

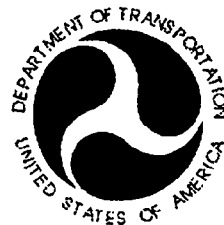
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Report Numbers: 208-TRC-97-001
212-TRC-97-001
301-TRC-97-001

Vehicle Safety Compliance Testing
for Occupant Crash Protection,
Windshield Retention, Windshield Zone Intrusion,
and Fuel System Integrity

Ford Motor Company
1997 Ford Expedition
Multi-Purpose Passenger Vehicle
NHTSA Number: CV0211
TRC Test Number: 961010

Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319



October 29, 1996

Final Report

Prepared For:
U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Vehicle Safety Compliance (NEF-30)
400 Seventh Street, S.W., Room No. 6115
Washington, DC 20590

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15. Supplemental Notes			
16. Abstract <p>A 30 mph flat frontal barrier impact test was conducted on a 1997 Ford Expedition multi-purpose passenger vehicle, NHTSA No. CV0211, at Transportation Research Center Inc. on October 10, 1996. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards (FMVSS): 208, "Occupant Crash Protection"; 212, "Windshield Retention"; 219 (partial), "Windshield Zone Intrusion"; and 301, "Fuel System Integrity." The barrier impact velocity was 29.3 mph. The vehicle's maximum static crush was 22.4 inches. The ambient temperature was 64° F.</p> <p>The driver's Head Injury Criteria (HIC) was 330. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 42.2 g. The driver's chest deflection was 1.1 inches. The driver's left and right femur maximum axial forces were 1509 pounds and 1957 pounds, respectively.</p> <p>The passenger's HIC was 516. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.7 g. The passenger's chest deflection was 0.5 inch. The passenger's left and right femur maximum axial forces were 1442 pounds and 1606 pounds, respectively.</p>			
17. Key Words Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Retention" FMVSS 219 (partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"		18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division Nassif Building, Room 5108 400 Seventh Street, S.W. Washington, DC 0590	
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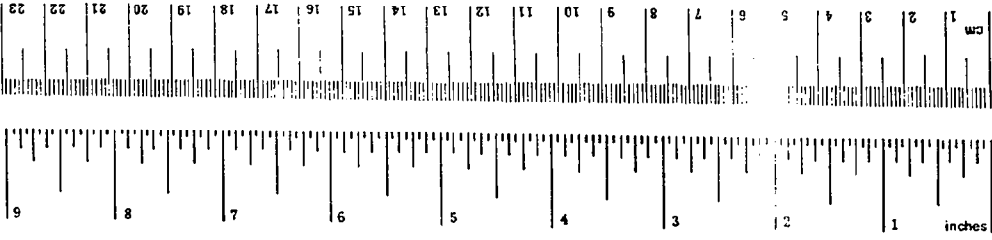
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	meters	m
yd	yards	0.9	kilometers	km
mi	miles	1.6		
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³

TEMPERATURE (exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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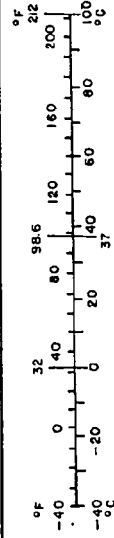


Approximate Conversions from Metric Measures

When You Know	Multiply by	To Find	Symbol
LENGTH			
millimeters	0.04	inches	in
centimeters	0.4	inches	in
meters	3.3	feet	ft
meters	1.1	yards	yd
kilometers	0.6	miles	mi
AREA			
square centimeters	0.16	square inches	in ²
square meters	1.2	square yards	yd ²
square kilometers	0.4	square miles	mi ²
hectares (10,000 m ²)	2.5	acres	
MASS (weight)			
grams	0.035	ounces	oz
kilograms	2.2	pounds	lb
tonnes (1000 kg)	1.1	short tons	
VOLUME			
milliliters	0.03	fluid ounces	fl oz
liters	2.1	pints	pt
liters	1.06	quarts	qt
liters	0.26	gallons	gal
cubic meters	35	cubic feet	ft ³
cubic meters	1.3	cubic yards	yd ³

TEMPERATURE (exact)

°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F
----	---------------------	-------------------	------------------------	----



* 1 in = 2.54 exactly. For other exact conversions and more detailed tables, see NIS Misc. Publ. 286, Units of Weights and Measures, Price 92.25, SD Catalog No. C-13-10200.

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Section 1.0

Purpose and Test Procedure

Purpose

This 30 mph flat frontal barrier impact test is part of the Federal Motor Vehicle Safety Standards (FMVSS) 208, 212, 219 (partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center Inc. (TRC) under Contract No. DTNH22-93-D-01089. The purpose of this test was to determine if the subject vehicle, a 1997 Ford Expedition multi-purpose passenger vehicle, NHTSA No. CV0211, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," in the flat frontal barrier impact mode.

Test Procedure

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-09. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations and one (1) accelerometer to measure vertical axis acceleration. The vehicle's specified impact velocity range was 28.9 to 29.9 mph. The vehicle impacted a flat frontal barrier.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendix B of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations; chest deflection potentiometers; left and right femur load cells to measure axial forces; and upper and lower tibia load cells to measure forces and moments.

The forty-six (46) data channels were digitally sampled at 12,500 samples per second and processed per Sections 11.13 through 11.15 of the Laboratory Test Procedure.

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

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 208, 212, 219 (partial) and 301 data are presented in Section 3.0. The vehicle, occupant, and camera 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 manufacturer's vehicle information.

Section 2.0

Frontal Barrier Impact Test Summary

Test Results Summary

This flat frontal barrier test was conducted at TRC on October 10, 1996.

The test vehicle, a 1997 Ford Expedition multi-purpose passenger vehicle, NHTSA No. CV0211, appeared to comply with the performance requirements of FMVSS 208, 212, 219 (partial), and 301 in the flat frontal barrier impact mode. The Head Injury Criteria (HIC) calculations were less than 1000, the chest resultant accelerations did not exceed 60 g's, the chest deflections did not exceed 3.0 inches, and the compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 E dummies seated in the front outboard designated seating positions. The vehicle's restraint system met the applicable comfort and convenience requirements. The windshield periphery retention was 100 percent. There was no penetration into any portion of the windshield. No fluid spilled from the vehicle's fuel system following the impact or during the static rollover test.

The test vehicle was equipped with airbags at the driver's and right front passenger's seating positions. The vehicle's test weight was 5540 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 22.4 inches.

The driver's HIC was 330. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 42.2 g. The driver's chest deflection was 1.1 inches. The driver's left and right femur maximum compressive forces were 1509 pounds and 1957 pounds, respectively.

The right front passenger's HIC was 516. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.7 g. The passenger's chest deflection was 0.5 inch. The right front passenger's left and right femur maximum compressive forces were 1442 pounds and 1606 pounds, respectively.

There was no loss of windshield periphery retention and no penetration through the windshield. Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

Table 1 Crash Test Summary

NHTSA number:	CV0211
Test type:	Frontal barrier impact
Test date:	10/10/96
Test time:	1607
Ambient temperature at impact area:	64° F
Vehicle year/make/ model/body style:	1997/Ford/Expedition/multi-purpose passenger vehicle
Vehicle test weight:	5540 lb
Impact angle ¹ :	0°
Impact velocity ² :	
Primary:	29.3 mph
Secondary:	29.3 mph
Maximum static crush:	22.4 in
Average rebound:	20.9 in
Number of cameras:	
Real-time:	2
High-speed:	14
Door opening data:	
Left-front:	Easy
Right-front:	Easy

¹ With respect to tow track centerline.

² Speed trap measurement ($\pm .05$ mph accuracy)

Table 1 Crash Test Summary, Cont'd.

Dummies:	<u>Driver #314</u>	<u>Passenger #229</u>
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	Airbag	Airbag
Number of data channels:	19	19
Front seat data:		
Seat track failure:	None	None
Seat back failure:	None	None
Visible dummy contact points:		
Head:	Airbag and head restraint	Airbag, windshield, sunvisor
Chest:	Airbag	Airbag
Abdomen:	None	None
Left knee:	Instrument panel	Instrument panel
Right knee:	Instrument panel	Instrument panel

Table 2 Test Vehicle Information

Vehicle year/make/
model/body style: 1997/Ford/Expedition/multi-purpose passenger vehicle

Color: Red

VIN: 1FMEU176XVLA17318

NHTSA number: CV0211

Engine data:
Placement: Inline/longitudinal
Cylinders: 8
Displacement: 4.6 liters

Transmission data: 4 speed, manual, X automatic, overdrive

Final drive: fwd, X rwd, 4wd

Date vehicle received: 09/12/96

Odometer reading: 101

Dealer's name
and address: Ricart Ford, Inc.
4255 South Hamilton Road
Columbus, OH 43227

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	Yes	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Power door locks	Yes	Other:	Trailer Towing Package

Certification data from vehicle's label:

Vehicle manufactured by: Ford Motor Company

Date of manufacture: 08/96

VIN: 1FMEU176XVLA17318

GVWR: 6750 lb

GAWR: Front: 3000 lb
Rear: 3900 lb

Table 2 Test Vehicle Information, Cont'd.

Size of tires on vehicle: P255/70R16
Spare tire: Full size
Type of front seats: Split bench

Tire & capacity data from vehicle's label:

Recommended tire size: P255/70R16

Recommended cold tire pressure:

Front: 30 psi

Rear: 35 psi

Designated Seating Capacity:

Front NA

Rear NA

Total NA

Vehicle Capacity Weight: NA

Test vehicle attitudes:

Delivered attitude: LF: 34.7 in. RF: 34.6 in LR: 30.5 in RR: 30.5 in

Fully loaded attitude: LF: 34.4 in RF: 34.3 in LR: 30.1 in RR: 30.2 in

Pre-test attitude: LF: 34.1 in RF: 34.2 in LR: 32.8 in RR: 33.1 in

Table 2 Test Vehicle Information, Cont'd.

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

Right front	1218	lb	Right rear	1189	lb
Left front	1291	lb	Left rear	1218	lb
Total front weight	2509	lb	(51.0% of total vehicle weight)		
Total rear weight	2407	lb	(49.0% of total vehicle weight)		
Total delivered weight	4916	lb			

Calculation of test vehicle's target test weight:

RCLW¹ = Rated Cargo and Luggage Weight

GVWR = Gross Vehicle Weight Rating (6750 lb)

UDW = Unloaded Delivered Weight (4916 lb)

VCW = Vehicle Capacity Weight = GVWR - UDW = 6750 - 4916 = 1834 lb

DSC² = Designated Seating Capacity (5)

RCLW¹ = GVWR - UDW - 150 (DSC) = 1084 lb

Target test weight = UDW + RCLW¹ + (Number of Hybrid III dummies x 167 lb per dummy)

Target test weight = 4916 + 300 + 334 = 5550 lb

Weight of test vehicle with required dummies and 290 lb of cargo weight:

Right front	1295	lb	Right rear	1448	lb
Left front	1354	lb	Left rear	1443	lb
Total front weight	2649	lb	(47.8% of total vehicle weight)		
Total rear weight	2891	lb	(52.2% of total vehicle weight)		
Total test weight	5540	lb	(0.2% under target test weight)		

Weight of ballast secured in vehicle: 150 lb

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 61.8 in

Vehicle Wheelbase: 118.5 in

¹ Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's calculated cargo and luggage weight or 300 pounds, whichever is less.

² The designated seating capacity is determined by counting the number of seat belts installed in the vehicle.

Table 3 Post-Impact Data

Test number: 961010
NHTSA number: CV0211
Test date: 10/10/96
Test time: 1607
Test type: Frontal barrier impact
Impact angle: 0°
Ambient temperature at impact area: 64° F
Temperature in occupant compartment: 70° F
Impact velocity:
 Primary: 29.3 mph
 Secondary: 29.3 mph
 Specified range: 28.9 to 29.9 mph

Distance from vehicle to barrier:
 Entering velocity trap: 14.0 in
 Exiting velocity trap: 2.0 in

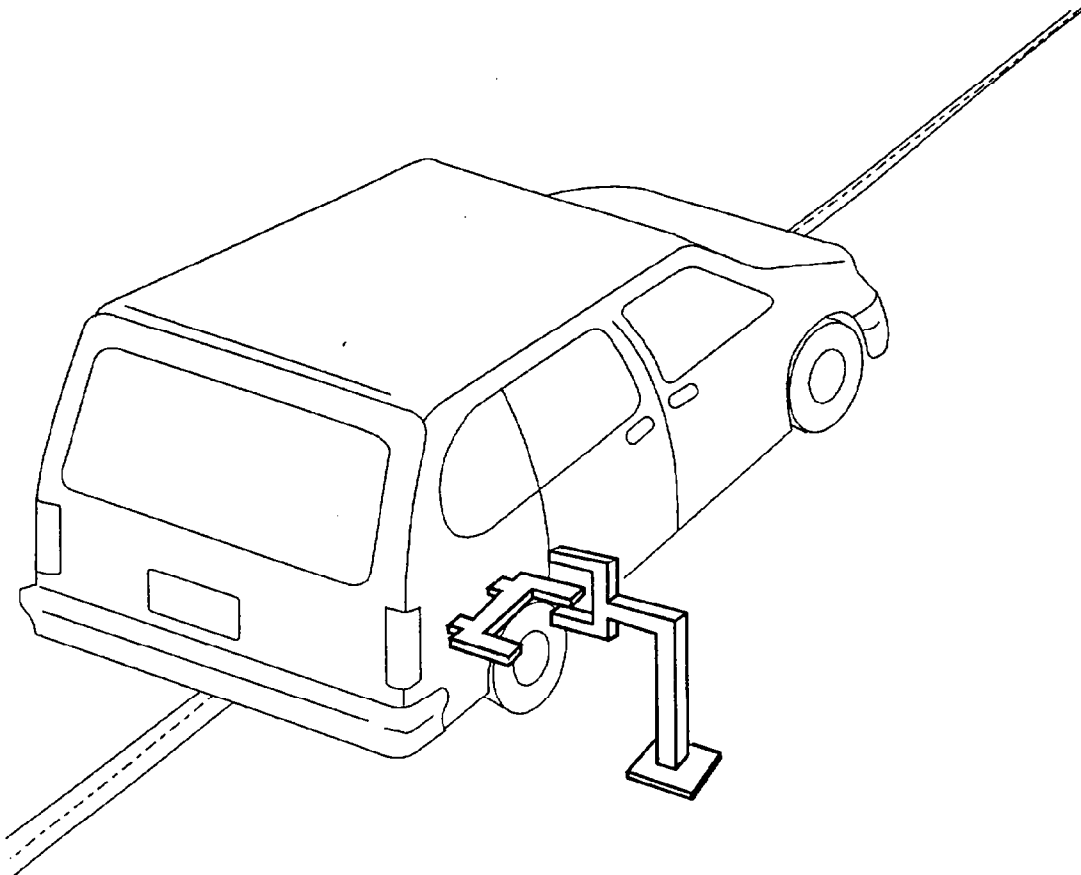
Test vehicle static crush:

Overall length of test vehicle:
 Pre-test: L: 197.8 in C: 204.8 in R: 198.2 in
 Post-test: L: 179.3 in C: 182.8 in R: 182.8 in
 Total crush: L: 18.5 in C: 22.0 in R: 15.4 in
 Average crush: 18.9 in

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:
 Post-test: L: 21.5 in C: 20.3 in R: 21.0 in
 Average rebound: 20.9 in

Figure 1 Impact Velocity Measurement System



The final vane clears the final emitter/receiver pair two inches before impact.
The vanes have a one-foot spacing.

Figure 2 Accident Investigation Division Data for 30 mph Frontal Barrier Impact

NHTSA number: CV0211
 Test date: 10/10/96
 Vehicle year/make/
 model/body style: 1997/Ford/Expedition/multi-purpose passenger vehicle
 Vehicle size category: Special purpose
 VIN: 1FMEU176XVLA17318
 Build date: 08/96
 Test weight: 5540 lb
 Vehicle wheelbase: 118.5 in
 Maximum width: 76.0 in
 Front overhang: 37.8 in

Collision Deformation

Classification (CDC) Code: 12FDEW3

Crush depth
 measurements:

C1:	18.5 in
C2:	20.5 in
C3:	22.1 in
C4:	22.4 in
C5:	19.9 in
C6:	15.4 in

Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged
 region: L: 60.0 in

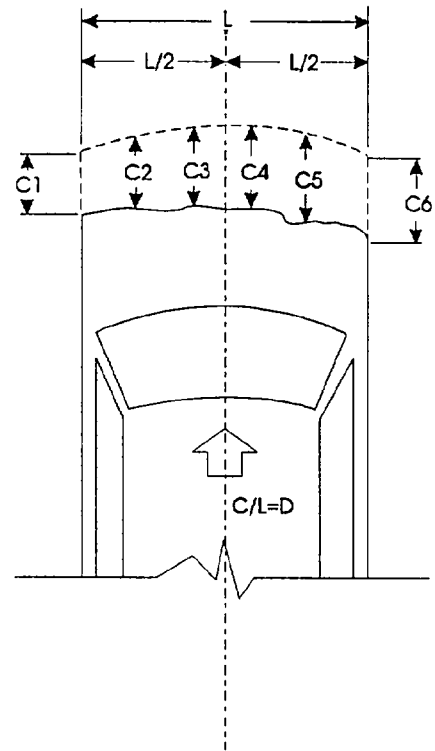


Table 4 Post-test Airbag Data

NHTSA number: CV0211
Test date: 10/10/96
Technician: Markusic
Vehicle year/make/
model/body style: 1997/Ford/Expedition/multi-purpose passenger vehicle

A. Number of airbag vent holes:

Driver: None

Passenger: None

B. Size of airbag vent holes:

Driver: NA

Passenger: NA

C. Total airbag vent area:

Driver: NA

Passenger: NA

D. Deflated airbag length and width dimensions or, if round, diameter

Driver: Length NA

Width NA

Diameter 23.0 in

Passenger: Length: 34.0 in

Width: 27.0 in

Diameter: NA

Table 4 Post-test Airbag Data, Cont'd.

E. Is the airbag tethered?

Driver: Yes

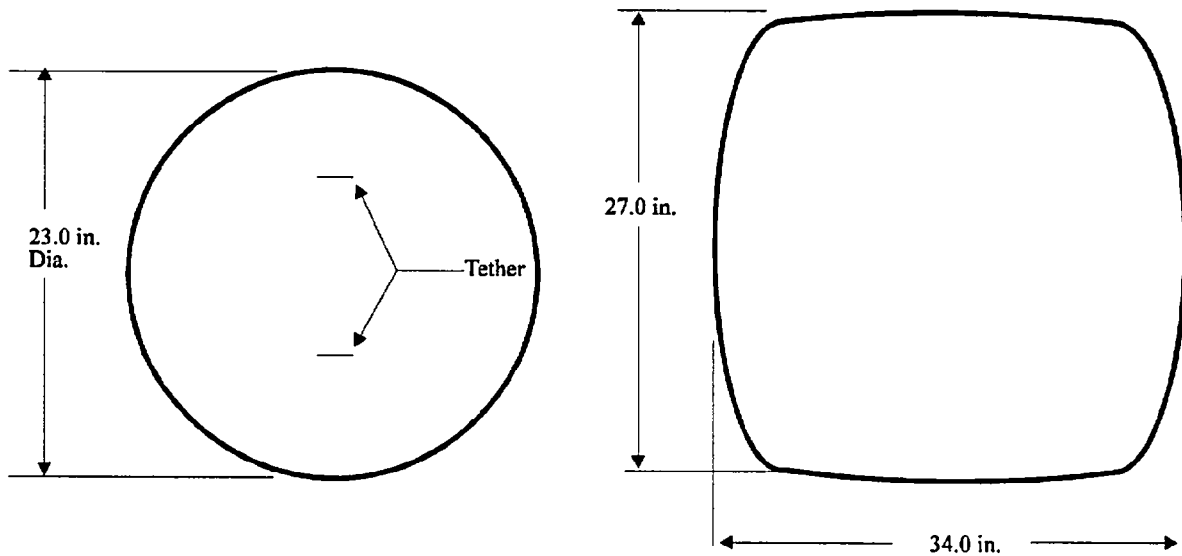
If yes, record length of tether: 2 tethers, 10.5 inches each

Passenger: No

If yes, record length of tether: NA

Driver's airbag:

Passenger's airbag:



F. Airbag and gas generator part numbers and manufacturer's names.

Driver: Manufacturer: NA

Airbag: 101672R

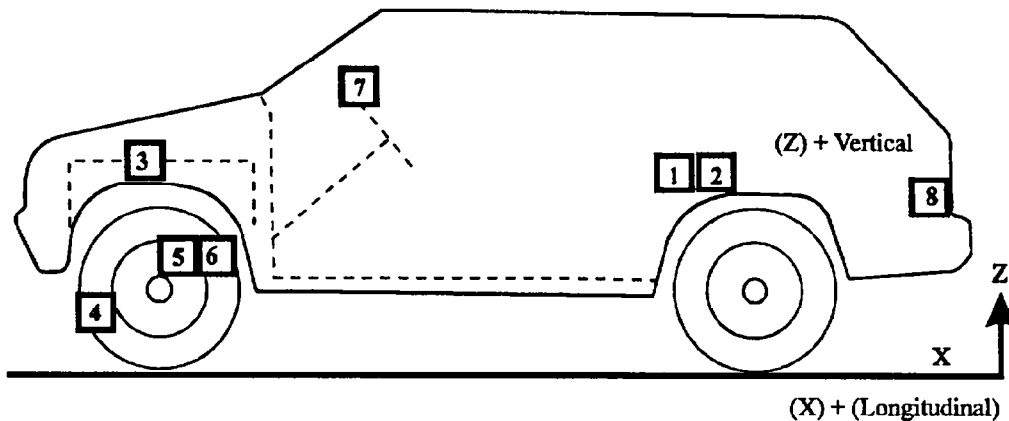
Inflator: 1ZMS207J10114

Passenger: Manufacturer: NA

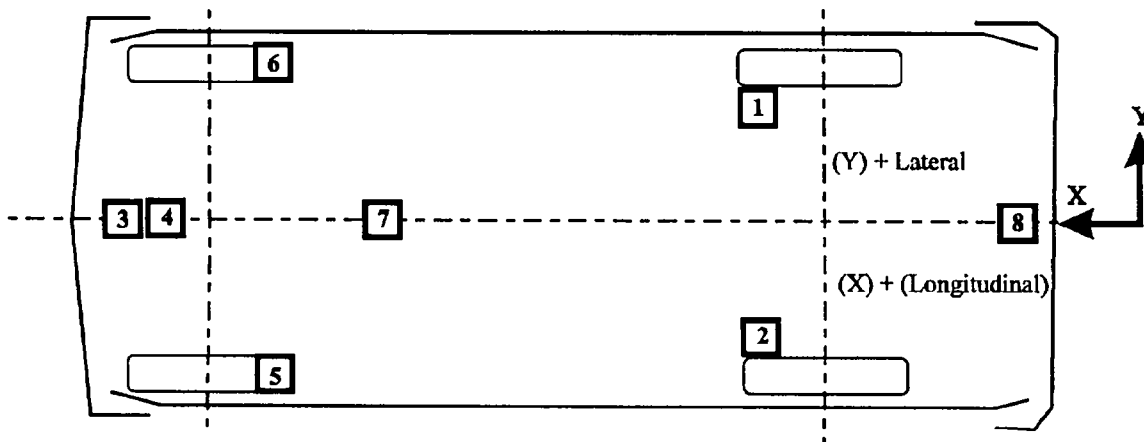
Airbag: F65B 15044A74 BCAYCO R62292090

Inflator: NA

Figure 3 Vehicle Accelerometer Placement



Side View



Bottom View

Table 5 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 961010	X			Y			Z			POSITIVE DIRECTION	NEGATIVE DIRECTION
No. LOCATION											
1 LEFT REAR SEAT CROSSHEBER LONGITUDINAL	PRE	76.3 in	28.2 in	23.0 in							
	POST	76.3 in	28.2 in	22.2 in	1.2 g	@ 153.8 ms	23.1 g	@ 60.7 ms			
2 RIGHT REAR SEAT CROSSHEBER LONGITUDINAL	PRE	77.6 in	-28.2 in	23.0 in							
	POST	77.6 in	-28.2 in	22.2 in	1.7 g	@ 143.0 ms	24.0 g	@ 65.3 ms			
3 ENGINE TOP LONGITUDINAL	PRE	163.6 in	-13.0 in	35.7 in							
	POST	164.2 in	-12.5 in	40.3 in	7.3 g	@ 78.2 ms	55.6 g	@ 55.0 ms			
4 ENGINE BOTTON LONGITUDINAL	PRE	155.7 in	-1.2 in	13.1 in							
	POST	155.1 in	-2.7 in	12.8 in	19.3 g	@ 79.0 ms	38.2 g	@ 56.7 ms			
5 RIGHT BRAKE CALIPER LONGITUDINAL	PRE	160.6 in	-26.1 in	12.8 in							
	POST	158.2 in	-29.8 in	11.3 in	44.1 g	@ 35.8 ms	68.6 g	@ 19.0 ms			
6 LEFT BRAKE CALIPER LONGITUDINAL	PRE	160.6 in	26.1 in	12.8 in							
	POST	157.1 in	29.8 in	11.6 in	28.7 g	@ 34.6 ms	75.7 g	@ 49.2 ms			
7 INSTRUMENT PANEL CENTER LONGITUDINAL	PRE	134.1 in	-2.0 in	53.3 in							
	POST	137.8 in	0.0 in	50.7 in	3.5 g	@ 109.0 ms	36.9 g	@ 75.2 ms			
8 VEHICLE REAR CENTER VERTICAL	PRE	11.5 in	0.0 in	31.6 in							
	POST	11.5 in	0.0 in	34.5 in	1.0 g	@ 199.6 ms	25.8 g	@ 40.5 ms			

REFERENCE: X: + FORWARD FROM REAR BUMPER
 Y: + LEFTWARD FROM VEHICLE CENTERLINE
 Z: + UPWARD FROM GROUND LEVEL

Section 3.0

FMVSS 208, 212, 219 (Partial), and 301 Data

Table 6 Dummy Injury Criteria

Maximum Acceleration

	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	-46.7 g	12.8 g	-24.1 g	48.8 g	-41.1 g	-6.8 g	-14.7 g
Passenger	-108.6 g	14.6 g	-30.4 g	111.2 g	-44.6 g	-4.6 g	-22.0 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	1509 lbf	1957 lbf
Passenger	1442 lbf	1606 lbf

Head Injury Criteria¹

	HIC	Time t ₁	Time t ₂
Driver	330	87.0 ms	123.0 ms
Passenger	516	133.5 ms	145.0 ms

Chest Maximum Resultant Acceleration²

	Acceleration	Time t ₁	Time t ₂
Driver	42.2 g	102.1 ms	105.4 ms
Passenger	43.7 g	92.9 ms	98.2 ms

Maximum Chest Deflection

Driver	1.1 in
Passenger	0.5 in

¹ As defined in FMVSS No. 208

² Defined as equal to or exceeding 0.003 sec. duration

Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy's head and chest were restrained by the airbag. The dummy's head and upper torso rotated rearward as the dummy rebounded into the seat back. The dummy's head contacted the head restraint. The driver dummy came to rest seated in the driver's seat.

Right Front Passenger Dummy

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag, windshield, and sunvisor. The dummy's head and chest were restrained by the passenger's airbag. The dummy rebounded rearward and slightly to the left into the seat back. The dummy came to rest seated in the right front passenger's seat rotated slightly to the left and leaning to the left.

Table 7 FMVSS 208 Seat Belt Comfort and Convenience Test Summary

Front Outboard Designated Seating Positions

NHTSA number: CV0211

Vehicle model year/make/model/body style: 1997/Ford/Expedition/multi-purpose
passenger vehicle

Date of comfort/convenience check: 10/10/96

Technician performing check: Markusic

GVWR: 6750 lb

Automatic seat belts installed in any vehicle, other than a walk-in van-type vehicle which has a gross vehicle weight rating of 10,000 pounds or less, and is manufactured on or after September 1, 1986, shall meet the requirements for convenience hooks, webbing tension-relieving devices, and belt contact force.

Manual seat belts installed for compliance with this standard in front outboard designated seating positions of any vehicle, other than a walk-in van-type vehicle which has a gross vehicle rating of 10,000 pounds or less, and is manufactured after September 1, 1989, shall meet the requirements for belt contact force, plate access, retraction and seat belt guides, and hardware.

Vehicle Equipment:

The vehicle's front outboard seating positions were equipped with manual Type 2 seat belts which must comply with the dynamic test requirements of S5.1; requirements for webbing tension-relieving devices (S7.4.2), belt contact force (S7.4.3), latchplate access (S7.4.4), retraction (S7.4.5), and seat belt guides and hardware (S7.4.6) apply.

Convenience Hooks (S7.4.1):

Not applicable, the vehicle was not equipped with automatic seat belts.

Table 7 FMVSS 208 Seat Belt Comfort and Convenience Test Summary
Front Outboard Designated Seating Positions, Cont'd.

NHTSA number: CV0211

Vehicle model year/make/model/body style: 1997/Ford/Expedition/multi-purpose
passenger vehicle

Date of comfort/convenience check: 10/10/96

Technician performing check: Markusic

GVWR: 6750 lb

Webbing Tension-Relieving Device (S7.4.2):

The front outboard seating position assemblies do not have webbing tension-relieving devices.

Belt Contact Force (S7.4.3):

The belt contact force on the chest of the test dummy is 0.5 pound.

Latchplate Access (S7.4.4):

The seat belt latchplates, in their normal stowed position, are within the reach envelope.

The clearance test block moves unhindered to the latchplate or buckle.

Retraction (S7.4.5):

The seat belt automatically retracts when the seat belt latchplate is released.

The stowed seat belt webbing and hardware are not pinched when the door is closed.

Table 7 FMVSS 208 Seat Belt Comfort and Convenience Test Summary

Front Outboard Designated Seating Positions, Cont'd.

NHTSA number: CV0211

Vehicle model year/make/model/body style: 1997/Ford/Expedition/multi-purpose
passenger vehicle

Date of comfort/convenience check: 10/10/96

Technician performing check: Markusic

GVWR: 6750 lb

Seat Belt Guides and Hardware (S7.4.6):

The seat cushion is not removable.

The seat back does not serve a function other than seating.

The seat is not removable.

The seat is movable but the space formerly occupied by the seat cannot be used for a secondary function.

Note: If the seat or seat cushion is removable or if the seat is movable so the space formerly occupied by the seat can be used for a secondary function, the seat belt guides and hardware requirements do not apply.

The webbing is not designed to pass through the seat cushion or between the cushion and seat back.

The restraint system does not include webbing guides.

The seat belt receptacles were accessible without moving the center arm rest for access.

Table 8 FMVSS 208 Equipment Data

FMVSS 208 Seat Belt Warning System Data

With an occupant in the driver's position and the unbelt in stowed position and ignition switch placed in the "start/on" position, the duration of the reminder light is 6 s. The audible warning signal operates for 120s.

With an occupant in the driver's position and the unbelt in use and the ignition switch placed in the "start/on" position the duration of audible warning signal and reminder light operation is 0 s.

NOTE: the audible warning should not operate.

The visual seat belt warning is the symbol from Table 2 of FMVSS 101.

Table 8 FMVSS 208 Equipment Data, Cont'd.

FMVSS 208 Labeling and Driver's Manual Data

The labels which describe the manufacturer's maintenance or replacement schedule for the crash-deployed occupant protection system were located on the driver's and passenger's sun visors.

The manufacturer's recommended regular airbag maintenance was that no routine maintenance is required.

Appropriate instructions concerning maintenance and/or replacement of this system were provided in the owner's manual on pages 90 and 92.

A description of the functional operation of the system was provided in the owner's manual on pages 90 - 91.

A reference to the instructions and description of the system was included on the label.

An owner's manual was provided.

The owner's manual contained appropriate information concerning maintenance and/or replacement and a description of the functional operation of the systems on pages 90 - 91.

Table 8 FMVSS 208 Equipment Data, Cont'd.

FMVSS 208 Readiness Indicator Data

The vehicle contained a crash-deployed occupant protection system which was not totally mechanical. The readiness indicator was a light located on the lower left corner of the instrument cluster.

The readiness indicator was clearly visible to the driver.

A list of the elements in the occupant restraint system, being monitored by the readiness indicator was provided in the owner's manual on page 92.

FMVSS 208 Rear Outboard Seating Position Seat Belts

All rear outboard seating positions had Type 2 seat belts.

Figure 4 FMVSS 212 Test Data

Details of windshield mounting such as retention method, trim type, etc.:

Plastic trim around outer perimeter and adhesive around inner perimeter.

Clips or brackets used to retain windshield: None

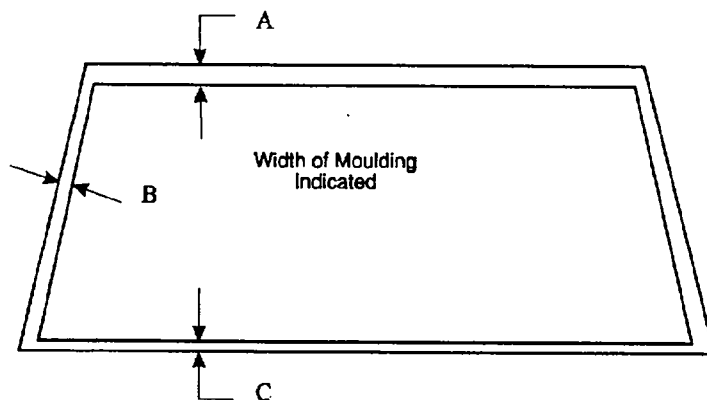
FMVSS 212 requirements: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants.

Windshield periphery measurements:

	Pre-test	Post-test	Percent Retention
Right side	89.7 in	89.7 in	100.0
Left side	89.7 in	89.7 in	100.0
Total	179.4 in	179.4 in	100.0

Pre-test windshield mounting material temperature: 70° F

- A = 1.1 in
- B = 1.0 in
- C = 0.6 in



Front view of windshield¹

Loss of windshield retention lengths: None

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

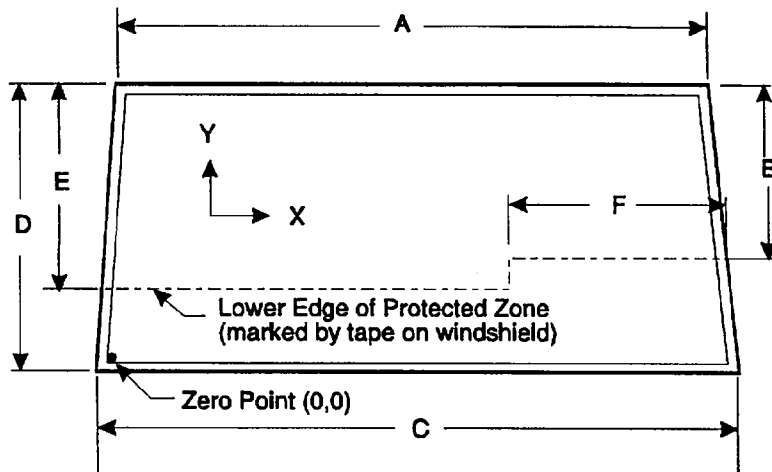
Figure 5 FMVSS 219 Test Data

Protected zone lower edge requirement:

The lower edge of the protected zone is determined by placing a 6.5-inch diameter rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 0.5 inch from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

Windshield measurements:

- A = 55.8 in
- B = 18.5 in
- C = 71.2 in
- D = 29.5 in
- E = 22.1 in
- F = 38.0 in



FRONT VIEW

Method of adhering protected zone template to windshield:

NA

Areas of windshield template penetration greater than 0.25 in:

NA

Coordinates

X	Y
---	---

- 1.
- 2.
- 3.

Areas of windshield penetration, below the protected zone, through the inner surface of the windshield:

None

- 1.
- 2.
- 3.

Table 9 Fuel System Data

Vehicle year/make/ model/body style:	1997/Ford/Expedition/multi-purpose passenger vehicle
NHTSA number:	CV0211
Fuel system capacity:	30.0 gal (from owner's manual)
Usable capacity:	30.0 gal (furnished by COTR)
Test volume range:	27.6 gal to 28.2 gal (92-94% of usable)
Actual test volume:	27.9 gal (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	purple
Type of fuel pump:	electric

The electric fuel pump did not operate with ignition switch "on" and the engine not operating.

