

V2469

Report Numbers: 208-TRC-97-003
212-TRC-97-003
301-TRC-97-003

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

Mitsubishi Motor Manufacturing of America, Inc.

1997 Mitsubishi Galant

4-Door Sedan

NHTSA Number: CV5601

TRC Test Number: 961031

Transportation Research Center Inc.

10820 State Route 347

East Liberty, OH 43319



November 18, 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

Rec'd
12/16/96

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-93-D-01089.

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1. Report No. 208-TRC-97-003 212-TRC-97-003 301-TRC-97-003	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS Nos. 208, 212, 219 (partial), and 301 Compliance Testing of a 1997 Mitsubishi Galant 4-Door Sedan, NHTSA No. CV5601		5. Report Date November 18, 1996	6. Performing Organization Code TRC
		8. Performing Organization Report No. 208-TRC-97-003 212-TRC-97-003 301-TRC-97-003	
7. Author(s) Craig A. Markusic Senior Project Engineer Transportation Research Center Inc.		10. Work Unit No. (TRAIS)	
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		11. Contract or Grant No. DTNH22-93-D-01089	
		13. Type of Report and Period Covered Final Report October - December 1996	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-31) 400 Seventh Street, S.W., Washington, DC 20590		14. Sponsoring Agency Code NEF-30	
15. Supplemental Notes			
16. Abstract A 30 mph flat frontal barrier impact test was conducted on a 1997 Mitsubishi Galant 4-door sedan, NHTSA No. CV5601, at Transportation Research Center Inc. on October 31, 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 17.4 inches. The ambient temperature was 72° F. The driver's Head Injury Criteria (HIC) was 135. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.8 g. The driver's chest deflection was 2.2 inches. The driver's left and right femur maximum axial forces were 1373 pounds and 1401 pounds, respectively. The passenger's HIC was 234. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 37.6 g. The passenger's chest deflection was 1.0 inch. The passenger's left and right femur maximum axial forces were 1312 pounds and 1160 pounds, respectively.			
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	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. Number of Pages 141	22. Price

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	1		centimeters	cm
ft	2.5		feet	ft
yd	30		meters	m
mi	0.9		kilometers	km
AREA				
in ²	6.5		square centimeters	cm ²
ft ²	0.09		square meters	m ²
yd ²	0.8		square meters	m ²
mi ²	2.6		square kilometers	km ²
	0.4		hectares	ha
MASS (weight)				
oz	29		grams	g
lb	0.45		kilograms	kg
	0.9		tonnes	t
VOLUME				
tsp	5		milliliters	ml
Tbsp	15		milliliters	ml
fl oz	30		milliliters	ml
c	0.24		liters	l
pt	0.47		liters	l
qt	0.96		liters	l
gal	3.8		liters	l
ft ³	0.03		cubic meters	m ³
yd ³	0.76		cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

* 1 in = 2.54 exactly. For other exact conversions and more detailed tables, see NIST Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SO Catalog No. C13, 1/82.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	0.04		inches	in
cm	0.4		inches	in
m	3.3		feet	ft
in	1.1		yards	yd
km	0.6		miles	mi
AREA				
cm ²	0.16		square inches	in ²
m ²	1.2		square yards	yd ²
km ²	0.4		square miles	mi ²
ha	2.5		acres	
MASS (weight)				
g	0.035		ounces	oz
kg	2.2		pounds	lb
t	1.1		short tons	
VOLUME				
ml	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

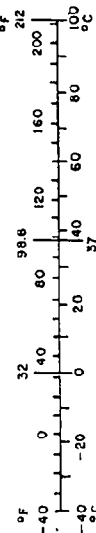


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Section 1.0

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 Mitsubishi Galant 4-door sedan, NHTSA No. CV5601, 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 31, 1996.

The test vehicle, a 1997 Mitsubishi Galant 4-door sedan, NHTSA No. CV5601, 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 3274 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 17.4 inches.

The driver's HIC was 135. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.8 g. The driver's chest deflection was 2.2 inches. The driver's left and right femur maximum compressive forces were 1373 pounds and 1401 pounds, respectively.

The right front passenger's HIC was 234. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 37.6 g. The passenger's chest deflection was 1.0 inch. The right front passenger's left and right femur maximum compressive forces were 1312 pounds and 1160 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.

Data Acquisition Explanations

The driver's right lower tibia moment, ANRYM1, exceeded the data channel's full scale limit from approximately 70 to 90 milliseconds.

Table 1 Crash Test Summary

NHTSA number:	CV5601
Test type:	Frontal barrier impact
Test date:	10/31/96
Test time:	1523
Ambient temperature at impact area:	72° F
Vehicle year/make/ model/body style:	1997/Mitsubishi/Galant/4-door sedan
Vehicle test weight:	3274 lb
Impact angle ¹ :	0°
Impact velocity ² :	
Primary:	29.3 mph
Secondary:	29.3 mph
Maximum static crush:	17.4 in
Average rebound:	111.9 in
Number of cameras:	
Real-time:	1
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 #230</u>	<u>Passenger #314</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, B-pillar	Airbag
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/Mitsubishi/Galant/4-door sedan

Color: Black

VIN: 4A3AJ46GXVE009115

NHTSA number: CV5601

Engine data:

Placement: Transverse/Lateral

Cylinders: 4

Displacement: 2.4 liters

Transmission data: 3 speed, manual, X automatic, X overdrive

Final drive: X fwd, rwd, 4wd

Date vehicle received: 10/28/96

Odometer reading: 64

Dealer's name
and address: Mathews Kennedy Mitsubishi
1127 Delaware Avenue
Marion, Ohio 43302

Accessories:

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

Certification data from vehicle's label:

Vehicle manufactured by: Mitsubishi Motor Manufacturing of America, Inc.

Date of manufacture: 08/96

VIN: 4A3AJ46GXVE009115

GVWR: 3925 lb

GAWR: Front: 2140 lb

Rear: 1785 lb

Table 2 Test Vehicle Information, Cont'd.

Size of tires on vehicle: P185/70R14 87h
Spare tire: Space Saver
Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: P185/70R14 87H
Recommended cold tire pressure:
Front: 32 psi
Rear: 29 psi
Designated Seating Capacity:
Front 2
Rear 3
Total 5
Vehicle Capacity Weight: 827 lb

Test vehicle attitudes:

Delivered attitude:	LF: 26.9 in	RF: 27.0 in	LR: 26.6 in	RR: 26.9 in
Fully loaded attitude:	LF: 26.3 in	RF: 26.4 in	LR: 25.6 in	RR: 25.9 in
Pre-test attitude:	LF: 26.6 in	RF: 26.5 in	LR: 25.6 in	RR: 25.6 in

Table 2 Test Vehicle Information, Cont'd.

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

Right front	886	lb	Right rear	535	lb
Left front	904	lb	Left rear	551	lb
Total front weight	1790	lb	(62.2% of total vehicle weight)		
Total rear weight	1086	lb	(37.8% of total vehicle weight)		
Total delivered weight	2876	lb			

Calculation of test vehicle's target test weight:

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (2876 lb)

VCW¹ = Vehicle Capacity Weight = 827 lb

DSC¹ = Designated Seating Capacity (5)

RCLW = VCW - 150 (DSC) = 827 - 150 (5) = 77 lb

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

Target test weight = 2876 + 77 + 334 = 3287 lb

Weight of test vehicle with required dummies and 64 lb of cargo weight:

Right front	952	lb	Right rear	676	lb
Left front	960	lb	Left rear	686	lb
Total front weight	1912	lb	(58.4% of total vehicle weight)		
Total rear weight	1362	lb	(41.6% of total vehicle weight)		
Total test weight	3274	lb	(0.4% under target test weight)		

Weight of ballast secured in vehicle: None

Components removed to meet target test weight: Rear bumper, rear seat, spare tire, right tail light.

CG rearward of front wheel centerline: 43.2 in

Vehicle Wheelbase: 104.0 in

¹ From vehicle's recommended tire pressure label.

Table 3 Post-Impact Data

Test number: 961031
NHTSA number: CV5601
Test date: 10/31/96
Test time: 1523
Test type: Frontal barrier impact
Impact angle: 0°
Ambient temperature
at impact area: 72° 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:

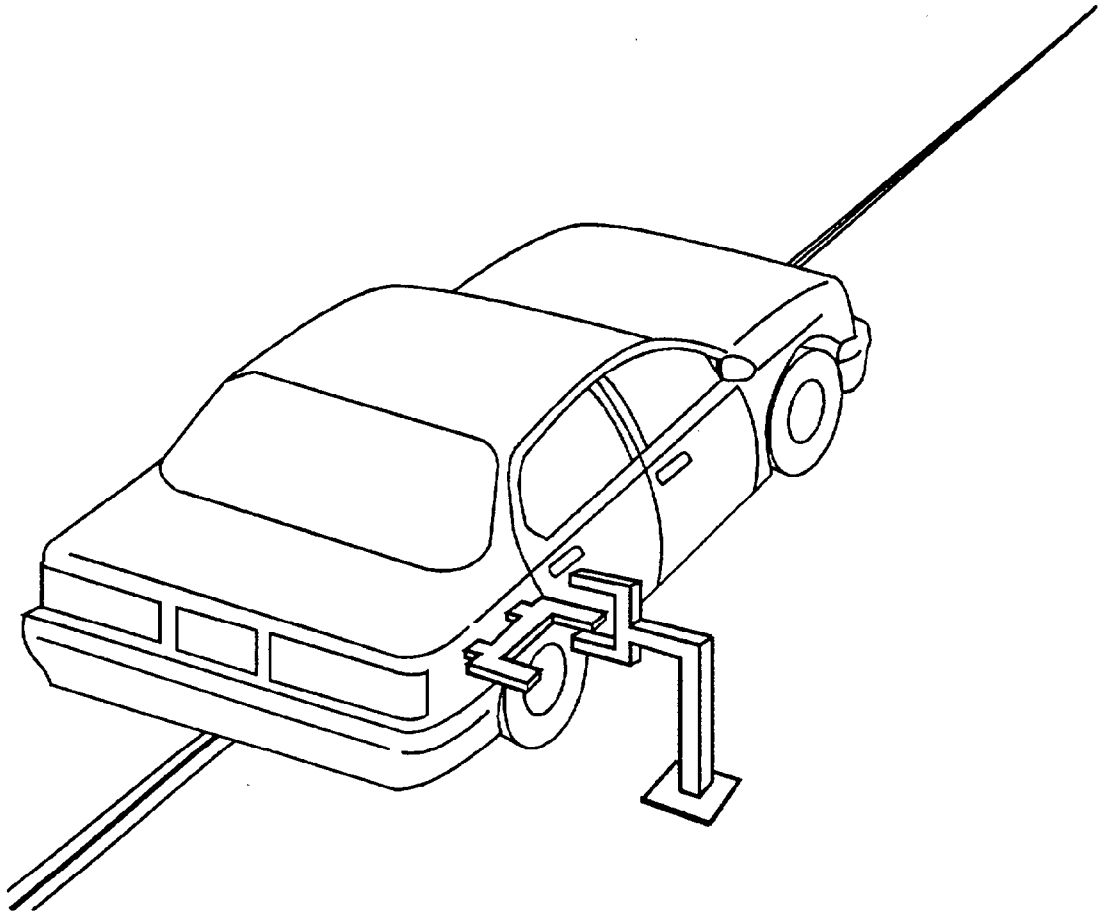
Pre-test:	L:	175.2 in	C:	184.6 in	R:	175.2 in
Post-test:	L:	165.8 in	C:	168.0 in	R:	165.2 in
Total crush:	L:	9.4 in	C:	16.6 in	R:	10.0 in
Average crush:		11.8 in				

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test:	L:	112.7 in	C:	111.5 in	R:	111.5 in
Average rebound:		111.8 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: CV5601
Test date: 10/31/96
Vehicle year/make/
model/body style: 1997/Mitsubishi/Galant/4-door sedan
Vehicle size category: 4-door sedan
VIN: 4A3AJ46GXVE009115
Build date: 08/96
Test weight: 3274 lb
Vehicle wheelbase: 104.0 in
Maximum width: 68.3 in
Front overhang: 36.5 in

Collision Deformation

Classification (CDC) Code: 12FDEW2

Crush depth measurements:	C1:	9.4 in
	C2:	17.4 in
	C3:	16.7 in
	C4:	15.3 in
	C5:	13.1 in
	C6:	10.0 in

Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged
region: L: 60.0 in

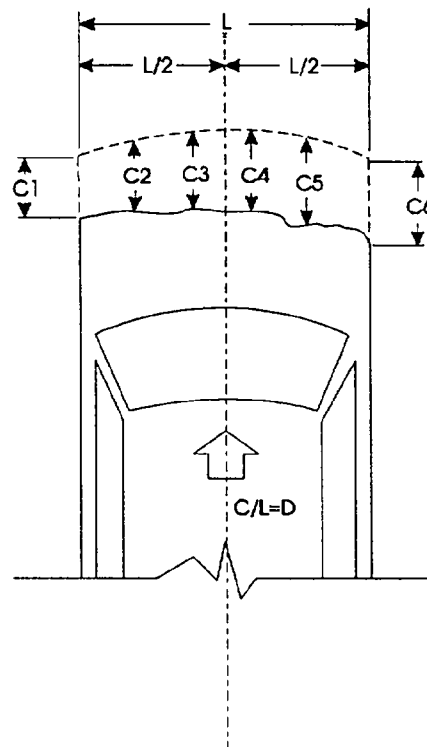


Table 4 Post-test Airbag Data

NHTSA number: CV5601
Test date: 10/31/96
Technician: Jenkins
Vehicle year/make/
model/body style: 1997/Mitsubishi/Galant/4-door sedan

A. Number of airbag vent holes:

Driver: 2
Passenger: 2

B. Size of airbag vent holes:

Driver: 1.0 in. diameter
Passenger: 2.25 in. diameter

C. Total airbag vent area:

Driver: 1.57 in²
Passenger: 7.95 in²

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

Driver:	Length	NA
	Width	NA
	Diameter	26.0 in
Passenger:	Length:	30.0 in
	Width:	24.0 in
	Diameter:	NA

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

E. Is the airbag tethered?

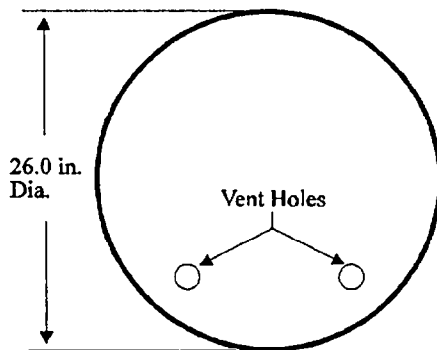
Driver: Yes

If yes, record length of tether: 13.0 inches.

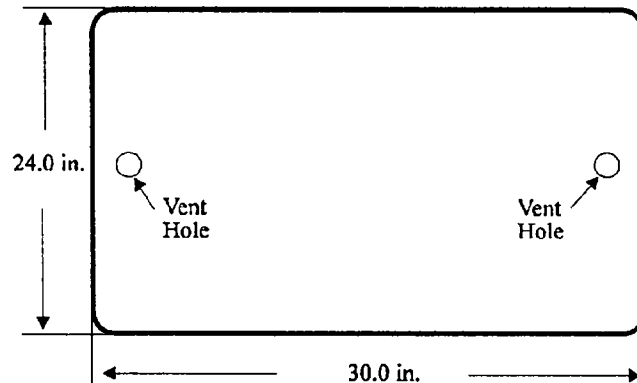
Passenger: No

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: NA

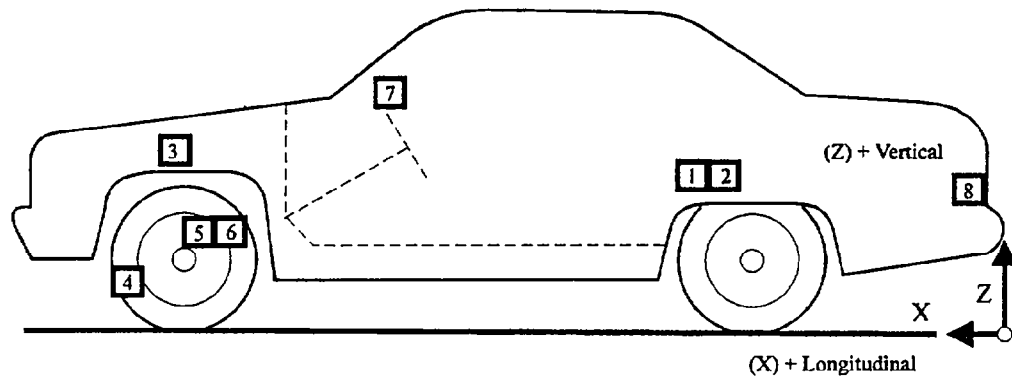
Inflator: DMA67C1ABCY

Passenger: Manufacturer: NA

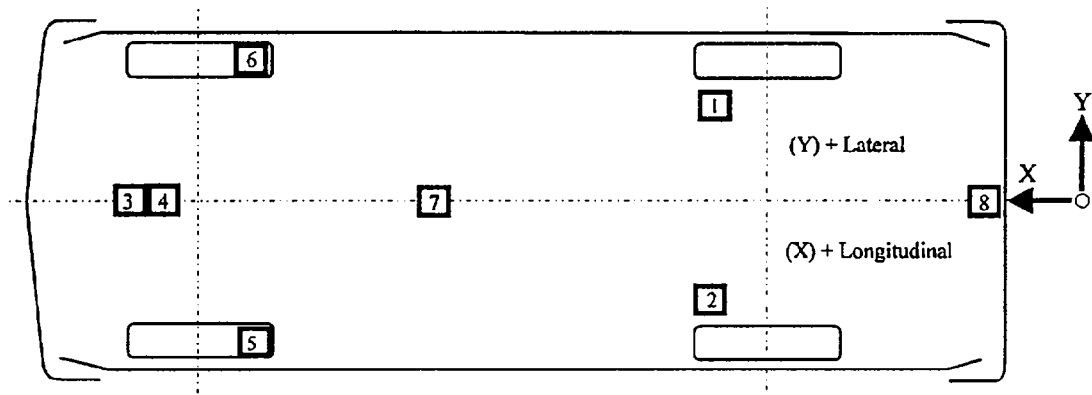
Airbag: NA

Inflator: CM0E213J10298

Figure 3 Vehicle Accelerometer Placement



Side View



Bottom View

TEST NUMBER: 961031
No. LOCATION

	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE 68.0 in POST 68.0 in	23.1 in 23.1 in	13.1 in 13.7 in	1.2 g @ 125.6 ms	26.7 g @ 58.2 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE 68.1 in POST 68.1 in	-23.1 in -23.1 in	13.1 in 13.0 in	1.4 g @ 115.7 ms	26.8 g @ 54.0 ms
3 ENGINE TOP LONGITUDINAL	PRE 153.6 in POST 147.4 in	6.0 in 7.2 in	31.1 in 31.4 in	27.3 g @ 53.5 ms	67.1 g @ 37.1 ms
4 ENGINE BOTTOM LONGITUDINAL	PRE 153.5 in POST 145.6 in	13.5 in 15.7 in	6.2 in 7.5 in	316.2 g @ 185.0 ms	68.3 g @ 34.6 ms
5 RIGHT BRAKE CALIPER LONGITUDINAL	PRE 153.0 in POST 147.2 in	-26.2 in -29.5 in	9.8 in 12.4 in	7.4 g @ 93.0 ms	59.2 g @ 39.0 ms

TEST NUMBER: 961031
No. LOCATION

	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
6 LEFT BRAKE CALIPER	PRE 153.0 in POST 149.8 in	26.2 in 22.2 in	9.9 in 12.1 in		
LONGITUDINAL				11.9 g @ 149.9 ms	54.6 g @ 51.6 ms
7 INSTRUMENT PANEL CENTER	PRE 122.6 in POST 121.8 in	0.5 in 0.0 in	36.7 in 36.8 in		
LONGITUDINAL				15.4 g @ 45.0 ms	61.4 g @ 65.7 ms
8 VEHICLE REAR CENTER	PRE 5.0 in POST 5.0 in	0.0 in 0.0 in	25.5 in 22.3 in		
VERTICAL				24.5 g @ 63.4 ms	16.7 g @ 71.5 ms

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

Table 5 Vehicle Accelerometer Locations and Data Summary



Section 3.0

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

Table 6 Dummy Injury Criteria

<u>Maximum Acceleration</u>							
	<u>Head</u>				<u>Chest</u>		
	X	Y	Z	R	X	Y	Z
Driver	-28.5 g	14.0 g	-25.1 g	36.6 g	-53.1 g	6.9 g	-18.4 g
Passenger	-41.3 g	13.5 g	-18.5 g	44.8 g	-38.5 g	4.1 g	-6.9 g

<u>Maximum Femur Compressive Force</u>		
	<u>Left Femur</u>	<u>Right Femur</u>
Driver	1373 lbf	1401 lbf
Passenger	1312 lbf	1160 lbf

<u>Head Injury Criteria¹</u>			
	<u>HIC</u>	<u>Time t₁</u>	<u>Time t₂</u>
Driver	135	67.3 ms	103.3 ms
Passenger	234	61.8 ms	91.8 ms

<u>Chest Maximum Resultant Acceleration²</u>			
	<u>Acceleration</u>	<u>Time t₁</u>	<u>Time t₂</u>
Driver	51.8 g	86.8 ms	89.8 ms
Passenger	37.6 g	70.6 ms	73.6 ms

<u>Maximum Chest Deflection</u>	
Driver	2.2 in
Passenger	1.0 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, sun visor, and head liner. 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, sun visor and head liner. The dummy's head and chest were restrained by the passenger's airbag. The dummy rebounded rearward into the seat back. The dummy came to rest seated in the right front passenger's seat.

Table 7 FMVSS 208 Seat Belt Comfort and Convenience Test Summary
Front Outboard Designated Seating Positions

NHTSA number: CV5601

Vehicle model year/make/model/body style: 1997/Mitsubishi/Galant/4-door sedan

Date of comfort/convenience check: 10/31/96

Technician performing check: Markusic

GVWR: 3925 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: CV5601

Vehicle model year/make/model/body style: 1997/Mitsubishi/Galant/4-door sedan

Date of comfort/convenience check: 10/31/96

Technician performing check: Markusic

GVWR: 3925 lb

Webbing Tension-Relieving Device (S7.4.2):

Not applicable, the vehicle is not equipped with automatic seat belts or manual type-2 belts that must comply with the dynamic test requirements.

Belt Contact Force (S7.4.3):

The belt contact force on the chest of the test dummy is 0.4 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: CV5601

Vehicle model year/make/model/body style: 1997/Mitsubishi/Galant/4-door sedan

Date of comfort/convenience check: 10/31/96

Technician performing check: Markusic

GVWR: 3925 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 inboard seat belt receptacles are accessible without moving the center arm rest.

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 6 s.

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 sun visor.

The manufacturer's recommended regular airbag maintenance is to inspect the entire SRS by an authorized dealer 10 years after the manufacture date on the certification label.

Appropriate instructions concerning maintenance and/or replacement of this system were provided in the owner's manual on page 190.

A description of the functional operation of the system was provided in the owner's manual on page 42.

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 42, 44 and 190.

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 upper right side 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 43.

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:

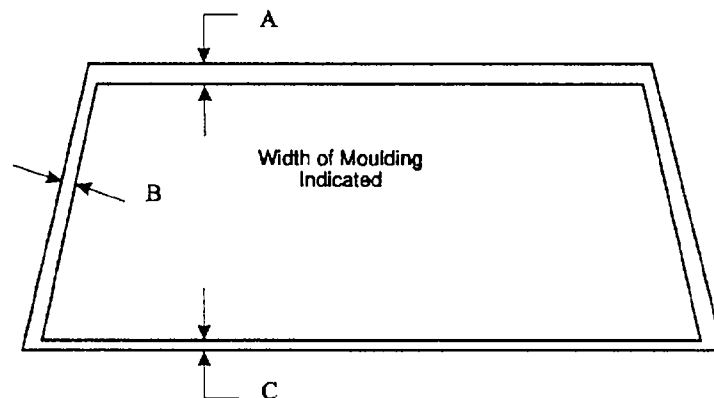
	Pre-test	Post-test	Percent Retention
Right side	80.5 in	80.5 in	100.0
Left side	80.5 in	80.5 in	100.0
Total	161.0 in	161.0 in	100.0

Pre-test windshield mounting material temperature: 70° F

A = 0.6 in

B = 0.6 in

C = 0.8 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 = 46.0 in

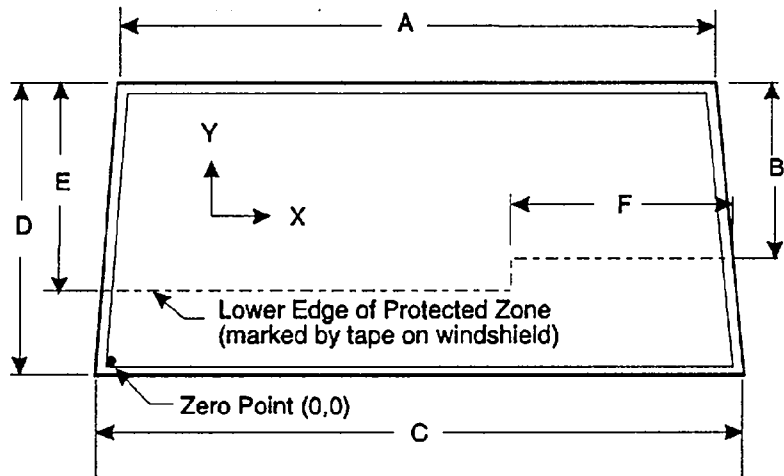
B = 19.8 in

C = 62.5 in

D = 30.0 in

E = 19.5 in

F = 23.8 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/Mitsubishi/Galant/4-door sedan
NHTSA number:	CV5601
Fuel system capacity:	16.9 gal (from owner's manual)
Usable capacity:	16.9 gal (furnished by COTR)
Test volume range:	15.5 gal to 15.9 gal (92-94% of usable)
Actual test volume:	15.9 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.

Details of fuel system: The fuel tank is located in front of the rear axle. The fuel filler neck was located on the right side and entered the right rear corner of the tank. The fuel lines ran along the right side of the vehicle.

Table 10 FMVSS 301 Post-Impact Test Data

NHTSA number: CV5601
Test date: 10/31/96
Vehicle year/make/
model/body style: 1997/Mitsubishi/Galant/4-door sedan

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:

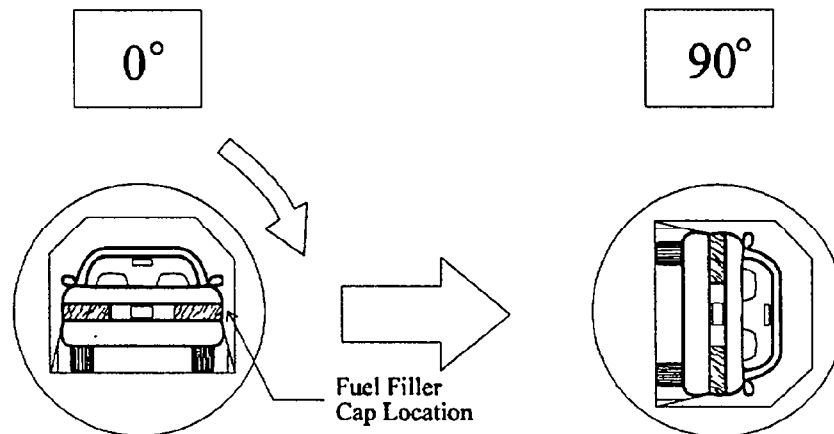
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 oz	1 oz
2. 5-Minute period after vehicle motion ceases	0 oz	5 oz
3. Next 25 minutes after 5-minute period	0 oz	1 oz/1 min

Fuel system fluid spillage location(s): None

Figure 6 FMVSS 301 Static Rollover Test Data

NHTSA number: CV5601

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

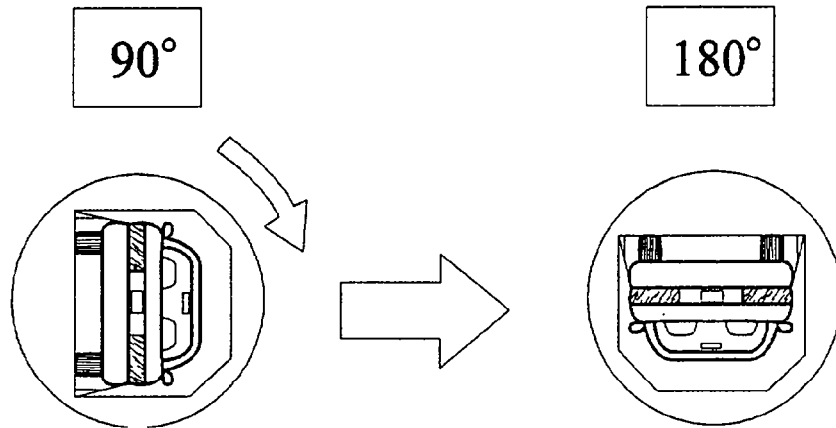
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>0° to 90° rotation (fuel filler cap down)</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		

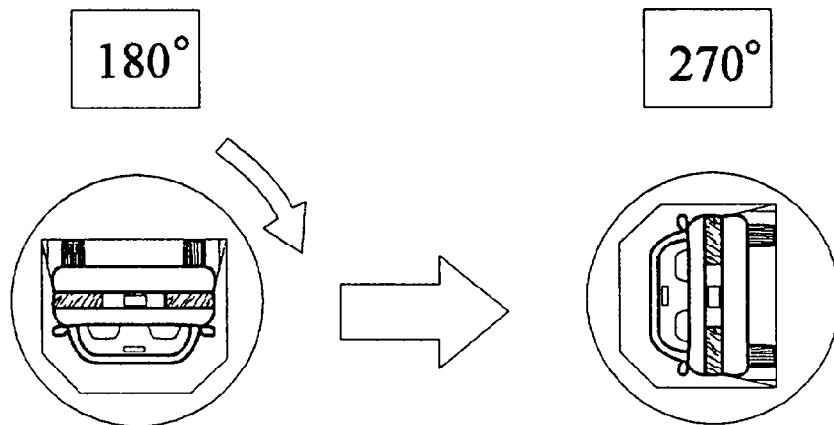
Fuel system fluid spillage measurements:

90° to 180° rotation	Test Results	Maximum Allowable
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

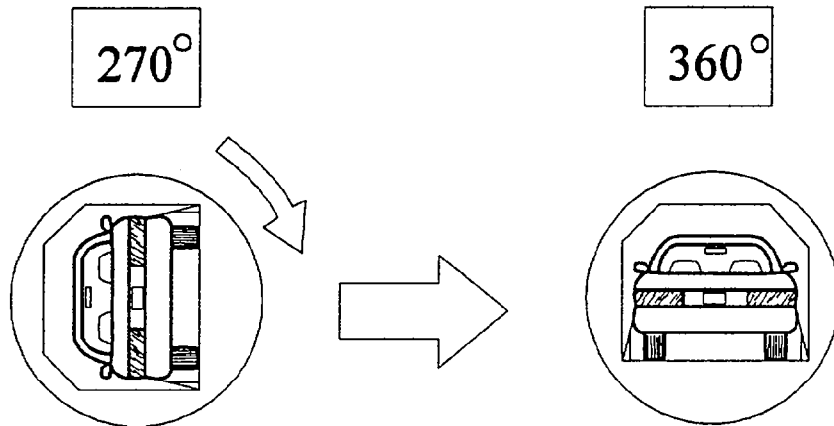
Fuel system fluid spillage measurements:

<u>180 to 270° rotation</u>		Test Results	Maximum Allowable
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

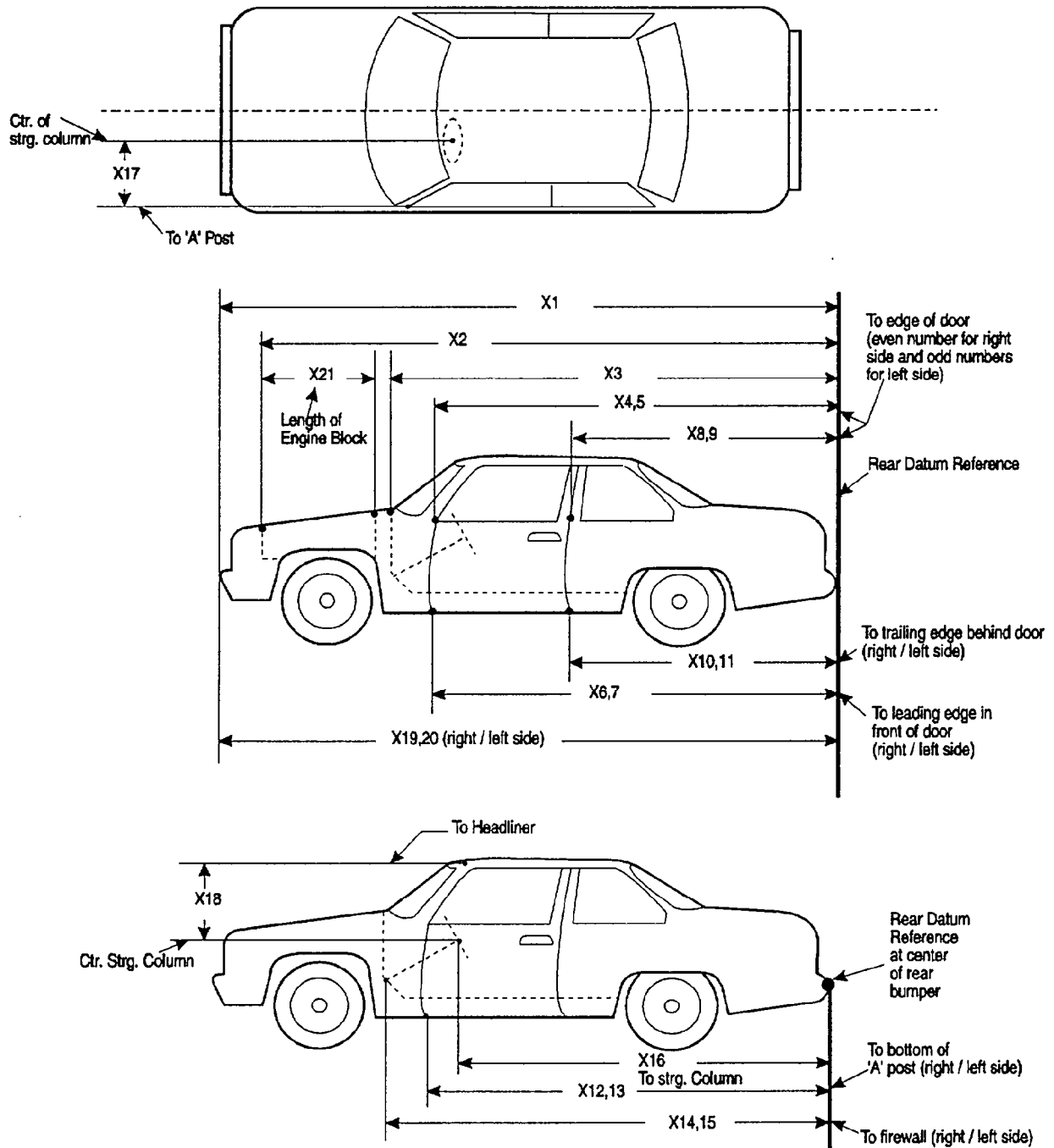


Table 11 Impacted Vehicle Measurements

Vehicle year/make/model/body style: 1997/Mitsubishi/Galant/4-door sedan

Test Number: 961031

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	184.6 in	168.0 in	16.6 in
X2	Rear surface of vehicle to front of engine block	158.4 in	152.8 in	5.6 in
X3	Rear surface of vehicle to firewall	135.6 in	133.6 in	2.0 in
X4	Rear surface of vehicle to upper leading edge of right door	120.8 in	121.0 in	-0.2 in
X5	Rear surface of vehicle to upper leading edge of left door	121.0 in	120.6 in	0.4 in
X6	Rear surface of vehicle to lower leading edge of right door	122.3 in	122.1 in	0.2 in
X7	Rear surface of vehicle to lower leading edge of left door	122.7 in	122.1 in	0.6 in
X8	Rear surface of vehicle to upper trailing edge of right door	83.6 in	83.8 in	-0.2 in
X9	Rear surface of vehicle to upper trailing edge of left door	83.9 in	83.5 in	0.4 in
X10	Rear surface of vehicle to lower trailing edge of right door	83.8 in	83.8 in	0.0 in
X11	Rear surface of vehicle to lower trailing edge of left door	84.2 in	83.7 in	0.5 in
X12	Rear surface of vehicle to bottom of "A" post on right side	123.5 in	123.2 in	0.3 in
X13	Rear surface of vehicle to bottom of "A" post on left side	123.7 in	122.0 in	1.7 in
X14	Rear surface of vehicle to firewall - right side	133.7 in	132.5 in	1.2 in
X15	Rear surface of vehicle to firewall - left side	133.7 in	129.3 in	4.4 in
X16	Rear surface of vehicle to steering wheel center	105.2 in	106.5 in	-1.3 in
X17	Center of steering column to "A" post	12.3 in	11.2 in	1.1 in
X18	Center of steering column to headliner	18.0 in	18.5 in	-0.5 in
X19	Rear surface of vehicle to right side of front bumper	175.2 in	165.2 in	10.0 in
X20	Rear surface of vehicle to left side of front bumper	175.2 in	162.8 in	12.4 in
X21	Length of engine block	17.0 in	17.0 in	0.0 in

