 mm
	Z	-705 mm	-710 mm	-700 mm	-702 mm	-711 mm	-708 mm
Center of Grille	X	4979 mm	5121 mm	5172 mm	5169 mm	5134 mm	5007 mm
	Y	-773 mm	-444 mm	-147 mm	144 mm	445 mm	768 mm
	Z	-895 mm	-905 mm	-905 mm	-913 mm	-921 mm	-914 mm
Front of Hood	X	4916 mm	5067 mm	5102 mm	5099 mm	5079 mm	4938 mm
	Y	-805 mm	-440 mm	-140 mm	142 mm	444 mm	804 mm
	Z	-1030 mm	-1090 mm	-1090 mm	-1079 mm	-1075 mm	-1026 mm

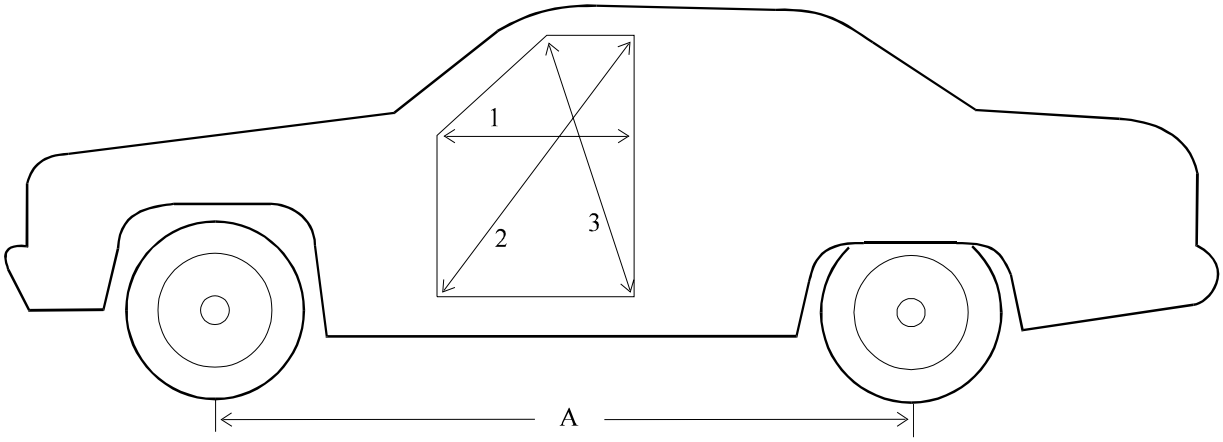
		Post-Test Profile					
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper	X	4791 mm	4842 mm	4749 mm	4784 mm	4830 mm	4829 mm
	Y	-760 mm	-422 mm	-135 mm	150 mm	454 mm	786 mm
	Z	-514 mm	-588 mm	-670 mm	-638 mm	-605 mm	-523 mm
Top of Front Bumper	X	4754 mm	4838 mm	4829 mm	4844 mm	4875 mm	4839 mm
	Y	-735 mm	-443 mm	-137 mm	168 mm	474 mm	770 mm
	Z	-650 mm	-695 mm	-750 mm	-740 mm	-700 mm	-665 mm
Center of Grille	X	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
	Y	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
	Z	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
Front of Hood	X	4939 mm	5079 mm	5113 mm	5111 mm	5083 mm	4950 mm
	Y	-780 mm	-437 mm	-139 mm	143 mm	443 mm	787 mm
	Z	-995 mm	-1046 mm	-1068 mm	-1072 mm	-1070 mm	-1028 mm

		Difference					
		Vehicle Left			Vehicle Right		
		Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Bottom of Front Bumper	X	310 mm	382 mm	520 mm	485 mm	404 mm	280 mm
	Y	-41 mm	-26 mm	-12 mm	0 mm	1 mm	15 mm
	Z	-51 mm	-17 mm	75 mm	38 mm	-4 mm	-39 mm
Top of Front Bumper	X	321 mm	353 mm	407 mm	392 mm	372 mm	255 mm
	Y	-13 mm	-1 mm	-9 mm	-18 mm	-22 mm	-8 mm
	Z	-55 mm	-15 mm	50 mm	38 mm	-11 mm	-43 mm
Center of Grille	X	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
	Y	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
	Z	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]
Front of Hood	X	-23 mm	-12 mm	-11 mm	-12 mm	-4 mm	-12 mm
	Y	-25 mm	-3 mm	-1 mm	-1 mm	1 mm	17 mm
	Z	-35 mm	-44 mm	-22 mm	-7 mm	-5 mm	2 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 points destroyed during impact.

Figure 18 Bullet Vehicle Intrusion Measurements
Door Opening Width

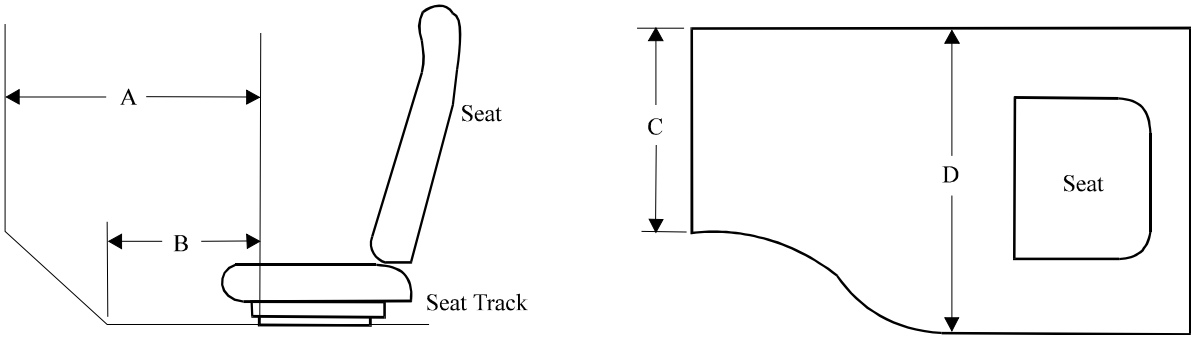


Units (mm)	Left			Right		
Measurement	1	2	3	1	2	3
Pre-Test	1030 mm	1575 mm	1248 mm	1006 mm	1564 mm	1242 mm
Post-Test	1031 mm	1575 mm	1248 mm	1003 mm	1563 mm	1240 mm
Difference	-1 mm	0 mm	0 mm	3 mm	1 mm	2 mm

Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	3030 mm	3030 mm
Post-Test	3024 mm	3020 mm
Difference	6 mm	10 mm

Figure 19 Bullet Vehicle Intrusion Measurements

Static Footwell Deformation



Driver's Side

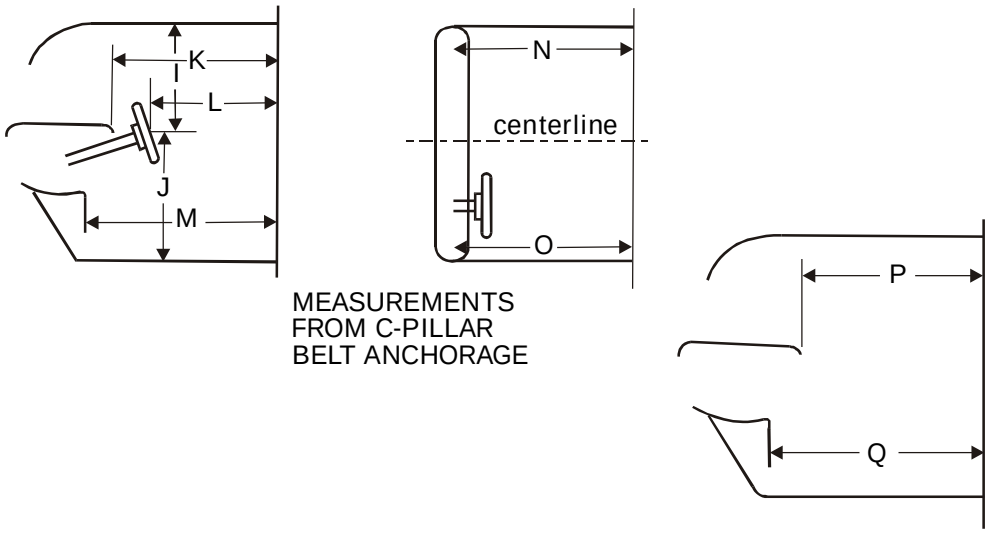
Measurement	Pre-Test	Post-Test	Difference
A	745 mm	745 mm	0 mm
B	580 mm	580 mm	0 mm
C	460 mm	460 mm	0 mm
D	420 mm	420 mm	0 mm

Passenger's Side

Measurement	Pre-Test	Post-Test	Difference
A	790 mm	802 mm	-12 mm
B	585 mm	574 mm	11 mm
C	400 mm	400 mm	0 mm
D	435 mm	435 mm	0 mm

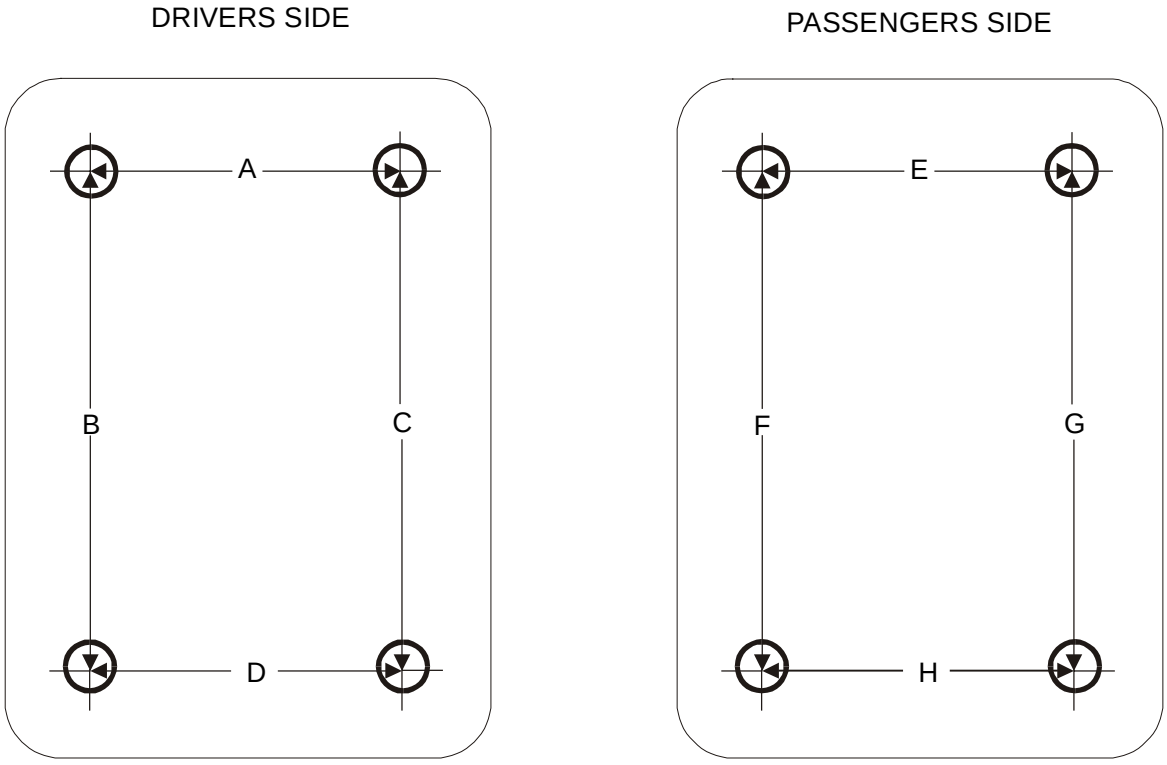
Figure 20 Bullet Vehicle Intrusion Measurements

Static Passenger Compartment Intrusion



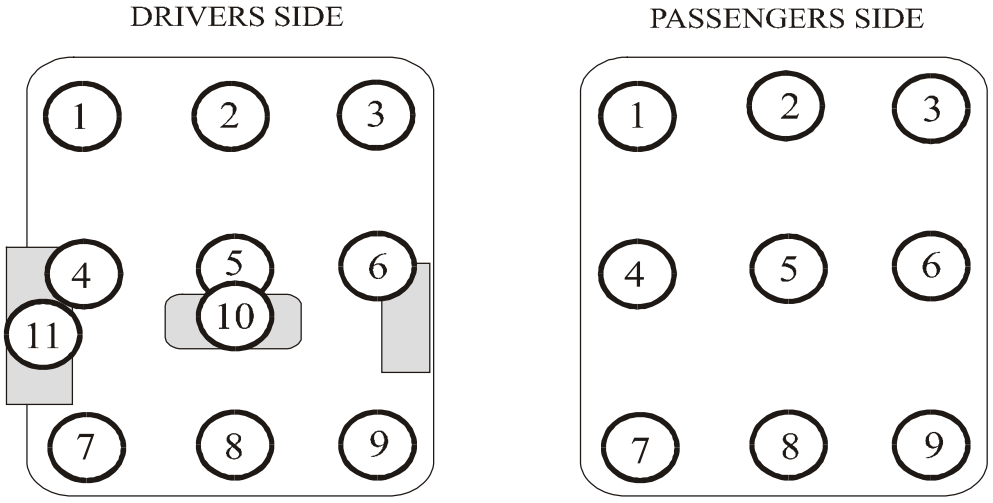
Measurement	Pre-Test	Post-Test	Difference
I	440 mm	433 mm	7 mm
J	750 mm	761 mm	-11 mm
K (driver's side)	1547 mm	1560 mm	-13 mm
L	1325 mm	1372 mm	-47 mm
M (driver's side)	1612 mm	1610 mm	2 mm
N (passenger's side)	1481 mm	1500 mm	-19 mm
O (driver's side)	1497 mm	1505 mm	-8 mm
P (passenger's side)	1542 mm	1552 mm	-10 mm
Q (passenger's side)	1625 mm	1634 mm	-9 mm

Figure 21 Bullet Vehicle Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	460 mm	460 mm	0 mm
B	409 mm	409 mm	0 mm
C	380 mm	380 mm	0 mm
D	420 mm	420 mm	0 mm
E	400 mm	400 mm	0 mm
F	375 mm	375 mm	0 mm
G	395 mm	395 mm	0 mm
H	435 mm	435 mm	0 mm

Figure 22 Bullet Vehicle Toeboard Measurements



Driver's Side Toeboard Measurements in Millimeters

Toeboard Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3806	-660	-551	3806	-660	-538	0	0	-13
2	3792	-445	-547	3792	-445	-540	0	0	-7
3	3782	-245	-538	3782	-245	-540	0	0	2
4	3707	-665	-499	3707	-665	-487	0	0	-12
5	3692	-445	-494	3692	-445	-500	0	0	6
6	3686	-235	-495	3686	-235	-485	0	0	-10
7	3634	-675	-462	3634	-675	-472	0	0	10
8	3625	-435	-469	3625	-435	-470	0	0	1
9	3618	-220	-471	3618	-220	-471	0	0	0
10	3644	-440	-685	3663	-444	-668	-19	4	-17
11	3707	-665	-499	3707	-665	-487	0	0	-12

Passenger's Side Toeboard Measurements in Millimeters

Toeboard Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3769	280	-547	3771	281	-540	-2	-1	-7
2	3789	490	-553	3787	481	-545	2	9	-8
3	3817	643	-555	3817	649	-565	0	-6	10
4	3706	285	-521	3707	284	-500	-1	1	-21
5	3719	495	-517	3715	484	-515	4	11	-2
6	3749	645	-518	3746	657	-515	3	-12	-3
7	3627	280	-469	3629	285	-482	-2	-5	13
8	3635	500	-476	3633	495	-490	2	5	14
9	3650	655	-473	3645	680	-495	5	-25	22

Reference: +X forward from rear bumper; +Y rightward from centerline; +Z downward from ground level

Table 21 Bullet Vehicle Intrusion of Upper Instrument Panel

Pre-Test	X	Y	Z
Driver Left Knee	3417	-540	-972
Driver Right Knee	3404	-340	-978
Passenger Left Knee	3430	375	-981
Passenger Right Knee	3417	580	-972

Post-Test	X	Y	Z
Driver Left Knee	3421	-530	-957
Driver Right Knee	3406	-340	-976
Passenger Left Knee	3430	367	-968
Passenger Right Knee	3418	574	-977

Difference	X	Y	Z
Driver Left Knee	-4	-10	-15
Driver Right Knee	-2	0	-2
Passenger Left Knee	0	8	-13
Passenger Right Knee	-1	6	5

All measurements are in millimeters.

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

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

Table 22 Bullet Vehicle Insurance Institute Measurement Locations and Floor Pan Deformation Data

IIHS Measurement Location Data (in millimeters)

Meas.	X-Axis Measurement			Y-Axis Measurement			Z-Axis Measurement		
Loc.*	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
1	3203	3188	15	-440	-428	-12	-1168	-1220	52
2	3461	3464	-3	-565	-565	0	-914	-905	-9
3	3470	3472	-2	-305	-291	-14	-901	-891	-10
4	3644	3663	-19	-440	-444	4	-685	-668	-17
5	3707	3707	0	-665	-665	0	-499	-487	-12
6	3692	3692	0	-445	-445	0	-494	-500	6
7	3686	3686	0	-235	-235	0	-495	-485	-10
8	3707	3707	0	-665	-665	0	-499	--487	-12
17	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	--[1]	---[1]
18	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]	---[1]

Floor Pan Deformation Measurement Data (in millimeters)

Meas.	X-Axis Measurement			Y-Axis Measurement			Z-Axis Measurement		
Loc.**	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
P0	3100	3100	0	-625	-625	0	-517	-515	-2
P1	3591	3591	0	-675	-675	0	-460	-456	-4
P2	3578	3578	0	-440	-441	-1	-471	461	-10
P3	3566	3566	0	-228	-228	0	-484	-461	-23
P4	3442	3442	0	-680	-680	0	-452	-456	4
P5	3449	3444	5	-430	-430	0	-464	-461	-3
P6	3443	3447	-3	-218	-218	0	-487	-480	-7
P7	3234	3234	0	-685	-685	0	-472	-454	-18
P8	3249	3245	4	-440	-440	0	-459	-451	-8
P9	3236	3234	2	-245	-245	0	-454	-453	-1

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

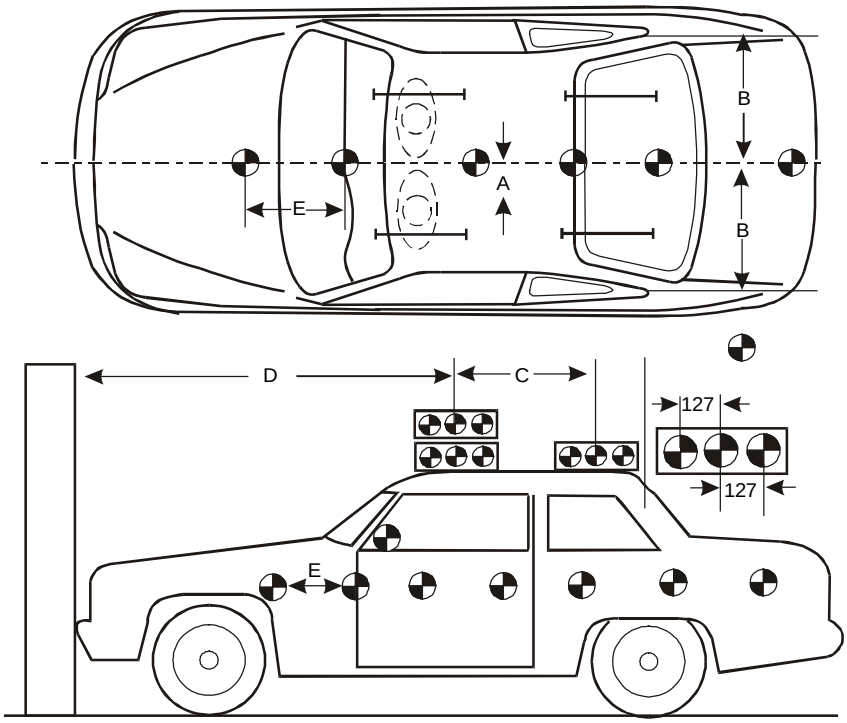
* Measurement Location Descriptions

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 Toepan Left - Taken 15 cm to the left of the brake pedal center on the same vertical plane on the vehicle toepan.
6 Toepan Center - Taken directly behind the brake pedal center on the same vertical plane on the vehicle.
7 Toepan Right - Taken 15 cm to the right of the brake pedal center on the same vertical plane on the vehicle toepan.
8 Left Footrest - Taken 25 cm to the left of the brake pedal center on the same vertical plane on the vehicle toepan.
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 spaced 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.

[1] Measurement not taken.

Figure 23 Bullet Vehicle Reference Photo Target Locations



Measurement	Pre-Test
A	Left 490 mm Right 490 mm
B	Left N/A Right N/A
C	Left N/A Right N/A
D	N/A
E	300 mm[1]

[1] The first side target is placed 600 mm from front edge of bumper, and others are at 300 mm intervals.

Figure 24 Camera Positions

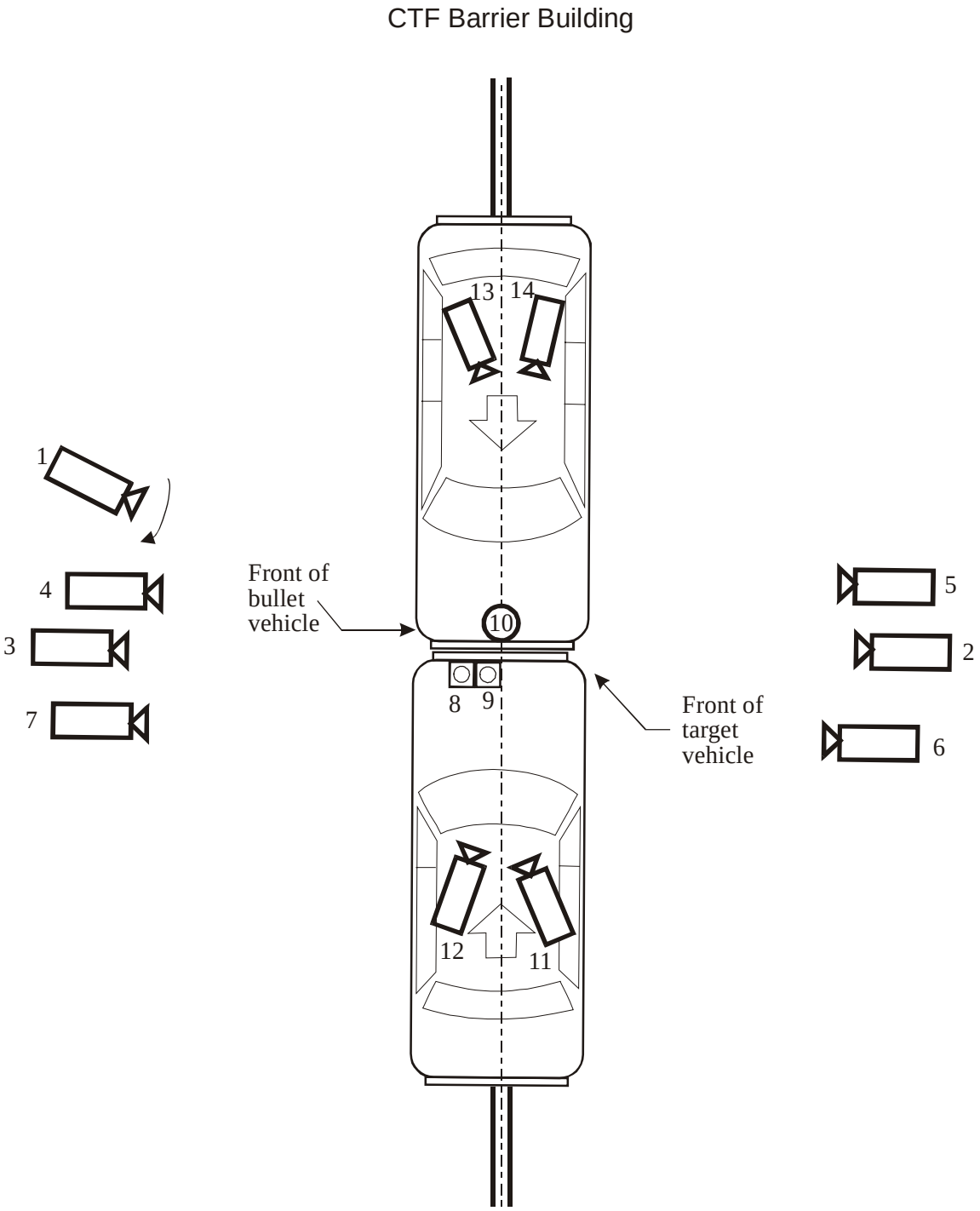


Table 23 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of camera data
1	Panning	Bolex	Zoom	24	Vehicle dynamics
2	Right wide (reference to target vehicle)	Photosonic	13	---[1]	Vehicle dynamics
3	Left wide (reference to target vehicle)	Photosonic	13	---[1]	Vehicle dynamics
4	Bullet vehicle right medium	Digital HG	Zoom	---[2]	Vehicle dynamics
5	Bullet vehicle left medium	Photosonic	N/A	---[2]	Vehicle dynamics
6	Target vehicle right medium	Digital HG	Zoom	---[2]	Vehicle dynamics
7	Target vehicle left medium	Photosonic	N/A	997	Vehicle dynamics
8	Overhead wide	Photosonic	N/A	---[1]	Vehicle dynamics
9	Overhead tight	Photosonic	25	---[2]	Vehicle crush
10	Pit-target and bullet	Photosonic	13	---[3]	Vehicle crush
11	Onboard target vehicle driver	Digital HG	8	1000	Dummy kinematics
12	Onboard target vehicle passenger	Digital HG	8	---[2]	Dummy kinematics
13	Onboard bullet vehicle driver	Digital HG	8	1000	Dummy kinematics
14	Onboard bullet vehicle passenger	Digital HG	8	1000	Dummy kinematics

[1] Ran too slow to time.
[2] Did not run or unable to download camera.
[3] No film LEDs, unable to time.

Appendix A

Photographs



Figure A-1 Pre-Test Car to Car Overall - View 1



Figure A-2 Post-Test Car to Car Overall - View 1



Figure A-3 Pre-Test Car to Car Overall - View 2



Figure A-4 Post-Test Car to Car Overall - View 2



Figure A-5 Pre-Test Car to Car Close-Up – View 1



Figure A-6 Post-Test Car to Car Close-Up - View 1



Figure A-7 Pre-Test Car to Car Close-Up - View 2



Figure A-8 Post-Test Car to Car Close-Up - View 2

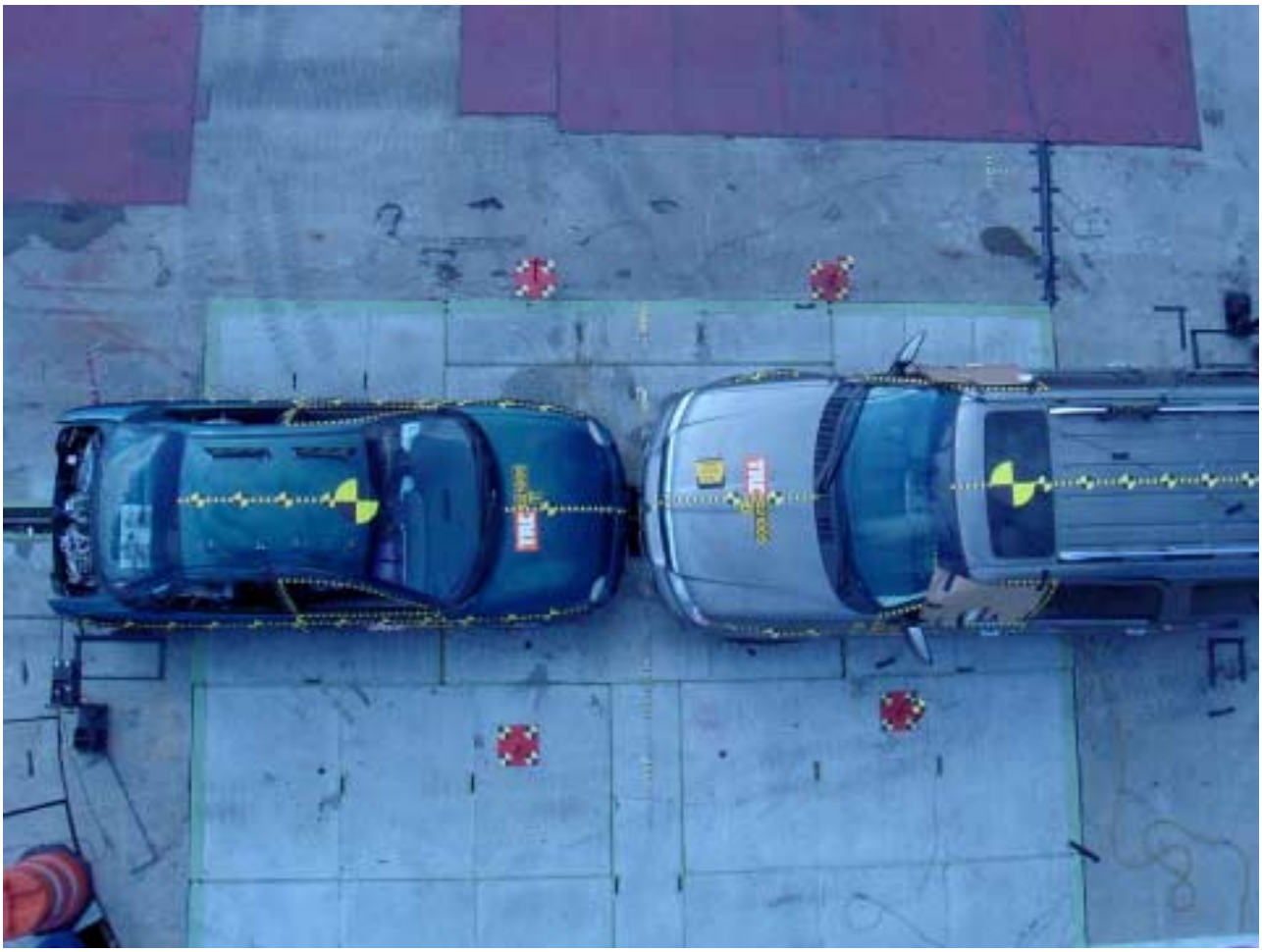


Figure A-9 Pre-Test Car to Car Overhead Wide View



Figure A-10 Pre-Test Car to Car Overhead Wide View

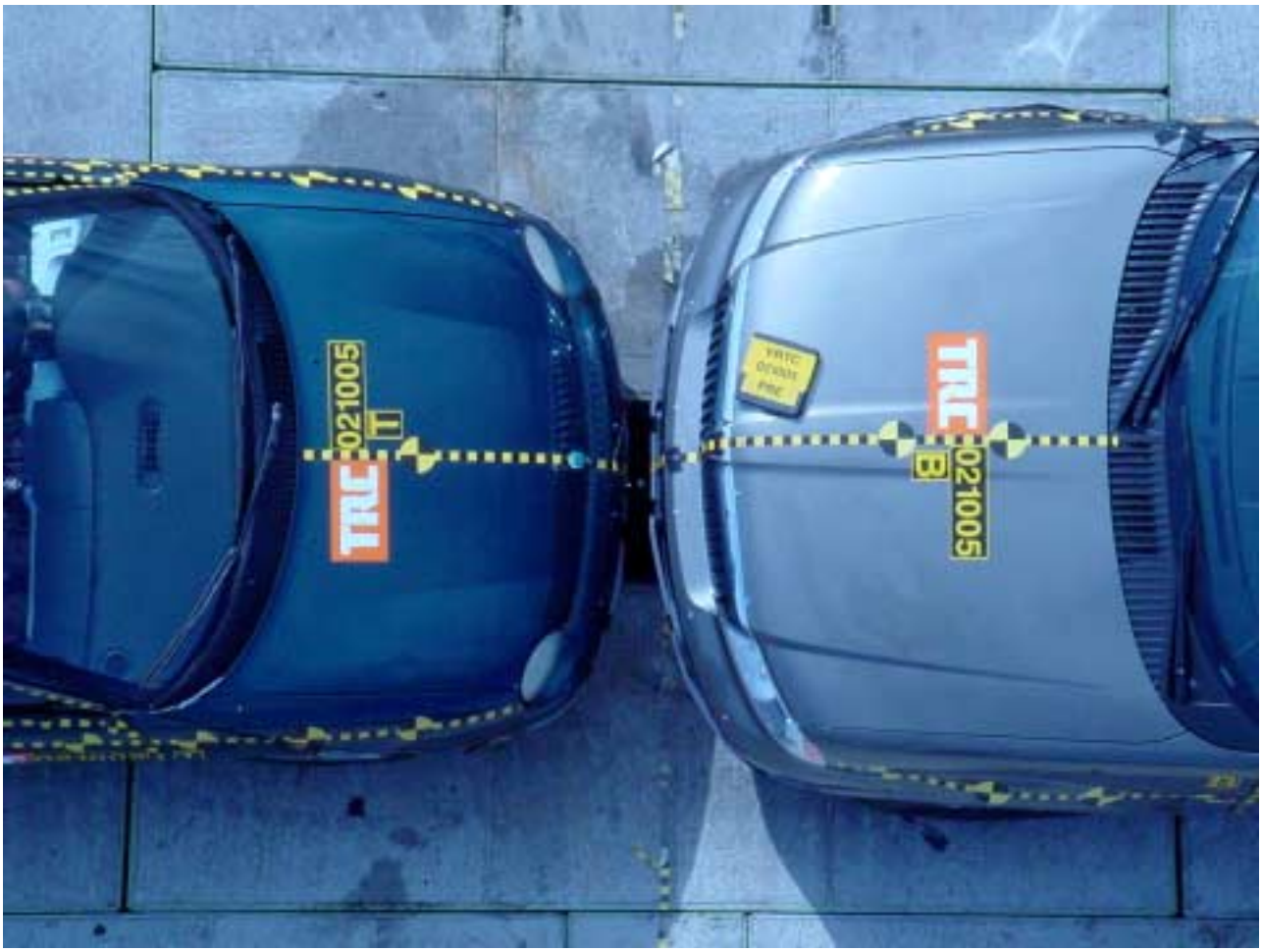


Figure A-11 Pre-Test Car to Car Overhead Close-Up View



Figure A-12 Pre-Test Car to Car Overhead Close-Up View



Figure A-13 Pre-Test Target Vehicle Front View



Figure A-14 Post-Test Target Vehicle Front View



Figure A-15 Pre-Test Target Vehicle Left Front View



Figure A-16 Post-Test Target Vehicle Left Front View



Figure A-17 Pre-Test Target Vehicle Left Side View



Figure A-18 Post-Test Target Vehicle Left Side View



Figure A-19 Pre-Test Target Vehicle Rear View



Figure A-20 Post-Test Target Vehicle Rear View



Figure A-21 Pre-Test Target Vehicle Right Side View



Figure A-22 Post-Test Target Vehicle Right Side View



Figure A-23 Pre-Test Target Vehicle Right Front View



Figure A-24 Post-Test Target Vehicle Right Front View



Figure A-25 Pre-Test Target Vehicle Engine Compartment View



Figure A-26 Post-Test Target Vehicle Engine Compartment View



Figure A-27 Pre-Test Target Vehicle Front Underbody View

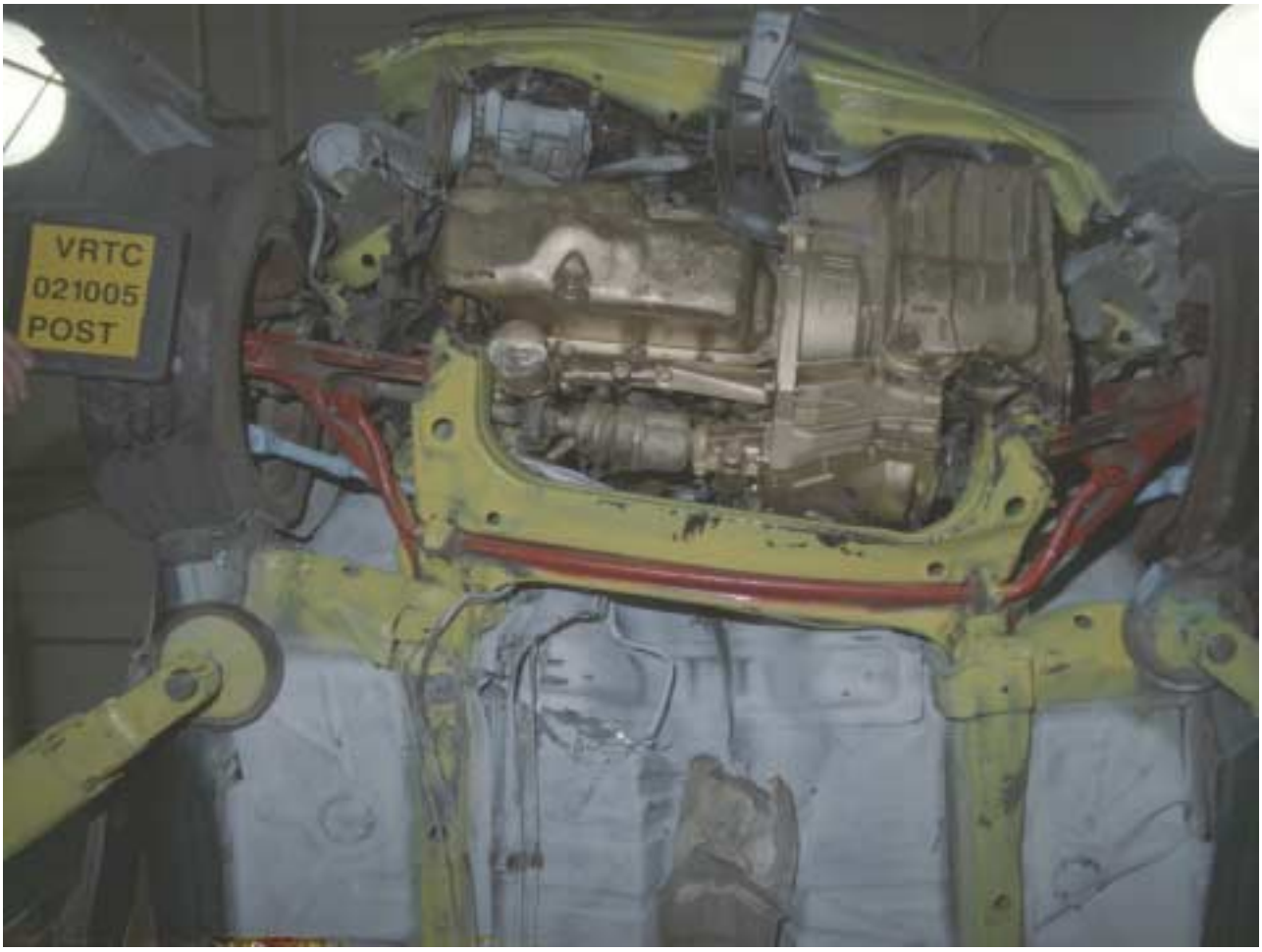


Figure A-28 Post-Test Target Vehicle Front Underbody View



Figure A-29 Pre-Test Target Vehicle Mid Underbody View



Figure A-30 Post-Test Target Vehicle Mid Underbody View



Figure A-31 Pre-Test Target Vehicle Rear Underbody View



Figure A-32 Post-Test Target Vehicle Rear Underbody View



Figure A-33 Pre-Test Bullet Vehicle Front View



Figure A-34 Post-Test Bullet Vehicle Front View



Figure A-35 Pre-Test Bullet Vehicle Left Front View



Figure A-36 Post-Test Bullet Vehicle Left Front View



Figure A-37 Pre-Test Bullet Vehicle Left Side View



Figure A-38 Post-Test Bullet Vehicle Left Side View



Figure A-39 Pre-Test Bullet Vehicle Rear View



Figure A-40 Post-Test Bullet Vehicle Rear View



Figure A-41 Pre-Test Bullet Vehicle Right Side View



Figure A-42 Post-Test Bullet Vehicle Right Side View



Figure A-43 Pre-Test Bullet Vehicle Right Front View



Figure A-44 Post-Test Bullet Vehicle Right Front View



Figure A-45 Pre-Test Bullet Vehicle Engine Compartment View



Figure A-46 Post-Test Bullet Vehicle Engine Compartment View

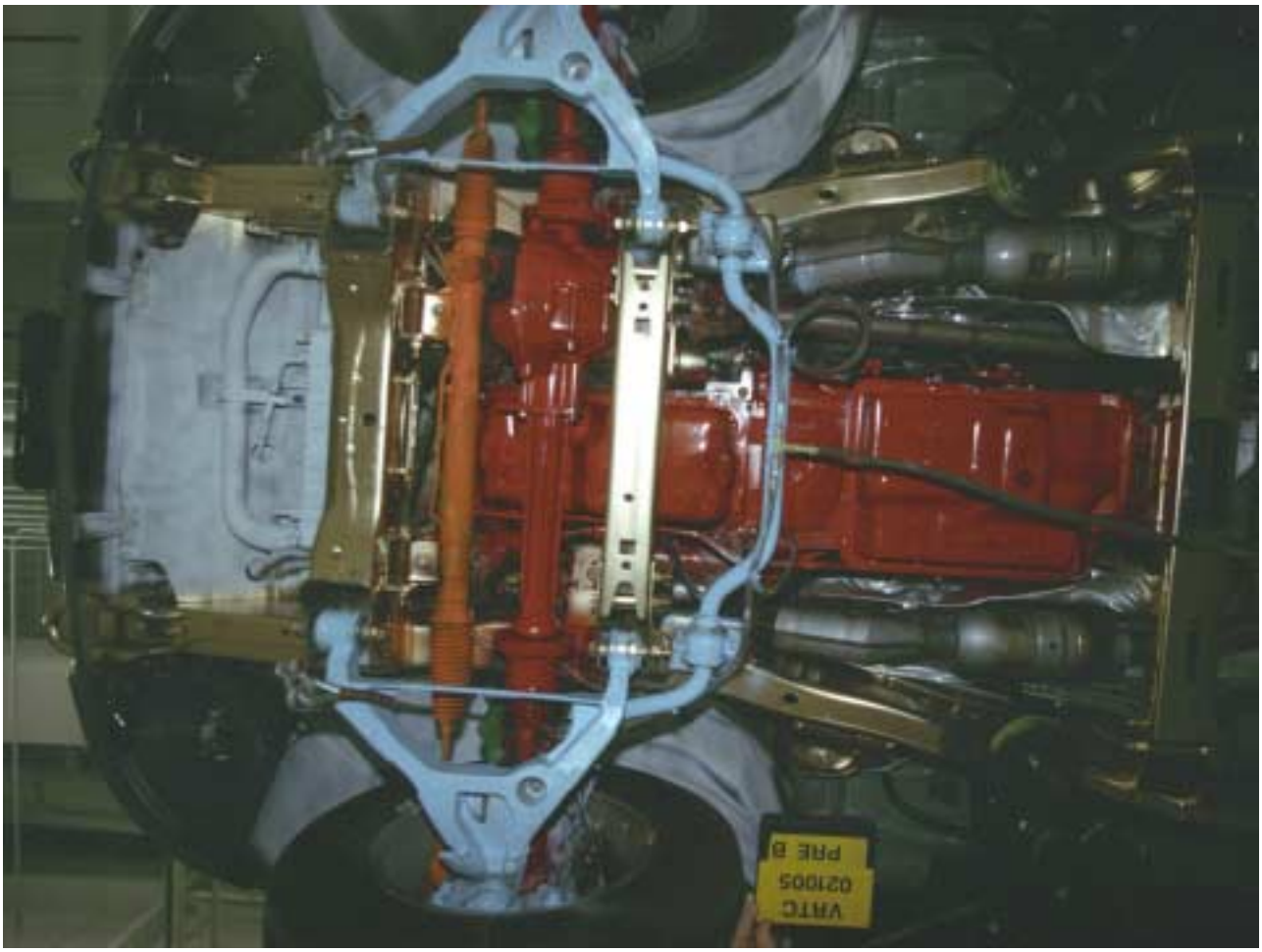


Figure A-47 Pre-Test Bullet Vehicle Front Underbody View

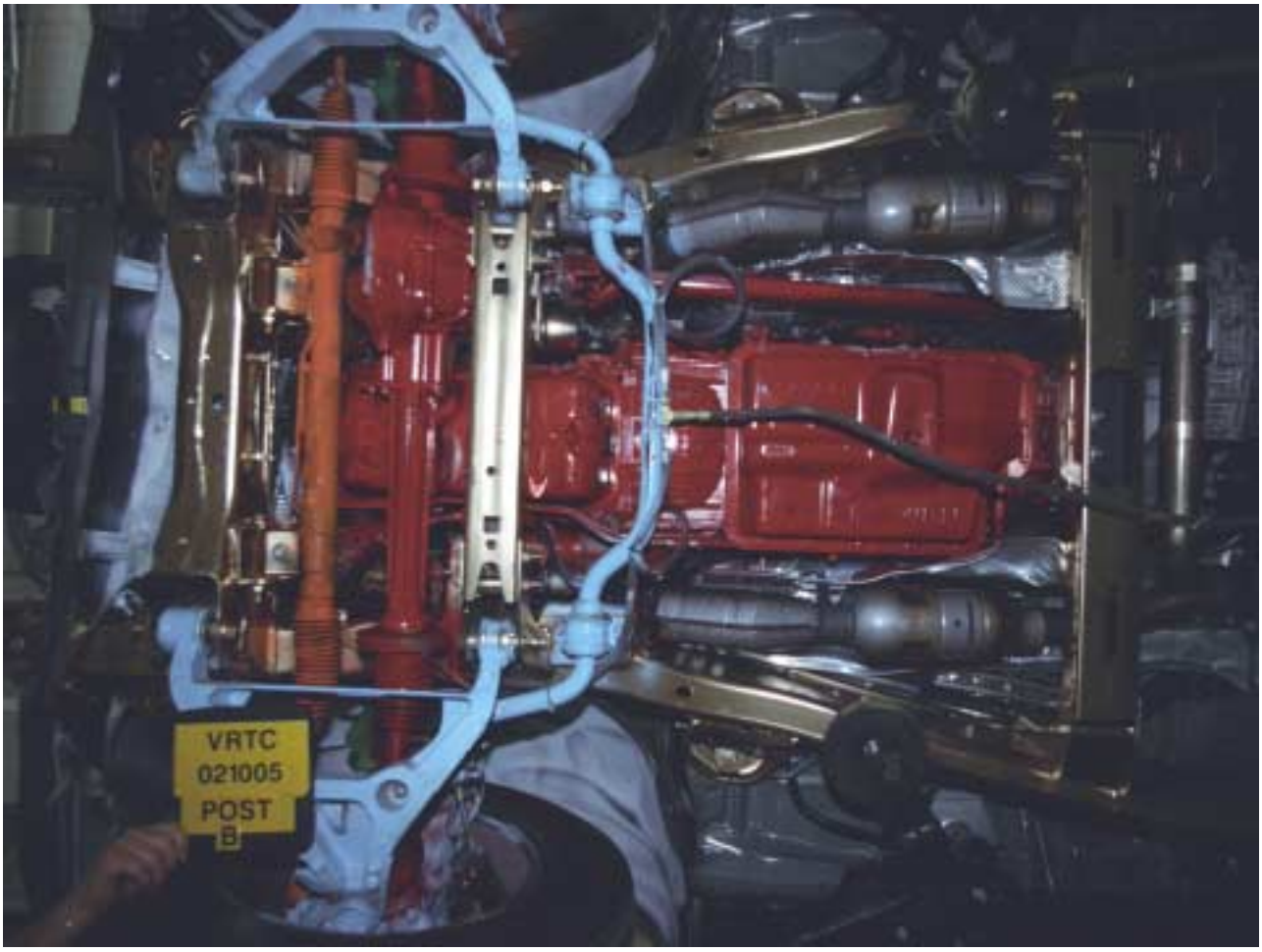


Figure A-48 Post-Test Bullet Vehicle Front Underbody View



Figure A-49 Pre-Test Bullet Vehicle Mid Underbody View



Figure A-50 Post-Test Bullet Vehicle Mid Underbody View

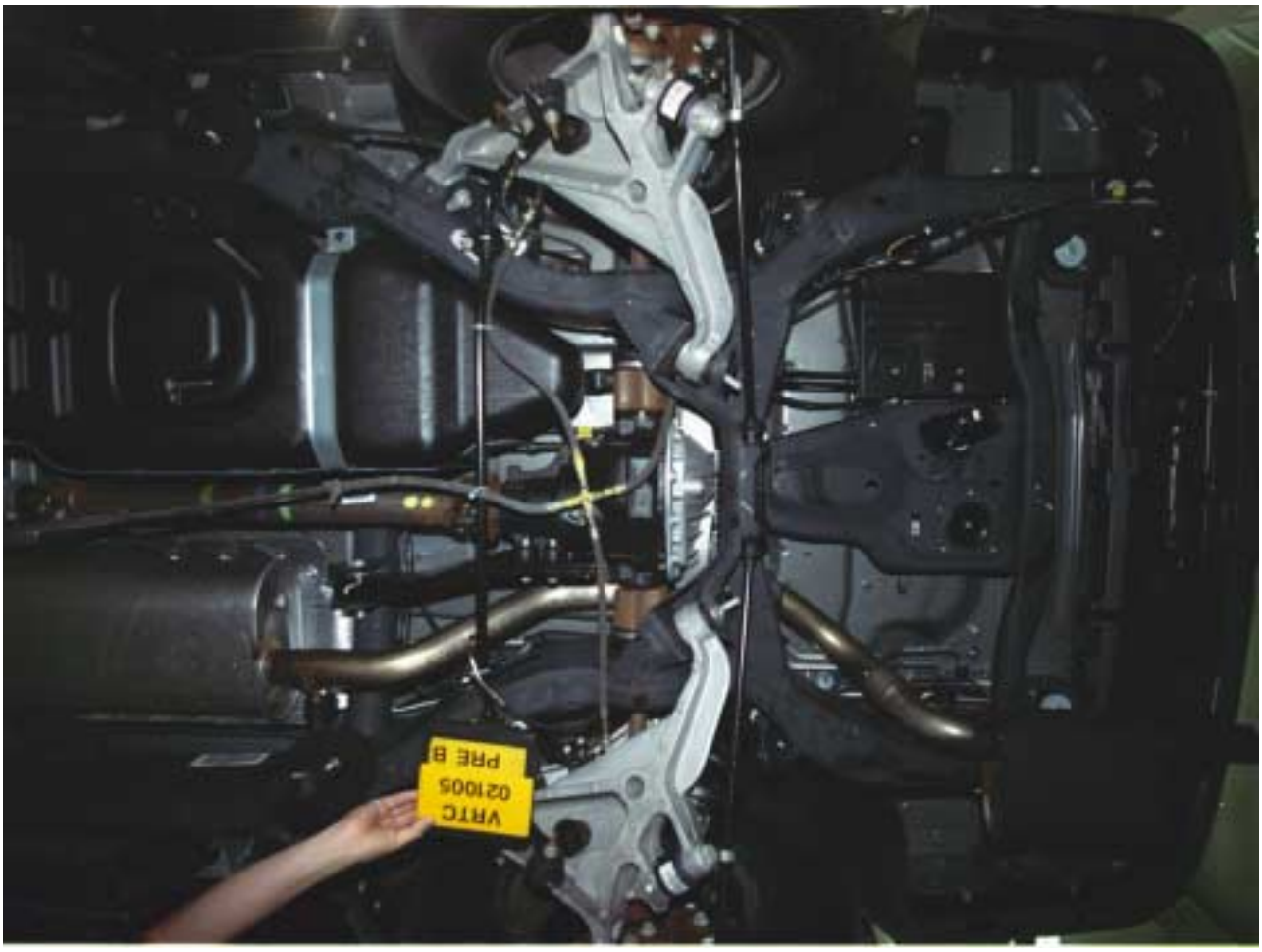


Figure A-51 Pre-Test Bullet Vehicle Rear Underbody View

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Figure A-52 Pre-Test Target Vehicle Driver and Passenger Dummies through Windshield View



Figure A-53 Post-Test Target Vehicle Driver and Passenger Dummies through Windshield View



Figure A-54 Pre-Test Target Vehicle Driver Dummy - View 1



Figure A-55 Post-Test Target Vehicle Driver Dummy - View 1



Figure A-56 Pre-Test Target Vehicle Driver Dummy - View 2



Figure A-57 Post-Test Target Vehicle Driver Dummy - View 2



Figure A-58 Pre-Test Target Vehicle Driver Dummy - View 3



Figure A-59 Post-Test Target Vehicle Driver Dummy - View 3



Figure A-60 Pre-Test Target Vehicle Driver Dummy - View 4



Figure A-61 Post-Test Target Vehicle Driver Dummy - View 4



Figure A-62 Pre-Test Target Vehicle Passenger Dummy - View 1



Figure A-63 Post-Test Target Vehicle Passenger Dummy - View 1



Figure A-64 Pre-Test Target Vehicle Passenger Dummy - View 2



Figure A-65 Post-Test Target Vehicle Passenger Dummy - View 2



Figure A-66 Pre-Test Target Vehicle Passenger Dummy - View 3



Figure A-67 Post-Test Target Vehicle Passenger Dummy - View 3



Figure A-68 Pre-Test Target Vehicle Passenger Dummy - View 4



Figure A-69 Post-Test Target Vehicle Passenger Dummy - View 4



Figure A-70 Pre-Test Bullet Vehicle Driver and Passenger Dummies through Windshield View



Figure A-71 Post-Test Bullet Vehicle Driver and Passenger Dummies through Windshield View



Figure A-72 Pre-Test Bullet Vehicle Driver Dummy - View 1



Figure A-73 Post-Test Bullet Vehicle Driver Dummy - View 1



Figure A-74 Pre-Test Bullet Vehicle Driver Dummy - View 2



Figure A-75 Post-Test Bullet Vehicle Driver Dummy - View 2



Figure A-76 Pre-Test Bullet Vehicle Driver Dummy - View 3



Figure A-77 Post-Test Bullet Vehicle Driver Dummy - View 3



Figure A-78 Pre-Test Bullet Vehicle Driver Dummy - View 4



Figure A-79 Post-Test Bullet Vehicle Driver Dummy - View 4



Figure A-80 Pre-Test Bullet Vehicle Passenger Dummy - View 1



Figure A-81 Post-Test Bullet Vehicle Passenger Dummy - View 1



Figure A-82 Pre-Test Bullet Vehicle Passenger Dummy - View 2



Figure A-83 Post-Test Bullet Vehicle Passenger Dummy - View 2



Figure A-84 Pre-Test Bullet Vehicle Passenger Dummy - View 3



Figure A-85 Post-Test Bullet Vehicle Passenger Dummy - View 3



Figure A-86 Pre-Test Bullet Vehicle Passenger Dummy - View 4



Figure A-87 Post-Test Bullet Vehicle Passenger Dummy - View 4



Figure A-88 Post-Test Target Vehicle Driver Dummy Overall Contact View



Figure A-89 Post-Test Target Vehicle Driver Dummy Head Contact - View 1



Figure A-90 Post-Test Target Vehicle Driver Dummy Head Contact - View 2



Figure A-91 Post-Test Target Vehicle Driver Dummy Head Contact - View 3



Figure A-92 Post-Test Target Vehicle Driver Dummy Knee Contact - View 1



Figure A-93 Post-Test Target Vehicle Driver Dummy Knee Contact - View 2



Figure A-94 Post-Test Target Vehicle Driver Dummy Toepan Deformation View

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Figure A-95 Post-Test Target Vehicle Passenger Dummy Overall Contact View



Figure A-96 Post-Test Target Vehicle Passenger Dummy Head Contact - View 1



Figure A-97 Post-Test Target Vehicle Passenger Dummy Head Contact - View 2



Figure A-98 Post-Test Target Vehicle Passenger Dummy Head Contact - View 3



Figure A-99 Post-Test Target Vehicle Passenger Dummy Knee Contact - View 1



Figure A-100 Post-Test Target Vehicle Passenger Dummy Knee Contact - View 2



Figure A-101 Post-Test Target Vehicle Passenger Dummy Toepan Deformation View

Intentionally Left Blank



Figure A-102 Post-Test Bullet Vehicle Driver Dummy Overall Contact View



Figure A-103 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 1



Figure A-104 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 2



Figure A-105 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 3



Figure A-106 Post-Test Bullet Vehicle Driver Dummy Knee Contact - View 1

Intentionally Left Blank



Figure A-107 Post-Test Bullet Vehicle Passenger Dummy Overall Contact View



Figure A-108 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 1



Figure A-109 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 2



Figure A-110 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 3



Figure A-111 Post-Test Bullet Vehicle Passenger Dummy Knee Contact - View 1

Intentionally Left Blank



Figure A-112 Pre-Test Target Vehicle Certification Label View



Figure A-113 Pre-Test Target Vehicle Tire Load Label View



Figure A-114 Pre-Test Bullet Vehicle Certification Label View

Intentionally Left Blank

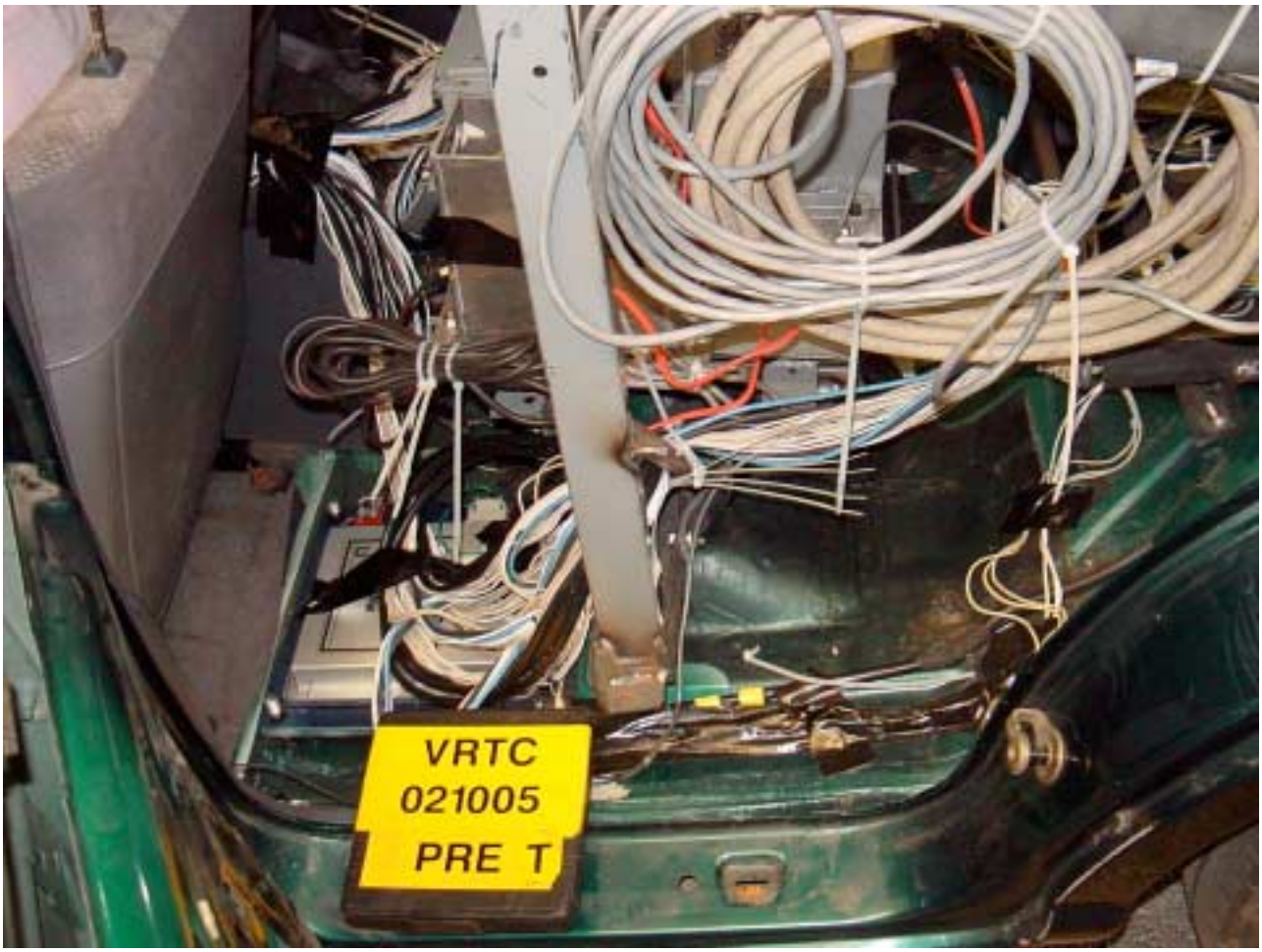


Figure A-115 Pre-Test Target Event Data Recorder – View 1



Figure A-116 Pre-Test Target Event Data Recorder – View 2

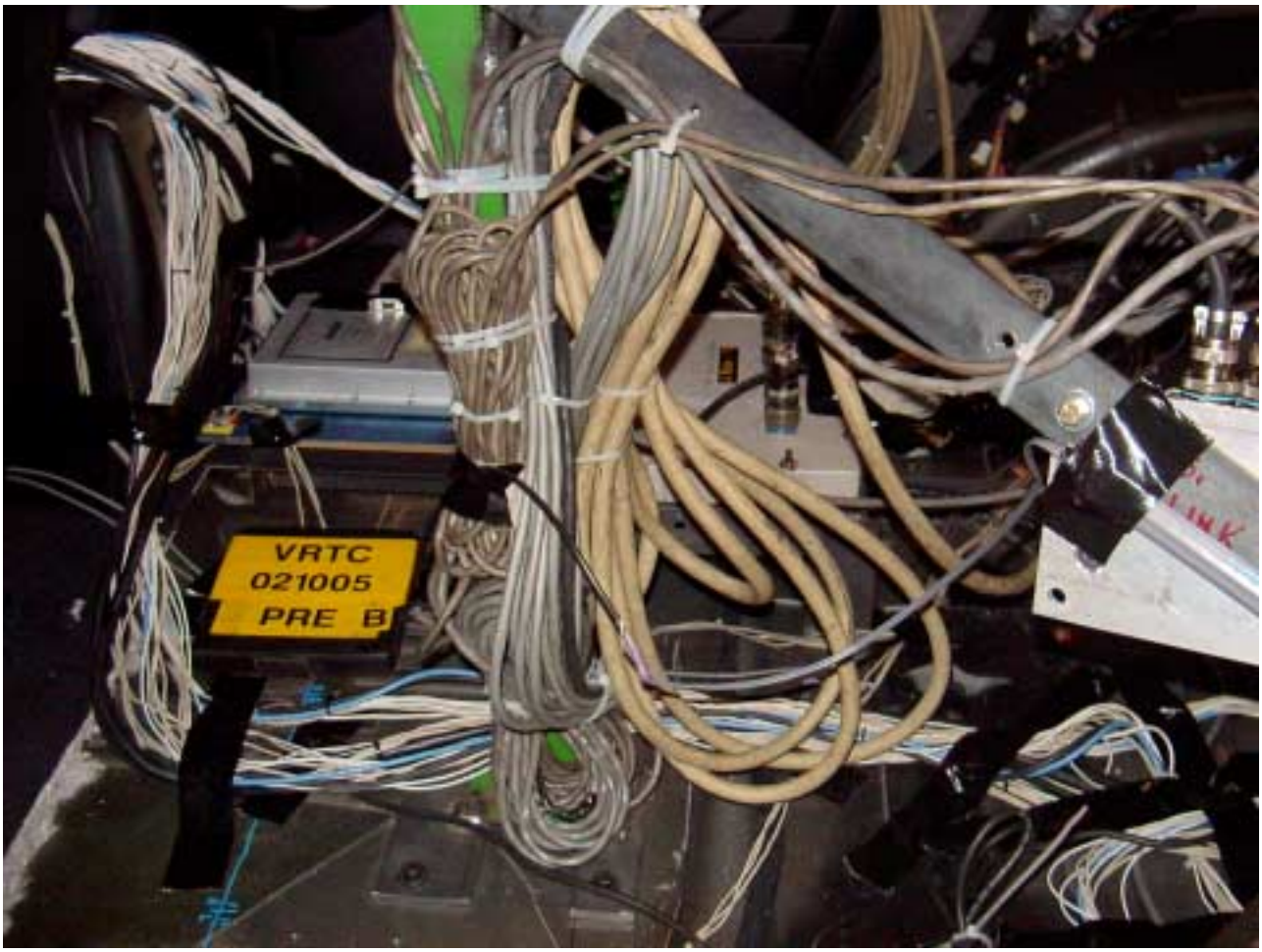


Figure A-117 Pre-Test Bullet Event Data Recorder - View 1



Figure A-118 Pre-Test Bullet Event Data Recorder - View 2



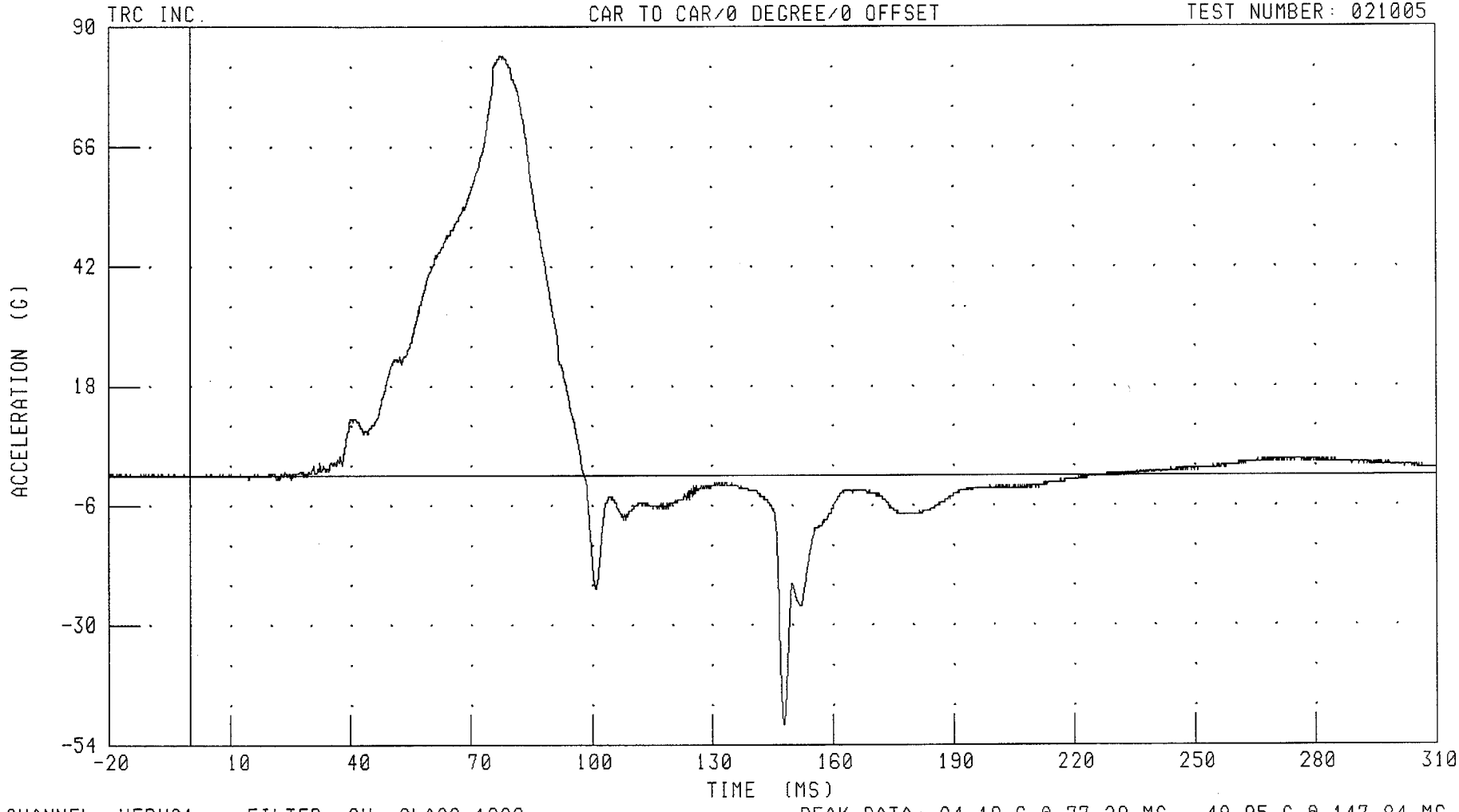
Figure A-119 Event Still View

Appendix B

Data Plots

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

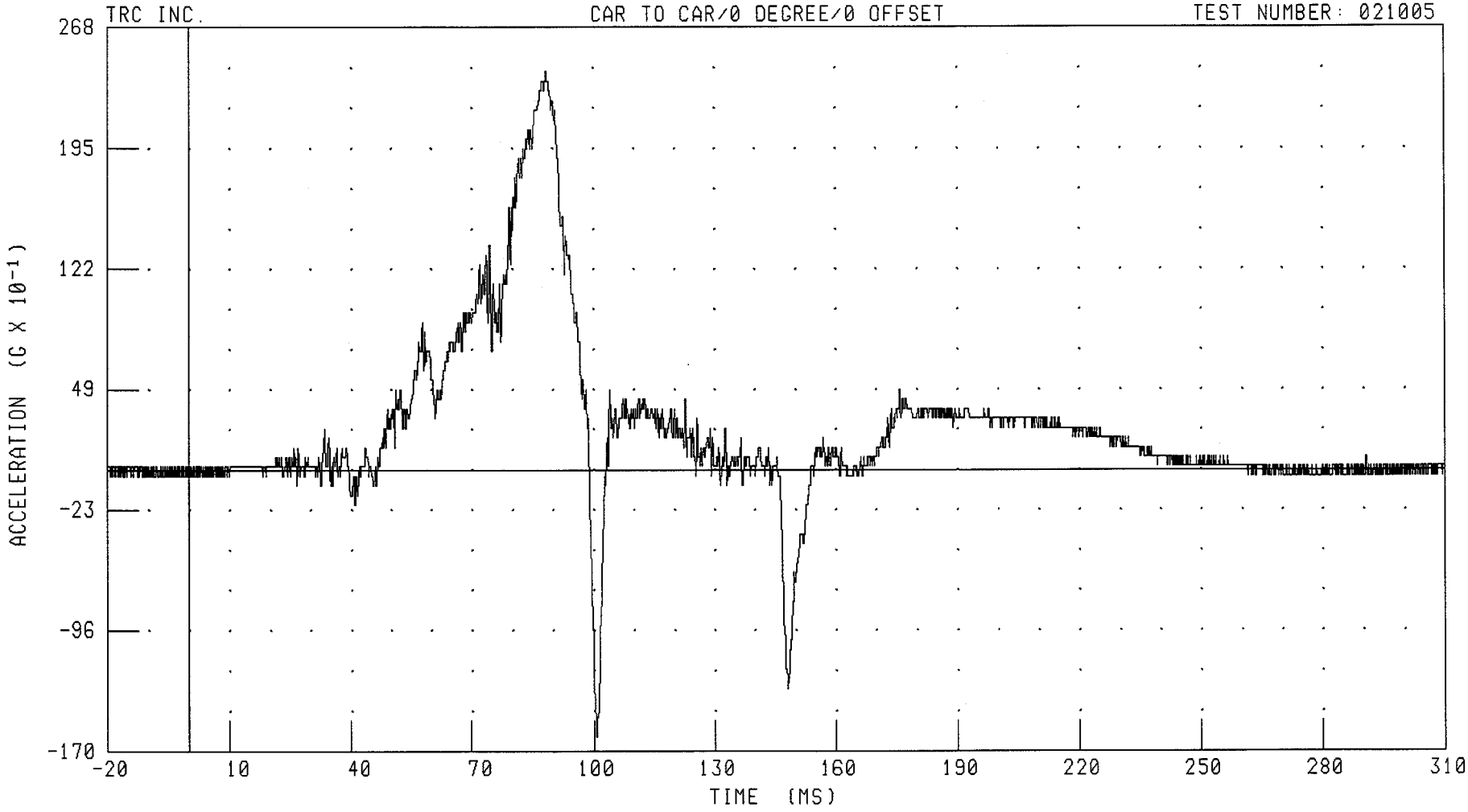
TARGET DRIVER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000 PEAK DATA: 84.19 G @ 77.28 MS; -49.95 G @ 147.84 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER HEAD Y-AXIS ACCELERATION



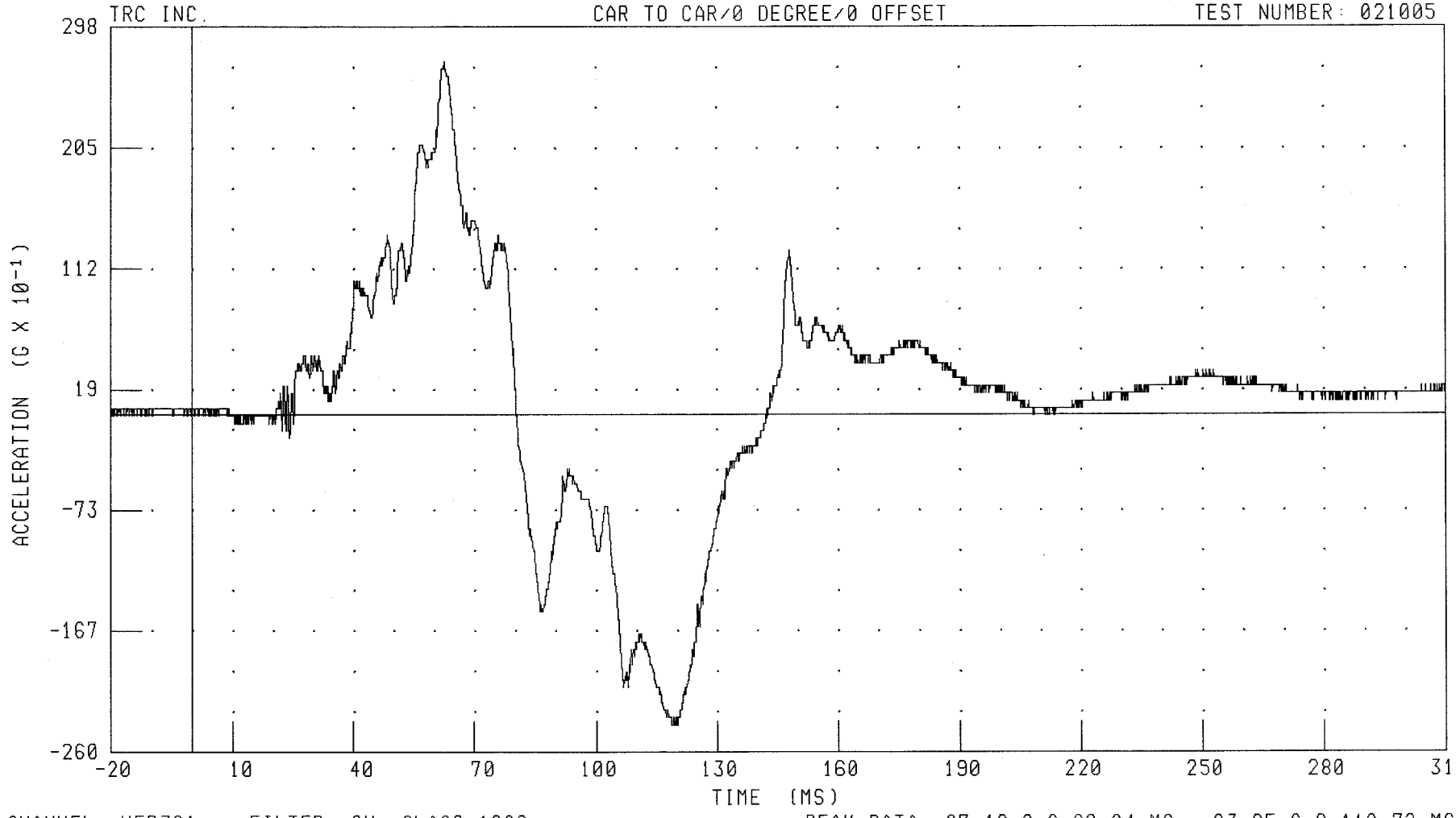
CHANNEL: HEDYC1 FILTER: CH. CLASS 1000 PEAK DATA: 24.14 G @ 88.40 MS; -16.13 G @ 100.72 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER HEAD Z-AXIS ACCELERATION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

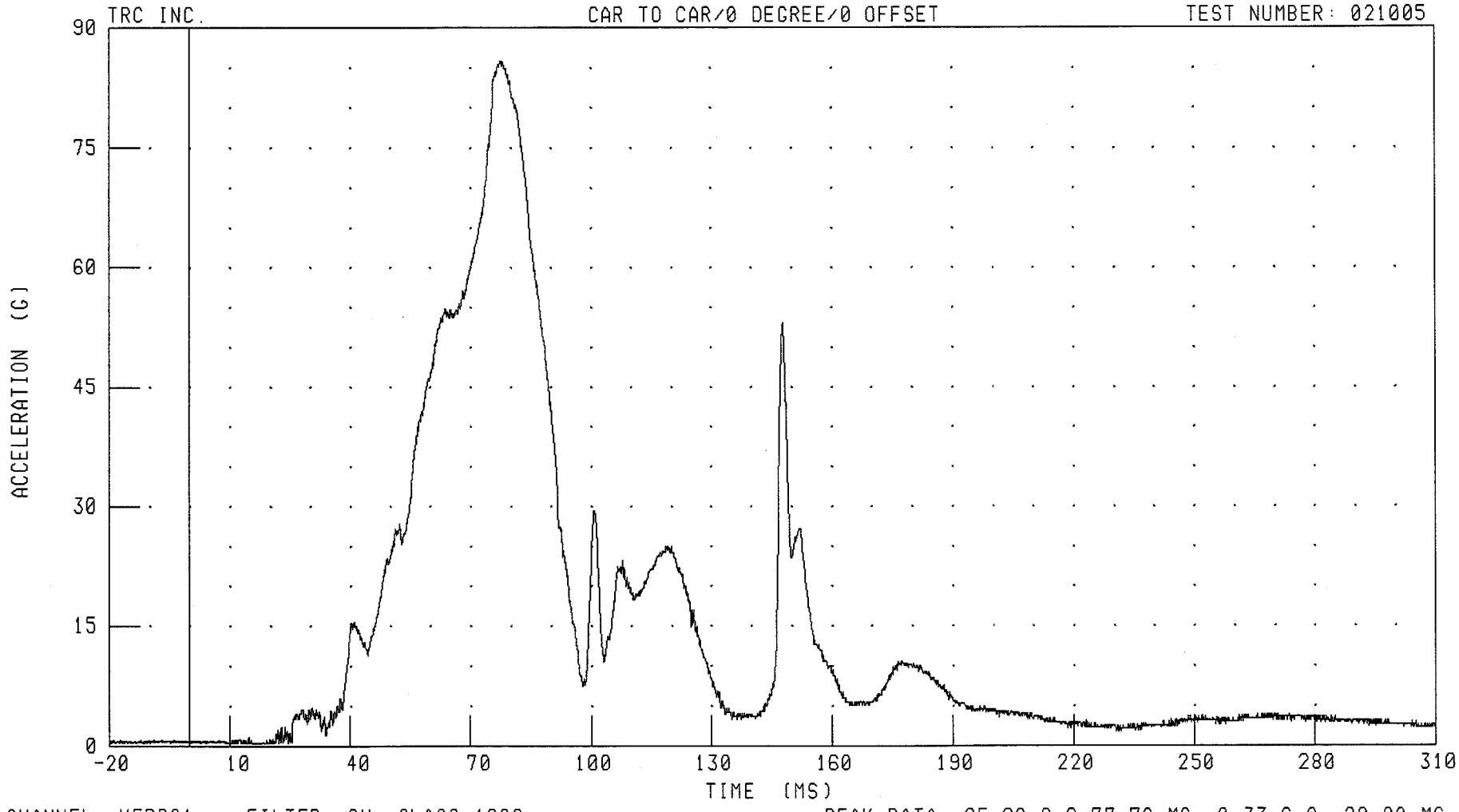


CHANNEL: HEDZG1 FILTER: CH. CLASS 1000 PEAK DATA: 27.18 G @ 62.64 MS; -23.95 G @ 118.72 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

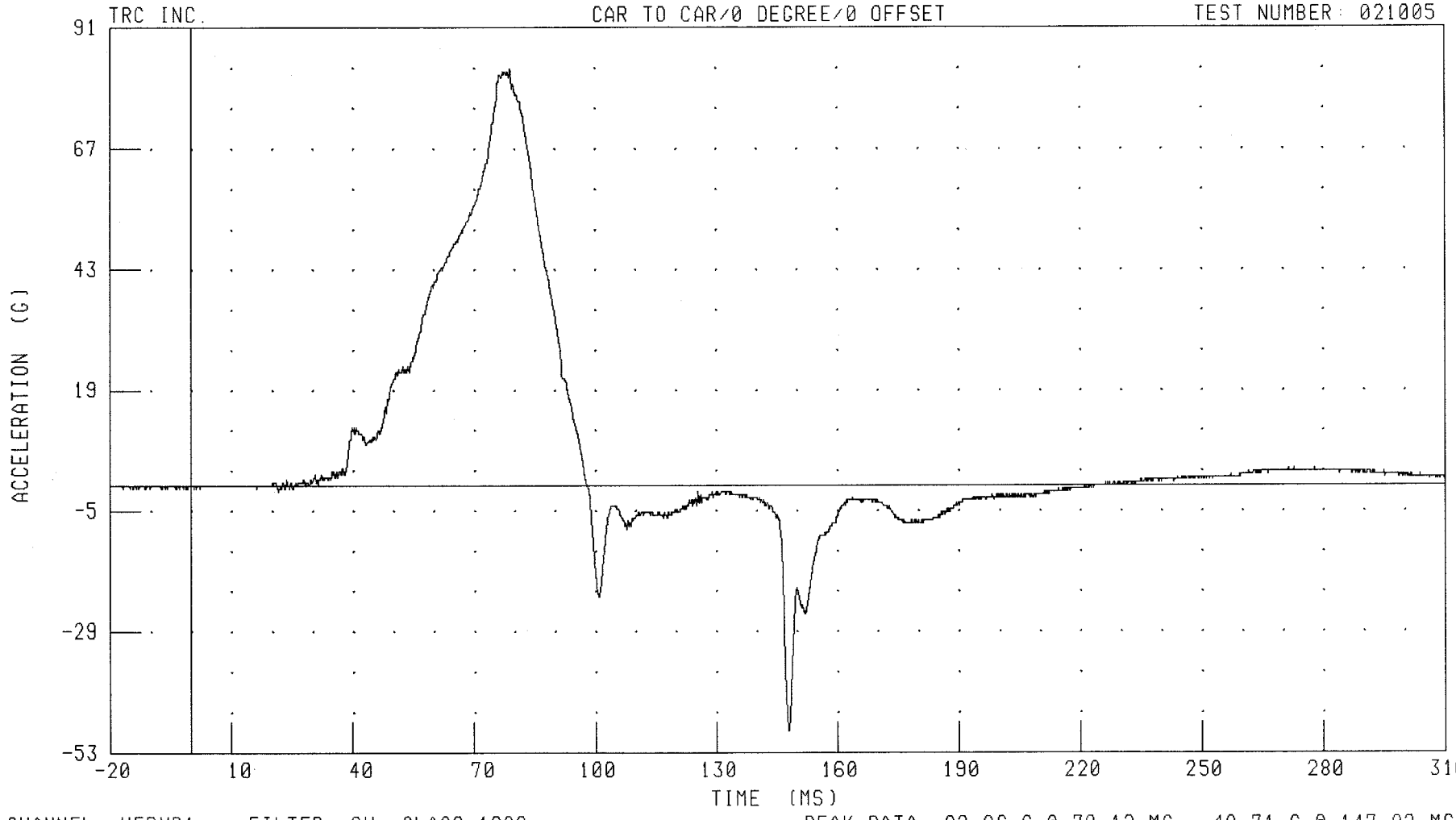
TARGET DRIVER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000 PEAK DATA: 85.88 G @ 77.76 MS; 0.33 G @ -20.00 MS

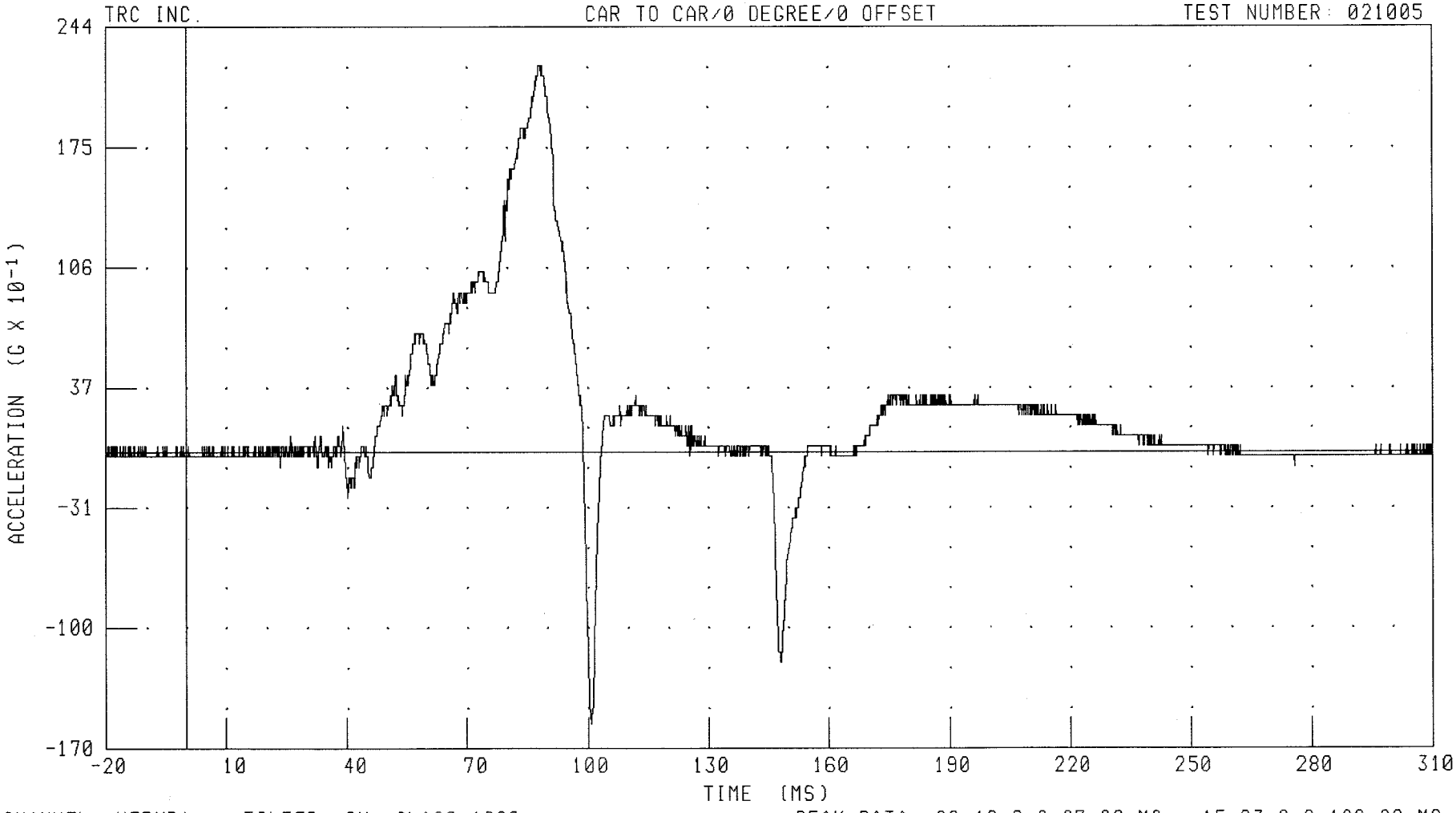
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER HEAD X-AXIS ACCELERATION REDUNDANT



CHANNEL: HEDXR1 FILTER: CH. CLASS 1000 PEAK DATA: 82.86 G @ 79.12 MS; -48.71 G @ 147.92 MS

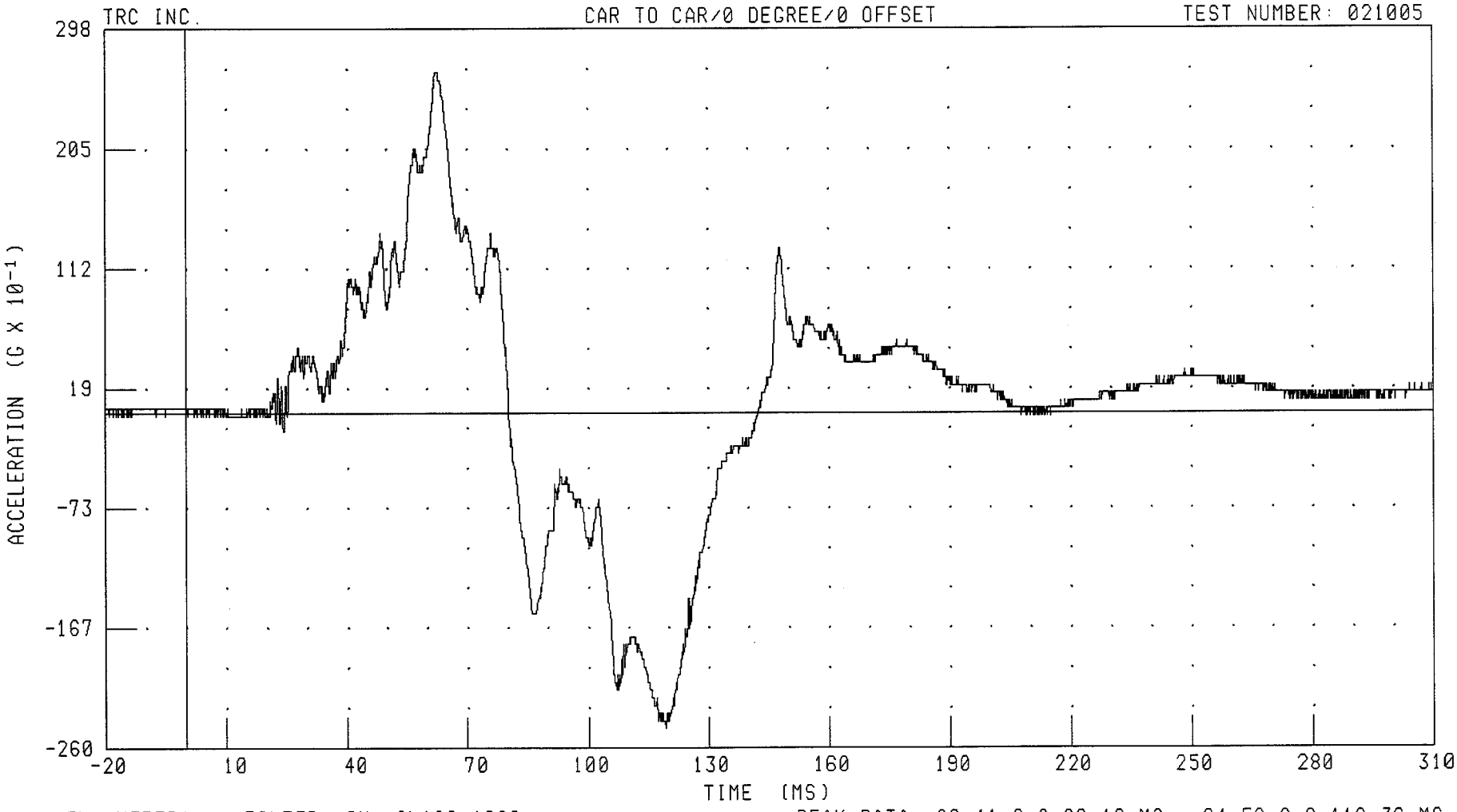
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER HEAD Y-AXIS ACCELERATION REDUNDANT



CHANNEL: HEDYR1 FILTER: CH. CLASS 1000 PEAK DATA: 22.19 G @ 87.92 MS; -15.63 G @ 100.80 MS

021005

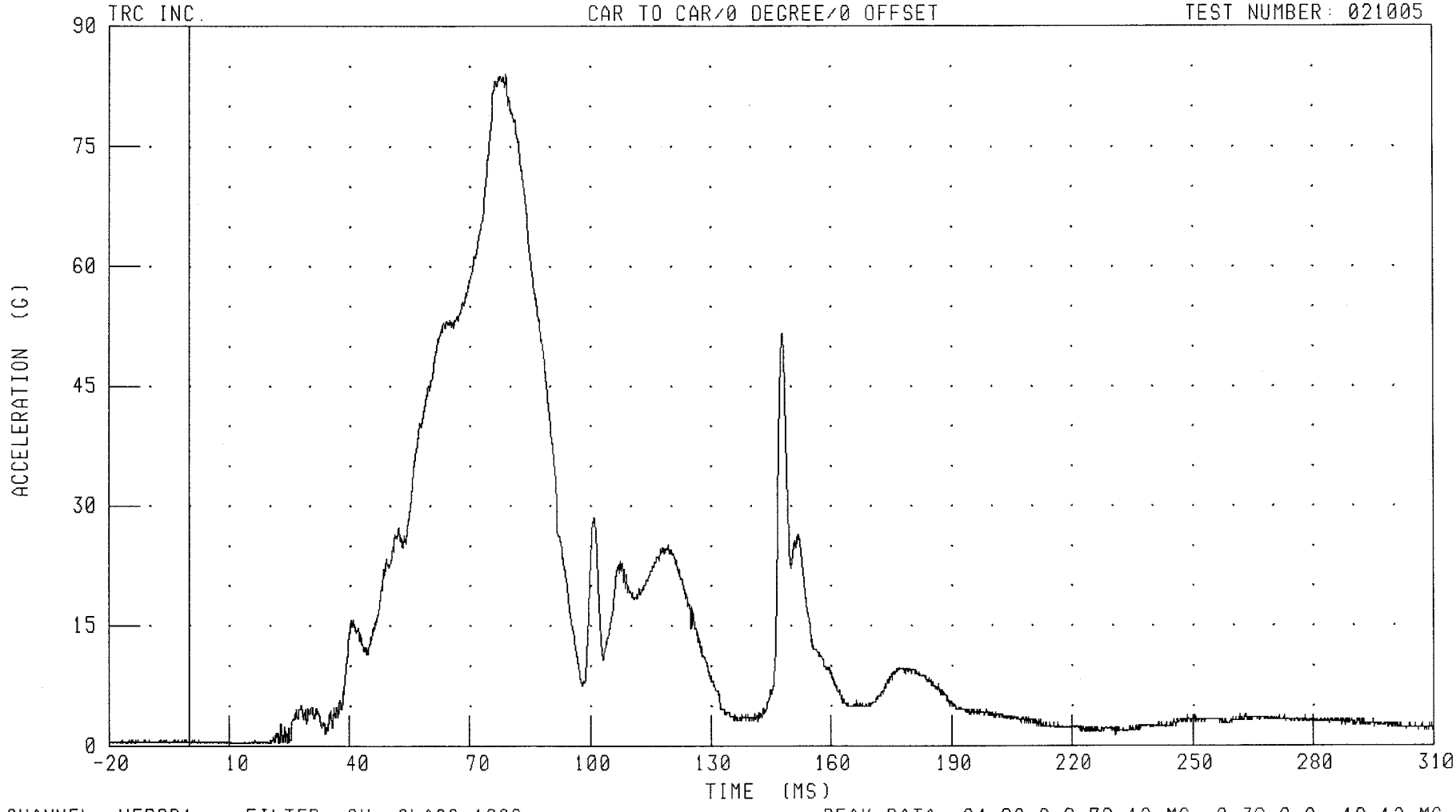
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER HEAD Z-AXIS ACCELERATION REDUNDANT



CHANNEL: HEDZR1 FILTER: CH. CLASS 1000 PEAK DATA: 26.41 G @ 62.16 MS; -24.52 G @ 119.36 MS

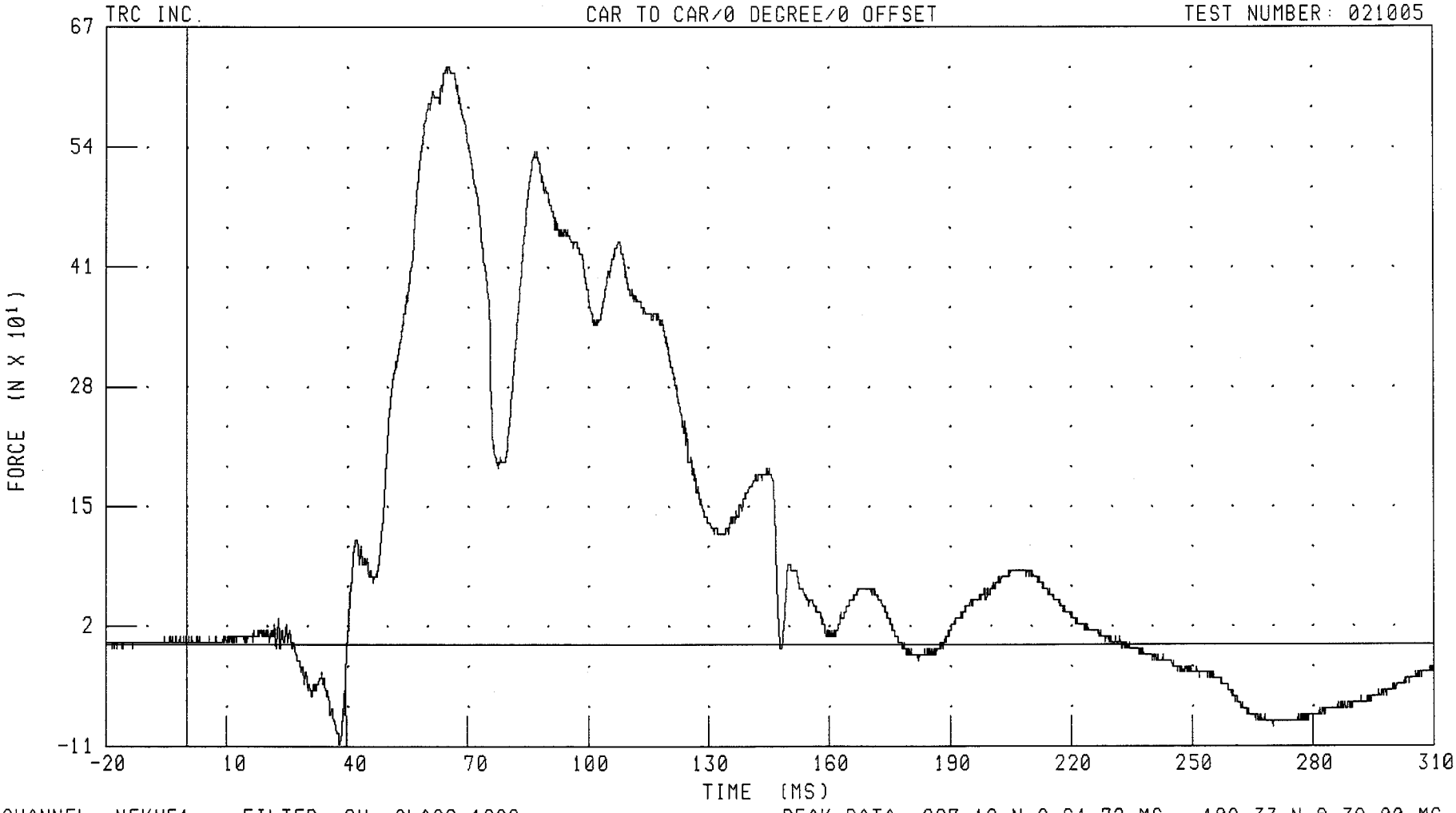
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER HEAD RESULTANT ACCELERATION REDUNDANT



CHANNEL: HEDRR1 FILTER: CH. CLASS 1000 PEAK DATA: 84.08 G @ 79.12 MS; 0.36 G @ -19.12 MS

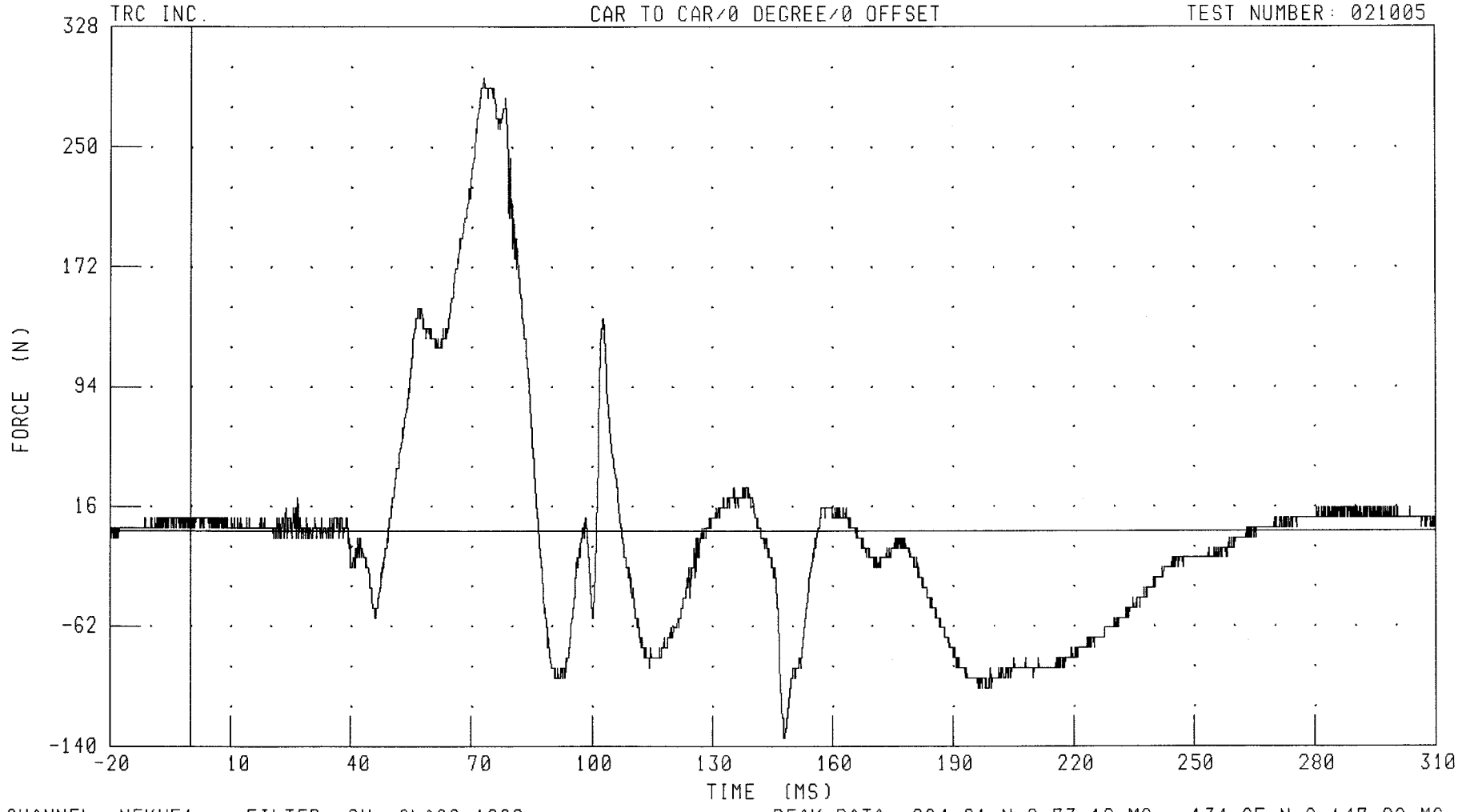
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 627.12 N @ 64.72 MS; -108.33 N @ 38.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER NECK Y-AXIS SHEAR FORCE



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 294.91 N @ 73.12 MS; -134.65 N @ 147.92 MS

021005

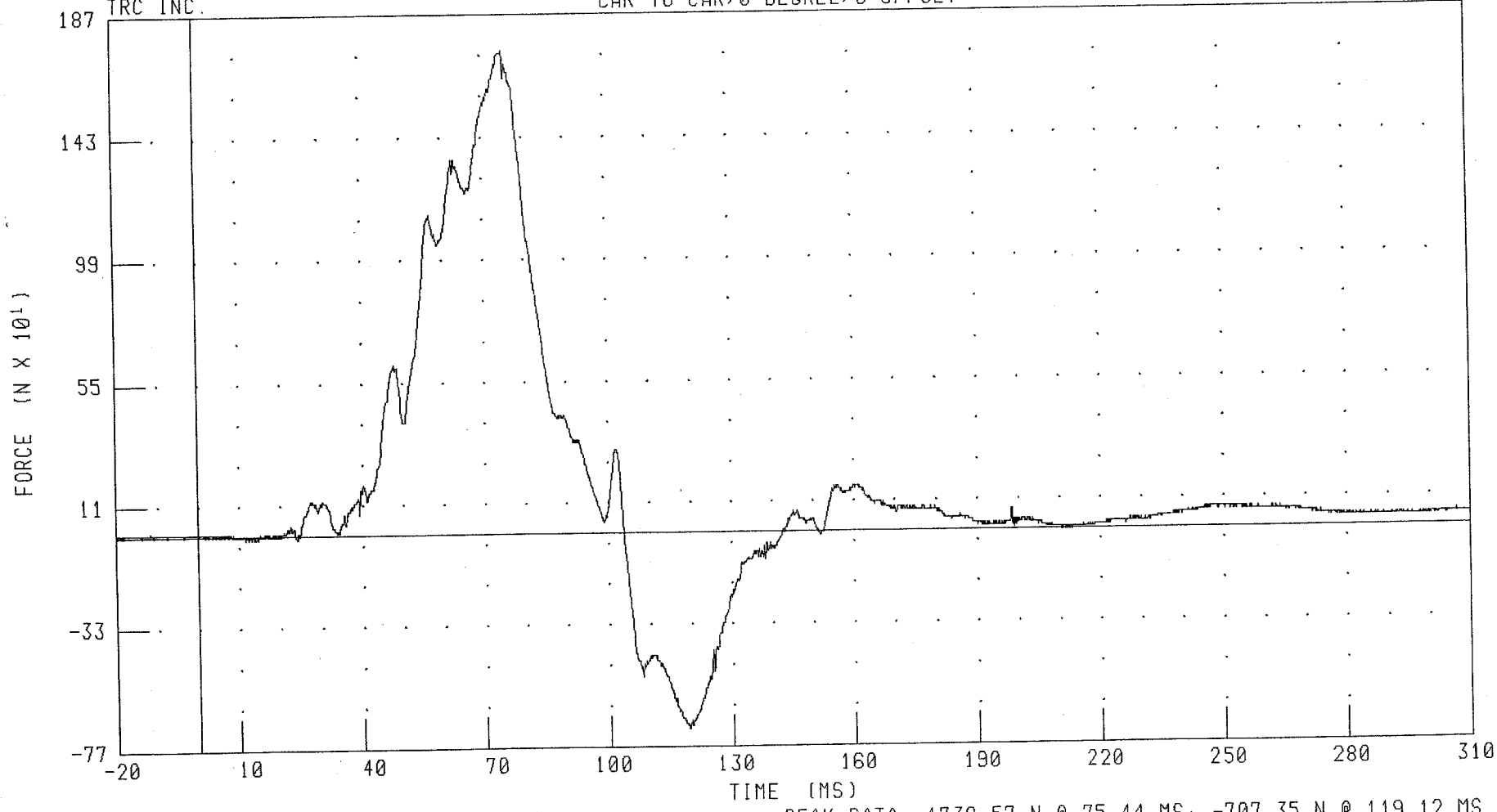
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER NECK Z-AXIS AXIAL FORCE

CAR TO CAR/0 DEGREE/0 OFFSET

TRC INC.

TEST NUMBER: 021005

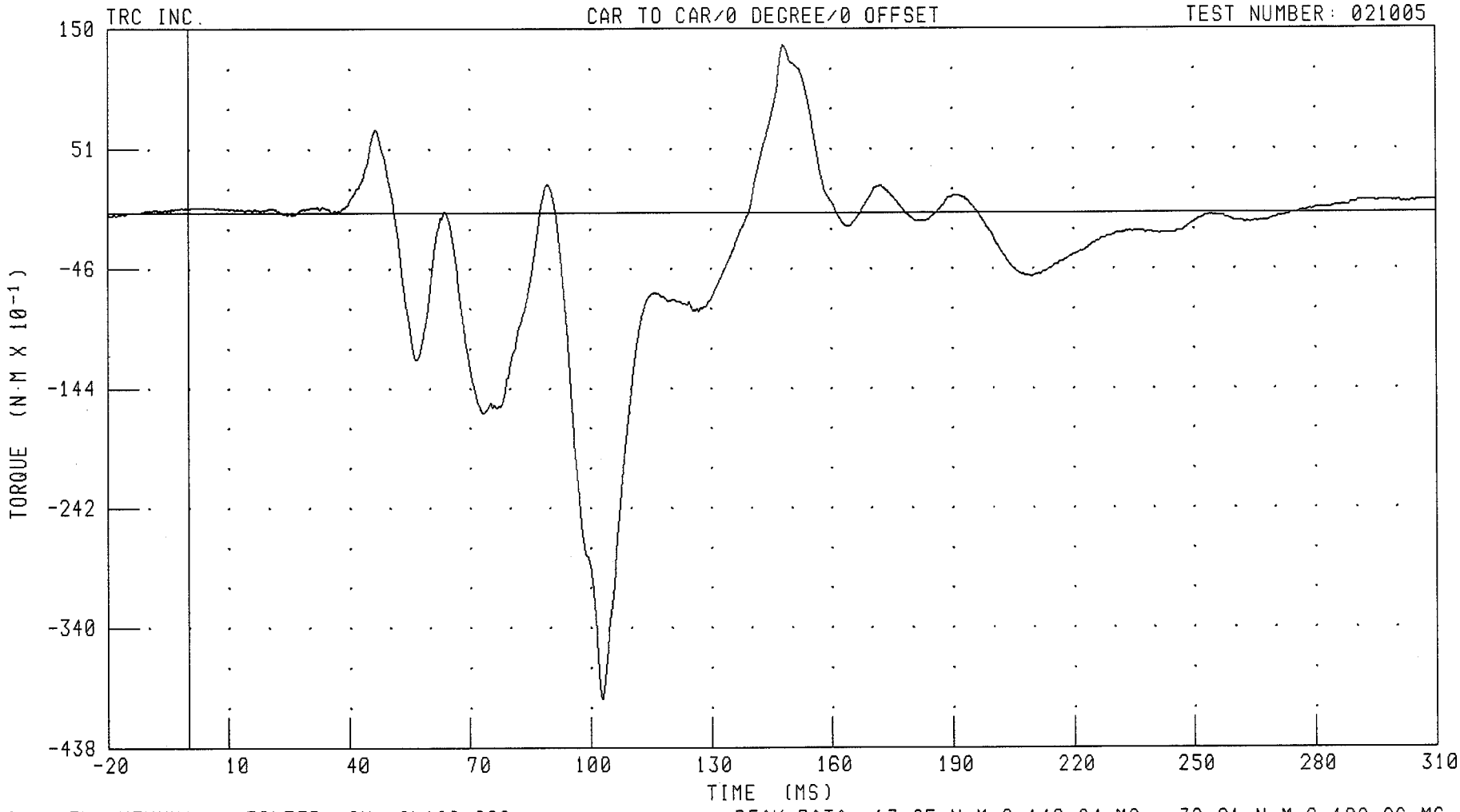


CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 1739.57 N @ 75.44 MS; -707.35 N @ 119.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER NECK MOMENT ABOUT X AXIS

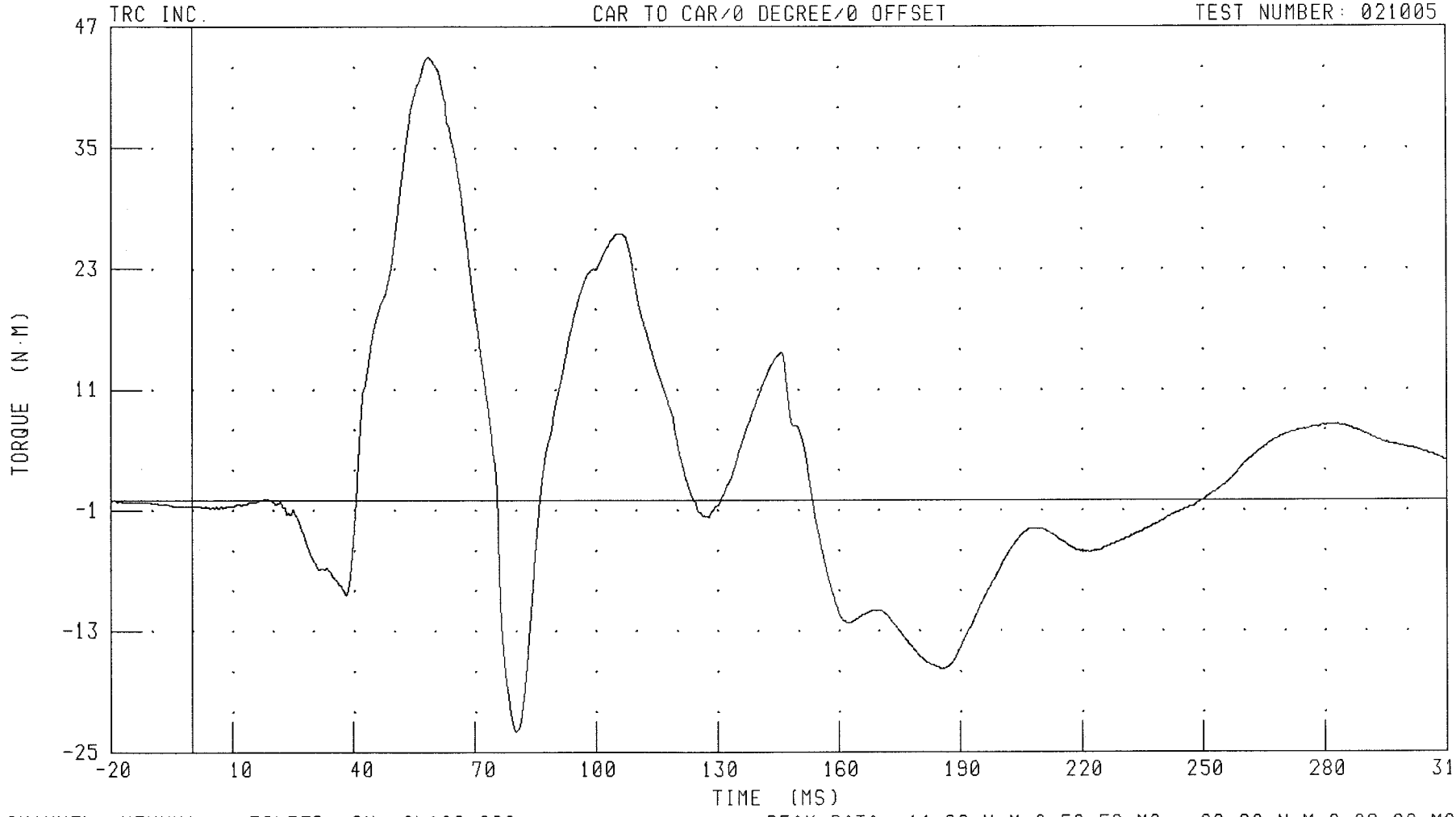


CHANNEL: NEKXM1 FILTER: CH. CLASS 600 PEAK DATA: 13.65 N·M @ 148.24 MS; -39.81 N·M @ 102.96 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER NECK MOMENT ABOUT Y AXIS

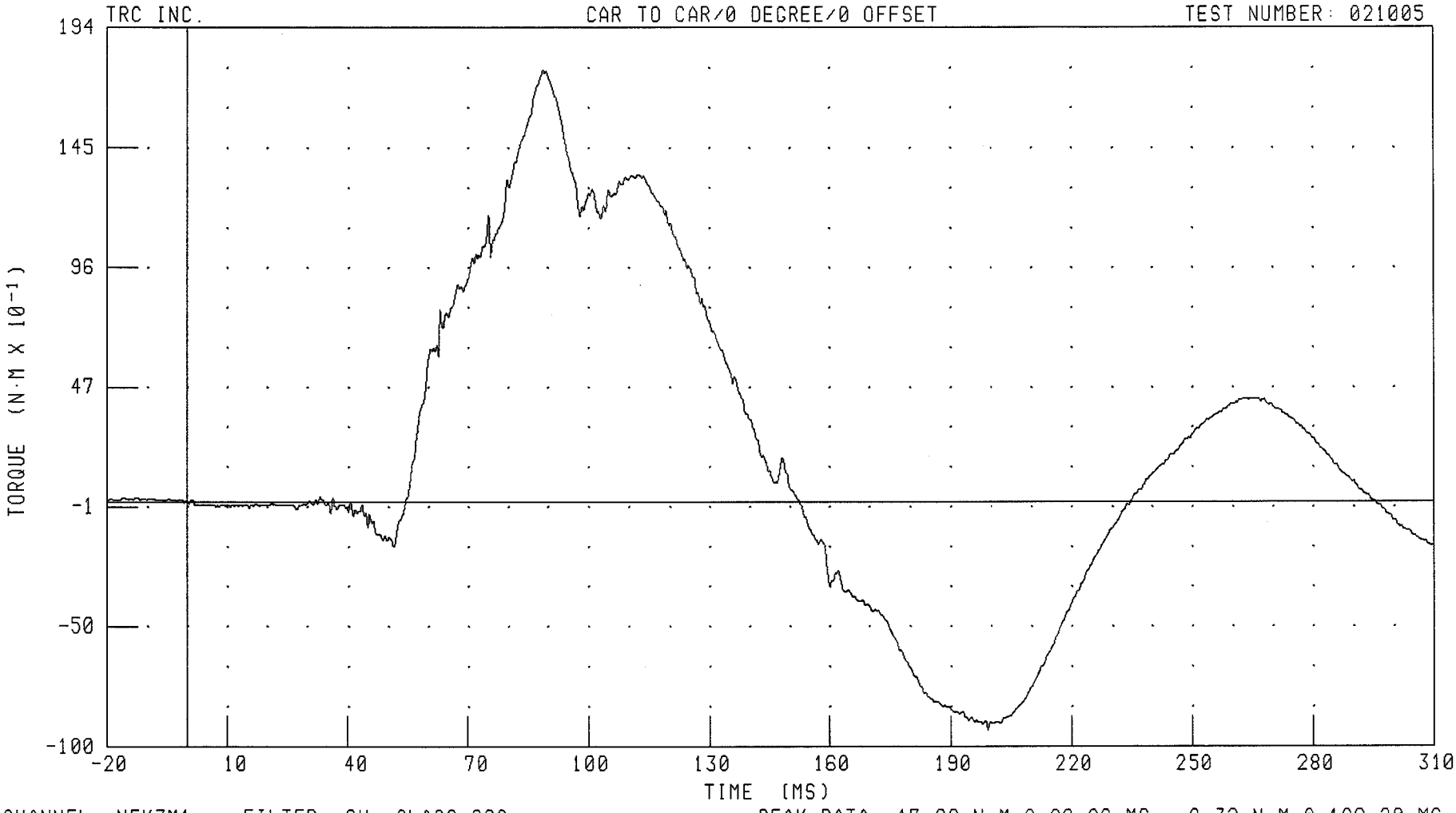


CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA: 44.00 N-M @ 58.56 MS; -22.98 N-M @ 80.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER NECK MOMENT ABOUT Z AXIS



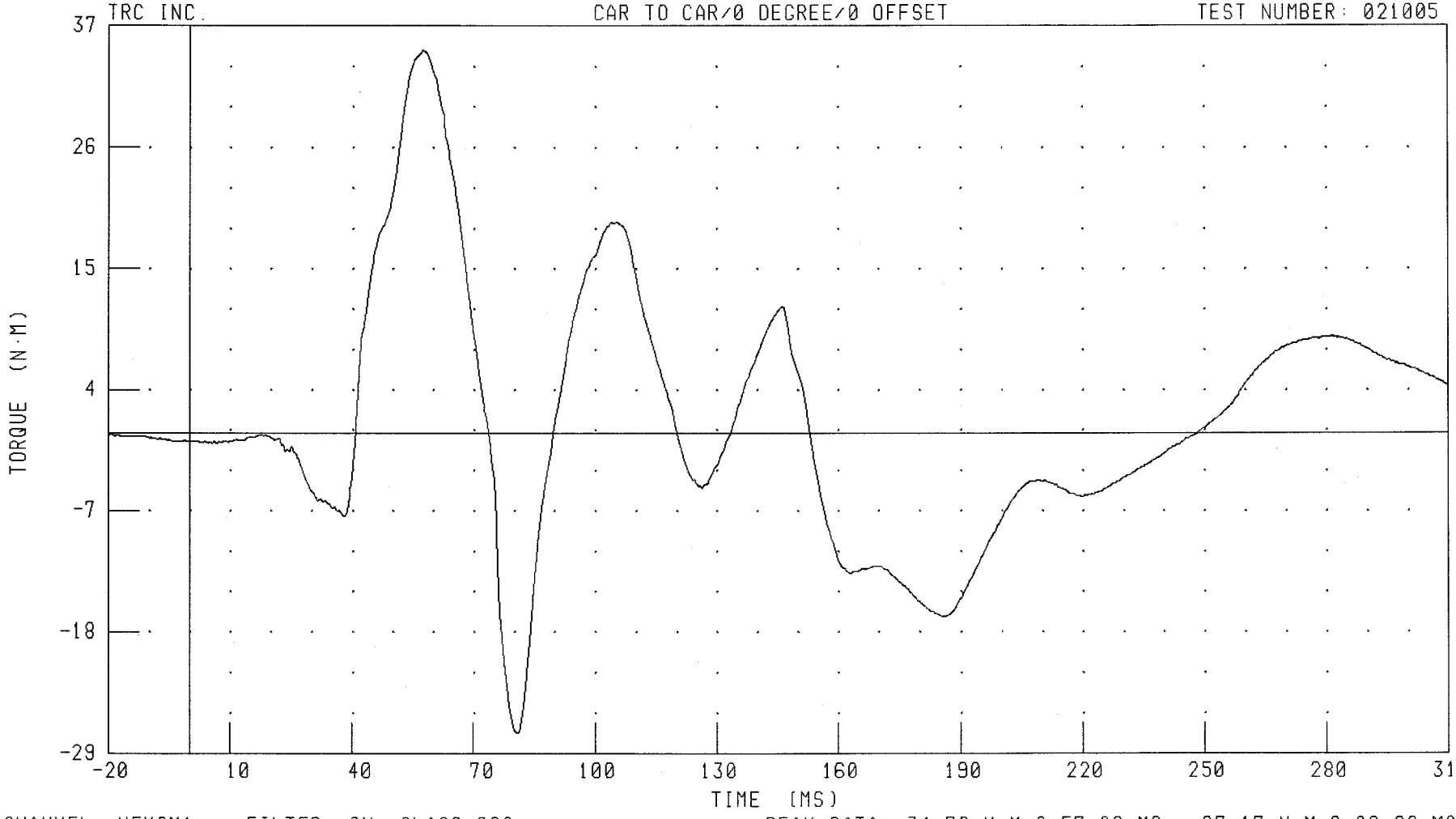
CHANNEL: NEKZM1 FILTER: CH. CLASS 600 PEAK DATA: 17.68 N·M @ 88.96 MS; -9.32 N·M @ 199.20 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

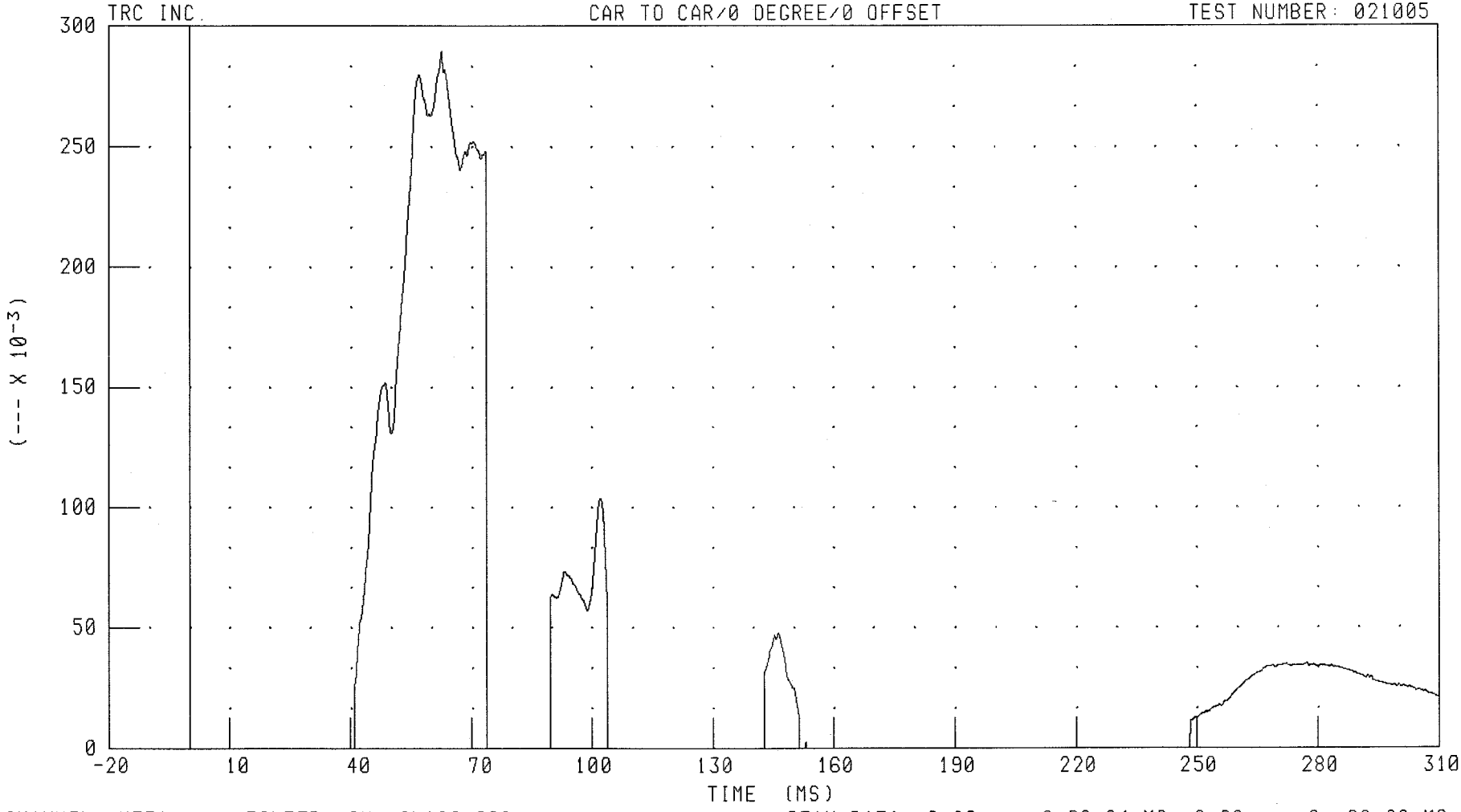


CHANNEL: NEKOM1 FILTER: CH. CLASS 600 PEAK DATA: 34.76 N·M @ 57.68 MS; -27.17 N·M @ 80.88 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

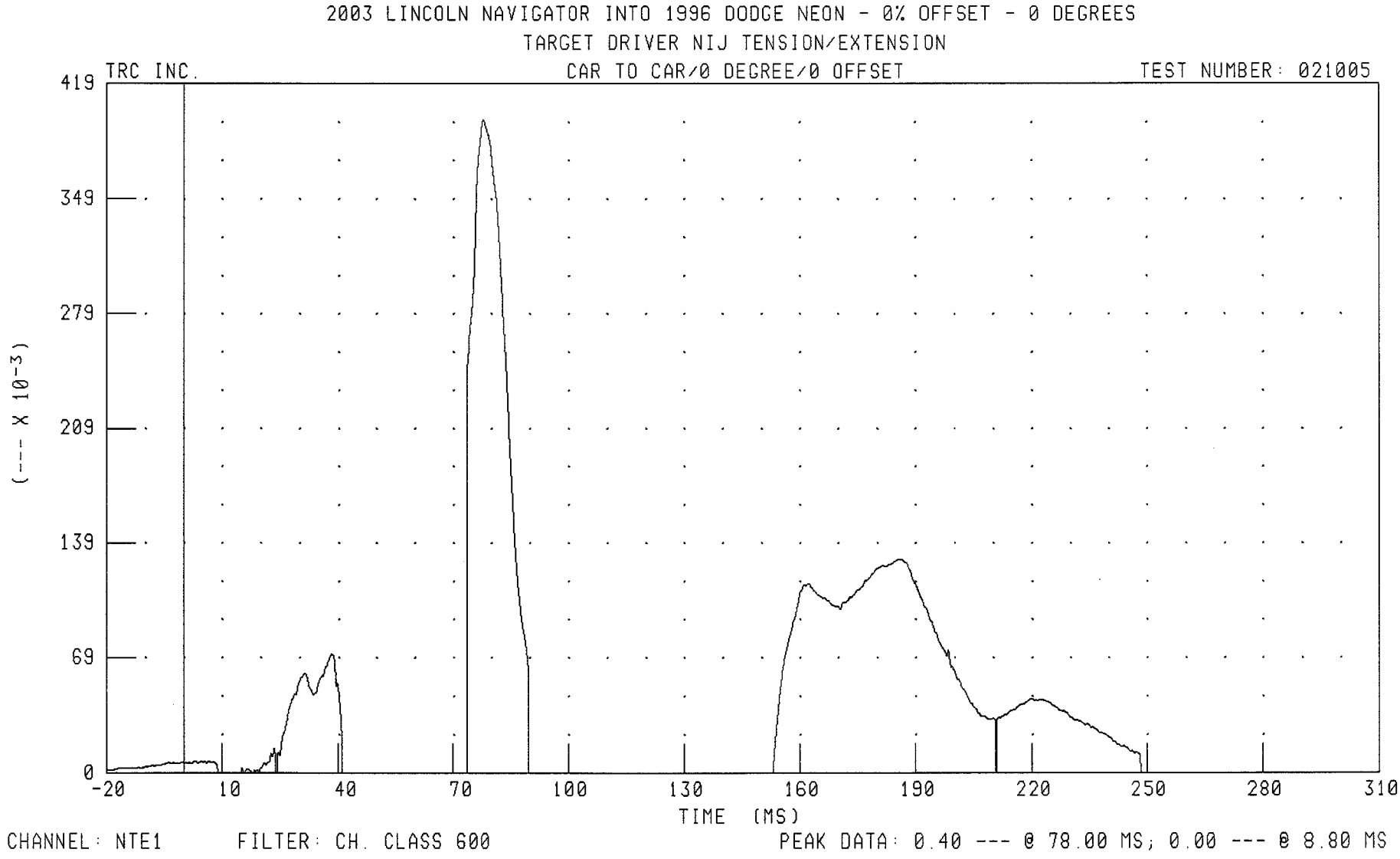
TARGET DRIVER NIJ TENSION/FLEXION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NTF1 FILTER: CH. CLASS 600 PEAK DATA: 0.29 --- @ 62.64 MS; 0.00 --- @ -20.00 MS

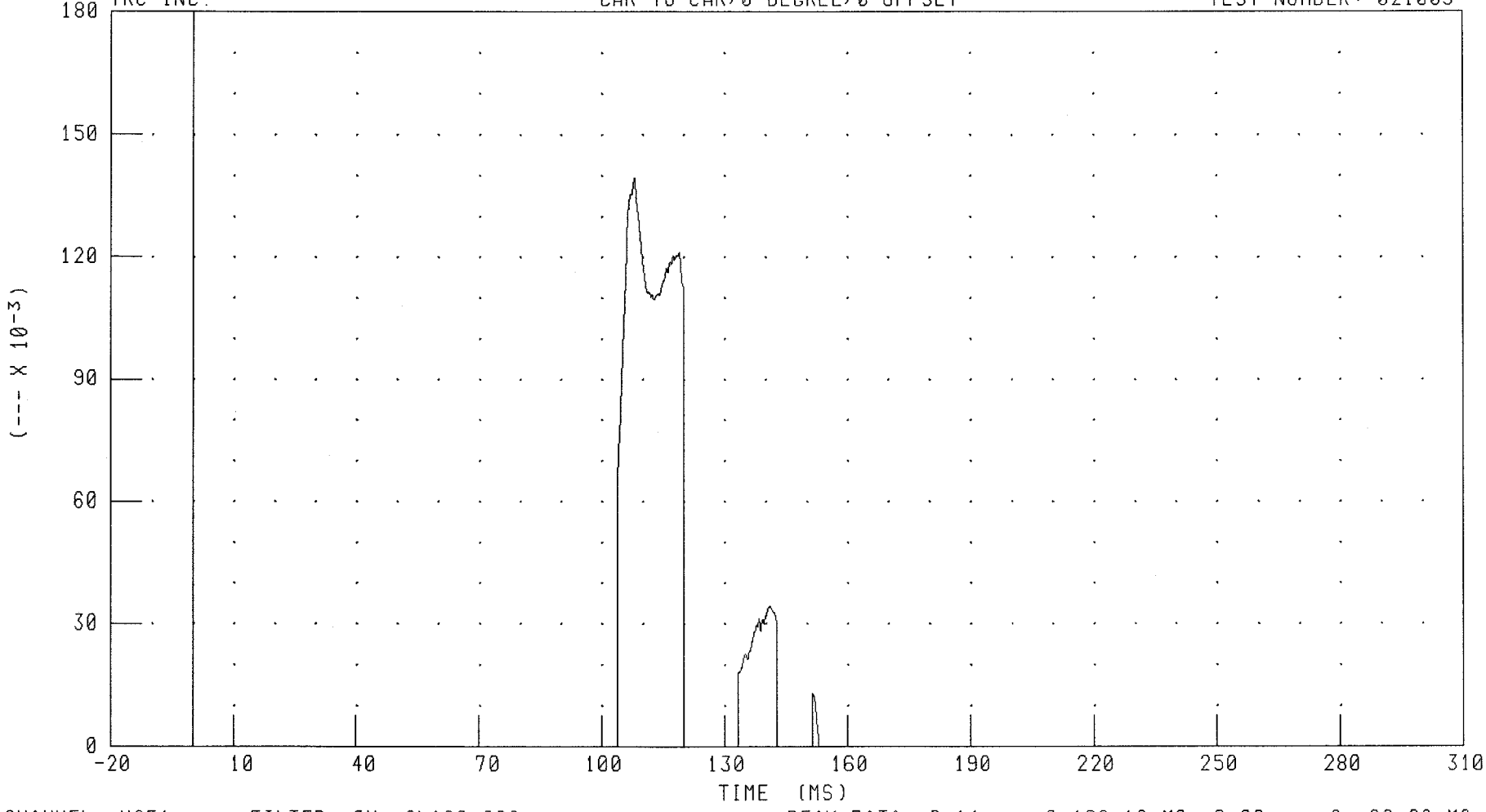
021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER NIJ TENSION/EXTENSION
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
419
349
279
209
139
69
0
(--- X 10-3)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NTE1
FILTER: CH. CLASS 600
PEAK DATA: 0.40 --- @ 78.00 MS; 0.00 --- @ 8.80 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER NIJ COMPRESSION/FLEXION

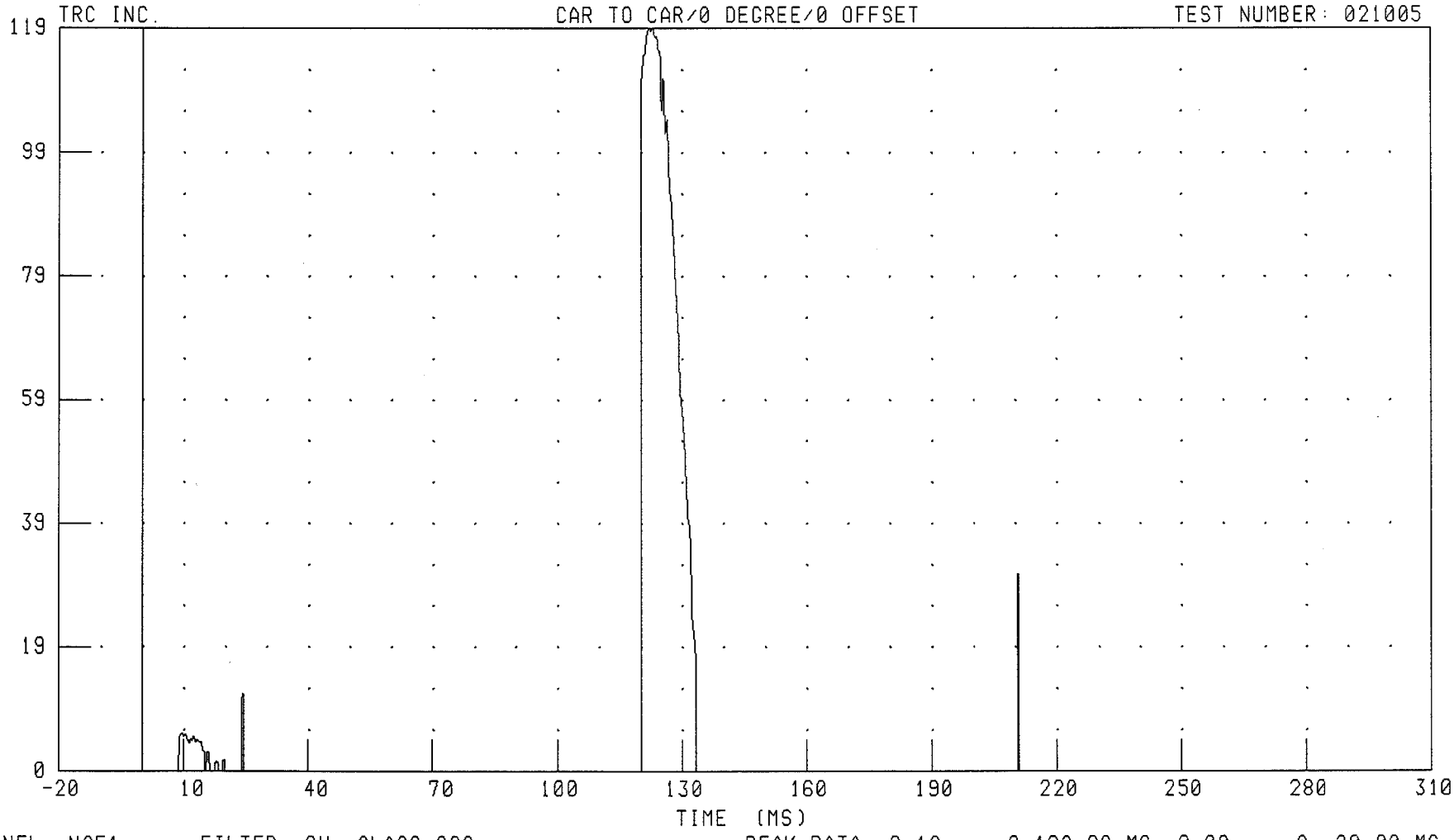
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NCF1 FILTER: CH. CLASS 600 PEAK DATA: 0.14 --- @ 108.16 MS; 0.00 --- @ -20.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER NIJ COMPRESSION/EXTENSION

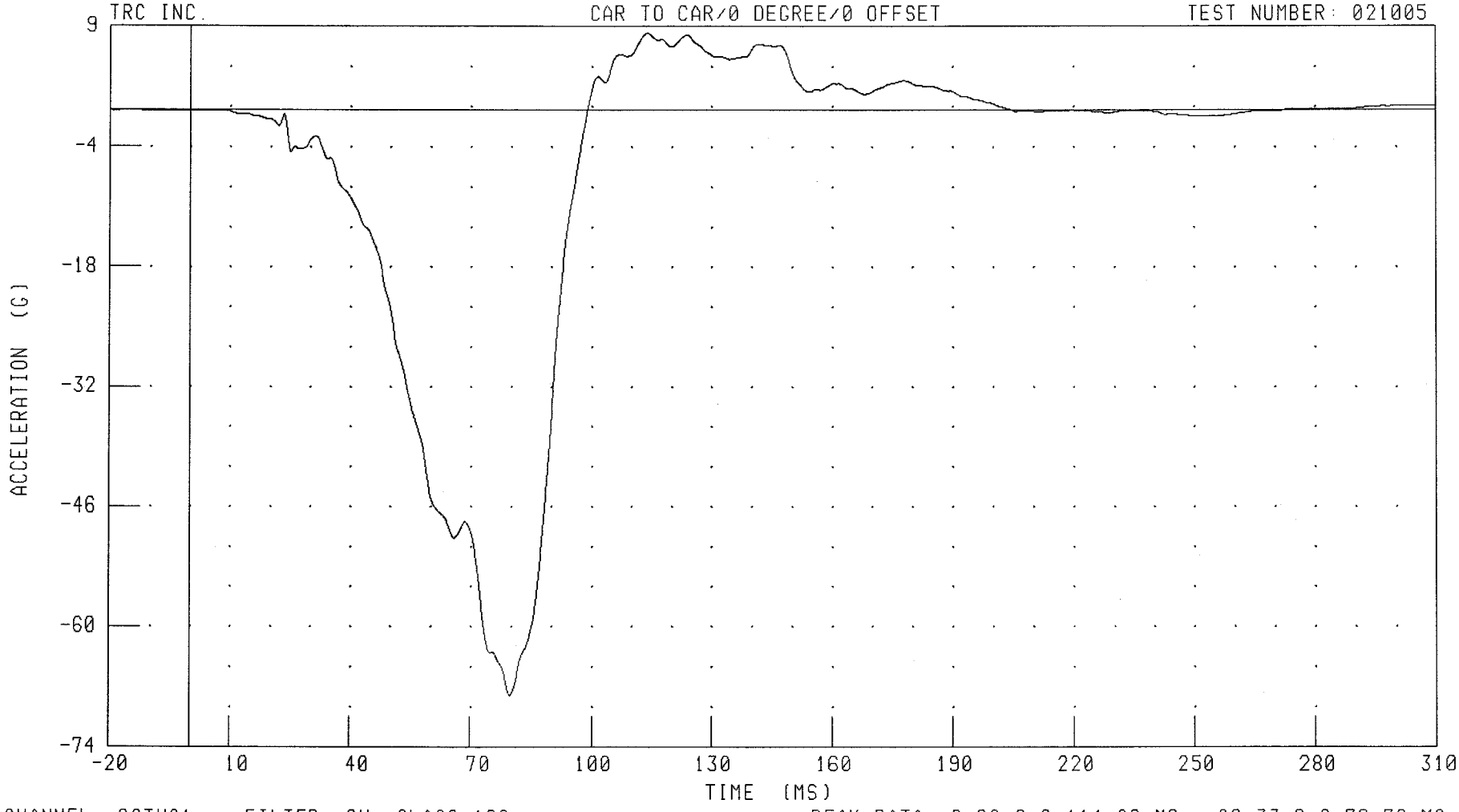


CHANNEL: NCE1 FILTER: CH. CLASS 600 PEAK DATA: 0.12 --- @ 122.88 MS; 0.00 --- @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER CHEST X-AXIS ACCELERATION

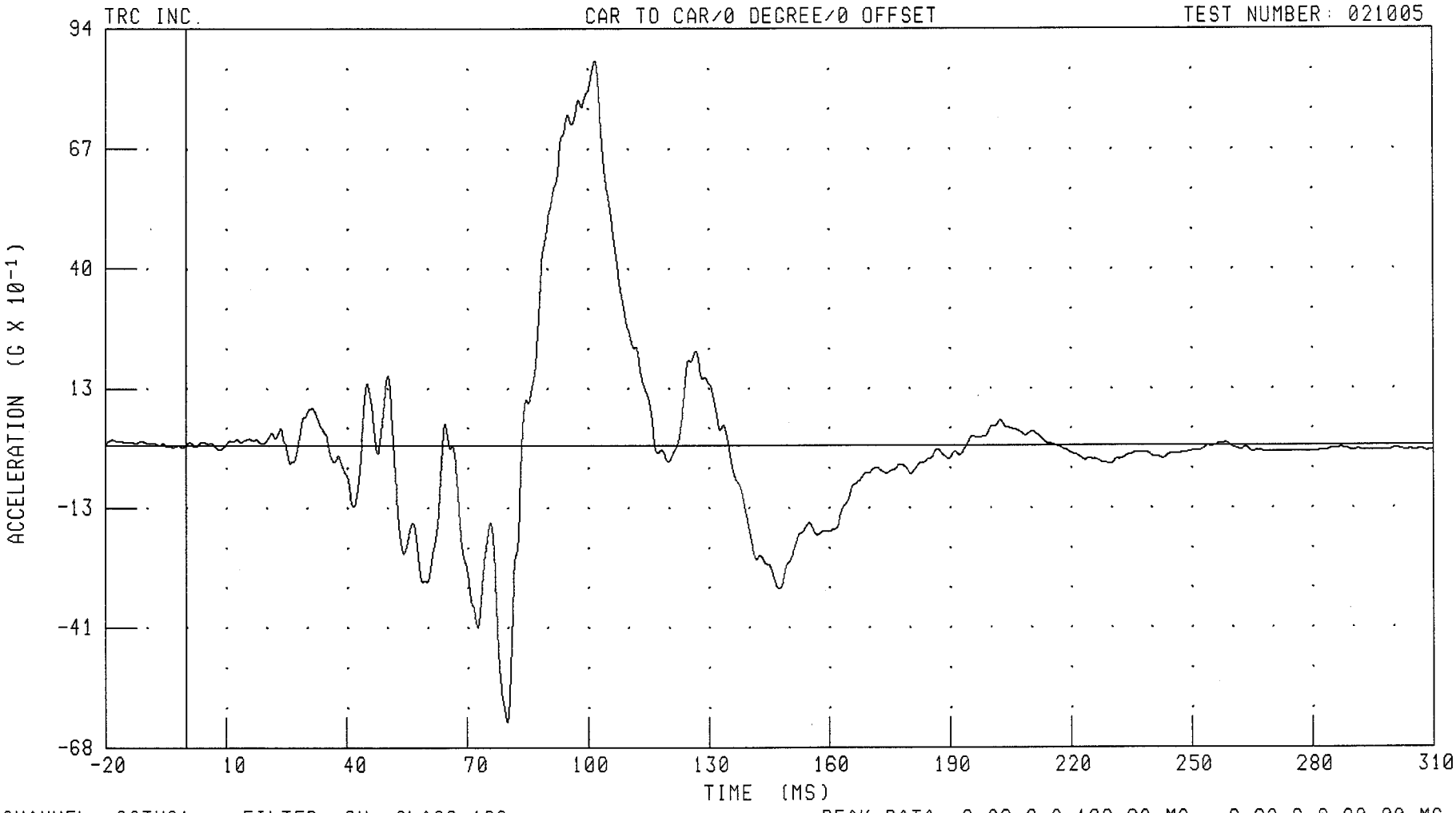


CHANNEL: CSTXG1 FILTER: CH. CLASS 180 PEAK DATA: 8.90 G @ 114.00 MS; -68.33 G @ 79.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER CHEST Y-AXIS ACCELERATION

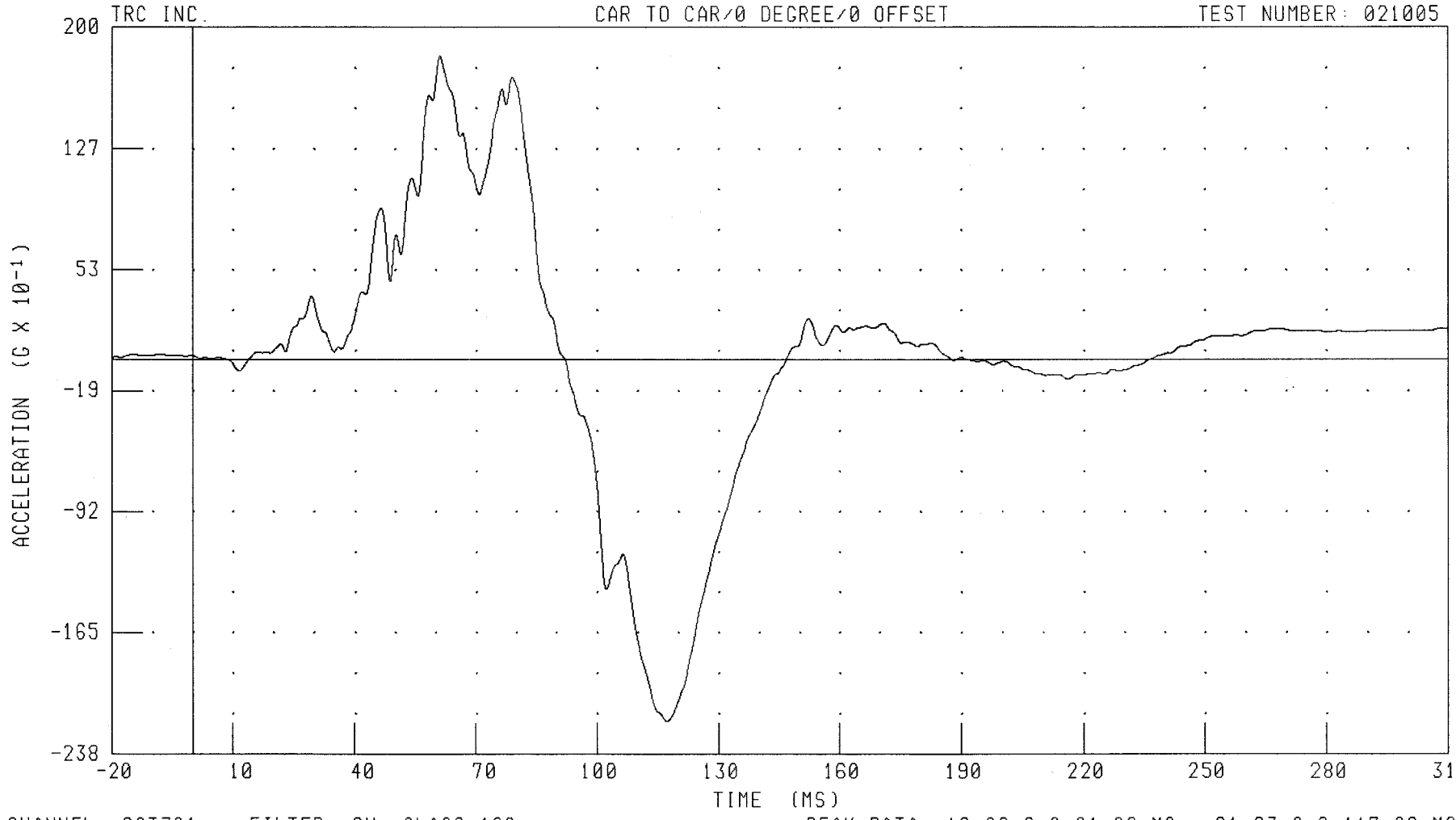


CHANNEL: CSTYG1 FILTER: CH. CLASS 180 PEAK DATA: 8.68 G @ 102.00 MS; -6.22 G @ 80.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

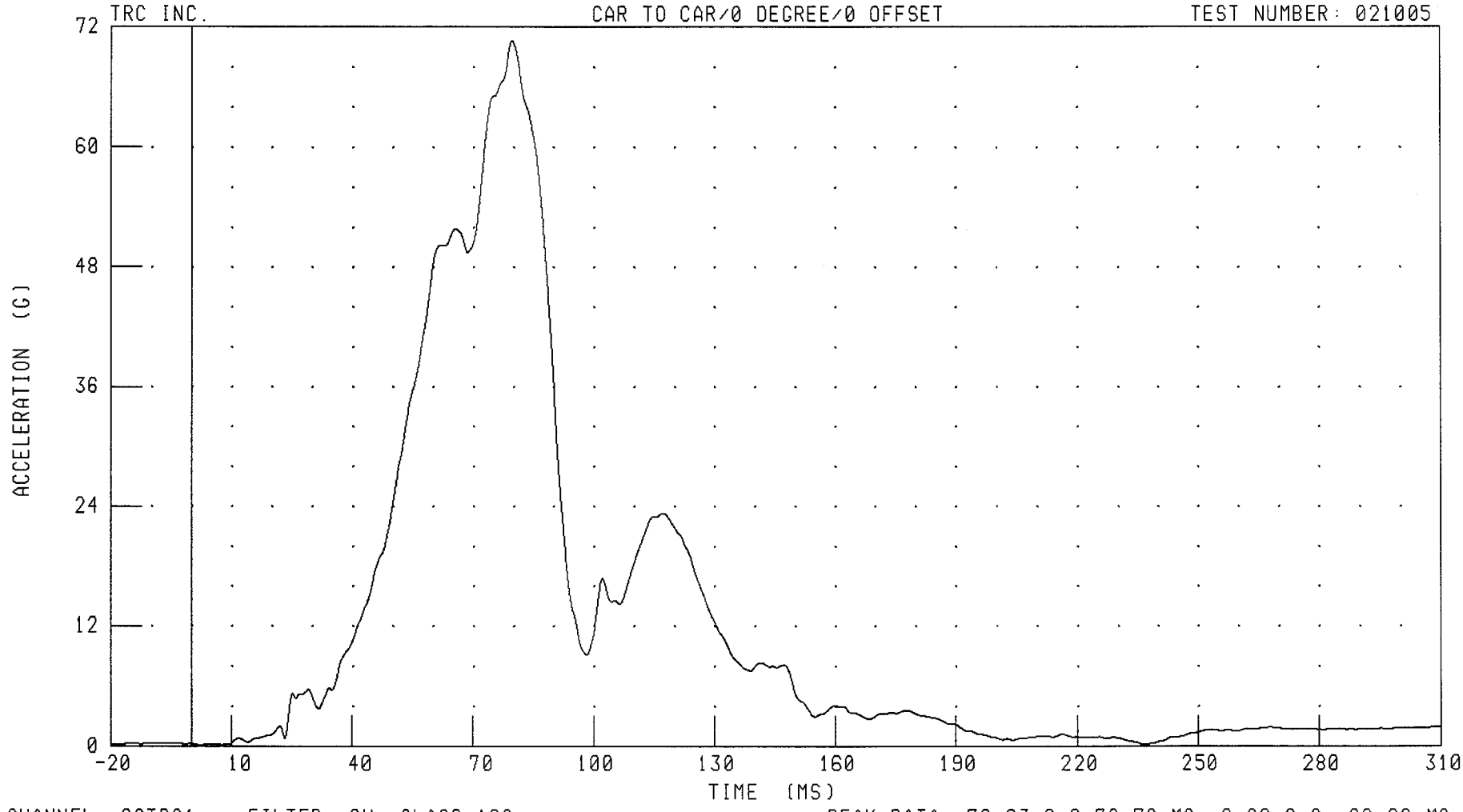
TARGET DRIVER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 18.29 G @ 61.20 MS; -21.83 G @ 117.20 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER CHEST RESULTANT ACCELERATION

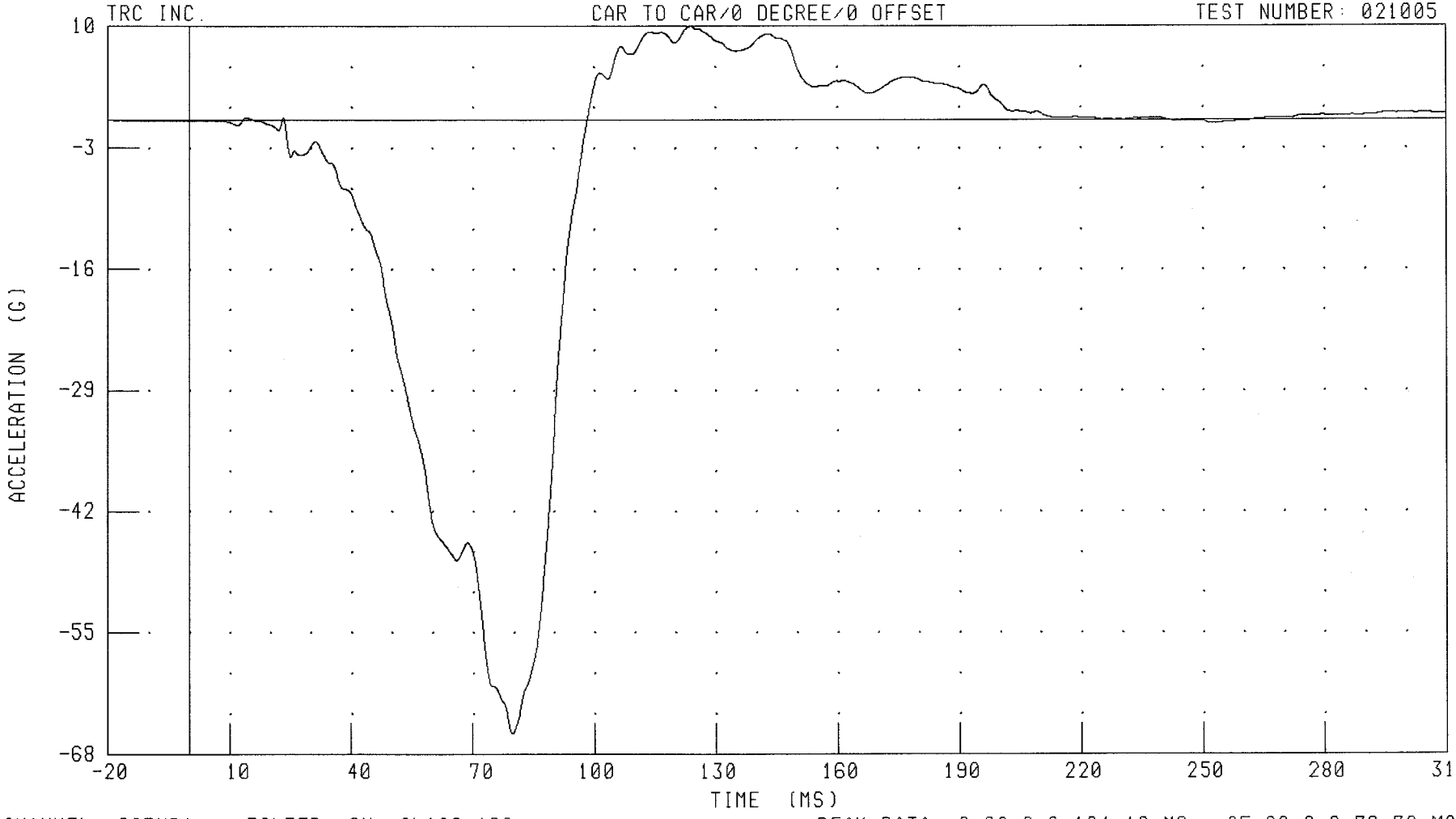


CHANNEL: CSTRG1 FILTER: CH. CLASS 180

PEAK DATA: 70.63 G @ 79.76 MS; 0.02 G @ -20.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER CHEST X-AXIS REDUNDANT ACCELERATION

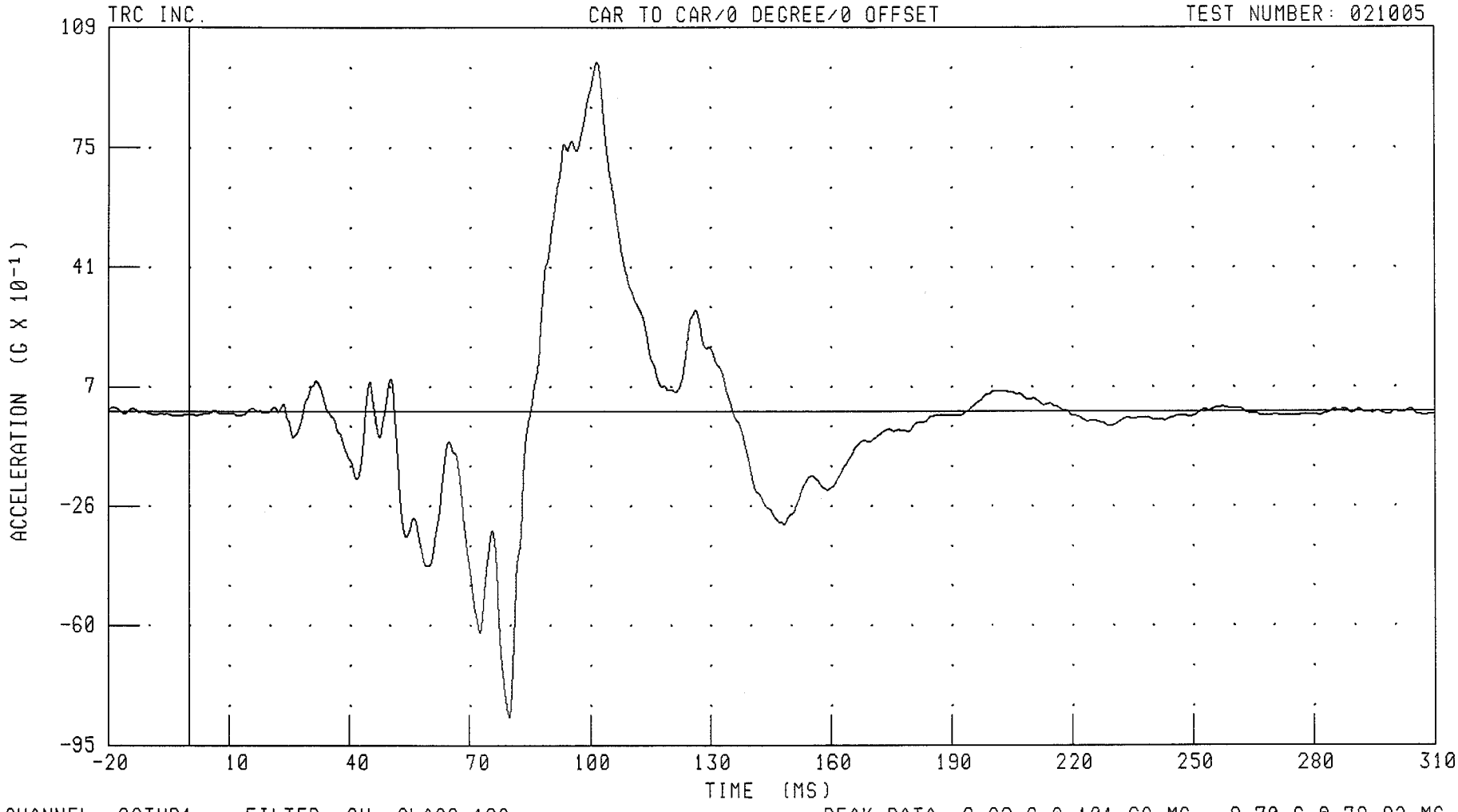


CHANNEL: CSTXR1 FILTER: CH. CLASS 180 PEAK DATA: 9.99 G @ 124.16 MS; -65.82 G @ 79.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER CHEST Y-AXIS REDUNDANT ACCELERATION

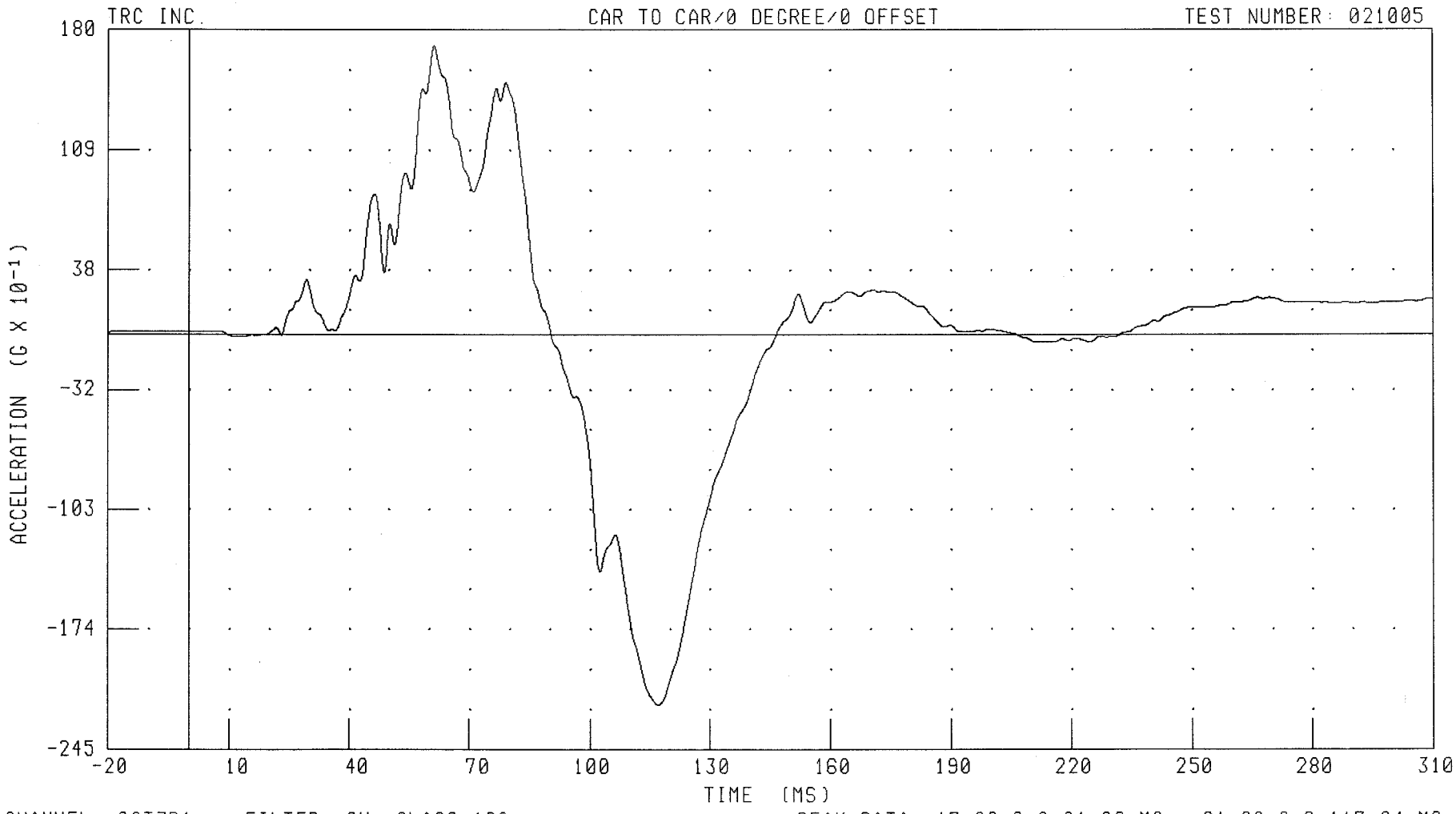


CHANNEL: CSTYR1 FILTER: CH. CLASS 180 PEAK DATA: 9.92 G @ 101.68 MS; -8.70 G @ 79.92 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

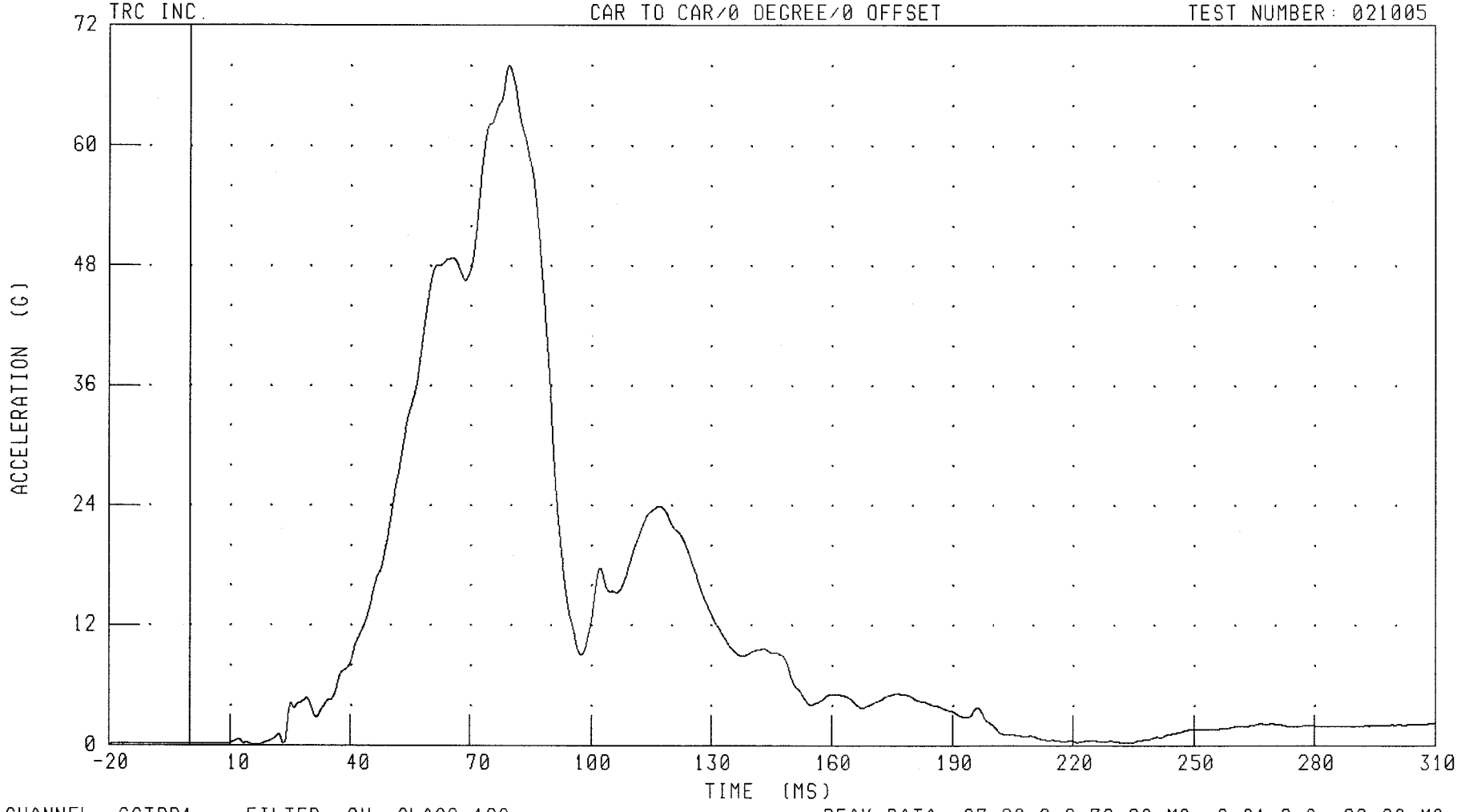
TARGET DRIVER CHEST Z-AXIS REDUNDANT ACCELERATION



CHANNEL: CSTZR1 FILTER: CH. CLASS 180 PEAK DATA: 17.06 G @ 61.28 MS; -21.96 G @ 117.04 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

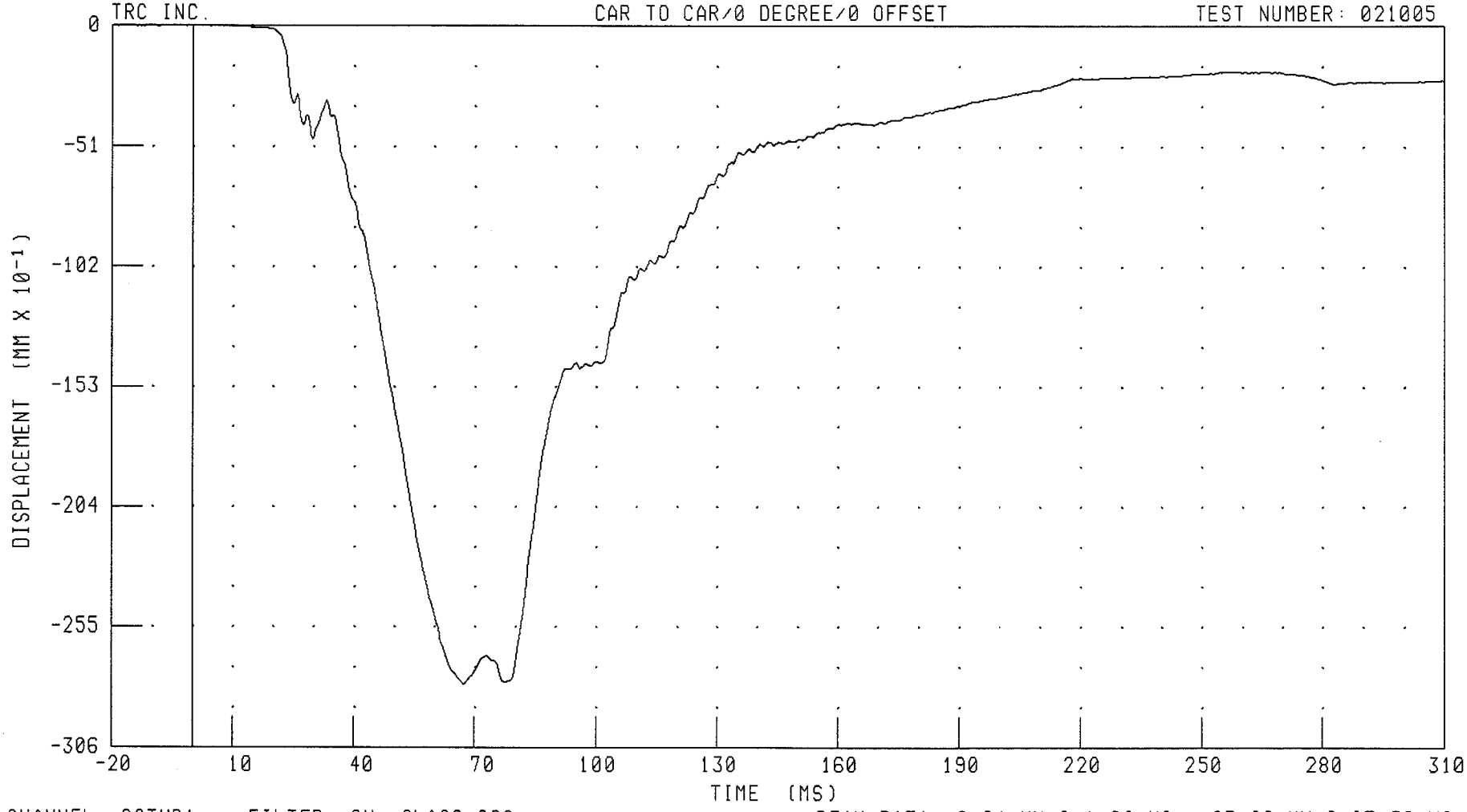
TARGET DRIVER CHEST REDUNDANT RESULTANT ACCELERATION



CHANNEL: CSTRR1 FILTER: CH. CLASS 180 PEAK DATA: 67.96 G @ 79.68 MS; 0.01 G @ -20.00 MS

021005

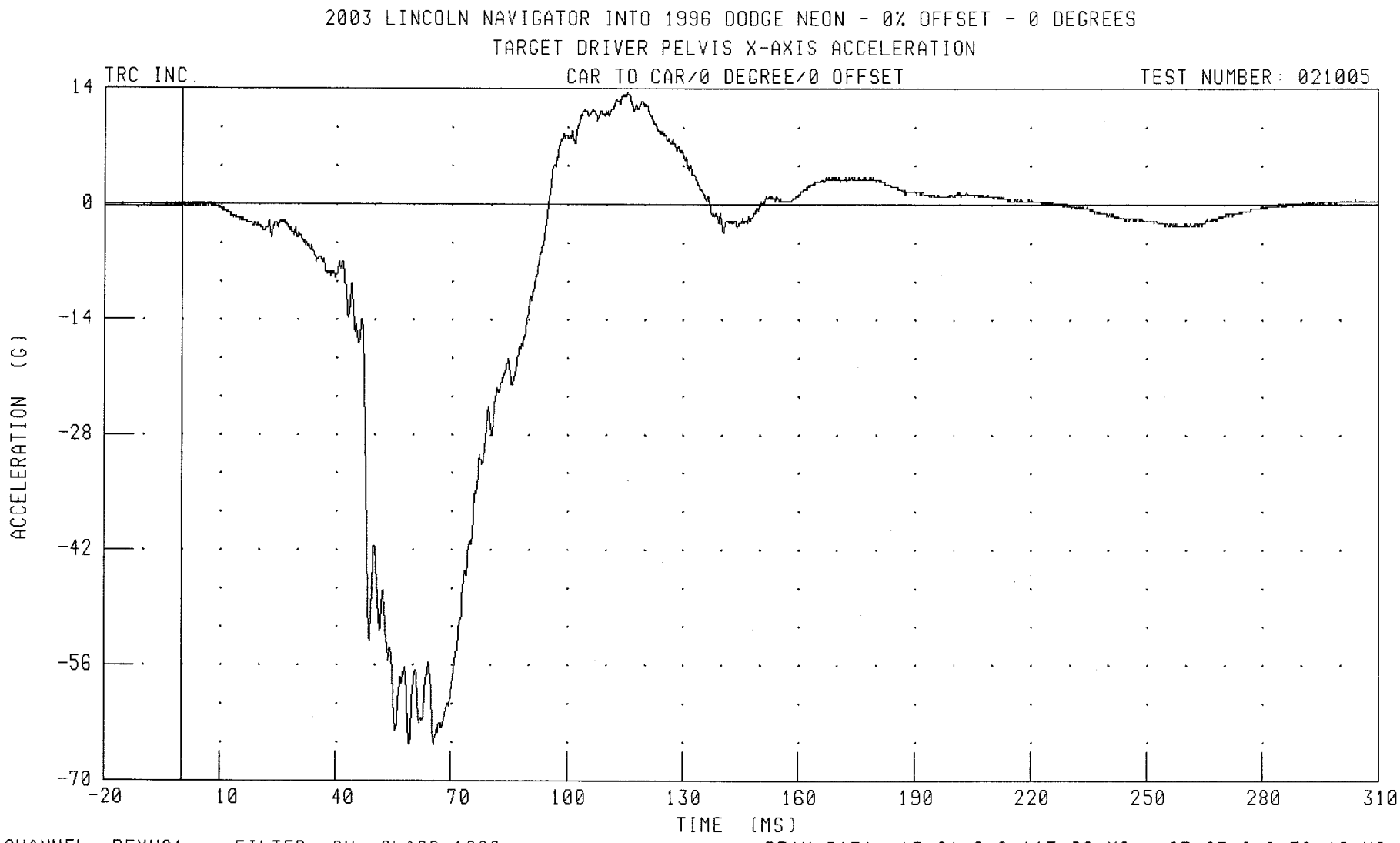
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER CHEST DEFLECTION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: CSTXD1 FILTER: CH. CLASS 600 PEAK DATA: 0.04 MM @ 1.68 MS; -27.92 MM @ 67.36 MS

021005

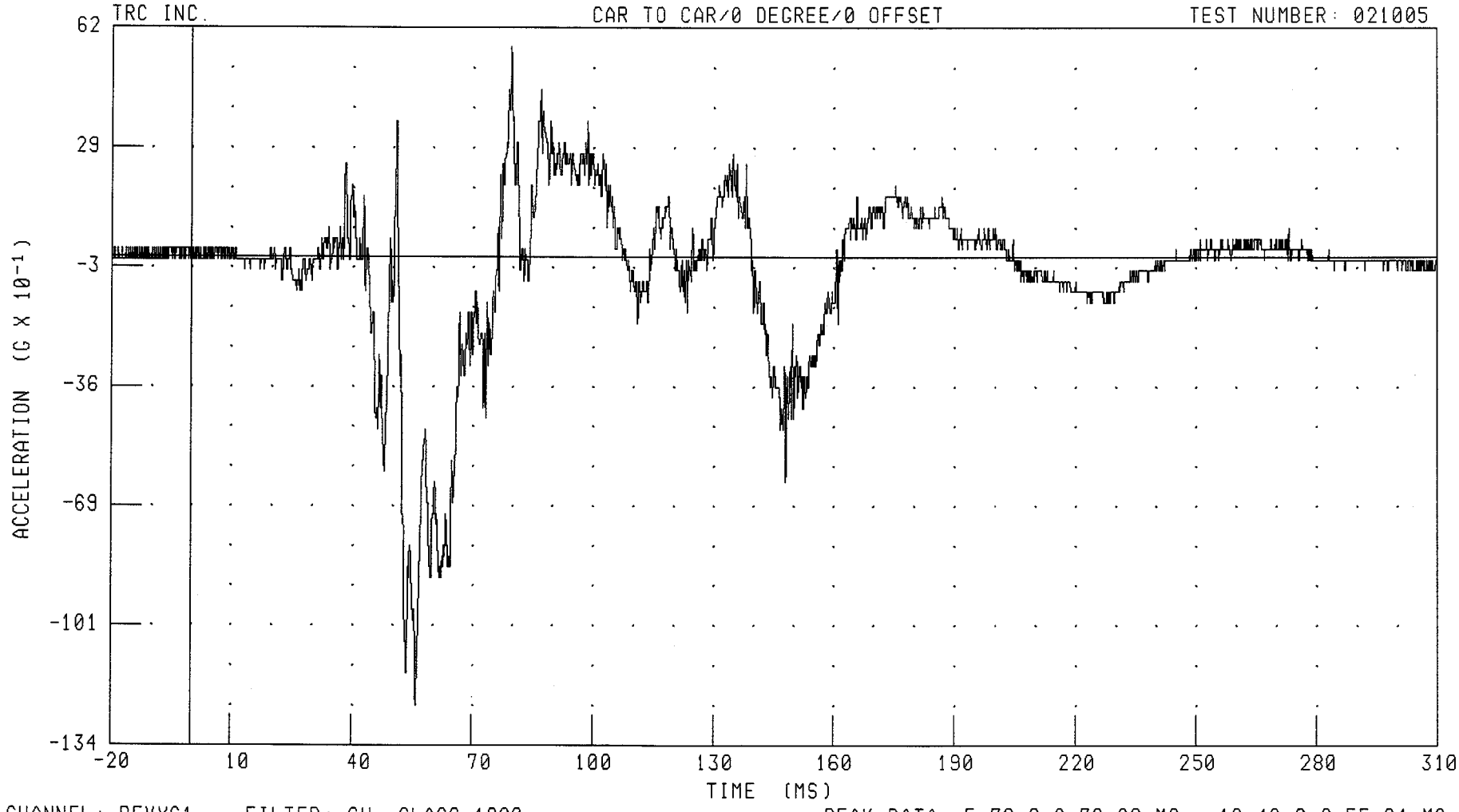
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER PELVIS X-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: PEVXG1 FILTER: CH. CLASS 1000 PEAK DATA: 13.61 G @ 115.60 MS; -65.67 G @ 59.12 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

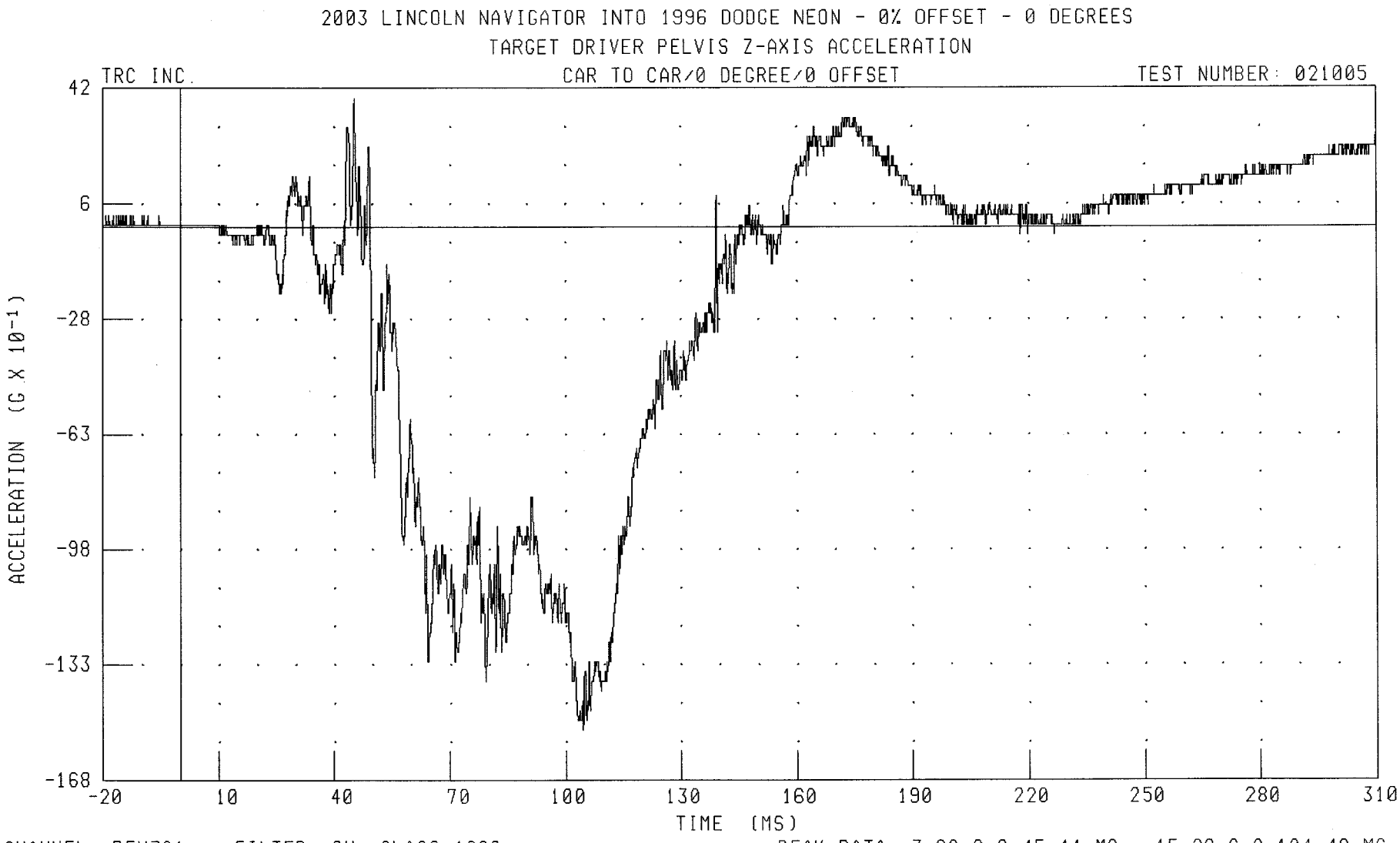
TARGET DRIVER PELVIS Y-AXIS ACCELERATION



CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

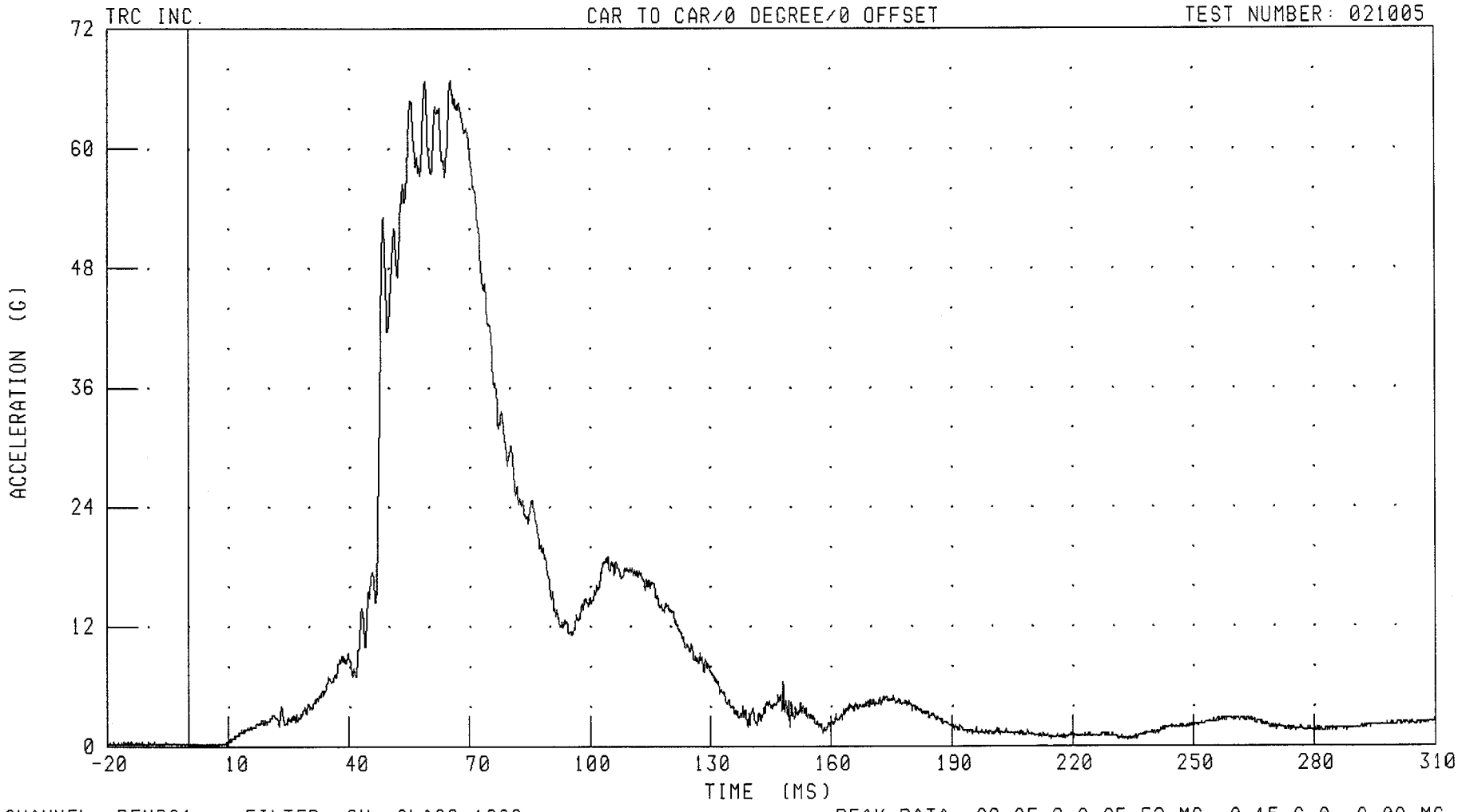
PEAK DATA: 5.78 G @ 79.60 MS; -12.40 G @ 55.84 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER PELVIS Z-AXIS ACCELERATION
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
42
6
-28
-63
-98
-133
-168
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVZG1
FILTER: CH. CLASS 1000
PEAK DATA: 3.89 G @ 45.44 MS; -15.28 G @ 104.48 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER PELVIS RESULTANT ACCELERATION



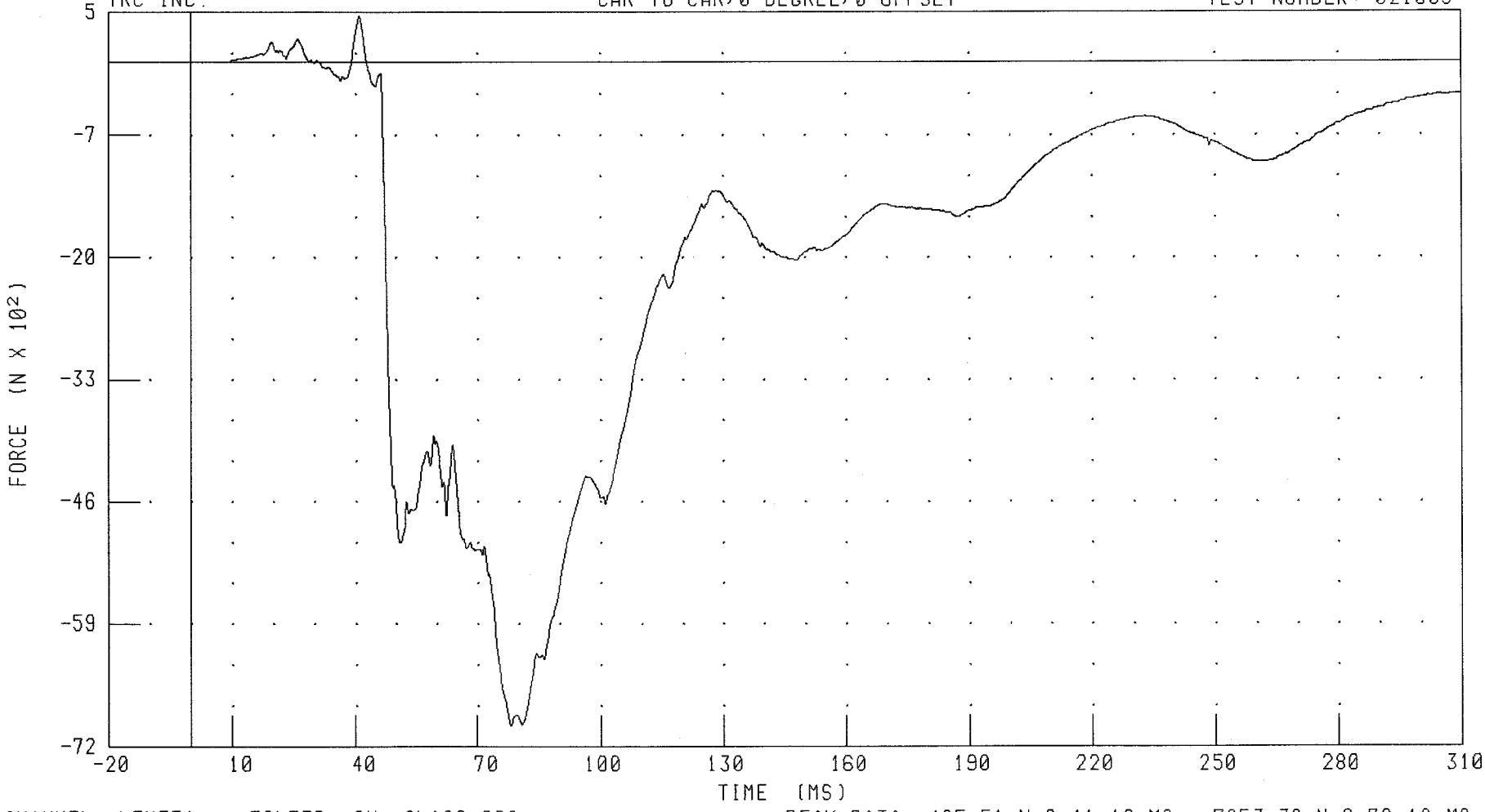
CHANNEL: PEVRG1 FILTER: CH. CLASS 1000 PEAK DATA: 66.85 G @ 65.52 MS; 0.15 G @ -8.08 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER LEFT FEMUR Z-AXIS FORCE

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



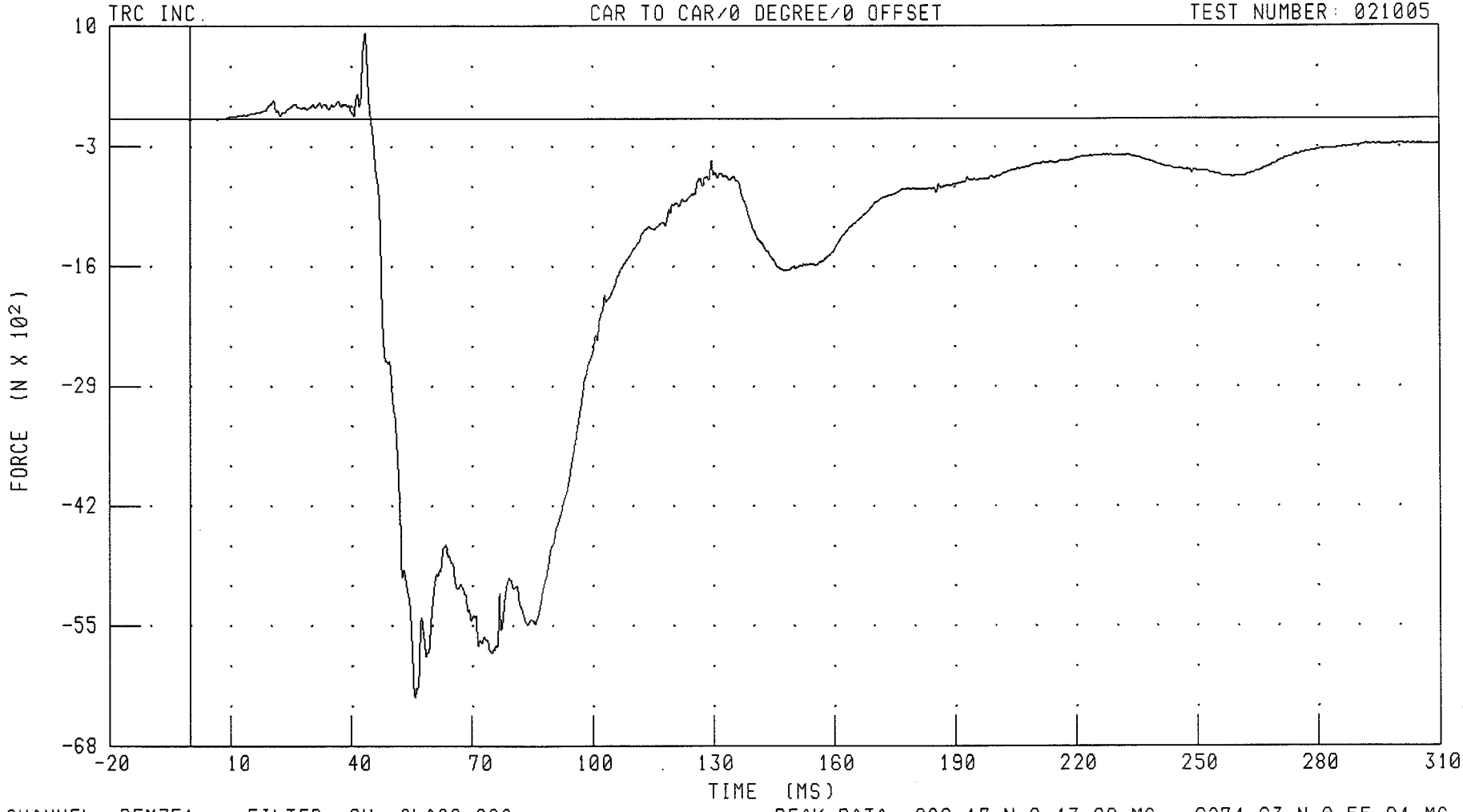
CHANNEL: LFMZF1 FILTER: CH. CLASS 600 PEAK DATA: 485.51 N @ 41.12 MS; -7053.30 N @ 78.16 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER RIGHT FEMUR Z-AXIS FORCE