Table 10 FMVSS 301 Post-Impact Test Data

NHTSA number: CV0211
Test date: 10/10/96
Vehicle year/make/
model/body style: 1997/Ford/Expedition/multi-purpose passenger vehicle

Test requirements:

Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

Test vehicle impact type:

- Frontal (30 mph)
- Oblique (30 mph) with ___° barrier face first contacting (driver's/passenger's) side
- Rear moving barrier (30 mph)
- Lateral moving barrier (20 mph)

Fuel system fluid spillage measurements:

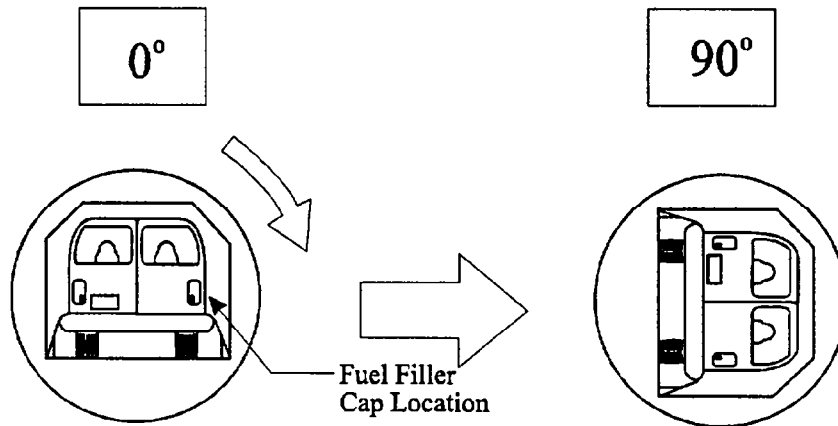
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 oz	1 oz
2. 5-Minute period after vehicle motion ceases	0 oz	5 oz
3. Next 25 minutes after 5-minute period	0 oz	1 oz/1 min

Fuel system fluid spillage location(s): None

Figure 6 FMVSS 301 Static Rollover Test Data

NHTSA number: CV0211

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 7 minutes

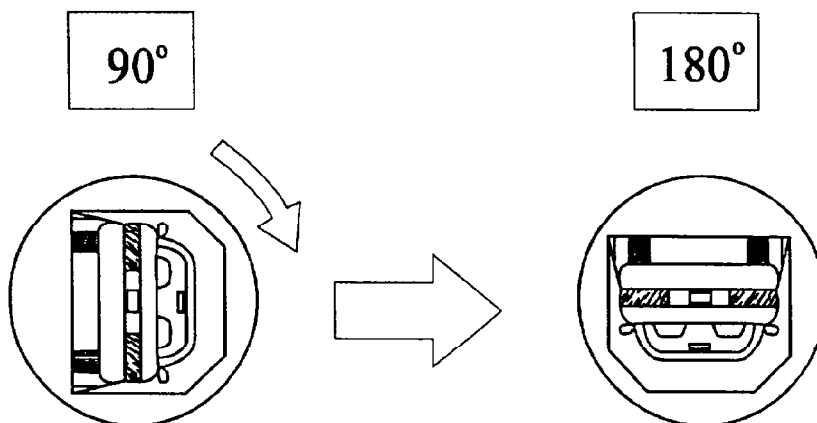
Fuel system fluid spillage measurements:

<u>0° to 90° rotation (fuel filler cap down)</u>	<u>Test Results</u>	<u>Maximum Allowable</u>
1. First five minutes from onset of rotation	0 oz	5 oz
2. Sixth minute from onset of rotation	0 oz	1 oz
3. Seventh minute from onset of rotation	0 oz	1 oz

Fuel system fluid spillage location(s): None

Figure 6 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 14 minutes

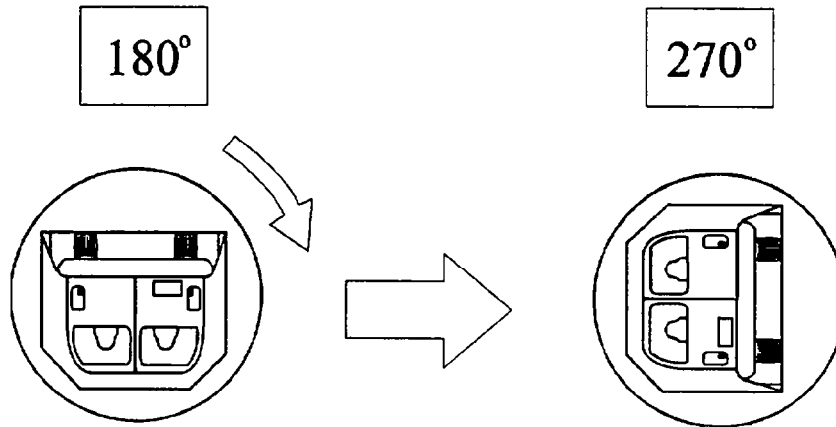
Fuel system fluid spillage measurements:

<u>90° to 180° rotation</u>	<u>Test Results</u>	<u>Maximum Allowable</u>
1. First five minutes from onset of rotation	0 oz	5 oz
2. Sixth minute from onset of rotation	0 oz	1 oz
3. Seventh minute from onset of rotation	0 oz	1 oz

Fuel system fluid spillage location(s): None

Figure 6 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 21 minutes

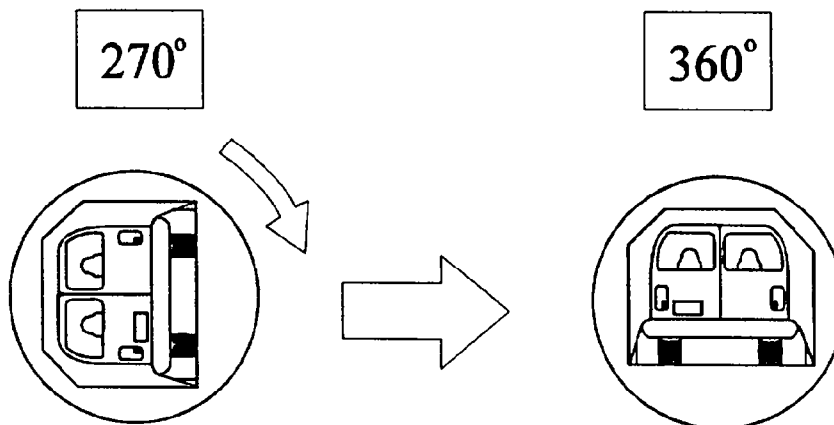
Fuel system fluid spillage measurements:

<u>180 to 270° rotation</u>	<u>Test Results</u>	<u>Maximum Allowable</u>
1. First five minutes from onset of rotation	0 oz	5 oz
2. Sixth minute from onset of rotation	0 oz	1 oz
3. Seventh minute from onset of rotation	0 oz	1 oz

Fuel system fluid spillage location(s): None

Figure 6 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



Static rollover machine rotation time information: (specified range is 1-3 minutes)

Time required for machine to rotate 90° = 2 minutes, 0 seconds
 FMVSS 301 position hold time = 5 minutes, 0 seconds
 Total = 7 minutes, 0 seconds
 Next whole minute interval = 28 minutes

Fuel system fluid spillage measurements:

<u>270° to 360° rotation</u>	<u>Test Results</u>	<u>Maximum Allowable</u>
1. First five minutes from onset of rotation	0 oz	5 oz
2. Sixth minute from onset of rotation	0 oz	1 oz
3. Seventh minute from onset of rotation	0 oz	1 oz

Fuel system fluid spillage location(s): None

Section 4.0

Vehicle, Occupant, and Camera Measurements

Figure 7 Pre-test and Post-test Measurement Points

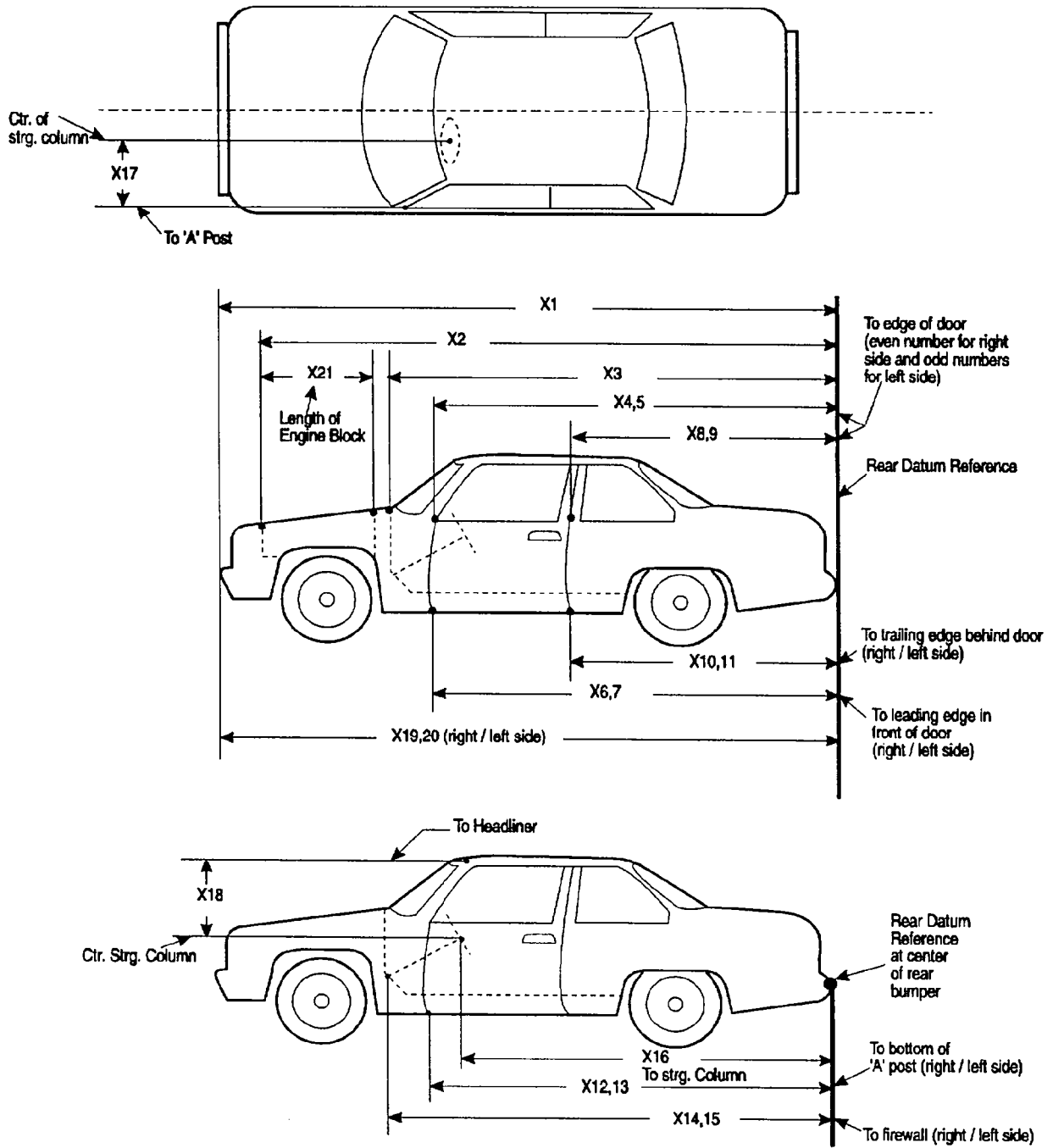


Table 11 Impacted Vehicle Measurements

Vehicle year/make/model/body style: 1997/Ford/Expedition/multi-purpose passenger vehicle

Test Number: 961010

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	204.8 in	182.8 in	22.0 in
X2	Rear surface of vehicle to front of engine block	170.0 in	167.1 in	2.9 in
X3	Rear surface of vehicle to firewall	155.9 in	155.9 in	0.0 in
X4	Rear surface of vehicle to upper leading edge of right door	141.5 in	143.3 in	-1.8 in
X5	Rear surface of vehicle to upper leading edge of left door	140.8 in	141.9 in	-1.1 in
X6	Rear surface of vehicle to lower leading edge of right door	138.9 in	140.0 in	-1.1 in
X7	Rear surface of vehicle to lower leading edge of left door	139.3 in	139.2 in	0.1 in
X8	Rear surface of vehicle to upper trailing edge of right door	96.5 in	98.4 in	-1.9 in
X9	Rear surface of vehicle to upper trailing edge of left door	96.4 in	97.3 in	-0.9 in
X10	Rear surface of vehicle to lower trailing edge of right door	96.9 in	98.0 in	-1.1 in
X11	Rear surface of vehicle to lower trailing edge of left door	97.3 in	97.3 in	0.0 in
X12	Rear surface of vehicle to bottom of "A" post on right side	138.9 in	140.5 in	-1.6 in
X13	Rear surface of vehicle to bottom of "A" post on left side	138.9 in	139.4 in	-0.5 in
X14	Rear surface of vehicle to firewall - right side	155.1 in	155.0 in	0.1 in
X15	Rear surface of vehicle to firewall - left side	154.8 in	154.8 in	0.0 in
X16	Rear surface of vehicle to steering wheel center	120.2 in	126.7 in	-6.5 in
X17	Center of steering column to "A" post	11.2 in	11.7 in	-0.5 in
X18	Center of steering column to headliner	18.7 in	16.5 in	1.8 in
X19	Rear surface of vehicle to right side of front bumper	198.2 in	182.8 in	15.4 in
X20	Rear surface of vehicle to left side of front bumper	197.8 in	179.3 in	18.5 in
X21	Length of engine block	16.0 in	16.0 in	0.0 in

Figure 8 Vehicle Target Locations

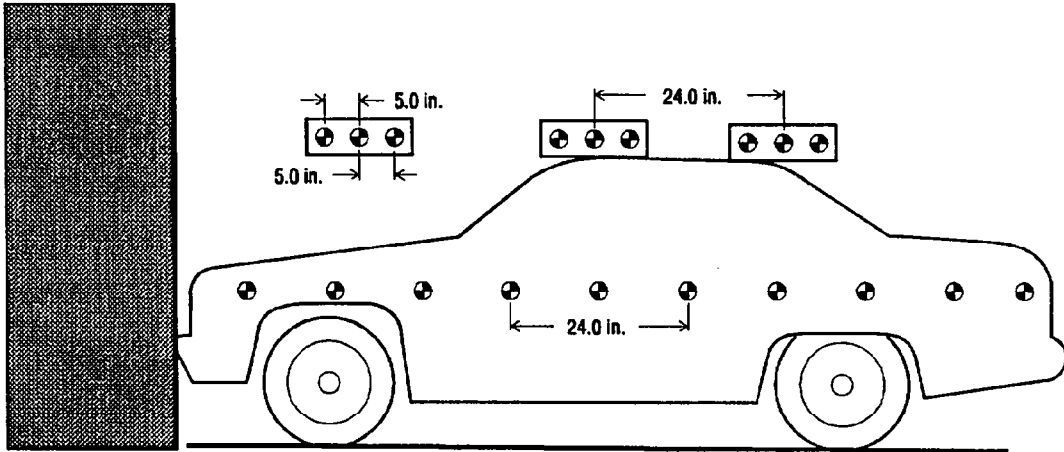
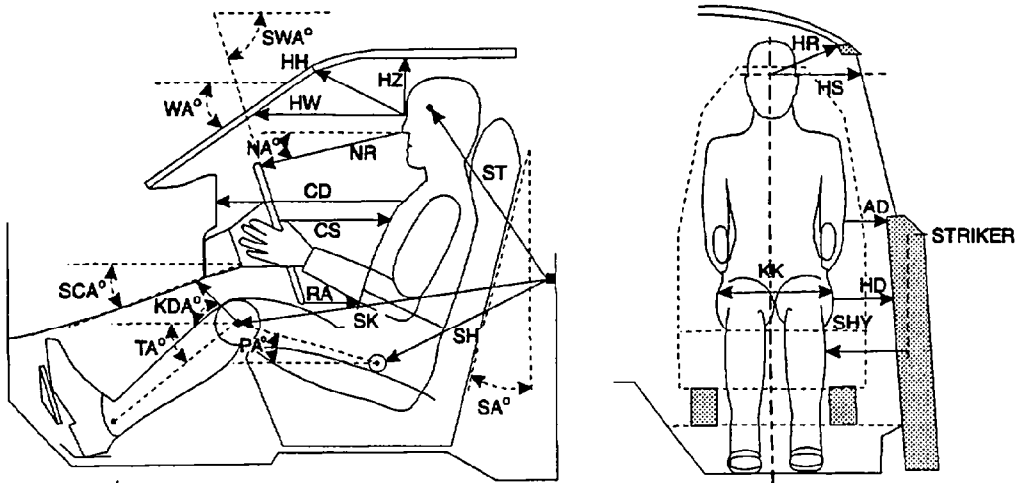
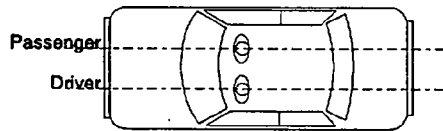


Figure 9 Dummy Measurement Locations for Front Seat Occupants



VERTICAL LONGITUDINAL PLANE



VERTICAL TRANSVERSE PLANE

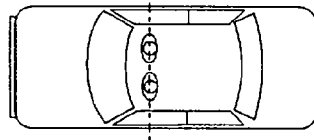


Table 12 Dummy Measurement Data for Front Seat Occupants

<u>Designation</u>	<u>Type of Measurement</u>	<u>Driver (Serial 314)</u>	<u>Passenger (Serial #229)</u>
WA	Windshield angle	32°	NA
SWA	Steering wheel angle	69°	NA
SCA	Steering column angle	21°	NA
SA	Seat back angle	21°	21°
HZ	Head to roof	9.4 in	9.1 in
HH	Head to header	16.2 in	17.0 in
HW	Head to windshield	24.6 in	25.4 in
HR	Head to side header	10.2 in	9.6 in
NR	Nose to rim	15.4 in	NA
NA	Nose to rim angle	10°	NA
CD	Chest to dash	22.6 in	22.5 in
CS	Steering wheel to chest	12.7 in	NA
RA	Rim to abdomen	8.1 in	NA
KDL	Left knee to dash	6.3 in	6.7 in
KDR	Right knee to dash	6.0 in	6.7 in
KDA	Outboard knee to dash angle	28°	22°
PA	Pelvic angle	21°	22°
TA	Tibial angle	44°	53°
KK	Knee to knee	13.9 in	10.7 in
ST ¹	Striker to head	25.3 in	25.4 in
	Striker to head angle	-84°	-82°
SK ¹	Striker to knee	23.6 in	24.9 in
	Striker to knee angle	-4°	-5°
SH ¹	Striker to H-point	8.5 in	9.2 in
	Striker to H-point angle	3°	2°
SHY	Striker to H-point (Y dir.)	9.7 in	9.6 in
HS	Head to side window	13.6 in	13.3 in
HD	H-point to door	6.6 in	6.5 in
AD	Arm to door	5.0 in	4.3 in

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 located above the striker.

Figure 10 Camera Positions

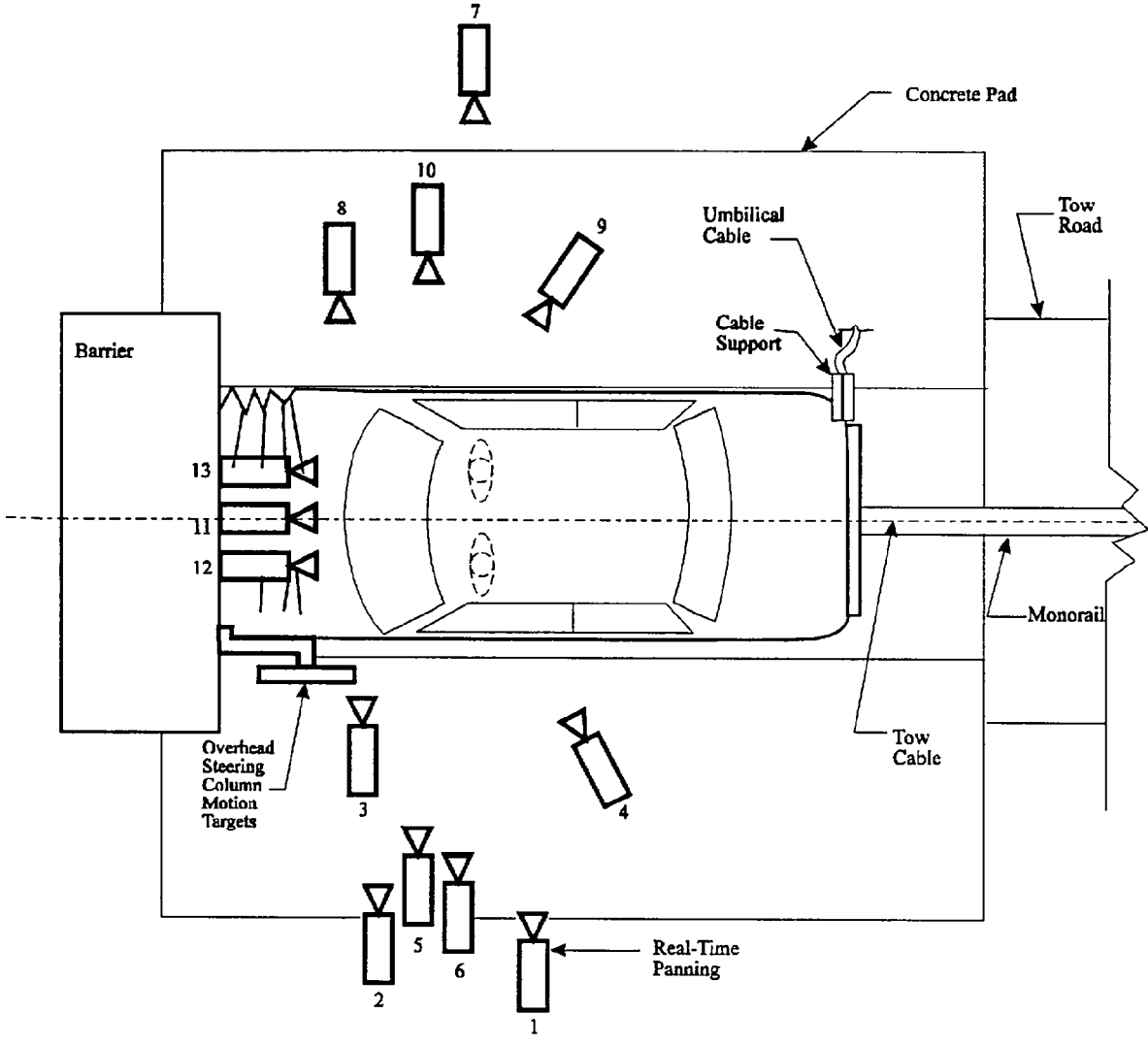


Figure 10 Camera Positions, Cont'd.

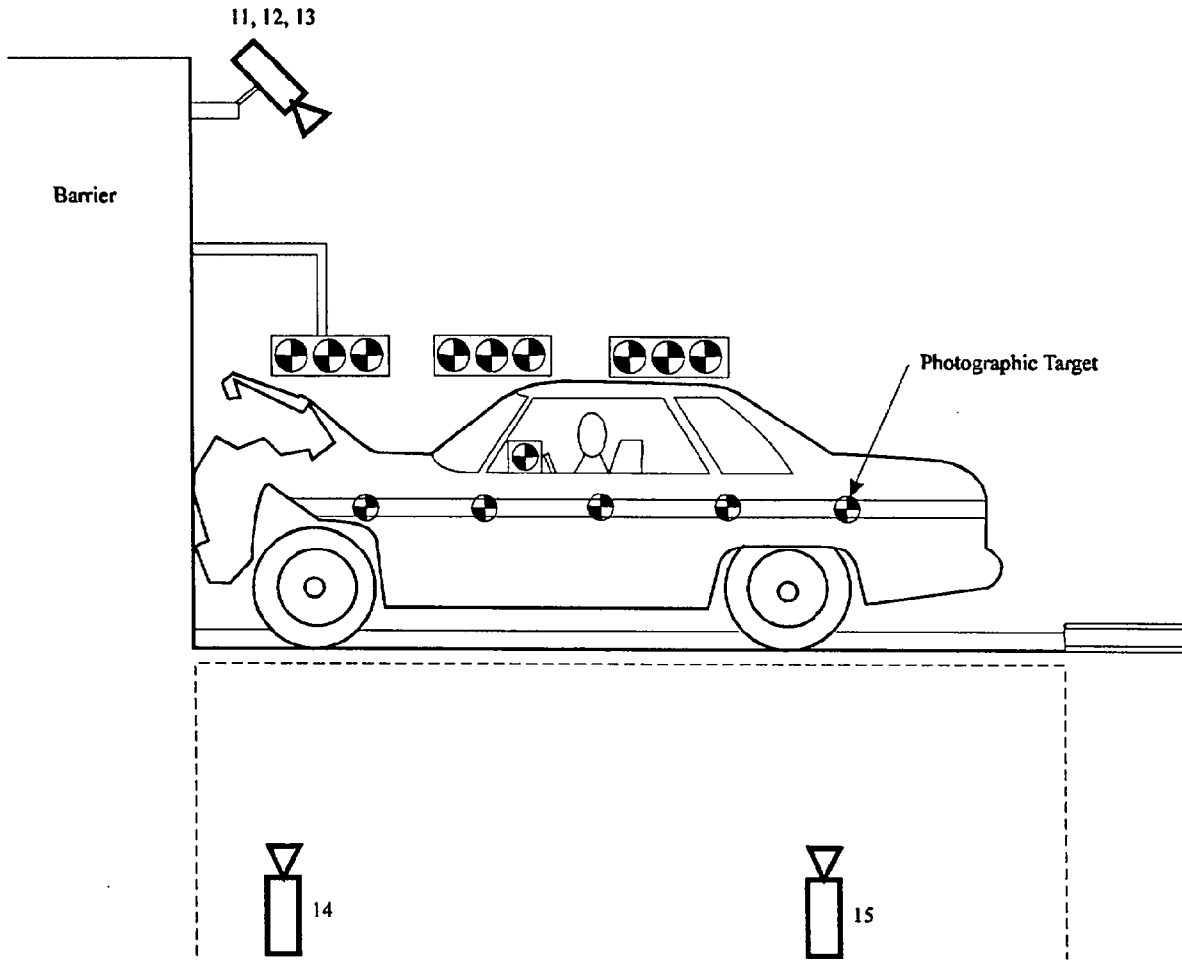


Table 13 Motion Picture Camera Locations

Vehicle year/make/model/body style: 1997/Ford/Expedition/multi-purpose passenger vehicle
 Test number: 961010

Camera Number	View	Camera Positions ¹			Camera Angle ²	Film Plane to Head Target	Camera Lens	Film Speed
		X	Y	Z				
1	Real-time panning	-142.0 in	504.0 in	61.0 in	NA	NA	16 mm	24 frames/s
2	Left vehicle crush	-41.5 in	295.0 in	44.0 in	-4°	286.0 in	25 mm	1010 frames/s
3	Left windshield intrusion	-53.0 in	309.4 in	42.3 in	0°	NA	50 mm	1005 frames/s
4	Driver kinematics	-157.3 in	116.0 in	87.0 in	-27°	93.0 in	25 mm	990 frames/s
5	Steering column motion	-46.0 in	286.0 in	103.0 in	-14°	NA	25 mm	1005 frames/s
6	Steering column motion	-46.0 in	286.0 in	75.1 in	-9°	NA	25 mm	1000 frames/s
7	Right overall	-81.3 in	-266.4 in	37.1 in	-2°	NA	13 mm	1005 frames/s
8	Right windshield intrusion	-38.1 in	-306.1 in	44.0 in	0°	NA	50 mm	1025 frames/s
9	Passenger kinematics	-152.1 in	-116.0 in	87.0 in	-26°	85.0 in	25 mm	1000 frames/s
10	Passenger kinematics	-38.8 in	-293.0 in	45.3 in	-4°	289.0 in	25 mm	1043 frames/s
11	Windshield front view	-6.0 in	0.0 in	88.0 in	-40°	NA	13 mm	998 frames/s
12	Driver - front view	-6.8 in	14.5 in	93.0 in	-50°	NA	17 mm	1000 frames/s
13	Passenger - front view	-4.5 in	-13.8 in	93.0 in	-50°	NA	17 mm	998 frames/s
14	Pit - front position	-50.5 in	0.0 in	-92.4 in	90°	NA	13 mm	1002 frames/s
15	Pit - rear position	-99.3 in	0.0 in	-99.0 in	90°	NA	13 mm	1002 frames/s
16	Real-time documentation	NA	NA	NA	NA	NA	12-120 mm	24 frames/s