Figure 8 Vehicle Target Locations

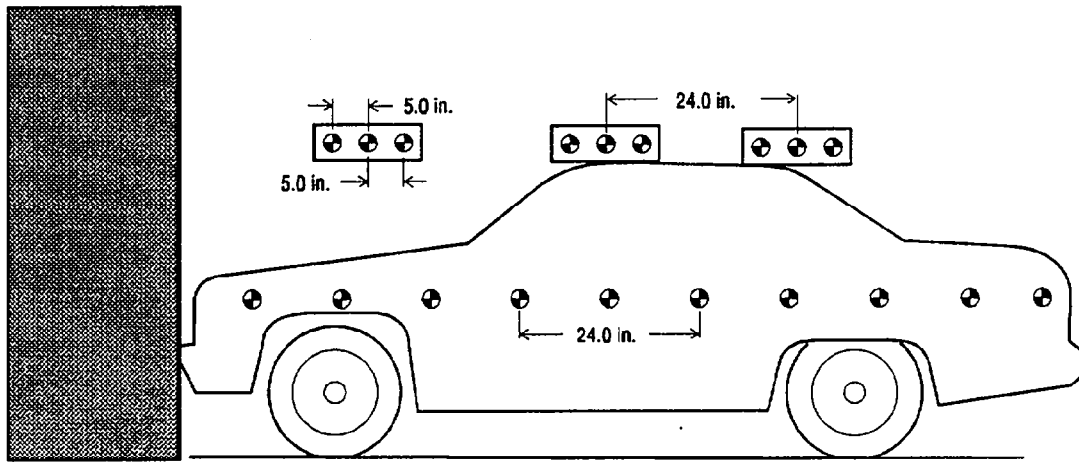


Figure 9 Dummy Measurement Locations for Front Seat Occupants

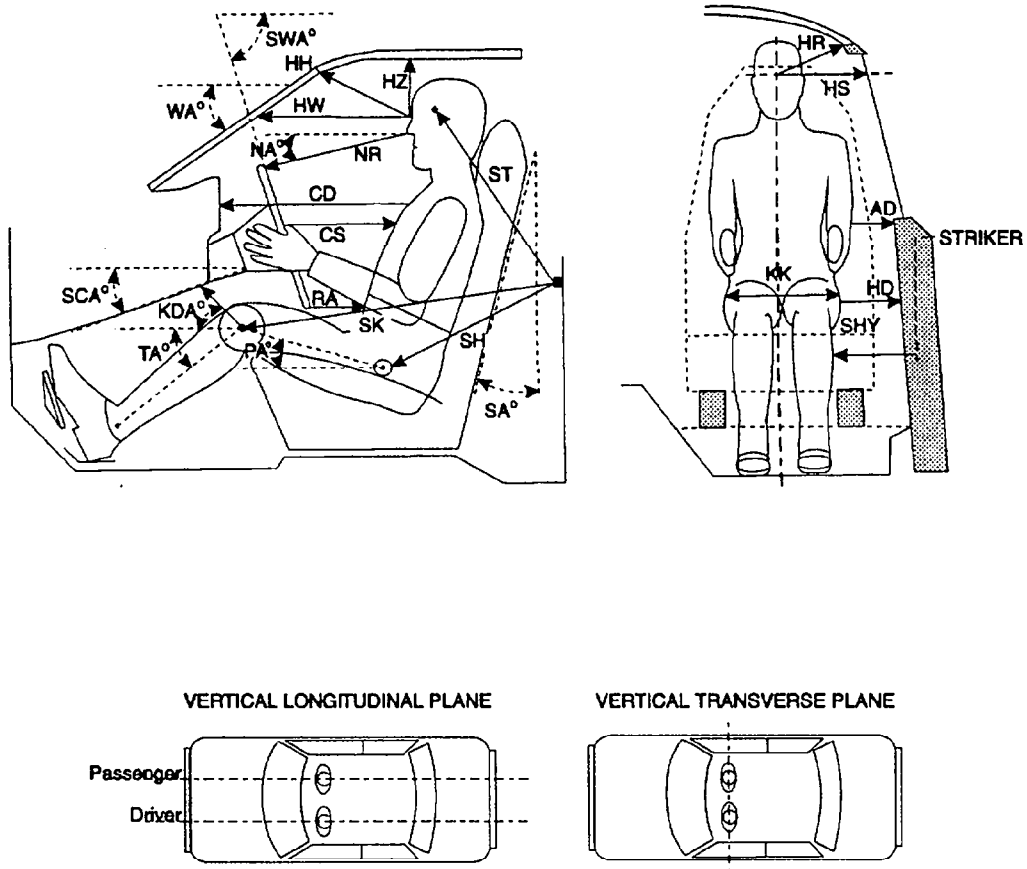


Table 12 Dummy Measurement Data for Front Seat Occupants

<u>Designation</u>	<u>Type of Measurement</u>	<u>Driver (Serial 230)</u>	<u>Passenger (Serial #314)</u>
WA	Windshield angle	26°	28°
SWA	Steering wheel angle	70°	NA
SCA	Steering column angle	20°	NA
SA	Seat back angle	24°	24°
HZ	Head to roof	7.5 in	7.0 in
HH	Head to header	12.8 in	12.5 in
HW	Head to windshield	22.5 in	21.6 in
HR	Head to side header	9.1 in	8.9 in
NR	Nose to rim	15.4 in	NA
NA	Nose to rim angle	10°	NA
CD	Chest to dash	21.7 in	22.0 in
CS	Steering wheel to chest	13.0 in	NA
RA	Rim to abdomen	8.1 in	NA
KDL	Left knee to dash	7.1 in	6.5 in
KDR	Right knee to dash	7.3 in	6.5 in
KDA	Outboard knee to dash angle	32°	32°
PA	Pelvic angle	25°	25°
TA	Tibial angle	37°	45°
KK	Knee to knee	12.2	10.7 in
ST ¹	Striker to head	18.4 in	18.9 in
	Striker to head angle	-84°	-84°
SK ¹	Striker to knee	23.2 in	24.0 in
	Striker to knee angle	3°	2°
SH ¹	Striker to H-point	11.6 in	12.1 in
	Striker to H-point angle	40°	40°
SHY	Striker to H-point (Y dir.)	9.9 in	9.6 in
HS	Head to side window	13.1 in	12.8 in
HD	H-point to door	7.6 in	7.6 in
AD	Arm to door	5.0 in	4.9 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

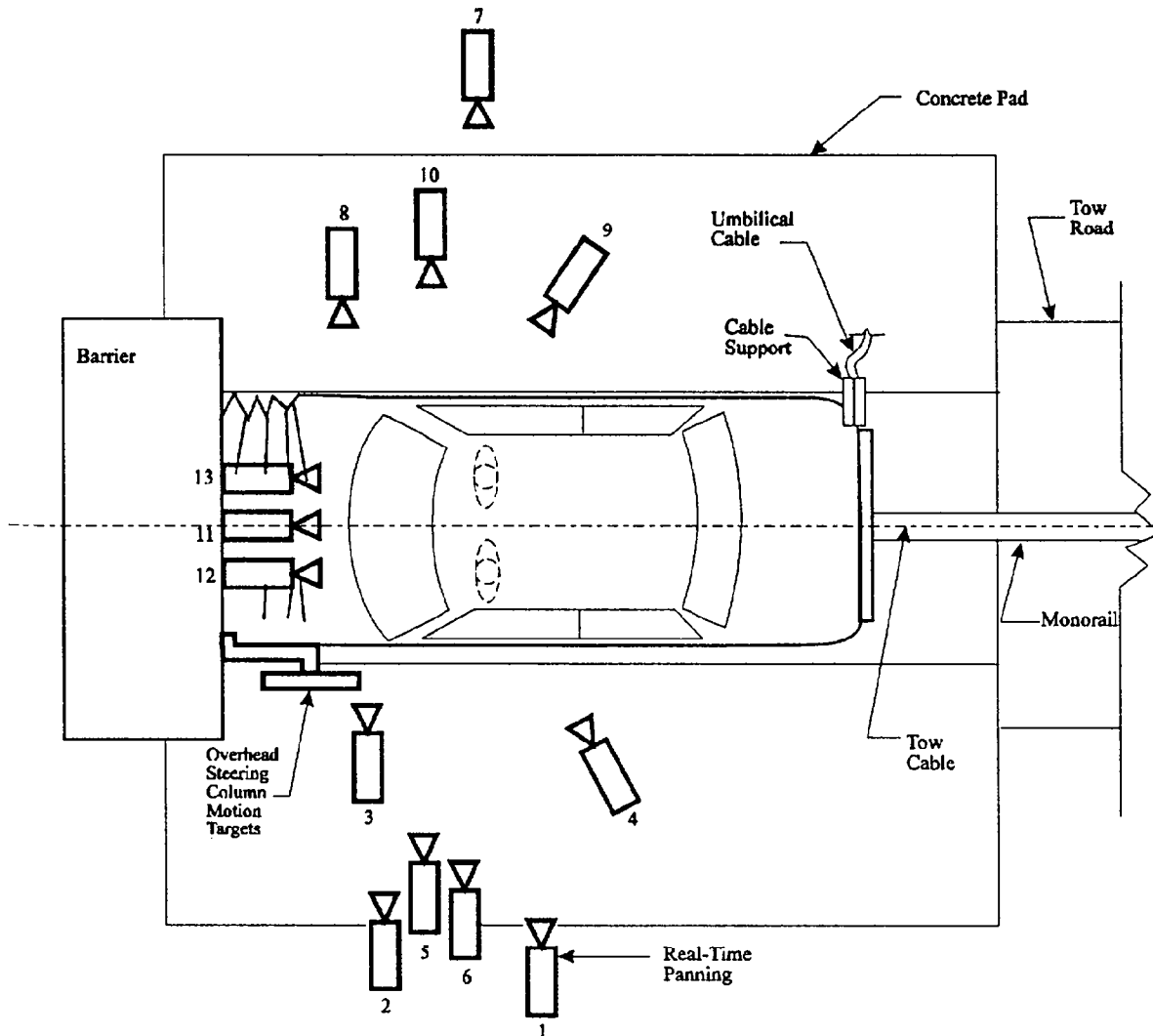


Figure 10 Camera Positions, Cont'd.

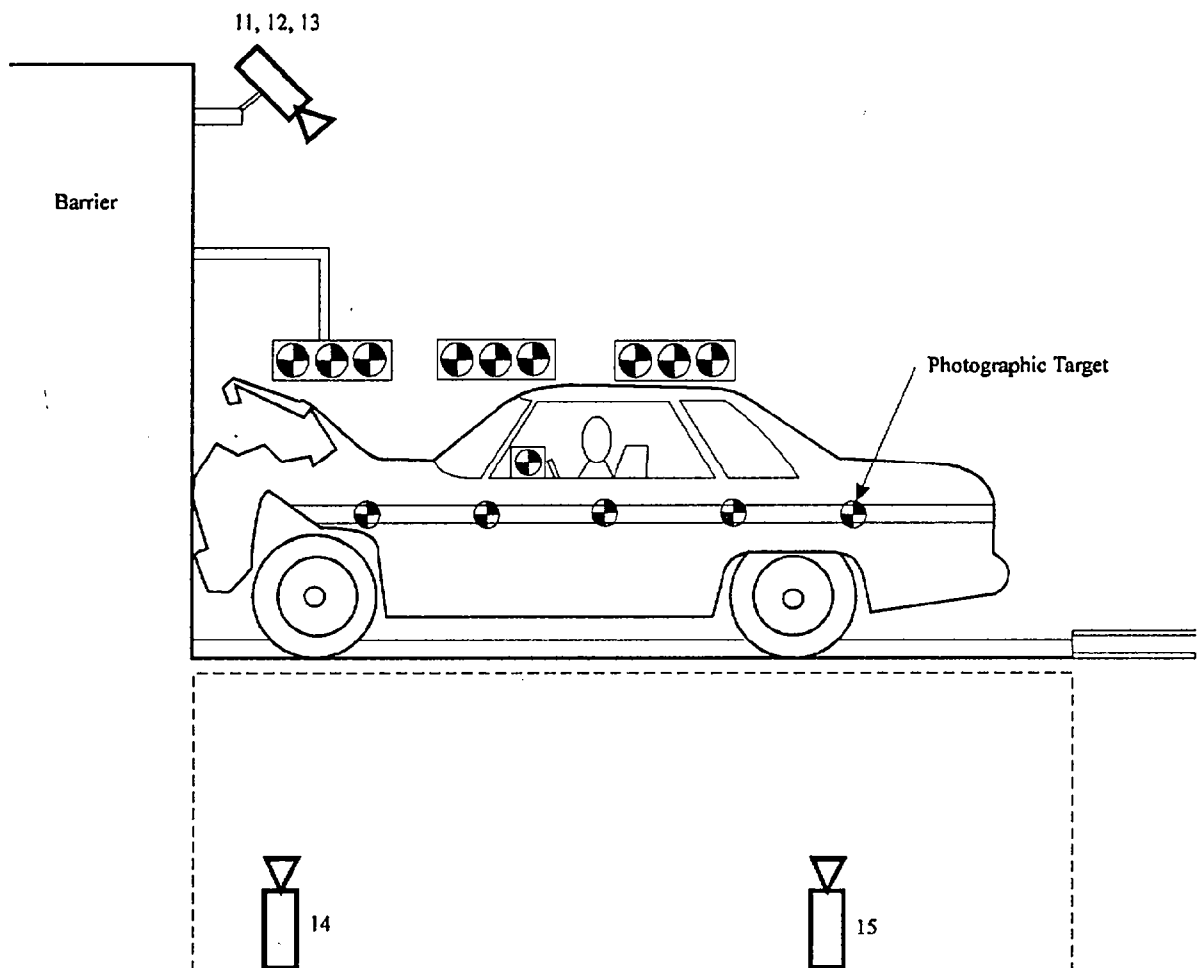


Table 13 Motion Picture Camera Locations

Vehicle year/make/model/body style: 1997/Mitsubishi/Galant/4-door sedan
Test number: 961031

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°	298.0 in	25 mm	995 frames/s
3	Left windshield intrusion	-53.0 in	309.4 in	42.3 in	0°	NA	50 mm	1008 frames/s
4	Driver kinematics	-157.3 in	116.0 in	87.0 in	-27°	96.0 in	25 mm	995 frames/s
5	Steering column motion	-46.0 in	286.0 in	103.0 in	-14°	NA	25 mm	1002 frames/s
6	Steering column motion	-46.0 in	286.0 in	75.1 in	-9°	NA	25 mm	1002 frames/s
7	Right overall	-81.3 in	-266.4 in	37.1 in	-2°	NA	13 mm	1008 frames/s
8	Right windshield intrusion	-38.1 in	-306.1 in	44.0 in	0°	NA	50 mm	1008 frames/s
9	Passenger kinematics	-152.1 in	-116.0 in	87.0 in	-26°	90.0 in	25 mm	1000 frames/s
10	Passenger kinematics	-38.8 in	-293.0 in	45.3 in	-4°	234.0 in	25 mm	992 frames/s
11	Windshield front view	-6.0 in	0.0 in	88.0 in	-40°	NA	13 mm	1000 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	1000 frames/s
14	Pit - front position	-50.5 in	0.0 in	-92.4 in	90°	NA	13 mm	1005 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