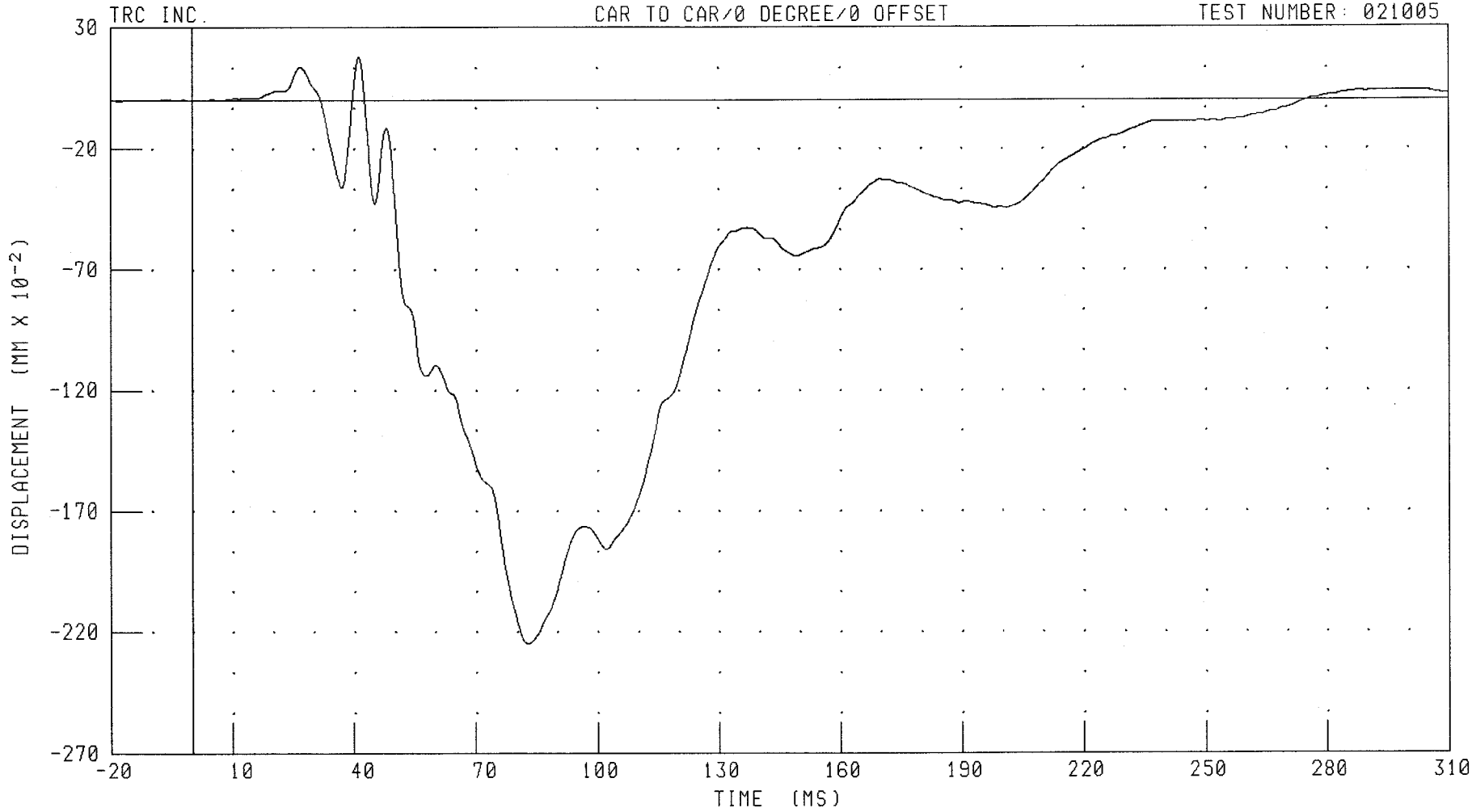
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: RFMZF1 FILTER: CH. CLASS 600 PEAK DATA: 928.17 N @ 43.60 MS; -6274.63 N @ 55.84 MS

021005

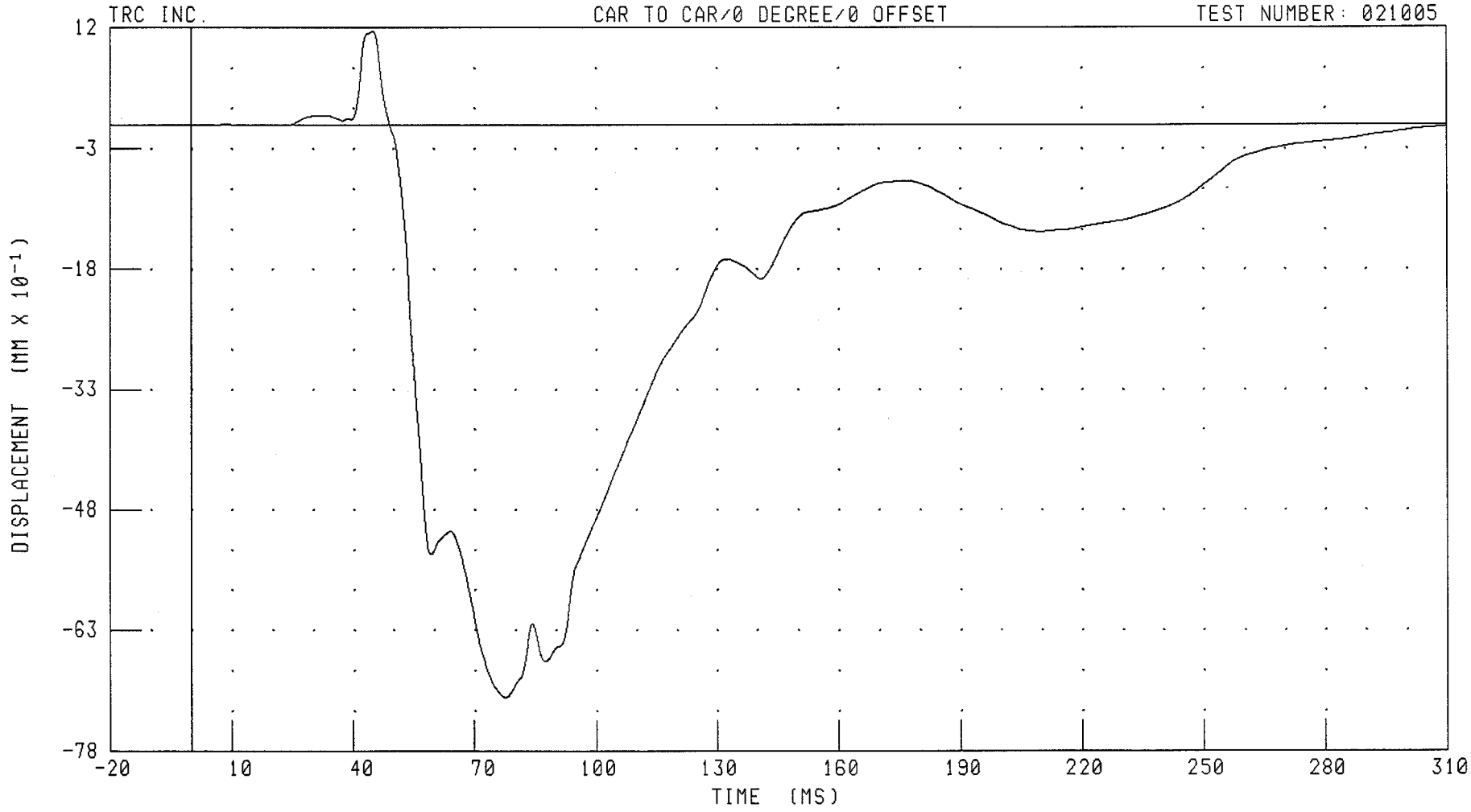
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER LEFT KNEE DISPLACEMENT
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: KNLXD1 FILTER: CH. CLASS 180 PEAK DATA: 0.18 MM @ 41.28 MS; -2.25 MM @ 82.80 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER RIGHT KNEE DISPLACEMENT

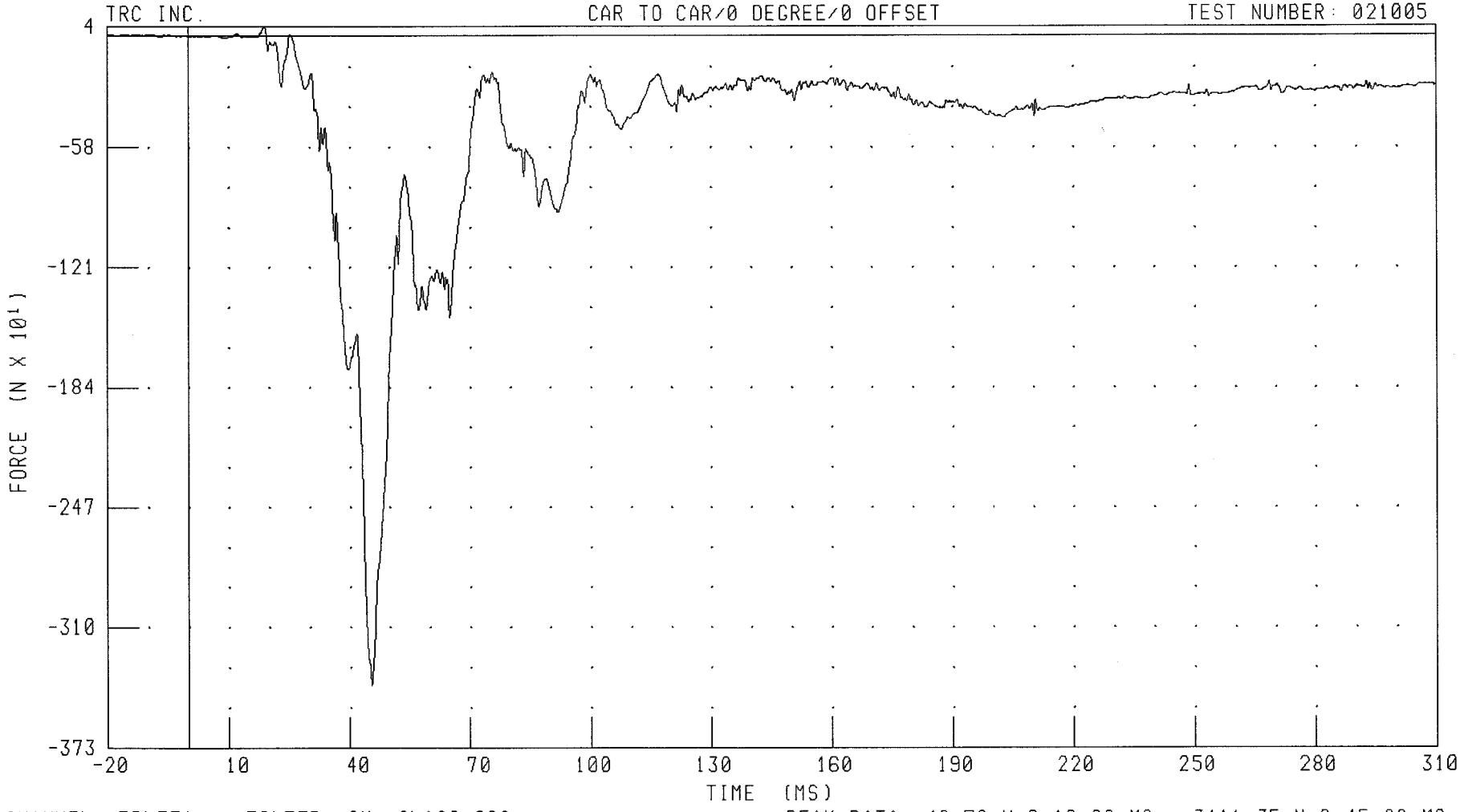


CHANNEL: KNRXD1 FILTER: CH. CLASS 180 PEAK DATA: 1.16 MM @ 45.04 MS; -7.14 MM @ 77.52 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER LEFT UPPER TIBIA Z-AXIS FORCE

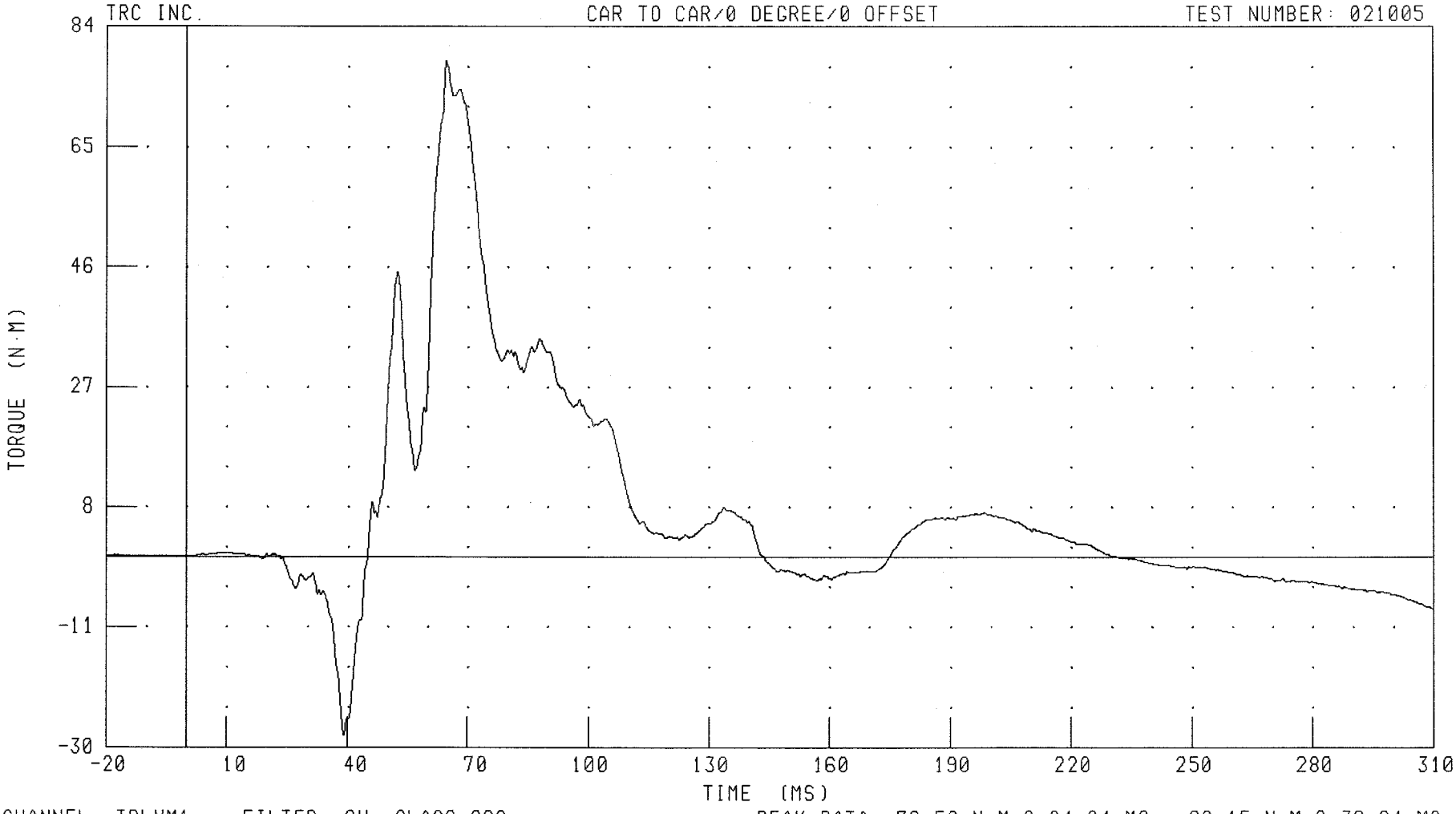


CHANNEL: TBLZF1 FILTER: CH. CLASS 600

PEAK DATA: 42.72 N @ 18.88 MS; -3411.35 N @ 45.60 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

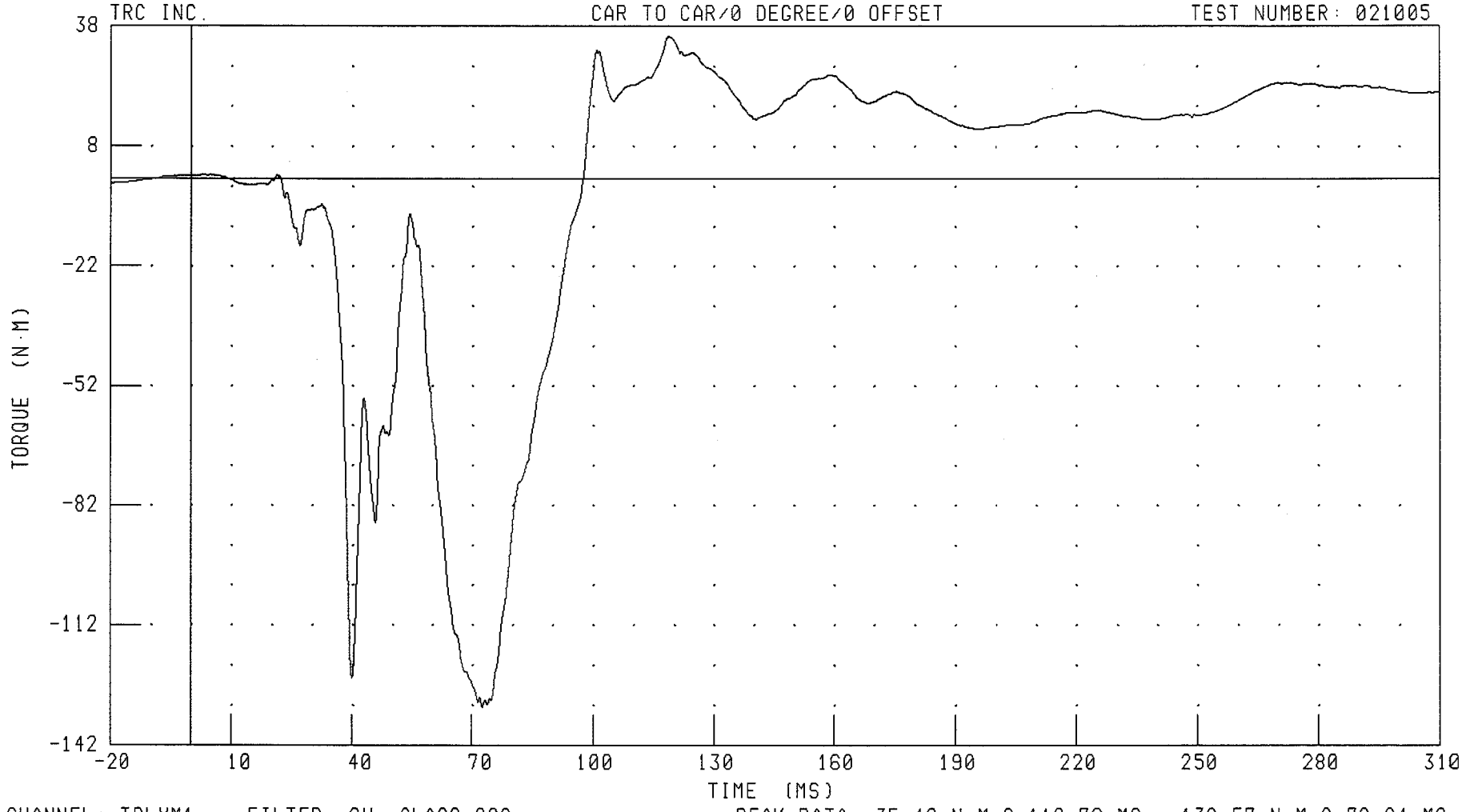


CHANNEL: TBLXM1 FILTER: CH. CLASS 600 PEAK DATA: 78.58 N-M @ 64.64 MS; -28.15 N-M @ 39.04 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

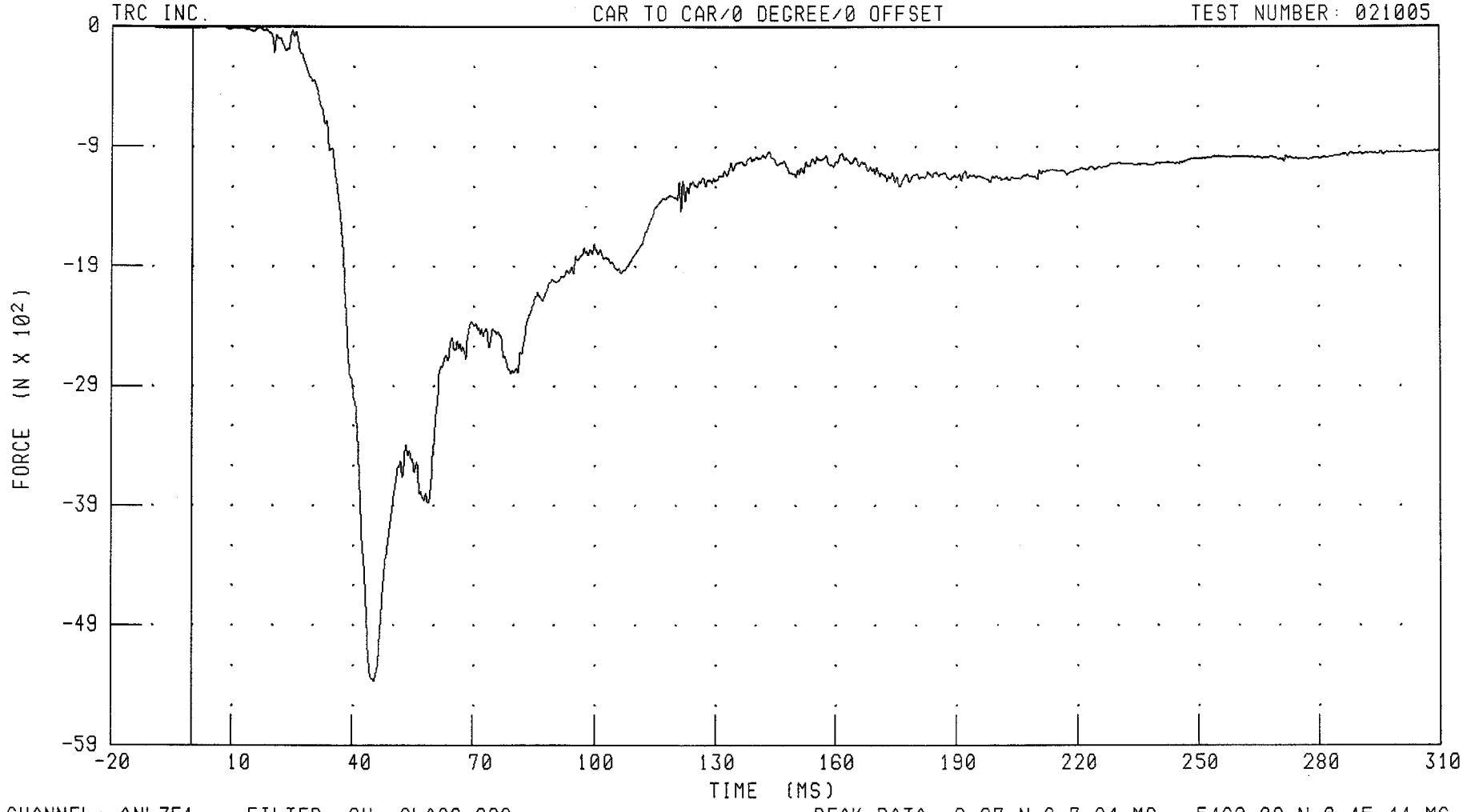
TARGET DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS



CHANNEL: TBLYM1 FILTER: CH. CLASS 600 PEAK DATA: 35.42 N-M @ 118.72 MS; -132.57 N-M @ 72.64 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER LEFT LOWER TIBIA Z-AXIS FORCE



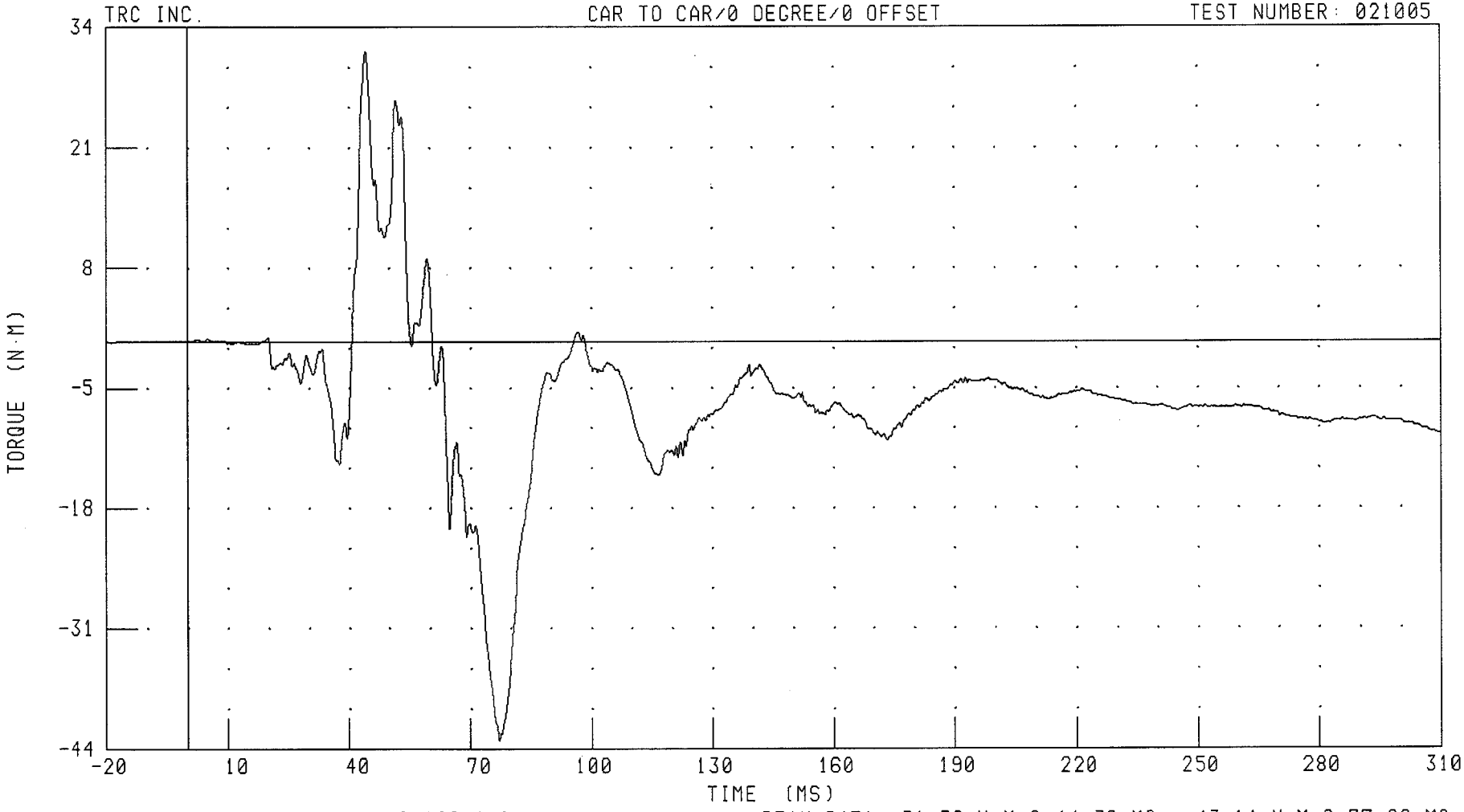
CHANNEL: ANLZF1 FILTER: CH. CLASS 600 PEAK DATA: 6.97 N @ 7.04 MS; -5460.09 N @ 45.44 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER LEFT LOWER TIBIA MOMENT ABOUT X AXIS

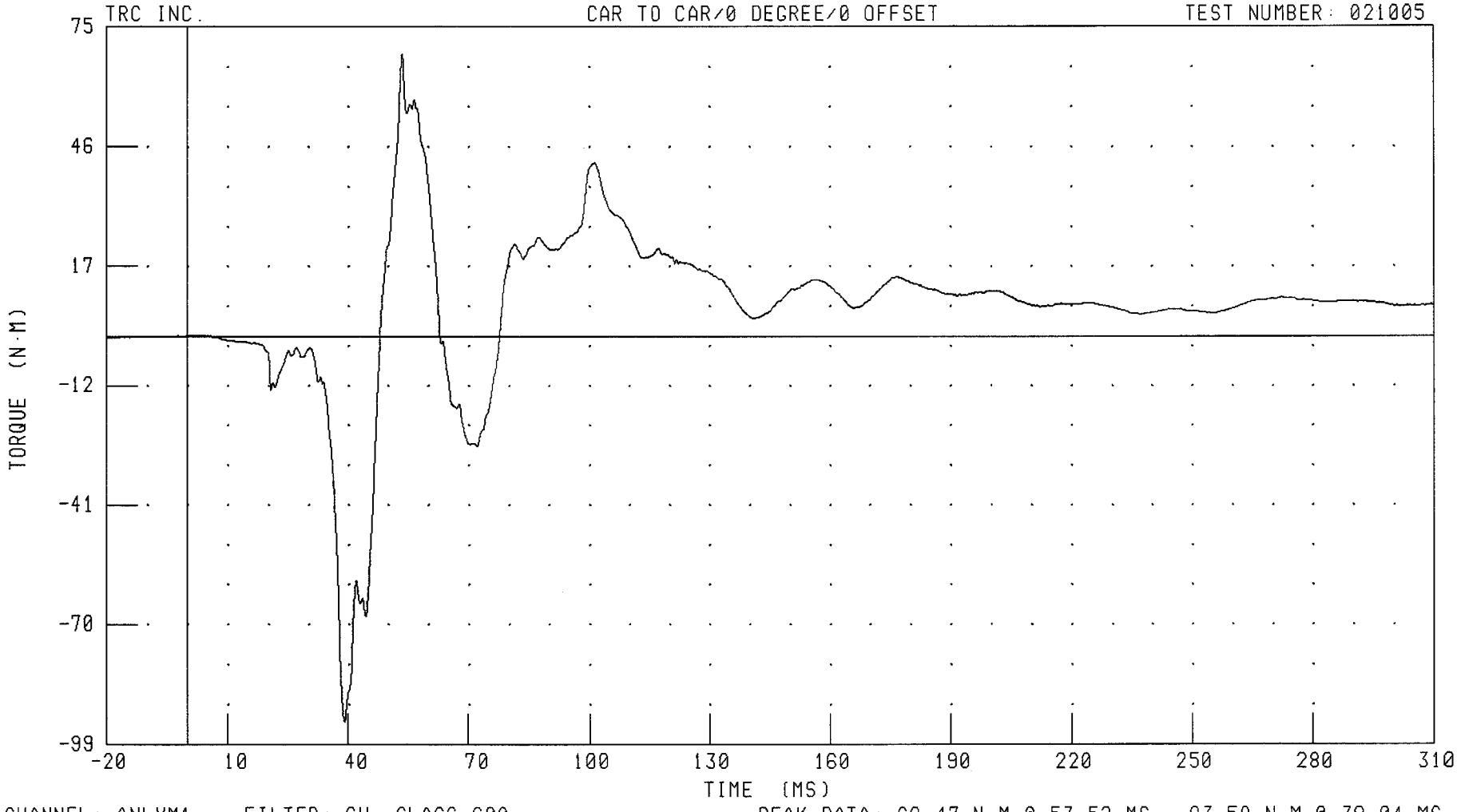
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: ANLXM1 FILTER: CH. CLASS 600 PEAK DATA: 31.38 N-M @ 44.32 MS; -43.14 N-M @ 77.20 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS



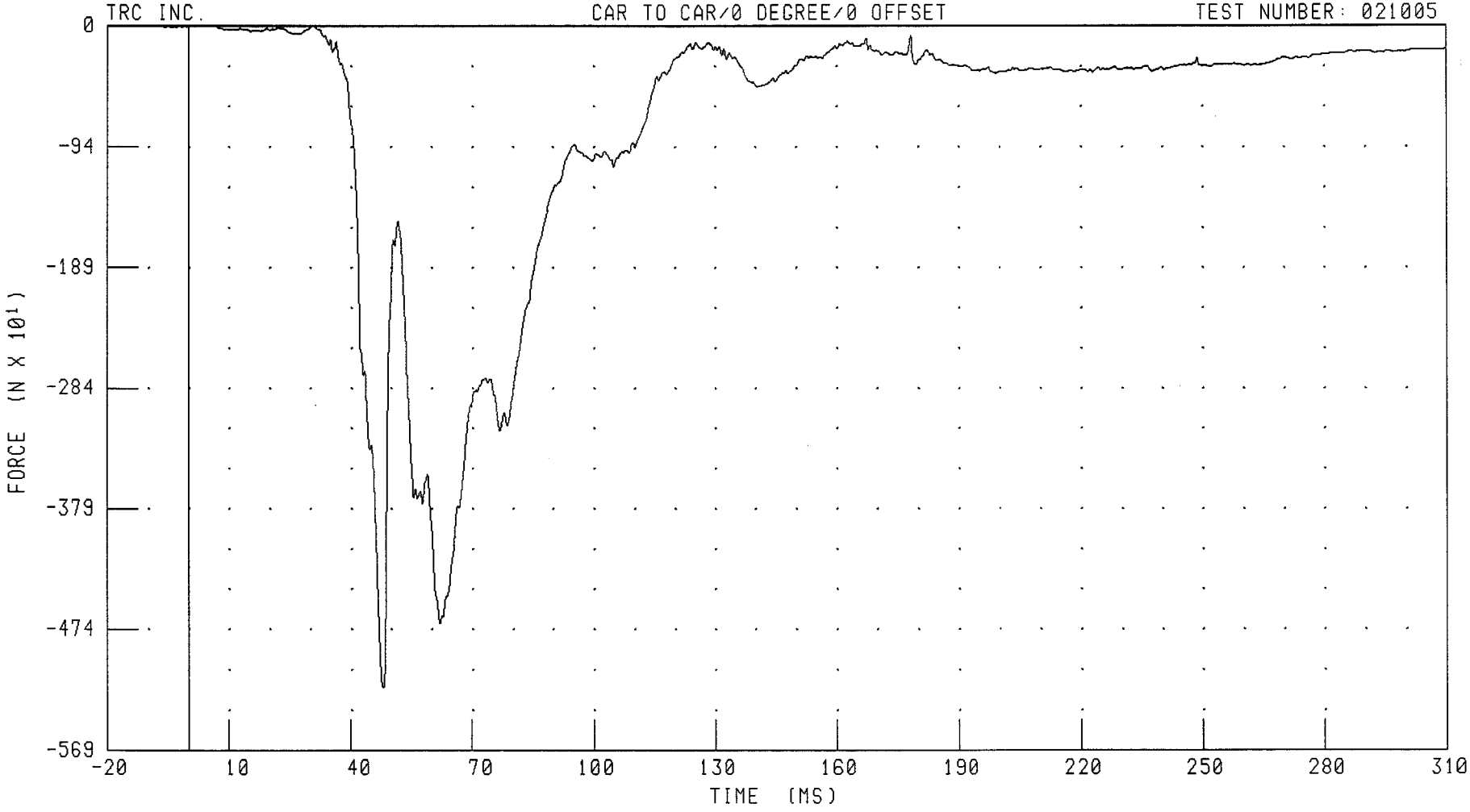
CHANNEL: ANLYM1 FILTER: CH. CLASS 600 PEAK DATA: 68.47 N-M @ 53.52 MS; -93.58 N-M @ 39.04 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER RIGHT UPPER TIBIA Z-AXIS FORCE

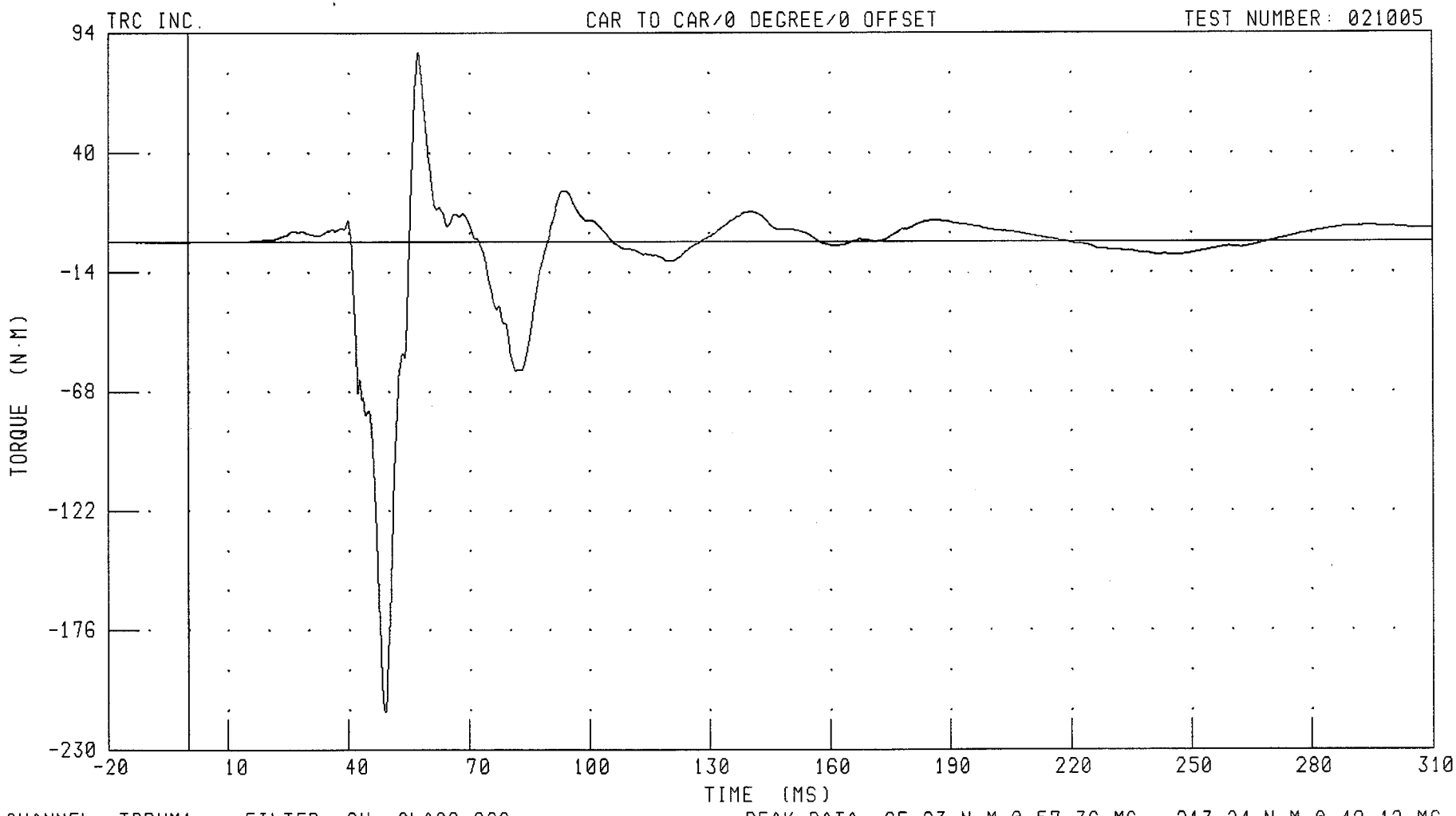
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: TBRZF1 FILTER: CH. CLASS 600 PEAK DATA: 3.72 N @ 5.68 MS; -5208.46 N @ 48.08 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

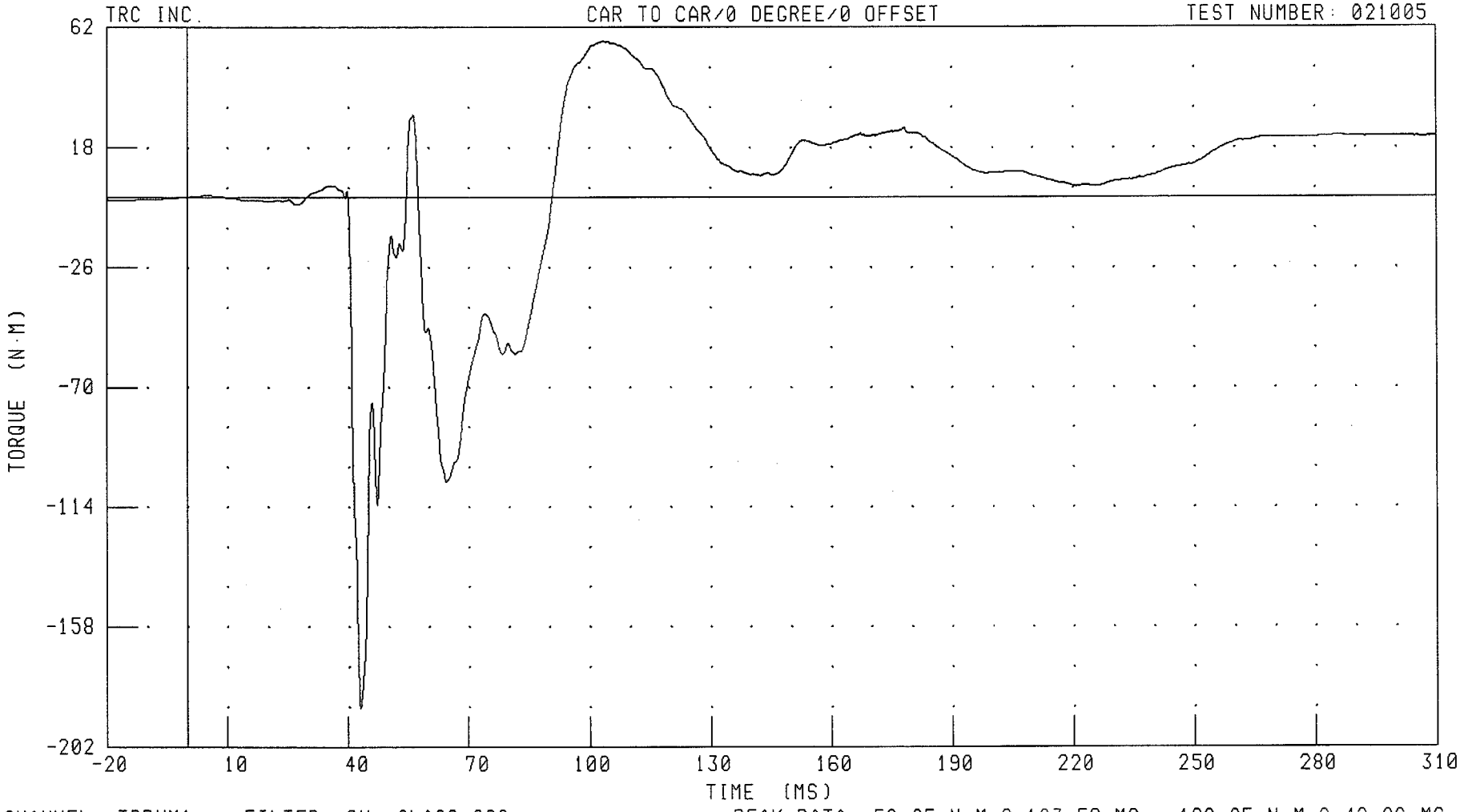


CHANNEL: TBRXM1 FILTER: CH. CLASS 600 PEAK DATA: 85.63 N·M @ 57.36 MS; -213.24 N·M @ 49.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

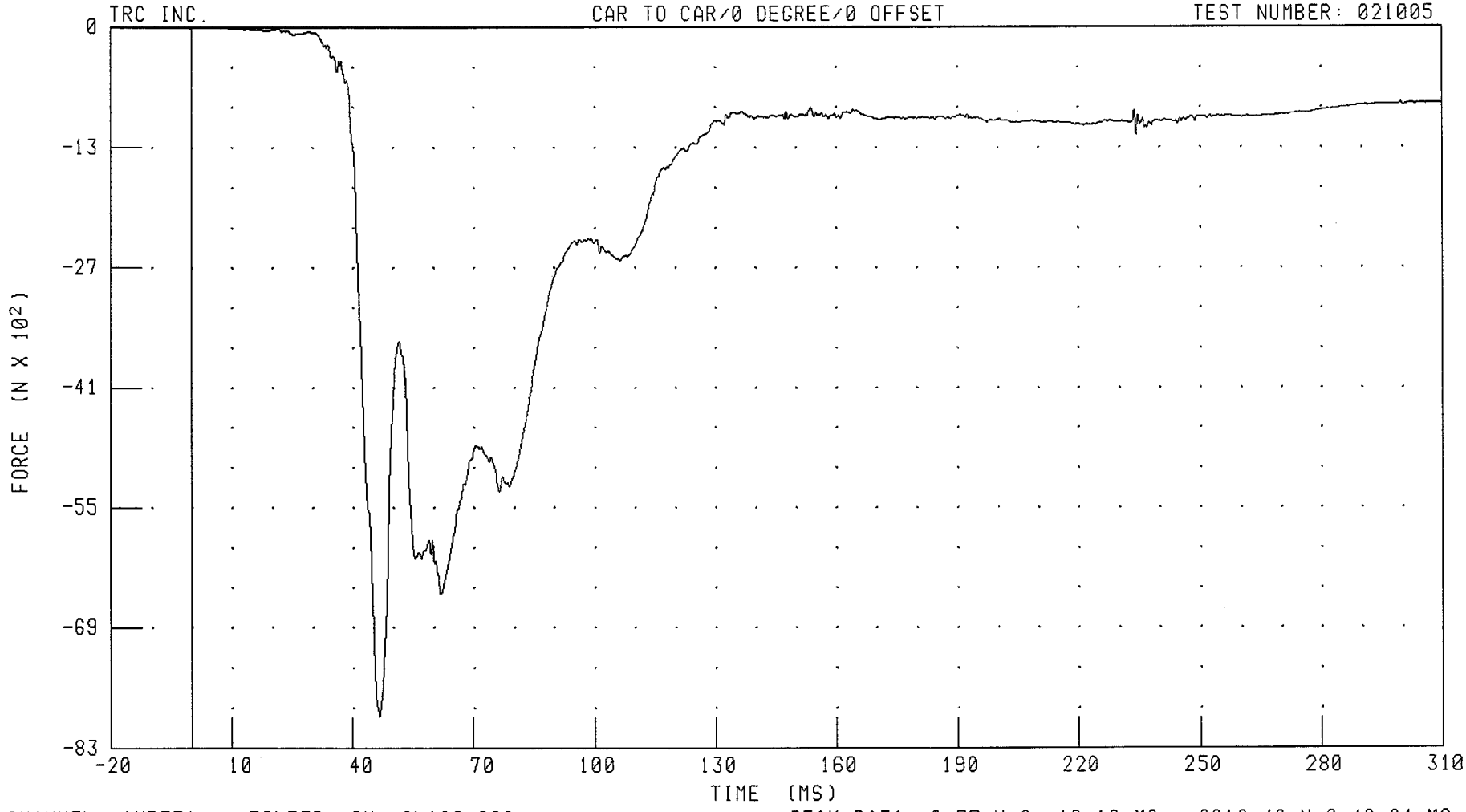


CHANNEL: TBRYM1 FILTER: CH. CLASS 600 PEAK DATA: 56.95 N·M @ 103.52 MS; -188.05 N·M @ 42.96 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE

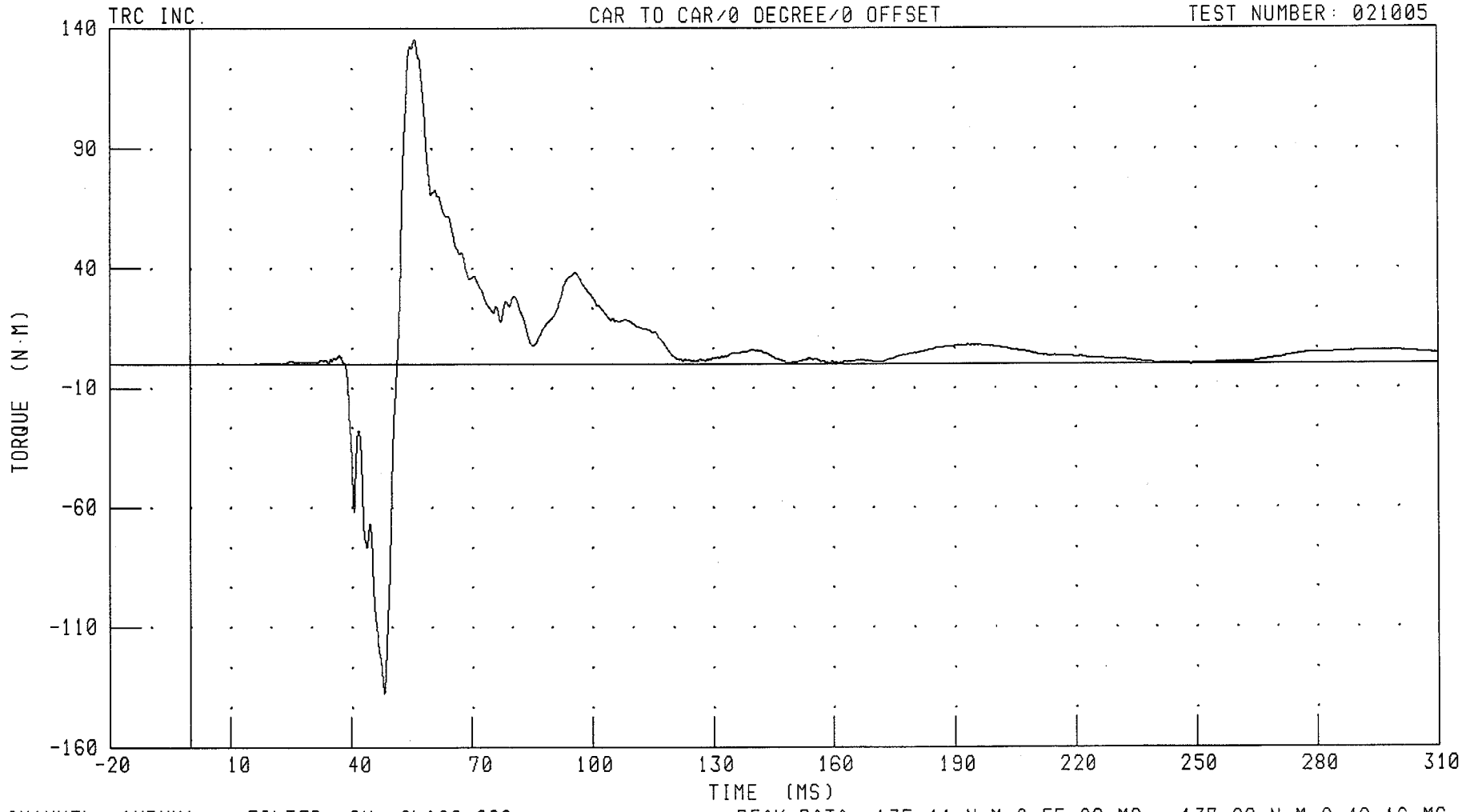


CHANNEL: ANRZF1 FILTER: CH. CLASS 600

PEAK DATA: 8.77 N @ -19.12 MS; -8018.49 N @ 46.64 MS

021005

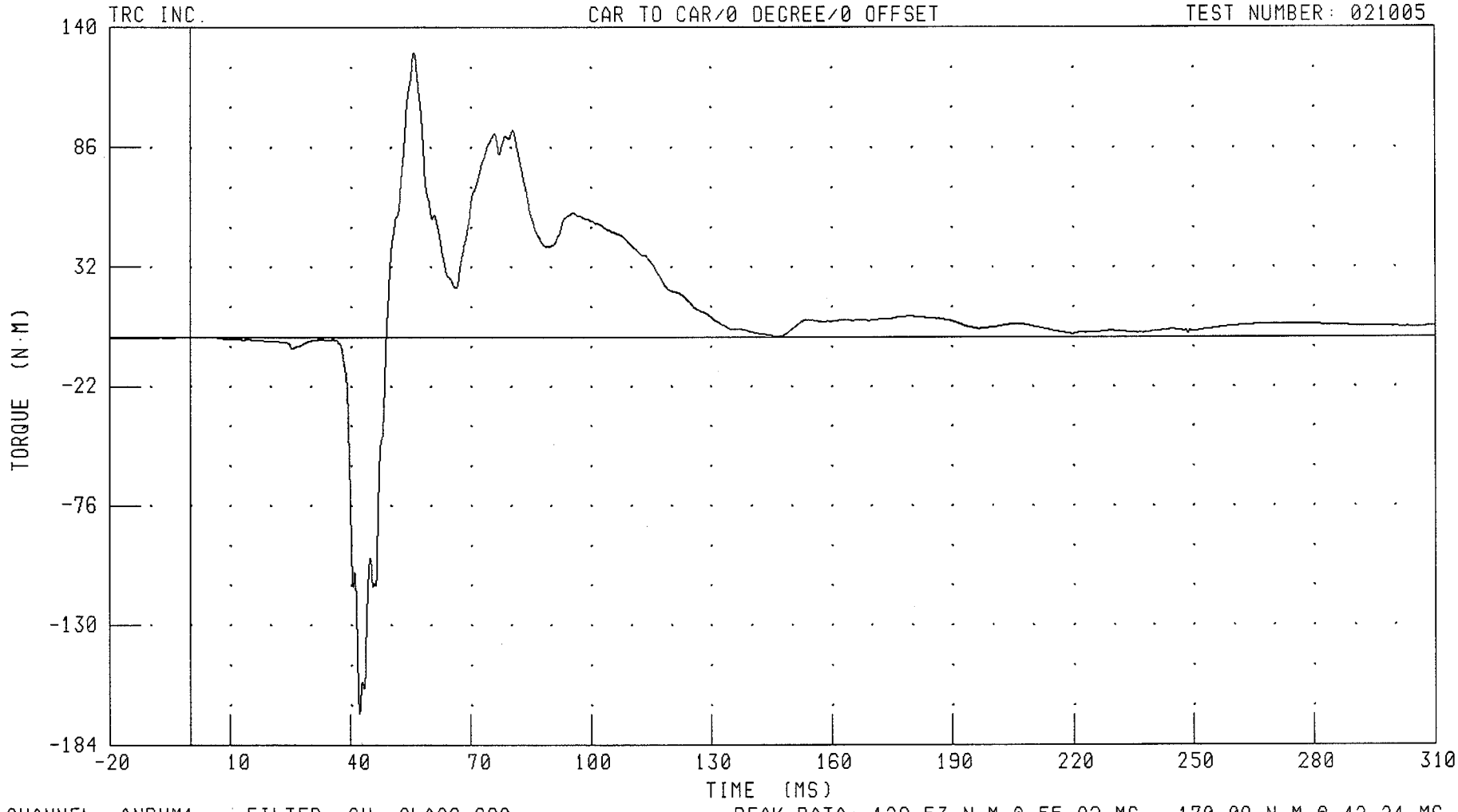
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS



CHANNEL: ANRXM1 FILTER: CH. CLASS 600 PEAK DATA: 135.44 N-M @ 55.92 MS; -137.69 N-M @ 48.16 MS

021005

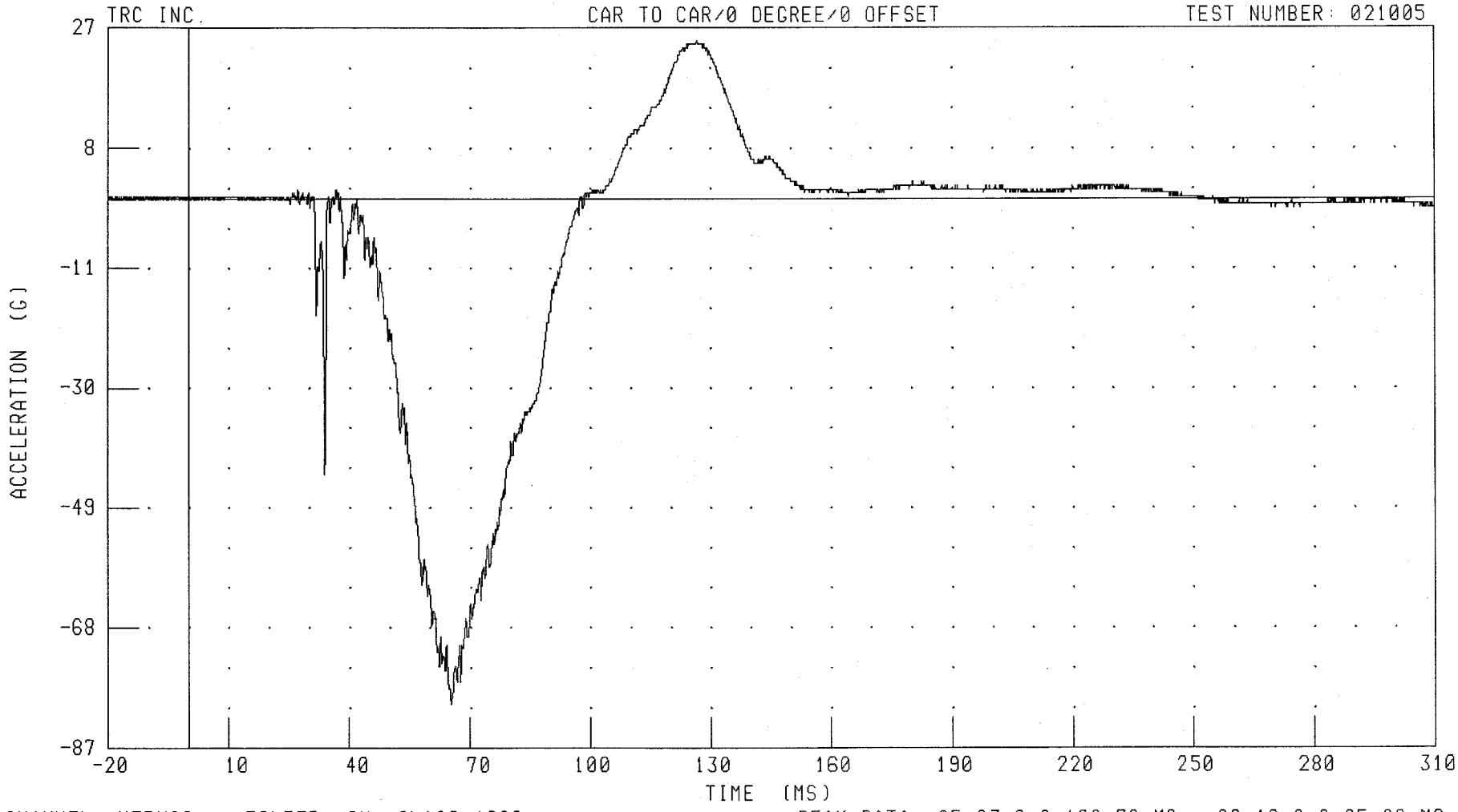
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS



CHANNEL: ANRYM1 FILTER: CH. CLASS 600 PEAK DATA: 128.53 N-M @ 55.92 MS; -170.09 N-M @ 42.24 MS

021005

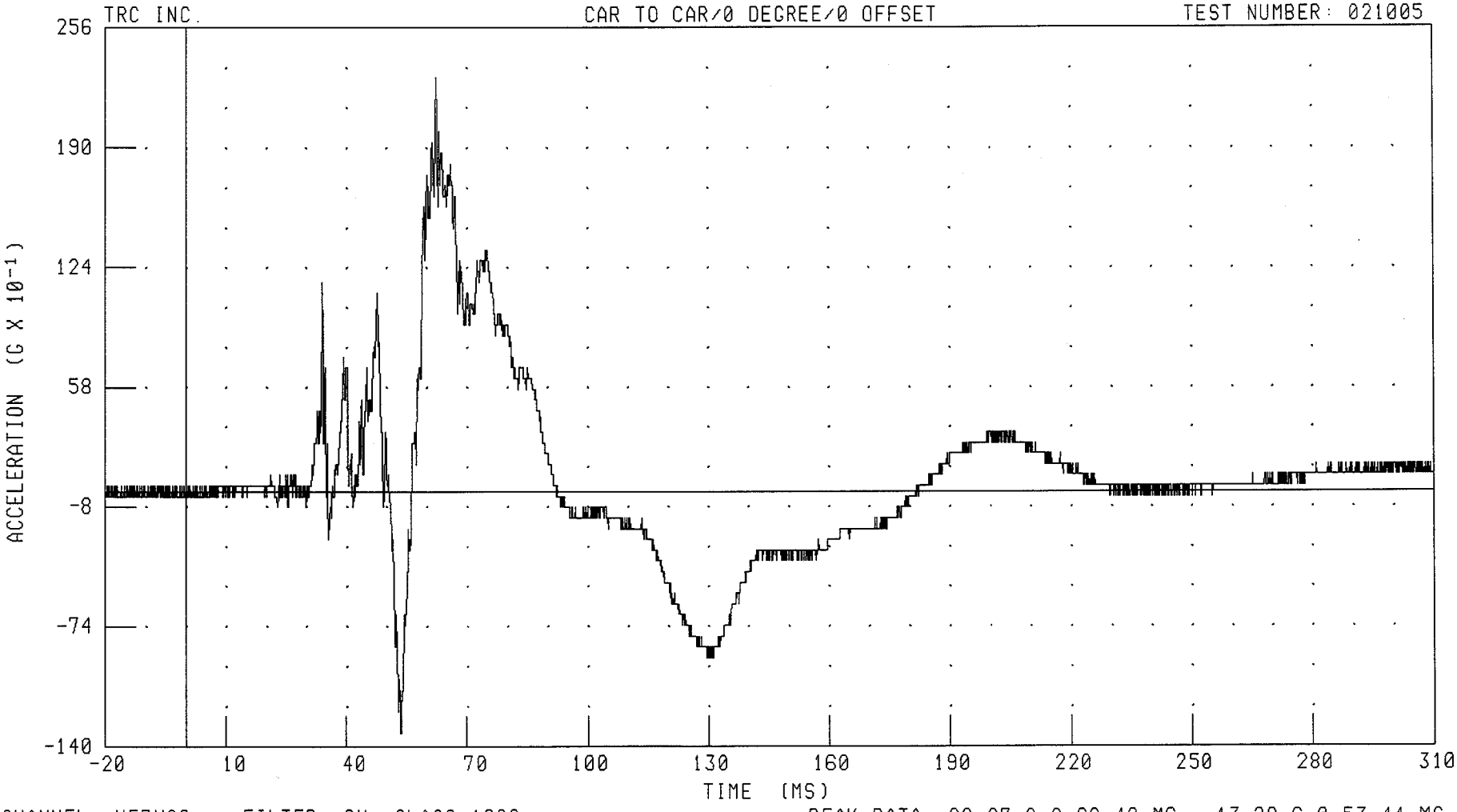
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000 PEAK DATA: 25.03 G @ 126.72 MS; -80.10 G @ 65.20 MS

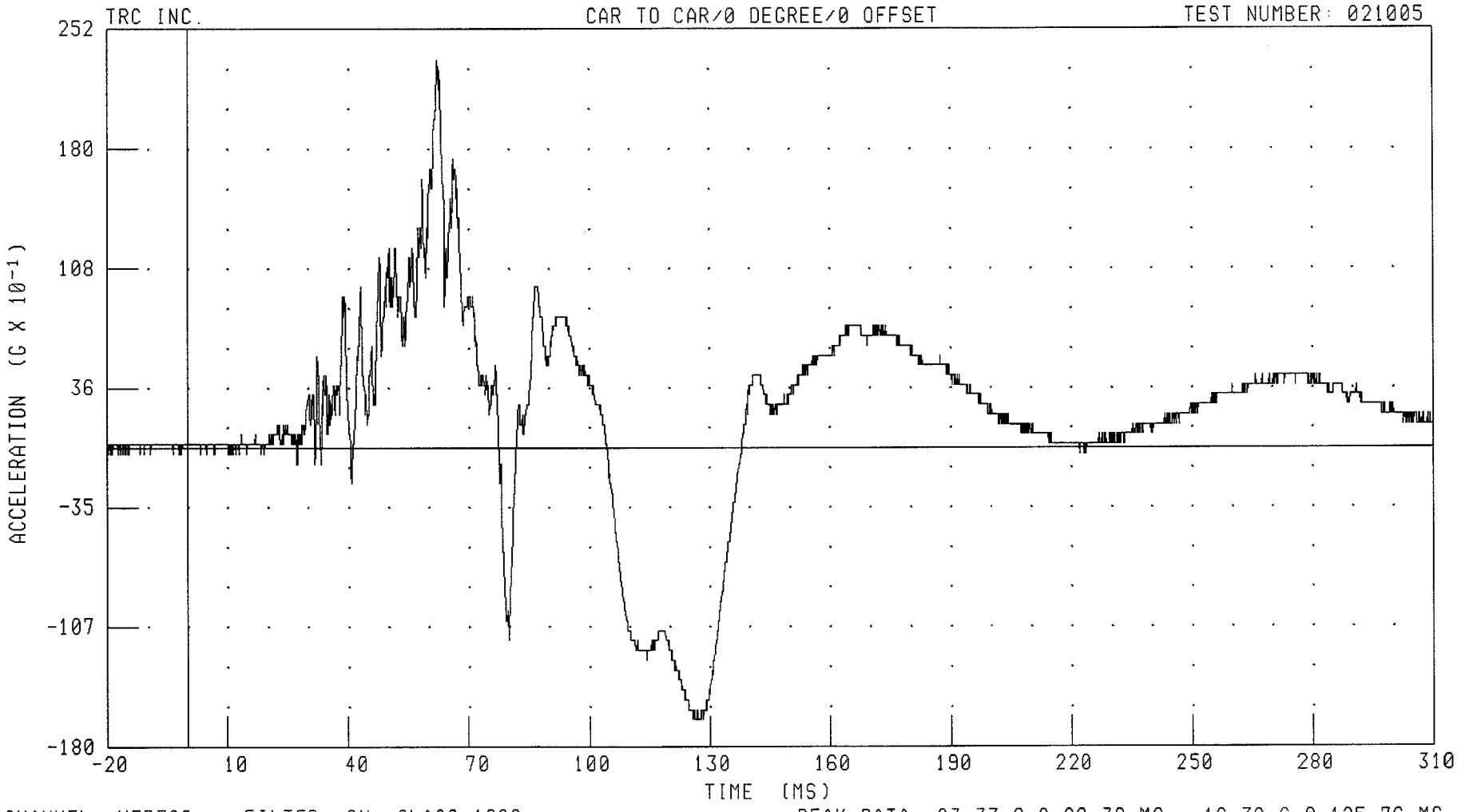
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000 PEAK DATA: 22.87 G @ 62.48 MS; -13.28 G @ 53.44 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD Z-AXIS ACCELERATION

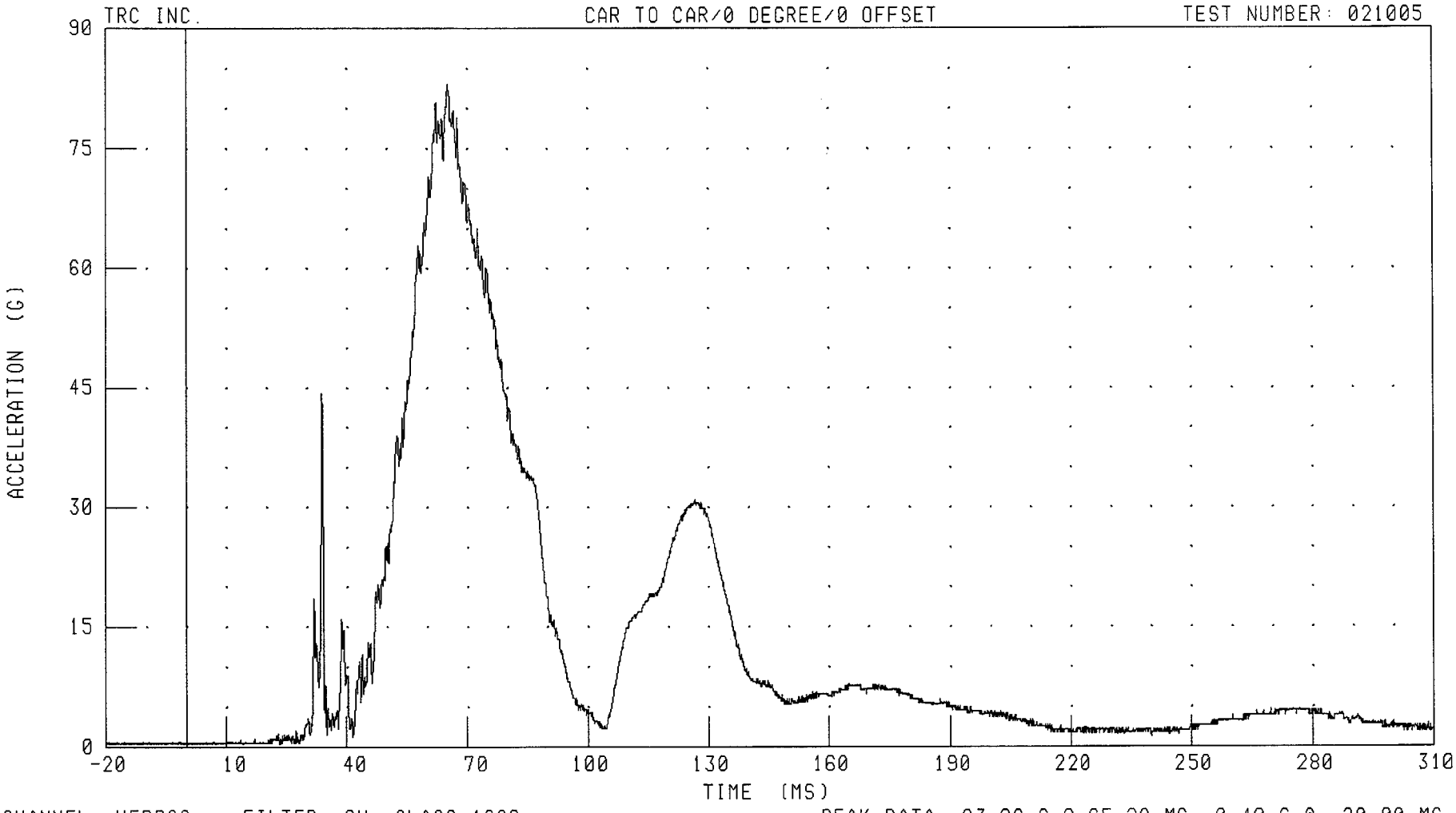


CHANNEL: HEDZG2 FILTER: CH. CLASS 1000 PEAK DATA: 23.33 G @ 62.32 MS; -16.38 G @ 125.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

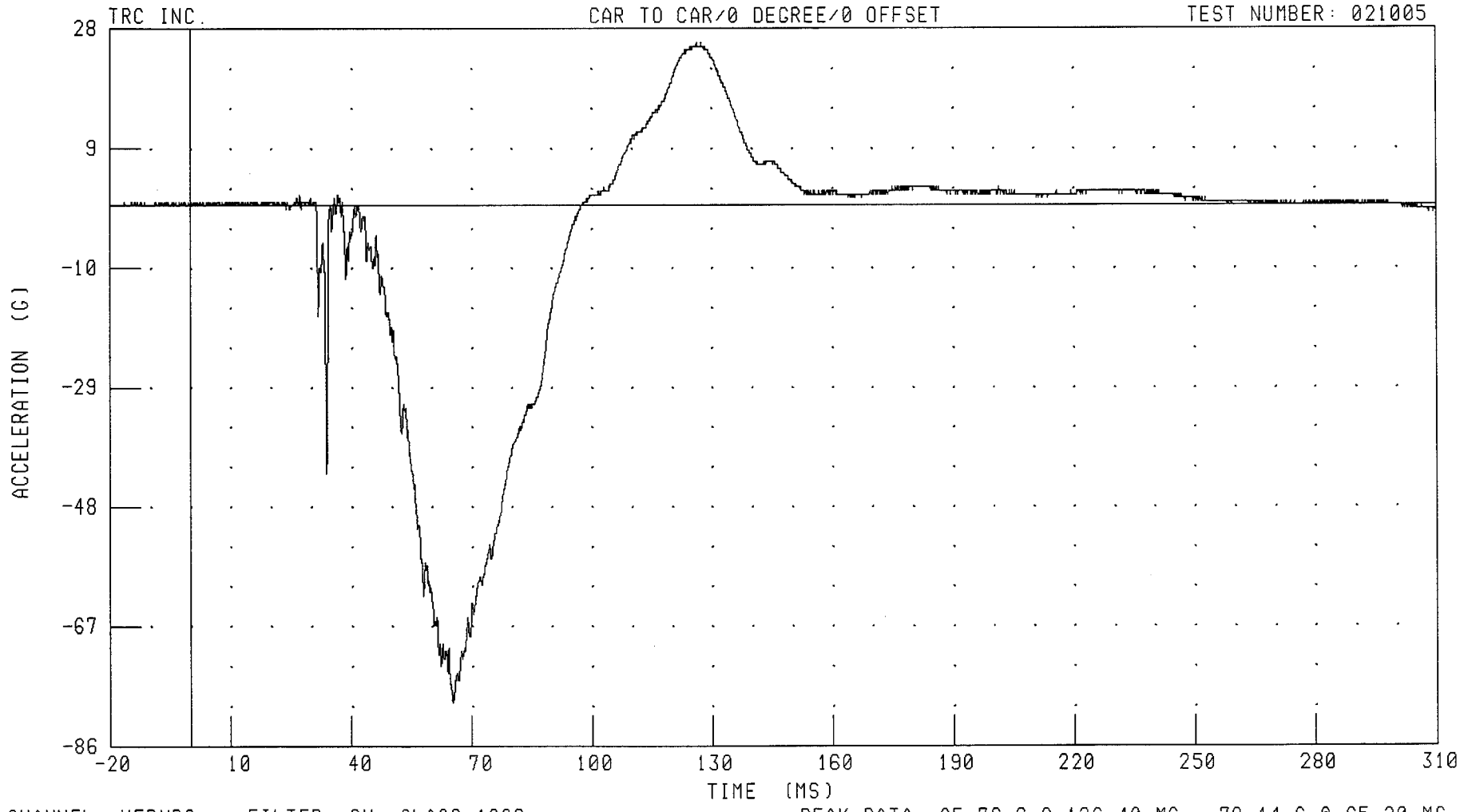
TARGET PASSENGER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG2 FILTER: CH. CLASS 1000 PEAK DATA: 83.06 G @ 65.28 MS; 0.40 G @ -20.00 MS

021005

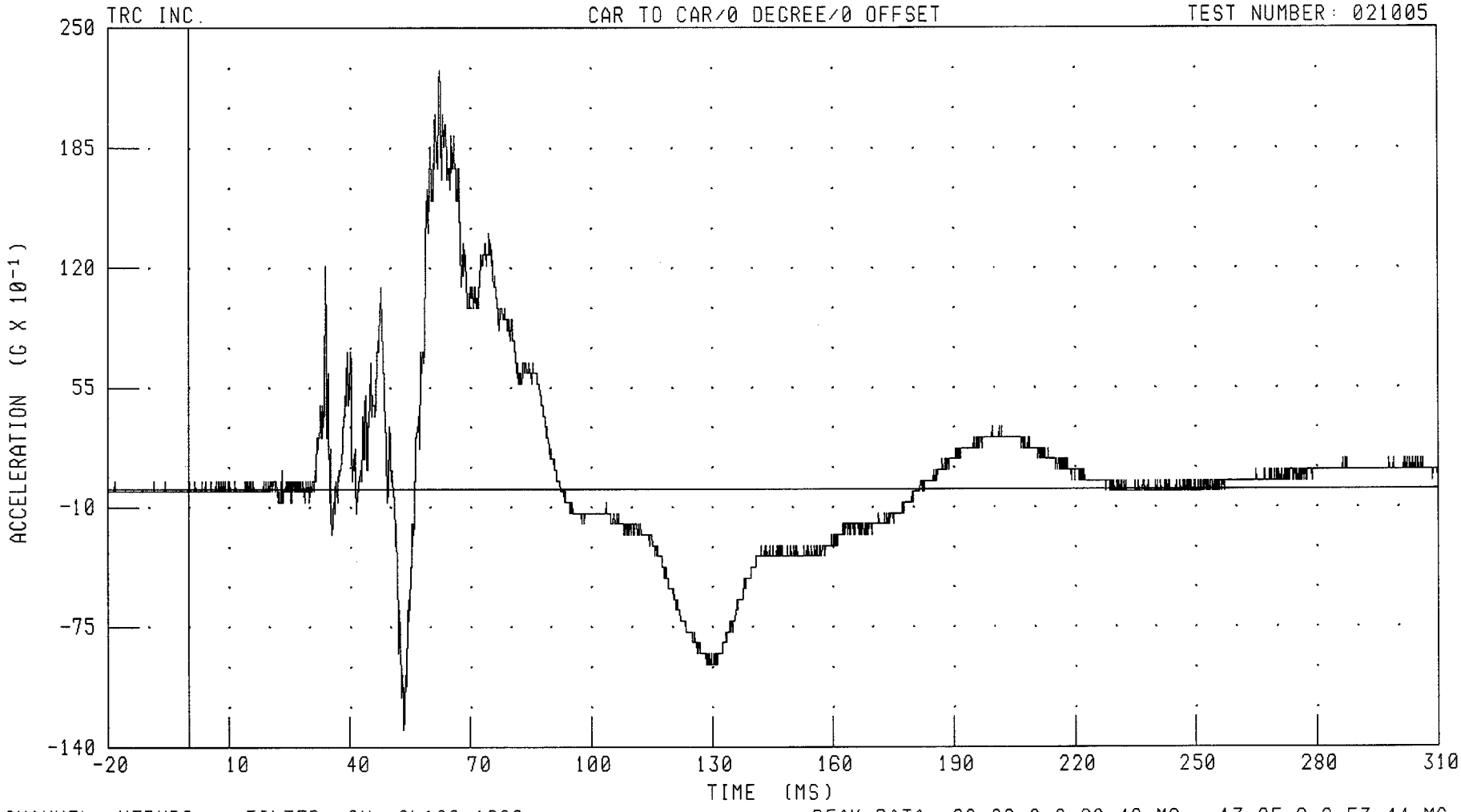
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD X-AXIS ACCELERATION REDUNDANT



CHANNEL: HEDXR2 FILTER: CH. CLASS 1000 PEAK DATA: 25.76 G @ 126.40 MS; -79.14 G @ 65.20 MS

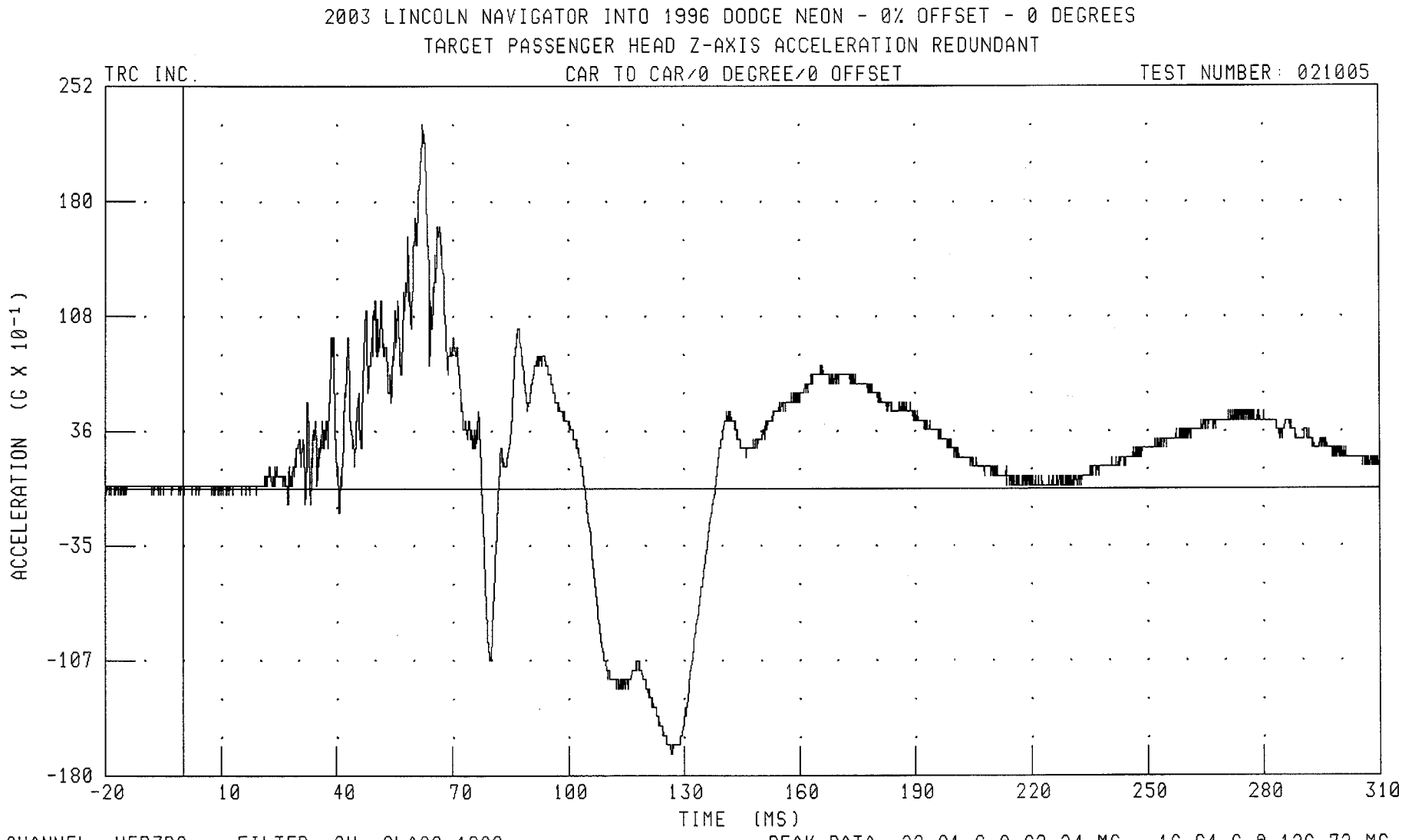
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD Y-AXIS ACCELERATION REDUNDANT

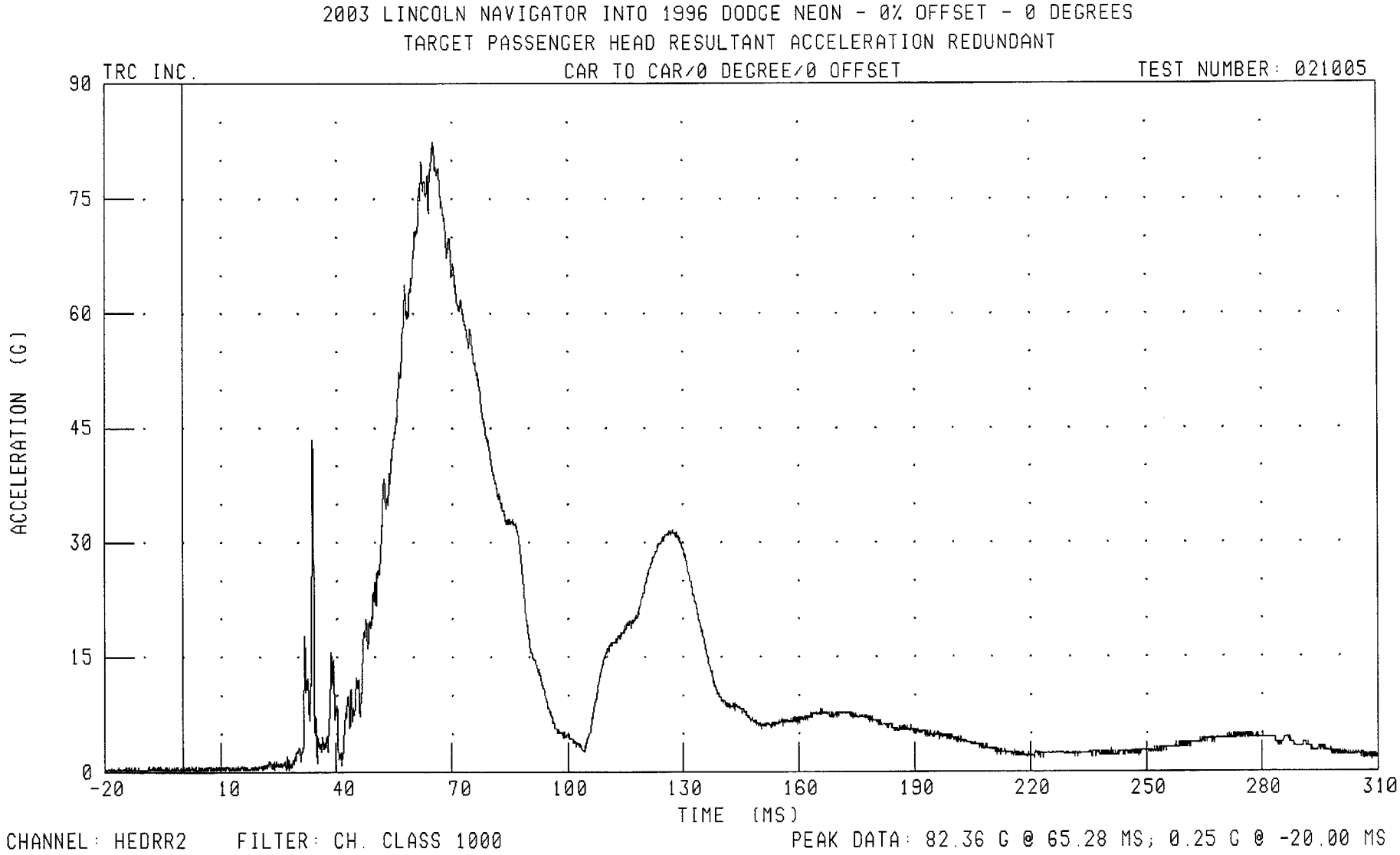


CHANNEL: HEDYR2 FILTER: CH. CLASS 1000 PEAK DATA: 22.69 G @ 62.40 MS; -13.05 G @ 53.44 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD Z-AXIS ACCELERATION REDUNDANT
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
ACCELERATION (G X 10-1)
252
180
108
36
-35
-107
-180
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDZR2
FILTER: CH. CLASS 1000
PEAK DATA: 22.81 G @ 62.24 MS; -16.64 G @ 126.72 MS

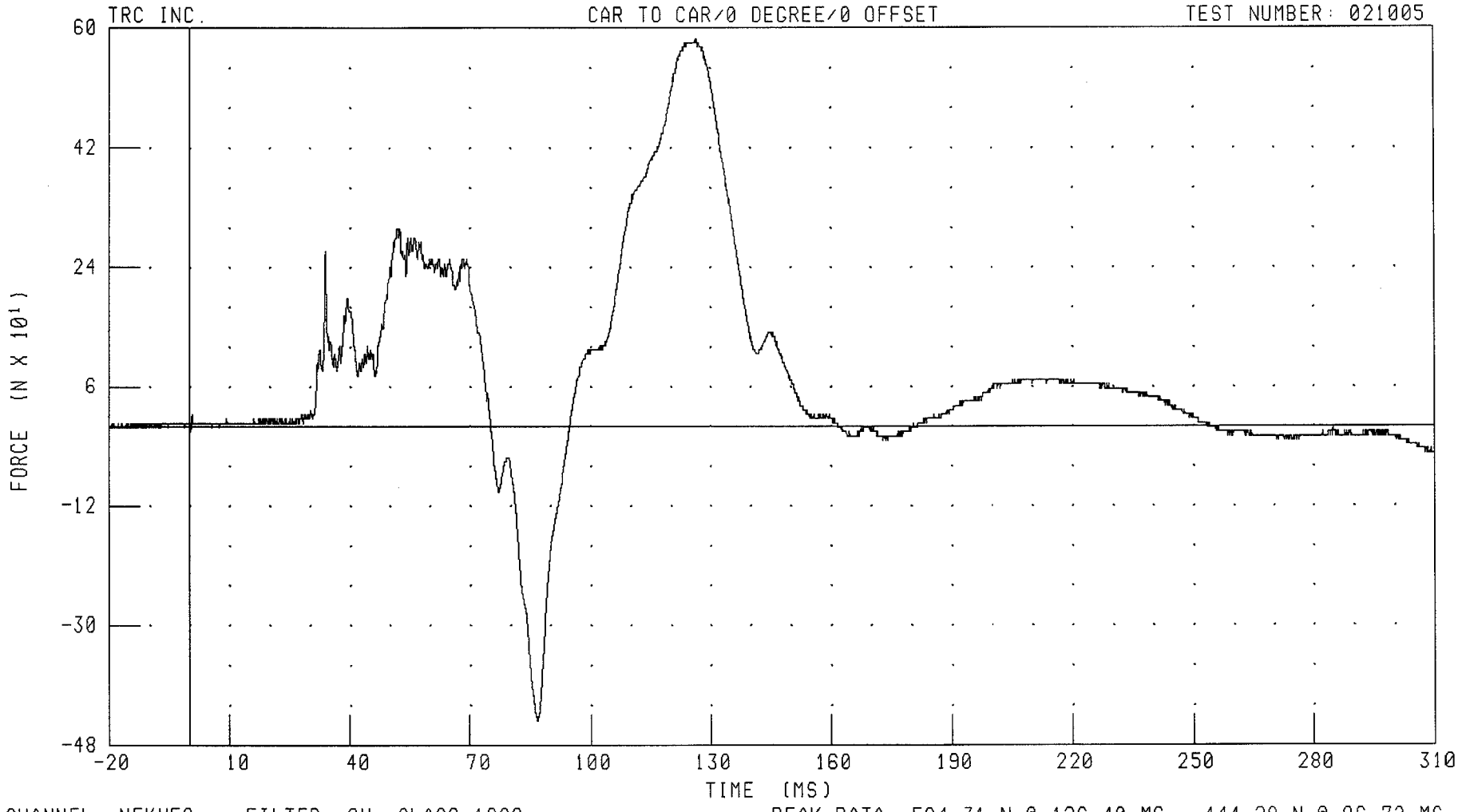
021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER HEAD RESULTANT ACCELERATION REDUNDANT
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
ACCELERATION (G)
90
75
60
45
30
15
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: HEDRR2
FILTER: CH. CLASS 1000
PEAK DATA: 82.36 G @ 65.28 MS; 0.25 G @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER NECK X-AXIS SHEAR FORCE

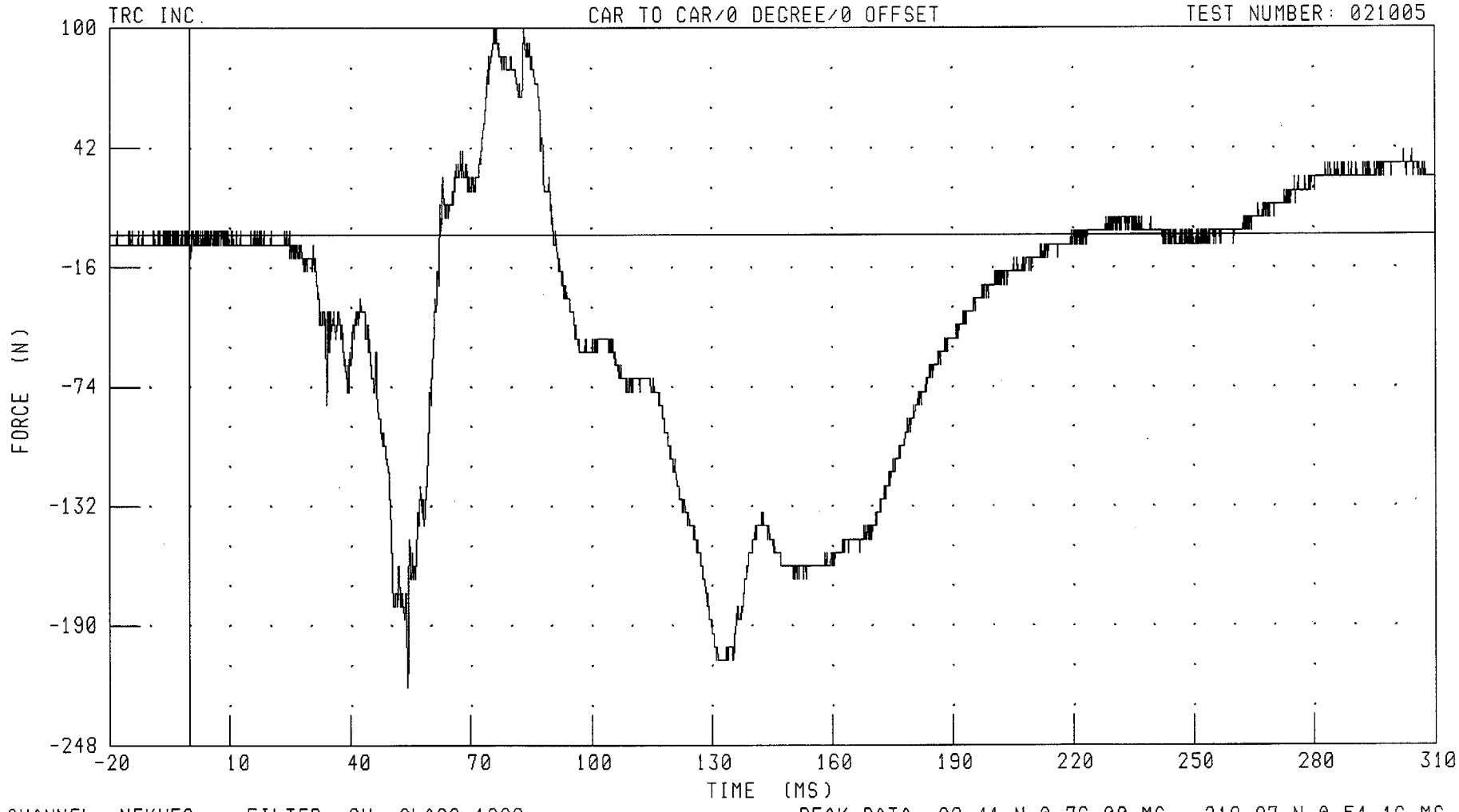


CHANNEL: NEKXF2 FILTER: CH. CLASS 1000 PEAK DATA: 584.31 N @ 126.40 MS; -444.29 N @ 86.72 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

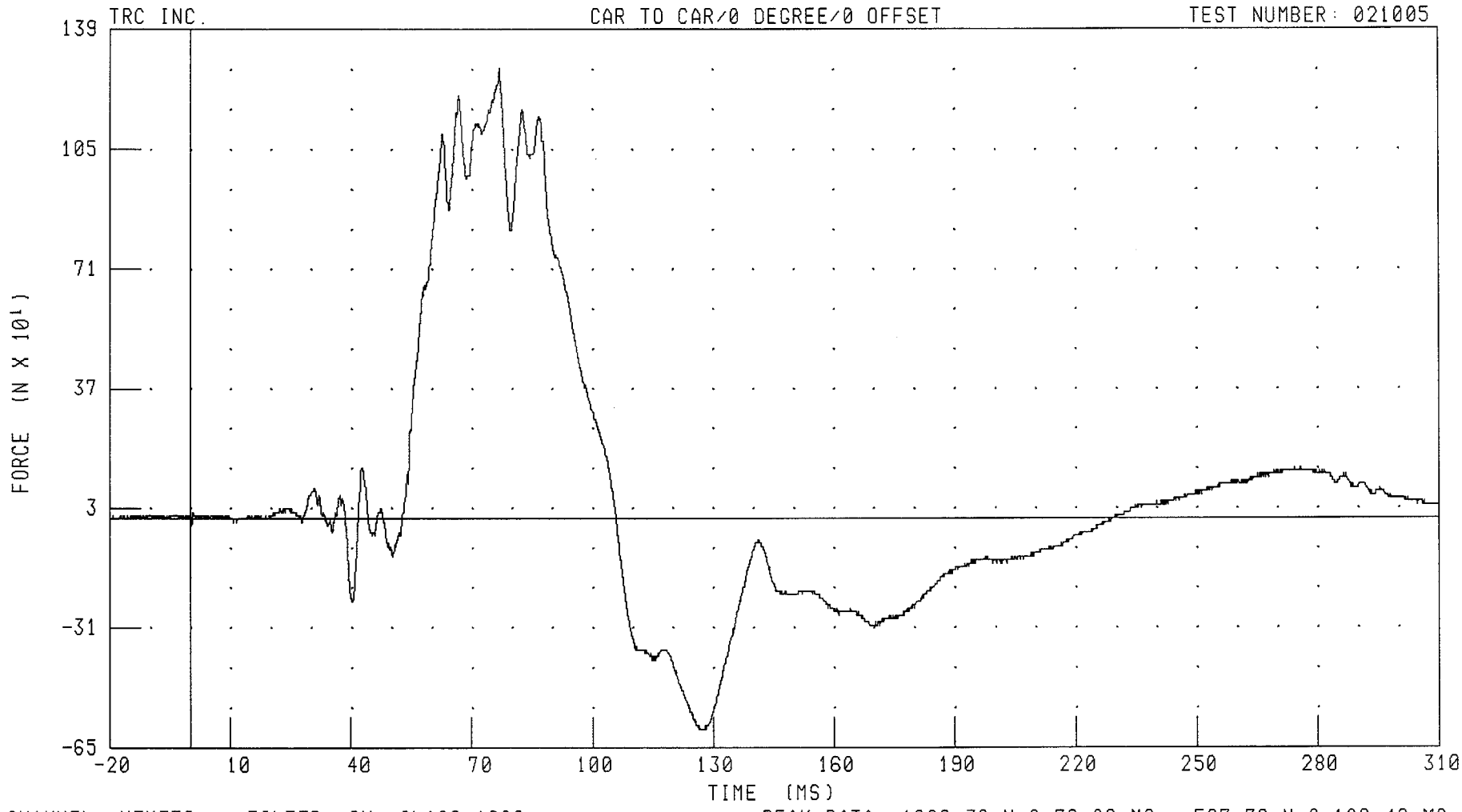
TARGET PASSENGER NECK Y-AXIS SHEAR FORCE



CHANNEL: NEKYF2 FILTER: CH. CLASS 1000 PEAK DATA: 99.41 N @ 76.00 MS; -219.87 N @ 54.16 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER NECK Z-AXIS AXIAL FORCE



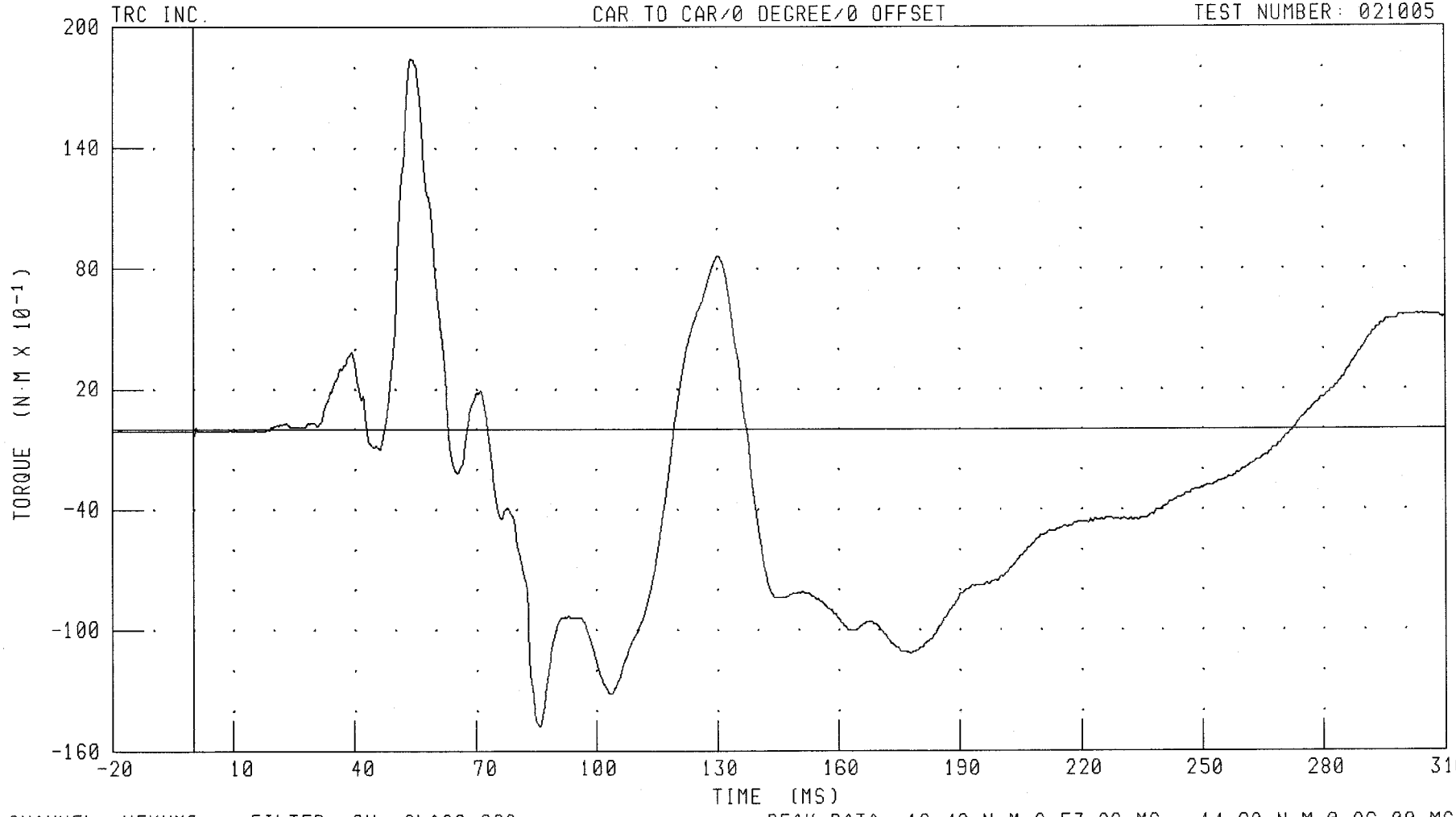
CHANNEL: NEKZF2 FILTER: CH. CLASS 1000 PEAK DATA: 1280.39 N @ 76.88 MS; -597.72 N @ 126.40 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER NECK MOMENT ABOUT X AXIS

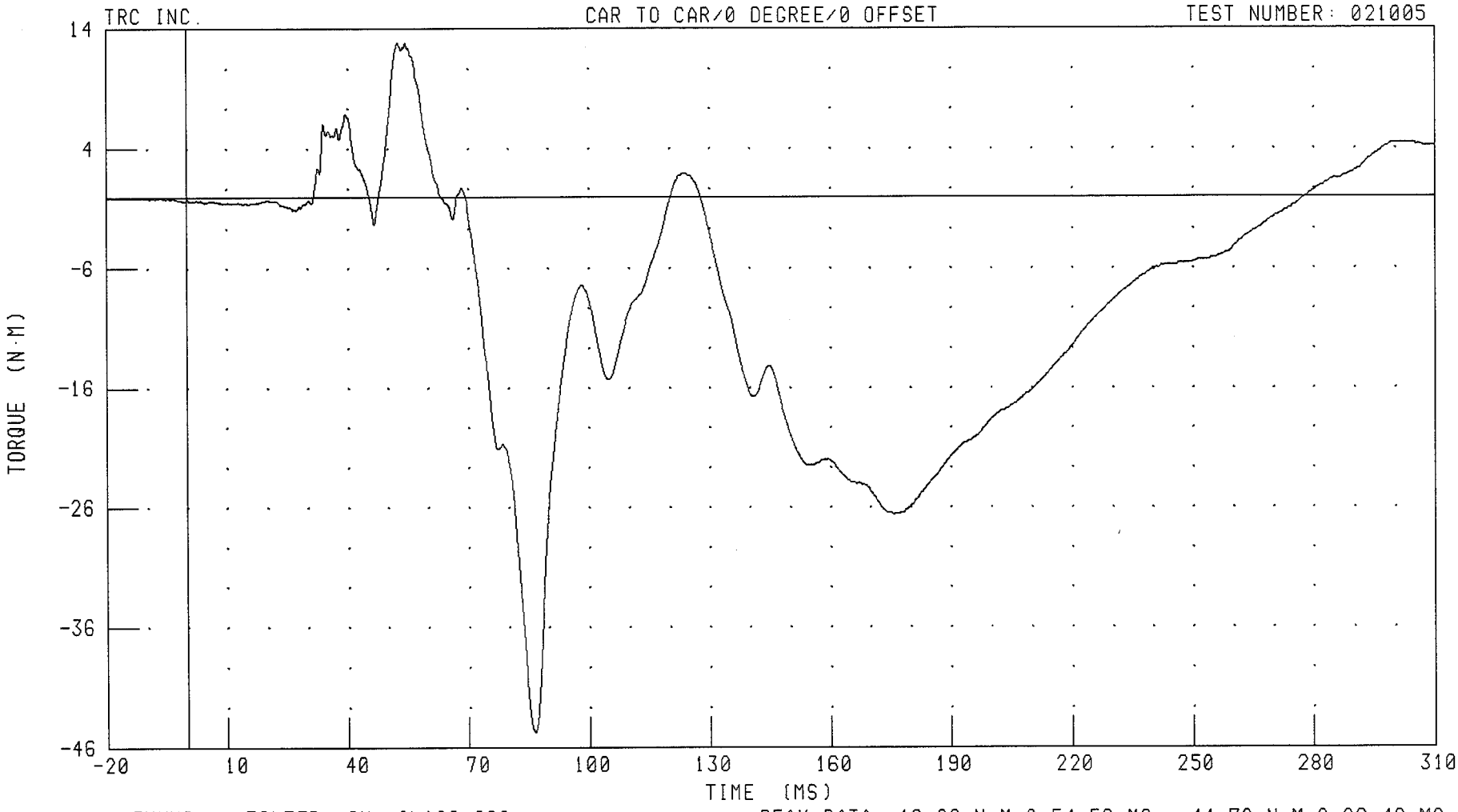
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NEKXM2 FILTER: CH. CLASS 600 PEAK DATA: 18.46 N·M @ 53.92 MS; -14.80 N·M @ 86.00 MS

021005

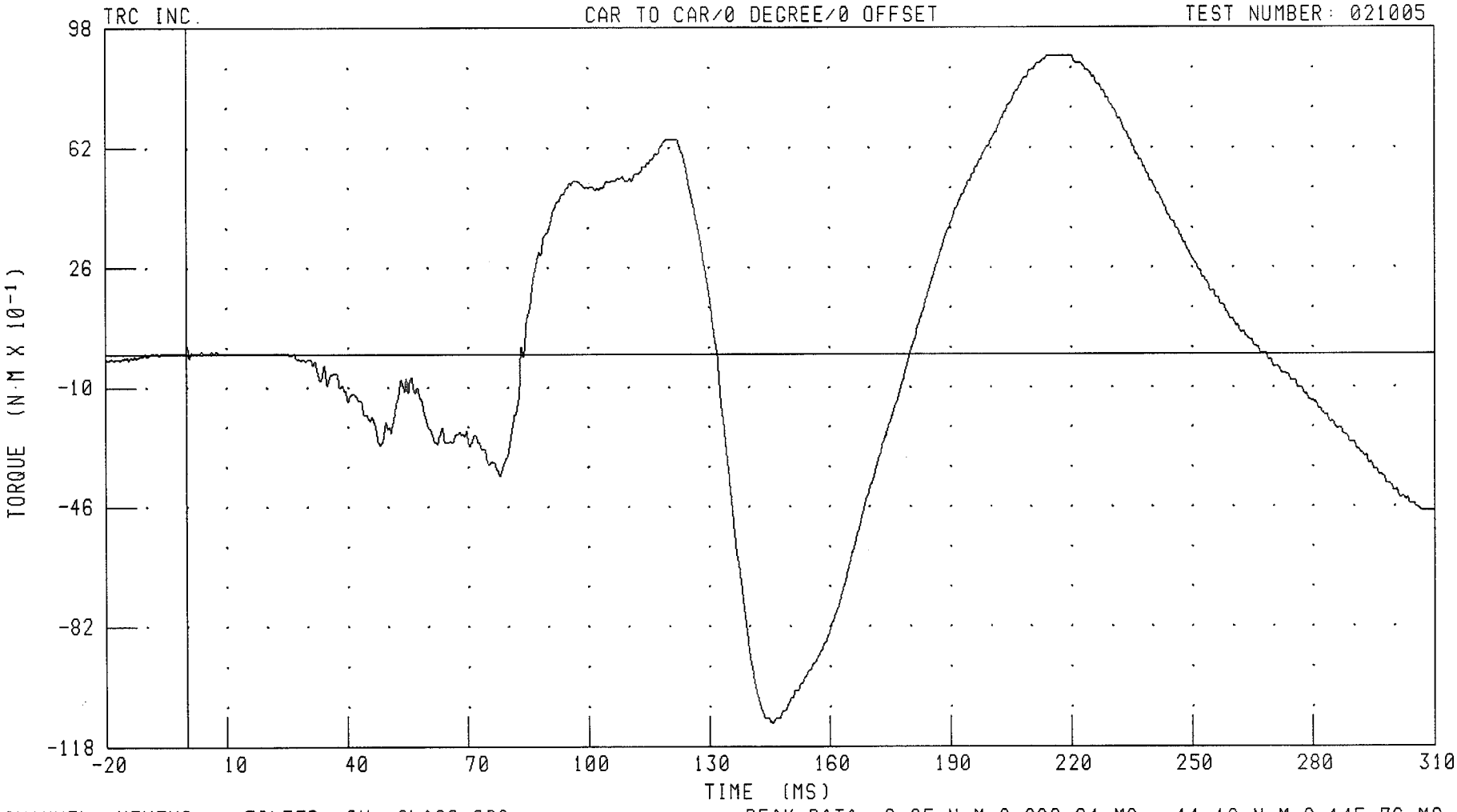
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER NECK MOMENT ABOUT Y AXIS



CHANNEL: NEKYM2 FILTER: CH. CLASS 600 PEAK DATA: 12.86 N·M @ 54.56 MS; -44.72 N·M @ 86.48 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER NECK MOMENT ABOUT Z AXIS



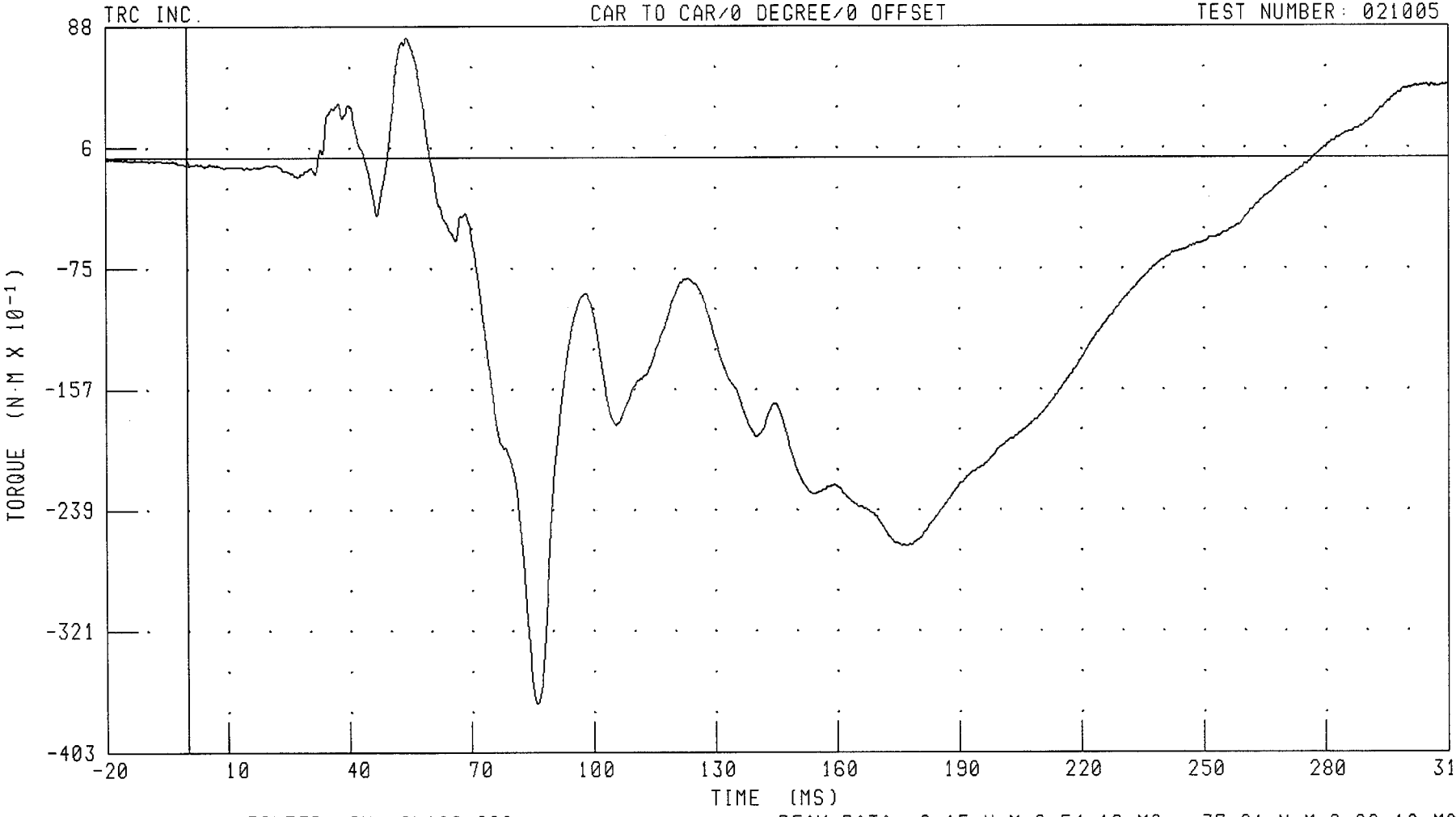
CHANNEL: NEKZM2 FILTER: CH. CLASS 600 PEAK DATA: 8.95 N·M @ 220.24 MS; -11.10 N·M @ 145.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

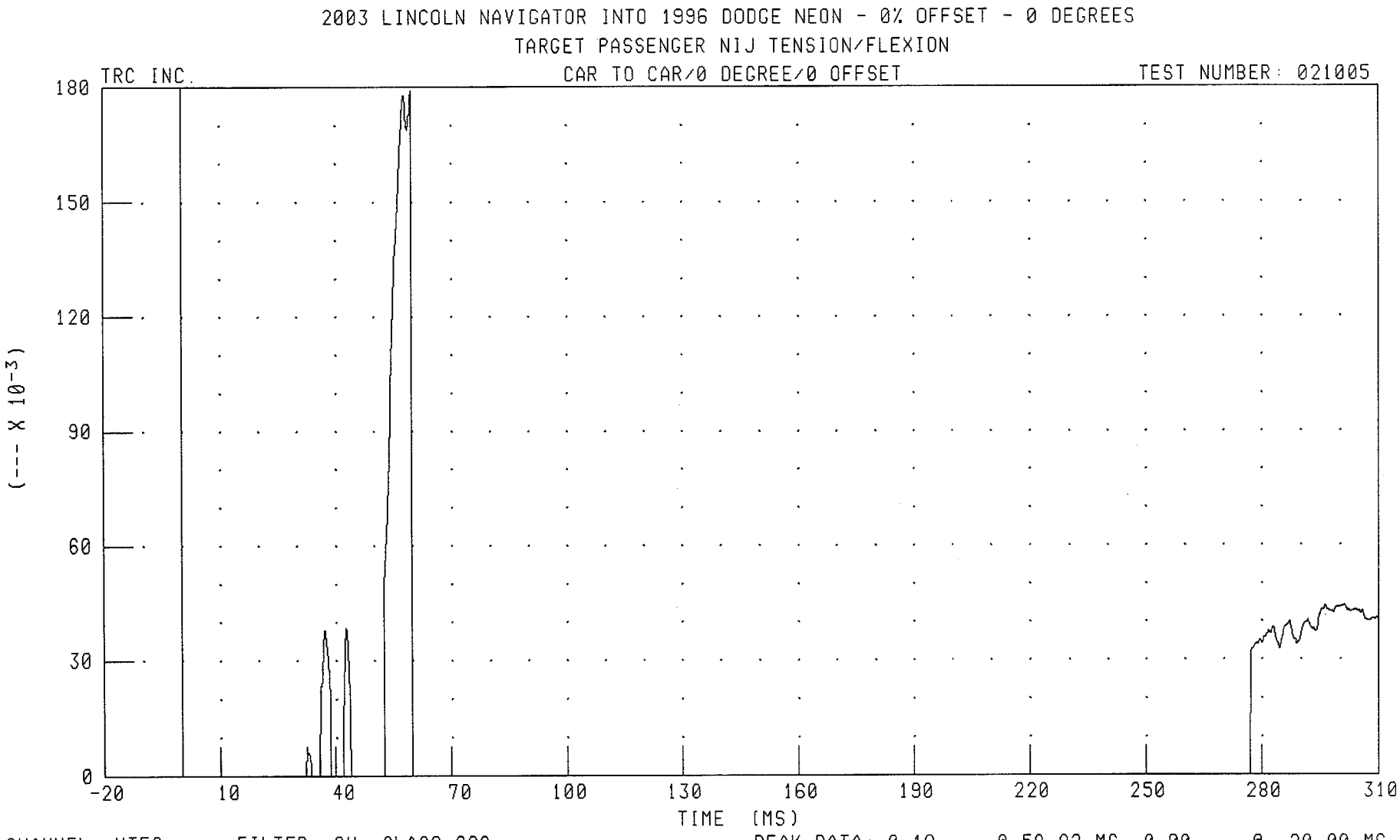
TARGET PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



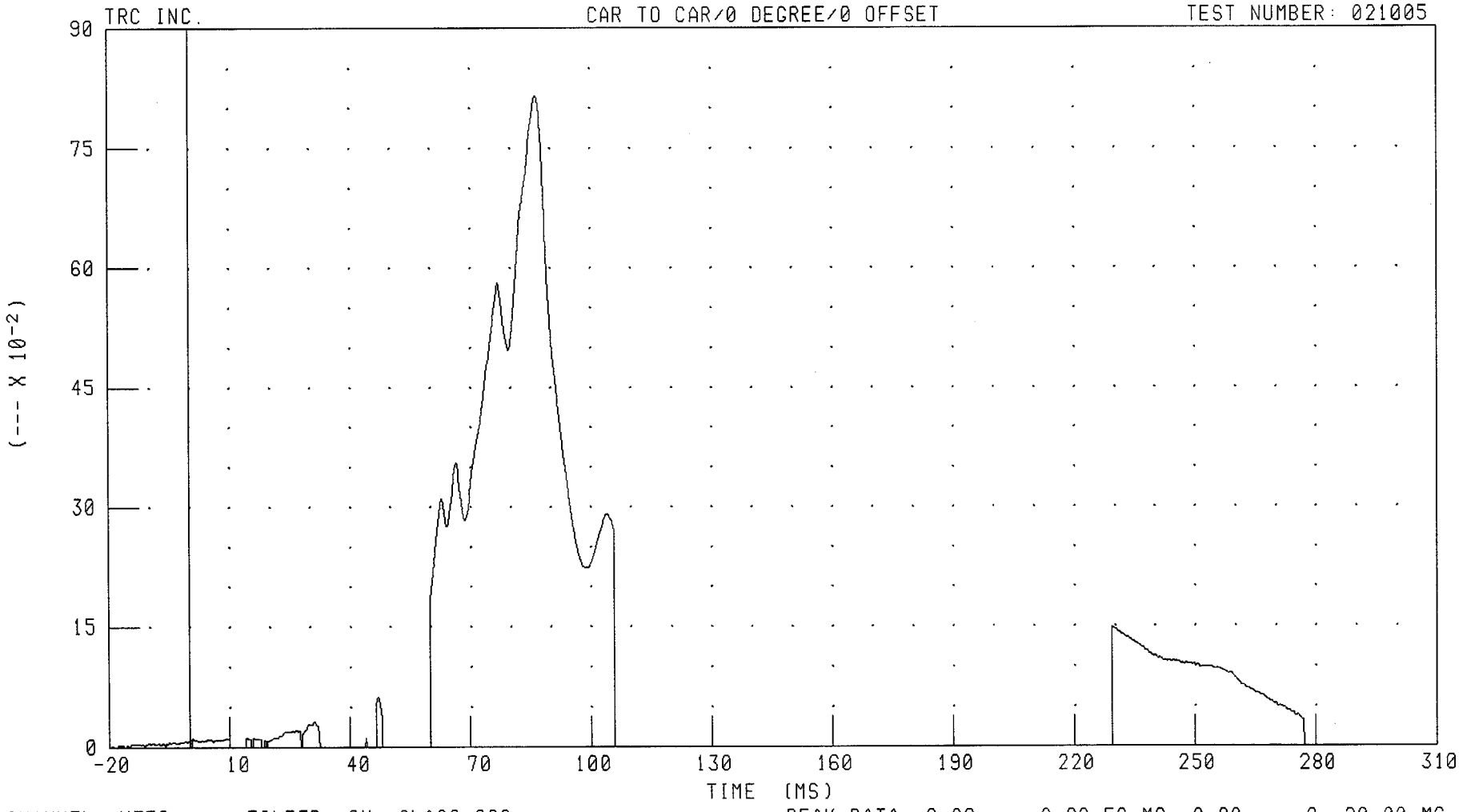
CHANNEL: NEKOM2 FILTER: CH. CLASS 600 PEAK DATA: 8.15 N·M @ 54.16 MS; -37.01 N·M @ 86.16 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER NIJ TENSION/FLEXION
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
180
150
120
90
60
30
0
(--- X 10-3)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NTF2
FILTER: CH. CLASS 600
PEAK DATA: 0.18 --- @ 59.92 MS; 0.00 --- @ -20.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER NIJ TENSION/EXTENSION



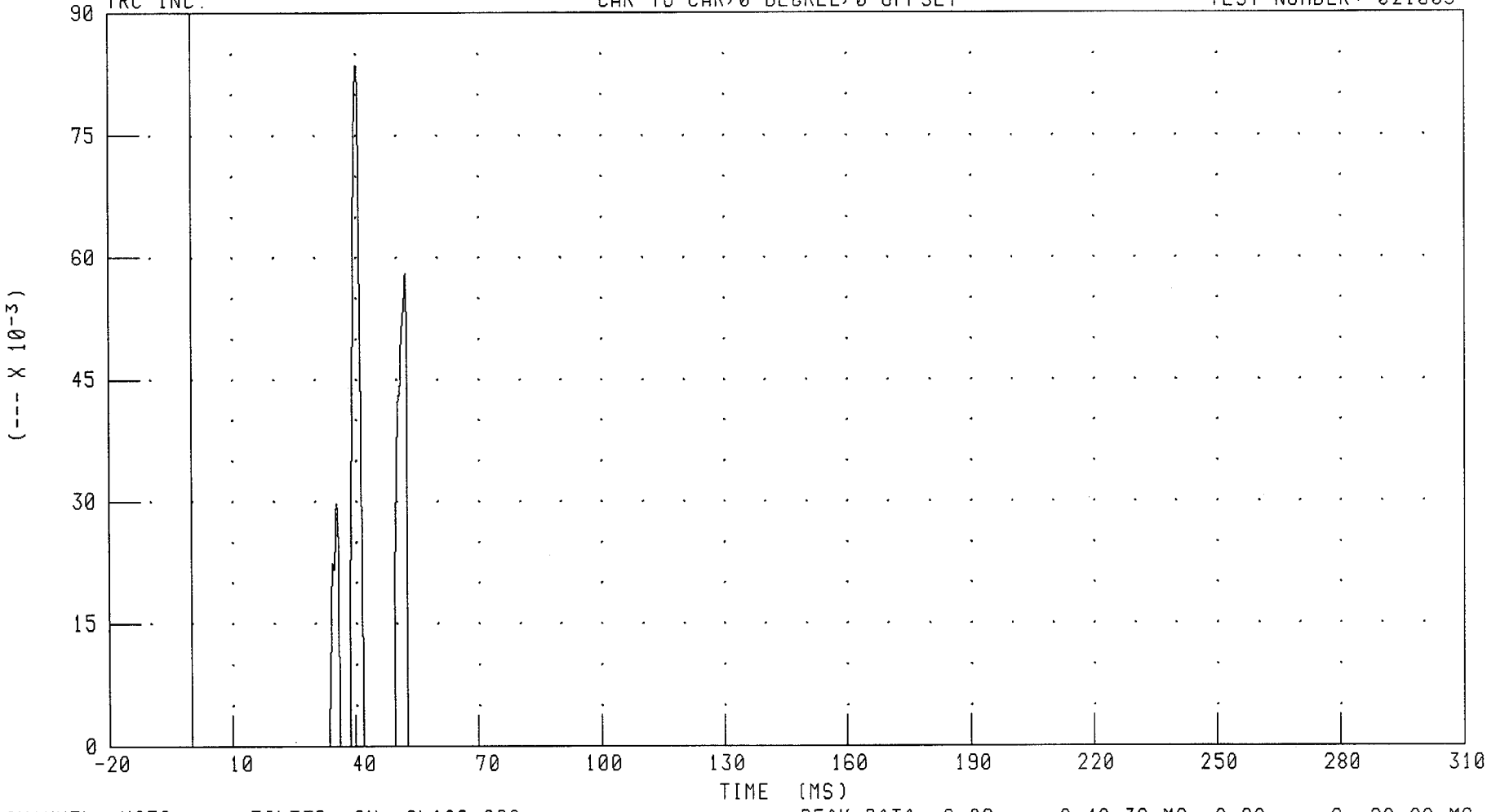
CHANNEL: NTE2 FILTER: CH. CLASS 600 PEAK DATA: 0.82 --- @ 86.56 MS; 0.00 --- @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER NIJ COMPRESSION/FLEXION

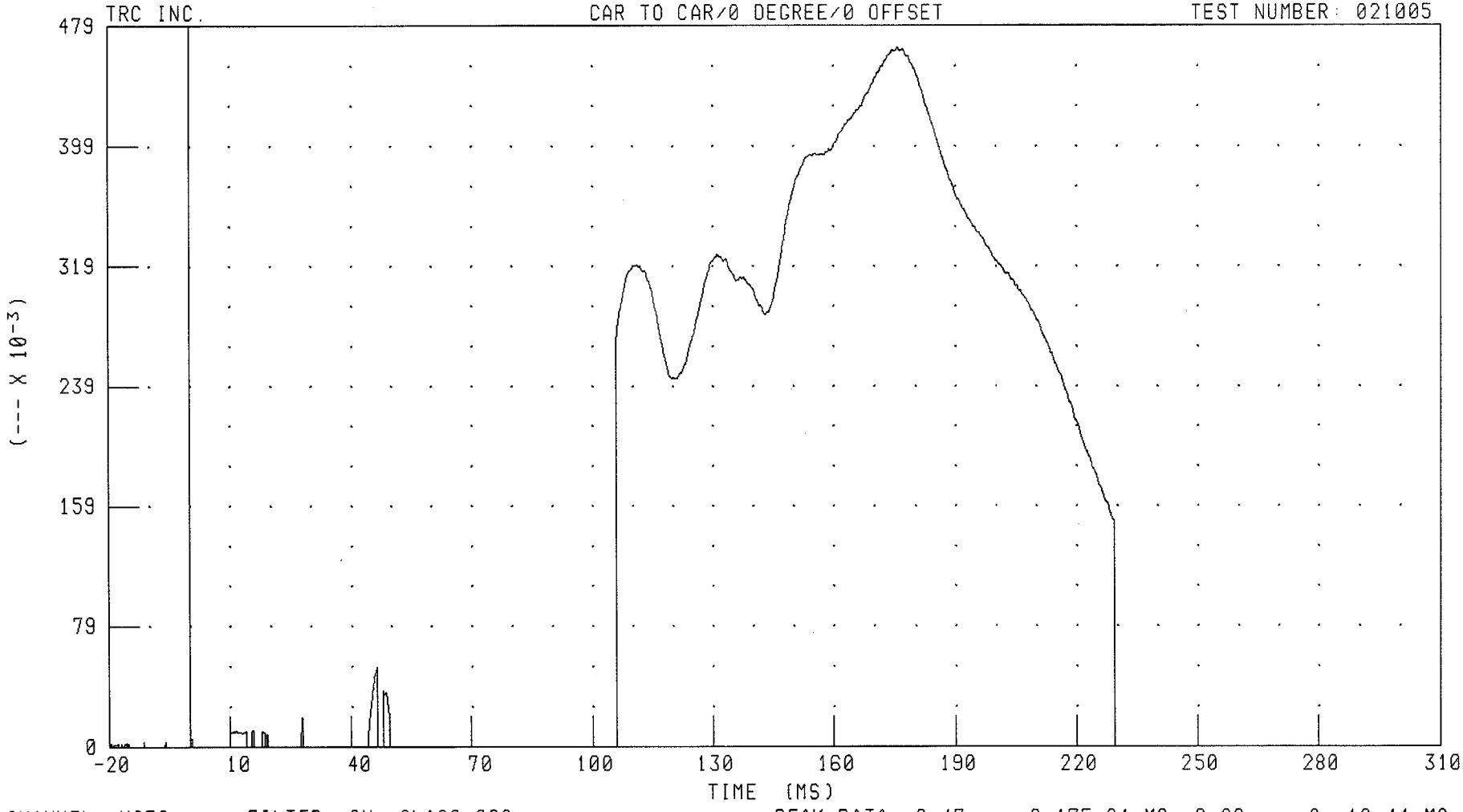
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NCF2 FILTER: CH. CLASS 600 PEAK DATA: 0.08 --- @ 40.32 MS; 0.00 --- @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER NIJ COMPRESSION/EXTENSION
CAR TO CAR/0 DEGREE/0 OFFSET



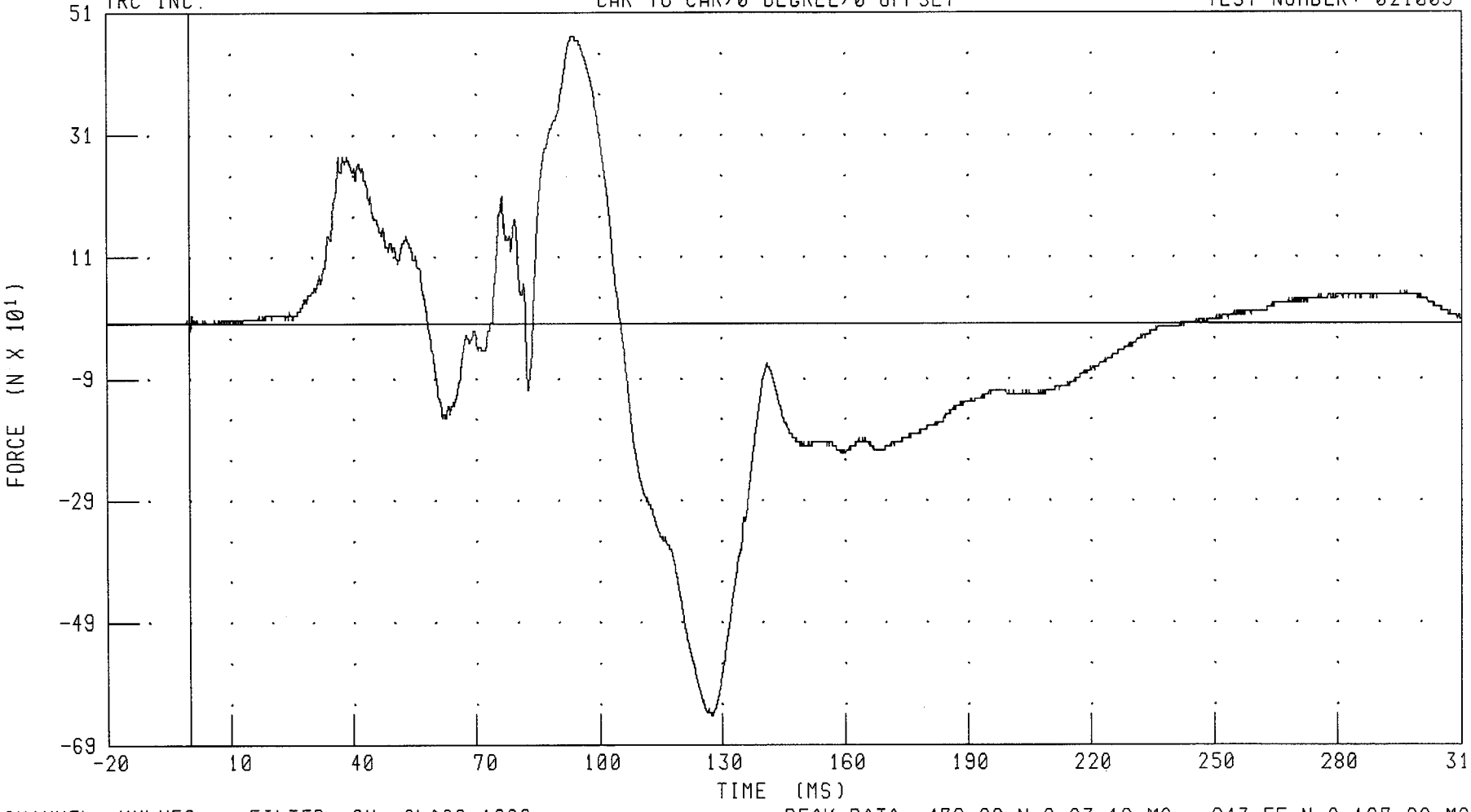
CHANNEL: NCE2 FILTER: CH. CLASS 600 PEAK DATA: 0.47 --- @ 175.84 MS; 0.00 --- @ -19.44 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LOWER NECK X-AXIS SHEAR FORCE

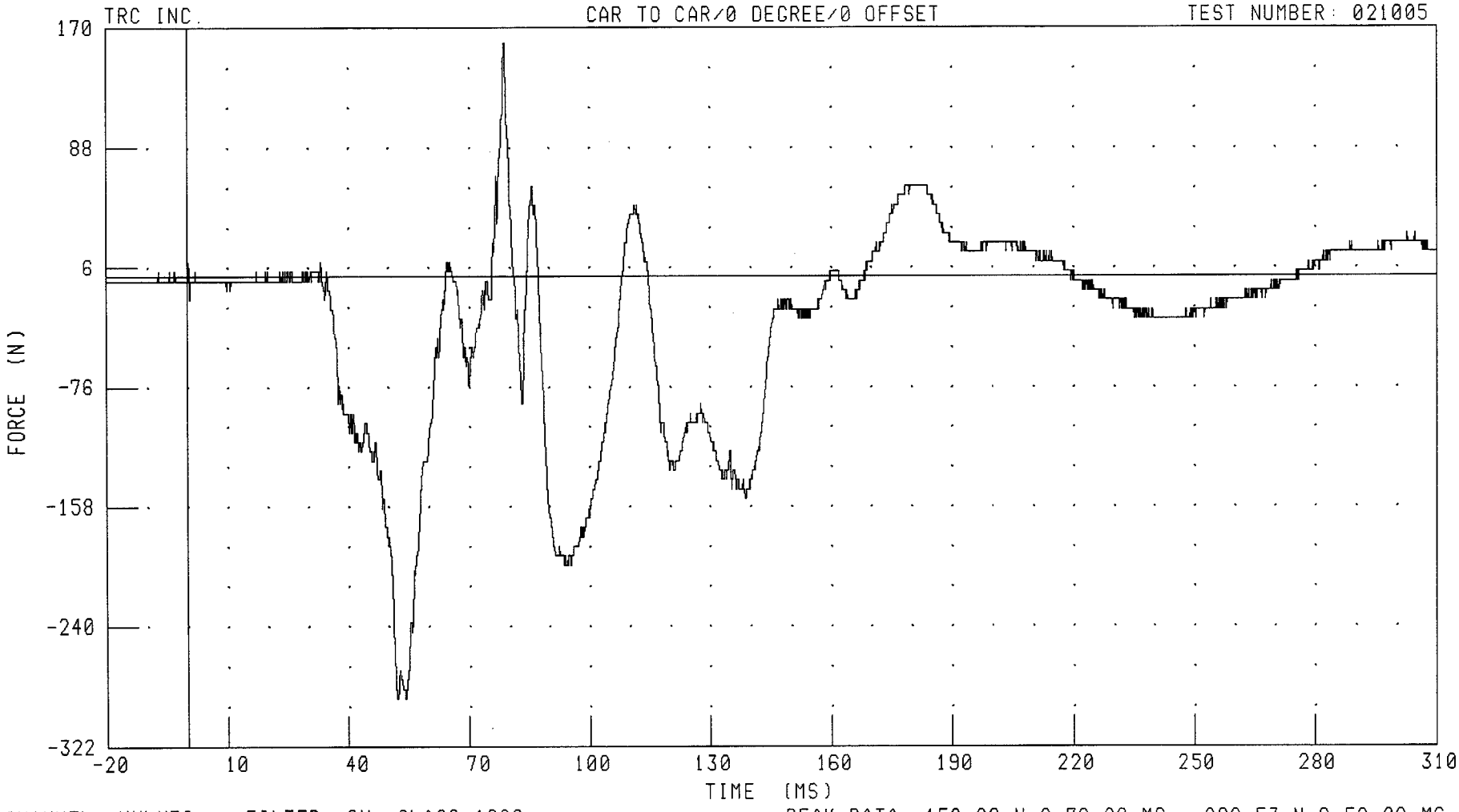
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NKLXF2 FILTER: CH. CLASS 1000 PEAK DATA: 470.96 N @ 93.12 MS; -643.55 N @ 127.28 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER LOWER NECK Y-AXIS SHEAR FORCE

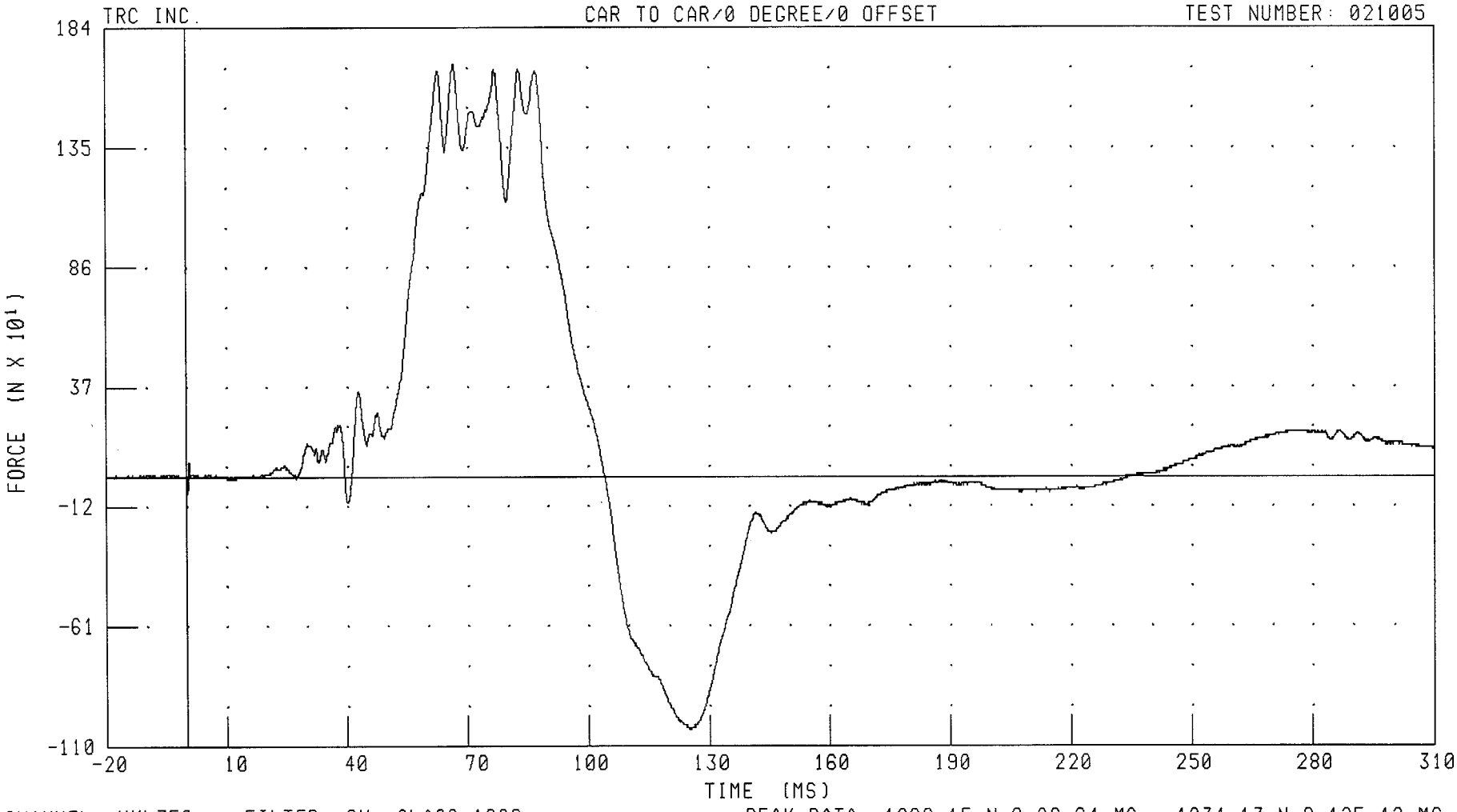


CHANNEL: NKLYF2 FILTER: CH. CLASS 1000 PEAK DATA: 159.62 N @ 78.80 MS; -289.53 N @ 52.08 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LOWER NECK Z-AXIS AXIAL FORCE

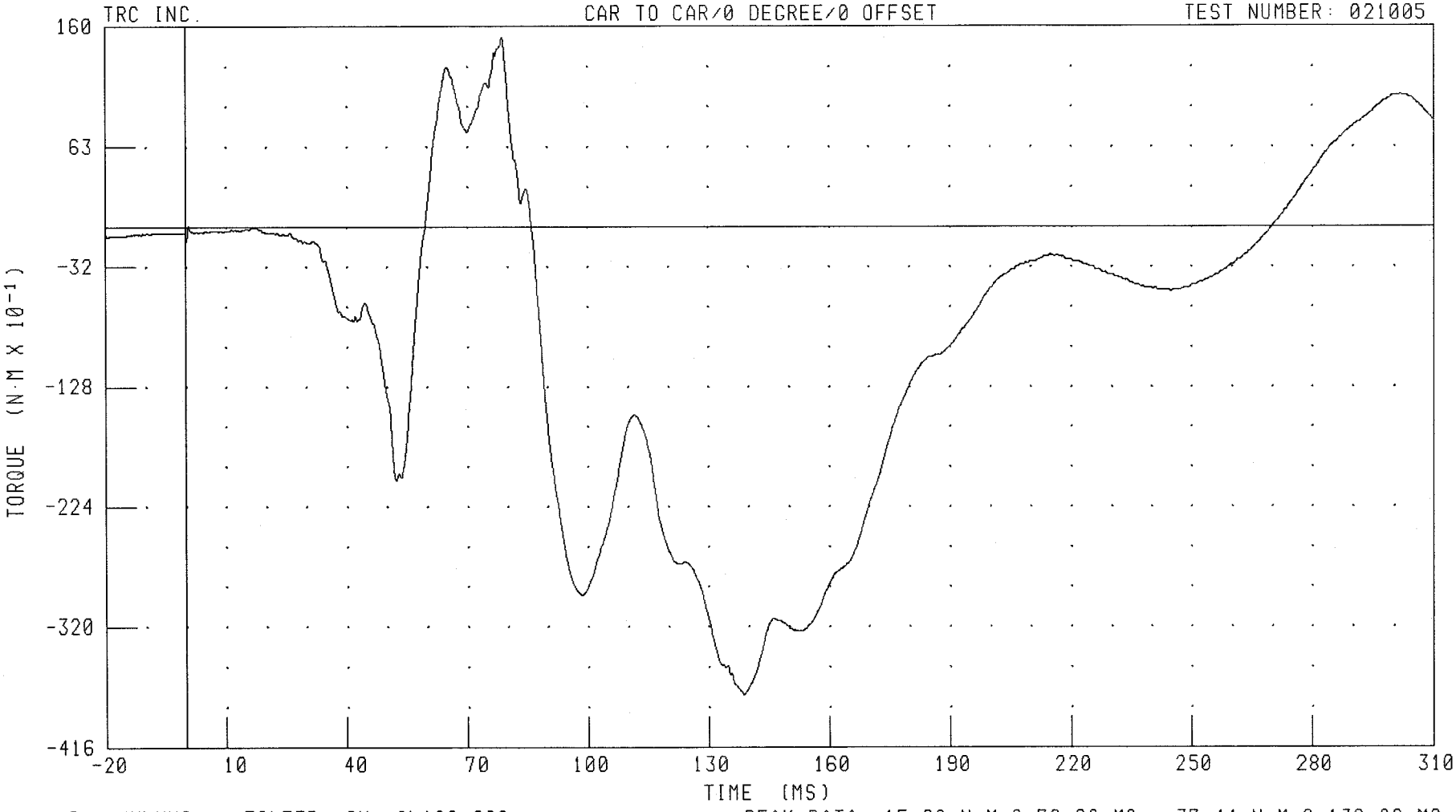


CHANNEL: NKLZF2 FILTER: CH. CLASS 1000 PEAK DATA: 1692.15 N @ 66.64 MS; -1034.13 N @ 125.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

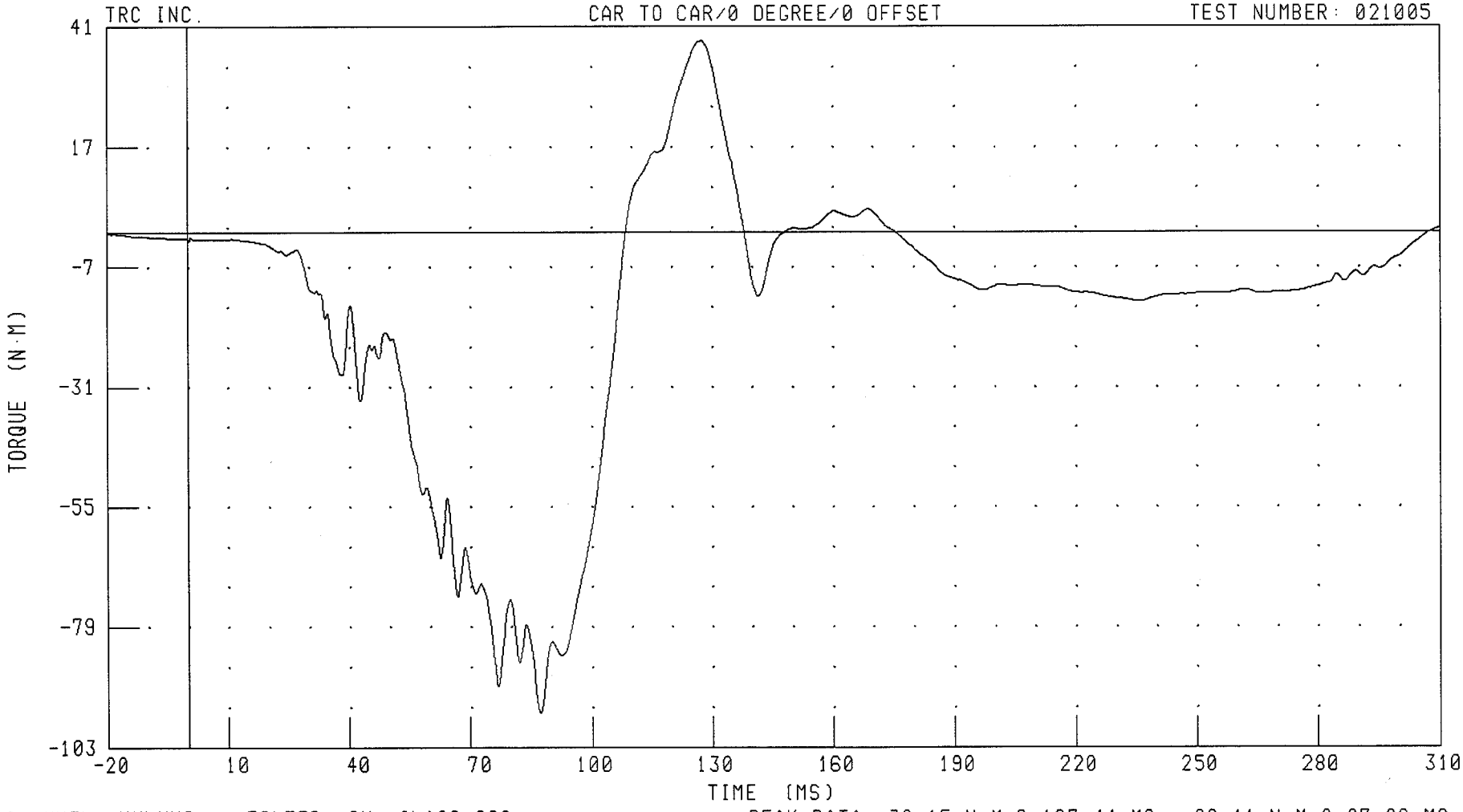
TARGET PASSENGER LOWER NECK MOMENT ABOUT X AXIS



CHANNEL: NKLXM2 FILTER: CH. CLASS 600 PEAK DATA: 15.09 N·M @ 78.80 MS; -37.44 N·M @ 138.88 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER LOWER NECK MOMENT ABOUT Y AXIS

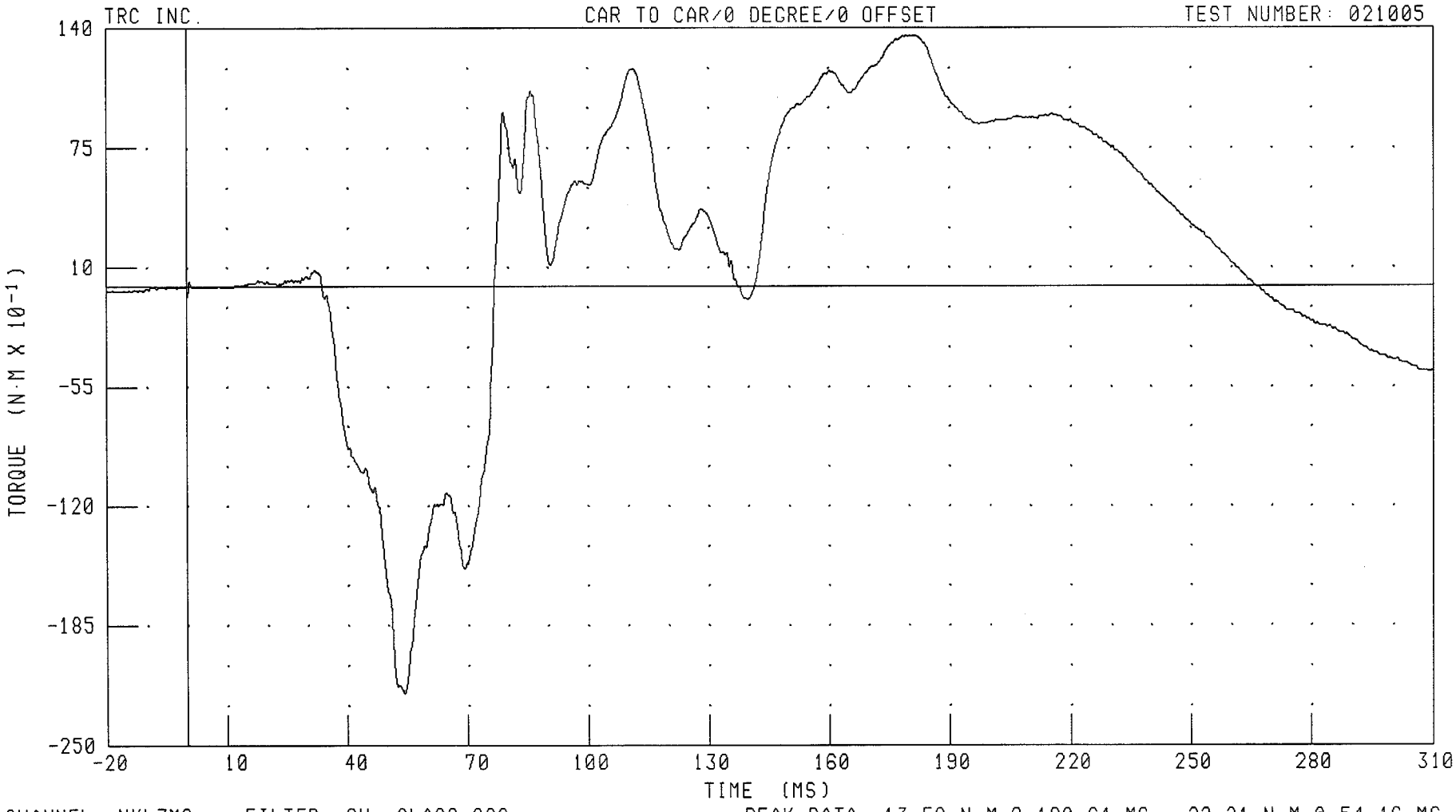


CHANNEL: NKLYM2 FILTER: CH. CLASS 600
PEAK DATA: 38.15 N-M @ 127.44 MS; -96.11 N-M @ 87.28 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LOWER NECK MOMENT ABOUT Z AXIS



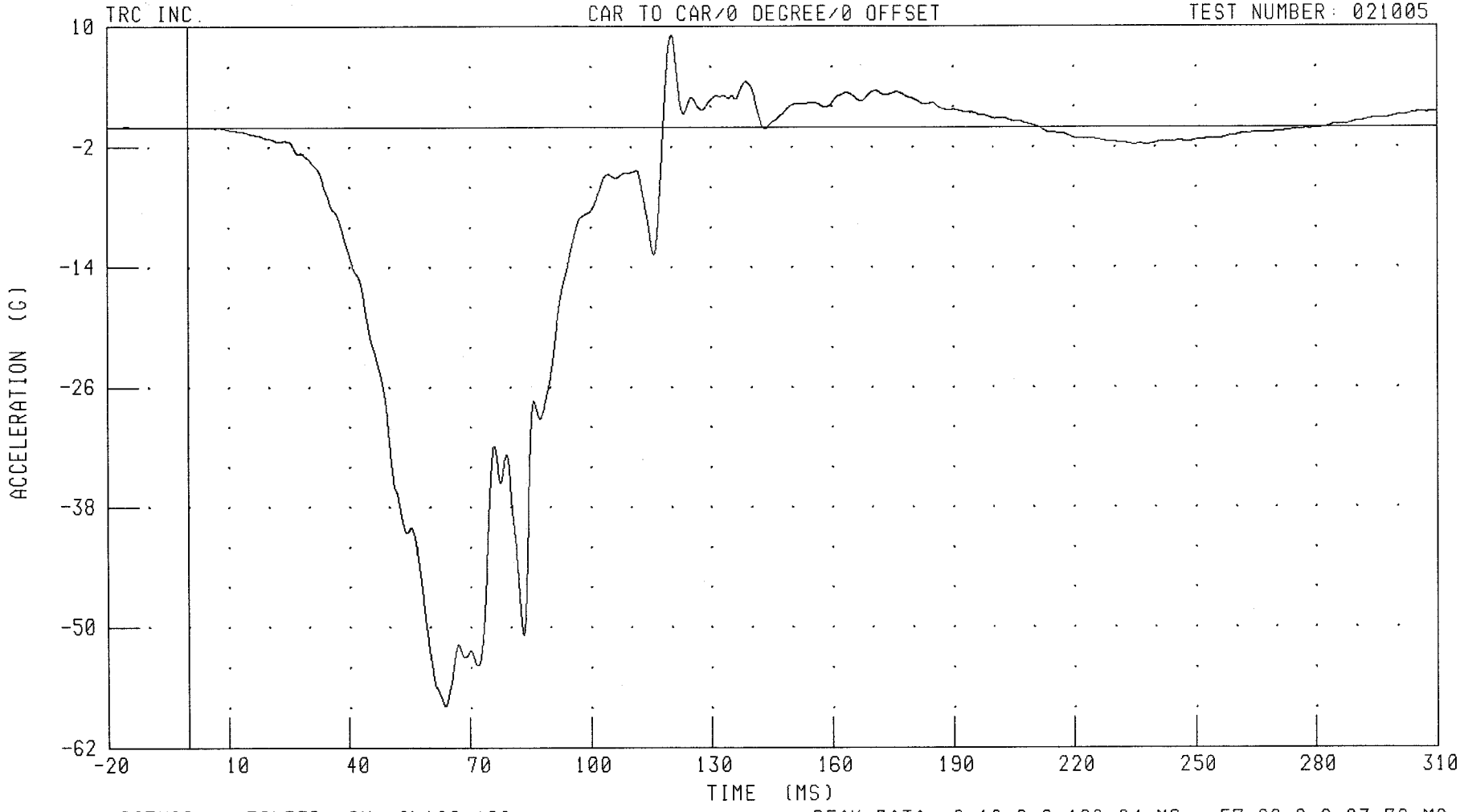
CHANNEL: NKLZM2 FILTER: CH. CLASS 600

PEAK DATA: 13.59 N·M @ 180.64 MS; -22.21 N·M @ 54.16 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

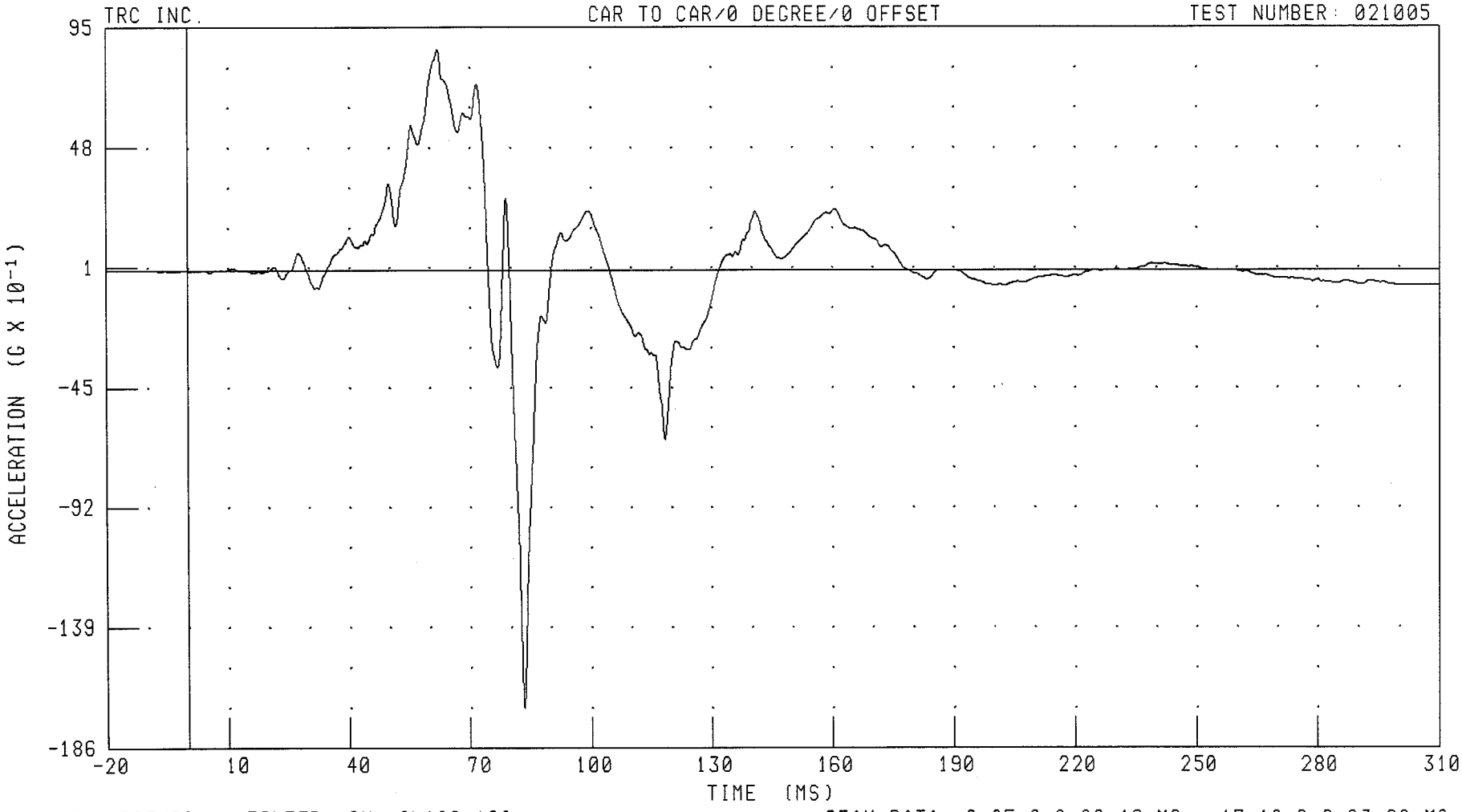
TARGET PASSENGER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG2 FILTER: CH. CLASS 180 PEAK DATA: 9.10 G @ 120.24 MS; -57.89 G @ 63.76 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER CHEST Y-AXIS ACCELERATION

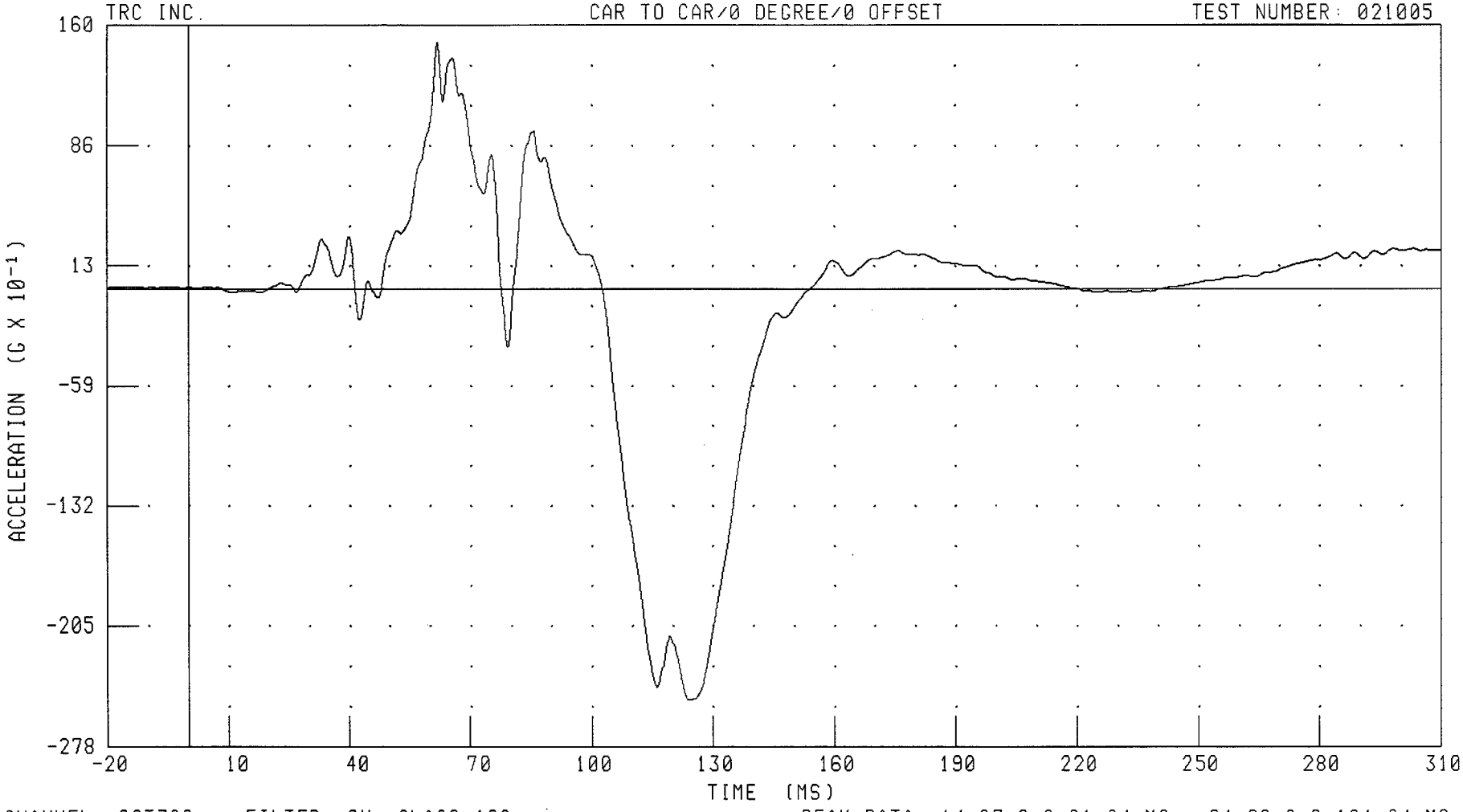


CHANNEL: CSTYG2 FILTER: CH. CLASS 180 PEAK DATA: 8.65 G @ 62.16 MS; -17.16 G @ 83.28 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER CHEST Z-AXIS ACCELERATION

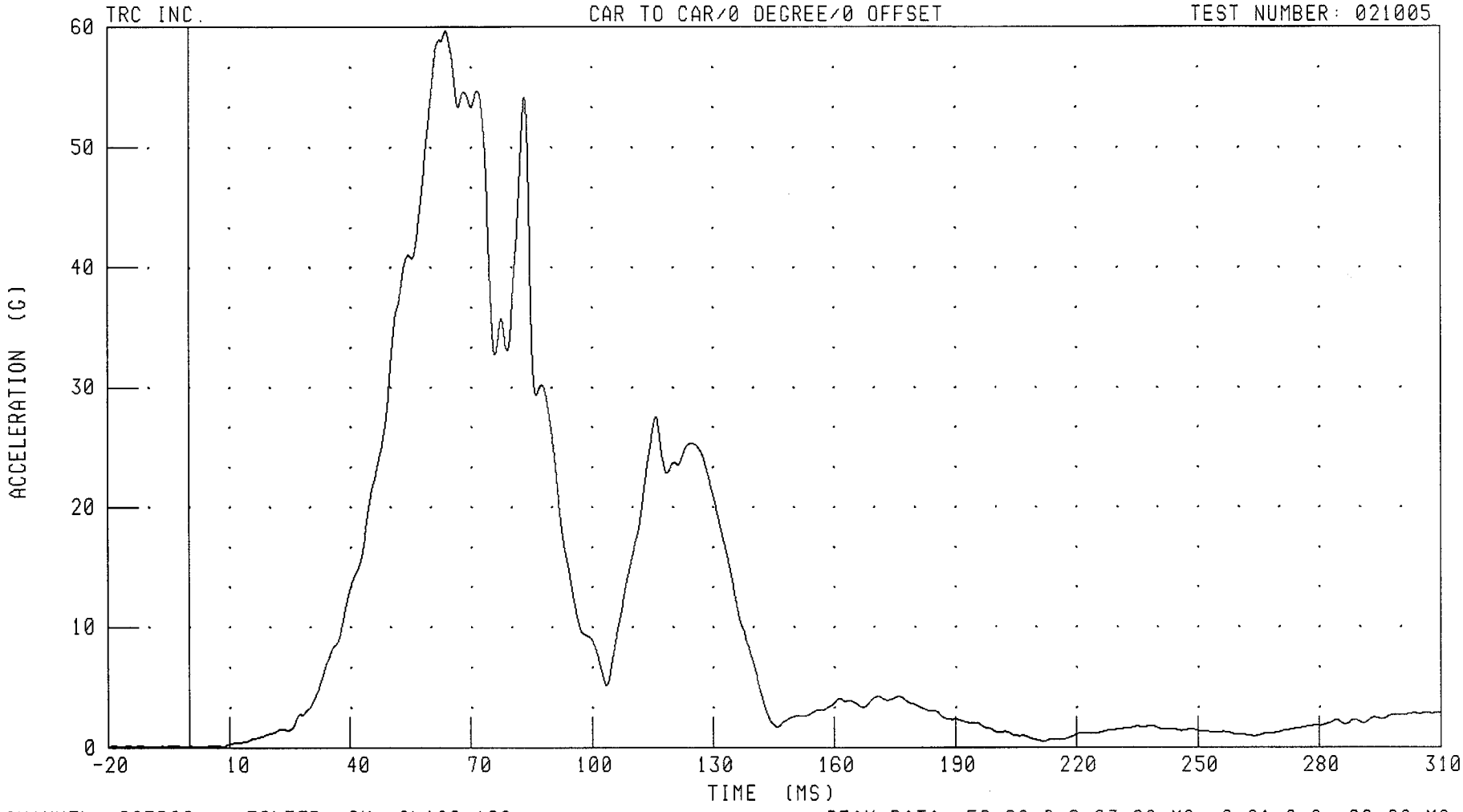


CHANNEL: CSTZG2 FILTER: CH. CLASS 180 PEAK DATA: 14.97 G @ 61.84 MS; -24.99 G @ 124.24 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER CHEST RESULTANT ACCELERATION

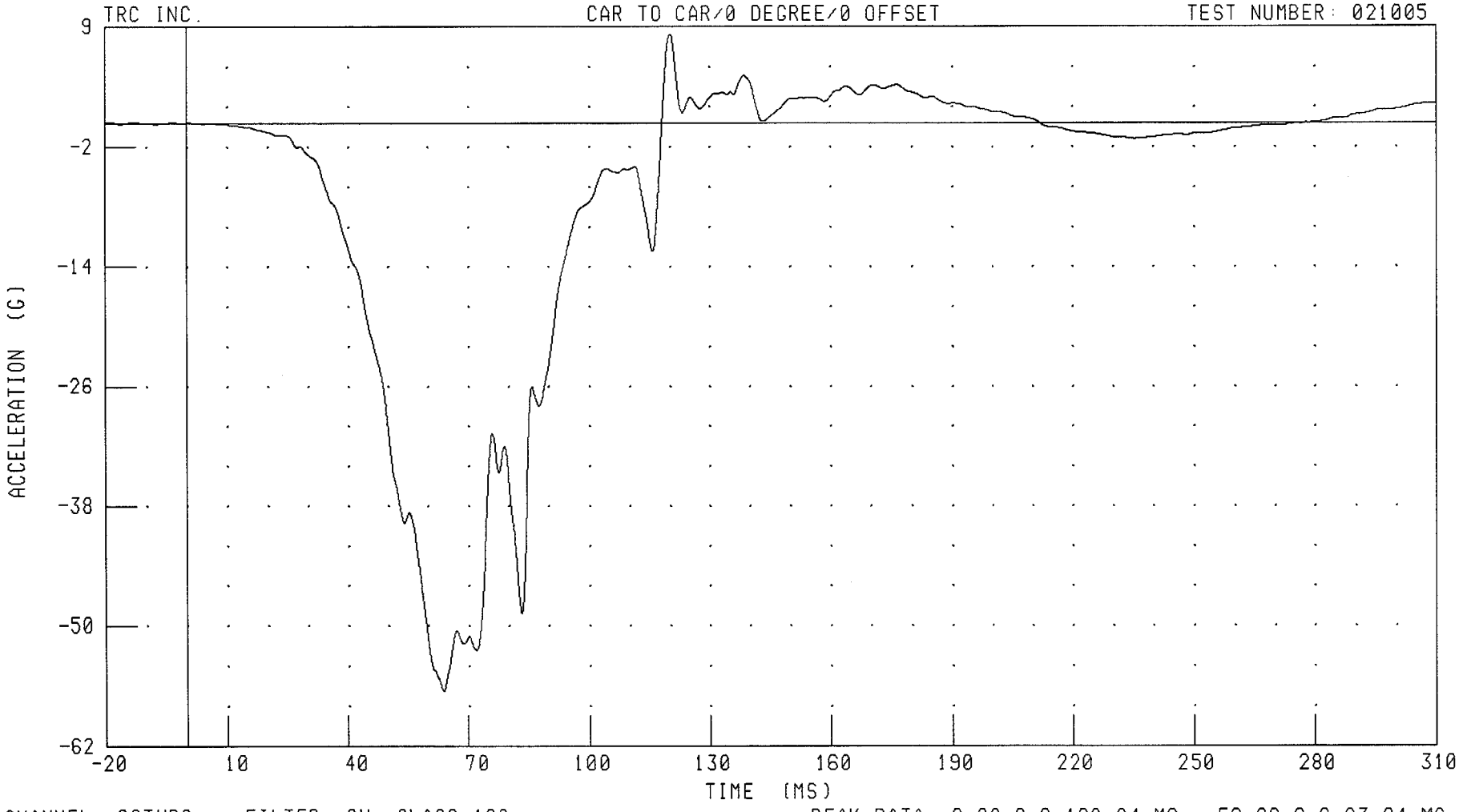


CHANNEL: CSTRG2 FILTER: CH. CLASS 180 PEAK DATA: 59.66 G @ 63.92 MS; 0.01 G @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER CHEST X-AXIS ACCELERATION REDUNDANT

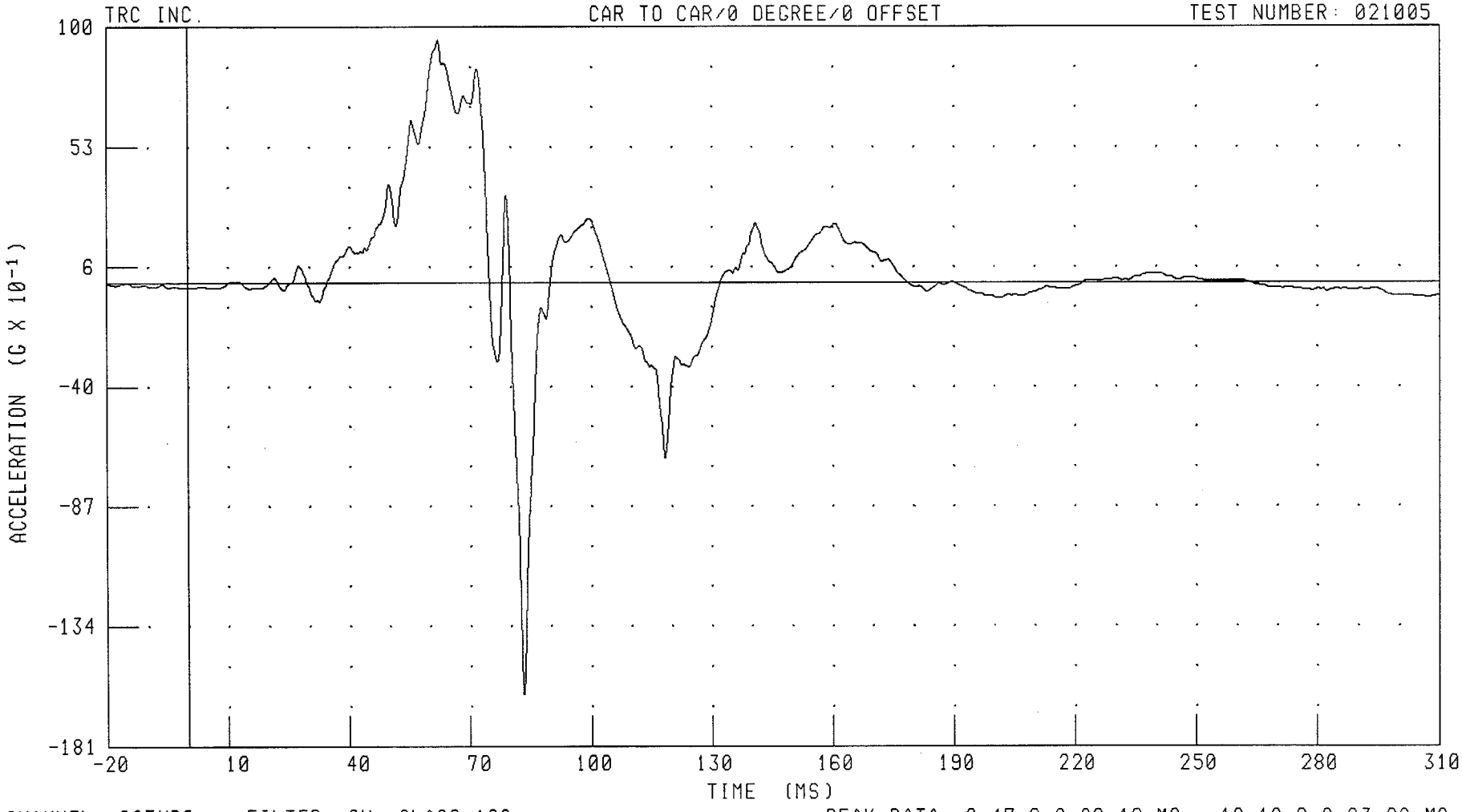


CHANNEL: CSTXR2 FILTER: CH. CLASS 180 PEAK DATA: 8.82 G @ 120.24 MS; -56.96 G @ 63.84 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

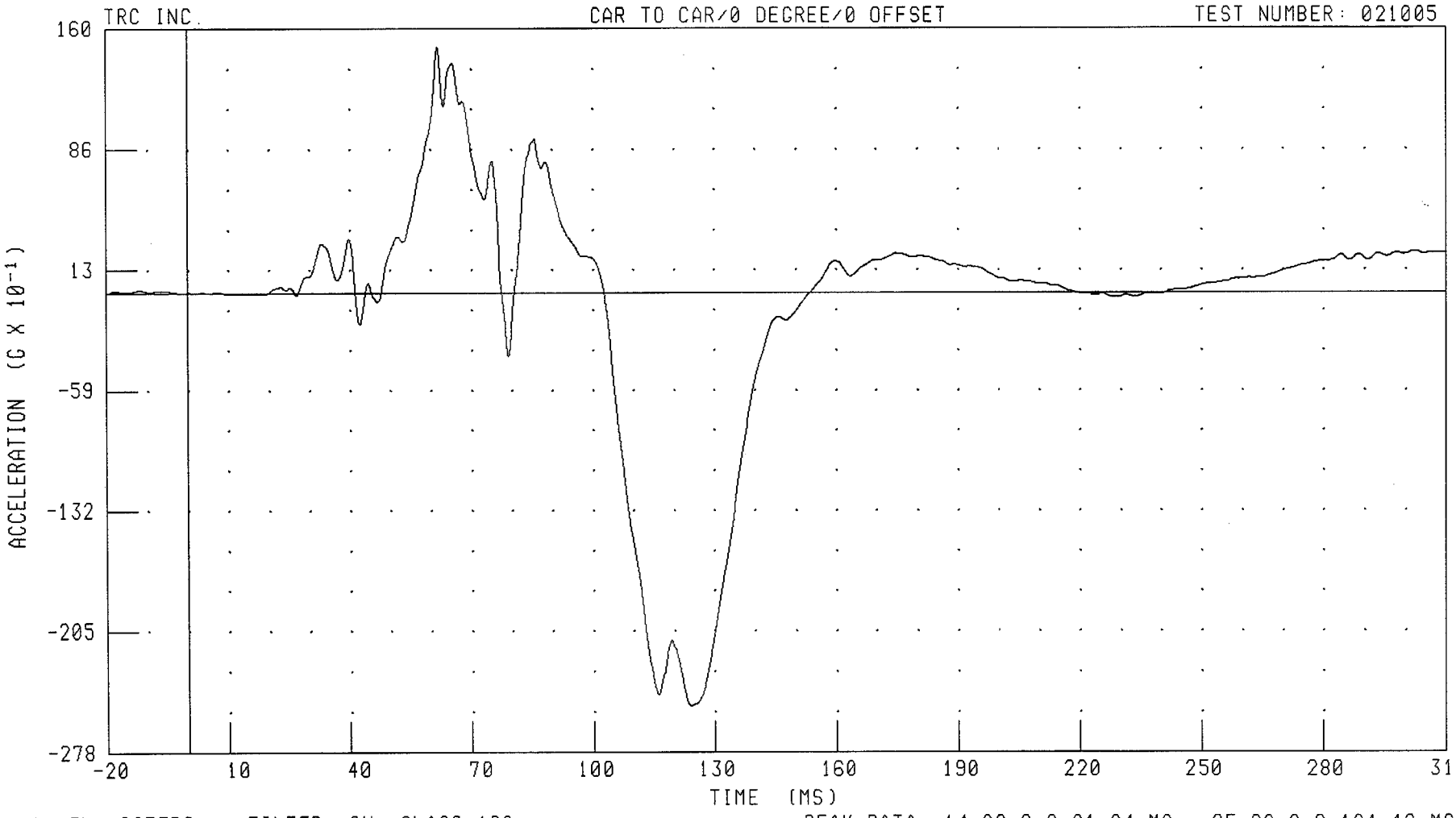
TARGET PASSENGER CHEST Y-AXIS ACCELERATION REDUNDANT



CHANNEL: CSTYR2 FILTER: CH. CLASS 180 PEAK DATA: 9.47 G @ 62.16 MS; -16.18 G @ 83.28 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

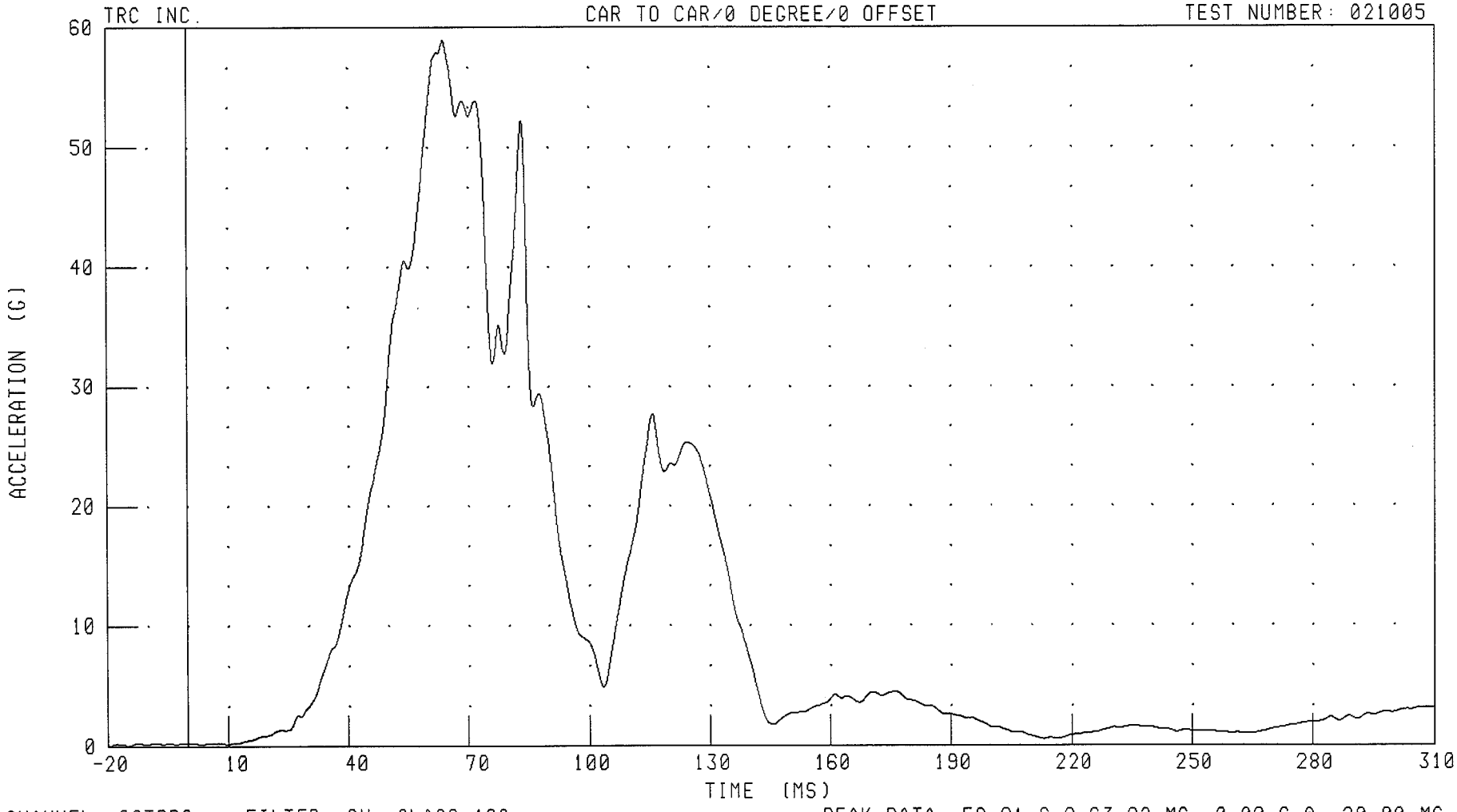
TARGET PASSENGER CHEST Z-AXIS ACCELERATION REDUNDANT



CHANNEL: CSTZR2 FILTER: CH. CLASS 180 PEAK DATA: 14.89 G @ 61.84 MS; -25.02 G @ 124.16 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER CHEST RESULTANT ACCELERATION REDUNDANT



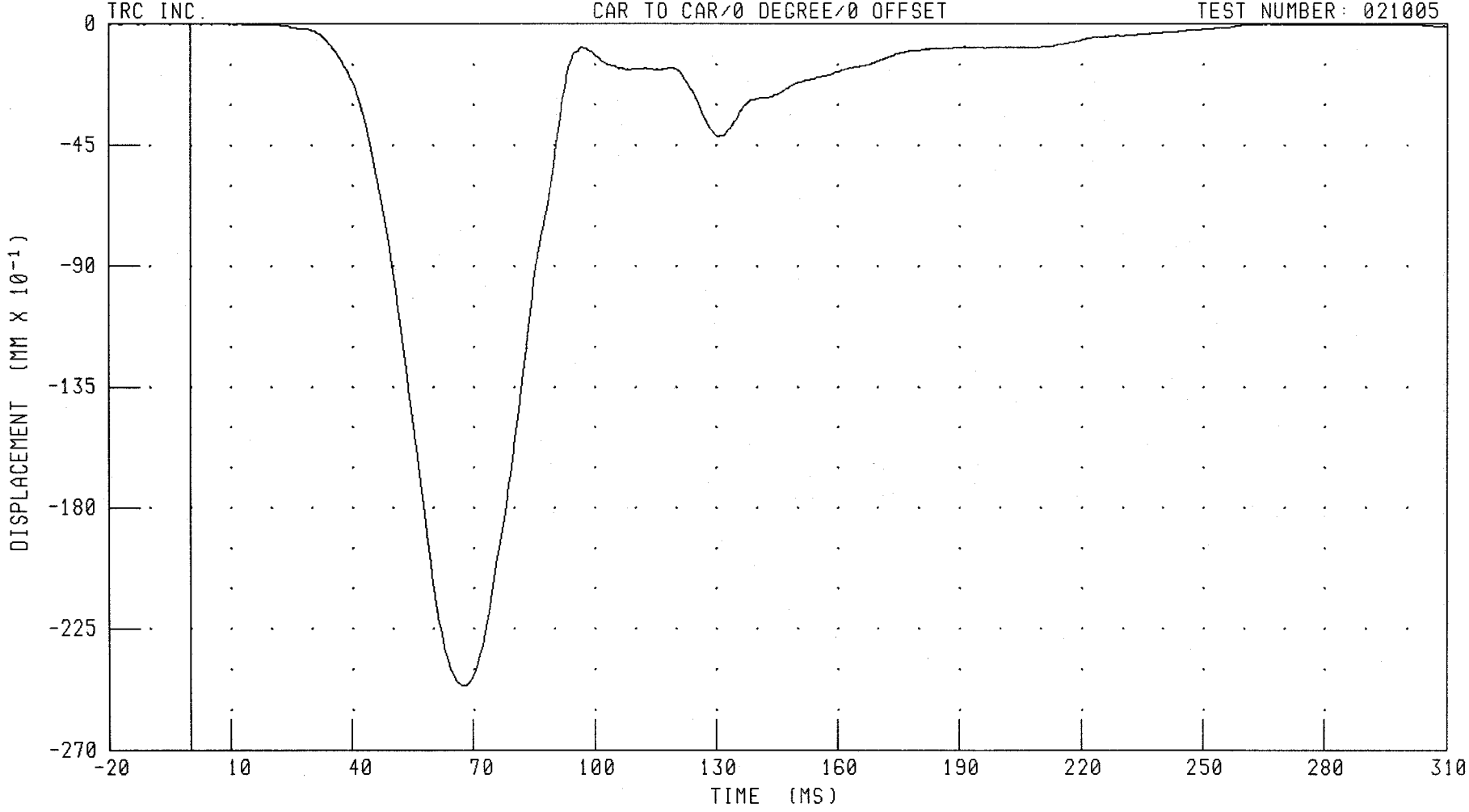
CHANNEL: CSTRR2 FILTER: CH. CLASS 180 PEAK DATA: 58.91 G @ 63.92 MS; 0.00 G @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER CHEST DEFLECTION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

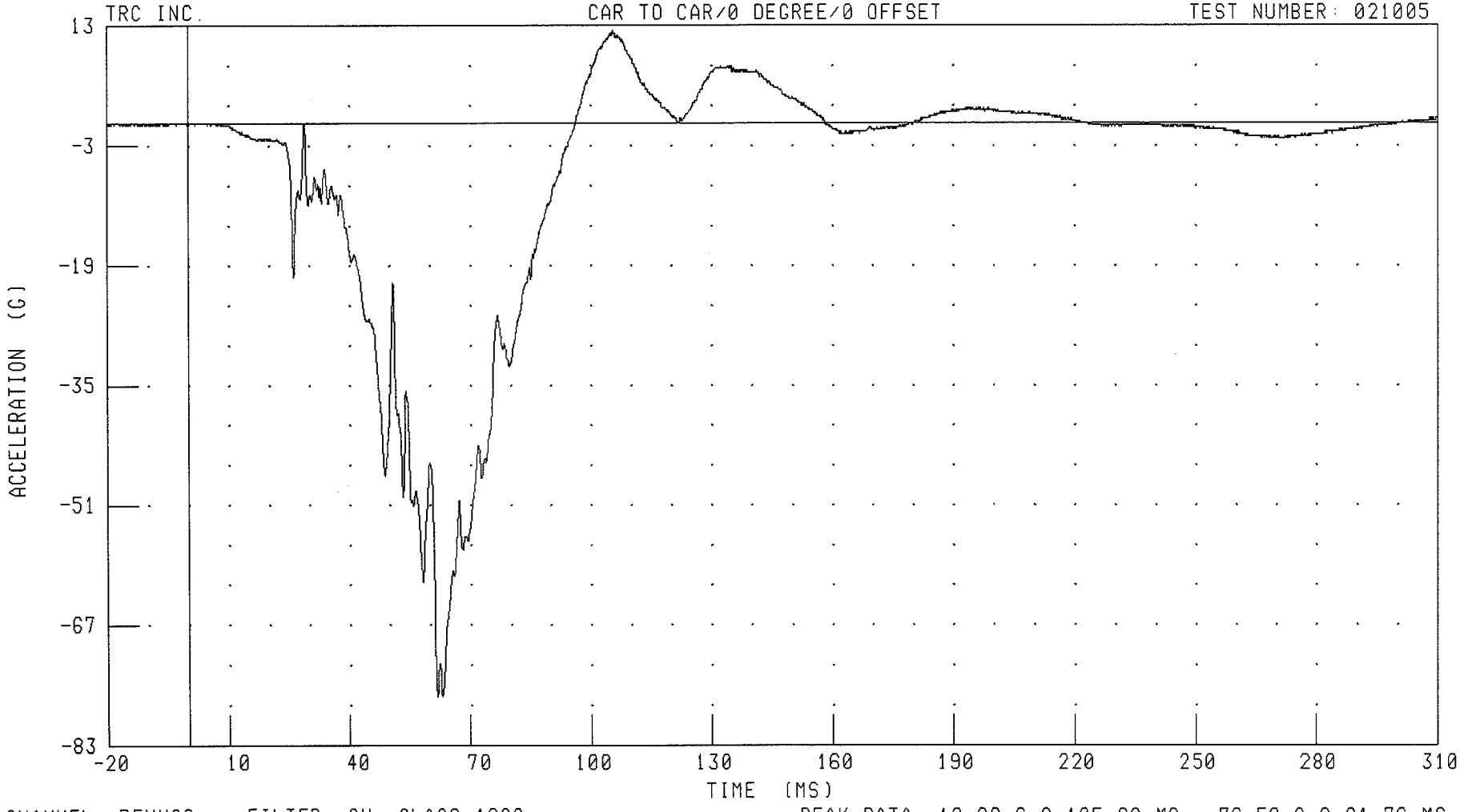


CHANNEL: CSTXD2 FILTER: CH. CLASS 600 PEAK DATA: 0.01 MM @ 10.24 MS; -24.61 MM @ 67.44 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER PELVIS X-AXIS ACCELERATION

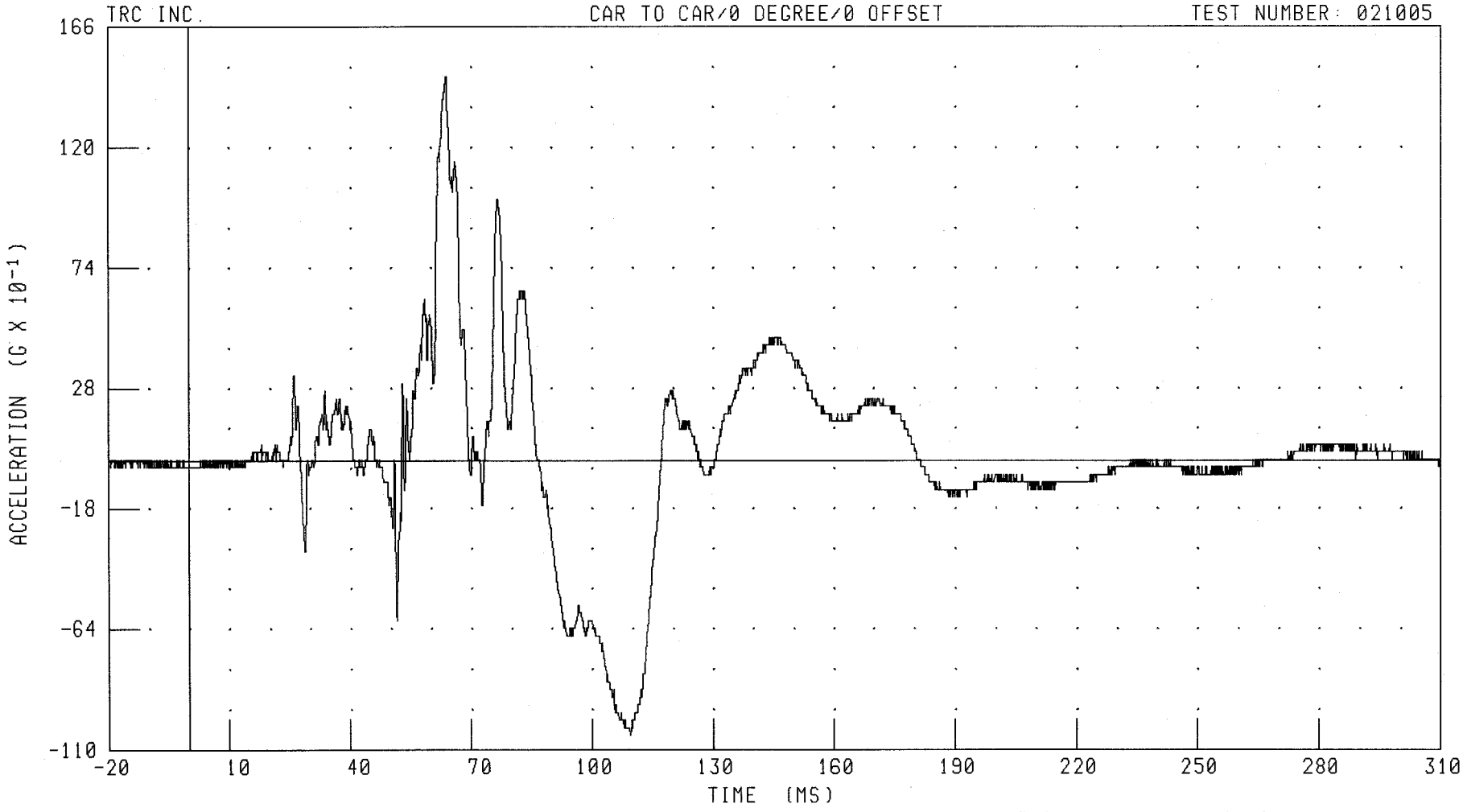


CHANNEL: PEVXG2 FILTER: CH. CLASS 1000 PEAK DATA: 12.29 G @ 105.60 MS; -76.52 G @ 61.76 MS

021005

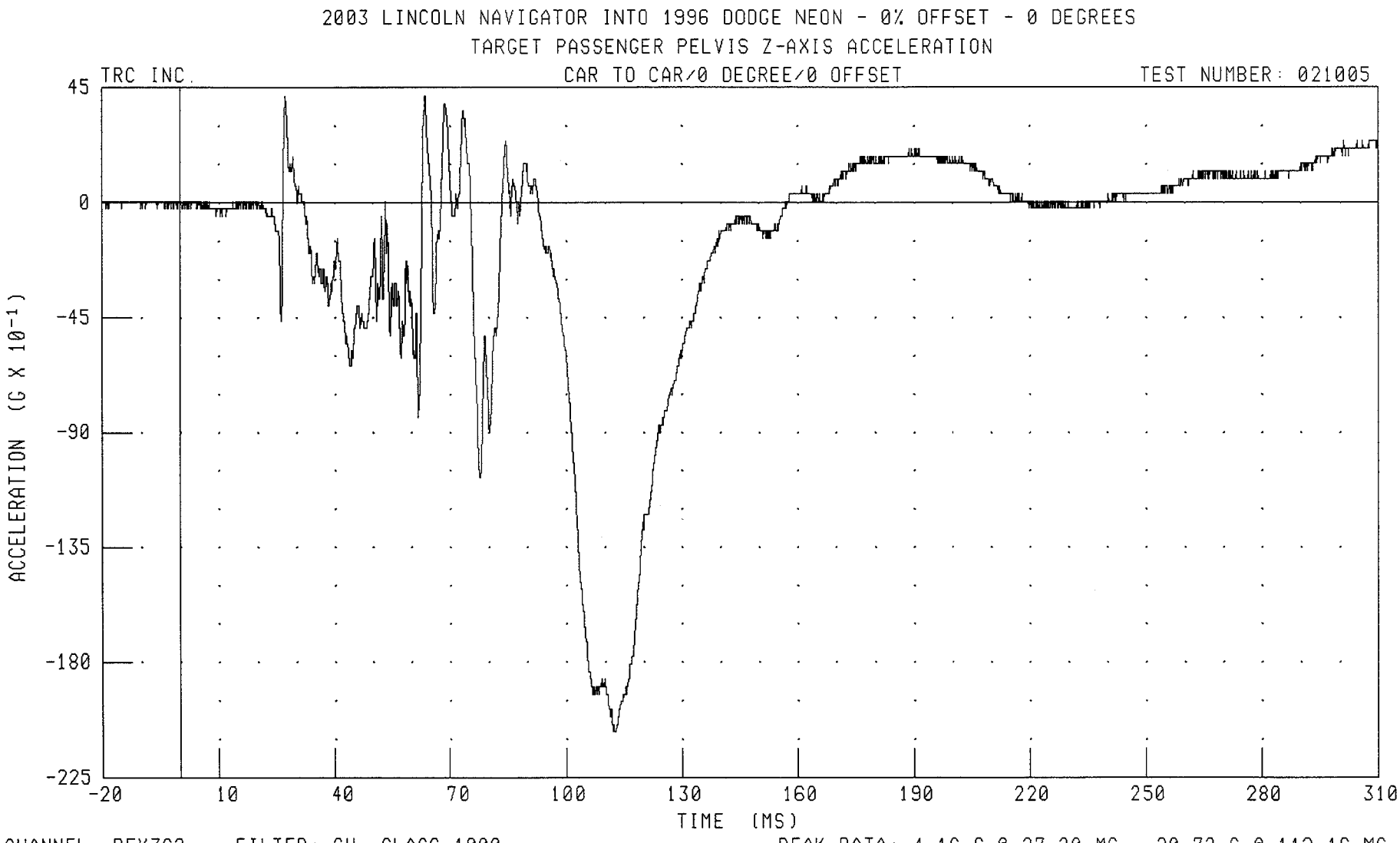
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER PELVIS Y-AXIS ACCELERATION