¹ +X: Film plane forward of barrier face

+Y: Film plane to left of monorail centerline

+Z: Film plane above ground level

² +Angle: Film plane angled upward from horizontal plane

Appendix A

Photographs



Figure A-1. Pre-test Front View
A-2

961010

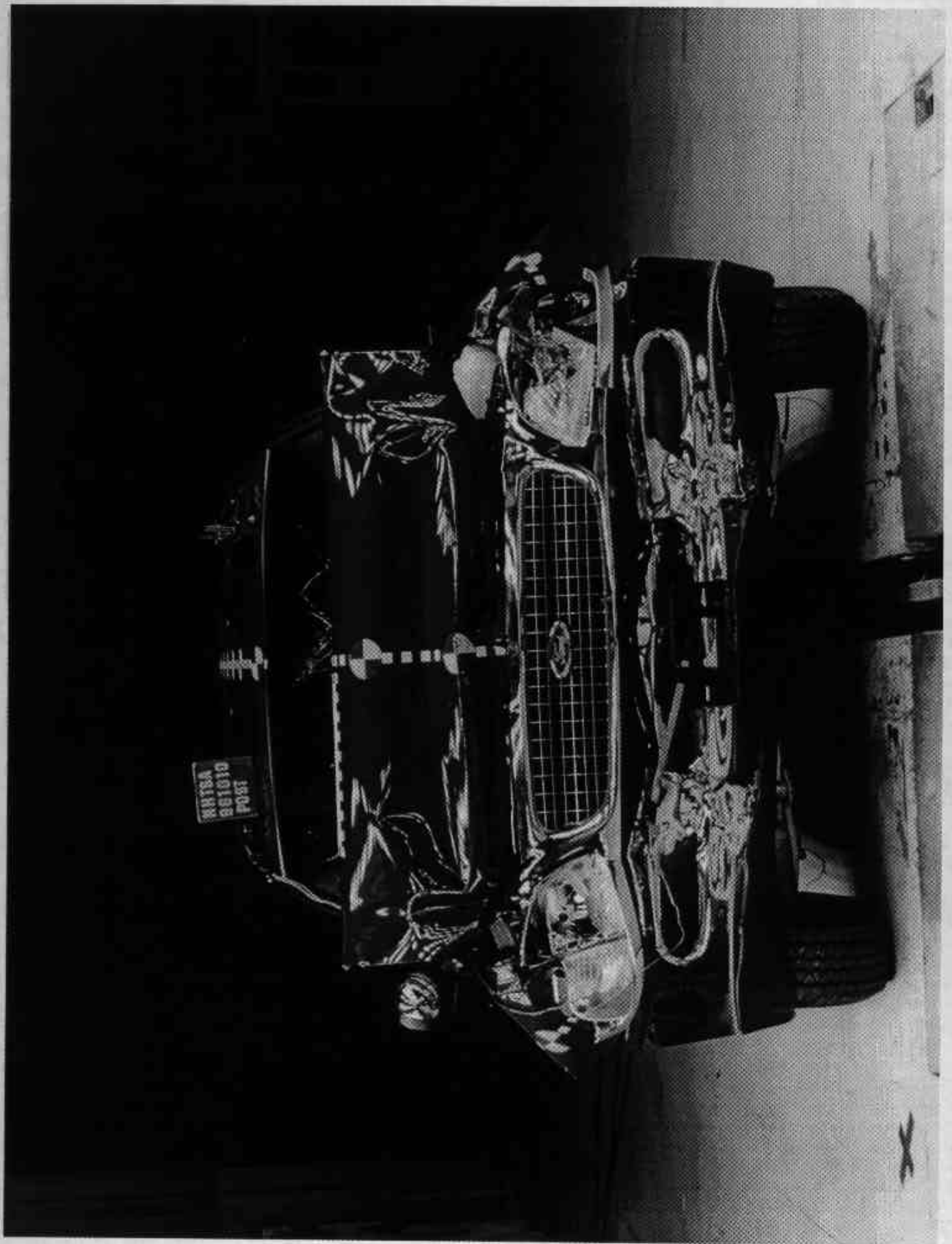


Figure A-2. Post-test Front View

A-3

961010

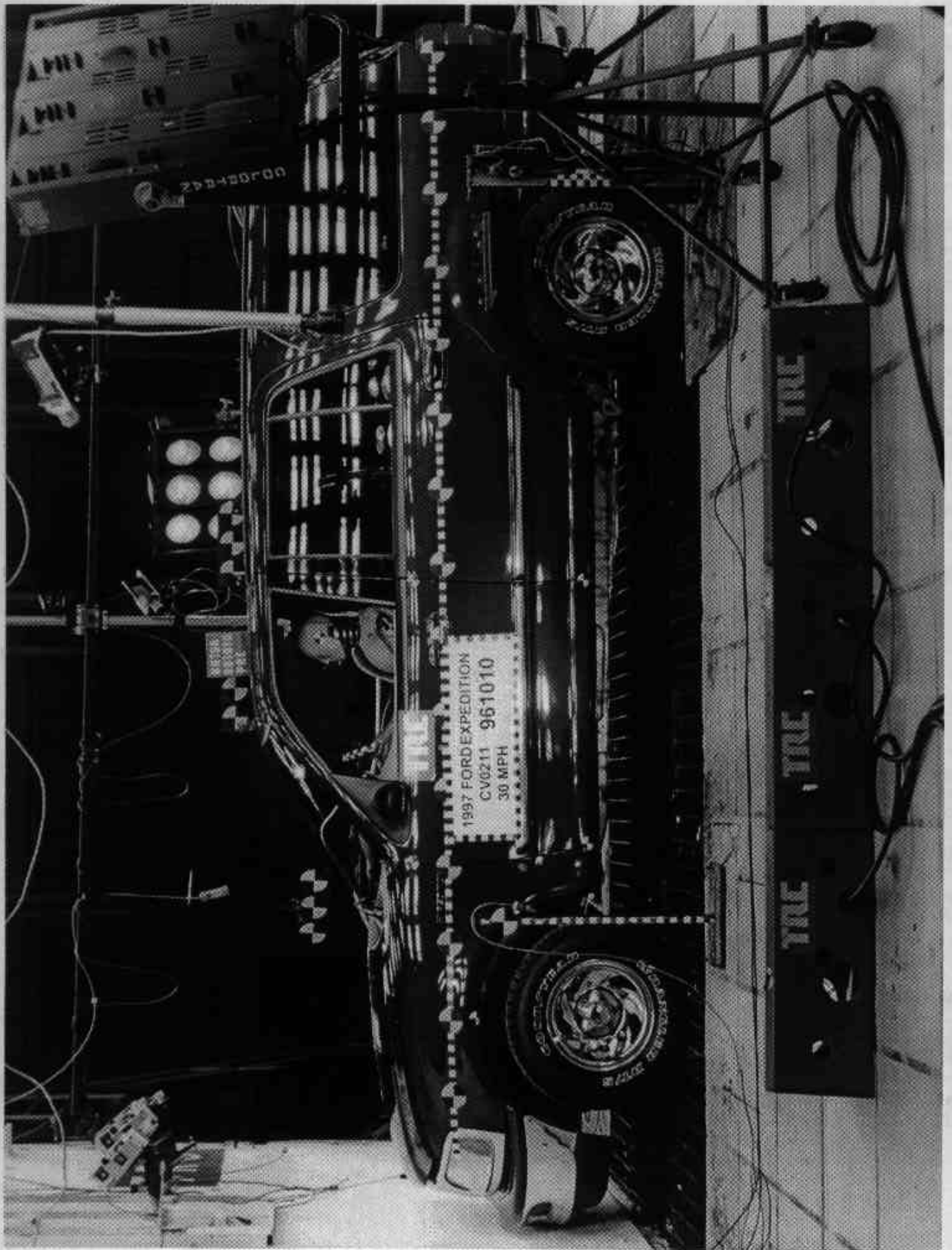


Figure A-3. Pre-test Left Side View

A-4

961010

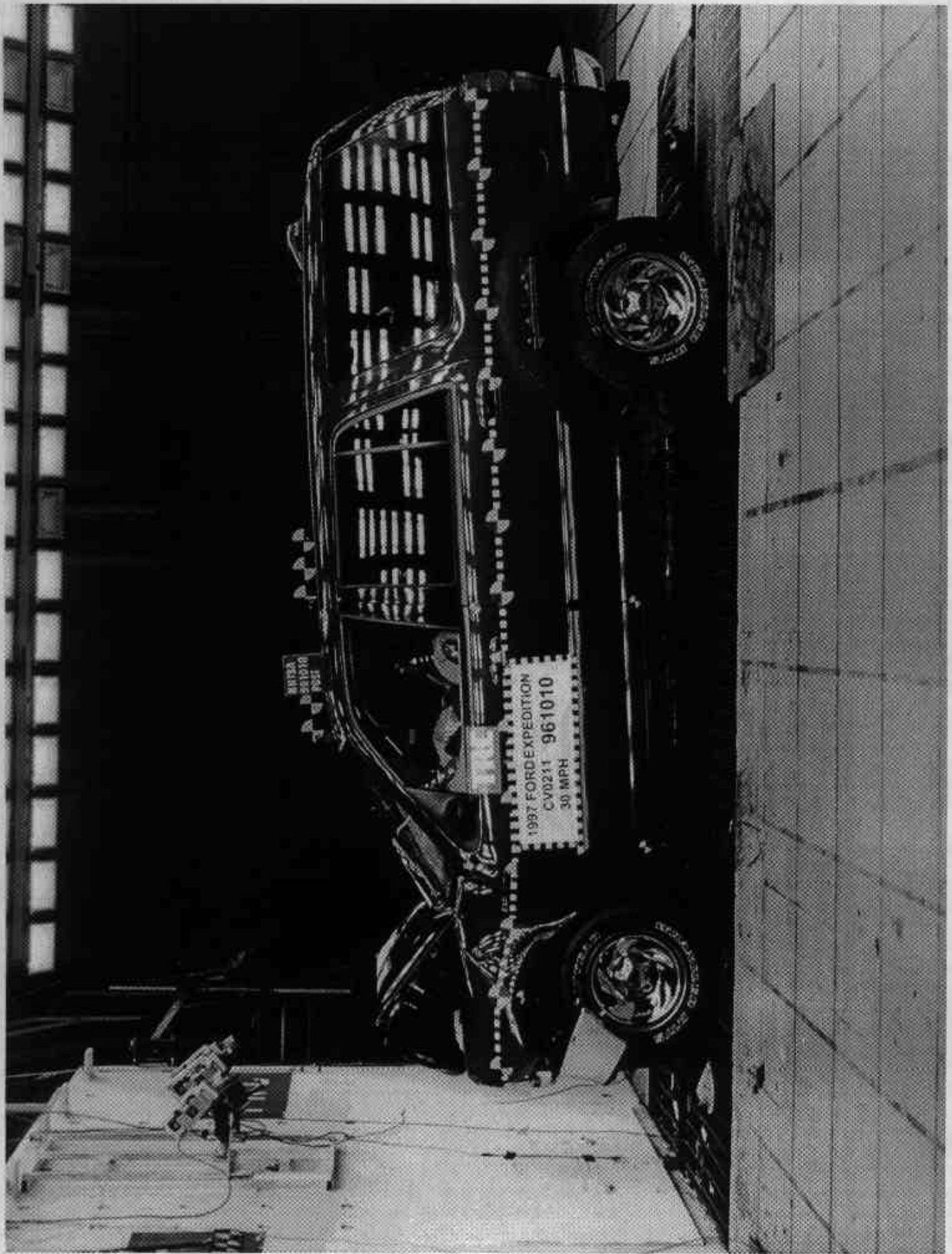


Figure A-4. Post-test Left Side View

A-5

961010

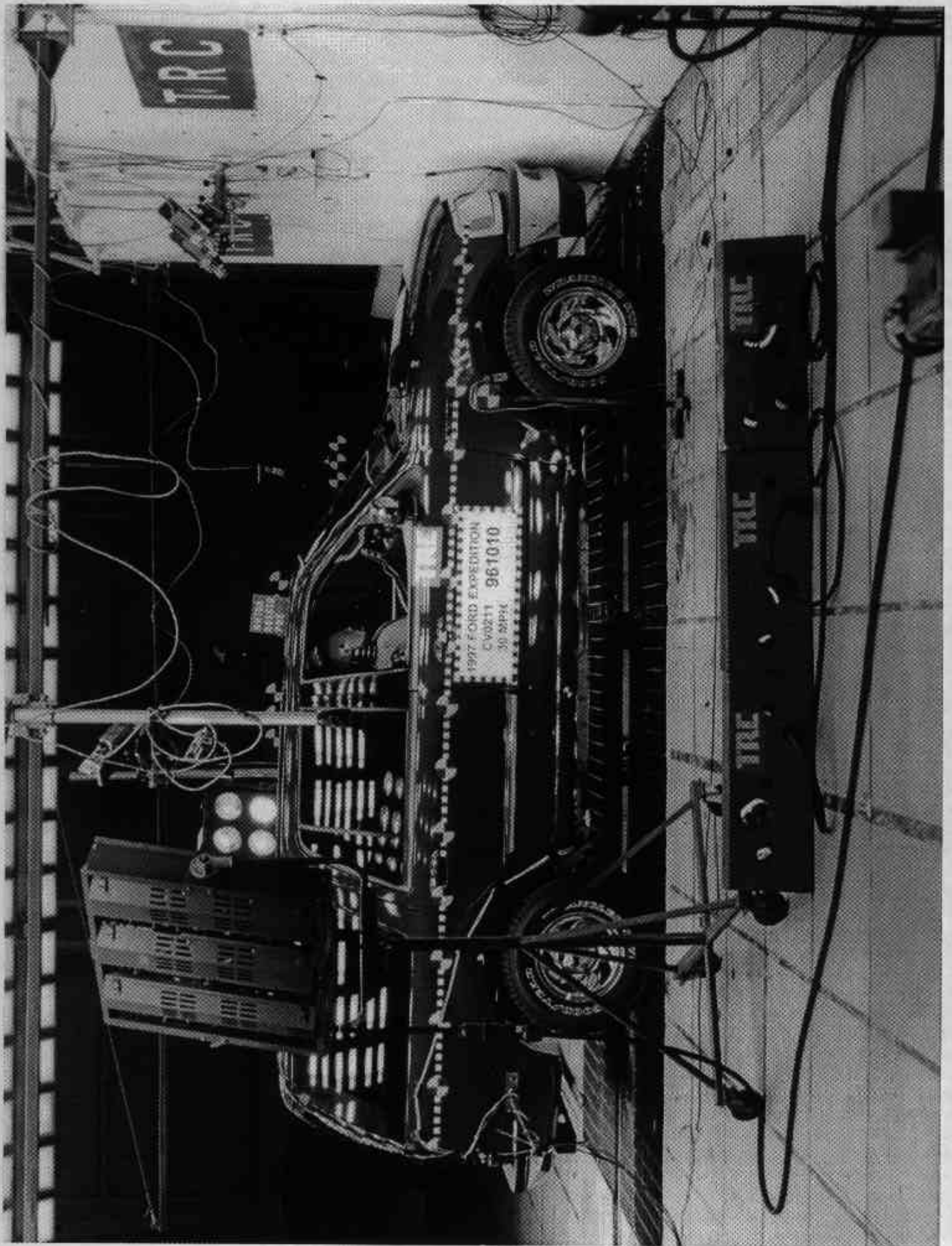


Figure A-5. Pre-test Right Side View

A-6

961010

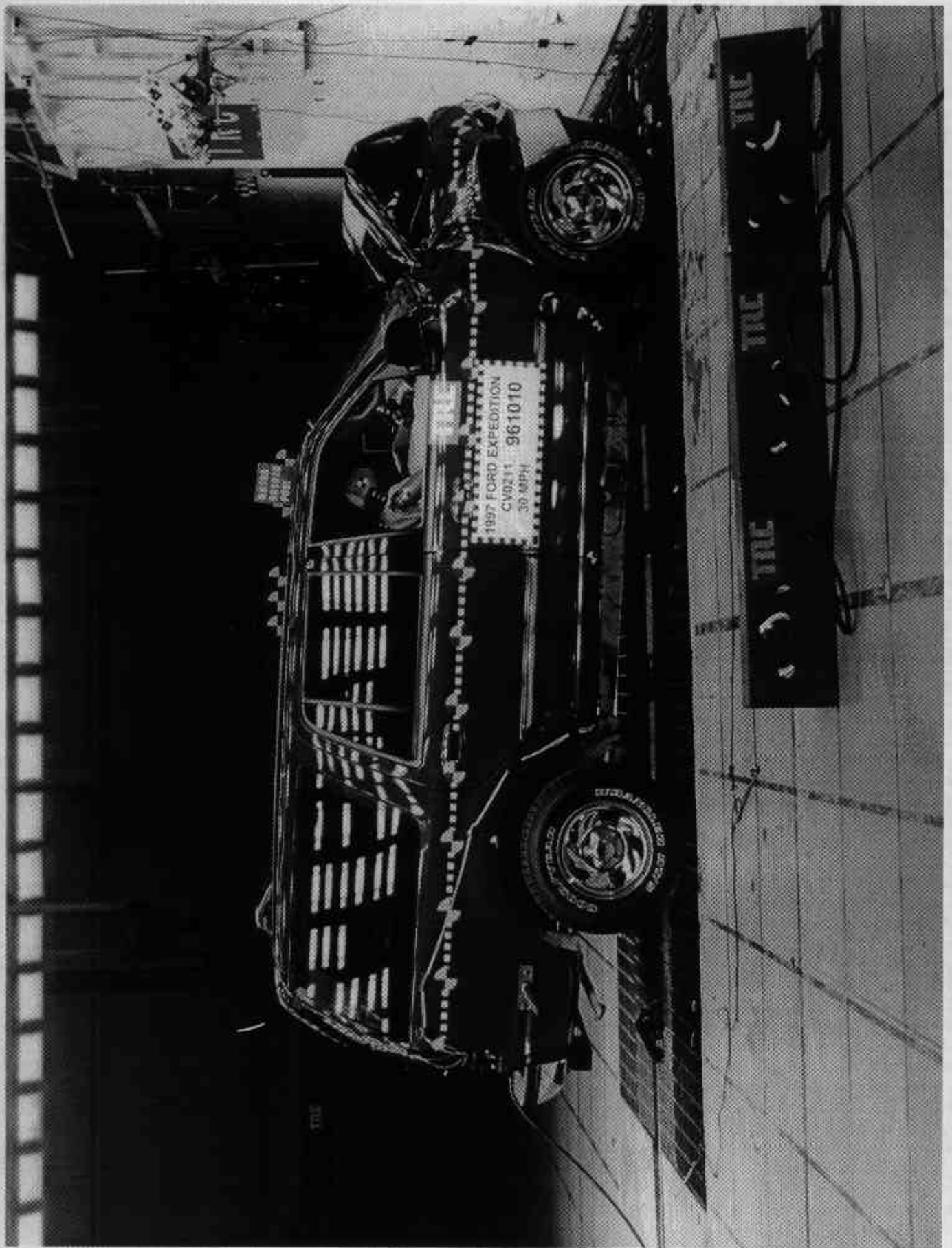


Figure A-6. Post-test Right Side View

A-7

961010

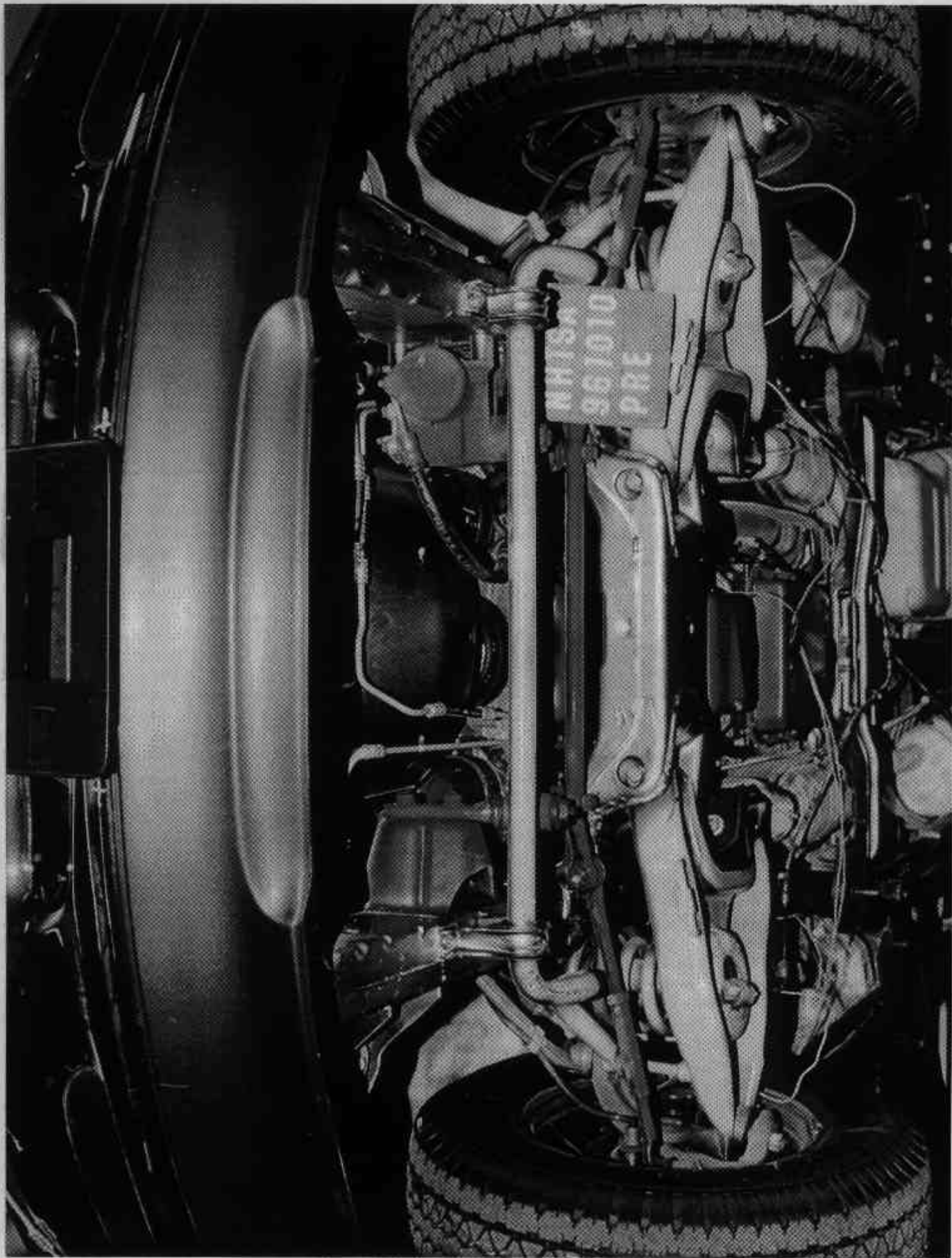


Figure A-7. Pre-test Front Underbody View

A-8

961010

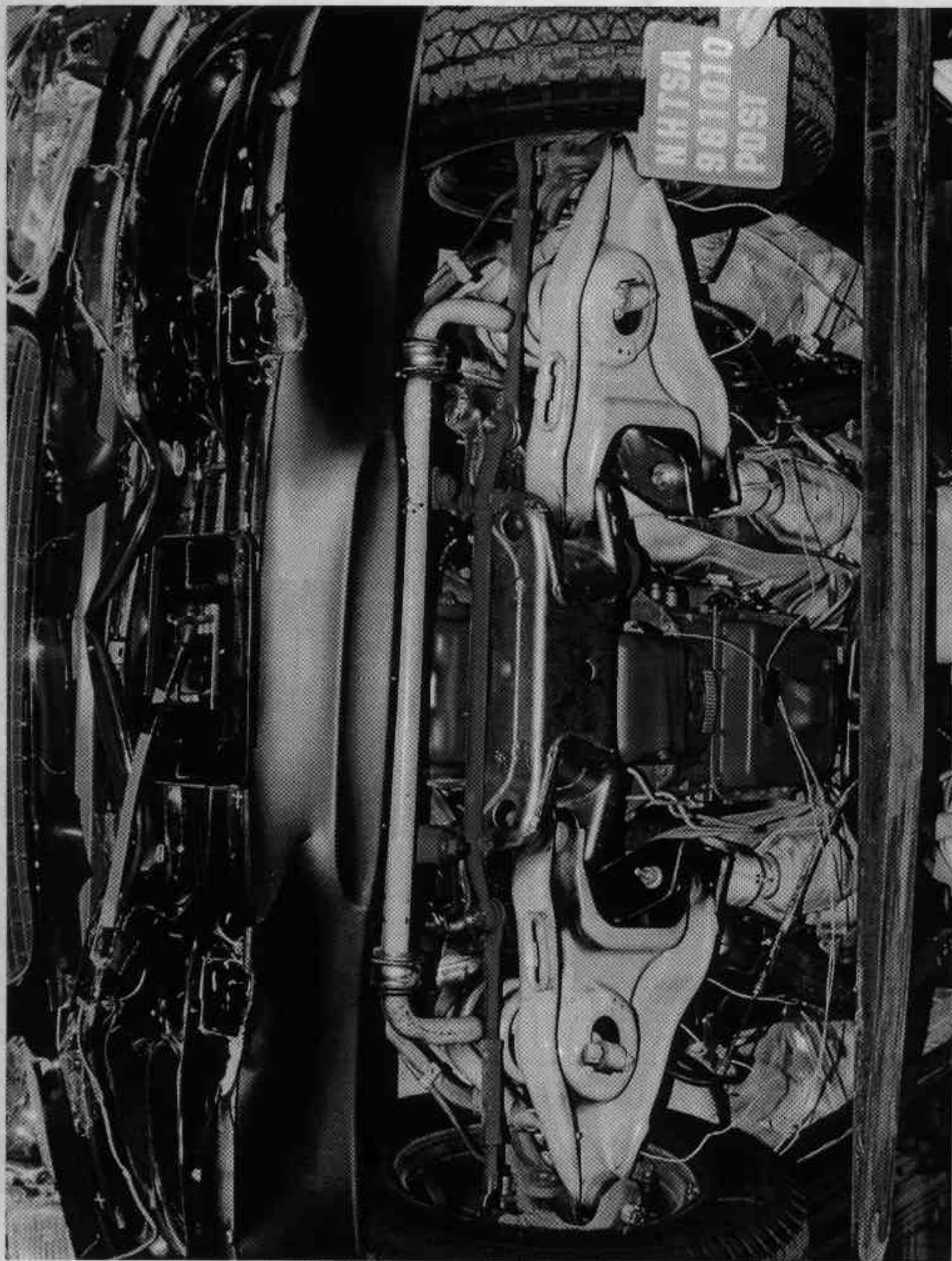


Figure A-8. Post-test Front Underbody View

A-9

961010

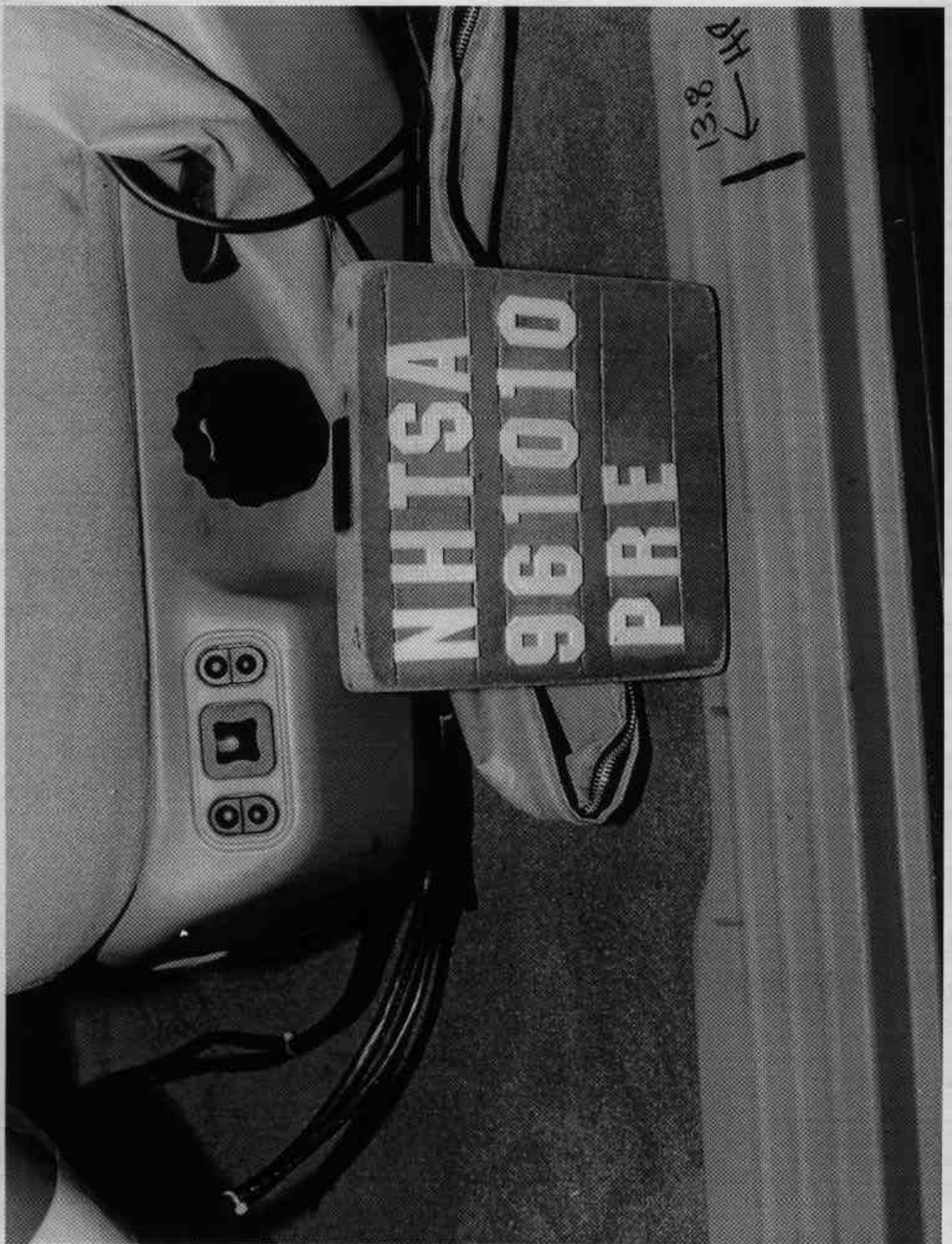


Figure A-9. Pre-test Driver's Seat Location View

A-10

961010



Figure A-10. Pre-test Passenger's Seat Location View

A-11

961010

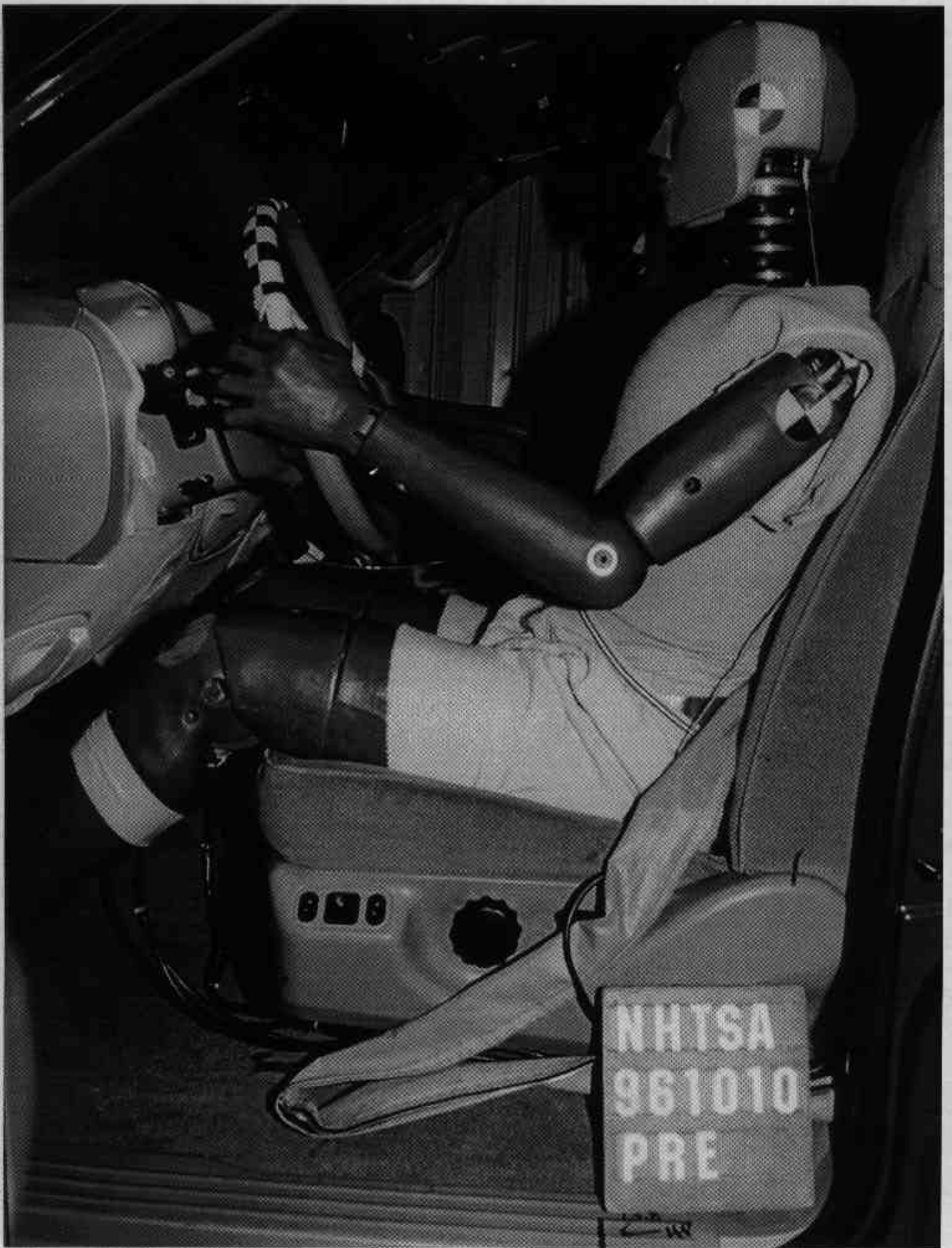


Figure A-11. Pre-test Driver Dummy and Vehicle Interior View

A-12

961010



Figure A-12. Post-test Driver Dummy and Vehicle Interior View

A-13

961010

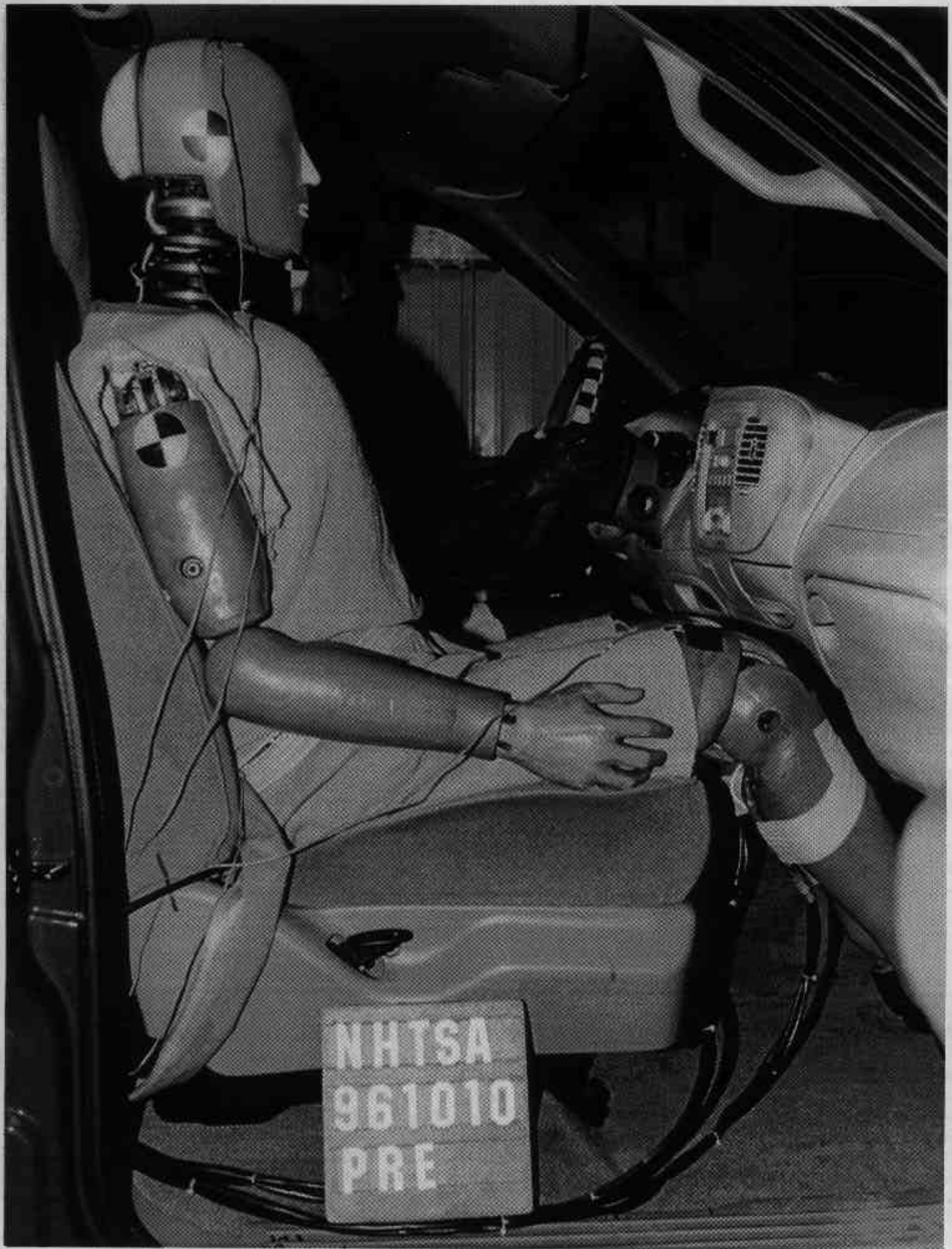


Figure A-13. Pre-test Passenger Dummy and Vehicle Interior View

A-14

961010



Figure A-14. Post-test Passenger Dummy and Vehicle Interior View

A-15

961010



Figure A-15. Post-test Driver Dummy Head Contact - View 1

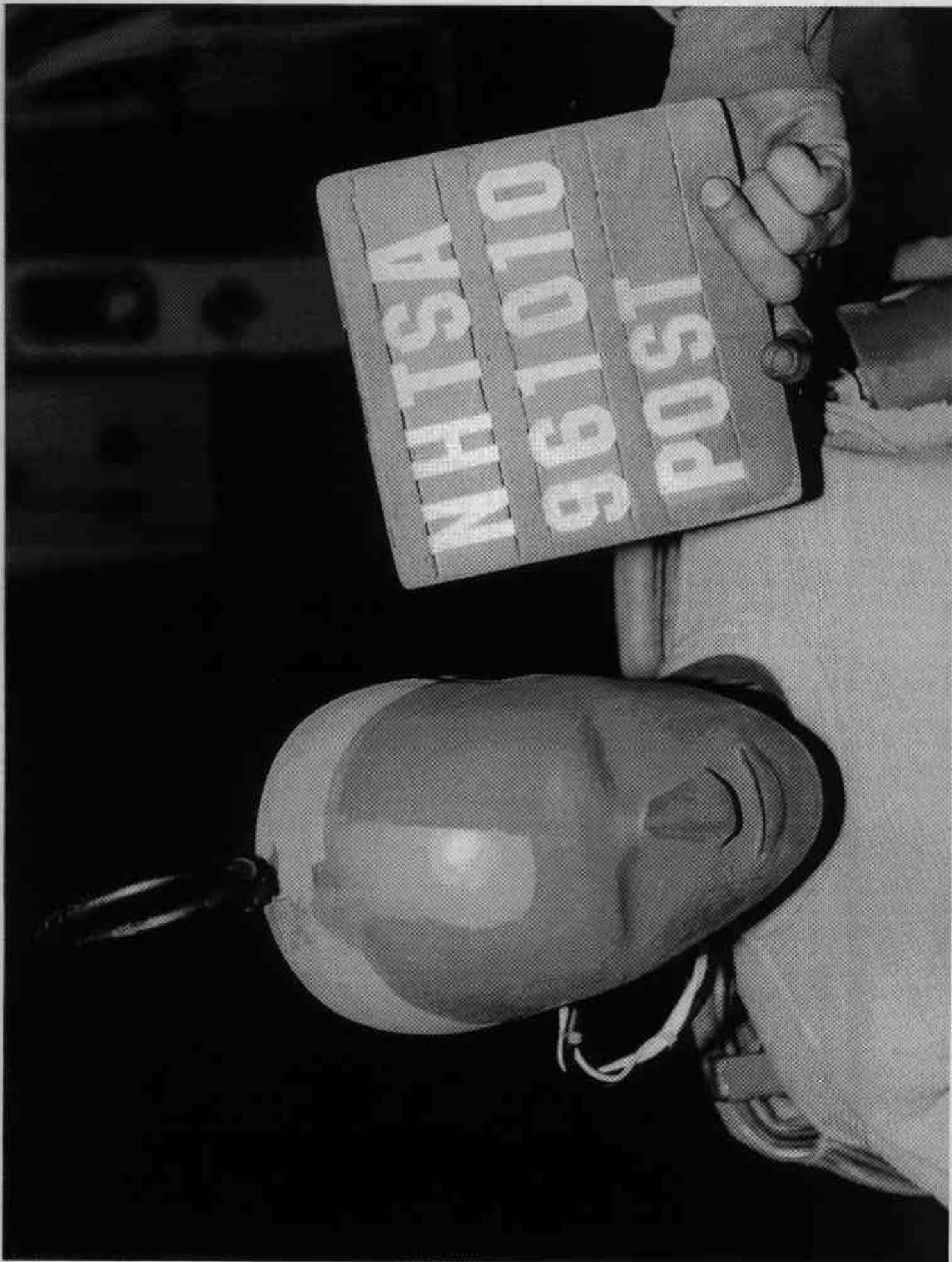


Figure A-16. Post-test Driver Dummy Head Contact - View 2

A-17

961010

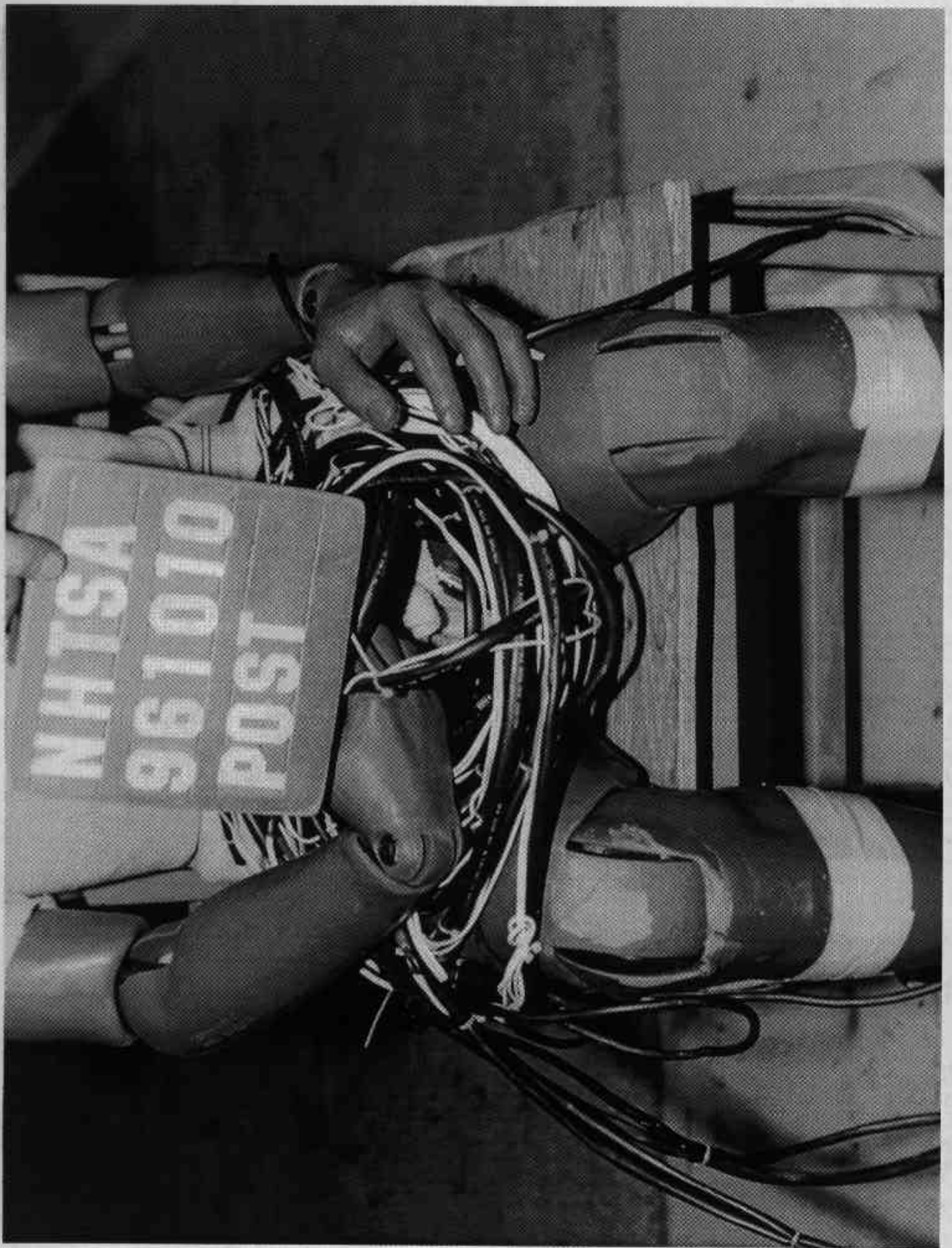


Figure A-17. Post-test Driver Dummy Knee Contact - View 1

A-18

961010

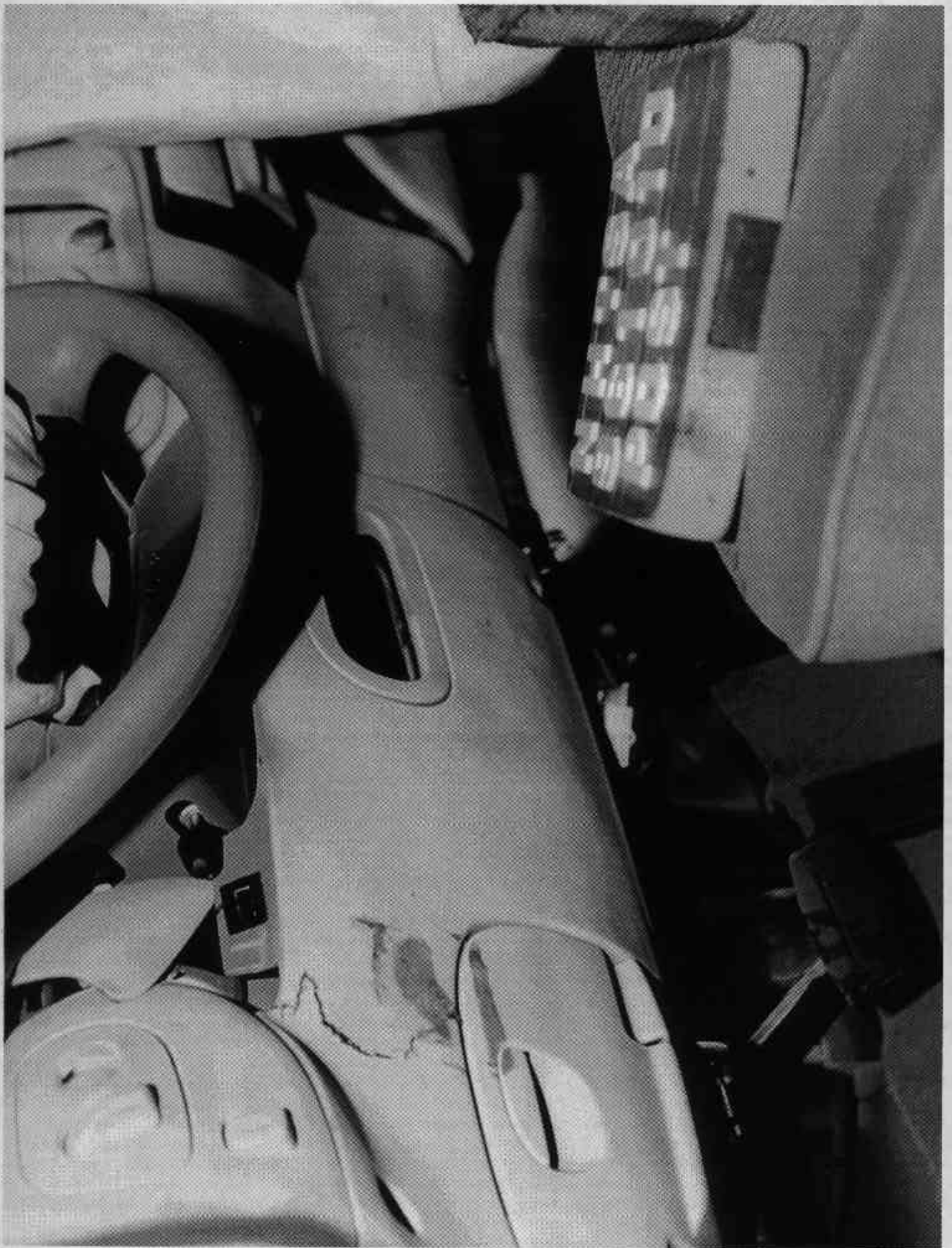


Figure A-18. Post-test Driver Dummy Knee Contact - View 2

A-19

961010



Figure A-19. Post-test Passenger Dummy Head Contact - View 1

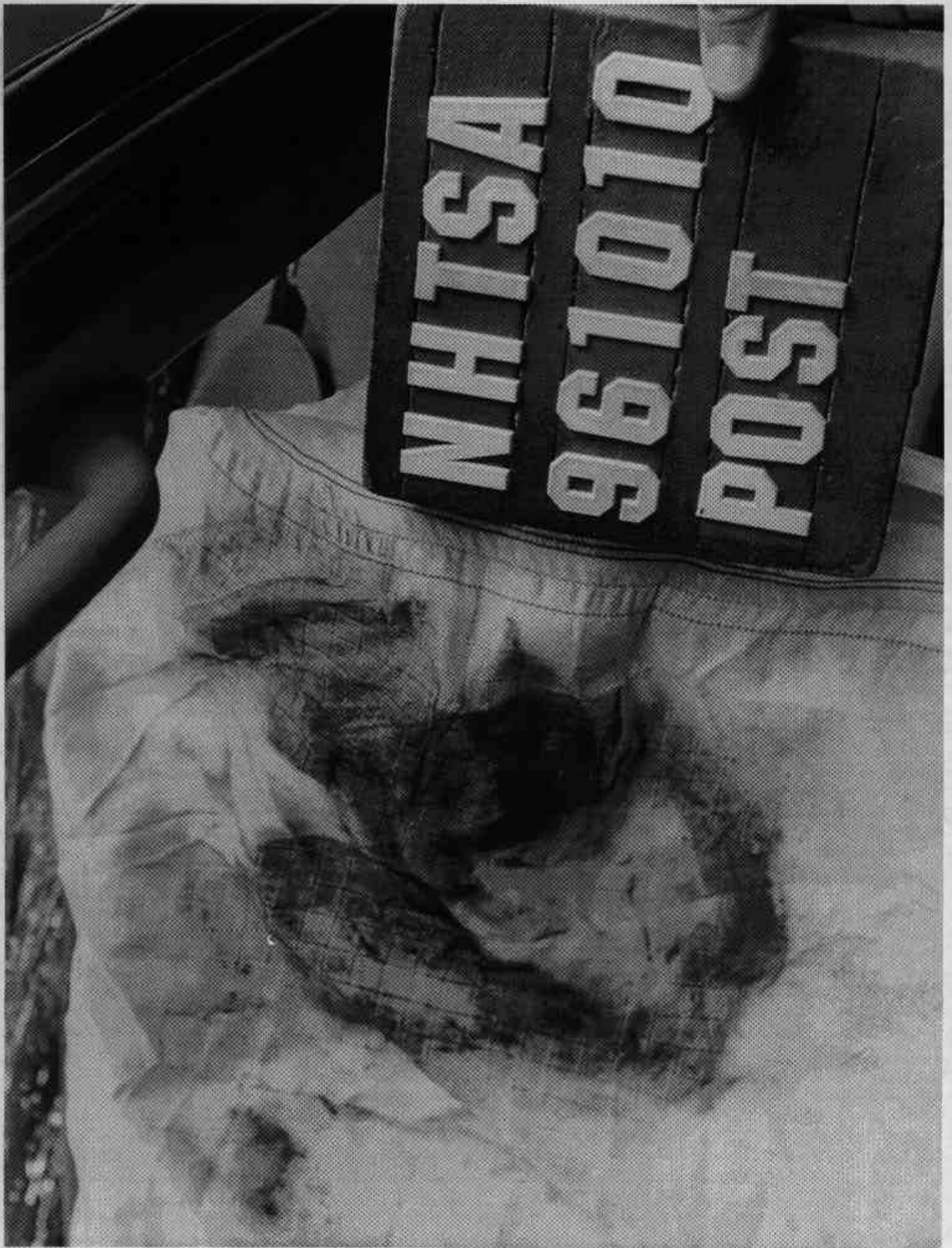


Figure A-20. Post-test Passenger Dummy Head Contact - View 2

A-21

961010



Figure A-21. Post-test Passenger Dummy Knee Contact - View 1



Figure A-22. Post-test Passenger Dummy Knee Contact - View 2

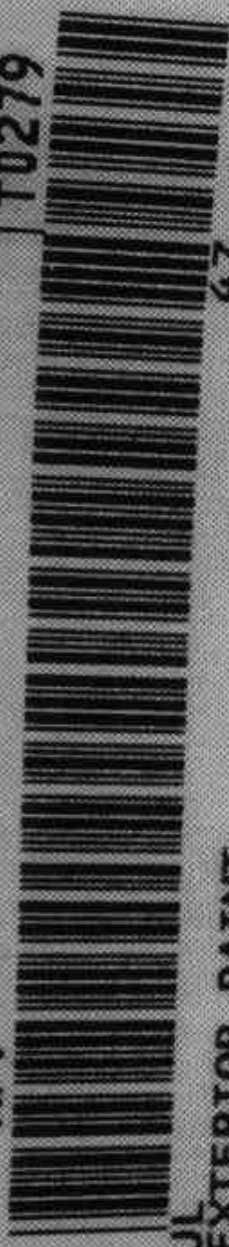
A-23

961010

MFD. BY FORD MOTOR CO. IN U.S.A.
 DATE: 08/96 GVMR: 6750LB/ 3061KG
 FRONT GAWR: 3000LB REAR GAWR: 3900LB
 1360KG WITH 1769KG WITH
 P255/70R16SL TIRES P255/70R16SL TIRES
 16X7.0J RIMS 16X7.0J RIMS
 AT 207 kPa/ 30 PSI COLD AT 241 kPa/ 35 PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
 VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF
 MANUFACTURE SHOWN ABOVE.