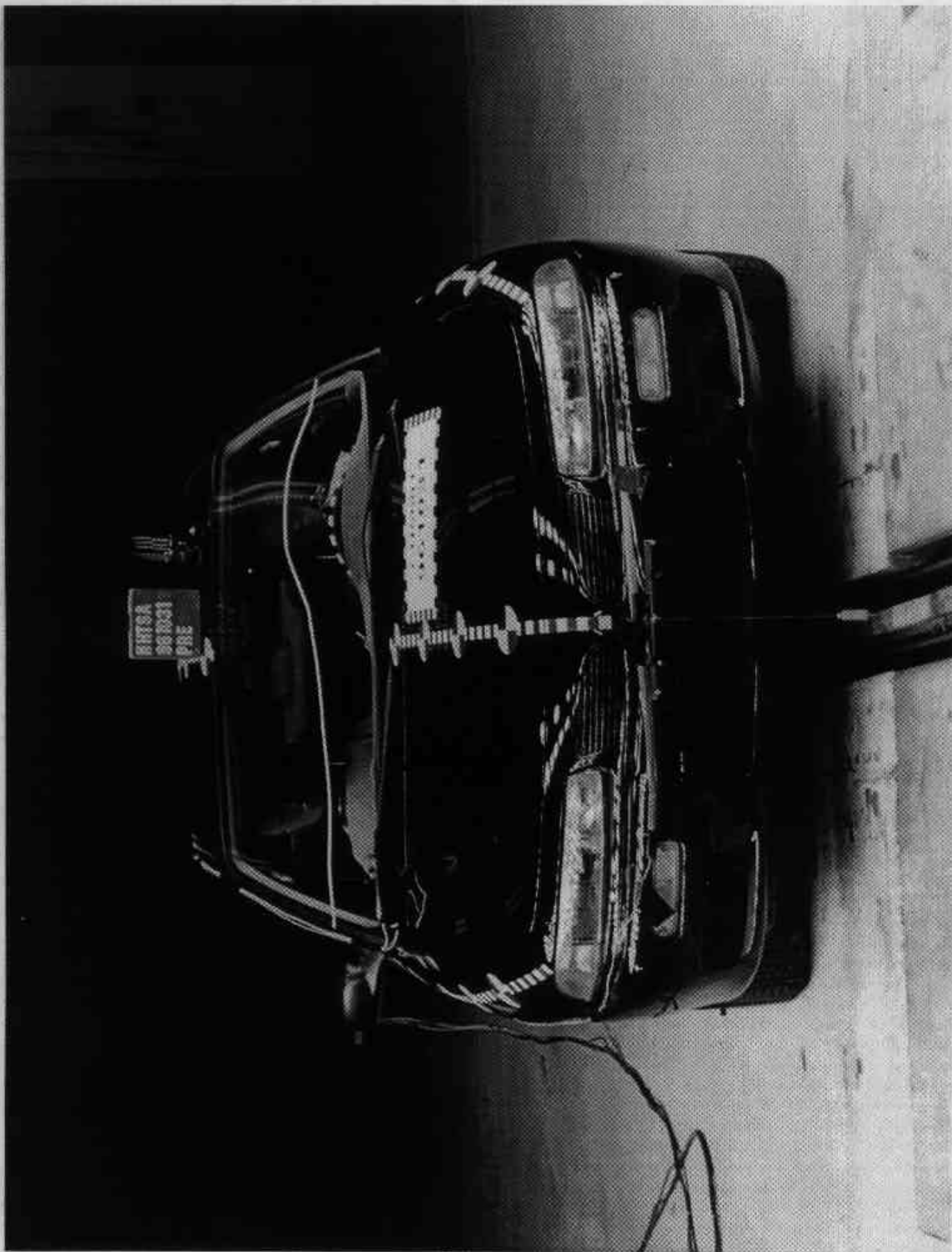


Figure A-1. Pre-test Front View

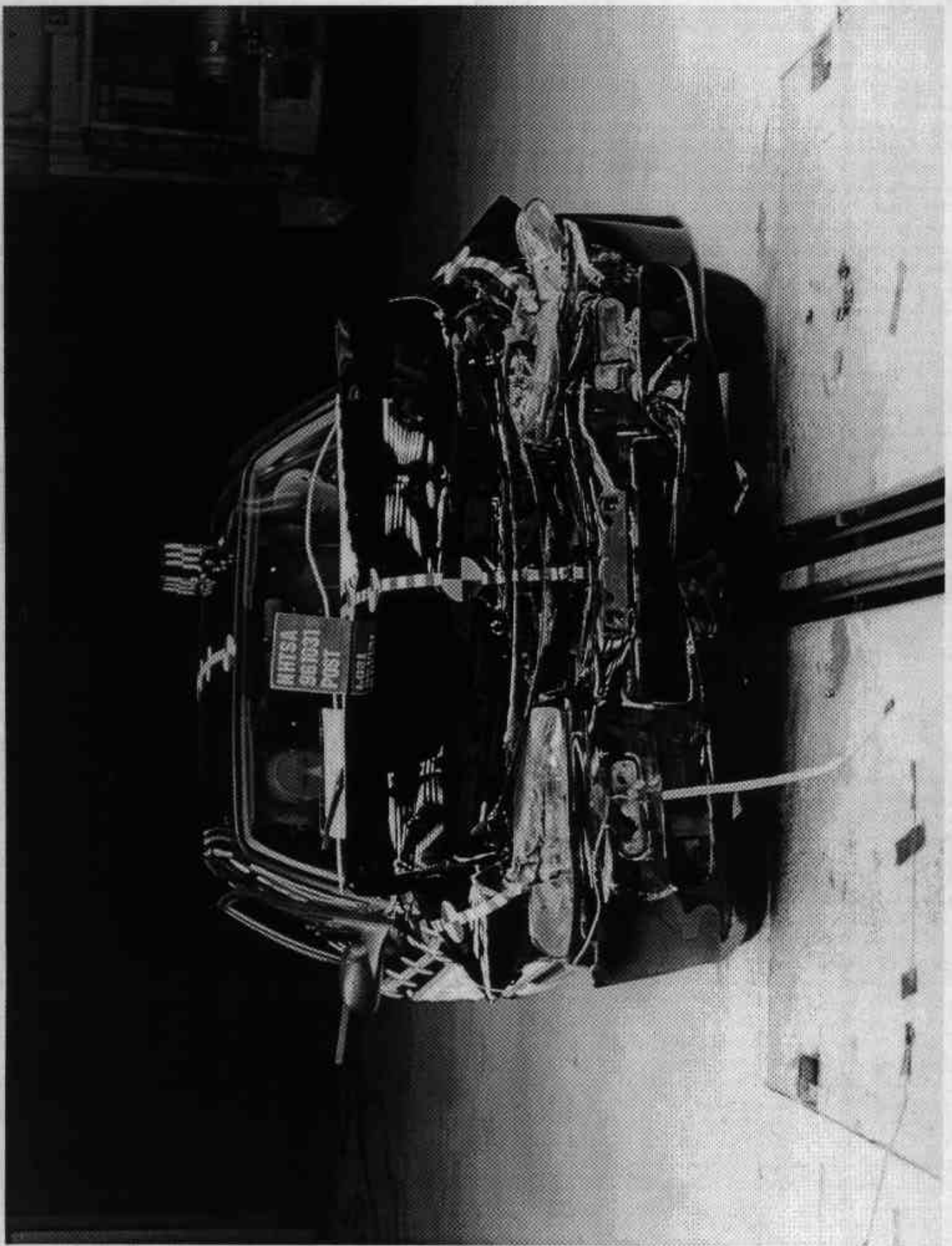


Figure A-2. Post-test Front View

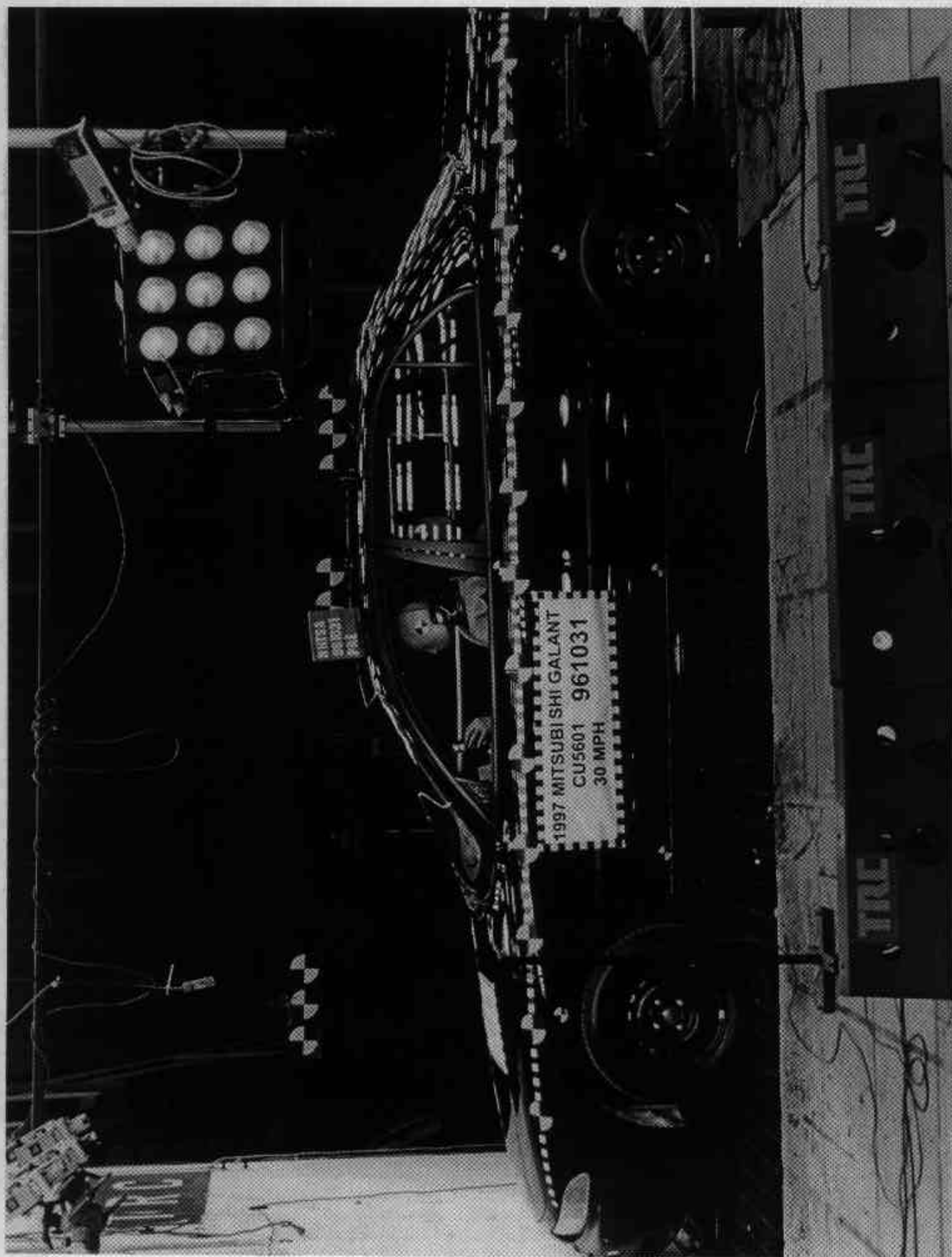


Figure A-3. Pre-test Left Side View

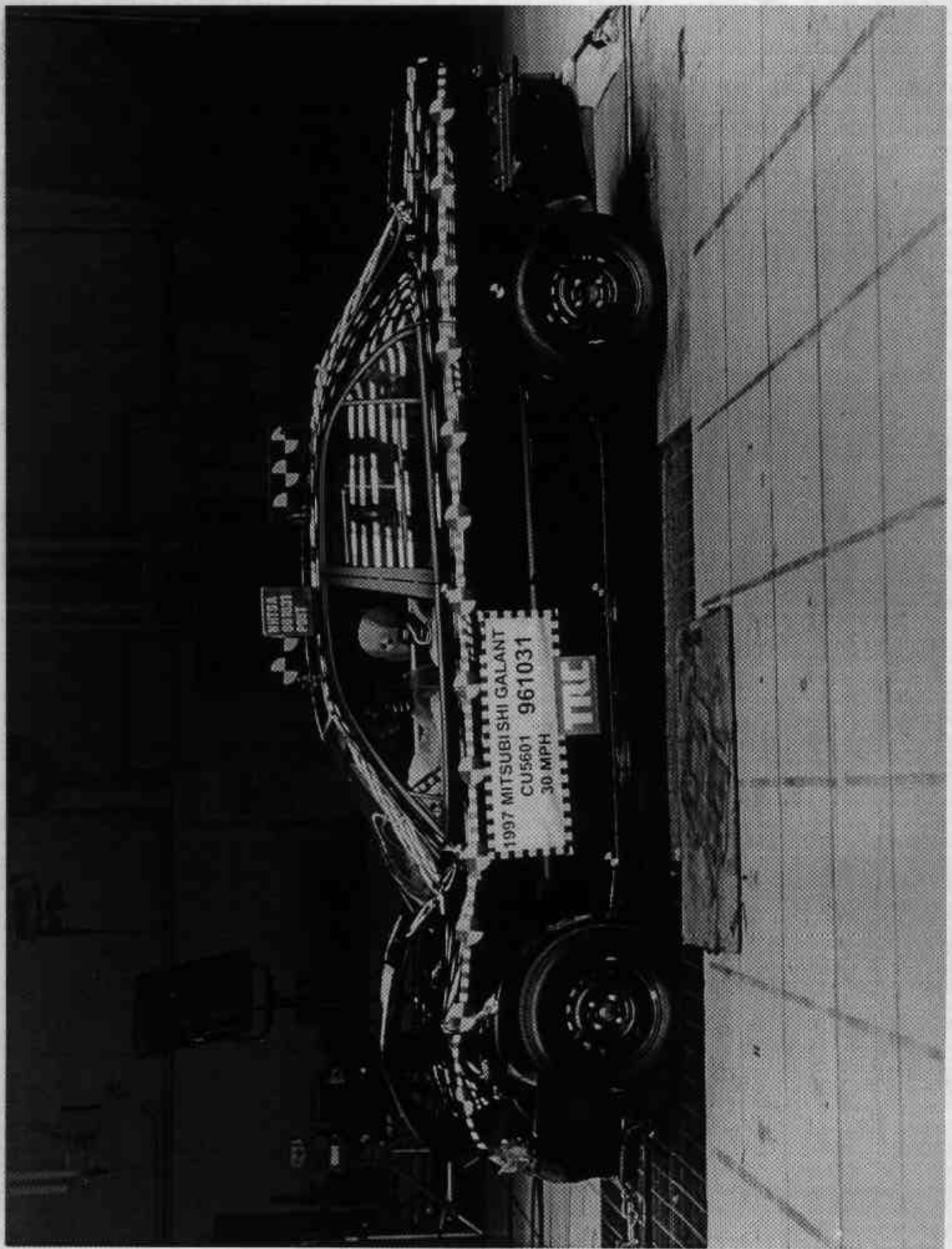


Figure A-4. Post-test Left Side View

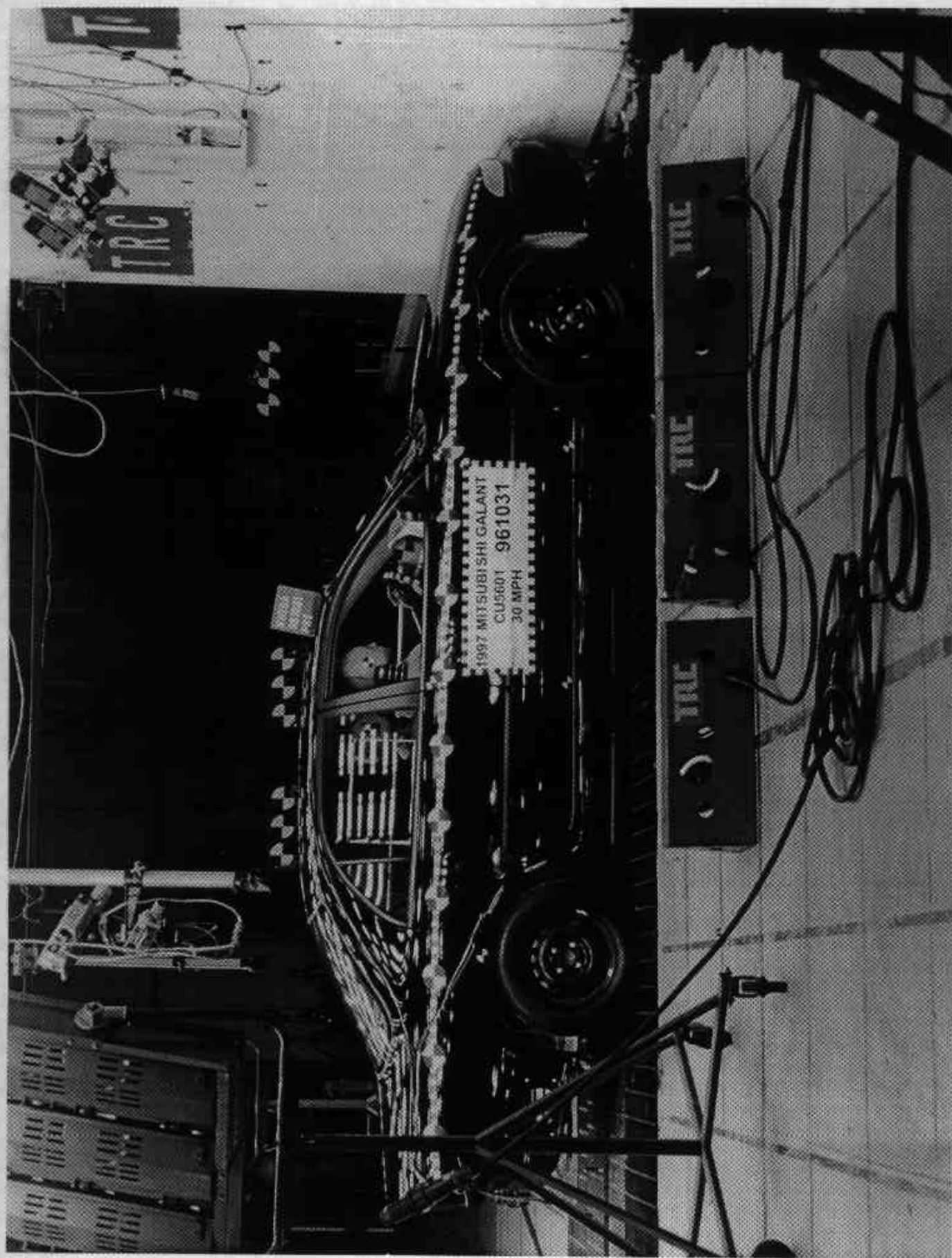


Figure A-5. Pre-test Right Side View

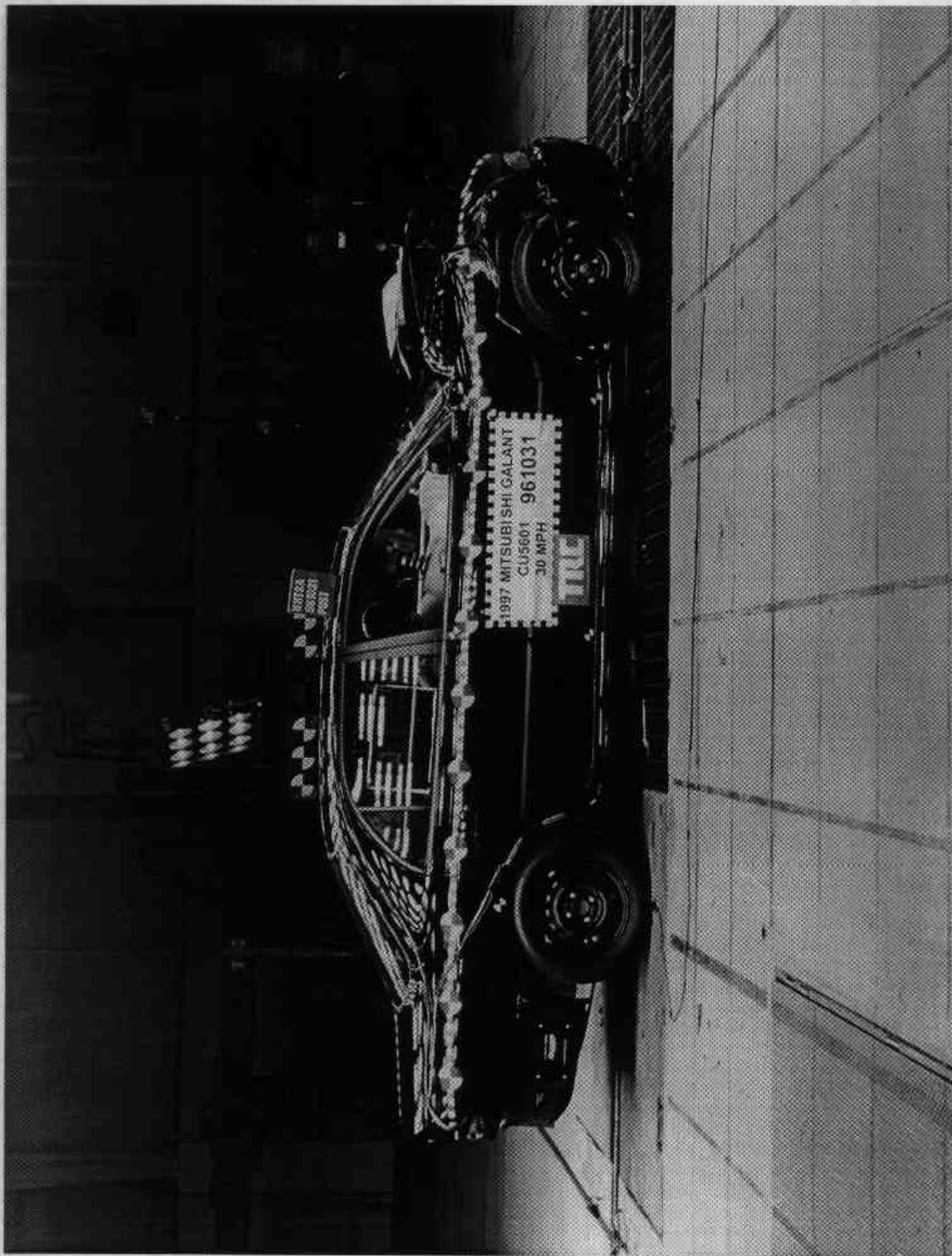


Figure A-6. Post-test Right Side View

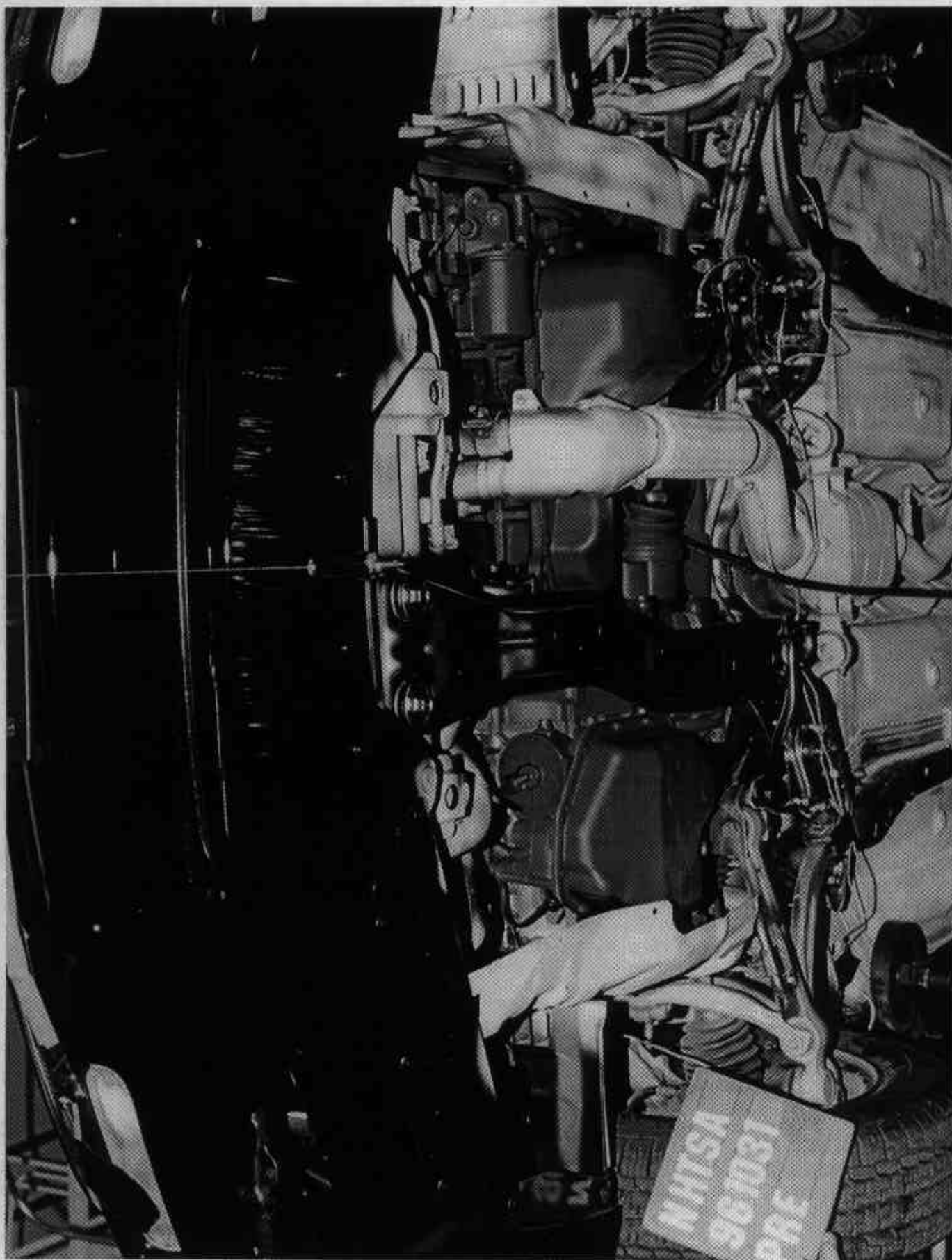


Figure A-7. Pre-test Front Underbody View



Figure A-8. Post-test Front Underbody View



Figure A-9. Pre-Test Driver's Knee Bolster View

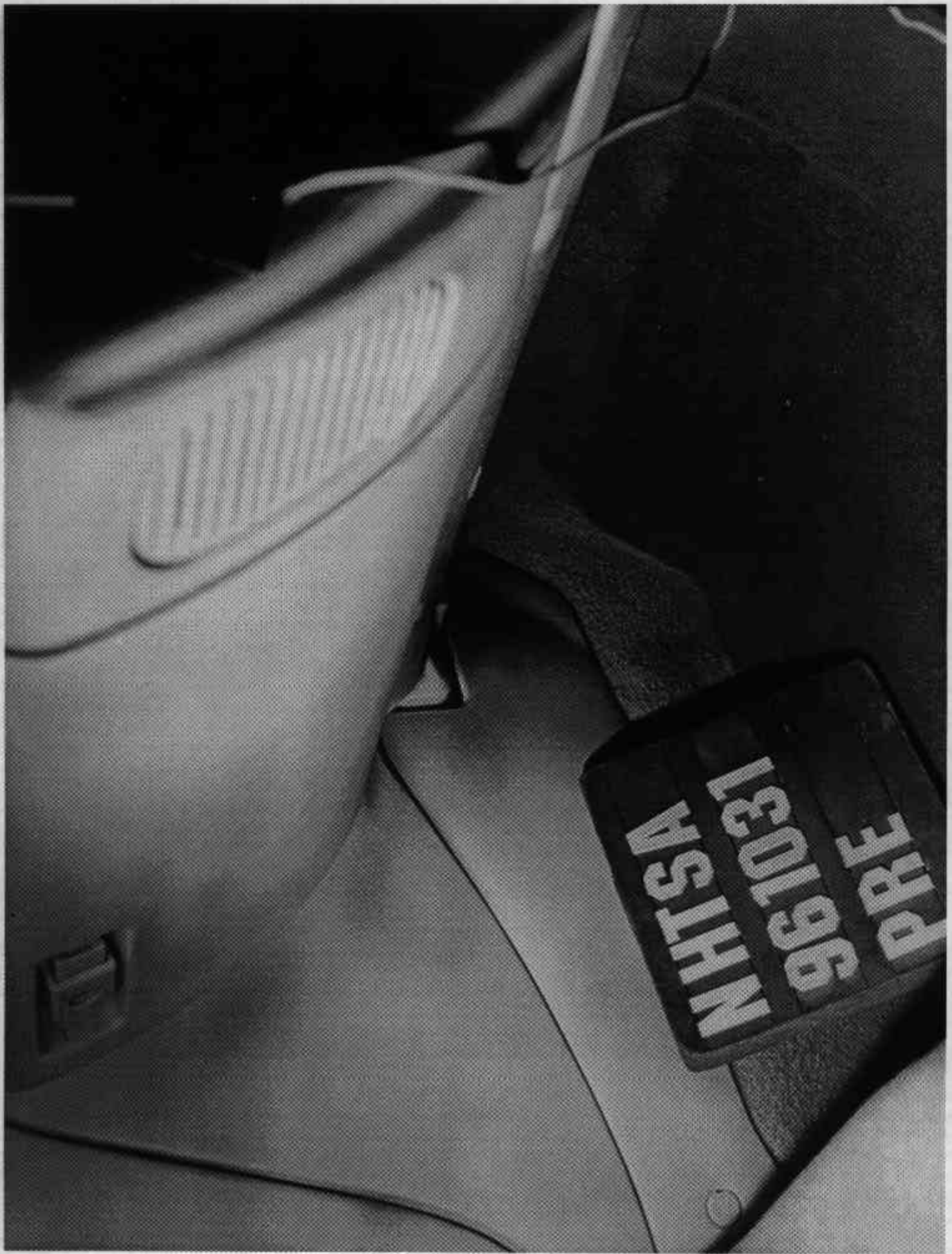


Figure A-10. Pre-Test Passenger's Knee Bolster View



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

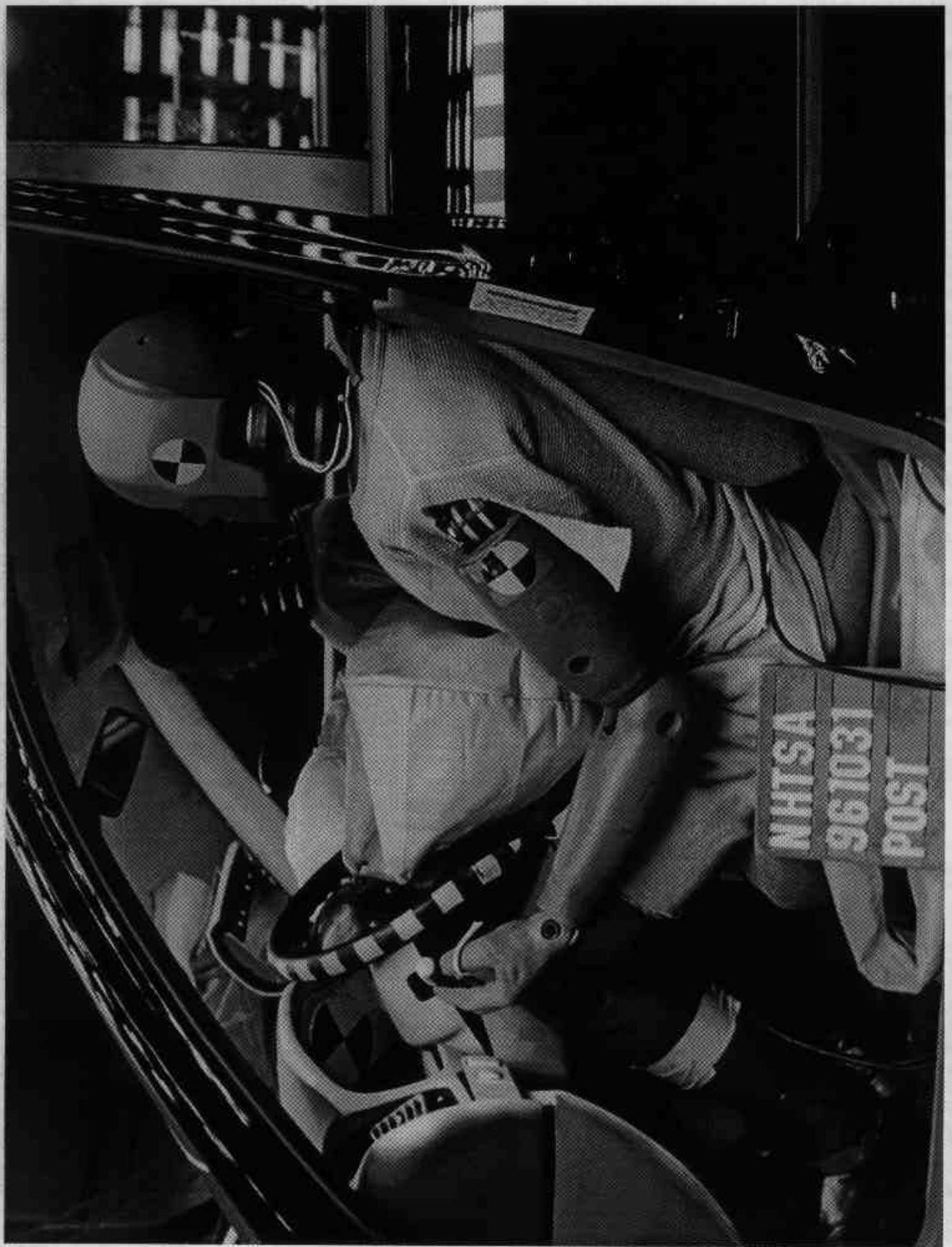


Figure A-12. Post-test Driver Dummy and Vehicle Interior View



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



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



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



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



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

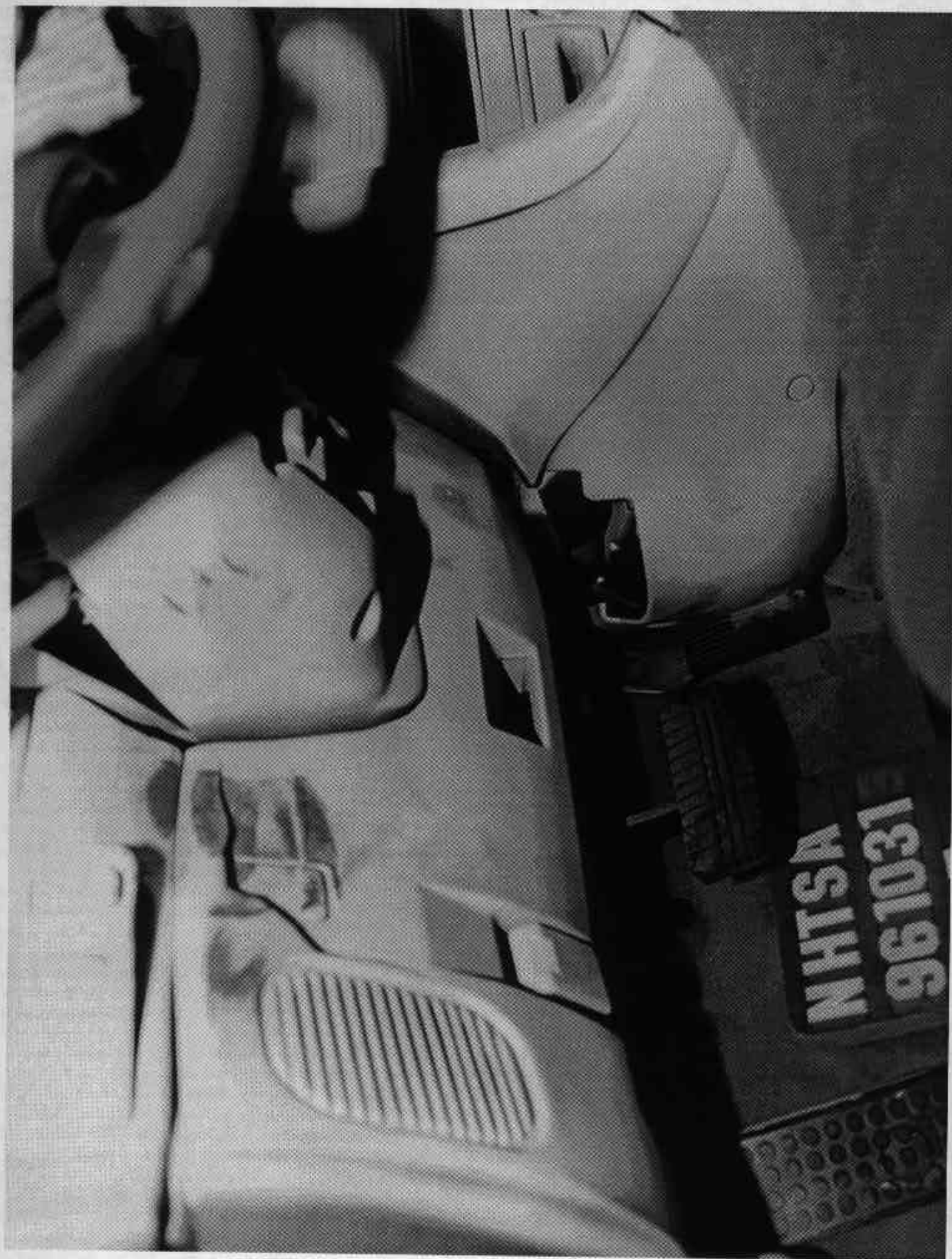


Figure A-18. Post-test Driver Dummy Knee Contact - View 2



Figure A-19. Post-test Driver Dummy Knee Contact - View 3



Figure A-20. Post-test Passenger Dummy Head Contact - View 1



Figure A-21. Post-test Passenger Dummy Head Contact - View 2



Figure A-22. Post-test Passenger Dummy Knee Contact - View 1



Figure A-23. Post-test Passenger Dummy Knee Contact - View 2



Figure A-24. Pre-test Steering Column Interior View

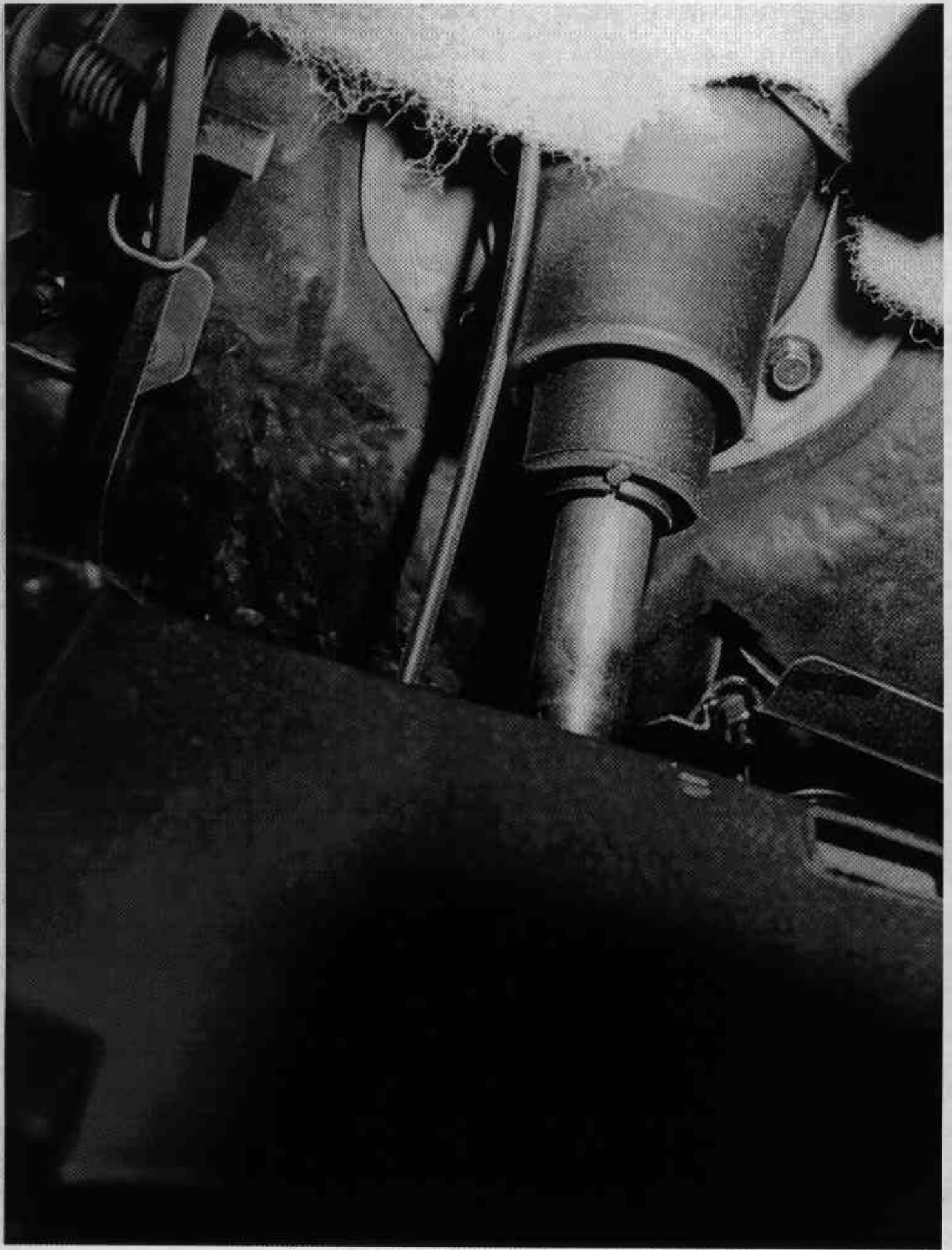


Figure A-25. Pre-test Steering Column Exterior View



Figure A-26. Pre-test Vehicle Certification Label View



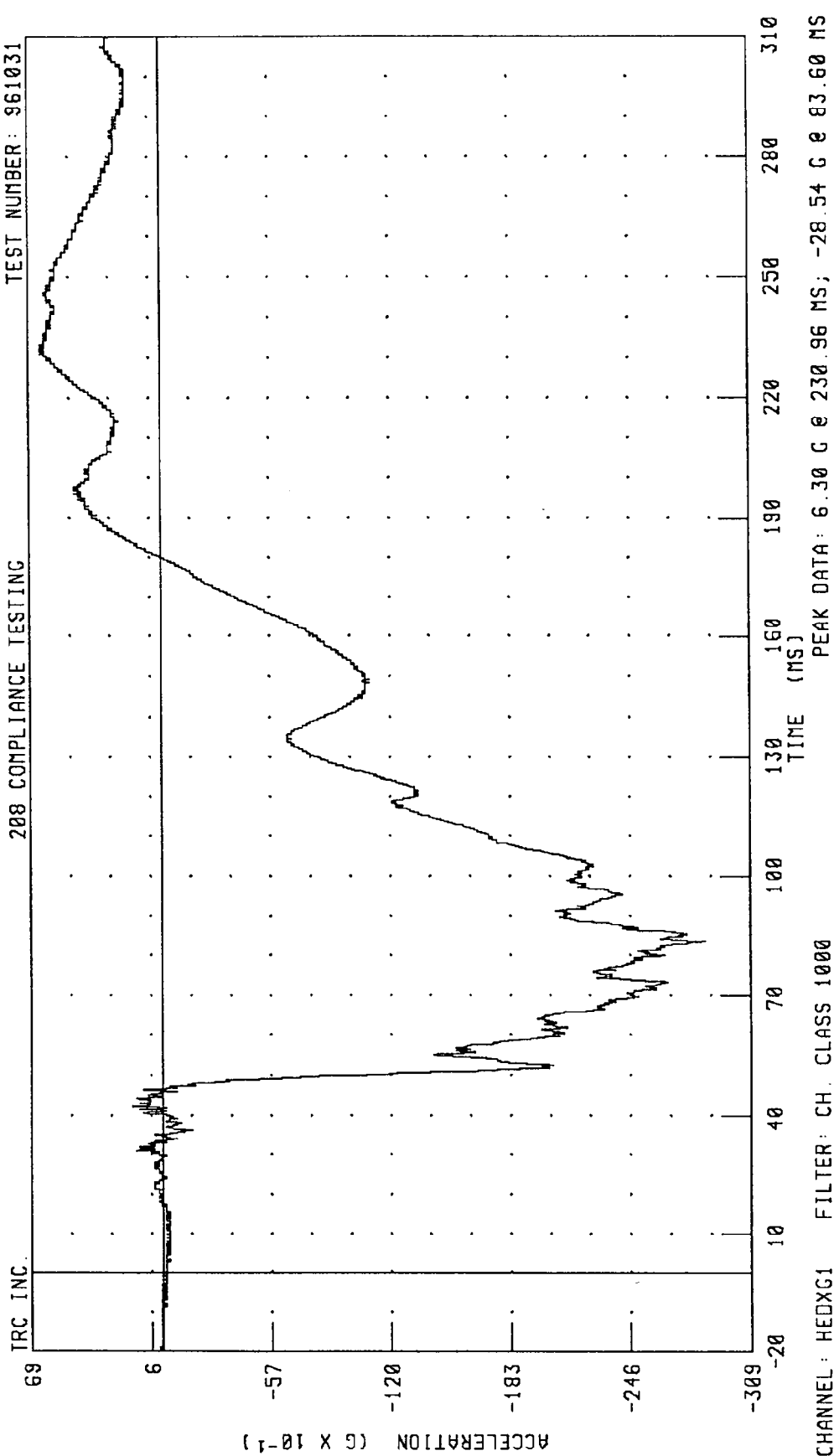
Figure A-27. Pre-test Recommended Tire Pressure Label View

Appendix B

Data Plots

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031



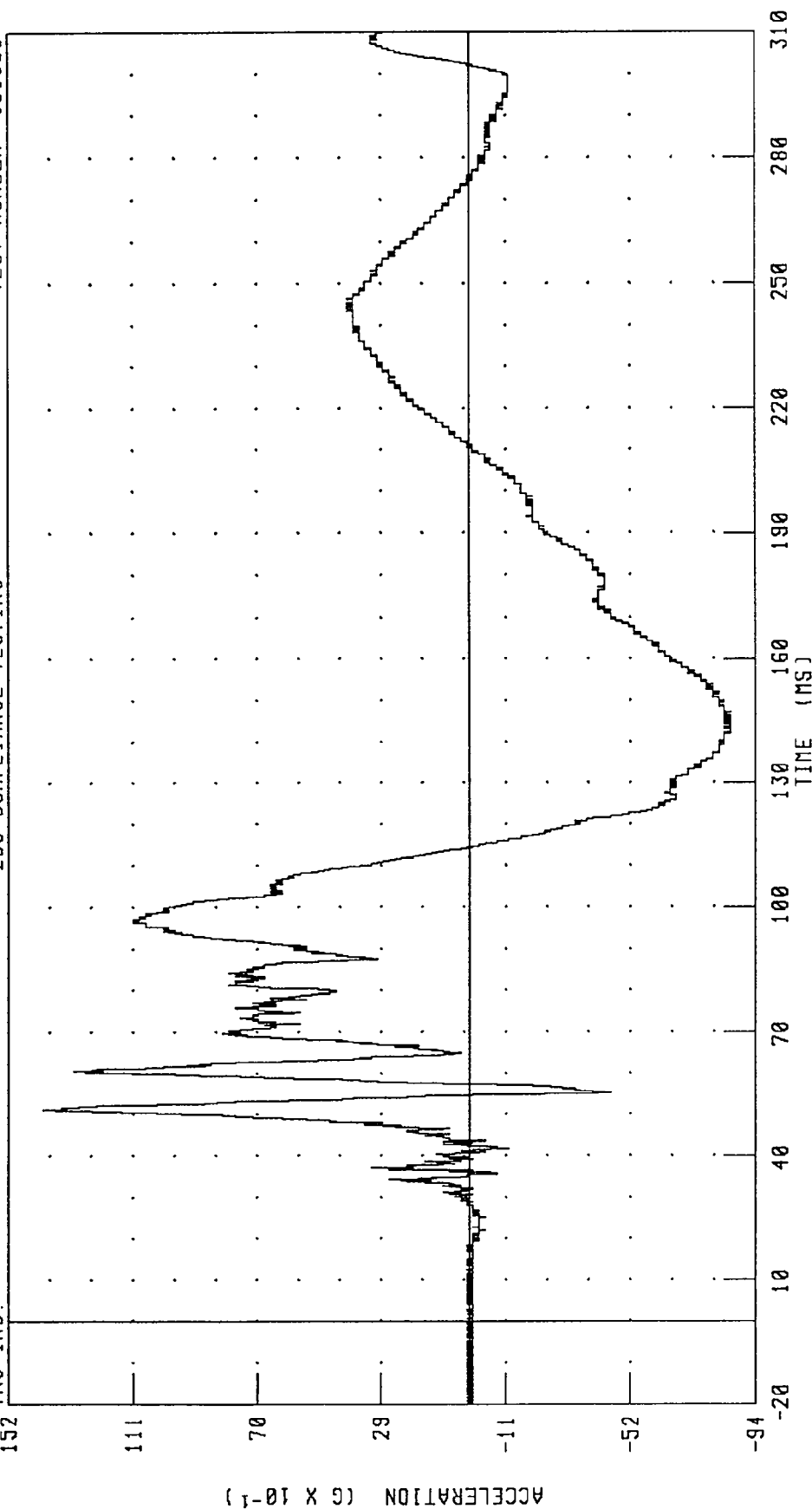
CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 6.30 G @ 230.96 MS; -28.54 G @ 83.60 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 208 COMPLIANCE TESTING

TEST NUMBER: 961031

IRC INC.

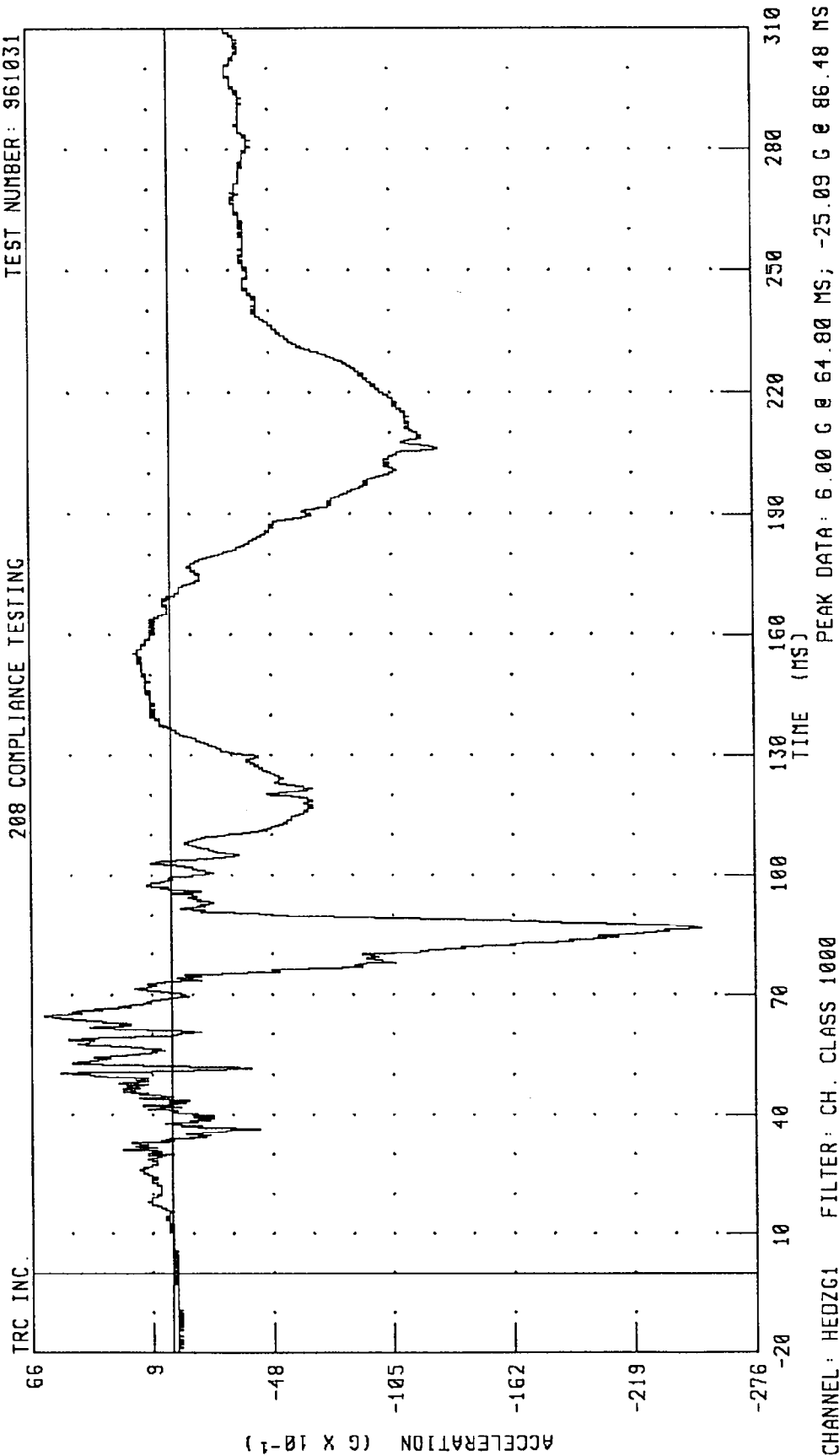


CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

PEAK DATA: 14.03 G @ 51.12 MS; -8.58 G @ 142.00 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION
 208 COMPLIANCE TESTING

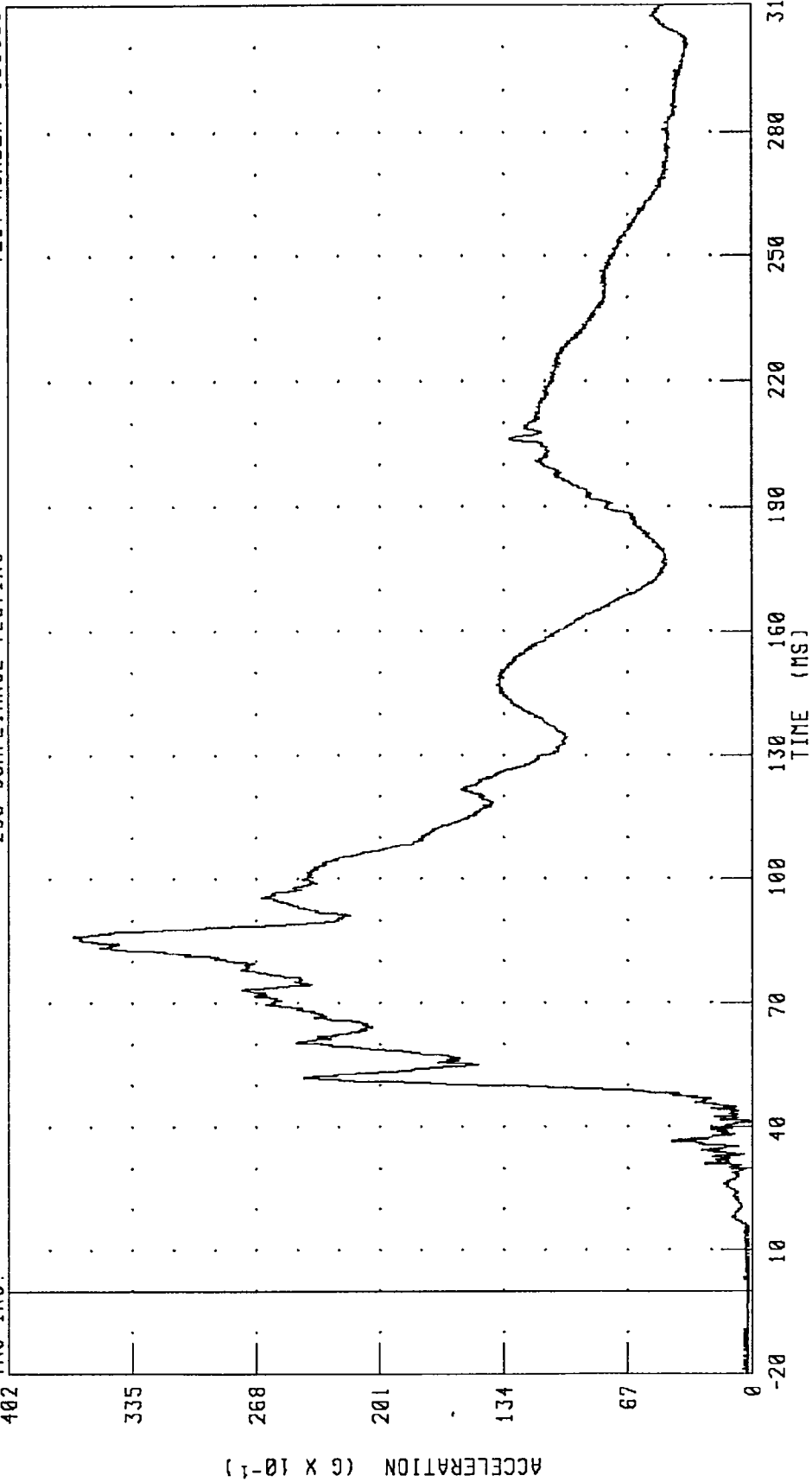
TEST NUMBER: 961031



1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.

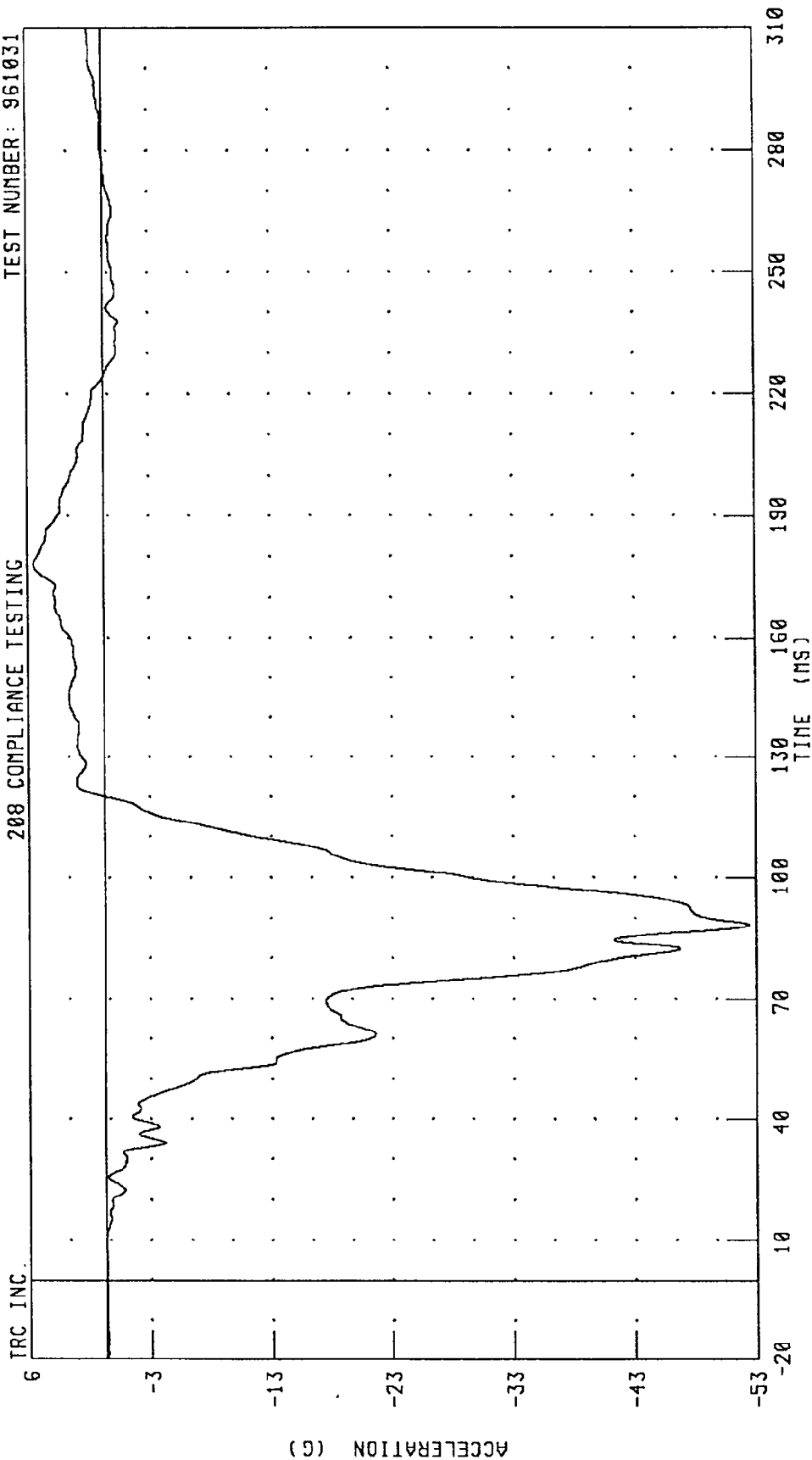


CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 36.64 G @ 86.32 MS; 0.10 G @ 30.08 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031



CHANNEL: CSTXG1 FILTER: CH. CLASS 180

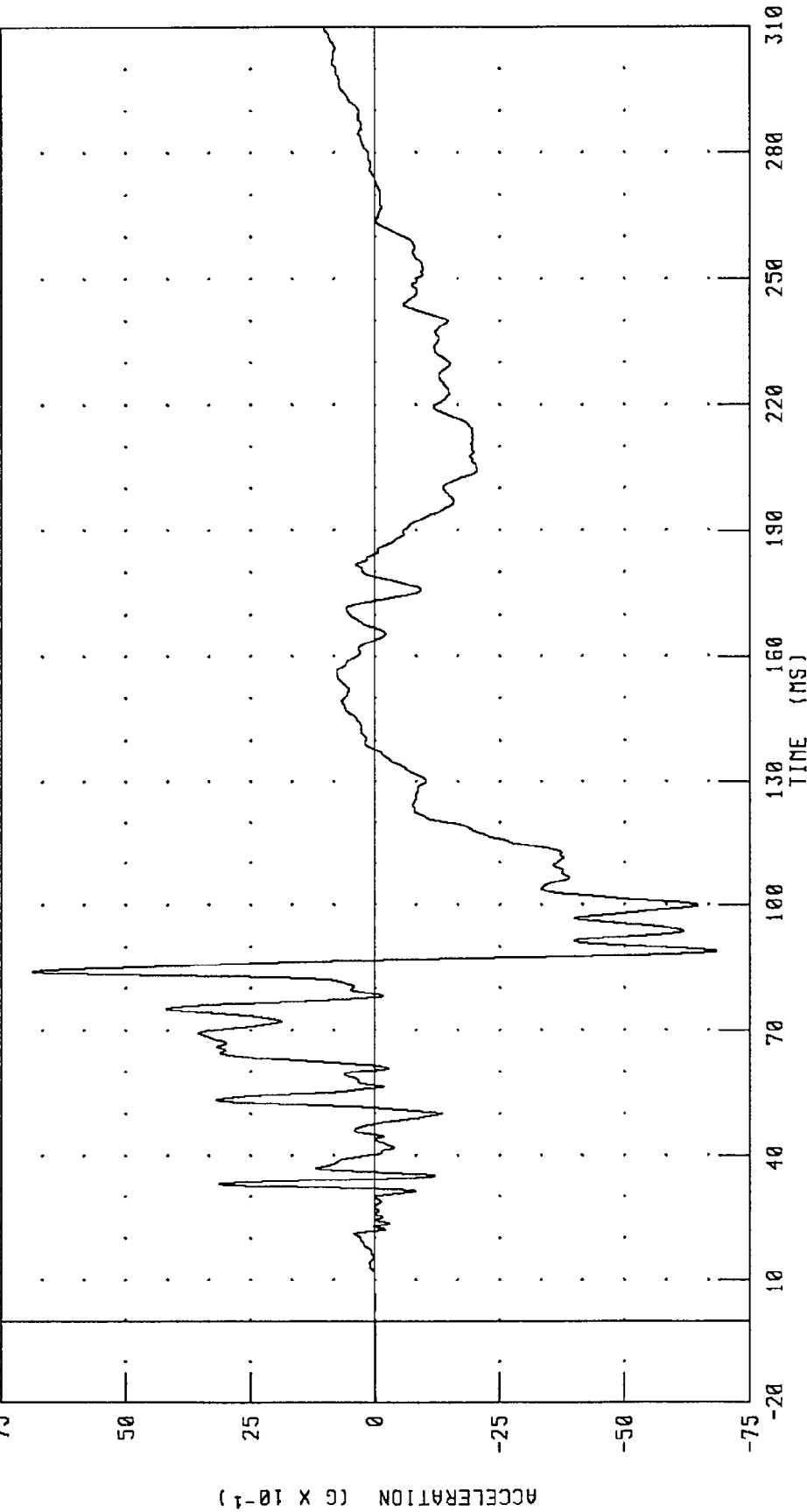
PEAK DATA: 5.80 G @ 178.00 MS; -53.00 G @ 88.24 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION

208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.



