

**Vehicle Research and Test Center
1996 Toyota Previa into Left Front of
1997 Honda Accord - 50% Offset - Oblique 30°
TRC Inc. Test Number: 040109**

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¹ Dummy lower legs removed post crash.

² Photo from test vehicle was not useable. Certification label photo is from an identically equipped 1997 Honda Accord.

Section 1.0

Purpose and Test Procedure

Purpose

This 56.3 km/h (35 mph), 50% offset, 30° oblique, vehicle-to-vehicle impact test was conducted for the National Highway Traffic Safety Administration (NHTSA)/Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc.).

The test mode was defined with both vehicles moving at 56.3 km/h to impact the bullet vehicle into the left front corner of the target, offset 50%, at an impact angle of 30 degrees. The purpose of this test was to evaluate the aggressiveness of the bullet vehicle, a 1996 Toyota Previa MPV, and the vehicle and occupant response of the target vehicle, a 1997 Honda Accord in this vehicle-to-vehicle impact mode.

Test Procedure

This test was conducted in accordance with VRTC instructions for a 50% offset 30° oblique, vehicle-to-vehicle test. Data was obtained relative to FMVSS 208, "Occupant Crash Protection" (December 18, 2001) performance for the 35 mph test mode.

The target vehicle, a 1997 Honda Accord was instrumented with twenty-four (24) accelerometers to measure longitudinal, lateral and vertical axis accelerations. The driver's airbag signal was monitored with inductive pickups. The vehicle's specified impact velocity range was 55.5 to 57.3 km/h.

The bullet vehicle, a 1996 Toyota Previa, was instrumented with twenty-four (24) accelerometers to measure longitudinal, lateral and vertical axis accelerations. The driver's and passenger's airbag signals were monitored with inductive pickups. The vehicle's specified impact velocity range was 55.5 to 57.3 km/h.

The bullet vehicle impacted the left front corner of the target, offset 50%, at an impact angle of 30 degrees. The bullet vehicle's left edge was aligned with the target vehicle's centerline.

One (1) 50th percentile adult male Hybrid III dummy was placed in the target vehicle's left front designated seating position according to NHTSA Laboratory Test Procedure TP-208-11. The driver dummy was both belted and restrained with front single stage airbag. No dummy was placed in the target vehicle right front passenger position, but the weight of a 5th percentile female dummy was used to obtain fully loaded weight and calculate test weight.

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 target vehicle's driver dummy was also instrumented with upper neck moment and force load cells, a chest deflection

potentiometer, left and right femur load cells to measure moments and forces, and tibia to femur displacement potentiometers at each knee. The target vehicle's driver dummy was also equipped with Denton lower legs and with upper and lower tibia load cells to measure forces and moments.

One (1) 50th percentile adult male Hybrid III dummy and one (1) 5th percentile adult female dummy were placed in the bullet vehicle's front outboard designated seating positions according to NHTSA Laboratory Test Procedure TP-208-11. The driver dummy and passenger dummy were both belted and were restrained with front airbags.

The bullet vehicle driver dummy was instrumented with an array of three (3) accelerometers in the head, plus three (3) chest, and three (3) pelvis accelerometers to measure longitudinal, lateral, and vertical accelerations. The bullet vehicle's driver dummy was also instrumented with upper neck moment and force load cells, a chest deflection potentiometer, left and right femur load cells to measure moments and forces, and tibia to femur displacement potentiometers at each knee.

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 vehicle's passenger dummy was also instrumented with upper neck moment and force load cells, lumbar moment and force load cells, left and right femur load cells to measure axial forces, a chest deflection potentiometer and tibia to femur displacement potentiometers at each knee.

The 155 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 thirteen (13) high-speed motion picture cameras. The pre-test 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 certification and performance verification data. Appendix D contains miscellaneous test information. Appendix E contains an INSIA report that was the basis for the Structural Measurements presented in Tables 13 and 16 of this report. Appendix F contains the vehicle manufacturer's information.

Section 2.0

Left Front Oblique Impact Test Summary

Test Results Summary

This 56.3 km/h 30° left front oblique, 50% offset, vehicle-to-vehicle impact test was conducted by TRC Inc. on January 10, 2004.

The target test vehicle, a 1997 Honda Accord, was equipped with a 2.2-liter transverse engine, automatic transmission, power steering, power brakes, and single stage front airbags. The target vehicle's test weight was 1500 kg. The target vehicle's impact speed was 56.5 km/h. The target vehicle sustained 469 mm of static crush during the impact. The bullet test vehicle, a 1996 Toyota Previa MPV, was equipped with a 2.4-liter inline engine, automatic transmission, power steering, power brakes, and single stage front airbags. The bullet vehicle's test weight was 1953 kg. The bullet vehicle's impact speed was 56.2 km/h. The bullet vehicle sustained 299 mm of static crush during the impact.

The target vehicle driver dummy's 36-millisecond Head Injury Criteria (HIC) was 226. The target vehicle driver dummy's 15-millisecond HIC was 119. The target vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.7 g. The target vehicle driver dummy's maximum chest deflection was 26 mm. The target vehicle driver dummy's left and right femur maximum axial compressive forces were 14920 N and 3048 N, respectively. The target vehicle driver dummy's upper neck injury calculations were as follows: neck tension-flexion (NTF), 0.26; neck tension-extension (NTE), 0.24; neck compression-flexion (NCF), 0.11; and neck compression-extension (NCE), 0.14. The target vehicle driver dummy's peak upper neck tension force was 1593 N and peak upper neck compression force was 417 N.

The bullet vehicle driver dummy's 36-millisecond HIC was 162. The bullet vehicle driver dummy's 15-millisecond HIC was 77. The bullet vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 38.6 g. The bullet vehicle driver dummy's maximum chest deflection was 37 mm. The bullet vehicle driver

dummy's left and right femur maximum axial compressive forces were 4471 N and 1232 N, respectively. The bullet vehicle driver dummy's upper neck injury calculations were as follows: NTF, 0.16; NTE 0.23; NCF, 0.02; and NCE, 0.00. The bullet vehicle driver dummy's peak upper neck tension force was 1189 N and peak upper neck compression force was 71 N.

The bullet vehicle right front passenger dummy's 36-millisecond HIC was 288. The bullet vehicle passenger dummy's 15-millisecond HIC was 149. The bullet vehicle passenger dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 33.8 g. The bullet vehicle passenger dummy's maximum chest deflection was 14 mm. The bullet vehicle passenger dummy's left and right femur maximum axial compressive forces were 558 N and 763 N, respectively. The bullet vehicle right front passenger dummy's upper neck injury calculations were as follows: NTF, 0.22; NTE, 0.10; NCF, 0.73; and NCE, 0.12. The bullet vehicle right front passenger dummy's peak upper neck tension force was 143 N and peak upper neck compression force was 1420 N.

Data Acquisition Explanations

The target vehicle's left front sil X-axis acceleration channel, LFSXG1, exceeded full-scale at approximately 84 milliseconds and recorded no useful data after that.

The target vehicle's left front sil Y-axis acceleration channel, LFSYG1, recorded questionable data after approximately 76 milliseconds.

The bullet vehicle's driver airbag fire circuit, DABETA, did not record an event signal during the test.

Table 1 Crash Test Summary

Test mode:	Left Front Oblique Impact		
Test date:	1/10/04		
Test time:	11:18		
Ambient temperature:	-8.9° C		
Target vehicle year/make/ model/body style:	1997/Honda/Accord/4-door sedan		
Target vehicle test weight:	1500 kg		
Bullet vehicle year/make/ model/body style:	1996/Toyota/Previa/MPV		
Bullet vehicle test weight:	1953 kg		
Impact angle ¹ :	330°		
Impact velocity ² :	Target vehicle = 56.5 km/h Bullet vehicle = 56.2 km/h		
Target vehicle maximum static crush:	469 mm		
Bullet vehicle maximum static crush:	299 mm		
Total number of data channels:	155		
Number of cameras:	High-speed	12	Real-time 1
<u>Target vehicle dummies:</u>	<u>Driver #168</u>		
Type:	Hybrid III 50 th Male		
Location:	Front left		
Restraint:	3-pt. seatbelt, single stage airbag		
<u>Bullet vehicle dummies:</u>	<u>Driver #169</u>	<u>Passenger #416</u>	
Type:	Hybrid III 50 th Male	Hybrid III 5 th Female	
Location:	Front left	Front right	
Restraint:	3-pt. seatbelt, single stage airbag	3-pt. seatbelt, single 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: Middle

Target vehicle seat back position for test:

Driver: 15°

Target vehicle head restraint position for test:

Driver: Full up

Target vehicle steering column

position for test: Middle of the geometric range of travel.

Target vehicle D-ring position for test:

Driver: 2nd from top

Bullet vehicle seat track position for test:

Driver: Middle

Passenger: Full forward

Bullet vehicle seat back position for test:

Driver: 16.7°

Passenger: 17.0°

Bullet vehicle head restraint position for test:

Driver: Full up

Passenger: Full down

Bullet vehicle steering column

position for test: Middle of the geometric range of travel.

Bullet vehicle D-ring position for test:

Driver: Full up

Passenger: Full down

Table 2 Target General Test and Vehicle Parameter Data

Vehicle year/make/ model/body style:	1997/Honda/Accord/4 door		
VIN:	1HGCD5630VA217695		
Model year:	1997		
Body style:	4 door		
Color:	Red		
Engine data:			
Cylinders:	4		
Displacement	2.2-liters		
Cylinder placement:	Straight		
Engine placement:	Transverse		
Transmission data:	<u>4</u> speed, ___ manual, <u>X</u> automatic, ___ overdrive		
Final drive:	<u>X</u> FWD, ___ RWD, ___ 4WD		
Date vehicle received:	3/19/2003		
Odometer reading:	88,489		
Dealer's name and address:	Vehicle provided by VRTC		
<u>Accessories:</u>			
Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	No	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None	Power door locks	Yes
<u>Certification data from vehicle's label:</u>			
Vehicle manufactured by:	Honda Mfg.		
Date of manufacture:	06/97		
VIN:	1HGCD5630VA217695		
GVWR:	3915 lbs.	(1775.8 kg)	
GAWR: Front:	2140 lbs.	(970.7 kg)	
Rear:	1810 lbs.	(821.0 kg)	

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

Tires on vehicle (mfr., line, size): Front: Kelly, Weatherwise Sport, P185/65R15
Rear: Michelin, Charger, P185/65R15

Tire pressure with maximum capacity vehicle load:

Front: 35 psi (240 kPa)

Rear: 35 psi (240 kPa)

Spare tire (mfr., line, size): Goodyear, Temporary, T115/70D14

Type of seats:

Front Bucket

Rear Bench

Maximum width: 1790 mm

Wheelbase: 2720 mm

Location of “Recommended Tire Pressure” label:

The label was located on Left B-pillar.

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

Recommended tire size: 185/65R15

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
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Vehicle capacity weight: 850 lbs. (385.6 kg)

Rated cargo/luggage weight	100 lbs. (45.4 kg)
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Test vehicle attitude:

Delivered attitude: LF N/A¹; RF N/A¹; LR N/A¹; RR N/A¹

Fully loaded attitude: LF N/A¹; RF N/A¹; LR N/A¹; RR N/A¹

Pre-test attitude: LF 695 mm; RF 684 mm; LR 658 mm; RR 648 mm

Post-test attitude: LF 630 mm; RF 670 mm; LR 635 mm; RR 695 mm

¹ Measurement not recorded prior to test.

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

Weight of test vehicle as received (with maximum fluids)=UDW:¹

Right front	N/A	kg	Right rear	N/A	kg
Left front	N/A	kg	Left rear	N/A	kg
Total front weight	N/A	kg	(N/A % of total vehicle weight)		
Total rear weight	N/A	kg	(N/A % of total vehicle weight)		
Total delivered weight	N/A	kg			

Calculation of test vehicle's target test weight:

Total Delivered Weight (UDW) =	N/A ¹ kg
Rated Cargo/Luggage Weight (RCLW) =	45.4 kg
Weight of 1 Part 572O Dummy @ 49 kg and 1 Part 572E Dummy @ 76 kg =	125.0 kg
Target test weight ¹ =	1500.0 kg

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

Right front	428.2 kg	Right rear	315.0 kg
Left front	434.4 kg	Left rear	322.4 kg
Total front weight	862.6 kg	(57.5% of total vehicle weight)	
Total rear weight	637.4 kg	(42.5% of total vehicle weight)	
Total test weight	1500.0 kg	(at target test weight)	

Weight of ballast secured in vehicle: 0.0 kg

Components removed to meet target test weight: Cargo area deck lid, gasket

Location of Vehicle's CG: 1156 mm rearward of front wheel centerline

Fuel System Data:

Usable fuel system capacity	64.3 liters (from owner's manual)
Actual test volume:	0.0 liters (0% of usable)

¹ Test vehicle was ballasted for test pulls at delivery and the UDW was not recorded. Target test weight of 1500 kg was based on previous test in this program.

Table 3 Bullet General Test and Vehicle Parameter Data

Vehicle year/make/ model/body style:	1996/Toyota/Previa/MPV		
VIN:	JT3GK12M4T1212384		
Model year:	1996		
Body style:	MPV		
Color:	Beige		
Engine data:			
Cylinders:	4		
Displacement	2.4-liters		
Cylinder placement:	Straight		
Engine placement:	Inline		
Transmission data:	<u> 3 </u> speed, <u> </u> manual, <u> X </u> automatic, <u> X </u> overdrive		
Final drive:	<u> </u> FWD, <u> X </u> RWD, <u> </u> 4WD		
Date vehicle received:			
Odometer reading:	91,694		
Dealer's name and address:	N/A		
<u>Accessories:</u>			
Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	No	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None	Power door locks	Yes

Certification data from vehicle's label:

Vehicle manufactured by:	Toyota Motor Corporation		
Date of manufacture:	08/95		
VIN:	JT3GK12M4T1212384		
GVWR:	5410 lbs.	(2453.9 kg)	
GAWR: Front:	2745 lbs.	(1245.1 kg)	
Rear:	2745 lbs.	(1245.1 kg)	

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

Tires on vehicle (mfr., line, size): Goodyear, Regatta, P215/65R15

Tire pressure with maximum capacity vehicle load:

Front:	44 psi	(300 kPa)
Rear:	44 psi	(300 kPa)

Spare tire (mfr., line, size): Toyo, Toyo A05, P215/65R15

Type of seats:

Front	Bucket
Mid	Bench
Rear	Split bench

Maximum width: 1800 mm

Wheelbase: 2855 mm

Location of "Recommended Tire Pressure" label:

The label was located on Left B-pillar.

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

Recommended tire size: P215/65R15

Recommended cold tire pressure:

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

Vehicle Capacity Data:

Number of Occupants (Designated seating capacity):

Front	2
Mid	2
Rear	3
Total	7

Vehicle capacity weight: 517.1 kg (1140 lbs.)

Rated cargo/luggage weight 41.1 kg (N/A lbs.)

Test vehicle attitude:

Delivered attitude:	LF 722 mm;	RF 713 mm;	LR 744 mm;	RR 735 mm
Fully loaded attitude:	LF 696 mm;	RF 688 mm;	LR 720 mm;	RR 713 mm
Pre-test attitude:	LF 679 mm;	RF 683 mm;	LR 713 mm;	RR 722 mm
Post-test attitude:	LF 618 mm;	RF 665 mm;	LR 697 mm;	RR 763 mm

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

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

Right front	488.5 kg	Right rear	401.0 kg
Left front	469.0 kg	Left rear	402.0 kg
Total front weight	957.5 kg	(54.4% of total vehicle weight)	
Total rear weight	803.0 kg	(45.6% of total vehicle weight)	
Total delivered weight	1760.5 kg		

Calculation of test vehicle's target test weight:

Total Delivered Weight (UDW) =	1760.5 kg
Rated Cargo/Luggage Weight (RCLW) ¹ =	41.1 kg
Weight of 1 Part 572O Dummy @ 49 kg and 1 Part 572E Dummy @ 76 kg =	125.0 kg
Target test weight =	1926.6 kg

Weight of test vehicle with required dummies and 67.5 kg of cargo weight:

Right front	506.4 kg	Right rear	439.6 kg
Left front	551.0 kg	Left rear	456.0 kg
Total front weight	1057.4 kg	(54.1% of total vehicle weight)	
Total rear weight	895.6 kg	(45.9% of total vehicle weight)	
Total test weight	1953.0 kg	(1.4% over target test weight)	

Weight of ballast secured in vehicle: 0.0 kg

Components removed to meet target test weight: Rear fascia, right side sliding door skin, spare tire cradle, taillights, rear hatch seal, sliding door seal, rear wiper motor, seat belts, trim
Rear fascia, right side sliding door skin, spare tire cradle, taillights, rear hatch seal, sliding door seal, rear wiper motor, seatbelts, trim

Location of Vehicle's CG: 1310 mm rearward of front wheel centerline

Fuel System Data:

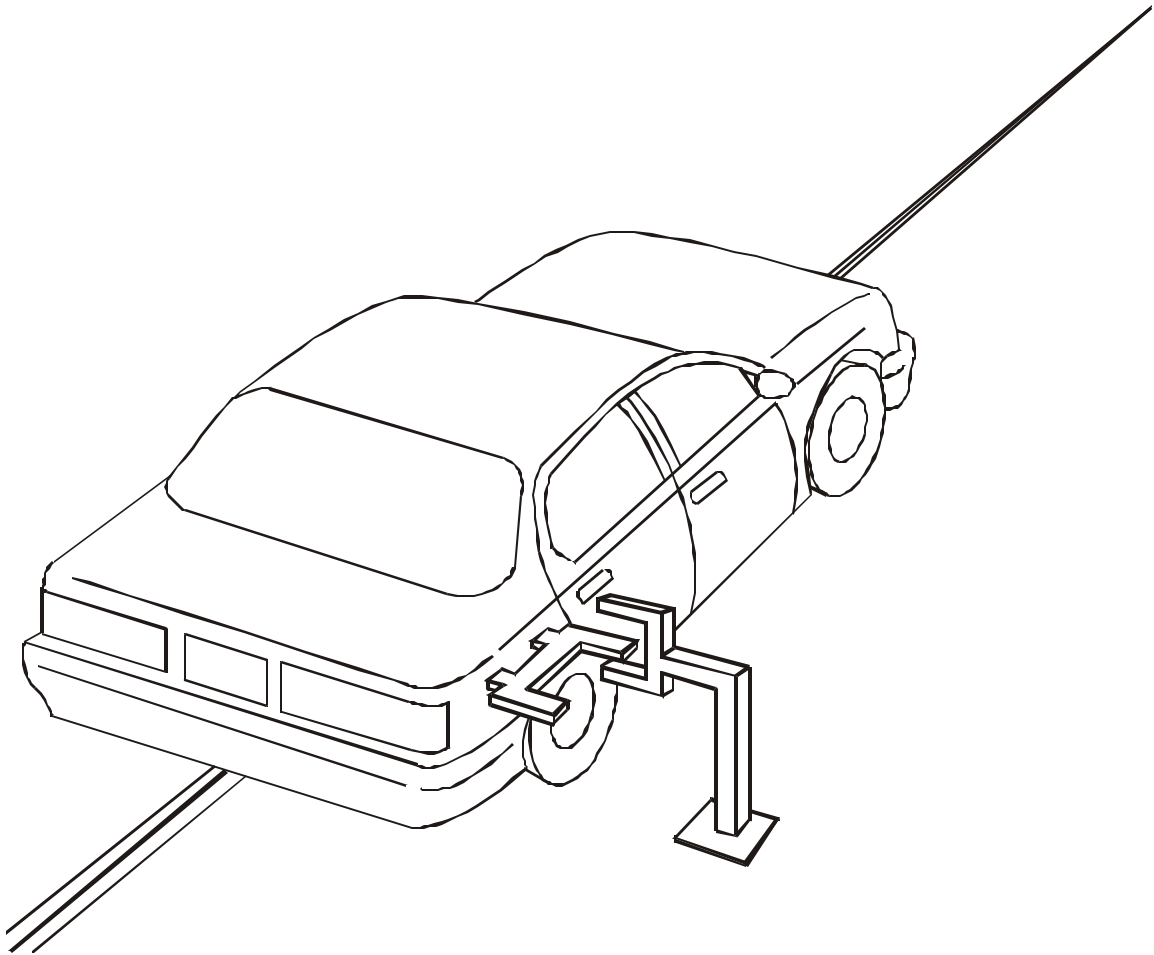
Usable fuel system capacity	74.9 liters (from owner's manual)
Actual test volume:	69.6 liters (93% of usable)

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:	040109
Test date:	01/10/04
Test time:	11:18
Test type:	Car-to-Car: 30°/50% offset
Impact angle:	330°
Ambient temperature at impact area:	-9° C
Impact velocity:	
Target vehicle:	56.5 km/h
Bullet vehicle:	56.2 km/h
Required impact velocity range:	55.5 to 57.3 km/h
Distance from each vehicle to intended impact point:	
Entering velocity trap:	661 mm
Exiting velocity trap:	51 mm, approximately
Impact point:	10 mm left 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

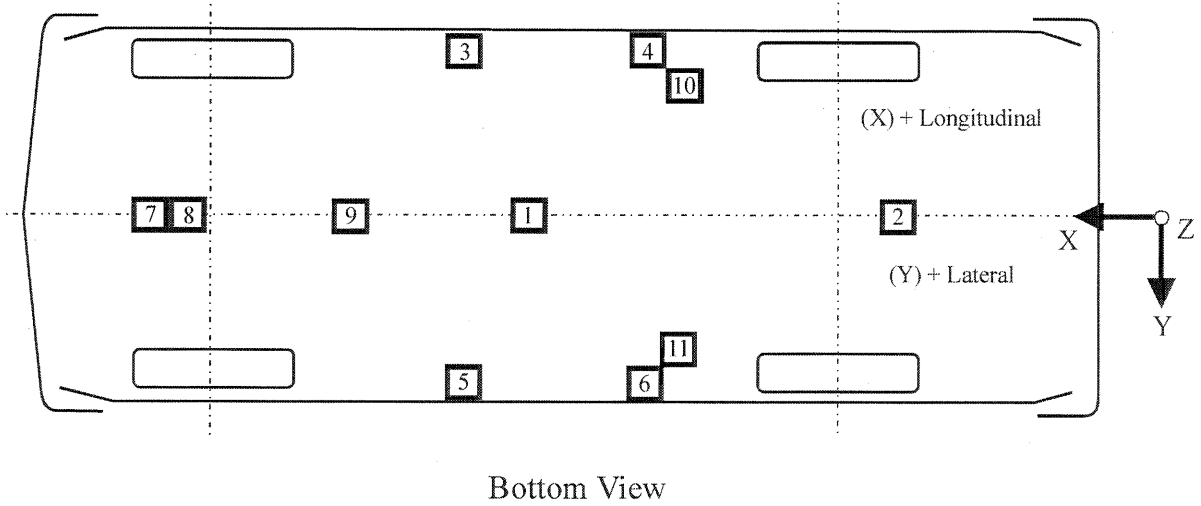
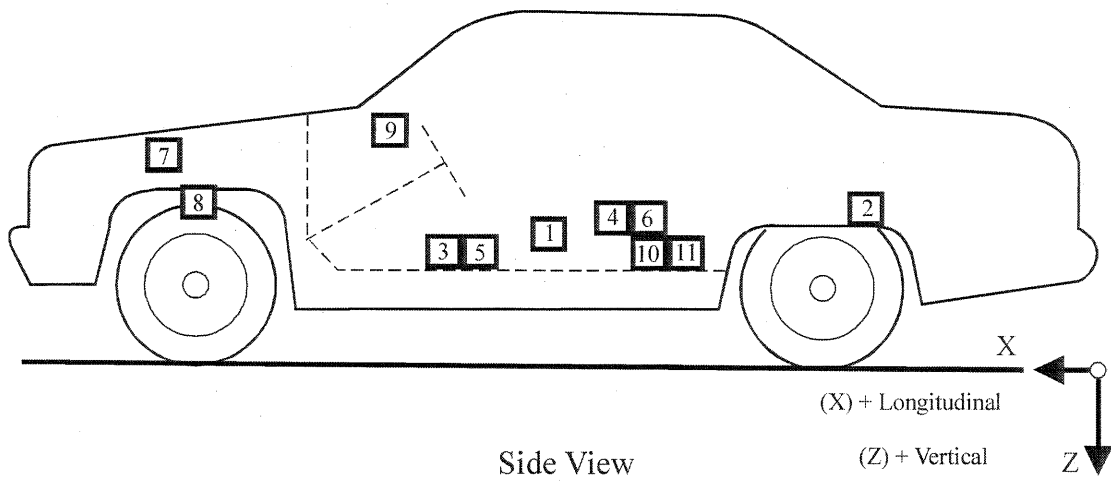


Table 5 Target Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 040109 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	2905 mm	0 mm	-414 mm				
LONGITUDINAL			6.0 g	@ 69.3 ms	49.4 g	@ 56.9 ms	
LATERAL			38.2 g	@ 32.7 ms	22.9 g	@ 75.0 ms	
VERTICAL			13.8 g	@ 47.5 ms	16.9 g	@ 82.6 ms	
RESULTANT			56.1 g	@ 56.6 ms			
2 REAR DECK	NA	NA	NA				
LONGITUDINAL			2.4 g	@ 202.7 ms	32.1 g	@ 57.1 ms	
LATERAL			13.6 g	@ 66.7 ms	10.2 g	@ 35.6 ms	
VERTICAL			9.1 g	@ 121.9 ms	10.1 g	@ 74.7 ms	
RESULTANT			34.3 g	@ 57.0 ms			
3 LEFT FRONT SILL ¹	NA	NA	NA				
LONGITUDINAL ³			---	---	---	---	
LATERAL ³			71.5 g	@ 59.4 ms	1003.6 g	@ 155.5 ms	
4 LEFT REAR SILL ¹	NA	NA	NA				
LONGITUDINAL			0.8 g	@ 193.5 ms	40.3 g	@ 52.2 ms	
LATERAL			17.5 g	@ 71.0 ms	13.7 g	@ 59.0 ms	
5 RIGHT FRONT SILL ²	NA	NA	NA				
LONGITUDINAL			1.3 g	@ 206.2 ms	30.5 g	@ 42.0 ms	
LATERAL			27.9 g	@ 55.1 ms	11.8 g	@ 70.2 ms	
6 RIGHT REAR SILL ²	NA	NA	NA				
LONGITUDINAL			1.3 g	@ 205.8 ms	29.3 g	@ 41.7 ms	
LATERAL			16.3 g	@ 42.1 ms	2.0 g	@ 69.3 ms	

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

TEST NUMBER: 040109 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
7 ENGINE TOP	NA	NA	NA				
LONGITUDINAL				9.7 g	@ 35.8 ms	73.1 g	@ 47.3 ms
LATERAL				45.3 g	@ 16.9 ms	26.3 g	@ 37.5 ms
8 ENGINE BOTTOM	NA	NA	NA				
LONGITUDINAL				49.5 g	@ 29.6 ms	83.8 g	@ 21.6 ms
LATERAL				47.2 g	@ 21.4 ms	35.0 g	@ 30.2 ms
9 INSTRUMENT PANEL	NA	NA	NA				
CENTER							
LONGITUDINAL				5.1 g	@ 120.2 ms	59.8 g	@ 53.1 ms
LATERAL				34.1 g	@ 52.1 ms	14.1 g	@ 93.9 ms
10 LEFT REAR SEAT	NA	NA	NA				
CROSSMEMBER							
LONGITUDINAL				0.9 g	@ 177.3 ms	28.6 g	@ 39.0 ms
LATERAL				15.8 g	@ 42.1 ms	1.7 g	@ 212.3 ms
11 RIGHT REAR SEAT	NA	NA	NA				
CROSSMEMBER							
LONGITUDINAL				1.0 g	@ 206.4 ms	29.9 g	@ 41.8 ms
LATERAL				12.7 g	@ 41.3 ms	1.5 g	@ 212.2 ms

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

- ¹ The X-axis distance between the left front sill and left rear sill accelerometer locations is 1320 mm.
- ² The X-axis distance between the right front sill and right rear sill accelerometer locations is 1335 mm.
- ³ See DATA ACQUISITION EXPLANATIONS

Figure 3 Bullet Vehicle Accelerometer Placement

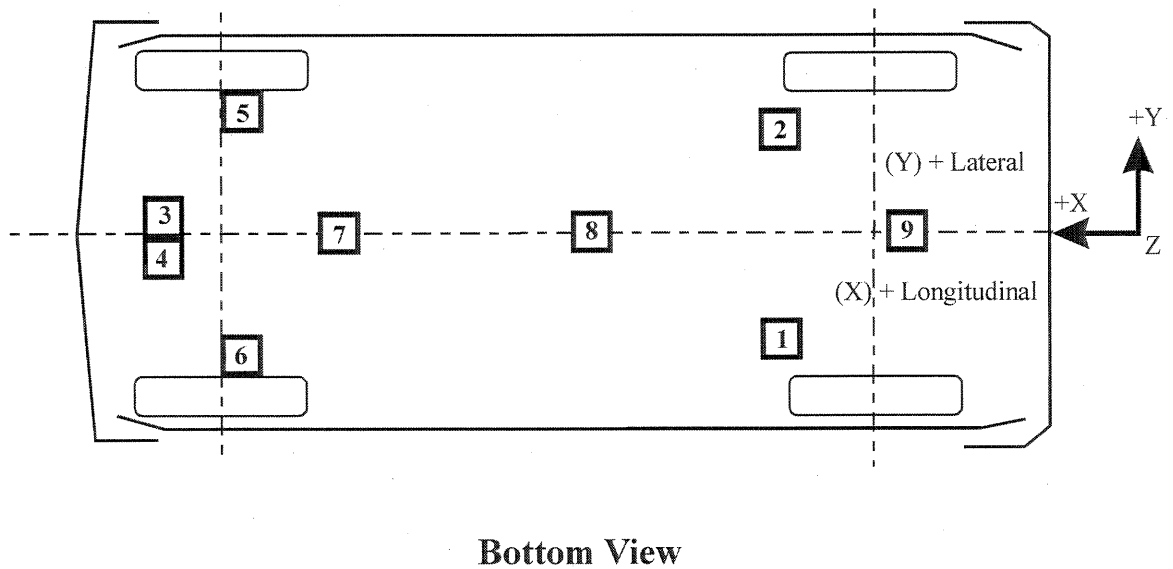
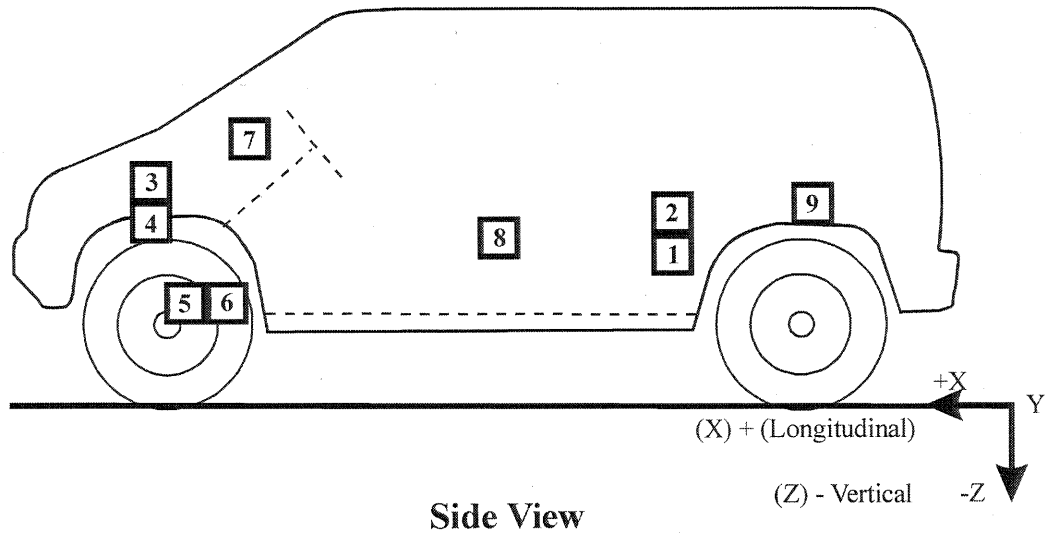


Table 6 Bullet Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 040109 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3129 mm	0 mm	-523 mm				
LONGITUDINAL				0.8 g	@ 194.9 ms	27.7 g	@ 58.1 ms
LATERAL				11.4 g	@ 64.3 ms	13.3 g	@ 36.5 ms
VERTICAL				21.6 g	@ 69.5 ms	21.7 g	@ 60.8 ms
RESULTANT				32.8 g	@ 60.5 ms		
2 REAR DECK	NA	NA	NA				
LONGITUDINAL				3.7 g	@ 191.0 ms	28.4 g	@ 58.1 ms
LATERAL				22.5 g	@ 59.0 ms	1.8 g	@ 146.7 ms
VERTICAL				10.6 g	@ 32.8 ms	18.3 g	@ 46.7 ms
RESULTANT				36.8 g	@ 58.1 ms		
3 LEFT FRONT SILL ¹	NA	NA	NA				
LONGITUDINAL				191.7 g	@ 74.4 ms	121.0 g	@ 58.1 ms
LATERAL				148.1 g	@ 69.6 ms	140.4 g	@ 74.8 ms
4 LEFT REAR SILL ¹	NA	NA	NA				
LONGITUDINAL				2.0 g	@ 27.5 ms	36.7 g	@ 57.8 ms
LATERAL				14.4 g	@ 64.6 ms	8.4 g	@ 37.0 ms
5 RIGHT FRONT SILL ²	NA	NA	NA				
LONGITUDINAL				0.0 g	@ 64.6 ms	25.2 g	@ 57.8 ms
LATERAL				8.2 g	@ 21.4 ms	15.0 g	@ 44.9 ms
6 RIGHT REAR SILL ²	NA	NA	NA				
LONGITUDINAL				1.5 g	@ 193.8 ms	21.5 g	@ 57.5 ms
LATERAL				13.9 g	@ 64.6 ms	8.2 g	@ 36.4 ms

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

TEST NUMBER: 040109 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
7 ENGINE TOP	NA	NA	NA				
LONGITUDINAL				0.6 g	@ 210.2 ms	28.5 g	@ 51.9 ms
LATERAL				2.3 g	@ 138.3 ms	28.7 g	@ 107.9 ms
8 ENGINE BOTTOM	NA	NA	NA				
LONGITUDINAL				0.4 g	@ 240.6 ms	25.6 g	@ 62.8 ms
LATERAL				5.4 g	@ 59.3 ms	16.3 g	@ 50.6 ms
9 INSTRUMENT PANEL	NA	NA	NA				
CENTER							
LONGITUDINAL				32.6 g	@ 36.1 ms	34.6 g	@ 41.0 ms
LATERAL				24.2 g	@ 32.5 ms	34.4 g	@ 75.0 ms
10 LEFT REAR SEAT	NA	NA	NA				
CROSSMEMBER							
LONGITUDINAL				2.8 g	@ 185.0 ms	38.5 g	@ 58.0 ms
LATERAL				12.4 g	@ 65.0 ms	0.4 g	@ 37.0 ms
11 RIGHT REAR SEAT	NA	NA	NA				
CROSSMEMBER							
LONGITUDINAL				2.3 g	@ 194.3 ms	20.6 g	@ 57.1 ms
LATERAL				12.3 g	@ 65.1 ms	1.8 g	@ 153.4 ms

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

- ¹ The X-axis distance between the left front sill and left rear sill accelerometer locations is 1360 mm.
² The X-axis distance between the right front sill and right rear sill accelerometer locations is 1360 mm.

Section 3.0

Summary of FMVSS 208 Data

Table 7 Target Vehicle Dummy Injury Criteria Data

<u>Maximum Acceleration¹</u>								
Head					Chest			
	X	Y	Z	R	X	Y	Z	R
Driver	-36.8 g	-45.3 g	28.8 g	53.9 g	-42.9 g	27.3 g	-12.0 g	44.7 g

<u>Maximum Femur Compressive Force</u>		
	Left Femur	Right Femur
Driver	14920 N	3048 N

<u>Head Injury Criteria²</u>			
36 millisecond			
	HIC	Start Time t ₁	End Time t ₂
Driver	226	72.80 ms	108.80 ms

15 millisecond			
	HIC	Start Time t ₁	End Time t ₂
Driver	119	96.24 ms	111.28 ms

<u>Chest Maximum Resultant Acceleration³</u>			
	Acceleration	Start Time t ₁	End Time t ₂
Driver	43.7 g	68.24 ms	73.88 ms

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

Maximum Chest Deflection

Driver	26 mm
--------	-------

Neck Injury Calculations (Nij)²

	NTF	NTE	NCF	NCE
Driver	0.26	0.24	0.11	0.14

Upper Neck Axial Force

	Tension	Compression
Driver	1593 N	417 N

Tibia Index

	Upper Tibia	Lower Tibia
Driver-left	0.86	0.73
Driver-right	2.70	2.78

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

<u>Maximum Acceleration¹</u>								
	Head				Chest			
	X	Y	Z	R	X	Y	Z	R
Driver	-30.0 g	-17.0 g	14.6 g	33.6 g	-38.9 g	7.4 g	-11.5 g	39.3 g
Passenger	-33.6 g	-29.7 g	45.4 g	47.6 g	-34.5 g	-7.3 g	-15.5 g	34.7 g

<u>Maximum Femur Compressive Force</u>		
	Left Femur	Right Femur
Driver	4471 N	1232 N
Passenger	558 N	763 N

<u>Head Injury Criteria²</u>			
36 millisecond			
	HIC	Start Time t ₁	End Time t ₂
Driver	162	61.52 ms	97.52 ms
Passenger	288	60.00 ms	96.00 ms

15 millisecond			
	HIC	Start Time t ₁	End Time t ₂
Driver	77	64.08 ms	79.12 ms
Passenger	149	62.88 ms	77.92 ms

<u>Chest Maximum Resultant Acceleration³</u>			
	Acceleration	Start Time t ₁	End Time t ₂
Driver	38.6 g	70.17 ms	73.17 ms
Passenger	33.8 g	69.65 ms	72.65 ms

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

<u>Maximum Chest Deflection</u>				
Driver	37 mm			
Passenger	14 mm			
<u>Upper Neck Injury Calculations (Nij)²</u>				
	NTF	NTE	NCF	NCE
Driver	0.16	0.23	0.02	0.00
Passenger	0.22	0.10	0.73	0.12
<u>Upper Neck Axial Force</u>				
	Tension		Compression	
Driver	1189 N		71 N	
Passenger	143 N		1420 N	

¹ See Report Sign Convention in Appendix D.

² As defined in FMVSS No. 208.

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

Table 9 Target Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver</u>
Head	Airbag, head restraint
Chest	Airbag
Abdomen	None
Left knee	Instrument panel
Right knee	Instrument panel

Door opening:

	<u>Left</u>	<u>Right</u>
Front	Jammed and latched	Easy
Rear	Jammed and latched	Easy

Seat movement:

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

Glazing damage: Windshield destroyed

Other notable impact effects: None

Table 10 Bullet Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

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

Door opening:

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

Seat movement:

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

Glazing damage: Windshield cracked at driver's side A-pillar.

Other notable impact effects: Left front tire flattened.

Section 4.0

Occupant, Camera, and Vehicle Information

Target Vehicle Dummy Kinematic Summary

Driver Dummy

Upon impact, the target driver dummy translated forward with the head and chest going squarely into the airbag. The knees contacted the dash panel. The dummy was then forced outboard and the head extended towards the forward door window frame. The dummy rebounded back into the seat. The dummy came to rest seated on the outboard side of the driver's seat, leaning outboard.

Bullet Vehicle Dummy Kinematic Summary

Driver Dummy

Upon impact, the bullet driver dummy translated forward with the head and chest contacting the airbag. The knees contacted the dash panel. The head and neck straighten and then extend slightly on rebound. 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 chest contacting the airbag. The knees contacted the dash panel. The dummy rebounded into the seatback with the head contacting the passenger head restraint. The dummy came to rest seated upright in the passenger seat.

Figure 4 Vehicle Dummy Measurement Locations for Front Seat Occupants

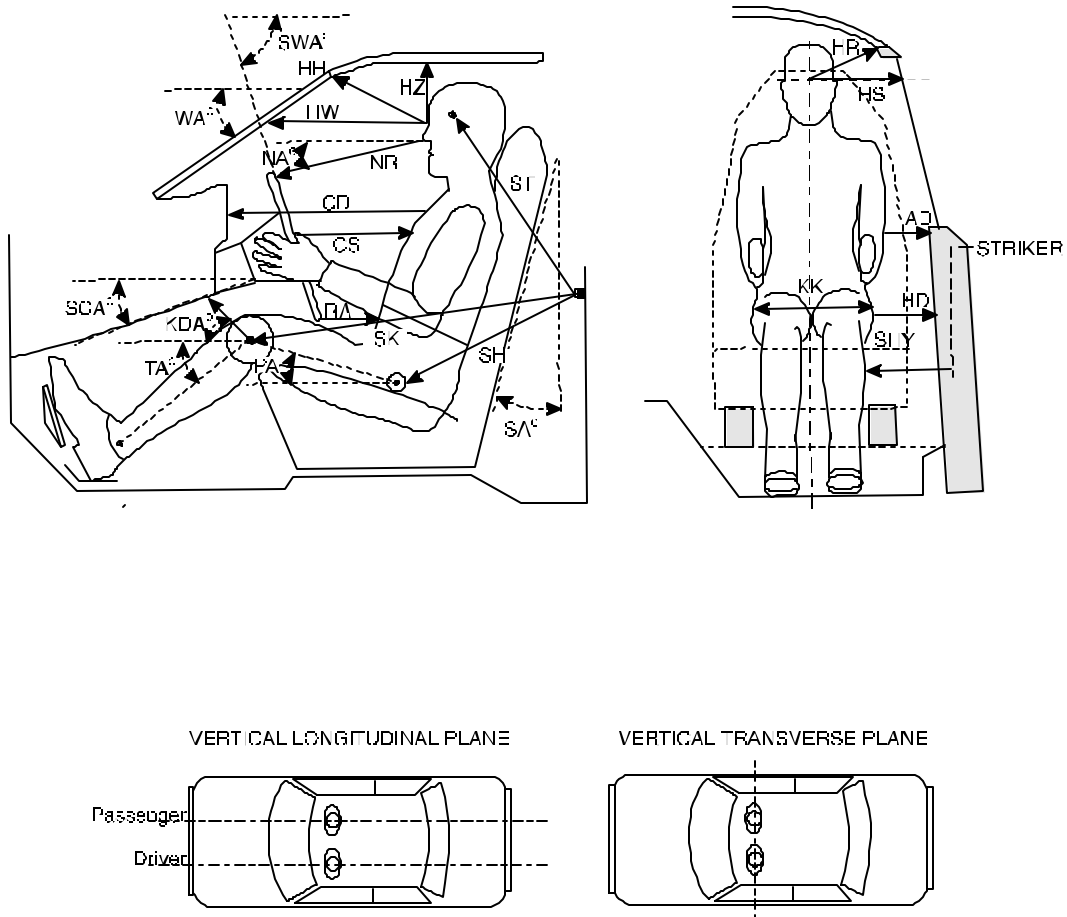


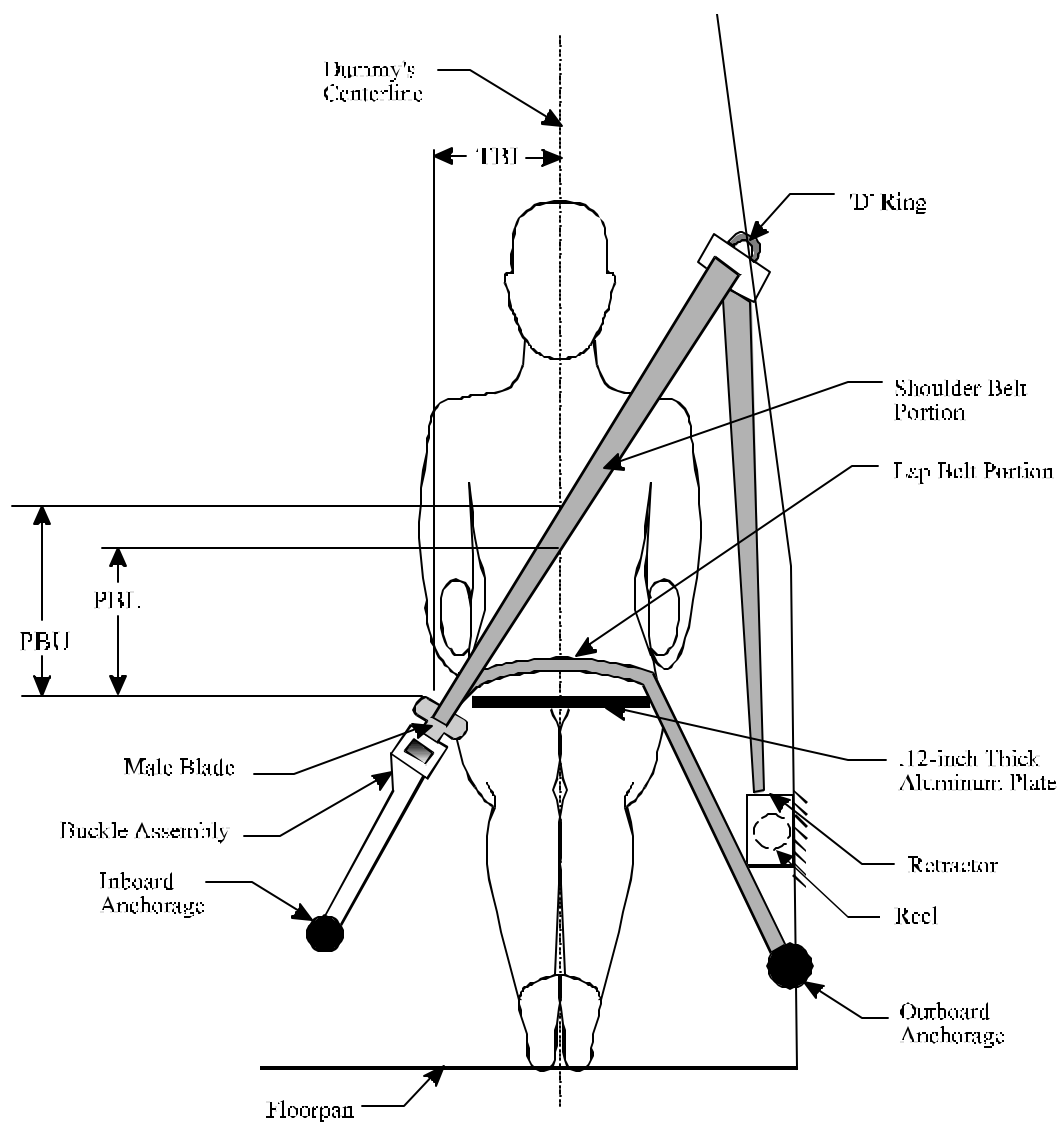
Table 11 Target Vehicle Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial # 168)
WA	Windshield angle	27.3°
SWA	Steering wheel angle	64.5°
SCA	Steering column angle	26.5°
SA	Seat back angle	15.0°
HZ	Head to roof	190 mm
HH	Head to header	313 mm
HW	Head to windshield	545 mm
HR	Head to side header	200 mm
NR	Nose to rim	430 mm
NA	Nose to rim angle	14.0°
CD	Chest to dash	550 mm
CS	Steering wheel to chest	300 mm
RA	Rim to abdomen	210 mm
KDL	Left knee to dash	205 mm
KDR	Right knee to dash	200 mm
KDA	Outboard knee to dash angle	60.3°
PA	Pelvic angle	24.5°
TA	Tibia angle	41.0°
KK	Knee to knee	330 mm
ST ¹	Striker to head	513 mm
	Striker to head angle	82.1°
SK ¹	Striker to knee	550 mm
	Striker to knee angle	4.4°
SH ¹	Striker to H-point	223 mm
	Striker to H-point angle	52.6°
SHY	Striker to H-point (Y dir.)	260 mm
HS	Head to side window	295 mm
HD	H-point to door	170 mm
AD	Arm to door	113 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.

Figure 5 Target Vehicle Seat Belt Positioning Data



Driver
Dummy

PBU - Top surface of aluminum plate to belt upper edge	340 mm
PBL - Top surface of aluminum plate to belt lower edge	220 mm
TBI - Dummy centerline to intersection of upper torso belt and lap belt	260 mm

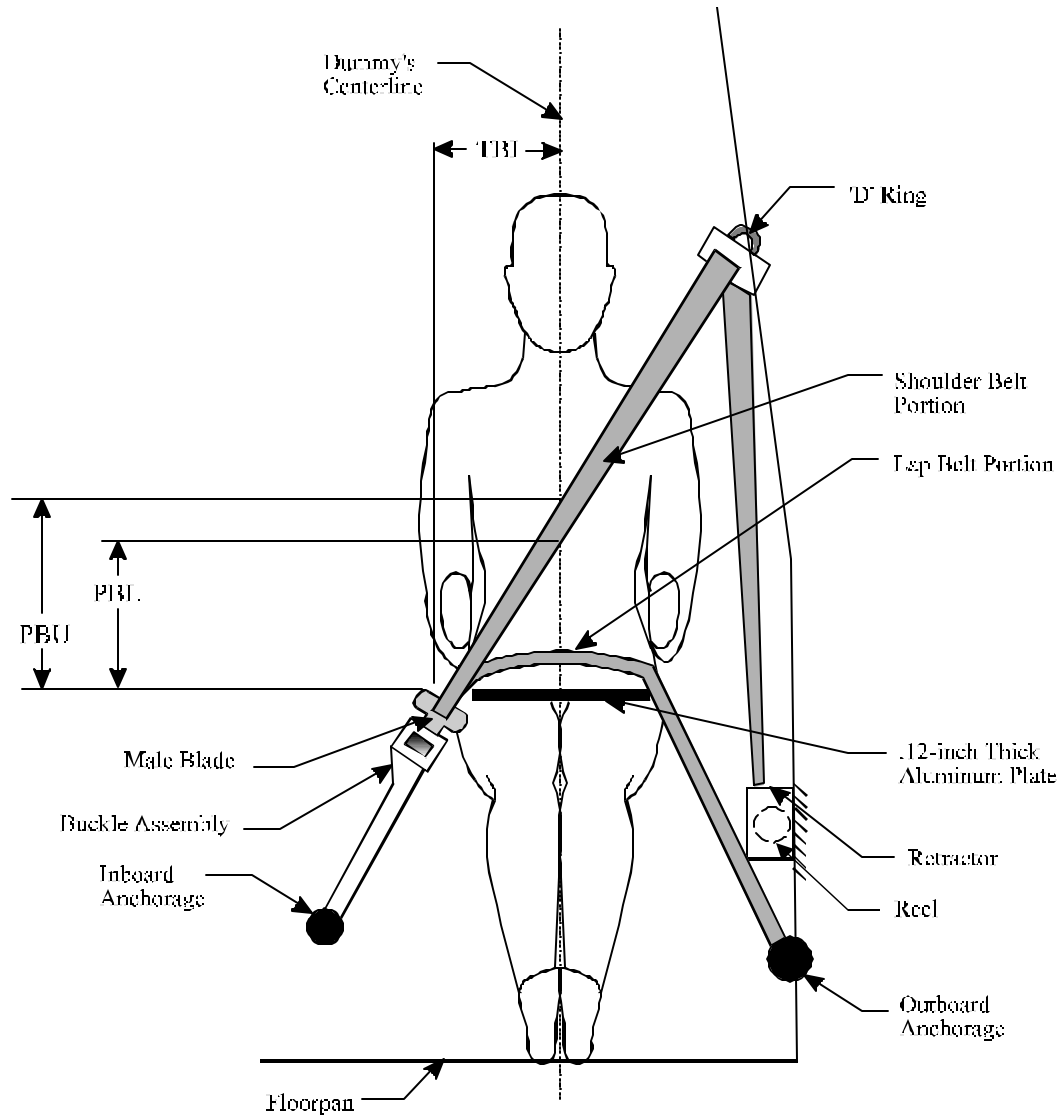
Table 12 Bullet Vehicle Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial # 169)	Passenger (Serial # 416)
WA	Windshield angle	29.8°	N/A
SWA	Steering wheel angle	58.4°	N/A
SCA	Steering column angle	31.6°	N/A
SA	Seat back angle	16.7°	17.0°
HZ	Head to roof	200 mm	270 mm
HH	Head to header	455 mm	400 mm
HW	Head to windshield	644 mm	700 mm
HR	Head to side header	275 mm	280 mm
NR	Nose to rim	444 mm	N/A
NA	Nose to rim angle	16.5°	N/A
CD	Chest to dash	682 mm	488 mm
CS	Steering wheel to chest	308 mm	N/A
RA	Rim to abdomen	202 mm	N/A
KDL	Left knee to dash	190 mm	120 mm
KDR	Right knee to dash	188 mm	140 mm
KDA	Outboard knee to dash angle	67.8°	65.0°
PA	Pelvic angle	23.0°	20.0°
TA	Tibia angle	53.5°	54.0°
KK	Knee to knee	280 mm	165 mm
ST ¹	Striker to head	596 mm	592 mm
	Striker to head angle	66.0°	57.0°
SK ¹	Striker to knee	780 mm	815 mm
	Striker to knee angle	1.6°	2.5°
SH ¹	Striker to H-point	397 mm	510 mm
	Striker to H-point angle	13.0°	14.6°
SHY	Striker to H-point (Y dir.)	290 mm	270 mm
HS	Head to side window	343 mm	345 mm
HD	H-point to door	197 mm	173 mm
AD	Arm to door	148 mm	148 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.

Figure 6 Bullet Vehicle Seat Belt Positioning Data



	Driver Dummy	Passenger Dummy
PBU - Top surface of aluminum plate to belt upper edge	330 mm	270 mm
PBL - Top surface of aluminum plate to belt lower edge	245 mm	185 mm
TBI - Dummy centerline to intersection of upper torso belt and lap belt	280 mm	115 mm

Table 13 Target Vehicle Structural Measurements¹

	Elements	Pre- Test
1	Total Length	4689
2	Total Width	1780
3	Bumper Top Height	557
4	Bumper Bottom Height	417
5	Longitudinal Member Top Height	497
6	Longitudinal Member Bottom Height	287
7	Distance Between Longitudinal Members	1100
7'	Longitudinal Member Width	80
8	Engine Top Height	758
9	Engine Bottom Height	177
10	Engine and Gearbox Width	930
11	Front Bumper – Engine Distance	490
12	Front Shock Absorber Fixing Height	917
13	Bonnet Leading Edge Height	637
14	Front Shock Absorber Fixing Width	788
15	Front Bumper - Front Axle Distance	912
16	Front Axle - A Pillar Distance	540
17	A Pillar - B Pillar Distance	1105
18	B Pillar - Rear Axle Distance	1104
19	B Pillar - C Pillar Distance	1440
20	Roof Sill Bottom Height	1077
21	Roof Sill Top Height	1212
22	Floor Sill Bottom Height	188
23	Floor Sill Top Height	335

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.

Figure 7 Target Vehicle Pre-Test And Post-Test Measurement Points

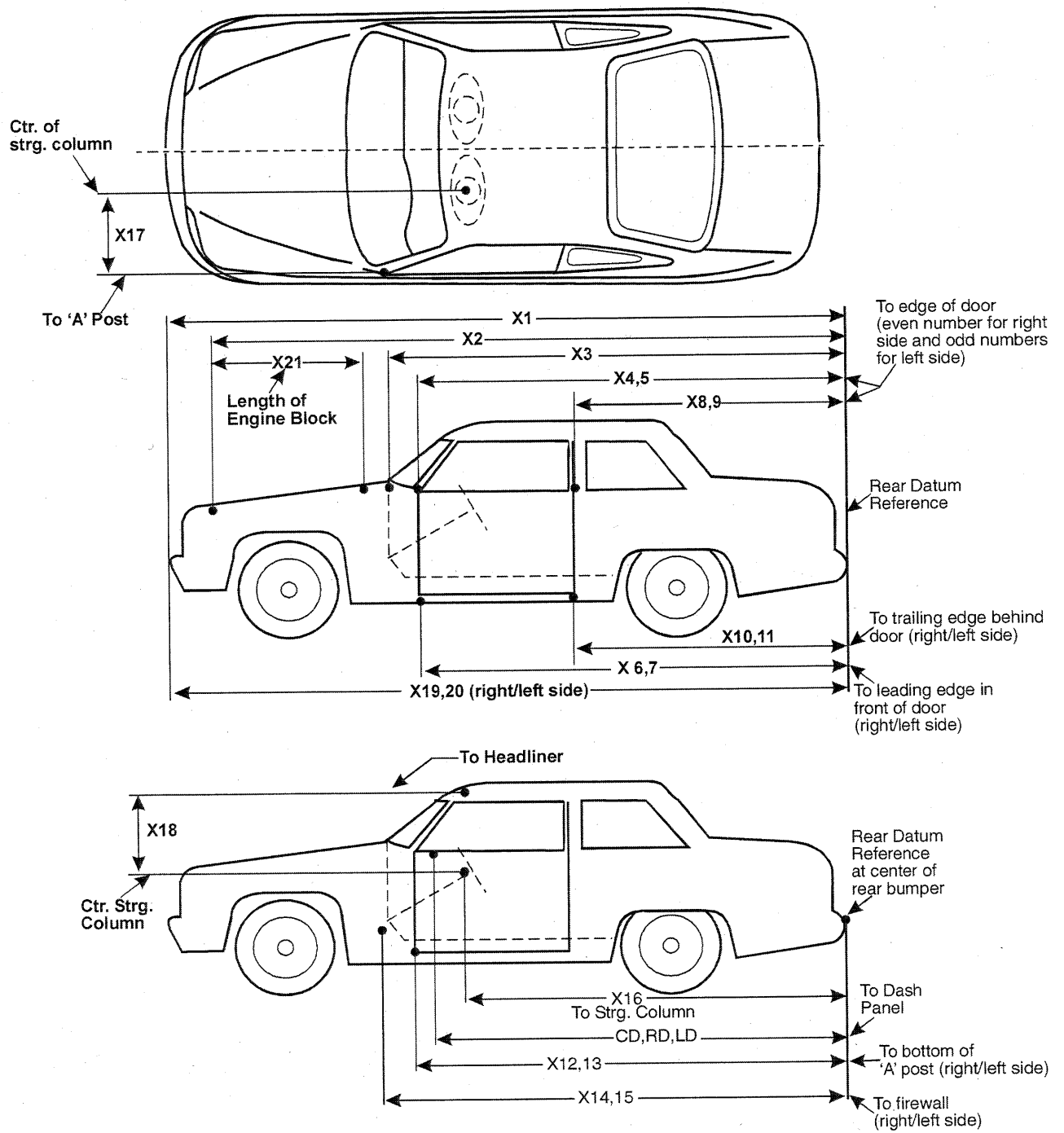


Table 14 Target Vehicle Impacted Measurements

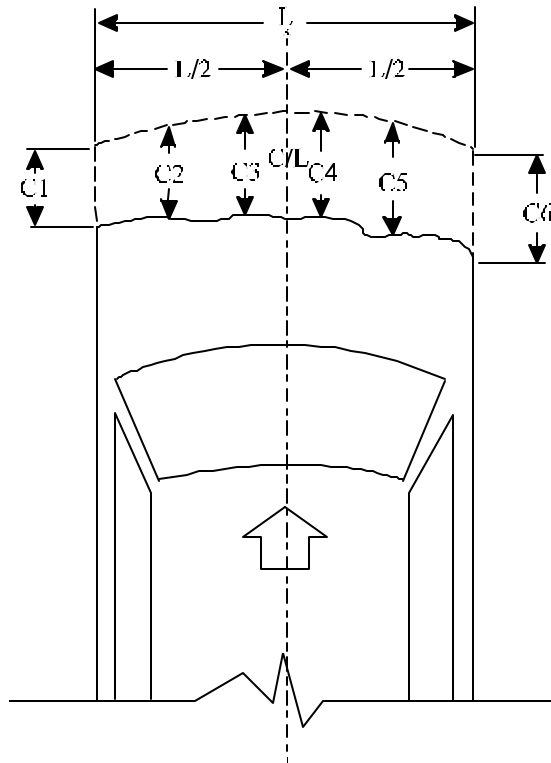
Test number: 040109

Vehicle year/make/model/body style: 1997/Honda/Accord/4 door

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4689	4587	102
X2	Rear Surface of Vehicle to Front of Engine Block	4019	3927	92
X3	Rear Surface of Vehicle to Firewall	3569	3503	66
X4	Rear Surface of Veh. to Upper Leading Edge of Right Door	3211	3211	0
X5	Rear Surface of Veh. to Upper Leading Edge of Left Door	3220	2921	299
X6	Rear Surface of Veh. to Lower Leading Edge of Right Door	3241	3217	24
X7	Rear Surface of Veh. to Lower Leading Edge of Left Door	2184	2830	-646
X8	Rear Surface of Veh. to Upper Trailing Edge of Right Door	2179	2177	2
X9	Rear Surface of Veh. to Upper Trailing Edge of Left Door	2244	2064	180
X10	Rear Surface of Veh. to Lower Trailing Edge of Right Door	2194	2169	25
X11	Rear Surface of Veh. to Lower Trailing Edge of Left Door	2200	1933	267
X12	Rear Surface of Veh. to Bottom of " A " Post on Right Side	3249	3241	8
X13	Rear Surface of Veh. to Bottom of " A " Post on Left Side	3262	2864	398
X14	Rear Surface of Vehicle to Firewall - Right Side	3518	3641	-123
X15	Rear Surface of Vehicle to Firewall - Left Side	3519	3312	207
X16	Rear Surface of Vehicle to Steering Wheel Center	2751	2553	198
X17	Center of Steering Column to " A " Post	292	338	-46
X18	Center of Steering Column to Headliner	450	406	44
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4520	4837	-317
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4520	4051	469
X21	Length of Engine Block	442	442	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2944	2930	14
CD	Rear Surface of Vehicle to Center of Dash Panel	2969	2819	150
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2948	2632	316

All distance measurements are in millimeters.

Figure 8 Target Vehicle Crush



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

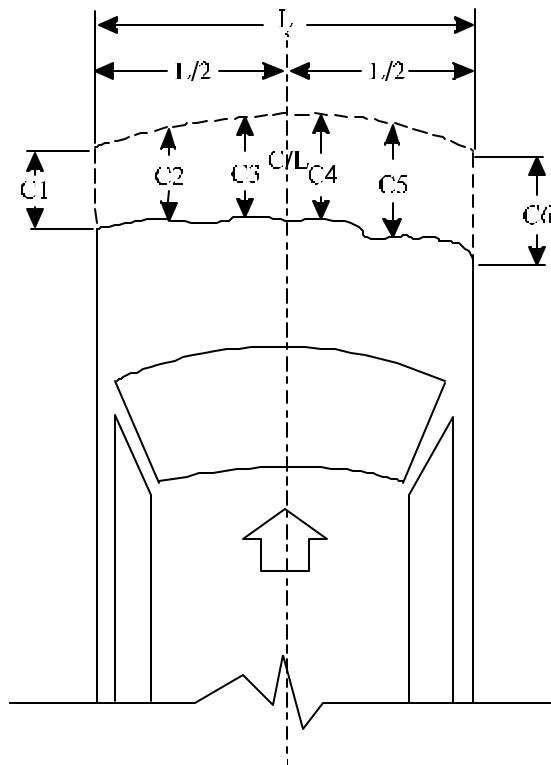
Vehicle: 1997 Honda Accord

Measured with bumper fascia:

Location	Pre-test	Post-test	Difference ¹
L	1524 mm		
C1	4520 mm	4051 mm	469 mm
C2	4629 mm	4302 mm	327 mm
C3	4684 mm	4503 mm	181 mm
C4	4686 mm	4665 mm	21 mm
C5	4639 mm	4786 mm	-147 mm
C6	4520 mm	4837 mm	-317 mm
CL	4689 mm	4587 mm	102 mm

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

Figure 8 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.

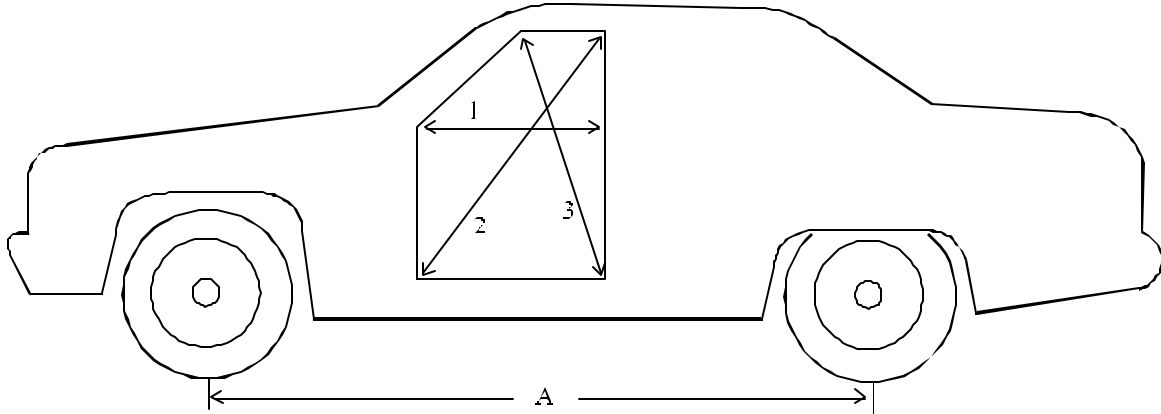
Vehicle: 1997 Honda Accord

Measured without bumper fascia:

Location	Pre-test	Post-test	Difference
L	1524 mm		
C1	4474 mm	4054 mm	420 mm
C2	4605 mm	4283 mm	322 mm
C3	4662 mm	4461 mm	201 mm
C4	4659 mm	4611 mm	48 mm
C5	4615 mm	4714 mm	-99 mm
C6	4478 mm	4733 mm	-255 mm
CL	4662 mm	4542 mm	120 mm

Figure 9 Target Vehicle Intrusion Measurements

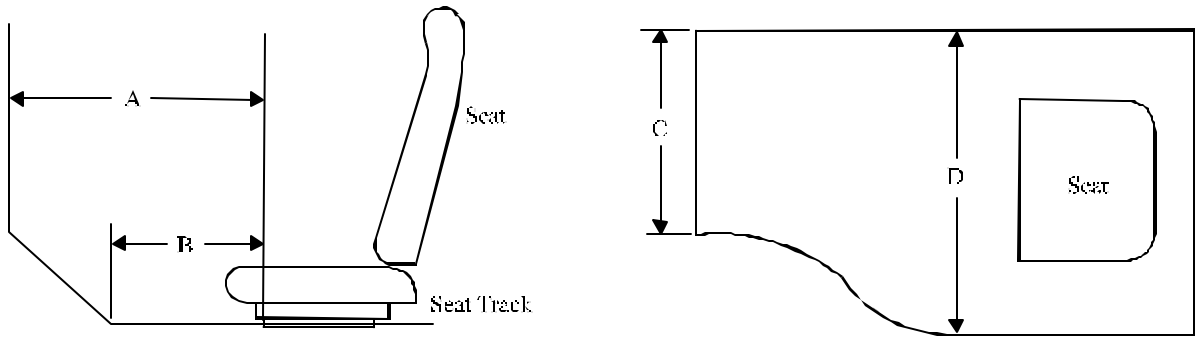
Door Opening Width



Units (mm)	Left			Right		
Measurement	1	2	3	1	2	3
Pre-Test	1032 mm	1490 mm	951 mm	1032 mm	1490 mm	947 mm
Post-Test	744 mm	1313 mm	1125 mm	1035mm	1480 mm	954 mm
Difference	288 mm	177 mm	-174 mm	-3 mm	10 mm	-7 mm

Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	2720 mm	2720 mm
Post-Test	2149 mm	2802 mm
Difference	571 mm	-82 mm

Figure 10 Target Vehicle Intrusion Measurements
Static Footwell Deformation



Driver's Side

Measurement	Pre-Test	Post-Test	Difference
A	755 mm	440 mm	315 mm
B	605 mm	436 mm	169 mm
C	362 mm	N/A ¹	N/A ¹
D	298 mm	N/A ¹	N/A ¹

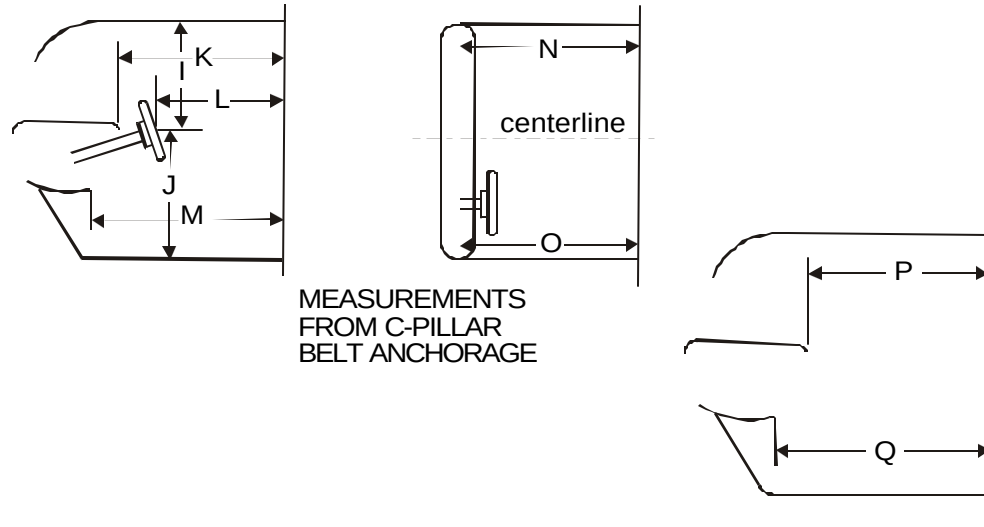
Passenger's Side

Measurement	Pre-Test	Post-Test	Difference
A	805 mm	802 mm	3 mm
B	615 mm	615 mm	0 mm
C	369 mm	N/A ¹	N/A ¹
D	322 mm	322 mm	0 mm

¹ Measurement point could not be located post-test.

Figure 11 Target Vehicle Intrusion Measurements

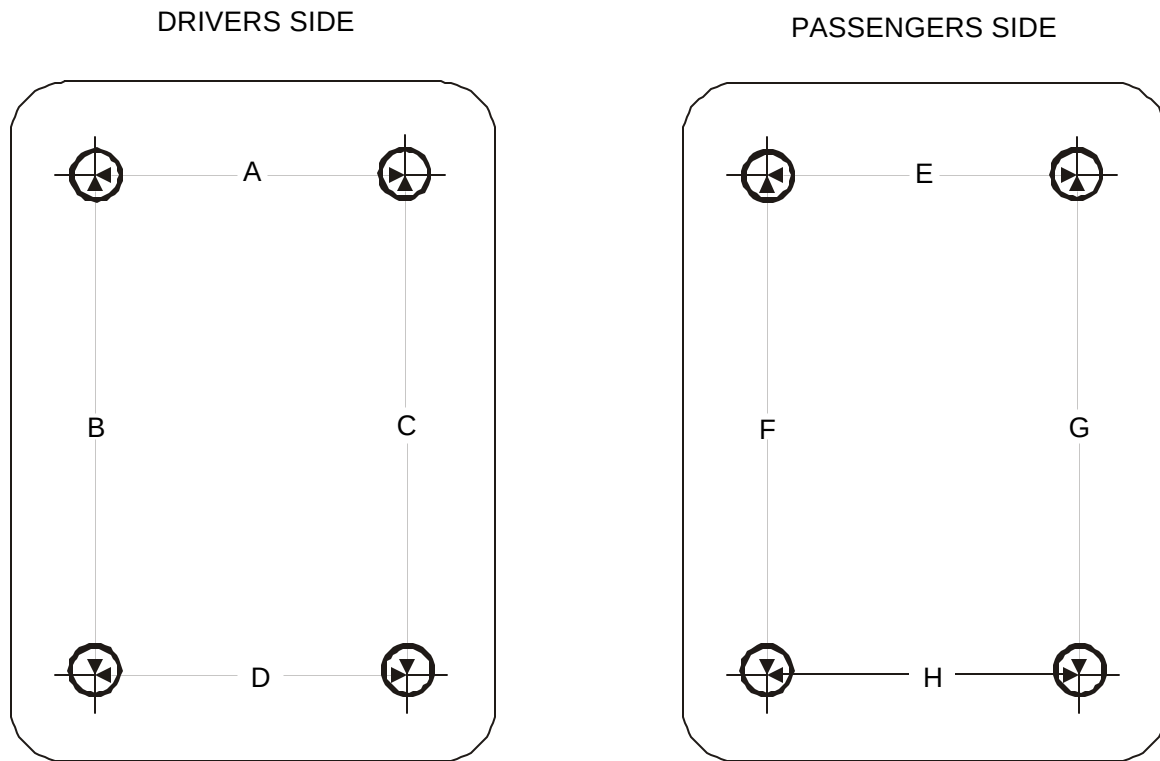
Static Passenger Compartment Intrusion



Measurement	Pre-Test	Post-Test	Difference
I	450 mm	406 mm	44 mm
J	620 mm	710 mm	-90 mm
K (driver's side)	1965 mm	1688 mm	277 mm
L	1730 mm	1555 mm	175 mm
M (driver's side)	2090 mm	N/A ¹	N/A ¹
N (passenger's side)	2063 mm	1979 mm	84 mm
O (driver's side)	1943 mm	1772 mm	171 mm
P (passenger's side)	1965 mm	1967 mm	-2 mm
Q (passenger's side)	2085 mm	2084 mm	1 mm

¹ Measurement point could not be located post-test.

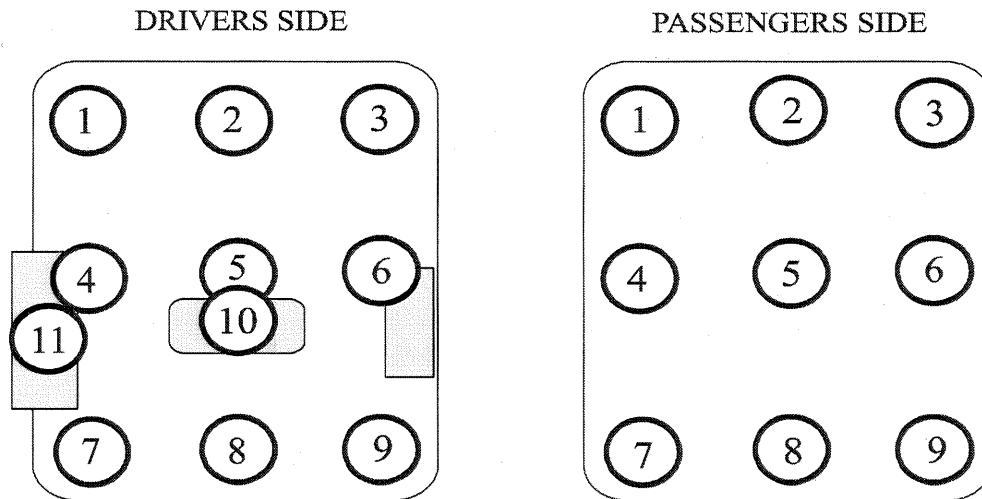
Figure 12 Target Vehicle Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	362 mm	N/A ¹	N/A ¹
B	545 mm	N/A ¹	N/A ¹
C	555 mm	N/A ¹	N/A ¹
D	298 mm	N/A ¹	N/A ¹
E	369 mm	N/A ¹	N/A ¹
F	570 mm	N/A ¹	N/A ¹
G	560 mm	561 mm	-1 mm
H	322 mm	322 mm	0 mm

¹ Measurement point could not be located post-test.

Figure 13 Target Vehicle Toeboard Measurements



Driver Toe Pan							
Pre-Test				Post-Test			
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Difference
1	3417	-564	177	3076	-409	172	341
2	3428	-390	194	3135	-261	187	-155
3	3419	-240	210	3048	-397	256	7
4	3366	-571	260	3131	-252	244	371
5	3363	-385	258	3195	-114	247	157
6	3365	-213	260	3060	-395	346	-46
7	3294	-564	333	3103	-236	369	235
8	3296	-387	335	3133	-133	319	-319
9	3295	-211	341	2946	-274	116	168
10	3256	-372	135	3056	-392	237	-271
11	3380	-565	245	3010	-560	353	305
							182
							-86
							191
							-328
							-36
							163
							-254
							16
							349
							63
							225
							200
							20
							-102
							370
							-5
							-108

Passenger Toe Pan							
Pre-Test				Post-Test			
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Difference
1	3447	195	173	3397	224	92	50
2	3448	364	171	3431	383	113	-29
3	3446	544	175	3443	560	112	17
4	3379	193	251	3321	237	160	-19
5	3379	370	244	3379	407	180	-16
6	3381	551	250	3380	571	189	3
7	3305	201	324	3249	246	237	58
8	3308	378	325	3320	401	259	-44
9	3304	557	326	3304	582	263	91
							58
							-44
							91
							0
							-37
							64
							1
							-20
							61
							56
							-45
							87
							-12
							-23
							66
							0
							-25
							63

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

Table 15 Target Vehicle Intrusion of Upper Instrument Panel

Driver Instrument Panel - Lower

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
Left	2994	-504	-109	2731	-389	-187	263	-115	78
Right	3003	-204	-110	2718	-95	-219	285	-109	109

Driver Knees

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
Left	2974	-494	-139	2708	-383	-220	266	-111	81
Right	2981	-204	-153	2690	-101	-257	291	-103	104

Passenger Knees

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
Left	2982	253	-143	2887	334	-191	95	-81	48
Right	2969	510	-147	2926	587	-200	43	-77	53

Steering Column

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
1	2731	-354	-274	2530	-245	-427	201	-109	153

Driver Front Outboard Seat Attachment Bolt

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
1	2673	-597	284	2632	-616	298	41	19	-14

Passenger Front Outboard Seat Attachment Bolt

Pre-Test				Post-Test			Difference		
Index	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm	Xmm	Ymm	Zmm
1	2674	594	286	2673	611	238	1	-17	48

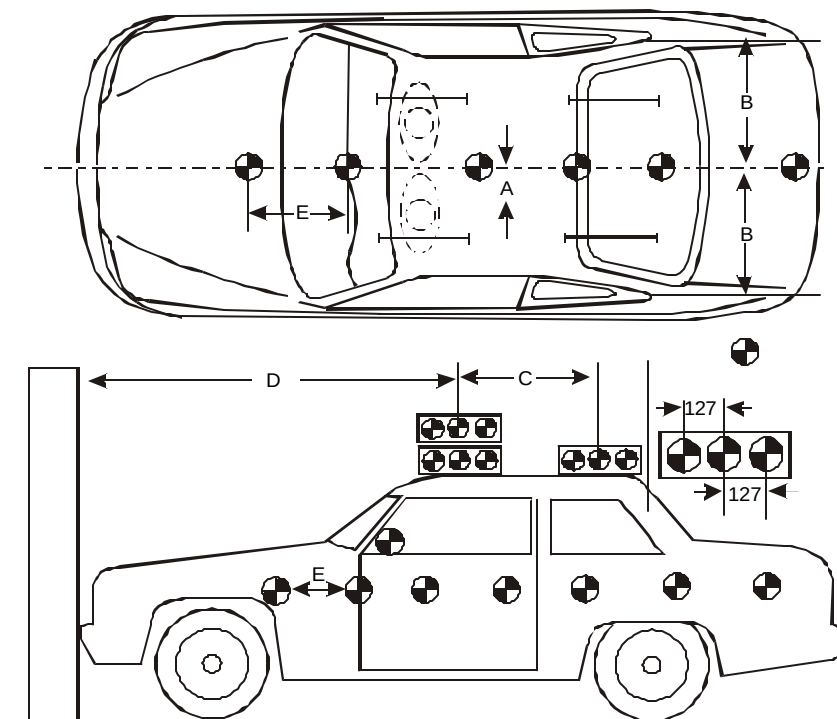
Knee intrusions are points measured pre and post, which are located just above where the four knees would be expected to contact the instrument panel.

+X: Forward from rear bumper

+Y: Rightward from centerline

+Z: Downward from vehicle reference point

Figure 14 Target Vehicle Reference Photo Target Locations



Measurement	Pre-Test
A	Left 325 mm
	Right 325 mm
C	Left 610 mm
	Right 610 mm
E ¹	300 mm

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

Table 16 Bullet Vehicle Structural Measurements¹

	Elements	Pre-Test
1	Total Length	4750
2	Total Width	1805
3	Bumper Top Height	499
4	Bumper Bottom Height	315
5	Longitudinal Member Top Height	458
6	Longitudinal Member Bottom Height	351
7	Distance Between Longitudinal Members	1000
7'	Longitudinal Member Width	85
8	Engine Top Height	N/A
9	Engine Bottom Height	2
10	Engine and Gearbox Width	N/A
11	Front Bumper - Engine Distance	N/A
12	Front Shock Absorber Fixing Height	N/A
13	Bonnet Leading Edge Height	711
14	Front Shock Absorber Fixing Width	N/A
15	Front Bumper - Front Axle Distance	860
16	Front Axle - A Pillar Distance	400
17	A Pillar - B Pillar Distance	940
18	B Pillar - Rear Axle Distance	1510
19	B Pillar - C Pillar Distance	1190
20	Roof Sill Bottom Height	1542
21	Roof Sill Top Height	1624
22	Floor Sill Bottom Height	239
23	Floor Sill Top Height	401

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.

Figure 15 Bullet Pre-Test And Post-Test Measurement Points

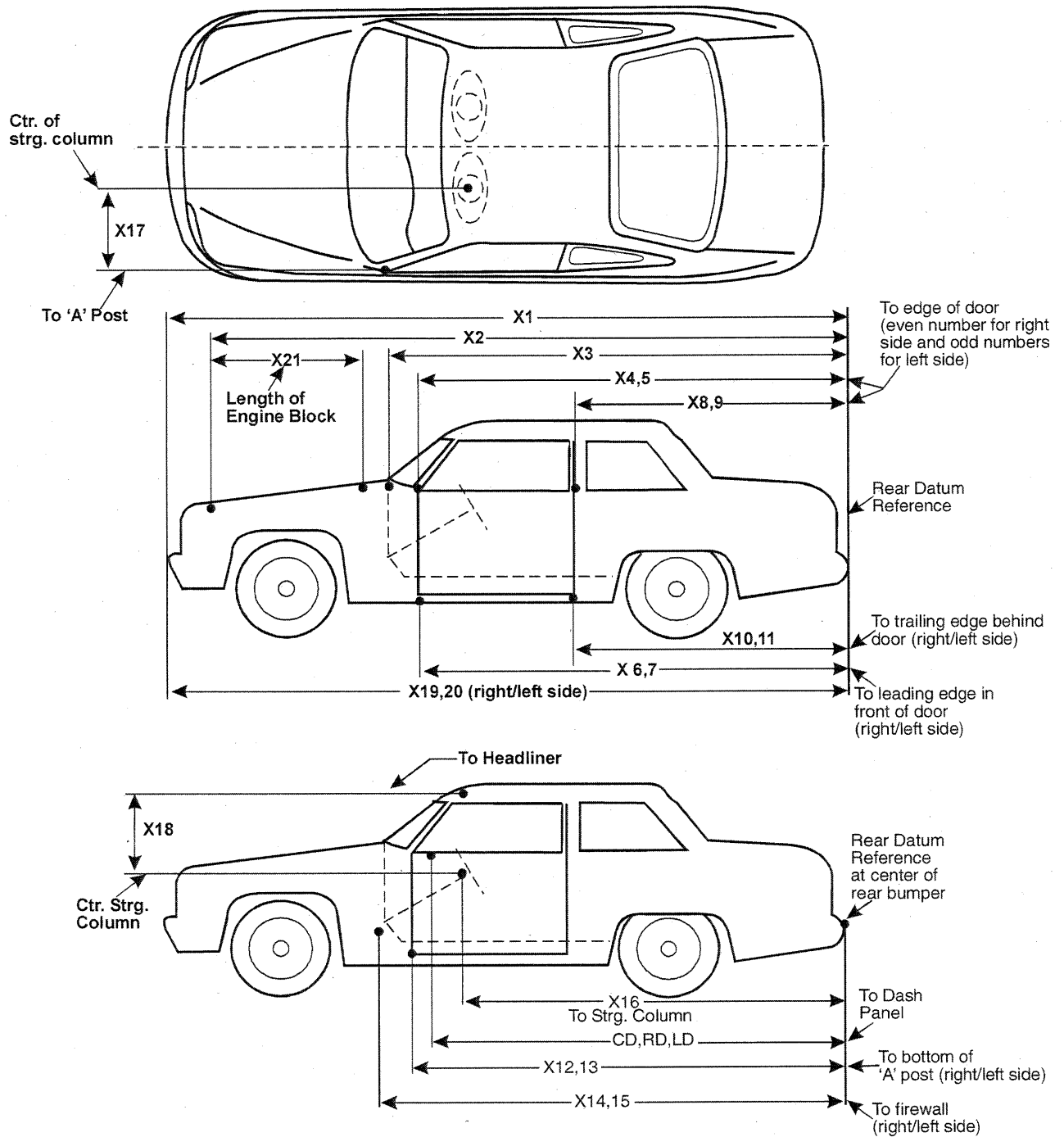


Table 17 Bullet Vehicle Impacted Measurements

Test number: 040109

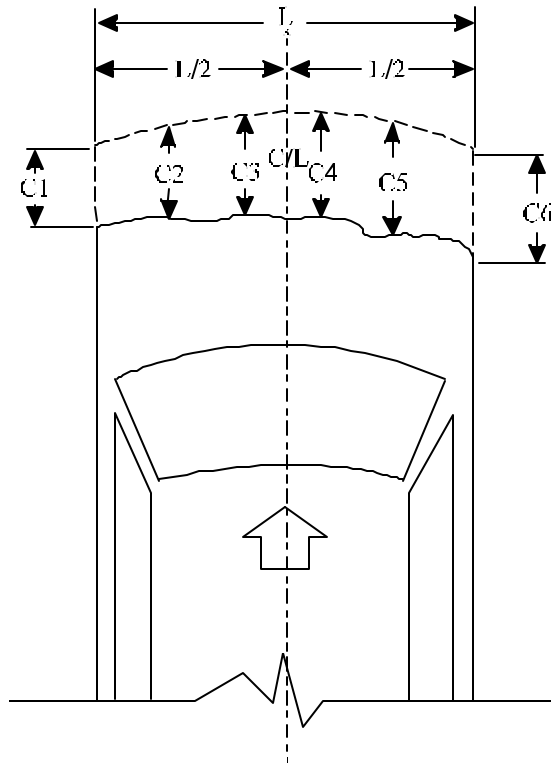
Vehicle year/make/model/body style: 1996/Toyota/Previa/MPV

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4750	4597	153
X2	Rear Surface of Vehicle to Front of Engine Block	3210	3245	-35
X3	Rear Surface of Vehicle to Firewall	3970	N/A ¹	N/A ¹
X4	Rear Surface of Veh. to Upper Leading Edge of Right Door	3533	3552	-19
X5	Rear Surface of Veh. to Upper Leading Edge of Left Door	3537	3533	4
X6	Rear Surface of Veh. to Lower Leading Edge of Right Door	3454	3450	4
X7	Rear Surface of Veh. to Lower Leading Edge of Left Door	3460	3442	18
X8	Rear Surface of Veh. to Upper Trailing Edge of Right Door	2527	2548	-21
X9	Rear Surface of Veh. to Upper Trailing Edge of Left Door	2527	2532	-5
X10	Rear Surface of Veh. to Lower Trailing Edge of Right Door	2508	2505	3
X11	Rear Surface of Veh. to Lower Trailing Edge of Left Door	2516	2497	19
X12	Rear Surface of Veh. to Bottom of " A " Post on Right Side	3480	3503	-23
X13	Rear Surface of Veh. to Bottom of " A " Post on Left Side	3480	3524	-44
X14	Rear Surface of Vehicle to Firewall - Right Side	3968	3980	-12
X15	Rear Surface of Vehicle to Firewall - Left Side	3930	3919	11
X16	Rear Surface of Vehicle to Steering Wheel Center	3285	3243	42
X17	Center of Steering Column to " A " Post	327	313	14
X18	Center of Steering Column to Headliner	410	378	32
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4600	4883	-283
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4595	N/A ¹	N/A ¹
X21	Length of Engine Block	500	500	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3455	3470	-15
CD	Rear Surface of Vehicle to Center of Dash Panel	3500	3509	-9
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3455	3433	22

All distance measurements are in millimeters.

¹ Measurement point could not be located post-test.

Figure 16 Bullet Vehicle Crush



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

Vehicle: 1996 Toyota Previa

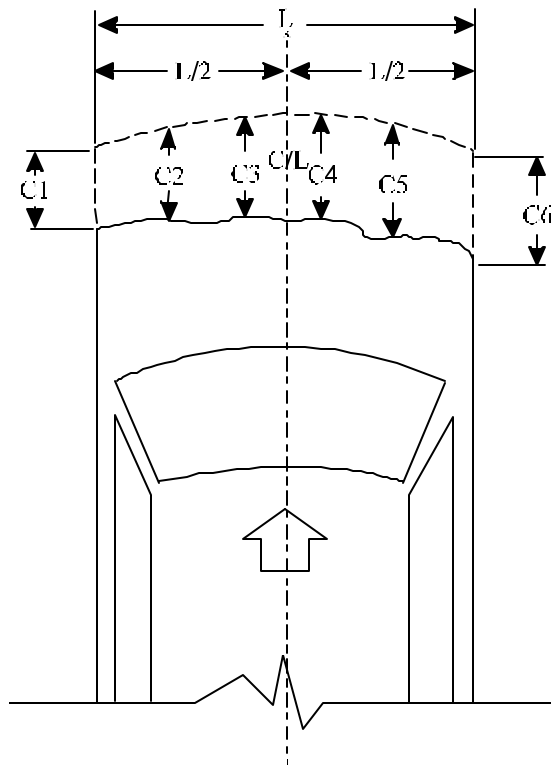
Measured with bumper fascia:

Location	Pre-test	Post-test	Difference ¹
L	1525 mm		
C1	4595 mm	N/A ²	N/A ²
C2	4715 mm	4416 mm	299 mm
C3	4745 mm	4483 mm	262 mm
C4	4740 mm	4693 mm	47 mm
C5	4715 mm	4851 mm	-136 mm
C6	4600 mm	4883 mm	-283 mm
CL	4750 mm	4597 mm	153 mm

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

² Measurement point could not be located post-test.

Figure 16 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: 1996 Toyota Previa

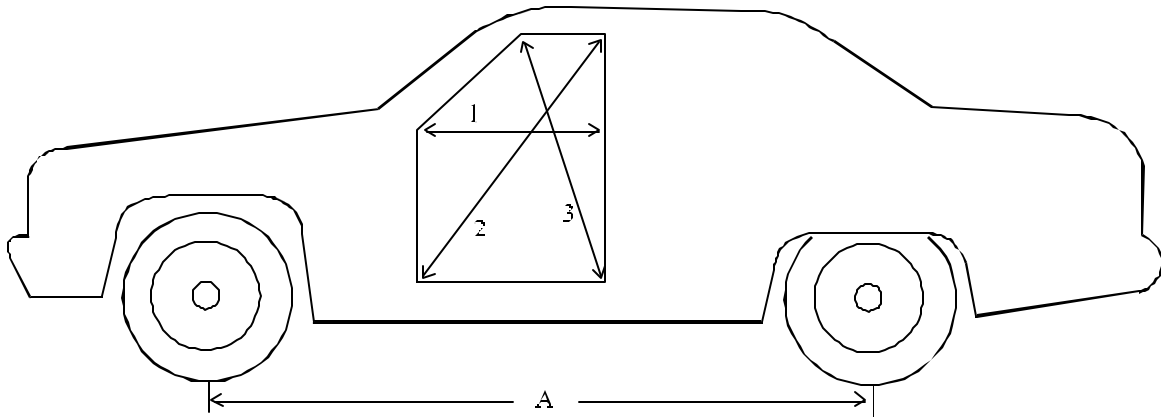
Measured to bumper beam without bumper fascia:

Location	Pre-test	Post-test	Difference
L	1525 mm		
C1	4587 mm	N/A ¹	N/A ¹
C2	4665 mm	N/A ¹	N/A ¹
C3	4685 mm	4363 mm	322 mm
C4	4686 mm	4575 mm	111 mm
C5	4675 mm	4773 mm	-98 mm
C6	4589 mm	4860 mm	-271 mm
CL	4695 mm	4480 mm	215 mm

¹ Measurement point could not be located post-test.

Figure 17 Bullet Vehicle Intrusion Measurements

Door Opening Width

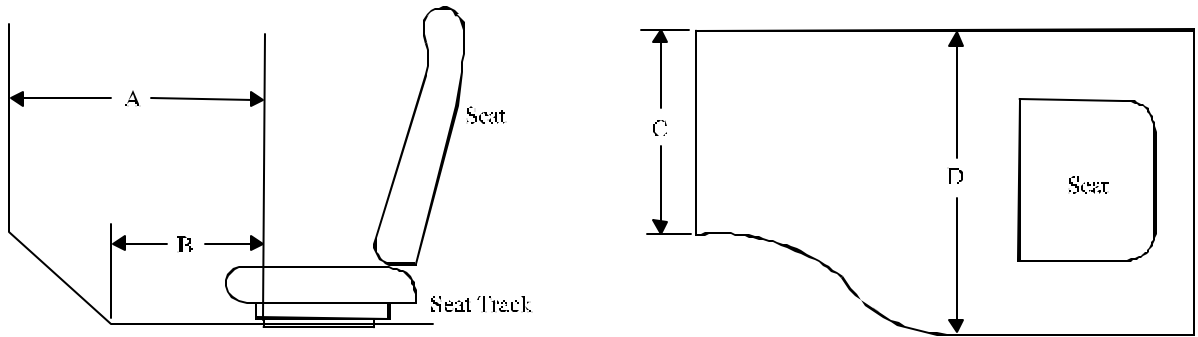


Units (mm)	Left			Right		
Measurement	1	2	3	1	2	3
Pre-Test	1020 mm	1470 mm	1294 mm	1020 mm	1470 mm	1280 mm
Post-Test	1003 mm	1467 mm	1312 mm	1026 mm	1468 mm	1289 mm
Difference	17 mm	3 mm	-18 mm	-6 mm	2 mm	-9 mm

Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	2855 mm	2855 mm
Post-Test	2729 mm	2835 mm
Difference	126 mm	20 mm

Figure 18 Bullet Vehicle Intrusion Measurements

Static Footwell Deformation



Driver's Side

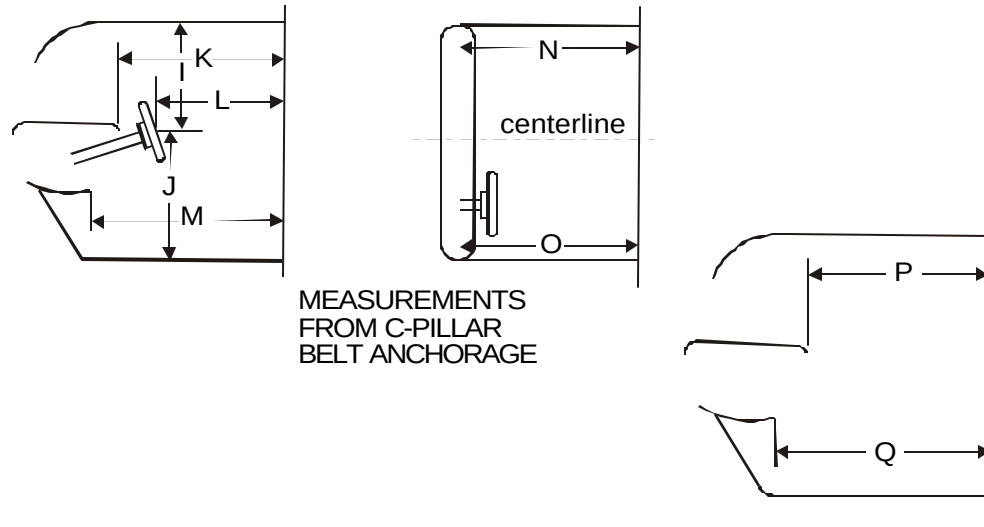
Measurement	Pre-Test	Post-Test	Difference
A	790 mm	760 mm	30 mm
B	600 mm	580 mm	20 mm
C	333 mm	325 mm	8 mm
D	448 mm	450 mm	-2 mm

Passenger's Side

Measurement	Pre-Test	Post-Test	Difference
A	800 mm	784 mm	16 mm
B	622 mm	612 mm	10 mm
C	363 mm	365 mm	-2 mm
D	417 mm	410 mm	7 mm

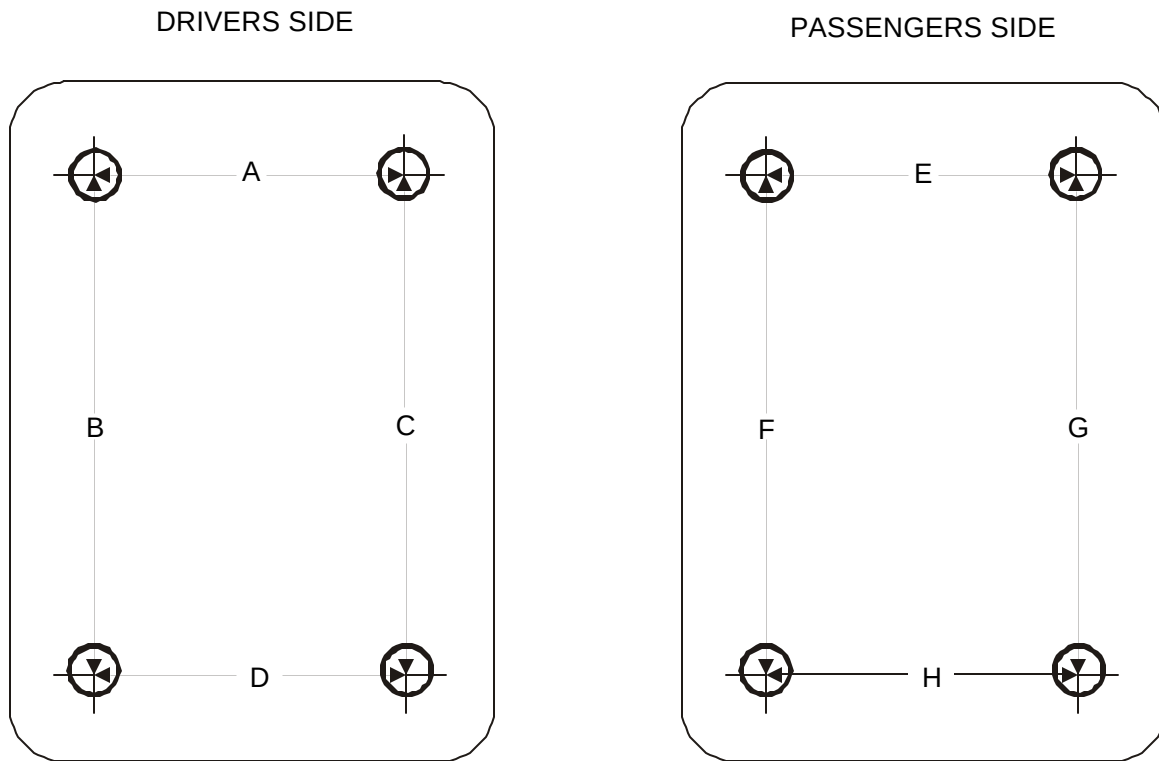
Figure 19 Bullet Vehicle Intrusion Measurements

Static Passenger Compartment Intrusion



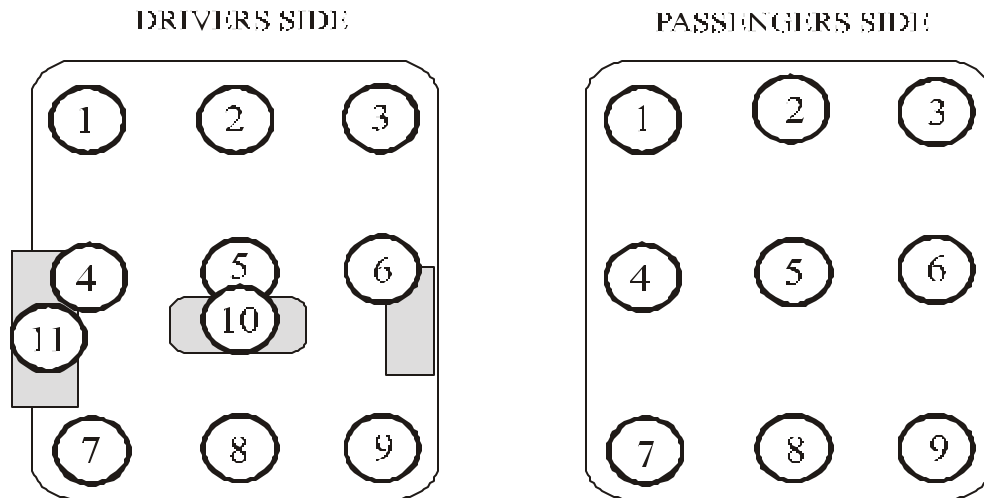
Measurement	Pre-Test	Post-Test	Difference
I	410 mm	378 mm	32 mm
J	700 mm	782 mm	-82 mm
K (driver's side)	2015 mm	1985 mm	30 mm
L	1885 mm	1843 mm	42 mm
M (driver's side)	2080 mm	2060 mm	20 mm
N (passenger's side)	1995 mm	2005 mm	-10 mm
O (driver's side)	2015 mm	2029 mm	-14 mm
P (passenger's side)	1970 mm	1982 mm	-12 mm
Q (passenger's side)	2040 mm	2049 mm	-9 mm

Figure 20 Bullet Vehicle Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	333 mm	325 mm	8 mm
B	403 mm	402 mm	1 mm
C	373 mm	372 mm	1 mm
D	448 mm	450 mm	-2 mm
E	363 mm	365 mm	-2 mm
F	345 mm	345 mm	0 mm
G	393 mm	395 mm	-2 mm
H	417 mm	410 mm	7 mm

Figure 21 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	3922	-480	-530	3897	-498	-525	25	18	5
2	3892	-278	-539	3856	-315	-540	36	37	-1
3	3882	-150	-546	3842	-197	-530	40	47	16
4	3832	-475	-494	3819	-505	-473	13	30	21
5	3818	-280	-473	3790	-317	-481	28	37	-8
6	3827	-140	-484	3812	-175	-460	15	35	24
7	3735	-470	-442	3737	-497	-415	-2	27	27
8	3732	-280	-440	3742	-310	-415	-10	30	25
9	3742	-140	-434	3745	-170	-416	-3	30	18
10	3712	-323	-595	3672	-367	-627	40	44	-32
11	3782	-480	-482	3782	-509	-464	0	29	18

Passenger's Side Toeboard Measurements in Millimeters

Toeboard Location	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3902	135	-512	3898	83	-494	4	52	18
2	3932	310	-530	3922	257	-525	10	53	5
3	3920	498	-547	3917	444	-530	3	54	17
4	3812	120	-476	3812	68	-455	0	52	21
5	3844	310	-490	3845	253	-480	-1	57	10
6	3847	495	-505	3844	437	-502	3	58	3
7	3742	138	-440	3742	76	-425	0	62	15
8	3767	320	-442	3771	259	-444	-4	61	-2
9	3757	500	-455	3758	440	-453	-1	60	2

Pre- and post-test measurement reference: +X forward from rear bumper; +Y from centerline; +Z upward from ground level

Table 18 Bullet Vehicle Intrusion of Upper Instrument Panel

Pre-Test	X	Y	Z
Driver Left Knee	3527	-560	-936
Driver Right Knee	3522	-255	-926
Passenger Left Knee	3502	230	-910
Passenger Right Knee	3527	433	-920
Steering Wheel	3282	-380	-1130
Driver Front Outboard Seat Attachment Bolt	3147	-588	-492
Passenger Front Outboard Seat Attachment Bolt	3137	615	-440

Post-Test	X	Y	Z
Driver Left Knee	3515	-582	-949
Driver Right Knee	3496	-273	-949
Passenger Left Knee	3496	227	-925
Passenger Right Knee	3520	445	-930
Steering Wheel	3253	-444	-1156
Driver Front Outboard Seat Attachment Bolt	3147	-596	-470
Passenger Front Outboard Seat Attachment Bolt	3137	570	-475

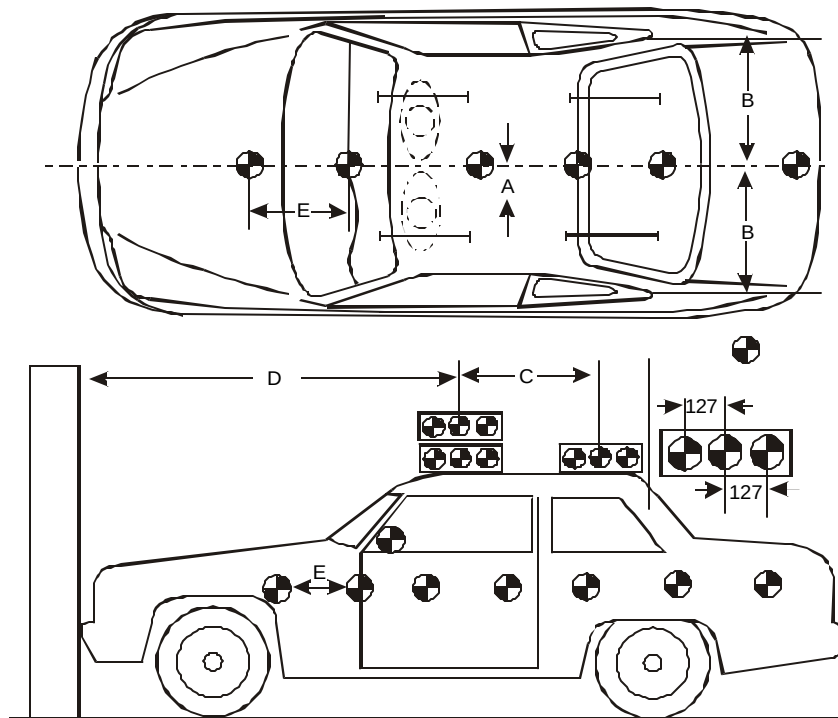
Difference	X	Y	Z
Driver Left Knee	12	22	13
Driver Right Knee	26	18	23
Passenger Left Knee	6	3	15
Passenger Right Knee	7	-12	10
Steering Wheel	29	64	26
Driver Front Outboard Seat Attachment Bolt	0	8	-22
Passenger Front Outboard Seat Attachment Bolt	0	45	35

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.

Figure 22 Bullet Vehicle Reference Photo Target Locations



Measurement	Pre-Test
A	Left 390 mm
	Right 393 mm
C	Left 613 mm
	Right 612 mm
E ¹	300 mm

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

Figure 23 Camera Positions

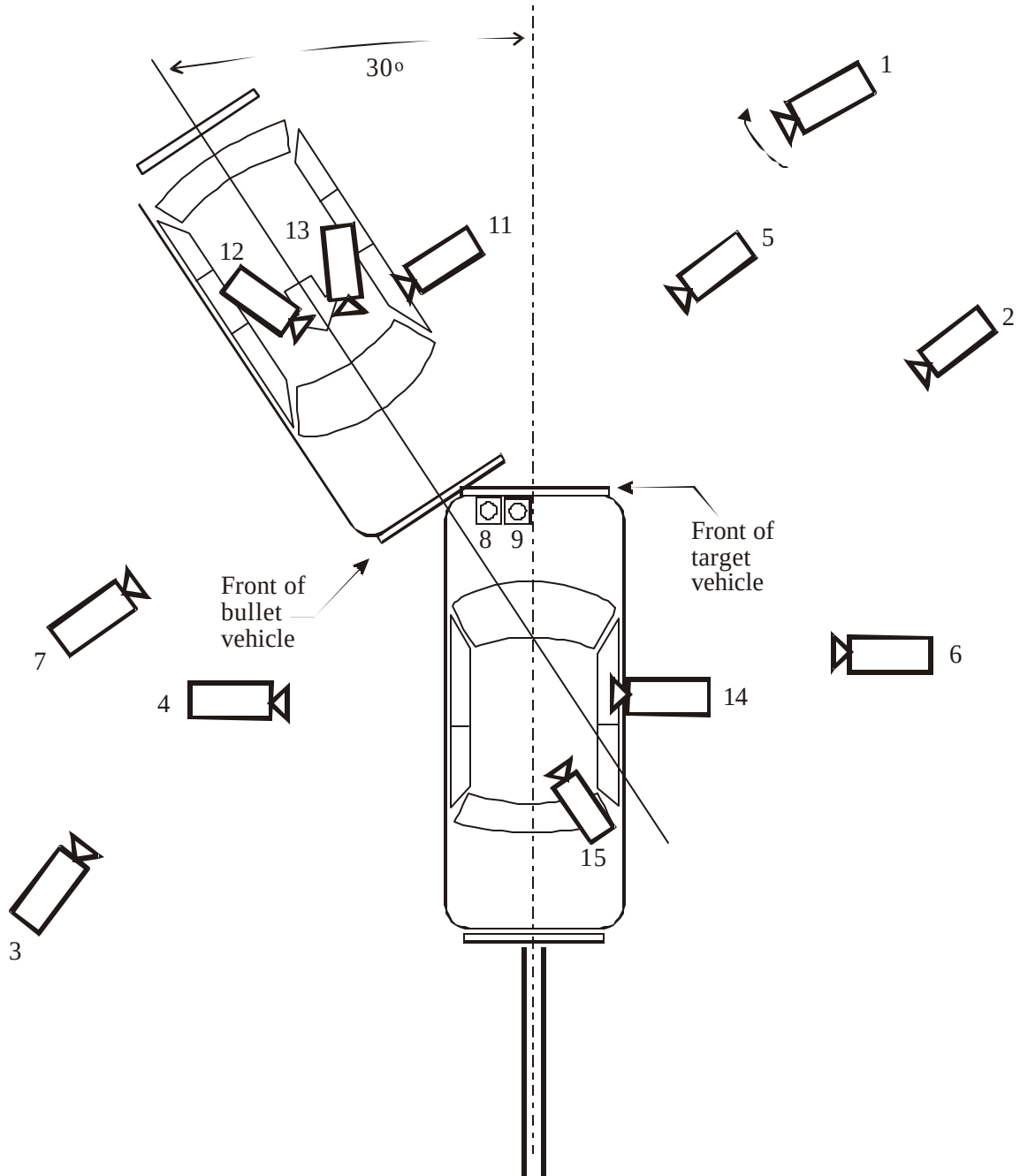


Table 19 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of camera data
1	Panning	Bolex	Zoom	30	Vehicle dynamics
2	Right wide (reference to target vehicle)	Visario	27	1000	Vehicle dynamics
3	Left wide (reference to target vehicle)	Visario	50	1000	Vehicle dynamics
4	Target vehicle left medium tight	Visario	50	1000	Vehicle dynamics
5	Bullet vehicle left medium tight	Photosonic	25	--- ¹	Vehicle dynamics
6	Target vehicle right medium tight	Visario	50	1000	Vehicle dynamics
7	Bullet vehicle right medium tight	Redlake	25	1000	Vehicle dynamics
8	Overhead wide	Visario	20	1000	Vehicle dynamics
9	Overhead tight	Visario	50	1000	Vehicle crush
11	Onboard bullet vehicle - side	Redlake	5	1000	Dummy kinematics
12	Onboard bullet vehicle - driver	Redlake	8	1000	Dummy kinematics
13	Onboard bullet vehicle - passenger	Redlake	8	1000	Dummy kinematics
14	Onboard target vehicle - side	Redlake	8	1000	Dummy kinematics
15	Onboard target vehicle - driver	Redlake	8	1000	Dummy kinematics

¹ Film was not useable.

Appendix A

Photographs



Figure A-1 Pre-Test Overall - View 1



Figure A-2 Post-Test Overall - View 1



Figure A-3 Pre-Test Overall - View 2



Figure A-4 Post-Test Overall - View 2



Figure A-5 Pre-Test Overall - View 3

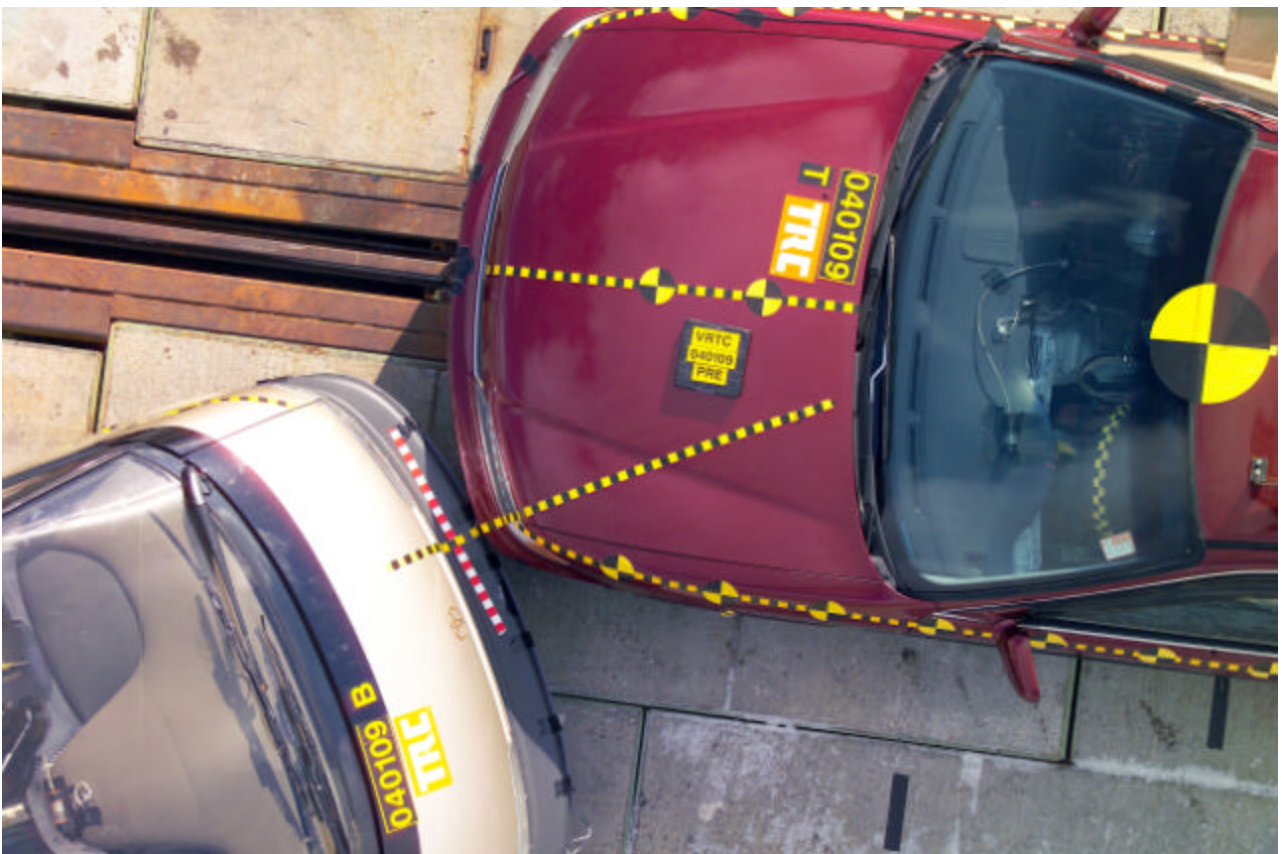


Figure A-6 Pre-Test Impact Alignment View



Figure A-7 Pre-Test Target Vehicle Front View



Figure A-8 Post-Test Target Vehicle Front View



Figure A-9 Pre-Test Target Vehicle Left Front View



Figure A-10 Post-Test Target Vehicle Left Front View



Figure A-11 Pre-Test Target Vehicle Left Side View

Intentionally Left Blank



Figure A-12 Pre-Test Target Vehicle Left Rear View



Figure A-13 Post-Test Target Vehicle Left Rear View



Figure A-14 Pre-Test Target Vehicle Rear View



Figure A-15 Post-Test Target Vehicle Rear View



Figure A-16 Pre-Test Target Vehicle Right Rear View



Figure A-17 Post-Test Target Vehicle Right Rear View



Figure A-18 Pre-Test Target Vehicle Right Side View



Figure A-19 Post-Test Target Vehicle Right Side View



Figure A-20 Pre-Test Target Vehicle Right Front View



Figure A-21 Post-Test Target Vehicle Right Front View

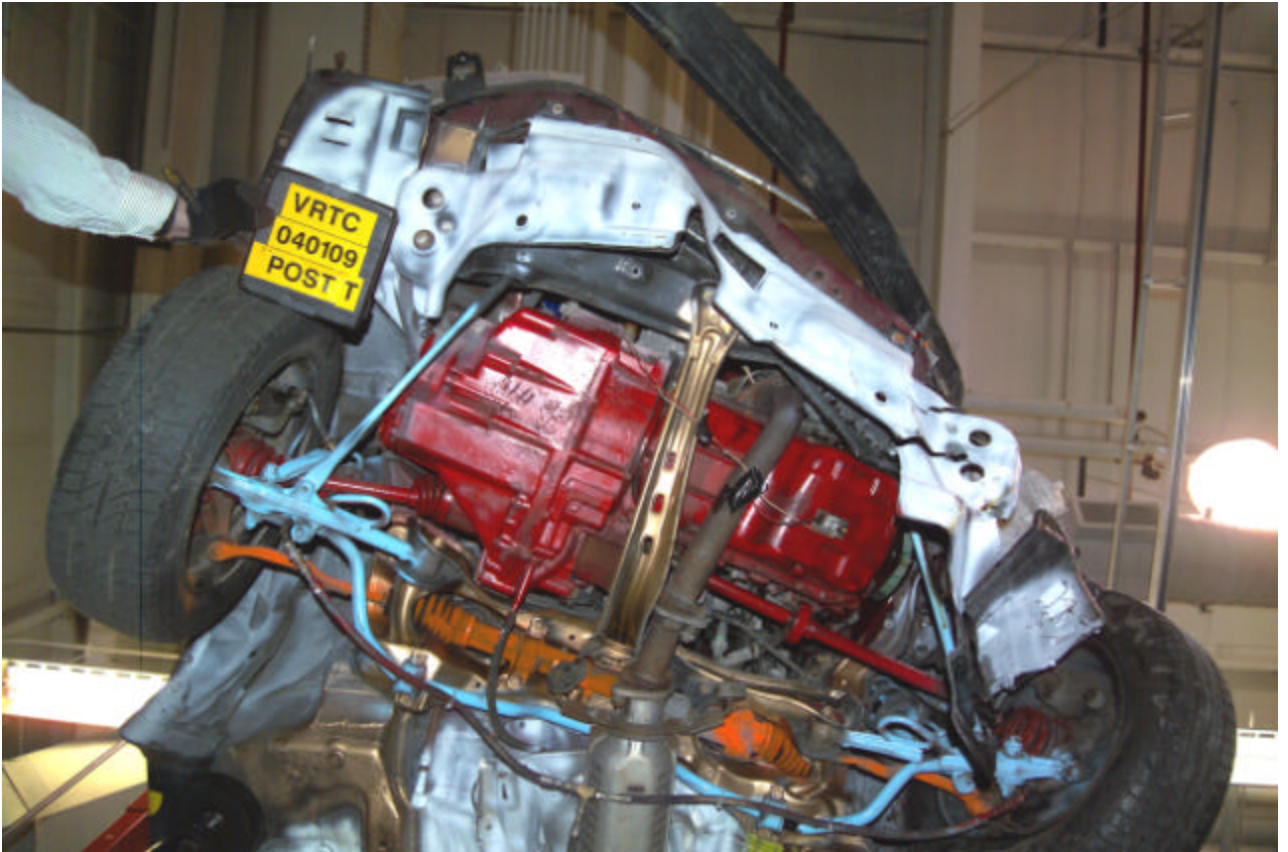


Figure A-22 Post-Test Target Vehicle Front Underbody View

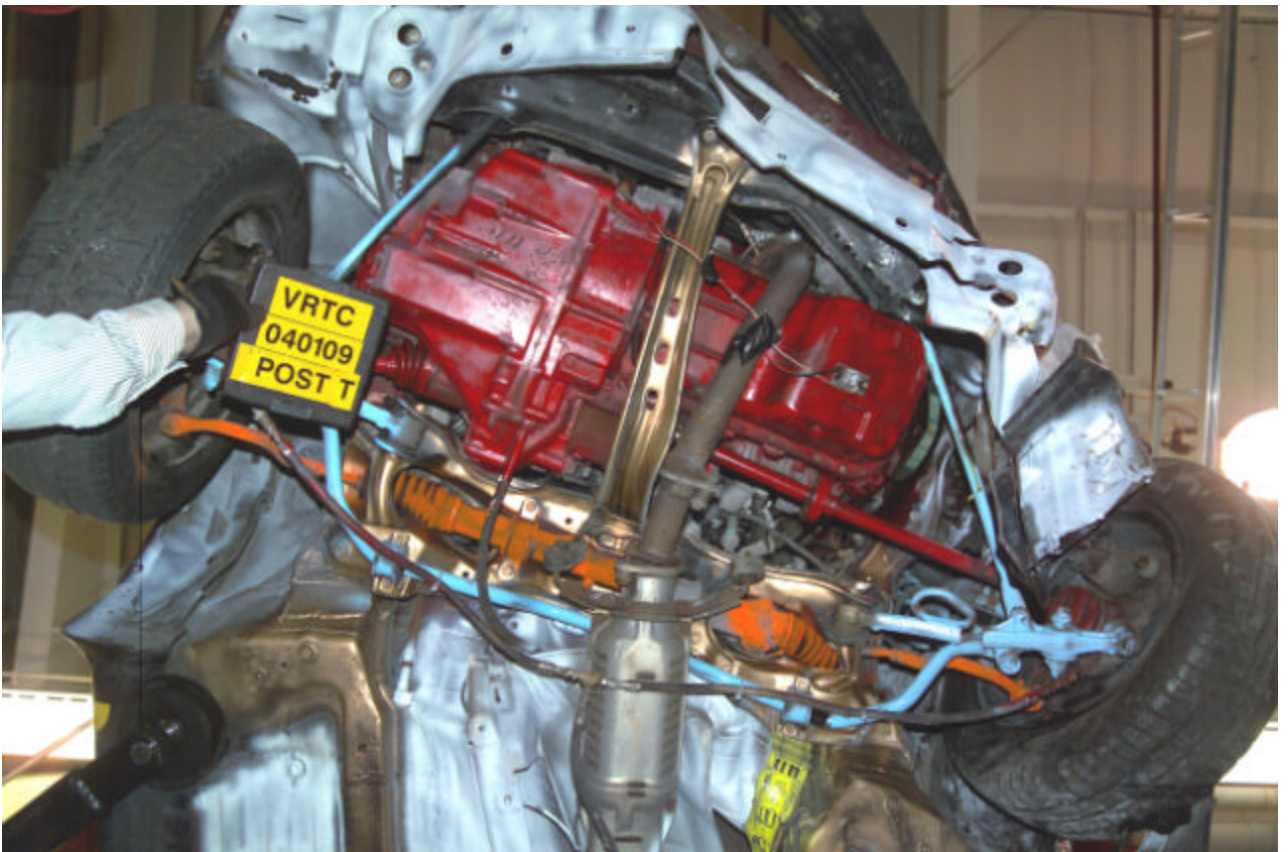


Figure A-23 Post-Test Target Vehicle Mid Front Underbody View

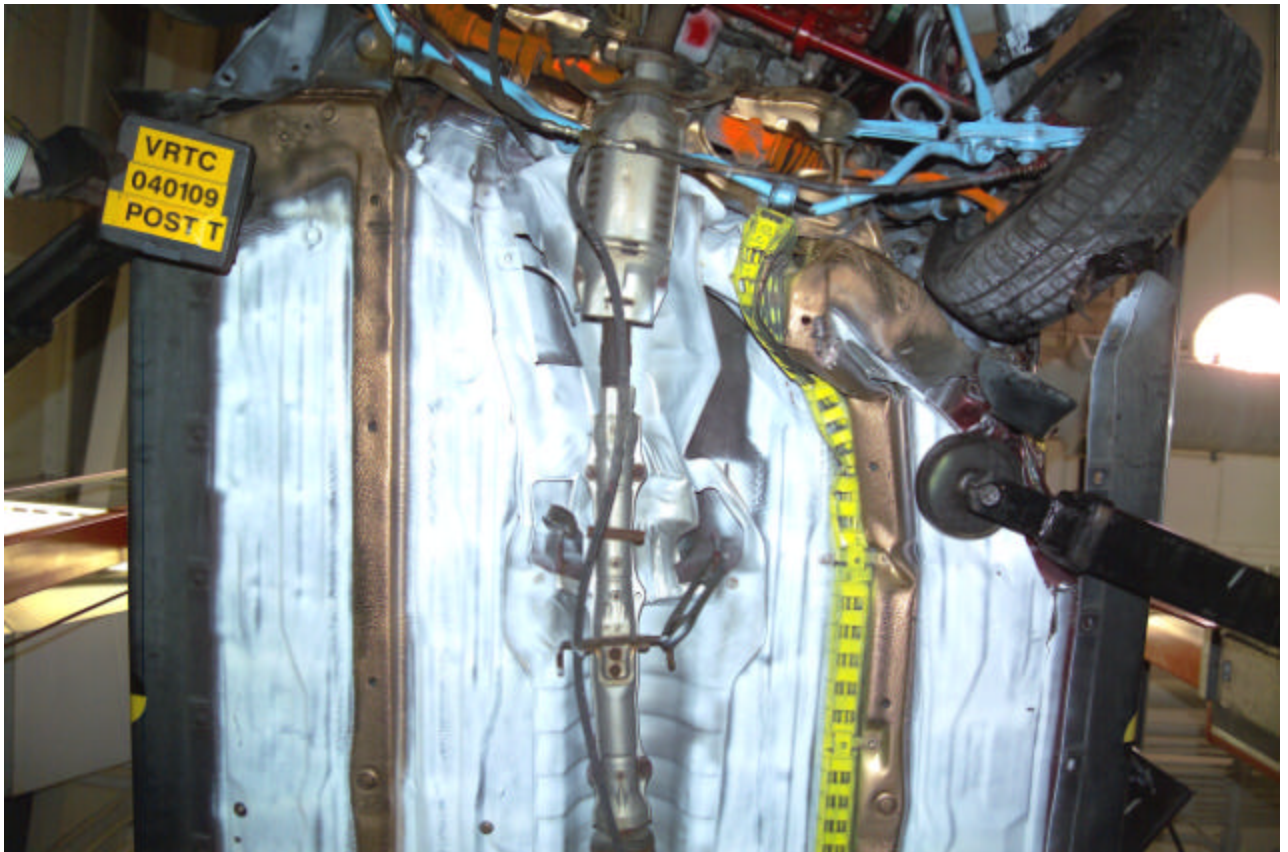


Figure A-24 Post-Test Target Vehicle Mid Underbody View

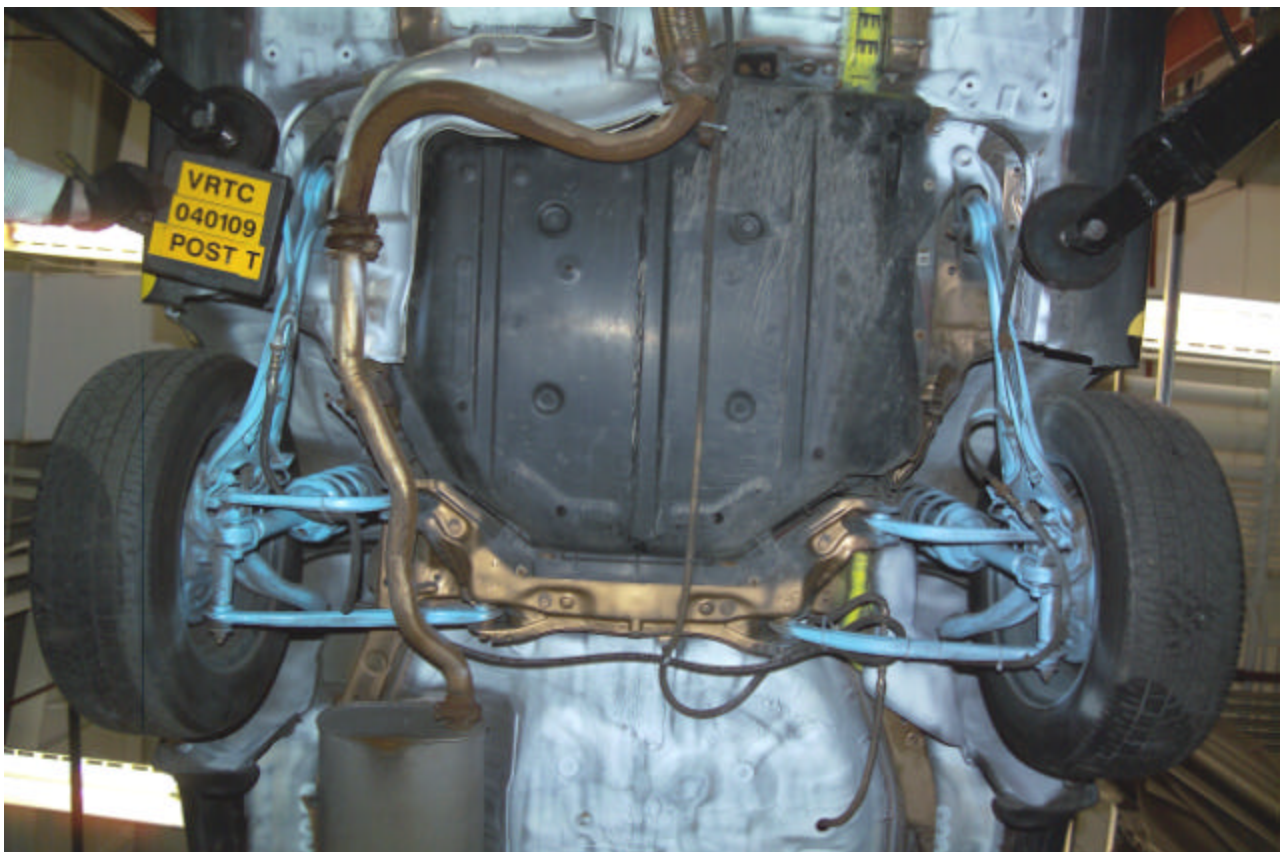


Figure A-25 Post-Test Target Vehicle Mid Rear Underbody View



Figure A-26 Post-Test Target Vehicle Rear Underbody View

Intentionally Left Blank



Figure A-27 Pre-Test Bullet Vehicle Front View



Figure A-28 Post-Test Bullet Vehicle Front View



Figure A-29 Pre-Test Bullet Vehicle Left Front View



Figure A-30 Post-Test Bullet Vehicle Left Front View



Figure A-31 Pre-Test Bullet Vehicle Left Side View



Figure A-32 Post-Test Bullet Vehicle Left Side View



Figure A-33 Pre-Test Bullet Vehicle Left Rear View



Figure A-34 Post-Test Bullet Vehicle Left Rear View



Figure A-35 Pre-Test Bullet Vehicle Rear View



Figure A-36 Post-Test Bullet Vehicle Rear View



Figure A-37 Pre-Test Bullet Vehicle Right Rear View



Figure A-38 Post-Test Bullet Vehicle Right Rear View



Figure A-39 Pre-Test Bullet Vehicle Right Side View



Figure A-40 Post-Test Bullet Vehicle Right Side View



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



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

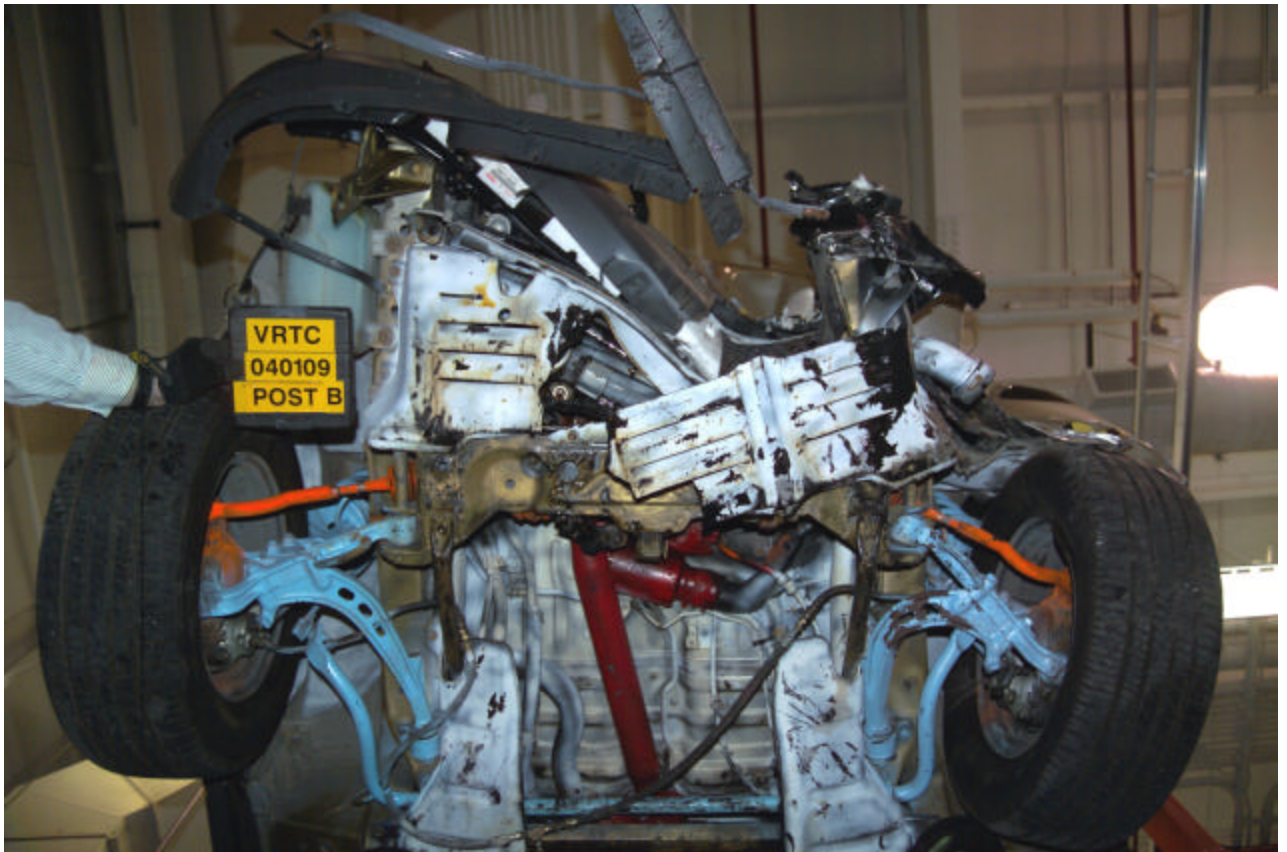


Figure A-43 Post-Test Bullet Vehicle Front Underbody View

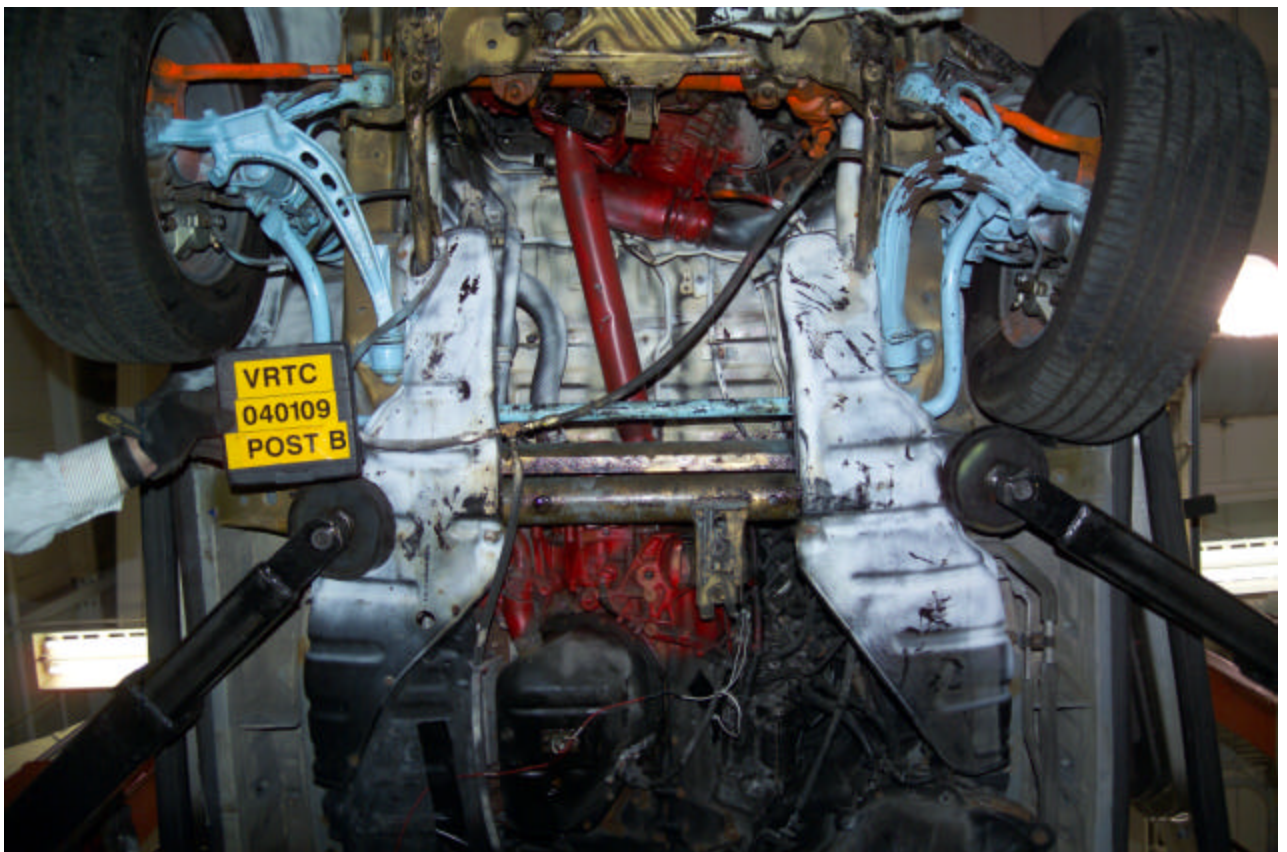


Figure A-44 Post-Test Bullet Vehicle Mid Front Underbody View

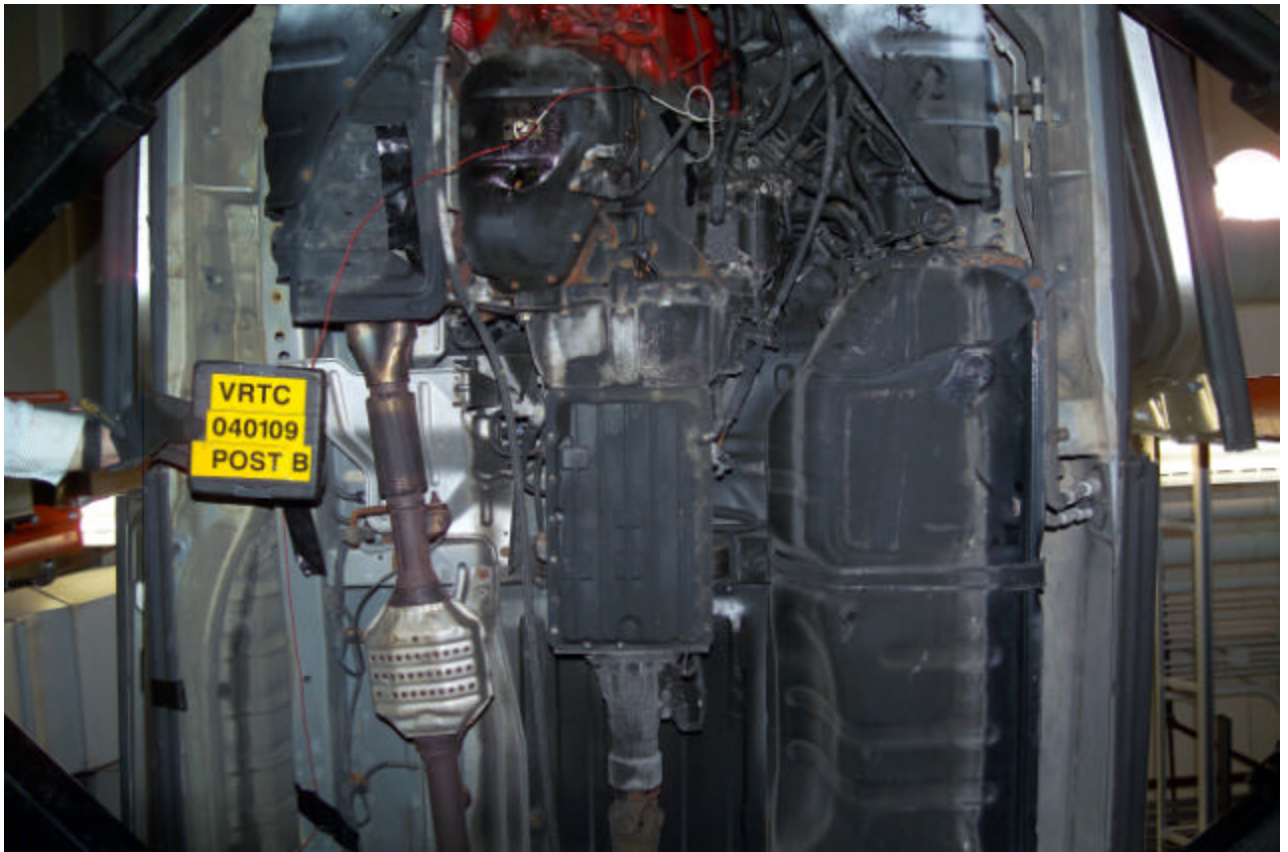


Figure A-45 Post-Test Bullet Vehicle Mid Underbody View

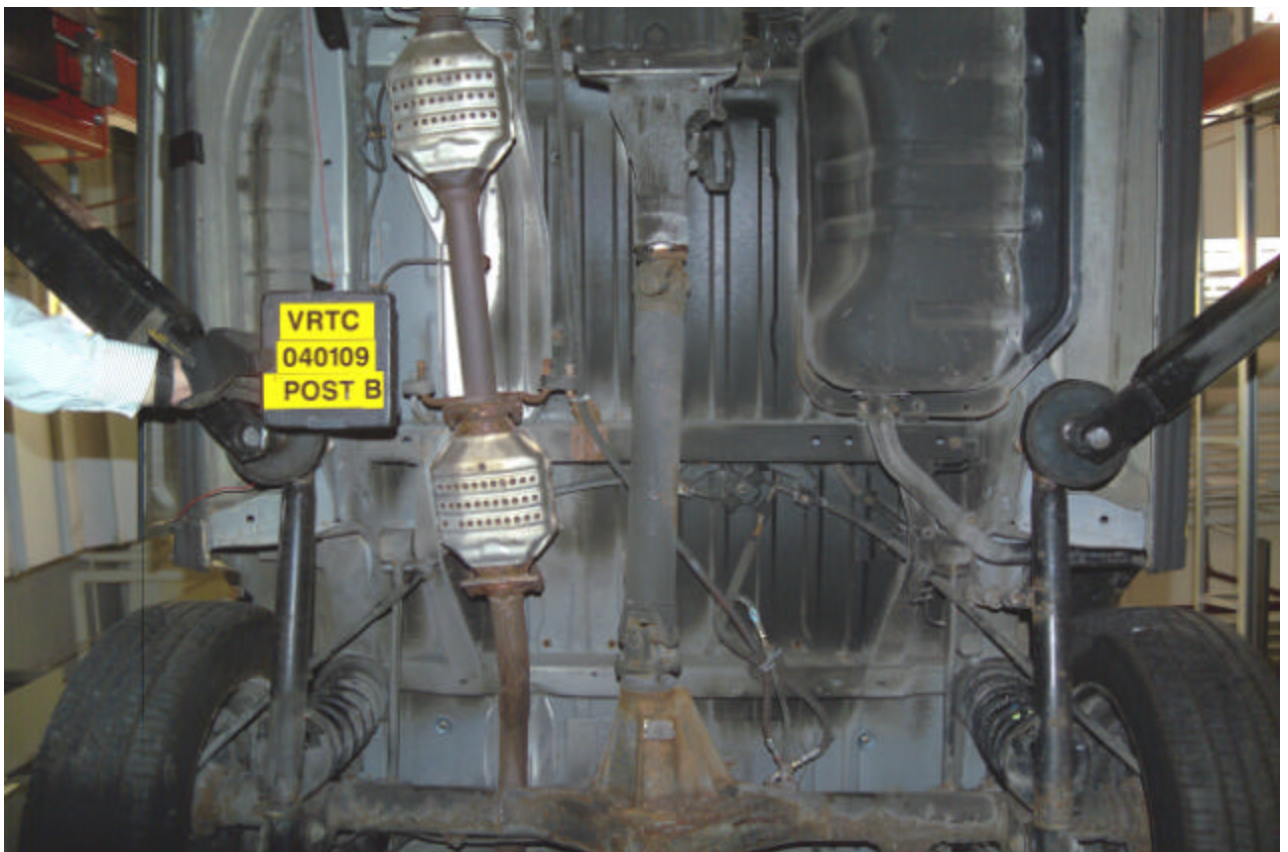


Figure A-46 Post-Test Bullet Vehicle Mid Rear Underbody View

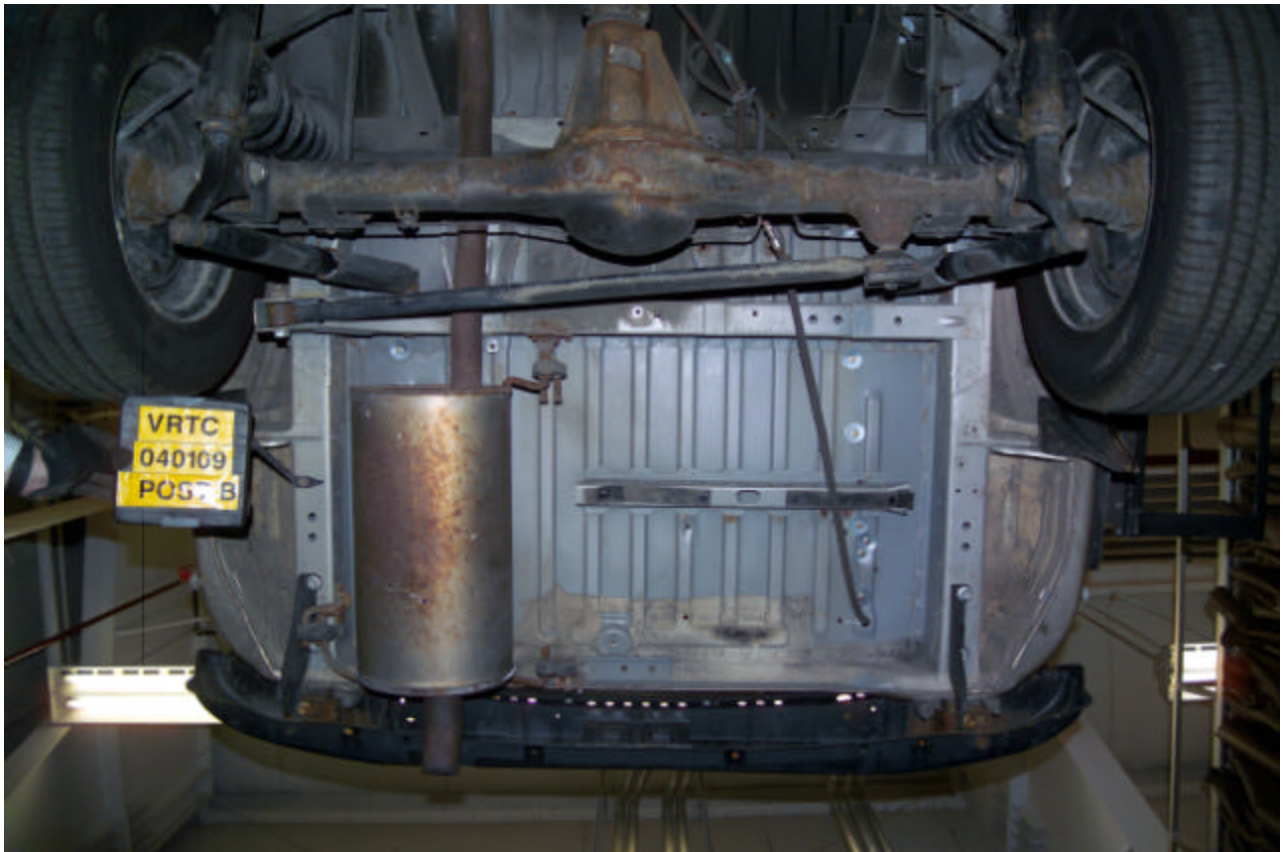


Figure A-47 Post-Test Bullet Vehicle Rear Underbody View



Figure A-48 Pre-Test Overhead View



Figure A-49 Pre-Test Target Vehicle Driver Dummy - View 1



Figure A-50 Post-Test Target Vehicle Driver Dummy - View 1



Figure A-51 Pre-Test Target Vehicle Driver Dummy - View 2



Figure A-52 Post-Test Target Vehicle Driver Dummy - View 2



Figure A-53 Pre-Test Target Vehicle Driver Dummy - View 3



Figure A-54 Pre-Test Target Vehicle Driver Dummy - View 4



Figure A-55 Post-Test Target Vehicle Driver Dummy Right Interior View

Intentionally Left Blank



Figure A-56 Pre-Test Bullet Vehicle Windshield View



Figure A-57 Post-Test Bullet Vehicle Windshield View



Figure A-58 Pre-Test Bullet Vehicle Driver Dummy - View 1



Figure A-59 Post-Test Bullet Vehicle Driver Dummy - View 1

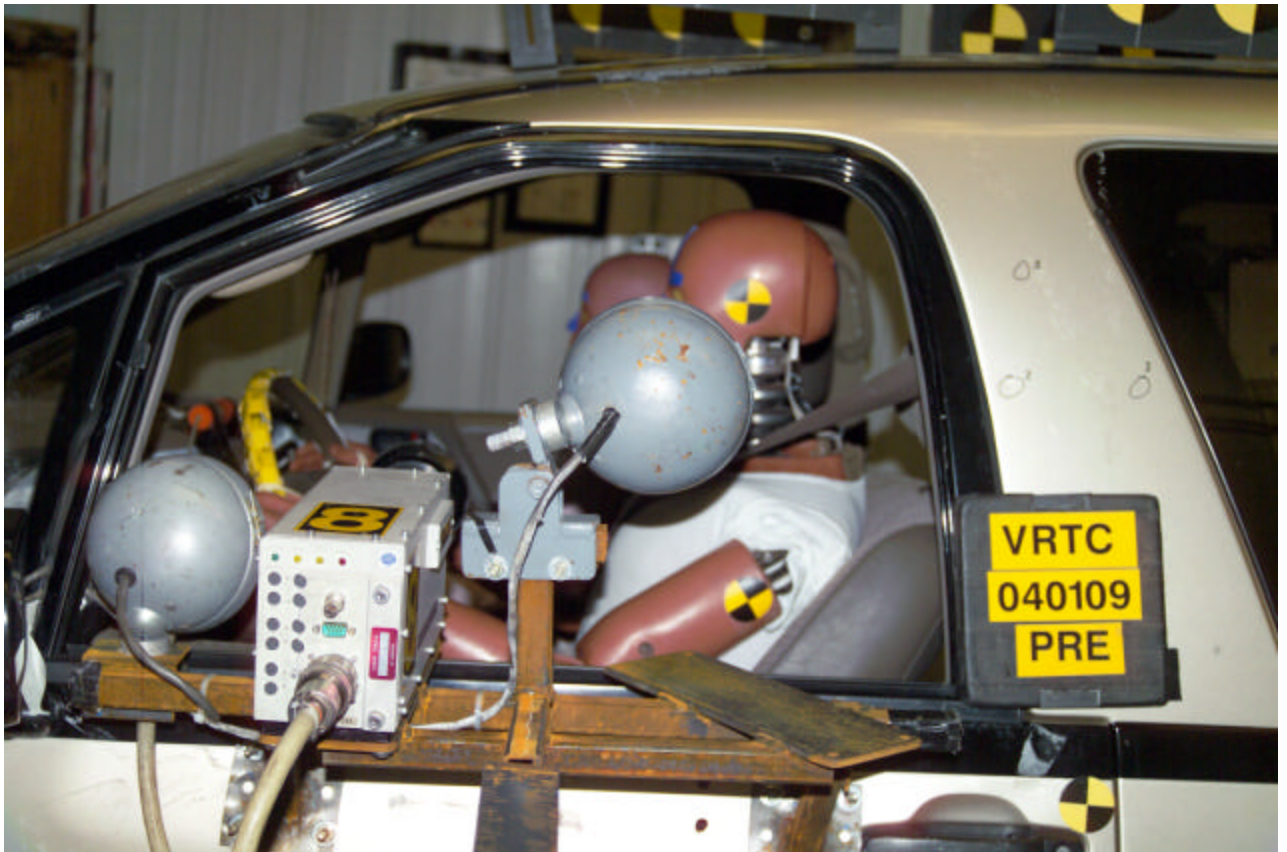


Figure A-60 Pre-Test Bullet Vehicle Driver Dummy - View 2



Figure A-61 Post-Test Bullet Vehicle Driver Dummy - View 2



Figure A-62 Pre-Test Bullet Vehicle Driver Dummy - View 3



Figure A-63 Post-Test Bullet Vehicle Driver Dummy - View 3



Figure A-64 Pre-Test Bullet Vehicle Driver Dummy - View 4



Figure A-65 Post-Test Bullet Vehicle Driver Dummy - View 4



Figure A-66 Post-Test Bullet Vehicle Passenger Dummy - View 1

Intentionally Left Blank



Figure A-67 Pre-Test Bullet Vehicle Passenger Dummy - View 2



Figure A-68 Post-Test Bullet Vehicle Passenger Dummy - View 2



Figure A-69 Pre-Test Bullet Vehicle Passenger Dummy - View 3



Figure A-70 Post-Test Bullet Vehicle Passenger Dummy - View 3



Figure A-71 Pre-Test Bullet Vehicle Passenger Dummy - View 4



Figure A-72 Post-Test Bullet Vehicle Passenger Dummy - View 4



Figure A-73 Post-Test Target Vehicle Driver Dummy Overall Contact View¹



Figure A-74 Post-Test Target Vehicle Driver Dummy Head Contact - View 1



Figure A-75 Post-Test Target Vehicle Driver Dummy Head Contact - View 2



Figure A-76 Post-Test Target Vehicle Driver Dummy Head Contact - View 3

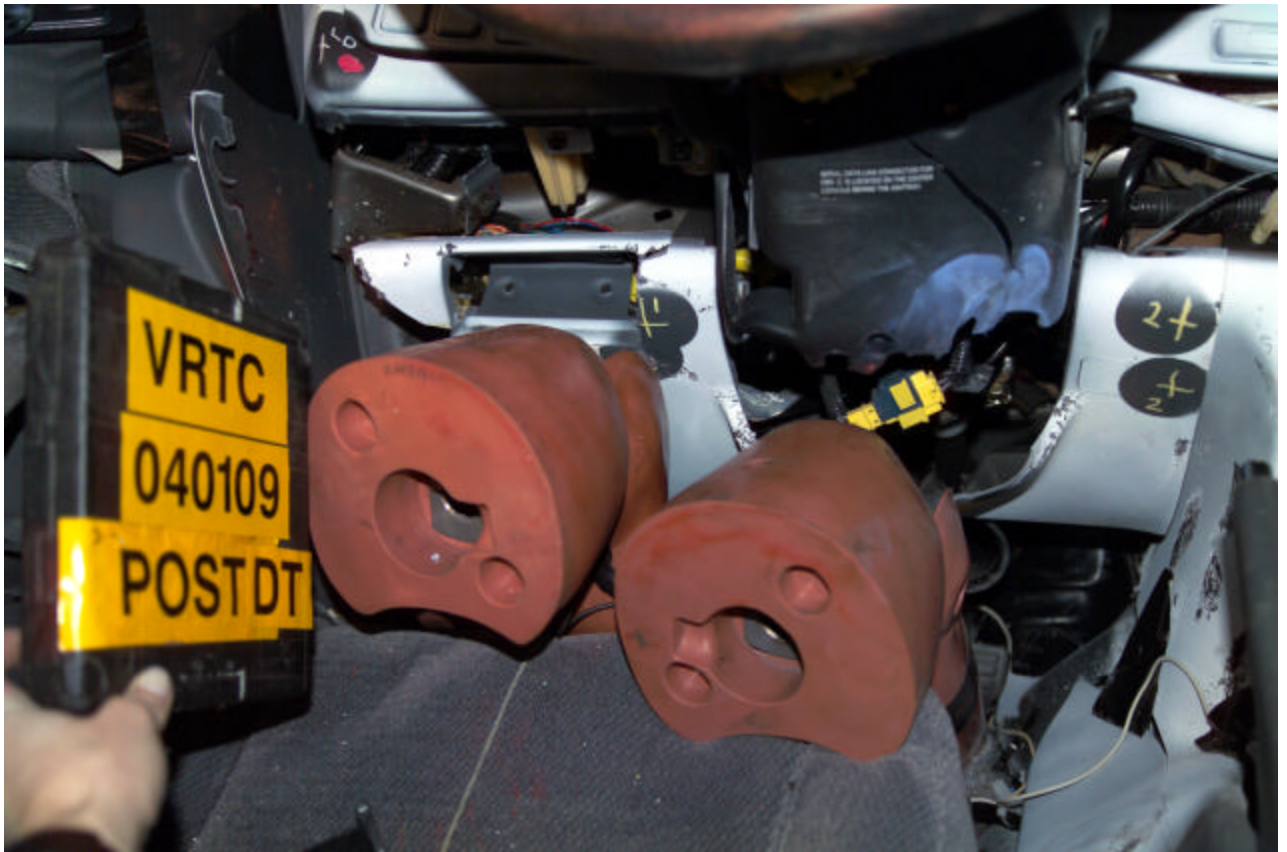


Figure A-77 Post-Test Target Vehicle Driver Dummy Lower Legs View

Intentionally Left Blank



Figure A-78 Post-Test Bullet Vehicle Driver Dummy Overall Contact View



Figure A-79 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 1



Figure A-80 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 2



Figure A-81 Post-Test Bullet Vehicle Driver Dummy Knee Contact - View 1



Figure A-82 Post-Test Bullet Vehicle Driver Dummy Knee Contact - View 2

Intentionally Left Blank



Figure A-83 Post-Test Bullet Vehicle Passenger Dummy Overall Contact View



Figure A-84 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 1



Figure A-85 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 2



Figure A-86 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 3



Figure A-87 Post-Test Bullet Vehicle Passenger Dummy Knee Contact - View 1



Figure A-88 Post-Test Bullet Vehicle Passenger Dummy Knee Contact - View 2



Figure A-89 Target Vehicle Certification Label View²



Figure A-90 Target Vehicle Tire Load Label View



Figure A-91 Bullet Vehicle Certification Label View

Intentionally Left Blank



Figure A-92 Post-Test Target Vehicle Subframe Damage - View 1



Figure A-93 Post-Test Target Vehicle Subframe Damage - View 2



Figure A-94 Post-Test Target Vehicle Bumper Beam Separation View



Figure A-95 Post-Test Target Vehicle Suspension Damage View



Figure A-96 Post-Test Target Vehicle A-Pillar Damage View



Figure A-97 Post-Test Target Vehicle Roof Damage View



Figure A-98 Post-Test Target Vehicle Wheel to Rocker Contact View

Intentionally Left Blank



Figure A-99 Post-Test Bullet Vehicle Wheel to Rocker Contact View



Figure A-100 Post-Test Bullet Vehicle Wheel Area Damage View

Appendix B

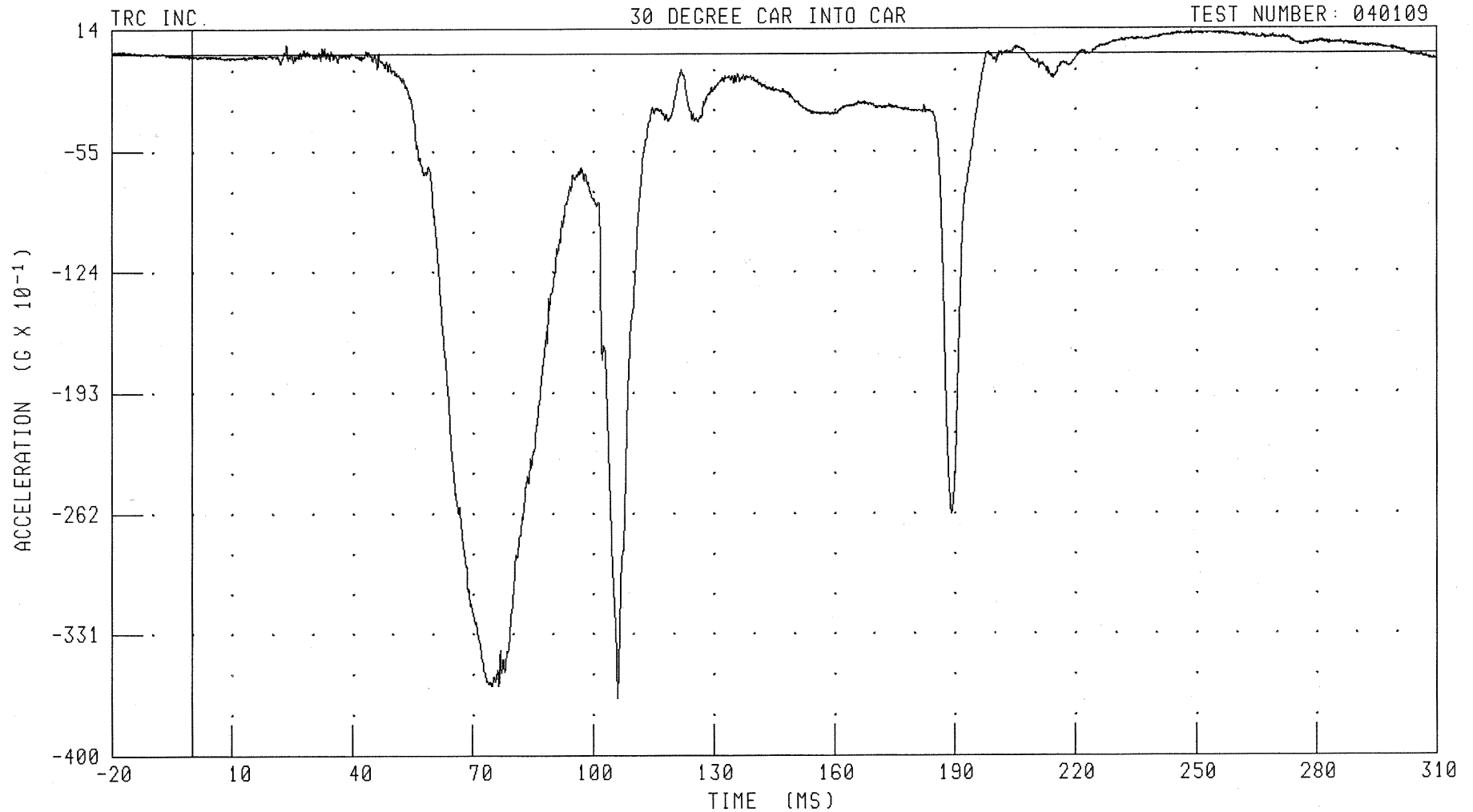
Data Plots

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

PEAK DATA: 1.32 G @ 248.72 MS; -36.78 G @ 106.16 MS

B-2

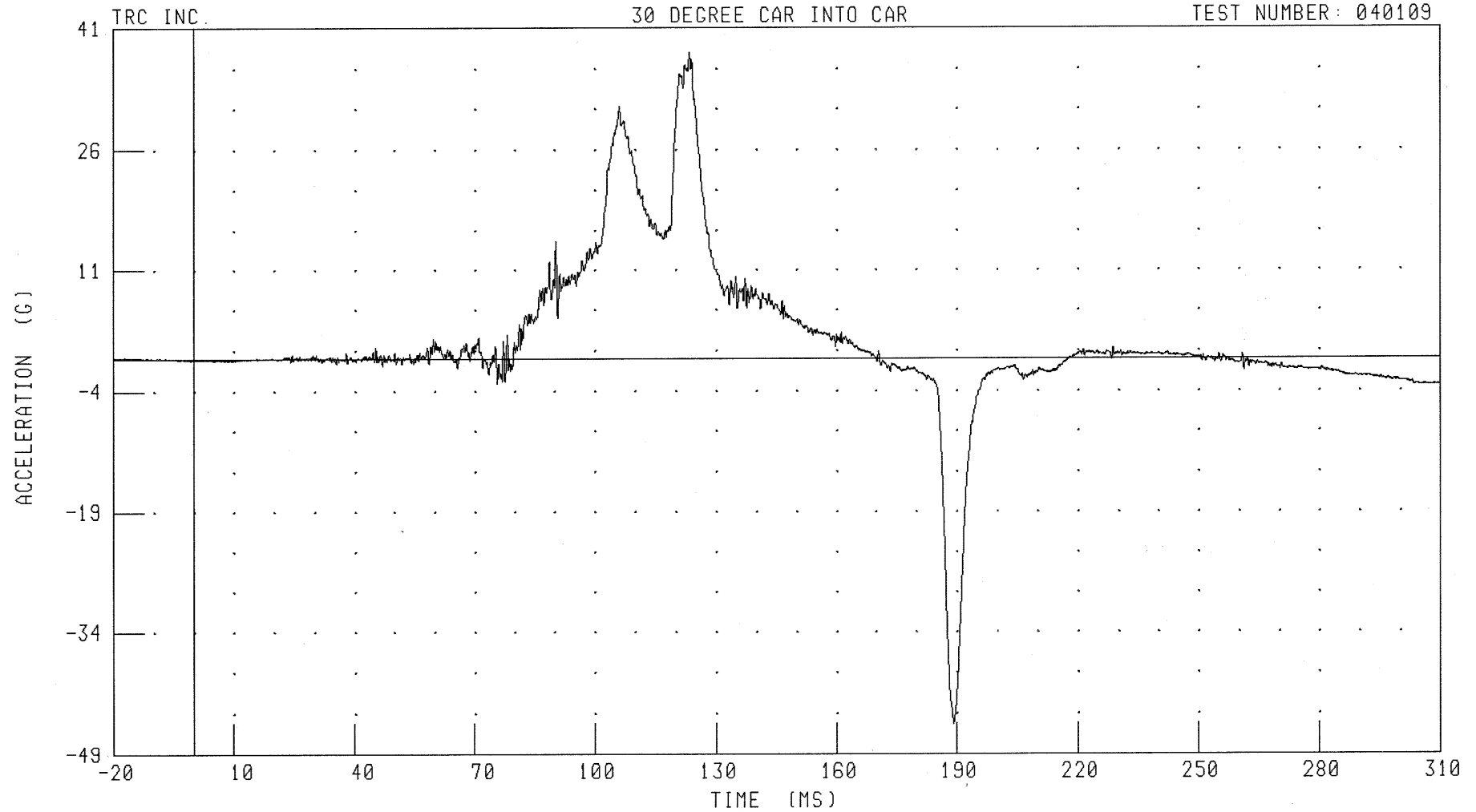
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