VIN: 1FMEU176XVLA17318
 TYPE: MPV
 F0091
 T0279



JL
 EXTERIOR PAINT 47
 MB | BRK | INT | TR | TP / PS | R | AXLE | TR | SPR | RC | DSO
 119 4 MX H7 U 2L9

UTC 0 F 6 SB - 1520472 - AA

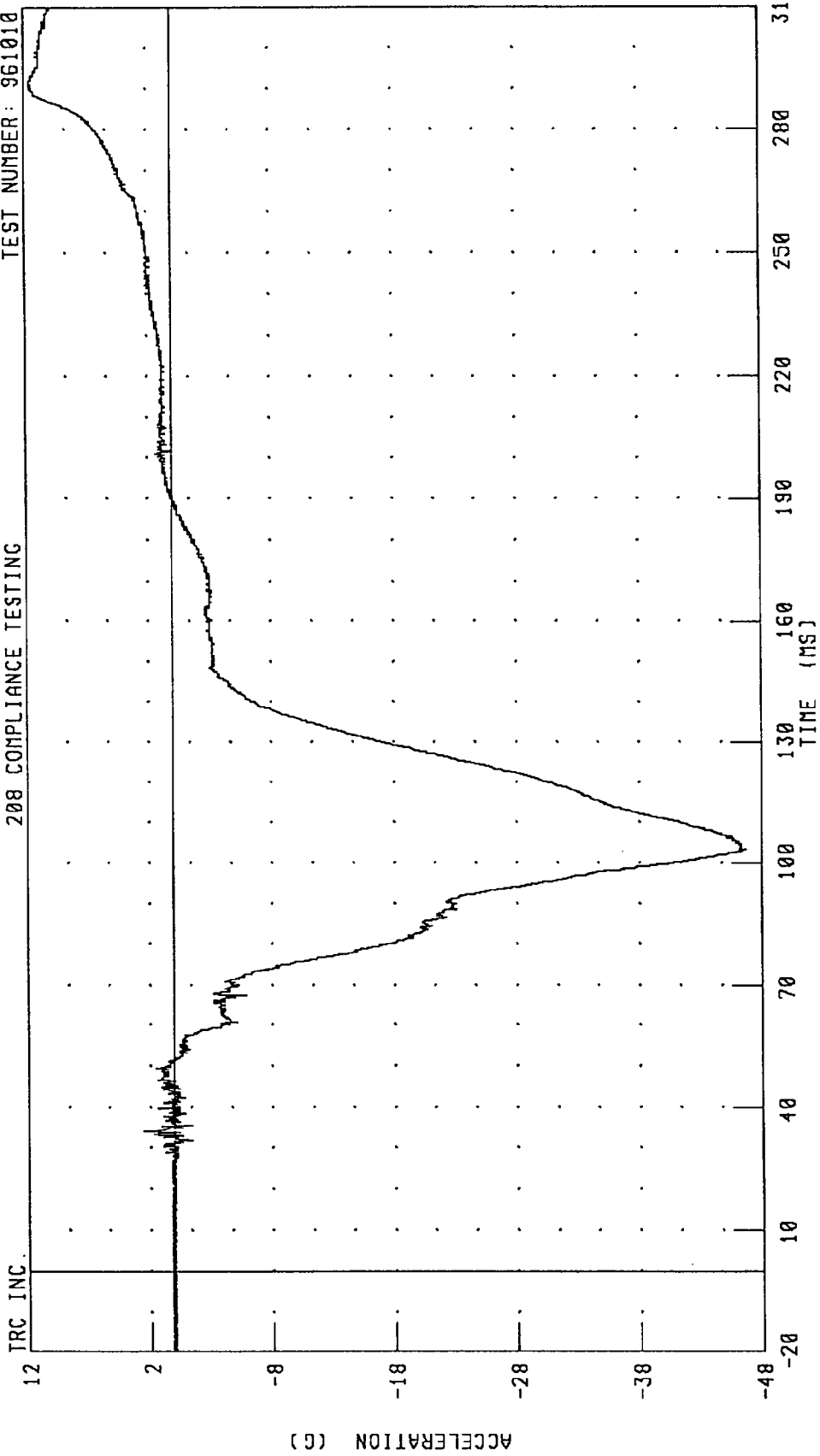
Figure A-23. Pre-test Vehicle Certification and Recommended Tire Pressure Label View
 A-24 961010

Appendix B

Data Plots

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



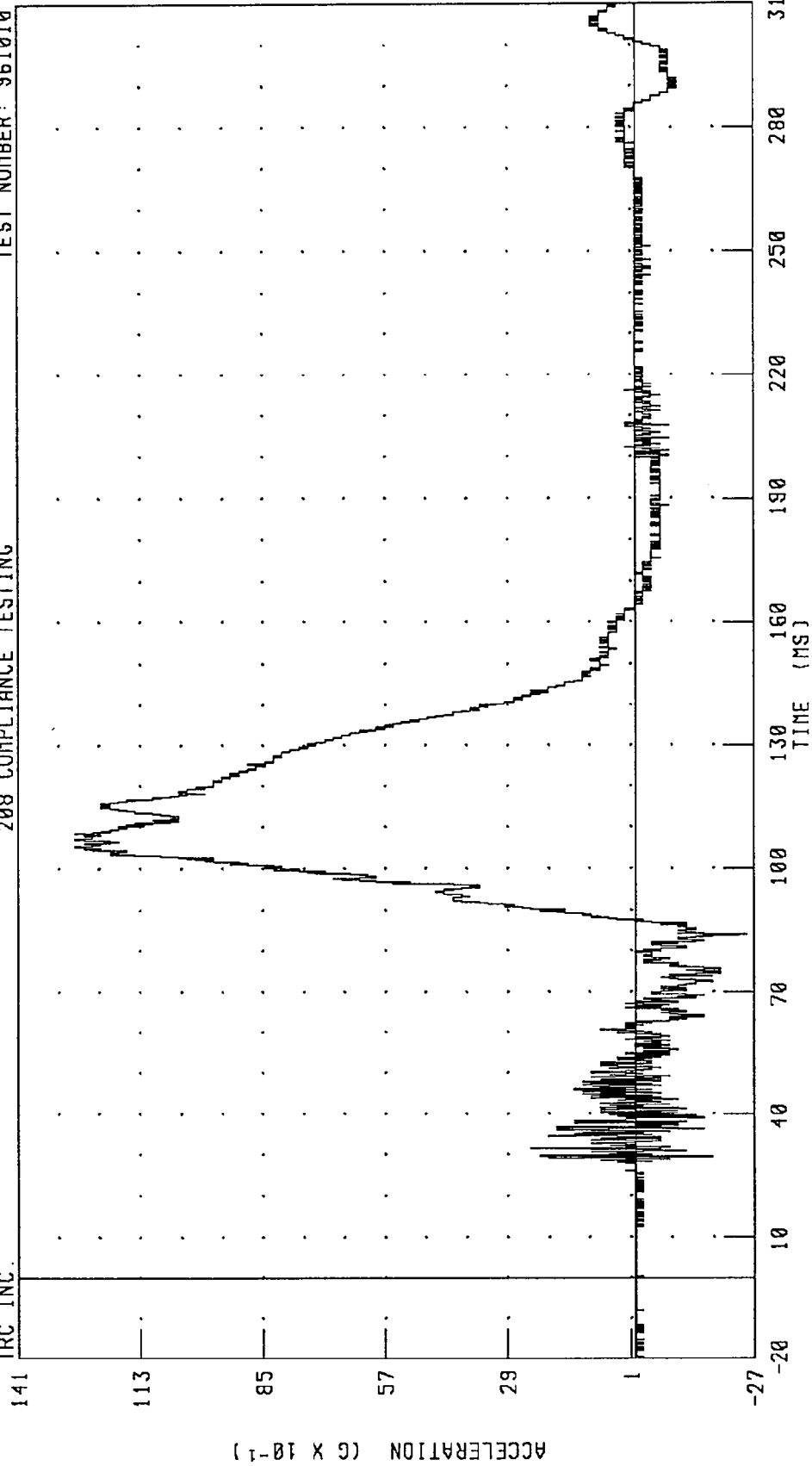
CHANNEL: HEDXG1 FILTER: CH. CLASS 1000
PEAK DATA: 11.60 G @ 289.92 MS; -46.67 G @ 103.28 MS

TRC INC.

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

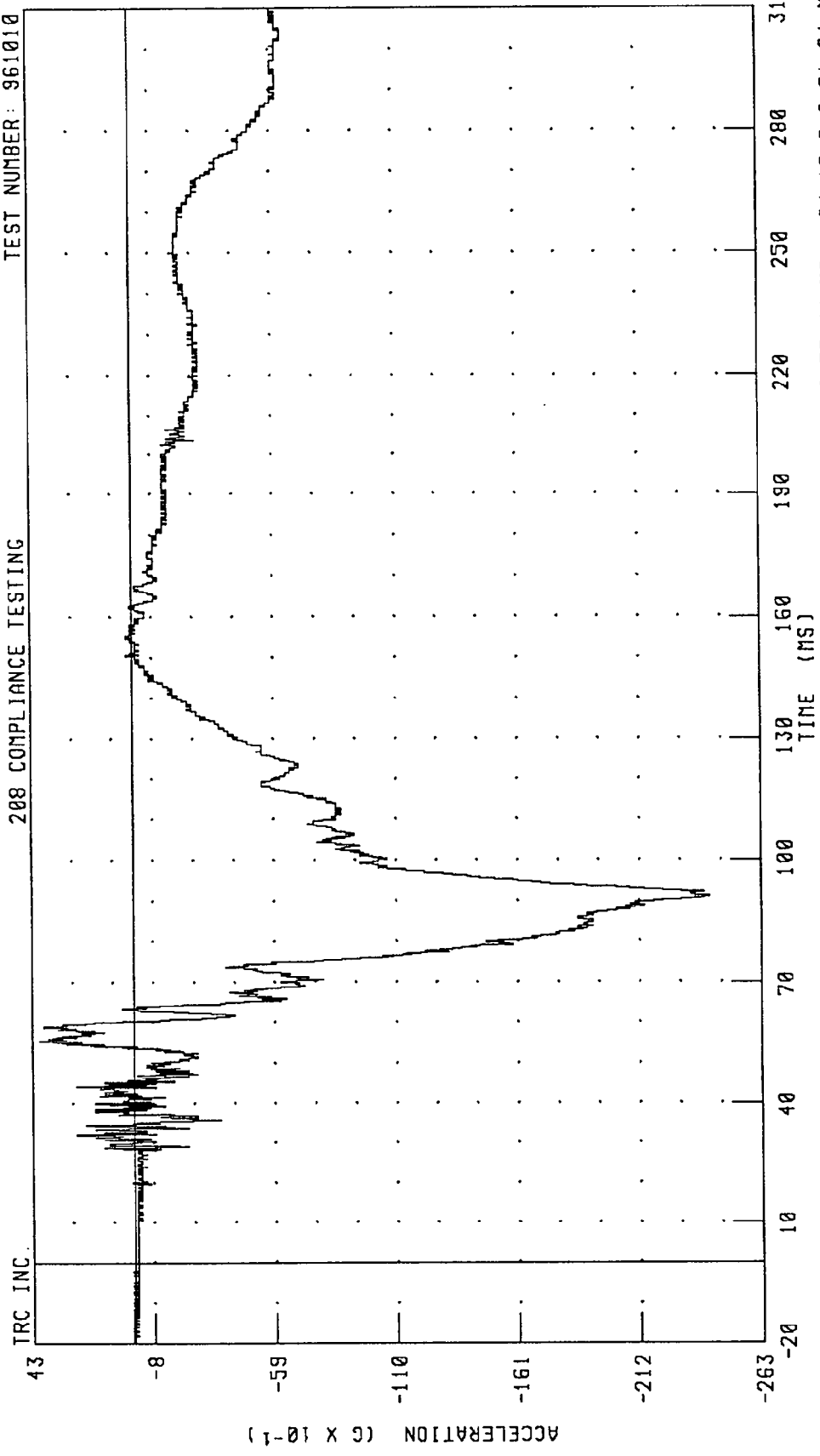


PEAK DATA: 12.78 G @ 105.20 MS; -2.53 G @ 83.92 MS

CHANNEL: HEDYGI FILTER: CH. CLASS 1000

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

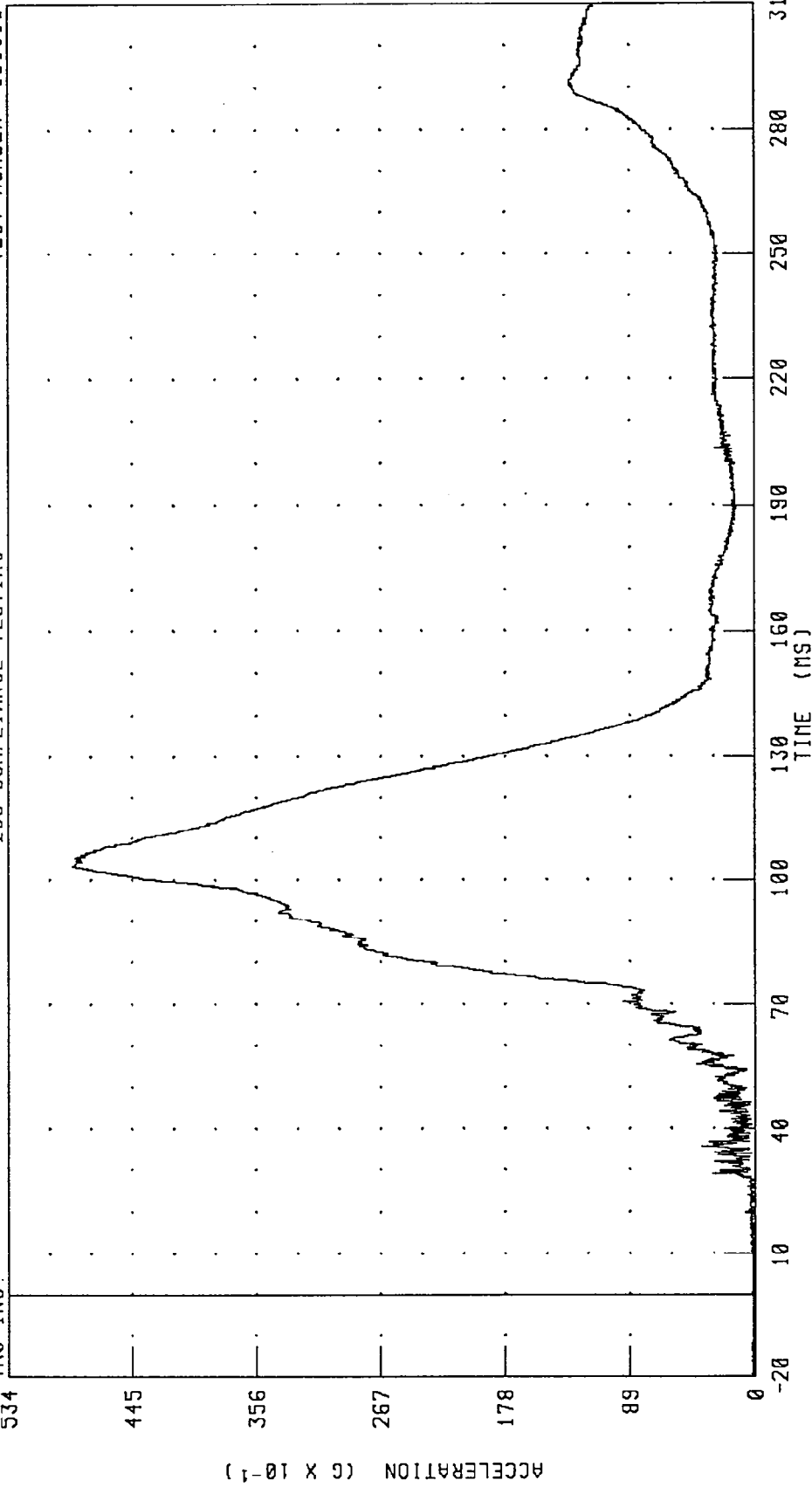


CHANNEL: HEDZG1 FILTER: CH. CLASS 1000 PEAK DATA: 3.99 G @ 55.44 MS; -24.12 G @ 91.04 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

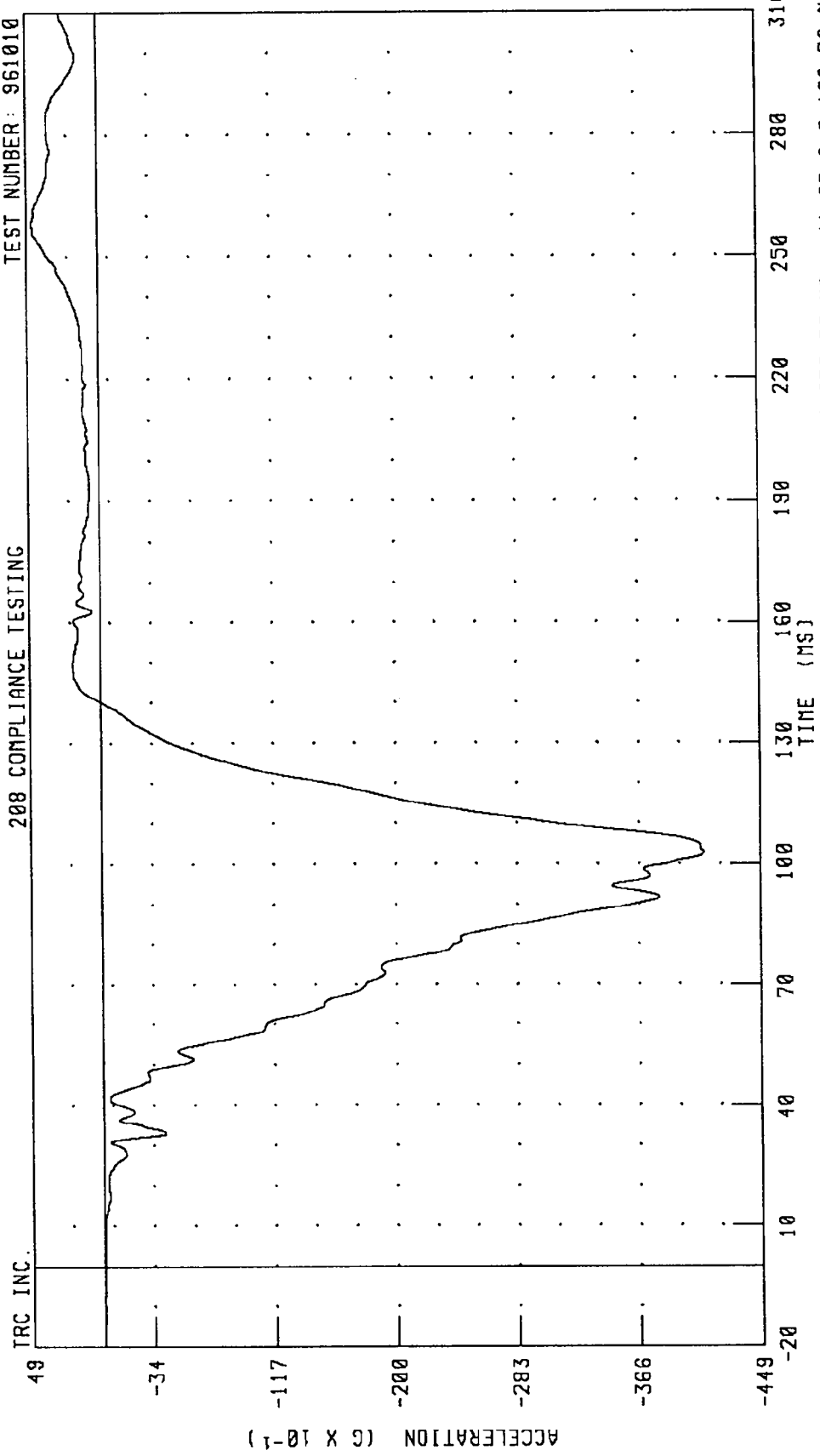


PEAK DATA: 48.81 G @ 103.28 MS; 0.09 G @ -20.00 MS

CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



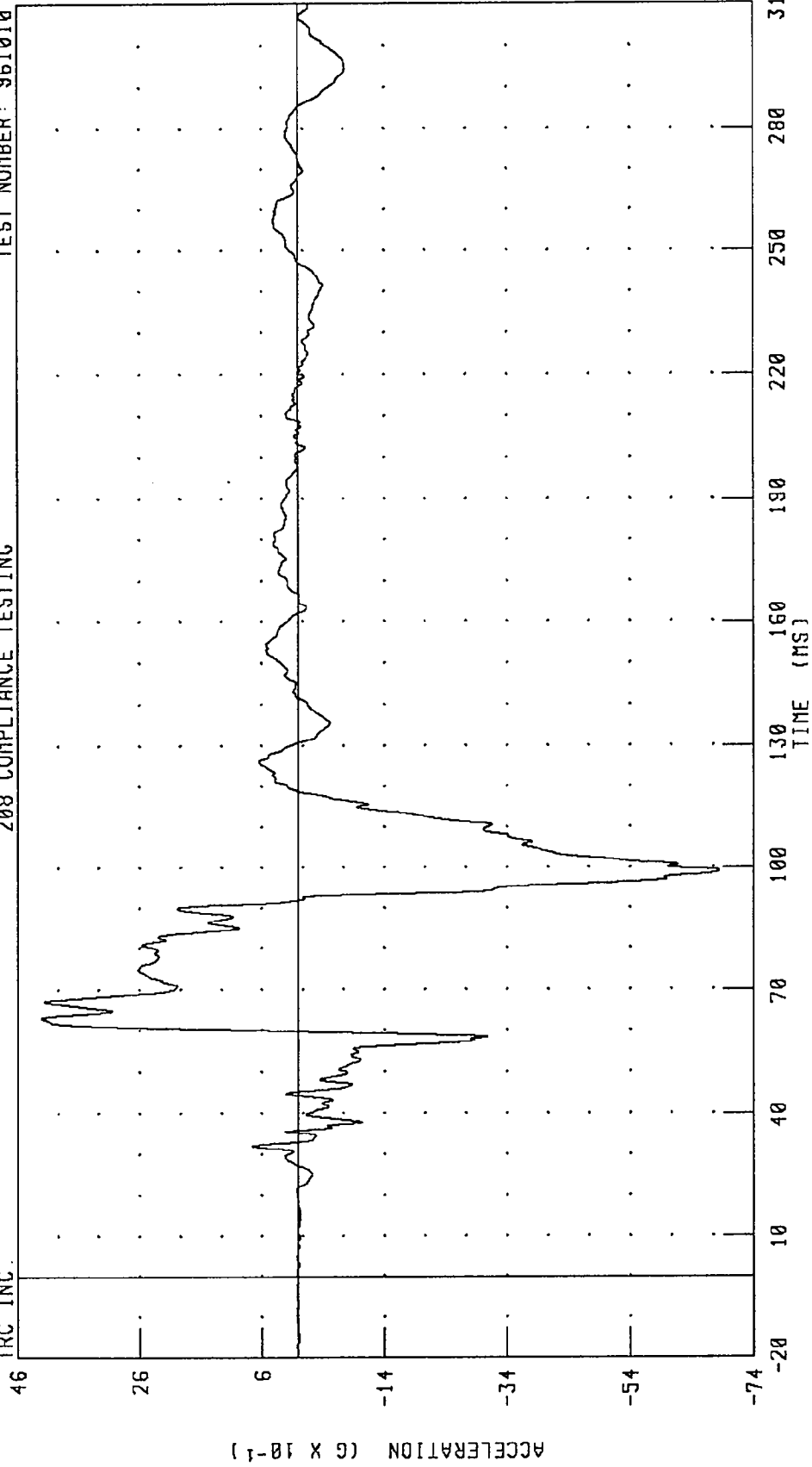
TRC INC.

CHANNEL: CSTXG1 FILTER: CH. CLASS 180
PEAK DATA: 4.52 G @ 258.32 MS; -41.05 G @ 102.72 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.



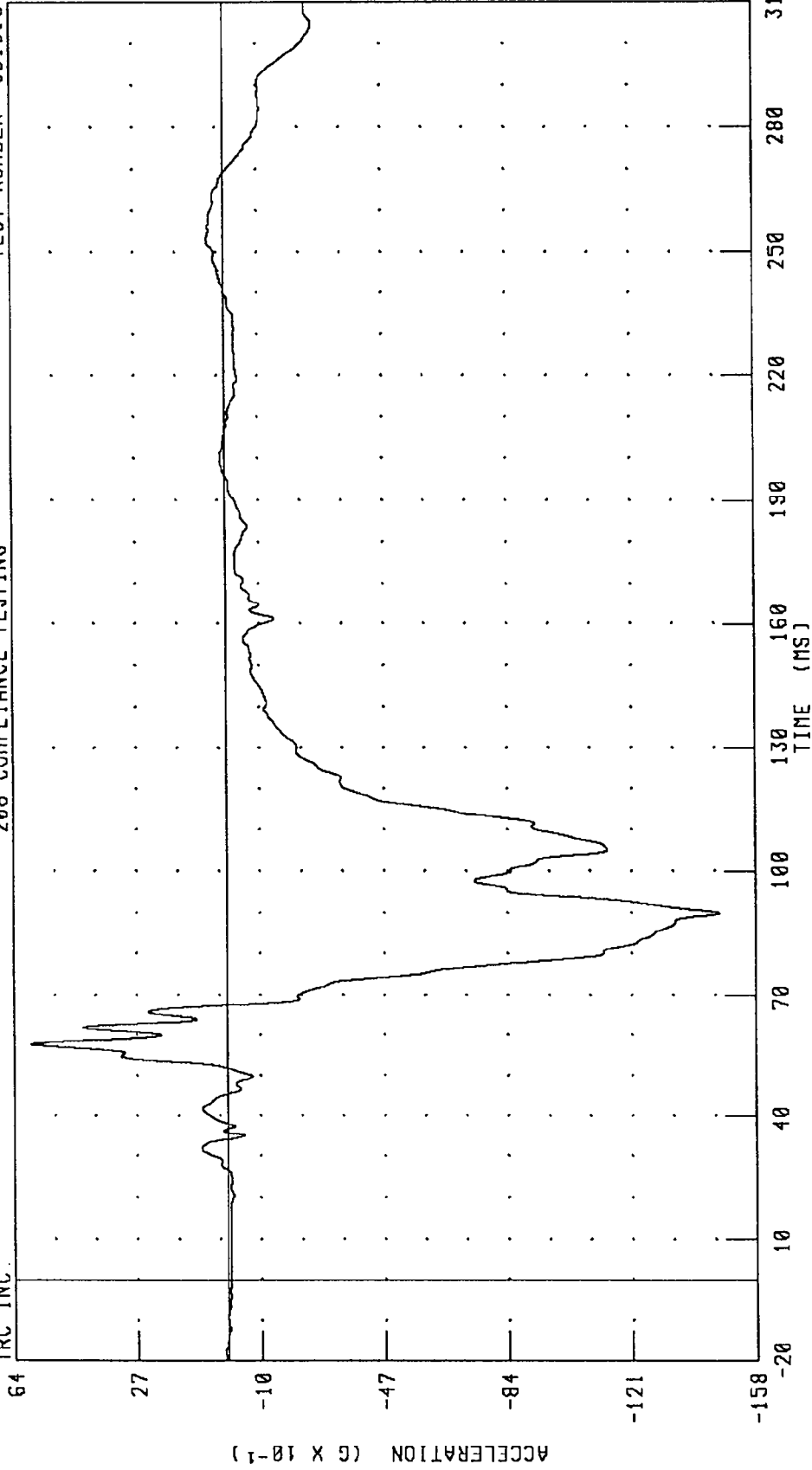
PEAK DATA: 4.20 G @ 63.28 MS; -6.84 G @ 99.12 MS

CHANNEL: CSTYG1 FILTER: CH. CLASS 180

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.



CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 5.87 G @ 57.76 MS; -14.73 G @ 90.00 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

462

385

308

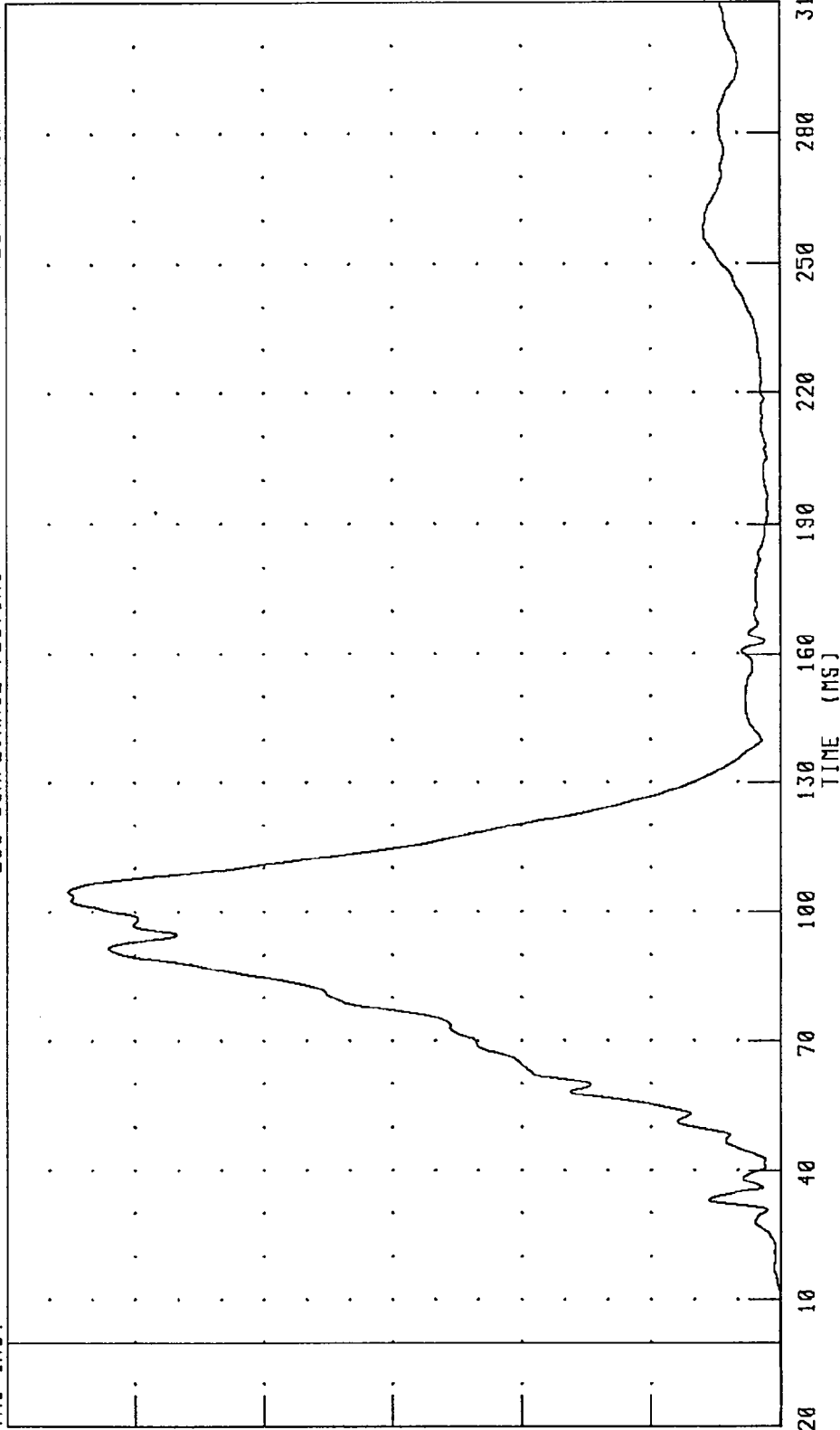
231

154

77

0

ACCELERATION (G X 10⁻¹)

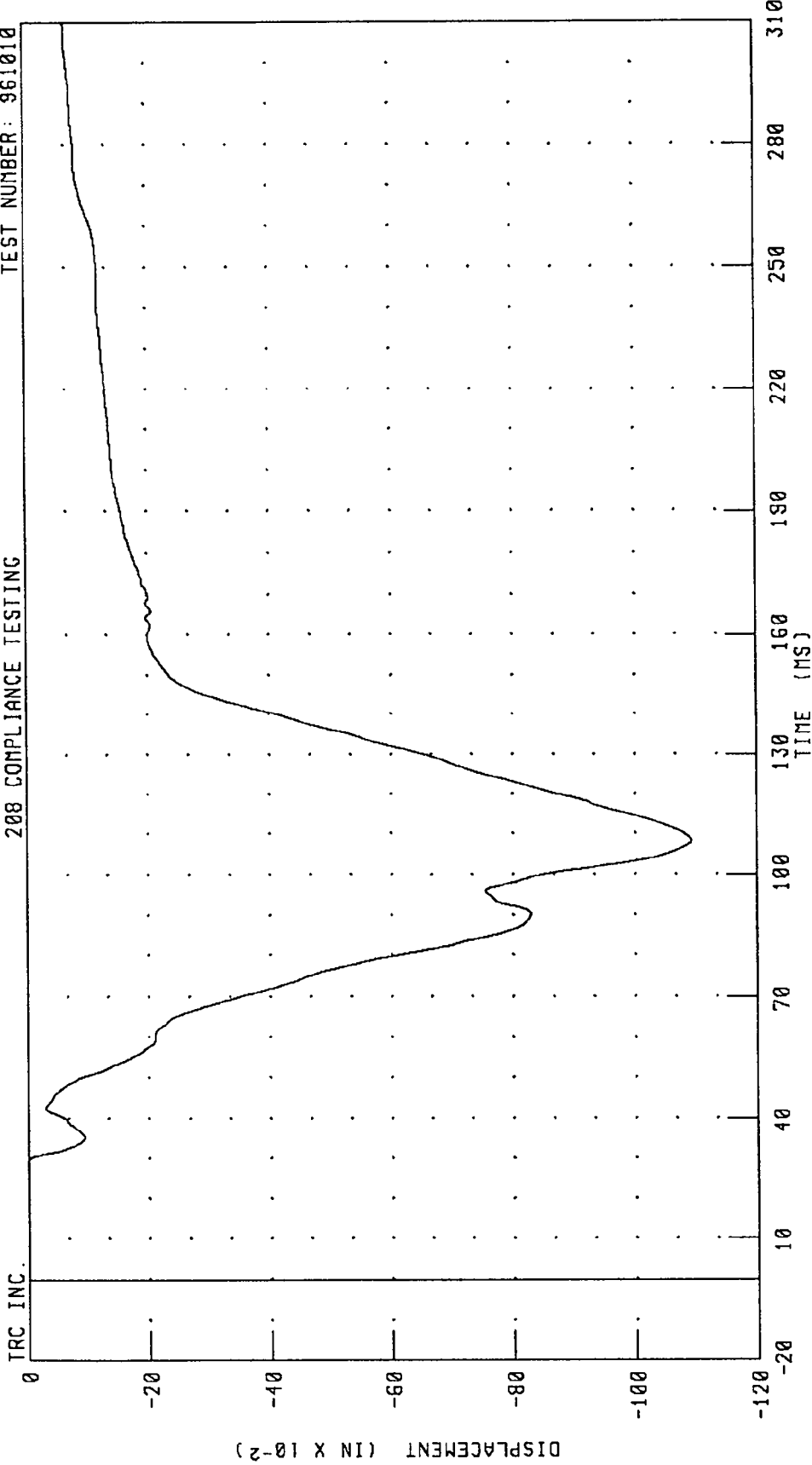


310
280
250
220
190
160
130
104.64 MS; 0.01 G @ -14.40 MS

CHANNEL: CSTRG1 FILTER: CH. CLASS 180

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER CHEST DEFLECTION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



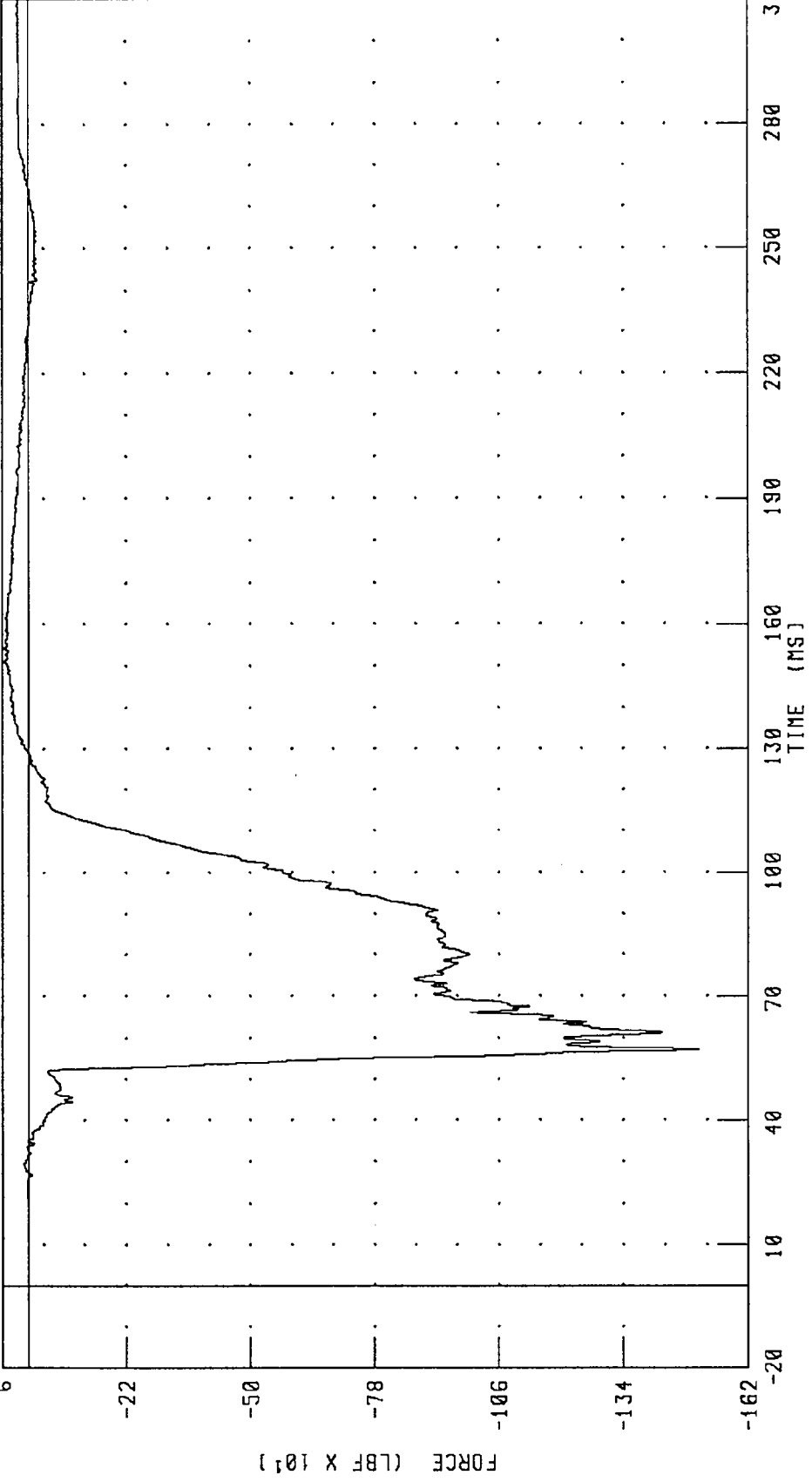
CHANNEL: CSTXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 IN @ 28.80 MS; -1.09 IN @ 108.24 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010

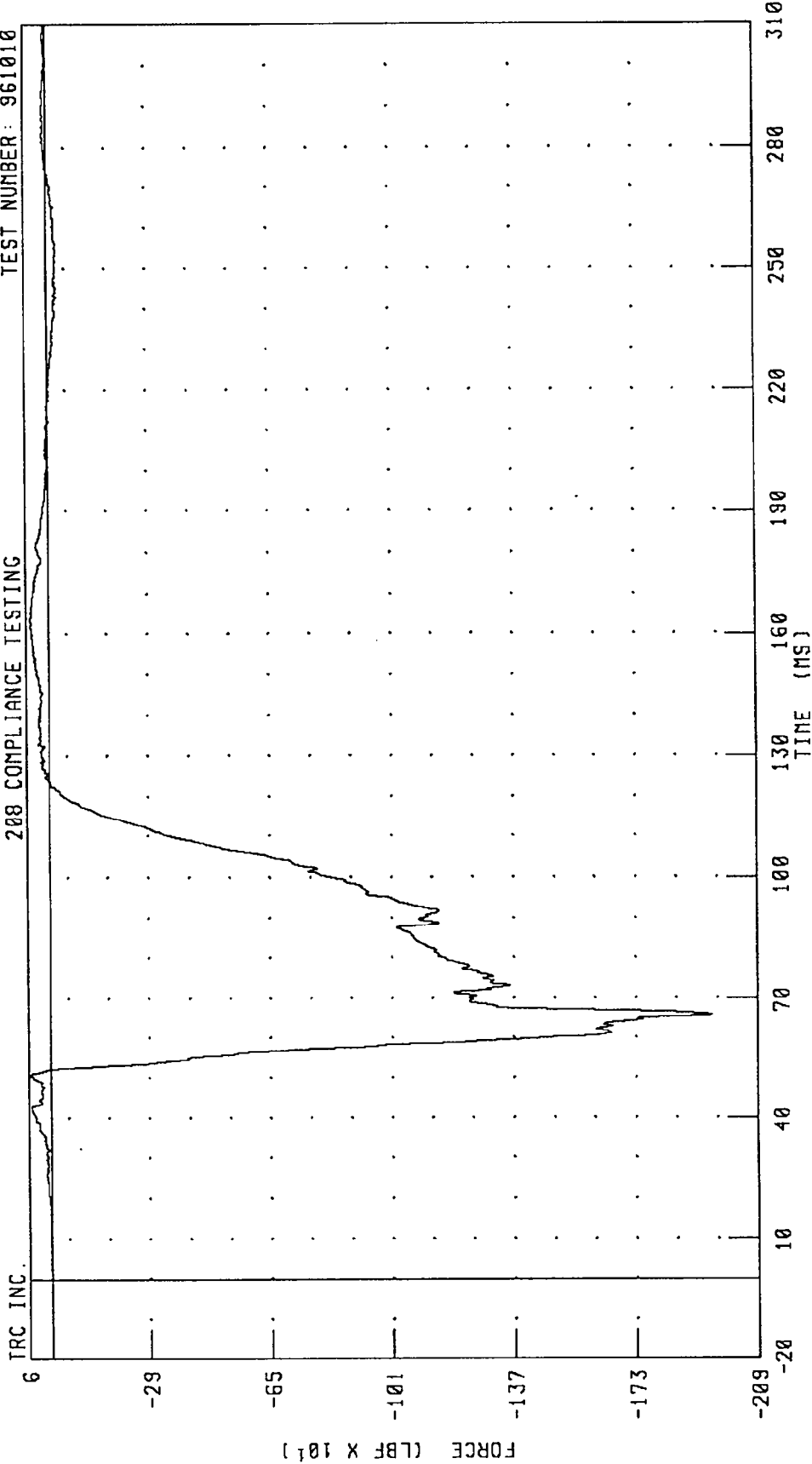
TRC INC.