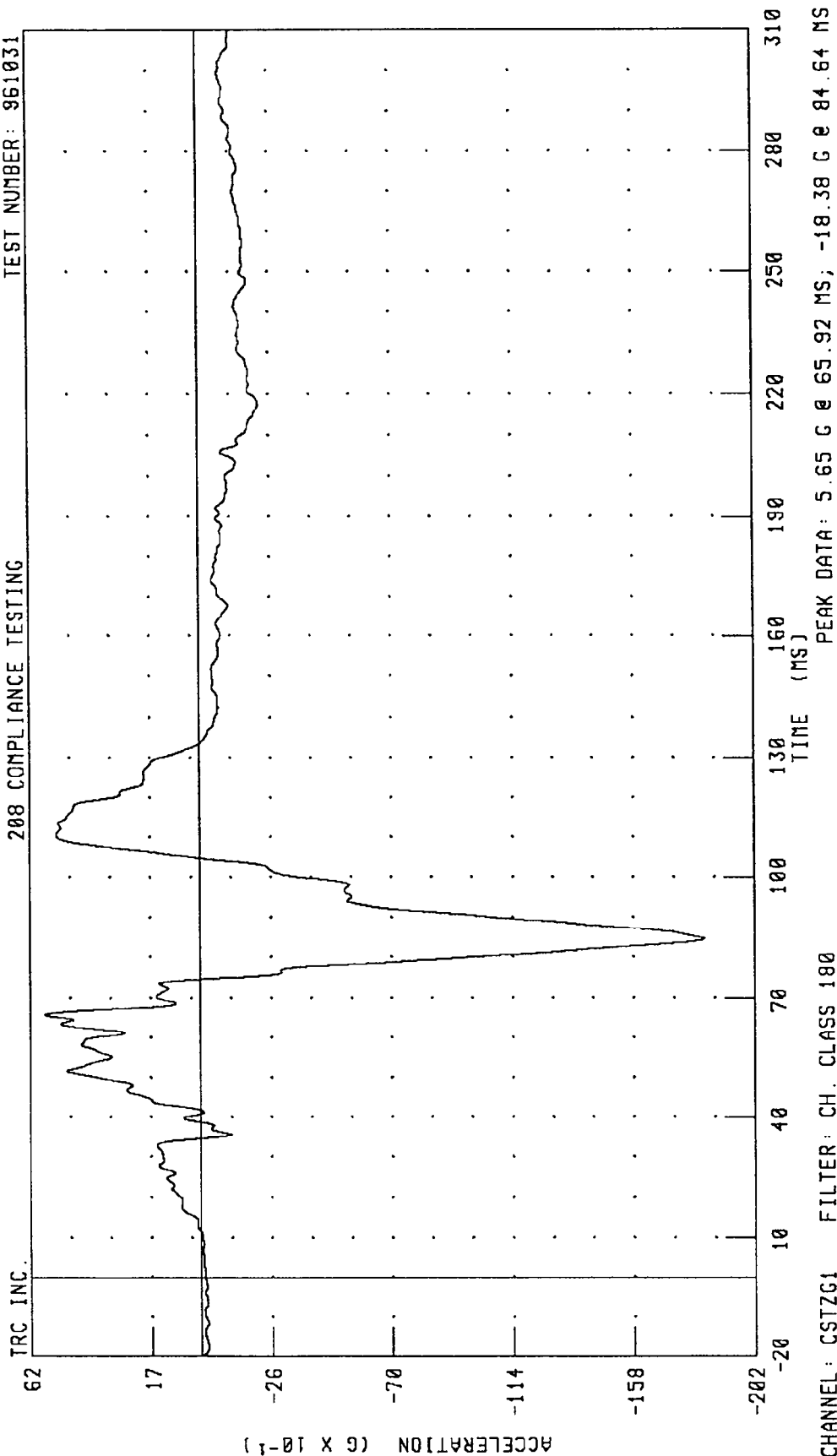
CHANNEL: CSTYG1 FILTER: CH. CLASS 180

PEAK DATA: 6.86 G @ 84.08 MS; -6.84 G @ 89.04 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION

208 COMPLIANCE TESTING

TEST NUMBER: 961031

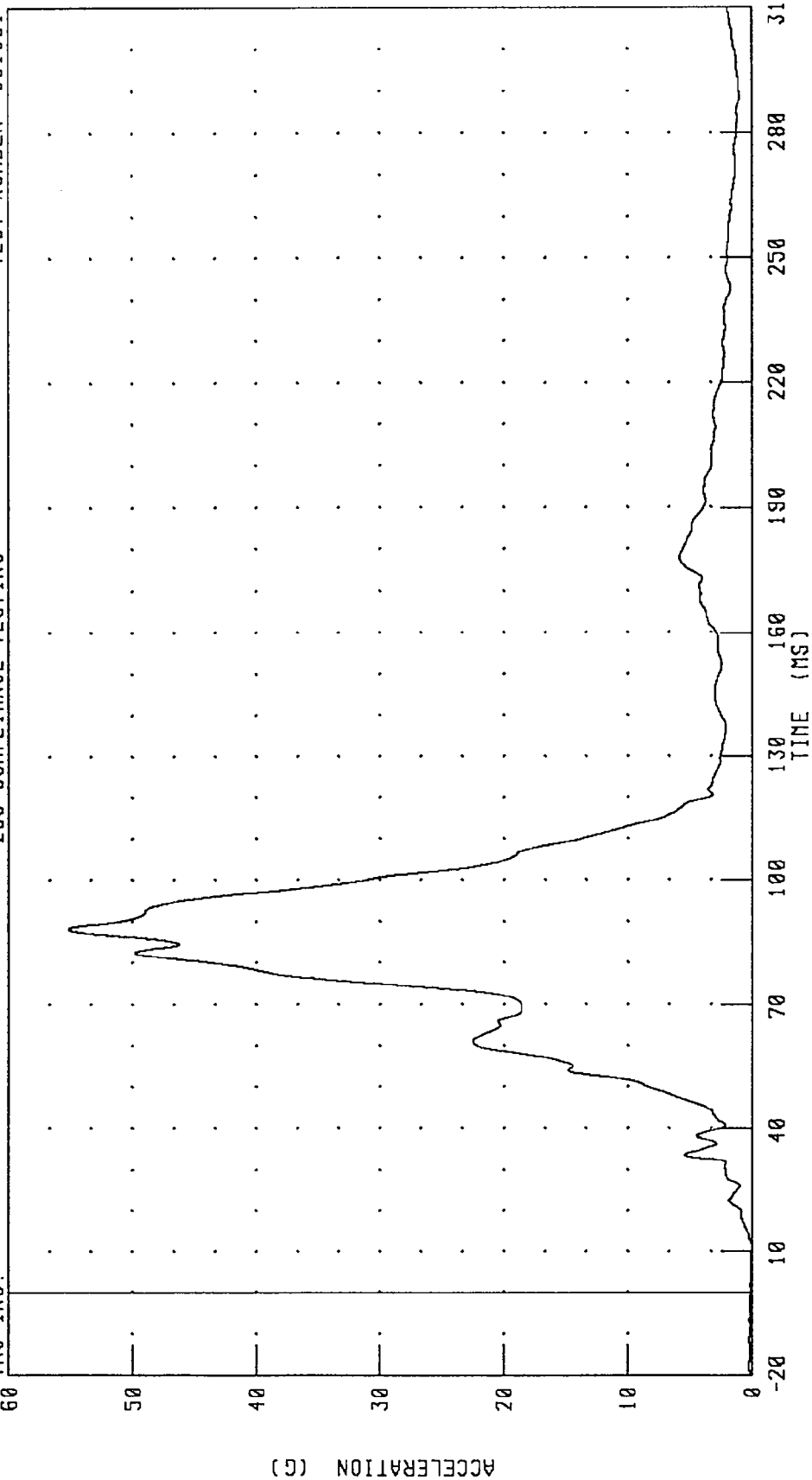


CHANNEL: CSTZG1 FILTER: CH. CLASS 180

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

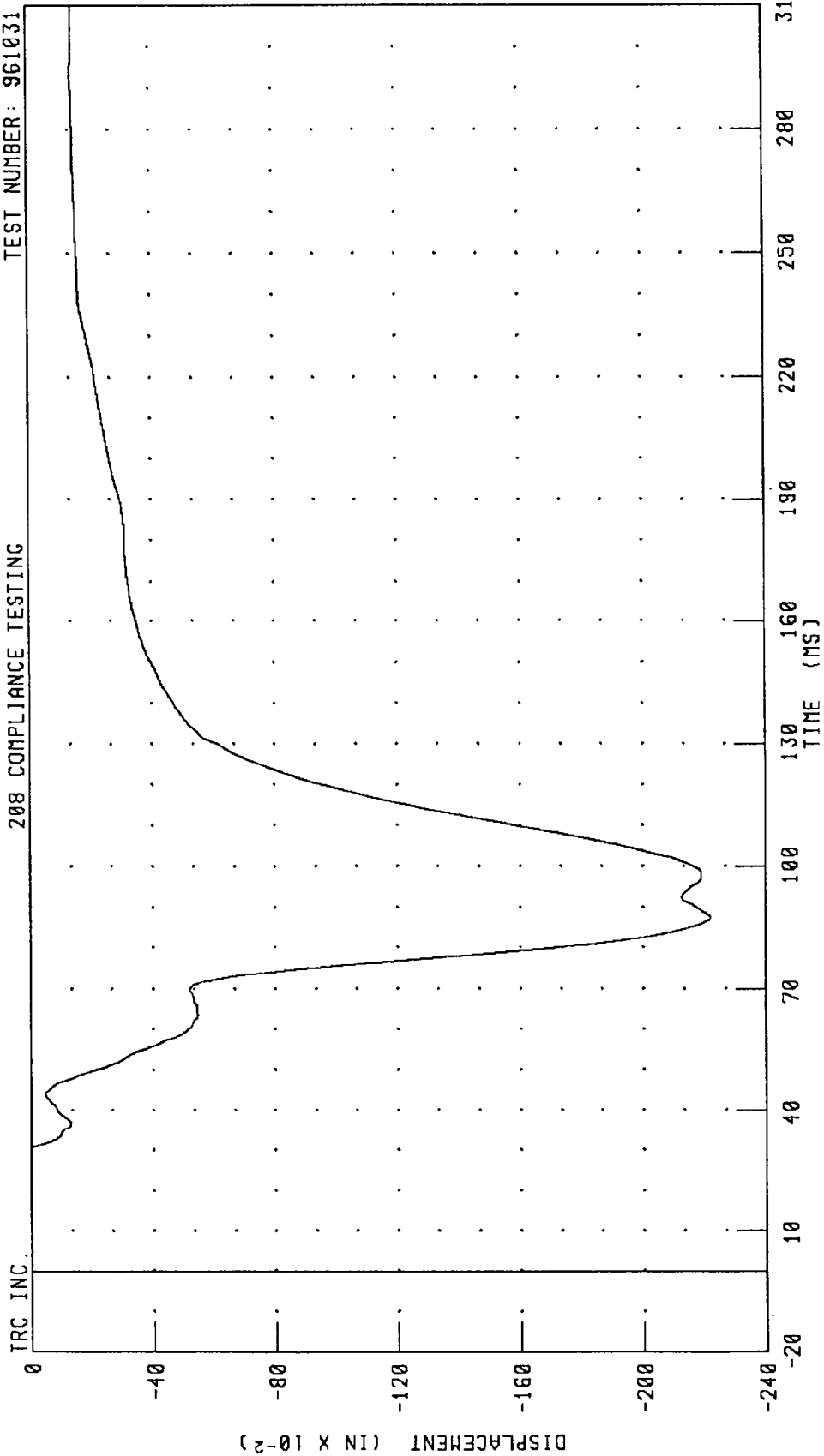
PEAK DATA: 55.17 G @ 88.24 MS; 0.01 G @ -20.00 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER

DRIVER CHEST DEFLECTION

208 COMPLIANCE TESTING

TEST NUMBER: 961031

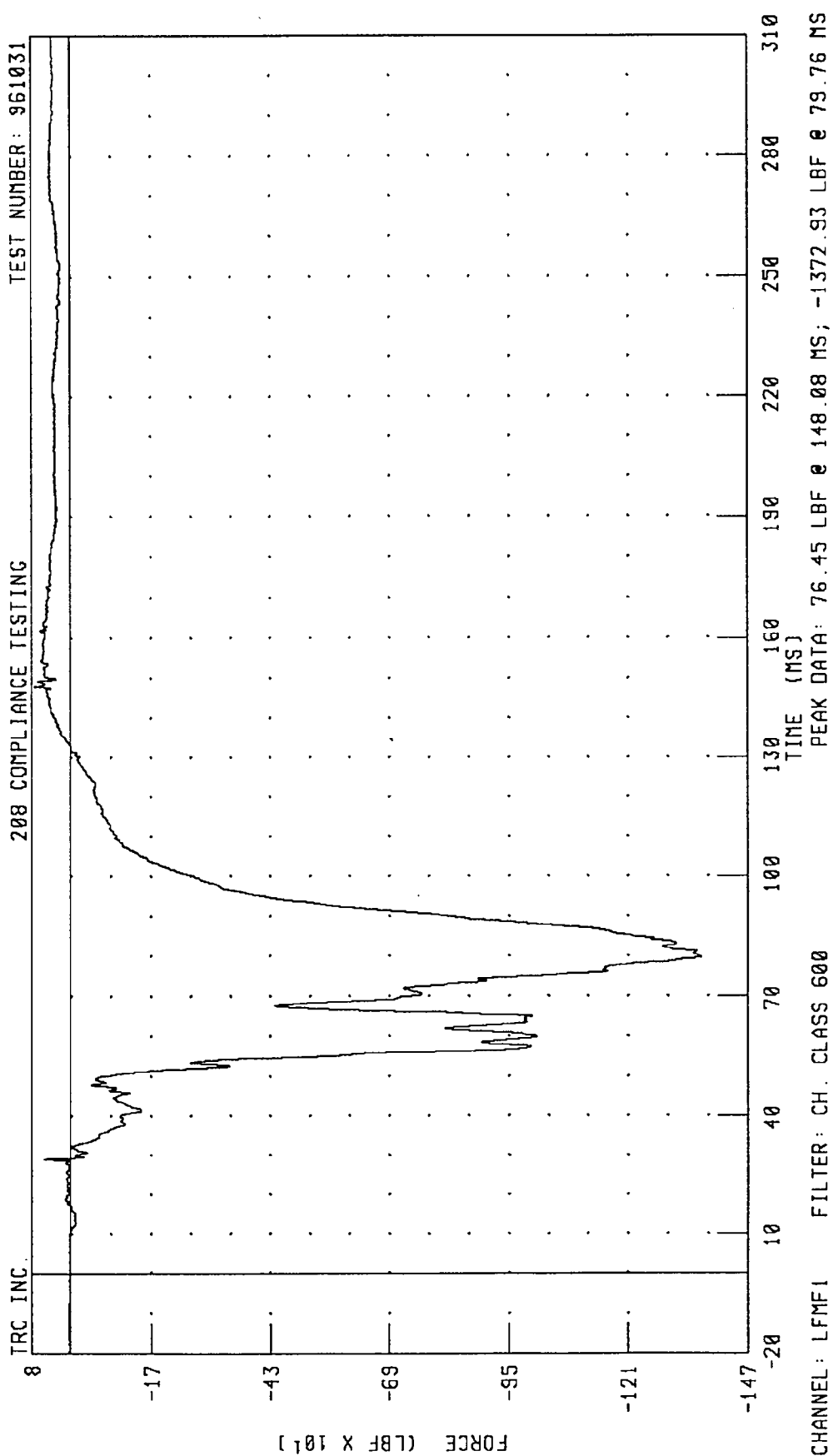


CHANNEL: CSTXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.01 IN @ 29.04 MS; -2.22 IN @ 87.36 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 DRIVER LEFT FEMUR FORCE
 208 COMPLIANCE TESTING

TEST NUMBER: 961031



CHANNEL: LFMF1 FILTER: CH. CLASS 600

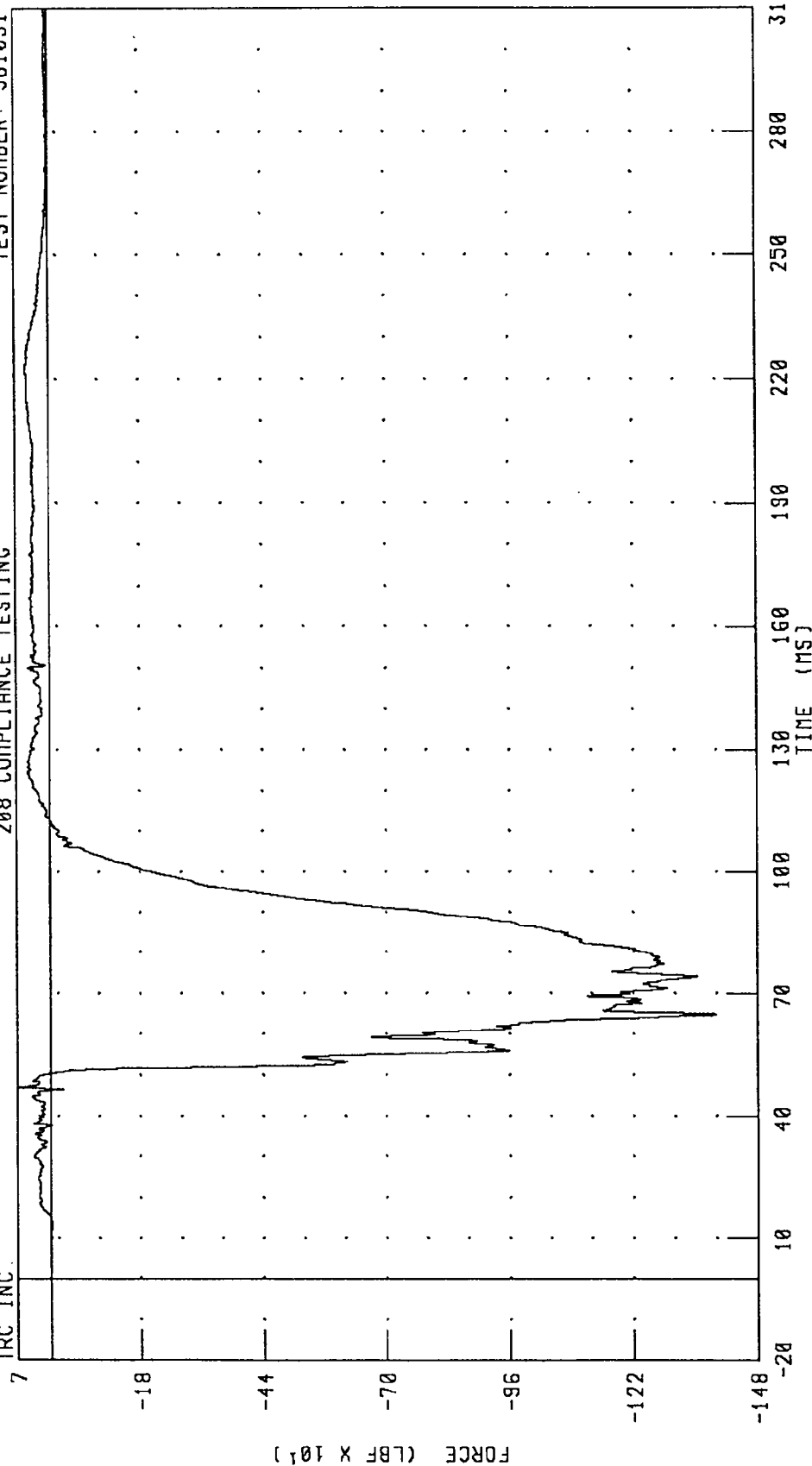
1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER

DRIVER RIGHT FEMUR FORCE

208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.



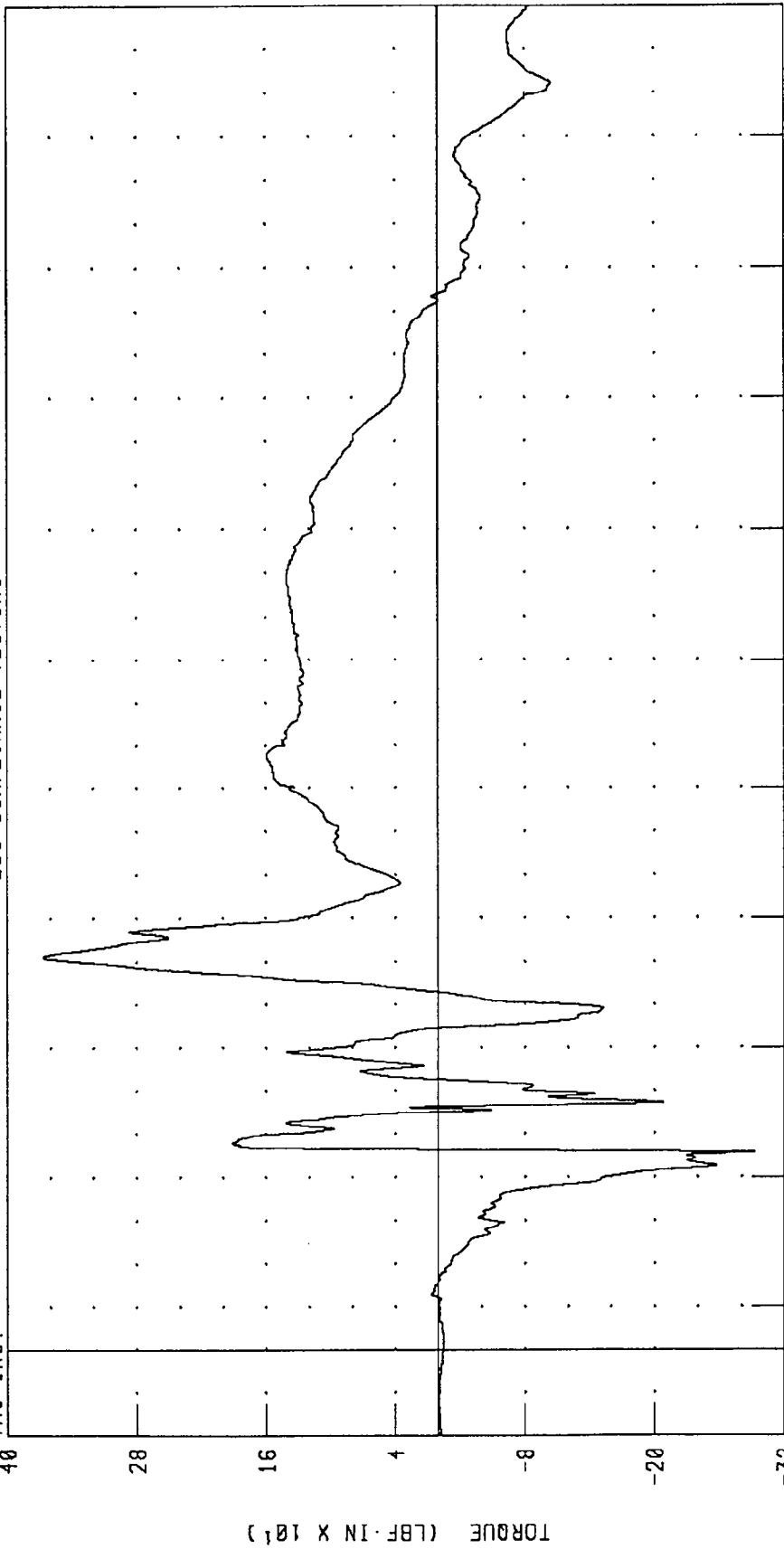
PEAK DATA: 65.94 LBF @ 46.96 MS; -1401.47 LBF @ 64.96 MS

CHANNEL: RFMF1 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 DRIVER LEFT UPPER TIBIA MOMENT ABOUT X-AXIS
 208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.



PEAK DATA: 366.36 LBF-IN @ 91.20 MS; -292.03 LBF-IN @ 45.68 MS

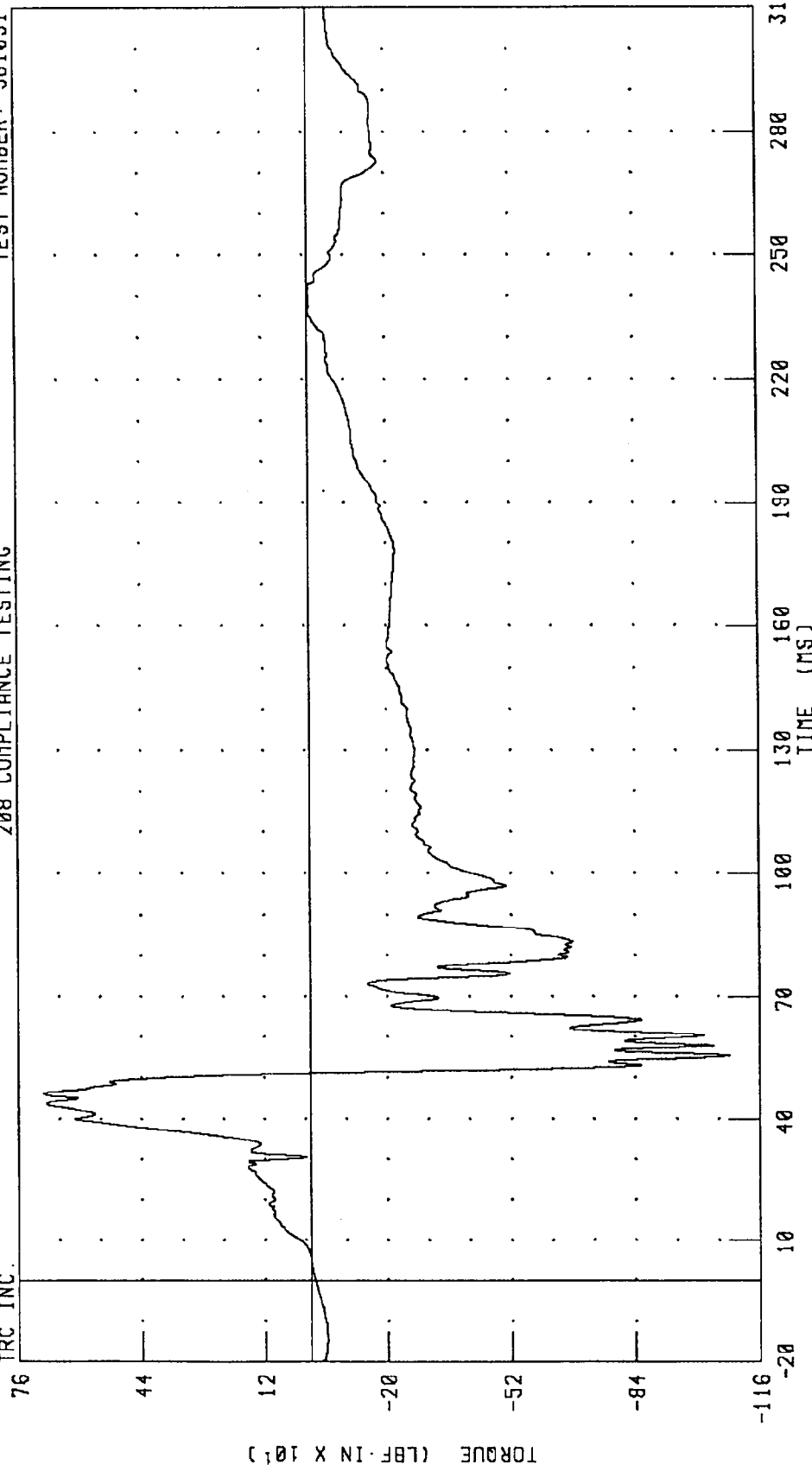
CHANNEL: TBLXM1 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



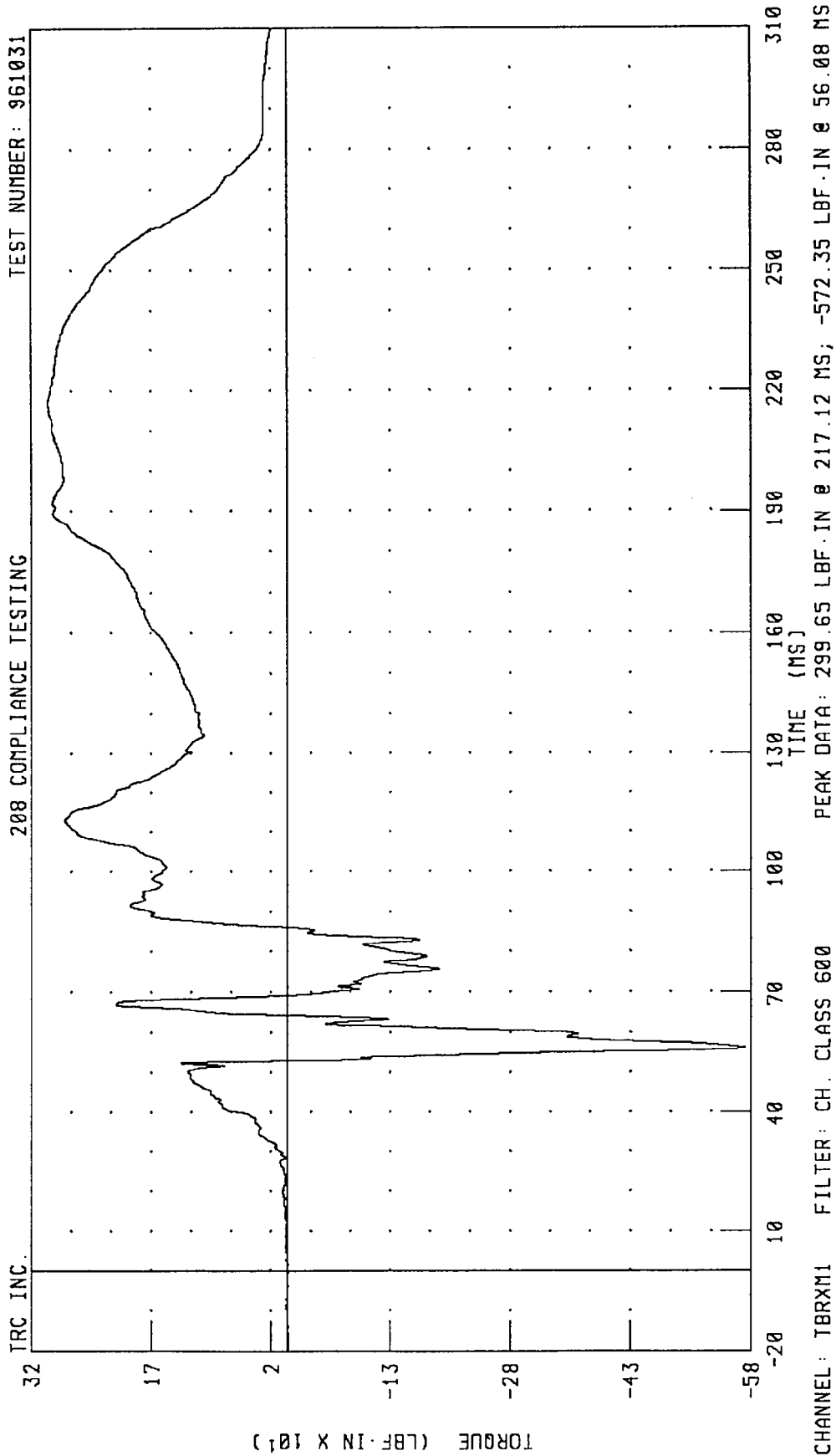
PEAK DATA: 694.41 LBF-IN @ 46.24 MS; -1083.12 LBF-IN @ 55.36 MS

CHANNEL: TBLYM1 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X-AXIS

208 COMPLIANCE TESTING

TEST NUMBER: 961031

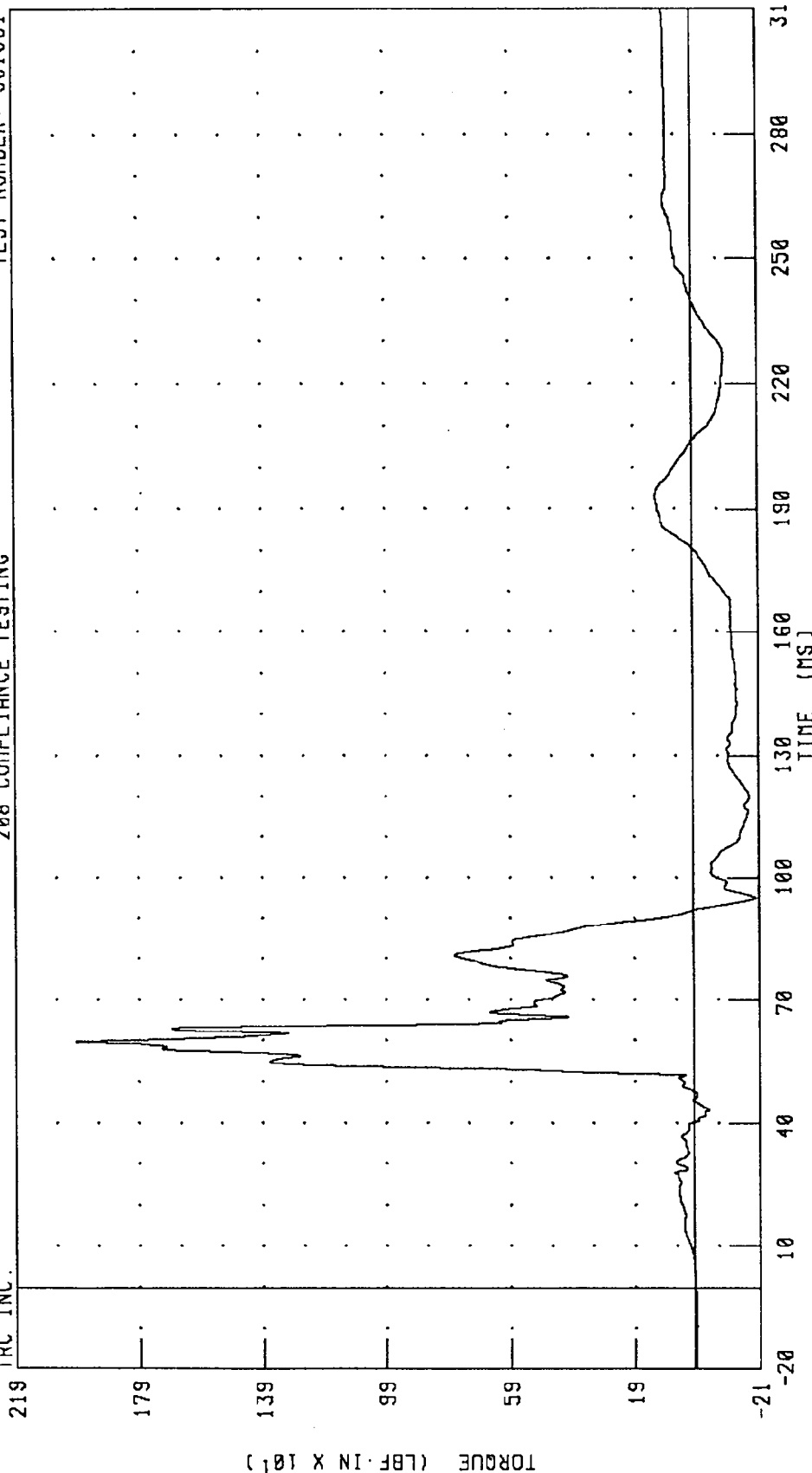


1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



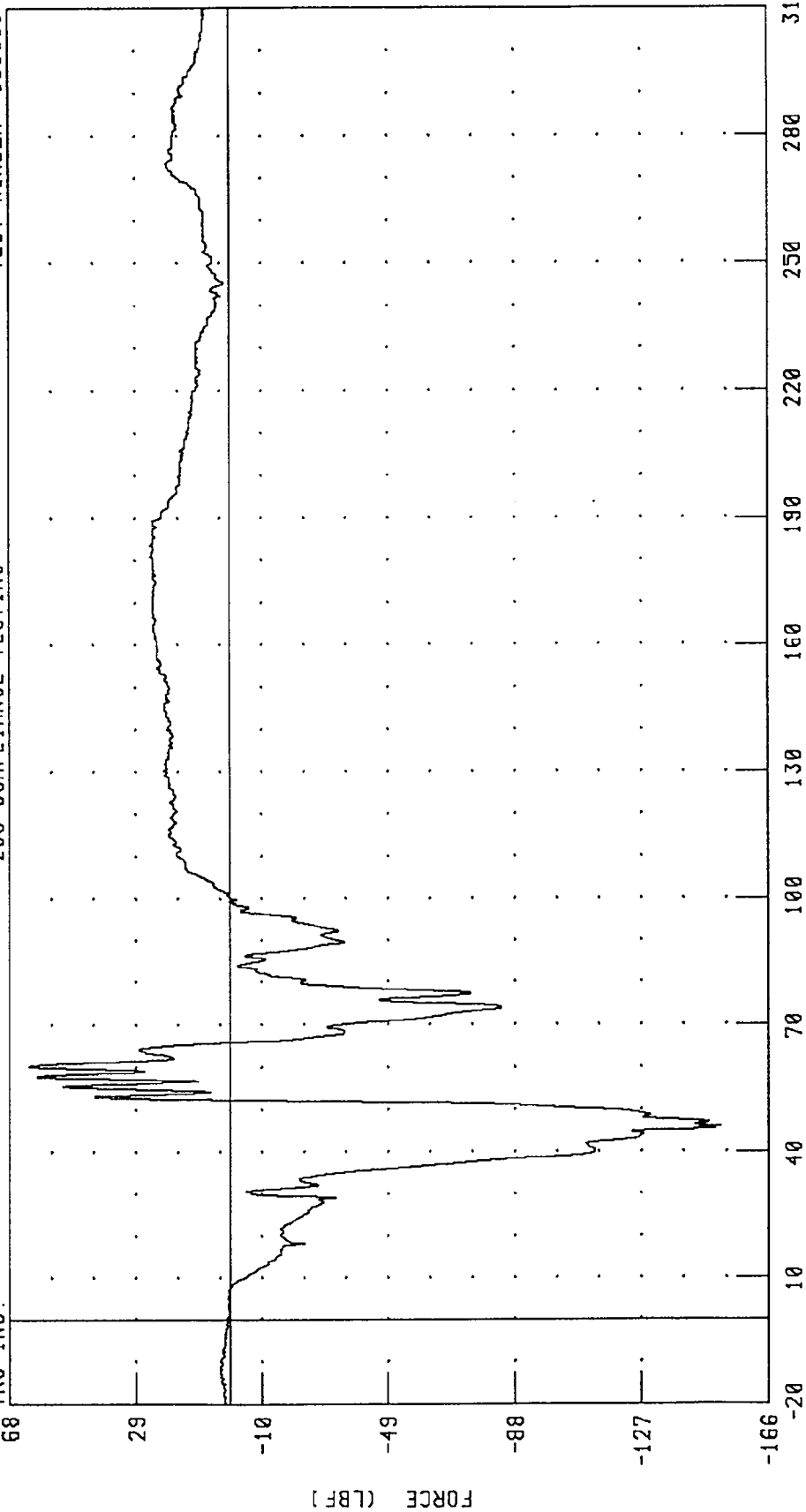
PEAK DATA: 1993.29 LBF-IN @ 59.68 MS; -198.86 LBF-IN @ 95.04 MS

CHANNEL: TBRYM1 FILTER: CH. CLASS 600

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

TEST NUMBER: 961031

TRC INC.