PEAK DATA: 37.96 G @ 123.52 MS; -45.32 G @ 189.36 MS

B-3

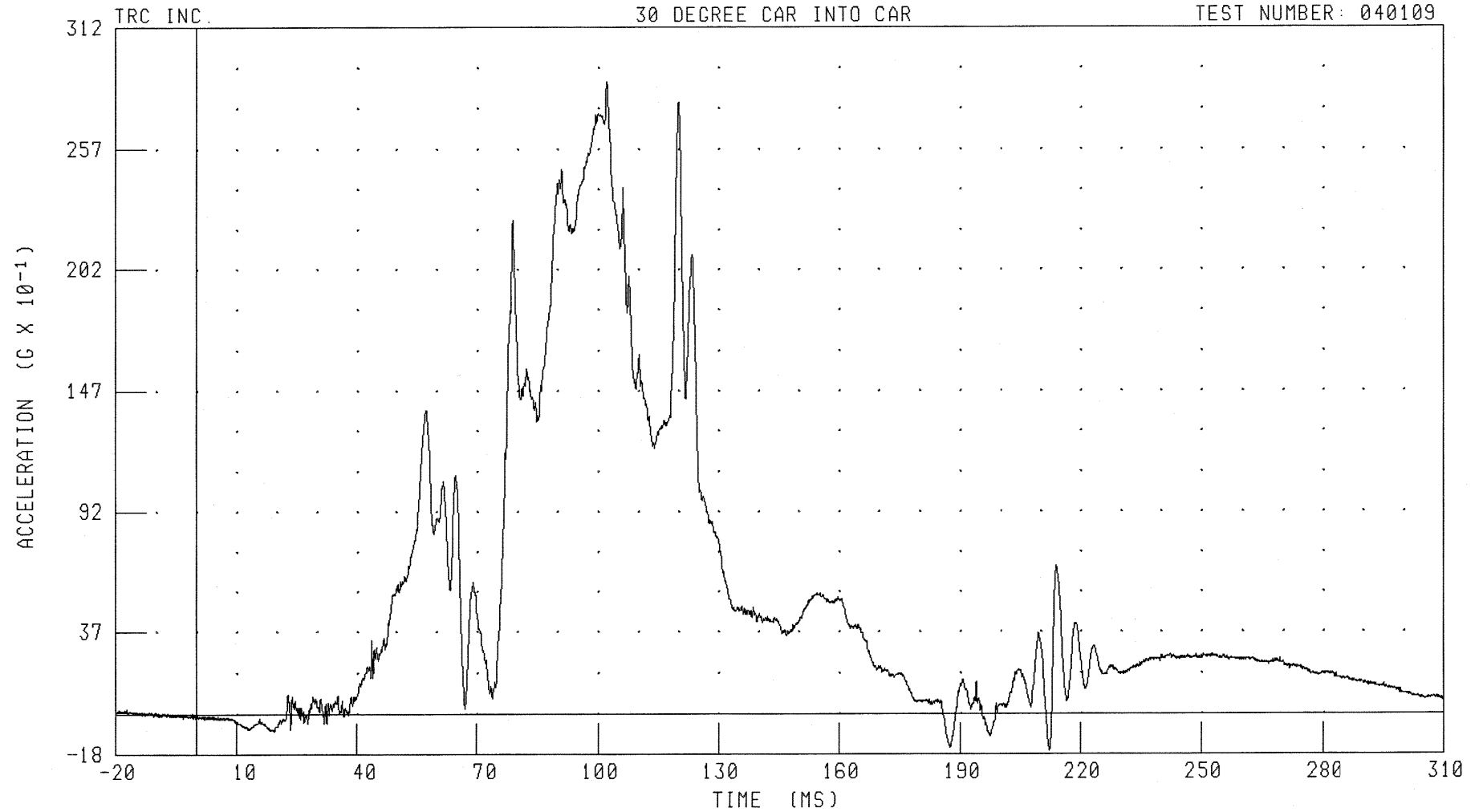
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-4

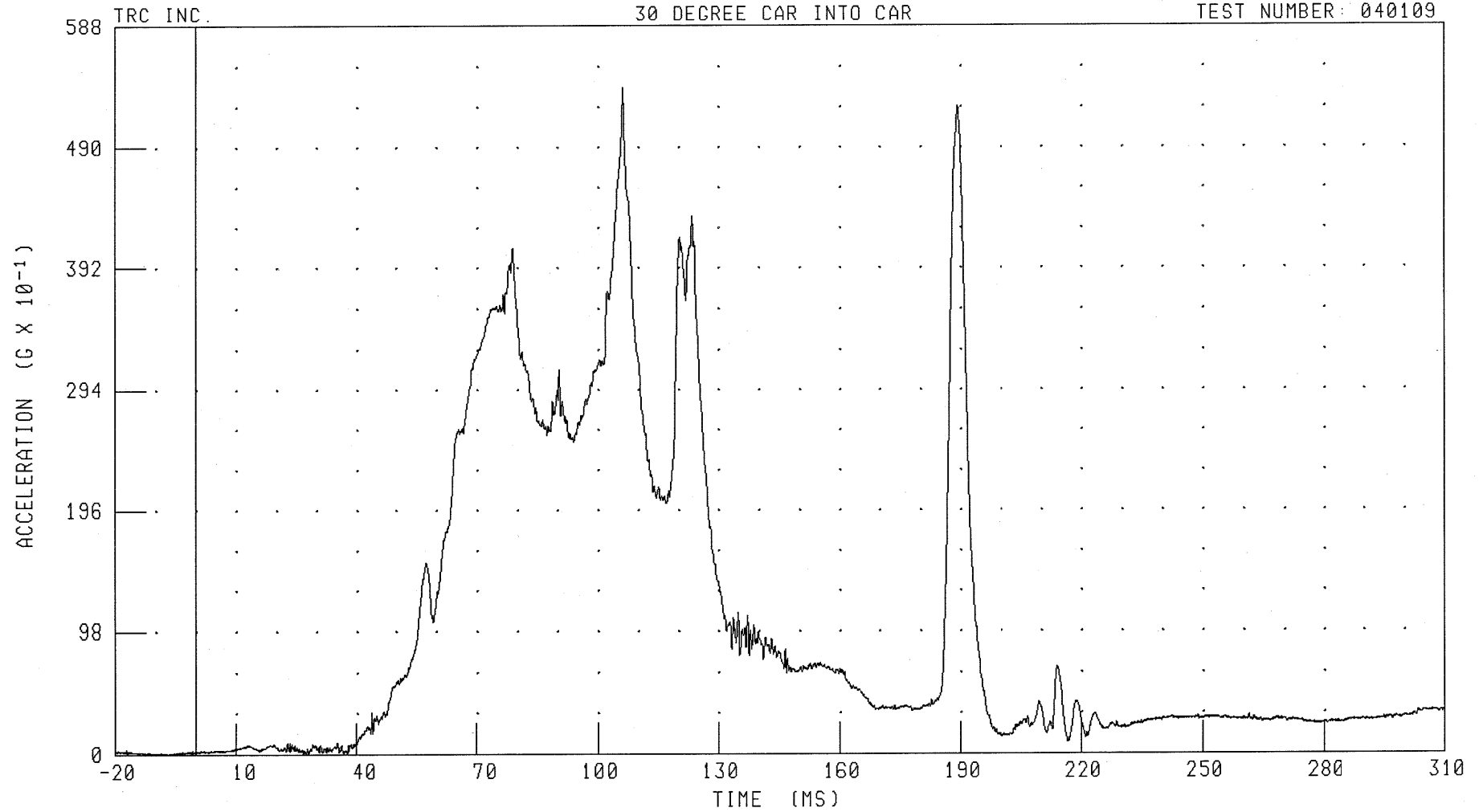
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

B-5

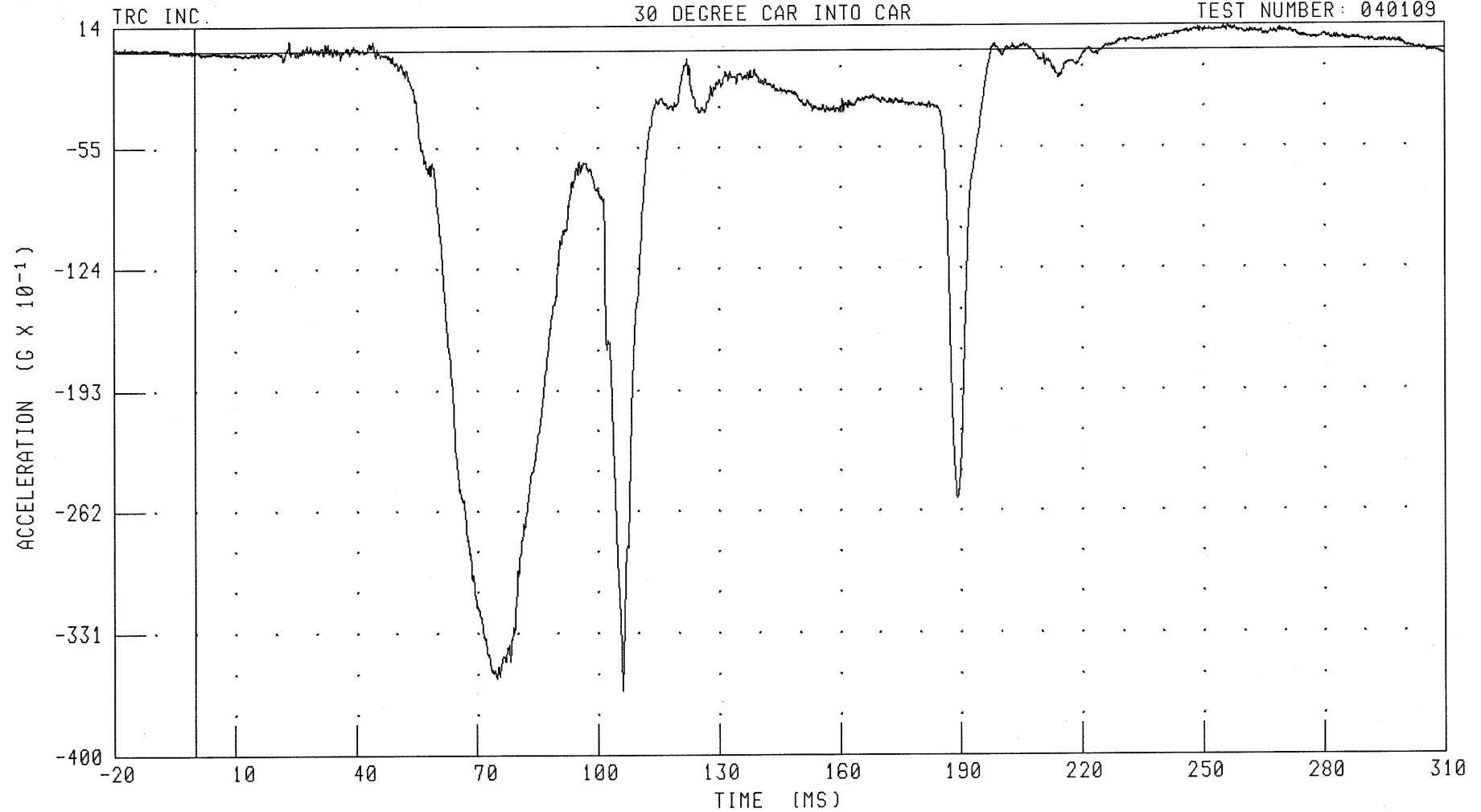
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD X-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-6

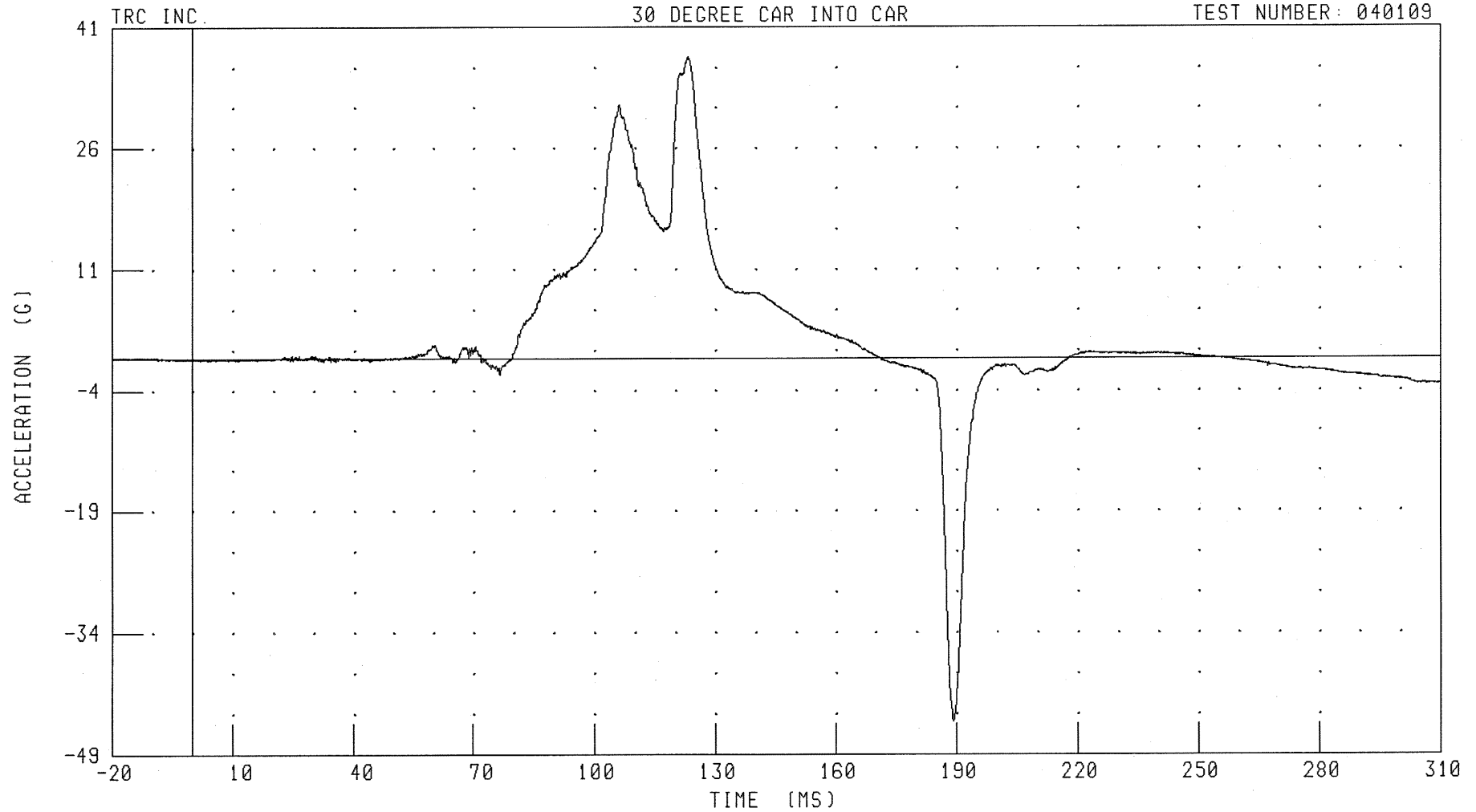
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD Y-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDYR1 FILTER: CH. CLASS 1000

PEAK DATA: 37.37 G @ 123.12 MS; -45.01 G @ 189.28 MS

B-7

040109

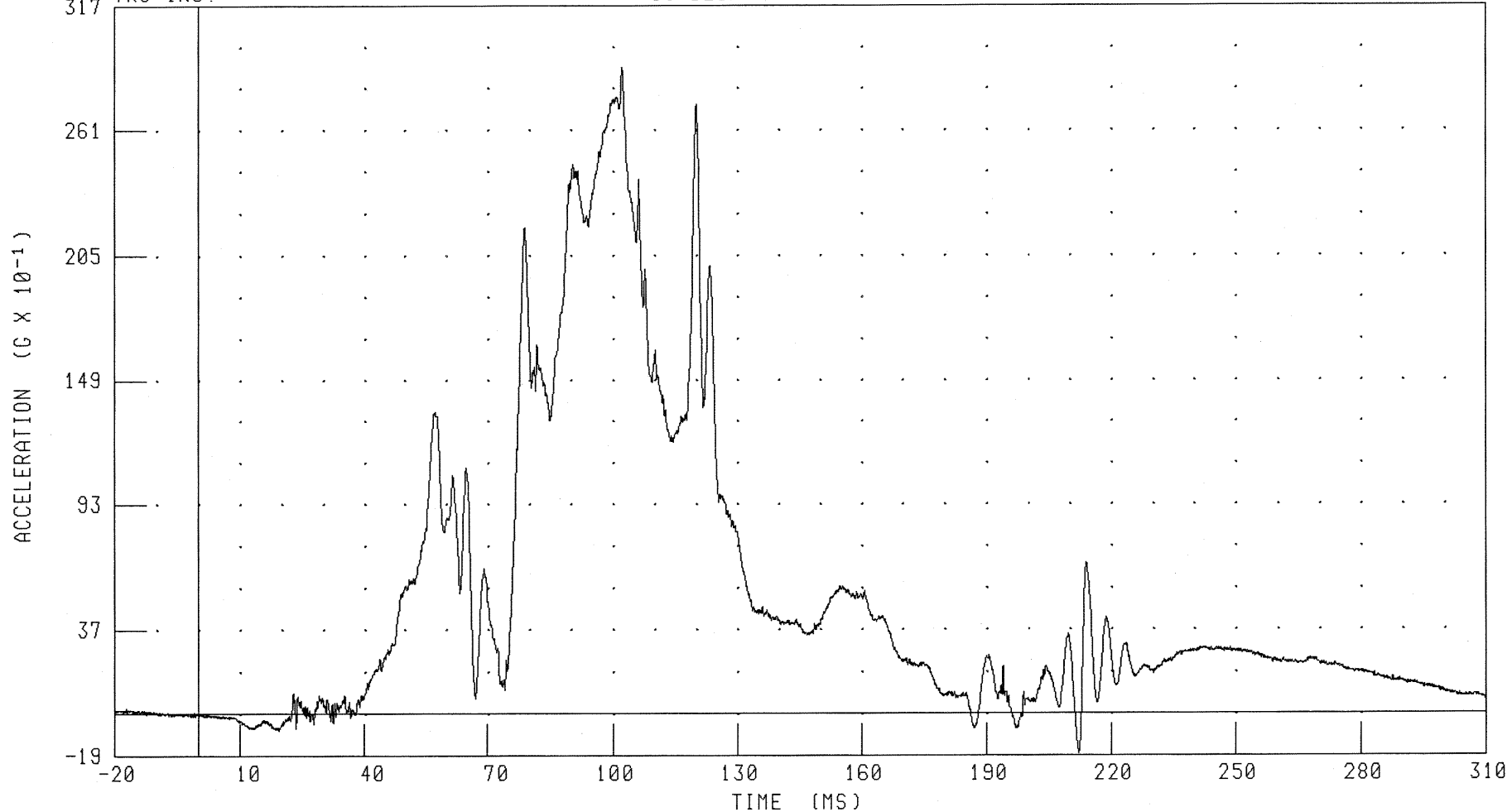
1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD Z-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109

TRC INC.



CHANNEL: HEDZR1 FILTER: CH. CLASS 1000

B-8

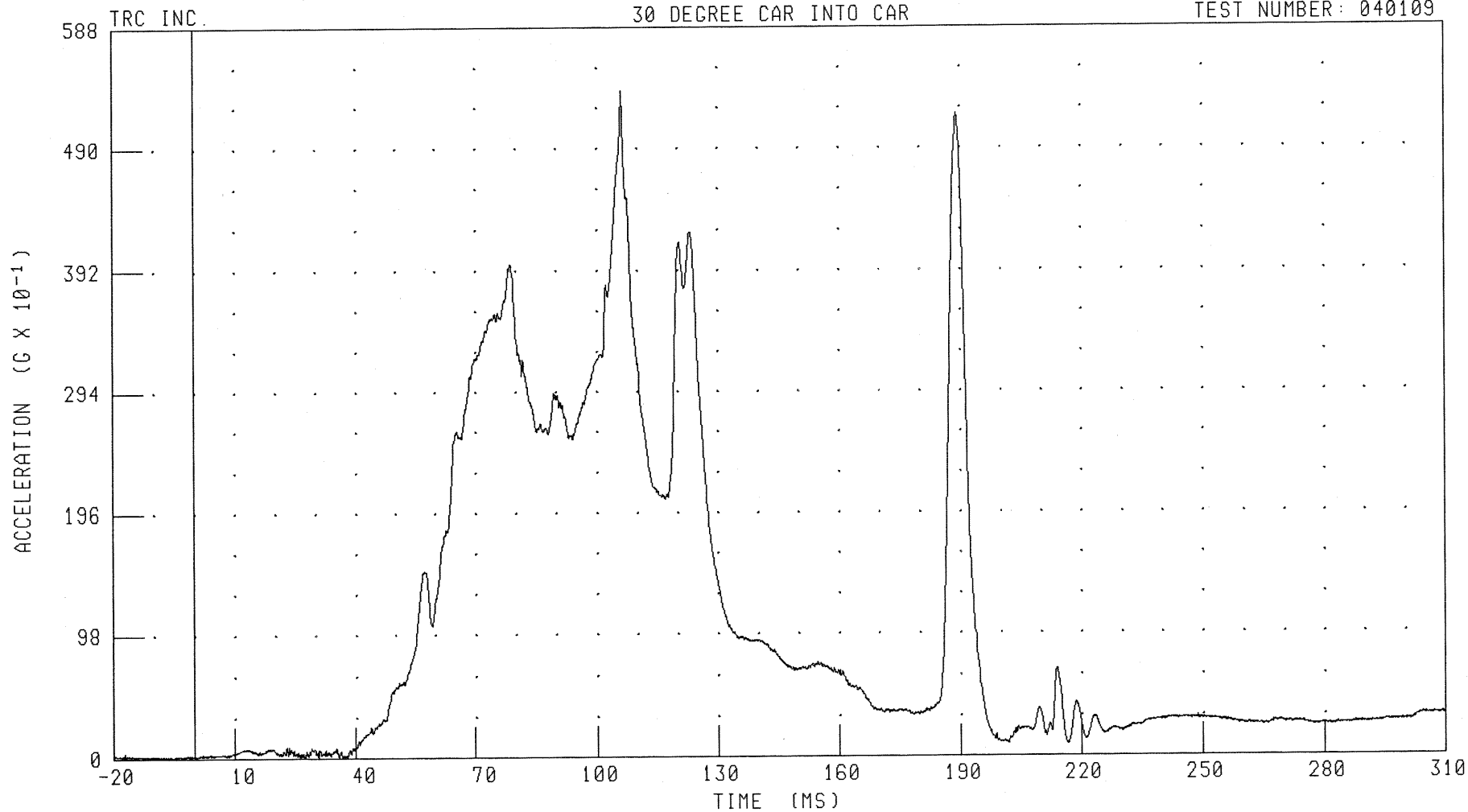
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER HEAD RESULTANT ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDRR1 FILTER: CH. CLASS 1000

PEAK DATA: 53.67 G @ 106.16 MS; 0.02 G @ 36.56 MS

B-9

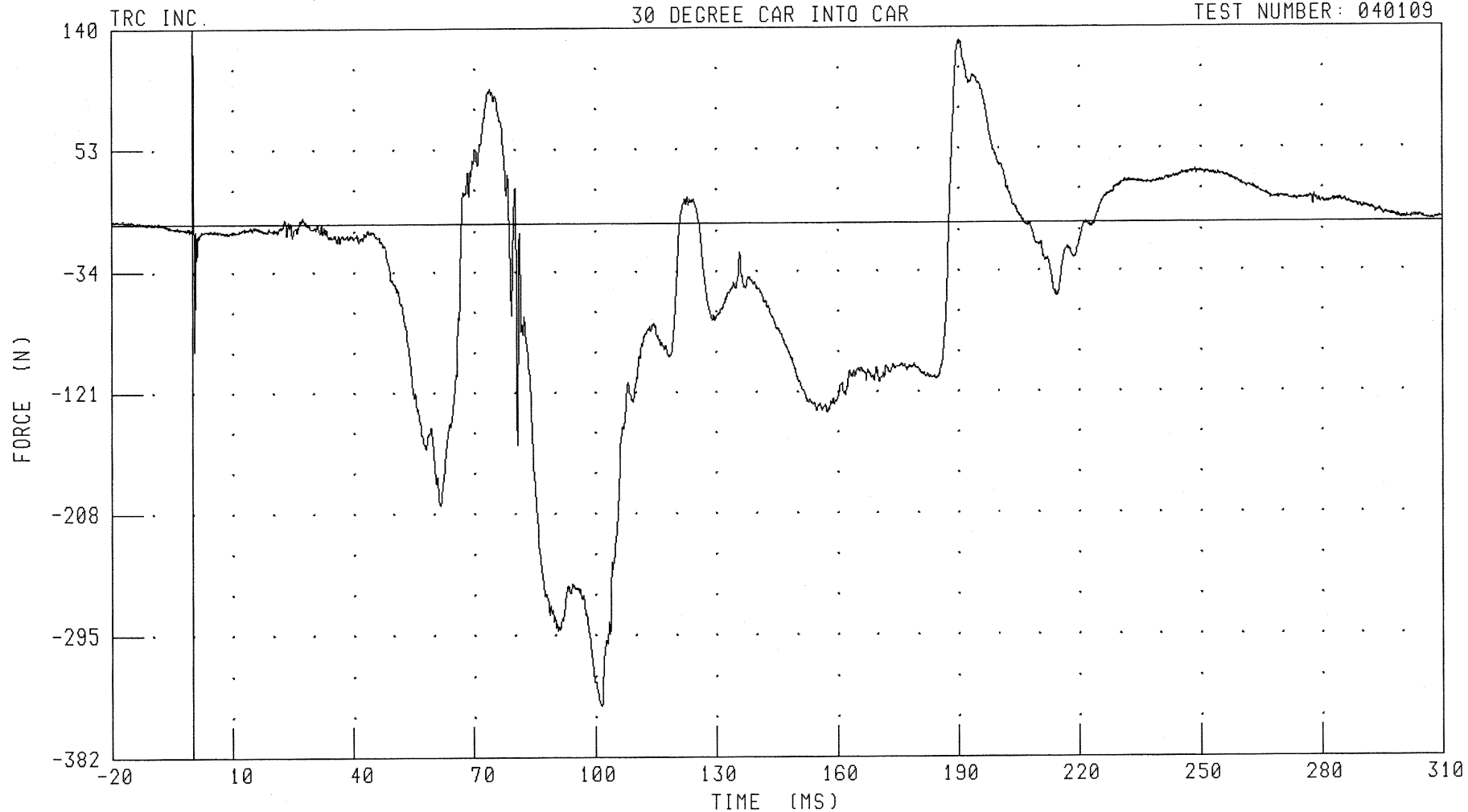
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK X-AXIS SHEAR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

PEAK DATA: 130.84 N @ 190.16 MS; -345.58 N @ 101.68 MS

B-10

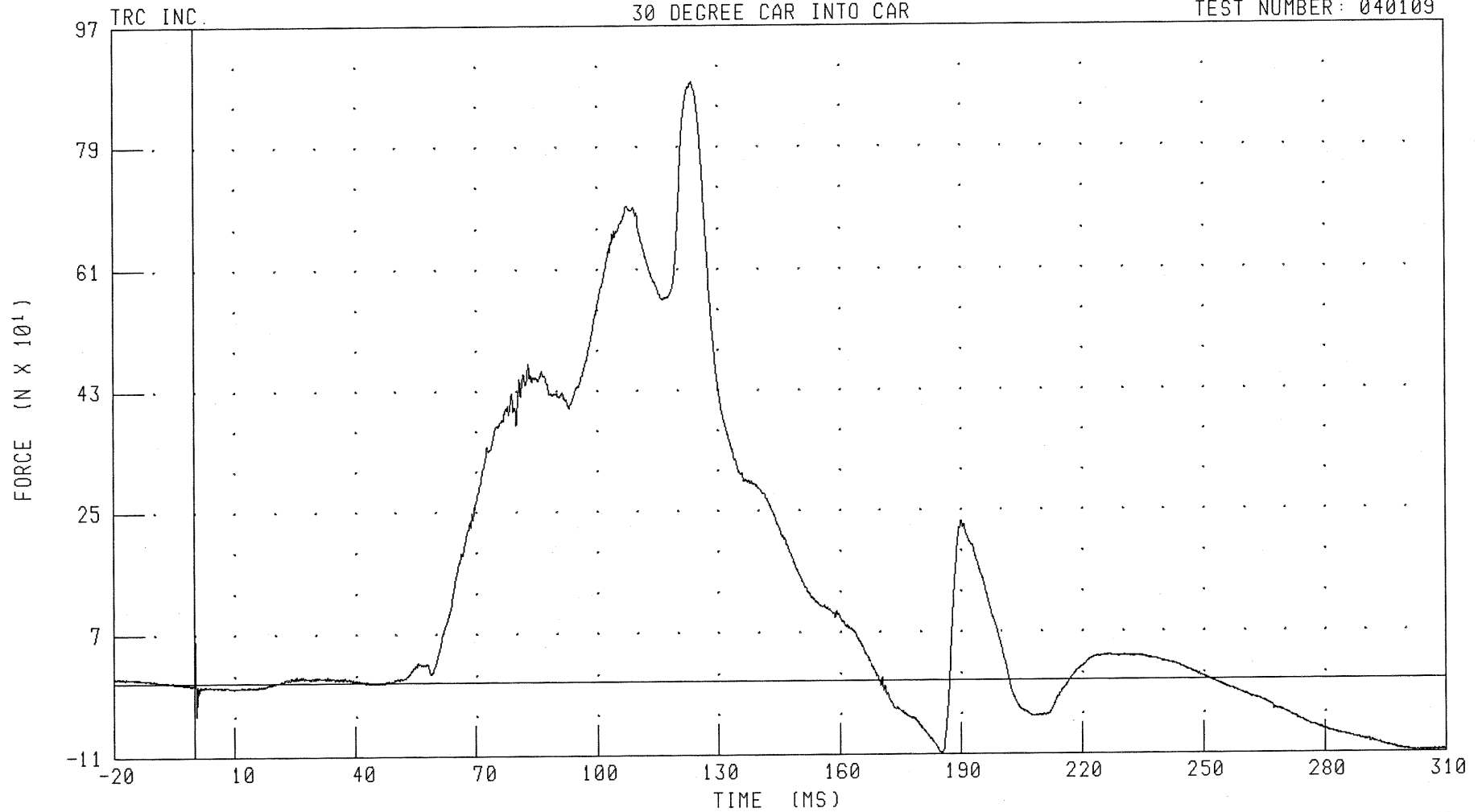
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK Y-AXIS SHEAR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 886.32 N @ 123.68 MS; -108.80 N @ 185.36 MS

B-11

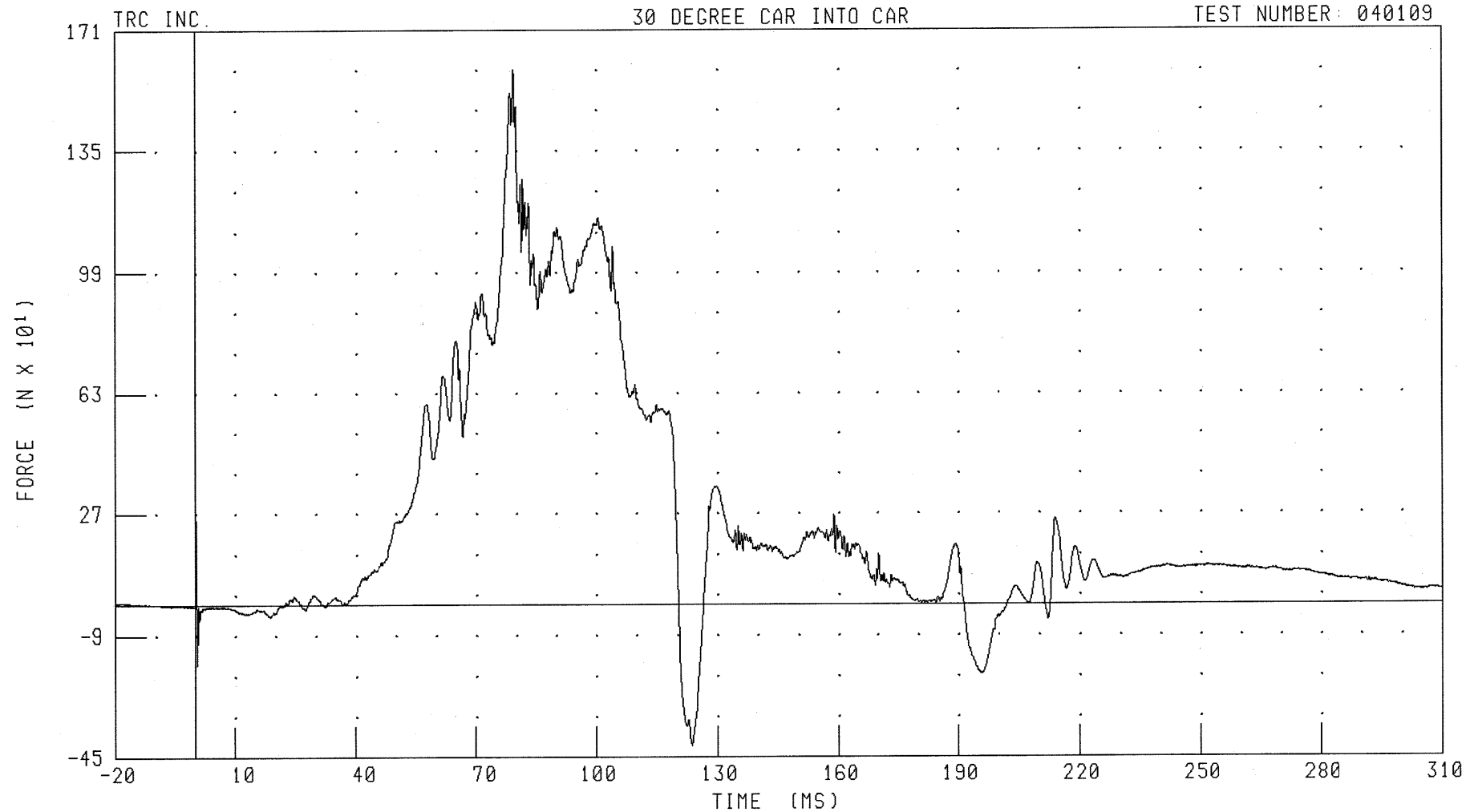
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK Z-AXIS AXIAL FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-12

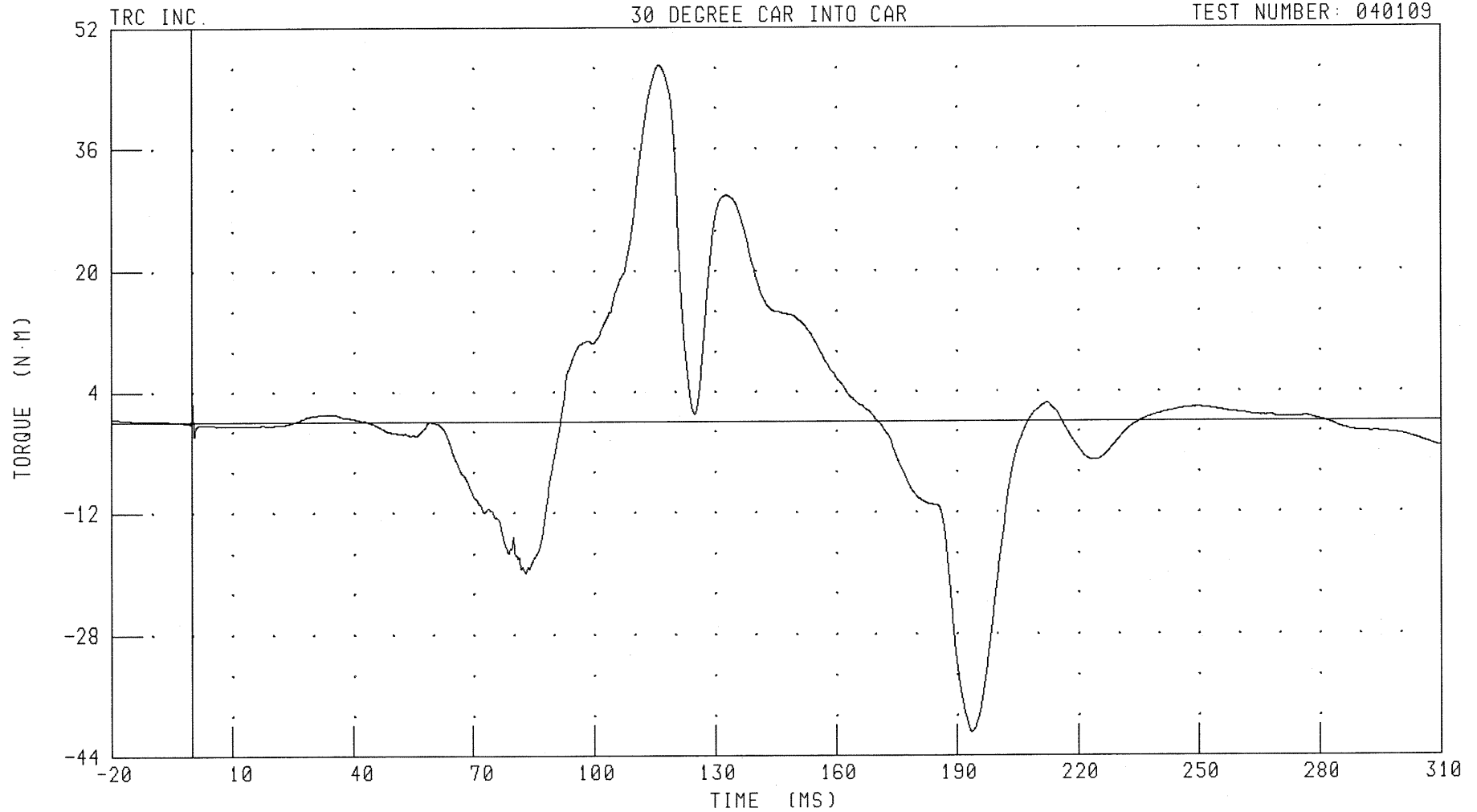
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKXM1 FILTER: CH. CLASS 600

B-13

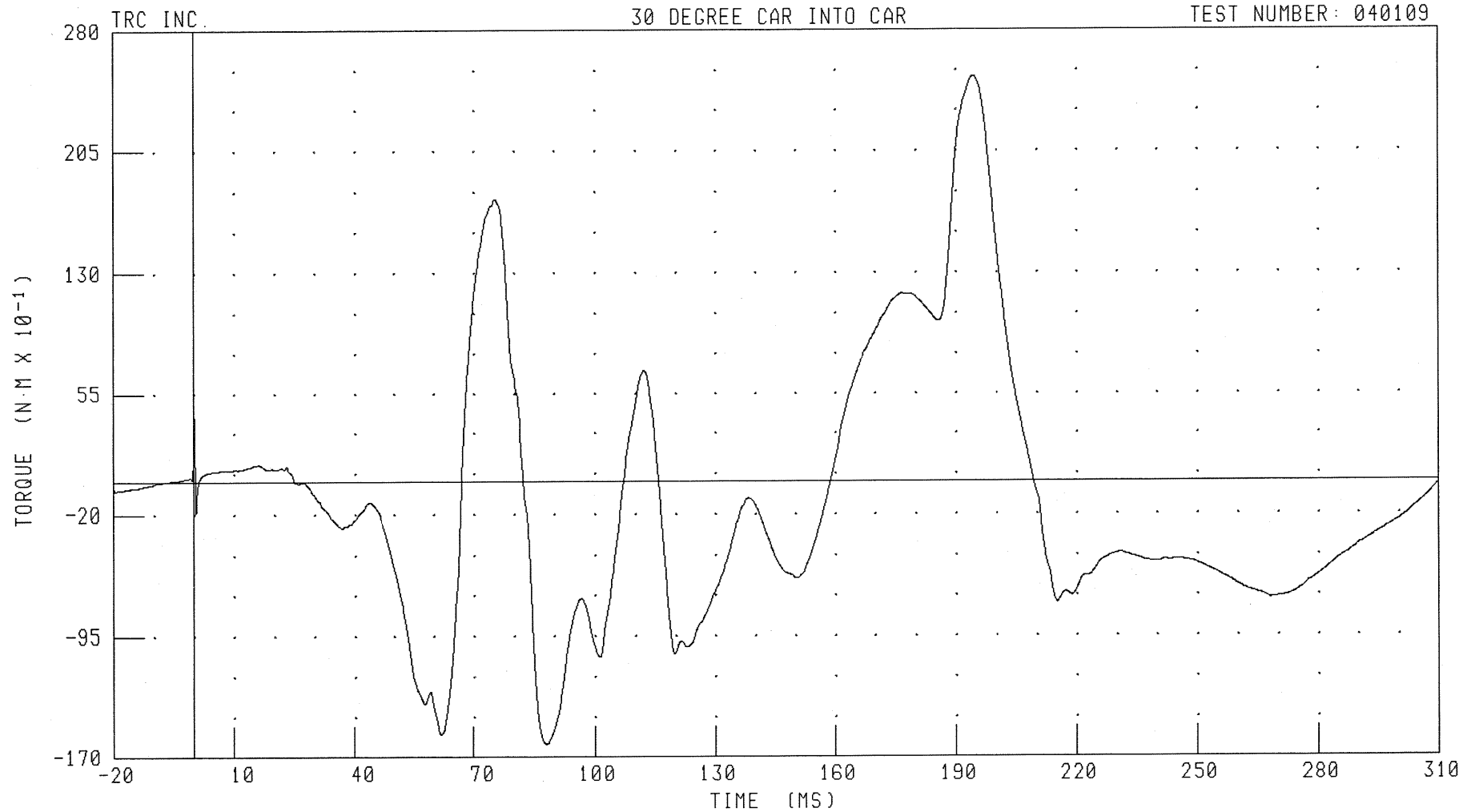
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA: 25.11 N·M @ 194.48 MS; -16.22 N·M @ 88.00 MS

B-14

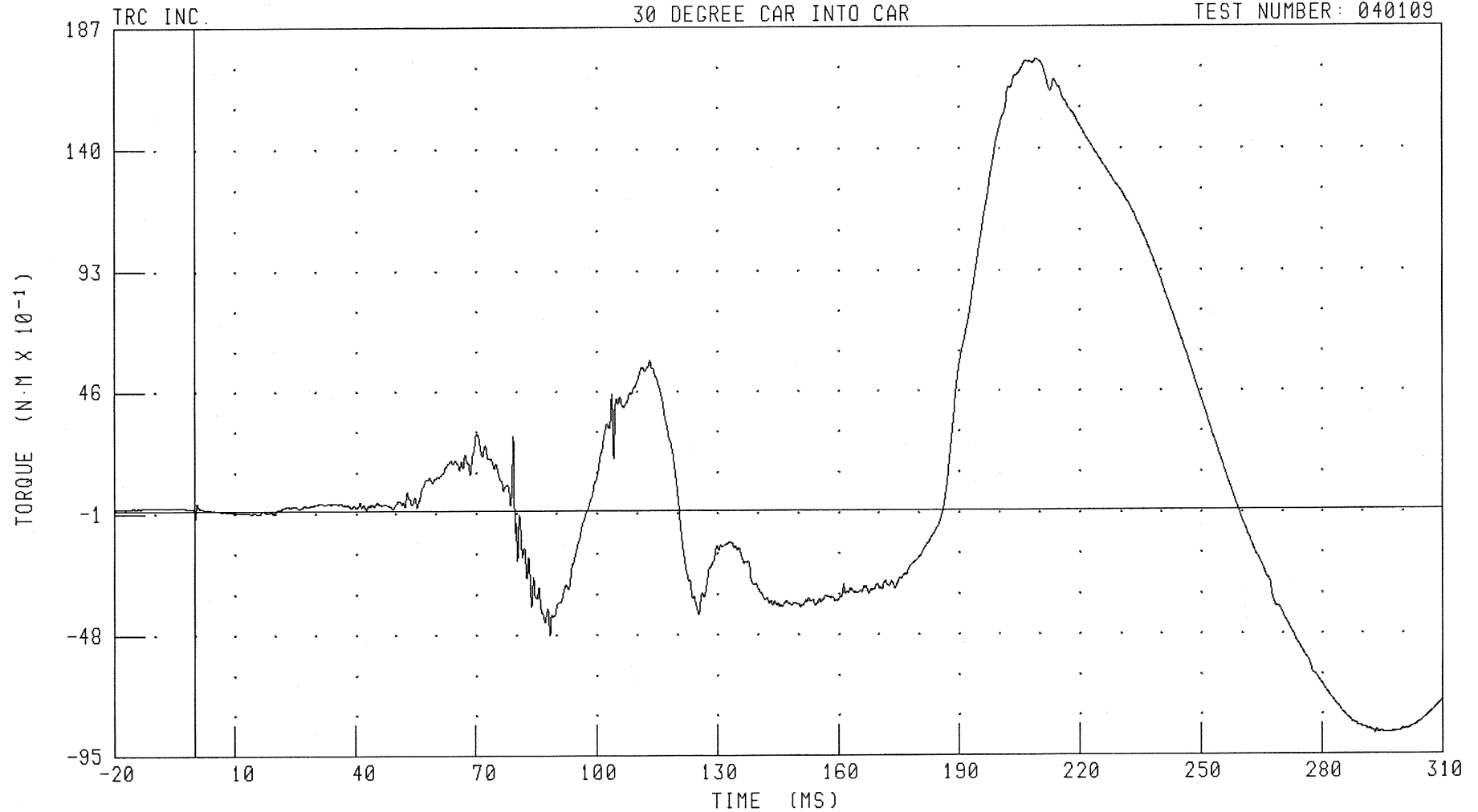
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKZM1 FILTER: CH. CLASS 600

PEAK DATA: 17.44 N·M @ 209.44 MS; -8.69 N·M @ 293.20 MS

B-15

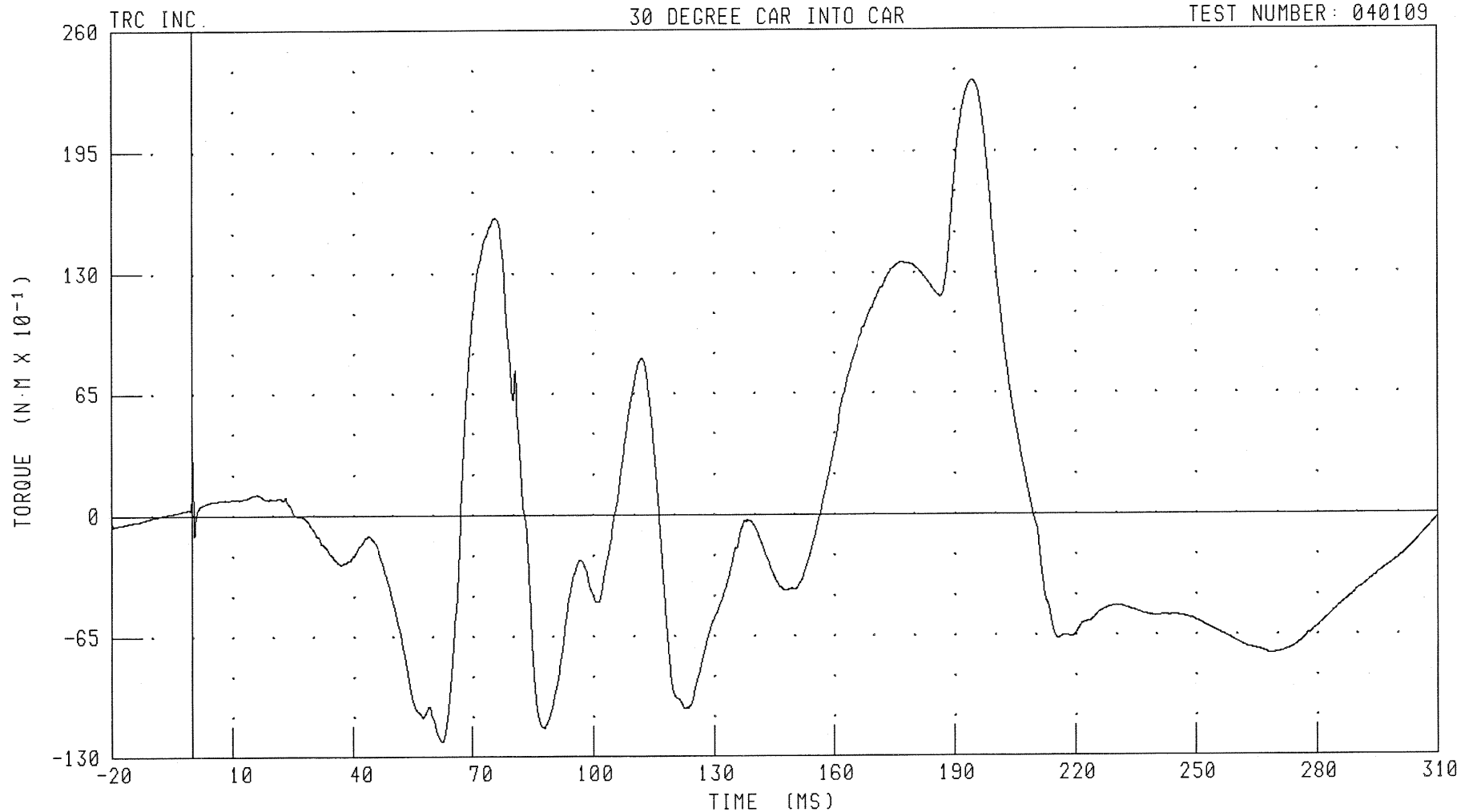
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKOM1

FILTER: CH. CLASS 600

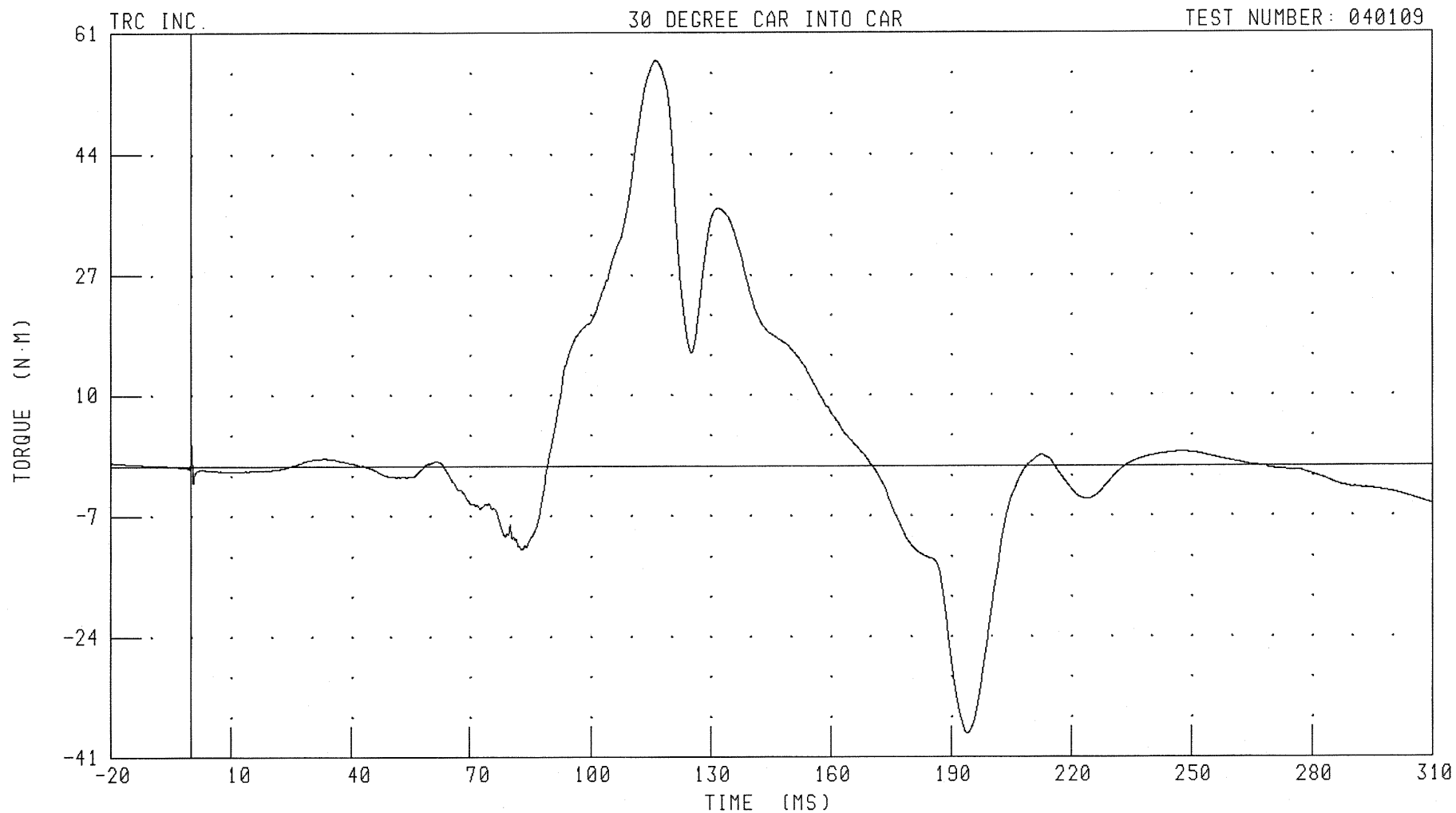
B-16

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

TEST NUMBER: 040109



CHANNEL: NK0XM1 FILTER: CH. CLASS 600

PEAK DATA: 57.08 N·M @ 116.00 MS; -37.72 N·M @ 193.92 MS

B-17

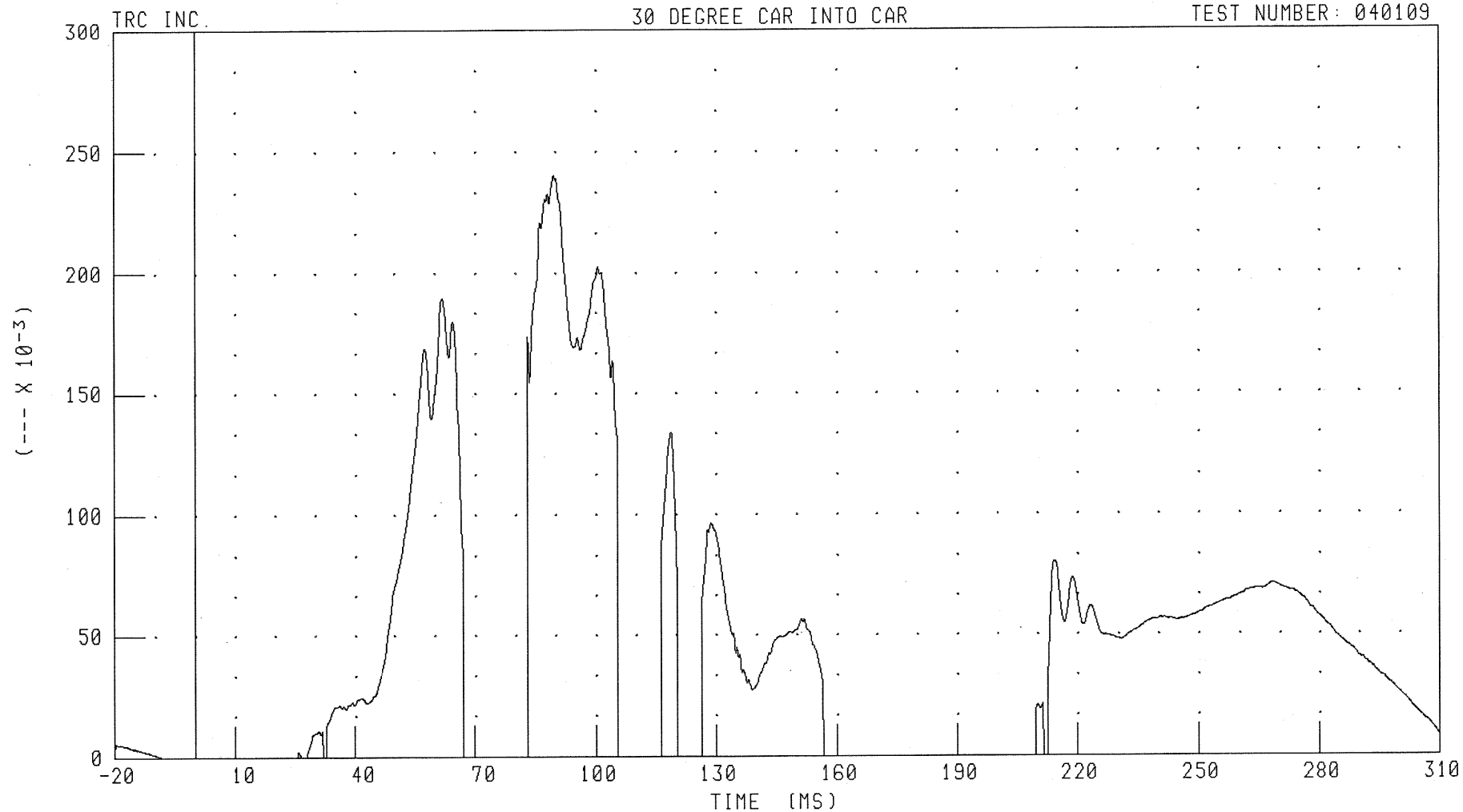
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NIJ TENSION/EXTENSION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NTE1

FILTER: CH. CLASS 600

PEAK DATA: 0.24 --- @ 89.60 MS; 0.00 --- @ -8.56 MS

B-18

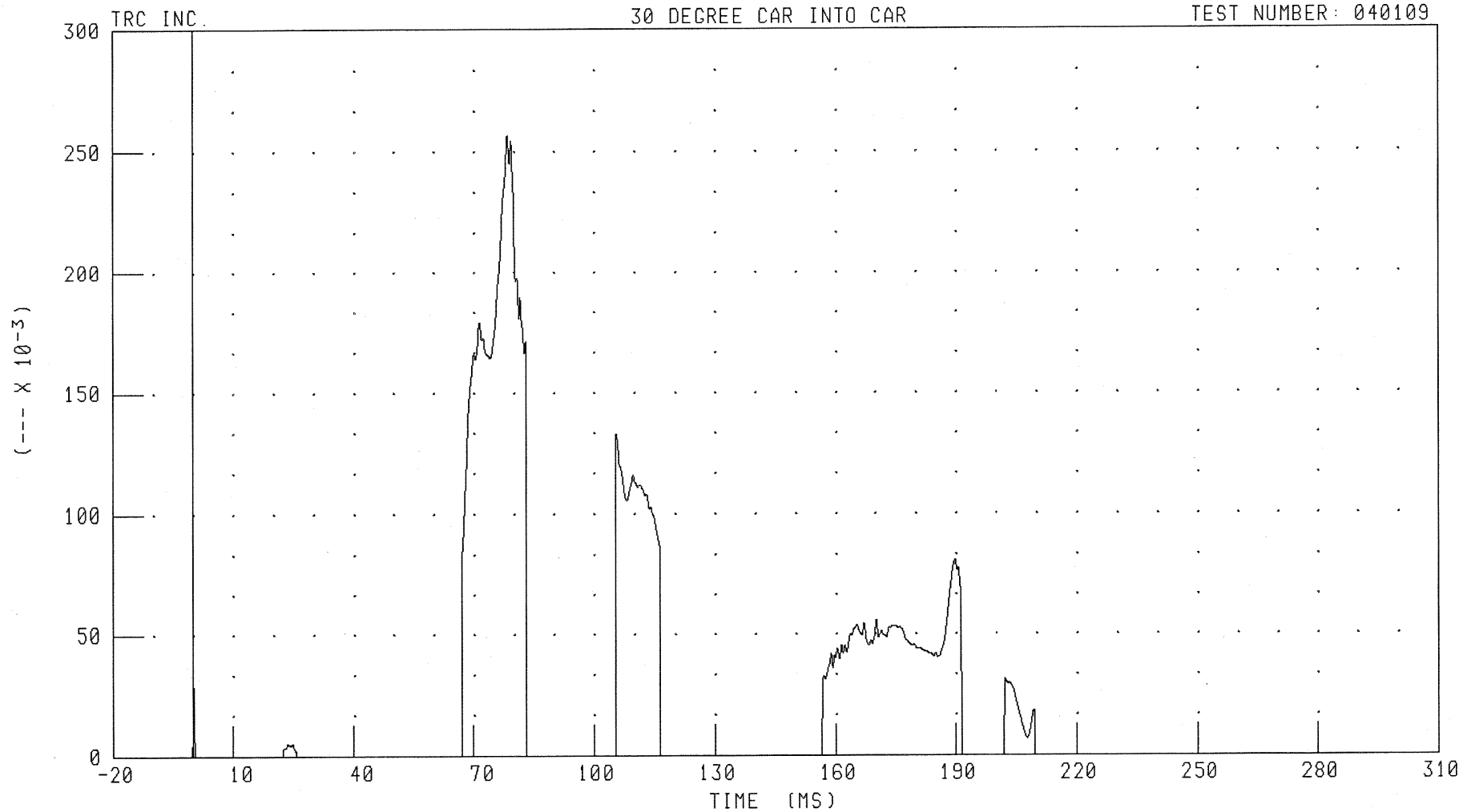
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NIJ TENSION/FLEXION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NTF1

FILTER: CH. CLASS 600

PEAK DATA: 0.26 --- @ 78.40 MS; 0.00 --- @ -20.00 MS

B-19

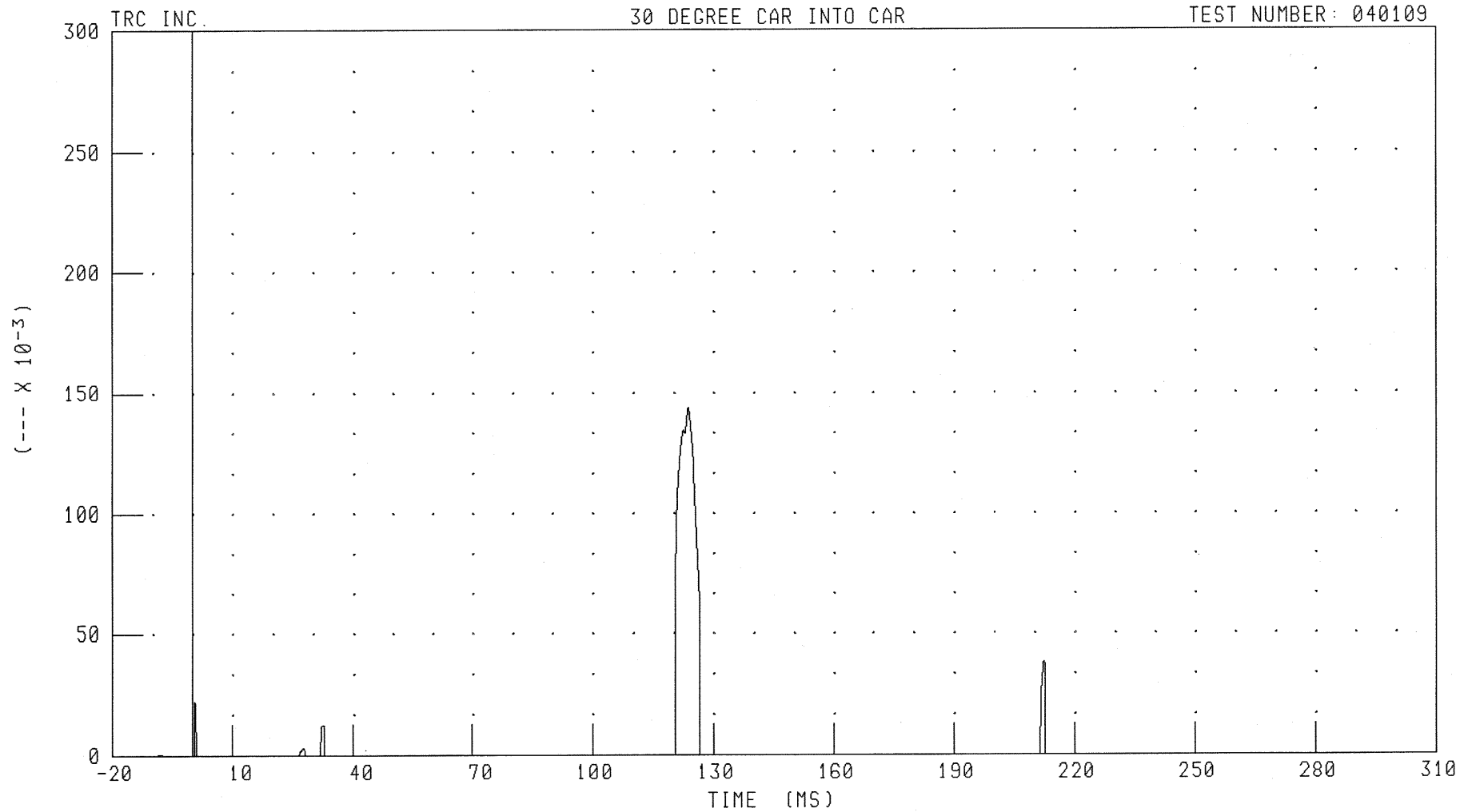
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NIJ COMPRESSION/EXTENSION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NCE1

FILTER: CH. CLASS 600

PEAK DATA: 0.14 --- @ 123.68 MS; 0.00 --- @ -20.00 MS

B-20

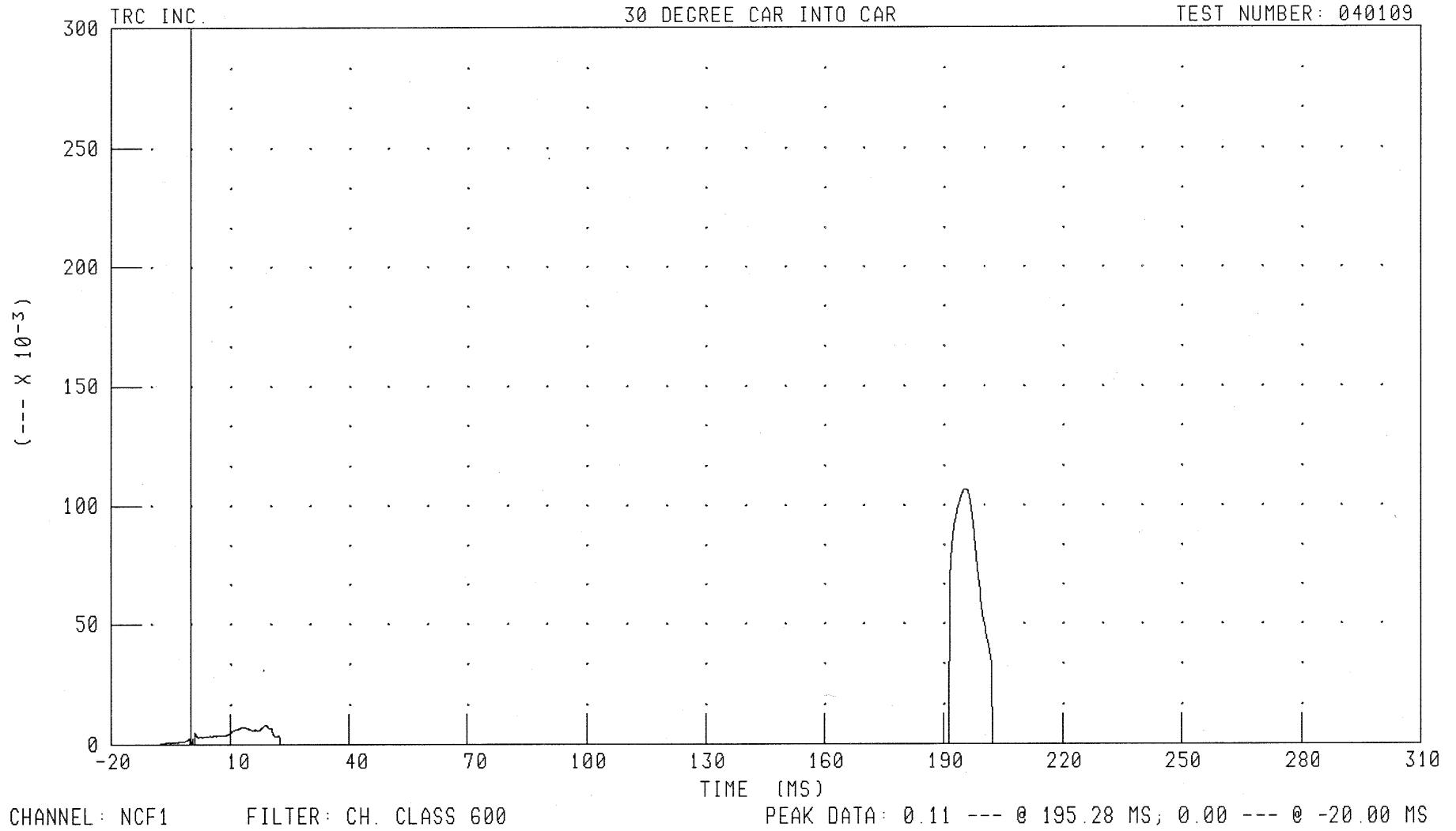
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER NIJ COMPRESSION/FLEXION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



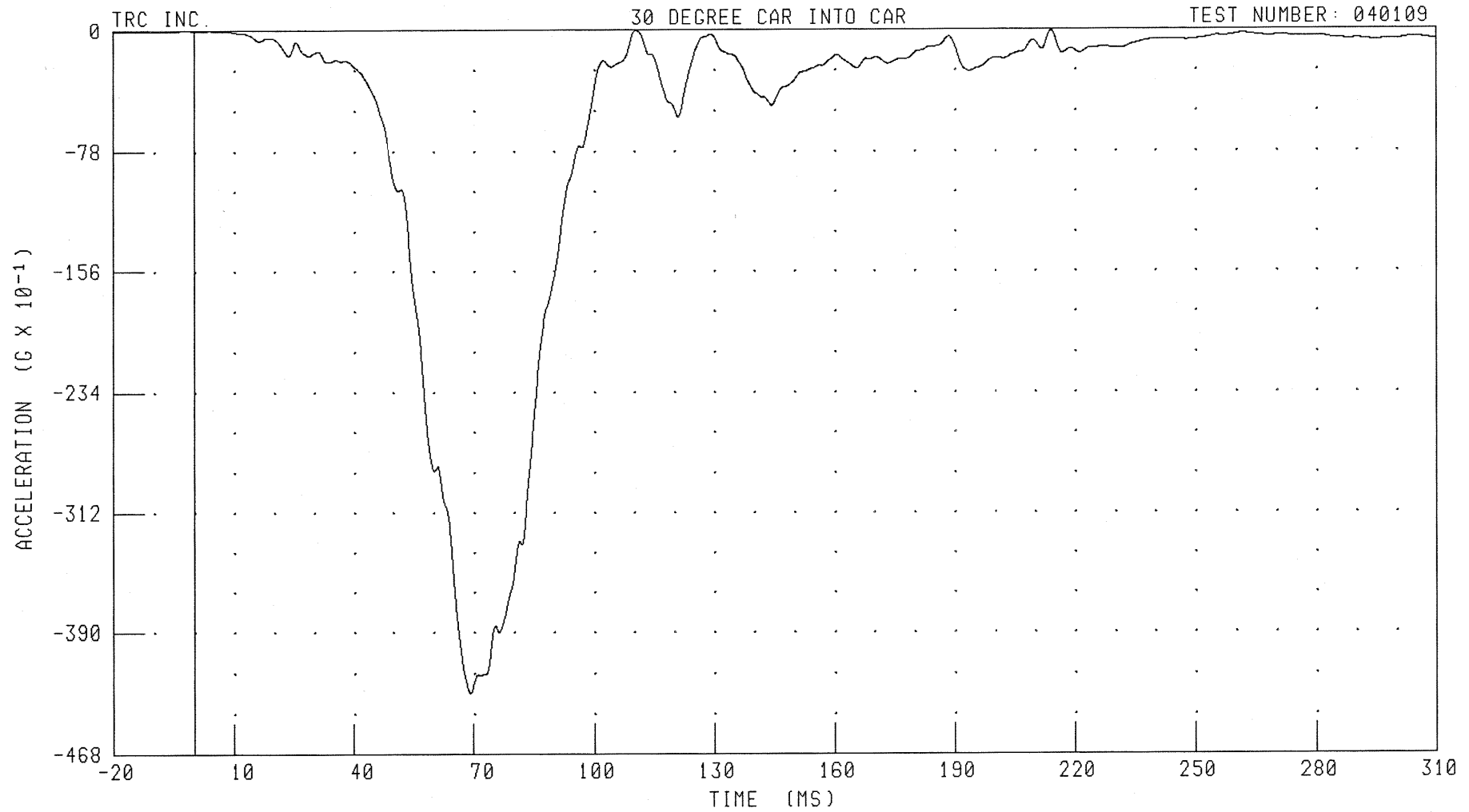
B-21

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST X-AXIS ACCELERATION

TEST NUMBER: 040109



CHANNEL: CSTXC1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 G @ -20.00 MS; -42.88 G @ 69.20 MS

B-22

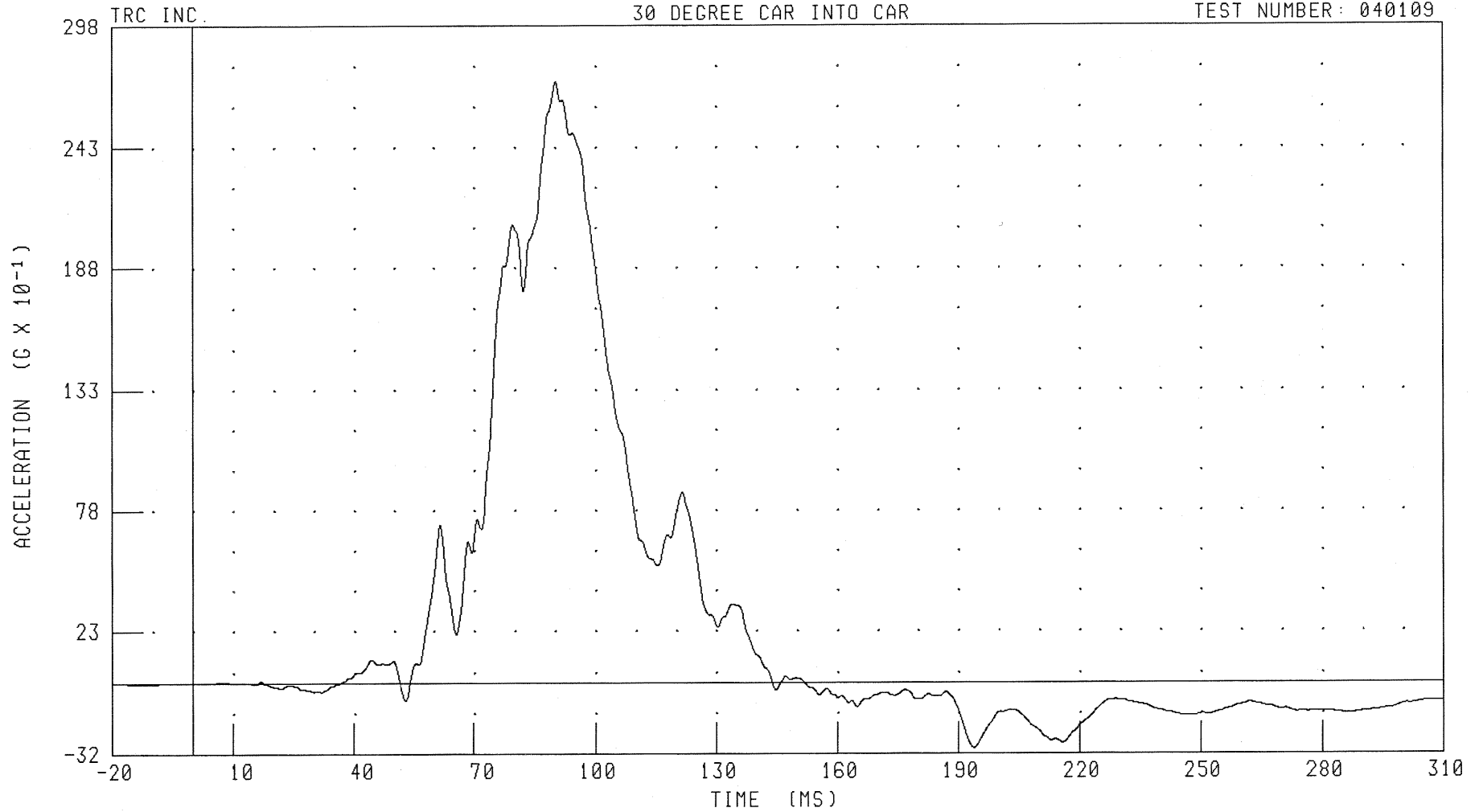
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTYG1 FILTER: CH. CLASS 180

B-23

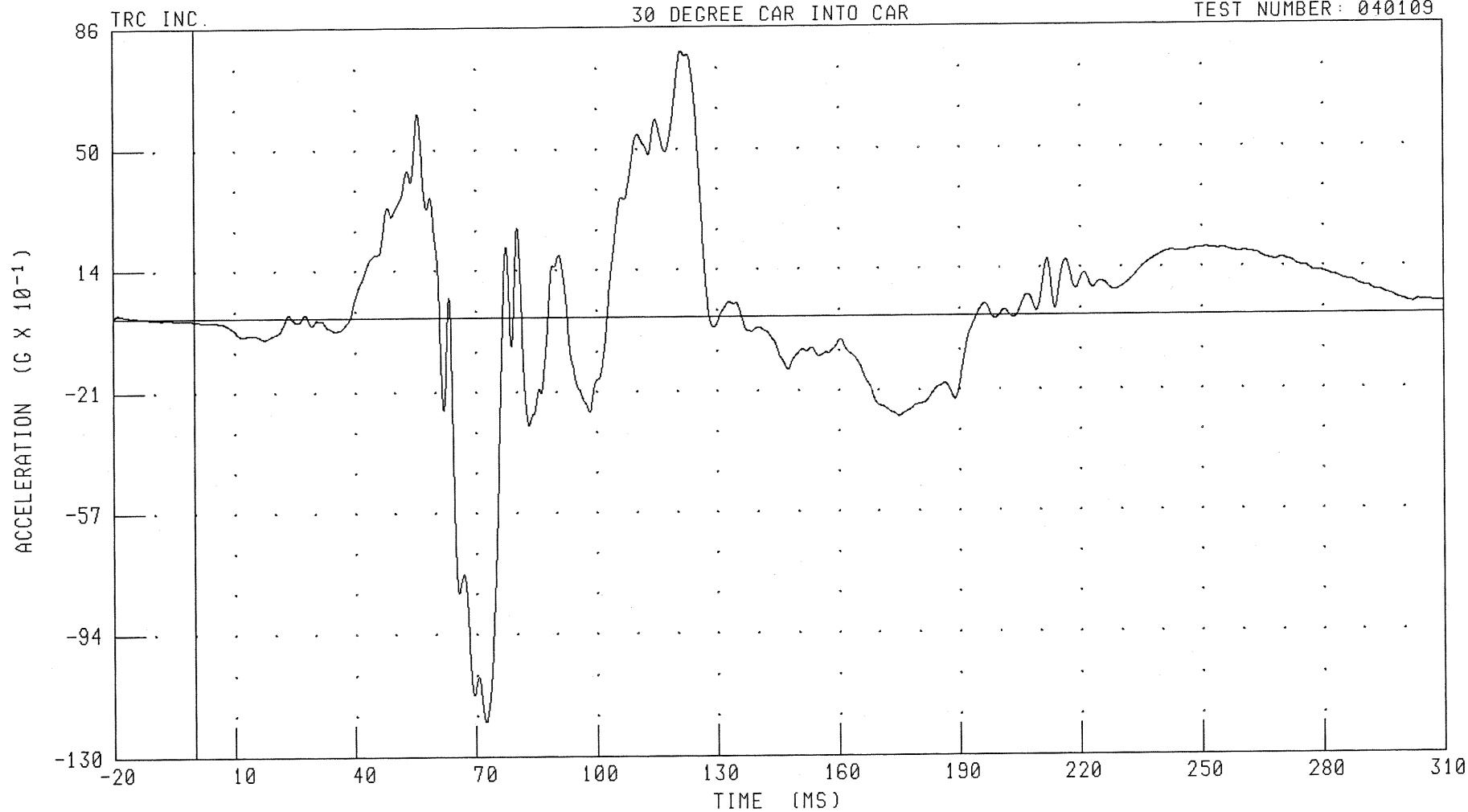
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 7.88 G @ 121.20 MS; -11.98 G @ 72.40 MS

B-24

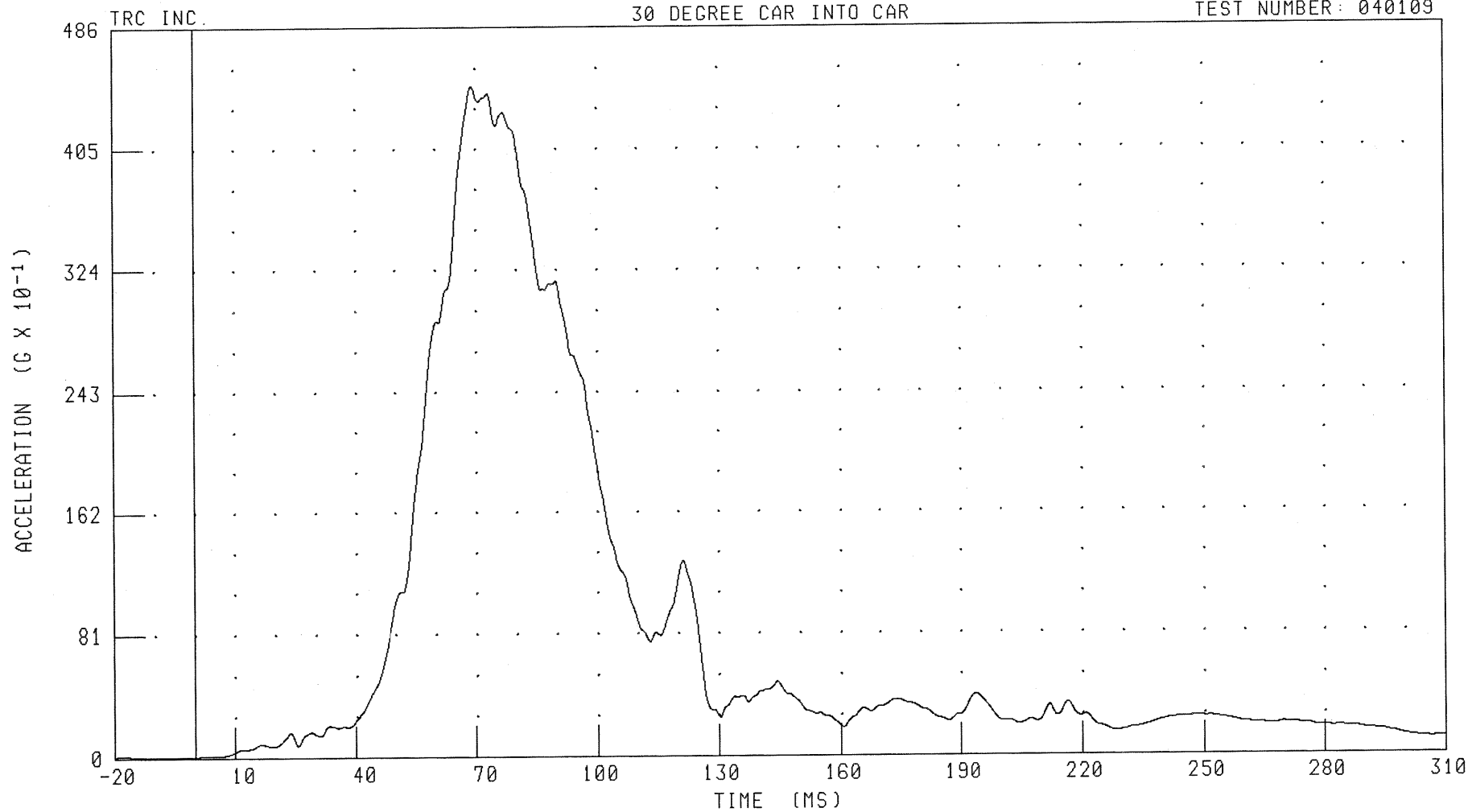
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTRG1

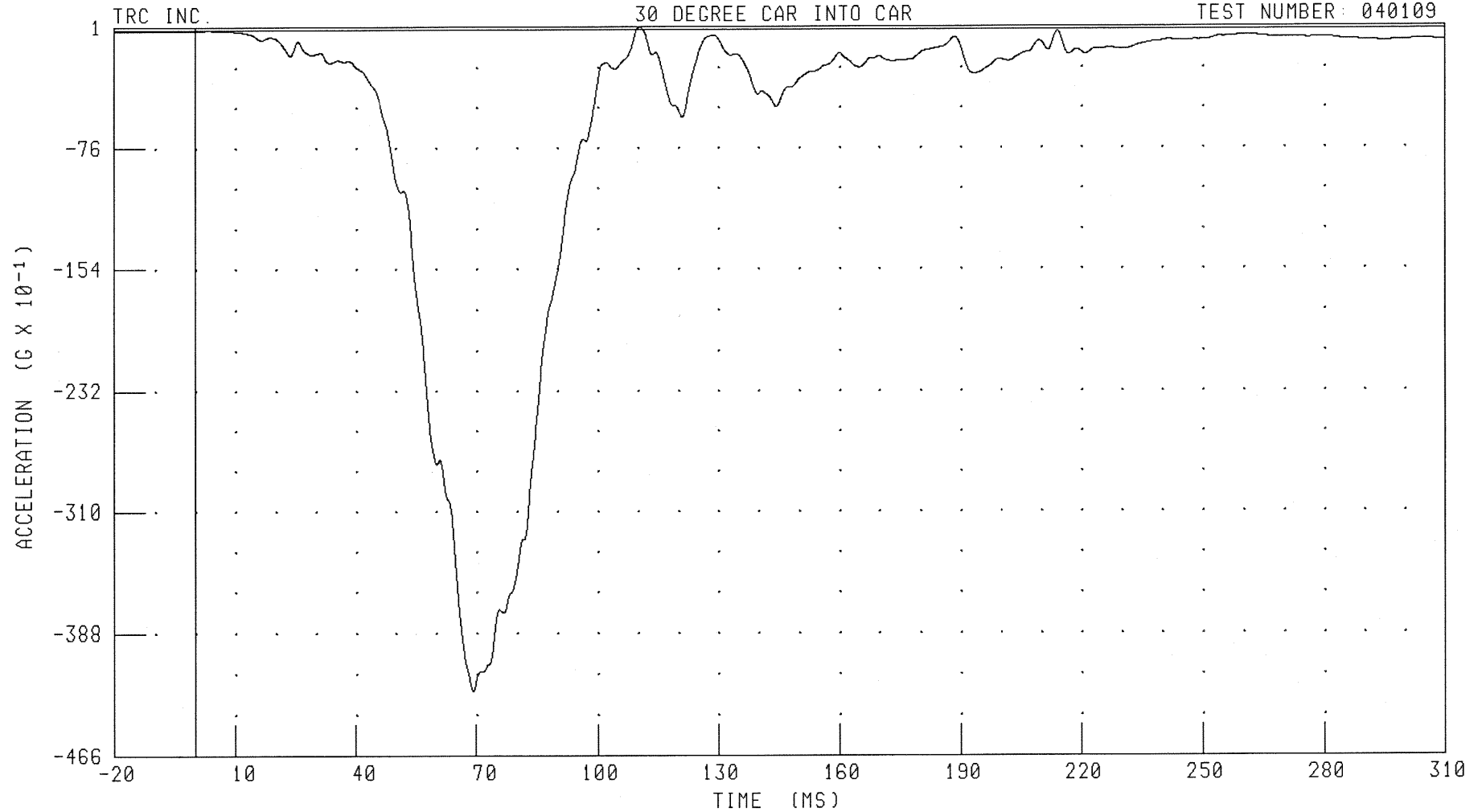
FILTER: CH. CLASS 180

PEAK DATA: 44.69 G @ 69.20 MS; 0.01 G @ -20.00 MS

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST X-AXIS REDUNDANT ACCELERATION

TEST NUMBER: 040109



CHANNEL: CSTXR1 FILTER: CH. CLASS 180

PEAK DATA: 0.20 G @ 110.40 MS; -42.49 G @ 69.28 MS

B-26

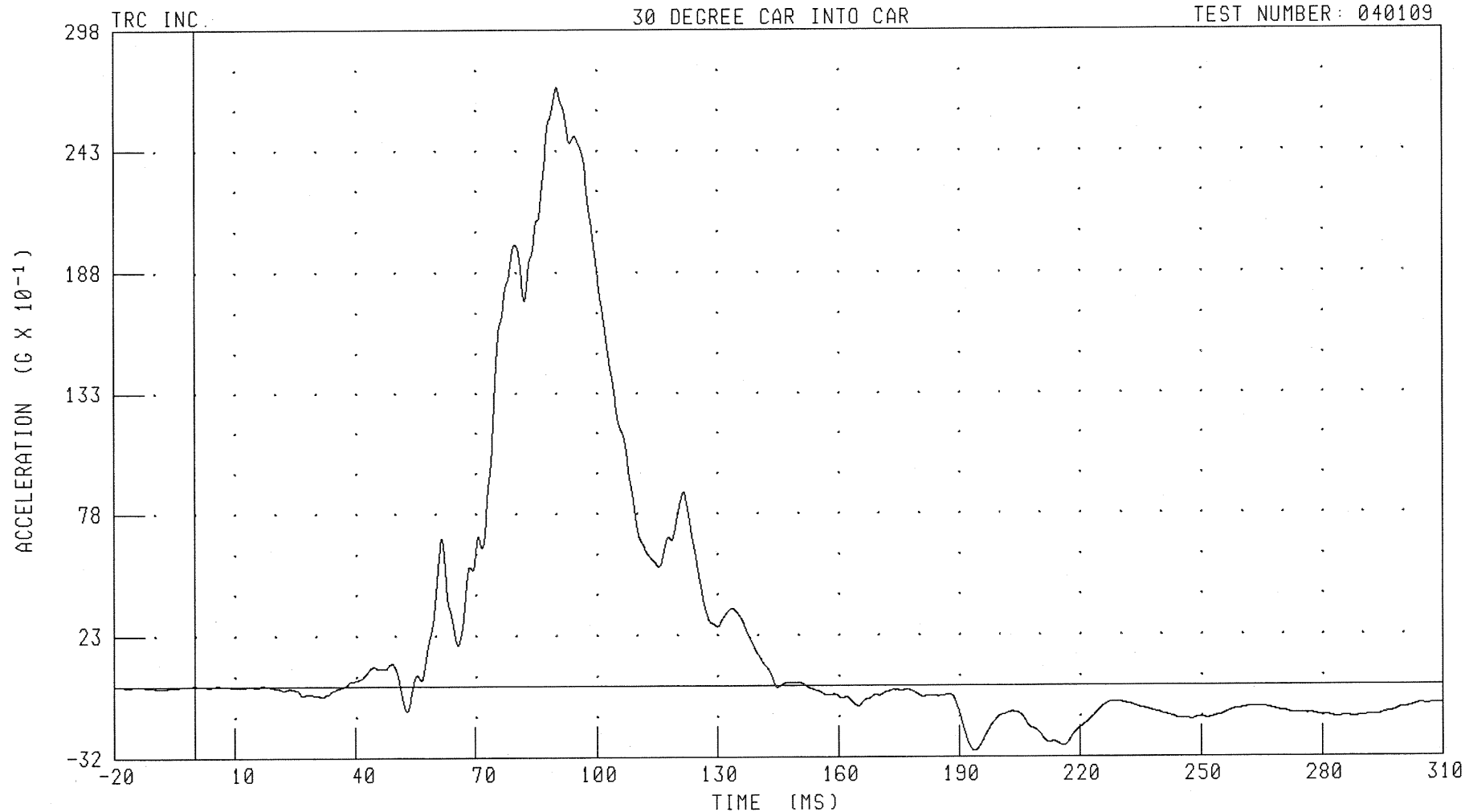
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST Y-AXIS REDUNDANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTYR1 FILTER: CH. CLASS 180

PEAK DATA: 27.18 G @ 90.24 MS; -2.93 G @ 193.92 MS

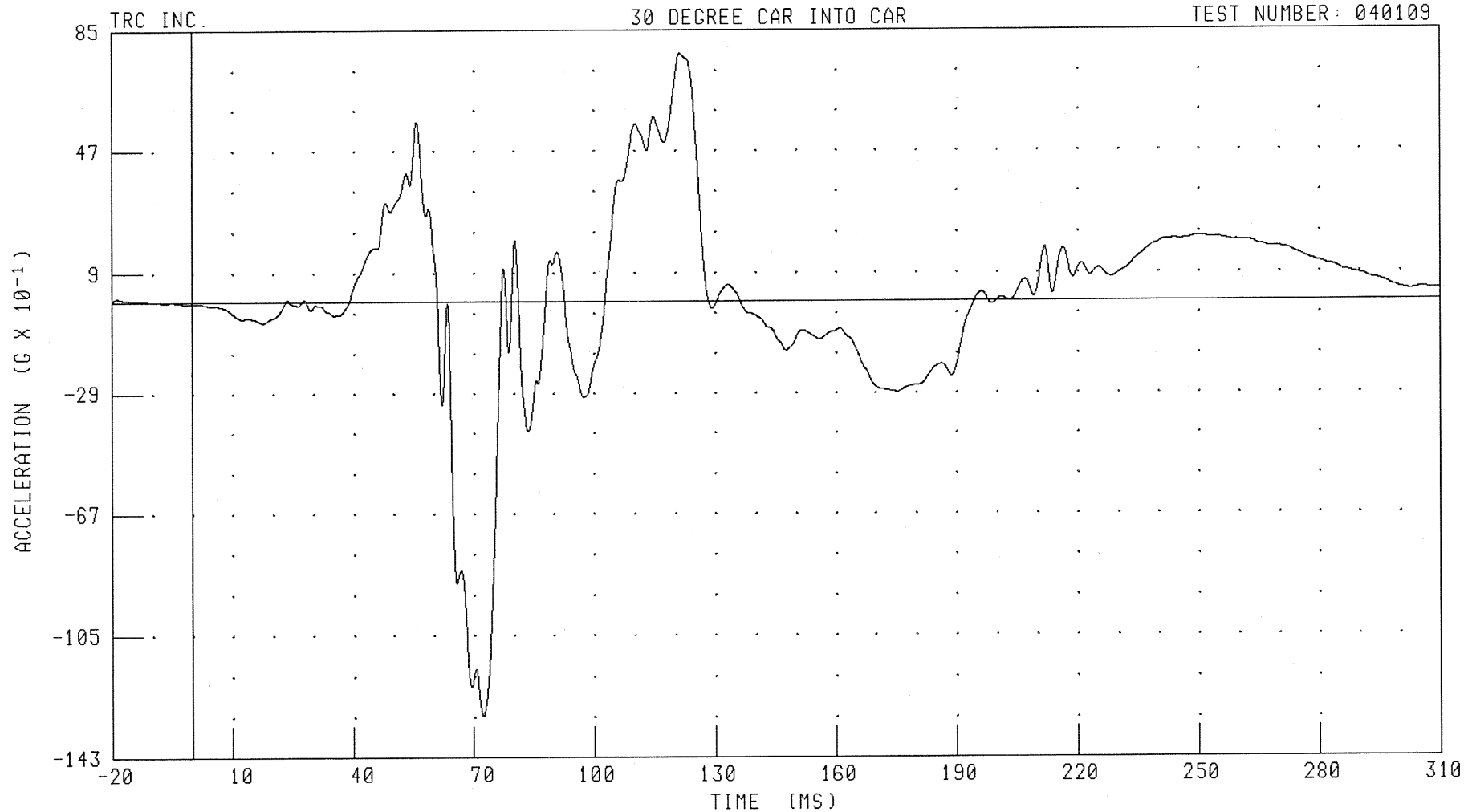
B-27

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST Z-AXIS REDUNDANT ACCELERATION

TEST NUMBER: 040109



CHANNEL: CSTZR1 FILTER: CH. CLASS 180

B-28

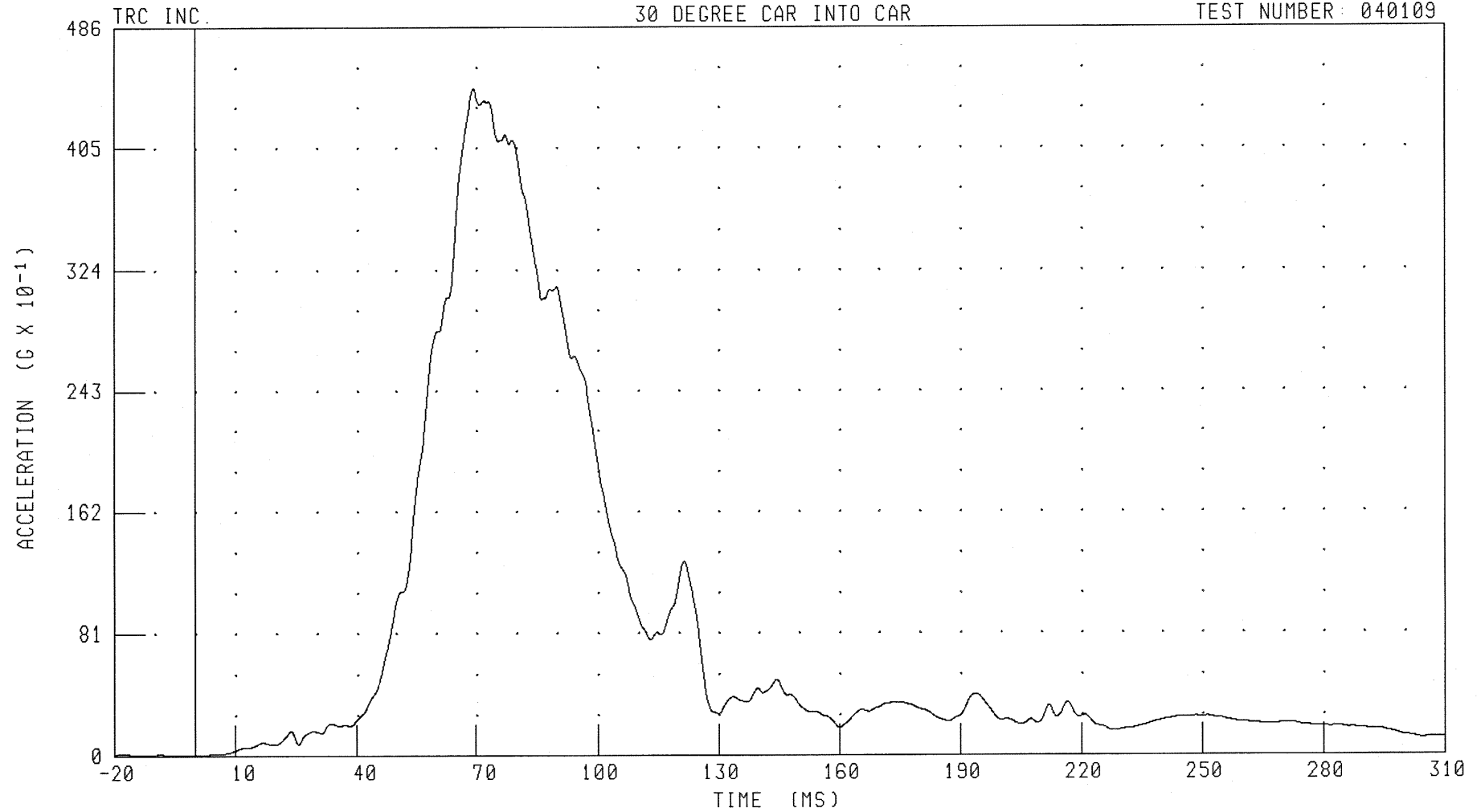
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST REDUNDANT RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-29

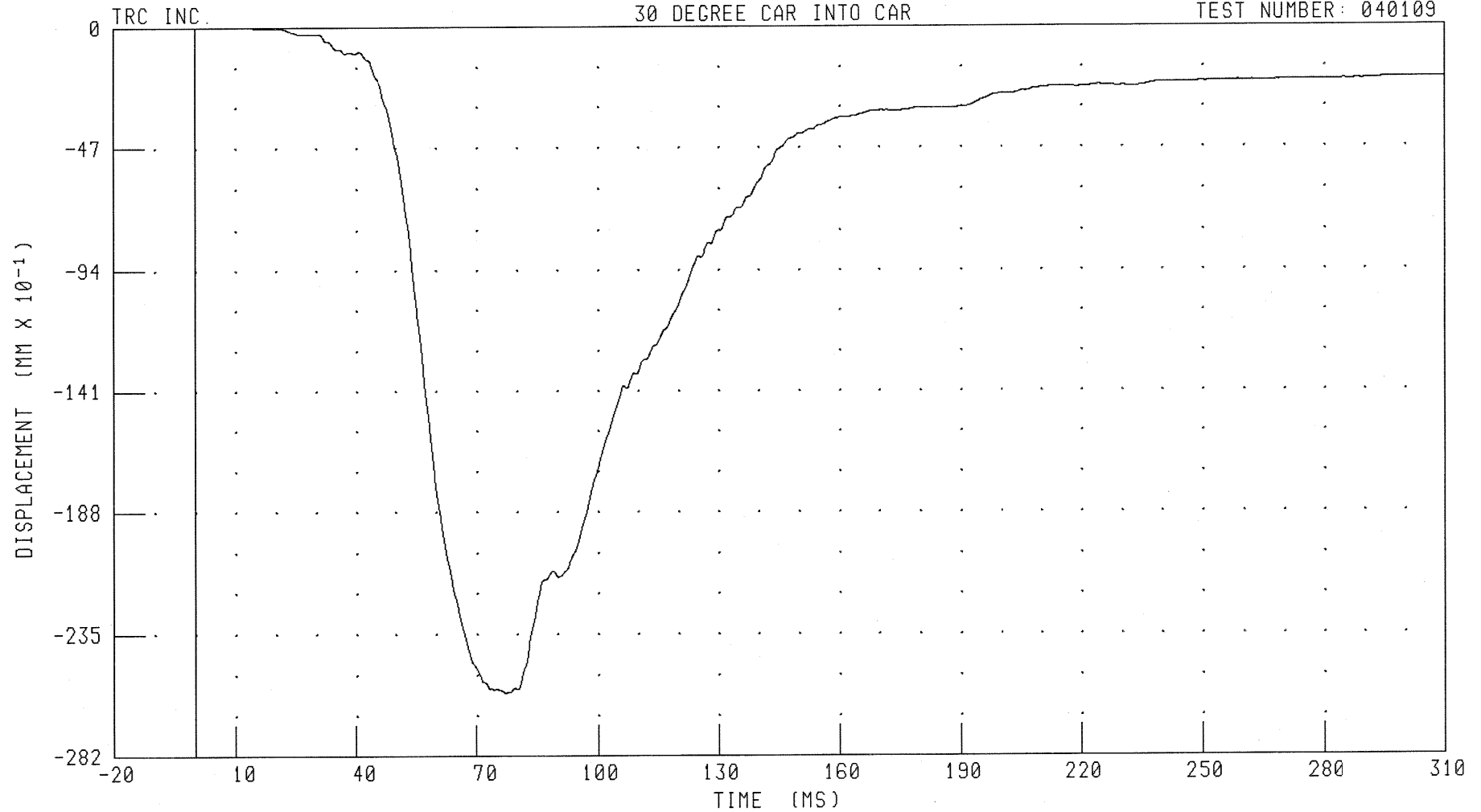
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER CHEST DEFLECTION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-30

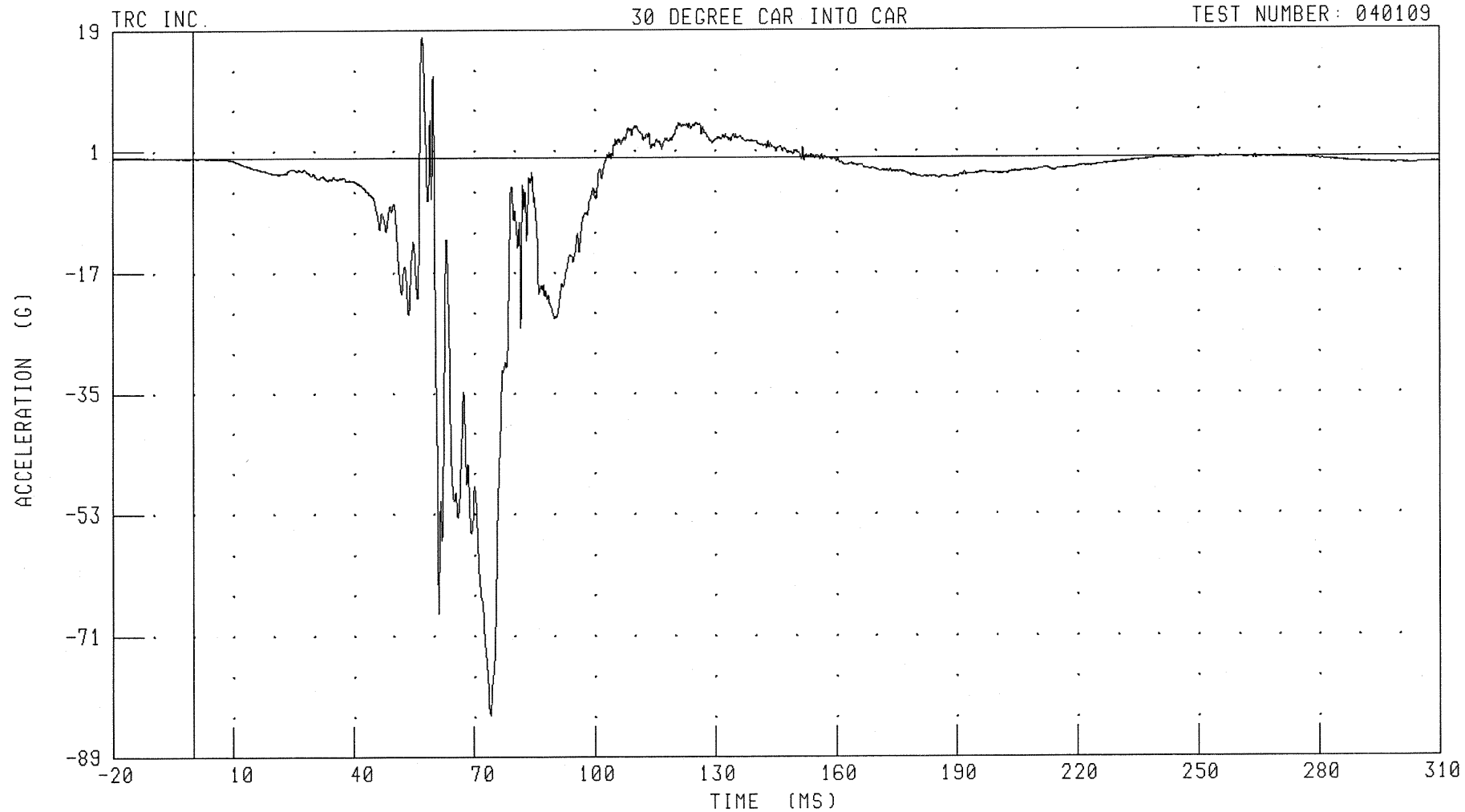
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER PELVIS X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

PEAK DATA: 17.92 G @ 57.12 MS; -82.76 G @ 74.16 MS

B-31

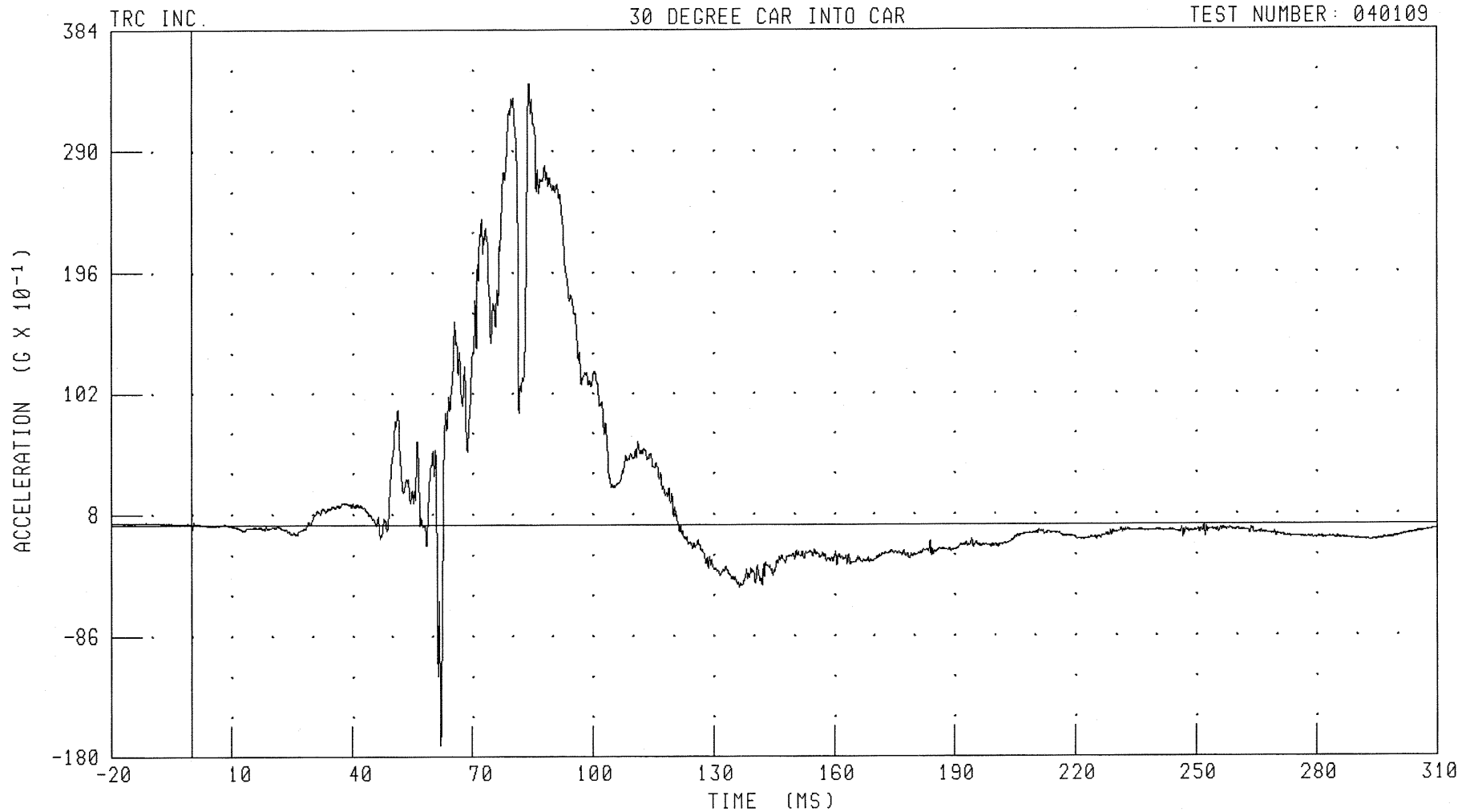
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER PELVIS Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

B-32

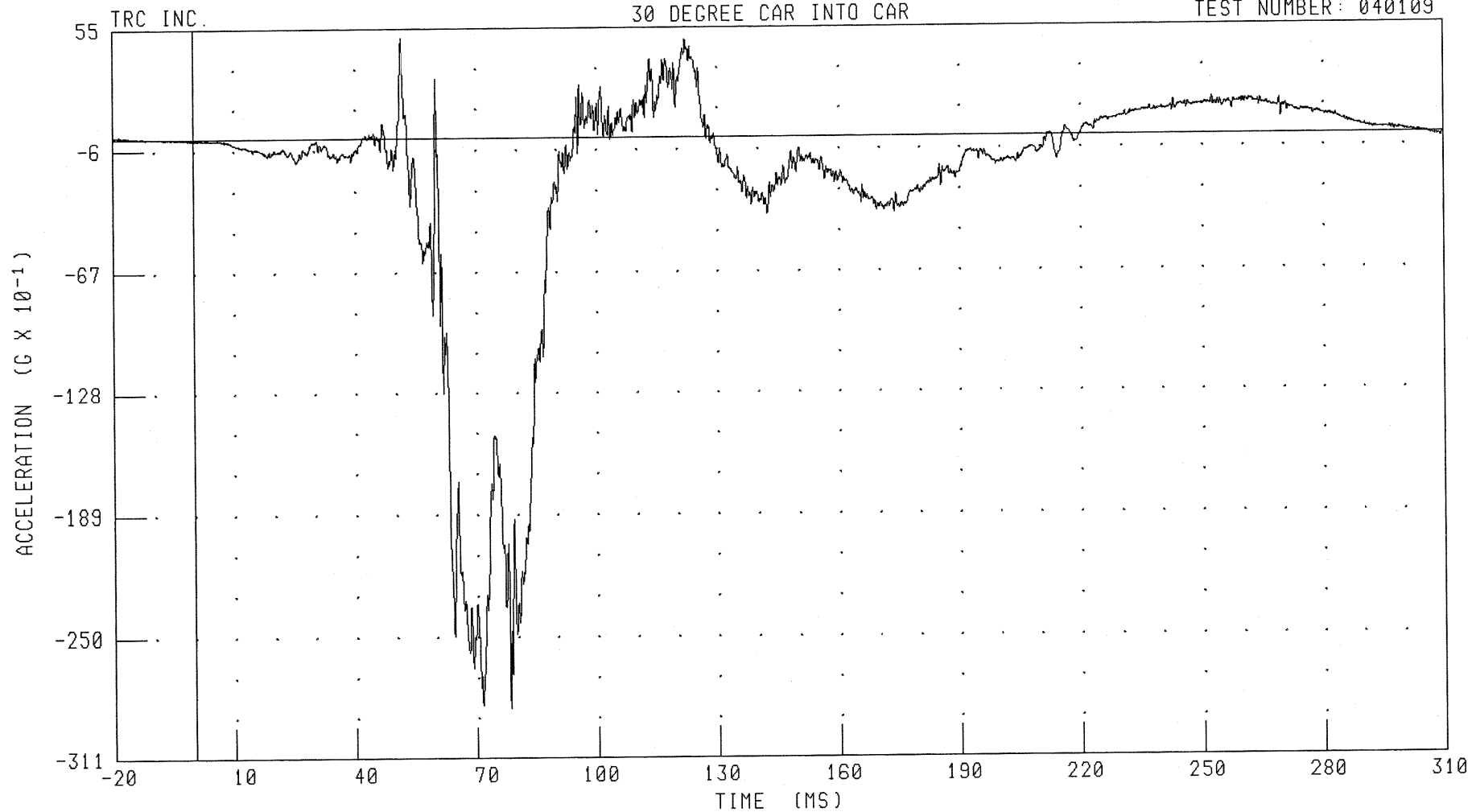
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER PELVIS Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

B-33

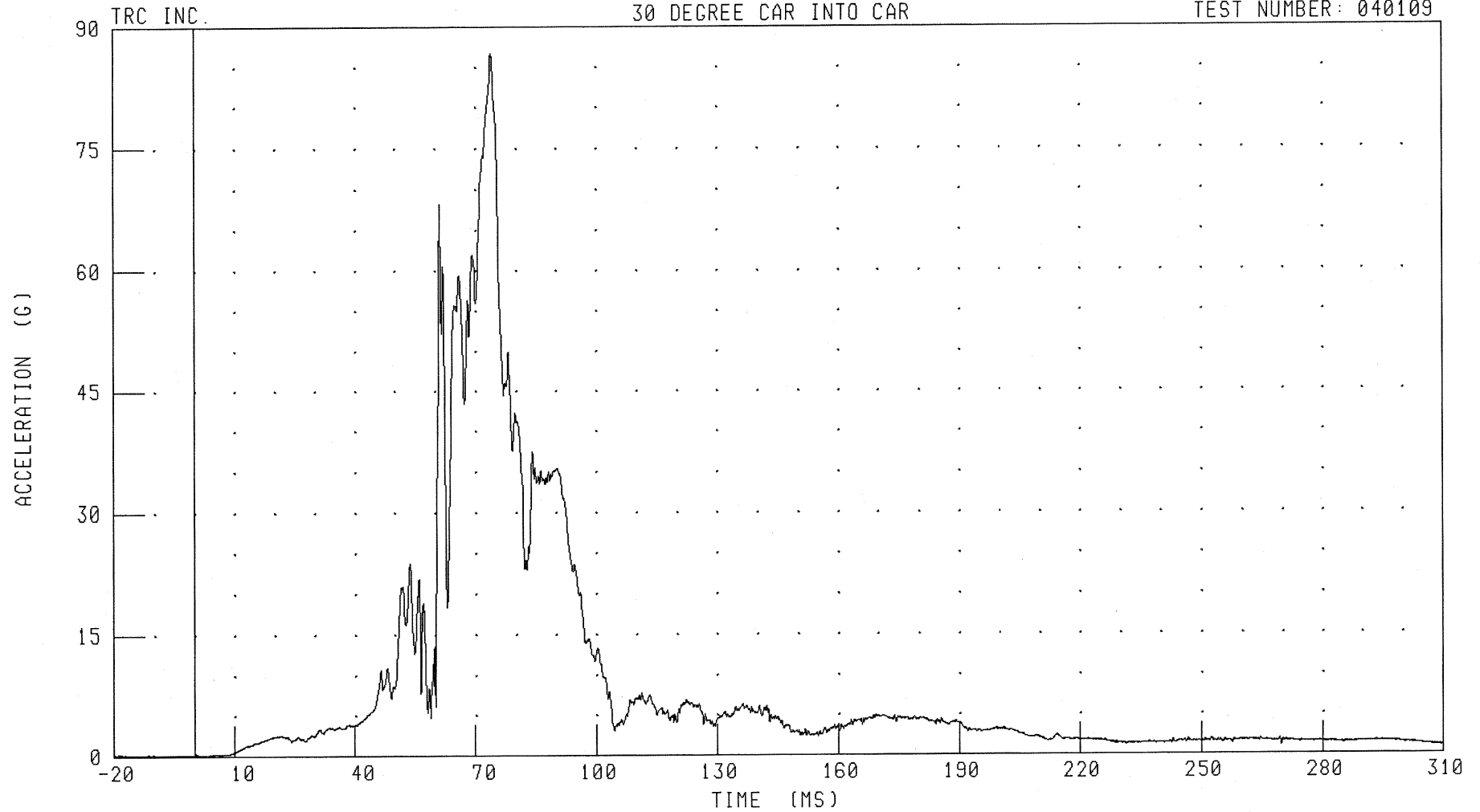
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER PELVIS RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

PEAK DATA: 86.76 G @ 73.84 MS; 0.05 G @ -6.64 MS

B-34

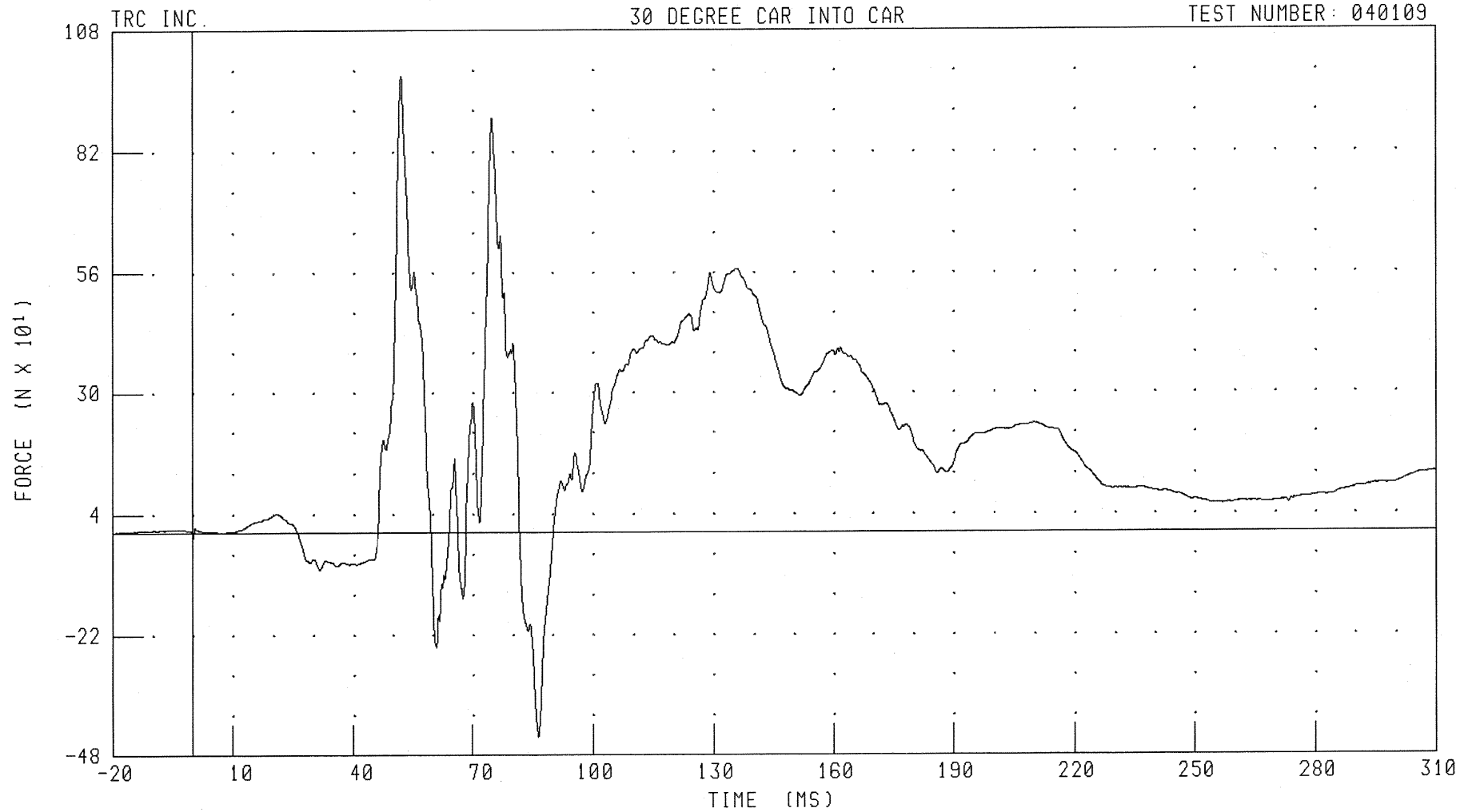
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT FEMUR X-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMXF1 FILTER: CH. CLASS 600

PEAK DATA: 981.76 N @ 52.08 MS; -439.84 N @ 86.48 MS

B-35

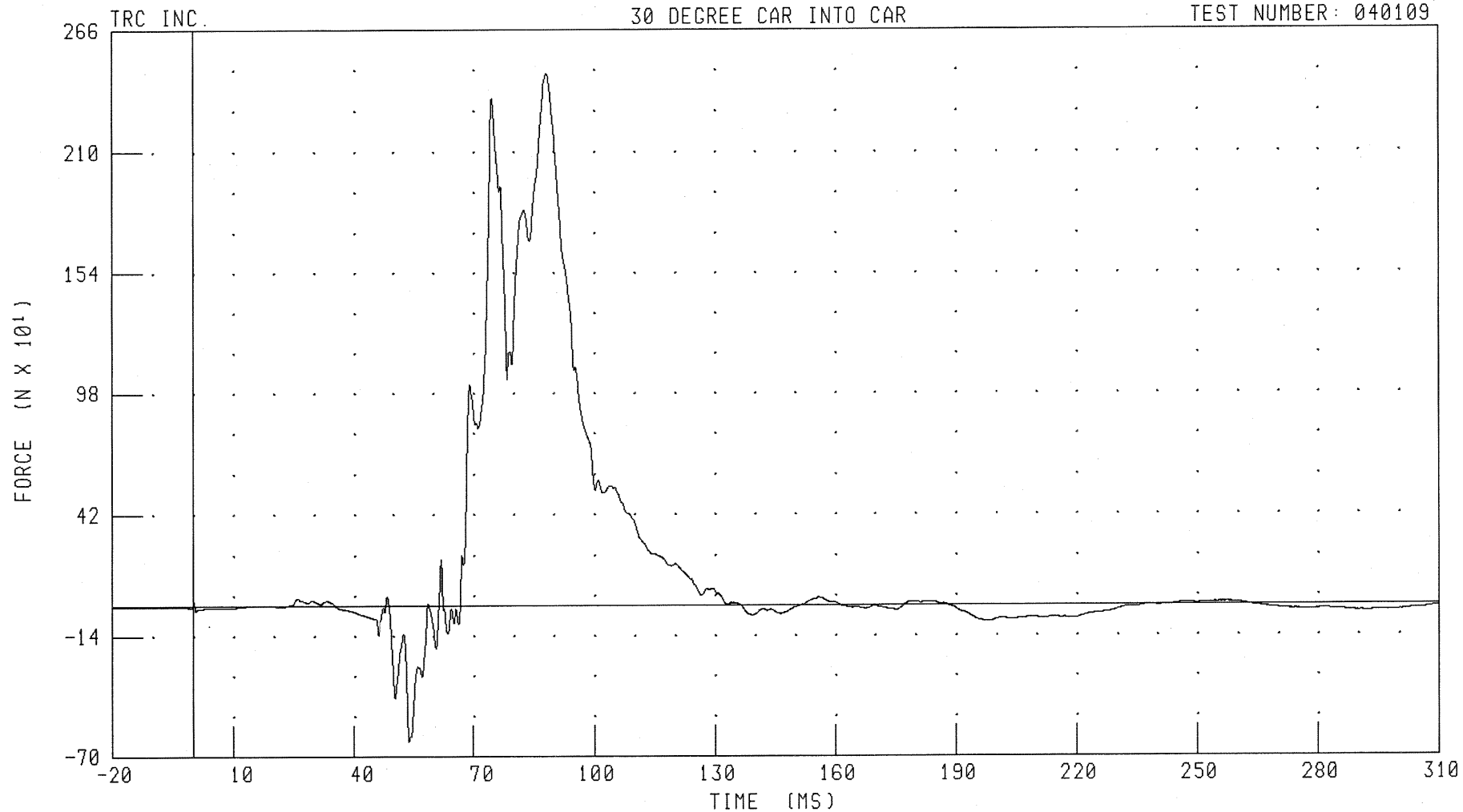
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT FEMUR Y-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMF1 FILTER: CH. CLASS 600

PEAK DATA: 2456.31 N @ 88.24 MS; -636.43 N @ 54.00 MS

B-36

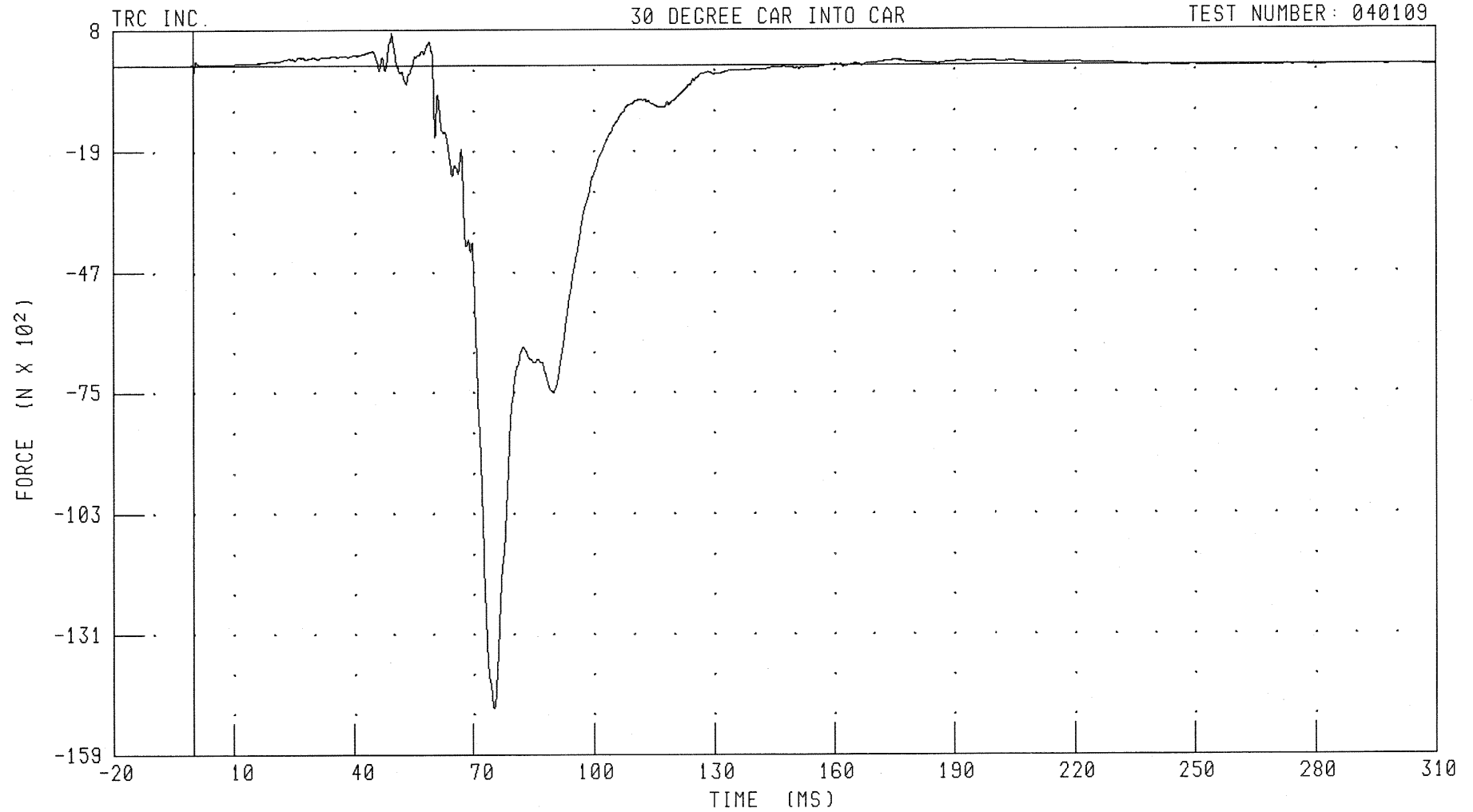
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT FEMUR Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMZF1 FILTER: CH. CLASS 600

PEAK DATA: 748.69 N @ 49.60 MS; -14919.67 N @ 75.20 MS

B-37

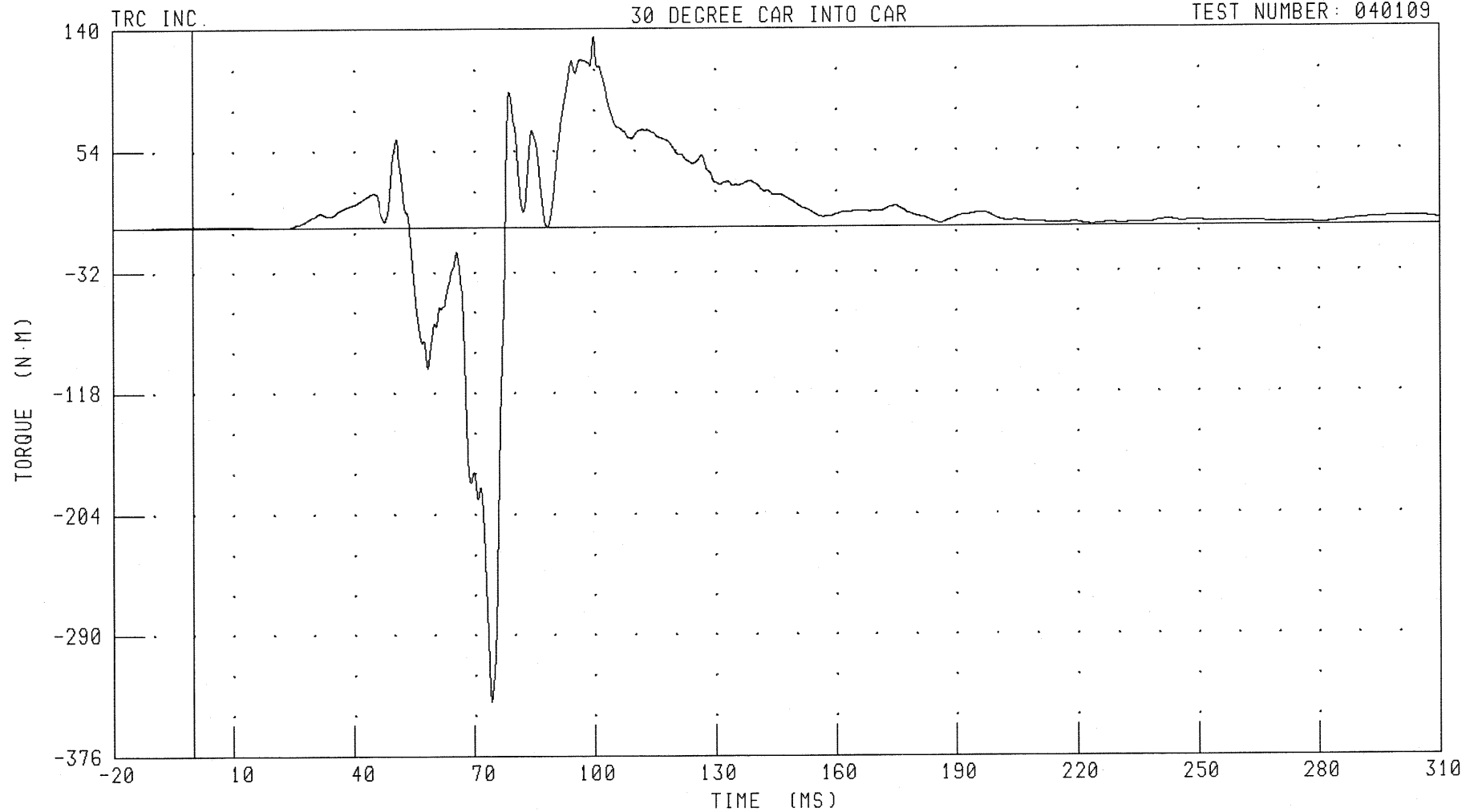
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT FEMUR MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMXM1

FILTER: CH. CLASS 600

TIME (MS)

PEAK DATA: 134.11 N·M @ 100.00 MS; -337.95 N·M @ 74.24 MS

B-38

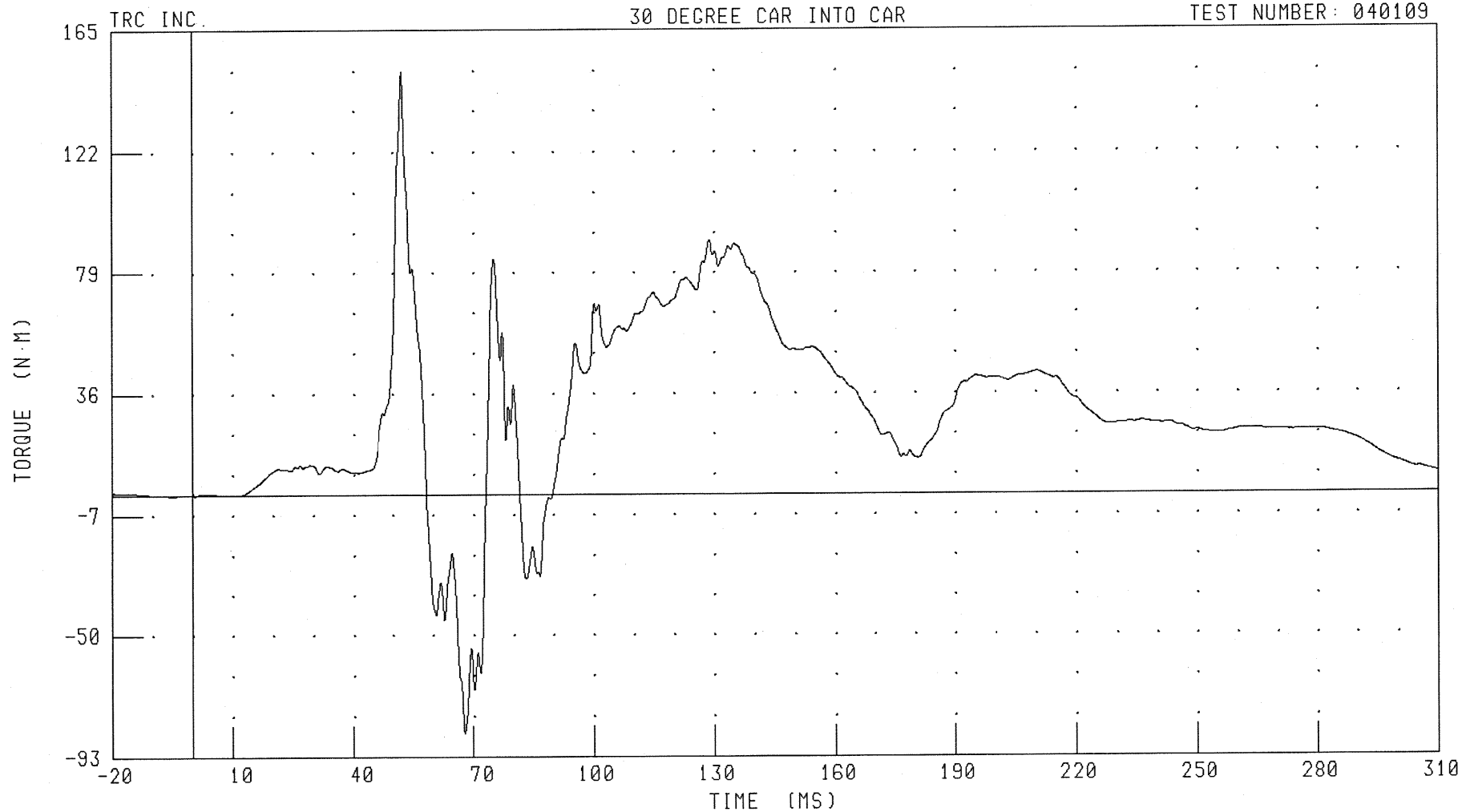
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT FEMUR MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMYM1

FILTER: CH. CLASS 600

PEAK DATA: 150.41 N·M @ 52.32 MS; -84.71 N·M @ 67.84 MS

B-39

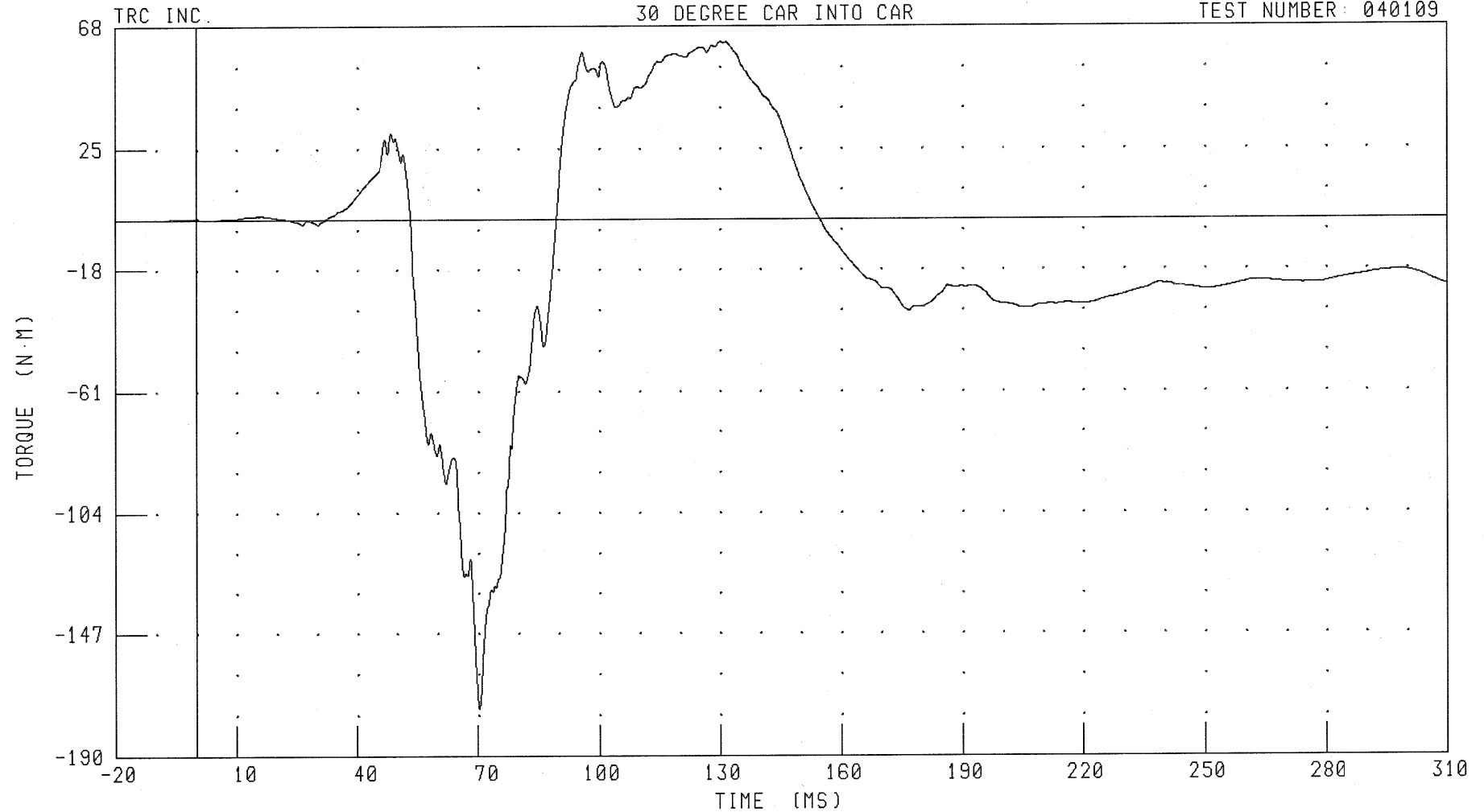
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT FEMUR MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMZM1 FILTER: CH. CLASS 600