CHANNEL: LFMFI FILTER: CH. CLASS 600
PEAK DATA: 55.22 LBF @ 154.40 MS; -1508.81 LBF @ 57.12 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010



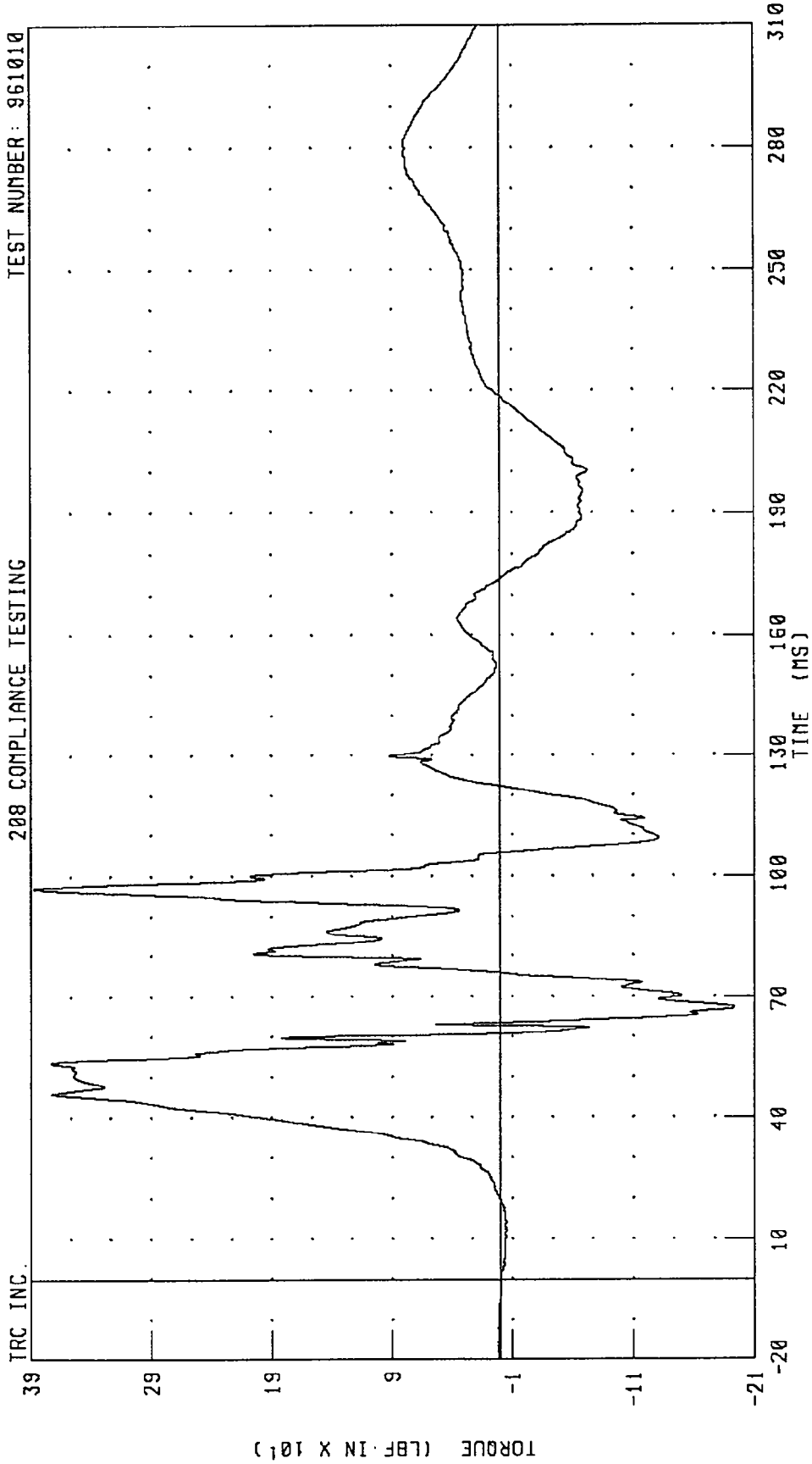
PEAK DATA: 61.30 LBF @ 50.72 MS; -1956.71 LBF @ 65.84 MS

CHANNEL: RFMF1 FILTER: CH. CLASS 600

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT X-AXIS

TEST NUMBER: 961010

208 COMPLIANCE TESTING

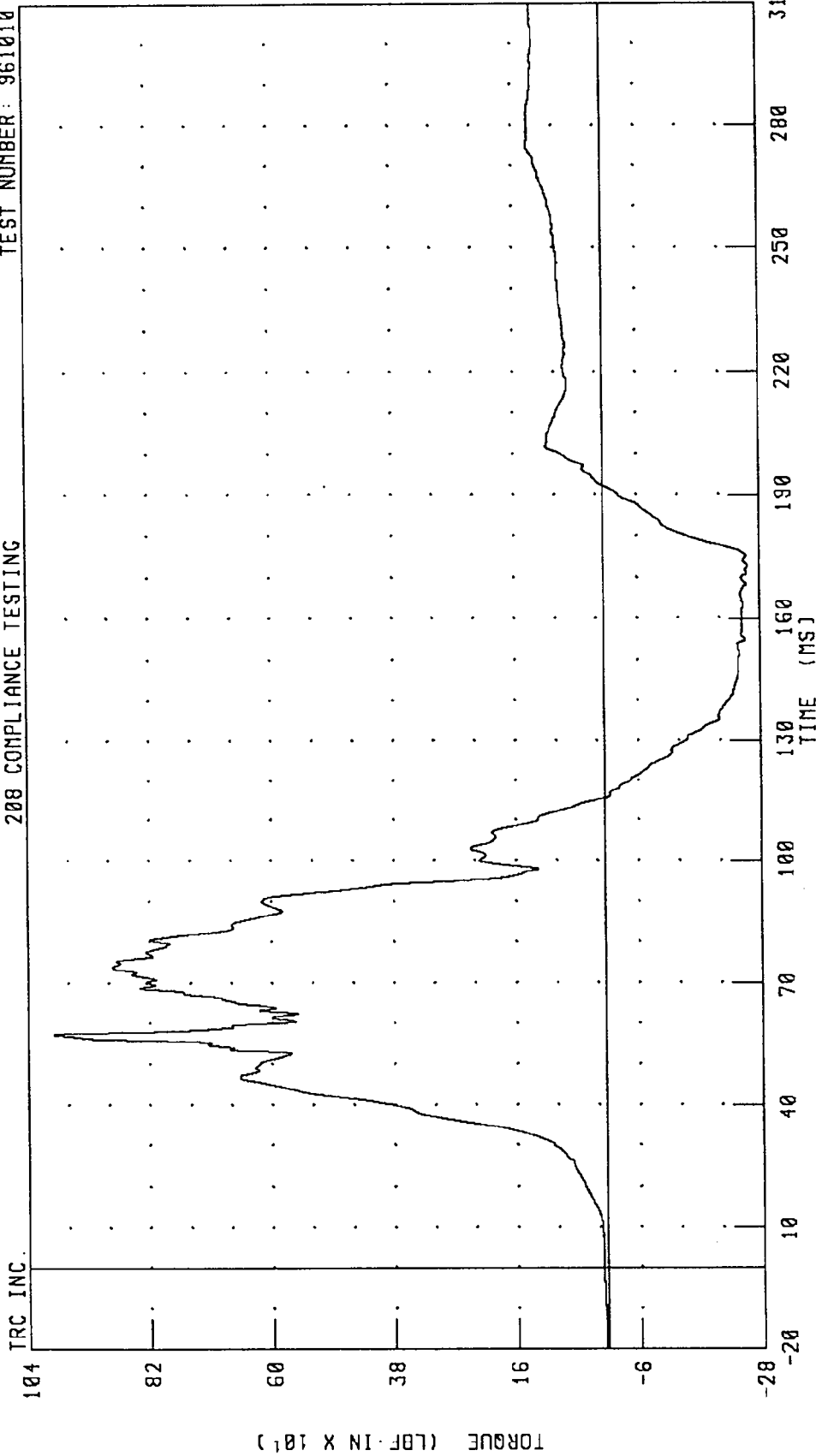


CHANNEL: TBLXM1 FILTER: CH. CLASS 600 PEAK DATA: 387.50 LBF·IN @ 97.04 MS; -192.85 LBF·IN @ 67.44 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y-AXIS

208 COMPLIANCE TESTING

TEST NUMBER: 961010



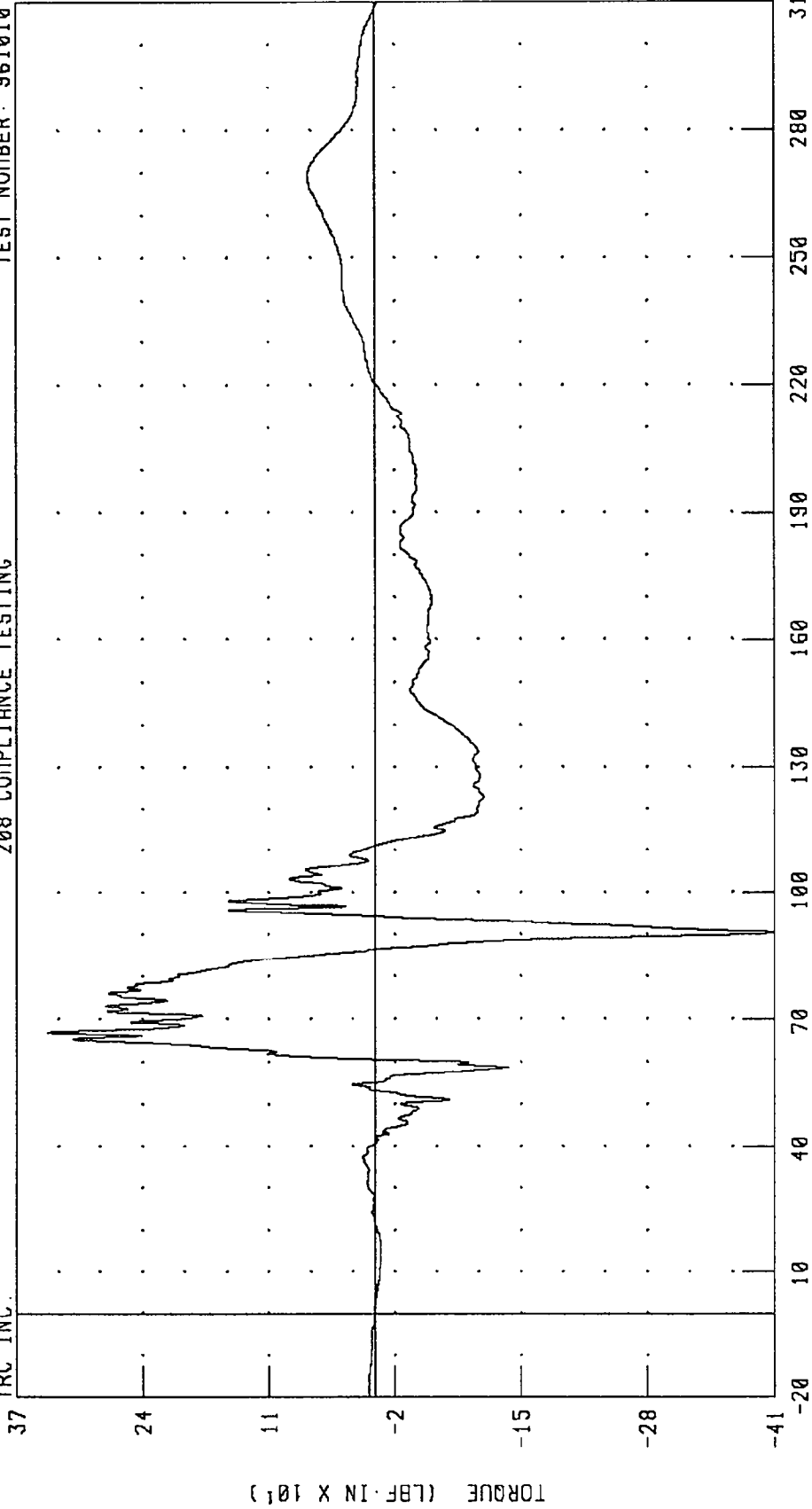
CHANNEL: TBLYM1 FILTER: CH. CLASS 600 PEAK DATA: 992.32 LBF-IN @ 57.12 MS; -257.61 LBF-IN @ 172.88 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X-AXIS

208 COMPLIANCE TESTING

TEST NUMBER: 961010

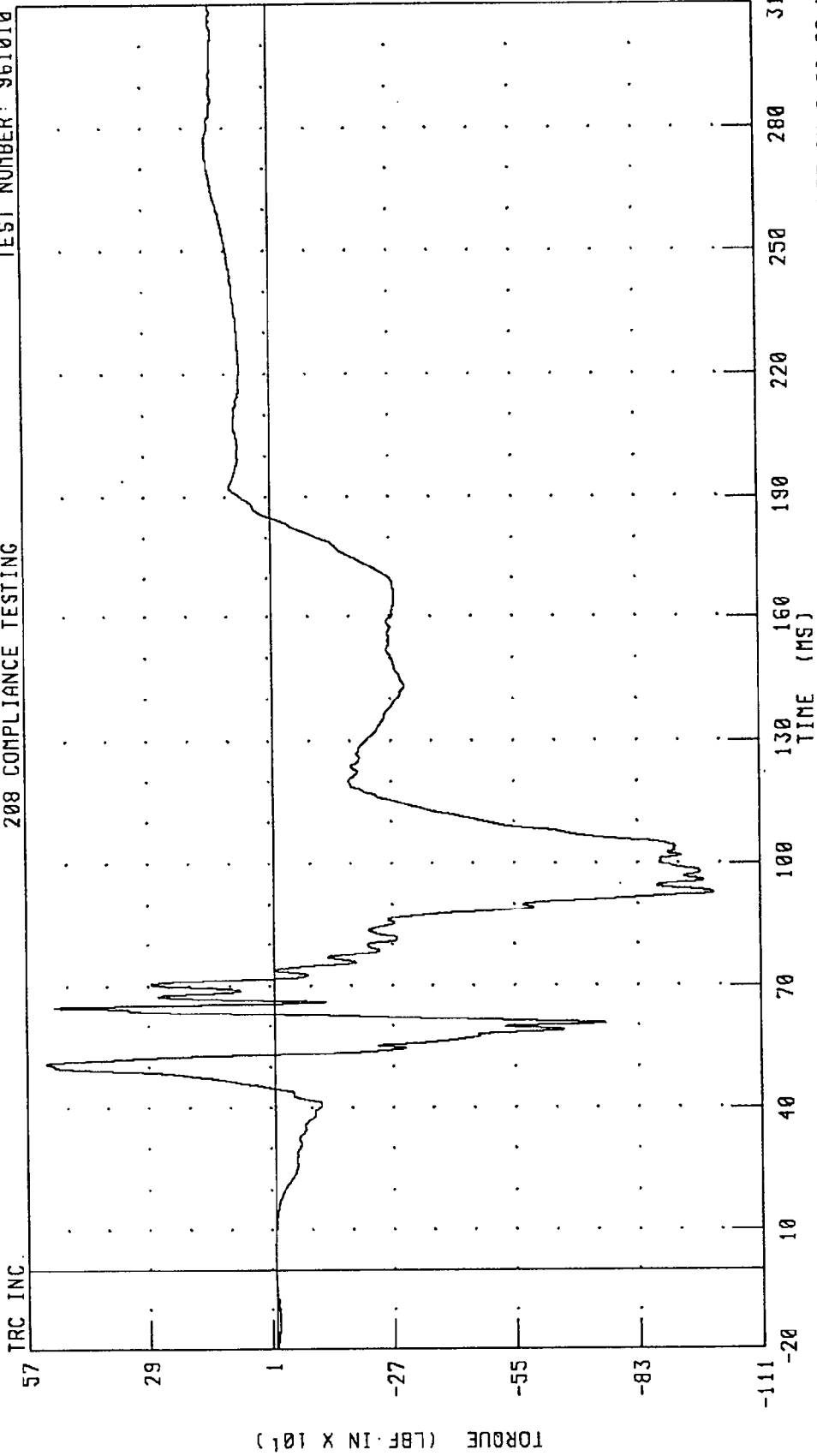
TRC INC.



CHANNEL: TBRXM1 FILTER: CH. CLASS 600 PEAK DATA: 337.79 LBF·IN @ 66.96 MS, -414.44 LBF·IN @ 90.40 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y-AXIS
208 COMPLIANCE TESTING

TEST NUMBER: 961010

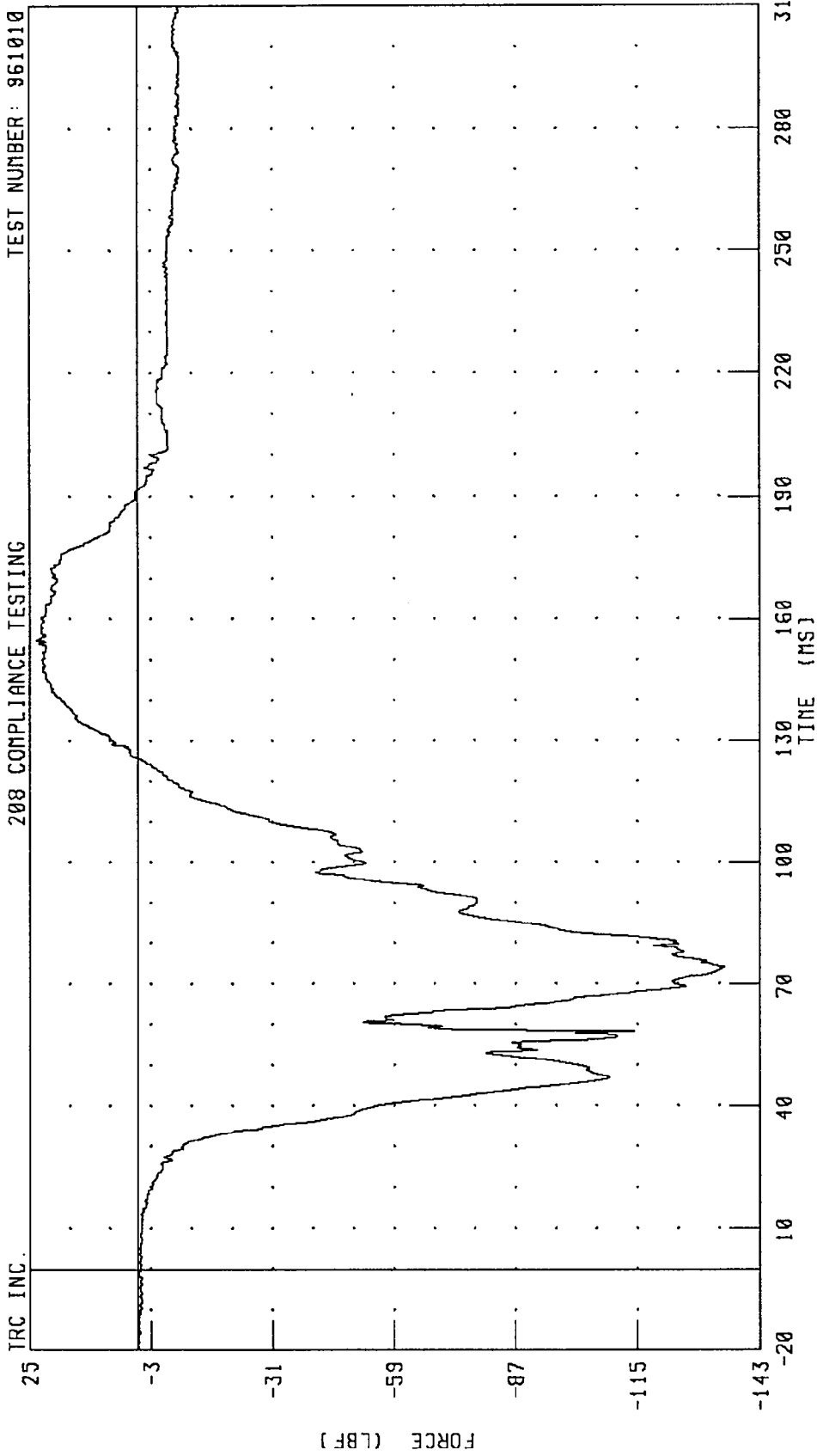


CHANNEL: TBRYM1 FILTER: CH. CLASS 600

PEAK DATA: 524.61 LBF·IN @ 50.88 MS; -1004.32 LBF·IN @ 92.80 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER LEFT LOWER TIBIA X-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010

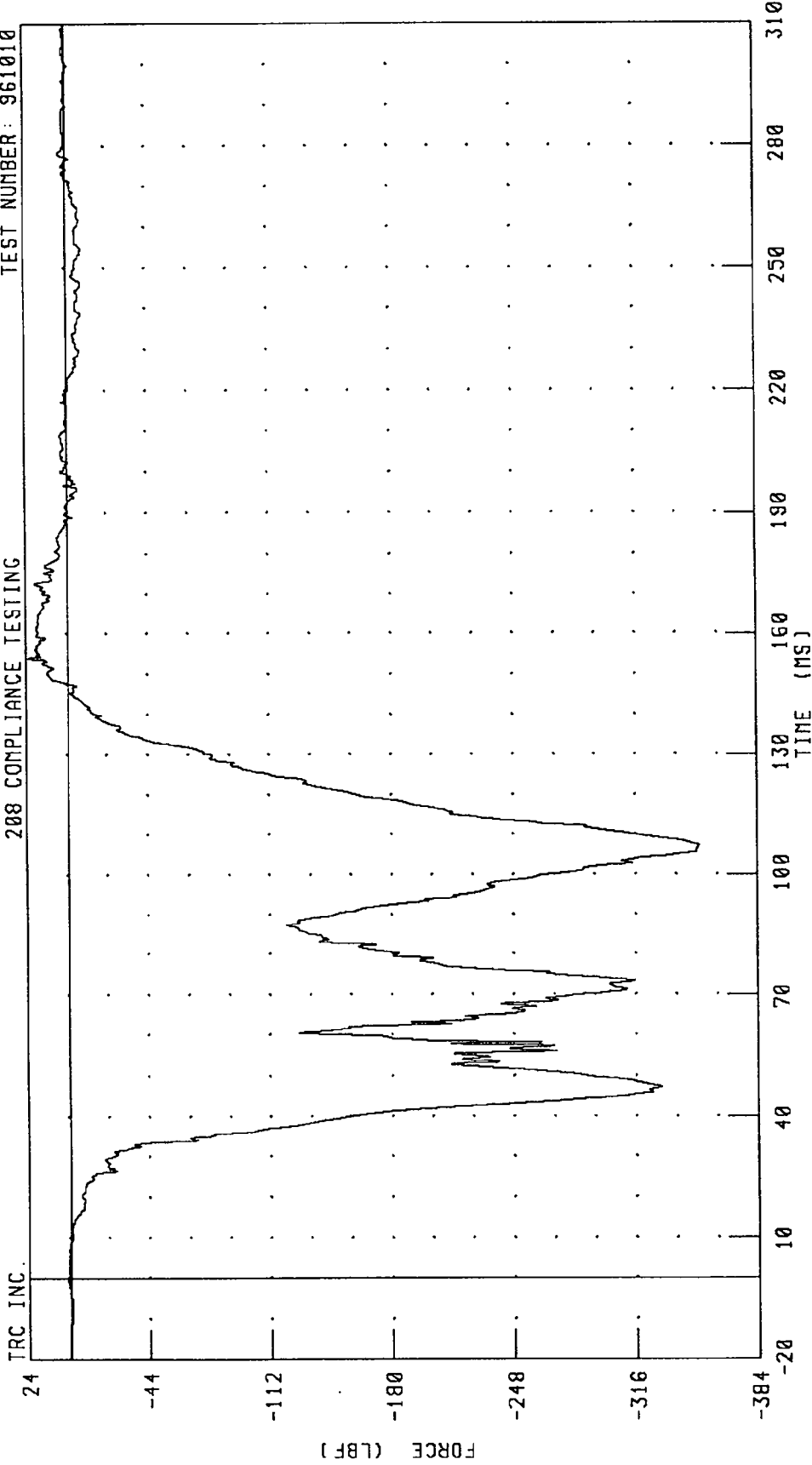


CHANNEL: ANLXF1 FILTER: CH. CLASS 600

PEAK DATA: 23.25 LBF @ 154.96 MS; -134.78 LBF @ 74.16 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER LEFT LOWER TIBIA Z-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010



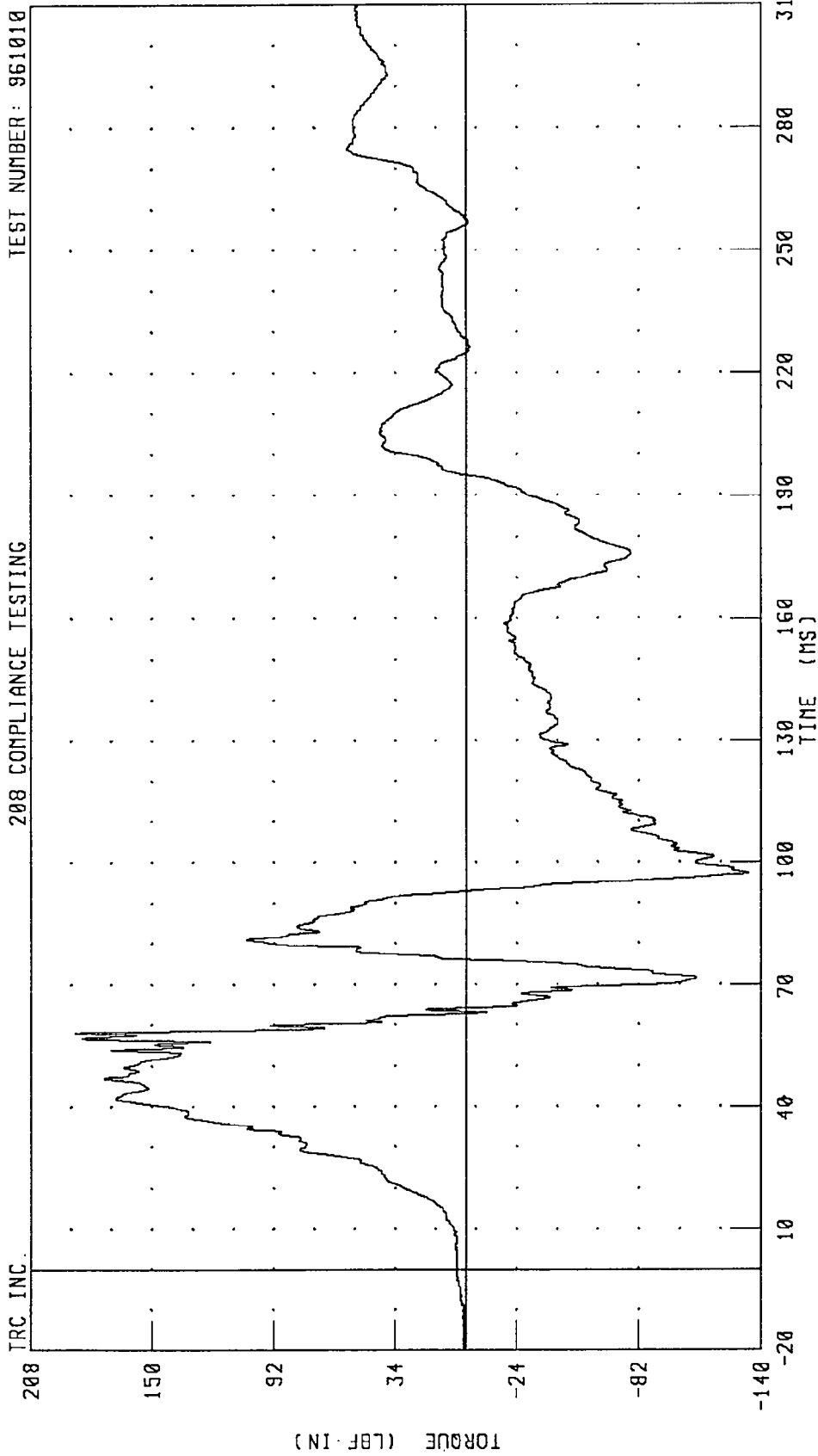
PEAK DATA: 22.70 LBF @ 154.08 MS; -351.38 LBF @ 107.28 MS

CHANNEL: ANLZF1 FILTER: CH. CLASS 600

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961010

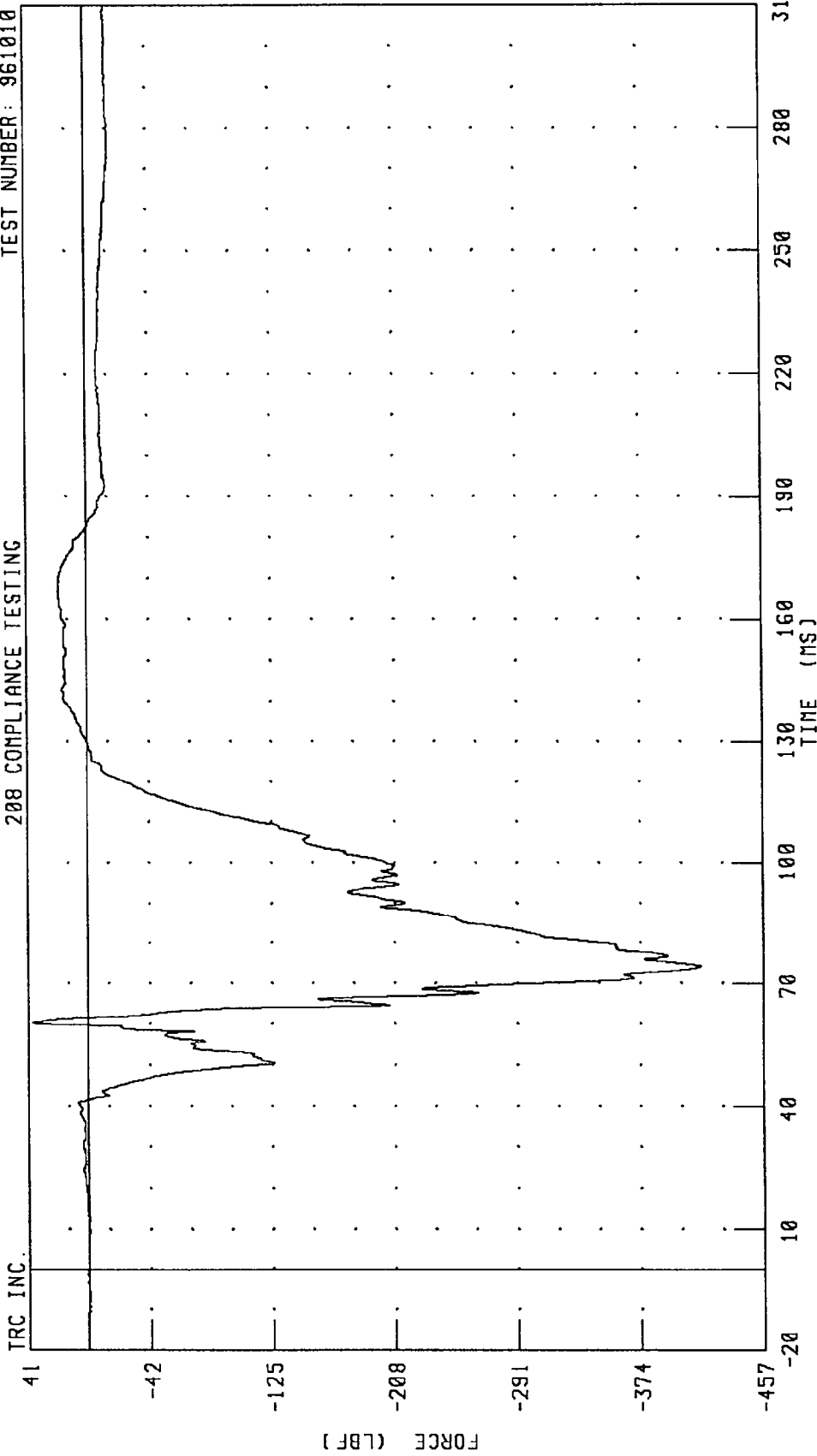
208 COMPLIANCE TESTING



CHANNEL: ANLYM1 FILTER: CH. CLASS 600 PEAK DATA: 186.56 LBF-IN @ 58.08 MS; -133.91 LBF-IN @ 97.28 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER RIGHT LOWER TIBIA X-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010



TRC INC.

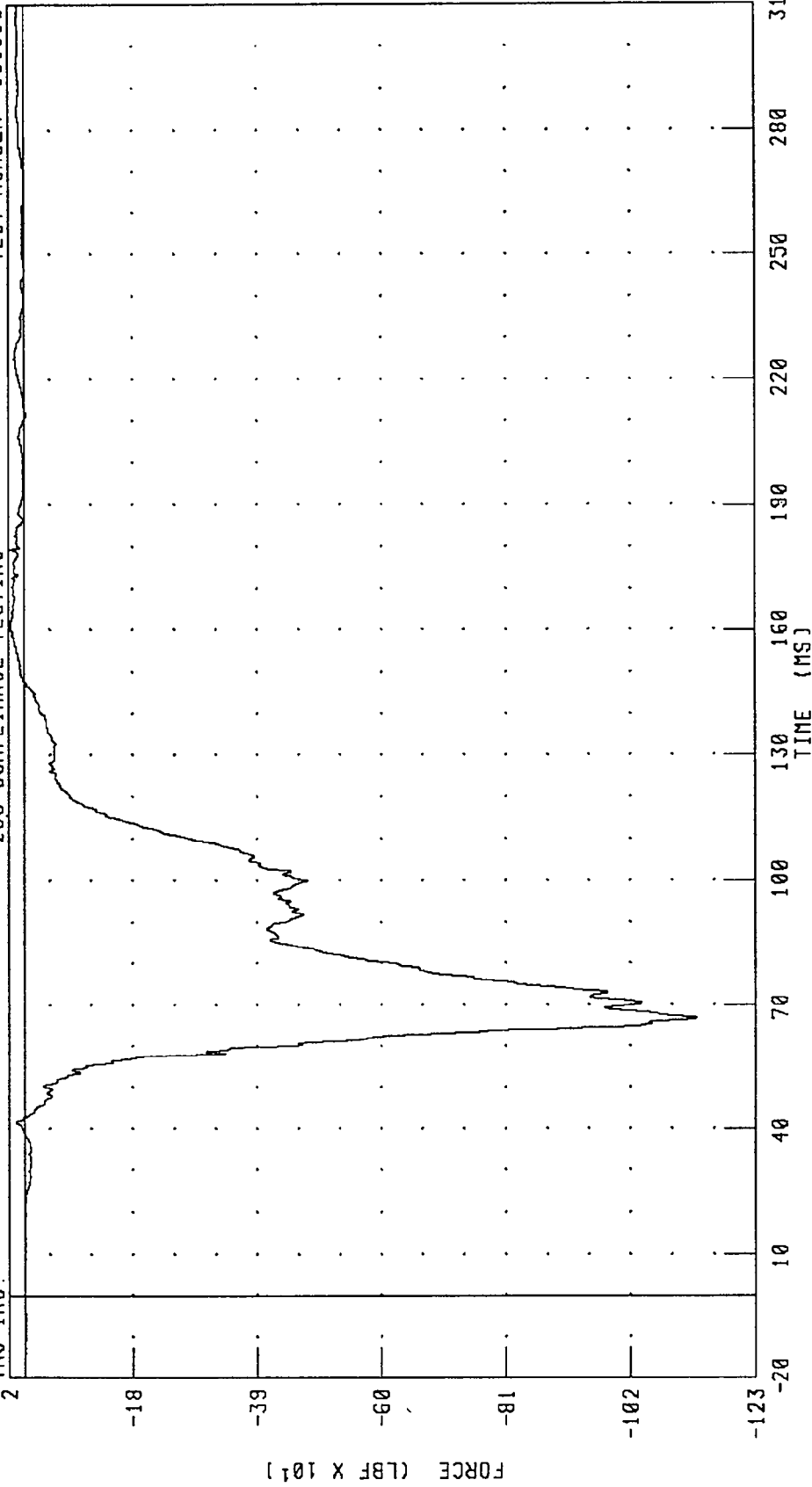
CHANNEL: ANRXF1 FILTER: CH. CLASS 600

961010

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010

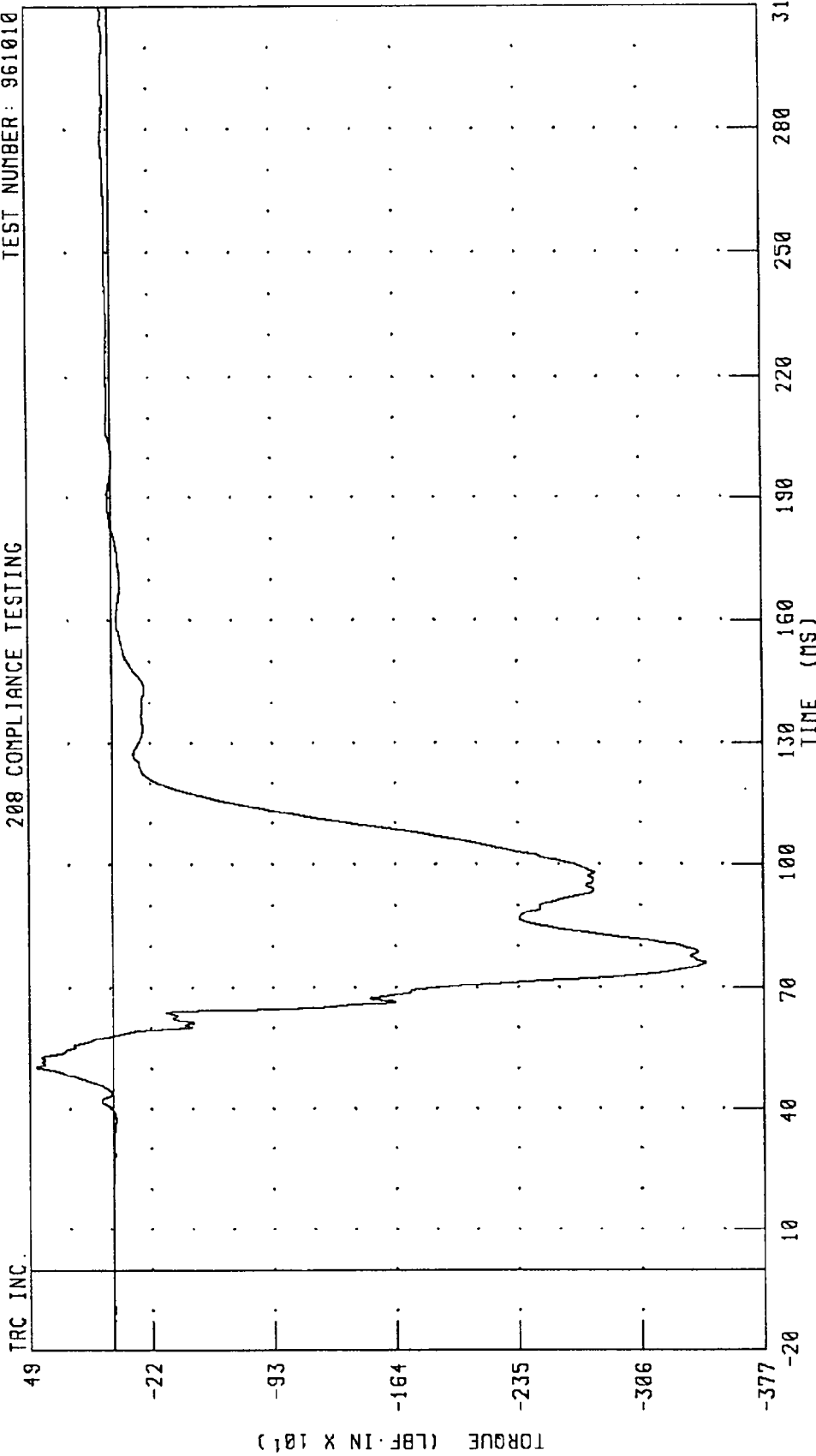
TRC INC.



