Report Number: 208S-TRC-007

Vehicle Safety Compliance Testing for FMVSS 208 for Occupant Crash Protection Sled Test

Land Rover Group Ltd.
2001 Land Rover Discovery
NHTSA Number: C10600
TRC Inc. Test Number: S010306

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

Test Date: March 6, 2001
Report Date: April 30, 2001

Final Report

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

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Transportation Research Center Inc

Final Report Accepted By:

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Contracting Officer's Technical Representative (COTR),
NHTSA, Office of Vehicle Safety Compliance

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16 Abstract

An FMVSS 208 Section 13 compliance sled test was conducted on a 2001 Land Rover Discovery MPV, NHTSA No C10600, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No TP208S-01 for the determination of FMVSS 208 compliance Possible test failures identified were as follows

Section 4 5 1(a) Airbag maintenance or replacement information The label in the vehicle is not lettered in block capital and numerals

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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	nches	*2 5	entimeters	n
ft	feet	30	centimeters	cm
yd	yards	0 9	m ters	m
mi	miles	1 6	k l met rs	km
		AREA		
in^2	square inches	6 5	square cent n eters	cm^2
ft^2	square feet	0 09	squ re meters	m^2
yd^2	square yards	0 8	square meters	m^2
mi^2	square miles	2 6	square k lometers	kn^2
	acres	0 4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	q
lb	pounds	0 45	kilograms	kg
	short tons (2000 lb)	0 9	to nes	t
		VOLUME		
tsp	teaspoons	5	illiliters	ml
Tbsp	tat lespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0 24	liters	l
pt	pints	0 47	l ters	l
qt	quarts	0 95	l te s	l
gal	g illons	3 8	lite s	l
ft^3	cul ic feet	0 03	c ib c meters	m^3
yd^3	cubic y r ls	0 76	cul c meters	m^3
		TEMPERATURE (exact)		
F	F ıt renheıt temper ıt ıre	5 9 (after s btracting 32)	Celsius ten perat e	

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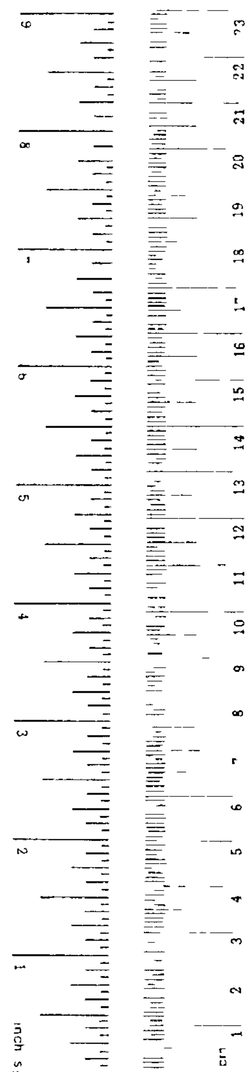
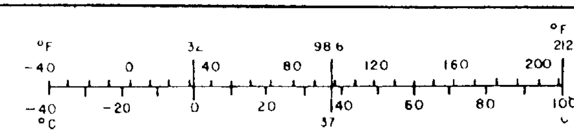


Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0 04	inches	in
cm	centimeters	0 4	inches	in
m	meters	3 3	feet	ft
m	meters	1 1	yards	yd
km	k lometers	0 6	miles	mi
		AREA		
cm^2	square centimeters	0 16	square inches	in^2
m^2	square meters	1 2	square yards	yd^2
km^2	square kilometers	0 4	square miles	mi^2
ha	hectares (10 000 m)	2 5	acres	
		MASS (weight)		
g	grams	0 035	ounces	oz
kg	kilograms	2 2	pounds	lb
t	tonnes (1000 kg)	1 1	short tons	
		VOLUME		
ml	milliliters	0 03	fluid ounces	fl oz
l	liters	2 1	pints	pt
l	liters	1 06	quarts	qt
l	liters	0 26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1 3	cubic yards	yd^3
		TEMPERATURE (exact)		
C	Celsius temperat re	9 5 (then add 32)	Fahrenheit temperature	°F



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Purpose

This Federal Motor Vehicle safety Standard (FMVSS) 208 compliance sled test is part of the FMVSS compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center Inc. (TRC Inc.) under Contract No DTNH22-98-D-01055 The purpose of this test was to determine if the subject vehicle, a 2001 Land Rover Discovery MPV, NHTSA No.C10600, meets the performance requirements of FMVSS 208, "Occupant Crash Protection," in the impact simulation sled test mode.

Test Procedure

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No TP-208S-01, dated January 15, 1998 Data was obtained relative to FMVSS 208, "Occupant Crash Protection," performance

The sled test vehicle was instrumented with six (6) accelerometers to measure longitudinal axis accelerations The sled was instrumented with one (1) longitudinal accelerometer which is prefiltered with an analog filter to 200 Hz as an integral part of the sled firing circuit (this data is not recorded by the TRC data acquisition system), and two (2) additional longitudinal accelerometers· the primary accelerometer for pulse and integrated velocity determination and a backup accelerometer In addition the sled was instrumented with one (1) light trap to measure velocity, and two (2) airbag firing timing circuits

The sled 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 The dummies were not restrained by seat belts

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 neck load cells to measure longitudinal, lateral, and vertical forces and moments.

The forty-one (41) data channels were digitally sampled at 12,500 samples per second and processed per Sections 11.7 through 11 9 of the Laboratory Test Procedure

The sled test event was recorded by one (1) real-time motion picture camera and six (6) high-speed motion picture cameras The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera

Test Results Summary

This FMVSS 208 compliance sled test was conducted by TRC Inc. on March 6, 2001.

The test vehicle, a 2001 Land Rover Discovery MPV, NHTSA No. C10600, does appear to comply with the performance requirements of FMVSS 208 in the impact simulation sled test mode as measured by Hybrid III 50th percentile male dummies.

	FMVSS 208 Max. Allowable Injury Assessment Values	Driver	Passenger
HIC	1000	99	263
Chest g	60 g	34.0	33.5
Chest Displacement	3 inches	1.3	0.5
Left Femur	2250 lbs	1075	1118
Right Femur	2250 lbs	1290	1218
Neck Extension	57 Nm	4.8	17.7
Neck Flexion	190 Nm	41.0	54.2
Neck Tension	3300 N	N/A[1]	504
Neck Compression	4000 N	118	558
Neck Shear	3100 N	713	1203

The subject vehicle, a 2001 Land Rover Discovery, NHTSA No. C10600, does not appear to meet all the other FMVSS 208 requirements for which it was tested. Section 4.5.1(a), airbag maintenance or replacement information, was identified as a possible failure. The label in the vehicle is not lettered in block capital and numerals. These results are shown in the data sheets that are included in this report.