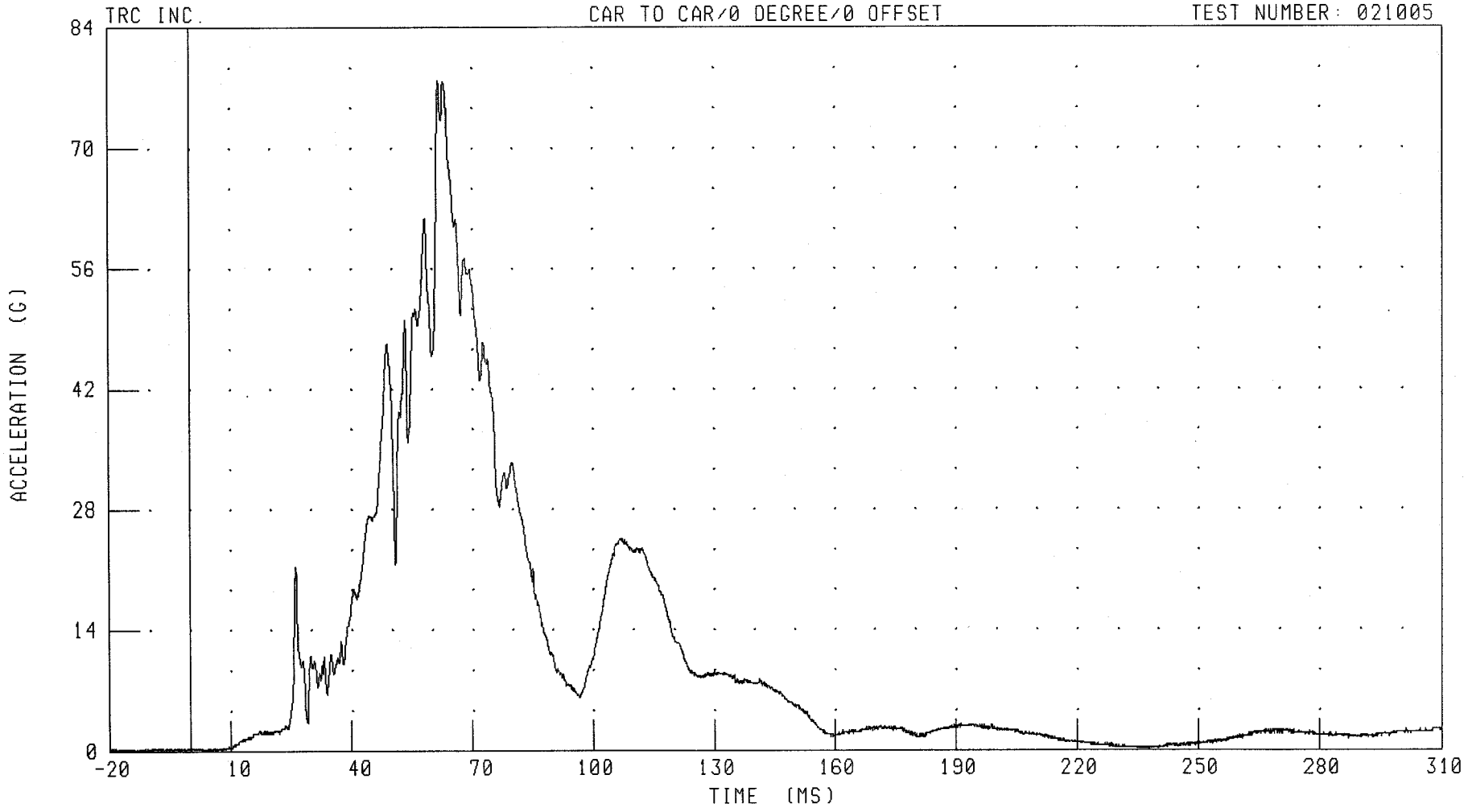


CHANNEL: PEVYG2 FILTER: CH. CLASS 1000 PEAK DATA: 14.70 G @ 63.76 MS; -10.48 G @ 109.44 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER PELVIS Z-AXIS ACCELERATION
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
45
0
-45
-90
-135
-180
-225
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVZG2
FILTER: CH. CLASS 1000
PEAK DATA: 4.16 G @ 27.20 MS; -20.72 G @ 112.16 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER PELVIS RESULTANT ACCELERATION



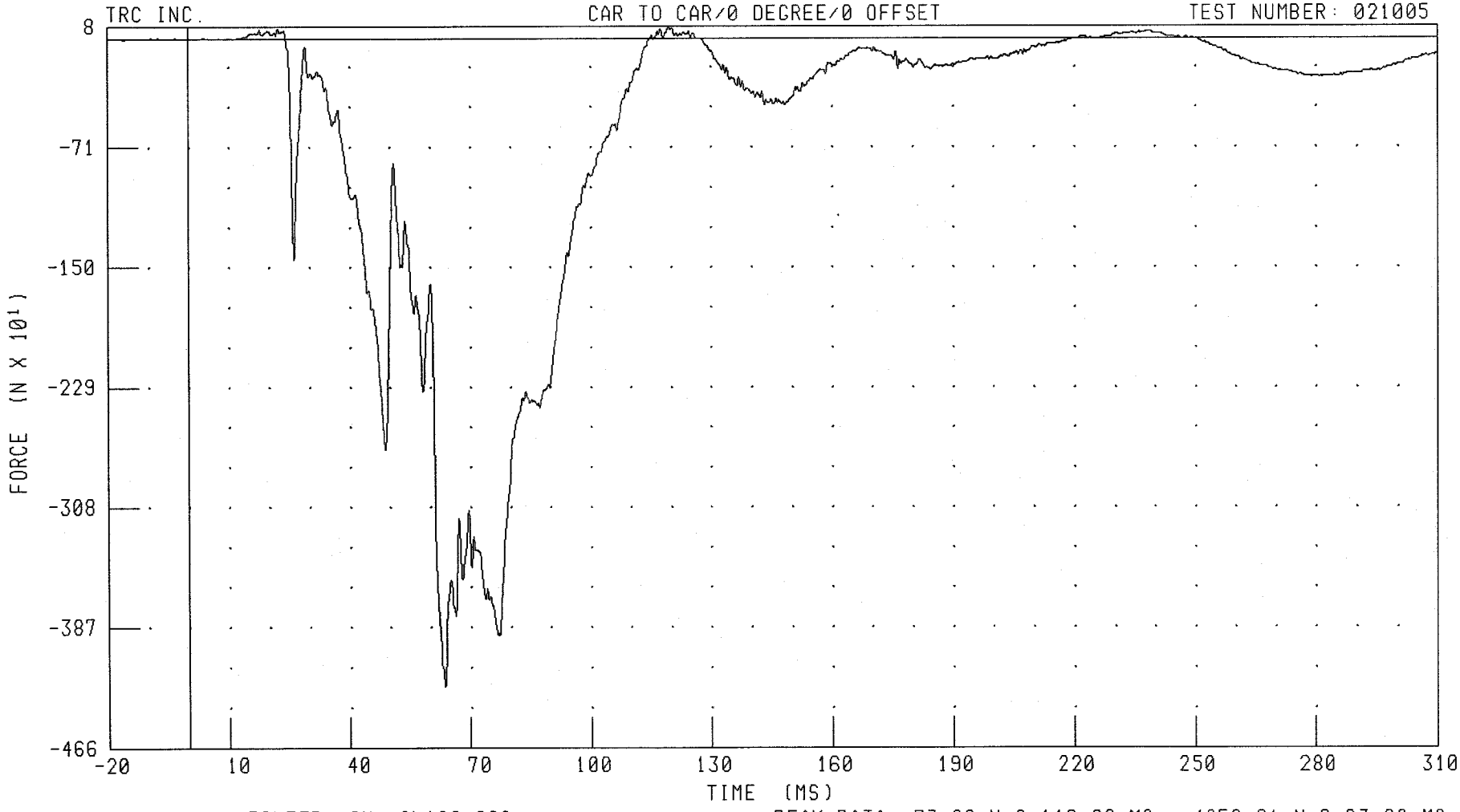
CHANNEL: PEVRG2 FILTER: CH. CLASS 1000 PEAK DATA: 77.83 G @ 61.84 MS; 0.11 G @ -19.92 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LEFT FEMUR FORCE

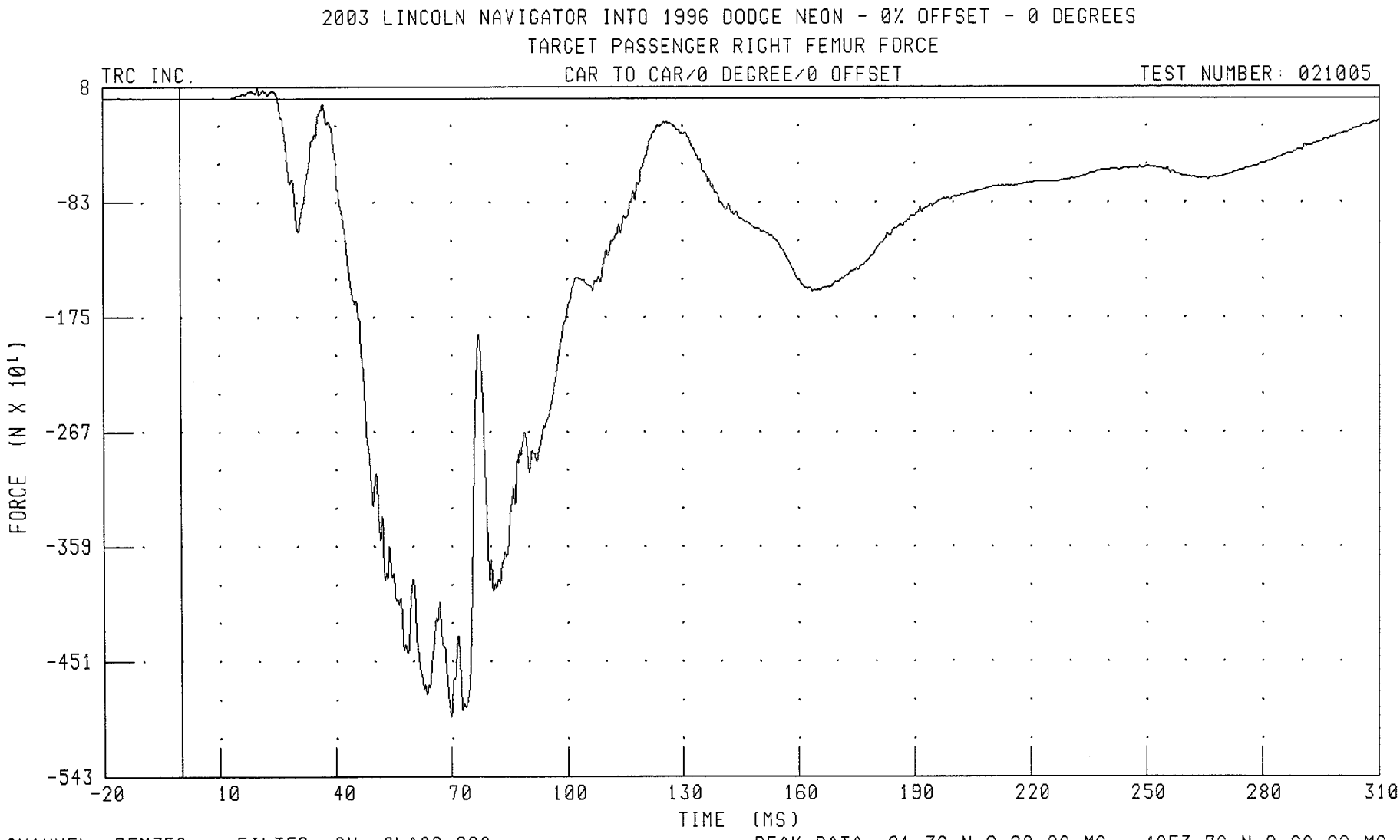
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: LFMZF2 FILTER: CH. CLASS 600

PEAK DATA: 73.08 N @ 119.68 MS; -4258.81 N @ 63.60 MS

021005

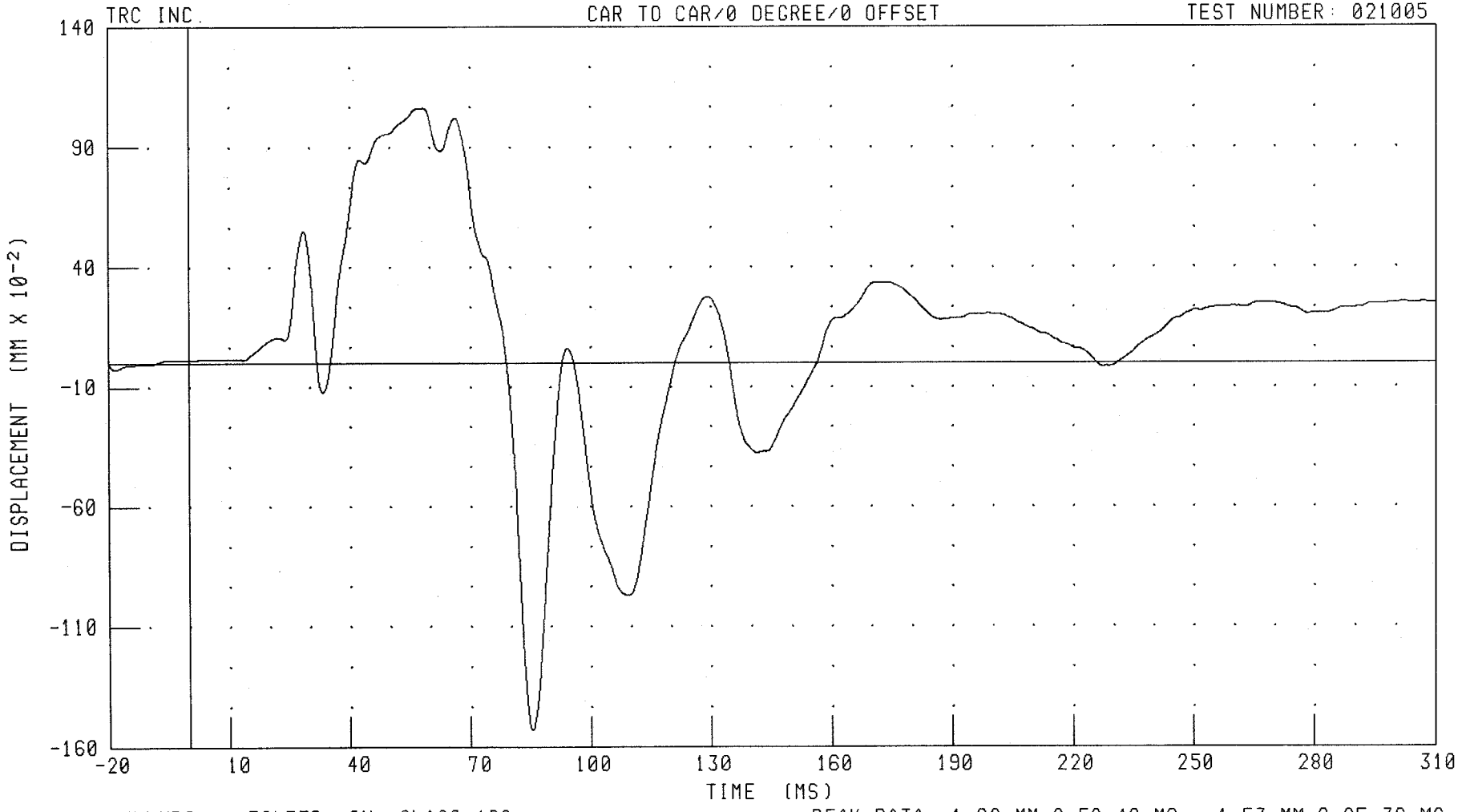

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER RIGHT FEMUR FORCE
CAR TO CAR/0 DEGREE/0 OFFSET
TRC INC.
TEST NUMBER: 021005
8
-83
-175
-267
-359
-451
-543
FORCE (N X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RFMZF2
FILTER: CH. CLASS 600
PEAK DATA: 81.36 N @ 20.08 MS; -4953.76 N @ 69.92 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LEFT KNEE DISPLACEMENT

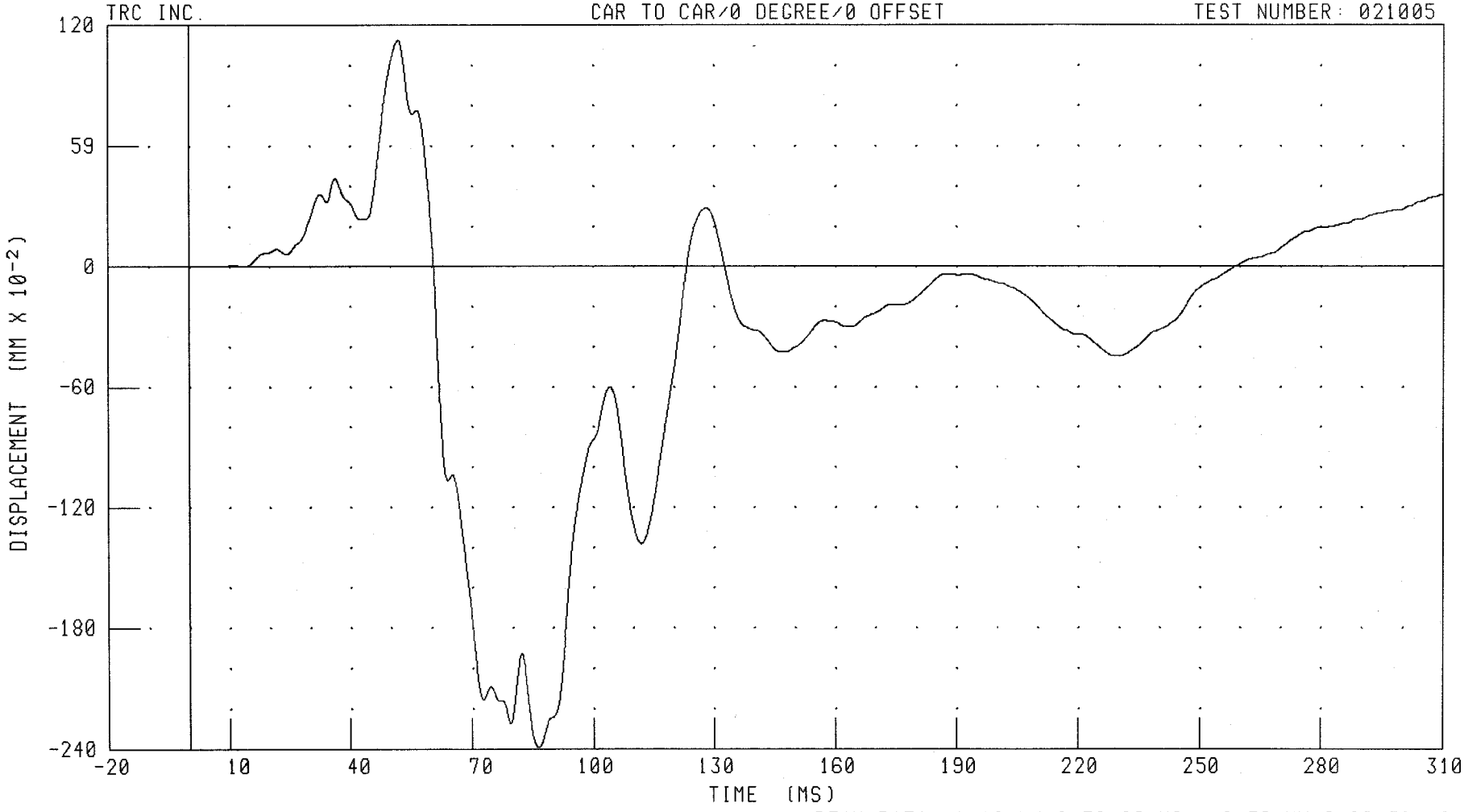
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: KNLXD2 FILTER: CH. CLASS 180 PEAK DATA: 1.06 MM @ 58.48 MS; -1.53 MM @ 85.36 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

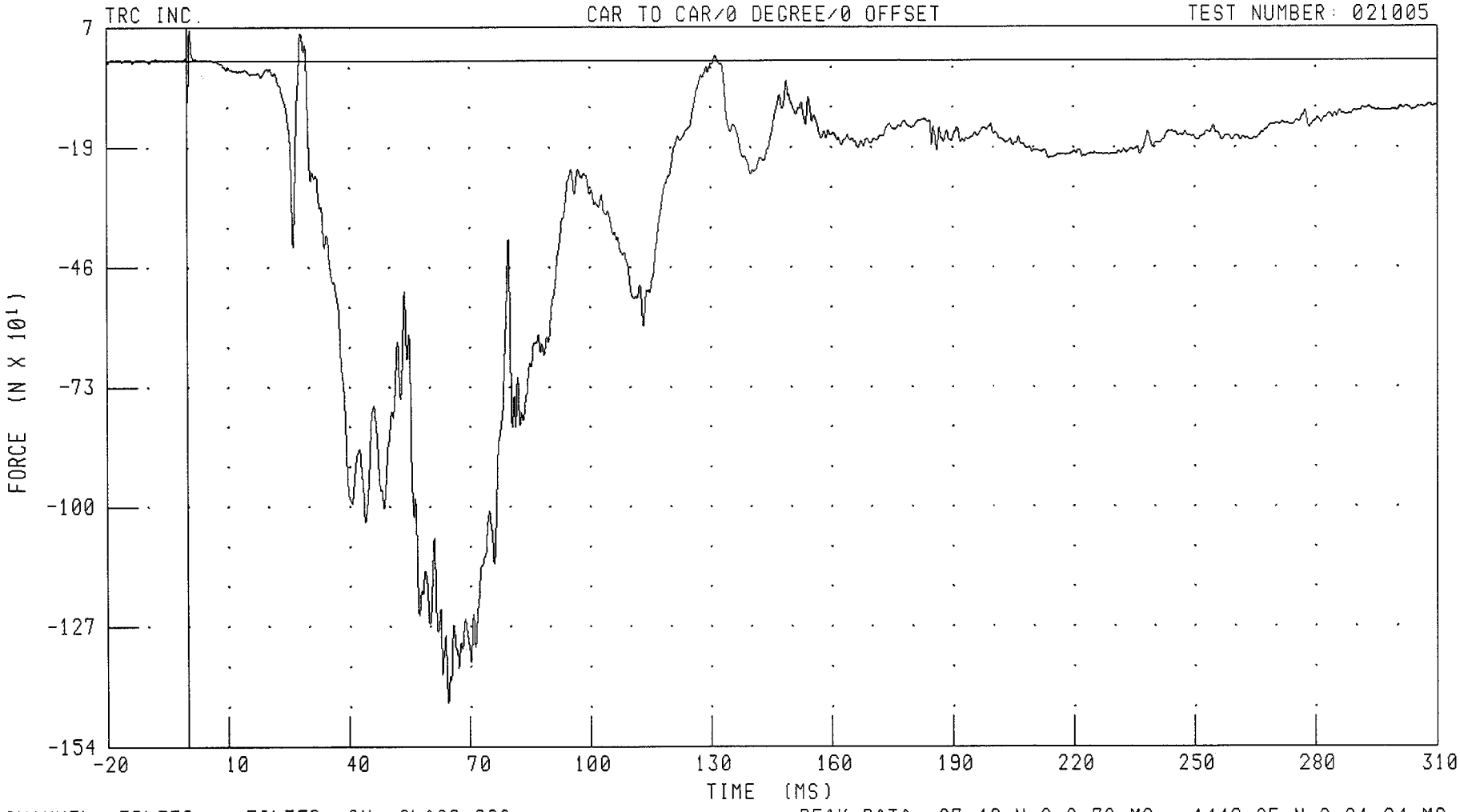
TARGET PASSENGER RIGHT KNEE DISPLACEMENT



CHANNEL: KNRXD2 FILTER: CH. CLASS 180 PEAK DATA: 1.12 MM @ 52.00 MS; -2.39 MM @ 86.32 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER LEFT UPPER TIBIA Z-AXIS FORCE

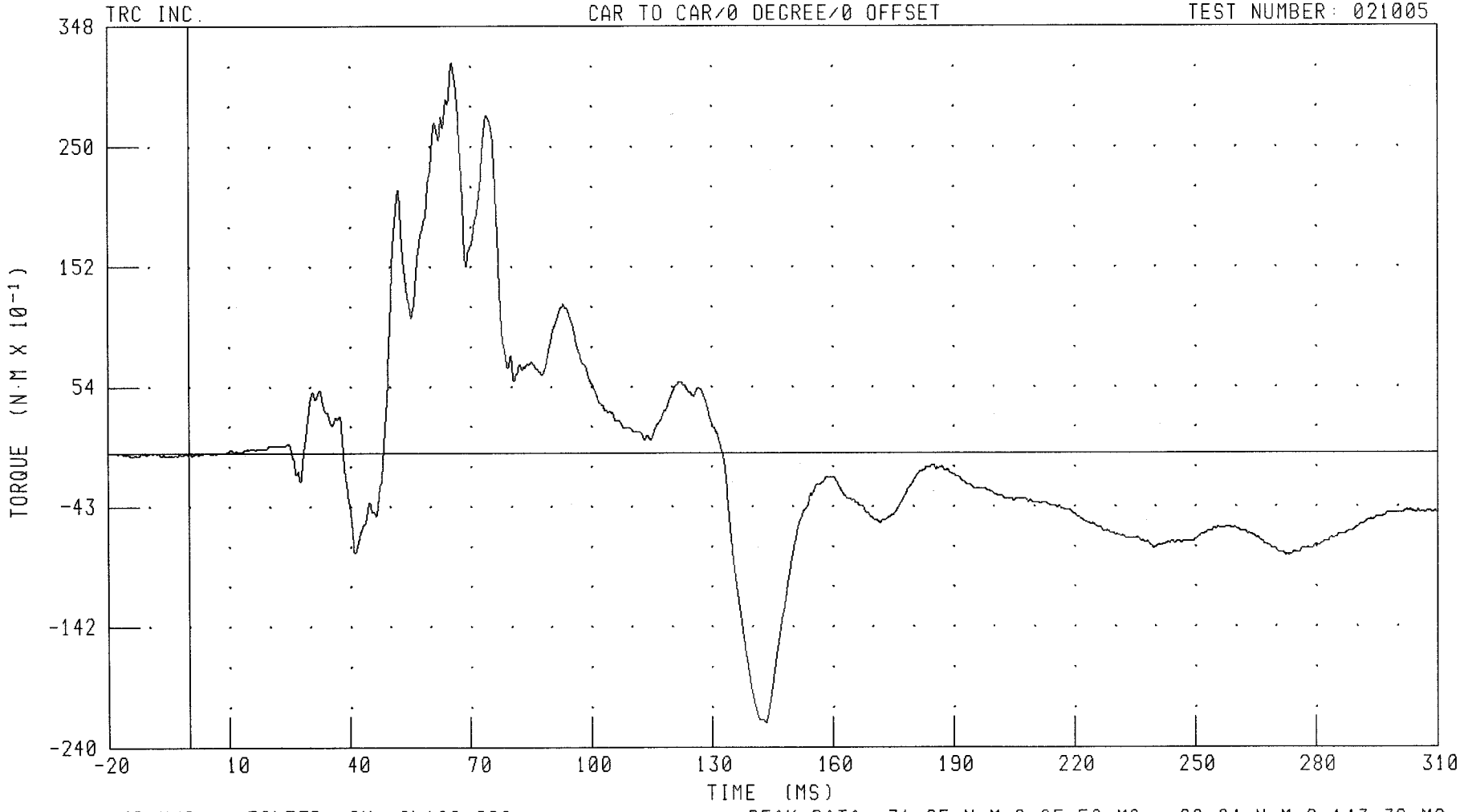


CHANNEL: TBLZF2 FILTER: CH. CLASS 600 PEAK DATA: 67.46 N @ 0.72 MS; -1448.65 N @ 64.64 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

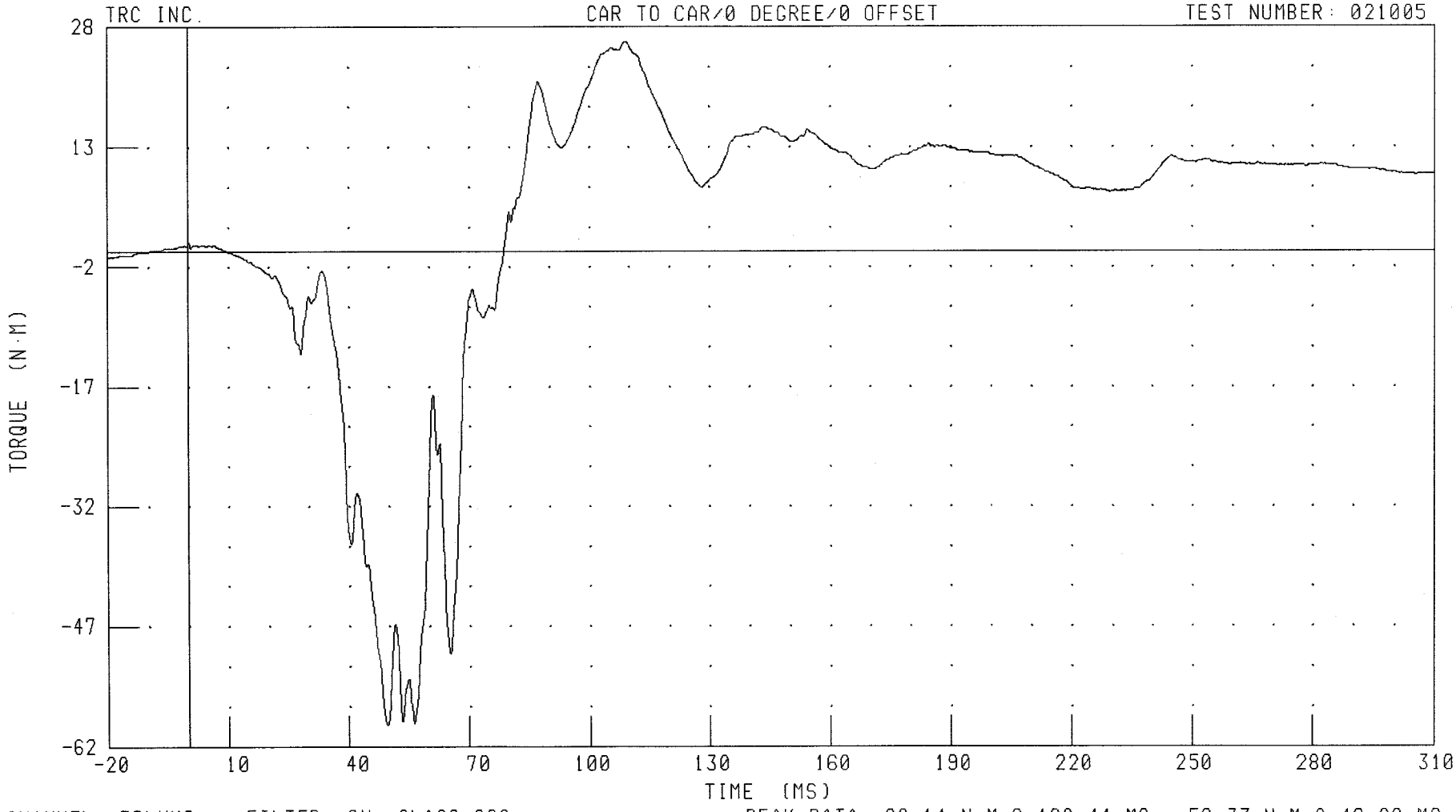


CHANNEL: TBLXM2 FILTER: CH. CLASS 600 PEAK DATA: 31.85 N·M @ 65.52 MS; -22.04 N·M @ 143.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS



CHANNEL: TBLYM2 FILTER: CH. CLASS 600

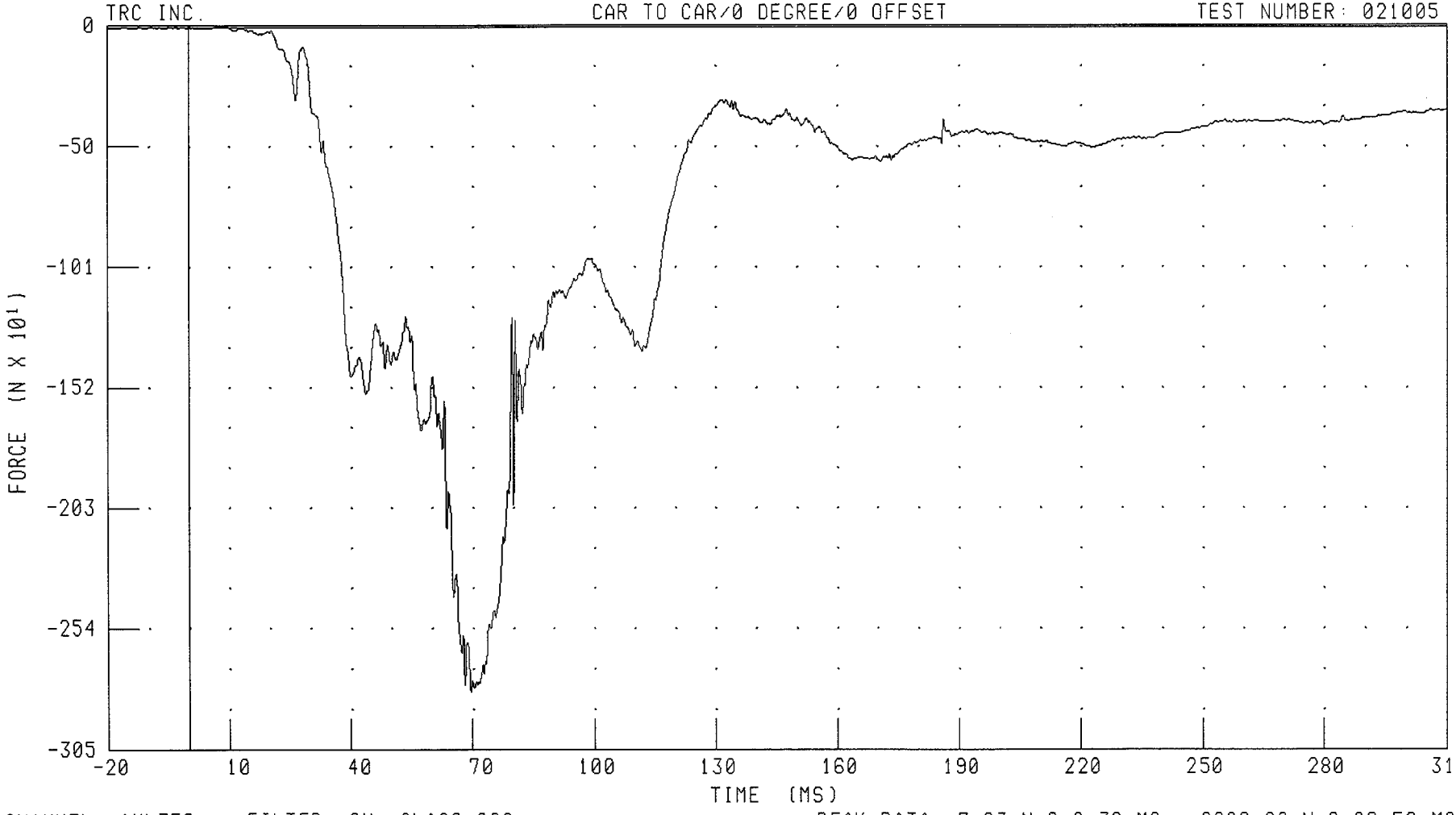
PEAK DATA: 26.14 N·M @ 109.44 MS, -59.33 N·M @ 49.60 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LEFT LOWER TIBIA Z-AXIS FORCE

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

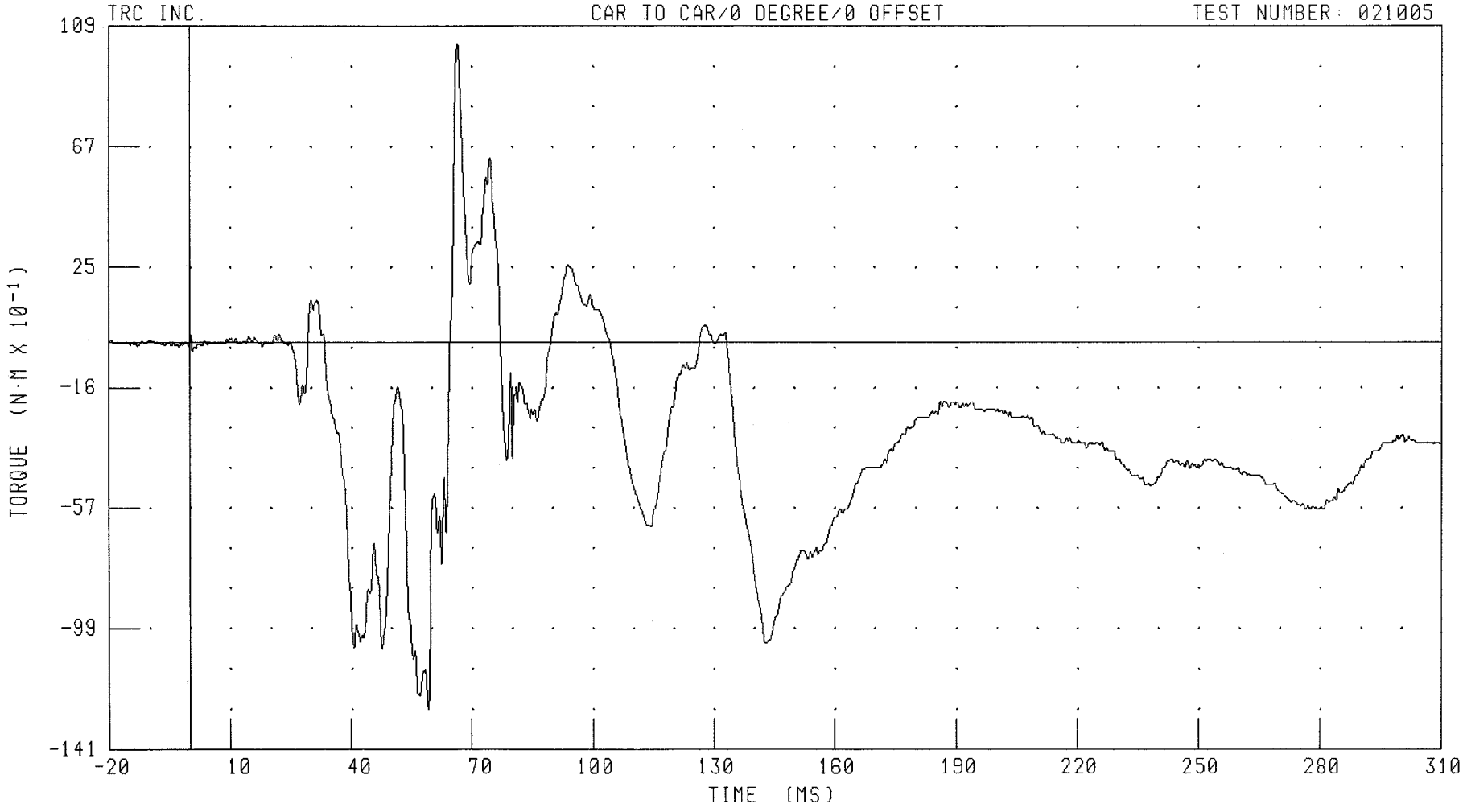


CHANNEL: ANLZF2 FILTER: CH. CLASS 600 PEAK DATA: 7.23 N @ 8.32 MS; -2809.89 N @ 69.52 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER LEFT LOWER TIBIA MOMENT ABOUT X AXIS

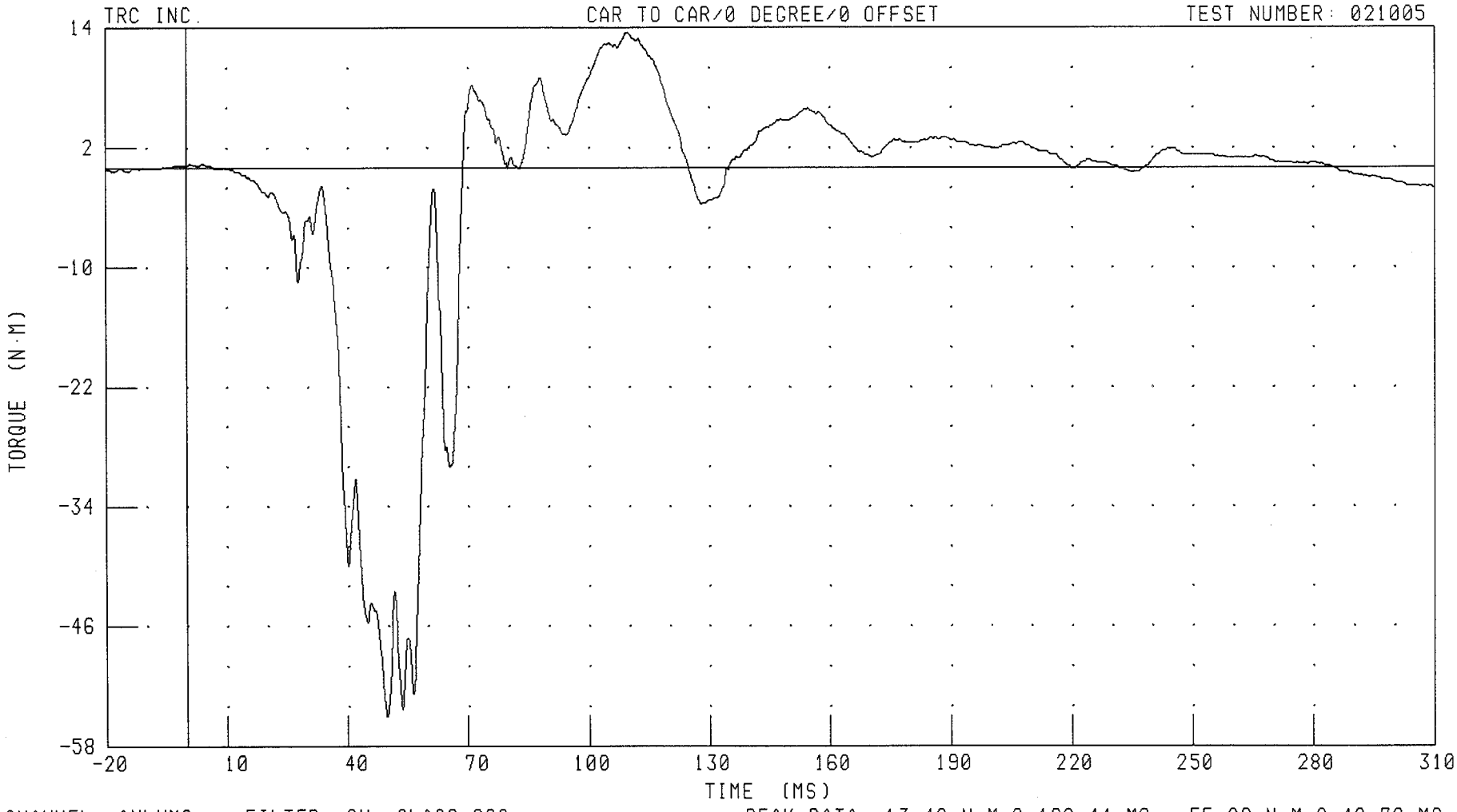


CHANNEL: ANLXM2 FILTER: CH. CLASS 600

PEAK DATA: 10.36 N·M @ 66.64 MS; -12.81 N·M @ 59.20 MS

021005

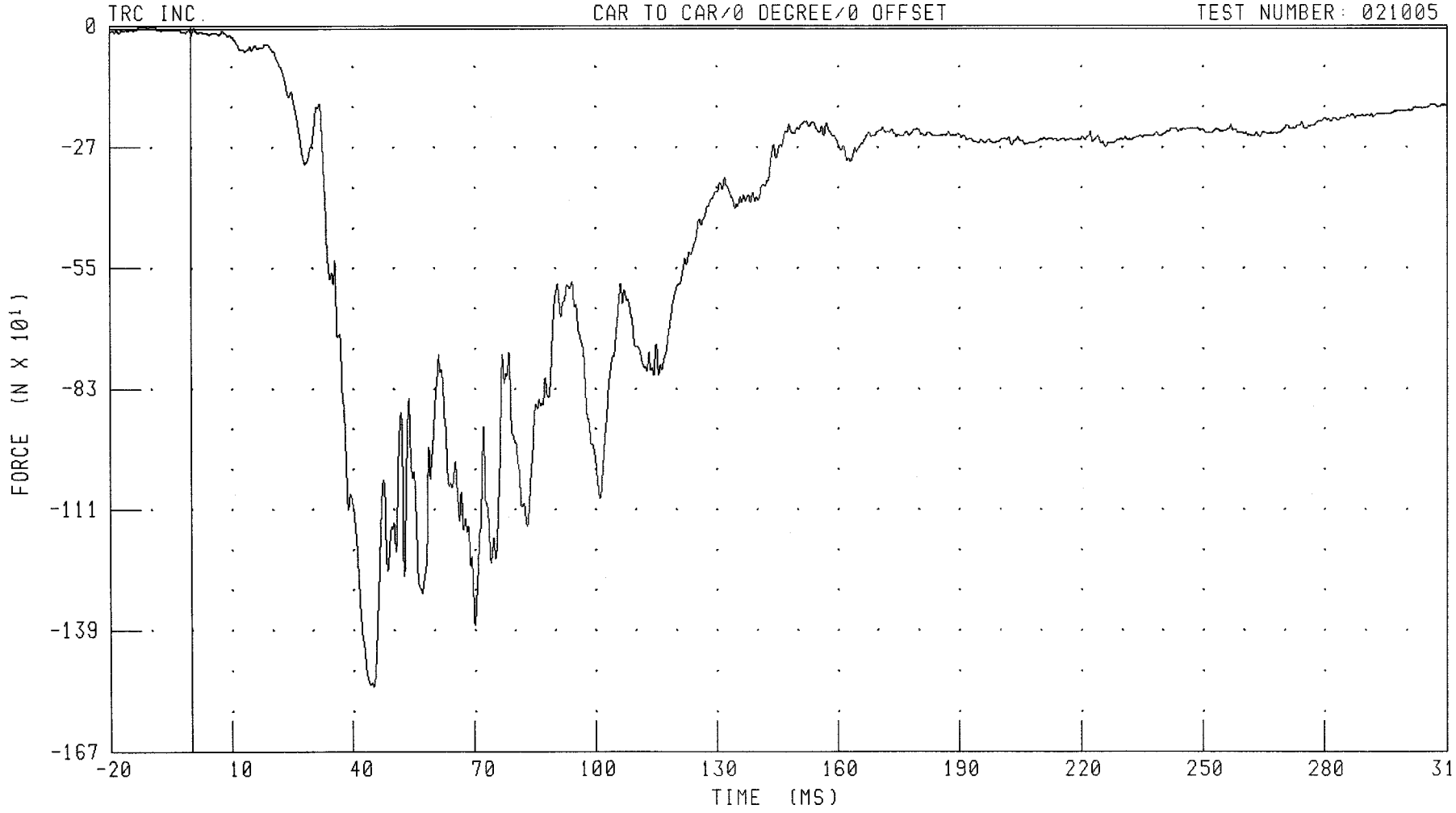
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS



CHANNEL: ANLYM2 FILTER: CH. CLASS 600
PEAK DATA: 13.49 N·M @ 109.44 MS; -55.09 N·M @ 49.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER RIGHT UPPER TIBIA Z-AXIS FORCE

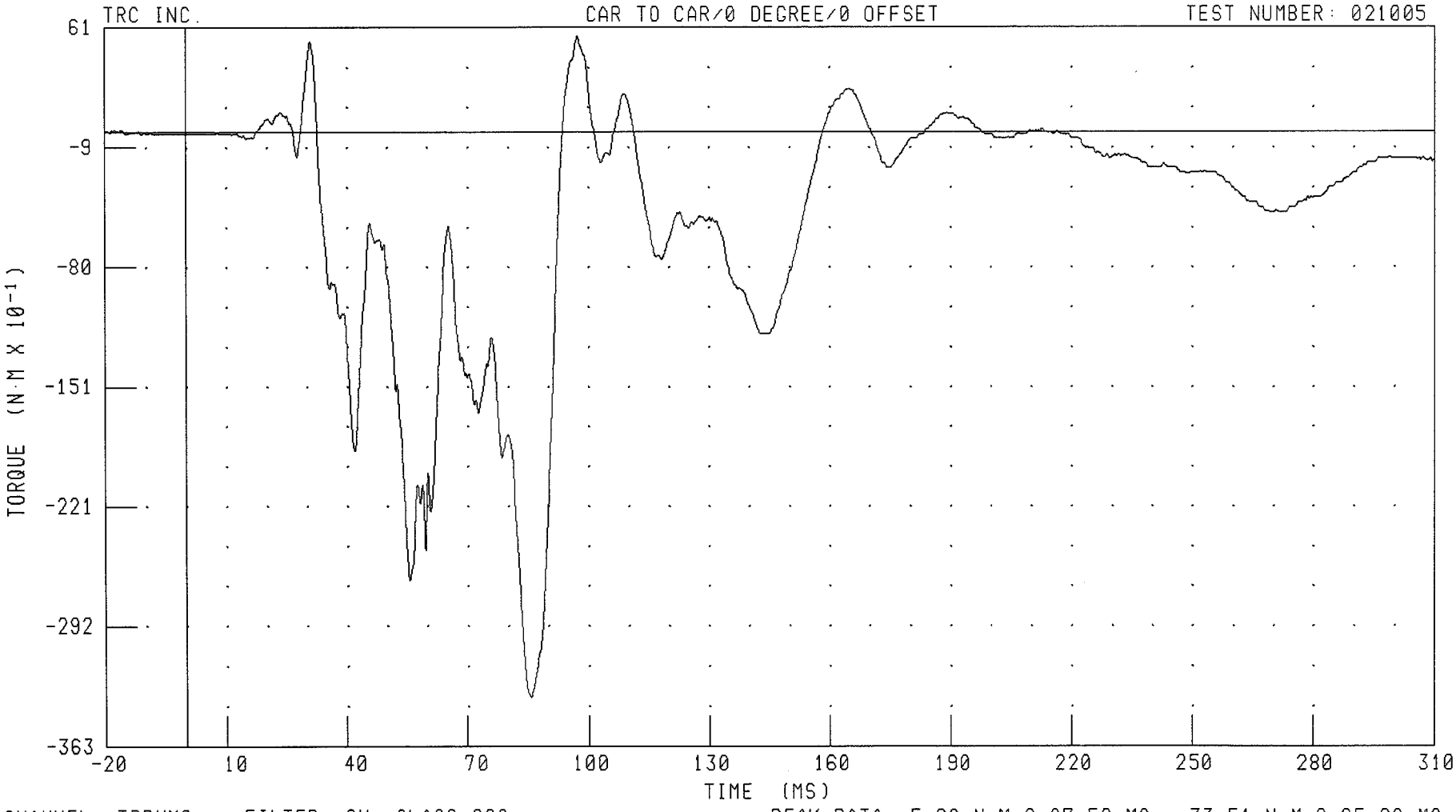


CHANNEL: TBRZF2 FILTER: CH. CLASS 600 PEAK DATA: 6.22 N @ -12.56 MS; -1523.35 N @ 45.04 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

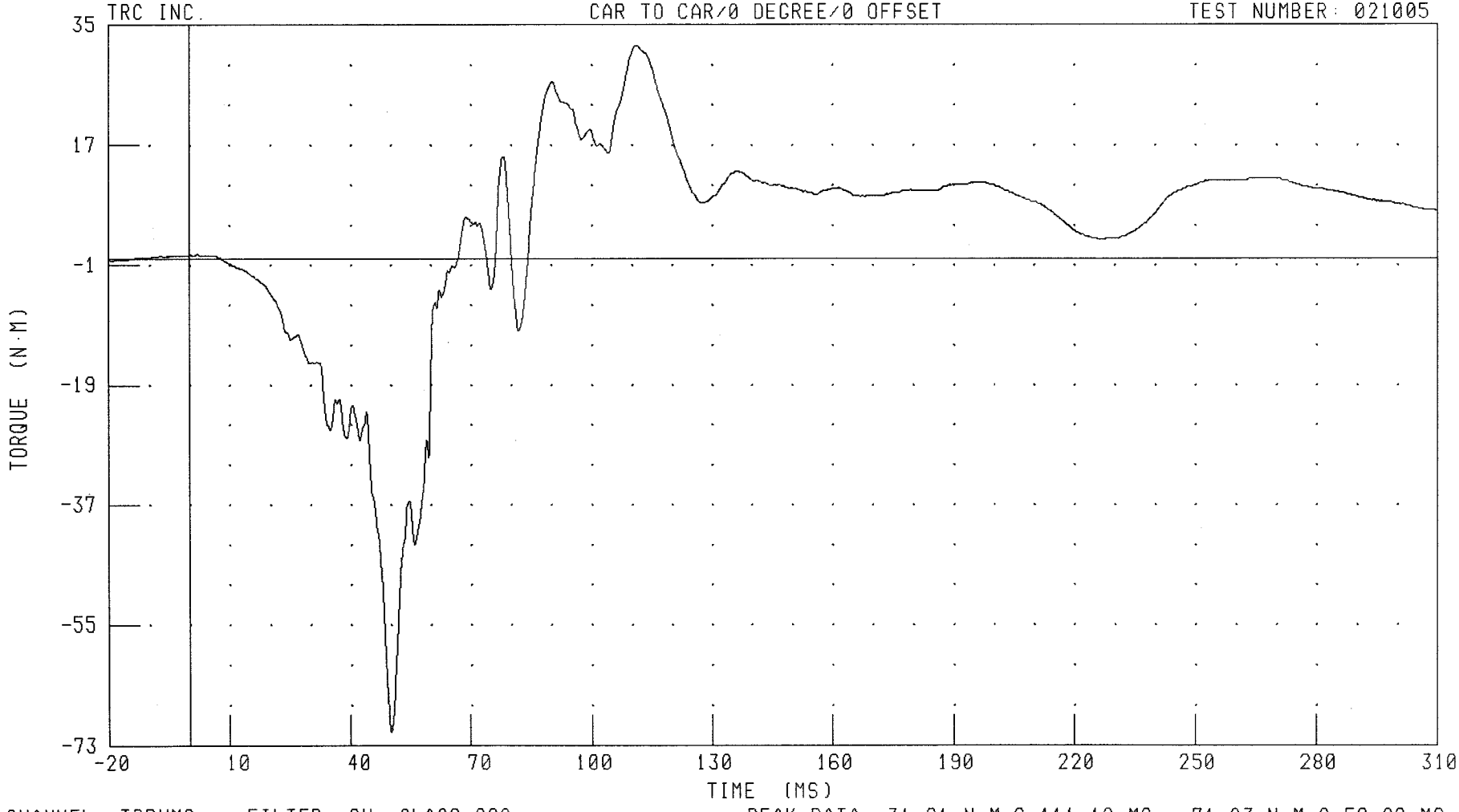


CHANNEL: TBRXM2 FILTER: CH. CLASS 600 PEAK DATA: 5.69 N·M @ 97.52 MS; -33.51 N·M @ 85.60 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

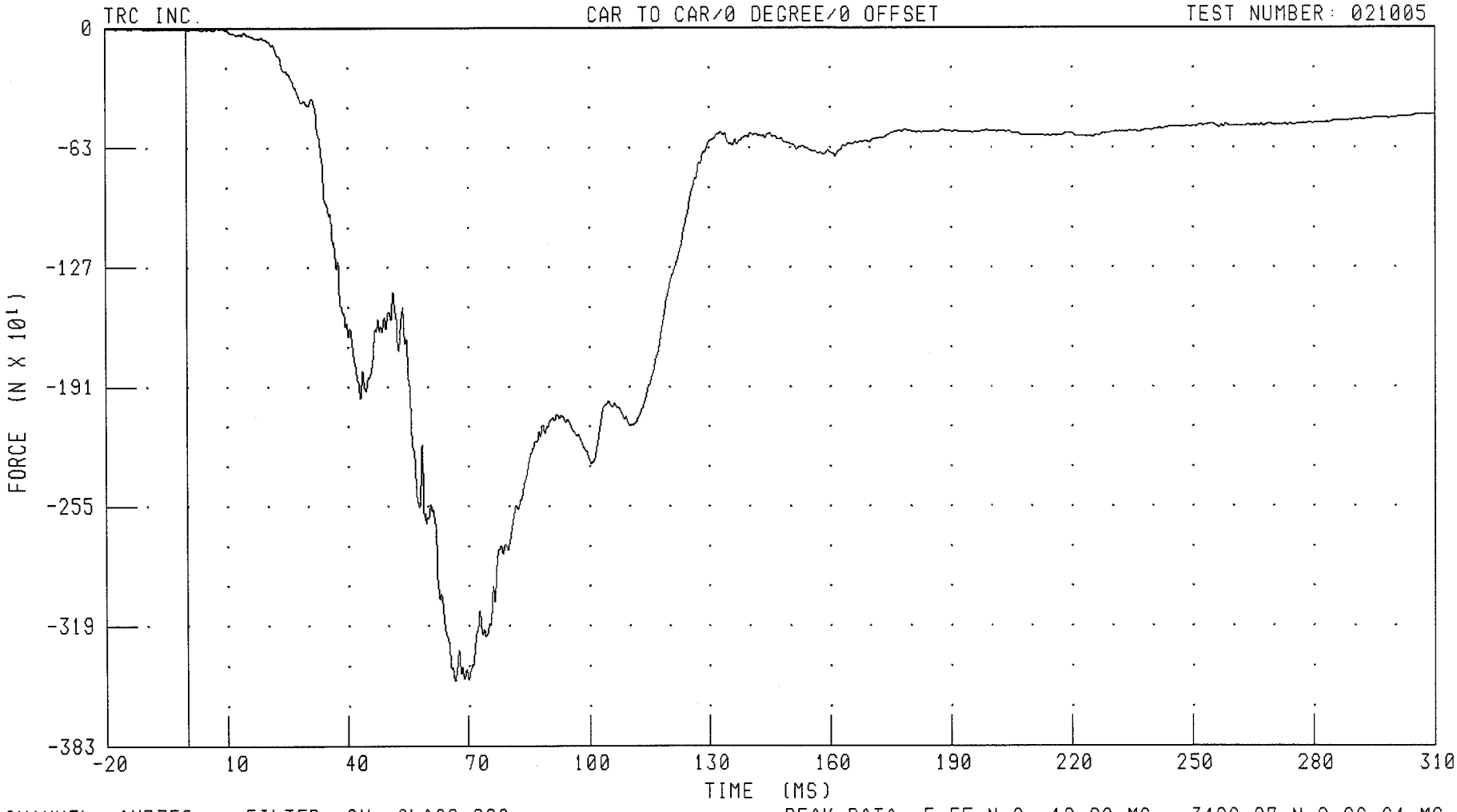


CHANNEL: TBRYM2 FILTER: CH. CLASS 600 PEAK DATA: 31.91 N-M @ 111.12 MS; -71.03 N-M @ 50.08 MS

B-100

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE

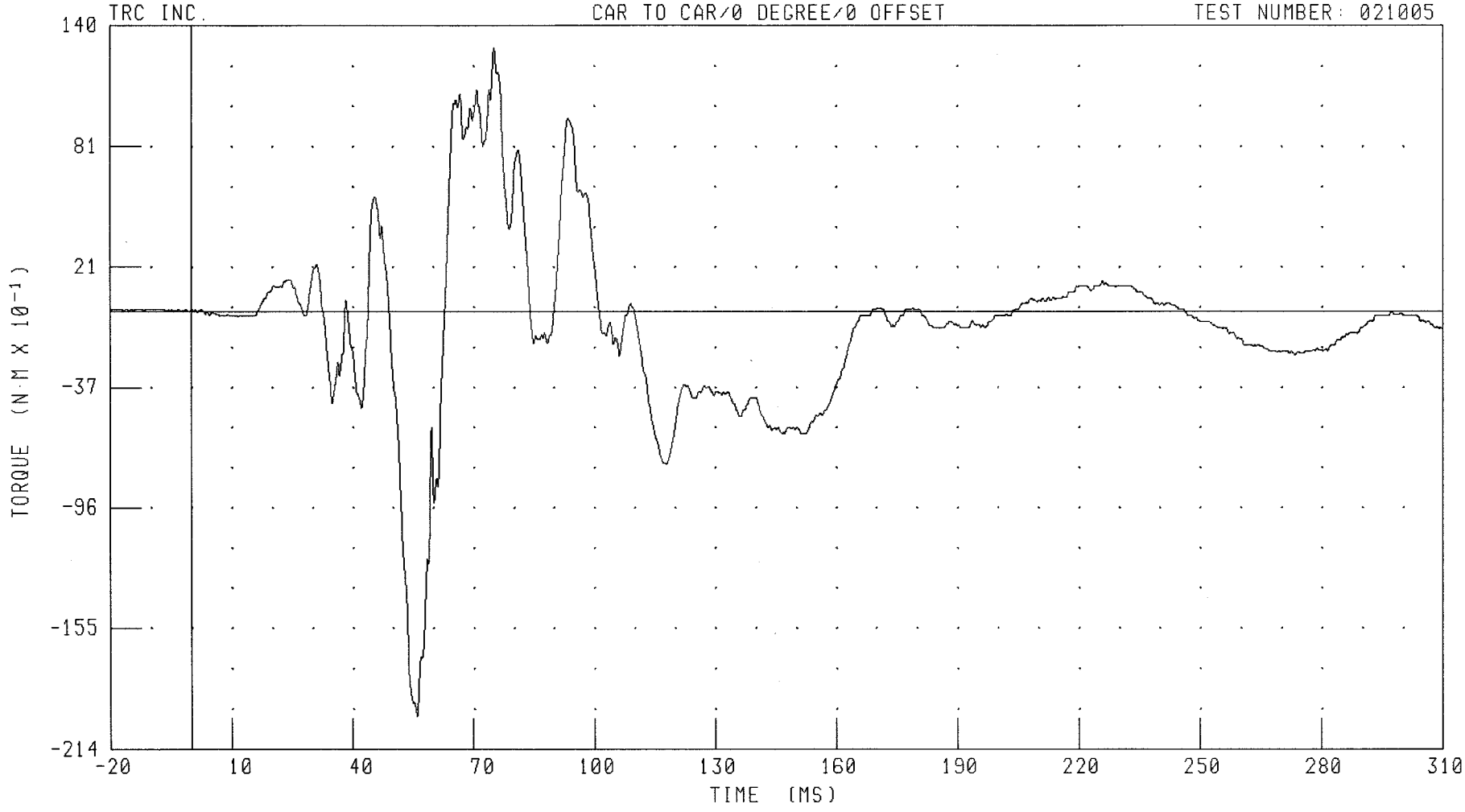


CHANNEL: ANRZF2 FILTER: CH. CLASS 600 PEAK DATA: 5.55 N @ -19.60 MS; -3488.97 N @ 66.64 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS



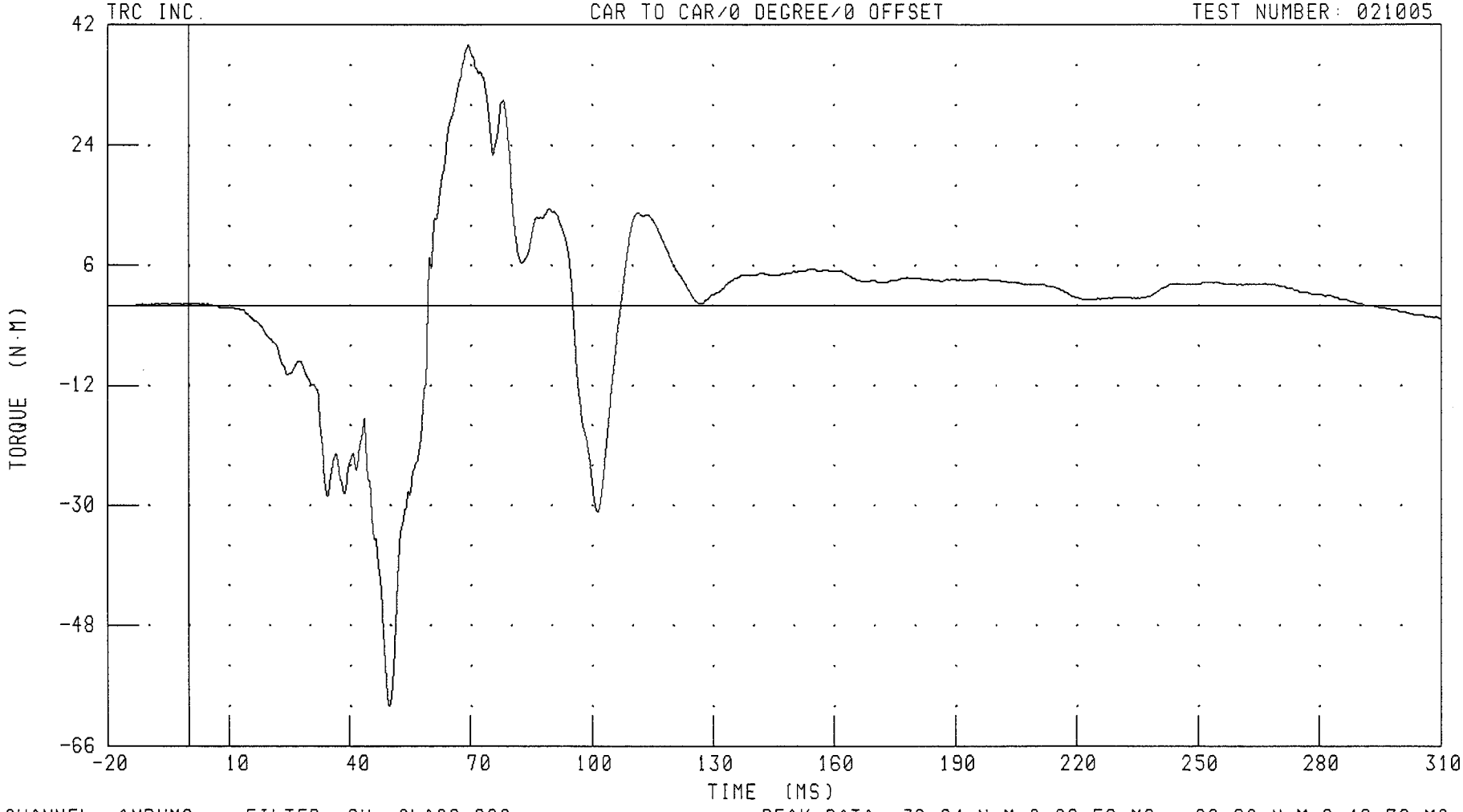
CHANNEL: ANRXM2 FILTER: CH. CLASS 600 PEAK DATA: 12.91 N·M @ 75.20 MS; -19.80 N·M @ 56.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

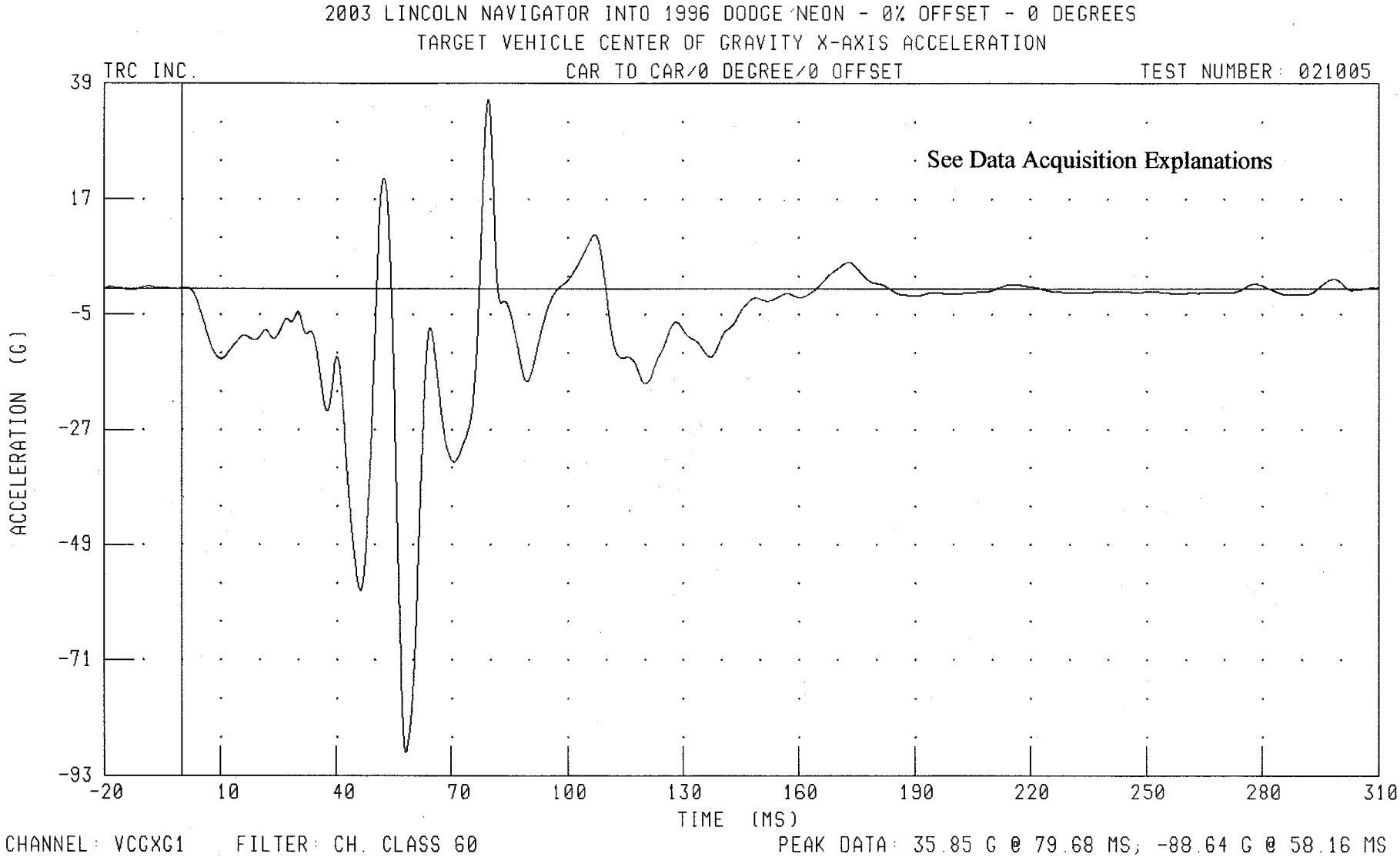
TARGET PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



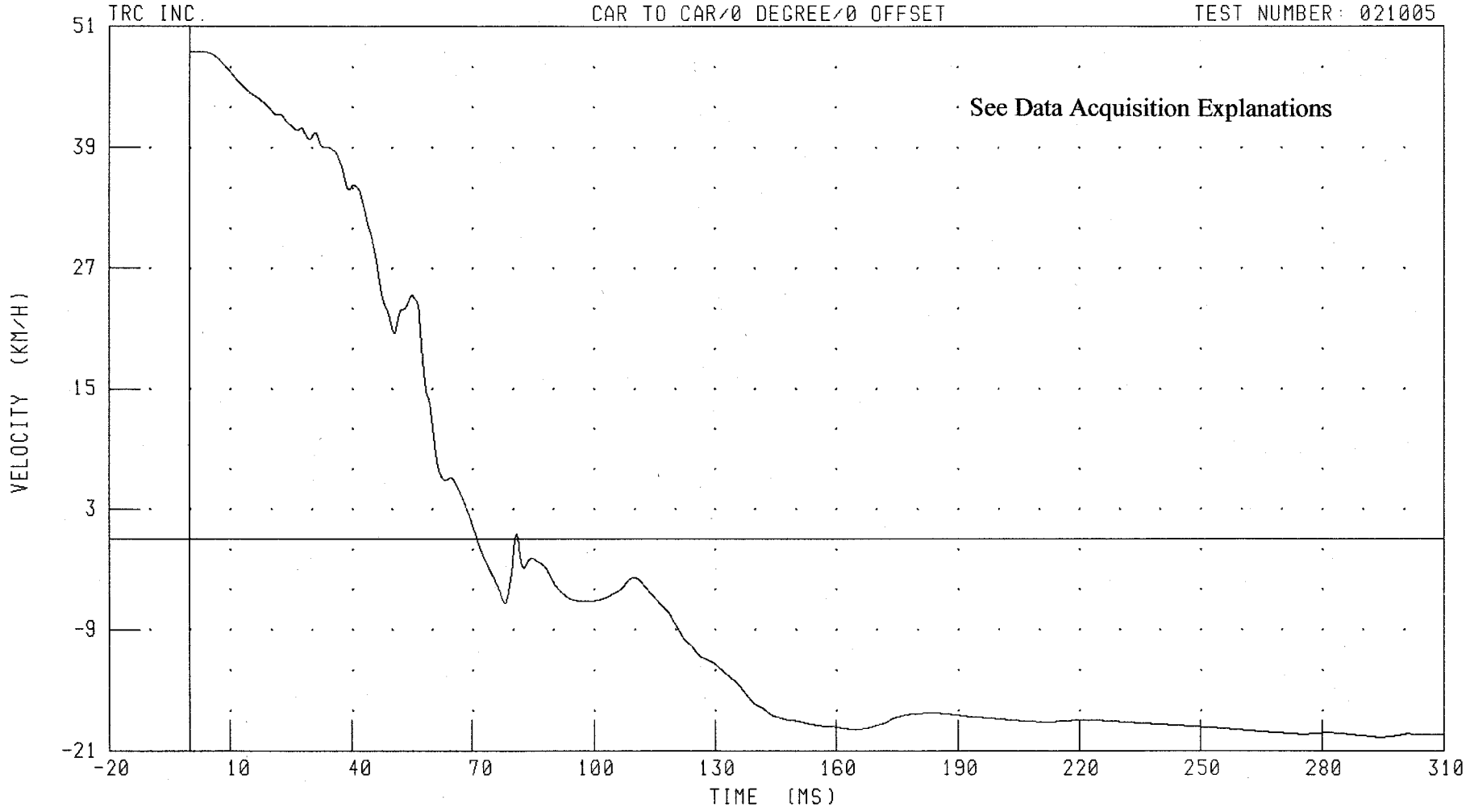
CHANNEL: ANRYM2 FILTER: CH. CLASS 600 PEAK DATA: 39.04 N-M @ 69.52 MS; -60.02 N-M @ 49.76 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
ACCELERATION (G)
39
17
-5
-27
-49
-71
-93
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGXG1
FILTER: CH. CLASS 60
PEAK DATA: 35.85 G @ 79.68 MS; -88.64 G @ 58.16 MS

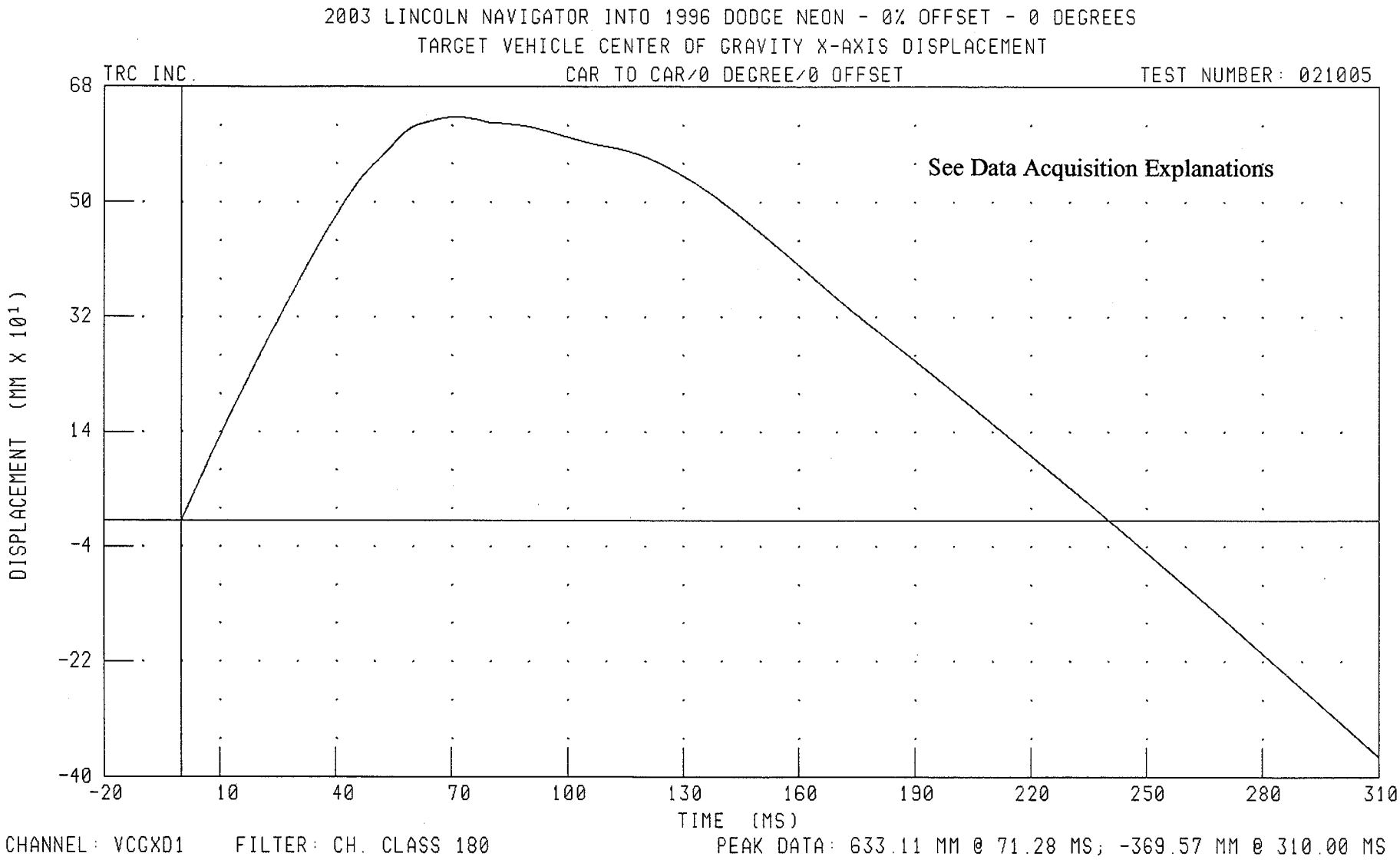
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY



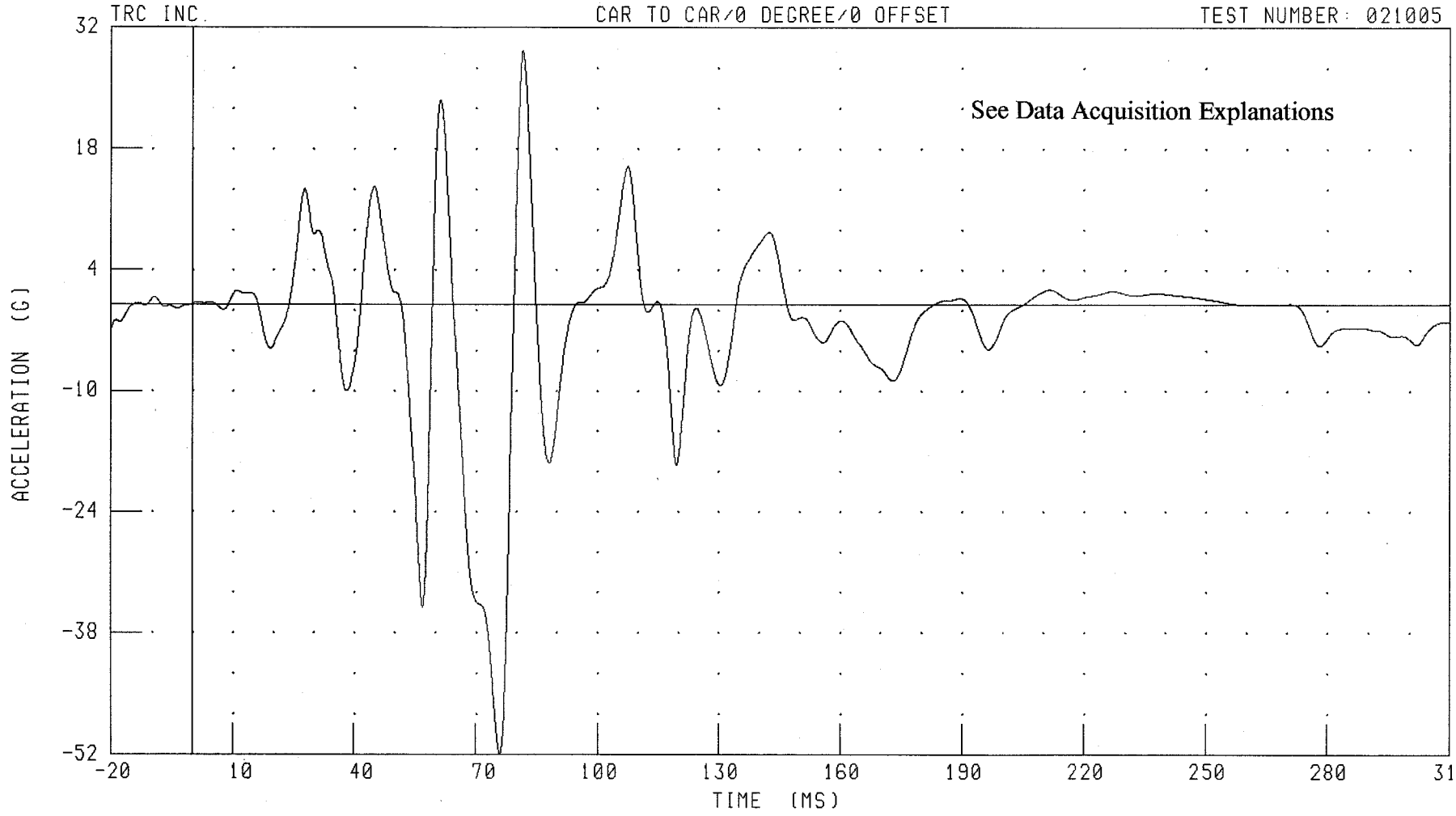
CHANNEL: VCGXV1 FILTER: CH. CLASS 180 PEAK DATA: 48.50 KM/H @ 0.00 MS; -19.66 KM/H @ 294.24 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
DISPLACEMENT (MM X 10¹)
68
50
32
14
-4
-22
-40
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGXD1
FILTER: CH. CLASS 180
PEAK DATA: 633.11 MM @ 71.28 MS; -369.57 MM @ 310.00 MS

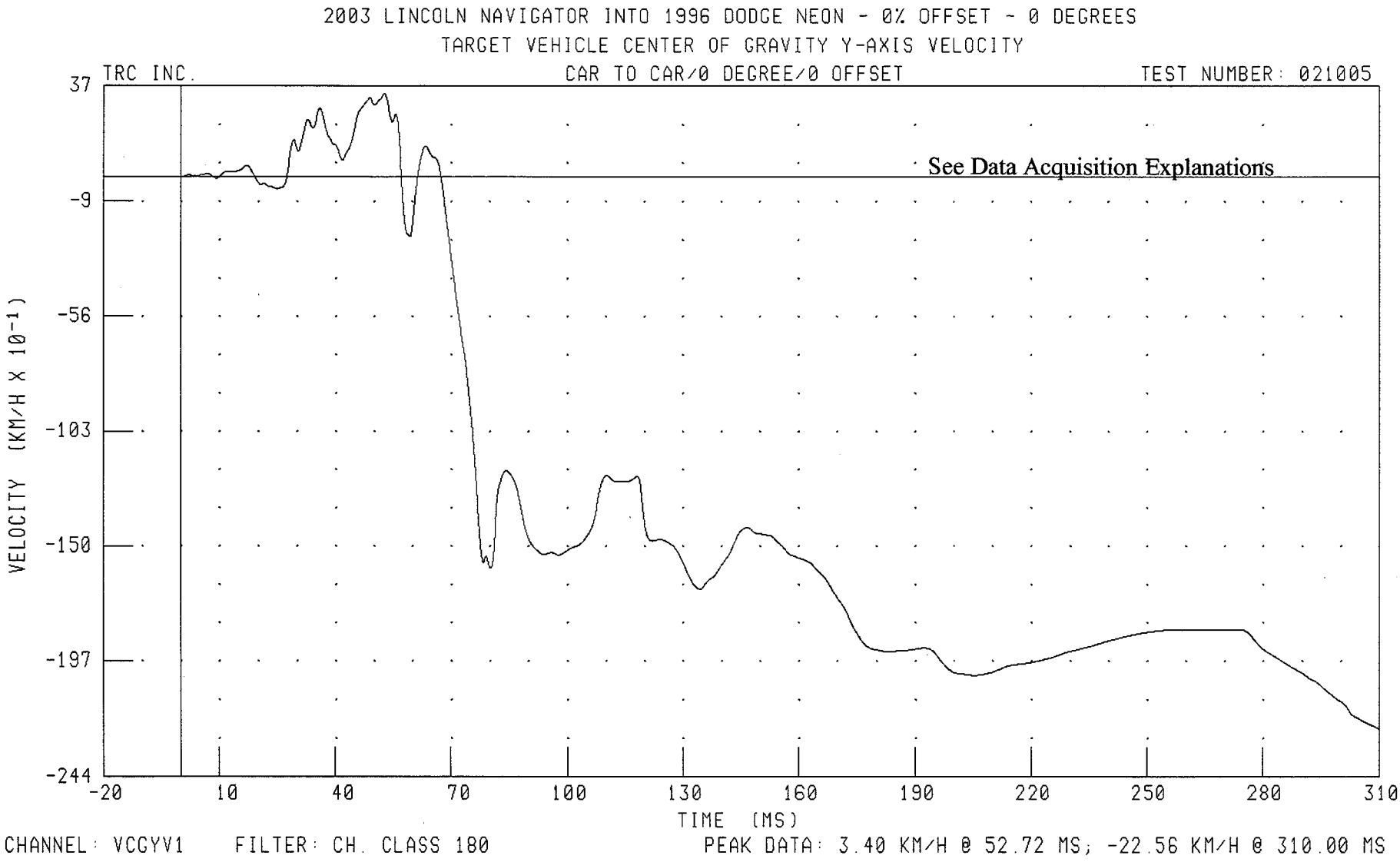
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

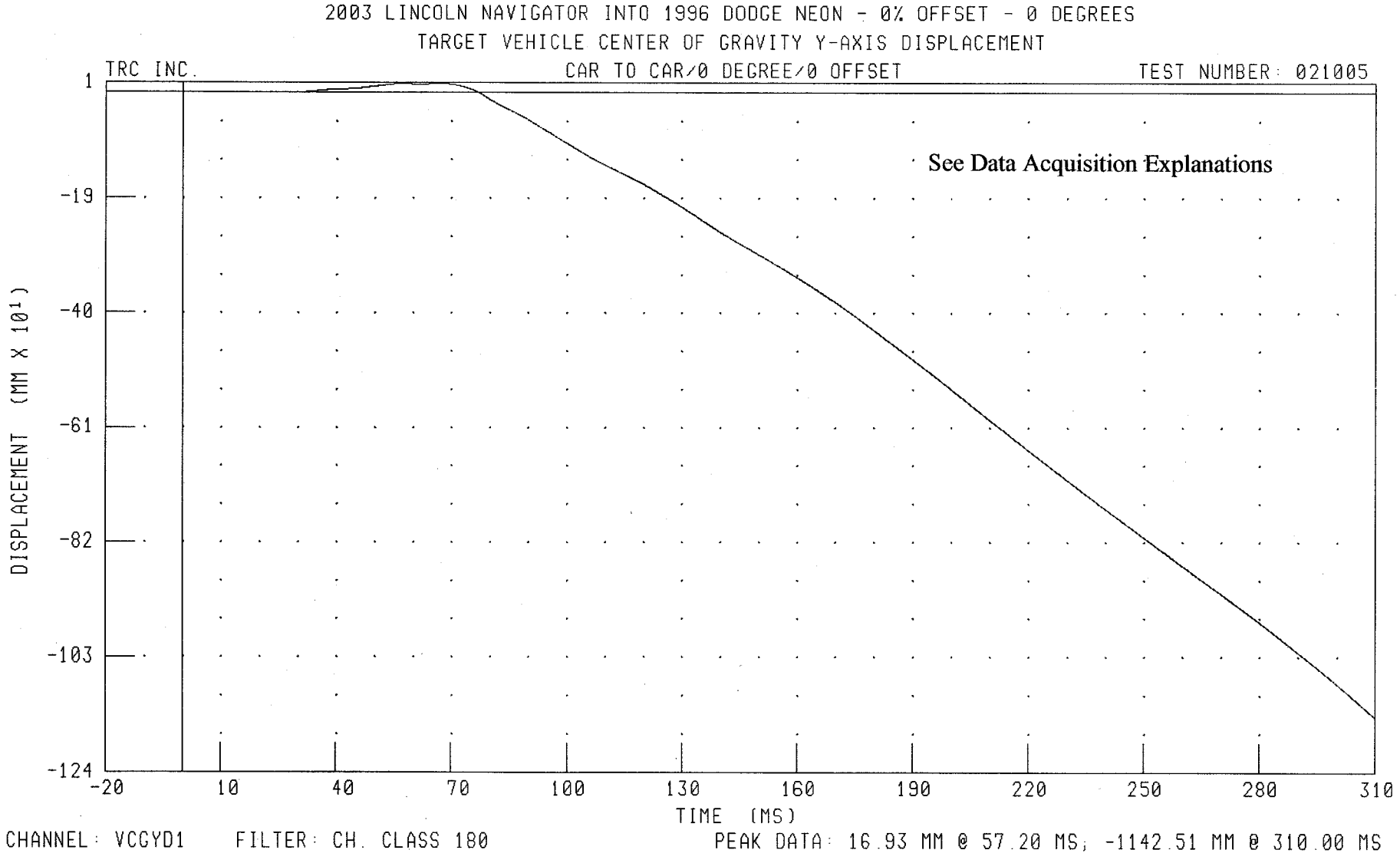


CHANNEL: VCGYG1 FILTER: CH. CLASS 60 PEAK DATA: 29.24 G @ 81.84 MS; -51.95 G @ 75.92 MS

021005

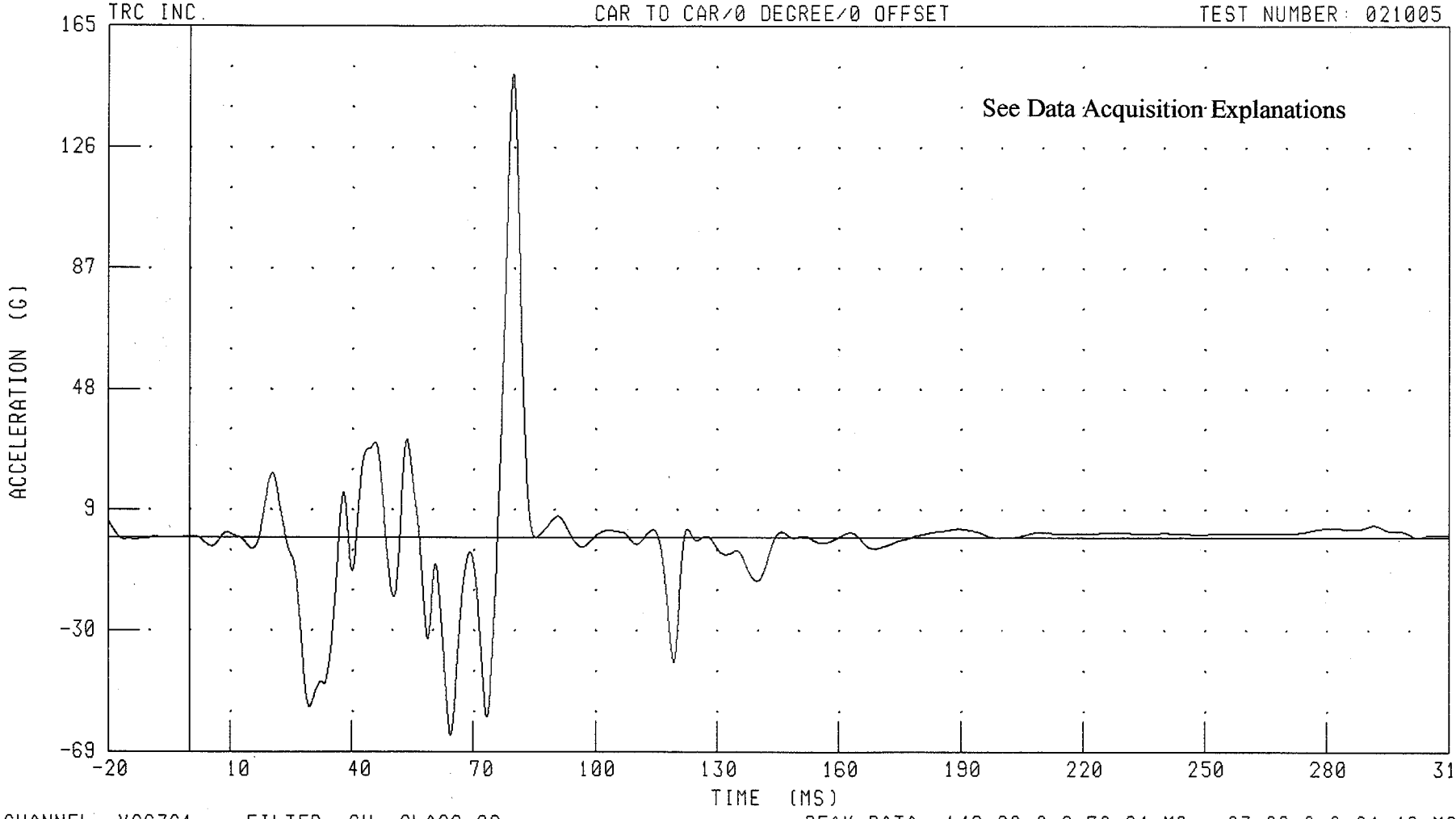

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
VELOCITY (KM/H X 10-1)
37
-9
-56
-103
-150
-197
-244
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGYV1
FILTER: CH. CLASS 180
PEAK DATA: 3.40 KM/H @ 52.72 MS; -22.56 KM/H @ 310.00 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
DISPLACEMENT (MM X 10¹)
1
-19
-40
-61
-82
-103
-124
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGYD1
FILTER: CH. CLASS 180
PEAK DATA: 16.93 MM @ 57.20 MS; -1142.51 MM @ 310.00 MS

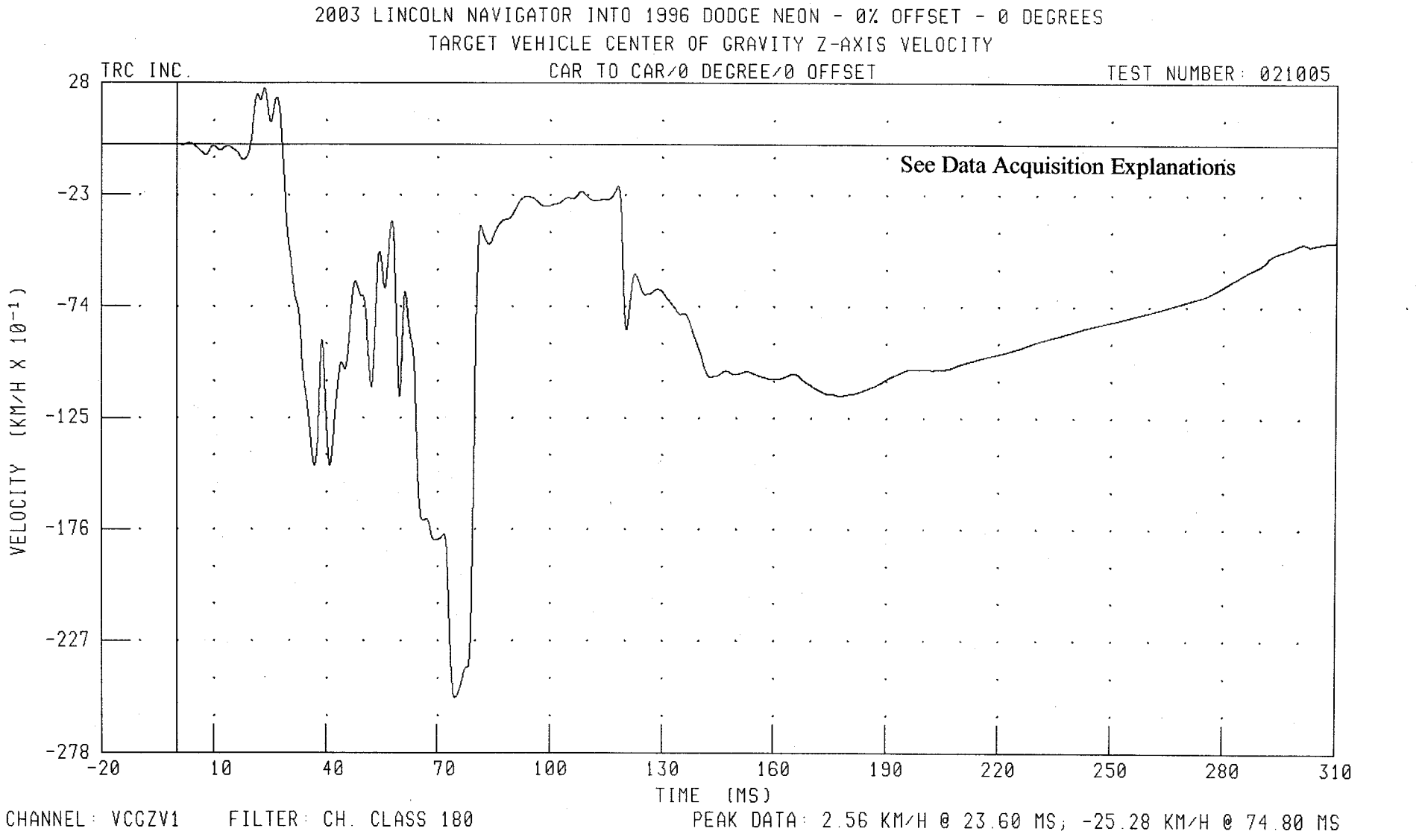
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

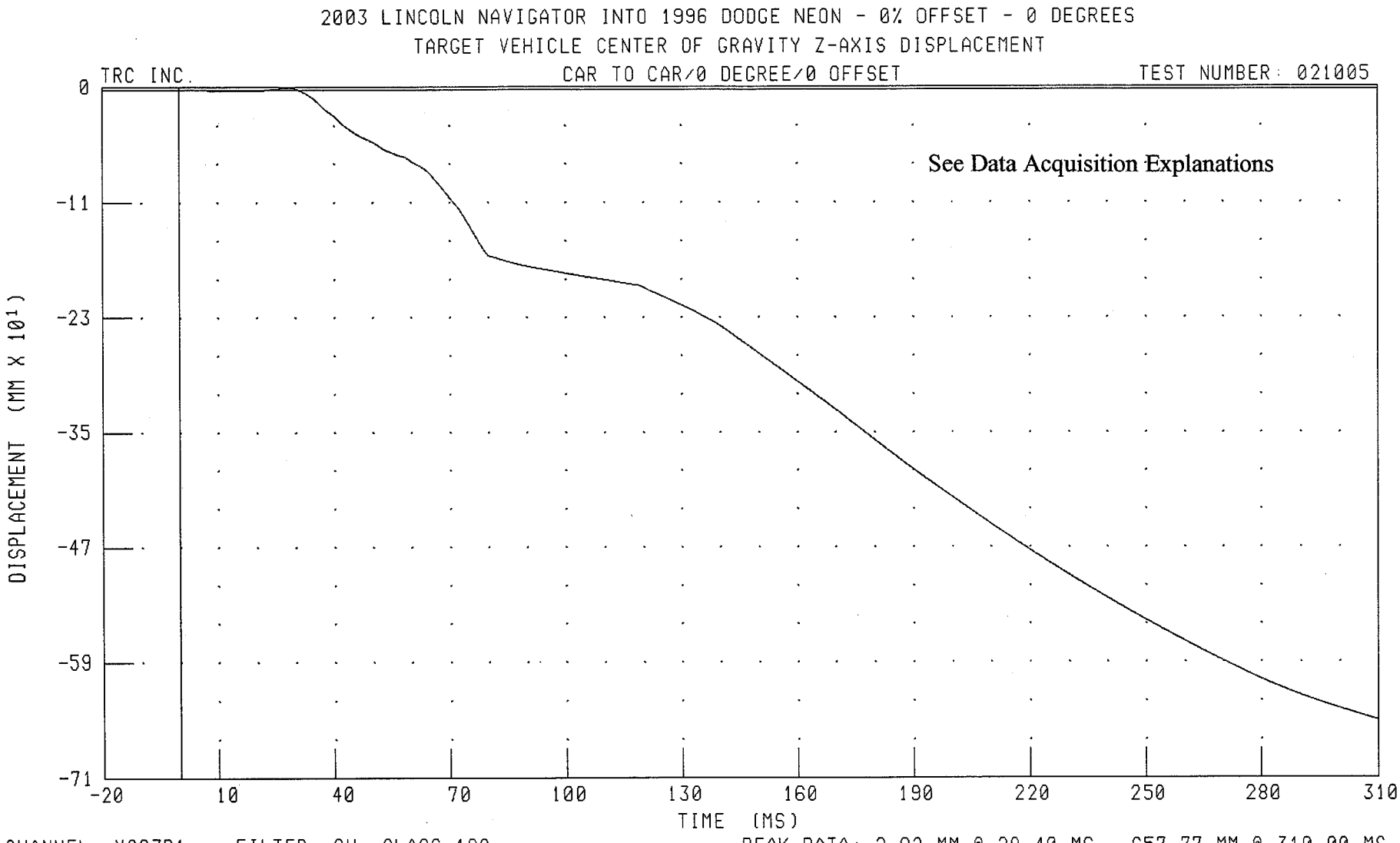
TARGET VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION



CHANNEL: VCGZG1 FILTER: CH. CLASS 60 PEAK DATA: 149.60 G @ 79.84 MS; -63.60 G @ 64.40 MS

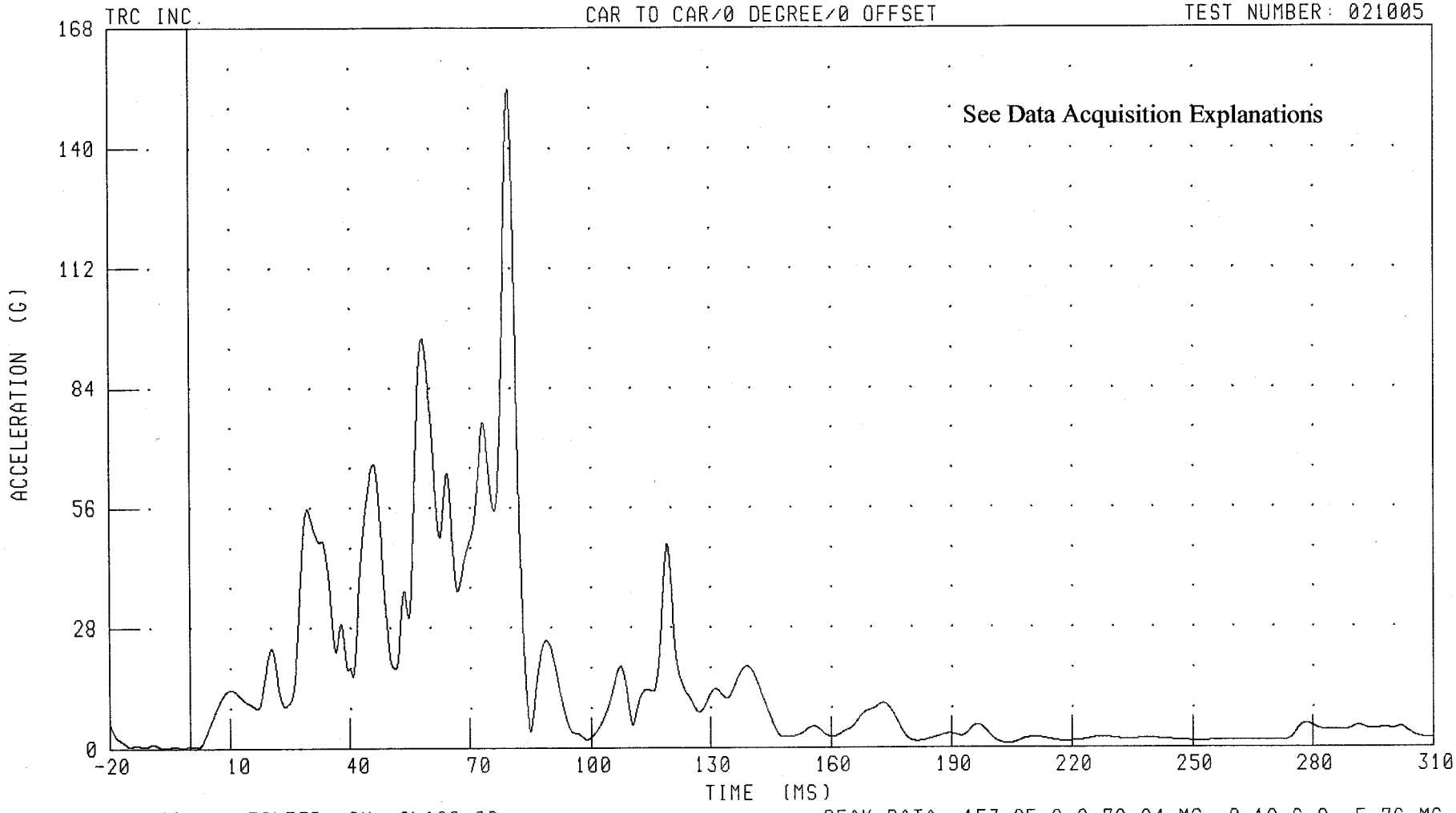
021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY
CAR TO CAR/0 DEGREE/0 OFFSET
TRC INC.
TEST NUMBER: 021005
See Data Acquisition Explanations
VELOCITY (KM/H X 10-1)
28
-23
-74
-125
-176
-227
-278
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGZV1
FILTER: CH. CLASS 180
PEAK DATA: 2.56 KM/H @ 23.60 MS; -25.28 KM/H @ 74.80 MS


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET VEHICLE CENTER OF GRAVITY Z-AXIS DISPLACEMENT
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
DISPLACEMENT (MM X 10¹)
0
-11
-23
-35
-47
-59
-71
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGZD1
FILTER: CH. CLASS 180
PEAK DATA: 2.82 MM @ 28.40 MS; -657.77 MM @ 310.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION



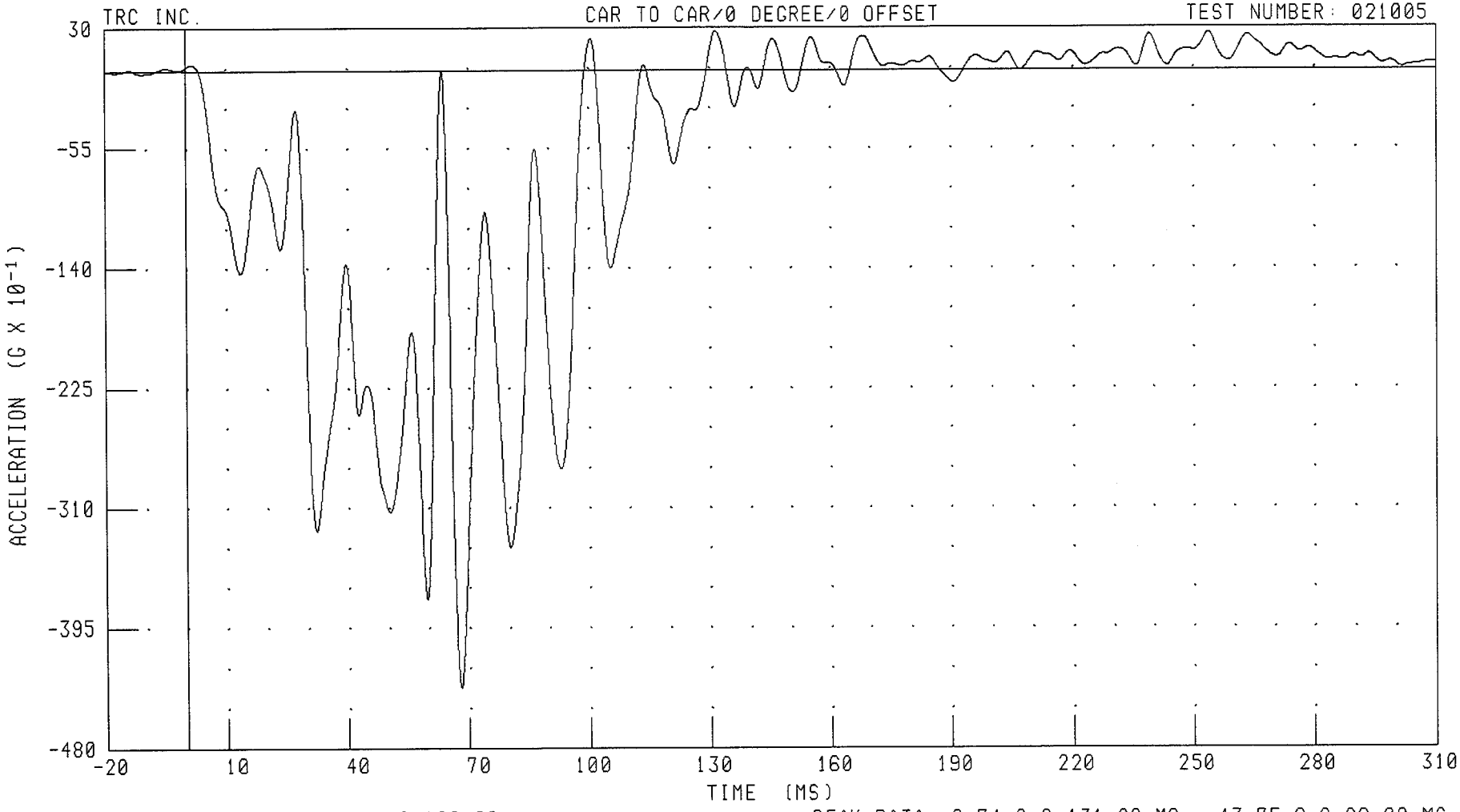
CHANNEL: VCGRG1 FILTER: CH. CLASS 60 PEAK DATA: 153.85 G @ 79.84 MS; 0.18 G @ -5.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET REAR DECK X-AXIS ACCELERATION

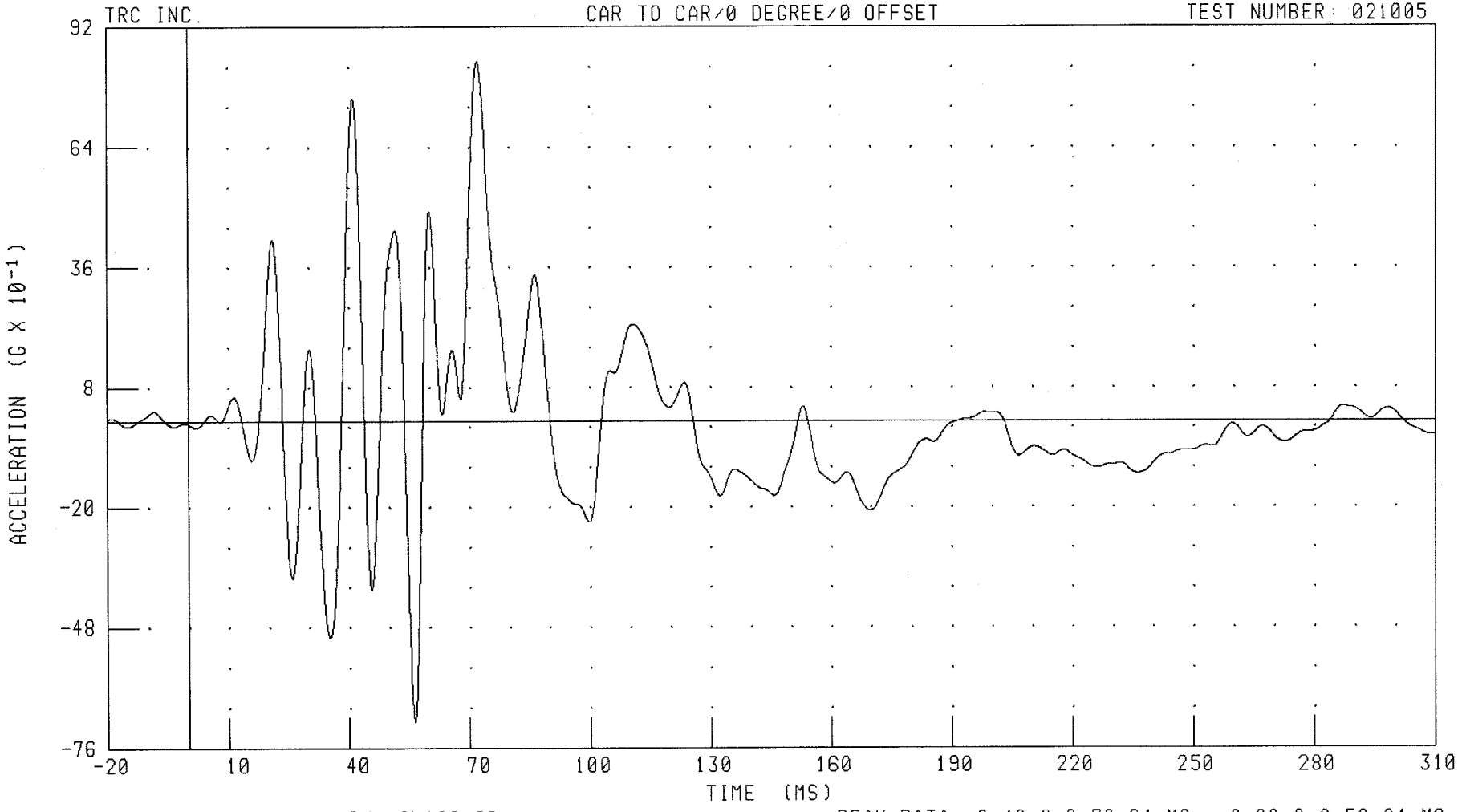
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: RDKXG1 FILTER: CH. CLASS 60 PEAK DATA: 2.74 G @ 131.68 MS; -43.75 G @ 68.00 MS

021005

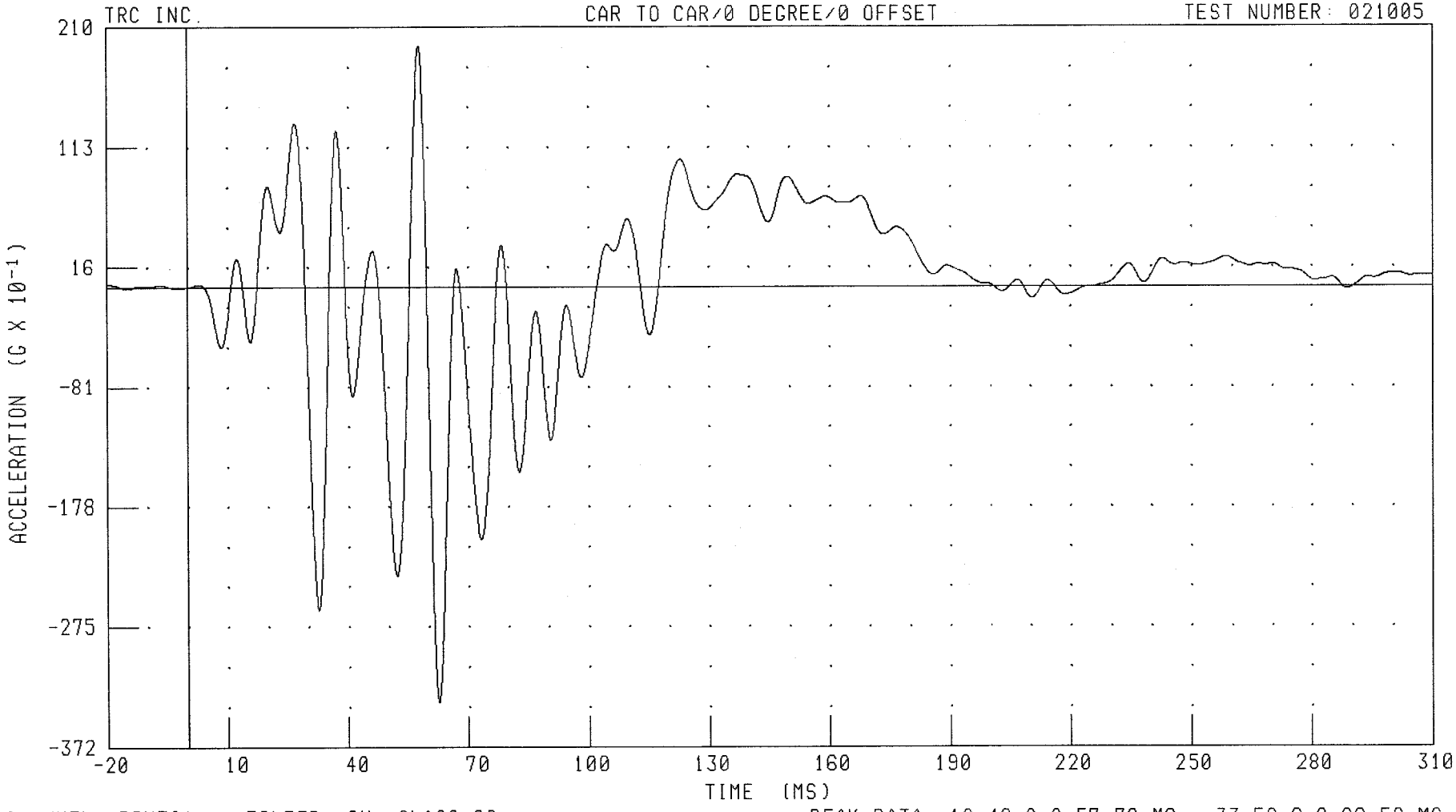
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET REAR DECK Y-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: RDKYG1 FILTER: CH. CLASS 60 PEAK DATA: 8.40 G @ 72.24 MS; -6.99 G @ 56.24 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET REAR DECK Z-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET

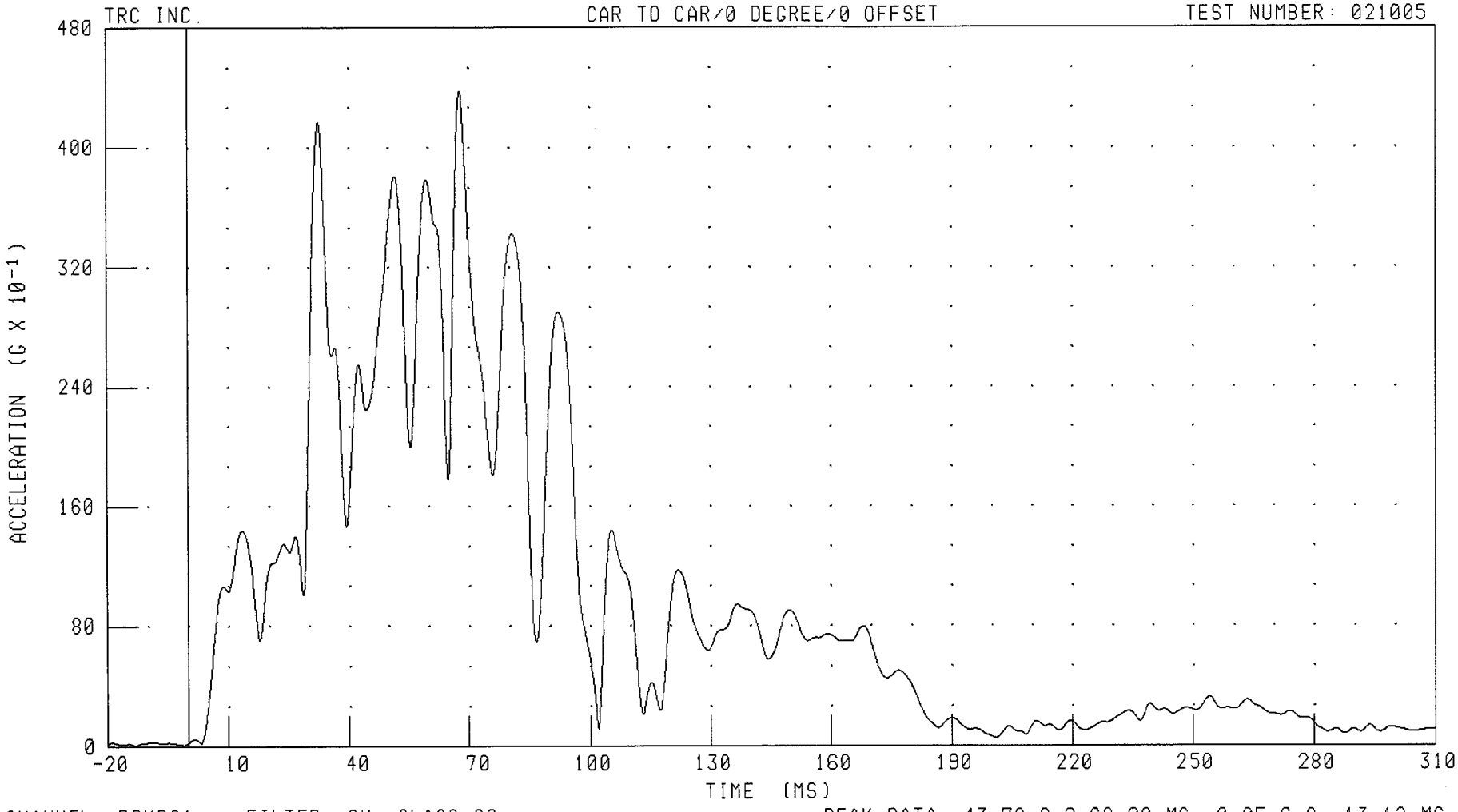


CHANNEL: RDKZG1 FILTER: CH. CLASS 60 PEAK DATA: 19.48 G @ 57.76 MS; -33.59 G @ 62.56 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET REAR DECK RESULTANT ACCELERATION

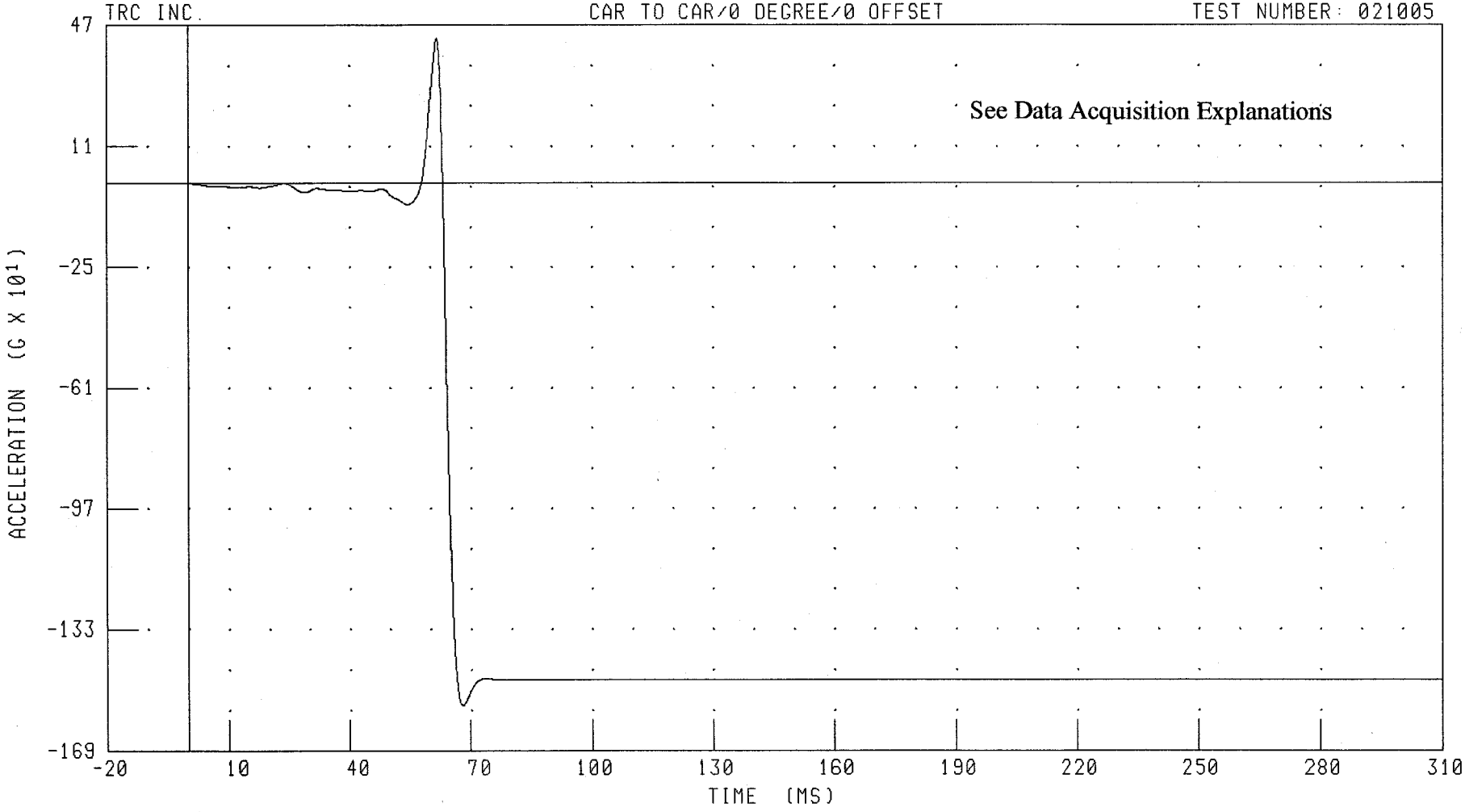


CHANNEL: RDKRG1 FILTER: CH. CLASS 60

PEAK DATA: 43.76 G @ 68.00 MS; 0.05 G @ -13.12 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET LEFT REAR SILL X-AXIS ACCELERATION

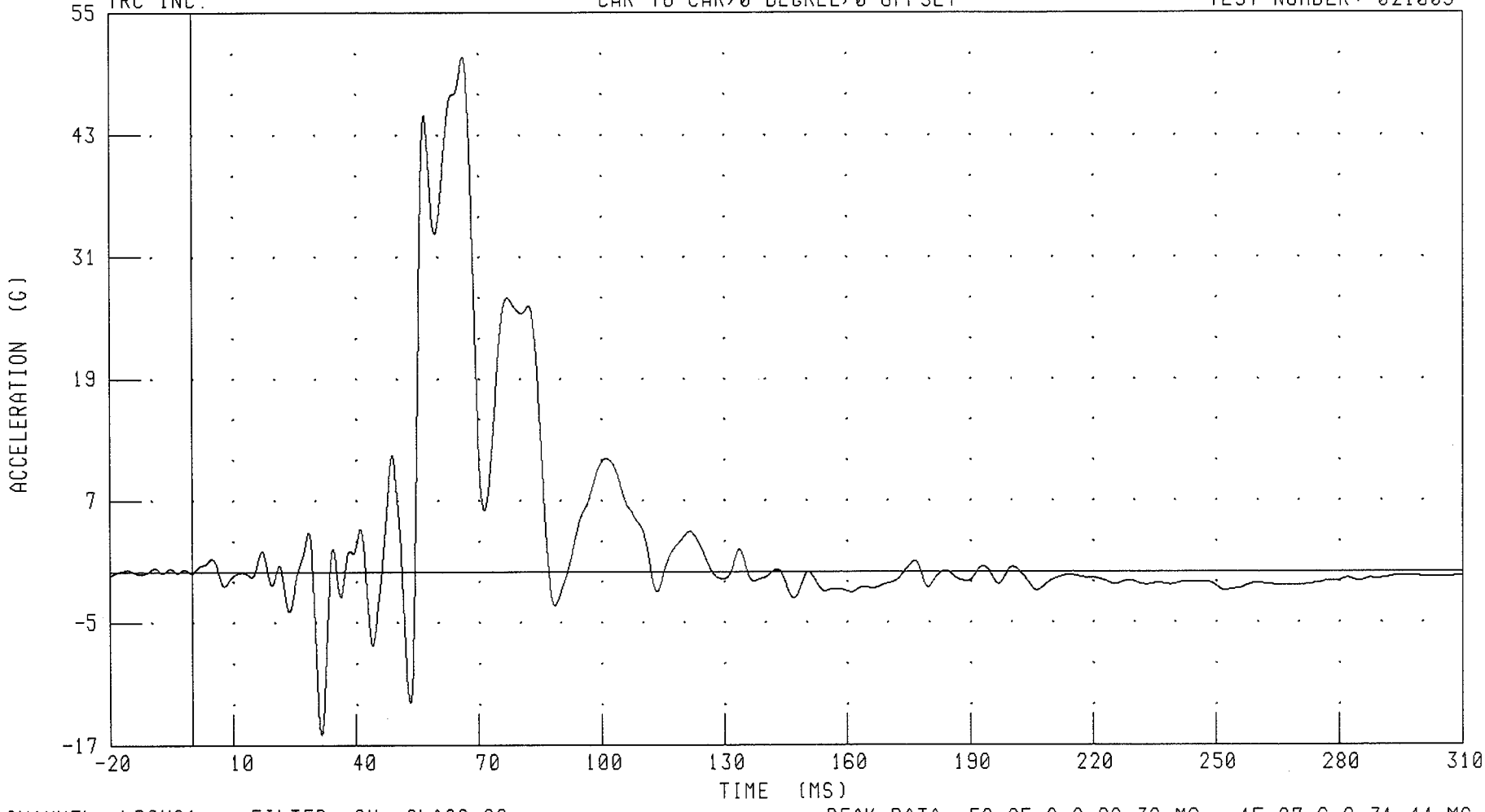


CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 429.85 G @ 61.68 MS; -1556.54 G @ 68.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET LEFT REAR SILL Y-AXIS ACCELERATION

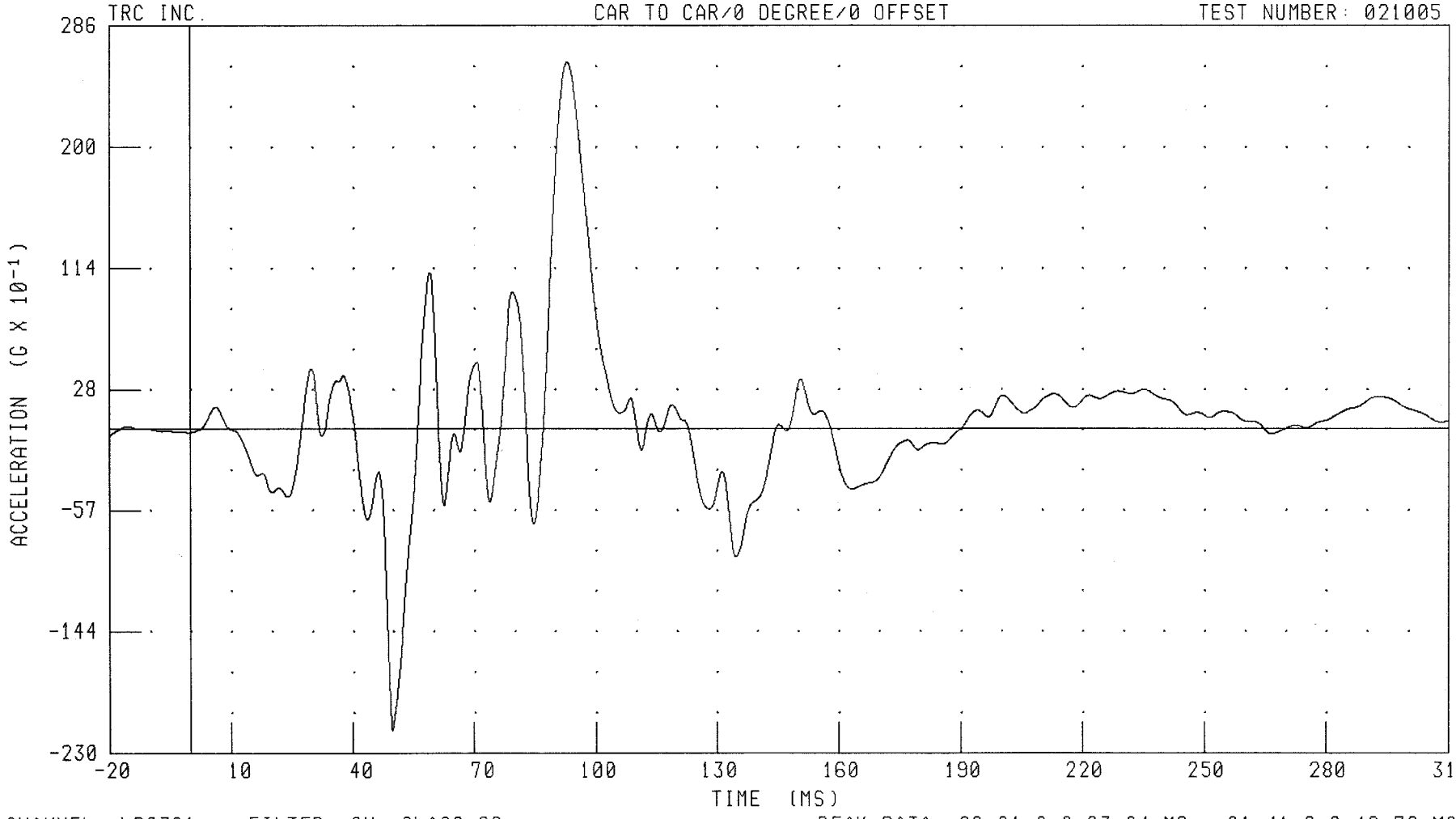
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: LRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 50.65 G @ 66.32 MS; -15.97 G @ 31.44 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

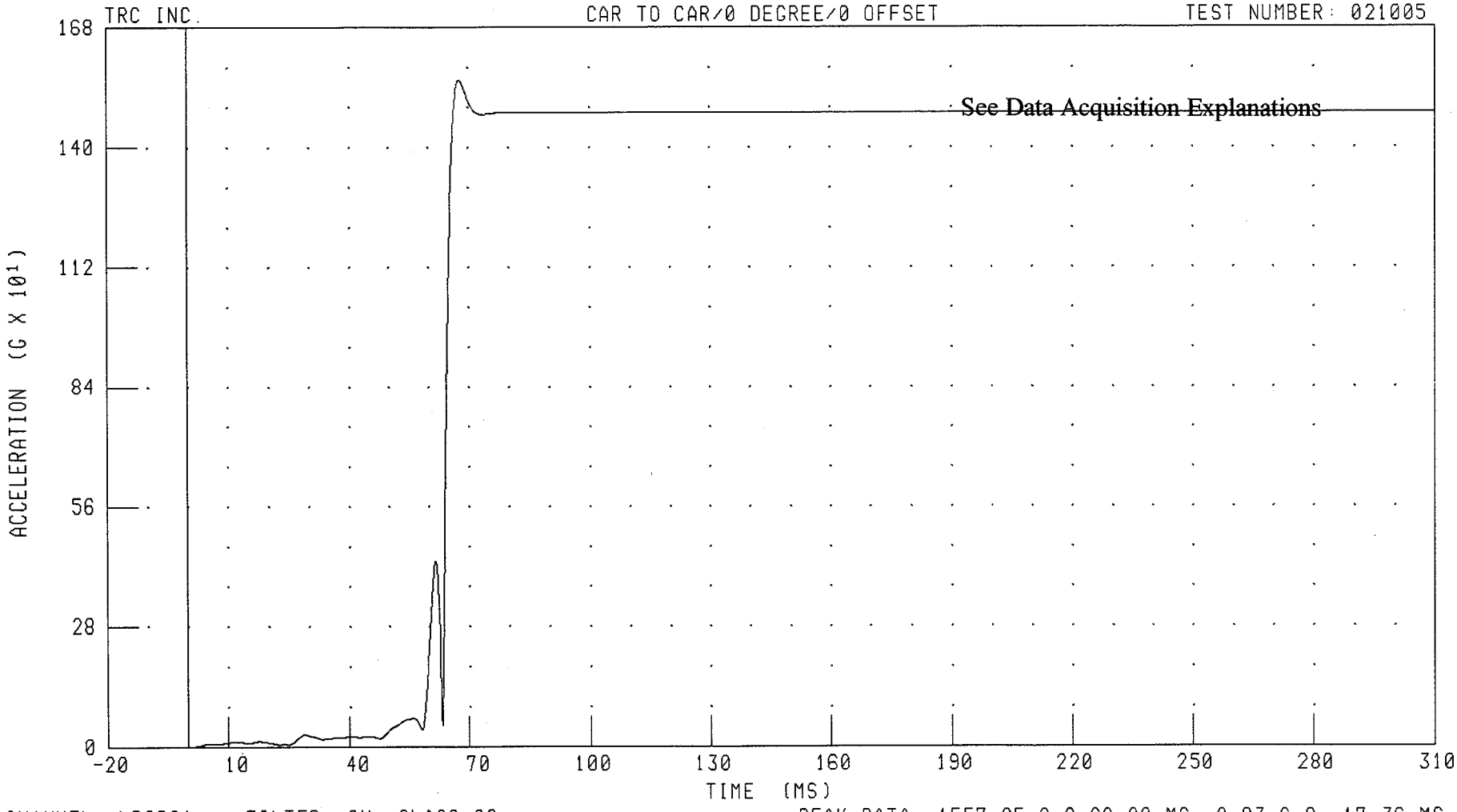
TARGET LEFT REAR SILL Z-AXIS ACCELERATION



CHANNEL: LRSZG1 FILTER: CH. CLASS 60 PEAK DATA: 26.01 G @ 93.04 MS; -21.41 G @ 49.76 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET LEFT REAR SILL RESULTANT ACCELERATION



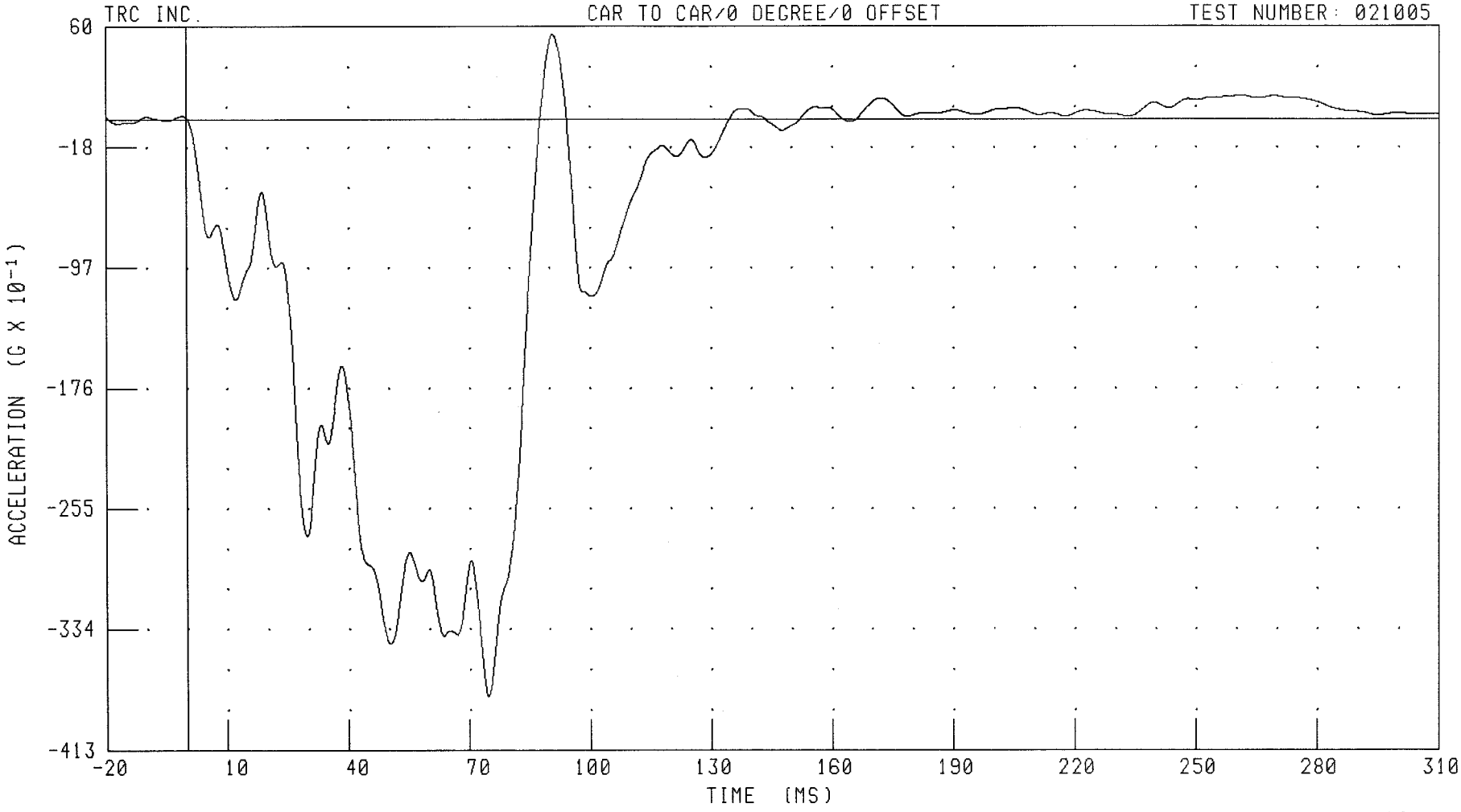
CHANNEL: LRSRG1 FILTER: CH. CLASS 60

PEAK DATA: 1557.05 G @ 68.00 MS; 0.03 G @ -17.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

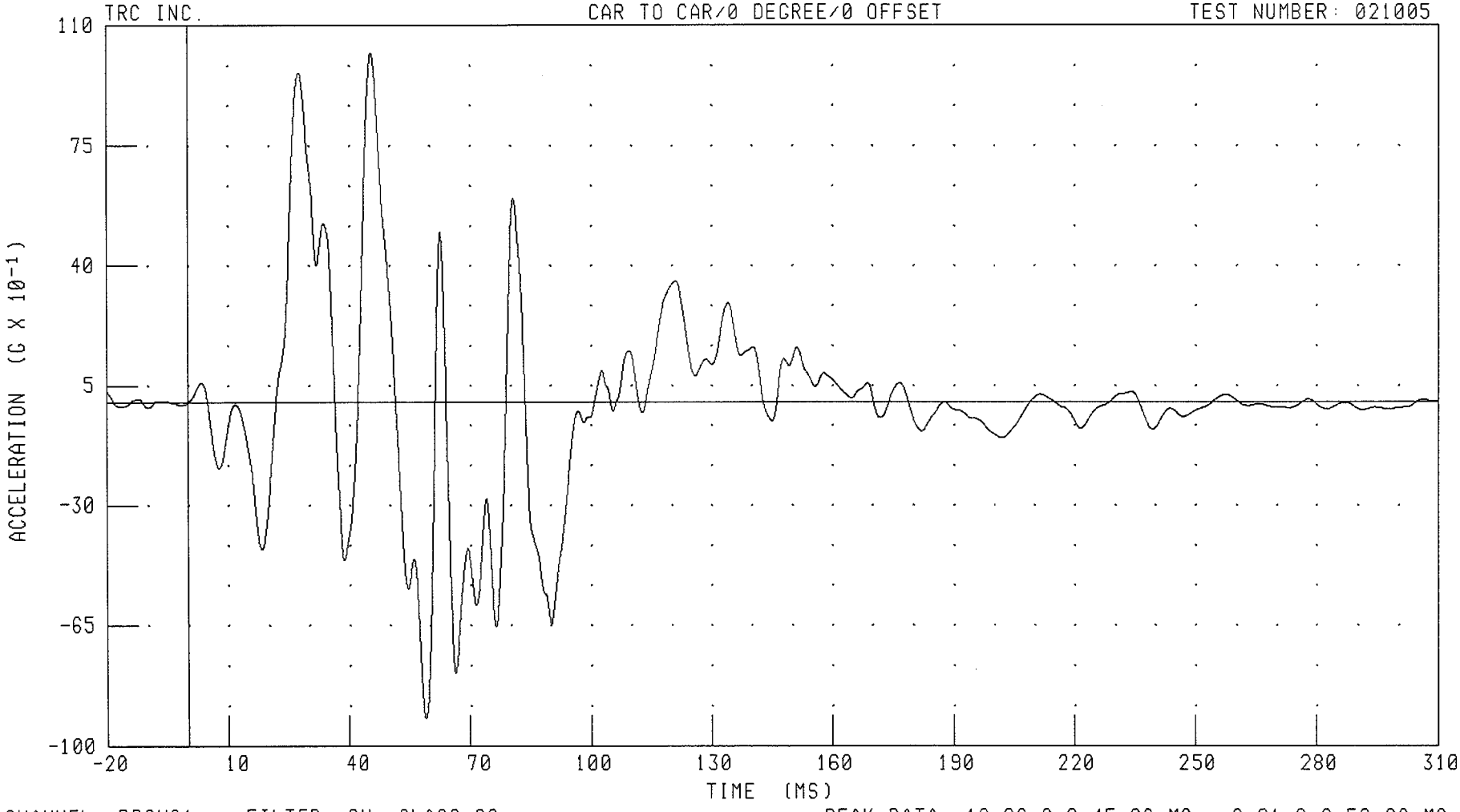
TARGET RIGHT REAR SILL X-AXIS ACCELERATION



CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 5.57 G @ 90.96 MS; -37.80 G @ 74.80 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET RIGHT REAR SILL Y-AXIS ACCELERATION

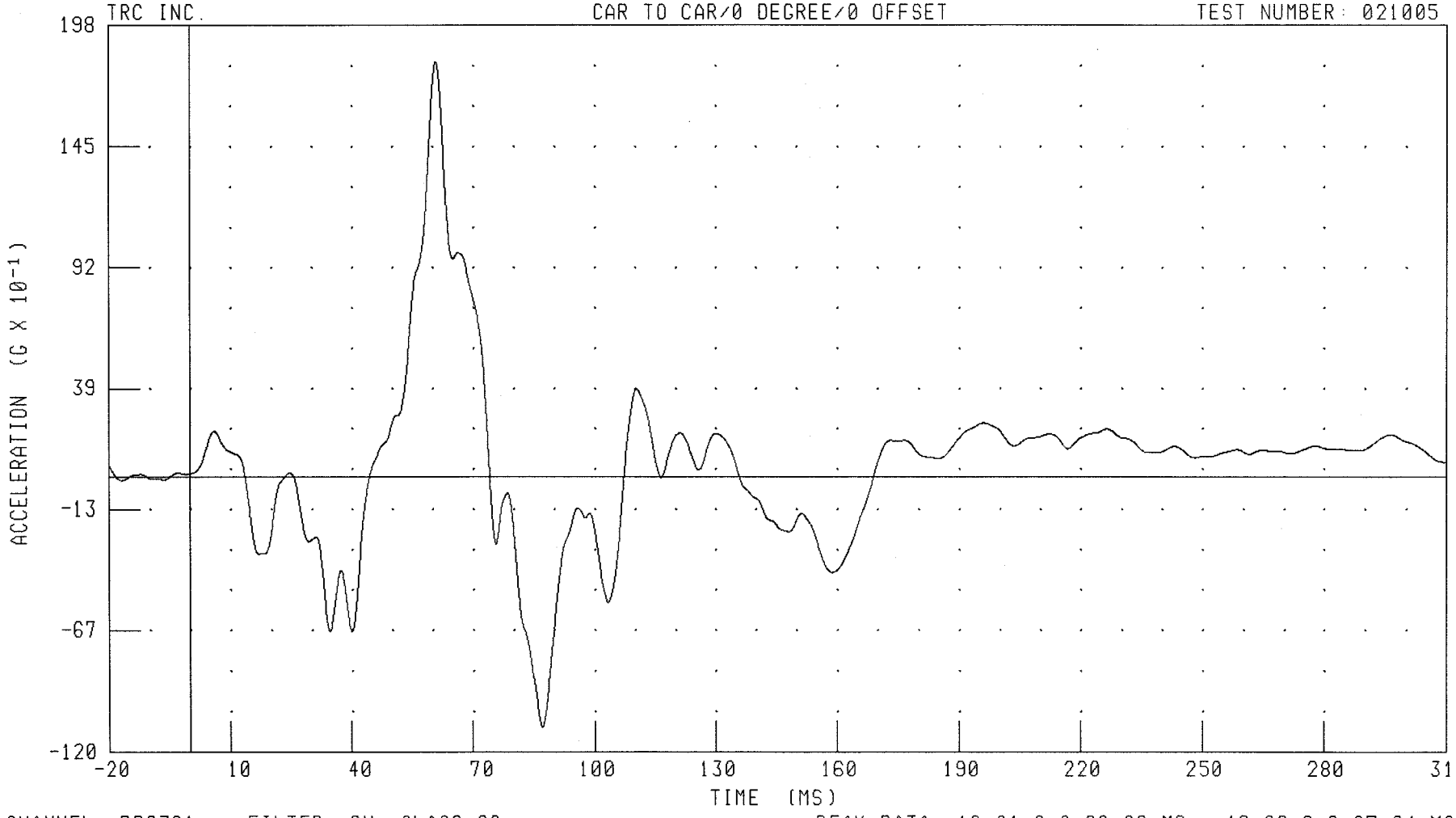


CHANNEL: RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 10.20 G @ 45.60 MS; -9.21 G @ 58.96 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET RIGHT REAR SILL Z-AXIS ACCELERATION

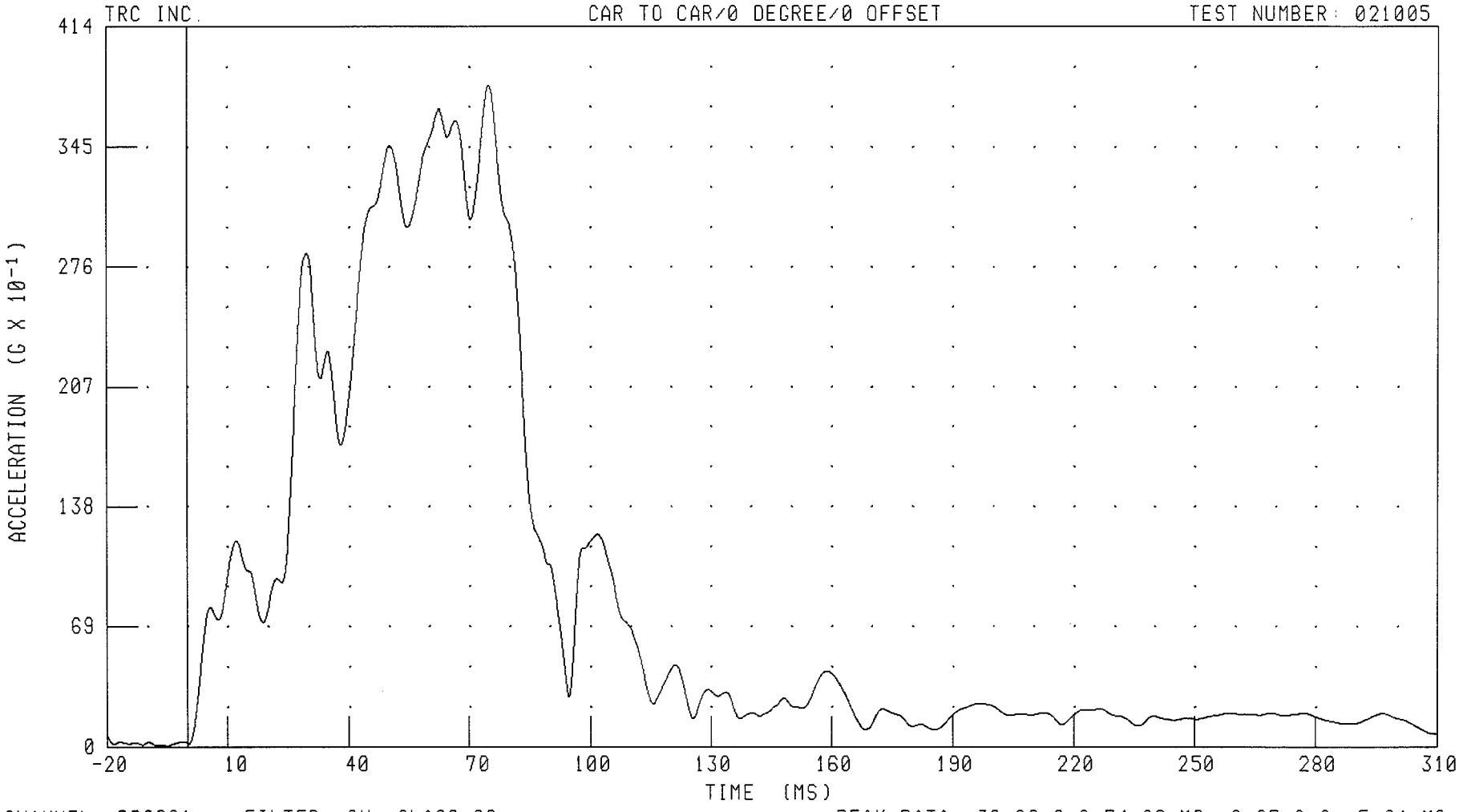


CHANNEL: RRSZG1 FILTER: CH. CLASS 60 PEAK DATA: 18.21 G @ 60.88 MS; -10.92 G @ 87.04 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

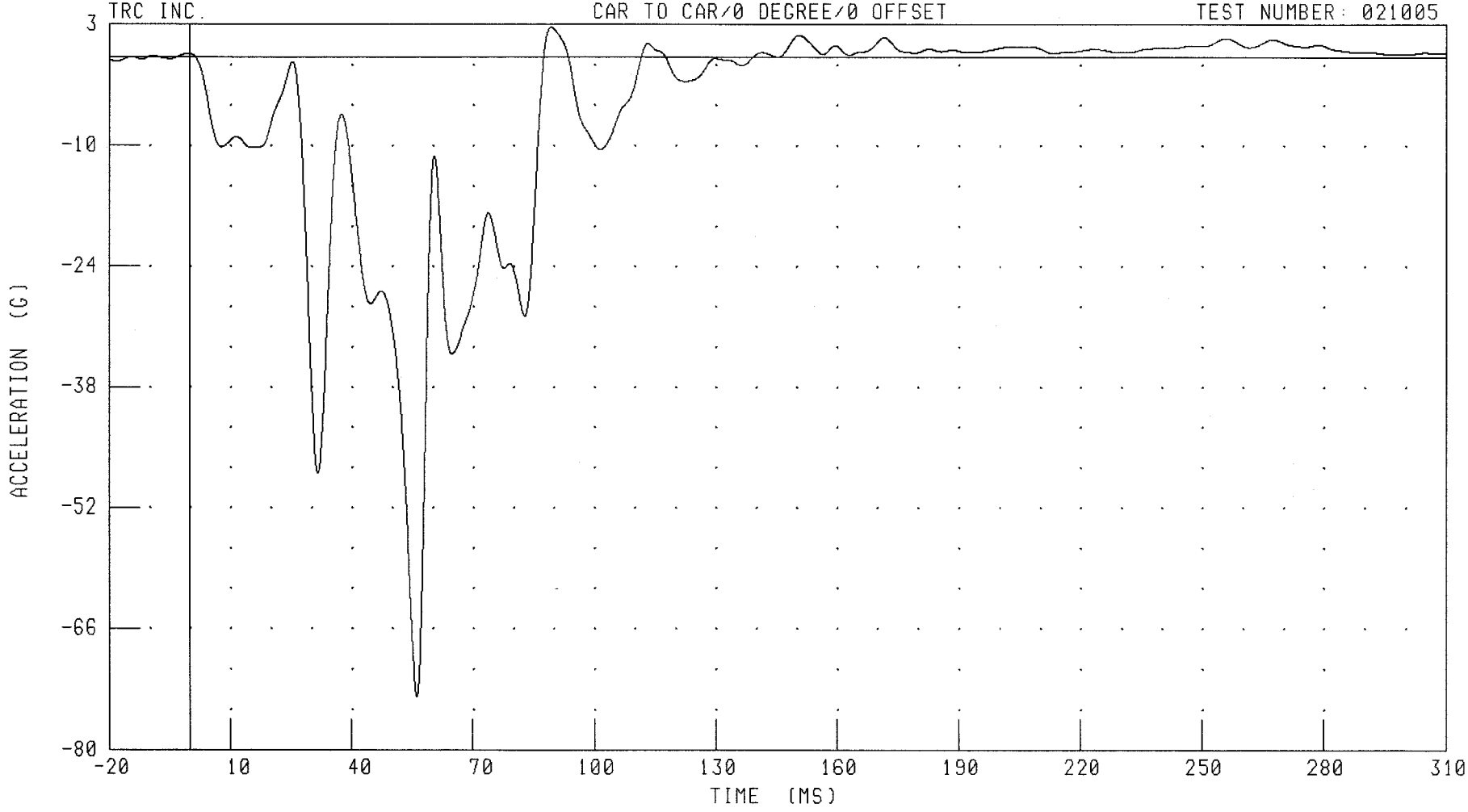
TARGET RIGHT REAR SILL RESULTANT ACCELERATION



CHANNEL: RRSRG1 FILTER: CH. CLASS 60 PEAK DATA: 38.02 G @ 74.88 MS; 0.07 G @ -5.04 MS

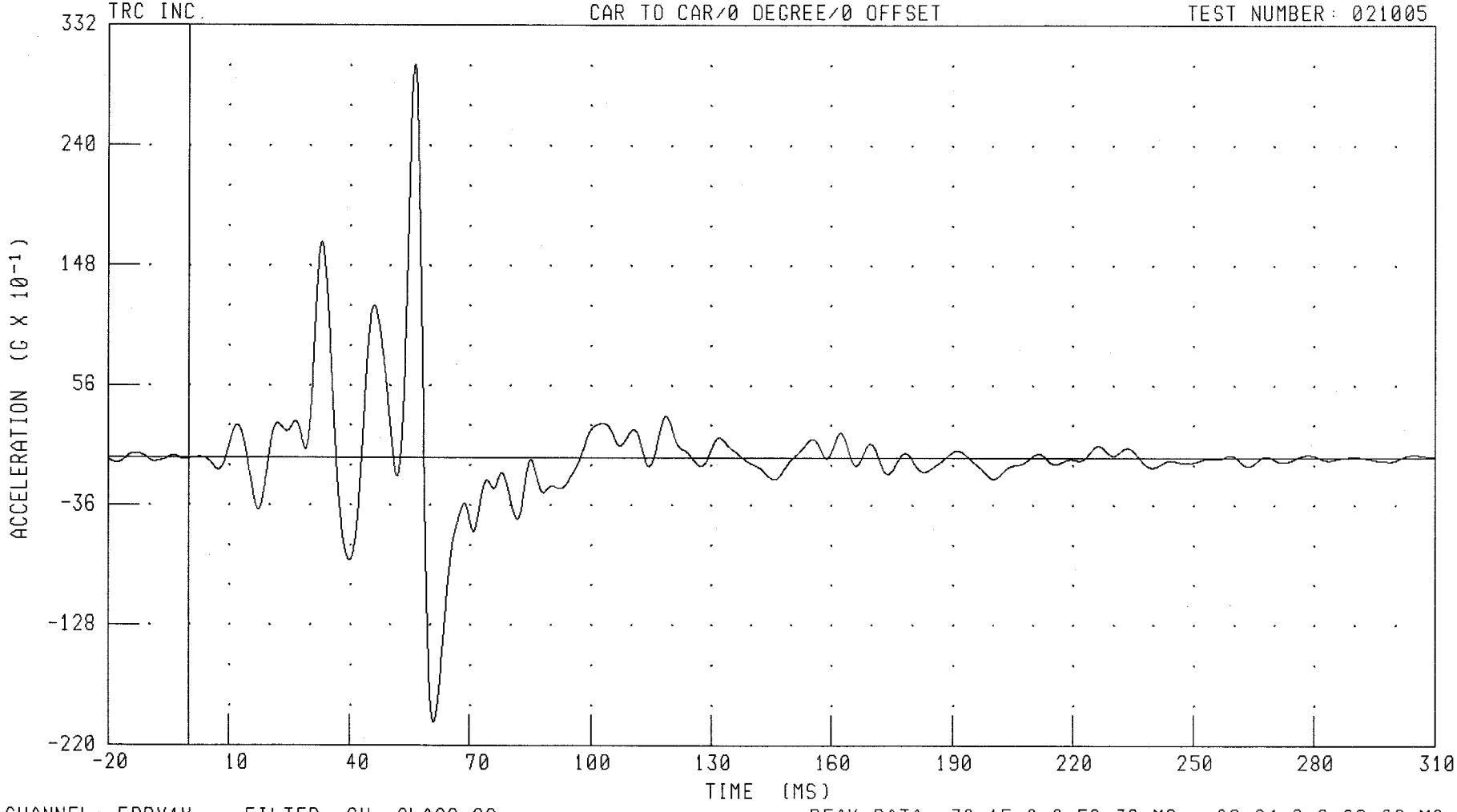
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET EVENT DATA RECORDER PLATE X-AXIS ACCELERATION



CHANNEL: EDRV1X FILTER: CH. CLASS 60 PEAK DATA: 3.47 G @ 89.36 MS; -74.08 G @ 56.08 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET EVENT DATA RECORDER PLATE Y-AXIS ACCELERATION

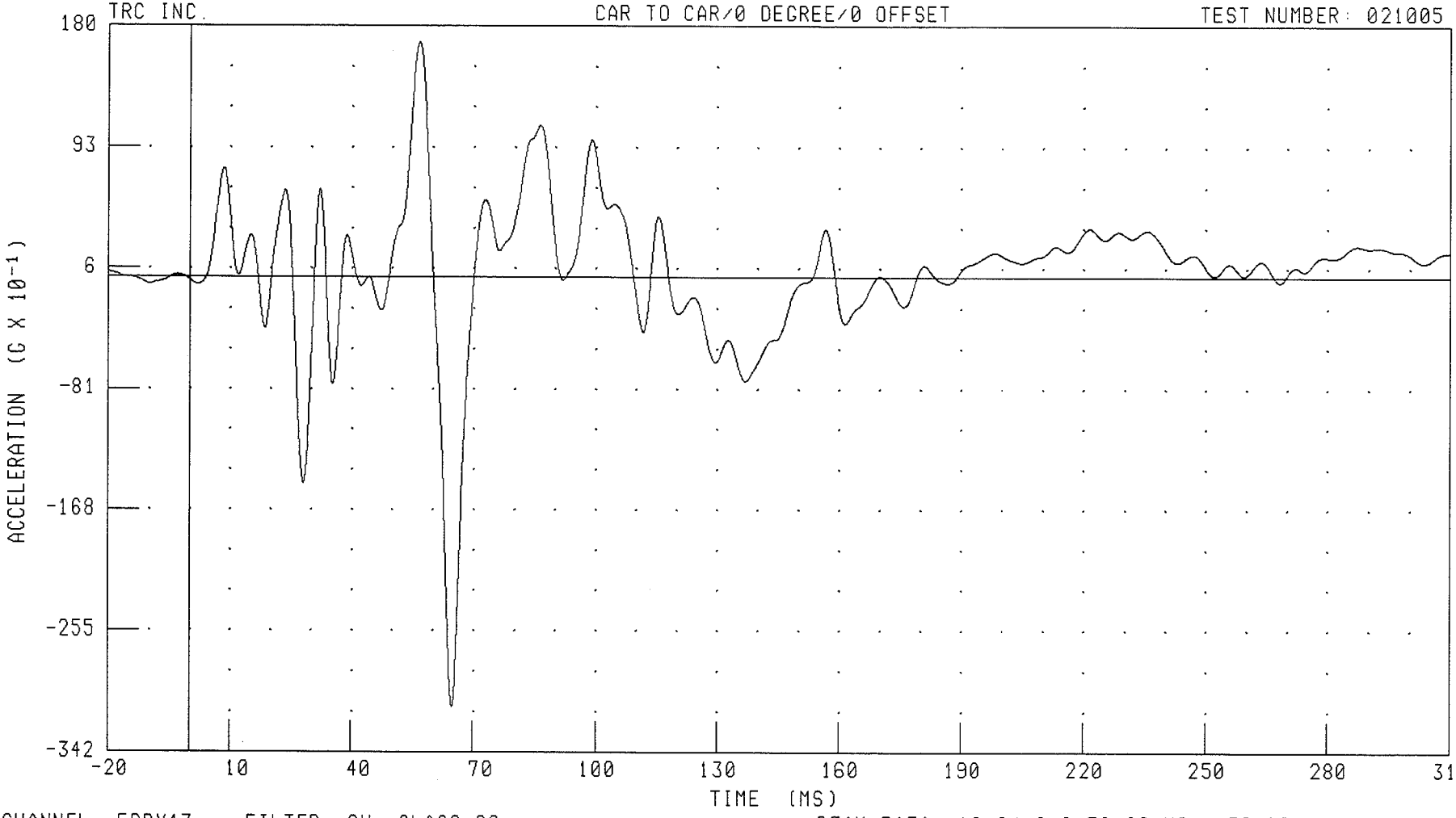


CHANNEL: EDRV1Y FILTER: CH. CLASS 60 PEAK DATA: 30.15 G @ 56.32 MS; -20.24 G @ 60.96 MS

021005

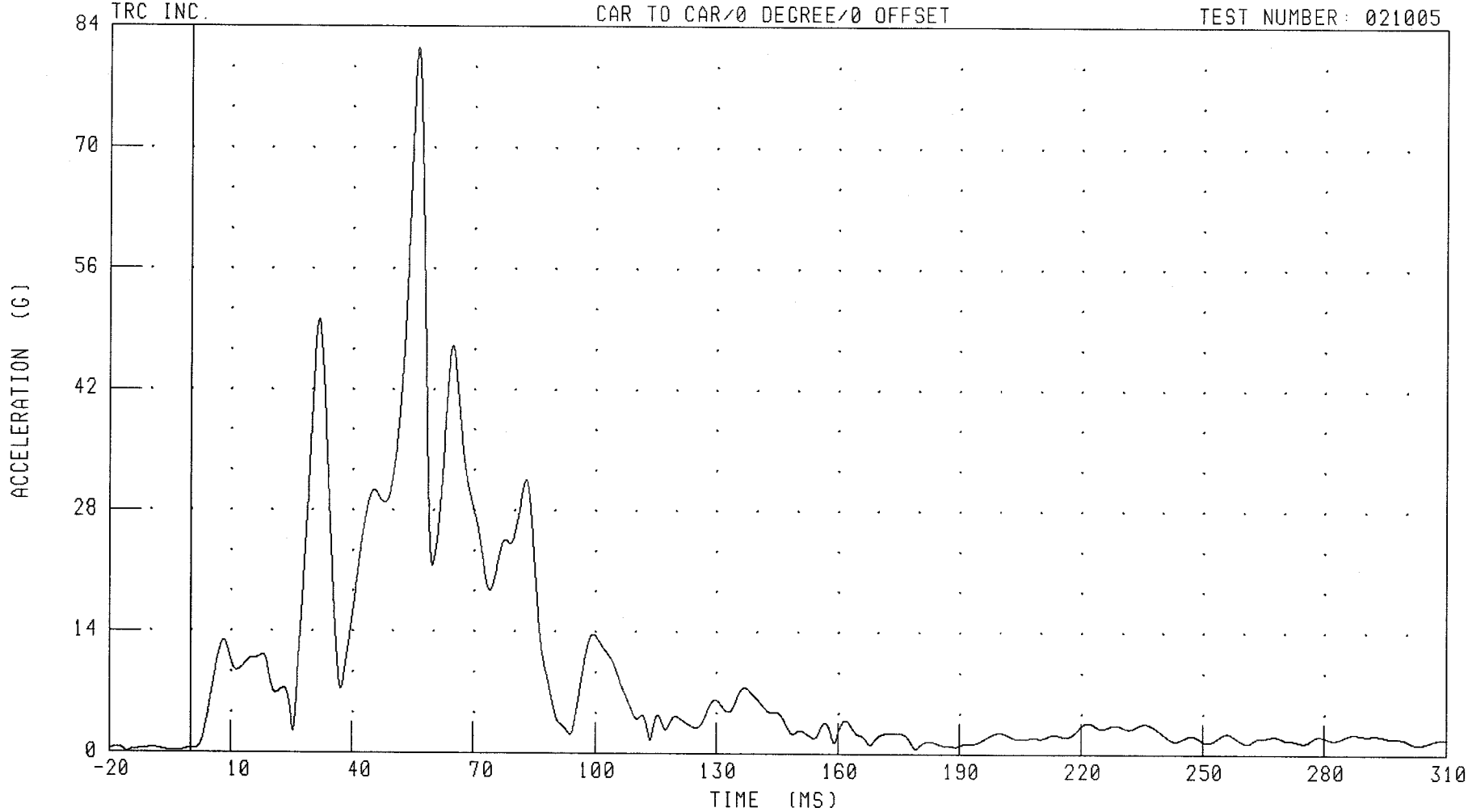
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

TARGET EVENT DATA RECORDER PLATE Z-AXIS ACCELERATION



CHANNEL: EDRV1Z FILTER: CH. CLASS 60 PEAK DATA: 16.84 G @ 56.80 MS; -30.98 G @ 64.88 MS

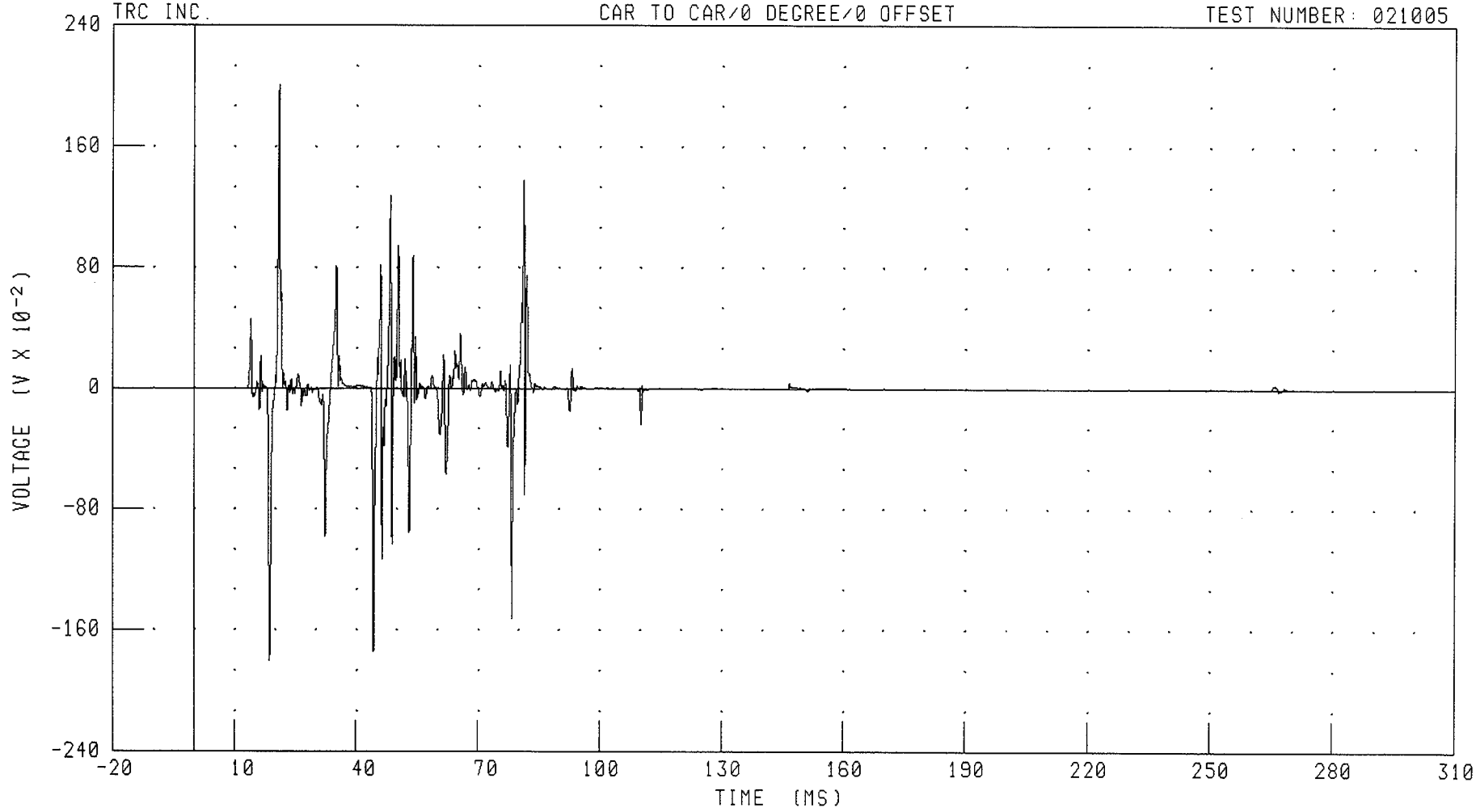
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET EVENT DATA RECORDER PLATE RESULTANT ACCELERATION



CHANNEL: EDRV1R FILTER: CH. CLASS 60

PEAK DATA: 81.49 G @ 56.16 MS; 0.07 G @ -15.68 MS

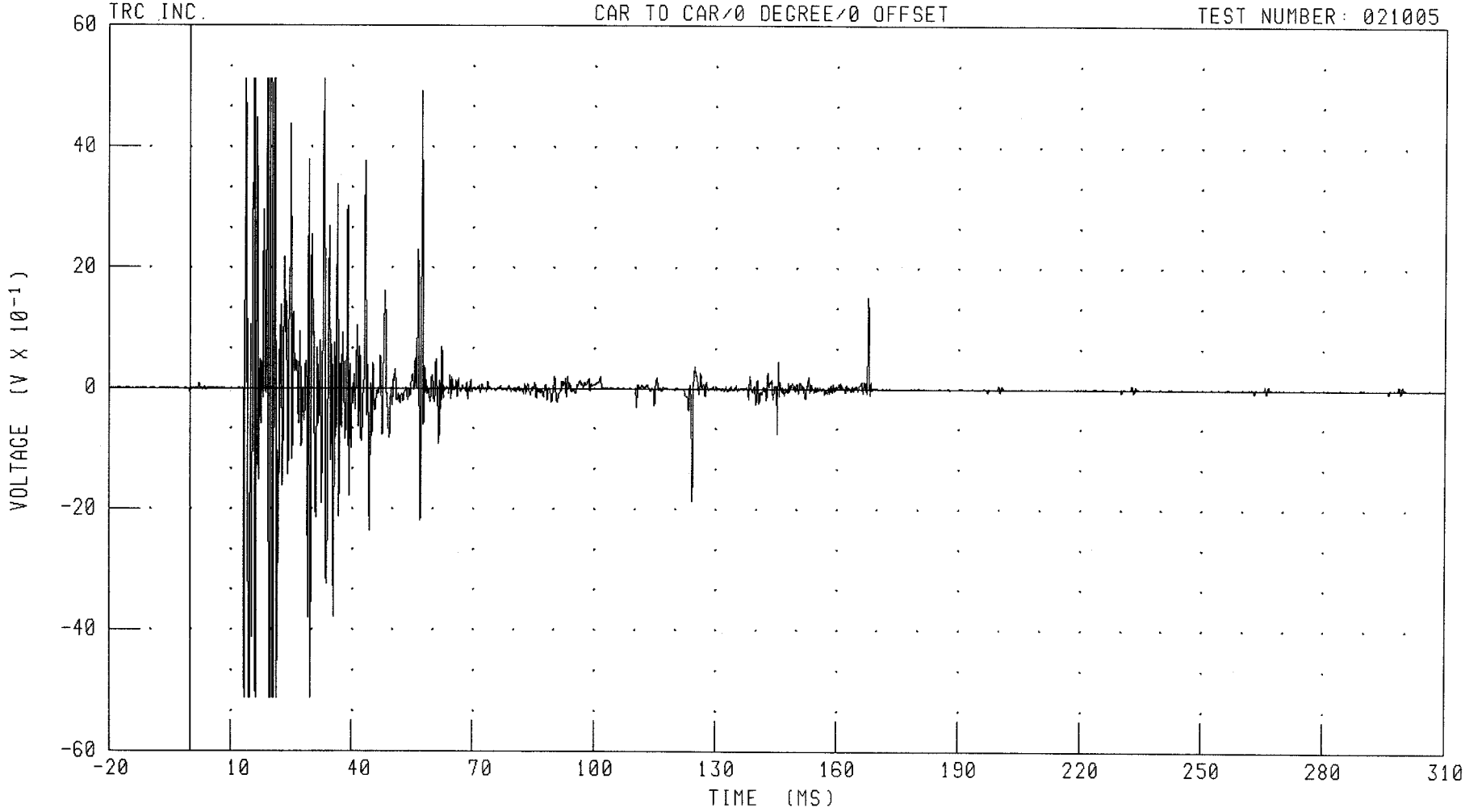
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET DRIVER AIRBAG EVENT



CHANNEL: DABET1 FILTER: CH. CLASS 1000 PEAK DATA: 2.01 V @ 21.04 MS; -1.81 V @ 18.64 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
TARGET PASSENGER AIRBAG EVENT
CAR TO CAR/0 DEGREE/0 OFFSET

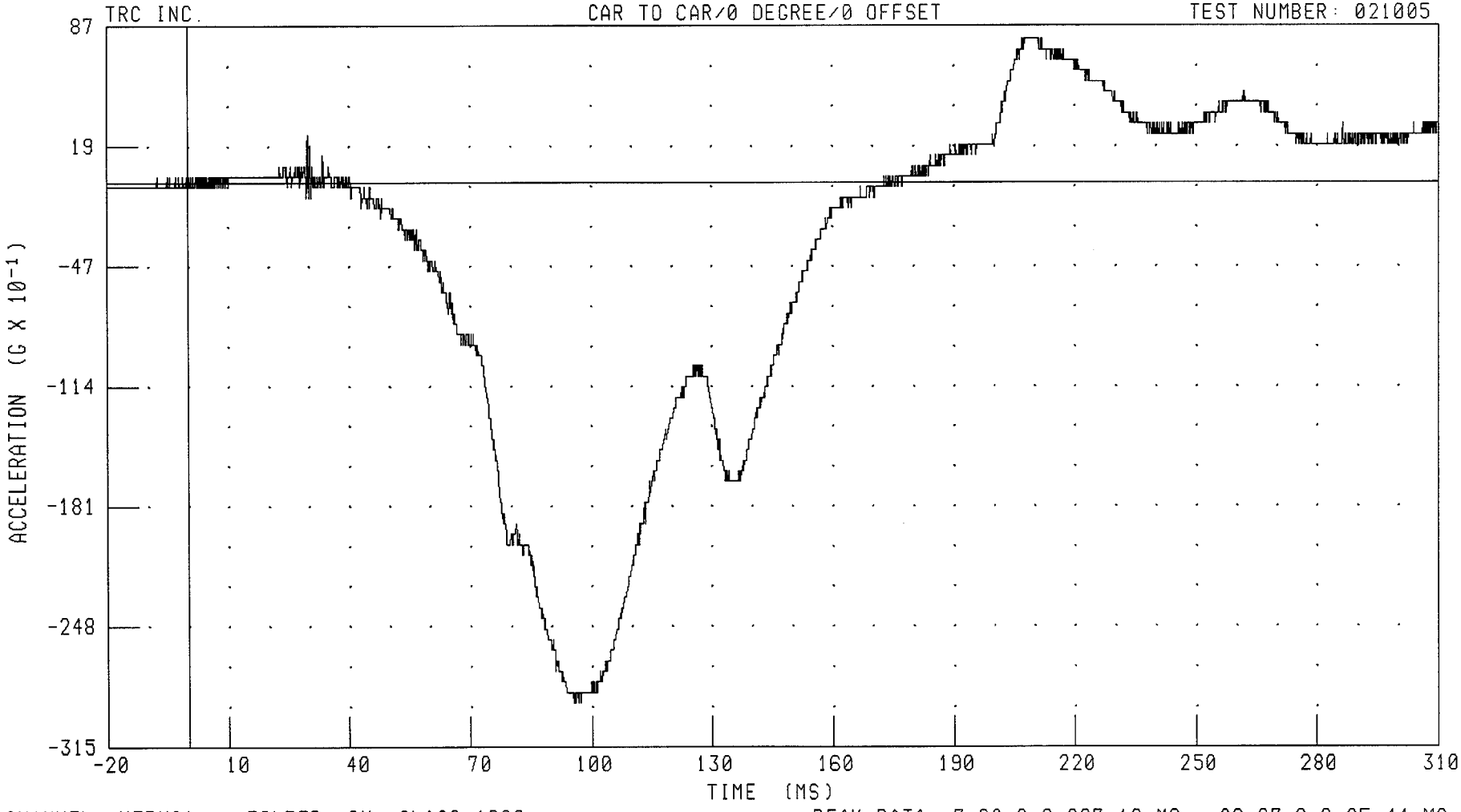


CHANNEL: PABET2 FILTER: CH. CLASS 1000 PEAK DATA: 5.12 V @ 13.76 MS; -5.12 V @ 13.44 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

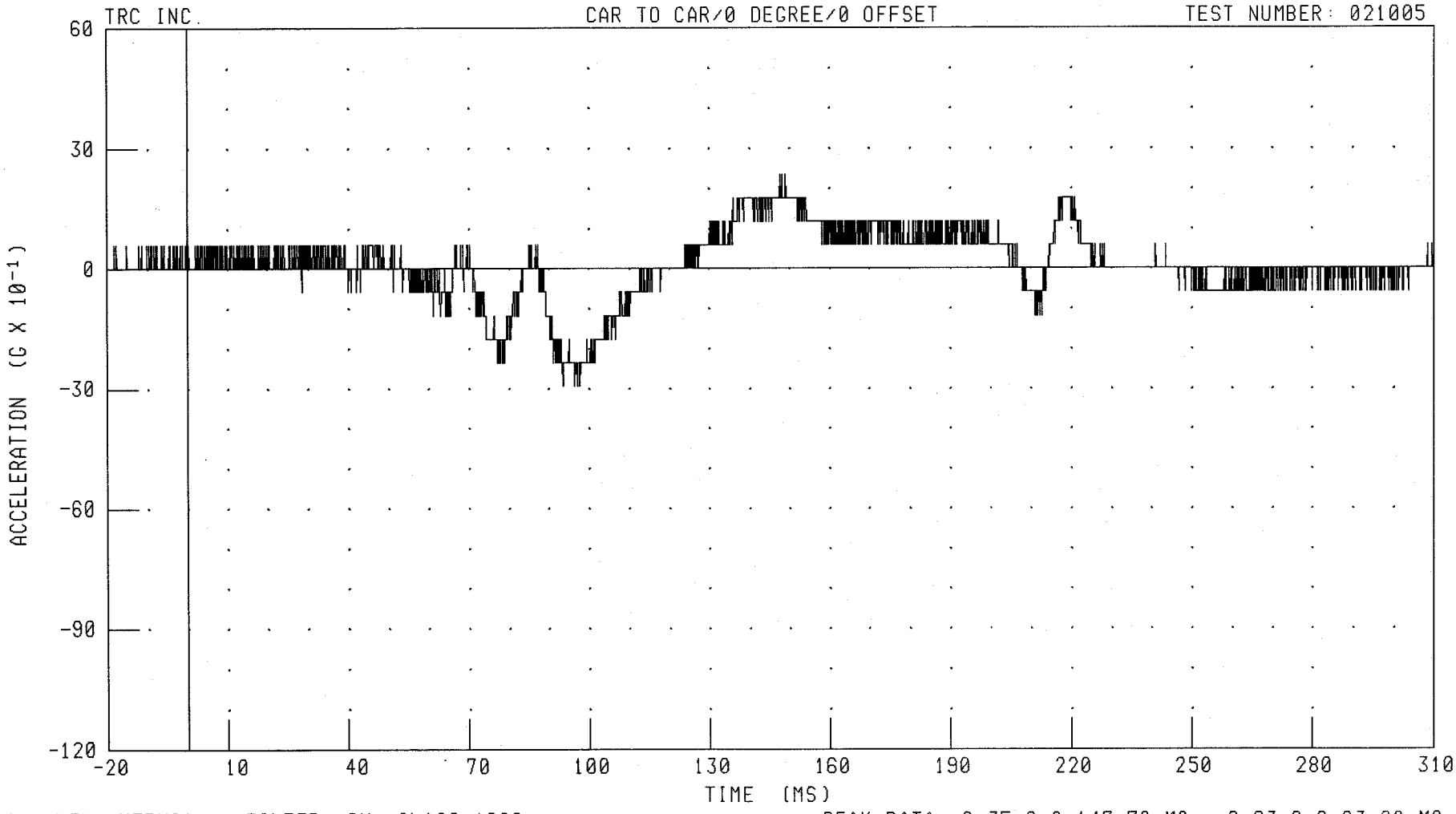
BULLET DRIVER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXGA FILTER: CH. CLASS 1000 PEAK DATA: 7.96 G @ 207.12 MS; -29.07 G @ 95.44 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER HEAD Y-AXIS ACCELERATION

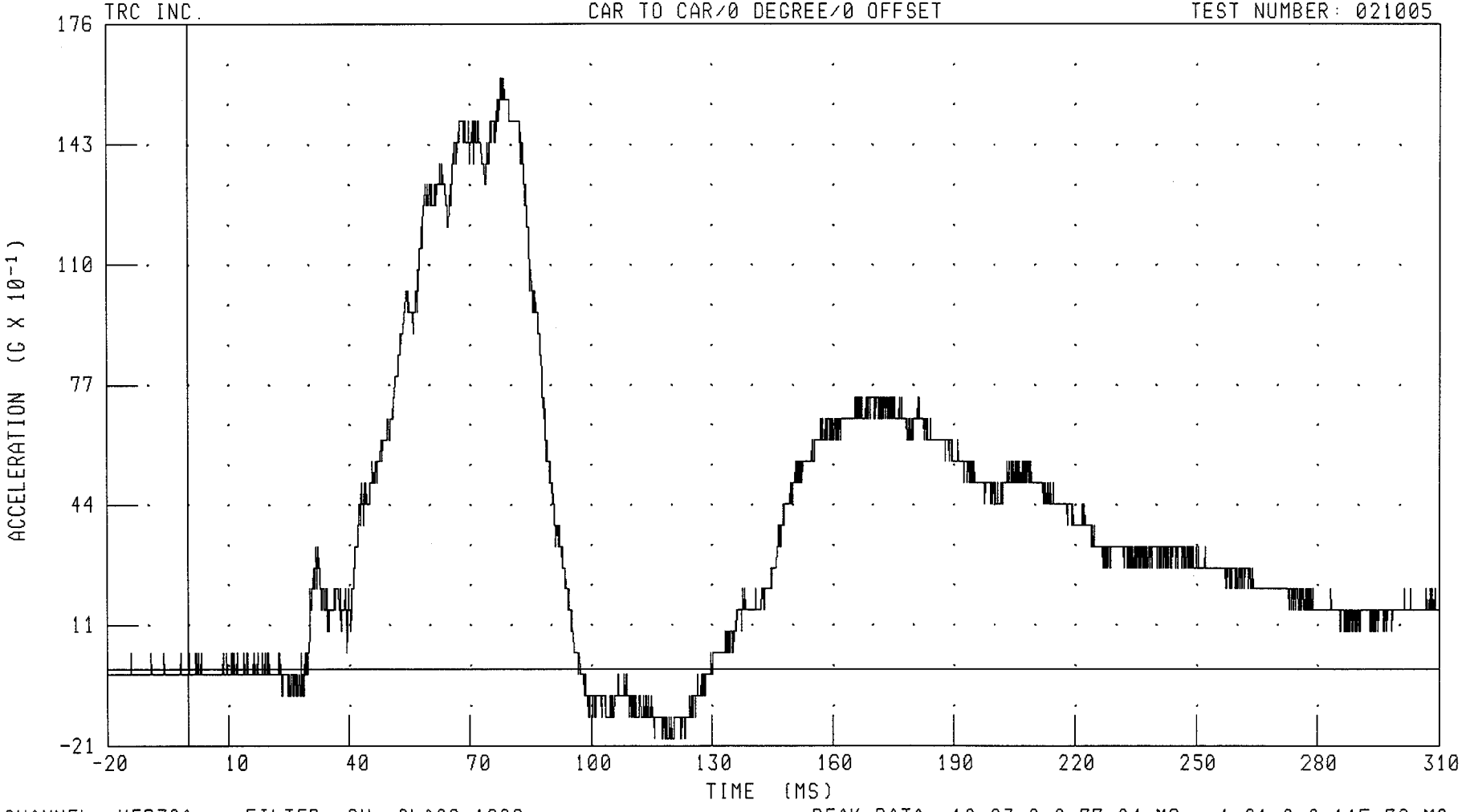


CHANNEL: HEDYGA FILTER: CH. CLASS 1000 PEAK DATA: 2.35 G @ 147.76 MS; -2.93 G @ 93.68 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER HEAD Z-AXIS ACCELERATION



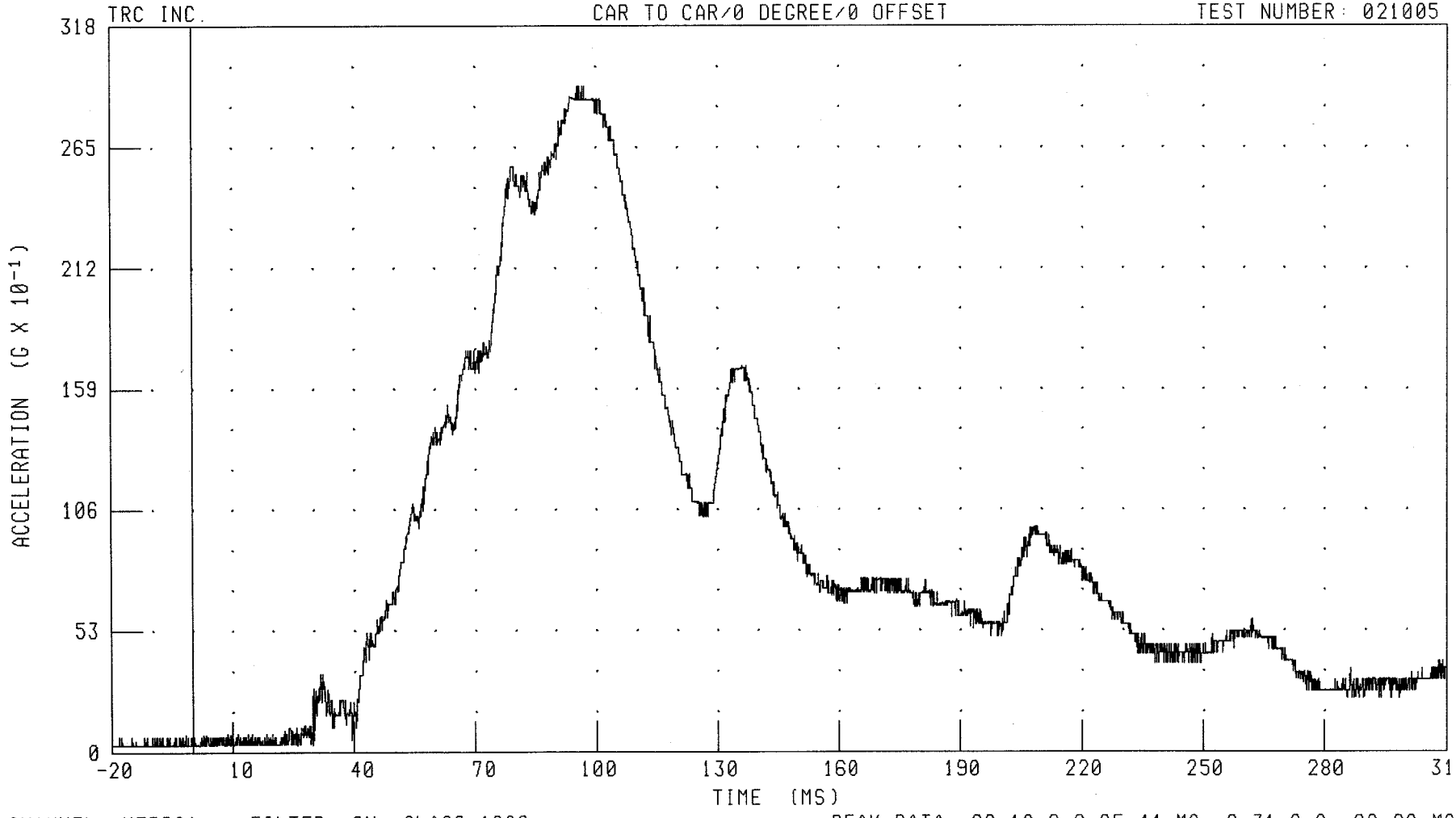
CHANNEL: HEDZGA FILTER: CH. CLASS 1000 PEAK DATA: 16.23 G @ 77.84 MS; -1.91 G @ 115.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER HEAD RESULTANT ACCELERATION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

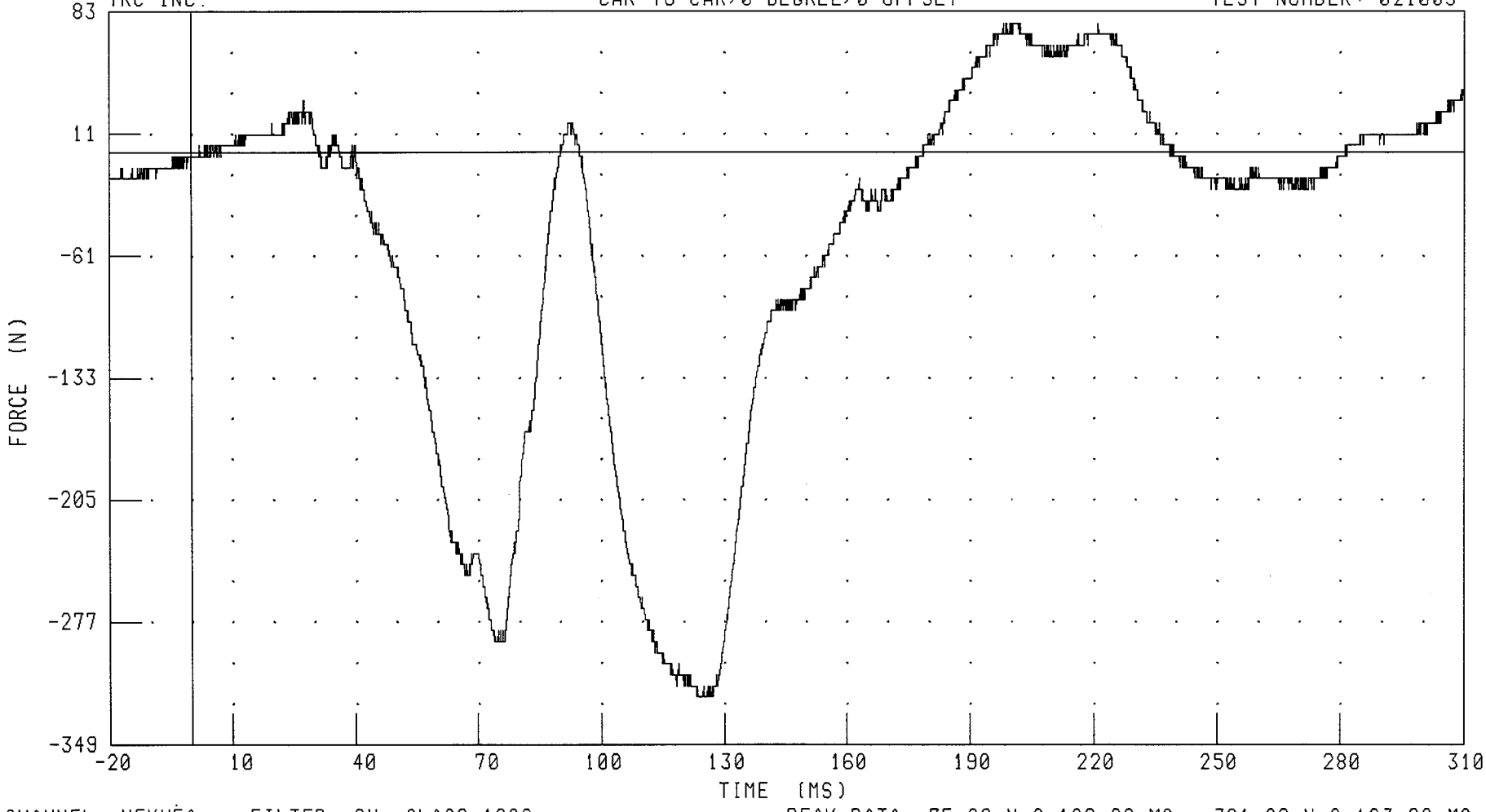


CHANNEL: HEDRGA FILTER: CH. CLASS 1000 PEAK DATA: 29.18 G @ 95.44 MS; 0.31 G @ -20.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NECK X-AXIS SHEAR FORCE