CHANNEL: ANRZF1 FILTER: CH. CLASS 600
PEAK DATA: 25.56 LBF @ 160.80 MS; -1133.30 LBF @ 66.96 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y-AXIS
208 COMPLIANCE TESTING

TEST NUMBER: 961010

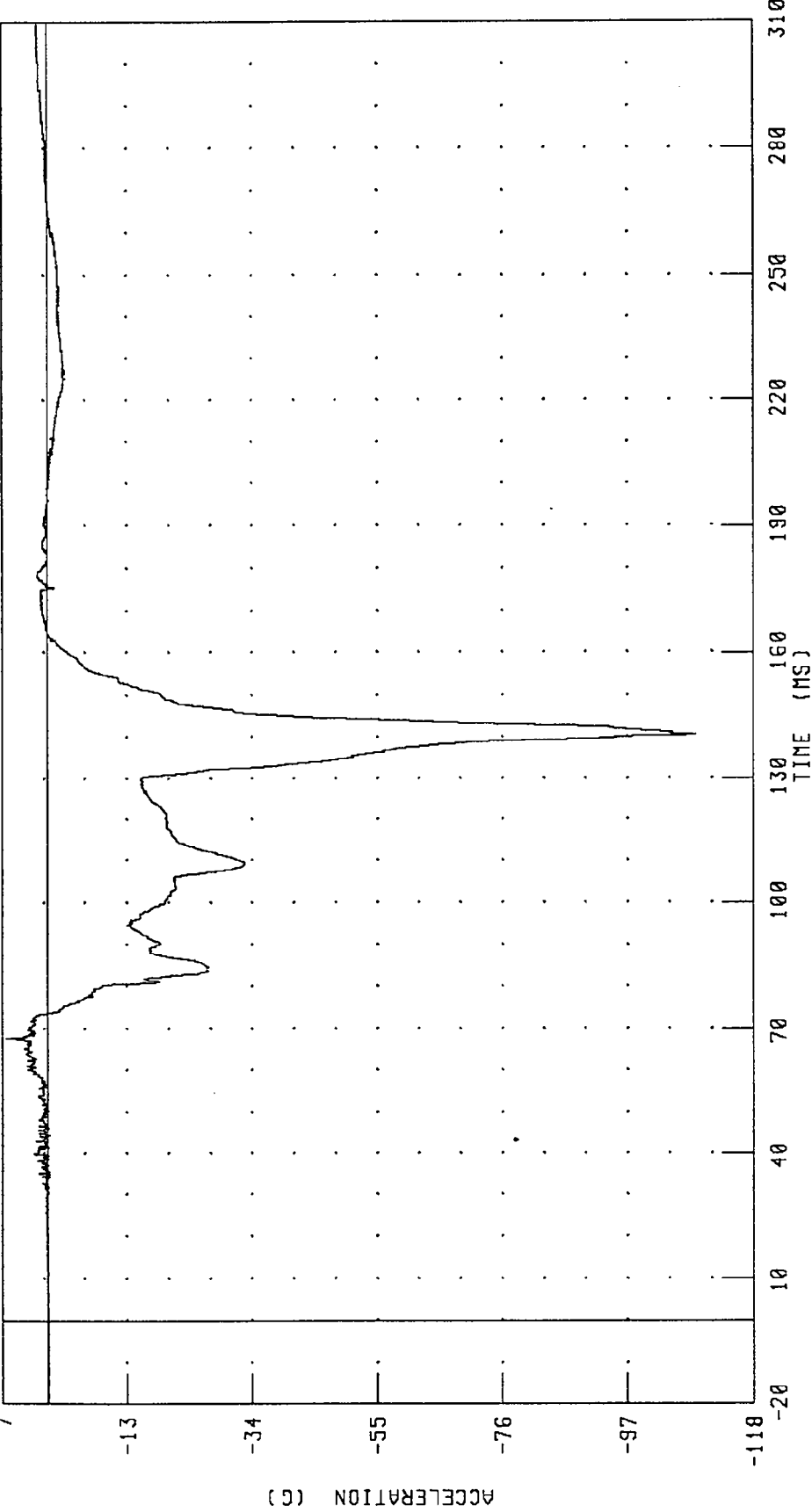


CHANNEL: ANRYM1 FILTER: CH. CLASS 600 PEAK DATA: 448.92 LBF·IN @ 50.40 MS; -3439.10 LBF·IN @ 76.00 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

7 TRC INC.

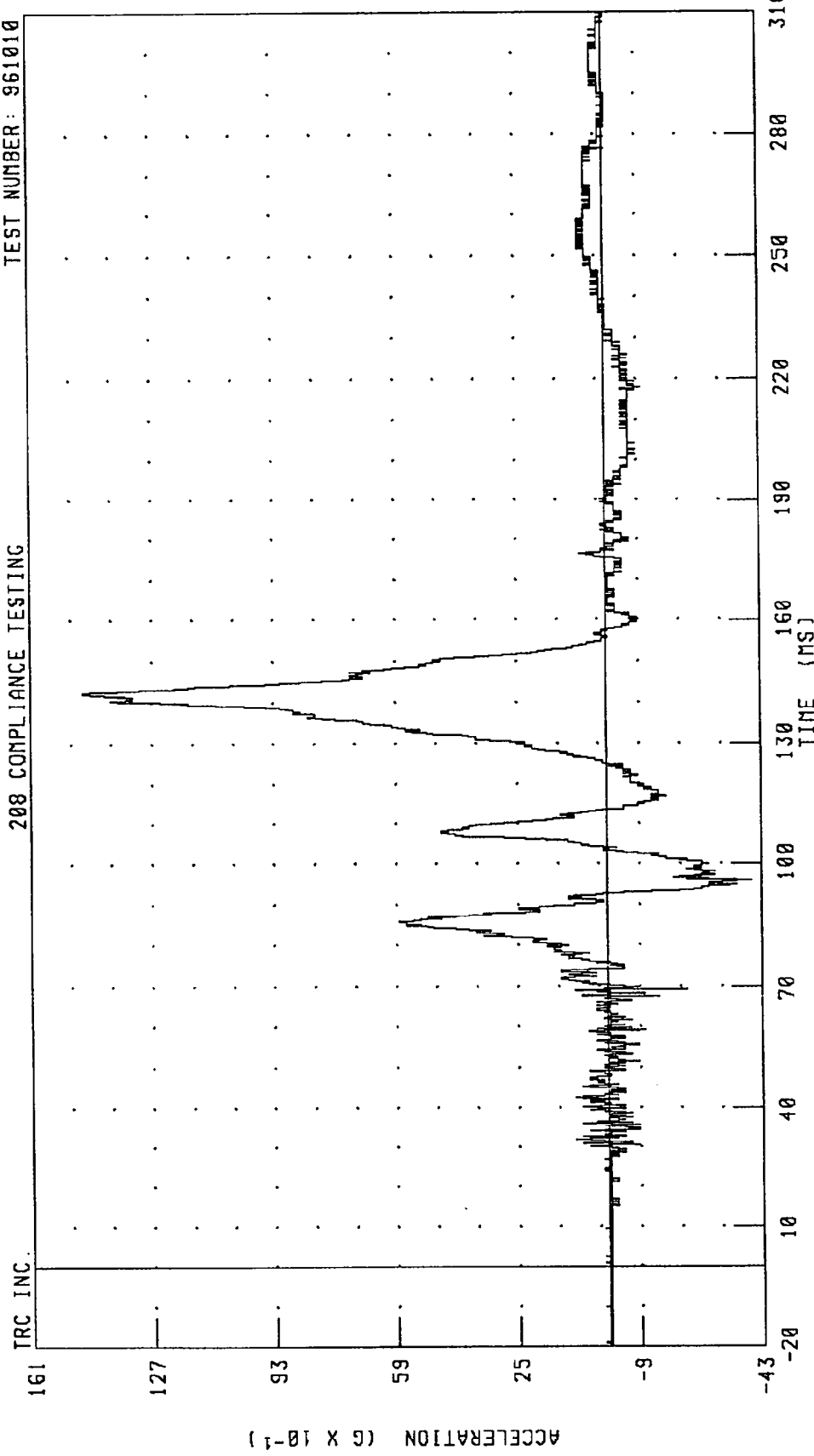


PEAK DATA: 7.04 G @ 67.68 MS; -108.64 G @ 140.64 MS

CHANNEL: HEDXC2 FILTER: CH. CLASS 1000

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

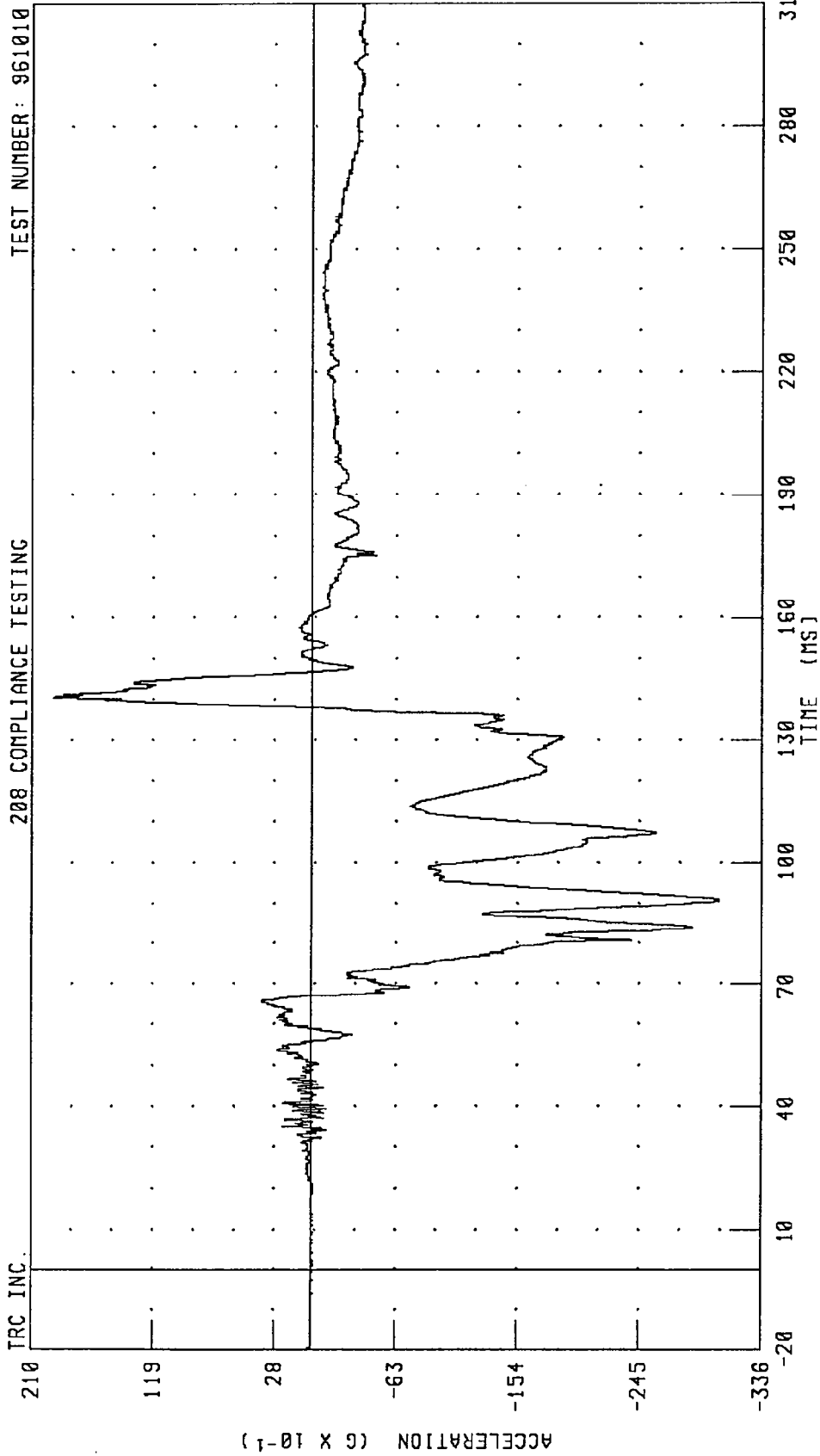


CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA: 14.62 G @ 142.40 MS; -3.99 G @ 95.84 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION
208 COMPLIANCE TESTING

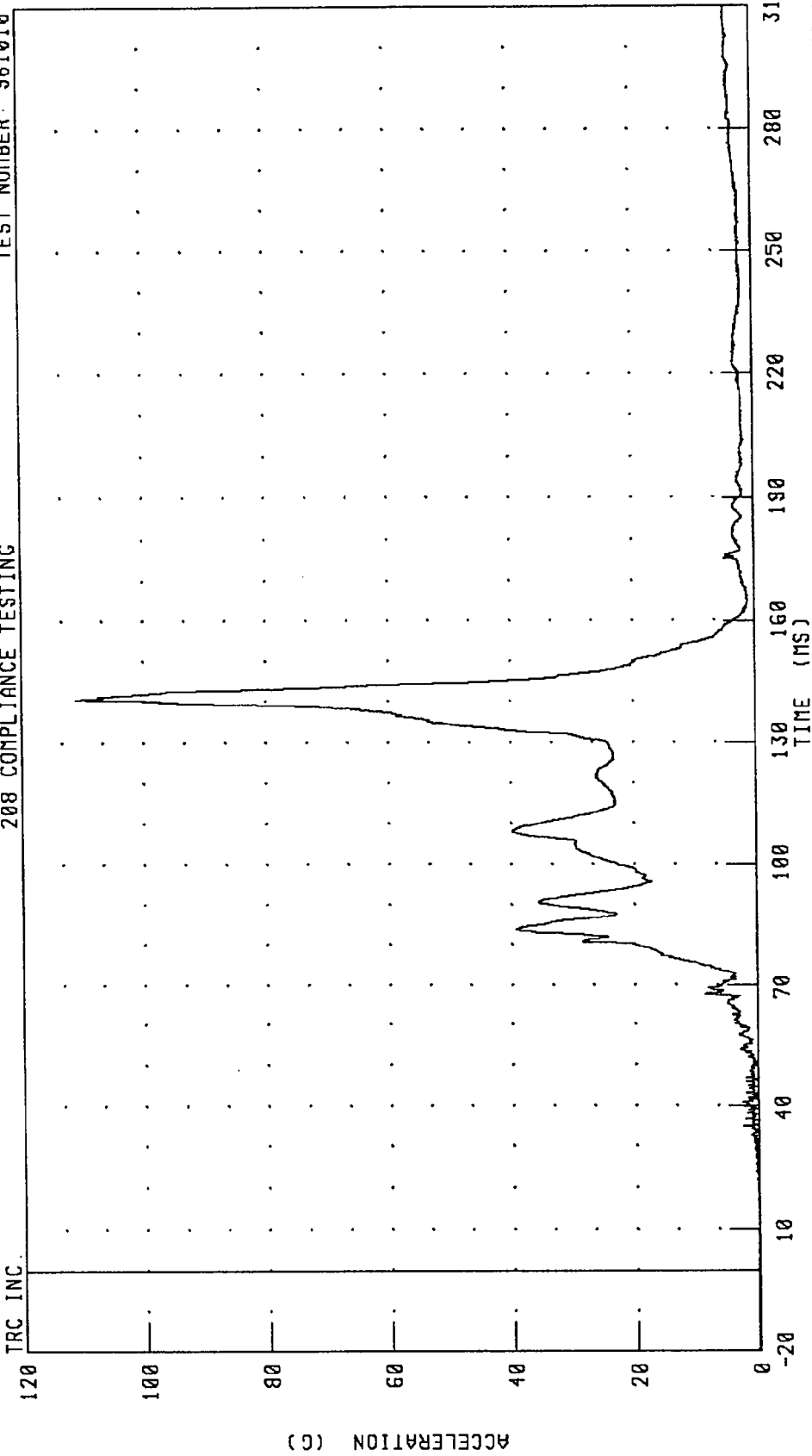
TEST NUMBER: 961010



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000
PEAK DATA: 19.37 G @ 140.64 MS; -30.39 G @ 90.56 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



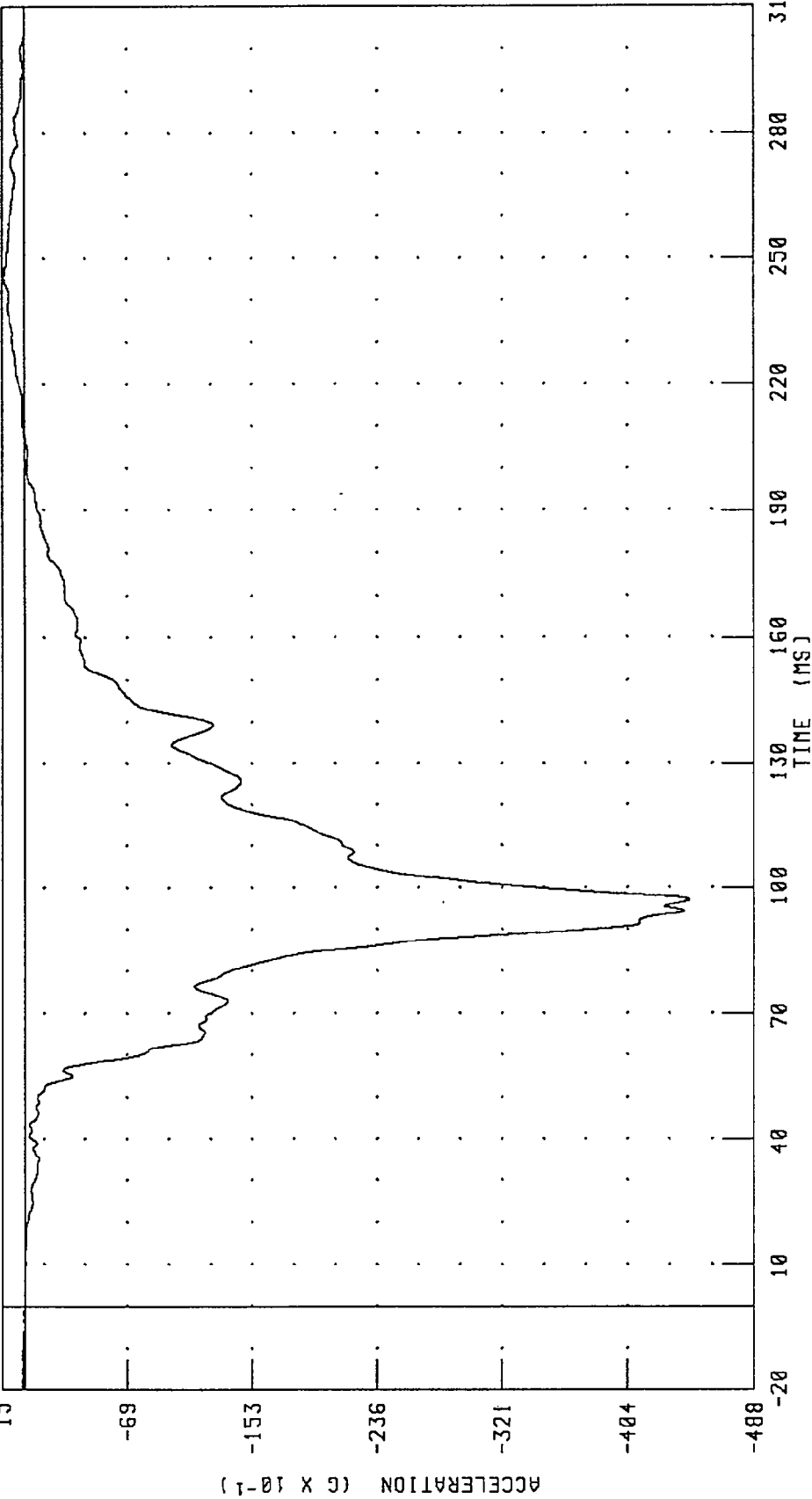
CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

010196

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

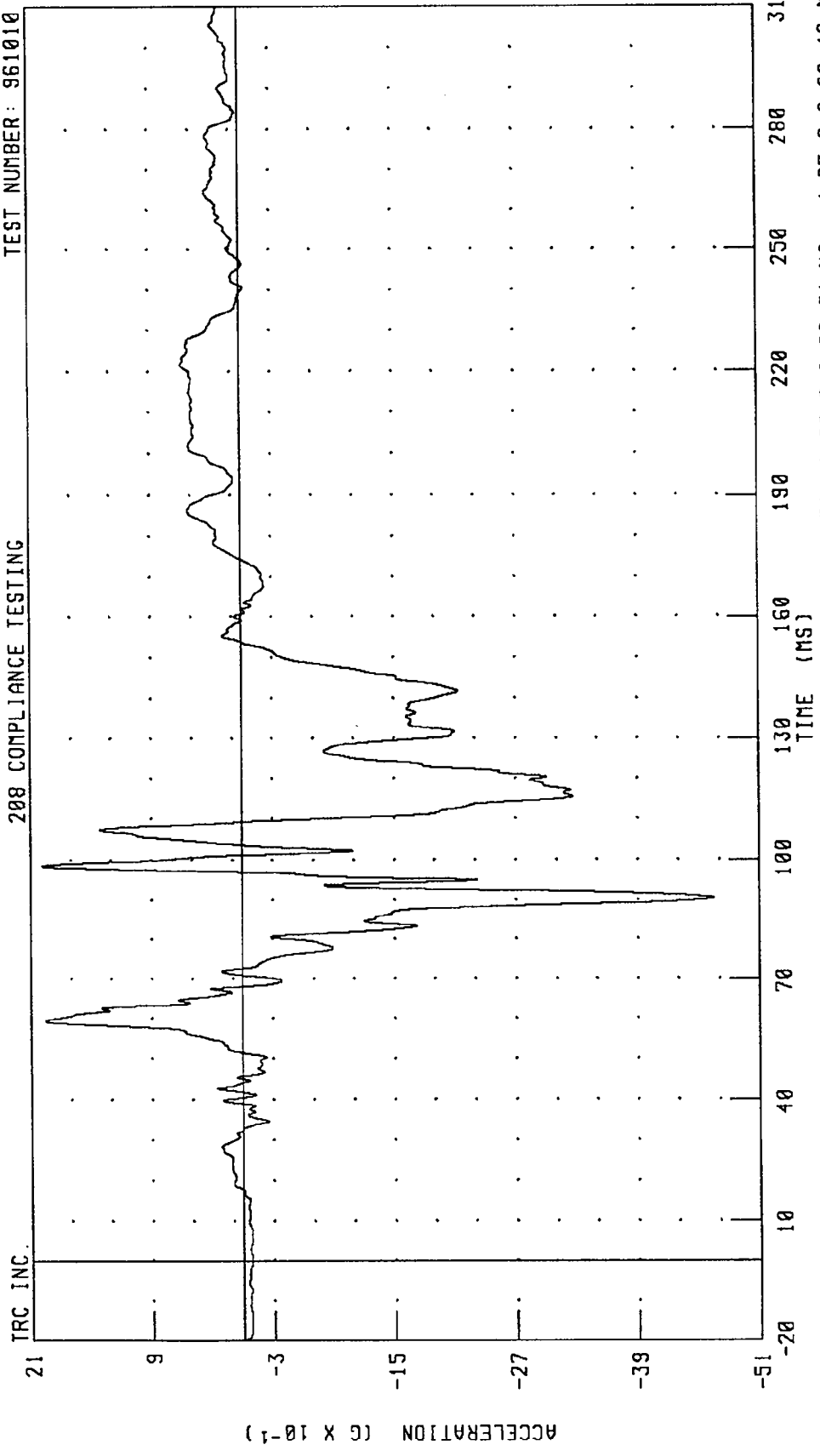
TRC INC.



CHANNEL: CSTXG2 FILTER: CH. CLASS 180
PEAK DATA: 1.38 G @ 245.60 MS; -44.64 G @ 97.20 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



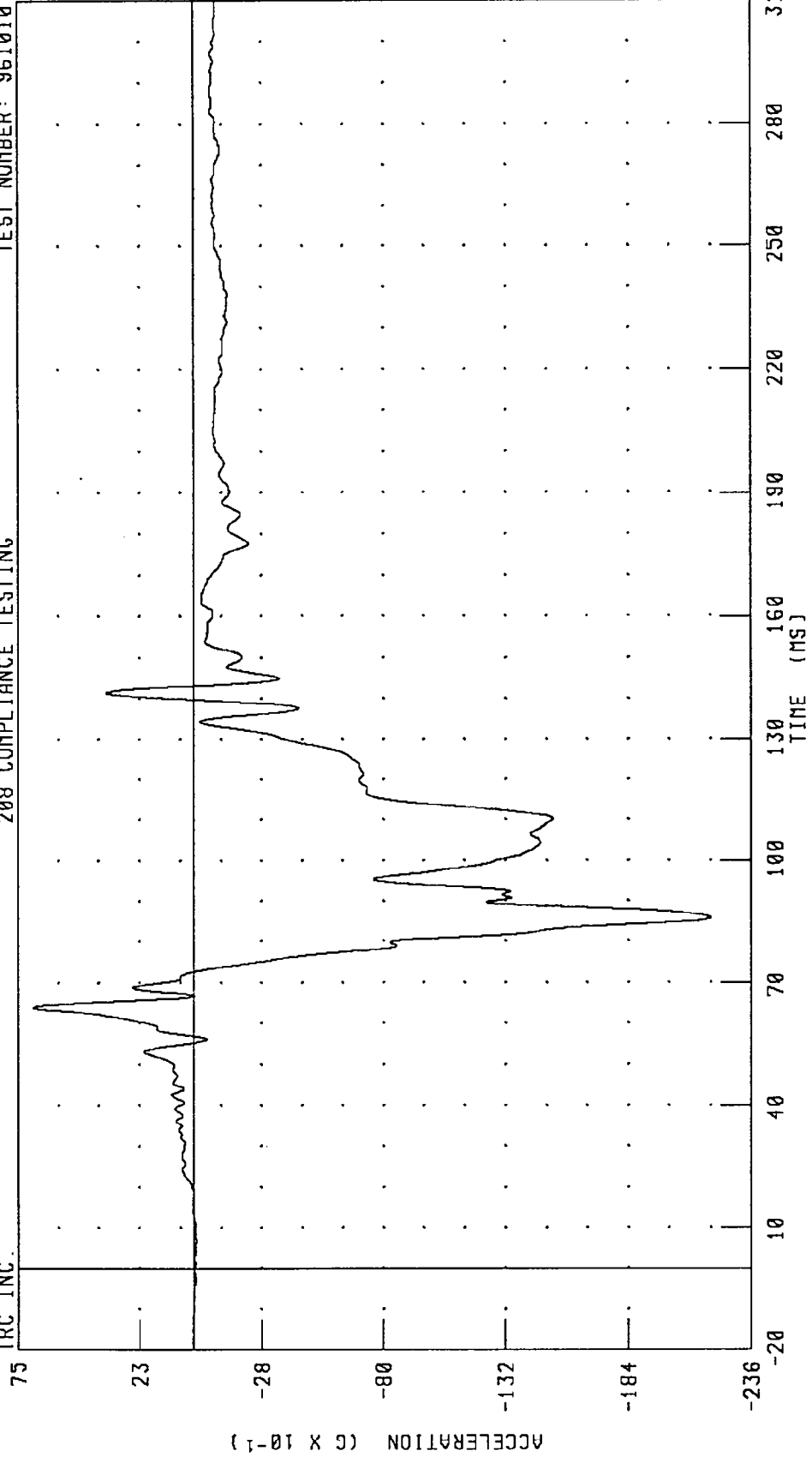
PEAK DATA: 1.98 G @ 98.64 MS; -4.65 G @ 90.48 MS

CHANNEL: CSTYG2 FILTER: CH. CLASS 180

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

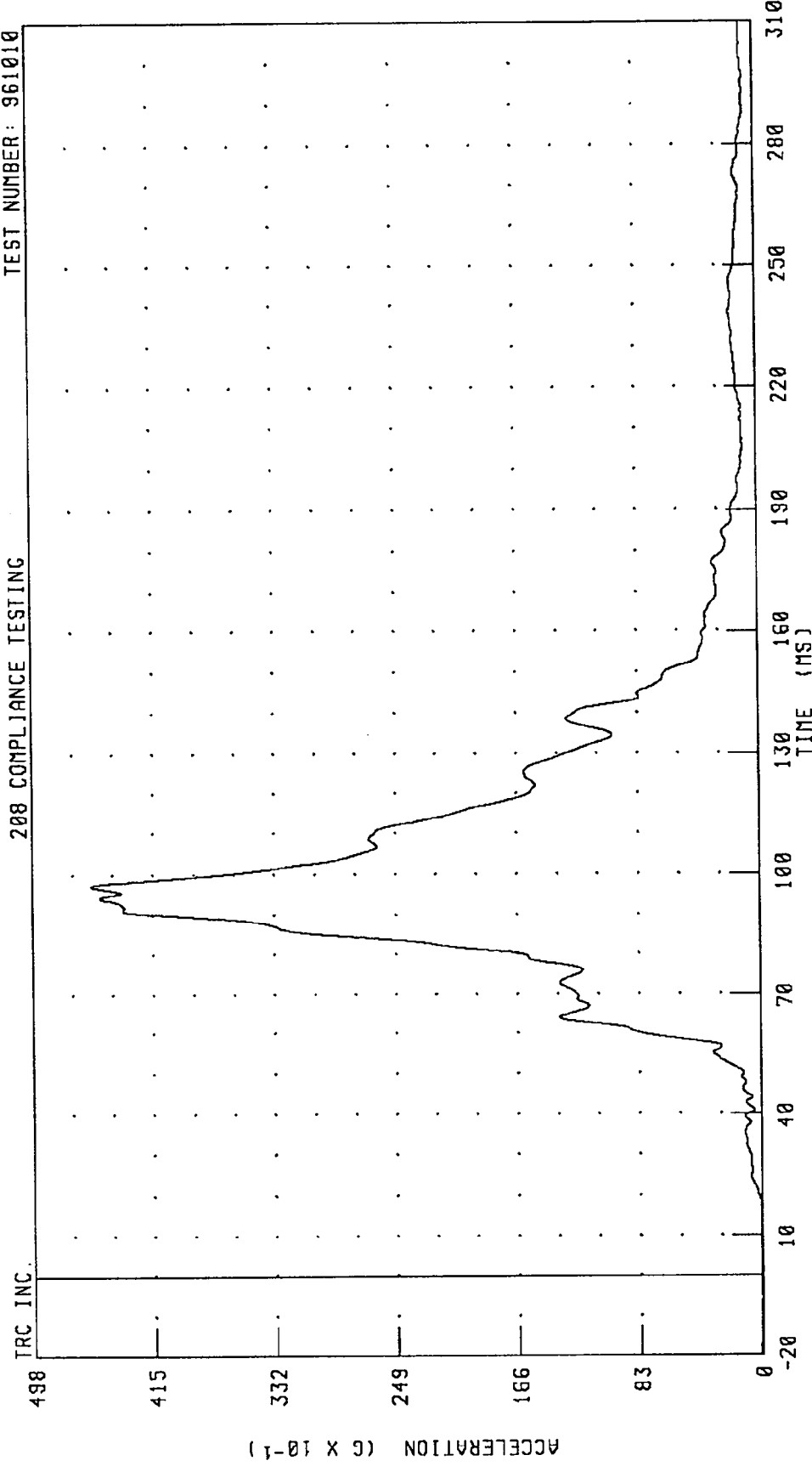


PEAK DATA: 6.83 G @ 64.08 MS; -21.97 G @ 85.76 MS

CHANNEL: CSTZG2 FILTER: CH. CLASS 180

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION
200 COMPLIANCE TESTING

TEST NUMBER: 961010

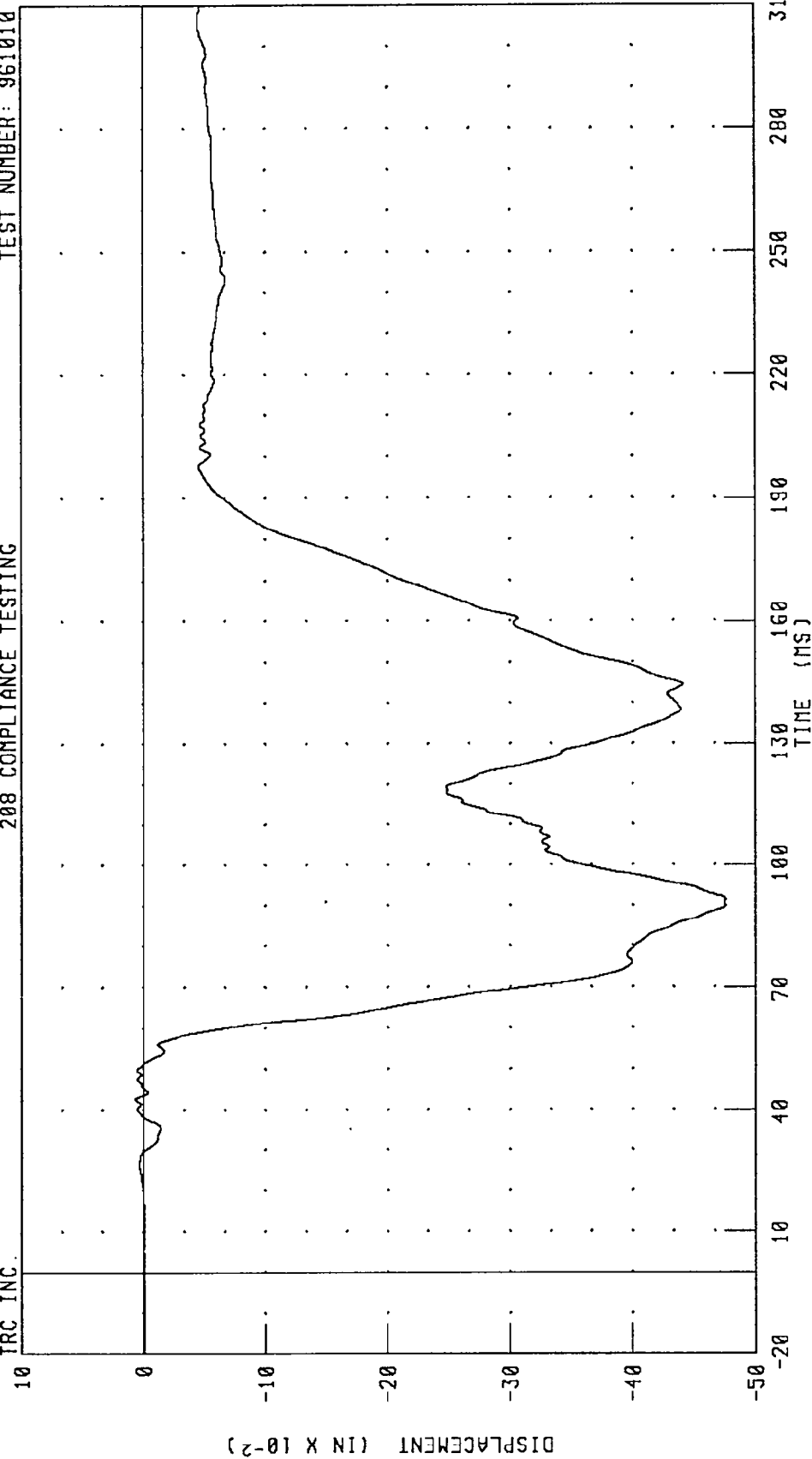


CHANNEL: CSTRG2 FILTER: CH. CLASS 180 PEAK DATA: 45.74 G @ 97.28 MS; 0.01 G @ -20.00 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST DEFLECTION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

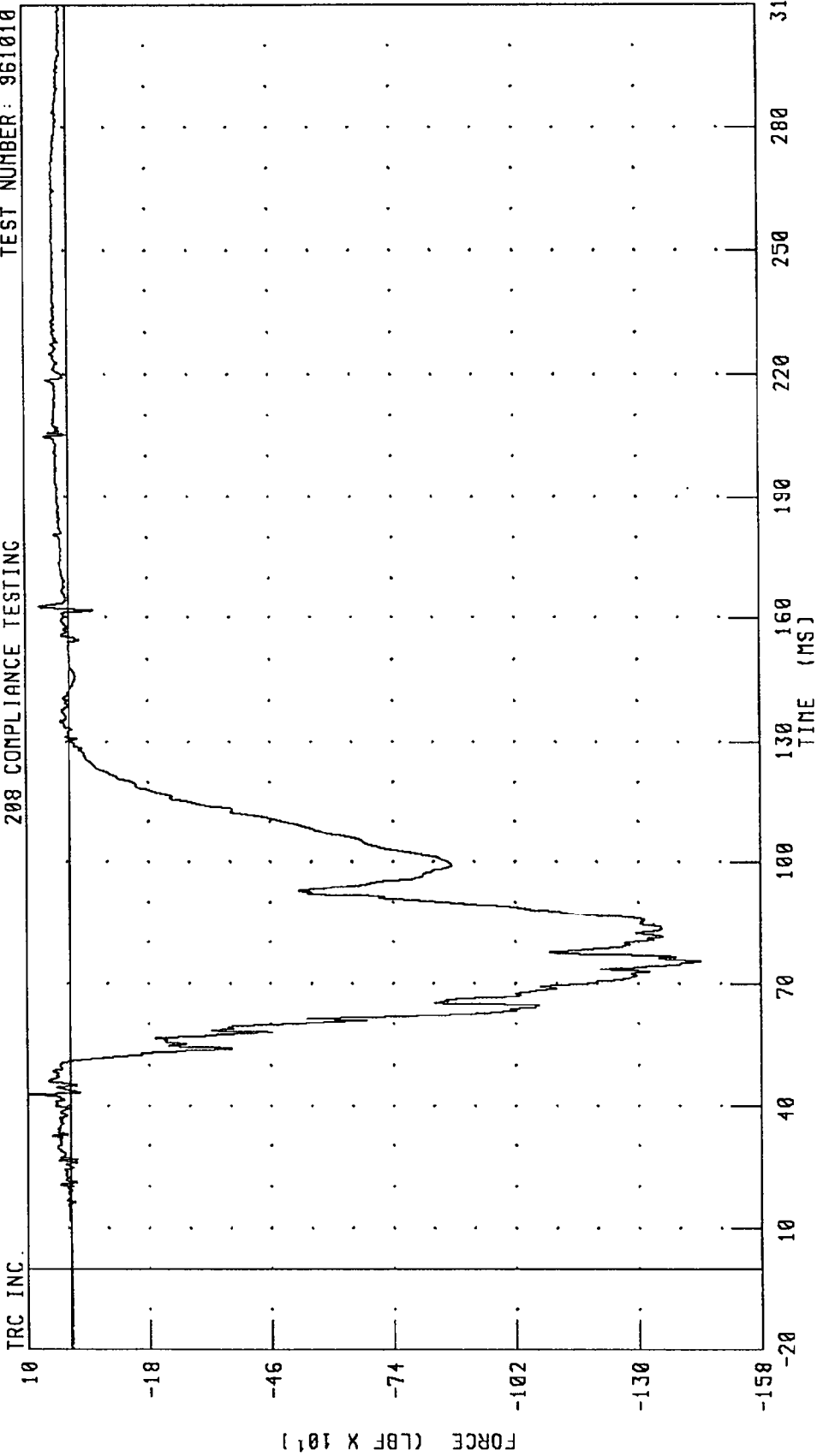
TRC INC.



CHANNEL: CSTXD2 FILTER: CH. CLASS 180 PEAK DATA: 0.01 IN @ 42.72 MS; -0.48 IN @ 89.92 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT FEMUR FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010

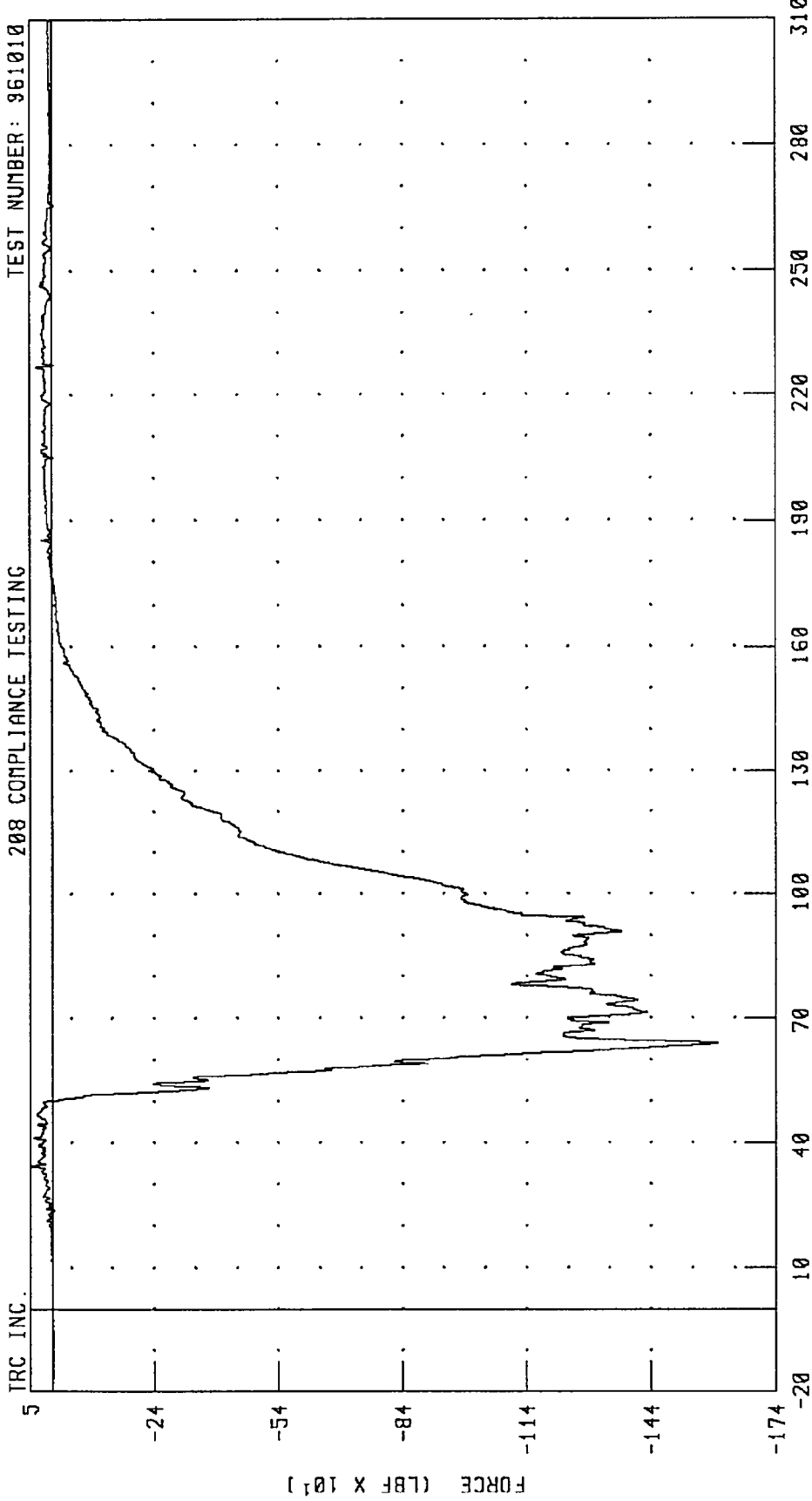


CHANNEL: LFMF2 FILTER: CH. CLASS 600
PEAK DATA: 98.43 LBF @ 42.96 MS; -1442.34 LBF @ 75.44 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 361010

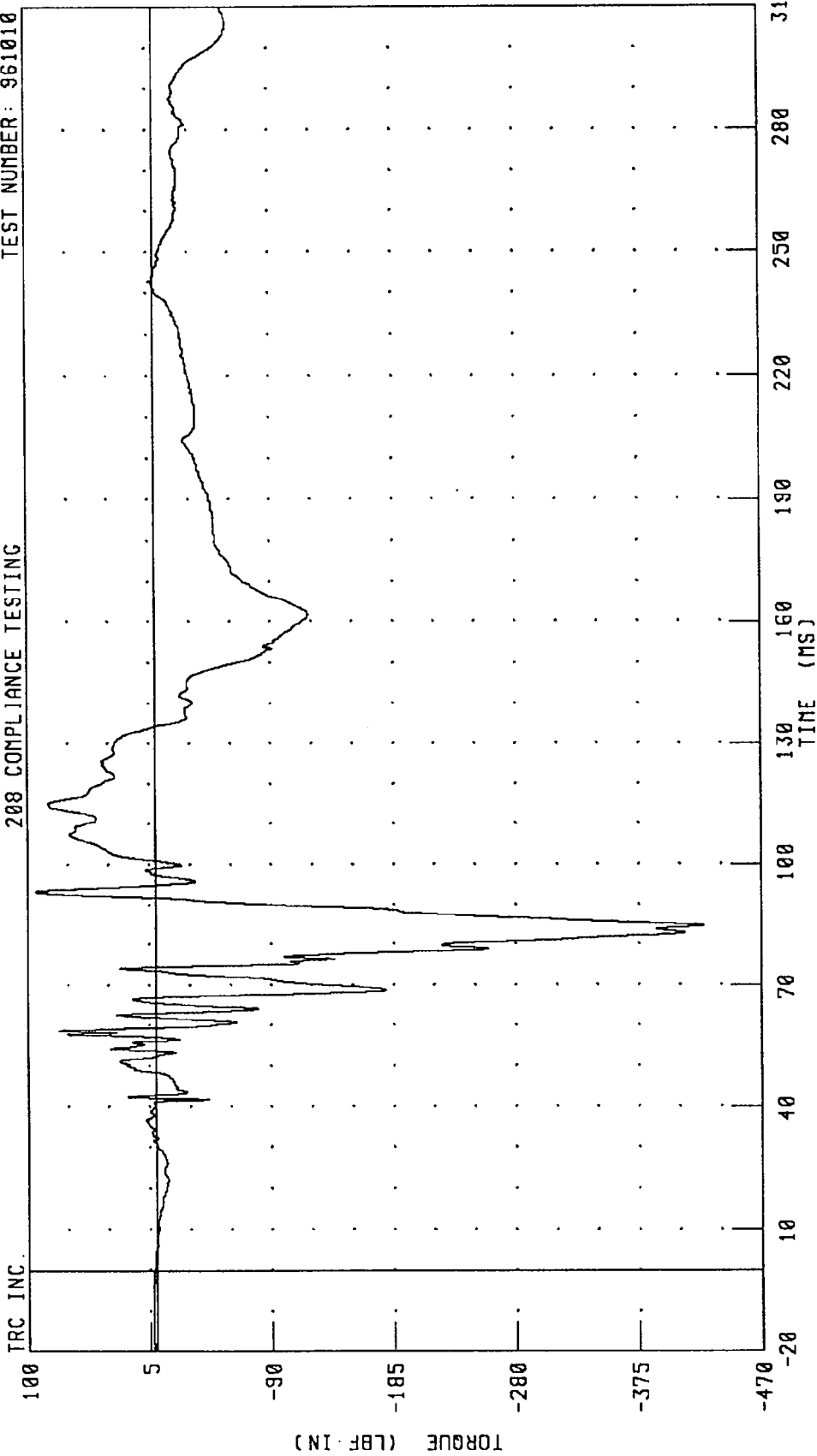
TRC INC.