The sled test vehicle was equipped with air bags at the driver and passenger seating positions. The dummies were not restrained by seat belts. The sled carriage was accelerated to 17.2 g with an integrated velocity change of 29.4 mph. The air bags were triggered at 20.2 milliseconds after 0.5 g acceleration was measured by the firing circuit. Following subsequent digital data processing and filtering the primary sled acceleration signal to Channel Class 60, the air bag event trigger signal was 21 6 ms after the 0.5 g acceleration level was indicated.

[1] See Data Acquisition Explanations

Data Acquisition Explanations

The primary sled accelerometer, SLDXG, was less than the minimum required for the specified corridor from approximately 65 to 73 milliseconds

The sled measured velocity trap data channel, SLDXV, recorded data spikes at approximately 156, 229, 241, and 252 milliseconds The peak data reported in this report's tables excludes the spikes.

The vehicle's right frame X-axis accelerometer, RFXG, recorded questionable data between approximately 85 and 133 milliseconds

The vehicle's left frame X-axis accelerometer, LFXG, recorded a questionable data spike at approximately 44 milliseconds.

A series of intermittent anomalous data spikes occurred concurrently in the data recorded from a number of dummy load cell channels, both driver and passenger Spikes of varying magnitude occurred at approximately 22, 85, 87, 132, 145, 170, 184, and 213 milliseconds Every affected channel does not show each of these spikes This also affected the calculated driver and passenger Y-axis moments about the occipital condyle The only injury criteria value affected by this anomaly is the driver dummy's neck tension, or Z-axis positive force, NEKZF1, which is not reported. The list of load cell channels with notable anomalous spikes is:

NEKZF1, driver dummy neck X-axis force
NEKYF1, driver dummy neck Y-axis force
NEKZF1, driver dummy neck Z-axis force
NEKXM1, driver dummy neck X-axis moment
NEKYM1, driver dummy neck Y-axis moment
NEKZM1, driver dummy neck Z-axis moment
NEKXF2, passenger dummy neck X-axis force
NEKYF2, passenger dummy neck Y-axis force
RFMZF2, passenger dummy right femur force

Sled Test Summary

NHTSA number:	C10600
Test type:	Alternate FMVSS 208 Sled Test
Test date:	03/06/01
Test time:	1437
Ambient temperature at impact area:	71° F
Vehicle year/make/ model/body style:	2001/Land Rover/Discovery/MPV

Dummy Info:	Driver #339	Passenger #230
Type:	HIII - Part 572 E	HIII - Part 572 E
Location:	Left Front	Right Front
Restraint:	Airbag, supplemental	Airbag, supplemental
Number of data channels:	15	15

Number of Cameras:	
Real-time:	1
High-speed:	6

Door Opening Data:	
Left Front:	Easy
Right Front:	Easy

Front Seat Data:		
Seat track failure:	None	None
Seat back failure	None	None

Visible Dummy Contact Points:		
Head:	Airbag, sun visor, headliner	Airbag
Chest:	Airbag	Airbag
Left knee:	Knee bolster	Glove box
Right knee:	Knee bolster	Glove box

General Test and Vehicle Parameter Data for the Sled Test Vehicle

Test Vehicle Information:

Vehicle year/make/ model/body style	2001/Land Rover/Discovery/MPV			
Color:	Epsom Green			
VIN:	SALTL12431A704630			
NHTSA number:	C10600			
Engine data:				
Placement:	Inline V			
Cylinders:	8			
Displacement:	4 0 liters			
Transmission data:	_4_speed,	__manual,	_X_automatic,	__overdrive
Final drive:	___fwd,	__rwd,	_X_4wd	
Date vehicle received:	02/05/2001			
Odometer reading:	48			
Dealer's name and address:	Brentlinger Enterprise 6325 Perimeter Loop Road Dublin, Ohio 43016			

Major Options:

Power steering	Yes	Other: Front seat belt pretensioners, four
Power brakes	Yes	channel ABS, child locks on rear doors
Power windows	Yes	
Air conditioning	Yes	
Power door locks	Yes	

Remarks: Transmission has a manual shift mode

General Test and Vehicle Parameter Data for the Sled Test Vehicle, Cont'd

Data from Vehicle's Certification Label:

Vehicle manufactured by:		Land Rover Group Ltd.
Date of manufacture:		October-00
VIN:		SALTL12431A704630
GVWR:		6064 lbs
GAWR:	Front:	2646 lbs
	Rear:	3793 lbs
Recommended tire size:		255/65R16 or 255/55R18 or 215/75R16
Recommended cold tire pressure:		
Front:		28 psi
Rear:		46 psi

Tire pressure with maximum capacity vehicle load:

Front:	51 psi
Rear:	51 psi
Load range	N/A
Size of tires on vehicle:	255/65R16
Spare tire:	255/65R16
Vehicle capacity data:	
Type of front seats:	Bucket
Number of occupants:[1]	
Front	2
Rear	3
Total	5

Remarks:

[1] Number of occupants determined by number of available seat belts.

General Test and Vehicle Parameter Data for the Sled Test Vehicle, Cont'd.

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

Right front	1102 3 lbs	Right rear	1220 0 lbs
Left front	1082 5 lbs	Left rear	1228 8 lbs
Total front weight	2184 8 lbs	(47 2% of total vehicle weight)	
Total rear weight	2448 8 lbs	(52 8% of total vehicle weight)	
Total delivered weight	4633 6 lbs		

Calculation of test vehicle's target test weight:

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (4633 6 lbs)

DSC = Designated Seating Capacity (5)

RCLW[1] = 300 lbs

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

Target test weight = 4633 6 + 300 + 334 = 5267.6 lbs

Weight of test vehicle with two dummies and 302 7 lbs of cargo weight

Right front	1166 2 lbs	Right rear	1476 2 lbs
Left front	1138.5 lbs	Left rear	1489.4 lbs
Total front weight	2304 7 lbs	(43 7% of total vehicle weight)	
Total rear weight	2965 6 lbs	(56 3% of total vehicle weight)	
Total test weight	5270 3 lbs		

Remarks:

Weight of ballast secured in vehicle cargo area: None

Components removed to meet target test weight: None

[1] RCLW is the vehicle's cargo capacity or 300 lbs, whichever is less.

General Test and Vehicle Parameter Data for the Sled Test Vehicle, Cont'd.

Test Vehicle Attitude:

As delivered door sill angle: 1.2° Nose Down

As tested door sill angle: 1.0° Nose Down

Fully loaded door sill angle: 0 9° Nose Down

Vehicle Wheelbase: 100 inches

Fuel System Data:

Fuel system capacity from owner's manual: 25 0 gallons

Useable capacity figure furnished by COTR: 25.09 gallons

Remarks: The roll angle measurements were within 1 inch of each other. The left and right side measurements were 32.4 inches.