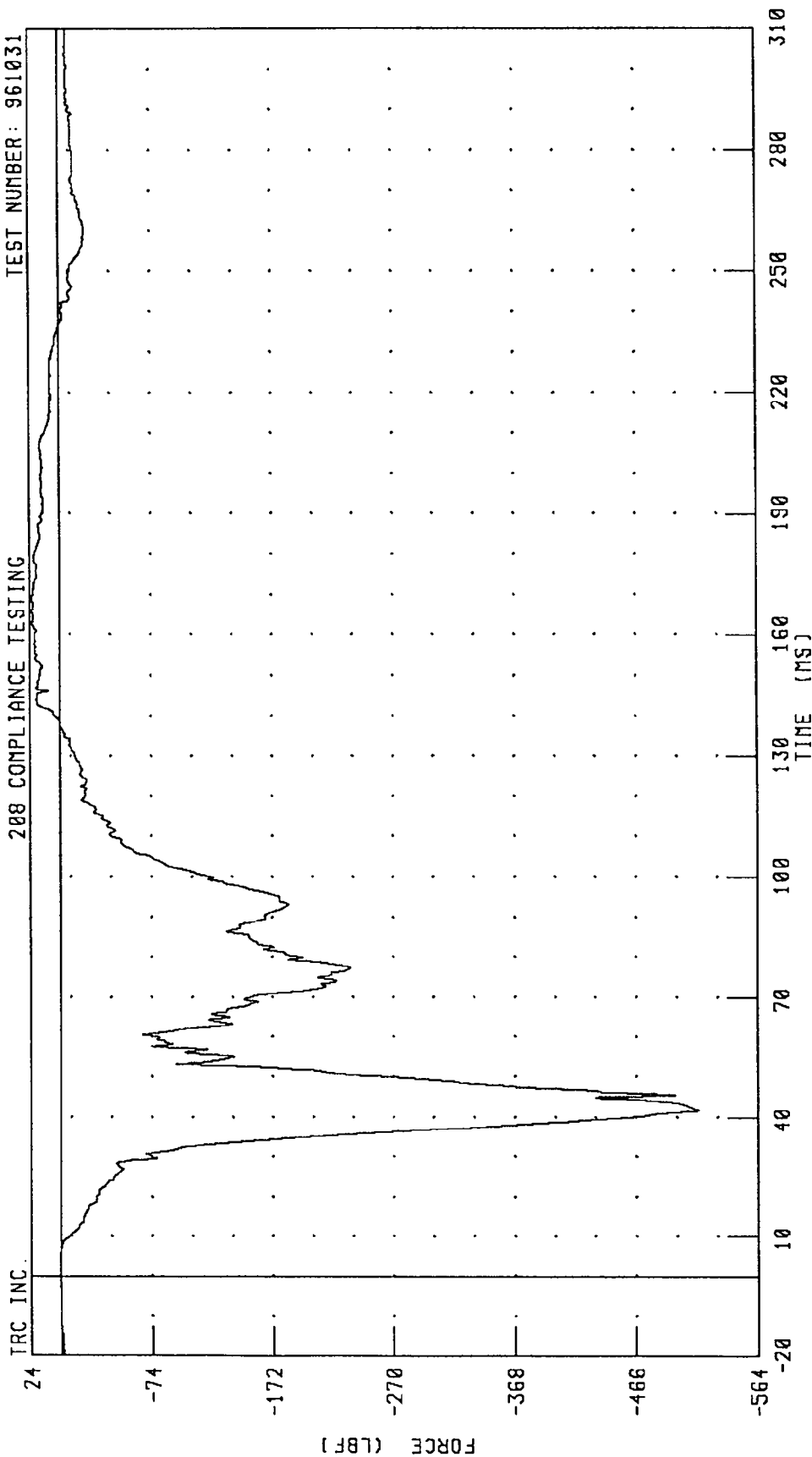


PEAK DATA: 61.83 LBF @ 60.40 MS; -151.45 LBF @ 16.00 MS

CHANNEL: ANLXF1 FILTER: CH. CLASS 600

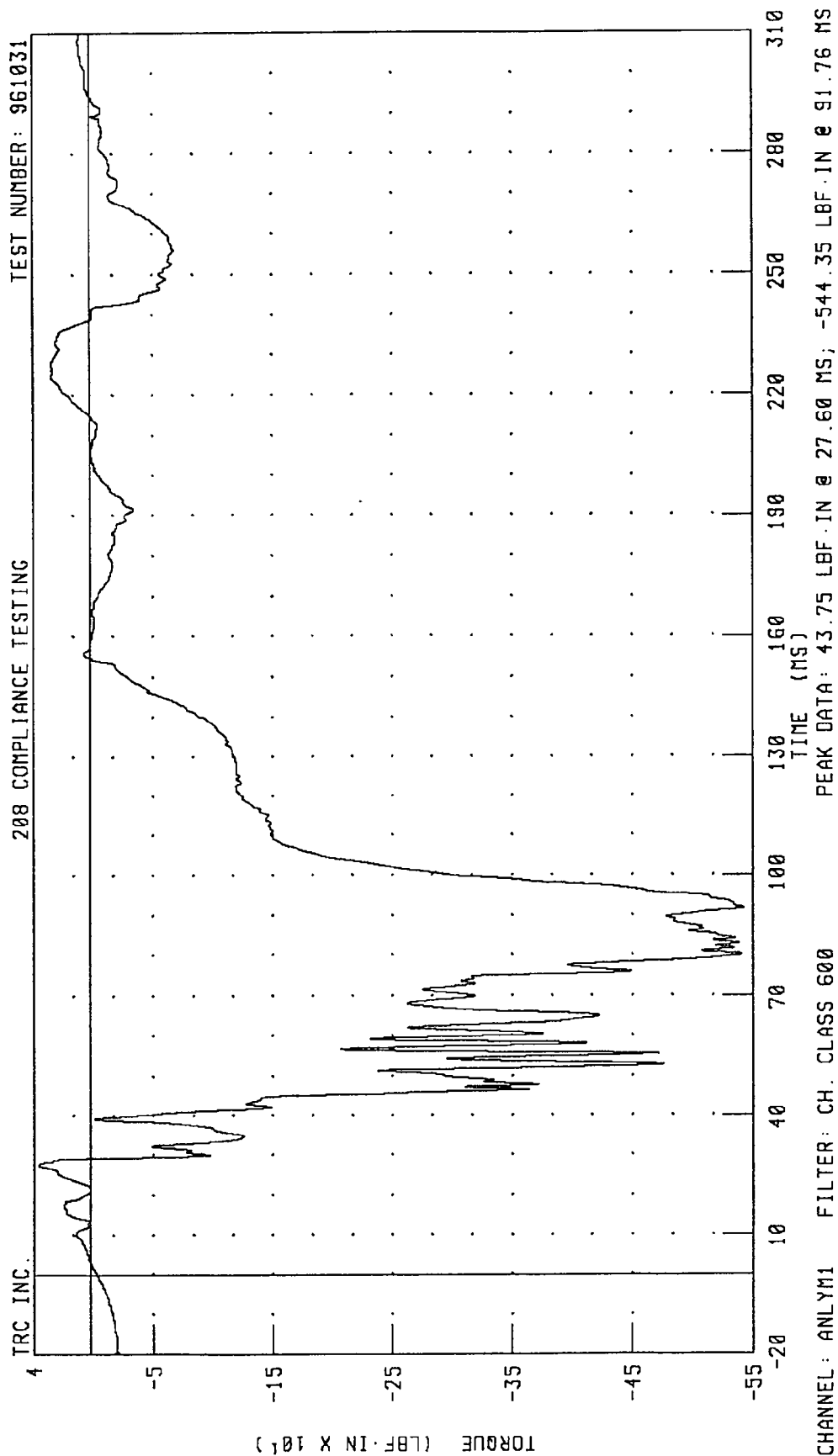
1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 DRIVER LEFT LOWER TIBIA Z-AXIS FORCE
 208 COMPLIANCE TESTING

TEST NUMBER: 961031



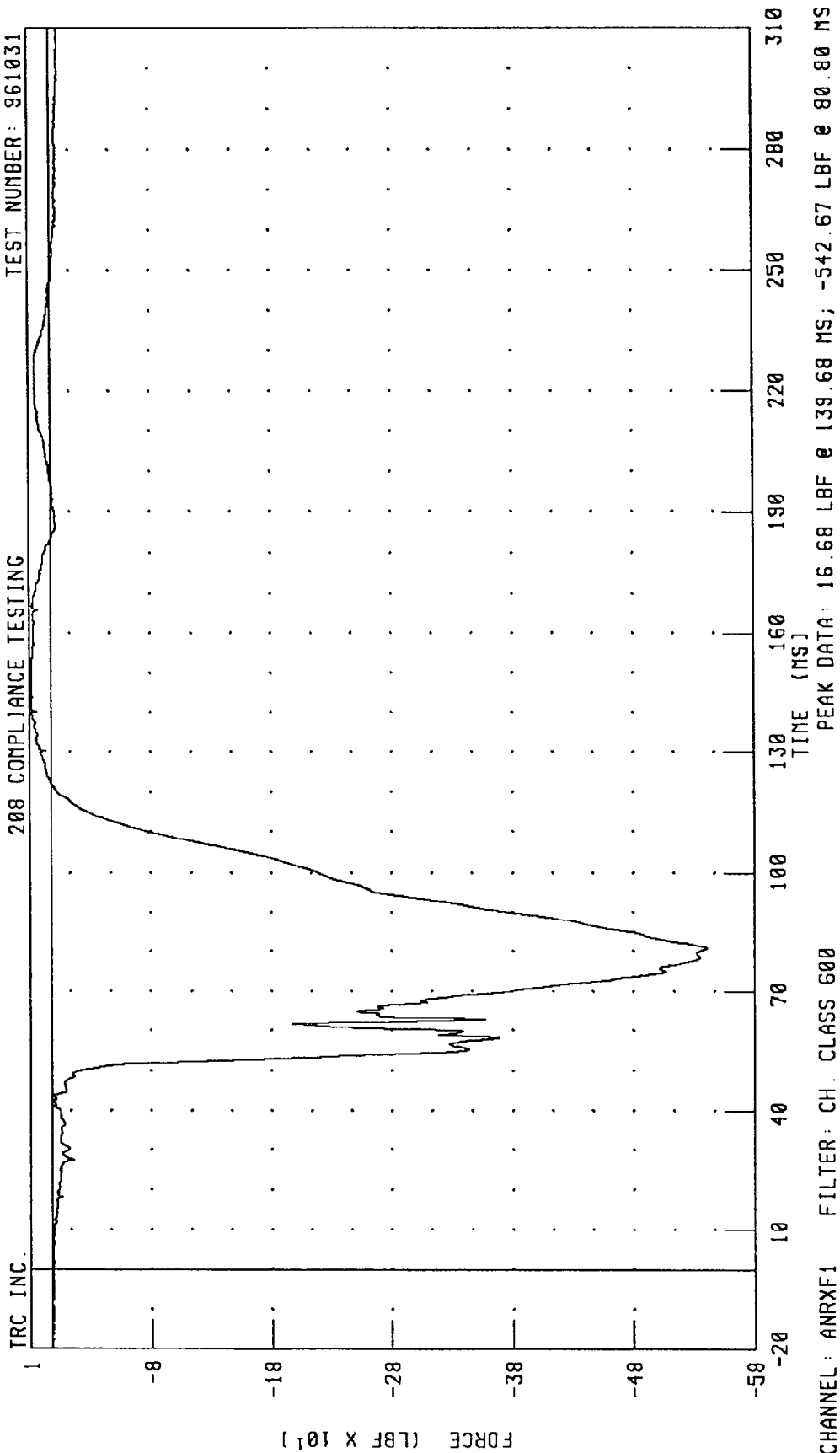
CHANNEL: ANLZF1 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y-AXIS



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

TEST NUMBER: 961031

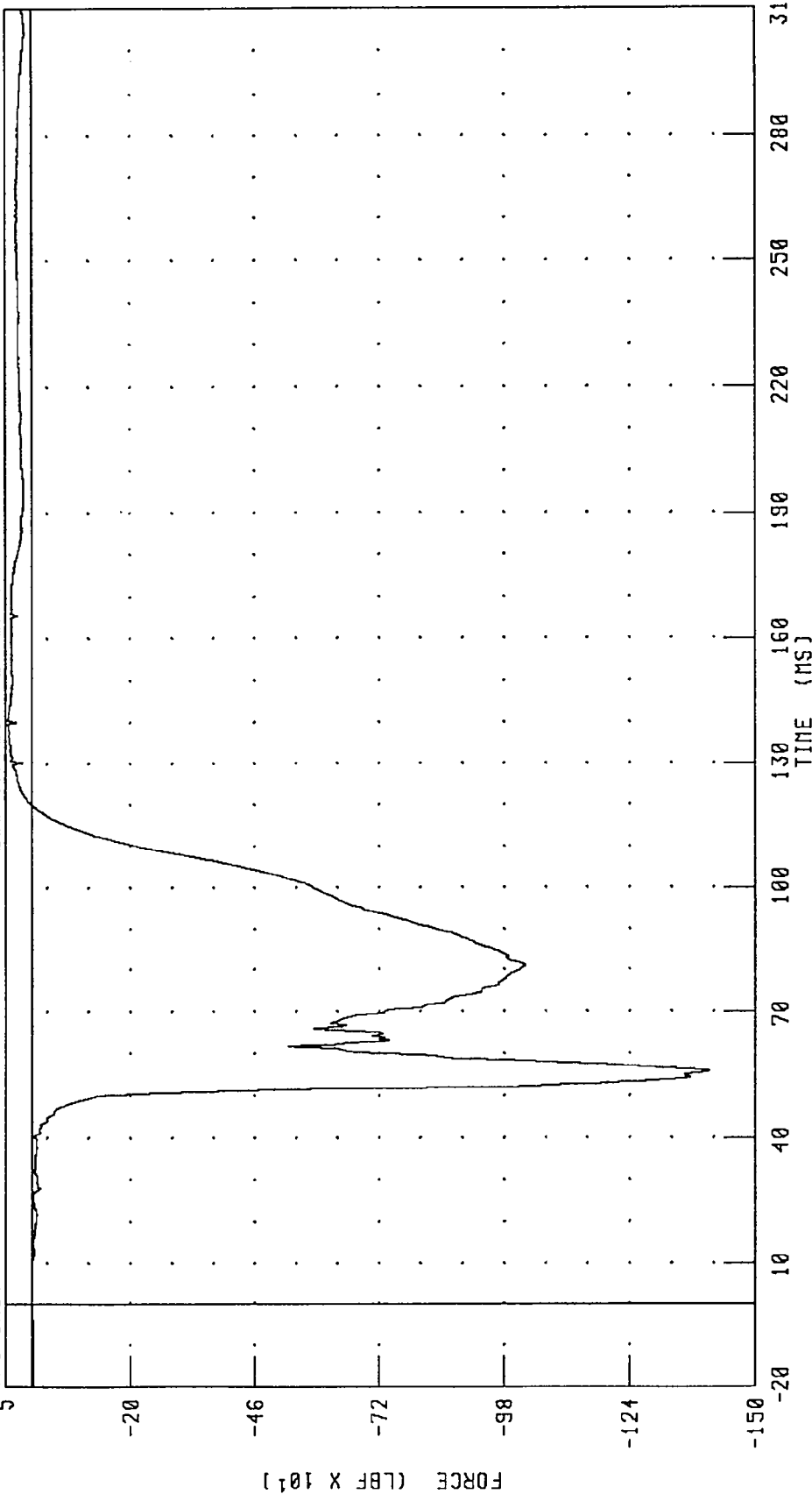


1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



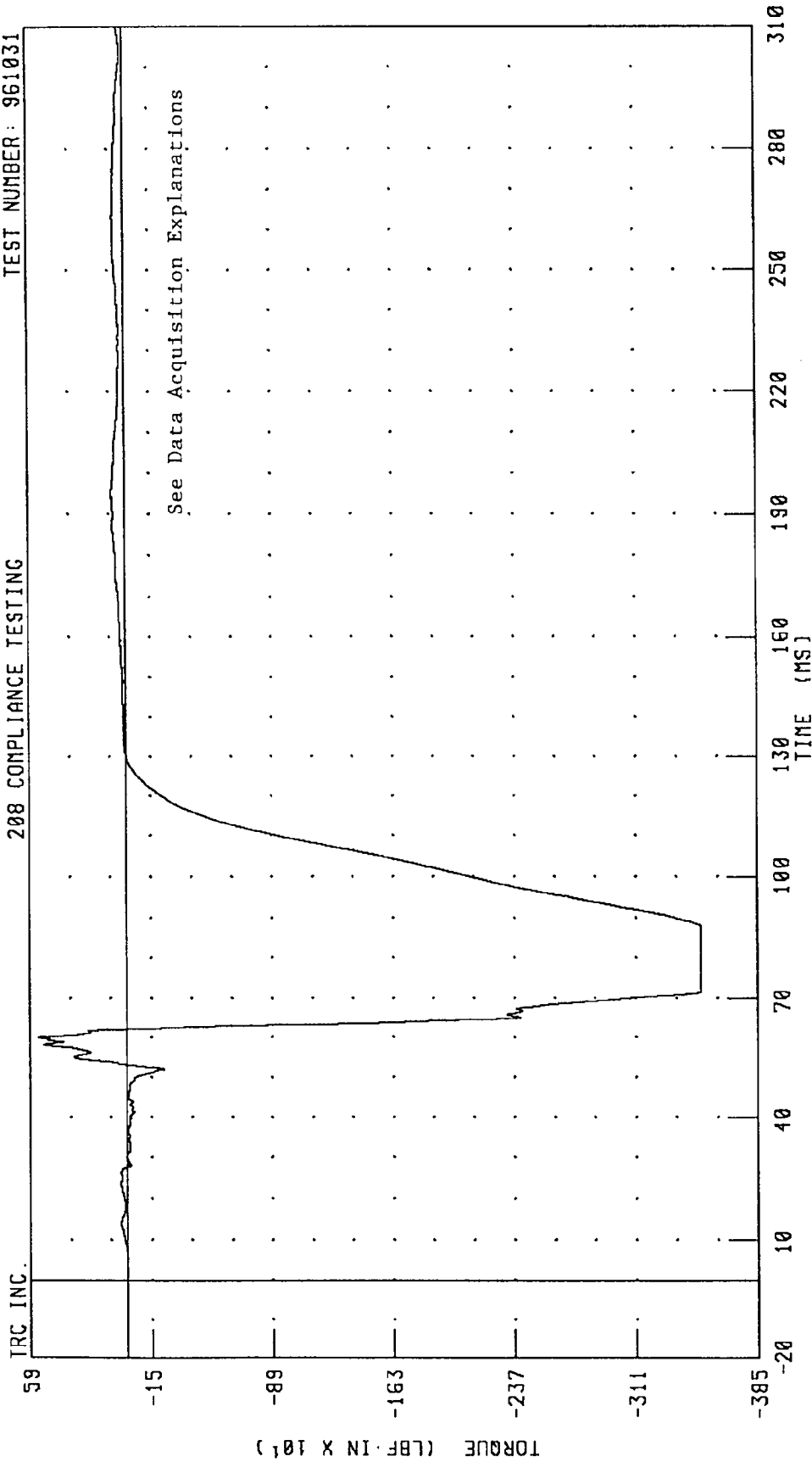
PEAK DATA: 51.23 LBF @ 140.72 MS; -1408.82 LBF @ 55.68 MS

CHANNEL: ANRZF1 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y-AXIS

208 COMPLIANCE TESTING

TEST NUMBER: 961031

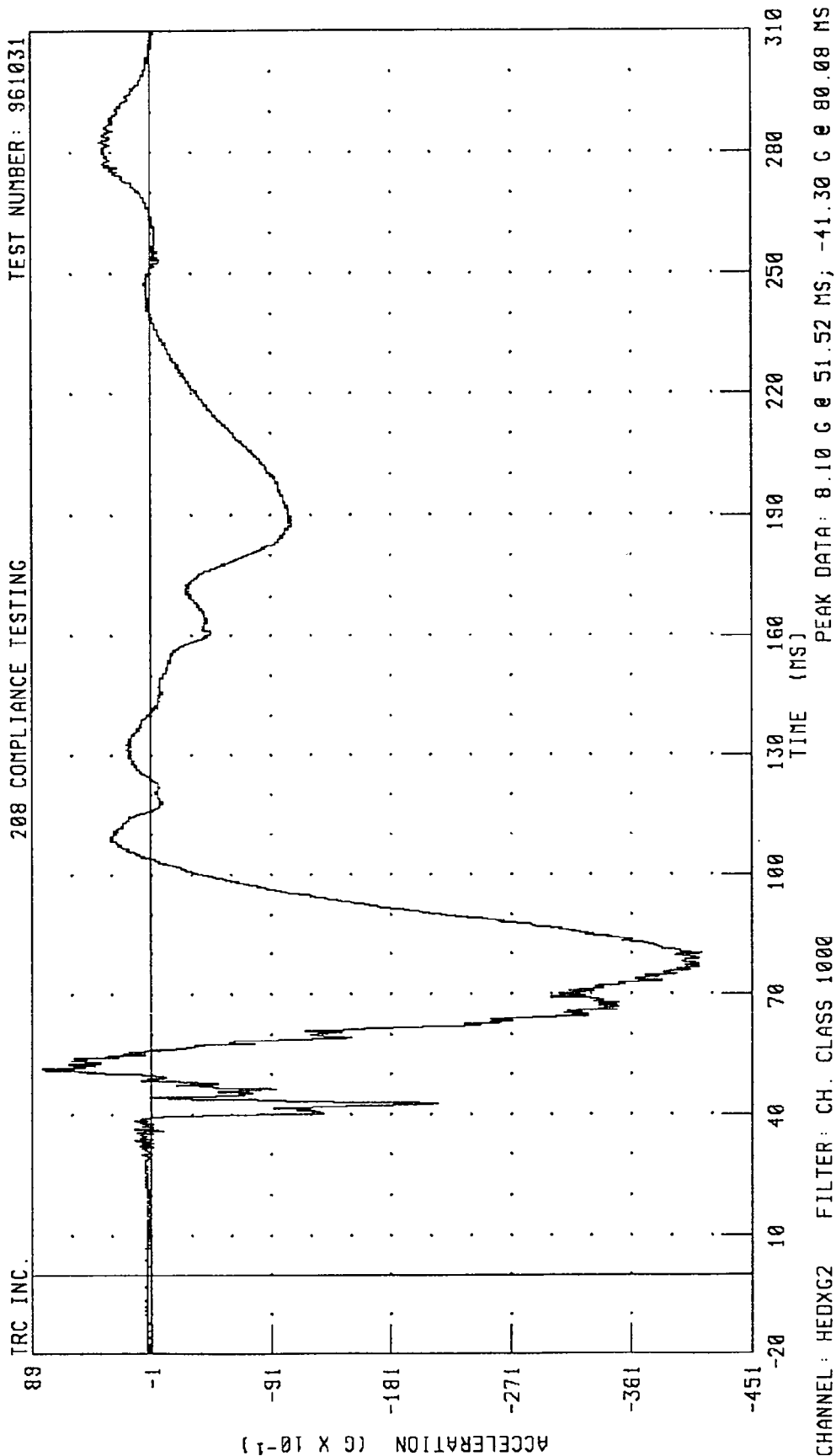


CHANNEL: ANYM1 FILTER: CH. CLASS 600 PEAK DATA: 539.85 LBF-IN @ 60.08 MS; -3506.44 LBF-IN @ 71.68 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

208 COMPLIANCE TESTING

TEST NUMBER: 961031

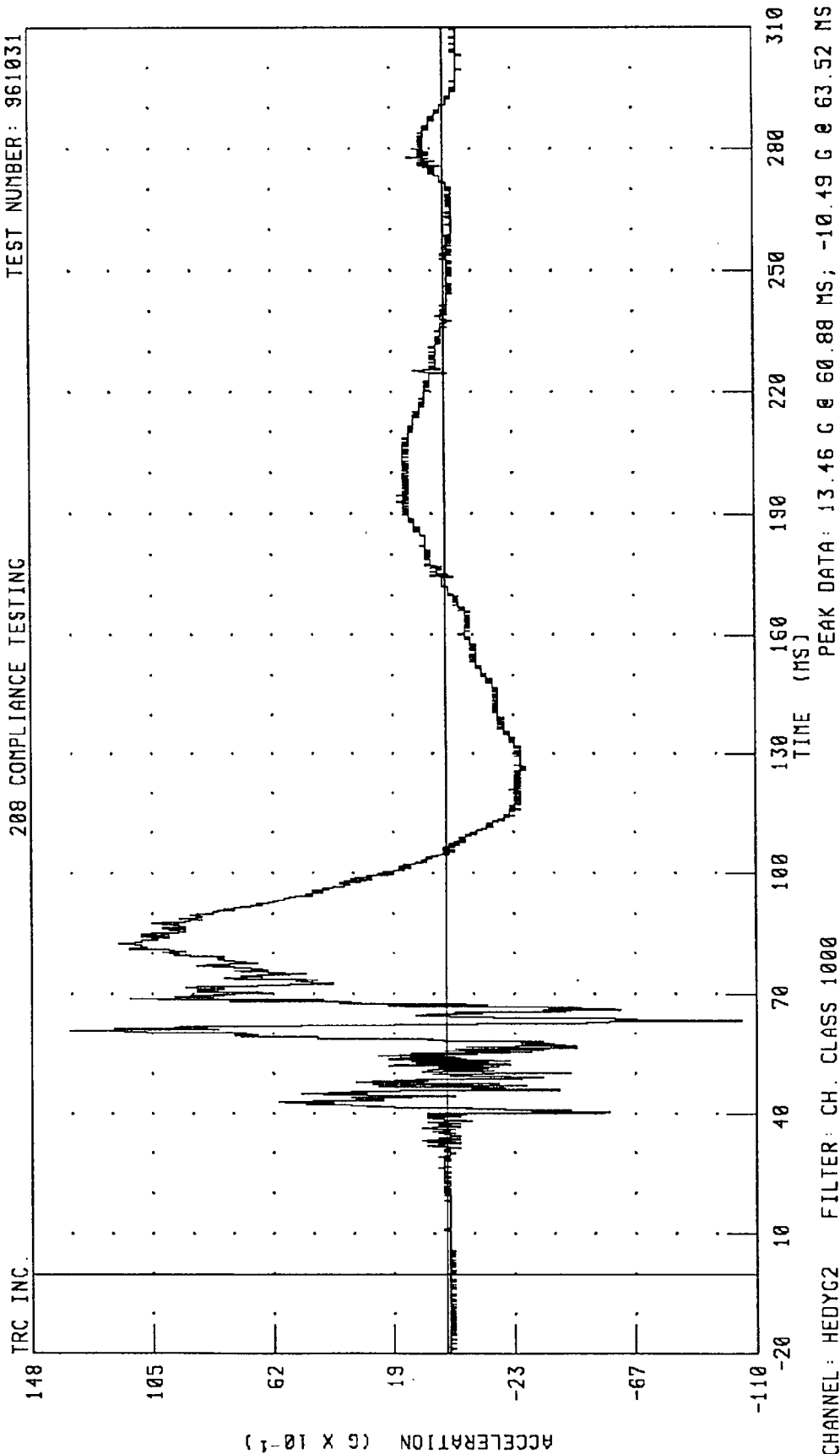


PEAK DATA: 8.10 G @ 51.52 MS; -41.30 G @ 80.08 MS

CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

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

TEST NUMBER: 961031

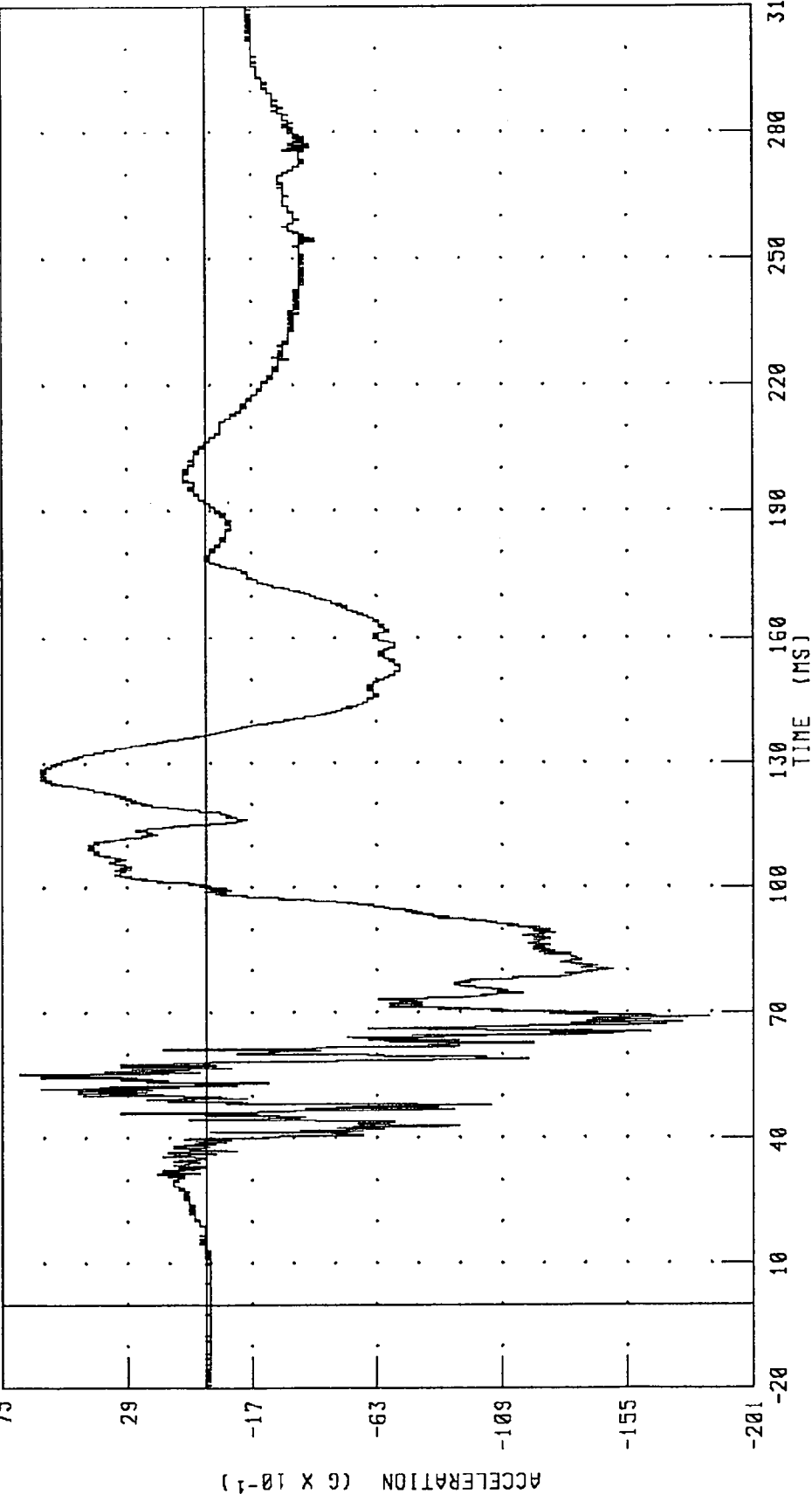


1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

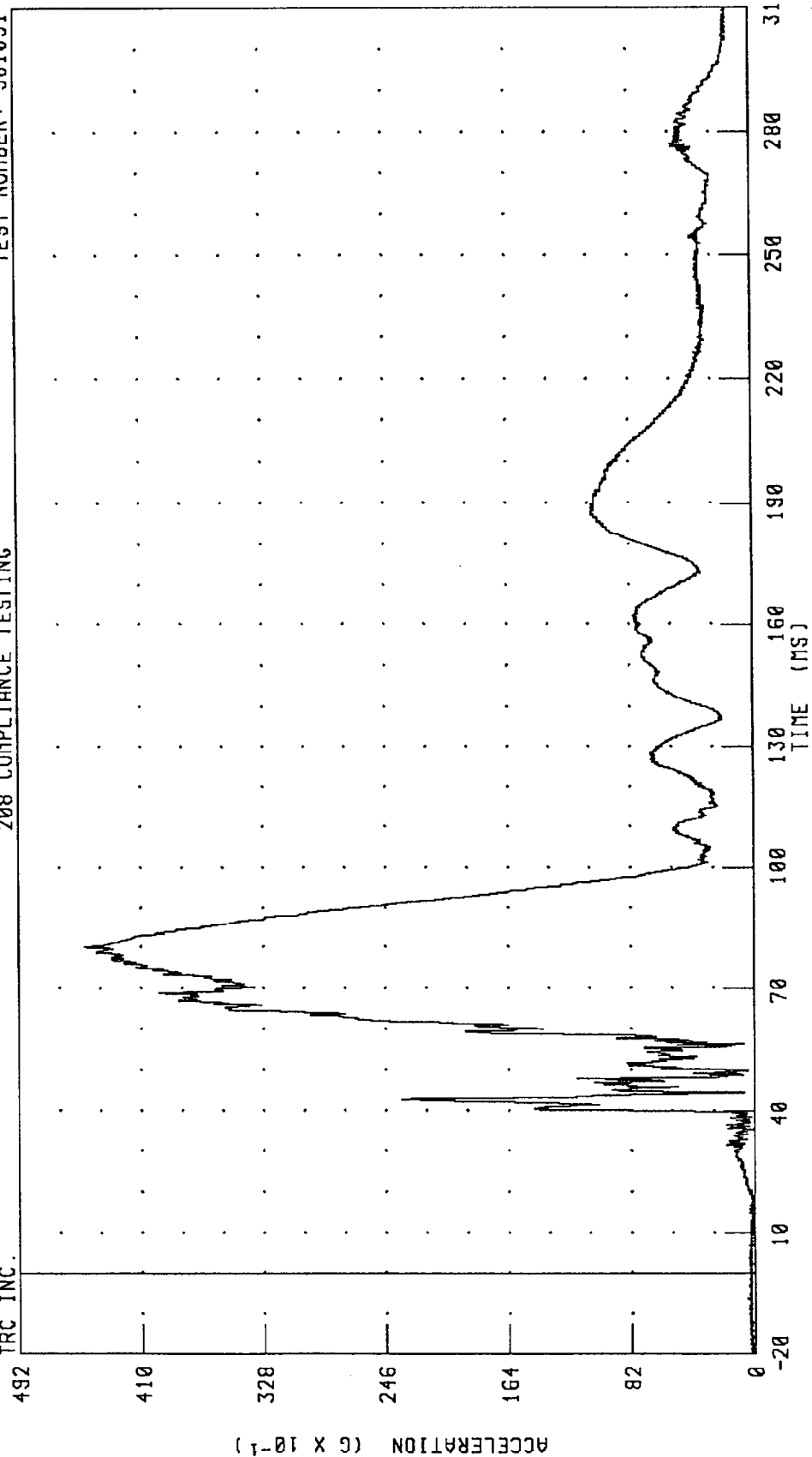
PEAK DATA: 6.88 G @ 55.36 MS; -18.50 G @ 68.88 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.