PEAK DATA: 62.52 N·M @ 130.16 MS; -173.49 N·M @ 70.32 MS

B-40

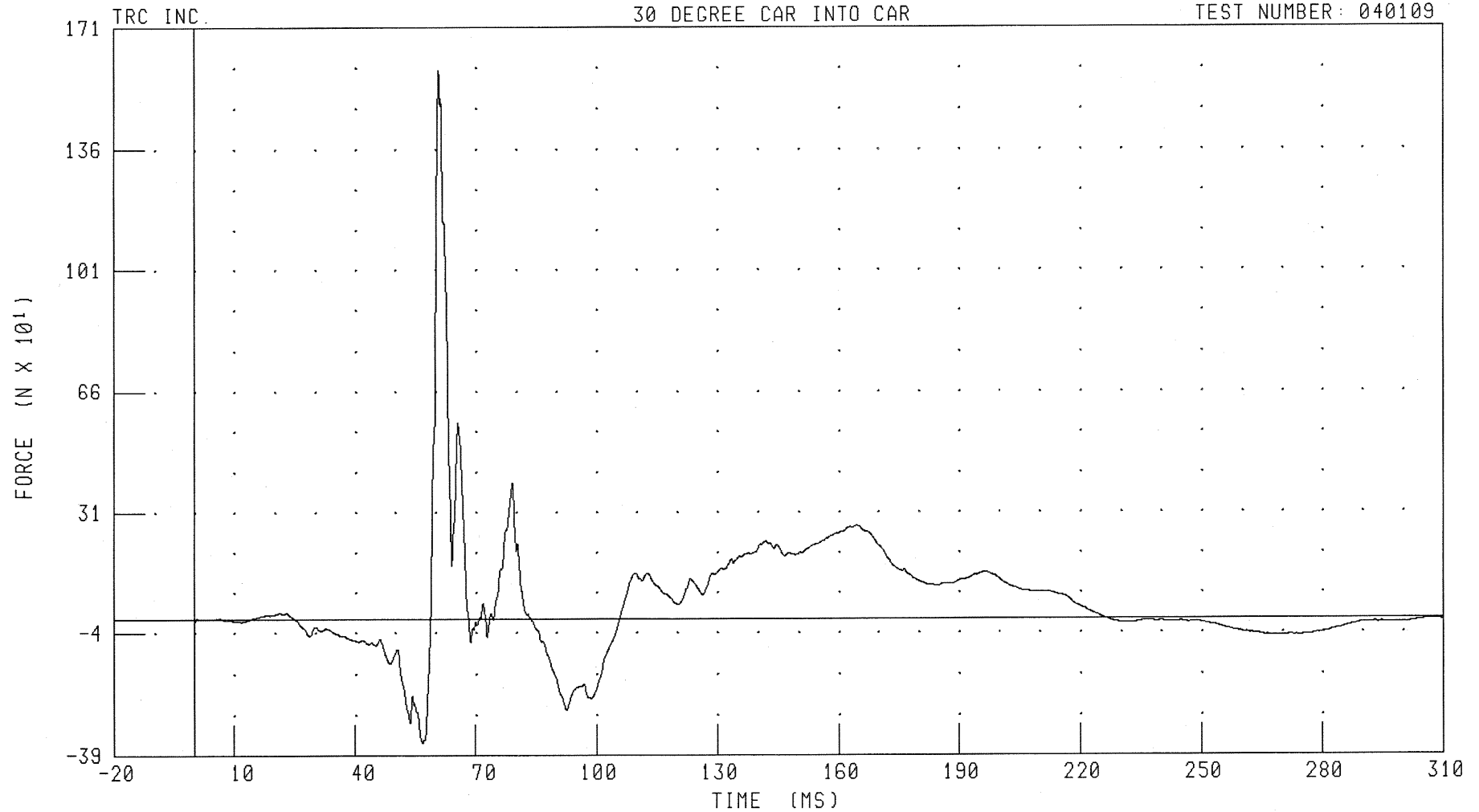
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT FEMUR X-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMXF1 FILTER: CH. CLASS 600

PEAK DATA: 1585.52 N @ 60.80 MS; -355.55 N @ 56.72 MS

B-41

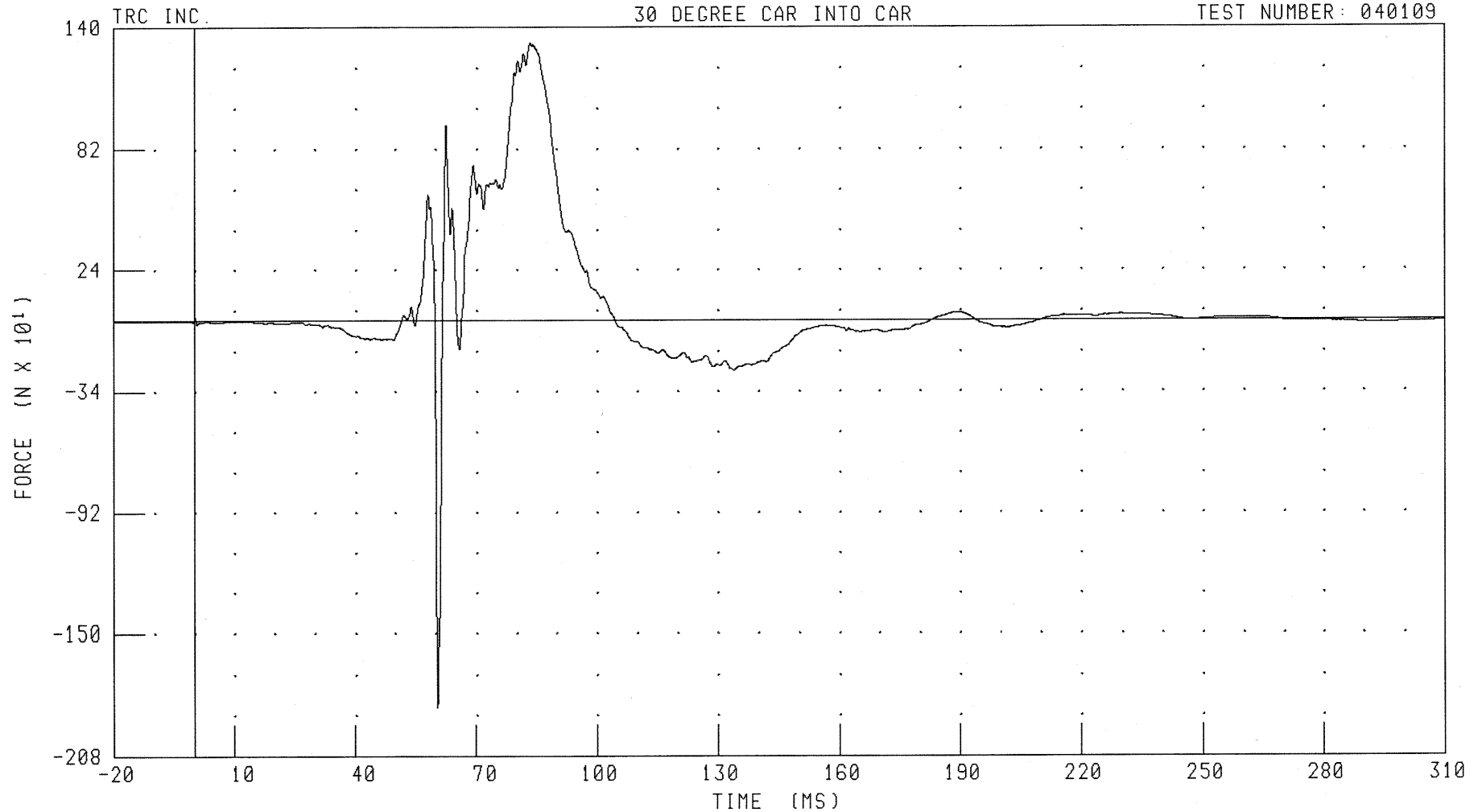
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT FEMUR Y-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMYF1 FILTER: CH. CLASS 600

PEAK DATA: 1323.36 N @ 83.44 MS; -1849.95 N @ 60.56 MS

B-42

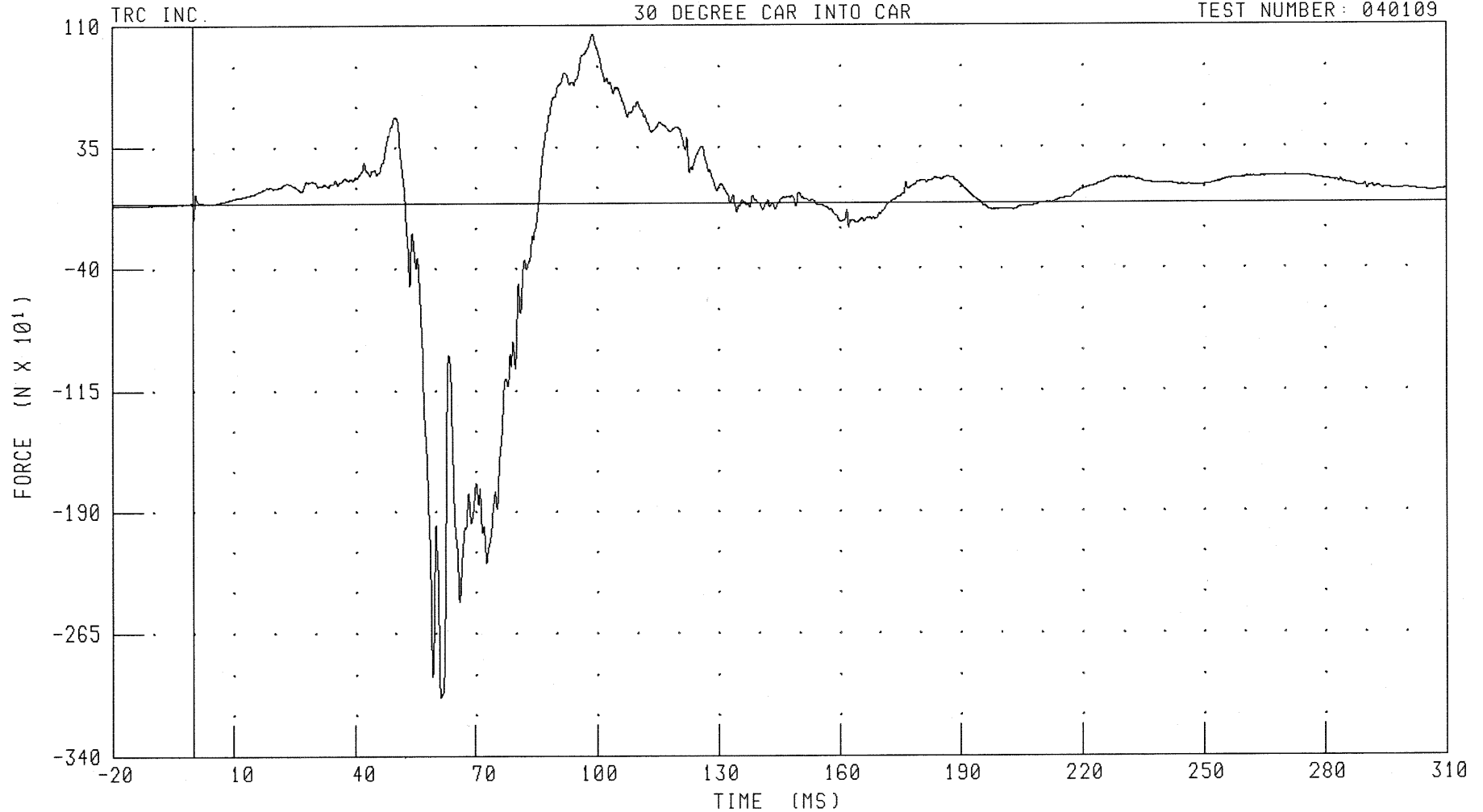
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT FEMUR Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMZFI FILTER: CH. CLASS 600

PEAK DATA: 1046.39 N @ 98.96 MS; -3047.53 N @ 61.28 MS

B-43

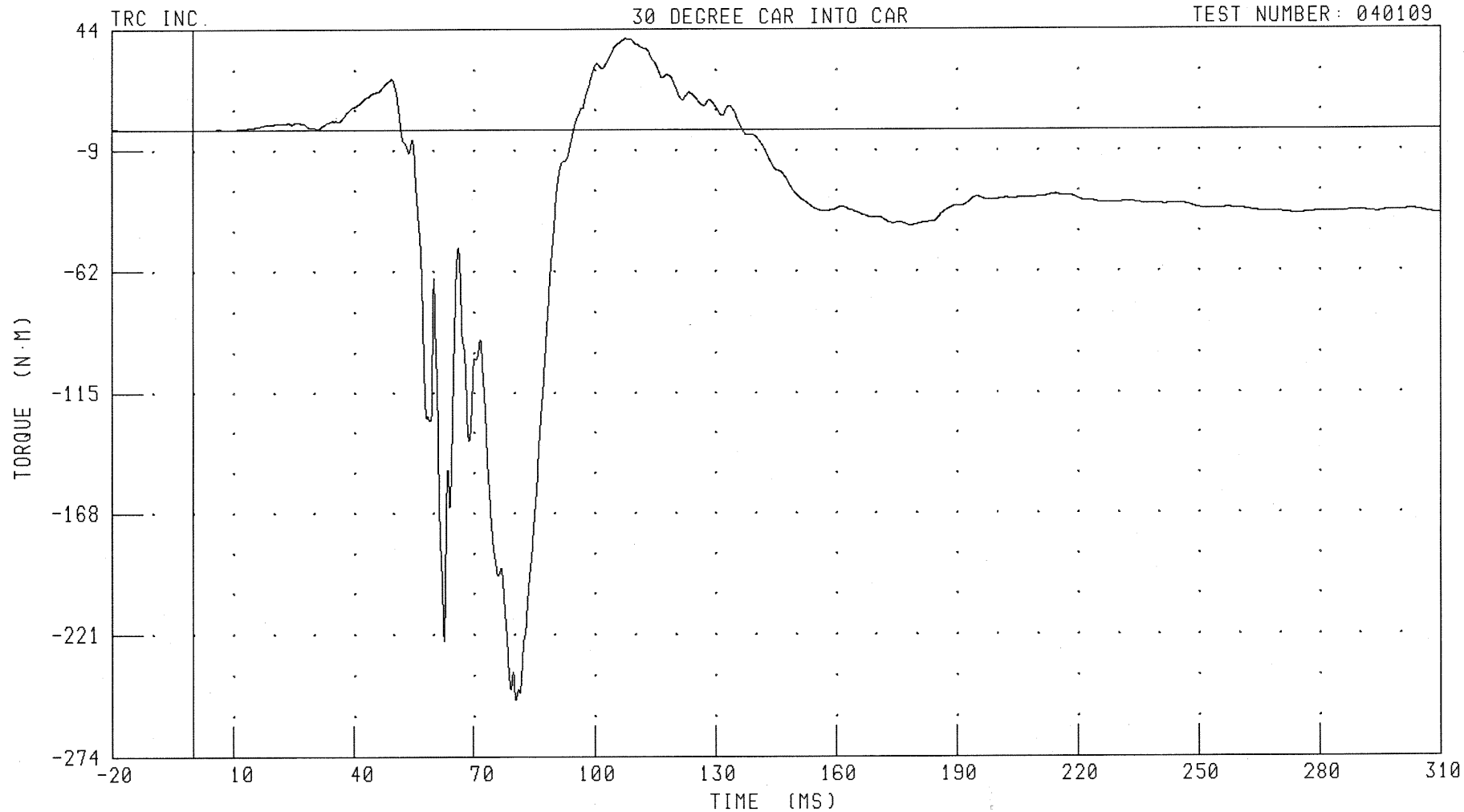
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT FEMUR MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMXM1

FILTER: CH. CLASS 600

PEAK DATA: 40.05 N·m @ 107.68 ms; -249.44 N·m @ 80.48 ms

B-44

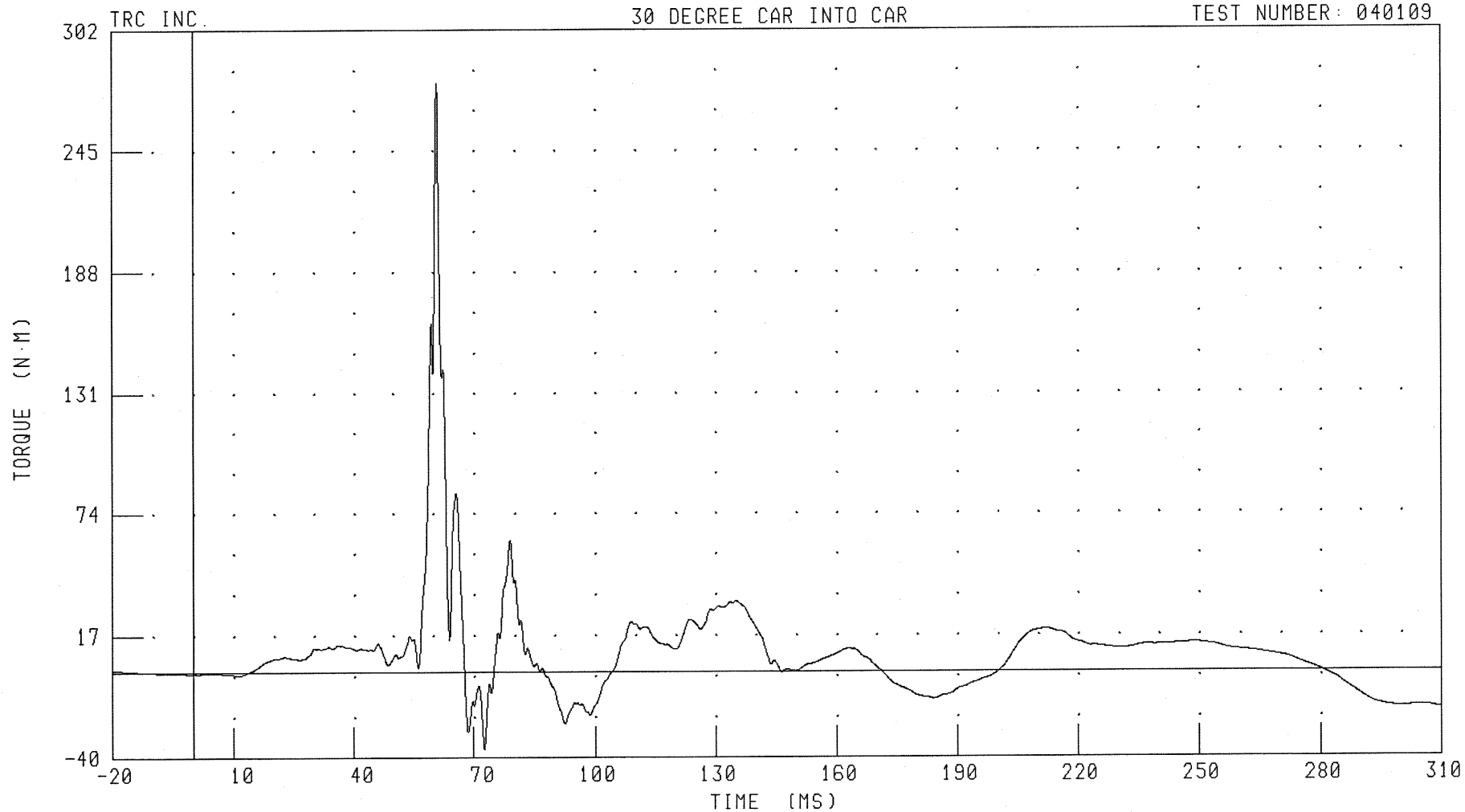
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT FEMUR MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMYM1

FILTER: CH. CLASS 600

PEAK DATA: 276.81 N·M @ 60.96 MS; -36.41 N·M @ 72.64 MS

B-45

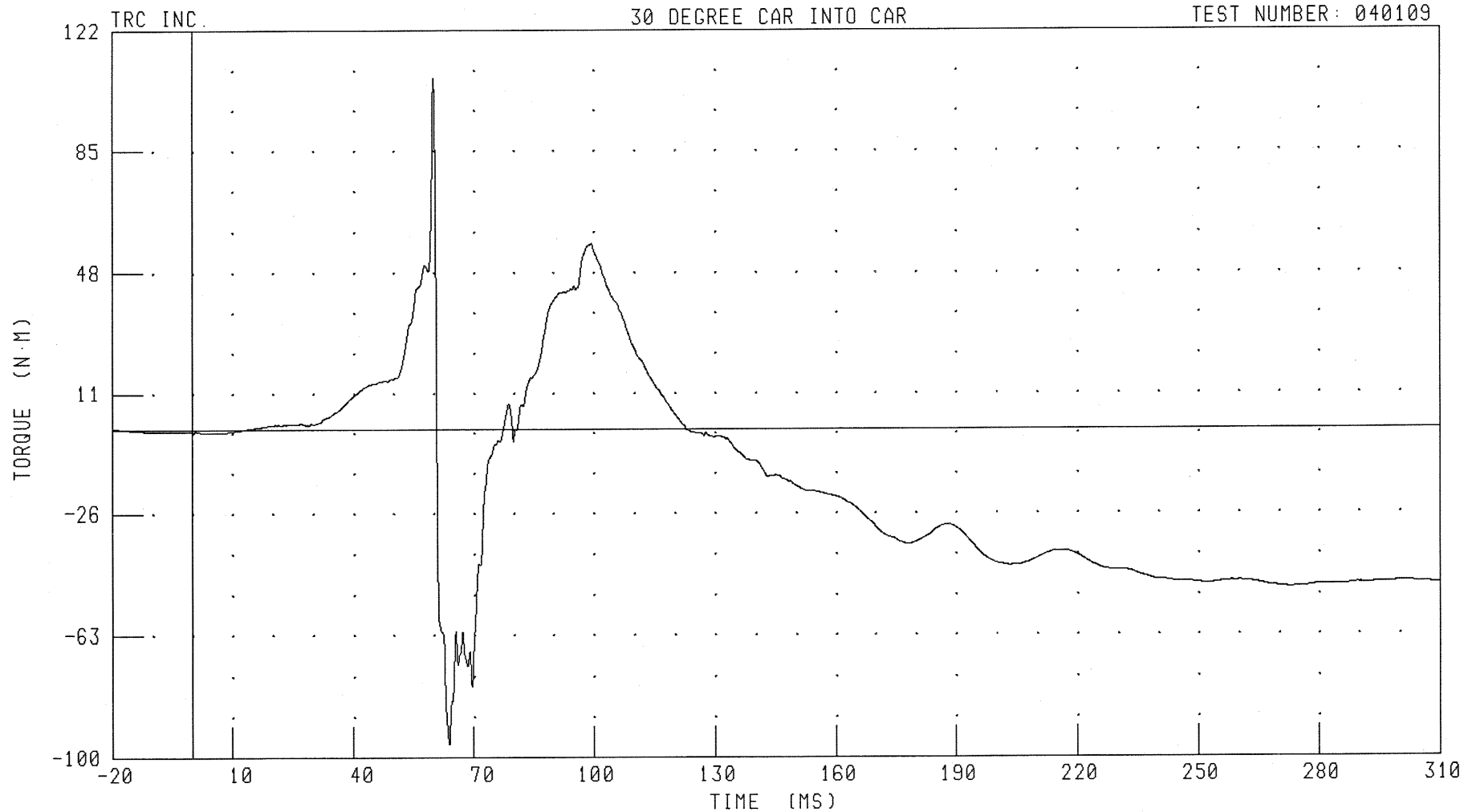
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT FEMUR MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMZM1 FILTER: CH. CLASS 600

PEAK DATA: 107.40 N·M @ 60.00 MS; -96.10 N·M @ 63.84 MS

B-46

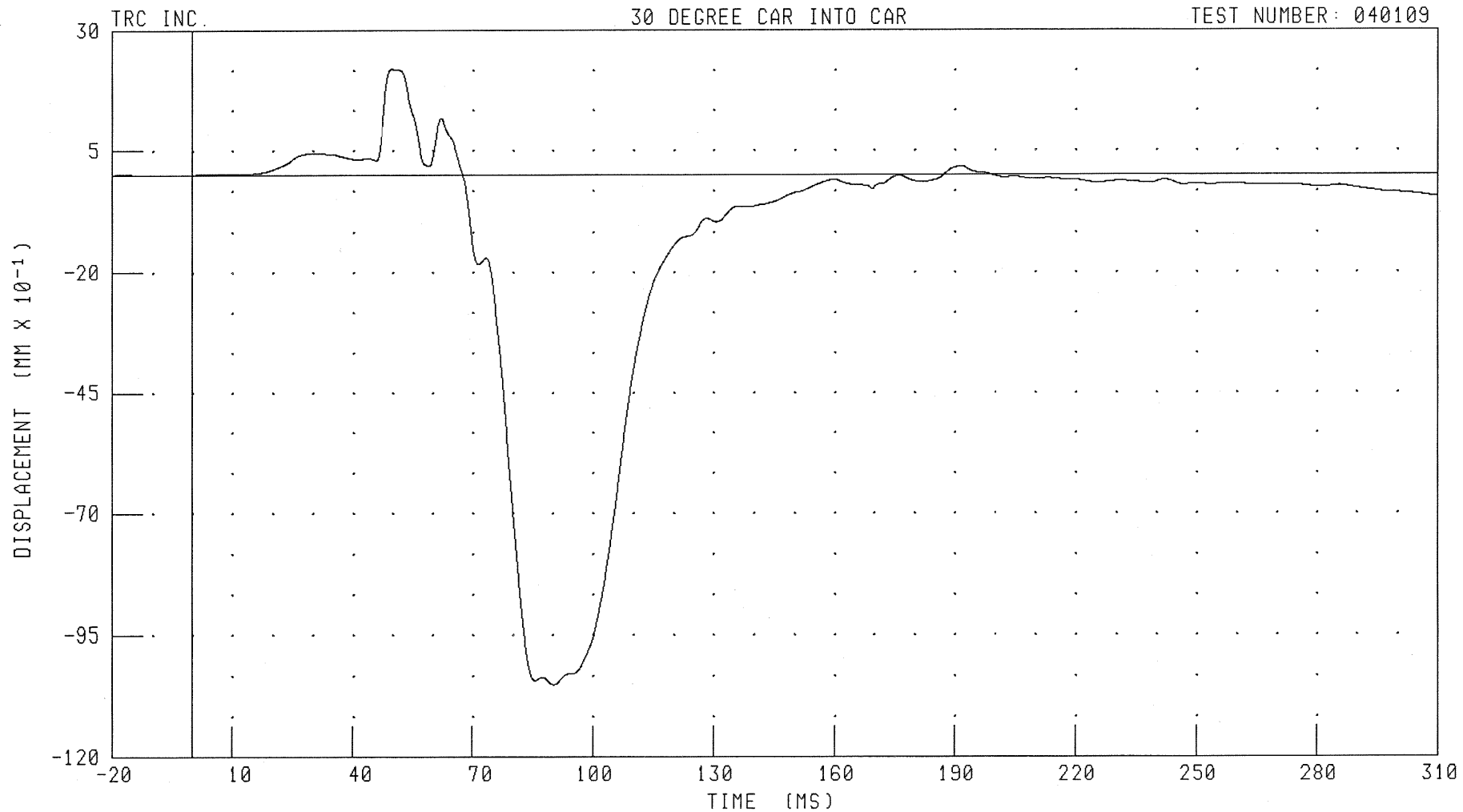
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT KNEE DISPLACEMENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: KNLXD1 FILTER: CH. CLASS 180

PEAK DATA: 2.20 MM @ 49.76 MS; -10.51 MM @ 90.32 MS

B-47

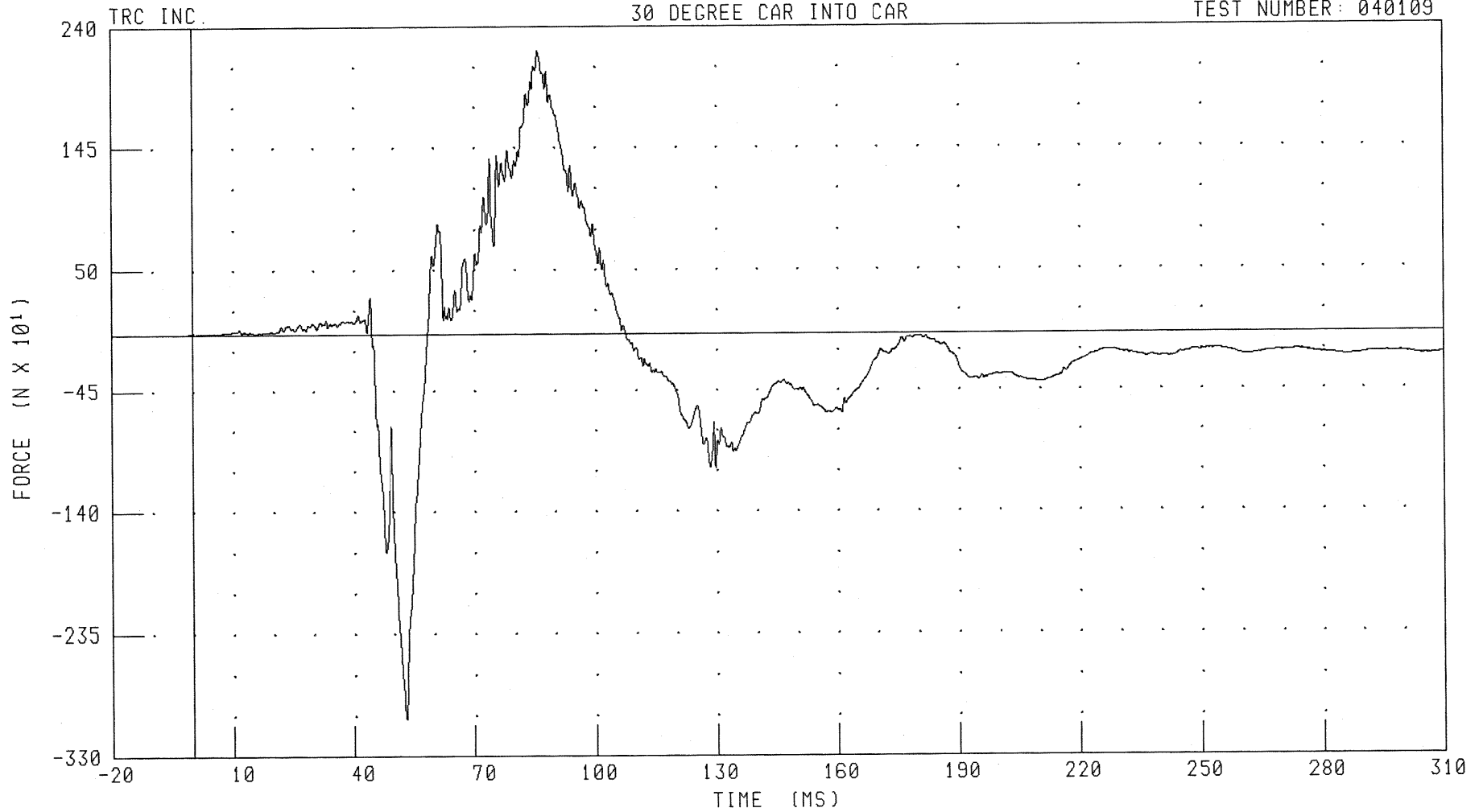
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT UPPER TIBIA Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: TBLZF1 FILTER: CH. CLASS 600

PEAK DATA: 2207.83 N @ 85.92 MS; -3007.30 N @ 53.04 MS

B-48

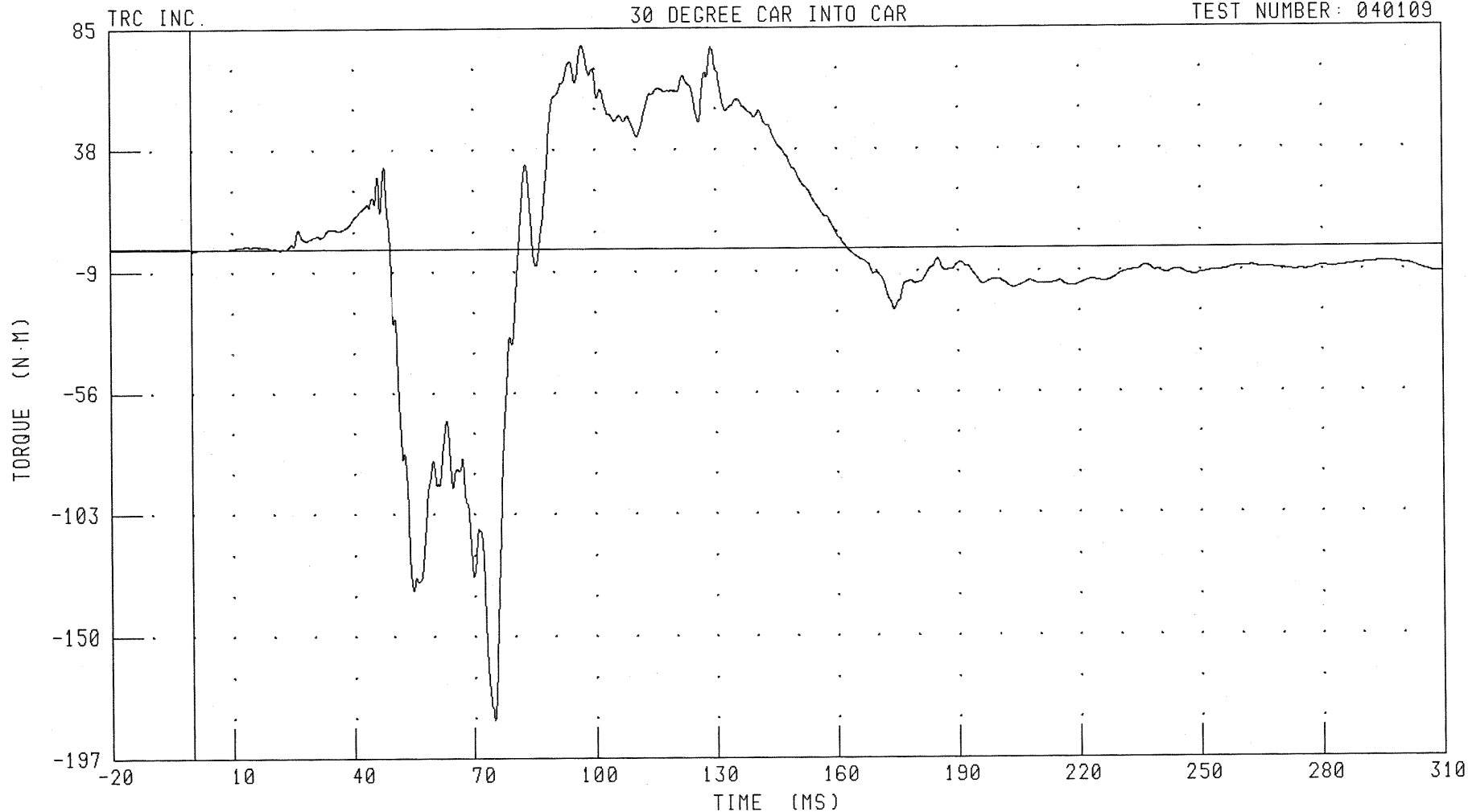
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: TBLXM1 FILTER: CH. CLASS 600

PEAK DATA: 78.16 N·M @ 97.04 MS; -182.49 N·M @ 74.96 MS

B-49

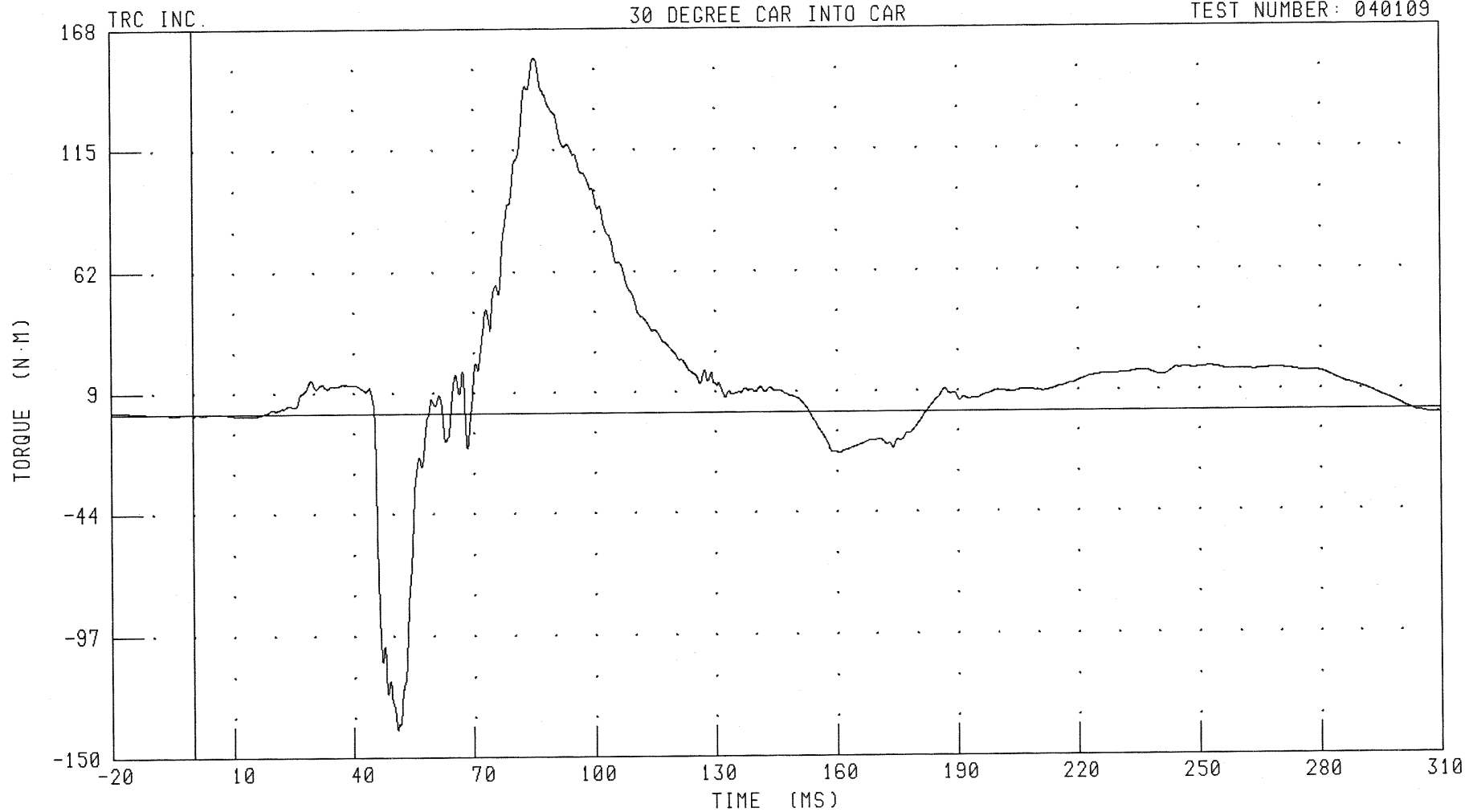
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: TBLYM1 FILTER: CH. CLASS 600

PEAK DATA: 155.17 N·m @ 85.20 MS; -137.93 N·m @ 51.04 MS

B-50

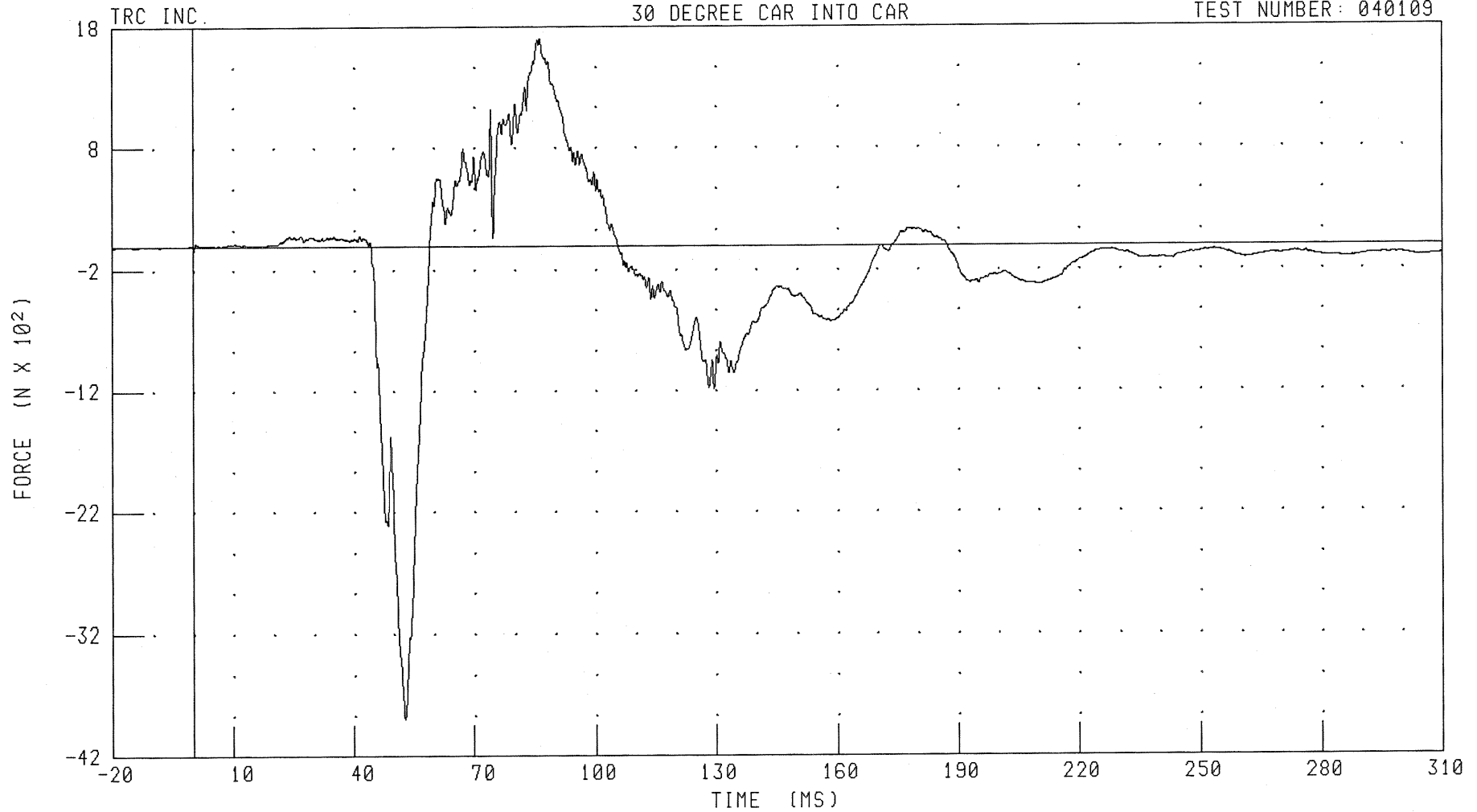
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT LOWER TIBIA Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ANLZF1 FILTER: CH. CLASS 600

B-51

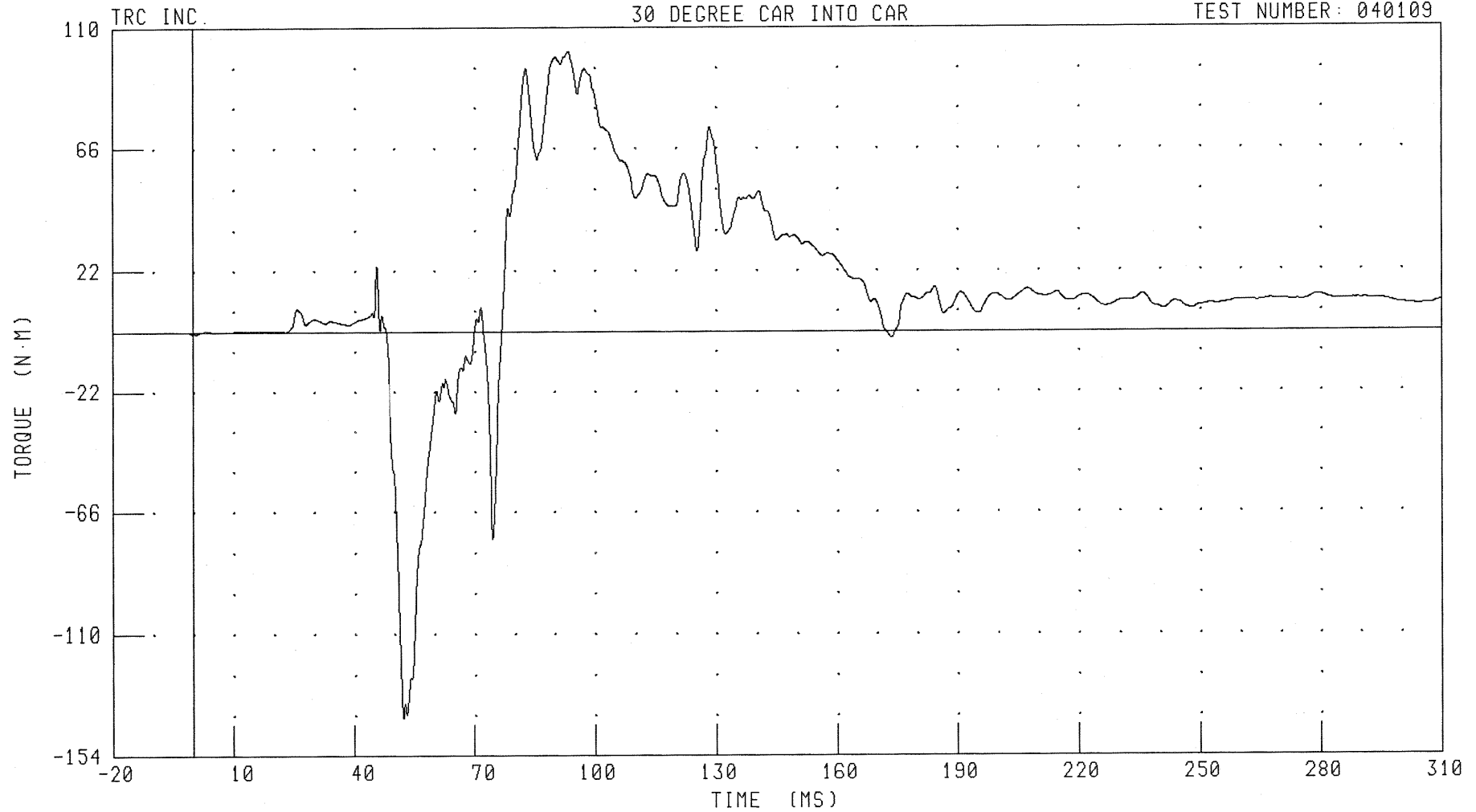
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT LOWER TIBIA MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ANLXM1 FILTER: CH. CLASS 600

B-52

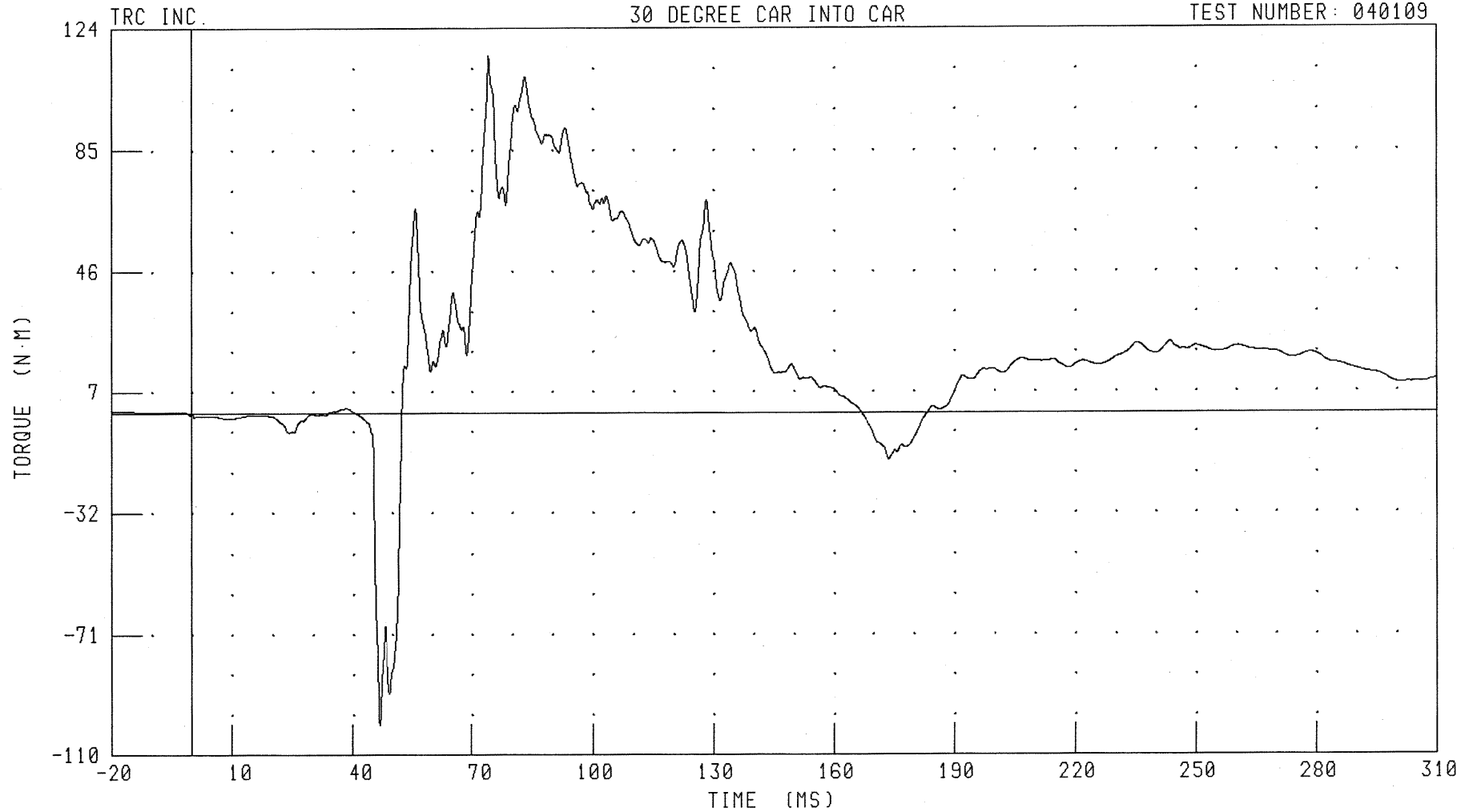
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ANLYM1

FILTER: CH. CLASS 600

PEAK DATA: 115.15 N·m @ 74.24 ms; -100.59 N·m @ 46.80 ms

B-53

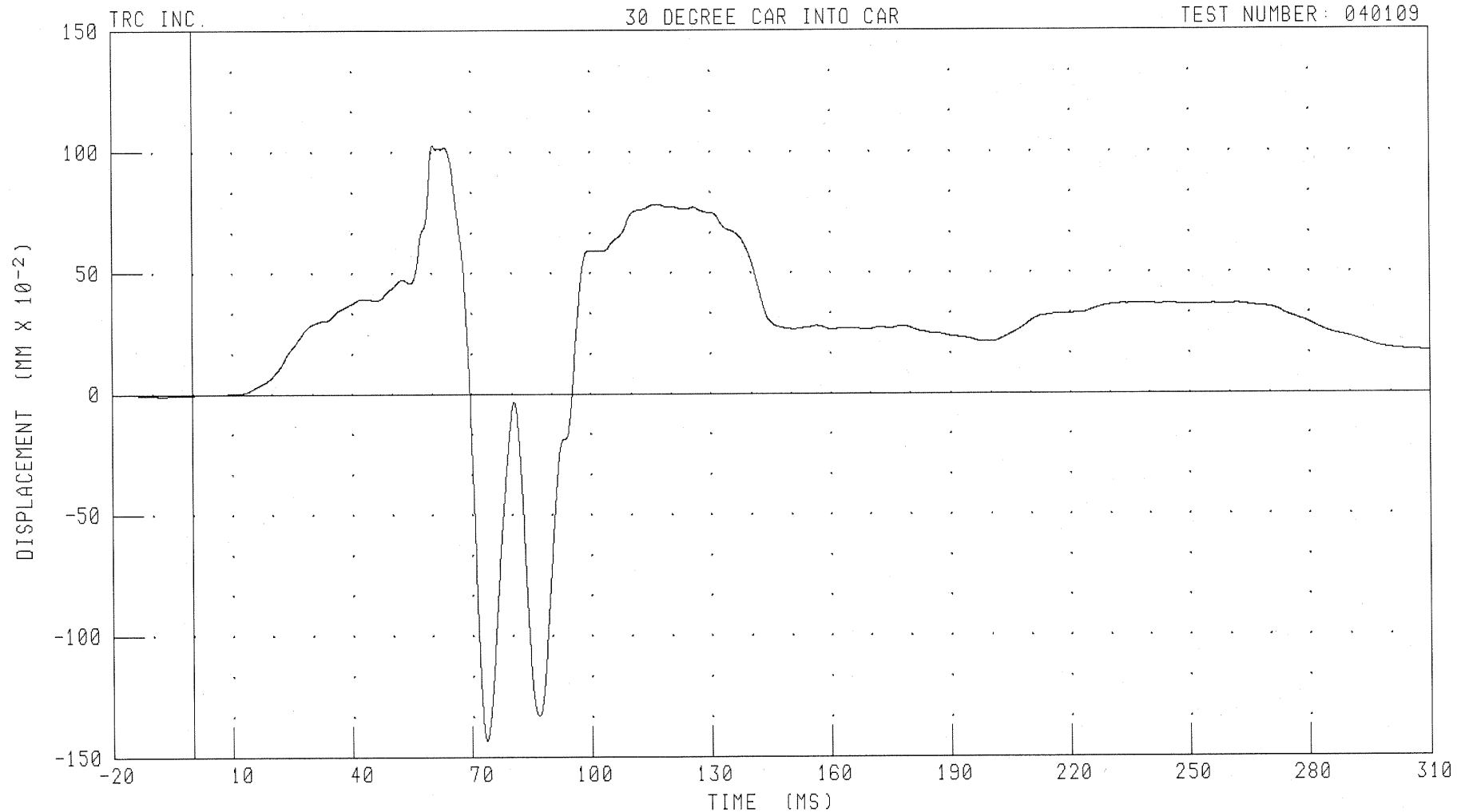
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT KNEE DISPLACEMENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: KNRXD1 FILTER: CH. CLASS 180

PEAK DATA: 1.03 MM @ 60.56 MS; -1.43 MM @ 73.60 MS

B-54

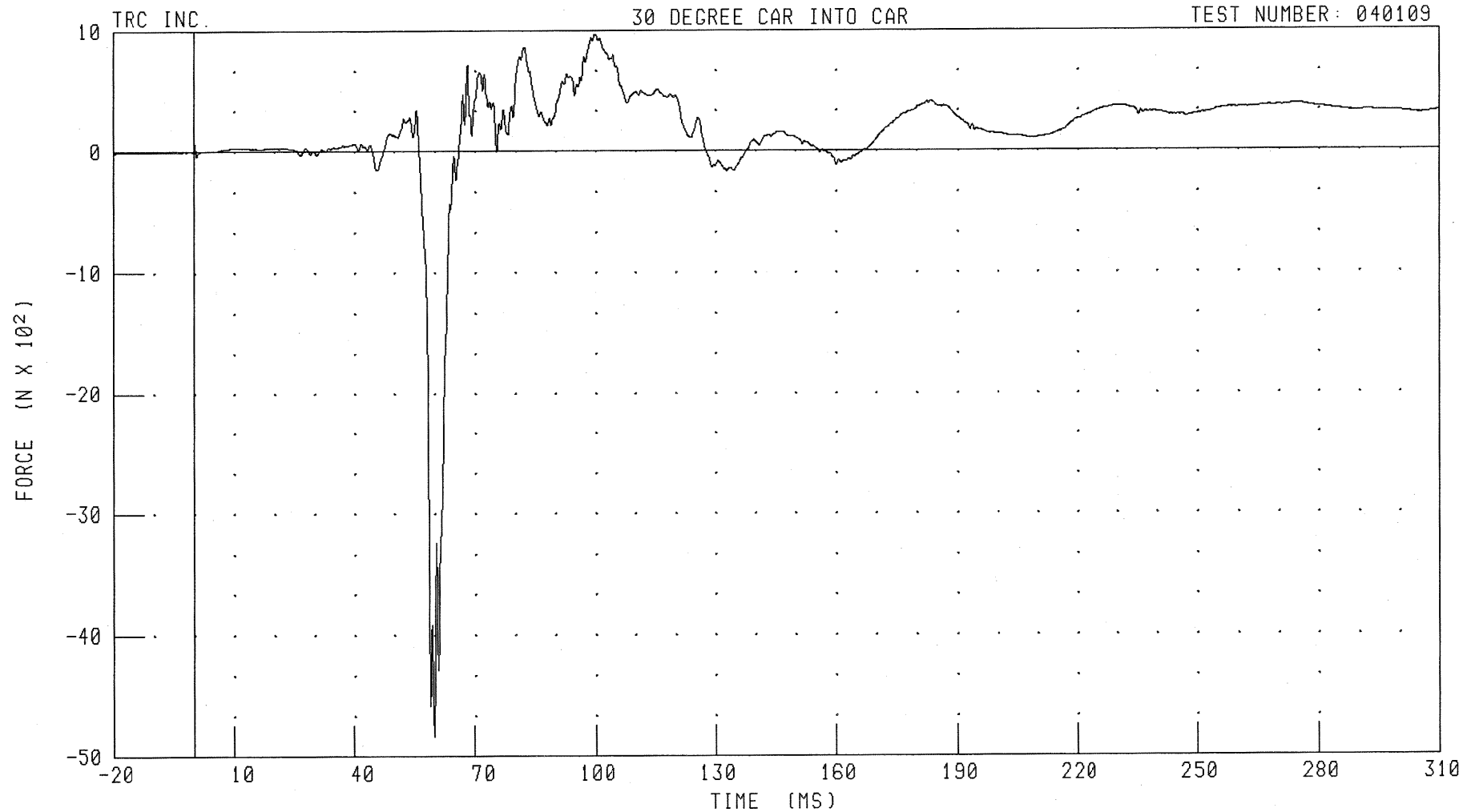
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT UPPER TIBIA Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: TBRZF1 FILTER: CH. CLASS 600

PEAK DATA: 971.94 N @ 99.92 MS; -4839.86 N @ 60.00 MS

B-55

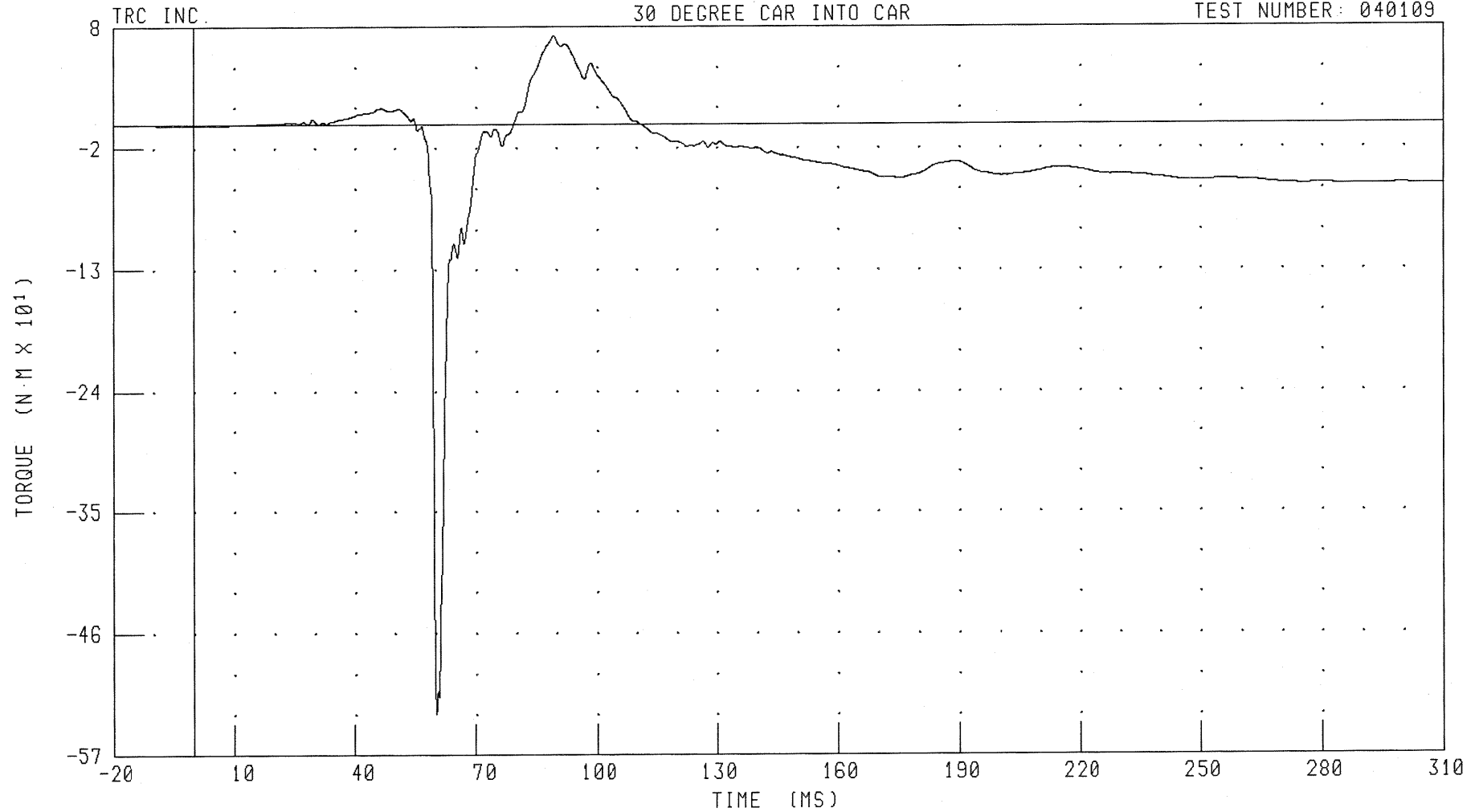
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: TBRXM1

FILTER: CH. CLASS 600

PEAK DATA: 80.23 N·M @ 89.28 MS; -534.96 N·M @ 60.32 MS

B-56

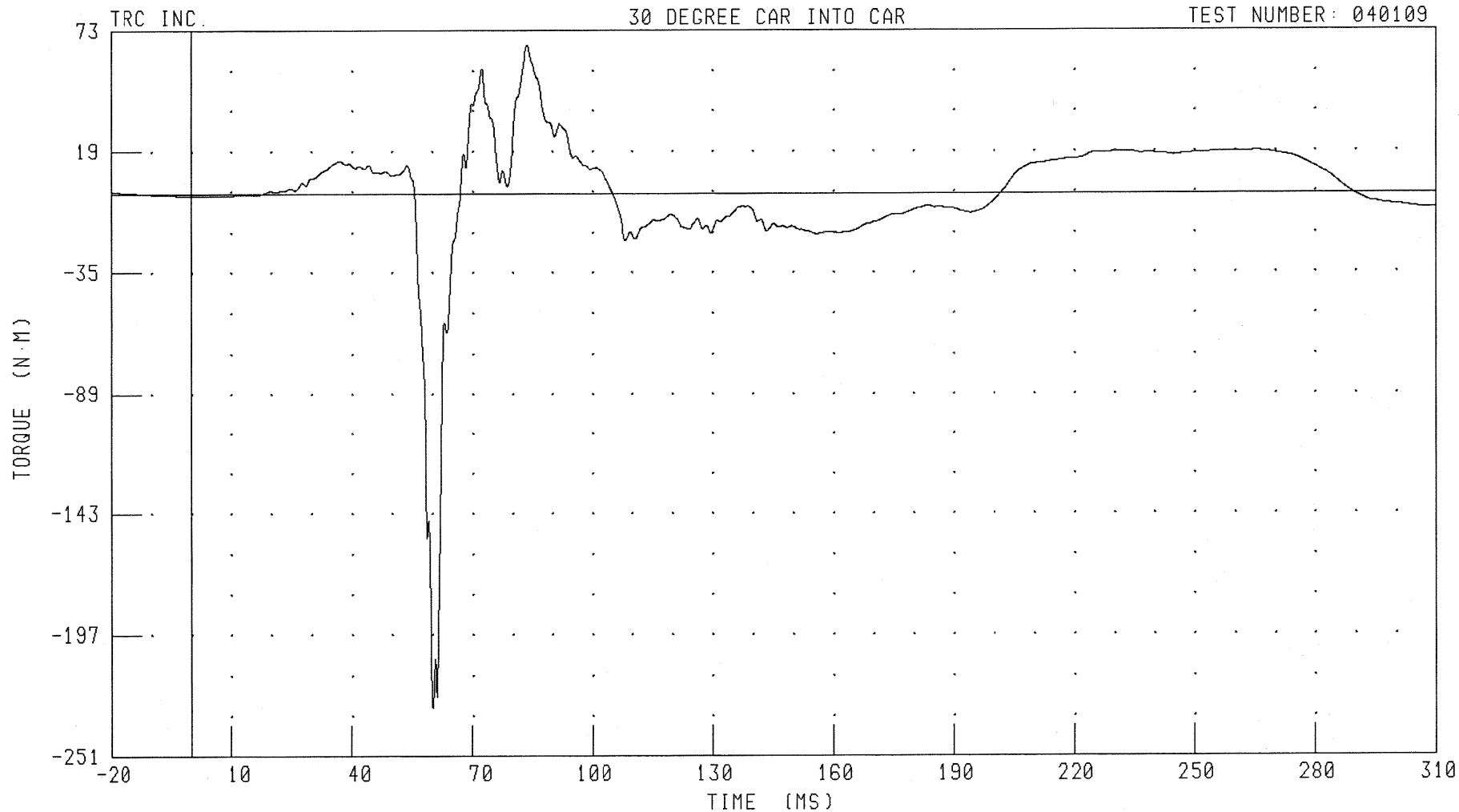
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: TBRYM1 FILTER: CH. CLASS 600

B-57

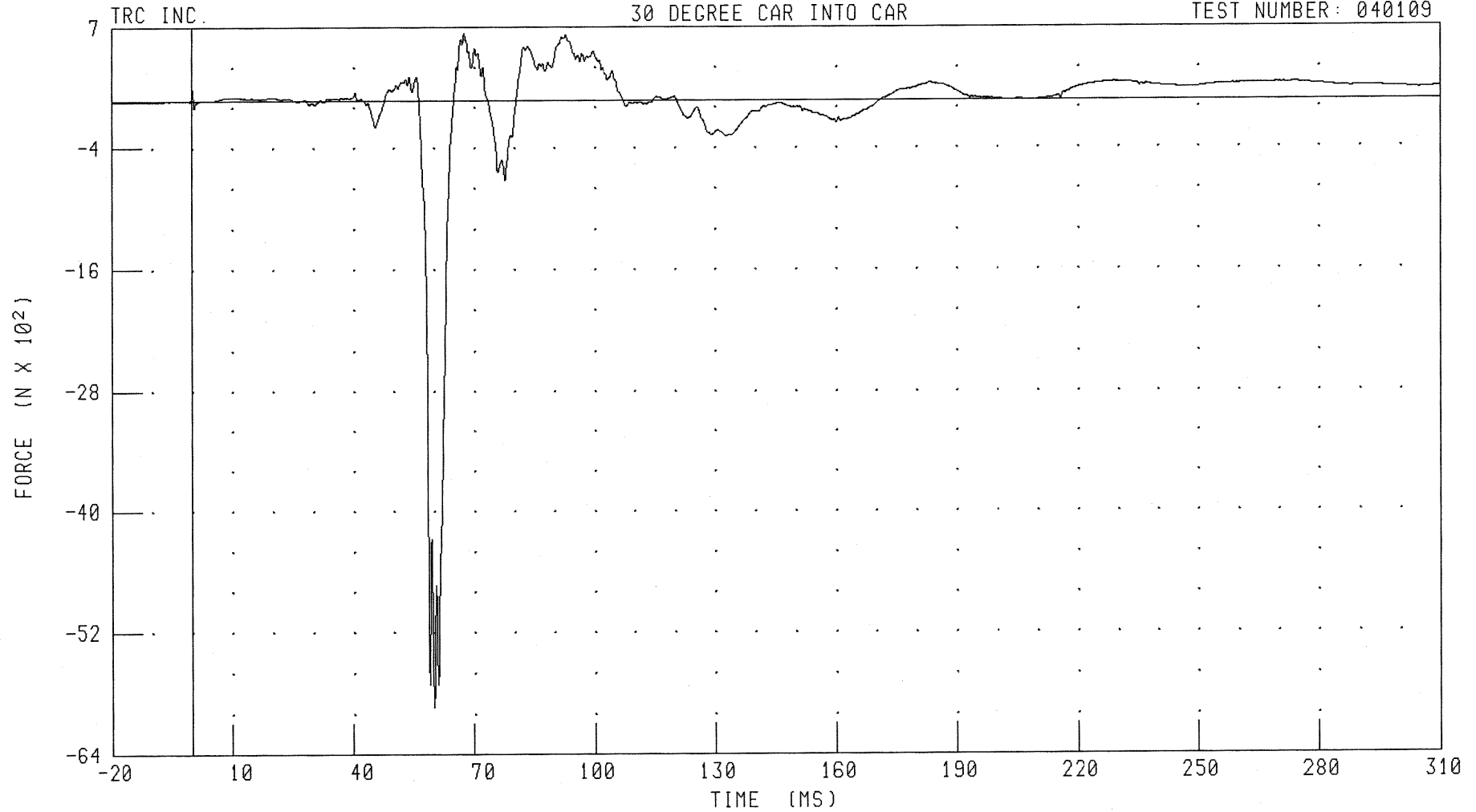
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ANRZF1 FILTER: CH. CLASS 600

B-58

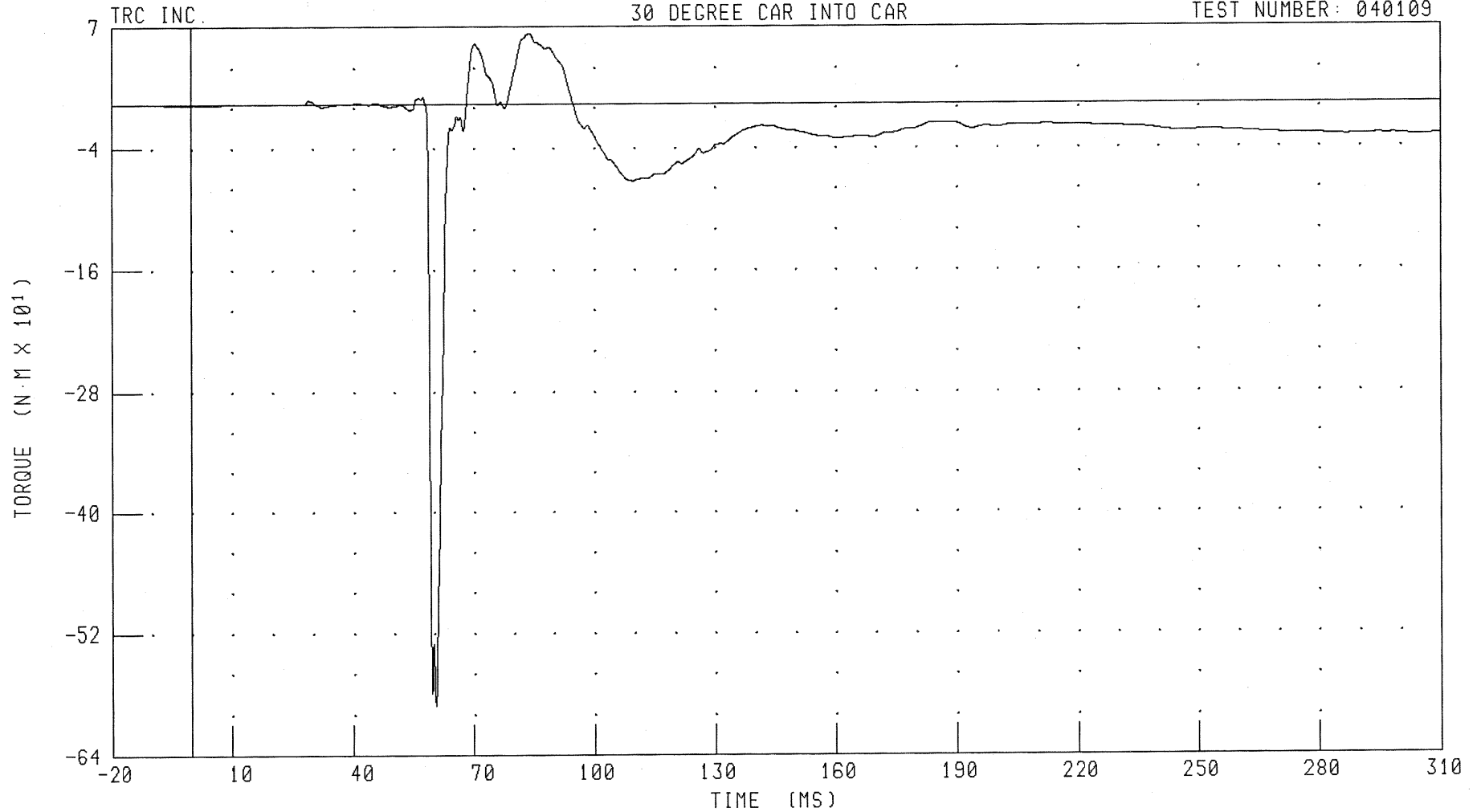
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER RIGHT LOWER TIBIA MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ANRXM1 FILTER: CH. CLASS 600

PEAK DATA: 69.25 N·M @ 83.84 MS; -59.52 N·M @ 60.48 MS

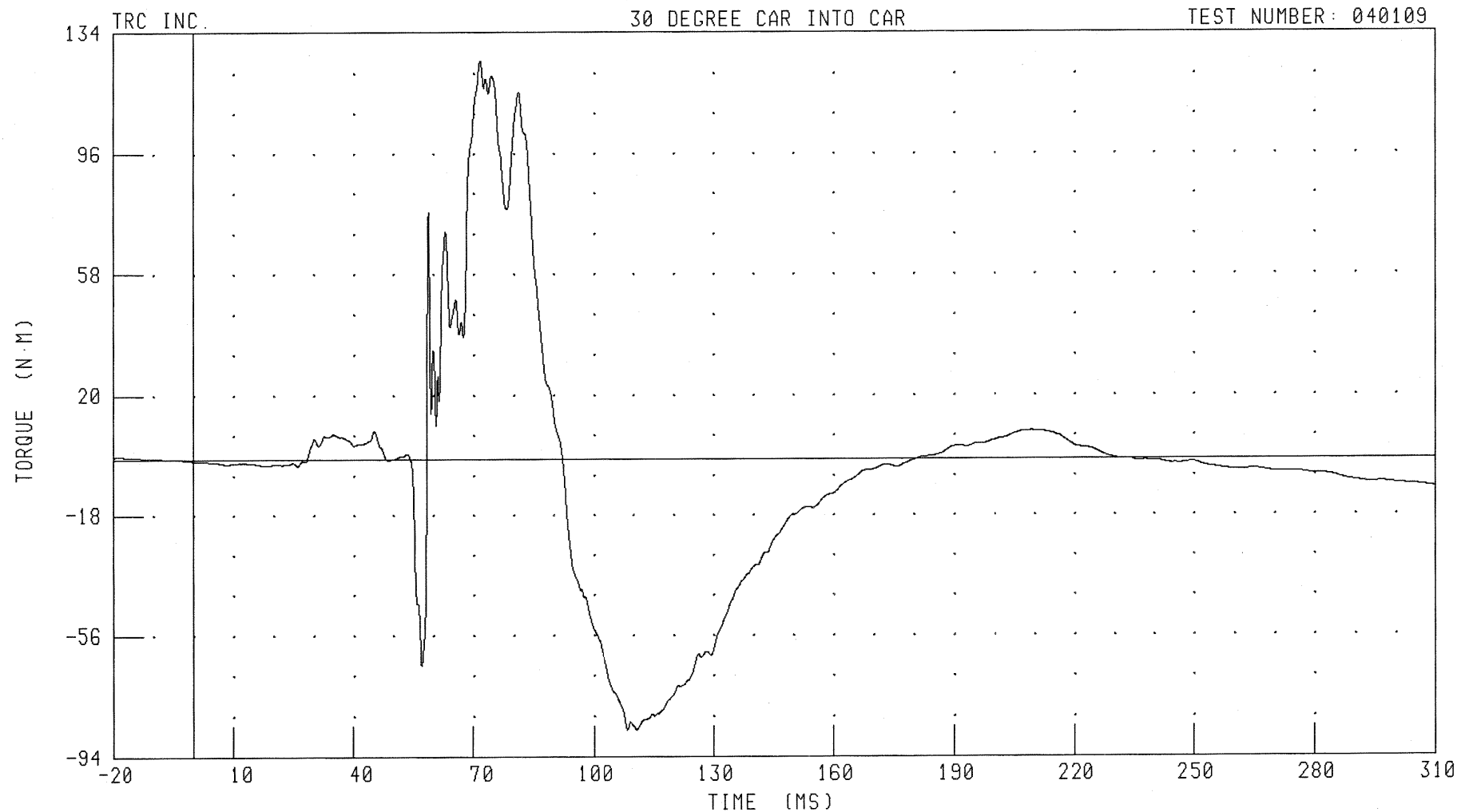
B-59

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
TARGET DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ANRYM1 FILTER: CH. CLASS 600

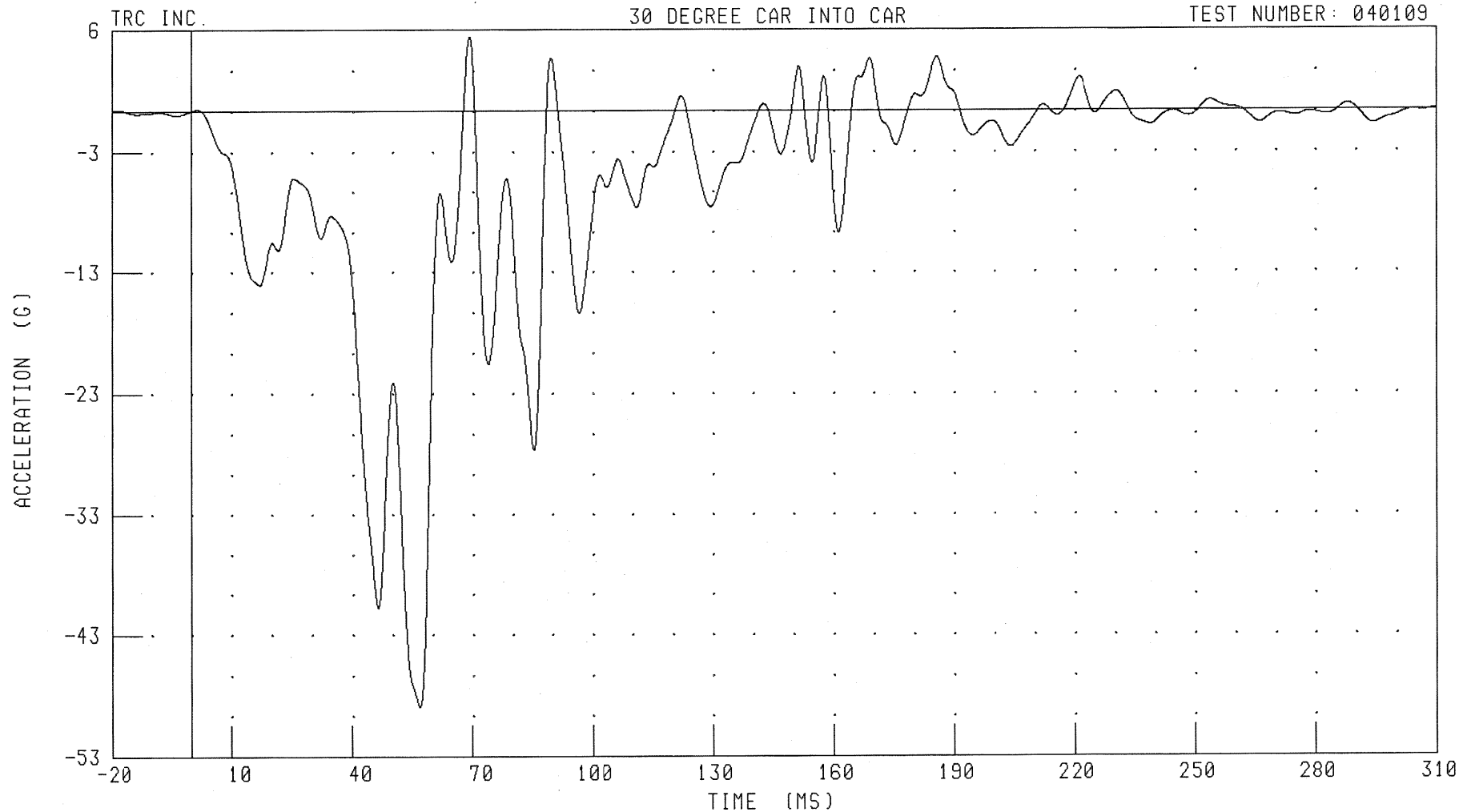
B-60

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
TARGET VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 6.03 G @ 69.28 MS; -49.37 G @ 56.88 MS

B-61

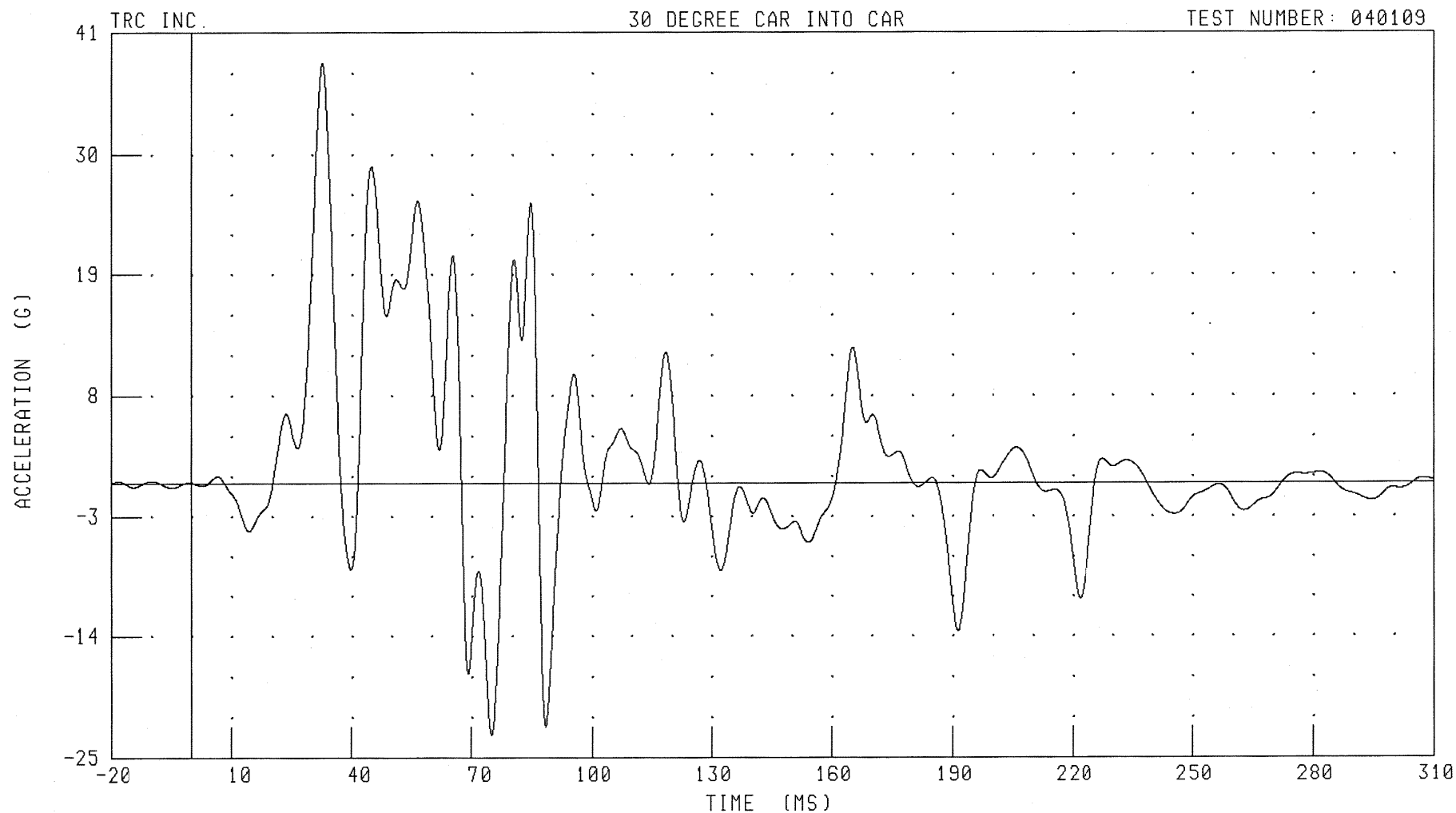
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: VCGYG1

FILTER: CH. CLASS 60

PEAK DATA: 38.24 G @ 32.72 MS; -22.92 G @ 74.96 MS

B-62

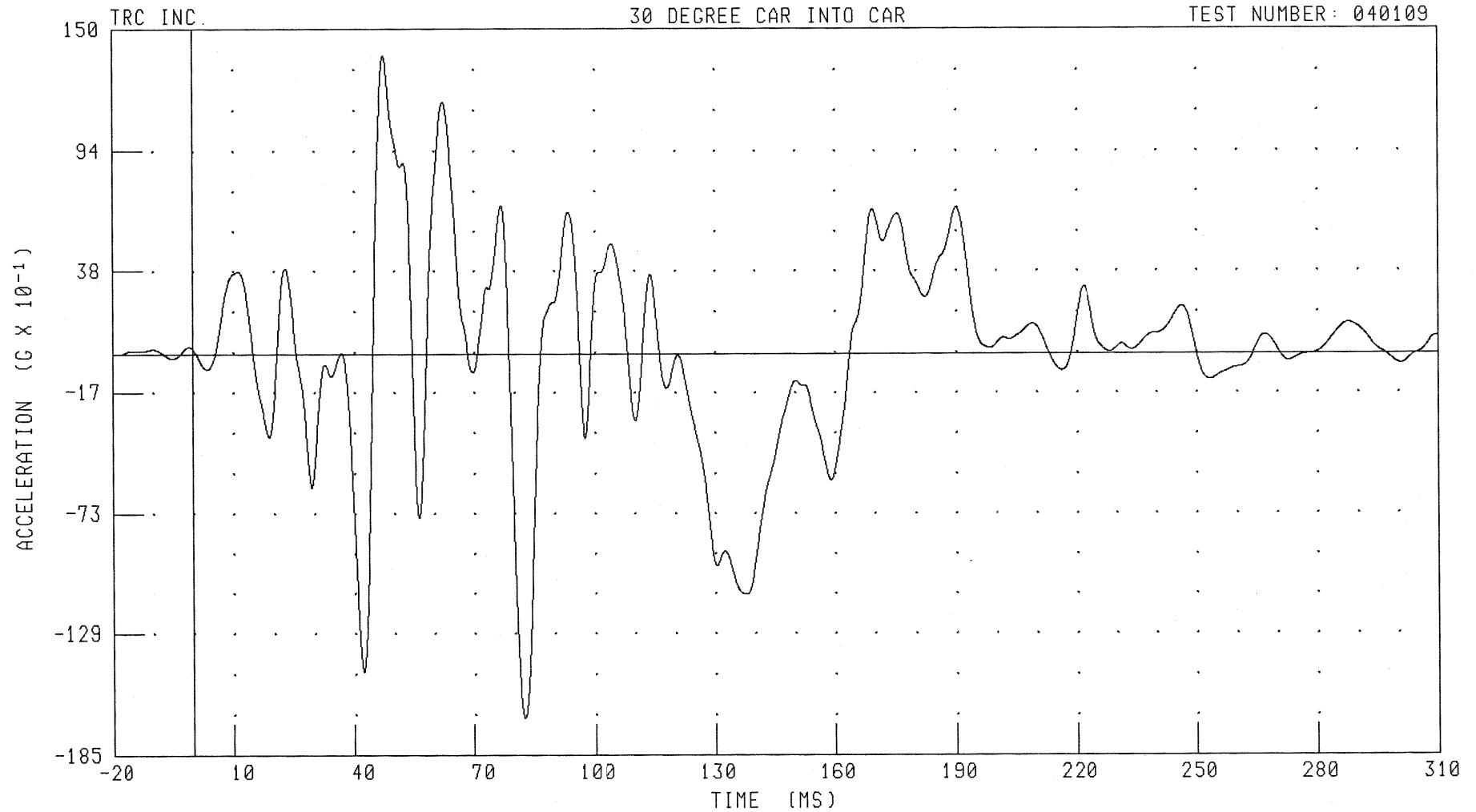
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: VCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 13.77 G @ 47.52 MS; -16.90 G @ 82.56 MS

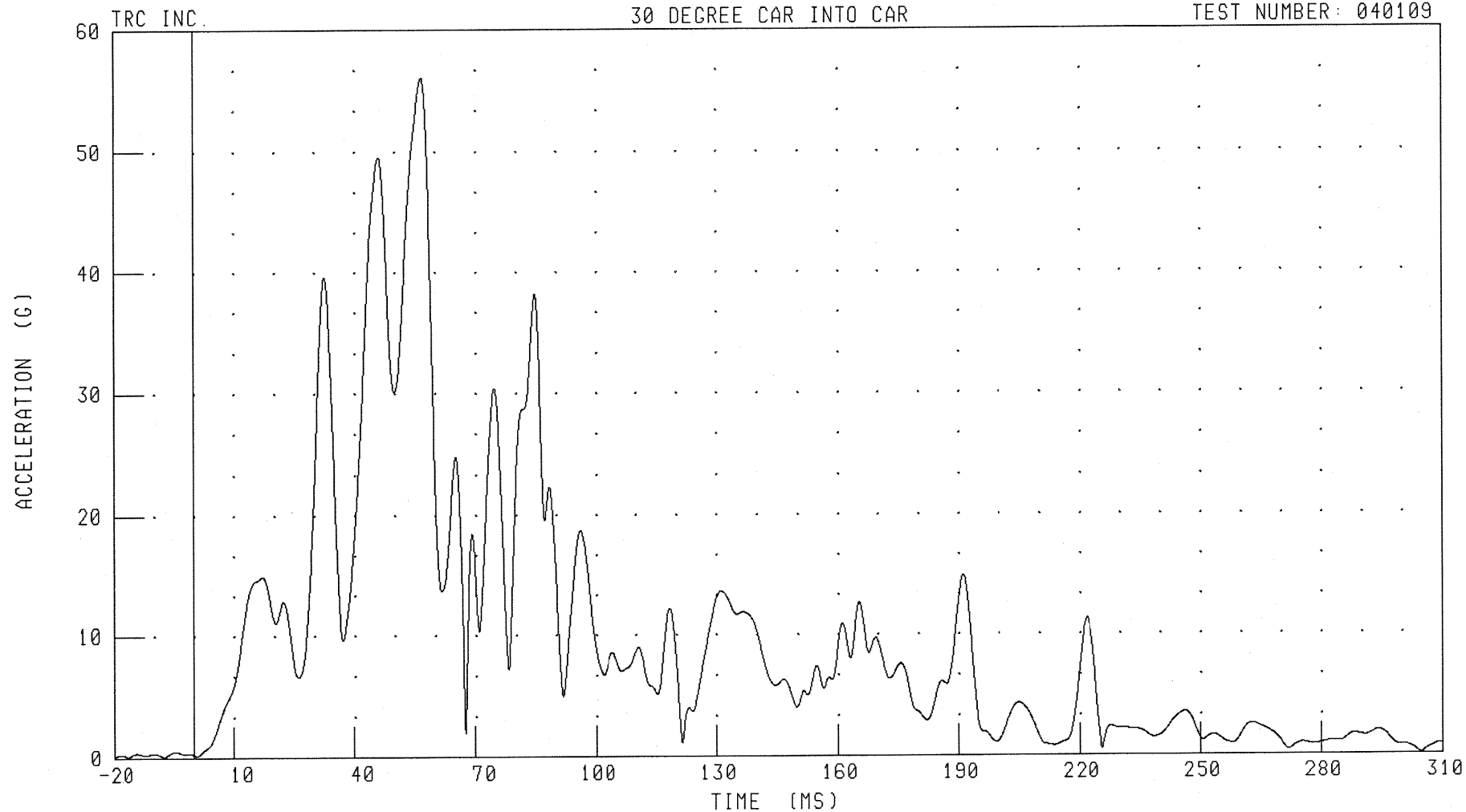
B-63

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
TARGET VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: VCGRG1

FILTER: CH. CLASS 60

PEAK DATA: 56.07 G @ 56.64 MS; 0.02 G @ 304.64 MS

B-64

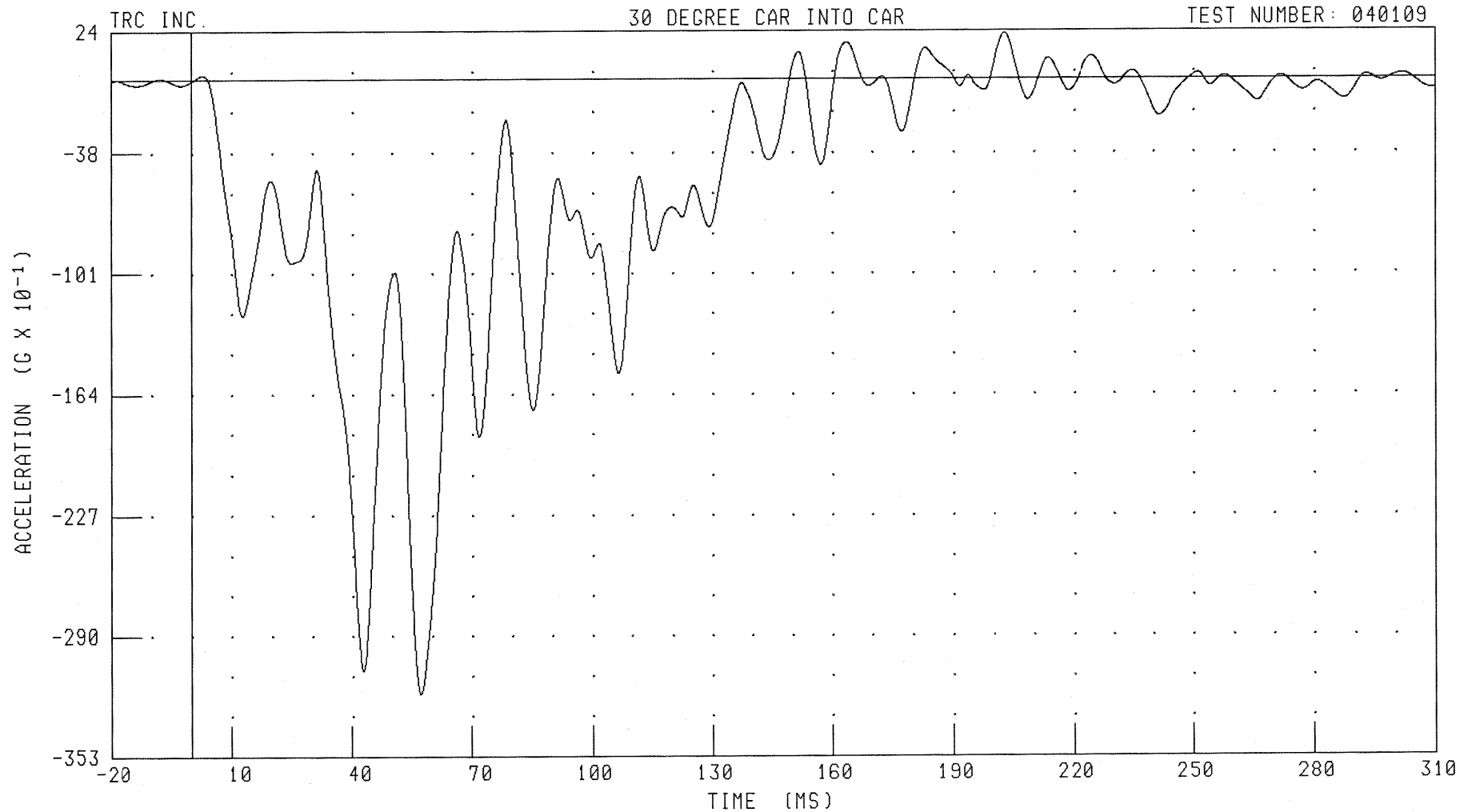
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET REAR DECK X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.36 G @ 202.72 MS; -32.08 G @ 57.12 MS

B-65

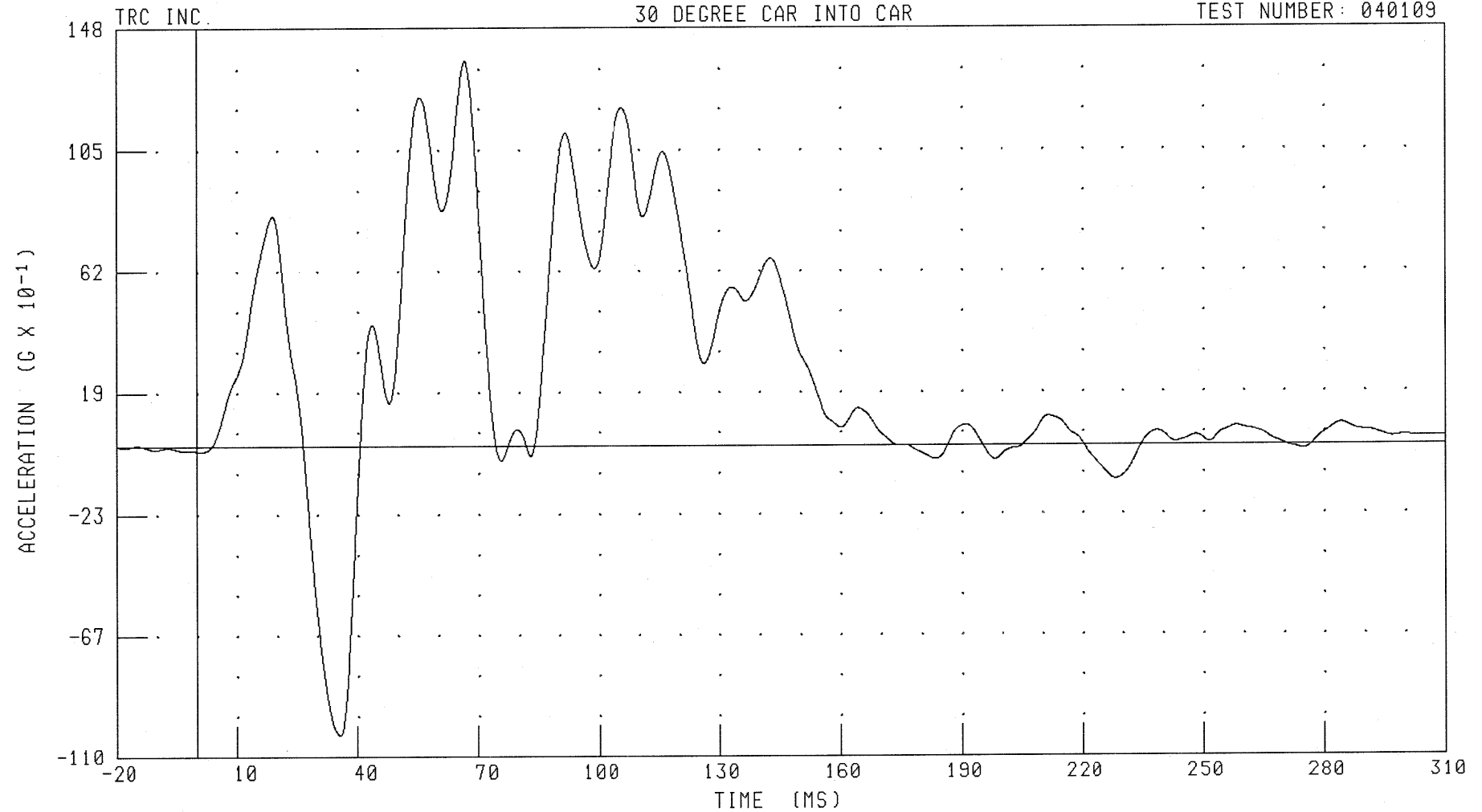
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET REAR DECK Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKYG1

FILTER: CH. CLASS 60

PEAK DATA: 13.64 G @ 66.72 MS; -10.25 G @ 35.60 MS

B-66

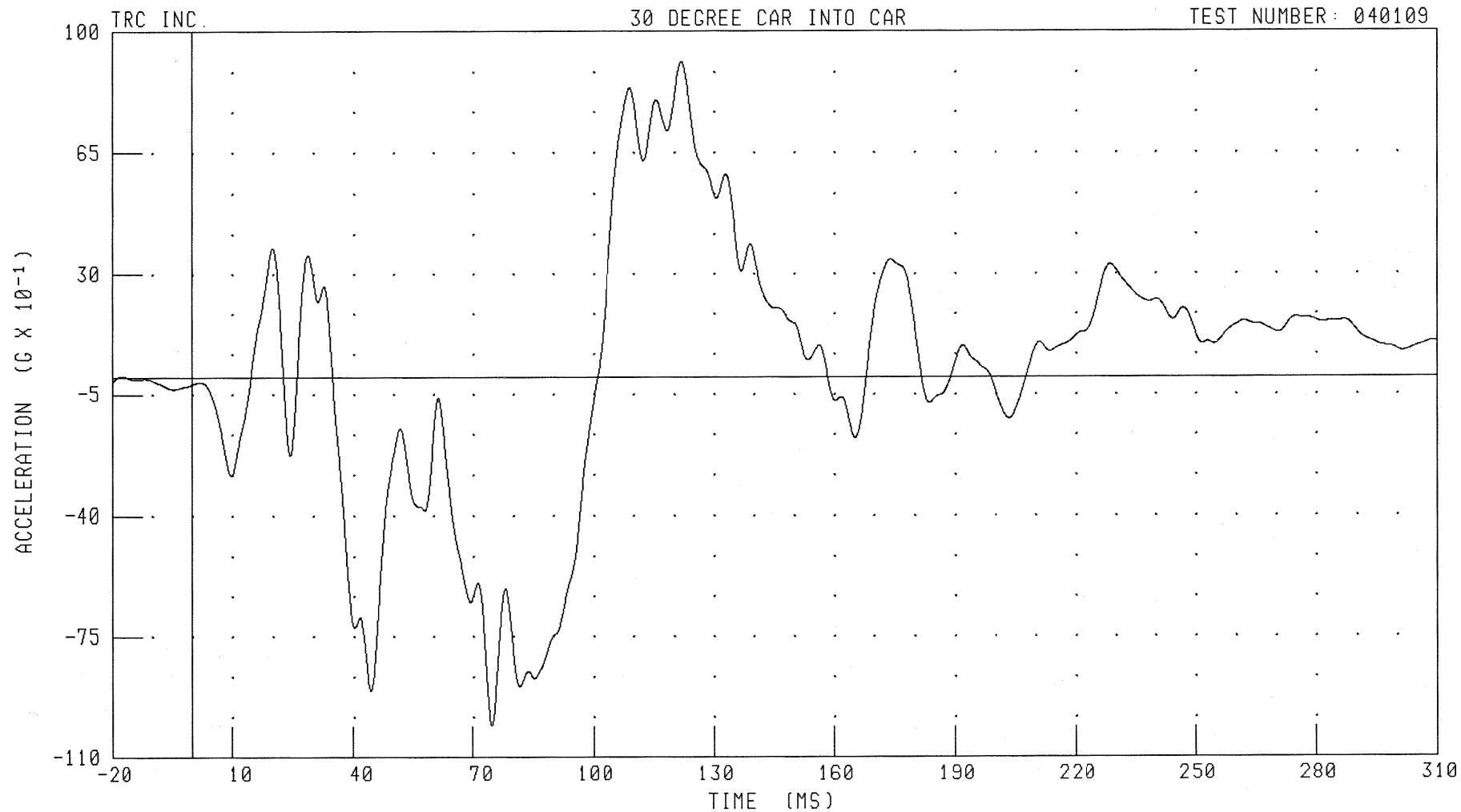
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET REAR DECK Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKZG1

FILTER: CH. CLASS 60

PEAK DATA: 9.11 G @ 121.92 MS; -10.09 G @ 74.72 MS

B-67

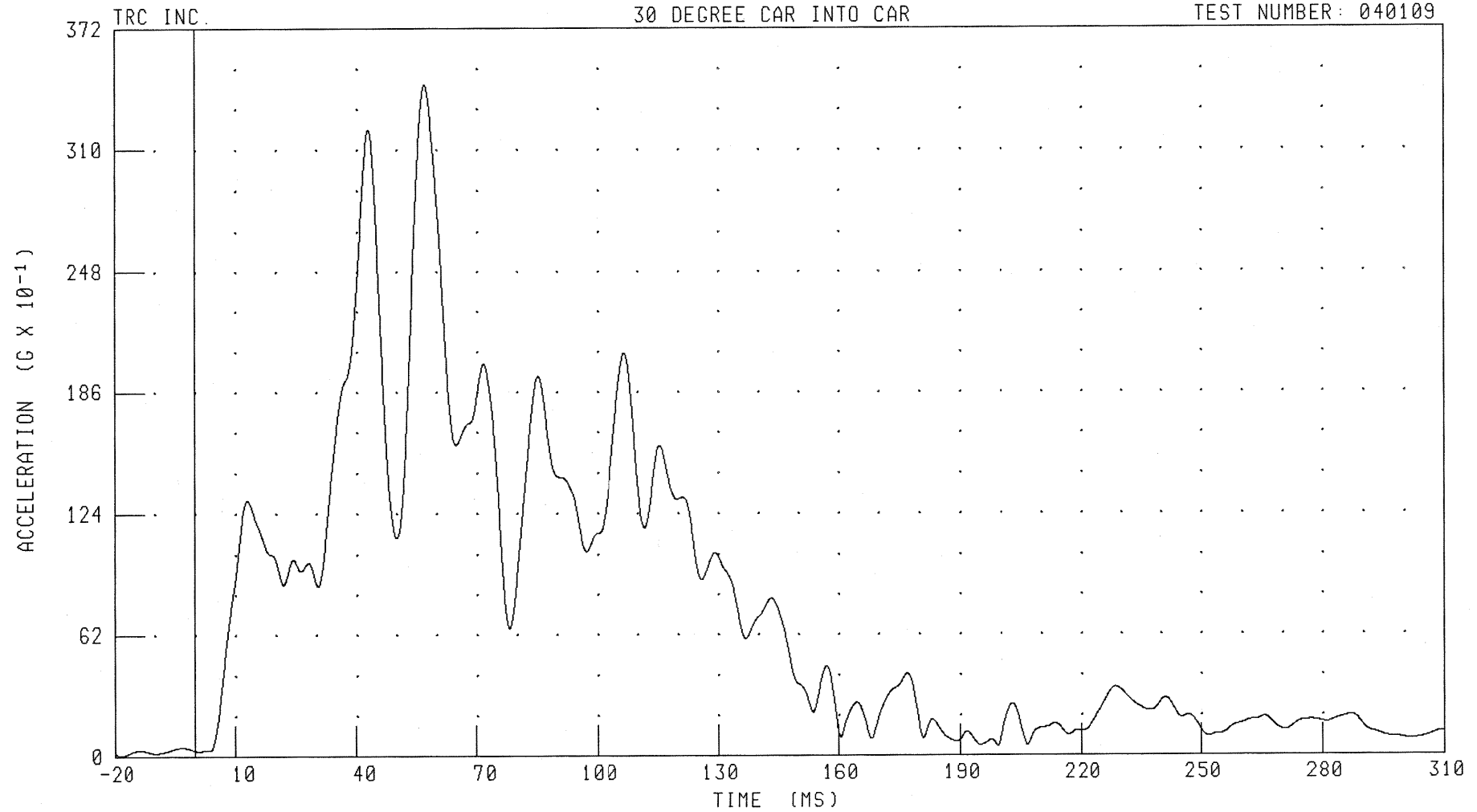
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET REAR DECK RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKRG1 FILTER: CH. CLASS 60

PEAK DATA: 34.33 G @ 57.04 MS; 0.05 G @ -18.80 MS

B-68

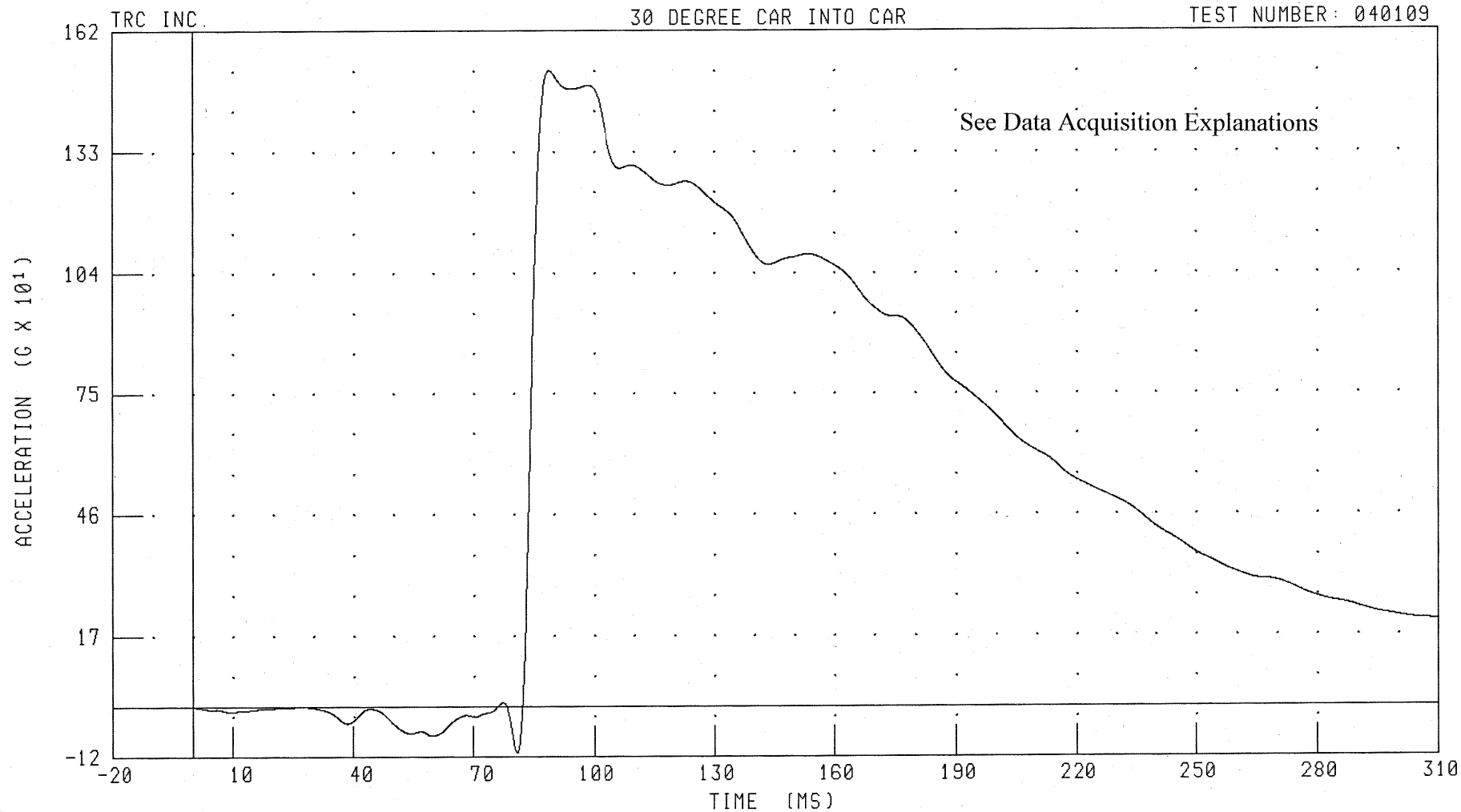
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET LEFT FRONT SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 1524.16 G @ 88.88 MS; -110.54 G @ 80.80 MS

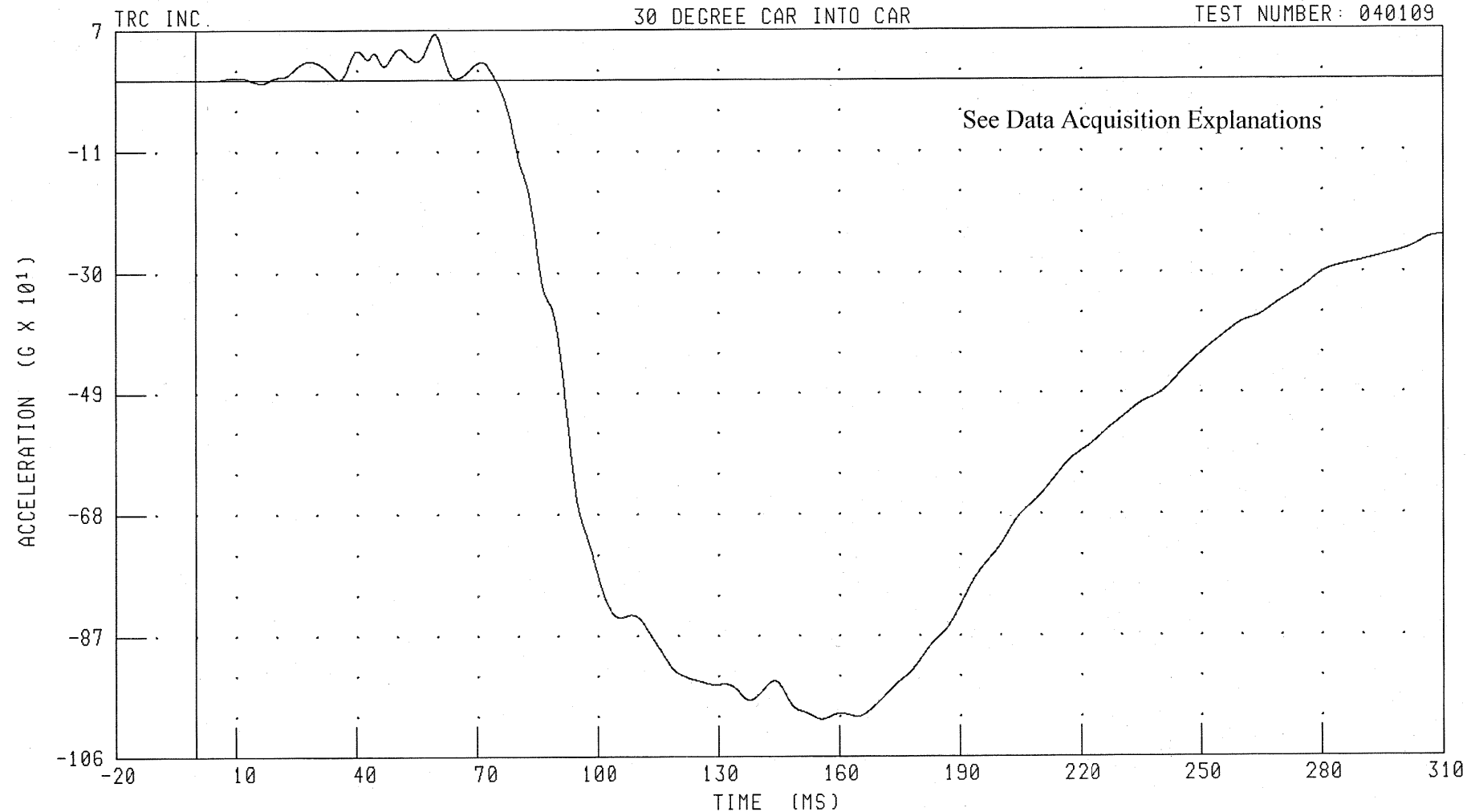
B-69

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
TARGET LEFT FRONT SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFSYG1 FILTER: CH. CLASS 60

PEAK DATA: 71.51 G @ 59.44 MS; -1003.61 G @ 155.52 MS

B-70

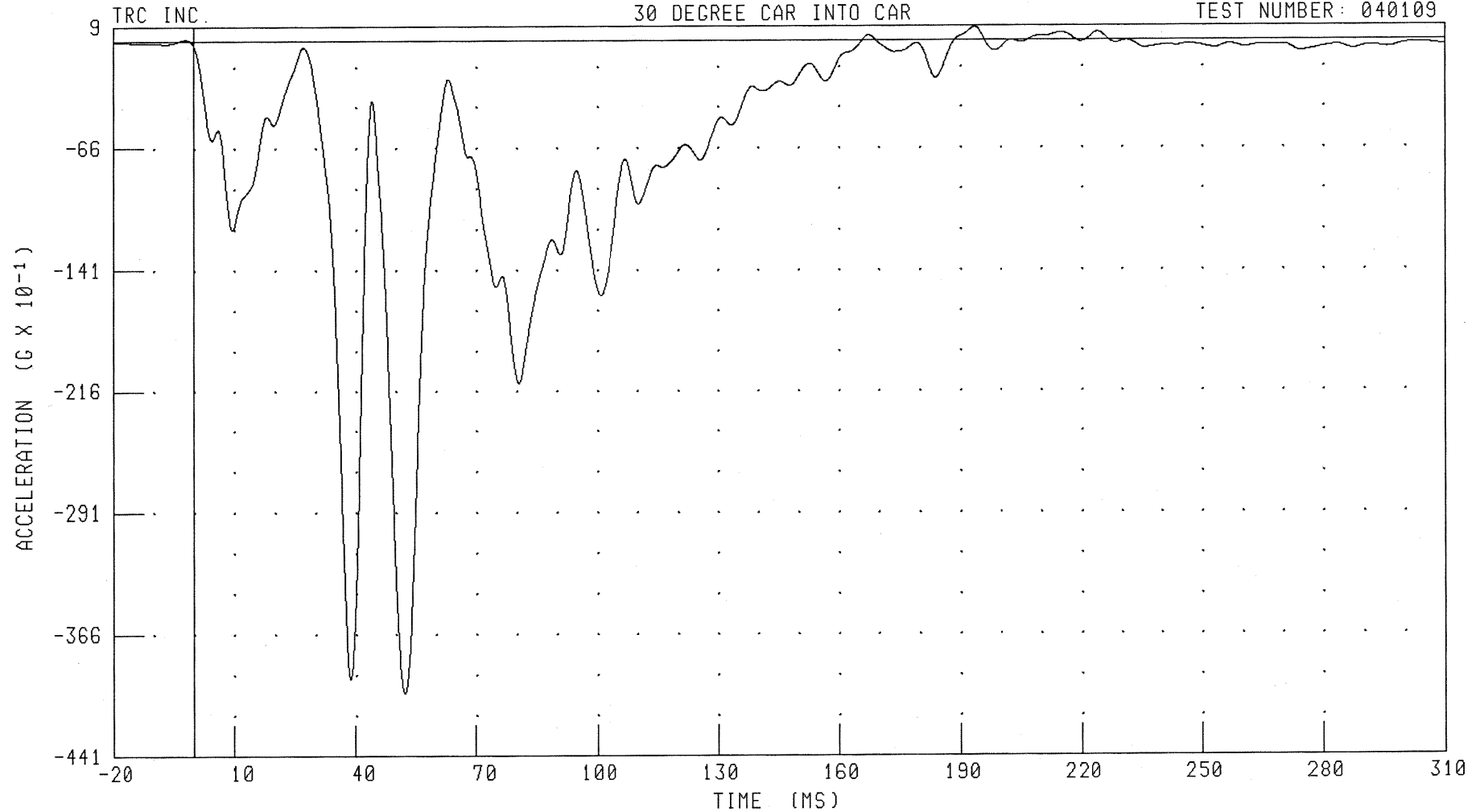
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET LEFT REAR SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRSXG1

FILTER: CH. CLASS 60

PEAK DATA: 0.83 G @ 193.52 MS; -40.26 G @ 52.24 MS

B-71

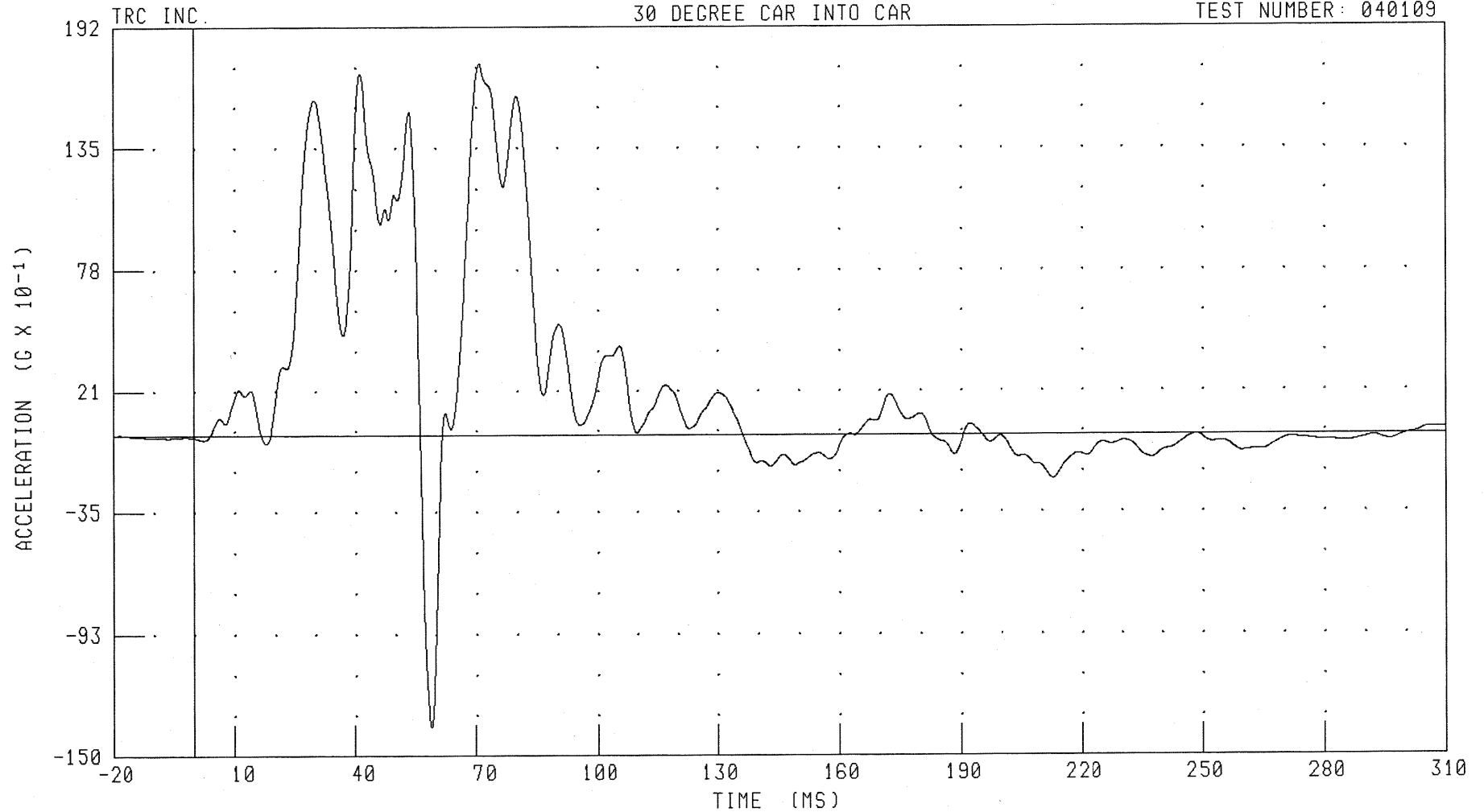
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET LEFT REAR SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 17.49 G @ 70.96 MS; -13.67 G @ 58.96 MS

B-72

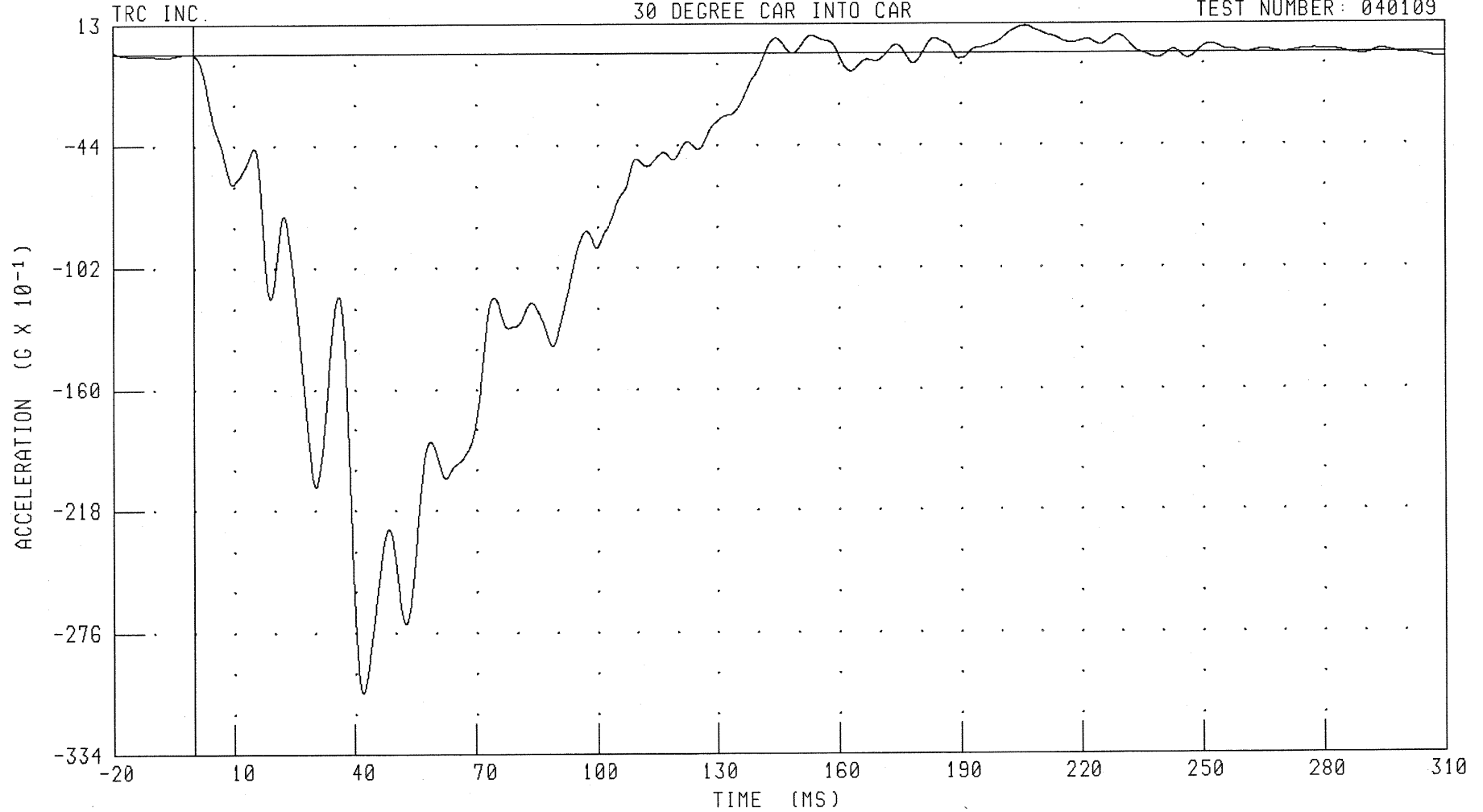
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET RIGHT FRONT SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFSXG1 FILTER: CH. CLASS 60

B-73

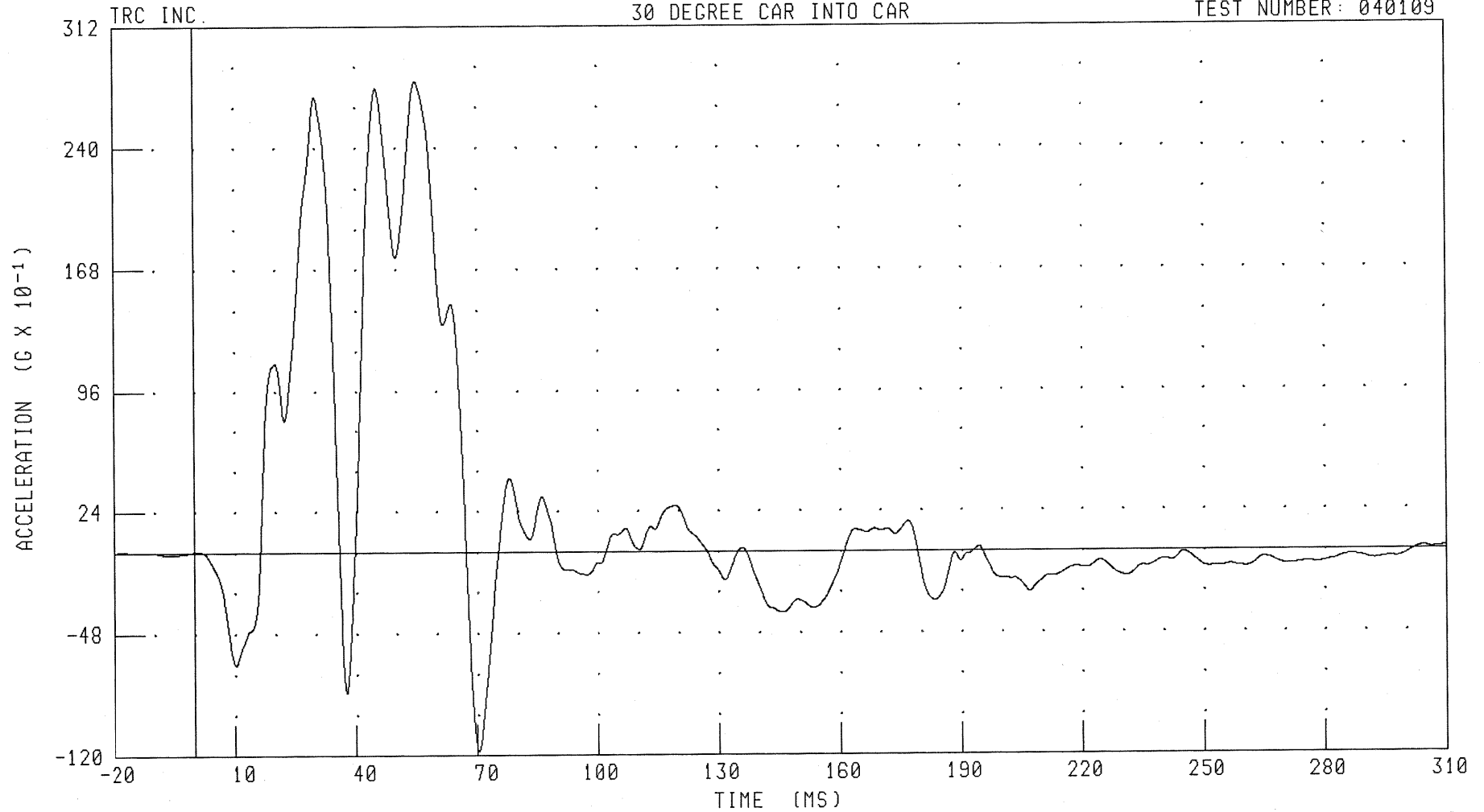
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET RIGHT FRONT SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFSYG1 FILTER: CH. CLASS 60

B-74

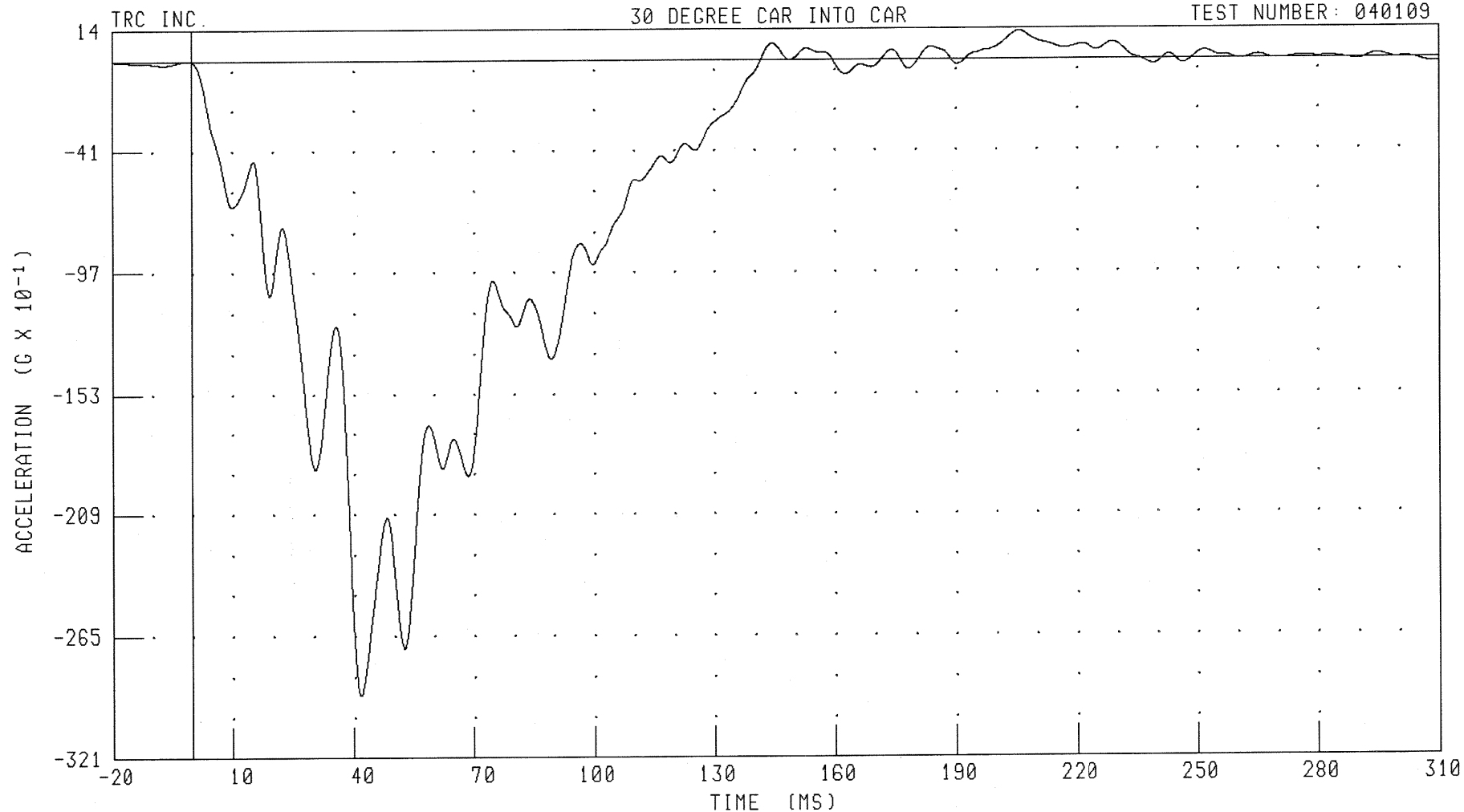
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET RIGHT REAR SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.29 G @ 205.84 MS; -29.33 G @ 41.68 MS

B-75

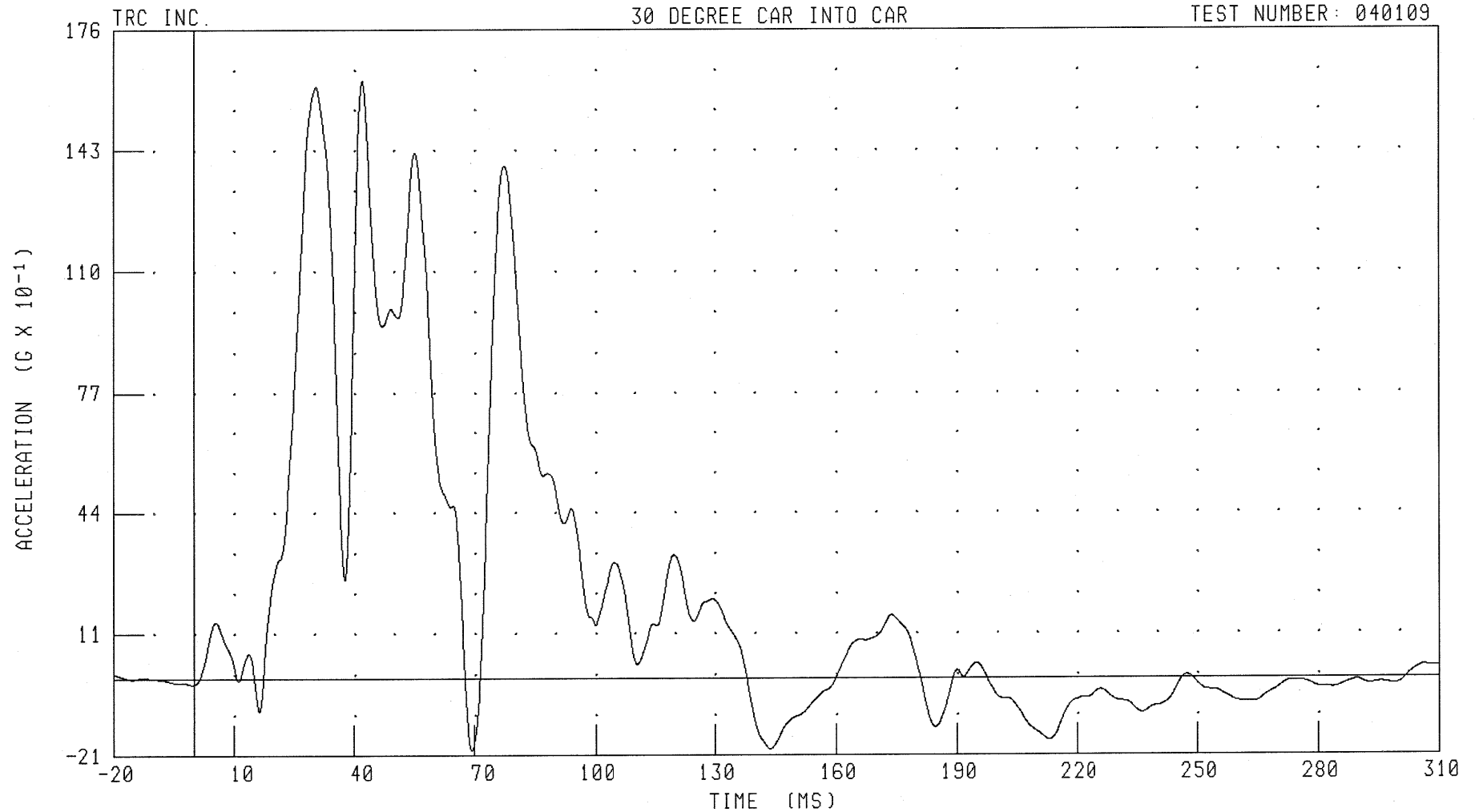
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET RIGHT REAR SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRSYG1

FILTER: CH. CLASS 60

PEAK DATA: 16.30 G @ 42.08 MS; -1.97 G @ 69.28 MS

B-76

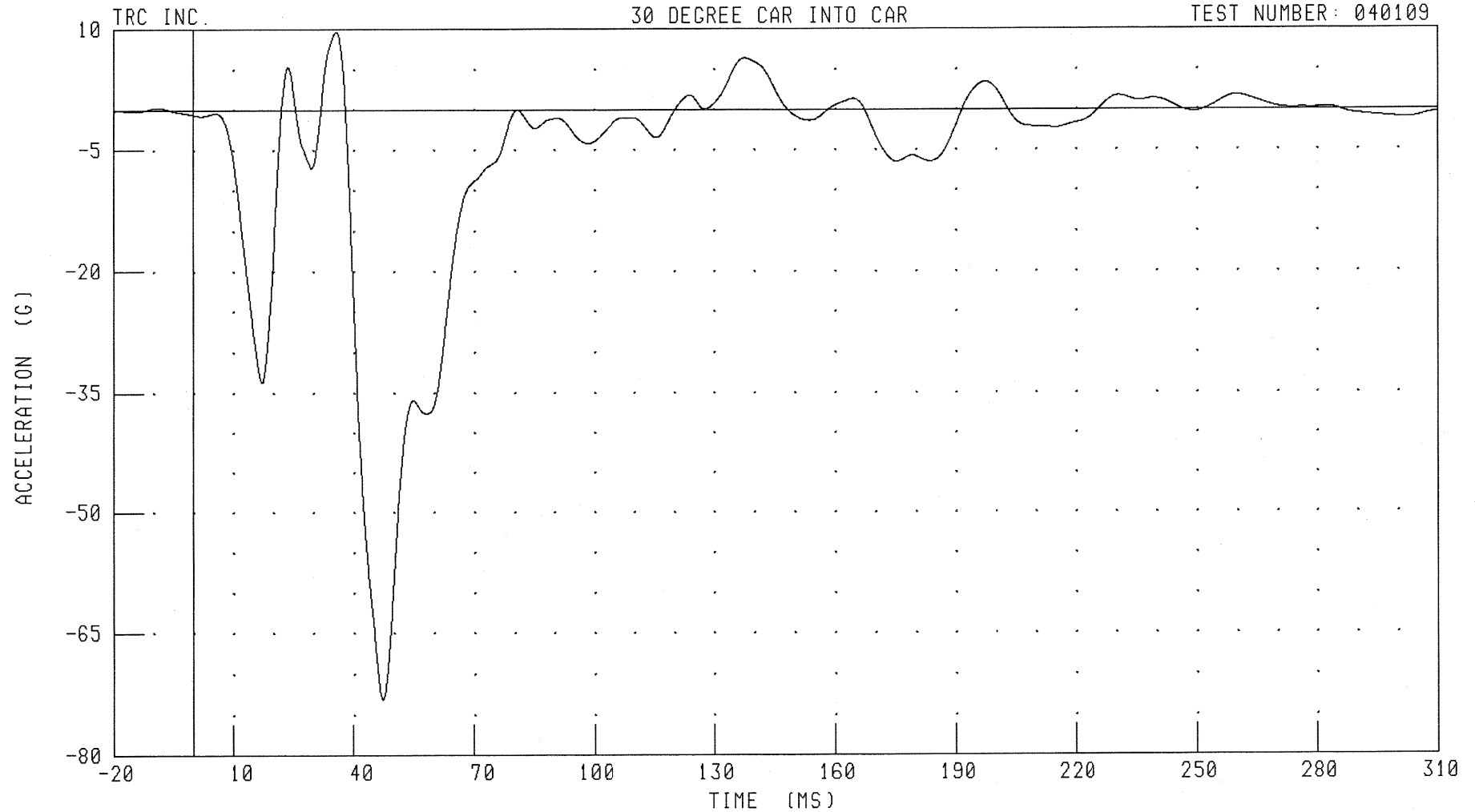
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET ENGINE TOP X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGXC1 FILTER: CH. CLASS 60

PEAK DATA: 9.66 G @ 35.76 MS; -73.10 G @ 47.28 MS

B-77

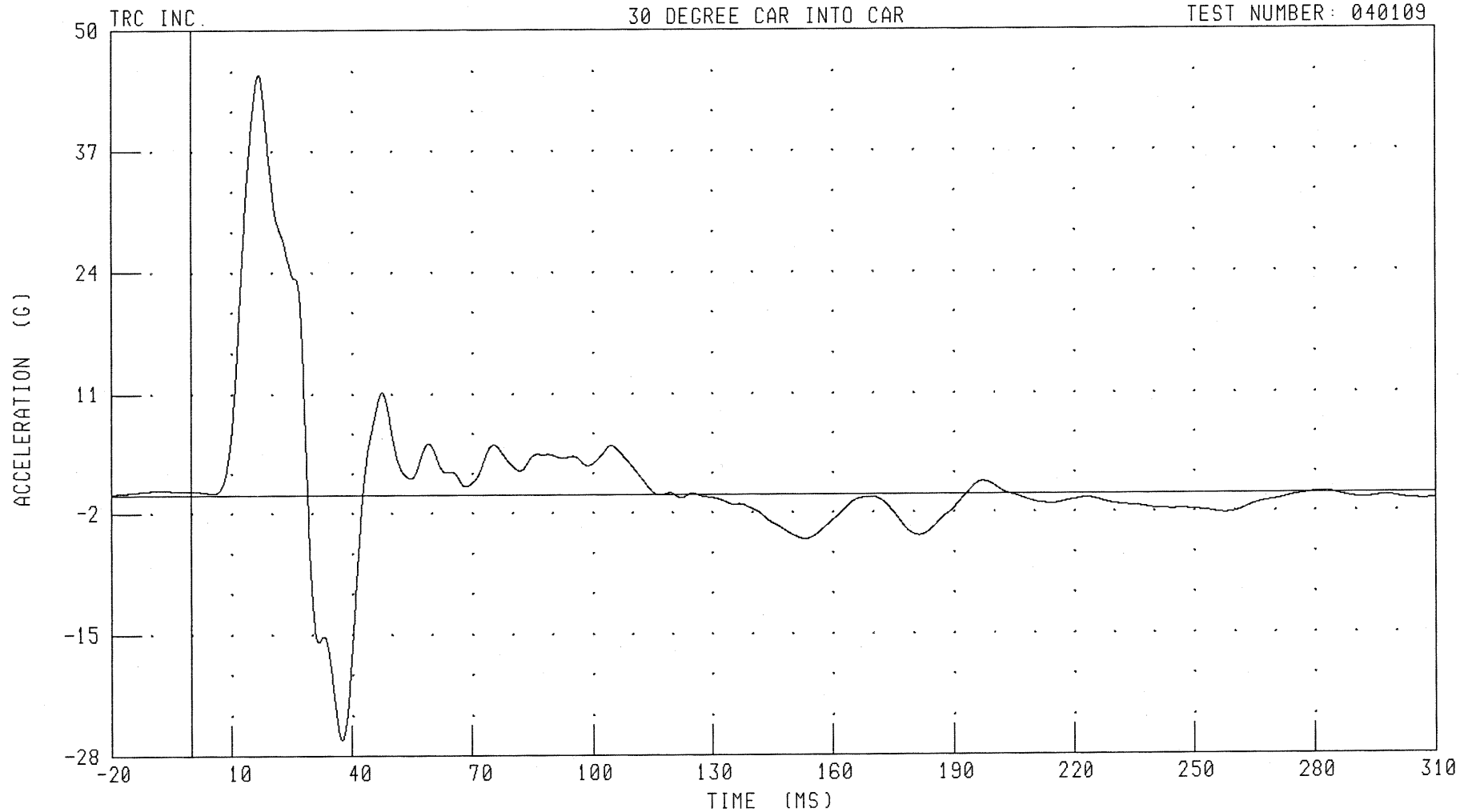
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET ENGINE TOP Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGYG1 FILTER: CH. CLASS 60

PEAK DATA: 45.29 G @ 16.88 MS; -26.28 G @ 37.52 MS

B-78

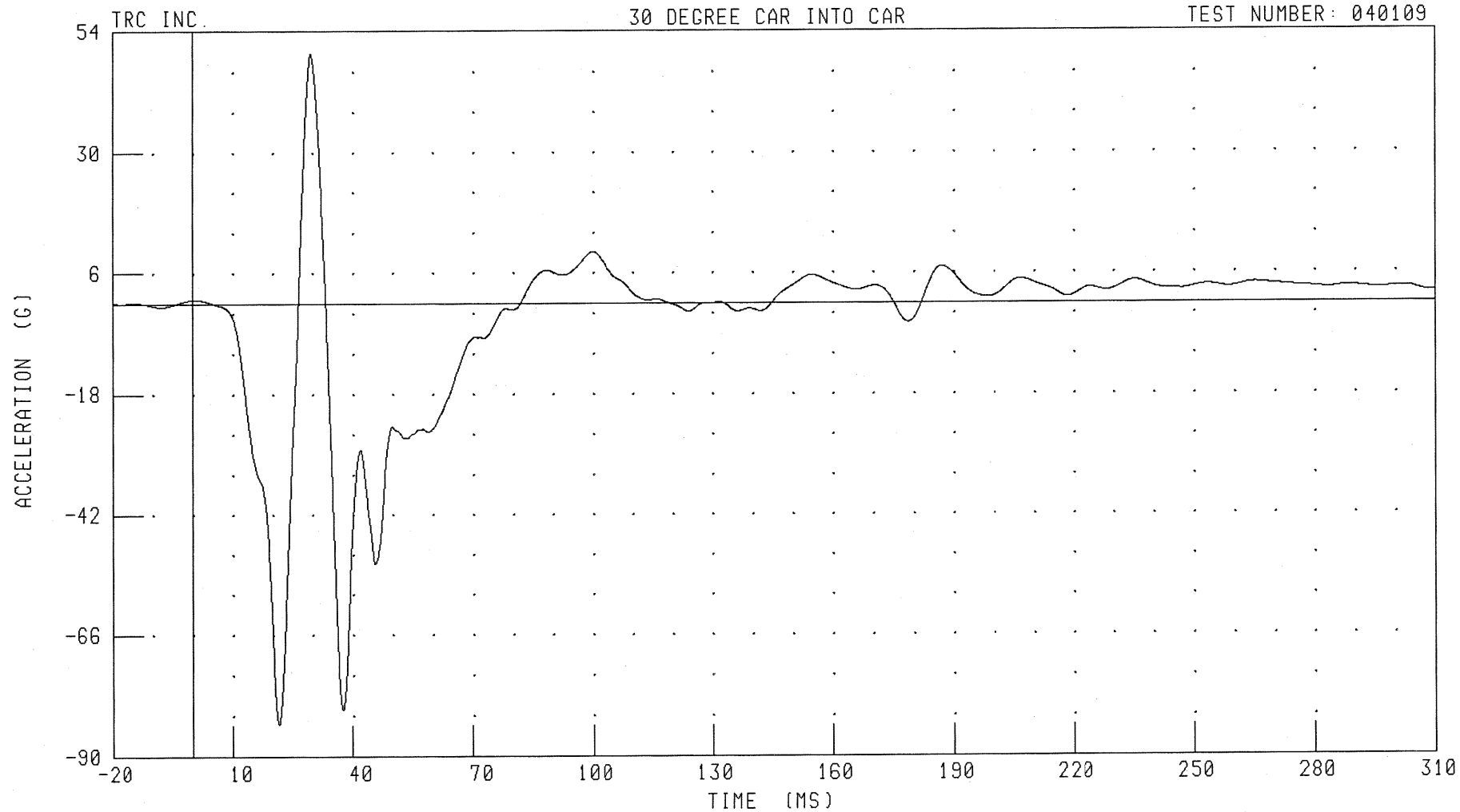
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET ENGINE BOTTOM X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGXC2 FILTER: CH. CLASS 60