Post-Impact Data

Test number	S010306
NHTSA number:	C10600
Test date·	03/06/01
Test time·	1437
Test type·	Alternate FMVSS 208 Sled Test
Impact angle·	0°
Ambient temperature at impact area·	71° F
Temperature in occupant compartment	71° F

Sled carriage velocity:

Integrated velocity from the integration of the entire sled acceleration	29 4 mph
Measured velocity from the light trap device attached to the sled (backup)·[1]	28 6 mph
Specified integrated velocity range·	28 0 to 30 0 mph

Sled carriage acceleration:

Acceleration:[1]	17 2 g
Specified acceleration range·	16 0 g - 18 2 g

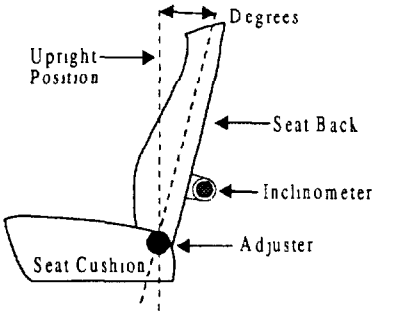
Sled carriage acceleration duration·

Time from T-0(-0.5 g) to 0 0 g·	123.2 ms
Specified acceleration duration·	120 - 130 ms

[1] See Data Acquisition Explanations

Seat and Steering Column Positioning Data

Vehicle: 2001/Land Rover/Discovery/MPV NHTSA No : C10600



Front Seat Assembly
Left Side View

Nominal Design Riding Position:

Driver Seat: Seat Back Angle = 23° Power adjustable. The seat was positioned using the J826 manikin and adjusting the seat to give a manikin torso angle of 23°. The seat back was remeasured at 23° on test day with an inclinometer on the seat back frame with the cover and foam cut away

Passenger Seat: Seat Back Angle = 23° Power adjustable The seat was positioned using the J826 manikin and adjusting the seat to give a manikin torso angle of 23°. The seat back was remeasured at 23° on test day with an inclinometer on the seat back frame with the cover and foam cut away.

Seat Fore and Aft Positions:

Driver Seat: Mid - The power seat was moved full forward and its position marked then moved full rearward and its position marked. The mid-point was established at the measured center between the marks. Full length of travel = 245 mm.

Passenger: Mid - The power seat was moved full forward and its position marked then moved full rearward and its position marked. The mid-point was established at the measured center between the marks. Full length of travel = 245 mm.

Steering Column Adjustments:

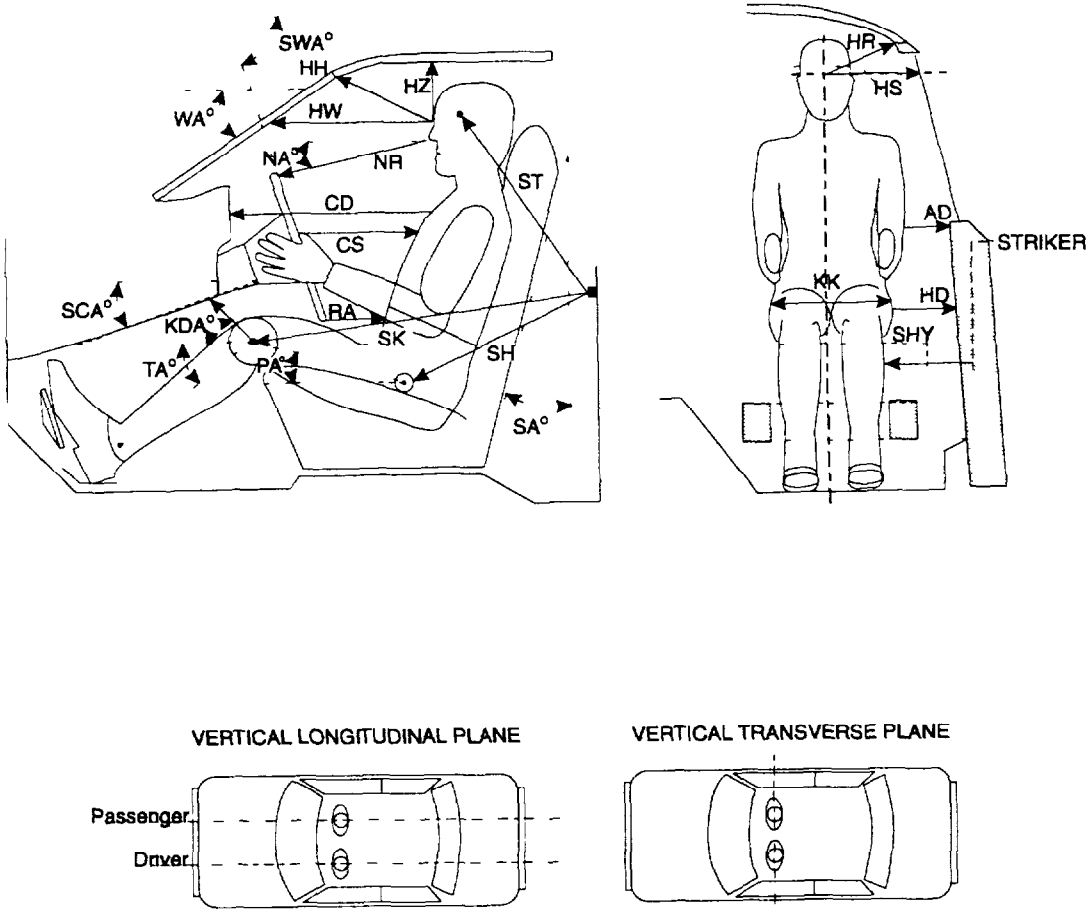
The steering column was adjustable. It was positioned in the center detent of three detents

Dummy Measurement Data for Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #339)	Passenger (Serial #230)
WA	Windshield angle	48 3°	N/A
SWA	Steering wheel angle	24 4°	N/A
SCA	Steering column angle	25 0°	N/A
SA	Seat back angle	23°	23 °
HZ	Head to roof	8 9 in	8 7 in
HH	Head to header	17 7 in	17 5 in
HW	Head to windshield	20 8 in	20 7 in
HR	Head to side header	10 0 in	10 2 in
NR	Nose to rim	14 8 in	N/A
NA	Nose to rim angle	20°	N/A
CD	Chest to dash	19 1 in	18 1 in
CS	Steering wheel to chest	9 3 in	N/A
RA	Rim to abdomen	5 4 in	N/A
KDL	Left knee to dash	4 1 in	3 8 in
KDR	Right knee to dash	4 1 in	3 9 in
KDA	Outboard knee to dash angle	23 0°	20 0°
PA	Pelvis angle	23 2°	24 6°
TA	Tibia angle	46 6°	47 4°
KK	Knee to knee	11 3 in	10 6 in
ST[1]	Striker to head	27 2 in	27 6 in
	Striker to head angle	81 6°	78 3°
SK[1]	Striker to knee	25 4 in	25 6 in
	Striker to knee angle	-9 0°	-9 7°
SH[1]	Striker to H-point	9 6 in	10 2 in
	Striker to H-point angle	-1 9°	-4 9°
SHY	Striker to H-point (Y dir)	7 3 in	6 8 in
HS	Head to side window	11 4 in	11.8 in
HD	H-point to door	5 3 in	5 0 in
AD	Arm to door	2 4 in	2 5 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 below the striker

Dummy Measurement Locations for Front Seat Occupants



Descriptions of Dummy Measurements

When a level is to be used, it is to ensure that the line containing the two points described is either parallel or perpendicular to the ground If a measurement to be made is less than 10 inches ignore the directions to use a level and approximate a level measurement Also, when a measurement is to be taken to or from the center of a bolt on the dummy, take the measurement from the center of the bolt hole if the bolt is recessed

The following measurements are to be made within a vertical longitudinal plane.