CHANNEL: RFMF2 FILTER: CH. CLASS 600
PEAK DATA: 48.31 LBF @ 34.64 MS; -1606.19 LBF @ 64.00 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X-AXIS
208 COMPLIANCE TESTING

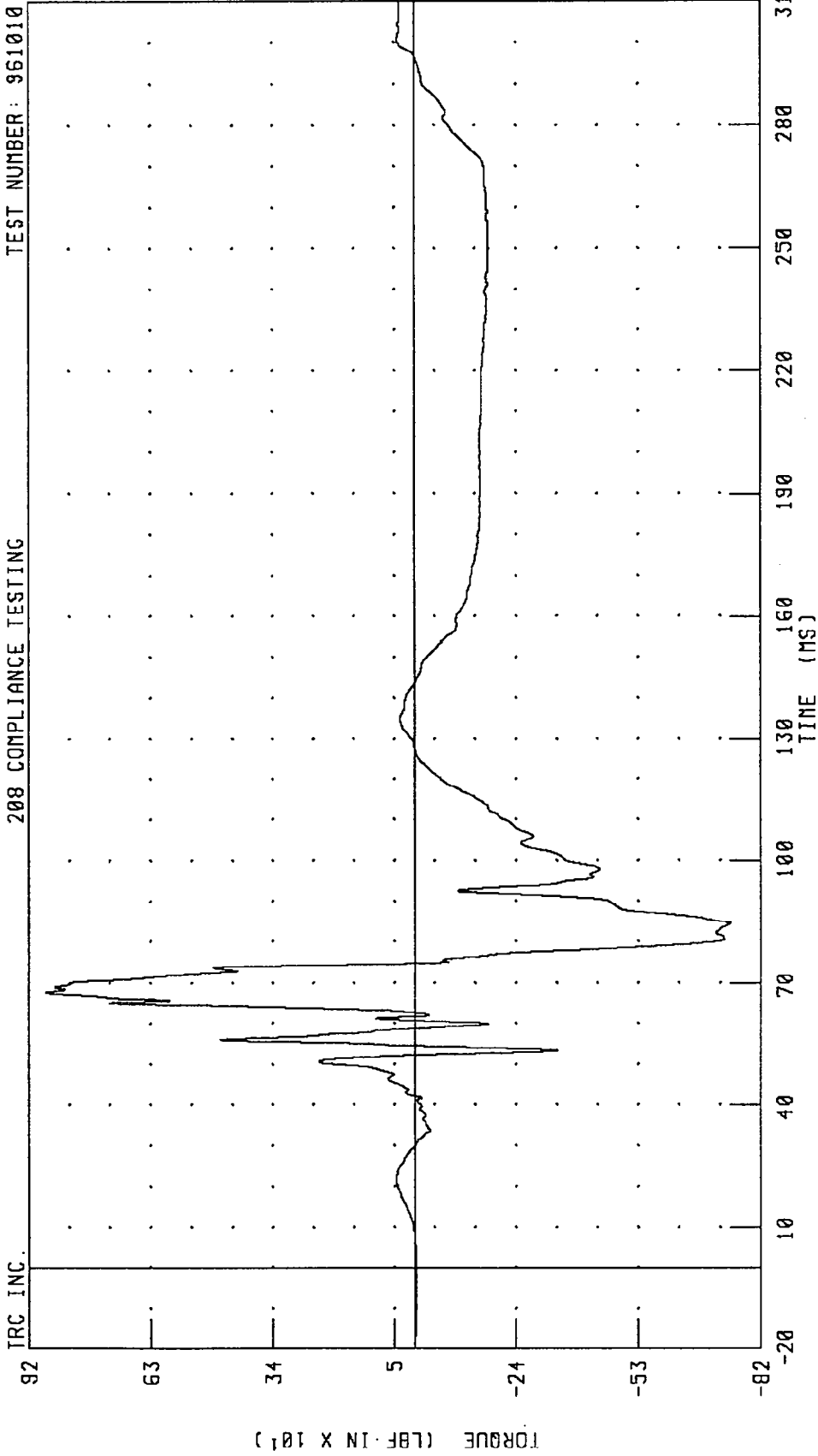
TEST NUMBER: 961010



CHANNEL: TBLXM2 FILTER: CH. CLASS 600 PEAK DATA: 93.76 LBF-IN @ 93.28 MS; -425.54 LBF-IN @ 84.64 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y-AXIS
208 COMPLIANCE TESTING

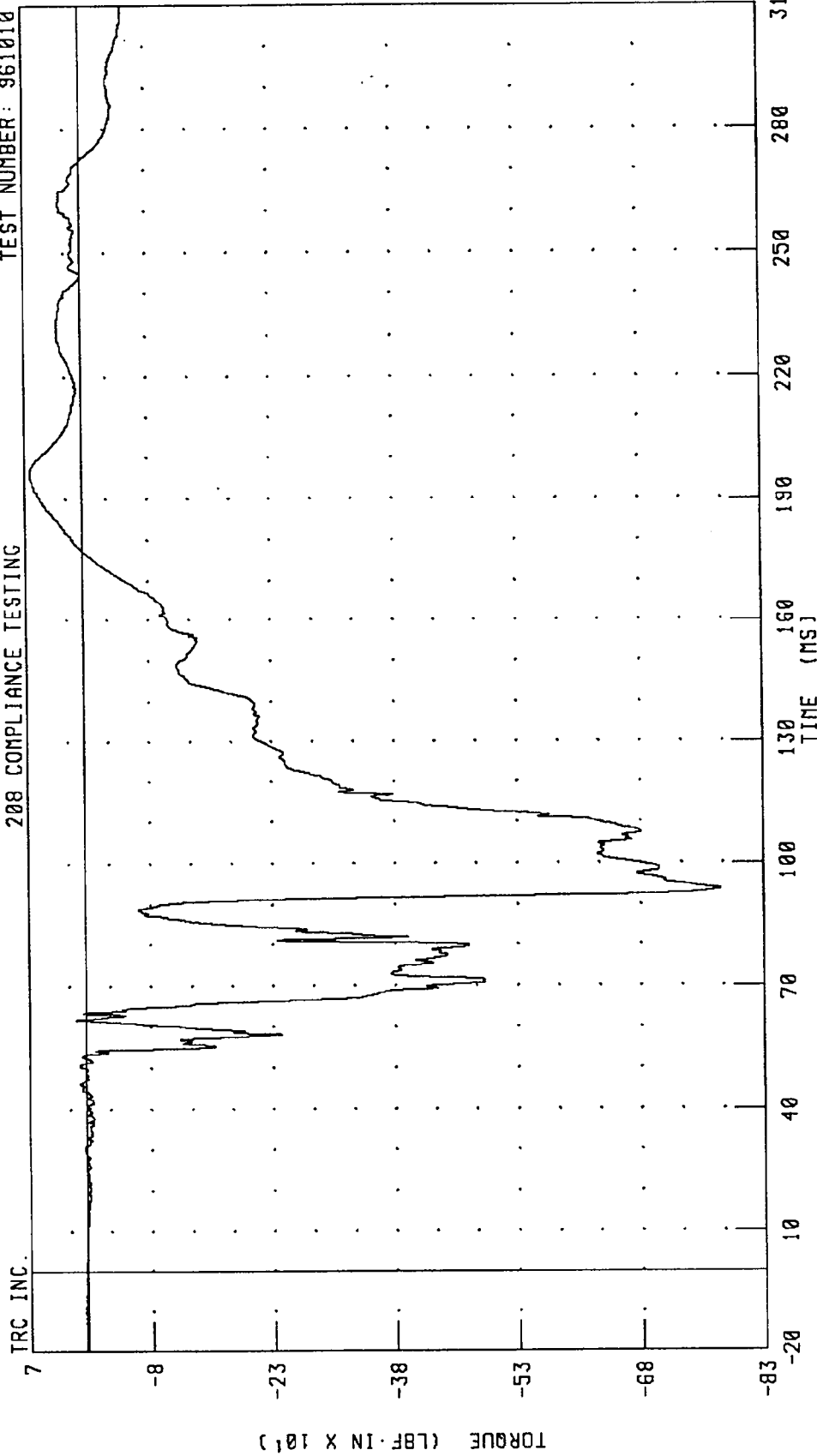
TEST NUMBER: 961010



CHANNEL: TBLYM2 FILTER: CH. CLASS 600 PEAK DATA: 881.27 LBF·IN @ 67.76 MS; -748.42 LBF·IN @ 84.48 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X-AXIS
208 COMPLIANCE TESTING

TEST NUMBER: 961010

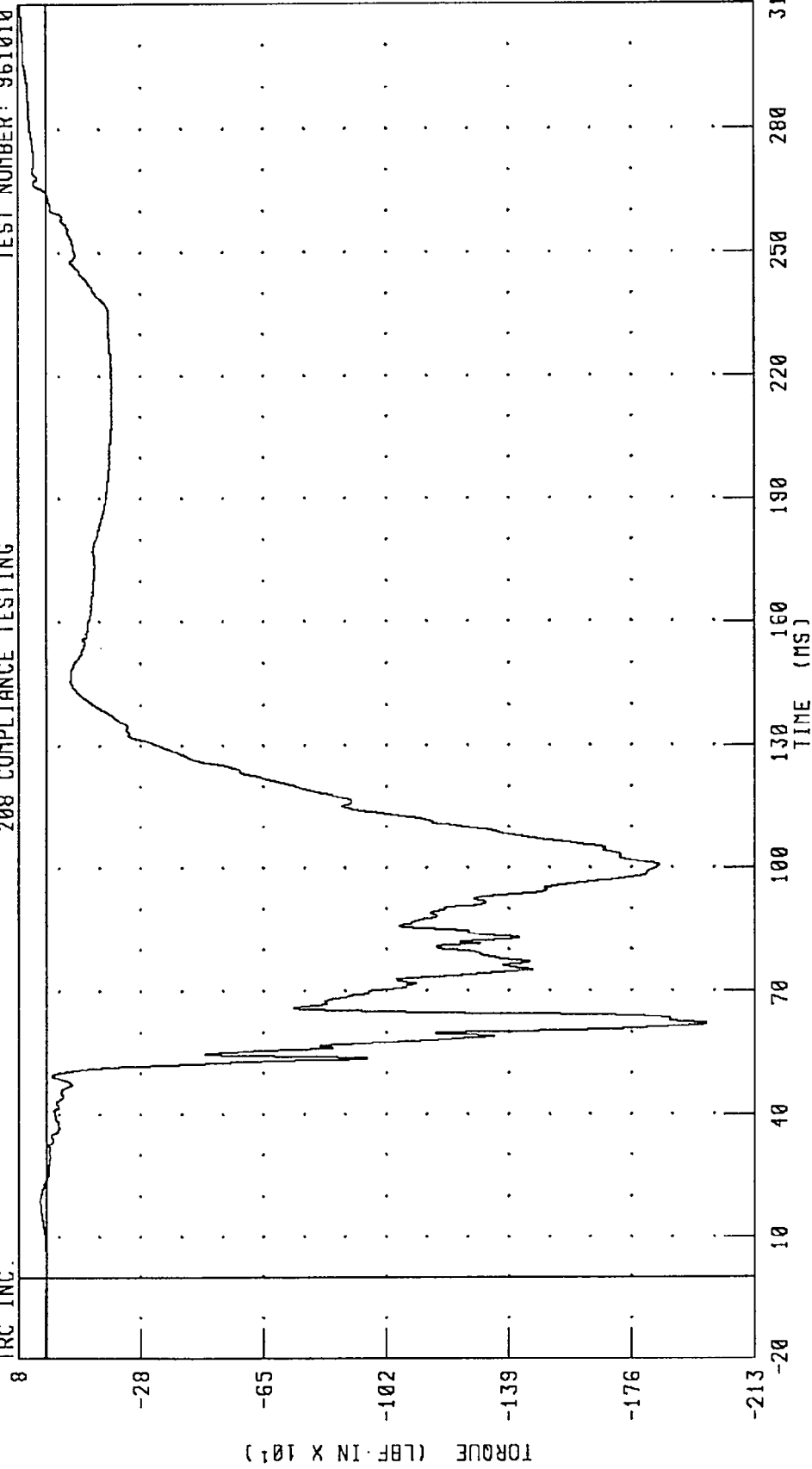


CHANNEL: TBRX12 FILTER: CH. CLASS 600 PEAK DATA: 63.82 LBF · IN @ 196.48 MS; -777.80 LBF · IN @ 93.84 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y-AXIS
208 COMPLIANCE TESTING

TEST NUMBER: 961010

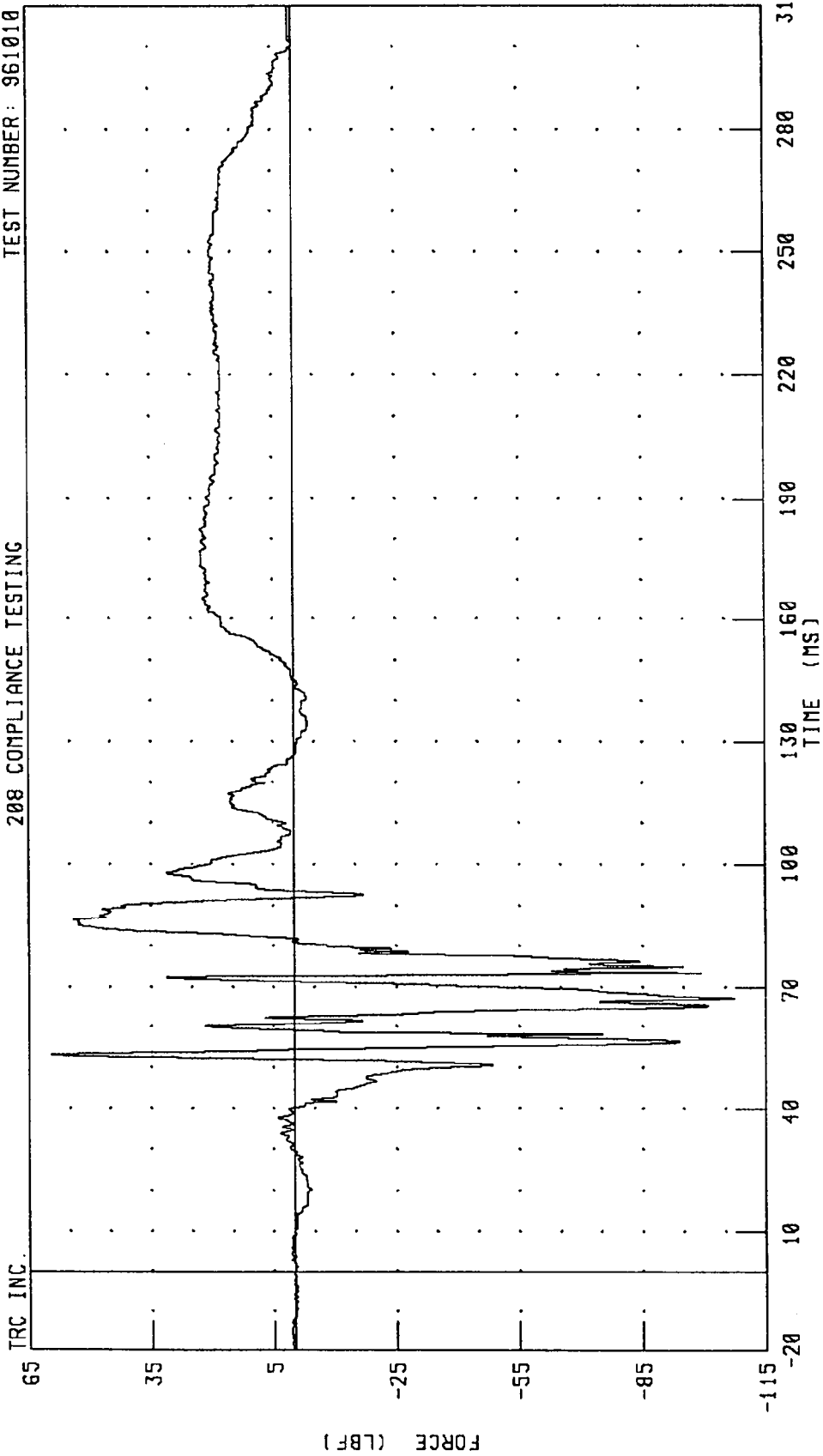
TRC INC.



CHANNEL: TBRYM2 FILTER: CH. CLASS 600 PEAK DATA: 78.58 LBF·IN @ 308.08 MS; -1989.68 LBF·IN @ 62.16 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT LOWER TIBIA X-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010



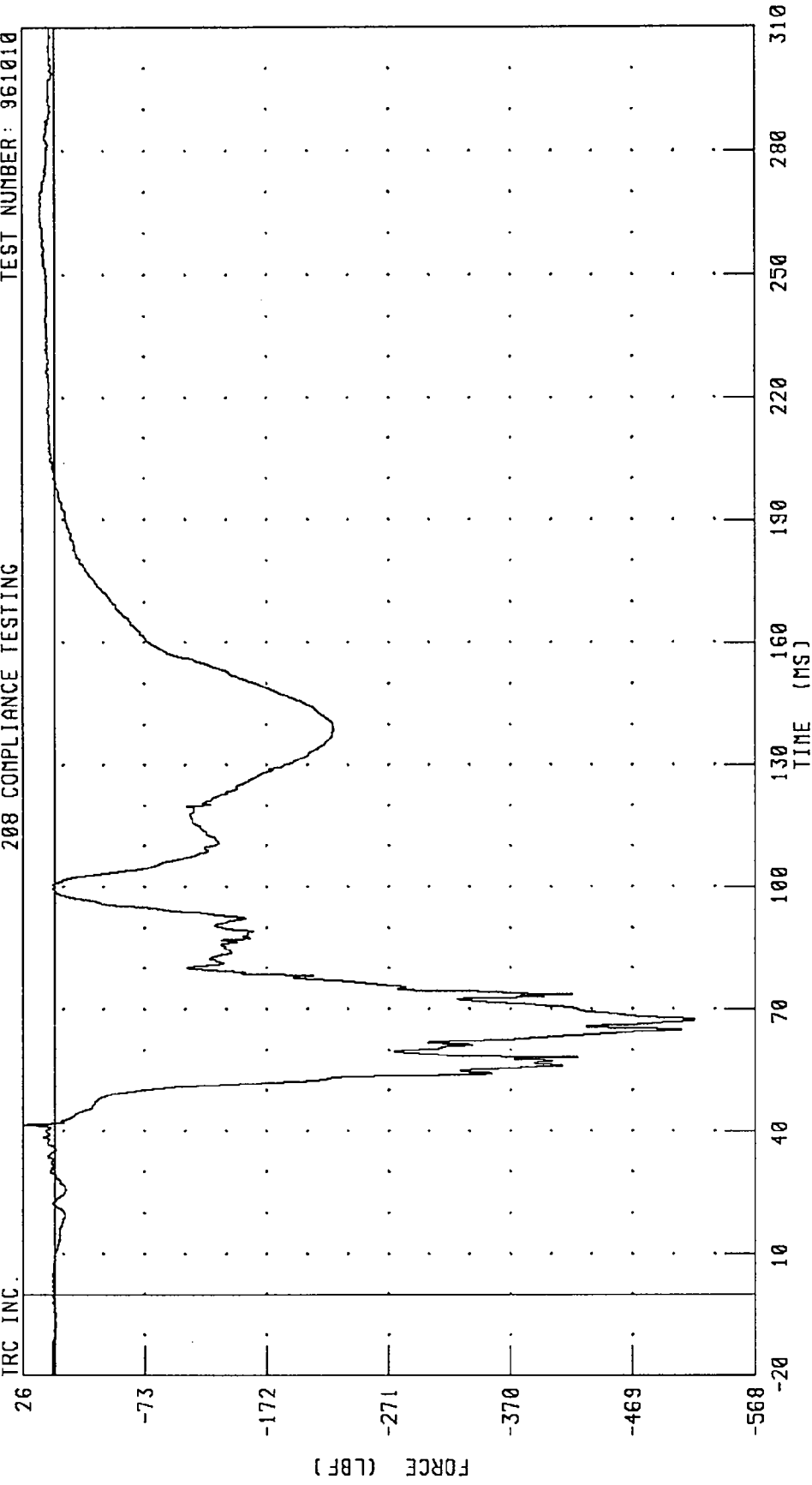
CHANNEL: ANLXF2 FILTER: CH. CLASS 600

PEAK DATA: 59.59 LBF @ 53.04 MS; -107.32 LBF @ 67.20 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT LOWER TIBIA Z-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

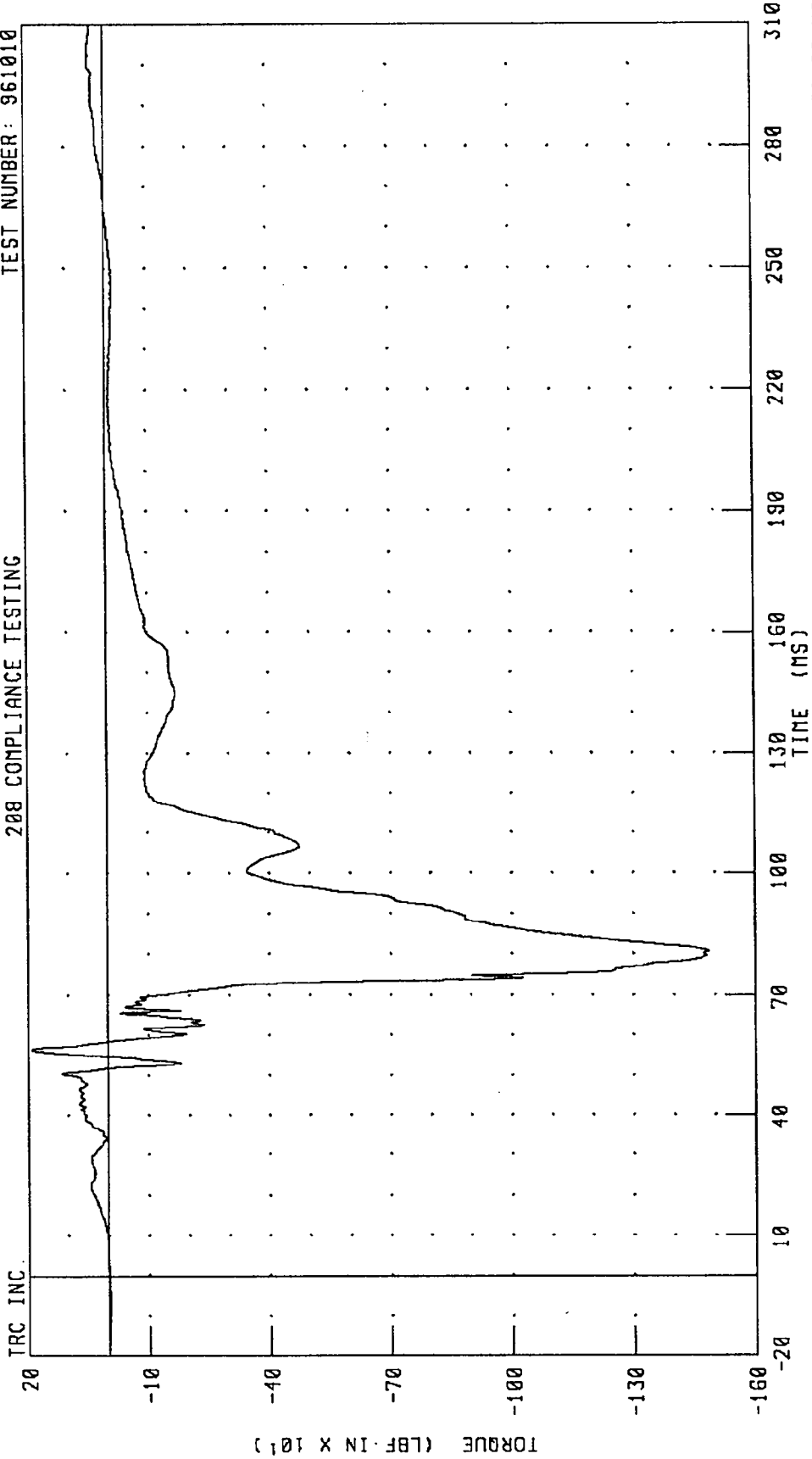


PEAK DATA: 23.93 LBF @ 41.60 MS; -519.32 LBF @ 67.52 MS

CHANNEL: ANLZF2 FILTER: CH. CLASS 600

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y-AXIS
208 COMPLIANCE TESTING

TEST NUMBER: 961010



CHANNEL: ANLYM2 FILTER: CH. CLASS 600 PEAK DATA: 190.03 LBF·IN @ 56.48 MS; -1485.51 LBF·IN @ 80.80 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT LOWER TIBIA X-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

533

443

353

263

173

83

-6

FORCE (LBF)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

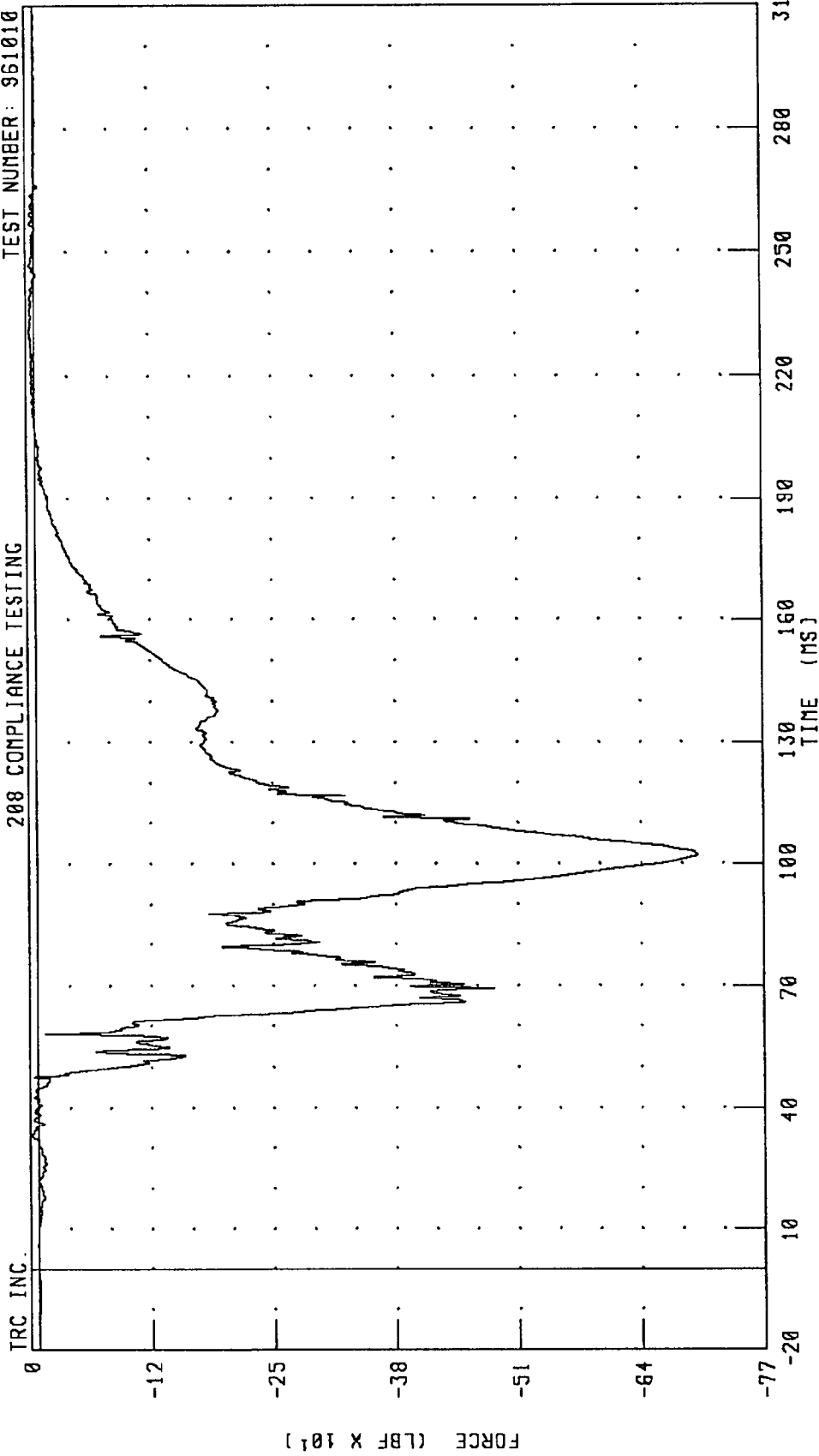
-20

PEAK DATA: 489.39 LBF @ 61.68 MS; -6.01 LBF @ 295.52 MS

CHANNEL: ANRXF2 FILTER: CH. CLASS 600

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE
208 COMPLIANCE TESTING

TEST NUMBER: 961010



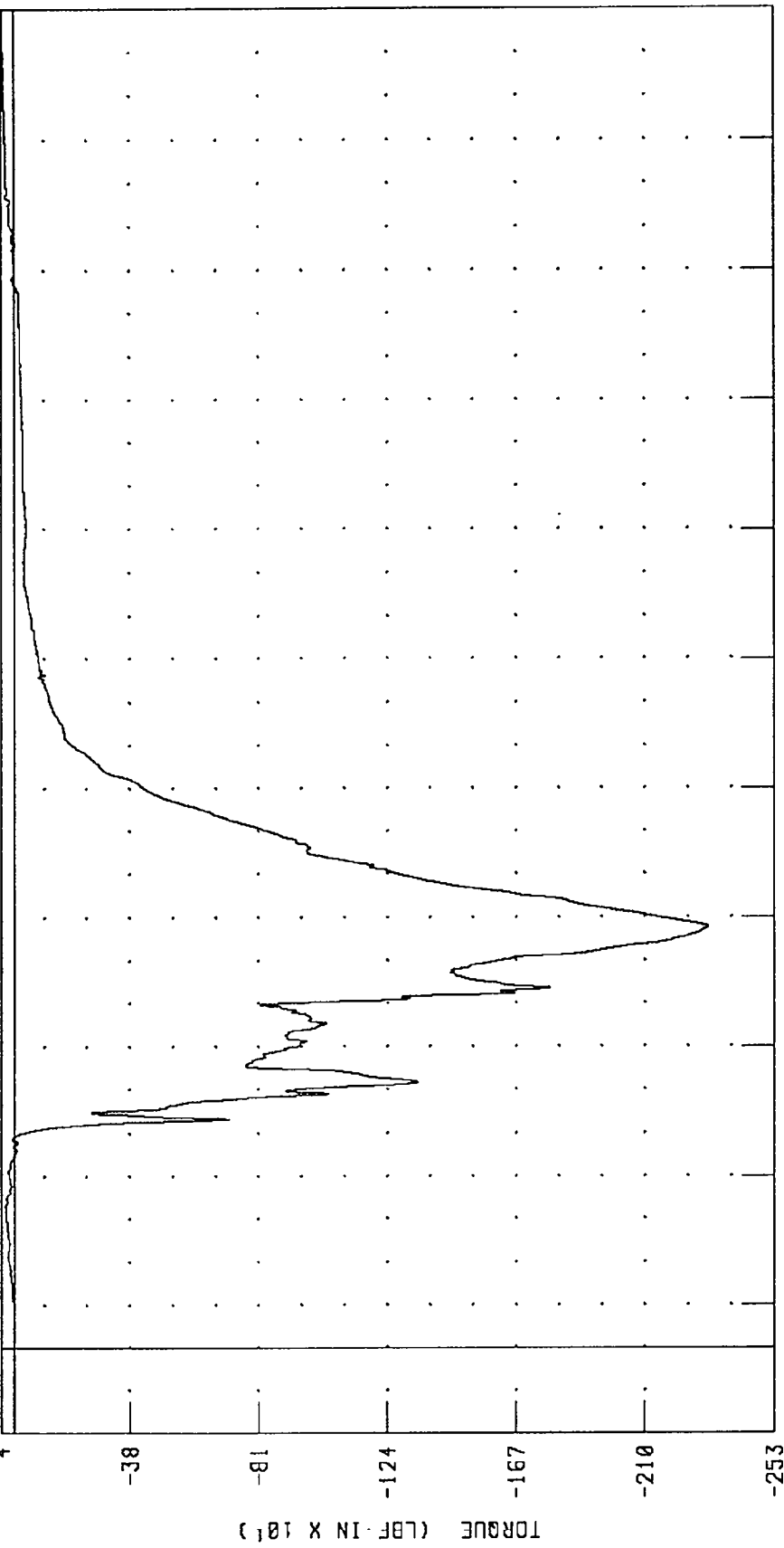
CHANNEL: ANRZF2 FILTER: CH. CLASS 600

PEAK DATA: 8.57 LBF @ 33.28 MS; -700.80 LBF @ 102.08 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y-AXIS
208 COMPLIANCE TESTING

TEST NUMBER: 961010

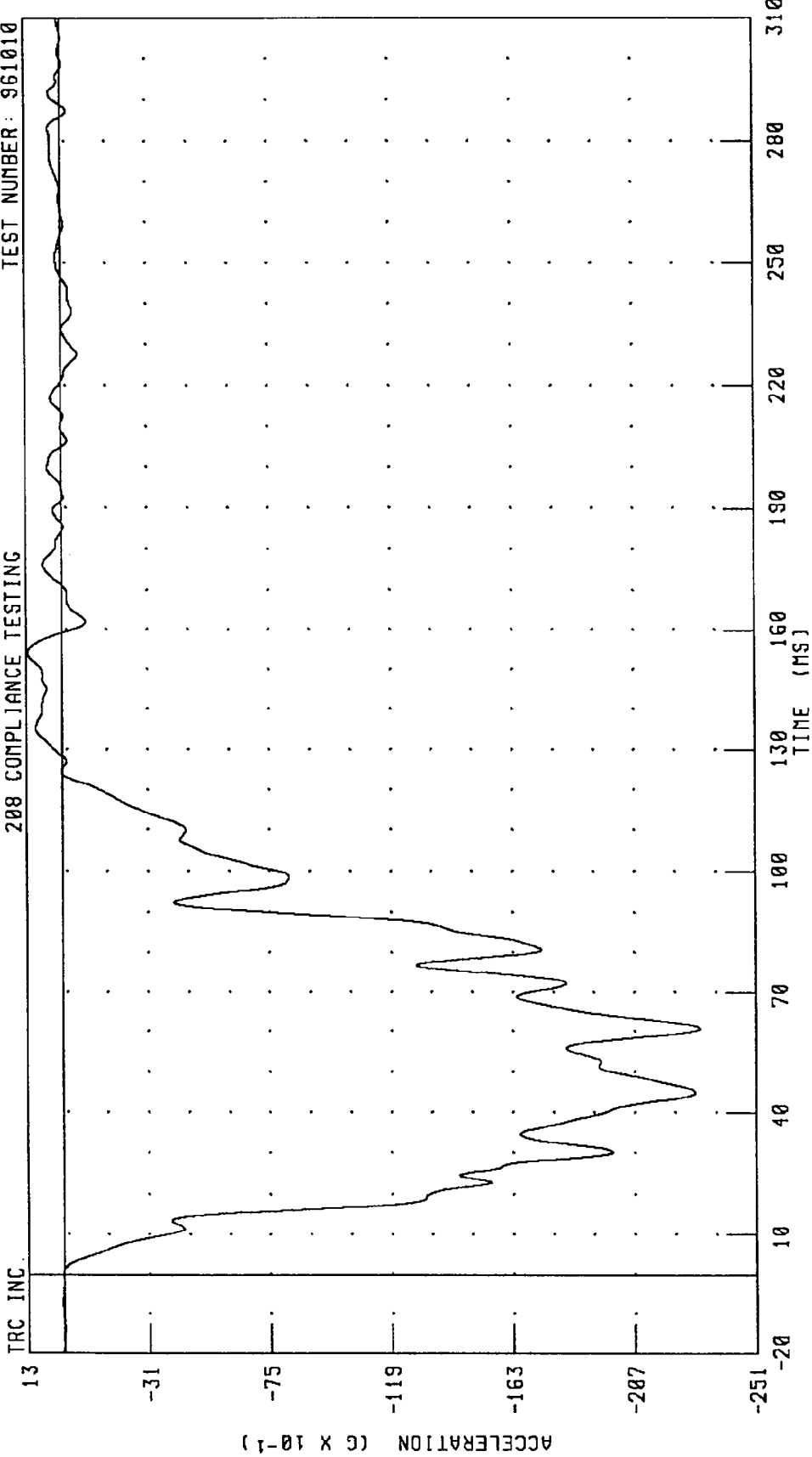
TRC INC.



CHANNEL: ANRYM2 FILTER: CH. CLASS 600 PEAK DATA: 39.83 LBF-IN @ 308.16 MS; -2316.75 LBF-IN @ 97.76 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.22 G @ 153.84 MS; -23.07 G @ 60.72 MS

TRC INC.