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

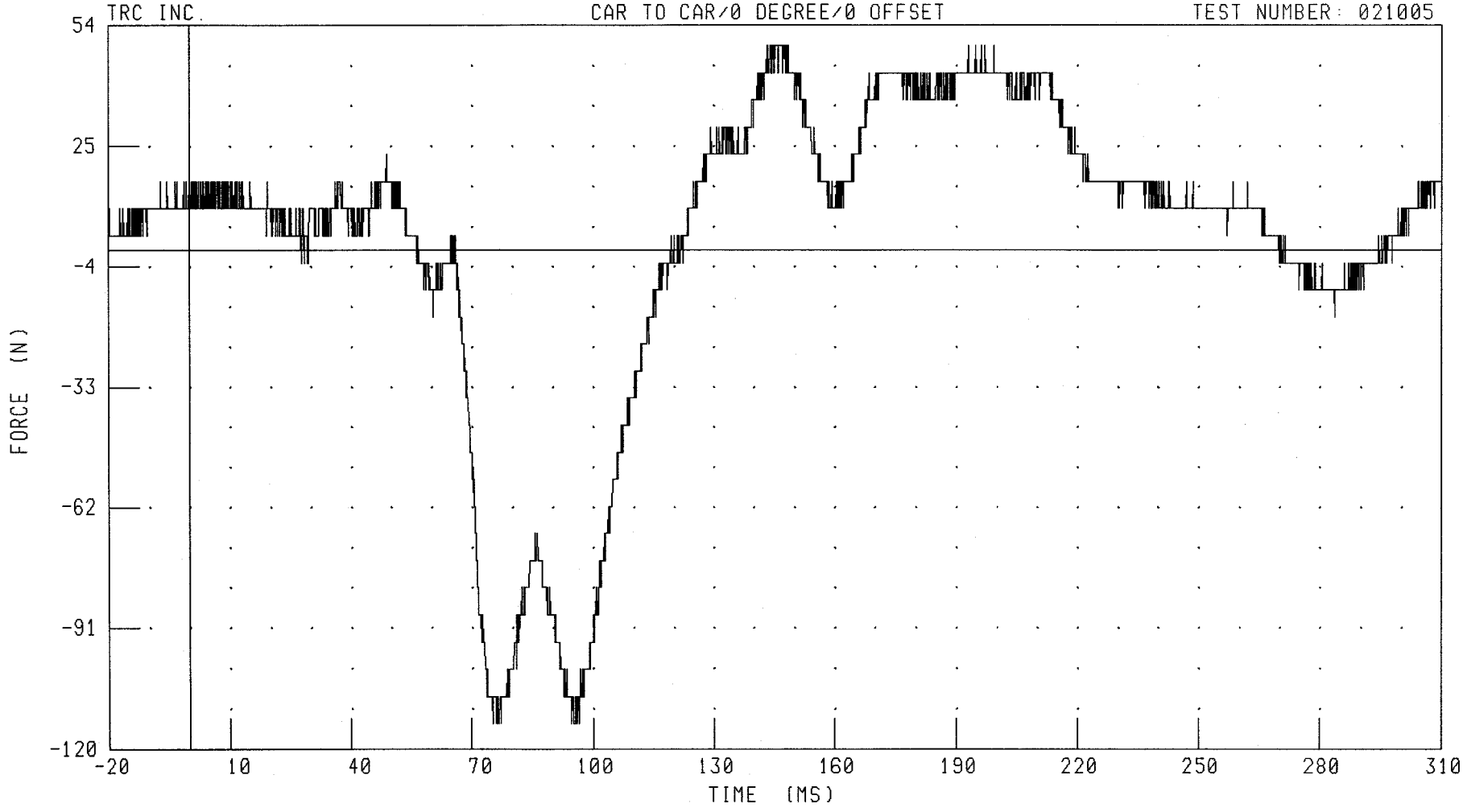


CHANNEL: NEKXFA FILTER: CH. CLASS 1000 PEAK DATA: 75.99 N @ 198.08 MS; -321.28 N @ 123.20 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NECK Y-AXIS SHEAR FORCE



CHANNEL: NEKYFA FILTER: CH. CLASS 1000

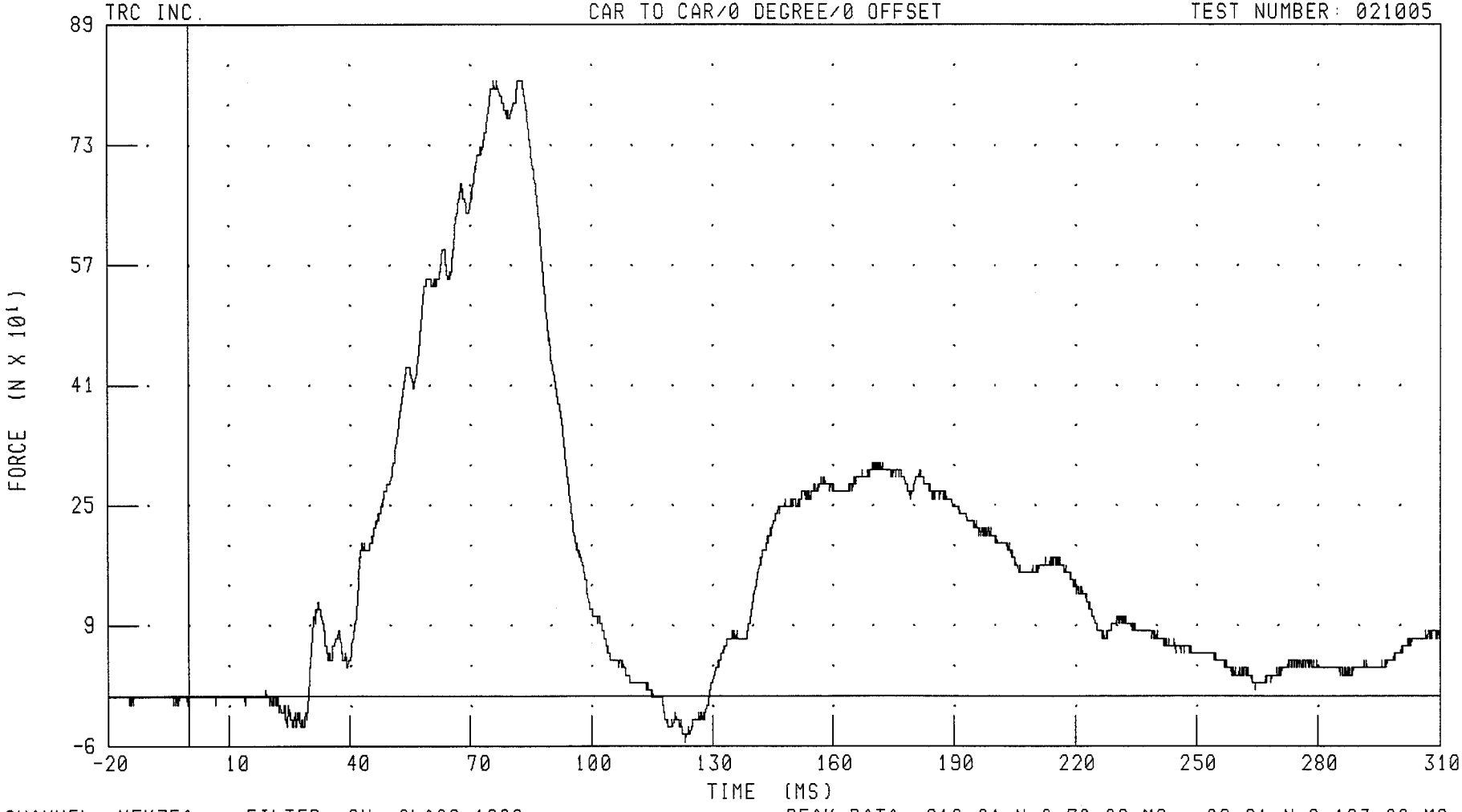
PEAK DATA: 49.13 N @ 143.20 MS; -113.94 N @ 75.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NECK Z-AXIS AXIAL FORCE

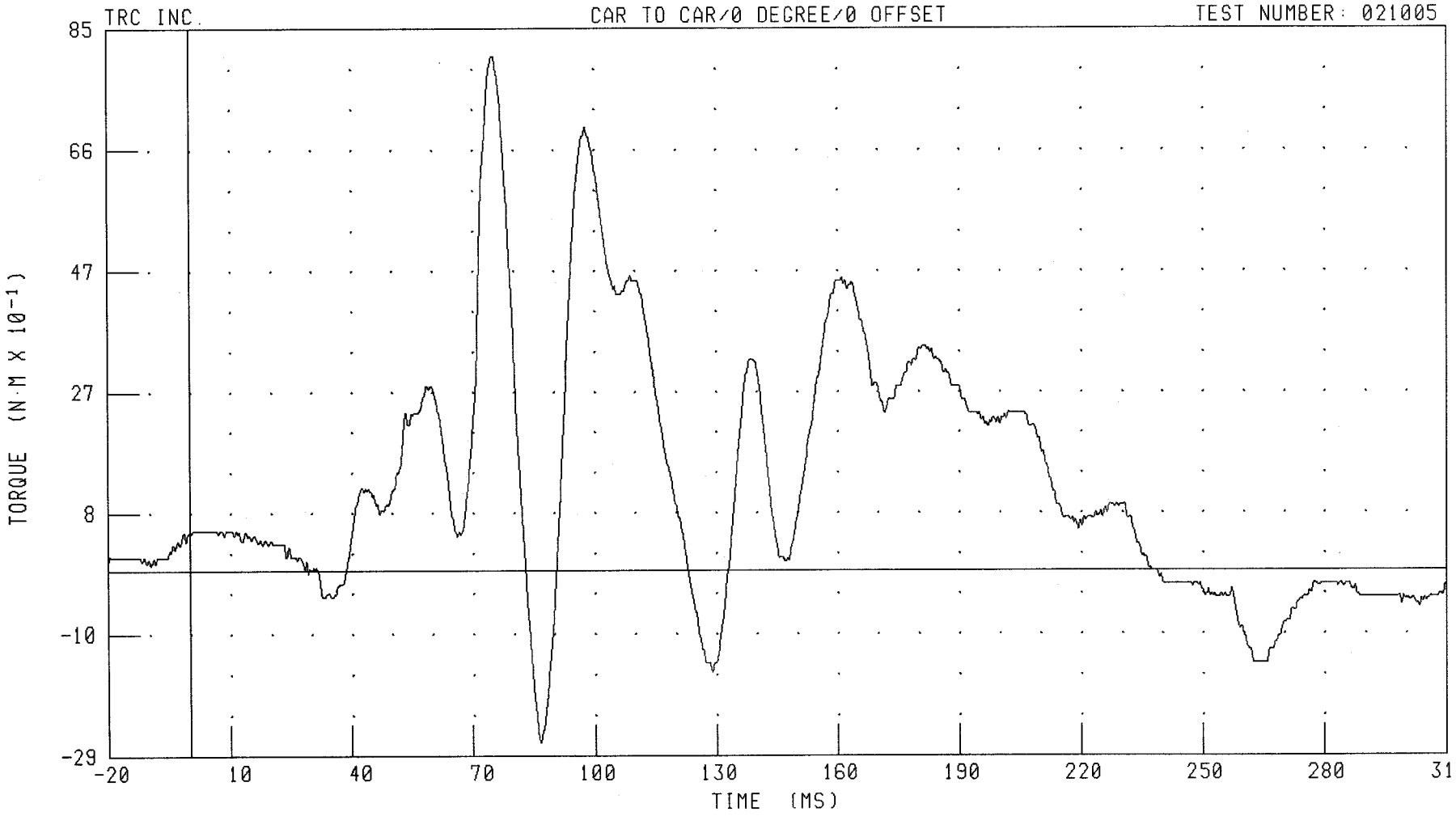
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NEKZFA FILTER: CH. CLASS 1000 PEAK DATA: 819.21 N @ 76.00 MS; -60.21 N @ 123.28 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER NECK MOMENT ABOUT X AXIS
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: NEKXMA FILTER: CH. CLASS 600

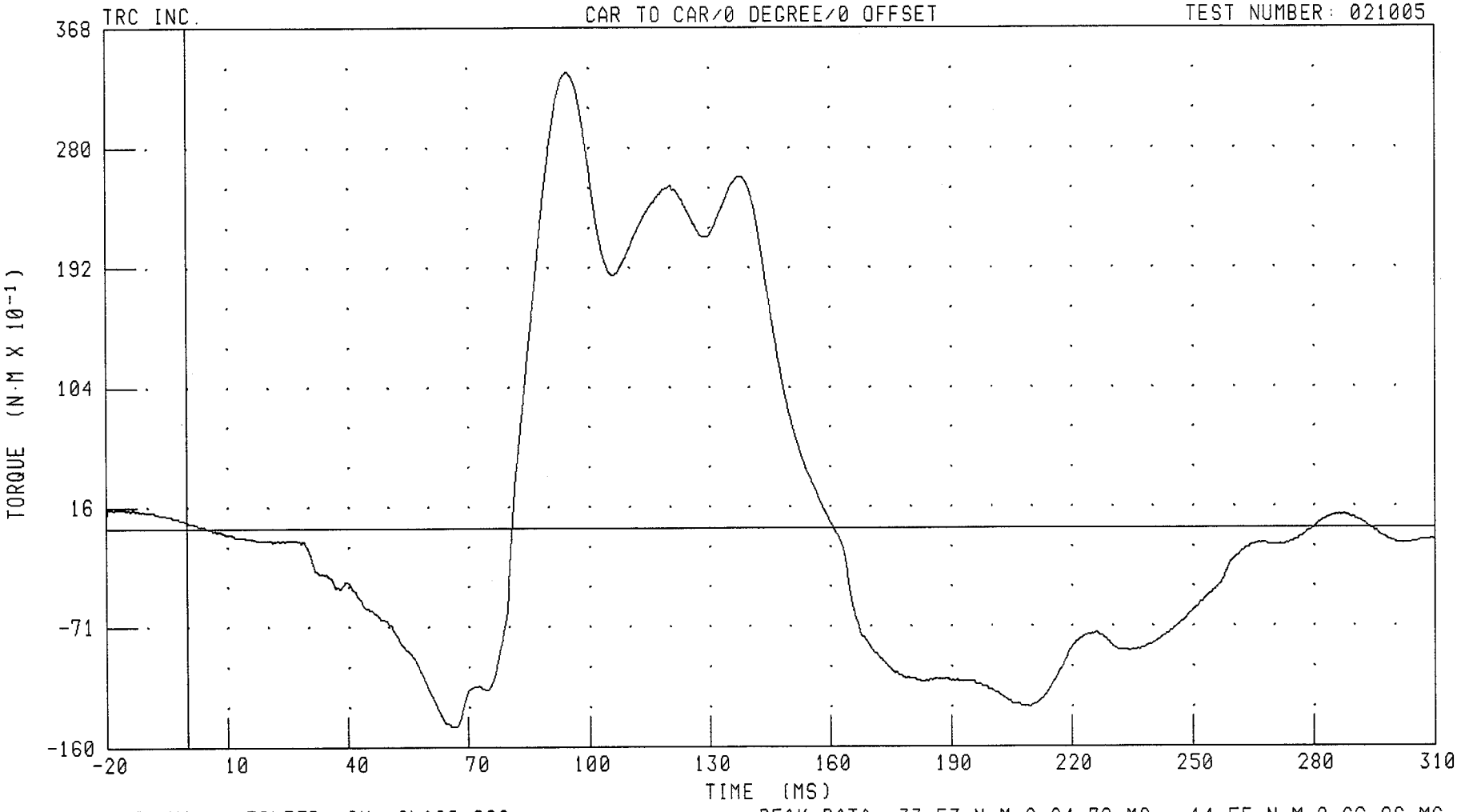
PEAK DATA: 8.07 N·M @ 75.12 MS; -2.69 N·M @ 86.56 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NECK MOMENT ABOUT Y AXIS

CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: NEKYMA FILTER: CH. CLASS 600

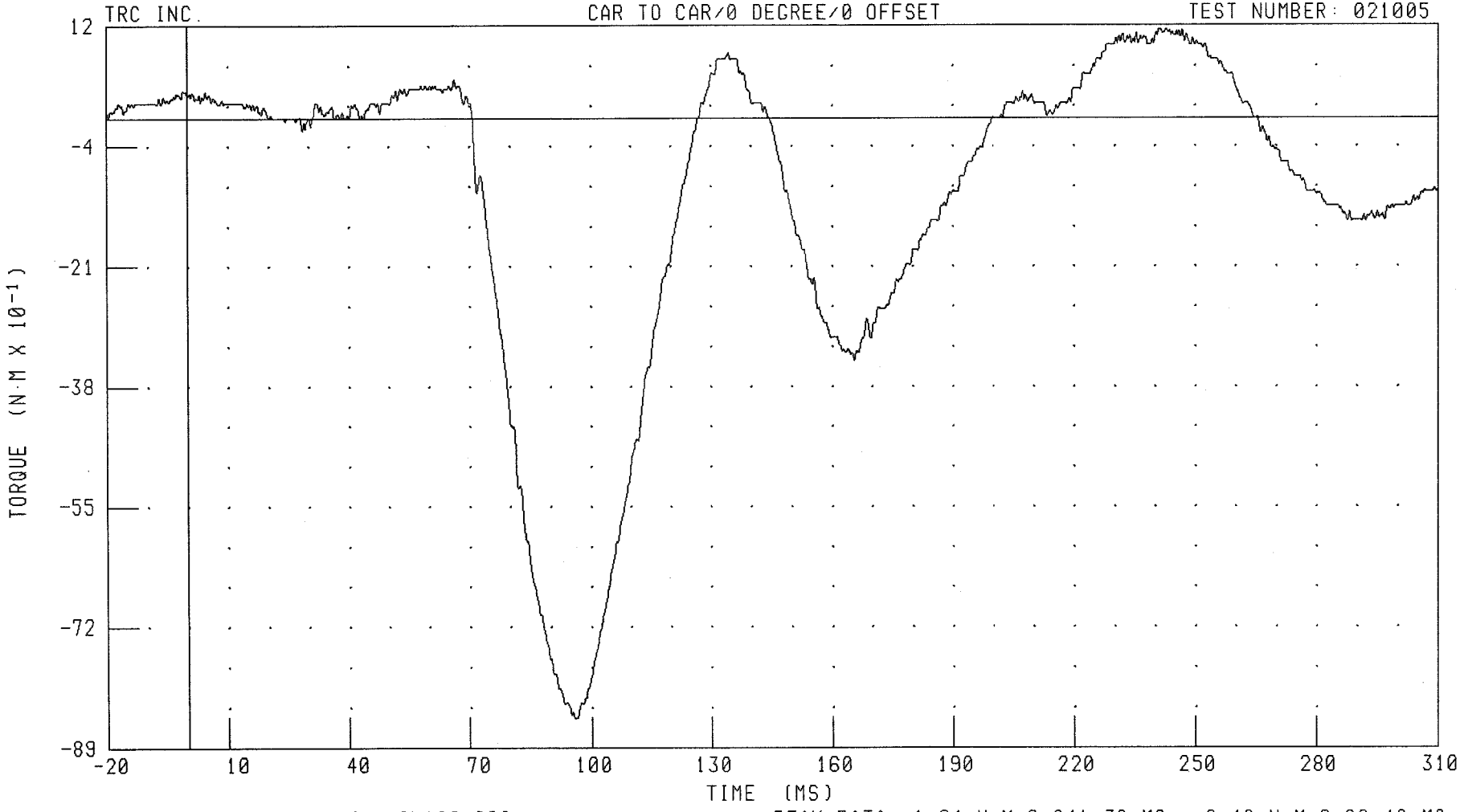
PEAK DATA: 33.53 N·M @ 94.72 MS; -14.55 N·M @ 66.96 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NECK MOMENT ABOUT Z AXIS

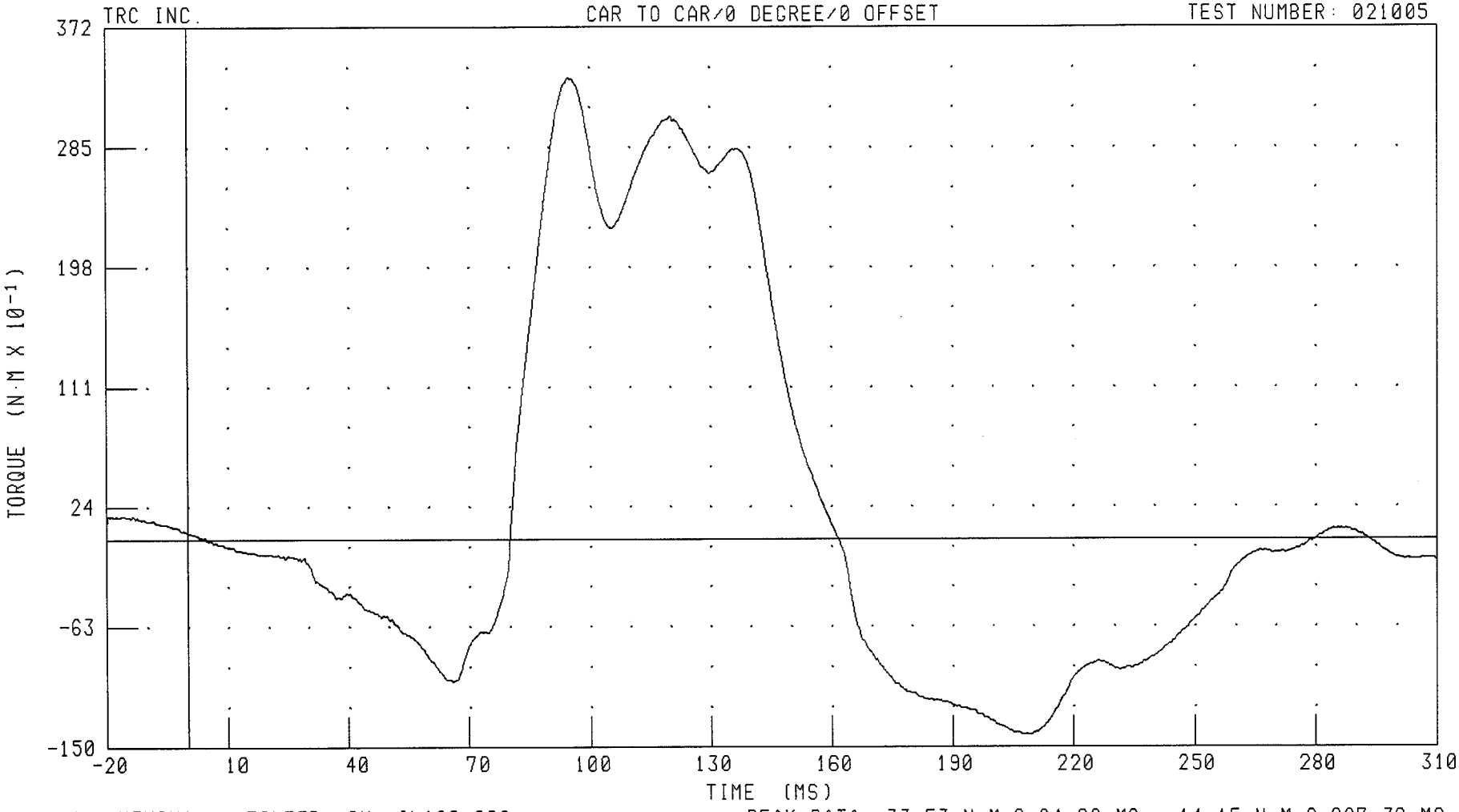
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NEKZMA FILTER: CH. CLASS 600 PEAK DATA: 1.24 N·M @ 241.36 MS; -8.49 N·M @ 96.40 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS



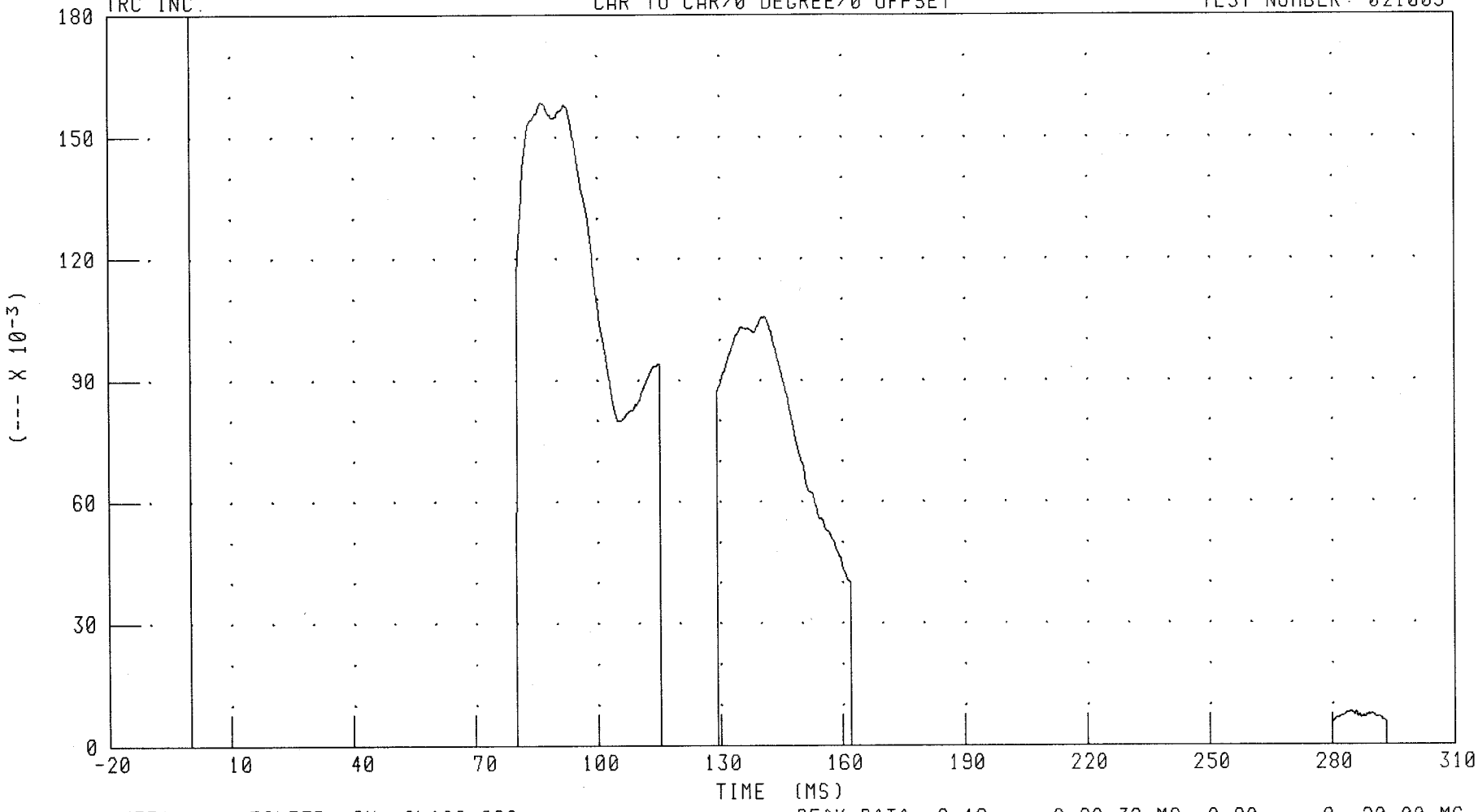
CHANNEL: NEKOMA FILTER: CH. CLASS 600 PEAK DATA: 33.53 N·M @ 94.88 MS; -14.15 N·M @ 207.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NIJ TENSION/FLEXION

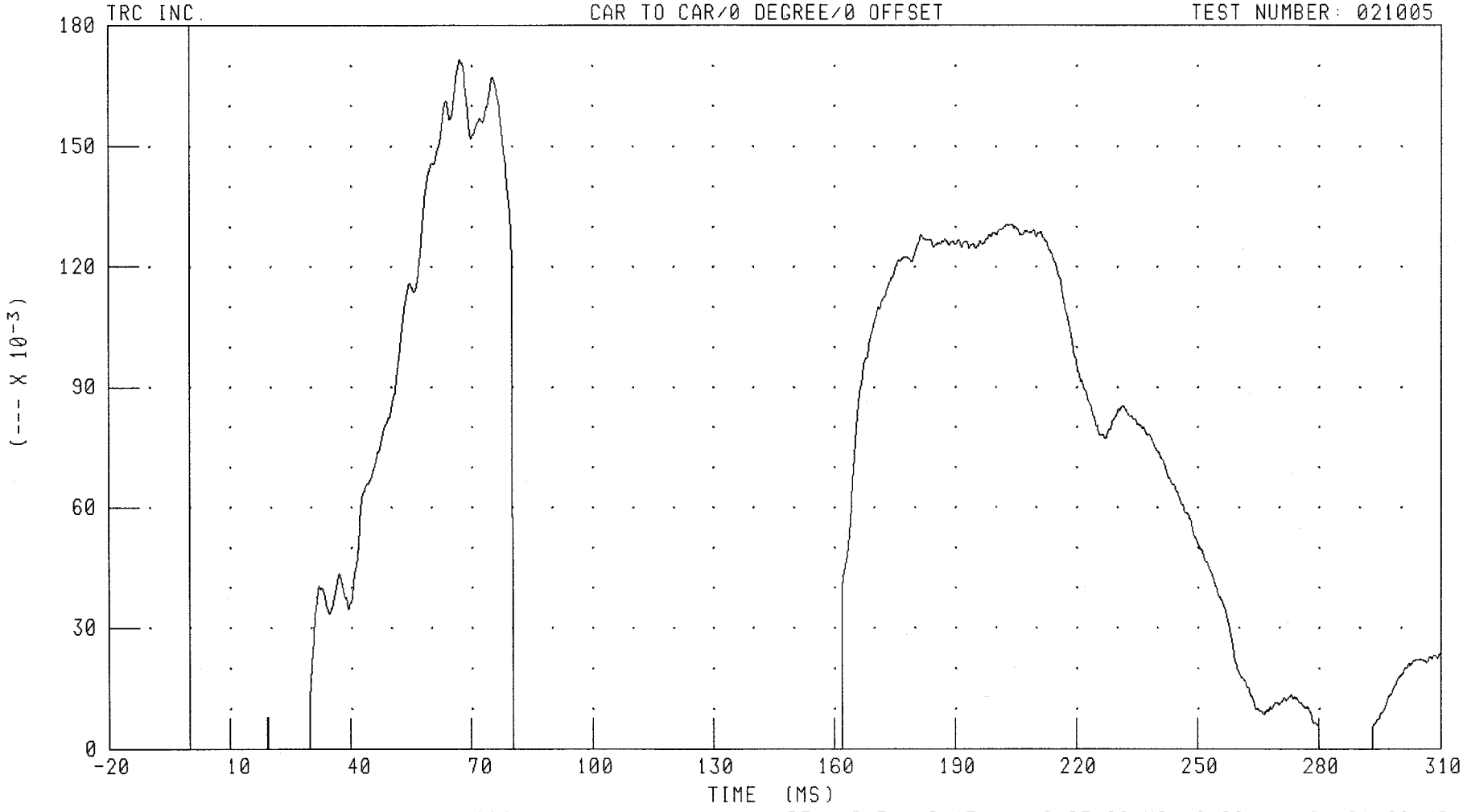
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: NTFA FILTER: CH. CLASS 600 PEAK DATA: 0.16 --- @ 86.32 MS; 0.00 --- @ -20.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NIJ TENSION/EXTENSION



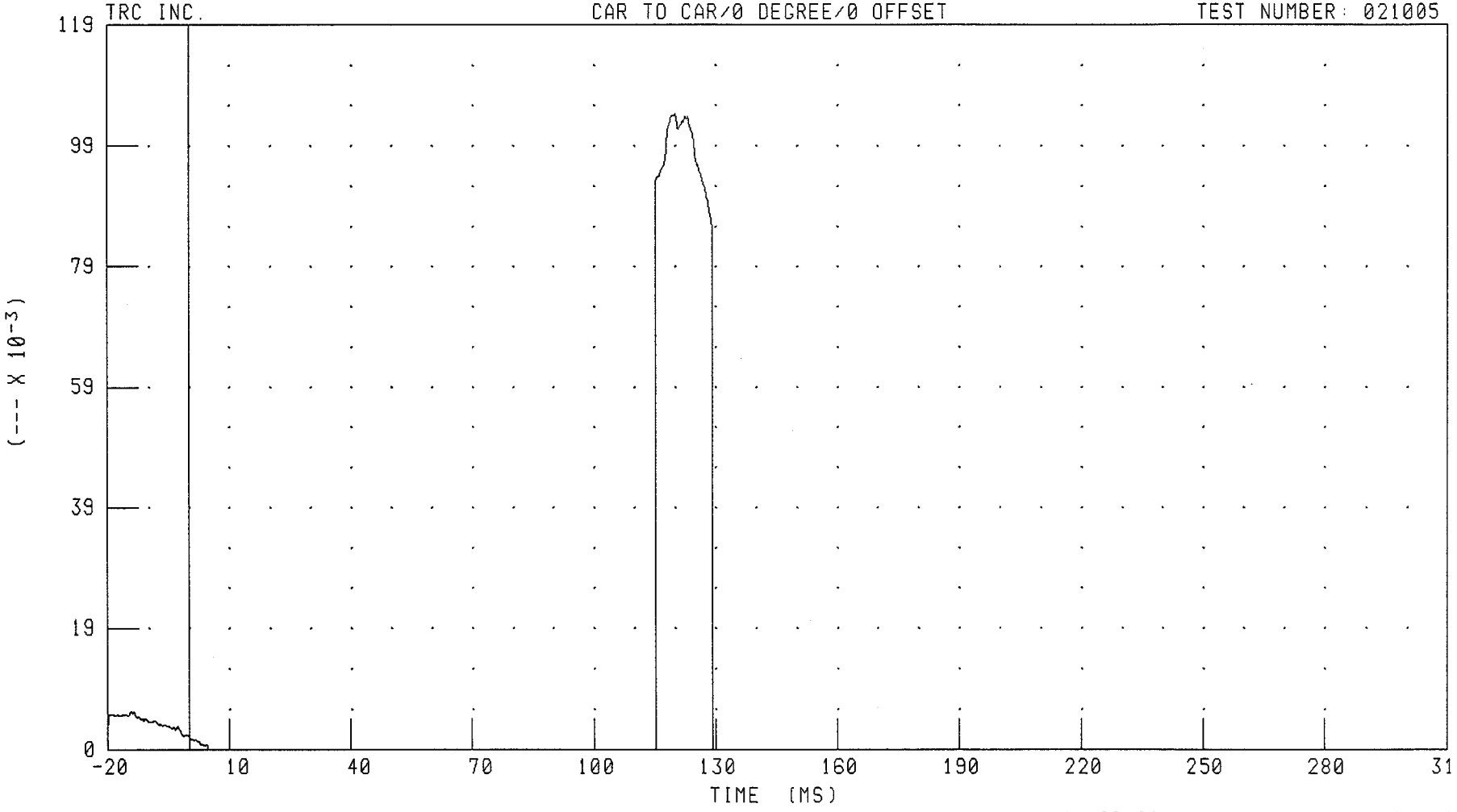
CHANNEL: NTEA FILTER: CH. CLASS 600 PEAK DATA: 0.17 --- @ 67.28 MS; 0.00 --- @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NIJ COMPRESSION/FLEXION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

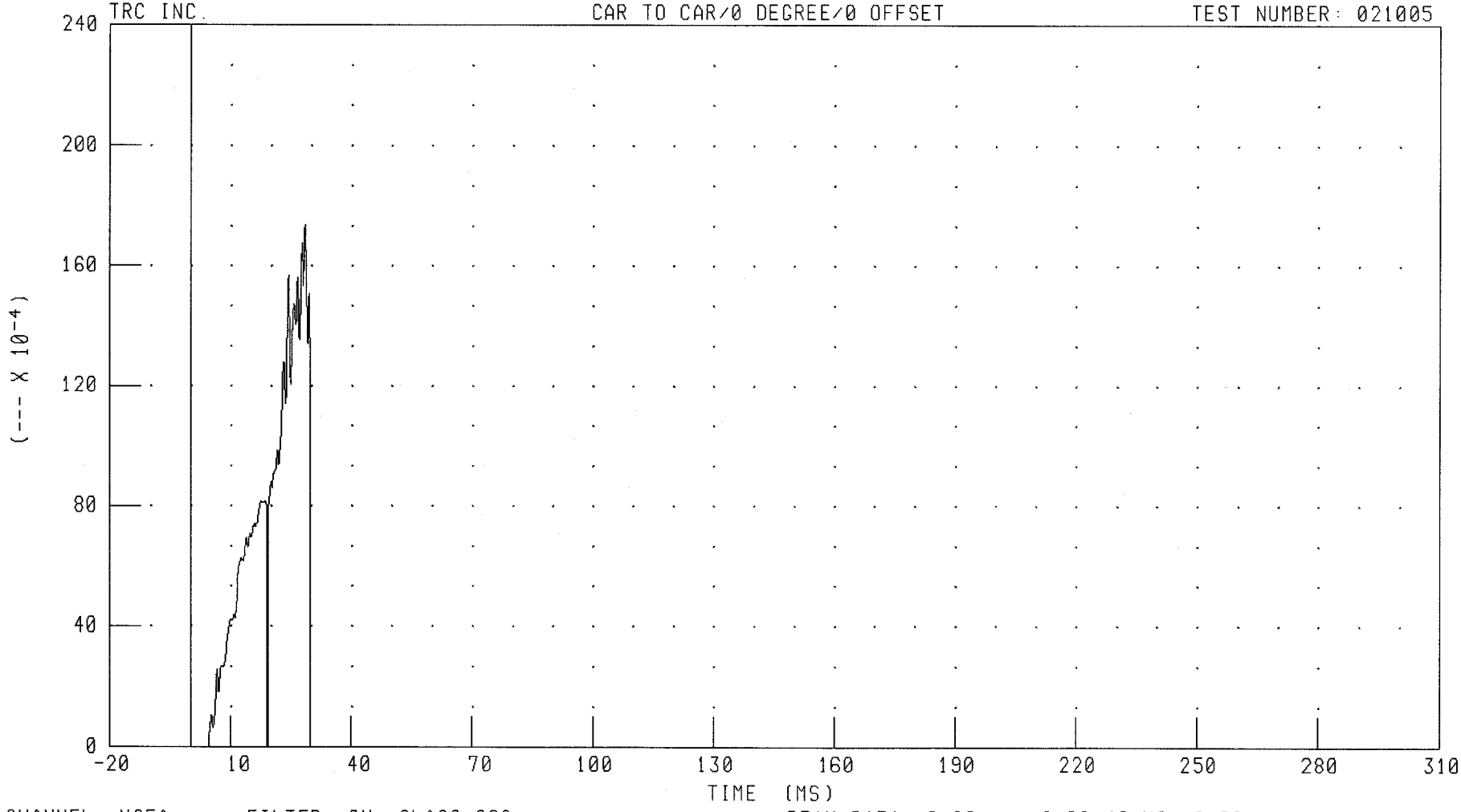


CHANNEL: NCFA FILTER: CH. CLASS 600 PEAK DATA: 0.11 --- @ 120.08 MS; 0.00 --- @ 4.72 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER NIJ COMPRESSION/EXTENSION

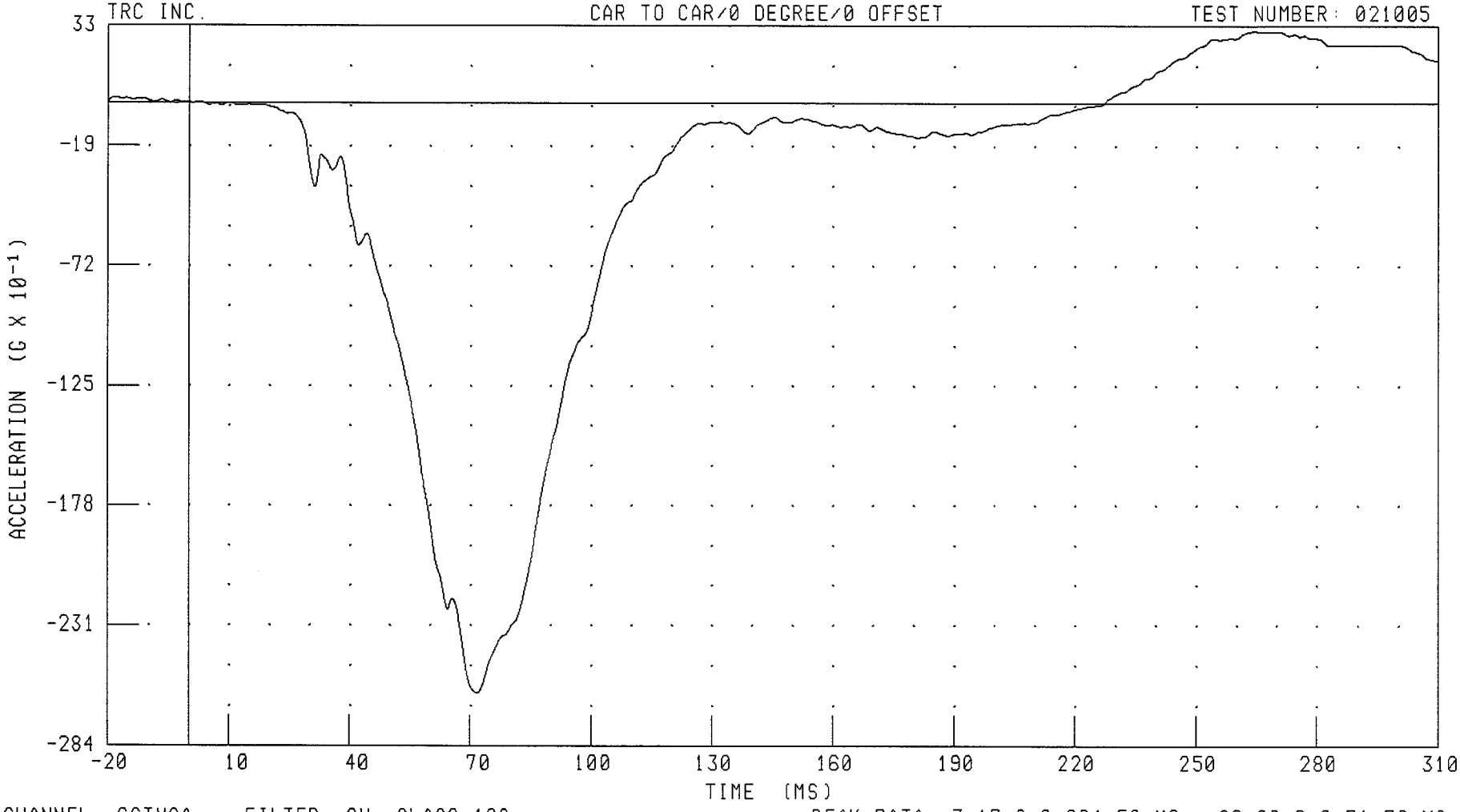


CHANNEL: NCEA FILTER: CH. CLASS 600 PEAK DATA: 0.02 --- @ 28.40 MS; 0.00 --- @ -20.00 MS

021005

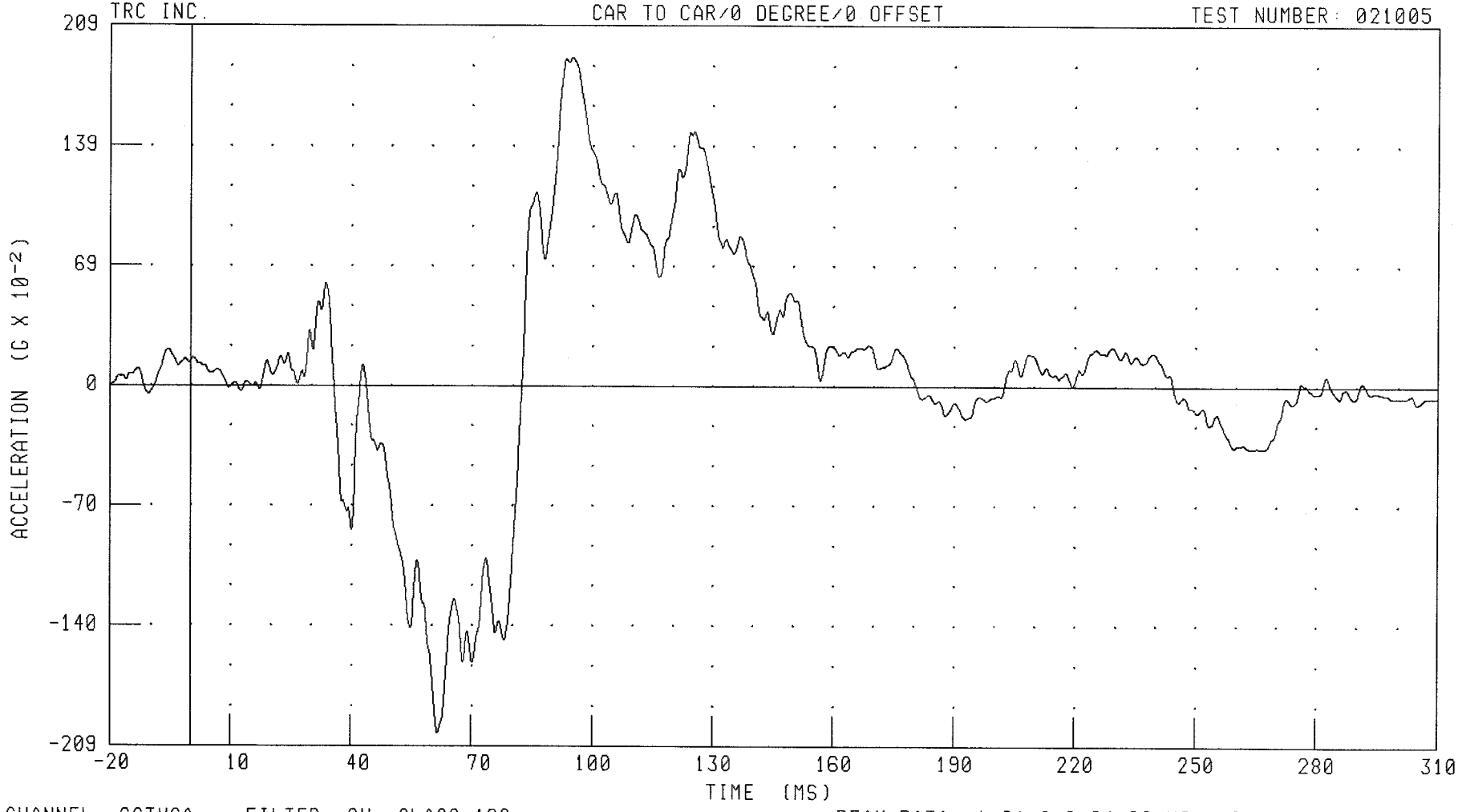
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXGA FILTER: CH. CLASS 180 PEAK DATA: 3.17 G @ 264.56 MS; -26.08 G @ 71.76 MS

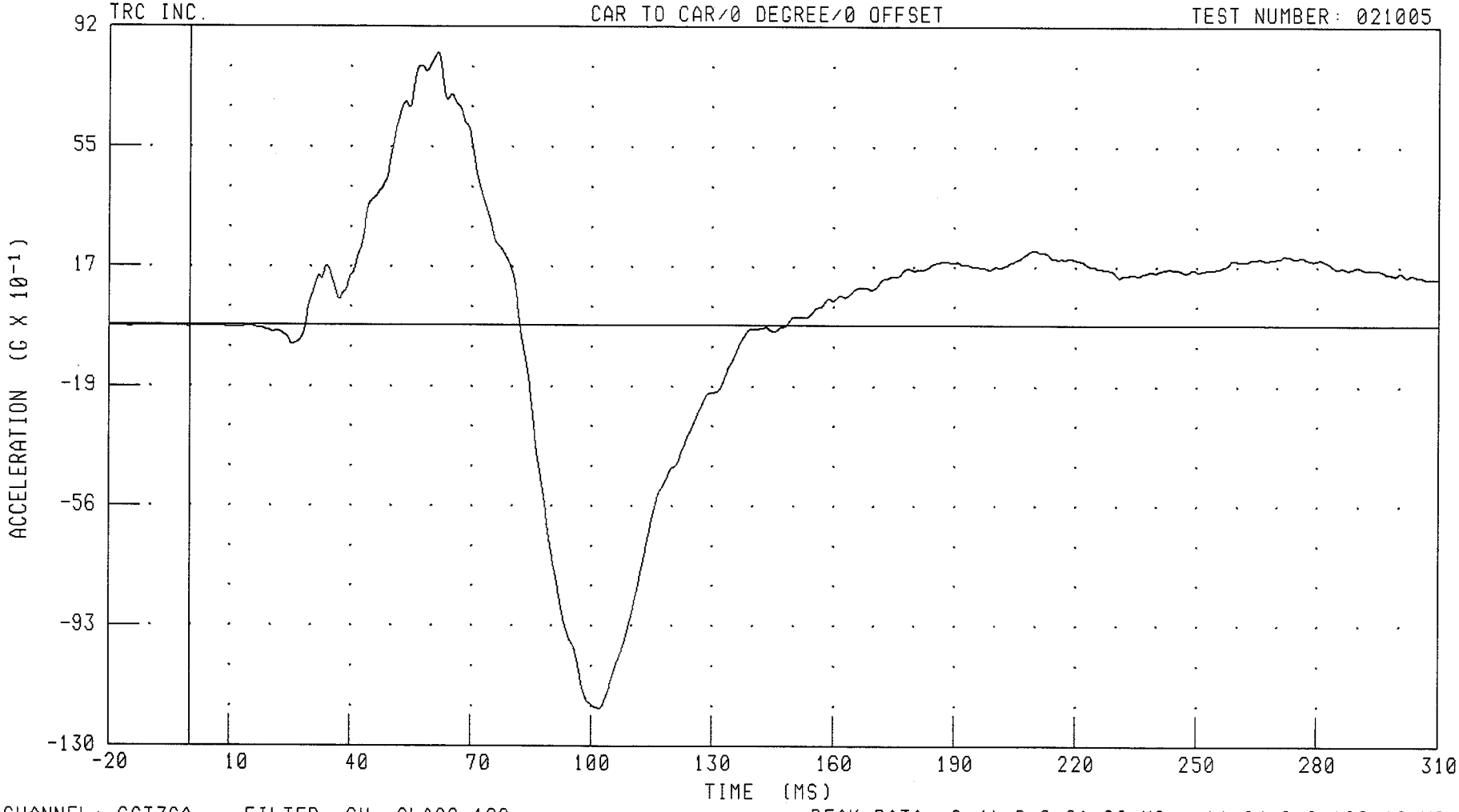
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYGA FILTER: CH. CLASS 180 PEAK DATA: 1.91 G @ 94.96 MS; -2.02 G @ 61.44 MS

021005

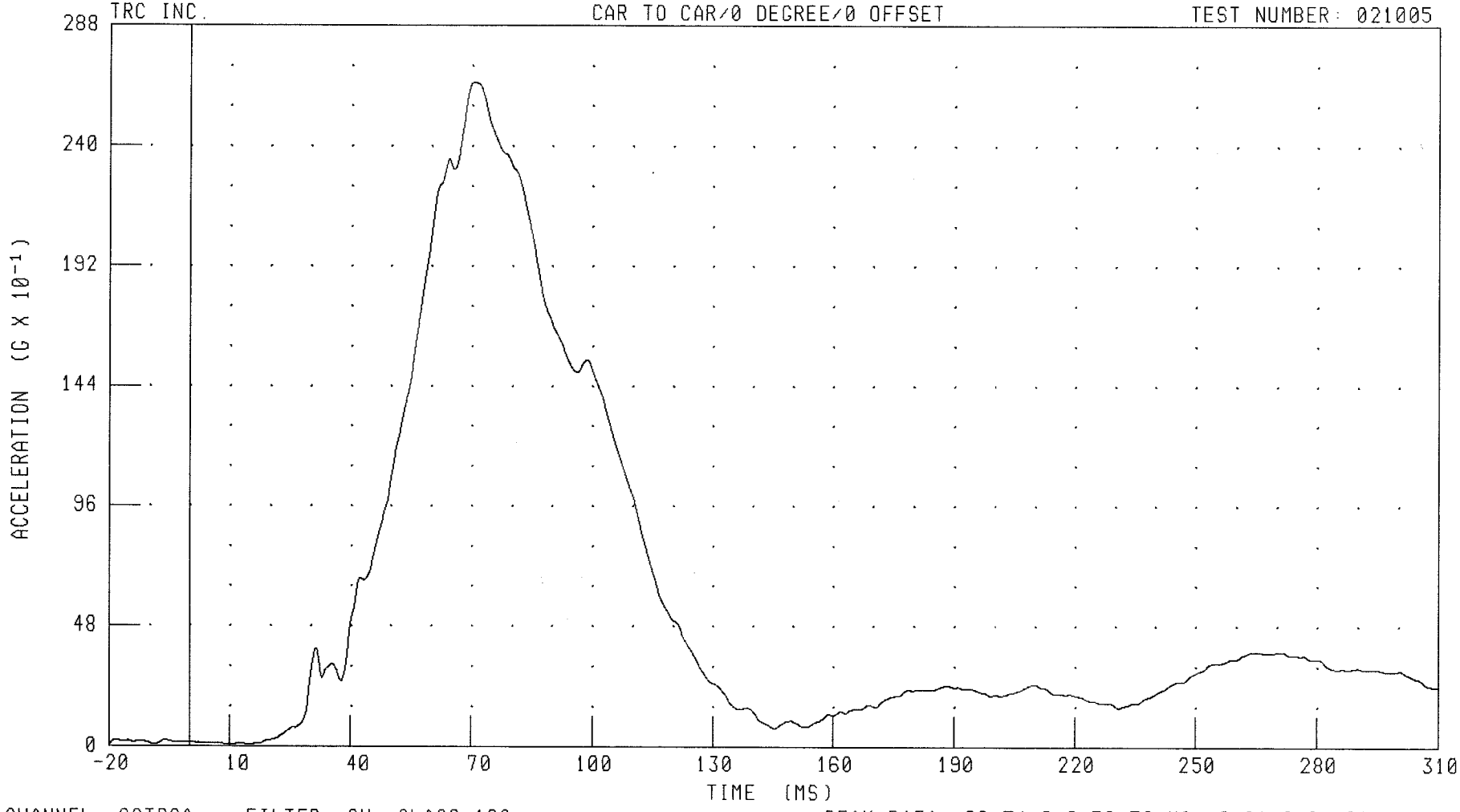
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZGA FILTER: CH. CLASS 180 PEAK DATA: 8.41 G @ 61.68 MS; -11.84 G @ 102.16 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER CHEST RESULTANT ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: CSTRGA FILTER: CH. CLASS 180 PEAK DATA: 26.54 G @ 70.56 MS; 0.01 G @ -20.00 MS

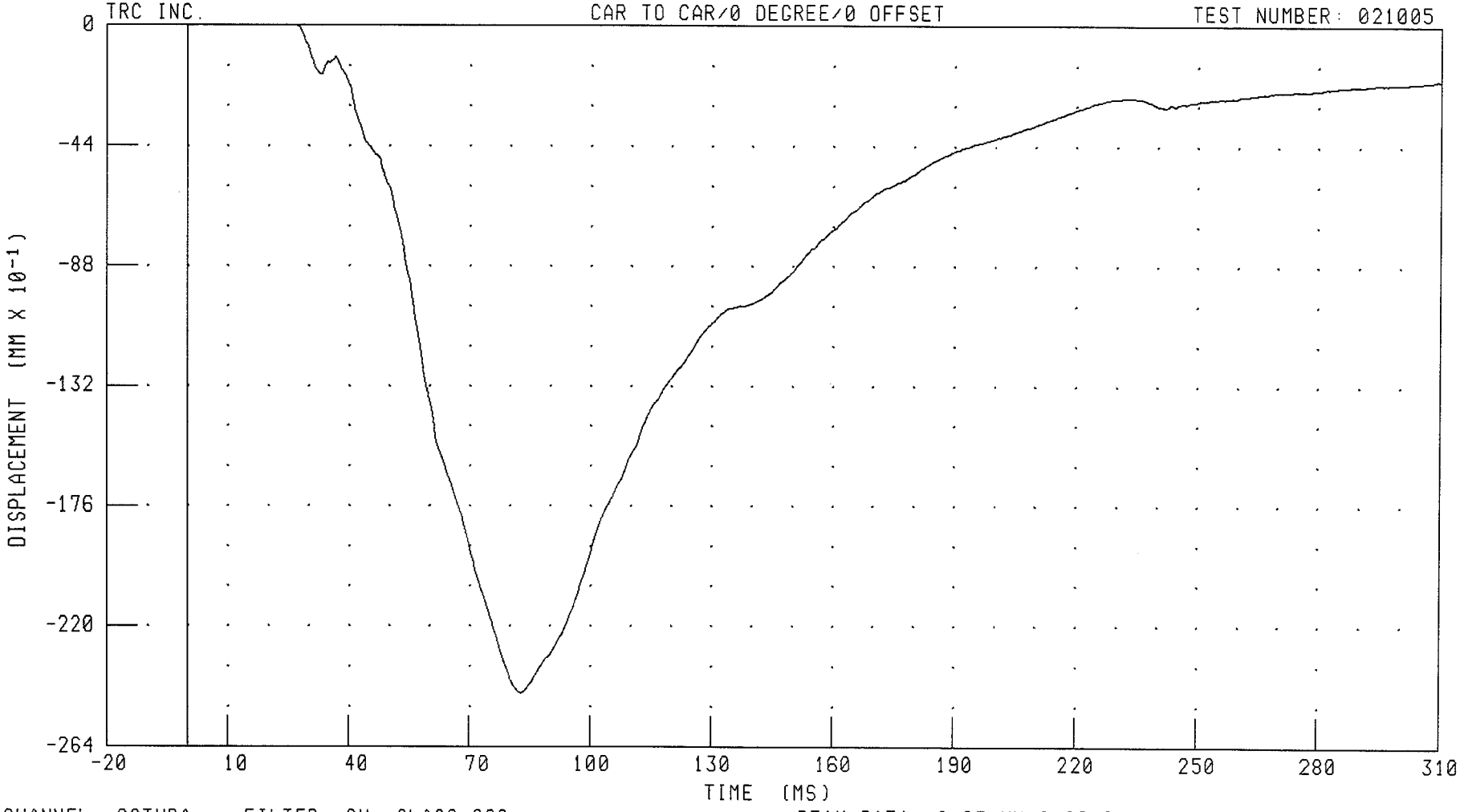
B-150

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER CHEST DEFLECTION

CAR TO CAR/0 DEGREE/0 OFFSET

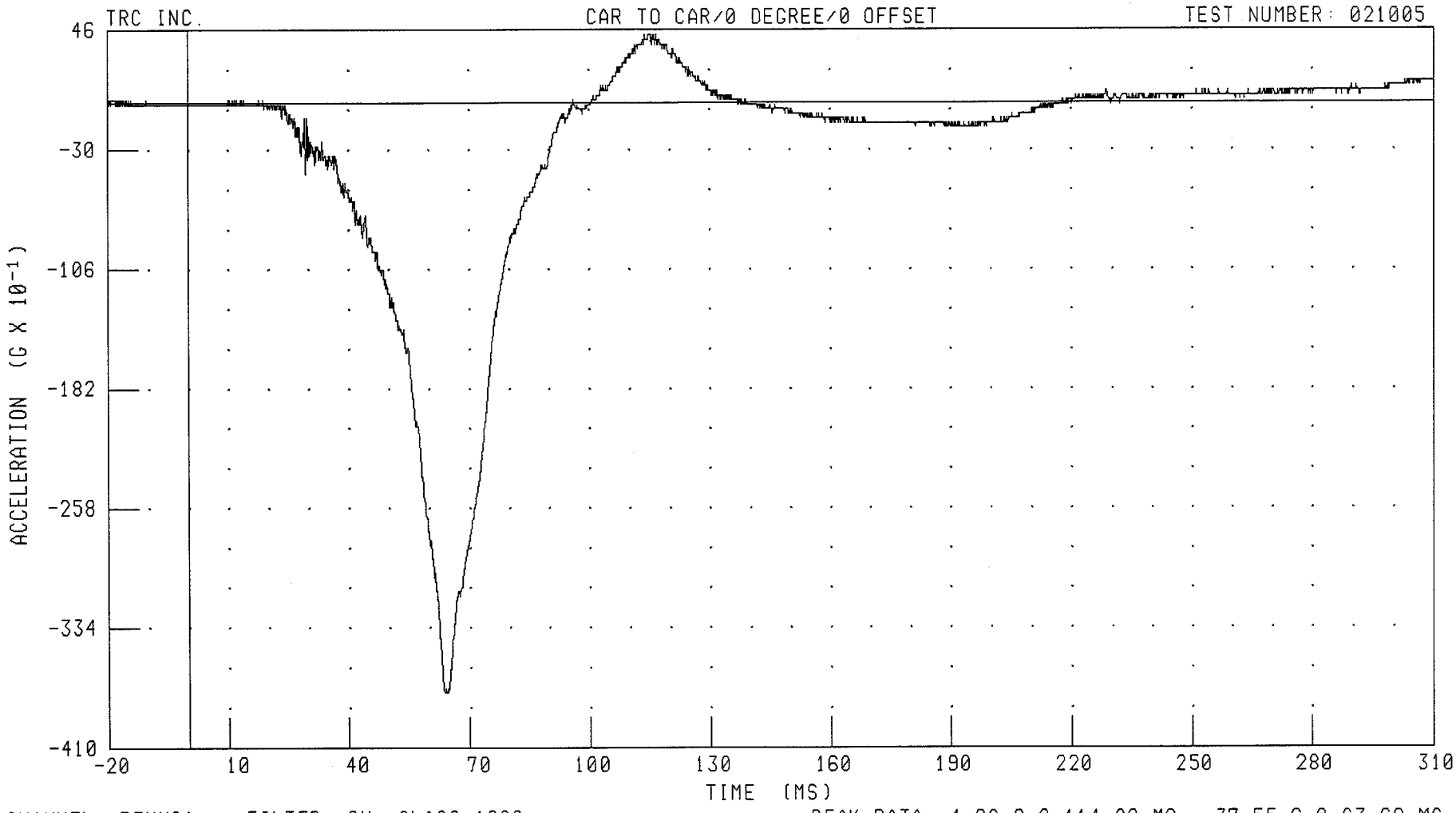


CHANNEL: CSTXDA FILTER: CH. CLASS 600

PEAK DATA: 0.03 MM @ 22.24 MS; -24.45 MM @ 82.88 MS

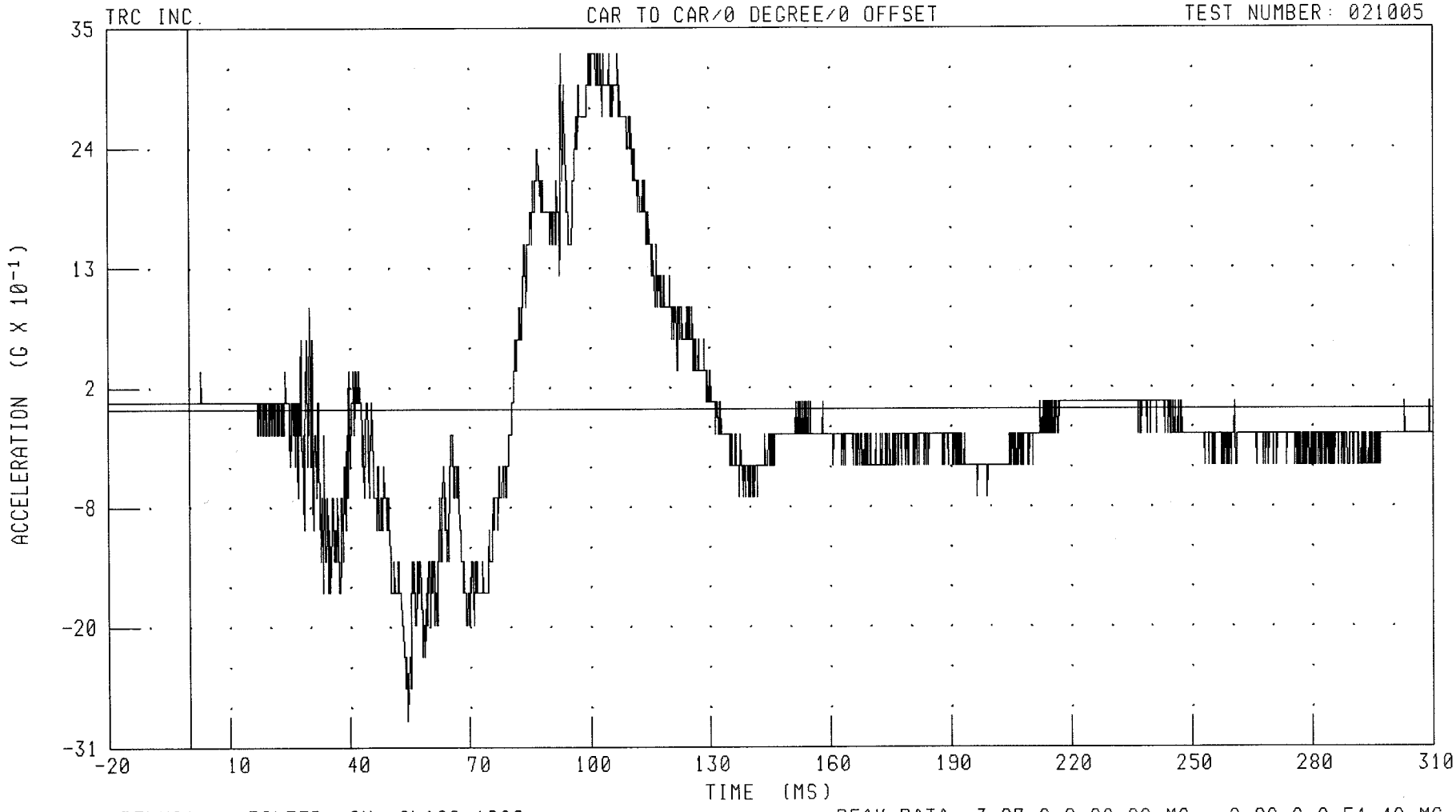
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER PELVIS X-AXIS ACCELERATION



CHANNEL: PEVXGA FILTER: CH. CLASS 1000 PEAK DATA: 4.26 G @ 114.08 MS; -37.55 G @ 63.68 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER PELVIS Y-AXIS ACCELERATION

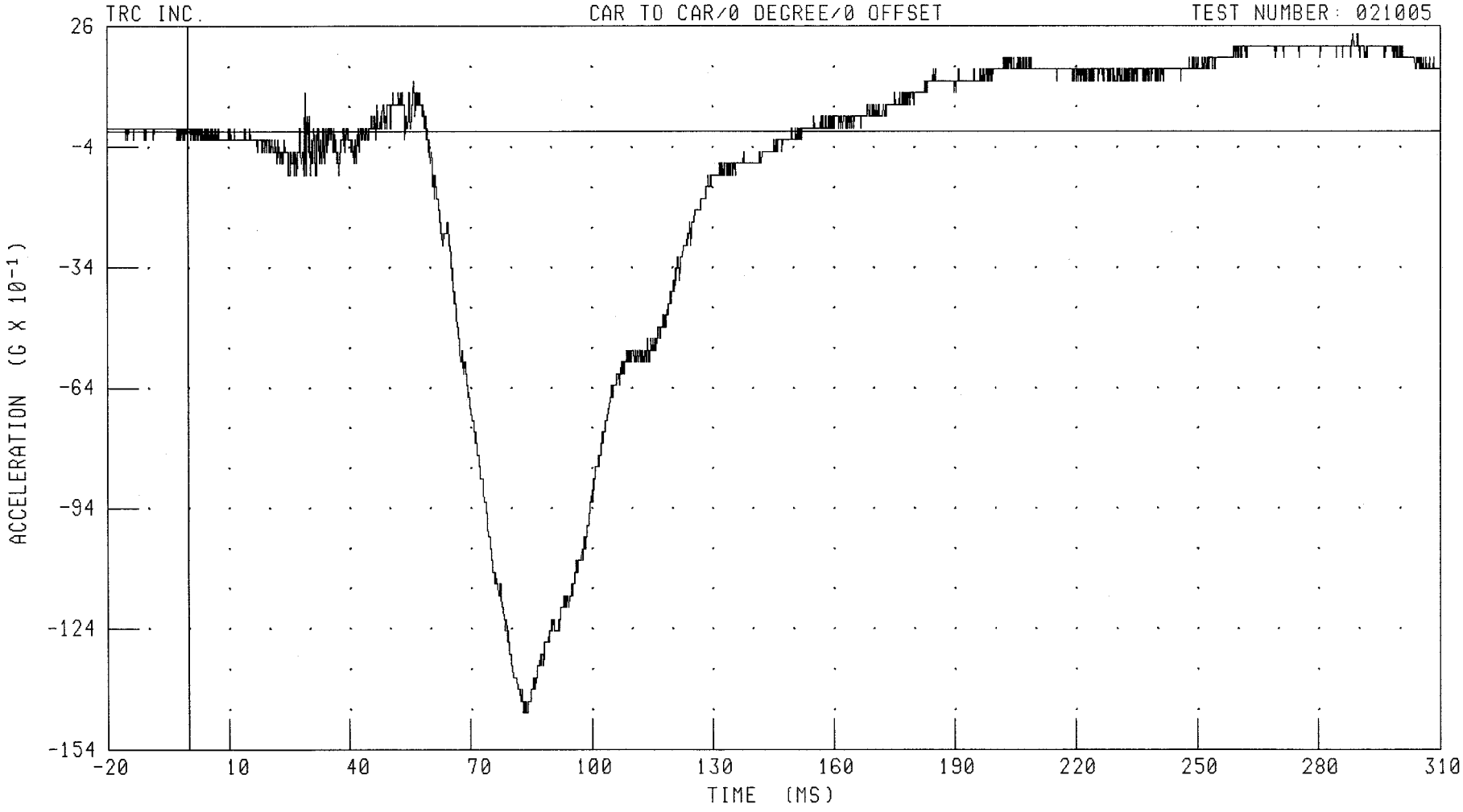


CHANNEL: PEVYGA FILTER: CH. CLASS 1000 PEAK DATA: 3.27 G @ 92.88 MS; -2.86 G @ 54.48 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER PELVIS Z-AXIS ACCELERATION

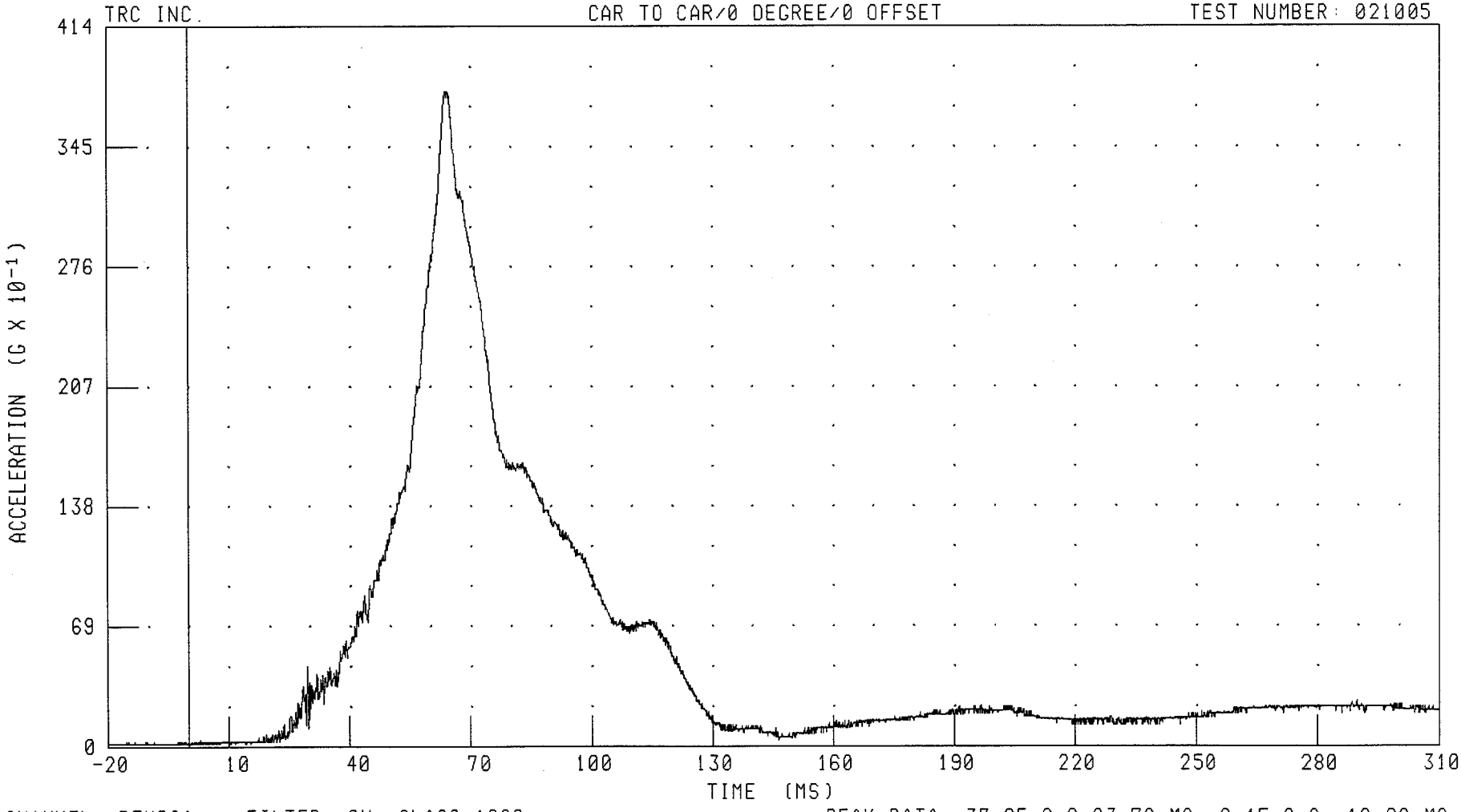


CHANNEL: PEVZGA FILTER: CH. CLASS 1000 PEAK DATA: 2.40 G @ 288.48 MS; -14.49 G @ 82.80 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER PELVIS RESULTANT ACCELERATION



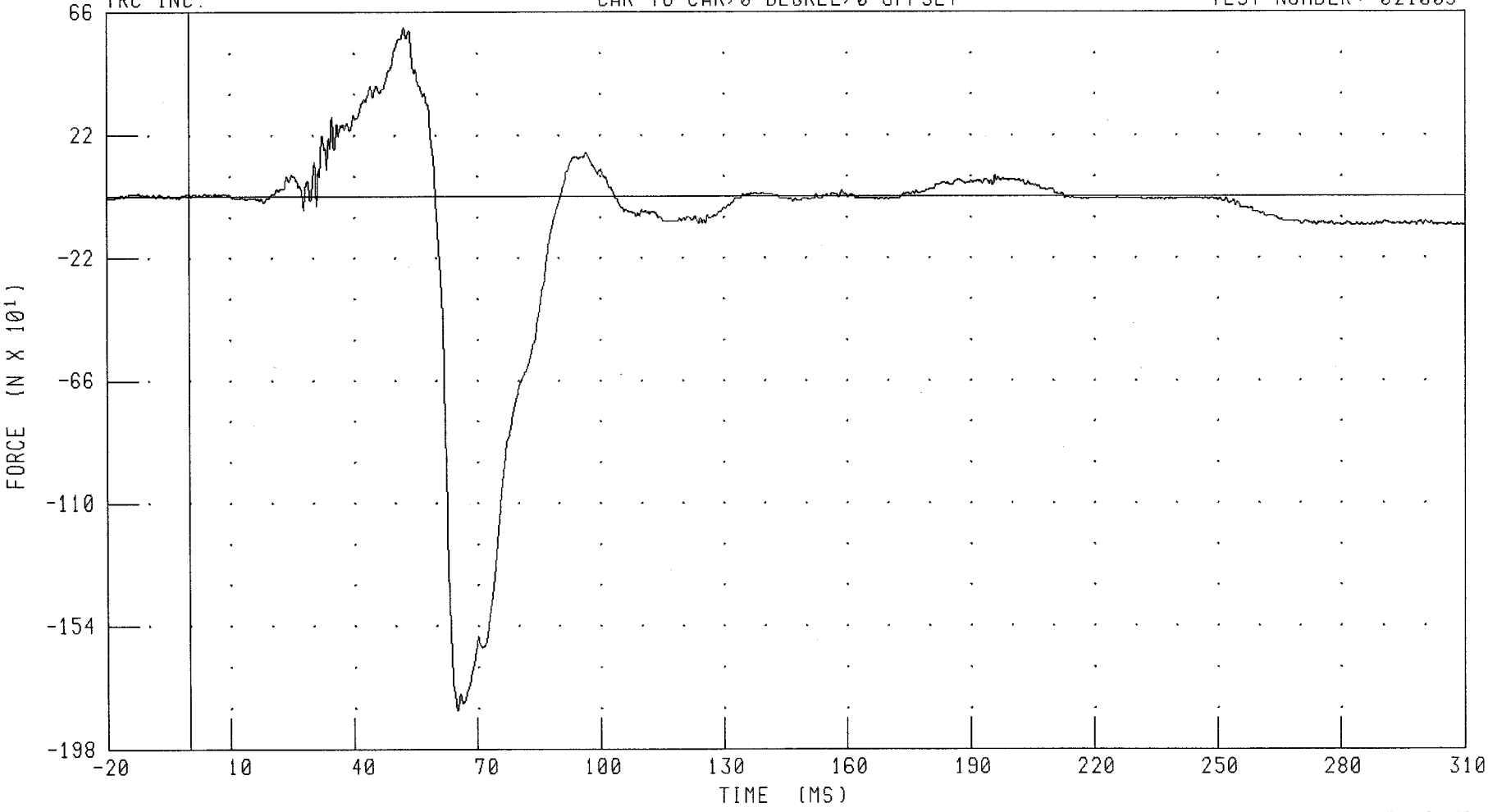
CHANNEL: PEVRGA FILTER: CH. CLASS 1000 PEAK DATA: 37.65 G @ 63.76 MS; 0.15 G @ -19.68 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER LEFT FEMUR Z-AXIS FORCE

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



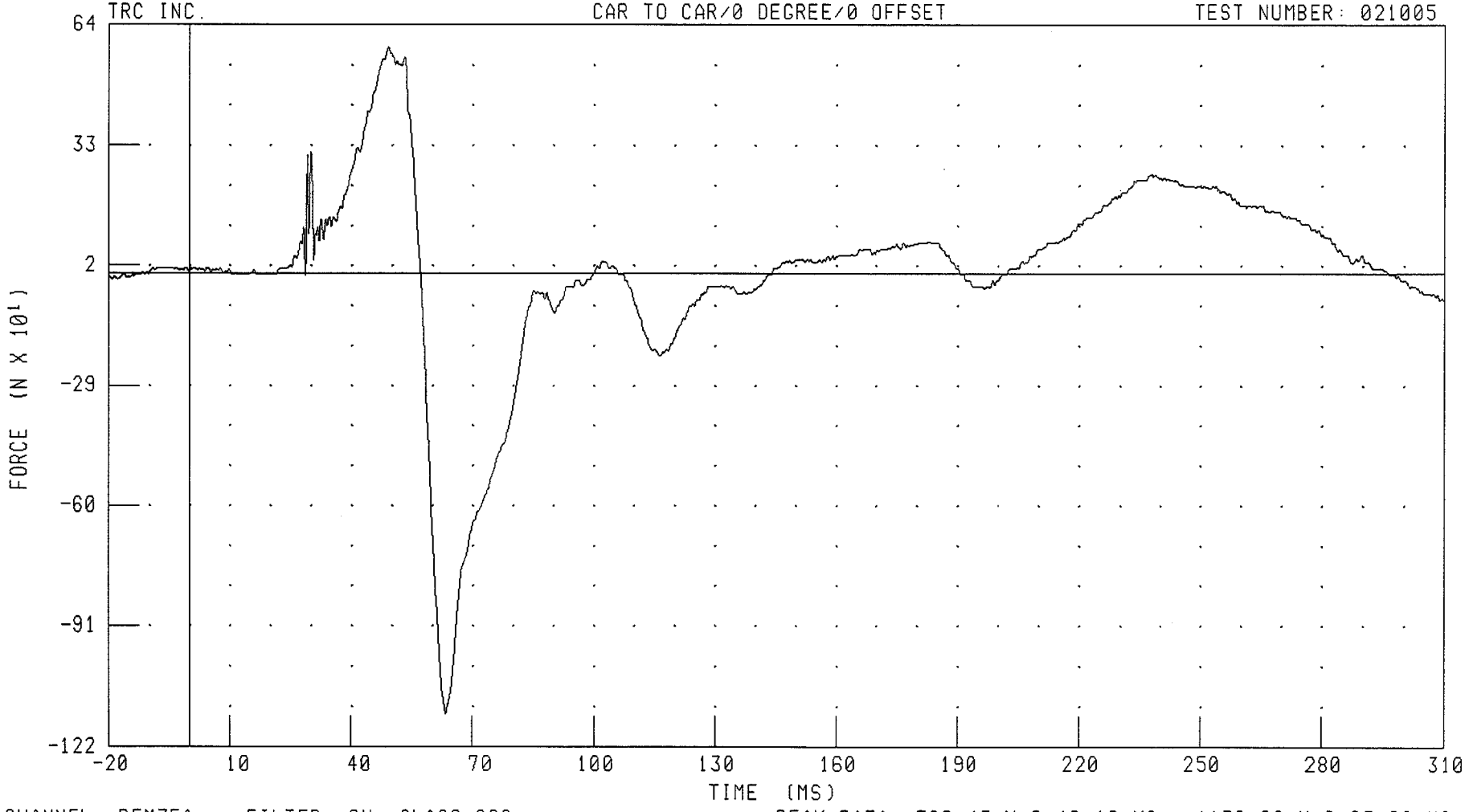
CHANNEL: LFMZFA FILTER: CH. CLASS 600 PEAK DATA: 606.67 N @ 52.40 MS; -1843.13 N @ 65.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER RIGHT FEMUR Z-AXIS FORCE

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

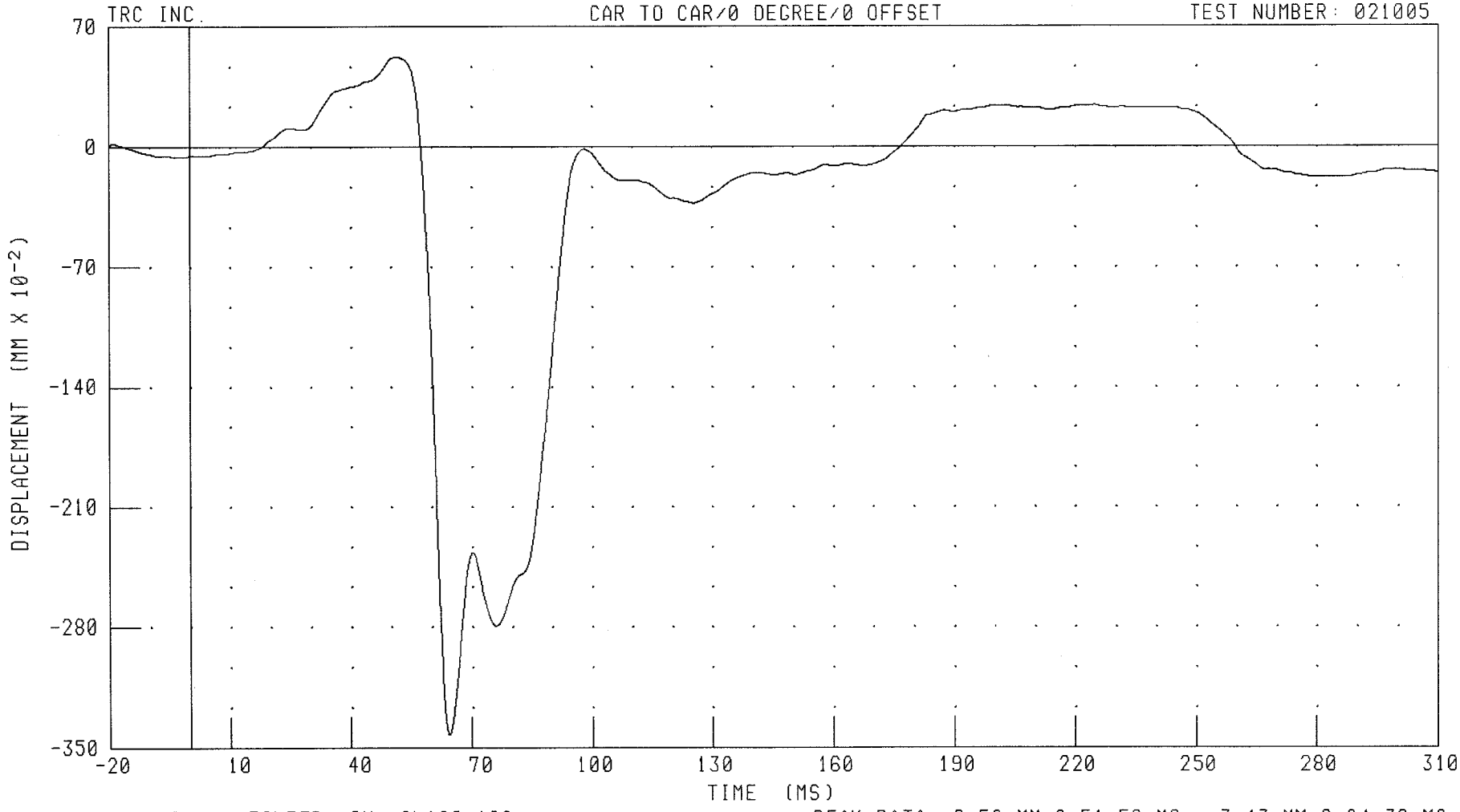


CHANNEL: RFMZFA FILTER: CH. CLASS 600 PEAK DATA: 582.43 N @ 49.12 MS; -1136.09 N @ 63.28 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER LEFT KNEE DISPLACEMENT

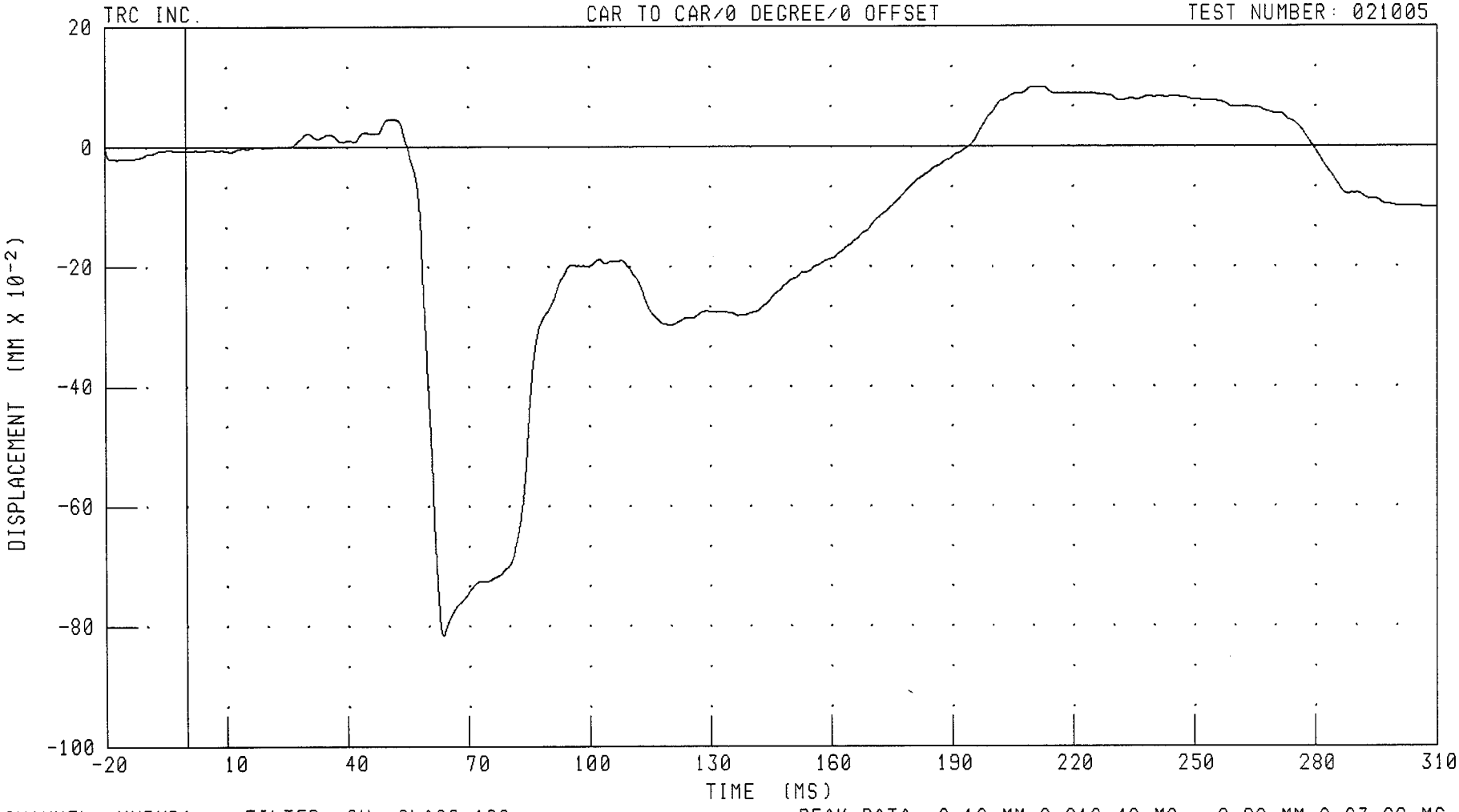


CHANNEL: KNLXDA FILTER: CH. CLASS 180 PEAK DATA: 0.52 MM @ 51.52 MS; -3.43 MM @ 64.32 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER RIGHT KNEE DISPLACEMENT



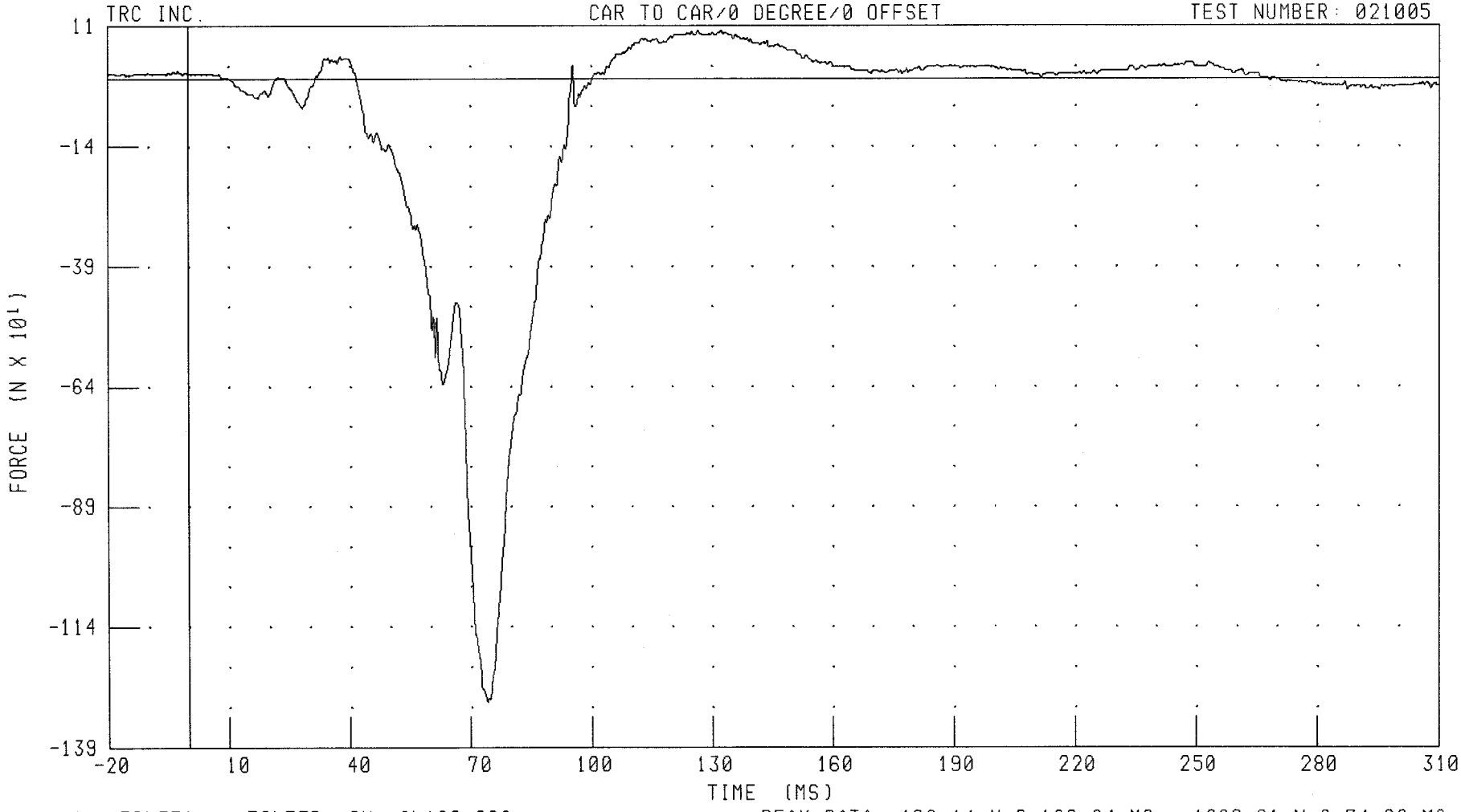
CHANNEL: KNRXDA FILTER: CH. CLASS 180

PEAK DATA: 0.10 MM @ 210.40 MS; -0.82 MM @ 63.68 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER LEFT UPPER TIBIA Z-AXIS FORCE

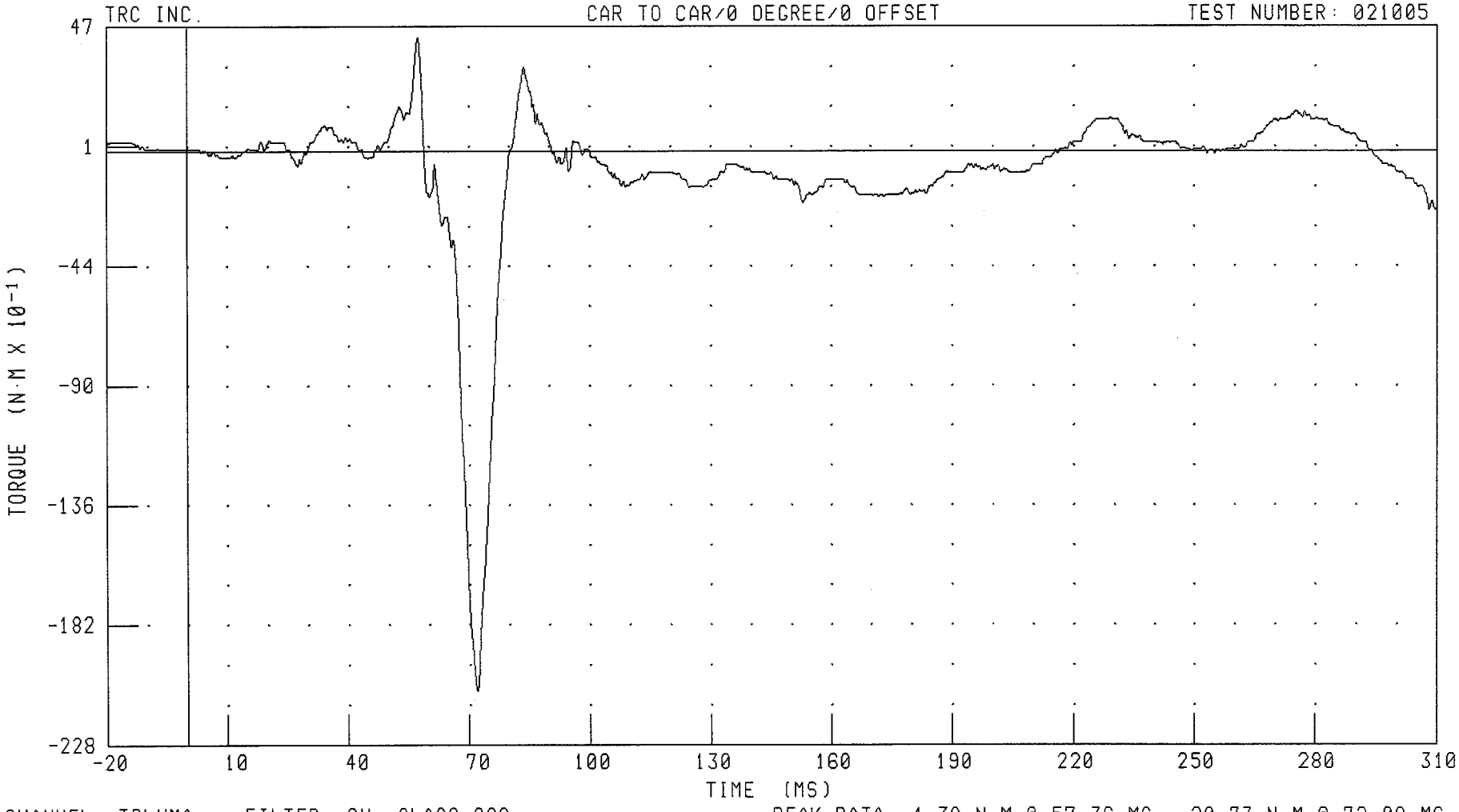


CHANNEL: TBLZFA FILTER: CH. CLASS 600 PEAK DATA: 100.14 N @ 126.64 MS; -1296.81 N @ 74.08 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS



CHANNEL: TBLXMA FILTER: CH. CLASS 600

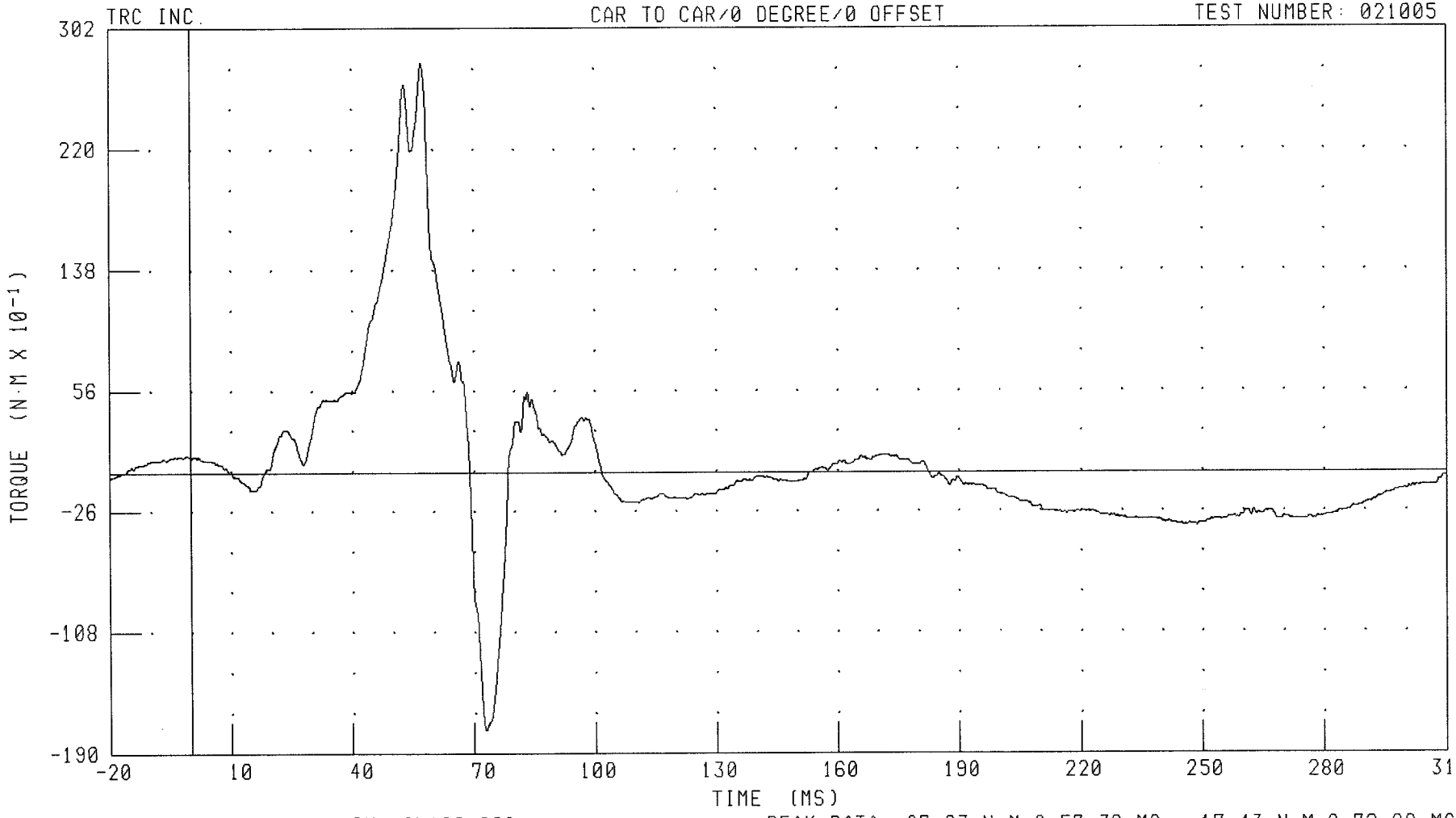
PEAK DATA: 4.38 N·M @ 57.36 MS; -20.73 N·M @ 72.08 MS

021005

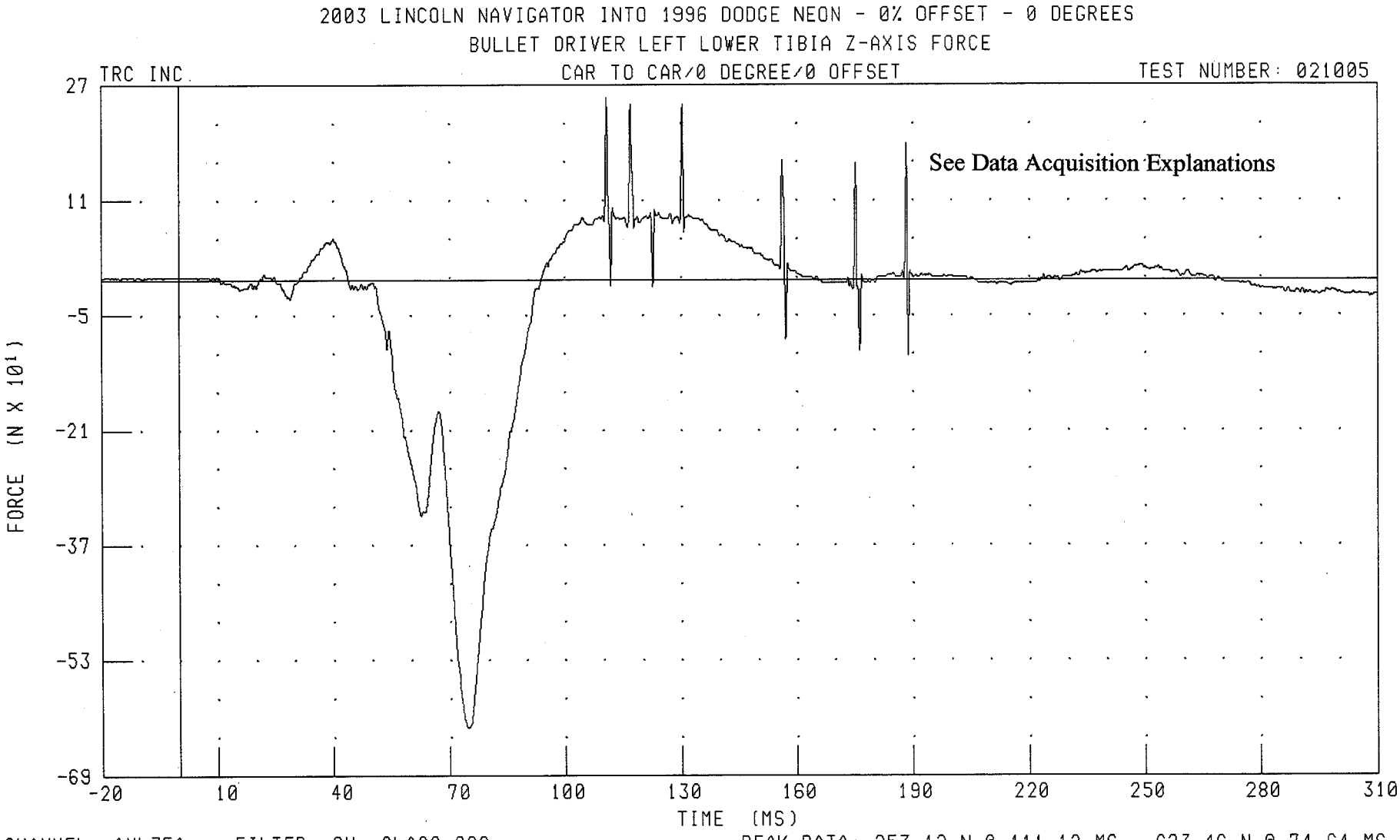
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: TBLYMA FILTER: CH. CLASS 600 PEAK DATA: 27.83 N·M @ 57.36 MS; -17.43 N·M @ 72.88 MS

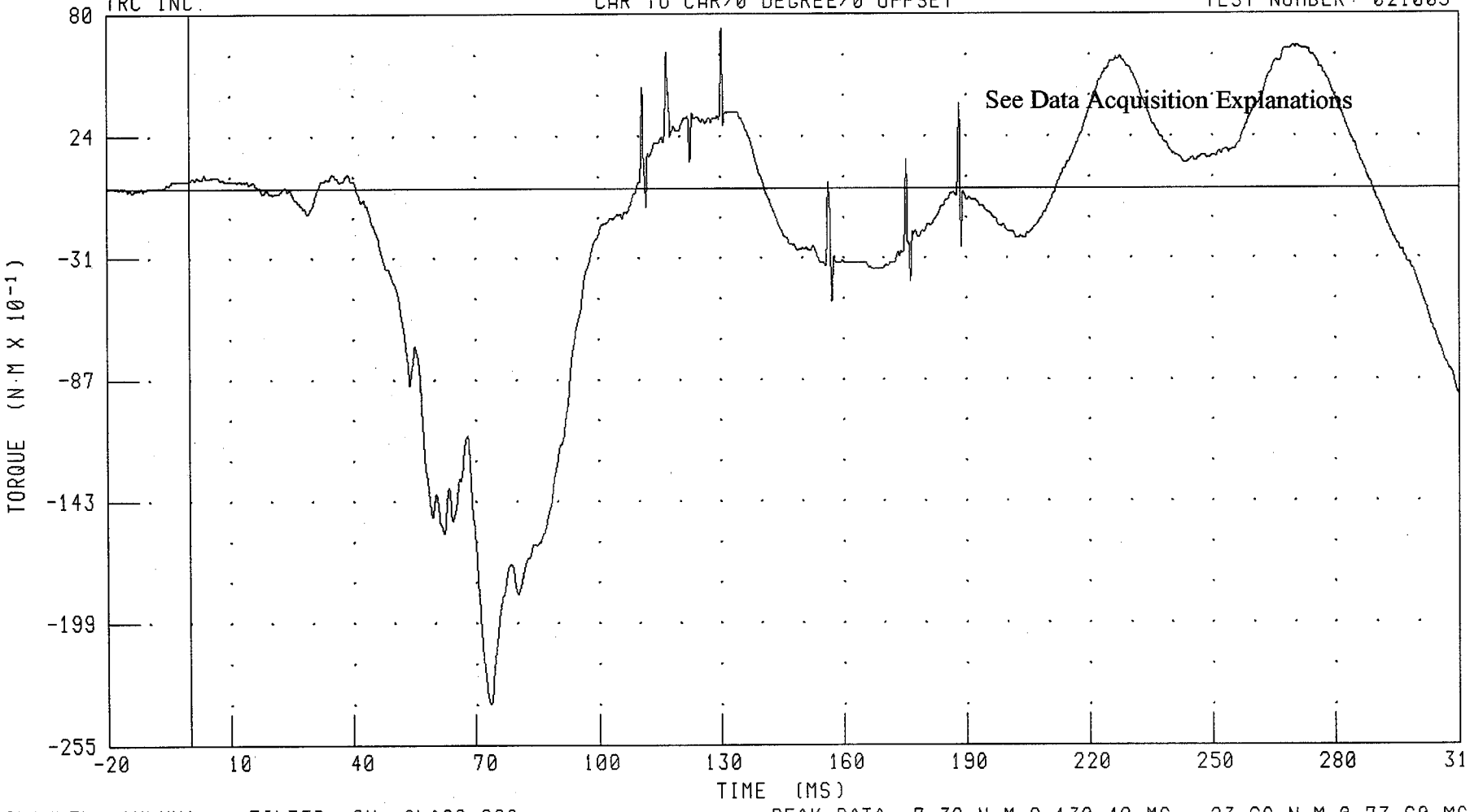

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER LEFT LOWER TIBIA Z-AXIS FORCE
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
27
11
-5
-21
-37
-53
-69
FORCE (N X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ANLZFA
FILTER: CH. CLASS 600
PEAK DATA: 253.12 N @ 111.12 MS; -623.46 N @ 74.64 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER LEFT LOWER TIBIA MOMENT ABOUT X AXIS

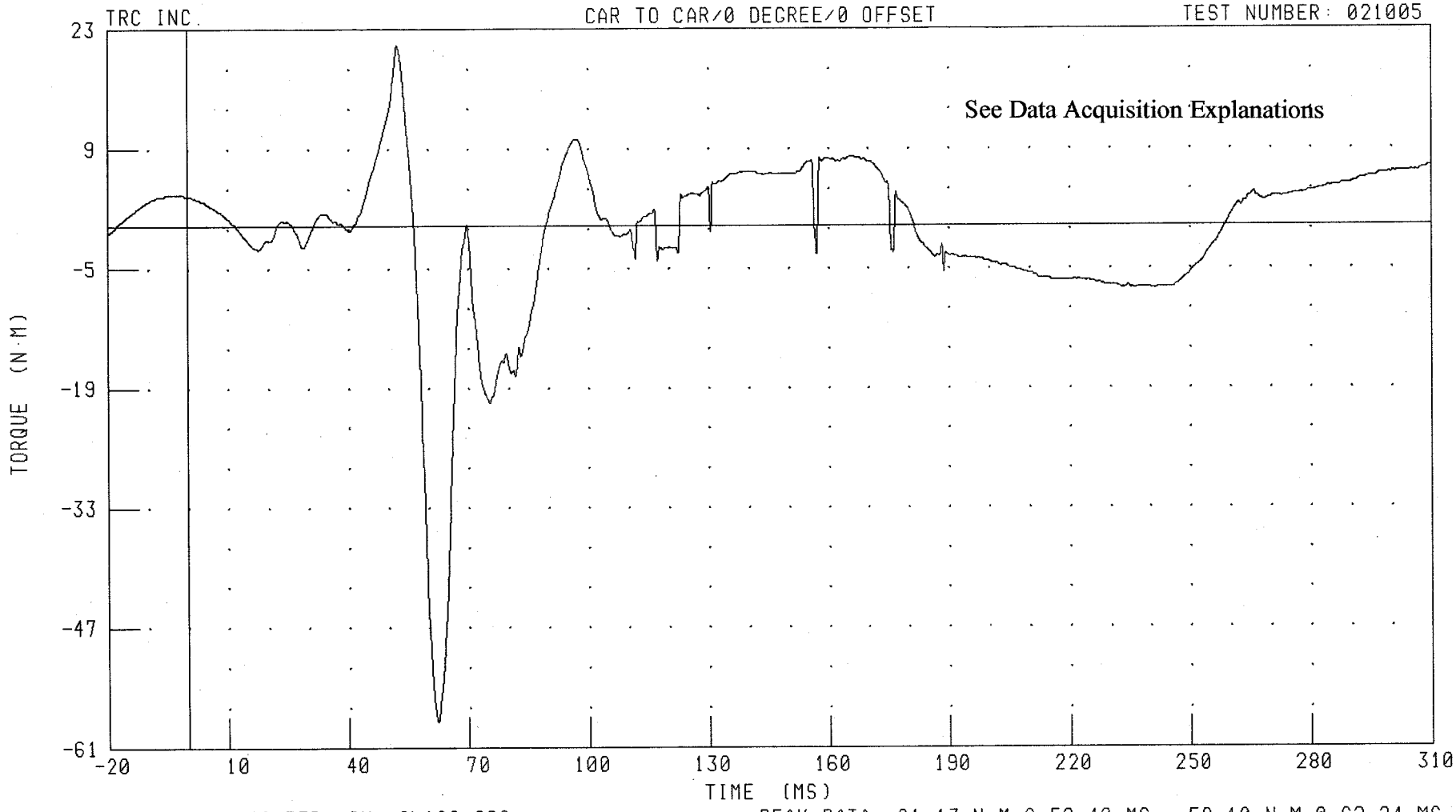
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: ANLXMA FILTER: CH. CLASS 600 PEAK DATA: 7.36 N·M @ 130.48 MS; -23.69 N·M @ 73.60 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS
CAR TO CAR/0 DEGREE/0 OFFSET



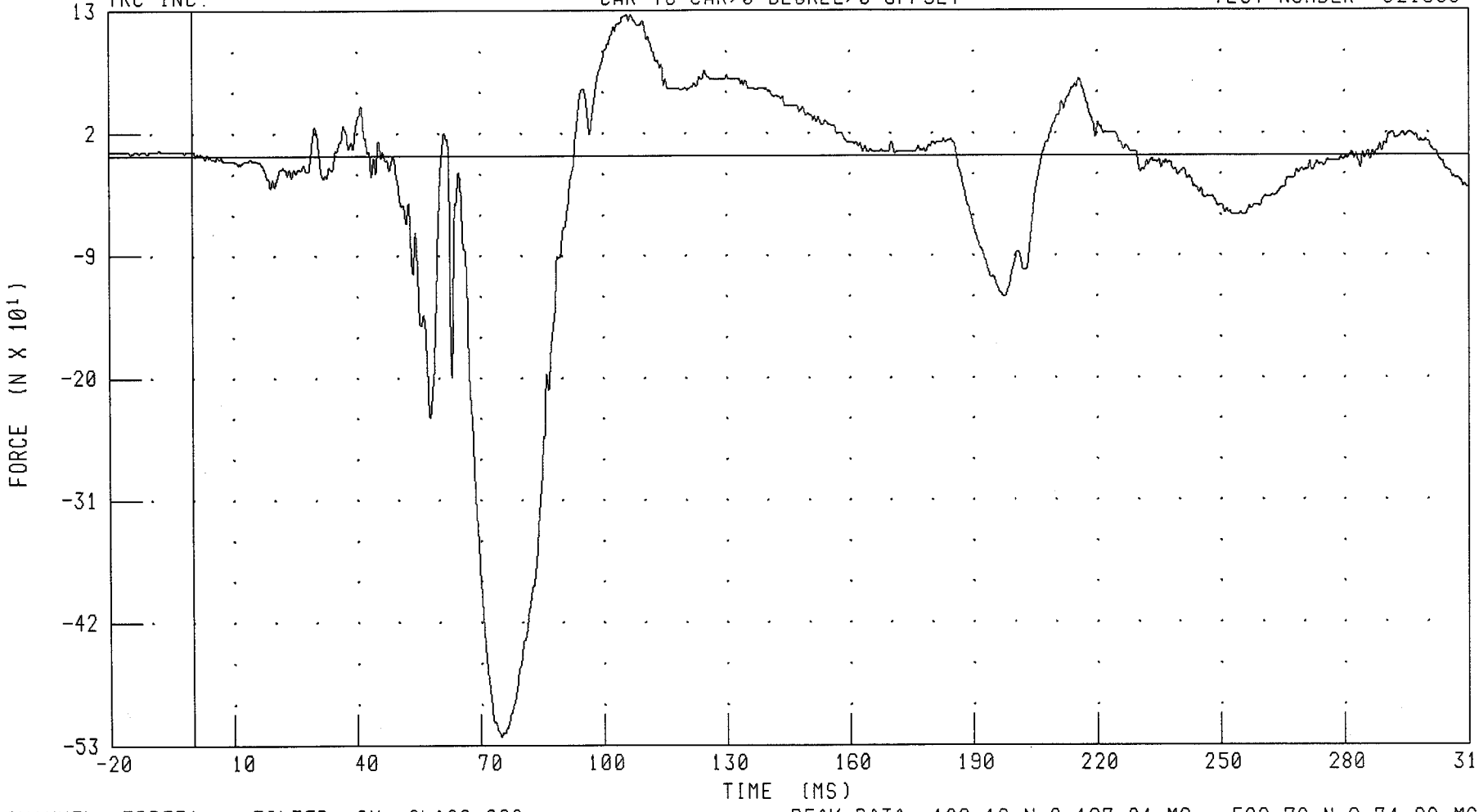
CHANNEL: ANLYMA FILTER: CH. CLASS 600 PEAK DATA: 21.13 N-M @ 52.40 MS; -58.10 N-M @ 62.24 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER RIGHT UPPER TIBIA Z-AXIS FORCE

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

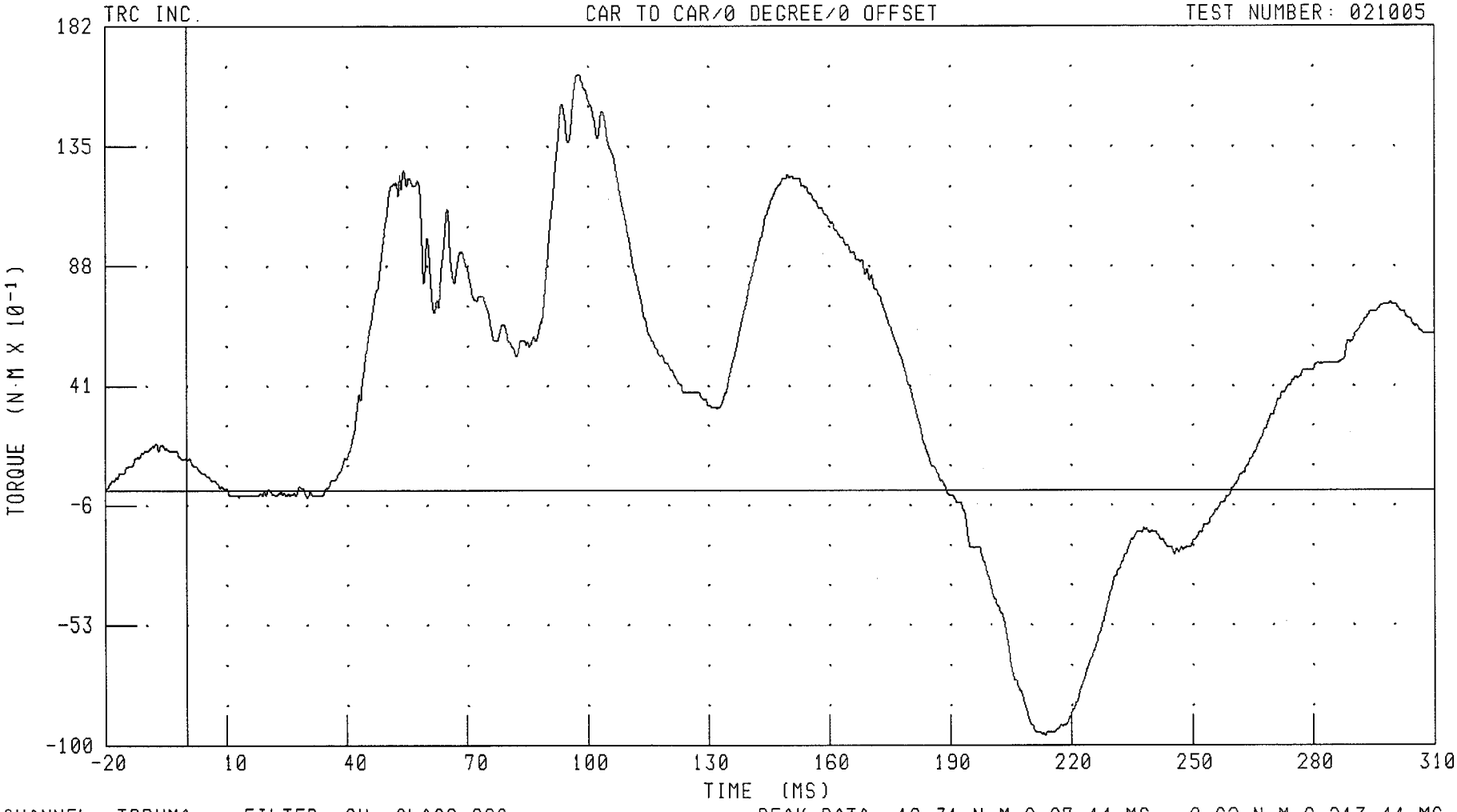


CHANNEL: TBRZFA FILTER: CH. CLASS 600 PEAK DATA: 126.16 N @ 107.04 MS; -522.76 N @ 74.88 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

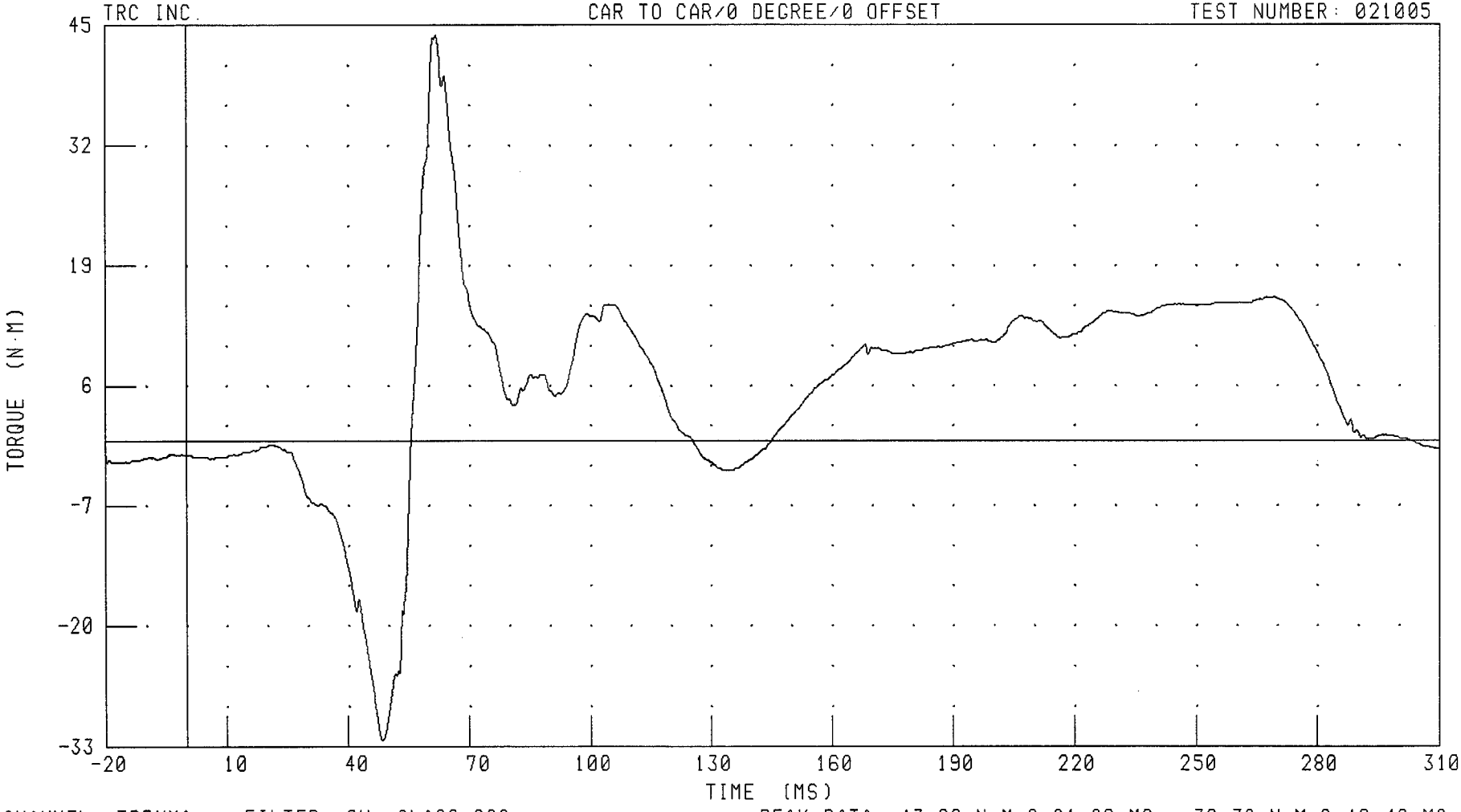


CHANNEL: TBRXMA FILTER: CH. CLASS 600 PEAK DATA: 16.31 N·M @ 97.44 MS; -9.62 N·M @ 213.44 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

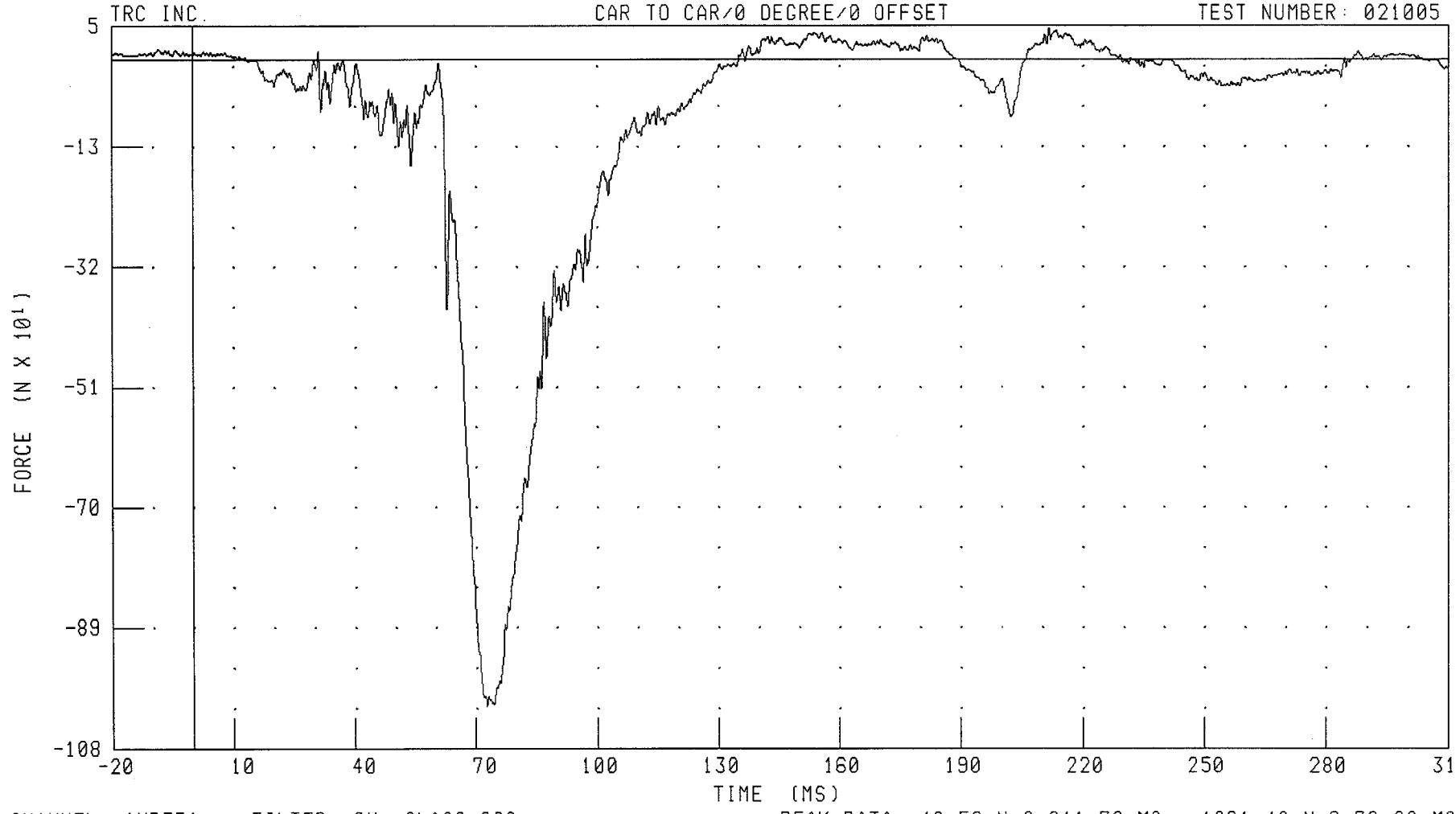
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: TBRYMA FILTER: CH. CLASS 600 PEAK DATA: 43.88 N-M @ 61.92 MS; -32.39 N-M @ 48.40 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE

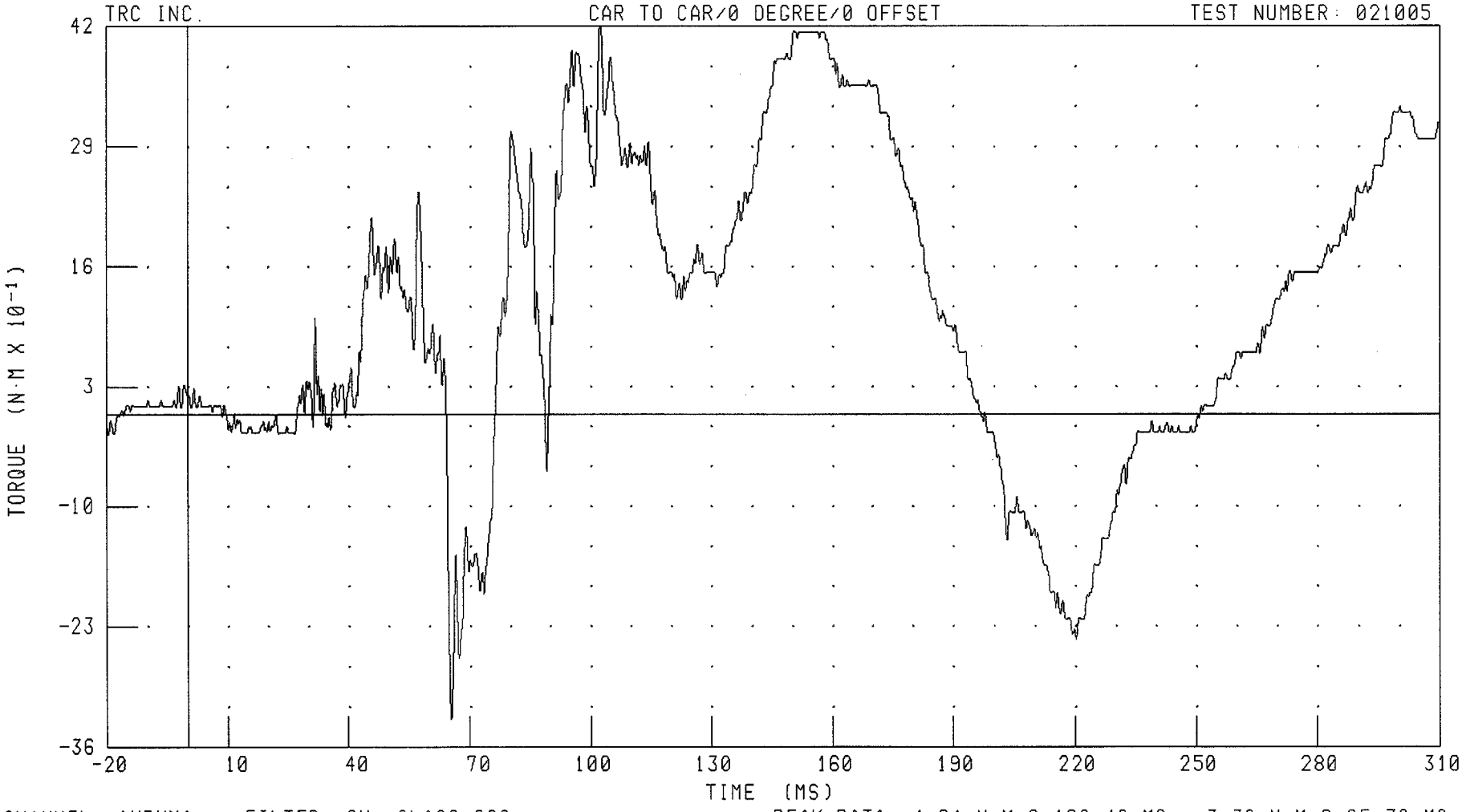


CHANNEL: ANRZFA FILTER: CH. CLASS 600

PEAK DATA: 48.52 N @ 211.76 MS; -1021.46 N @ 72.80 MS

021005

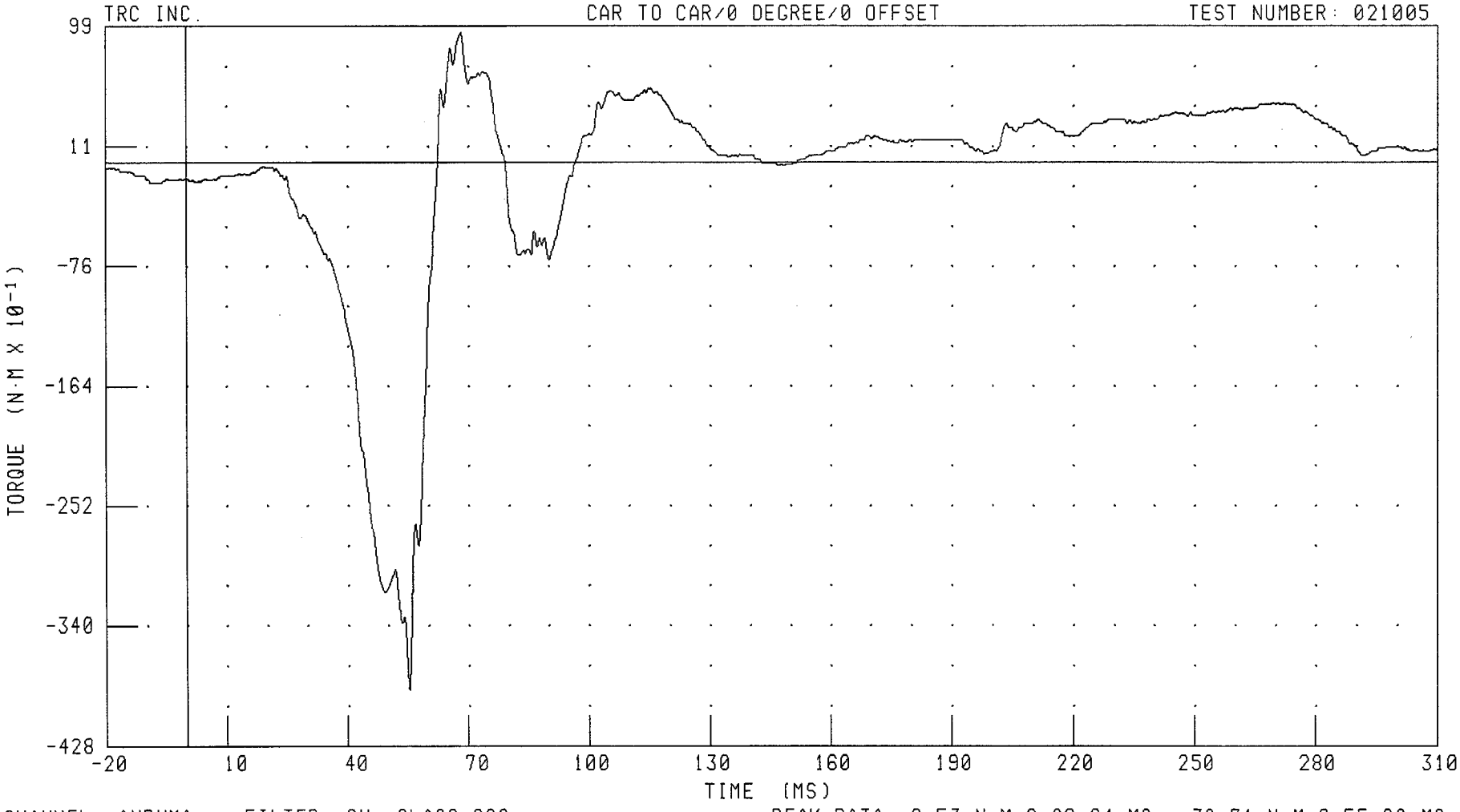
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS



CHANNEL: ANRXMA FILTER: CH. CLASS 600 PEAK DATA: 4.24 N·M @ 102.48 MS; -3.30 N·M @ 65.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

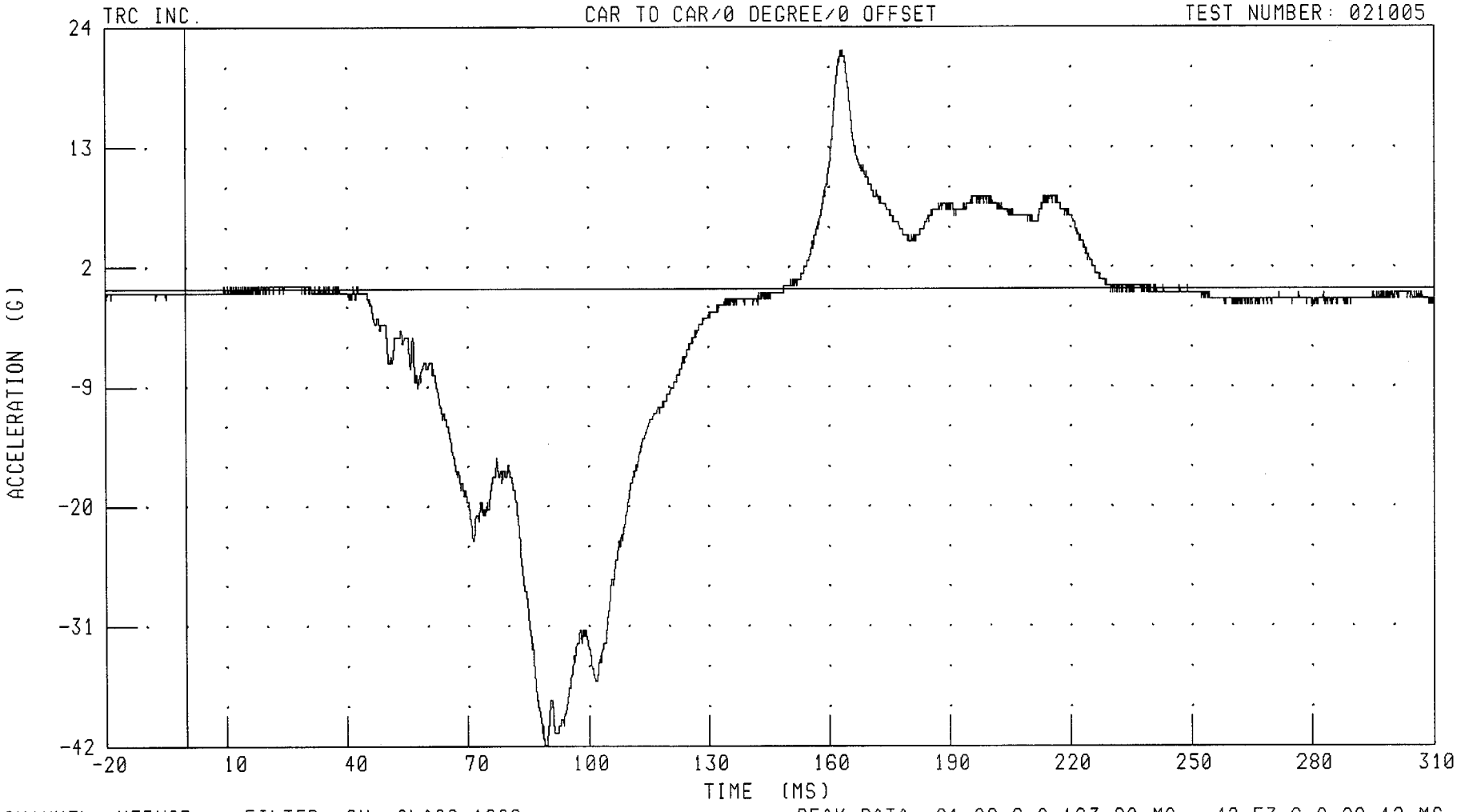


CHANNEL: ANRYMA FILTER: CH. CLASS 600 PEAK DATA: 9.53 N·M @ 68.24 MS; -38.71 N·M @ 55.28 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER HEAD X-AXIS ACCELERATION

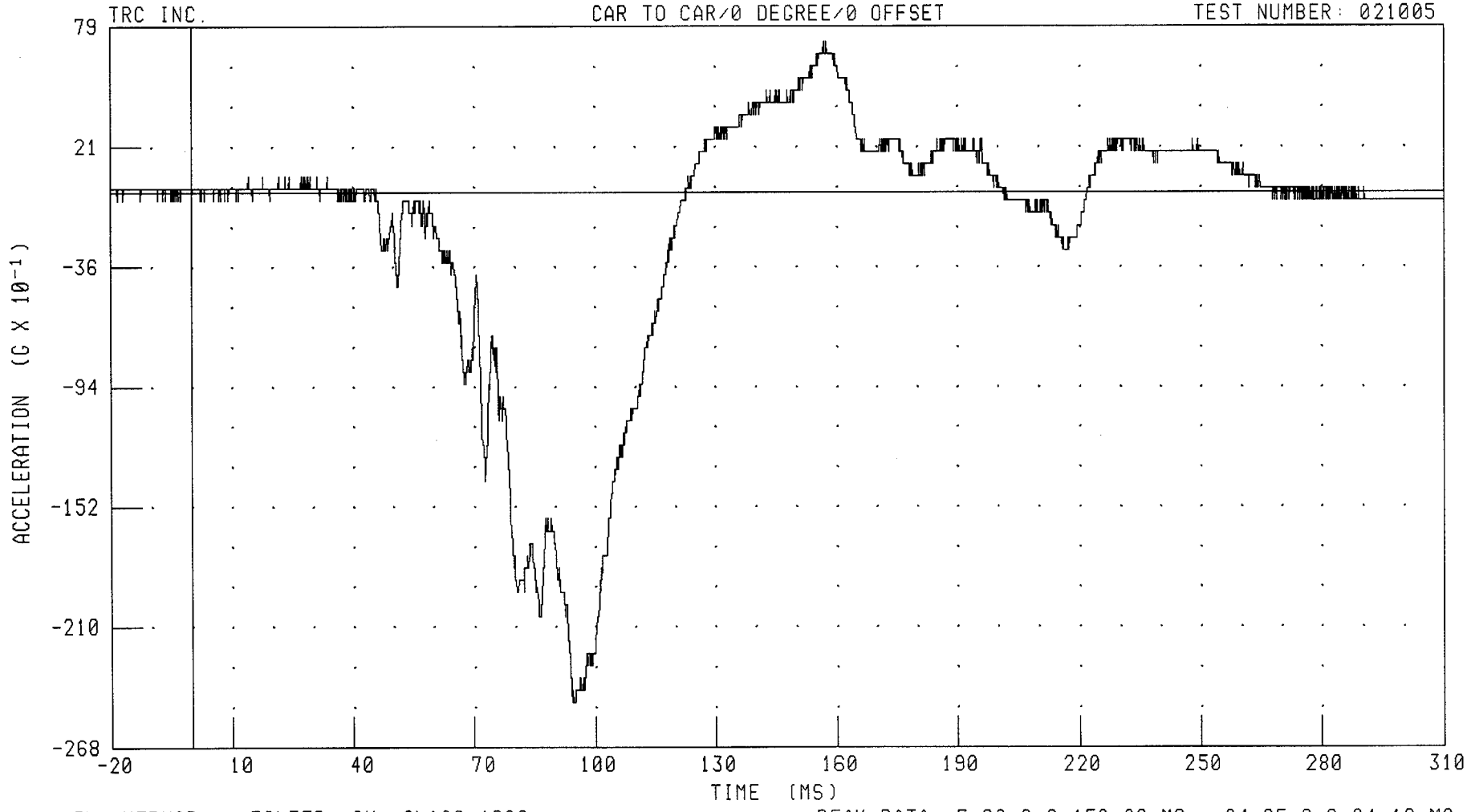


CHANNEL: HEDXGB FILTER: CH. CLASS 1000 PEAK DATA: 21.92 G @ 163.20 MS; -42.53 G @ 89.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

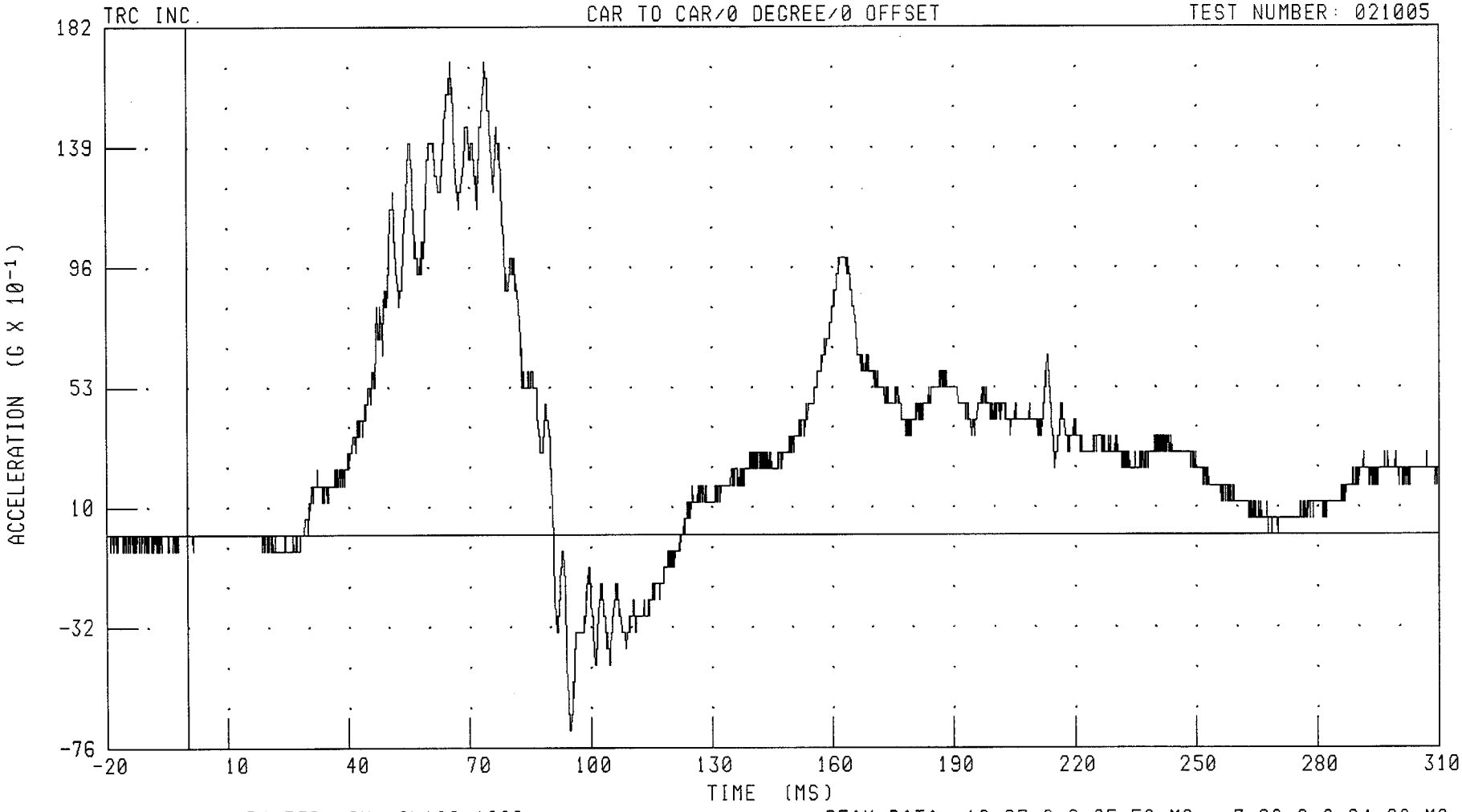
BULLET PASSENGER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYGB FILTER: CH. CLASS 1000 PEAK DATA: 7.28 G @ 156.88 MS; -24.65 G @ 94.16 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

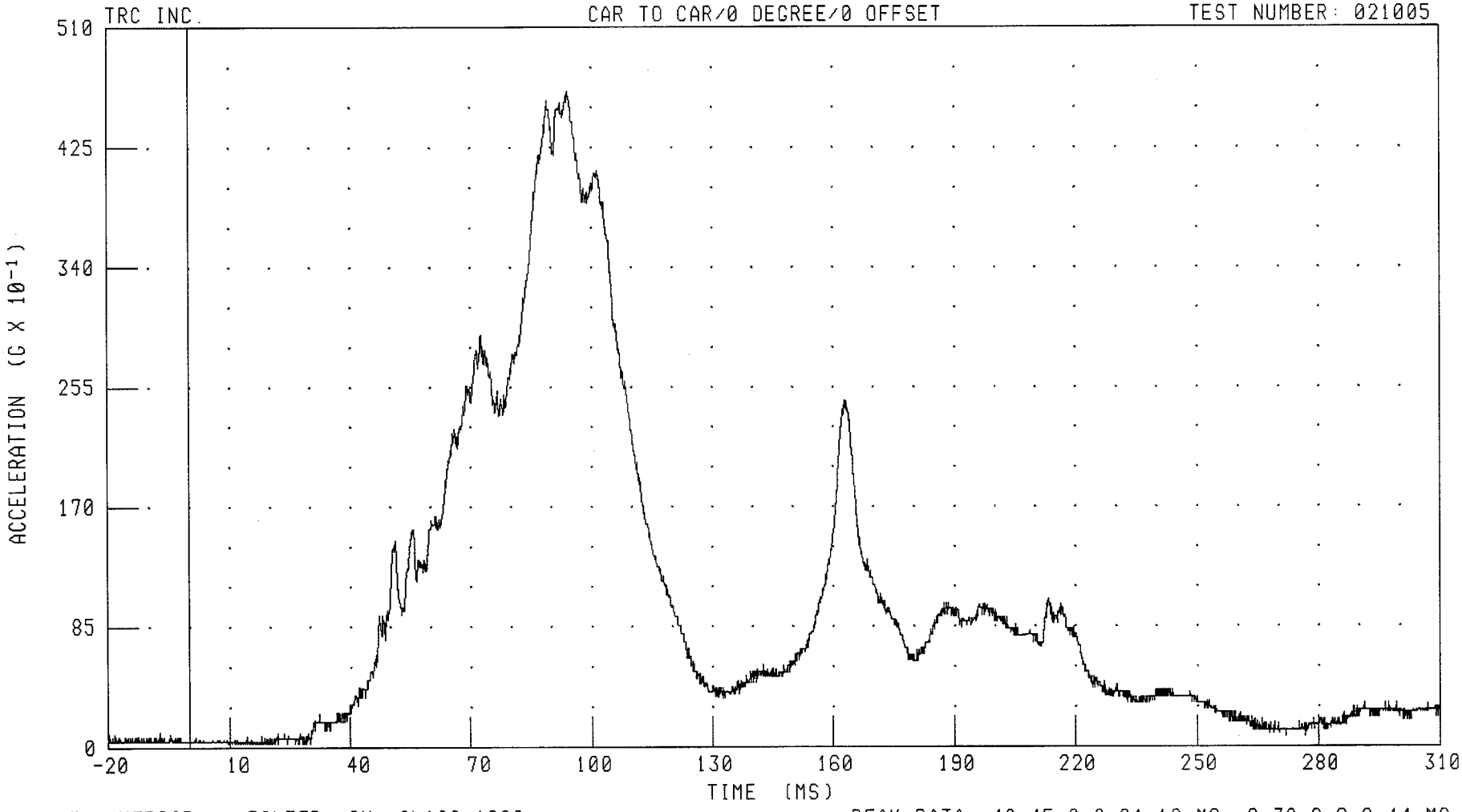
BULLET PASSENGER HEAD Z-AXIS ACCELERATION



CHANNEL: HEDZGB FILTER: CH. CLASS 1000 PEAK DATA: 16.97 G @ 65.52 MS; -7.00 G @ 94.80 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER HEAD RESULTANT ACCELERATION

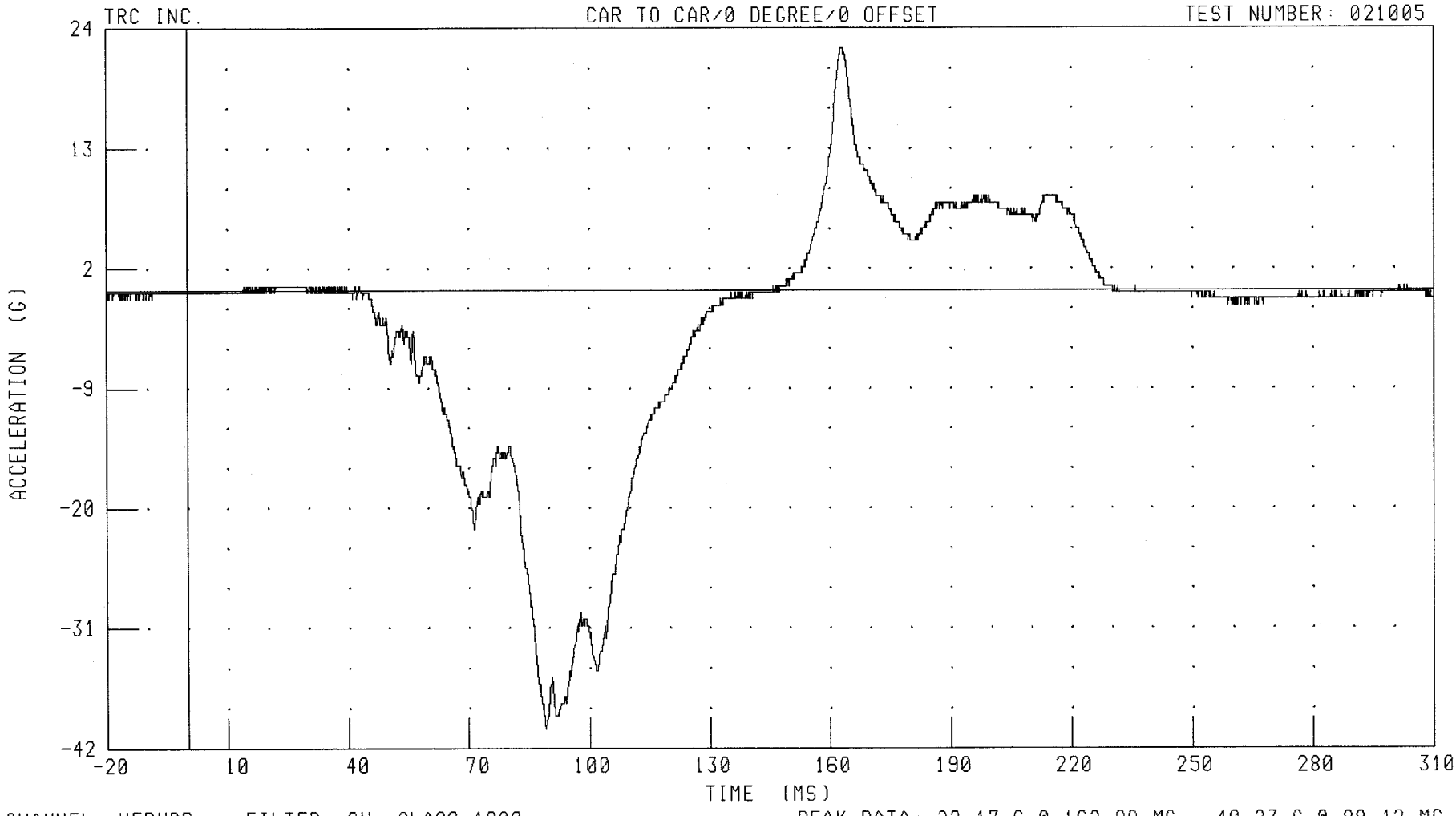


CHANNEL: HEDRGB FILTER: CH. CLASS 1000

PEAK DATA: 46.45 G @ 94.16 MS; 0.30 G @ 9.44 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER HEAD X-AXIS ACCELERATION REDUNDANT

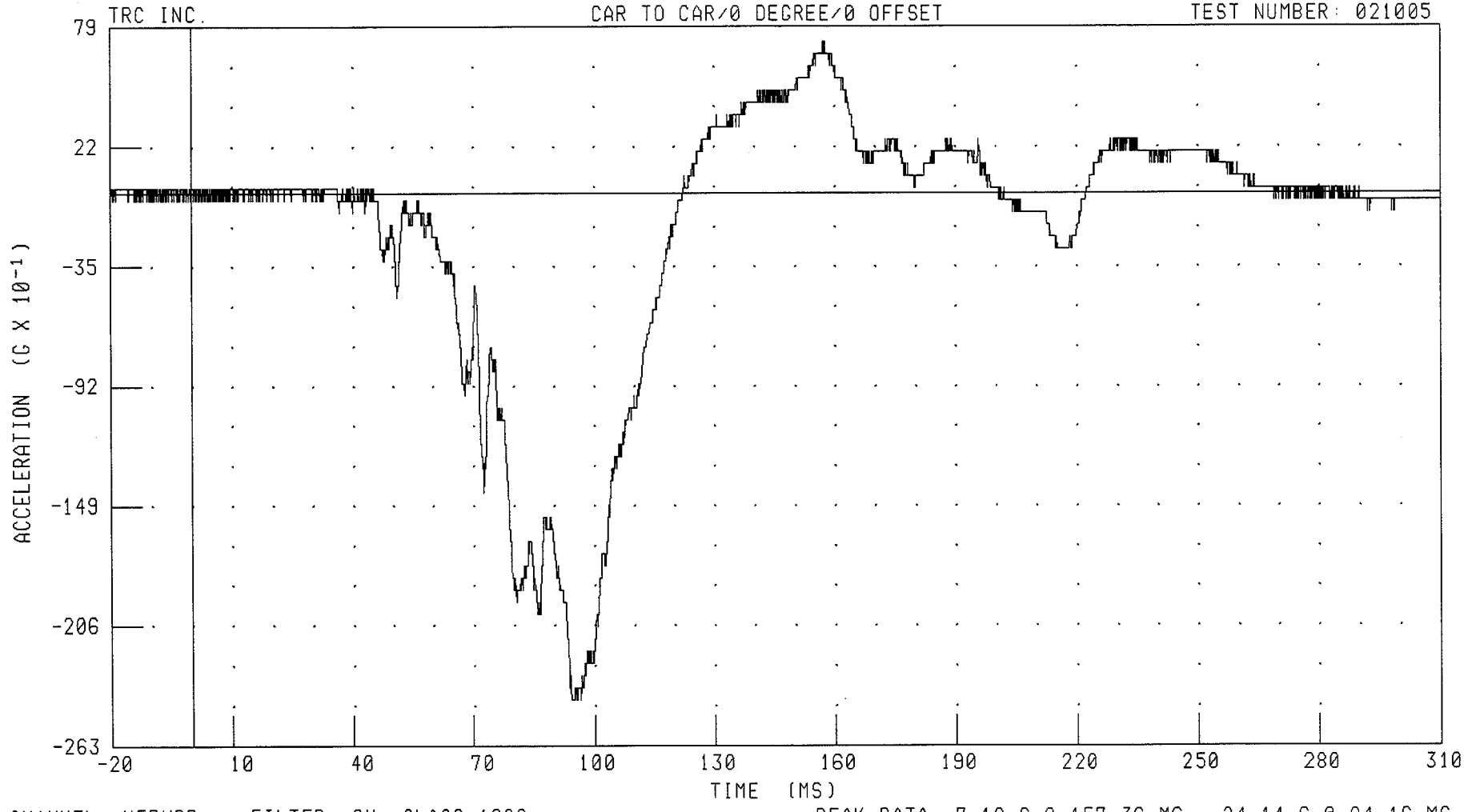


CHANNEL: HEDXRB FILTER: CH. CLASS 1000 PEAK DATA: 22.17 G @ 162.88 MS; -40.23 G @ 89.12 MS

021005

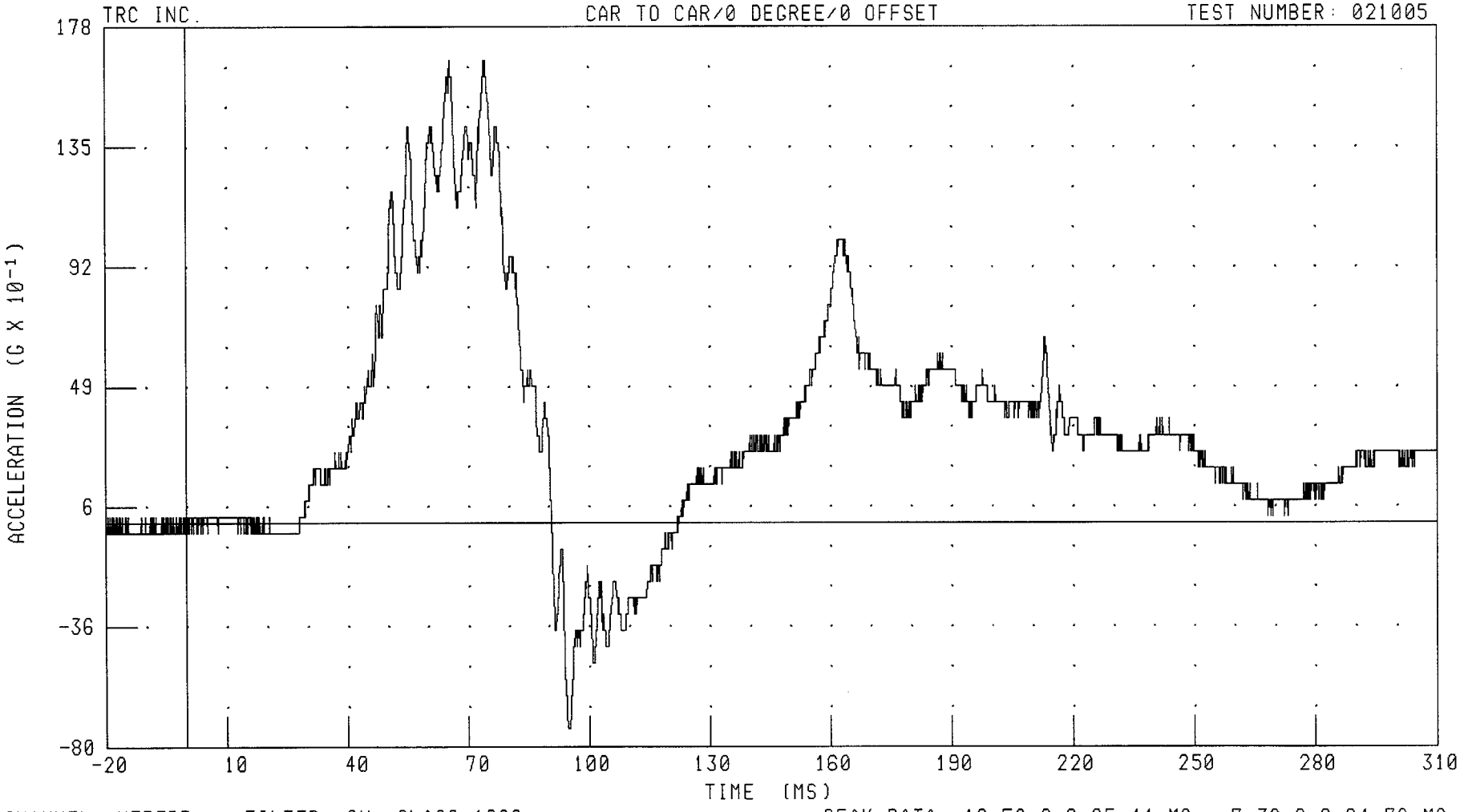
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER HEAD Y-AXIS ACCELERATION REDUNDANT



CHANNEL: HEDYRB FILTER: CH. CLASS 1000 PEAK DATA: 7.19 G @ 157.36 MS; -24.14 G @ 94.16 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER HEAD Z-AXIS ACCELERATION REDUNDANT



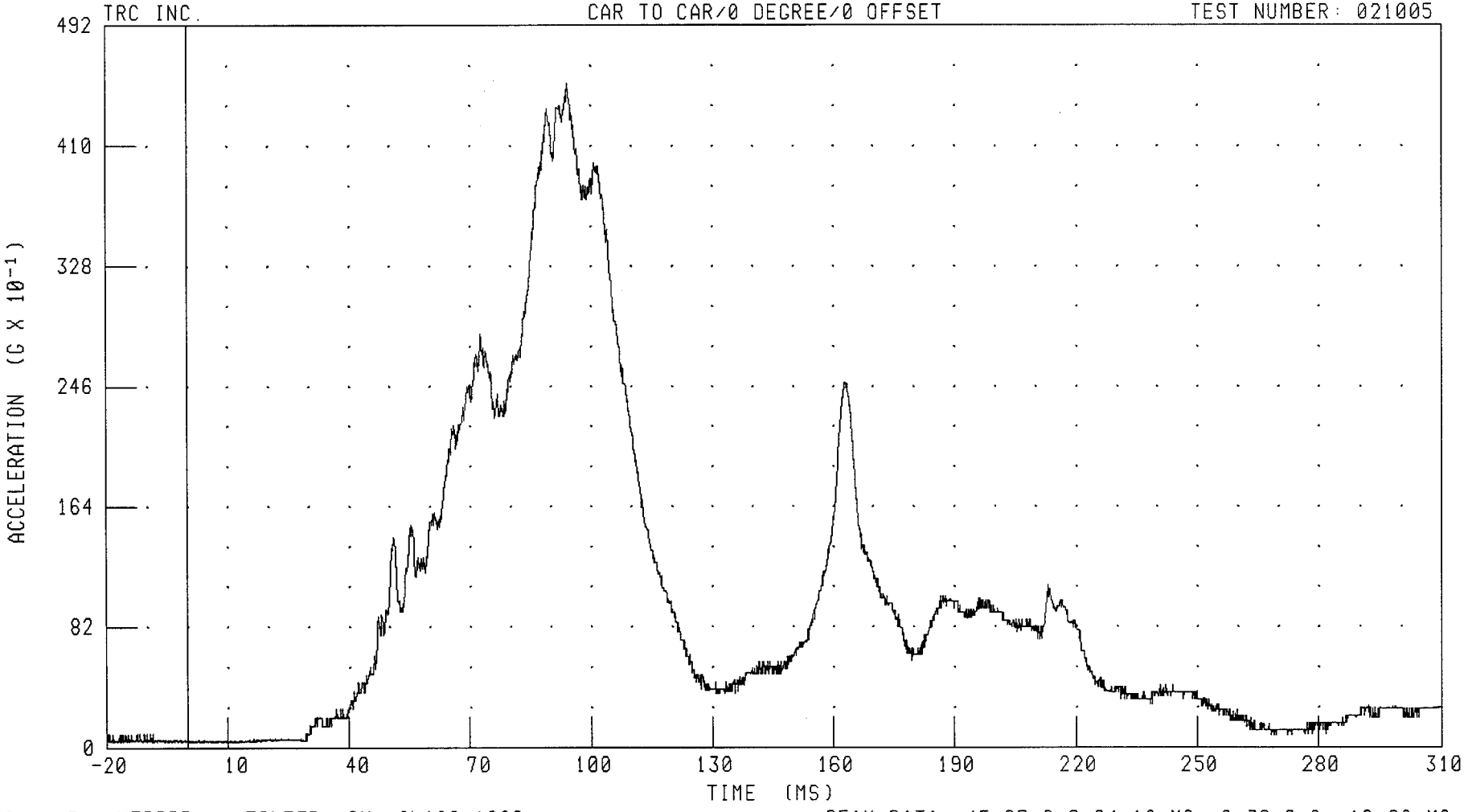
CHANNEL: HEDZRB FILTER: CH. CLASS 1000 PEAK DATA: 16.59 G @ 65.44 MS; -7.36 G @ 94.72 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

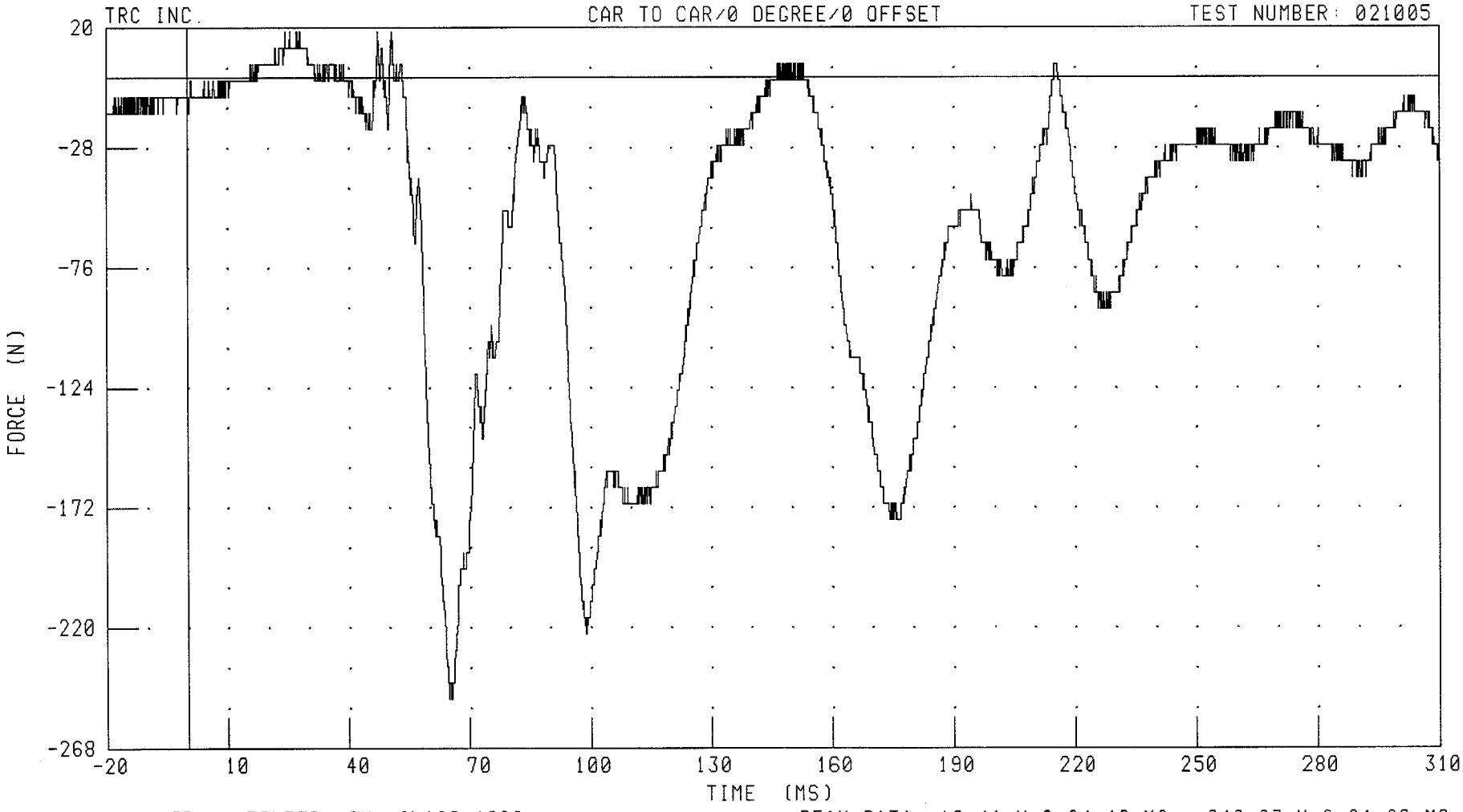
BULLET PASSENGER HEAD RESULTANT ACCELERATION REDUNDANT

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: HEDRRB FILTER: CH. CLASS 1000 PEAK DATA: 45.27 G @ 94.16 MS; 0.38 G @ -19.92 MS

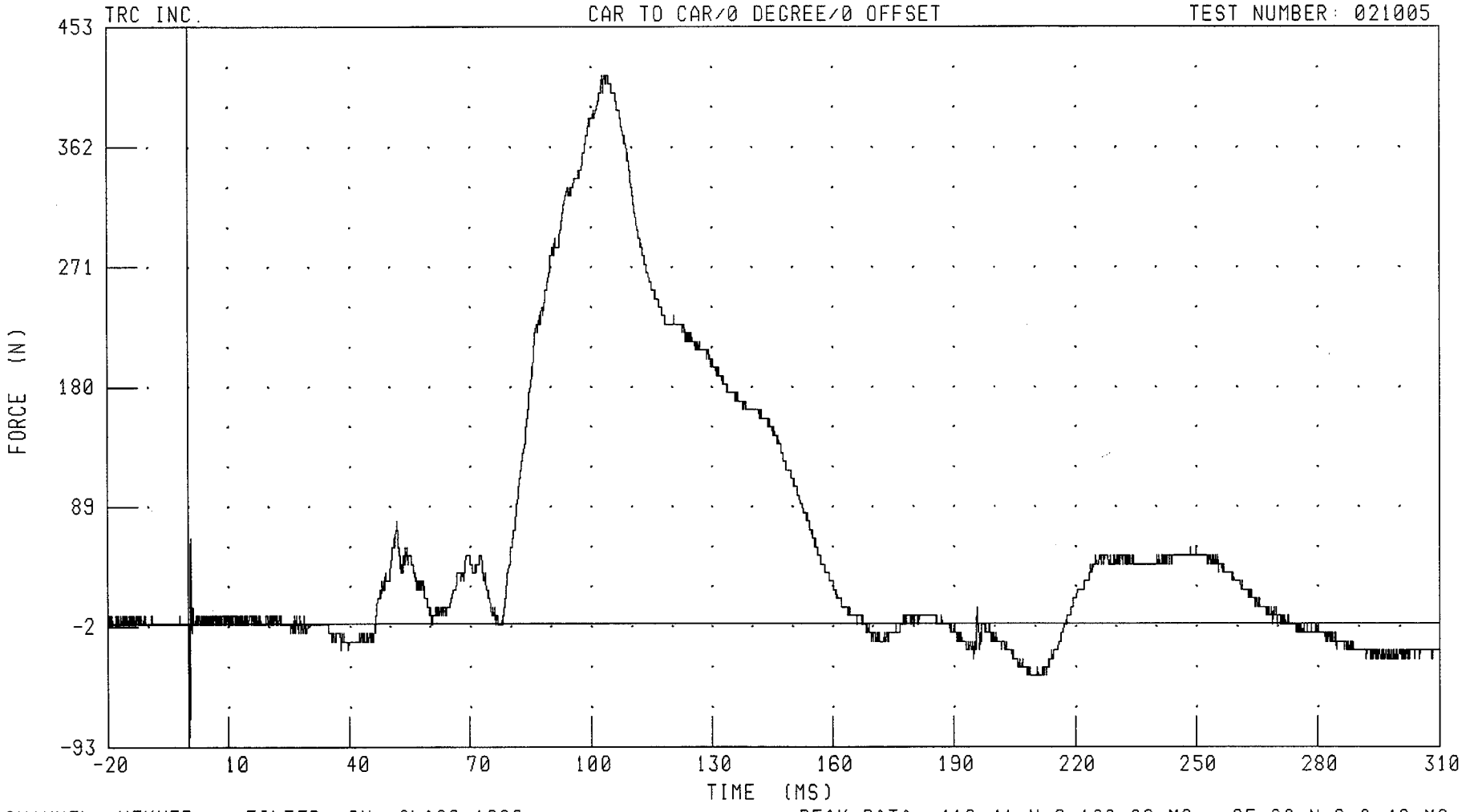
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXFB FILTER: CH. CLASS 1000 PEAK DATA: 18.41 N @ 24.40 MS; -248.63 N @ 64.80 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NECK Y-AXIS SHEAR FORCE



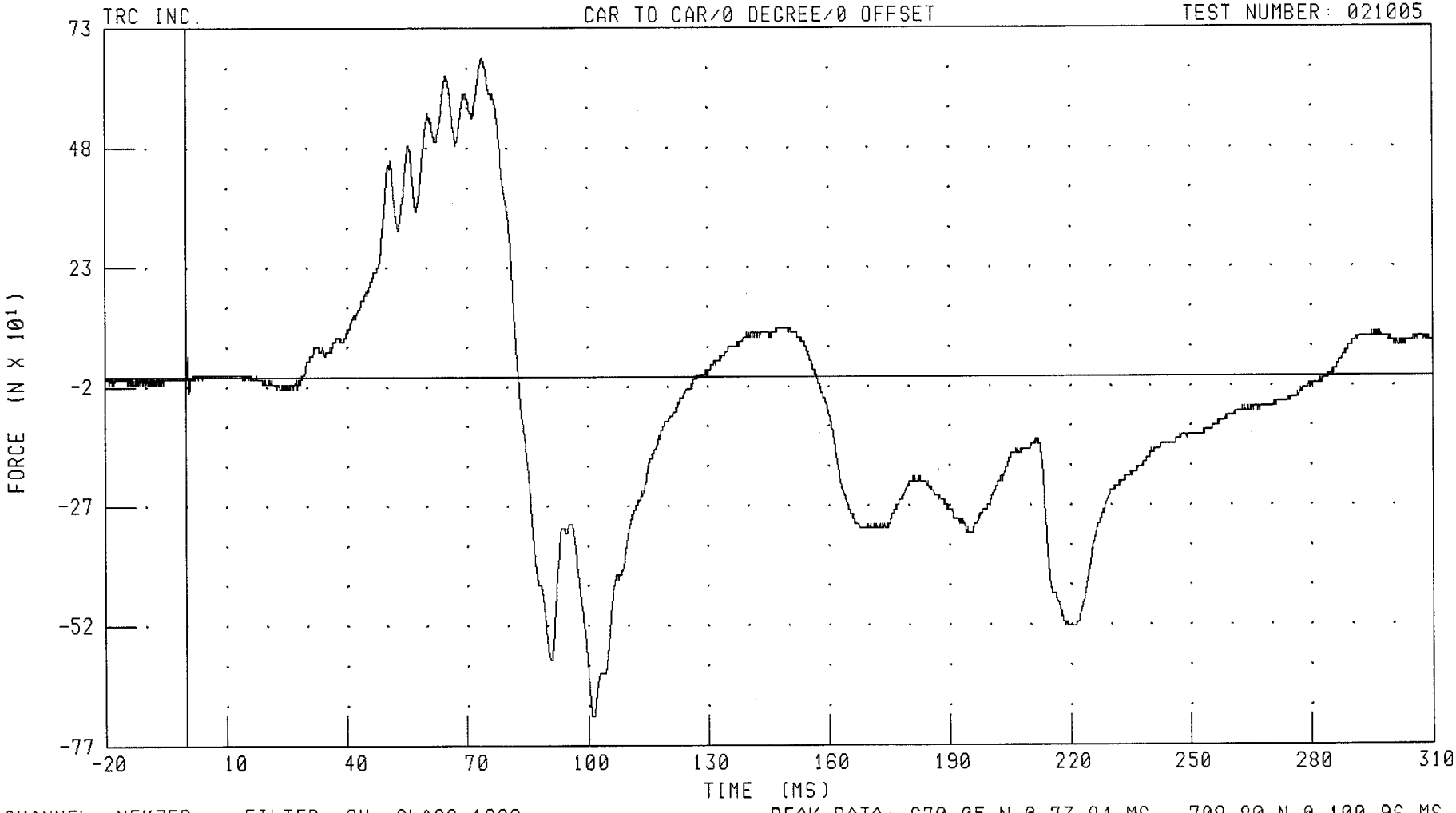
CHANNEL: NEKYFB FILTER: CH. CLASS 1000 PEAK DATA: 416.41 N @ 102.80 MS; -85.09 N @ 0.40 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER NECK Z-AXIS AXIAL FORCE

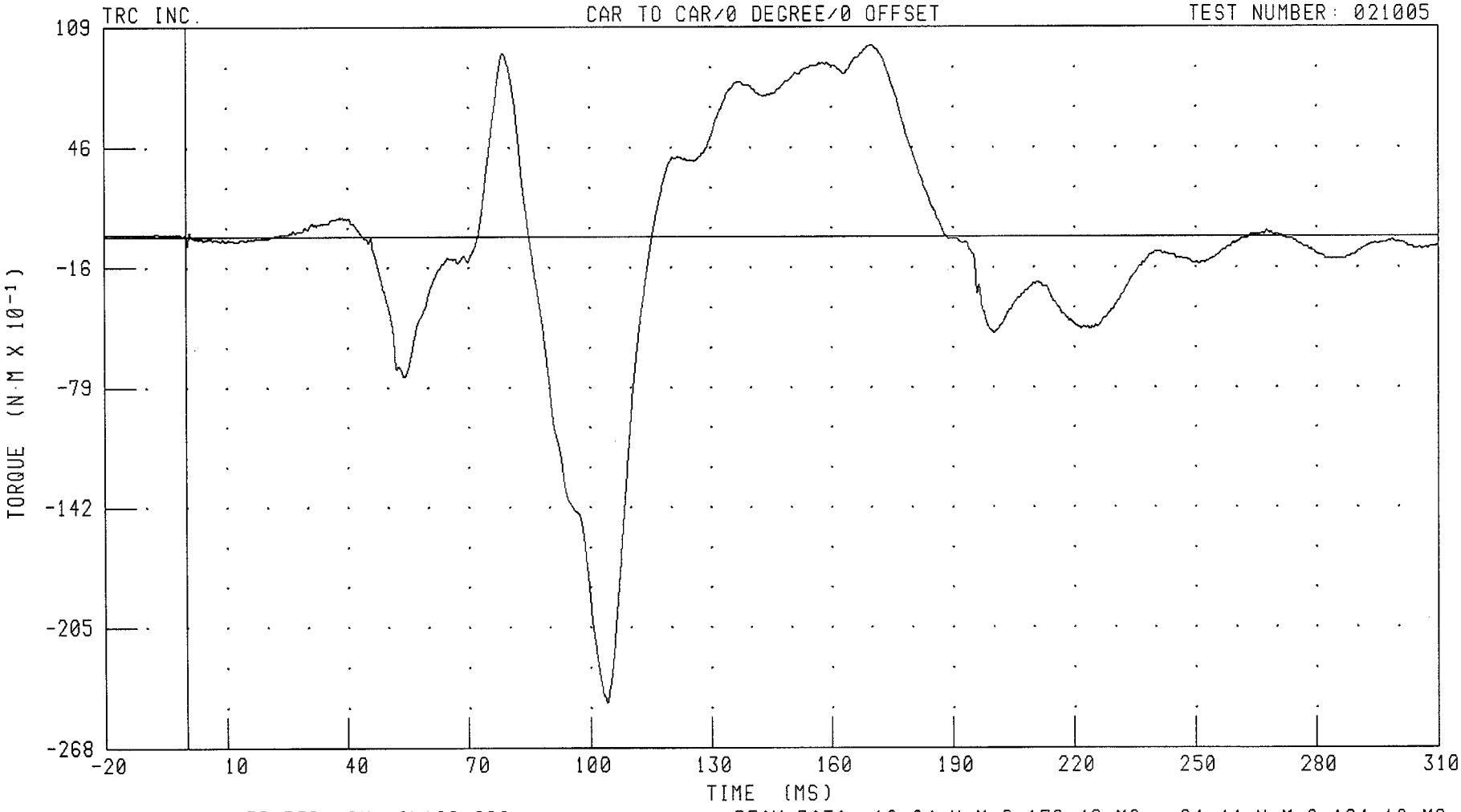
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: NEKZFB FILTER: CH. CLASS 1000

PEAK DATA: 670.05 N @ 73.84 MS; -708.80 N @ 100.96 MS

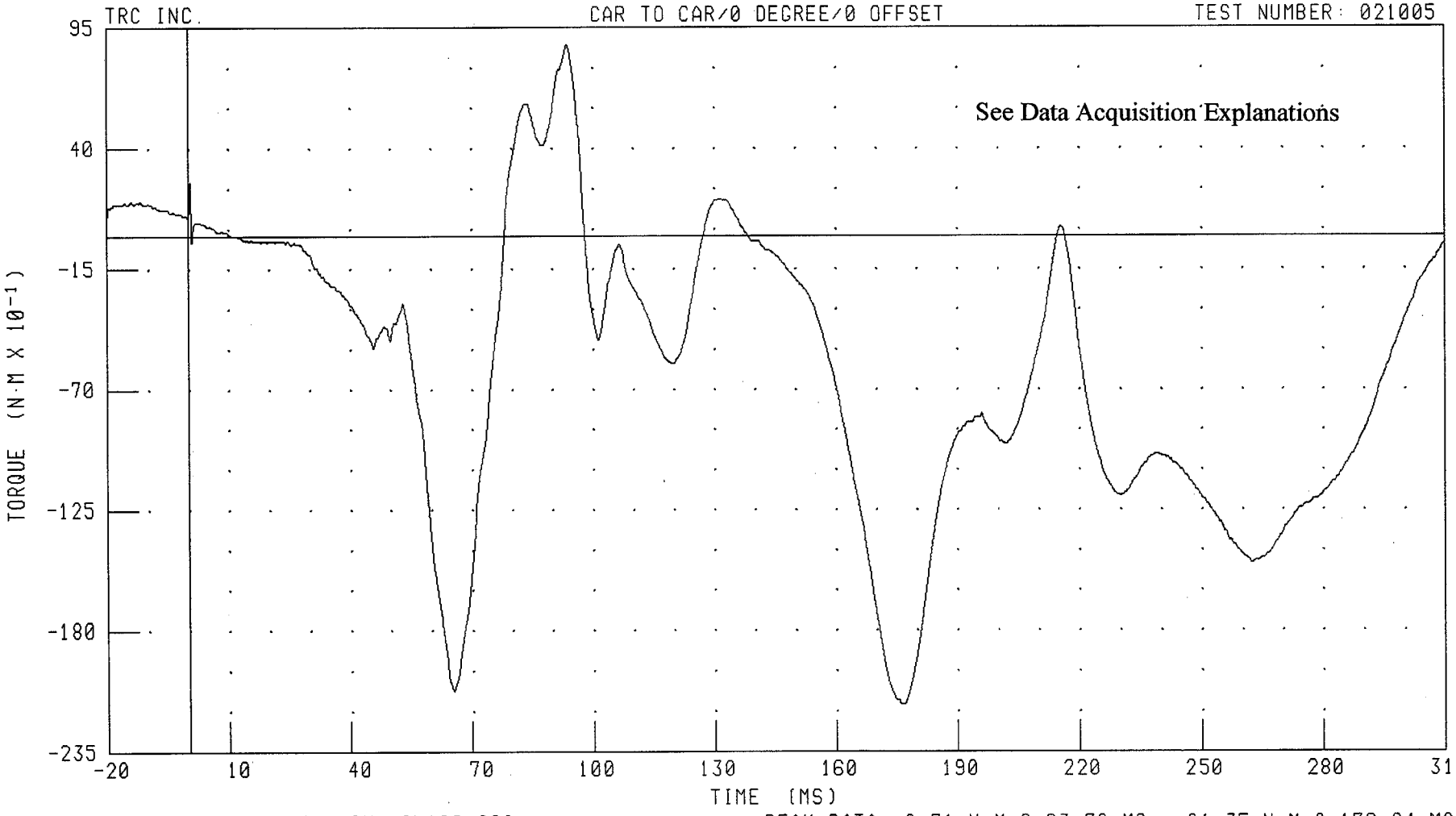
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NECK MOMENT ABOUT X AXIS



CHANNEL: NEKXMB FILTER: CH. CLASS 600 PEAK DATA: 10.04 N·M @ 170.40 MS; -24.44 N·M @ 104.16 MS

021005

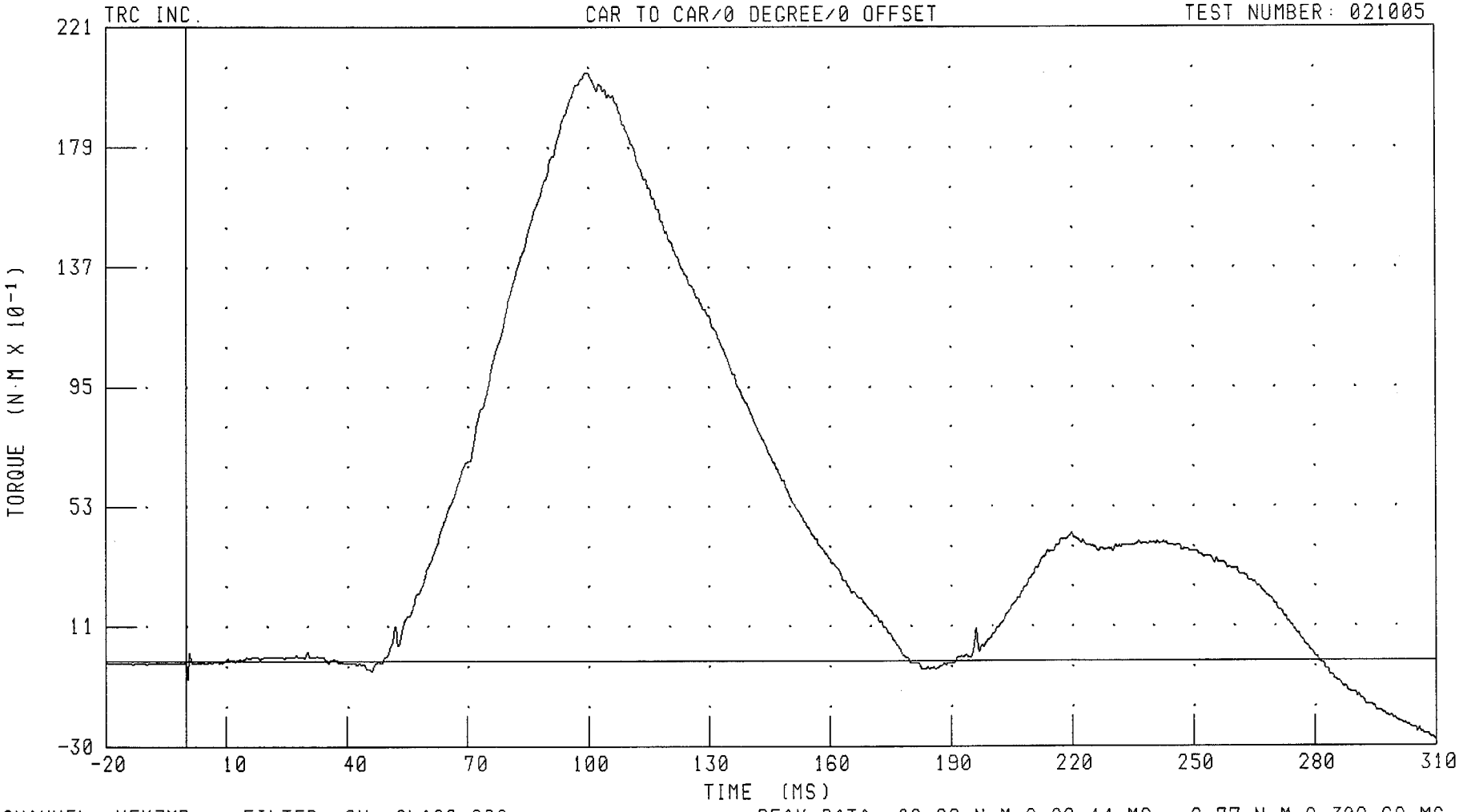
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NECK MOMENT ABOUT Y AXIS



CHANNEL: NEKYMB FILTER: CH. CLASS 600 PEAK DATA: 8.71 N-M @ 93.76 MS; -21.35 N-M @ 176.24 MS

021005

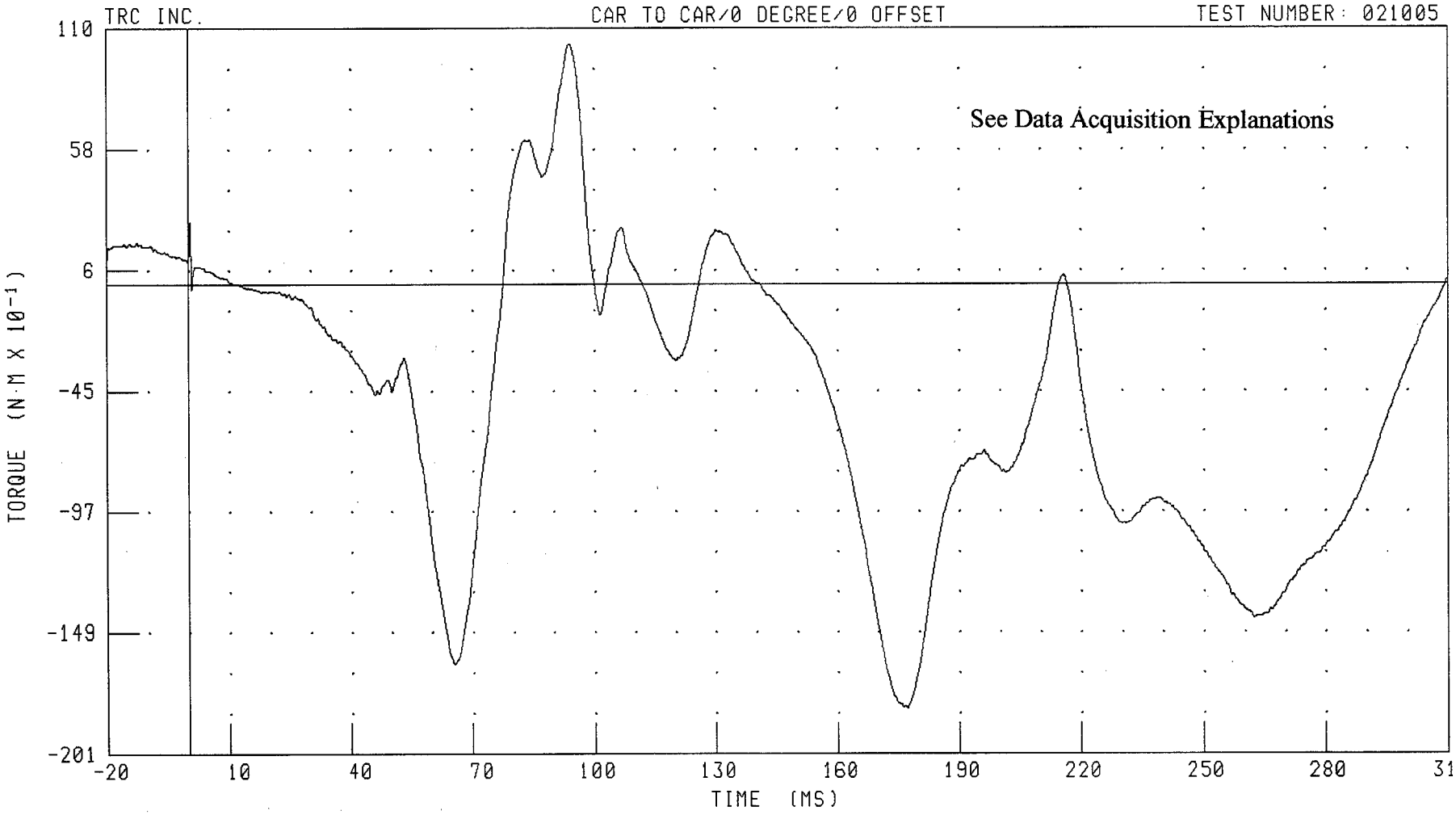
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NECK MOMENT ABOUT Z AXIS
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: NEKZMB FILTER: CH. CLASS 600
PEAK DATA: 20.60 N·M @ 99.44 MS; -2.77 N·M @ 309.68 MS