* HH Head to Header, taken from the point where the dummy's nose meets his forehead (between his eyes) to the furthest point forward on the header

* HW Head to Windshield, taken from the point where the dummy's nose meets his forehead (between his eyes) to a point on the windshield Use a level

HZ Head to Roof, taken from the point where the dummy's nose meets his forehead (between his eyes) to the point on the roof directly above it Use a level

* CS Steering Wheel to Chest, taken from the center of the steering wheel hub to the dummy's chest Use a level

* CD Chest to Dash, place a tape measure on the tip of the dummy's chin and rotate five inches of it downward toward the dummy to the point of contact on the transverse center of the dummy's chest Then measure from this point to the closest point on the dashboard either between the upper part of the steering wheel between the hub and the rim, or measure to the dashboard placing the tape measure above the rim, whichever is a shorter measurement See diagram

RA Steering Wheel Rim to Abdomen, taken from the bottommost point of the steering wheel rim horizontally rearward to the dummy Use a level

NR Nose to Rim, taken from the tip of the dummy's nose to the closest point on the top of the steering wheel rim Also indicate the angle this line makes with respect to the horizontal (NA)

*[1] KDL, KDR Left and Right Knees to Dashboard, taken from the center of the knee pivot bolt's outer surface to the closest point forward acquired by swinging the tape measure in continually larger arcs until it contacts the dashboard. Also reference the angle of this measurement with respect to the horizontal for the outboard knee (KDA) See diagram

* Measurement used in Data Tape Reference Guide

[1] Only outboard measurement is referenced in Data Tape Reference Guide

SH, SK, ST — Striker to Hip, Knee, and Head, these measurements are to be taken in the X-Z plane measured from the forward most center point on the striker to the center of the H-point, outer knee bolt, and head target. When taking this measurement a firm device that can be rigidly connected to the striker should be used Use a level The angles of these measurements with respect to the horizontal should also be recorded The measurement in the Y (transverse) direction from the striker to the H-point should also be taken (SHY) See diagram.

The following measurements are to be made within a vertical transverse plane.

HS — Head to Side Window, taken from the point where the dummy's nose meets his forehead (between his eyes) to the outside of the side window. In order to make this measurement, roll the window down to the exact height which allows a level measurement. Use a level. See diagram.

* AD — Arm to Door, taken from the outer surface of the elbow pivot bolt on a Hybrid II dummy to the first point it hits on the door. In the case of a Hybrid III dummy, measure from the bolt on the outer biceps. When a SID is used make the measurement from the center of the bottom of the arm segment where it meets the dummy's torso

* HD — H-point to Door, taken from the H-point on the dummy to the closest point on the door Use a level

* HR — Head to Side Header, measure the shortest distance from the point where the dummy's nose meets his forehead (between his eyes) to the side edge of the header just above the window frame, directly adjacent to the dummy.

SHY — Striker to H-point, taken from a rod rigidly connected to the forward most center point on the striker to the H-point. Use a level See diagram.

KK — Knee to Knee, for Hybrid II dummies measure the distance between knee pivot bolt head outer surfaces. For Hybrid III dummies measure the distance between the outboard knee clevis flange surfaces. (This measurement may not be exactly transverse.)

Angles

SA — Seat Back Angle, find this angle using the instructions provided by the manufacturer. If the manufacturer doesn't provide clear instructions contact the COTR.

* Measurement used in Data Tape Reference Guide

Descriptions of Dummy Measurements, Cont'd

PA Pelvis or Femur Angle, taken by inserting the pelvic angle gauge into the H-point gauging hole on the SID or the Hybrid III dummies and taking this angle with respect to the horizontal Measure the angle of the line connecting the H-point hole and the outer knee pivot bolt hole on a Hybrid II dummy with respect to the horizontal, to find the femur angle

SWA Steering Wheel Angle, find this by placing a straight edge against the steering wheel rim along the longitudinal plane Then measure the acute angle of the straight edge with respect to the horizontal

SCA Steering Column Angle, measured with respect to the horizontal by placing an inclinometer on the center of the underside of the steering column

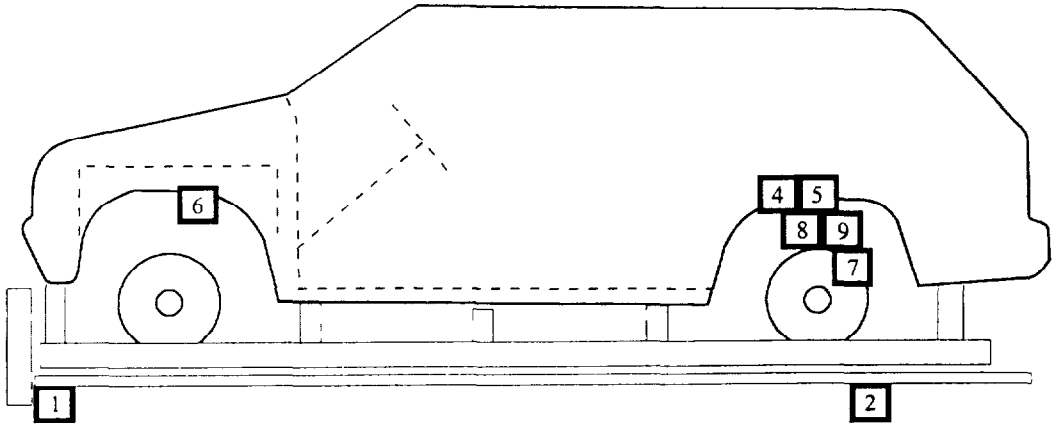
NA Measure the angle made when taking the measurement NR with respect to the horizontal

KDA Knee to Dash Angle, the angle that the measurement KD is taken at with respect to the horizontal Only get this angle for the outboard knee See diagram