PEAK DATA: 49.50 G @ 29.60 MS; -83.77 G @ 21.60 MS

B-79

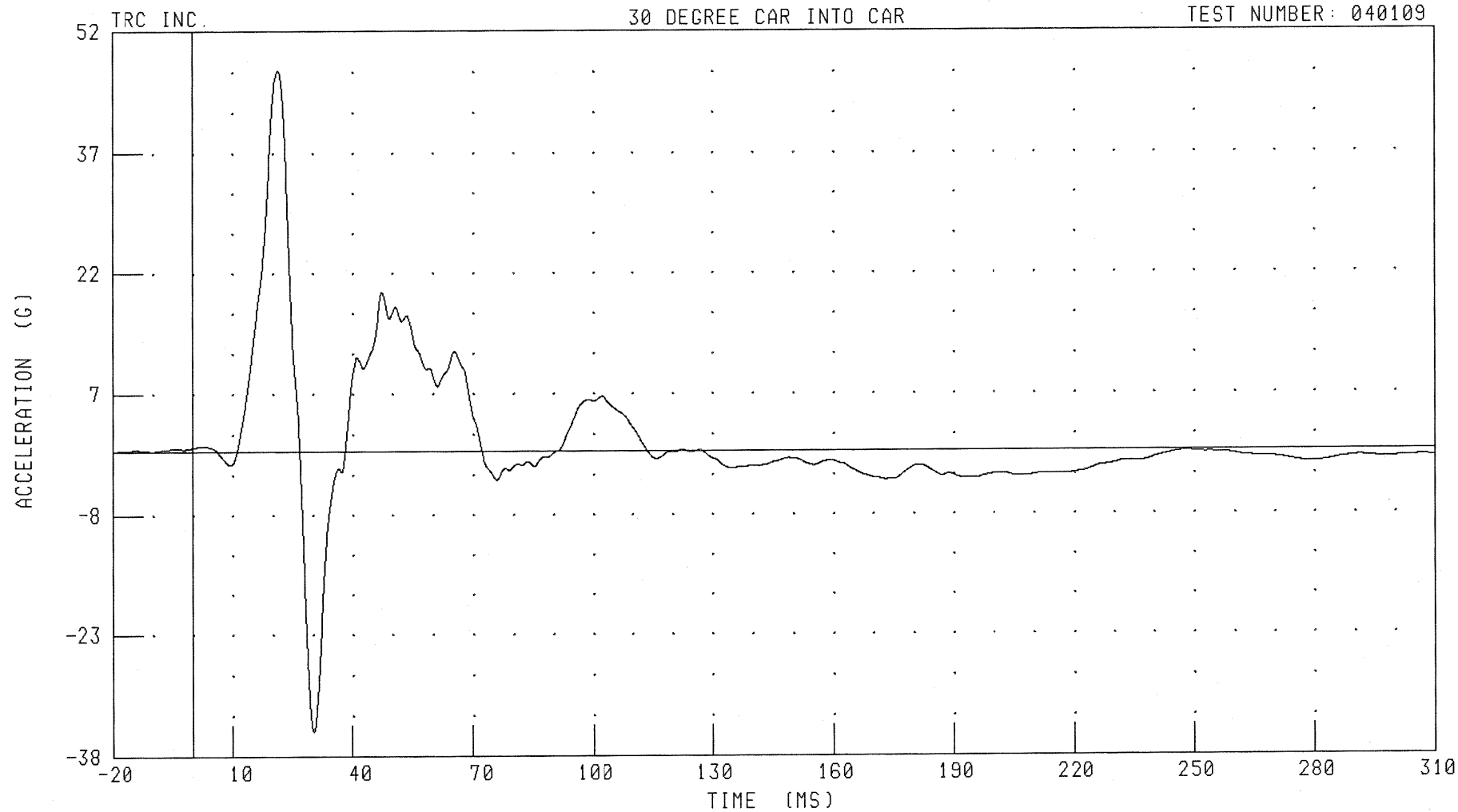
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET ENGINE BOTTOM Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGYG2 FILTER: CH. CLASS 60

PEAK DATA: 47.17 G @ 21.36 MS; -34.96 G @ 30.24 MS

B-80

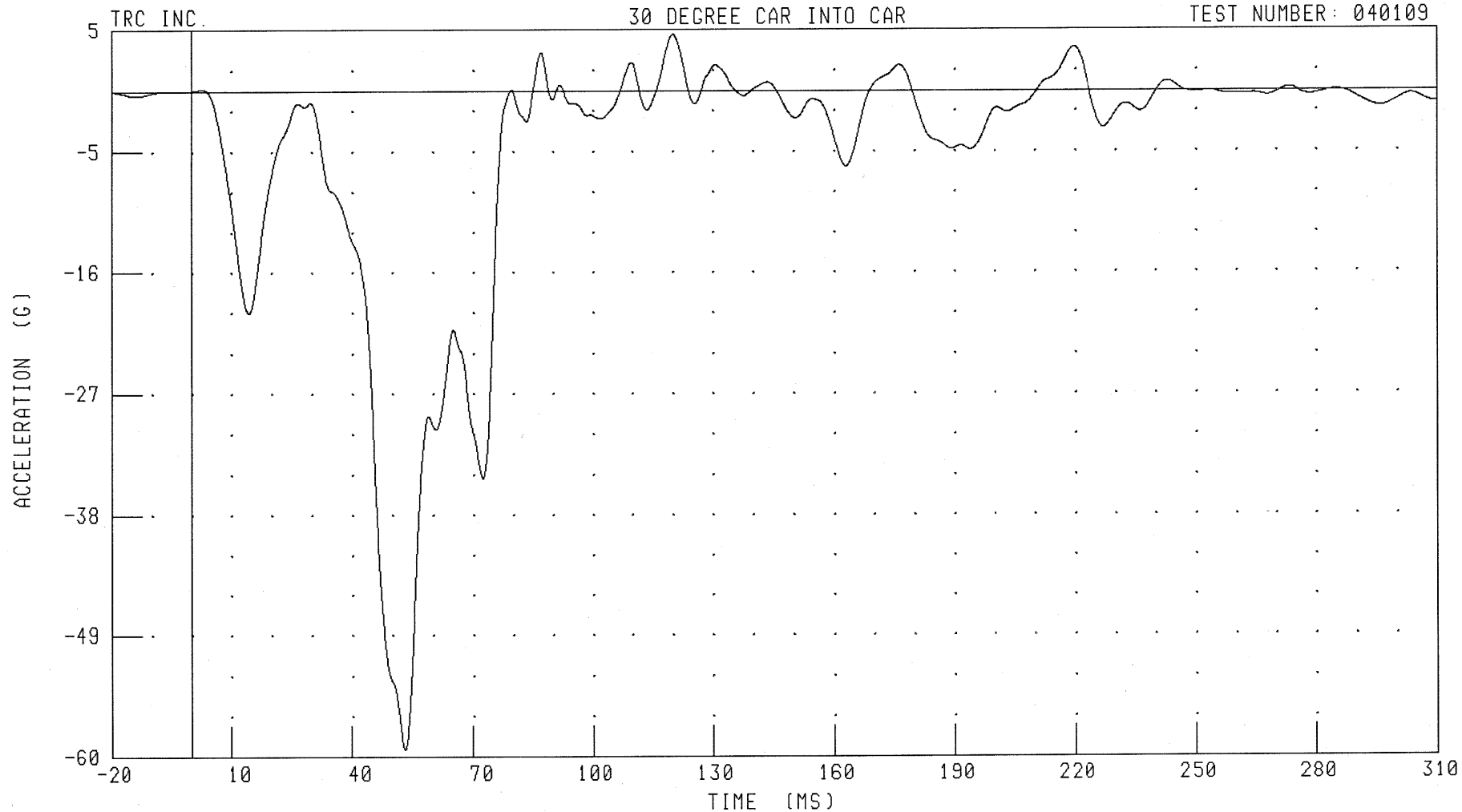
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: DPCXG1 FILTER: CH. CLASS 60

PEAK DATA: 5.12 G @ 120.24 MS; -59.75 G @ 53.12 MS

B-81

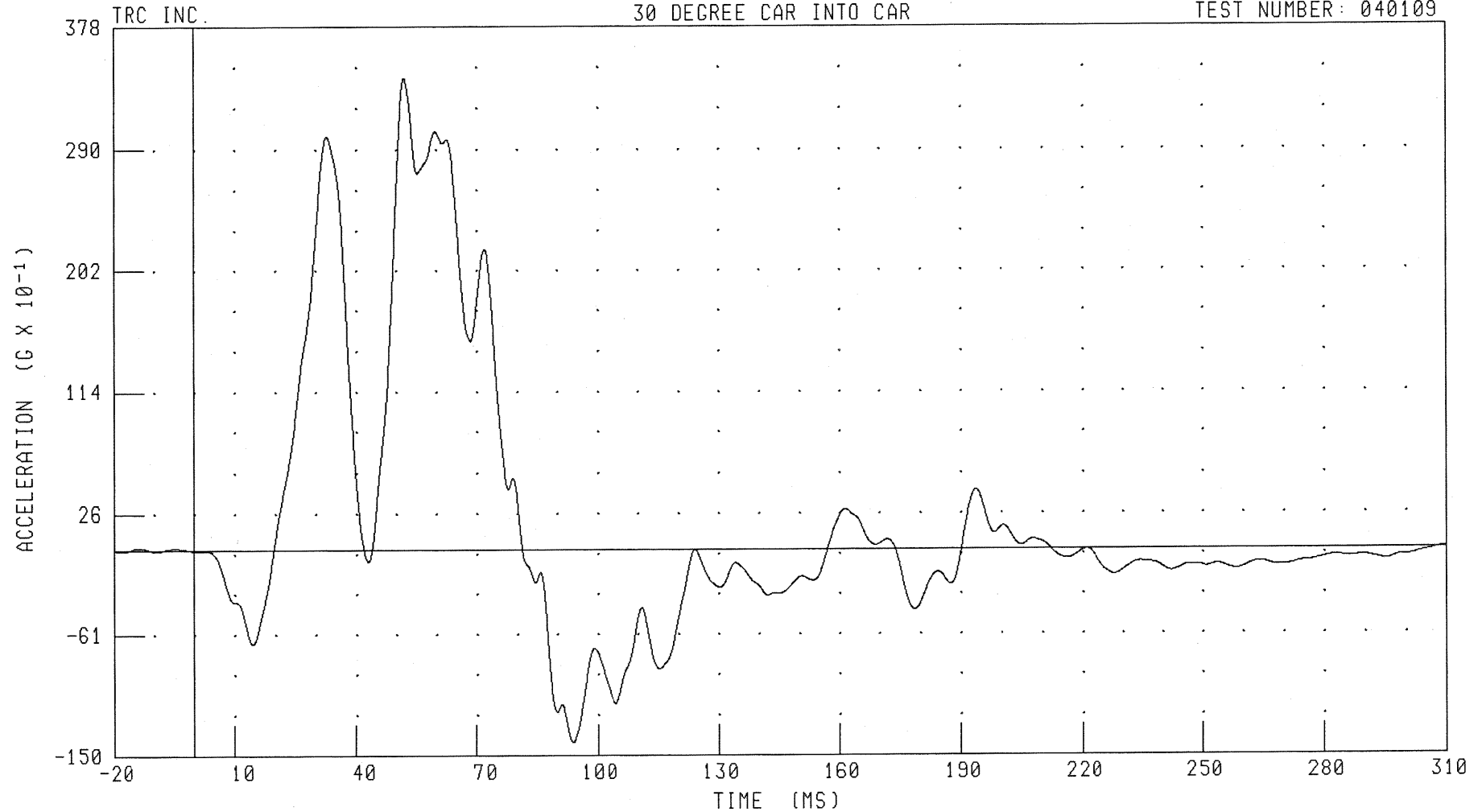
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET INSTRUMENT PANEL CENTER Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: DPCYC1

FILTER: CH. CLASS 60

PEAK DATA: 34.11 G @ 52.08 MS, -14.06 G @ 93.92 MS

B-82

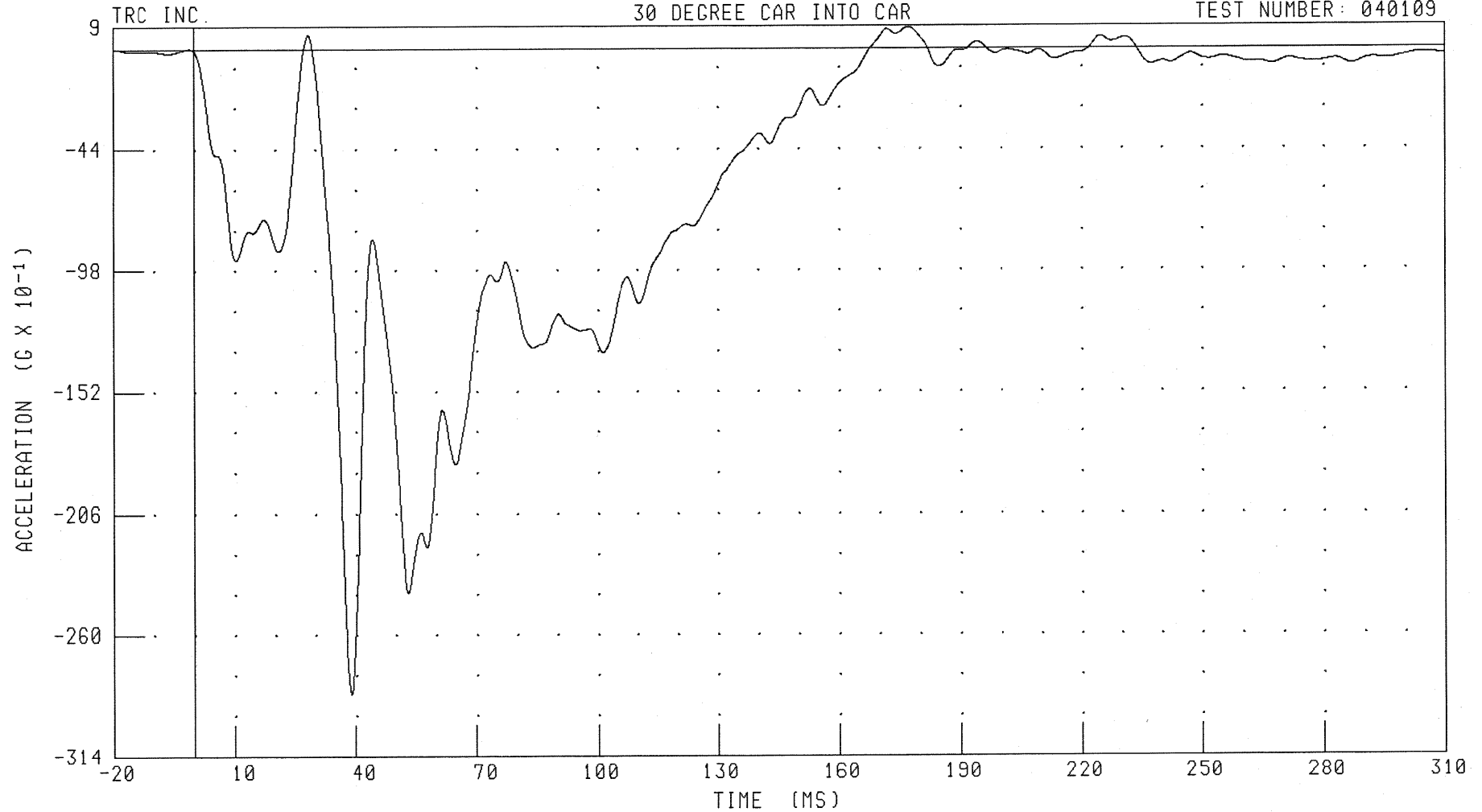
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET LEFT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRXXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.94 G @ 177.28 MS; -28.64 G @ 38.96 MS

B-83

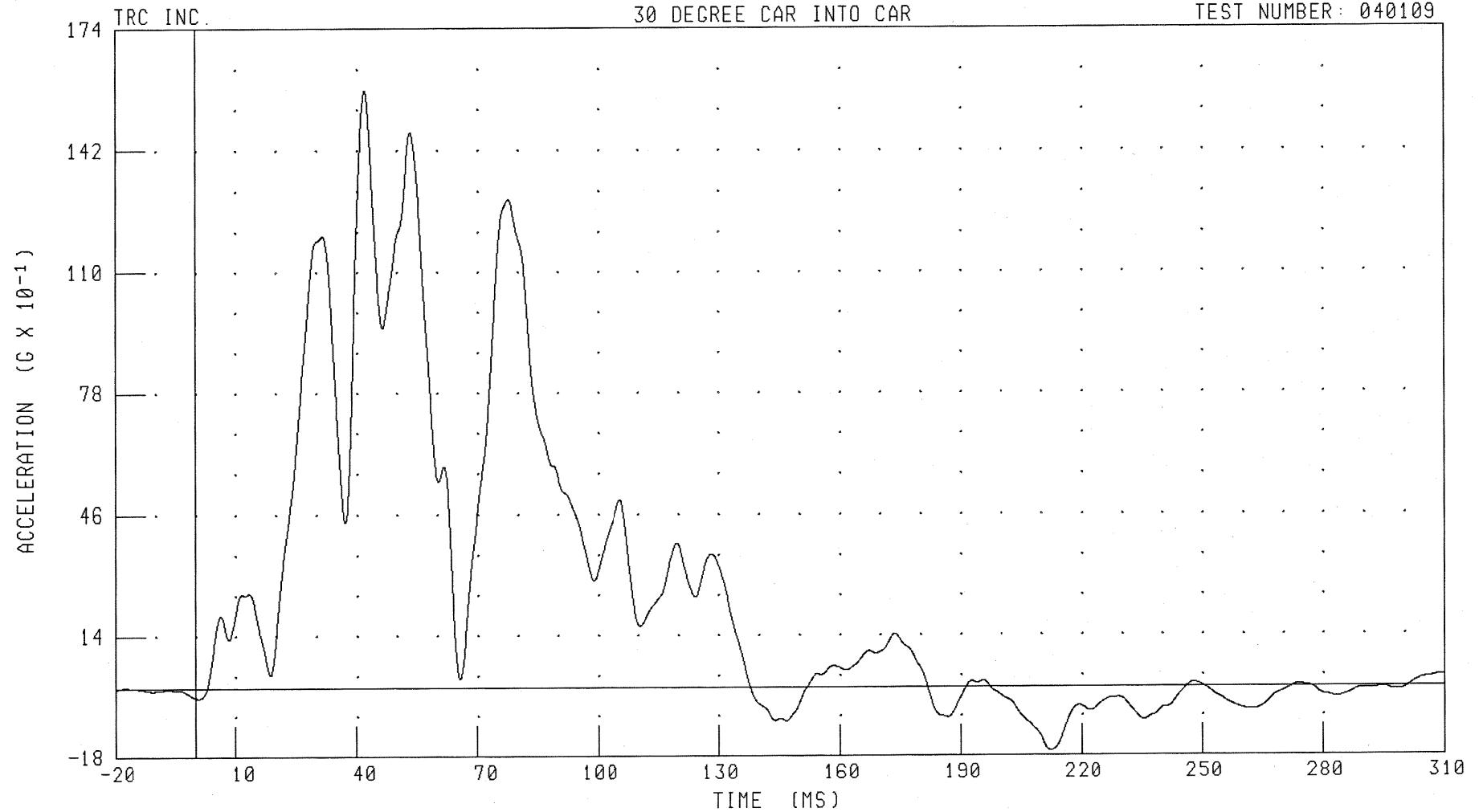
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET LEFT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRXYG1 FILTER: CH. CLASS 60

PEAK DATA: 15.79 G @ 42.08 MS; -1.68 G @ 212.32 MS

B-84

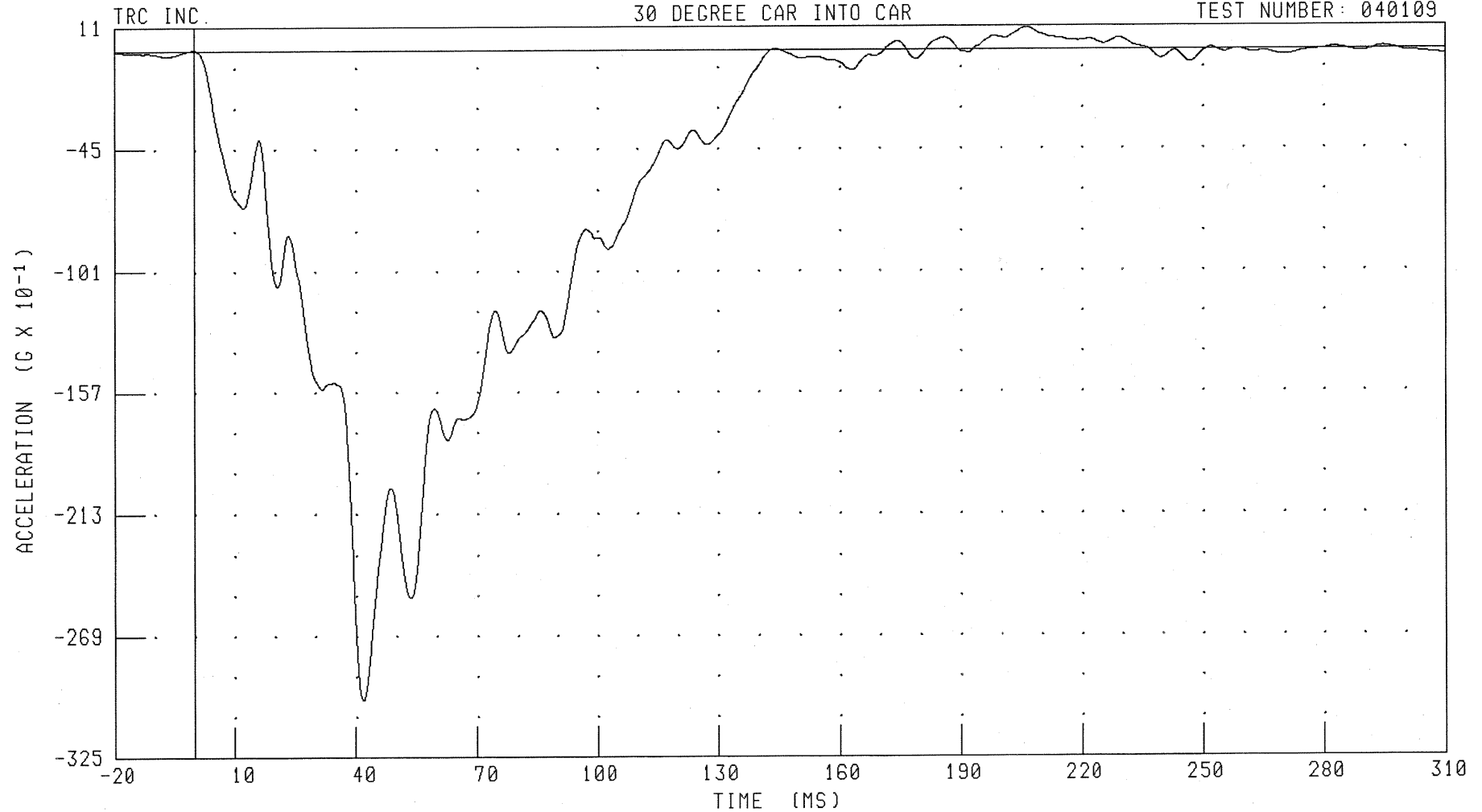
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET RIGHT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRXXG1

FILTER: CH. CLASS 60

PEAK DATA: 1.03 G @ 206.40 MS; -29.86 G @ 41.84 MS

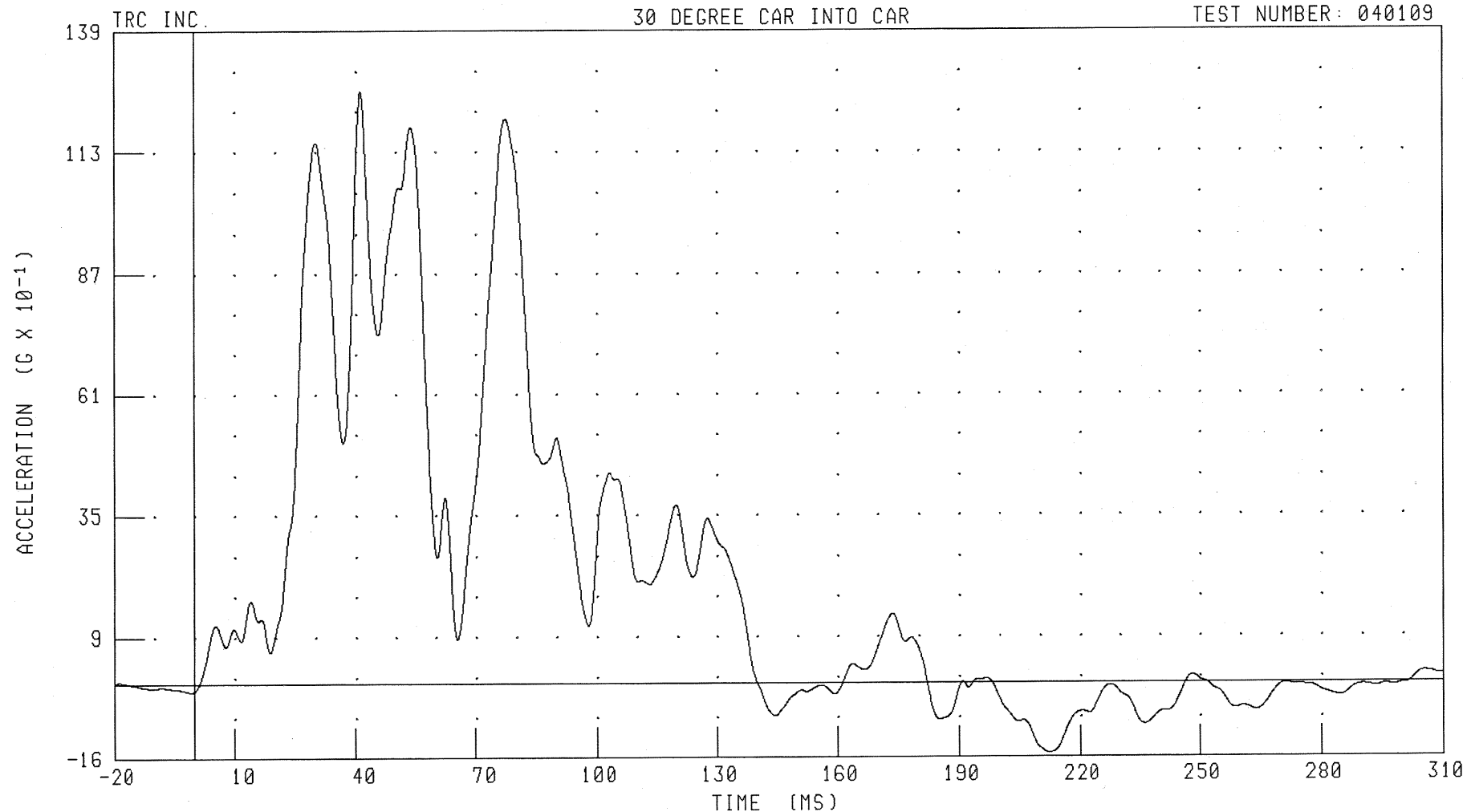
B-85

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
TARGET RIGHT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRXYG1

FILTER: CH. CLASS 60

PEAK DATA: 12.70 G @ 41.28 MS; -1.52 G @ 212.16 MS

B-86

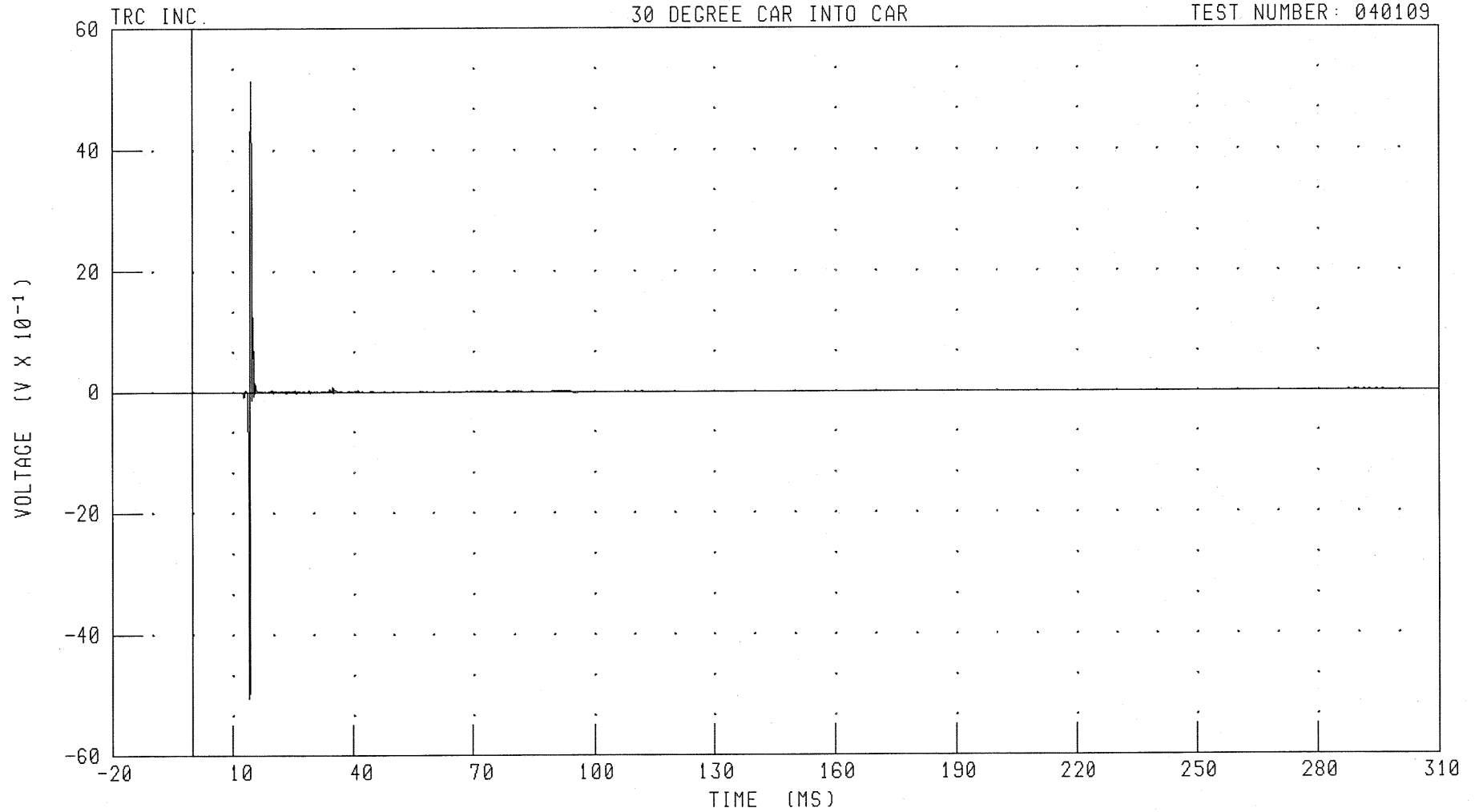
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

TARGET DRIVER AIRBAG EVENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: DABET1 FILTER: CH. CLASS 1000

PEAK DATA: 5.12 V @ 14.40 MS; -5.06 V @ 14.08 MS

B-87

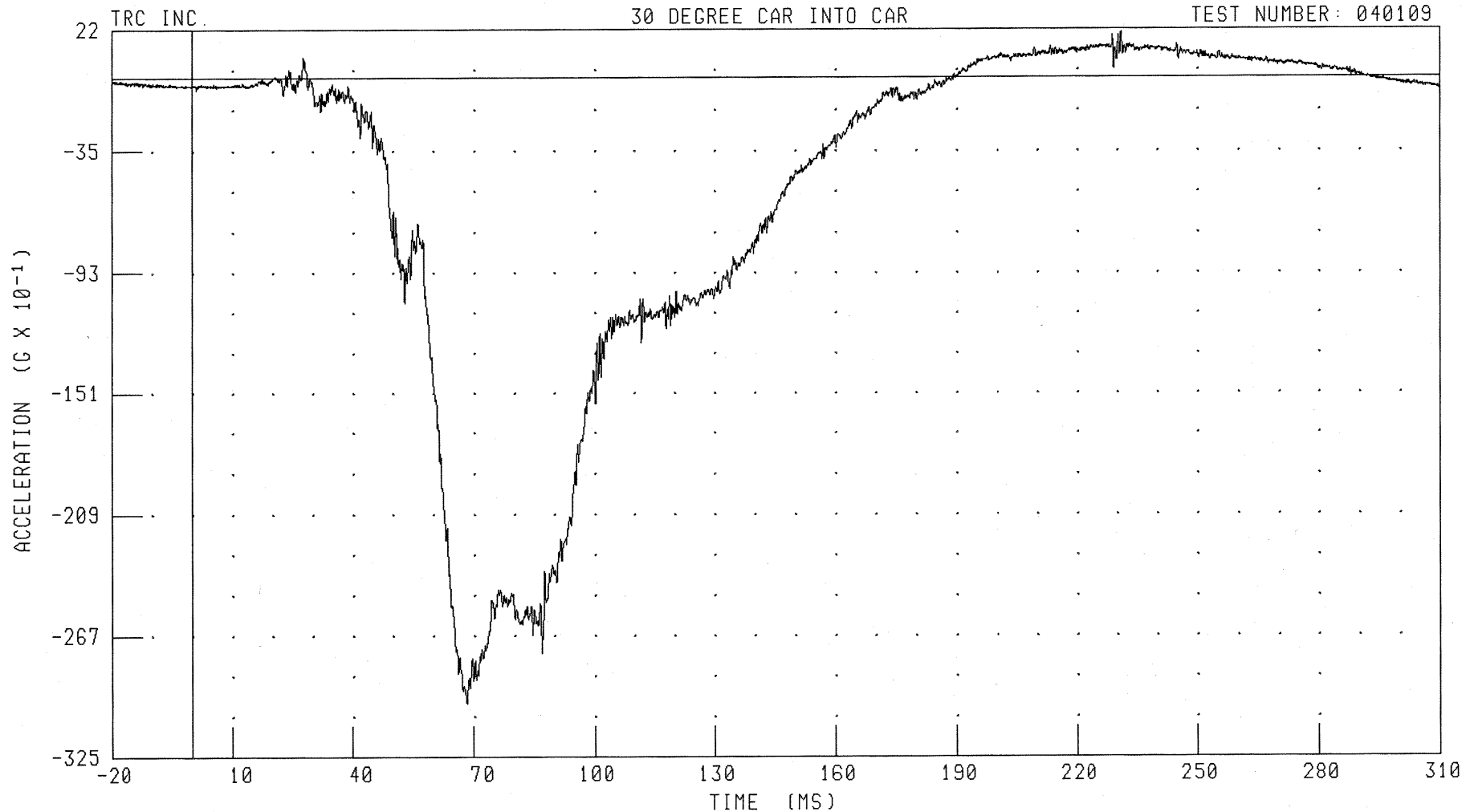
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER HEAD X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDXGA FILTER: CH. CLASS 1000

PEAK DATA: 2.15 G @ 231.12 MS, -29.95 G @ 68.24 MS

B-88

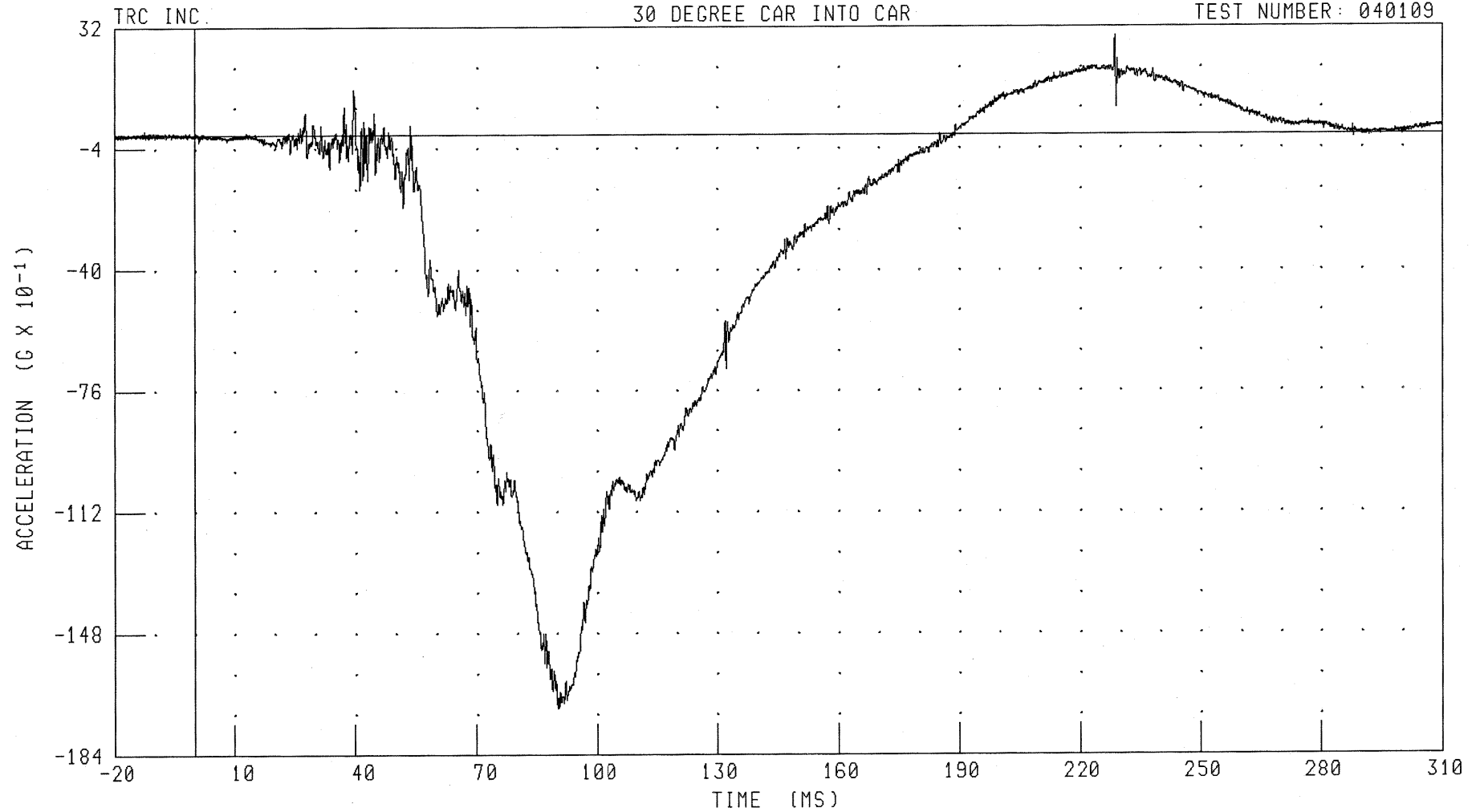
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER HEAD Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDYGA FILTER: CH. CLASS 1000

PEAK DATA: 2.94 G @ 228.80 MS; -17.02 G @ 90.08 MS

B-89

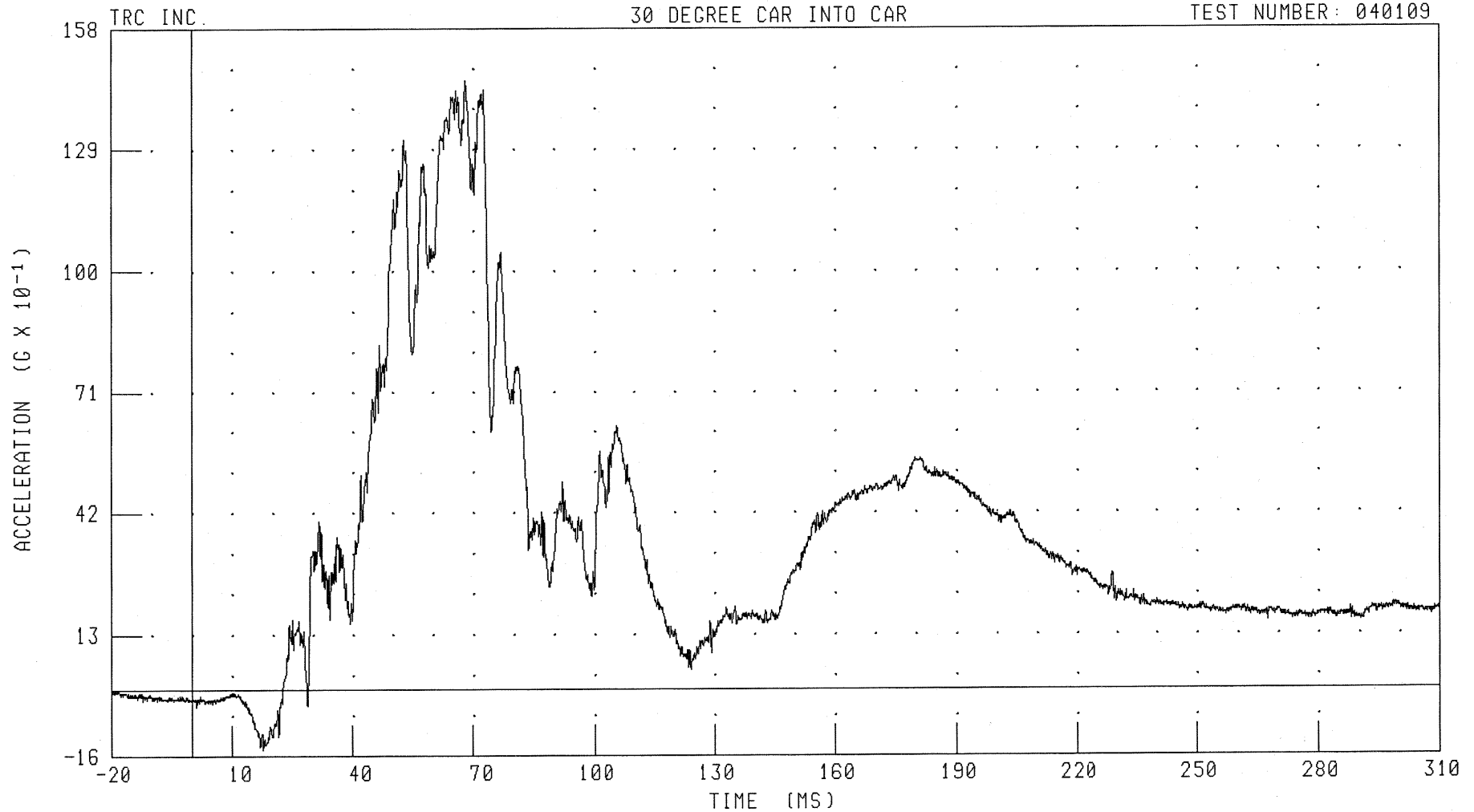
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER HEAD Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDZGA FILTER: CH. CLASS 1000

PEAK DATA: 14.55 G @ 68.16 MS; -1.46 G @ 17.60 MS

B-90

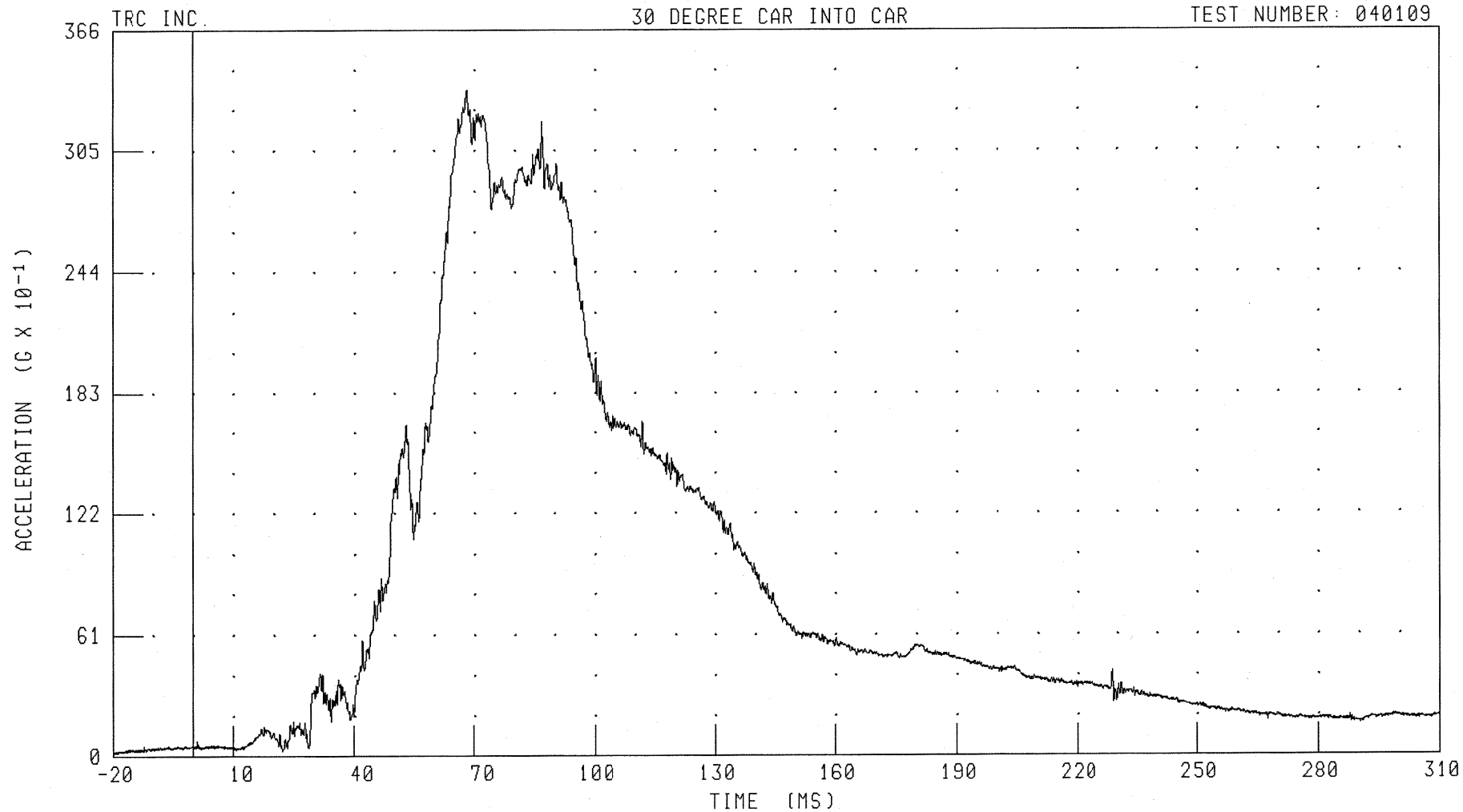
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER HEAD RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDRGA FILTER: CH. CLASS 1000

PEAK DATA: 33.55 G @ 68.24 MS; 0.12 G @ -20.00 MS

B-91

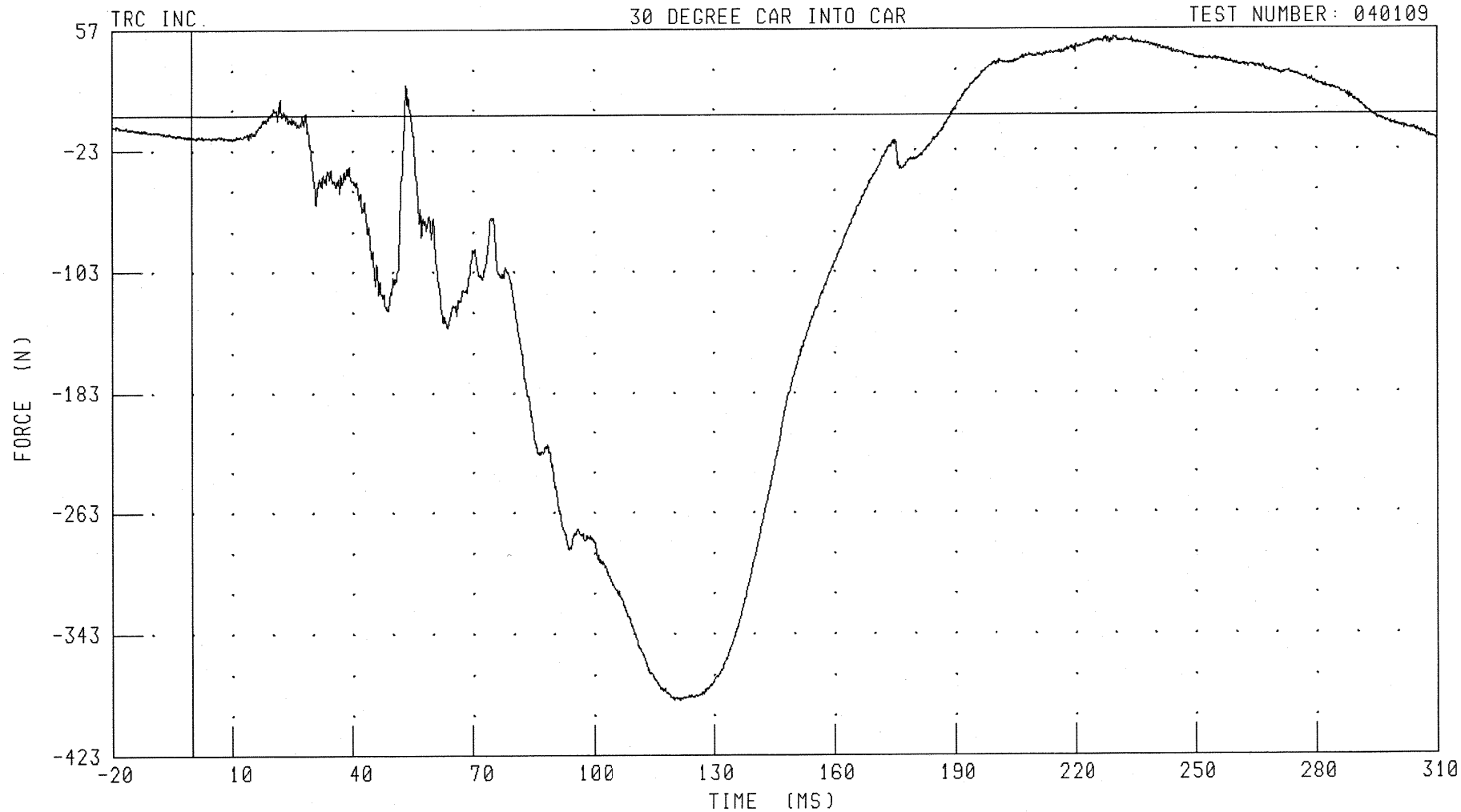
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK X-AXIS SHEAR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKXFA FILTER: CH. CLASS 1000

PEAK DATA: 52.00 N @ 229.84 MS; -386.64 N @ 120.08 MS

B-92

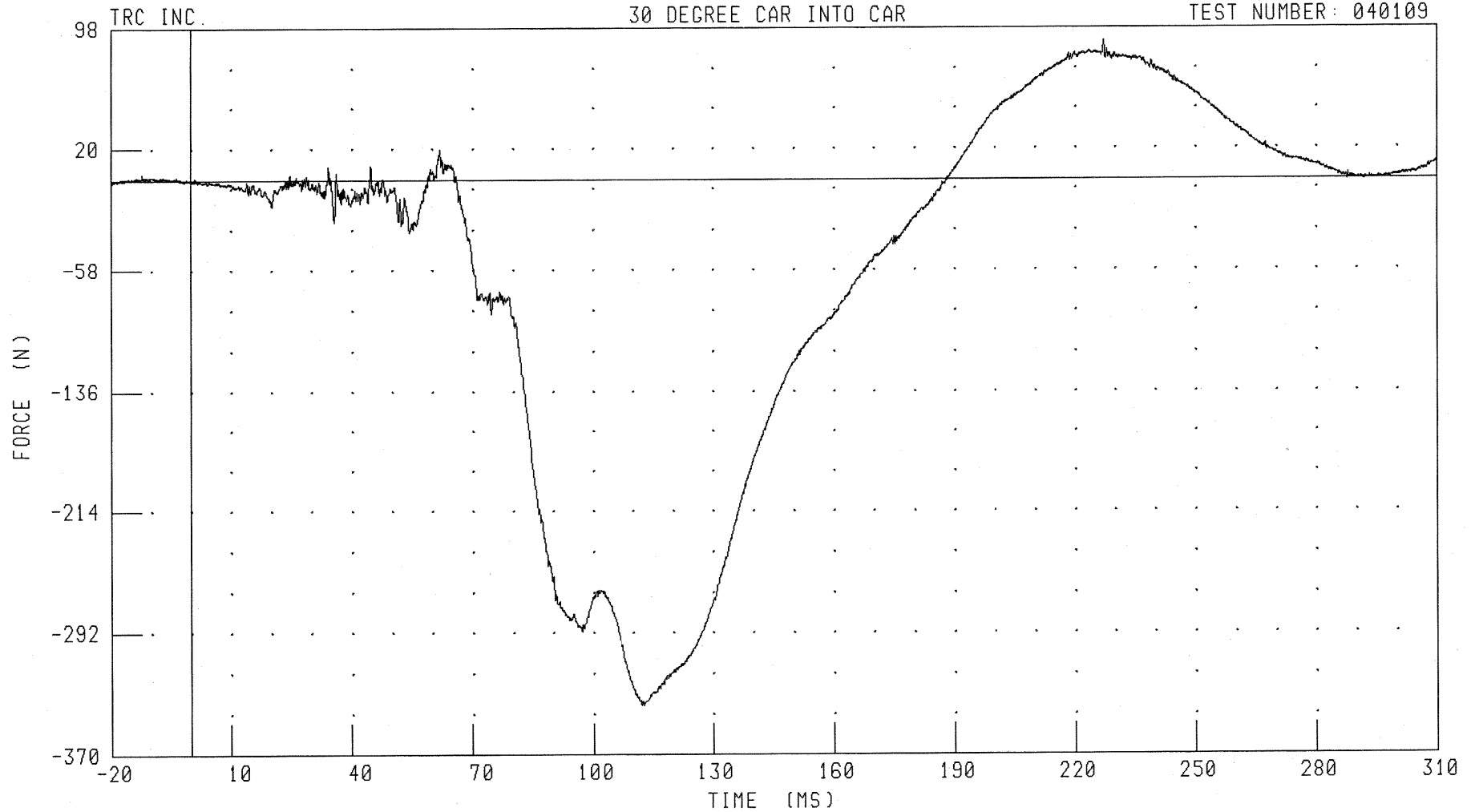
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK Y-AXIS SHEAR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKYFA FILTER: CH. CLASS 1000

B-93

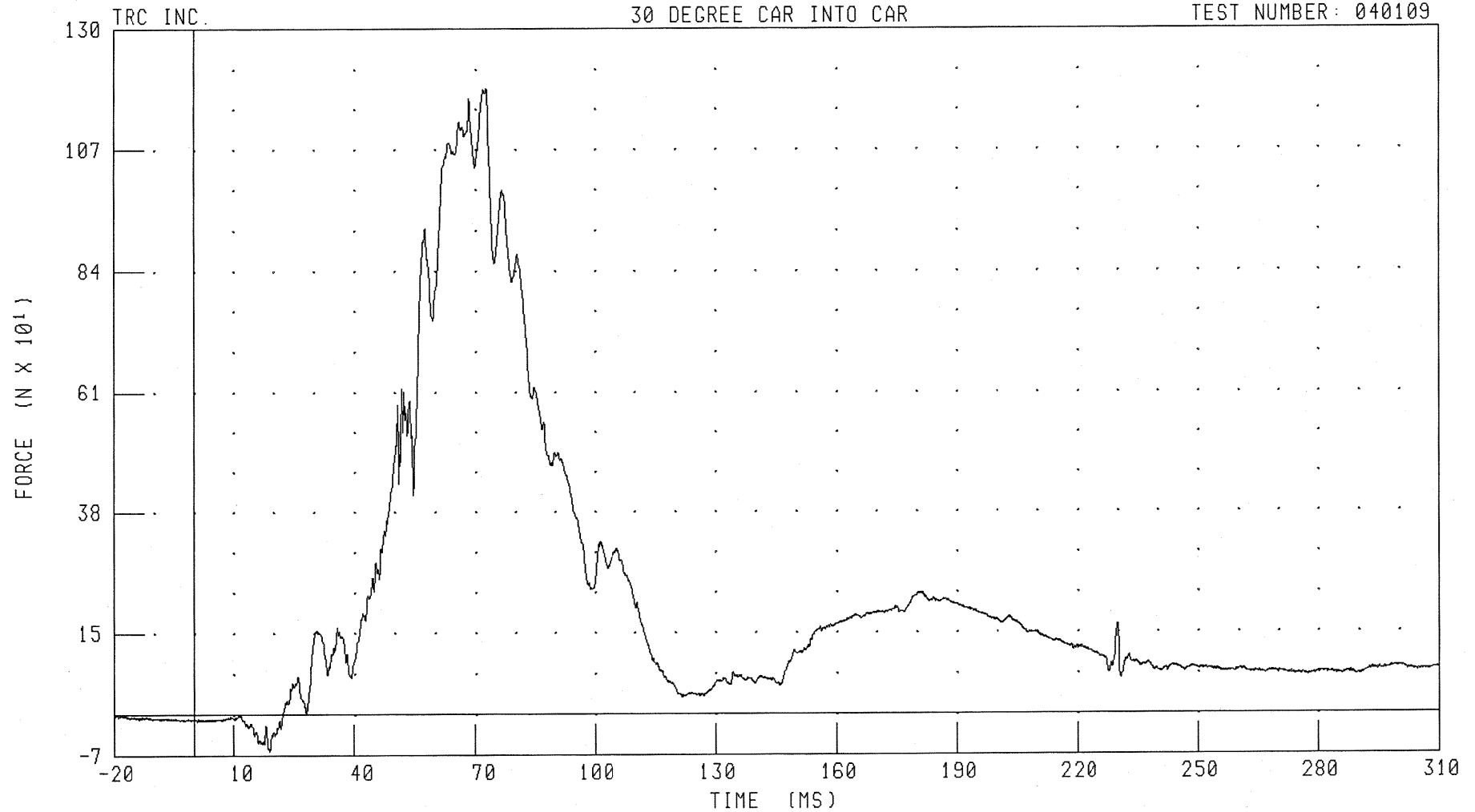
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK Z-AXIS AXIAL FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKZFA FILTER: CH. CLASS 1000

PEAK DATA: 1188.64 N @ 72.80 MS; -70.98 N @ 19.12 MS

B-94

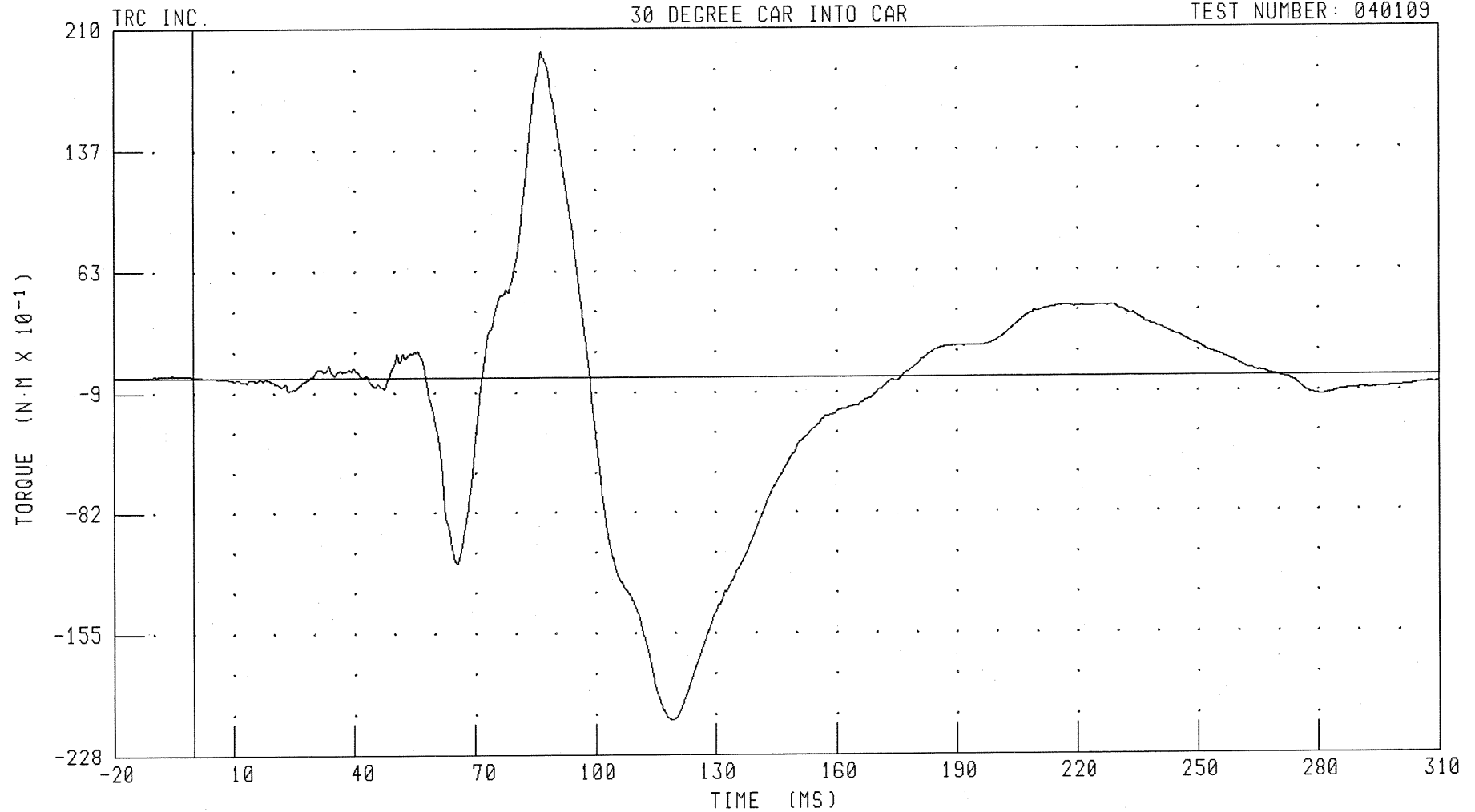
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKXMA FILTER: CH. CLASS 600

PEAK DATA: 19.64 N·M @ 86.64 MS; -20.70 N·M @ 119.12 MS

B-95

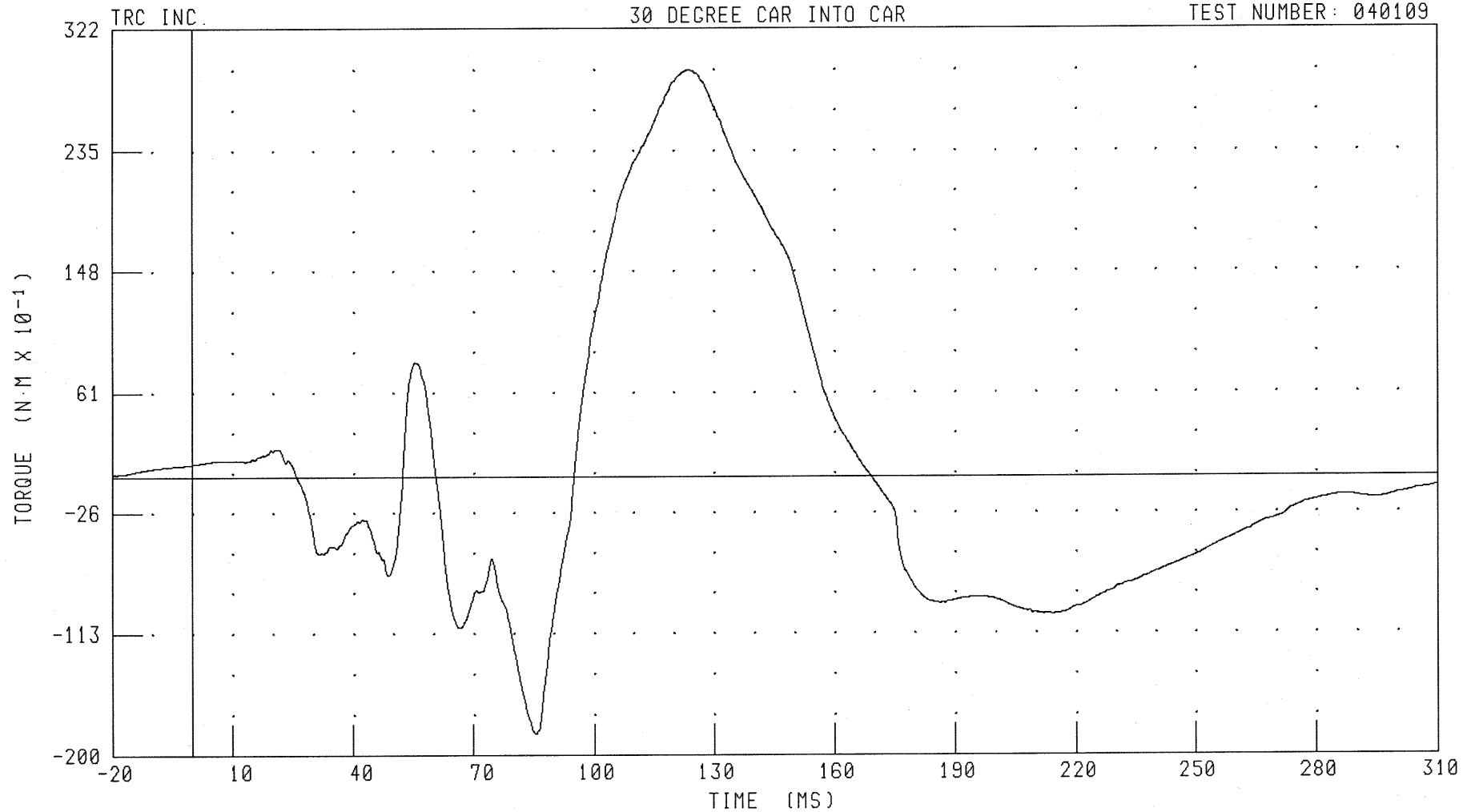
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKYMA FILTER: CH. CLASS 600

PEAK DATA: 29.29 N·M @ 123.60 MS; -18.50 N·M @ 85.52 MS

B-96

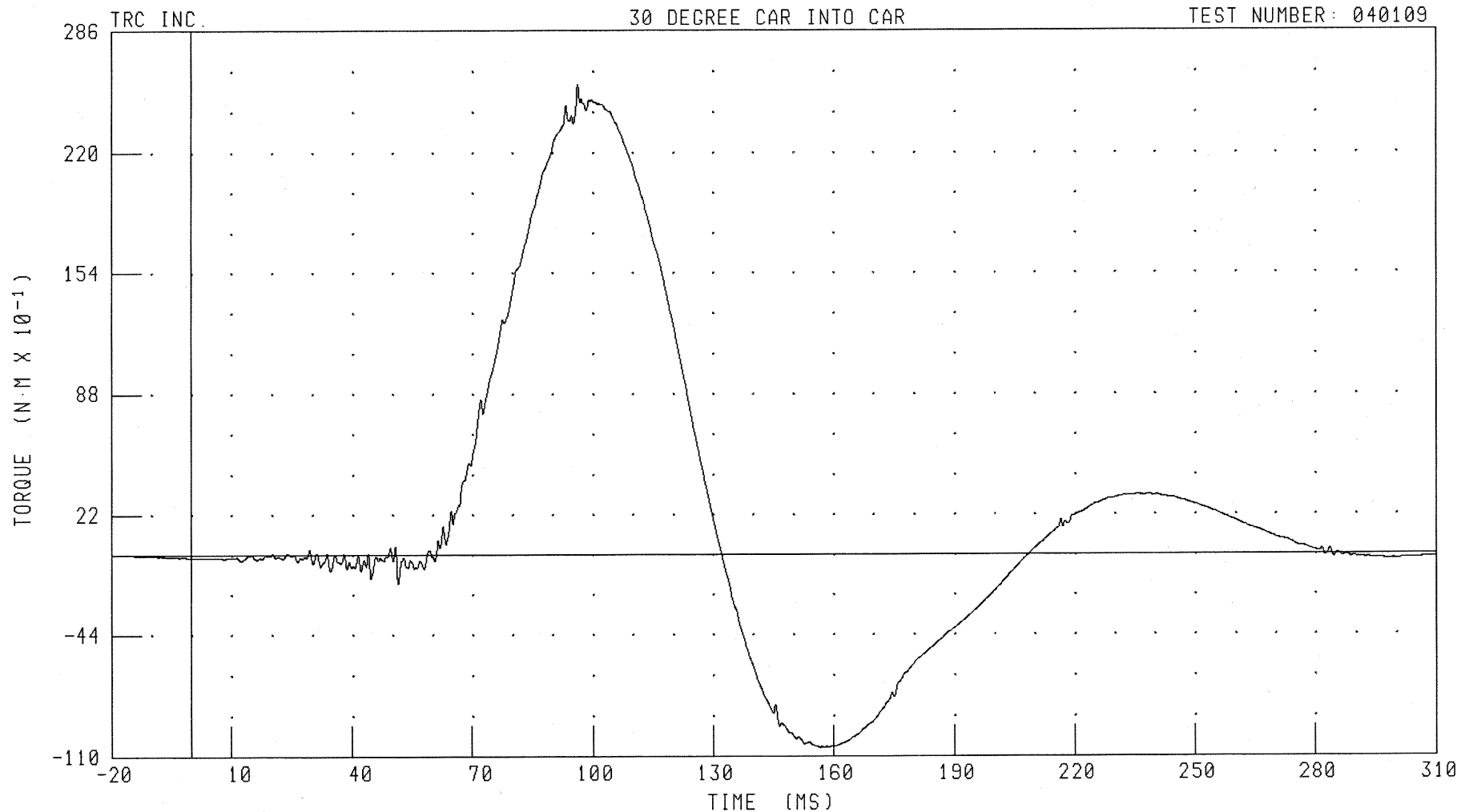
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKZMA FILTER: CH. CLASS 600

PEAK DATA: 25.70 N·M @ 96.32 MS; -10.53 N·M @ 156.72 MS

B-97

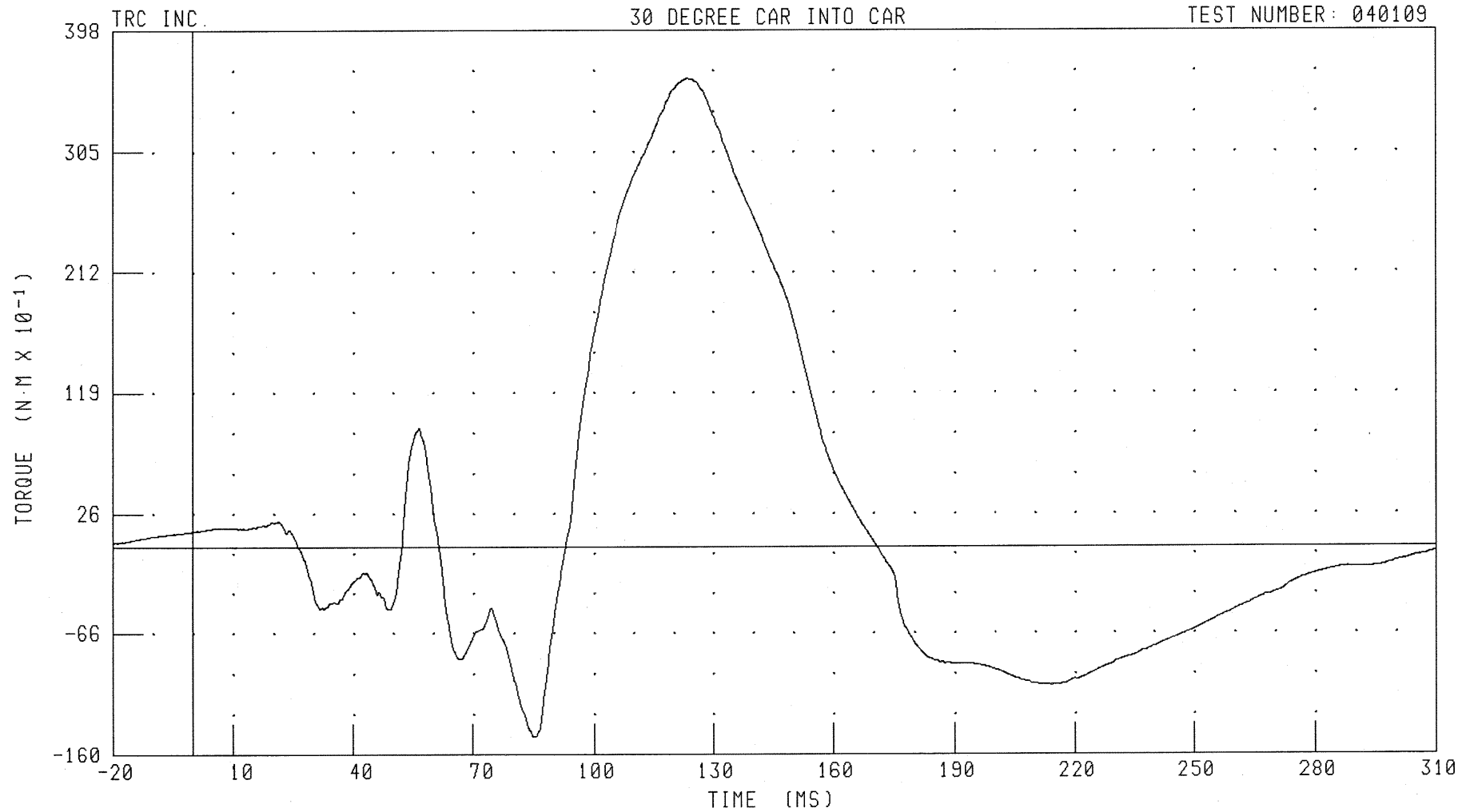
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKOMA FILTER: CH. CLASS 600

PEAK DATA: 36.12 N·M @ 123.60 MS; -14.62 N·M @ 85.44 MS

B-98

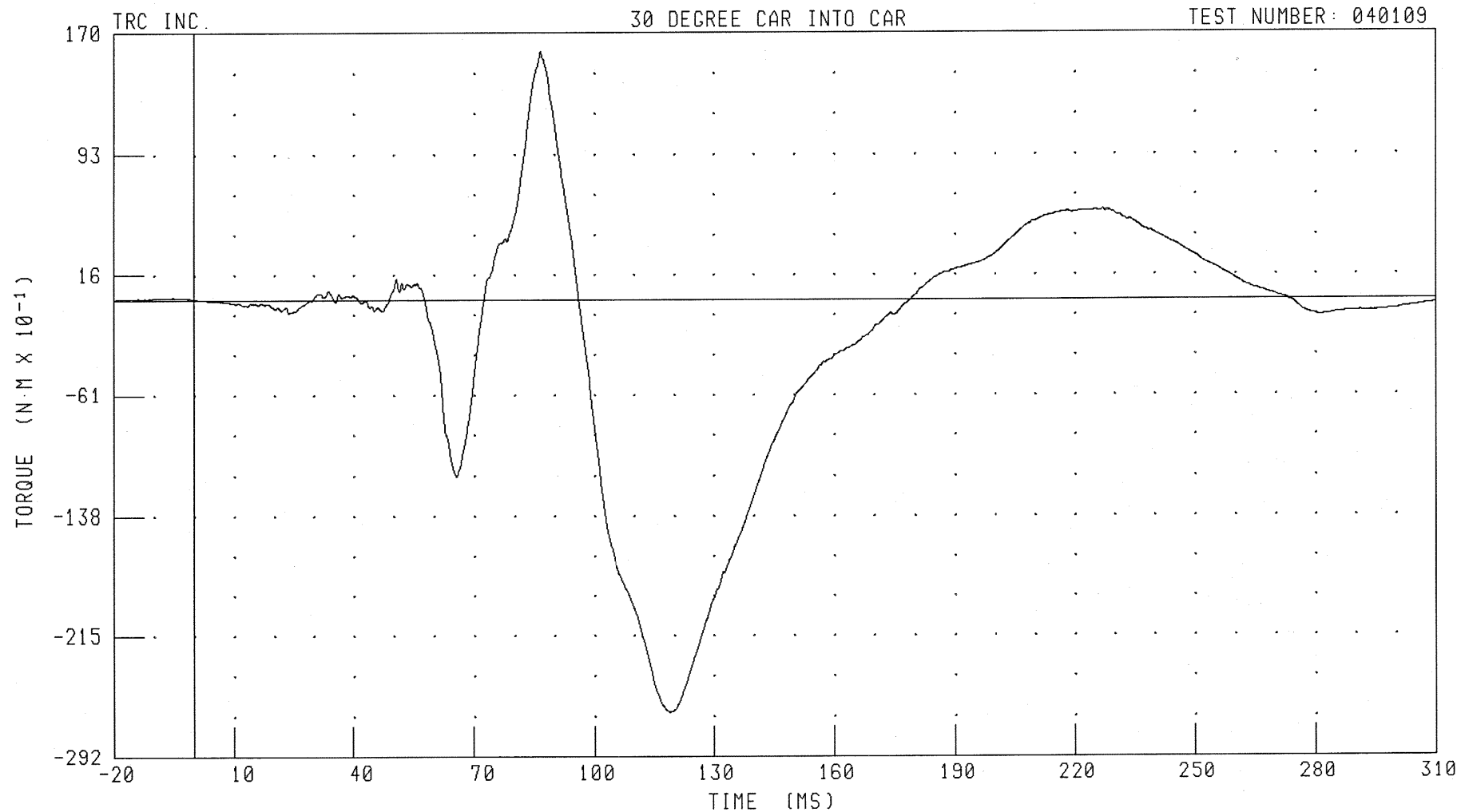
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NK0XMA FILTER: CH. CLASS 600

PEAK DATA: 15.82 N·M @ 86.56 MS; -26.38 N·M @ 119.12 MS

B-99

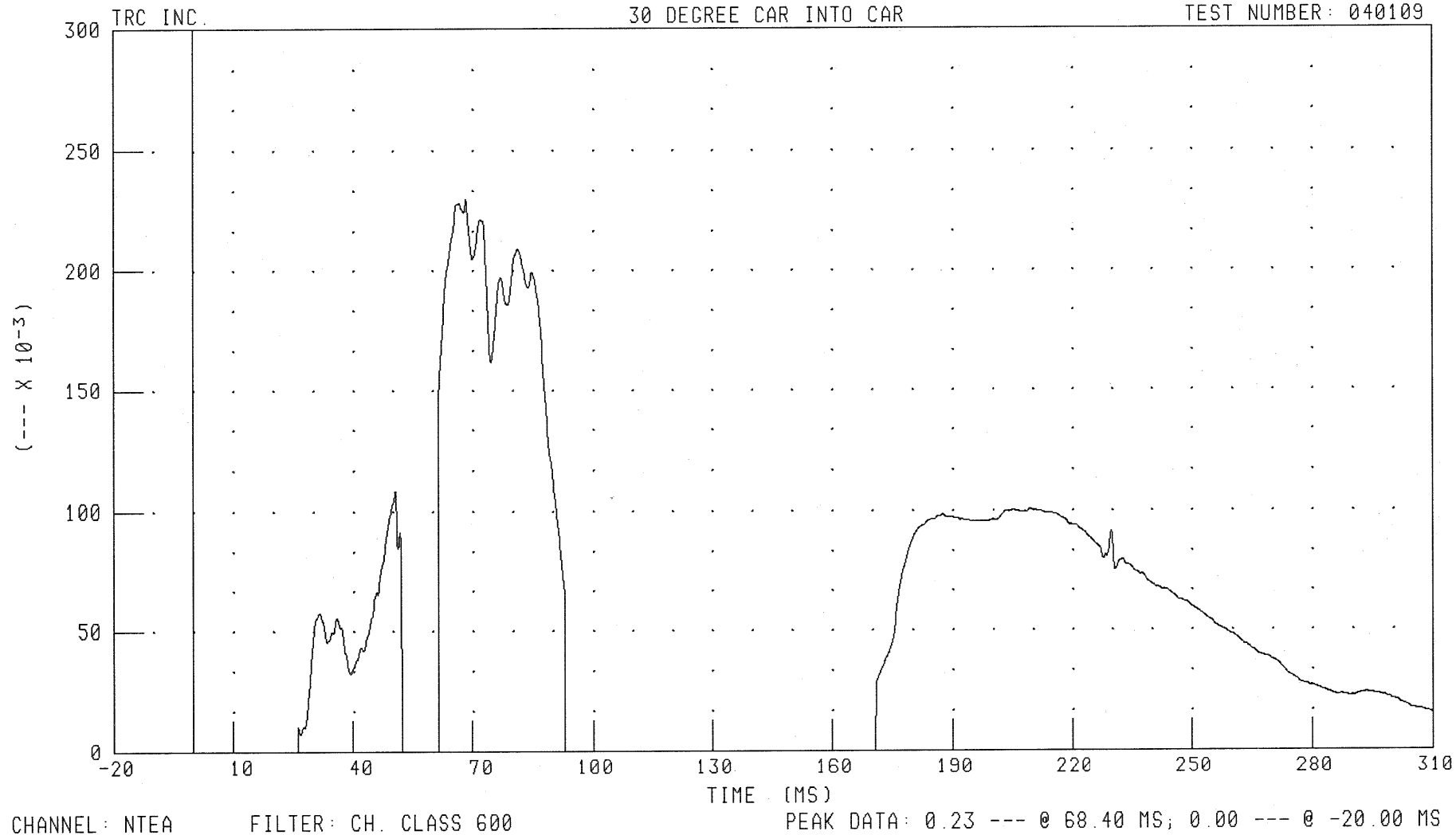
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NIJ TENSION/EXTENSION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-100

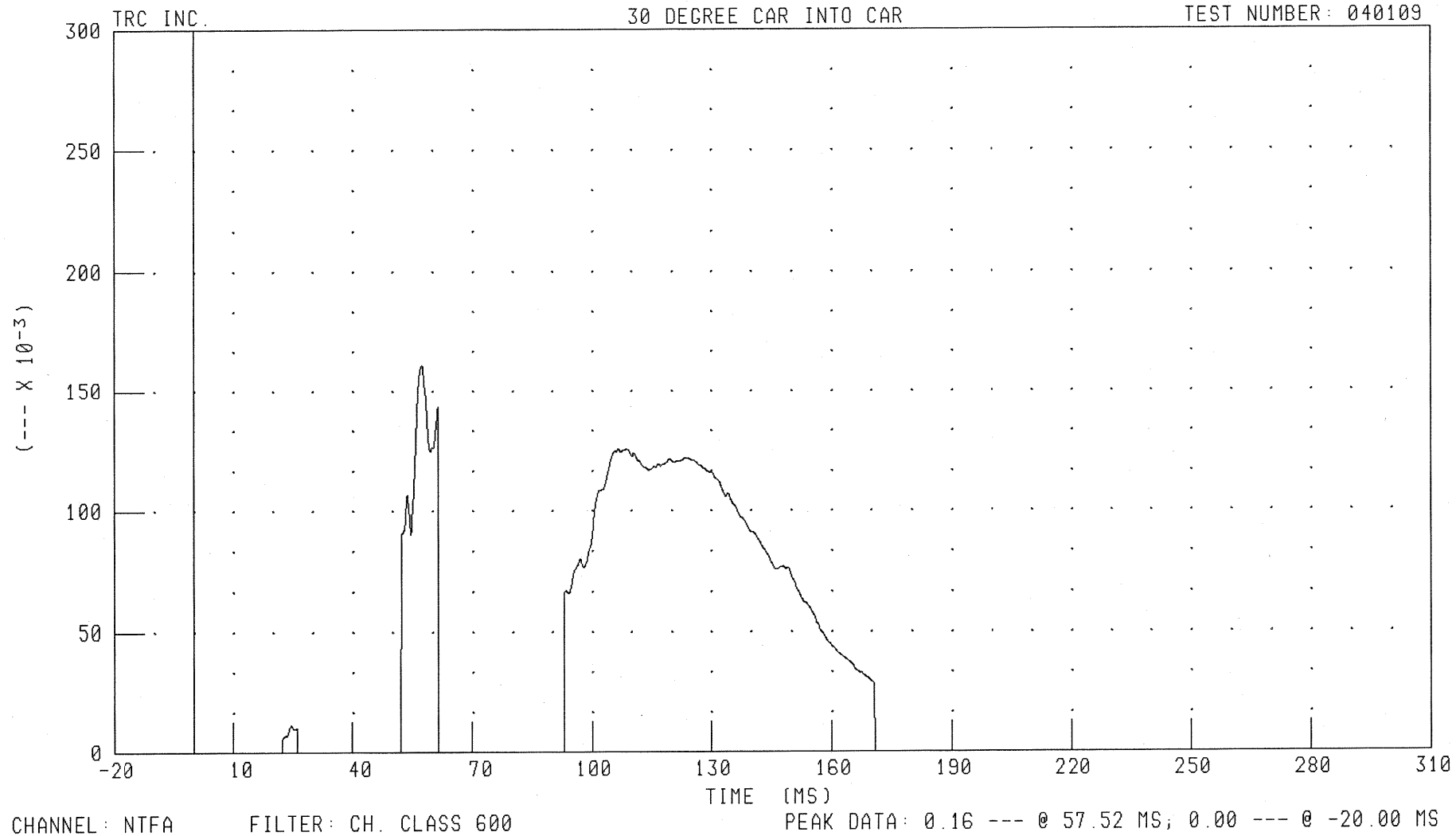
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NIJ TENSION/FLEXION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



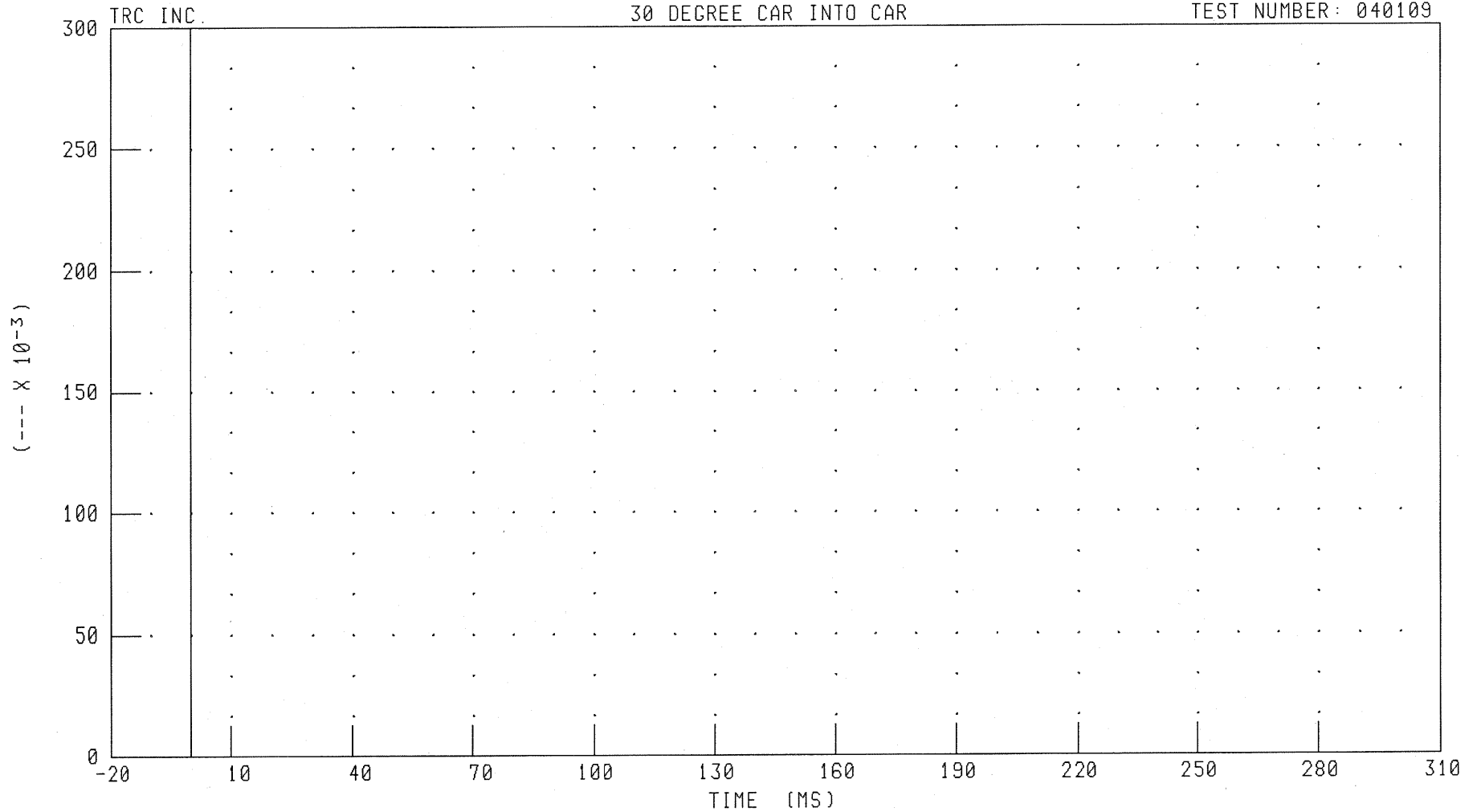
B-101

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
BULLET DRIVER NIJ COMPRESSION/EXTENSION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-102

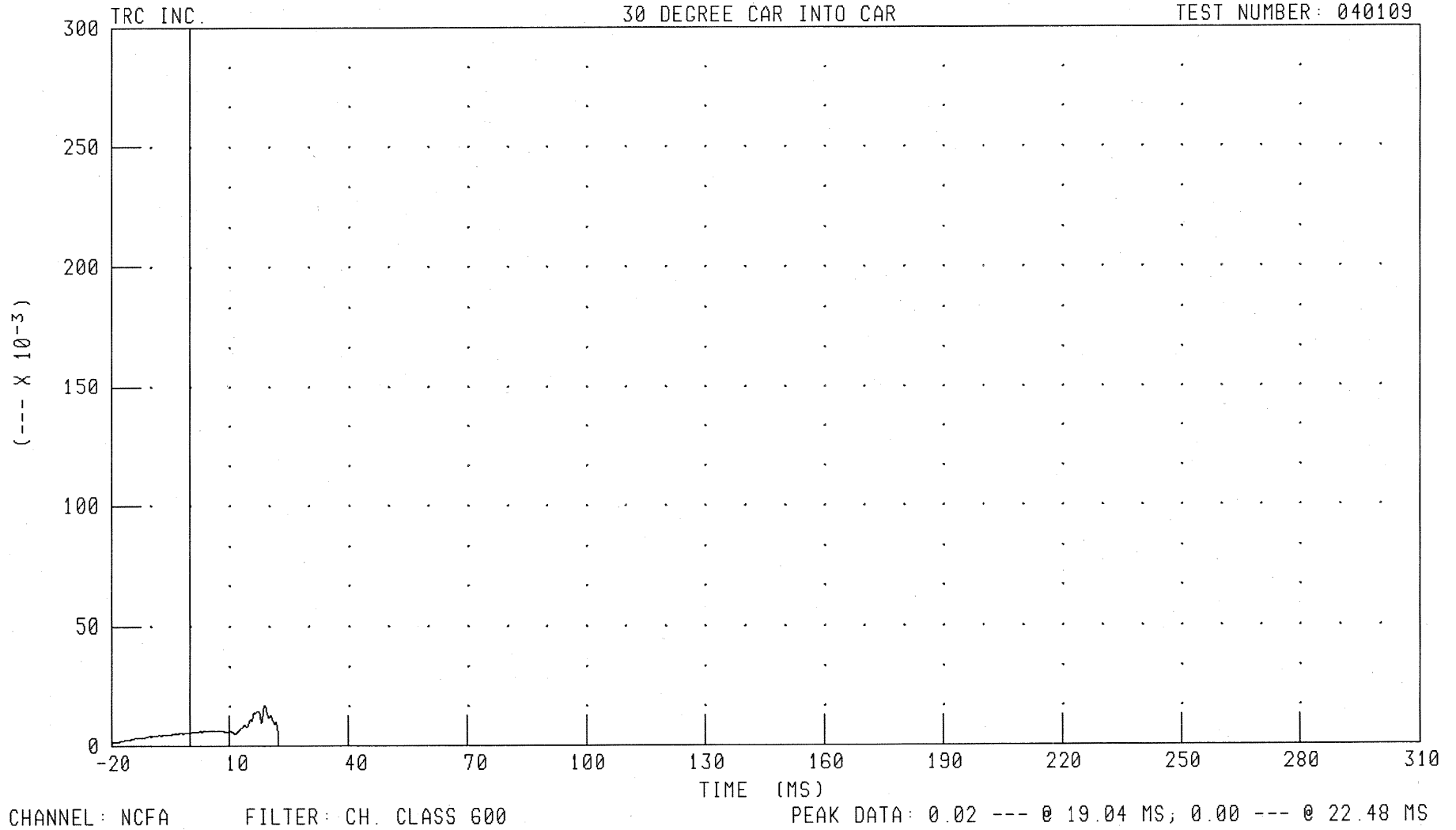
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER NIJ COMPRESSION/FLEXION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-103

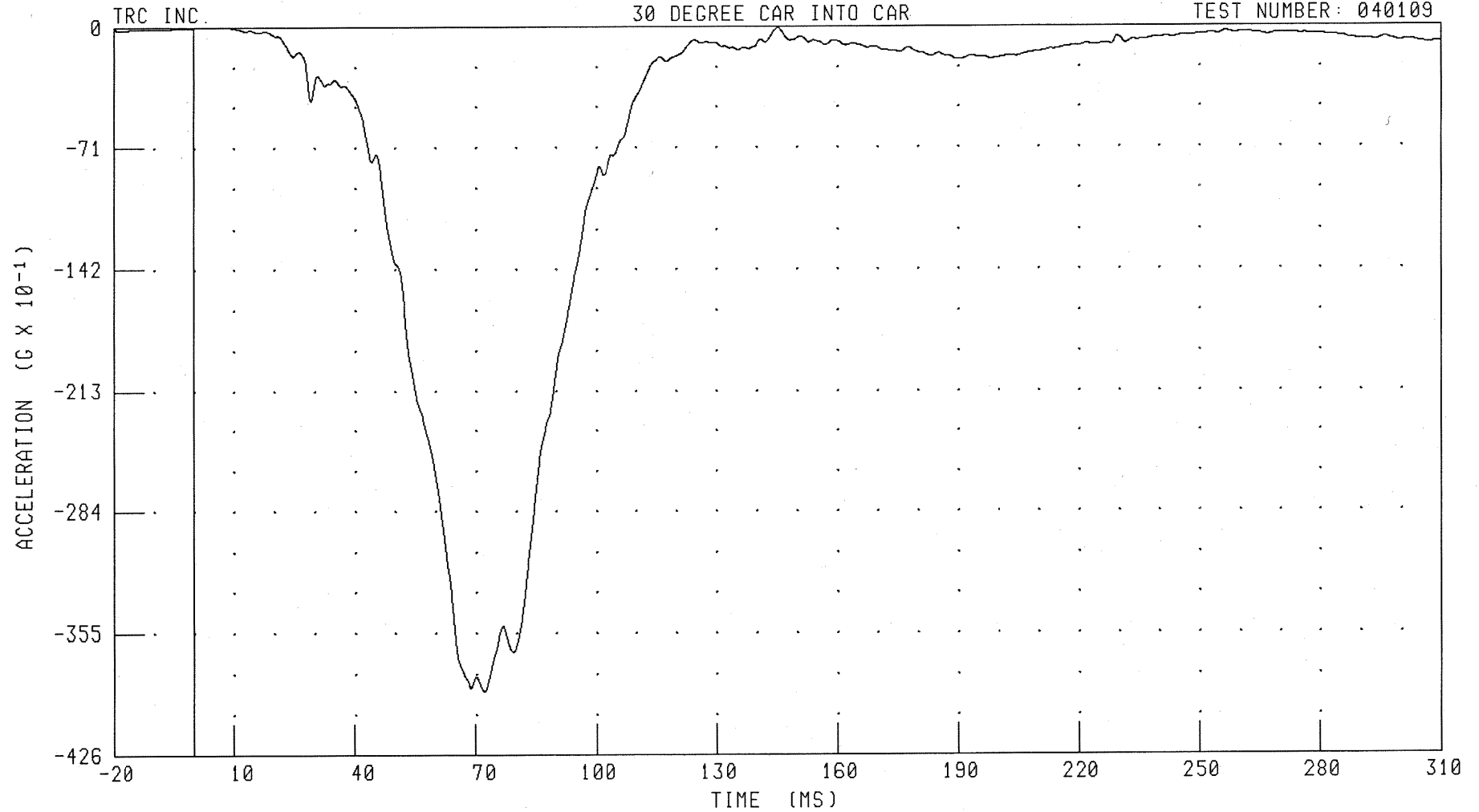
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER CHEST X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTXGA FILTER: CH. CLASS 180

PEAK DATA: 0.05 G @ 6.96 MS; -38.87 G @ 72.08 MS

B-104

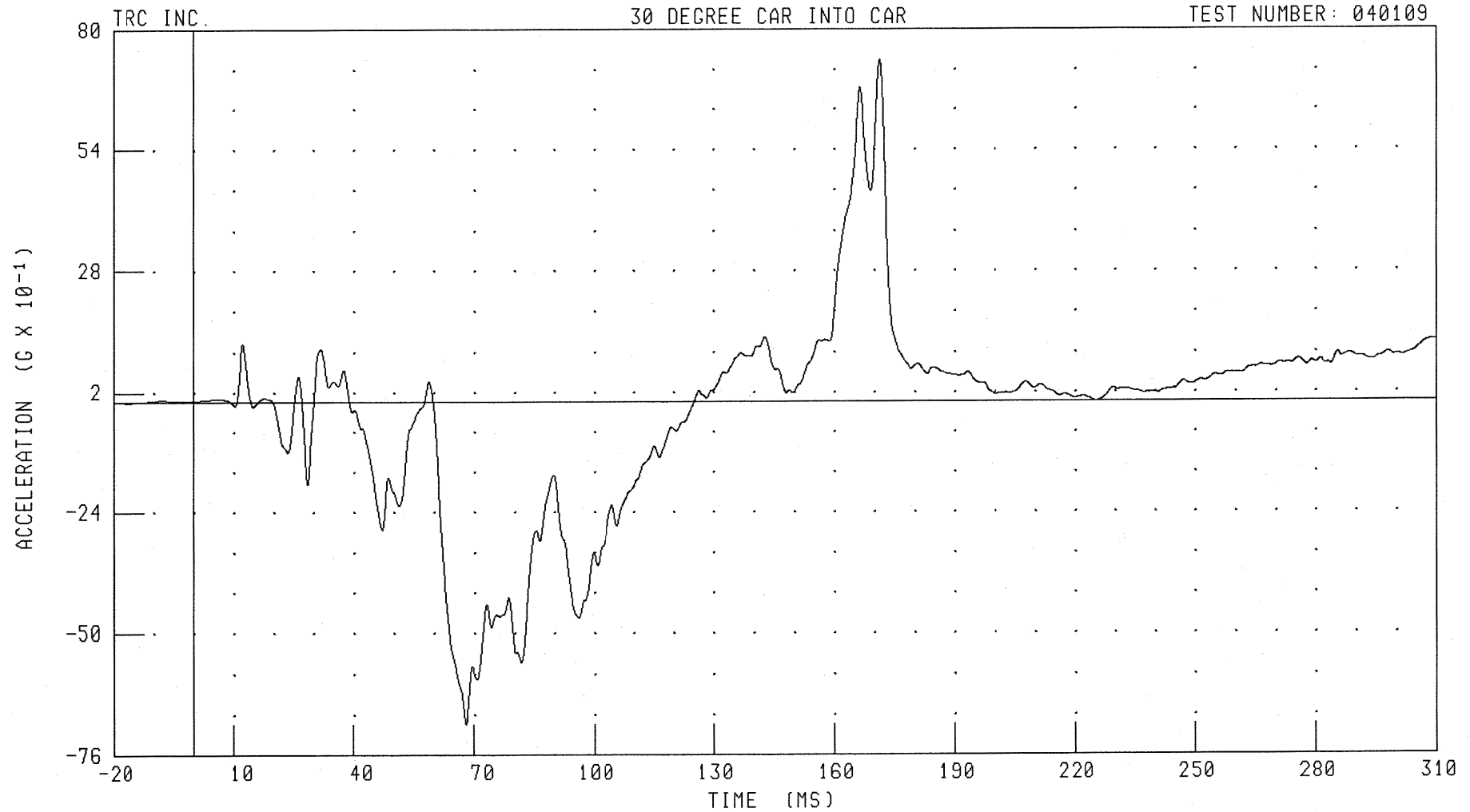
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER CHEST Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTYGA FILTER: CH. CLASS 180

PEAK DATA: 7.35 G @ 171.44 MS; -6.93 G @ 68.00 MS

B-105

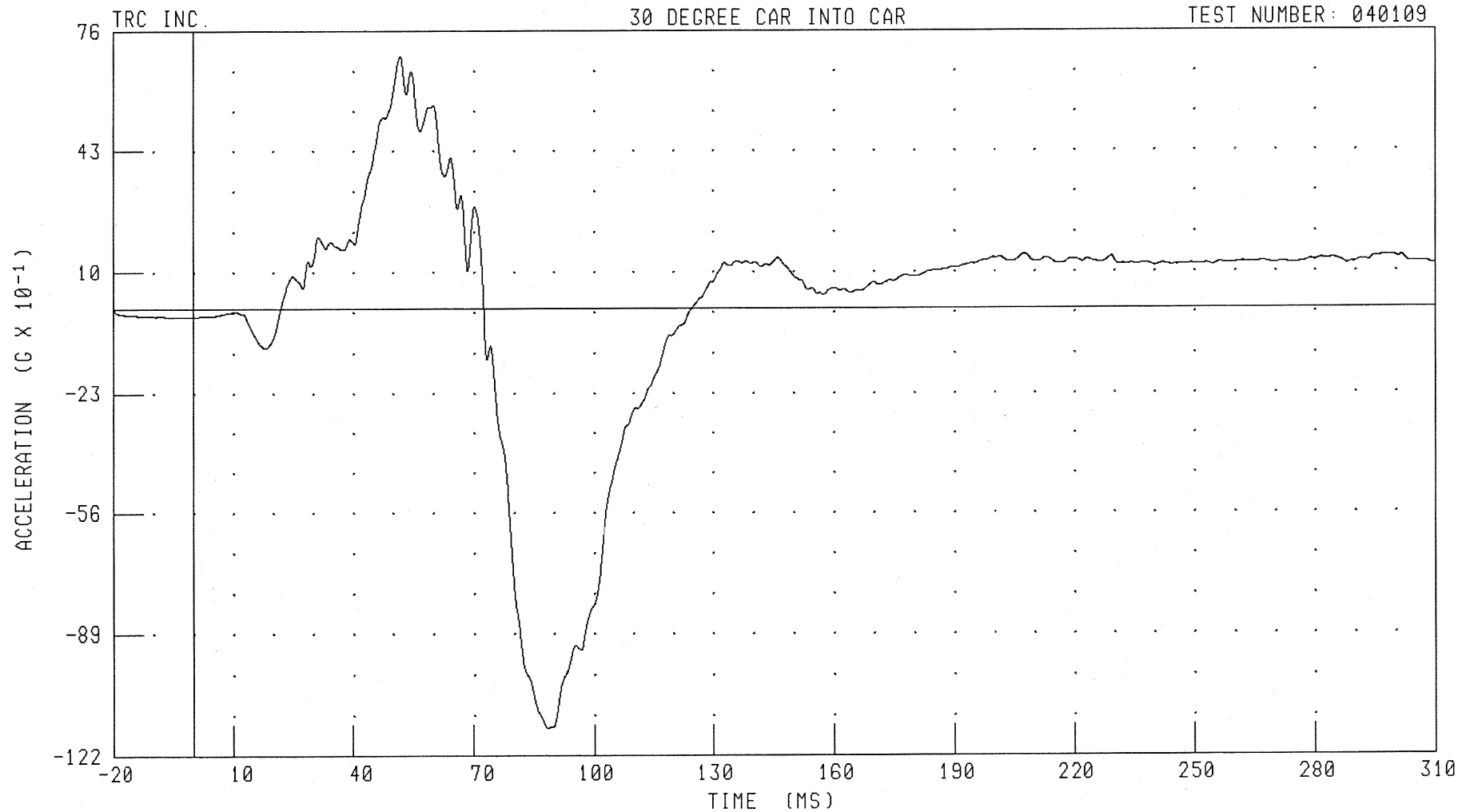
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER CHEST Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTZGA FILTER: CH. CLASS 180

PEAK DATA: 6.91 G @ 52.00 MS; -11.45 G @ 88.32 MS

B-106

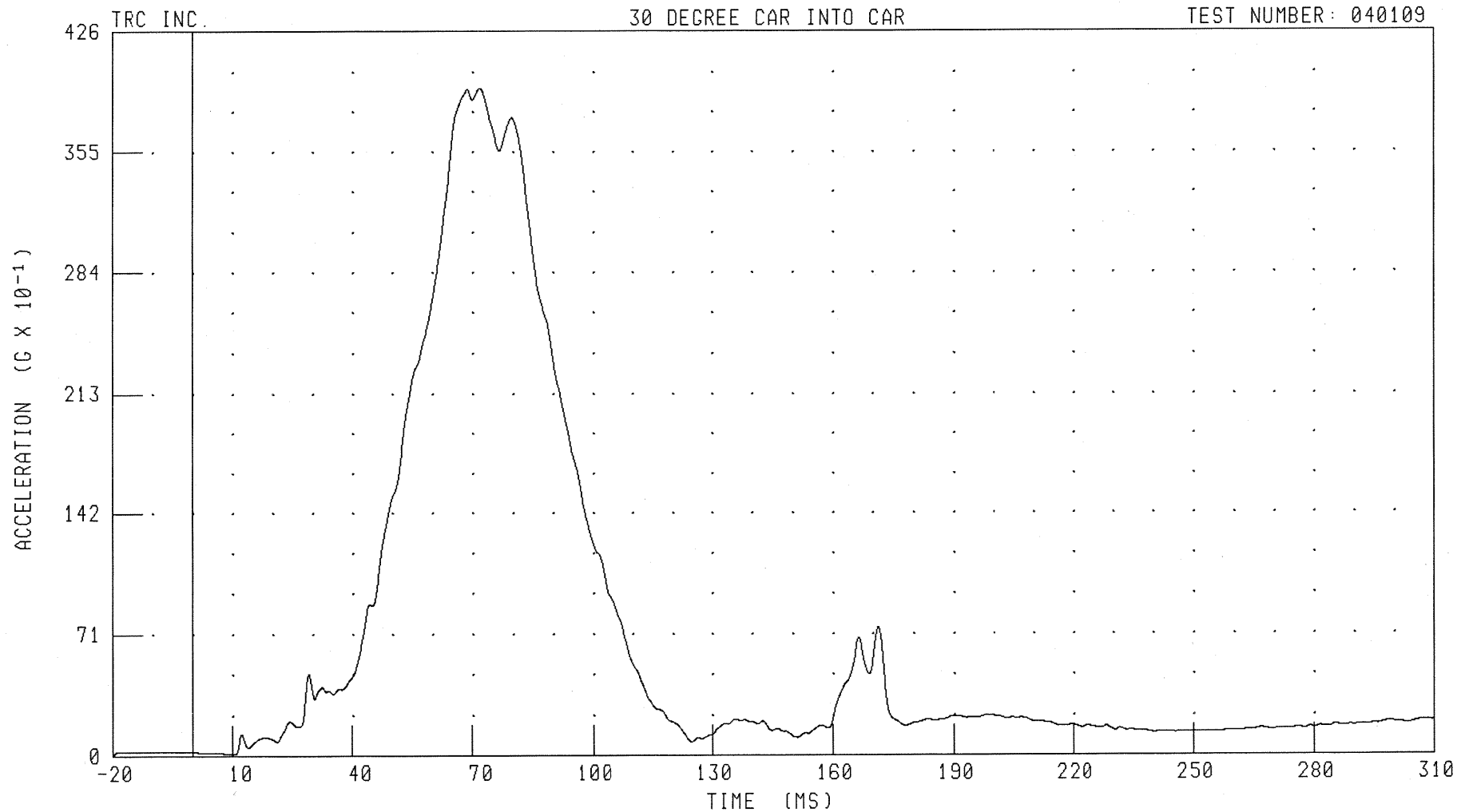
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER CHEST RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-107

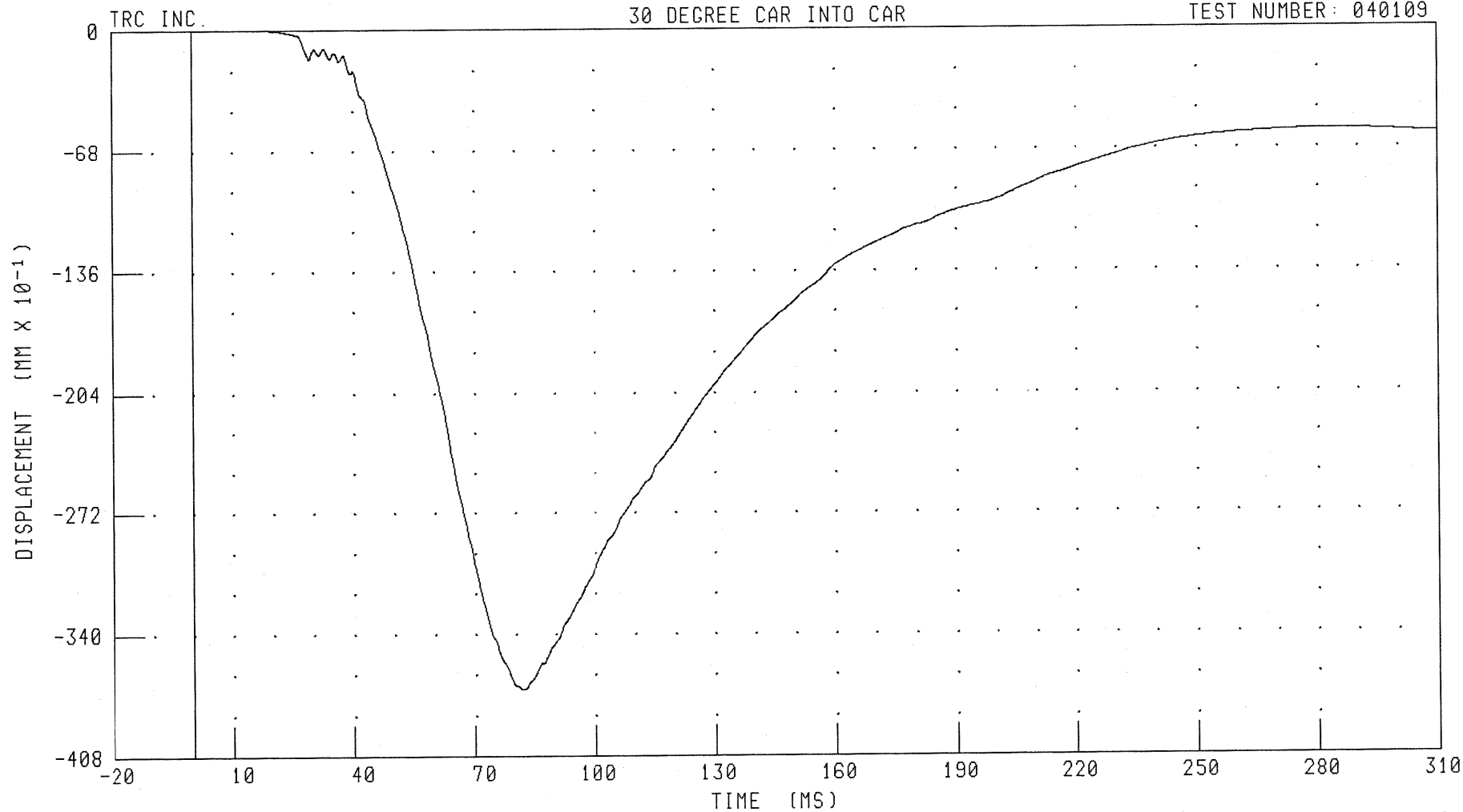
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER CHEST DEFLECTION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTXDA

FILTER: CH. CLASS 600

PEAK DATA: 0.03 MM @ 1.12 MS, -37.08 MM @ 81.68 MS

B-108

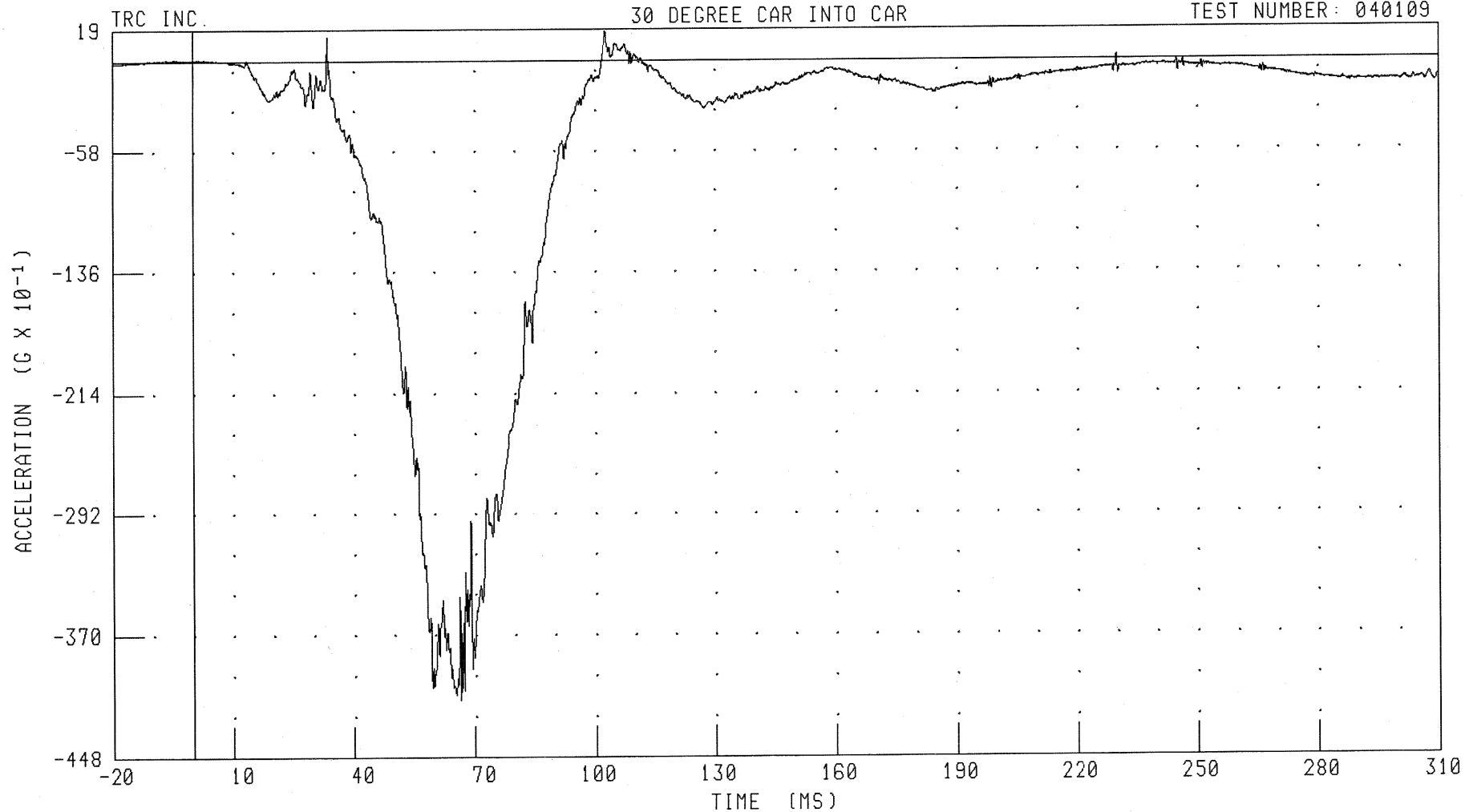
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER PELVIS X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVXGA

FILTER: CH. CLASS 1000

PEAK DATA: 1.87 G @ 102.72 MS; -41.16 G @ 66.40 MS

B-109

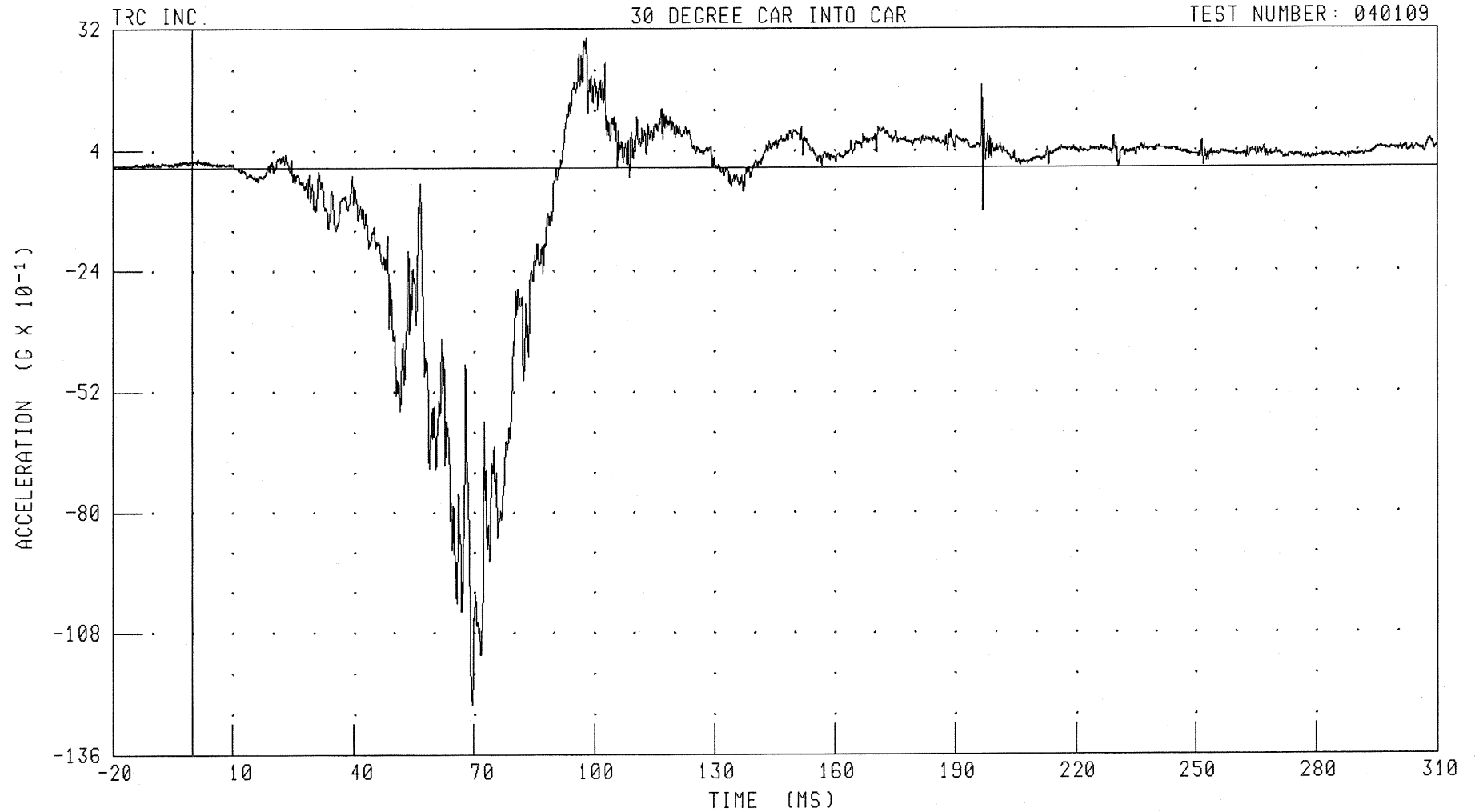
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER PELVIS Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-110

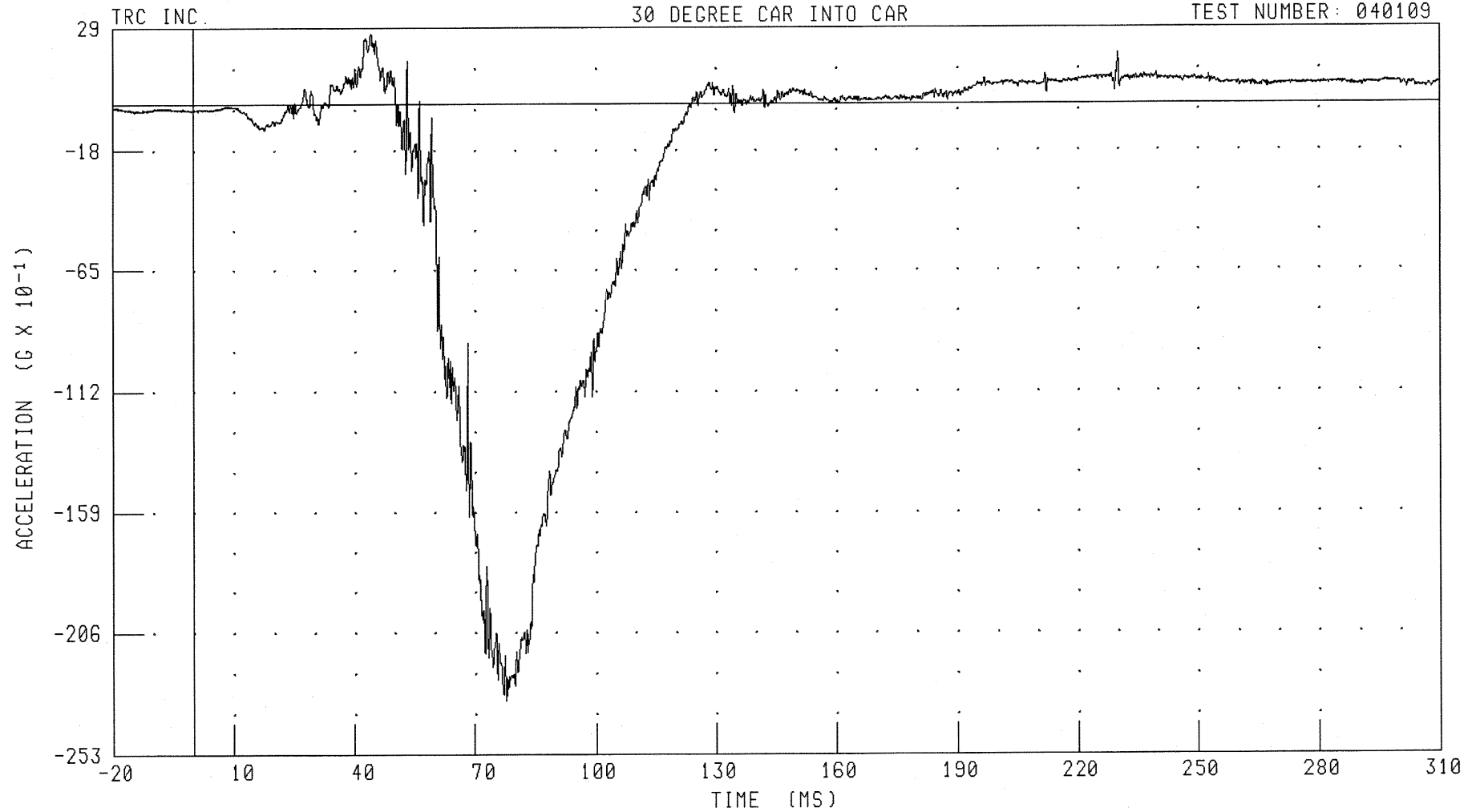
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER PELVIS Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVZGA FILTER: CH. CLASS 1000

PEAK DATA: 2.69 G @ 44.32 MS; -23.22 G @ 77.84 MS

B-111

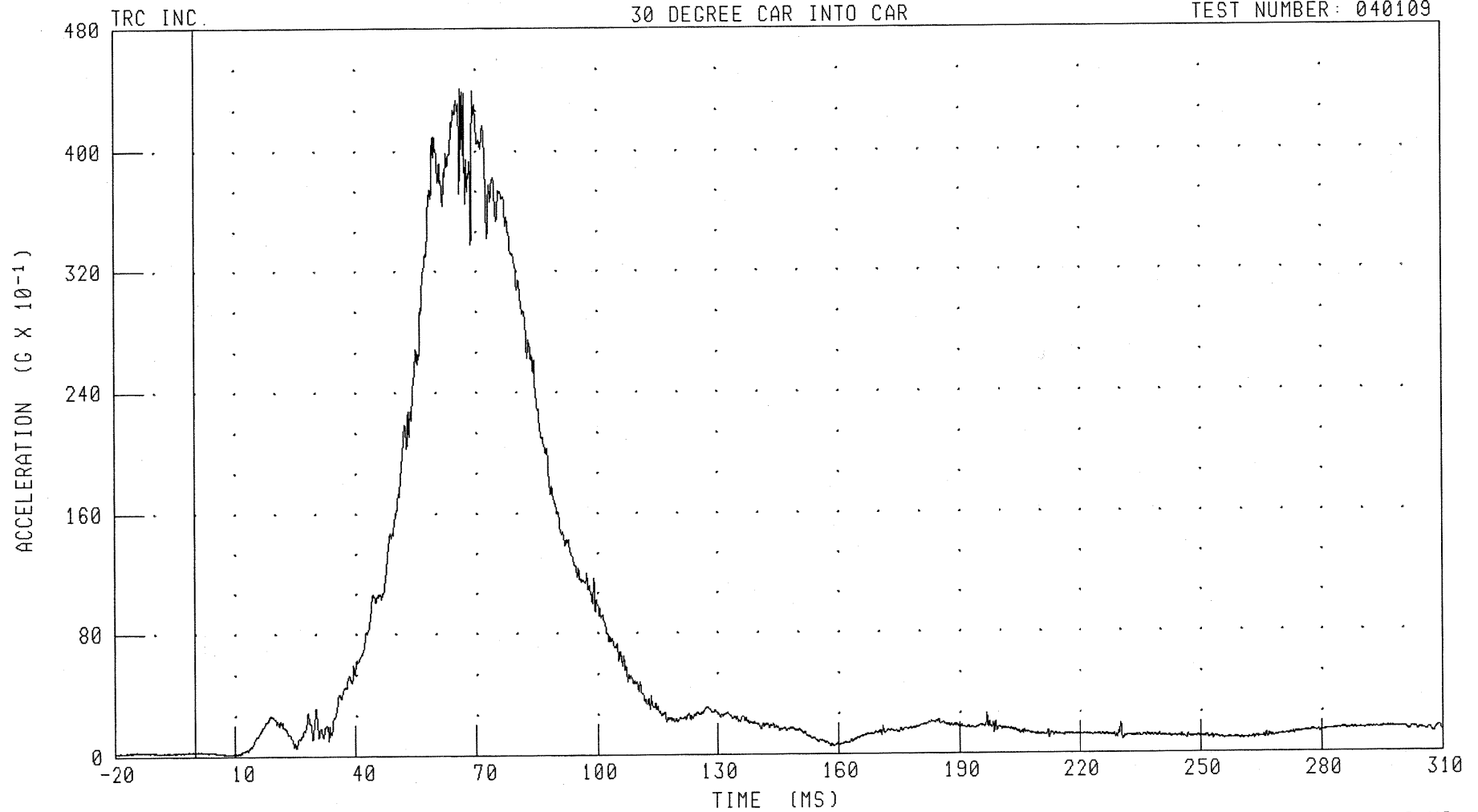
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER PELVIS RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVRGA FILTER: CH. CLASS 1000

PEAK DATA: 44.07 G @ 66.40 MS; 0.10 G @ 8.16 MS

B-112

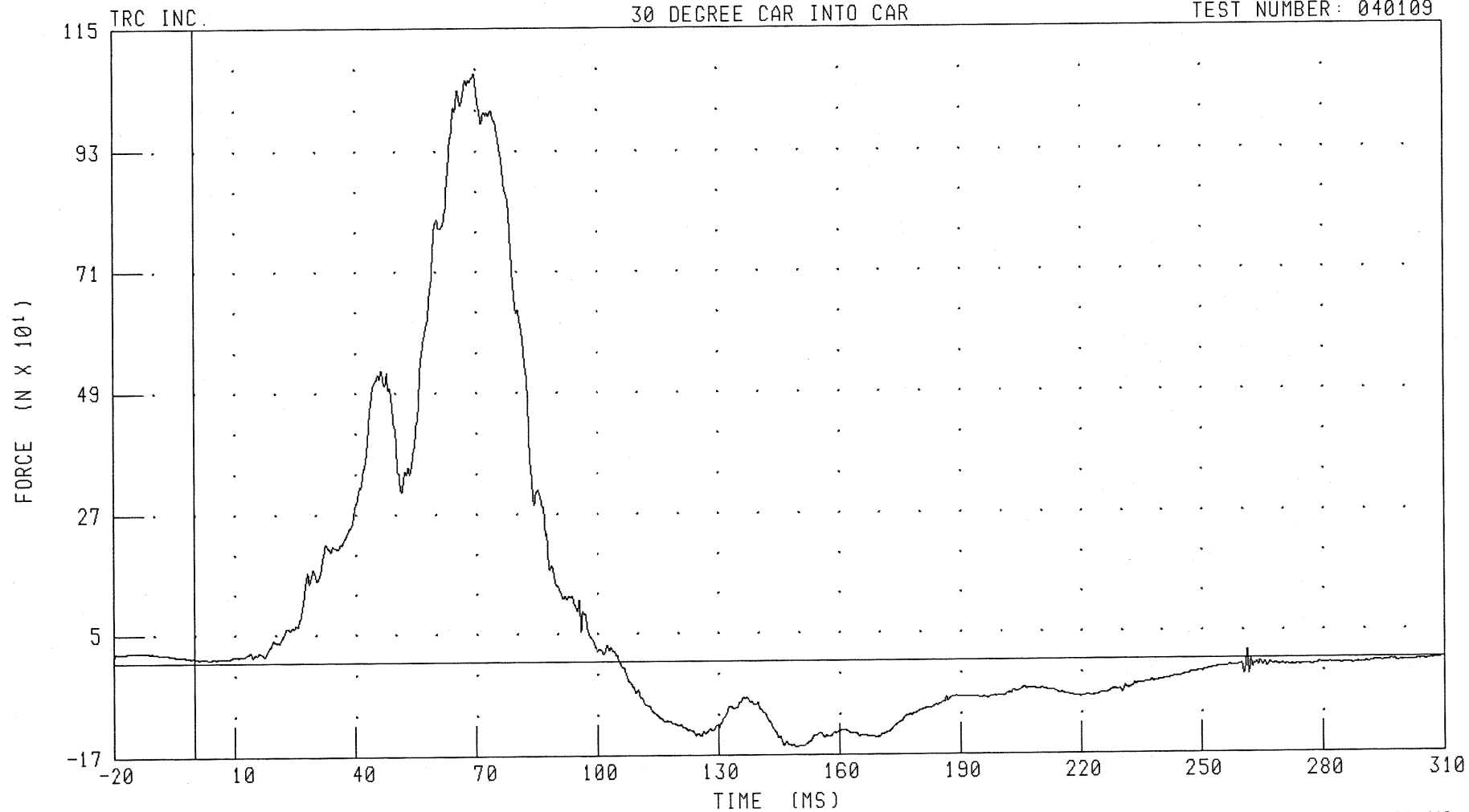
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT FEMUR X-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMXFA FILTER: CH. CLASS 600

B-113

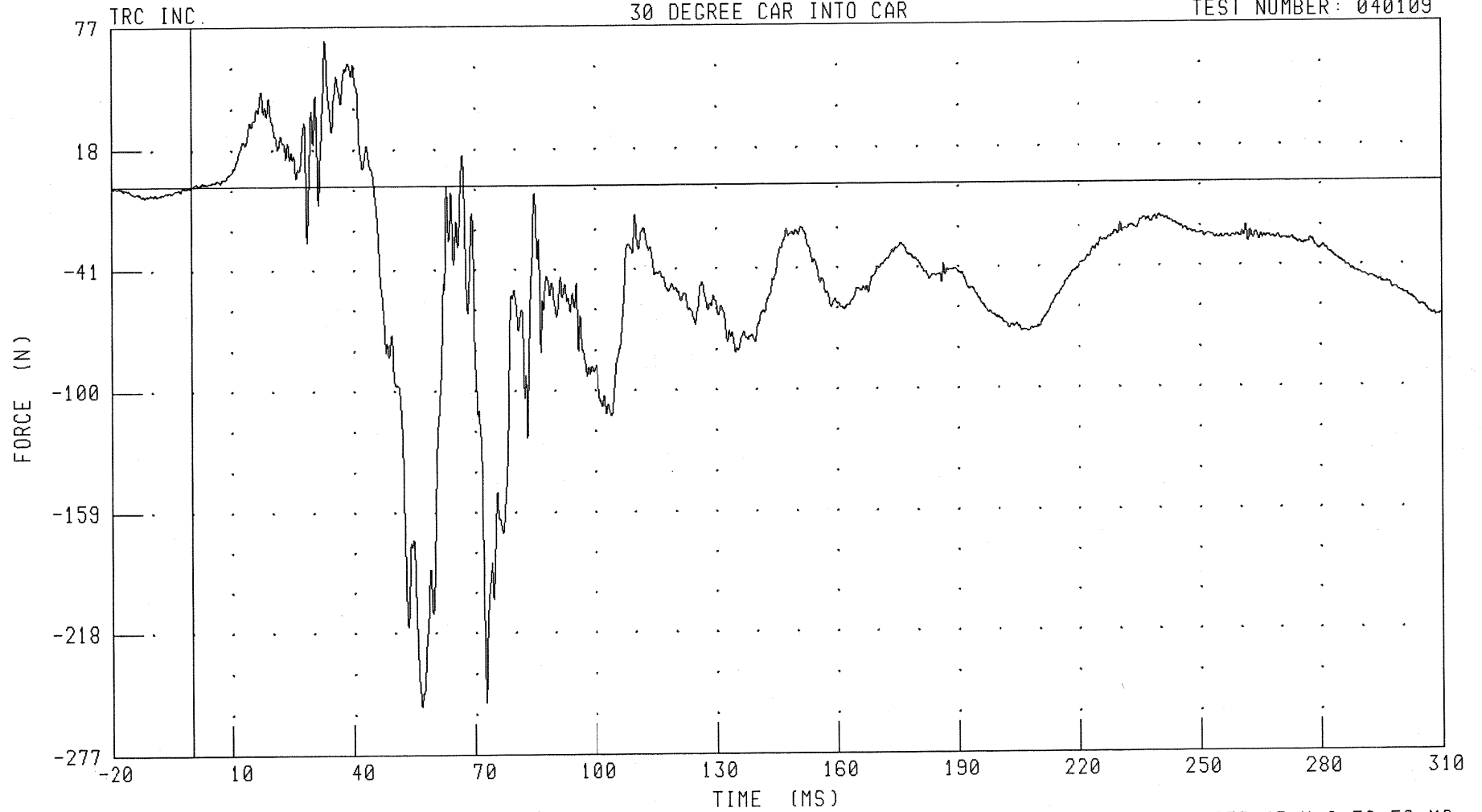
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT FEMUR Y-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMYFA FILTER: CH. CLASS 600

B-114

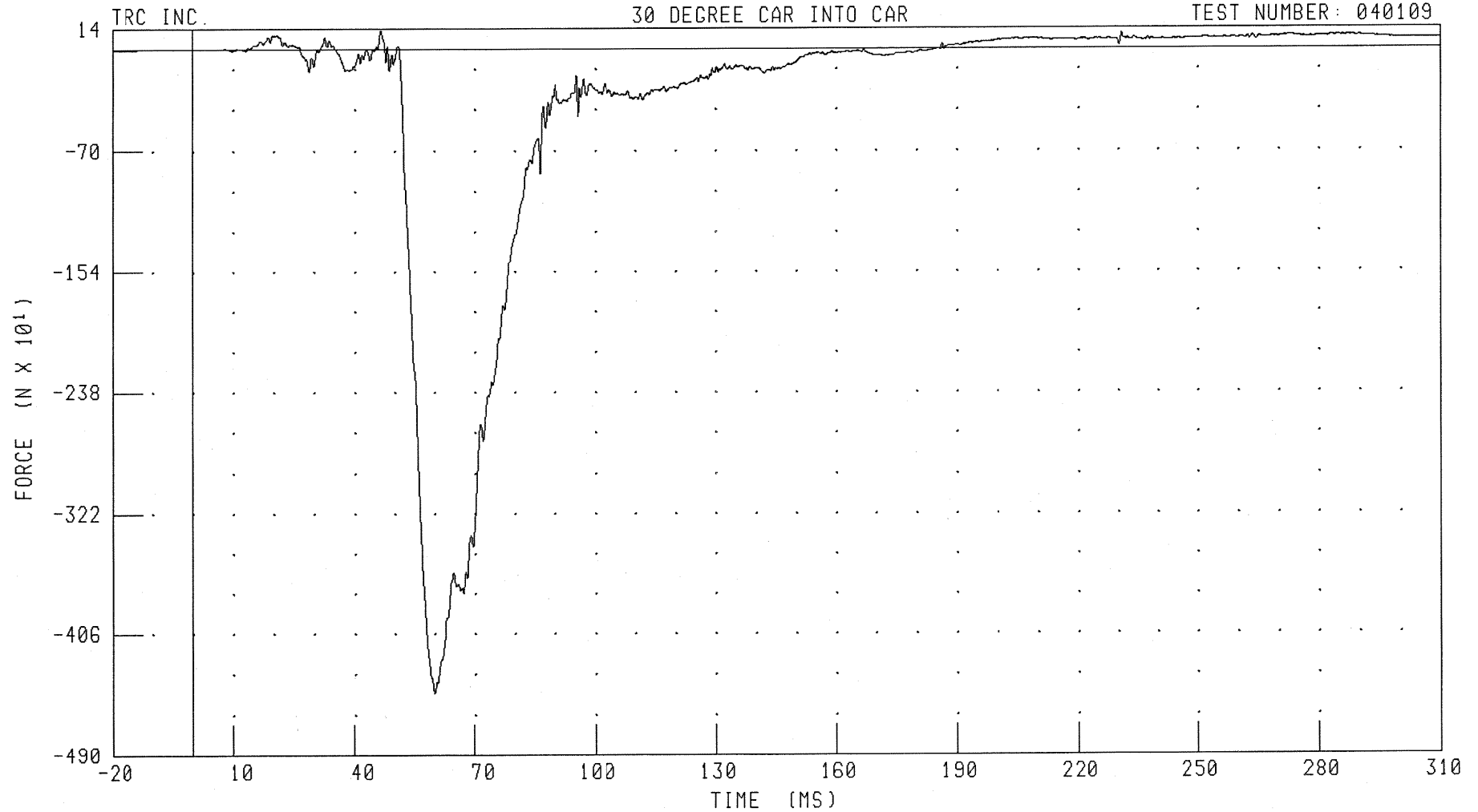
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT FEMUR Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMZFA FILTER: CH. CLASS 600

B-115

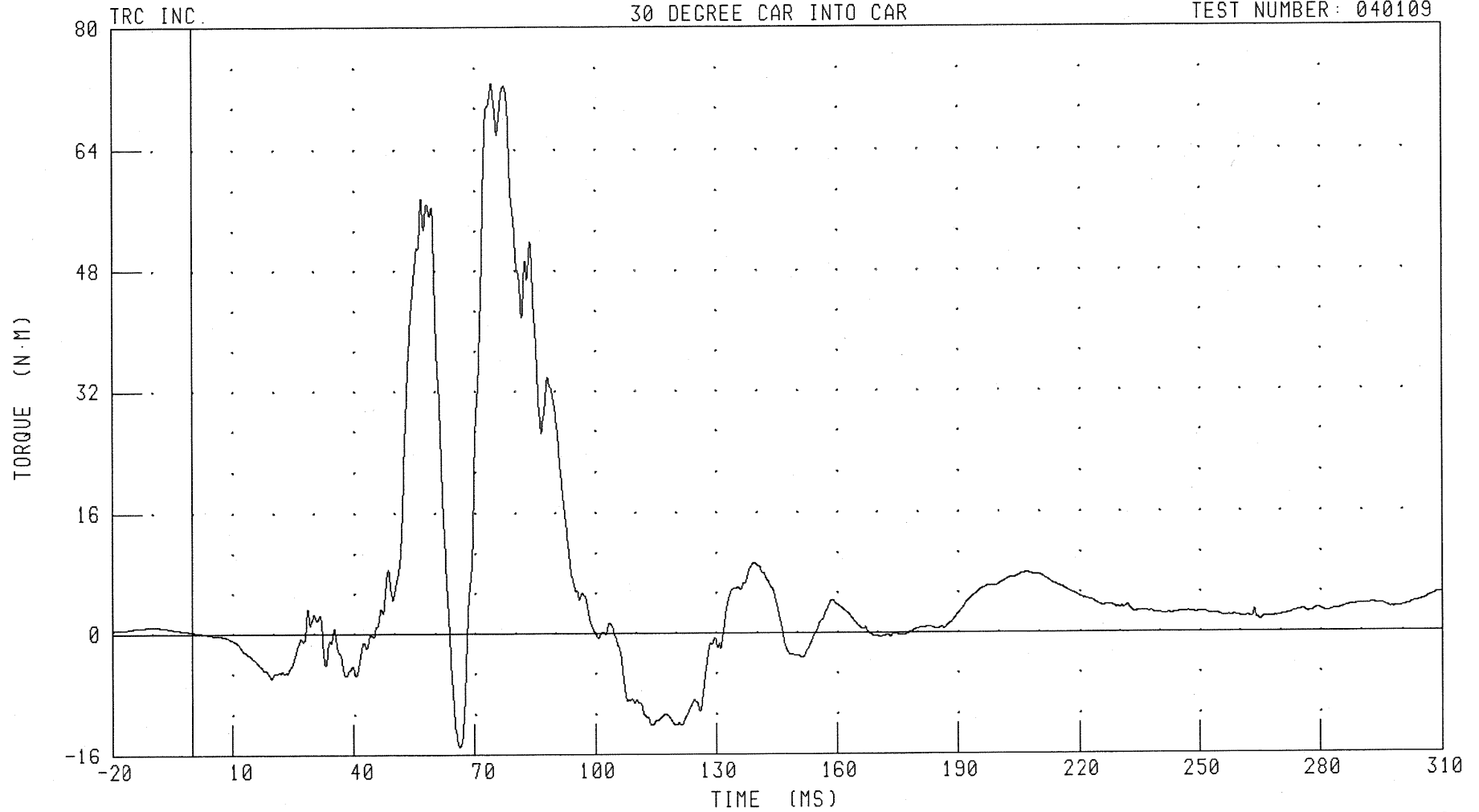
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT FEMUR MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMXMA FILTER: CH. CLASS 600

B-116

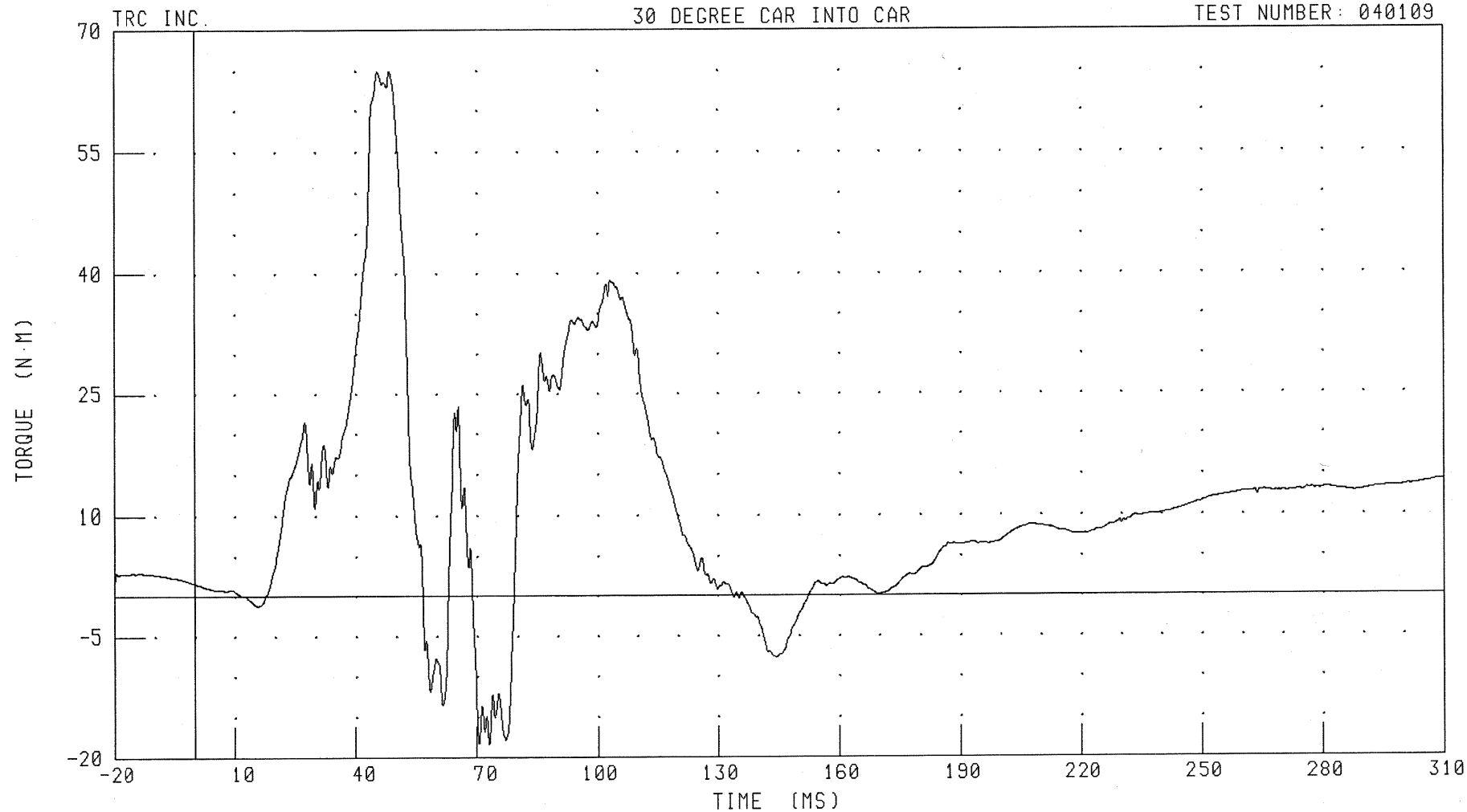
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT FEMUR MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMVMA FILTER: CH. CLASS 600

PEAK DATA: 64.97 N·M @ 48.48 MS; -18.35 N·M @ 73.04 MS

B-117

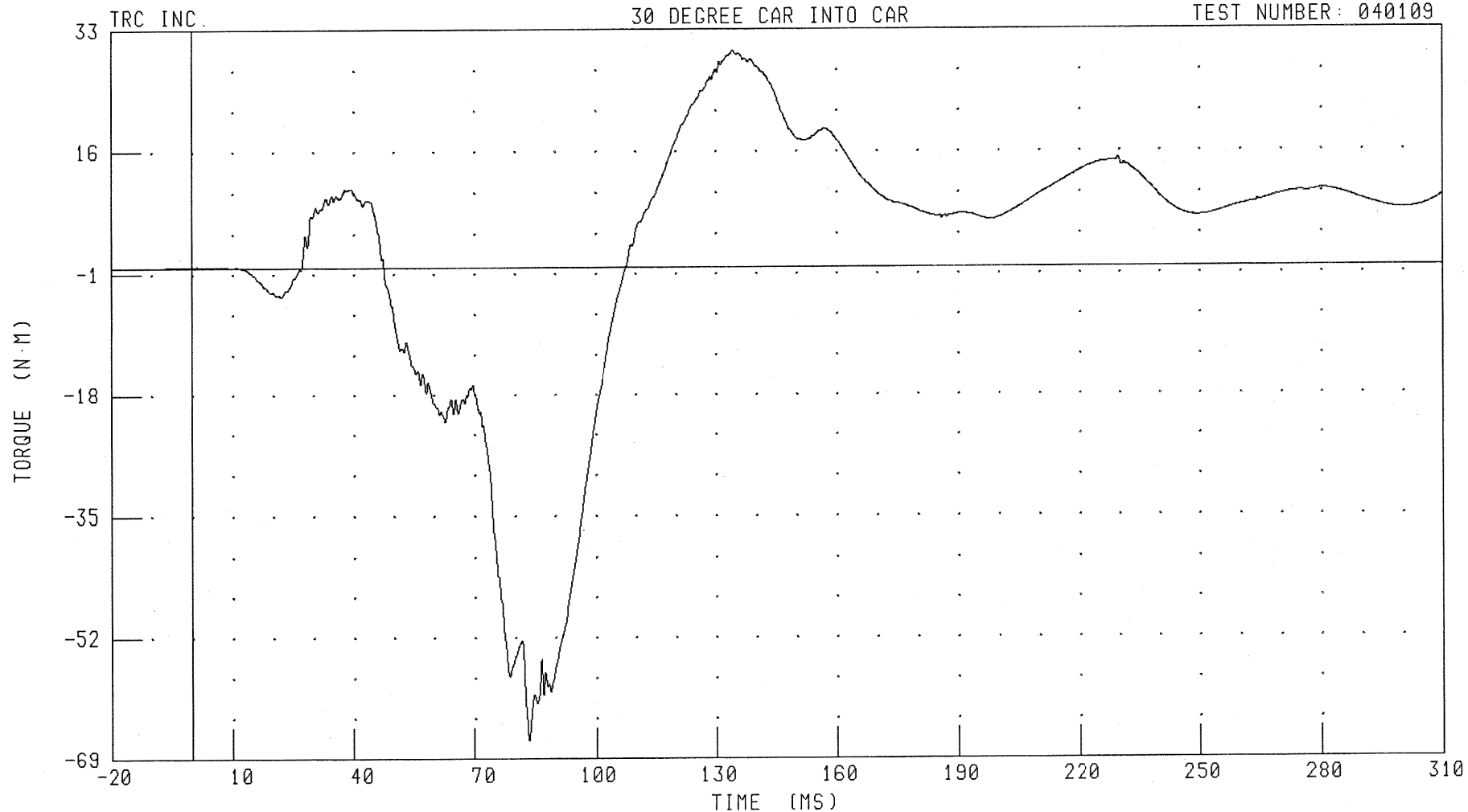
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT FEMUR MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMZMA FILTER: CH. CLASS 600

PEAK DATA: 30.03 N·M @ 134.32 MS; -66.46 N·M @ 83.44 MS

B-118

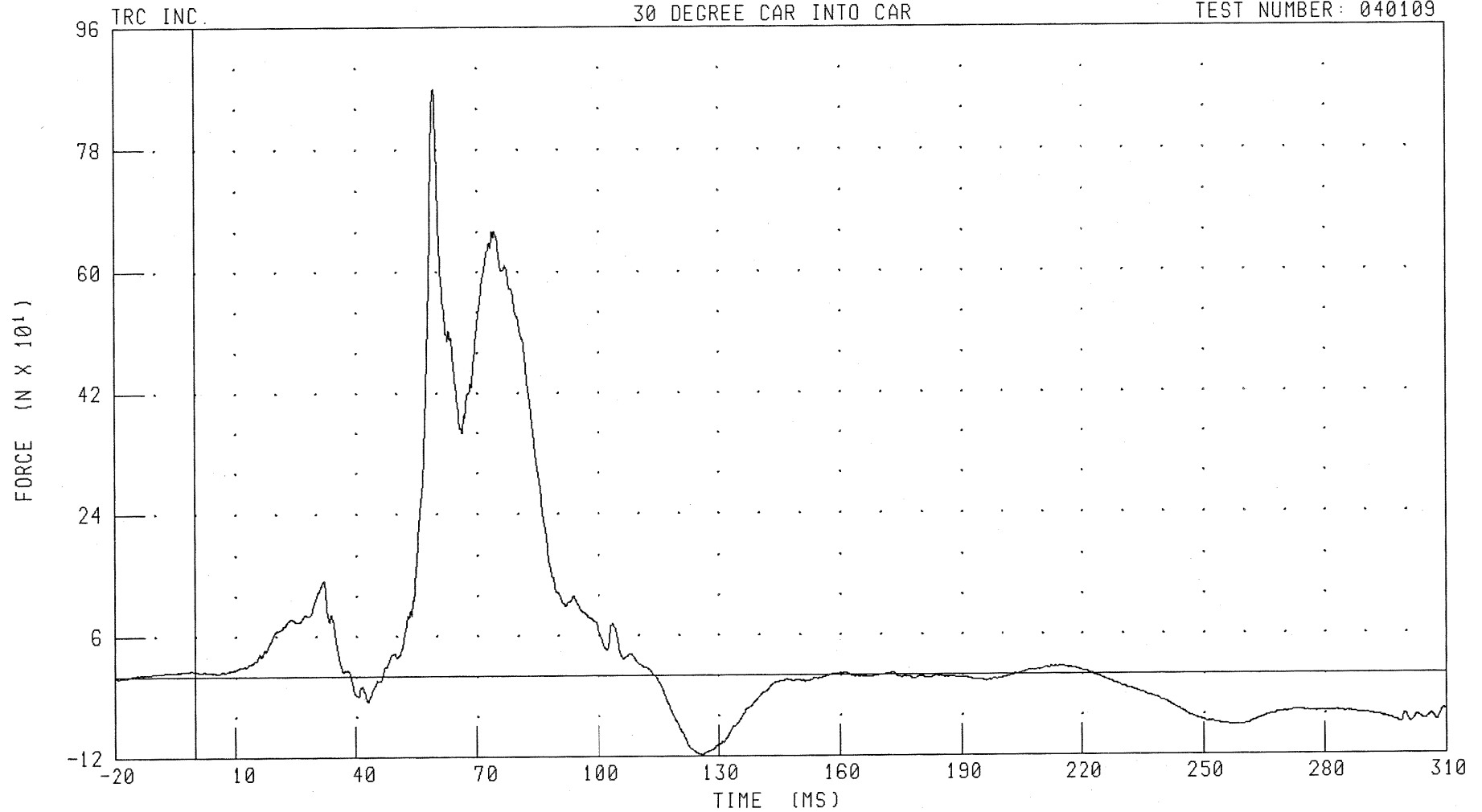
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER RIGHT FEMUR X-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMXFA FILTER: CH. CLASS 600