021005

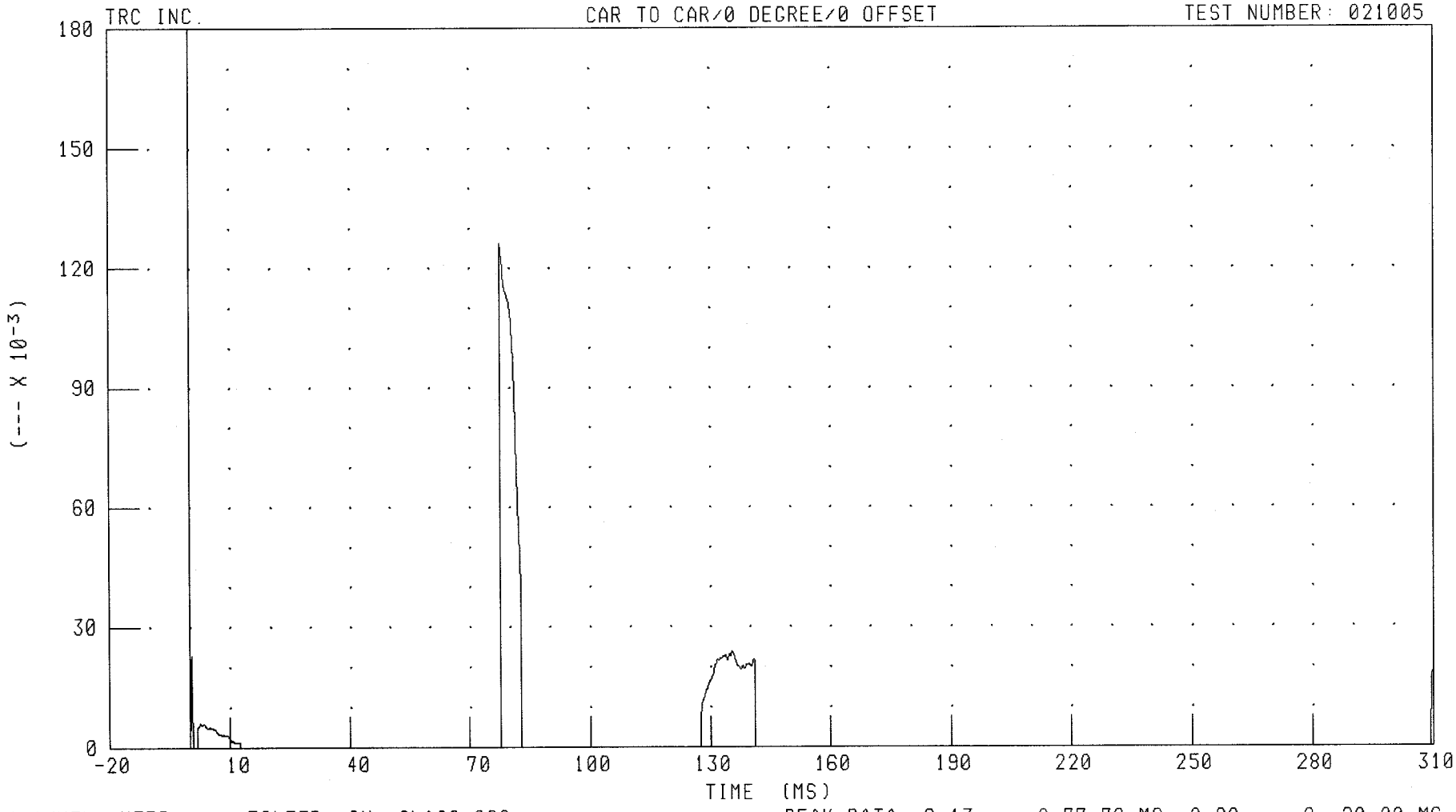
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS



CHANNEL: NEKOMB FILTER: CH. CLASS 600 PEAK DATA: 10.32 N-M @ 94.00 MS; -18.25 N-M @ 177.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NIJ TENSION/FLEXION
CAR TO CAR/0 DEGREE/0 OFFSET



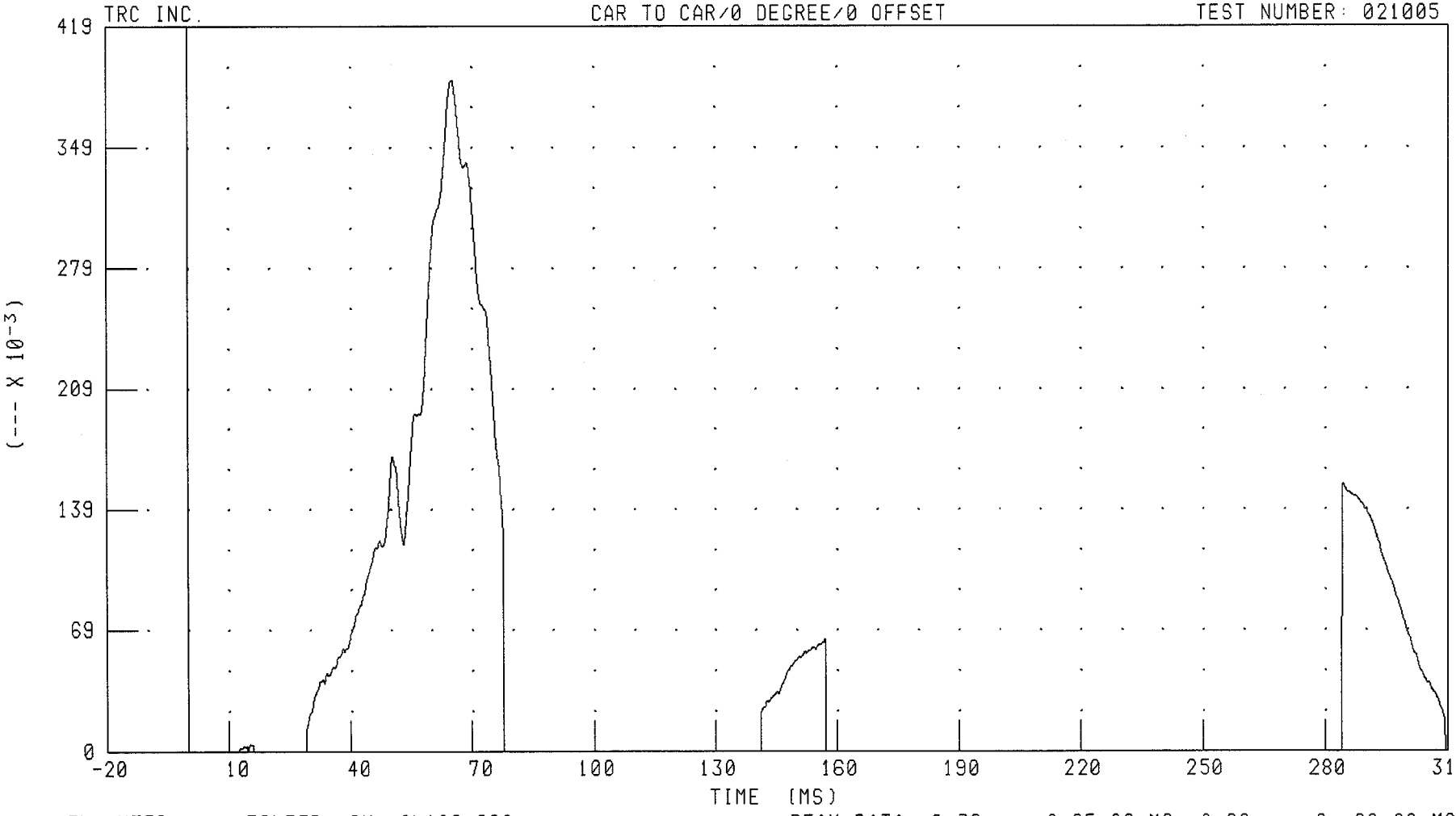
CHANNEL: NTFB FILTER: CH. CLASS 600 PEAK DATA: 0.13 --- @ 77.76 MS; 0.00 --- @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER NIJ TENSION/EXTENSION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



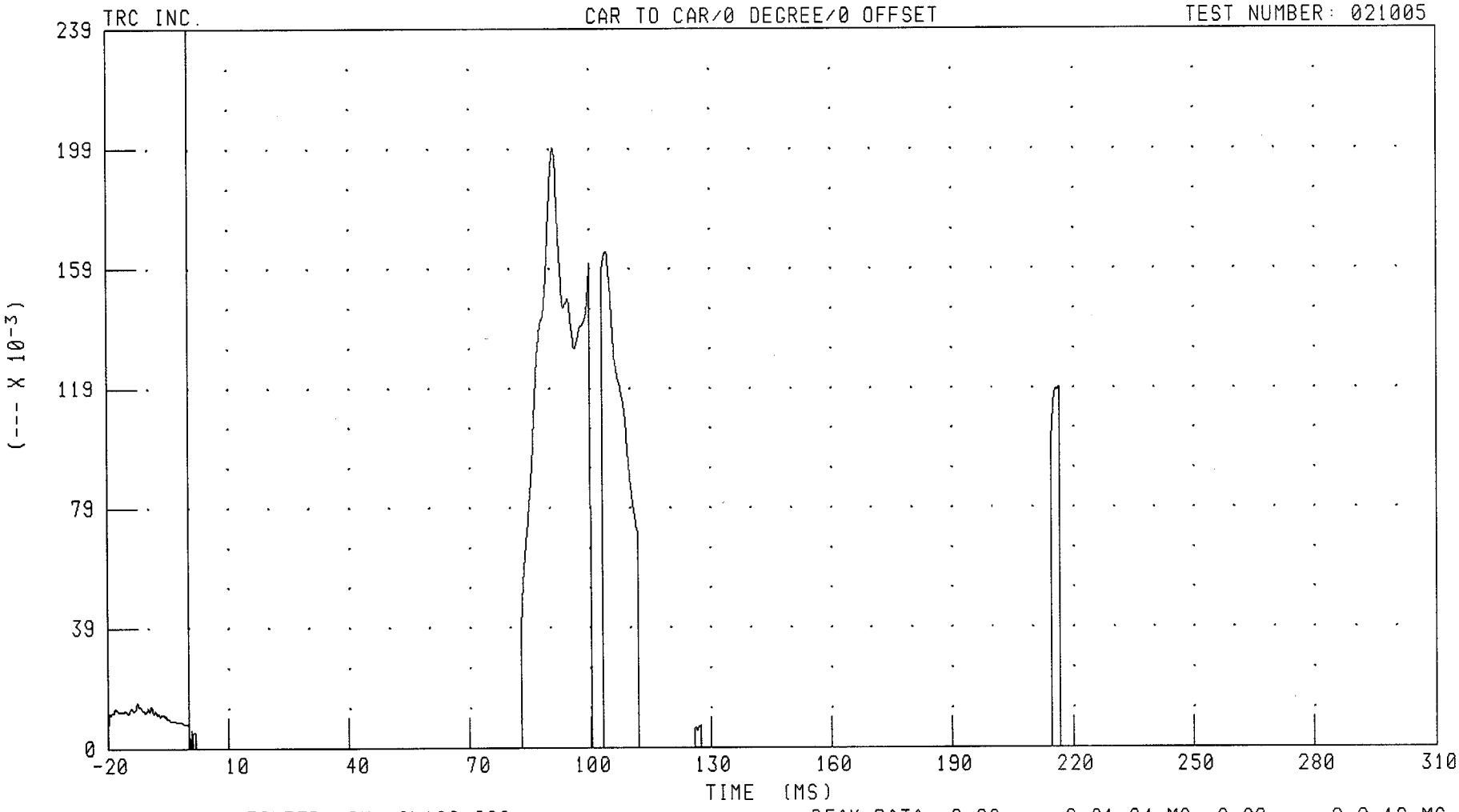
CHANNEL: NTEB FILTER: CH. CLASS 600 PEAK DATA: 0.39 --- @ 65.20 MS; 0.00 --- @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER NIJ COMPRESSION/FLEXION

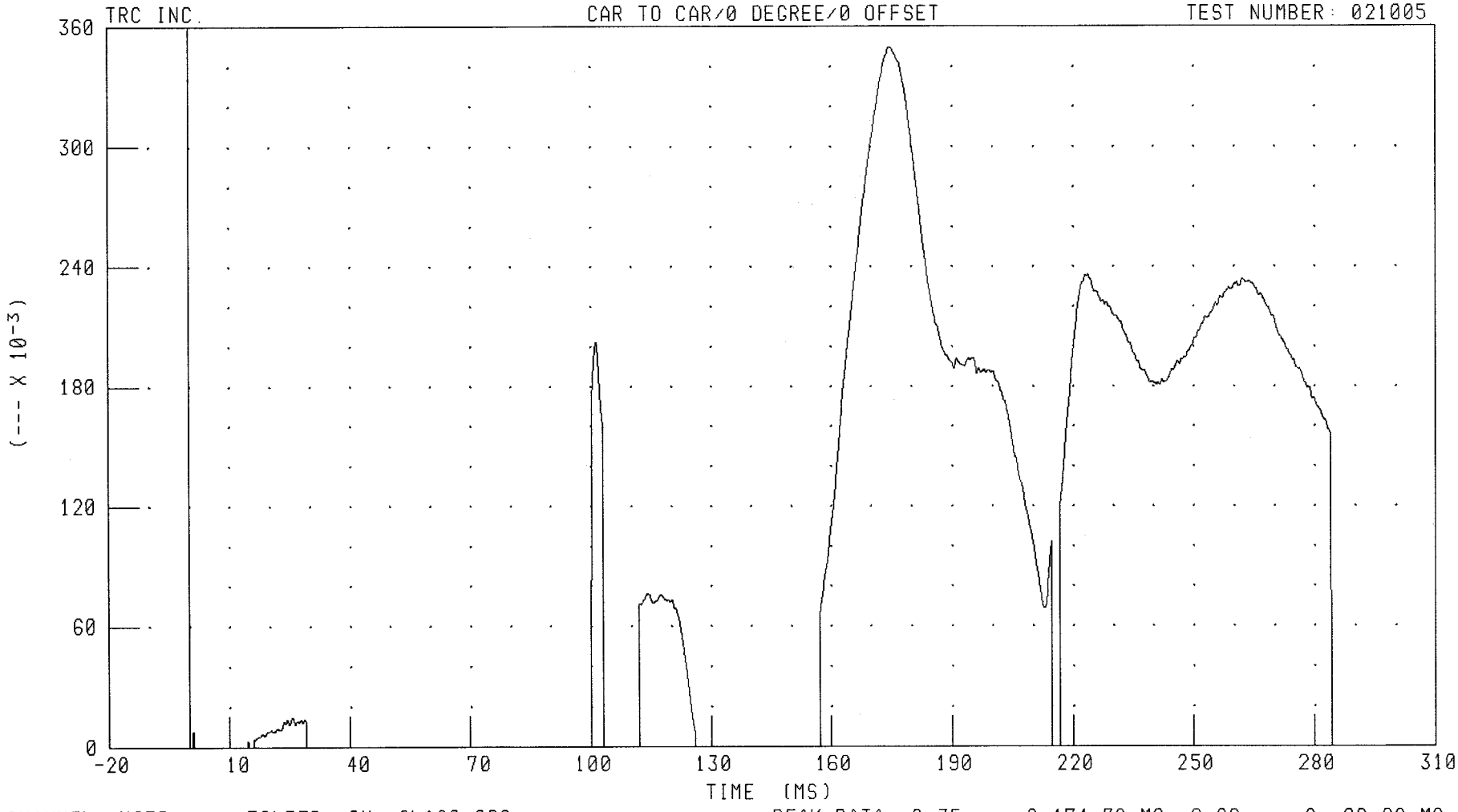
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: NCFB FILTER: CH. CLASS 600 PEAK DATA: 0.20 --- @ 91.04 MS; 0.00 --- @ 0.16 MS

021005

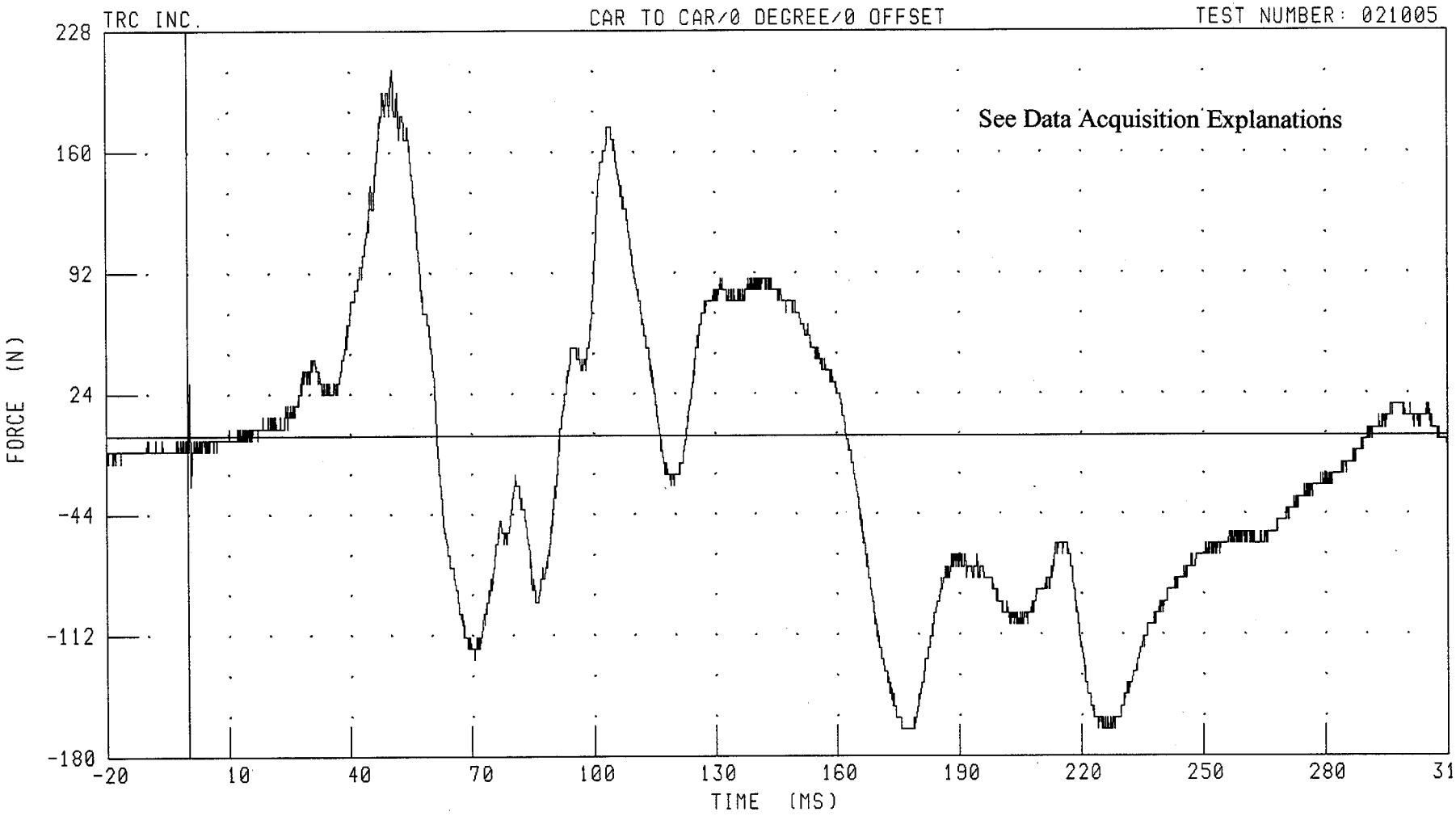
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER NIJ COMPRESSION/EXTENSION



CHANNEL: NCEB FILTER: CH. CLASS 600 PEAK DATA: 0.35 --- @ 174.72 MS; 0.00 --- @ -20.00 MS

021005

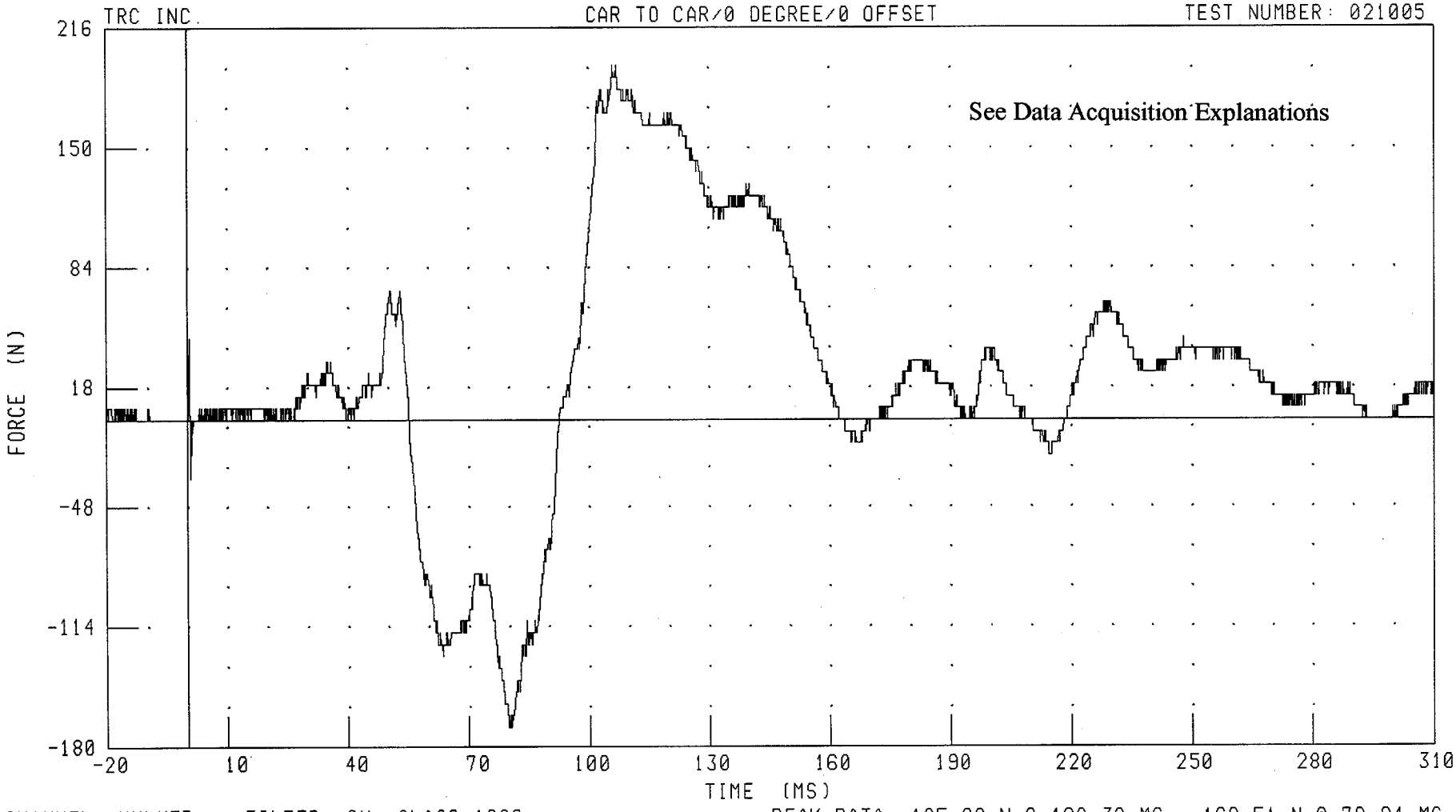
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LOWER NECK X-AXIS SHEAR FORCE



CHANNEL: NKLXFB FILTER: CH. CLASS 1000 PEAK DATA: 206.36 N @ 50.72 MS; -165.21 N @ 175.76 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LOWER NECK Y-AXIS SHEAR FORCE

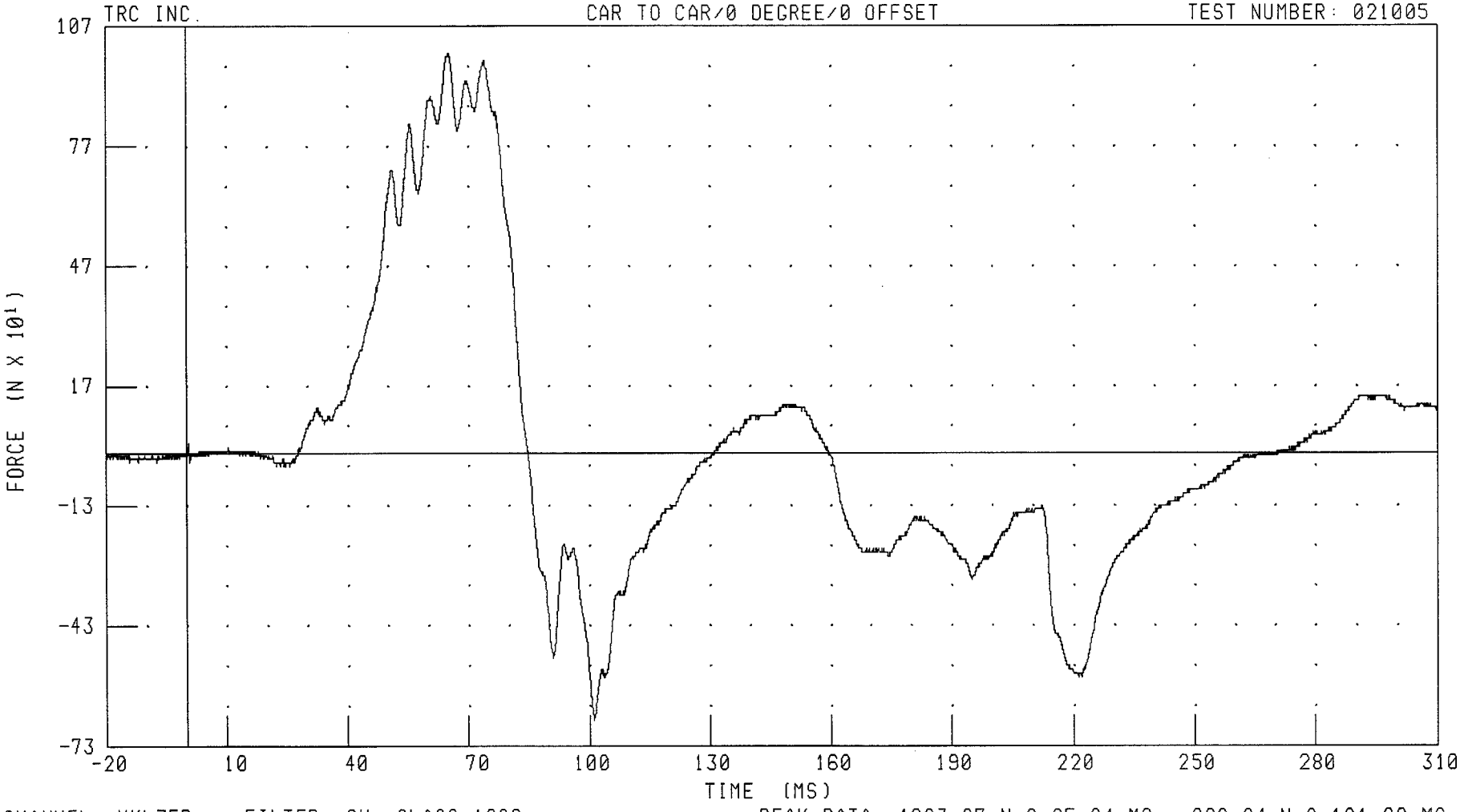


CHANNEL: NKLYFB FILTER: CH. CLASS 1000 PEAK DATA: 195.20 N @ 106.32 MS; -169.51 N @ 79.84 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER LOWER NECK Z-AXIS AXIAL FORCE



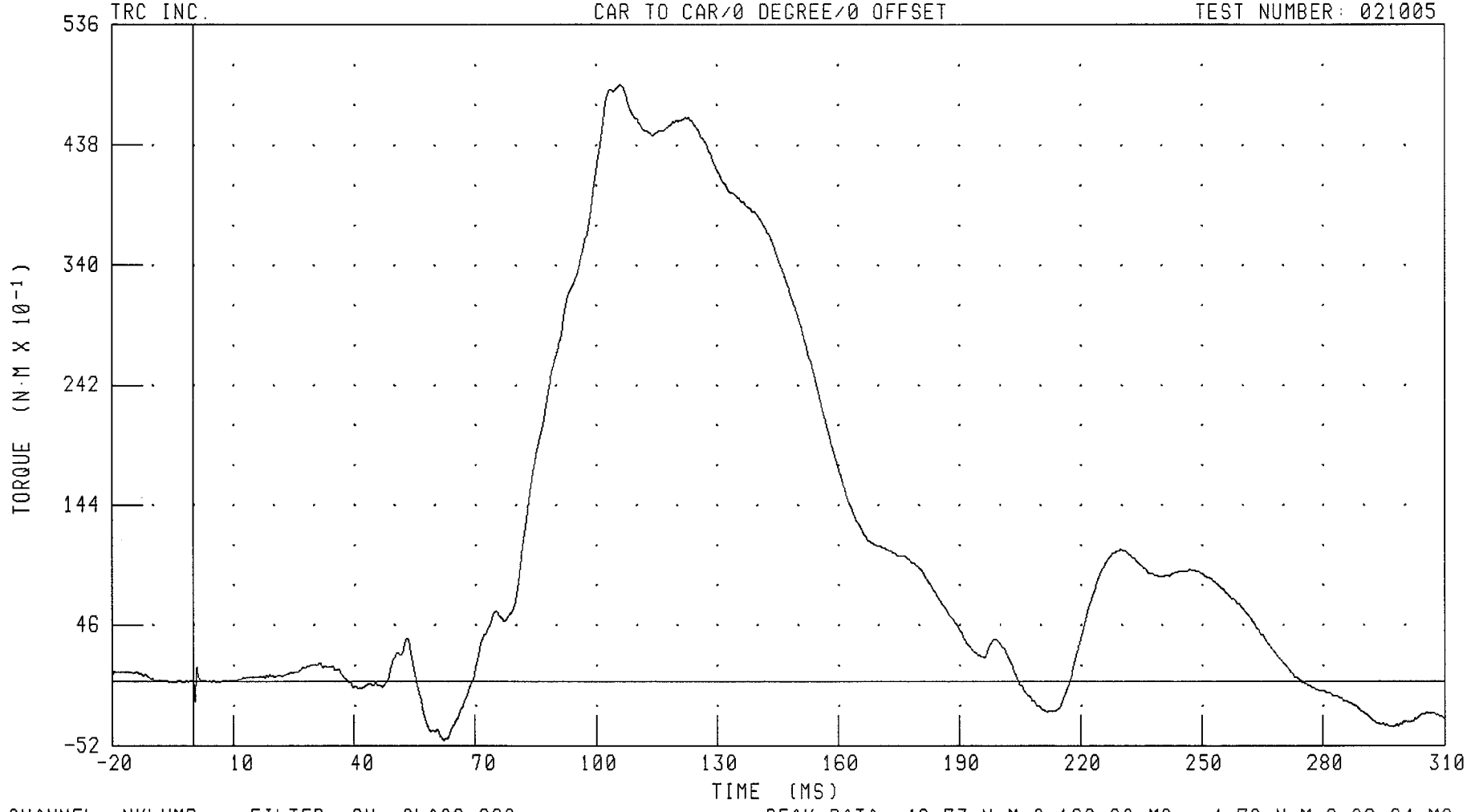
CHANNEL: NKLZFB FILTER: CH. CLASS 1000 PEAK DATA: 1003.07 N @ 65.04 MS; -666.84 N @ 101.20 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

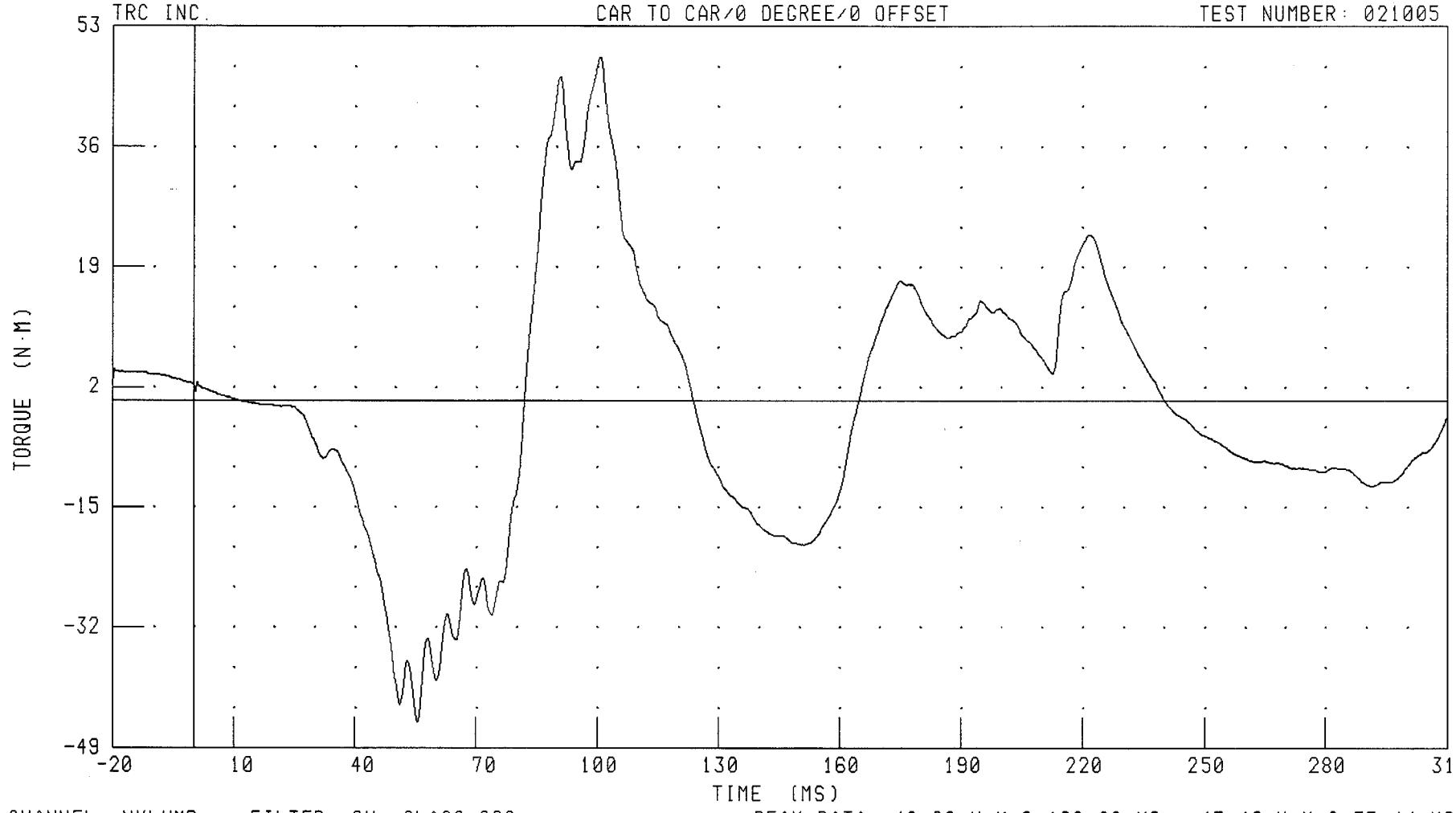
BULLET PASSENGER LOWER NECK MOMENT ABOUT X AXIS

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



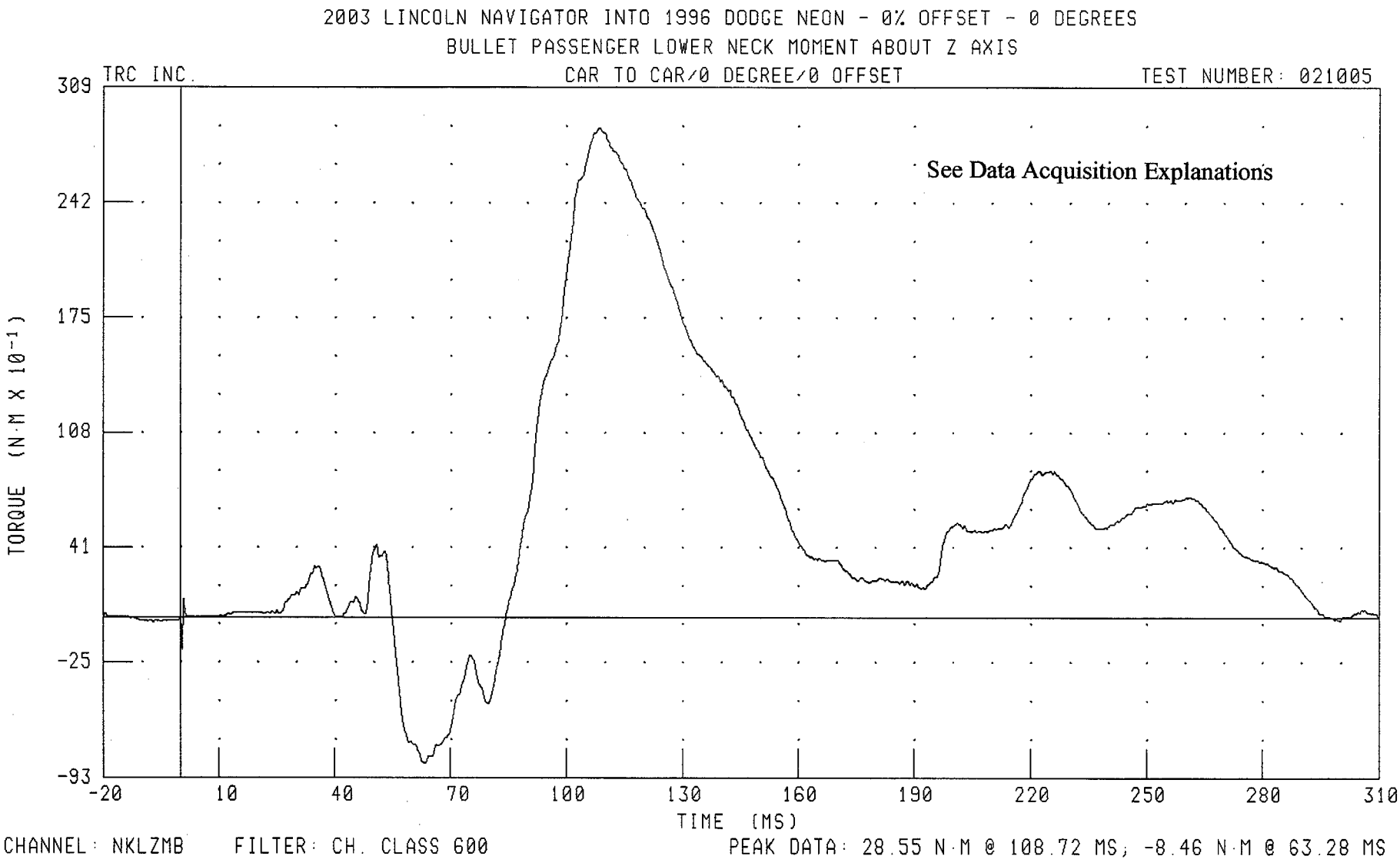
CHANNEL: NKLXMB FILTER: CH. CLASS 600 PEAK DATA: 48.73 N·M @ 106.08 MS; -4.76 N·M @ 62.24 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LOWER NECK MOMENT ABOUT Y AXIS



CHANNEL: NKLYMB FILTER: CH. CLASS 600 PEAK DATA: 48.62 N·M @ 100.88 MS; -45.40 N·M @ 55.44 MS

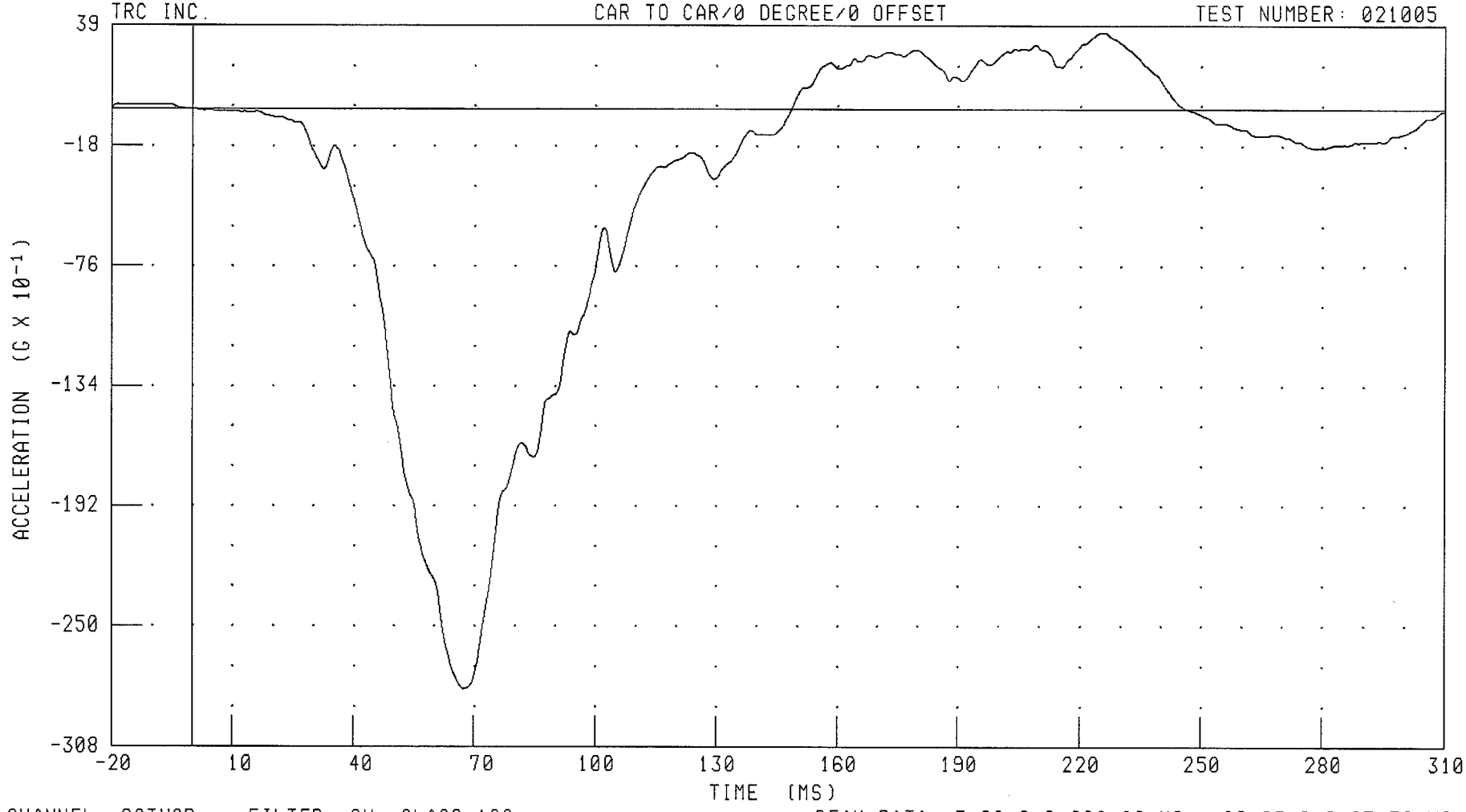
021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LOWER NECK MOMENT ABOUT Z AXIS
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
TORQUE (N·M X 10⁻¹)
309
242
175
108
41
-25
-93
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: NKLZMB
FILTER: CH. CLASS 600
PEAK DATA: 28.55 N·M @ 108.72 MS; -8.46 N·M @ 63.28 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

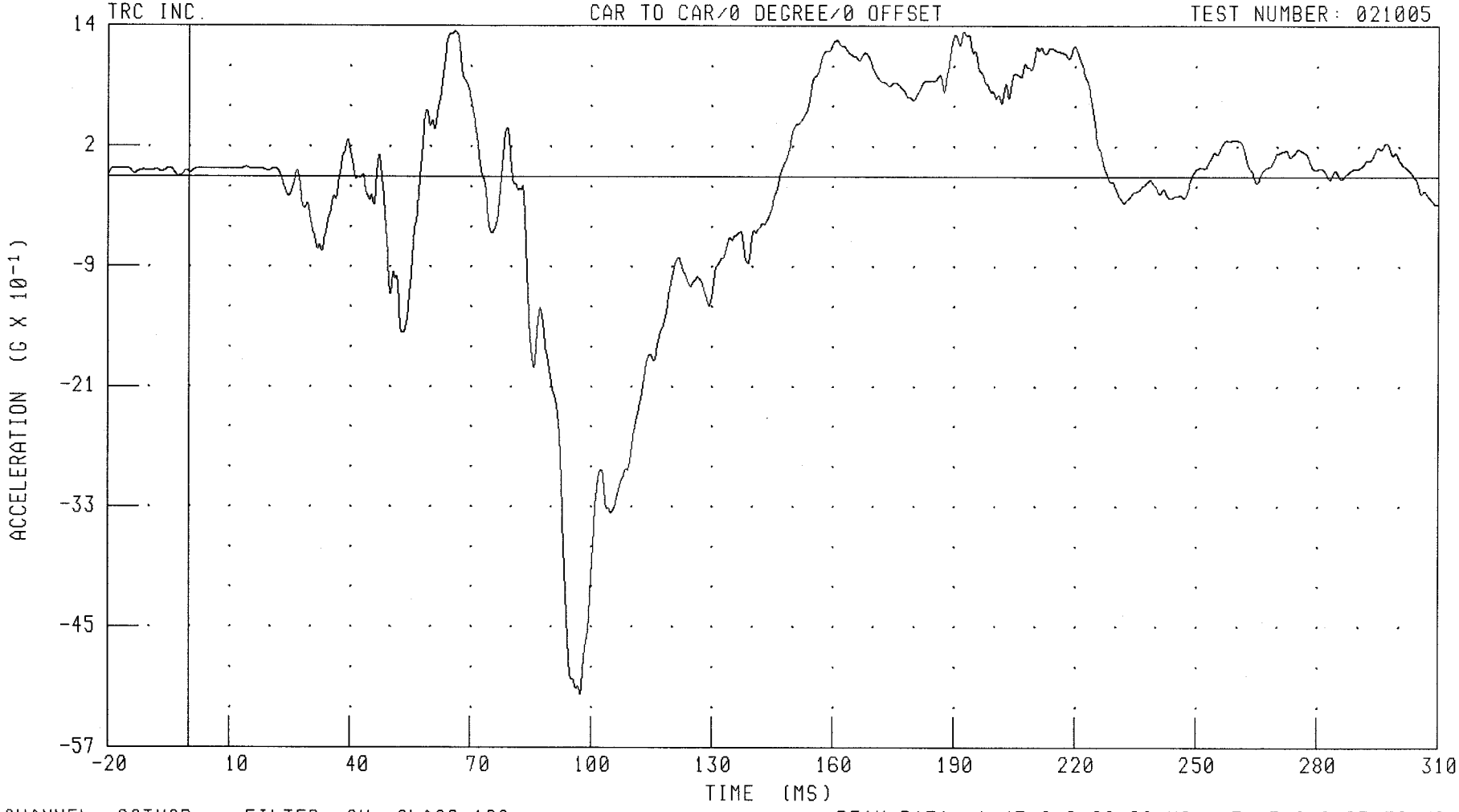
BULLET PASSENGER CHEST X-AXIS ACCELERATION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: CSTXGB FILTER: CH. CLASS 180 PEAK DATA: 3.69 G @ 226.08 MS; -28.03 G @ 67.52 MS

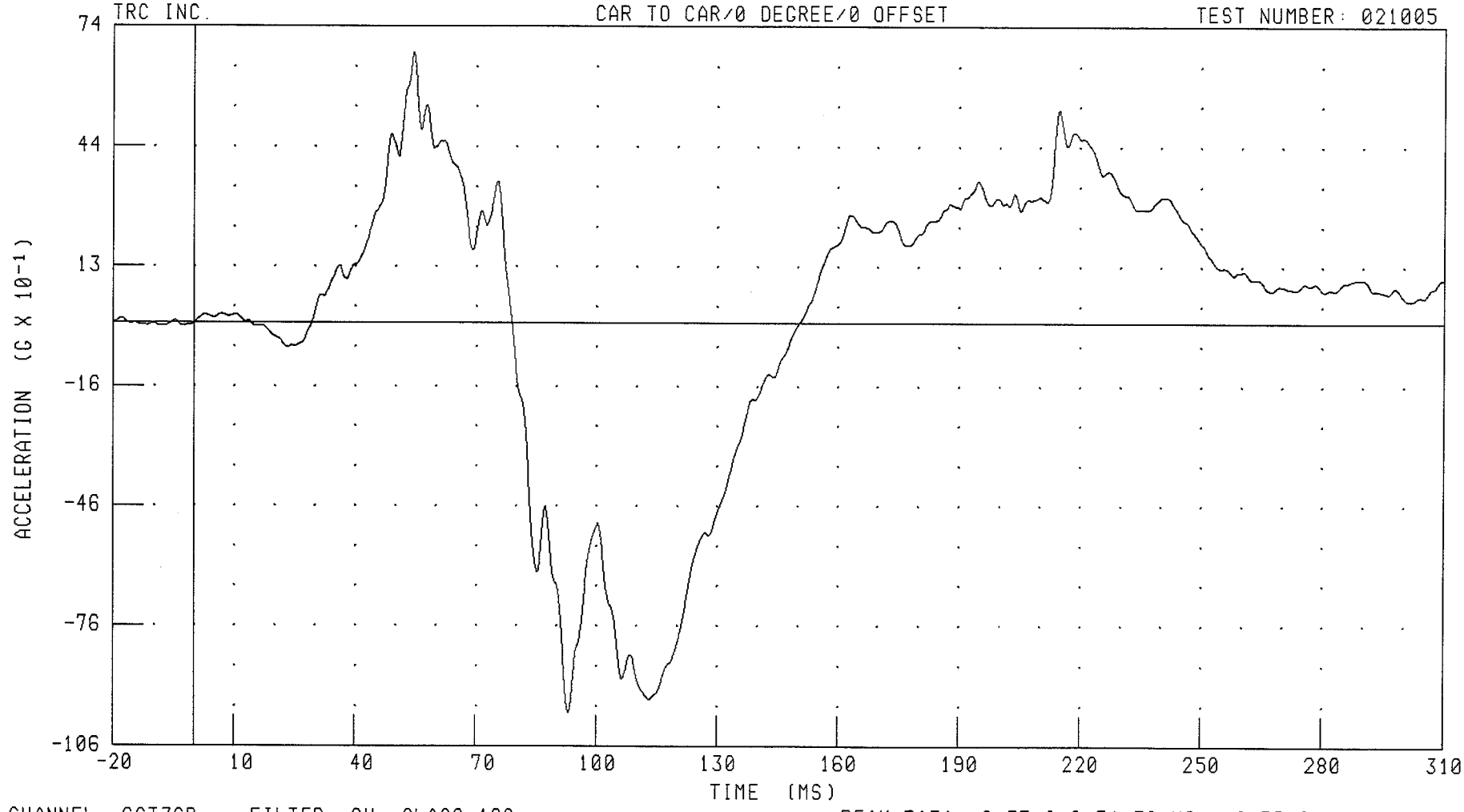
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYGB FILTER: CH. CLASS 180 PEAK DATA: 1.45 G @ 66.08 MS; -5.17 G @ 97.52 MS

021005

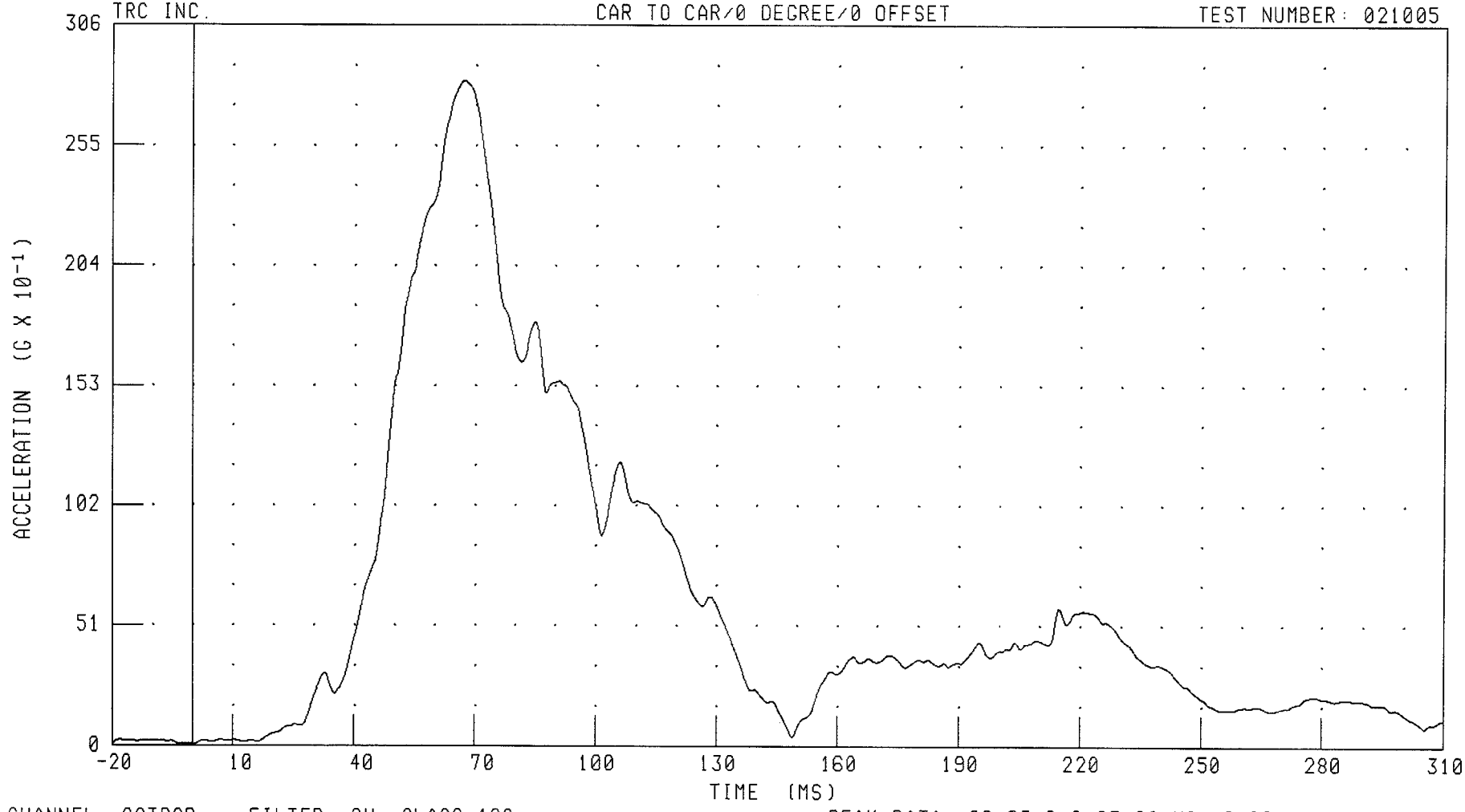
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZGB FILTER: CH. CLASS 180 PEAK DATA: 6.75 G @ 54.56 MS; -9.77 G @ 93.12 MS

021005

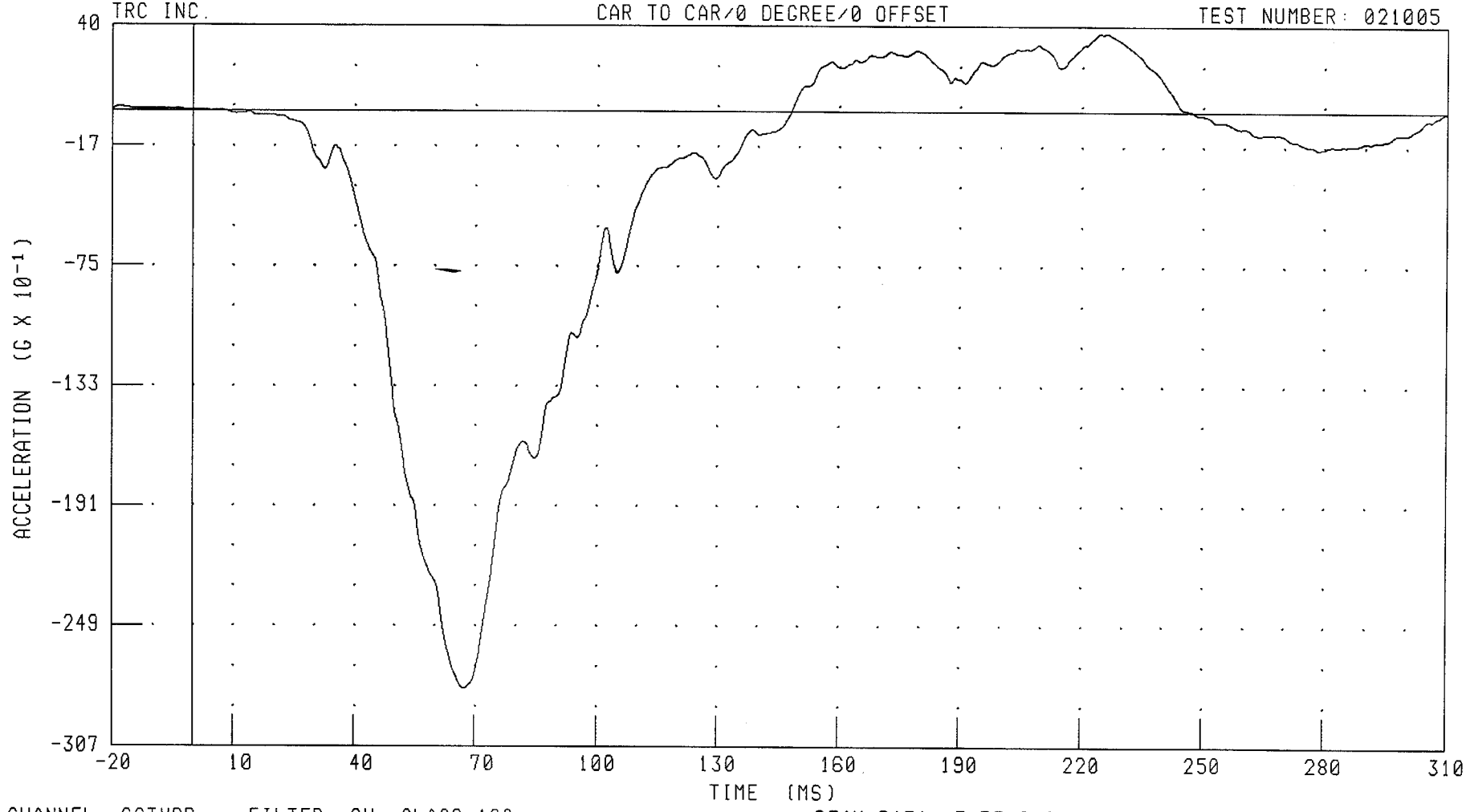
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST RESULTANT ACCELERATION



CHANNEL: CSTRGB FILTER: CH. CLASS 180 PEAK DATA: 28.23 G @ 67.28 MS; 0.02 G @ -20.00 MS

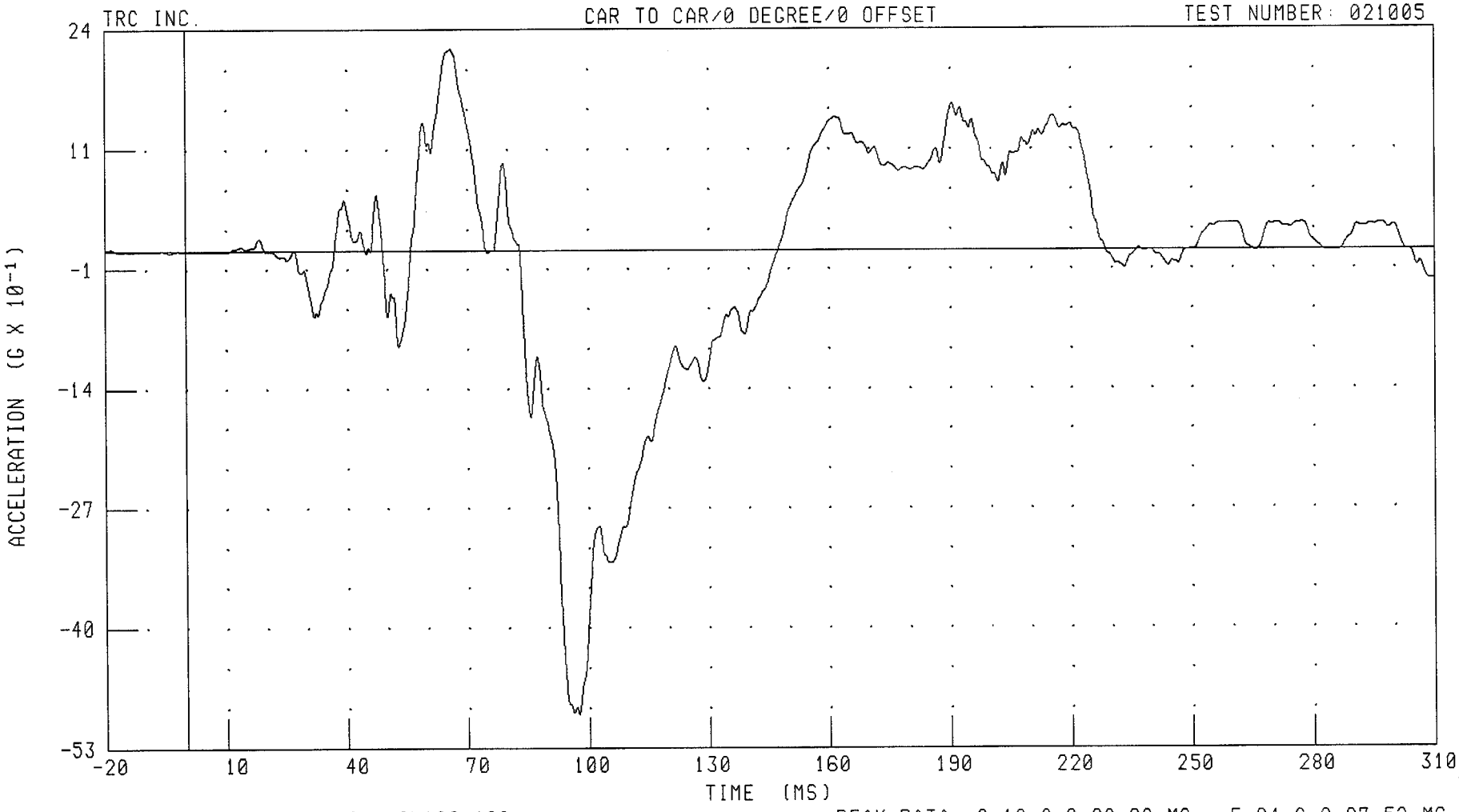
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST X-AXIS ACCELERATION REDUNDANT



CHANNEL: CSTXRB FILTER: CH. CLASS 180 PEAK DATA: 3.77 G @ 226.24 MS; -27.91 G @ 67.36 MS

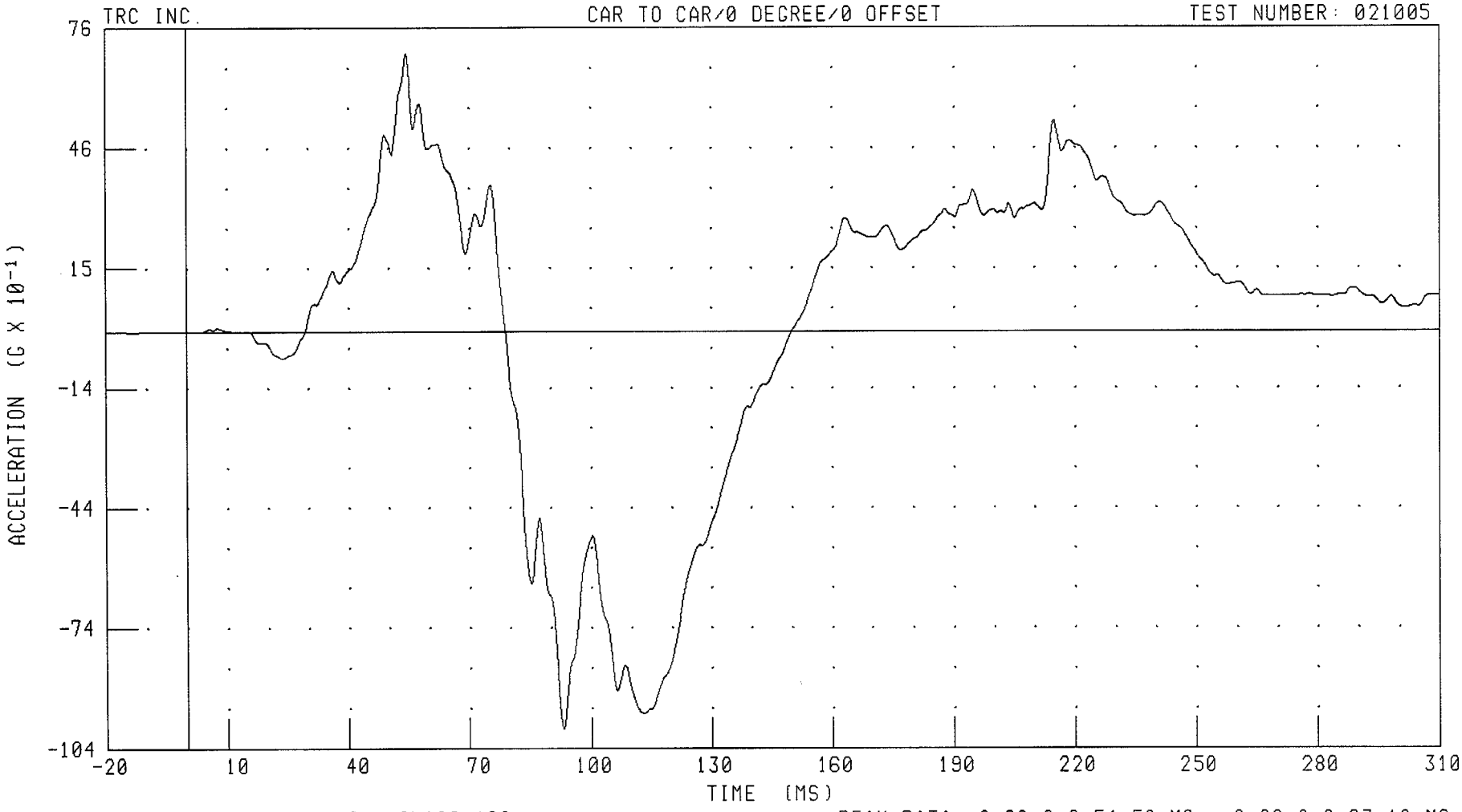
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST Y-AXIS ACCELERATION REDUNDANT



CHANNEL: CSTYRB FILTER: CH. CLASS 180 PEAK DATA: 2.19 G @ 66.00 MS; -5.04 G @ 97.52 MS

021005

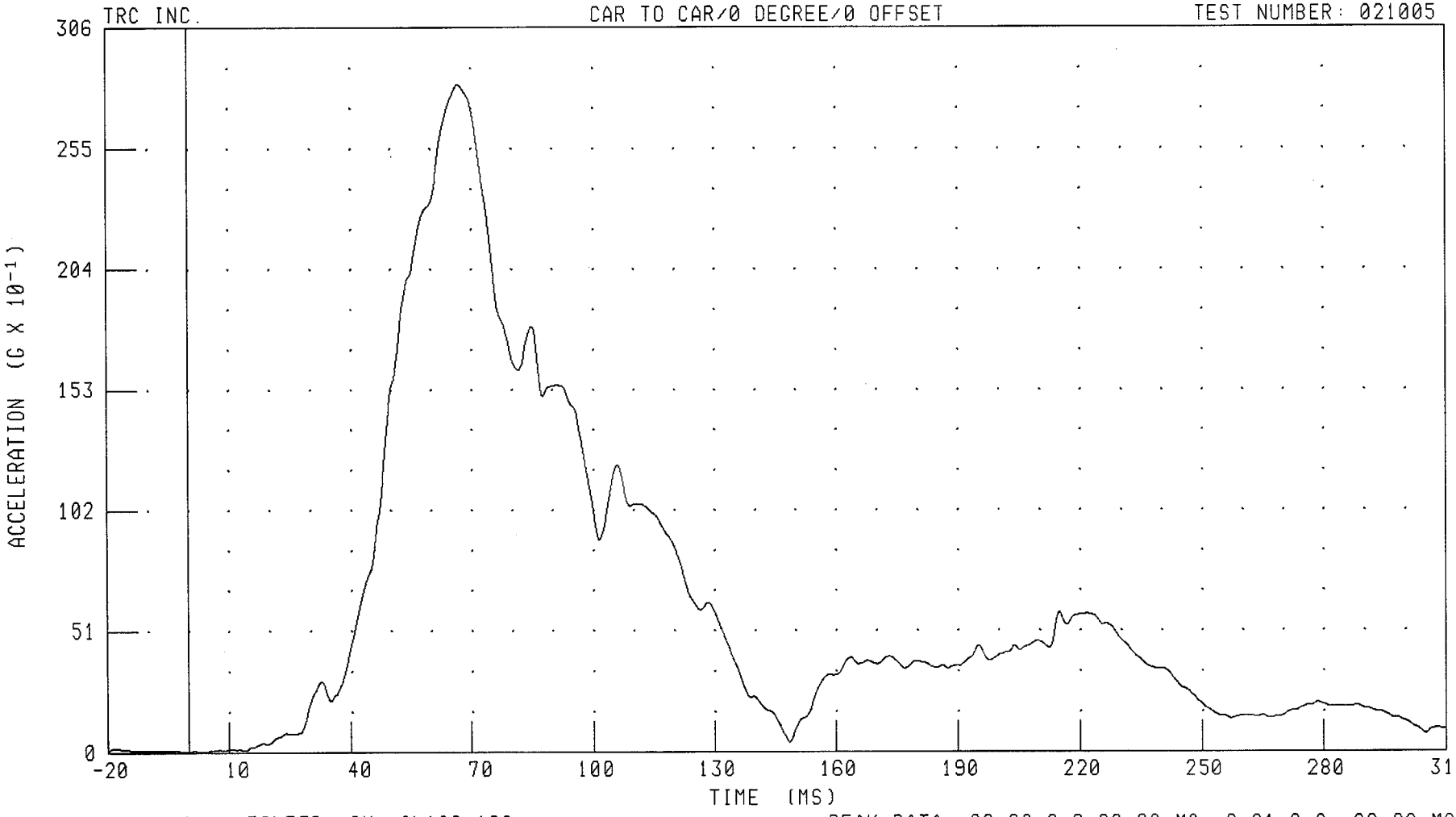
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST Z-AXIS ACCELERATION REDUNDANT



CHANNEL: CSTZRB FILTER: CH. CLASS 180 PEAK DATA: 6.96 G @ 54.56 MS; -9.92 G @ 93.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER CHEST RESULTANT ACCELERATION REDUNDANT



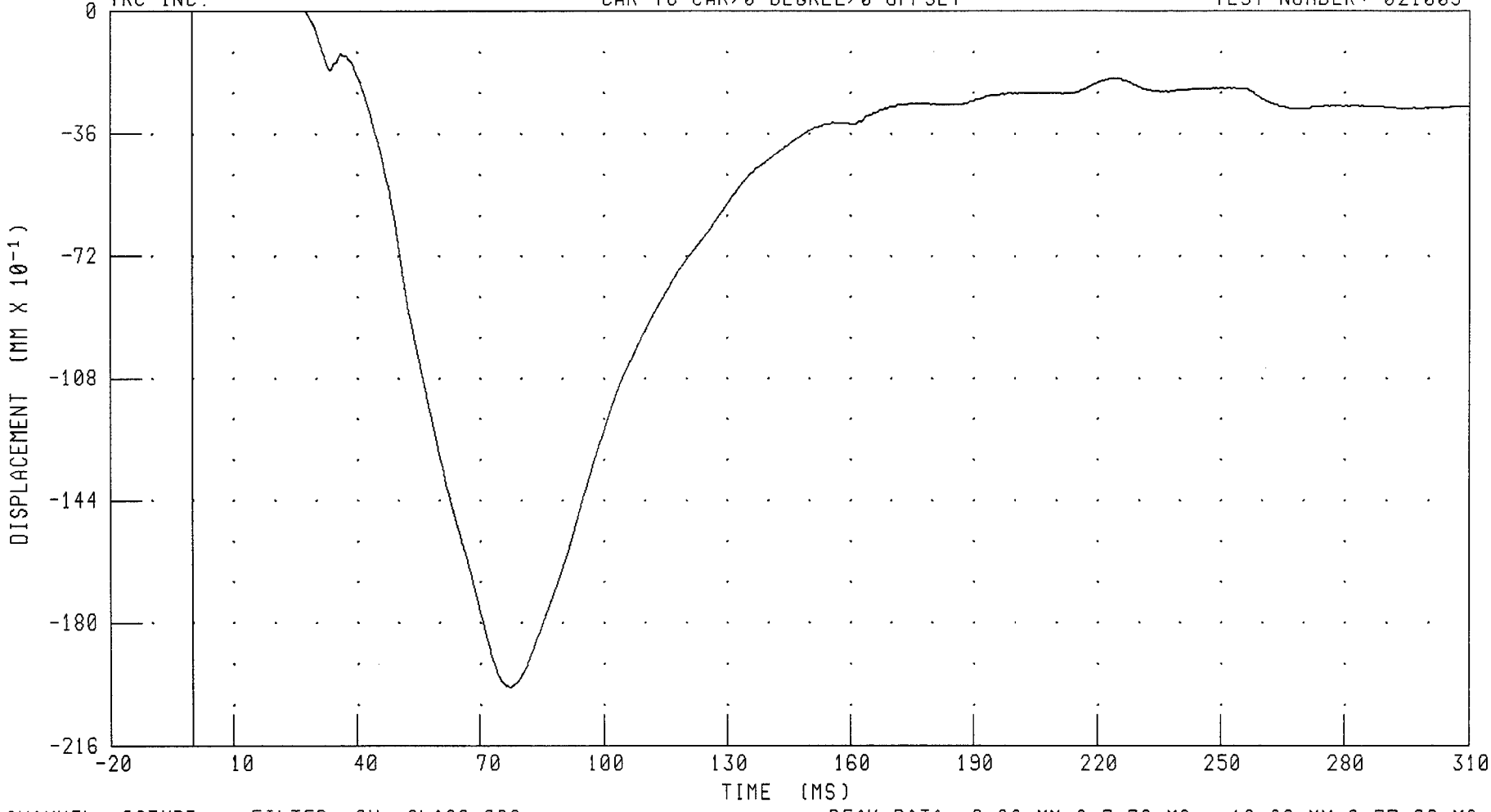
CHANNEL: CSTRRB FILTER: CH. CLASS 180 PEAK DATA: 28.20 G @ 66.96 MS; 0.01 G @ -20.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER CHEST DEFLECTION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

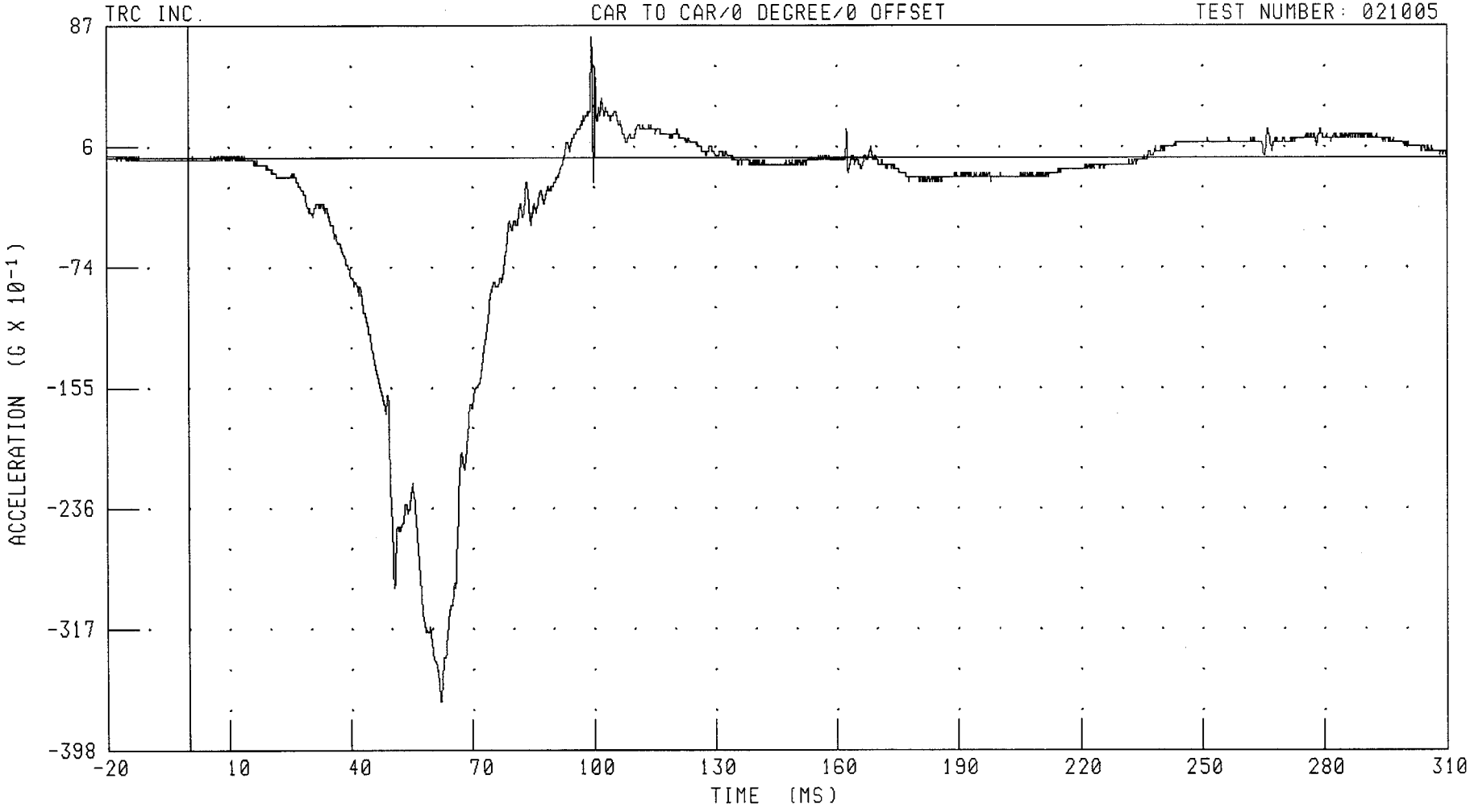


CHANNEL: CSTXDB FILTER: CH. CLASS 600 PEAK DATA: 0.02 MM @ 7.76 MS; -19.88 MM @ 77.60 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

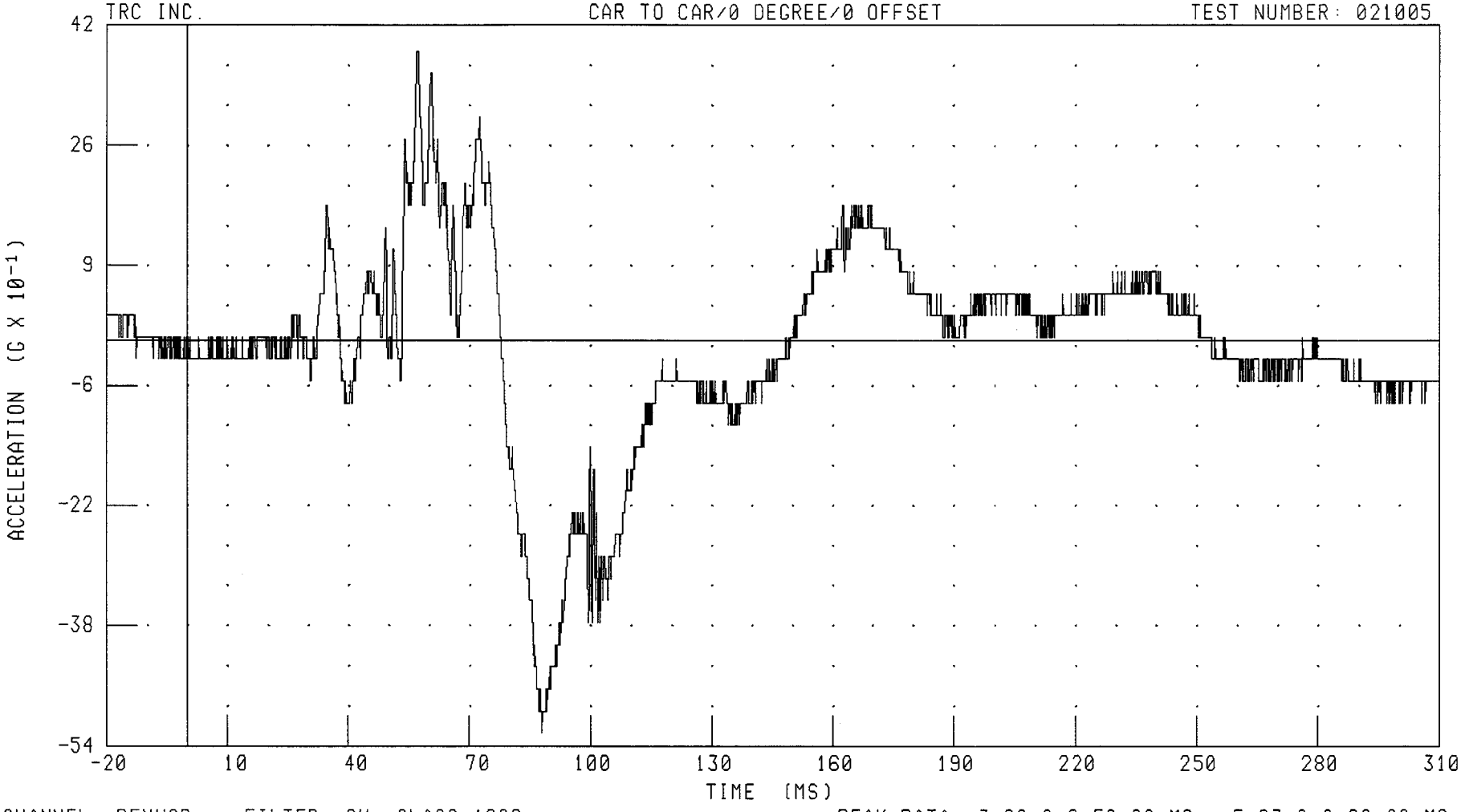
BULLET PASSENGER PELVIS X-AXIS ACCELERATION



CHANNEL: PEVXGB FILTER: CH. CLASS 1000 PEAK DATA: 8.03 G @ 99.68 MS; -36.59 G @ 62.08 MS

021005

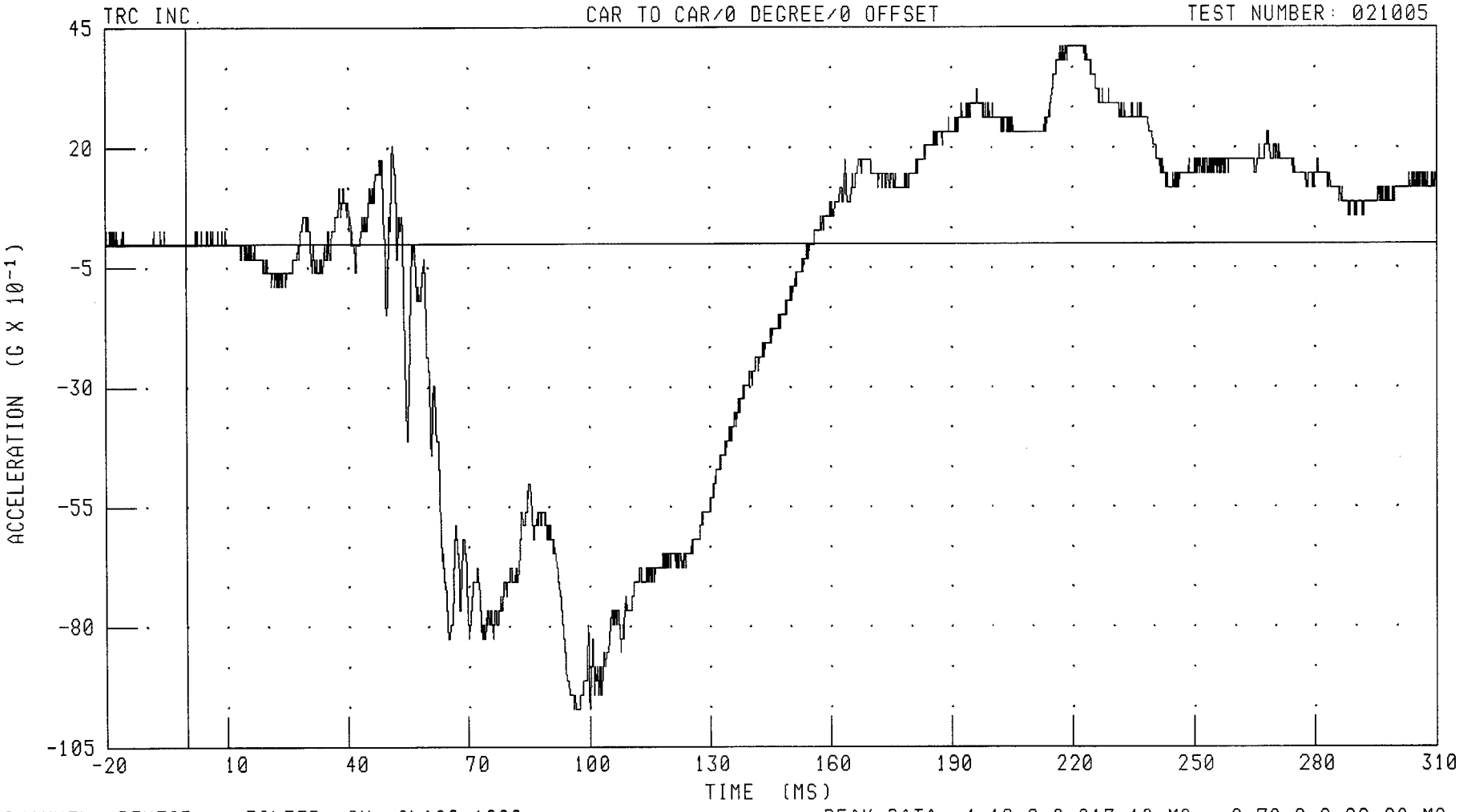
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER PELVIS Y-AXIS ACCELERATION



CHANNEL: PEVYGB FILTER: CH. CLASS 1000 PEAK DATA: 3.86 G @ 56.96 MS; -5.23 G @ 88.00 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER PELVIS Z-AXIS ACCELERATION

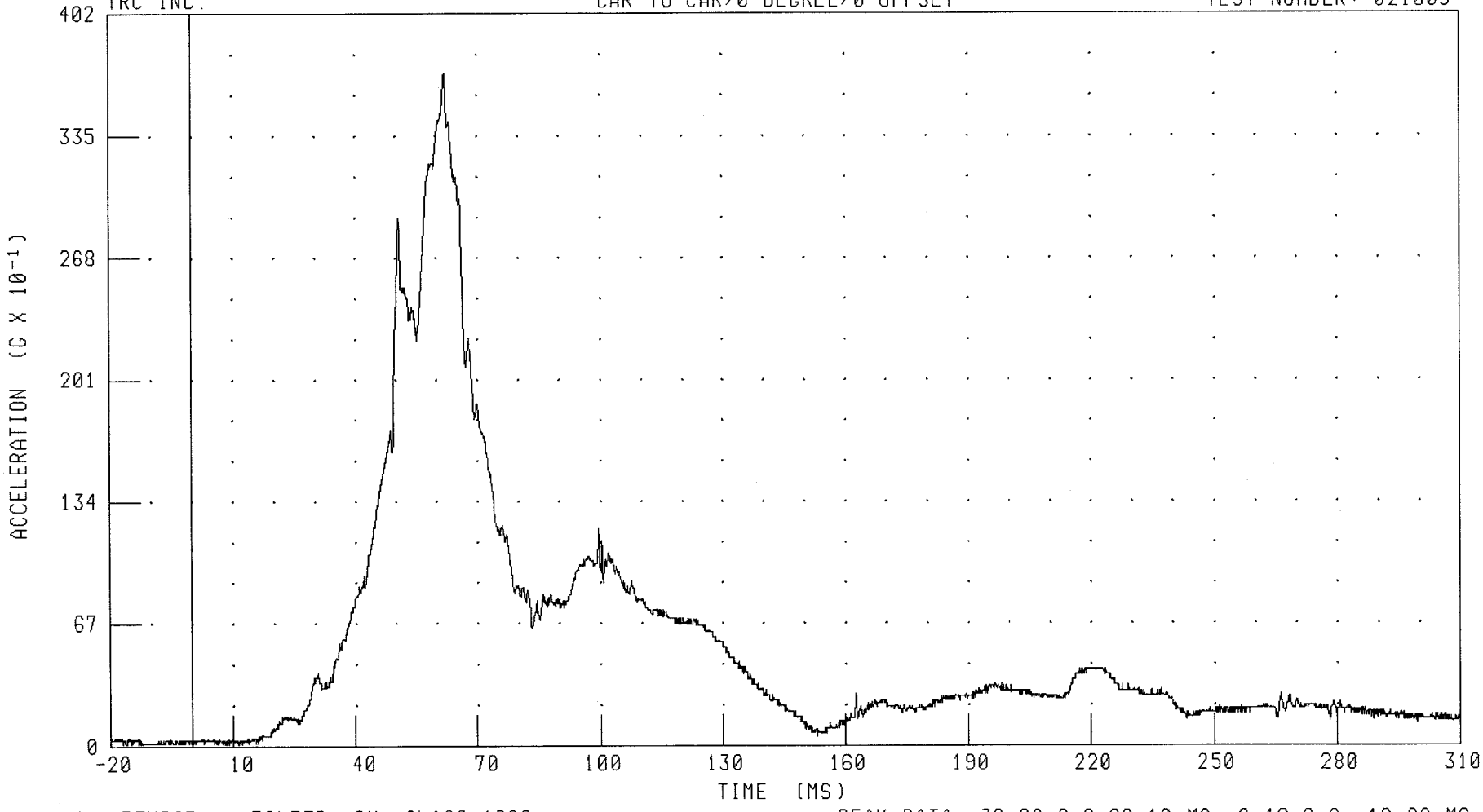


CHANNEL: PEVZGB FILTER: CH. CLASS 1000 PEAK DATA: 4.10 G @ 217.12 MS, -9.72 G @ 96.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

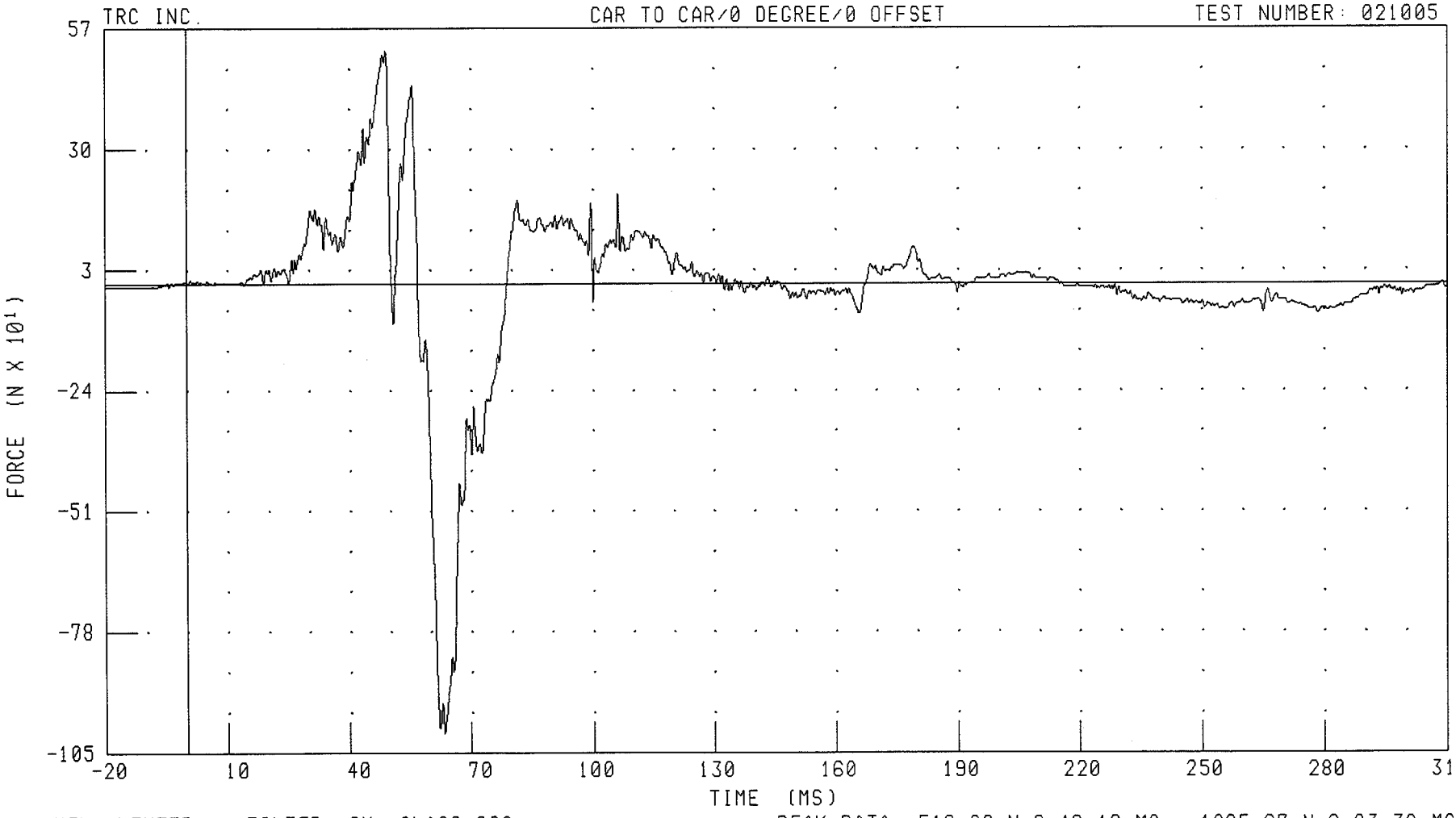
BULLET PASSENGER PELVIS RESULTANT ACCELERATION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: PEVRGB FILTER: CH. CLASS 1000 PEAK DATA: 36.92 G @ 62.16 MS; 0.12 G @ -16.96 MS

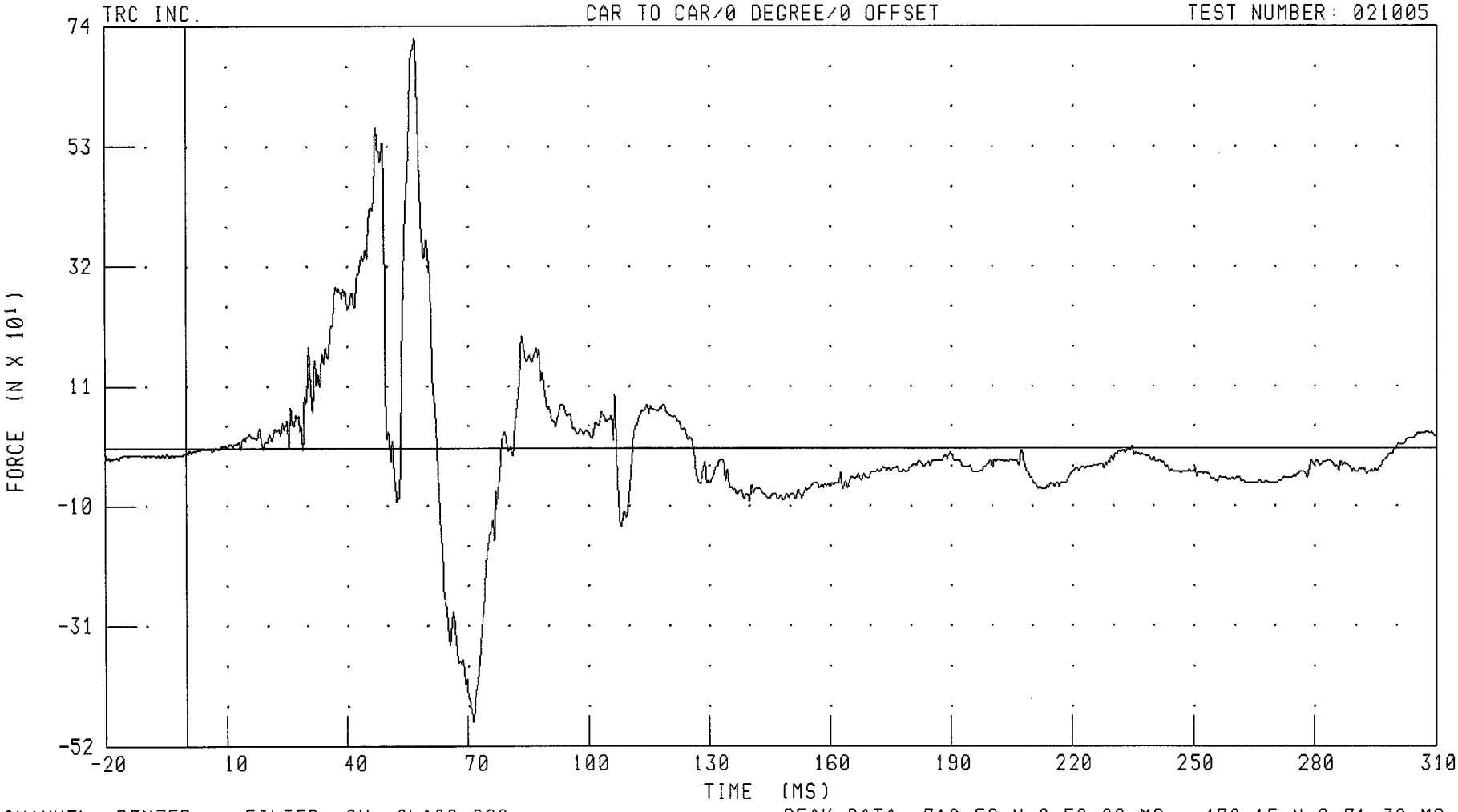
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LEFT FEMUR FORCE



CHANNEL: LFMZFB FILTER: CH. CLASS 600 PEAK DATA: 519.08 N @ 49.12 MS; -1005.97 N @ 63.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER RIGHT FEMUR FORCE

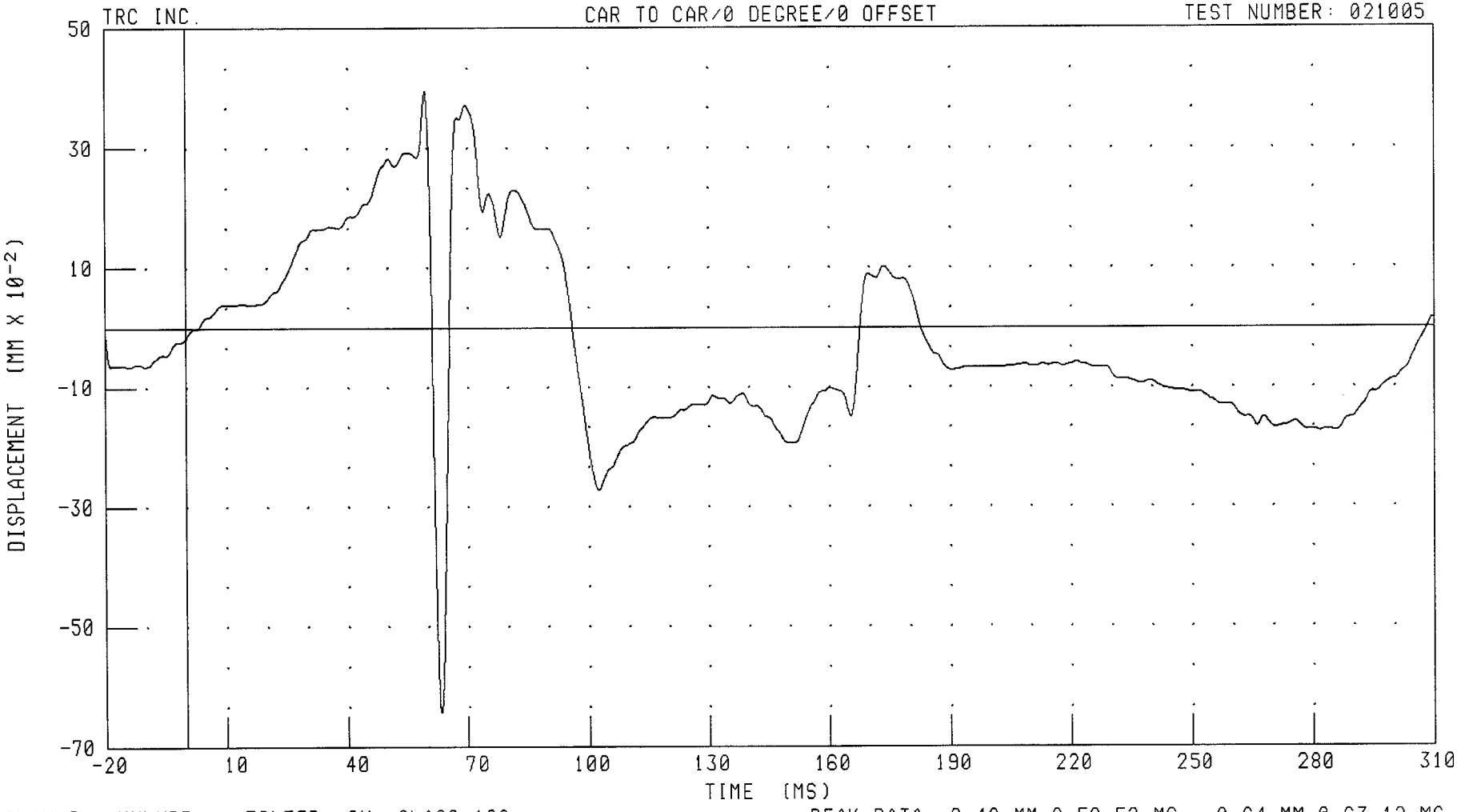


CHANNEL: RFMZFB FILTER: CH. CLASS 600 PEAK DATA: 719.59 N @ 56.96 MS; -478.15 N @ 71.36 MS

021005

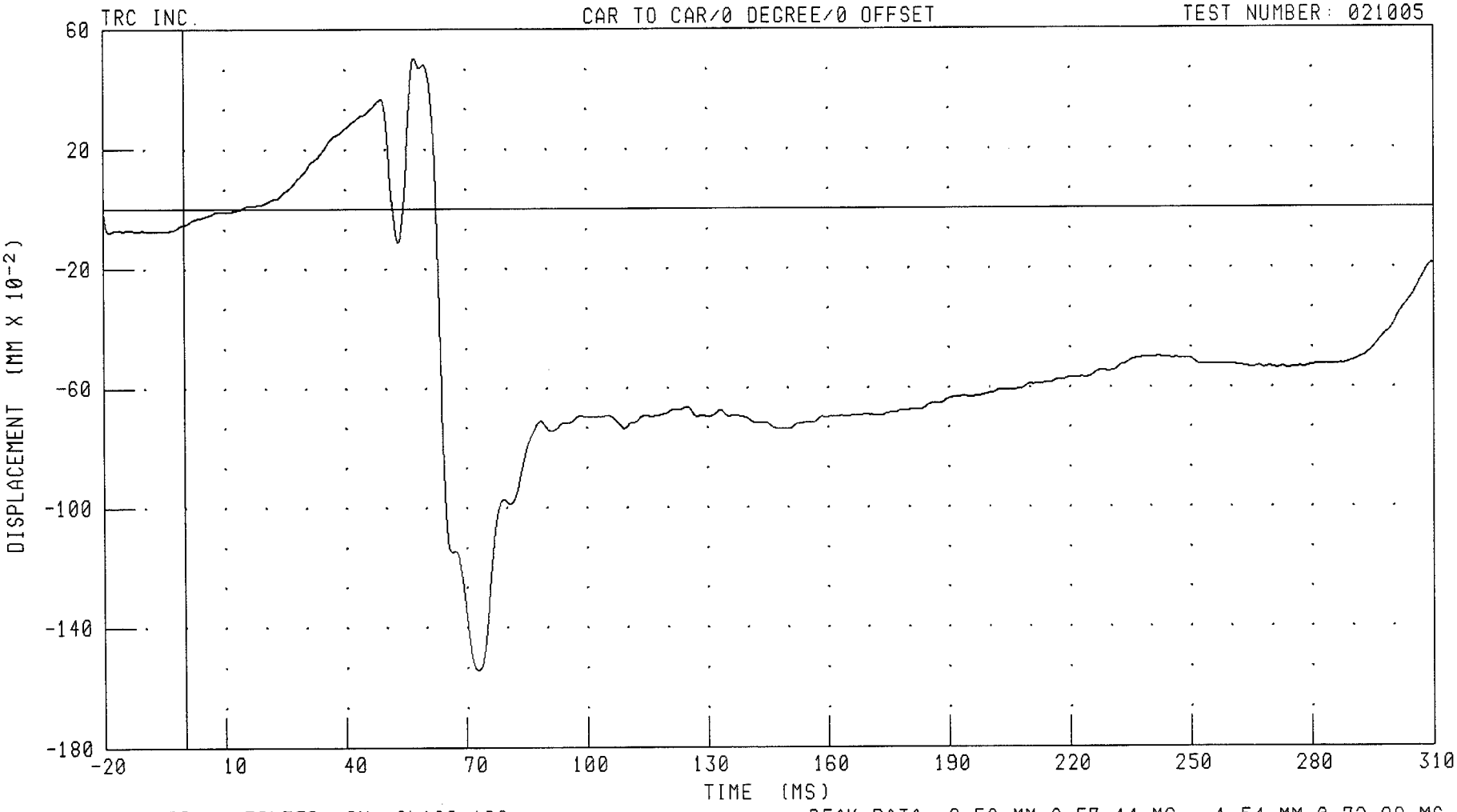
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER LEFT KNEE DISPLACEMENT



CHANNEL: KNLXDB FILTER: CH. CLASS 180 PEAK DATA: 0.40 MM @ 59.52 MS; -0.64 MM @ 63.12 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER RIGHT KNEE DISPLACEMENT
CAR TO CAR/0 DEGREE/0 OFFSET



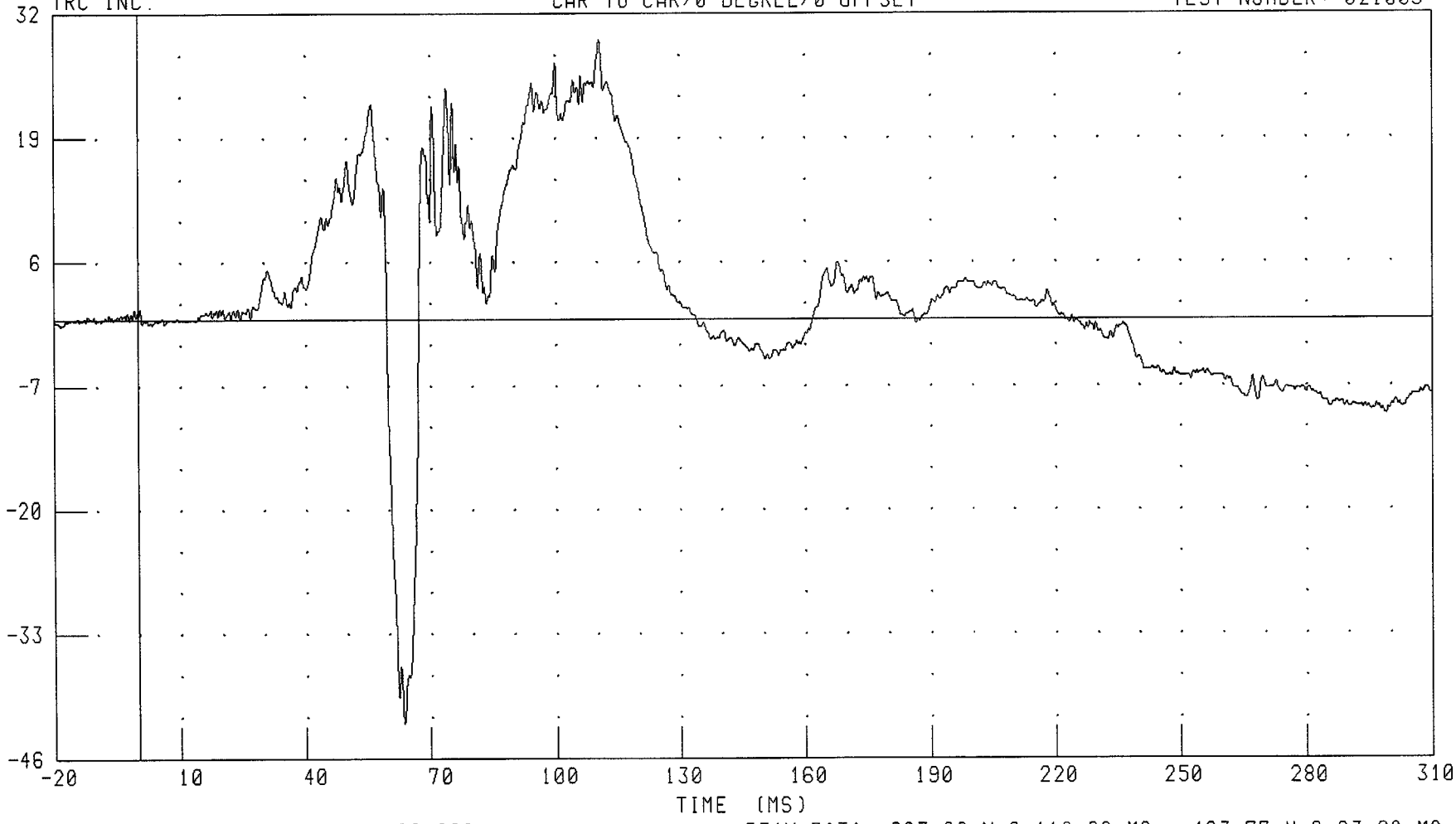
CHANNEL: KNRXDB FILTER: CH. CLASS 180 PEAK DATA: 0.50 MM @ 57.44 MS; -1.54 MM @ 72.88 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER LEFT UPPER TIBIA Z-AXIS FORCE

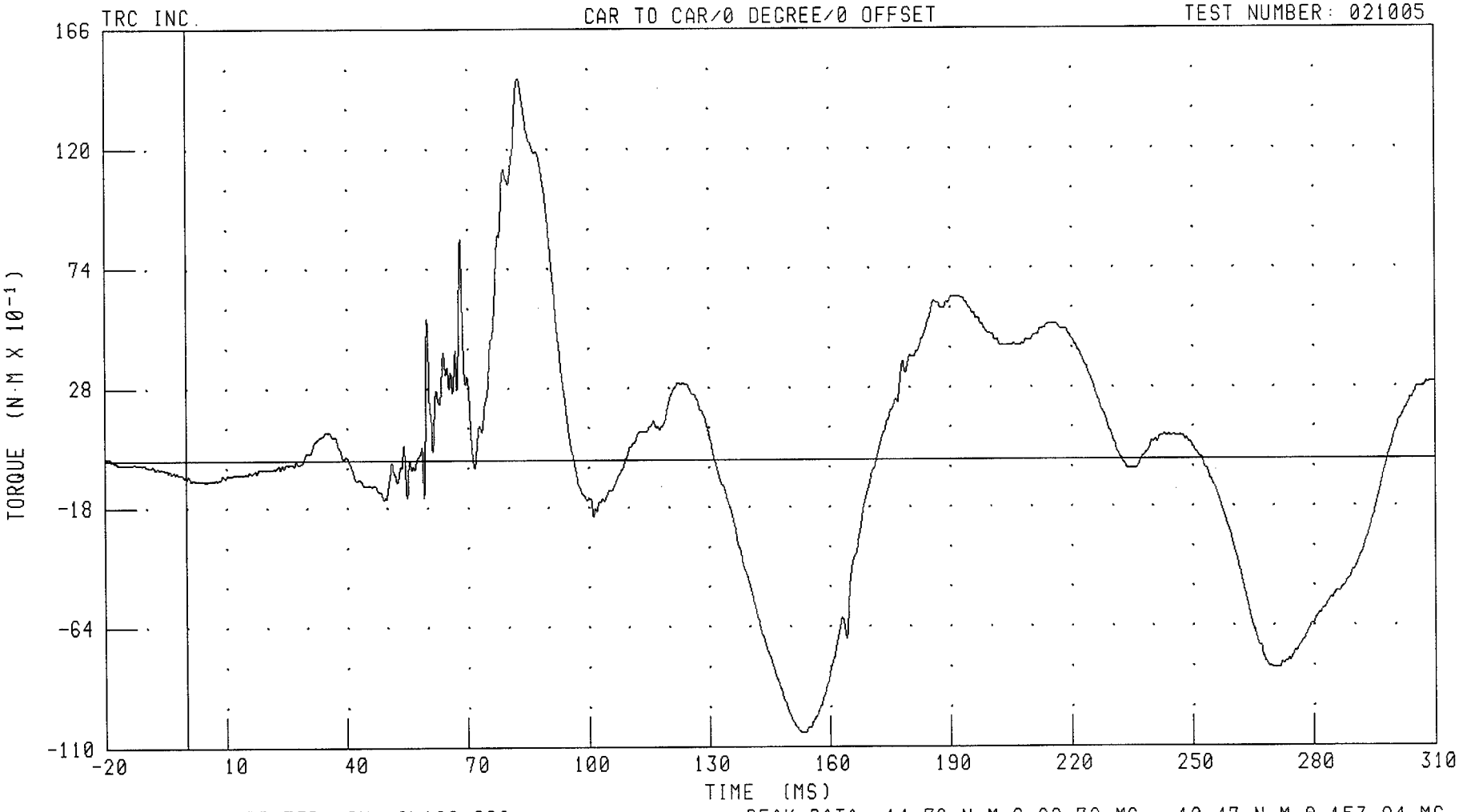
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: TBLZFB FILTER: CH. CLASS 600 PEAK DATA: 293.06 N @ 110.80 MS; -423.77 N @ 63.60 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

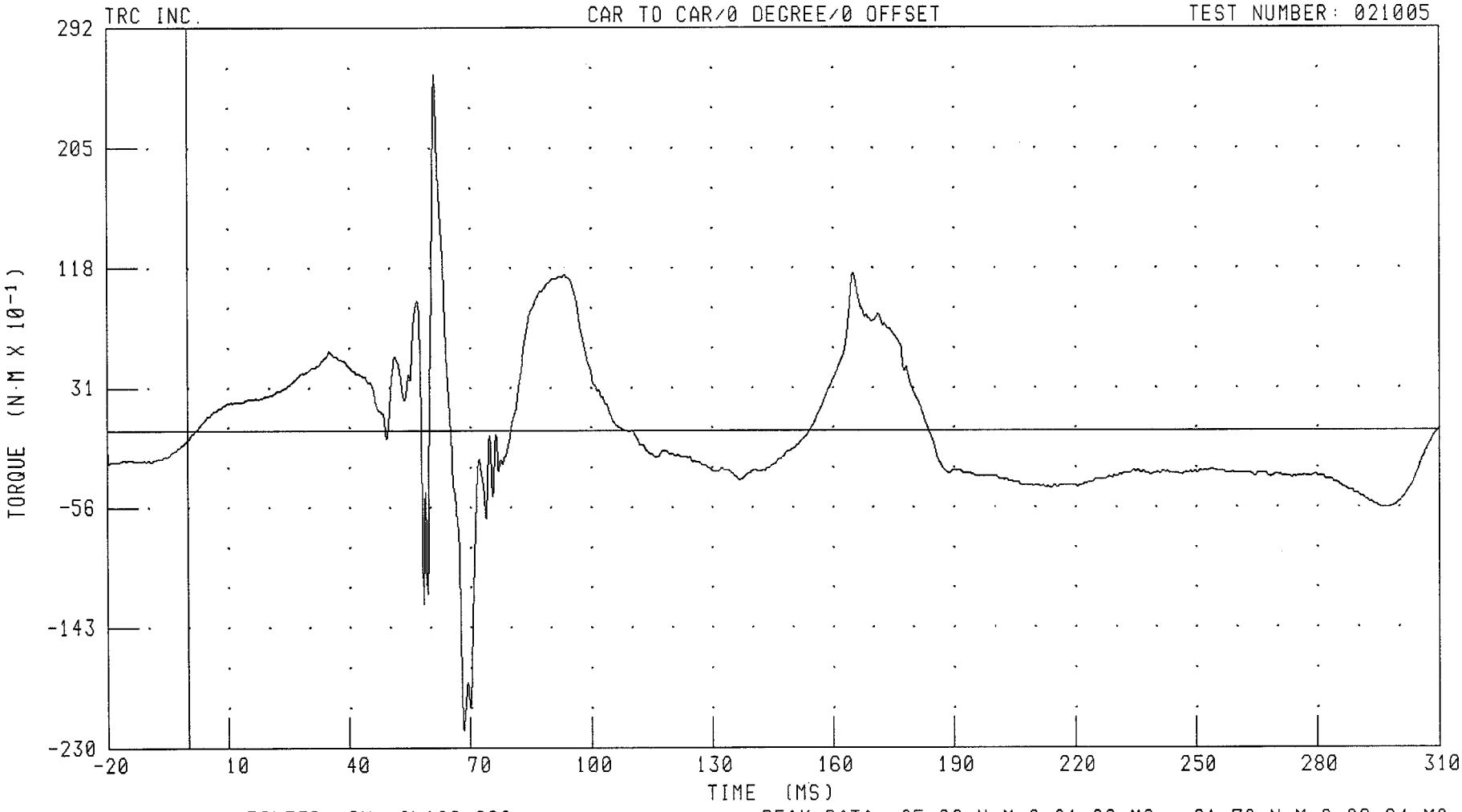
BULLET PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X AXIS



CHANNEL: TBLXMB FILTER: CH. CLASS 600

PEAK DATA: 14.70 N·M @ 82.72 MS; -10.47 N·M @ 153.84 MS

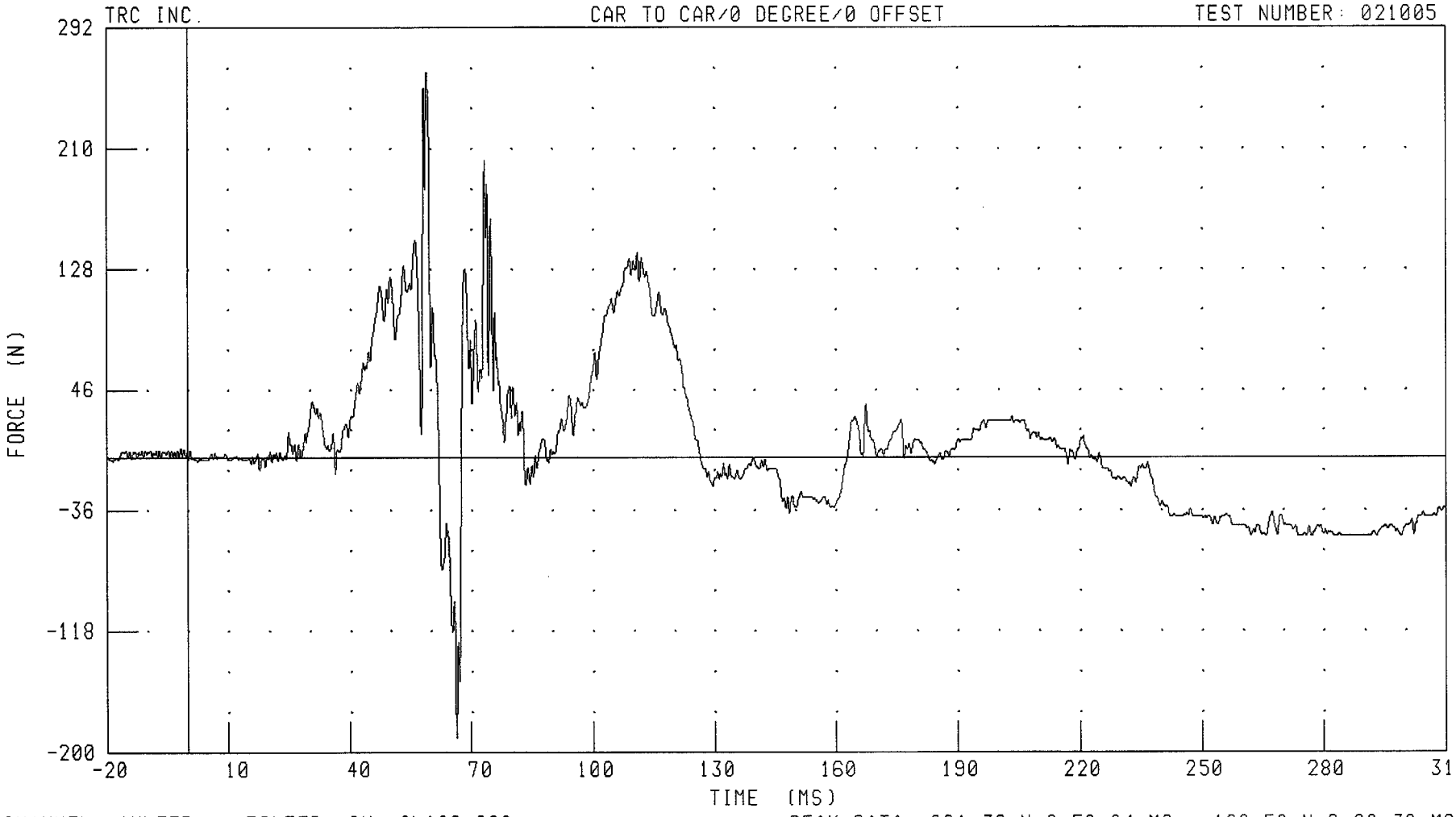
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS



CHANNEL: TBLYMB FILTER: CH. CLASS 600 PEAK DATA: 25.80 N·M @ 61.28 MS; -21.78 N·M @ 68.24 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER LEFT LOWER TIBIA Z-AXIS FORCE

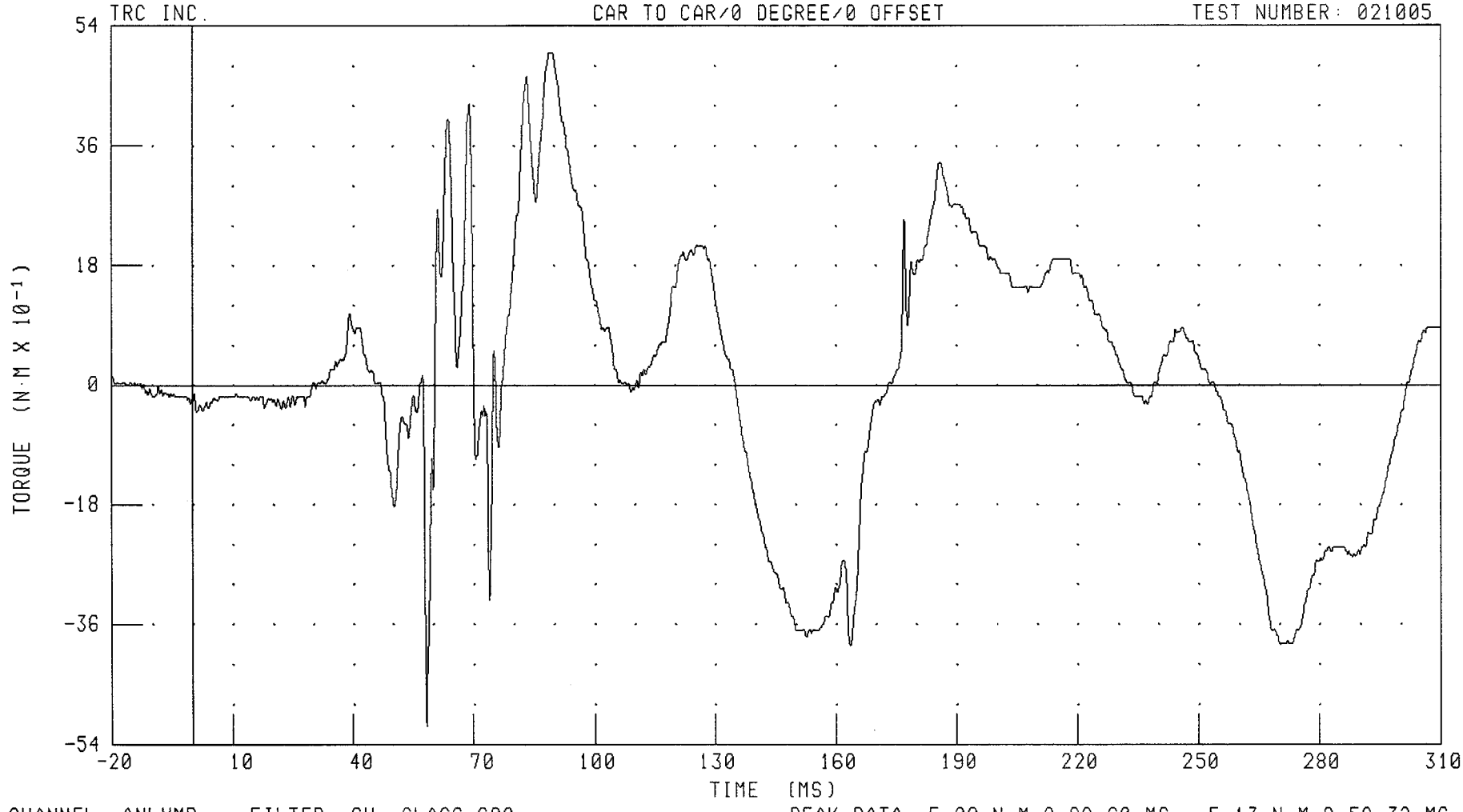


CHANNEL: ANLZFB FILTER: CH. CLASS 600 PEAK DATA: 261.38 N @ 59.04 MS; -190.50 N @ 66.32 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER LEFT LOWER TIBIA MOMENT ABOUT X AXIS



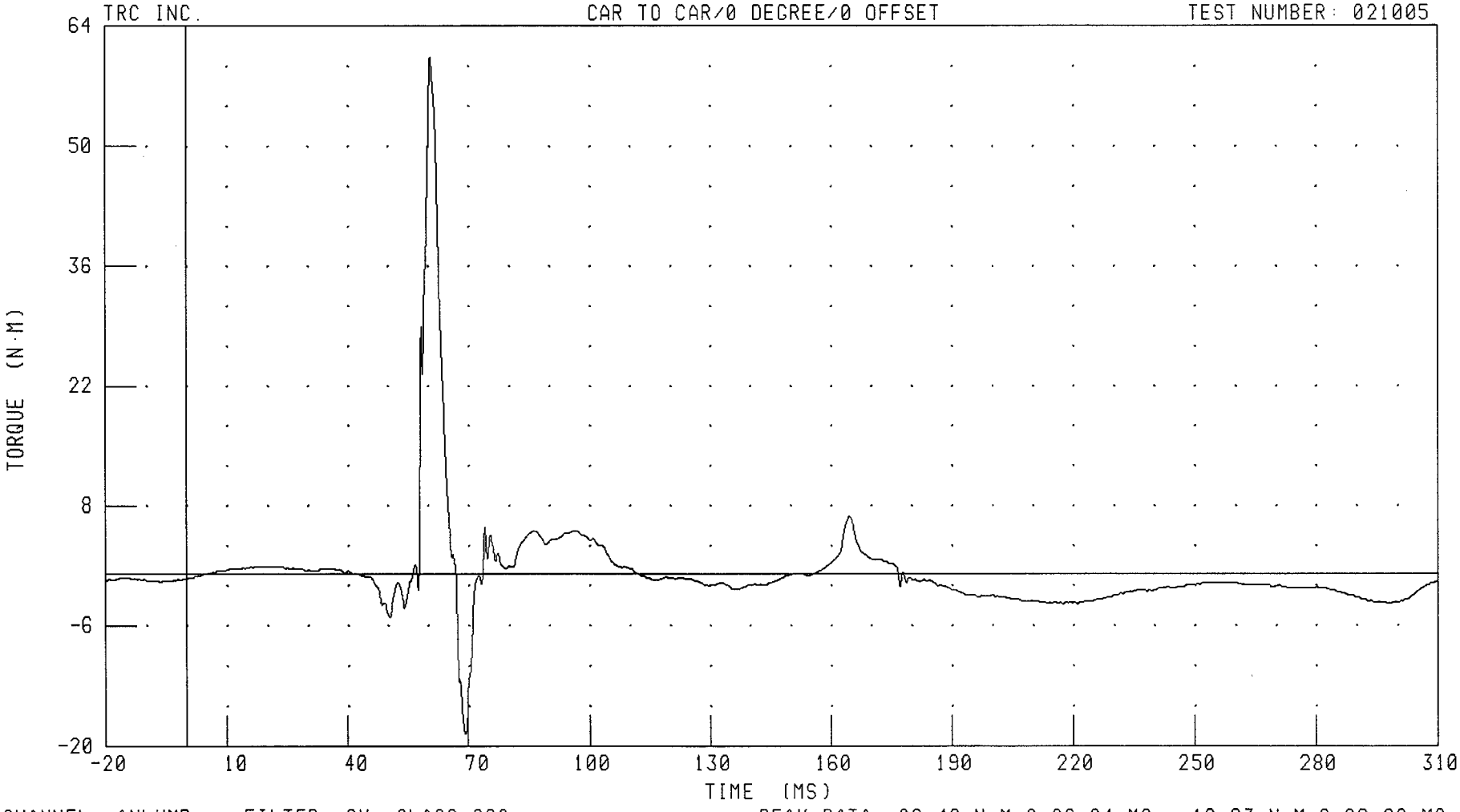
CHANNEL: ANLXMB FILTER: CH. CLASS 600

PEAK DATA: 5.00 N·M @ 89.60 MS; -5.13 N·M @ 58.32 MS

021005

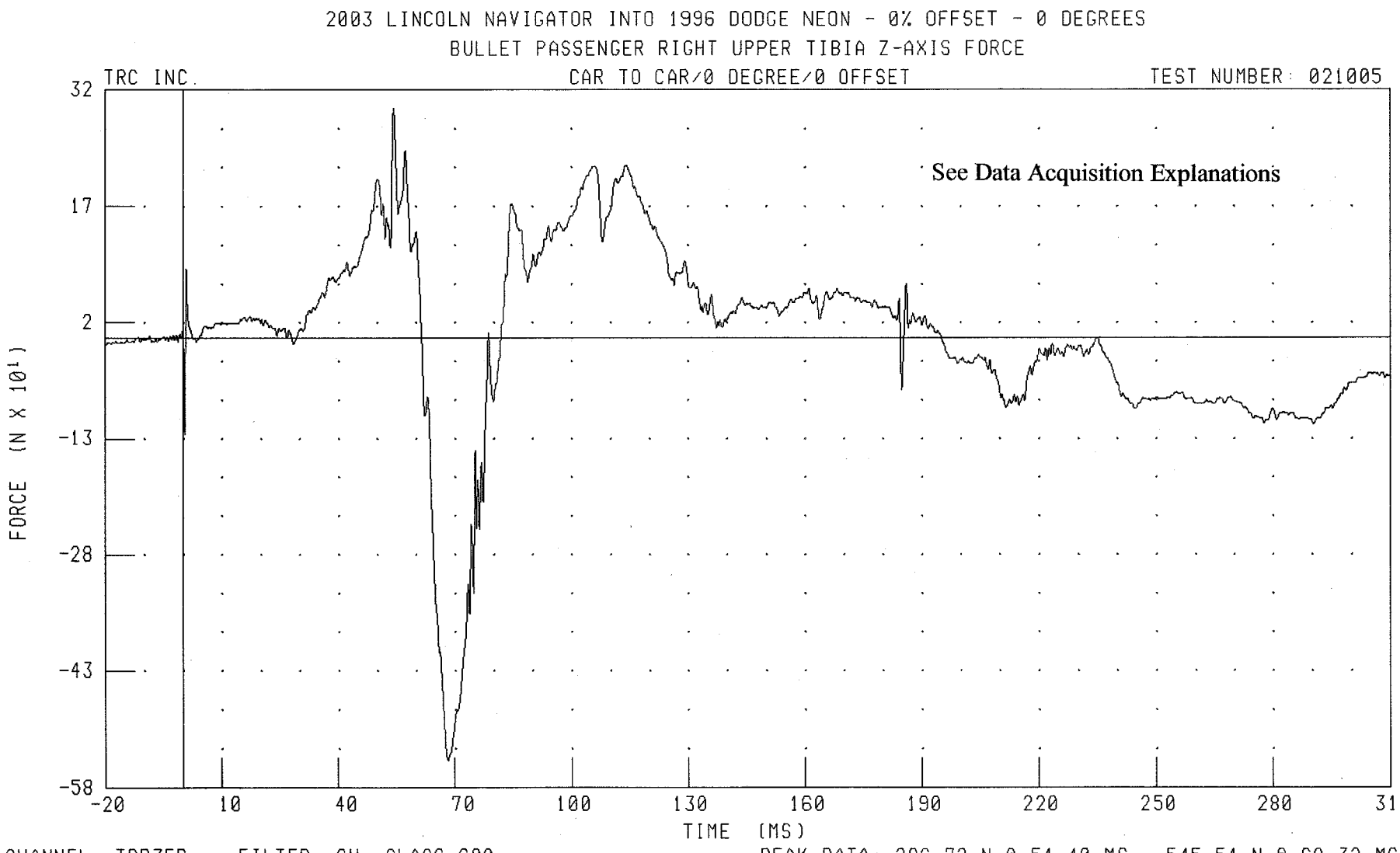
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

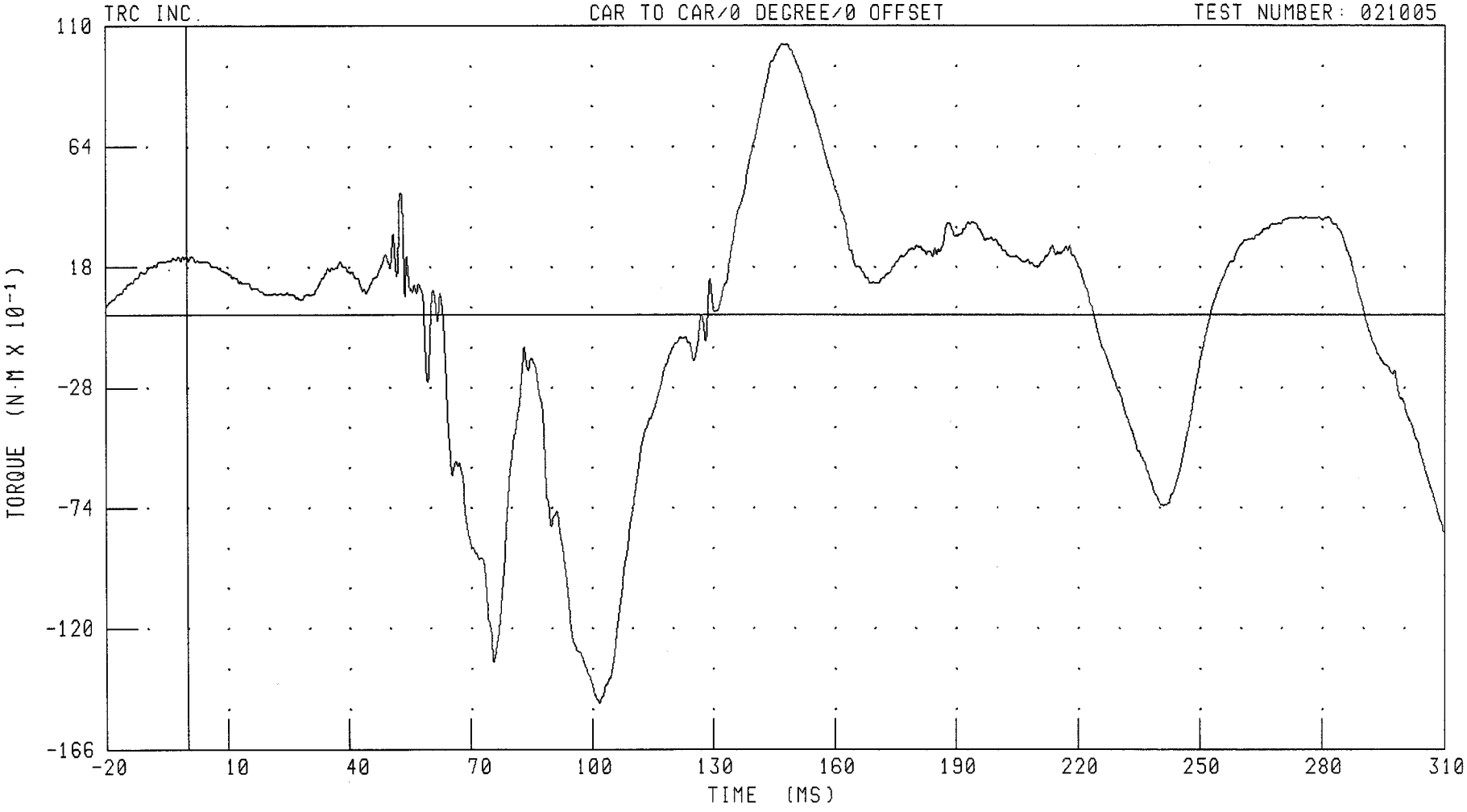


CHANNEL: ANLYMB FILTER: CH. CLASS 600 PEAK DATA: 60.40 N-M @ 60.64 MS; -18.63 N-M @ 69.28 MS

021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER RIGHT UPPER TIBIA Z-AXIS FORCE
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
32
17
2
-13
-28
-43
-58
FORCE (N X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: TBRZFB
FILTER: CH. CLASS 600
PEAK DATA: 296.72 N @ 54.40 MS; -545.54 N @ 68.32 MS

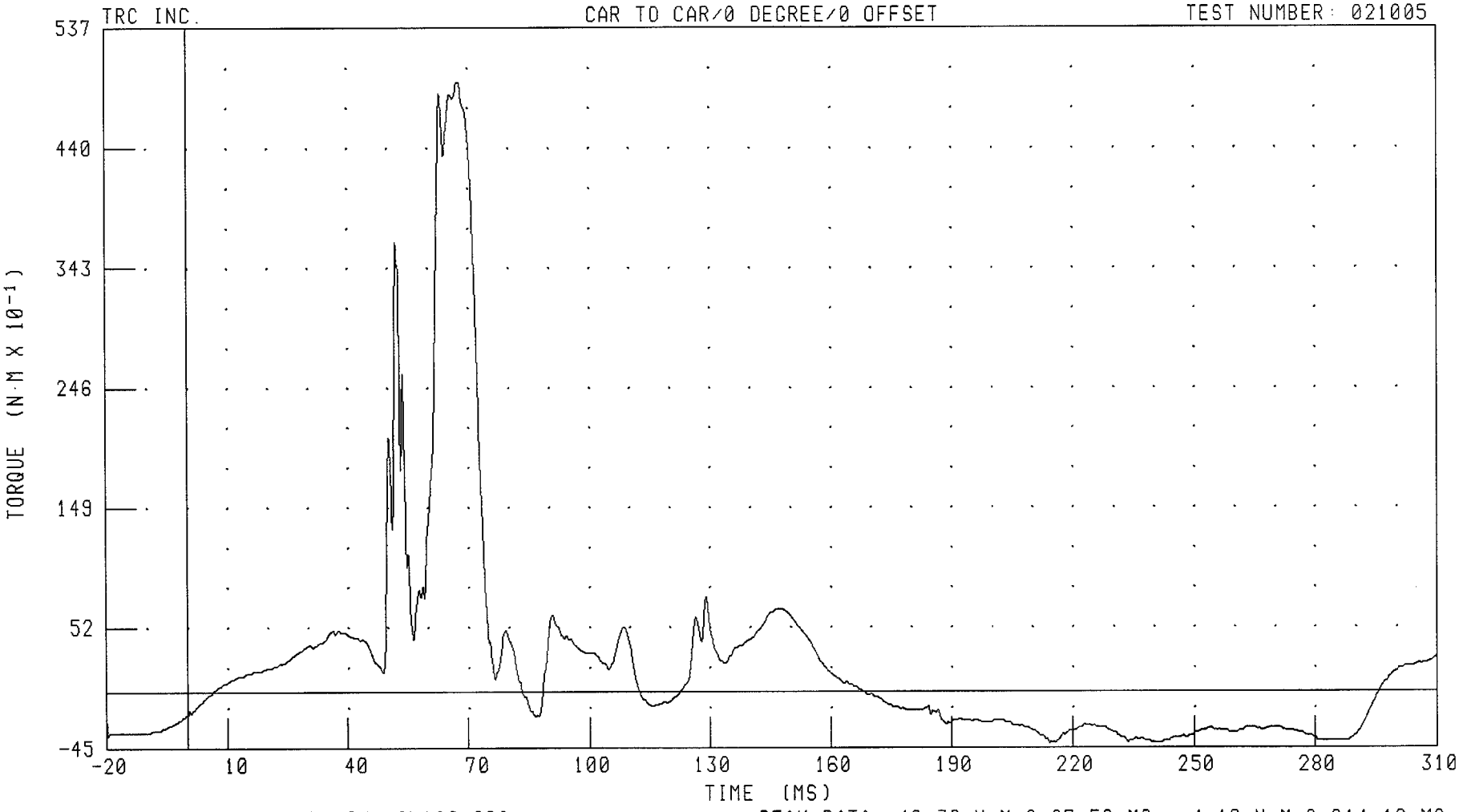
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS



CHANNEL: TBRXMB FILTER: CH. CLASS 600 PEAK DATA: 10.29 N·M @ 148.32 MS; -14.84 N·M @ 101.92 MS

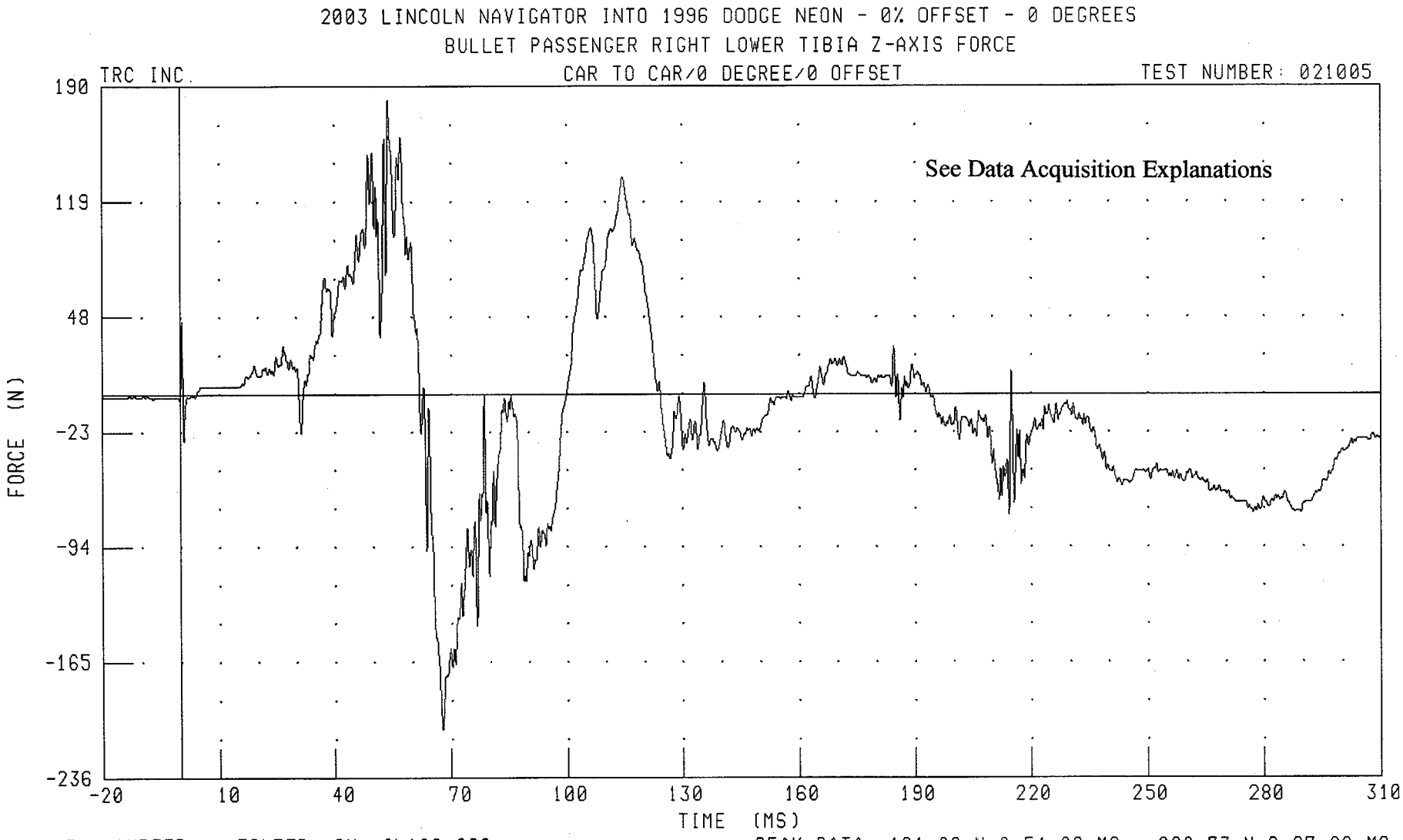
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS



CHANNEL: TBRYMB FILTER: CH. CLASS 600 PEAK DATA: 49.30 N·M @ 67.52 MS; -4.16 N·M @ 214.16 MS

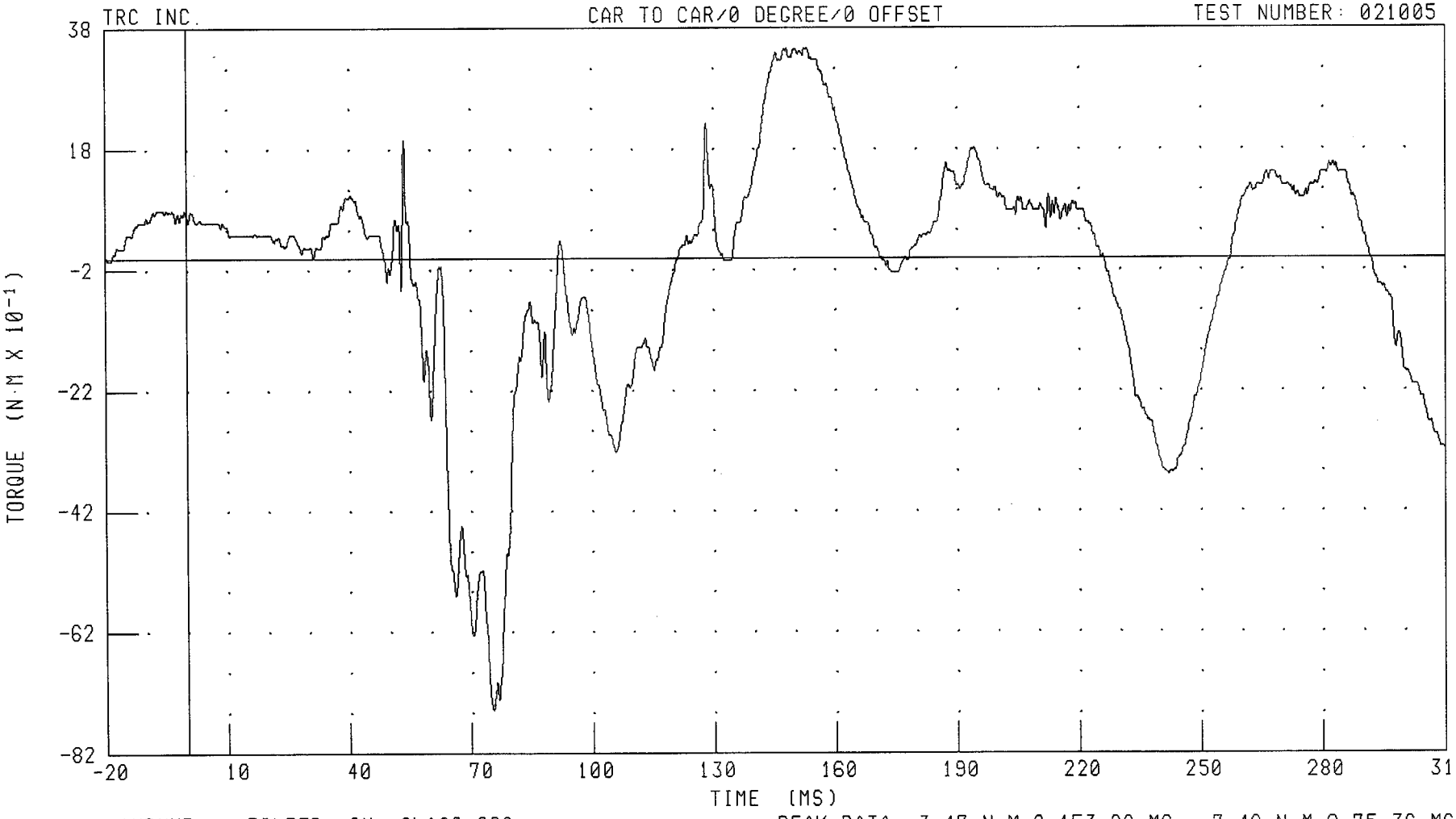
021005


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE
TRC INC.
CAR TO CAR/0 DEGREE/0 OFFSET
TEST NUMBER: 021005
See Data Acquisition Explanations
190
119
48
-23
-94
-165
-236
FORCE (N)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: ANRZFB
FILTER: CH. CLASS 600
PEAK DATA: 181.69 N @ 54.08 MS; -206.73 N @ 67.68 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS



CHANNEL: ANRXMB FILTER: CH. CLASS 600

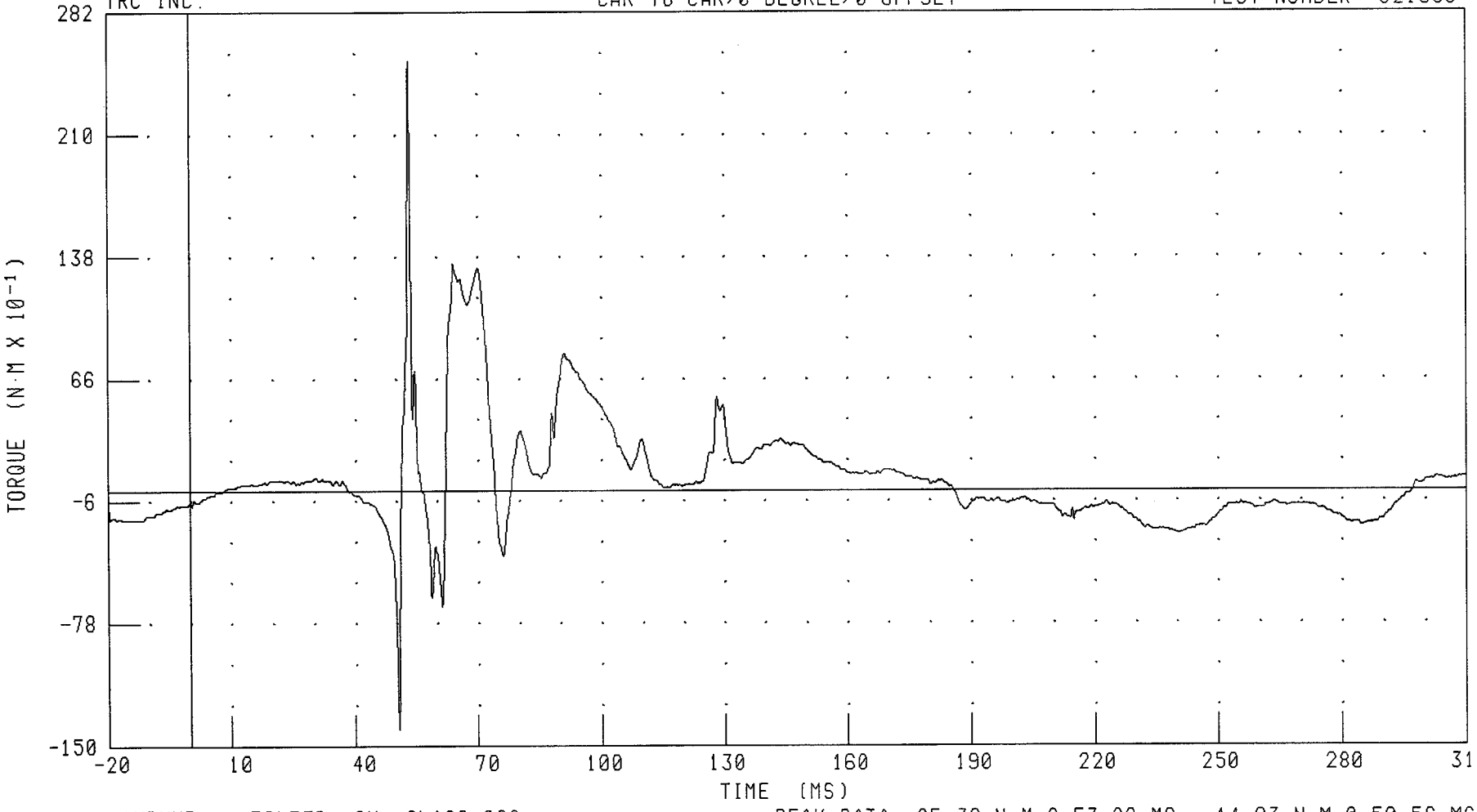
PEAK DATA: 3.47 N·M @ 153.28 MS; -7.49 N·M @ 75.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

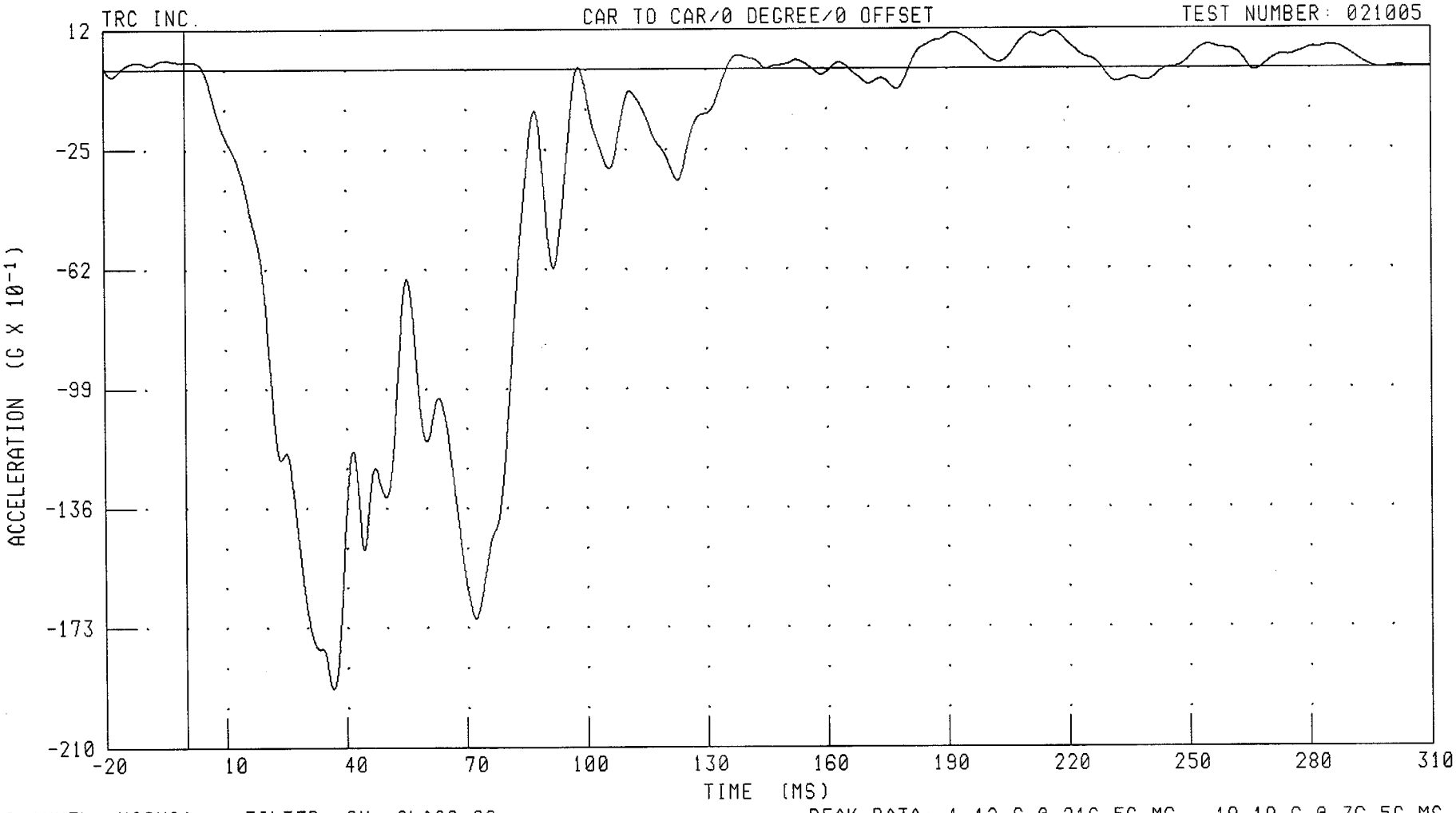
TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: ANRYMB FILTER: CH. CLASS 600 PEAK DATA: 25.36 N·M @ 53.28 MS; -14.03 N·M @ 50.56 MS

021005

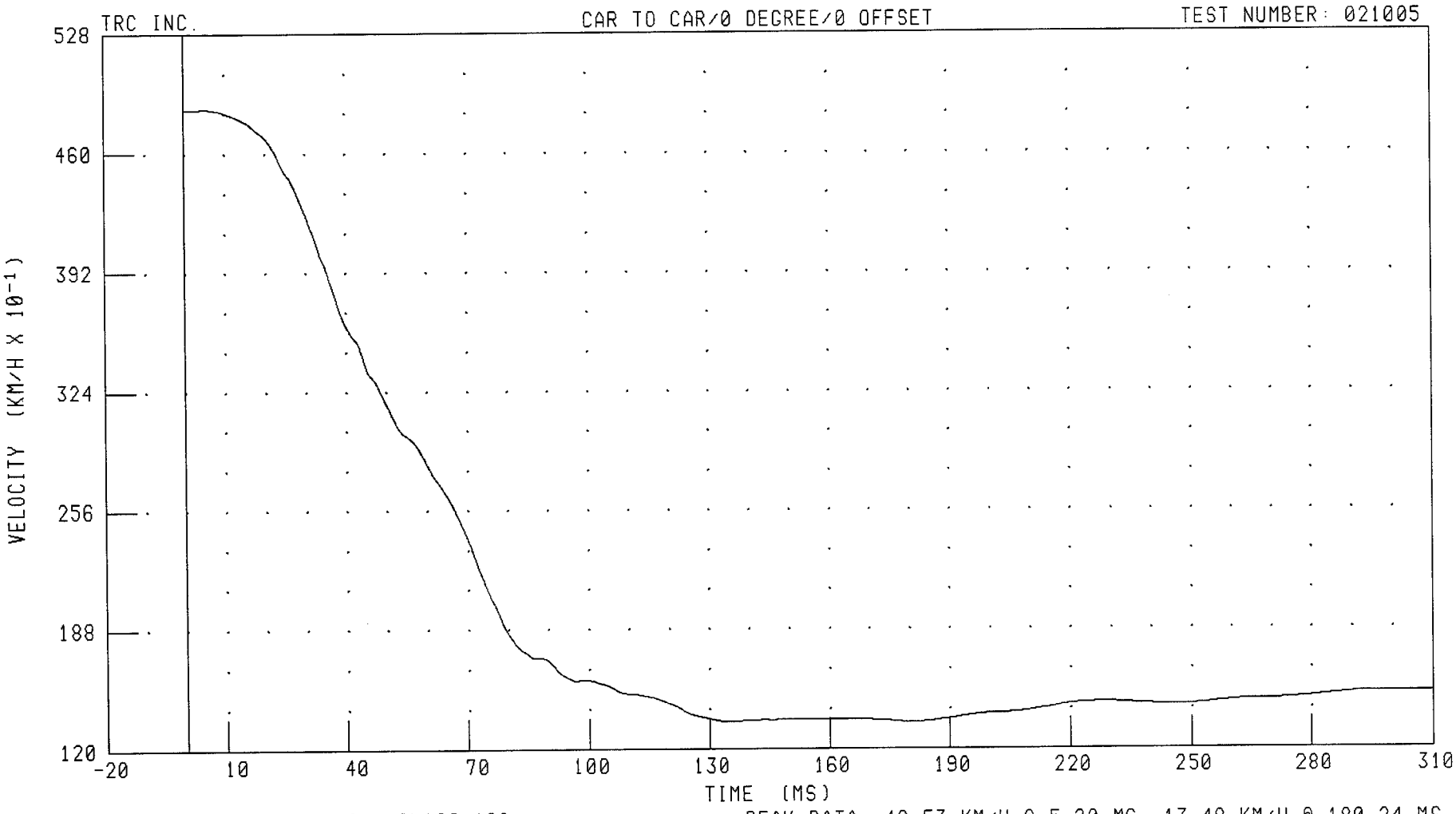
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION



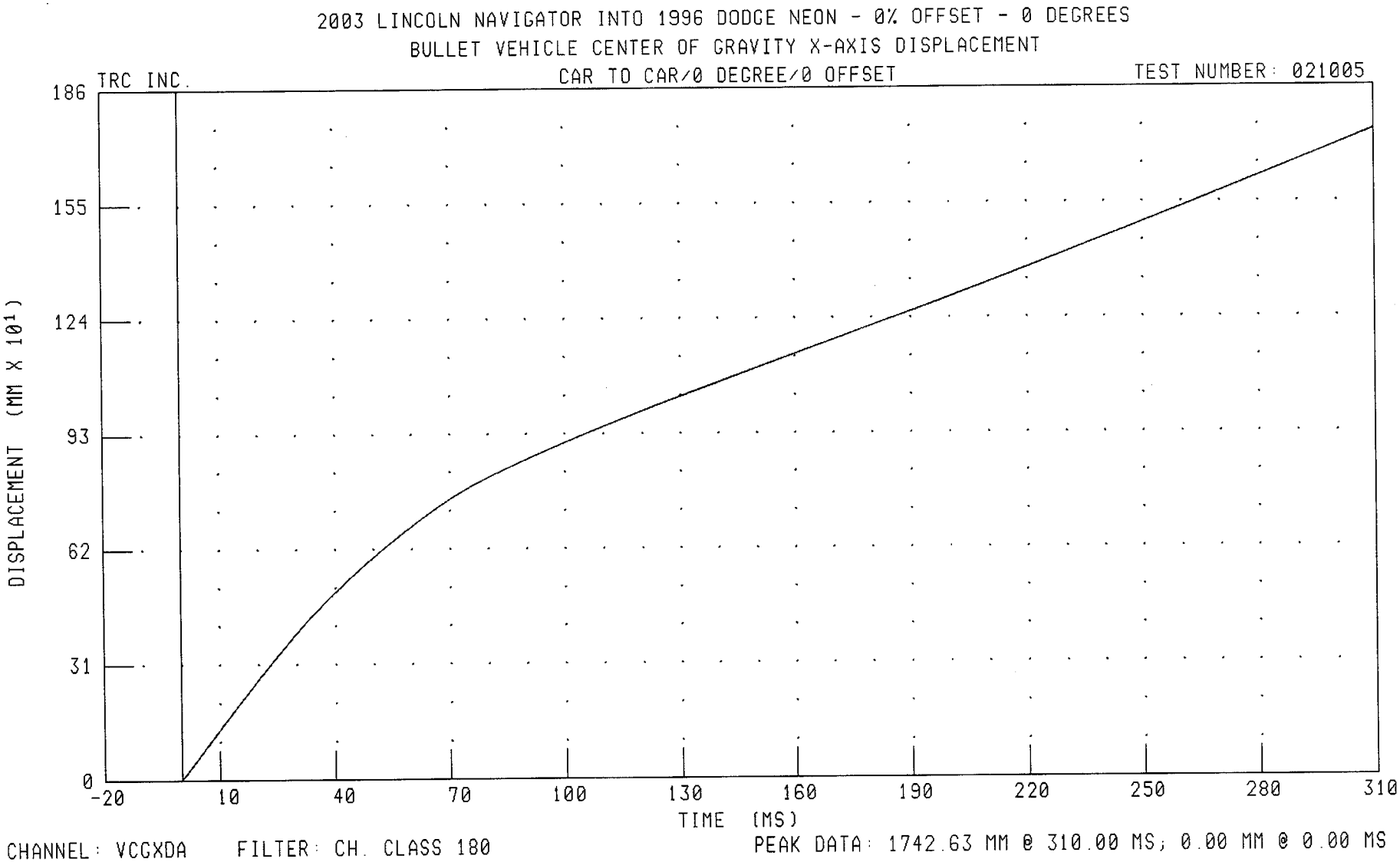
CHANNEL: VCGXGA FILTER: CH. CLASS 60 PEAK DATA: 1.12 G @ 216.56 MS; -19.19 G @ 36.56 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY
CAR TO CAR/0 DEGREE/0 OFFSET

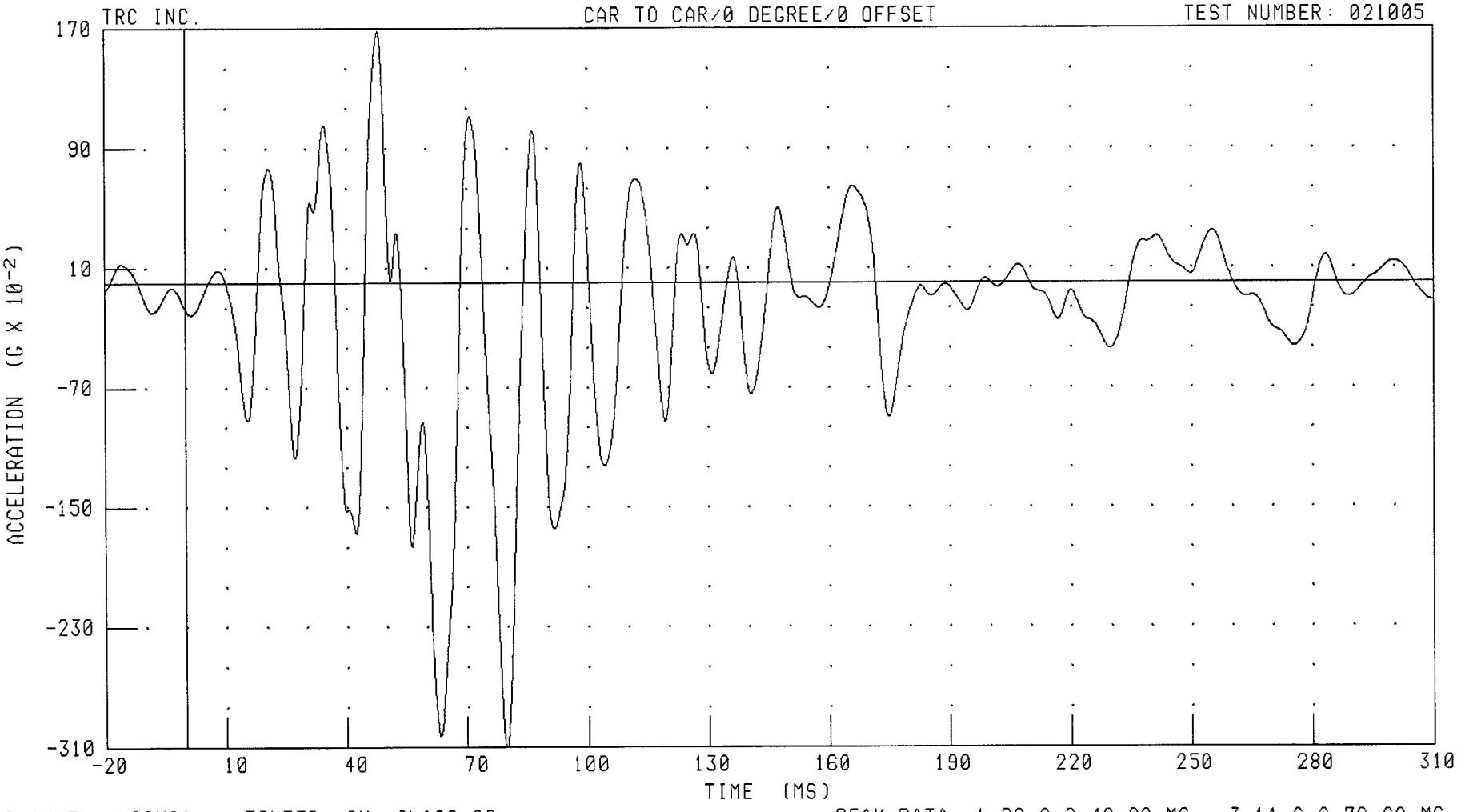


CHANNEL: VCGXVA FILTER: CH. CLASS 180
PEAK DATA: 48.53 KM/H @ 5.20 MS; 13.48 KM/H @ 180.24 MS


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT
CAR TO CAR/0 DEGREE/0 OFFSET
TRC INC.
TEST NUMBER: 021005
DISPLACEMENT (MM X 10¹)
186
155
124
93
62
31
0
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: VCGXDA
FILTER: CH. CLASS 180
PEAK DATA: 1742.63 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION



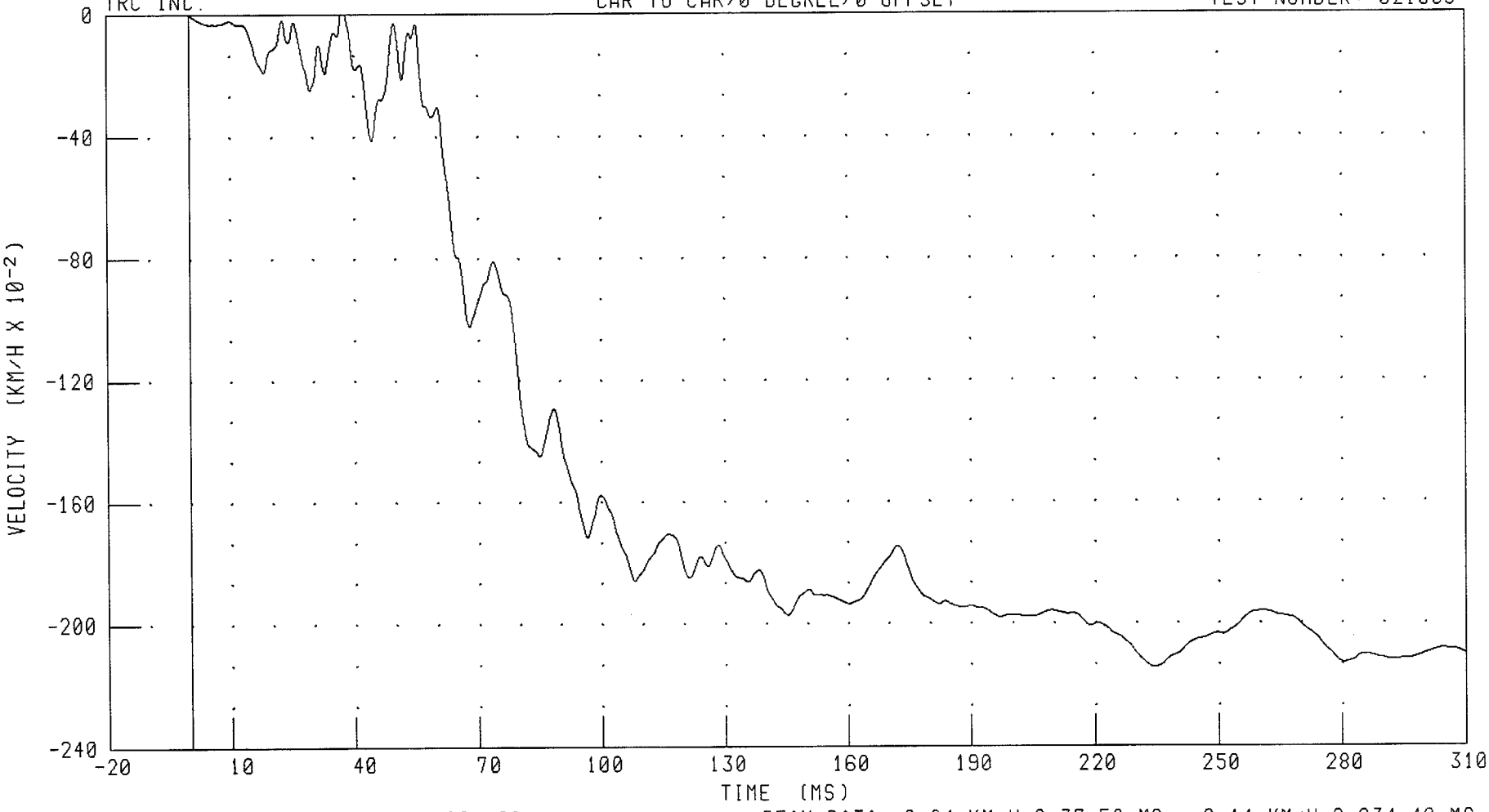
CHANNEL: VCGYGA FILTER: CH. CLASS 60 PEAK DATA: 1.68 G @ 48.08 MS; -3.11 G @ 79.68 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



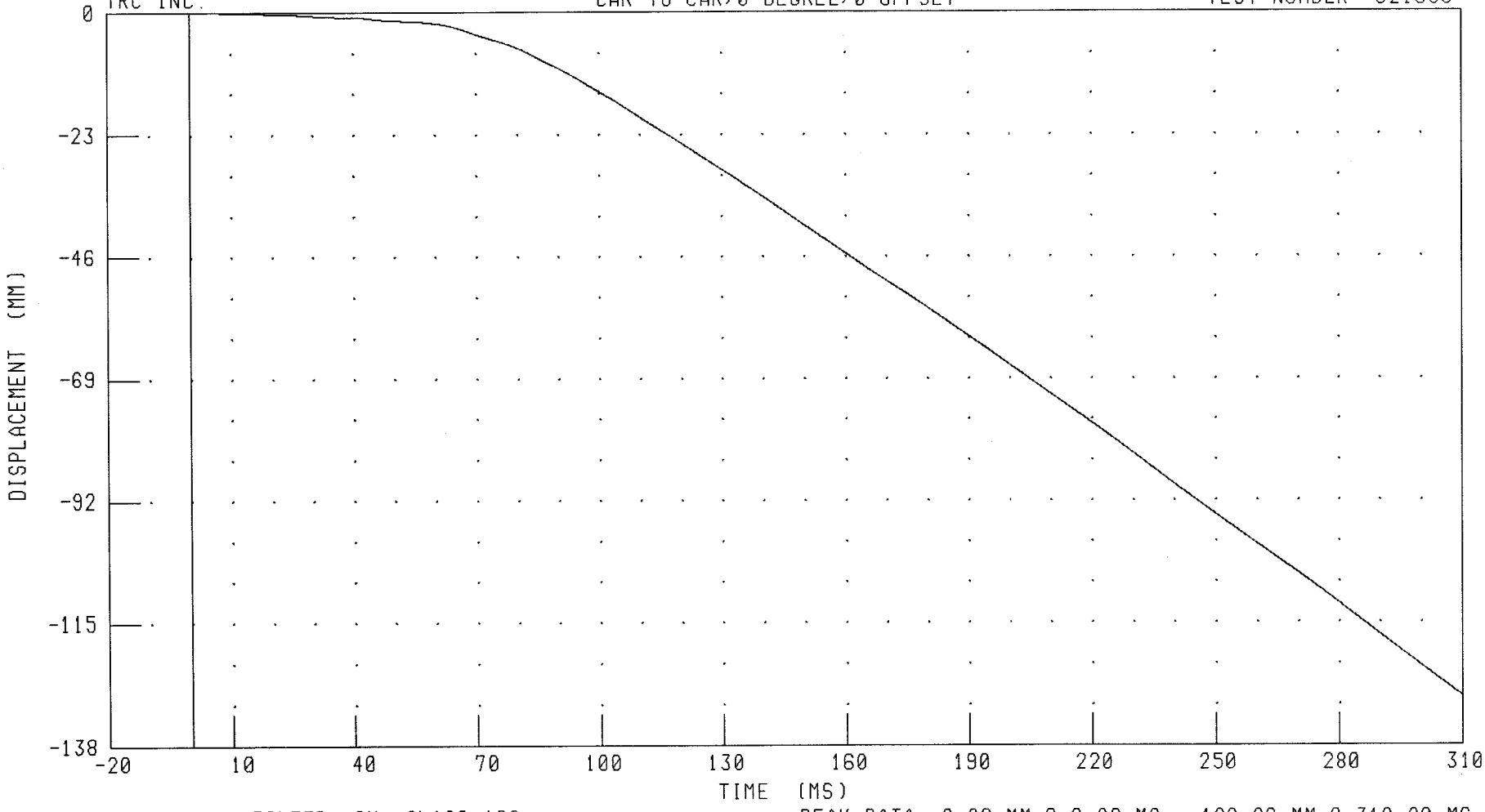
CHANNEL: VCGYVA FILTER: CH. CLASS 180 PEAK DATA: 0.04 KM/H @ 37.52 MS; -2.14 KM/H @ 234.40 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



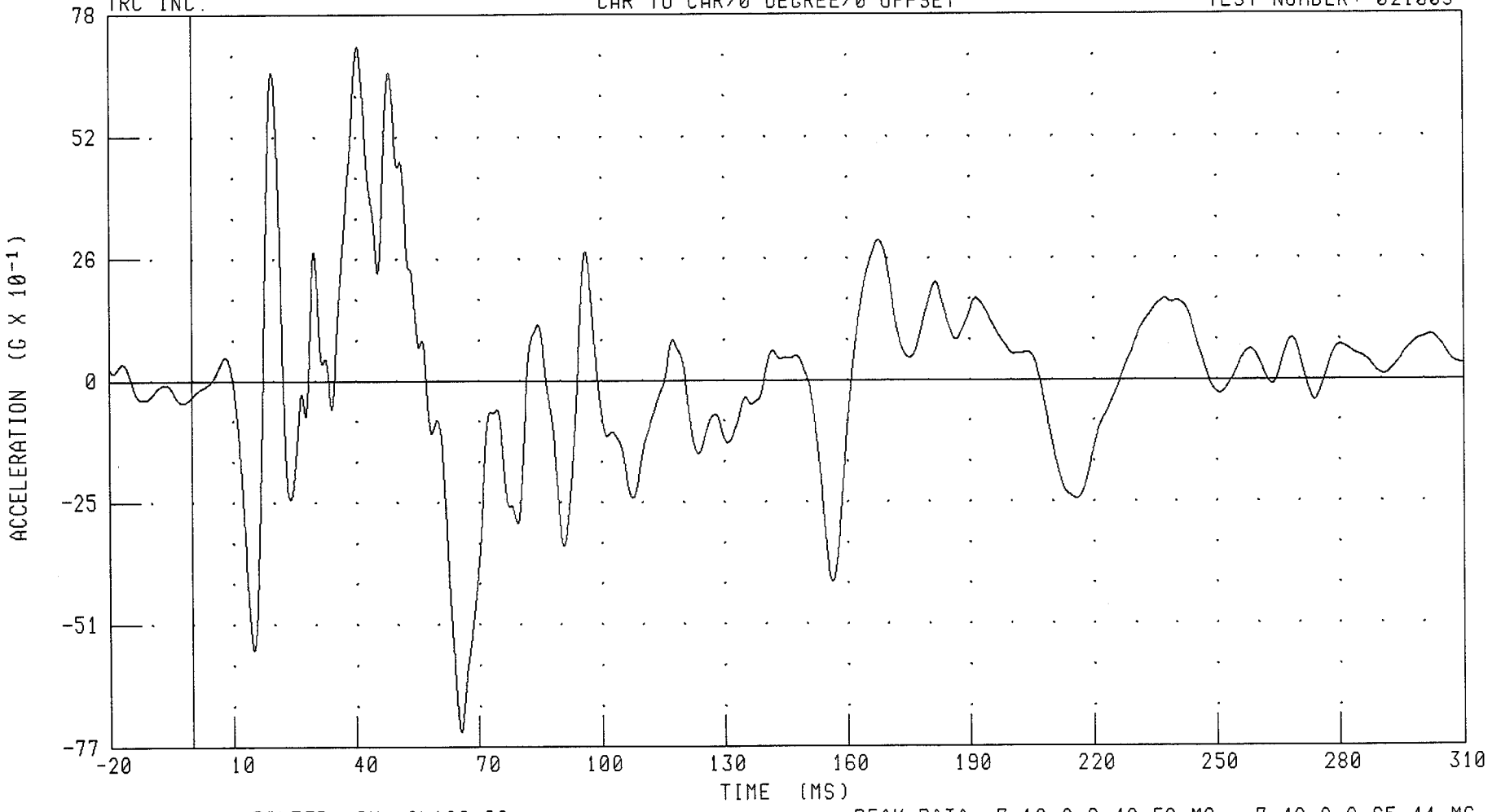
CHANNEL: VCGYDA FILTER: CH. CLASS 180

PEAK DATA: 0.00 MM @ 0.00 MS; -128.98 MM @ 310.00 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

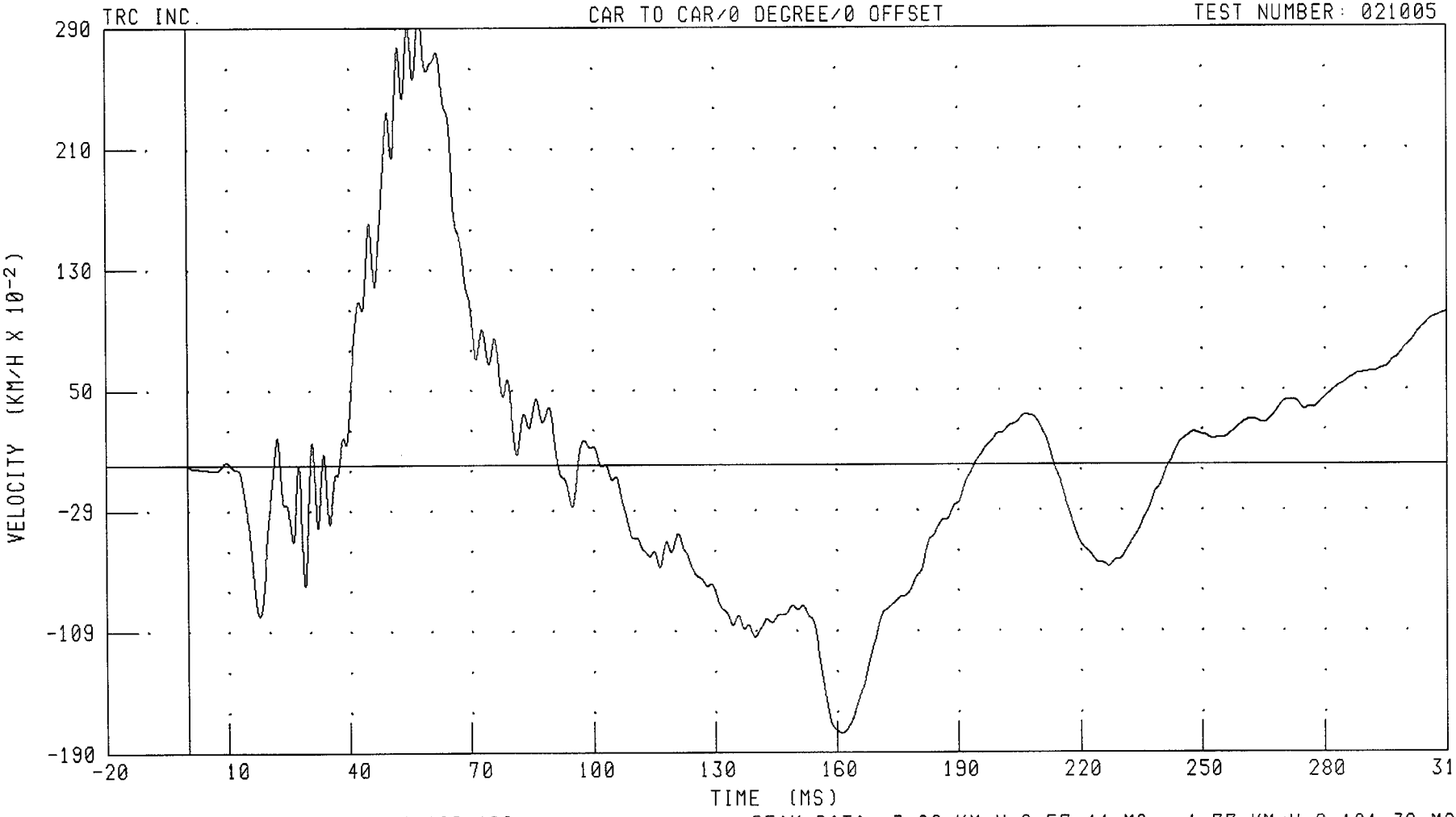
BULLET VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: VCGZGA FILTER: CH. CLASS 60 PEAK DATA: 7.12 G @ 40.56 MS; -7.49 G @ 65.44 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY



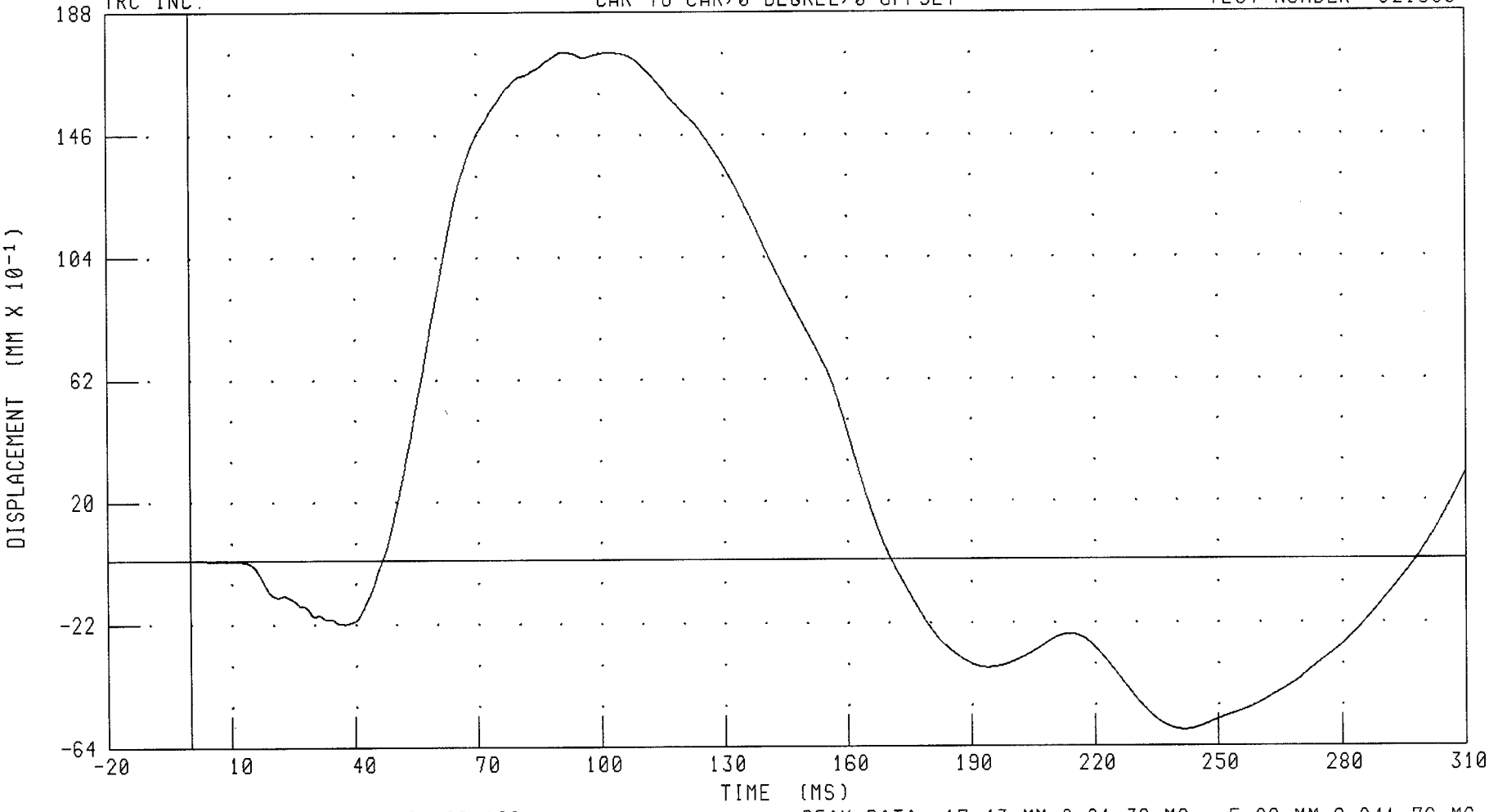
CHANNEL: VCGZVA FILTER: CH. CLASS 180 PEAK DATA: 3.02 KM/H @ 57.44 MS; -1.77 KM/H @ 161.36 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

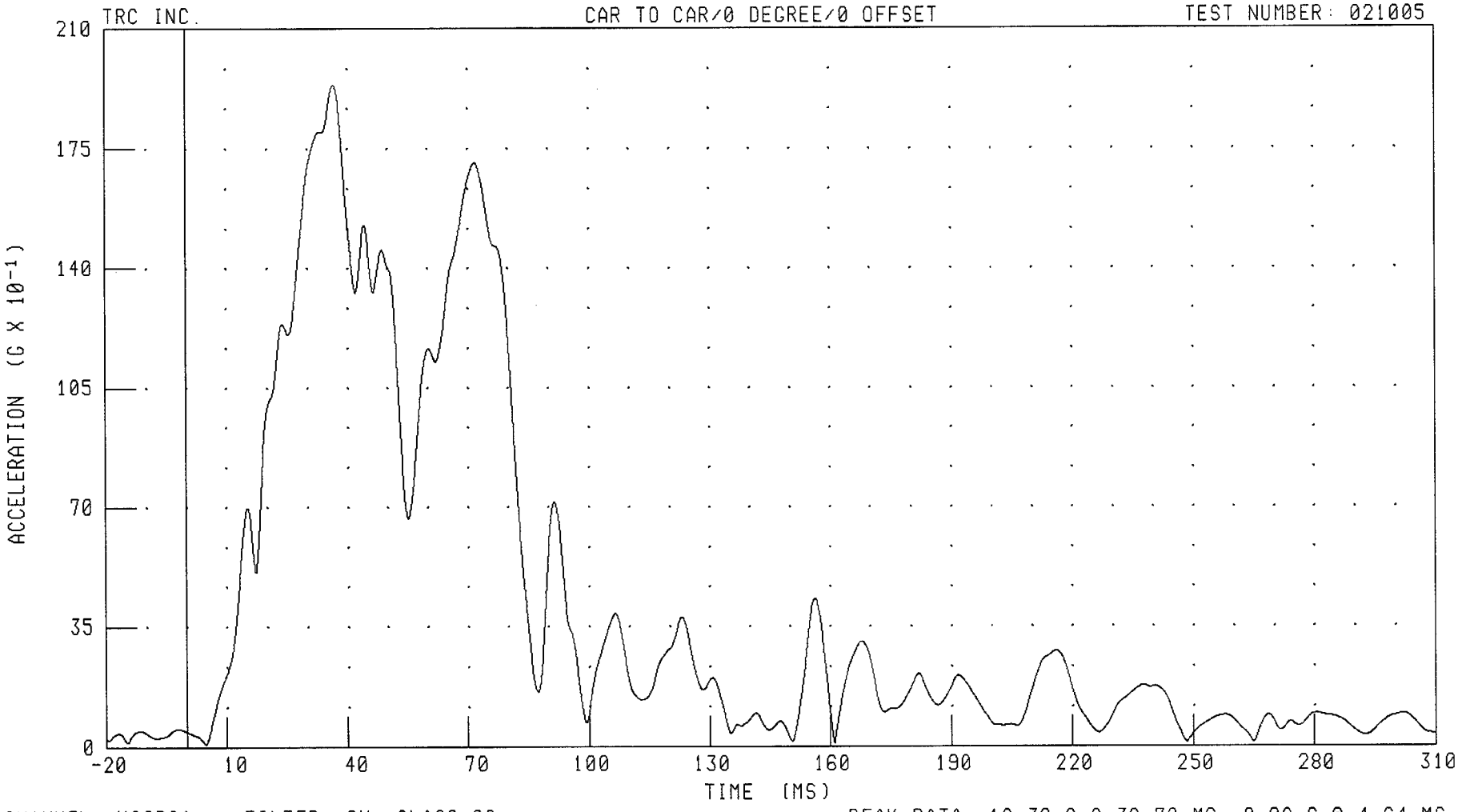
BULLET VEHICLE CENTER OF GRAVITY Z-AXIS DISPLACEMENT

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005

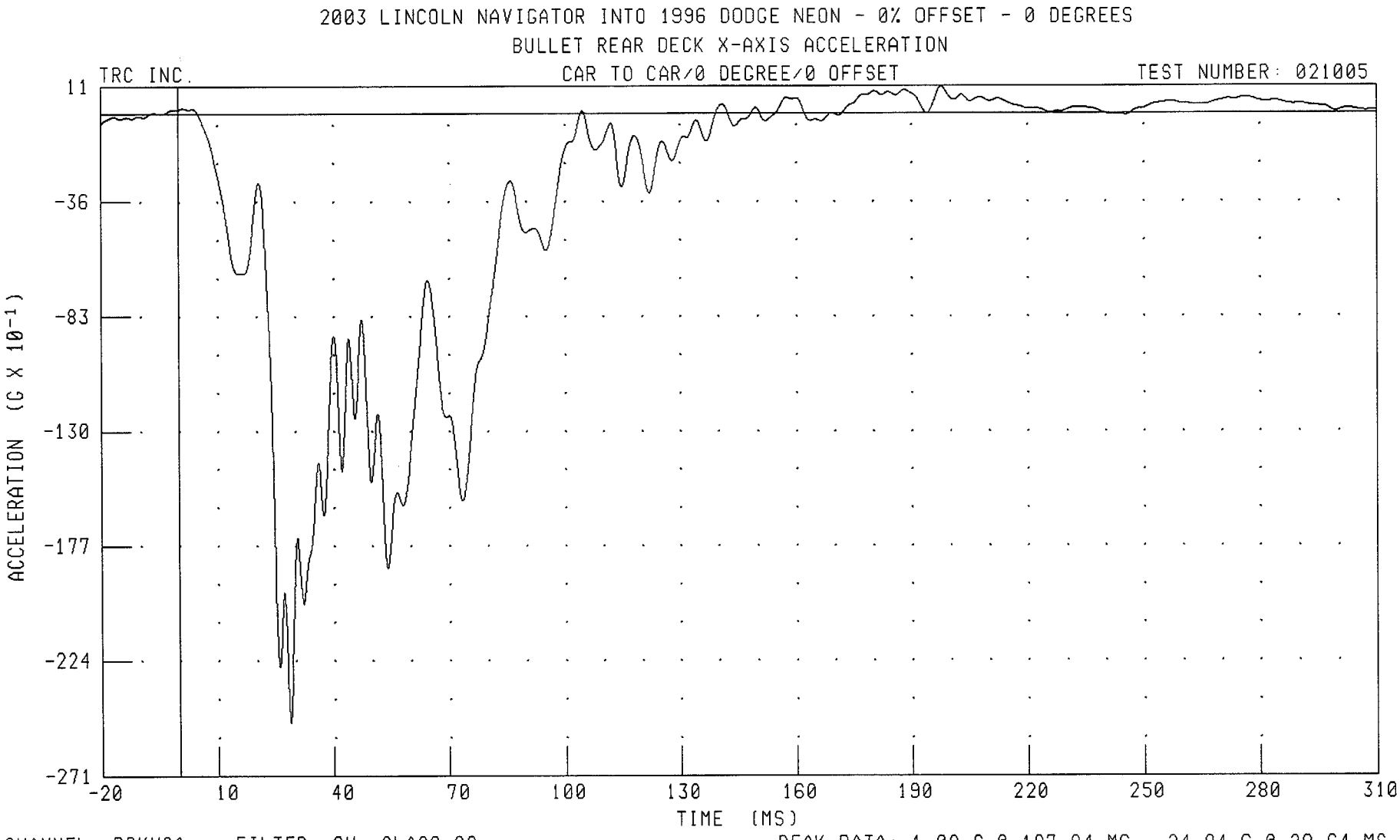


CHANNEL: VCGZDA FILTER: CH. CLASS 180 PEAK DATA: 17.43 MM @ 91.36 MS; -5.86 MM @ 241.76 MS

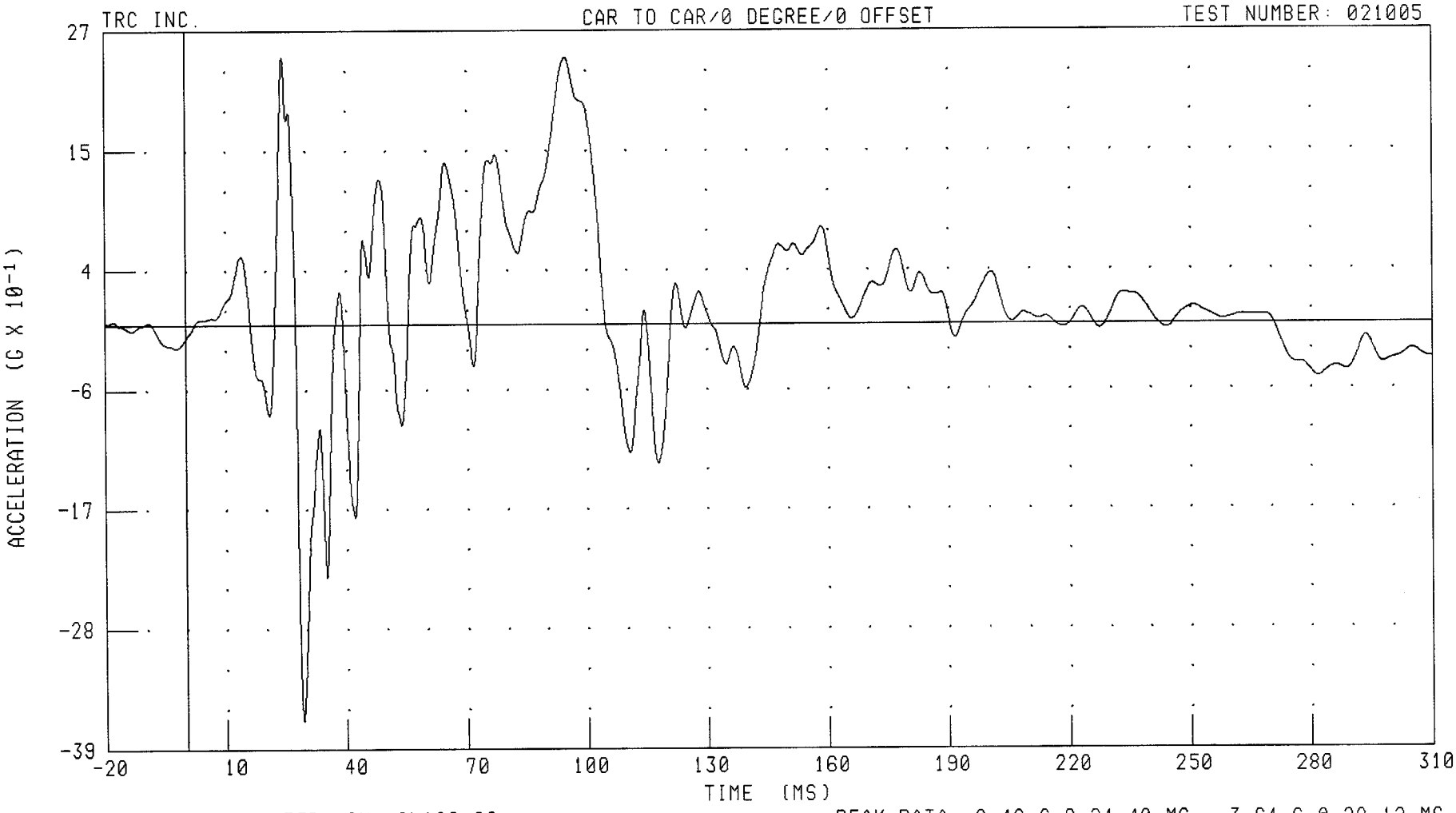
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION



CHANNEL: VCGRGA FILTER: CH. CLASS 60 PEAK DATA: 19.36 G @ 36.72 MS; 0.08 G @ 4.64 MS


2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET REAR DECK X-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET
TRC INC.
TEST NUMBER: 021005
ACCELERATION (G X 10⁻¹)
11
-36
-83
-130
-177
-224
-271
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: RDKXGA
FILTER: CH. CLASS 60
PEAK DATA: 1.08 G @ 197.84 MS; -24.94 G @ 28.64 MS

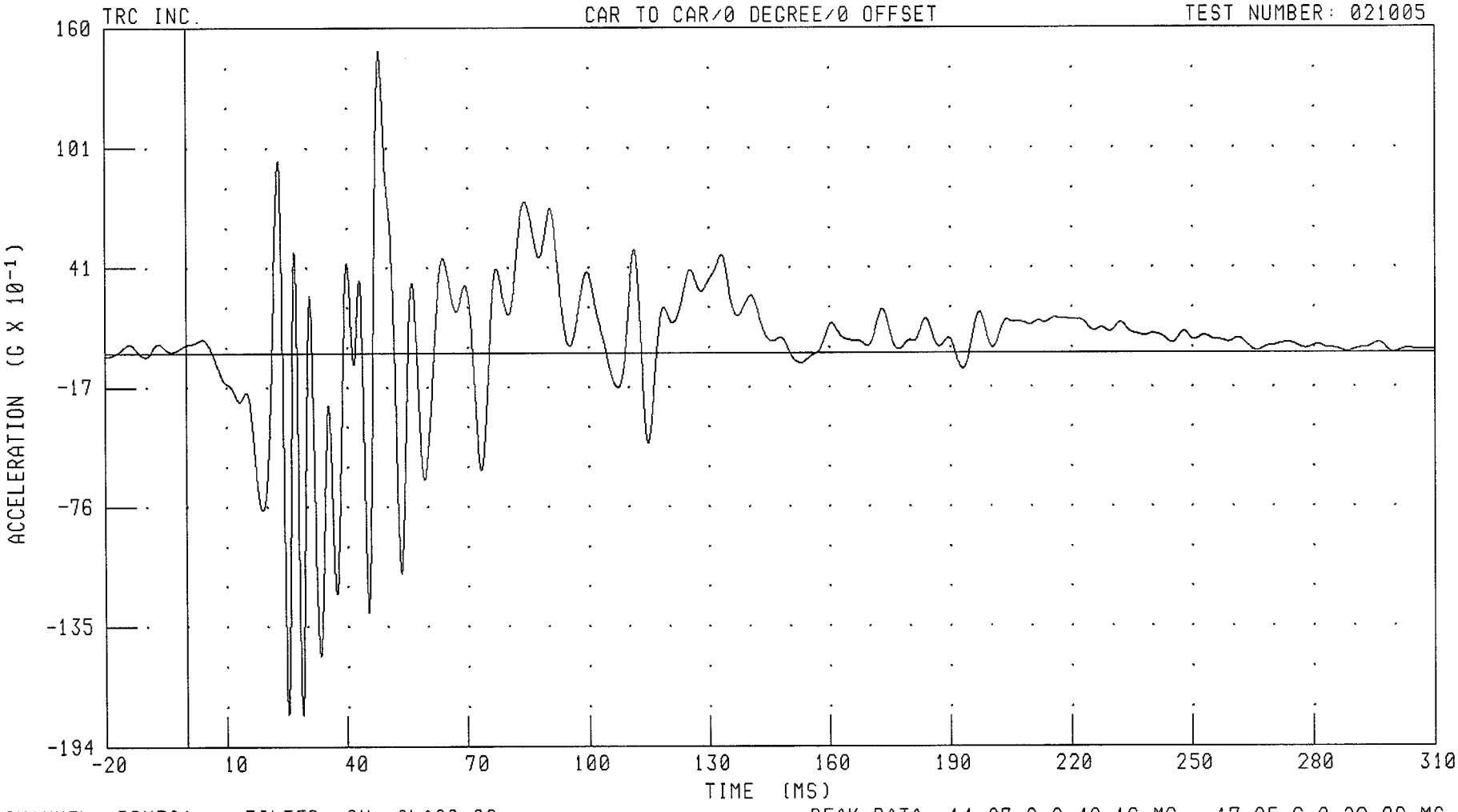
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET REAR DECK Y-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: RDKYGA FILTER: CH. CLASS 60 PEAK DATA: 2.46 G @ 24.40 MS; -3.64 G @ 29.12 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET REAR DECK Z-AXIS ACCELERATION

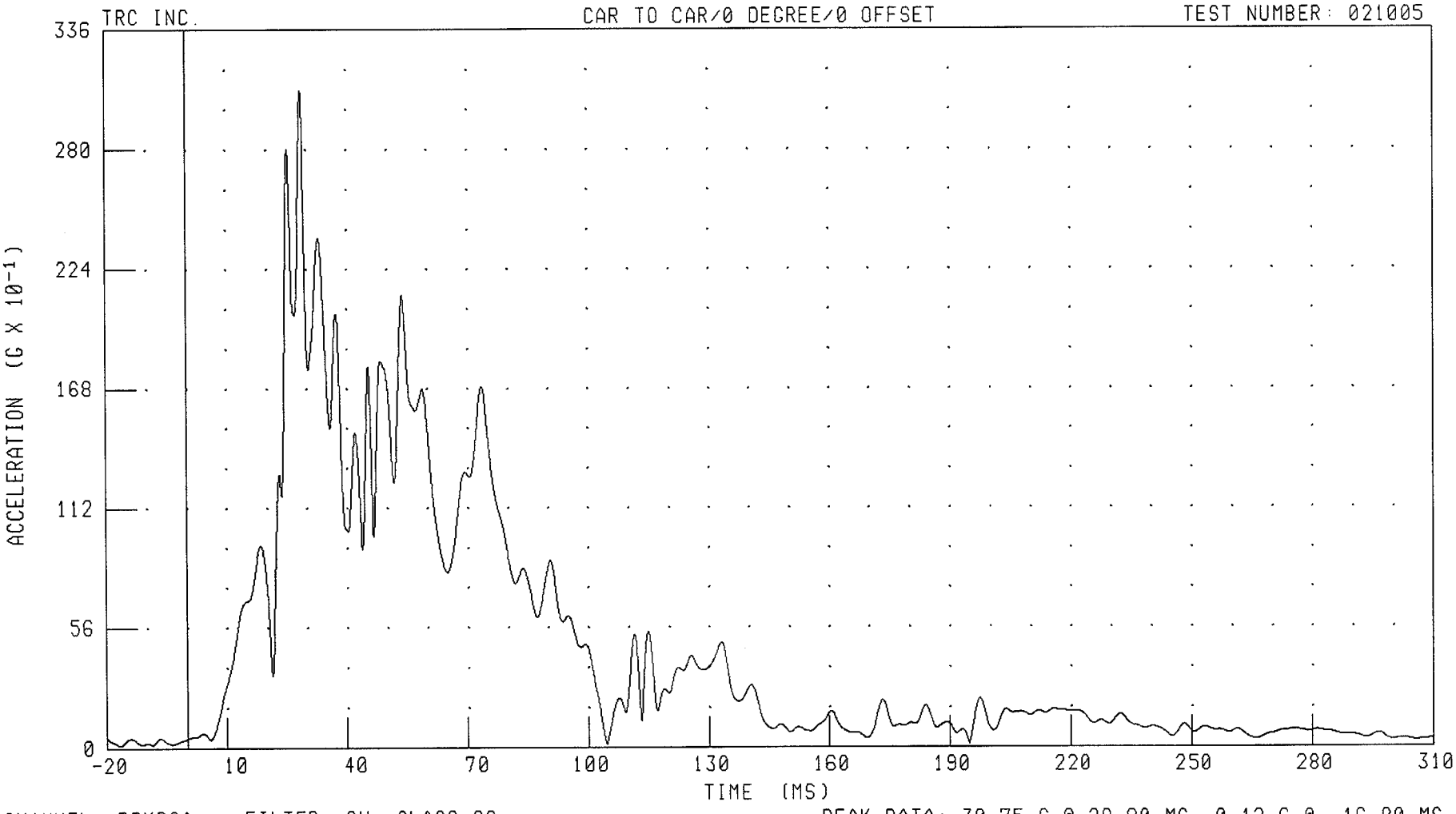


CHANNEL: RDKZGA FILTER: CH. CLASS 60 PEAK DATA: 14.87 G @ 48.16 MS; -17.85 G @ 28.88 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET REAR DECK RESULTANT ACCELERATION



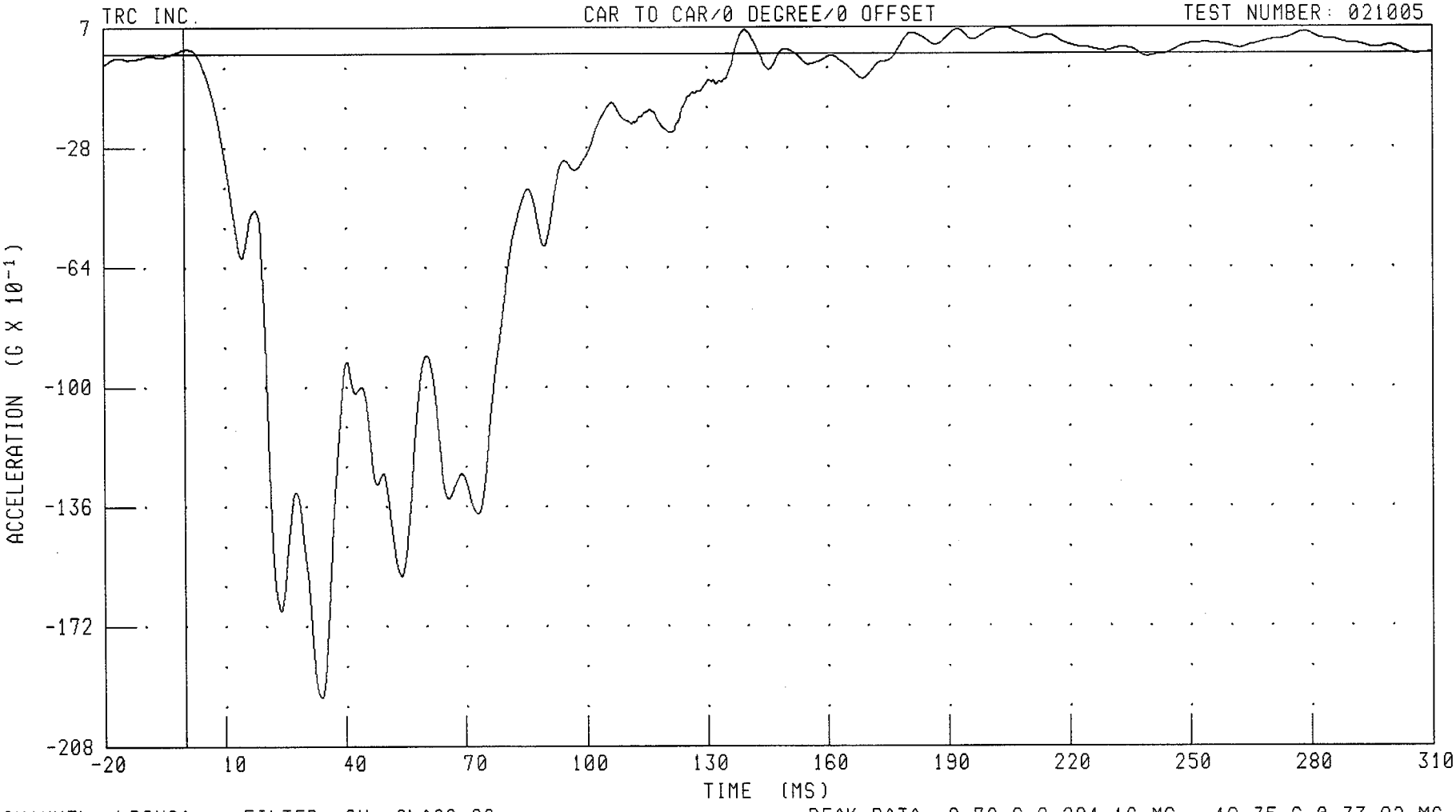
CHANNEL: RDKRGA FILTER: CH. CLASS 60

PEAK DATA: 30.75 G @ 28.80 MS; 0.12 G @ -16.80 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET LEFT REAR SILL X-AXIS ACCELERATION

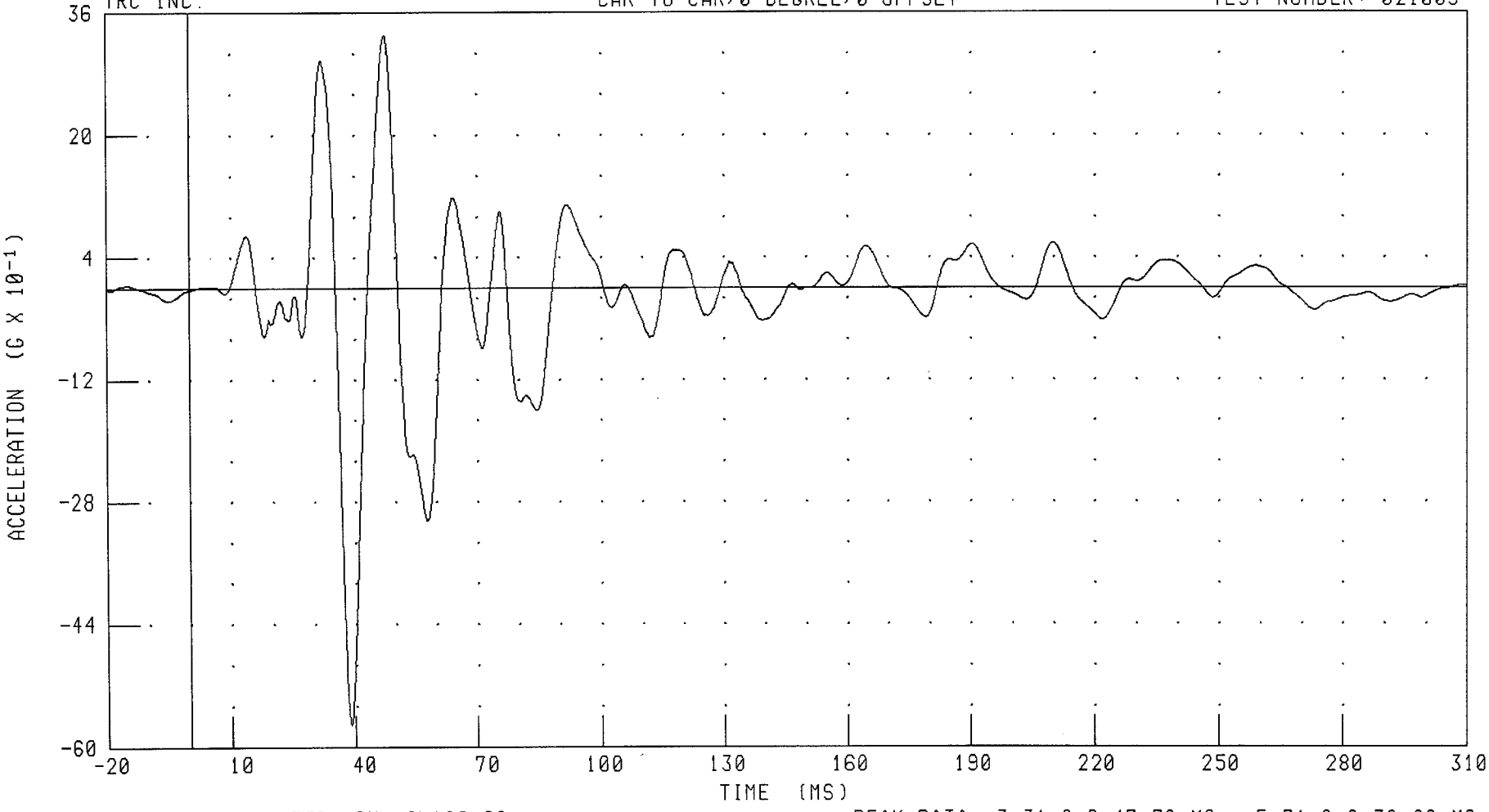


CHANNEL: LRSXGA FILTER: CH. CLASS 60 PEAK DATA: 0.78 G @ 204.16 MS; -19.35 G @ 33.92 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

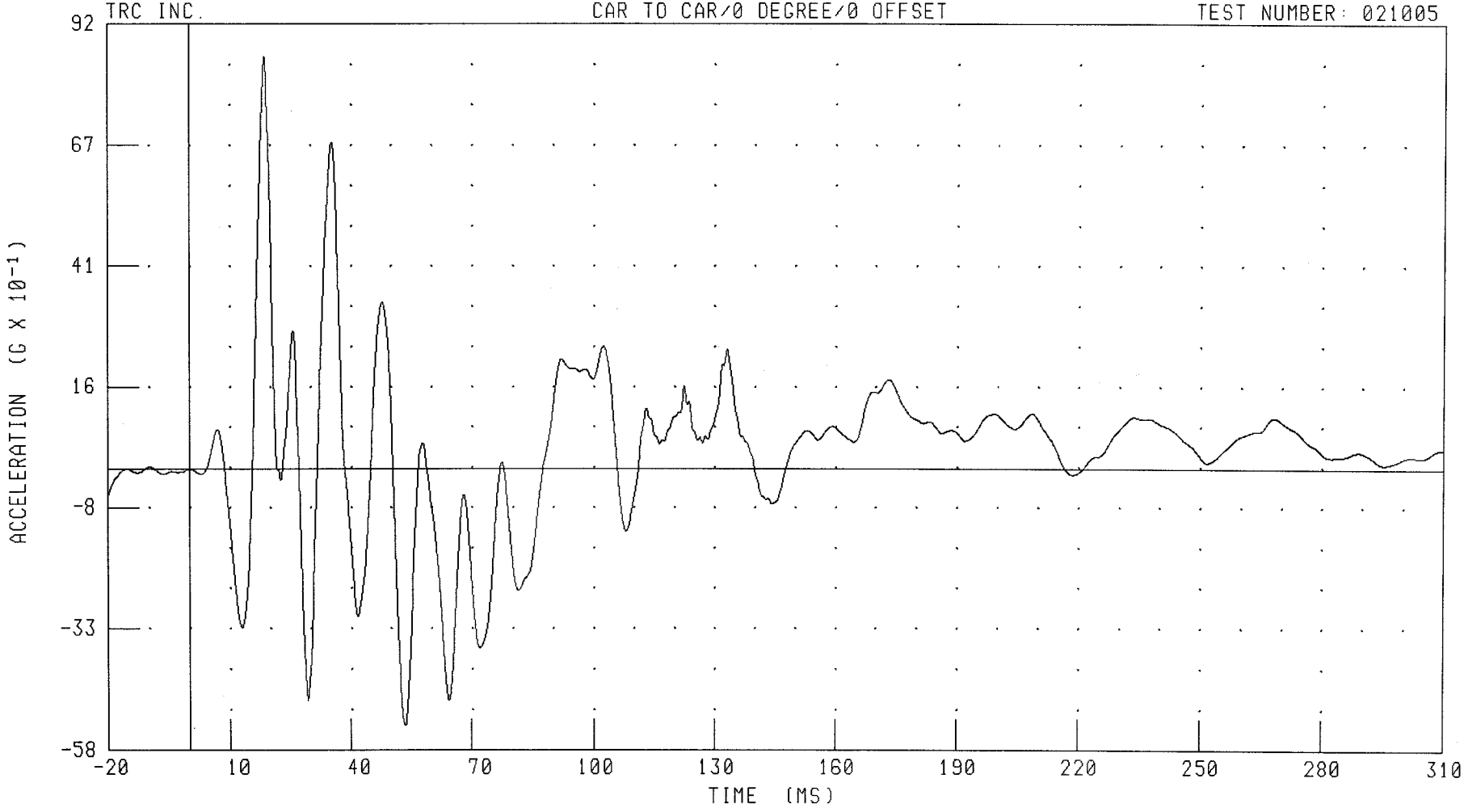
BULLET LEFT REAR SILL Y-AXIS ACCELERATION

TRC INC. CAR TO CAR/0 DEGREE/0 OFFSET TEST NUMBER: 021005



CHANNEL: LRSYGA FILTER: CH. CLASS 60 PEAK DATA: 3.31 G @ 47.76 MS; -5.71 G @ 38.88 MS

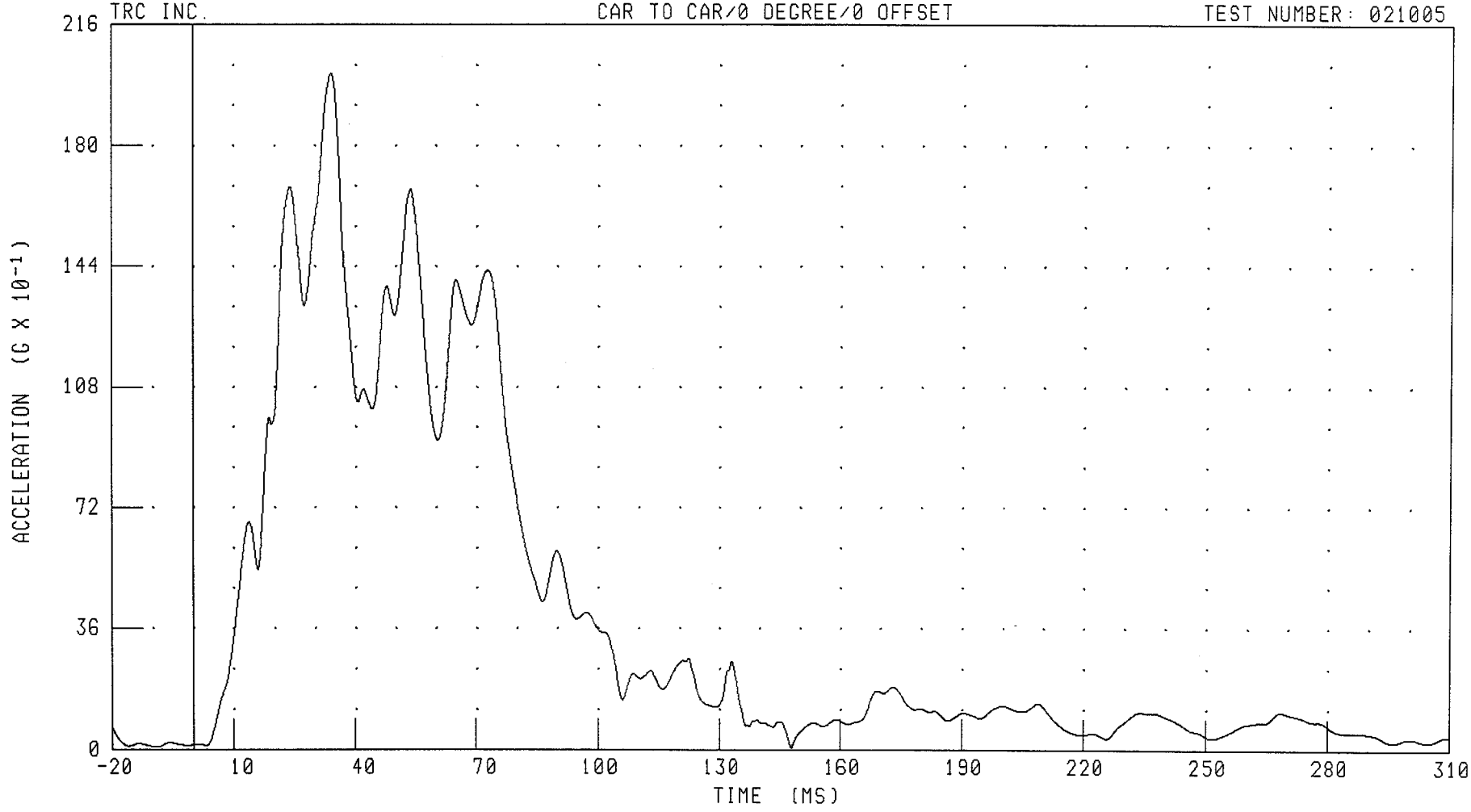
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET LEFT REAR SILL Z-AXIS ACCELERATION



CHANNEL: LRSZGA FILTER: CH. CLASS 60 PEAK DATA: 8.53 G @ 18.64 MS; -5.30 G @ 53.60 MS

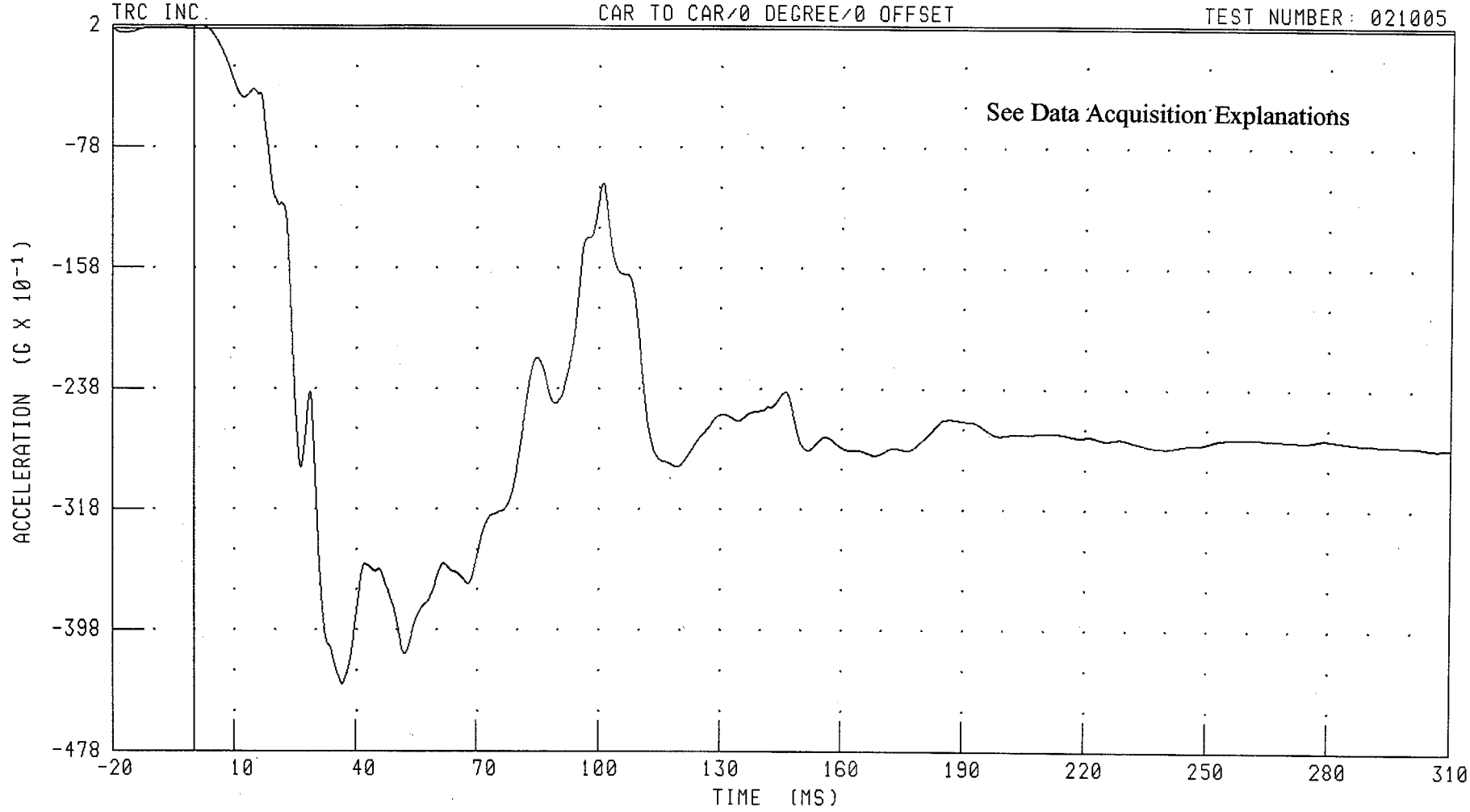
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET LEFT REAR SILL RESULTANT ACCELERATION



CHANNEL: LRSRGA FILTER: CH. CLASS 60 PEAK DATA: 20.15 G @ 34.08 MS; 0.05 G @ 147.84 MS

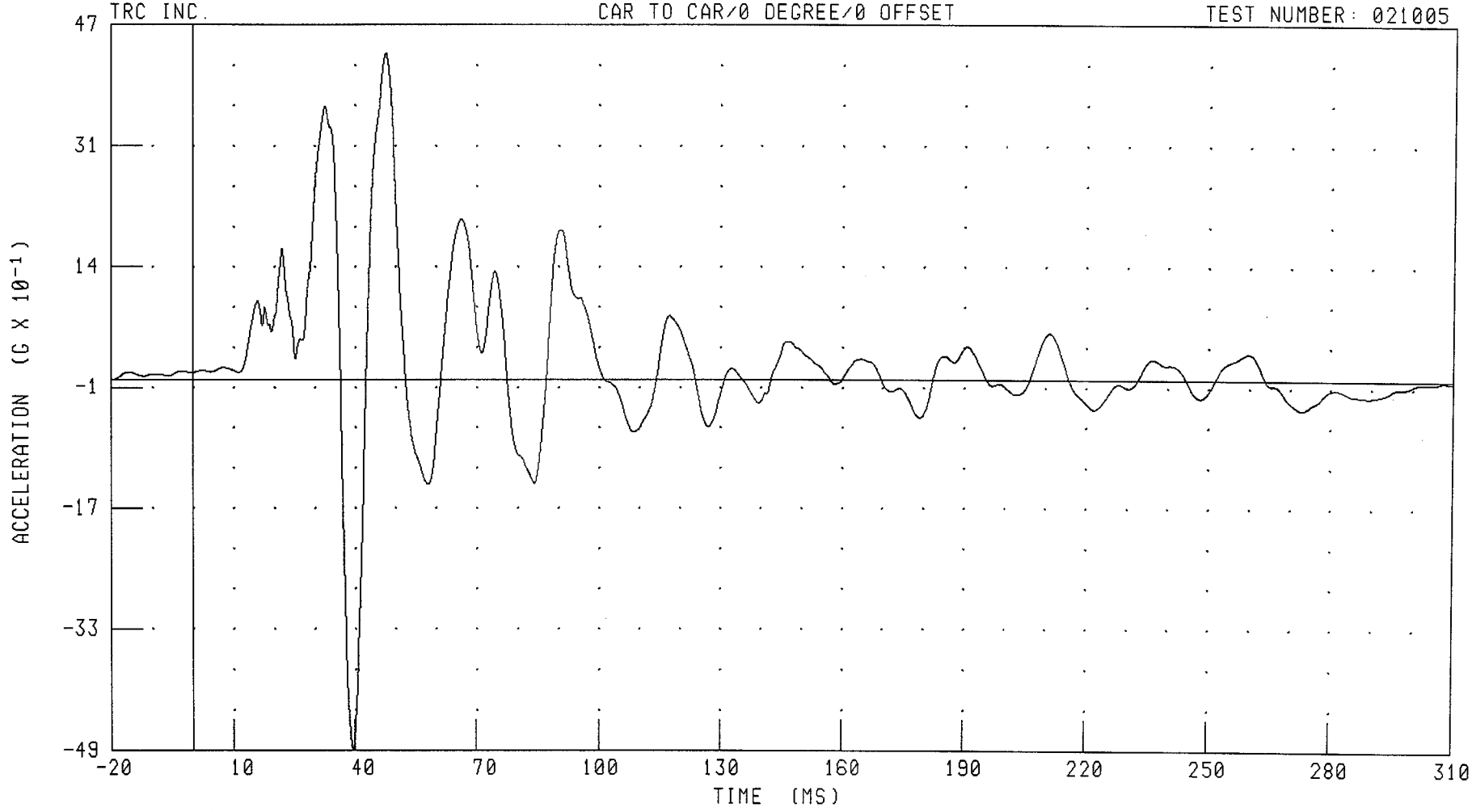
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET RIGHT REAR SILL X-AXIS ACCELERATION



CHANNEL: RRSXGA FILTER: CH. CLASS 60 PEAK DATA: 0.26 G @ 1.28 MS; -43.39 G @ 36.64 MS

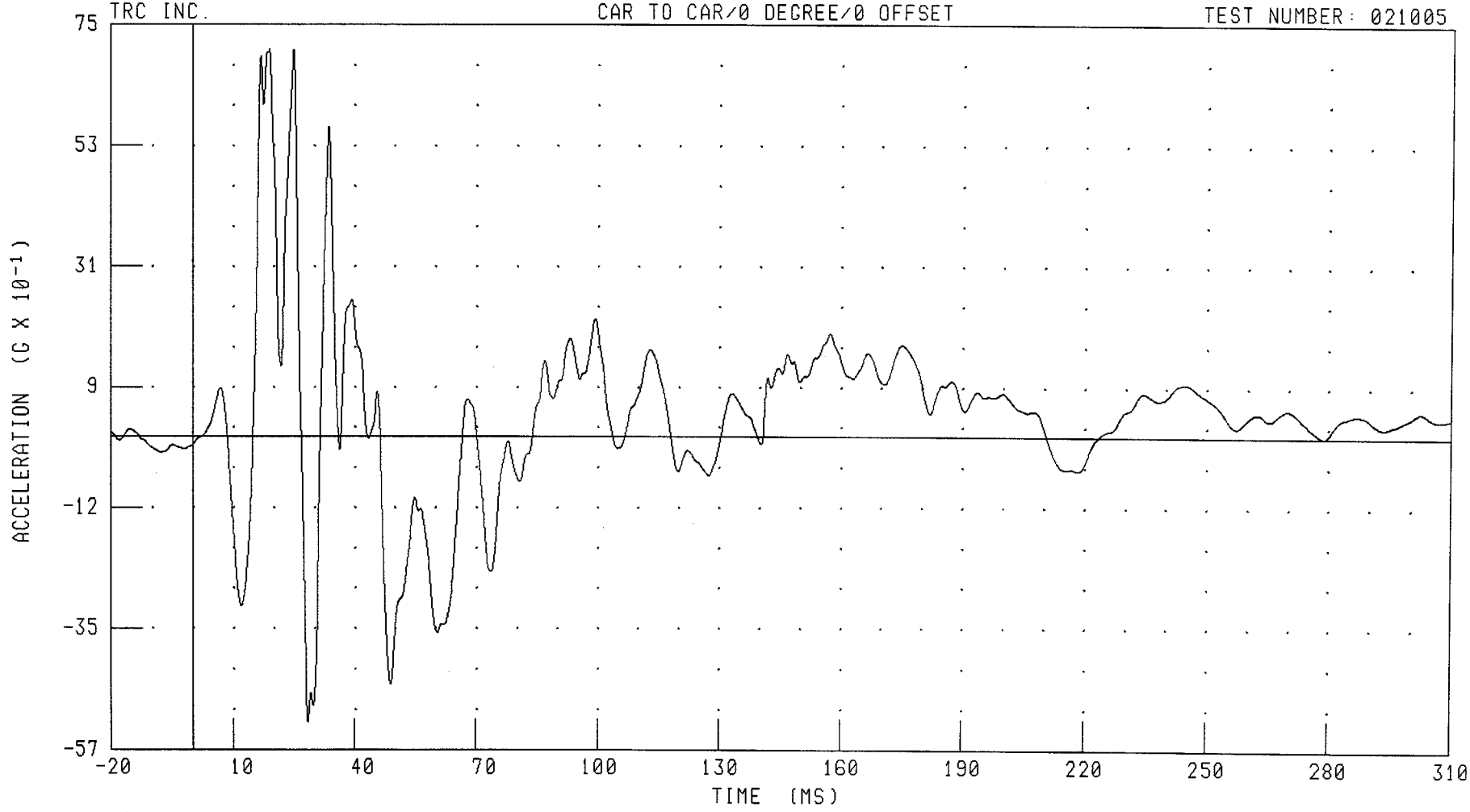
021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET RIGHT REAR SILL Y-AXIS ACCELERATION



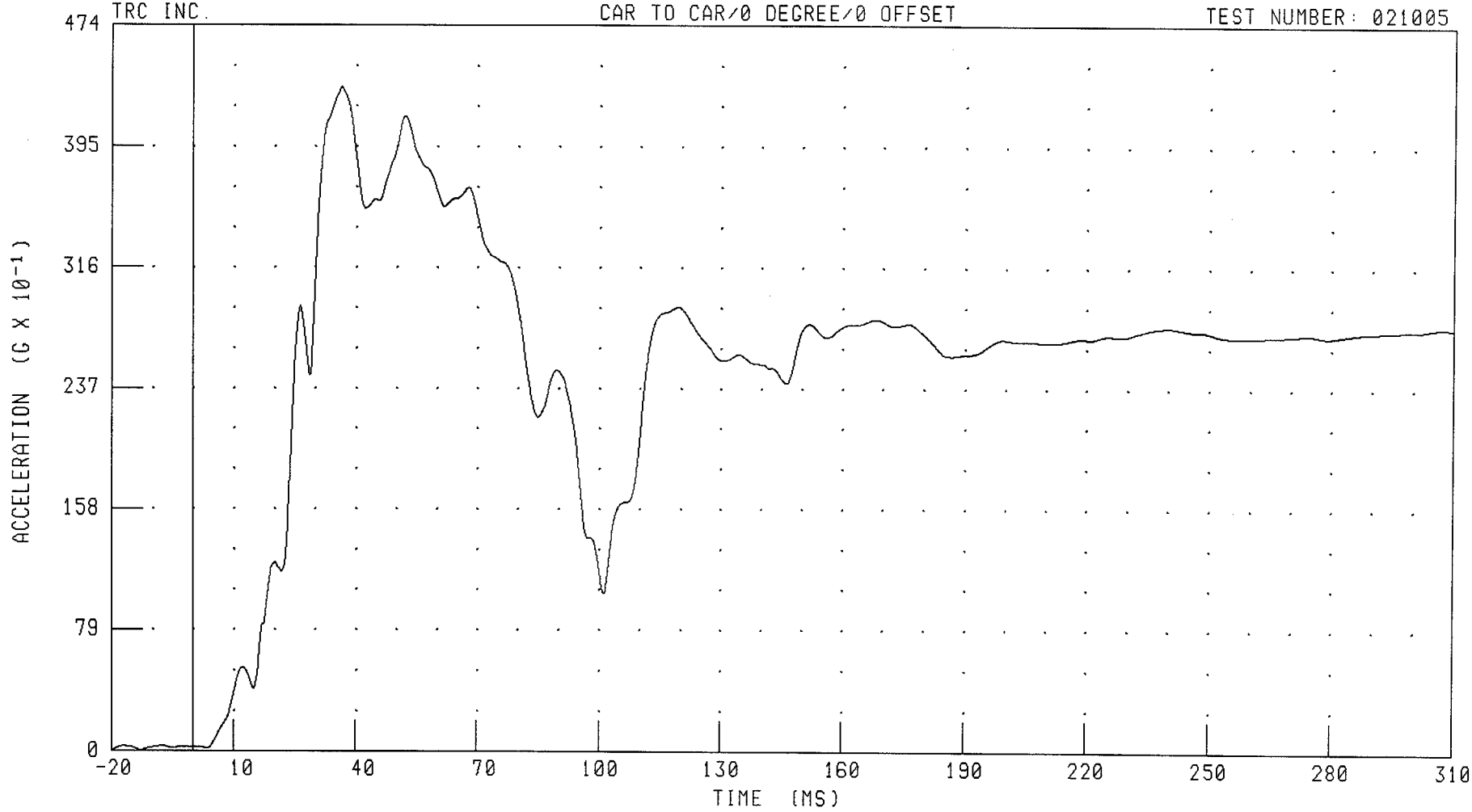
CHANNEL: RRSYGA FILTER: CH. CLASS 60 PEAK DATA: 4.32 G @ 47.84 MS; -4.90 G @ 39.52 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET RIGHT REAR SILL Z-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: RRSZGA FILTER: CH. CLASS 60 PEAK DATA: 7.05 G @ 19.12 MS; -5.19 G @ 28.40 MS

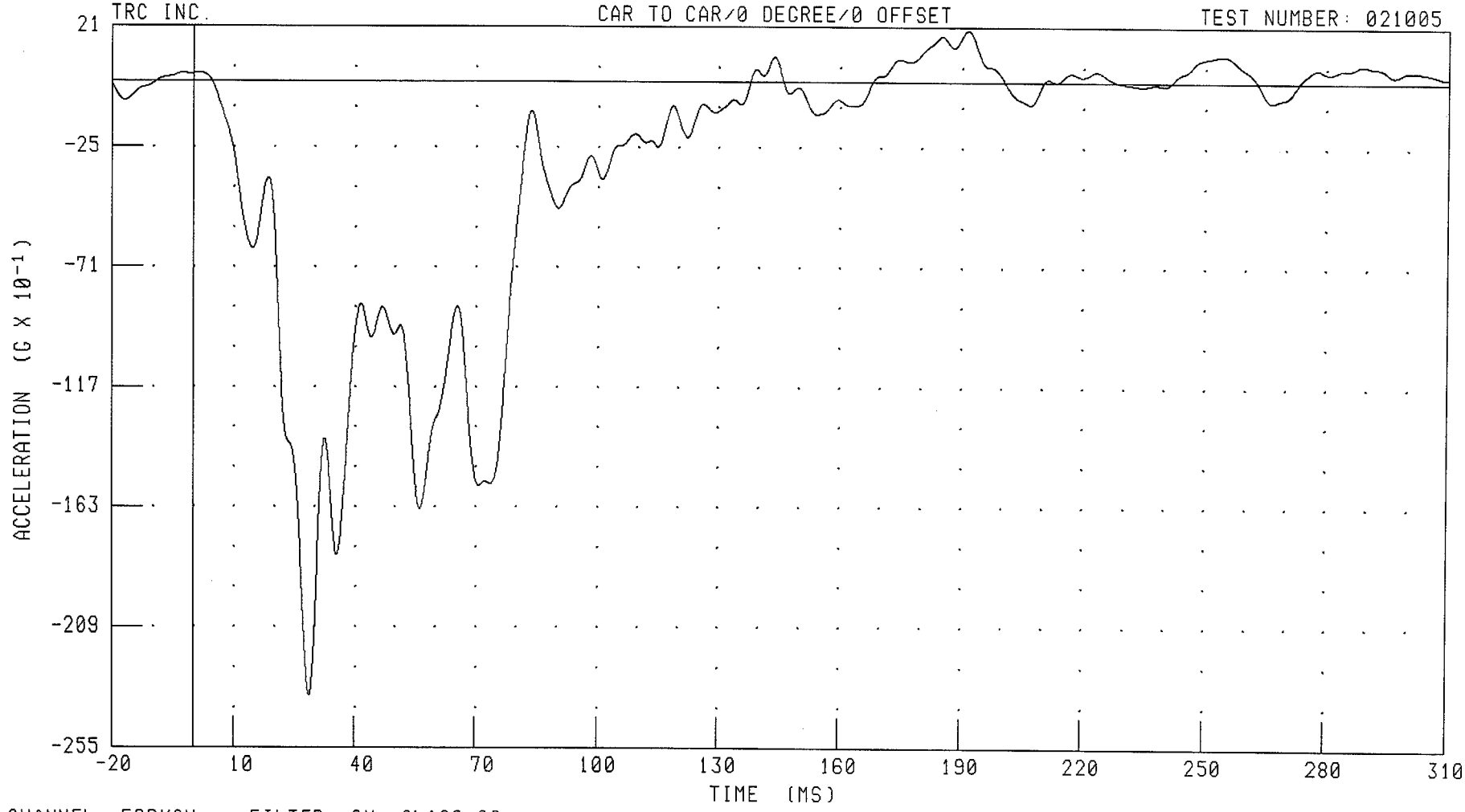
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET RIGHT REAR SILL RESULTANT ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: RRSRGA FILTER: CH. CLASS 60 PEAK DATA: 43.39 G @ 36.64 MS; 0.06 G @ -13.04 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

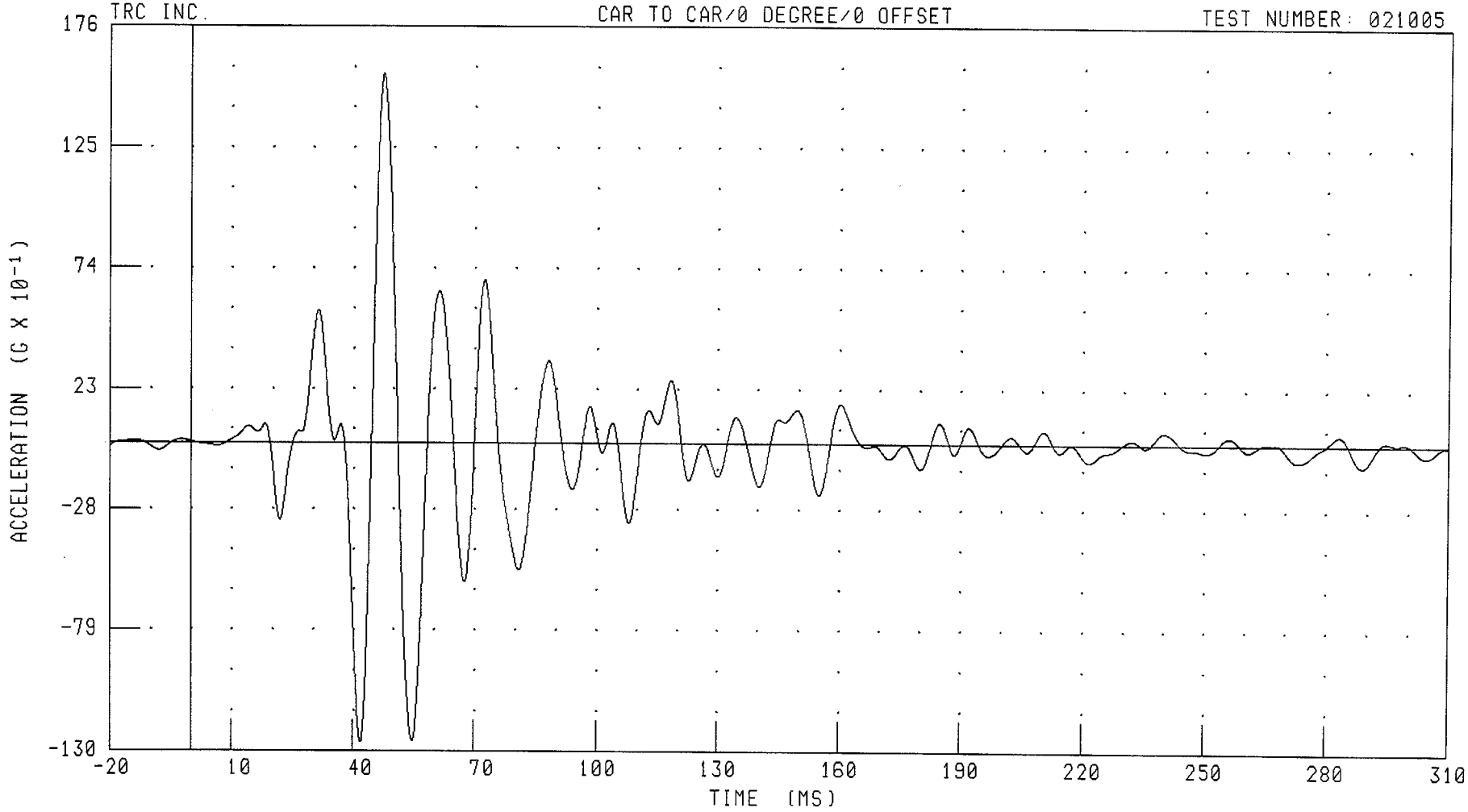
BULLET EVENT DATA RECORDER PLATE X-AXIS ACCELERATION



CHANNEL: EDRV2X FILTER: CH. CLASS 60

PEAK DATA: 1.98 G @ 191.52 MS; -23.51 G @ 28.72 MS

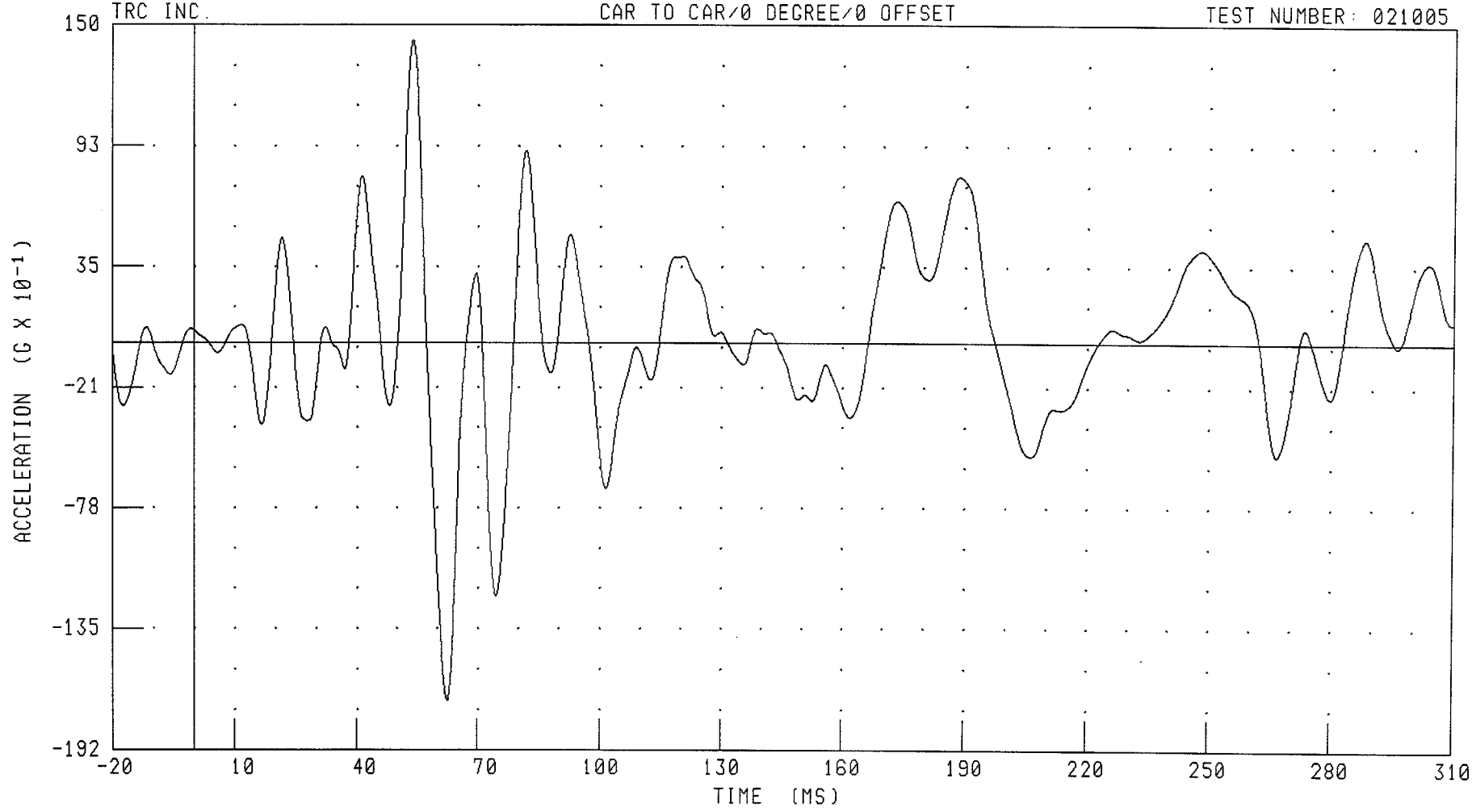
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET EVENT DATA RECORDER PLATE Y-AXIS ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: EDRV2Y FILTER: CH. CLASS 60 PEAK DATA: 15.61 G @ 47.60 MS; -12.62 G @ 41.92 MS

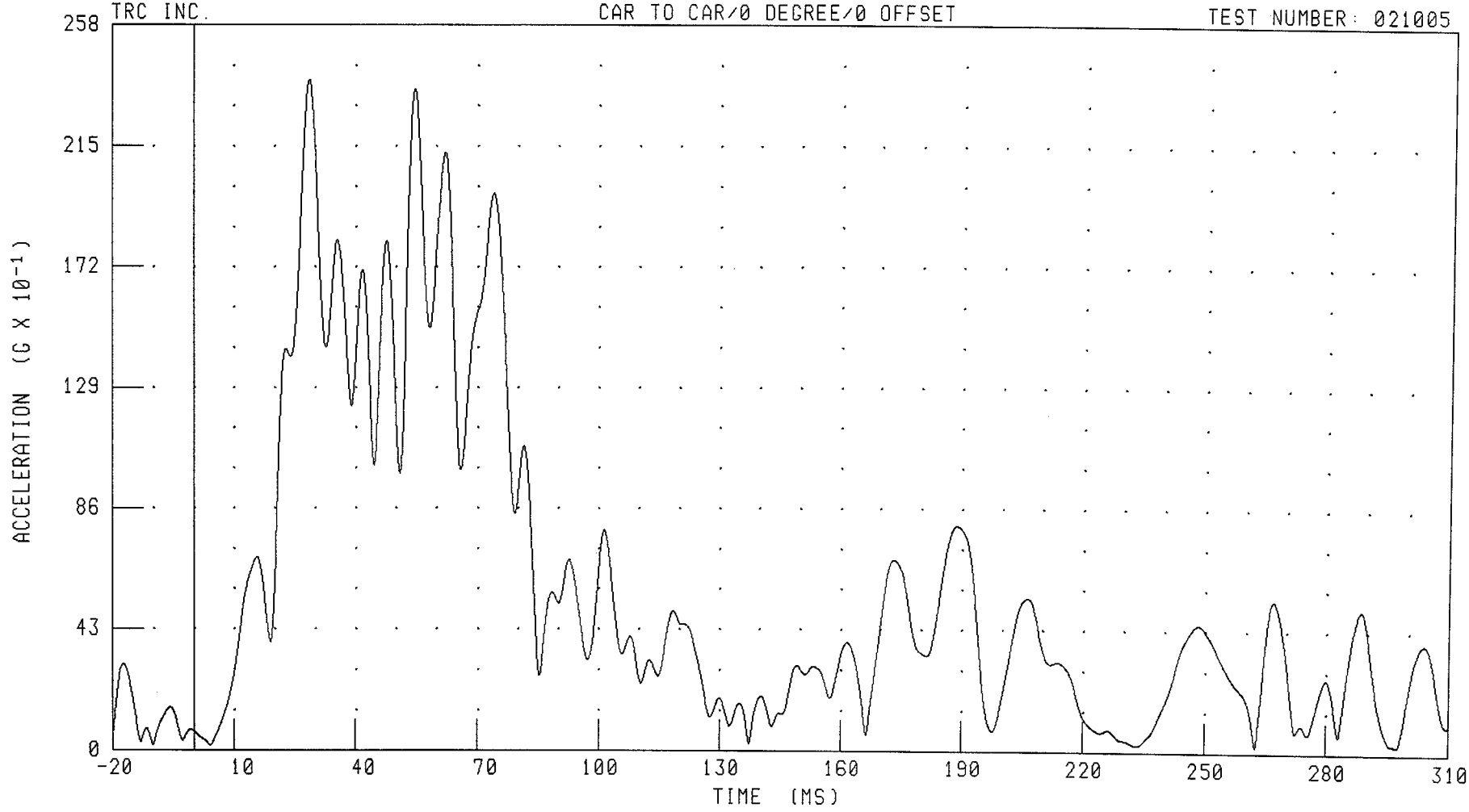
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

BULLET EVENT DATA RECORDER PLATE Z-AXIS ACCELERATION



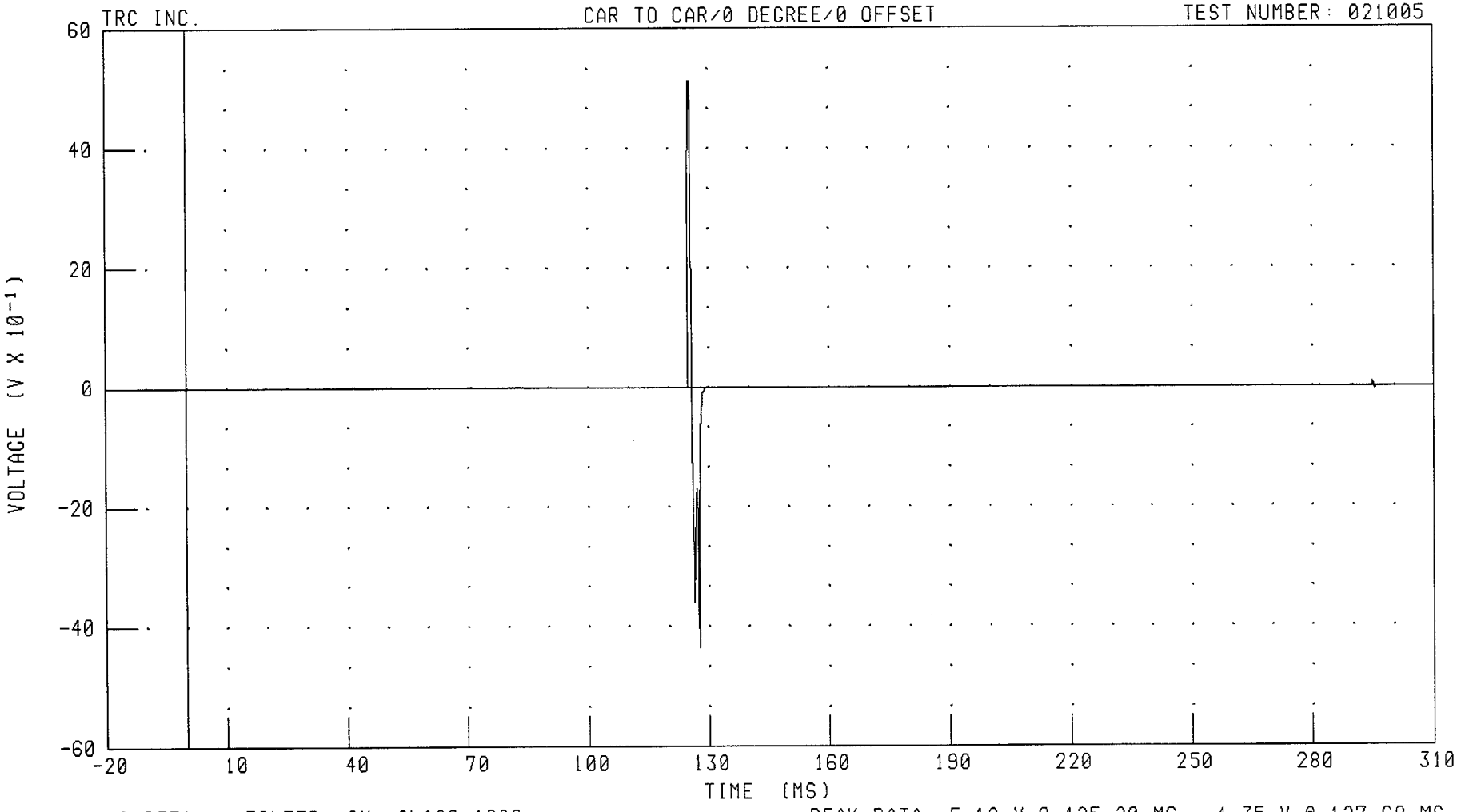
CHANNEL: EDRV2Z FILTER: CH. CLASS 60 PEAK DATA: 14.28 G @ 54.16 MS; -16.88 G @ 62.56 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET EVENT DATA RECORDER PLATE RESULTANT ACCELERATION
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: EDRV2R FILTER: CH. CLASS 60 PEAK DATA: 23.85 G @ 28.72 MS; 0.17 G @ -10.08 MS

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET DRIVER AIRBAG EVENT - WIRE A

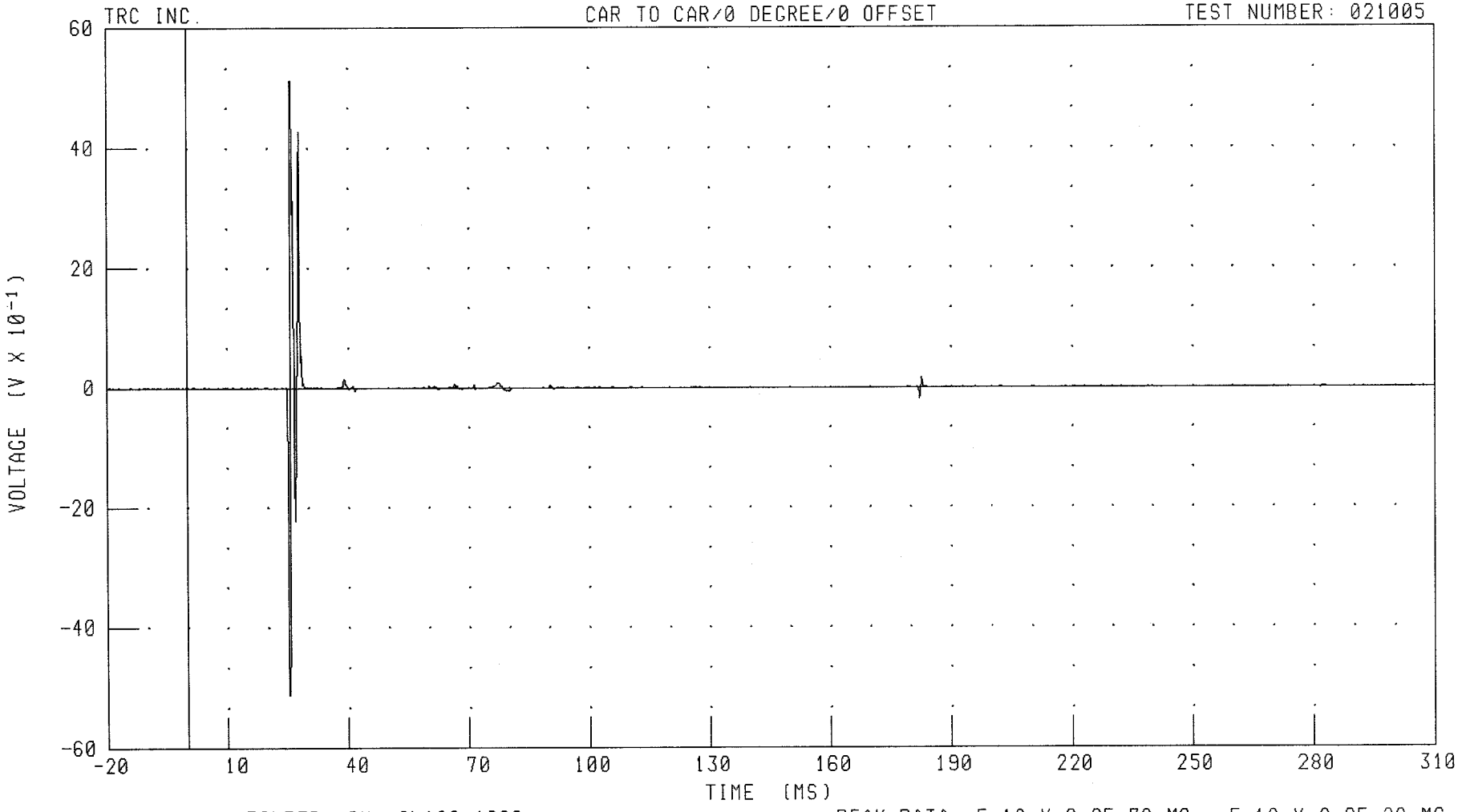


CHANNEL: DABETA FILTER: CH. CLASS 1000 PEAK DATA: 5.12 V @ 125.20 MS; -4.35 V @ 127.68 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES

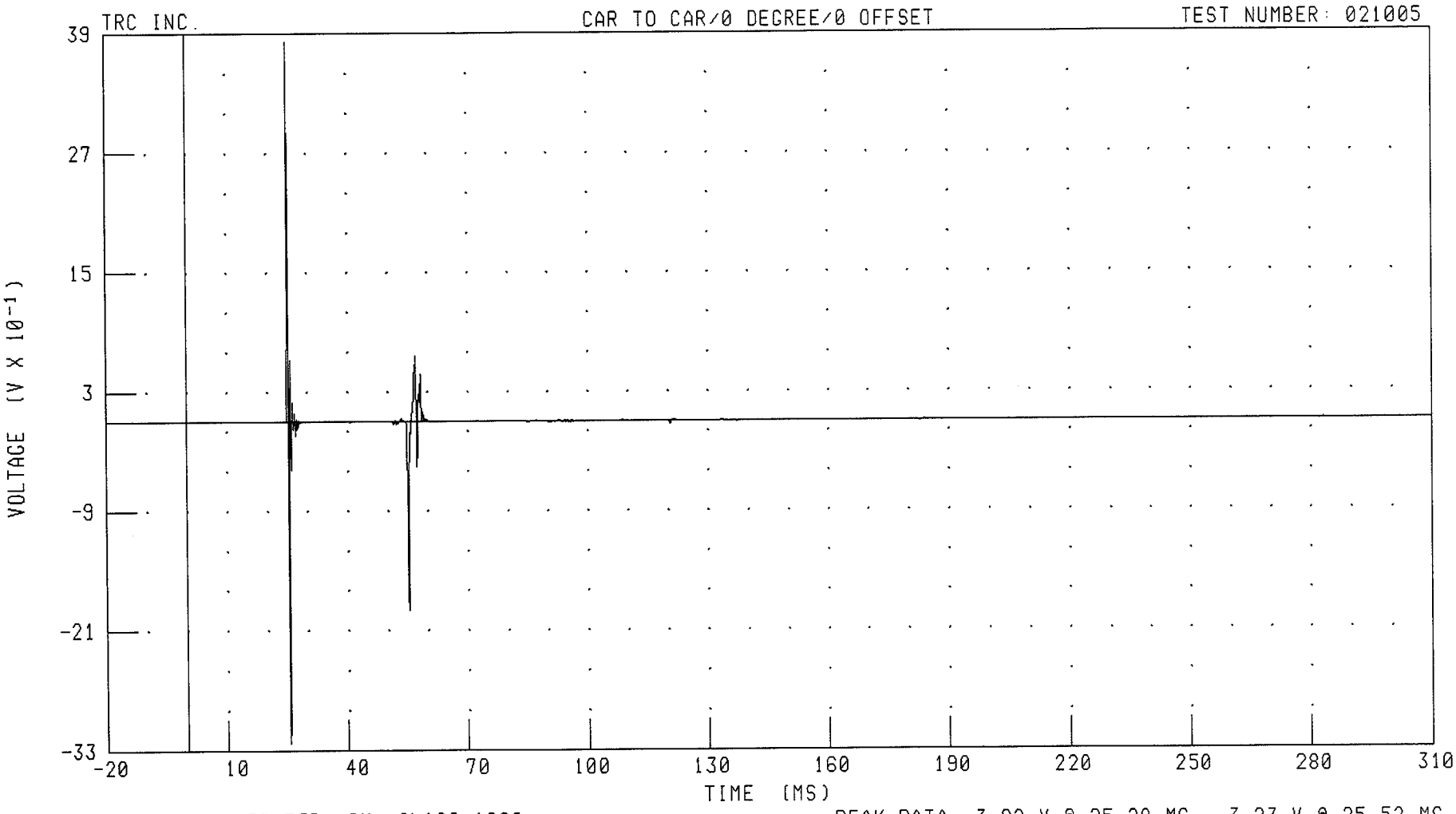
BULLET DRIVER AIRBAG EVENT - WIRE B



CHANNEL: DABETB FILTER: CH. CLASS 1000 PEAK DATA: 5.12 V @ 25.76 MS; -5.12 V @ 25.28 MS

021005

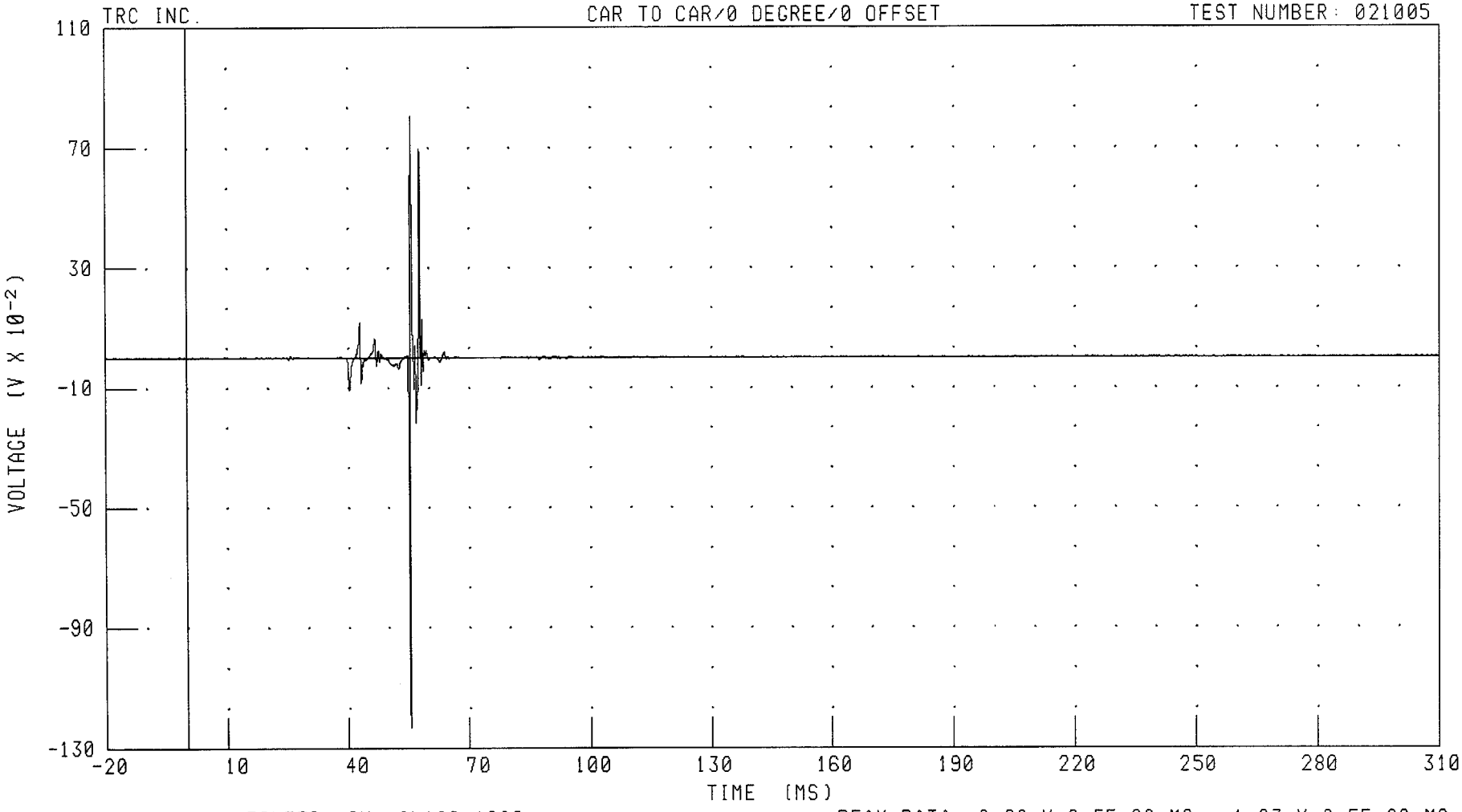
2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER AIRBAG EVENT - WIRE A
CAR TO CAR/0 DEGREE/0 OFFSET



CHANNEL: PABETA FILTER: CH. CLASS 1000 PEAK DATA: 3.82 V @ 25.28 MS; -3.23 V @ 25.52 MS

021005

2003 LINCOLN NAVIGATOR INTO 1996 DODGE NEON - 0% OFFSET - 0 DEGREES
BULLET PASSENGER AIRBAG EVENT - WIRE B



CHANNEL: PABETB FILTER: CH. CLASS 1000 PEAK DATA: 0.80 V @ 55.68 MS; -1.23 V @ 55.28 MS

021005

Appendix C

Dummy Configuration and Performance Verification Data

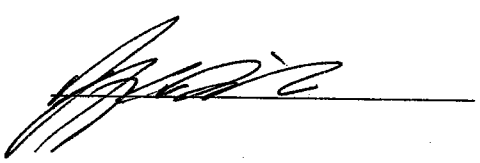
Pre-Test Dummy Configuration and Performance Verification Data

Target Vehicle Driver Dummy S/N: 168

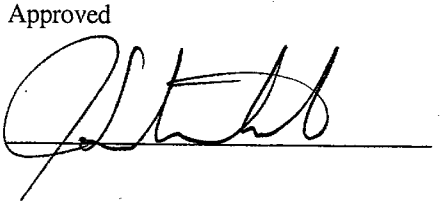
Transportation Research Center Inc.
572E HIII 50th Dummy
External Dimensions
Serial No. 168 Calibration No. 17

Test Parameter	Dimension	Specification	Results	Pass
Location For Chest Circumference	AA	429 - 434 mm	432 mm	Yes
Location For Waist Circumference	BB	226 - 231 mm	229 mm	Yes
Chest Circumference	Y	970 - 1001 mm	983 mm	Yes
Waist Circumference	Z	836 - 866 mm	855 mm	Yes
Chest Depth	O	213 - 229 mm	225 mm	Yes
H-Point Height	C	84 - 89 mm	85 mm	Yes
H-Point From Seatback	D	135 - 140 mm	137 mm	Yes
Skull Cap To Backline	H	41 - 46 mm	45 mm	Yes
Total Sitting Height	A	879 - 889 mm	883 mm	Yes
Thigh Clearance	F	140 - 155 mm	150 mm	Yes
Buttock Knee Length	K	579 - 605 mm	597 mm	Yes
Buttock Popliteal Length	N	452 - 478 mm	472 mm	Yes
Popliteal Height	L	429 - 455 mm	445 mm	Yes
Knee Pivot Height	M	485 - 500 mm	493 mm	Yes
Foot Length	P	252 - 267 mm	262 mm	Yes
Foot Breadth	W	91 - 107 mm	102 mm	Yes
Shoulder Pivot From Backline	E	84 - 94 mm	90 mm	Yes
Shoulder Breadth	V	422 - 437 mm	431 mm	Yes
Shoulder Pivot Height	B	506 - 521 mm	515 mm	Yes
Elbow Rest Height	J	191 - 211 mm	207 mm	Yes
Shoulder-Elbow Length	I	330 - 345 mm	339 mm	Yes
Back Of Elbow To Wrist Pivot	G	290 - 305 mm	297 mm	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/24/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Peak Resultant Acceleration	225 - 275 g	247.2 g	Yes
Peak Lateral Acceleration	15 g Max	8.3 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

09.24.2002 14:53:40 612

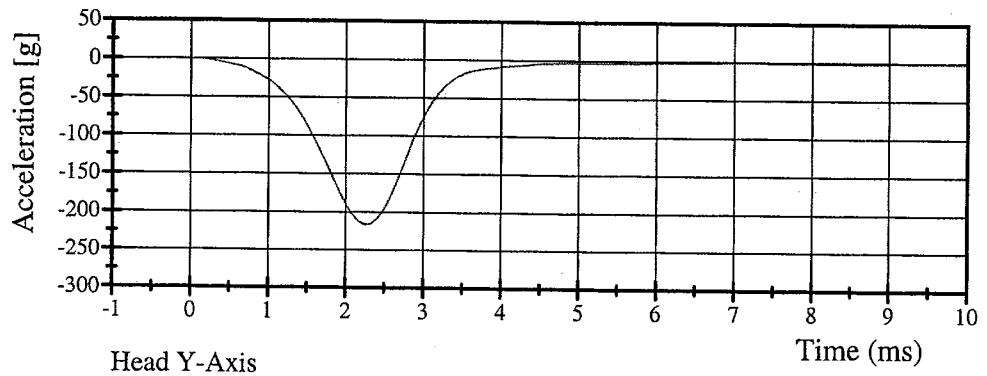
Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/24/2002

Head X-Axis

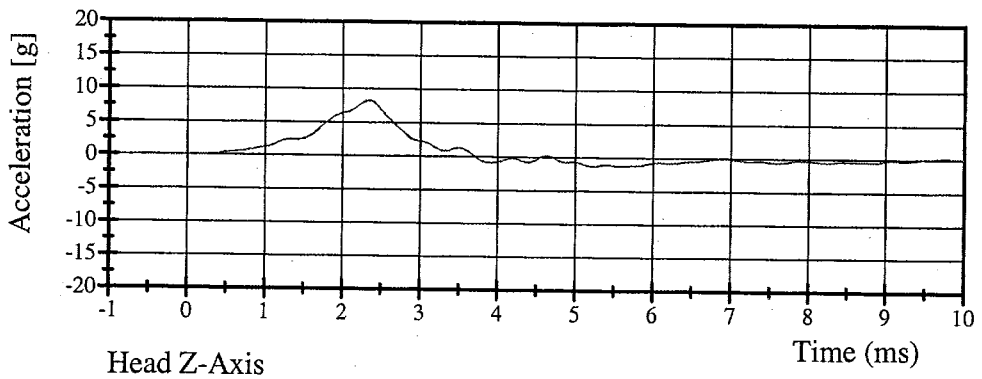


Filter Class: 1000

Max: -0.0 g at 0.0 ms

Min: -215.9 g at 2.2 ms

Head Y-Axis

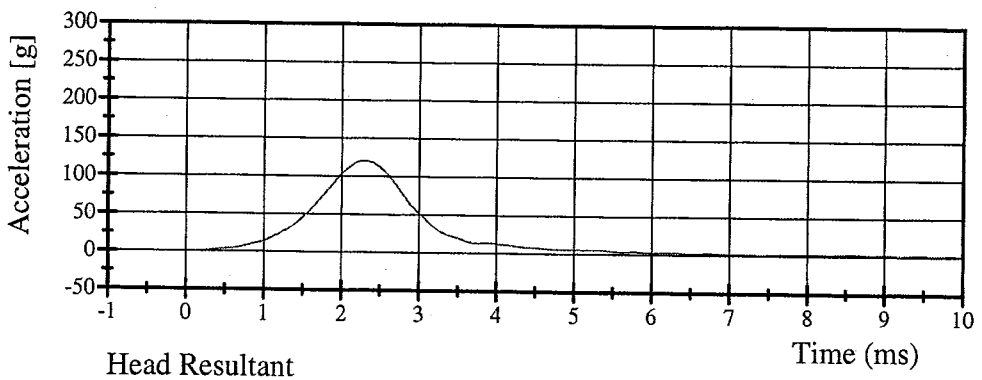


Filter Class: 1000

Max: 8.3 g at 2.3 ms

Min: -1.3 g at 5.2 ms

Head Z-Axis

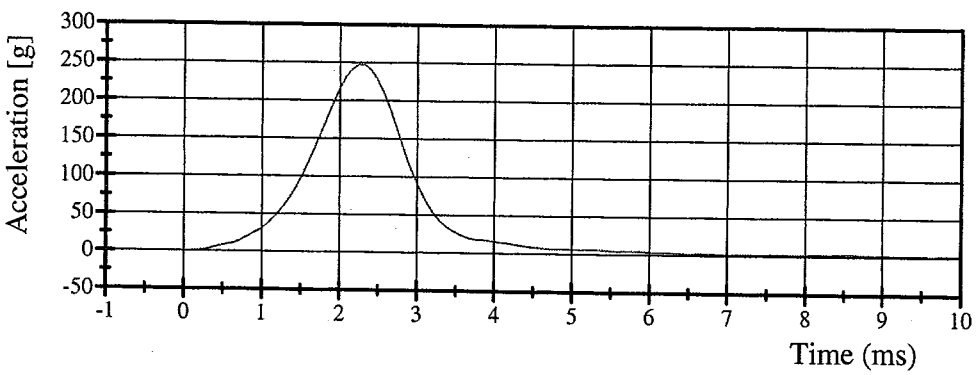


Filter Class: 1000

Max: 120.7 g at 2.3 ms

Min: 0.0 g at 0.0 ms

Head Resultant



Filter Class: 1000

Max: 247.2 g at 2.2 ms

Min: 0.0 g at 1.1 ms

09.24.2002 14:53:41 612

Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

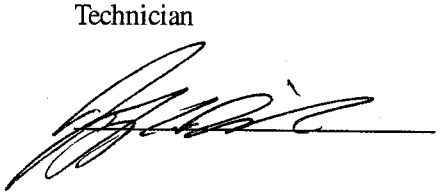
HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/23/2002

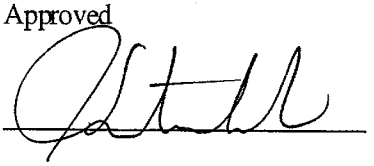
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	25.99 g	Yes
20 ms	17.60 - 22.60 g	21.59 g	Yes
30 ms	12.50 - 18.50 g	16.91 g	Yes
Max Pendulum Deceleration	29.00 g	26.42 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	16.87 g	Yes
Deceleration-Time Curve Decay Time To 5g	34 - 42 ms	37.12 ms	Yes
D Plane Rotation			
Max	64 - 78 °	69.09 °	Yes
Time	57 - 64 ms	57.68 ms	Yes
Moment About Occipital Condyle			
Max	88.2 - 108.4 N·m	105.78 N·m	Yes
Time	47 - 58 ms	49.60 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	113 - 128 ms	113.84 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	97 - 107 ms	97.60 ms	Yes

Comments:

Technician



Approved



09.23.2002 13:11:04 462

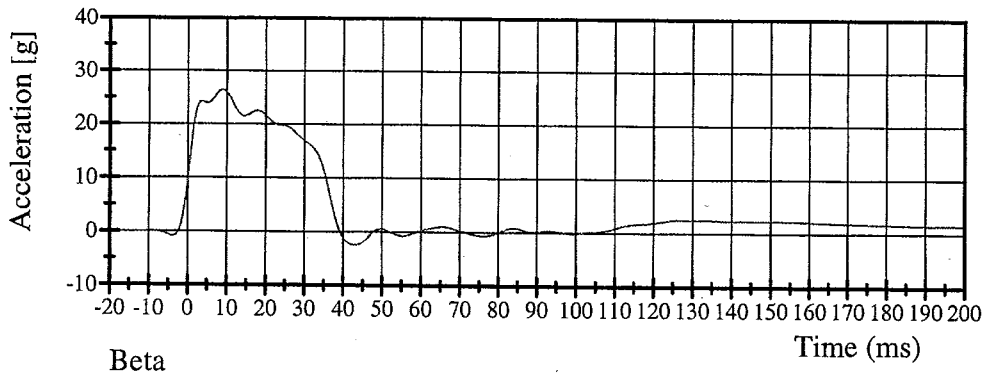
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/23/2002

Pendulum Deceleration

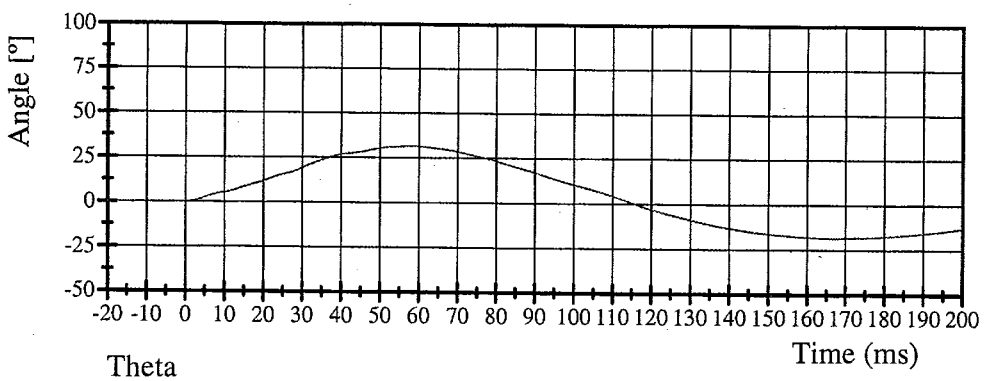


Filter Class: 60

Max: 26.4 g at 9.0 ms

Min: -2.4 g at 43.0 ms

Beta

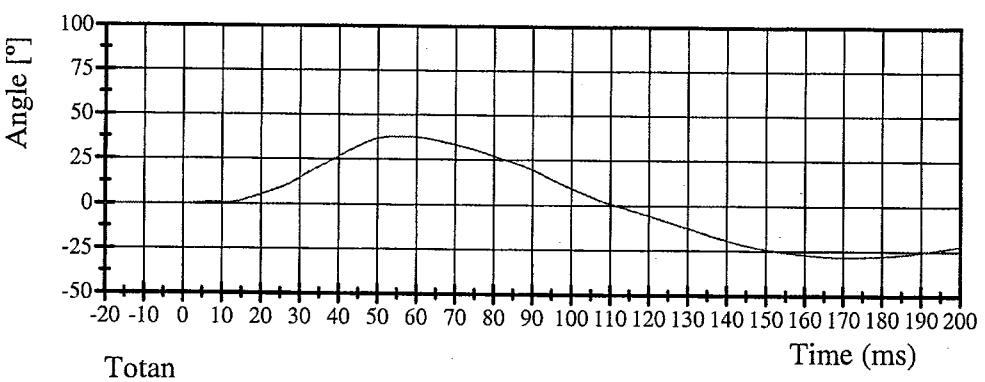


Filter Class: 60

Max: 31.4 ° at 58.5 ms

Min: -18.3 ° at 167.4 ms

Theta

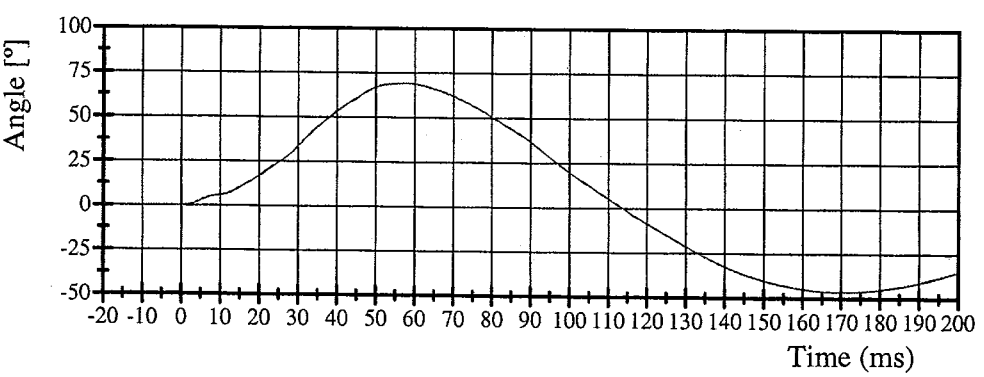


Filter Class: 60

Max: 37.7 ° at 56.2 ms

Min: -28.1 ° at 171.1 ms

Totan



Filter Class: 60

Max: 69.1 ° at 57.7 ms

Min: -46.4 ° at 169.8 ms

09.23.2002 13:11:07 462

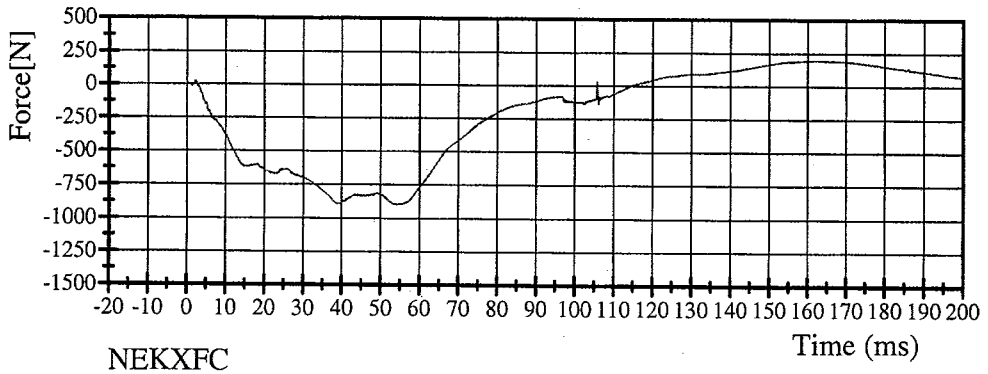
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/23/2002

NEKXF

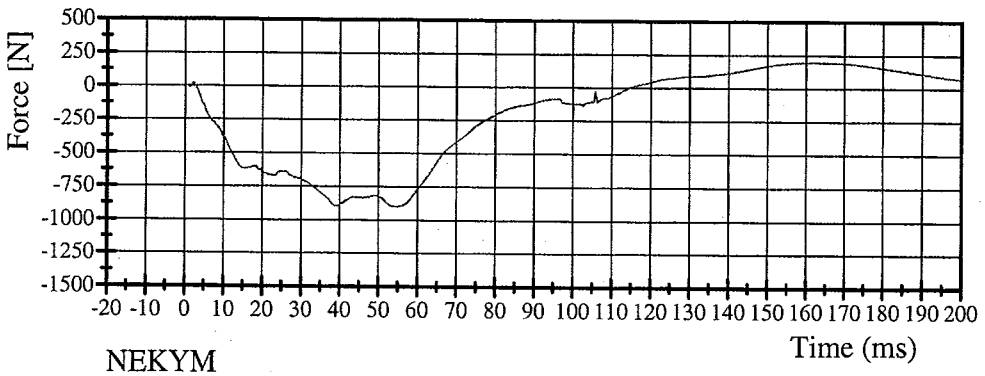


Filter Class: 1000

Max: 195.5 N at 161.8 ms

Min: -896.8 N at 54.2 ms

NEKXFC

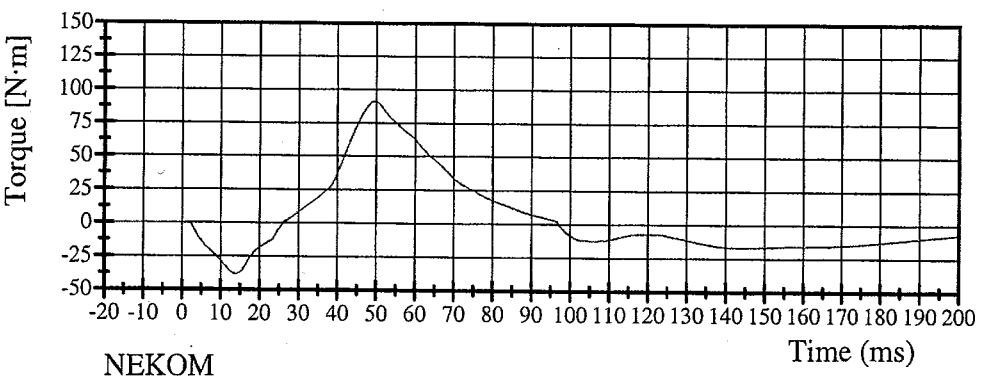


Filter Class: 600

Max: 195.1 N at 161.8 ms

Min: -896.6 N at 54.3 ms

NEKYM

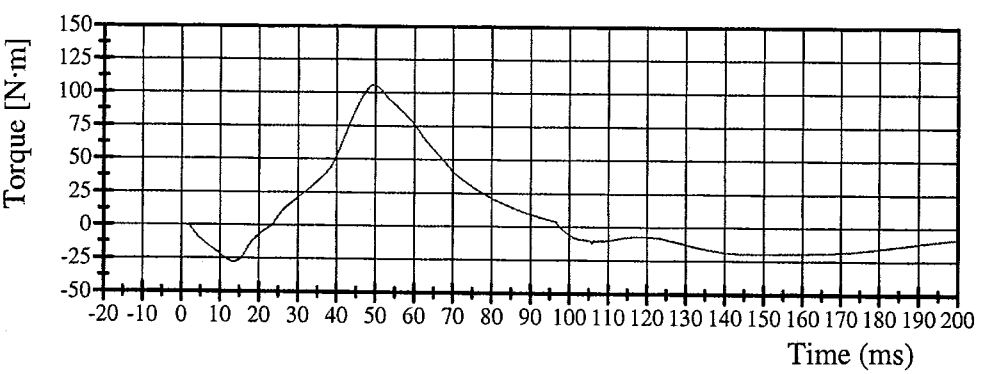


Filter Class: 600

Max: 91.3 N·m at 49.5 ms

Min: -38.3 N·m at 13.9 ms

NEKOM



Filter Class: 600

Max: 105.8 N·m at 49.6 ms

Min: -27.9 N·m at 13.6 ms

09.23.2002 13:11:09 462

Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 09/24/2002

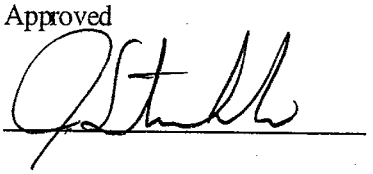
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.11 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	18.51 g	Yes
20 ms	14.00 - 19.00 g	17.01 g	Yes
30 ms	11.00 - 16.00 g	15.37 g	Yes
Max Pendulum Deceleration	22.00 g	18.84 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	15.35 g	Yes
Deceleration-Time Curve Decay Time To 5g	38 - 46 ms	42.64 ms	Yes
D Plane Rotation			
Max	81 - 106 °	91.96 °	Yes
Time	72 - 82 ms	76.24 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-68.70 N·m	Yes
Time	65 - 79 ms	70.96 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	147 - 174 ms	154.16 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	120 - 148 ms	141.52 ms	Yes

Comments:

Technician



Approved



09.24.2002 07:23:20 533

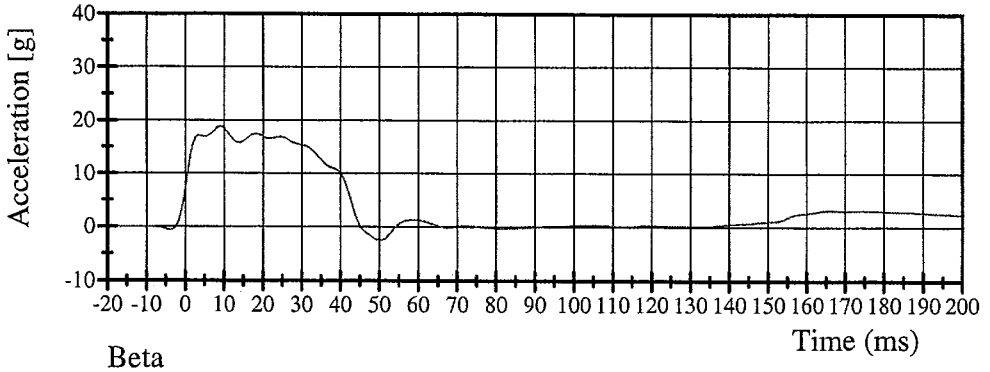
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 09/24/2002

Pendulum Deceleration

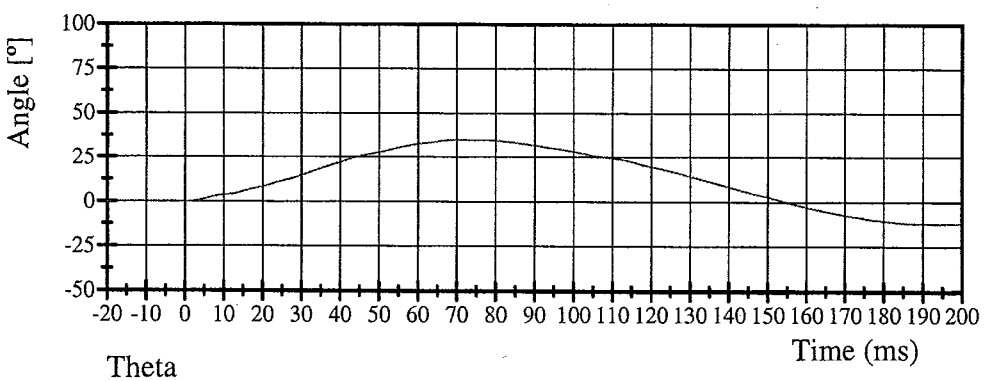


Filter Class: 60

Max: 18.8 g at 9.0 ms

Min: -2.5 g at 50.2 ms

Beta

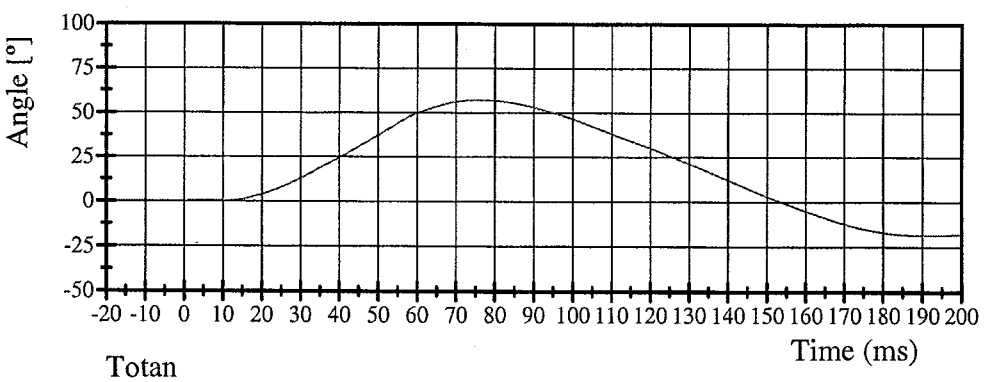


Filter Class: 60

Max: 35.0 ° at 70.5 ms

Min: -12.2 ° at 193.6 ms

Theta

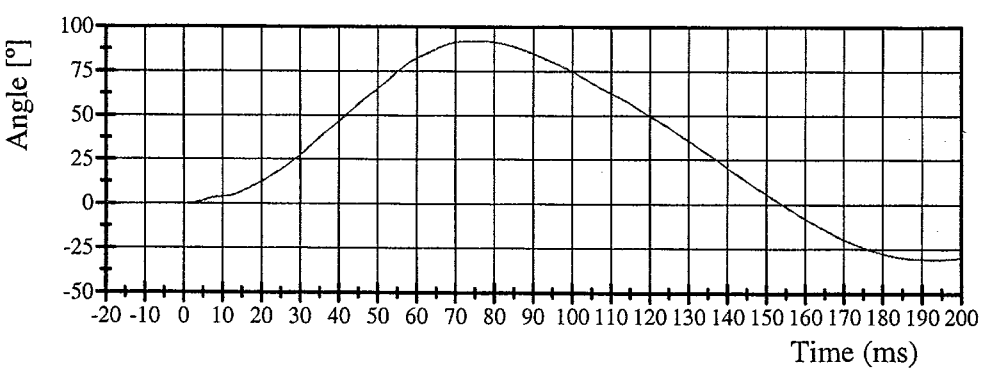


Filter Class: 60

Max: 57.2 ° at 76.5 ms

Min: -18.5 ° at 192.2 ms

Totan



Filter Class: 60

Max: 92.0 ° at 76.2 ms

Min: -30.7 ° at 192.9 ms

09.24.2002 07:23:21 533

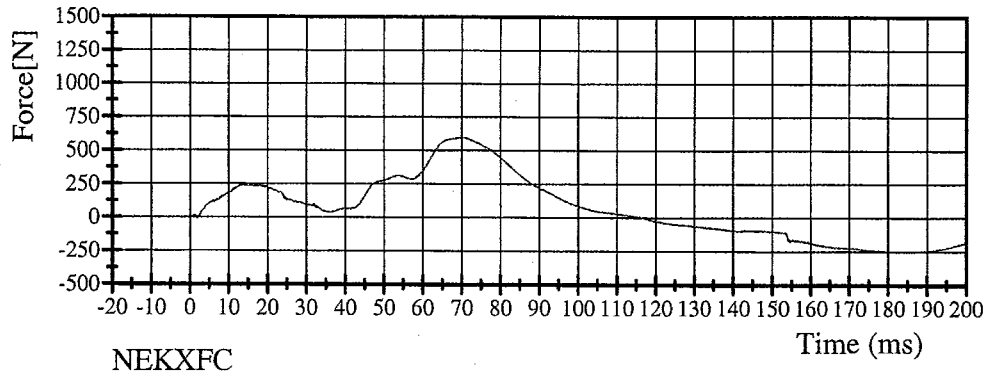
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 09/24/2002

NEKXF

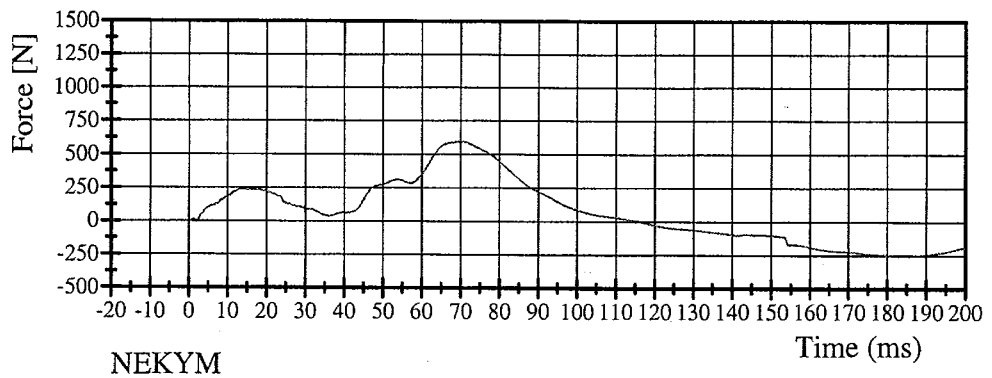


Filter Class: 1000

Max: 594.2 N at 69.9 ms

Min: -253.6 N at 184.8 ms

NEKXFC

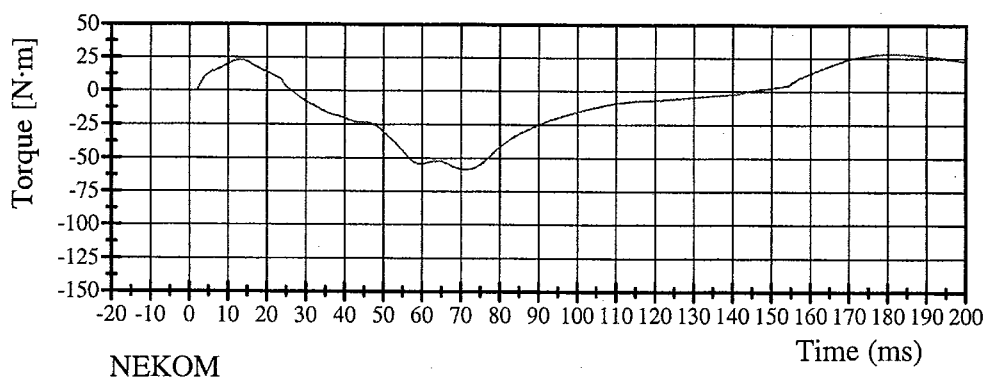


Filter Class: 600

Max: 593.6 N at 69.8 ms

Min: -253.2 N at 184.9 ms

NEKYM

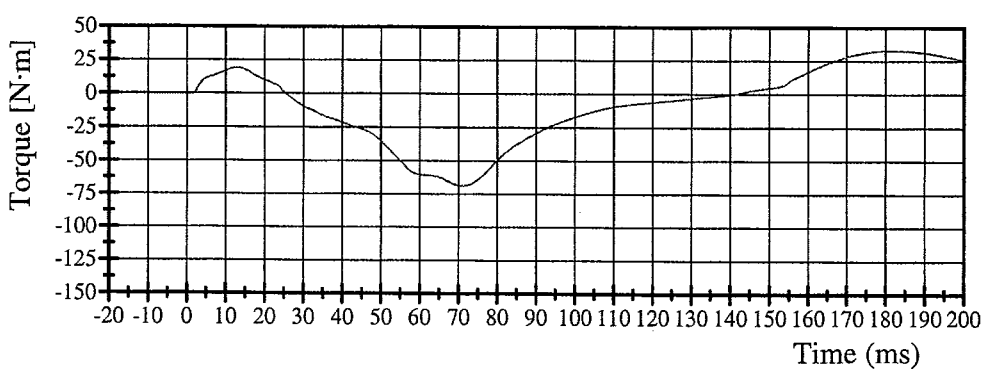


Filter Class: 600

Max: 28.5 N·m at 181.8 ms

Min: -58.2 N·m at 71.0 ms

NEKOM



Filter Class: 600

Max: 32.9 N·m at 181.8 ms

Min: -68.7 N·m at 71.0 ms

09.24.2002 07:23:22 533

Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 10/04/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	63 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.66 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-65.5 mm	Yes
Maximum Resistive Force	5159 - 5894 N	5721 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician

Approved

10.04.2002 13:03:21 985

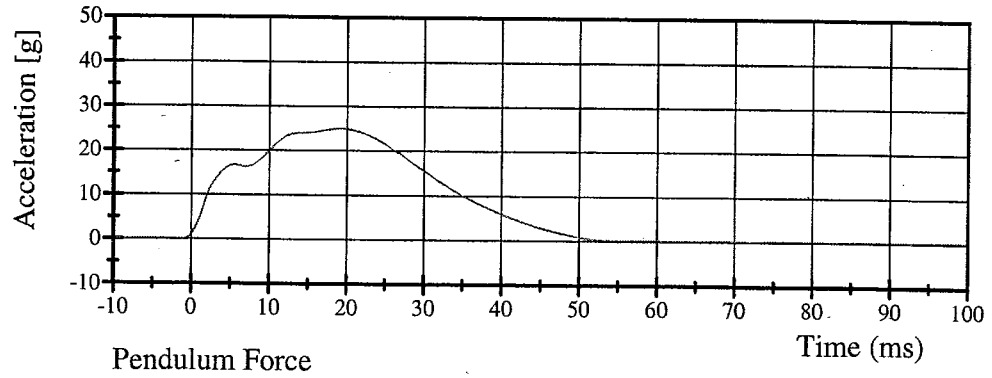
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 10/04/2002

Pendulum Deceleration

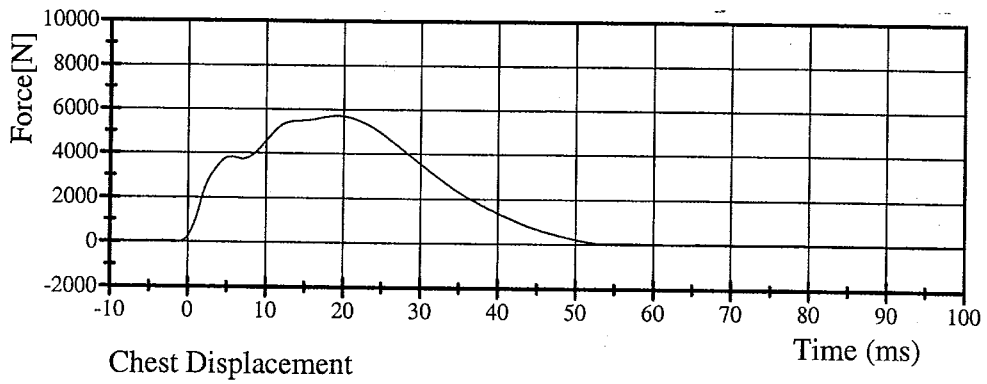


Filter Class: 180

Max: 25.0 g at 19.2 ms

Min: -0.0 g at -77.4 ms

Pendulum Force

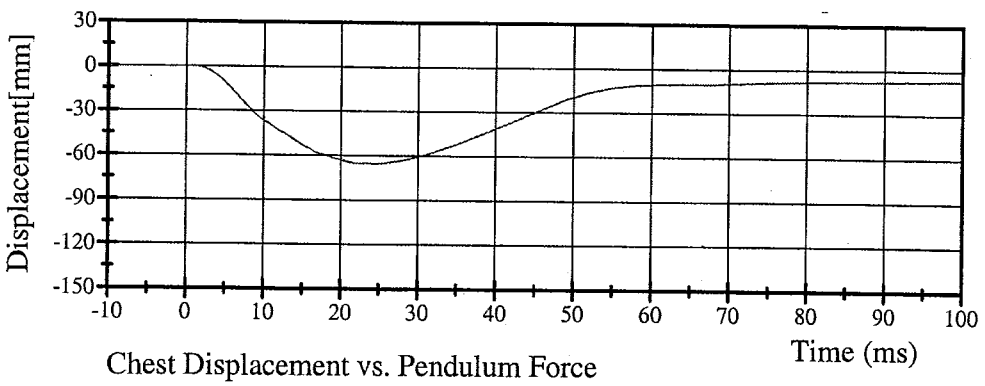


Filter Class: 180

Max: 5721.2 N at 19.2 ms

Min: -8.6 N at -77.4 ms

Chest Displacement

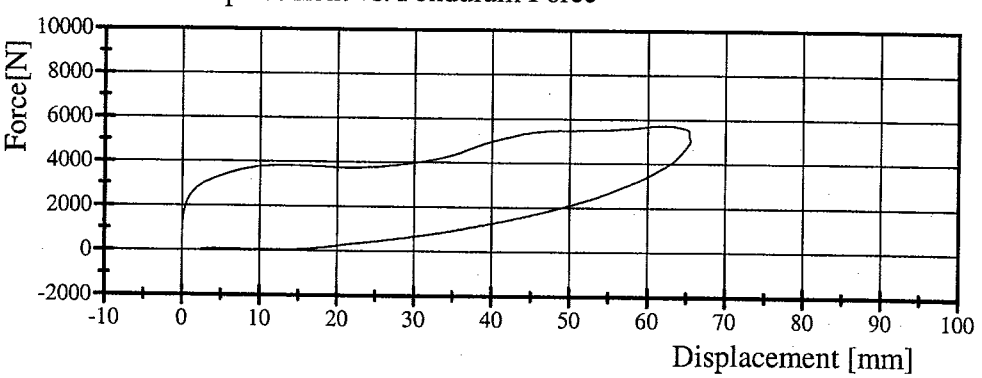


Filter Class: 180

Max: 0.0 mm at 0.5 ms

Min: -65.5 mm at 24.4 ms

Chest Displacement vs. Pendulum Force



10.04.2002 13:03:27 985

Transportation Research Center Inc

Hybrid III Hip Range of Motion

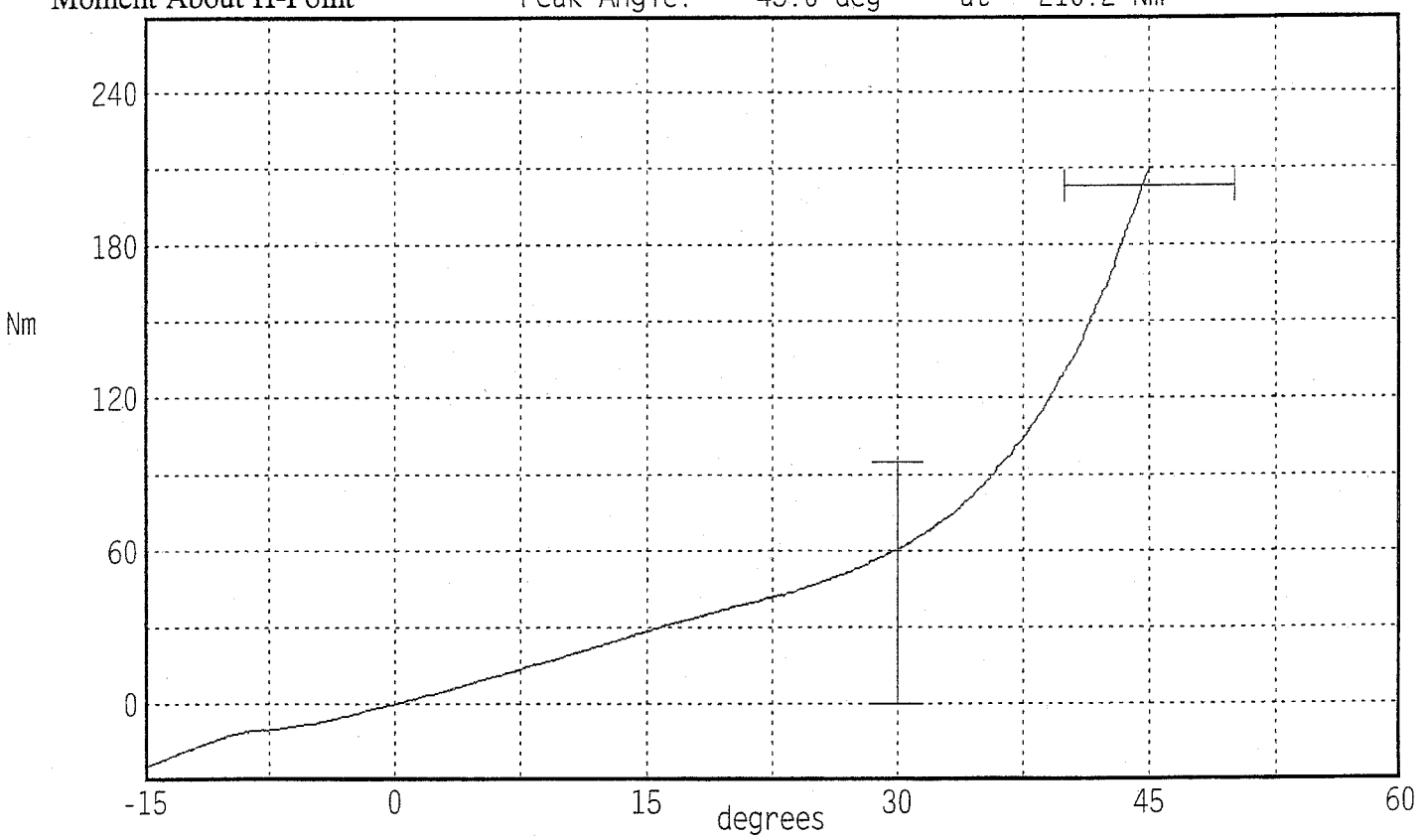
Serial Number: 168L
Test Number: 168C17
Comments:

Date: 09/23/2002
Time: 15:26

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.1	°C	Pass
Humidity	10 - 70	45	%	Pass
Moment at 30 deg	<= 94.9	60.9	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	44.7	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

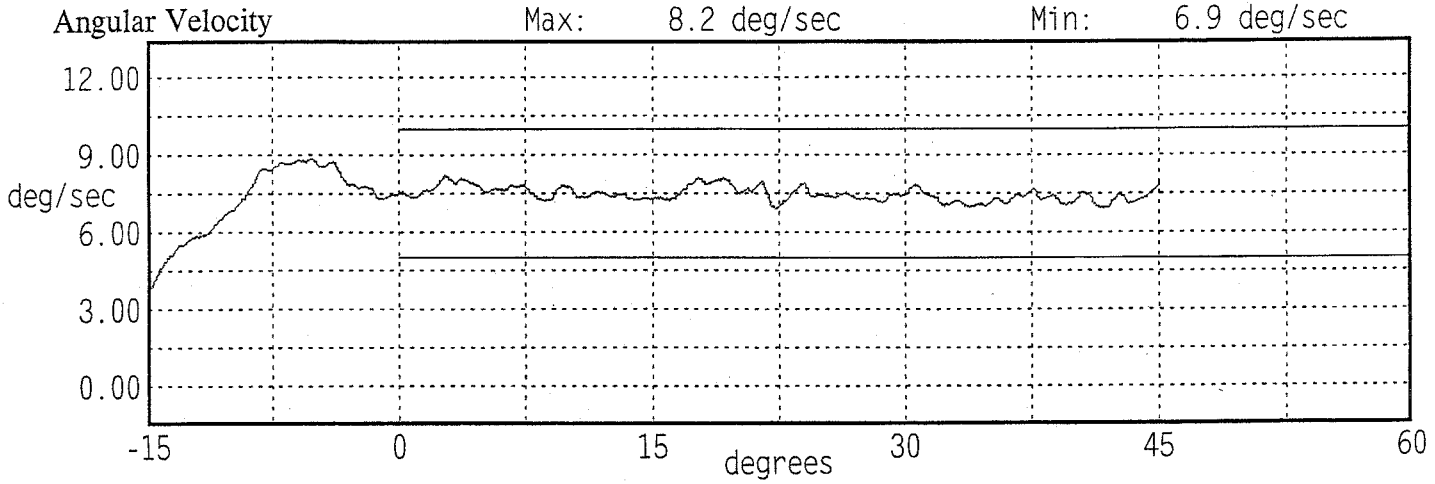
Moment About H-Point

Peak Moment: 210.2 Nm at 45.0 deg
Peak Angle: 45.0 deg at 210.2 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.9 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

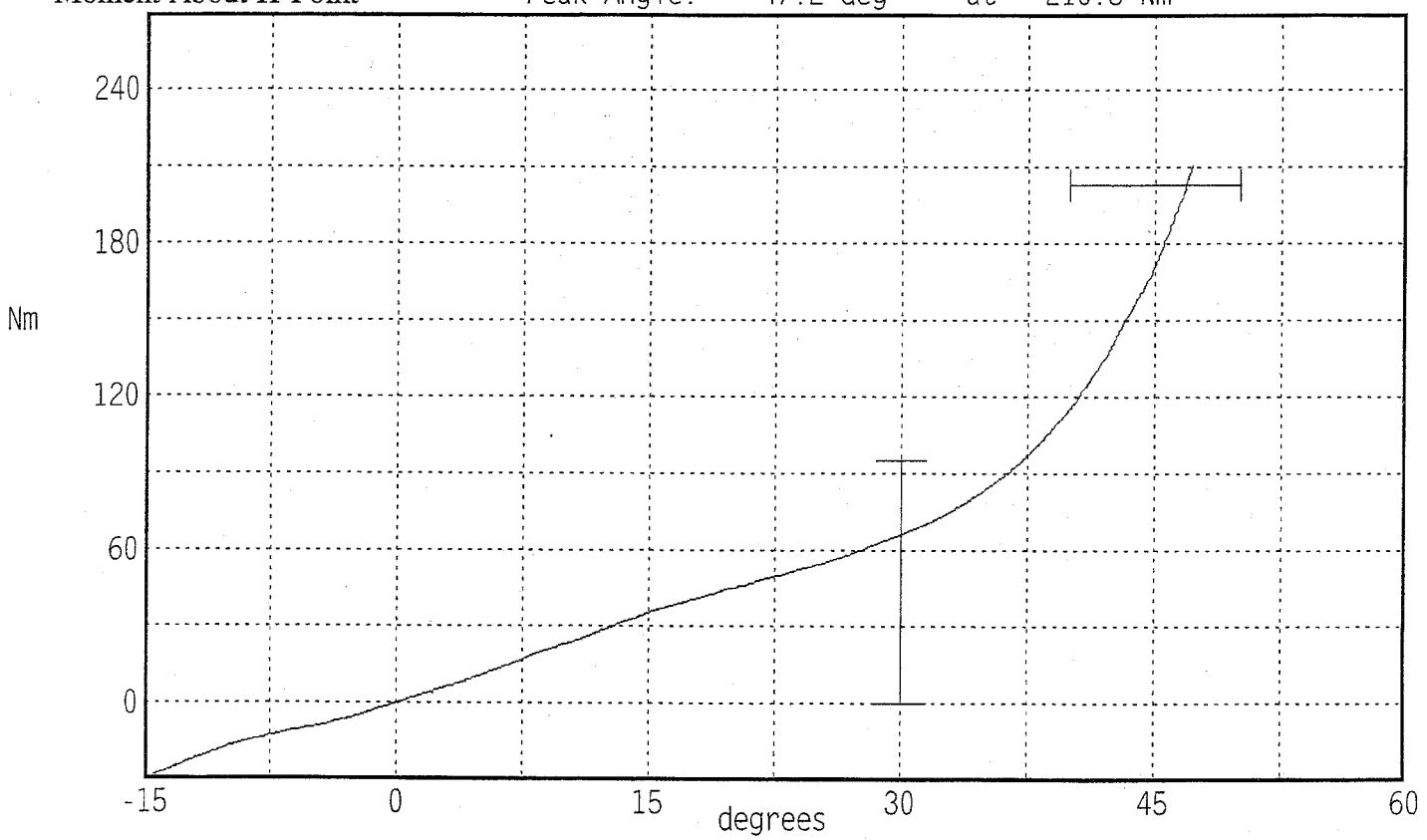
Serial Number: 168R
Test Number: 168C17
Comments:

Date: 09/23/2002
Time: 15:29

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.1 °C	Pass
Humidity	10 - 70	45 %	Pass
Moment at 30 deg	<= 94.9	66.4 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	46.9 deg	Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass

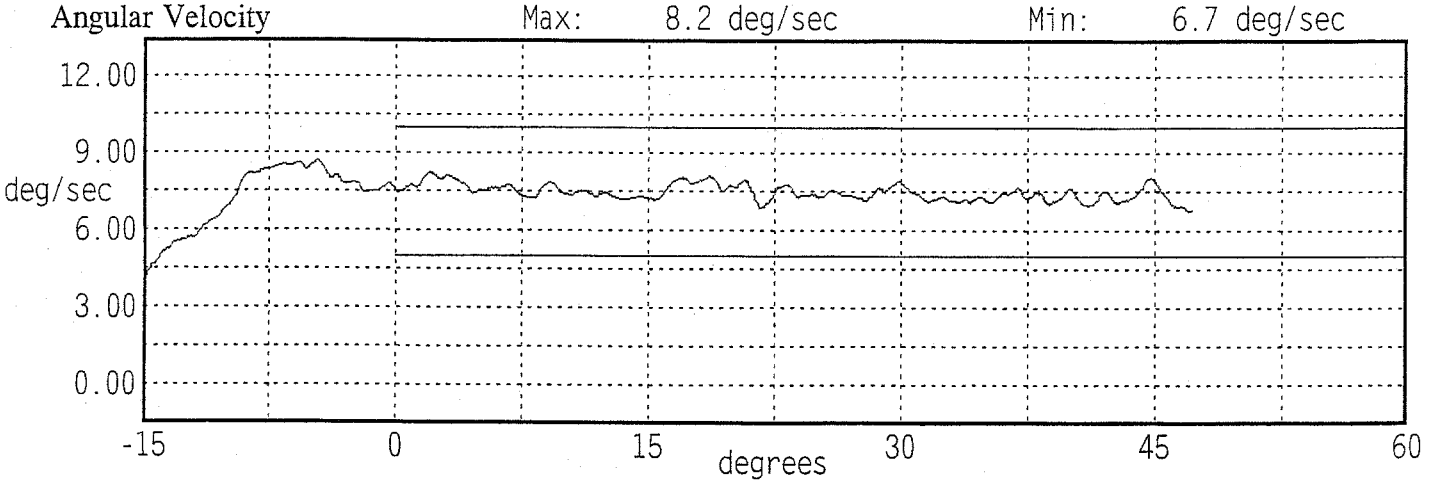
Moment About H-Point

Peak Moment: 210.3 Nm at 47.2 deg
Peak Angle: 47.2 deg at 210.3 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.7 deg/sec



Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/24/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1458 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-3282 N	No

Comments:

Will Replace Left Knee Slider Prior To More Crash Testing.

Technician

Approved

09.25.2002 09:55:37 1155

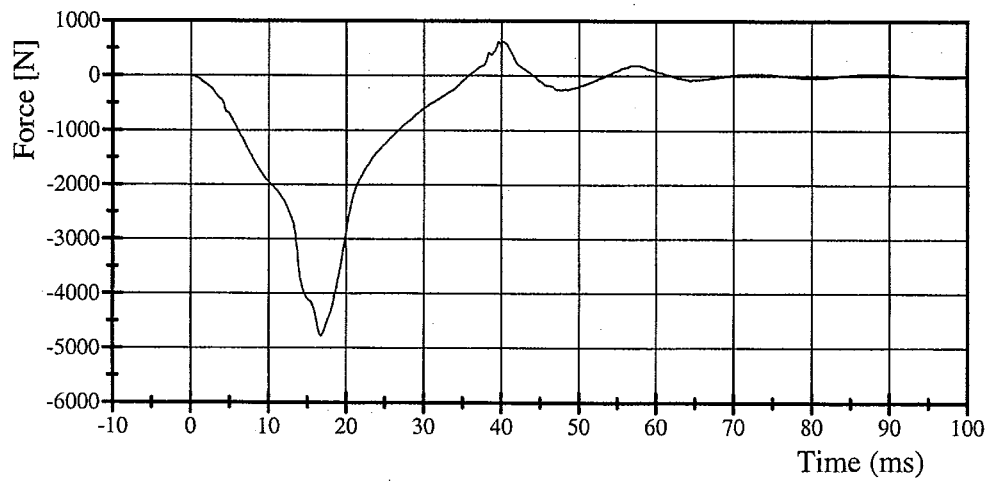
Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/24/2002

Femur Force

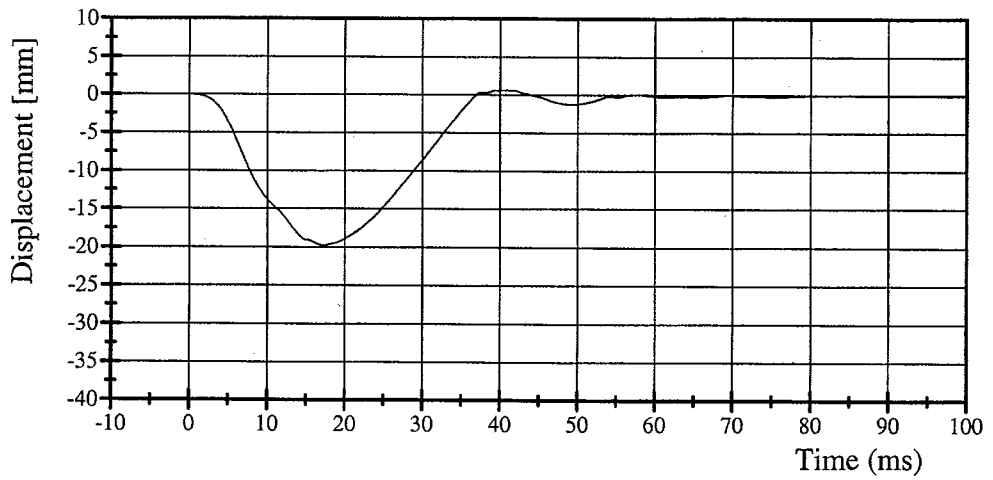


Filter Class: 600

Max: 621.3 N at 40.2 ms

Min: -4774.5 N at 16.7 ms

Tibia Displacement

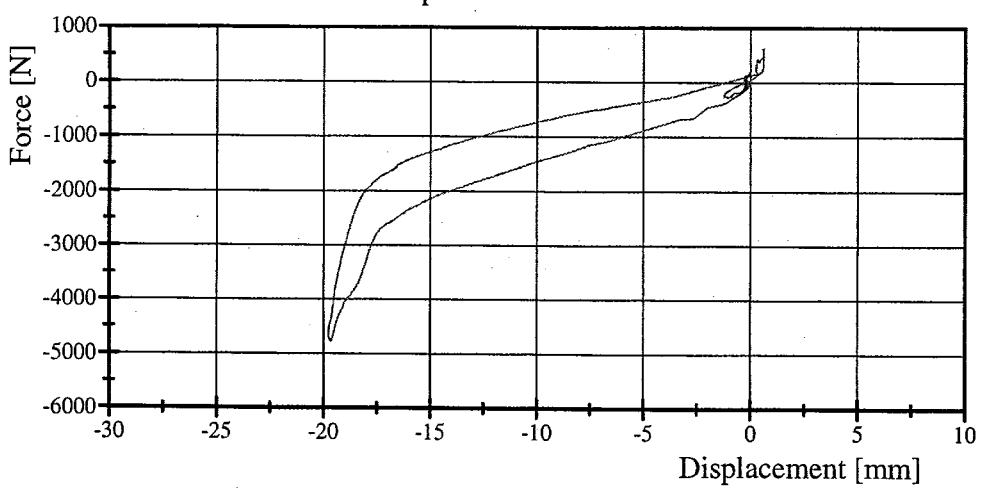


Filter Class: 600

Max: 0.6 mm at 40.2 ms

Min: -19.8 mm at 17.2 ms

Femur Force vs Tibia Displacement



09.24.2002 14:47:56 1155

Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 4

Test Date 09/25/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.70 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1586 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-3022 N	Yes

Comments:

Replaced Knee Slider With A New Knee Slider.

Technician

Approved

09.25.2002 14:25:42 1174

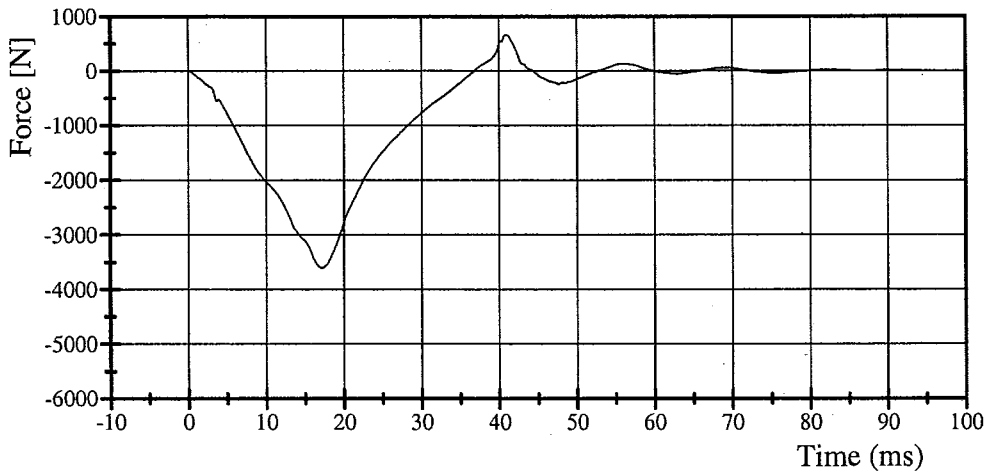
Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 4

Test Date 09/25/2002

Femur Force

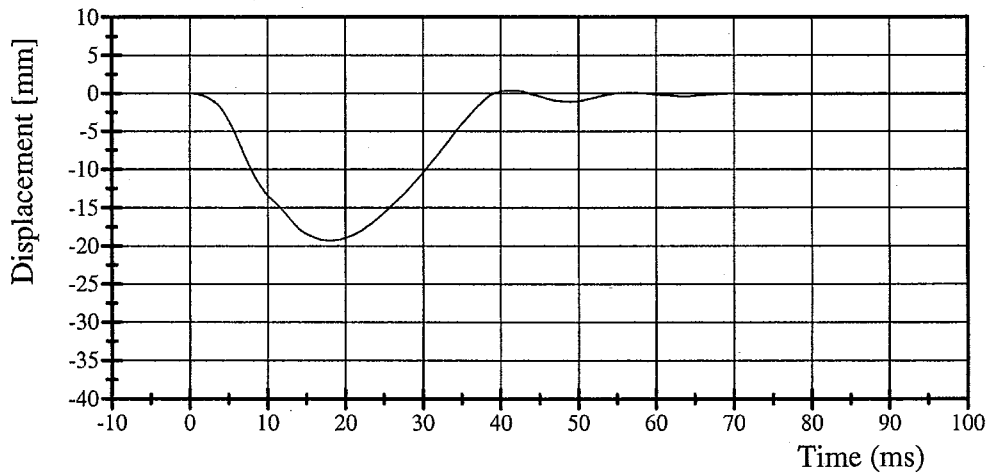


Filter Class: 600

Max: 657.0 N at 40.8 ms

Min: -3603.6 N at 17.2 ms

Tibia Displacement

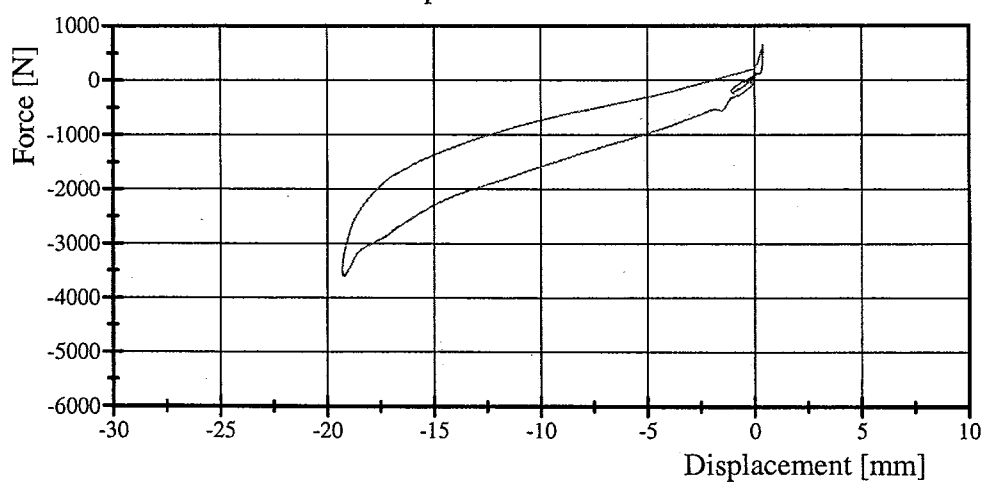


Filter Class: 600

Max: 0.4 mm at 41.5 ms

Min: -19.3 mm at 18.1 ms

Femur Force vs Tibia Displacement



09.25.2002 09:52:59 1174

Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/24/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.77 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1374 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2353 N	Yes

Comments:

Technician

Approved

09.24.2002 13:41:29 1133

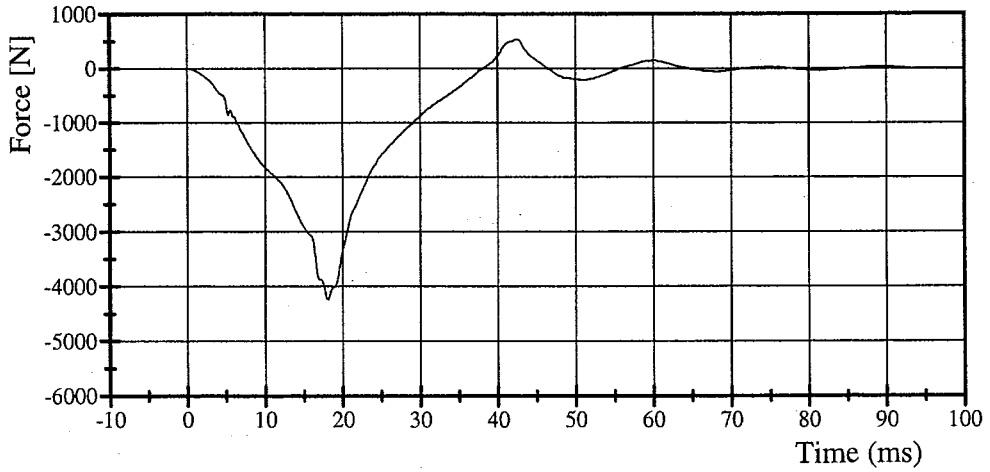
Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 1

Test Date 09/24/2002

Femur Force

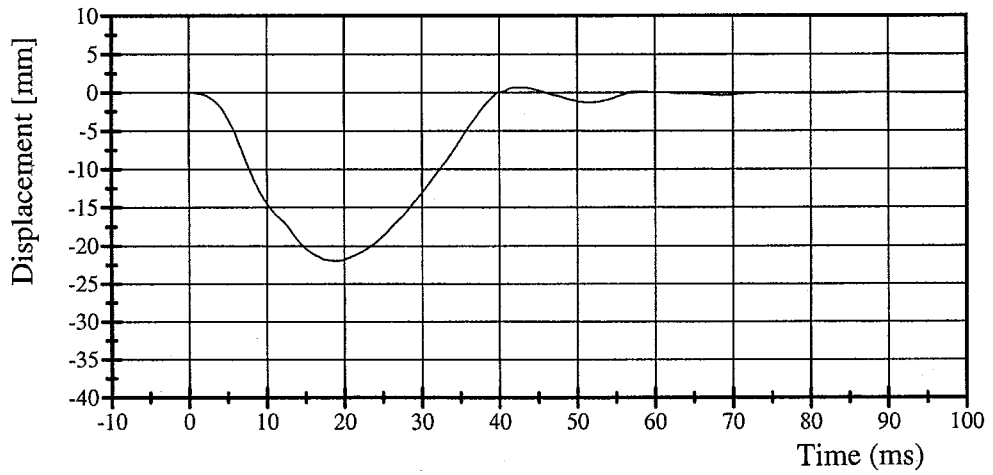


Filter Class: 600

Max: 536.1 N at 42.4 ms

Min: -4236.3 N at 18.1 ms

Tibia Displacement

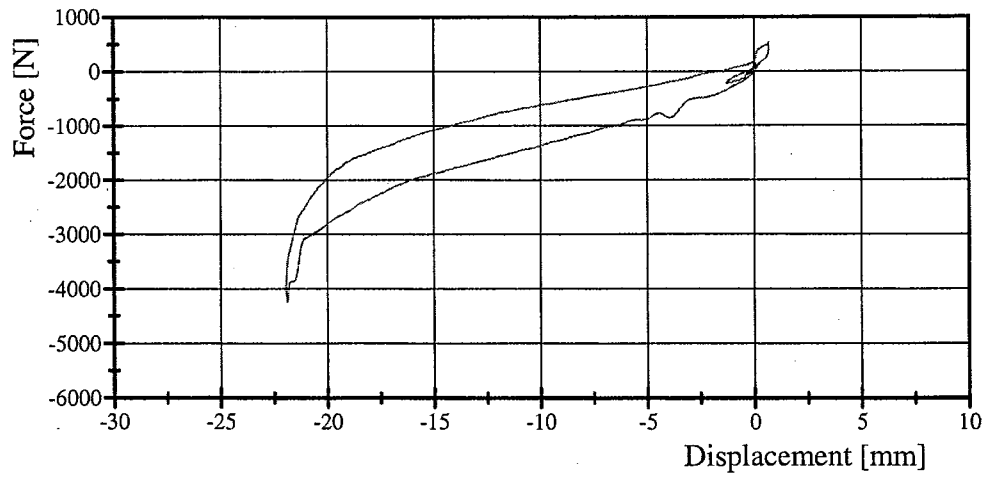


Filter Class: 600

Max: 0.7 mm at 42.4 ms

Min: -22.0 mm at 18.9 ms

Femur Force vs Tibia Displacement



09.24.2002 13:41:30 1133

Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 10/04/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5321 N	Yes

Comments:

Technician

Approved

10.07.2002 13:30:16 2106

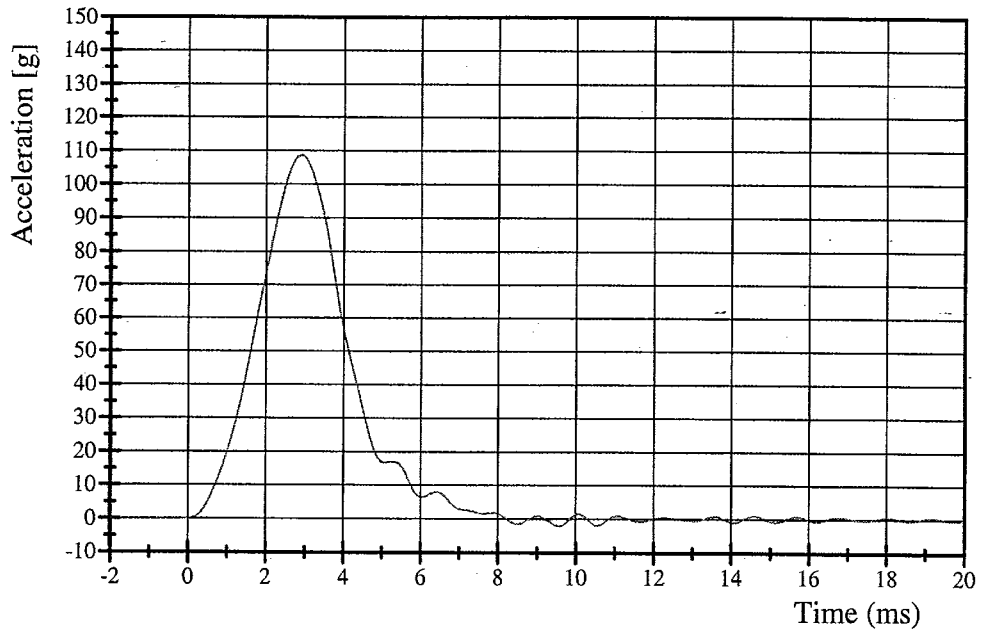
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 10/04/2002

Pendulum Deceleration

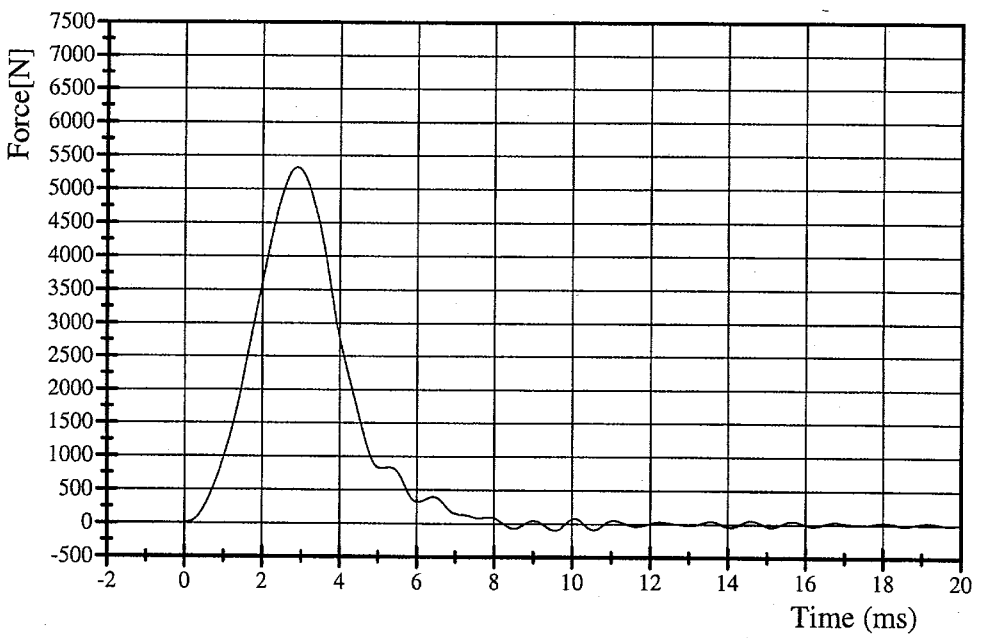


Filter Class: 600

Max: 108.8 g at 2.9 ms

Min: -2.0 g at 9.6 ms

Pendulum Force



Filter Class: 600

Max: 5321.2 N at 2.9 ms

Min: -95.8 N at 9.6 ms

10.07.2002 13:30:17 2106

Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 10/04/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	63 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5708 N	Yes

Comments:

Technician

Approved

10.07.2002 13:31:15 2108

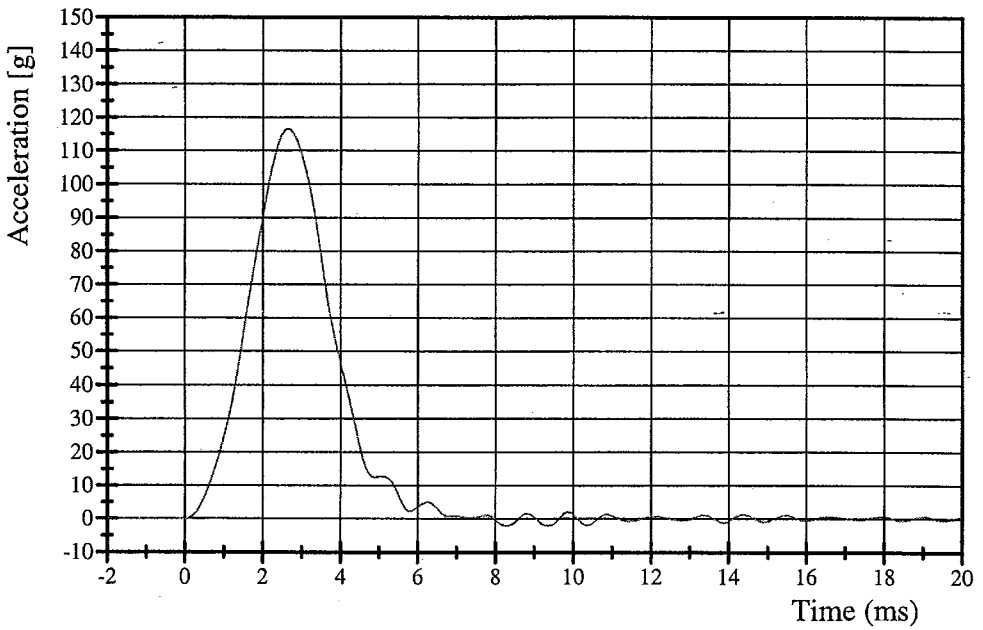
Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 168 Calibration No. 17 - 2

Test Date 10/04/2002

Pendulum Deceleration

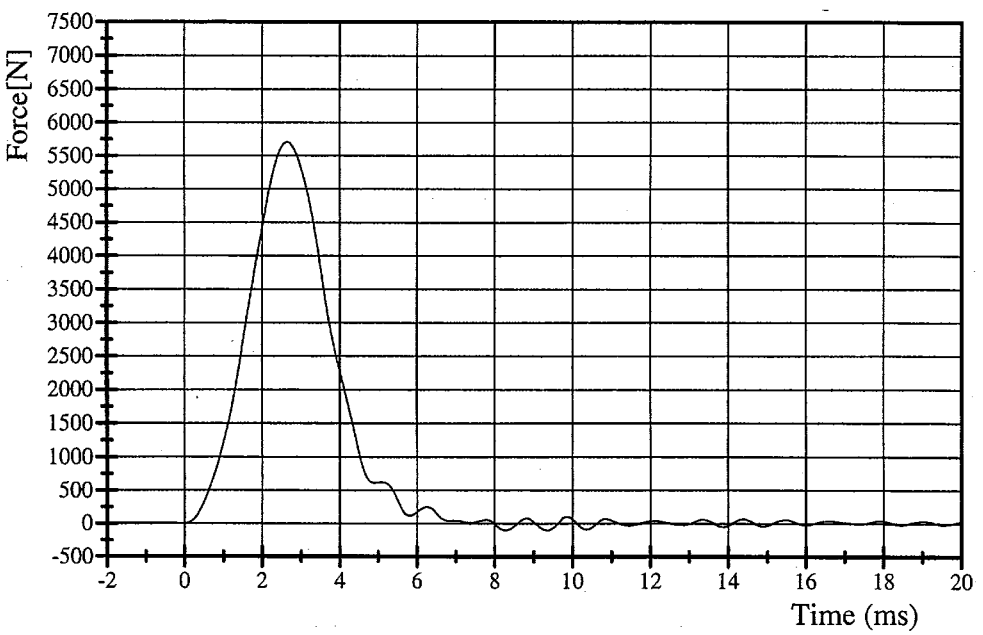


Filter Class: 600

Max: 116.7 g at 2.6 ms

Min: -2.1 g at 9.4 ms

Pendulum Force



Filter Class: 600

Max: 5708.0 N at 2.6 ms

Min: -103.4 N at 9.4 ms

10.07.2002 13:31:16 2108

Post-Test Dummy Configuration and Performance Verification Data

Target Vehicle Driver Dummy S/N: 168

Transportation Research Center Inc.
572E HIII 50th Dummy
External Dimensions
Serial No. 168 Calibration No. 18

Test Parameter	Dimension	Specification	Results	Pass
Location For Chest Circumference	AA	429 - 434 mm	432 mm	Yes
Location For Waist Circumference	BB	226 - 231 mm	229 mm	Yes
Chest Circumference	Y	970 - 1001 mm	981 mm	Yes
Waist Circumference	Z	836 - 866 mm	853 mm	Yes
Chest Depth	O	213 - 229 mm	227 mm	Yes
H-Point Height	C	84 - 89 mm	86 mm	Yes
H-Point From Seatback	D	135 - 140 mm	138 mm	Yes
Skull Cap To Backline	H	41 - 46 mm	46 mm	Yes
Total Sitting Height	A	879 - 889 mm	882 mm	Yes
Thigh Clearance	F	140 - 155 mm	151 mm	Yes
Buttock Knee Length	K	579 - 605 mm	597 mm	Yes
Buttock Popliteal Length	N	452 - 478 mm	473 mm	Yes
Popliteal Height	L	429 - 455 mm	446 mm	Yes
Knee Pivot Height	M	485 - 500 mm	491 mm	Yes
Foot Length	P	252 - 267 mm	260 mm	Yes
Foot Breadth	W	91 - 107 mm	103 mm	Yes
Shoulder Pivot From Backline	E	84 - 94 mm	91 mm	Yes
Shoulder Breadth	V	422 - 437 mm	430 mm	Yes
Shoulder Pivot Height	B	506 - 521 mm	514 mm	Yes
Elbow Rest Height	J	191 - 211 mm	208 mm	Yes
Shoulder-Elbow Length	I	330 - 345 mm	340 mm	Yes
Back Of Elbow To Wrist Pivot	G	290 - 305 mm	299 mm	Yes

Technician

Approved

Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Peak Resultant Acceleration	225 - 275 g	266.8 g	Yes
Peak Lateral Acceleration	15 g Max	-5.2 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

10.07.2002 15:32:08 612

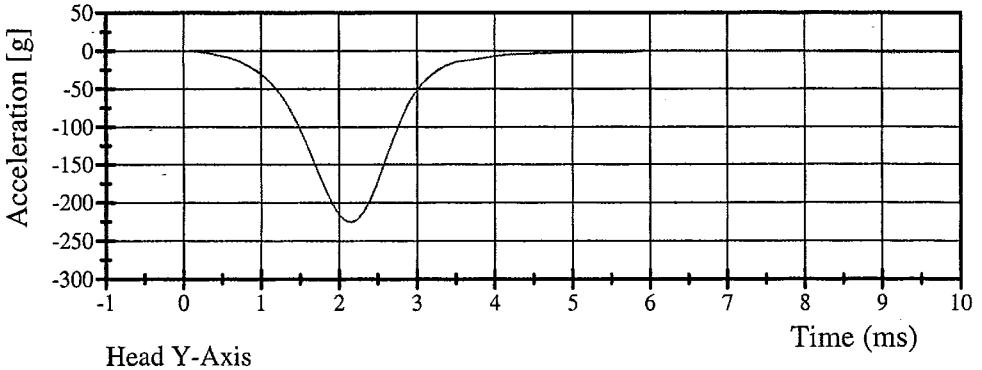
Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Head X-Axis

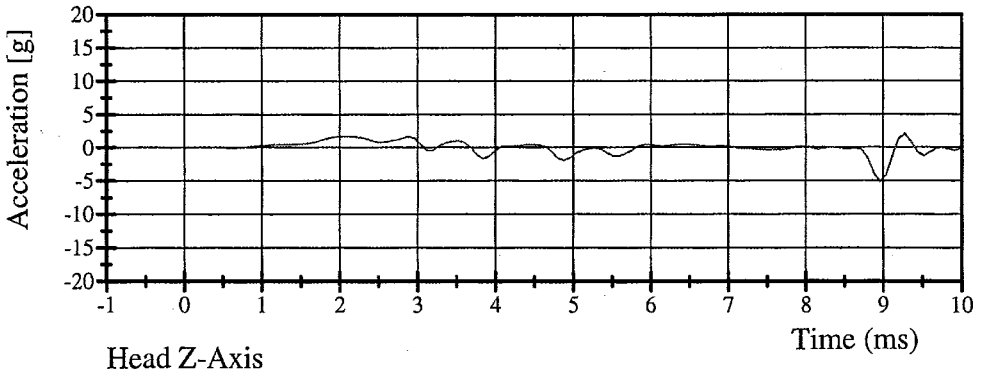


Filter Class: 1000

Max: 0.6 g at 6.4 ms

Min: -225.9 g at 2.2 ms

Head Y-Axis

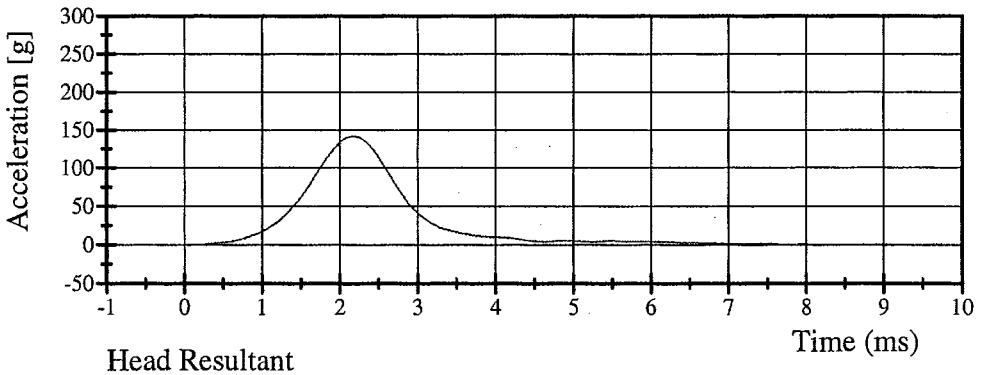


Filter Class: 1000

Max: 2.1 g at 9.3 ms

Min: -5.2 g at 9.0 ms

Head Z-Axis

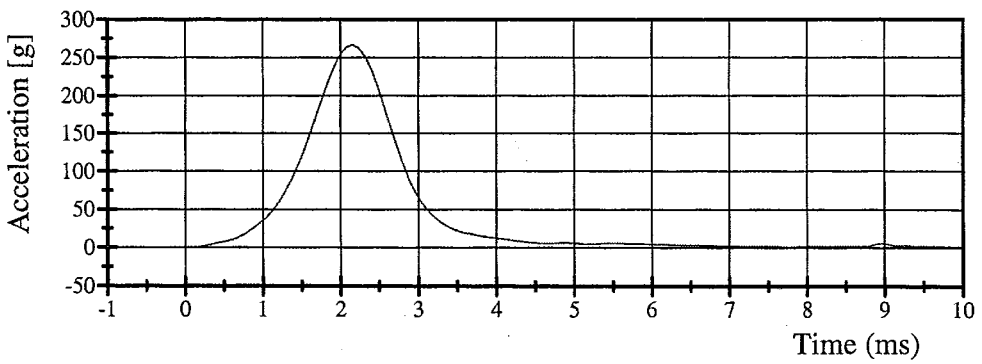


Filter Class: 1000

Max: 142.0 g at 2.2 ms

Min: 0.0 g at 0.0 ms

Head Resultant



Filter Class: 1000

Max: 266.8 g at 2.2 ms

Min: 0.0 g at 0.5 ms

10.07.2002 15:32:09 612

Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.06 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	24.04 g	Yes
20 ms	17.60 - 22.60 g	22.29 g	Yes
30 ms	12.50 - 18.50 g	17.34 g	Yes
Max Pendulum Deceleration	29.00 g	24.25 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	17.26 g	Yes
Deceleration-Time Curve Decay Time To 5g	34 - 42 ms	39.20 ms	Yes
D Plane Rotation			
Max	64 - 78 °	71.25 °	Yes
Time	57 - 64 ms	57.04 ms	Yes
Moment About Occipital Condyle			
Max	88.2 - 108.4 N·m	102.33 N·m	Yes
Time	47 - 58 ms	52.00 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	113 - 128 ms	114.24 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	97 - 107 ms	99.36 ms	Yes

Comments:

Technician

Approved

10.07.2002 16:18:55 460

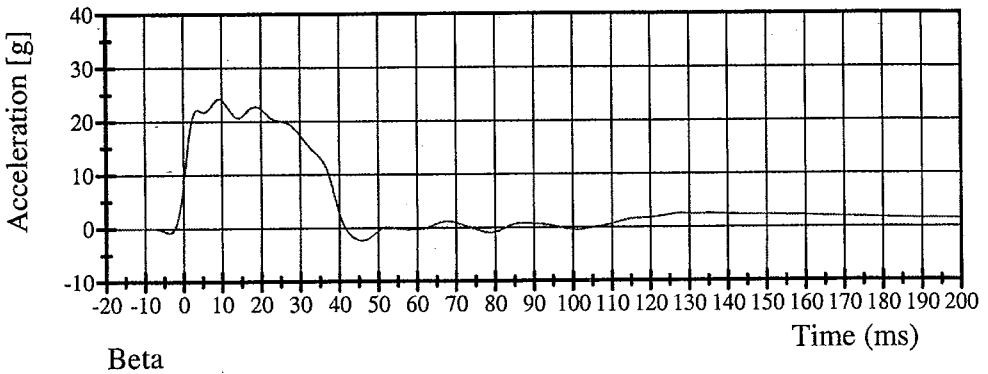
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Pendulum Deceleration

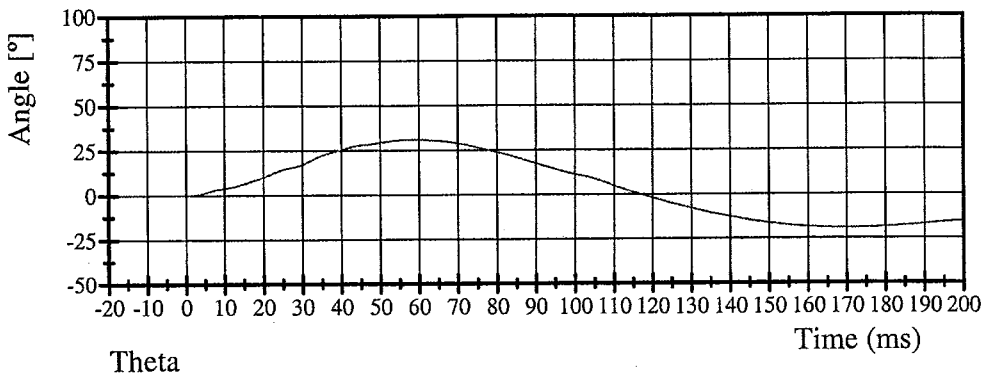


Filter Class: 60

Max: 24.2 g at 9.3 ms

Min: -2.3 g at 45.8 ms

Beta

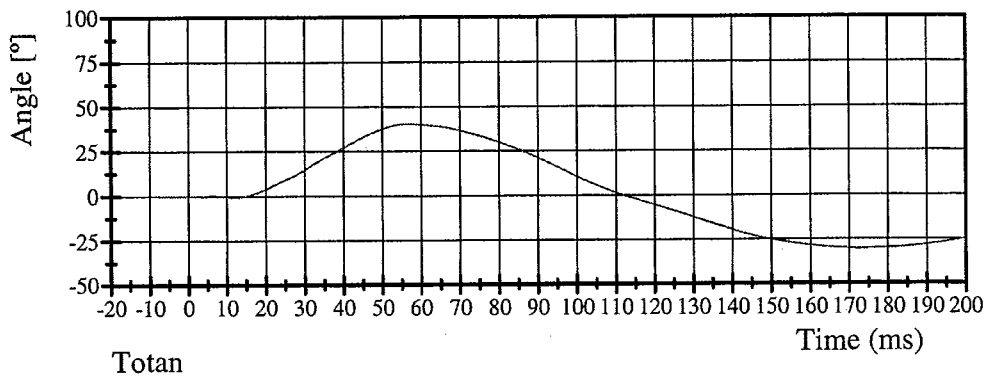


Filter Class: 60

Max: 30.9 ° at 58.4 ms

Min: -19.2 ° at 170.2 ms

Theta

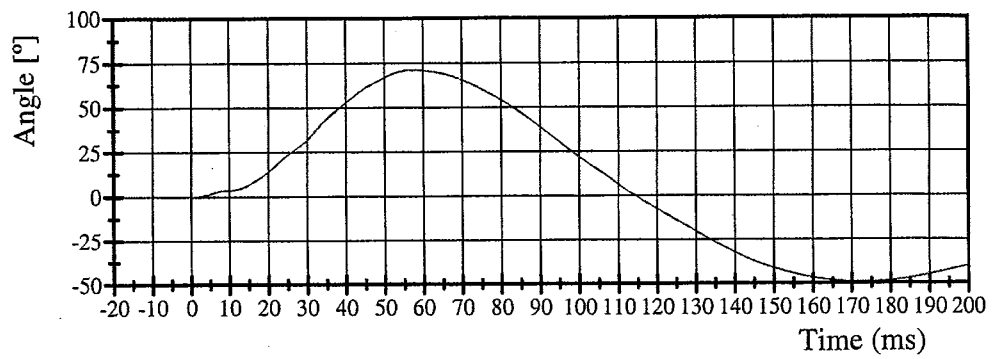


Filter Class: 60

Max: 40.4 ° at 56.6 ms

Min: -30.1 ° at 173.1 ms

Totan



Filter Class: 60

Max: 71.2 ° at 57.0 ms

Min: -49.3 ° at 172.0 ms

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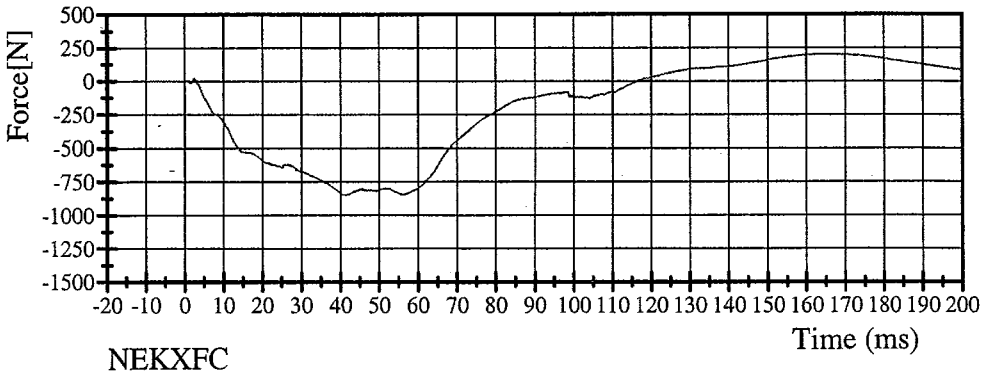
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

NEKXF

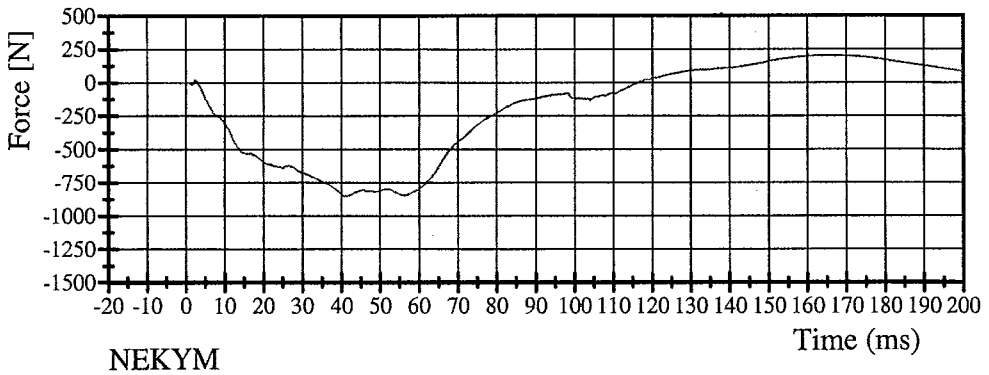


Filter Class: 1000

Max: 200.6 N at 166.4 ms

Min: -850.0 N at 41.0 ms

NEKXFC

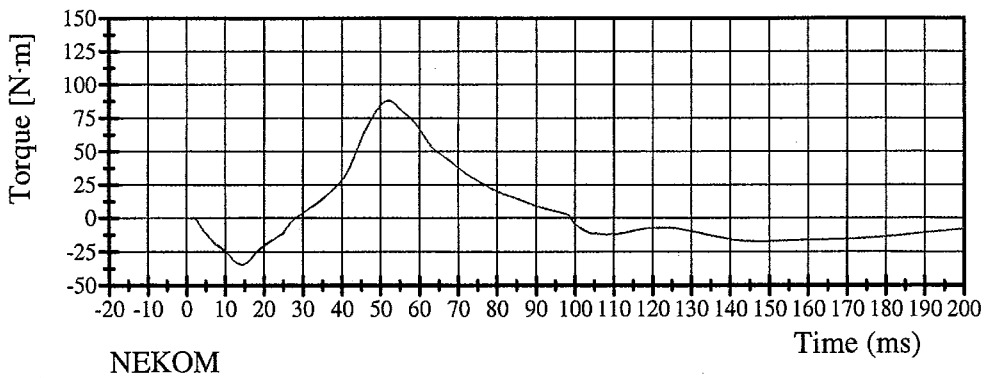


Filter Class: 600

Max: 200.0 N at 166.3 ms

Min: -849.4 N at 41.1 ms

NEKYM

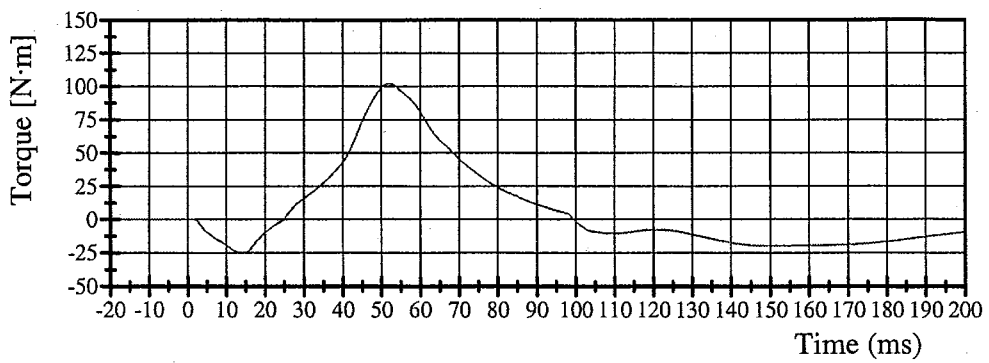


Filter Class: 600

Max: 88.2 N·m at 52.0 ms

Min: -34.5 N·m at 14.2 ms

NEKOM



Filter Class: 600

Max: 102.3 N·m at 52.0 ms

Min: -25.4 N·m at 14.0 ms

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Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.11 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	19.09 g	Yes
20 ms	14.00 - 19.00 g	18.72 g	Yes
30 ms	11.00 - 16.00 g..	15.10 g	Yes
Max Pendulum Deceleration	22.00 g	19.32 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	15.06 g	Yes
Deceleration-Time Curve Decay Time To 5g	38 - 46 ms	41.04 ms	Yes
D Plane Rotation			
Max	81 - 106 °	95.79 °	Yes
Time	72 - 82 ms	74.64 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-70.39 N·m	Yes
Time	65 - 79 ms	70.64 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	147 - 174 ms	151.44 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	120 - 148 ms	141.12 ms	Yes

Comments:

Technician

Approved

10.07.2002 16:45:06 532

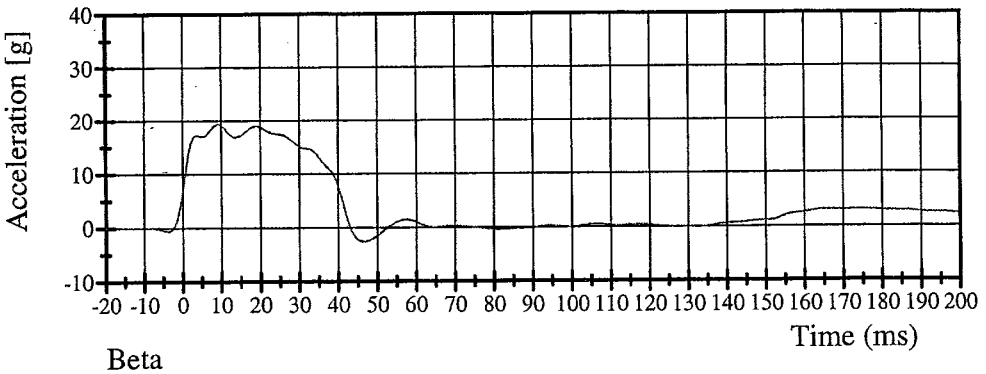
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Pendulum Deceleration

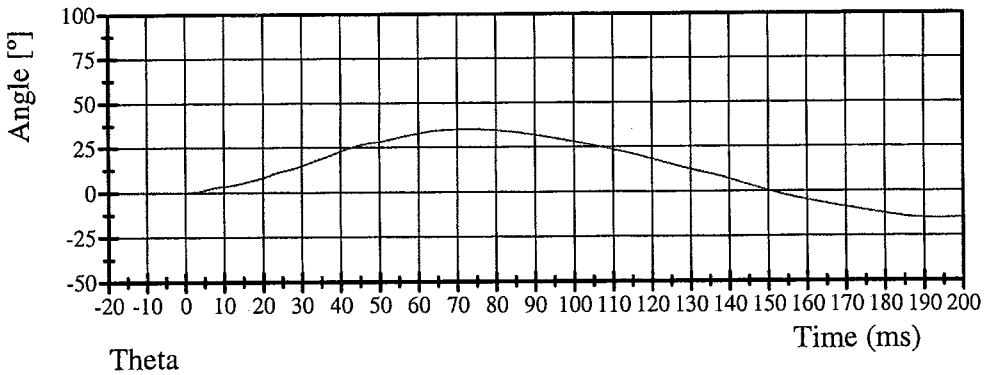


Filter Class: 60

Max: 19.3 g at 9.2 ms

Min: -2.6 g at 46.6 ms

Beta

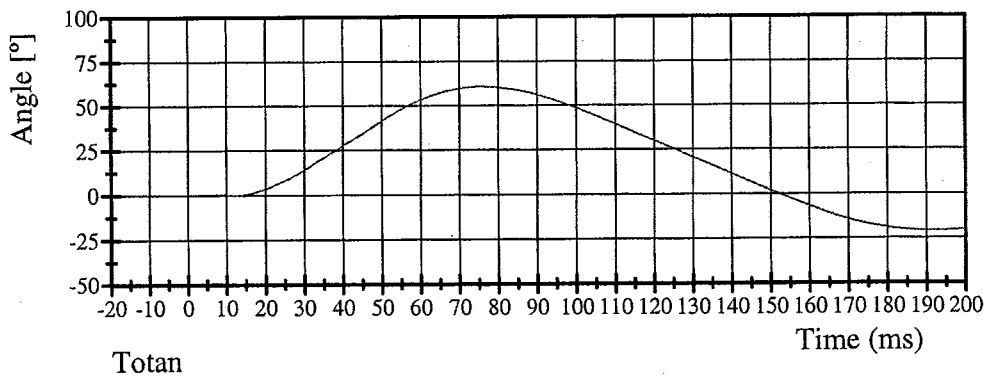


Filter Class: 60

Max: 35.1 ° at 73.4 ms

Min: -15.1 ° at 194.2 ms

Theta

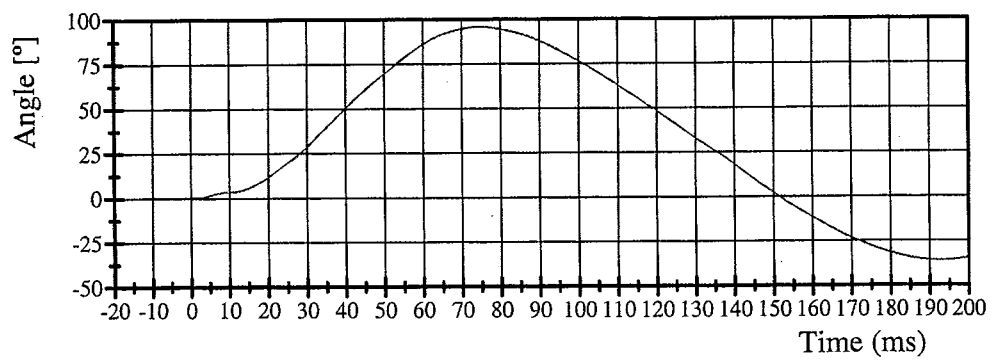


Filter Class: 60

Max: 60.7 ° at 75.3 ms

Min: -20.8 ° at 191.0 ms

Totan



Filter Class: 60

Max: 95.8 ° at 74.6 ms

Min: -35.9 ° at 192.7 ms

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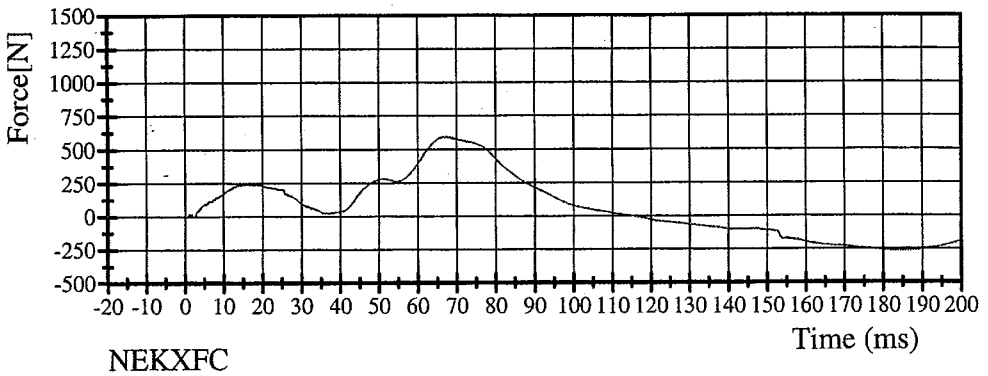
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

NEKXF

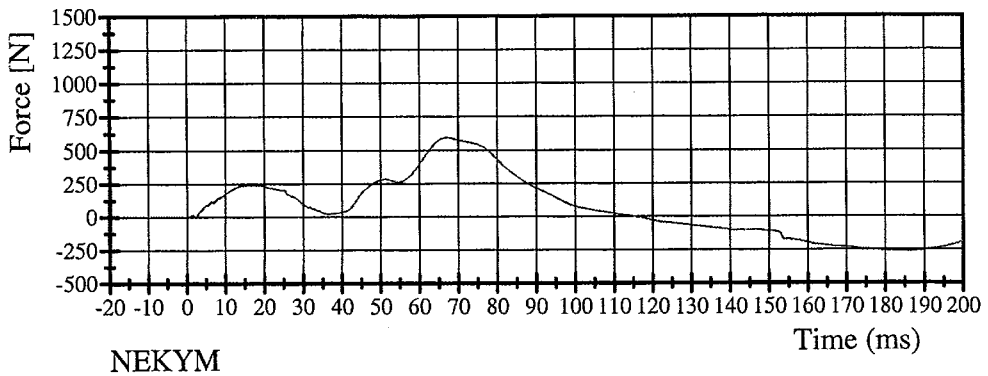


Filter Class: 1000

Max: 594.6 N at 67.1 ms

Min: -263.5 N at 183.6 ms

NEKXFC

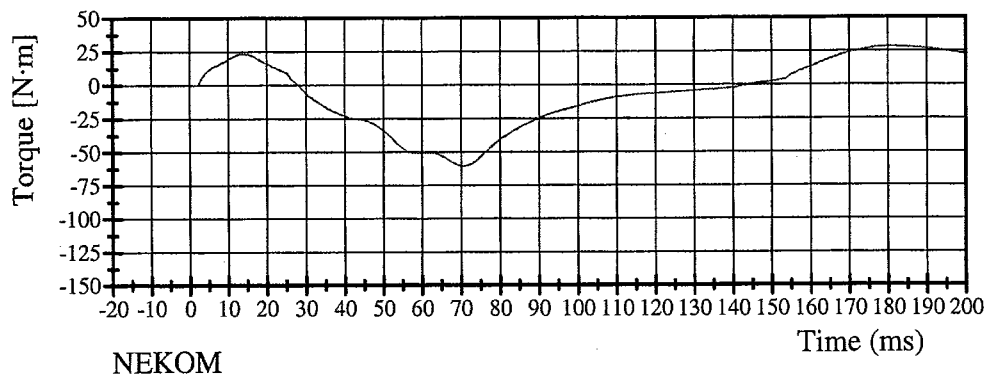


Filter Class: 600

Max: 593.8 N at 67.1 ms

Min: -263.1 N at 184.4 ms

NEKYM

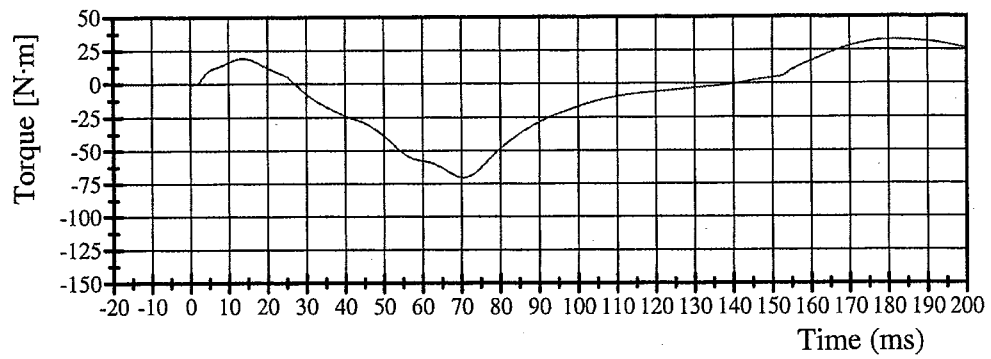


Filter Class: 600

Max: 28.3 N·m at 180.7 ms

Min: -60.3 N·m at 70.7 ms

NEKOM



Filter Class: 600

Max: 32.8 N·m at 180.7 ms

Min: -70.4 N·m at 70.6 ms

10.07.2002 16:45:09 532

Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.60 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-66.9 mm	Yes
Maximum Resistive Force	5159 - 5894 N	5782 N	Yes
Internal Hysteresis	69 - 85 %	71 %	Yes

Comments:

Technician

Approved

10.07.2002 14:09:10 943

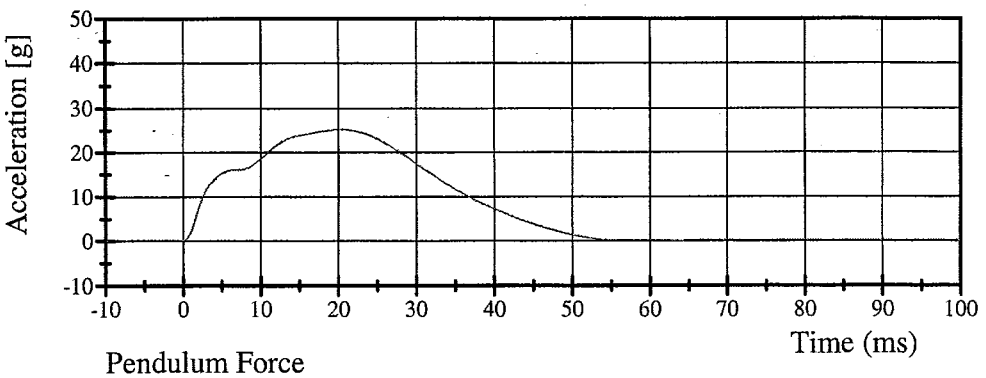
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Pendulum Deceleration

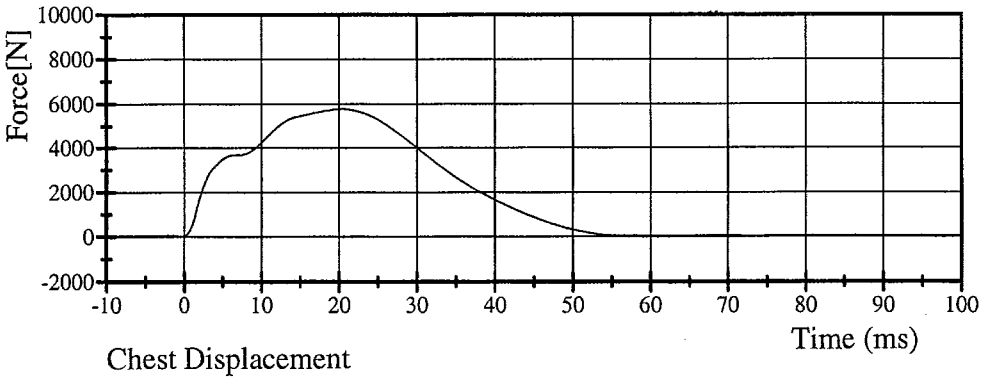


Filter Class: 180

Max: 25.2 g at 20.3 ms

Min: -0.2 g at 356.6 ms

Pendulum Force

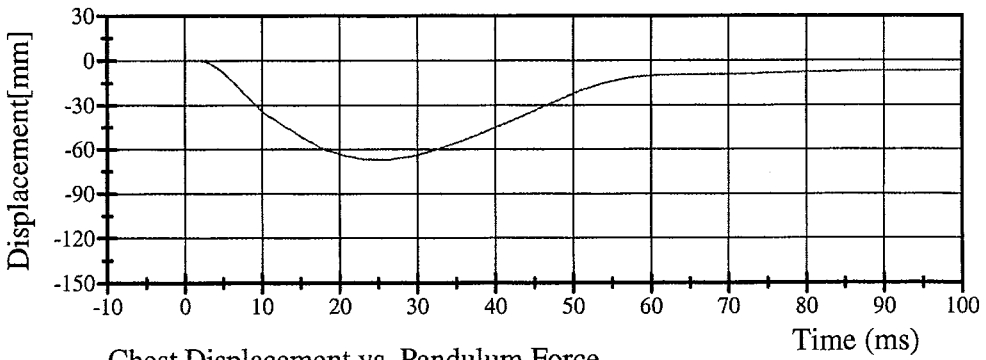


Filter Class: 180

Max: 5781.8 N at 20.3 ms

Min: -35.0 N at 356.6 ms

Chest Displacement

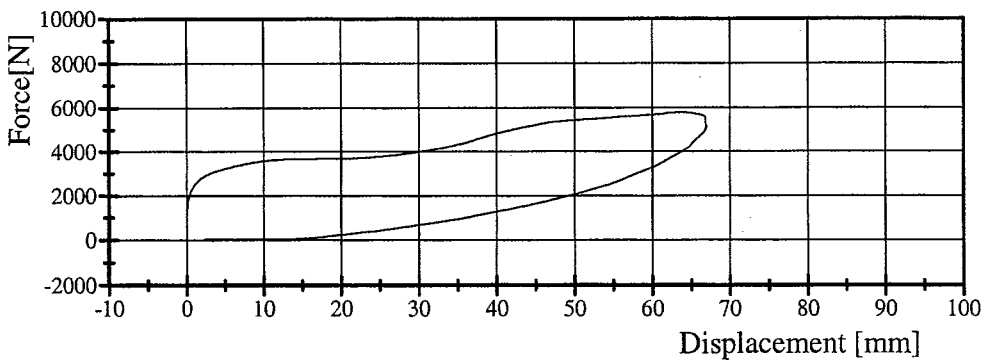


Filter Class: 180

Max: 0.0 mm at 1.0 ms

Min: -66.9 mm at 25.8 ms

Chest Displacement vs. Pendulum Force



10.07.2002 14:09:11 943

Transportation Research Center Inc

Hybrid III Hip Range of Motion

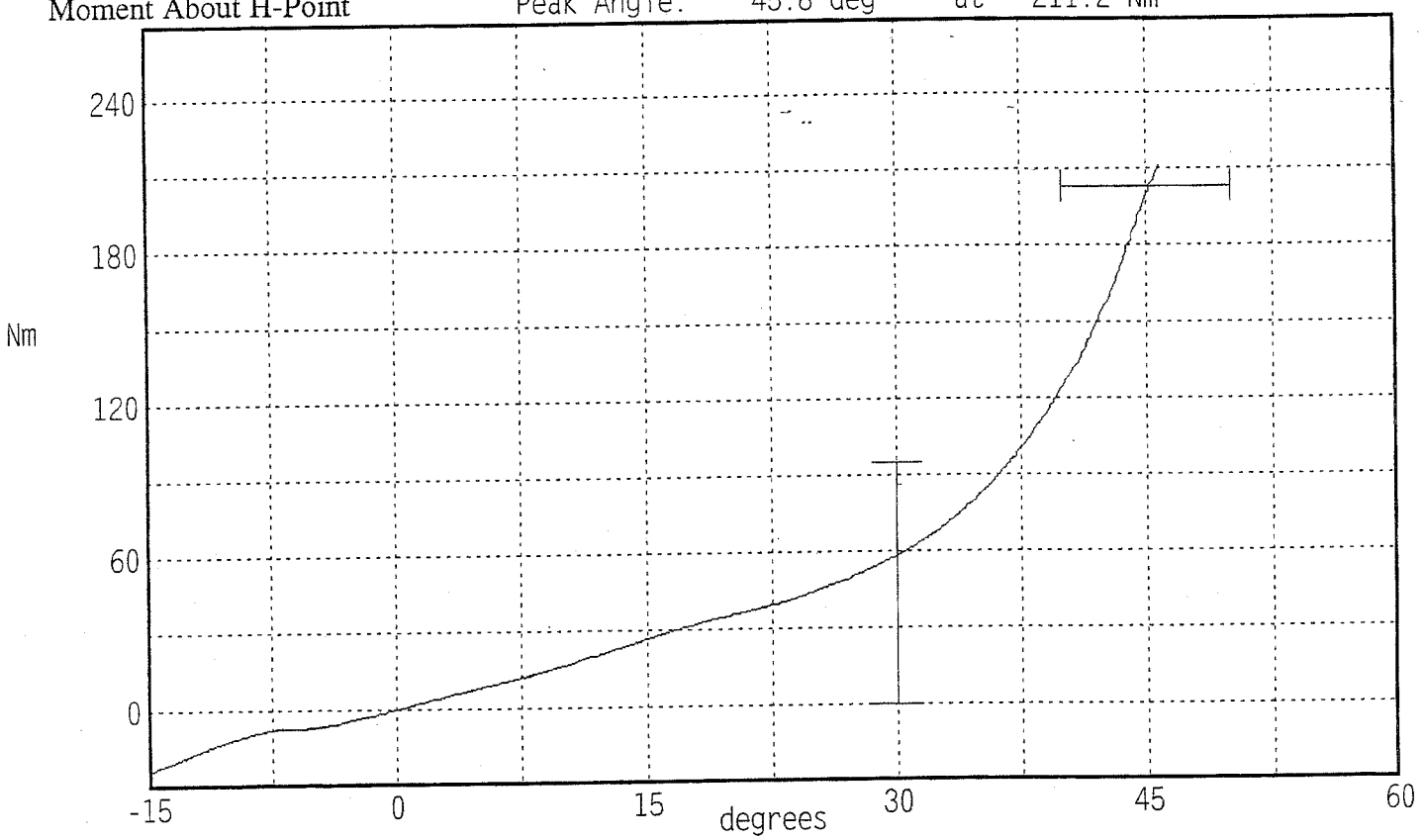
Serial Number: 168C18
Test Number: 168L
Comments:

Date: 10/07/2002
Time: 16:00

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	37	%	Pass
Moment at 30 deg	<= 94.9	58.8	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	45.3	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

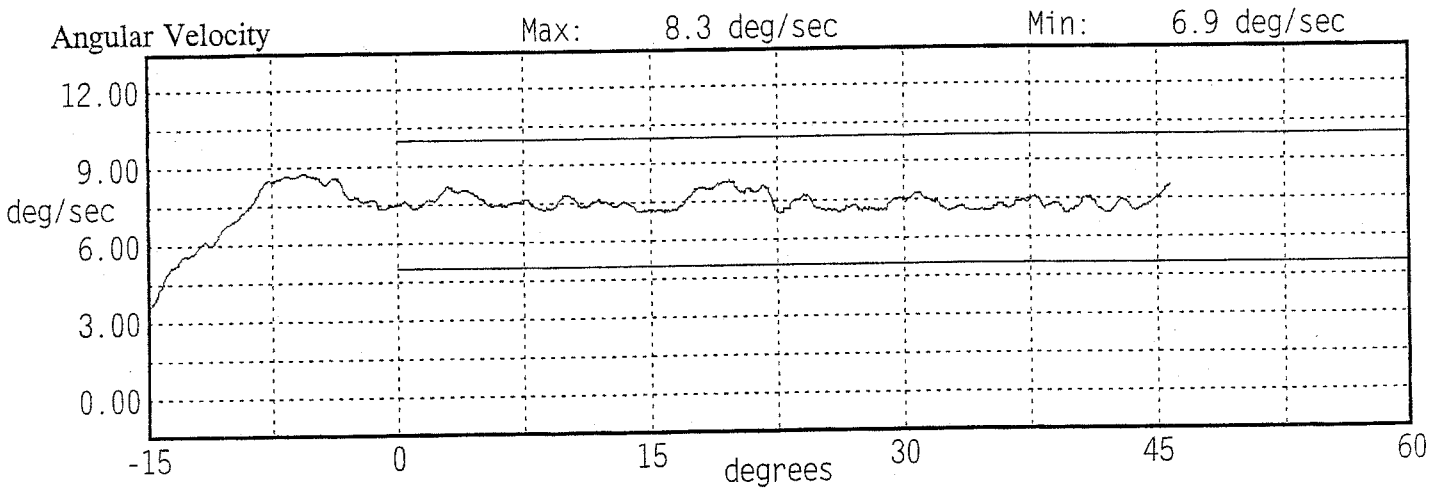
Moment About H-Point

Peak Moment: 211.2 Nm at 45.8 deg
Peak Angle: 45.8 deg at 211.2 Nm



Angular Velocity

Max: 8.3 deg/sec Min: 6.9 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

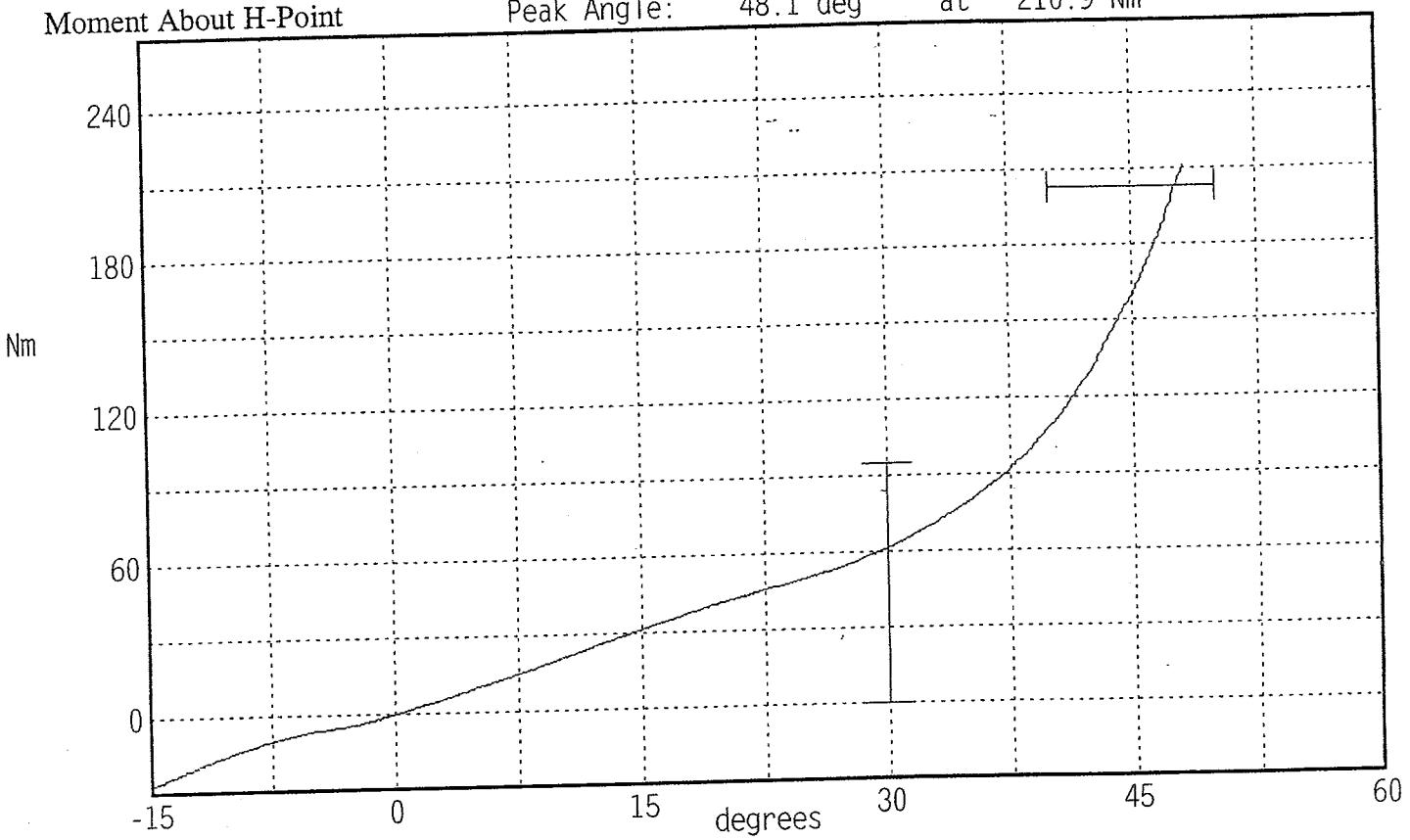
Serial Number: 168C18
Test Number: 168R
Comments:

Date: 10/07/2002
Time: 16:07

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	37	%	Pass
Moment at 30 deg	<= 94.9	61.8	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	47.8	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

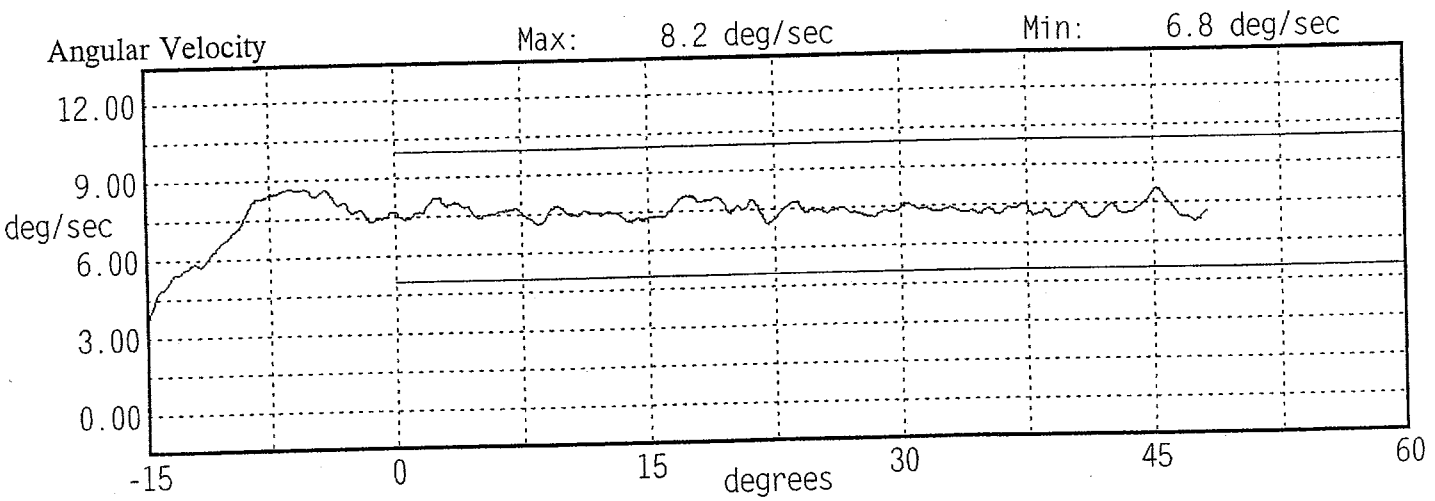
Moment About H-Point

Peak Moment: 210.9 Nm at 48.1 deg
Peak Angle: 48.1 deg at 210.9 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.8 deg/sec



Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.72 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1664 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-3036 N	Yes

Comments:

Technician

Approved

10.07.2002 14:25:43 1165

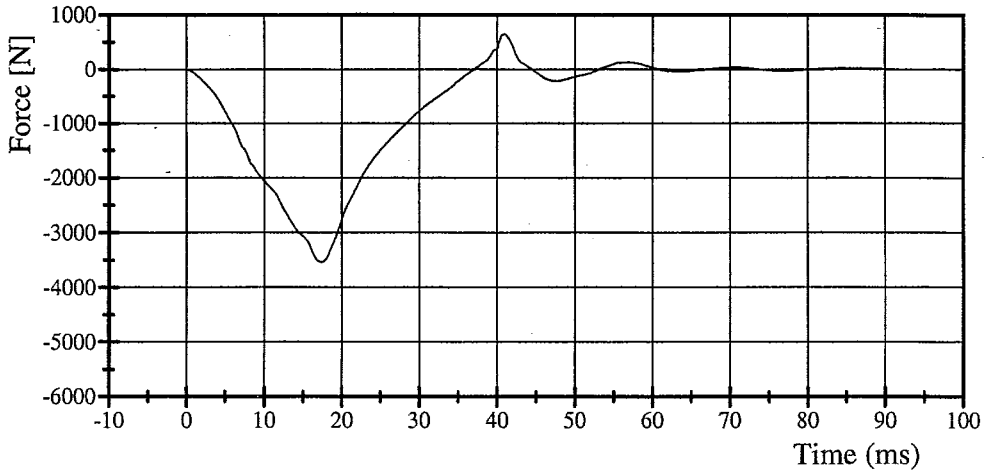
Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Femur Force

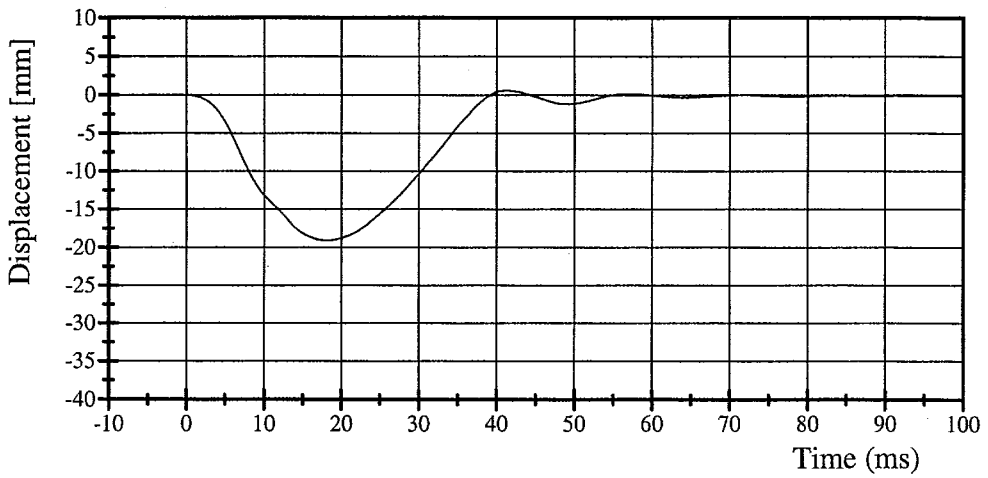


Filter Class: 600

Max: 643.0 N at 40.9 ms

Min: -3539.4 N at 17.4 ms

Tibia Displacement

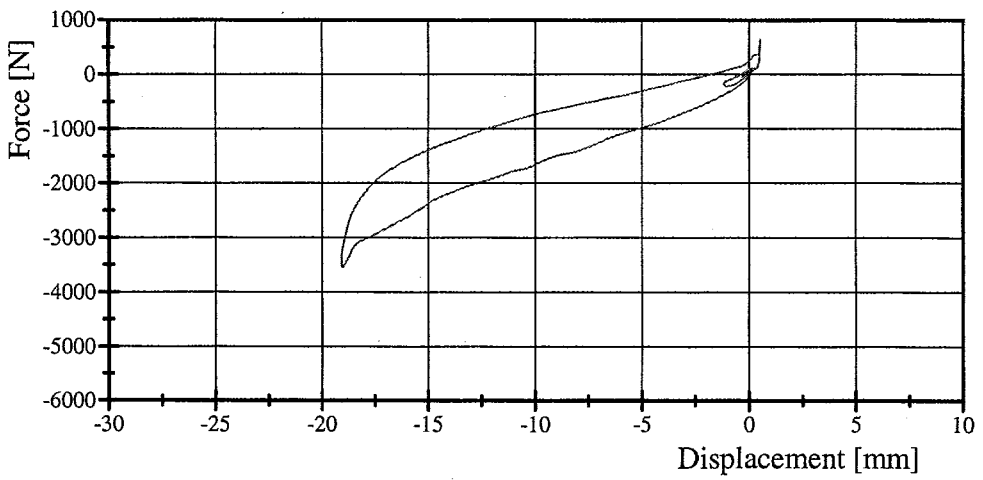


Filter Class: 600

Max: 0.5 mm at 41.4 ms

Min: -19.1 mm at 18.2 ms

Femur Force vs Tibia Displacement



10.07.2002 14:25:44 1165

Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.71 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1336 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2305 N	Yes

Comments:

Technician

Approved

10.07.2002 15:08:38 1171

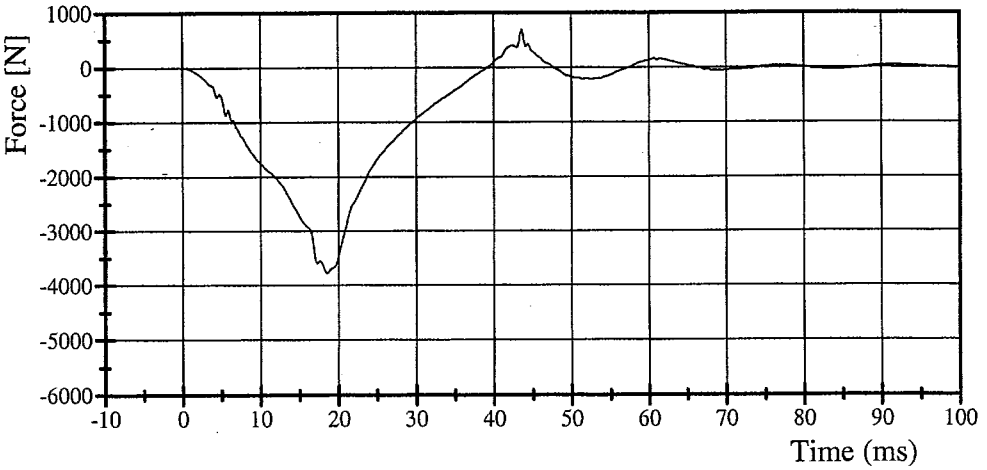
Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Femur Force

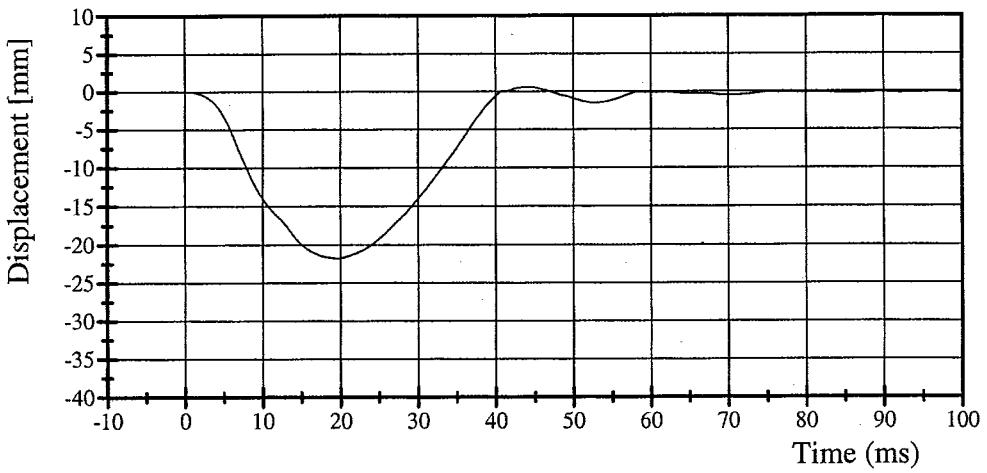


Filter Class: 600

Max: 694.6 N at 43.6 ms

Min: -3772.7 N at 18.6 ms

Tibia Displacement

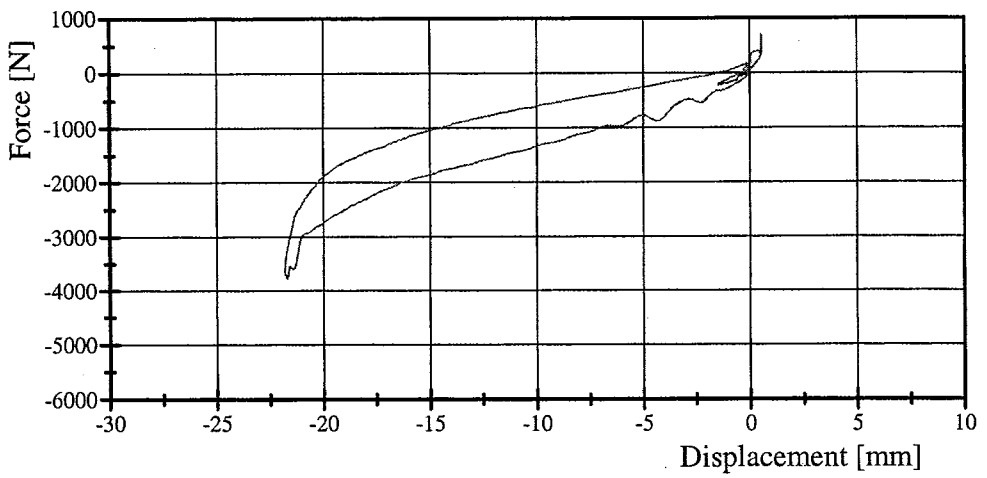


Filter Class: 600

Max: 0.6 mm at 44.2 ms

Min: -21.8 mm at 19.4 ms

Femur Force vs Tibia Displacement



10.07.2002 15:08:40 1171

Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5181 N	Yes

Comments:

Technician

Approved

10.07.2002 15:24:34 2106

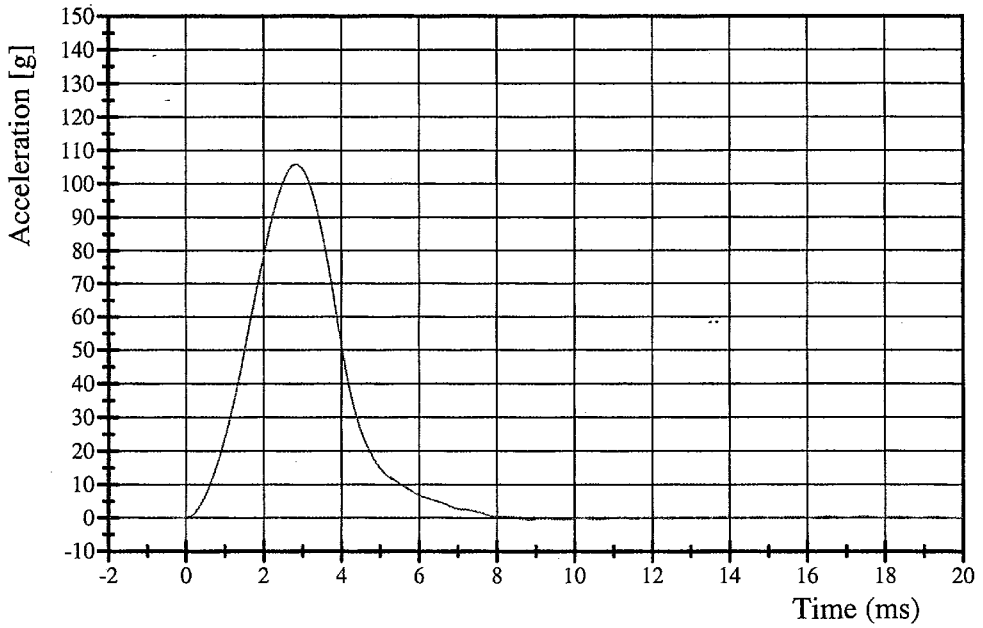
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Pendulum Deceleration

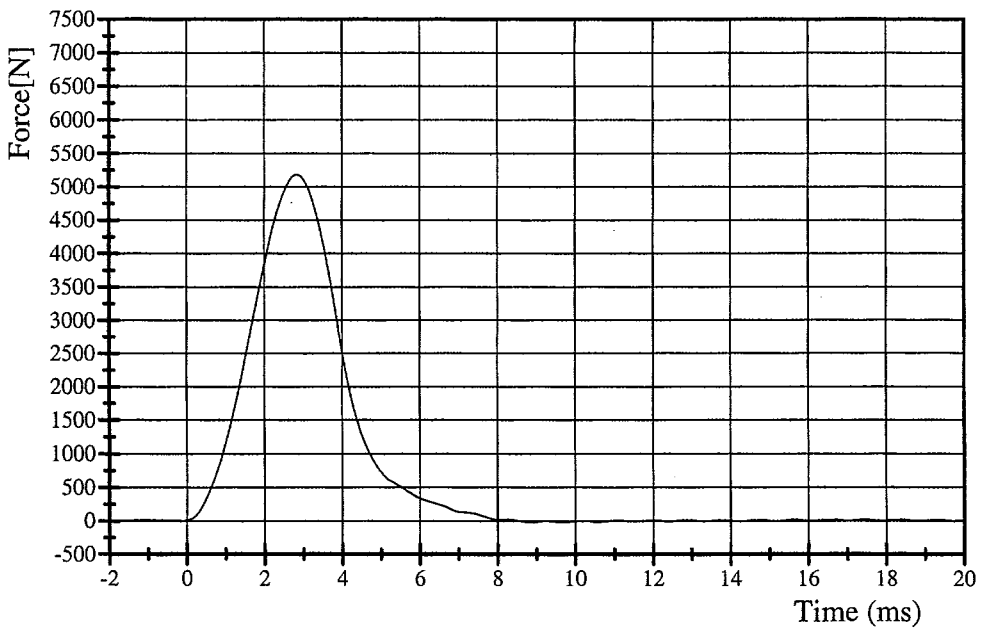


Filter Class: 600

Max: 105.9 g at 2.8 ms

Min: -0.5 g at 8.9 ms

Pendulum Force



Filter Class: 600

Max: 5180.8 N at 2.8 ms

Min: -23.8 N at 8.9 ms

10.07.2002 15:24:34 2106

Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.13 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5181 N	Yes

Comments:

Technician

Approved

10.07.2002 15:25:12 2085

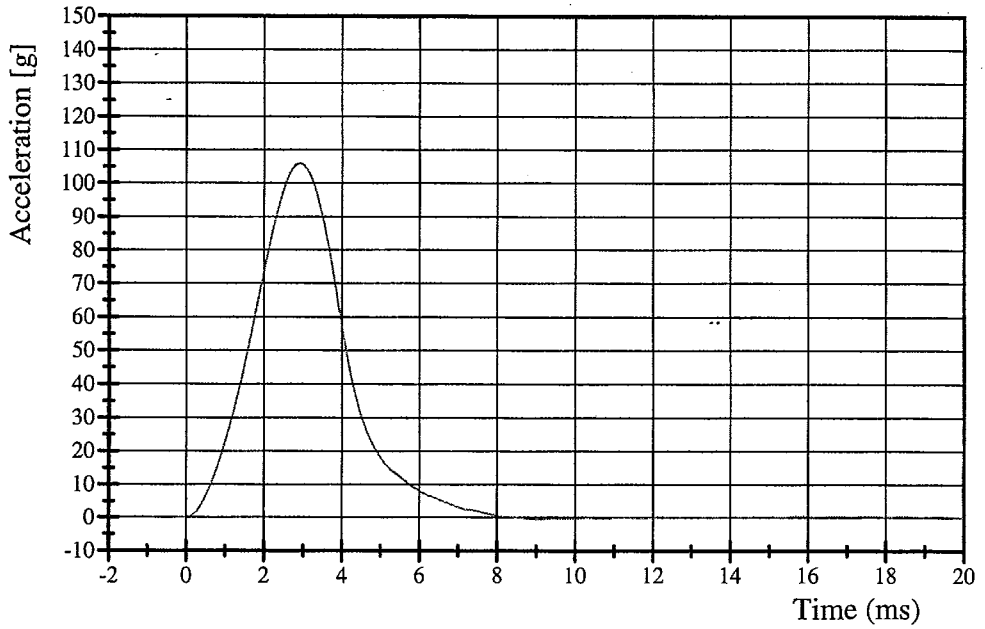
Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 168 Calibration No. 18 - 1

Test Date 10/07/2002

Pendulum Deceleration

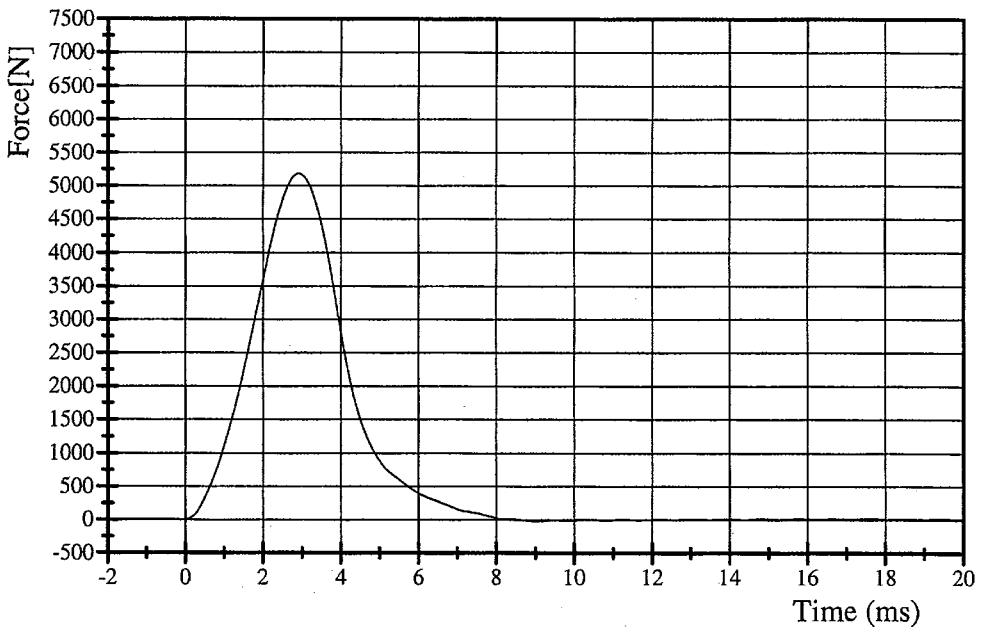


Filter Class: 600

Max: 105.9 g at 2.9 ms

Min: -0.6 g at 9.0 ms

Pendulum Force



Filter Class: 600

Max: 5181.1 N at 2.9 ms

Min: -27.6 N at 9.0 ms

10.07.2002 15:25:13 2085

Pre-Test Dummy Configuration and Performance Verification Data

Target Vehicle Passenger Dummy S/N: 421

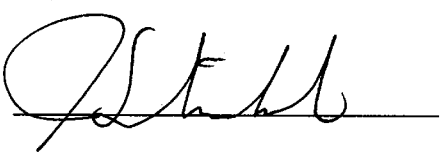
Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 421 Calibration No. 10

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	774.7 - 800.1 mm	793 mm	Yes
Shoulder Pivot Height	B	431.8 - 457.2 mm	450 mm	Yes
Hip Pivot Height	C	81.3 - 86.3 mm	84 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	81 mm	Yes
Thigh Clearance	F	119.4 - 134.6 mm	127 mm	Yes
Back of Elbow to Wrist Pivot	G	243.9 - 259.0 mm	253 mm	Yes
Head Back to Backline	H	40.7 - 45.7 mm	45 mm	Yes
Shoulder to Elbow Length	I	276.9 - 297.1 mm	289 mm	Yes
Elbow Rest Height	J	182.9 - 203.2 mm	200 mm	Yes
Buttock Knee Length	K	520.7 - 546.1 mm	532 mm	Yes
Popliteal Height	L	355.6 - 375.9 mm	369 mm	Yes
Knee Pivot Height	M	393.7 - 419.1 mm	413 mm	Yes
Buttock Popliteal Height	N	414.1 - 439.4 mm	421 mm	Yes
Chest Depth without Jacket	O	175.3 - 190.5 mm	185 mm	Yes
Foot Length	P	218.5 - 233.6 mm	226 mm	Yes
Buttock to Knee Pivot Length	R	457.2 - 482.6 mm	481 mm	Yes
Head Breadth	S	137.2 - 147.3 mm	140 mm	Yes
Head Depth	T	177.8 - 187.9 mm	183 mm	Yes
Hip Breadth	U	299.8 - 314.9 mm	310 mm	Yes
Shoulder Breadth	V	350.6 - 365.7 mm	354 mm	Yes
Foot Breadth	W	78.8 - 93.9 mm	87 mm	Yes
Head Circumference	X	528.4 - 548.6 mm	540 mm	Yes
Chest Circumference with Jacket	Y	850.9 - 881.3 mm	879 mm	Yes
Waist Circumference	Z	759.5 - 789.9 mm	774 mm	Yes
Reference Location for Chest Circumference	AA	299.8 - 309.8 mm	305 mm	Yes
Reference Location for Waist Circumference	BB	160.1 - 170.1 mm	165 mm	Yes

Technician



Approved



Transportation Research Center Inc.