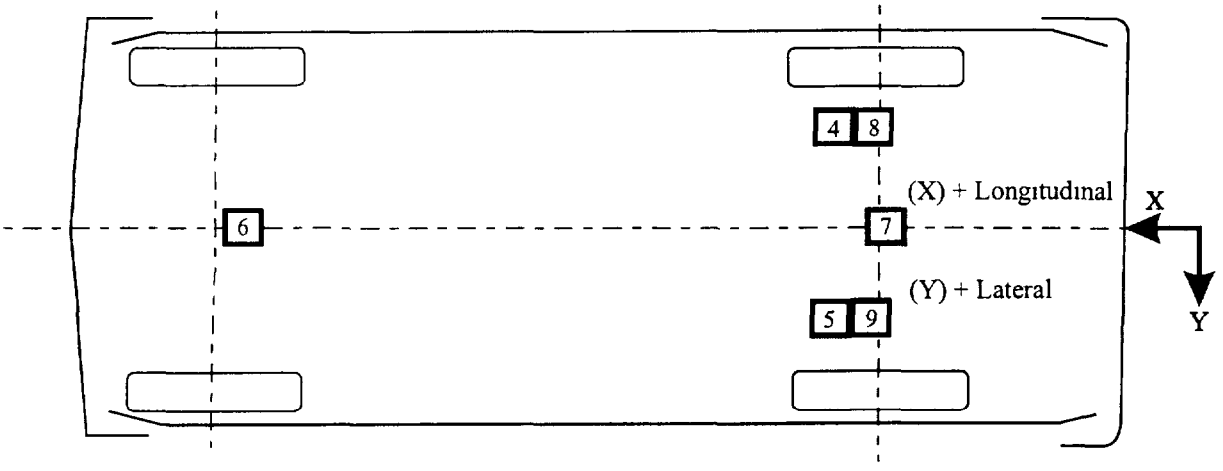
WA Windshield Angle, place an inclinometer along the transverse center of the windshield exterior (measurement is made with respect to horizontal)

TA Tibia Angle, use a straight edge to connect the dummy's knee and ankle bolts Then place an inclinometer on the straight edge and measure the angle with respect to the horizontal.

Vehicle Accelerometer Placement



Side View



Bottom View

Vehicle Data Summary and Accelerometer Locations

TEST NUMBER: S010306 No. LOCATION	X	Y	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 SLED ACCELERATION PRIMARY [1]	165.6 in	-1.0 in	0.8 g	@ 126.5 ms	17.2 g	@ 53.9 ms
2 SLED ACCELERATION - BACKUP			1.0 g	@ 126.1 ms	17.9 g	@ 57.1 ms
3 SLED VELOCITY						
MEASURED [1]			0.1 mph	@ 4.4 ms	28.6 mph	@ 150.4 ms
INTEGRATED			0.0 mph	@ 4.4 ms	29.4 mph	@ 152.6 ms
4 LEFT BODY AT REAR SEAT LONGITUDINAL	54.2 in	-15.9 in	2.0 g	@ 130.6 ms	20.7 g	@ 46.4 ms
5 RIGHT BODY AT REAR SEAT LONGITUDINAL	54.2 in	17.3 in	1.9 g	@ 130.3 ms	21.5 g	@ 43.7 ms
6 TOP ENGINE LONGITUDINAL	151.0 in	1.0 in	4.7 g	@ 142.9 ms	20.4 g	@ 62.2 ms
7 REAR AXLE LONGITUDINAL	52.1 in	-0.6 in	2.0 g	@ 128.4 ms	21.3 g	@ 43.9 ms
8 LEFT VEHICLE FRAME LONGITUDINAL [1]	57.8 in	-15.7 in	23.6 g	@ 45.2 ms	19.0 g	@ 55.6 ms

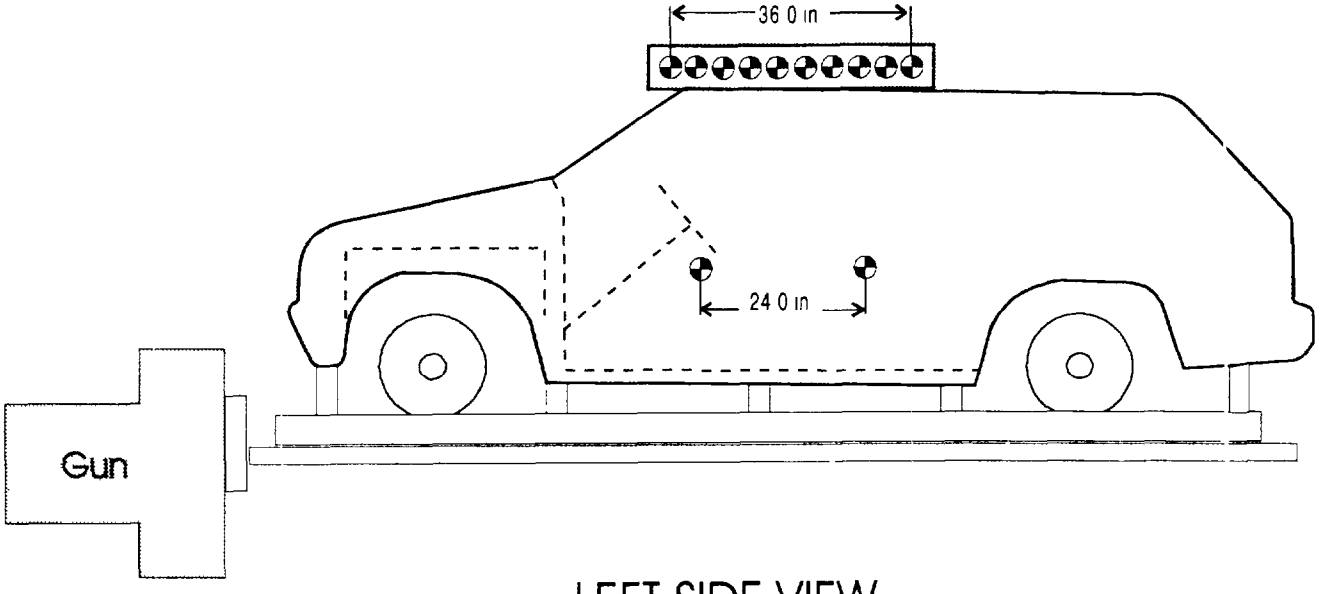
Vehicle Data Summary and Accelerometer Locations, Cont'd

TEST NUMBER: S010306 No. LOCATION	X	Y	POSITIVE DIRECTION		NEGATIVE DIRECTION	
9 RIGHT VEHICLE FRAME LONGITUDINAL [1]	57.2 in	15.6 in	1.8 g	@ 131.3 ms	40.0 g	@ 104.8 ms
10 DRIVER AIRBAG EVENT			1.0 volt	@ 21.6 ms	---	---
11 PASSENGER AIRBAG EVENT			1.0 volt	@ 21.6 ms	---	---