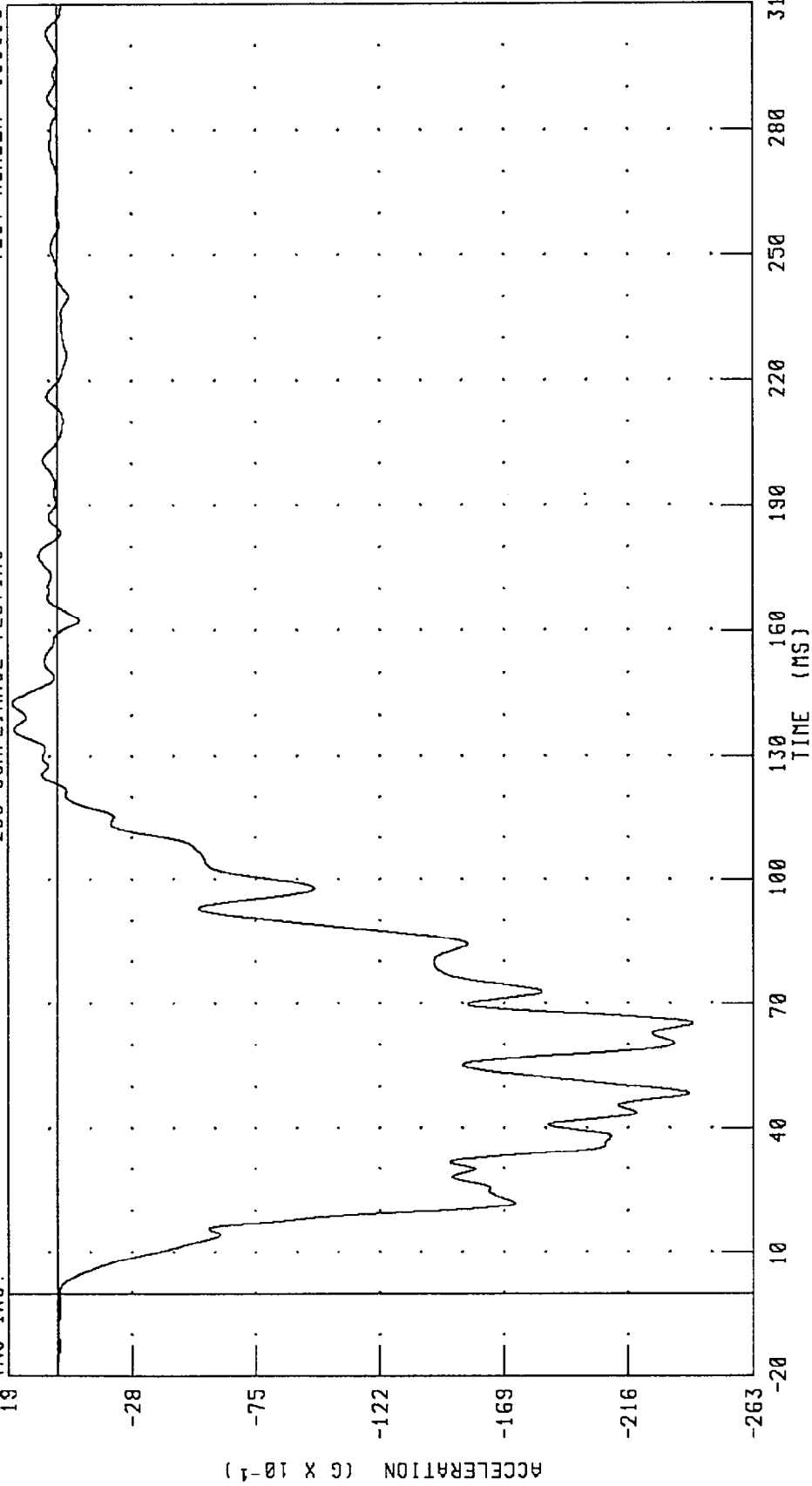
-31

ACCELERATION (G X 10⁻¹)

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

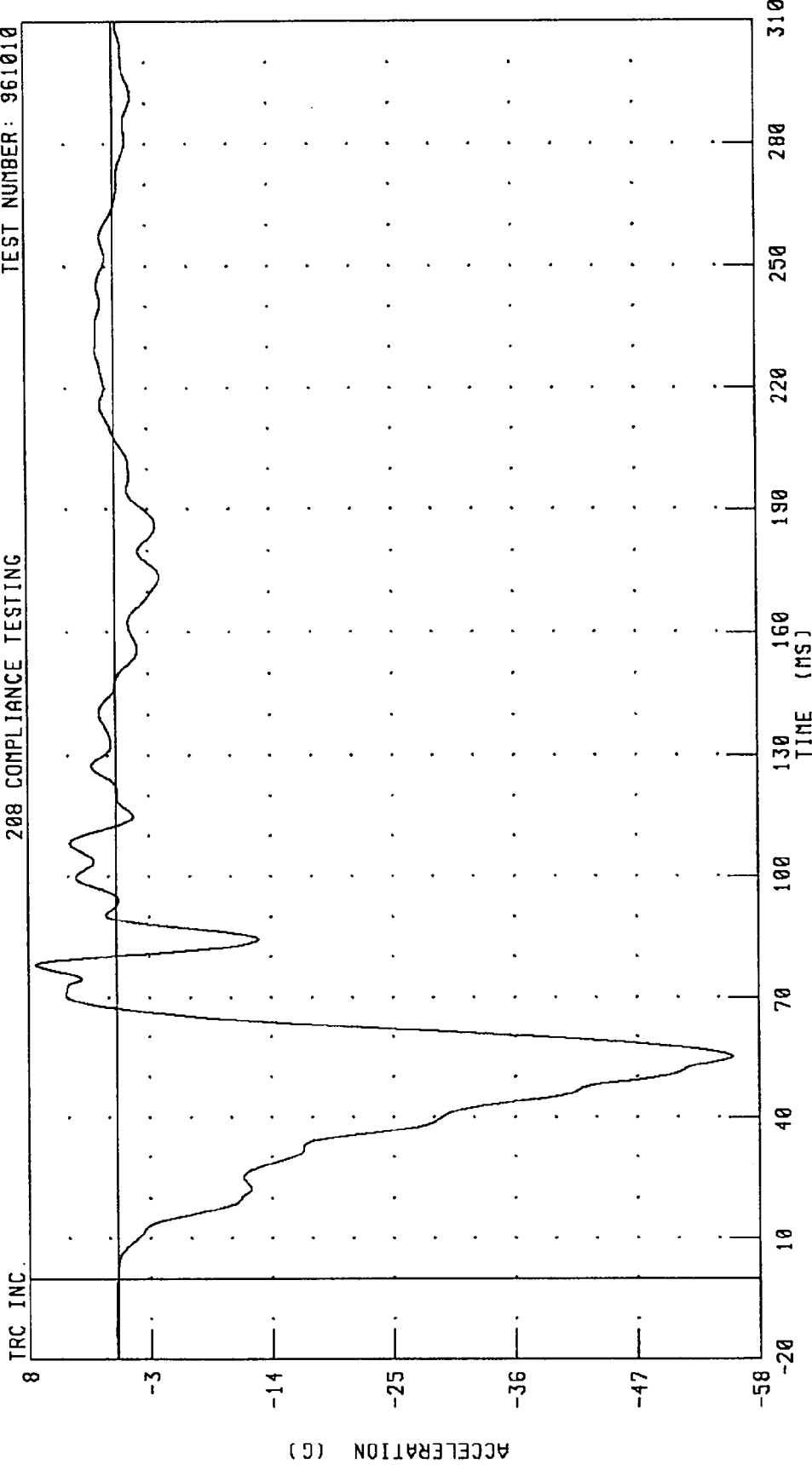


PEAK DATA: 1.74 G @ 142.96 MS; -24.03 G @ 65.28 MS

CHANNEL: TRRXG1 FILTER: CH. CLASS 60

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
ENGINE UPPER BLOCK X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



CHANNEL: ENGXC1 FILTER: CH. CLASS 60
PEAK DATA: 7.30 G @ 78.16 MS; -55.59 G @ 51.96 MS

ACCELERATION (G)

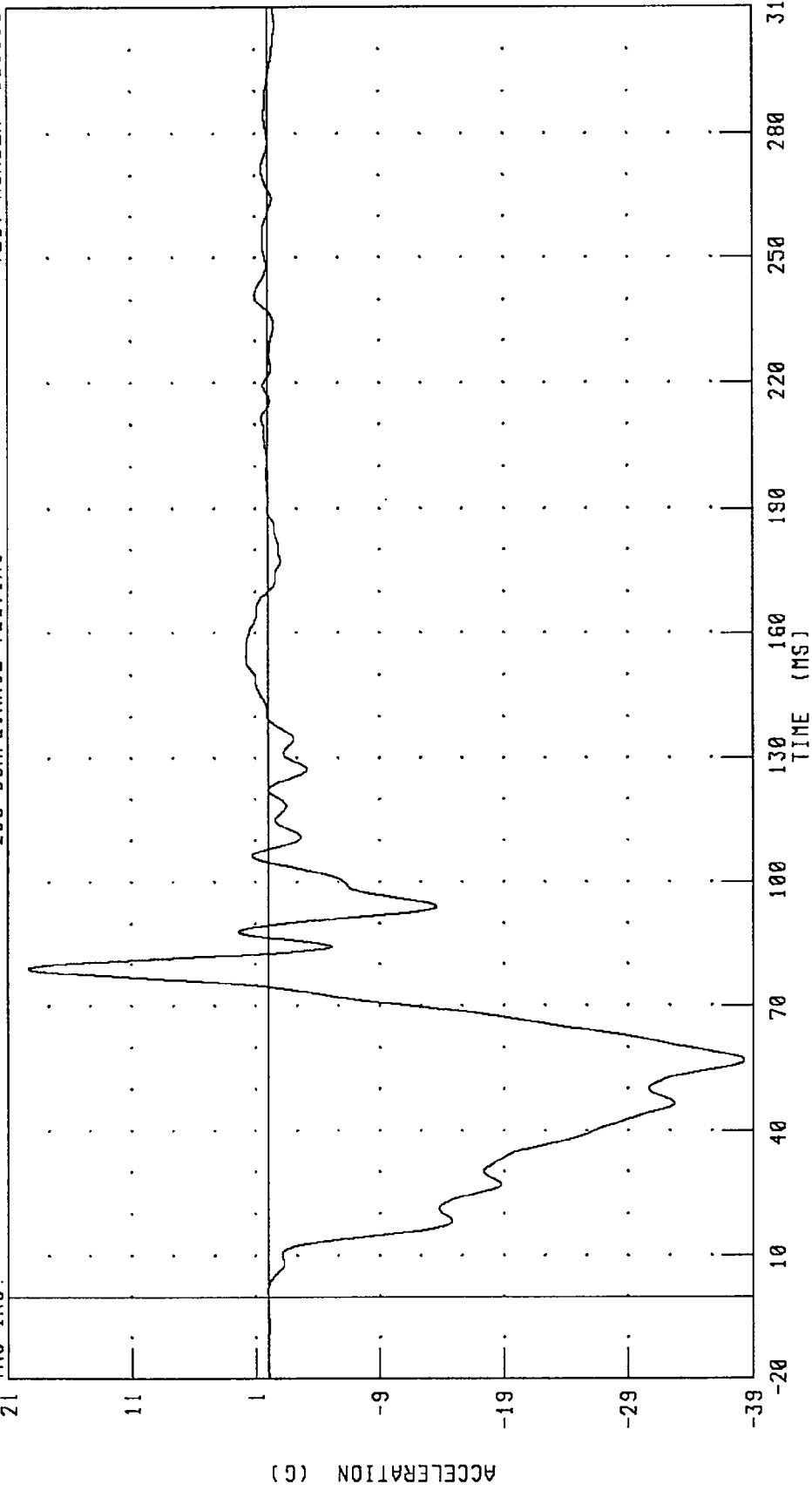
TIME (MS)

TRC INC.

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM BLOCK X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

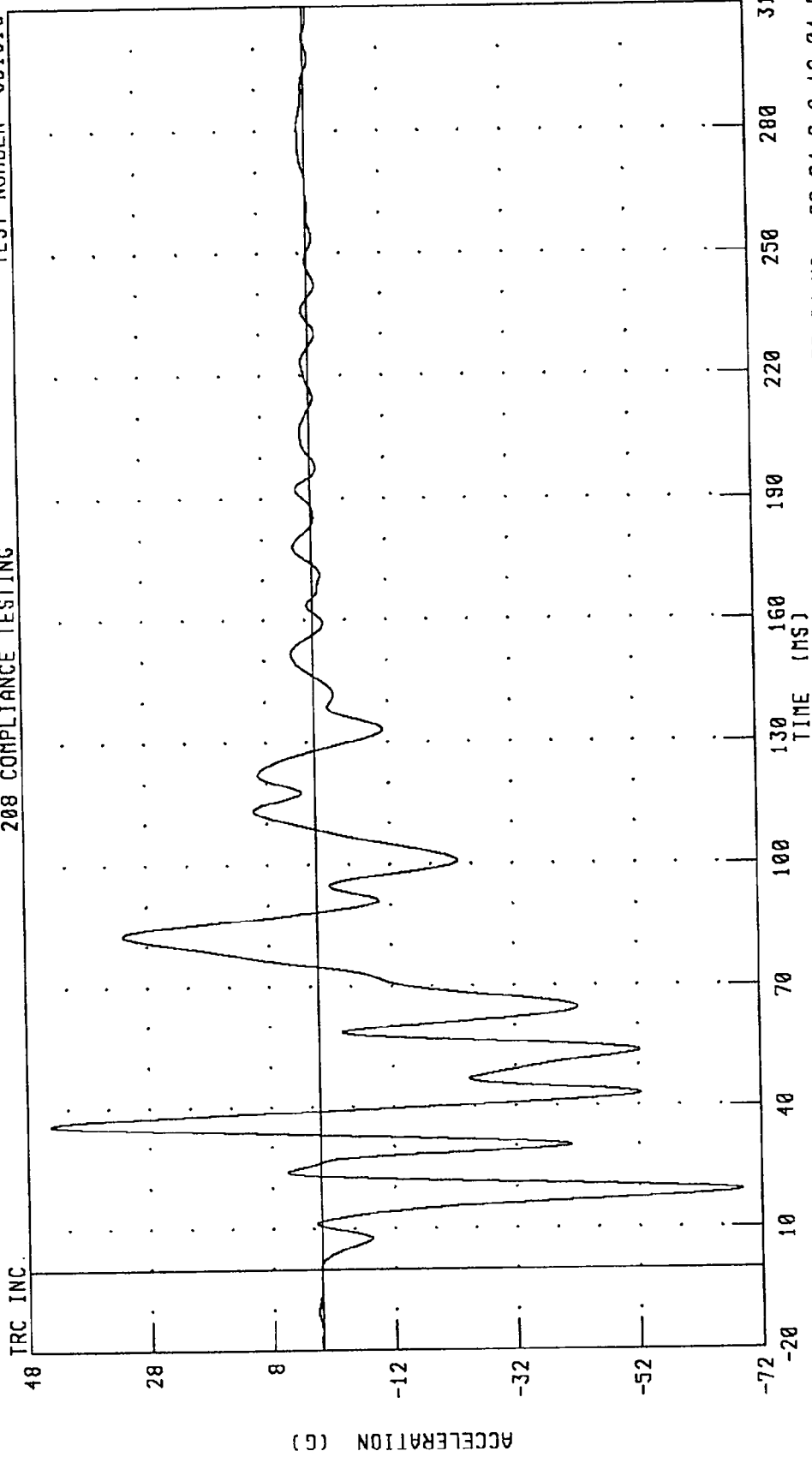
TRC INC.



CHANNEL: ENGXG2 FILTER: CH. CLASS 60
PEAK DATA: 19.32 G @ 79.04 MS; -38.21 G @ 56.72 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010

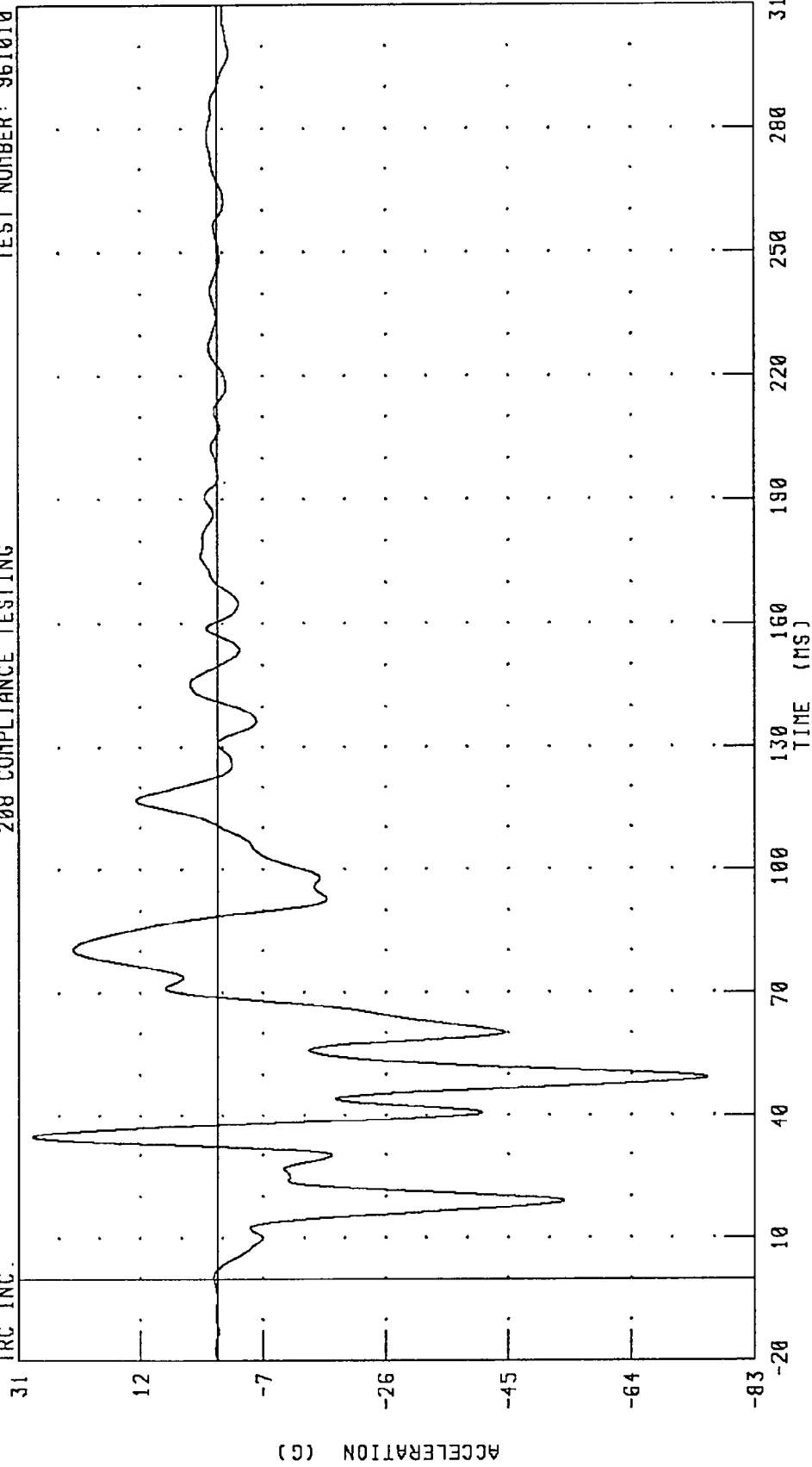


CHANNEL: BCRXG1 FILTER: CH. CLASS 60 PEAK DATA: 44.09 G @ 35.84 MS; -68.64 G @ 19.04 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
200 COMPLIANCE TESTING

TEST NUMBER: 961010

TRC INC.

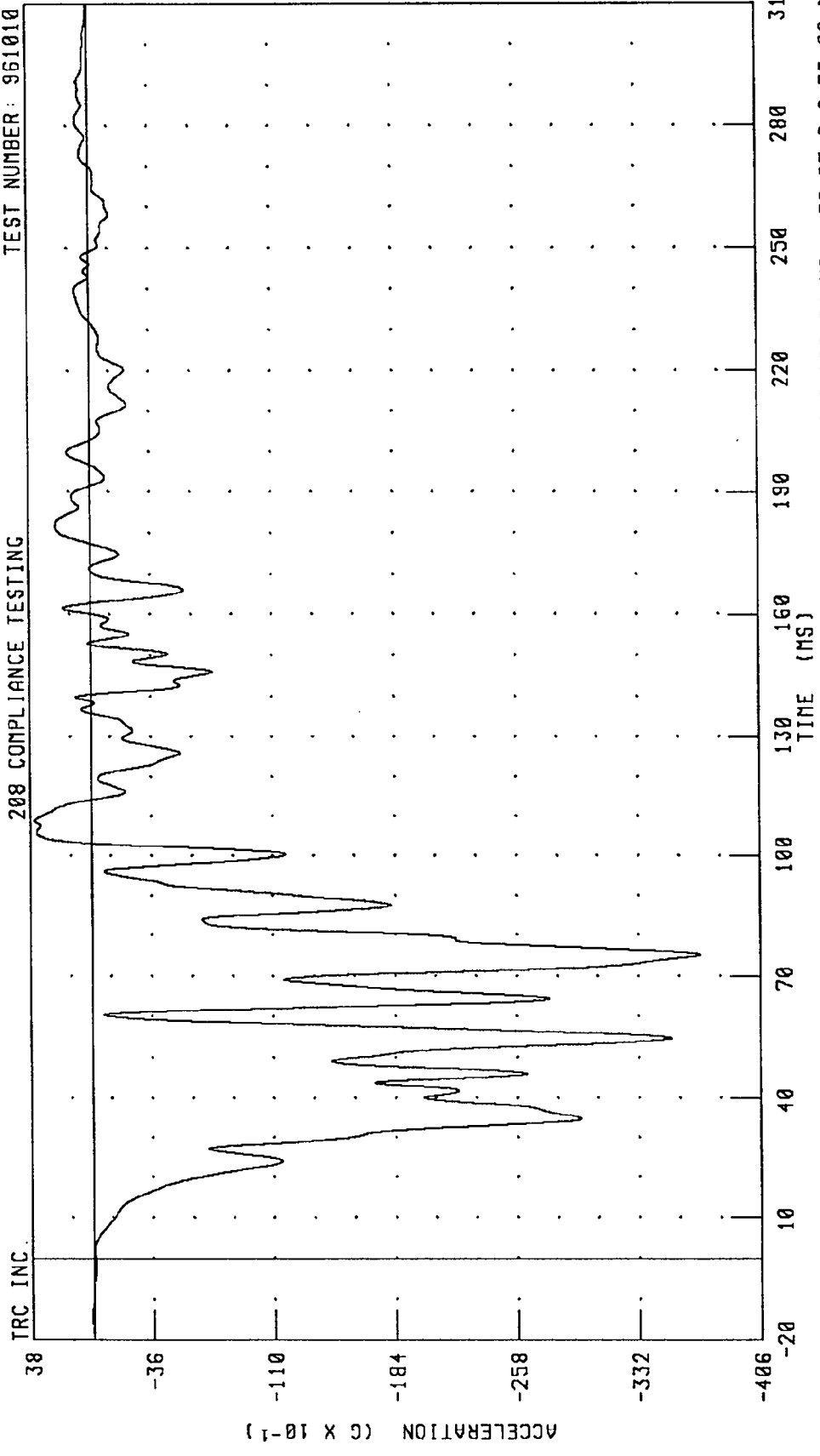


PEAK DATA: 28.67 G @ 34.64 MS; -75.71 G @ 49.20 MS

CHANNEL: BCLXG1 FILTER: CH. CLASS 60

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
DASH PANEL CENTER X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961010



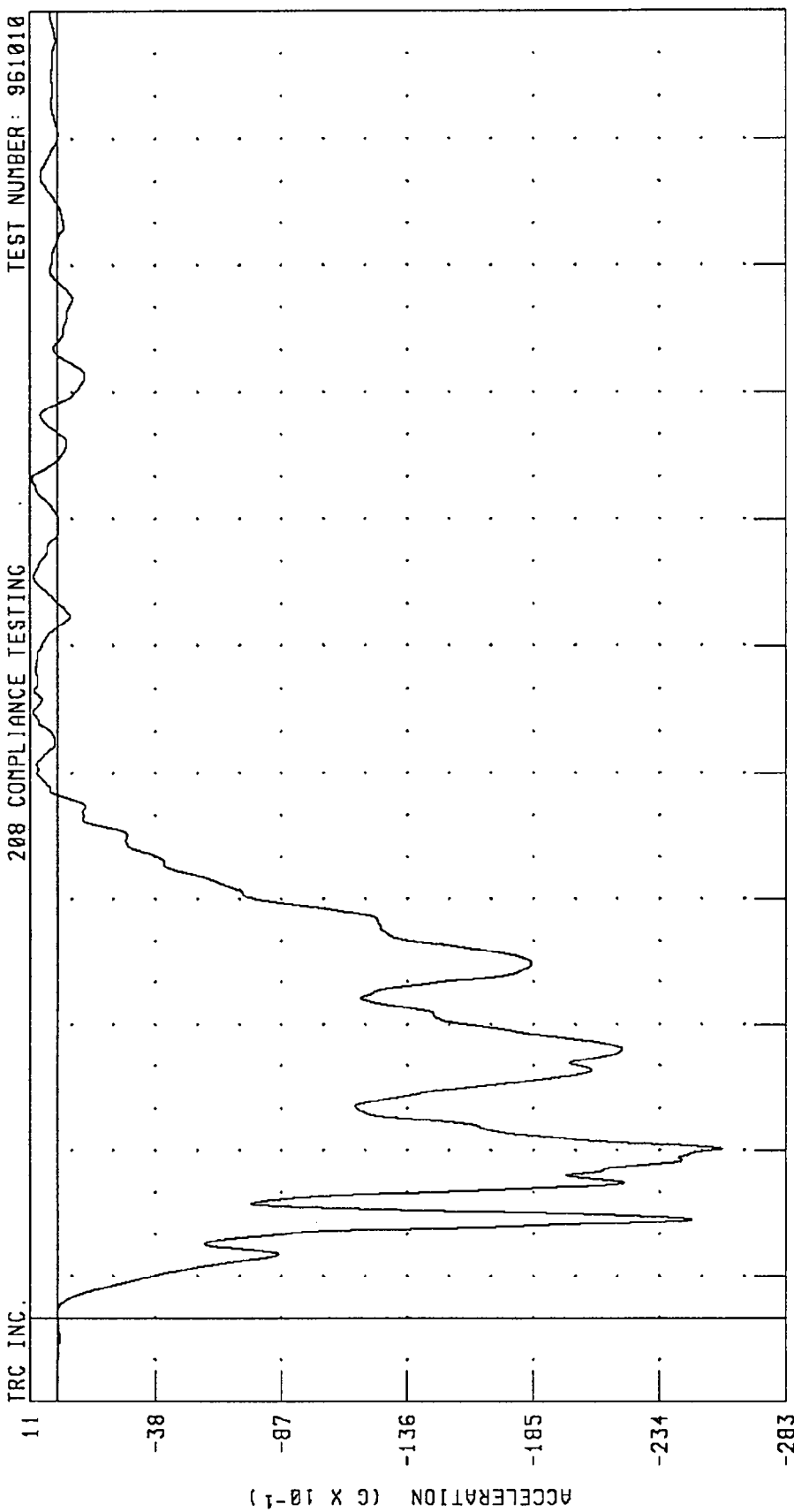
CHANNEL: DPCXG1 FILTER: CH. CLASS 60

PEAK DATA: 3.51 G @ 109.04 MS; -36.95 G @ 75.20 MS

1997 FORD EXPEDITION INTO FLAT FRONTAL BARRIER
VEHICLE REAR CENTER Z-AXIS ACCELERATION

208 COMPLIANCE TESTING

TEST NUMBER: 961010



CHANNEL: TFCZG1 FILTER: CH. CLASS 60
PEAK DATA: 1.02 G @ 199.60 MS; -25.82 G @ 40.48 MS

Appendix C

Manufacturer's Vehicle Information



3M EMT 9165 TRANSMISSION

MACHINE TELEPHONE: USA (313) 594-2268 AUTOMATIC

ENVIRONMENTAL AND SAFETY ENGINEERING STAFF
AUTOMOTIVE SAFETY AND ENGRG. STANDARDS OFFICE
330 TOWN CENTER DRIVE
Suite 500 - FAIRLANE PLAZA SOUTH
DEARBORN, MICHIGAN 48125

Date: September 20 1996

Time: 01:00PM

Please deliver to: Mr. Charlie Case
Office of Vehicle Safety Compliance
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, DC 20590

Phone: (202) 366-5319

FAX: (202) 366-3081

Number of sheets to be transmitted (Including this one): 7

Message/Special Instructions:

Subject: Your September 17, 1996 Phone Request for FMVSS No. 208 Compliance
Test Information: 1997 Ford Expedition VIN: 1FMEU176XVLA17318
Reference: IR-1751/NSA-31CCa

In the subject phone request, you indicated that your office had an opportunity to test the 1997 Ford Expedition (ahead of your expected schedule) at TRC in East Liberty, Ohio during the week of September 23, 1996 (possibly on Friday September 27th). You asked if we could expedite the critical test parameter/dummy positioning information to your office to facilitate testing on this revised date. Attached are sheets containing the requested information. Also, shown below is some additional information that you may need to set up your test vehicle for the planned 90 degree perpendicular 30 MPH unbelted test. The IR request number is noted along with our response.

Request No. 6

Frontal crash tests on which Ford relies as a basis for certification of 1997 Expedition vehicles were conducted with all moveable windows and vents fully open for 90 degree perpendicular frontal impacts and in the fully closed position for all 30 degree frontal angular impacts.

Request No. 7

The 1997 Expedition used the SAE modified Part 573 (E) Hybrid III dummy (as described in the notice of Proposed Rulemaking - Part 572 Anthropomorphic Test

Dummy, Subpart E Hybrid III Test Dummy; Docket 74-14; Notice 96, 60 Federal Register 34213, June 30, 1995) for both the driver and the passenger for all tests.

There are two basic types of seats available, a split bench and captains chairs. Both the driver and passenger dummies were positioned so that the midsagittal plane was in the center of the seat cushion for both types of seats.

The Expedition does have a foot rest for the driver only.

All seats provide the same dummy positioning including the lateral measurements with the exception of the power seat (driver side only) which positions the dummy 10mm lower than the manual seat.

Request No. 13

The vehicle components are removed using the following priority: (a) rear seat, (b) spare tire, trunk contents and trim, and (c) rear bumper.

If you have any questions, please call me on (313) 594-0718.

Paul A. Anton

FAX: (313) 59-42268

FAXNHTSA.003

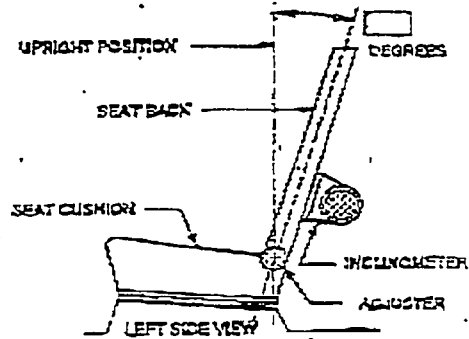
ATTACHMENT
IR-1751/NSA-31CCa

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1997 Ford
Vehicle Model & Body Style: Expedition (all models)

1. NOMINAL DESIGN RIDING POSITION -- For adjustable driver and passenger seat backs.

Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable.



Seat back angle for driver's seat = degrees.

Measurement instructions:

* See detailed note below

See attached sheet

Seat back angle for passenger's seat = degrees.

Measurement instructions:

Same as for Driver's Seat

2. SEAT FORE & AFT POSITIONS --

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:

Reference points are chosen on the seat and the seat track. Total seat travel is measured, and the seat is then positioned at the center of the seat travel.

Positioning of the passenger's seat (if applicable):

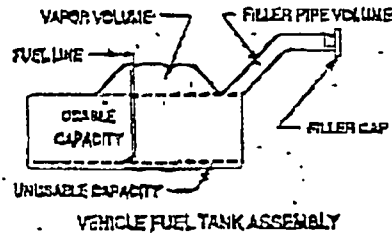
Same method as for driver's seat

Note

The Ford procedure uses an inclinometer attached to a small fixture which contacts the back of the seat back frame at a specified location (13 inches up from the pivot on the outboard edge) using pins which penetrate the seat pads and trim. Using this procedure and the angle data provided, the seat back can be adjusted to assure that it is in the design riding position with a test dummy positioned in the seat.

3. FUEL TANK CAPACITY DATA --

- 3.1 A. "Usable Capacity" of standard equipment fuel tank = 26 gallons. See table below.
- B. "Usable Capacity" of optional equipment fuel tank = N/A gallons.
- C. Capacity used when certification testing to requirements of FMVSS 301 = 26/30 gallons.



** Fuel Capacity of the 1997 Expedition fuel tanks:

- 4X2 without load leveling.....26 gallons usable capacity
 4X2 with load leveling.....30 gallons usable capacity
 4X4 all.....30 gallons usable capacity
 (Note: This fuel tank is not the same as the 4X2 30 gallon tank.)

3.2 Amount of Stoddard solvent added to vehicle for certification test = 24.7 / 28.5 gallons

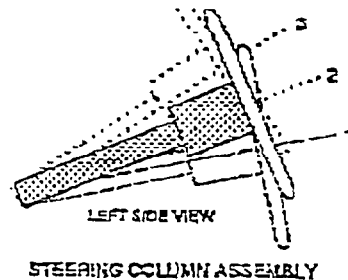
3.3 Is vehicle equipped with electric fuel pump? YES NO
 If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

Electric Fuel Pump Operation

The electric fuel pump operates for 2 (two) seconds to pressurize the fuel system following actuation of the ignition. If no attempt has been made to start the engine within 2 (two) seconds following ignition actuation, the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is inactivated. Also, if the vehicle sustains an impact (e.g., in an accident) a fuel pump shut-off switch is tripped.

4. STEERING COLUMN ADJUSTMENTS --

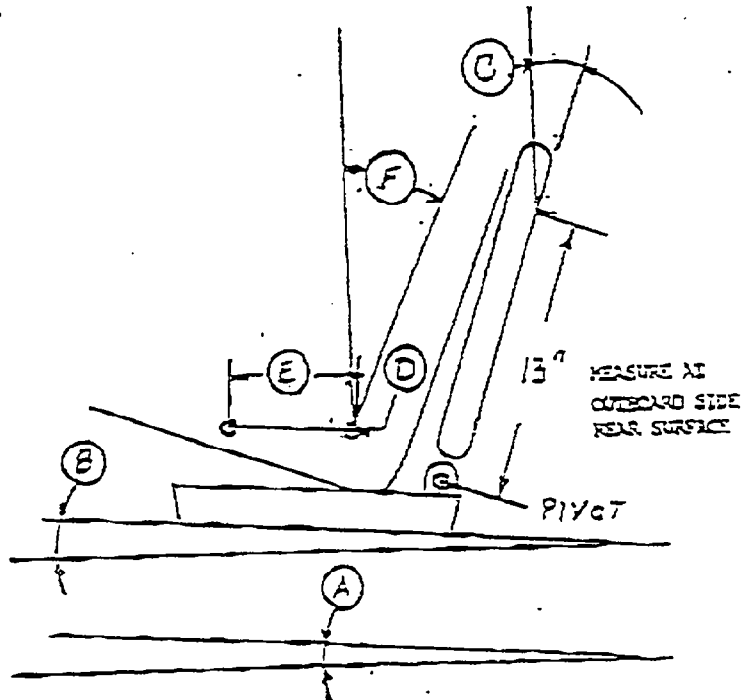
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.
 If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine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



Adjustable steering columns are positioned in the center detent for FMVSS No. 208 testing (Note: This vehicle has 5 positions on adjustable columns).

VEHICLE 1997 FORD Expedition

IR# 1751



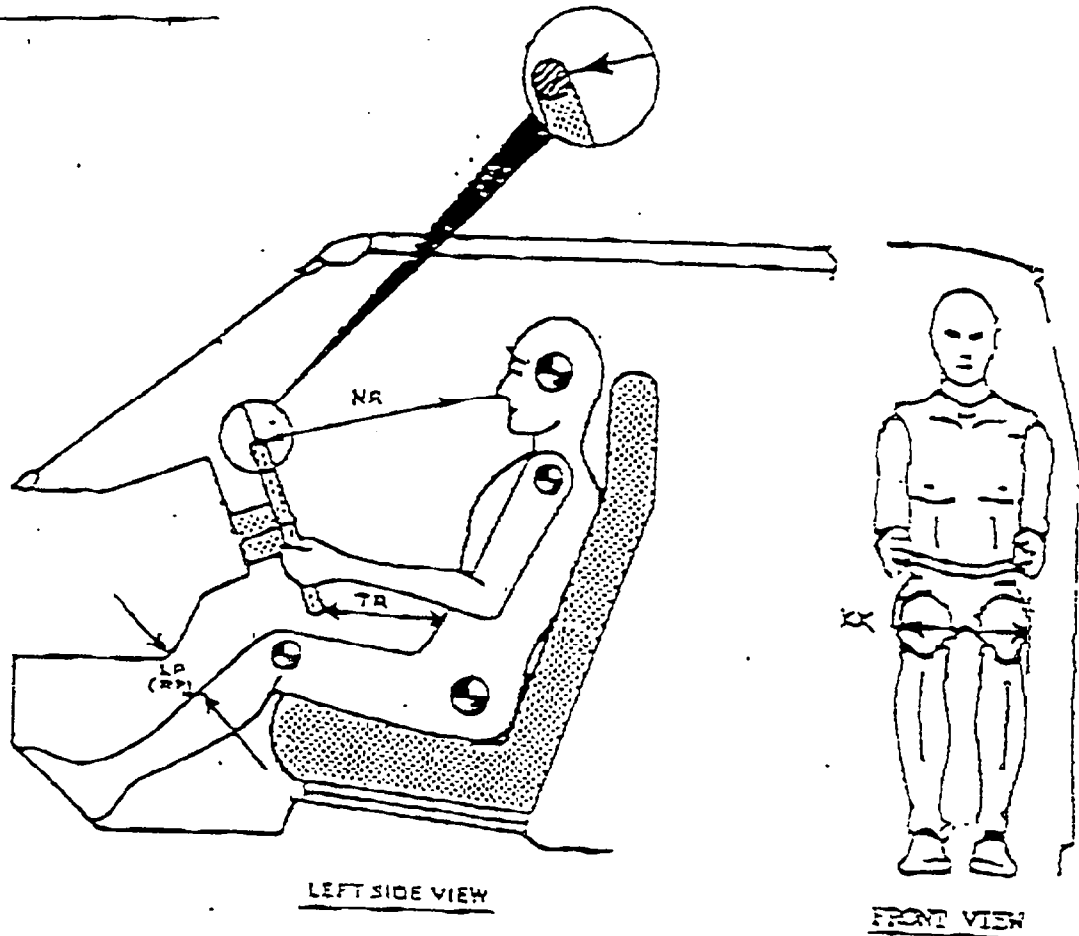
A - SILL ANGLE	<u>0 Deg. @ Center of door opening</u>
B - DESIGN CUSHION FRAME ANGLE	<u>6.12 Degrees</u>
C - DESIGN SEAT BACK FRAME ANGLE	<u>21 Degrees</u>
D - REARMOSt "H" POINT	<u>3123 +/- 15 mm</u>
E - TRACK TRAVEL	<u>180 Max., 200 P-r., mm</u>
F - MANIKIN BACK ANGLE	<u>21 +/- 2 Degrees</u>

Cut seat back material to avoid taking measurement on reinforcement plate.

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS

VEHICLE 1997 EXPEDITION

IR# 1751

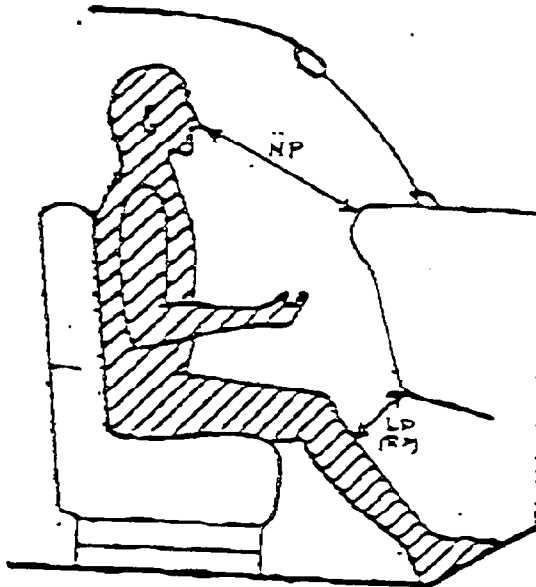


		MEASUREMENTS (All distances in inches)	
		TARGET	RANGE
NR	Distance from tip of dummy's nose to Top Rear surface of steering wheel rim	16.5	(17.2-15.8)
TR	Horizontal distance from bottom rear surface of steering wheel rim to dummy's torso	1.9	(2.9-1.0)
LP	Perpendicular distance from dummy's left lower leg surface to closest point on instrument panel surface	3.6	(4.0-3.3)
RP	Perpendicular distance from dummy's right lower leg surface to closest point on instrument panel surface	3.6	(3.9-3.1)
KK	Distance between outside surfaces of dummy's legs measured at the knee bolts	10.3	(10.6-9.9)

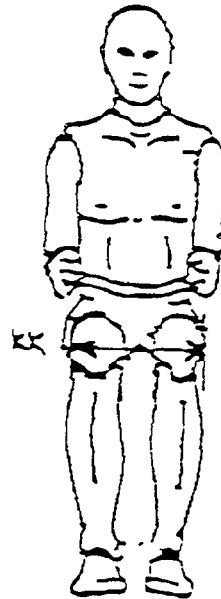
PASSENGER DUMMY PLACEMENT REFERENCE DIMENSIONS

VEHICLE 1997 EXPEDITION

IR# 1751



RIGHT SIDE VIEW



FRONT VIEW

		MEASUREMENTS (All distances in inches)	
		TARGET	RANGE
NP	Distance from tip of dummy's nose to closest point on surface of instrument panel	26.7	(27.4-25.7)
LP	Perpendicular distance from dummy's left lower leg surface to closest point on instrument panel surface	4.6	(5.0-3.8)
RP	Perpendicular distance from dummy's right lower leg surface to closest point on instrument panel surface	4.9	(6.0-3.9)
KK	Distance between outside surfaces of dummy's legs measured at the knee bolts	N/A	N/A