PEAK DATA: 868.76 N @ 59.36 MS; -118.12 N @ 126.00 MS

B-119

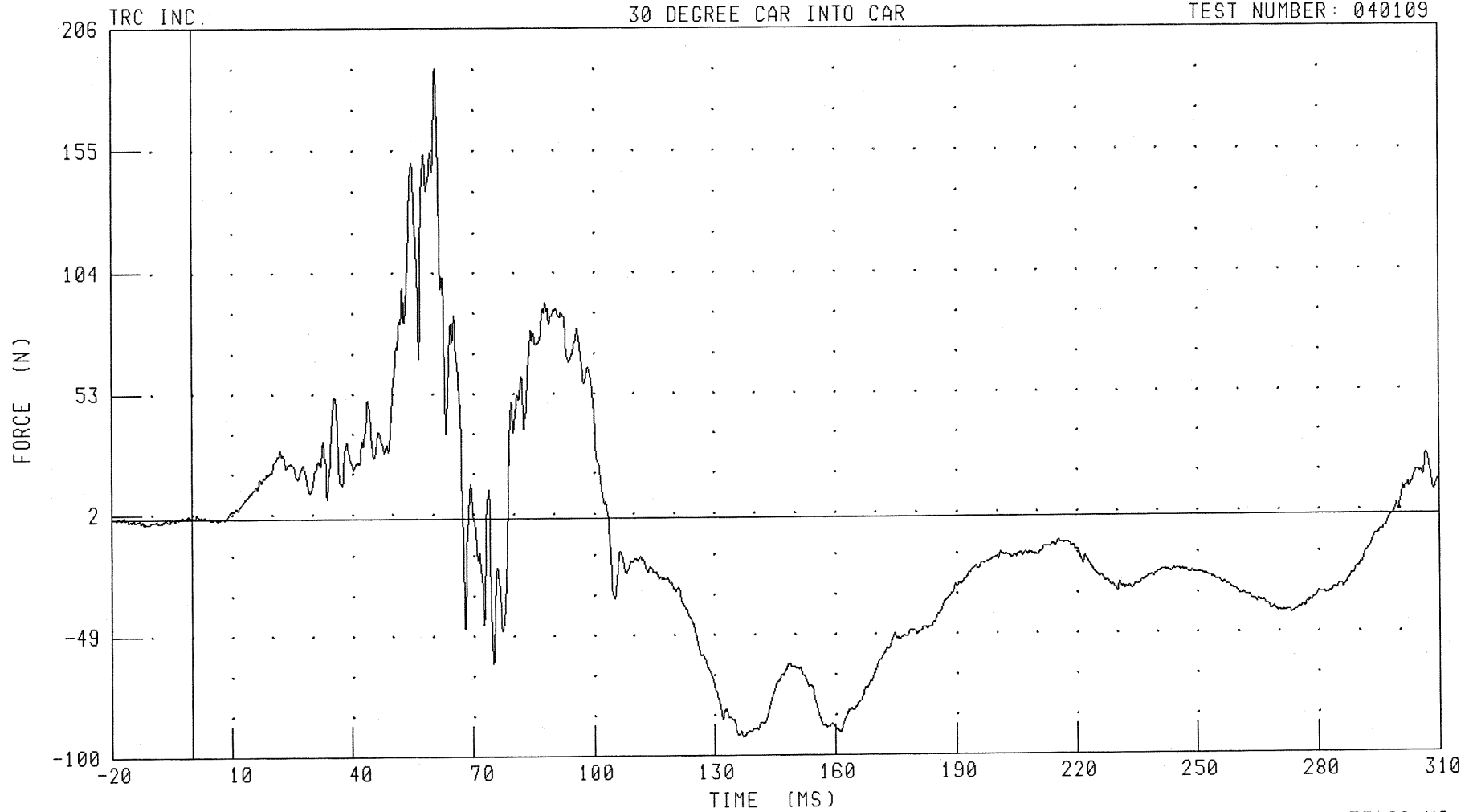
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER RIGHT FEMUR Y-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMYFA FILTER: CH. CLASS 600

PEAK DATA: 189.40 N @ 60.64 MS; -92.15 N @ 137.20 MS

B-120

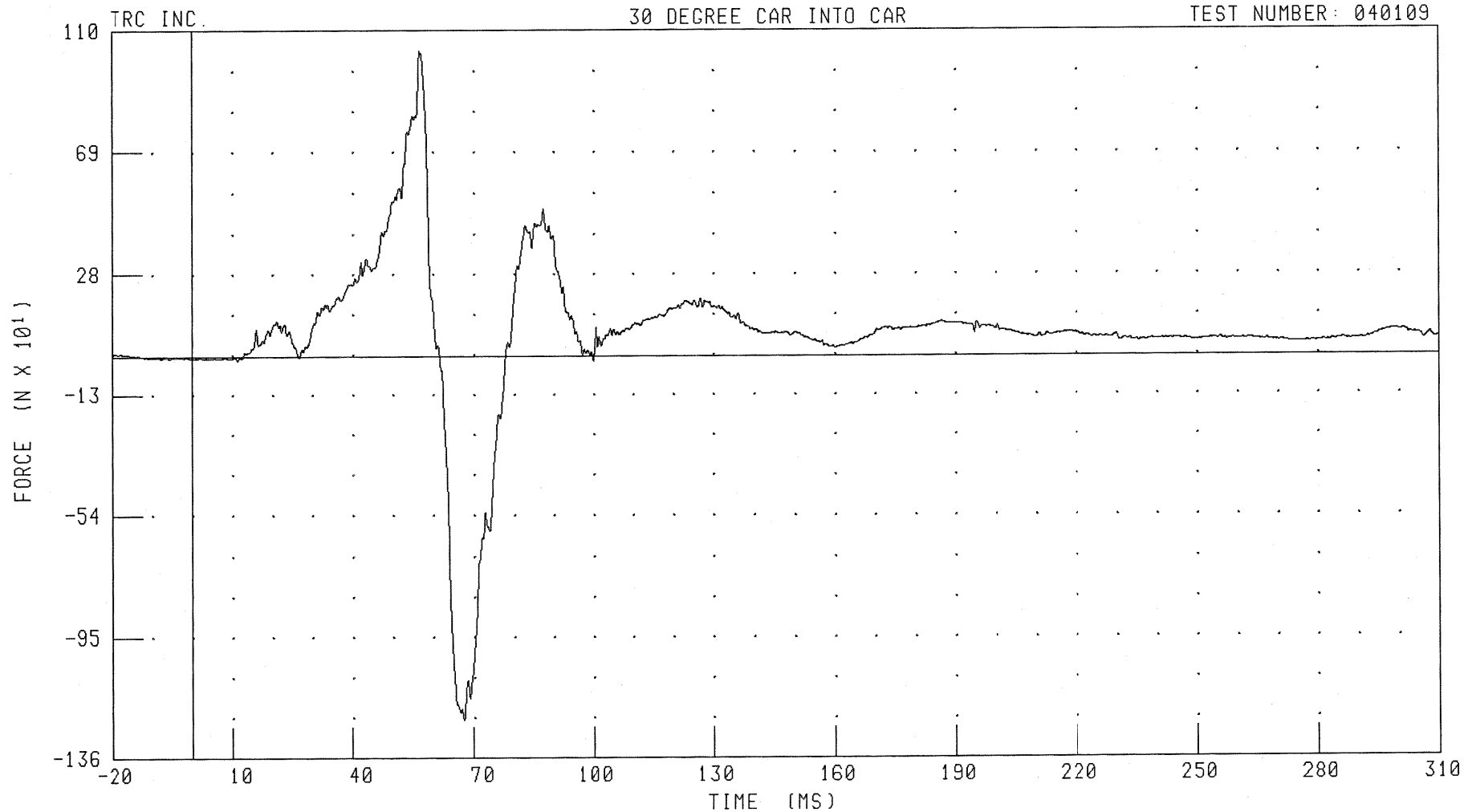
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER RIGHT FEMUR Z-AXIS FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMZFA FILTER: CH. CLASS 600

B-121

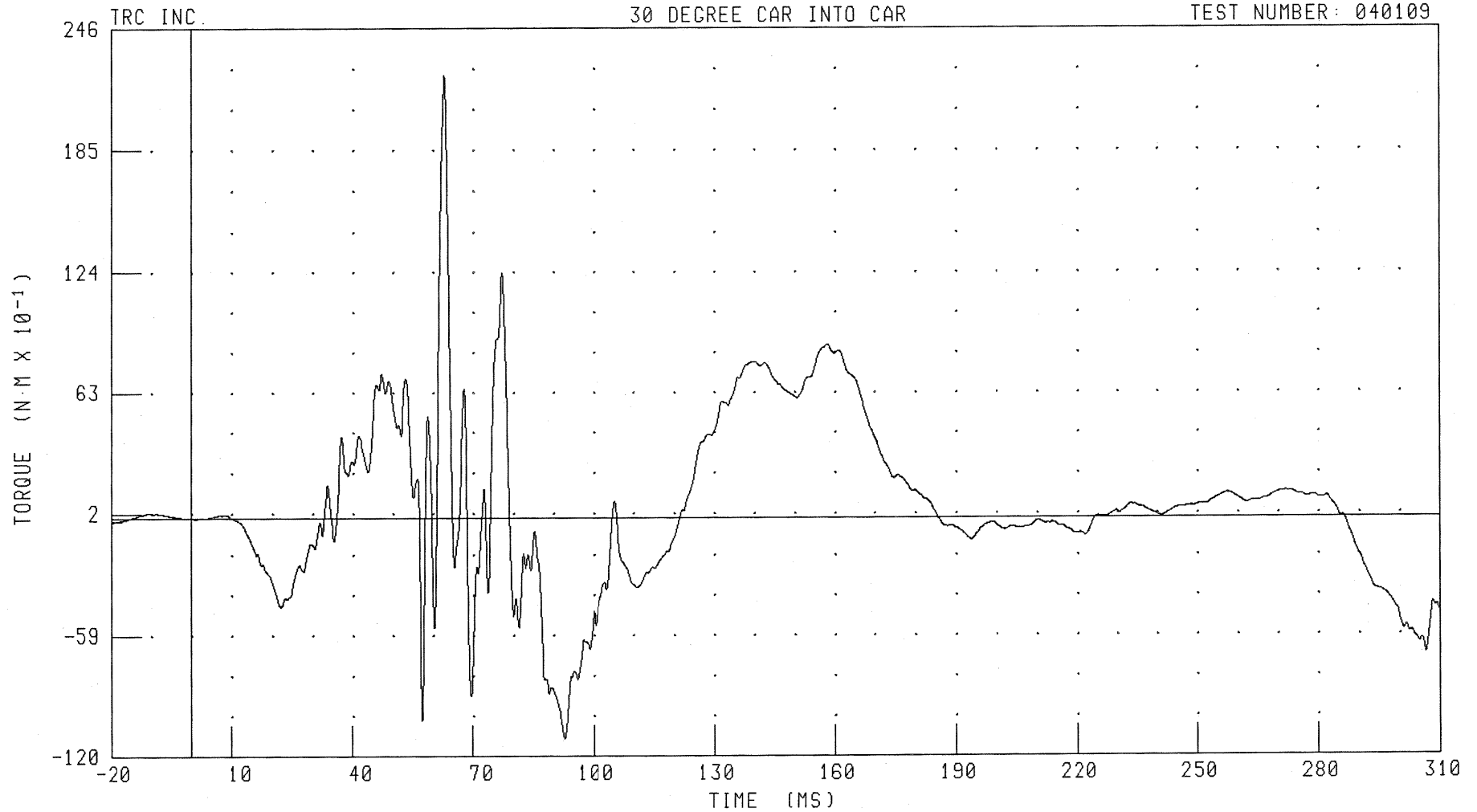
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER RIGHT FEMUR MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMXMA FILTER: CH. CLASS 600

PEAK DATA: 22.23 N·M @ 62.88 MS; -11.13 N·M @ 92.72 MS

B-122

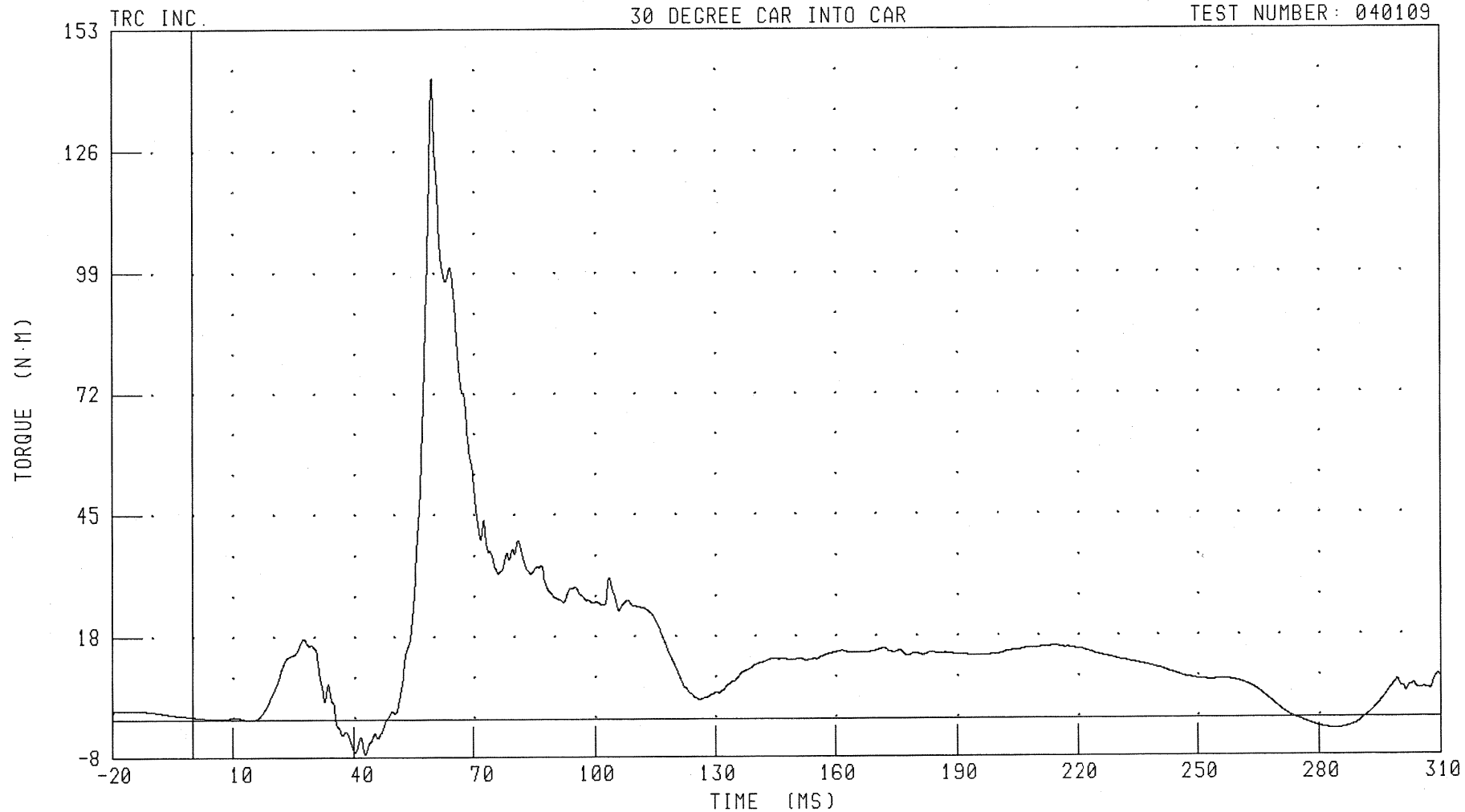
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER RIGHT FEMUR MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMYMA FILTER: CH. CLASS 600

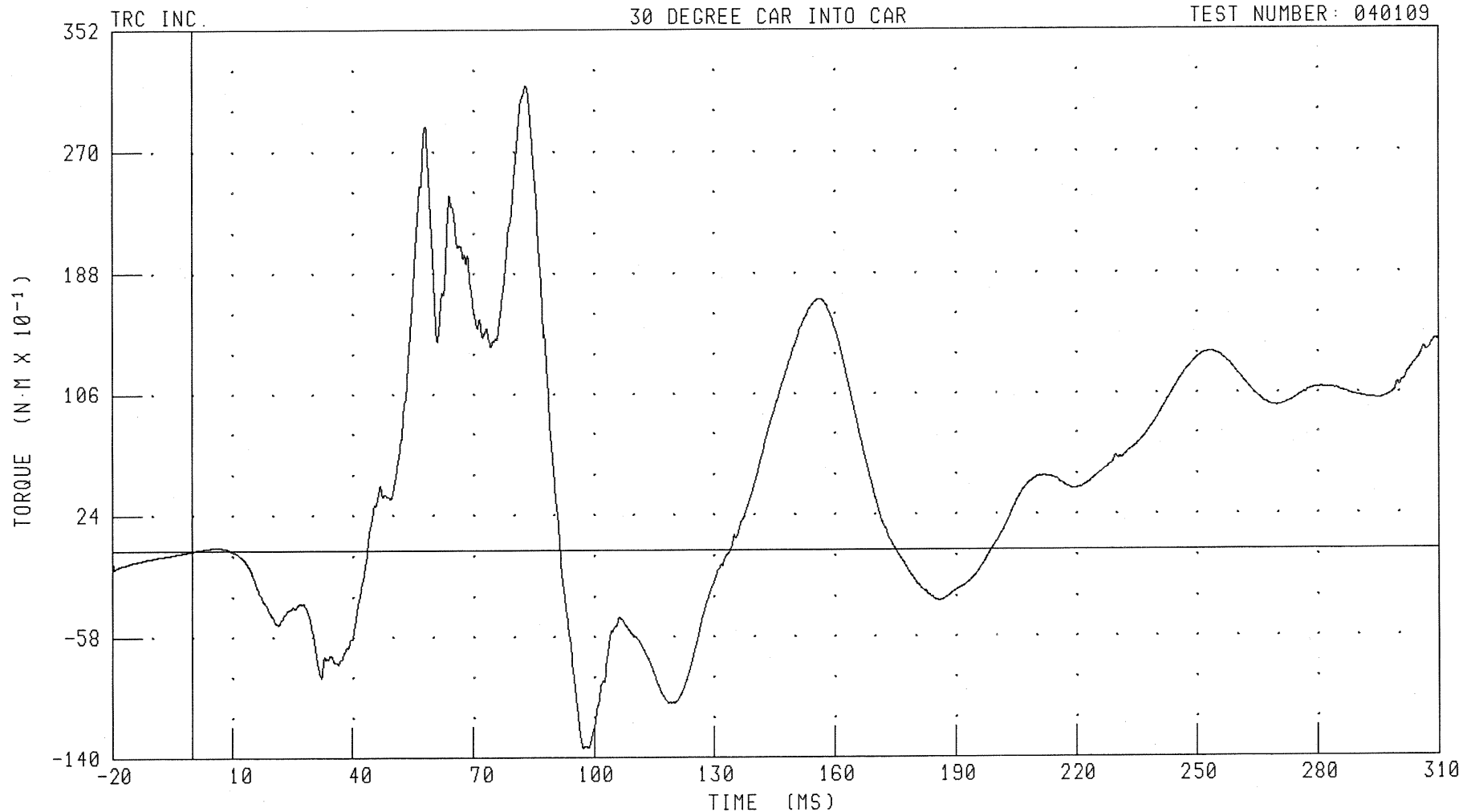
B-123

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
BULLET DRIVER RIGHT FEMUR MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMZMA FILTER: CH. CLASS 600

B-124

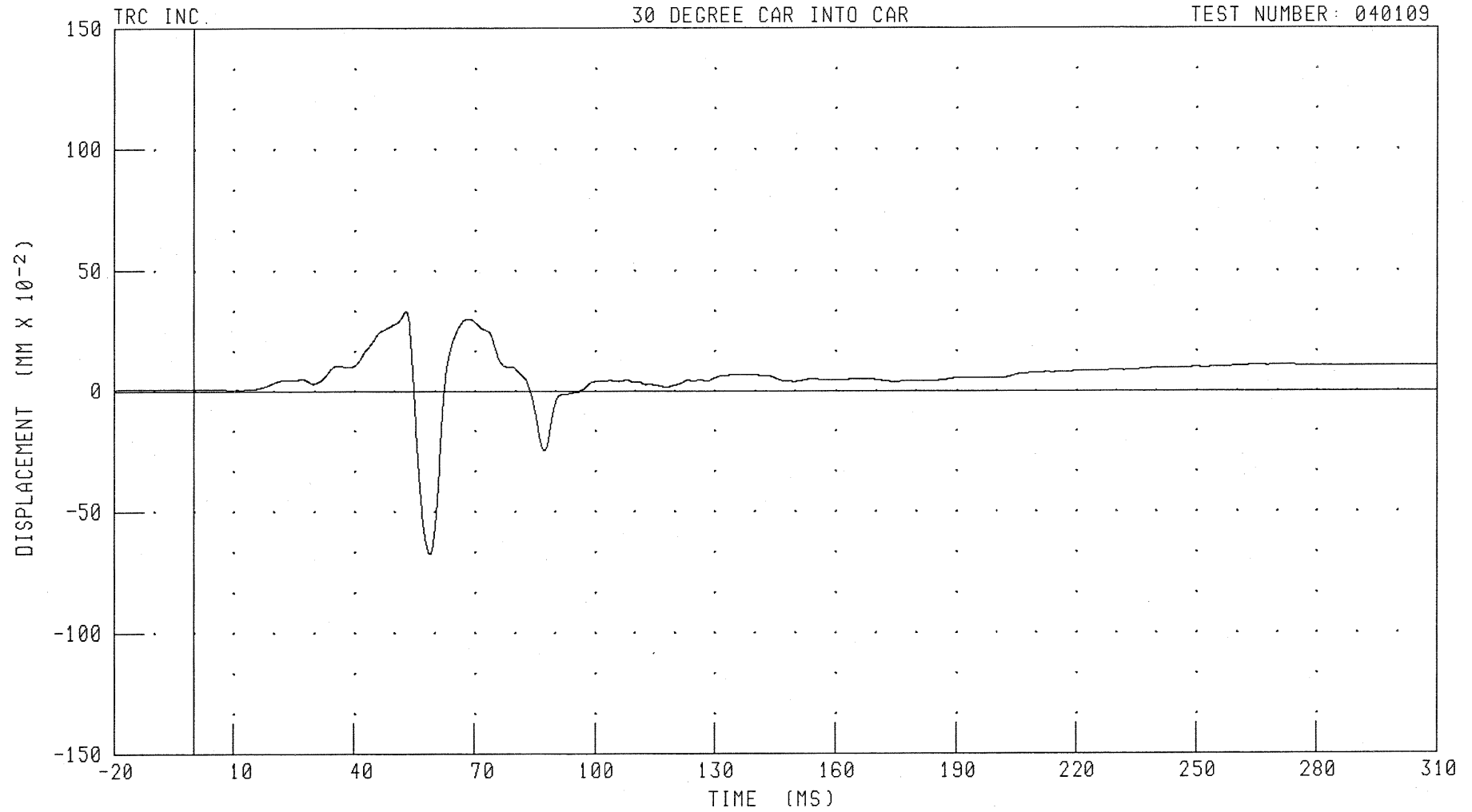
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER LEFT KNEE DISPLACEMENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: KNLXDA FILTER: CH. CLASS 180

PEAK DATA: 0.33 MM @ 52.96 MS; -0.68 MM @ 58.88 MS

B-125

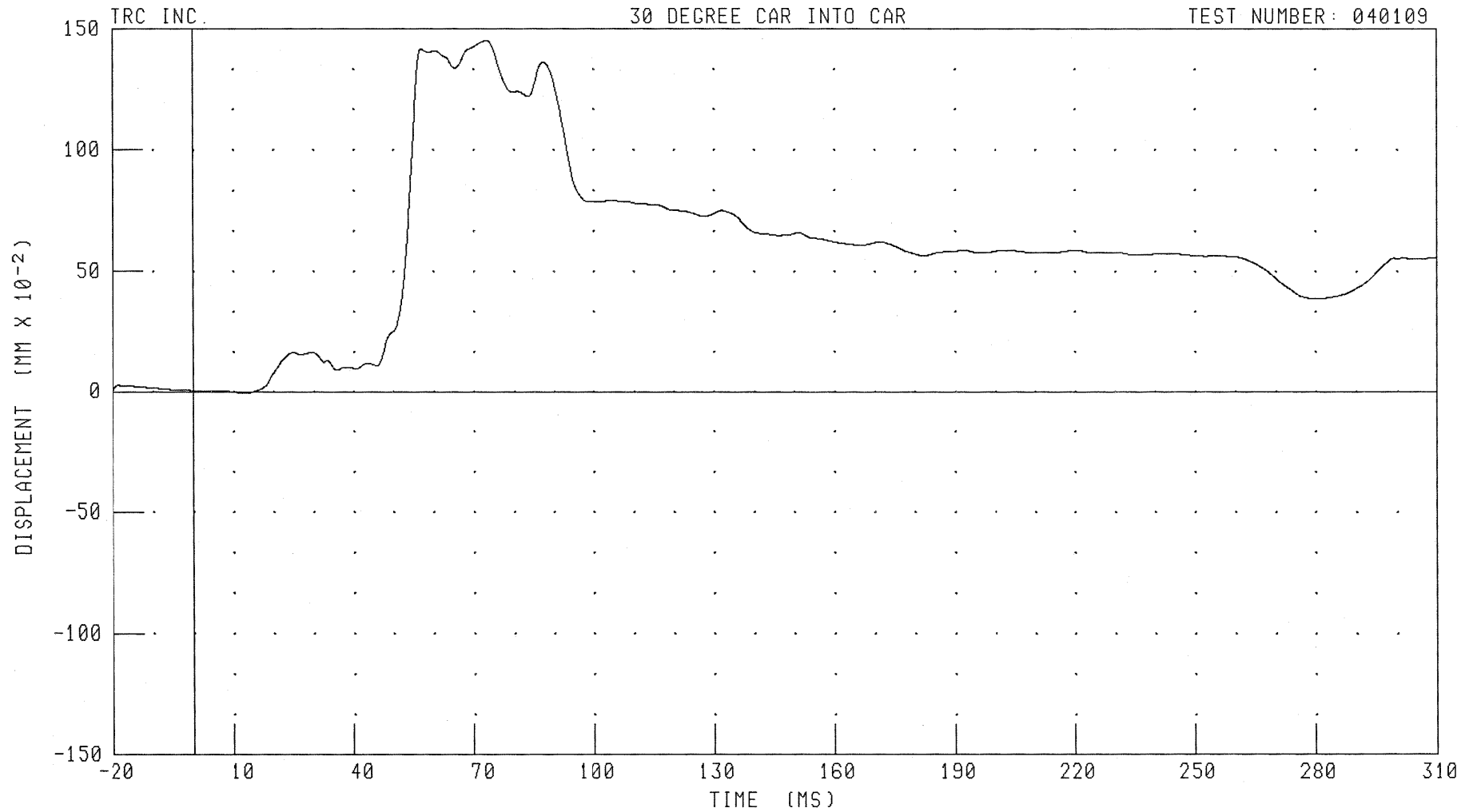
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER RIGHT KNEE DISPLACEMENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: KNRXDA FILTER: CH. CLASS 180

PEAK DATA: 1.45 MM @ 73.44 MS; -0.01 MM @ 13.04 MS

B-126

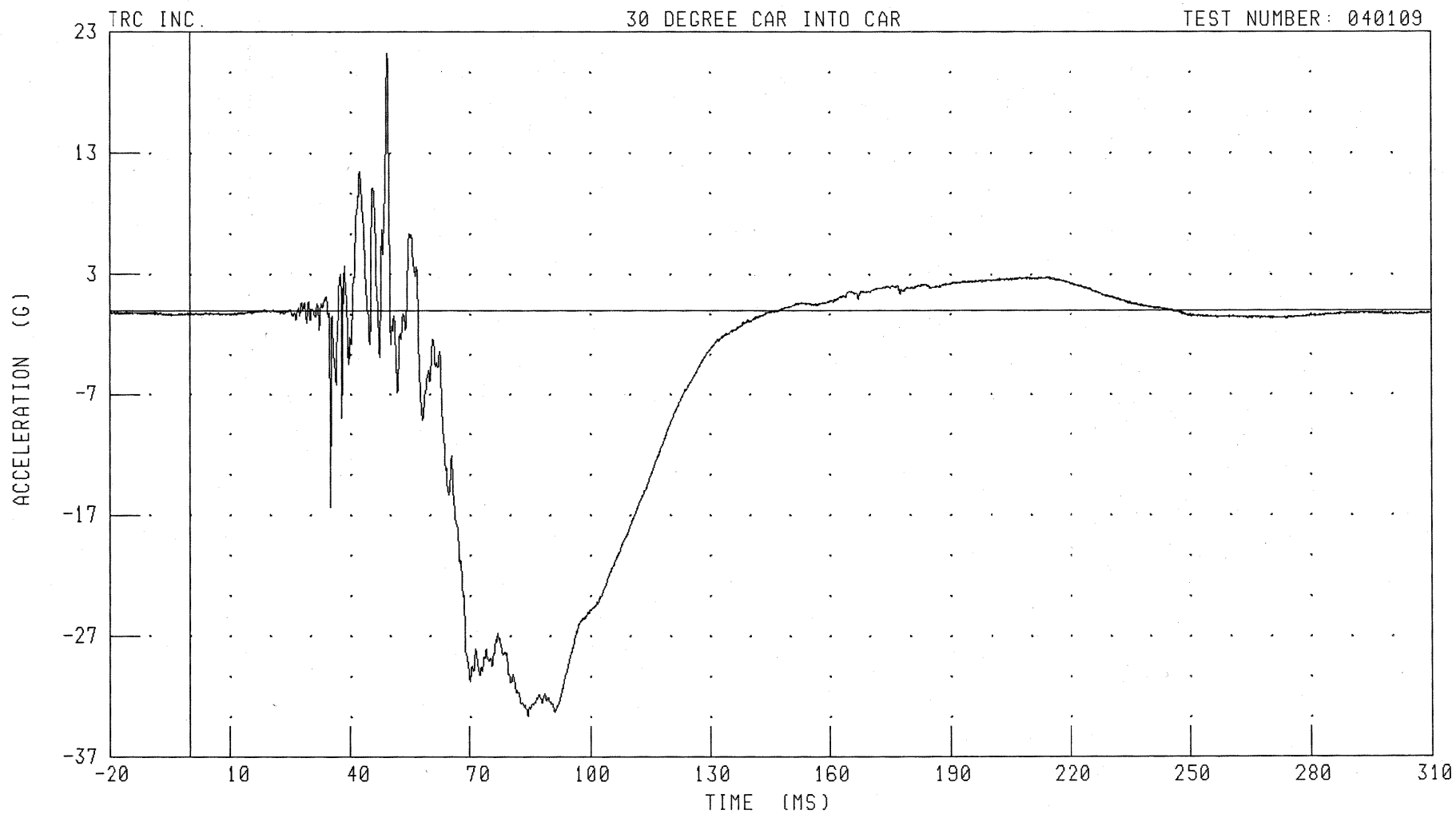
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDXGB FILTER: CH. CLASS 1000

PEAK DATA: 21.24 G @ 49.36 MS; -33.60 G @ 84.48 MS

B-127

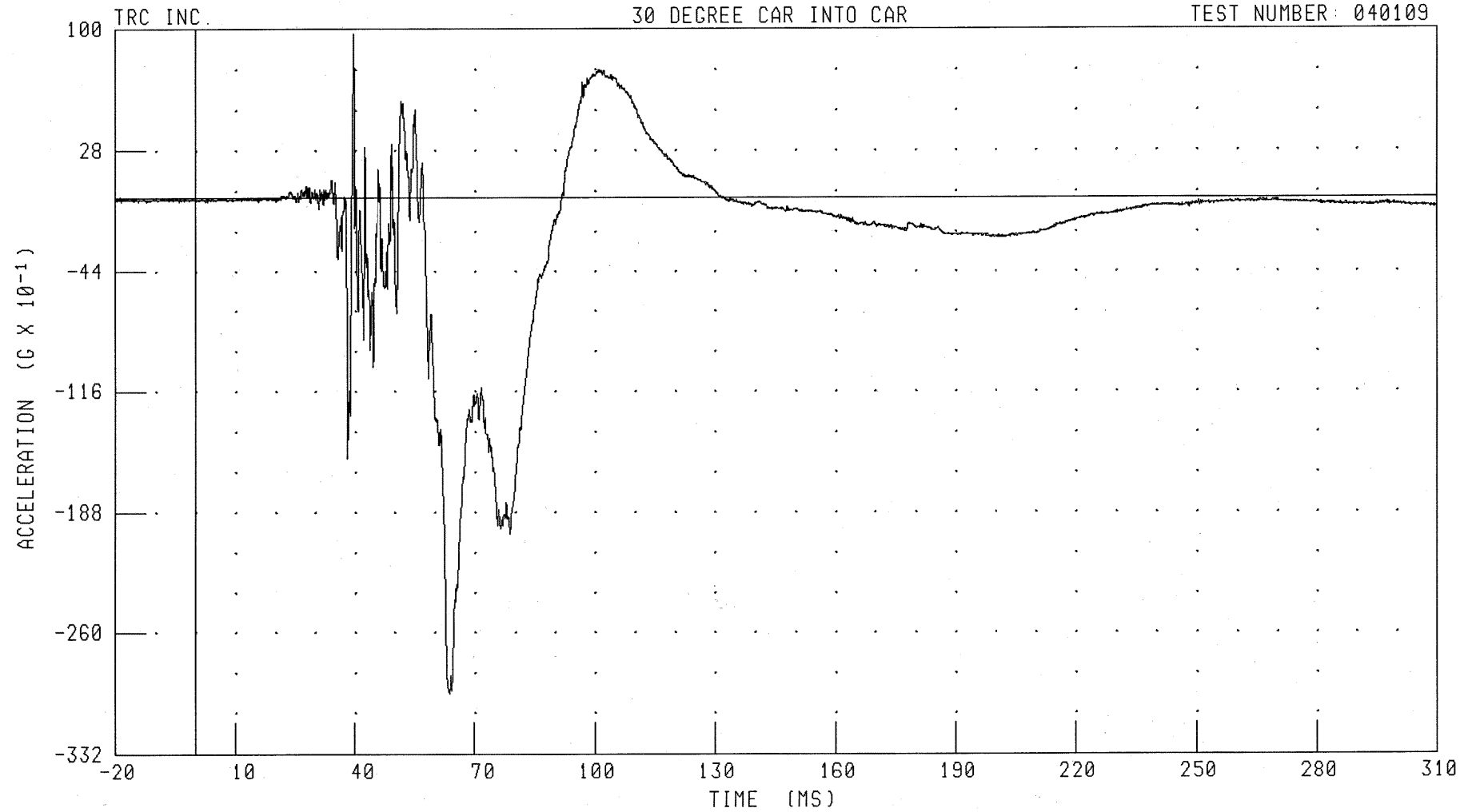
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDYGB FILTER: CH. CLASS 1000

PEAK DATA: 9.73 G @ 39.76 MS; -29.68 G @ 63.76 MS

B-128

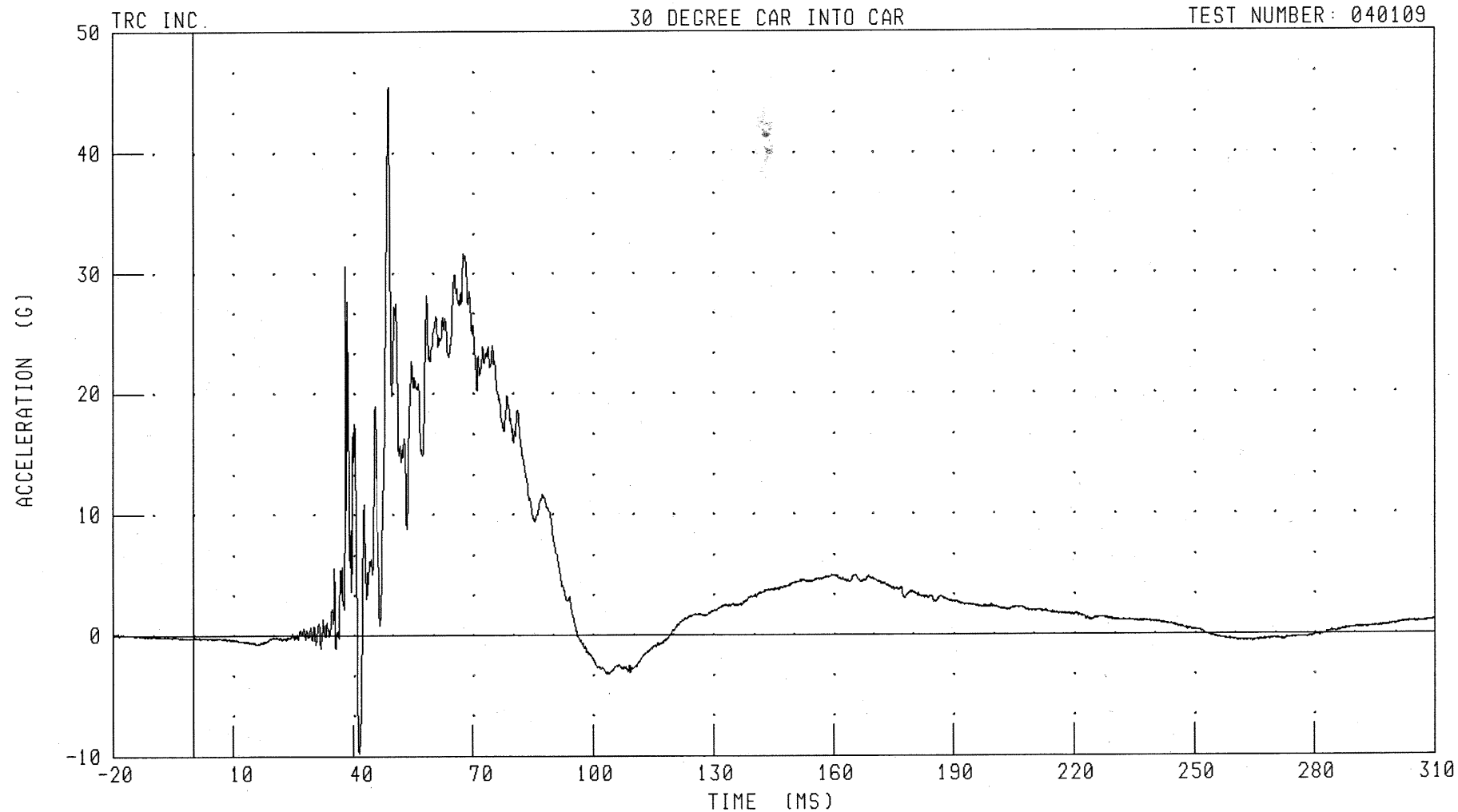
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDZGB FILTER: CH. CLASS 1000

PEAK DATA: 45.40 G @ 48.96 MS; -9.74 G @ 41.36 MS

B-129

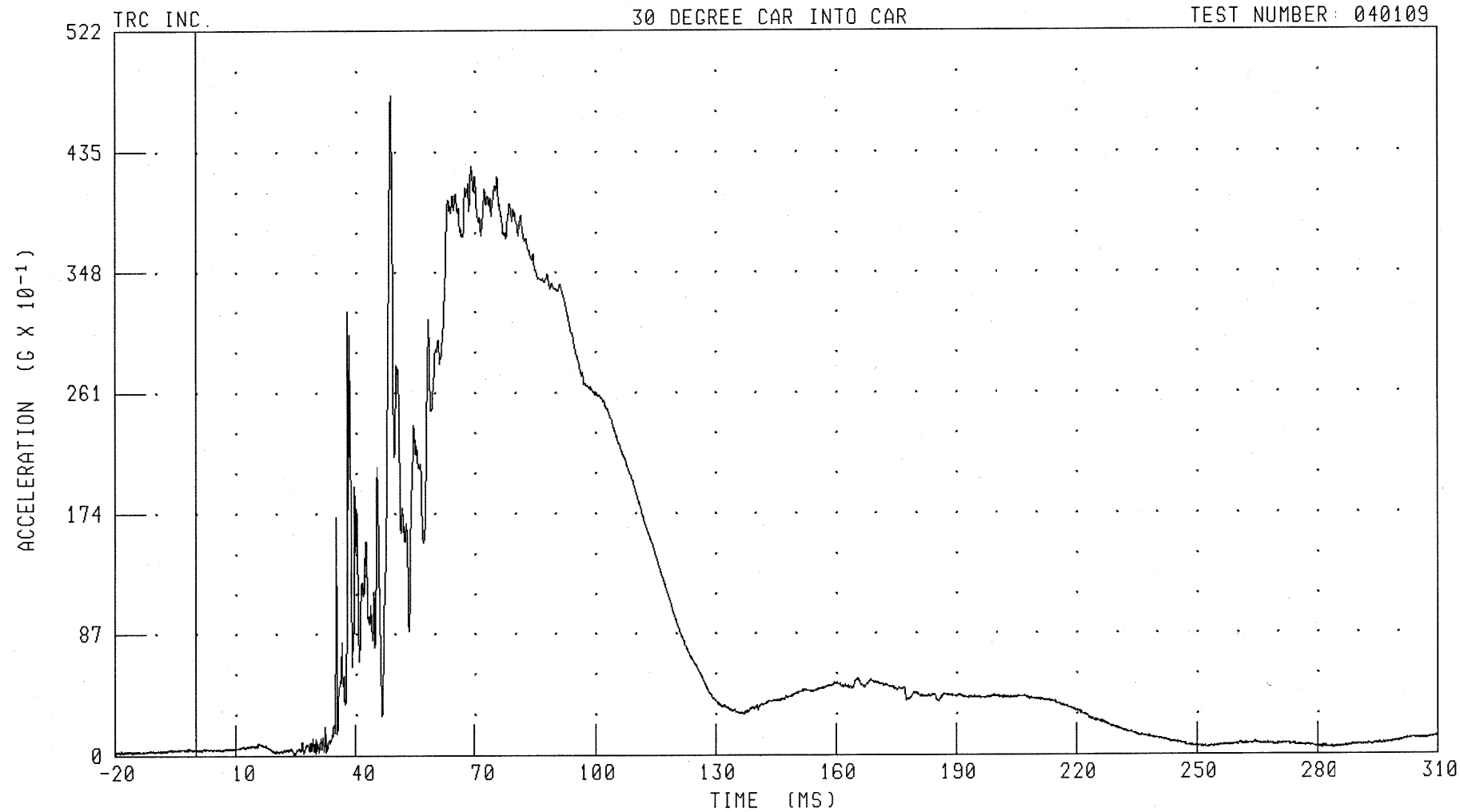
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDRGB FILTER: CH. CLASS 1000

PEAK DATA: 47.55 G @ 48.96 MS; 0.08 G @ 24.56 MS

B-130

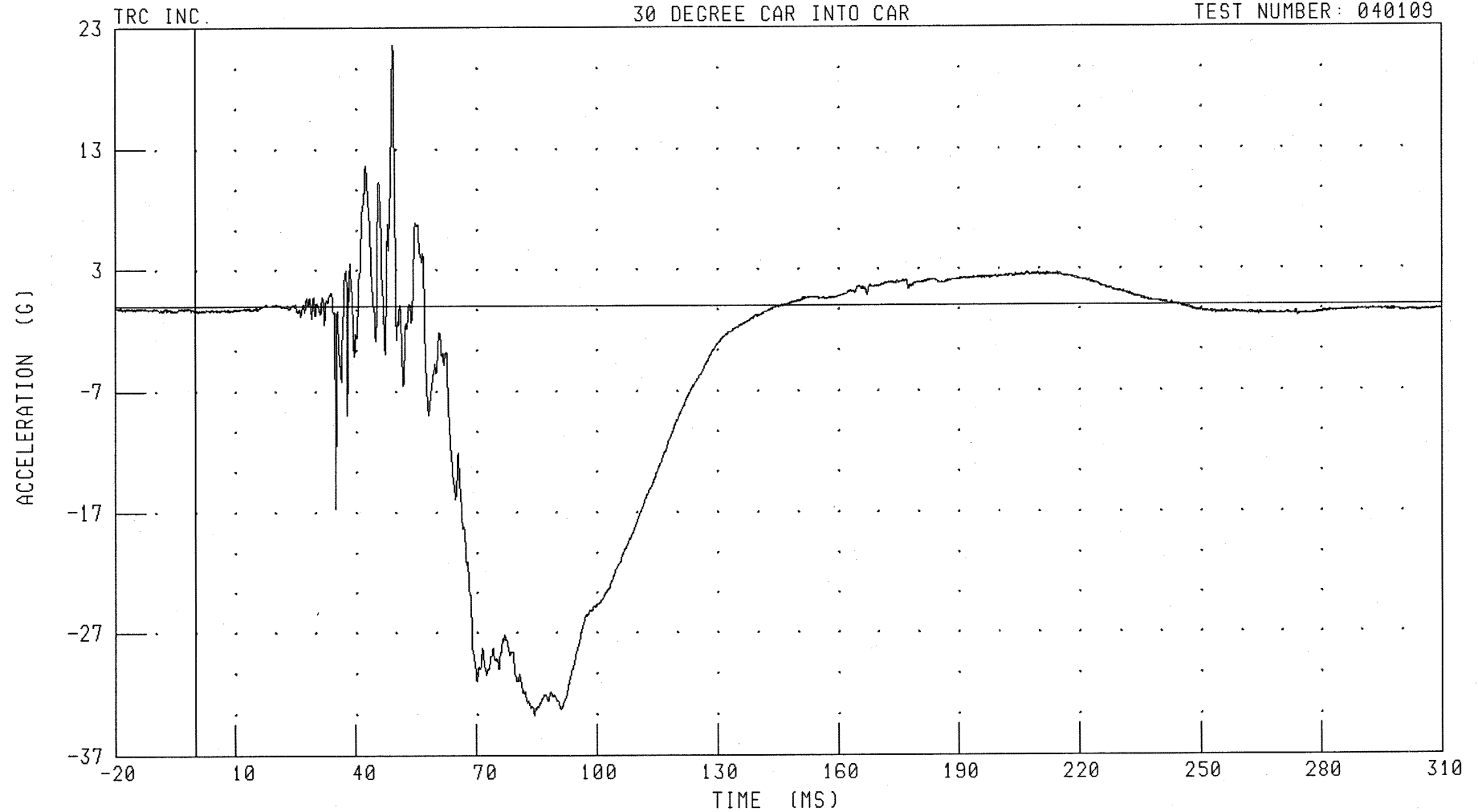
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD X-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDXRB FILTER: CH. CLASS 1000

PEAK DATA: 21.54 G @ 49.36 MS; -33.76 G @ 84.56 MS

B-131

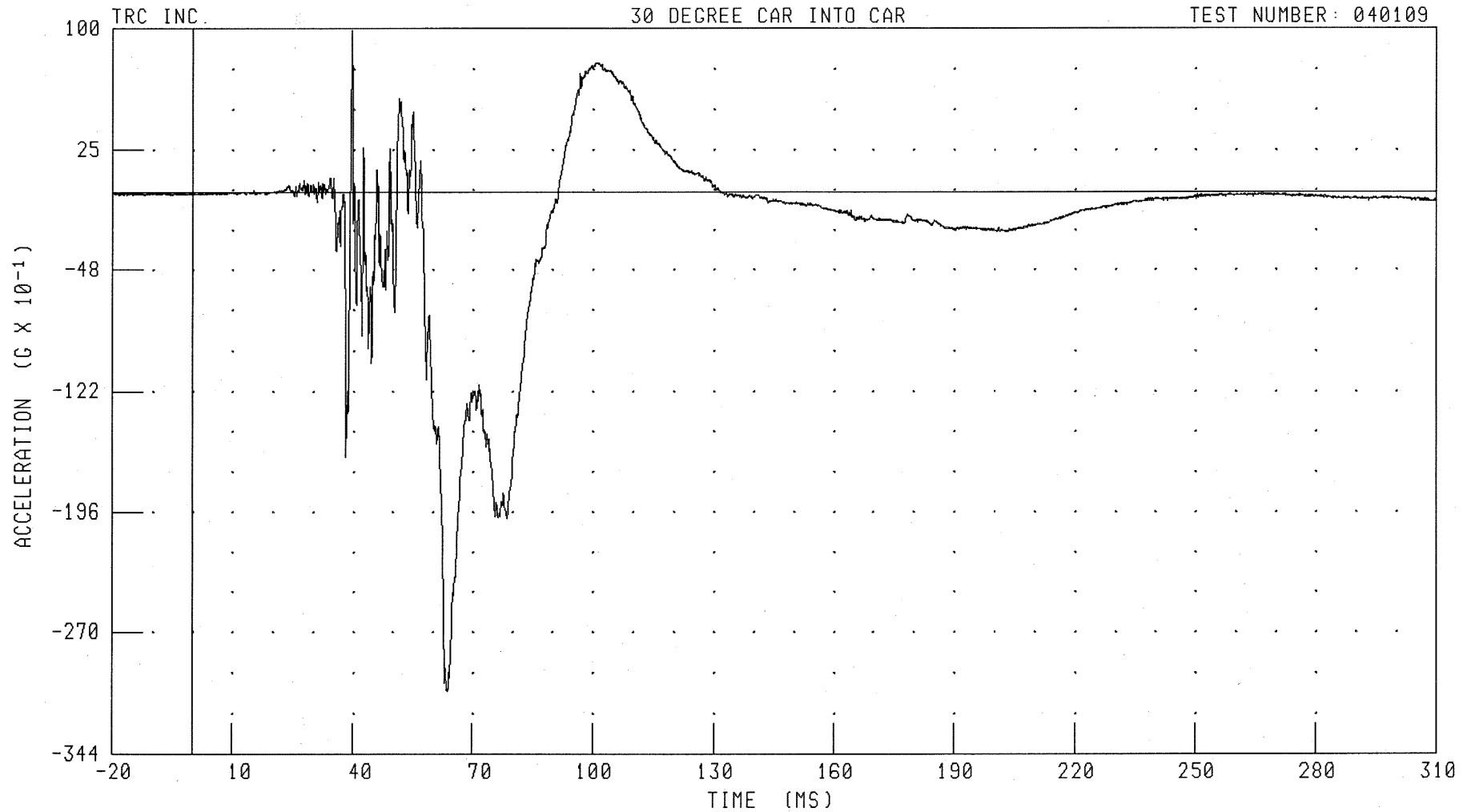
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD Y-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDYRB FILTER: CH. CLASS 1000

PEAK DATA: 9.90 G @ 39.76 MS; -30.60 G @ 63.84 MS

B-132

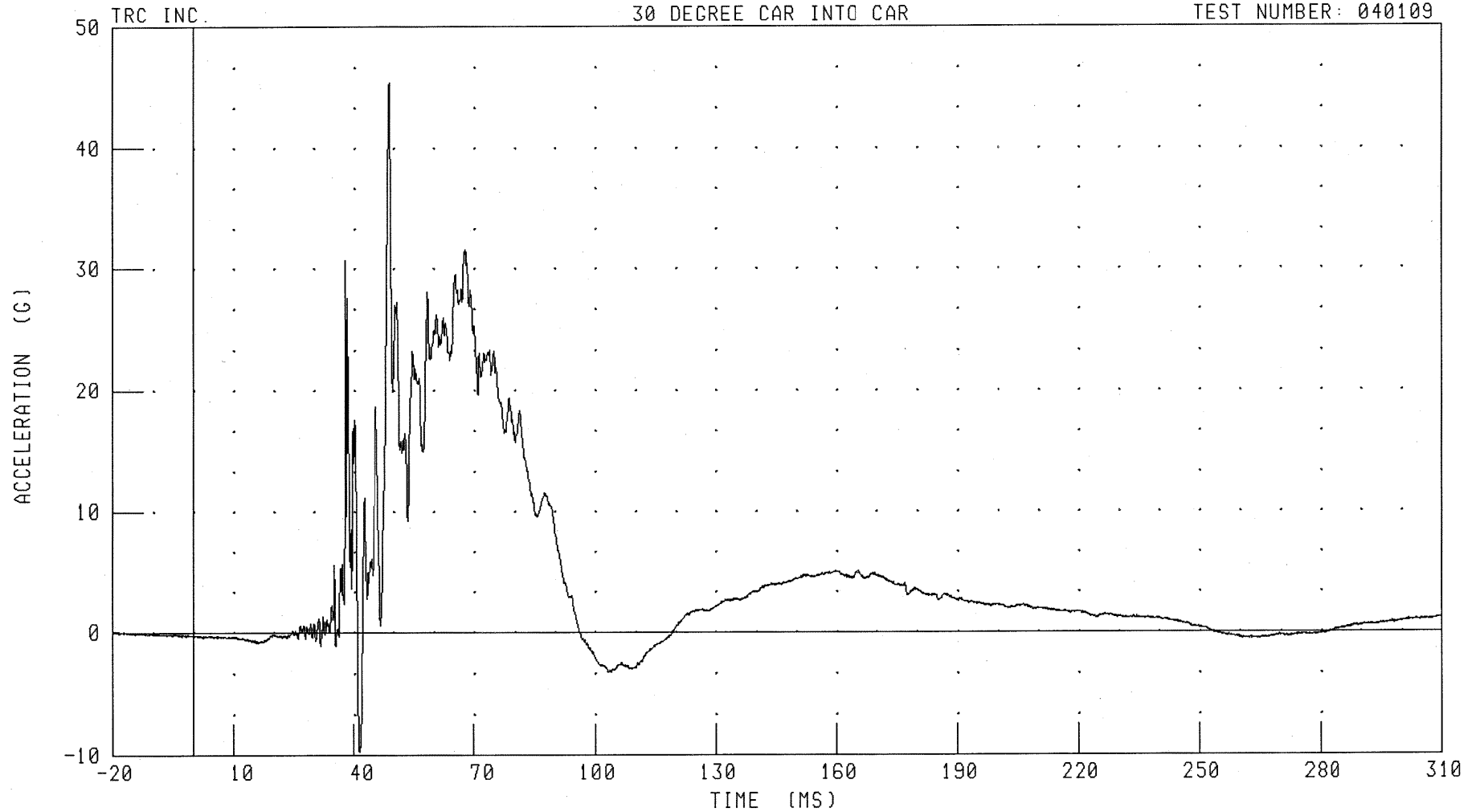
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD Z-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDZRB FILTER: CH. CLASS 1000

PEAK DATA: 45.46 G @ 48.96 MS; -9.72 G @ 41.36 MS

B-133

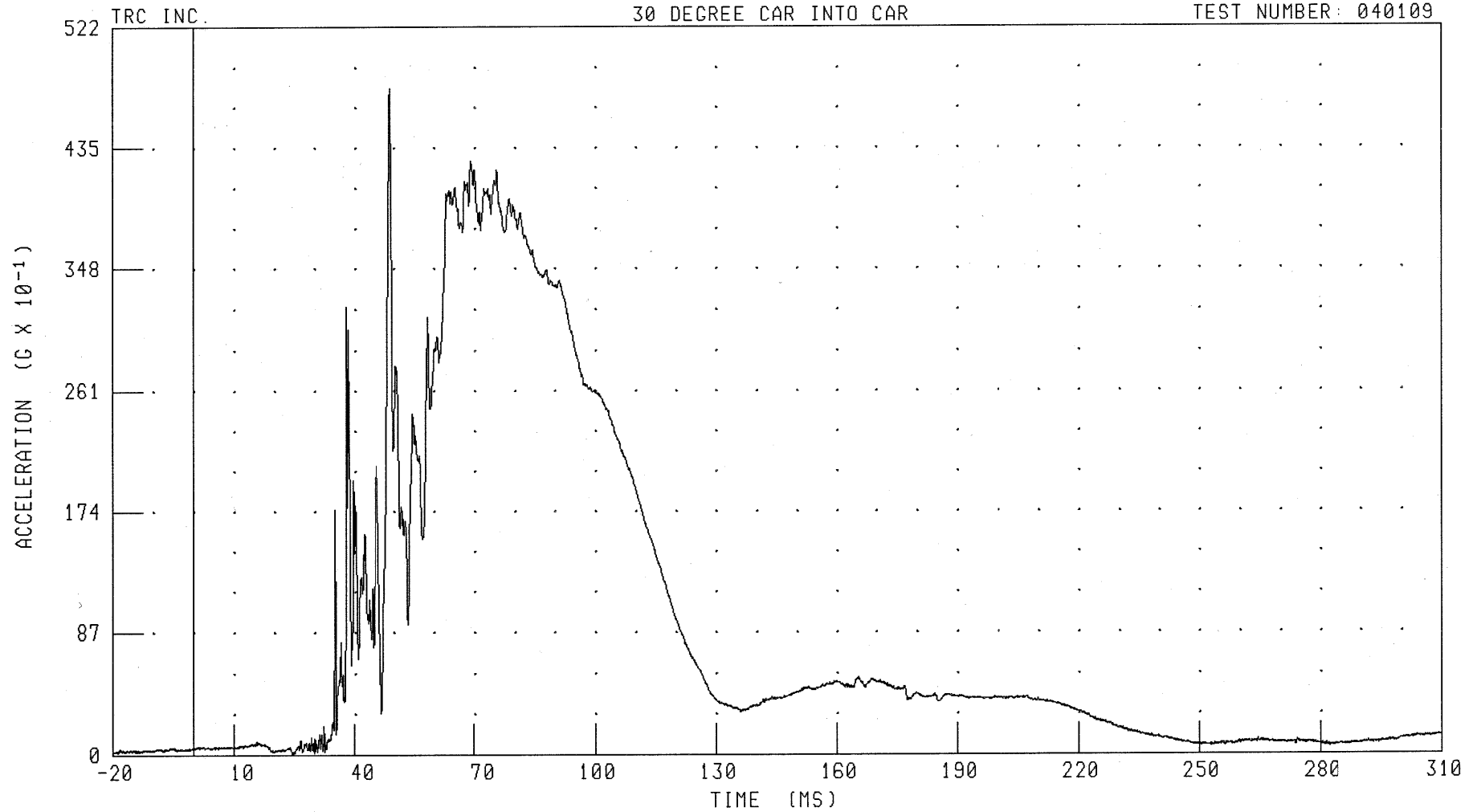
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER HEAD RESULTANT ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: HEDRRB FILTER: CH. CLASS 1000

PEAK DATA: 47.79 G @ 48.96 MS; 0.04 G @ 24.40 MS

B-134

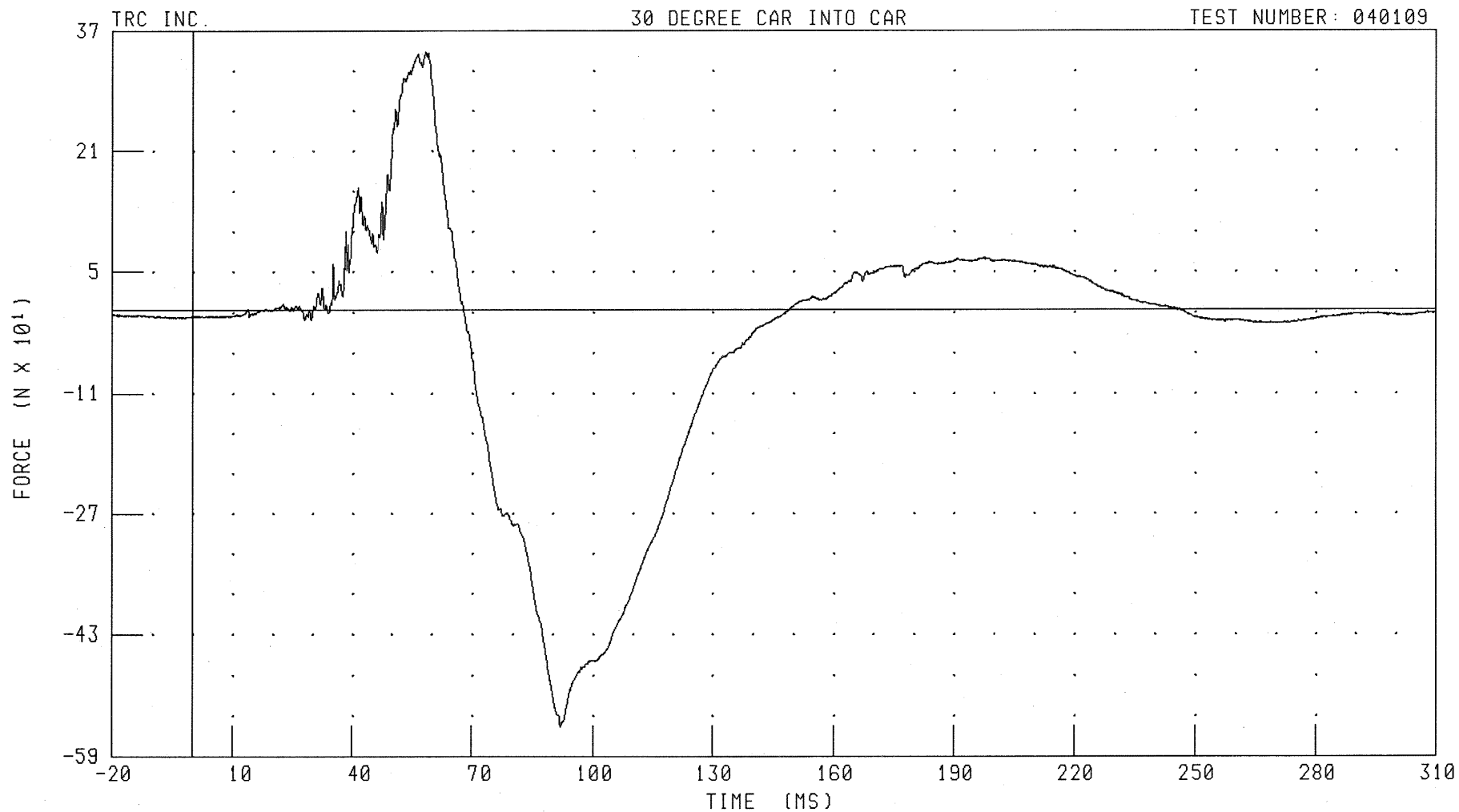
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK X-AXIS SHEAR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKXFB FILTER: CH. CLASS 1000

PEAK DATA: 341.45 N @ 58.48 MS; -551.52 N @ 92.00 MS

B-135

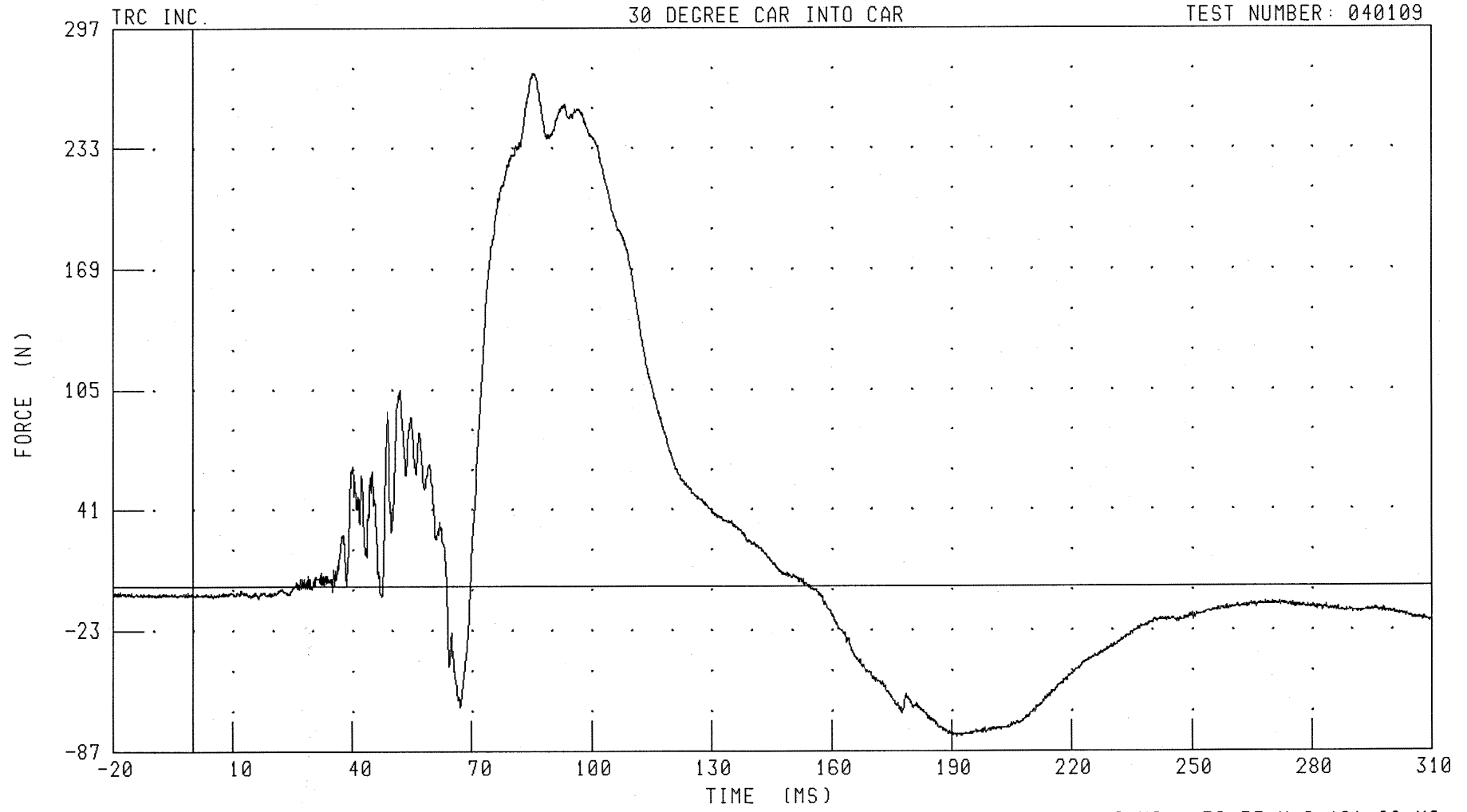
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK Y-AXIS SHEAR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKYFB FILTER: CH. CLASS 1000

PEAK DATA: 272.74 N @ 85.12 MS; -79.33 N @ 191.28 MS

B-136

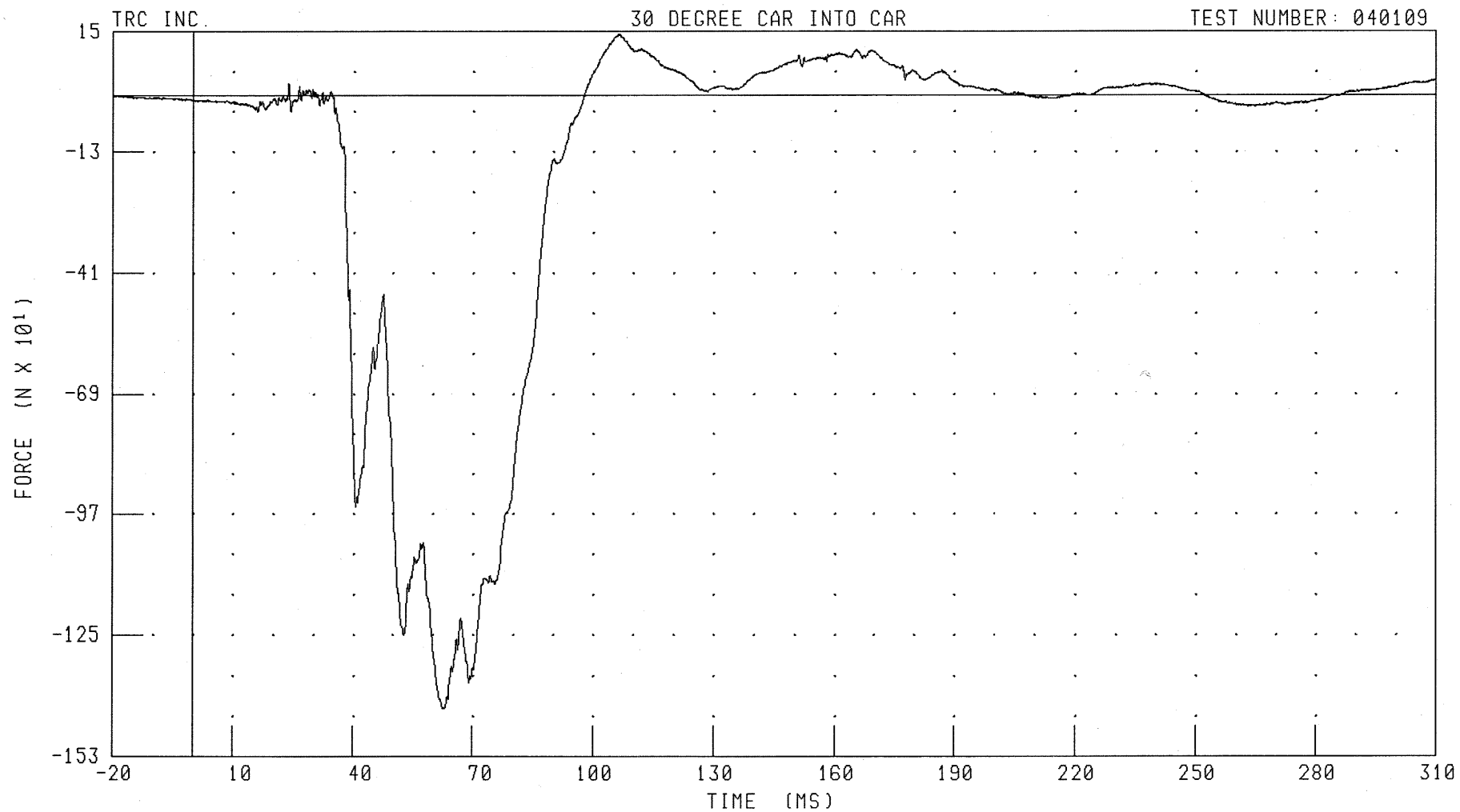
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK Z-AXIS AXIAL FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKZFB FILTER: CH. CLASS 1000

B-137

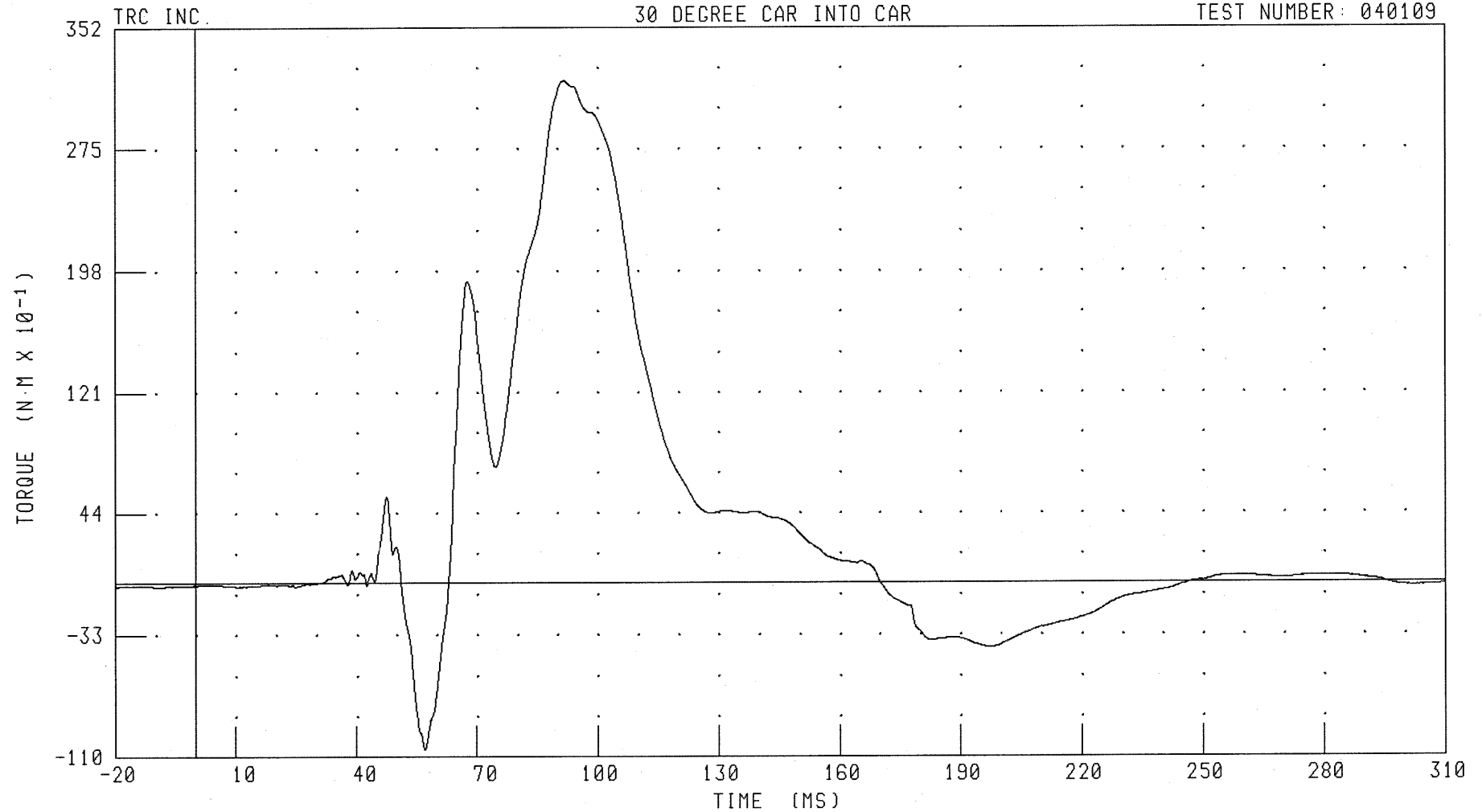
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKXMB FILTER: CH. CLASS 600

PEAK DATA: 31.81 N·m @ 91.76 MS; -10.57 N·m @ 57.04 MS

B-138

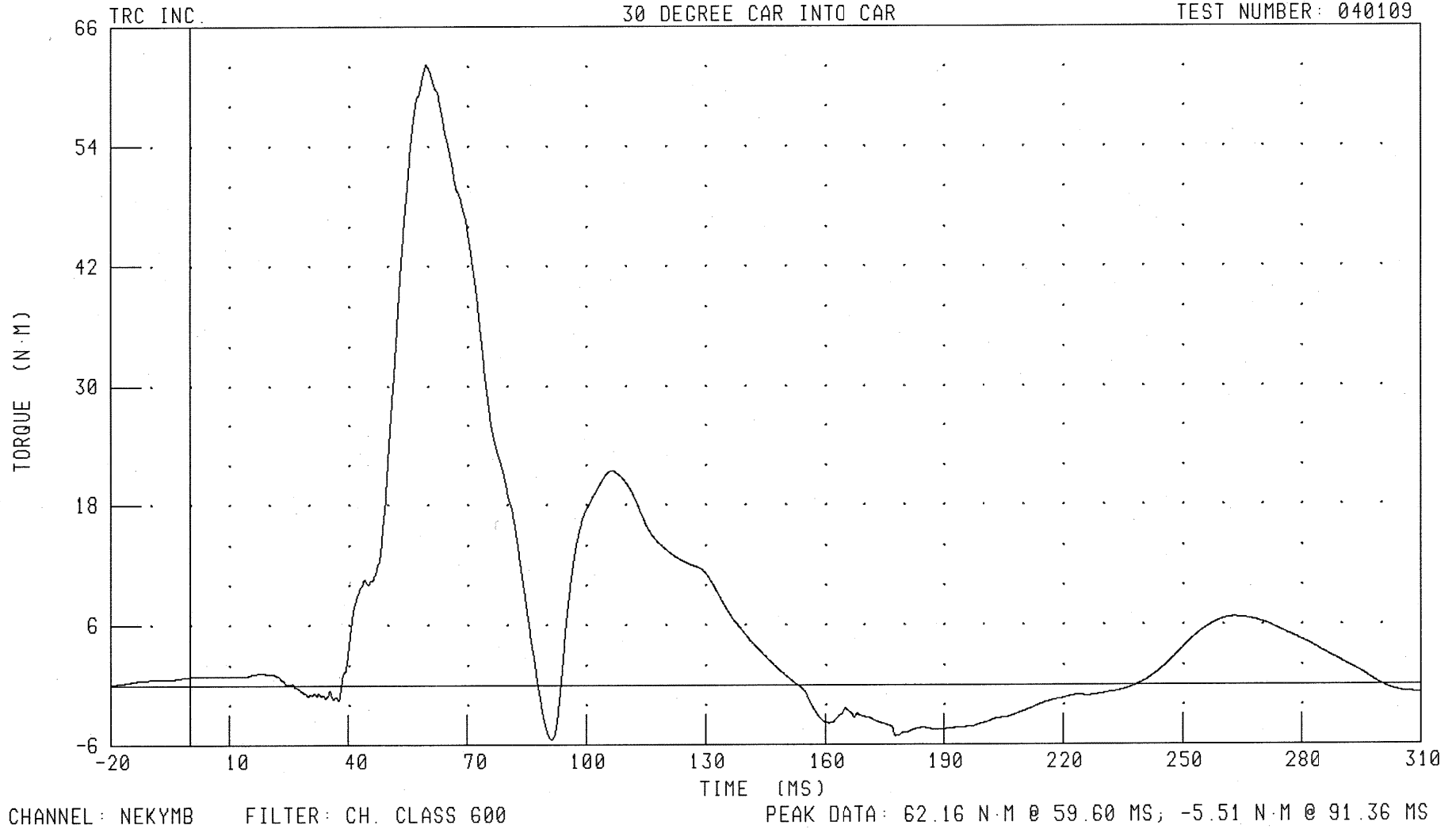
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-139

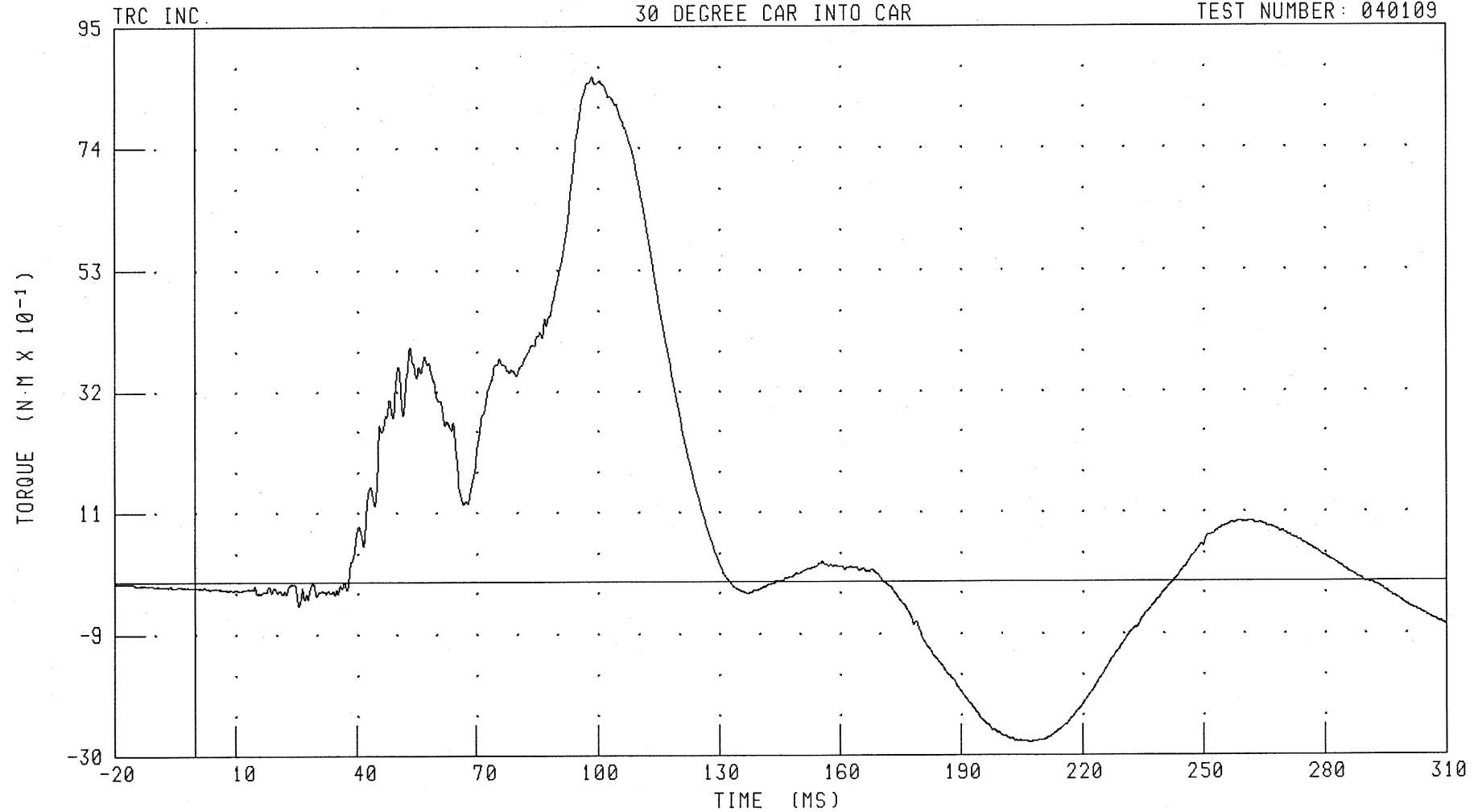
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK MOMENT ABOUT Z AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKZMB FILTER: CH. CLASS 600

PEAK DATA: 8.73 N-M @ 98.56 MS; -2.77 N-M @ 206.80 MS

B-140

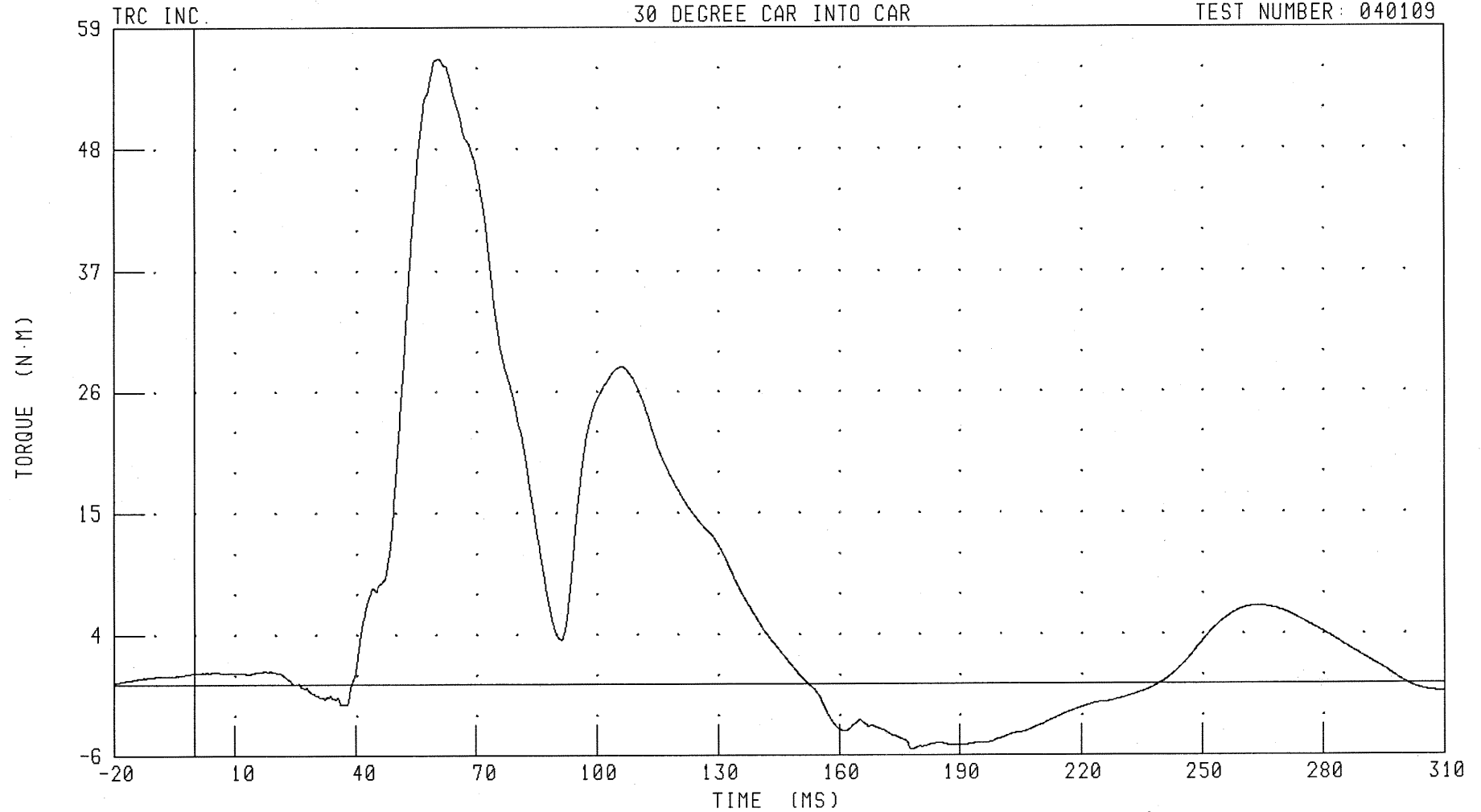
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NEKOMB FILTER: CH. CLASS 600

B-141

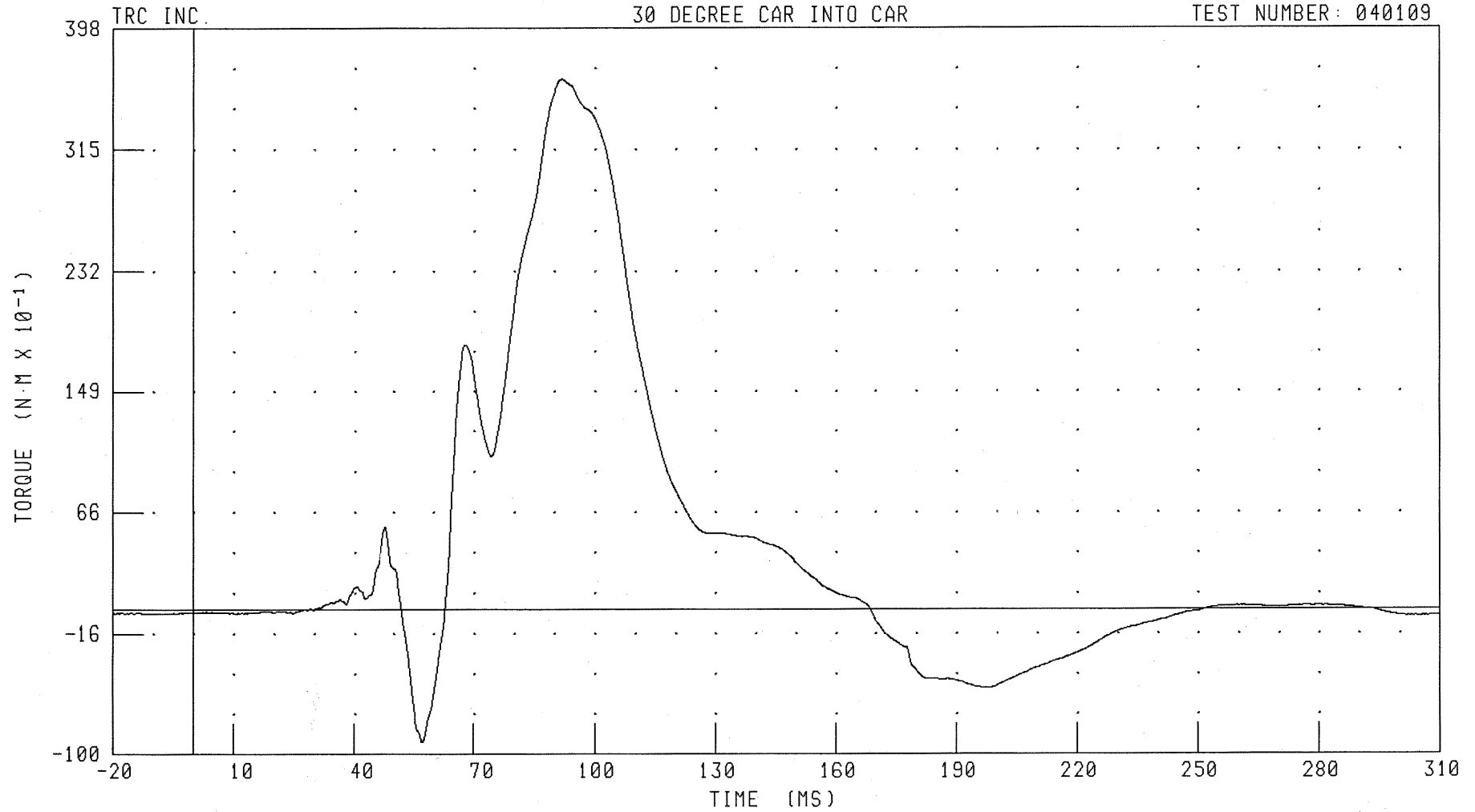
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NK0XMB FILTER: CH. CLASS 600

PEAK DATA: 36.29 N·M @ 91.84 MS, -9.18 N·M @ 57.20 MS

B-142

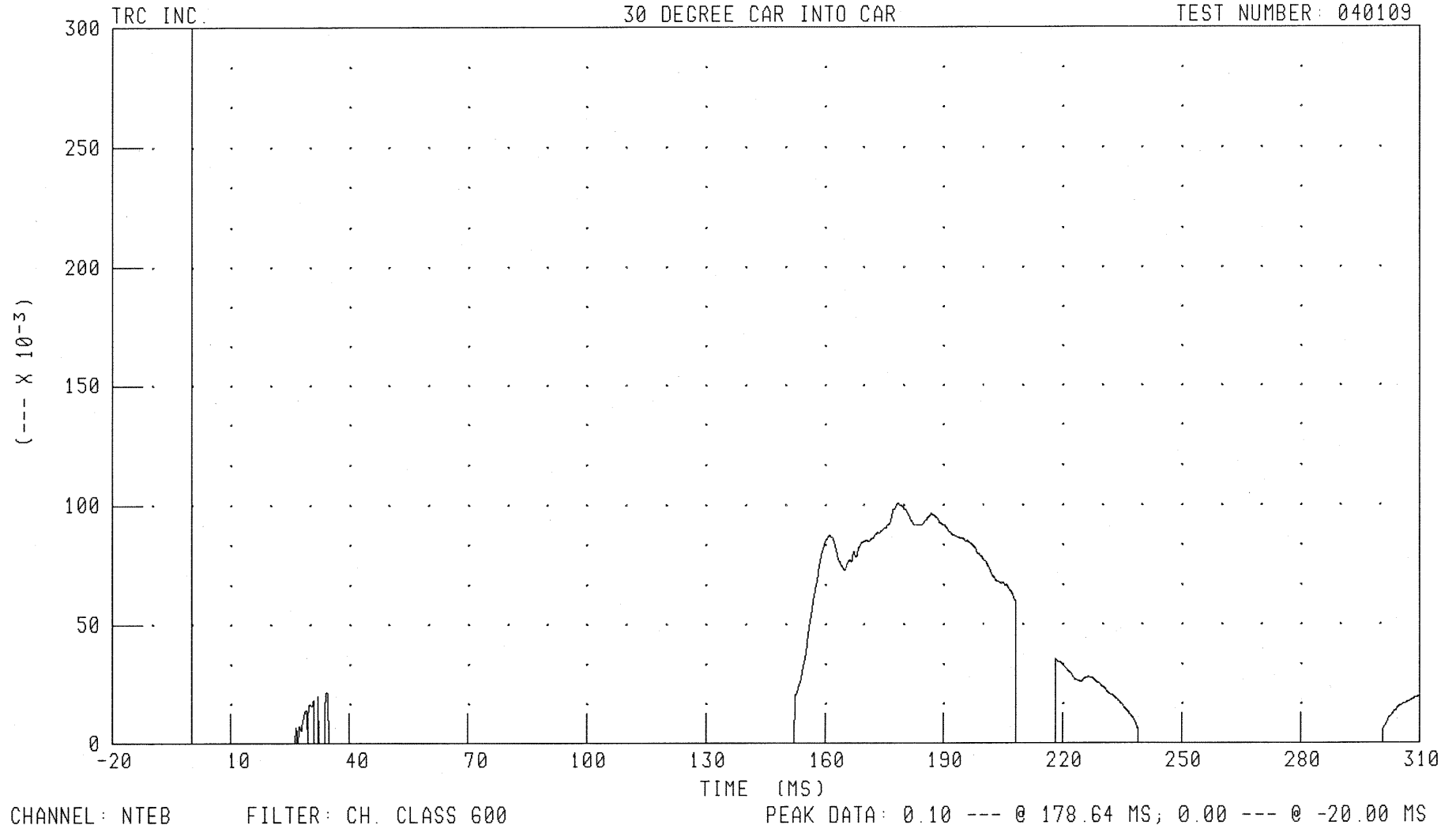
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NIJ TENSION/EXTENSION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-143

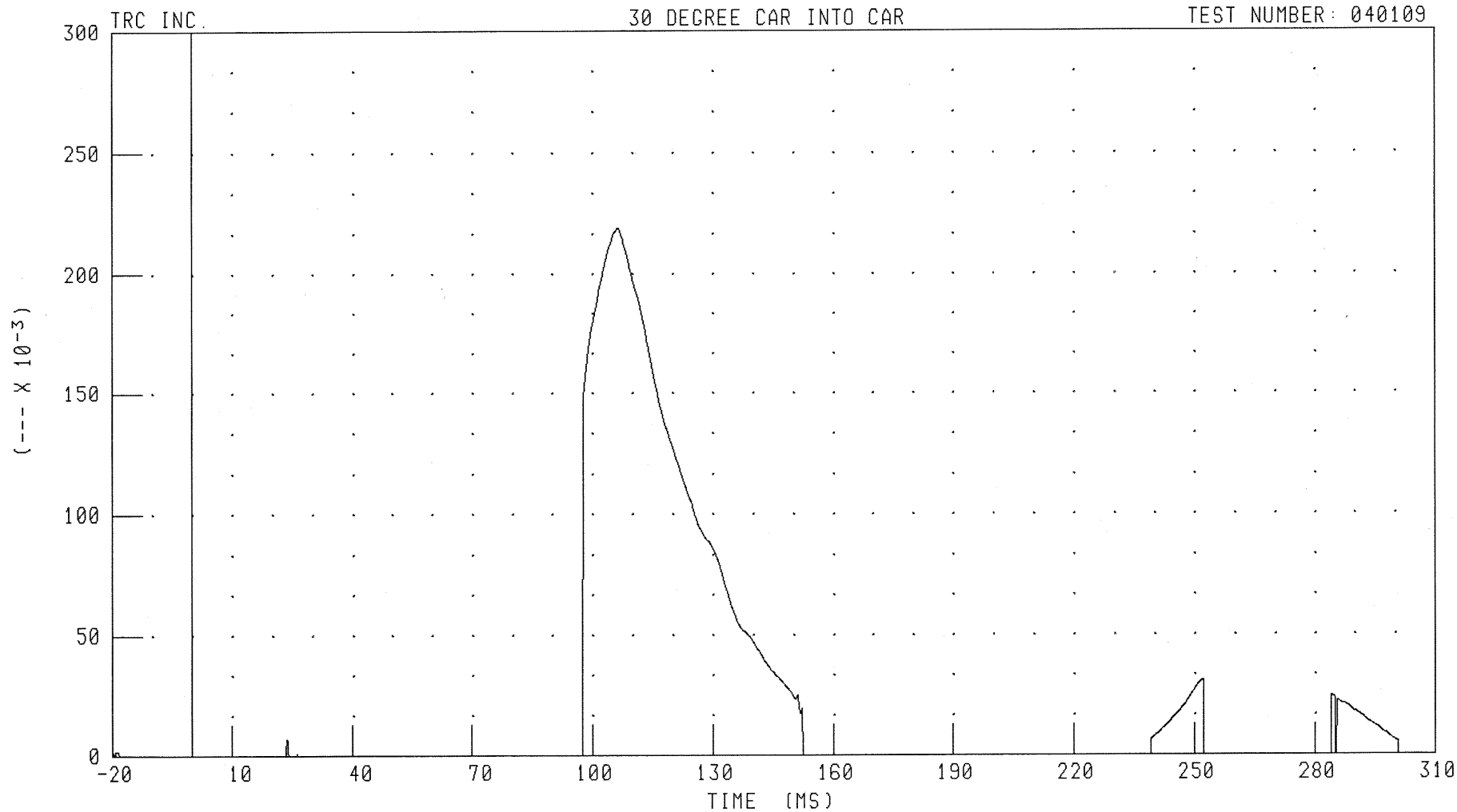
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NIJ TENSION/FLEXION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NTFB

FILTER: CH. CLASS 600

PEAK DATA: 0.22 --- @ 106.40 MS; 0.00 --- @ -19.60 MS

B-144

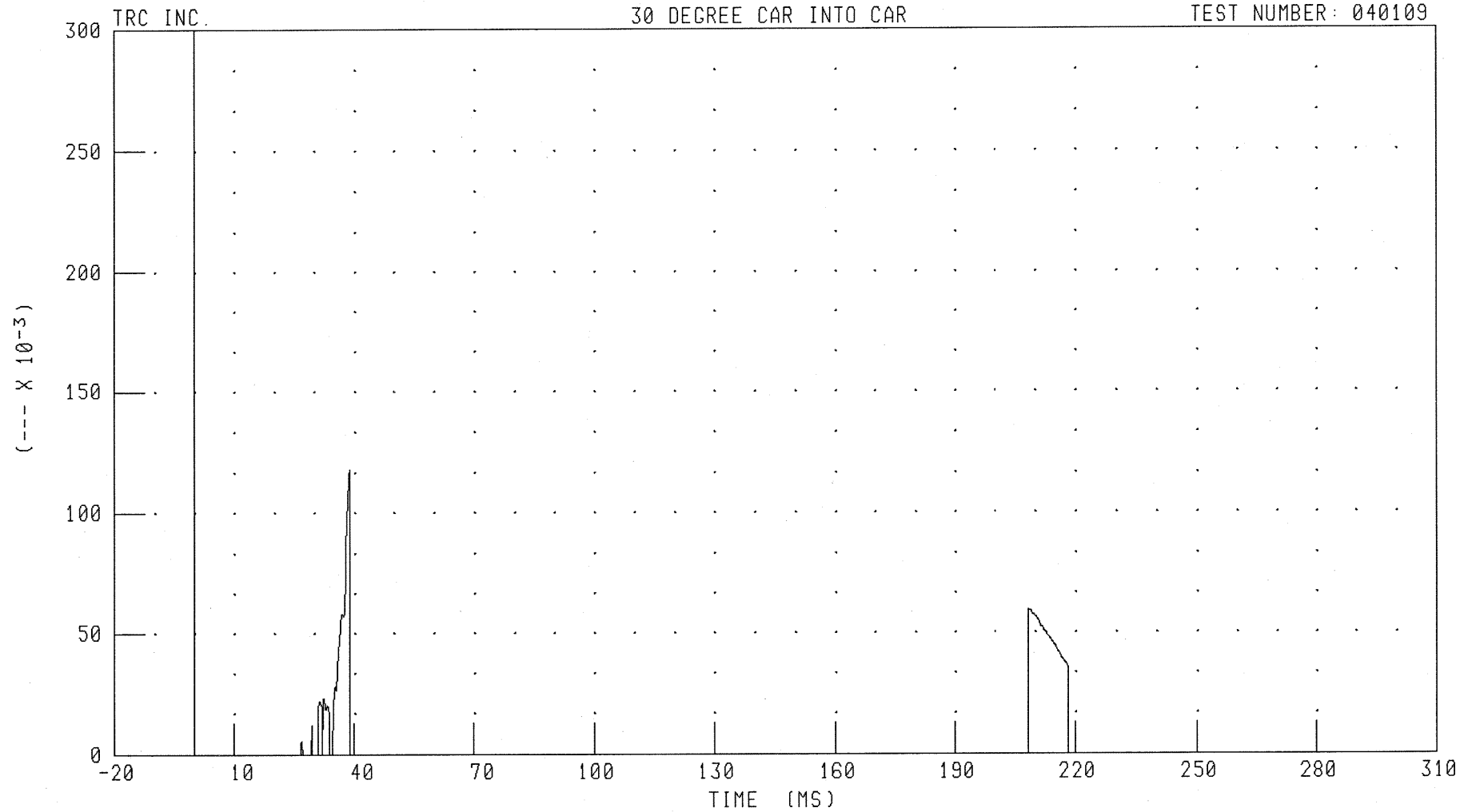
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NIJ COMPRESSION/EXTENSION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NCEB

FILTER: CH. CLASS 600

PEAK DATA: 0.12 --- @ 38.88 MS; 0.00 --- @ -20.00 MS

B-145

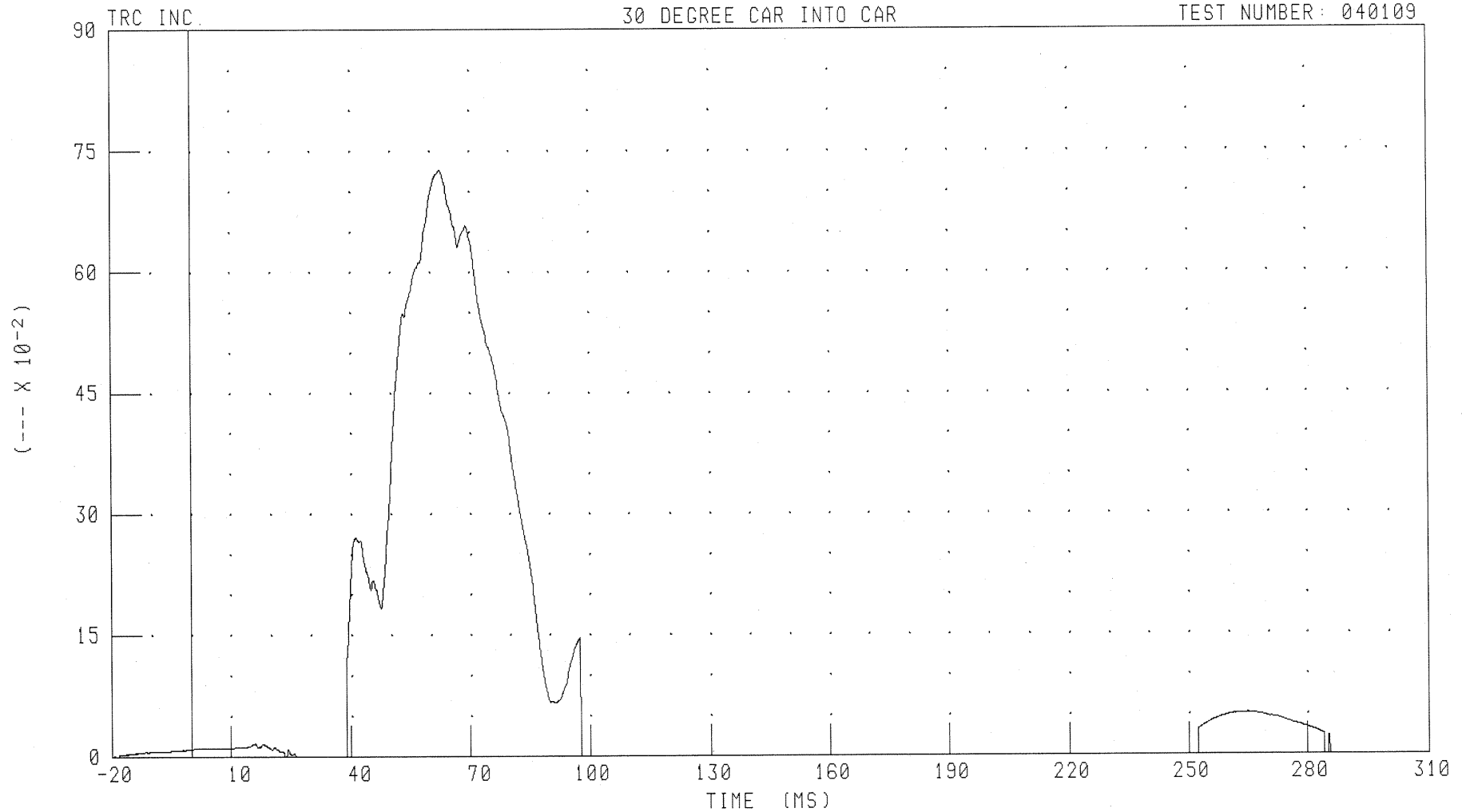
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER NIJ COMPRESSION/FLEXION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: NCFB

FILTER: CH. CLASS 600

PEAK DATA: 0.73 --- @ 62.56 MS; 0.00 --- @ -20.00 MS

B-146

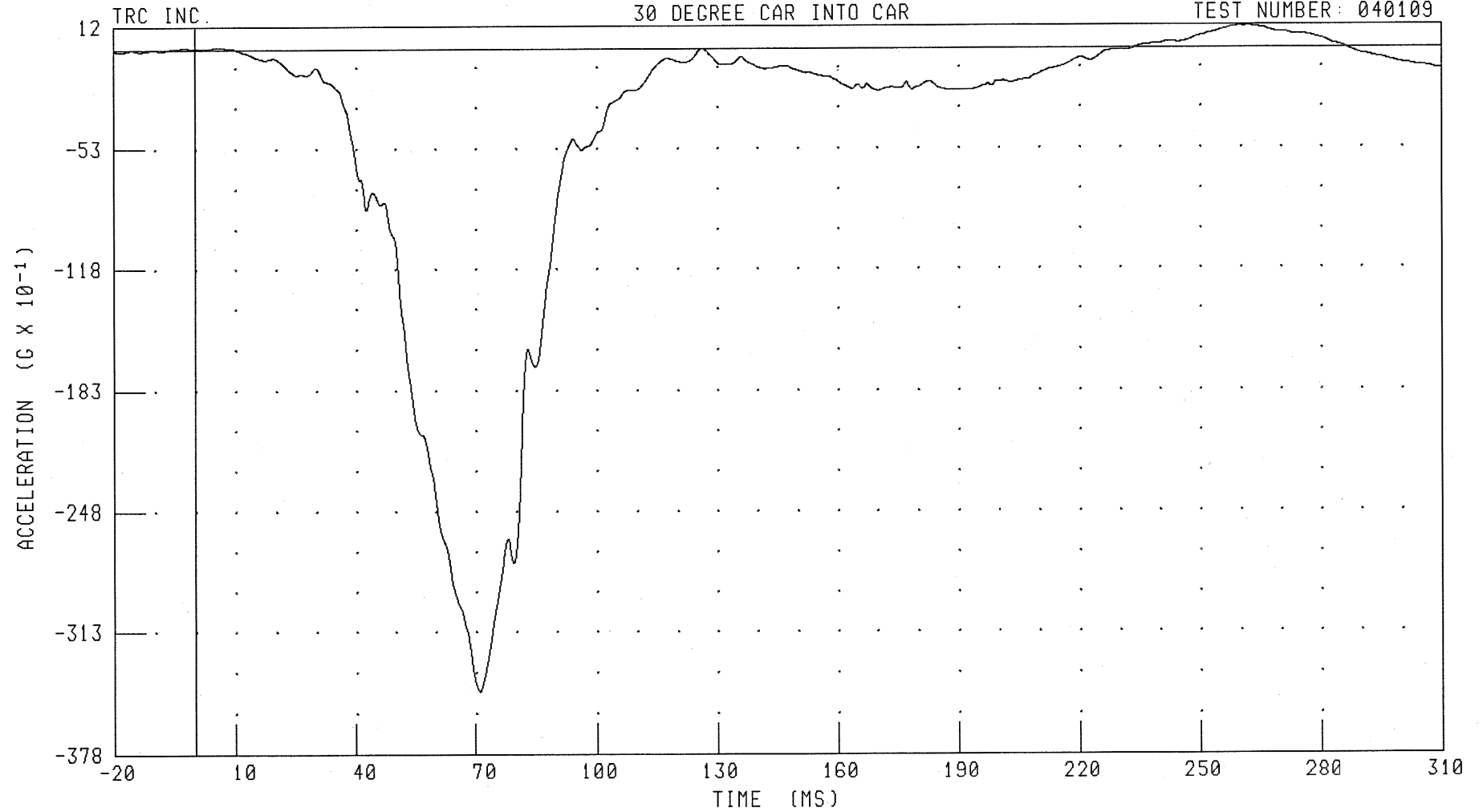
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTXGB FILTER: CH. CLASS 180

PEAK DATA: 1.16 G @ 262.24 MS; -34.48 G @ 71.04 MS

B-147

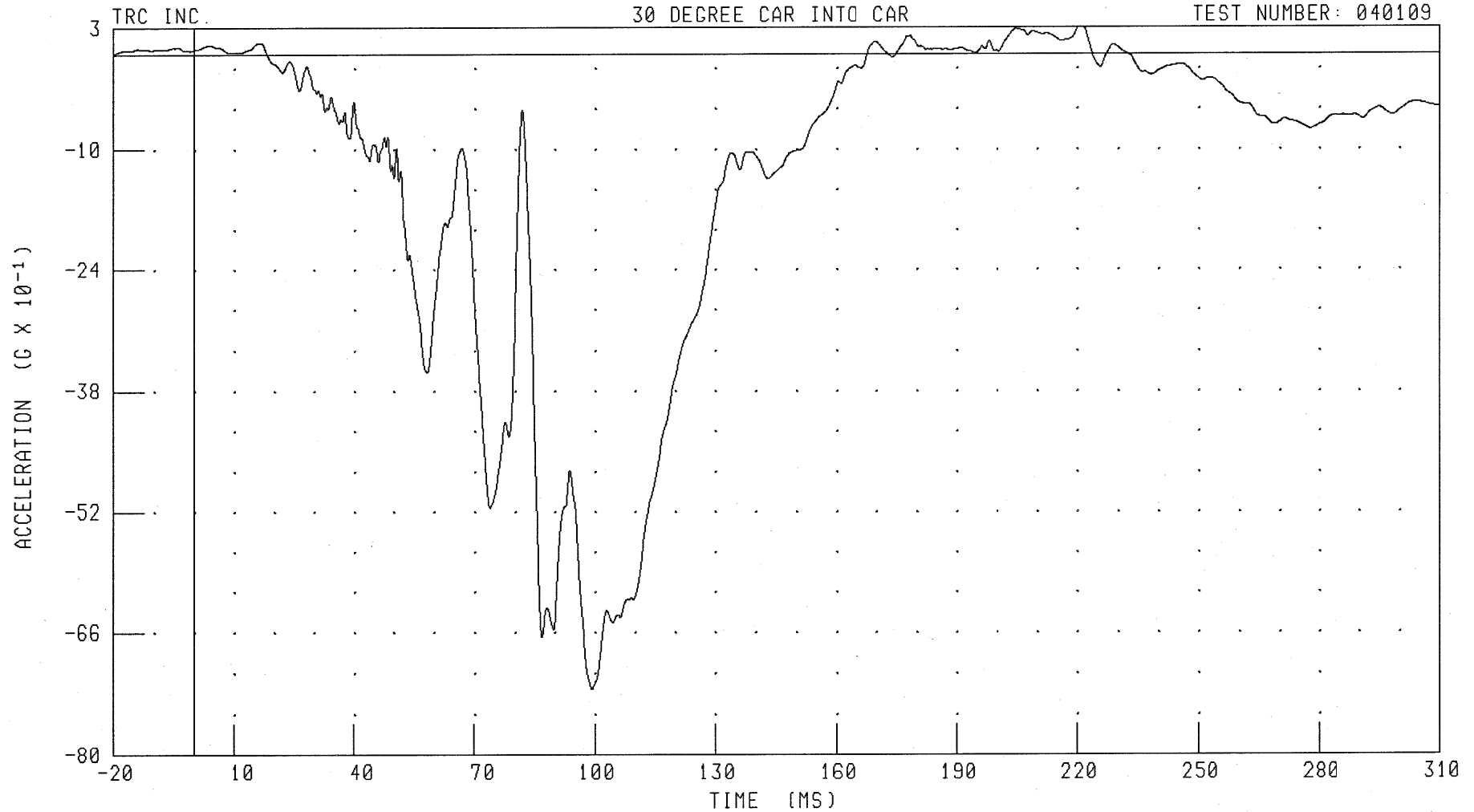
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTYGB FILTER: CH. CLASS 180

PEAK DATA: 0.34 G @ 220.88 MS; -7.34 G @ 99.36 MS

B-148

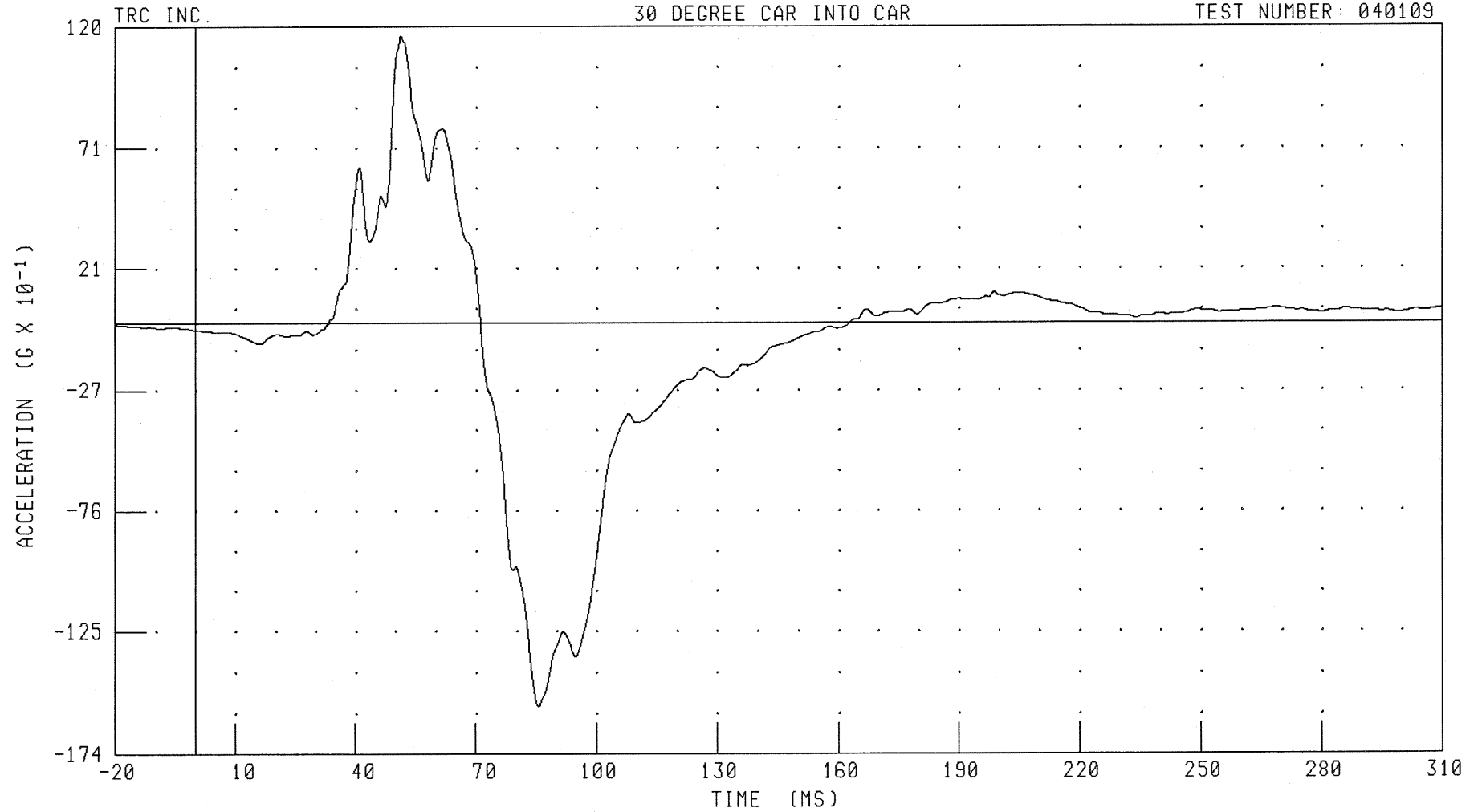
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTZGB FILTER: CH. CLASS 180

PEAK DATA: 11.63 G @ 51.36 MS; -15.49 G @ 85.44 MS

B-149

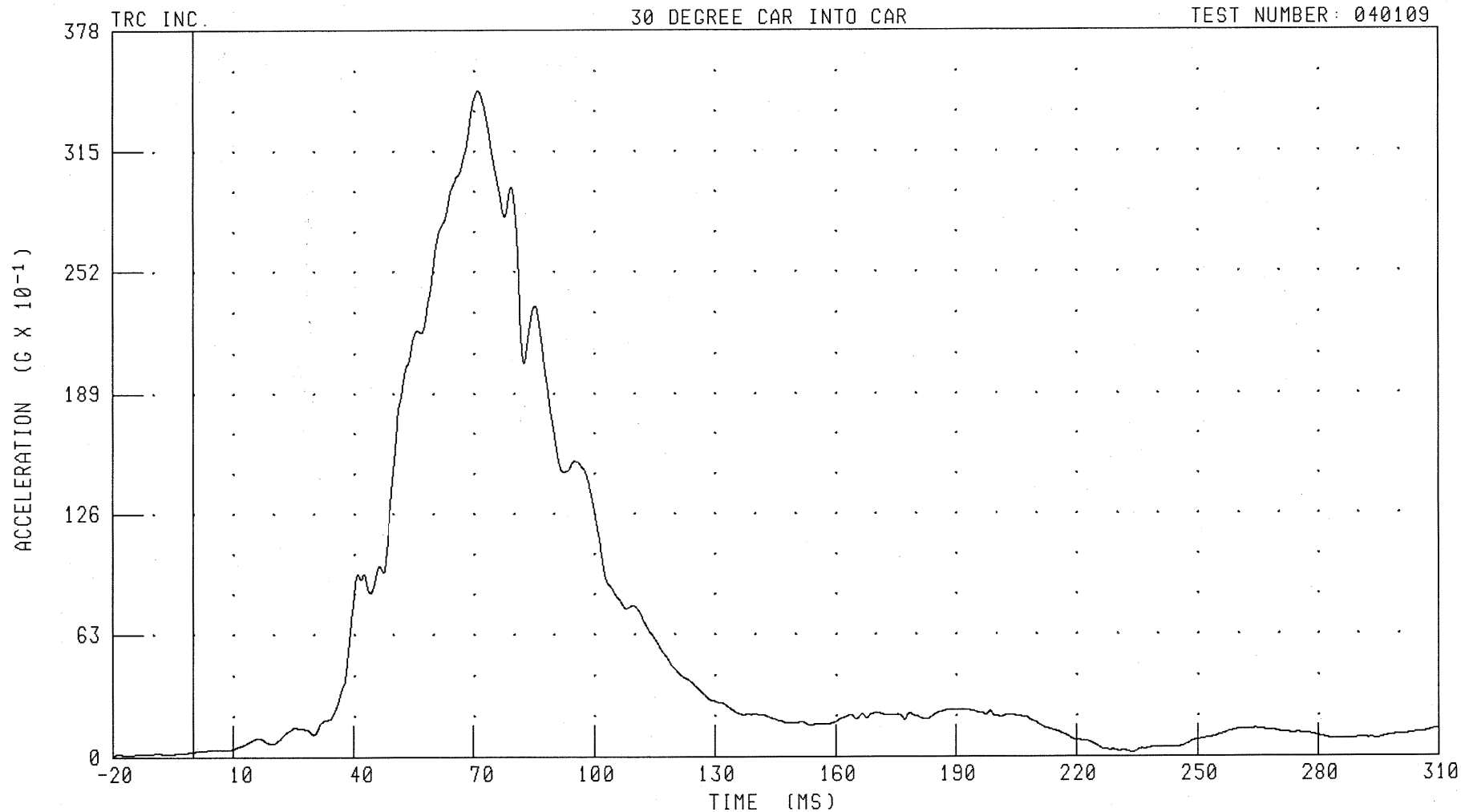
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTRGB FILTER: CH. CLASS 180

B-150

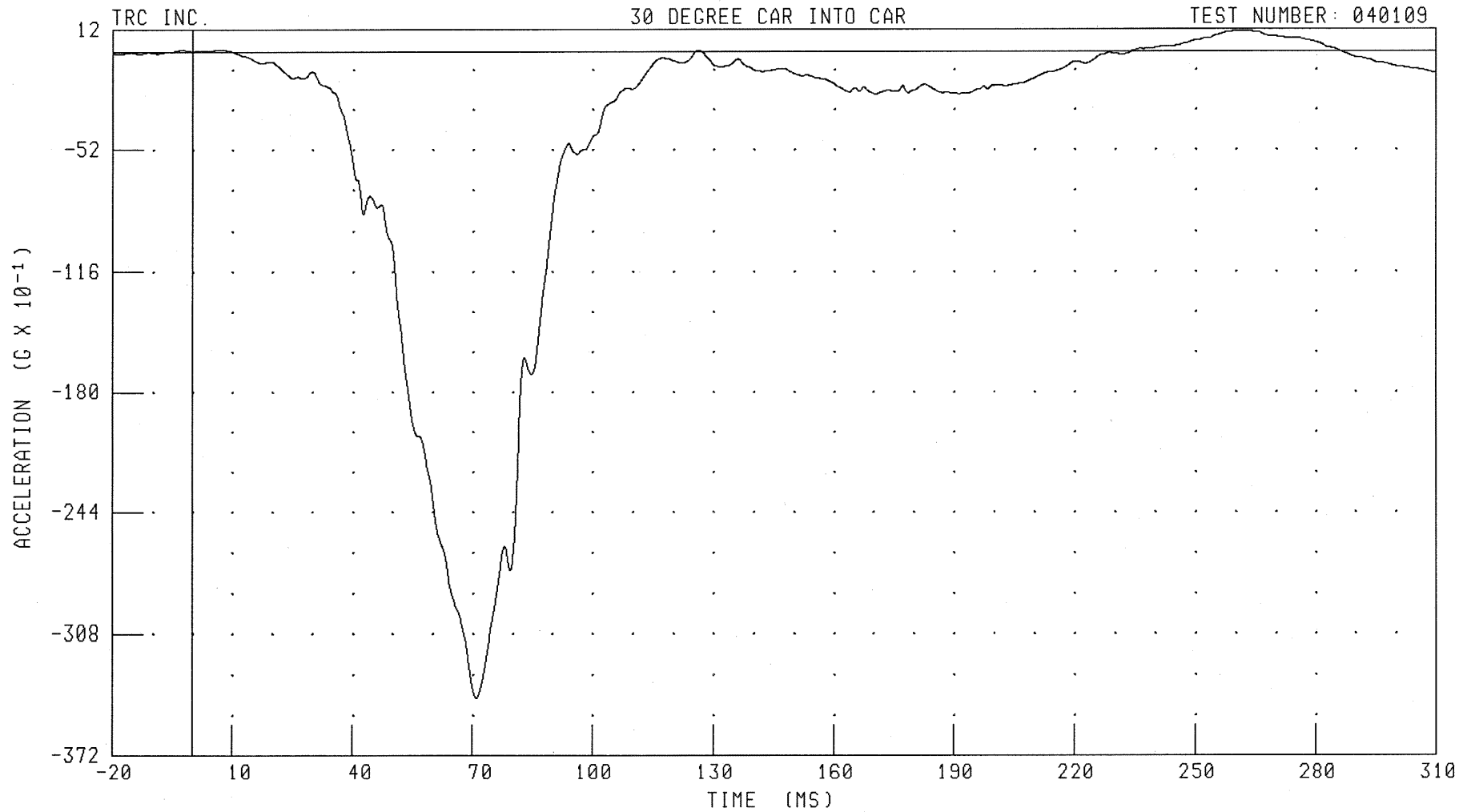
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST X-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTXRB FILTER: CH. CLASS 180

PEAK DATA: 1.12 G @ 262.32 MS; -34.18 G @ 70.96 MS

B-151

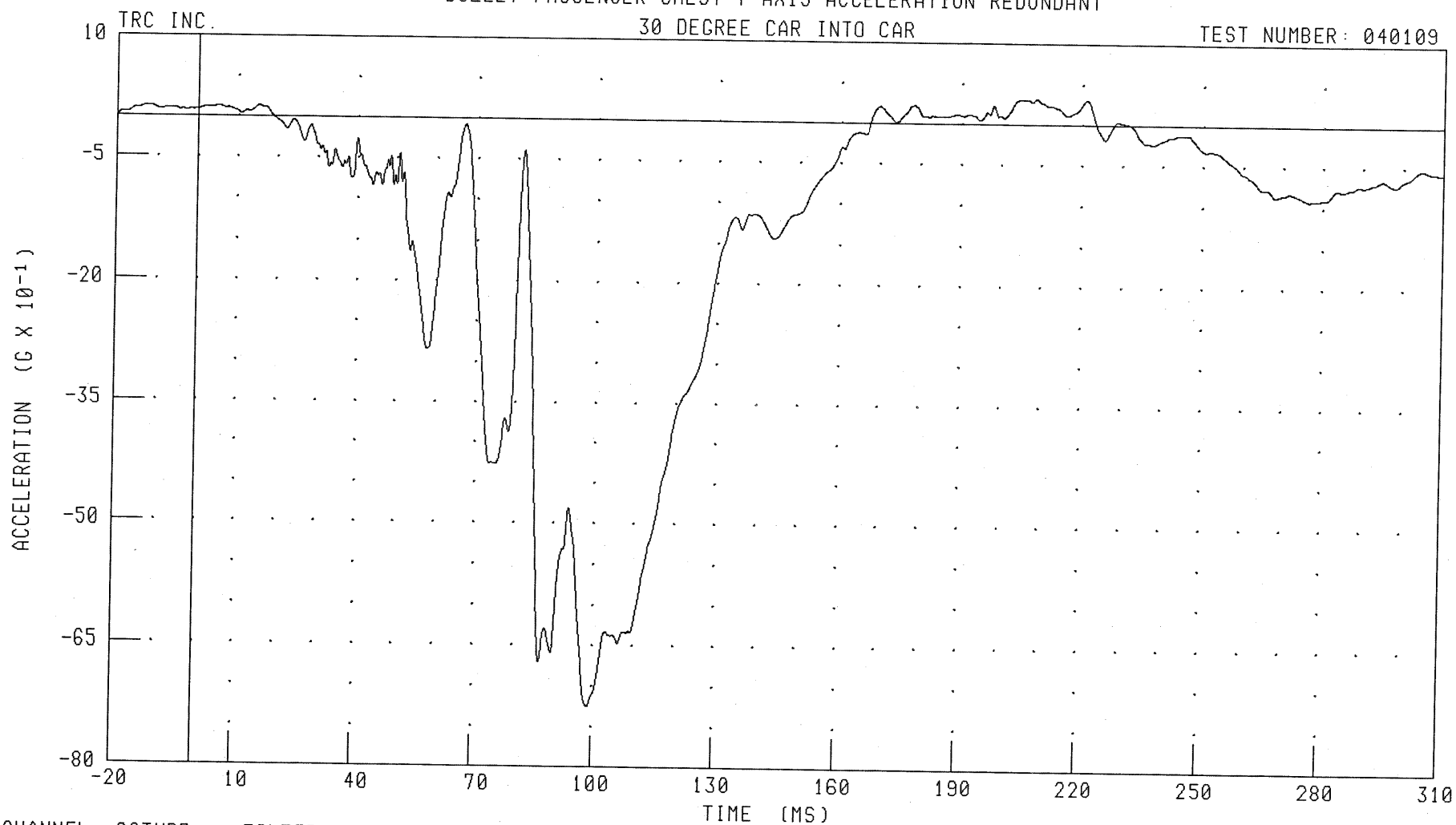
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST Y-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTYRB

FILTER: CH. CLASS 180

PEAK DATA: 0.31 G @ 208.80 MS; -7.26 G @ 99.12 MS

B-152

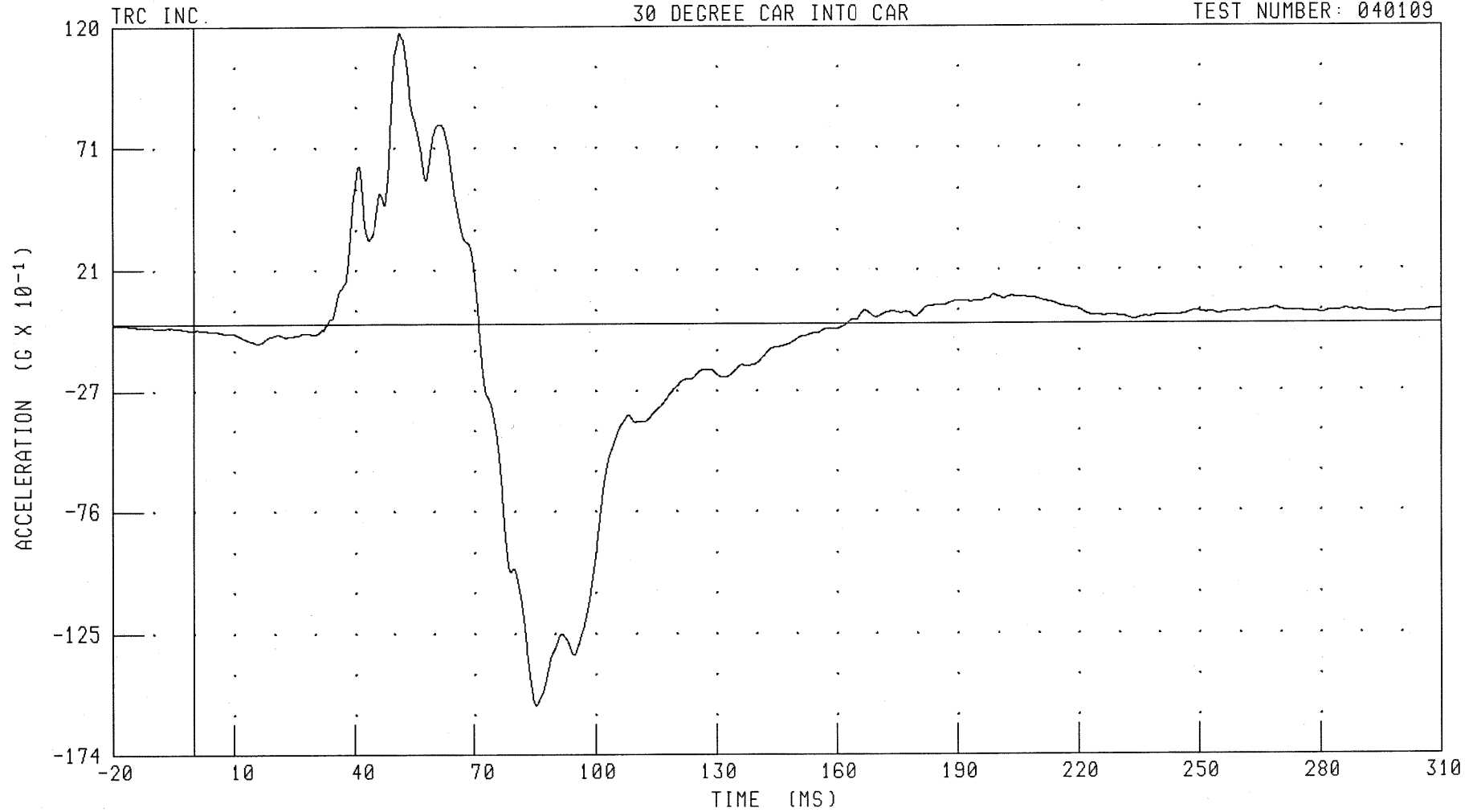
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST Z-AXIS ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTZRB FILTER: CH. CLASS 180

B-153

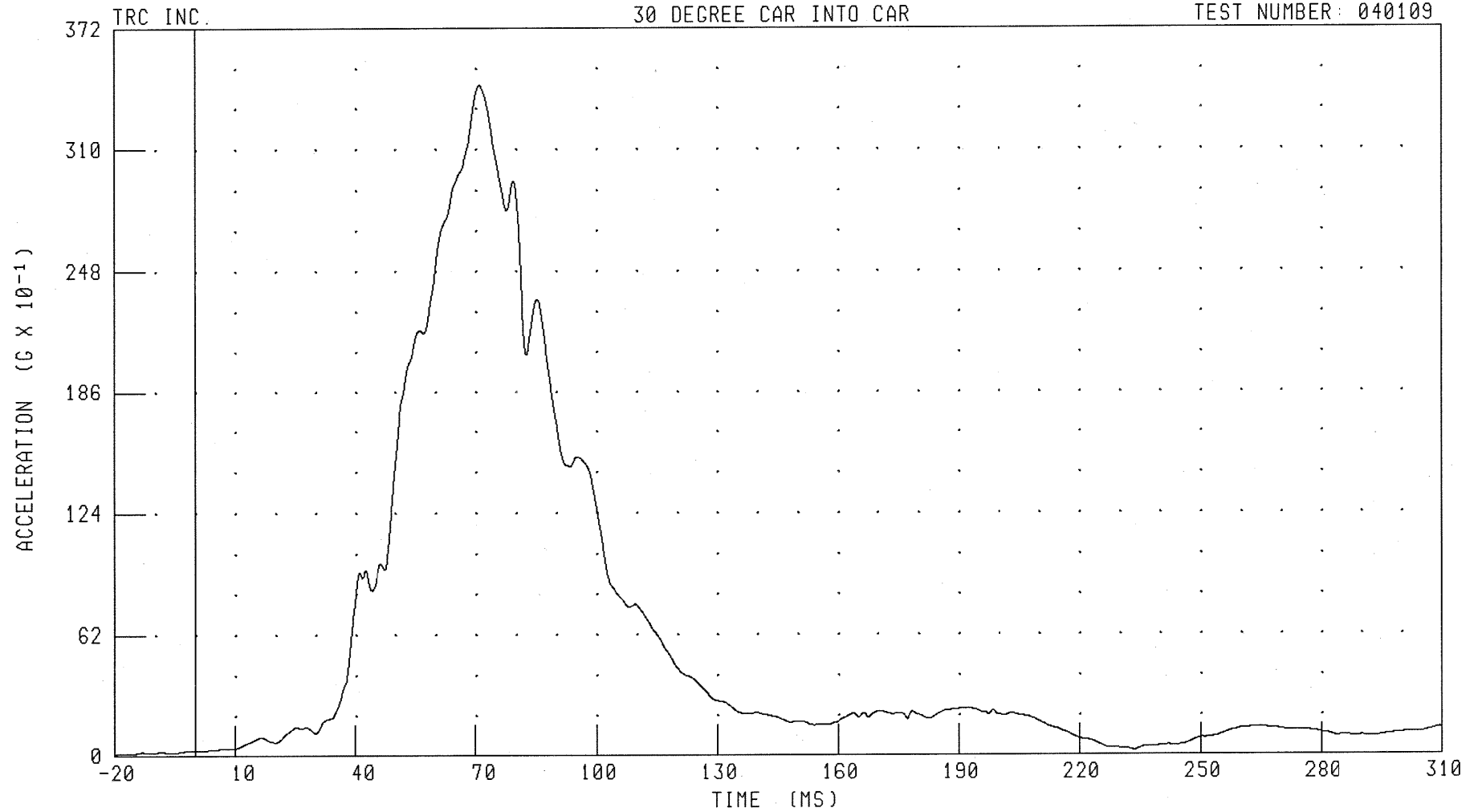
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST RESULTANT ACCELERATION REDUNDANT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTRRB FILTER: CH. CLASS 180

B-154

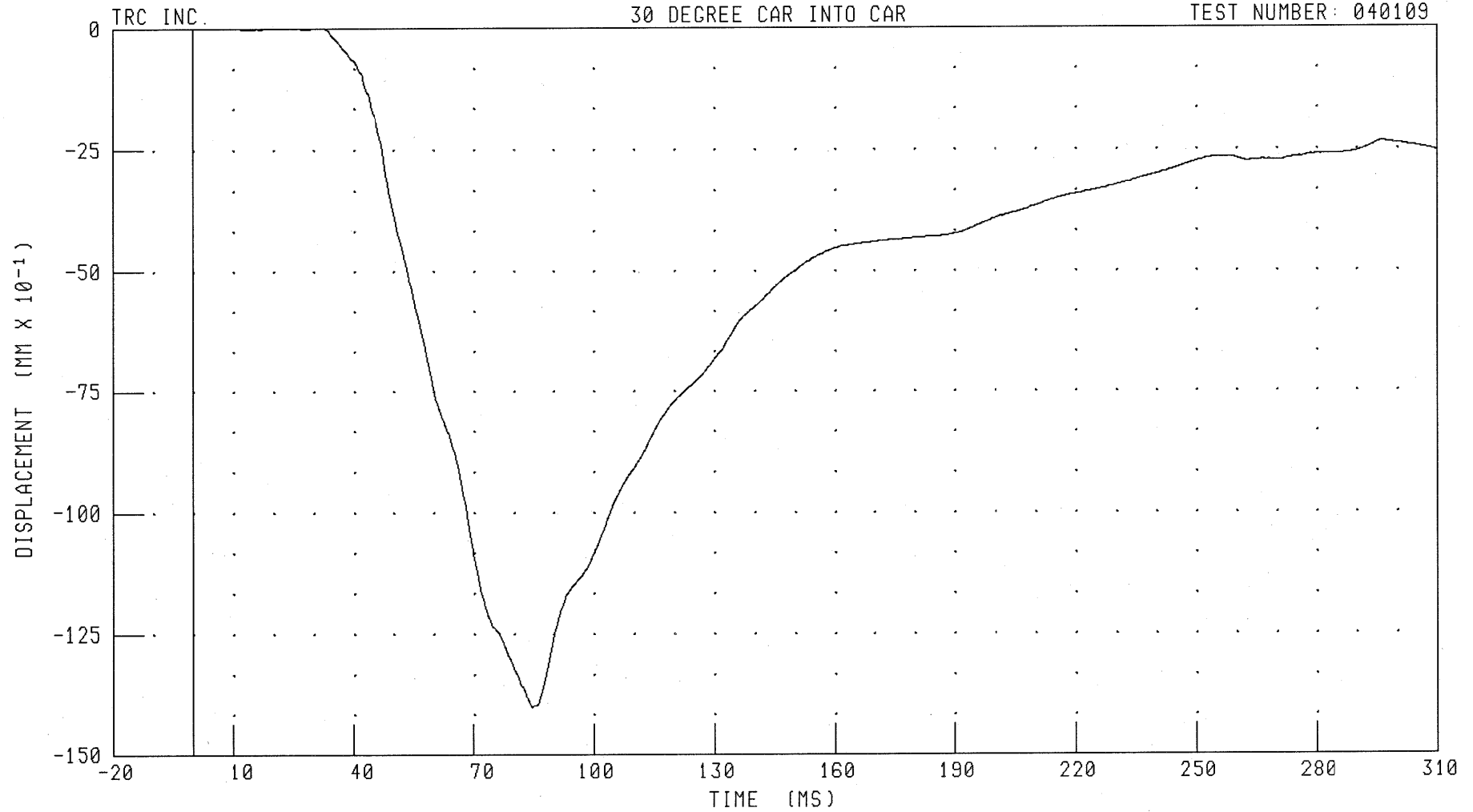
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER CHEST DEFLECTION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: CSTXDB FILTER: CH. CLASS 600

PEAK DATA: 0.02 MM @ 20.16 MS; -14.02 MM @ 84.64 MS

B-155

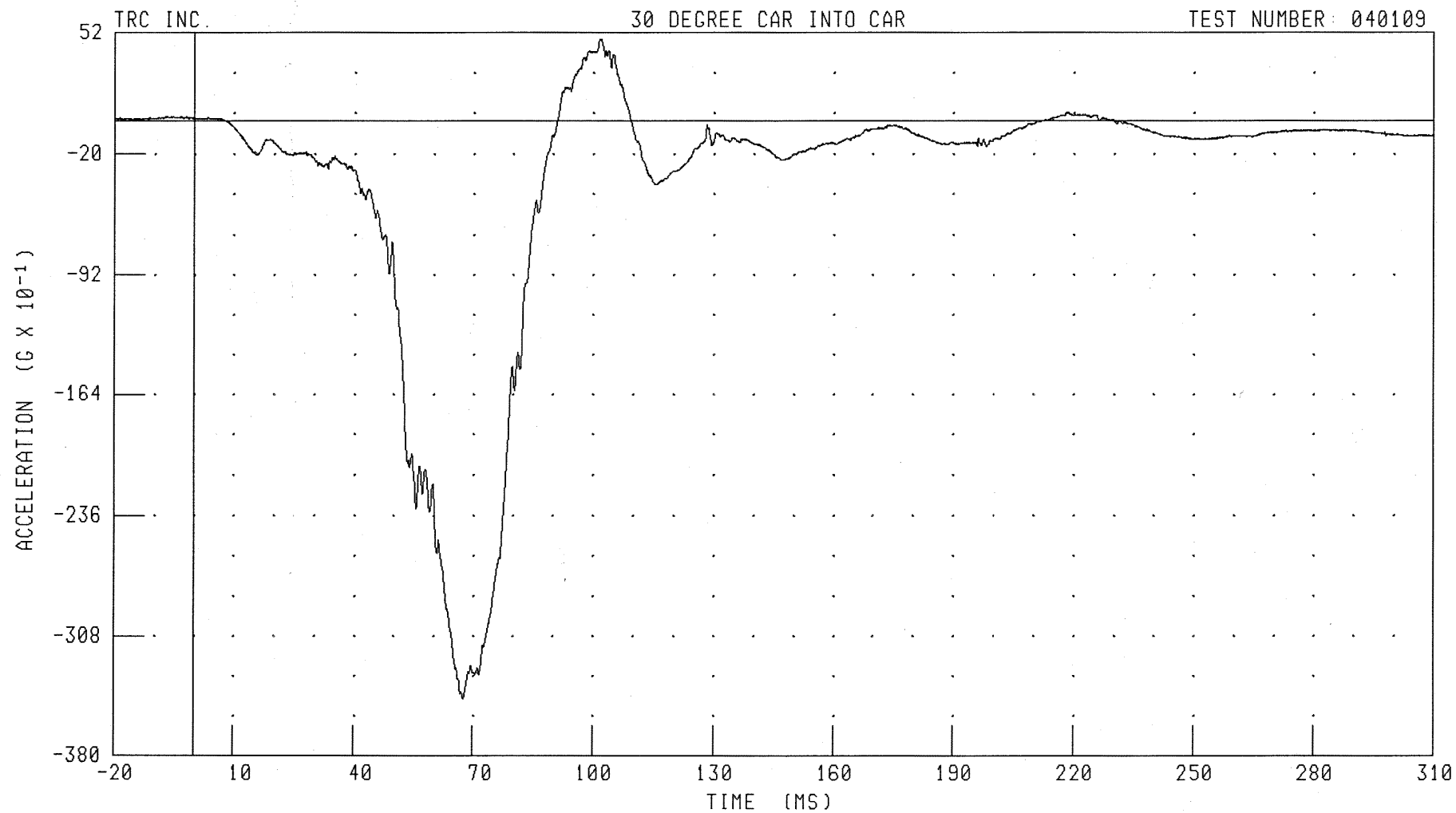
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER PELVIS X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVXGB FILTER: CH. CLASS 1000

PEAK DATA: 4.80 G @ 101.60 MS; -34.58 G @ 67.60 MS

B-156

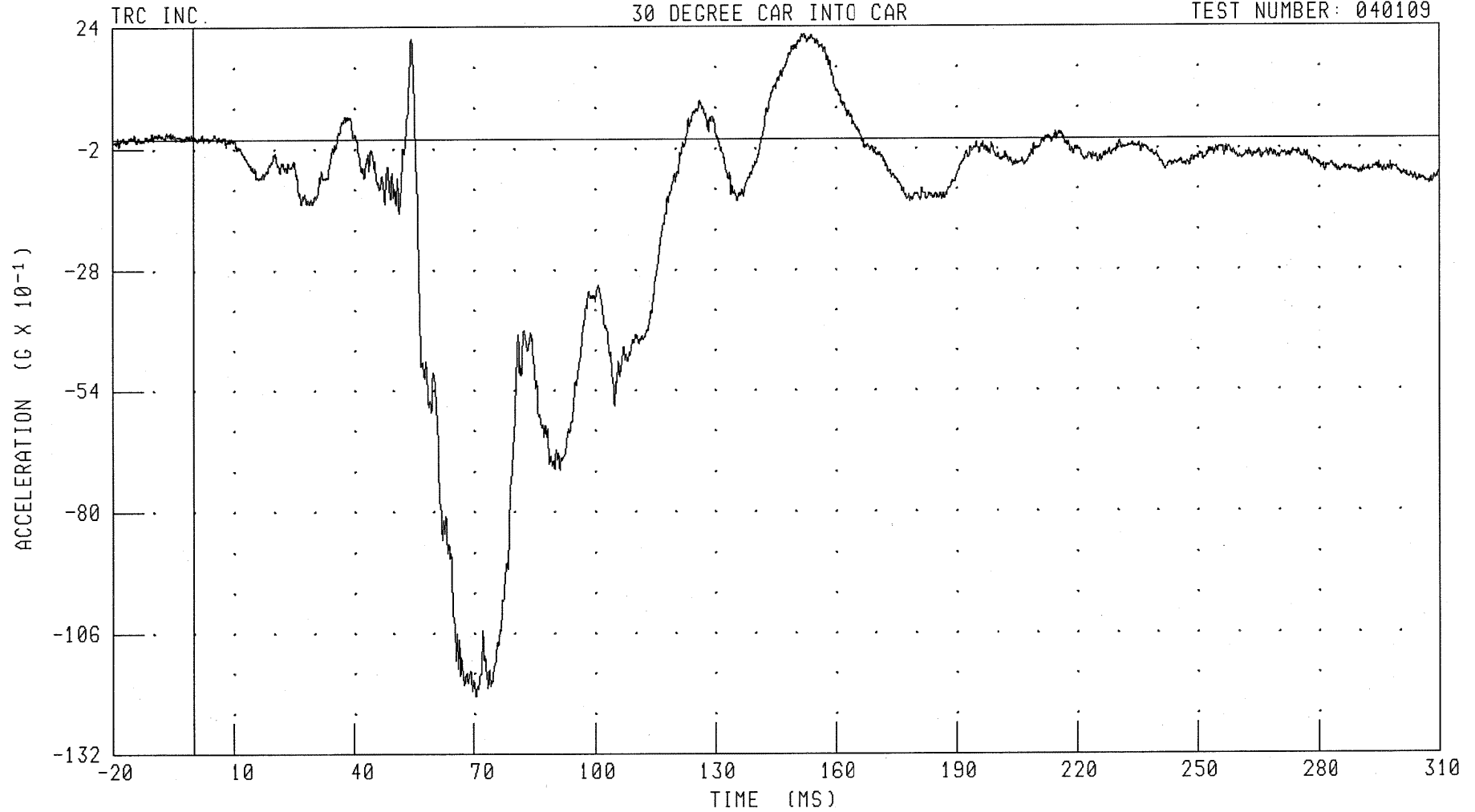
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER PELVIS Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVYGB FILTER: CH. CLASS 1000

B-157

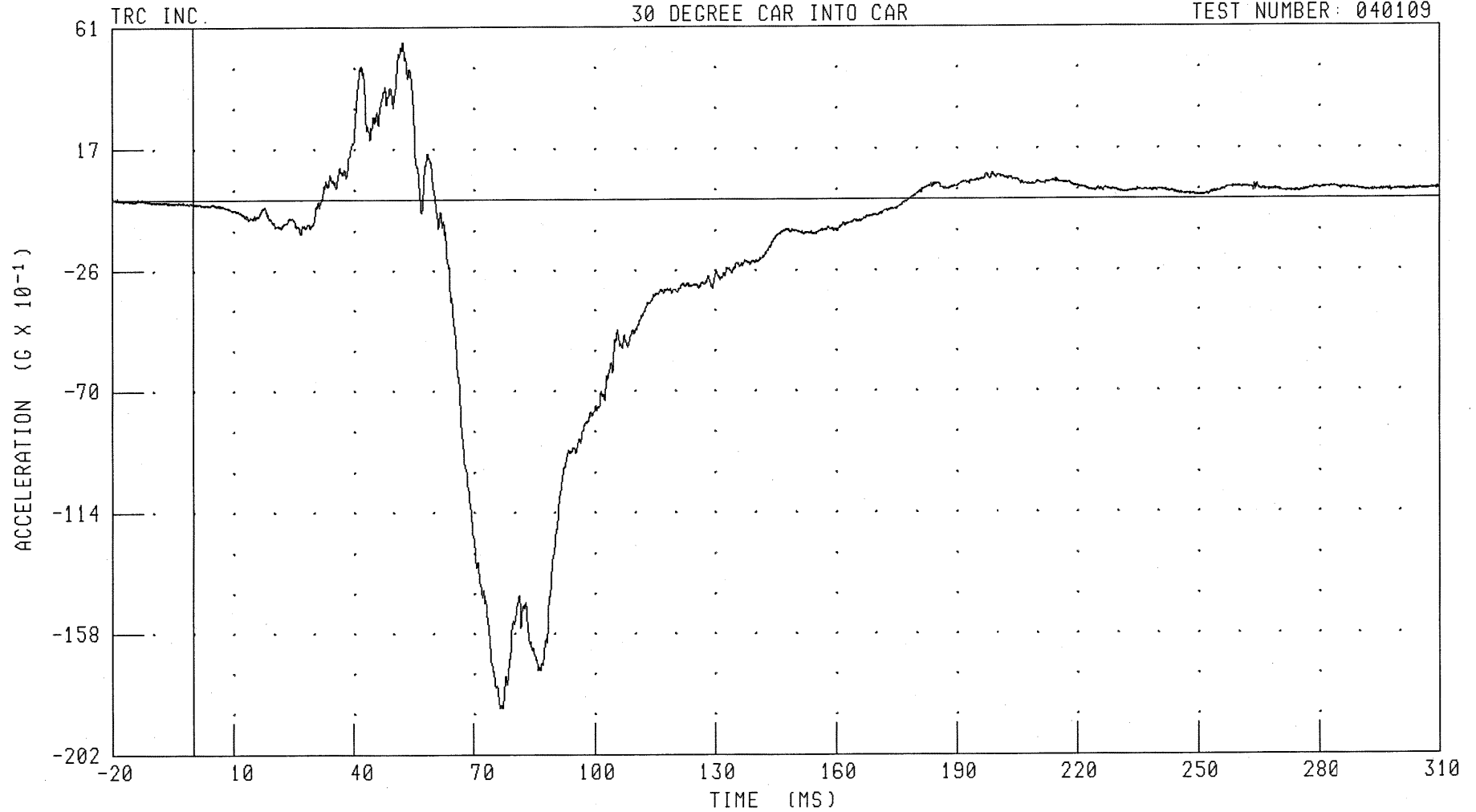
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER PELVIS Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVZGB FILTER: CH. CLASS 1000

B-158

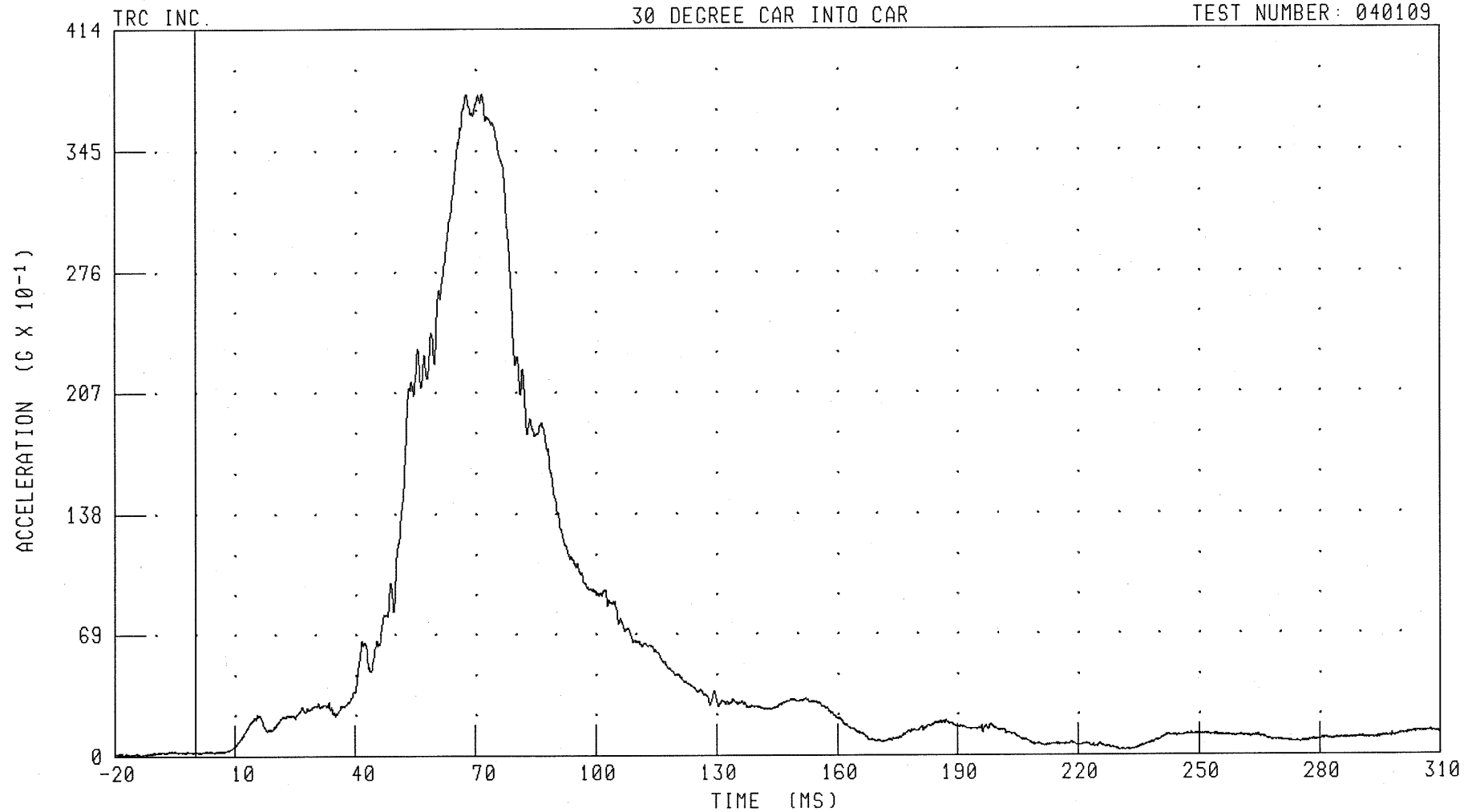
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER PELVIS RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PEVRGB FILTER: CH. CLASS 1000