REFERENCE: X: + FORWARD FROM VEHICLE REAR SURFACE
Y: + RIGHTWARD FROM SLED CARRIAGE CENTERLINE

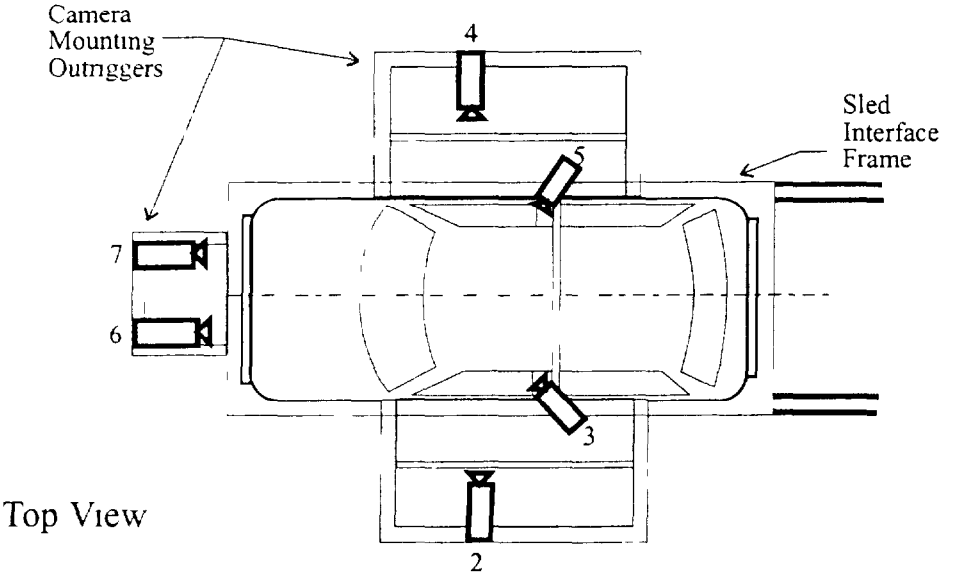
[1]See Data Acquisition Explanations.

REFERENCE PHOTO TARGETS



LEFT SIDE VIEW

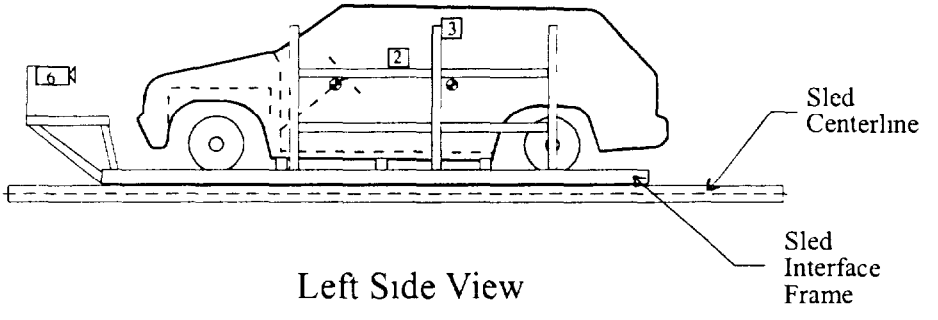
Camera Positions



Top View

Camera Frame Rates
#1 = 24 fps
All Others = 1,000 fps

Real-Time
Camera



Left Side View

Motion Picture Camera Locations

Vehicle year/make/model/body style: 2001/Land Rover/Discovery/MPV NHTSA No · C10600 Test Number: S010306

Camera Number	View	Camera Positions[1] X	Y	Z	Camera Angle[2]	Film Plane to Head Target	Camera Lens	Film Speed
1	Left side view offboard	93.0 in	311 1 in	53 0 in	0°	290 0 in	10 mm	24 frames/s
2	Left side view wide	75.4 in	72.0 in	52 0 in	-0.3°	53 2 in	8 mm	1000 frames/s
3	Left side view over shoulder	99.0 in	49 6 in	63 4 in	13 0°	31.9 in	8 mm	1005 frames/s
4	Right side view wide	76.5 in	91.2 in	51 1 in	-6 2°	72.7 in	13 mm	977 frames/s
5	Right side view over shoulder	101.4 in	48.9 in	63.5 in	11.3°	33 4 in	8 mm	1002 frames/s
6	Front view - driver	26 5 in	18.2 in	62.0 in	6 1°	59 3 in	8 mm	992 frames/s
7	Front view - passenger	26.8 in	15 7 in	61.1 in	6 7°	58 8 in	8 mm	997 frames/s

[1] X· Film plane to front of sled
Y: Film plane to sled centerline
Z· Film plane to top of sled

[2] Angle: Film plane of camera downward from horizontal plane

FMVSS 208 Occupant Injury Data

Vehicle: 2001/Land Rover/Discovery/MPV NHTSA No.: C10600 Date: 03/06/01

Maximum Acceleration Values (g's)[1]	Driver Dummy #339	Passenger Dummy #230
Head Channel X	-29.8	-37.3
Head Channel Y	-4.5	-30.0
Head Channel Z	13.1	16.4
HEAD RESULTANT	32 8	46.3
Chest Channel X	-34 6	-30.4
Chest Channel Y	-2 2	-5.9
Chest Channel Z	-7.7	15.8
CHEST RESULTANT	34.6	34.0

Head Injury Criteria (HIC) Values:

HIC	99	263
t_1 = (ms)	80 24	86.96
t_2 = (ms)	116.24	121.12

[The maximum time interval from t_1 to t_2 is 36 milliseconds]

Chest Injury Criteria (Clip) Values: (g's)

CLIP	34.0	33 5
t^1 = (ms)	87.92	93.92
t^2 = (ms)	90.96	96.96
Chest Deflection (in)	1.3	0.5

[1] Sign Convention per SAE J211, MAR95

FMVSS 208 Occupant Injury Data, Cont'd.

Vehicle: 2001/Land Rover/Discovery/MPV NHTSA No C10600 Date: 03/06/0

Max Compressive Femur Forces (lbs.):	Driver Dummy #339	Passenger Dummy #230
Left Side (lbs)	1075	1118
Right Side (lbs)	1290	1218

Neck Injury Criteria:	Driver Dummy #339	Passenger Dummy #230
Peak Flexion Bending Moment (N-m)	41 0	54 2
Peak Extension Bending Moment (N-m)	4 8	17 7
Peak Axial Tension (N)	N/A[1]	504
Peak Axial Compression (N)	118	558
Peak Positive X-axis Shear (N)	713	1203
Peak Negative X-axis Shear (N)	150	222

[1] See Data Acquisition Explanations

FMVSS 208 Seat Belt Warning System Check

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No : C10600 Technician: S. Bell and N. Kinney Date: 02/15/2001

Complete the following to determine which seat belt warning system option (S7.3(a)(1) or S7 3(a)(2)) is used. (Manufacturers may use either option.)