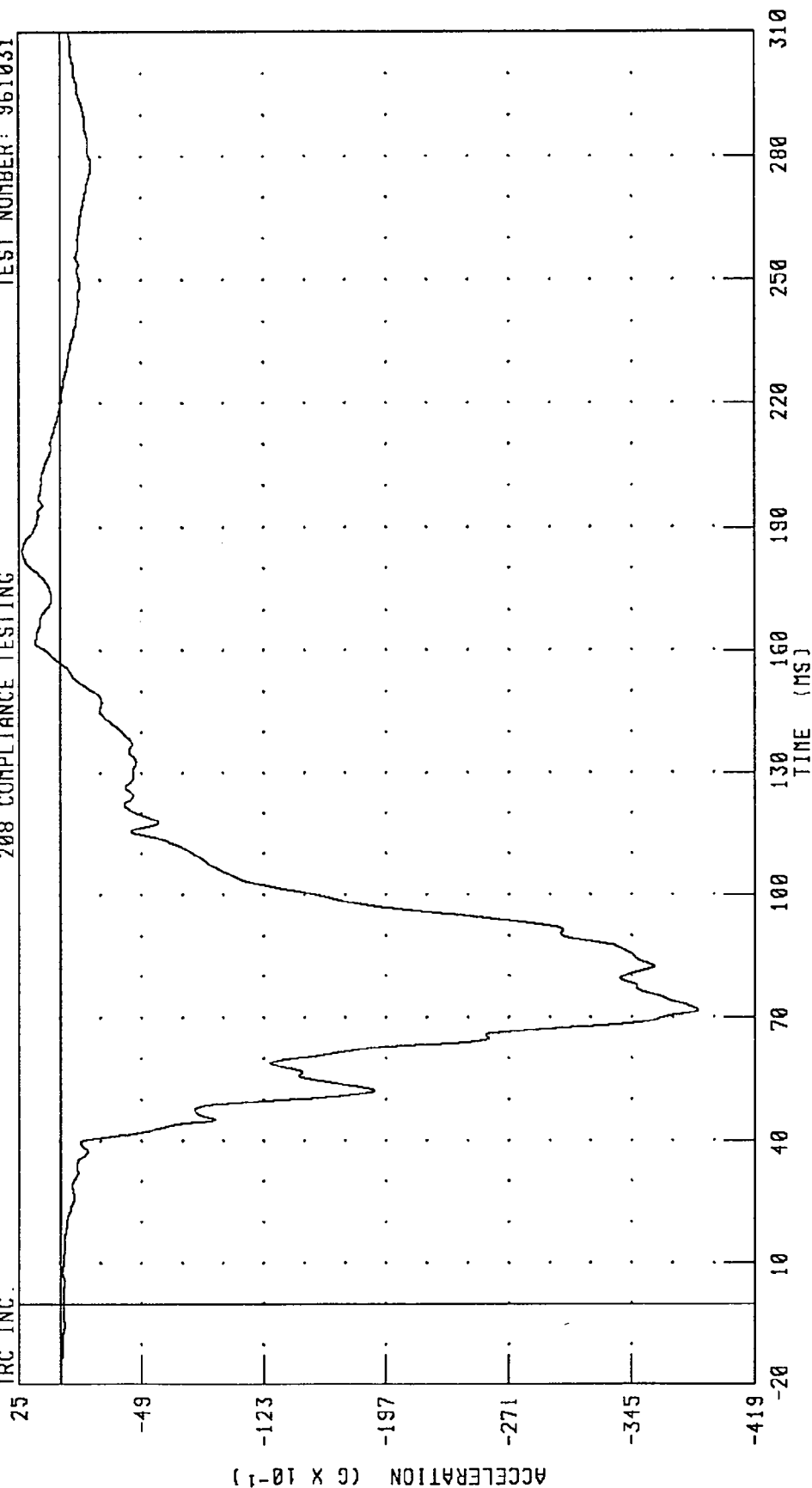
CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

PEAK DATA: 44.83 G @ 80.08 MS; 0.10 G @ -20.00 MS

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

TEST NUMBER: 961031

TRC INC.

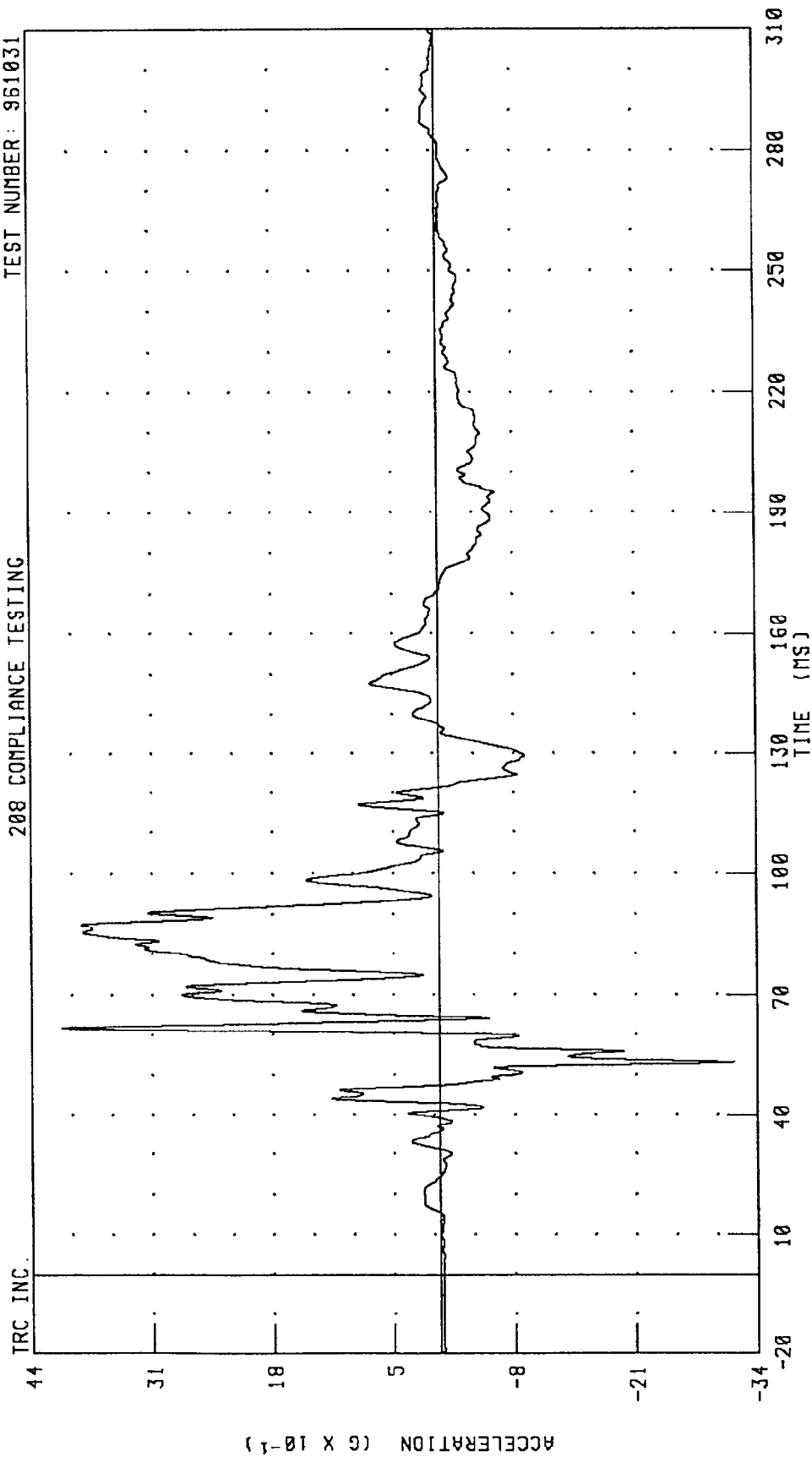


PEAK DATA: 2.28 G @ 184.24 MS; -38.52 G @ 71.76 MS

CHANNEL: CSTXG2 FILTER: CH. CLASS 180

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

TEST NUMBER: 961031

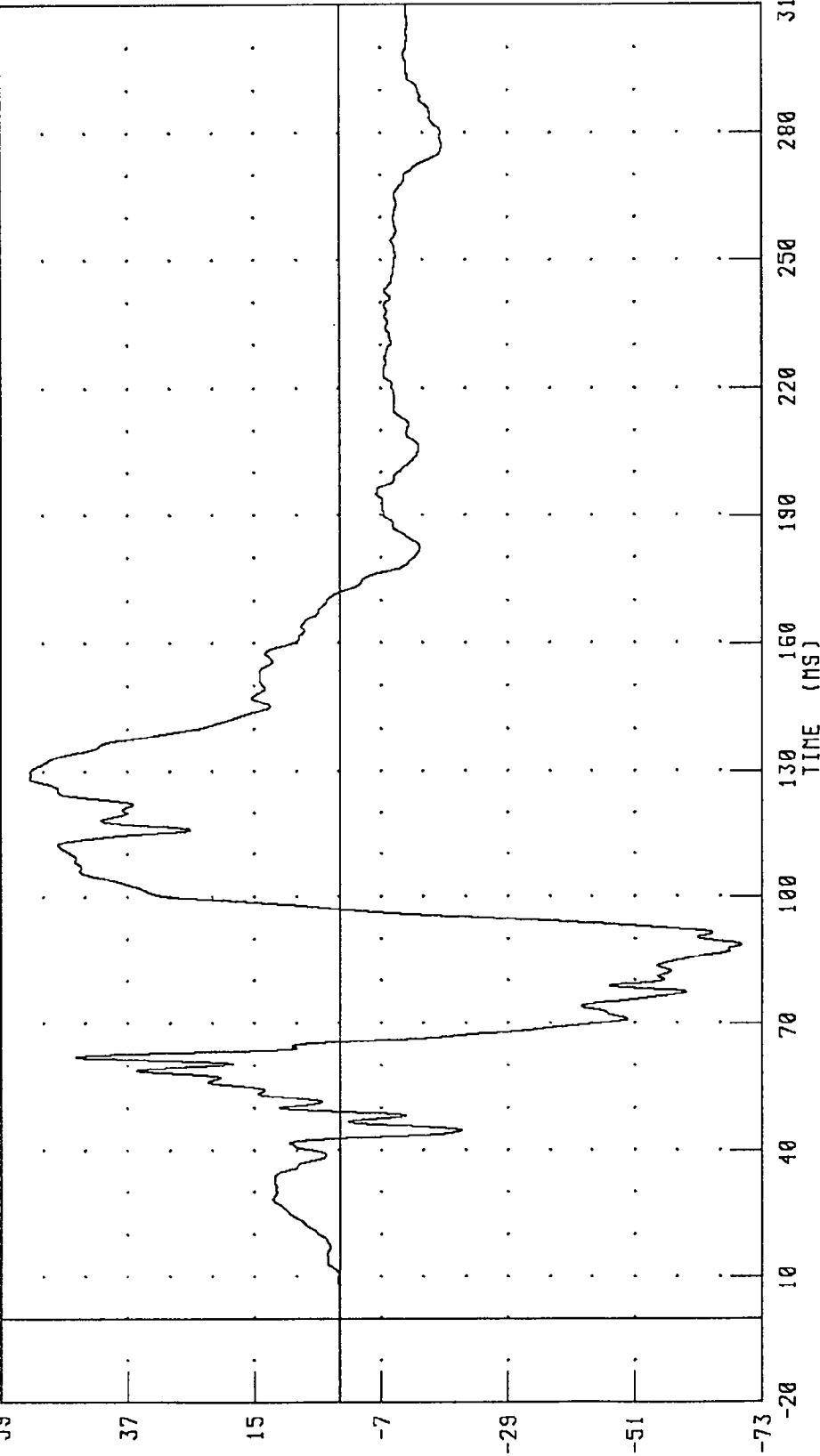


CHANNEL: CSTYG2 FILTER: CH. CLASS 180

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

TEST NUMBER: 961031

TRC INC.



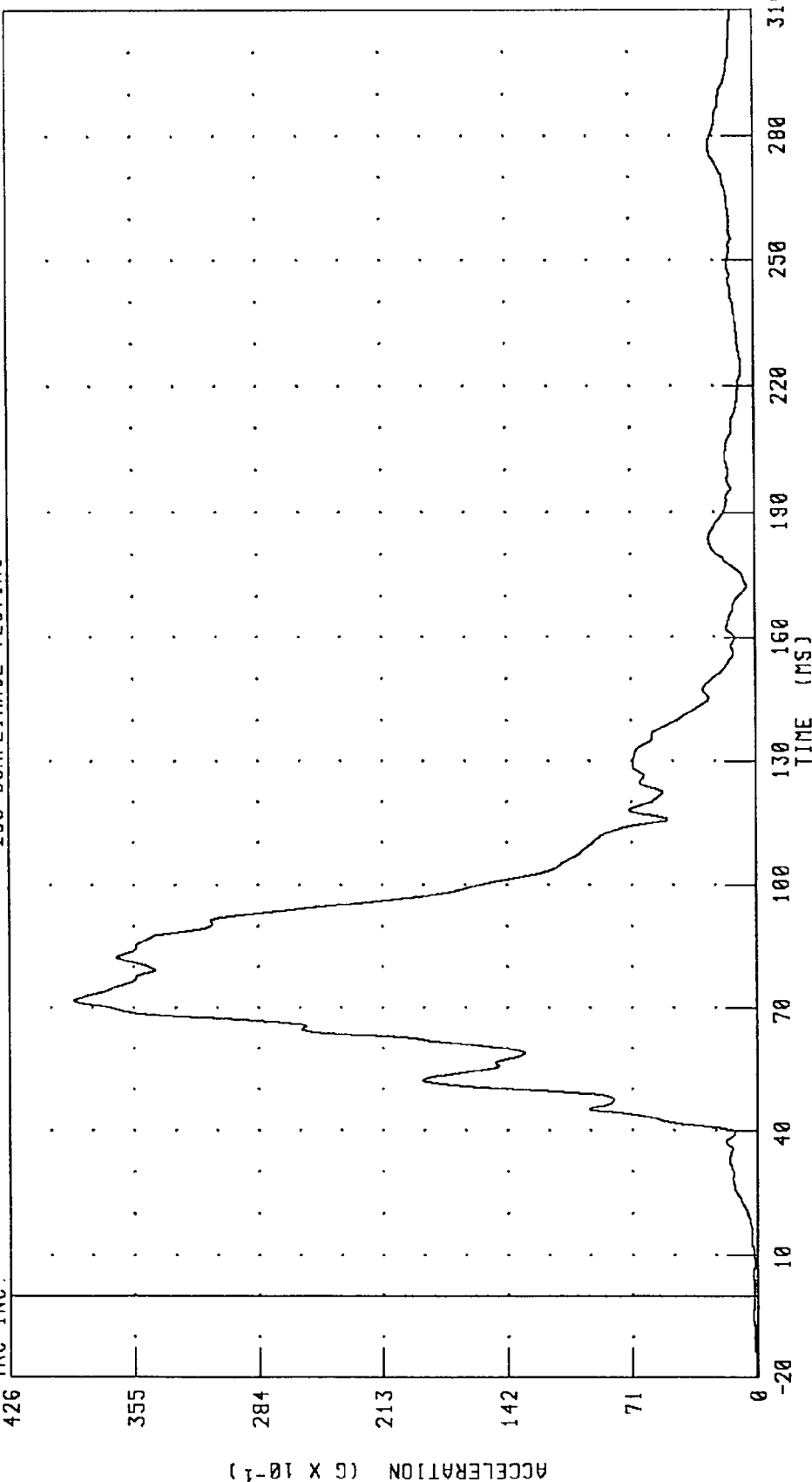
CHANNEL: CST7G2 FILTER: CH. CLASS 180

PEAK DATA: 5.40 G @ 128.48 MS; -6.93 G @ 88.64 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION
 200 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.

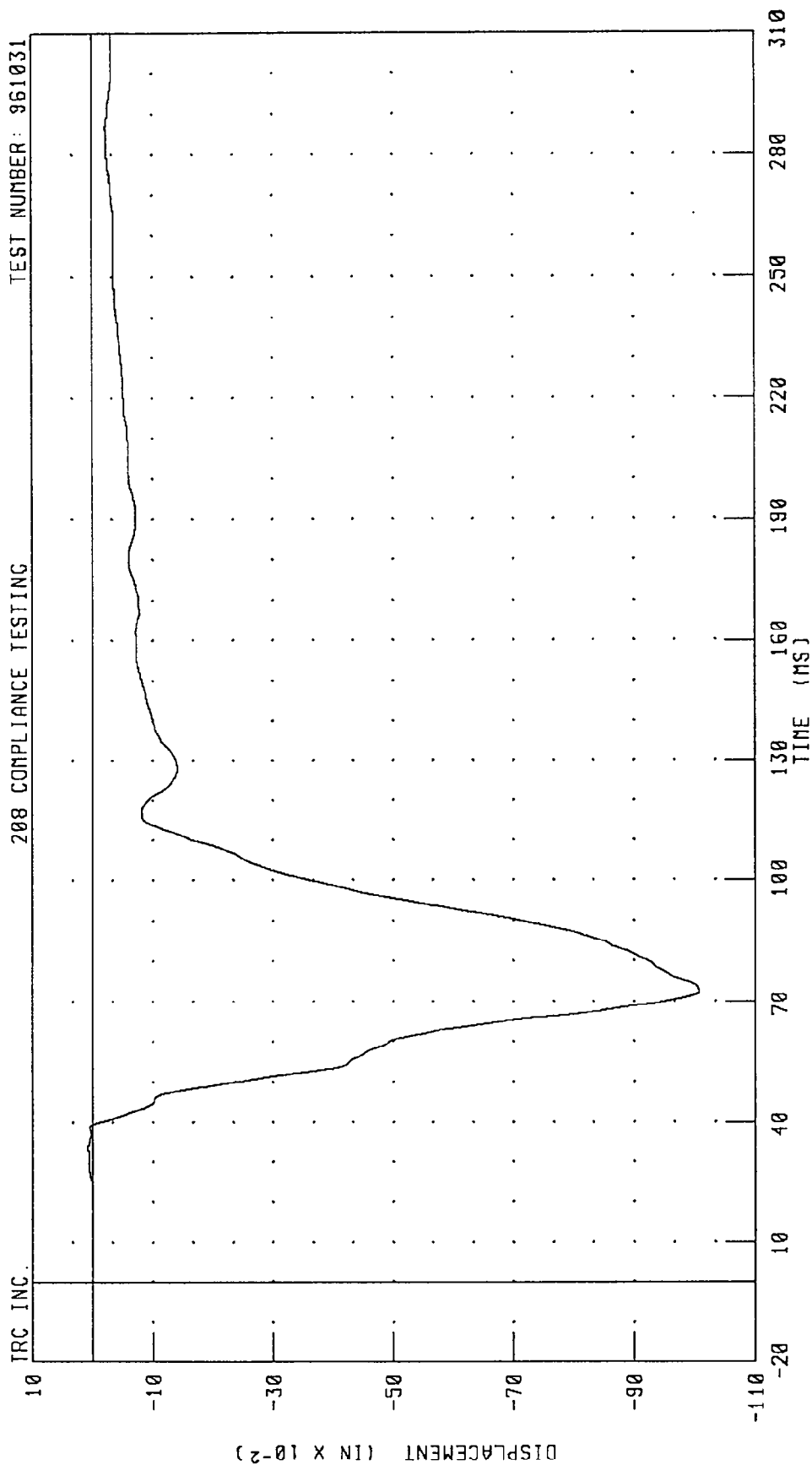


CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 38.89 G @ 71.76 MS; 0.01 G @ -20.00 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER CHEST DEFLECTION
 208 COMPLIANCE TESTING

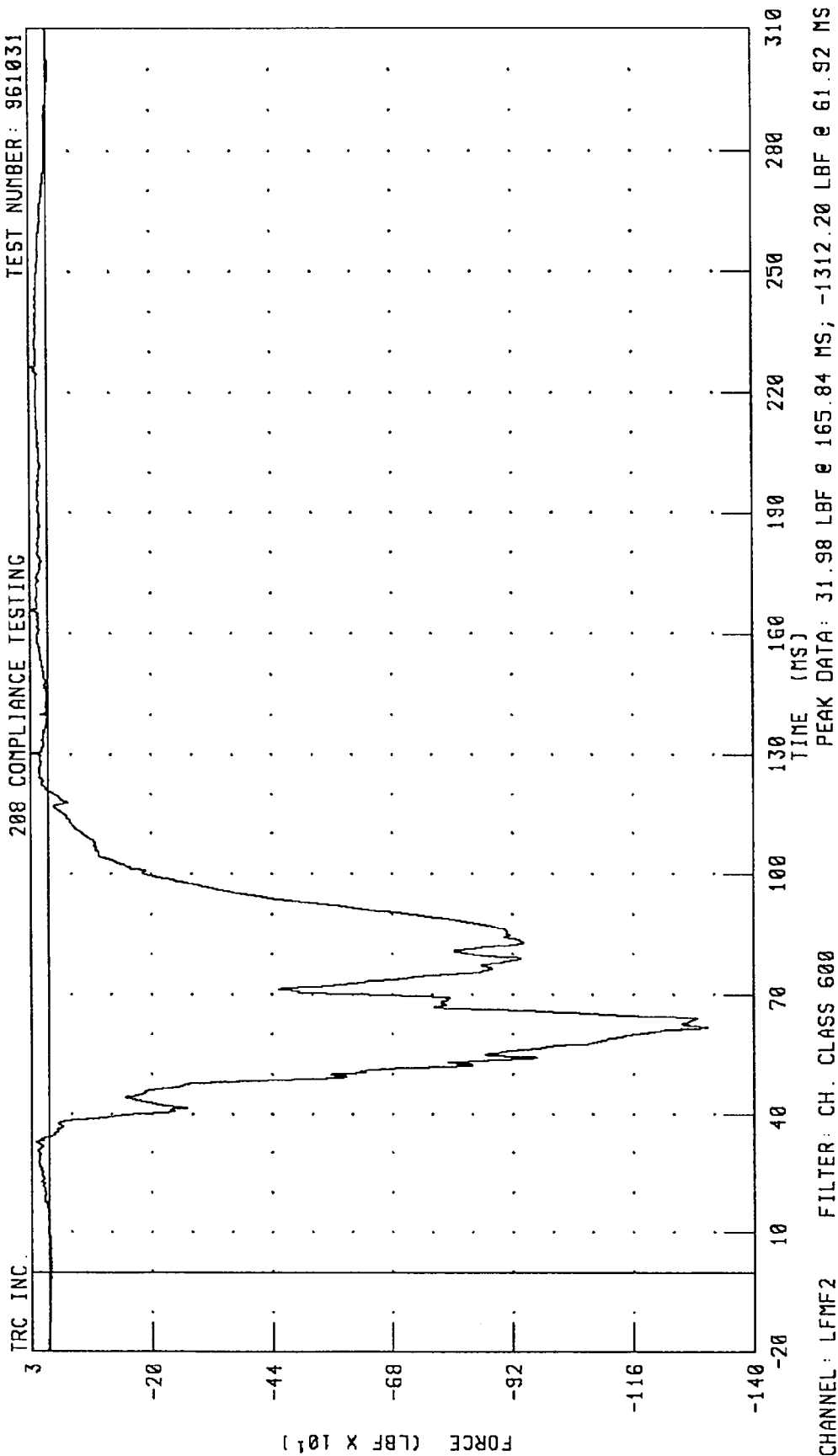
TEST NUMBER: 961031



CHANNEL: CSTX02 FILTER: CH. CLASS 180

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER LEFT FEMUR FORCE
 208 COMPLIANCE TESTING

TEST NUMBER: 961031

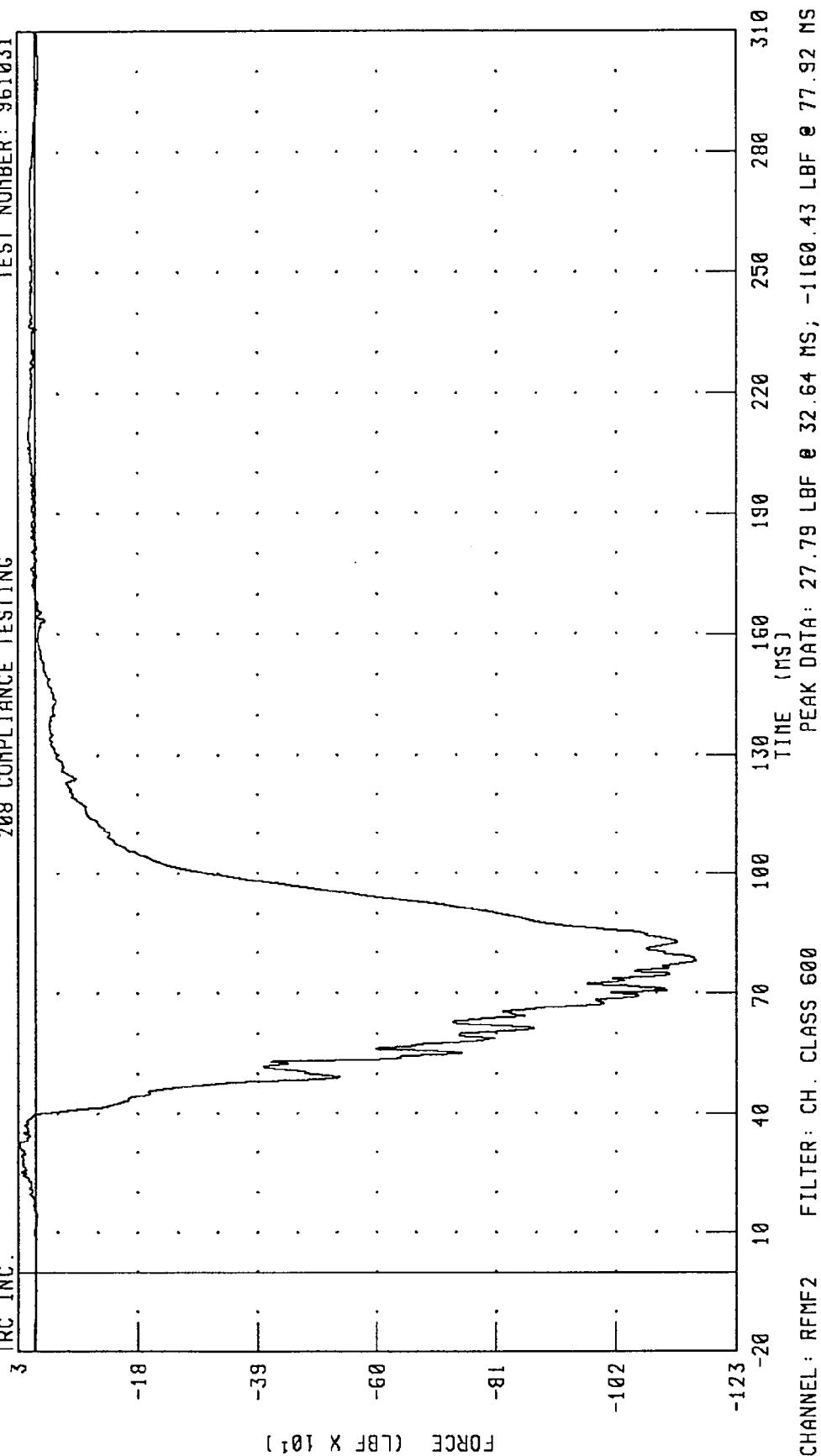


1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

208 COMPLIANCE TESTING

TEST NUMBER: 961031

TRC INC.

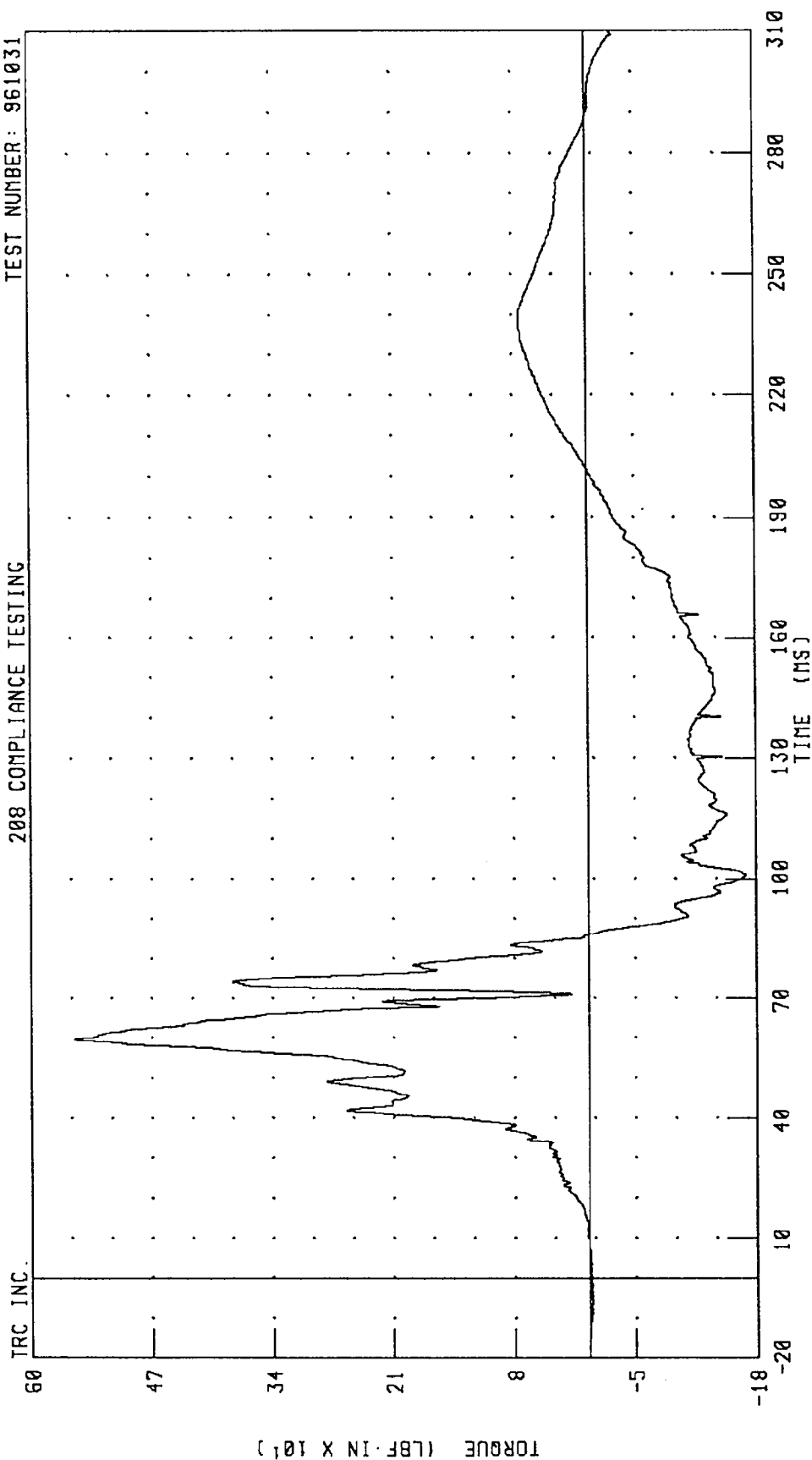


CHANNEL: RFMF2 FILTER: CH. CLASS 600

PEAK DATA: 27.79 LBF @ 32.64 MS; -1160.43 LBF @ 77.92 MS

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

TEST NUMBER: 961031



PEAK DATA: 553.11 LBF-IN @ 59.60 MS; -168.83 LBF-IN @ 100.88 MS

CHANNEL: TBLXM2 FILTER: CH. CLASS 600

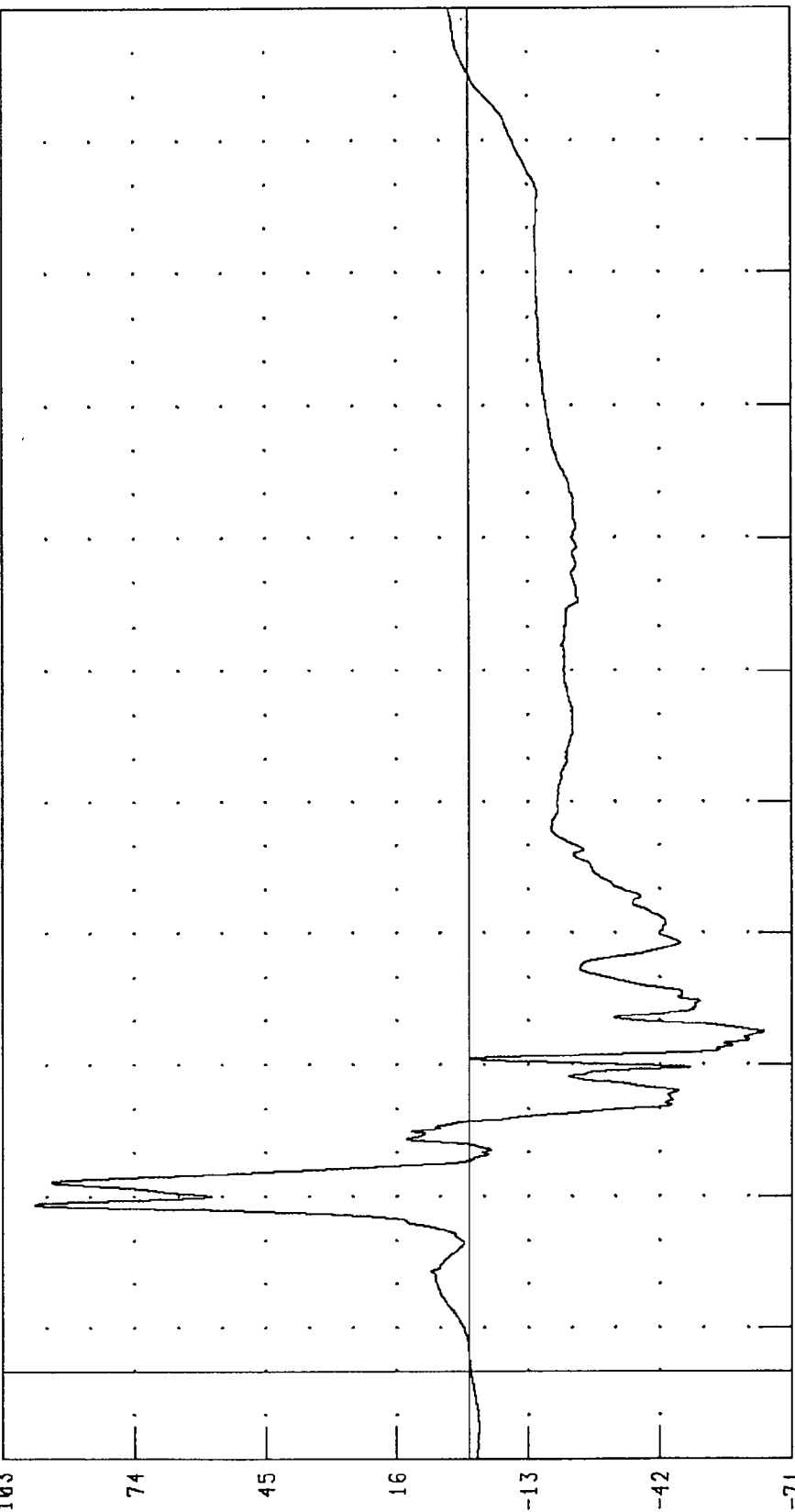
1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961031

208 COMPLIANCE TESTING

IRC INC.