PEAK DATA: 37.75 G @ 71.68 MS; 0.04 G @ -13.36 MS

B-159

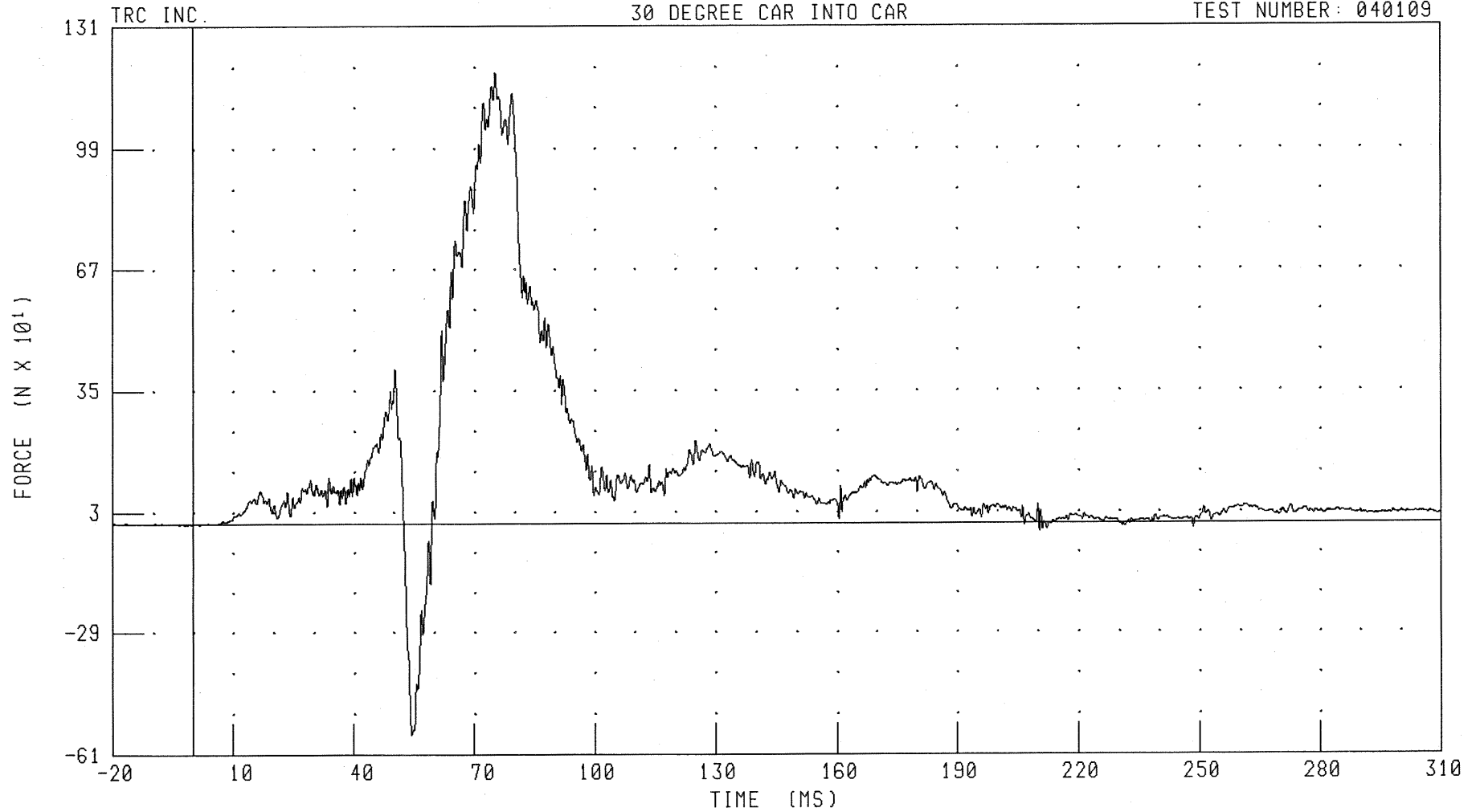
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER LEFT FEMUR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFMZFB FILTER: CH. CLASS 600

PEAK DATA: 1187.53 N @ 75.28 MS; -558.00 N @ 54.48 MS

B-160

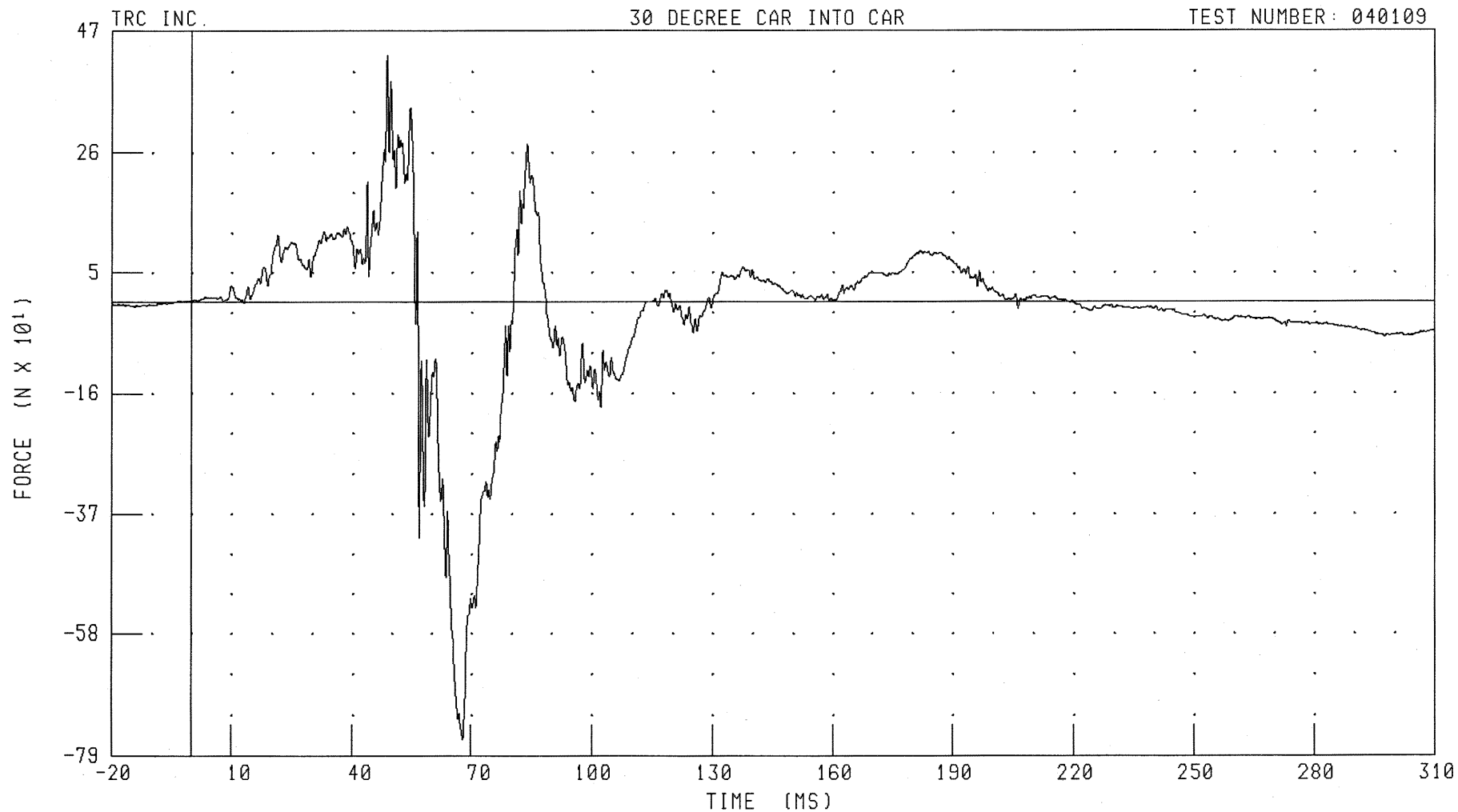
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER RIGHT FEMUR FORCE

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFMZFB FILTER: CH. CLASS 600

PEAK DATA: 427.55 N @ 48.72 MS; -762.51 N @ 67.92 MS

B-161

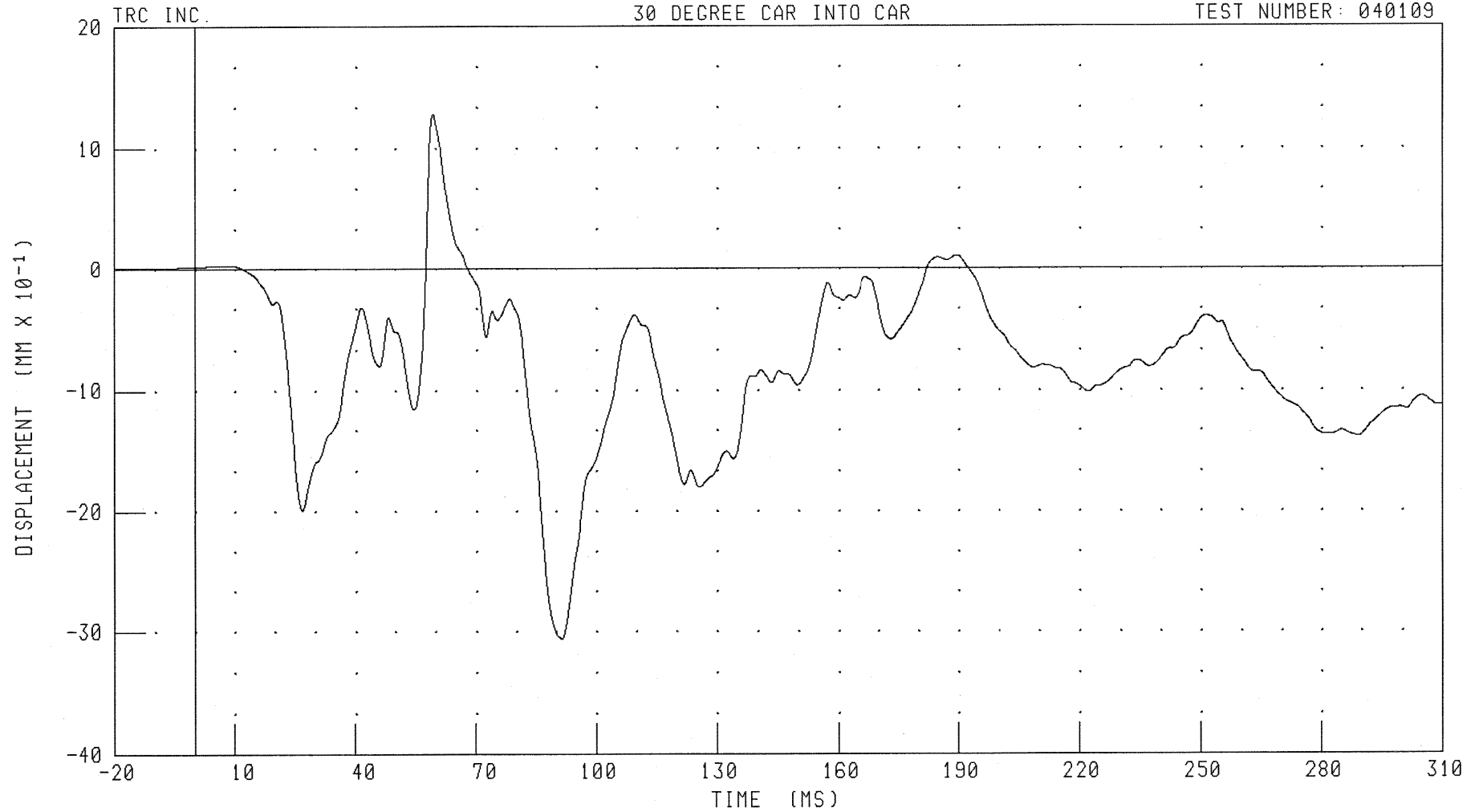
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER LEFT KNEE DISPLACEMENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: KNLXDB FILTER: CH. CLASS 180

PEAK DATA: 1.28 MM @ 59.44 MS; -3.06 MM @ 91.52 MS

B-162

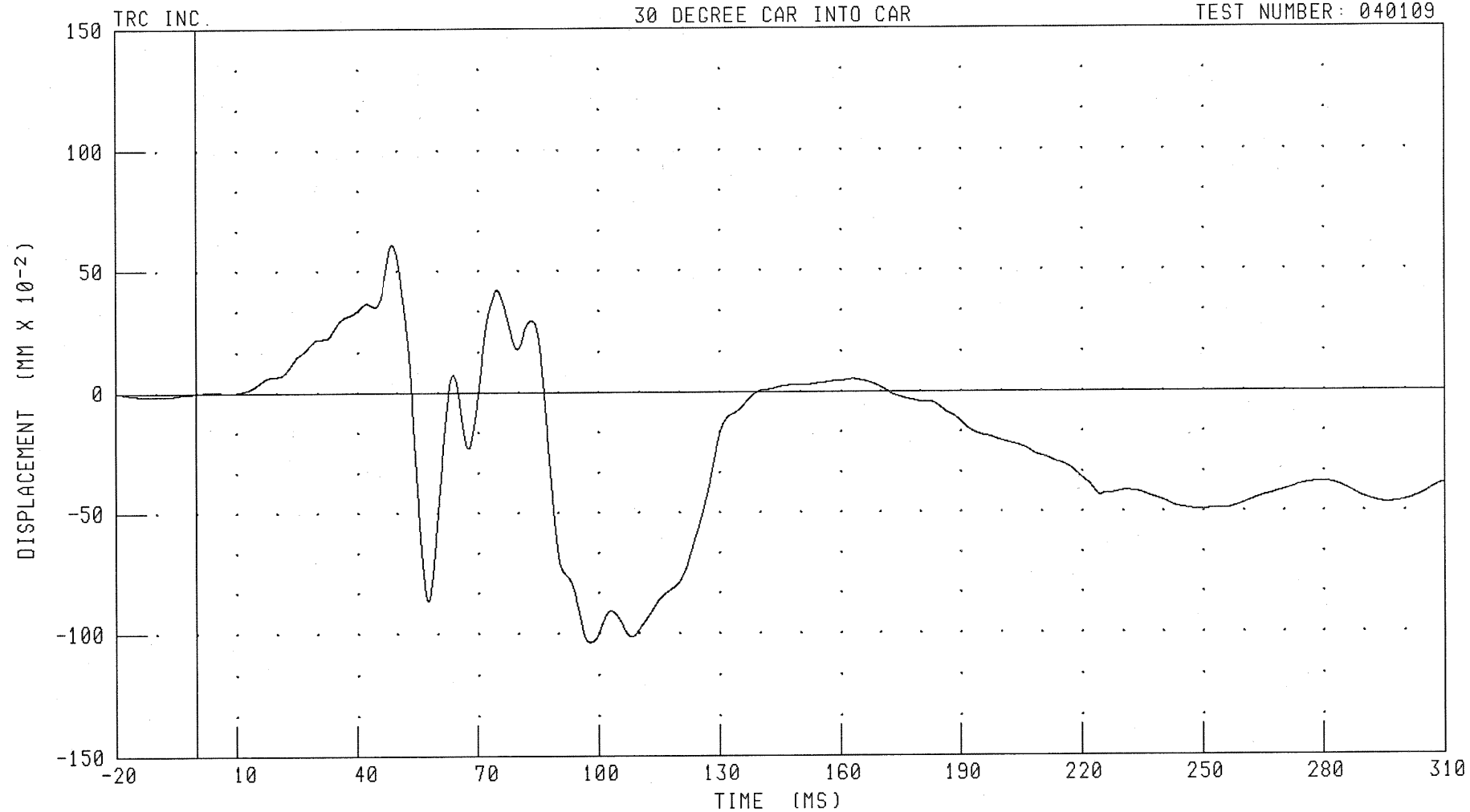
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET PASSENGER RIGHT KNEE DISPLACEMENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: KNRXDB FILTER: CH. CLASS 180

PEAK DATA: 0.61 MM @ 48.88 MS; -1.04 MM @ 97.92 MS

B-163

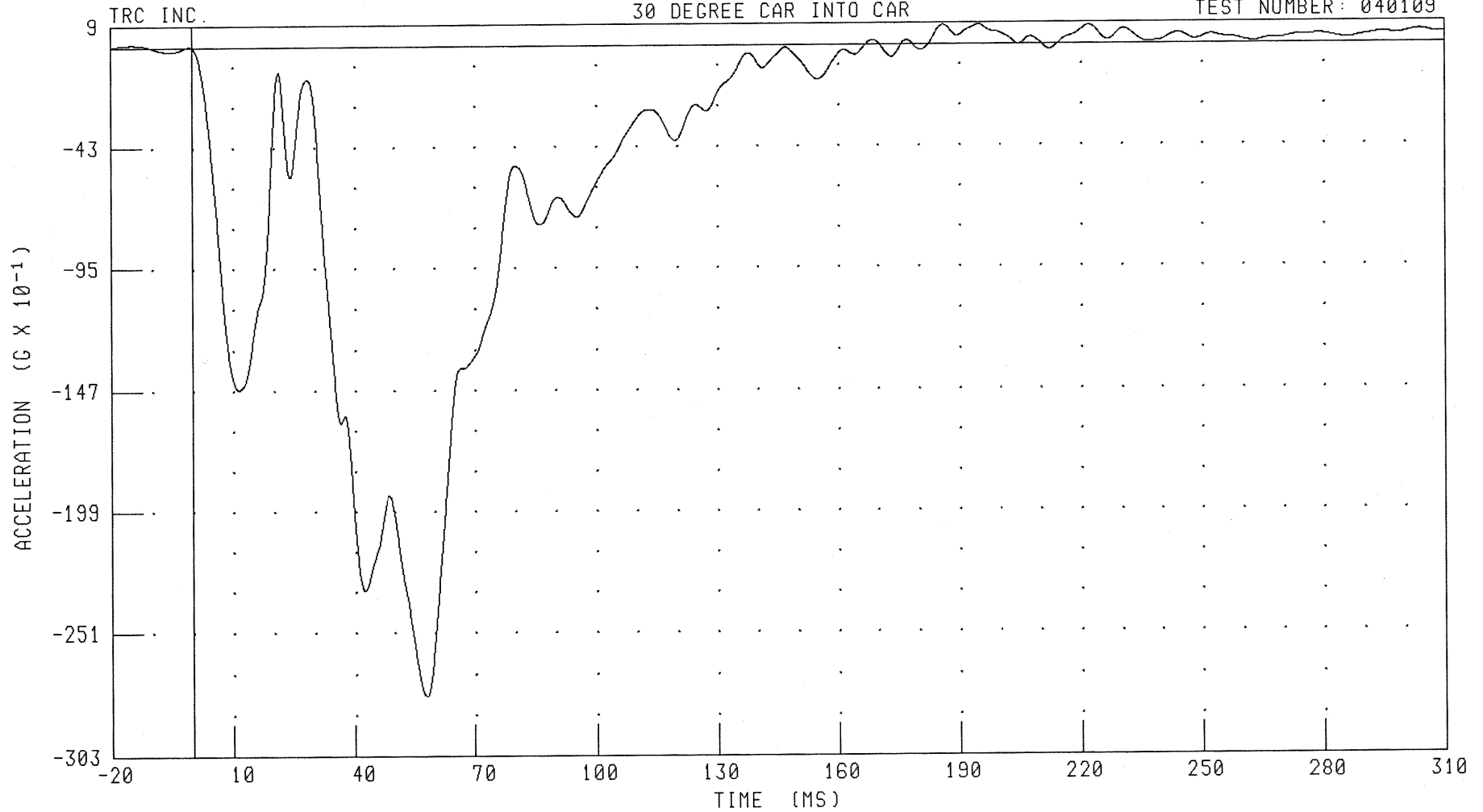
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: VCGXGA FILTER: CH. CLASS 60

PEAK DATA: 0.83 G @ 194.88 MS; -27.74 G @ 58.08 MS

B-164

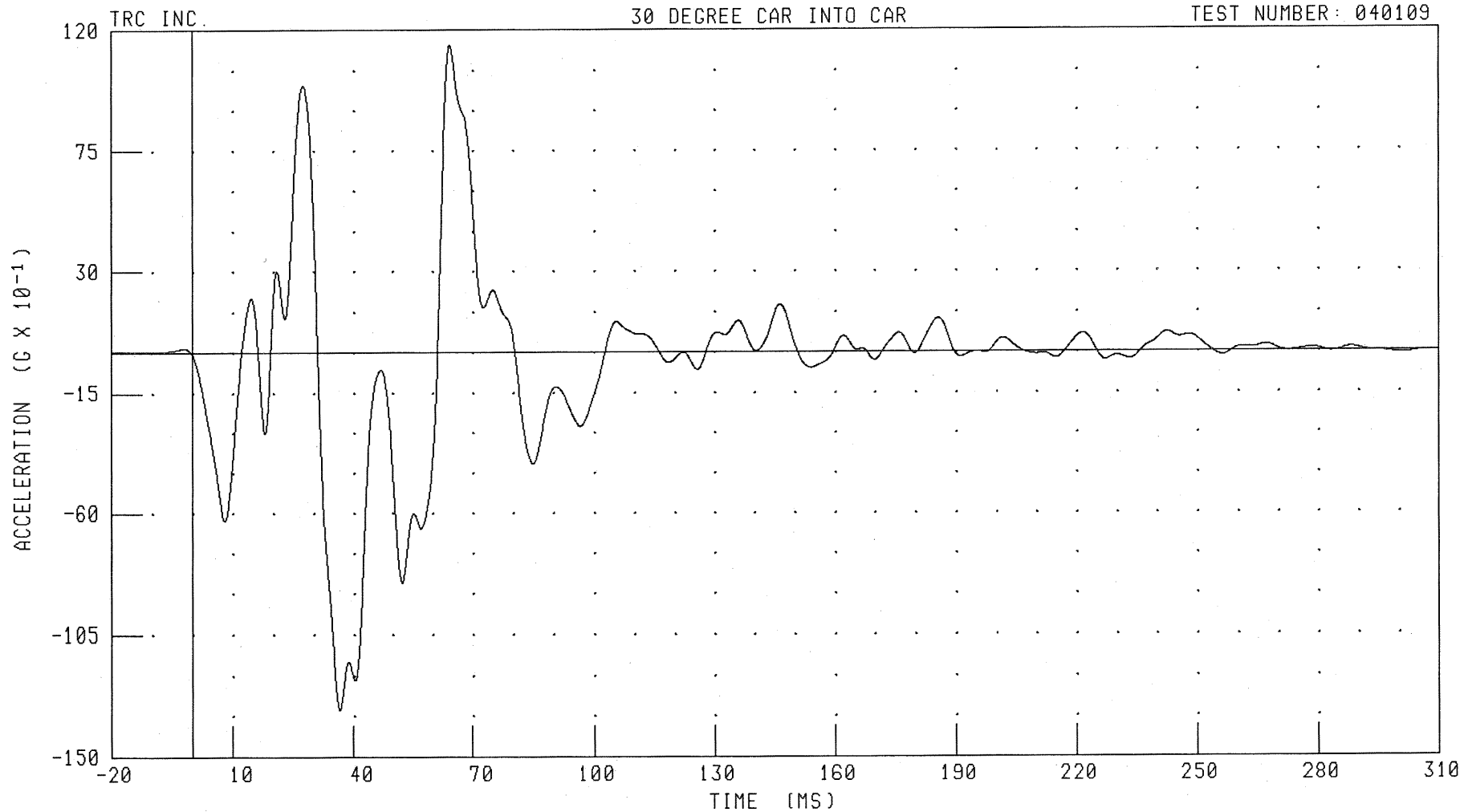
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



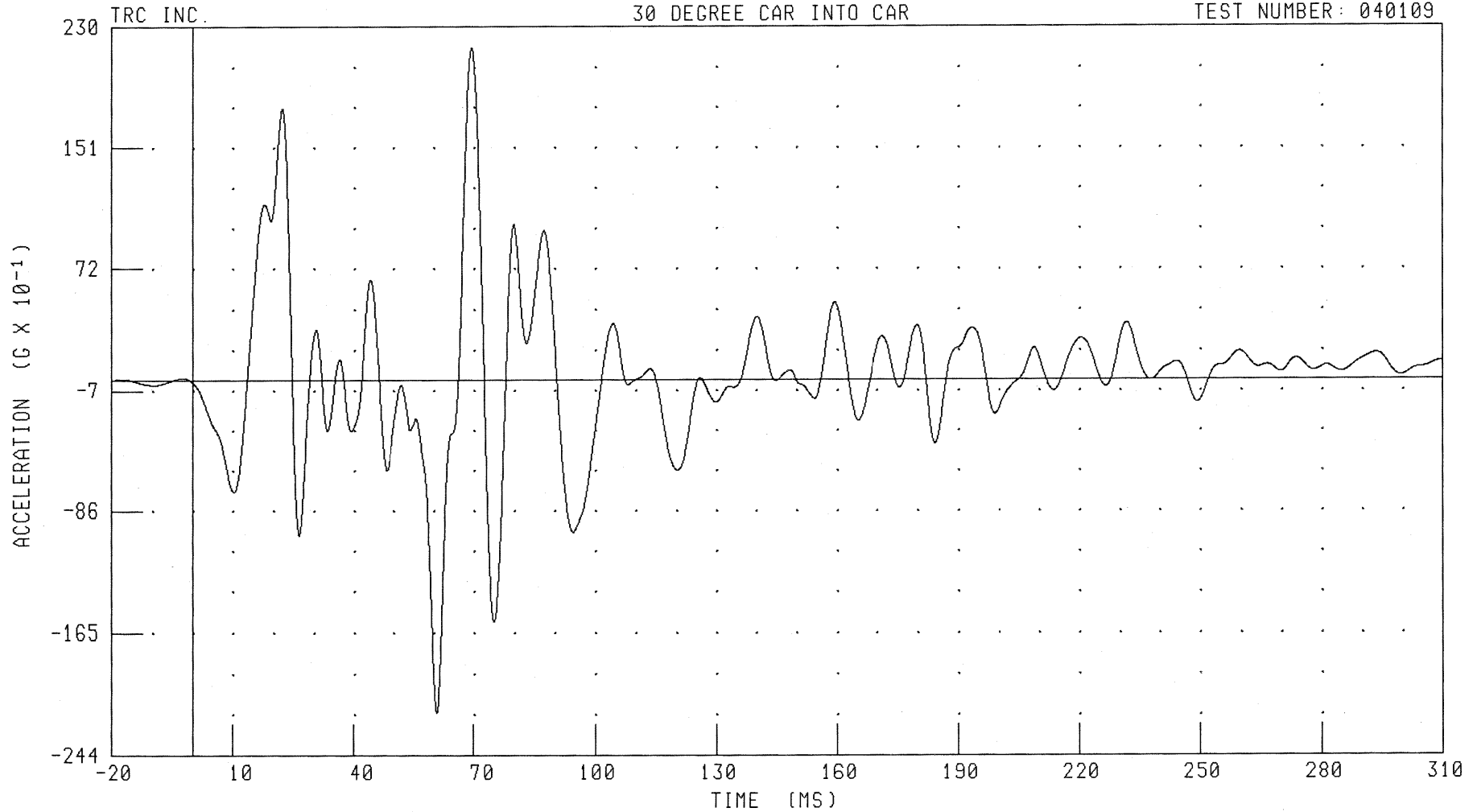
CHANNEL: VCGYGA FILTER: CH. CLASS 60

B-165

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
BULLET VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION
30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: VCGZGA FILTER: CH. CLASS 60

PEAK DATA: 21.63 G @ 69.52 MS; -21.67 G @ 60.80 MS

B-166

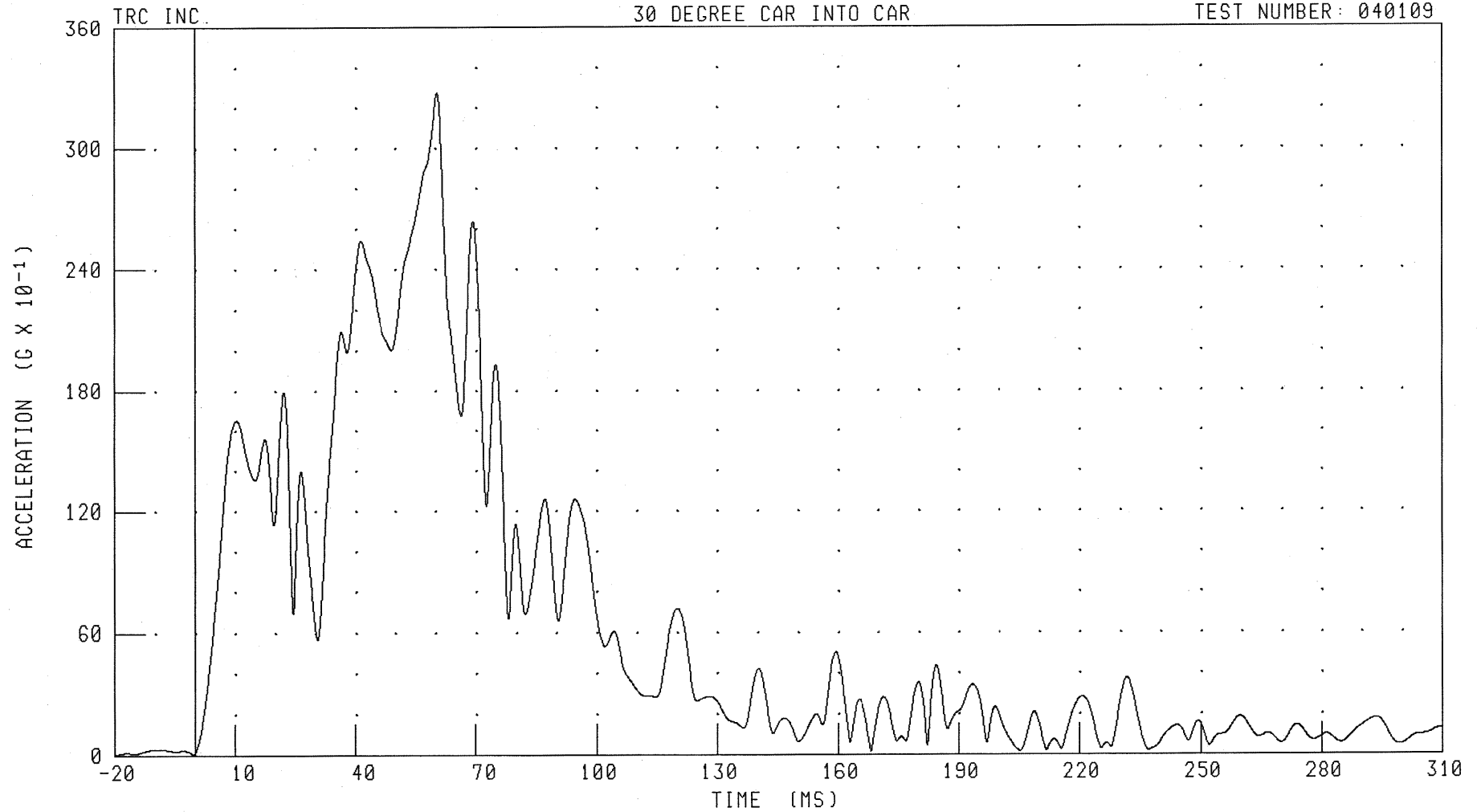
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-167

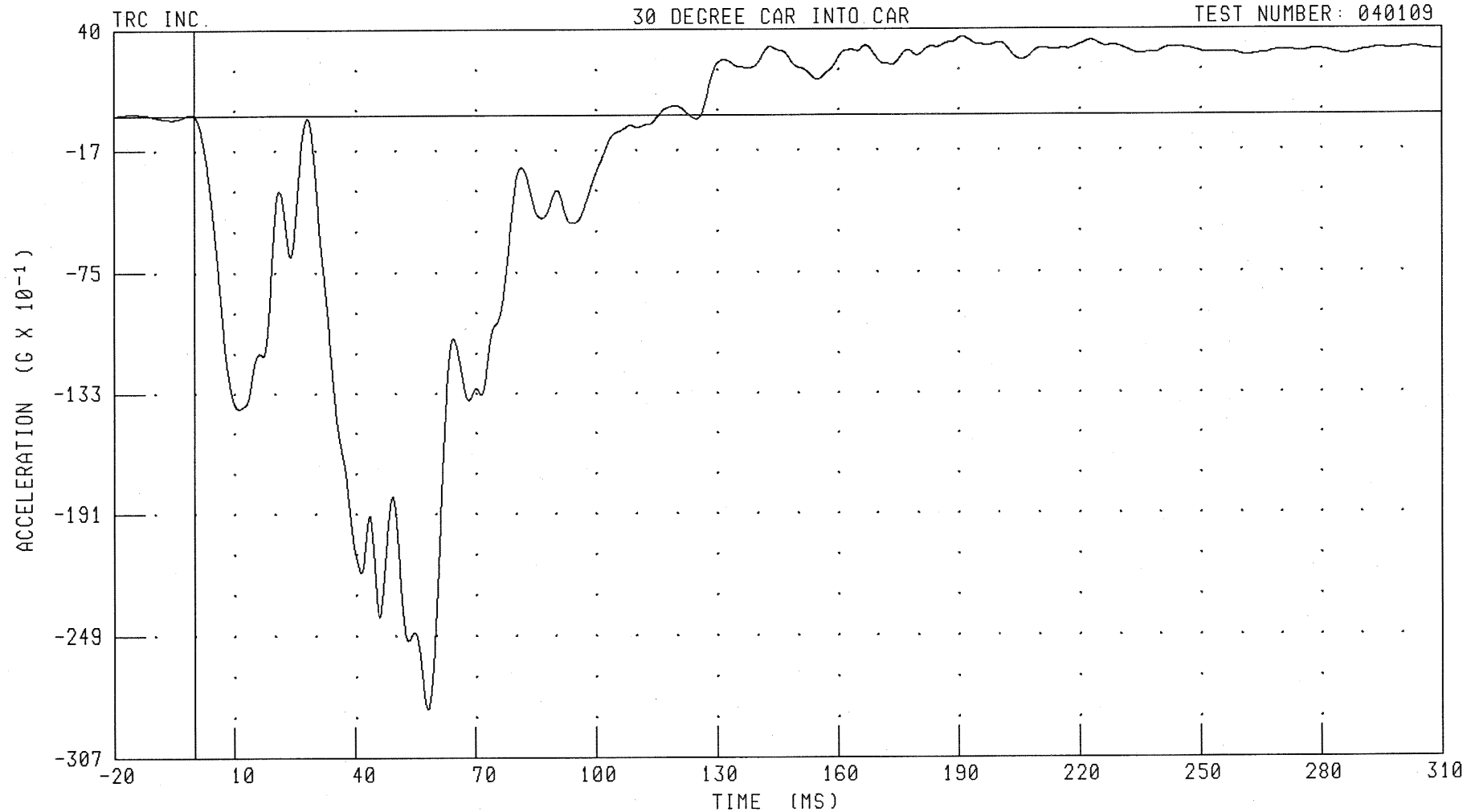
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET REAR DECK X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKXGA FILTER: CH. CLASS 60

PEAK DATA: 3.73 G @ 191.04 MS; -28.42 G @ 58.08 MS

B-168

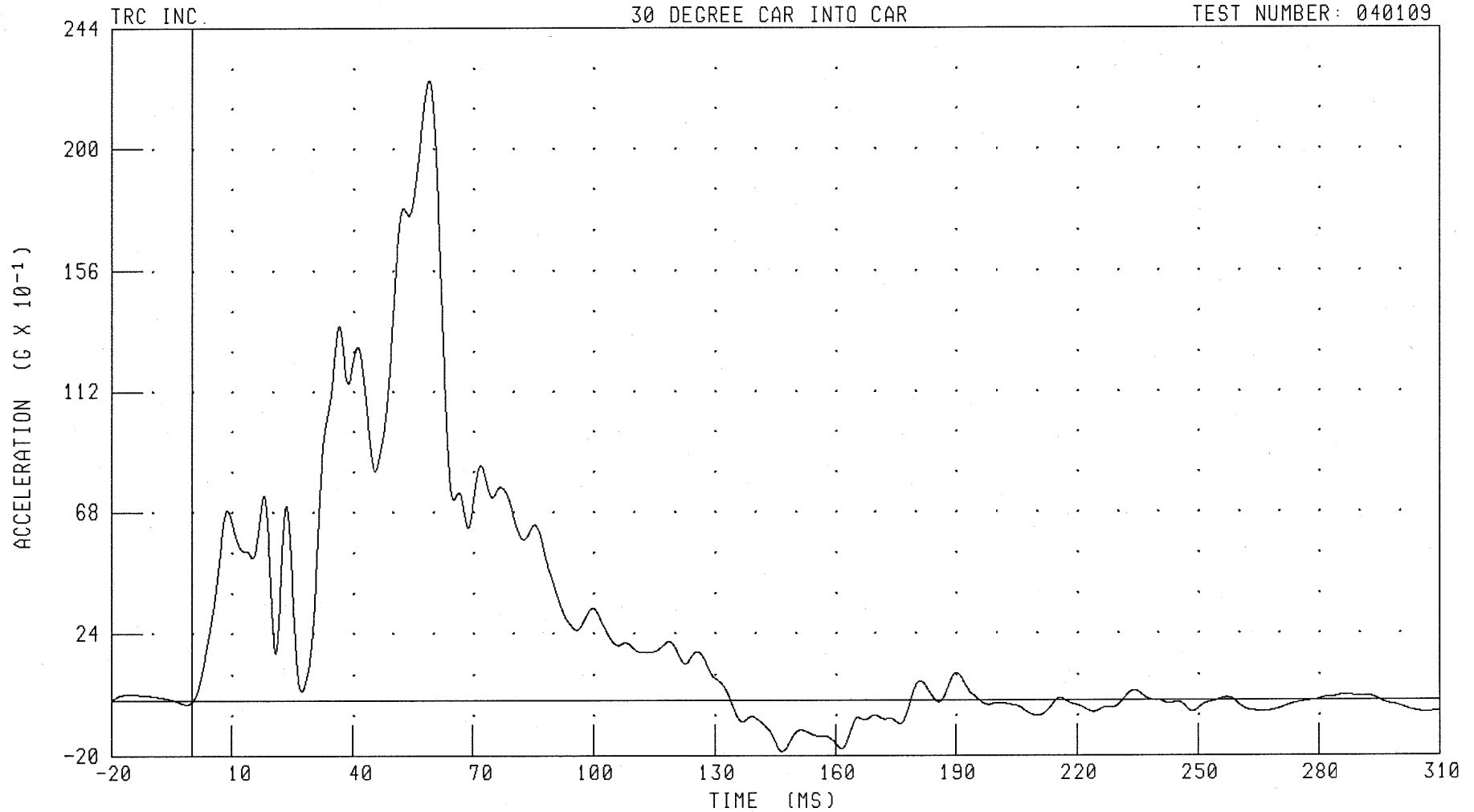
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET REAR DECK Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKYGA FILTER: CH. CLASS 60

PEAK DATA: 22.48 G @ 58.96 MS; -1.85 G @ 146.72 MS

B-169

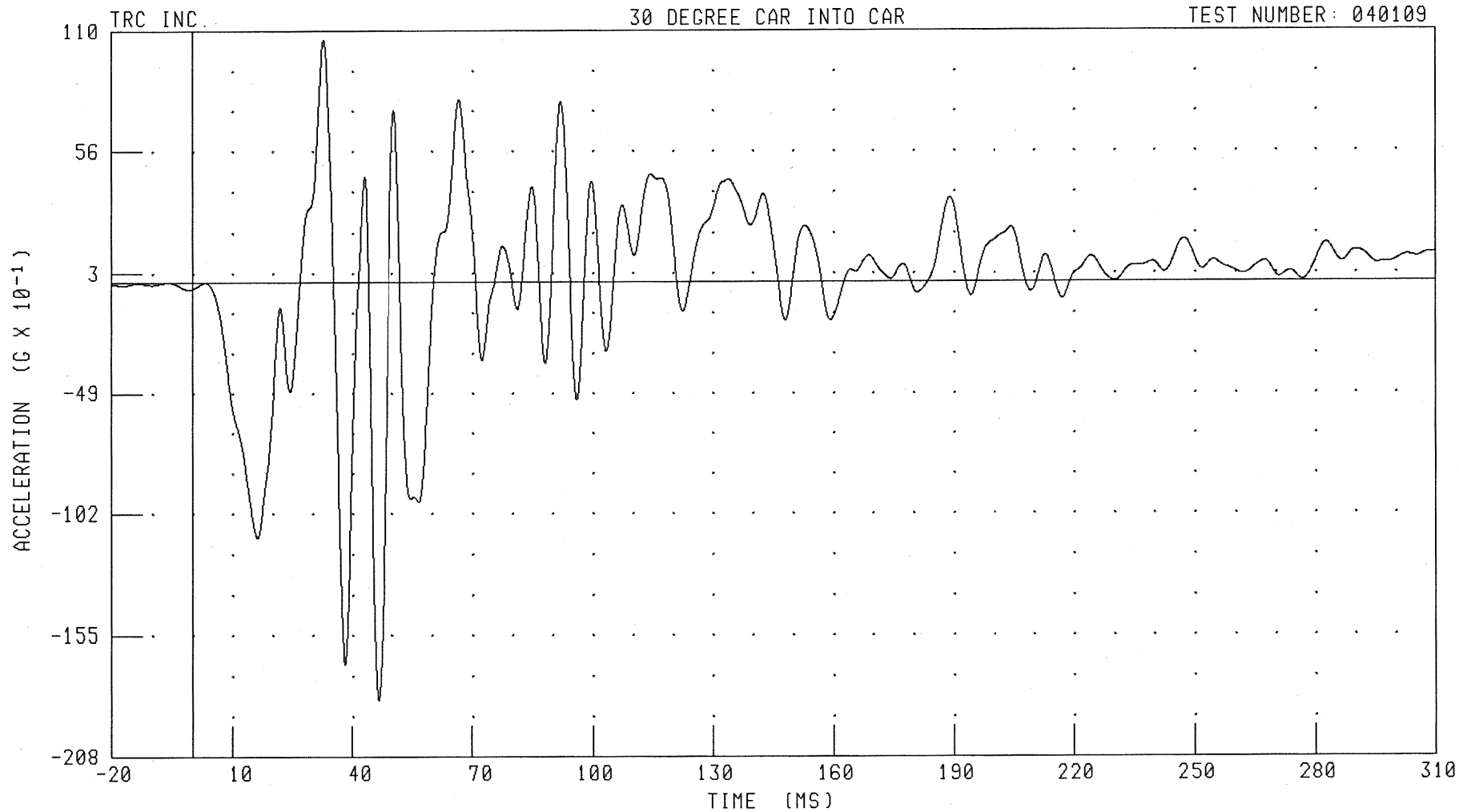
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET REAR DECK Z-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RDKZGA FILTER: CH. CLASS 60

PEAK DATA: 10.59 G @ 32.80 MS; -18.33 G @ 46.72 MS

B-170

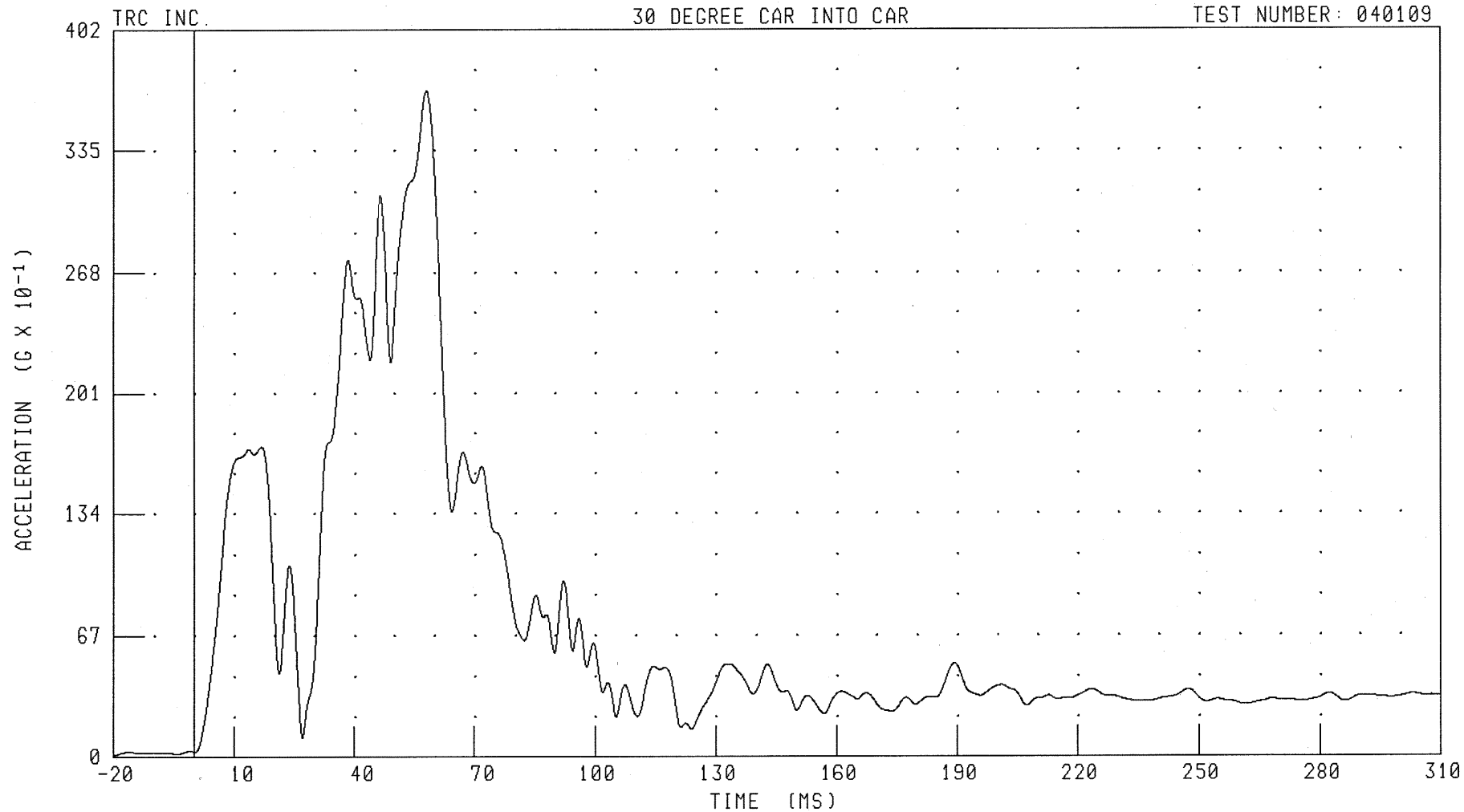
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET REAR DECK RESULTANT ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-171

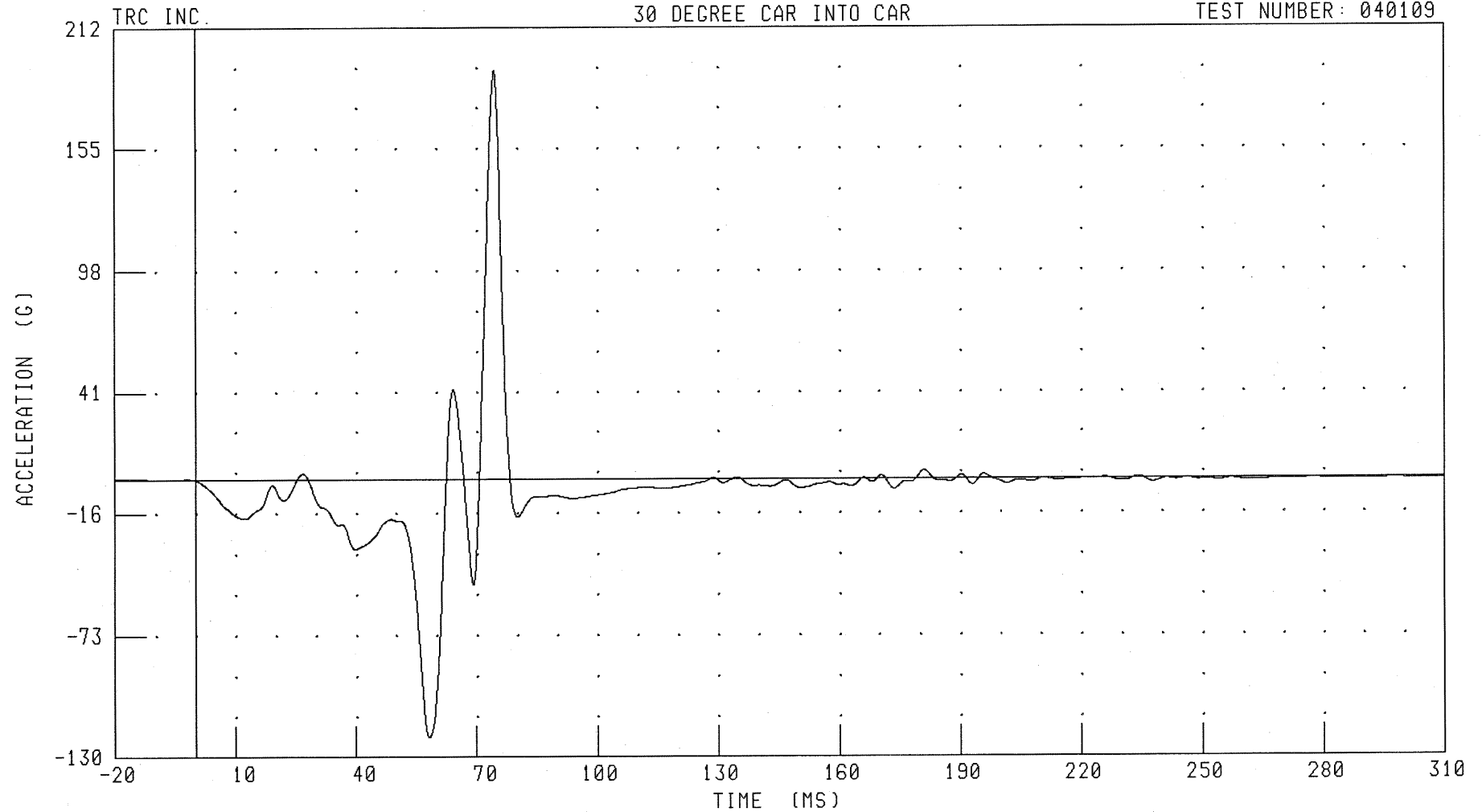
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET LEFT FRONT SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFSXGA FILTER: CH. CLASS 60

B-172

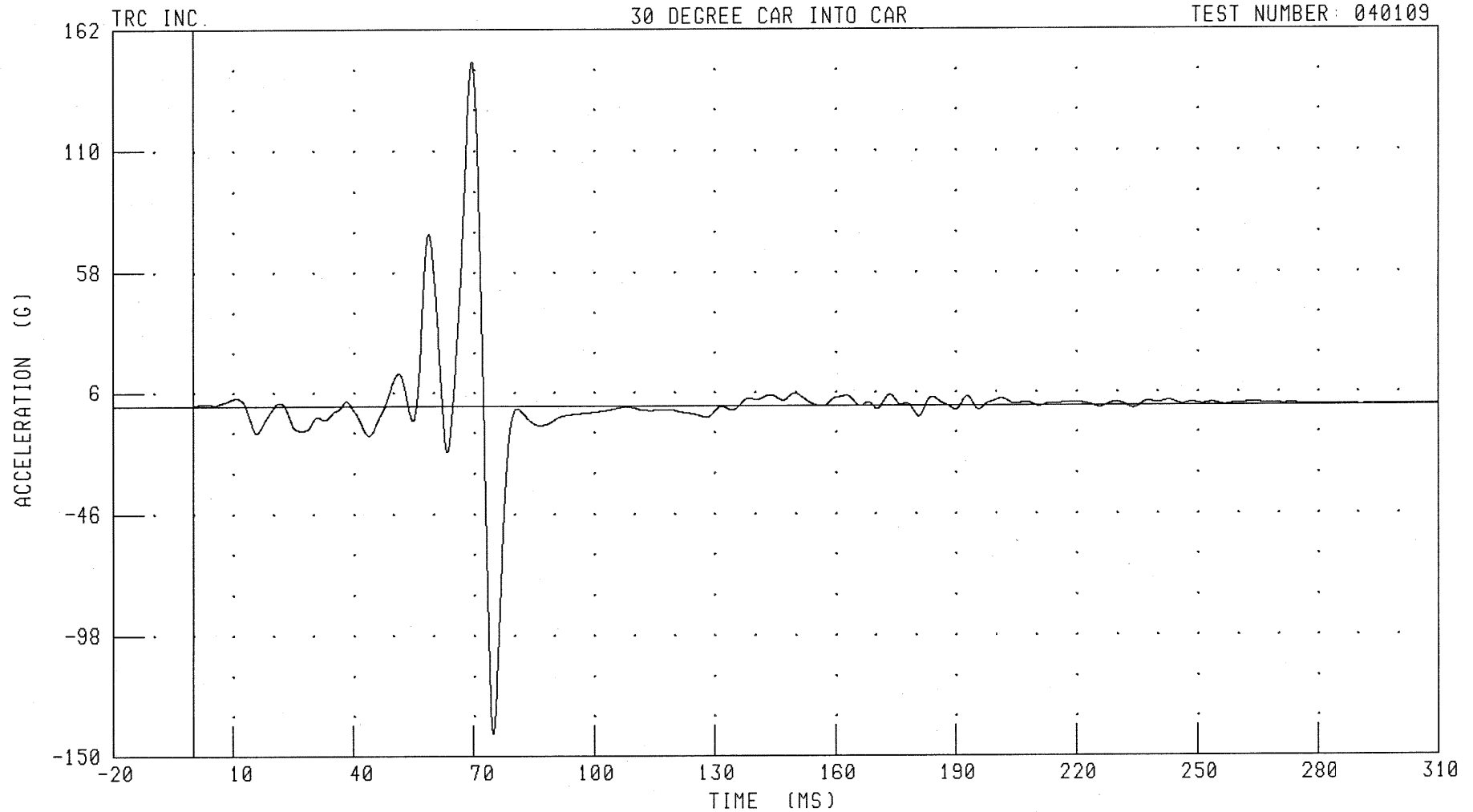
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET LEFT FRONT SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LFSYGA FILTER: CH. CLASS 60

B-173

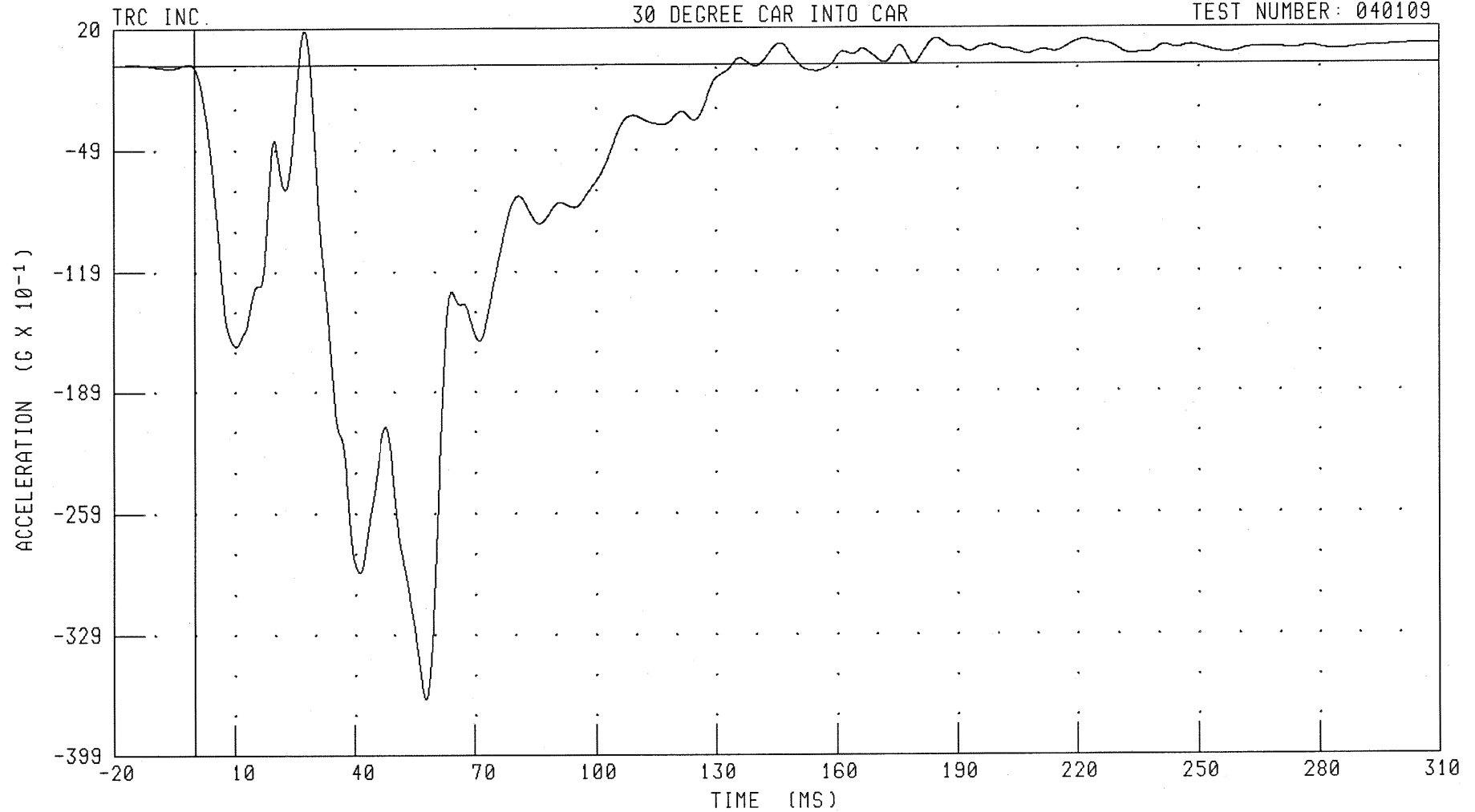
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET LEFT REAR SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRSXGA FILTER: CH. CLASS 60

PEAK DATA: 1.96 G @ 27.52 MS; -36.66 G @ 57.84 MS

B-174

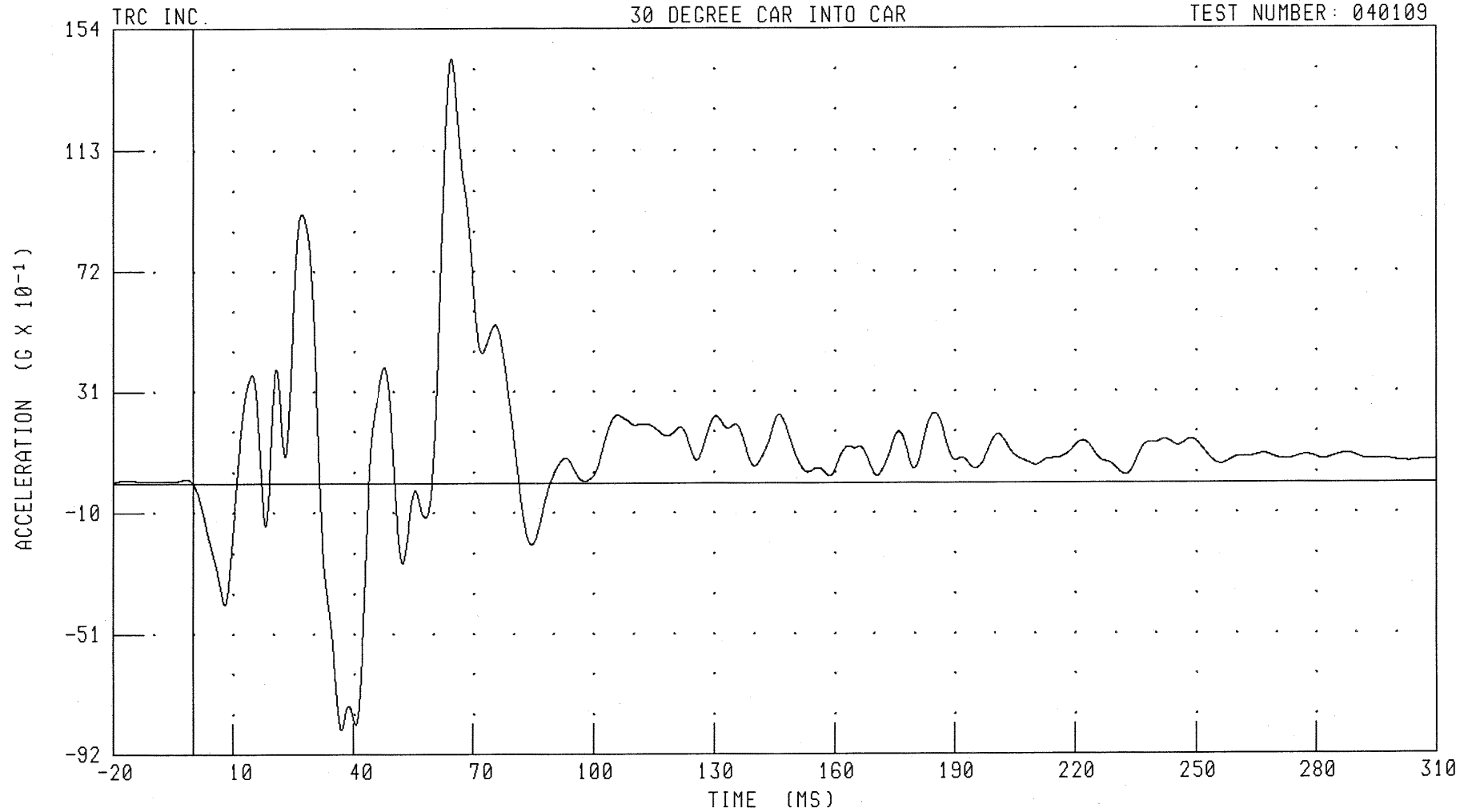
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET LEFT REAR SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-175

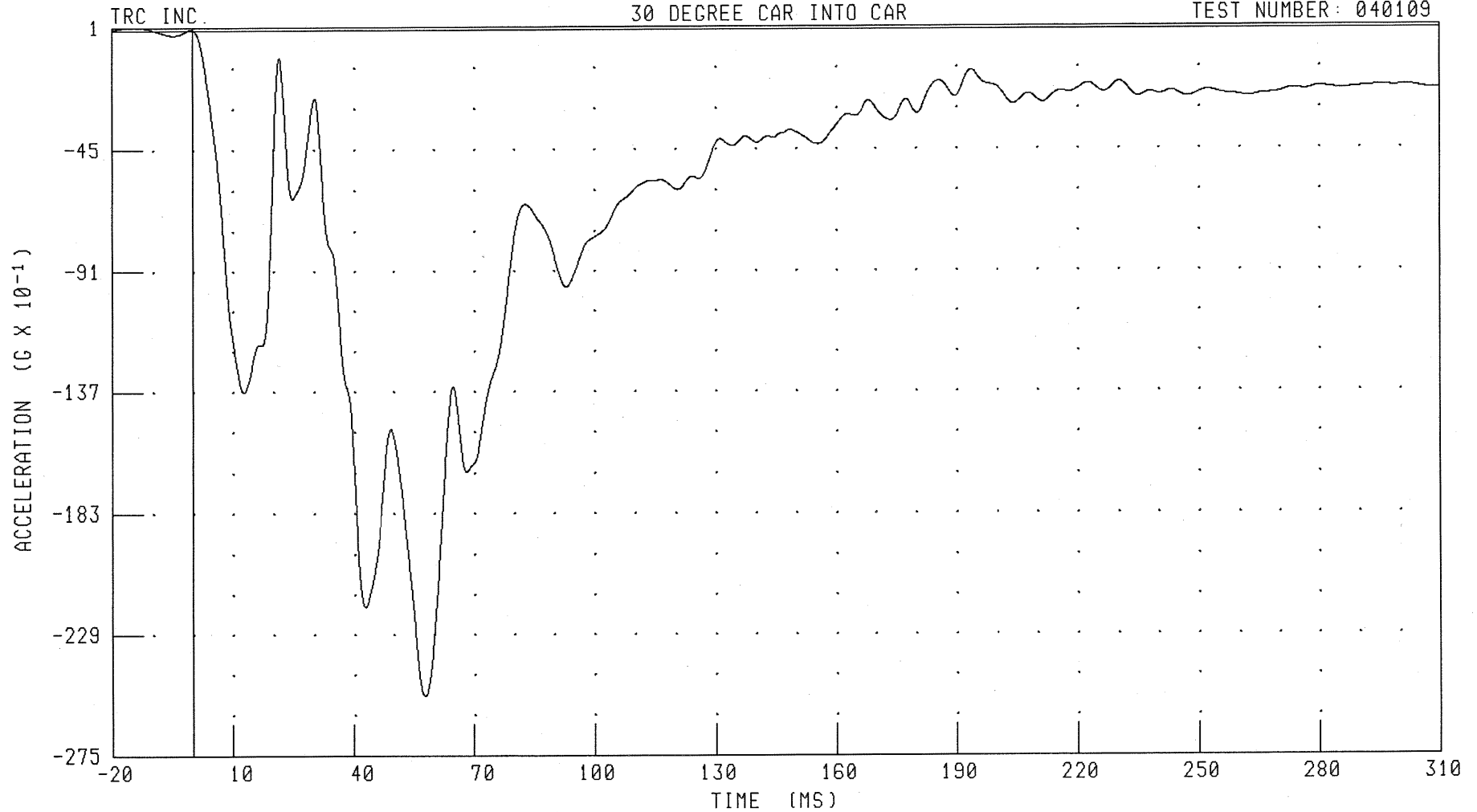
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET RIGHT FRONT SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFSXGA FILTER: CH. CLASS 60

PEAK DATA: 0.13 G @ -15.04 MS; -25.24 G @ 57.76 MS

B-176

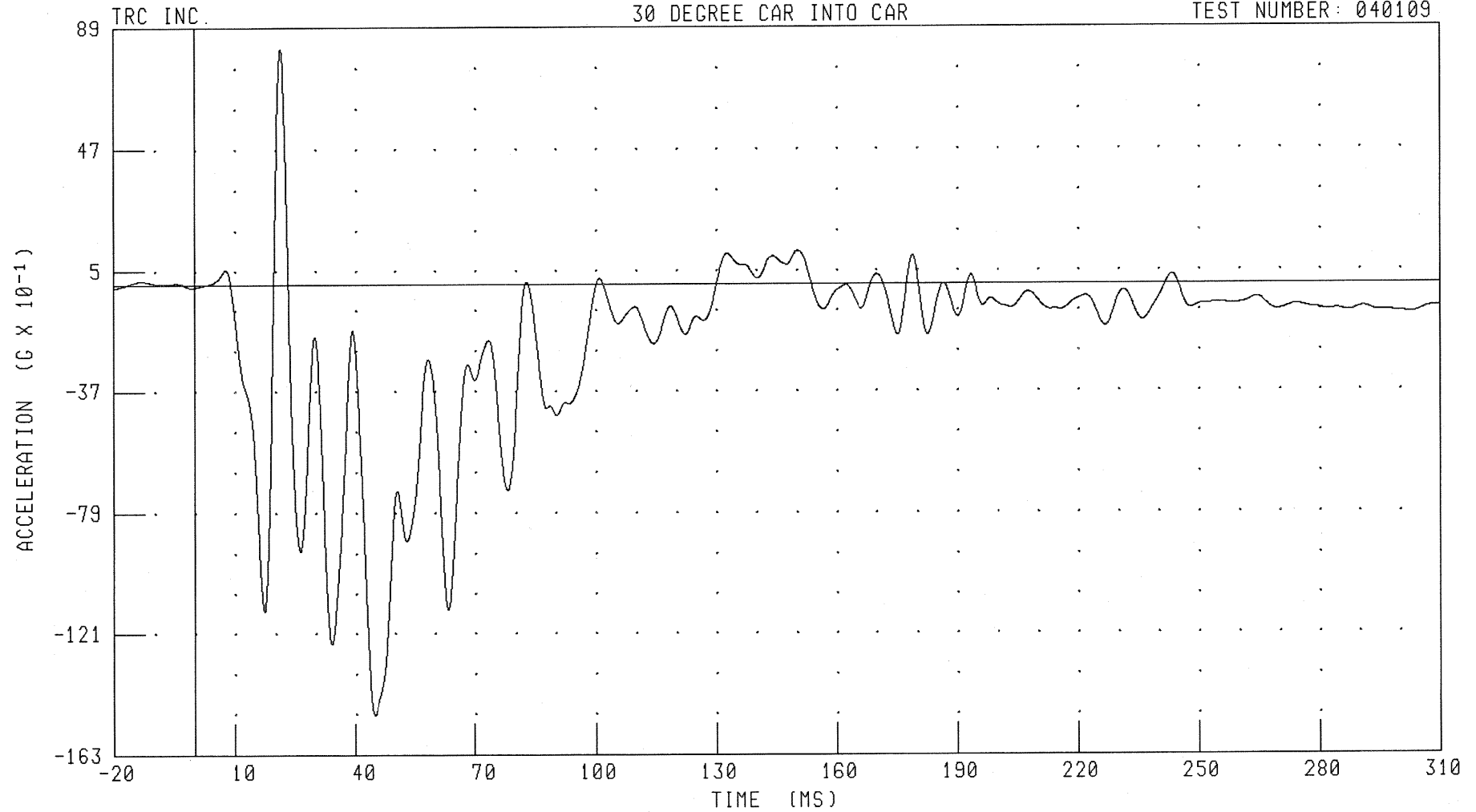
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET RIGHT FRONT SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RFSYGA FILTER: CH. CLASS 60

PEAK DATA: 8.16 G @ 21.36 MS, -14.95 G @ 44.88 MS

B-177

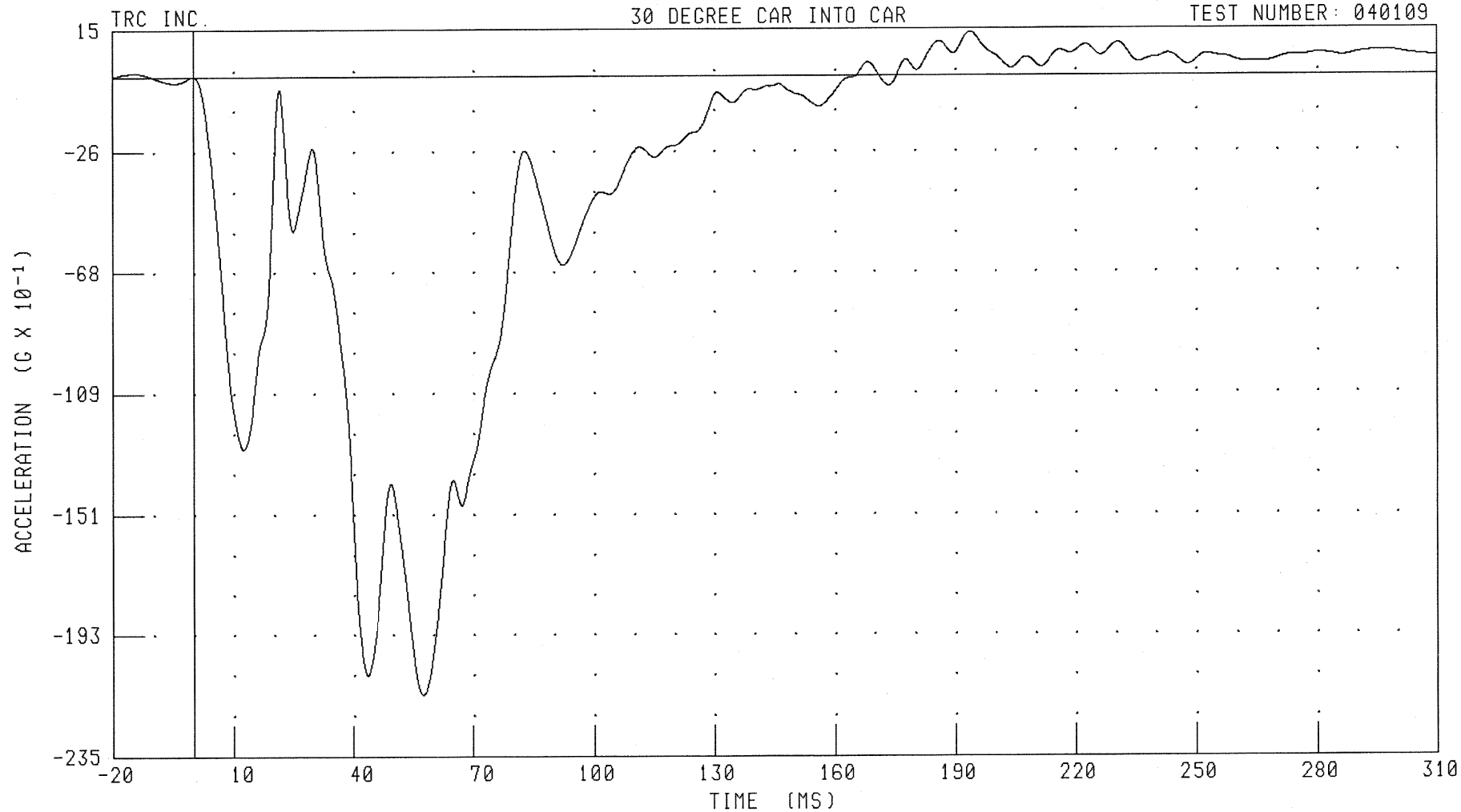
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET RIGHT REAR SILL X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRSXGA FILTER: CH. CLASS 60

PEAK DATA: 1.48 G @ 193.84 MS; -21.50 G @ 57.52 MS

B-178

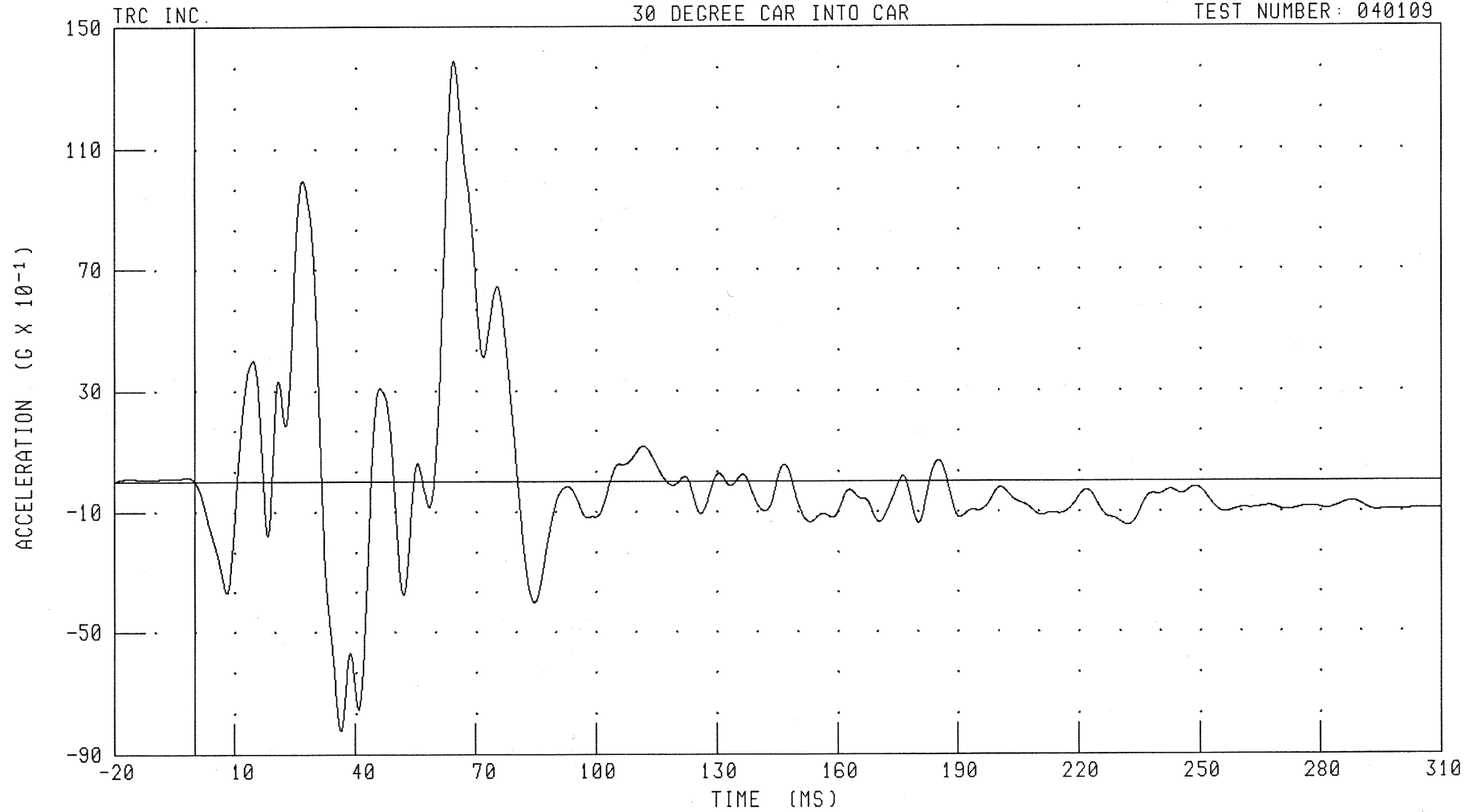
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET RIGHT REAR SILL Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRSYGA FILTER: CH. CLASS 60

PEAK DATA: 13.88 G @ 64.56 MS; -8.24 G @ 36.40 MS

B-179

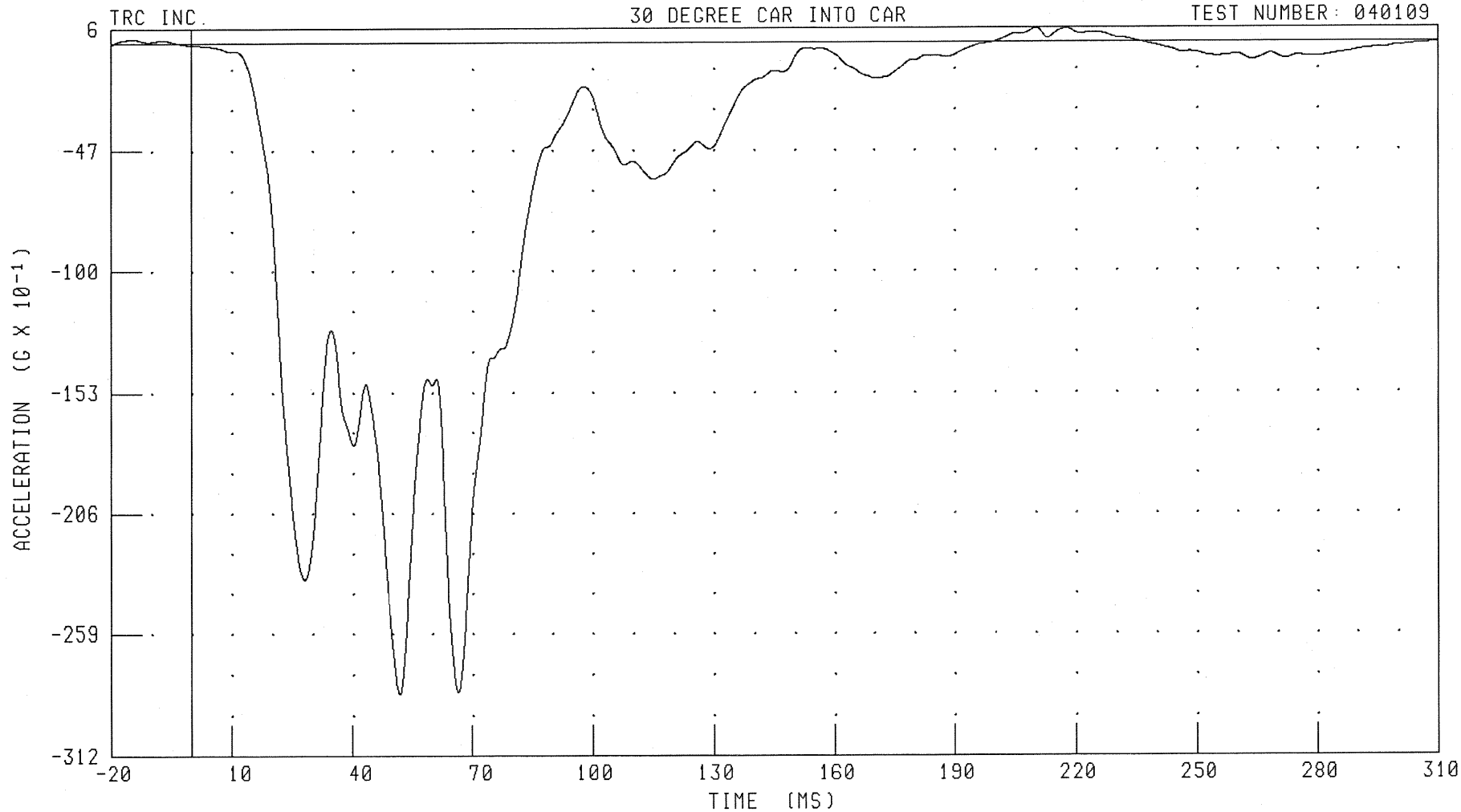
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET ENGINE TOP X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGXGA FILTER: CH. CLASS 60

PEAK DATA: 0.59 G @ 210.16 MS; -28.52 G @ 51.92 MS

B-180

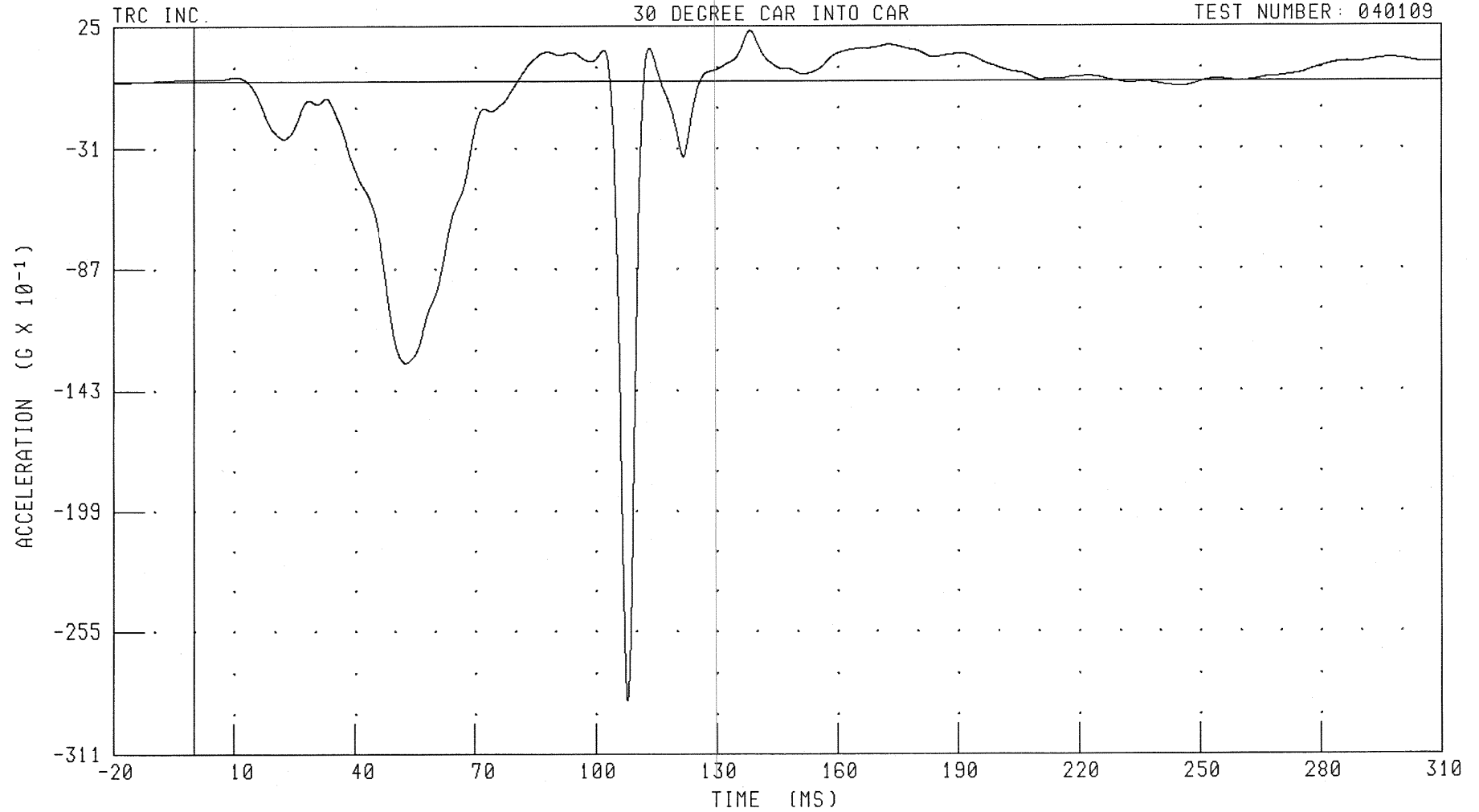
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET ENGINE TOP Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



B-181

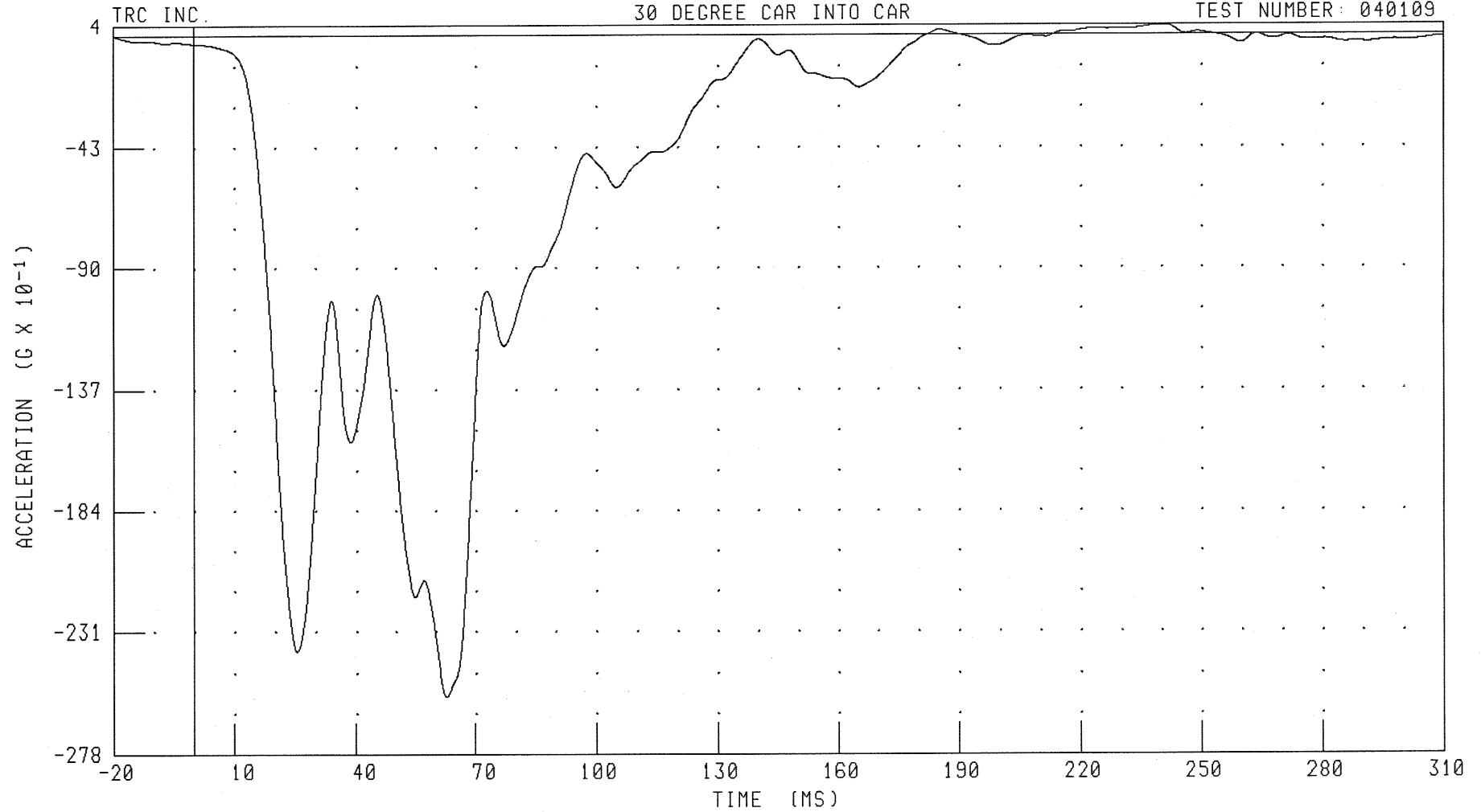
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET ENGINE BOTTOM X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGXGB

FILTER: CH. CLASS 60

B-182

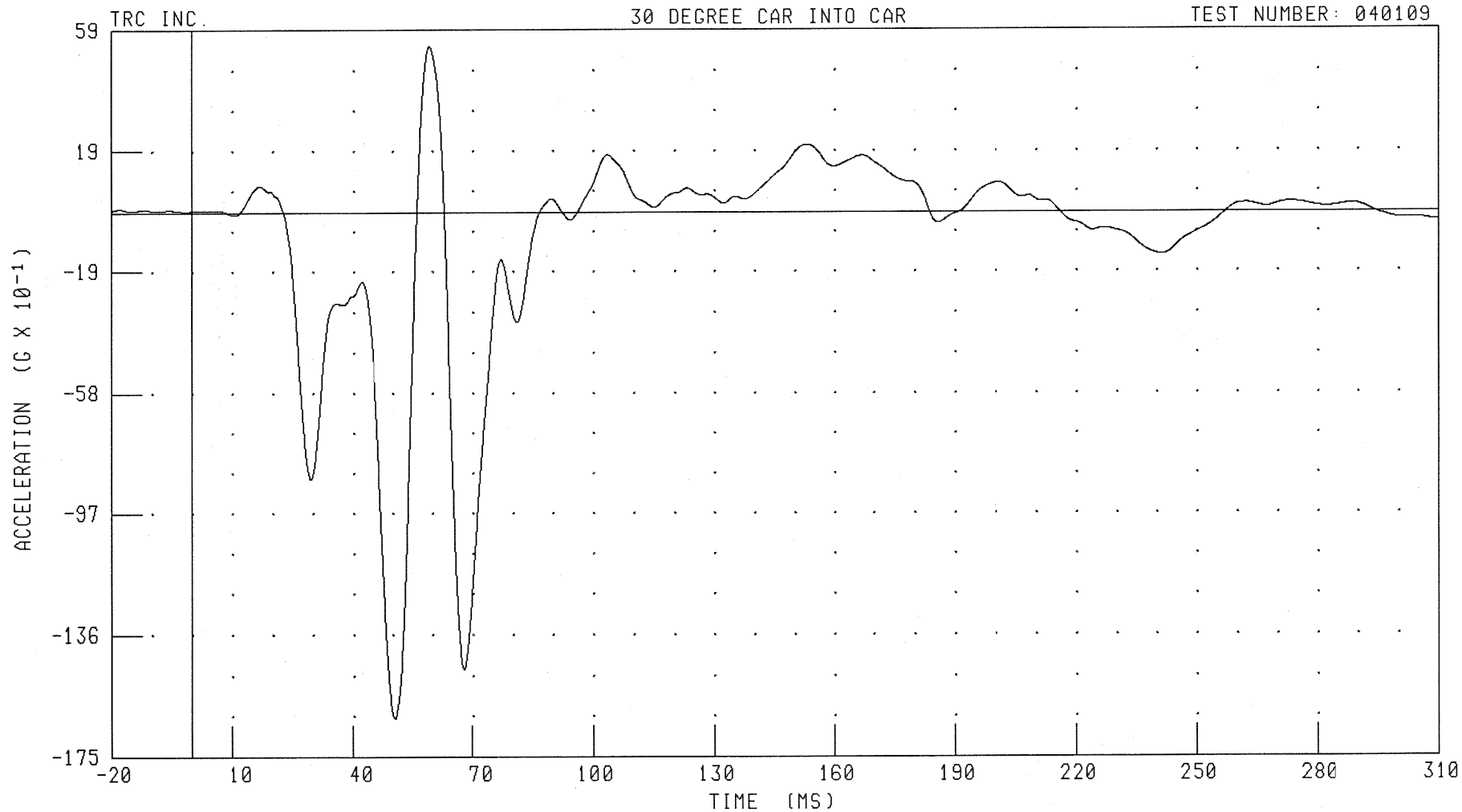
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET ENGINE BOTTOM Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: ENGYGB

FILTER: CH. CLASS 60

PEAK DATA: 5.36 G @ 59.28 MS; -16.28 G @ 50.56 MS

B-183

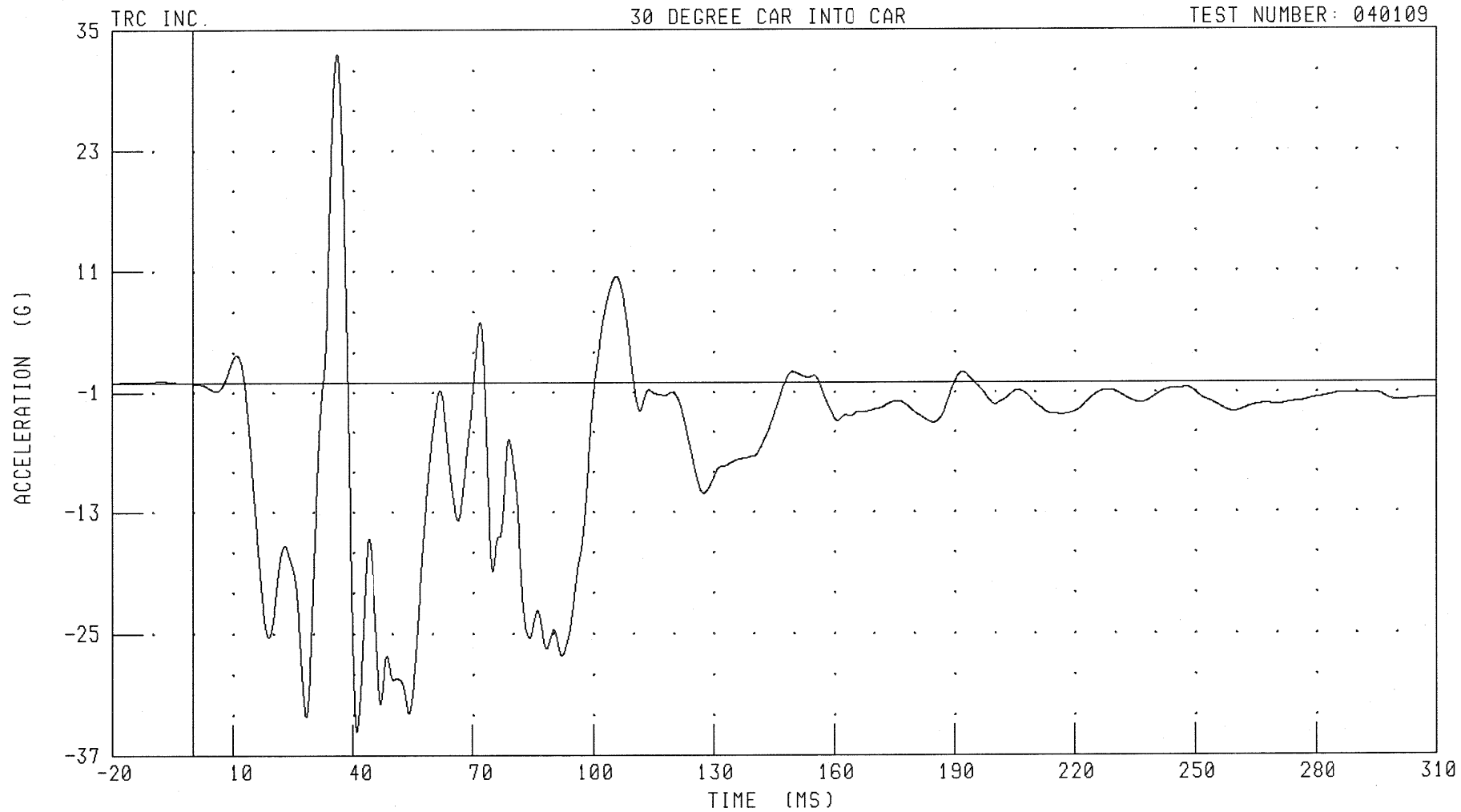
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: DPCXGA

FILTER: CH. CLASS 60

PEAK DATA: 32.58 G @ 36.08 MS; -34.63 G @ 41.04 MS

B-184

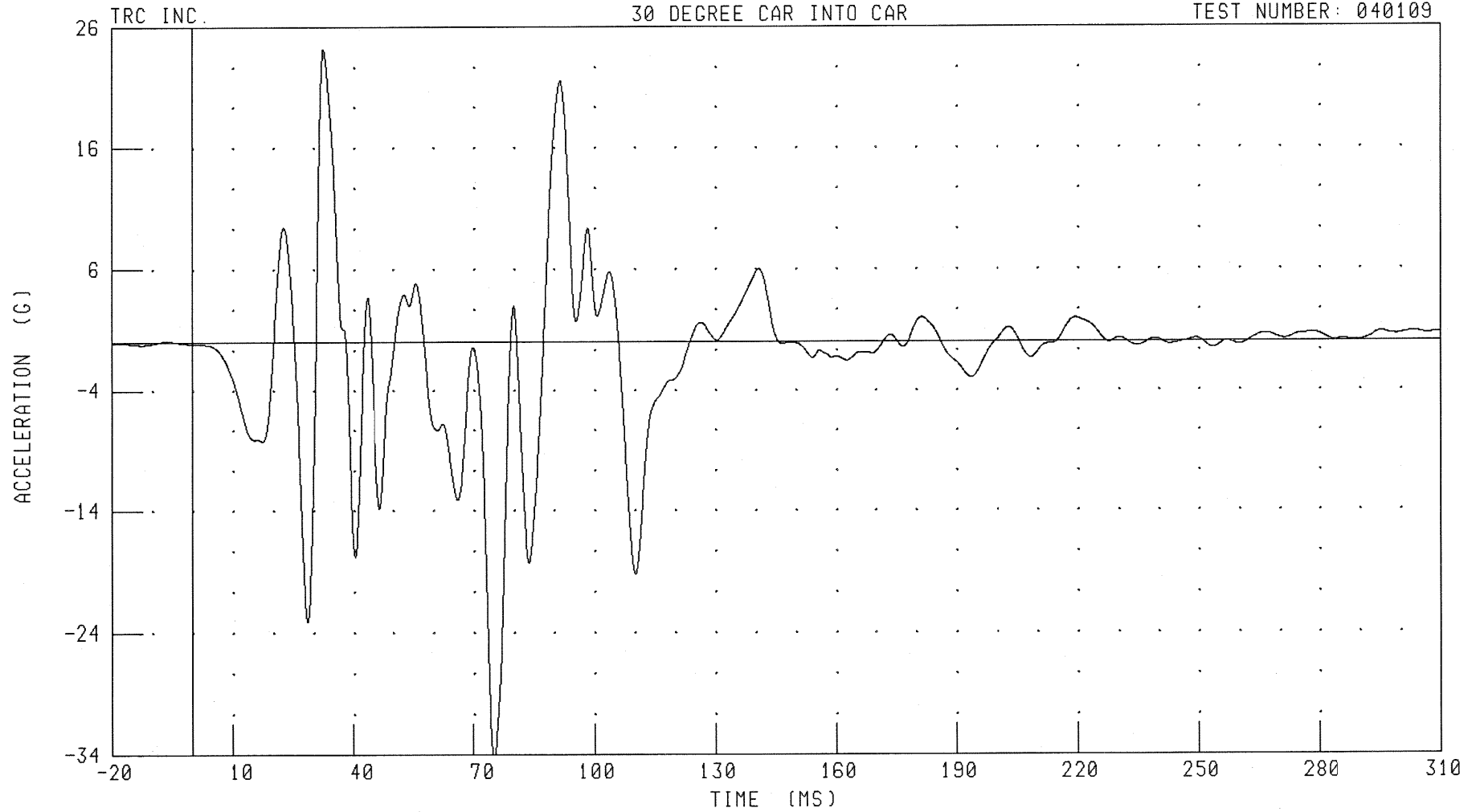
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET INSTRUMENT PANEL CENTER Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: DPCYGA FILTER: CH. CLASS 60

PEAK DATA: 24.18 G @ 32.48 MS; -34.39 G @ 75.04 MS

B-185

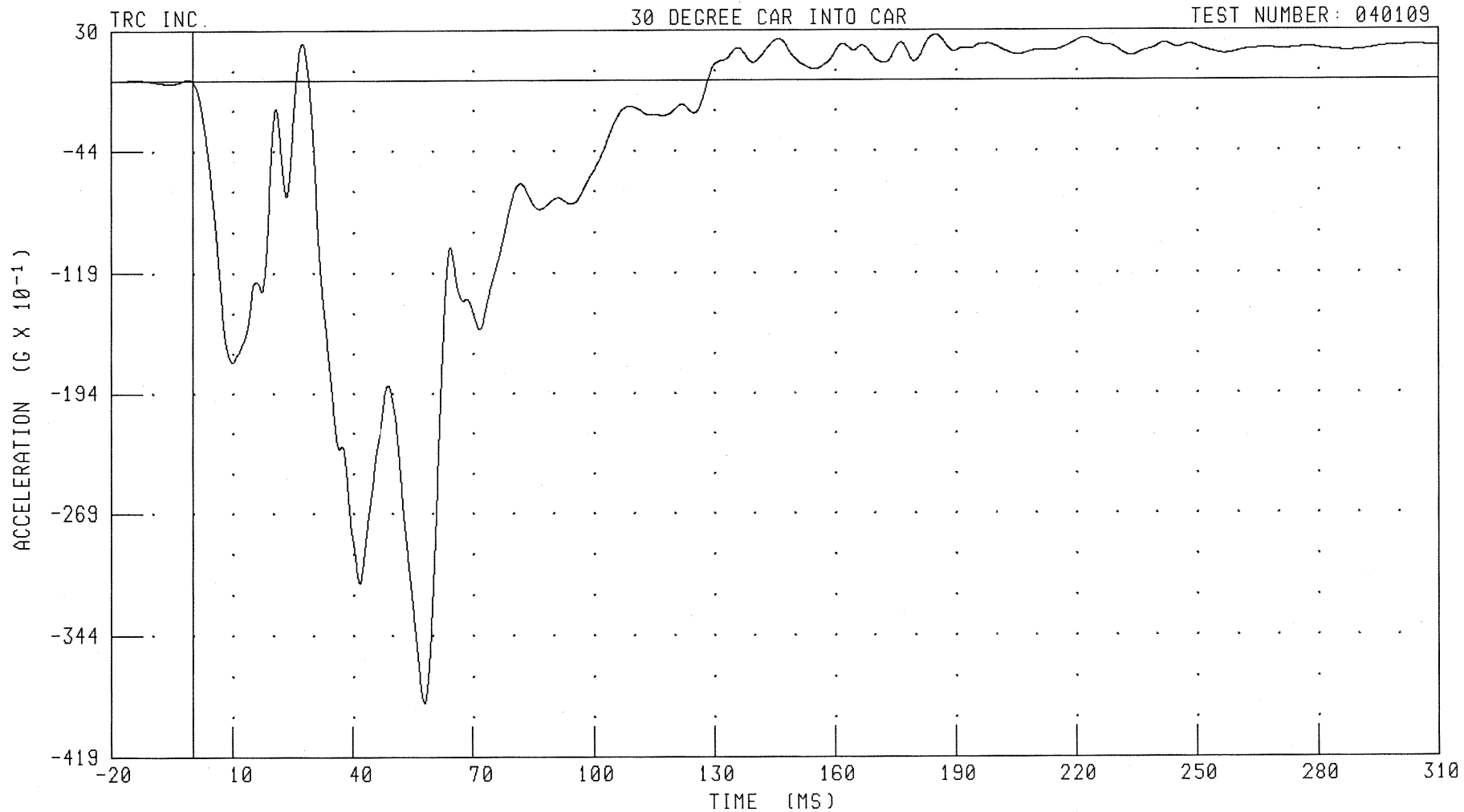
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET LEFT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRXXGA FILTER: CH. CLASS 60

PEAK DATA: 2.83 G @ 185.04 MS; -38.53 G @ 58.00 MS

B-186

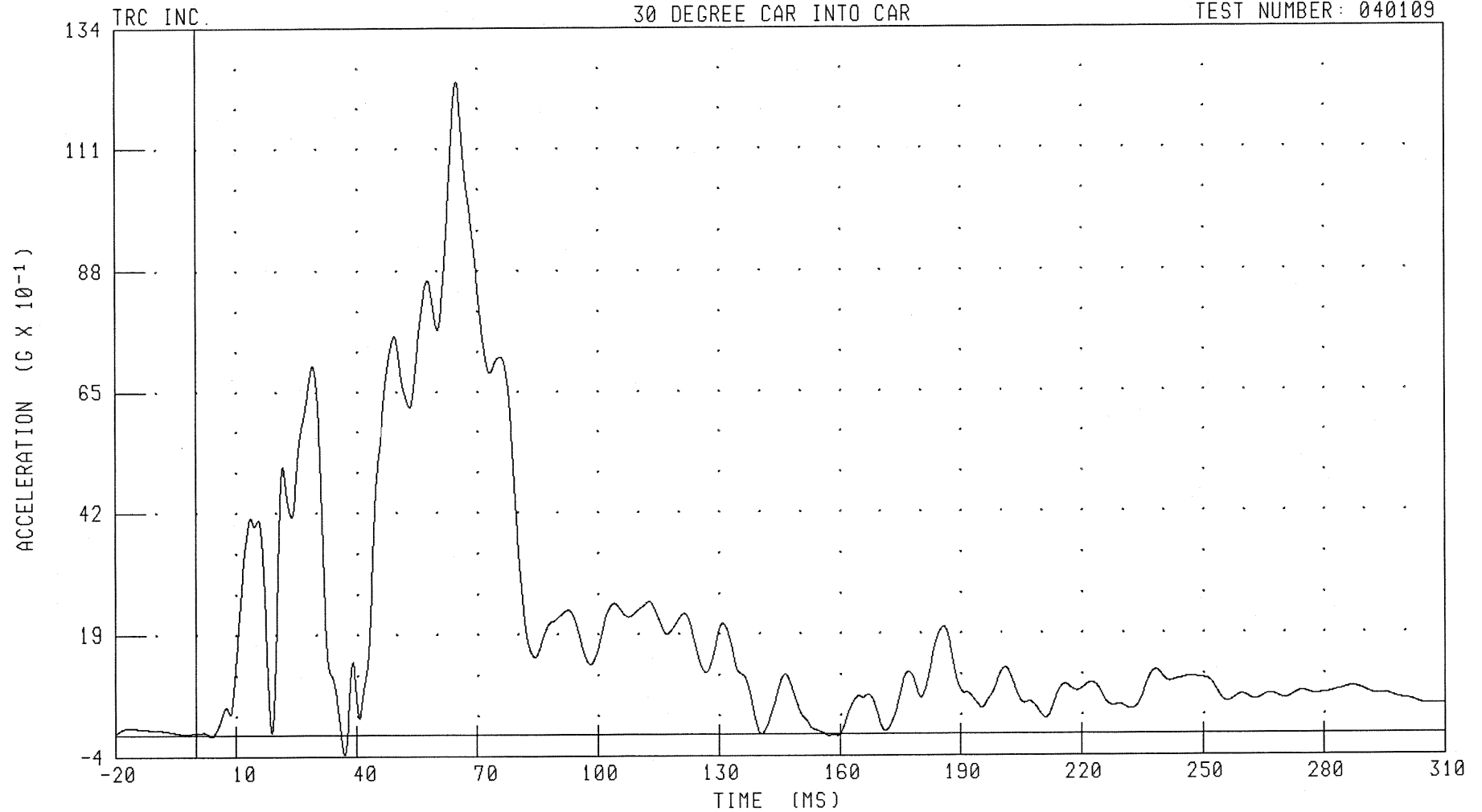
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET LEFT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: LRXYGA FILTER: CH. CLASS 60

B-187

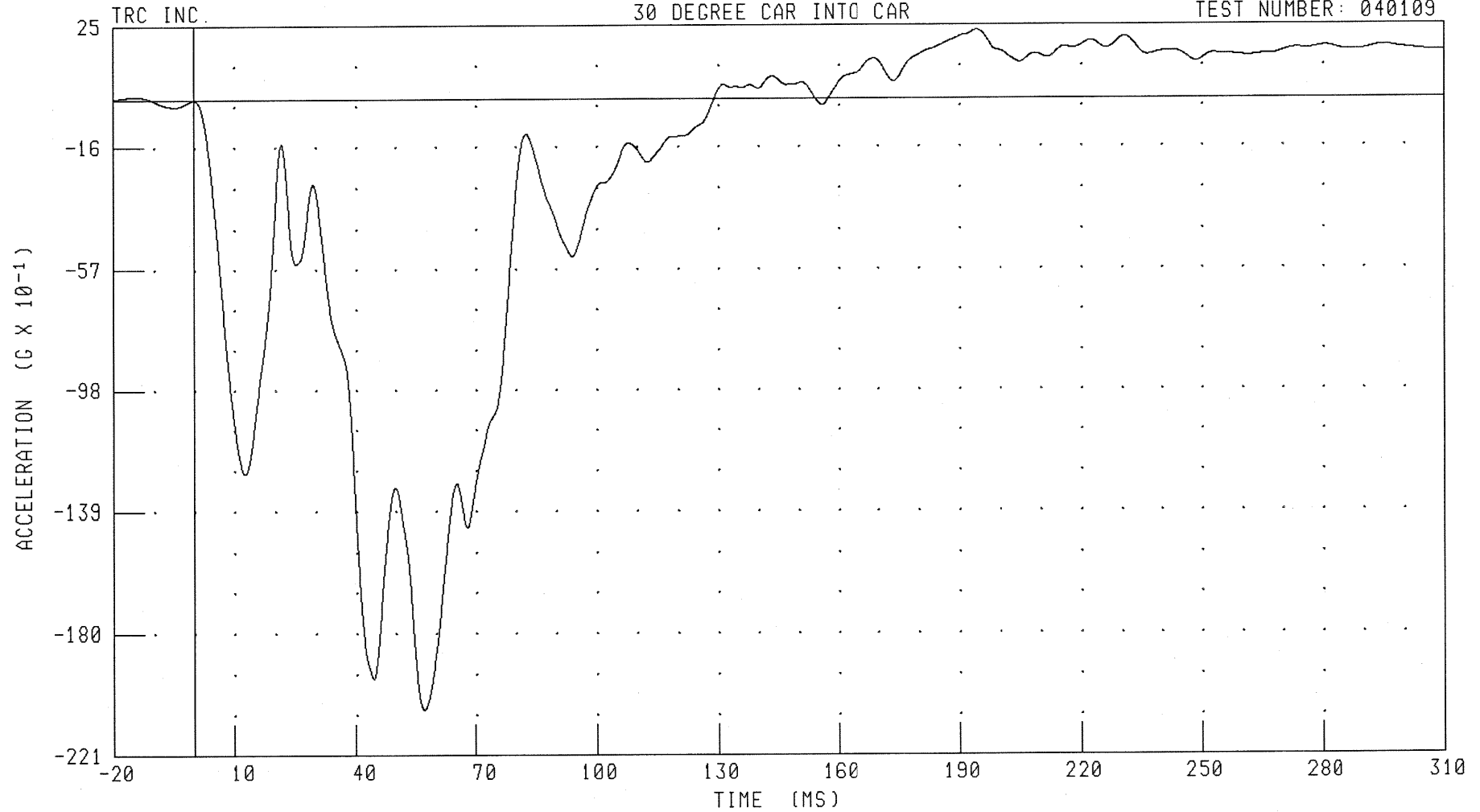
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET RIGHT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRXXGA FILTER: CH. CLASS 60

PEAK DATA: 2.32 G @ 194.32 MS; -20.58 G @ 57.12 MS

B-188

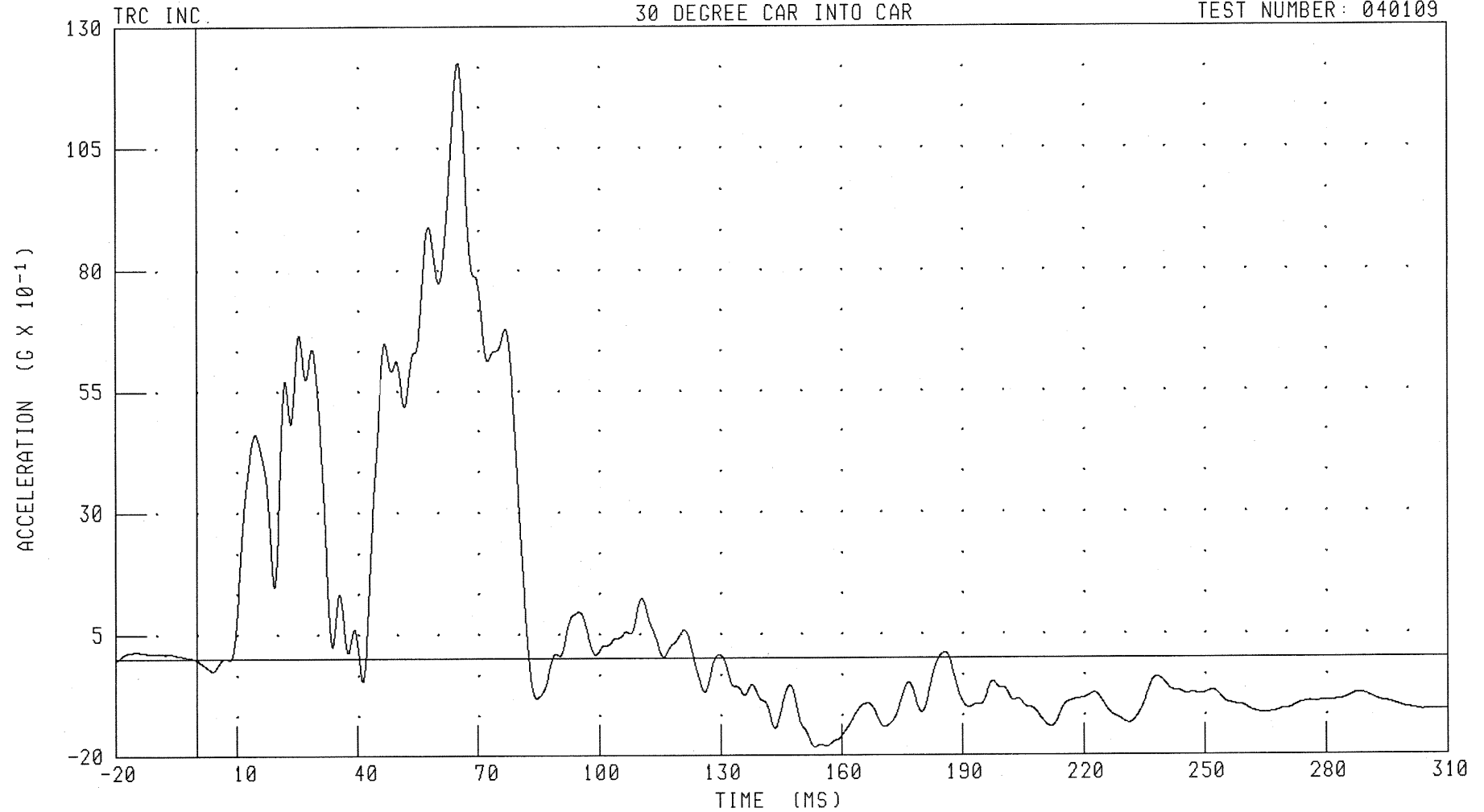
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET RIGHT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: RRXYGA

FILTER: CH. CLASS 60

PEAK DATA: 12.25 G @ 65.12 MS; -1.83 G @ 153.44 MS

B-189

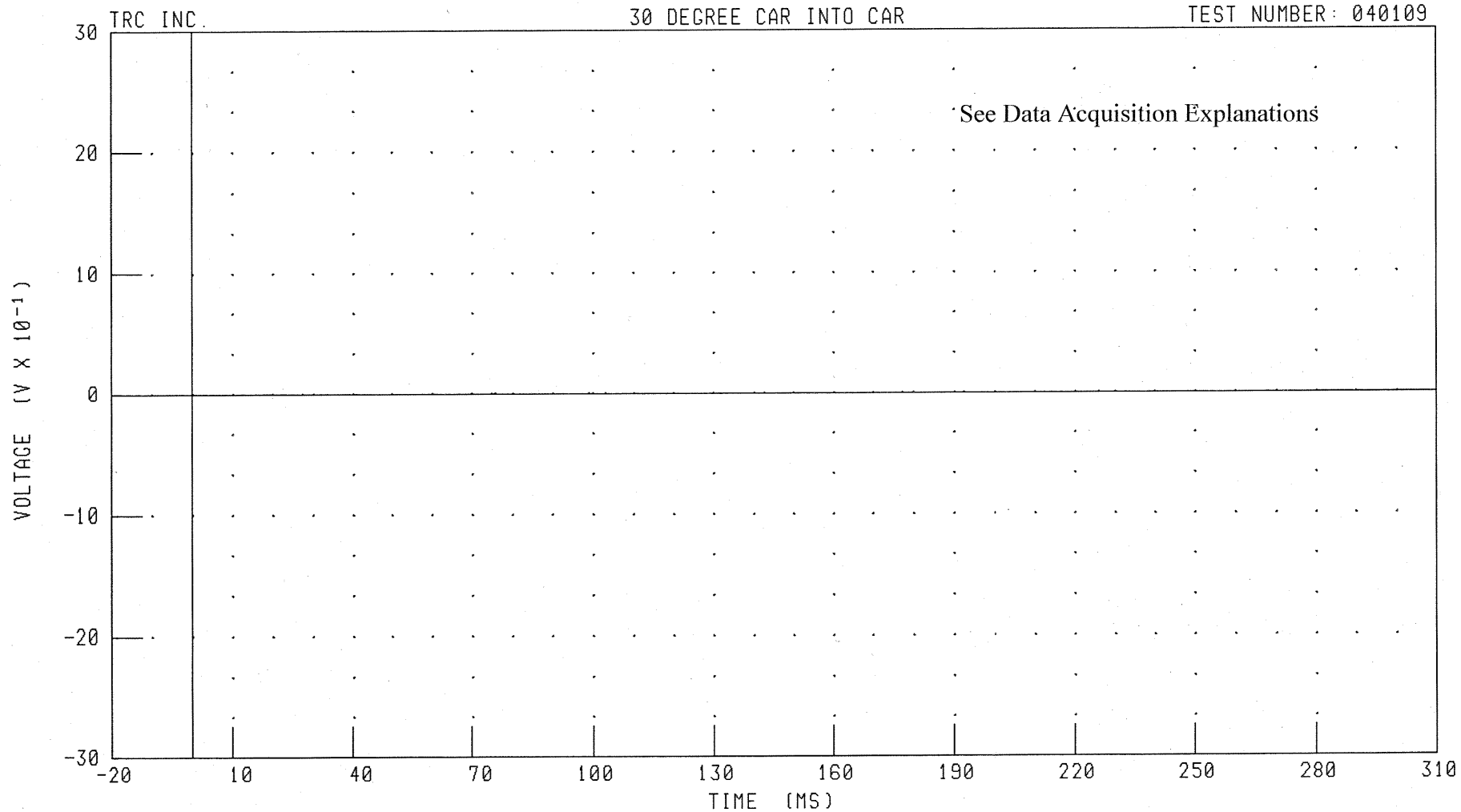
040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES

BULLET DRIVER AIRBAG EVENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: DABETA FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 70.00 MS; -0.01 V @ 69.68 MS

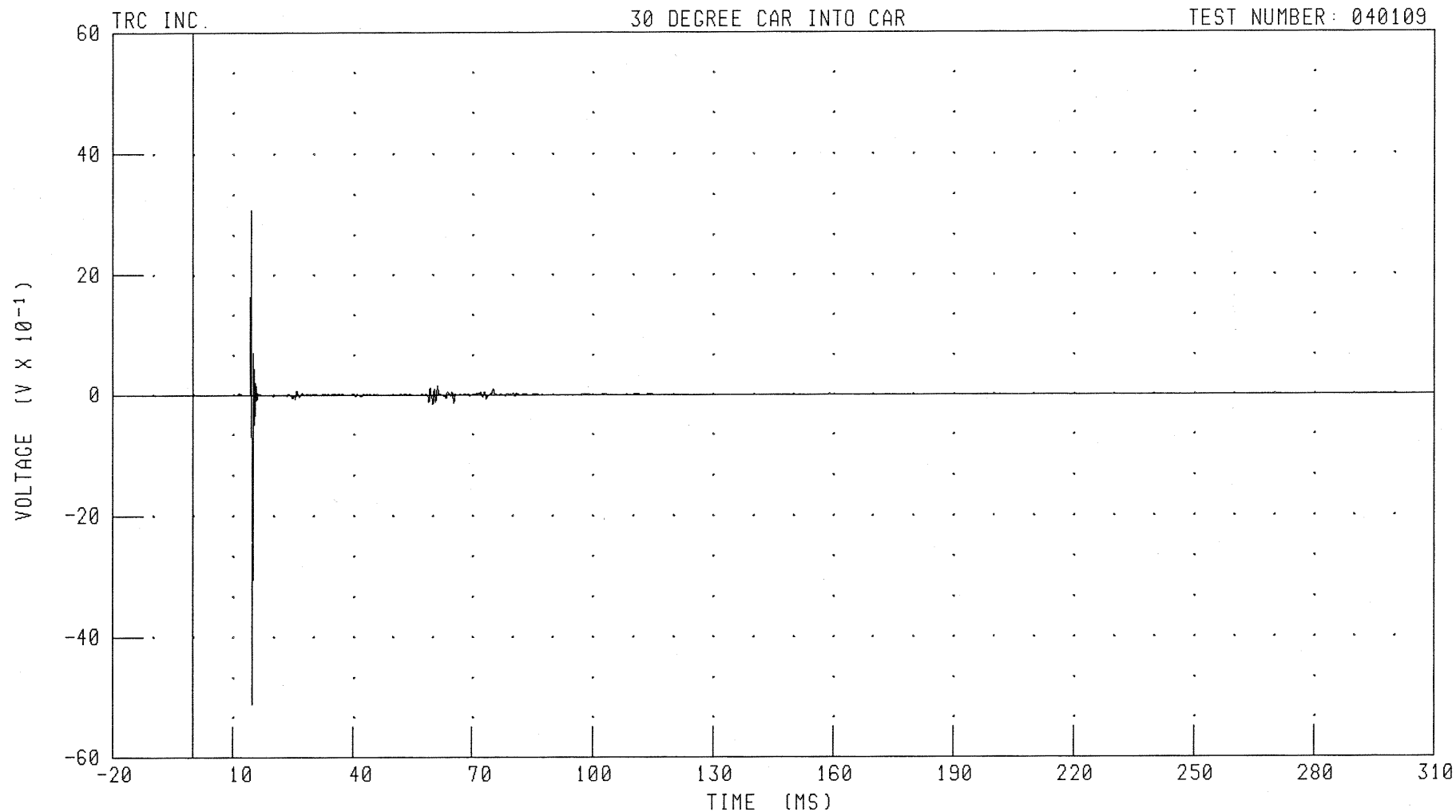
B-190

040109

1996 TOYOTA PREVIA INTO LEFT FRONT OF 1997 HONDA ACCORD - OBLIQUE 30 DEGREES
BULLET PASSENGER AIRBAG EVENT

30 DEGREE CAR INTO CAR

TEST NUMBER: 040109



CHANNEL: PABETA FILTER: CH. CLASS 1000

PEAK DATA: 3.07 V @ 14.48 MS; -5.12 V @ 14.72 MS

B-191

040109

Appendix C

Dummy Configuration and Performance Verification Data

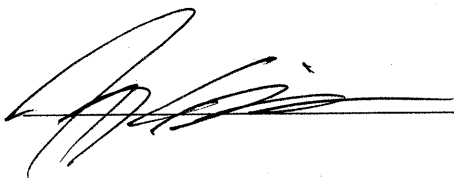
Pre-Test Dummy Configuration and Performance Verification Data

Target Vehicle Driver Dummy S/N: 168

Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 168 Calibration No. 22
Date: 12/05/03

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	881	Yes
B	Shoulder Pivot Height	505.5 - 520.7	516	Yes
C	H-Point Height	83.8 - 88.9	88	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	145	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	297	Yes
H	Skull Cap To Backline	40.6 - 45.7	43	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	341	Yes
J	Elbow Rest Height	190.5 - 210.8	207	Yes
K	Buttock Knee Length	579.1 - 604.5	584	Yes
L	Popliteal Height	429.3 - 454.7	439	Yes
M	Knee Pivot Height	485.1 - 500.4	492	Yes
N	Buttock Popliteal Length	452.1 - 477.5	474	Yes
O	Chest Depth	213.4 - 228.6	225	Yes
P	Foot Length	251.5 - 266.7	254	Yes
V	Shoulder Breadth	421.6 - 436.9	426	Yes
W	Foot Breadth	91.4 - 106.7	102	Yes
Y	Chest Circumference	970.3 - 1000.8	984	Yes
Z	Waist Circumference	835.7 - 866.1	856	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Peak Resultant Acceleration	225 - 275 g	257.2 g	Yes
Peak Lateral Acceleration	15 g Max	2.2 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician

John K. Chumbley

Approved

V. J. Watts

12.02.2003 13:56:47 610

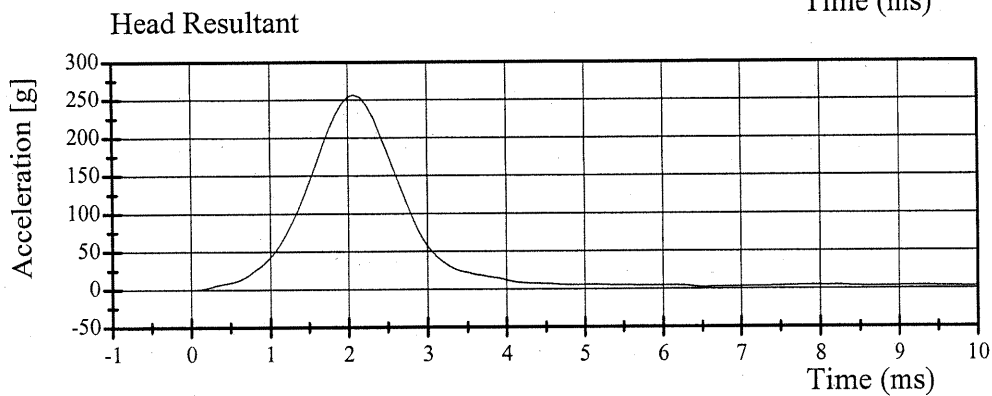
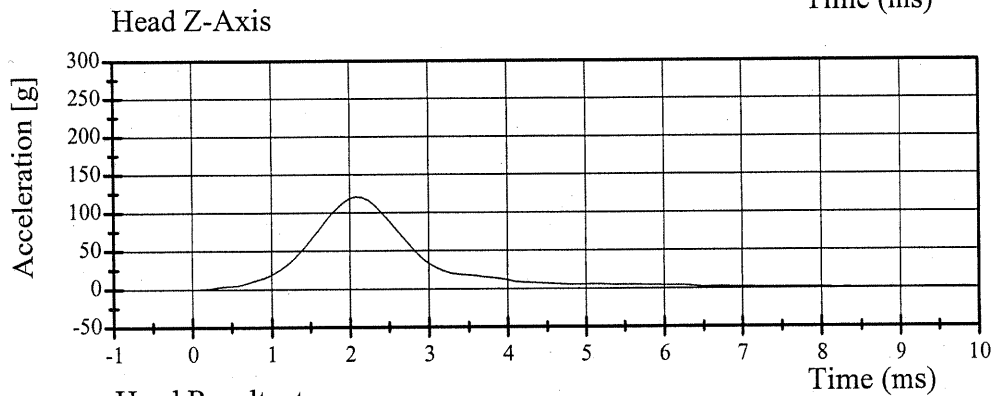
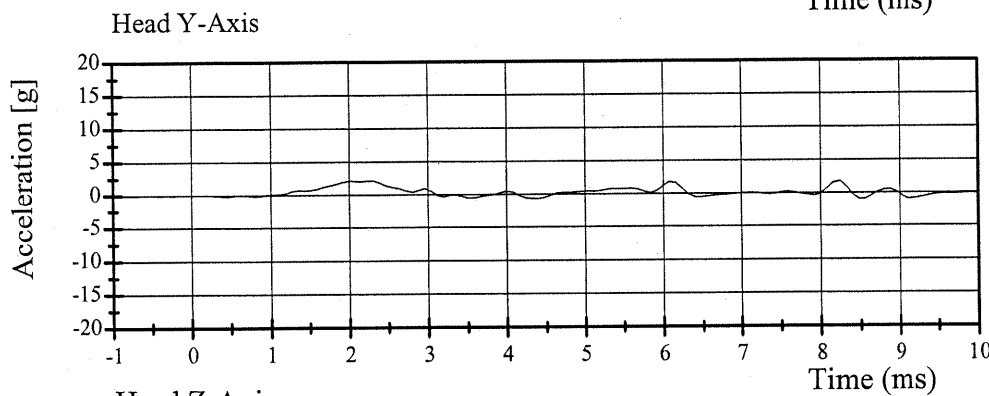
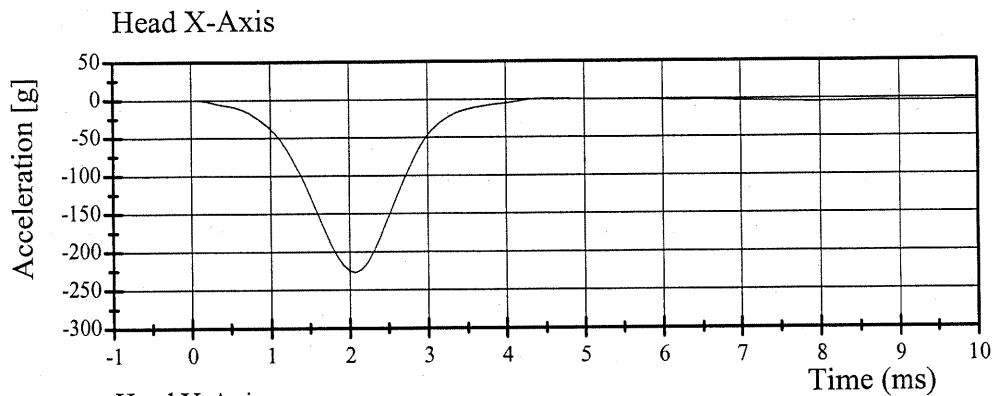


Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003



12.02.2003 13:56:48 610



Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

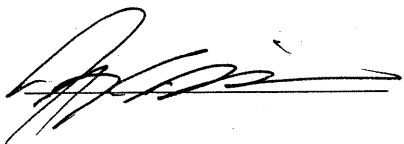
HIII 50th Male Serial No. 168 Calibration No. 22 - 3

Test Date 12/05/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.01 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	24.65 g	Yes
20 ms	17.60 - 22.60 g	22.53 g	Yes
30 ms	12.50 - 18.50 g	17.63 g	Yes
Max Pendulum Deceleration	29.00 g	26.33 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	17.54 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	34 - 42 ms	35.44 ms	Yes
D Plane Rotation			
Max	64 - 78 °	66.38 °	Yes
Time	57 - 64 ms	58.32 ms	Yes
Moment About Occipital Condyle			
Max	88.1 - 108.5 N·m	100.96 N·m	Yes
Time	47 - 58 ms	48.32 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	113 - 128 ms	113.20 ms	Yes
Positive Moment-Time Curve			
Decay Time To Zero	97 - 107 ms	98.32 ms	Yes

Comments:

Technician



Approved



12.05.2003 08:22:07 529



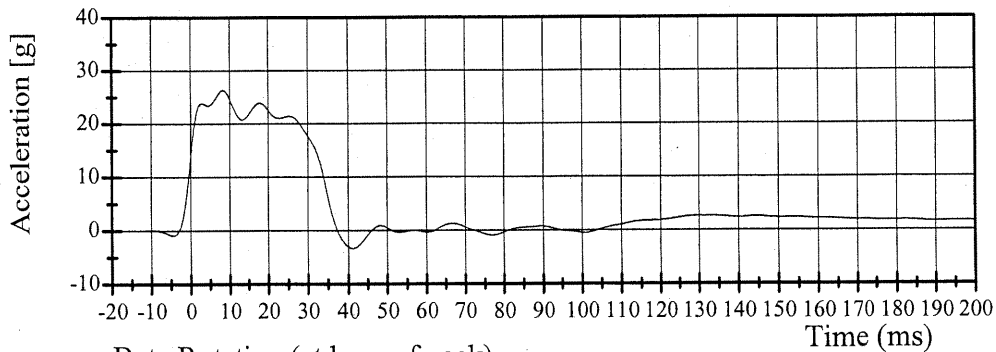
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 3

Test Date 12/05/2003

Pendulum Deceleration

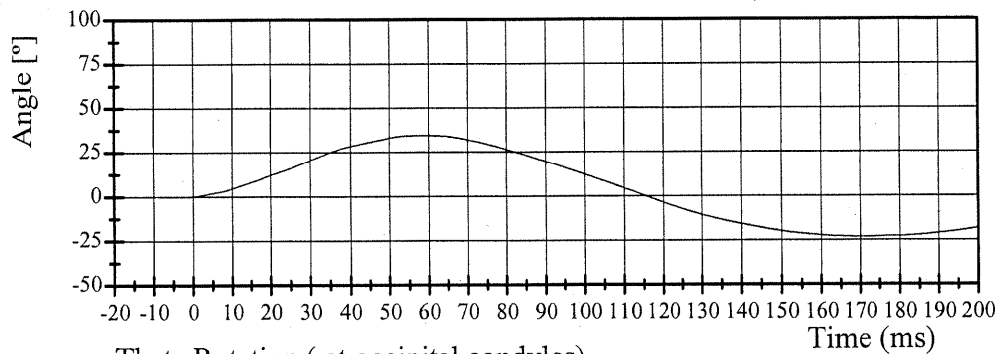


Filter Class: 60

Max: 26.3 g at 8.2 ms

Min: -3.3 g at 41.2 ms

Beta Rotation (at base of neck)

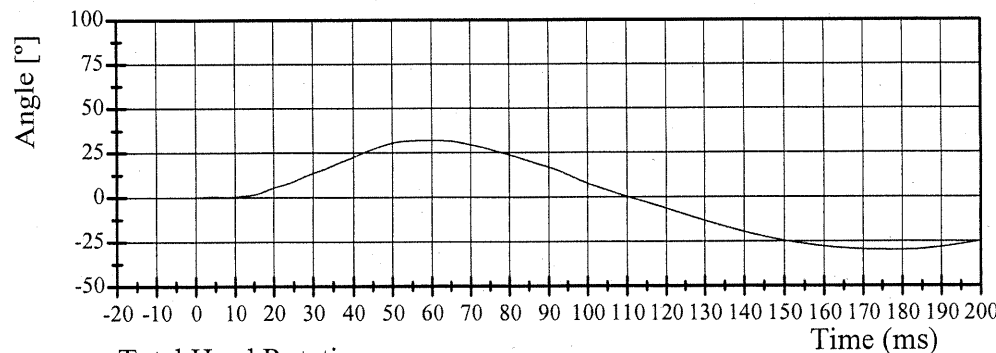


Filter Class: 60

Max: 34.5 ° at 58.3 ms

Min: -23.2 ° at 171.3 ms

Theta Rotation (at occipital condyles)

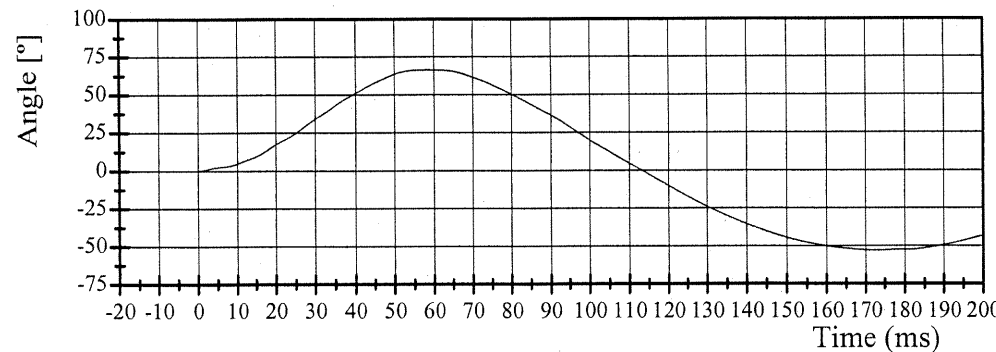


Filter Class: 60

Max: 31.9 ° at 61.3 ms

Min: -29.8 ° at 177.8 ms

Total Head Rotation



Filter Class: 60

Max: 66.4 ° at 58.3 ms

Min: -52.9 ° at 172.8 ms

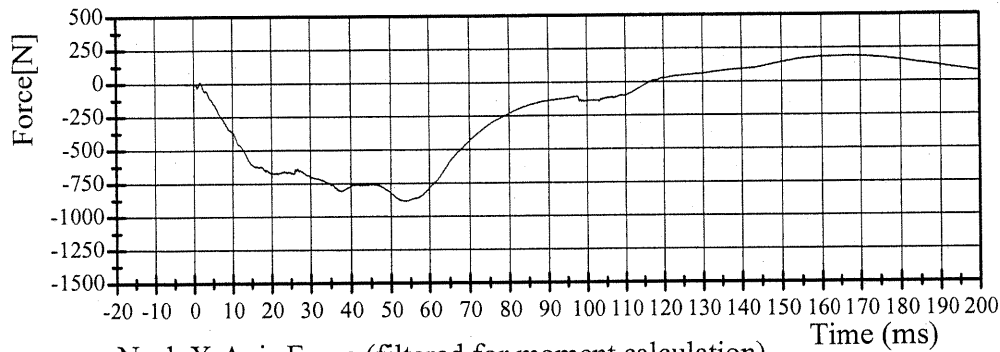
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 3

Test Date 12/05/2003

Neck X-Axis Force

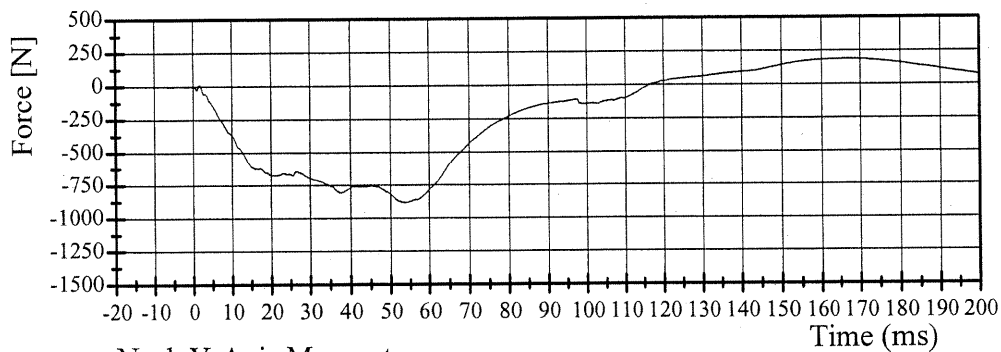


Filter Class: 1000

Max: 188.3 N at 167.5 ms

Min: -883.0 N at 54.0 ms

Neck X-Axis Force (filtered for moment calculation)

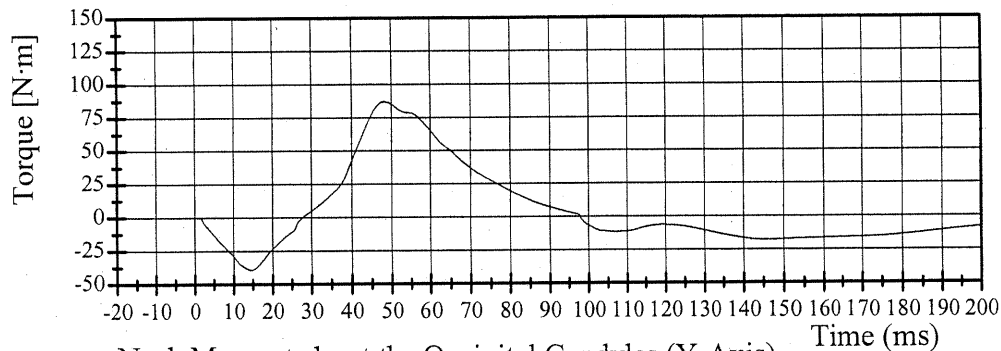


Filter Class: 600

Max: 188.1 N at 167.6 ms

Min: -882.5 N at 54.1 ms

Neck Y-Axis Moment

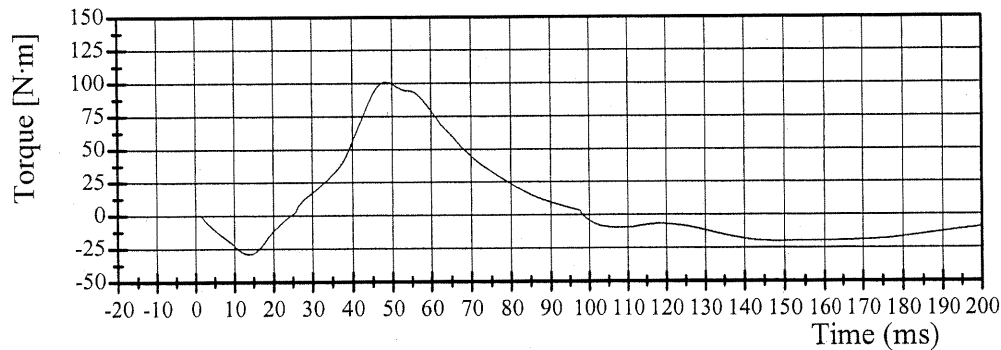


Filter Class: 600

Max: 87.1 N·m at 48.2 ms

Min: -39.2 N·m at 14.6 ms

Neck Moment about the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 101.0 N·m at 48.3 ms

Min: -29.0 N·m at 13.8 ms

12.05.2003 08:22:10 529



Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

HIII 50th Male Serial No. 168 Calibration No. 22 - 2

Test Date 12/05/2003

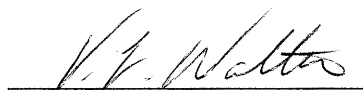
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	28 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.02 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	17.84 g	Yes
20 ms	14.00 - 19.00 g	17.48 g	Yes
30 ms	11.00 - 16.00 g	14.83 g	Yes
Max Pendulum Deceleration	22.00 g	18.62 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	14.78 g	Yes
Deceleration-Time Curve			
Decay Time To 5g	38 - 46 ms	41.28 ms	Yes
D Plane Rotation			
Max	81 - 106 °	91.19 °	Yes
Time	72 - 82 ms	77.28 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-66.34 N·m	Yes
Time	65 - 79 ms	72.00 ms	Yes
Rotation Angle-Time Curve			
Decay Time To Zero	147 - 174 ms	153.60 ms	Yes
Negative Moment-Time Curve			
Decay Time To Zero	120 - 148 ms	144.40 ms	Yes

Comments:

Technician



Approved



12.05.2003 09:57:34 606



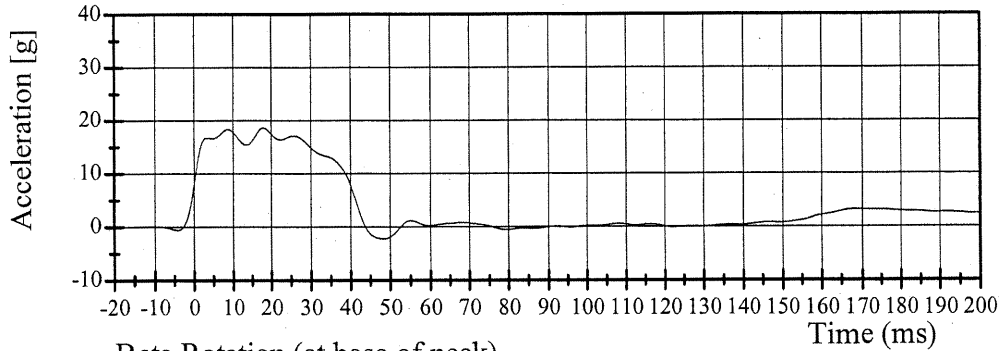
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 2

Test Date 12/05/2003

Pendulum Deceleration

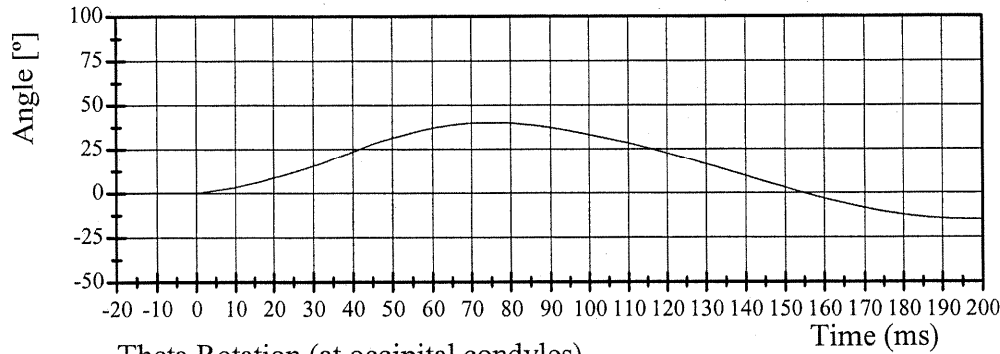


Filter Class: 60

Max: 18.6 g at 17.9 ms

Min: -2.2 g at 48.3 ms

Beta Rotation (at base of neck)

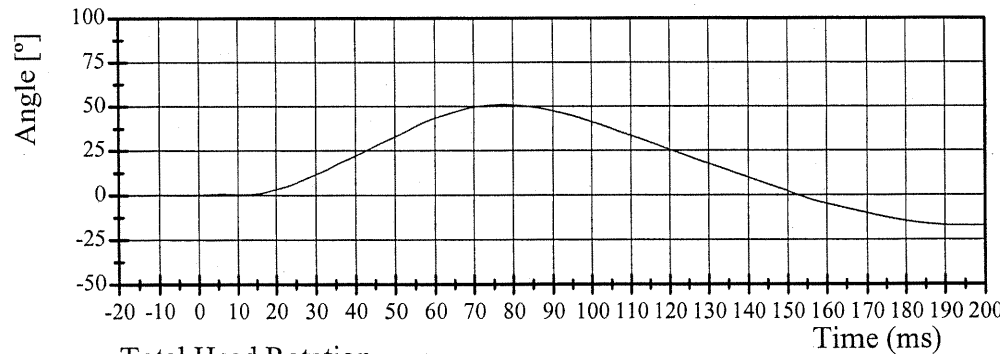


Filter Class: 60

Max: 40.1 ° at 72.8 ms

Min: -15.0 ° at 198.6 ms

Theta Rotation (at occipital condyles)

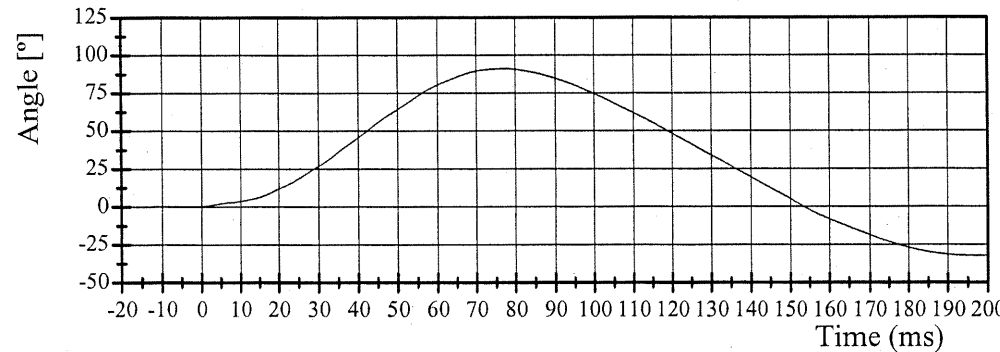


Filter Class: 60

Max: 51.1 ° at 77.4 ms

Min: -17.1 ° at 195.0 ms

Total Head Rotation



Filter Class: 60

Max: 91.2 ° at 77.3 ms

Min: -32.1 ° at 197.4 ms

12.05.2003 09:57:35 606



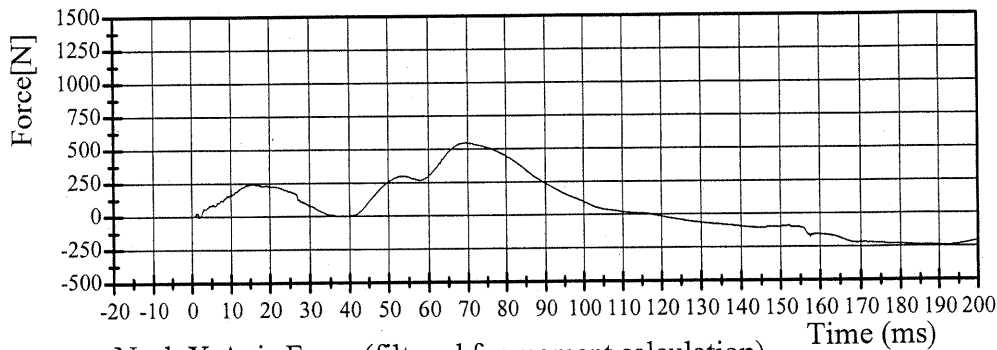
Transportation Research Center Inc.

572E Neck Extension Test

HIH 50th Male Serial No. 168 Calibration No. 22 - 2

Test Date 12/05/2003

Neck X-Axis Force

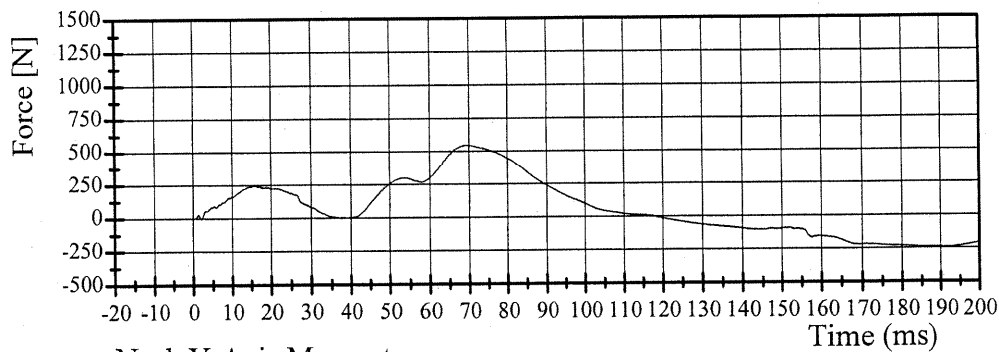


Filter Class: 1000

Max: 548.4 N at 69.4 ms

Min: -241.7 N at 191.4 ms

Neck X-Axis Force (filtered for moment calculation)

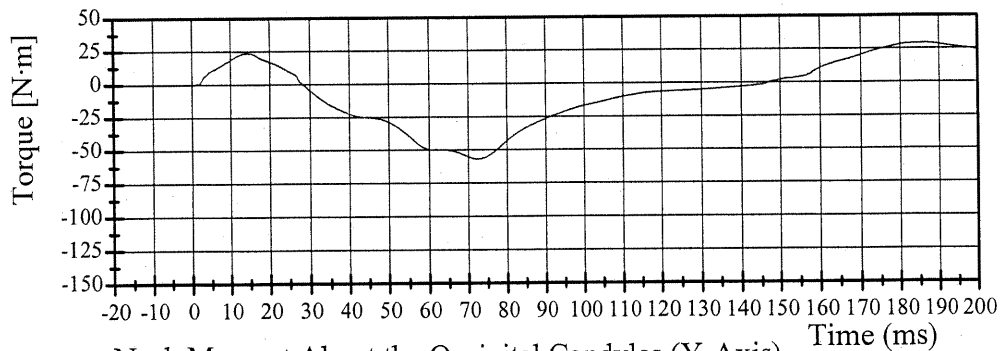


Filter Class: 600

Max: 547.4 N at 69.4 ms

Min: -241.3 N at 191.4 ms

Neck Y-Axis Moment

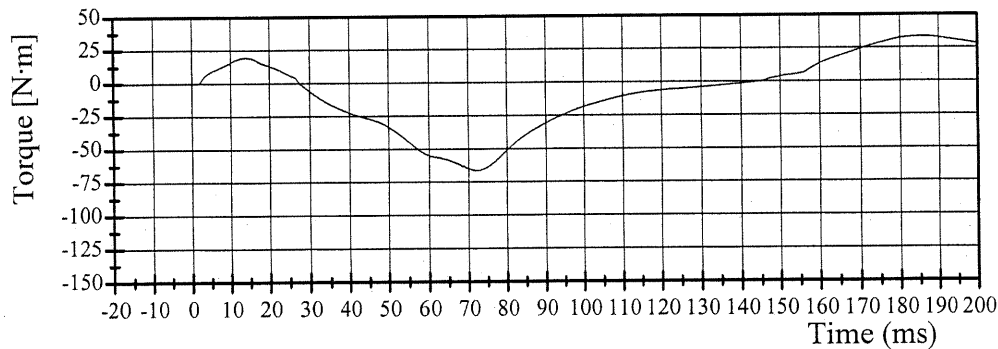


Filter Class: 600

Max: 29.2 N·m at 186.2 ms

Min: -56.9 N·m at 72.4 ms

Neck Moment About the Occipital Condyles (Y-Axis)



Filter Class: 600

Max: 33.4 N·m at 186.2 ms

Min: -66.3 N·m at 72.0 ms

12.05.2003 09:57:37 606



Transportation Research Center Inc.