A With occupant in driver's position and lap belt in stowed position and ignition switch placed in "Start/On" position:

A 1 S7 3(a)(1)
Time duration of audible warning signal = seconds
(4 to 8 seconds)

Time duration of reminder light operation = seconds
(no less than 60 seconds)

A 2 S7.3(a)(2)
Time duration of audible warning signal = 5 seconds
(4 to 8 seconds) (see 49 USCS @ 30124)

Time duration of reminder light operation = 5 seconds
(4 to 8 seconds)

B With occupant in driver's position and lap belt in use and the ignition switch placed in "Start/On" position:

B 1 S7.3(a)(1)
Time duration of audible warning signal = seconds
(audible warning should not operate)

Time duration of reminder light operation = seconds
(reminder light does not operate)

B 2 S7.3(a)(2)
Time duration of audible warning signal = 0 seconds
(audible warning should not operate)

Time duration of reminder light operation = 5 seconds
(4 to 8 seconds)

C. Note wording of visual warning:
Fasten Seat Belt ___
Fasten Belt ___
Symbol 101 ☒

FMVSS 208 Readiness Indicator

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No · C10600 Technician· S. Bell and N Kinney Date· 02/15/2001

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator A totally mechanical system is exempt from this requirement (11/8/94 legal interpretation)

Is the system totally mechanical?

Yes-☐; No-☒

Describe the location of the readiness indicator· Right side of instrument panel

Is the readiness indicator clearly visible to the driver?

Yes-☒; No-☐

Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?

Yes-☒; No-☐;

FMVSS 208 Air Bag Labels

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No : C10600 Technician: S. Bell, N. Kinney, R. Stoner Date: 02/15/2001

1 Air Bag Maintenance Label and Owner's Manual Instructions:

1 1 Does the manufacturer recommend periodic maintenance or replacement of the air bag?

☒ Yes (Go to 1.2)

☐ No (Go to 2)

1 2 Does the Vehicle have a maintenance or replacement label?

☒ Yes-Pass ☐ **No-Fail**

1 3 Does the label contain one of the following? ☐ Yes-Pass ☐ **No-Fail**

☐ Schedule on label specifies month and year

☐ Schedule on label specifies vehicle mileage

☒ Schedule on label specifies interval measured from date on certification label

1.4 Is the label permanently affixed within the passenger compartment?

☒ Yes-Pass ☐ **No-Fail**

1.5 Is the label lettered in English?

☒ Yes-Pass ☐ **No-Fail**

1 6 Is the label in block capitals and numerals?

☐ Yes-Pass ☒ **No-Fail**

1 7 Are the letters and numerals at least 3/32 inch high?

☒ Yes-Pass ☐ **No-Fail**

1.8 Does the owner's manual set forth the recommended schedule for maintenance or replacement?

☒ Yes-Pass ☐ **No-Fail**

2. Does the owner's manual: (S4.5.1 (f))

2.1 Include a description of the vehicle's air bag system in an easily understandable format? ☒ Yes ☐ **No-Fail**

2.2 Include a statement that the vehicle is equipped with an air bag and a lap/shoulder belt at the front outboard seating positions?

☒ Yes ☐ **No-Fail**

FMVSS 208 Air Bag Labels, Cont'd.

2 3 Include a statement that the air bag is a supplemental restraint at the front outboard seating positions? ☒ Yes ☐ **No-Fail**

2 4 Emphasize that all occupants, including the driver, should always wear their seat belts whether or not an air bag is also provided at their seating positions to minimize the risk of severe injury or death in the event of a crash?
☒ Yes ☐ **No-Fail**

2 5 Provide any necessary precautions regarding the proper positioning of occupants, including children, at seating positions equipped with air bags to insure maximum safety protection for those occupants?
☒ Yes ☐ **No-Fail**

2 6 Explain that no objects should be place over or near the air bag on the steering wheel or on the instrument panel, because any such objects could cause harm if the vehicle is in a crash severe enough to cause the air bag to inflate?
☒ Yes ☐ **No-Fail**

3 Does the Vehicle:

3 1 Provide an automatic means to ensure that the air bag does not deploy when a child seat or child with a total mass of 30 kg or less is present on the front outboard seat? ☐ Yes ☒ No

3 2 Incorporate sensors, other than or in addition to weight sensors, which automatically prevent the passenger air bag from deploying in situations in which it might have an adverse effect on infants in rear-facing child seat, and unbelted or improperly belted children? ☐ Yes ☒ No

3 3 Have a passenger air bag designed to deploy in a manner that does not create a risk of serious injury to infants in rear-facing child seats, and unbelted or improperly belted children? ☐ Yes ☒ No

If yes to 3.1, or 3.2, or 3.3, the vehicle is not required to have a Sun Visor Warning Label (S4 5 1(b)), an air bag alert label (S4.5 1(c)) or a label on the dash (S4 5 1(e)) and **this check sheet is complete. (S4.5.1) If no to 3.1, 3.2, and 3.3, go to 4.**

FMVSS 208 Air Bag Labels, Cont'd.

4 Sun Visor Warning Label

4 1 Is the label permanently affixed (may be permanent marking or molding) to either side of the sun visor at each front outboard seating position with an air bag?

Driver side ☒ Yes-Pass ☐ **No-Fail**
Passenger side ☒ Yes-Pass ☐ **No-Fail**

4.2 Does the label conform in content (**vehicles without back seats may omit the statement: "The BACK SEAT is the SAFEST place for children."**) (S4 5 1(b)(2)(v)) to the label shown in either Figure 6a or 6b as appropriate at each front outboard seating position with an air bag? (S4 5.1(b)(2))

4 2 1 Dual air bags

Driver side ☒ Yes-Pass ☐ **No-Fail**
Passenger side ☒ Yes-Pass ☐ **No-Fail**

4 2 2 Vehicles with driver air bag ONLY - either 4.2.1 or 4 2 2 is applicable, not both (S4 5 1(b)(2)(iv))

4 2.2 1 Does the label conform on content to the label shown in either Figure 6a or 6b as appropriate?

☒ N/A
Driver side ☐ Yes-Pass ☐ **No-Fail**

4 2 2 2 Does the label conform in content to the label shown in Figure 6a where the label can be modified to omit the pictogram and the message may read·

DEATH or SERIOUS INJURY can occur.
. Sit as far back as possible from the air bag
. ALWAYS use SEAT BELTS and CHILD RESTRAINTS.
. The BACK SEAT is the SAFEST place for children.