572O Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/26/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Peak Resultant Acceleration	250 - 300 g	288.8 g	Yes
Peak Lateral Acceleration	15 g Max	13.3 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

08.26.2002 12:45:37 608

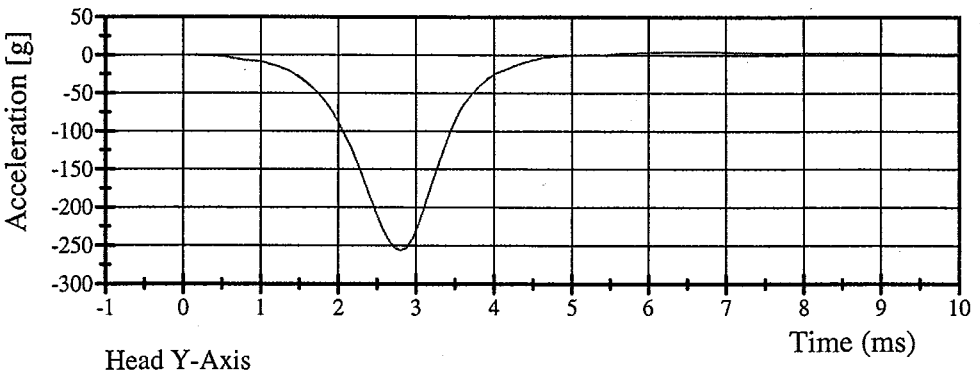
Transportation Research Center Inc.

572O Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/26/2002

Head X-Axis

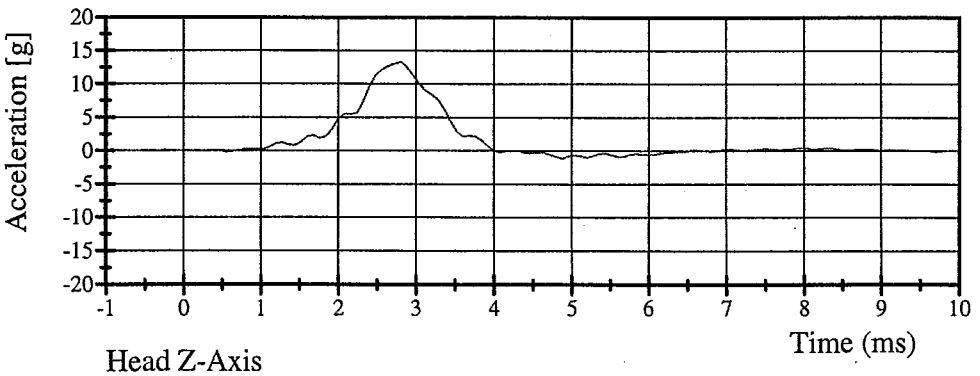


Filter Class: 1000

Max: 4.4 g at 6.5 ms

Min: -256.5 g at 2.8 ms

Head Y-Axis

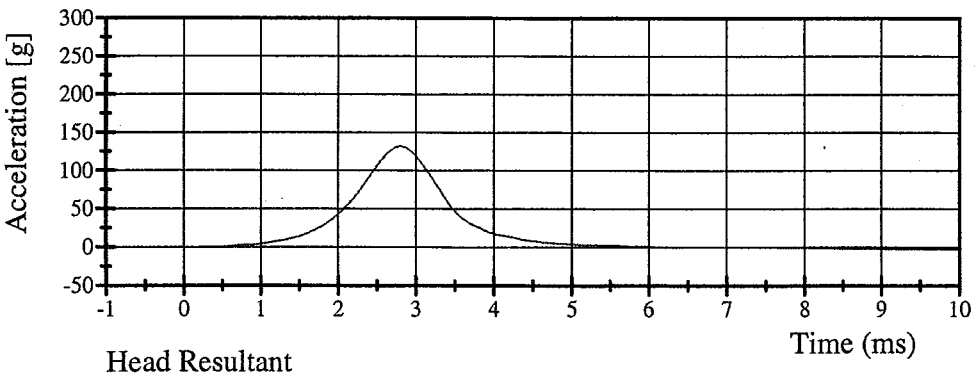


Filter Class: 1000

Max: 13.3 g at 2.8 ms

Min: -1.2 g at 4.9 ms

Head Z-Axis

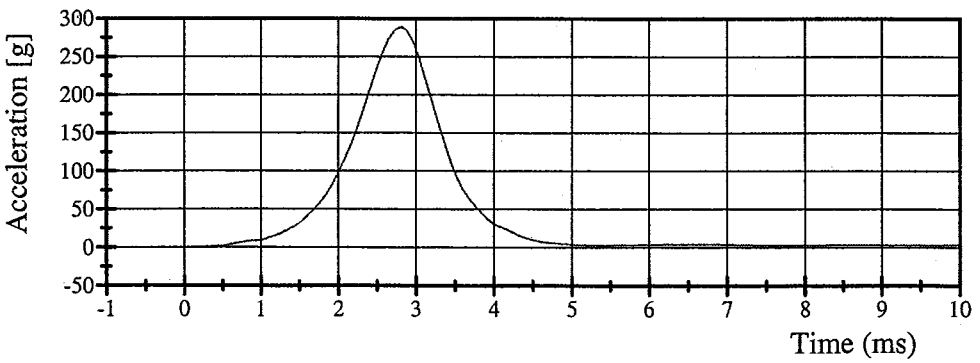


Filter Class: 1000

Max: 132.1 g at 2.8 ms

Min: -2.7 g at 9.9 ms

Head Resultant



Filter Class: 1000

Max: 288.8 g at 2.8 ms

Min: 0.0 g at 2.6 ms

08.26.2002 12:45:46 608

Transportation Research Center Inc.

572O Neck Flexion Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	55 %	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	2.11 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.21 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.24 m/s	Yes
Peak D Plane Rotation	77 - 91 °	77.4 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	73.30 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	88.48 ms	Yes

Comments:

Technician

Approved

08.28.2002 13:53:36 462

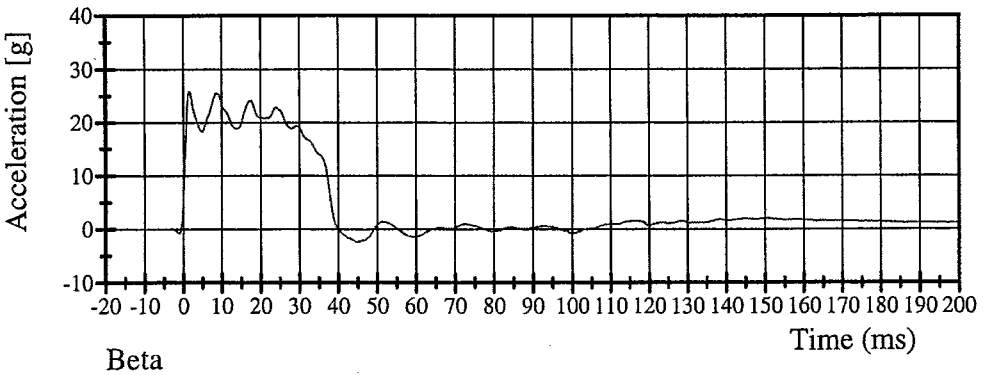
Transportation Research Center Inc.

572O Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Pendulum Deceleration

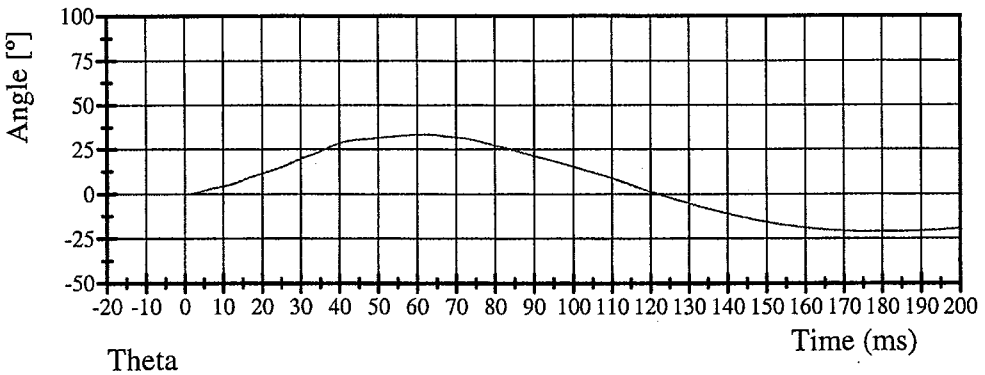


Filter Class: 180

Max: 25.9 g at 1.6 ms

Min: -2.4 g at 44.9 ms

Beta

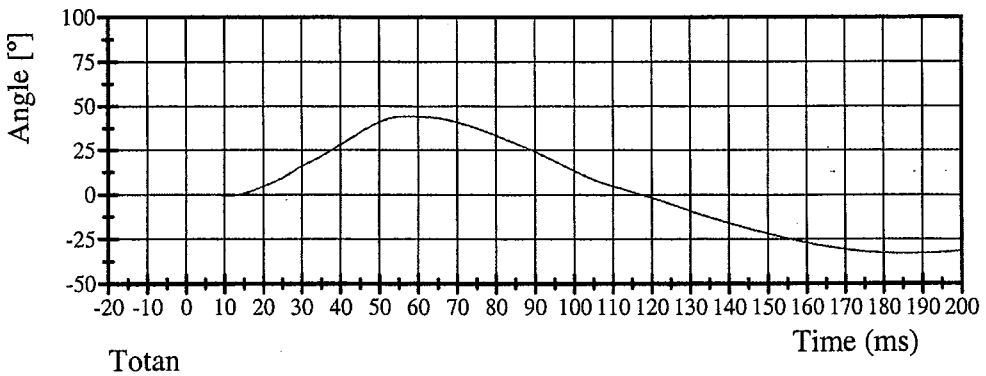


Filter Class: 60

Max: 33.5 ° at 61.9 ms

Min: -21.0 ° at 181.8 ms

Theta



Filter Class: 60

Max: 44.2 ° at 57.0 ms

Min: -32.9 ° at 186.5 ms

Totan



Filter Class: 60

Max: 77.4 ° at 60.7 ms

Min: -53.8 ° at 184.5 ms

08.28.2002 13:53:37 462

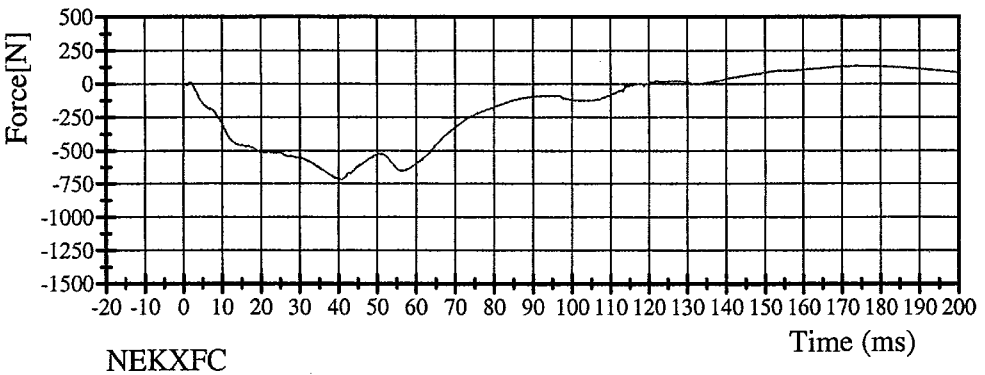
Transportation Research Center Inc.

572O Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

NEKXF

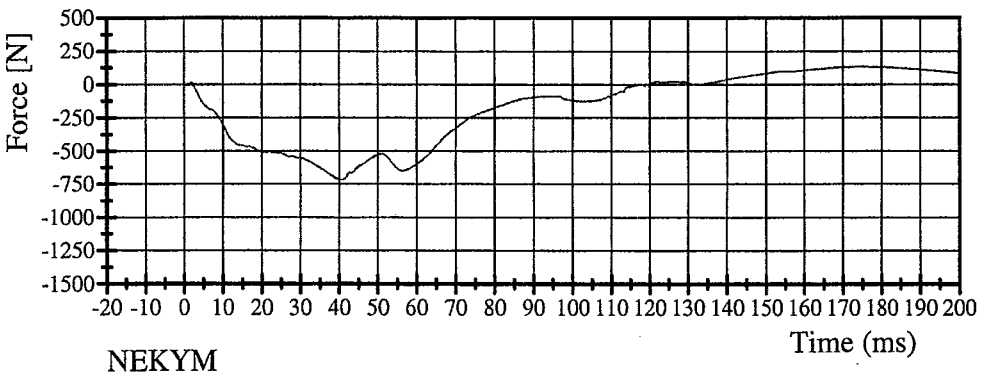


Filter Class: 1000

Max: 134.5 N at 174.7 ms

Min: -716.5 N at 40.2 ms

NEKXFC

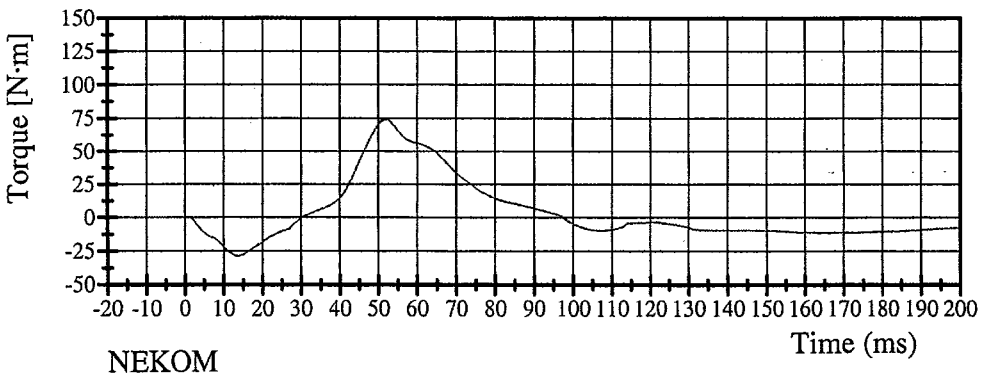


Filter Class: 600

Max: 133.6 N at 174.7 ms

Min: -716.1 N at 40.2 ms

NEKYM

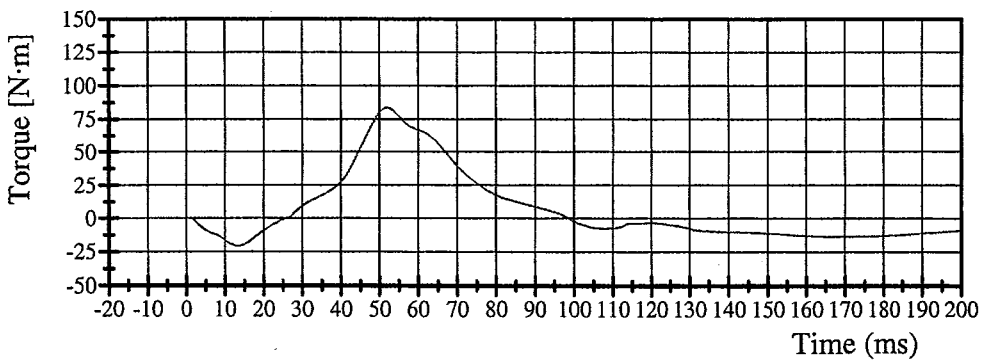


Filter Class: 600

Max: 74.2 N·m at 51.8 ms

Min: -28.8 N·m at 13.5 ms

NEKOM



Filter Class: 600

Max: 83.7 N·m at 51.9 ms

Min: -20.8 N·m at 13.4 ms

08.28.2002 13:53:38 462

Transportation Research Center Inc.

572O Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	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	1.73 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.47 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.09 m/s	Yes
Peak D Plane Rotation	99 - 114 °	100.7 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-60.47 N·m	Yes
Positive Moment Decay Time To -10 N·m	94 - 114 ms	102.32 ms	Yes

Comments:

Technician

Approved

08.28.2002 14:59:02 528

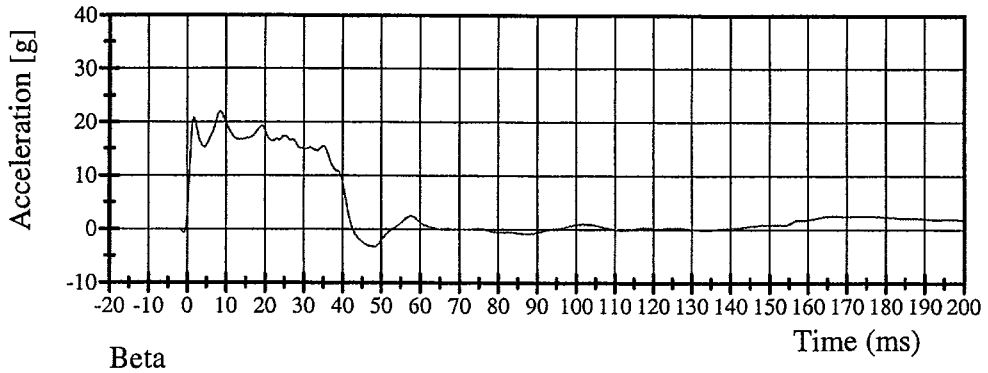
Transportation Research Center Inc.

572O Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Pendulum Deceleration

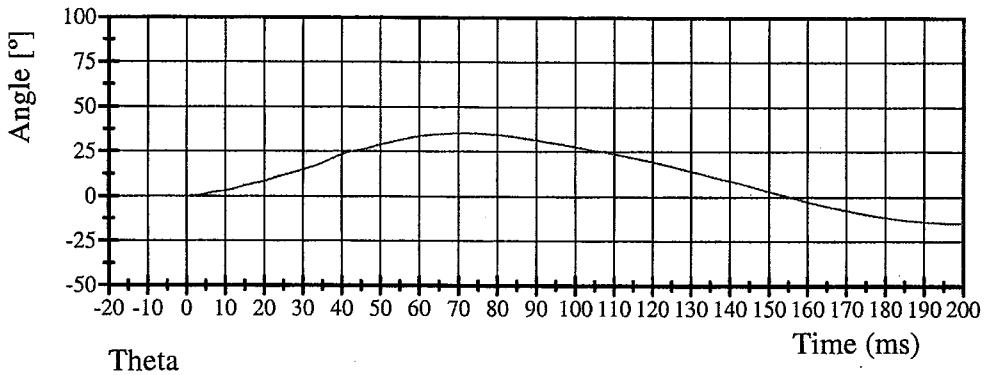


Filter Class: 180

Max: 22.0 g at 8.6 ms

Min: -3.3 g at 48.2 ms

Beta

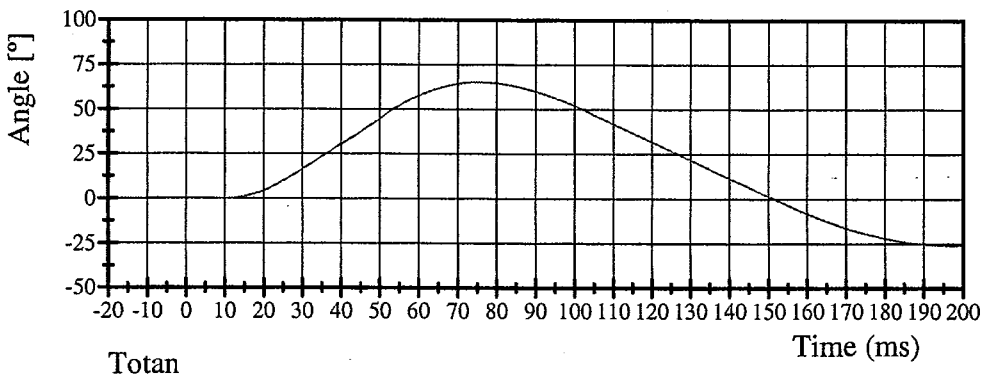


Filter Class: 60

Max: 35.4 ° at 71.9 ms

Min: -14.8 ° at 199.4 ms

Theta

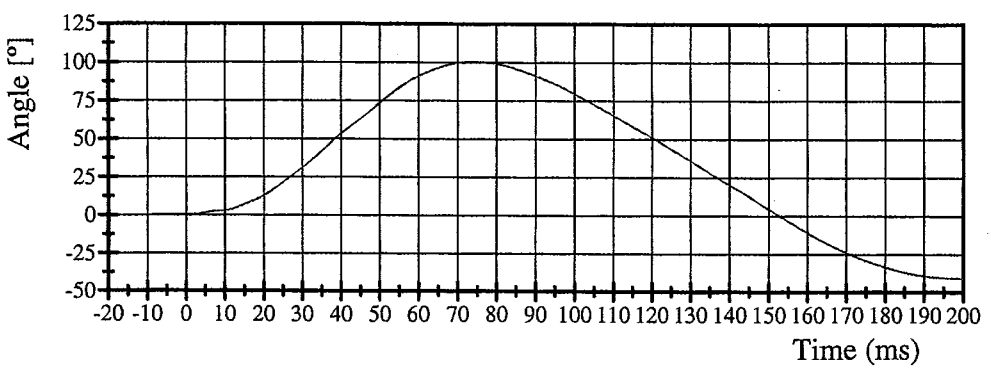


Filter Class: 60

Max: 65.4 ° at 74.6 ms

Min: -25.8 ° at 196.9 ms

Totan



Filter Class: 60

Max: 100.7 ° at 73.5 ms

Min: -40.6 ° at 197.9 ms

08.28.2002 14:59:07 528

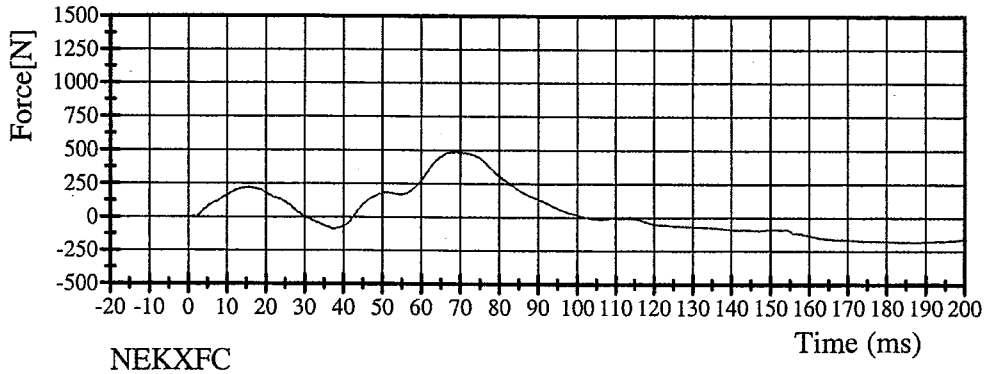
Transportation Research Center Inc.

572O Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

NEKXF

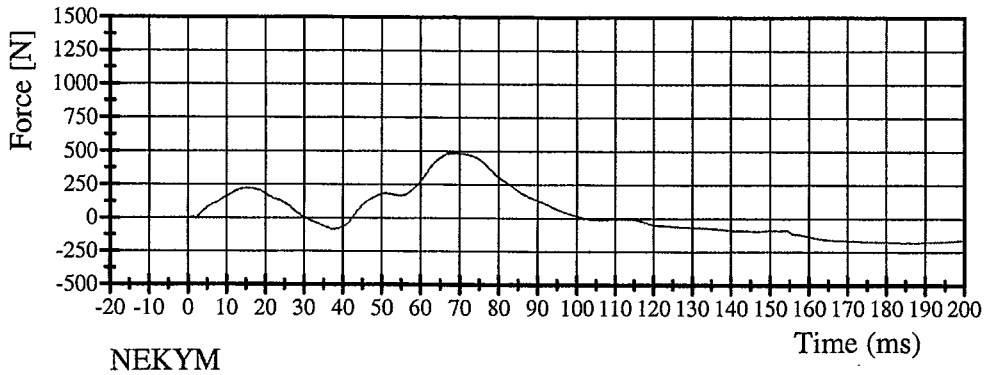


Filter Class: 1000

Max: 484.0 N at 69.0 ms

Min: -179.8 N at 186.9 ms

NEKXFC

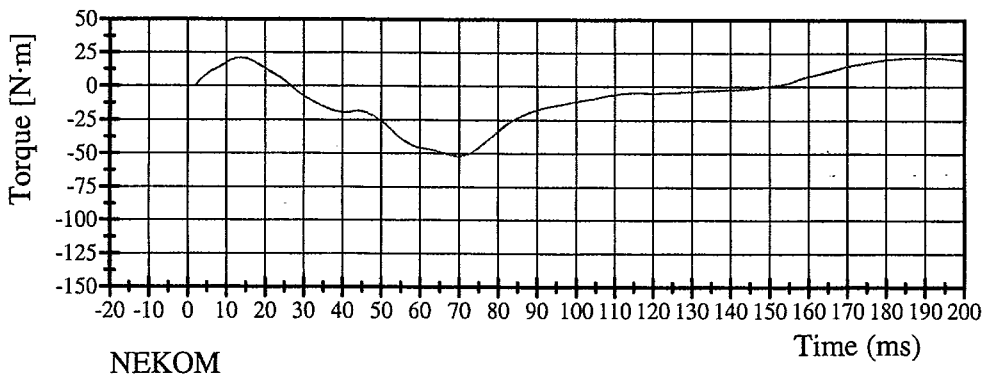


Filter Class: 600

Max: 483.7 N at 69.1 ms

Min: -179.7 N at 187.0 ms

NEKYM

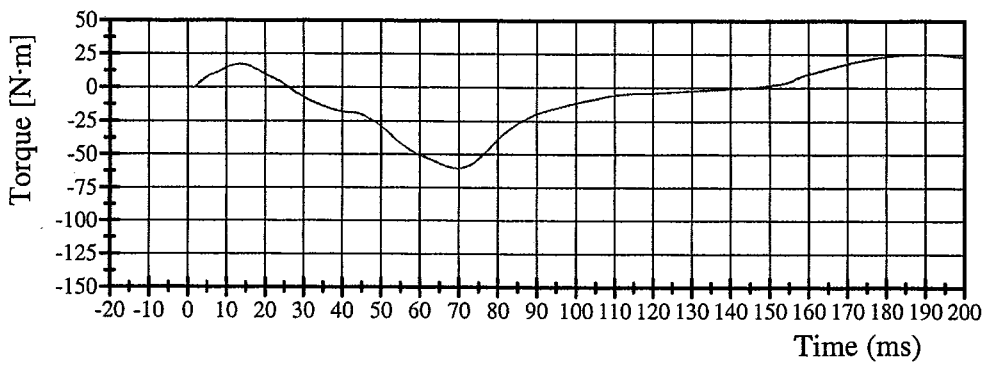


Filter Class: 600

Max: 21.9 N·m at 190.2 ms

Min: -51.9 N·m at 69.7 ms

NEKOM



Filter Class: 600

Max: 25.1 N·m at 190.1 ms

Min: -60.5 N·m at 69.5 ms

08.28.2002 14:59:09 528

Transportation Research Center Inc.

572O Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 09/09/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.63 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-56.6 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4395 N	Yes
Internal Hysteresis	105 % Max.	93 %	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician

Approved

09.09.2002 13:39:28 1072

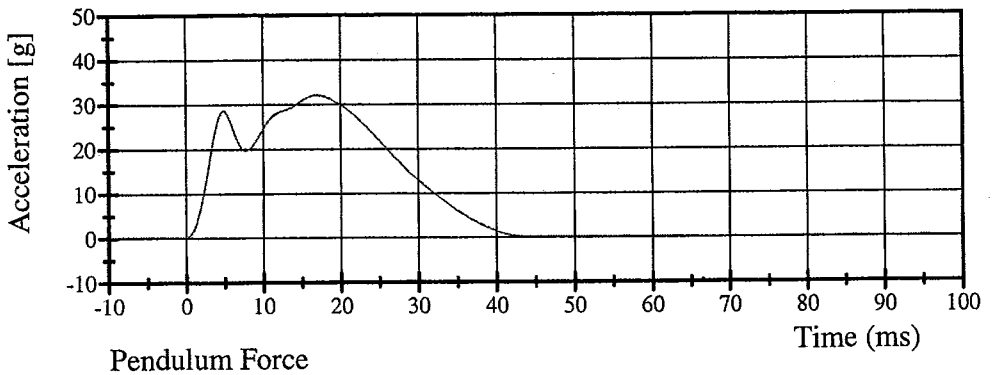
Transportation Research Center Inc.

572O Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 09/09/2002

Pendulum Deceleration

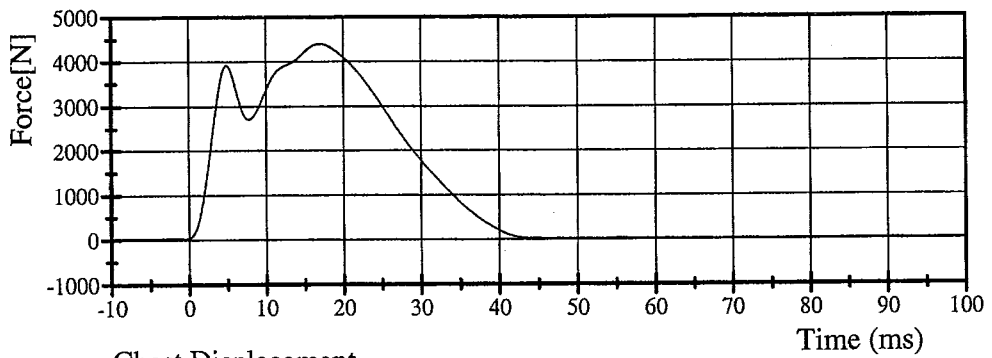


Filter Class: 180

Max: 32.1 g at 17.0 ms

Min: -0.0 g at -85.7 ms

Pendulum Force

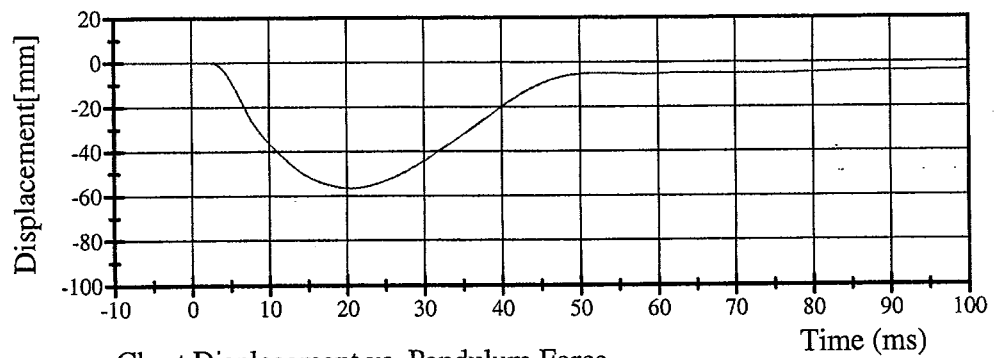


Filter Class: 180

Max: 4395.0 N at 17.0 ms

Min: -5.0 N at -85.7 ms

Chest Displacement

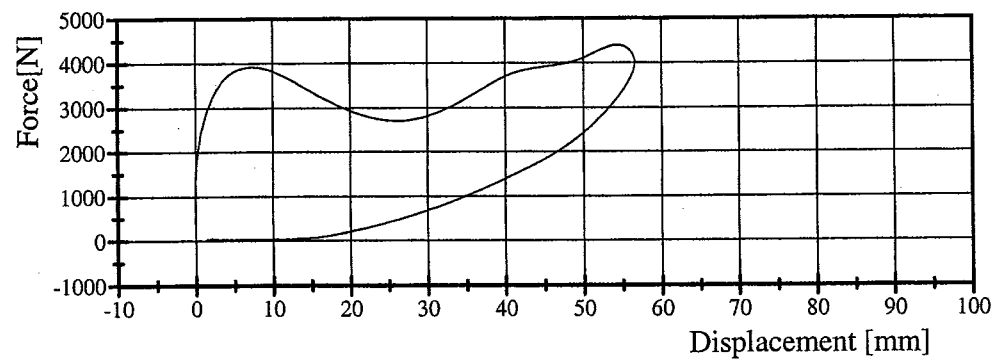


Filter Class: 180

Max: 0.1 mm at 1.8 ms

Min: -56.6 mm at 20.6 ms

Chest Displacement vs. Pendulum Force



09.09.2002 13:39:30 1072

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

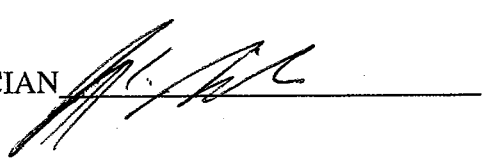
HYBRID III SMALL FEMALE

CAL DATE: 30-Aug-02

TRC, INC. TEST NO: 416C17TF1 572 O SN416 TORSO FLEX CAL 17

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 – 70 %	60 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY	<= 20 DEG. REFERENCED TO VERTICAL	12.5 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	321.5 N
RETURN ANGLE		19.3 DEG.
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 DEG. OF INTIAL ANGLE	6.8 DEG.

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572O Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.75 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-13.7 mm	Yes

Comments:

Technician

Approved

08.28.2002 08:16:52 1363

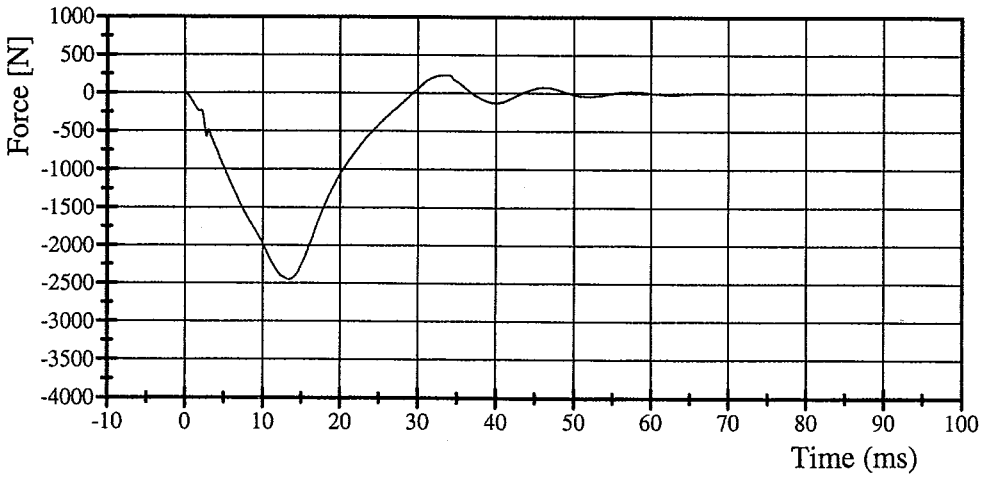
Transportation Research Center Inc.

572O Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Femur Force

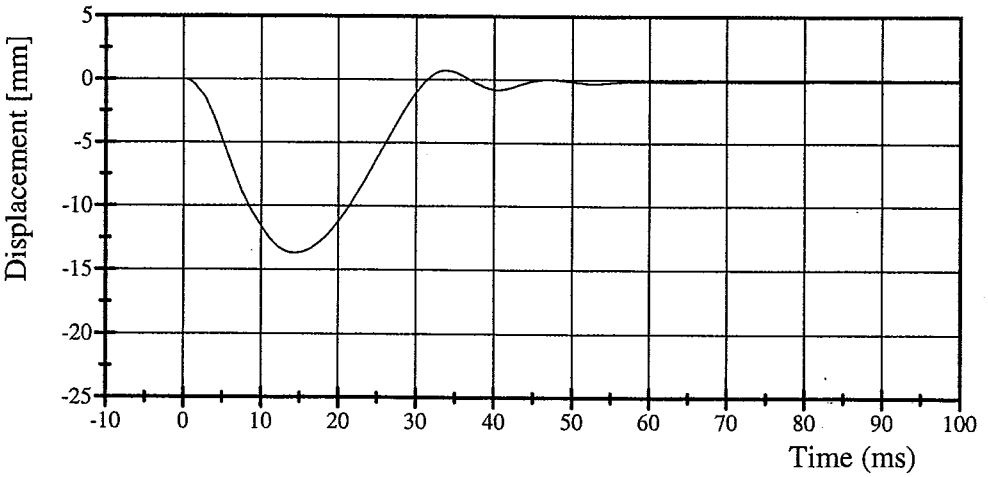


Filter Class: 600

Max: 231.2 N at 33.5 ms

Min: -2449.0 N at 13.4 ms

Tibia Displacement

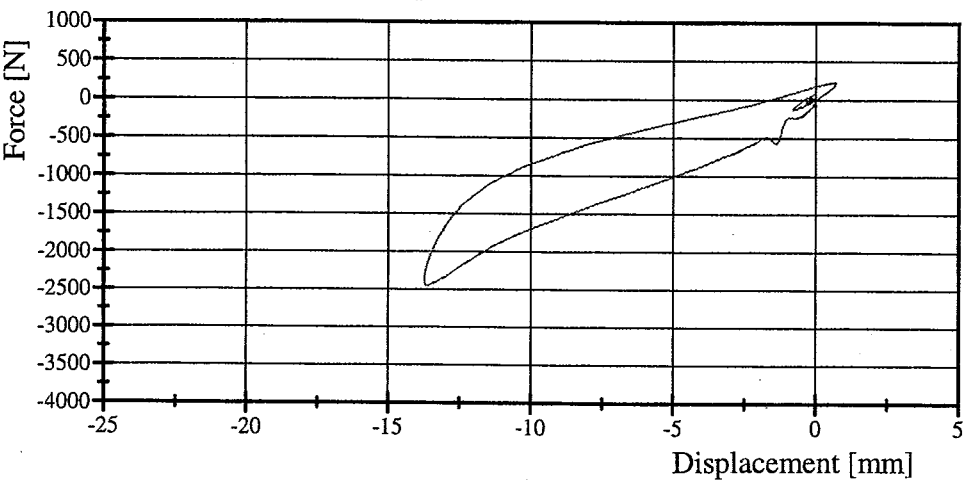


Filter Class: 600

Max: 0.7 mm at 33.7 ms

Min: -13.7 mm at 14.3 ms

Femur Force vs Tibia Displacement



08.28.2002 08:16:40 1363

Transportation Research Center Inc.

572O Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-13.9 mm	Yes

Comments:

Technician

Approved

08.28.2002 08:29:48 1360

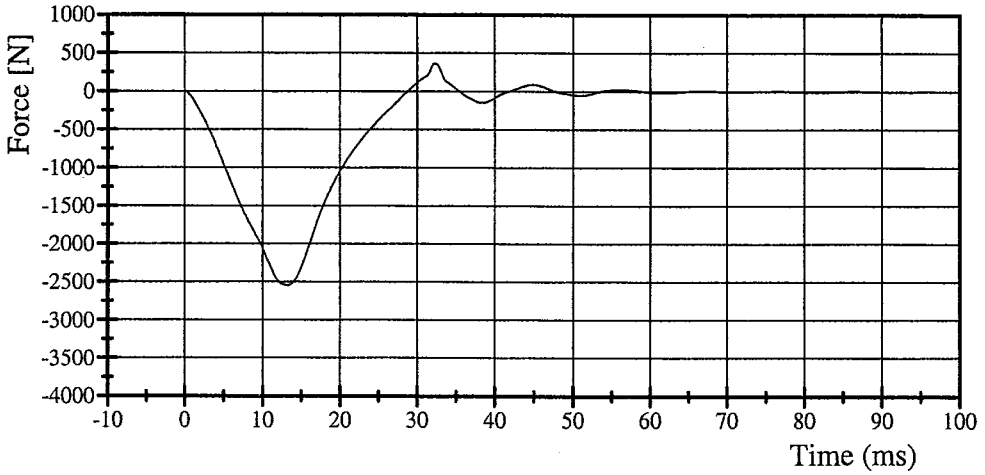
Transportation Research Center Inc.

572O Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Femur Force

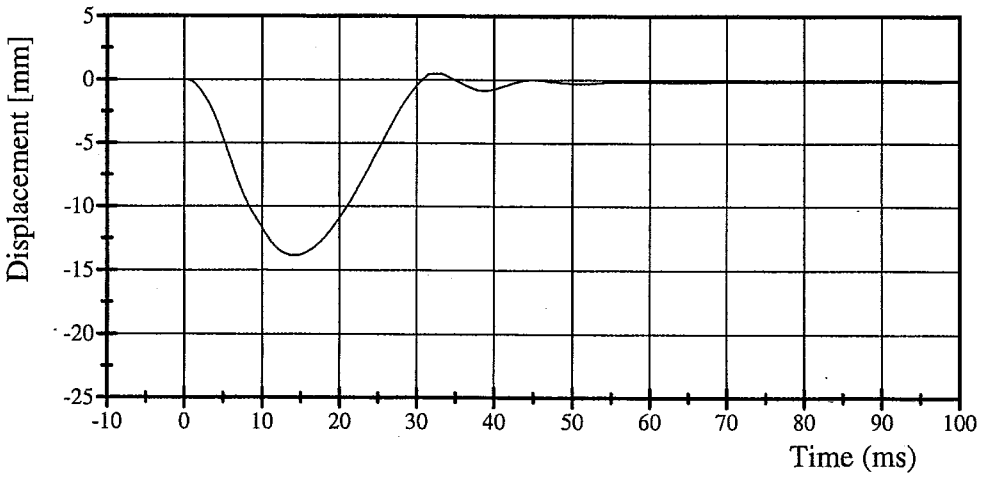


Filter Class: 600

Max: 360.5 N at 32.3 ms

Min: -2546.2 N at 13.2 ms

Tibia Displacement

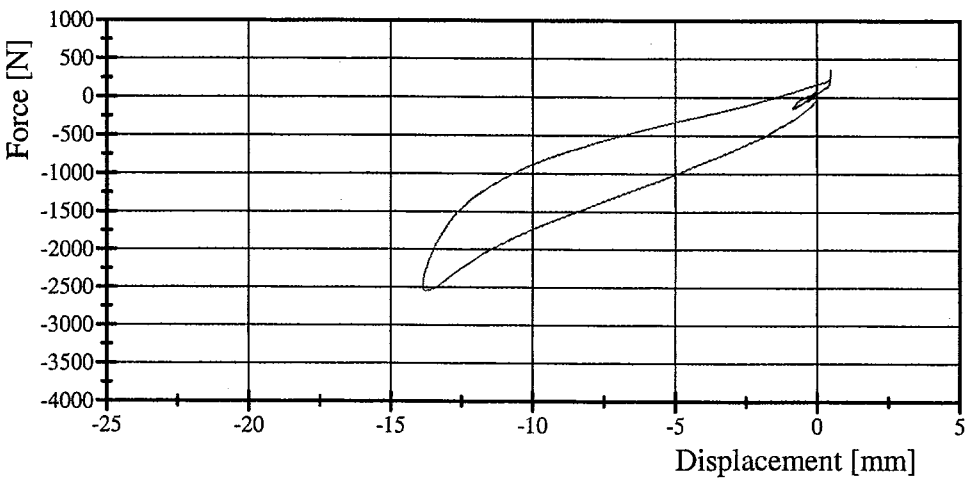


Filter Class: 600

Max: 0.5 mm at 31.9 ms

Min: -13.9 mm at 14.2 ms

Femur Force vs Tibia Displacement



08.28.2002 08:29:50 1360

Transportation Research Center Inc.

572O Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3935 N	Yes

Comments:

Technician

Approved

08.28.2002 10:10:40 1761

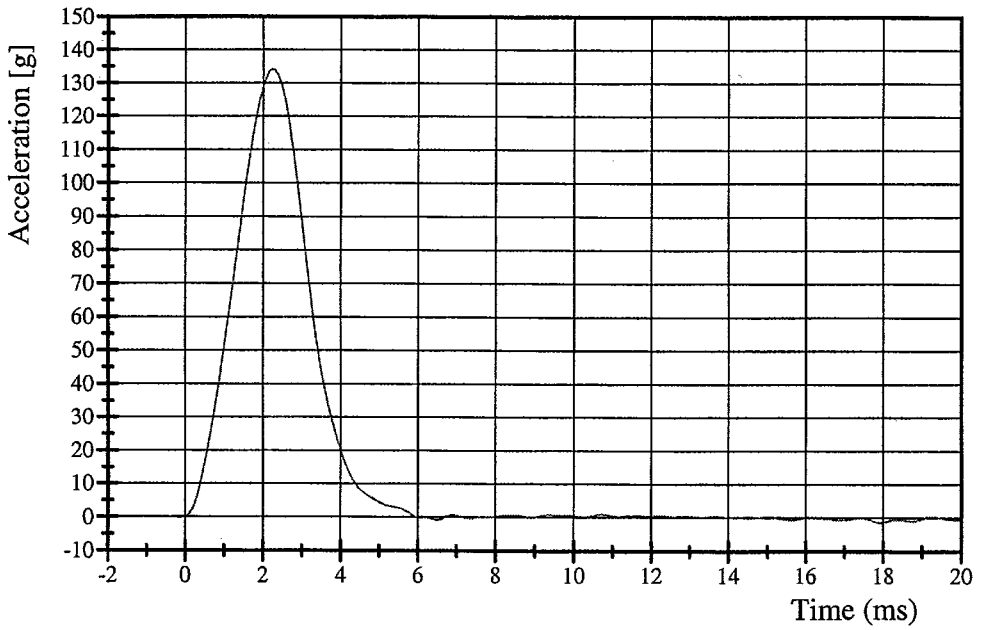
Transportation Research Center Inc.

572O Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Pendulum Deceleration

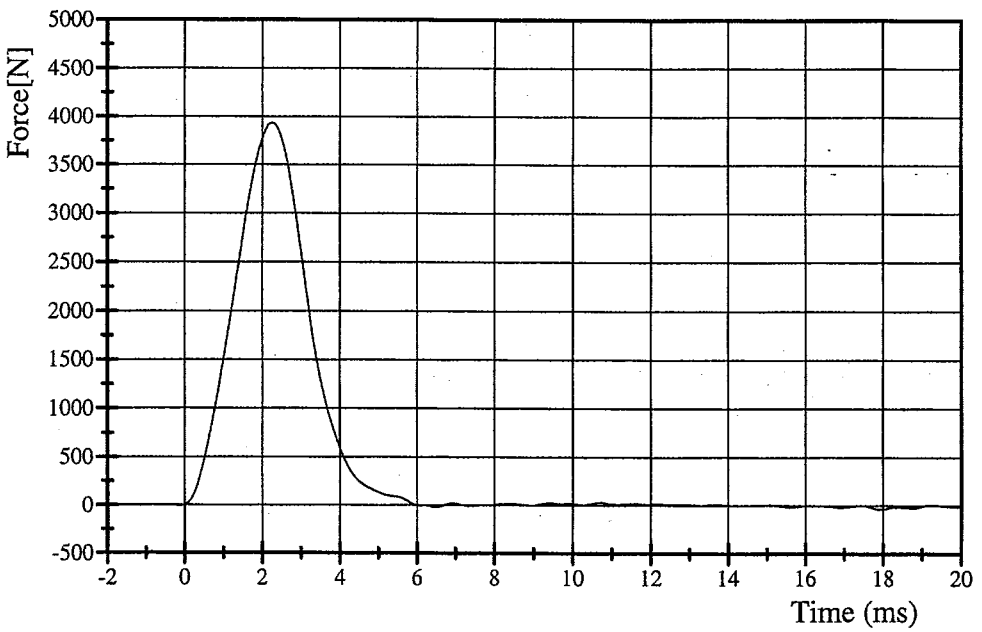


Filter Class: 600

Max: 134.2 g at 2.2 ms

Min: -1.3 g at 17.9 ms

Pendulum Force



Filter Class: 600

Max: 3935.0 N at 2.2 ms

Min: -39.2 N at 17.9 ms

08.28.2002 10:10:41 1761

Transportation Research Center Inc.

572O Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3663 N	Yes

Comments:

Technician

Approved

08.28.2002 09:26:00 1721

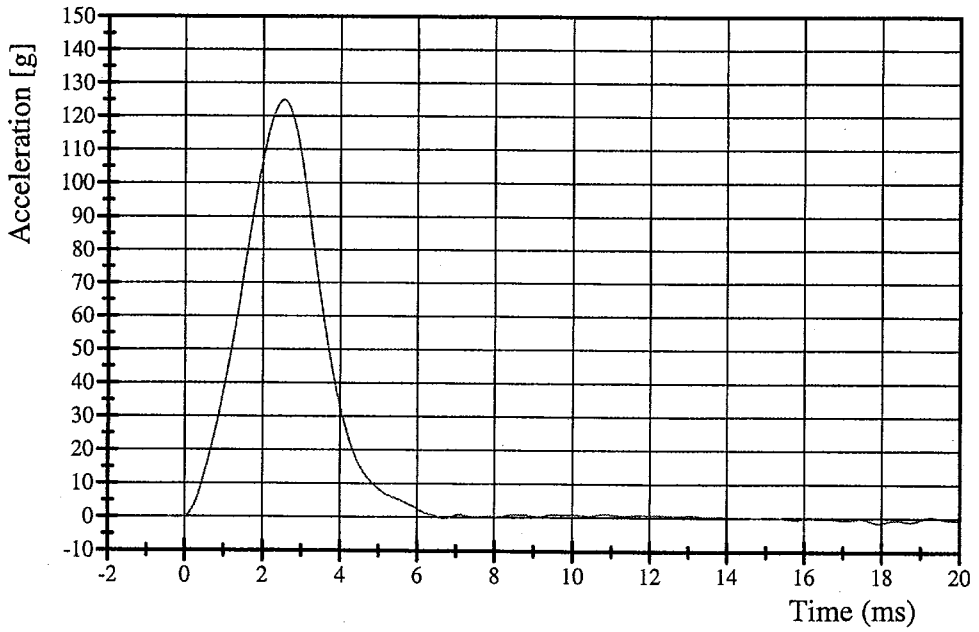
Transportation Research Center Inc.

572O Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 17 - 1

Test Date 08/28/2002

Pendulum Deceleration

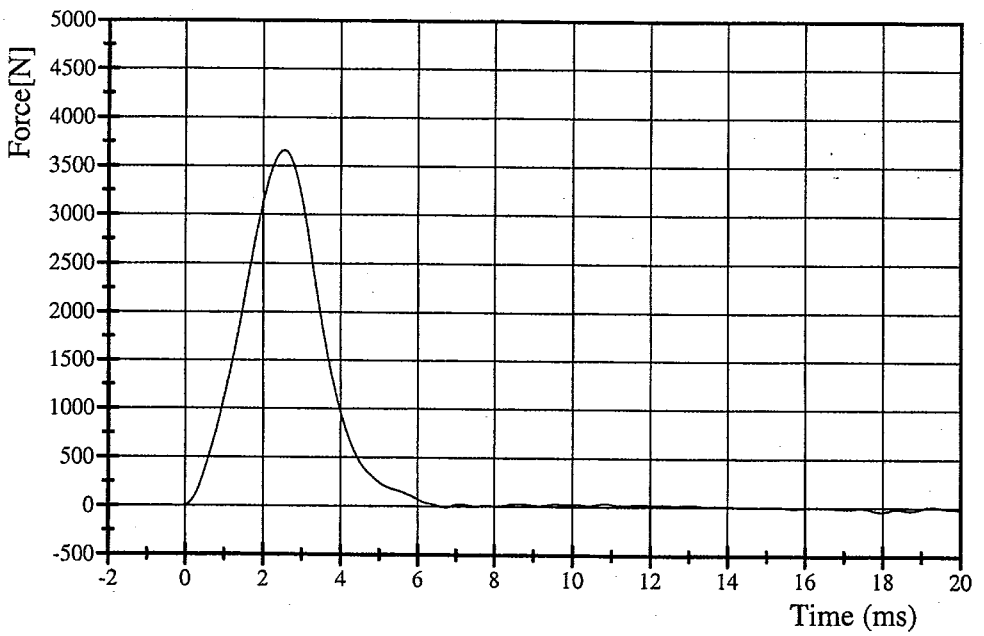


Filter Class: 600

Max: 124.9 g at 2.6 ms

Min: -1.5 g at 17.9 ms

Pendulum Force



Filter Class: 600

Max: 3662.9 N at 2.6 ms

Min: -42.8 N at 17.9 ms

08.28.2002 09:26:02 1721

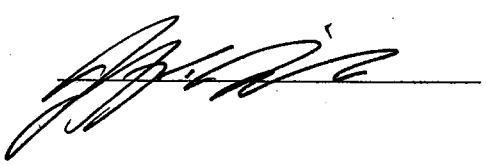
Post-Test Dummy Configuration and Performance Verification Data

Target Vehicle Passenger Dummy S/N: 421

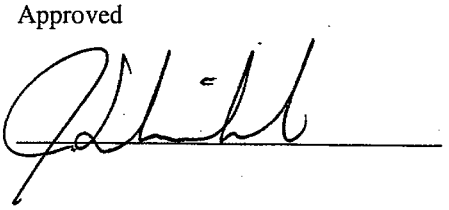
Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 421 Calibration No. 11

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	454 mm	Yes
Hip Pivot Height	C	81.3 - 86.3 mm	85 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	82 mm	Yes
Thigh Clearance	F	119.4 - 134.6 mm	125 mm	Yes
Back of Elbow to Wrist Pivot	G	243.9 - 259.0 mm	251 mm	Yes
Head Back to Backline	H	40.7 - 45.7 mm	44 mm	Yes
Shoulder to Elbow Length	I	276.9 - 297.1 mm	290 mm	Yes
Elbow Rest Height	J	182.9 - 203.2 mm	197 mm	Yes
Buttock Knee Length	K	520.7 - 546.1 mm	530 mm	Yes
Popliteal Height	L	355.6 - 375.9 mm	366 mm	Yes
Knee Pivot Height	M	393.7 - 419.1 mm	415 mm	Yes
Buttock Popliteal Height	N	414.1 - 439.4 mm	421 mm	Yes
Chest Depth without Jacket	O	175.3 - 190.5 mm	186 mm	Yes
Foot Length	P	218.5 - 233.6 mm	227 mm	Yes
Buttock to Knee Pivot Length	R	457.2 - 482.6 mm	478 mm	Yes
Head Breadth	S	137.2 - 147.3 mm	141 mm	Yes
Head Depth	T	177.8 - 187.9 mm	180 mm	Yes
Hip Breadth	U	299.8 - 314.9 mm	311 mm	Yes
Shoulder Breadth	V	350.6 - 365.7 mm	356 mm	Yes
Foot Breadth	W	78.8 - 93.9 mm	88 mm	Yes
Head Circumference	X	528.4 - 548.6 mm	541 mm	Yes
Chest Circumference with Jacket	Y	850.9 - 881.3 mm	880 mm	Yes
Waist Circumference	Z	759.5 - 789.9 mm	773 mm	Yes
Reference Location for Chest Circumference	AA	299.8 - 309.8 mm	305 mm	Yes
Reference Location for Waist Circumference	BB	160.1 - 170.1 mm	165 mm	Yes

Technician



Approved



Transportation Research Center Inc.

572O Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 2

Test Date 10/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Peak Resultant Acceleration	250 - 300 g	259.6 g	Yes
Peak Lateral Acceleration	15 g Max	-7.4 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

10.23.2002 12:22:45 614

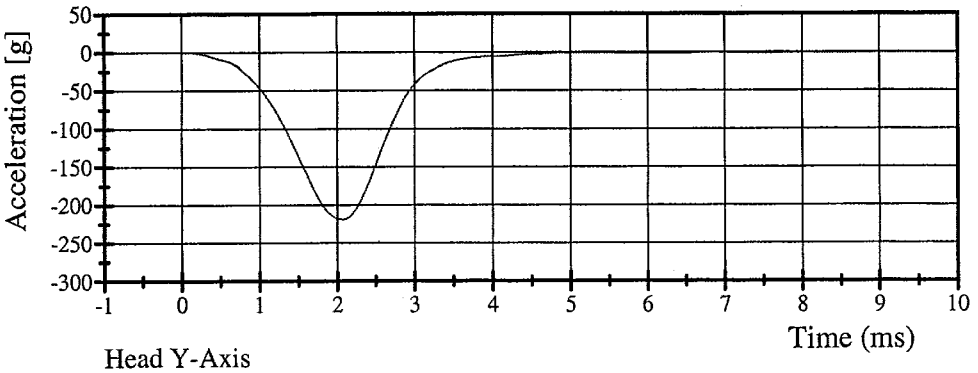
Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 2

Test Date 10/23/2002

Head X-Axis

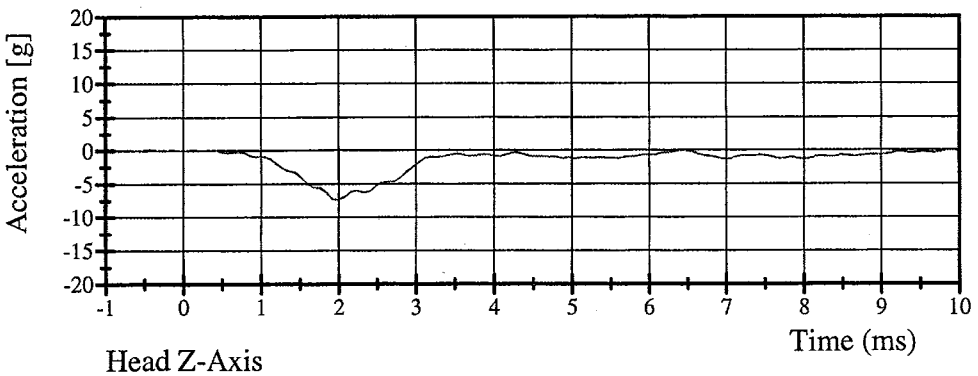


Filter Class: 1000

Max: -0.0 g at 0.0 ms

Min: -218.9 g at 2.1 ms

Head Y-Axis

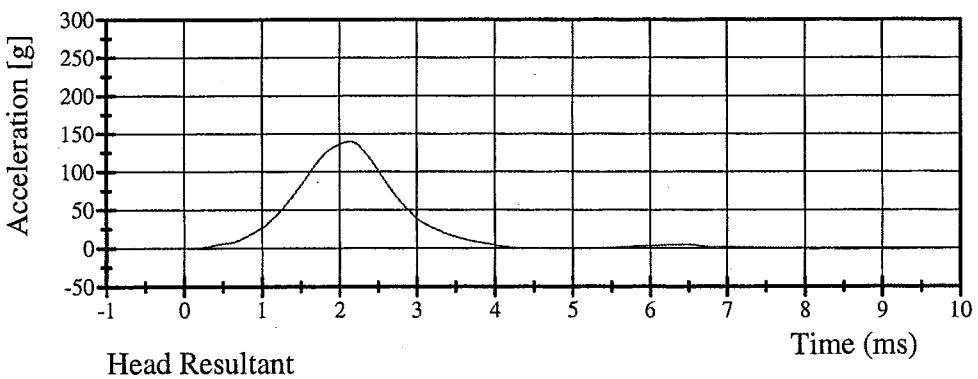


Filter Class: 1000

Max: 0.1 g at 0.4 ms

Min: -7.4 g at 2.0 ms

Head Z-Axis

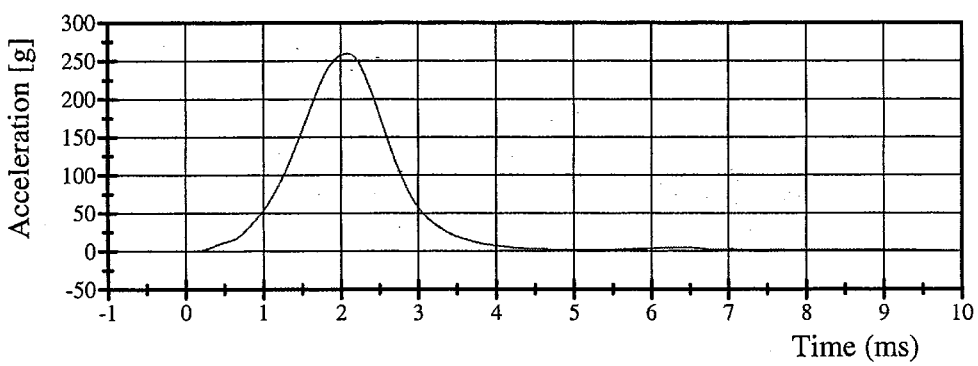


Filter Class: 1000

Max: 140.1 g at 2.2 ms

Min: -1.5 g at 8.8 ms

Head Resultant



Filter Class: 1000

Max: 259.6 g at 2.1 ms

Min: 0.0 g at 3.0 ms

10.23.2002 12:22:46 614

Transportation Research Center Inc.

572O Neck Flexion Test - 6 Channel Transducer

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	38 %	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	2.33 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.63 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.69 m/s	Yes
Peak D Plane Rotation	77 - 91 °	80.4 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	75.30 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	88.08 ms	Yes

Comments:

Technician

Approved

10.23.2002 14:34:16 460

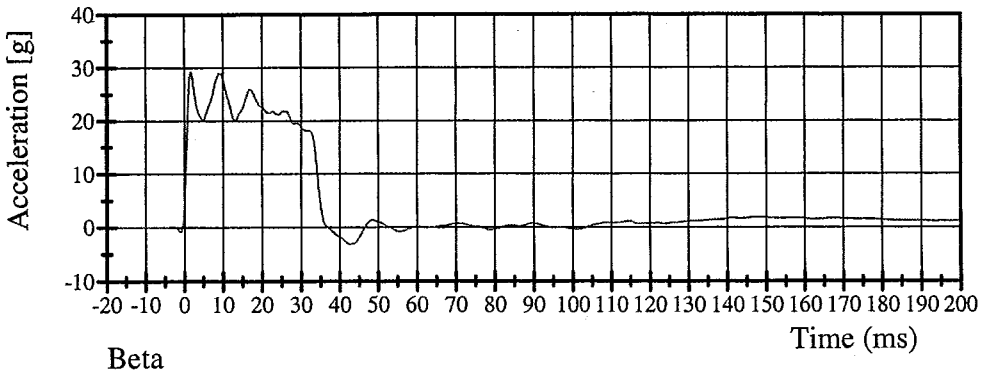
Transportation Research Center Inc.

572O Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/23/2002

Pendulum Deceleration

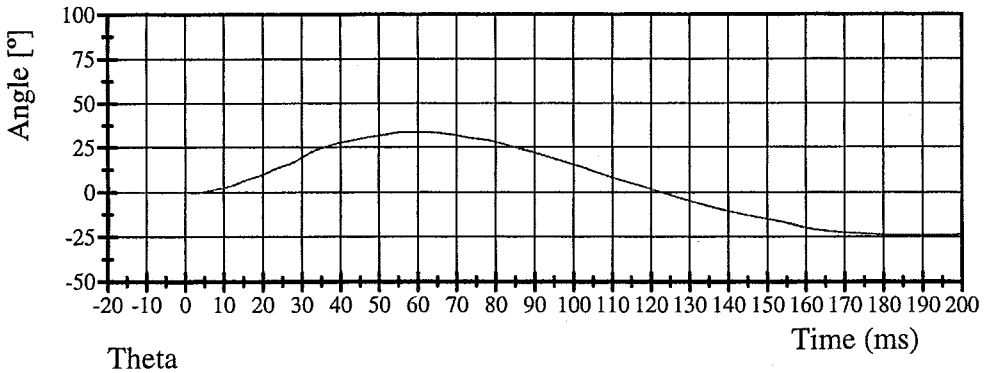


Filter Class: 180

Max: 29.3 g at 1.7 ms

Min: -3.1 g at 42.6 ms

Beta

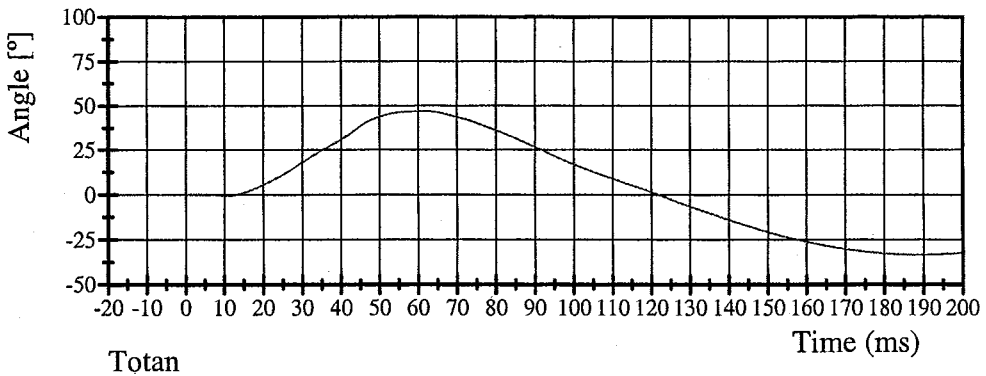


Filter Class: 60

Max: 33.5 ° at 56.6 ms

Min: -23.9 ° at 187.1 ms

Theta

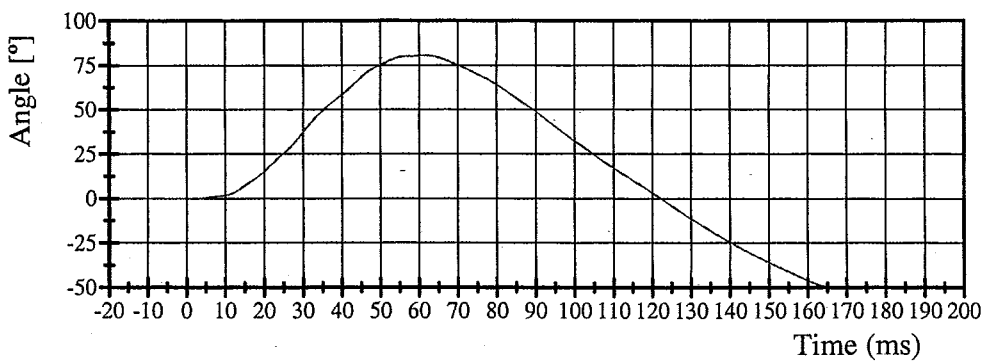


Filter Class: 60

Max: 46.9 ° at 61.5 ms

Min: -33.3 ° at 188.3 ms

Totan



Filter Class: 60

Max: 80.4 ° at 61.5 ms

Min: -57.2 ° at 188.0 ms

10.23.2002 14:34:17 460

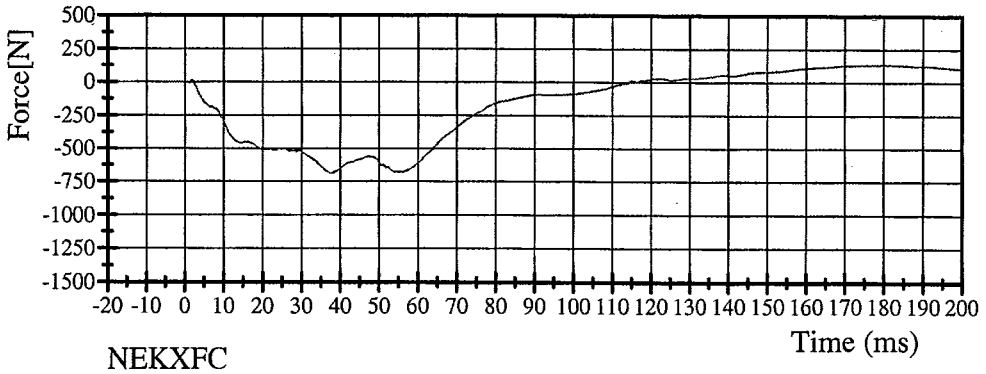
Transportation Research Center Inc.

572O Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/23/2002

NEKXF

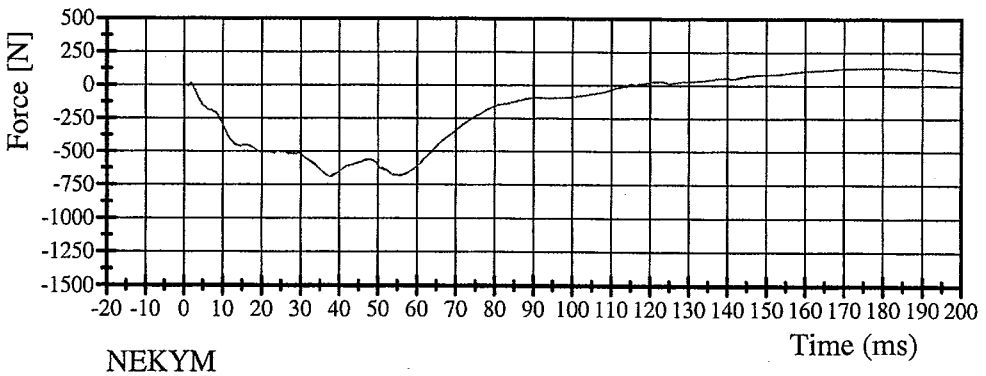


Filter Class: 1000

Max: 133.2 N at 180.4 ms

Min: -687.7 N at 37.4 ms

NEKXFC

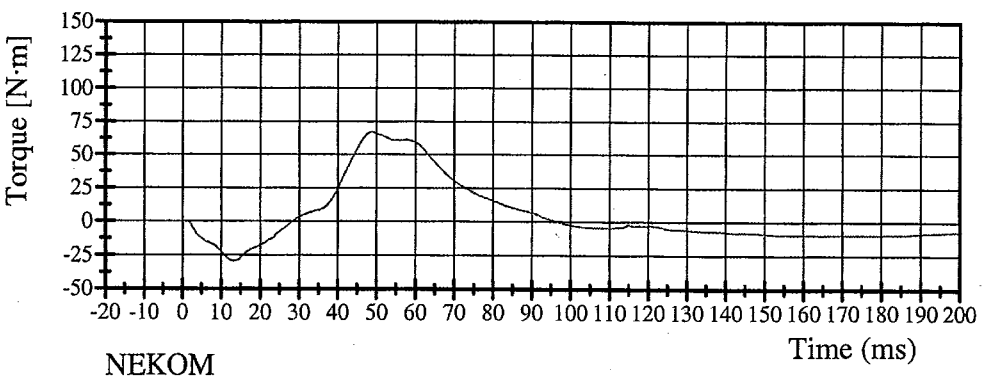


Filter Class: 600

Max: 132.7 N at 181.4 ms

Min: -687.3 N at 37.5 ms

NEKYM

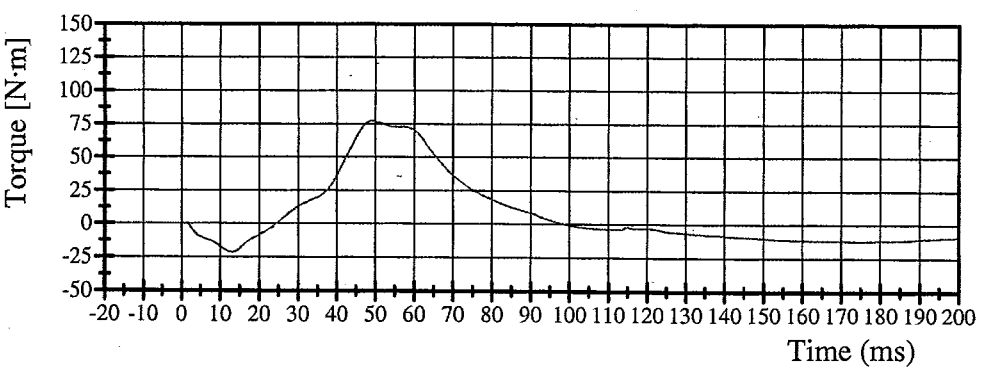


Filter Class: 600

Max: 67.3 N·m at 48.8 ms

Min: -29.3 N·m at 13.3 ms

NEKOM



Filter Class: 600

Max: 77.5 N·m at 49.1 ms

Min: -21.4 N·m at 13.0 ms

10.23.2002 14:34:18 460

Transportation Research Center Inc.

572O Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 421 Calibration No. 11 - 2

Test Date 10/24/2002

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	3.68 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.44 m/s	Yes
Peak D Plane Rotation	99 - 114 °	112.9 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-60.14 N·m	Yes
Positive Moment Decay Time To -10 N·m	94 - 114 ms	104.40 ms	Yes

Comments:

Technician

Approved

10.24.2002 07:22:36 530

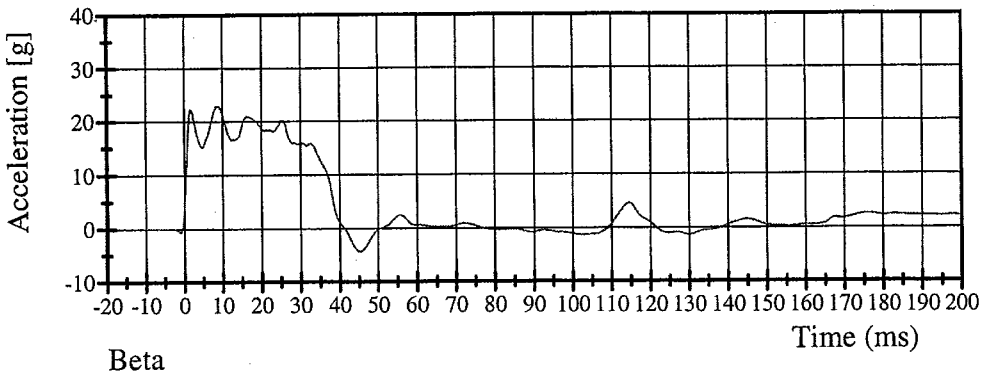
Transportation Research Center Inc.

572O Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 2

Test Date 10/24/2002

Pendulum Deceleration

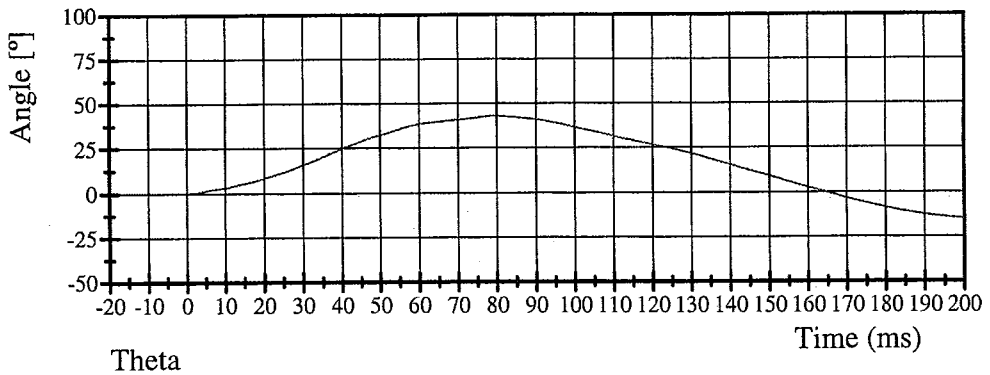


Filter Class: 180

Max: 22.9 g at 8.8 ms

Min: -4.4 g at 45.4 ms

Beta

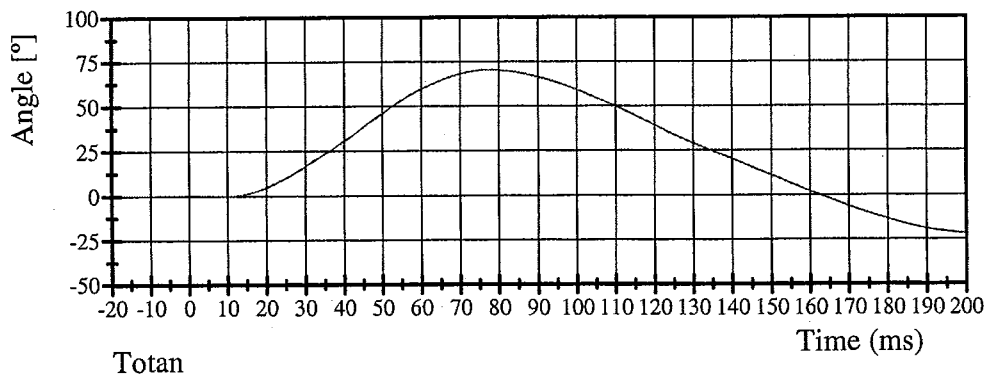


Filter Class: 60

Max: 42.9 ° at 79.5 ms

Min: -15.5 ° at 209.3 ms

Theta

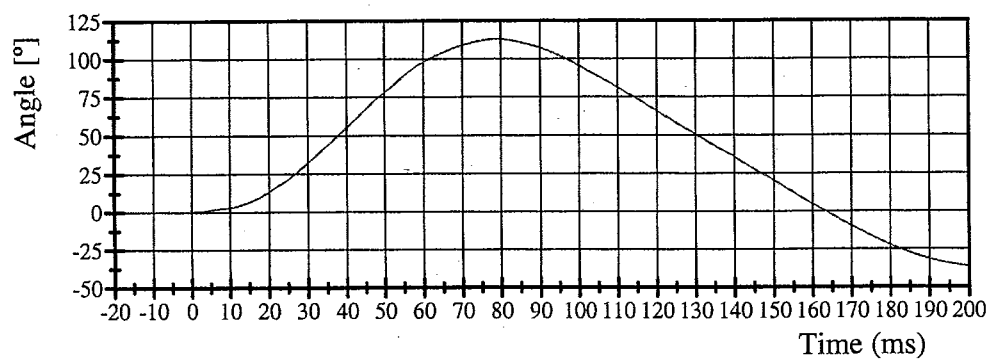


Filter Class: 60

Max: 70.2 ° at 76.8 ms

Min: -22.5 ° at 207.9 ms

Totan



Filter Class: 60

Max: 112.9 ° at 78.9 ms

Min: -38.0 ° at 208.4 ms

10.24.2002 07:22:36 530

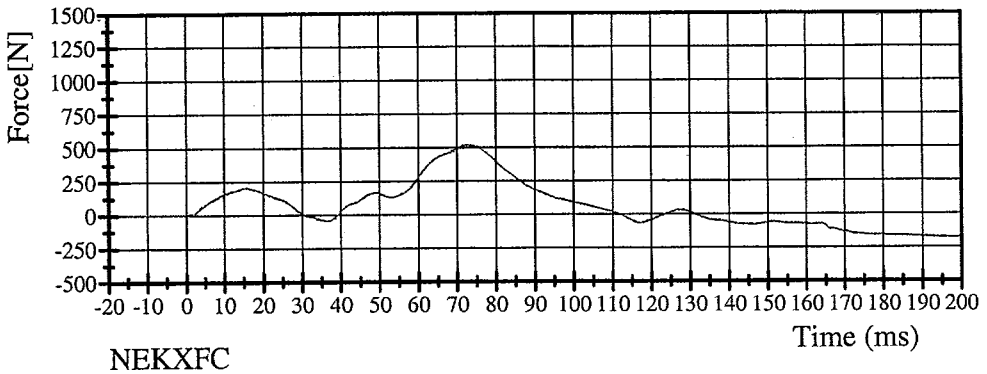
Transportation Research Center Inc.

572O Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 2

Test Date 10/24/2002

NEKXF

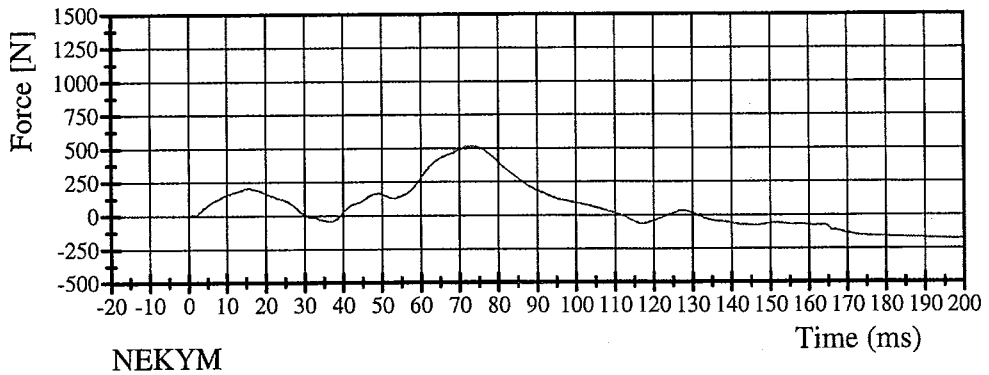


Filter Class: 1000

Max: 517.4 N at 72.6 ms

Min: -179.5 N at 197.0 ms

NEKXFC

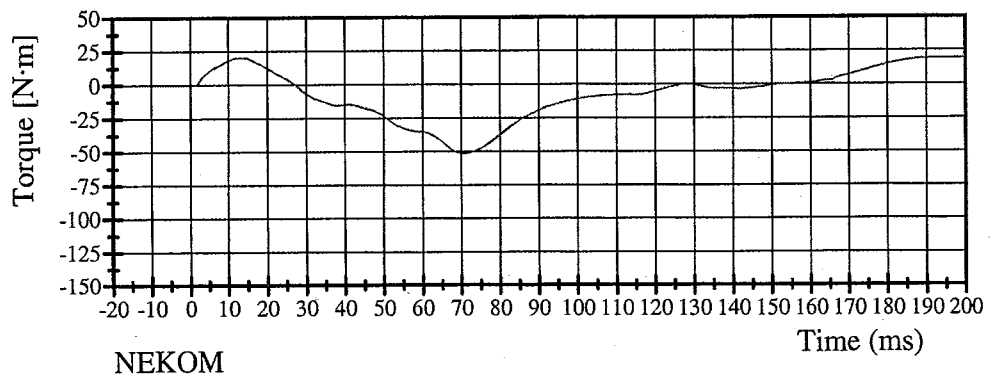


Filter Class: 600

Max: 516.9 N at 72.6 ms

Min: -178.9 N at 197.0 ms

NEKYM

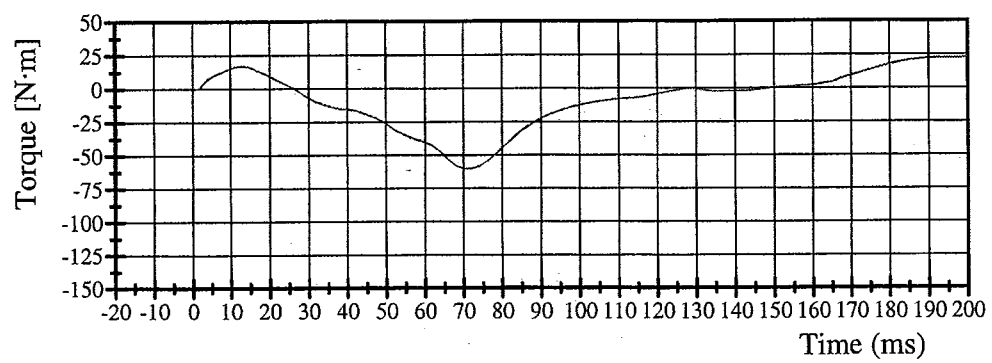


Filter Class: 600

Max: 20.4 N·m at 13.1 ms

Min: -51.2 N·m at 70.4 ms

NEKOM



Filter Class: 600

Max: 22.6 N·m at 200.4 ms

Min: -60.1 N·m at 71.2 ms

10.24.2002 07:22:37 530

Transportation Research Center Inc.

572O Thorax Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/22/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.66 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-50.4 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4129 N	Yes
Peak Force Between 18 mm and 50 mm	4600 N	4345 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician

Approved

10.22.2002 12:40:38 1707

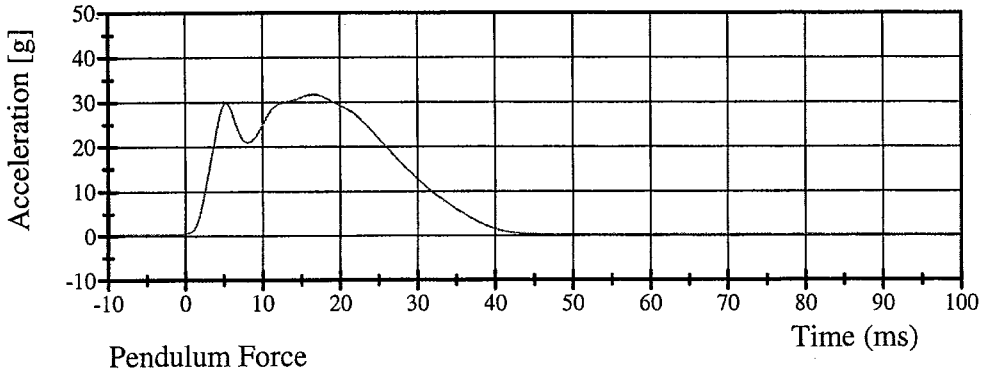
Transportation Research Center Inc.

572O Thorax Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/22/2002

Pendulum Deceleration

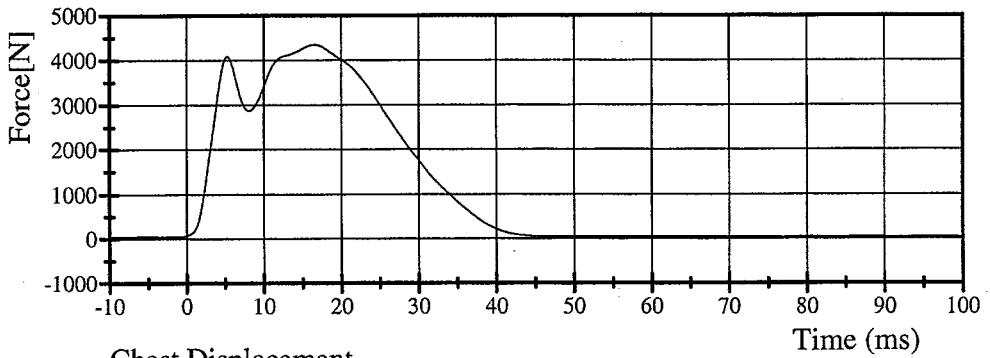


Filter Class: 180

Max: 31.7 g at 16.5 ms

Min: -0.3 g at 159.0 ms

Pendulum Force

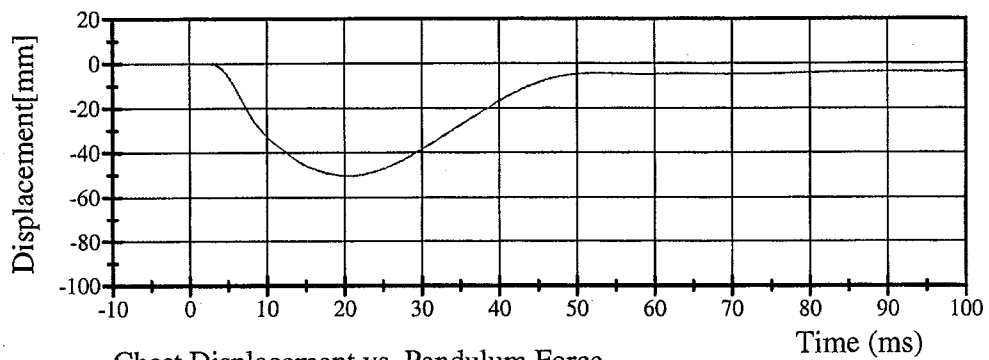


Filter Class: 180

Max: 4344.9 N at 16.5 ms

Min: -34.7 N at 159.0 ms

Chest Displacement

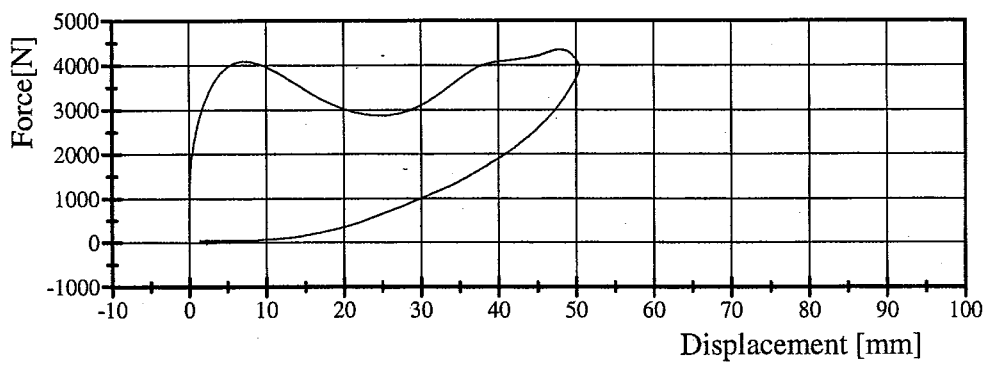


Filter Class: 180

Max: 0.0 mm at 1.8 ms

Min: -50.4 mm at 20.6 ms

Chest Displacement vs. Pendulum Force



10.22.2002 12:40:39 1707

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

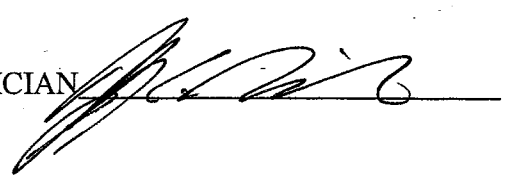
HYBRID III SMALL FEMALE

CAL DATE: 22-Oct-02

TRC, INC. TEST NO: 421C11TF1 572 O SN421 TORSO FLEX CAL 11

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 – 70 %	33 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY	<= 20 DEG. REFERENCED TO VERTICAL	14.7 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	378.1 N
RETURN ANGLE		20.2 DEG.
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 DEG. OF INTIAL ANGLE	5.5 DEG.

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572O Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

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	2.72 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.2 mm	Yes

Comments:

Technician

Approved

10.24.2002 09:02:26 1340

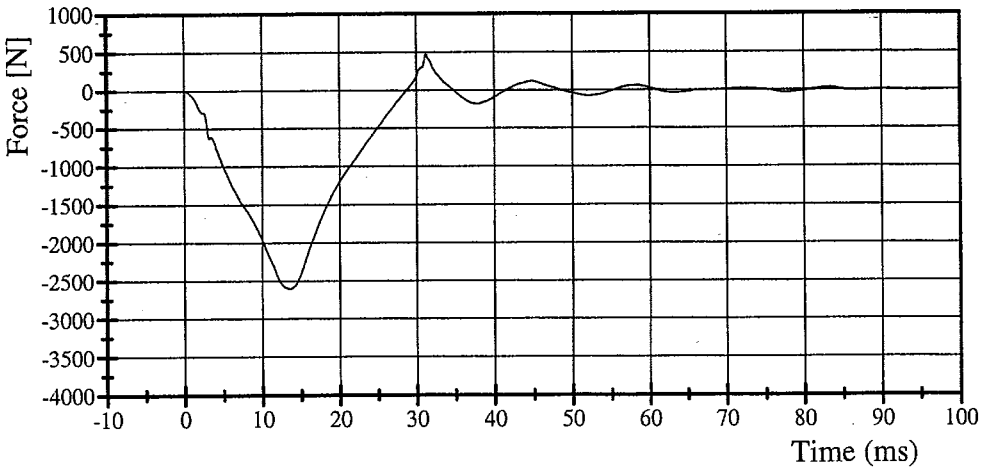
Transportation Research Center Inc.

572O Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Femur Force

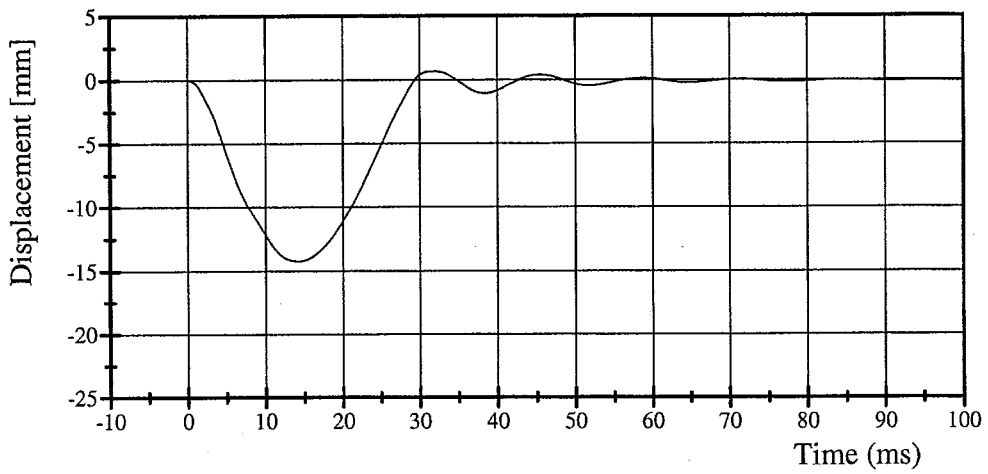


Filter Class: 600

Max: 472.1 N at 31.3 ms

Min: -2602.3 N at 13.5 ms

Tibia Displacement

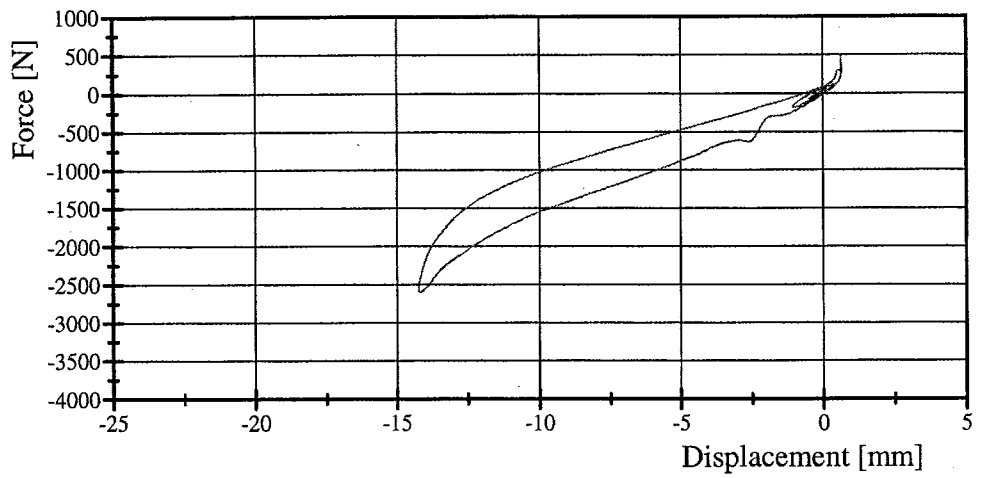


Filter Class: 600

Max: 0.6 mm at 32.0 ms

Min: -14.2 mm at 14.2 ms

Femur Force vs Tibia Displacement



10.24.2002 09:02:19 1340

Transportation Research Center Inc.

572O Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.72 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.7 mm	Yes

Comments:

Technician

Approved

10.24.2002 09:35:36 1340

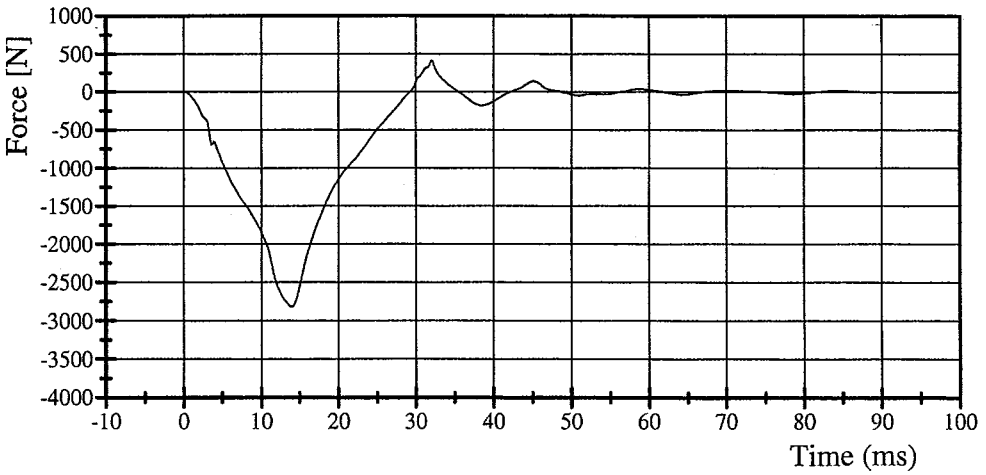
Transportation Research Center Inc.

572O Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Femur Force

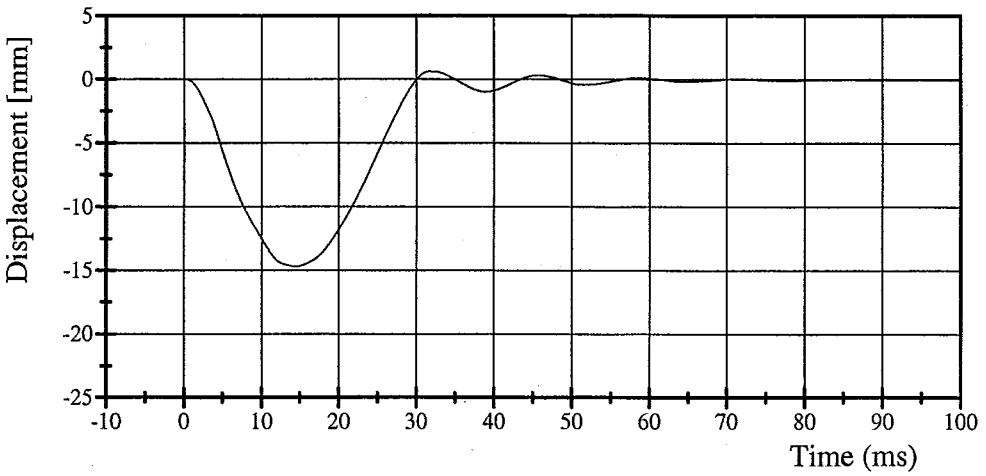


Filter Class: 600

Max: 411.8 N at 32.1 ms

Min: -2815.7 N at 13.9 ms

Tibia Displacement

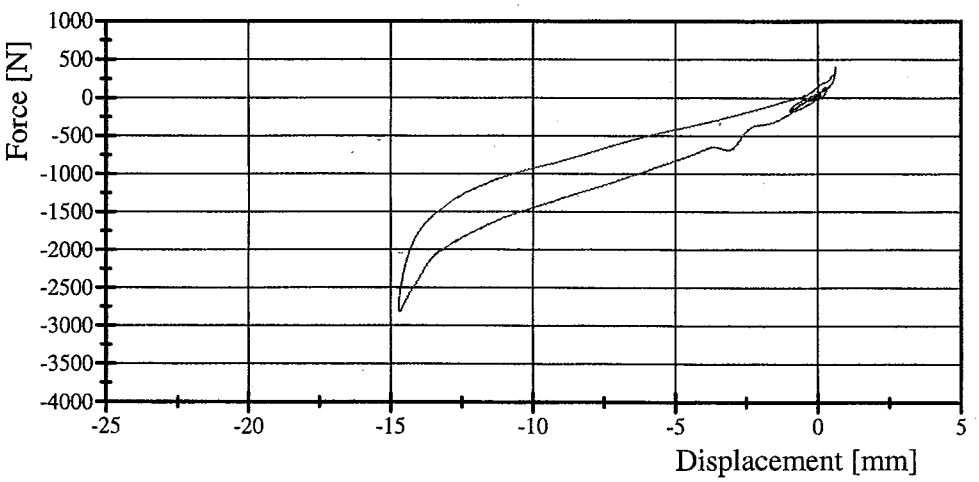


Filter Class: 600

Max: 0.6 mm at 31.8 ms

Min: -14.7 mm at 14.5 ms

Femur Force vs Tibia Displacement



10.24.2002 09:35:37 1340

Transportation Research Center Inc.

572O Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.13 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3930 N	Yes

Comments:

Technician

Approved

10.24.2002 10:45:53 1738

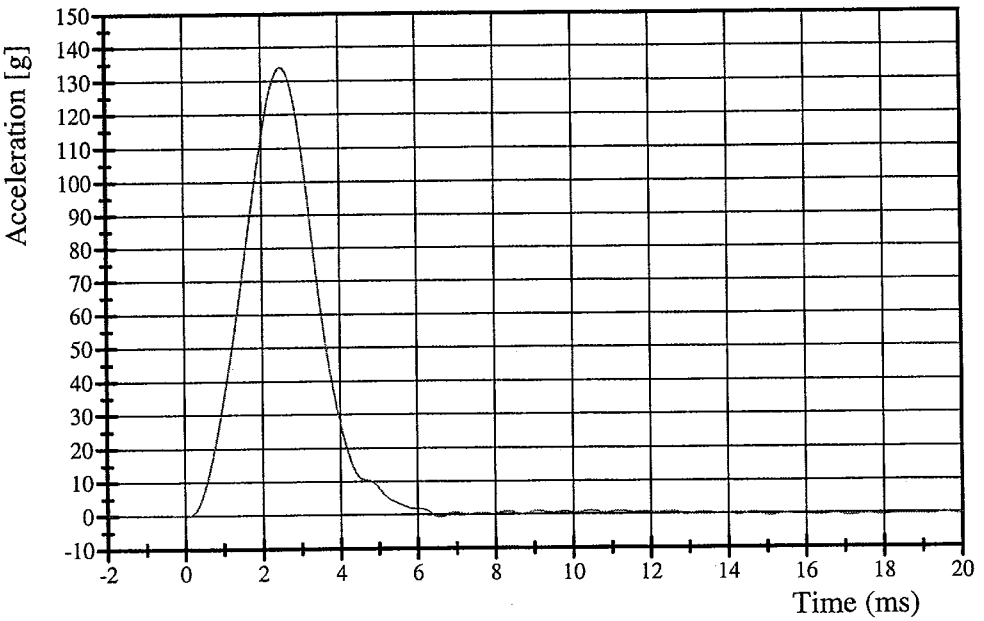
Transportation Research Center Inc.

572O Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Pendulum Deceleration

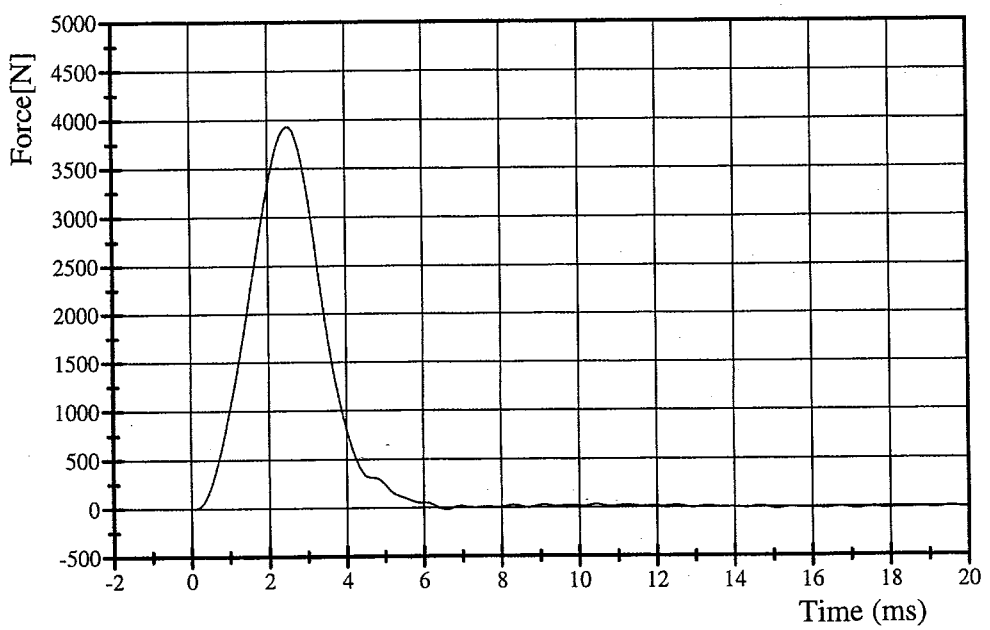


Filter Class: 600

Max: 134.0 g at 2.5 ms

Min: -0.7 g at 17.1 ms

Pendulum Force



Filter Class: 600

Max: 3930.4 N at 2.5 ms

Min: -20.3 N at 17.1 ms

10.24.2002 10:45:53 1738

Transportation Research Center Inc.

572O Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.07 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3774 N	Yes

Comments:

Technician

Approved

10.24.2002 10:49:41 1768

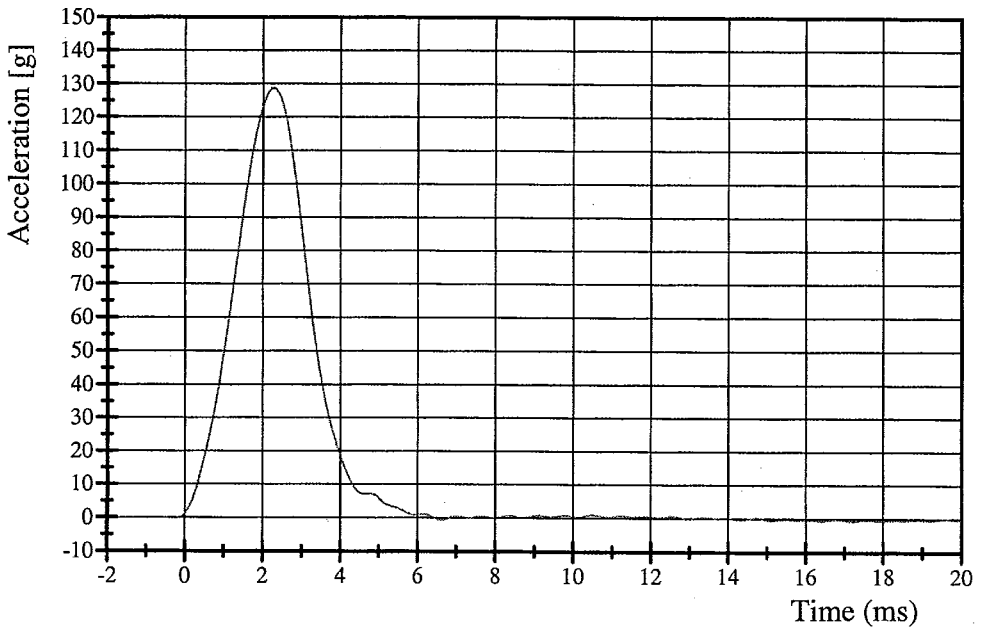
Transportation Research Center Inc.

572O Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 11 - 1

Test Date 10/24/2002

Pendulum Deceleration

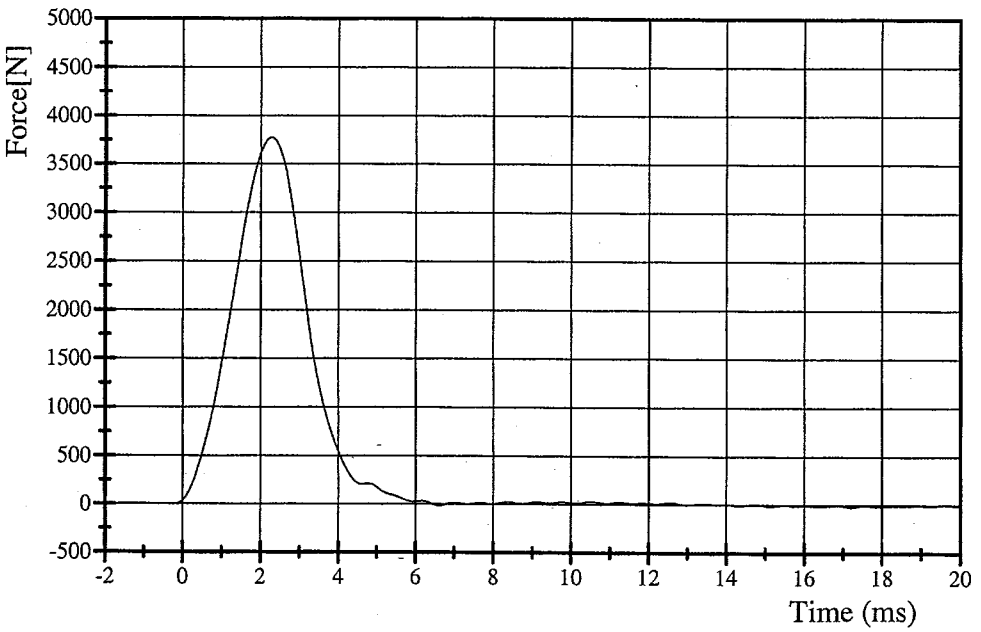


Filter Class: 600

Max: 128.7 g at 2.2 ms

Min: -0.7 g at 17.2 ms

Pendulum Force



Filter Class: 600

Max: 3773.6 N at 2.2 ms

Min: -21.1 N at 17.2 ms

10.24.2002 10:49:43 1768

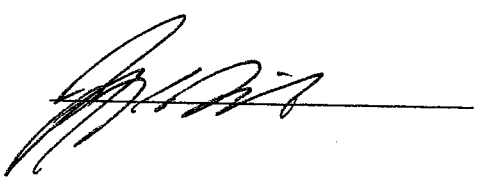
Pre-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Driver Dummy S/N: 169

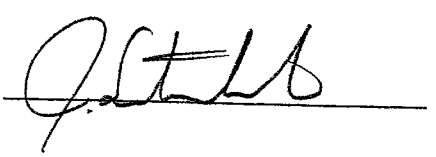
Transportation Research Center Inc.
572E HIII 50th Dummy
External Dimensions
Serial No. 169 Calibration No. 15

Test Parameter	Dimension	Specification	Results	Pass
Location For Chest Circumference	AA	429 - 434 mm	432 mm	Yes
Location For Waist Circumference	BB	226 - 231 mm	229 mm	Yes
Chest Circumference	Y	970 - 1001 mm	994 mm	Yes
Waist Circumference	Z	836 - 866 mm	862 mm	Yes
Chest Depth	O	213 - 229 mm	223 mm	Yes
H-Point Height	C	84 - 89 mm	86 mm	Yes
H-Point From Seatback	D	135 - 140 mm	136 mm	Yes
Skull Cap To Backline	H	41 - 46 mm	45 mm	Yes
Total Sitting Height	A	879 - 889 mm	882 mm	Yes
Thigh Clearance	F	140 - 155 mm	147 mm	Yes
Buttock Knee Length	K	579 - 605 mm	591 mm	Yes
Buttock Popliteal Length	N	452 - 478 mm	470 mm	Yes
Popliteal Height	L	429 - 455 mm	438 mm	Yes
Knee Pivot Height	M	485 - 500 mm	488 mm	Yes
Foot Length	P	252 - 267 mm	254 mm	Yes
Foot Breadth	W	91 - 107 mm	102 mm	Yes
Shoulder Pivot From Backline	E	84 - 94 mm	90 mm	Yes
Shoulder Breadth	V	422 - 437 mm	428 mm	Yes
Shoulder Pivot Height	B	506 - 521 mm	517 mm	Yes
Elbow Rest Height	J	191 - 211 mm	206 mm	Yes
Shoulder-Elbow Length	I	330 - 345 mm	342 mm	Yes
Back Of Elbow To Wrist Pivot	G	290 - 305 mm	298 mm	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 2

Test Date 09/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Peak Resultant Acceleration	225 - 275 g	260.2 g	Yes
Peak Lateral Acceleration	15 g Max	3.3 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

09.23.2002 13:39:18 610

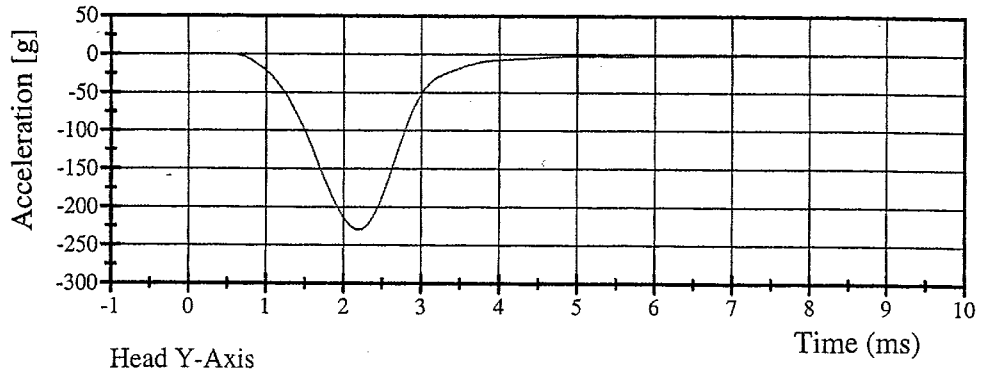
Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 2

Test Date 09/23/2002

Head X-Axis

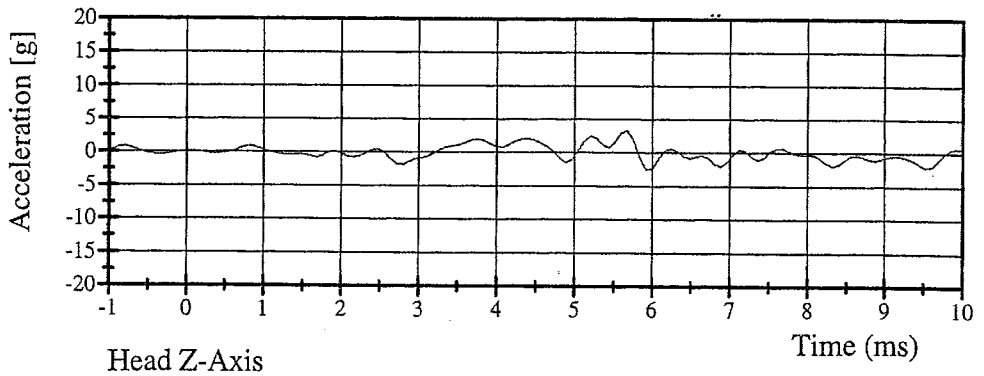


Filter Class: 1000

Max: 0.2 g at 9.9 ms

Min: -229.9 g at 2.2 ms

Head Y-Axis

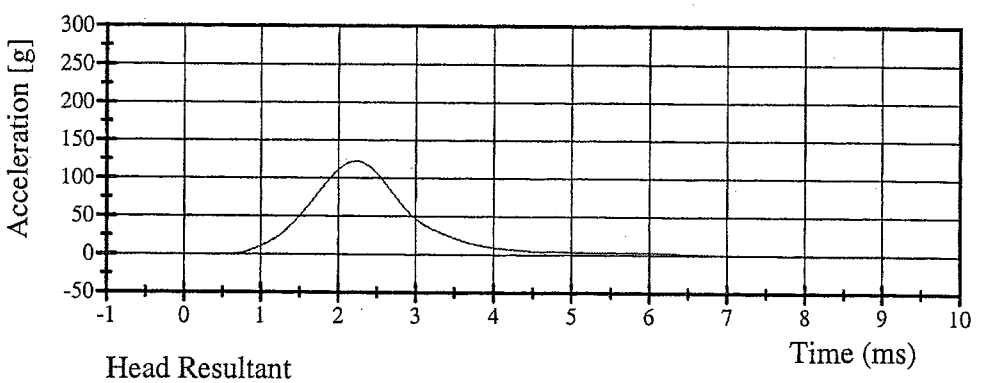


Filter Class: 1000

Max: 3.3 g at 5.7 ms

Min: -2.5 g at 5.9 ms

Head Z-Axis

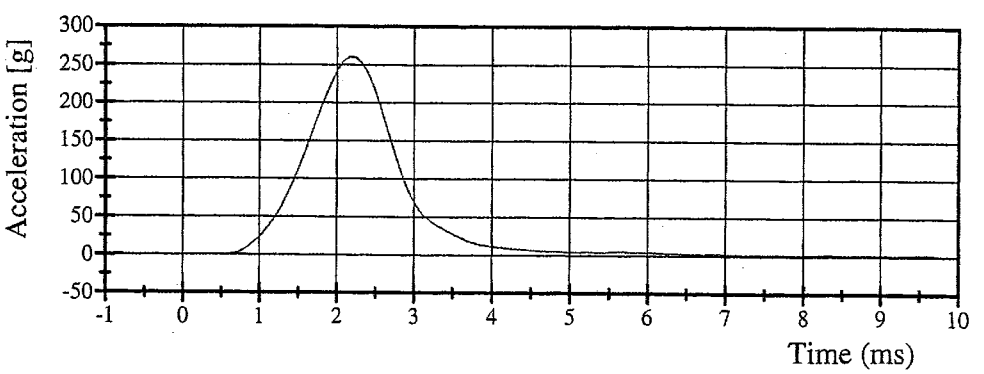


Filter Class: 1000

Max: 122.6 g at 2.2 ms

Min: -0.8 g at 8.9 ms

Head Resultant



Filter Class: 1000

Max: 260.2 g at 2.2 ms

Min: 0.0 g at 2.6 ms

09.23.2002 13:39:19 610

Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.06 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	24.32 g	Yes
20 ms	17.60 - 22.60 g	22.09 g	Yes
30 ms	12.50 - 18.50 g	16.90 g	Yes
Max Pendulum Deceleration	29.00 g	25.01 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	16.88 g	Yes
Deceleration-Time Curve Decay Time To 5g	34 - 42 ms	38.32 ms	Yes
D Plane Rotation			
Max	64 - 78 °	71.42 °	Yes
Time	57 - 64 ms	57.44 ms	Yes
Moment About Occipital Condyle			
Max	88.2 - 108.4 N·m	96.14 N·m	Yes
Time	47 - 58 ms	51.44 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	113 - 128 ms	114.88 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	97 - 107 ms	101.36 ms	Yes

Comments:

Technician

Approved

09.23.2002 09:04:38 461

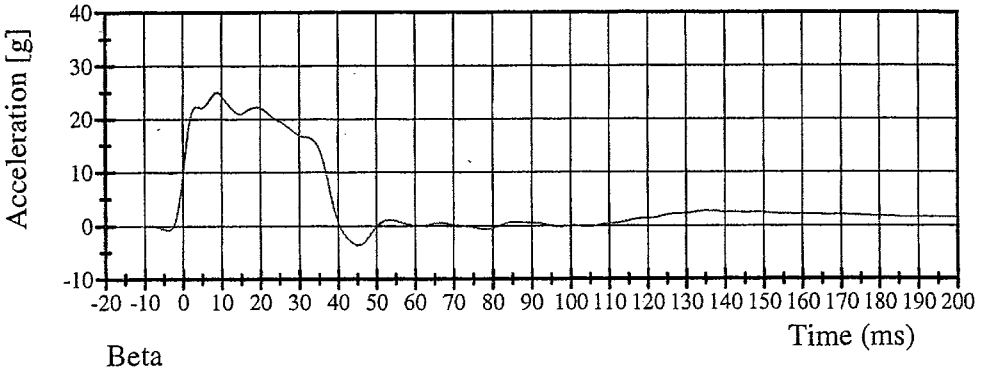
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Pendulum Deceleration

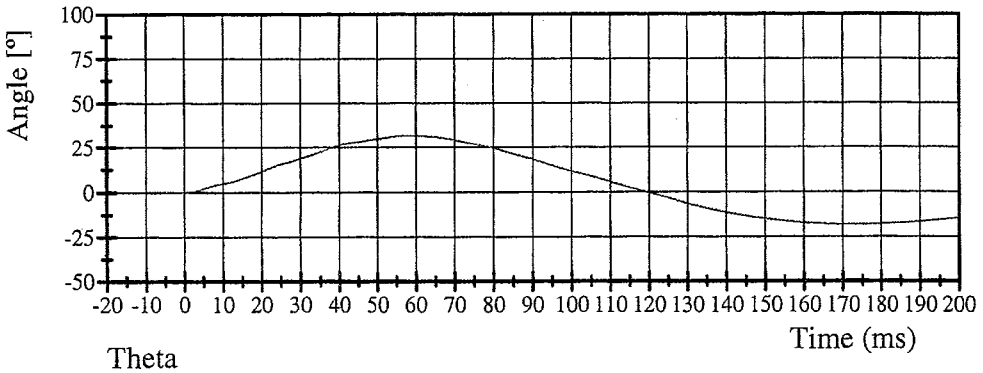


Filter Class: 60

Max: 25.0 g at 8.7 ms

Min: -3.6 g at 45.3 ms

Beta

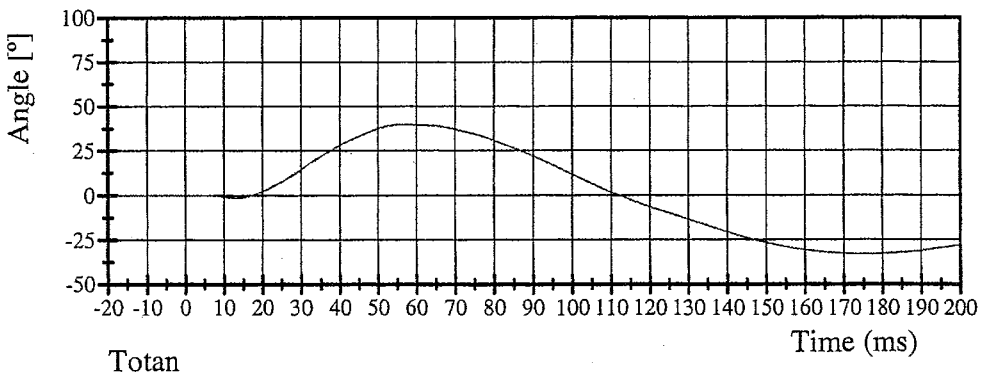


Filter Class: 60

Max: 31.6 ° at 58.0 ms

Min: -18.1 ° at 171.8 ms

Theta

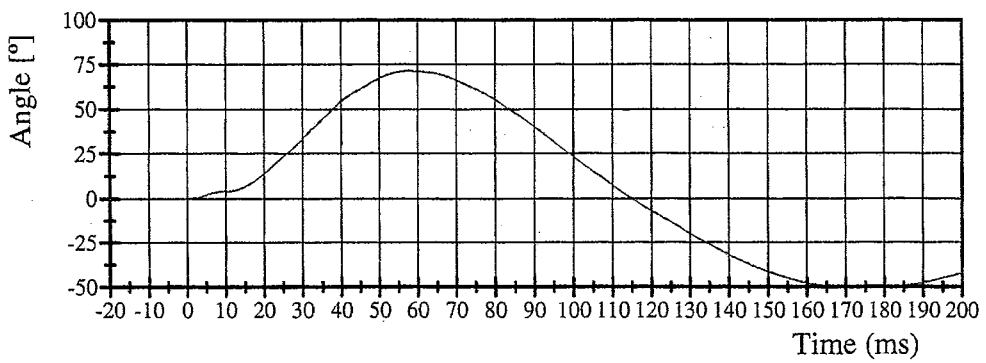


Filter Class: 60

Max: 39.8 ° at 56.7 ms

Min: -33.1 ° at 175.2 ms

Totan



Filter Class: 60

Max: 71.4 ° at 57.4 ms

Min: -51.2 ° at 174.1 ms

09.23.2002 09:04:39 461

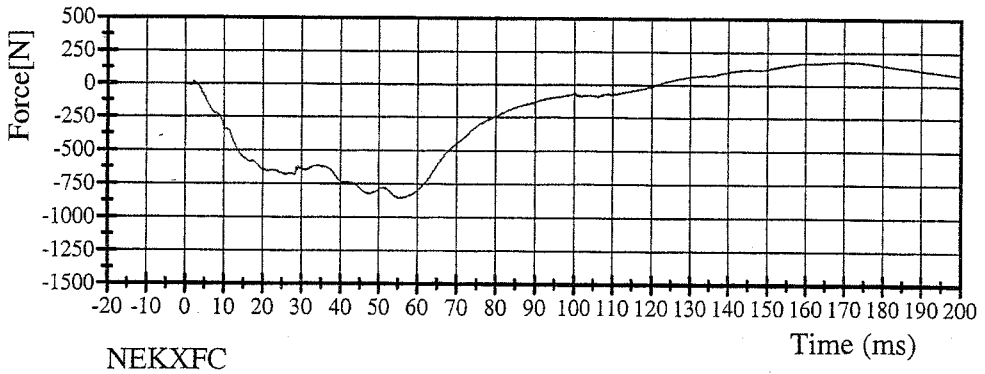
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

NEKXF

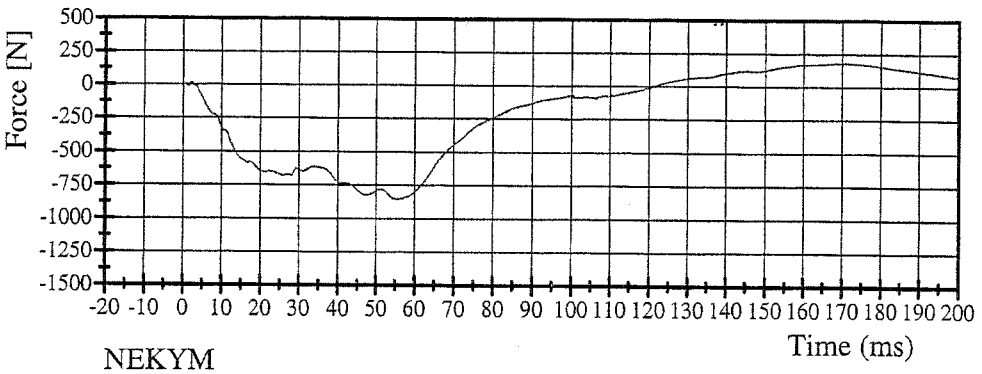


Filter Class: 1000

Max: 180.0 N at 170.4 ms

Min: -855.0 N at 55.4 ms

NEKXFC

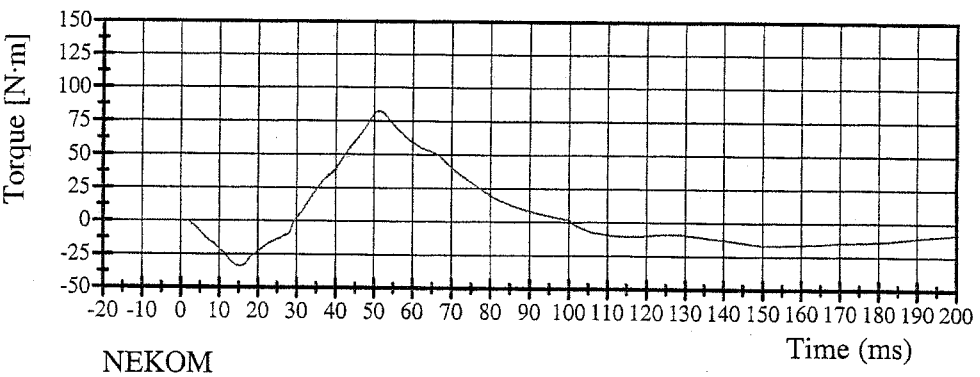


Filter Class: 600

Max: 179.5 N at 170.3 ms

Min: -854.6 N at 55.5 ms

NEKYM

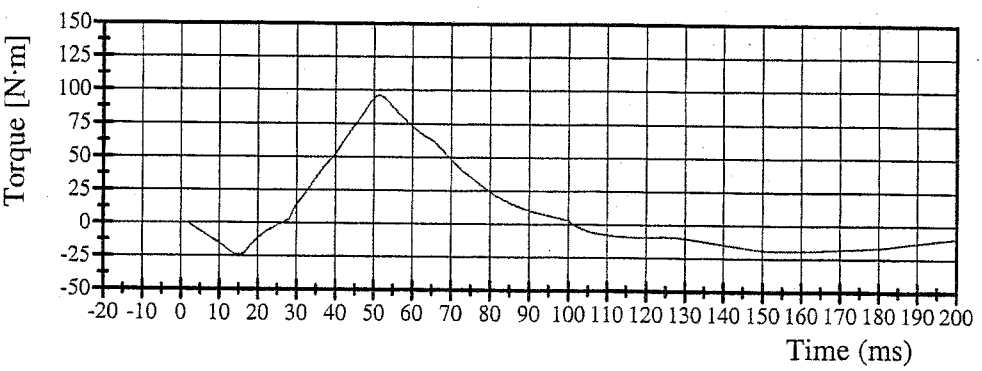


Filter Class: 600

Max: 82.3 N·m at 51.4 ms

Min: -33.9 N·m at 15.4 ms

NEKOM



Filter Class: 600

Max: 96.1 N·m at 51.4 ms

Min: -24.0 N·m at 15.1 ms

09.23.2002 09:04:41 461

Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.11 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	18.68 g	Yes
20 ms	14.00 - 19.00 g	17.66 g	Yes
30 ms	11.00 - 16.00 g	15.96 g	Yes
Max Pendulum Deceleration	22.00 g	18.81 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	15.93 g	Yes
Deceleration-Time Curve Decay Time To 5g	38 - 46 ms	41.76 ms	Yes
D Plane Rotation			
Max	81 - 106 °	97.95 °	Yes
Time	72 - 82 ms	74.88 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-65.87 N·m	Yes
Time	65 - 79 ms	72.08 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	147 - 174 ms	155.52 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	120 - 148 ms	143.68 ms	Yes

Comments:

Technician

Approved

09.23.2002 09:56:36 535

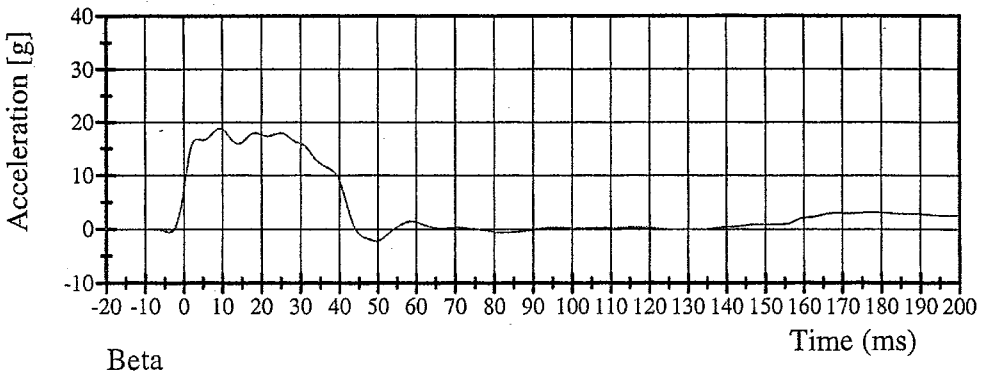
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Pendulum Deceleration

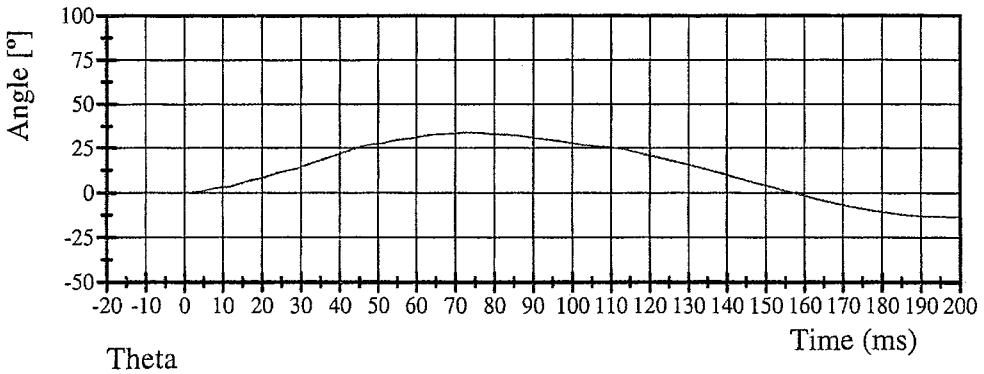


Filter Class: 60

Max: 18.8 g at 9.4 ms

Min: -2.2 g at 49.4 ms

Beta

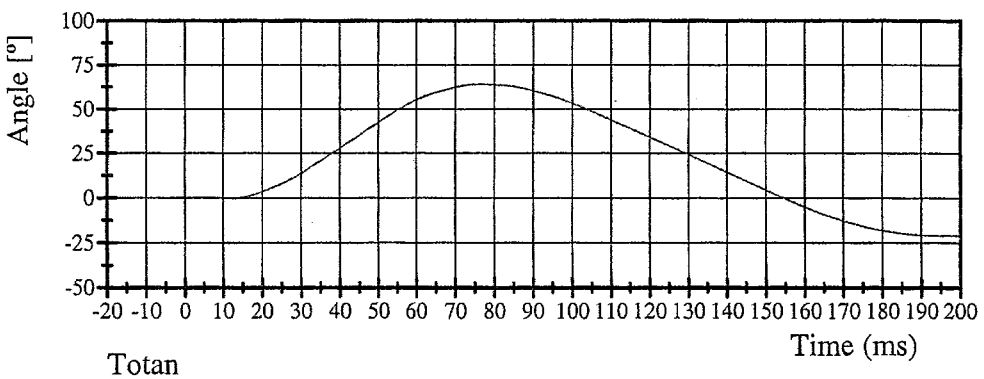


Filter Class: 60

Max: 33.9 ° at 73.8 ms

Min: -13.3 ° at 197.7 ms

Theta

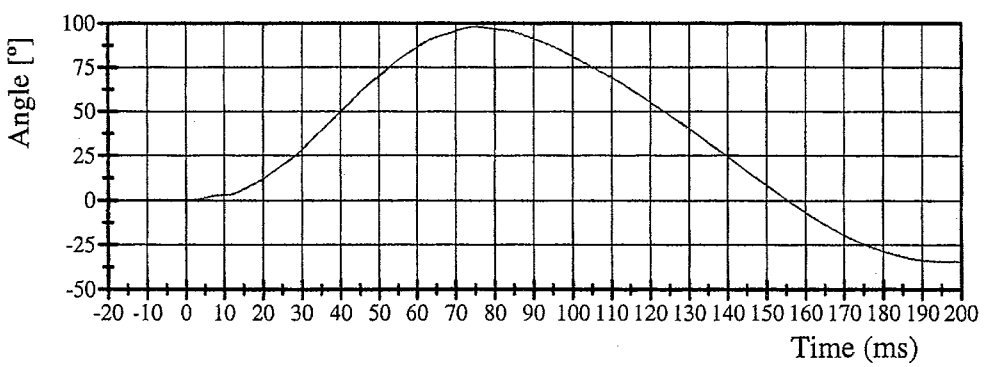


Filter Class: 60

Max: 64.2 ° at 75.8 ms

Min: -21.0 ° at 196.2 ms

Totan



Filter Class: 60

Max: 98.0 ° at 74.9 ms

Min: -34.3 ° at 197.0 ms

09.23.2002 09:56:42 535

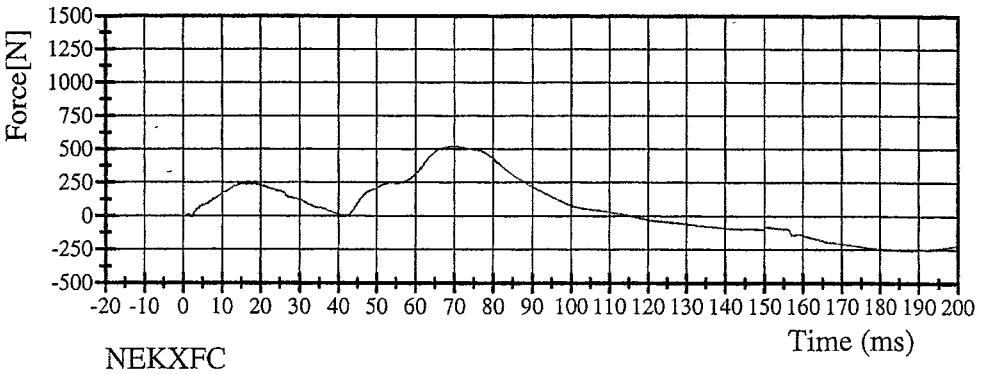
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

NEKXF

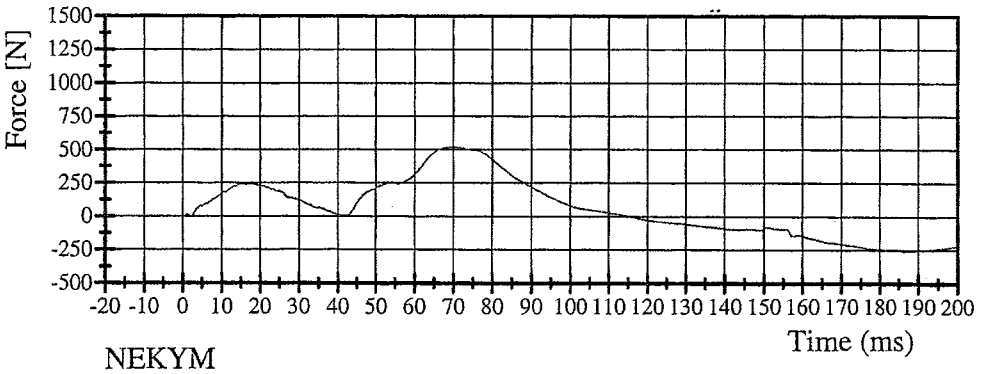


Filter Class: 1000

Max: 519.3 N at 69.6 ms

Min: -256.9 N at 186.5 ms

NEKXFC

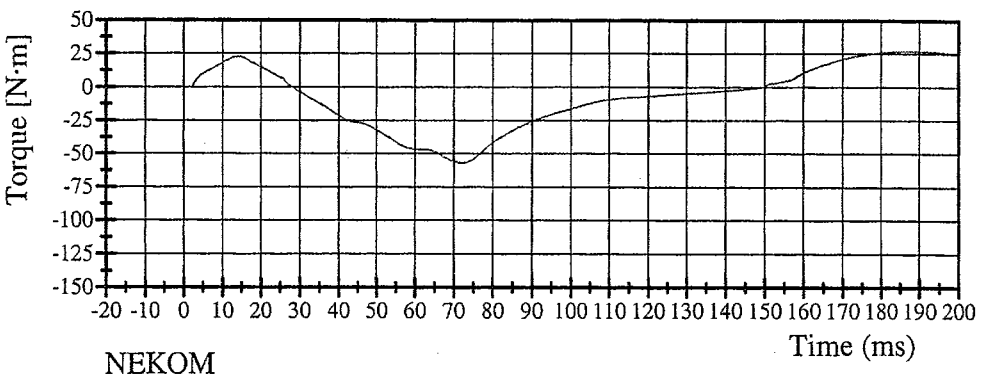


Filter Class: 600

Max: 519.1 N at 70.2 ms

Min: -256.6 N at 187.8 ms

NEKYM

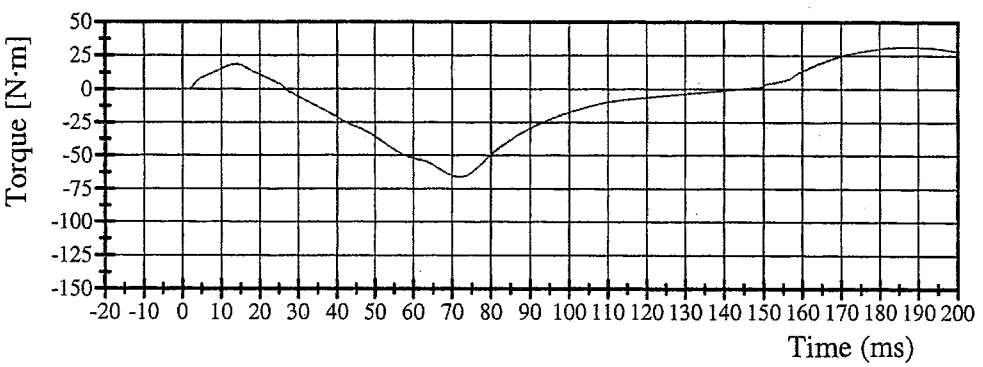


Filter Class: 600

Max: 27.0 N·m at 186.6 ms

Min: -56.9 N·m at 72.2 ms

NEKOM



Filter Class: 600

Max: 31.5 N·m at 186.6 ms

Min: -65.9 N·m at 72.1 ms

09.23.2002 09:56:43 535

Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.66 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-68.3 mm	Yes
Maximum Resistive Force	5159 - 5894 N	5504 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician

Approved

09.23.2002 08:19:15 972

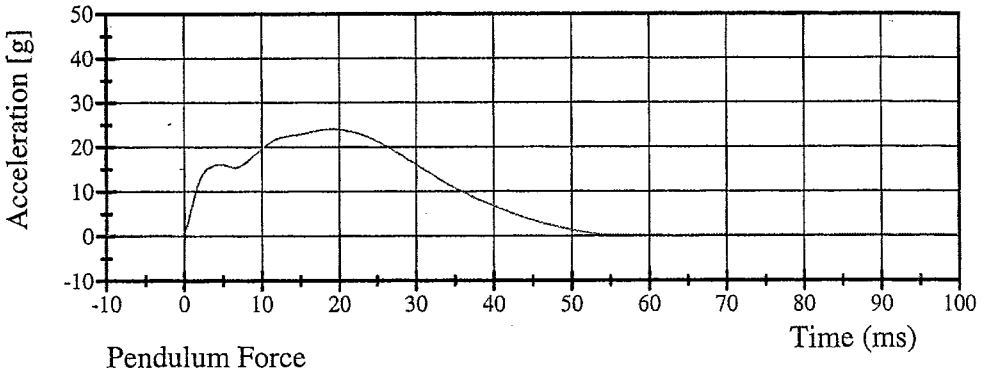
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Pendulum Deceleration

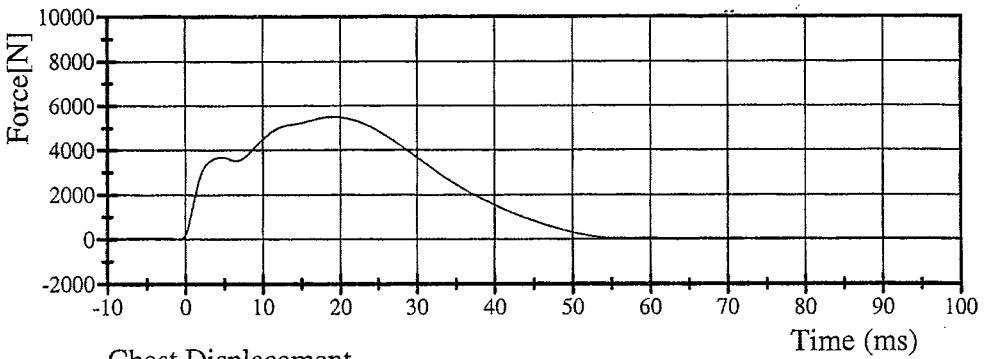


Filter Class: 180

Max: 24.0 g at 19.0 ms

Min: -0.0 g at -0.7 ms

Pendulum Force

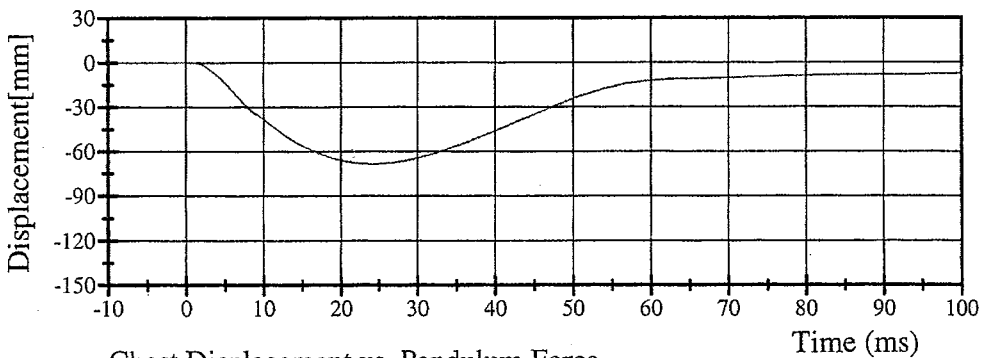


Filter Class: 180

Max: 5503.7 N at 19.0 ms

Min: -10.2 N at -0.7 ms

Chest Displacement

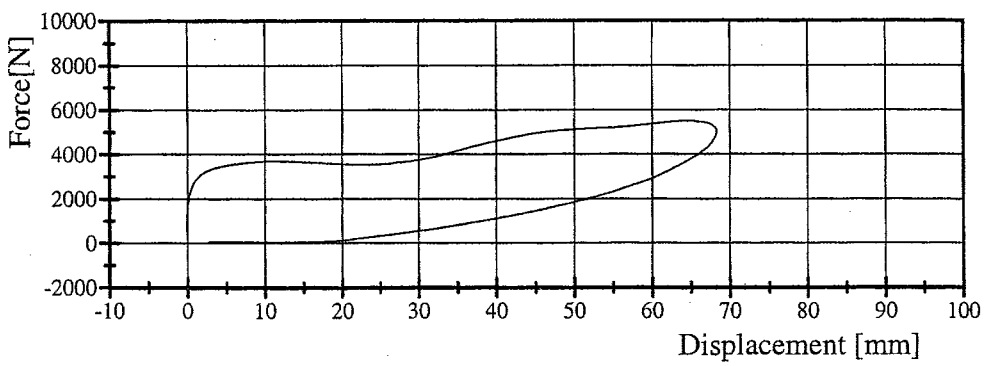


Filter Class: 180

Max: 0.1 mm at 0.6 ms

Min: -68.3 mm at 24.2 ms

Chest Displacement vs. Pendulum Force



09.23.2002 08:19:16 972

Transportation Research Center Inc

Hybrid III Hip Range of Motion

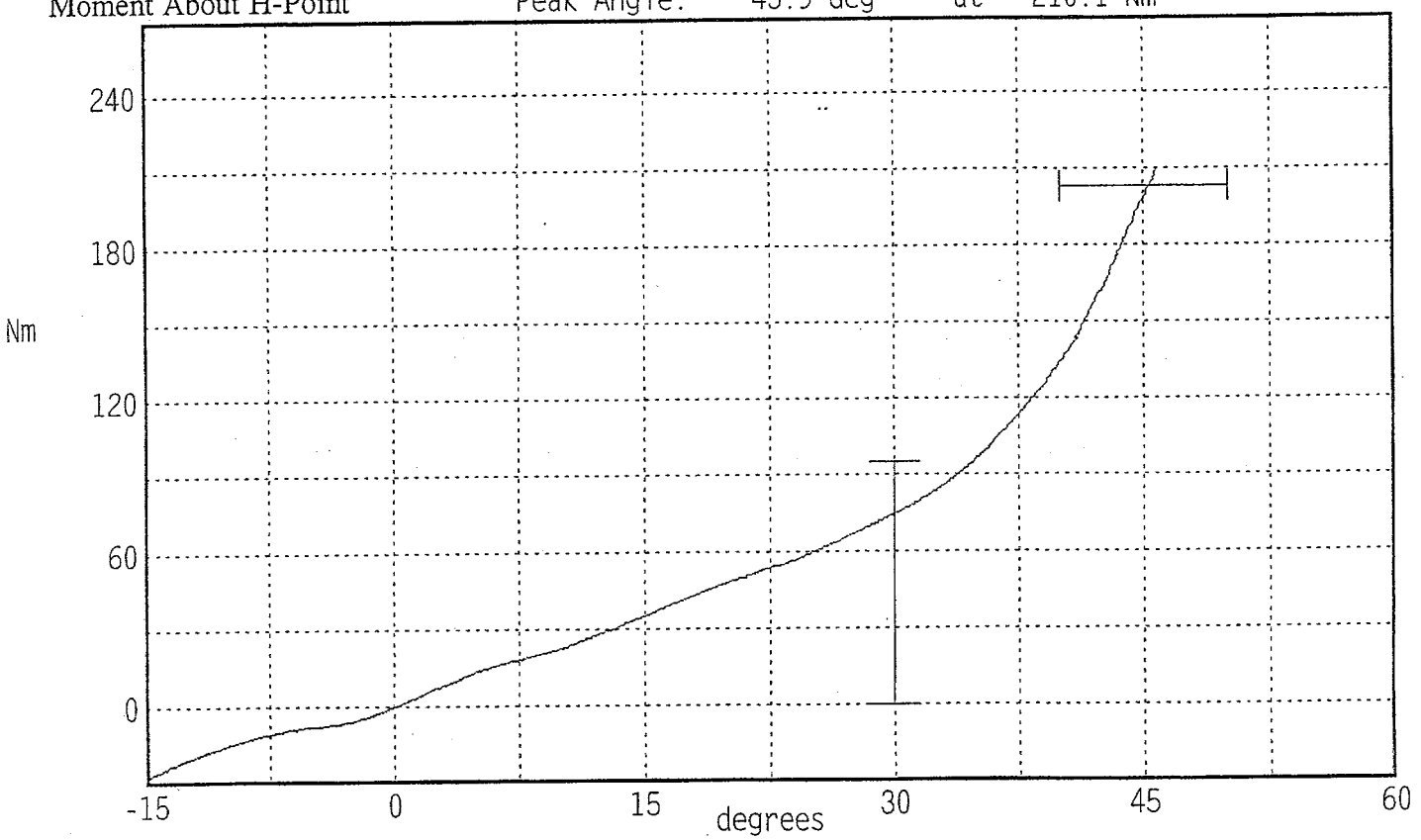
Serial Number: 169L
Test Number: 169C15
Comments:

Date: 09/23/2002
Time: 09:27

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.1	°C	Pass
Humidity	10 - 70	45	%	Pass
Moment at 30 deg	<= 94.9	74.8	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	45.4	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

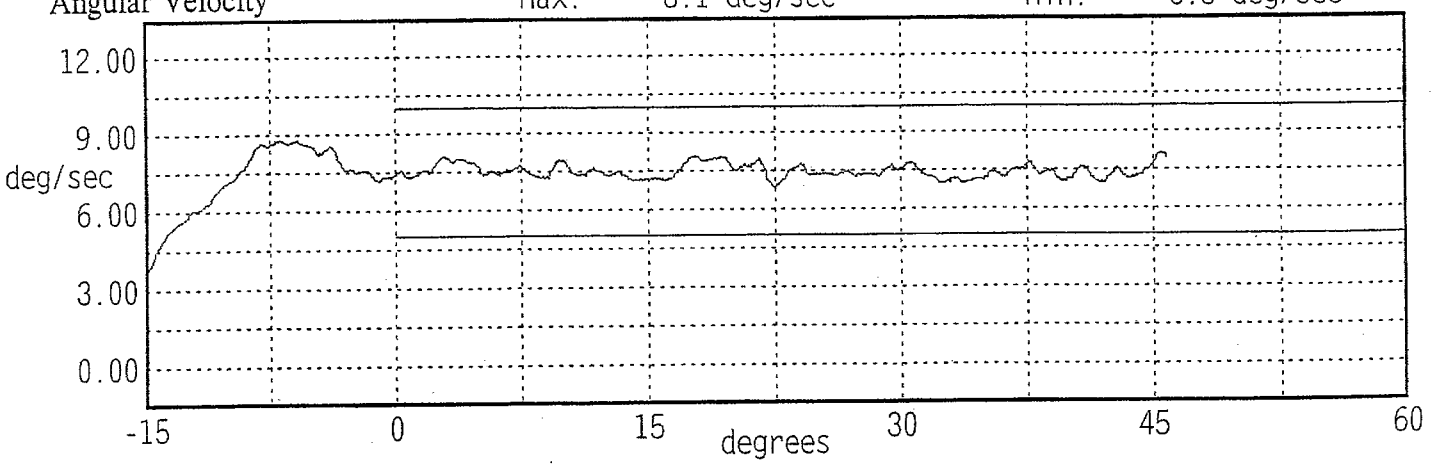
Moment About H-Point

Peak Moment: 210.1 Nm at 45.9 deg
Peak Angle: 45.9 deg at 210.1 Nm



Angular Velocity

Max: 8.1 deg/sec Min: 6.8 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

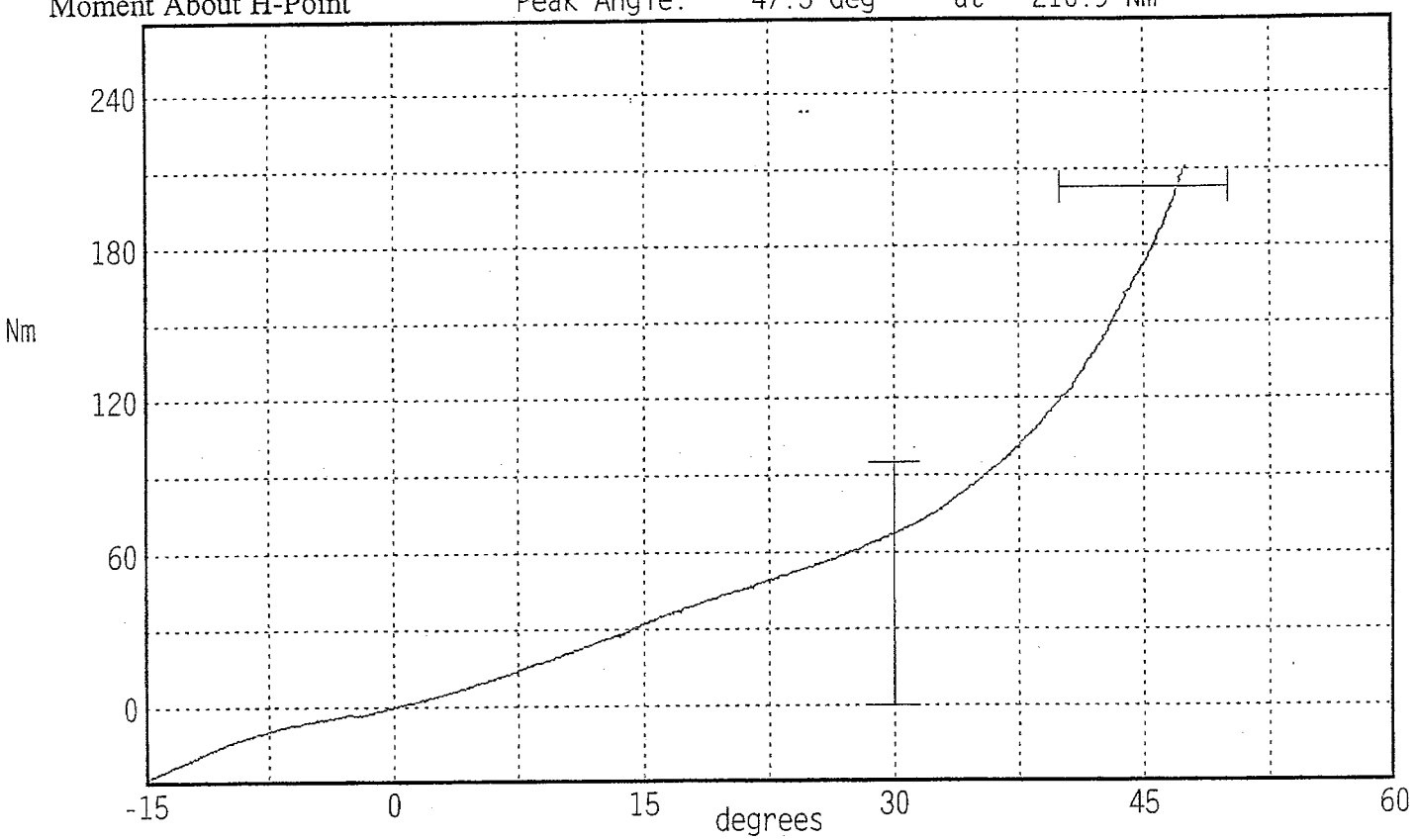
Serial Number: 169R
Test Number: 169C15
Comments:

Date: 09/23/2002
Time: 09:20

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.1	°C	Pass
Humidity	10 - 70	45	%	Pass
Moment at 30 deg	<= 94.9	67.3	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	47.1	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

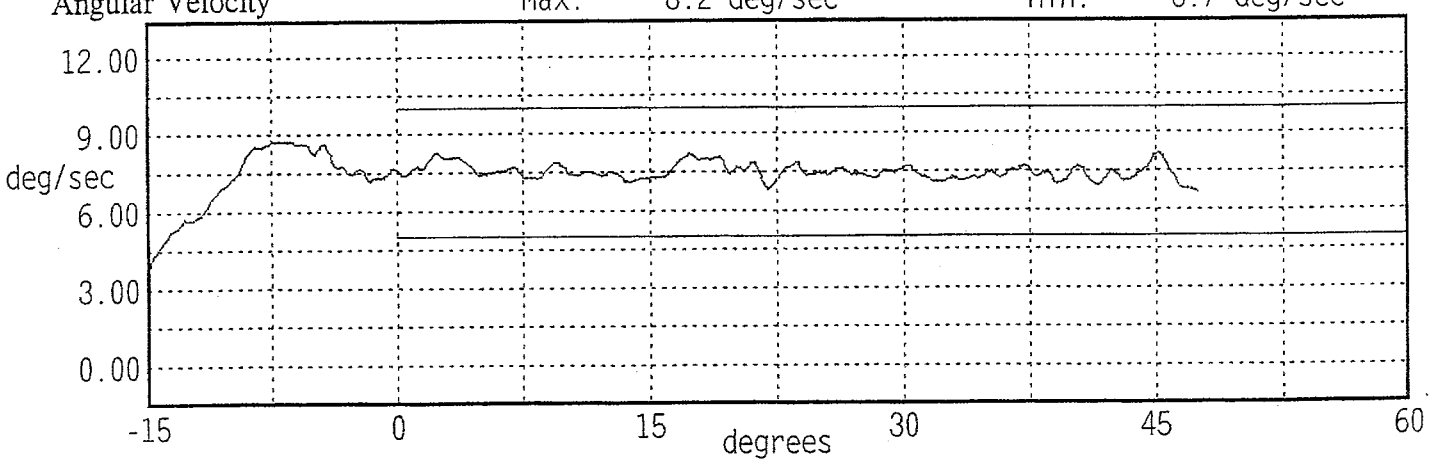
Moment About H-Point

Peak Moment: 210.9 Nm at 47.5 deg
Peak Angle: 47.5 deg at 210.9 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.7 deg/sec



Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/25/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.71 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1390 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2916 N	Yes

Comments:

Technician

Approved

09.25.2002 08:42:06 1160

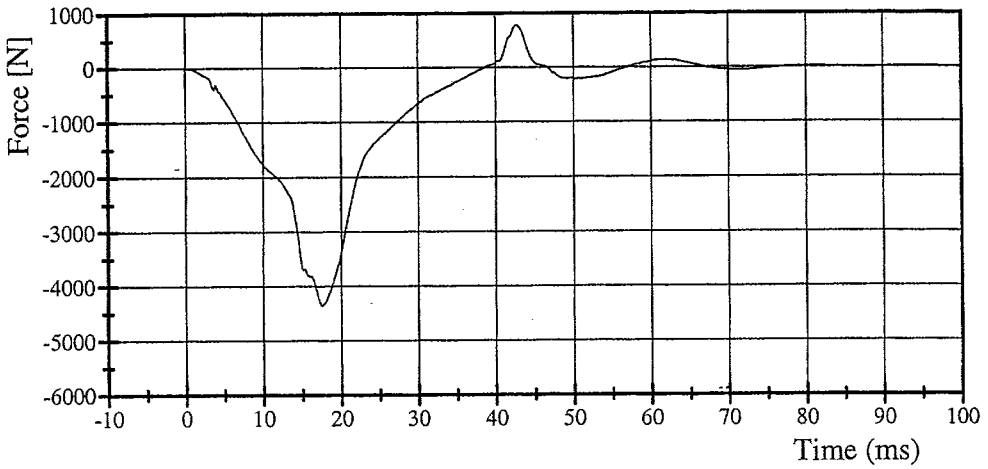
Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/25/2002

Femur Force

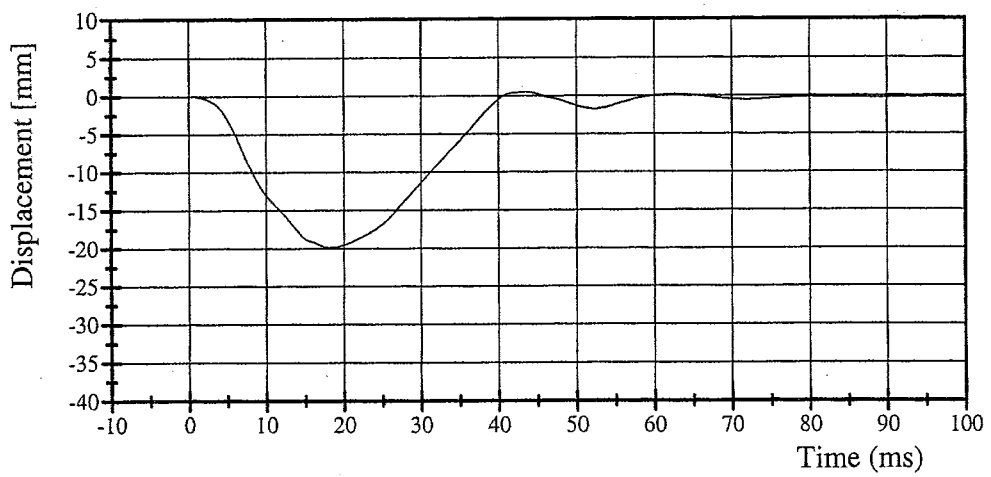


Filter Class: 600

Max: 781.0 N at 42.7 ms

Min: -4354.1 N at 17.5 ms

Tibia Displacement

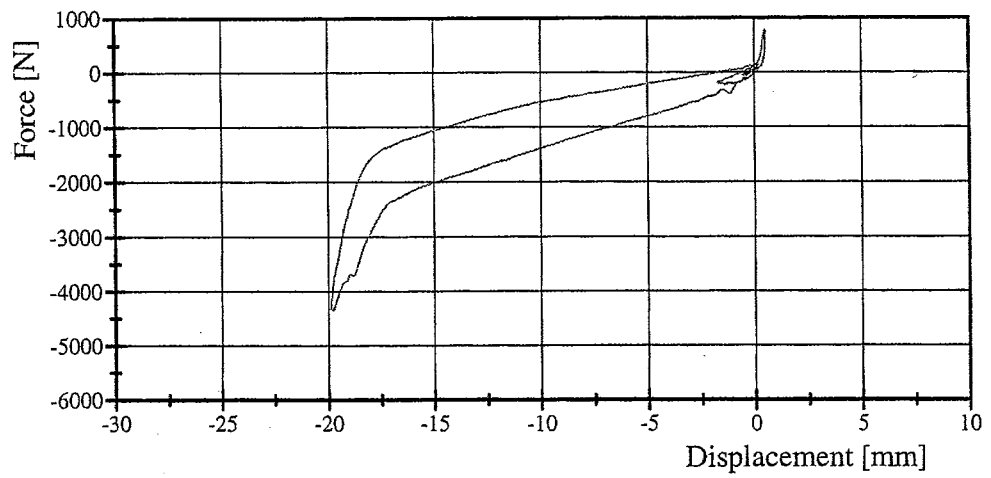


Filter Class: 600

Max: 0.5 mm at 43.0 ms

Min: -19.9 mm at 18.1 ms

Femur Force vs Tibia Displacement



09.25.2002 08:42:07 1160

Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/25/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	42 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.70 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1467 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2644 N	Yes

Comments:

Technician

Approved

09.25.2002 07:43:48 1165

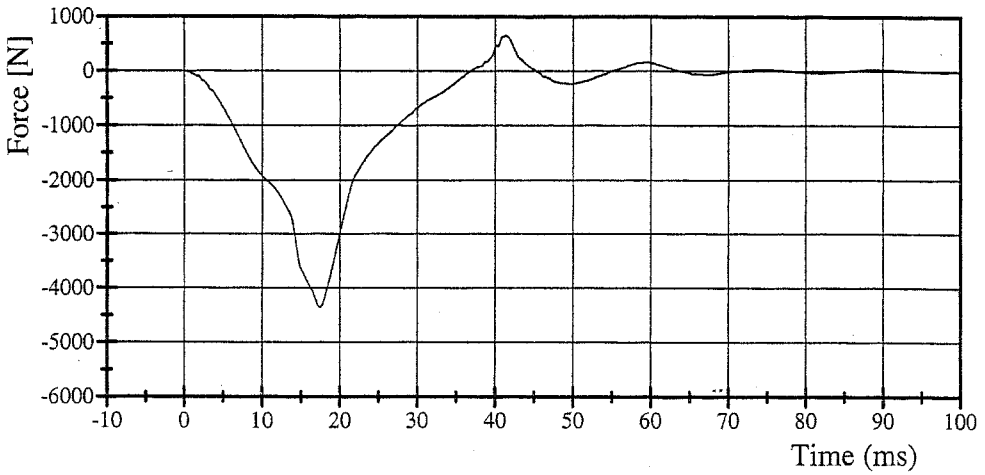
Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/25/2002

Femur Force

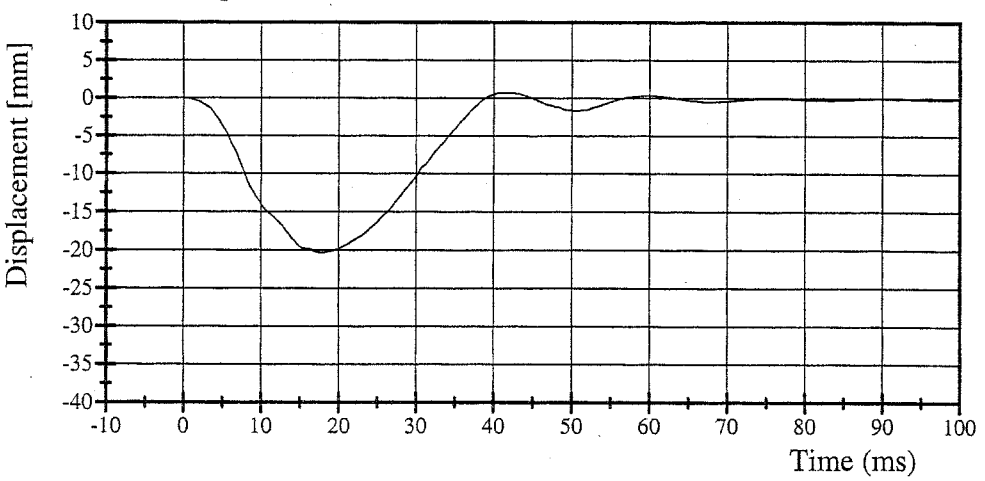


Filter Class: 600

Max: 650.3 N at 41.4 ms

Min: -4352.1 N at 17.4 ms

Tibia Displacement

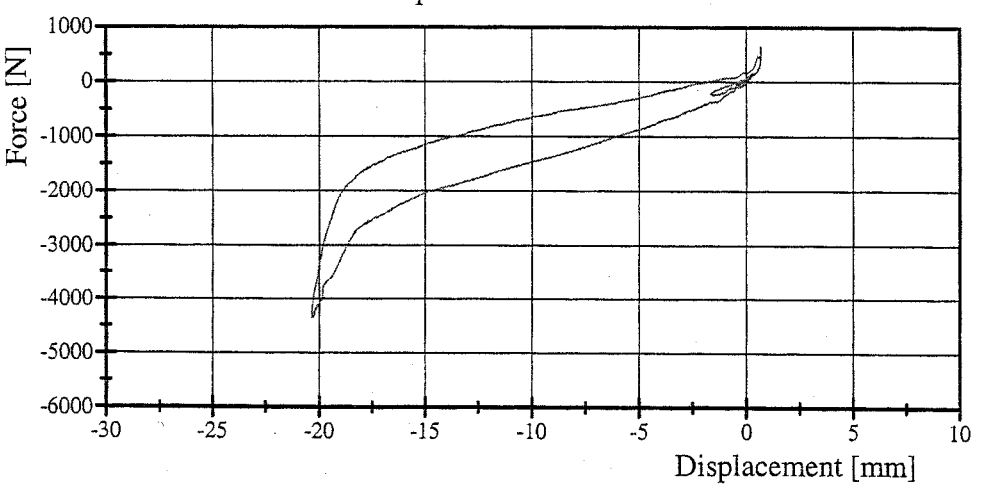


Filter Class: 600

Max: 0.7 mm at 41.5 ms

Min: -20.3 mm at 17.8 ms

Femur Force vs Tibia Displacement



09.25.2002 07:43:52 1165

Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5328 N	Yes

Comments:

Technician

Approved

09.23.2002 12:58:32 2146

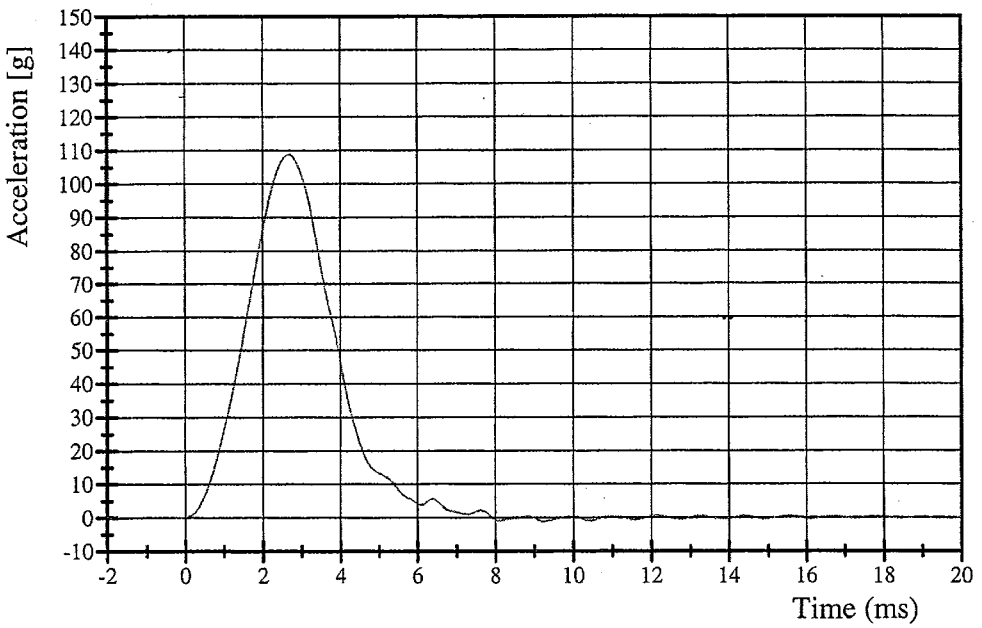
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Pendulum Deceleration

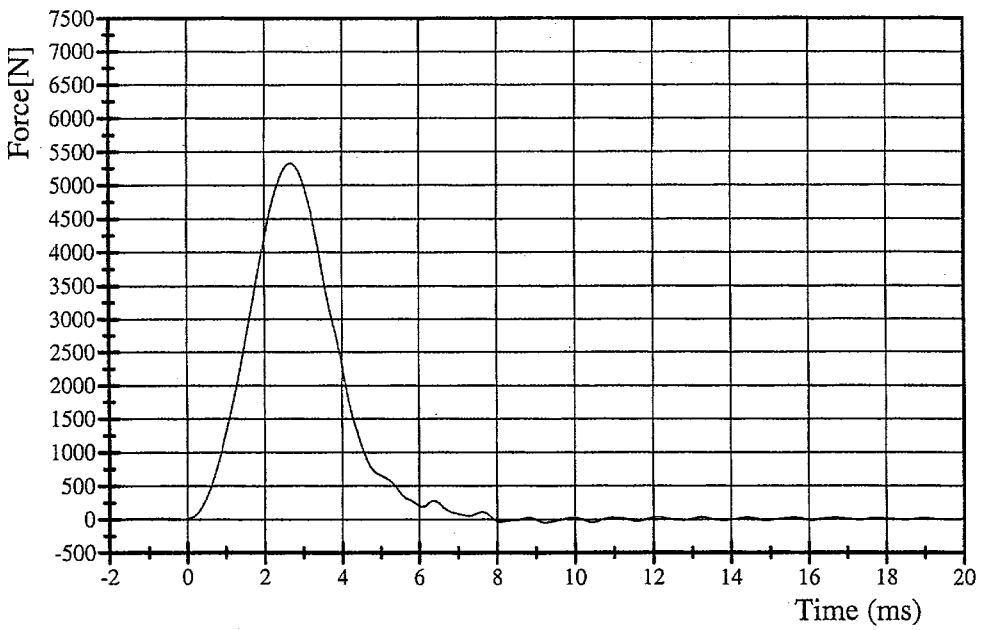


Filter Class: 600

Max: 108.9 g at 2.6 ms

Min: -1.1 g at 9.3 ms

Pendulum Force



Filter Class: 600

Max: 5328.1 N at 2.6 ms

Min: -52.9 N at 9.3 ms

09.23.2002 12:58:45 2146

Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5005 N	Yes

Comments:

Technician

Approved

09.23.2002 12:52:10 2144

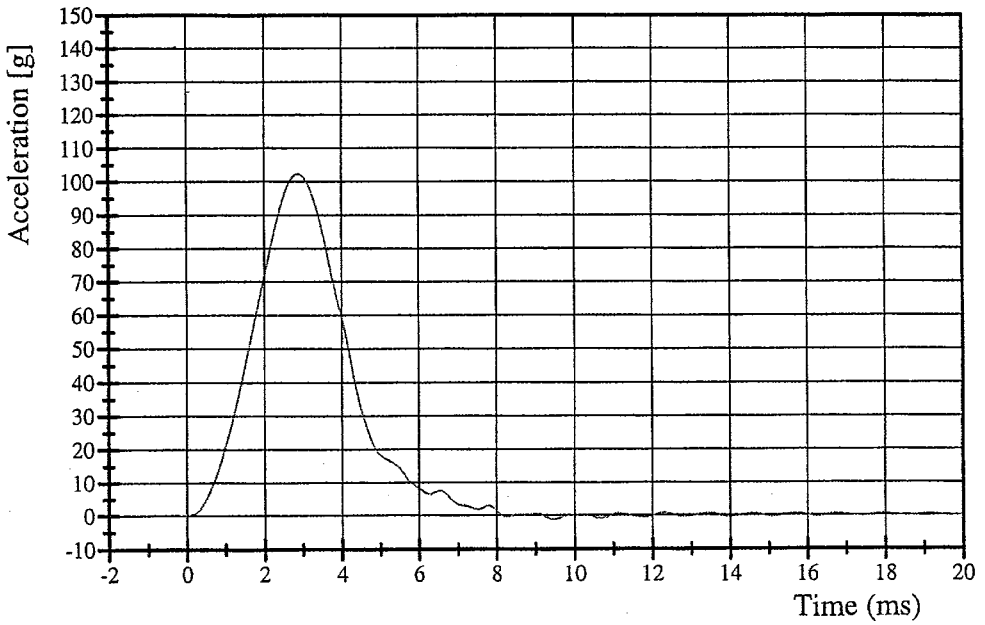
Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 169 Calibration No. 15 - 1

Test Date 09/23/2002

Pendulum Deceleration

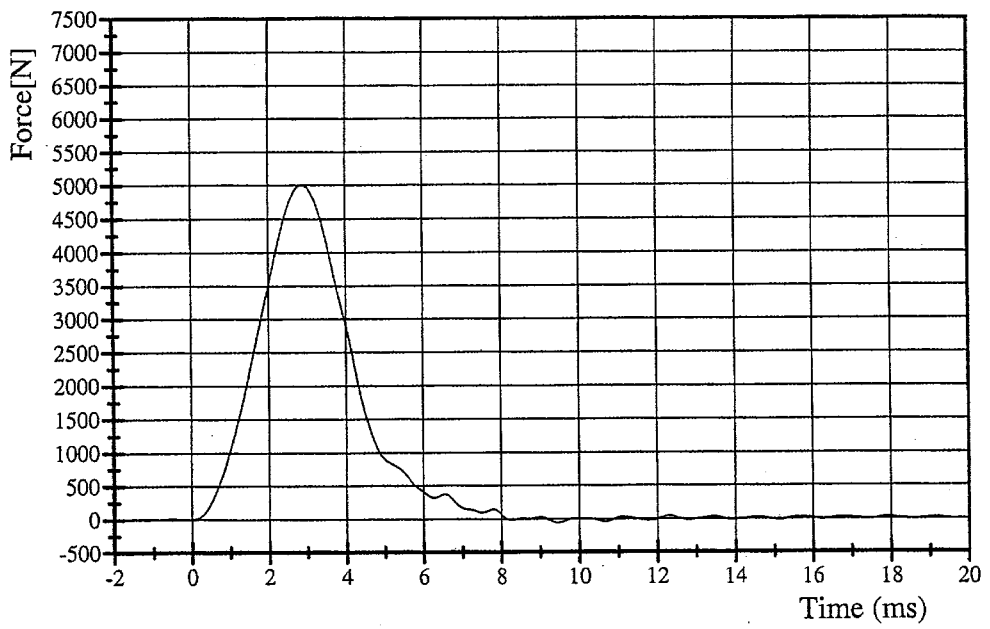


Filter Class: 600

Max: 102.3 g at 2.9 ms

Min: -1.2 g at 9.4 ms

Pendulum Force



Filter Class: 600

Max: 5005.4 N at 2.9 ms

Min: -60.8 N at 9.4 ms

09.23.2002 12:52:16 2144

Post-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Driver Dummy S/N: 169

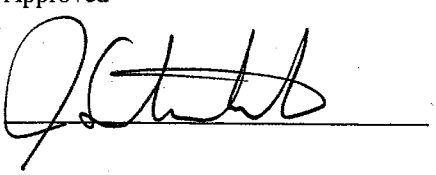
Transportation Research Center Inc.
572E HIII 50th Dummy
External Dimensions
Serial No. 169 Calibration No. 16

Test Parameter	Dimension	Specification	Results	Pass
Location For Chest Circumference	AA	429 - 434 mm	432 mm	Yes
Location For Waist Circumference	BB	226 - 231 mm	229 mm	Yes
Chest Circumference	Y	970 - 1001 mm	993 mm	Yes
Waist Circumference	Z	836 - 866 mm	860 mm	Yes
Chest Depth	O	213 - 229 mm	221 mm	Yes
H-Point Height	C	84 - 89 mm	87 mm	Yes
H-Point From Seatback	D	135 - 140 mm	136 mm	Yes
Skull Cap To Backline	H	41 - 46 mm	44 mm	Yes
Total Sitting Height	A	879 - 889 mm	883 mm	Yes
Thigh Clearance	F	140 - 155 mm	149 mm	Yes
Buttock Knee Length	K	579 - 605 mm	591 mm	Yes
Buttock Popliteal Length	N	452 - 478 mm	474 mm	Yes
Popliteal Height	L	429 - 455 mm	440 mm	Yes
Knee Pivot Height	M	485 - 500 mm	489 mm	Yes
Foot Length	P	252 - 267 mm	253 mm	Yes
Foot Breadth	W	91 - 107 mm	102 mm	Yes
Shoulder Pivot From Backline	E	84 - 94 mm	91 mm	Yes
Shoulder Breadth	V	422 - 437 mm	427 mm	Yes
Shoulder Pivot Height	B	506 - 521 mm	518 mm	Yes
Elbow Rest Height	J	191 - 211 mm	205 mm	Yes
Shoulder-Elbow Length	I	330 - 345 mm	344 mm	Yes
Back Of Elbow To Wrist Pivot	G	290 - 305 mm	295 mm	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Resultant Acceleration	225 - 275 g	262.9 g	Yes
Peak Lateral Acceleration	15 g Max	-8.0 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