103



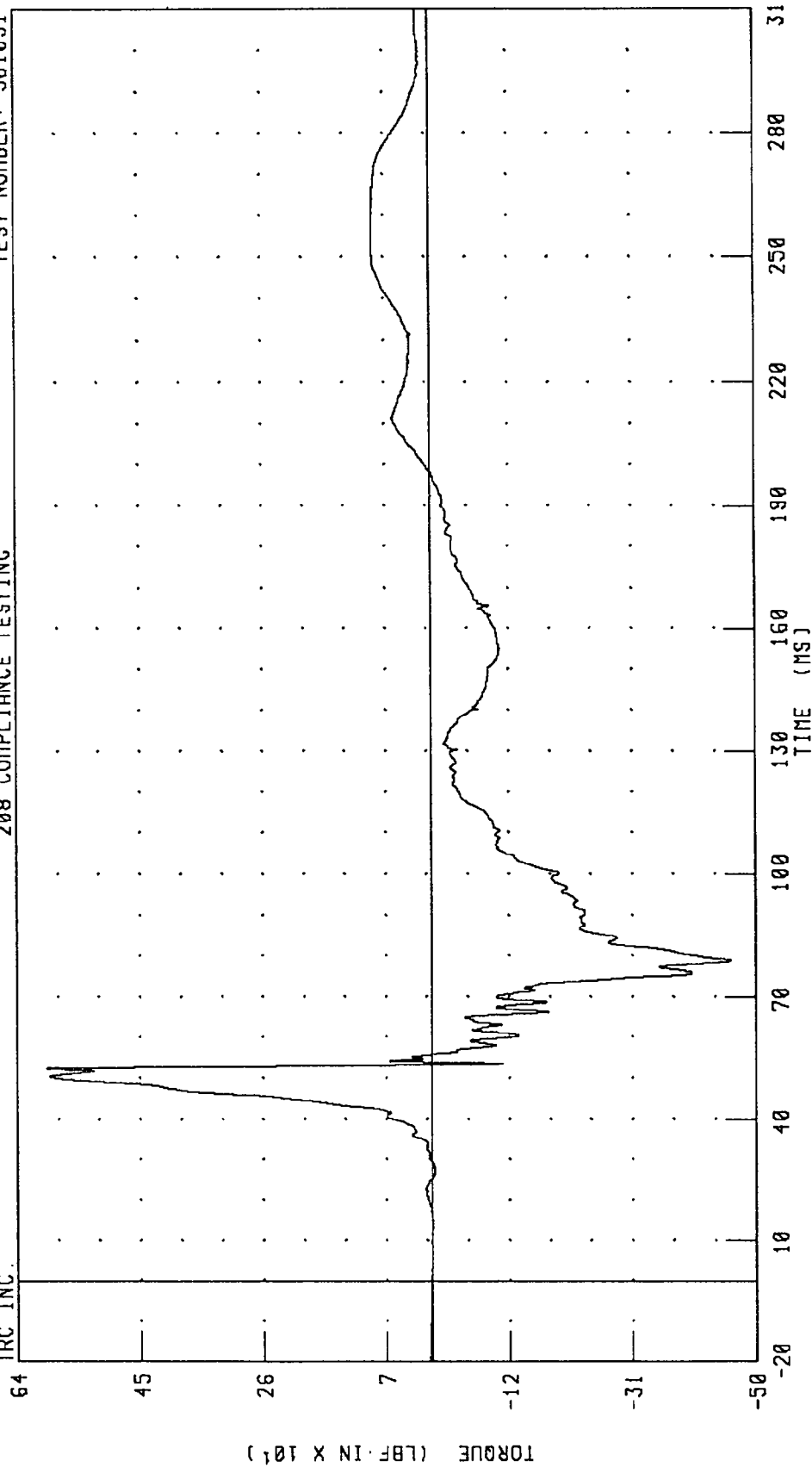
PEAK DATA: 958.70 LBF-IN @ 38.40 MS; -648.52 LBF-IN @ 77.36 MS

CHANNEL: TBLYM2 FILTER: CH. CLASS 600

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

TEST NUMBER: 961031

TRC INC.



CHANNEL: TBRXM2 FILTER: CH. CLASS 600

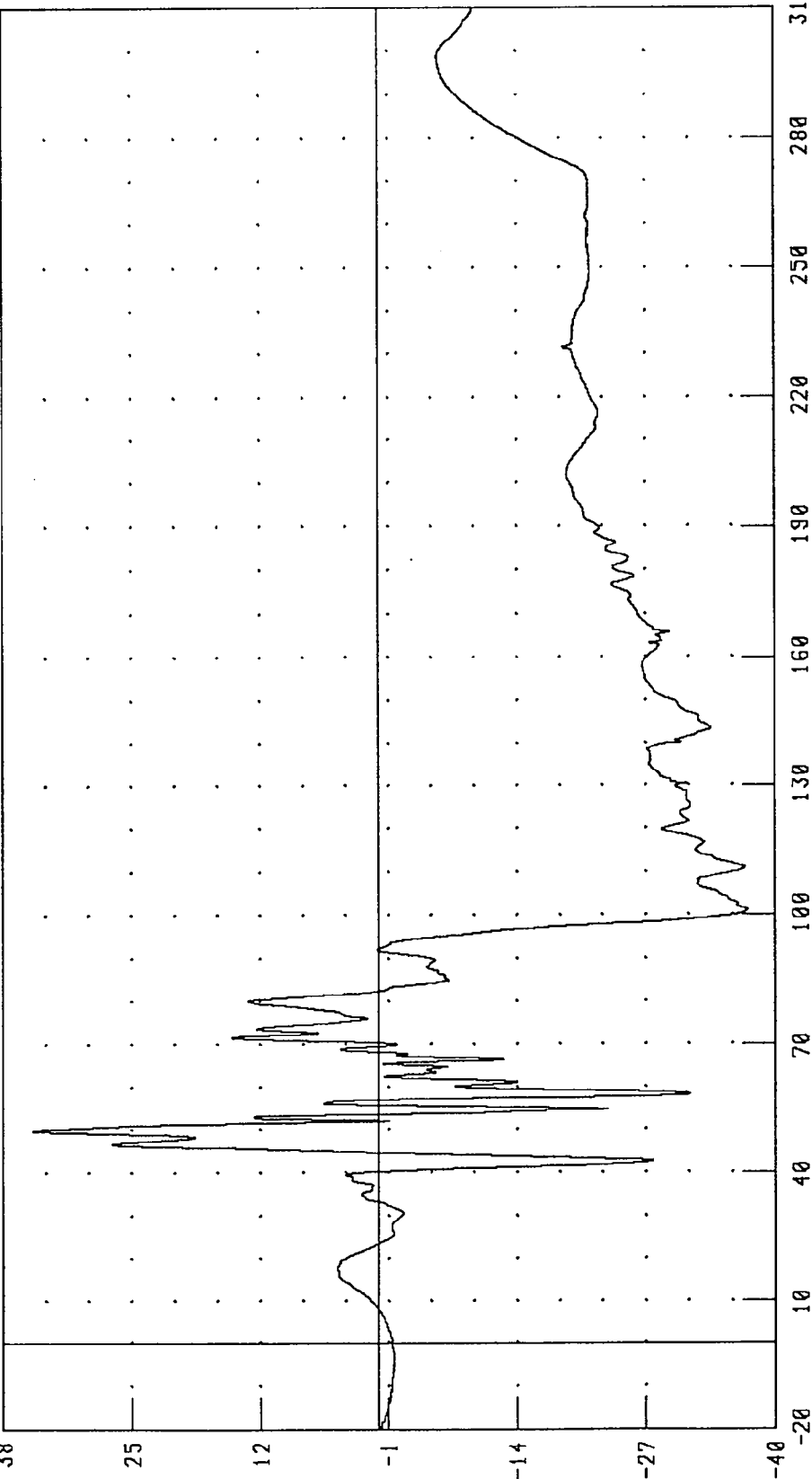
PEAK DATA: 595.32 LBF-IN @ 52.24 MS; -460.32 LBF-IN @ 78.88 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



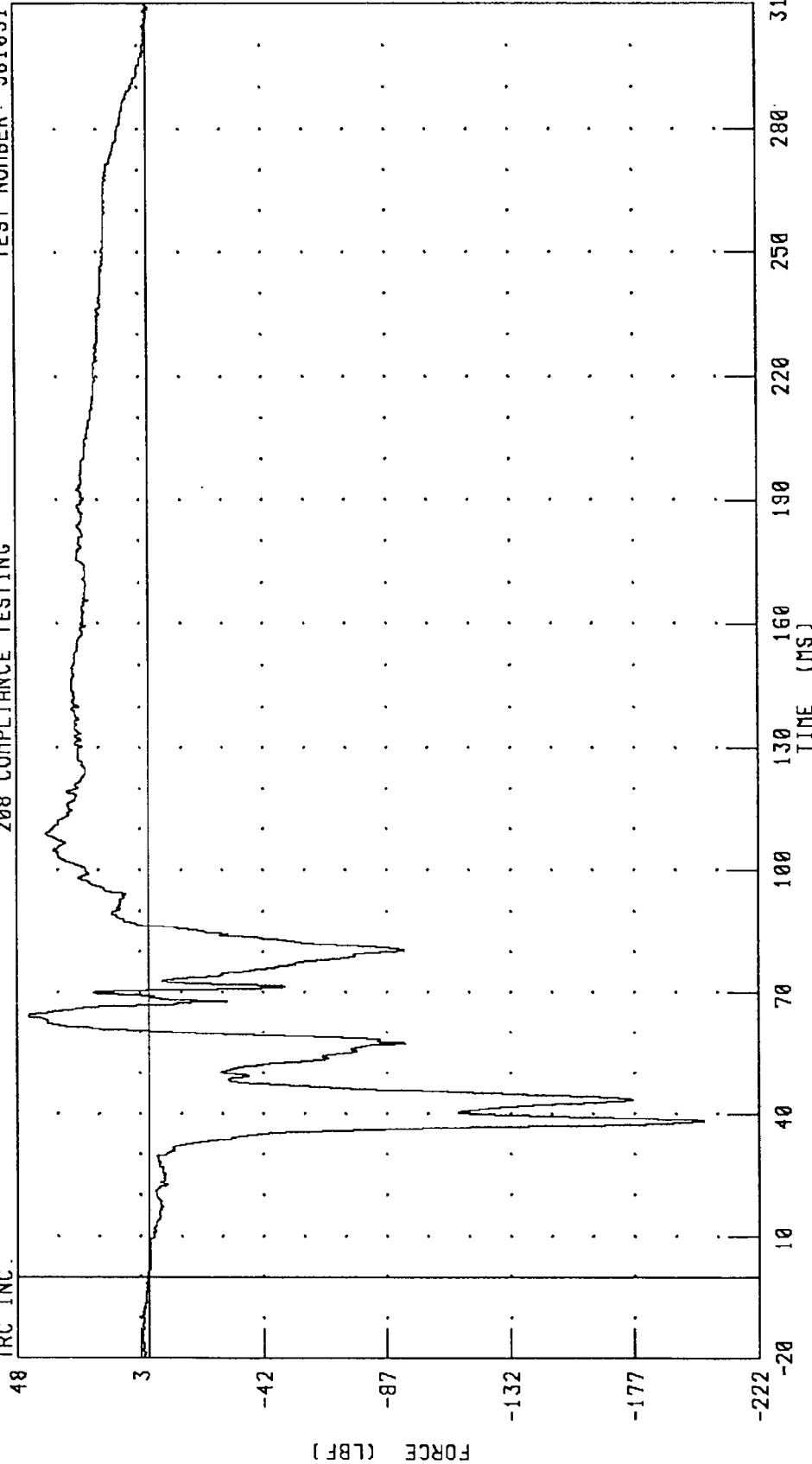
PEAK DATA: 349.55 LBF-IN @ 49.76 MS; -371.96 LBF-IN @ 101.04 MS

CHANNEL: TBRM2 FILTER: CH. CLASS 600

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

TEST NUMBER: 961031

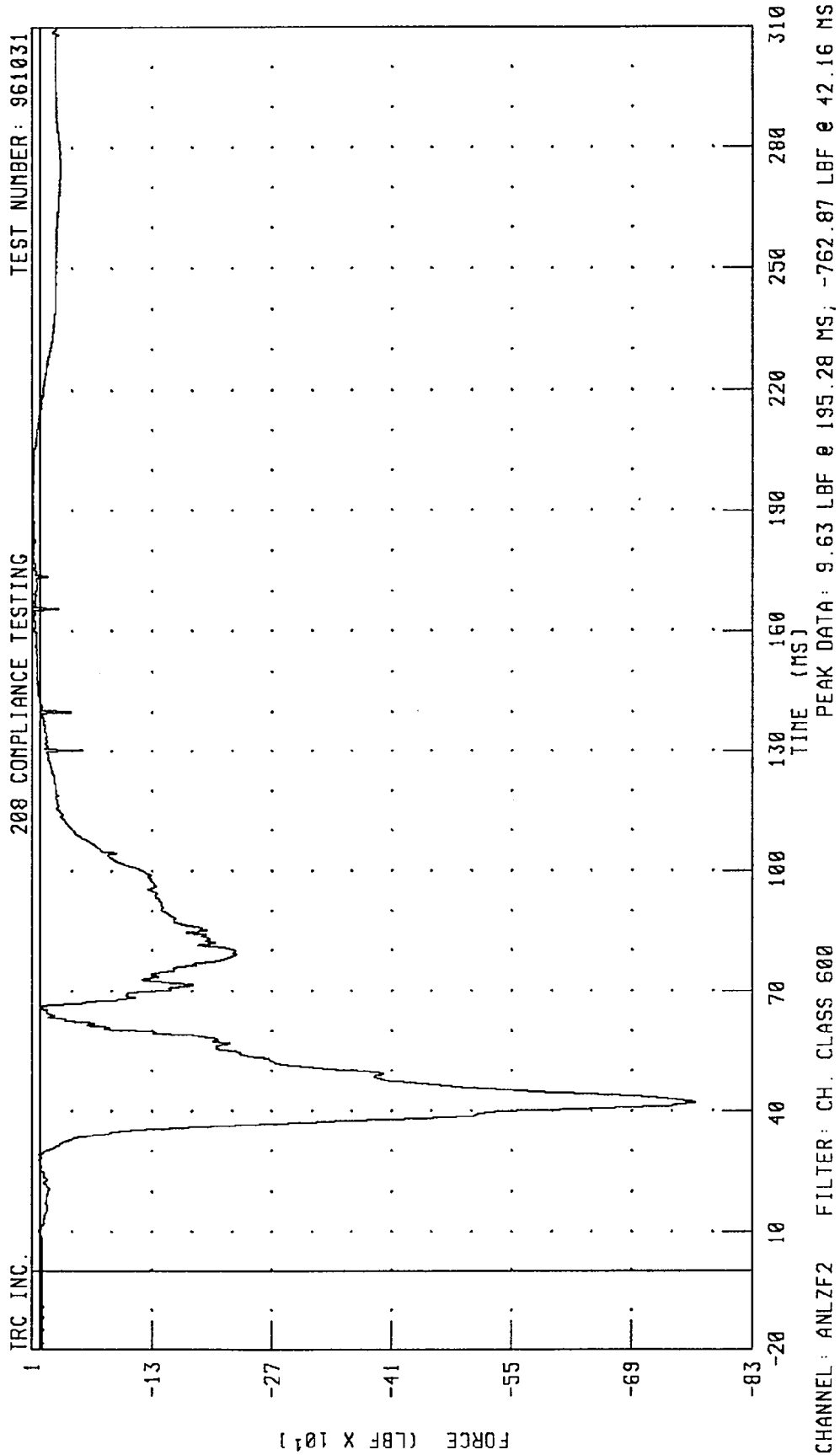
TRC INC.



PEAK DATA: 43.85 LBF @ 64.16 MS; -202.15 LBF @ 38.32 MS

CHANNEL: ANLXF2 FILTER: CH. CLASS 600

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

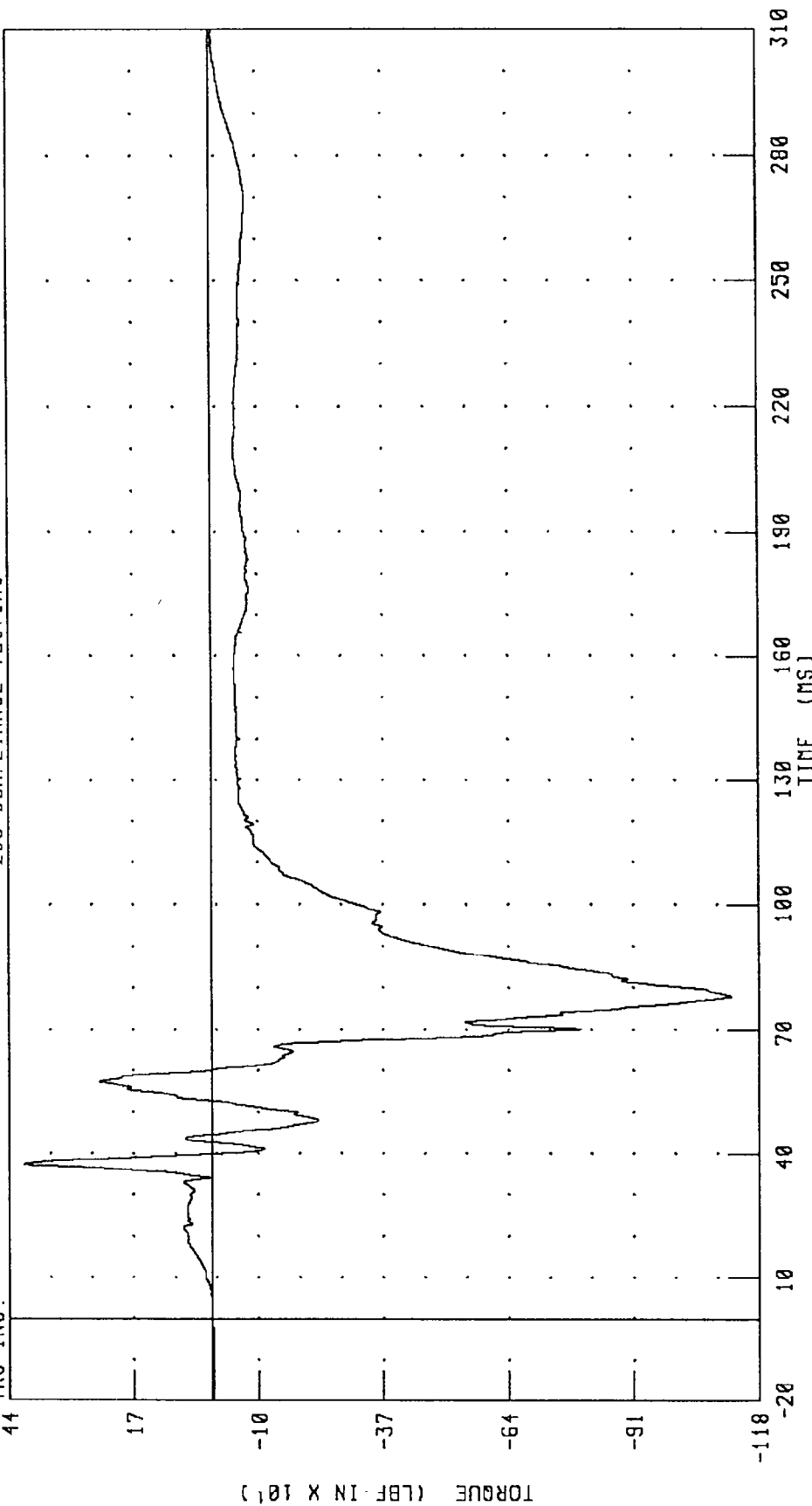


1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961031

208 COMPLIANCE TESTING

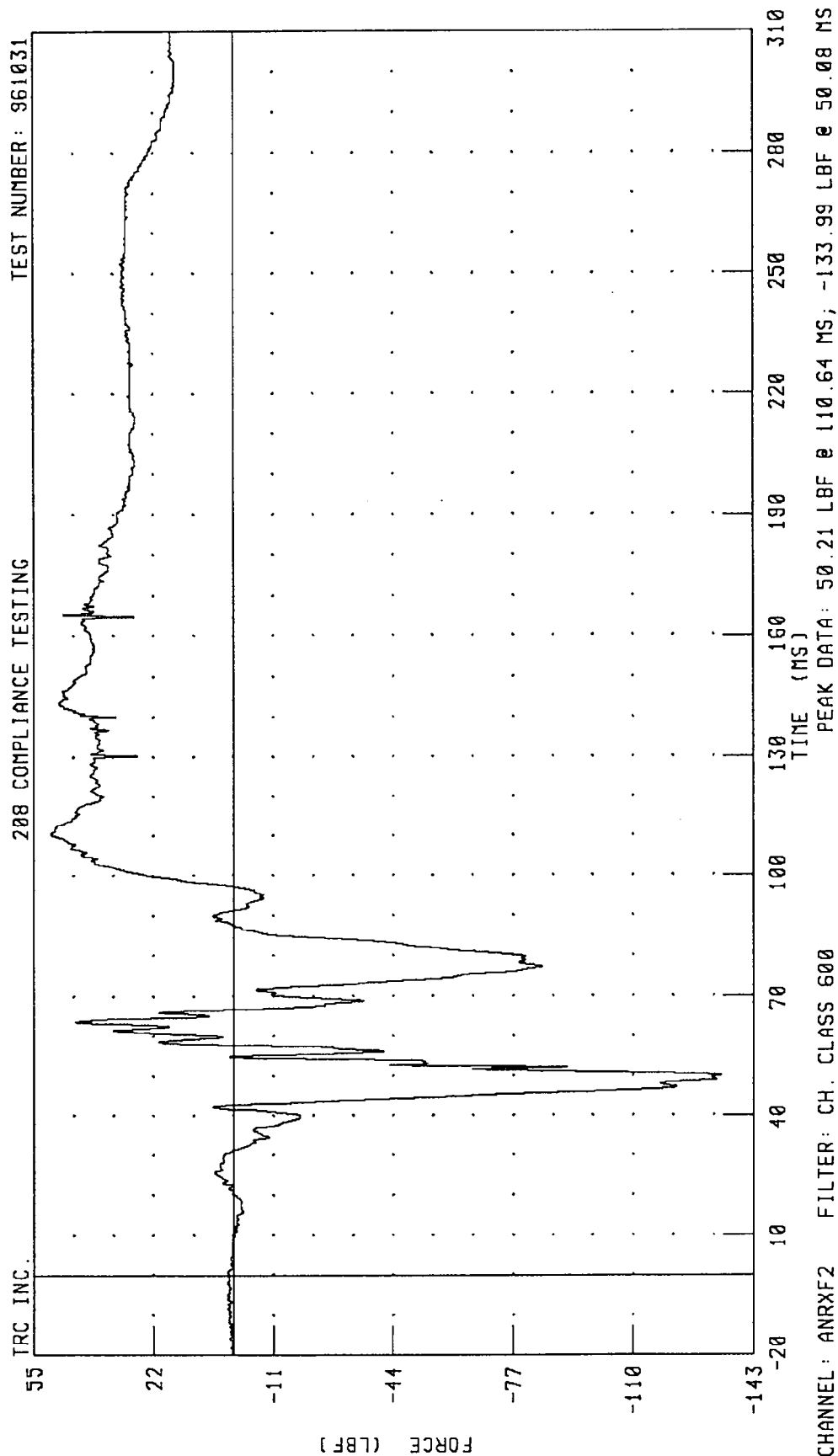
TRC INC.



PEAK DATA: 406.22 LBF-IN @ 37.52 MS; -1119.78 LBF-IN @ 78.08 MS

CHANNEL: ANLYM2 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT LOWER TIBIA X-AXIS FORCE

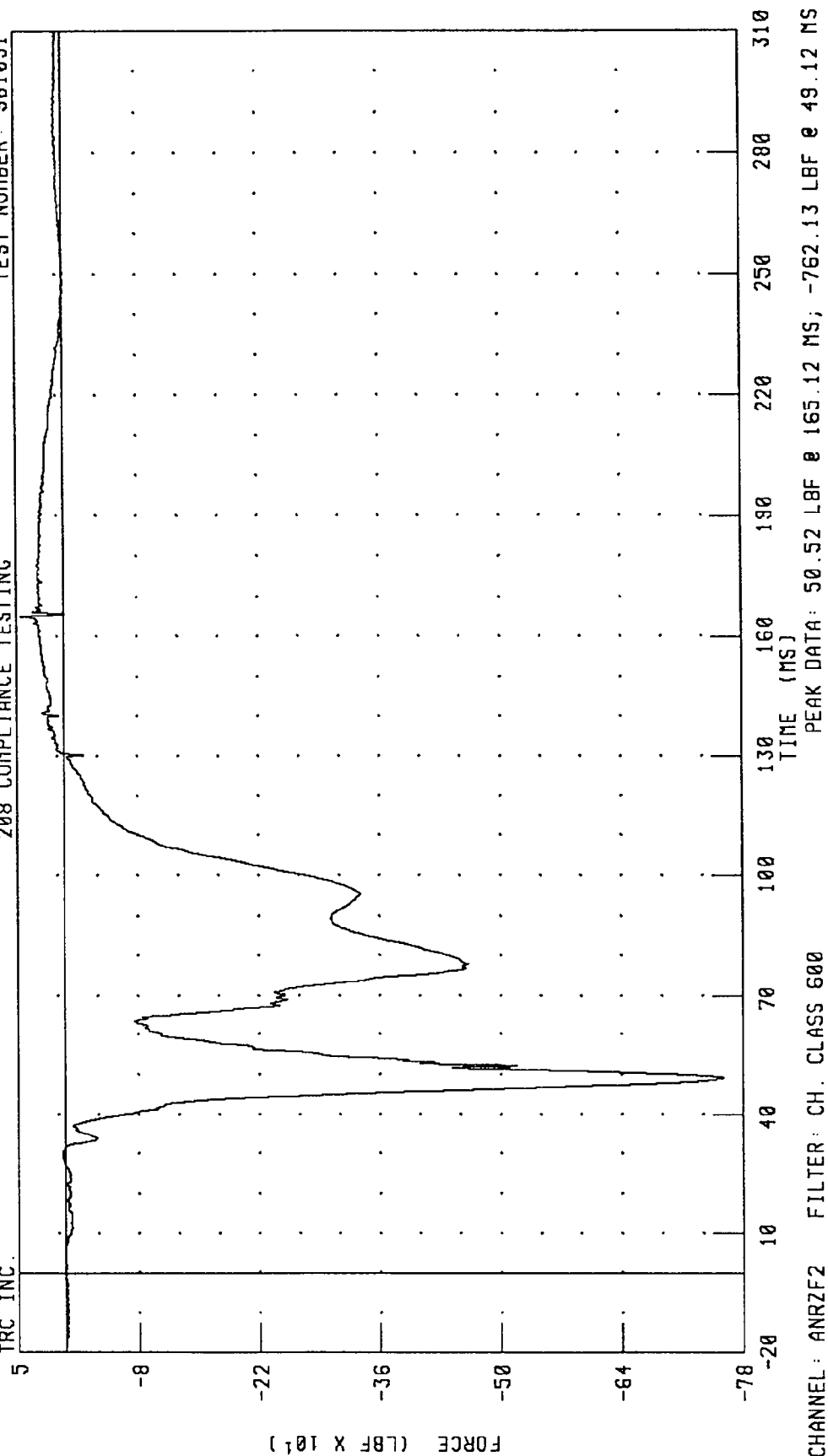


1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



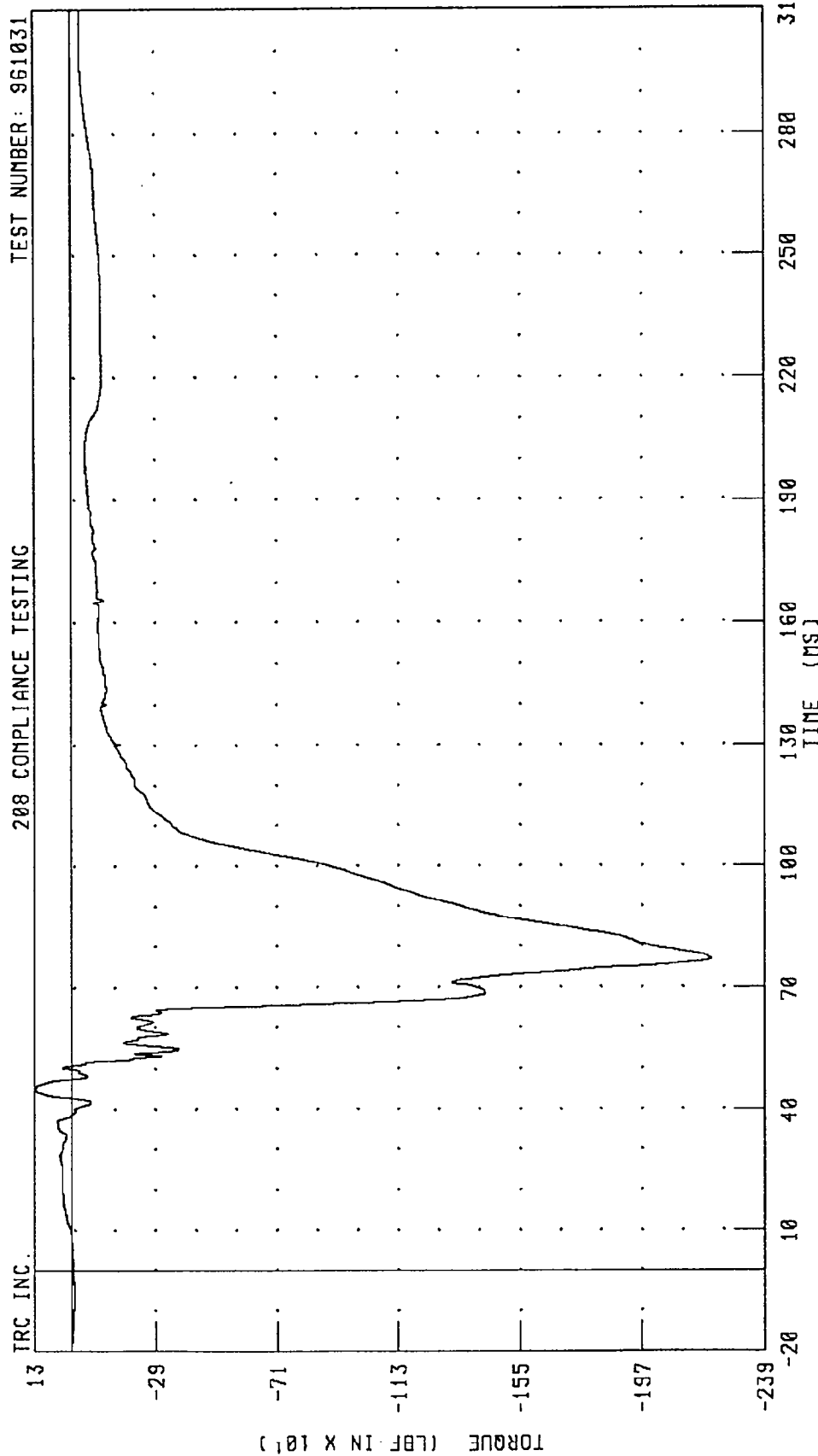
CHANNEL: ANRZF2 FILTER: CH. CLASS 600

PEAK DATA: 50.52 LBF @ 165.12 MS; -762.13 LBF @ 49.12 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y-AXIS

TEST NUMBER: 961031

208 COMPLIANCE TESTING

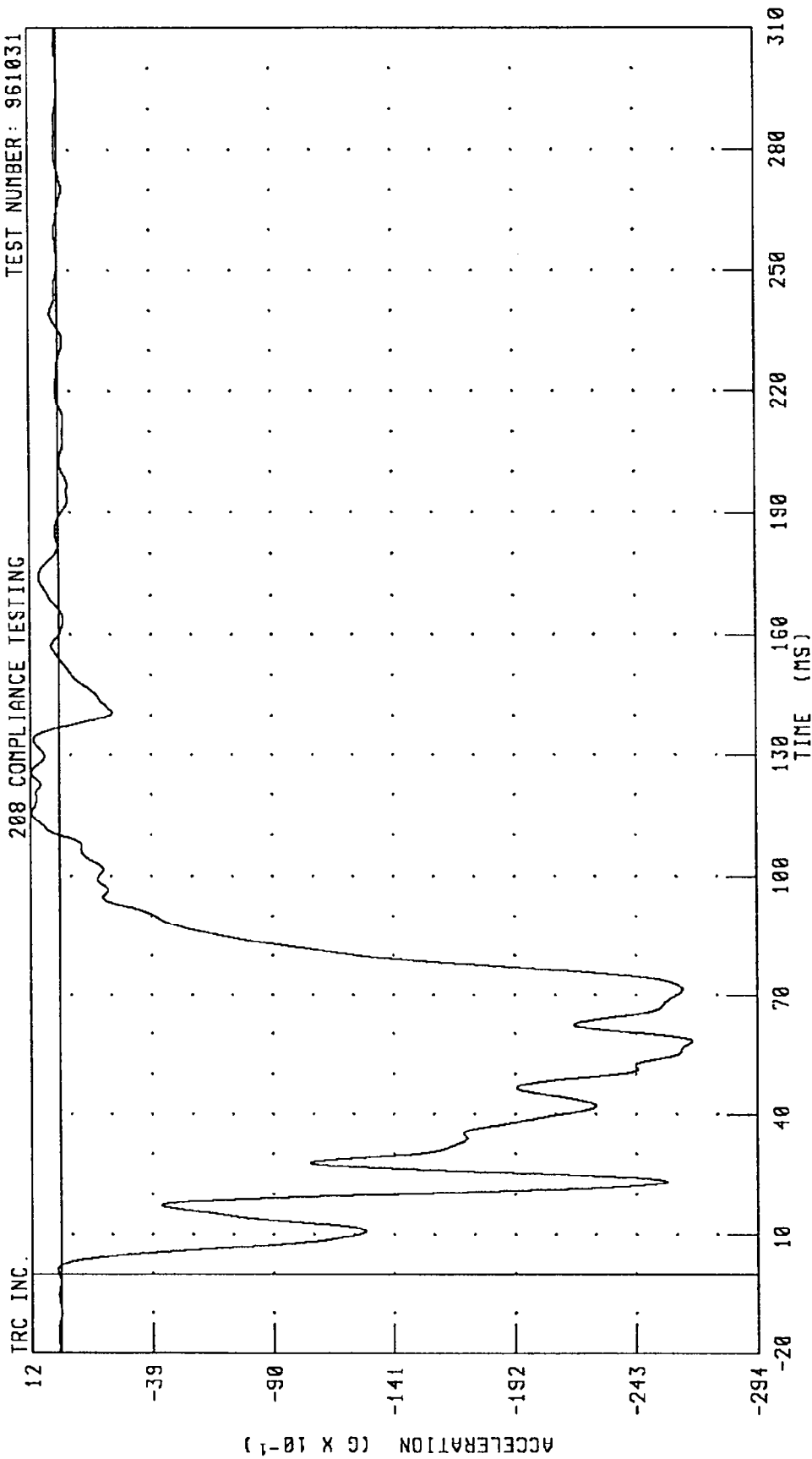


PEAK DATA: 124.03 LBF-IN @ 45.20 MS; -2205.94 LBF-IN @ 77.04 MS

CHANNEL: ANRYM2 FILTER: CH. CLASS 600

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
200 COMPLIANCE TESTING

TEST NUMBER: 961031



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

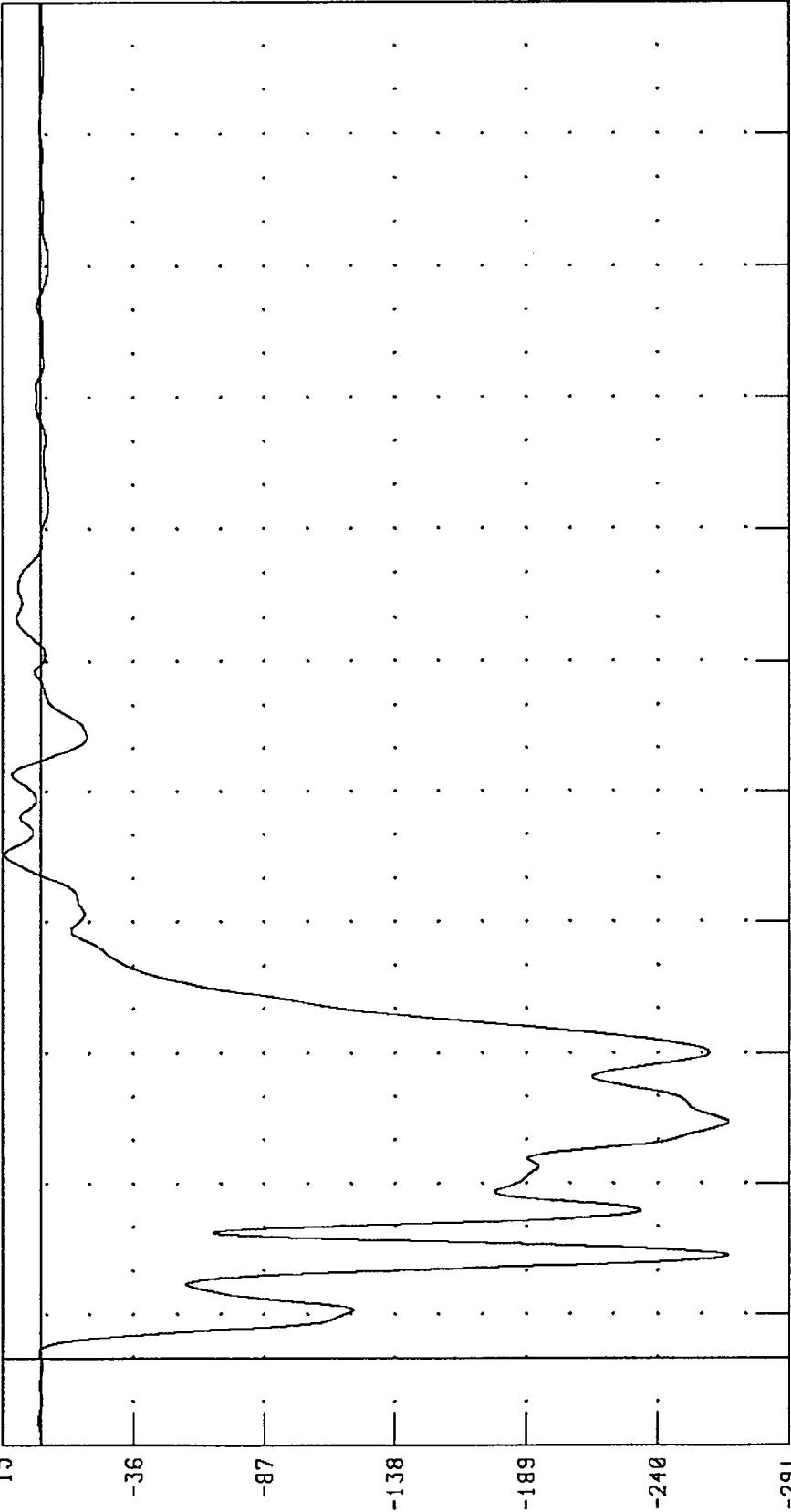
1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.