572E Thorax Test

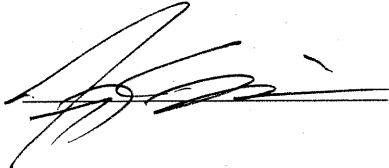
HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 11/25/2003

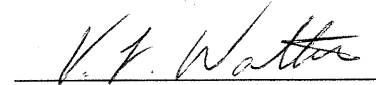
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.65 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-67.1 mm	Yes
Maximum Resistive Force	5160 - 5894 N	5829 N	Yes
Internal Hysteresis	69 - 85 %	71 %	Yes

Comments:

Technician



Approved



11.25.2003 13:06:17 967



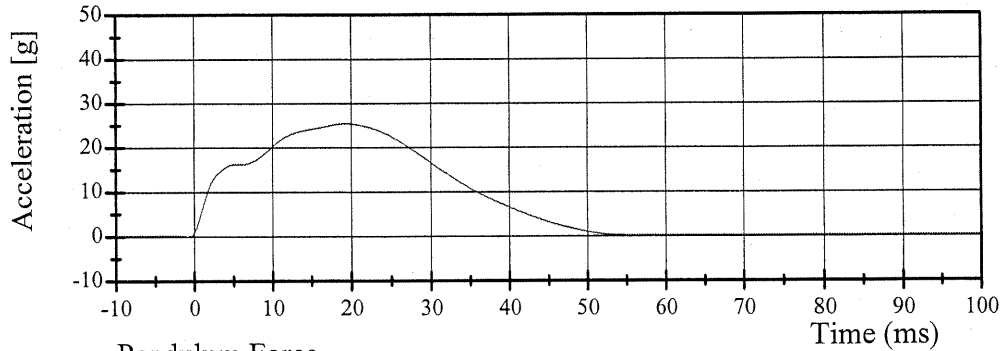
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 11/25/2003

Pendulum Deceleration

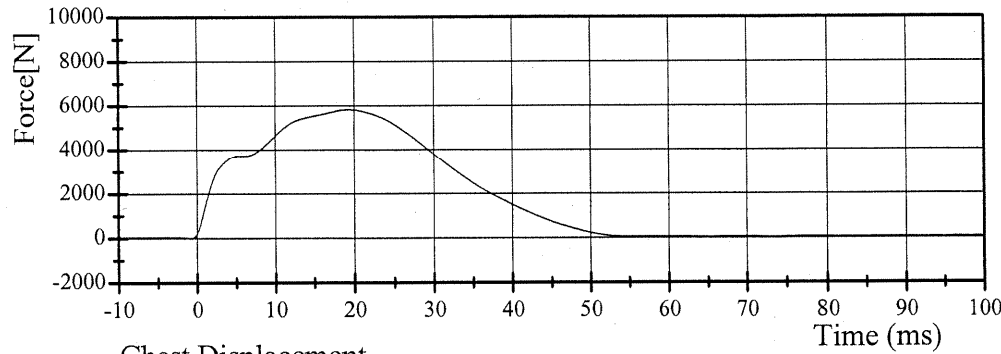


Filter Class: 180

Max: 25.4 g at 19.4 ms

Min: -0.1 g at 343.1 ms

Pendulum Force

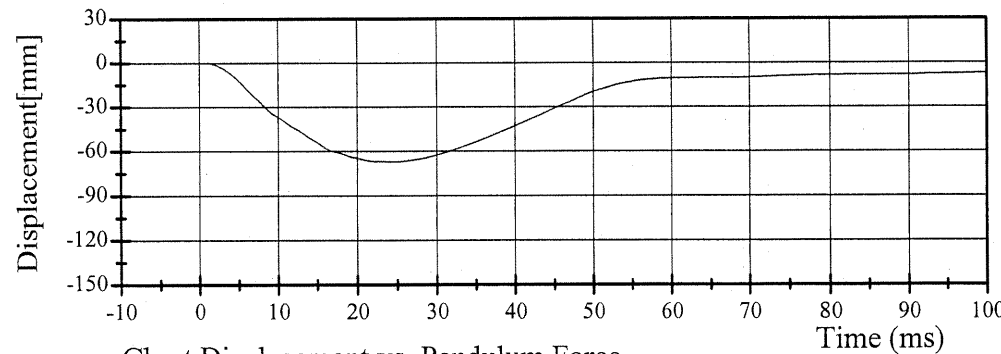


Filter Class: 180

Max: 5828.7 N at 19.4 ms

Min: -20.4 N at 343.1 ms

Chest Displacement

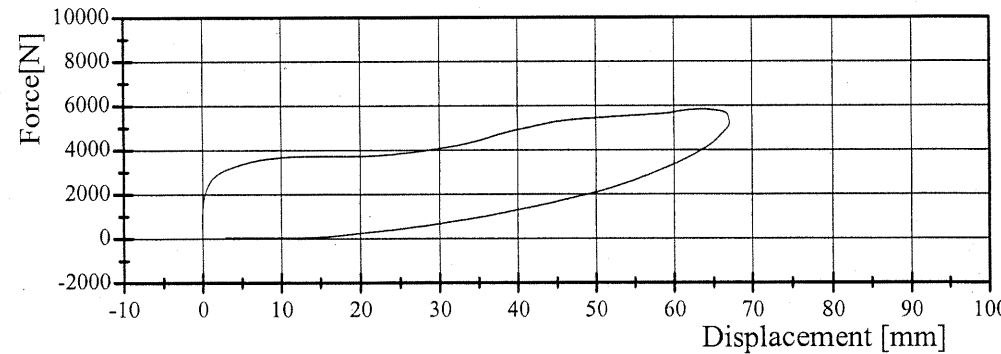


Filter Class: 180

Max: 0.0 mm at 0.4 ms

Min: -67.1 mm at 24.7 ms

Chest Displacement vs. Pendulum Force



Transportation Research Center Inc

Hybrid III Hip Range of Motion

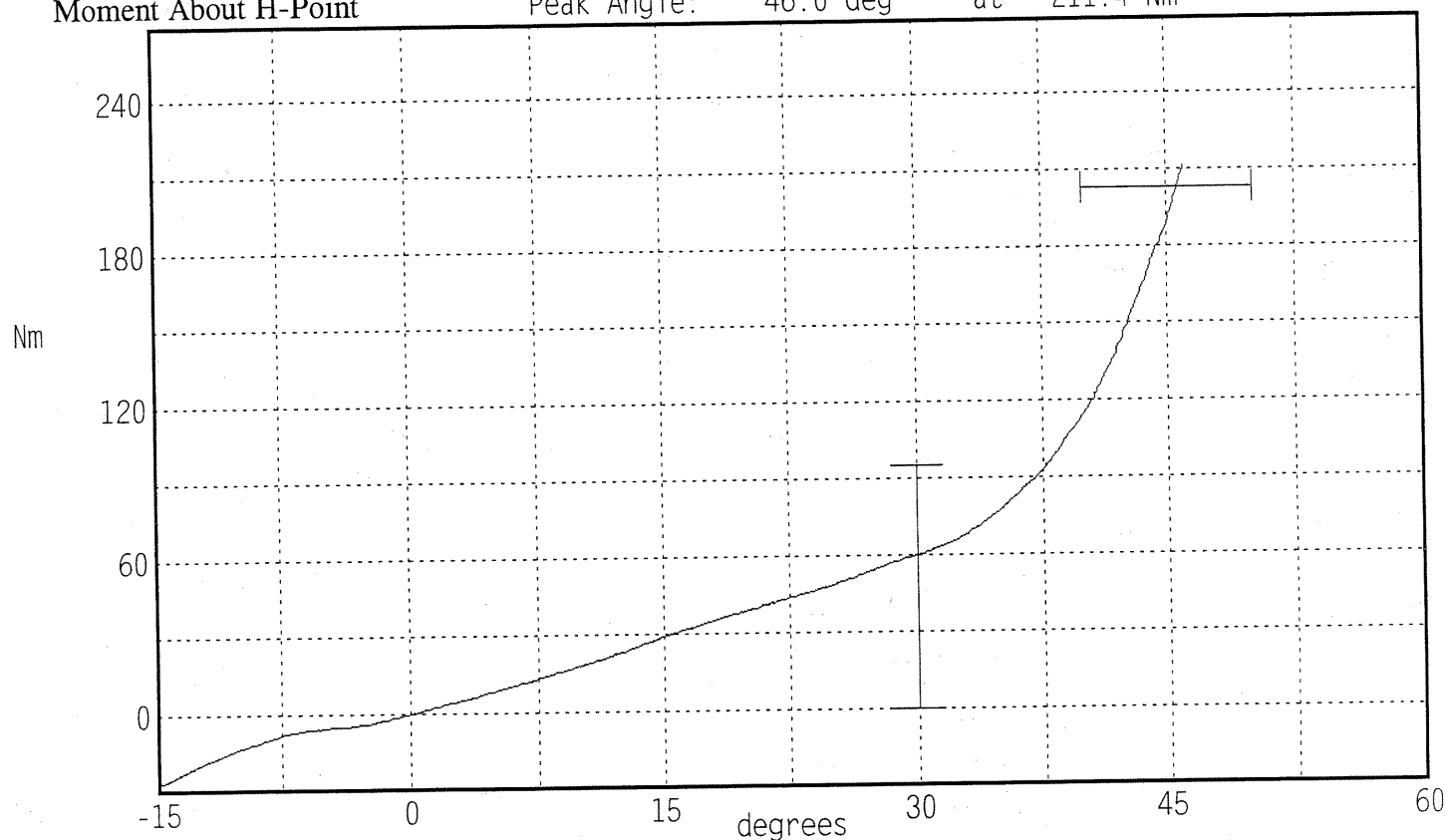
Serial Number: 168L
Test Number: 168C22
Comments:

Date: 11/25/2003
Time: 15:27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.1 °C Pass
Humidity	10 - 70	34 % Pass
Moment at 30 deg	<= 94.9	60.1 Nm Pass
Angle at 203 Nm	40.0 - 50.0	45.7 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Peak Moment: 211.4 Nm at 46.0 deg
Peak Angle: 46.0 deg at 211.4 Nm

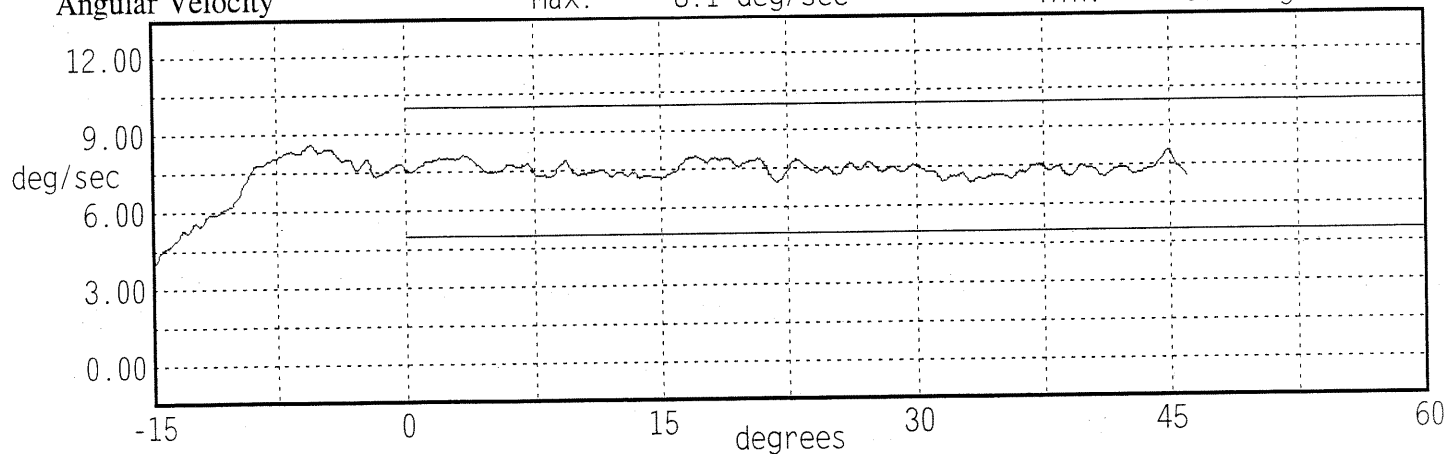
Moment About H-Point



Angular Velocity

Max: 8.1 deg/sec

Min: 6.9 deg/sec



Transportation Research Center Inc

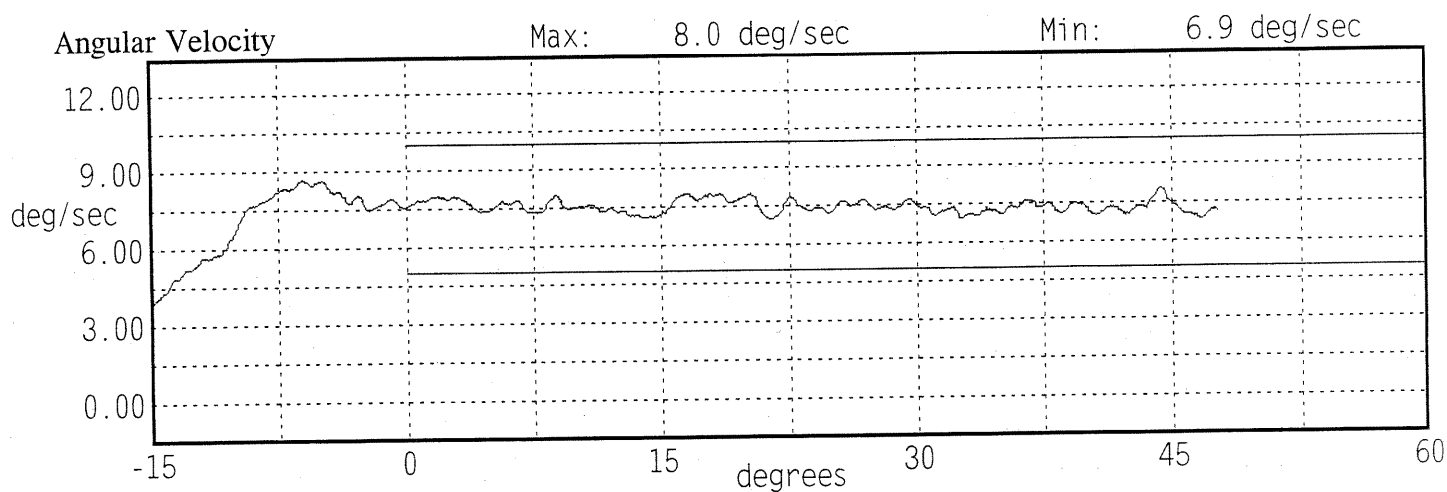
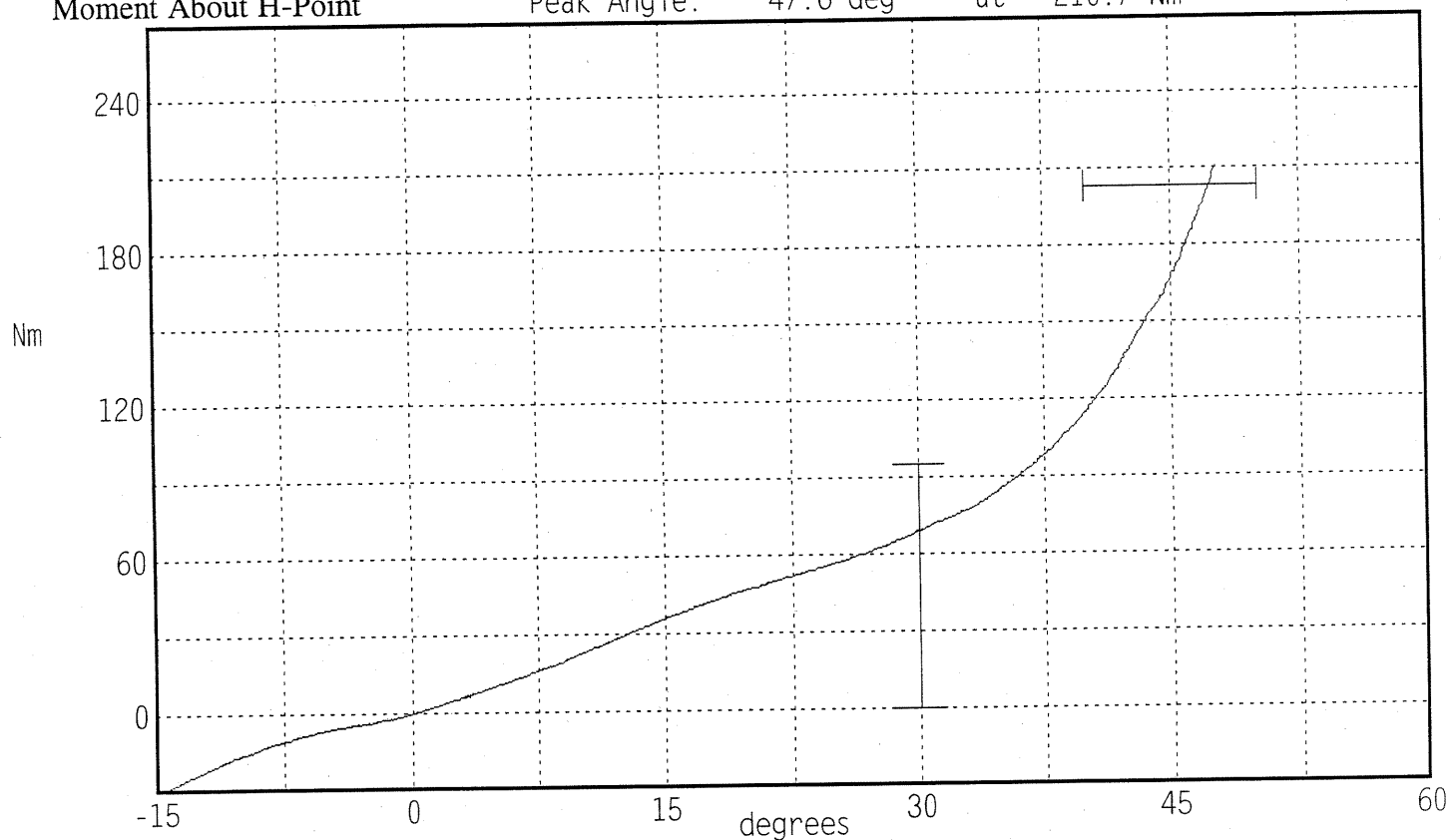
Hybrid III Hip Range of Motion

Serial Number: 168R
Test Number: 168C22
Comments:

Date: 11/25/2003
Time: 15:17

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	21.1 °C	Pass	
Humidity	10 - 70	34 %	Pass	
Moment at 30 deg	<= 94.9	69.1 Nm	Pass	
Angle at 203 Nm	40.0 - 50.0	47.2 deg	Pass	
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass	

Moment About H-Point
Peak Moment: 210.7 Nm at 47.6 deg
Peak Angle: 47.6 deg at 210.7 Nm



Transportation Research Center Inc.

572E Left Knee Slider Test

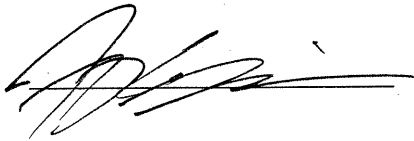
HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.77 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1641 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2957 N	Yes

Comments:

Technician



Approved



12.02.2003 10:55:38 1094

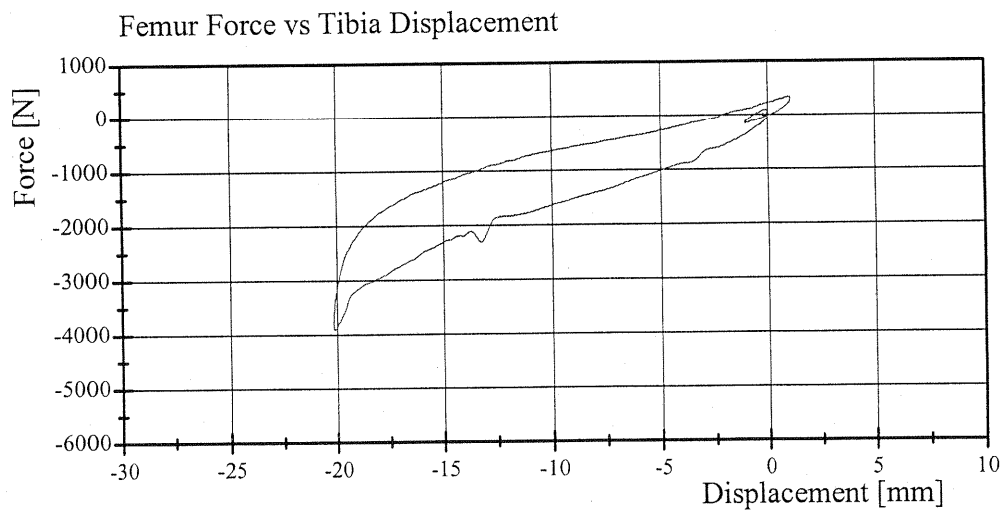
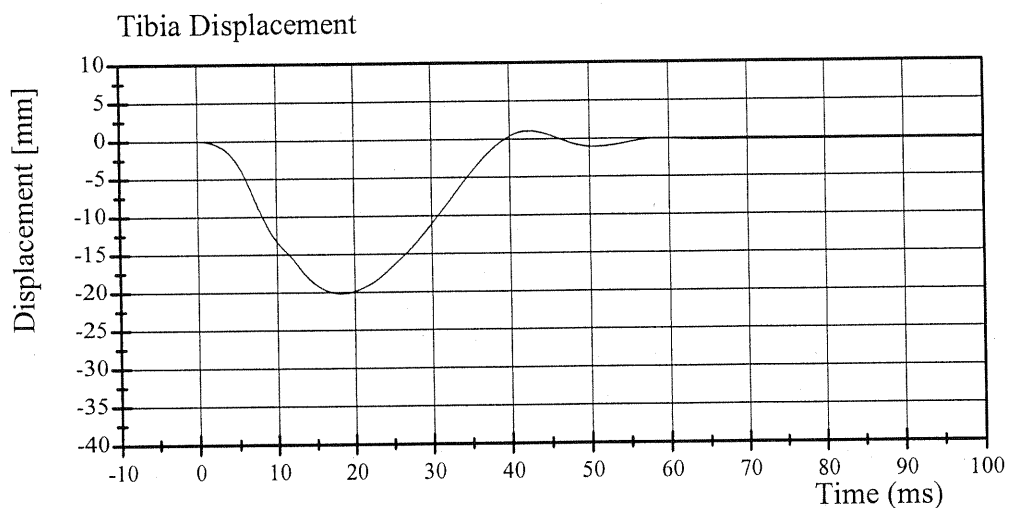
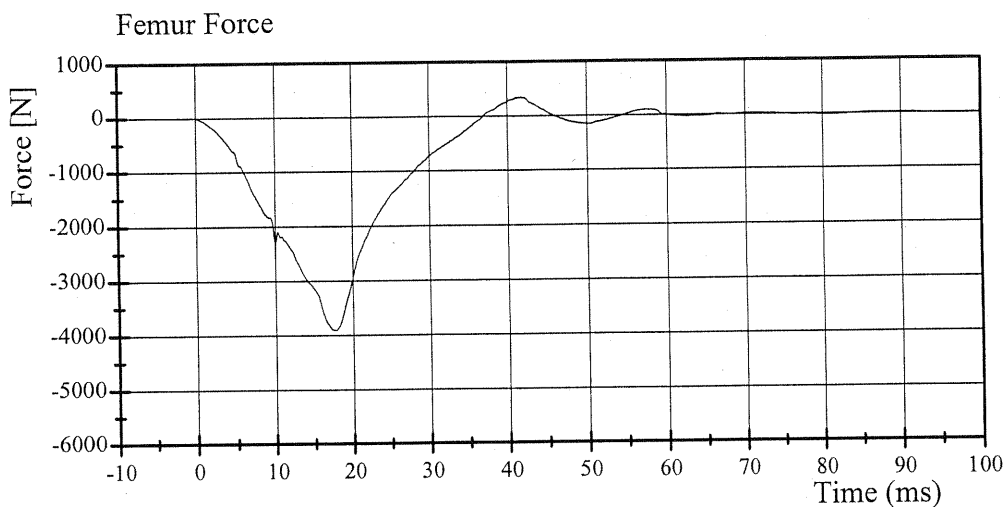


Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003



12.02.2003 10:55:39 1094



Transportation Research Center Inc.

572E Right Knee Slider Test

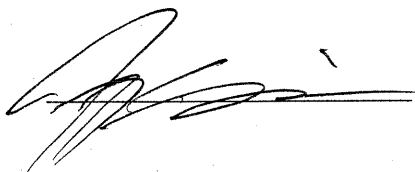
HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.77 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1663 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-3089 N	Yes

Comments:

Technician



Approved



12.02.2003 11:13:16 1096

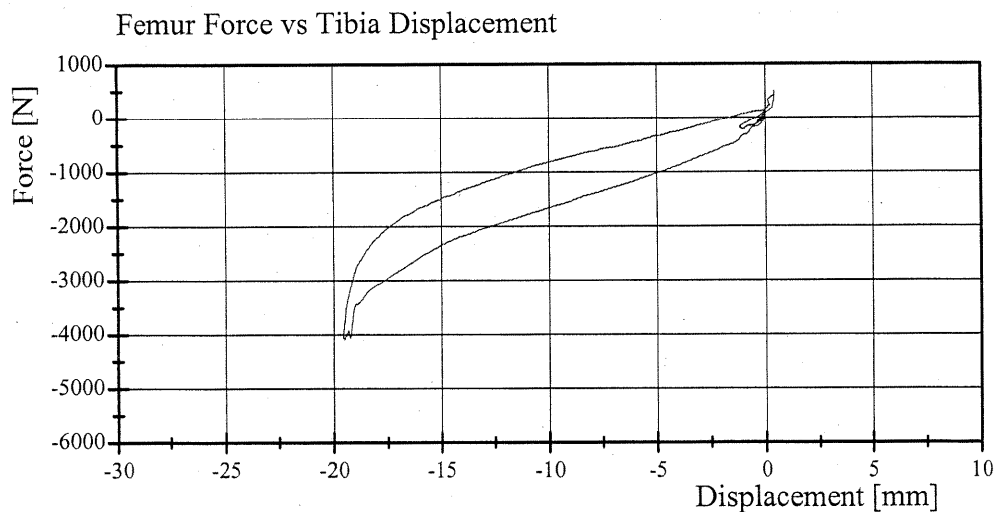
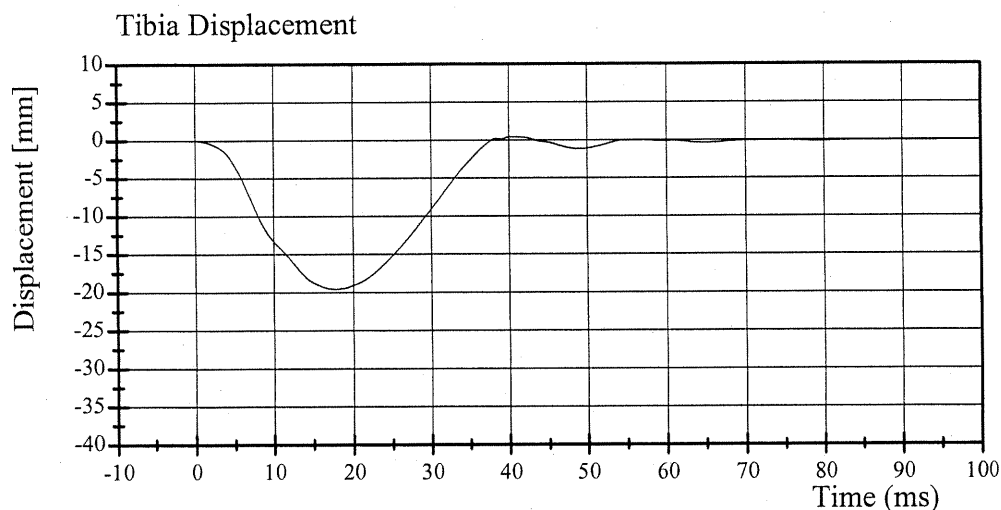
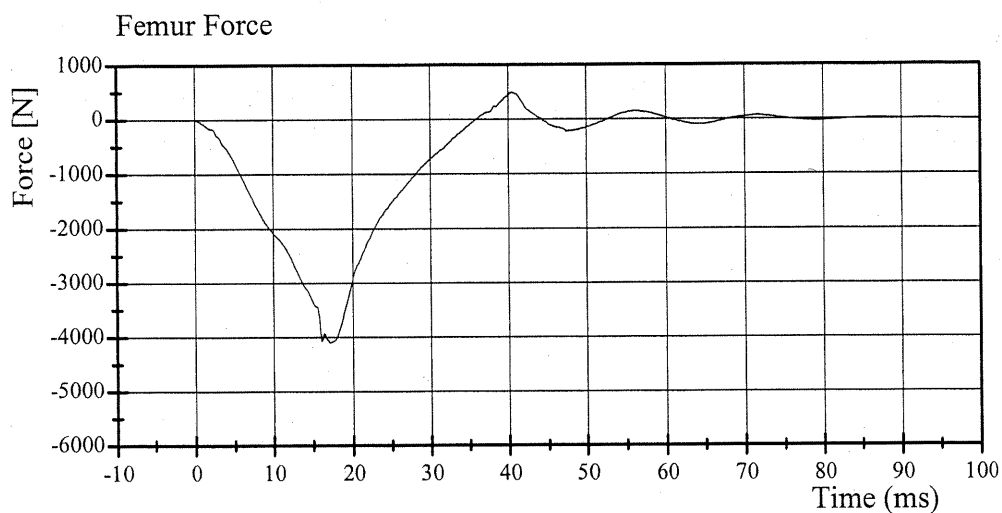


Transportation Research Center Inc.

572E Right Knee Slider Test

HHH 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003



12.02.2003 11:13:17 1096



Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003

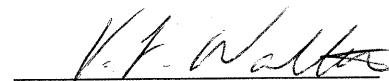
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5523 N	Yes

Comments:

Technician



Approved



12.02.2003 11:26:56 2096

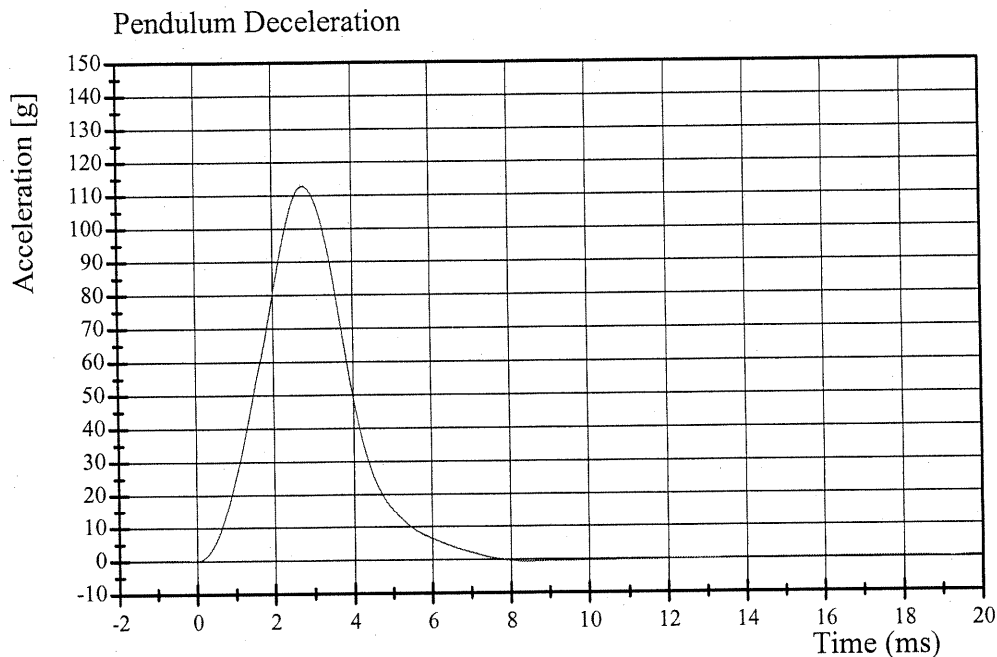


Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

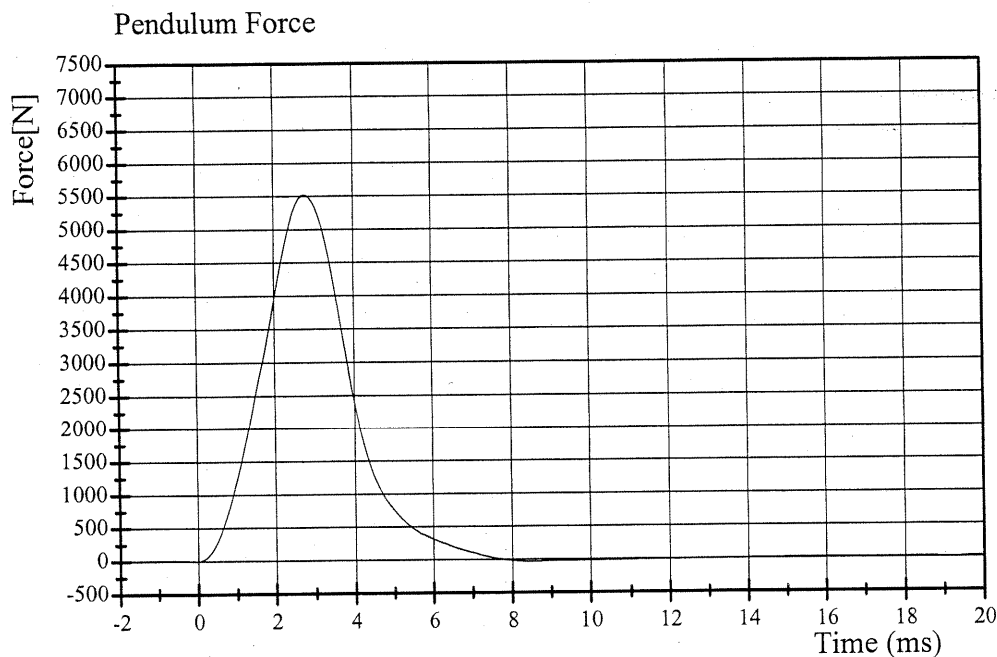
Test Date 12/02/2003



Filter Class: 600

Max: 112.9 g at 2.8 ms

Min: -0.7 g at 8.5 ms



Filter Class: 600

Max: 5523.2 N at 2.8 ms

Min: -32.2 N at 8.5 ms

12.02.2003 11:26:57 2096



Transportation Research Center Inc.

572E Right Knee Test

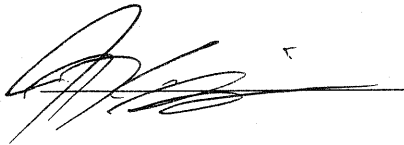
HIII 50th Male Serial No. 168 Calibration No. 22 - 1

Test Date 12/02/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.10 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	4973 N	Yes

Comments:

Technician



Approved



12.02.2003 11:24:29 2098

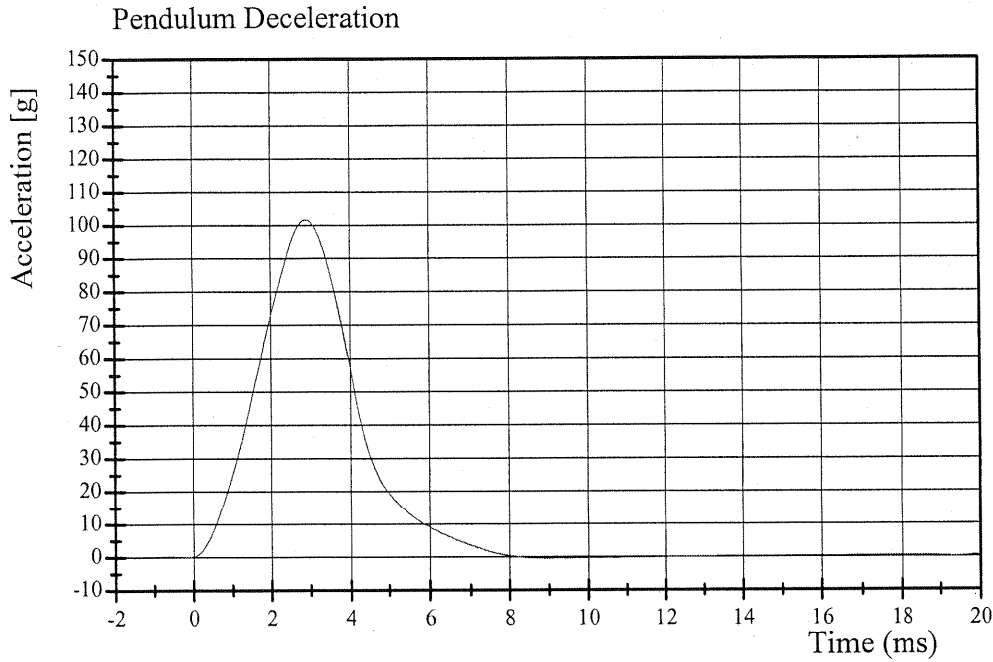


Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 168 Calibration No. 22 - 1

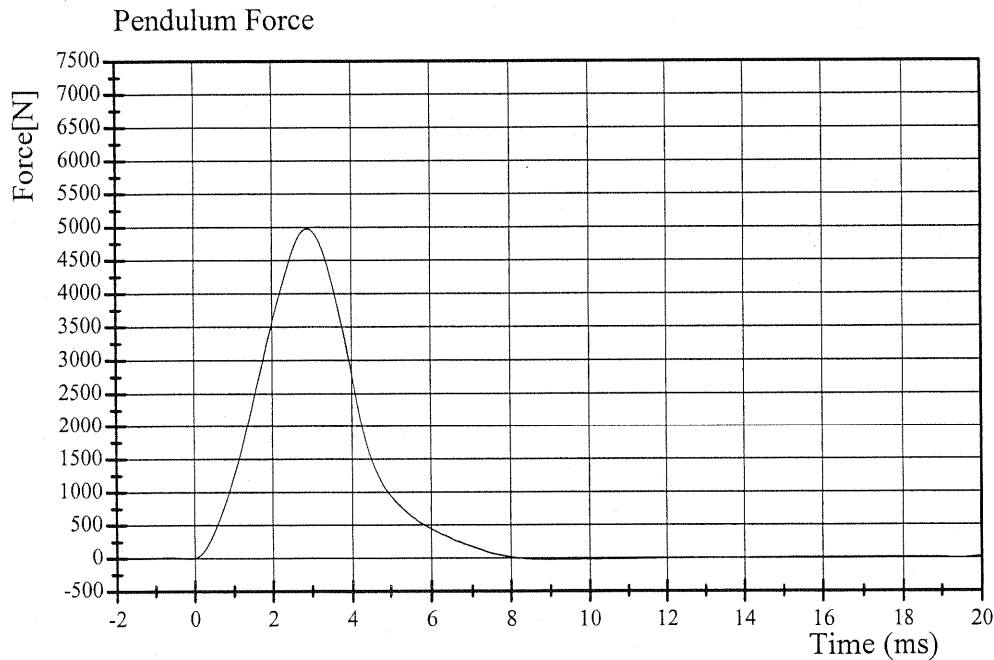
Test Date 12/02/2003



Filter Class: 600

Max: 101.6 g at 2.9 ms

Min: -0.4 g at 9.0 ms



Filter Class: 600

Max: 4973.5 N at 2.9 ms

Min: -21.0 N at 9.0 ms

12.02.2003 11:24:30 2098



Pre-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Driver Dummy S/N: 169

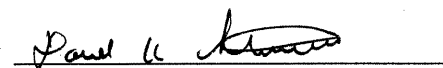
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 169 Calibration No. 19

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	882	Yes
B	Shoulder Pivot Height	505.5 - 520.7	515	Yes
C	H-Point Height	83.8 - 88.9	86	Yes
D	H-Point From Seatback	134.6 - 139.7	137	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	93	Yes
F	Thigh Clearance	139.7 - 154.9	149	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	298	Yes
H	Skull Cap To Backline	40.6 - 45.7	43	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	341	Yes
J	Elbow Rest Height	190.5 - 210.8	208	Yes
K	Buttock Knee Length	579.1 - 604.5	597	Yes
L	Popliteal Height	429.3 - 454.7	436	Yes
M	Knee Pivot Height	485.1 - 500.4	492	Yes
N	Buttock Popliteal Length	452.1 - 477.5	476	Yes
O	Chest Depth	213.4 - 228.6	220	Yes
P	Foot Length	251.5 - 266.7	252	Yes
V	Shoulder Breadth	421.6 - 436.9	431	Yes
W	Foot Breadth	91.4 - 106.7	100	Yes
Y	Chest Circumference	970.3 - 1000.8	991	Yes
Z	Waist Circumference	835.7 - 866.1	857	Yes
AA	Location For Chest Circumference	429.3 - 434.3	432	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician



Approved



Transportation Research Center Inc.

572E Head Drop Test

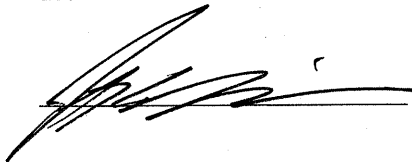
HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/19/2003

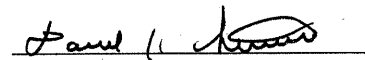
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Resultant Acceleration	225 - 275 g	248.9 g	Yes
Peak Lateral Acceleration	15 g Max	6.7 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician



Approved



06.19.2003 13:18:11 614

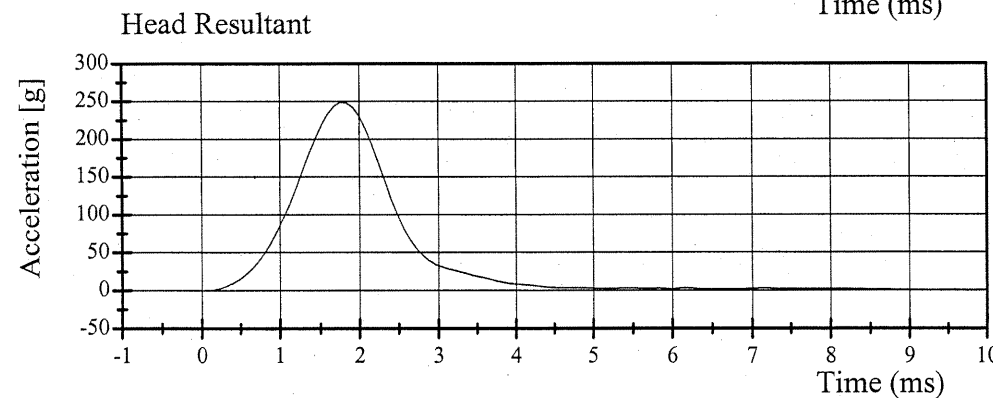
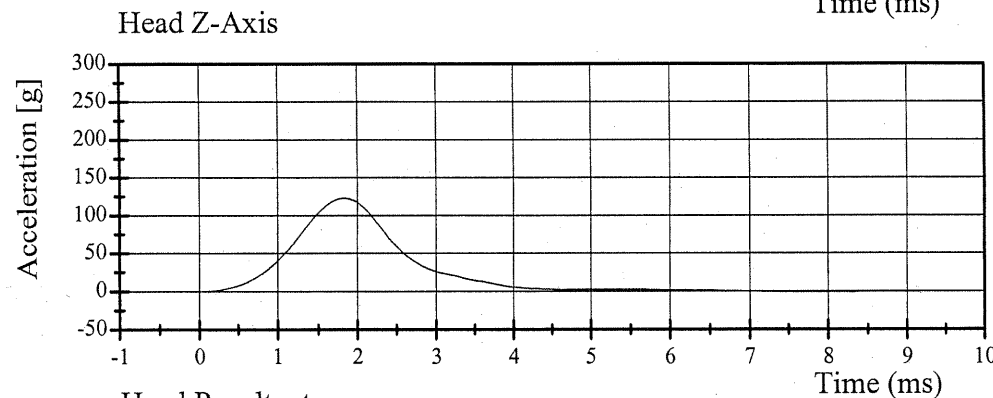
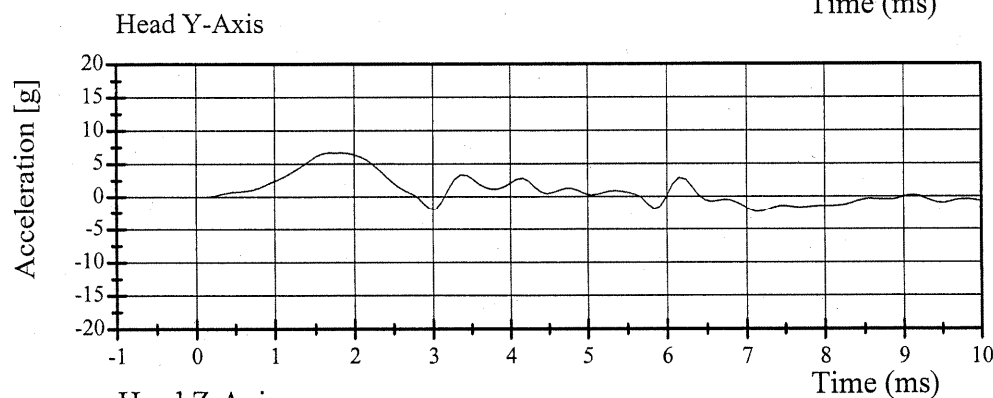
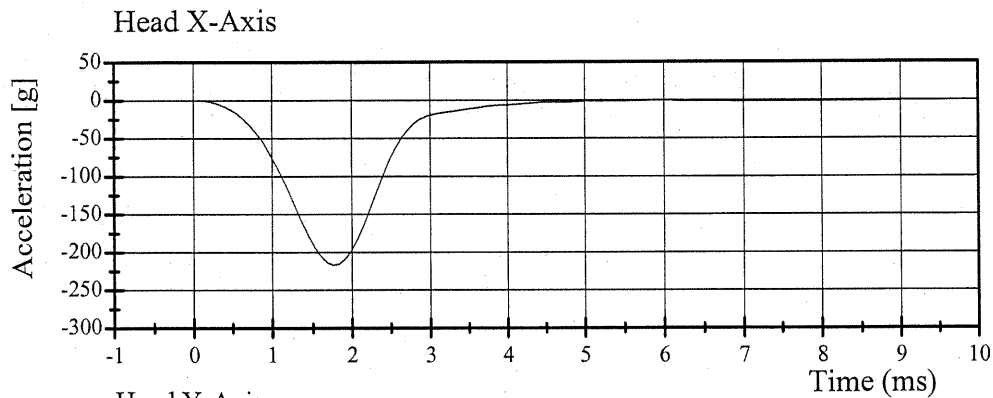


Transportation Research Center Inc.

572E Head Drop Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/19/2003



06.19.2003 13:18:12 614



Transportation Research Center Inc.

572E Neck Flexion Test - 6 Channel Transducer

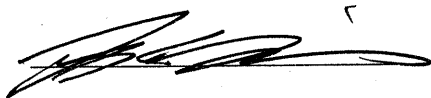
HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

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	6.97 m/s	Yes
Pendulum Deceleration			
10 ms	22.50 - 27.50 g	25.49 g	Yes
20 ms	17.60 - 22.60 g	21.44 g	Yes
30 ms	12.50 - 18.50 g	15.99 g	Yes
Max Pendulum Deceleration	29.00 g	27.25 g	Yes
Max Pendulum Deceleration After 30 ms	29.00 g	15.92 g	Yes
Deceleration-Time Curve Decay Time To 5g	34 - 42 ms	35.44 ms	Yes
D Plane Rotation			
Max	64 - 78 °	73.02 °	Yes
Time	57 - 64 ms	58.40 ms	Yes
Moment About Occipital Condyle			
Max	88.1 - 108.5 N·m	93.86 N·m	Yes
Time	47 - 58 ms	48.64 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	113 - 128 ms	114.96 ms	Yes
Positive Moment-Time Curve Decay Time To Zero	97 - 107 ms	101.52 ms	Yes

Comments:

Technician



Approved



06.20.2003 07:46:49 505



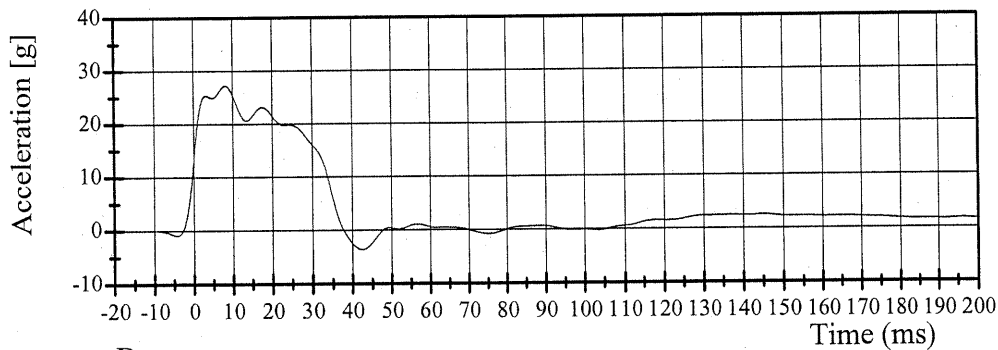
Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

Pendulum Deceleration

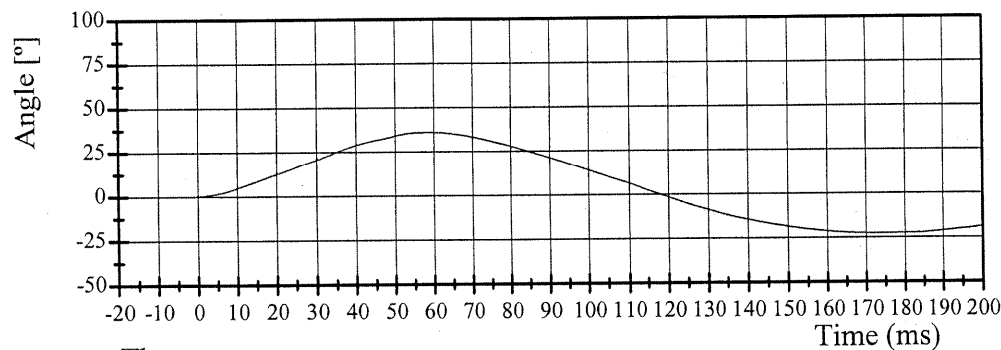


Filter Class: 60

Max: 27.2 g at 8.2 ms

Min: -3.6 g at 42.6 ms

Beta

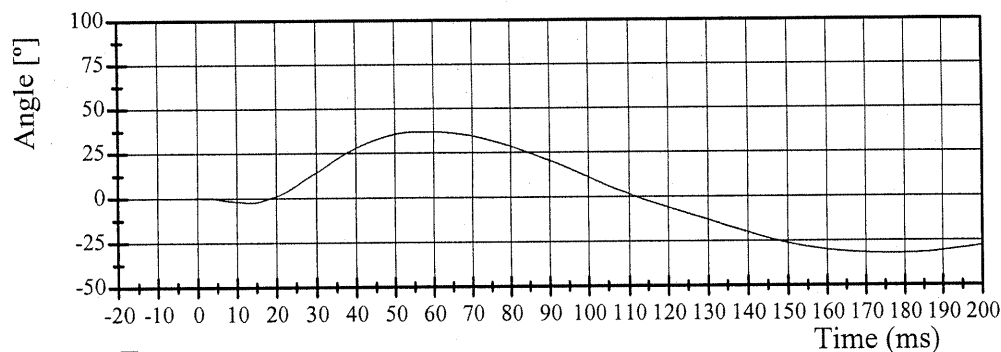


Filter Class: 60

Max: 36.1 ° at 58.7 ms

Min: -22.6 ° at 173.1 ms

Theta

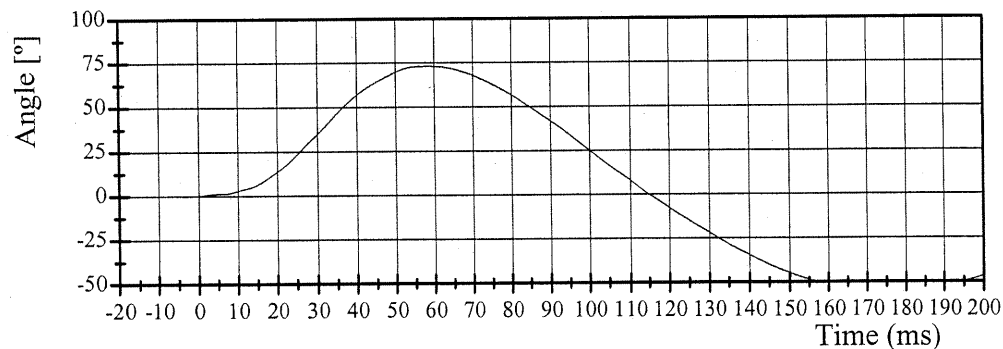


Filter Class: 60

Max: 37.0 ° at 57.2 ms

Min: -32.2 ° at 177.0 ms

Totan



Filter Class: 60

Max: 73.0 ° at 58.4 ms

Min: -54.8 ° at 176.4 ms

06.20.2003 07:46:50 505

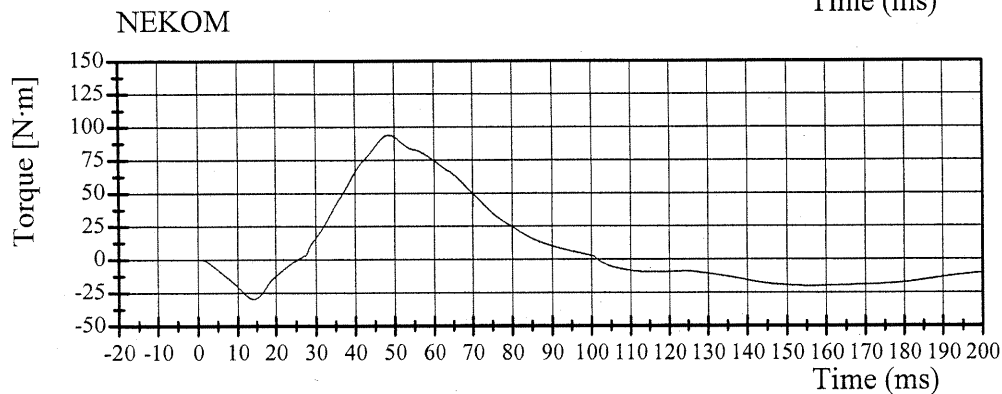
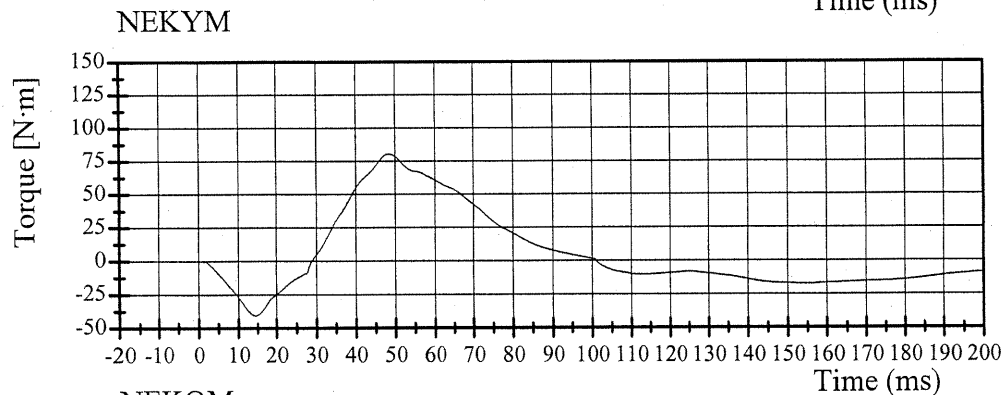
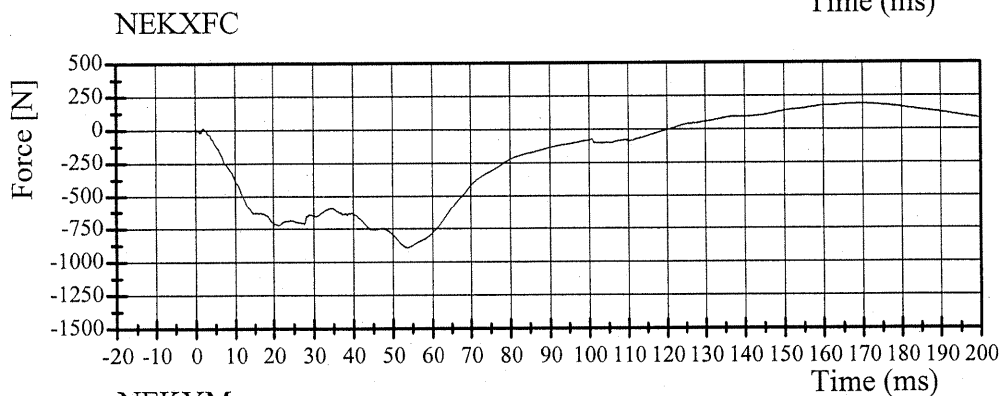
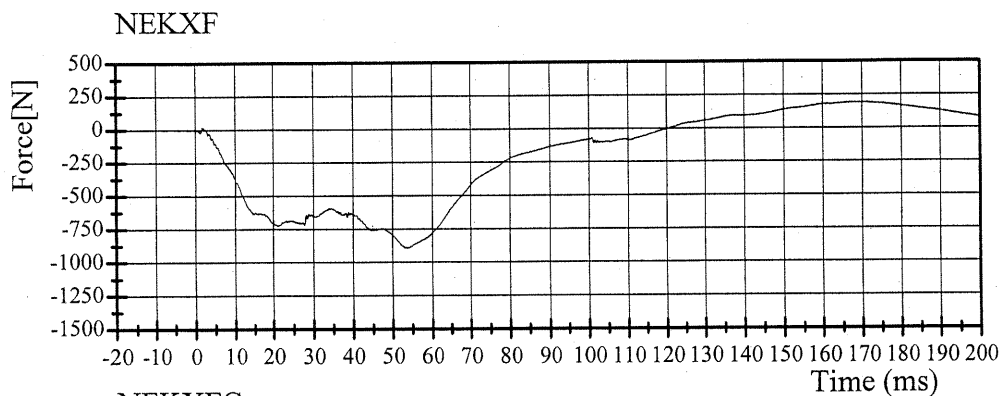


Transportation Research Center Inc.

572E Neck Flexion Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003



06.20.2003 07:46:51 505



Transportation Research Center Inc.

572E Neck Extension Test - 6 Channel Transducer

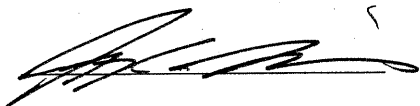
HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

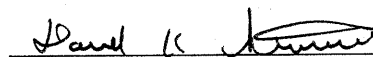
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.02 m/s	Yes
Pendulum Deceleration			
10 ms	17.20 - 21.20 g	17.70 g	Yes
20 ms	14.00 - 19.00 g	16.26 g	Yes
30 ms	11.00 - 16.00 g	15.03 g	Yes
Max Pendulum Deceleration	22.00 g	18.31 g	Yes
Max Pendulum Deceleration After 30 ms	22.00 g	14.97 g	Yes
Deceleration-Time Curve Decay Time To 5g	38 - 46 ms	41.92 ms	Yes
D Plane Rotation			
Max	81 - 106 °	97.12 °	Yes
Time	72 - 82 ms	77.84 ms	Yes
Moment About Occipital Condyle			
Min	-80.0 - (-52.9) N·m	-64.53 N·m	Yes
Time	65 - 79 ms	73.12 ms	Yes
Rotation Angle-Time Curve Decay Time To Zero	147 - 174 ms	156.96 ms	Yes
Negative Moment-Time Curve Decay Time To Zero	120 - 148 ms	145.28 ms	Yes

Comments:

Technician



Approved



06.20.2003 08:25:47 576



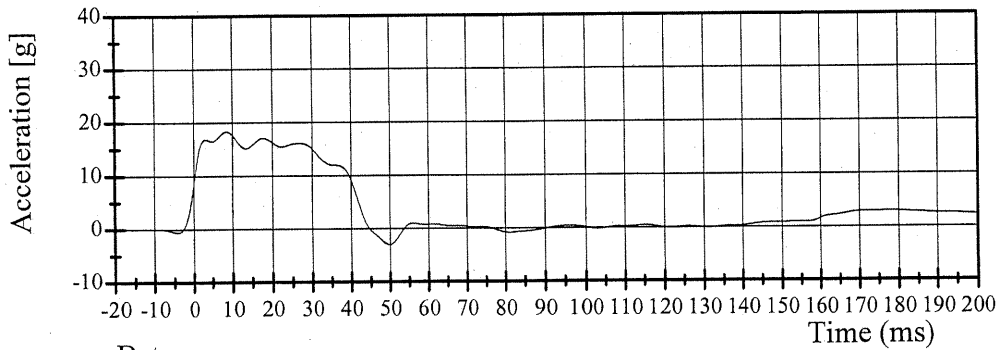
Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

Pendulum Deceleration

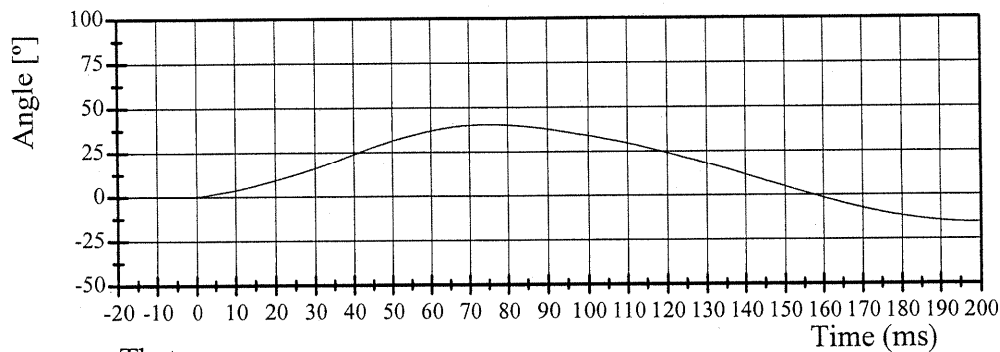


Filter Class: 60

Max: 18.3 g at 8.6 ms

Min: -3.0 g at 49.8 ms

Beta

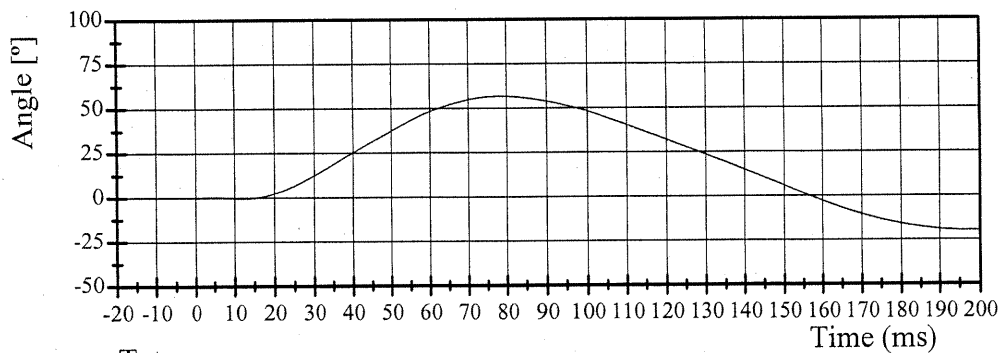


Filter Class: 60

Max: 40.4 ° at 74.6 ms

Min: -15.6 ° at 199.5 ms

Theta

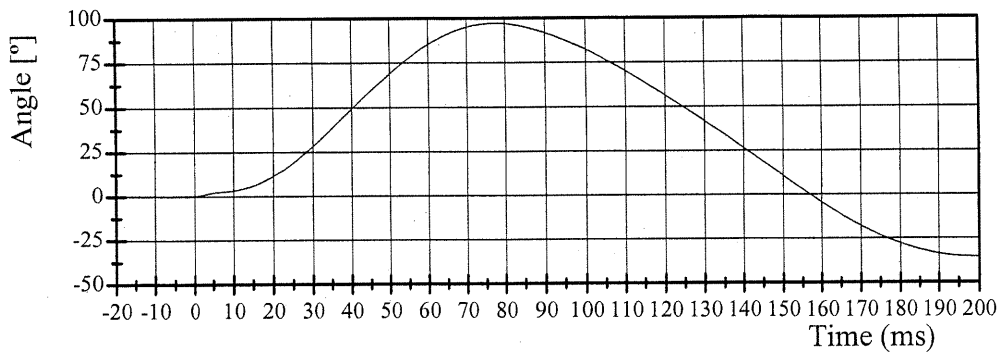


Filter Class: 60

Max: 56.8 ° at 78.8 ms

Min: -19.7 ° at 198.5 ms

Totan



Filter Class: 60

Max: 97.1 ° at 77.8 ms

Min: -35.3 ° at 198.9 ms

06.20.2003 08:25:48 576

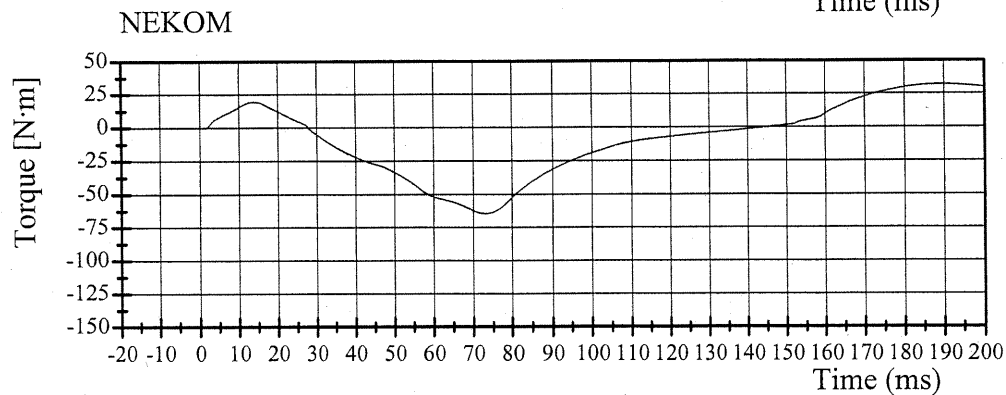
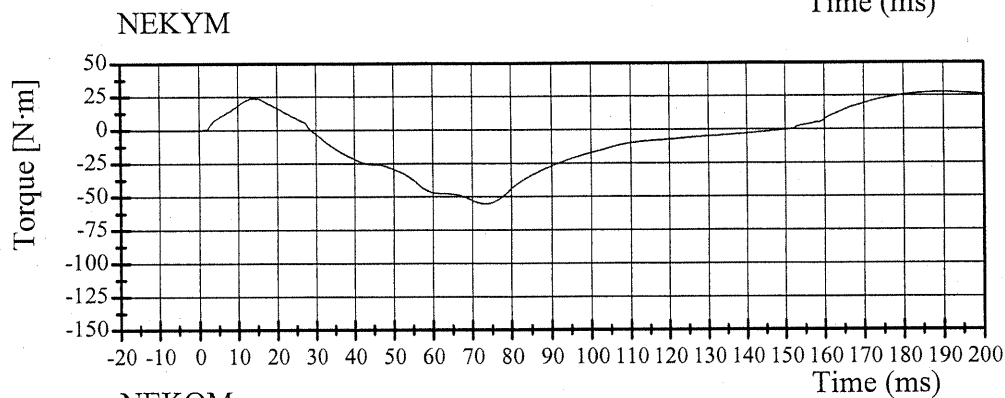
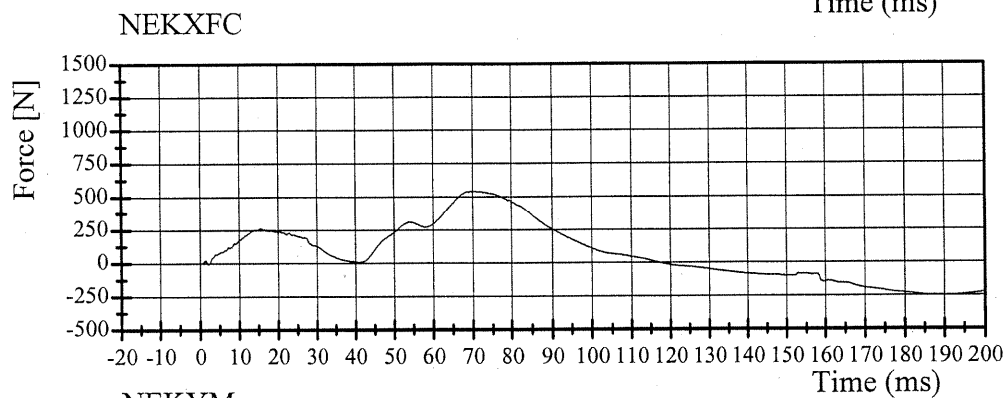
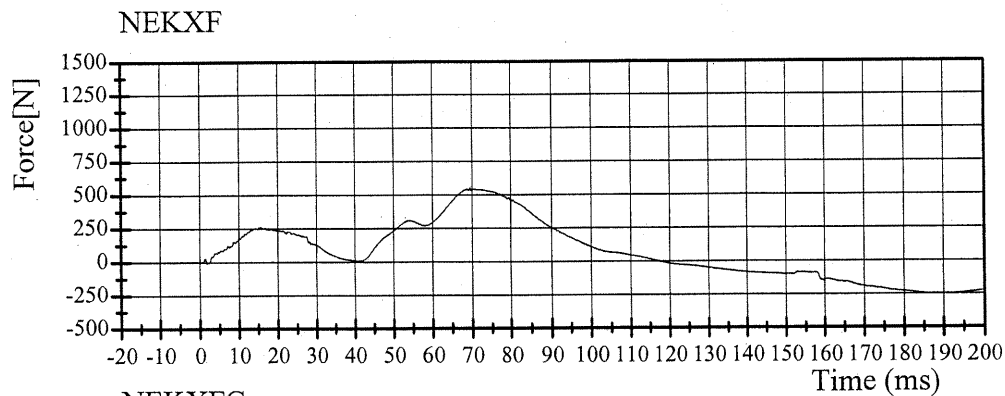


Transportation Research Center Inc.

572E Neck Extension Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003



06.20.2003 08:25:49 576



Transportation Research Center Inc.

572E Thorax Test

HHH 50th Male Serial No. 169 Calibration No. 19 - 2

Test Date 12/16/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.61 m/s	Yes
Maximum Chest Deflection	-72.6 - (-63.5) mm	-66.8 mm	Yes
Maximum Resistive Force	5160 - 5894 N	5551 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Pre-cal due to chest pot having been cal'ed.

Technician



Approved



12.16.2003 10:59:23 967



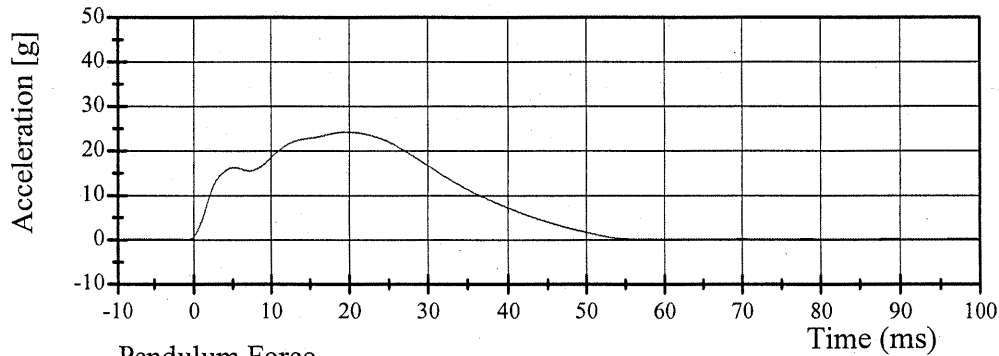
Transportation Research Center Inc.

572E Thorax Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 2

Test Date 12/16/2003

Pendulum Deceleration

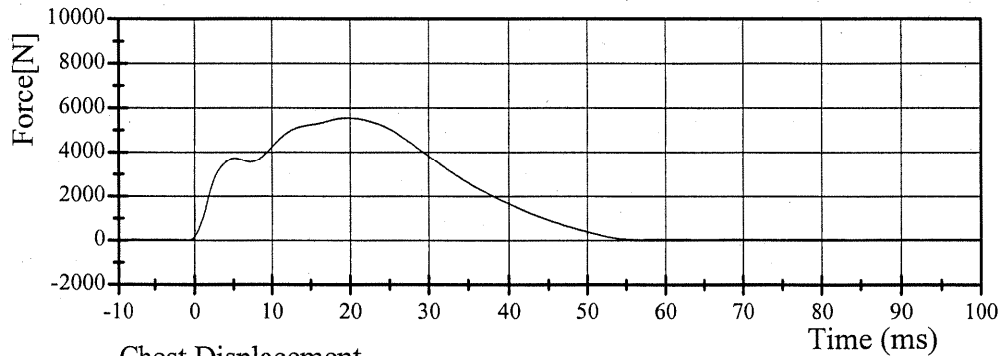


Filter Class: 180

Max: 24.2 g at 19.7 ms

Min: -0.0 g at -77.3 ms

Pendulum Force

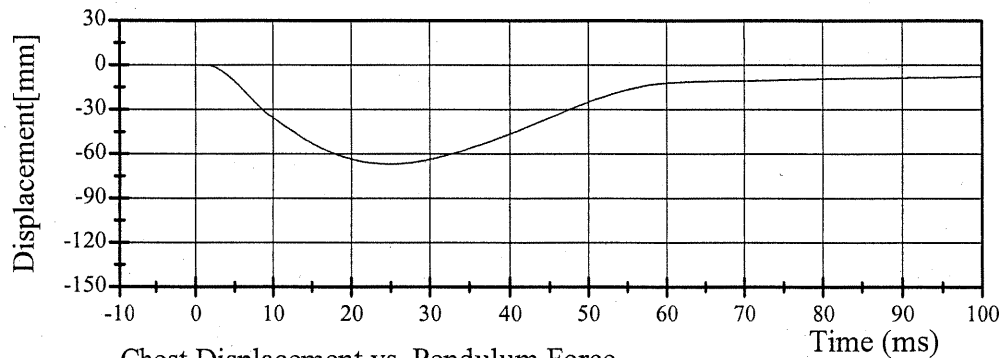


Filter Class: 180

Max: 5551.5 N at 19.7 ms

Min: -6.6 N at -77.3 ms

Chest Displacement

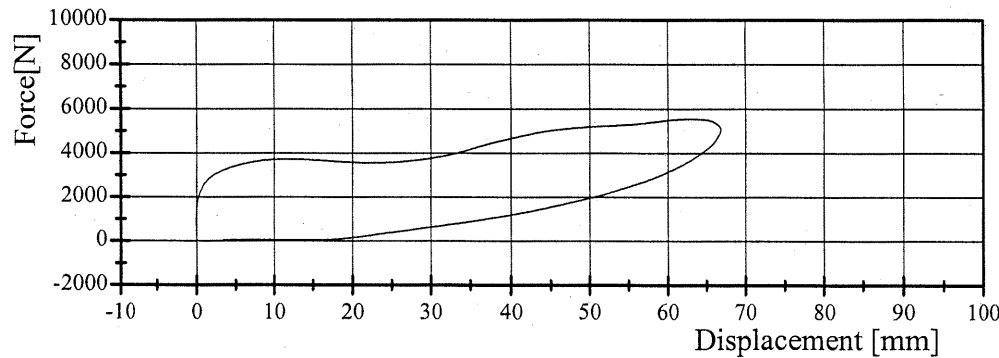


Filter Class: 180

Max: 0.1 mm at 0.9 ms

Min: -66.8 mm at 25.0 ms

Chest Displacement vs. Pendulum Force



12.16.2003 10:59:24 967



Transportation Research Center Inc

Hybrid III Hip Range of Motion

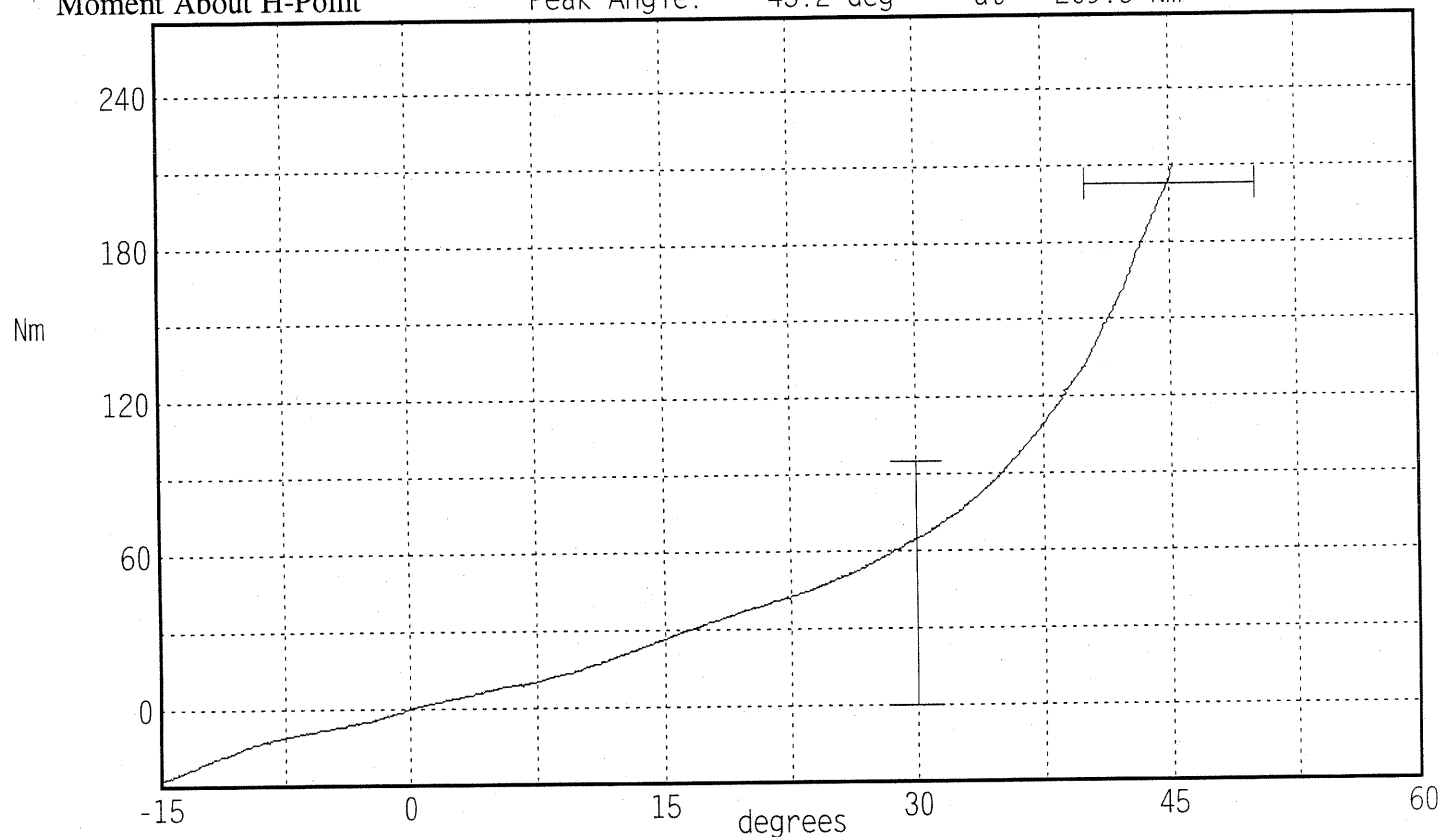
Serial Number: 169L
Test Number: 169C19
Comments:

Date: 06/19/2003
Time: 13:09

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.7 °C	Pass
Humidity	10 - 70	53 %	Pass
Moment at 30 deg	<= 94.9	64.9 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	44.9 deg	Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec	Pass

Peak Moment: 210.5 Nm at 45.2 deg
Peak Angle: 45.2 deg at 209.5 Nm

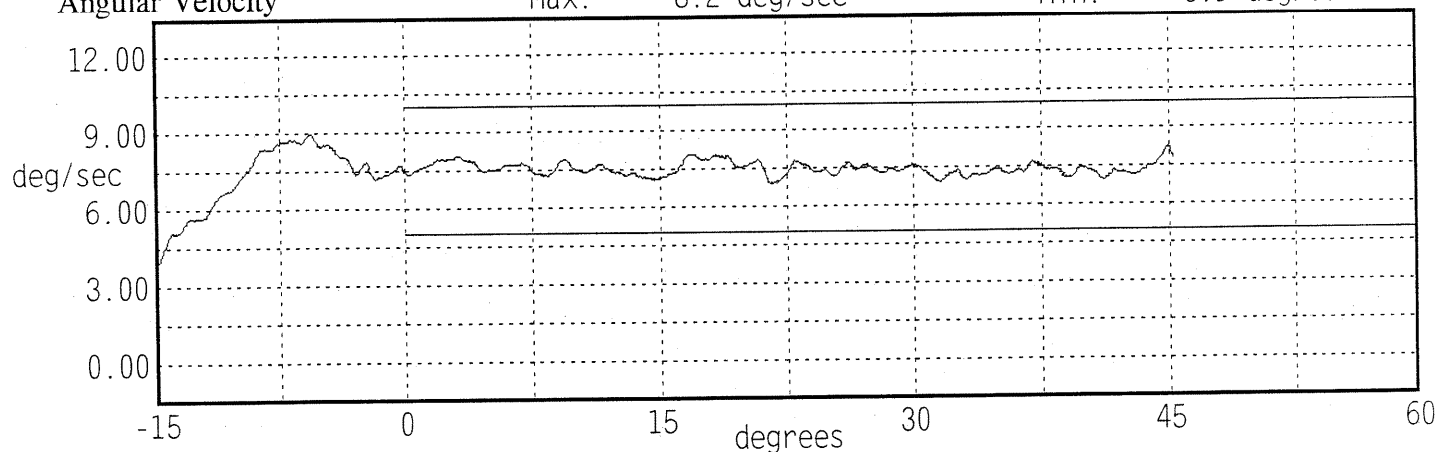
Moment About H-Point



Angular Velocity

Max: 8.2 deg/sec

Min: 6.9 deg/sec



Transportation Research Center Inc

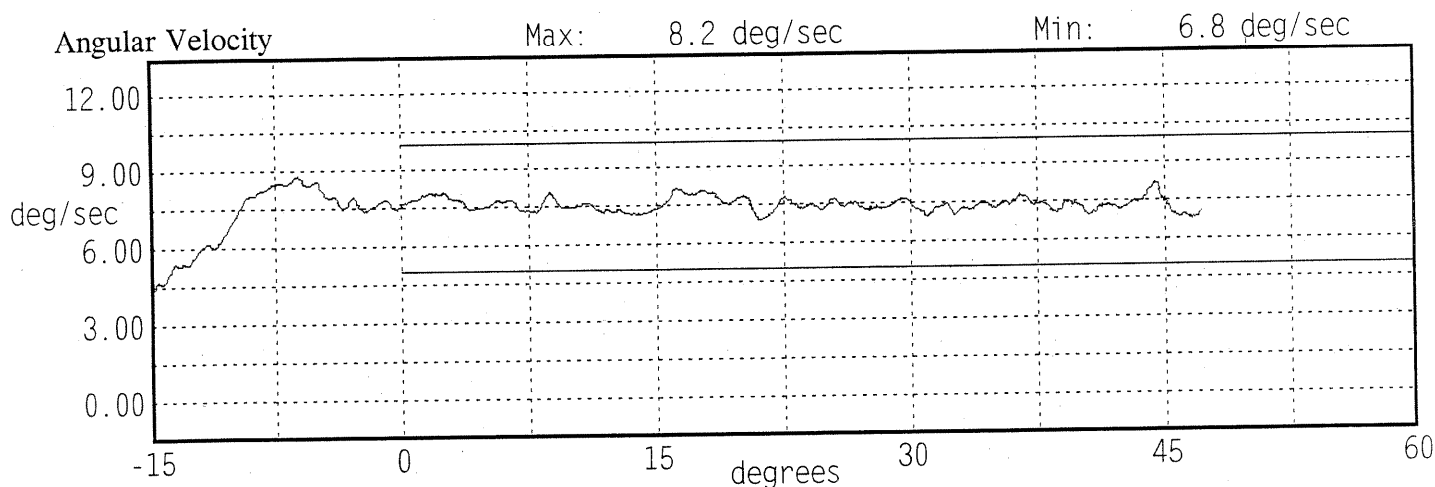
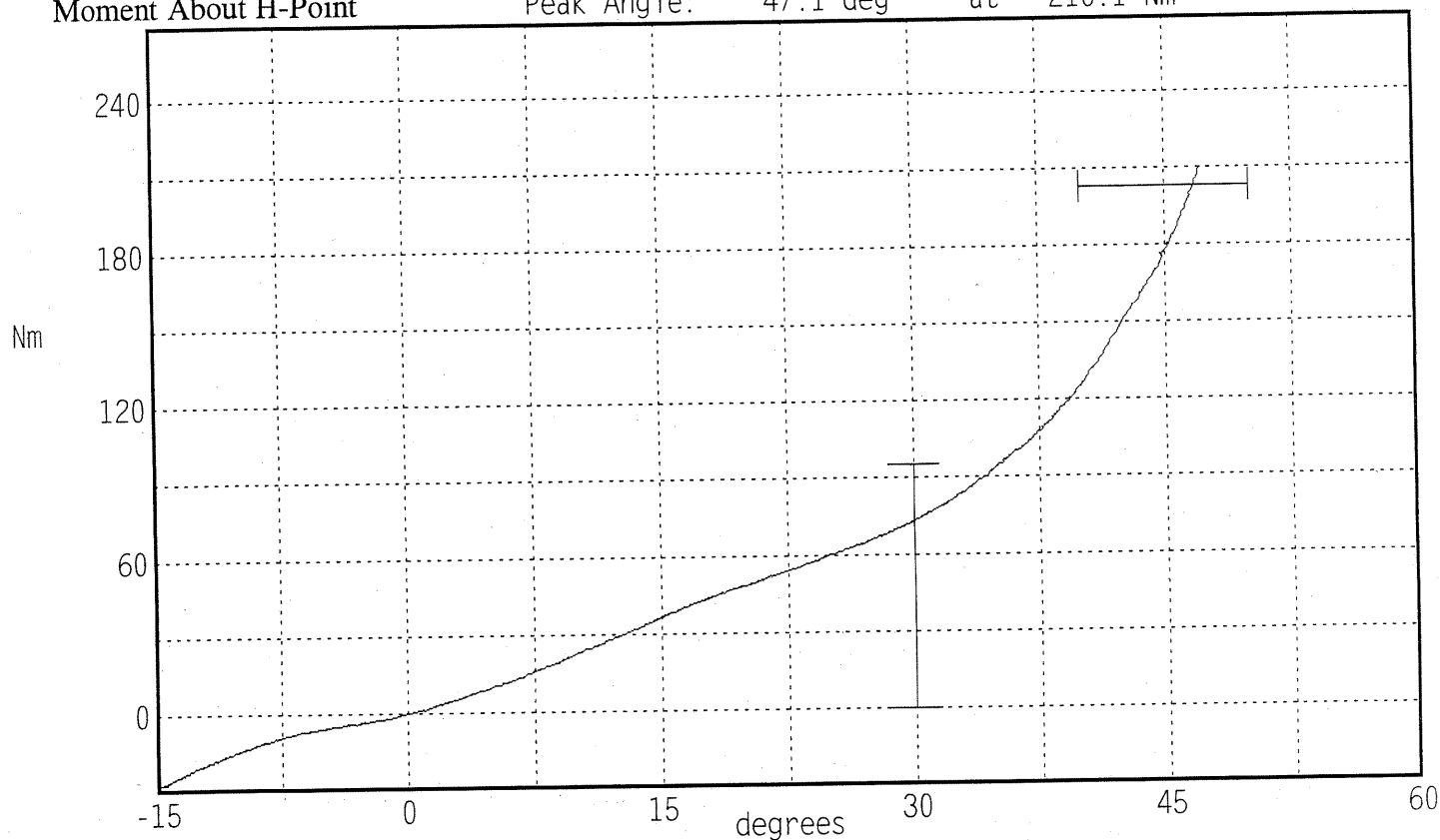
Hybrid III Hip Range of Motion

Serial Number: 169R
Test Number: 169C19
Comments:

Date: 06/19/2003
Time: 13:05

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.7 °C	Pass
Humidity	10 - 70	53 %	Pass
Moment at 30 deg	<= 94.9	73.3 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: 210.1 Nm at 47.1 deg
Peak Angle: 47.1 deg at 210.1 Nm



Transportation Research Center Inc.

572E Left Knee Slider Test

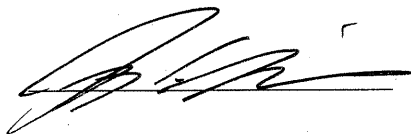
HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

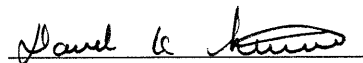
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.73 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1465 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-3081 N	Yes

Comments:

Technician



Approved



06.20.2003 15:37:00 1783

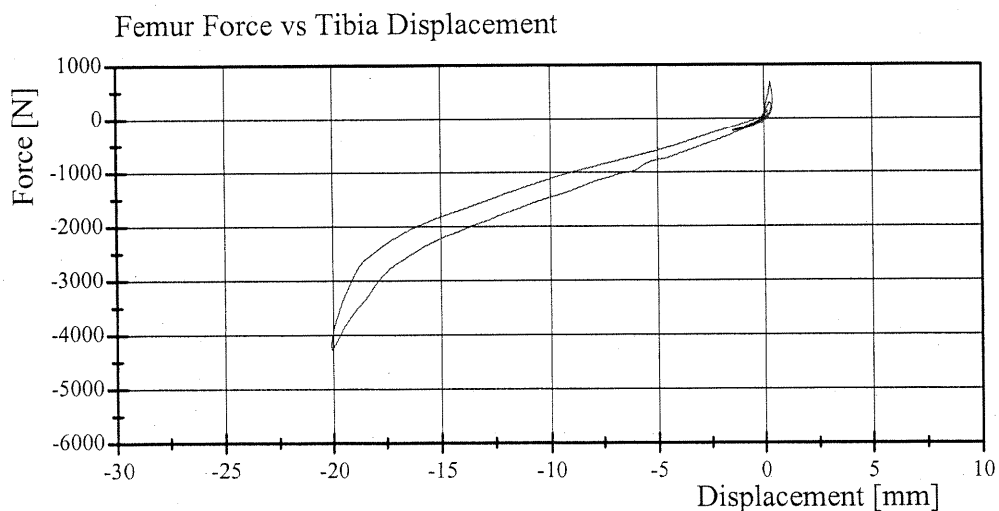
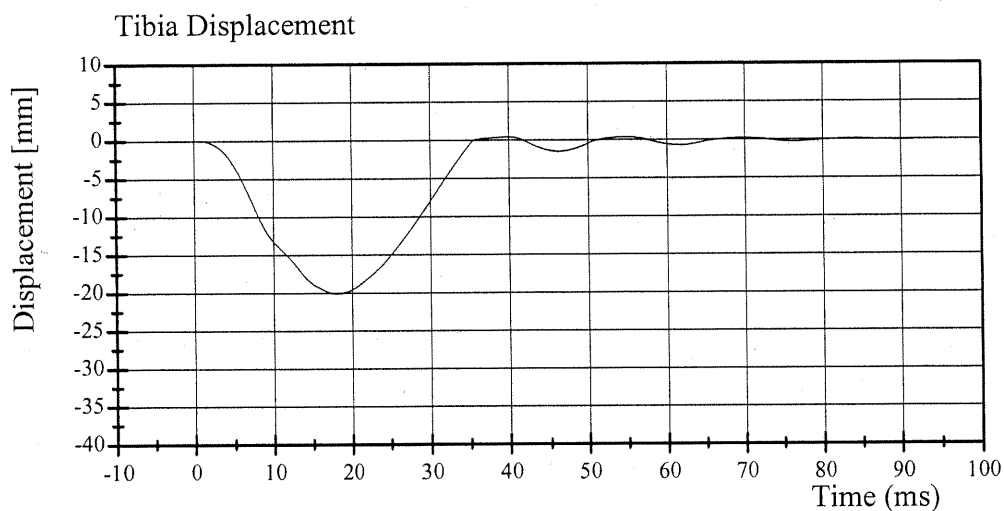
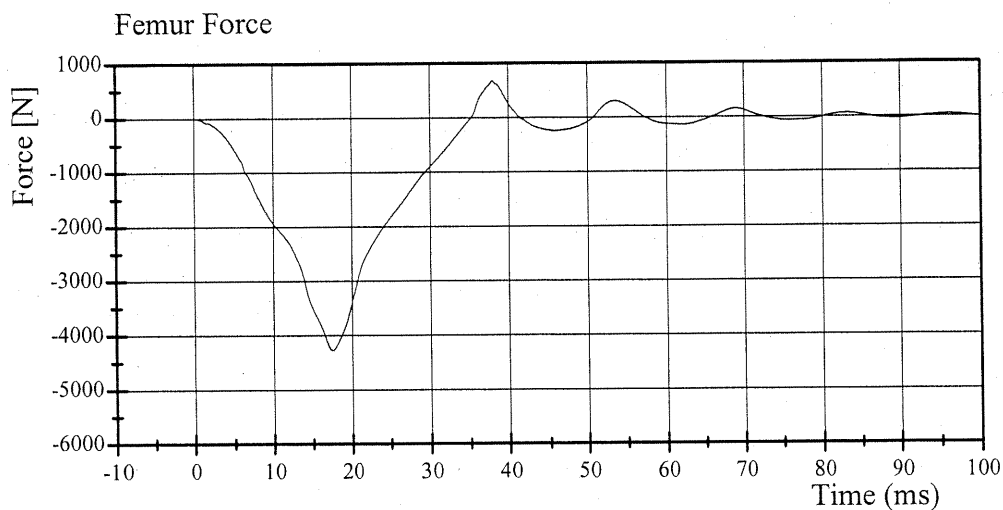


Transportation Research Center Inc.

572E Left Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003



06.20.2003 15:37:00 1783



Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

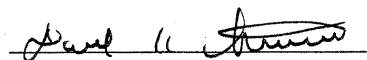
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.72 m/s	Yes
Force At 10 mm Displacement	-1259 - (-1721) N	-1356 N	Yes
Force At 18 mm Displacement	-2268 - (-3096) N	-2535 N	Yes

Comments:

Technician



Approved



06.20.2003 15:31:40 1779

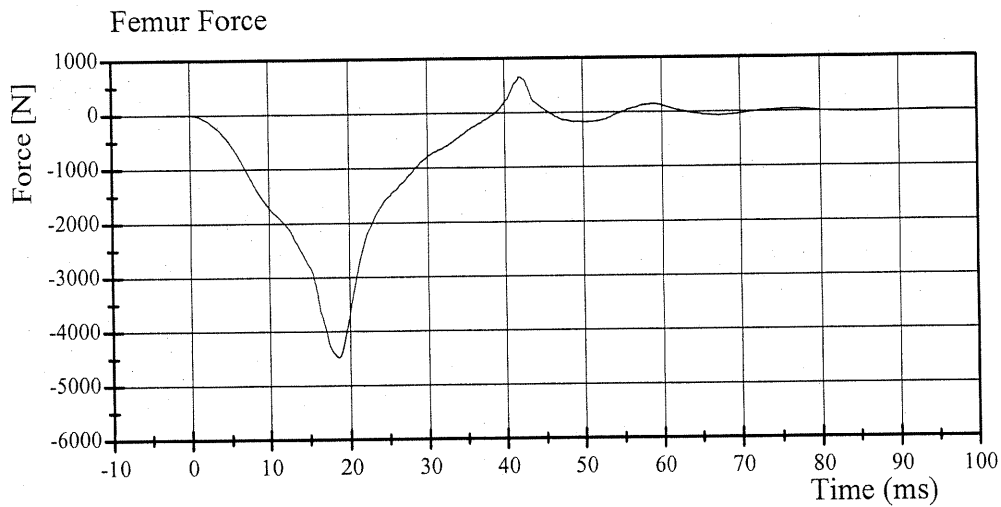


Transportation Research Center Inc.

572E Right Knee Slider Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

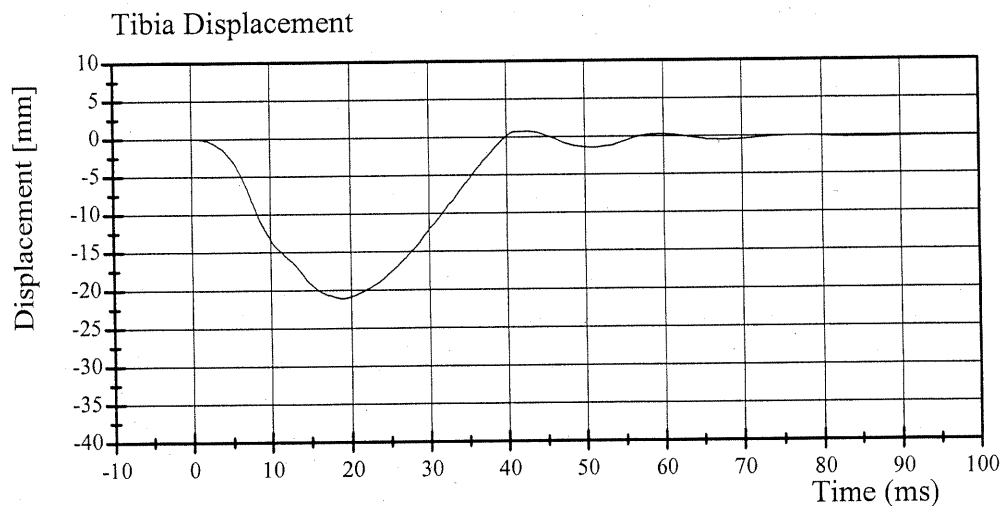
Test Date 06/20/2003



Filter Class: 600

Max: 661.3 N at 41.9 ms

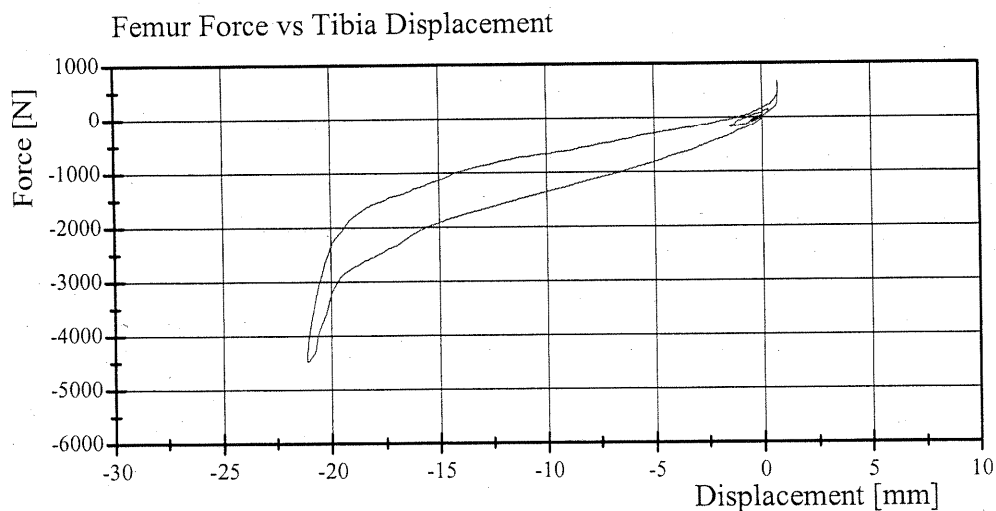
Min: -4483.1 N at 18.6 ms



Filter Class: 600

Max: 0.7 mm at 42.6 ms

Min: -21.1 mm at 18.9 ms



06.20.2003 15:31:41 1779



Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

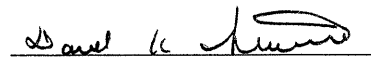
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5282 N	Yes

Comments:

Technician



Approved



06.20.2003 15:09:04 2133

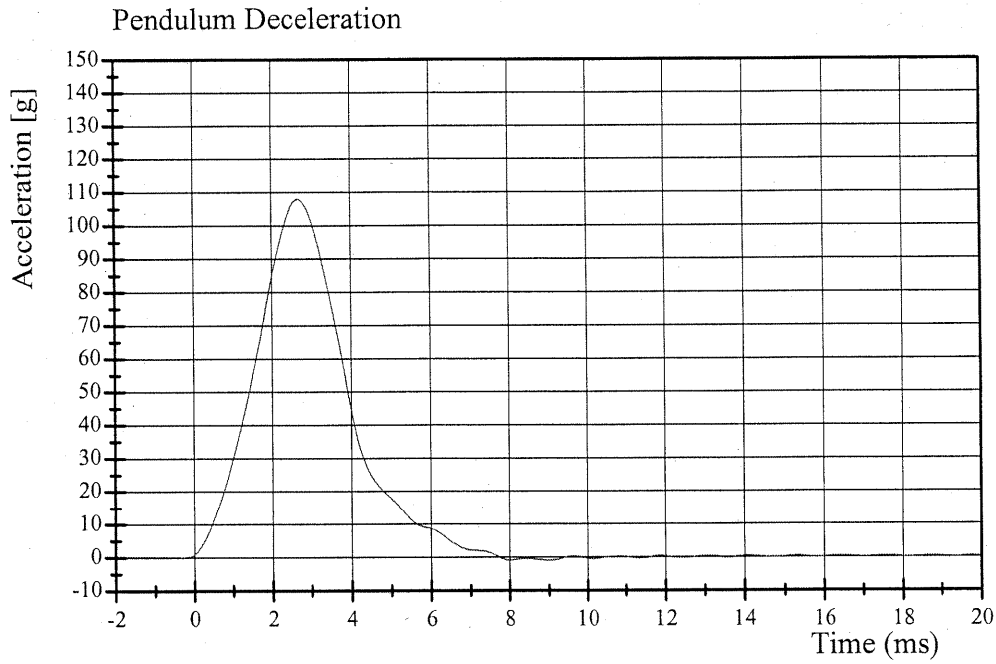


Transportation Research Center Inc.

572E Left Knee Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

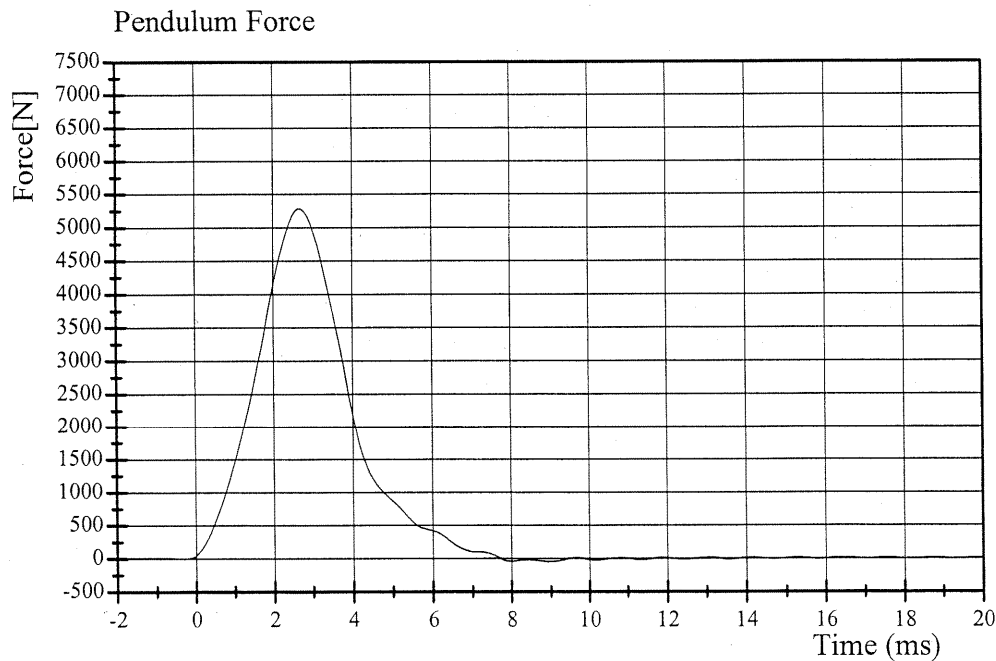
Test Date 06/20/2003



Filter Class: 600

Max: 107.9 g at 2.7 ms

Min: -0.9 g at 9.0 ms



Filter Class: 600

Max: 5282.0 N at 2.7 ms

Min: -45.9 N at 9.0 ms

06.20.2003 15:09:06 2133



Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

Test Date 06/20/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.08 m/s	Yes
Maximum Pendulum Force	4715 - 5783 N	5461 N	Yes

Comments:

Technician



Approved



06.20.2003 15:14:23 2131

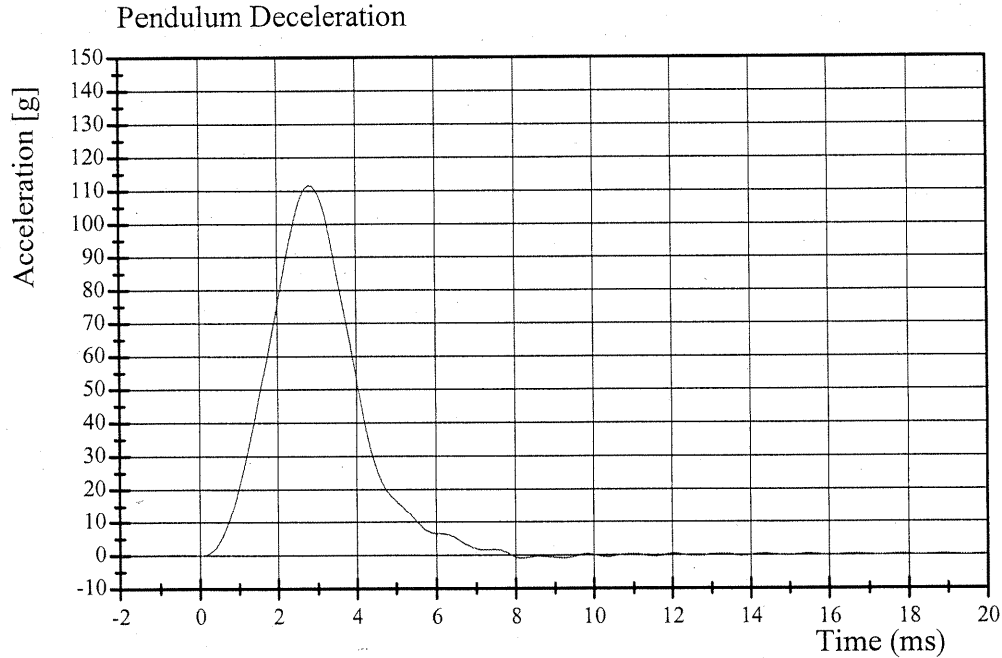


Transportation Research Center Inc.

572E Right Knee Test

HIII 50th Male Serial No. 169 Calibration No. 19 - 1

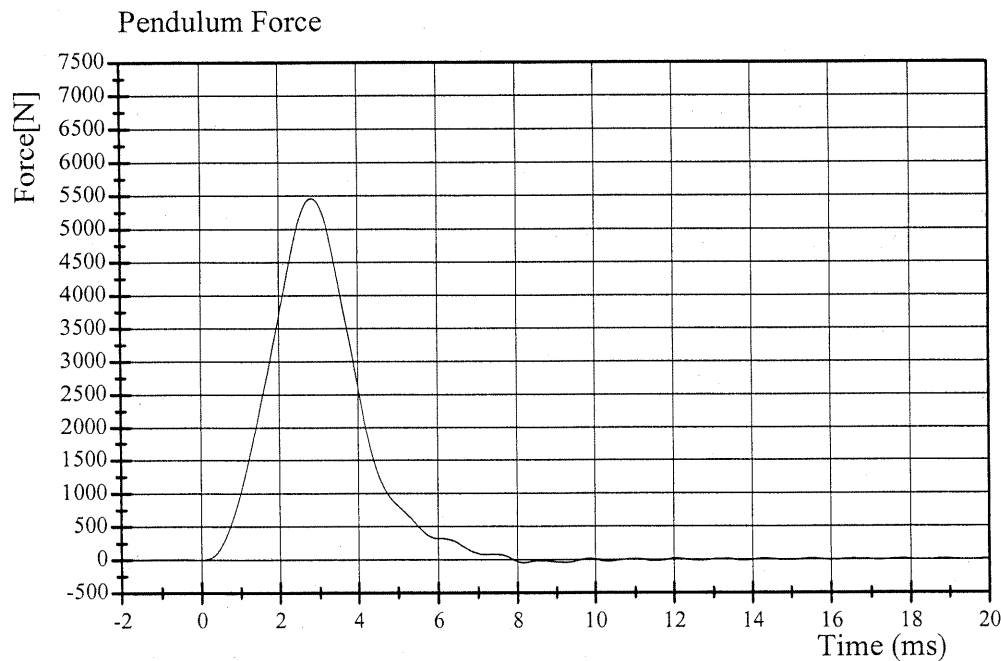
Test Date 06/20/2003



Filter Class: 600

Max: 111.6 g at 2.8 ms

Min: -0.9 g at 8.2 ms



Filter Class: 600

Max: 5461.1 N at 2.8 ms

Min: -43.9 N at 8.2 ms

06.20.2003 15:14:24 2131



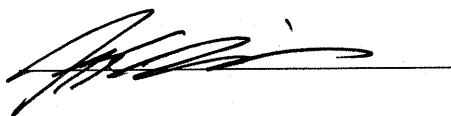
Pre-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Passenger Dummy S/N: 416

Transportation Research Center Inc.
5720 HHH 5th Female Dummy
External Dimensions
Serial No. 416 Calibration No. 21

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	774.7 - 800.1	786	Yes
B	Shoulder Pivot Height	431.8 - 457.2	443	Yes
C	Hip Pivot Height	81.3 - 86.3	83	Yes
D	Hip Pivot from Backline	144.8 - 149.8	145	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	77	Yes
F	Thigh Clearance	119.4 - 134.6	131	Yes
G	Back of Elbow to Wrist Pivot	243.9 - 259.1	250	Yes
H	Head Back to Backline	43.2 - 48.2	48	Yes
I	Shoulder to Elbow Length	276.8 - 297.2	289	Yes
J	Elbow Rest Height	182.8 - 203.2	197	Yes
K	Buttock Knee Length	520.7 - 546.1	541	Yes
L	Popliteal Height	355.6 - 376.0	359	Yes
M	Knee Pivot Height	393.7 - 419.1	400	Yes
N	Buttock Popliteal Height	414.0 - 439.4	428	Yes
O	Chest Depth without Jacket	175.3 - 190.5	183	Yes
P	Foot Length	218.5 - 233.7	225	Yes
R	Buttock to Knee Pivot Length	457.2 - 482.6	467	Yes
S	Head Breadth	137.1 - 147.3	140	Yes
T	Head Depth	177.8 - 188.0	186	Yes
U	Hip Breadth	299.7 - 314.9	304	Yes
V	Shoulder Breadth	350.5 - 365.7	365	Yes
W	Foot Breadth	78.8 - 94.0	94	Yes
X	Head Circumference	528.3 - 548.7	543	Yes
Y	Chest Circumference with Jacket	850.9 - 881.3	874	Yes
Z	Waist Circumference	759.5 - 789.9	782	Yes
AA	Reference Location for Chest Circumference	332.7 - 358.1	346	Yes
BB	Reference Location for Waist Circumference	160.0 - 170.2	165	Yes

Technician



Approved




Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 09/26/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Peak Resultant Acceleration	250 - 300 g	283.1 g	Yes
Peak Lateral Acceleration	15 g Max	-9.1 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician

John K. Clumidge

Approved

V. L. Watten

09.26.2003 15:33:52 607

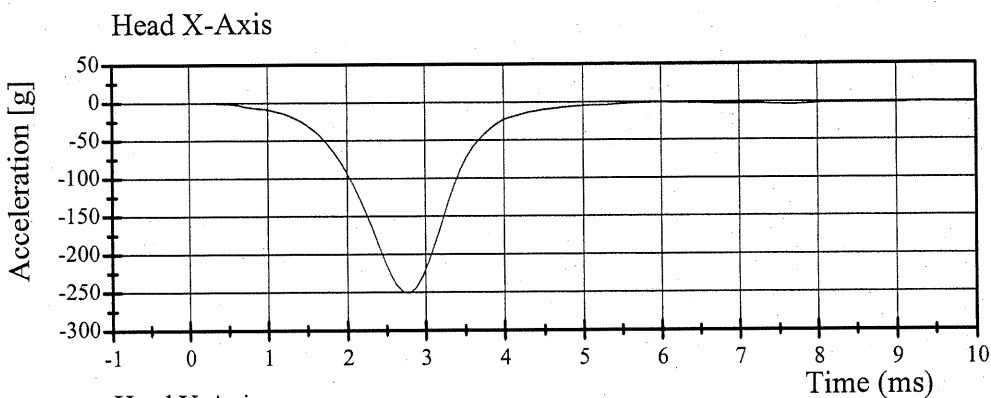


Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

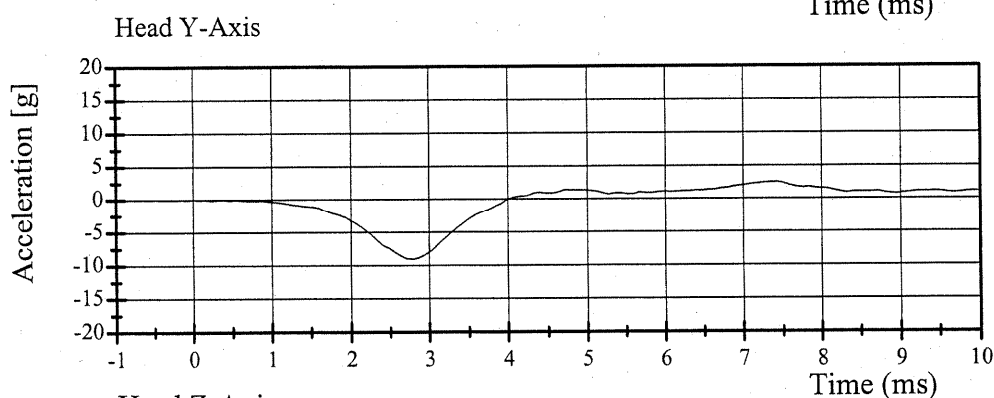
Test Date 09/26/2003



Filter Class: 1000

Max: 0.1 g at 0.0 ms

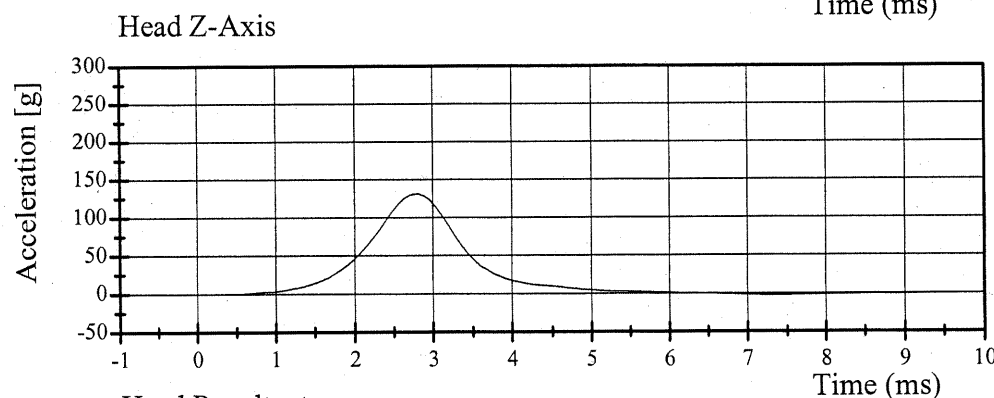
Min: -250.5 g at 2.8 ms



Filter Class: 1000

Max: 2.5 g at 7.4 ms

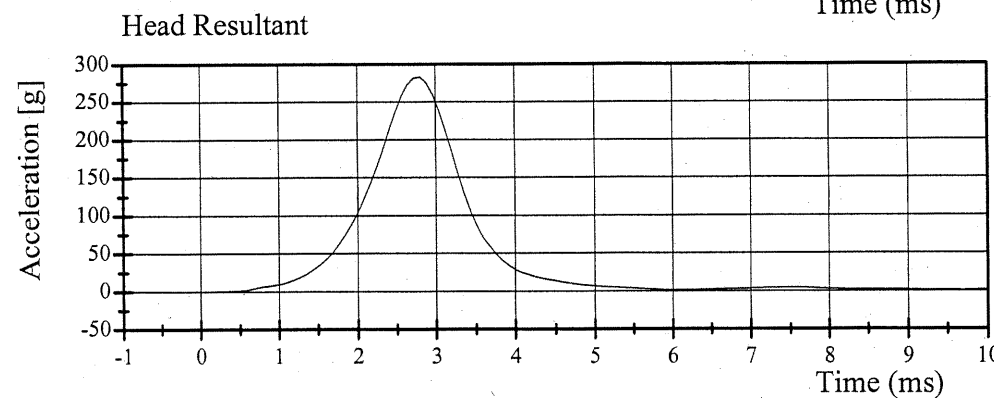
Min: -9.1 g at 2.8 ms



Filter Class: 1000

Max: 131.6 g at 2.8 ms

Min: -2.3 g at 7.3 ms



Filter Class: 1000

Max: 283.1 g at 2.8 ms

Min: 0.0 g at 0.4 ms

09.26.2003 15:33:53 607



Transportation Research Center Inc.

5720 Neck Flexion Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003

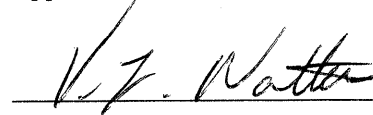
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Impact Velocity	6.89 - 7.13 m/s	7.10 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.10 - 2.50 m/s	2.46 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.81 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.78 m/s	Yes
Peak D Plane Rotation	77 - 91 °	79.1 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	76.14 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	86.96 ms	Yes

Comments:

Technician



Approved



08.04.2003 08:50:41 483

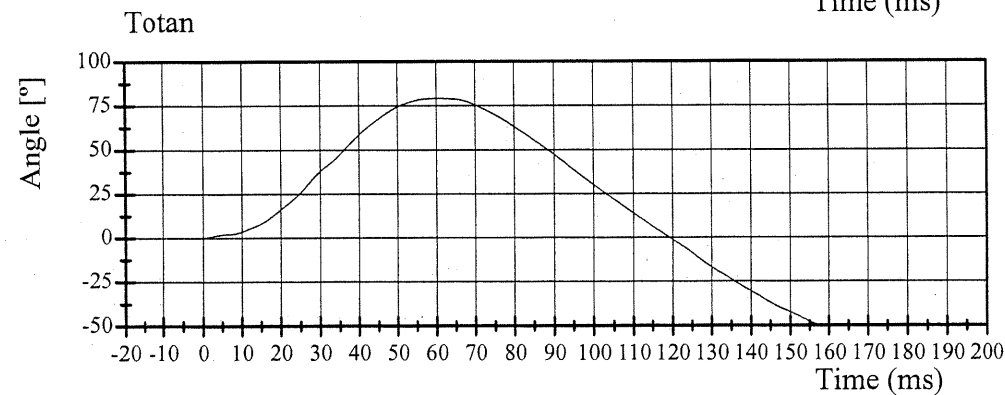
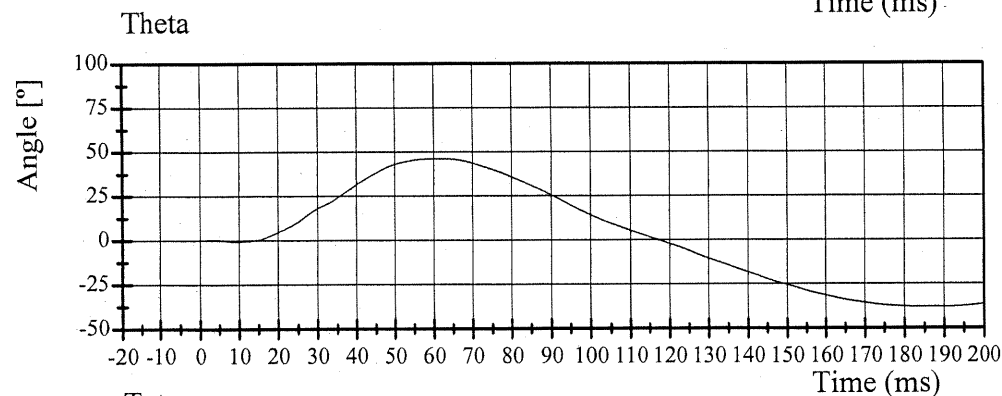
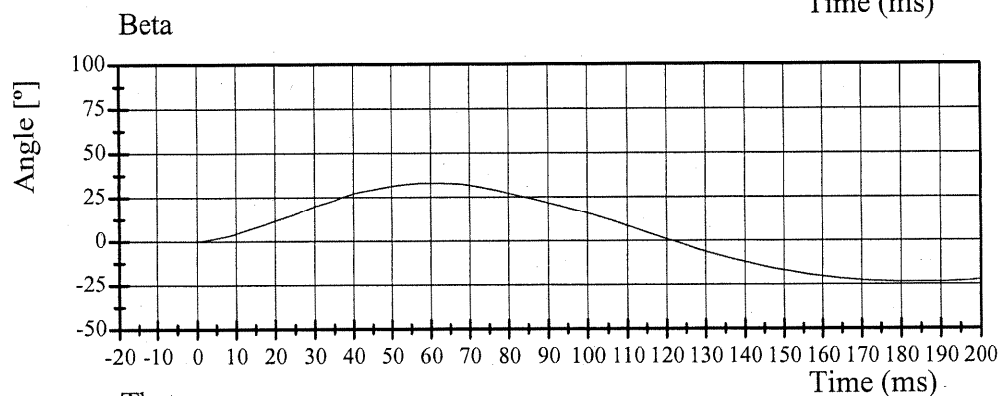
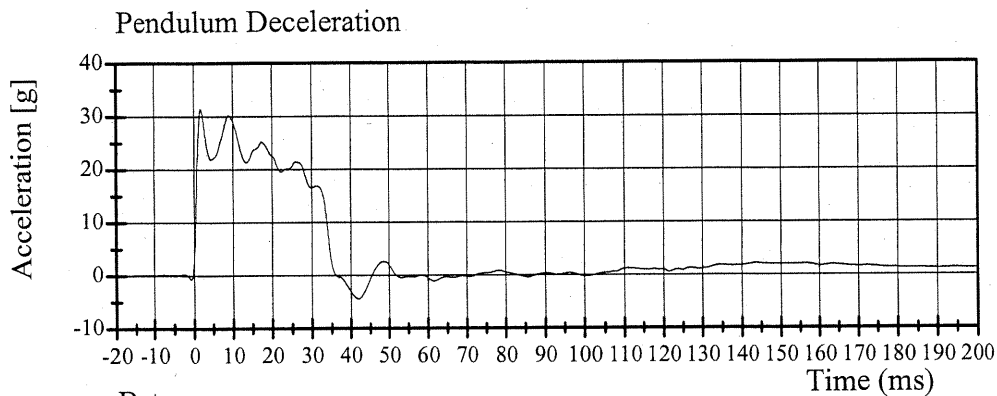


Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003



08.04.2003 08:50:42 483

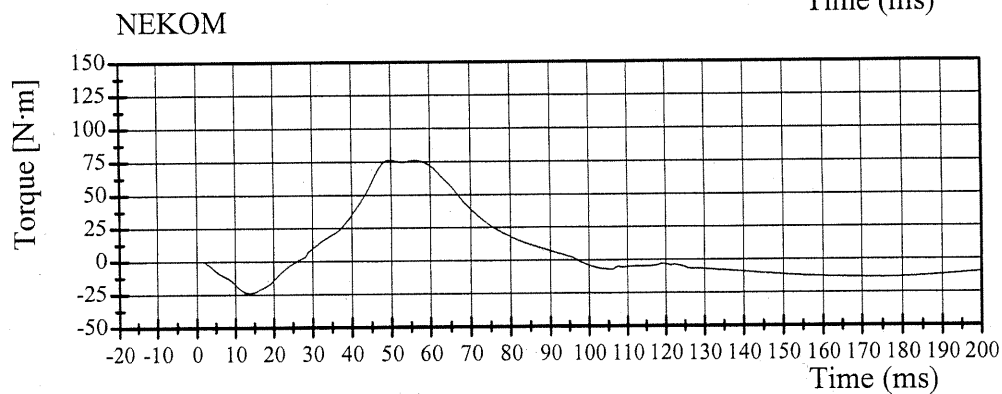
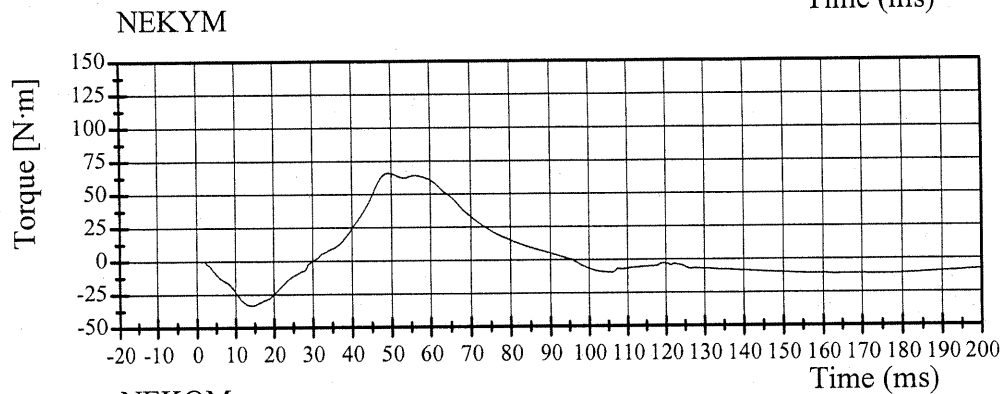
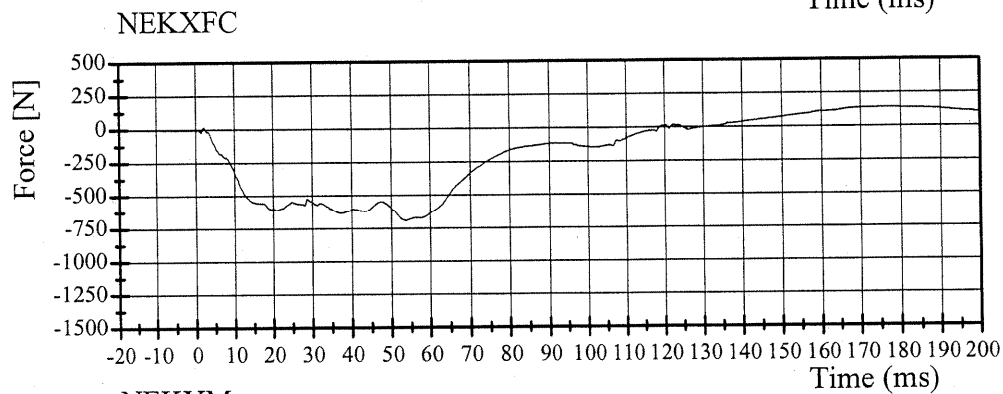
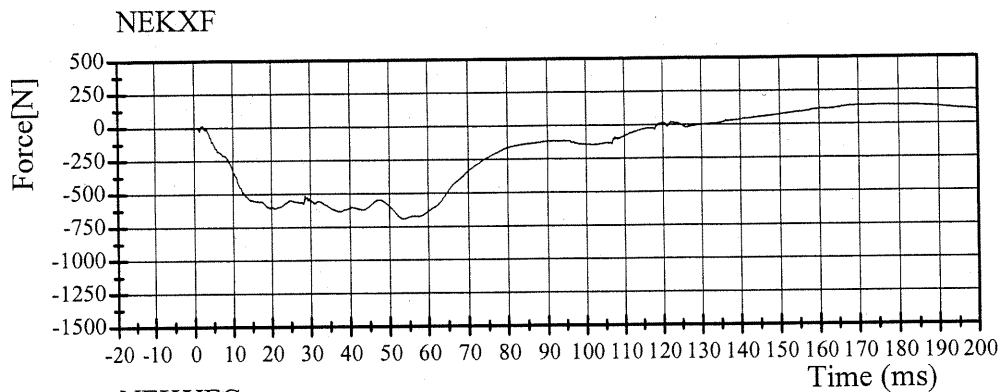


Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003



08.04.2003 08:50:44 483



Transportation Research Center Inc.

5720 Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003

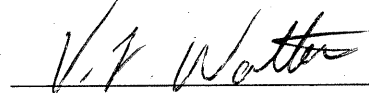
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	60 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.08 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.50 - 1.90 m/s	1.88 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.77 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.40 m/s	Yes
Peak D Plane Rotation	99 - 114 °	106.0 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-65.0 - (-53.0) N·m	-57.20 N·m	Yes
Negative Moment Decay Time To -10 N·m	94 - 114 ms	102.64 ms	Yes

Comments:

Technician



Approved



08.04.2003 09:16:17 566



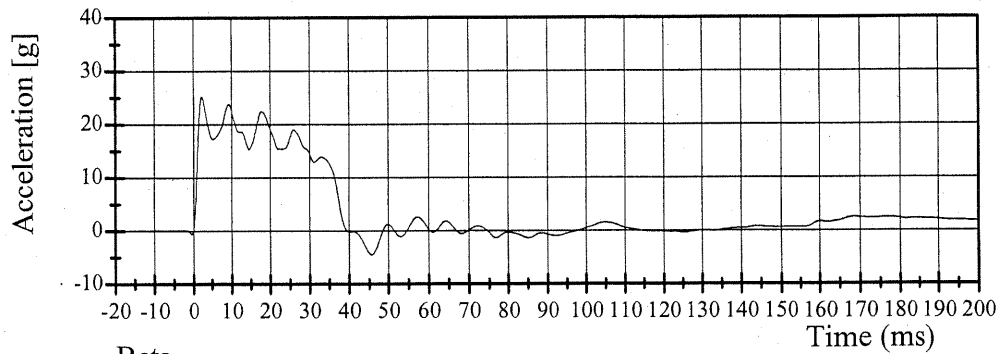
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003

Pendulum Deceleration

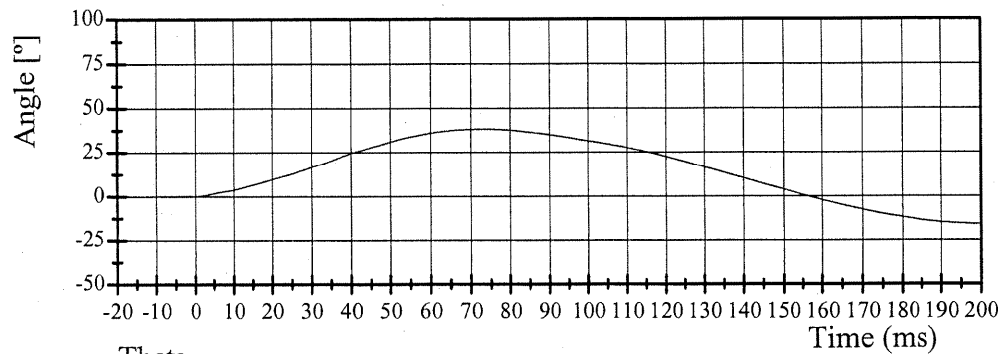


Filter Class: 180

Max: 25.2 g at 2.3 ms

Min: -4.5 g at 45.7 ms

Beta

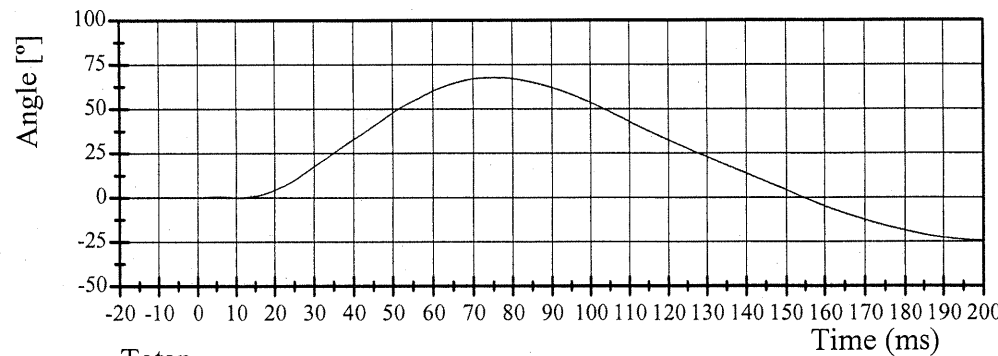


Filter Class: 60

Max: 38.2 ° at 73.4 ms

Min: -16.1 ° at 204.7 ms

Theta

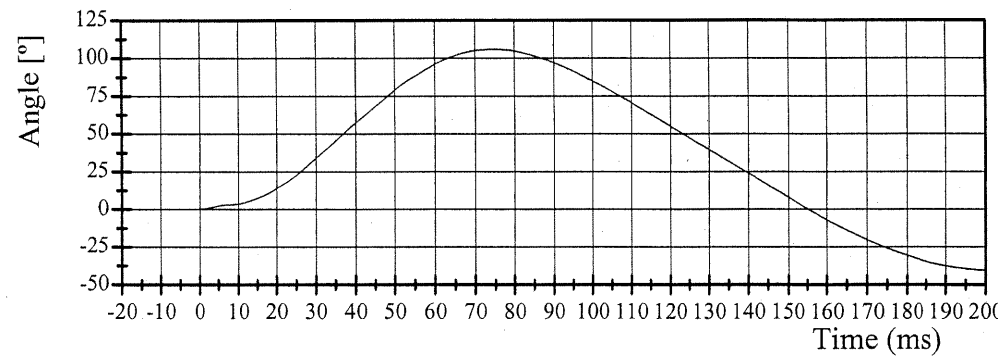


Filter Class: 60

Max: 67.8 ° at 75.2 ms

Min: -24.3 ° at 203.0 ms

Totan



Filter Class: 60

Max: 106.0 ° at 74.9 ms

Min: -40.4 ° at 203.9 ms

08.04.2003 09:16:18 566

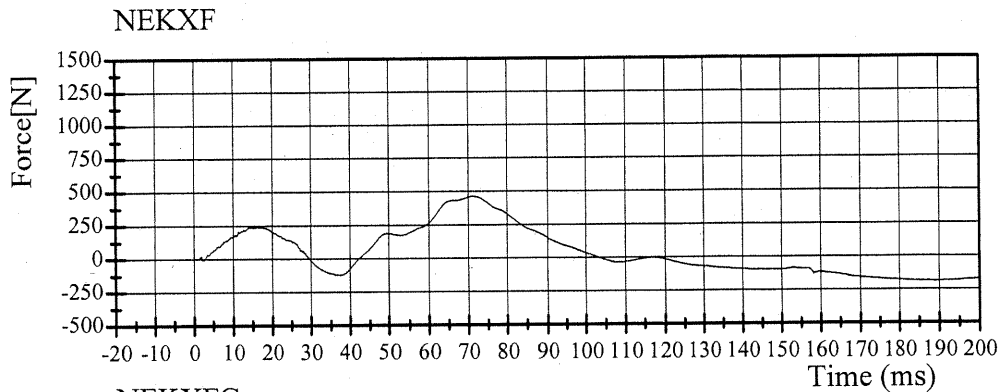


Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

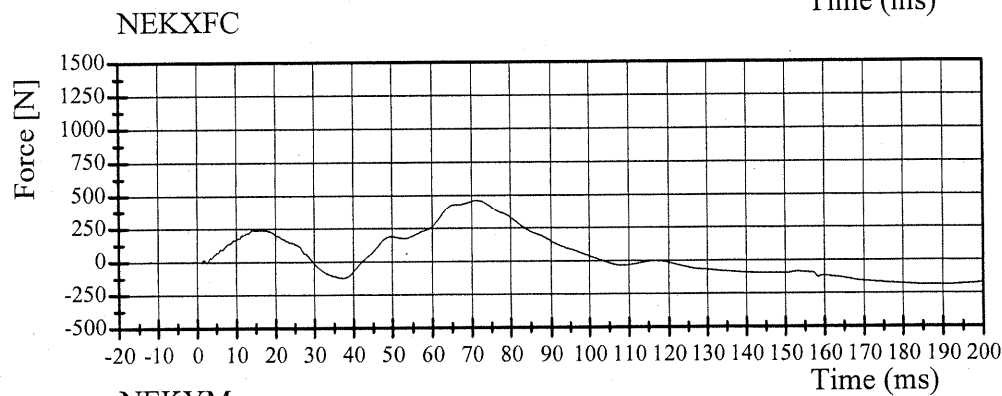
Test Date 08/04/2003



Filter Class: 1000

Max: 463.1 N at 71.1 ms

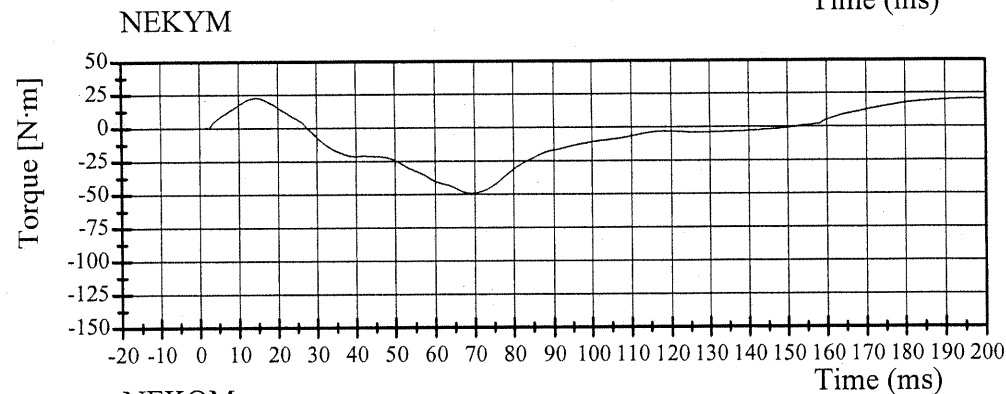
Min: -187.6 N at 188.9 ms



Filter Class: 600

Max: 463.1 N at 71.4 ms

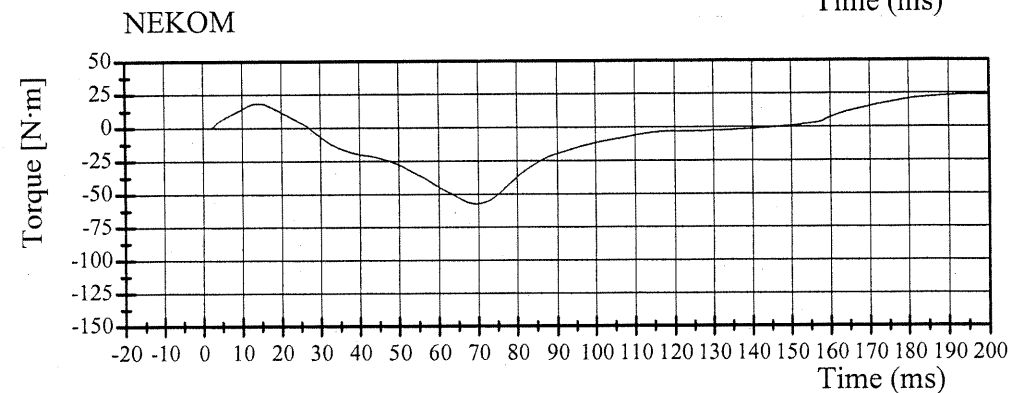
Min: -187.3 N at 189.9 ms



Filter Class: 600

Max: 22.7 N·m at 14.6 ms

Min: -49.2 N·m at 69.2 ms



Filter Class: 600

Max: 23.9 N·m at 195.2 ms

Min: -57.2 N·m at 69.4 ms

08.04.2003 09:16:20 566



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

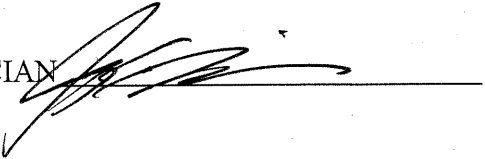
CAL DATE: 04-Aug-03

TRC, INC. TEST NO: 416C21TF1 572 O SN416 TORSO FLEX CAL 21

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2° C	21.1 ° C
RELATIVE HUMIDITY	10 – 70 %	63 %
INITIAL ANGLE OF UNSUPPORTED DUMMY	<= 20° REFERENCED TO VERTICAL	16.6 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	375.1 N
RETURN ANGLE		21.6 °
DIFFERENCE BETWEEN RETURN ANGLE & INITIAL ANGLE	+/- 8 ° OF INITIAL ANGLE	5.0 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN 

Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/01/2003

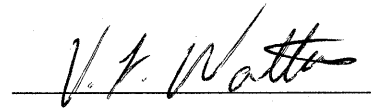
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.63 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-53.4 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4035 N	Yes
Peak Force Between 18 mm and 50 mm	4600 N	4039 N	Yes
Internal Hysteresis	69 - 85 %	72 %	Yes

Comments:

Technician



Approved



08.01.2003 11:01:36 962



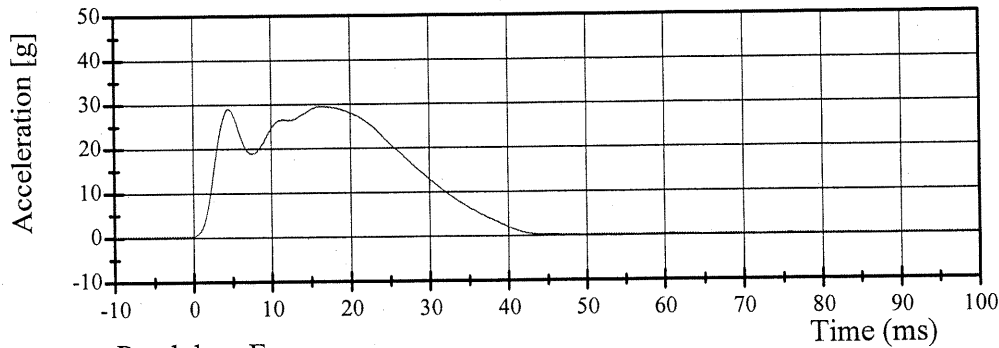
Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/01/2003

Pendulum Deceleration

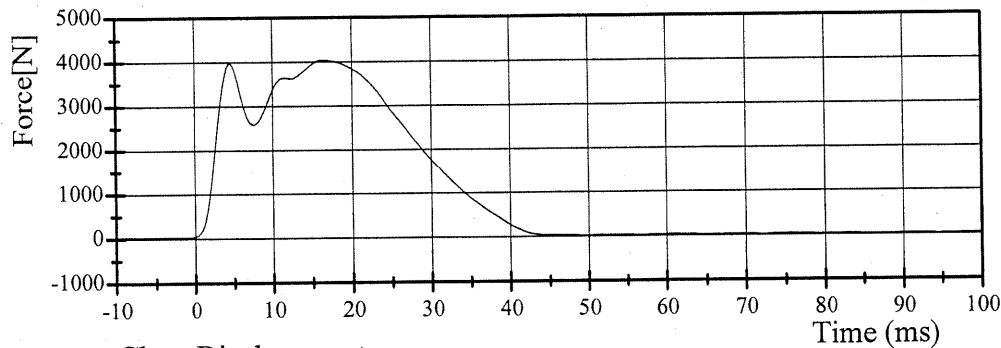


Filter Class: 180

Max: 29.5 g at 16.4 ms

Min: -0.0 g at -71.0 ms

Pendulum Force

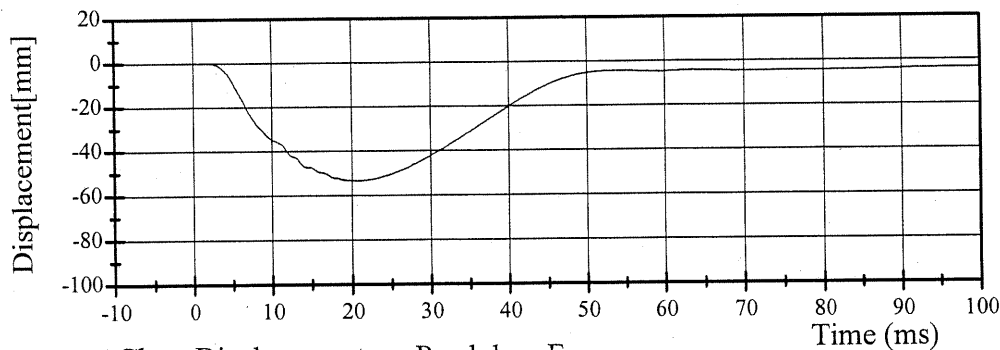


Filter Class: 180

Max: 4039.5 N at 16.4 ms

Min: -4.0 N at -71.0 ms

Chest Displacement

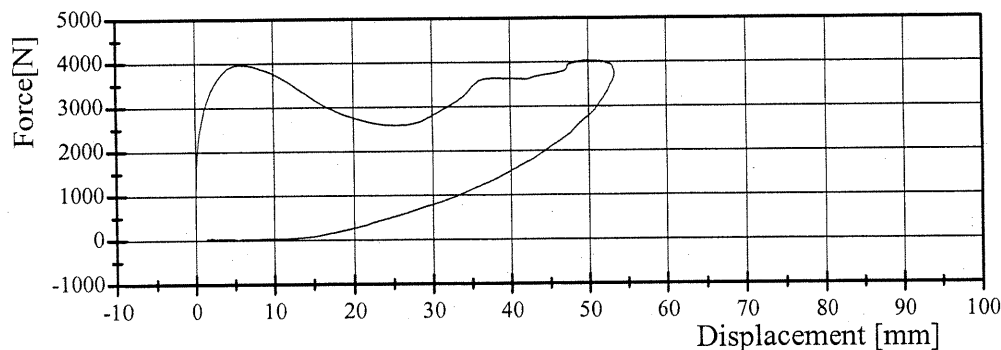


Filter Class: 600

Max: 0.0 mm at -60.6 ms

Min: -53.4 mm at 20.7 ms

Chest Displacement vs. Pendulum Force



08.01.2003 11:01:37 962



Transportation Research Center Inc.

5720 Left Knee Slider Test

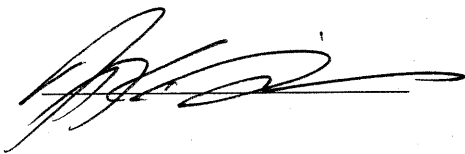
HIII 5th Female Serial No. 416 Calibration No. 21 - 2

Test Date 08/04/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	61 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.74 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-14.7 mm	Yes

Comments:

Technician



Approved



08.04.2003 09:56:25 1121

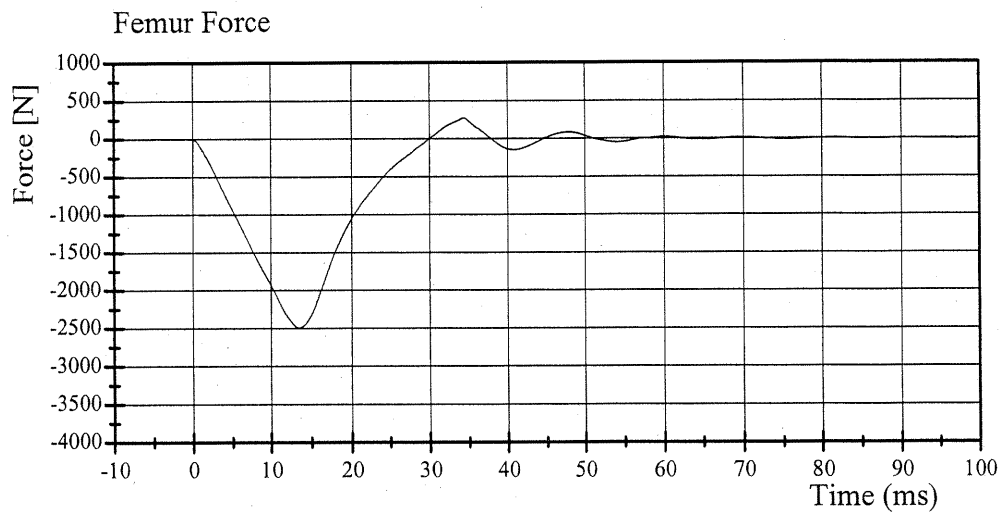


Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 2

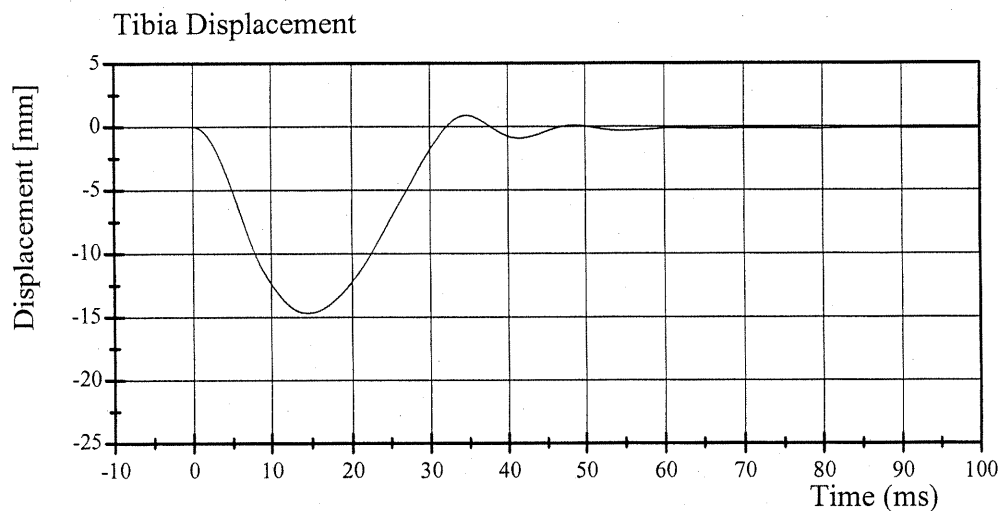
Test Date 08/04/2003



Filter Class: 600

Max: 275.3 N at 34.3 ms

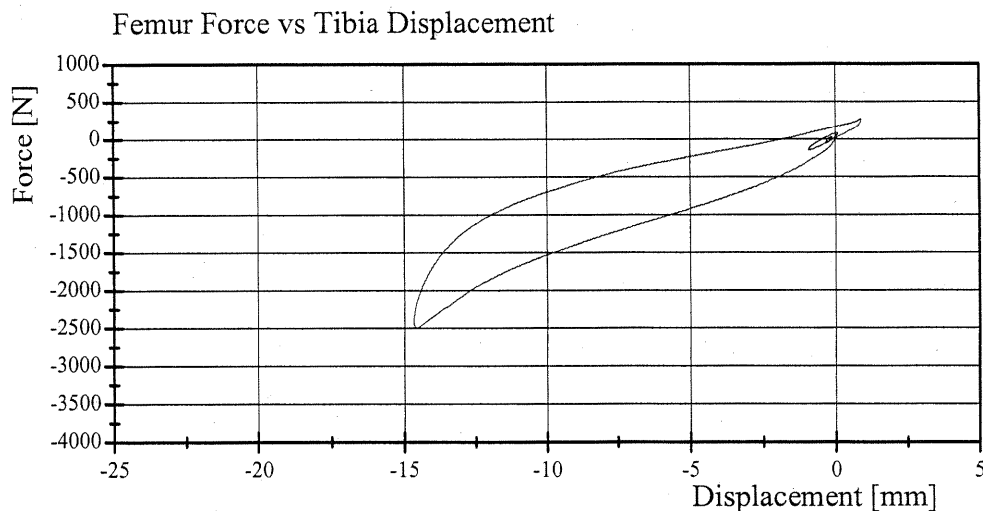
Min: -2494.6 N at 13.4 ms



Filter Class: 180

Max: 0.9 mm at 34.6 ms

Min: -14.7 mm at 14.5 ms



08.04.2003 09:56:27 1121



Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/02/2003

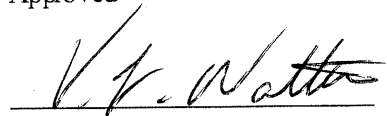
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.75 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-13.3 mm	Yes

Comments:

Technician



Approved



08.02.2003 15:55:24 1115

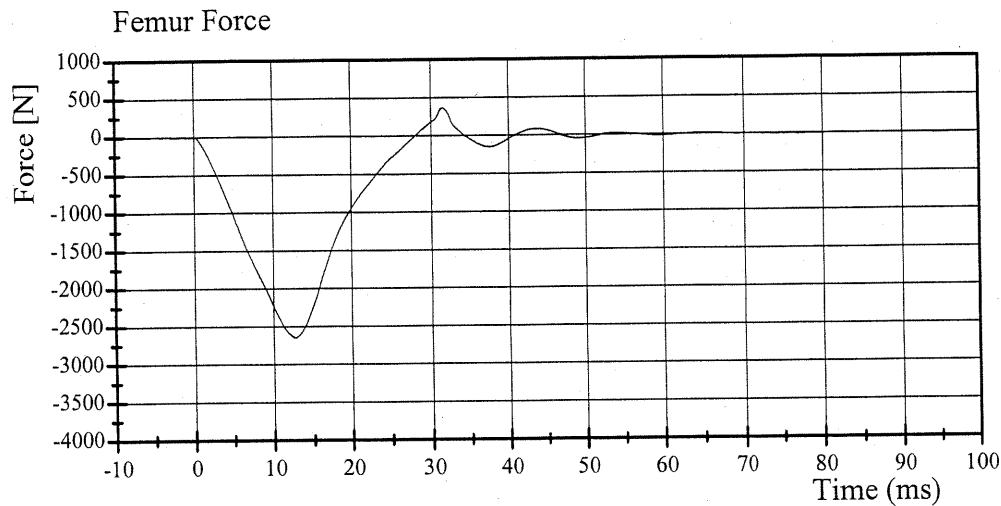


Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

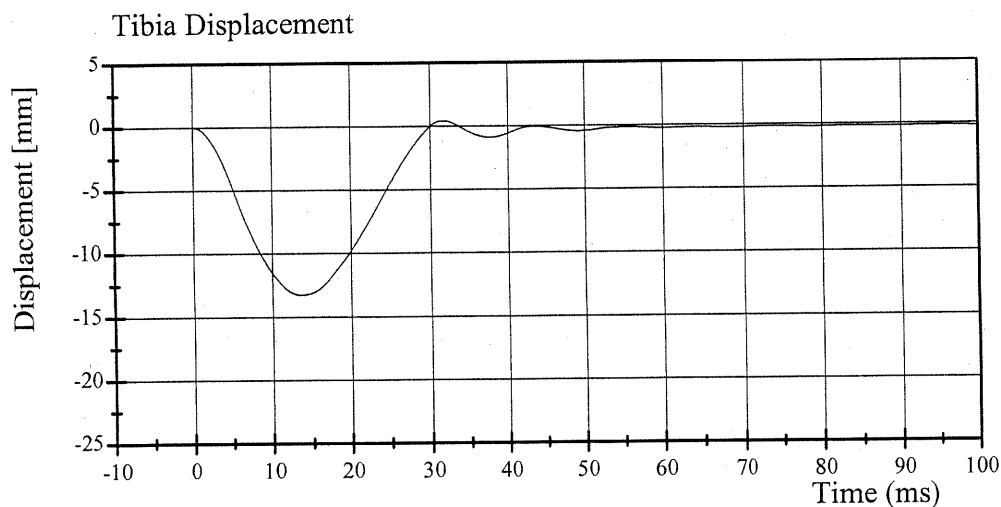
Test Date 08/02/2003



Filter Class: 600

Max: 363.0 N at 31.4 ms

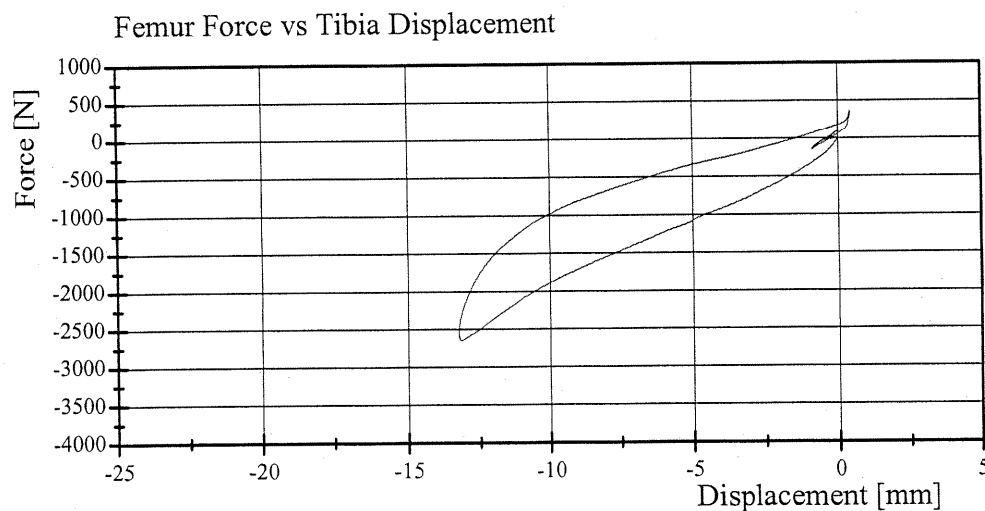
Min: -2647.2 N at 12.7 ms



Filter Class: 180

Max: 0.4 mm at 31.6 ms

Min: -13.3 mm at 13.7 ms



08.02.2003 15:55:25 1115



Transportation Research Center Inc.