10.07.2002 12:09:09 614

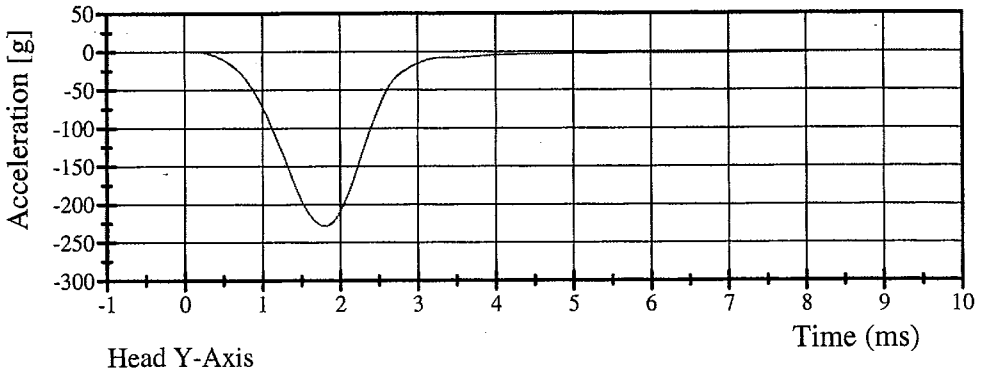
Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Head X-Axis

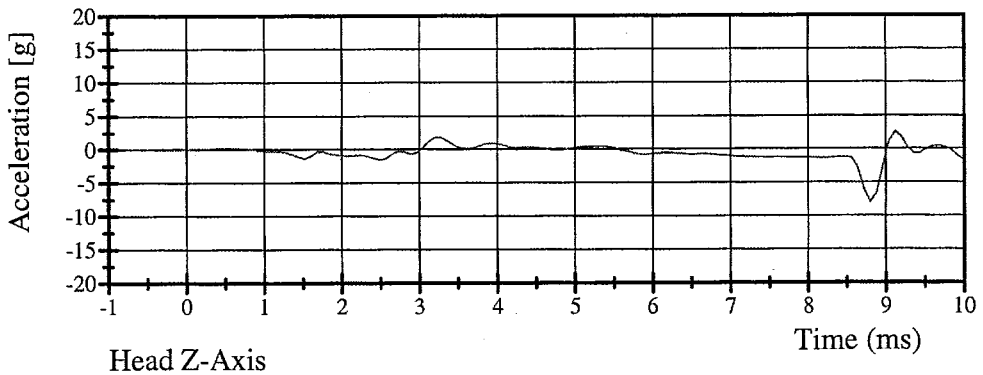


Filter Class: 1000

Max: 0.2 g at 10.0 ms

Min: -228.4 g at 1.8 ms

Head Y-Axis

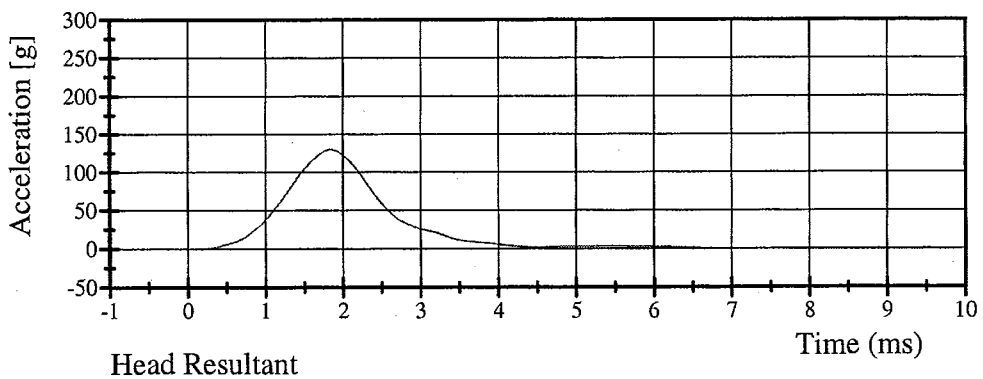


Filter Class: 1000

Max: 2.6 g at 9.1 ms

Min: -8.0 g at 8.8 ms

Head Z-Axis

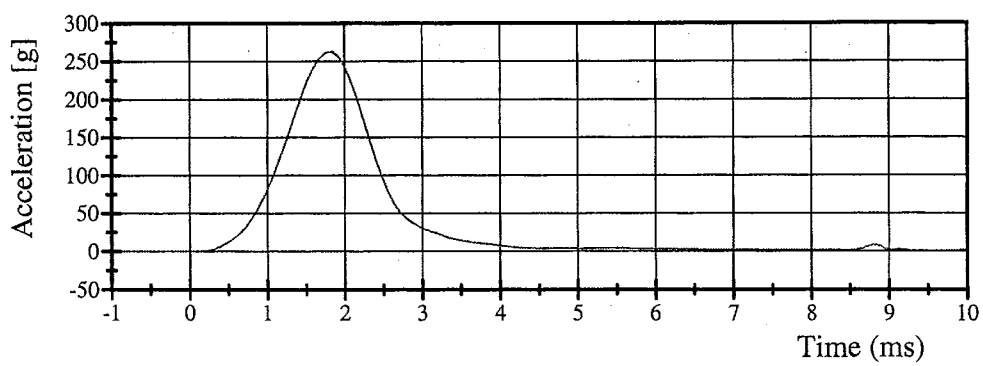


Filter Class: 1000

Max: 130.3 g at 1.8 ms

Min: -0.9 g at 8.8 ms

Head Resultant



Filter Class: 1000

Max: 262.9 g at 1.8 ms

Min: 0.0 g at 8.2 ms

10.07.2002 12:09:11 614

Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	23.62 g	Yes
20 ms	17.60 - 22.60 g	21.90 g	Yes
30 ms	12.50 - 18.50 g	16.52 g	Yes
Max Pendulum Deceleration	29.00 g	23.97 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	16.45 g	Yes
Deceleration-Time Curve Decay Time To 5g	34 - 42 ms	40.72 ms	Yes
D Plane Rotation			
Max	64 - 78 °	71.74 °	Yes
Time	57 - 64 ms	58.88 ms	Yes
Moment About Occipital Condyle			
Max	88.2 - 108.4 N·m	93.48 N·m	Yes
Time	47 - 58 ms	53.36 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	113 - 128 ms	116.80 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	97 - 107 ms	102.72 ms	Yes

Comments:

Technician

Approved

10.07.2002 12:09:43 463

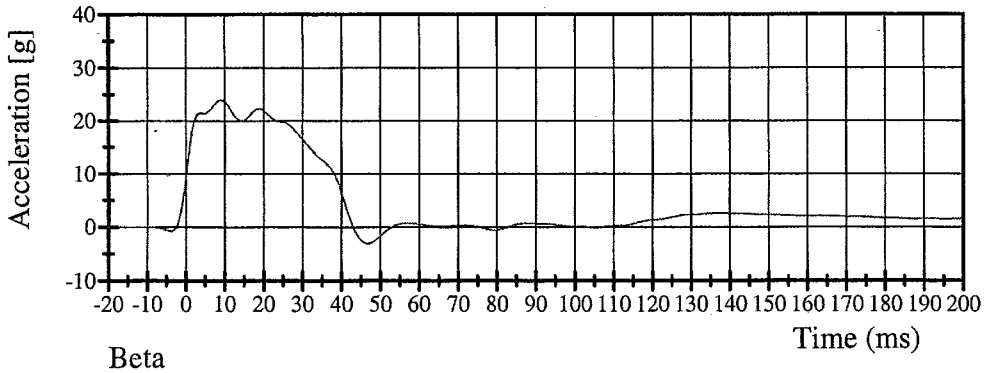
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Pendulum Deceleration

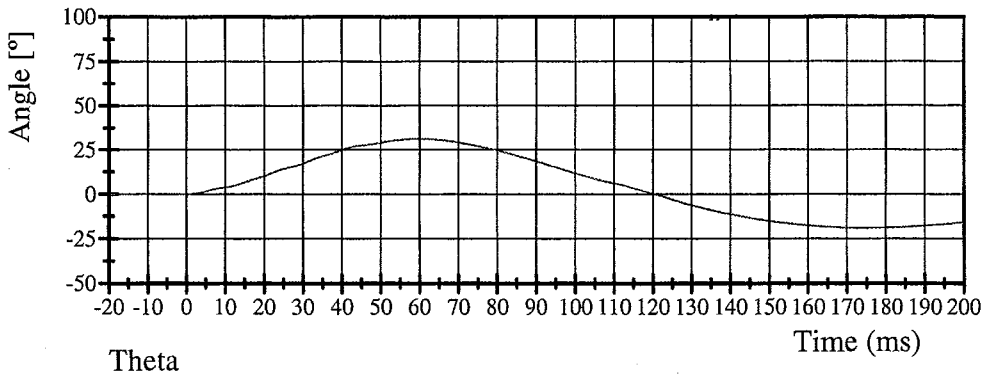


Filter Class: 60

Max: 24.0 g at 9.0 ms

Min: -3.0 g at 46.8 ms

Beta

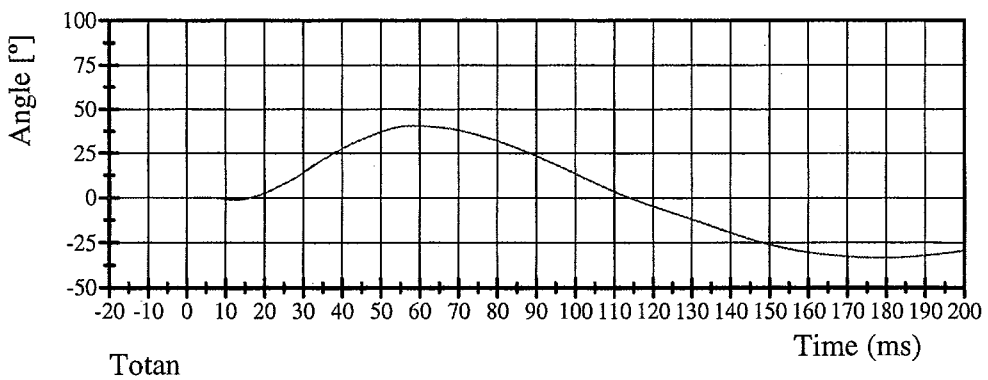


Filter Class: 60

Max: 31.1 ° at 59.8 ms

Min: -19.1 ° at 173.4 ms

Theta

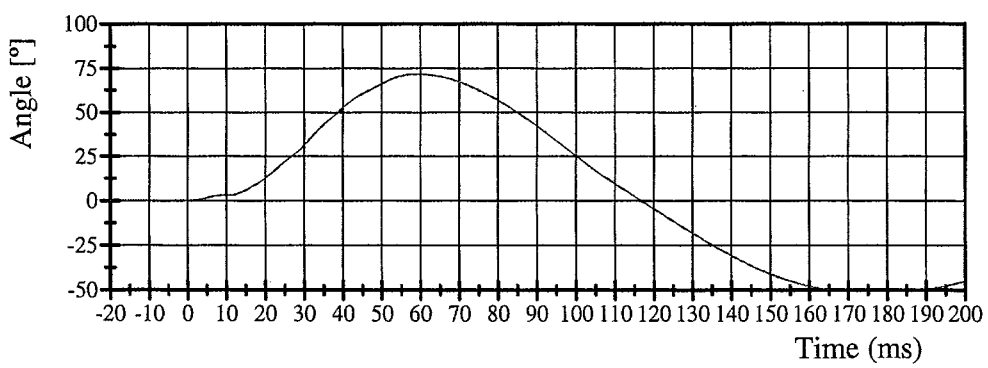


Filter Class: 60

Max: 40.6 ° at 58.3 ms

Min: -33.3 ° at 178.3 ms

Totan



Filter Class: 60

Max: 71.7 ° at 58.9 ms

Min: -52.2 ° at 176.8 ms

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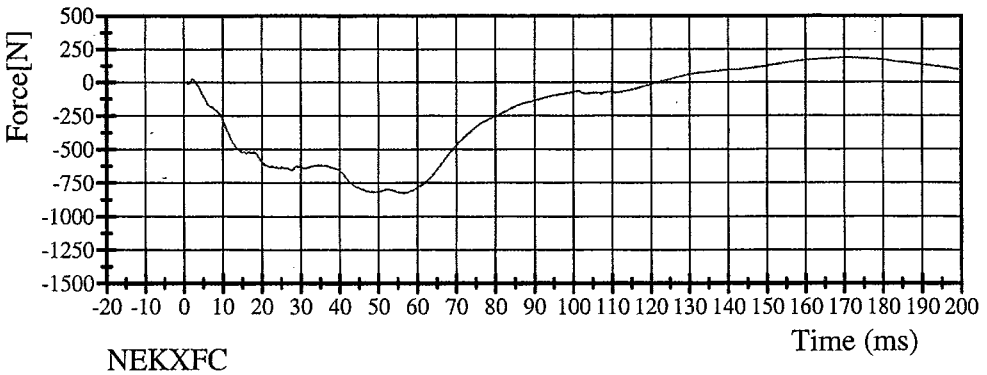
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

NEKXF

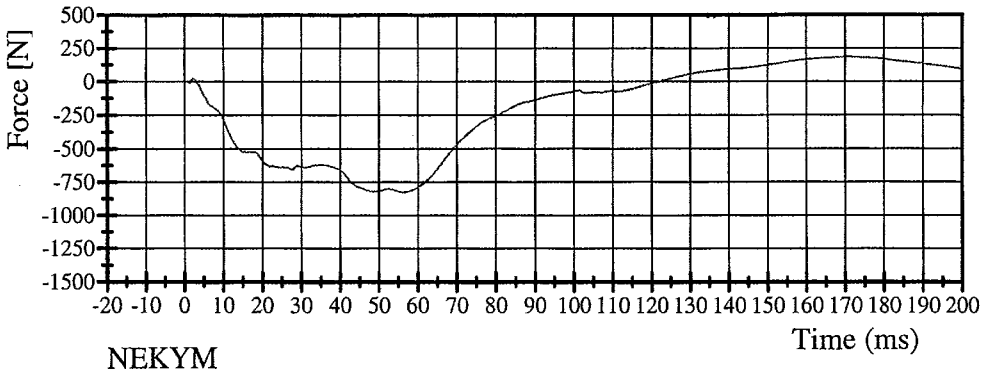


Filter Class: 1000

Max: 185.5 N at 170.4 ms

Min: -826.2 N at 56.3 ms

NEKXFC

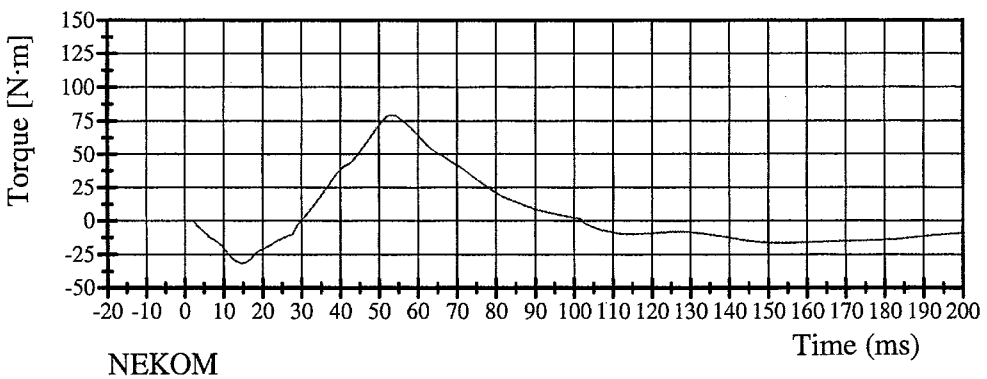


Filter Class: 600

Max: 185.1 N at 171.1 ms

Min: -826.0 N at 56.3 ms

NEKYM

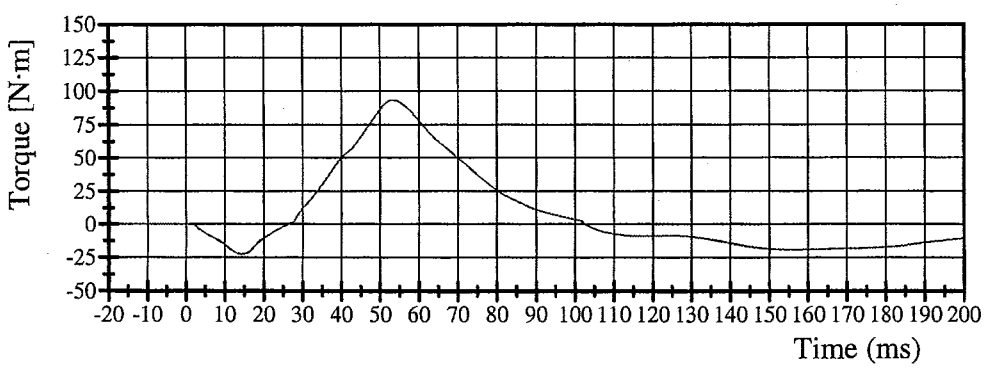


Filter Class: 600

Max: 79.3 N·m at 53.3 ms

Min: -31.6 N·m at 14.6 ms

NEKOM



Filter Class: 600

Max: 93.5 N·m at 53.4 ms

Min: -22.4 N·m at 14.4 ms

10.07.2002 12:09:47 463

Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

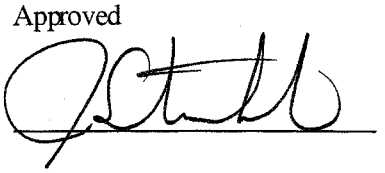
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.11 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	17.47 g	Yes
20 ms	14.00 - 19.00 g	17.24 g	Yes
30 ms	11.00 - 16.00 g.	14.57 g	Yes
Max Pendulum Deceleration	22.00 g	17.75 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	14.56 g	Yes
Deceleration-Time Curve Decay Time To 5g	38 - 46 ms	44.08 ms	Yes
D Plane Rotation			
Max	81 - 106 °	99.77 °	Yes
Time	72 - 82 ms	78.32 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-63.40 N·m	Yes
Time	65 - 79 ms	74.56 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	147 - 174 ms	157.52 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	120 - 148 ms	147.20 ms	Yes

Comments:

Technician



Approved



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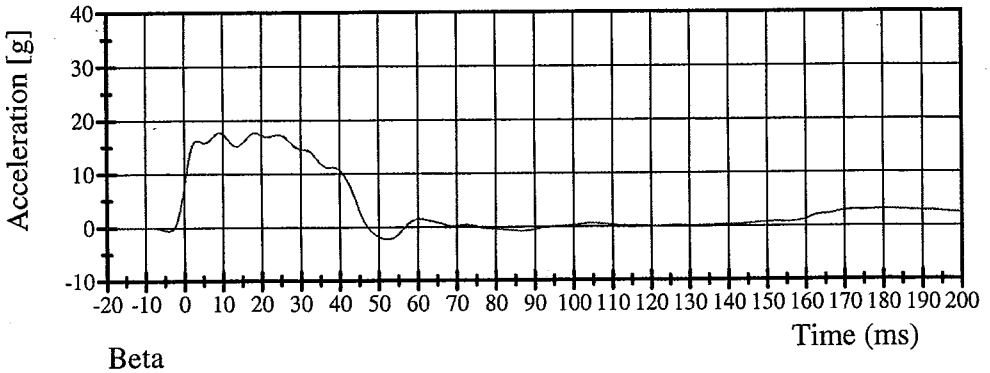
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Pendulum Deceleration

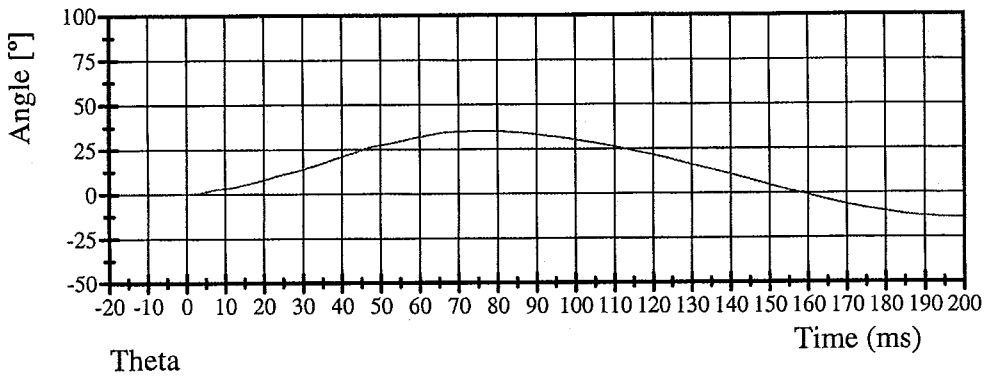


Filter Class: 60

Max: 17.7 g at 9.0 ms

Min: -2.3 g at 52.2 ms

Beta

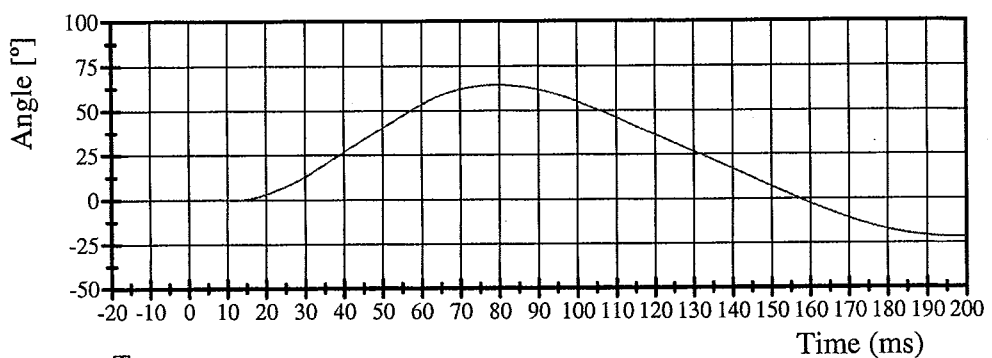


Filter Class: 60

Max: 35.3 ° at 77.0 ms

Min: -13.9 ° at 199.4 ms

Theta

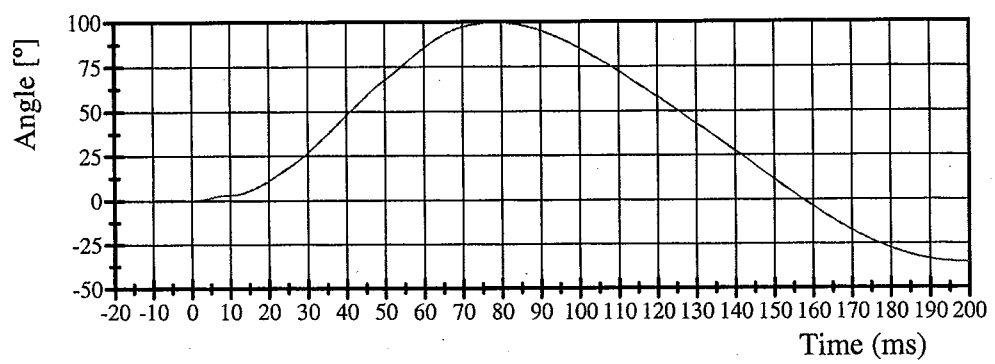


Filter Class: 60

Max: 64.5 ° at 78.8 ms

Min: -21.6 ° at 198.8 ms

Totan



Filter Class: 60

Max: 99.8 ° at 78.3 ms

Min: -35.4 ° at 199.1 ms

10.07.2002 12:10:25 535

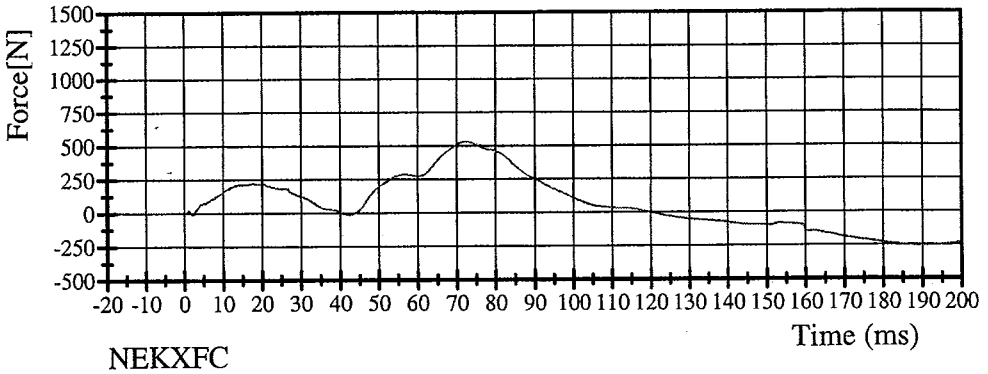
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

NEKXF

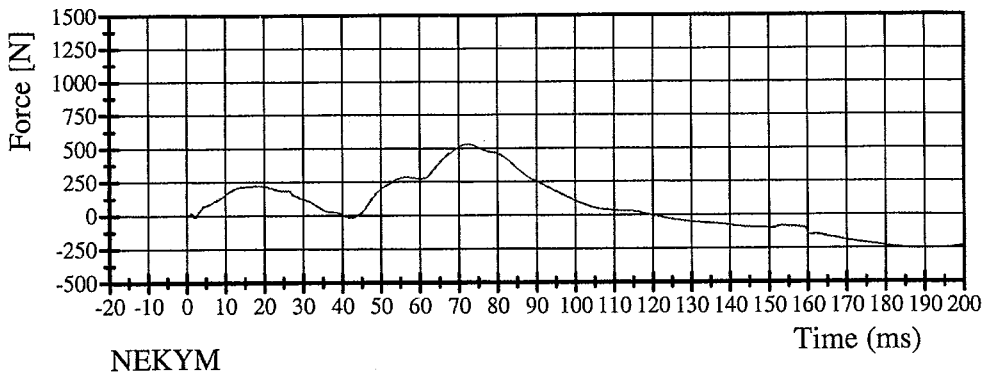


Filter Class: 1000

Max: 531.1 N at 72.2 ms

Min: -256.5 N at 189.9 ms

NEKXFC

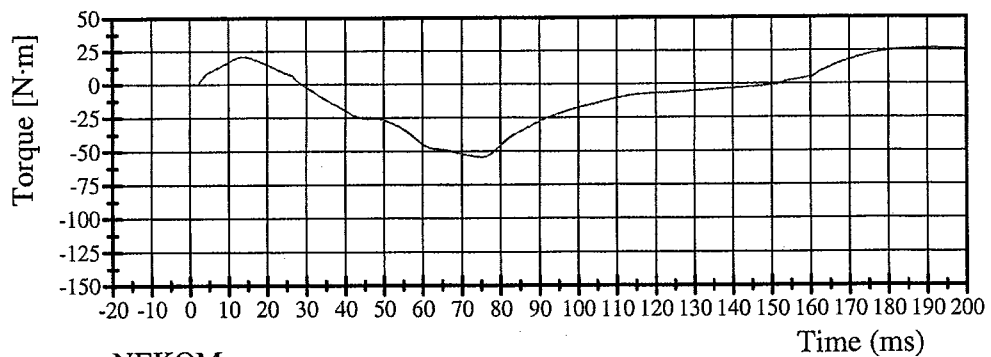


Filter Class: 600

Max: 530.5 N at 72.3 ms

Min: -255.8 N at 190.0 ms

NEKYM

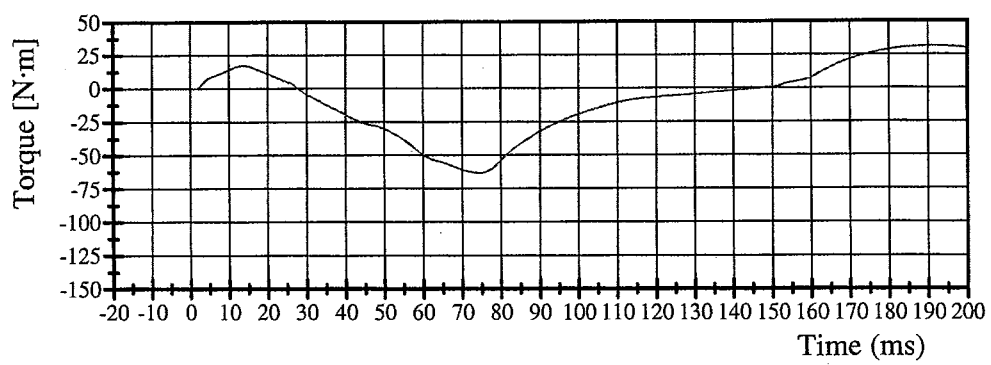


Filter Class: 600

Max: 26.8 N·m at 191.9 ms

Min: -54.4 N·m at 75.0 ms

NEKOM



Filter Class: 600

Max: 31.3 N·m at 191.2 ms

Min: -63.4 N·m at 74.6 ms

10.07.2002 12:10:27 535

Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.66 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-70.5 mm	Yes
Maximum Resistive Force	5159 - 5894 N	5646 N	Yes
Internal Hysteresis	69 - 85 %	71 %	Yes

Comments:

Technician

Approved

10.07.2002 12:11:01 966

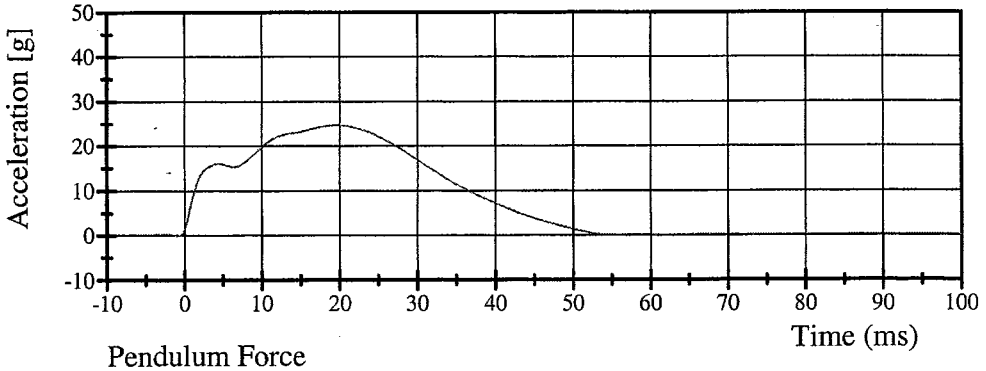
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Pendulum Deceleration

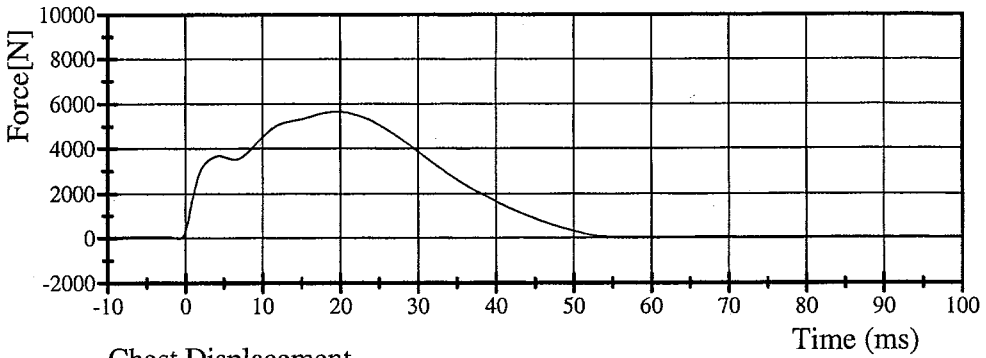


Filter Class: 180

Max: 24.6 g at 19.6 ms

Min: -0.1 g at -0.9 ms

Pendulum Force

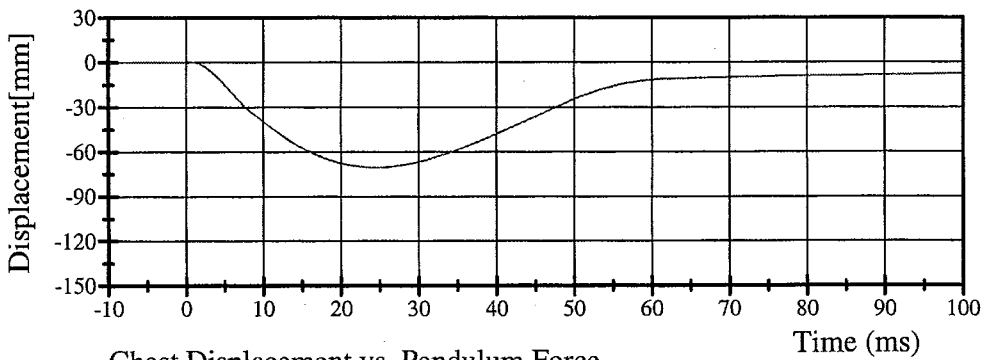


Filter Class: 180

Max: 5646.0 N at 19.6 ms

Min: -14.5 N at -0.9 ms

Chest Displacement

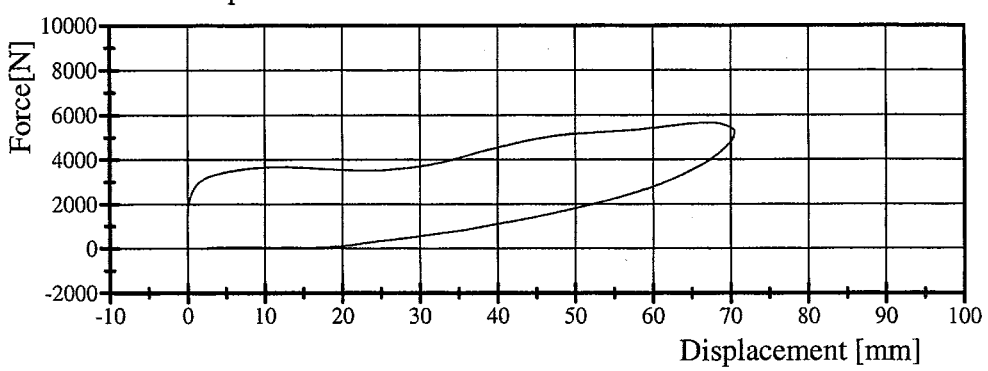


Filter Class: 180

Max: 0.1 mm at 0.3 ms

Min: -70.5 mm at 24.2 ms

Chest Displacement vs. Pendulum Force



10.07.2002 12:11:03 966

Transportation Research Center Inc

Hybrid III Hip Range of Motion

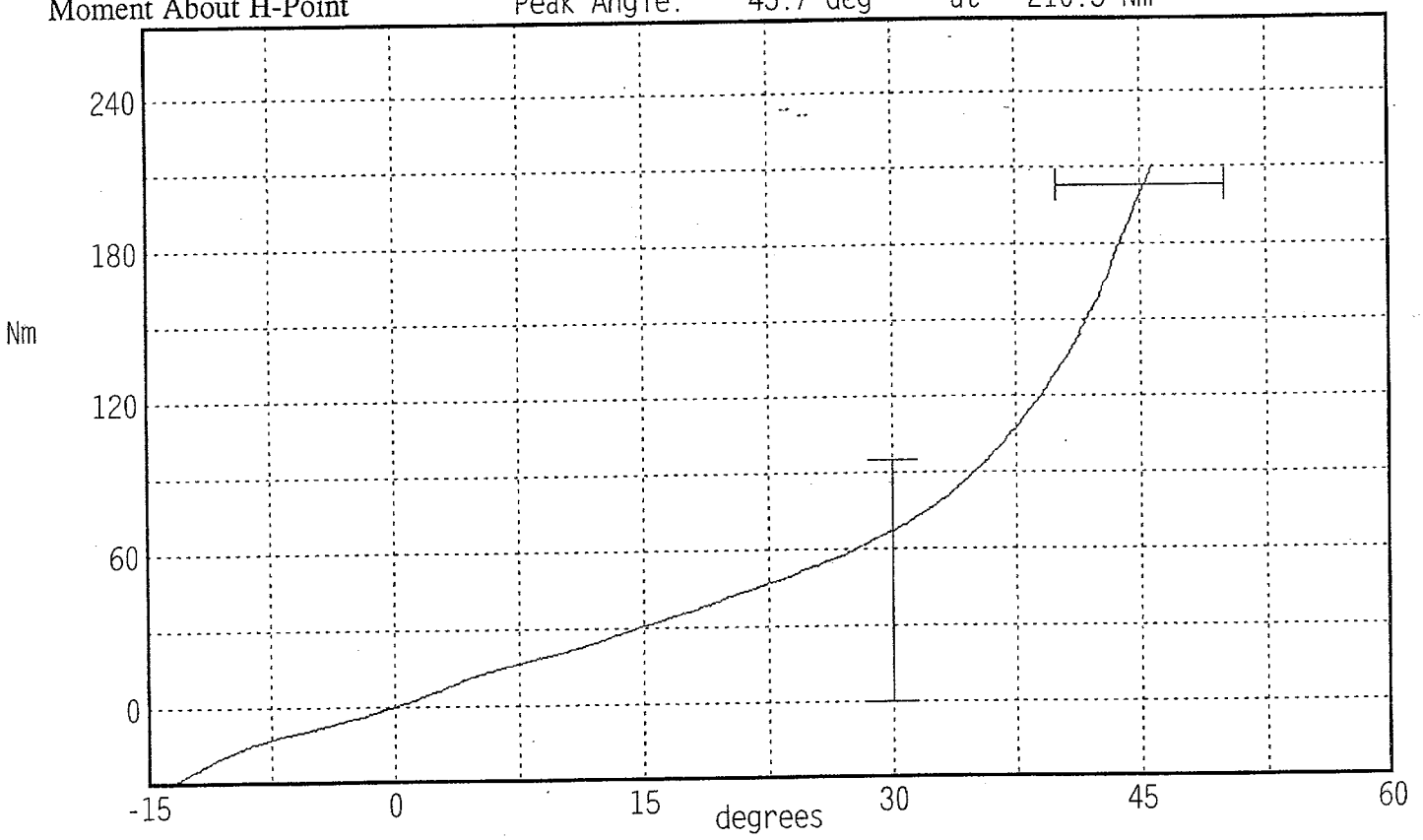
Serial Number: 169C16
Test Number: 169L
Comments:

Date: 10/07/2002
Time: 09:55

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	37	%	Pass
Moment at 30 deg	<= 94.9	67.3	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	45.3	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

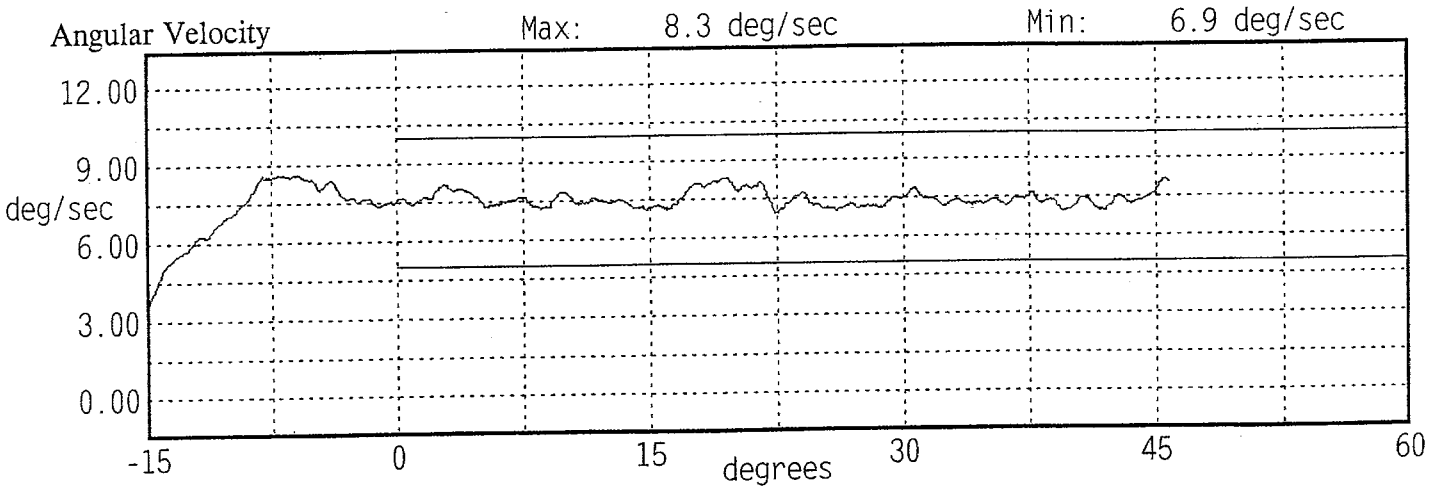
Moment About H-Point

Peak Moment: 210.5 Nm at 45.7 deg
Peak Angle: 45.7 deg at 210.5 Nm



Angular Velocity

Max: 8.3 deg/sec Min: 6.9 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

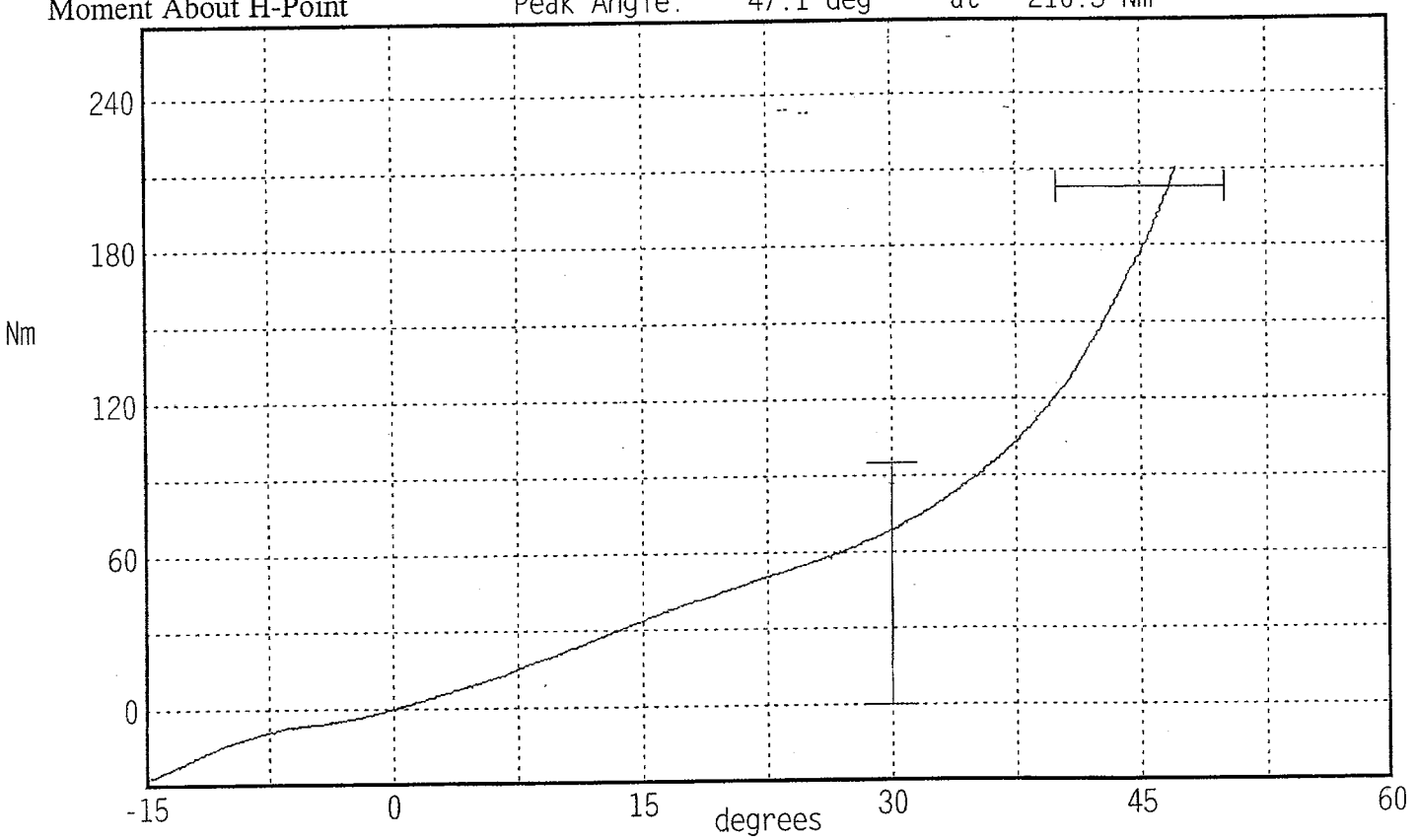
Serial Number: 169C16
Test Number: 169R
Comments:

Date: 10/07/2002
Time: 09:41

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.7	°C	Pass
Humidity	10 - 70	37	%	Pass
Moment at 30 deg	<= 94.9	68.9	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	46.7	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

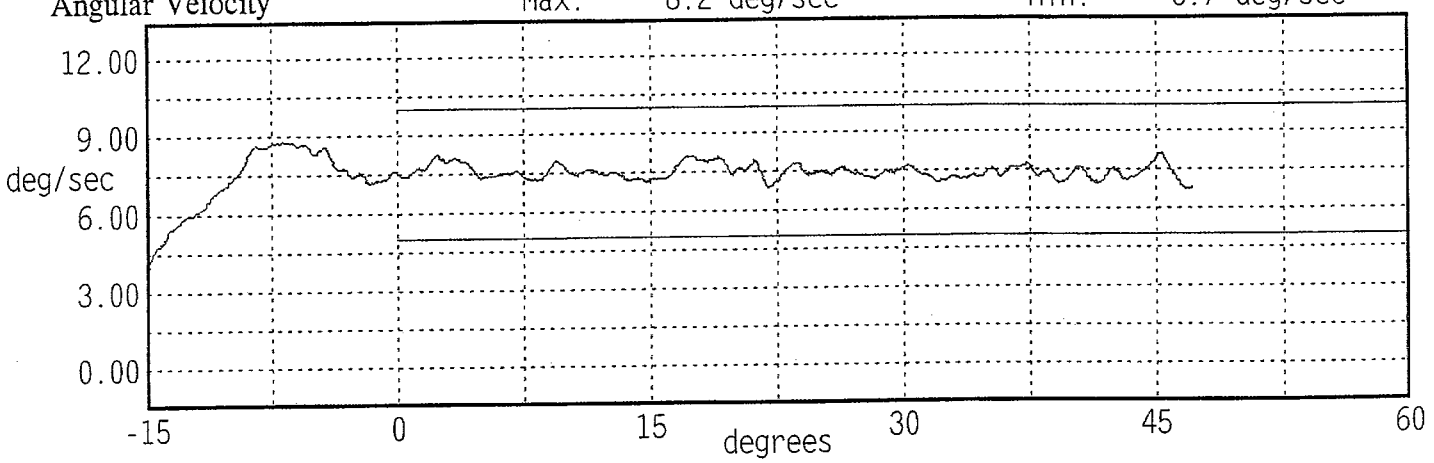
Moment About H-Point

Peak Moment: 210.5 Nm at 47.1 deg
Peak Angle: 47.1 deg at 210.5 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.7 deg/sec



Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.73 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1314 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-3088 N	Yes

Comments:

Technician

Approved

10.07.2002 12:11:52 1804

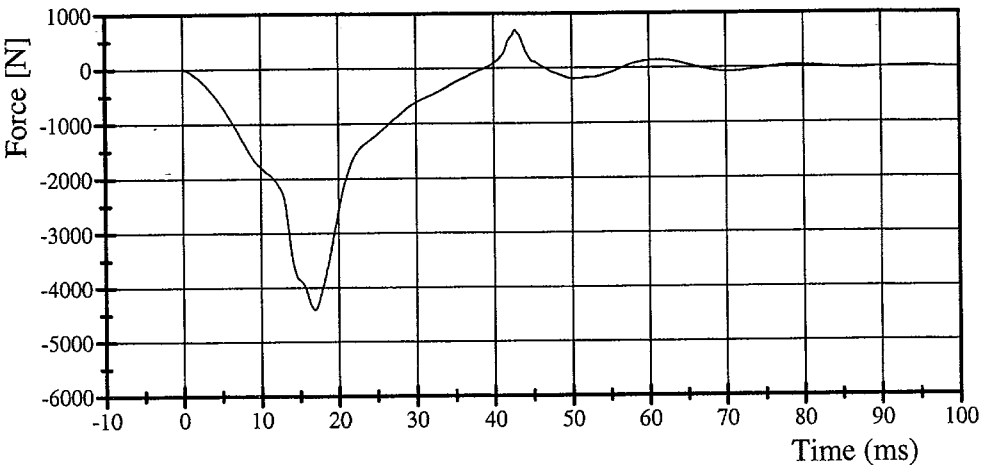
Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Femur Force

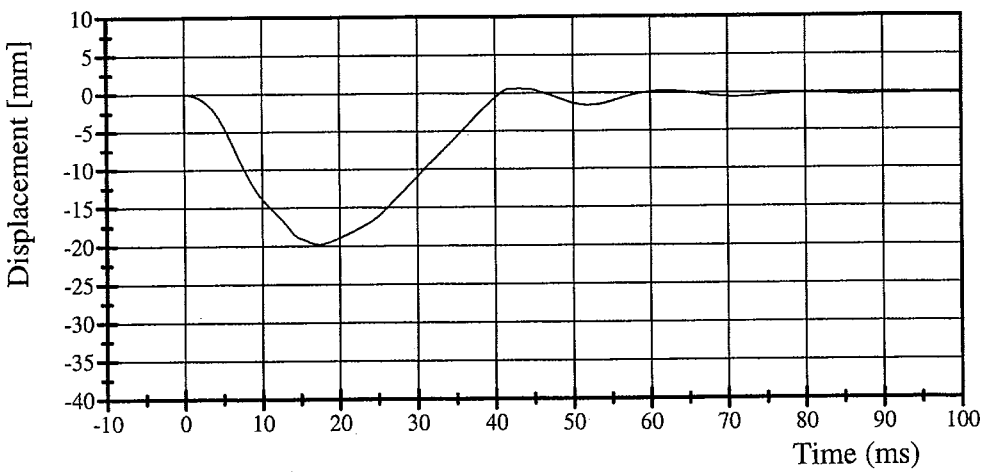


Filter Class: 600

Max: 696.1 N at 42.7 ms

Min: -4410.2 N at 17.0 ms

Tibia Displacement

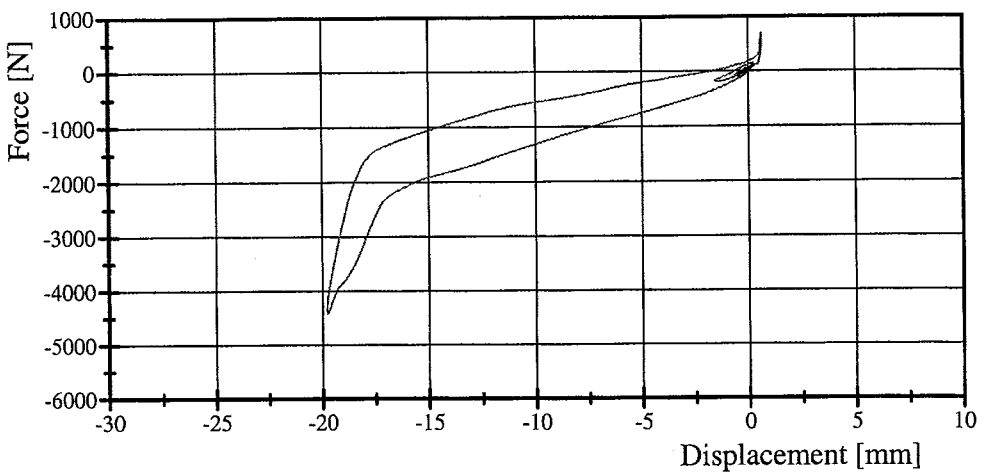


Filter Class: 600

Max: 0.6 mm at 43.1 ms

Min: -19.8 mm at 17.2 ms

Femur Force vs Tibia Displacement



10.07.2002 12:11:54 1804

Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.73 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1364 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2445 N	Yes

Comments:

Technician

Approved

10.07.2002 12:12:40 1787

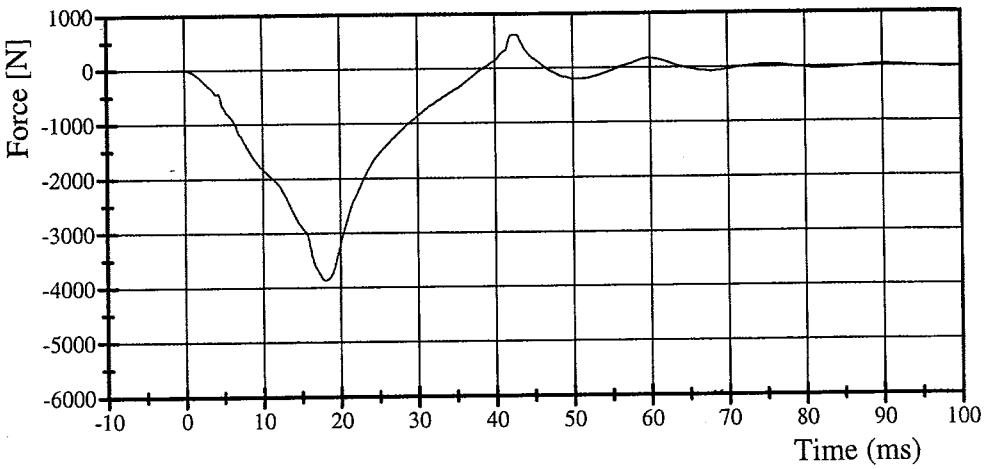
Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Femur Force

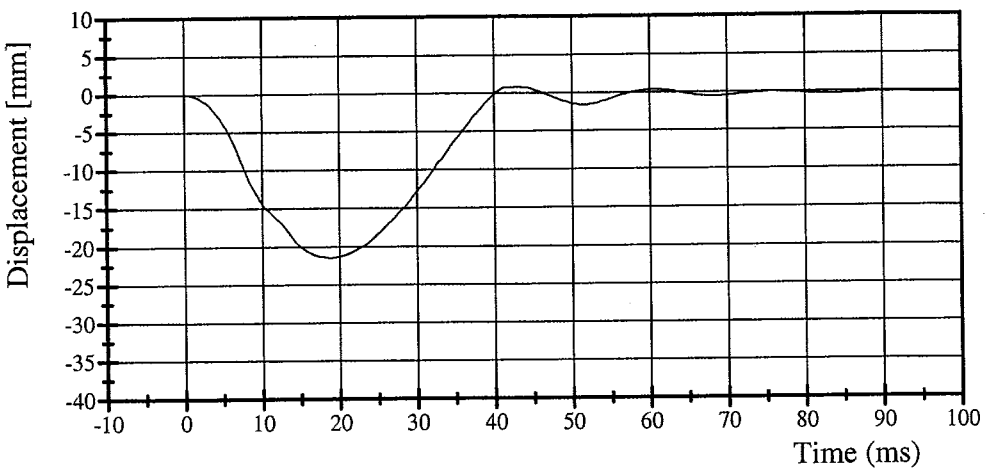


Filter Class: 600

Max: 617.4 N at 42.3 ms

Min: -3870.3 N at 18.0 ms

Tibia Displacement

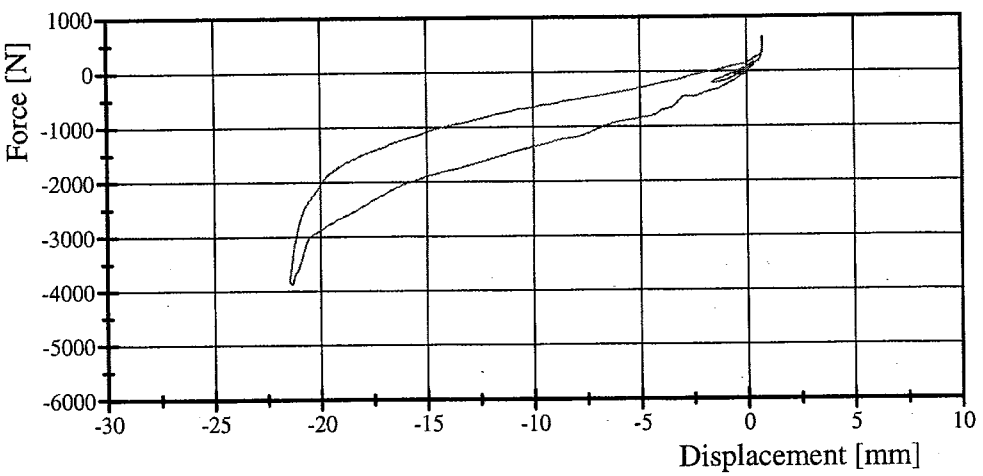


Filter Class: 600

Max: 0.8 mm at 42.7 ms

Min: -21.5 mm at 18.7 ms

Femur Force vs Tibia Displacement



10.07.2002 12:12:42 1787

Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.08 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5386 N	Yes

Comments:

Technician

Approved

10.07.2002 12:13:19 2124

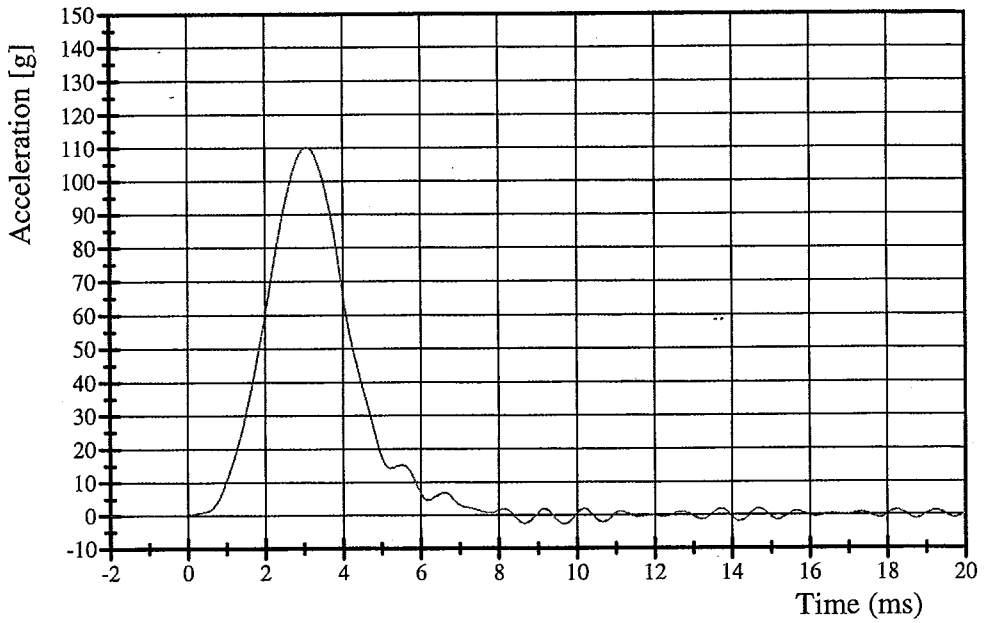
Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Pendulum Deceleration

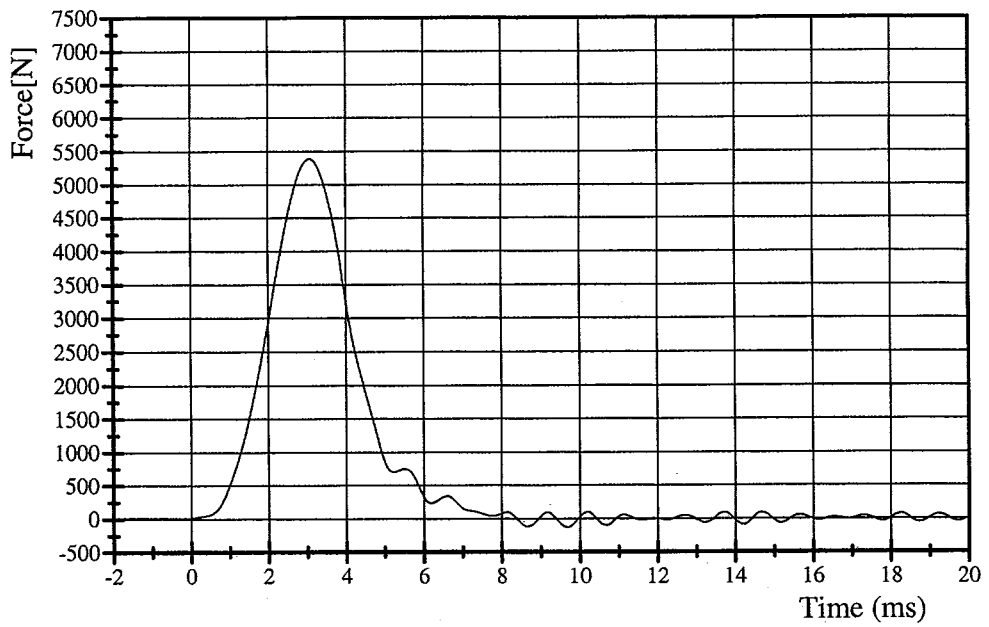


Filter Class: 600

Max: 110.1 g at 3.0 ms

Min: -2.7 g at 9.7 ms

Pendulum Force



Filter Class: 600

Max: 5386.4 N at 3.0 ms

Min: -133.9 N at 9.7 ms

10.07.2002 12:13:21 2124

Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Pendulum Velocity	2.08 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	4716 - 5782 N	5527 N	Yes

Comments:

Technician

Approved

10.07.2002 12:13:50 2126

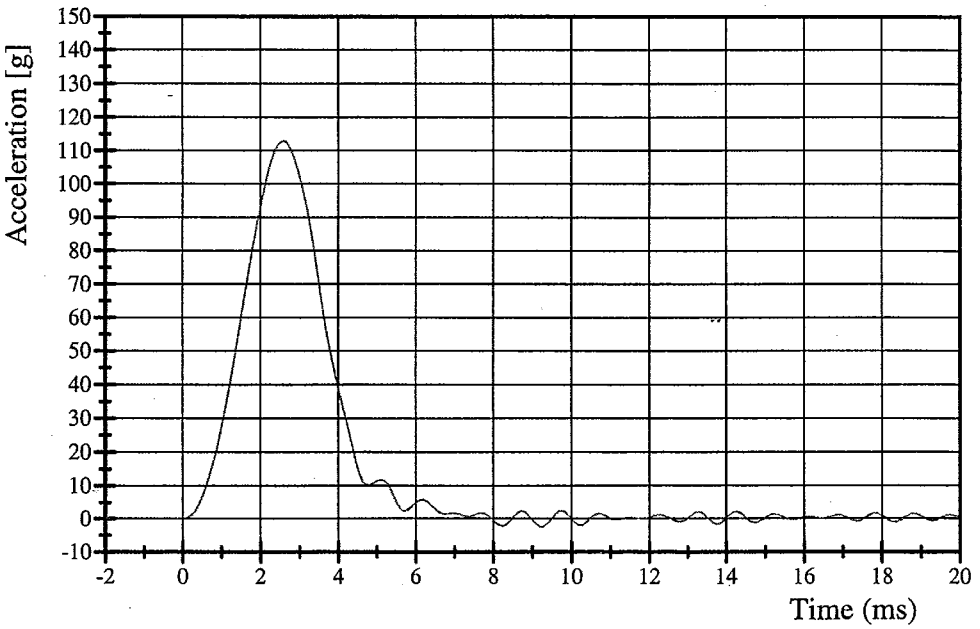
Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 169 Calibration No. 16 - 1

Test Date 10/07/2002

Pendulum Deceleration

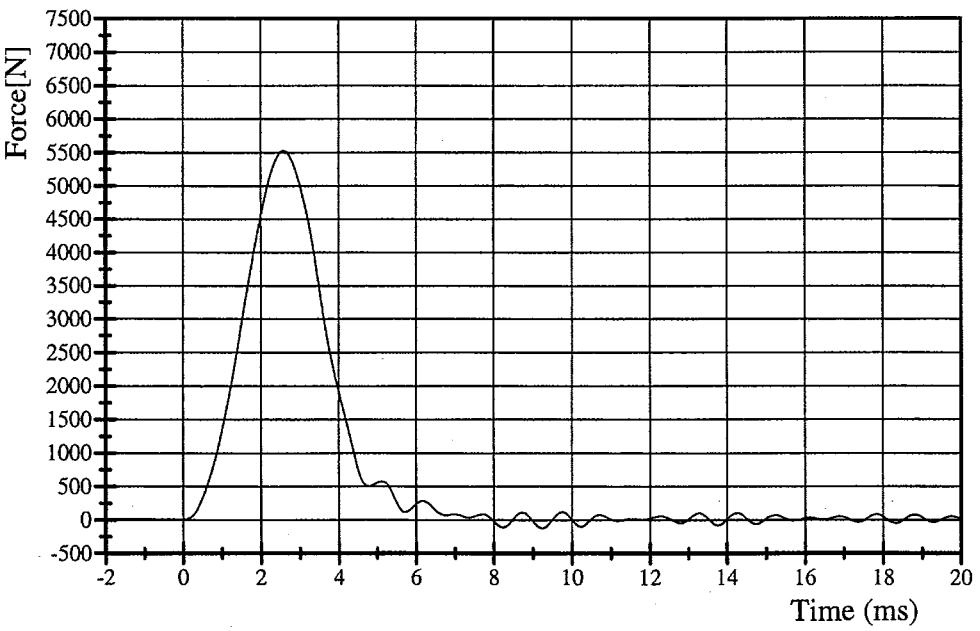


Filter Class: 600

Max: 113.0 g at 2.6 ms

Min: -2.4 g at 9.2 ms

Pendulum Force



Filter Class: 600

Max: 5527.3 N at 2.6 ms

Min: -119.8 N at 9.2 ms

10.07.2002 12:13:51 2126

Pre-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Passenger Dummy S/N: 416

Transportation Research Center Inc.
572O HIII 5th Dummy
External Dimensions
Serial No. 416 Calibration No. 17

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	774.7 - 800.1 mm	779 mm	Yes
Shoulder Pivot Height	B	431.8 - 457.2 mm	443 mm	Yes
Hip Pivot Height	C	81.3 - 86.3 mm	83 mm	Yes
Hip Pivot from Backline	D	144.8 - 149.8 mm	145 mm	Yes
Shoulder Pivot from Backline	E	68.6 - 83.8 mm	76 mm	Yes
Thigh Clearance	F	119.4 - 134.6 mm	123 mm	Yes
Back of Elbow to Wrist Pivot	G	243.9 - 259.0 mm	251 mm	Yes
Head Back to Backline	H	40.7 - 45.7 mm	45 mm	Yes
Shoulder to Elbow Length	I	276.9 - 297.1 mm	287 mm	Yes
Elbow Rest Height	J	182.9 - 203.2 mm	198 mm	Yes
Buttock Knee Length	K	520.7 - 546.1 mm	539 mm	Yes
Popliteal Height	L	355.6 - 375.9 mm	360 mm	Yes
Knee Pivot Height	M	393.7 - 419.1 mm	399 mm	Yes
Buttock Popliteal Height	N	414.1 - 439.4 mm	423 mm	Yes
Chest Depth without Jacket	O	175.3 - 190.5 mm	188 mm	Yes
Foot Length	P	218.5 - 233.6 mm	227 mm	Yes
Buttock to Knee Pivot Length	R	457.2 - 482.6 mm	466 mm	Yes
Head Breadth	S	137.2 - 147.3 mm	142 mm	Yes
Head Depth	T	177.8 - 187.9 mm	184 mm	Yes
Hip Breadth	U	299.8 - 314.9 mm	300 mm	Yes
Shoulder Breadth	V	350.6 - 365.7 mm	360 mm	Yes
Foot Breadth	W	78.8 - 93.9 mm	91 mm	Yes
Head Circumference	X	528.4 - 548.6 mm	546 mm	Yes
Chest Circumference with Jacket	Y	850.9 - 881.3 mm	872 mm	Yes
Waist Circumference	Z	759.5 - 789.9 mm	783 mm	Yes
Reference Location for Chest Circumference	AA	299.8 - 309.8 mm	305 mm	Yes
Reference Location for Waist Circumference	BB	160.1 - 170.1 mm	165 mm	Yes

Technician

Approved

Transportation Research Center Inc.

572O Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/26/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	64 %	Yes
Peak Resultant Acceleration	250 - 300 g	264.1 g	Yes
Peak Lateral Acceleration	15 g Max	6.1 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician

Approved

08.26.2002 11:02:55 617

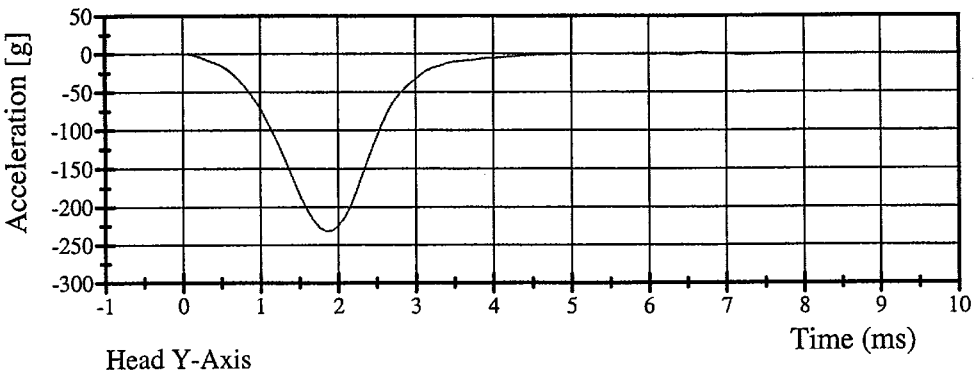
Transportation Research Center Inc.

572O Head Drop Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/26/2002

Head X-Axis

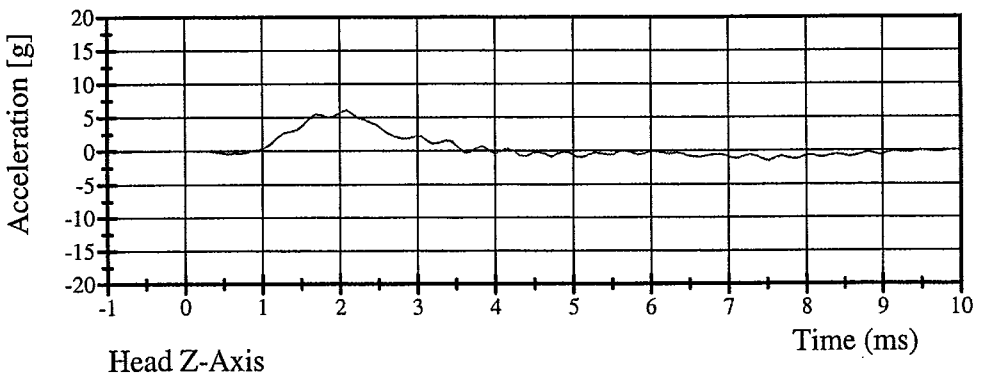


Filter Class: 1000

Max: 1.5 g at 6.7 ms

Min: -232.1 g at 1.8 ms

Head Y-Axis

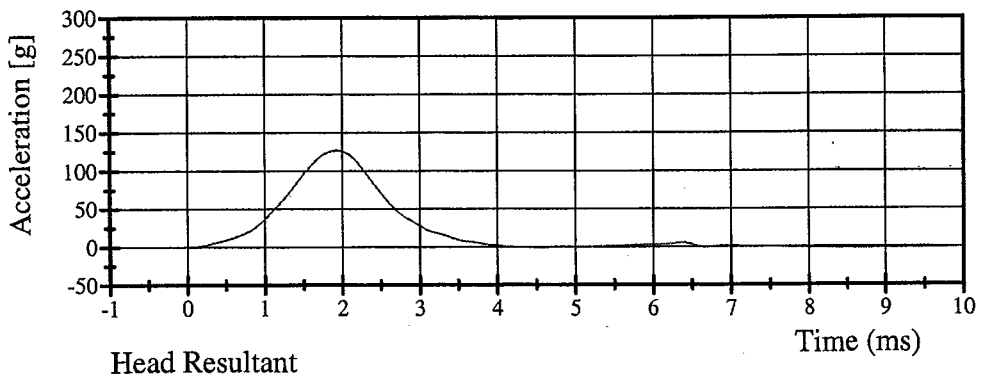


Filter Class: 1000

Max: 6.1 g at 2.1 ms

Min: -1.5 g at 7.5 ms

Head Z-Axis

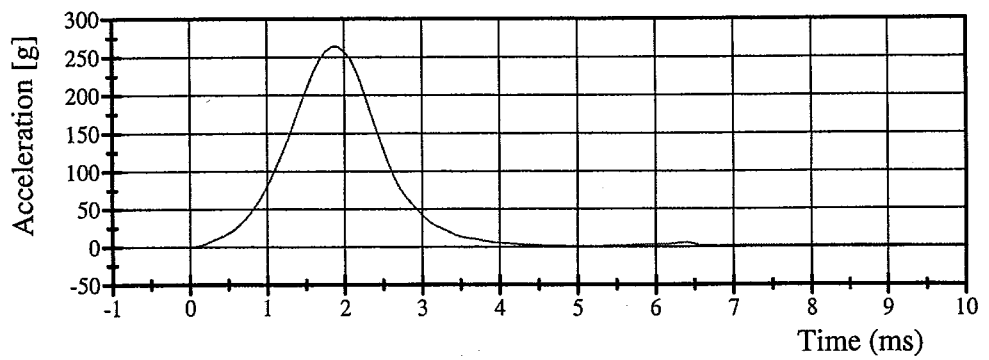


Filter Class: 1000

Max: 127.1 g at 1.9 ms

Min: -1.8 g at 8.6 ms

Head Resultant



Filter Class: 1000

Max: 264.1 g at 1.8 ms

Min: 0.0 g at 1.6 ms

08.26.2002 11:03:02 617

Transportation Research Center Inc.

572O Neck Flexion Test - 6 Channel Transducer

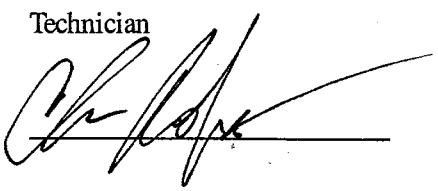
HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

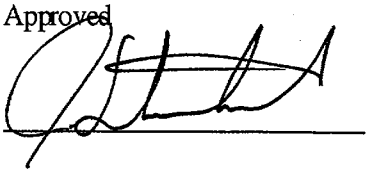
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.10 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.10 - 2.50 m/s	2.33 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.68 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.85 m/s	Yes
Peak D Plane Rotation	77 - 91 °	81.3 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	77.15 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	88.32 ms	Yes

Comments:

Technician



Approved



08.28.2002 12:29:18 456

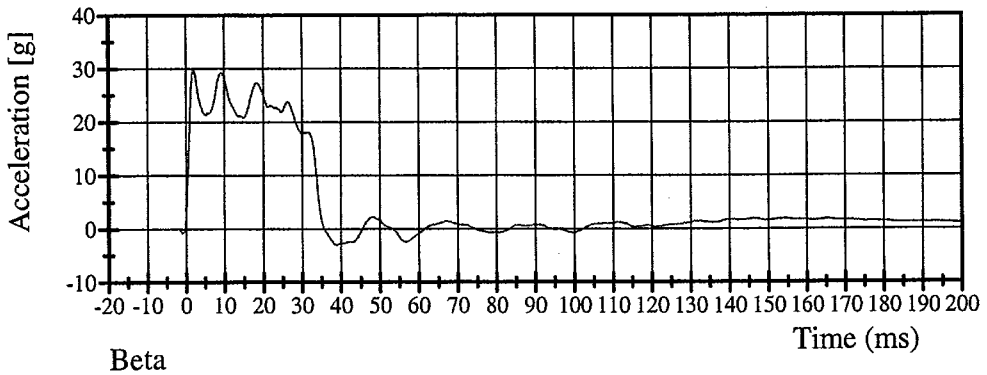
Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Pendulum Deceleration

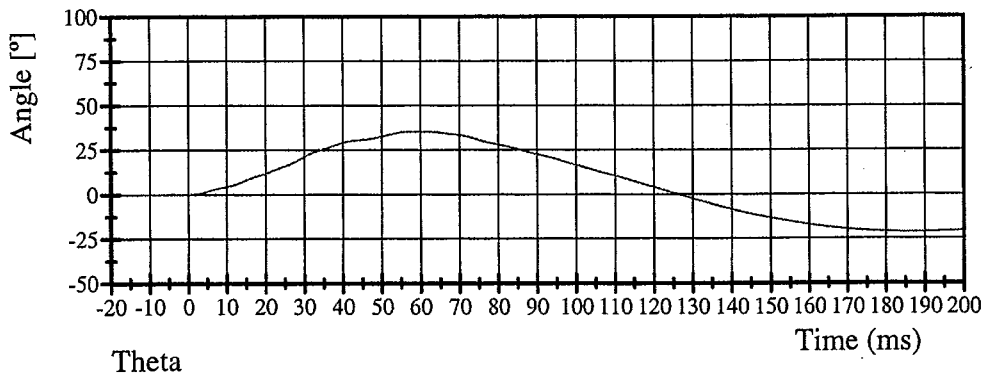


Filter Class: 180

Max: 30.2 g at 1.9 ms

Min: -3.0 g at 38.8 ms

Beta

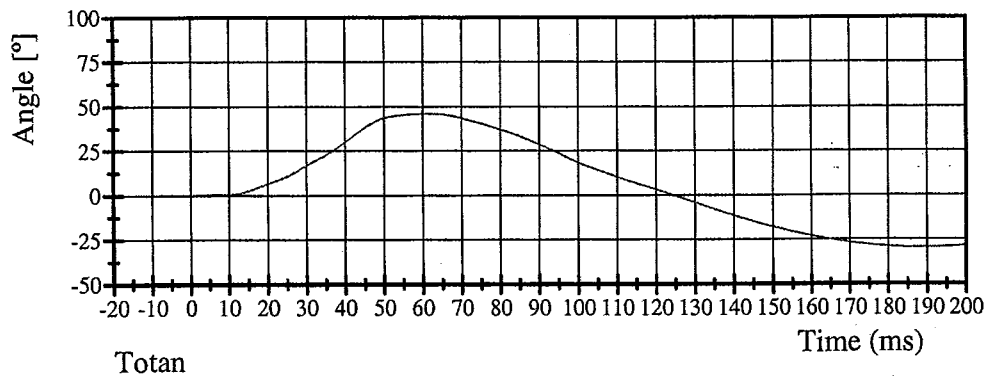


Filter Class: 60

Max: 35.4 ° at 58.7 ms

Min: -21.2 ° at 185.6 ms

Theta

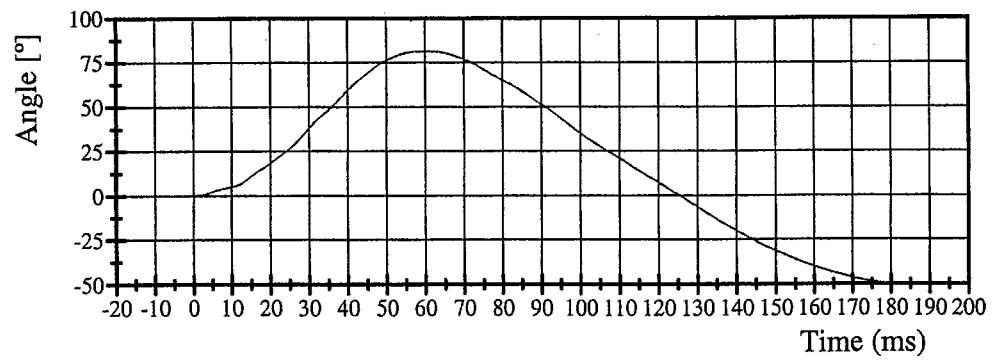


Filter Class: 60

Max: 45.9 ° at 61.0 ms

Min: -29.5 ° at 188.1 ms

Totan



Filter Class: 60

Max: 81.3 ° at 60.4 ms

Min: -50.7 ° at 187.2 ms

08.28.2002 12:29:20 456

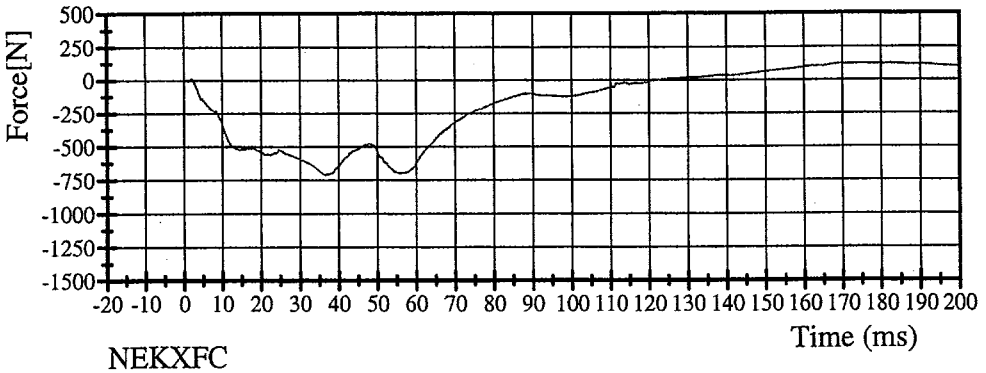
Transportation Research Center Inc.

572O Neck Flexion Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

NEKXF

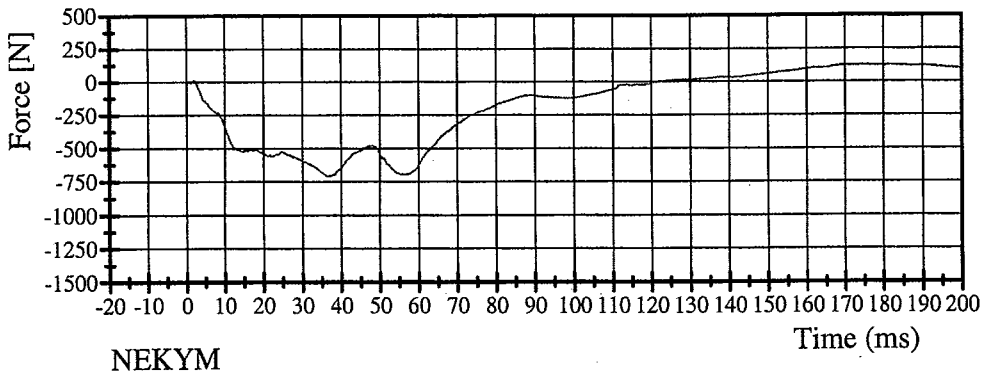


Filter Class: 1000

Max: 124.7 N at 182.8 ms

Min: -709.5 N at 36.7 ms

NEKXFC

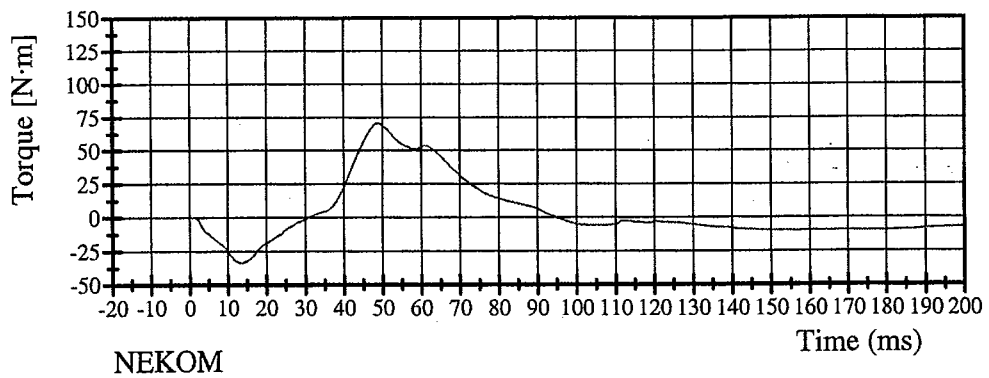


Filter Class: 600

Max: 124.1 N at 182.7 ms

Min: -708.3 N at 36.7 ms

NEKYM

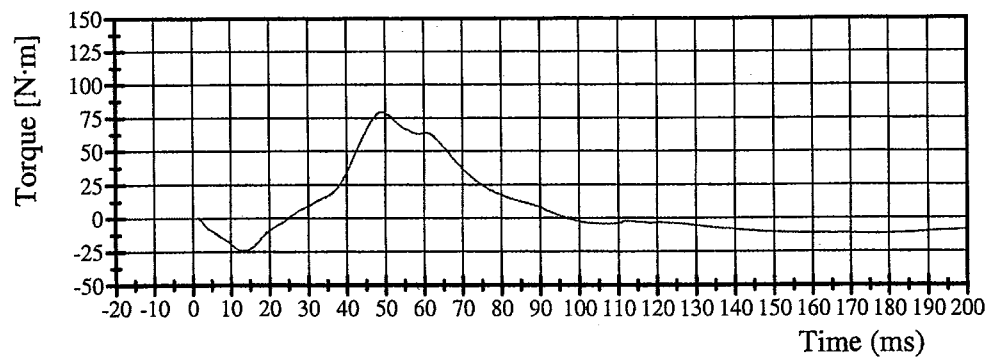


Filter Class: 600

Max: 70.8 N·m at 48.8 ms

Min: -33.5 N·m at 13.5 ms

NEKOM



Filter Class: 600

Max: 79.5 N·m at 49.0 ms

Min: -24.4 N·m at 13.4 ms

08.28.2002 12:29:22 456

Transportation Research Center Inc.

572O Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.18 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.50 - 1.90 m/s	1.64 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.30 m/s	Yes
30 ms	4.60 - 5.60 m/s	4.95 m/s	Yes
Peak D Plane Rotation	99 - 114 °	104.9 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-54.53 N·m	Yes
Positive Moment Decay Time To -10 N·m	94 - 114 ms	106.40 ms	Yes

Comments:

Technician

Approved

08.28.2002 12:52:06 528

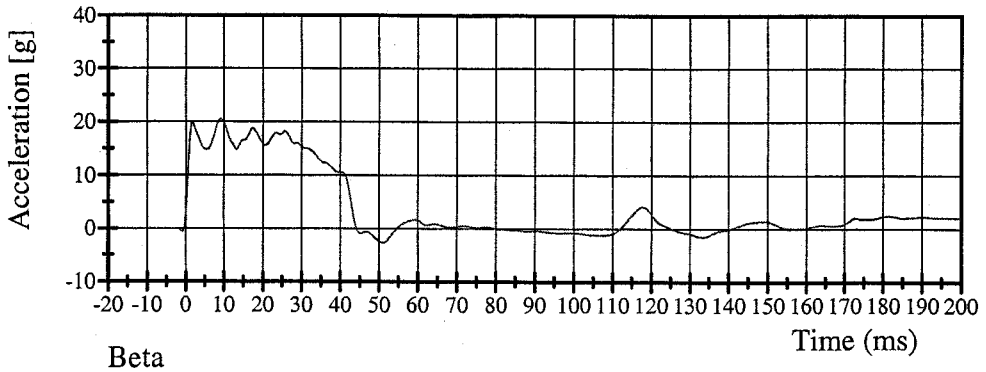
Transportation Research Center Inc.

572O Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Pendulum Deceleration

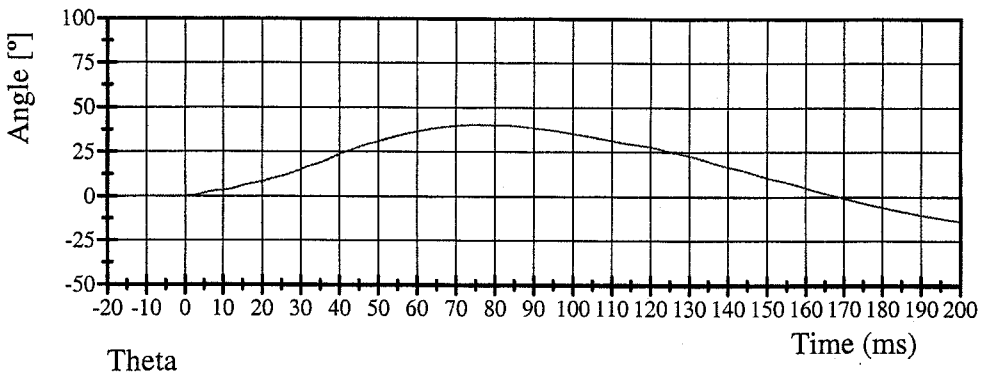


Filter Class: 180

Max: 20.5 g at 9.2 ms

Min: -2.7 g at 51.0 ms

Beta

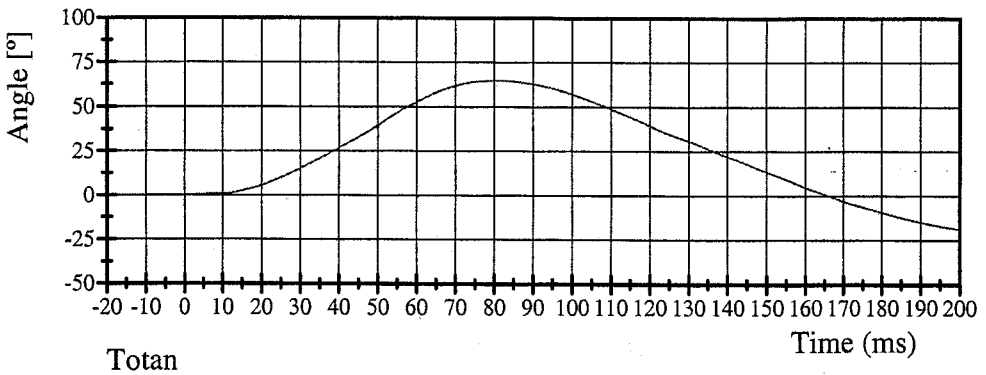


Filter Class: 60

Max: 40.3 ° at 74.8 ms

Min: -16.4 ° at 213.4 ms

Theta

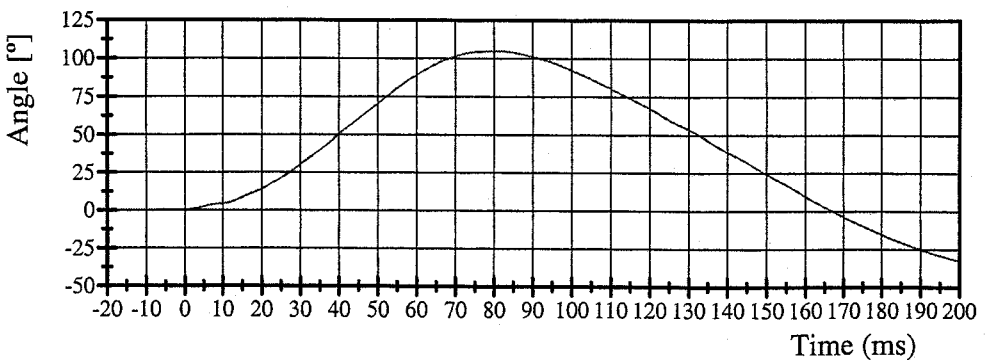


Filter Class: 60

Max: 64.8 ° at 81.4 ms

Min: -20.6 ° at 213.1 ms

Totan



Filter Class: 60

Max: 104.9 ° at 81.2 ms

Min: -36.9 ° at 213.3 ms

08.28.2002 12:52:11 528

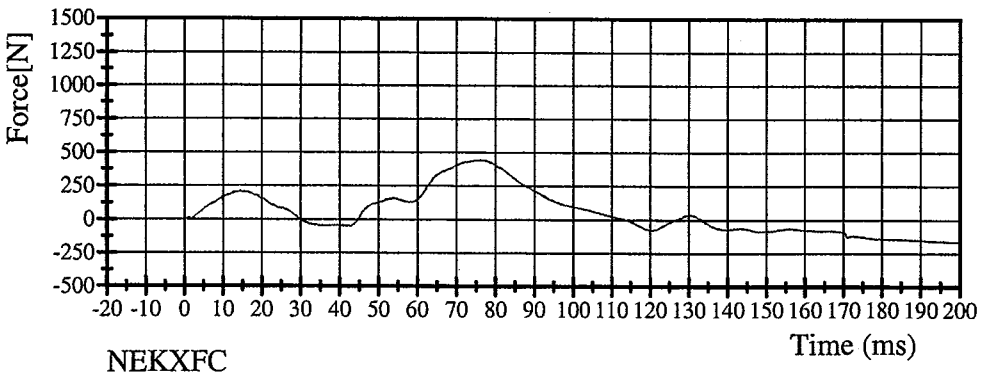
Transportation Research Center Inc.

572O Neck Extension Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

NEKXF

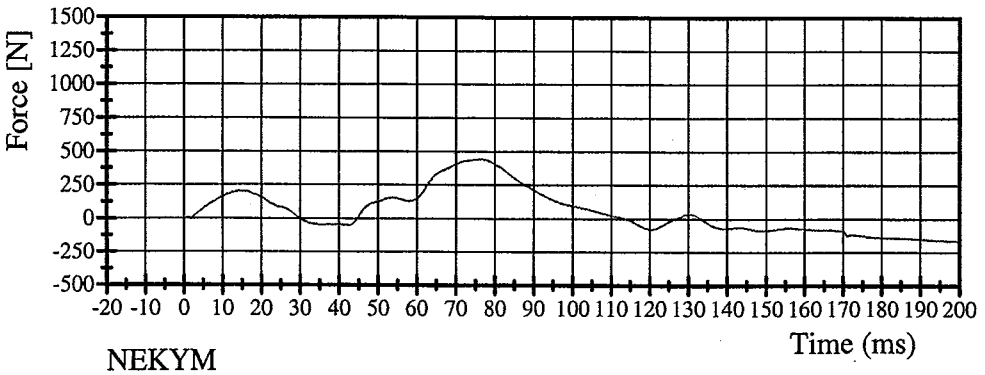


Filter Class: 1000

Max: 442.1 N at 76.6 ms

Min: -167.0 N at 202.2 ms

NEKXFC

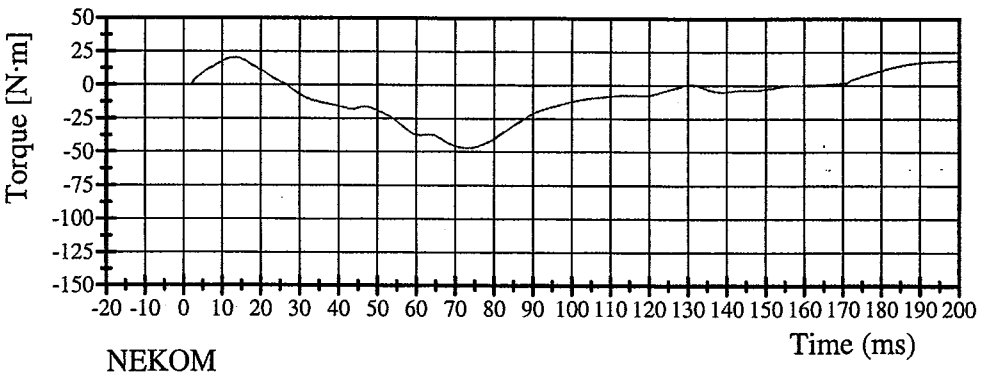


Filter Class: 600

Max: 441.7 N at 76.6 ms

Min: -166.6 N at 202.2 ms

NEKYM

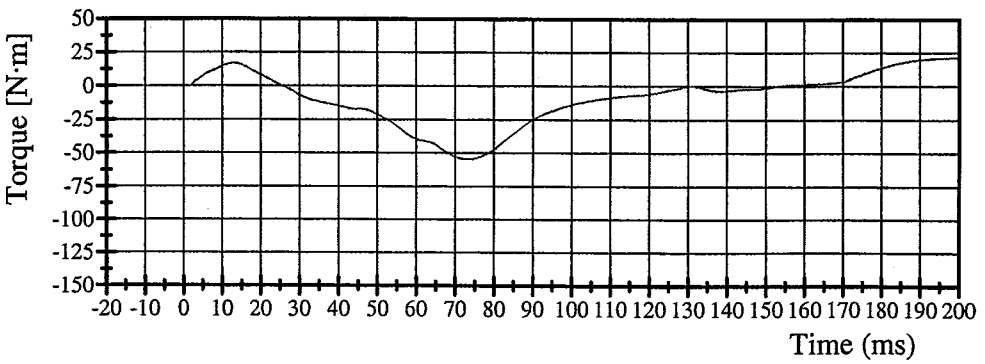


Filter Class: 600

Max: 20.3 N·m at 13.3 ms

Min: -46.9 N·m at 73.3 ms

NEKOM



Filter Class: 600

Max: 21.5 N·m at 204.8 ms

Min: -54.5 N·m at 73.6 ms

08.28.2002 12:52:19 528

Transportation Research Center Inc.

572O Thorax Test

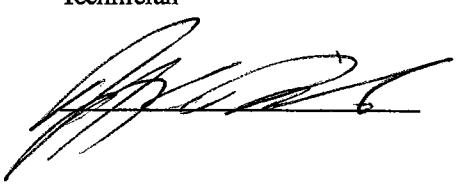
HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 09/10/2002

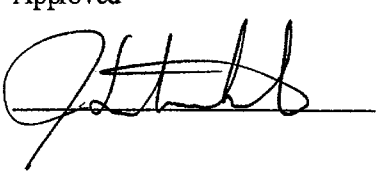
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.63 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-52.8 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4106 N	Yes
Internal Hysteresis	105 % Max.	100 %	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician



Approved



09.10.2002 07:24:16 1712

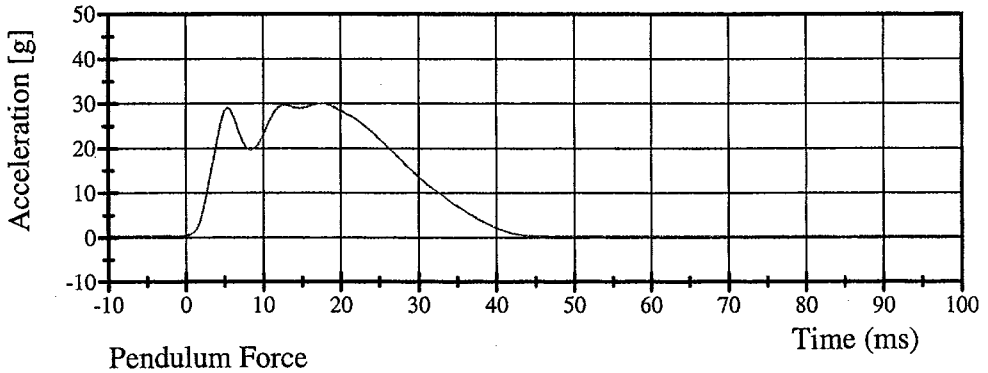
Transportation Research Center Inc.

572O Thorax Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 09/10/2002

Pendulum Deceleration

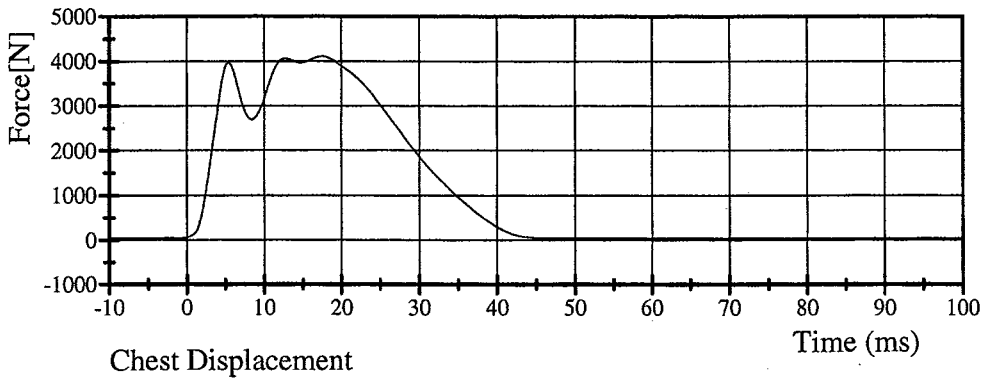


Filter Class: 180

Max: 30.0 g at 17.5 ms

Min: -0.0 g at -135.8 ms

Pendulum Force

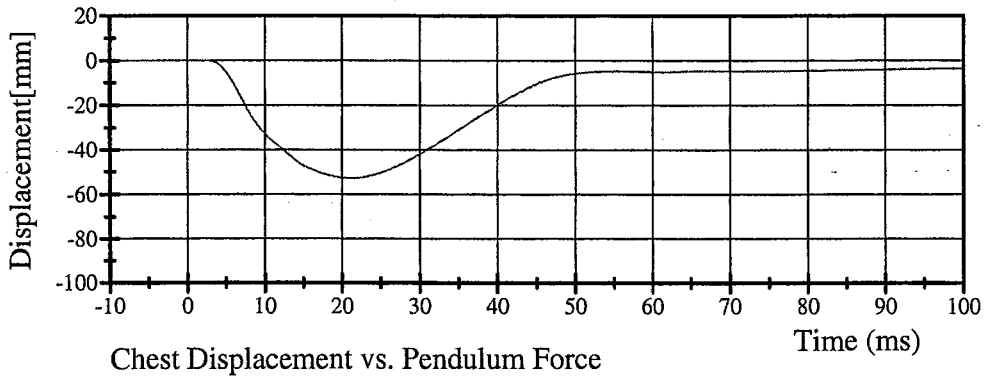


Filter Class: 180

Max: 4106.2 N at 17.5 ms

Min: -2.0 N at -135.8 ms

Chest Displacement

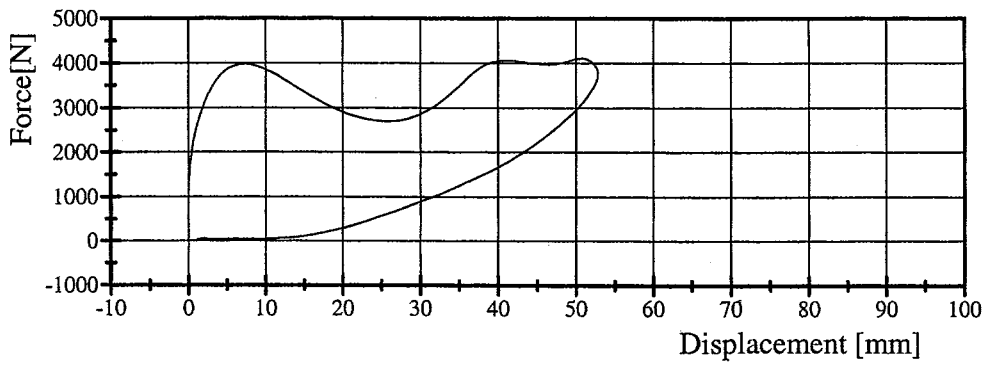


Filter Class: 180

Max: 0.0 mm at 2.0 ms

Min: -52.8 mm at 21.1 ms

Chest Displacement vs. Pendulum Force



09.10.2002 07:24:20 1712

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

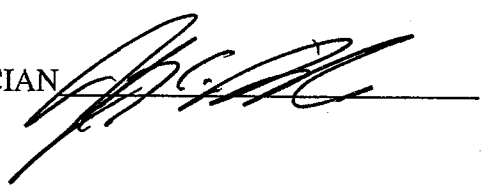
HYBRID III SMALL FEMALE

CAL DATE: 06-Sep-02

TRC, INC. TEST NO: 421C10TF1 572 O SN421 TORSO FLEX CAL 10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 – 70 %	55 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY	<= 20 DEG. REFERENCED TO VERTICAL	14.8 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	323.70 N
RETURN ANGLE		19.8 DEG.
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 DEG. OF INTIAL ANGLE	5.0 DEG.

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572O Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/26/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.6 mm	Yes

Comments:

Technician

Approved

08.28.2002 08:10:11 1360

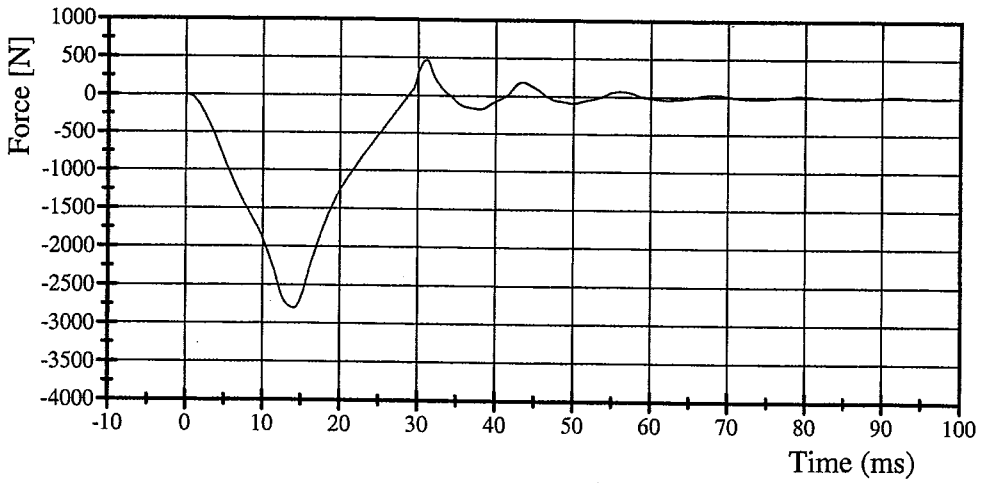
Transportation Research Center Inc.

572O Left Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/26/2002

Femur Force

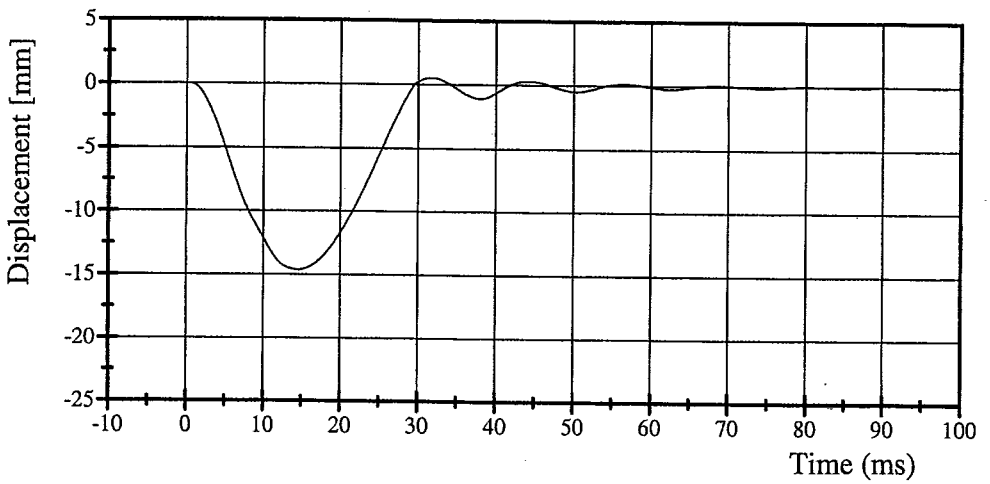


Filter Class: 600

Max: 465.7 N at 31.0 ms

Min: -2800.3 N at 14.1 ms

Tibia Displacement

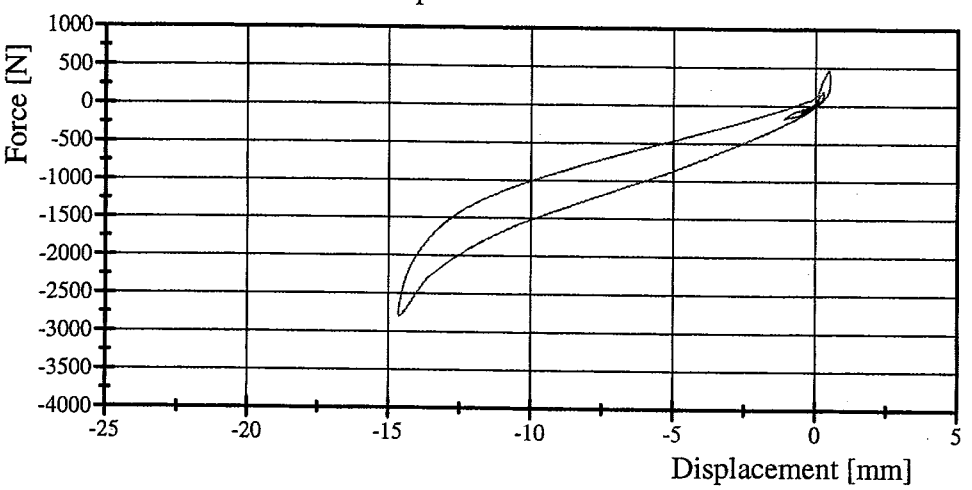


Filter Class: 600

Max: 0.5 mm at 31.8 ms

Min: -14.6 mm at 14.6 ms

Femur Force vs Tibia Displacement



08.28.2002 08:07:02 1360

Transportation Research Center Inc.

572O Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/26/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.6 mm	Yes

Comments:

Technician

Approved

08.26.2002 15:11:50 1361

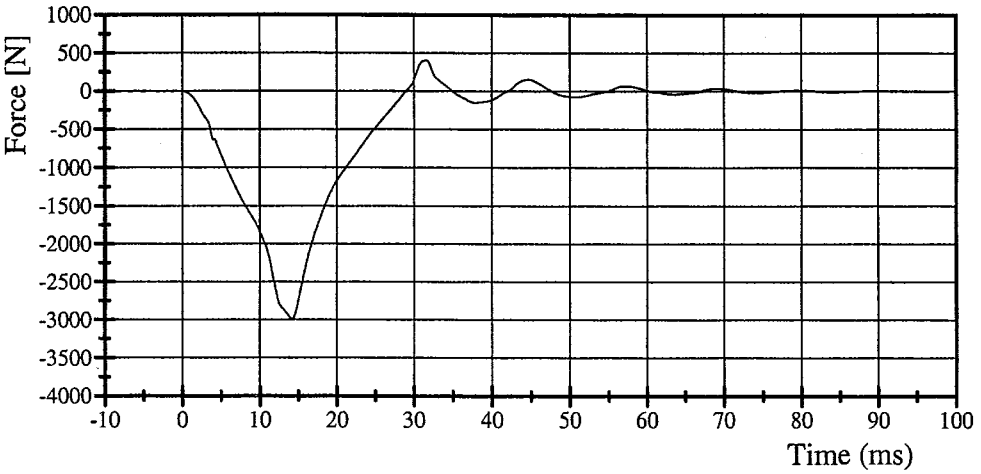
Transportation Research Center Inc.

572O Right Knee Slider Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/26/2002

Femur Force

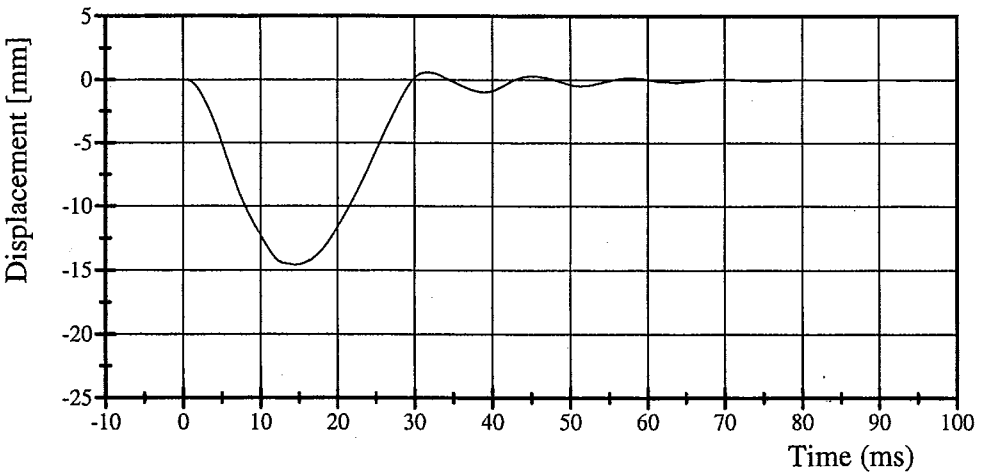


Filter Class: 600

Max: 402.3 N at 31.6 ms

Min: -2989.0 N at 14.2 ms

Tibia Displacement

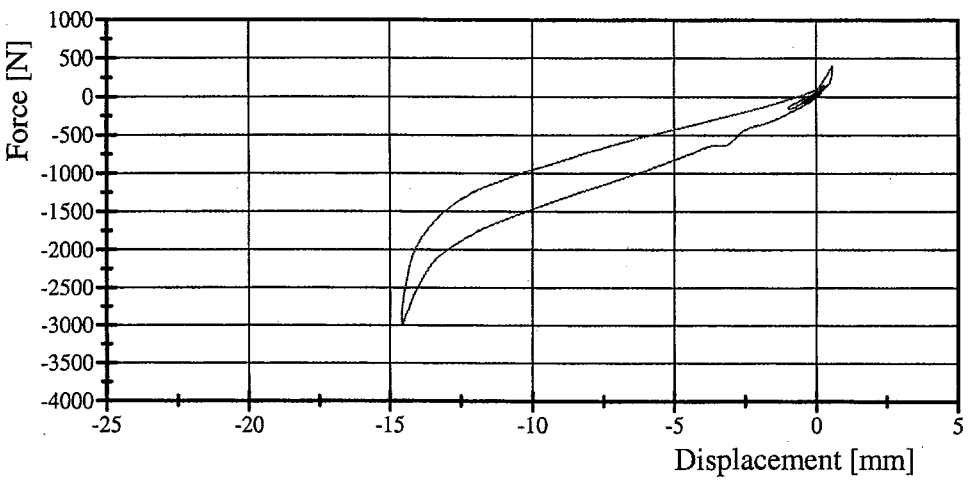


Filter Class: 600

Max: 0.6 mm at 31.7 ms

Min: -14.6 mm at 14.6 ms

Femur Force vs Tibia Displacement



08.26.2002 15:11:52 1361

Transportation Research Center Inc.

572O Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3946 N	Yes

Comments:

Technician

Approved

08.28.2002 10:17:39 1760

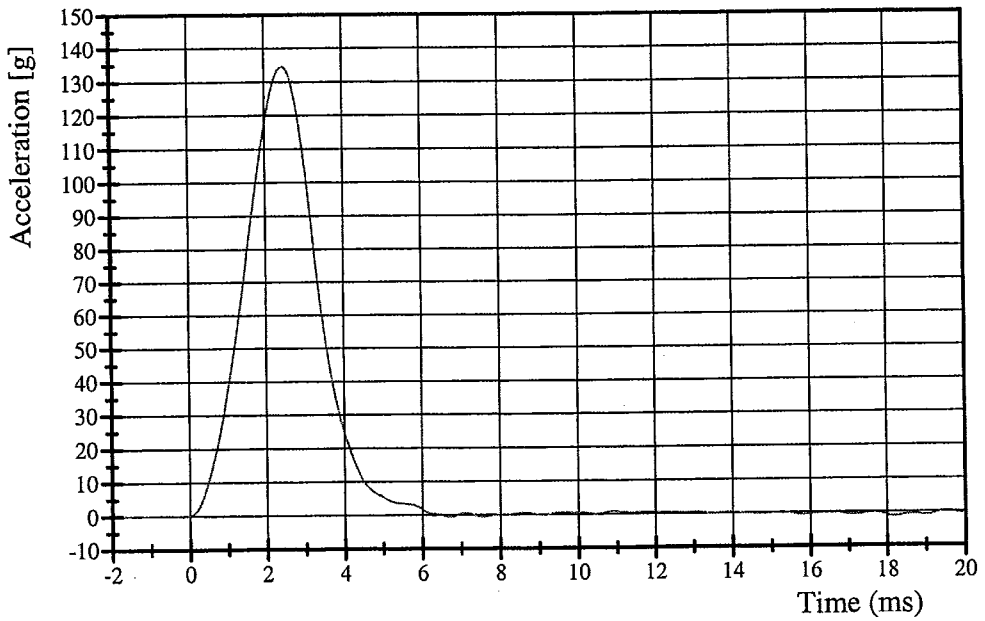
Transportation Research Center Inc.

572O Left Knee Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Pendulum Deceleration

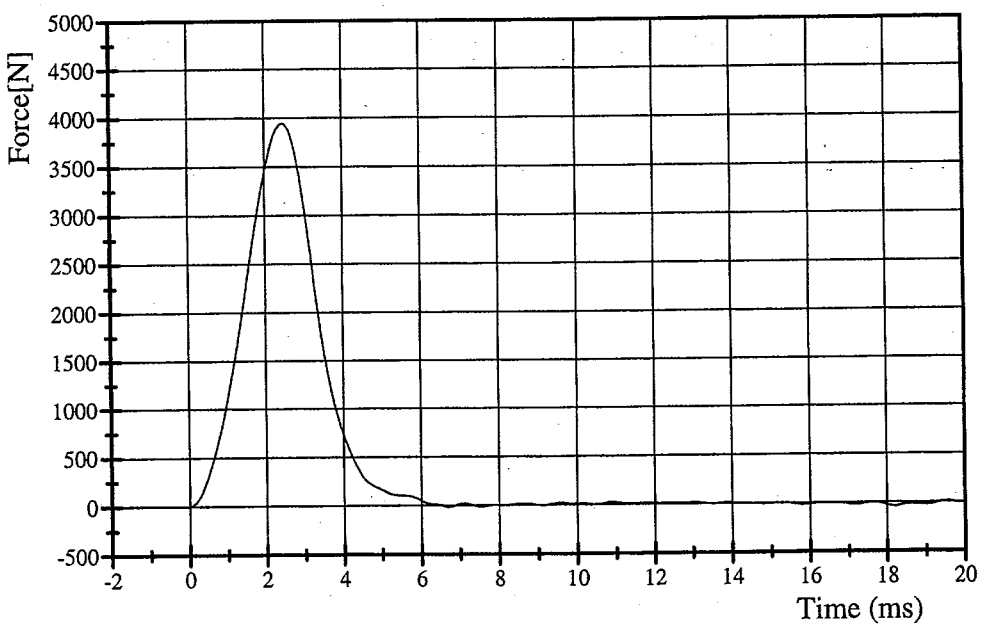


Filter Class: 600

Max: 134.6 g at 2.5 ms

Min: -1.3 g at 18.2 ms

Pendulum Force



Filter Class: 600

Max: 3945.9 N at 2.5 ms

Min: -37.8 N at 18.2 ms

08.28.2002 10:17:41 1760

Transportation Research Center Inc.

572O Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3748 N	Yes

Comments:

Technician

Approved

08.28.2002 10:21:48 1755

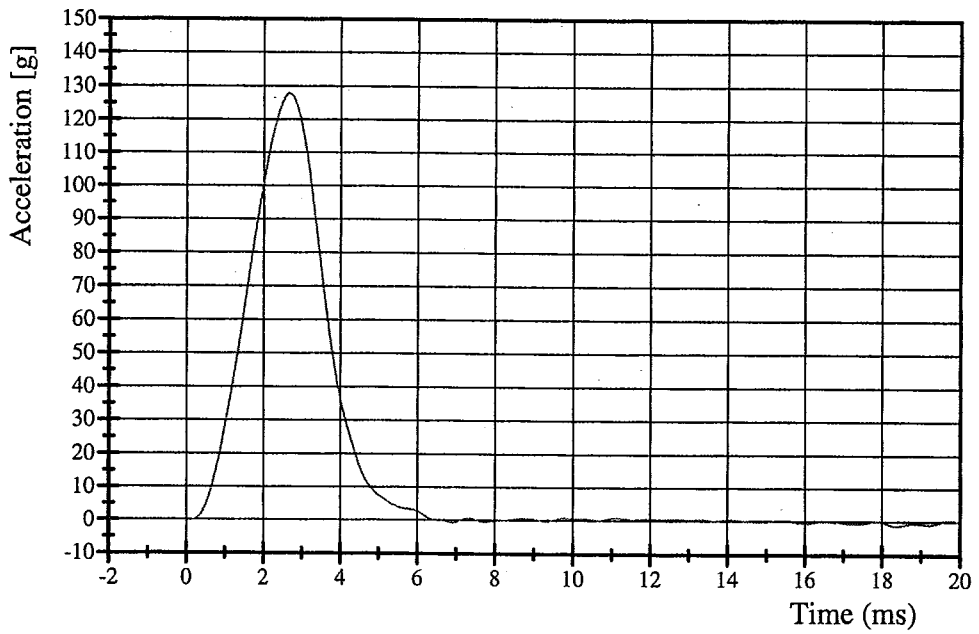
Transportation Research Center Inc.

572O Right Knee Test

HIII 5th Female Serial No. 421 Calibration No. 10 - 1

Test Date 08/28/2002

Pendulum Deceleration

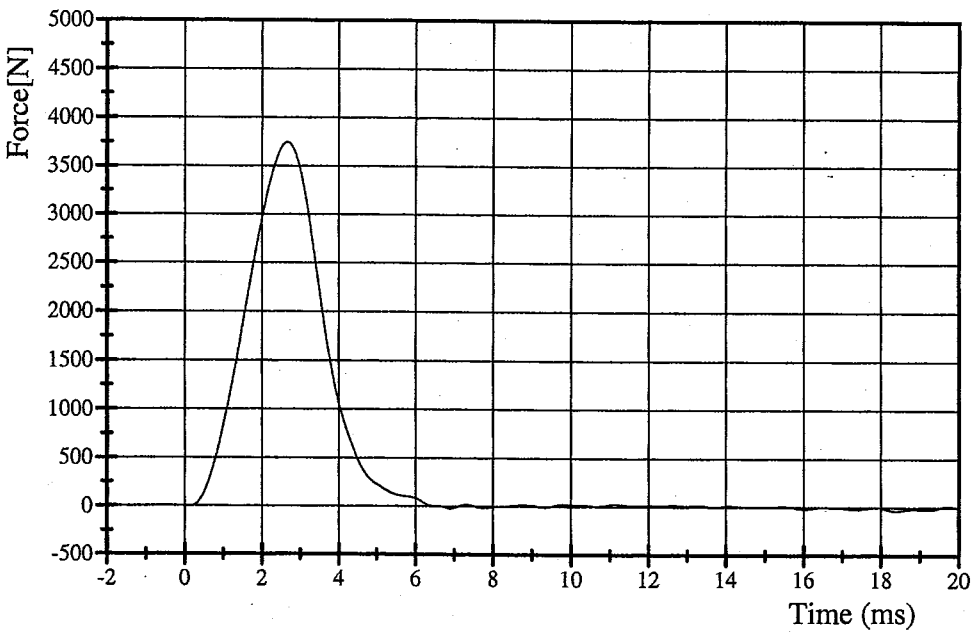


Filter Class: 600

Max: 127.8 g at 2.6 ms

Min: -1.3 g at 18.4 ms

Pendulum Force



Filter Class: 600

Max: 3748.3 N at 2.6 ms

Min: -36.7 N at 18.4 ms

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Post-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Passenger Dummy S/N: 416

No post-test calibration.

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:	Leftward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (in relation to a seated dummy)

Rotation potentiometers:

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

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

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

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

Frequency Response Classes
SAE J211 MAR95

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

Bullet Vehicle Dual Stage Airbag Event Information

Inductive pick-ups to monitor airbag fire times were labeled “A” and “B” rather than primary and secondary, because wiring information to distinguish primary and secondary was not available.

The following set-up information was recorded for the bullet vehicle in test 021005:

Driver A, DABETA, inductive pick-up 5, was placed on the red with orange airbag plug wire.

Driver B, DABETB, inductive pick-up 3, was placed on the gray with orange airbag plug wire.

Passenger A, PABETA, inductive pick-up 4, was placed on the red with black airbag plug wire.

Passenger B, PABETB, inductive pick-up D, was placed on the red with white airbag plug wire.

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

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

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

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

1. Every frame will have **one** LED appear in it. This indicates a *millisecond* pulse.

2. Every ten frames will have **two** LEDs appear in it. These indicate a *millisecond* pulse plus a *hundredth of a second* pulse.

3. Every one hundred frames will have **three** LEDs appear in it. These indicate a *millisecond* pulse, a *hundredth of a second* pulse, and a *tenth of a second* pulse.

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

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

Channel Report

0030	4929J-75-FZ	ANRZFA	Right Lower Tibia Force Z	Ank	16669.709	N	+	7/17/2002	OK	169v	Denton	4929J
0031	4929J-75-MX	ANRXMA	Right Lower Tibia Moment X	Ank	591.82488	N·m	+	7/17/2002	OK	169v	Denton	4929J
0032	4929J-75-MY	ANRYMA	Right Lower Tibia Moment Y	Ank	592.12989	N·m	+	7/17/2002	OK	169v	Denton	4929J
0033	02A02-F02	HEDXGB	Head Accel X	Fwd	1199.9062	g	+	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0034	02A18-N10	HEDYGB	Head Accel Y	Lft	1210.6737	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0035	02A09-F15	HEDZGB	Head Accel Z	Up	1197.3807	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0036	01L26-F02	HEDXRB	Head Accel Red X	Rwd	1205.7839	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0037	02A09-F13	HEDYRB	Head Accel Red Y	Lft	1187.9901	g	-	8/5/2002	OK	416v	Entran	EGE-73B6Q-200
0038	02A16-A06	HEDZRB	Head Accel Red Z	Up	1196.5412	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0039	IF-205-161-FX	NEKXFB	Neck Force X	Hd	13338.750	N	-	3/18/2002	OK	416v	FTSS	IF-205
0040	IF-205-161-FY	NEKYFB	Neck Force Y	Hd	13338.786	N	+	3/18/2002	OK	416v	FTSS	IF-205
0041	IF-205-161-FZ	NEKZFB	Neck Force Z	Hd	20027.556	N	+	3/18/2002	OK	416v	FTSS	IF-205
0042	IF-205-161-MX	NEKXMB	Neck Moment X	Rt Ear	423.58502	N·m	-	3/18/2002	OK	416v	FTSS	IF-205
0043	IF-205-161-MY	NEKYMB	Neck Moment Y	Chin	424.34279	N·m	+	3/18/2002	OK	416v	FTSS	IF-205
0044	IF-205-161-MZ	NEKZMB	Neck Moment Z	Chn	423.65464	N·m	+	3/18/2002	OK	416v	FTSS	IF-205
0045	3251-108-FX	NKLXFB	Neck Lwr Force X	Hd	13350.194	N	-	8/21/2001	---	416v	Denton	3251
0046	3251-108-FY	NKLYFB	Neck Lwr Force Y	Hd	13337.912	N	+	8/21/2001	---	416v	Denton	3251
0047	3251-108-FZ	NKLZFB	Neck Lwr Force Z	Hd	19999.799	N	+	8/21/2001	---	416v	Denton	3251
0048	3251-108-MX	NKLXMB	Neck Lwr Moment X	Rt Ear	423.72625	N·m	-	8/21/2001	---	416v	Denton	3251
0049	3251-108-MY	NKLYMB	Neck Lwr Moment Y	Chn	423.94740	N·m	+	8/21/2001	---	416v	Denton	3251
0050	3251-108-MZ	NKLZMB	Neck Lwr Moment Z	Chn	424.30015	N·m	+	8/21/2001	---	416v	Denton	3251
0051	02A16-A04	CSTXGB	Chest Accel X	Fwd	602.28562	g	+	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0052	C02B19-F02	CSTYGB	Chest Accel Y	Lft	598.86893	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0053	C02B19-F06	CSTZGB	Chest Accel Z	Up	597.88637	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0054	B02A25-N08	CSTXRB	Chest Accel Red X	Rwd	597.46776	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0055	01L17-F09	CSTYRB	Chest Accel Red Y	Lft	598.88644	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0056	C02B19-F04	CSTZRB	Chest Accel Red Z	Up	600.93896	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0057	14CB1-2897-416	CSTXDB	Chest Deflection X 516	Strnm	98.566265	mm	+	6/18/2001	---	416v	Servo	14CB1-2897
0058	C02B19-F03	PEVXGB	Pelvis Accel X	Rwd	601.17887	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0059	02A16-A27	PEVYGB	Pelvis Accel Y	Lft	600.09376	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0060	C02B19-F01	PEVZGB	Pelvis Accel Z	Up	602.05191	g	-	8/1/2002	OK	416v	Entran	EGE-73B6Q-200
0061	2430-736	LFMZFB	Left Femur Force Z #8	Knee	20010.993	N	+	3/18/2002	OK	416v	GSE	2430
0062	2430-742	RFMZFB	Right Femur Force Z 507	Knee	20018.276	N	+	3/18/2002	OK	416v	GSE	2430
0063	150-0121VR-555	KNLXDB	Left Knee Displacement	Tib	43.132134	mm	-	5/8/2002	OK	416v	SpaceAge	150-0121VR
0064	150-0121VL-548	KNRXDB	Right Knee Displacement	Tib	43.923990	mm	-	5/8/2002	OK	416v	SpaceAge	150-0121VL

Channel Report

0065	4825J-79-FZ	TBLZFB	Left Upr Tibia Force Z	Tib	13346.796	N	+	7/16/2002	OK	416v	Denton	4825J
0066	4825J-79-MX	TBLXMB	Left Upr Tibia Moment X	Ank	423.46176	N·m	+	7/16/2002	OK	416v	Denton	4825J
0067	4825J-79-MY	TBLYMB	Left Upr Tibia Moment Y	Ank	423.81801	N·m	+	7/16/2002	OK	416v	Denton	4825J
0068	4826J-77-FZ	ANLZFB	Left Lwr Tibia Force Z	Ank	13338.746	N	+	7/16/2002	OK	416v	Denton	4826J
0069	4826J-77-MX	ANLXMB	Left Lwr Tibia Moment X	Ank	423.27857	N·m	+	7/16/2002	OK	416v	Denton	4826J
0070	4826J-77-MY	ANLYMB	Left Lwr Tibia Moment Y	Ank	424.61364	N·m	+	7/16/2002	OK	416v	Denton	4826J
0071	4825J-76-FZ	TBRZFB	Right Upr Tibia Force Z	Tib	13342.011	N	+	7/16/2002	OK	416v	Denton	4825J
0072	4825J-76-MX	TBRXMB	Right Upr Tibia Moment X	Ank	423.38267	N·m	+	7/16/2002	OK	416v	Denton	4825J
0073	4825J-76-MY	TBRYMB	Right Upr Tibia Moment Y	Ank	424.24212	N·m	+	7/16/2002	OK	416v	Denton	4825J
0074	4826J-78-FZ	ANRZFB	Right Lwr Tibia Force Z	Ank	13338.830	N	+	7/16/2002	OK	416v	Denton	4826J
0075	4826J-78-MX	ANRXMB	Right Lwr Tibia Moment X	Ank	423.56700	N·m	+	7/16/2002	OK	416v	Denton	4826J
0076	4826J-78-MY	ANRYMB	Right Lwr Tibia Moment Y	Ank	423.89025	N·m	+	7/16/2002	OK	416v	Denton	4826J
0077	J20184	VCGXGA	VEHICLE CG X-AXIS	FWD	1009.8619	g	+	5/23/2002	OK	-1	Endevco	7264-2000TZ
0078	J37990	VCGYGA	VEHICLE CG Y-AXIS	RT	1006.6454	g	+	9/18/2002	OK	-1	Endevco	7264-2000TZ
0079	J20025	VCGZGA	VEHICLE CG Z-AXIS	UP	1011.6577	g	-	8/1/2002	OK	-1	Endevco	7264-2000TZ
0080	P22077	RDKXGA	REAR DECK X-AXIS	FWD	993.08525	g	+	7/11/2002	OK	VRTC	Endevco	7264C-2K-2-180
0081	P23820	RDKYGA	REAR DECK Y-AXIS	LT	1008.5887	g	-	8/15/2002	OK	VRTC	Endevco	7264C-2K-2-180
0082	J40978	RDKZGA	REAR DECK Z-AXIS	UP	997.60341	g	-	10/4/2002	OK	VRTC	Endevco	7264-2000TZ
0083	J36168	LRSXGA	LEFT REAR SILL X-AXIS	FWD	1475.6956	g	+	9/4/2002	OK	VRTC	Endevco	7264-2000TZ
0084	J36199	LRSYGA	LEFT REAR SILL Y-AXIS	LT	1512.4660	g	-	9/4/2002	OK	VRTC	Endevco	7264-2000TZ
0085	J35583	LRSZGA	LEFT REAR SILL Z-AXIS	UP	1499.7070	g	-	9/4/2002	OK	VRTC	Endevco	7264-2000TZ
0086	J34758	RRSXGA	RIGHT REAR SILL X-AXIS	FWD	1506.4361	g	+	10/21/2002	OK	VRTC	Endevco	7264-2000TZ
0087	P23842	RRSYGA	RIGHT REAR SILL Y-AXIS	LT	1488.7399	g	-	8/15/2002	OK	VRTC	Endevco	7264C-2K-2-180
0088	P23843	RRSZGA	RIGHT REAR SILL Z-AXIS	UP	1491.8414	g	-	8/19/2002	OK	VRTC	Endevco	7264C-2K-2-180
0089	J14374	EDRV2XA	EDR PLATE X-AXIS	FWD	600.06211	g	+	6/6/2002	OK	VRTC	Endevco	7264-2000T
0090	J40971	EDRV2YA	EDR PLATE Y-AXIS	LT	1506.2367	g	-	6/6/2002	OK	VRTC	Endevco	7264-2000TZ
0091	J40970	EDRV2ZA	EDR PLATE Z-AXIS	UP	1480.9672	g	-	6/6/2002	OK	VRTC	Endevco	7264-2000TZ
0092	ABFire	DABETA	DRIVER AIRBAG EVENT -	5	5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A
0093	ABFire	DABETB	DRIVER AIRBAG EVENT -	3	5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A
0094	ABFire	PABETA	PASSENGER AIRBAG EVENT	4	5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A
0095	ABFire	PABETB	PASSENGER AIRBAG EVENT	D	5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A

Channel Report

10/25/2002 3:37:44 PM

Name of Test 021005 **System** K3600 **Name of DAU** DAU1

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
1000	EVENT	SYNC1	SYNC1		10.24	V	+	4/15/2002	OK	-1	TRC	Event
1001	J17649	HEDXG1	Head Accel X	Rwd	1184.0751	g	-	5/24/2002	OK	168v	Endevco	7264-2KM5T
1002	AJ454	HEDYG1	Head Accel Y	Lft	1195.1447	g	-	5/24/2002	OK	168v	Endevco	7264-2000T
1003	J14189	HEDZG1	Head Accel Z	Up	1189.8675	g	-	5/24/2002	OK	168v	Endevco	7264-2000T
1004	P17196	HEDXR1	Head Accel Red X S39	Rwd	1187.0536	g	-	1/25/2002	---	168v	Endevco	7264C-2KLC-2-
1005	B02A25-N05	HEDYR1	Head Accel Red Y	Lft	1210.0586	g	-	2/8/2002	OK	168v	Entran	EGE-73B6Q-200
1006	01G25-N09	HEDZR1	Head Accel Red Z	Up	1212.7528	g	-	1/24/2002	OK	168v	Entran	EGE-73B6Q-200
1007	1716A-851-FX	NEKXF1	Neck Force X	Hd	13329.236	N	-	5/29/2002	OK	168v	Denton	1716A
1008	1716A-851-FY	NEKYF1	Neck Force Y	Hd	13329.530	N	+	5/29/2002	OK	168v	Denton	1716A
1009	1716A-851-FZ	NEKZF1	Neck Force Z	Hd	20045.227	N	+	5/29/2002	OK	168v	Denton	1716A
1010	1716A-851-MX	NEKXM1	Neck Moment X	Rt Ear	424.21628	N·m	-	5/29/2002	OK	168v	Denton	1716A
1011	1716A-851-MY	NEKYM1	Neck Moment Y	Chn	423.71713	N·m	+	5/29/2002	OK	168v	Denton	1716A
1012	1716A-851-MZ	NEKZM1	Neck Moment Z	Chn	423.80316	N·m	+	5/29/2002	OK	168v	Denton	1716A
1013	J35921	CSTXG1	Chest Accel X	Fwd	601.70168	g	+	5/24/2002	OK	168v	Endevco	7264-2000TZ
1014	AJ7F7	CSTYG1	Chest Accel Y	Lft	597.08454	g	-	5/24/2002	OK	168v	Endevco	7264-2000T
1015	J36723	CSTZG1	Chest Accel Z	Up	597.09847	g	-	5/24/2002	OK	168v	Endevco	7264-2000TZ
1016	99H30-Z14	CSTXR1	Chest Accel Red X	Rwd	602.40255	g	-	4/25/2002	OK	168v	Entran	EGE-73BQE0-20
1017	98H14-K05	CSTYR1	Chest Accel Red Y	Lft	599.48247	g	-	4/25/2002	OK	168v	Entran	EGE-73BQ-2000
1018	98H13-F03	CSTZR1	Chest Accel Red Z	Up	600.08673	g	-	4/25/2002	OK	168v	Entran	EGE-73BQ-2000
1019	14CB1-2847-168	CSTXD1	Chest Deflection X	Strnm	101.85558	mm	+	6/5/2002	OK	168v	Servo	14CB1-2847
1020	ACCY2	PEVXG1	Pelvis Accel X	Rwd	601.36246	g	-	5/24/2002	OK	168v	Endevco	7264-2000T
1021	J27490	PEVYG1	Pelvis Accel Y	Lft	600.66401	g	-	5/24/2002	OK	168v	Endevco	7264-2KM5T
1022	J21963	PEVZG1	Pelvis Accel Z	Up	604.09415	g	-	5/24/2002	OK	168v	Endevco	7264-2KM5T
1023	1914A-362-FZ	LFMZF1	Left Femur Force Z	Knee	33334.982	N	+	5/24/2002	OK	168v	Denton	1914A
1024	1914A-376-FZ	RFMZF1	Right Femur Force Z	Knee	33337.253	N	+	5/24/2002	OK	168v	Denton	1914A
1025	150-0121VR-180	KNLXD1	Left Knee Displacement	Tib	29.039759	mm	-	6/13/2002	OK	168v	SpaceAge	150-0121VR
1026	150-0121VL-181	KNRXD1	Right Knee Displacement	Tib	22.301594	mm	-	6/13/2002	OK	168v	SpaceAge	150-0121VL
1027	4353J-79-FZ	TBLZF1	Left Upper Tibia Force Z	Tib	16680.912	N	+	7/16/2002	OK	168v	Denton	4353J
1028	4353J-79-MX	TBLXM1	Left Upper Tibia Moment X	Tib	592.55391	N·m	-	7/16/2002	OK	168v	Denton	4353J
1029	4353J-79-MY	TBLYM1	Left Upper Tibia Moment Y	Tib	592.62243	N·m	-	7/16/2002	OK	168v	Denton	4353J

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1030	4929J-77-FZ	ANLZF1	Left Lower Tibia Force Z	Ank	16673.976	N	+	7/16/2002	OK	168v	Denton	4929J
1031	4929J-77-MX	ANLXM1	Left Lower Tibia Moment X	Ank	593.84346	N·m	+	7/16/2002	OK	168v	Denton	4929J
1032	4929J-77-MY	ANLYM1	Left Lower Tibia Moment Y	Ank	594.01423	N·m	+	7/16/2002	OK	168v	Denton	4929J
1033	4353J-75-FZ	TBRZF1	Right Upper Tibia Force Z	Tib	16693.171	N	+	8/2/2002	OK	168v	Denton	4353J
1034	4353J-75-MX	TBRXM1	Right Upper Tibia Moment X	Tib	593.09571	N·m	+	8/2/2002	OK	168v	Denton	4353J
1035	4353J-75-MY	TBRYM1	Right Upper Tibia Moment Y	Tib	591.99233	N·m	+	8/2/2002	OK	168v	Denton	4353J
1036	4929J-76-FZ	ANRZF1	Right Lower Tibia Force Z	Ank	16678.298	N	+	7/16/2002	OK	168v	Denton	4929J
1037	4929J-76-MX	ANRXM1	Right Lower Tibia Moment X	Ank	593.26308	N·m	+	7/16/2002	OK	168v	Denton	4929J
1038	4929J-76-MY	ANRYM1	Right Lower Tibia Moment Y	Ank	592.63214	N·m	+	7/16/2002	OK	168v	Denton	4929J
1039	AJ4R6	HEDXG2	Head Accel X VRTC 5	Fwd	1202.7673	g	+	8/6/2002	OK	421v	Endevco	7264-2KM5T
1040	02A16-A01	HEDYG2	Head Accel Y	Lft	1213.8454	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1041	01L26-F06	HEDZG2	Head Accel Z	Up	1213.7590	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1042	02A16-A03	HEDXR2	Head Accel Red X	Rwd	1200.1593	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1043	02A16-A08	HEDYR2	Head Accel Red Y	Lft	1199.9062	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1044	02A16-A09	HEDZR2	Head Accel Red Z	Up	1188.1555	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1045	IF-205-180-FX	NEKXF2	Neck Force X	Hd	13332.807	N	-	3/18/2002	OK	421v	FTSS	IF-205
1046	IF-205-180-FY	NEKYF2	Neck Force Y	Hd	13344.549	N	+	3/18/2002	OK	421v	FTSS	IF-205
1047	IF-205-180-FZ	NEKZF2	Neck Force Z	Hd	20033.115	N	+	3/18/2002	OK	421v	FTSS	IF-205
1048	IF-205-180-MX	NEKXM2	Neck Moment X	Rt Ear	423.99134	N·m	-	3/18/2002	OK	421v	FTSS	IF-205
1049	IF-205-180-MY	NEKYM2	Neck Moment Y	Chin	424.10165	N·m	+	3/18/2002	OK	421v	FTSS	IF-205
1050	IF-205-180-MZ	NEKZM2	Neck Moment Z	Chn	424.47778	N·m	+	3/18/2002	OK	421v	FTSS	IF-205
1051	3251-107-FX	NKLXF2	Neck Lwr Force X	Hd	13348.061	N	-	7/6/2001	---	421v	Denton	3251
1052	3251-107-FY	NKLYF2	Neck Lwr Force Y	Hd	13331.262	N	+	7/6/2001	---	421v	Denton	3251
1053	3251-107-FZ	NKLZF2	Neck Lwr Force Z	Hd	20012.256	N	+	7/6/2001	---	421v	Denton	3251
1054	3251-107-MX	NKLXM2	Neck Lwr Moment X	Rt Ear	423.89906	N·m	-	7/6/2001	---	421v	Denton	3251
1055	3251-107-MY	NKLYM2	Neck Lwr Moment Y	Chn	424.11583	N·m	+	7/6/2001	---	421v	Denton	3251
1056	3251-107-MZ	NKLZM2	Neck Lwr Moment Z	Chn	424.01391	N·m	+	7/6/2001	---	421v	Denton	3251
1057	B02A25-N03	CSTXG2	Chest Accel X	Fwd	599.26145	g	+	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1058	02A18-N12	CSTYG2	Chest Accel Y	Lft	597.38411	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1059	B02A25-N10	CSTZG2	Chest Accel Z	Up	598.37900	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1060	AE9B7	CSTXR2	Chest Accel Red X	Rwd	598.41047	g	-	8/6/2002	OK	421v	Endevco	7264-2KM5T
1061	02A04-A24	CSTYR2	Chest Accel Red Y	Lft	598.00509	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1062	B02A18-N22	CSTZR2	Chest Accel Red Z	Up	600.28372	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1063	14CB1-2897-135	CSTXD2	Chest Deflection X	Strnm	99.823164	mm	+	3/25/2002	OK	421v	Servo	14CB1-2897
1064	AF9K3	PEVXG2	Pelvis Accel X	Rwd	596.31959	g	-	8/5/2002	OK	421v	Endevco	7264-2000LC

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1065	02A16-A26	PEVYG2	Pelvis Accel Y	Lft	599.65449	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1066	02A18-N15	PEVZG2	Pelvis Accel Z	Up	599.50704	g	-	8/5/2002	OK	421v	Entran	EGE-73B6Q-200
1067	2430-739	LFMZF2	Left Femur Force Z S37	Knee	33328.013	N	+	3/18/2002	OK	421v	GSE	2430
1068	2430-760	RFMZF2	Right Femur Force Z VRTC 4	Knee	33335.935	N	+	3/18/2002	OK	421v	GSE	2430
1069	150-0121VR-150	KNLXD2	Left Knee Displacement	Tib	43.785008	mm	+	5/8/2002	OK	421v	SpaceAge	150-0121VR
1070	150-0121VL-149	KNRXD2	Right Knee Displacement	Tib	43.693463	mm	+	5/8/2002	OK	421v	SpaceAge	150-0121VL
1071	4825J-82-FZ	TBLZF2	Left Upr Tibia Force Z	Tib	16686.535	N	+	7/16/2002	OK	421v	Denton	4825J
1072	4825J-82-MX	TBLXM2	Left Upr Tibia Moment X	Ank	593.84221	N·m	+	7/16/2002	OK	421v	Denton	4825J
1073	4825J-82-MY	TBLYM2	Left Upr Tibia Moment Y	Ank	592.75261	N·m	+	7/16/2002	OK	421v	Denton	4825J
1074	4826J-82-FZ	ANLZF2	Left Lwr Tibia Force Z	Ank	16696.325	N	+	7/16/2002	OK	421v	Denton	4826J
1075	4826J-82-MX	ANLXM2	Left Lwr Tibia Moment X	Ank	594.17438	N·m	+	7/16/2002	OK	421v	Denton	4826J
1076	4826J-82-MY	ANLYM2	Left Lwr Tibia Moment Y	Ank	591.27201	N·m	+	7/16/2002	OK	421v	Denton	4826J
1077	4825J-80-FZ	TBRZF2	Right Upr Tibia Force Z	Tib	16673.893	N	+	7/16/2002	OK	421v	Denton	4825J
1078	4825J-80-MX	TBRXM2	Right Upr Tibia Moment X	Ank	592.26344	N·m	+	7/16/2002	OK	421v	Denton	4825J
1079	4825J-80-MY	TBRYM2	Right Upr Tibia Moment Y	Ank	591.53219	N·m	+	7/16/2002	OK	421v	Denton	4825J
1080	4826J-76-FZ	ANRZF2	Right Lwr Tibia Force Z	Ank	16693.189	N	+	7/16/2002	OK	421v	Denton	4826J
1081	4826J-76-MX	ANRXM2	Right Lwr Tibia Moment X	Ank	592.98033	N·m	+	7/16/2002	OK	421v	Denton	4826J
1082	4826J-76-MY	ANRYM2	Right Lwr Tibia Moment Y	Ank	591.67533	N·m	+	7/16/2002	OK	421v	Denton	4826J
1083	J40086	VCGXG1	VEHICLE CG X-AXIS	FWD	1012.6782	g	+	6/19/2002	OK	-1	Endevco	7264-2000TZ
1084	J29018	VCGYG1	VEHICLE CG Y-AXIS	RT	988.74147	g	+	8/27/2002	OK	-1	Endevco	7264-2000TZ
1085	J35767	VCGZG1	VEHICLE CG Z-AXIS	UP	996.57427	g	-	5/13/2002	OK	-1	Endevco	7264-2000TZ
1086	P23805	RDKXG1	REAR DECK X-AXIS	FWD	997.07887	g	+	8/16/2002	OK	VRTC	Endevco	7264C-2K-2-180
1087	P23626	RDKYG1	REAR DECK Y-AXIS	RT	1004.7490	g	+	8/13/2002	OK	VRTC	Endevco	7264C-2K-2-180
1088	P23848	RDKZG1	REAR DECK Z-AXIS	UP	1000.8601	g	-	8/16/2002	OK	VRTC	Endevco	7264C-2K-2-180
1089	P23807	LRSXG1	LEFT REAR SILL X-AXIS	FWD	1481.3743	g	+	10/8/2002	OK	VRTC	Endevco	7264C-2K-2-180
1090	P23809	LRSYG1	LEFT REAR SILL Y-AXIS	RT	1498.6535	g	-	8/16/2002	OK	VRTC	Endevco	7264C-2K-2-180
1091	P23806	LRSZG1	LEFT REAR SILL Z-AXIS	DN	1493.9309	g	+	8/15/2002	OK	VRTC	Endevco	7264C-2K-2-180
1092	P23625	RRSXG1	RIGHT REAR SILL X-AXIS	FWD	1492.6896	g	+	8/13/2002	OK	VRTC	Endevco	7264C-2K-2-180
1093	P23632	RRSYG1	RIGHT REAR SILL Y-AXIS	LT	1509.2559	g	-	8/9/2002	OK	VRTC	Endevco	7264C-2K-2-180
1094	P24187	RRSZG1	RIGHT REAR SILL Z-AXIS	UP	1511.9970	g	-	7/25/2002	OK	VRTC	Endevco	7264C-2K-2-180
1095	J27503	EDRV1X	EDR PLATE X-AXIS	FWD	601.63805	g	+	7/30/2002	OK	VRTC	Endevco	7264-2000TZ
1096	J39062	EDRV1Y	EDR PLATE Y-AXIS	LT	1523.1748	g	-	7/15/2002	OK	VRTC	Endevco	7264-2000TZ
1097	J39618	EDRV1Z	EDR PLATE Z-AXIS	UP	1516.1161	g	-	5/9/2002	OK	VRTC	Endevco	7264-2000TZ
1098	ABFire	DABET1	DRIVER AIRBAG EVENT		5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A
1099	ABFire	PABET1	PASSENGER AIRBAG EVENT	P	5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A

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1100	ABFire	PABET2	PASSENGER AIRBAG EVENT	2	5.12	V	+	8/20/2002	OK	-1	FLUKE	Y8101A

Channel Report

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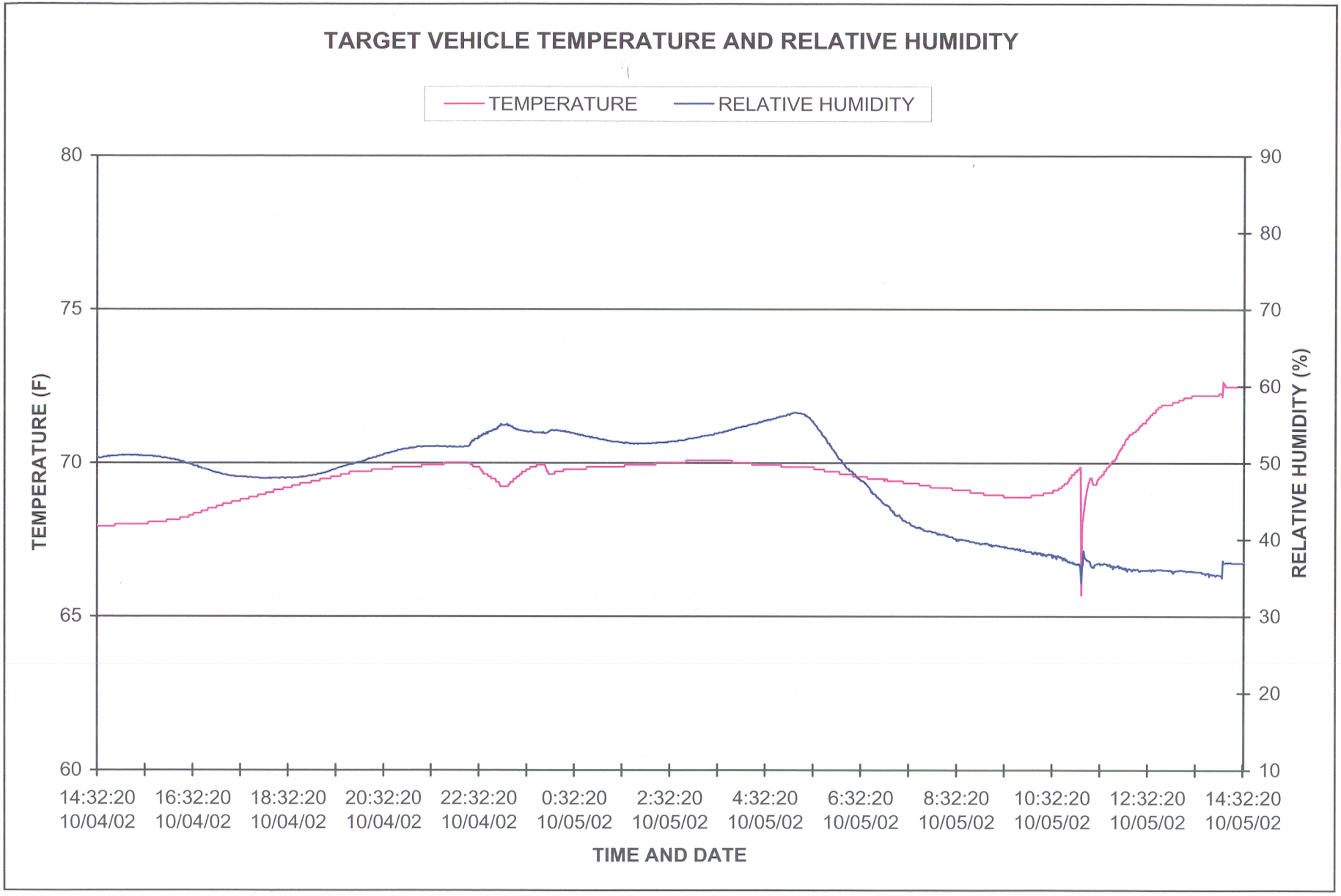
Name of Test 021005 **System** K3600 **Name of DAU** DAU0

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
0000	EVENT	SYNC0	SYNC0		10.24	V	+	4/15/2002	---	-1	TRC	Event
0001	J20083	HEDXGA	Head Accel X	Rwd	1203.8702	g	-	5/24/2002	OK	169v	Endevco	7264-2000T
0002	J19843	HEDYGA	Head Accel Y	Lft	1203.0075	g	-	5/24/2002	OK	169v	Endevco	7264-2000T
0003	J20027	HEDZGA	Head Accel Z	Up	1198.5439	g	-	5/24/2002	OK	169v	Endevco	7264-2KM5T
0004	1716A-782-FX	NEKXFA	Neck Force X	Hd	13338.003	N	-	5/30/2002	OK	169v	Denton	1716A
0005	1716A-782-FY	NEKYFA	Neck Force Y	Hd	13358.829	N	+	5/30/2002	OK	169v	Denton	1716A
0006	1716A-782-FZ	NEKZFA	Neck Force Z	Hd	20011.553	N	+	5/30/2002	OK	169v	Denton	1716A
0007	1716A-782-MX	NEKXMA	Neck Moment X	Rt Ear	423.49857	N·m	-	5/30/2002	OK	169v	Denton	1716A
0008	1716A-782-MY	NEKYMA	Neck Moment Y	Chn	424.23483	N·m	+	5/30/2002	OK	169v	Denton	1716A
0009	1716A-782-MZ	NEKZMA	Neck Moment Z	Chn	423.51205	N·m	+	5/30/2002	OK	169v	Denton	1716A
0010	J23757	CSTXGA	Chest Accel X	Fwd	599.31757	g	+	5/24/2002	OK	169v	Endevco	7264-2000T
0011	J21989	CSTYGA	Chest Accel Y	Lft	601.26006	g	-	5/24/2002	OK	169v	Endevco	7264-2KM5T
0012	J35747	CSTZGA	Chest Accel Z	Up	602.63653	g	-	5/24/2002	OK	169v	Endevco	7264-2000TZ
0013	14CB1-2847-169	CSTXDA	Chest Deflection X	Strnm	102.03095	mm	+	6/6/2002	OK	169v	Servo	14CB1-2847
0014	J36741	PEVXGA	Pelvis Accel X	Rwd	598.78138	g	-	5/24/2002	OK	169v	Endevco	7264-2000TZ
0015	J36605	PEVYGA	Pelvis Accel Y	Lft	597.68397	g	-	5/24/2002	OK	169v	Endevco	7264-2000TZ
0016	AAMD7	PEVZGA	Pelvis Accel Z	Up	596.56972	g	-	5/24/2002	OK	169v	Endevco	7264-2000LC
0017	1914-0261-FZ	LFMZFA	Left Femur Force Z	Knee	33361.064	N	+	5/24/2002	OK	169v	Denton	1914
0018	1914A-383-FZ	RFMZFA	Right Femur Force Z	Knee	33365.199	N	+	5/24/2002	OK	169v	Denton	1914A
0019	150-0121VR-171	KNLXDA	Left Knee Displacement	Tib	28.758390	mm	-	6/13/2002	OK	169v	SpaceAge	150-0121VR
0020	150-0121VL-210	KNRXDA	Right Knee Displacement	Tib	22.515391	mm	-	6/13/2002	OK	169v	SpaceAge	150-0121VL
0021	4353J-78-FZ	TBLZFA	Left Upper Tibia Force Z	Tib	16676.730	N	+	7/17/2002	OK	169v	Denton	4353J
0022	4353J-78-MX	TBLXMA	Left Upper Tibia Moment X	Tib	592.17164	N·m	-	7/17/2002	OK	169v	Denton	4353J
0023	4353J-78-MY	TBLYMA	Left Upper Tibia Moment Y	Tib	593.90357	N·m	-	7/17/2002	OK	169v	Denton	4353J
0024	4929J-78-FZ	ANLZFA	Left Lower Tibia Force Z	Ank	16673.287	N	+	7/16/2002	OK	169v	Denton	4929J
0025	4929J-78-MX	ANLXMA	Left Lower Tibia Moment X	Ank	592.01163	N·m	+	7/16/2002	OK	169v	Denton	4929J
0026	4929J-78-MY	ANLYMA	Left Lower Tibia Moment Y	Ank	592.57411	N·m	+	7/16/2002	OK	169v	Denton	4929J
0027	4353J-77-FZ	TBRZFA	Right Upper Tibia Force Z	Tib	16674.151	N	+	7/17/2002	OK	169v	Denton	4353J
0028	4353J-77-MX	TBRXMA	Right Upper Tibia Moment X	Tib	593.28865	N·m	-	7/17/2002	OK	169v	Denton	4353J
0029	4353J-77-MY	TBRYMA	Right Upper Tibia Moment Y	Tib	592.12384	N·m	-	7/17/2002	OK	169v	Denton	4353J


TARGET VEHICLE TEMPERATURE AND RELATIVE HUMIDITY
TEMPERATURE
RELATIVE HUMIDITY
TEMPERATURE (F)
RELATIVE HUMIDITY (%)
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75
70
65
60
90
80
70
60
50
40
30
20
10
14:32:20 10/04/02
16:32:20 10/04/02
18:32:20 10/04/02
20:32:20 10/04/02
22:32:20 10/04/02
0:32:20 10/05/02
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4:32:20 10/05/02
6:32:20 10/05/02
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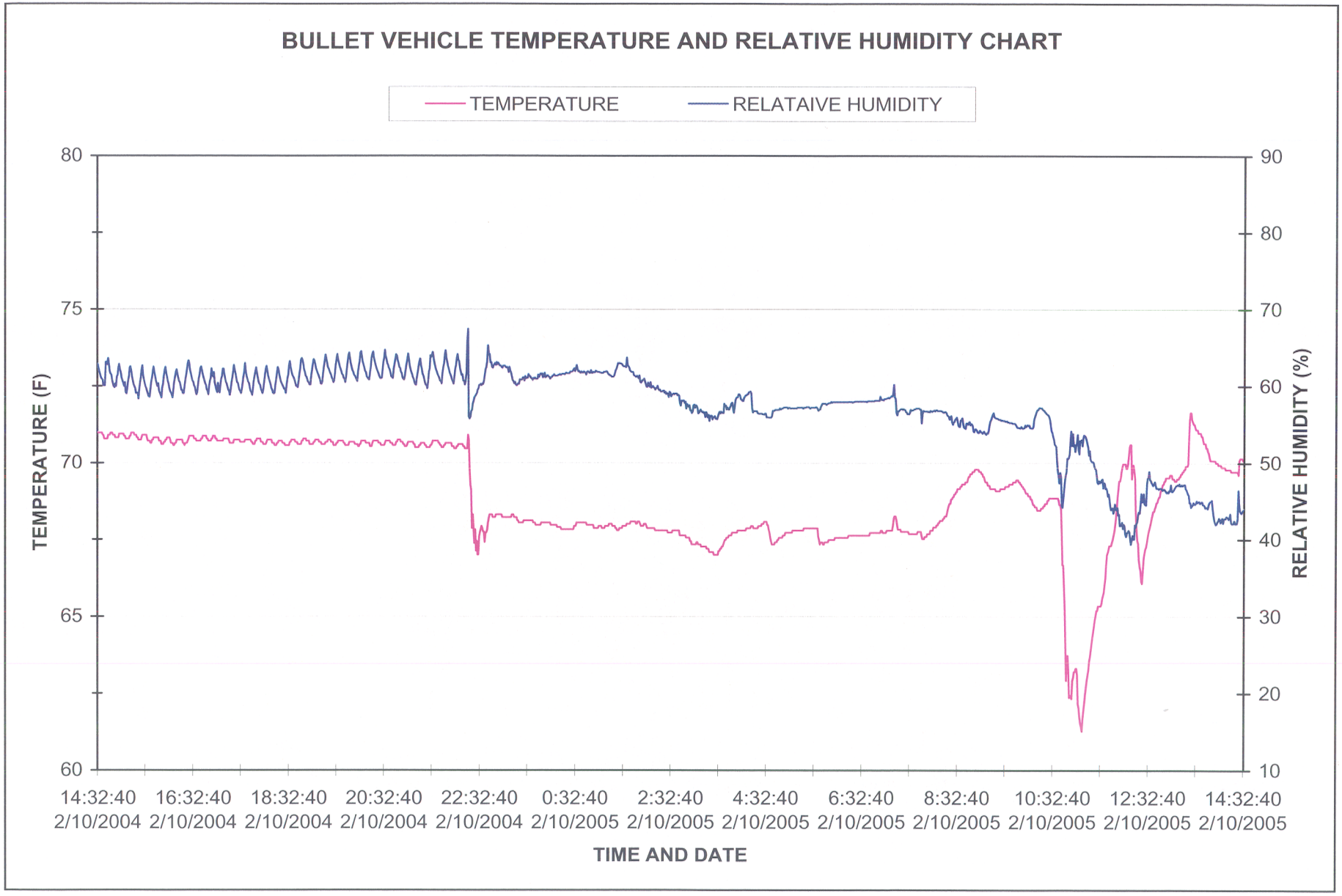
12:32:20 10/05/02
14:32:20 10/05/02
TIME AND DATE


BULLET VEHICLE TEMPERATURE AND RELATIVE HUMIDITY CHART
TEMPERATURE
RELATAIVE HUMIDITY
TEMPERATURE (F)
RELATIVE HUMIDITY (%)
80
75
70
65
60
90
80
70
60
50
40
30
20
10
14:32:40 2/10/2004
16:32:40 2/10/2004
18:32:40 2/10/2004
20:32:40 2/10/2004
22:32:40 2/10/2004
0:32:40 2/10/2005
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6:32:40 2/10/2005
8:32:40 2/10/2005
10:32:40 2/10/2005
12:32:40 2/10/2005
14:32:40 2/10/2005
TIME AND DATE

Appendix E

INSIA Report on Structural Measurements

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

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REPORT DOCUMENTATION PAGE
Title: *STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY*
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Suplementary notes: Under contract to: THE EUROPEAN COMMUNITY Project: "Improvement of Crash Compatibility between Cars" Contract Nº: 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.

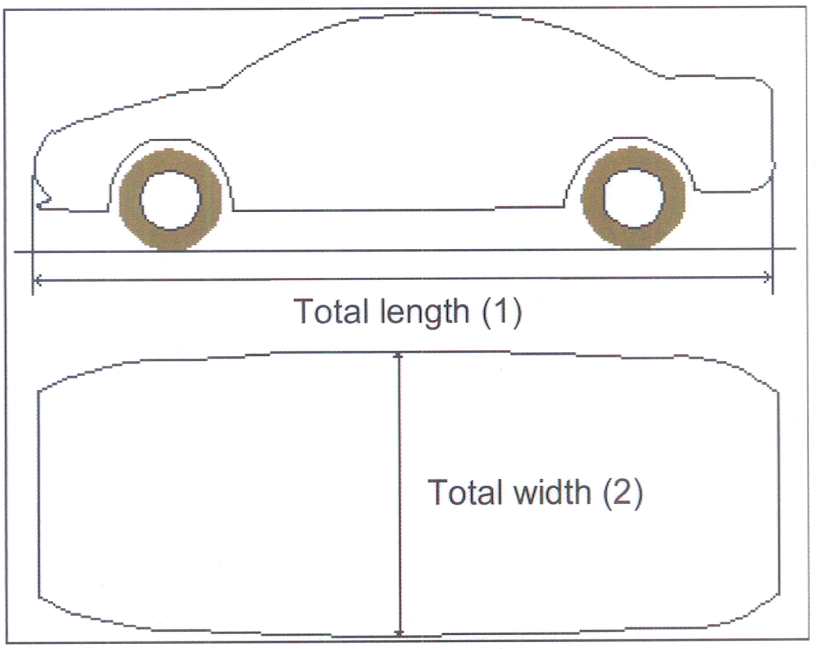


Figure 1.- Definition of the main resistant elements. General dimensions.

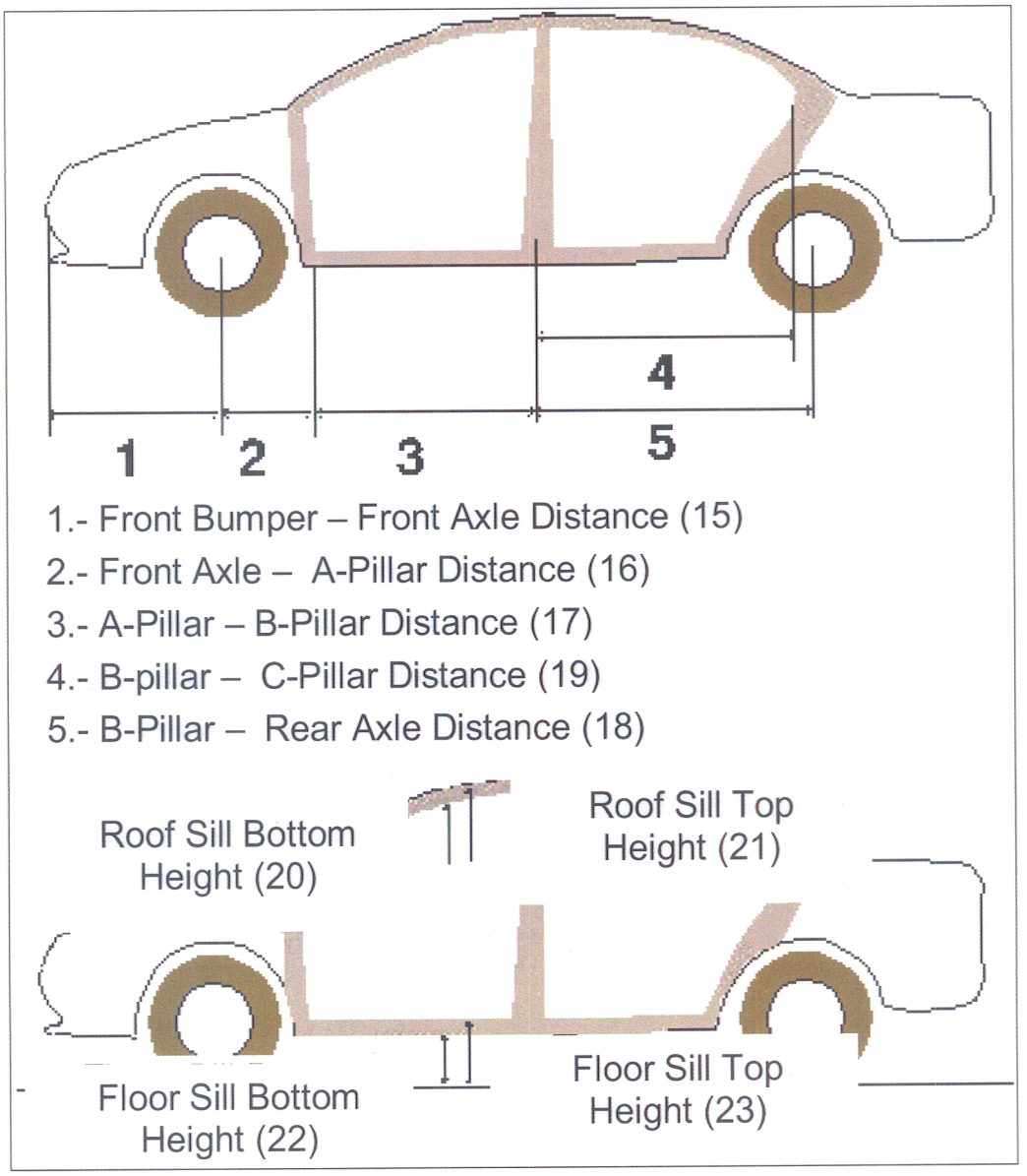


Figure 2.- Definition of the main resistant elements. Side elements.

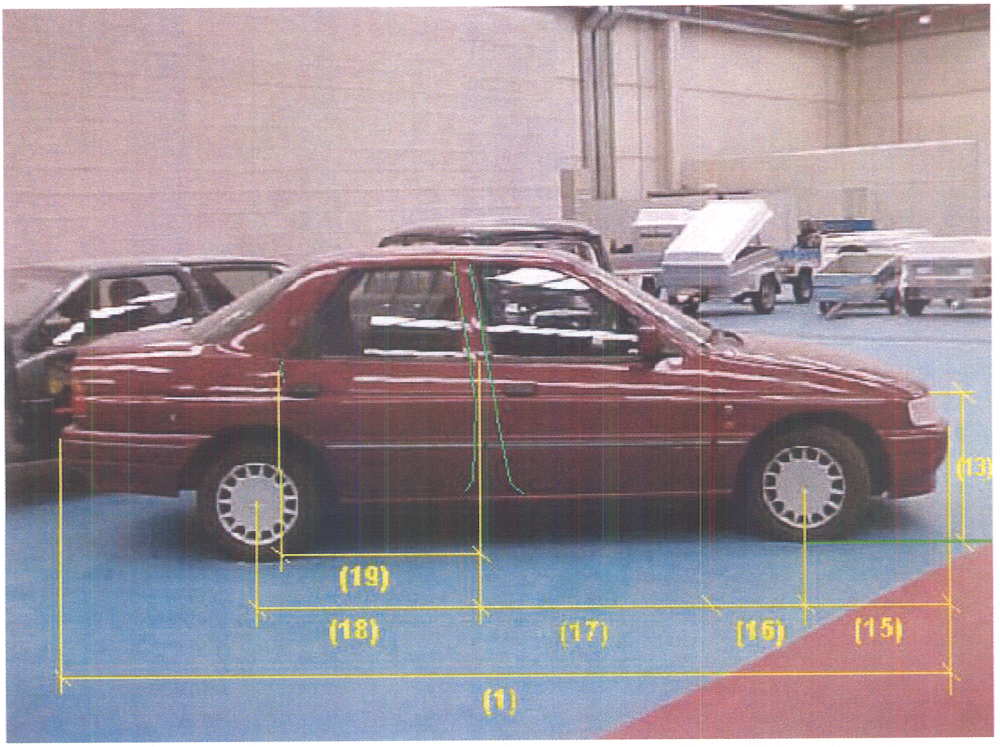


Figure 3.- Measurements of the side resistant elements (outer).

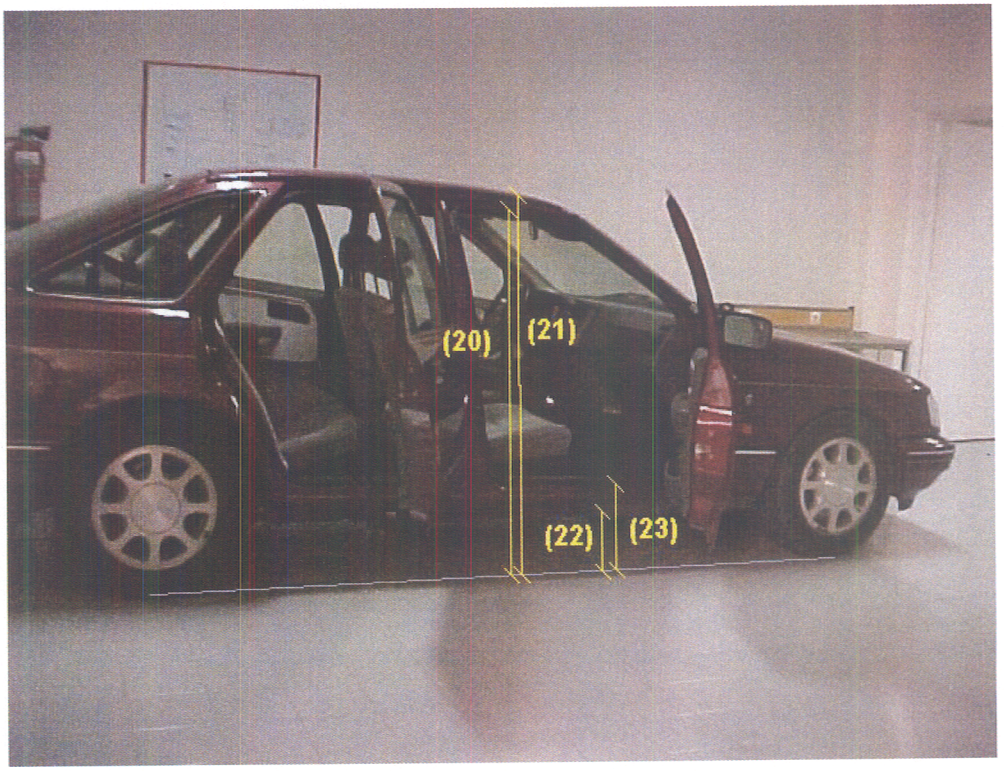


Figure 4.- Measurements of the side resistant elements (inner).

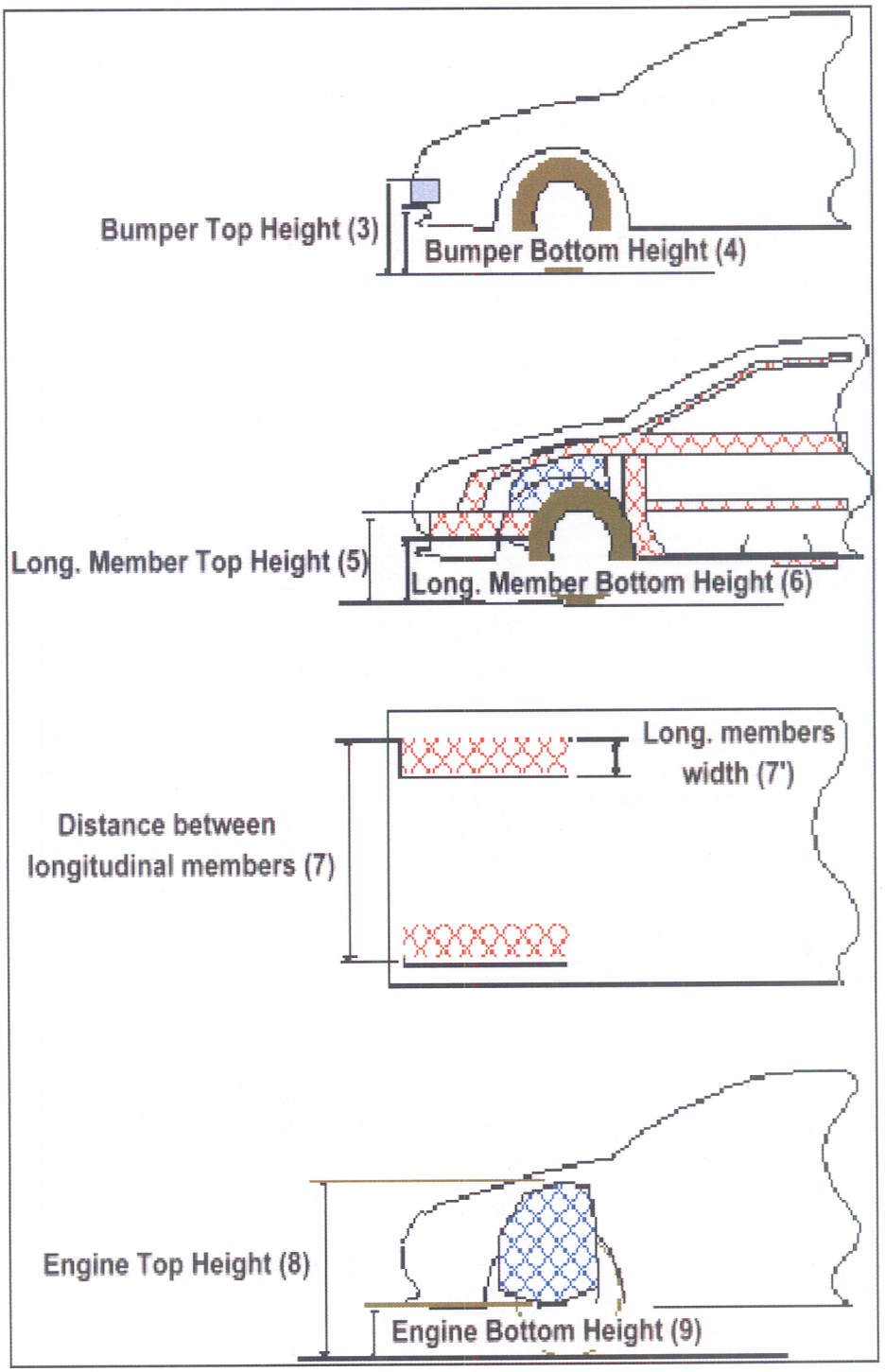


Figure 5.- Definition of the main resistant elements. Front elements.

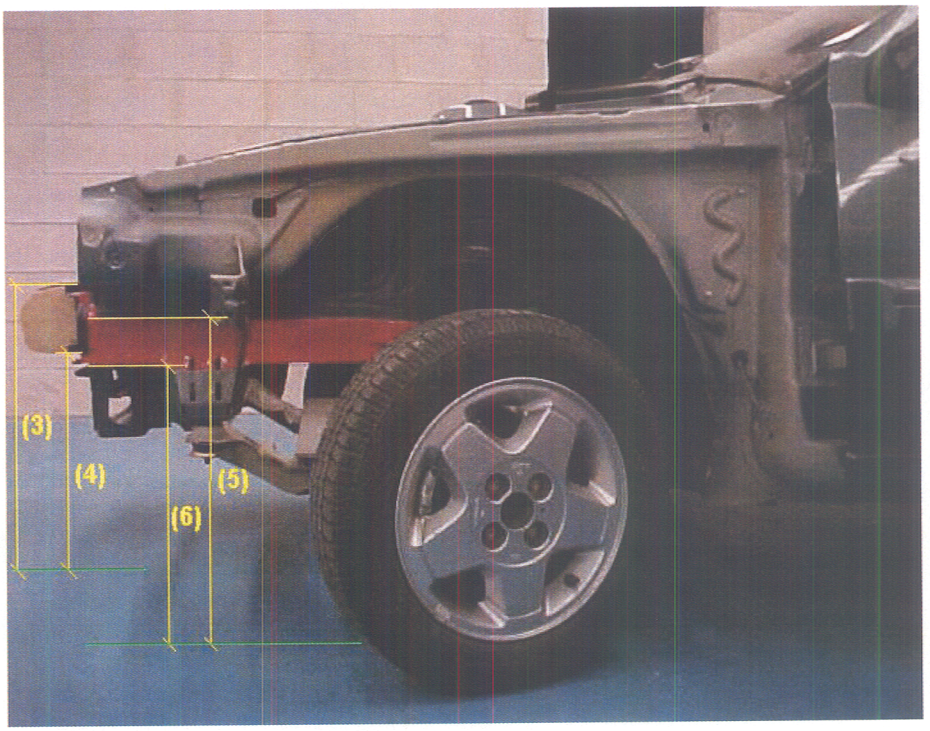


Figure 6.- Measurements of the main resistant elements. Front elements 1.

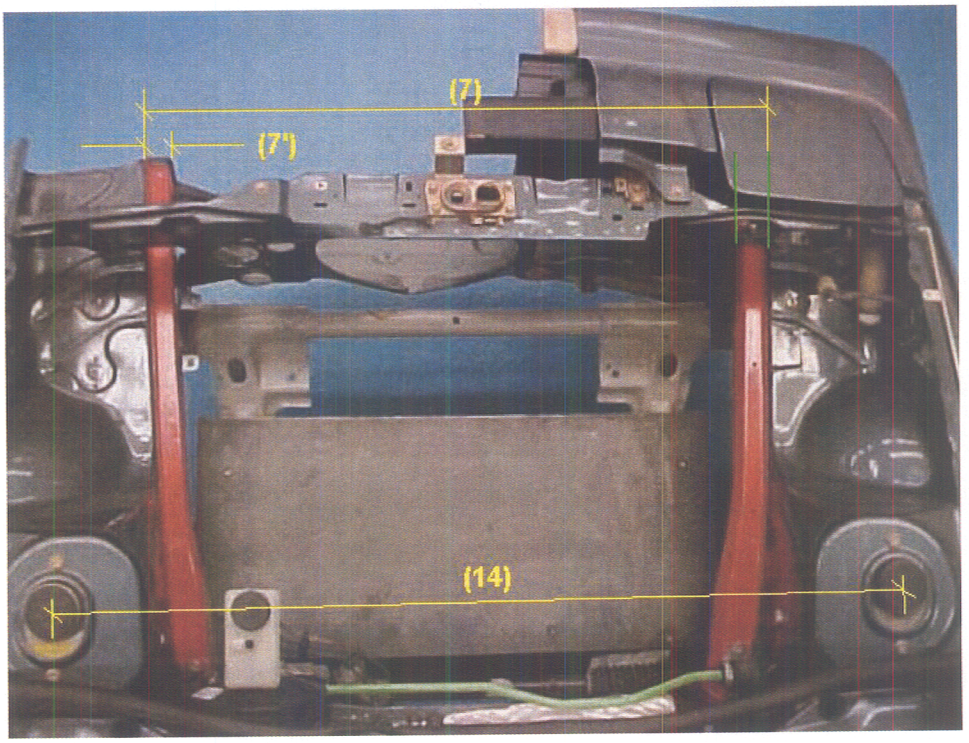


Figure 7.- Measurements of the main resistant elements. Front elements 2.

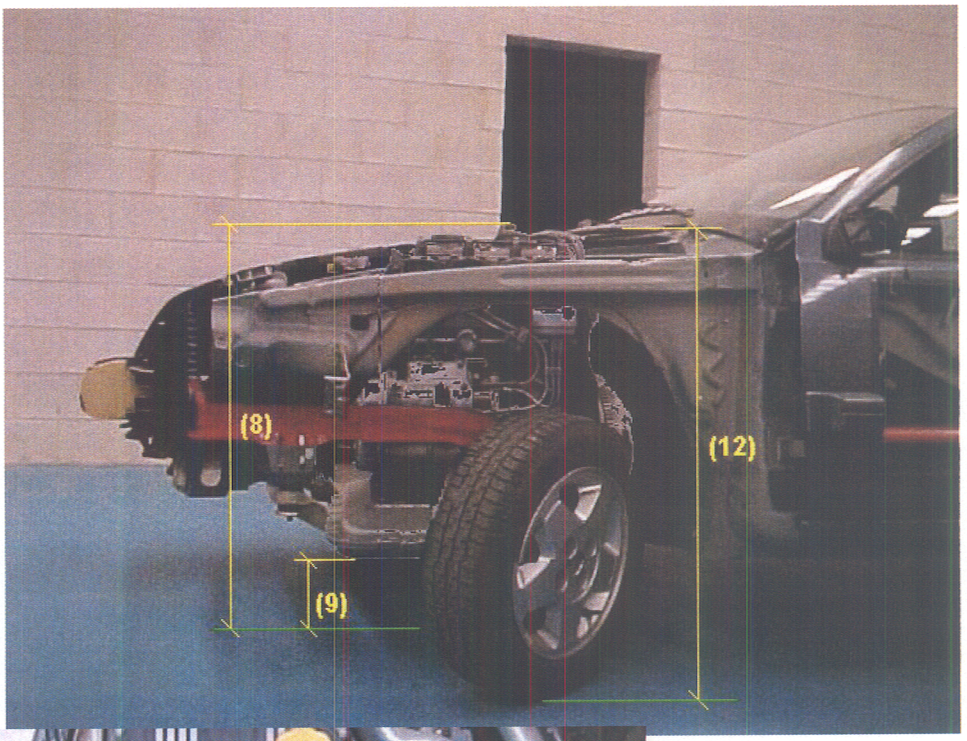


Figure 8.- Measurements of the main resistant elements. Front elements 3.

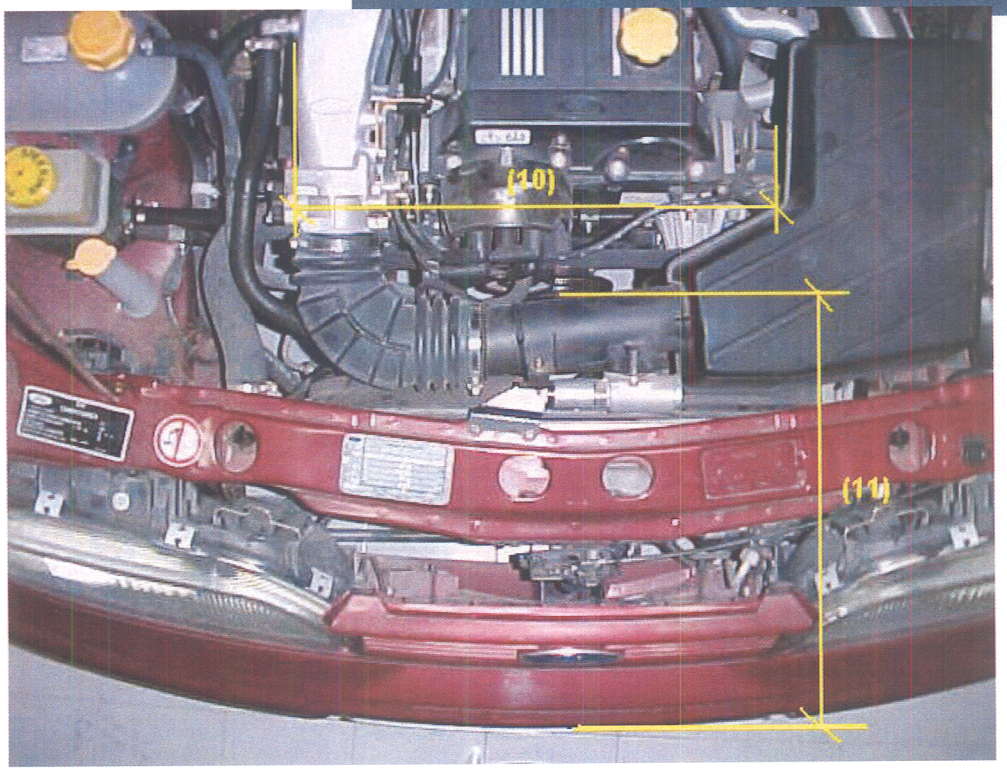


Figure 9.- Definition of the main resistant elements. Front elements (Longitudinal engine).

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

Vehicle Manufacturer's Information

email string from Aloke Prasad at VRTC and Echung Su at Ford on Navigator set ups:

This is what I got back from Ford on the 2003 Navigator:

Don't cut the seat fabric/foam, at least, not yet.

D-ring is mid-height only for the 50th male. For 5th F , it is "best fit" pos
ition.

Aloke

>>> esu1@ford.com 08/22/02 03:58PM >>>
Aloke:

1. The seat of the U228 has a side air bag mounted in it. Is it OK to cut the

fabric (near the frame, 13" up from the pivot)? Are there any side air bag w

iring etc around that location?

<= Seat supplier: JCI inform that there actually is a wiring route through the
frame area, I will send the inquiry to JCI (seat supplier) and get back to yo
u later.

2. Do the D-ring position remain at mid-height for 5th female dummies (for bot

h U228 and UN173)?

<= NO, it should be at "Best fit" position. meaning: ajust the height-ajuster
so the belt rests actrss the middle of dummy's shoulder

3. Finally, does the information you sent me (for U93) apply to U173?

<= yes UN93 and UN173 share the same info except 40/60 bench only existed on U
N93.

Regards,

Echung Su
Amazon Program
NAT-Impact Safety TEL: (313-322-1099)
Ford Motor Company FAX: (248-248-6053)
2CE48, PDC

-----Original Message-----
From: Prasad, Aloke <NHTSA> [mailto:Aloke.Prasad@nhtsa.dot.gov]
Sent: Thursday, August 22, 2002 2:35 PM
To: esu1@ford.com
Subject: RE: NHTSA Request - Important

Hi,

Thanks for the info. I have a few more questions:

We are using U228 and UN173 in our test program

□
1. The seat of the U228 has a side air bag mounted in it. Is it OK to cut the

fabric (near the frame, 13" up from the pivot)? Are there any side air bag w

iring etc around that location?

2. Do the D-ring position remain at mid-height for 5th female dummies (for bot

h U228 and UN173)?

3. Finally, does the information you sent me (for U93) apply to U173?

Thanks,

Aloke

>>> esu1@ford.com 08/22/02 02:19PM >>>
Aloke:

Following are the UN93/173 info for 208 set-up with 50% HYBRID III ATD:

1. Seatback angle (at Mid-track & full down): 22 degree
2. Column/Tilt: Mid-point
3. D-ring: Mid-point

Attachment file is the detailed info seat for seating position.

Per your question:

U222 = MY2003 Expedition
U228 = MY2003 Navigator
UN93 = MY2002 & below Expedition
UN173 = MY2002 & below Navigator

Let mwe know if you have any more question!

Regards,

Echung Su
Amazon Program
NAT-Impact Safety TEL: (313-322-1099)
Ford Motor Company FAX: (248-248-6053)
2CE48, PDC

U222/8 SEAT INFORMATION FOR VEHICLE SAFETY PACKAGE LAB WORK ORDER

Description		Fiducial Point x (mm)	Fiducial Point y (mm)	Fiducial Point z (mm)	Seat frame angle (deg)	location to measure frame angle	H-point SGRR x (mm)	H-point SGRR y (mm)	H-point SGRR z (mm)	Power Seat Track Envelope Full Down FF x (mm)	Power Seat Track Envelope Full Down FF z (mm)	Power Seat Track Envelope Full Down FR x (mm)	Power Seat Track Envelope Full Down FR z (mm)	H-point Test position (midtrack full down) x (mm)	H-point Test position (midtrack full down) y (mm)	H-point Test position (midtrack full down) z (mm)	FMVSS *Drawing Note
U222	Driver Power Bucket	3105.00	829.07	554.97	16.7	13" up from pivot point	3103.16	-440.00	1058.50	2935.92	1063.25	3134.82	1042.34	3035.37	-440.00	1052.80	A
	Passenger Power Bucket	3105.00	829.07	554.97	16.7	13" up from pivot point	3103.16	440.00	1058.50	2935.92	1063.25	3134.82	1042.34	3035.37	440.00	1052.80	A
	Passenger Manual Bucket	3105.00	829.07	554.97	16.7	13" up from pivot point	3103.16	440.00	1058.50					3033.56	440.00	1065.81	A
	Passenger Manual 60% Bench	3105.00	829.07	554.97	21.7	13" up from pivot point	3103.16	440.00	1058.50					3033.56	440.00	1065.94	B
U228	Driver Power Bucket	3105.00	829.07	554.97	16.7	13" up from pivot point	3103.16	-440.00	1058.50	2935.92	1063.25	3134.82	1042.34	3035.37	-440.00	1052.80	C
	Passenger Power Bucket	3105.00	829.07	554.97	16.7	13" up from pivot point	3103.16	440.00	1058.50	2935.92	1063.25	3134.82	1042.34	3035.37	440.00	1052.80	C

FMVSS DRAWING NOTES:

A: SK-2L14-011000-78563-AC (SIGNED OFF 5/08/2001)

B: SK-2L14-011000-78563-BD (SIGNED OFF 5/08/2001)

C: SK-2L74-011000-78563-AB (SIGNED OFF 4/19/2001)

F-5

021005

Originator: G. Williams
Navigator seat back angle

Date Issued: 9/13/96
Date Revised: 5/25/01

TA#: JB7492

DATE	MODEL	YEAR	CARLINE	WORK ORDER NO.
8/19/2002	U222	2003	Expecdition	R06

ENGINEER	PHONE	DEPT#	WORK TASK
Esu1	32-21099	#REF!	#REF!

COORDINATOR	PHONE	TEST MODE
DATTARD	84-53376	NCAP

VIN NUMBER	VEHICLE NO.	TAG NUMBER
1FMFU16L43LA00278	NA	308H654

TYPE OF SEAT	TA NUMBER	DATE CLOSED
Bucket / Power	JB7492	

SEAT POSITION

SGRP		MID POINT	X	FULL REAR	

SEATS TO BE CHECKED

LH FRT	X	CENTER FRT		RH FRT	X
LH REAR		CENTER REAR		RH REAR	
VEHICLE DELIVERED TO		D/A	BARRIER	BUILD SITE	

ANY QUESTIONS CONTACT:

Derek Attard
PHONE: (313) 84-53376

DESCRIPTION OF JOB TO BE PERFORMED:

(1) See "U222/8 SEAT INFORMATION FOR VEHICLE SAFETY PACKAGE LAB WORK ORDER" on next page.

(2) Set Steerng Column Adjustable Tilt and Telescope to mid position and lock/scribble in place

(3) Set Adjustable Pedal Package to full forward if equipped on vehicle

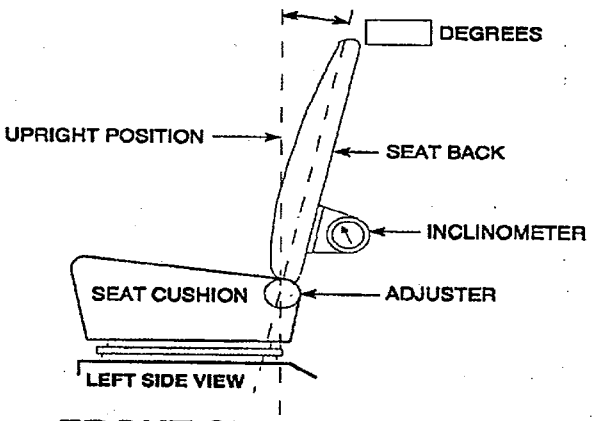
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1996 Vehicle Model: Dodge Neon Body Style : 4-Door Sedan

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



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat : N/A

Measurement instructions : Remove seat recliner mechanism (seat in full up position), insert 6 mm. dowel pin in gauge hole, recline seat rearward until it stops at dowel.

Seat back angle for passenger's seat : N/A

Measurement instructions : Same as driver

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Place seat in 12th detent (mid-position) from a total of 23 detent locations.

Positioning of the passenger's seat (if applicable) : Same as driver.

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 11.2 gallons

B. "Usable Capacity" of the optional equipment fuel tank is - gallons

4. Steering Column Position :

27 mm. up from lowest position.

5. Other:

None.

8353-4

Table 4

FRONT SEAT OCCUPANT MEASUREMENTS

(All dimensions excluding angles are in inches).

	DRIVER (Serial #341)			PASSENGER (Serial #342)		
WA°	26 deg.			-		
SWA°	23 deg.			-		
SCA°	67 deg.			-		
SA°	18 deg.			18 deg.		
HZ	7.4			6.8		
HH	11.1			11.2		
HW	20.2			18.7		
HR	8.5			7.6		
NR	13.2	Angle	9 deg.	-		
CD	19.5			18.2		
CS	10.0			-		
RA	5.5			-		
KDL/KDA	4.6	Angle	38 deg.	6.1		
KDR/KDA	3.5			6.2	Angle	40 deg.
PA°	24 deg.			24 deg.		
TA°	36 deg.			34 deg.		
KK	12.1			10.5		
ST	21.5	Angle	75 deg.	21.5	Angle	81 deg.
SK	23.5	Angle	-1 deg.	22.2	Angle	-2 deg.
SH	9.6	Angle	-34 deg.	9.1	Angle	-32 deg.
SHY	9.5			9.8		
HS	11.6			10.8		
HD	4.0**			4.5**		
AD	2.4			2.9		

** Measurement taken to door pocket

8353-4

Table 9 Target Vehicle Dummy Measurement Data for Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #090)	Passenger (Serial #416)
WA	Windshield angle	27.3°	N/A
SWA	Steering wheel angle	67.4°	NA
SCA	Steering column angle	22.6°	NA
SA	Seat back angle	20.9°	17.9°
HZ[2]	Head to roof	207 mm	230 mm
HH	Head to header	334 mm	283 mm
HW	Head to windshield	587 mm	597 mm
HR	Head to side header	227 mm	262 mm
NR	Nose to rim	354 mm	NA
NA	Nose to rim angle	13.5°	NA
CD	Chest to dash	516 mm	340 mm
CS	Steering wheel to chest	283 mm	NA
RA	Rim to abdomen	165 mm	NA
KDL	Left knee to dash	142 mm	95 mm
KDR	Right knee to dash	120 mm	97 mm
KDA	Outboard knee to dash angle	29.0°	32.9°
PA	Pelvic angle	25.0°	20.1°
TA	Tibial angle	42.9°	58.6°
KK	Knee to knee	320 mm	240 mm
ST[1]	Striker to head	510 mm	504 mm
	Striker to head angle	-85.4°	-67.1°
SK	Striker to knee	556 mm	641 mm
	Striker to knee angle	-3 2°	-2.0°
SH	Striker to H-point	227 mm	333 mm
	Striker to H-point angle	28.2°	15.3°
SHY	Striker to H-point (Y dir.)	212 mm	255
HS	Head to side window	294 mm	332 mm
HD	H-point to door	112 mm	148 mm
AD	Arm to door	99 mm	80 mm

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

[1] A negative angle indicates the measurement point was above the striker.
[2] Passenger's measurement was taken to the visor.