ACCELERATION (G X 10⁻¹)

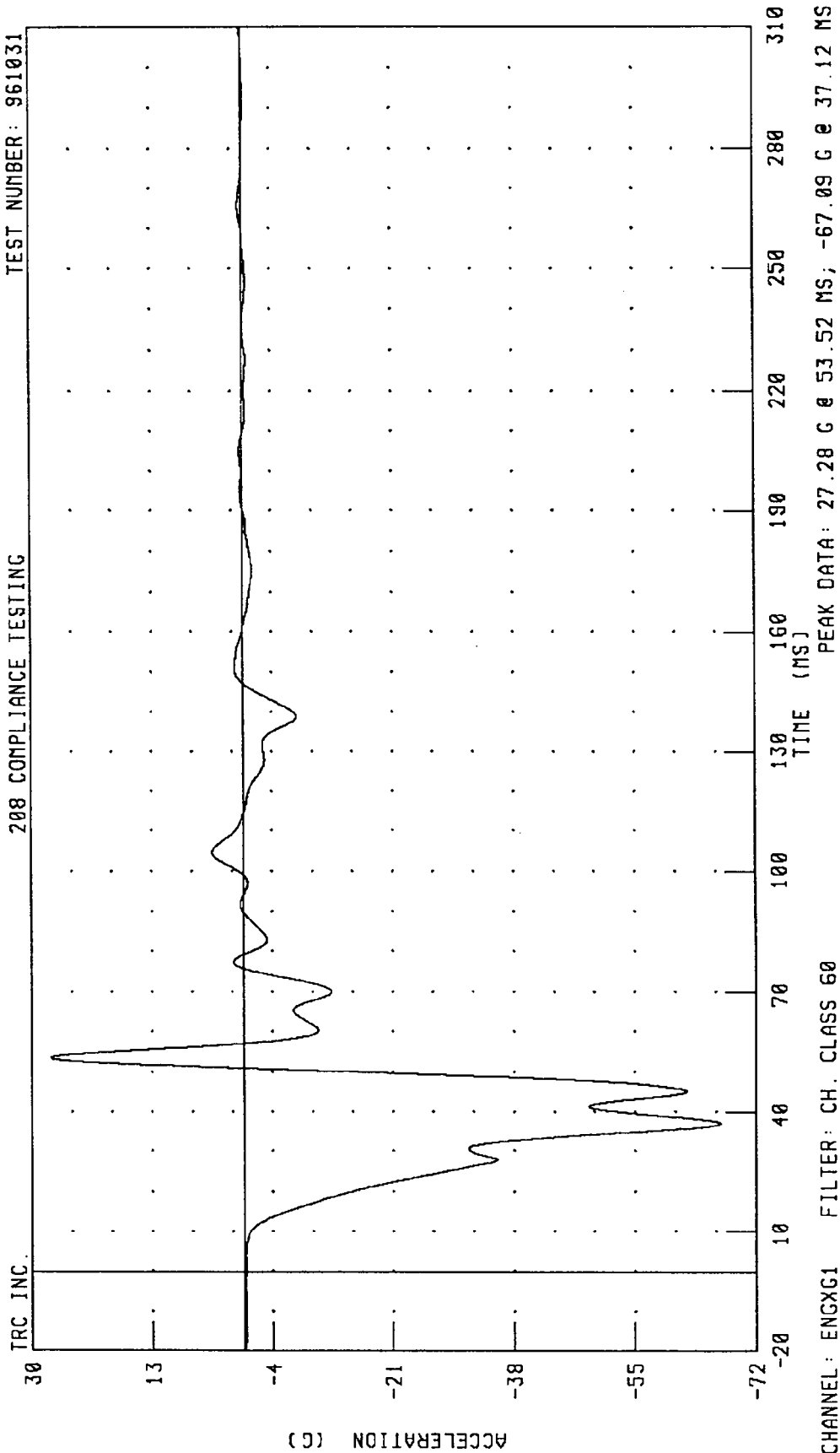


PEAK DATA: 1.43 G @ 115.68 MS; -26.76 G @ 54.00 MS

CHANNEL: TRRXG1 FILTER: CH. CLASS 60

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
ENGINE UPPER BLOCK X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031



CHANNEL: ENGXC1 FILTER: CH. CLASS 60

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM BLOCK X-AXIS ACCELERATION

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.

345

275

205

135

65

-5

-75

ACCELERATION (G)

310 280 250 220 190 160 130 100 70 40 10 -20

TIME (MS)

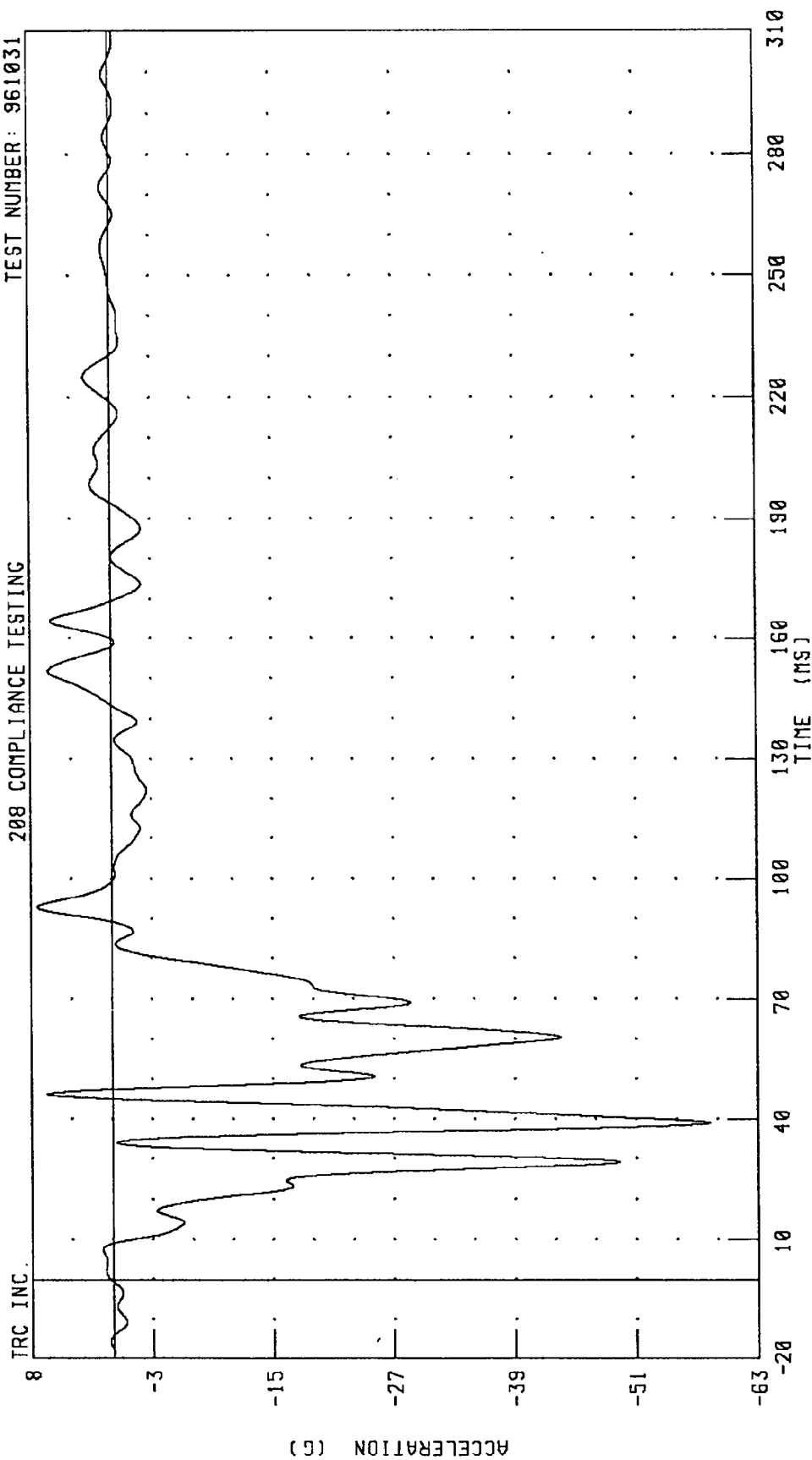
CHANNEL: ENGXC2 FILTER: CH. CLASS 60

961031

PEAK DATA: 316.16 G @ 185.04 MS; -68.26 G @ 34.64 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031



PEAK DATA: 7.42 G @ 92.96 MS; -59.19 G @ 39.04 MS

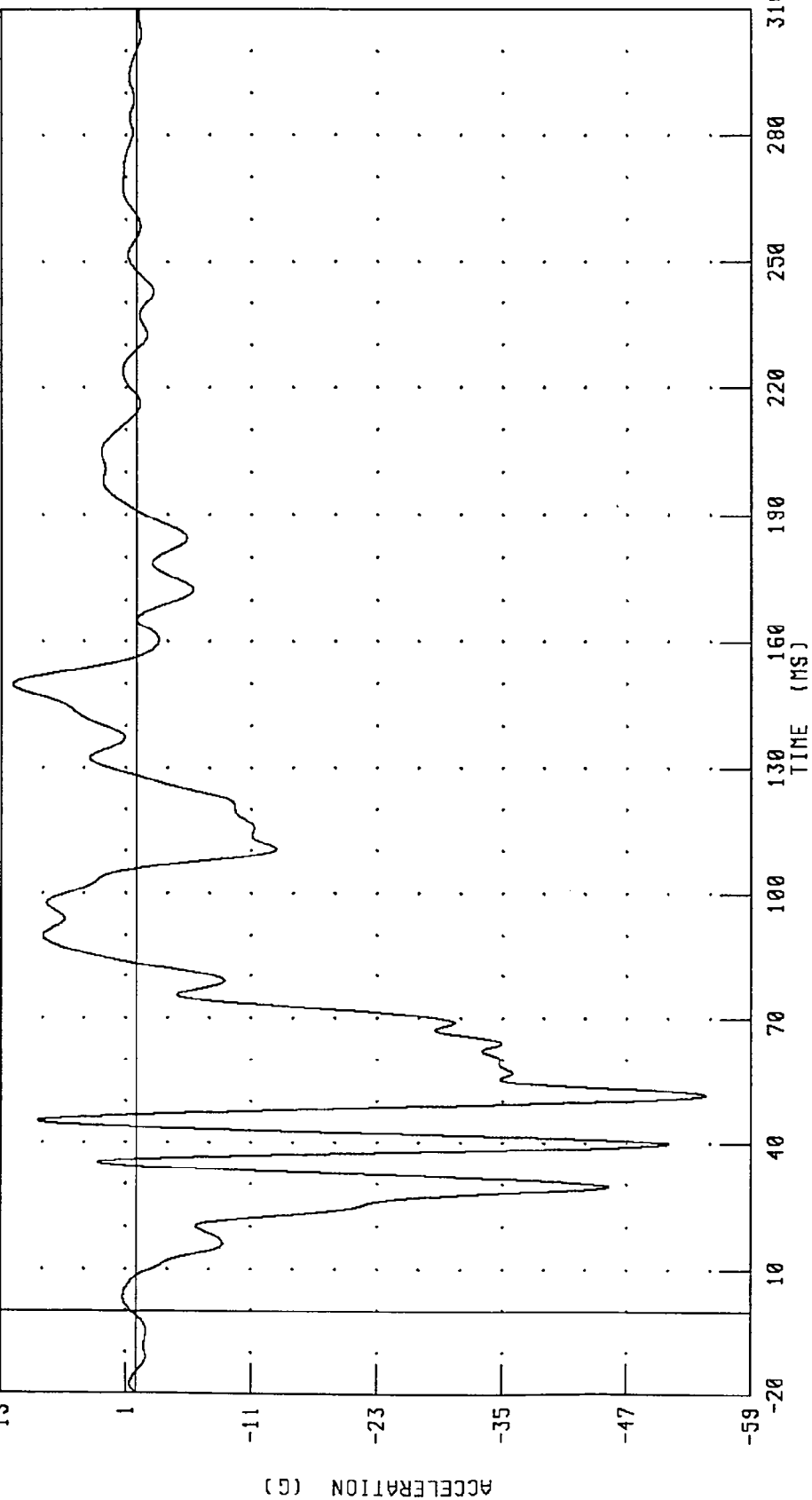
CHANNEL: BCRXG1 FILTER: CH. CLASS 60

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.

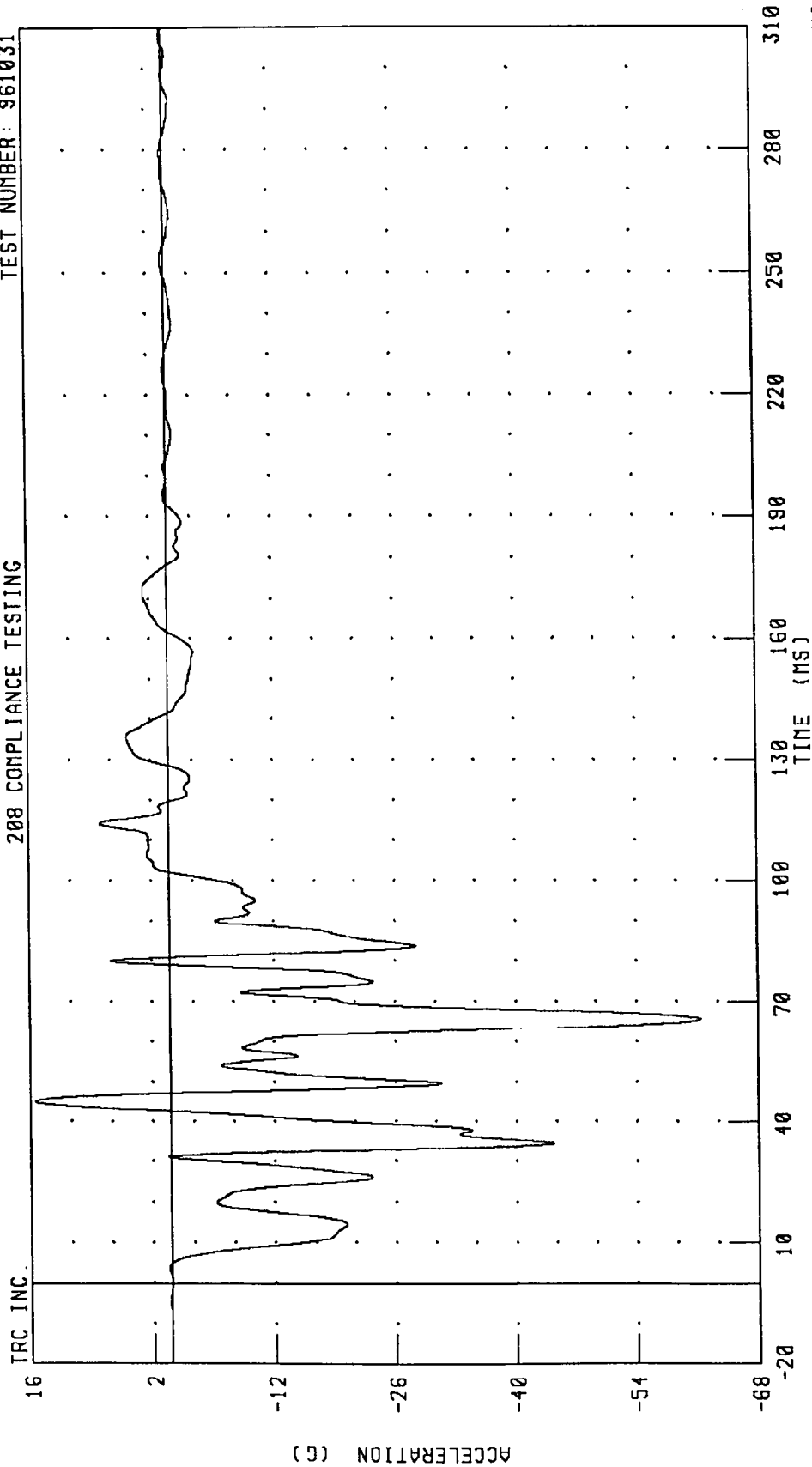


CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 11.88 G @ 149.92 MS; -54.59 G @ 51.60 MS

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
DASH PANEL CENTER X-AXIS ACCELERATION
208 COMPLIANCE TESTING

TEST NUMBER: 961031



PEAK DATA: 15.38 G @ 45.04 MS; -61.41 G @ 65.68 MS

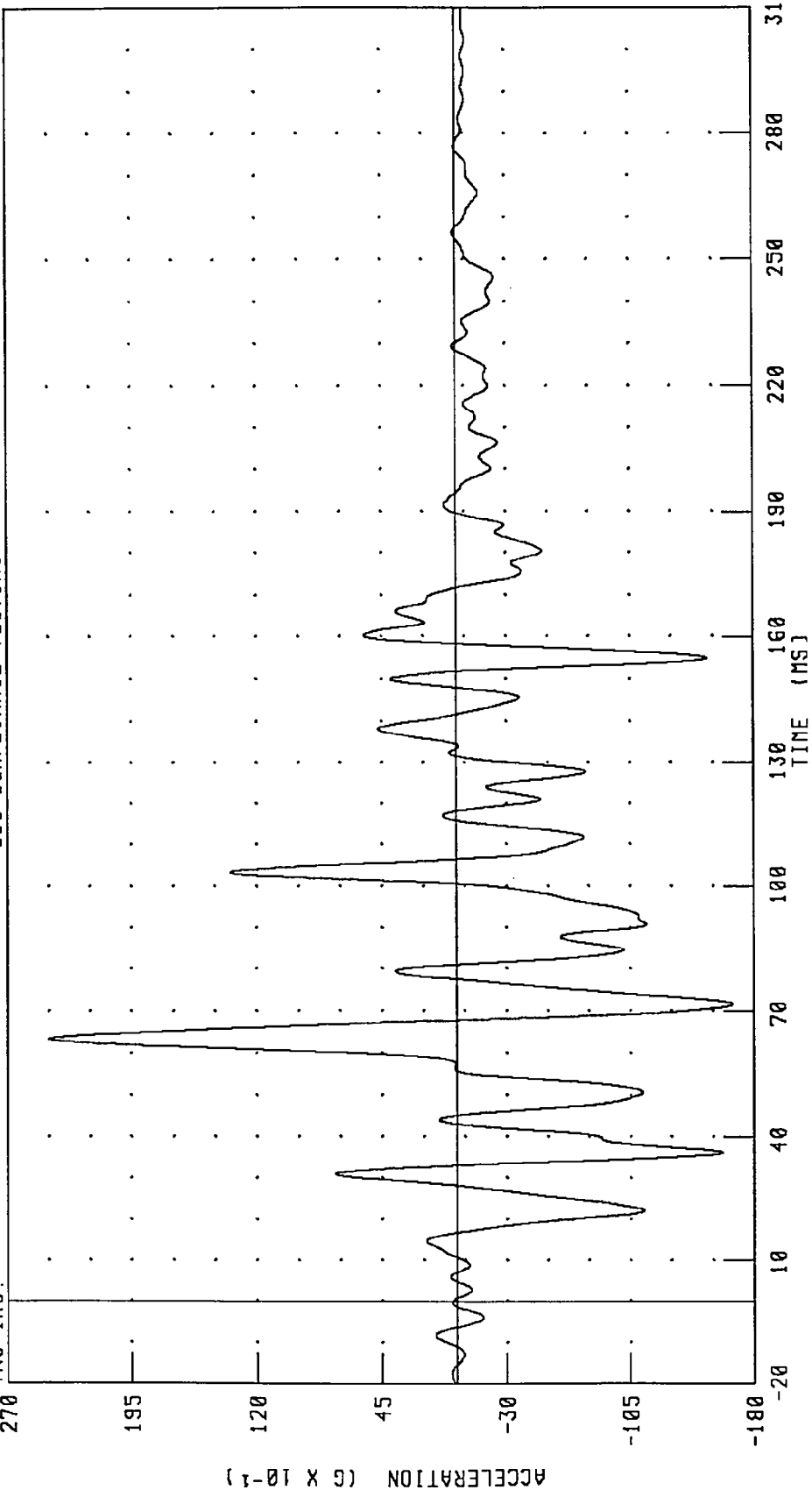
CHANNEL: DPCXG1 FILTER: CH. CLASS 60

1997 MITSUBISHI GALANT INTO FLAT FRONTAL BARRIER
VEHICLE REAR CENTER Z-AXIS ACCELERATION

TEST NUMBER: 961031

208 COMPLIANCE TESTING

TRC INC.



CHANNEL: TFCZG1 FILTER: CH. CLASS 60

PEAK DATA: 24.49 G @ 63.44 MS; -16.68 G @ 71.52 MS

Appendix C

Manufacturer's Vehicle Information

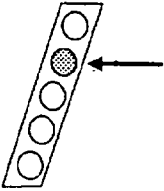
MMC ANSWERS ABOUT OVSC QUESTION FOR '97 MITSUBISHI GALANT FMVSS 208 COMPLIANCE TEST

OVSC QUESTION		MMC ANSWER																					
1	•Whether the air bag automatic restraint systems provided at Dr.&Ps. Seating positions are certified to meet the requirements of S4.1.2.1(c)(1) or S4.1.2.1(c)(2)?	•Our system meets the requirement of S4.1.2.1.(c)(2)																					
2	•If the automatic restraint systems provided , S4.1.2.1(c)(1) provide a copy of the certification test reports.	•Not applicable																					
3	•If a manual 3-point safety belt is provided with the driver's automatic restraint system in order to meet the requirement of S4.1.2.1(c)(2), provide a copy of the certification test reports.	•We provide a copy of our certification test reports shown bellow. <table border="1"> <thead> <tr> <th>Test configuration</th><th>Seat Belt Condition</th><th></th></tr> </thead> <tbody> <tr> <td>0 deg.</td><td>Fastened</td><td>×</td></tr> <tr> <td>Frontal</td><td>Unfastened</td><td>*</td></tr> <tr> <td>30 deg.</td><td>Fastened</td><td>※</td></tr> <tr> <td>Left Oblique</td><td>Unfastened</td><td>×</td></tr> <tr> <td>30 deg.</td><td>Fastened</td><td>※</td></tr> <tr> <td>Right Oblique</td><td>Unfastened</td><td>×</td></tr> </tbody> </table> Test report No. XH961229 Attachment No.1 × : Test was conducted * : Conducted as 35mph test ※ : Covered by unfastened condition.	Test configuration	Seat Belt Condition		0 deg.	Fastened	×	Frontal	Unfastened	*	30 deg.	Fastened	※	Left Oblique	Unfastened	×	30 deg.	Fastened	※	Right Oblique	Unfastened	×
Test configuration	Seat Belt Condition																						
0 deg.	Fastened	×																					
Frontal	Unfastened	*																					
30 deg.	Fastened	※																					
Left Oblique	Unfastened	×																					
30 deg.	Fastened	※																					
Right Oblique	Unfastened	×																					
4	•If the manual safety belt provided at the Dr.&Ps. seat positions was not installed to meet the requirement of S4.1.2.1(c)(2),provide a copy of a crash test reports or engineering analysis showing that the use of the manual safety belt with the automatic restraint system does not affect the ability of the vehicle to meet the requirements of FMVSS No.208.	•Not applicable.																					

MMC ANSWERS ABOUT OVSC QUESTION FOR '97 MITSUBISHI GALANT FMVSS 208
COMPLIANCE TEST(Cont'd)

OVSC QUESTION		MMC ANSWER
5	•If the vehicle uses a pressure vessel to inflate the air bag,provide a copy of the test reports or engineering analysis.	•Not used.
6	•If the vehicle uses an explosive device to inflate the air bag,provide a copy of the test reports or engineering analysis.	•The explosive device(inflator)of our air bag system meets all the requirement of S9.2. •It is certified by the letter of Morton International Inc. - Refer Test Report No.XH961229 - Attachment No.1.
7	•For any automatic safety belt system, whether or not it is equipped with a tension-relieving device? Provide a copy of the information furnished in accordance with S7.4.2, if the tension-relieving device is used.	•Not used.
8	•Whether the vehicle's movable windows and vents were opened or closed for certification tests?	•All of movable windows and vents were positioned to full open condition on our tests.
9	•Which test dummy was used in each seat for each certification test? •Submit dummy placement measurements including diagrams or photographs. •Whether the vehicle has a foot rest for the driver? •If the Vehicle can be equipped with a split front bench seat,	•Part 572(E) (Hybrid-III)dummy was used in each front seat for the certification tests. •Refer Attachment No.2-1,2-2 •All •Not equipped.

**MMC ANSWERS ABOUT OVSC QUESTION FOR '97 MITSUBISHI GALANT FMVSS 208
COMPLIANCE TEST(Cont'd)**

OVSC QUESTION		MMC ANSWER
10	•Provide a seat positioning , steering column positioning, and fuel tank data.	•Refer Attachment No.3-1,3-2
11	•If the vehicle is equipped with adjustable seat belt anchorages, provide the manufacturer's nominal design position for a 50th percentile adult male occupant.	•2nd position from the top anchorage. 
12	•Provide the speed at impact , vehicle test weight, and resulting injury criteria recorded for all certification tests conducted to meet the requirement of S4.1.2.1. •In addition , include each dummy's head and chest acceleration versus time plots and femur load versus time plots for the full frontal barrier impact test.	•Refer the Attachment No.4-1 •Refer the Attachment No.4-2,4-3,4-4,4-5
13	•When vehicle components must be removed to obtain the proper test weight, what components and what priority does MMC recommend removal?	•Tool , Jack •Rear combination lamp •2nd seat •spare tire
14	•Provide FMVSS No.204 certification data. •Discuss the test procedure detailing the vehicle preparation and measurement technique used to determine the steering ^{control} control rearward displacement. •Provide a diagram of the steering ^{control} control system and describe how the components of the steering ^{control} control system work to provide energy management in a frontal impact.	•Refer Attachment No.5 and No.6. •Refer Attachment No.7
15	•If the vehicle have built-in child restraints either as standard equipment or optional equipment.	•Not equipment.

ATTACHMENT-2

INFORMATIONS FOR DUMMY AND SEAT POSITIONING

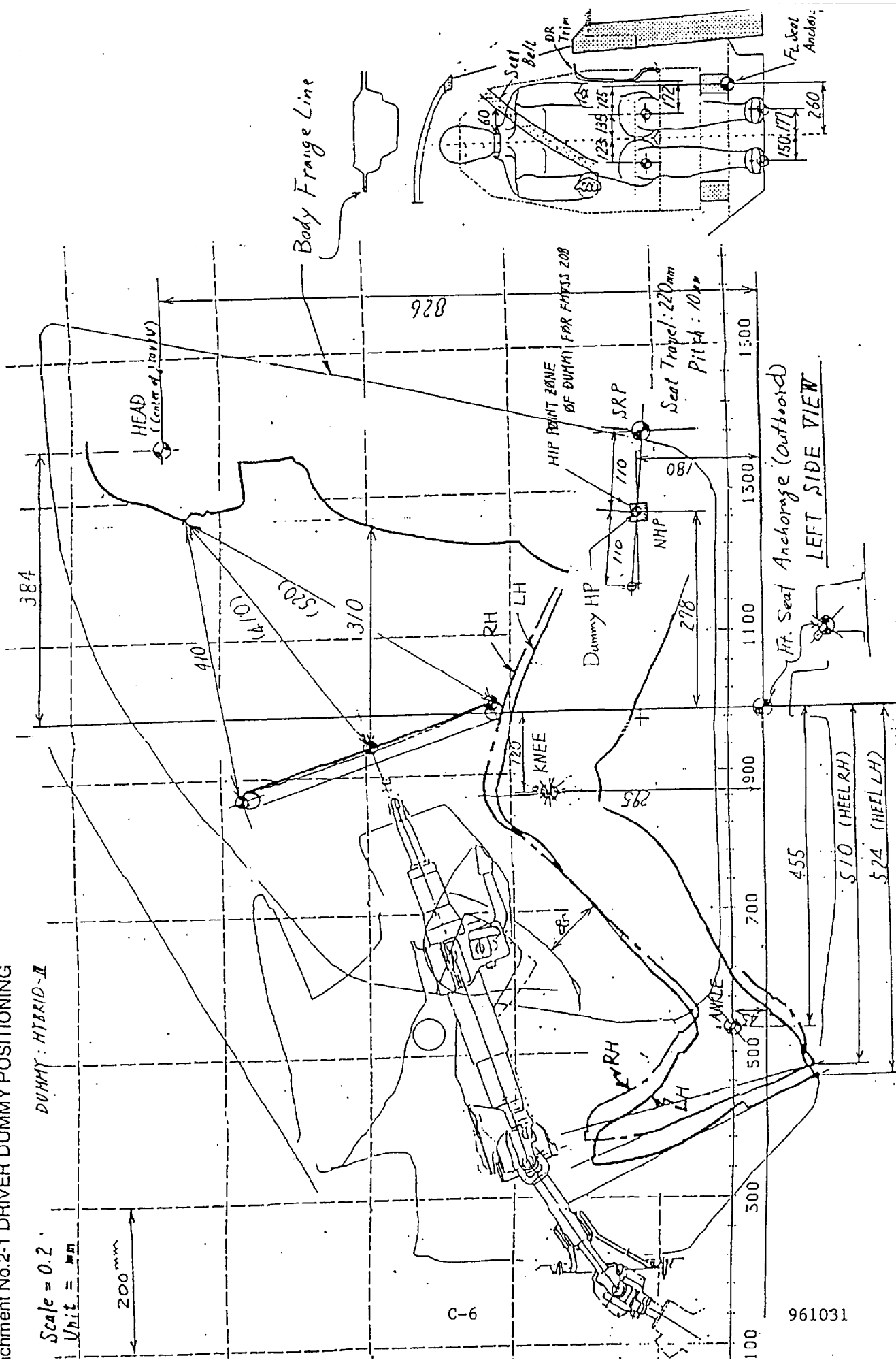
achment No.2-1 DRIVER DUMMY POSITIONING

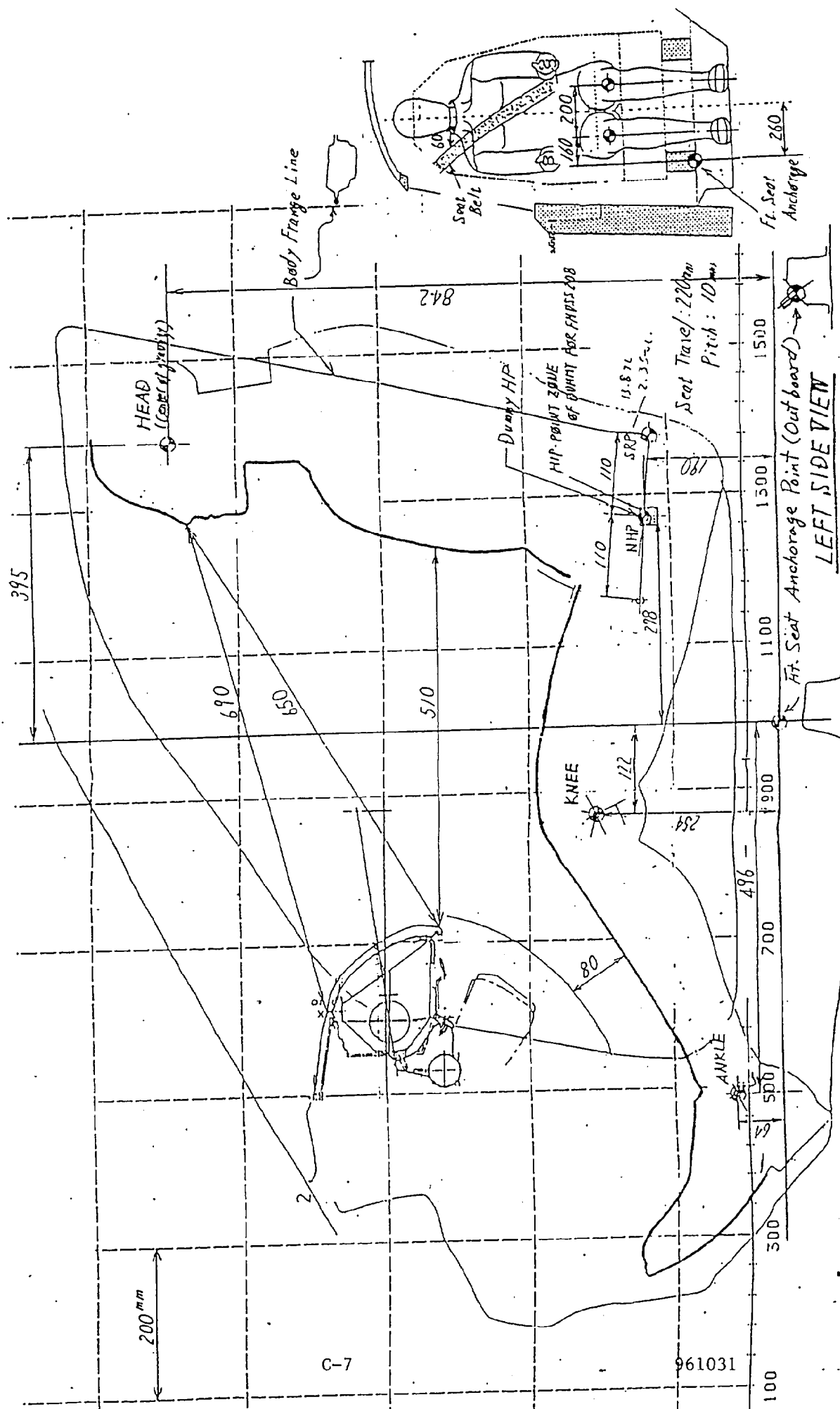
DUMMY: HYBRID-II

Scale = 0.2

Unit = mm

200 mm



$$e = 0.2 \text{ mm}$$


ATTACHMENT-3

TEST VEHICLE INFORMATION
(SEAT,STEERING COLUMN AND FUEL TANK CAPACITY)

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1997 MITSUBISHI GALANT MITSUBISHI MOTORS CORP.
 Vehicle Model & Body Style: E56A, E98A 4DOOR

1. NOMINAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs.
 Please describe how to position the inclinometer to measure the seat backangle. Include description of the location of the adjustment latch detent if applicable. Indicate, if applicable, how the detents are numbered (Is the first detent "0" or "1"?). Indicate if the seat back angle is measured with the dummy in the seat.

Seat back angle for driver's seat = 24 degrees.

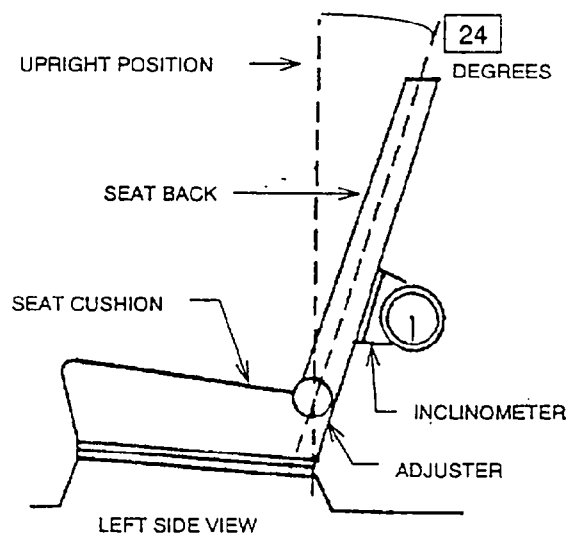
Measurement Instructions:

Adjust the seat back to be 24deg. with inclinometer on
the side frame pipe, or, locate the seat back to the 13th
step from the first locking position as 1st step.

Seat back angle for passenger's seat = 24 degrees.

Measurement Instructions:

Same as driver's.



2. SEAT FOR & AFT POSITIONS

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, indicate how the detents are numbered (Is the first detent "0" or "1"?). Provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:

The center position is 12th position from rearmost locking position as 1st.

The pitch to be locked is 0.39inches(10mm).

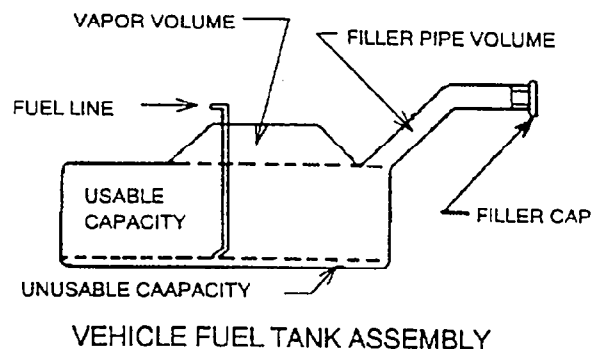
Positioning of the passenger's seat(if applicable):

Same as driver's.

3. FUEL TANK CAPACITY DATA

- 3.1 A. "Usable Capacity" of standard equipment fuel tank = 16.9 gallons.
- B. "Usable Capacity" of optional equipment fuel tank = gallons.
- C. "Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 15.9 gallons.

Operational Instructions:



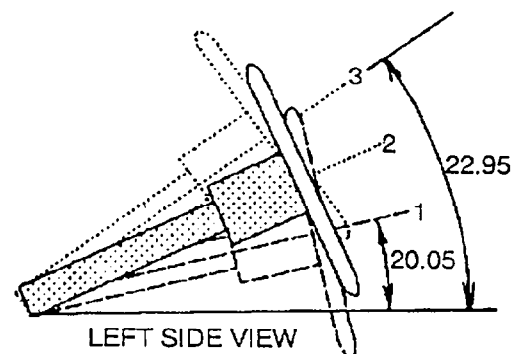
- 3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 16.1 gallons.
- 3.3 Is vehicle equipped with electric fuel pump? ☒ YES ☐ NO
If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.
Fuel pump will pump fuel when engine is running.

4. STEERING COLUMN ADJUSTMENTS

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

Operational instructions:

The steering column can be locked at any position from
20.05deg. to 22.95deg.



STEERING COLUMN ASSEMBLY