5720 Left Knee Test

HHH 5th Female Serial No. 416 Calibration No. 21 - 2

Test Date 08/04/2003

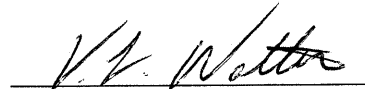
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	64 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3946 N	Yes

Comments:

Technician



Approved



08.04.2003 12:17:04 1685



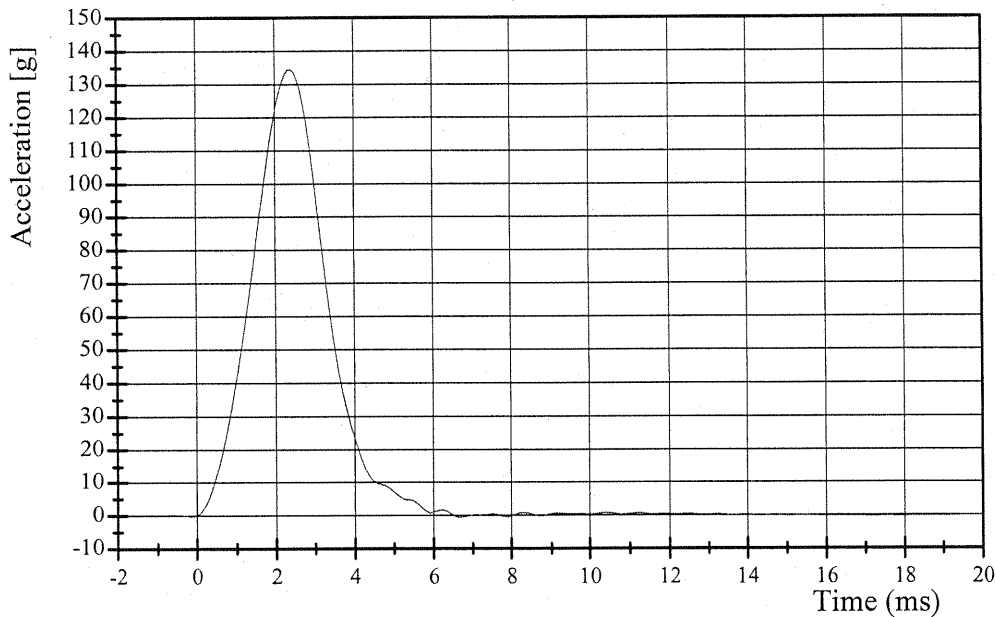
Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 2

Test Date 08/04/2003

Pendulum Deceleration

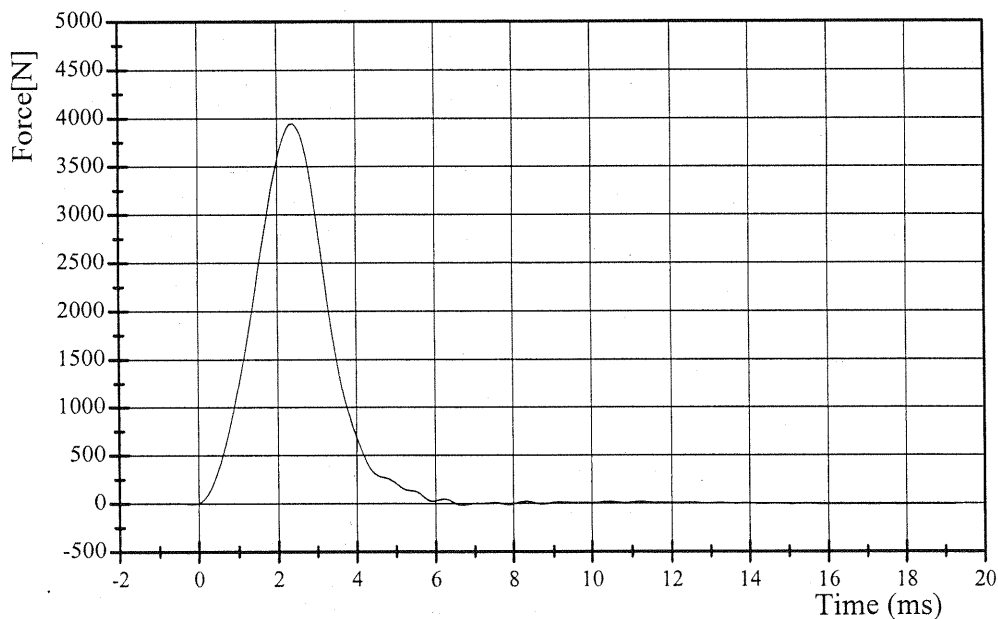


Filter Class: 600

Max: 134.6 g at 2.4 ms

Min: -0.5 g at 6.7 ms

Pendulum Force



Filter Class: 600

Max: 3945.8 N at 2.4 ms

Min: -16.1 N at 6.7 ms

08.04.2003 12:17:05 1685



Transportation Research Center Inc.

5720 Right Knee Test

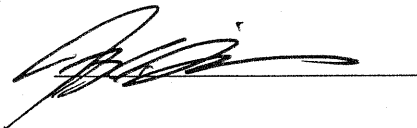
HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003

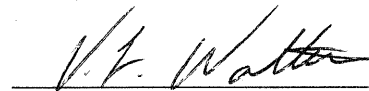
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.11 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3867 N	Yes

Comments:

Technician



Approved



08.04.2003 12:20:37 1685



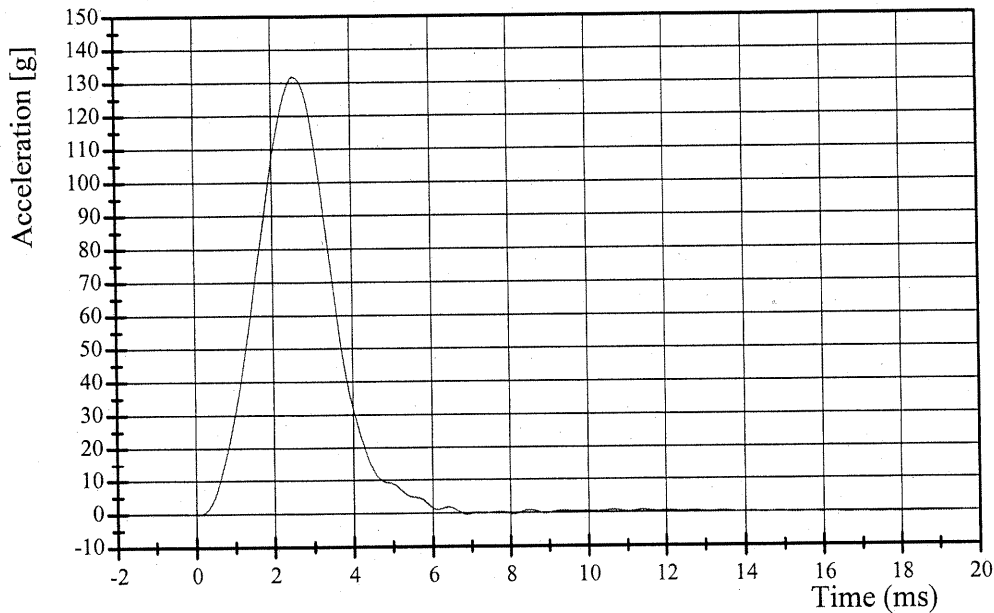
Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 21 - 1

Test Date 08/04/2003

Pendulum Deceleration

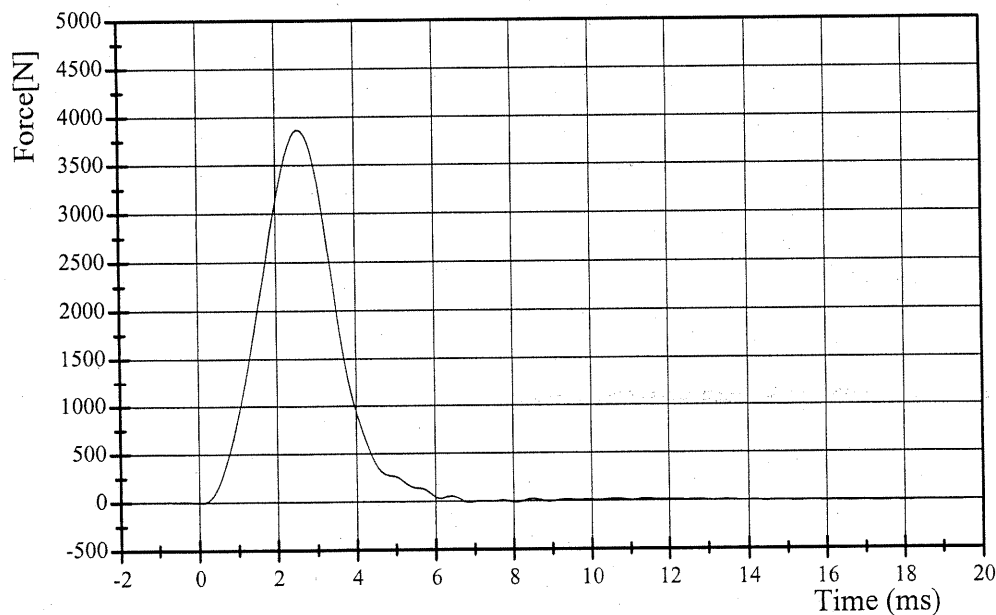


Filter Class: 600

Max: 131.9 g at 2.6 ms

Min: -0.4 g at 6.9 ms

Pendulum Force



Filter Class: 600

Max: 3867.0 N at 2.6 ms

Min: -12.1 N at 6.9 ms

08.04.2003 12:20:37 1685



Post-Test Dummy Configuration and Performance Verification Data

Bullet Vehicle Passenger Dummy S/N: 416

Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/23/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	20 %	Yes
Peak Resultant Acceleration	250 - 300 g	271.6 g	Yes
Peak Lateral Acceleration	15 g Max	-13.9 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Comments:

Technician

V. J. Walker

Approved

Paul K. Turner

01.23.2004 08:40:15 608

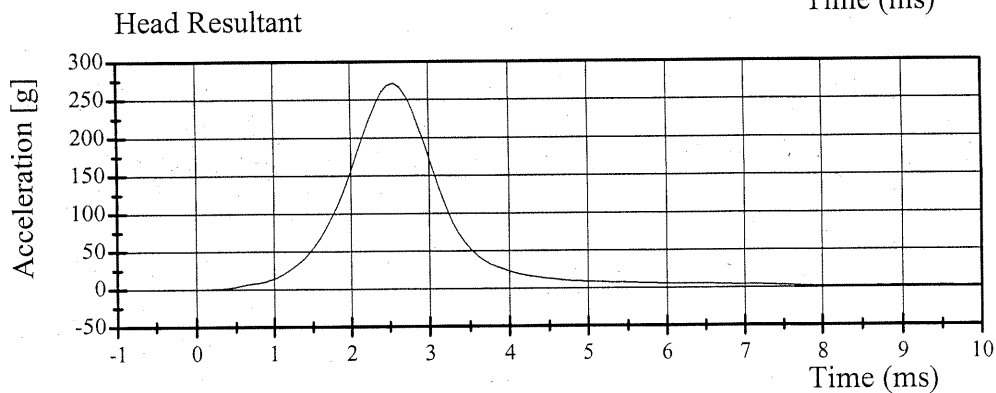
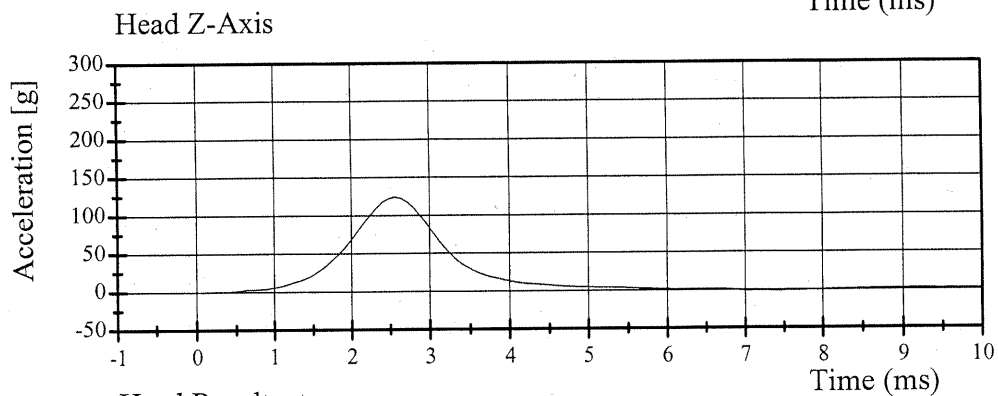
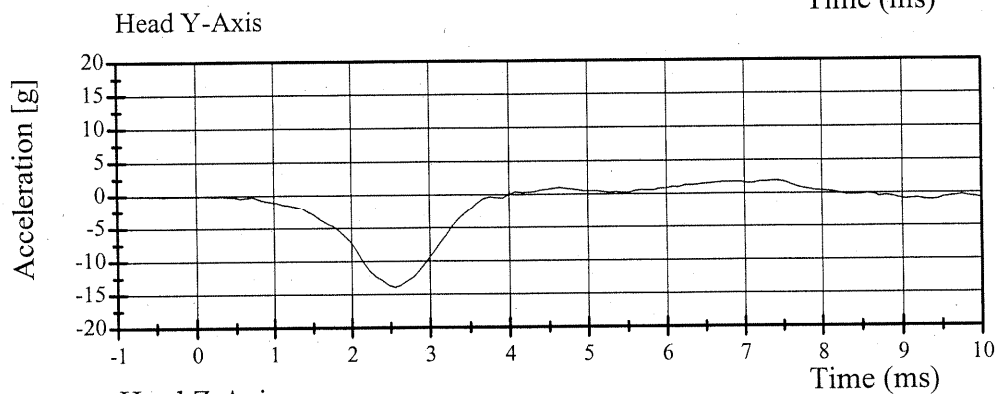
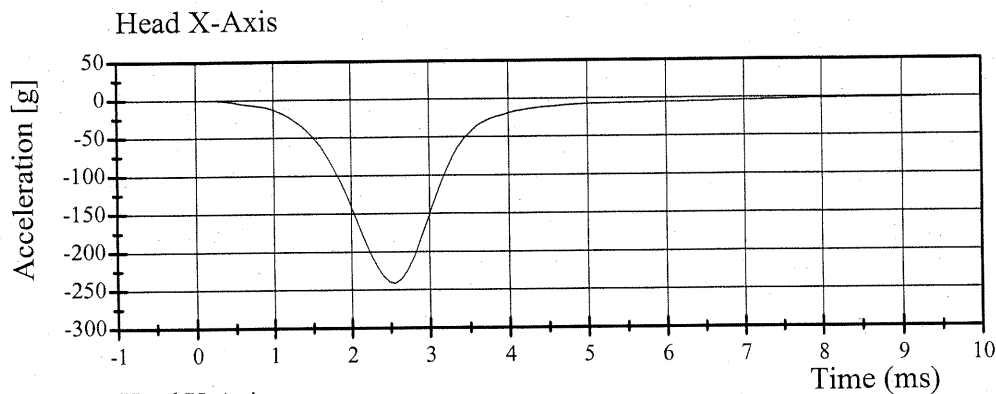


Transportation Research Center Inc.

5720 Head Drop Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/23/2004



01.23.2004 08:40:16 608



Transportation Research Center Inc.

5720 Neck Flexion Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/23/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	23 %	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	2.43 m/s	Yes
20 ms	4.00 - 5.00 m/s	4.71 m/s	Yes
30 ms	5.80 - 7.00 m/s	6.76 m/s	Yes
Peak D Plane Rotation	77 - 91 °	80.7 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	69.0 - 83.0 N·m	78.99 N·m	Yes
Positive Moment Decay Time To 10 N·m	80 - 100 ms	87.60 ms	Yes

Comments:

POST-TEST CALIBRATION

Technician

K. J. Watters

Approved

David K. Johnson

01.23.2004 17:29:17 509



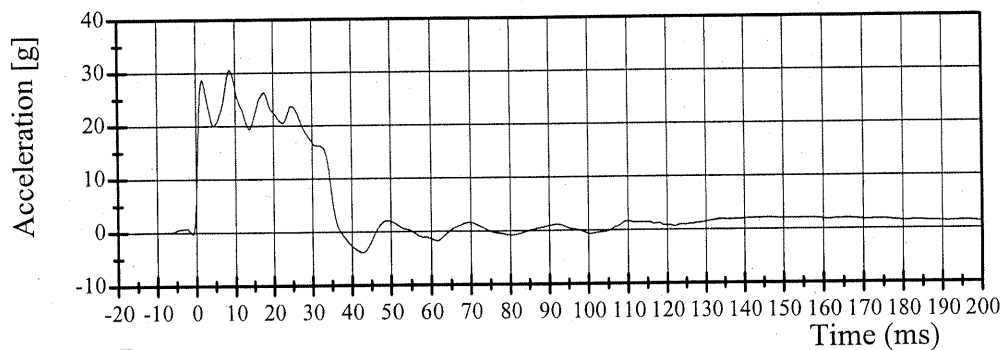
Transportation Research Center Inc.

5720 Neck Flexion Test

HHH 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/23/2004

Pendulum Deceleration

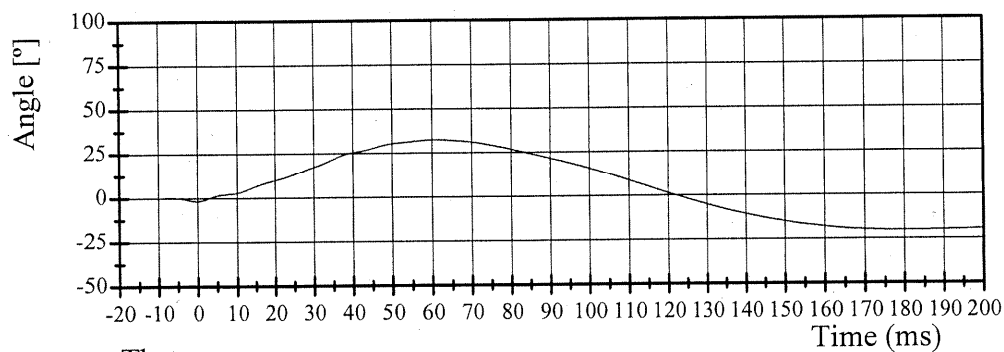


Filter Class: 180

Max: 30.6 g at 8.6 ms

Min: -3.9 g at 42.7 ms

Beta

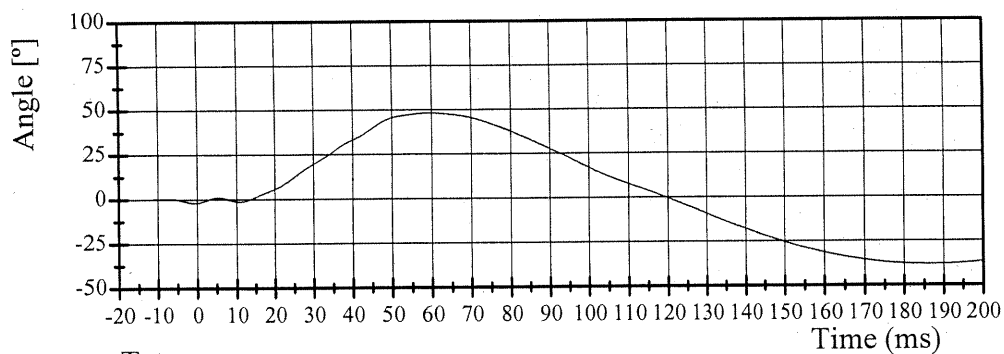


Filter Class: 60

Max: 32.6 ° at 61.0 ms

Min: -20.4 ° at 180.2 ms

Theta

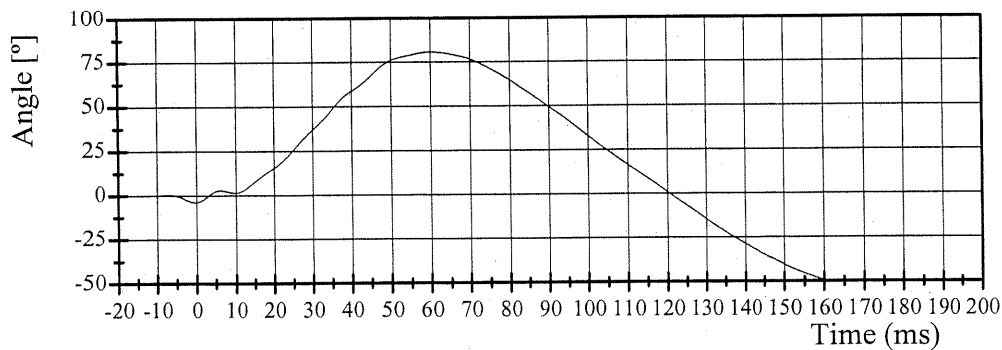


Filter Class: 60

Max: 48.2 ° at 59.4 ms

Min: -38.1 ° at 186.6 ms

Totan



Filter Class: 60

Max: 80.7 ° at 60.2 ms

Min: -58.4 ° at 184.4 ms

01.23.2004 17:29:18 509

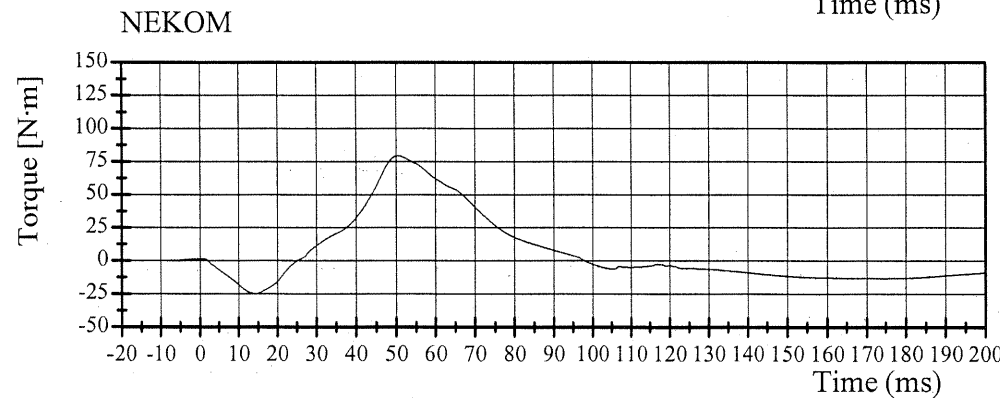
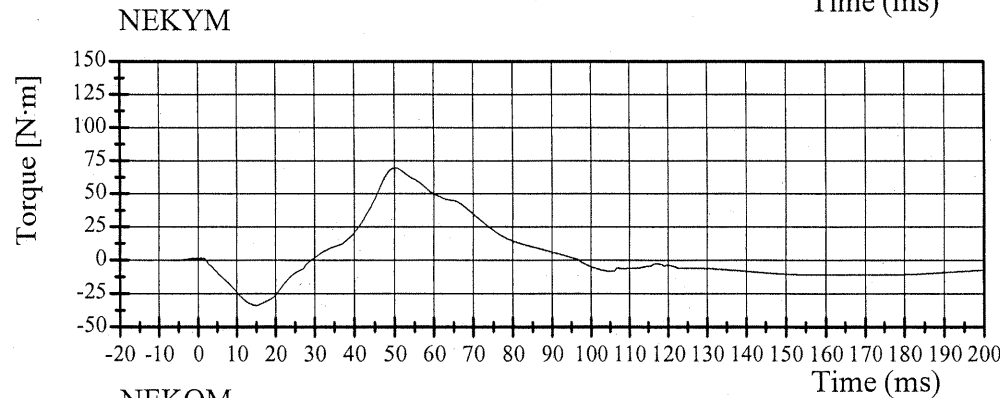
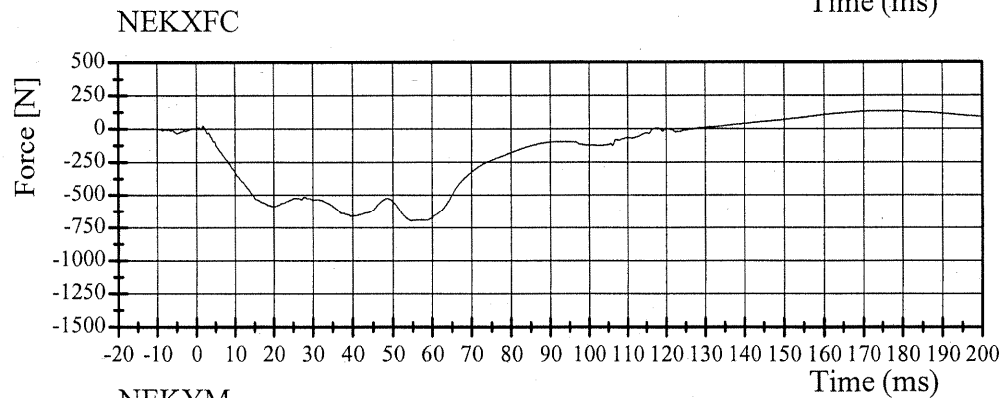
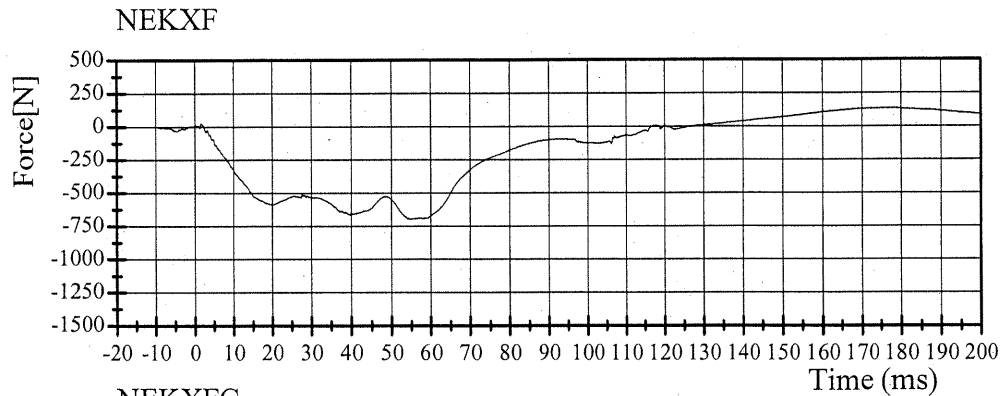


Transportation Research Center Inc.

5720 Neck Flexion Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/23/2004



Transportation Research Center Inc.

5720 Neck Extension Test - 6 Channel Transducer

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/23/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	23 %	Yes
Impact Velocity	5.95 - 6.19 m/s	6.08 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.50 - 1.90 m/s	1.73 m/s	Yes
20 ms	3.10 - 3.90 m/s	3.41 m/s	Yes
30 ms	4.60 - 5.60 m/s	5.03 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	-59.47 N·m	Yes
Negative Moment Decay Time To -10 N·m	94 - 114 ms	102.08 ms	Yes

Comments:

POST-TEST CALIBRATION

Technician

V. J. Walter

Approved

David A. Stuenkel

01.23.2004 17:57:12 597



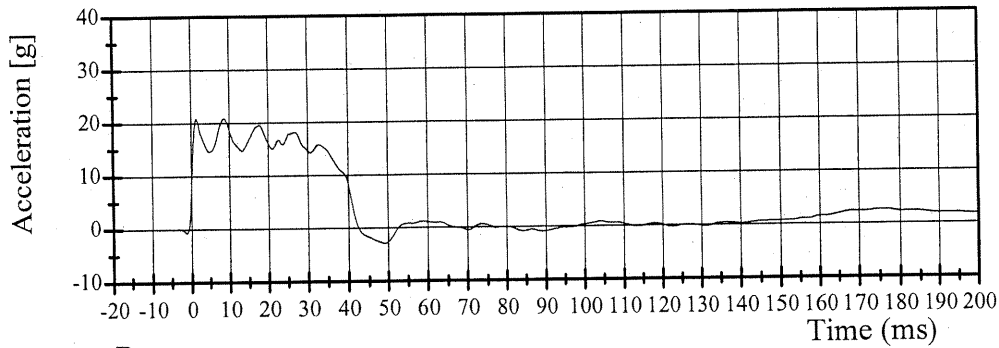
Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/23/2004

Pendulum Deceleration

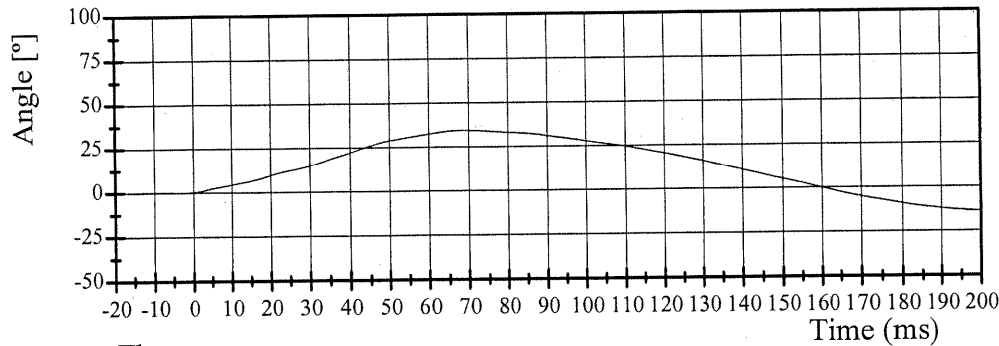


Filter Class: 180

Max: 20.9 g at 8.6 ms

Min: -2.9 g at 49.0 ms

Beta

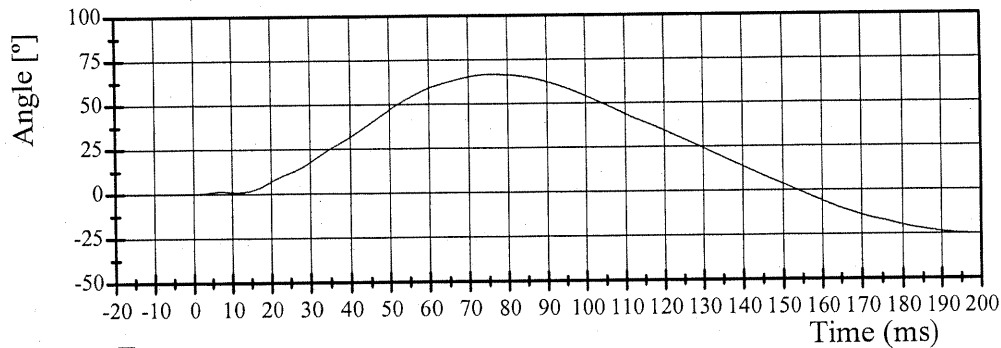


Filter Class: 60

Max: 34.5 ° at 68.7 ms

Min: -14.2 ° at 206.6 ms

Theta

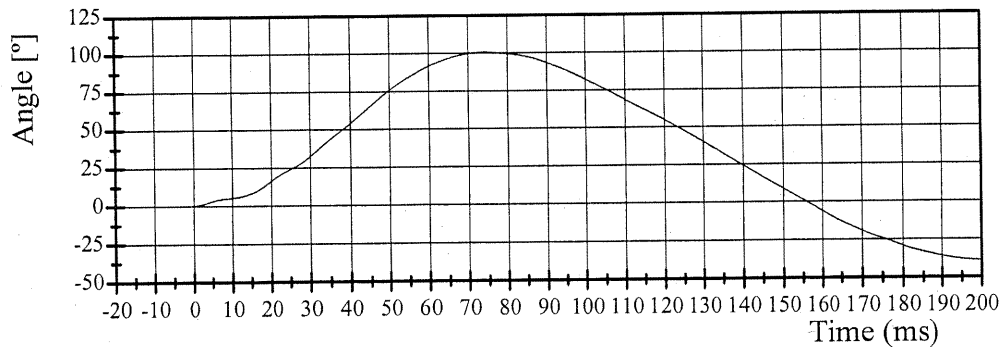


Filter Class: 60

Max: 66.7 ° at 75.5 ms

Min: -25.0 ° at 201.5 ms

Totan



Filter Class: 60

Max: 100.7 ° at 74.1 ms

Min: -39.1 ° at 204.2 ms

01.23.2004 17:57:13 597

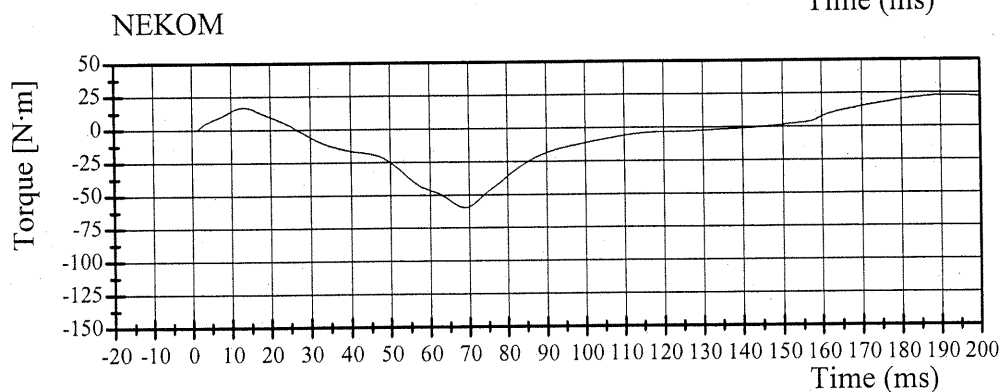
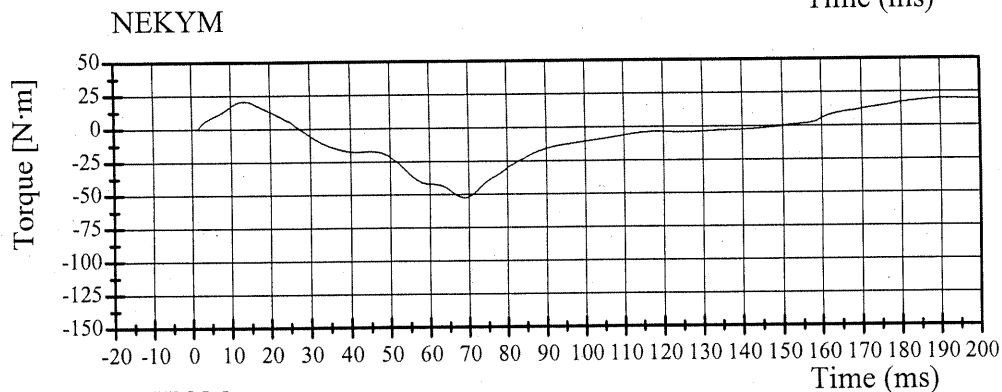
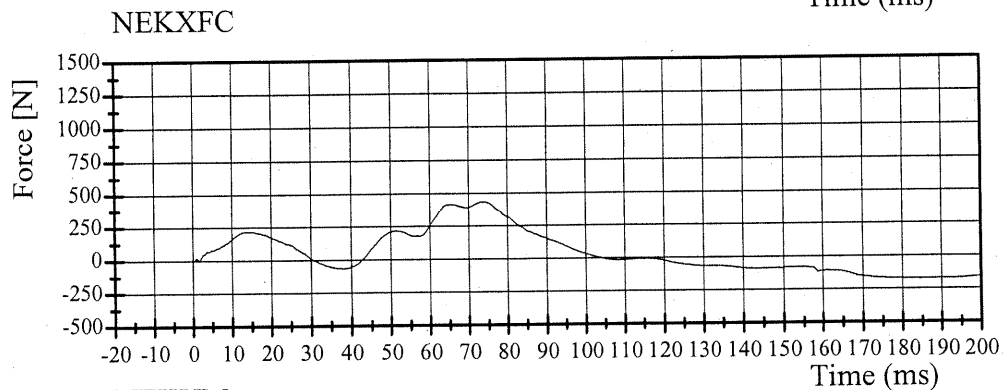
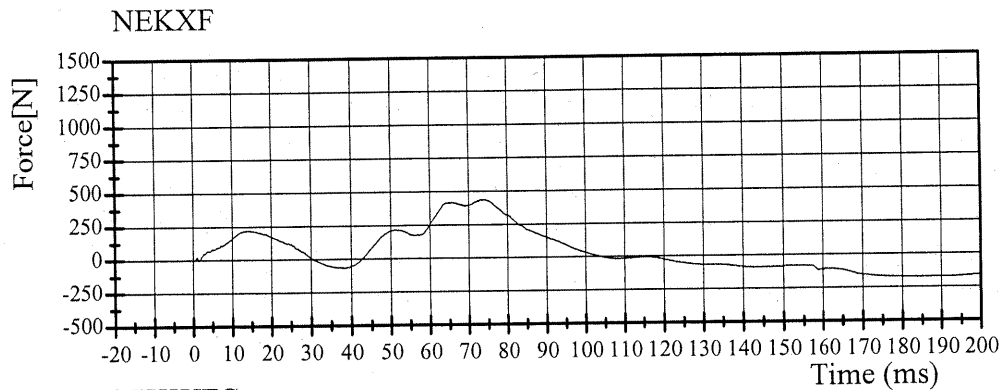


Transportation Research Center Inc.

5720 Neck Extension Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/23/2004



01.23.2004 17:57:14 597



Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/21/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	24 %	Yes
Pendulum Velocity	6.59 - 6.83 m/s	6.60 m/s	Yes
Maximum Chest Deflection	-58.0 - (-50.0) mm	-50.7 mm	Yes
Peak Impact Probe Force Within Compression Corridor	3900 - 4400 N	4181 N	Yes
Peak Force Between 18 mm and 50 mm	4600 N	4273 N	Yes
Internal Hysteresis	69 - 85 %	74 %	Yes

Comments:

Technician

V. J. Nether

Approved

David K. Turner

01.21.2004 10:20:52 952



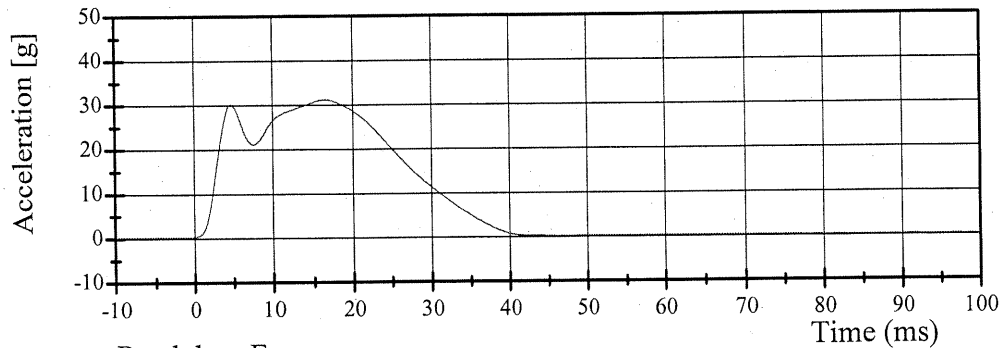
Transportation Research Center Inc.

5720 Thorax Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/21/2004

Pendulum Deceleration

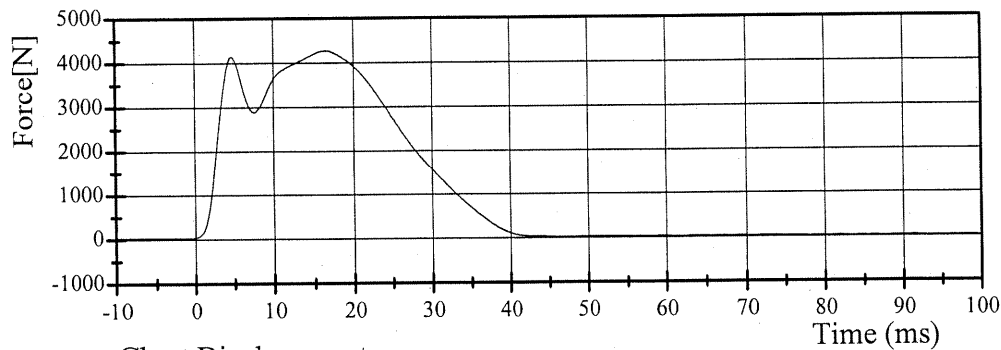


Filter Class: 180

Max: 31.2 g at 16.5 ms

Min: -0.1 g at -76.1 ms

Pendulum Force

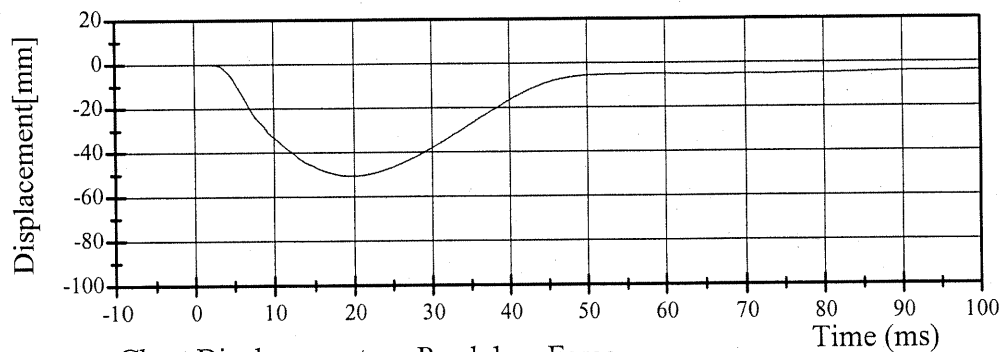


Filter Class: 180

Max: 4272.9 N at 16.5 ms

Min: -8.7 N at -76.1 ms

Chest Displacement

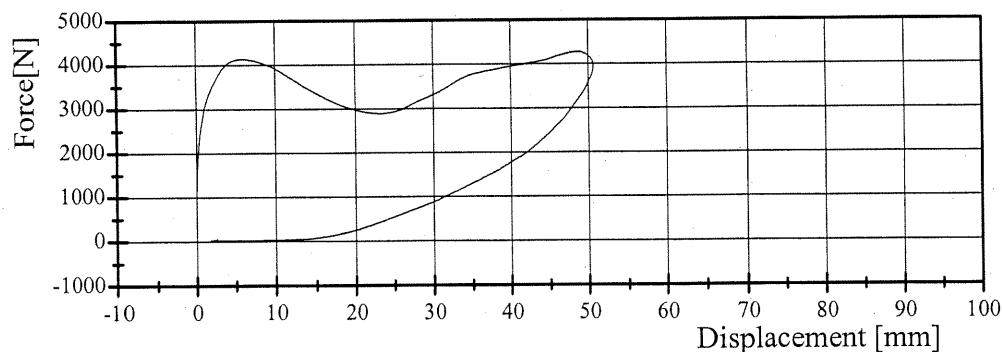


Filter Class: 600

Max: 0.0 mm at -64.4 ms

Min: -50.7 mm at 19.9 ms

Chest Displacement vs. Pendulum Force



01.21.2004 10:20:53 952



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 22-Jan-04

TRC, INC. TEST NO: 416C22TF1 572 O SN416 TORSO FLEX CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2° C	21.1 ° C
RELATIVE HUMIDITY	10 – 70 %	24 %
INITIAL ANGLE OF UNSUPPORTED DUMMY	<= 20° REFERENCED TO VERTICAL	18.9 °
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	385.4 N
RETURN ANGLE		21.8 °
DIFFERENCE BETWEEN RETURN ANGLE & INITIAL ANGLE	+/- 8 ° OF INITIAL ANGLE	2.9 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN V. J. Walter

Transportation Research Center Inc.

5720 Left Knee Slider Test

HIIL 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/26/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Velocity	2.70 - 2.80 m/s	2.73 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-13.8 mm	Yes

Comments:

Technician

V. J. Wath

Approved

David C. [Signature]

01.26.2004 13:03:57 1173



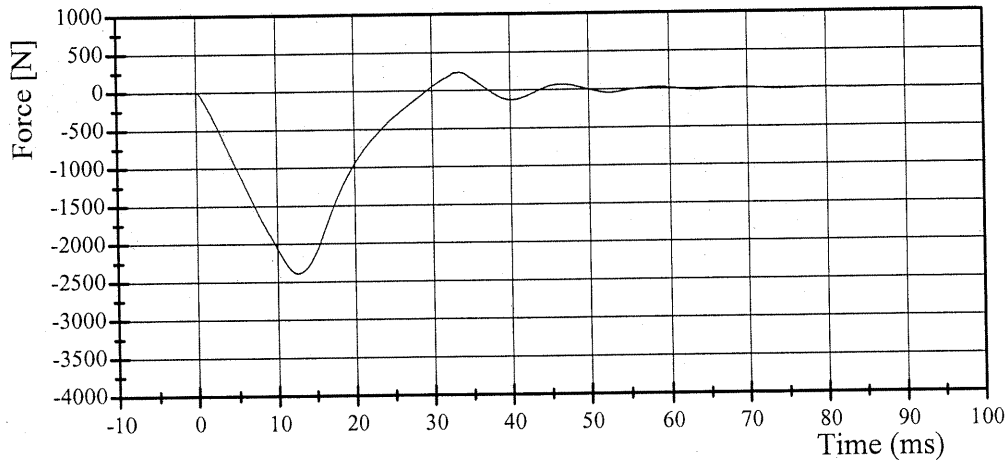
Transportation Research Center Inc.

5720 Left Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/26/2004

Femur Force

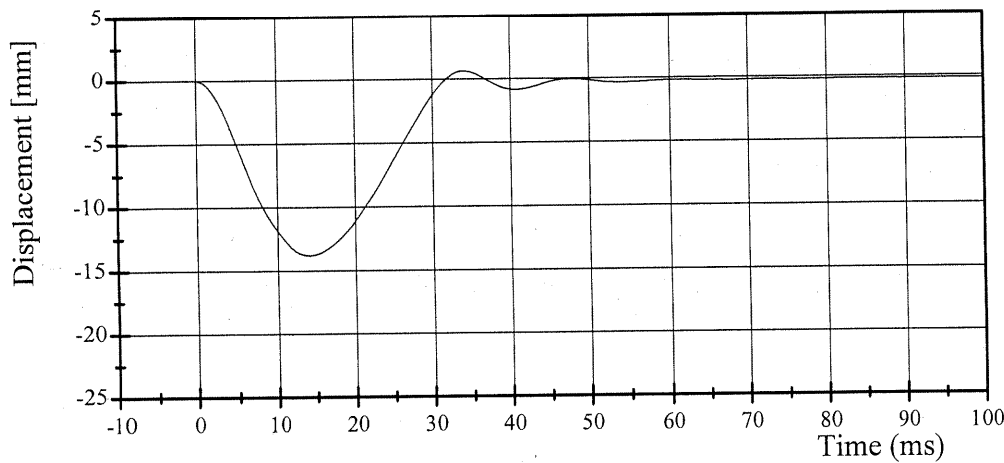


Filter Class: 600

Max: 240.1 N at 33.4 ms

Min: -2389.5 N at 12.6 ms

Tibia Displacement

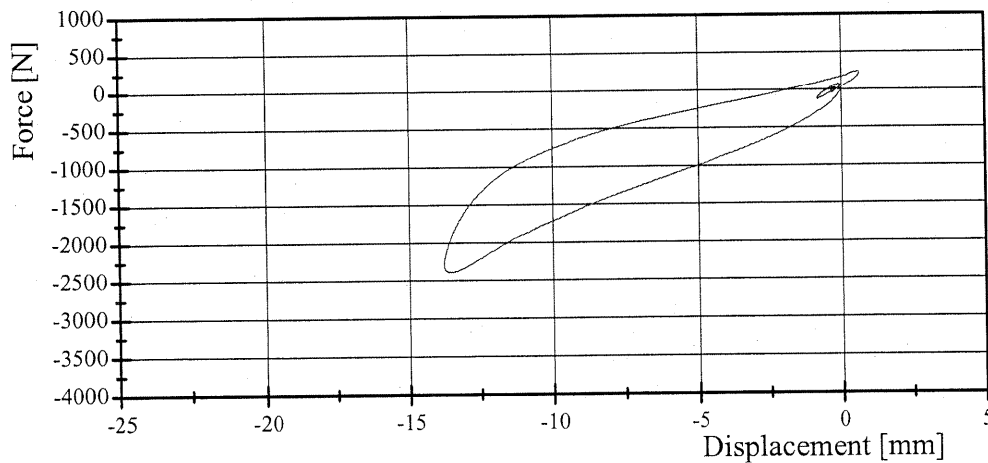


Filter Class: 180

Max: 0.6 mm at 34.0 ms

Min: -13.8 mm at 14.2 ms

Femur Force vs Tibia Displacement



01.26.2004 13:03:58 1173



Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 3

Test Date 01/26/2004

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	2.80 m/s	Yes
Knee Displacement	-15.5 - (-12.7) mm	-12.9 mm	Yes

Comments:

Technician

V. J. Walter

Approved

Paul K. Hume

01.26.2004 15:21:47 1143

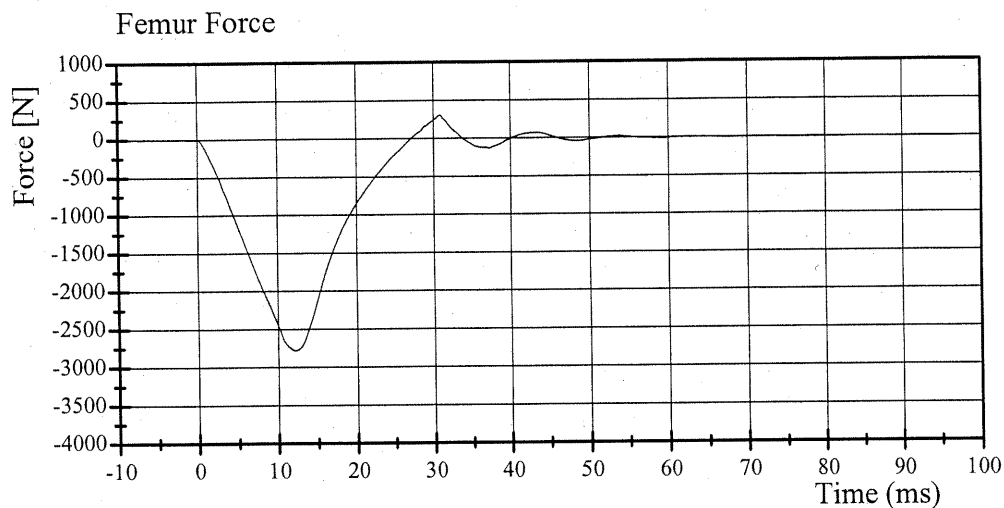


Transportation Research Center Inc.

5720 Right Knee Slider Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 3

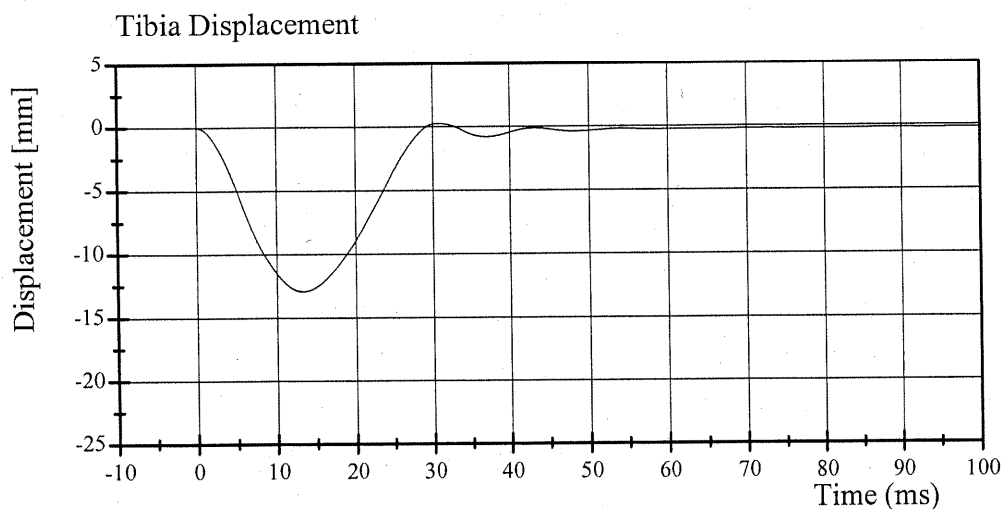
Test Date 01/26/2004



Filter Class: 600

Max: 306.6 N at 30.9 ms

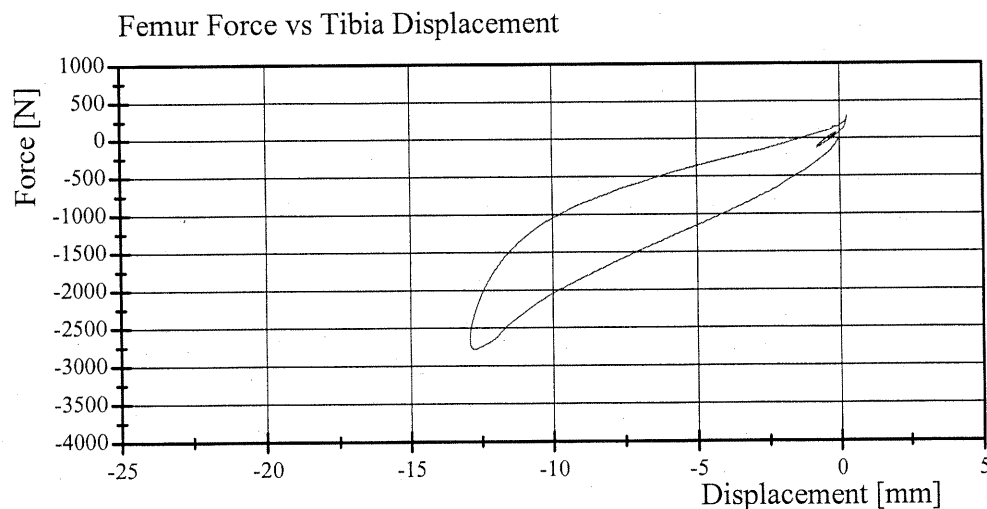
Min: -2779.0 N at 12.2 ms



Filter Class: 180

Max: 0.3 mm at 30.6 ms

Min: -12.9 mm at 13.3 ms



01.26.2004 15:21:48 1143



Transportation Research Center Inc.

5720 Left Knee Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/26/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3870 N	Yes

Comments:

Technician

V. F. Walter

Approved

David K. Steiner

01.26.2004 16:51:14 1736



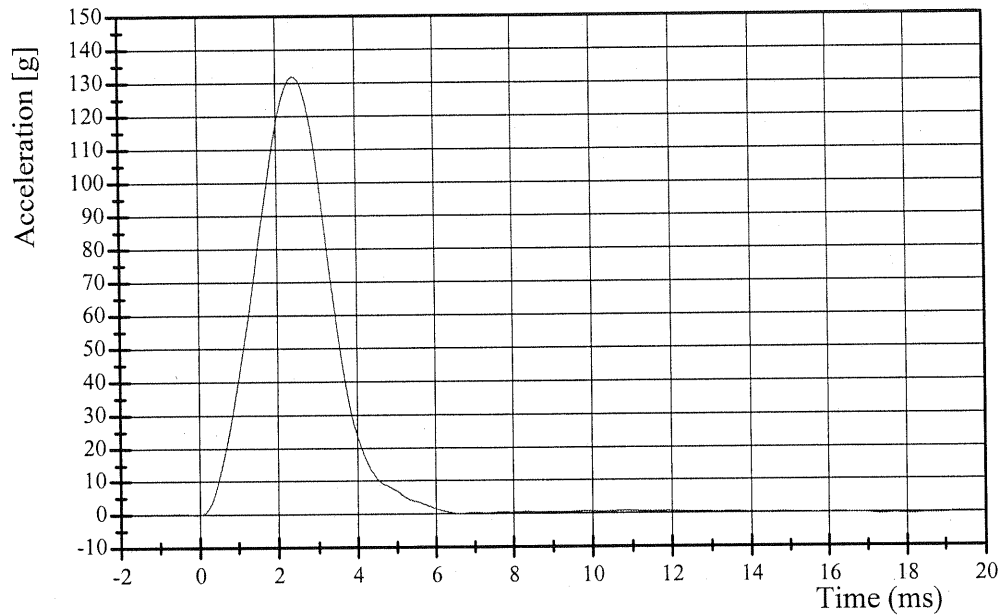
Transportation Research Center Inc.

5720 Left Knee Test

IIII 5th Female Serial No. 416 Calibration No. 22 - 1

Test Date 01/26/2004

Pendulum Deceleration

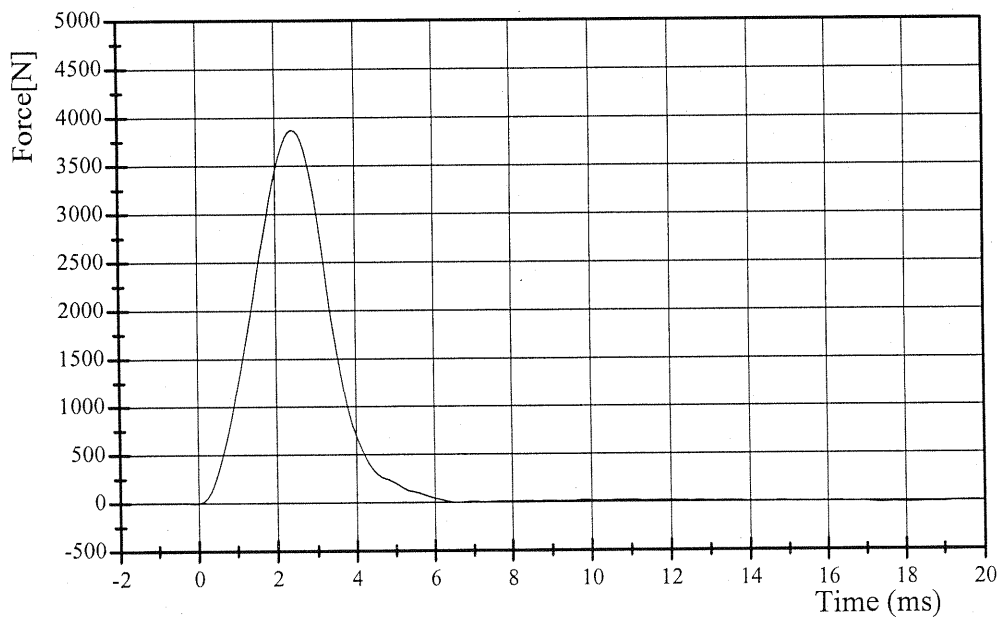


Filter Class: 600

Max: 132.0 g at 2.4 ms

Min: -0.5 g at 18.1 ms

Pendulum Force



Filter Class: 600

Max: 3870.3 N at 2.4 ms

Min: -14.7 N at 18.1 ms

01.26.2004 16:51:15 1736



Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/26/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.12 m/s	Yes
Maximum Pendulum Force	3450 - 4060 N	3953 N	Yes

Comments:

Technician

V. F. Walter

Approved

David K. Hume

01.26.2004 17:09:40 1734

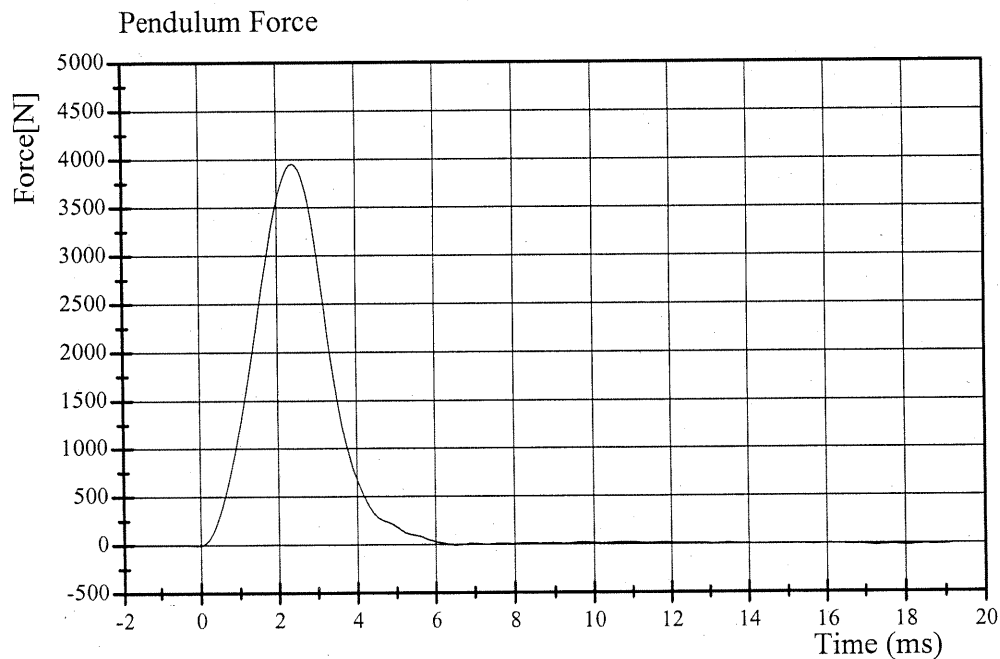
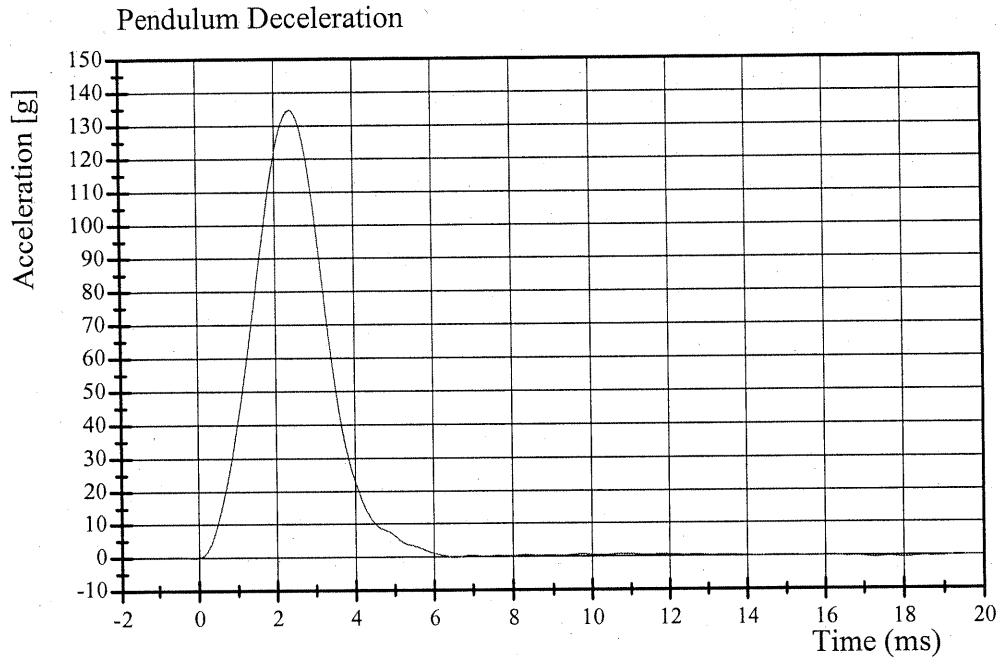


Transportation Research Center Inc.

5720 Right Knee Test

HIII 5th Female Serial No. 416 Calibration No. 22 - 2

Test Date 01/26/2004



01.26.2004 17:09:41 1734



Appendix D

Test Equipment and Instrumentation Calibration Information

Sign Convention
SAE J211 MAR95

Accelerometers:

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

Potentiometers:

+Chest longitudinal deflection: Outward
+Chest lateral deflection: Rightward
+Seat belt displacement: Outward
+Seat belt extension: Elongation
+Knee slider displacement: Distance between femur and tibia
increased (in relation to a seated
dummy)

Rotation potentiometers:

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

Load cells:

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

Neck load cells:

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

Tibia load cells:

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

Frequency Response Classes
SAE J211 MAR95

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

Description Of Timing Marks On TRC 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.

Appendix E

INSIA Report on Structural Measurements

Channel Report

1/9/2004 9:47:45 AM

Name of Test 040109

System MINIDAU

Name of DAU DAU9

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
9001	J20083	HEDXGA	Head Accel X	Rwd	1179.1801 g	-	10/10/2003	OK	169v-	Endevco 7264-2000T
9002	J19843	HEDYGA	Head Accel Y	Lft	1208.9442 g	-	10/10/2003	OK	169v-	Endevco 7264-2000T
9003	J20027	HEDZGA	Head Accel Z	Up	1168.7096 g	-	10/10/2003	OK	169v-	Endevco 7264-2KM5T
9004	1716A-782-FX	NEKXFA	Neck Force X	Hd	13333.334 N	-	10/10/2003	OK	169v-	Denton 1716A
9005	1716A-782-FY	NEKYFA	Neck Force Y	Hd	13322.897 N	+	10/10/2003	OK	169v-	Denton 1716A
9006	1716A-782-FZ	NEKZFA	Neck Force Z	Hd	19987.982 N	+	10/10/2003	OK	169v-	Denton 1716A
9007	1716A-782-MX	NEKXMA	Neck Moment X	Rt Ear	424.51877 N-m	-	10/10/2003	OK	169v-	Denton 1716A
9008	1716A-782-MY	NEKYMA	Neck Moment Y	Chn	424.83571 N-m	+	10/10/2003	OK	169v-	Denton 1716A
9009	1716A-782-MZ	NEKZMA	Neck Moment Z	Chn	424.68193 N-m	+	10/10/2003	OK	169v-	Denton 1716A
9010	J23757	CSTXGA	Chest Accel X	Fwd	592.82588 g	+	10/10/2003	OK	169v-	Endevco 7264-2000T
9011	J21989	CSTYGA	Chest Accel Y	Lft	596.20154 g	-	10/10/2003	OK	169v-	Endevco 7264-2KM5T
9012	J35747	CSTZGA	Chest Accel Z	Up	604.55779 g	-	10/10/2003	OK	169v-	Endevco 7264-2000TZ
9013	14CB1-2847-169	CSTXDA	Chest Deflection X	Strnm	99.901464 mm	+	10/14/2003	OK	169v-	Servo 14CB1-2847
9014	J36741	PEVXGA	Pelvis Accel X	Rwd	600.34003 g	-	10/10/2003	OK	169v-	Endevco 7264-2000TZ
9015	J36605	PEVYGA	Pelvis Accel Y	Lft	599.70014 g	-	10/10/2003	OK	169v-	Endevco 7264-2000TZ
9016	AAMD7	PEVZGA	Pelvis Accel Z	Up	600.37523 g	-	10/10/2003	OK	169v-	Endevco 7264-2000LC
9017	1914A-0261-FX	LFMXFA	Left Femur Force X	Knee	19982.663 N	-	10/10/2003	OK	169v-	Denton 1914A
9018	1914A-0261-FY	LFMYFA	Left Femur Force Y	Knee	19985.320 N	+	10/10/2003	OK	169v-	Denton 1914A
9019	1914A-0261-FZ	LFMZFA	Left Femur Force Z	Knee	33365.447 N	+	10/10/2003	OK	169v-	Denton 1914A
9020	1914A-0261-MX	LFMXMA	Left Femur Moment X	Knee	508.82043 N-m	-	10/10/2003	OK	169v-	Denton 1914A
9021	1914A-0261-MY	LFMYMA	Left Femur Moment Y	Knee	508.07092 N-m	+	10/10/2003	OK	169v-	Denton 1914A
9022	1914A-0261-MZ	LFMZMA	Left Femur Moment Z	Tib	510.40871 N-m	+	10/10/2003	OK	169v-	Denton 1914A
9023	150-121VR-1716	KNLXDA	Left Knee Displacement	Tib	24.308374 mm	-	10/14/2003	OK	169v-	Space Age 150-0121VR
9024	1914A-383-FX	RFMXFA	Right Femur Force X	Knee	20023.059 N	-	10/10/2003	OK	169v-	Denton 1914A
9025	1914A-383-FY	RFMYFA	Right Femur Force Y	Knee	19999.515 N	+	10/10/2003	OK	169v-	Denton 1914A
9026	1914A-383-FZ	RFMZFA	Right Femur Force Z	Knee	33381.710 N	+	10/10/2003	OK	169v-	Denton 1914A
9027	1914A-383-MX	RFMXMA	Right Femur Moment X	Knee	509.50624 N-m	-	10/10/2003	OK	169v-	Denton 1914A
9028	1914A-383-MY	RFMYMA	Right Femur Moment Y	Knee	508.23636 N-m	+	10/10/2003	OK	169v-	Denton 1914A
9030	1914A-383-MZ	RFMZMA	Right Femur Moment Z	Tib	510.04285 N-m	+	10/10/2003	OK	169v-	Denton 1914A
9032	150-121VL-2103	KNRXDA	Right Knee Displacement	Tib	25.243187 mm	-	10/14/2003	OK	169v-	Space Age 150-0121VL

D-6

040109

Channel Report

1/9/2004 9:47:46 AM

Name of Test 040109

System MINIDAU

Name of DAU DAUA

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0001	J17649	HEDXG1	Head Accel X	Rwd	1216.7011 g	-	10/15/2003	OK 168v	Endevco	7264-2KM5T
0002	AJ454	HEDYG1	Head Accel Y	Lft	1202.3012 g	-	10/15/2003	OK 168v	Endevco	7264-2000T
0003	J14189	HEDZG1	Head Accel Z	Up	1196.7370 g	-	10/15/2003	OK 168v	Endevco	7264-2000T
0004	P17196	HEDXR1	Head Accel Red X S39	Rwd	1218.4673 g	-	10/15/2003	OK 168v	Endevco	7264C-2KLC-2-
0005	B02A25-N09	HEDYR1	Head Accel Red Y	Lft	1185.9813 g	-	10/15/2003	OK 168v	Entran	EGE-73B6Q-200
0006	01G25-N09	HEDZR1	Head Accel Red Z	Up	1202.1036 g	-	10/15/2003	OK 168v	Entran	EGE-73B6Q-200
0007	1716A-851-FX	NEKXF1	Neck Force X	Hd	13331.504 N	-	10/15/2003	OK 168v	Denton	1716A
0008	1716A-851-FY	NEKYF1	Neck Force Y	Hd	13325.726 N	+	10/15/2003	OK 168v	Denton	1716A
0009	1716A-851-FZ	NEKZF1	Neck Force Z	Hd	19992.455 N	+	10/15/2003	OK 168v	Denton	1716A
0010	1716A-851-MX	NEKXM1	Neck Moment X	Rt Ear	424.39371 N·m	-	10/15/2003	OK 168v	Denton	1716A
0011	1716A-851-MY	NEKYM1	Neck Moment Y	Chn	424.21893 N·m	+	10/15/2003	OK 168v	Denton	1716A
0012	1716A-851-MZ	NEKZM1	Neck Moment Z	Chn	424.44852 N·m	+	10/15/2003	OK 168v	Denton	1716A
D-7 0013	J35921	CSTXG1	Chest Accel X	Fwd	603.88752 g	+	10/14/2003	OK 168v	Endevco	7264-2000TZ
0014	AJ7F7	CSTYG1	Chest Accel Y	Lft	603.68815 g	-	10/13/2003	OK 168v	Endevco	7264-2000T
0015	J36723	CSTZG1	Chest Accel Z	Up	599.71419 g	-	10/14/2003	OK 168v	Endevco	7264-2000TZ
0016	99H30-Z14	CSTXR1	Chest Accel Red X	Rwd	595.23809 g	-	10/14/2003	OK 168v	Entran	EGE-73BQE0-20
0017	98H14-K05	CSTYR1	Chest Accel Red Y	Lft	606.08930 g	-	10/13/2003	OK 168v	Entran	EGE-73BQ-2000
0018	98H13-F03	CSTZR1	Chest Accel Red Z	Up	607.08822 g	-	10/14/2003	OK 168v	Entran	EGE-73BQ-2000
0019	14CB1-2847-168	CSTXD1	Chest Deflection X	Strnm	100.27124 mm	+	11/25/2003	OK 168v	Servo	14CB1-2847
0020	ACCY2	PEVXG1	Pelvis Accel X	Rwd	604.42933 g	-	10/15/2003	OK 168v	Endevco	7264-2000T
0021	J27490	PEVYG1	Pelvis Accel Y	Lft	596.73659 g	-	10/15/2003	OK 168v	Endevco	7264-2KM5T
0022	J21963	PEVZG1	Pelvis Accel Z	Up	598.28460 g	-	10/15/2003	OK 168v	Endevco	7264-2KM5T
0023	1914A-362-FX	LFMXF1	Left Femur Force X	Knee	20016.732 N	-	10/17/2003	OK 168v	Denton	1914A
0024	1914A-362-FY	LFMYF1	Left Femur Force Y	Knee	20046.121 N	+	10/17/2003	OK 168v	Denton	1914A
0025	1914A-362-FZ	LFMZF1	Left Femur Force Z	Knee	33320.317 N	+	10/17/2003	OK 168v	Denton	1914A
0026	1914A-362-MX	LFMXM1	Left Femur Moment X	Knee	508.44495 N·m	-	10/17/2003	OK 168v	Denton	1914A
0027	1914A-362-MY	LFMYM1	Left Femur Moment Y	Knee	509.79508 N·m	+	10/17/2003	OK 168v	Denton	1914A
0028	1914A-362-MZ	LFMZM1	Left Femur Moment Z	Tib	509.60607 N·m	+	10/17/2003	OK 168v	Denton	1914A
0029	150-121VR-1802	KNLXD1	Left Knee Displacement	Tib	24.780628 mm	-	10/27/2003	OK 168v	Space Age	150-0121VR
0030	3115-268-FZ	TBLZF1	Left Upper Tibia Force Z	Tib	16675.832 N	+	10/23/2003	OK 168v	Denton	3115
0031	3115-268-MX	TBLXM1	Left Upper Tibia Moment X	Tib	591.94534 N·m	-	10/23/2003	OK 168v	Denton	3115
0032	3115-268-MY	TBLYM1	Left Upper Tibia Moment Y	Tib	594.80725 N·m	+	10/23/2003	OK 168v	Denton	3115

040109

Channel Report

1/9/2004 9:47:46 AM

Name of Test 040109

System MINIDAU

Name of DAU DAUB

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0001	3287-196-FZ	ANLZF1	Left Lower Tibia Force Z	Ank	16684.711	N	+ 10/23/2003	OK 168v	Denton	3287
0003	3287-196-MX	ANLXM1	Left Lower Tibia Moment X	Ank	593.72516	N·m	- 10/23/2003	OK 168v	Denton	3287
0004	3287-196-MY	ANLYM1	Left Lower Tibia Moment Y	Ank	592.04605	N·m	+ 10/23/2003	OK 168v	Denton	3287
0005	1914A-376-FX	RFMXF1	Right Femur Force X	Knee	20058.137	N	- 10/17/2003	OK 168v	Denton	1914A
0006	1914A-376-FY	RFMYF1	Right Femur Force Y	Knee	20011.725	N	+ 10/17/2003	OK 168v	Denton	1914A
0007	1914A-376-FZ	RFMZ1	Right Femur Force Z	Knee	33408.371	N	+ 10/17/2003	OK 168v	Denton	1914A
0008	1914A-376-MX	RFMXM1	Right Femur Moment X	Knee	508.24902	N·m	- 10/17/2003	OK 168v	Denton	1914A
0009	1914A-376-MY	RFMYM1	Right Femur Moment Y	Knee	509.63975	N·m	+ 10/17/2003	OK 168v	Denton	1914A
0010	1914A-376-MZ	RFMZM1	Right Femur Moment Z	Tib	508.09402	N·m	+ 10/17/2003	OK 168v	Denton	1914A
0011	150-121VL-2310	KNRDX1	Right Knee Displacement	Tib	25.519104	mm	- 10/27/2003	OK 168v	Space Age	150-0121VL
0012	3115-274-FZ	TBRZF1	Right Upper Tibia Force Z	Tib	16662.392	N	+ 10/24/2003	OK 168v	Denton	3115
0013	3115-274-MX	TBRXM1	Right Upper Tibia Moment X	Tib	592.18484	N·m	- 10/24/2003	OK 168v	Denton	3115
0014	3115-274-MY	TBRYM1	Right Upper Tibia Moment Y	Tib	590.53665	N·m	+ 10/24/2003	OK 168v	Denton	3115
0015	3287-185-FZ	ANRZF1	Right Lower Tibia Force Z	Ank	16688.578	N	+ 10/24/2003	OK 168v	Denton	3287
0016	3287-185-MX	ANRXM1	Right Lower Tibia Moment X	Ank	590.76280	N·m	- 10/24/2003	OK 168v	Denton	3287
0017	3287-185-MY	ANRYM1	Right Lower Tibia Moment Y	Ank	595.60569	N·m	+ 10/24/2003	OK 168v	Denton	3287
0018	P29635	VCGXG1	VEHICLE CG X-AXIS	FWD	1004.8673	g	+ 11/12/2003	OK -1	Endevco	7264C-2K-2-180
0019	P29861	VCGYG1	VEHICLE CG Y-AXIS	LT	989.56320	g	- 12/16/2003	OK -1	Endevco	7264C-2K-2-180
0020	J37150	VCGZG1	VEHICLE CG Z-AXIS	UP	989.90758	g	- 12/15/2003	OK -1	Endevco	7264-2000TZ
0021	P27324	RDKXG1	REAR DECK X-AXIS	FWD	1006.6454	g	+ 1/6/2004	OK -1	Endevco	7264C-2K-2-180
0022	P24668	RDKYG1	REAR DECK Y-AXIS	RT	997.58397	g	+ 1/6/2004	OK -1	Endevco	7264C-2K-2-180
0023	P30444	RDKZG1	REAR DECK Z-AXIS	UP	987.48288	g	- 12/22/2003	OK -1	Endevco	7264C-2K-2-180
0024	P25042	LFSXG1	LEFT FRONT SILL X-AXIS	RR	1482.3393	g	- 12/23/2003	OK -1	Endevco	7264C-2K-2-180
0025	P27185	LFSYG1	LEFT FRONT SILL Y-AXIS	RT	1512.2873	g	+ 12/11/2003	OK -1	Endevco	7264C-2K-2-180
0026	P28084	LRSXG1	LEFT REAR SILL X-AXIS	FWD	1474.6543	g	+ 12/26/2003	OK -1	Endevco	7264C-2K-2-180
0027	P27528	LRSYG1	LEFT REAR SILL Y-AXIS	RT	1468.7320	g	+ 12/26/2003	OK -1	Endevco	7264C-2K-2-180
0028	P27508	RFSXG1	RIGHT FRONT SILL X-AXIS	FWD	1010.0213	g	+ 1/8/2004	OK -1	Endevco	7264C-2K-2-180
0029	P28305	RFSYG1	RIGHT FRONT SILL Y-AXIS	LT	984.61538	g	- 1/8/2004	OK -1	Endevco	7264C-2K-2-180
0030	P28127	RRSXG1	RIGHT REAR SILL X-AXIS	FWD	1018.8040	g	+ 12/26/2003	OK -1	Endevco	7264C-2K-2-180
0031	P28092	RRSYG1	RIGHT REAR SILL Y-AXIS	LT	991.78676	g	- 11/28/2003	OK -1	Endevco	7264C-2K-2-180
0032	P28113	ENGXG1	ENGINE TOP X-AXIS	FWD	1458.6894	g	+ 12/26/2003	OK -1	Endevco	7264C-2K-2-180

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040109

Channel Report

1/9/2004 9:47:47 AM

Name of Test 040109

System MINIDAU

Name of DAU DAUC

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0001	P27919	ENGYG1	ENGINE TOP Y-AXIS	LT	1472.9574	g	- 1/8/2004	OK -1	Endevco	7264C-2K-2-180
0002	P27940	ENGXG2	ENGINE BOTTOM X-AXIS	FWD	1520.7318	g	+ 12/15/2003	OK -1	Endevco	7264C-2K-2-180
0003	J26491	ENGYG2	ENGINE BOTTOM Y-AXIS	LT	1449.5215	g	- 11/28/2003	OK -1	Endevco	7264-2000TZ
0004	P28868	DPCXG1	INSTRUMENT PANEL	FWD	983.55617	g	+ 8/13/2003	OK -1	Endevco	7264C-2K-2-180
0005	P22074	DPCYG1	INSTRUMENT PANEL	LT	1010.7790	g	- 12/12/2003	OK -1	Endevco	7264C-2K-2-180
0006	P30401	LRXXG1	LEFT REAR SEAT	FWD	1016.8818	g	+ 11/19/2003	OK -1	Endevco	7264C-2K-2-180
0007	P27937	LRXYG1	LEFT REAR SEAT	LT	1009.3443	g	- 12/26/2003	OK -1	Endevco	7264C-2K-2-180
0008	P28880	RRXXG1	RIGHT REAR SEAT	FWD	1011.0584	g	+ 12/8/2003	OK -1	Endevco	7264C-2K-2-180
0009	P29549	RRXYG1	RIGHT REAR SEAT	LT	981.31288	g	- 11/12/2003	OK -1	Endevco	7264C-2K-2-180
0010	ABFire3	DABET1	DRIV. AB EVENT PRIMARY	IP10	5.12	V	+ 8/20/2002	--- -1	FLUKE	Y8101A

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040109

Channel Report

1/9/2004 9:47:47 AM

Name of Test 040109

System MINIDAU

Name of DAU DAUG

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0001	03E03E20-N20	HEDXGB	Head Accel X	Rwd	1226.6411 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0002	02A18-N10	HEDYGB	Head Accel Y	Lft	1187.9901 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0003	02A09-F15	HEDZGB	Head Accel Z	Up	1206.9778 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0004	01L26-F02	HEDXRB	Head Accel Red X	Rwd	1210.5736 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0005	02A09-F13	HEDYRB	Head Accel Red Y	Lft	1193.4731 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0006	02A16-A06	HEDZRB	Head Accel Red Z	Up	1201.4830 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0007	IF-205-161-FX	NEKXFB	Neck Force X	Hd	13342.836 N	-	3/18/2003	OK 416v-	FTSS	IF-205
0008	IF-205-161-FY	NEKYFB	Neck Force Y	Hd	13337.257 N	+	3/18/2003	OK 416v-	FTSS	IF-205
0009	IF-205-161-FZ	NEKZFB	Neck Force Z	Hd	19992.065 N	+	3/18/2003	OK 416v-	FTSS	IF-205
0010	IF-205-161-MX	NEKXMB	Neck Moment X	Rt Ear	423.09963 N·m	-	3/18/2003	OK 416v-	FTSS	IF-205
0011	IF-205-161-MY	NEKYMB	Neck Moment Y	Chin	424.72122 N·m	+	3/18/2003	OK 416v-	FTSS	IF-205
0012	IF-205-161-MZ	NEKZMB	Neck Moment Z	Chn	425.40576 N·m	+	3/18/2003	OK 416v-	FTSS	IF-205
D-10 0013	02A16-A04	CSTXGB	Chest Accel X	Fwd	598.64836 g	+	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0014	C02B19-F02	CSTYGB	Chest Accel Y	Lft	606.16823 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0015	C02B19-F06	CSTZGB	Chest Accel Z	Up	600.41043 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0016	B02A25-N08	CSTXRB	Chest Accel Red X	Rwd	594.29844 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0017	03E03E19-N02	CSTYRB	Chest Accel Red Y	Lft	596.70877 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0018	C02B19-F04	CSTZRB	Chest Accel Red Z	Up	602.97719 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0019	14CB1-2897-416	CSTXDB	Chest Deflection X 516	Strnm	100.40396 mm	+	9/26/2003	OK 416v-	Servo	14CB1-2897
0020	C02B19-F03	PEVXGB	Pelvis Accel X	Rwd	598.10987 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0021	02A16-A27	PEVYGB	Pelvis Accel Y	Lft	600.37523 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0022	C02B19-F01	PEVZGB	Pelvis Accel Z	Up	599.81255 g	-	9/25/2003	OK 416v-	Entran	EGE-73B6Q-200
0023	2430-736	LFMZFB	Left Femur Force Z #8	Knee	19990.763 N	+	3/19/2003	OK 416v-	GSE	2430
0024	2430-742	RFMZFB	Right Femur Force Z 507	Knee	20013.575 N	+	3/19/2003	OK 416v-	GSE	2430
0025	150-121VR-5556	KNLXDB	Left Knee Displacement	Tib	40.539524 mm	-	9/26/2003	OK 416v-	Space Age	150-0121VR
0026	150-121VL-5482	KNRXDB	Right Knee Displacement	Tib	39.623269 mm	-	9/26/2003	OK 416v-	Space Age	150-0121VL
0027	P28981	VCGXGA	VEHICLE CG X-AXIS	FWD	1013.5001 g	+	12/3/2003	OK -1	Endevco	7264C-2K-2-180
0028	P28306	VCGYGA	VEHICLE CG Y-AXIS	LT	1014.1827 g	-	12/3/2003	OK -1	Endevco	7264C-2K-2-180
0029	P27392	VCGZGA	VEHICLE CG Z-AXIS	UP	983.63175 g	-	12/22/2003	OK -1	Endevco	7264C-2K-2-180
0030	P29192	RDKXGA	REAR DECK X-AXIS	FWD	1027.2460 g	+	12/22/2003	OK -1	Endevco	7264C-2K-2-180
0031	P29966	RDKYGA	REAR DECK Y-AXIS	LT	1014.6248 g	-	7/29/2003	OK -1	Endevco	7264C-2K-2-180
0032	P29875	RDKZGA	REAR DECK Z-AXIS	UP	987.88299 g	-	12/22/2003	OK -1	Endevco	7264C-2K-2-180

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040109

Channel Report

1/9/2004 9:47:47 AM

Name of Test 040109

System MINIDAU

Name of DAU DAUH

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.	Group	Mfg.	Model	
0001	P29844	LFSXGA	LEFT FRONT SILL X-AXIS	FWD	1520.4157	g	+	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0002	P28587	LFSYGA	LEFT FRONT SILL Y-AXIS	LT	1469.9971	g	-	12/24/2003	OK	-1	Endevco	7264C-2K-2-180
0003	P29799	LRSXGA	LEFT REAR SILL X-AXIS	FWD	1505.5281	g	+	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0004	P29199	LRSYGA	LEFT REAR SILL Y-AXIS	LT	1453.8845	g	-	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0005	P29241	RFSXGA	RIGHT FRONT SILL X-AXIS	FWD	990.23305	g	+	11/24/2003	OK	-1	Endevco	7264C-2K-2-180
0006	P30424	RFSYGA	RIGHT FRONT SILL Y-AXIS	LT	994.17475	g	-	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0007	P24671	RRSXGA	RIGHT REAR SILL X-AXIS	FWD	1012.3378	g	+	12/24/2003	OK	-1	Endevco	7264C-2K-2-180
0008	P28870	RRSYGA	RIGHT REAR SILL Y-AXIS	LT	988.93245	g	-	12/24/2003	OK	-1	Endevco	7264C-2K-2-180
0009	P30027	ENGXGA	ENGINE TOP X-AXIS ACCEL.	FWD	1462.7317	g	+	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0010	P29849	ENGYGA	ENGINE TOP Y-AXIS	LT	1487.2912	g	-	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0011	P27095	ENGXGB	ENGINE BOTTOM X-AXIS	FWD	1508.1001	g	+	7/19/2003	OK	-1	Endevco	7264C-2K-2-180
0012	P23816	ENGYGB	ENGINE BOTTOM Y-AXIS	RT	1487.5072	g	+	12/11/2003	OK	-1	Endevco	7264C-2K-2-180
D-11 0013	P30422	DPCXGA	INSTRUMENT PANEL	FWD	1004.7095	g	+	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0014	P30417	DPCYGA	INSTRUMENT PANEL	RT	1003.6263	g	+	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0015	P28891	LRXXGA	LEFT REAR SEAT	FWD	995.10223	g	+	8/13/2003	OK	-1	Endevco	7264C-2K-2-180
0016	P28894	LRXYGA	LEFT REAR SEAT	LT	1000.4885	g	-	12/26/2003	OK	-1	Endevco	7264C-2K-2-180
0017	P29189	RRXXGA	RIGHT REAR SEAT	FWD	990.06071	g	+	12/22/2003	OK	-1	Endevco	7264C-2K-2-180
0018	P29963	RRXYGA	RIGHT REAR SEAT	LT	980.61748	g	-	7/29/2003	OK	-1	Endevco	7264C-2K-2-180
0019	ABFire1	DABETA	DRIVER AIRBAG EVENT -	IP05	5.12	V	+	8/20/2002	---	VRTC	FLUKE	Y8101A
0020	ABFire2	PABETA	PASSENGER AIRBAG EVENT	IP07	5.12	V	+	8/20/2002	---	VRTC	FLUKE	Y8101A

040109

Dummy 168v Type HIII 50TH Descriptio VRTC - 168v w/ Red. Accel,Knee Pot,& Denton Legs ICAL'd10-15-03(DKS10-23-03)J211

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos	Flip
HEDXG	Head Accel X	7264-2KM5T	J17649	Endevco	0.03237 g	2000	10/15/2003	Rwd	1
HEDYG	Head Accel Y	7264-2000T	AJ454	Endevco	0.02839 g	2000	10/15/2003	Lft	1
HEDZG	Head Accel Z	7264-2000T	J14189	Endevco	0.03291 g	2000	10/15/2003	Up	1
HEDXR	Head Accel Red X S39	7264C-2KLC-2-	P17196	Endevco	0.02101 g	2000	10/15/2003	Rwd	1
HEDYR	Head Accel Red Y	EGE-73B6Q-200B02A25-N09		Entran	0.01877 g	2000	10/15/2003	Lft	1
HEDZR	Head Accel Red Z	EGE-73B6Q-20001G25-N09		Entran	0.01936 g	2000	10/15/2003	Up	1
NEKXF	Neck Force X	1716A	1716A-851-FX	Denton	0.000193966 N	8896.4	10/15/2003	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y	1716A	1716A-851-FY	Denton	0.000187424 N	8896.4	10/15/2003	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z	1716A	1716A-851-FZ	Denton	0.000098879 N	13344.6	10/15/2003	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	1716A	1716A-851-MX	Denton	0.006002124 N·m	282.5	10/15/2003	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	1716A	1716A-851-MY	Denton	0.005887434 N·m	282.5	10/15/2003	Chn to Strnm	0
NEKZM	Neck Moment Z	1716A	1716A-851-MZ	Denton	0.008494867 N·m	282.5	10/15/2003	Chn to Lt Shld	0
CSTXG	Chest Accel X	7264-2000TZ	J35921	Endevco	0.03028 g	2000	10/14/2003	Fwd	0
CSTYG	Chest Accel Y	7264-2000T	AJ7F7	Endevco	0.03029 g	2000	10/13/2003	Lft	1
CSTZG	Chest Accel Z	7264-2000TZ	J36723	Endevco	0.02511 g	2000	10/14/2003	Up	1
CSTXR	Chest Accel Red X	EGE-73BQE0-2	99H30-Z14	Entran	0.02048 g	2000	10/14/2003	Rwd	1
CSTYR	Chest Accel Red Y	EGE-73BQ-200098H14-K05		Entran	0.01724 g	2000	10/13/2003	Lft	1
CSTZR	Chest Accel Red Z	EGE-73BQ-200098H13-F03		Entran	0.02057 g	2000	10/14/2003	Up	1
CSTXD	Chest Deflection X	14CB1-2847	14CB1-2847-168	Servo	1.1347 mm	100	11/25/2003	Strnm Away Frm Spn	0
PEVXG	Pelvis Accel X	7264-2000T	ACCY2	Endevco	0.02353 g	2000	10/15/2003	Rwd	1
PEVYG	Pelvis Accel Y	7264-2KM5T	J27490	Endevco	0.022 g	2000	10/15/2003	Lft	1
PEVZG	Pelvis Accel Z	7264-2KM5T	J21963	Endevco	0.02517 g	2000	10/15/2003	Up	1
LFMXF	Left Femur Force X	1914A	1914A-362-FX	Denton	0.0001437 N	13344	10/17/2003	Knee Dn,Fem Up	1
LFMYF	Left Femur Force Y	1914A	1914A-362-FY	Denton	0.0001443 N	13344	10/17/2003	Knee Rt,Fem Lt	0
LFMZG	Left Femur Force Z	1914A	1914A-362-FZ	Denton	0.0000591 N	22240	10/17/2003	Knee Fd,Pel Rr	0
LFMXM	Left Femur Moment X	1914A	1914A-362-MX	Denton	0.0044955 N·m	339	10/17/2003	Knee Rt,Hld Fem	1

Friday, January 09, 2004 168v

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos	Flip	
LFMYM	Left Femur Moment Y	1914A	1914A-362-MY	Denton	0.0045037	N·m	339	10/17/2003	Knee Up,Hld Fem	0
LFMZM	Left Femur Moment Z	1914A	1914A-362-MZ	Denton	0.0078492	N·m	339	10/17/2003	Tib Lt,Hld Pel	0
RFMXF	Right Femur Force X	1914A	1914A-376-FX	Denton	0.0001467	N	13344	10/17/2003	Knee Dn,Fem Up	1
RFMYF	Right Femur Force Y	1914A	1914A-376-FY	Denton	0.0001462	N	13344	10/17/2003	Knee Rt,Fem Lt	0
RFMZF	Right Femur Force Z	1914A	1914A-376-FZ	Denton	0.0000601	N	22240	10/17/2003	Knee Fd,Pel Rr	0
RFMXM	Right Femur Moment X	1914A	1914A-376-MX	Denton	0.0045174	N·m	339	10/17/2003	Knee Rt,Hld Fem	1
RFMYM	Right Femur Moment Y	1914A	1914A-376-MY	Denton	0.0046084	N·m	339	10/17/2003	Knee Up,Hld Fem	0
RFMZM	Right Femur Moment Z	1914A	1914A-376-MZ	Denton	0.0080615	N·m	339	10/17/2003	Tib Lt,Hld Pel	0
KNLXD	Left Knee Displacement	150-0121VR	150-121VR-18026	Space Age	22.957	mm	40	10/27/2003	Tib Rr,Hld Fem	1
TBLZF	Left Upper Tibia Force Z	3115	3115-268-FZ	Denton	0.0000947627	N	11120.6	10/23/2003	Tib Dn,Knee Up	0
TBLXM	Left Upper Tibia Moment X	3115	3115-268-MX	Denton	0.00733004	N·m	395.4	10/23/2003	Tib Rt,Hld Knee	1
TBLYM	Left Upper Tibia Moment Y	3115	3115-268-MY	Denton	0.00748507	N·m	395.4	10/23/2003	Tib Fd,Hld Knee	0
ANLZF	Left Lower Tibia Force Z	3287	3287-196-FZ	Denton	0.0000950055	N	11120.5	10/23/2003	Ank Dn,Knee Up	0
ANLXM	Left Lower Tibia Moment X	3287	3287-196-MX	Denton	0.00756449	N·m	395.4	10/23/2003	Ank Rt,Hld Knee	1
ANLYM	Left Lower Tibia Moment Y	3287	3287-196-MY	Denton	0.007519979	N·m	395.4	10/23/2003	Ank Fd,Hld Knee	0
KNRXd	Right Knee Displacement	150-0121VL	150-121VL-23106	Space Age	23.604	mm	40	10/27/2003	Tib Rr,Hld Fem	1
TBRZF	Right Upper Tibia Force Z	3115	3115-274-FZ	Denton	0.0000954282	N	11120.6	10/24/2003	Tib Dn,Knee Up	0
TBRXM	Right Upper Tibia Moment X	3115	3115-274-MX	Denton	0.0073897	N·m	395.4	10/24/2003	Tib Rt,Hld Knee	1
TBRYM	Right Upper Tibia Moment Y	3115	3115-274-MY	Denton	0.0075392	N·m	395.4	10/24/2003	Tib Fd,Hld Knee	0
ANRZF	Right Lower Tibia Force Z	3287	3287-185-FZ	Denton	0.0000961745	N	11120.5	10/24/2003	Ank Dn,Knee Up	0
ANRXM	Right Lower Tibia Moment X	3287	3287-185-MX	Denton	0.0076697	N·m	395.4	10/24/2003	Ank Rt,Hld Knee	1
ANRYM	Right Lower Tibia Moment Y	3287	3287-185-MY	Denton	0.00767526	N·m	395.4	10/24/2003	Ank Fd,Hld Knee	0

Dummy 169v- Type HIII 50TH Descriptio VRTC - 169v HIII 50TH w/o INSTR. LEGS ICAL'd 10-10-03 (DKS 10-20-03)J211

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos	Flip
HEDXG	Head Accel X	7264-2000T	J20083	Endevco	0.02171 g	2000	10/10/2003	Rwd	1
HEDYG	Head Accel Y	7264-2000T	J19843	Endevco	0.02229 g	2000	10/10/2003	Lft	1
HEDZG	Head Accel Z	7264-2KM5T	J20027	Endevco	0.02577 g	2000	10/10/2003	Up	1
NEKXF	Neck Force X	1716A	1716A-782-FX	Denton	0.000190099 N	8896	10/10/2003	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y	1716A	1716A-782-FY	Denton	0.00018476 N	8896	10/10/2003	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z	1716A	1716A-782-FZ	Denton	0.000097028 N	13344	10/10/2003	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	1716A	1716A-782-MX	Denton	0.005941239 N·m	282.5	10/10/2003	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	1716A	1716A-782-MY	Denton	0.005766372 N·m	282.5	10/10/2003	Chn to Strnm	0
NEKZM	Neck Moment Z	1716A	1716A-782-MZ	Denton	0.008201416 N·m	282.5	10/10/2003	Chn to Lt Shld	0
CSTXG	Chest Accel X	7264-2000T	J23757	Endevco	0.02786 g	2000	10/10/2003	Fwd	0
CSTYG	Chest Accel Y	7264-2KM5T	J21989	Endevco	0.02321 g	2000	10/10/2003	Lft	1
CSTZG	Chest Accel Z	7264-2000TZ	J35747	Endevco	0.02823 g	2000	10/10/2003	Up	1
CSTXD	Chest Deflection X	14CB1-2847	14CB1-2847-169	Servo	1.1389 mm	100	10/14/2003	Strnm Away Frm Spn	0
PEVXG	Pelvis Accel X	7264-2000TZ	J36741	Endevco	0.02305 g	2000	10/10/2003	Rwd	1
PEVYG	Pelvis Accel Y	7264-2000TZ	J36605	Endevco	0.02668 g	2000	10/10/2003	Lft	1
PEVZG	Pelvis Accel Z	7264-2000LC	AAMD7	Endevco	0.02665 g	2000	10/10/2003	Up	1
LFMXF	Left Femur Force X	1914A	1914A-0261-FX	Denton	0.000143945 N	13344	10/10/2003	Knee Dn,Fem Up	1
LFMYF	Left Femur Force Y	1914A	1914A-0261-FY	Denton	0.000144739 N	13344	10/10/2003	Knee Rt,Fem Lt	0
LFMZF	Left Femur Force Z	1914A	1914A-0261-FZ	Denton	0.000053282 N	22240	10/10/2003	Knee Fd,Pel Rr	0
LFMXM	Left Femur Moment X	1914A	1914A-0261-MX	Denton	0.0043941 N·m	339	10/10/2003	Knee Rt,Hld Fem	1
LFMYM	Left Femur Moment Y	1914A	1914A-0261-MY	Denton	0.004458997 N·m	339	10/10/2003	Knee Up,Hld Fem	0
LFMZM	Left Femur Moment Z	1914A	1914A-0261-MZ	Denton	0.007776106 N·m	339	10/10/2003	Tib Lt,Hld Pel	0
RFMXF	Right Femur Force X	1914A	1914A-383-FX	Denton	0.000146957 N	13344	10/10/2003	Knee Dn,Fem Up	1
RFMYF	Right Femur Force Y	1914A	1914A-383-FY	Denton	0.00014713 N	13344	10/10/2003	Knee Rt,Fem Lt	0
RFMZF	Right Femur Force Z	1914A	1914A-383-FZ	Denton	0.000060148 N	22240	10/10/2003	Knee Fd,Pel Rr	0
RFMXM	Right Femur Moment X	1914A	1914A-383-MX	Denton	0.004486136 N·m	339	10/10/2003	Knee Rt,Hld Fem	1

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040109

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos	Flip	
RFMYM	Right Femur Moment Y	1914A	1914A-383-MY	Denton	0.004497345	N·m	339	10/10/2003	Knee Up,Hld Fem	0
RFMZM	Right Femur Moment Z	1914A	1914A-383-MZ	Denton	0.007966962	N·m	339	10/10/2003	Tib Lt,Hld Pel	0
KNLXD	Left Knee Displacement	150-0121VR	150-121VR-17169	Space Age	23.403	mm	40	10/14/2003	Tib Rr,Hld Fem	1
KNRXD	Right Knee Displacement	150-0121VL	150-121VL-21033	Space Age	23.862	mm	40	10/14/2003	Tib Rr,Hld Fem	1

Dummy 416v- Type HYBRID III 5th Descriptio VRTC - 416v HYBRID III RED. w/o THOR LEGS ICAL'd 3-18-03(DKS 9-26-03)J211

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos	Flip
HEDXG	Head Accel X	EGE-73B6Q-20003E03E20-N20		Entran	0.02087 g	2000	09/25/2003	Rwd	1
HEDYG	Head Accel Y	EGE-73B6Q-20002A18-N10		Entran	0.01959 g	2000	09/25/2003	Lft	1
HEDZG	Head Accel Z	EGE-73B6Q-20002A09-F15		Entran	0.02121 g	2000	09/25/2003	Up	1
HEDXR	Head Accel Red X	EGE-73B6Q-20001L26-F02		Entran	0.02014 g	2000	09/25/2003	Rwd	1
HEDYR	Head Accel Red Y	EGE-73B6Q-20002A09-F13		Entran	0.0195 g	2000	09/25/2003	Lft	1
HEDZR	Head Accel Red Z	EGE-73B6Q-20002A16-A06		Entran	0.01937 g	2000	09/25/2003	Up	1
NEKXF	Neck Force X	IF-205	IF-205-161-FX	FTSS	0.000186275 N	8896	03/18/2003	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y	IF-205	IF-205-161-FY	FTSS	0.000183678 N	8896	03/18/2003	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z	IF-205	IF-205-161-FZ	FTSS	0.000094155 N	13344	03/18/2003	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	IF-205	IF-205-161-MX	FTSS	0.005903009 N·m	282.5	03/18/2003	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	IF-205	IF-205-161-MY	FTSS	0.005938407 N·m	282.5	03/18/2003	Chin to Strnm	0
NEKZM	Neck Moment Z	IF-205	IF-205-161-MZ	FTSS	0.008475752 N·m	282.5	03/18/2003	Chn to Lt Shld	0
CSTXG	Chest Accel X	EGE-73B6Q-20002A16-A04		Entran	0.02086 g	2000	09/25/2003	Fwd	0
CSTYG	Chest Accel Y	EGE-73B6Q-200C02B19-F02		Entran	0.01877 g	2000	09/25/2003	Lft	1
CSTZG	Chest Accel Z	EGE-73B6Q-200C02B19-F06		Entran	0.01895 g	2000	09/25/2003	Up	1
CSTXR	Chest Accel Red X	EGE-73B6Q-200B02A25-N08		Entran	0.01958 g	2000	09/25/2003	Rwd	1
CSTYR	Chest Accel Red Y	EGE-73B6Q-20003E03E19-N02		Entran	0.02258 g	2000	09/25/2003	Lft	1
CSTZR	Chest Accel Red Z	EGE-73B6Q-200C02B19-F04		Entran	0.01769 g	2000	09/25/2003	Up	1
CSTXD	Chest Deflection X 516	14CB1-2897	14CB1-2897-416	Servo	1.6998 mm	100	09/26/2003	Strnm Away Frm Spn	0
PEVXG	Pelvis Accel X	EGE-73B6Q-200C02B19-F03		Entran	0.01747 g	2000	09/25/2003	Rwd	1
PEVYG	Pelvis Accel Y	EGE-73B6Q-20002A16-A27		Entran	0.02132 g	2000	09/25/2003	Lft	1
PEVZG	Pelvis Accel Z	EGE-73B6Q-200C02B19-F01		Entran	0.0194 g	2000	09/25/2003	Up	1
LFMZF	Left Femur Force Z #8	2430	2430-736	GSE	0.000070556 N	13344	03/19/2003	Knee Fd,Pel Rr	0
RFMZF	Right Femur Force Z 507	2430	2430-742	GSE	0.000066105 N	13344	03/19/2003	Knee Fd,Pel Rr	0
KNLXD	Left Knee Displacement	150-0121VR	150-121VR-5556	Space Age	22.963 mm	40	09/26/2003	Tib Rr,Hld Fem	1
KNRXD	Right Knee Displacement	150-0121VL	150-121VL-5482	Space Age	23.494 mm	40	09/26/2003	Tib Rr,Hld Fem	1

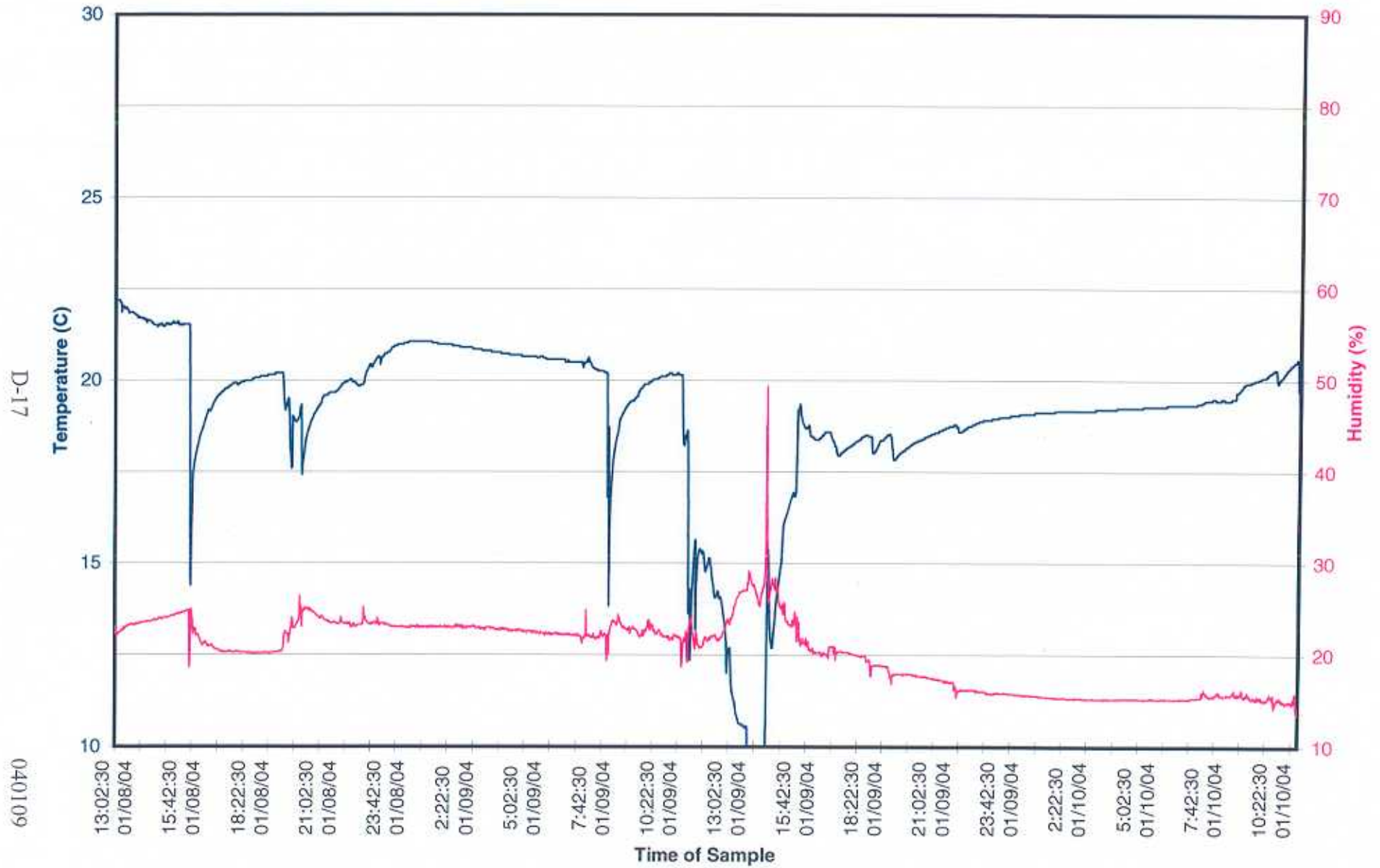
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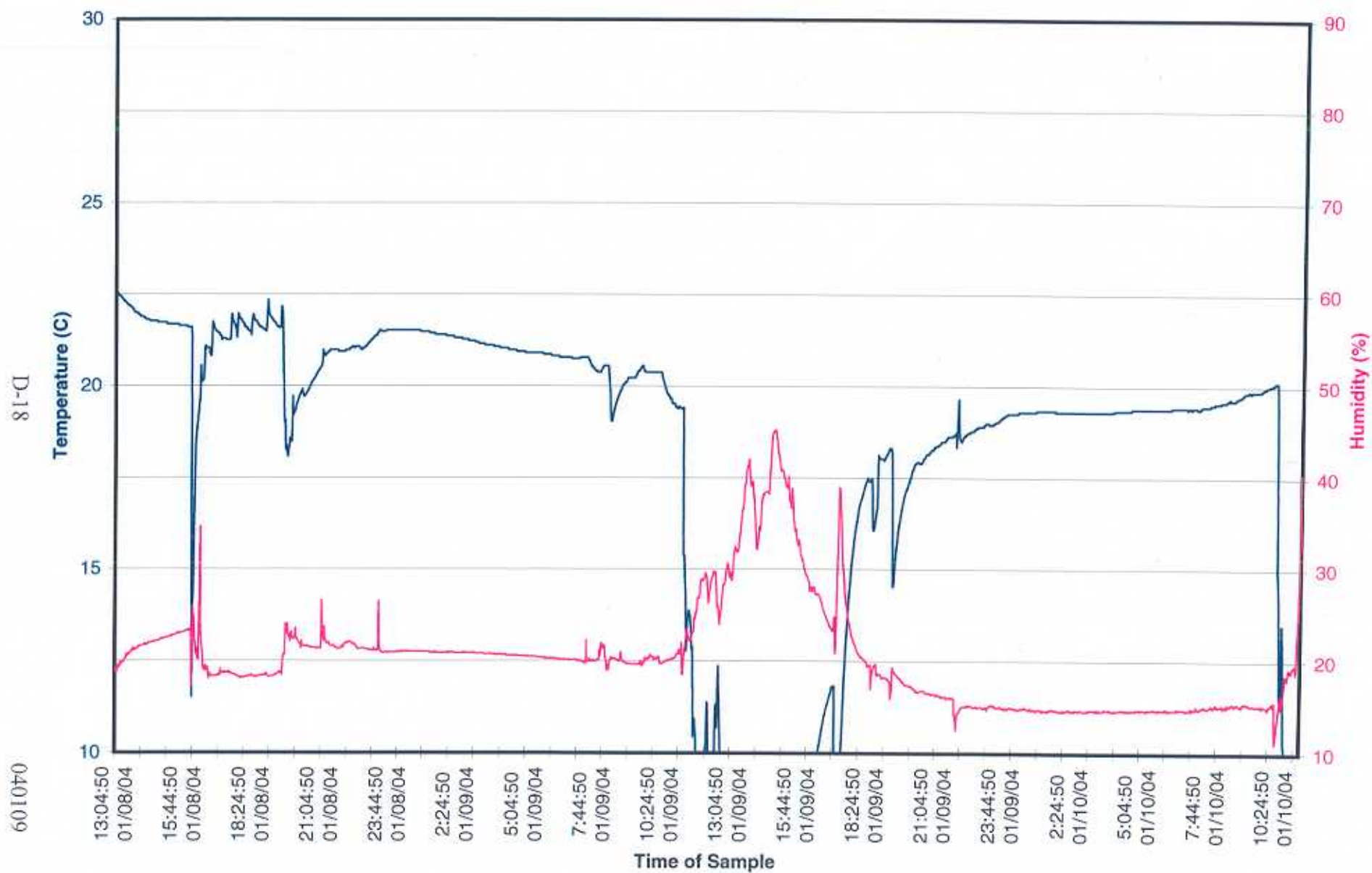
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040109

30 DEGREE CAR INTO CAR / 1997 HONDA ACCORD / 040109



30 DEGREE CAR INTO CAR / 1996 TOYOTA PREVIA / 040109



Appendix E

INSIA Report on Structural Measurements

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

**APARICIO IZQUIERDO, FRANCISCO
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Carretera de Valencia, km. 7
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28031 – MADRID – (SPAIN)**

March, 1999

REPORT DOCUMENTATION PAGE

Title: <i>STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY</i>
Author(s): Aparicio Izquierdo, Francisco Páez Ayuso, Francisco Javier
Performing Organisation name and address: INSIA – University Institute for Automobile Research Carretera de Valencia, Km. 7 – Campus Sur de la Universidad Politécnica de Madrid 28031 – Madrid – Spain
Supplementary notes: Under contract to: THE EUROPEAN COMMUNITY Project: “Improvement of Crash Compatibility between Cars” Contract N°: RO – 97 – SC.1064
Abstract: The main aim of this working package - <i>Structural Survey of Cars</i> - 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.

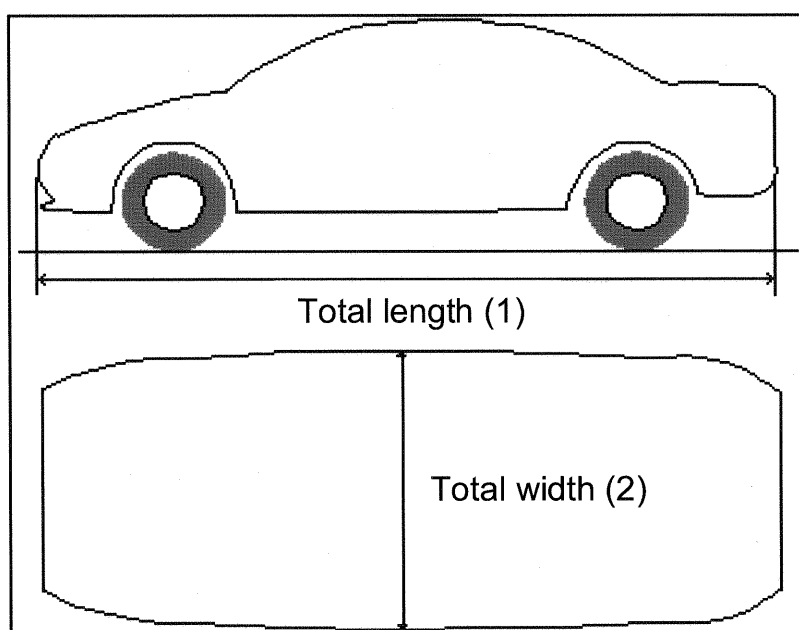


Figure 1.- Definition of the main resistant elements. General dimensions.

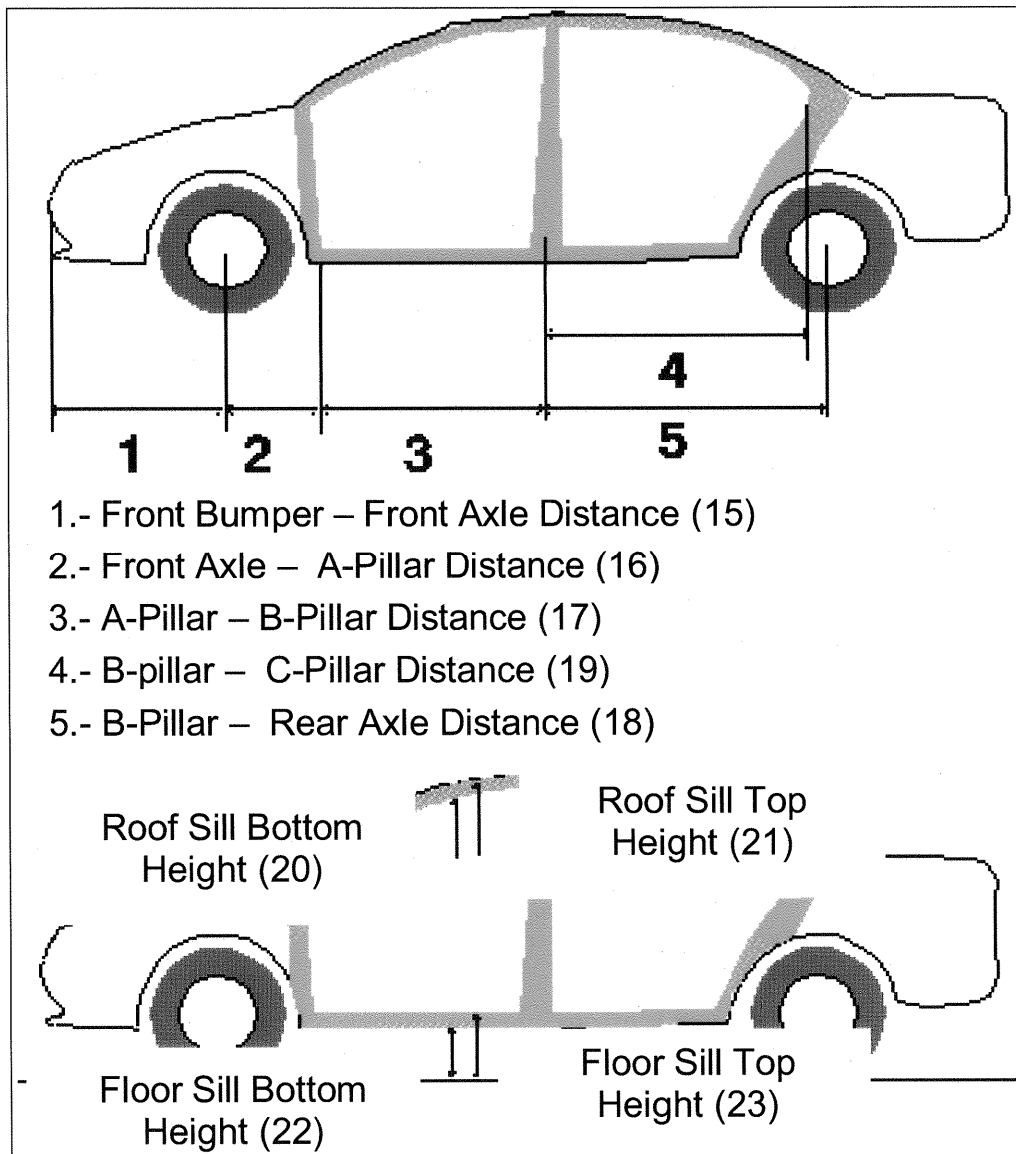
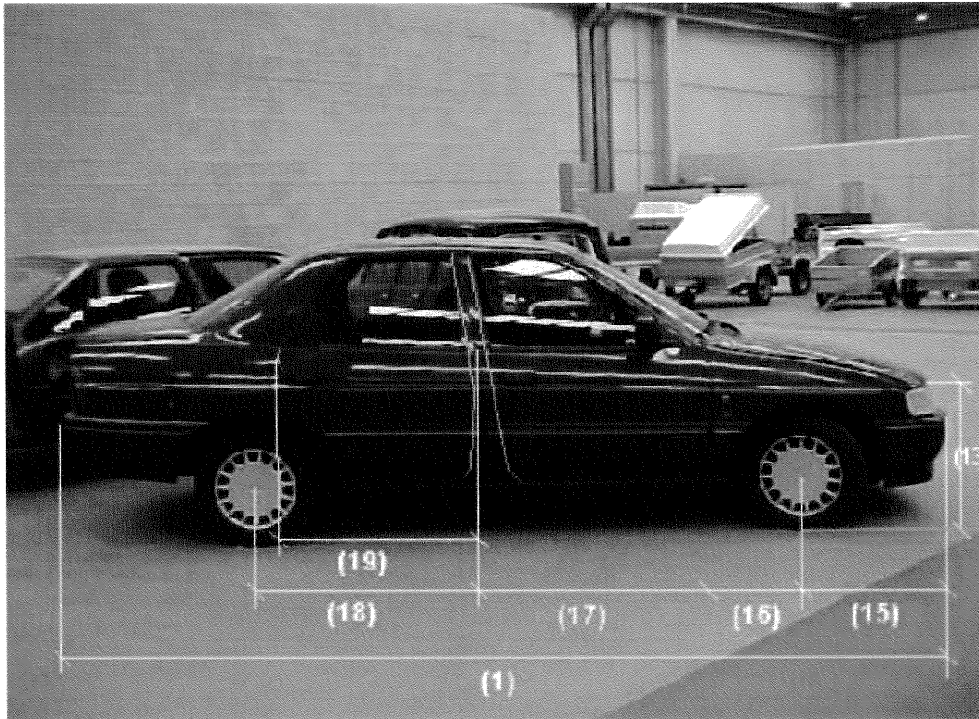
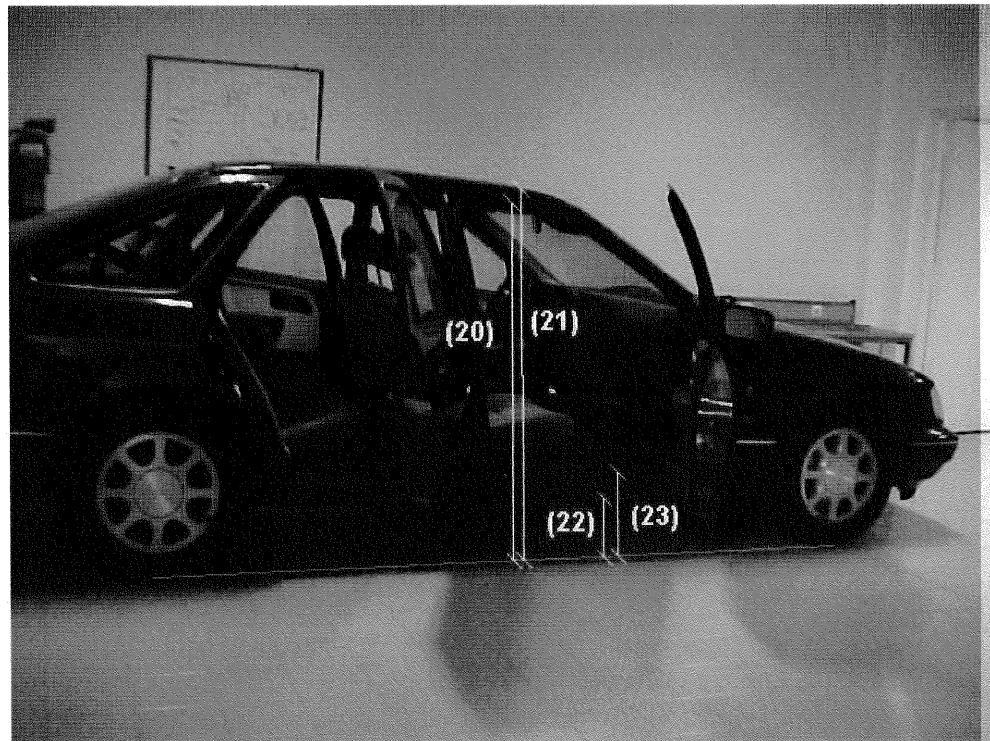


Figure 2.- Definition of the main resistant elements. Side elements.



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



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

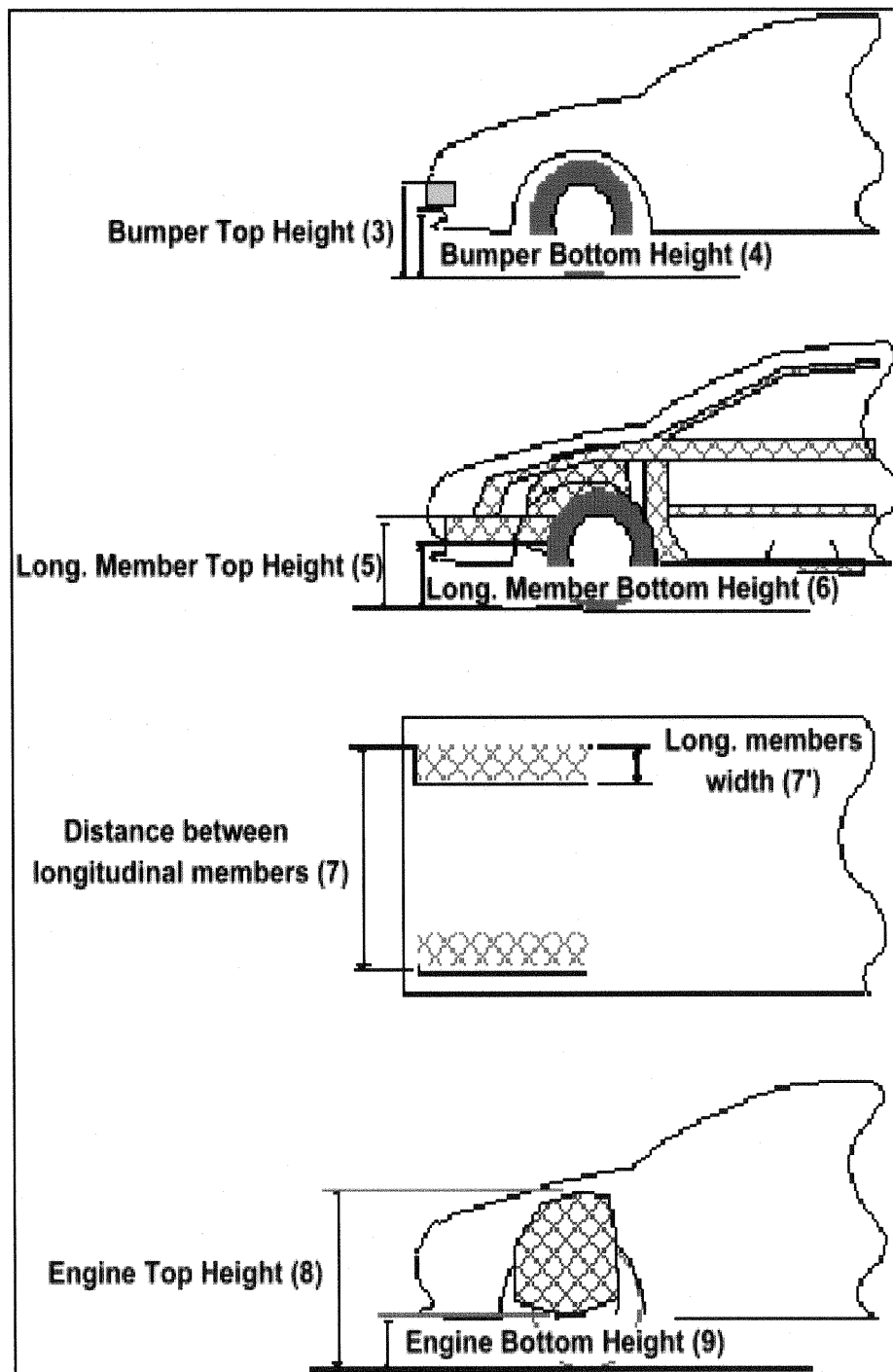
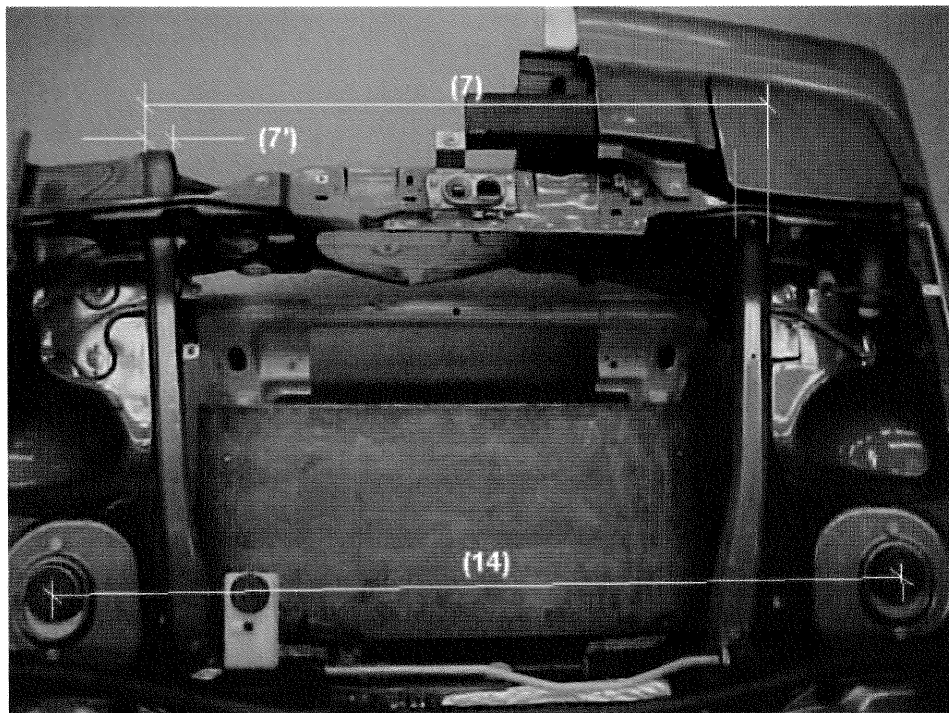
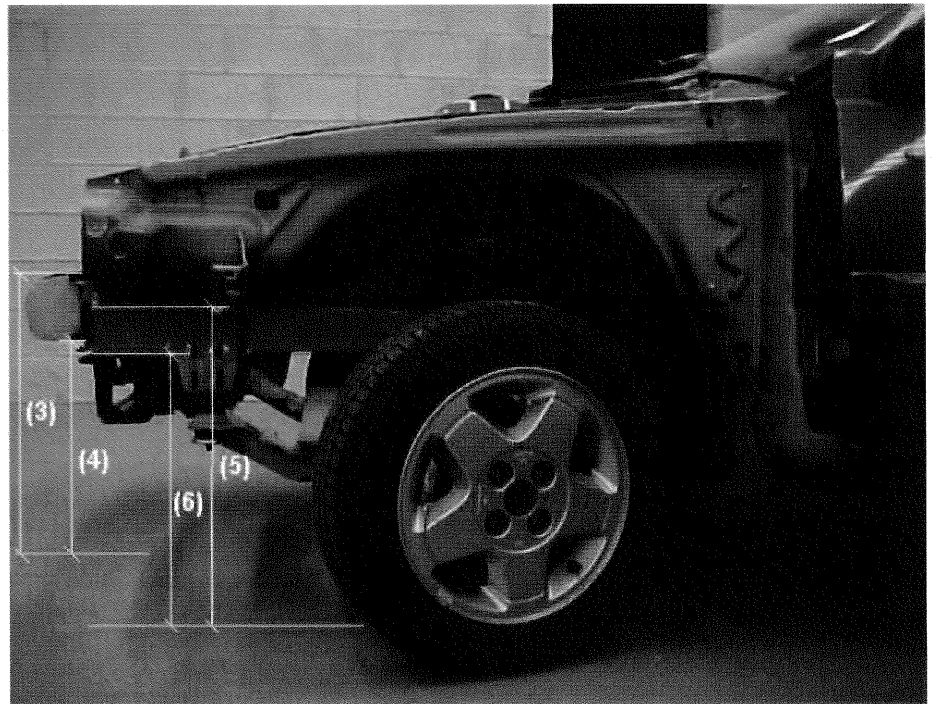


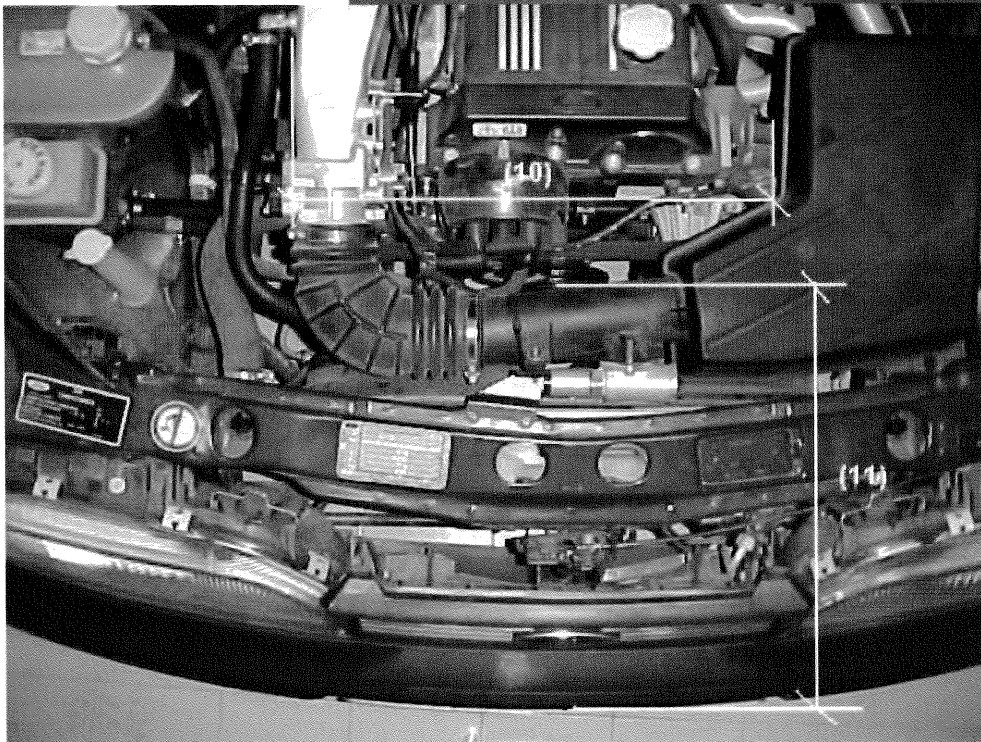
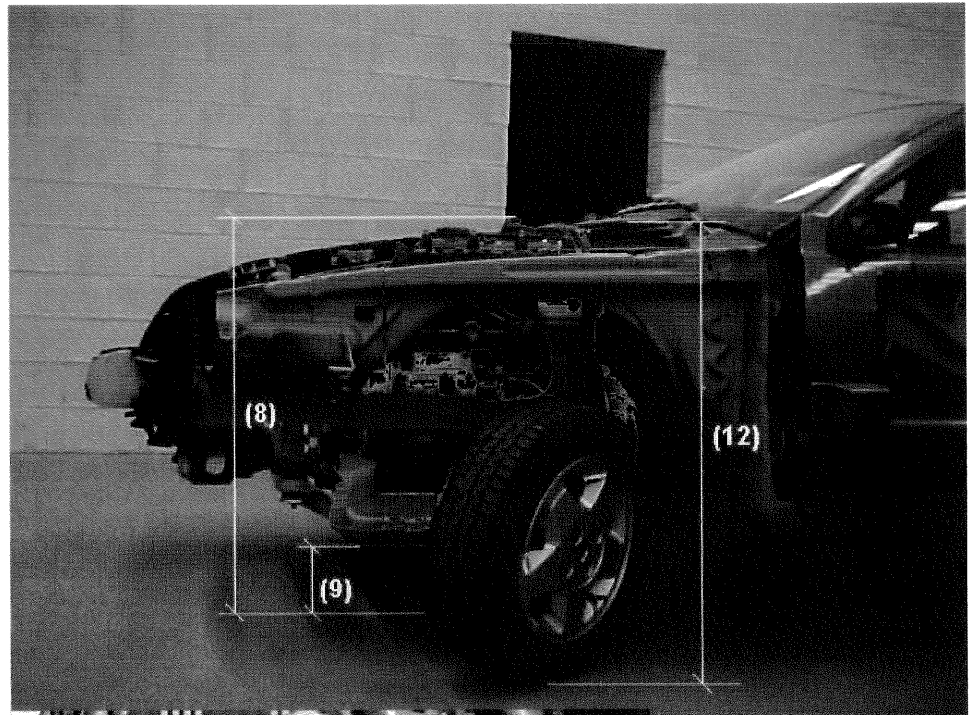
Figure 5.- Definition of the main resistant elements. Front elements.

*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

Green Sheet

Same as 97 per A. Presto

96 HONDA ACCORD
NSA-31JMG IR1683

g. Information and data relating to the test conditions (S6)

(1) Test weight measured at each wheel (S6.1)

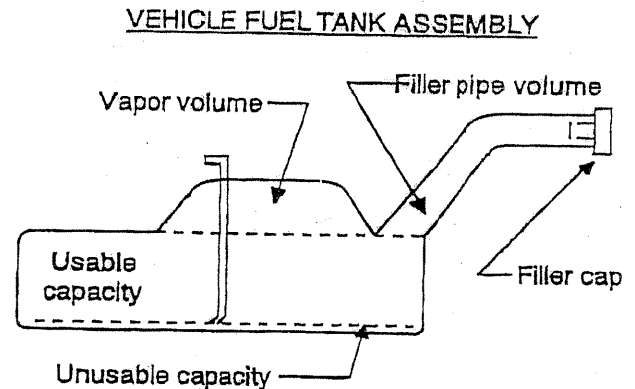
Fr.: 1896 lbs.

Rr.: 1506 lbs.

(2) Fuel tank capacity and the amount of Stoddard solvent added (S6.1)

Usable capacity : 17.0 gallons.

Amount of Stoddard solvent : 15.8 gallons.



(3) Vehicle test attitude immediately prior to testing including measurements to the reference points in the "as delivered" and "fully loaded" conditions (S6.2)

Wheel Opening Height

Unit : inch

	Front		Rear	
	L	R	L	R
As delivered	27.2	27.4	27.1	27.0
Fully loaded	26.4	27.4	24.9	25.9

Green sheet

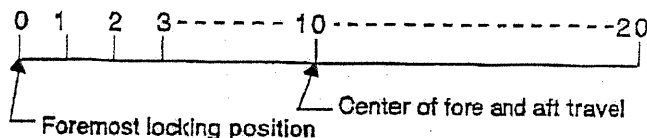
96 HONDA ACCORD CO
NSA-31JMG IR1683

g. (cont.)

(4) Position of adjustable seats (S6.3)

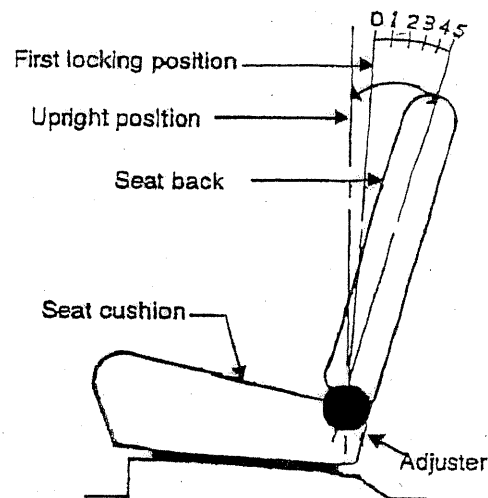
10th steps from the Foremost locking position for Passenger's seat. Fit and Controlled to use power SW of Driver's seat to the same position as passenger's seat.

Locking position of side adjuster



(5) Position of adjustable seat backs (S6.4)

Nominal design riding position is located with seat back adjusted to the 5th latch position from the first locking position.



LEFT SIDE VIEW

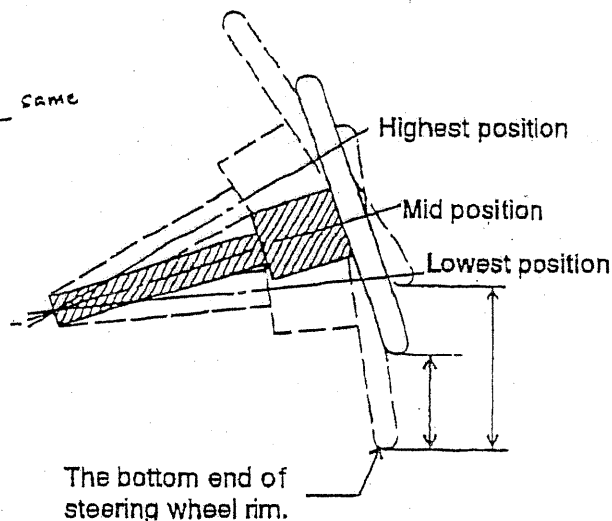
(6) Position of adjustable steering wheel (S6.5)

A : 1.76 inch (Highest position)

B : 0.87 inch (Mid position)

LEFT SIDE VIEW

STEERING COULUMN ASSEMBLY



94-97 same

4962-NCAP

1996 Toyota Previa

Attachment III

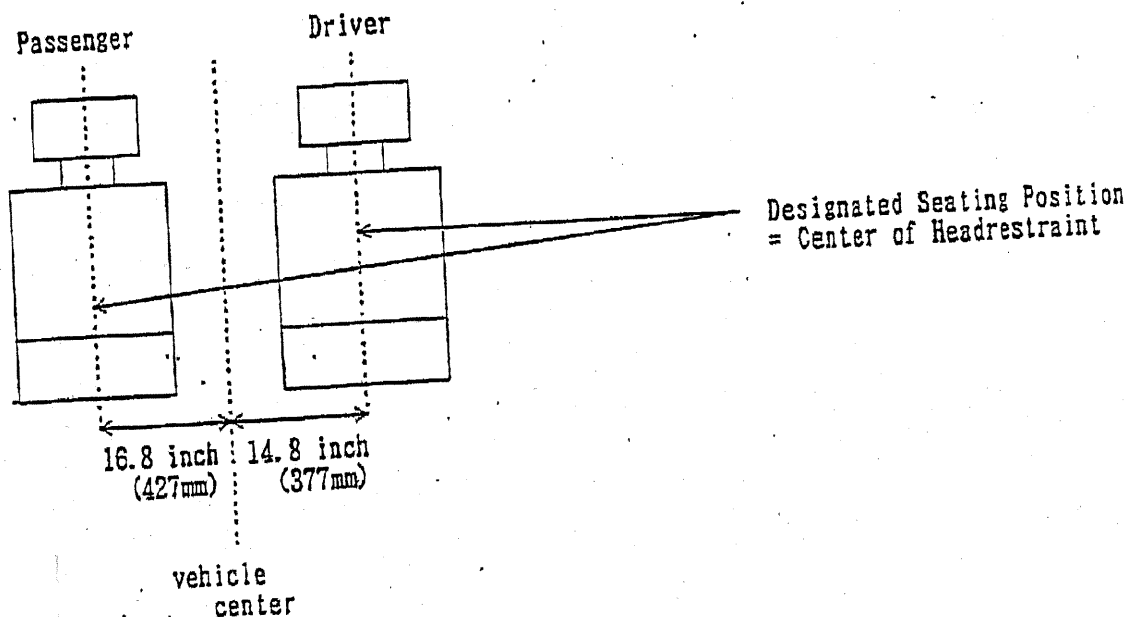
Information for NHTSA Regarding The 1994 TOYOTA PREVIA (Test Conditions for Barrier Crash Test)

The following are design-related matters necessary for conducting the barrier crash test.

Test Conditions:

1. Useable Fuel Tank Volume : 19.81 gallons
92% of useable volume : 18.23 gallons
94% of useable volume : 18.62 gallons
2. Vehicle Capacity Weight : LE 1100 lbs
DX 1185 lbs
Rated Cargo & Luggage Weight : LE 501 lbs
DX 135 lbs
Designated Seating Capacity : 7
3. Tire Inflation Pressure : Fr. 35 psi Rr. 35 psi
4. Outboard Designated Seating Position :

16.8 inch(427mm) and 14.8 inch(377mm) outboard of the vertical plane which includes vehicle center

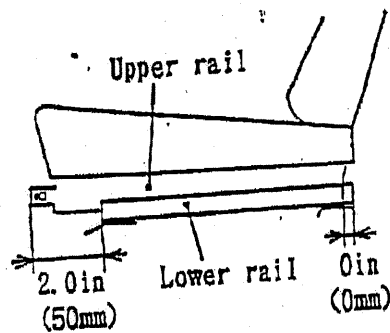
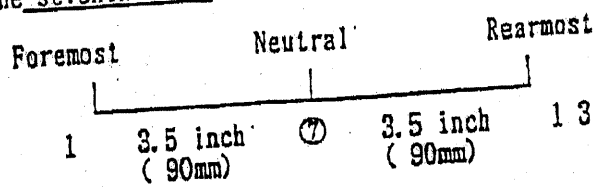


C-6

5. Front Seat Adjustment (Driver & Passenger Side) :

Driver's Seat

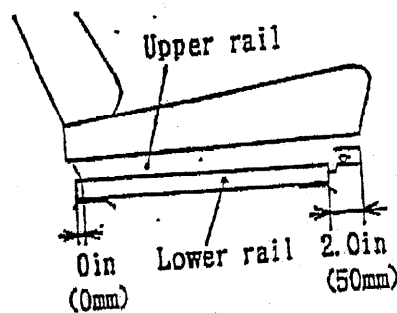
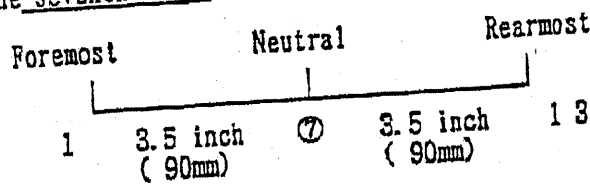
Move to the seventh notch rearward from the foremost position.



without vertical adjuster

Passenger's Seat

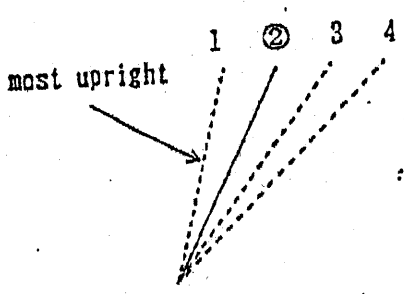
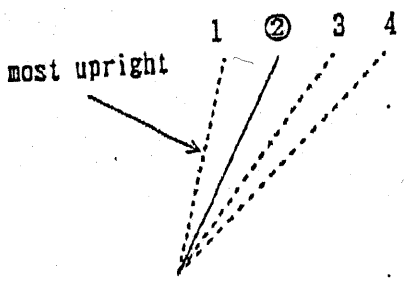
Move to the seventh notch rearward from the foremost position.



without vertical adjuster

C-7

6. Designated Seat Back Positions :

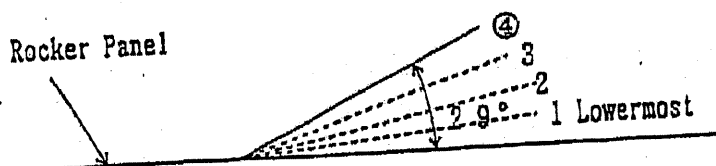
Seat Type	Driver Side Position	Passenger Side Position
Separate Seat	Recline to the <u>second notch</u> rearward from the most upright position. 	Recline to the <u>second notch</u> rearward from the most upright position. 

7. Other Seat Adjustment :

None.

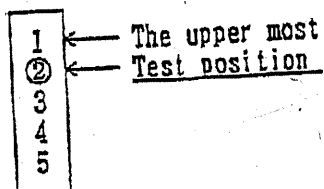
8. Steering Column Adjustment :

Tilt to the fourth notch upward from the lowermost position.



9. Shoulder Belt Anchor Position :

We conducted our certification tests with the adjustable shoulder belt connection locked in the second position from the upper most.



10. Anthropomorphic Test Device :

Driver : HYBRID-II

Passenger : HYBRID-II

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FORM NO. 1

TEST VEHICLE INFORMATION

Vehicle Model Year & Make : 1994 Model Toyota
 Vehicle Model & Body Style : PREVIA 1BOX

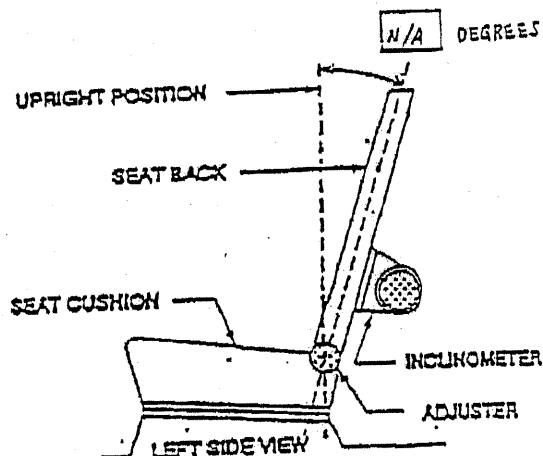
1. NOMINAL DESIGN RIDING POSITION

(1) Driver's Seat:

See section 6 "Designated Seat Back Position"
 of Attachment II.

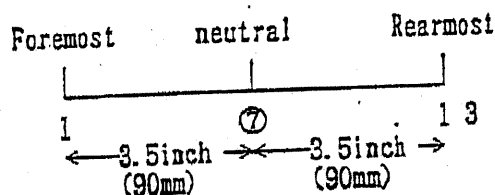
(2) Passenger's Seat:

See section 6 "Designated Seat Back Position"
 of Attachment II.

2. SEAT FORE & AFT POSITIONS

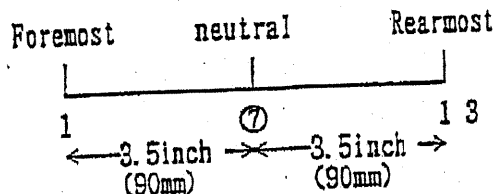
(1) Positioning of the driver's seat:

Move to the seventh notch
 rearward from the foremost position.
 (See section 5 of Attachment II
 in detail.)



(2) Positioning of the passenger's seat:

Move to the seventh notch
 rearward from the foremost position.
 (See section 5 of Attachment II
 in detail.)



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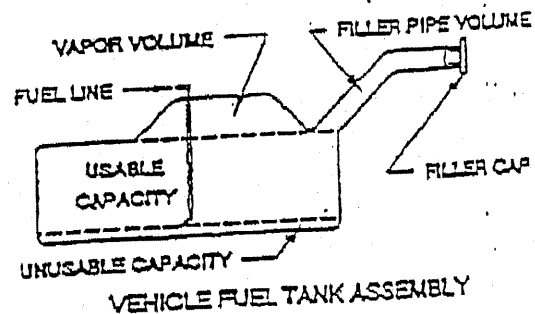
3. FUEL TANK CAPACITY DATA

3.1

- A. "Usable Capacity" of standard equipment fuel tank = 19.81 gallons.
- B. "Usable Capacity" of optional equipment fuel tank = N/A.
- C. "Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 18.81 gallons.

Operational Instructions*

None.



3.2 Amount of Stoddard solvent added to vehicle for certification test = 18.81 gallons.

3.3 Is vehicle equipped with electric fuel pump? (X) YES () NO
If-YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

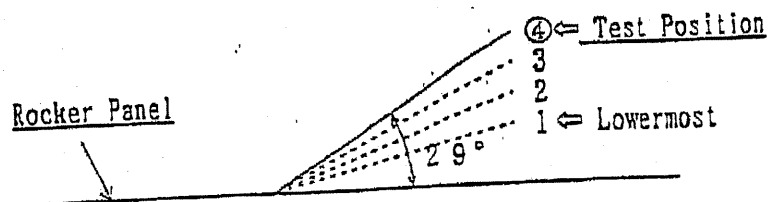
The electric fuel pump operates only during the engine is running.

4. STEERING COLUMN ADJUSTMENTS

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center. -

Operational Instructions:

Tilt to the fourth notch upward from the lowermost position.
(See section 8 of Attachment 11.)



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