☒ N/A
Driver side ☐ Yes-Pass ☐ **No-Fail**

SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION

LABEL OUTLINE, VERTICAL AND HORIZONTAL LINE BLACK

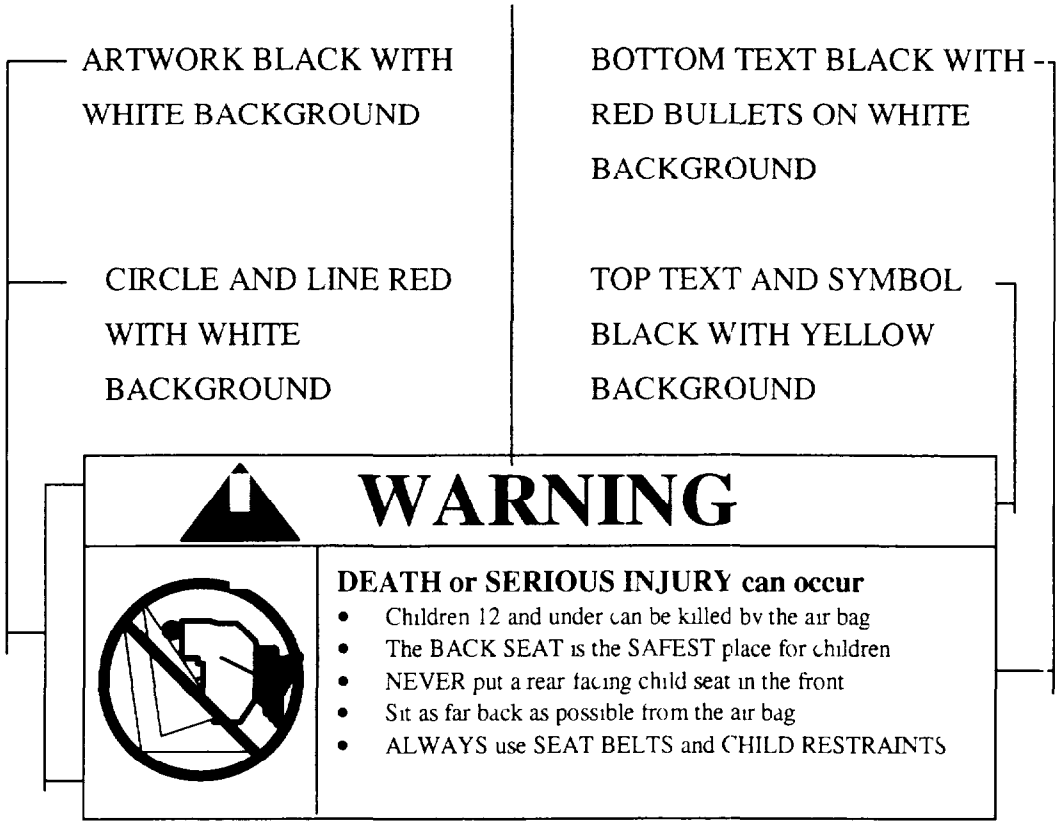


Figure 6a
(S4.5.1(b)(2))

SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION

LABEL OUTLINE, VERTICAL AND HORIZONTAL LINE BLACK

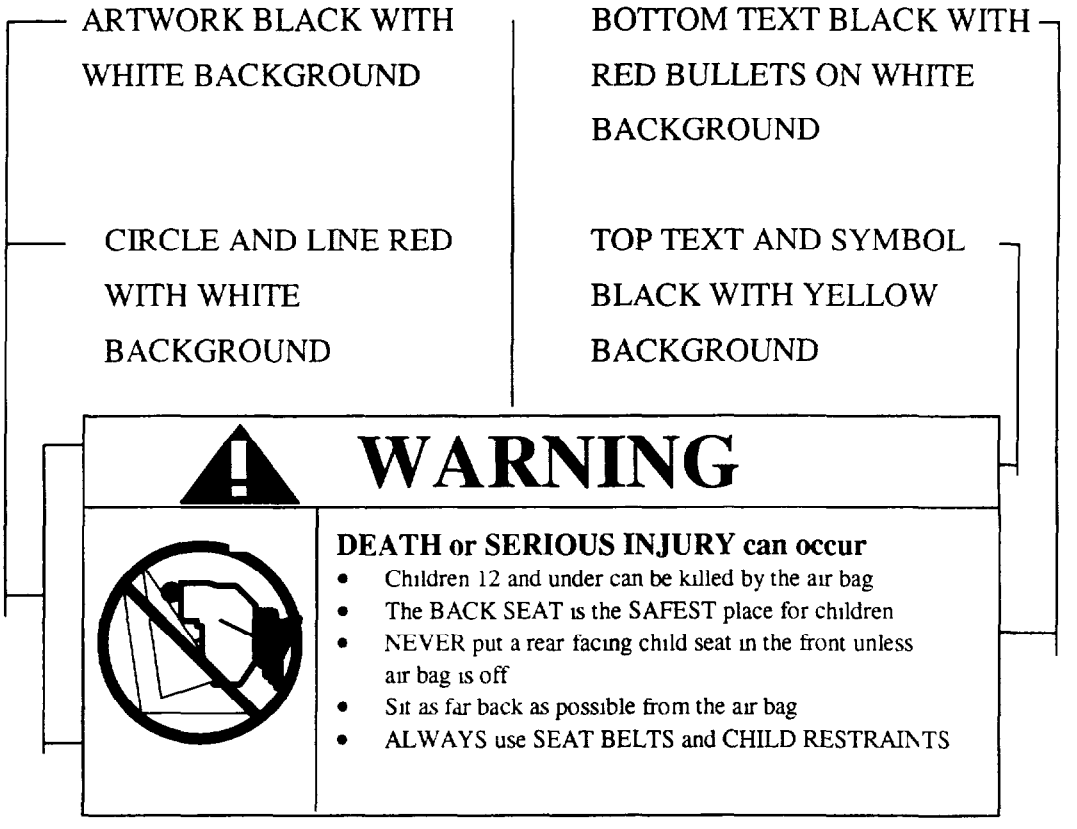


Figure 6b
(S4 5 1(b)(2))

4.3 Is the driver side label heading area yellow with the word "warning" and the alert symbol in black? (S4.5.1.(b)(2)(i))

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☒ Yes-Pass ☐ **No-Fail**

4.4 Is the message white with black text? (S4.5.1 (b)(2)(ii))

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☐ No air bag ☒ Yes-Pass ☐ **No-Fail**

4.5 Is the message area at least 30 cm^2? (S4.5.1(b)(2)(ii))

Actual message area, driver side **31.5** cm^2

Actual message area, passenger side **31.5** cm^2

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☐ No air bag ☒ Yes-Pass ☐ **No-Fail**

FMVSS 208 Air Bag Labels, Cont'd.

4 6 Is the pictogram black with a red circle and slash on a white background? (S4 5 1(b)(2)(iii)) & (S4.5 1(b)(2)(iv))

For vehicles with driver side air bag ONLY ☐ N/A

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☐ No air bag ☒ Yes-Pass ☐ **No-Fail**

4 7 Is the pictogram at least 30 mm in diameter? (S4 5 1(b)(2)(iii))
Actual diameter, driver side 33 mm
Actual diameter, passenger side 33 mm

For vehicles with driver side air bag ONLY ☐ N/A

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☐ No air bag ☒ Yes-Pass ☐ **No-Fail**

4 8 Is the same side of the sun visor to which the sun visor label is affixed free of other information with the exception of an air bag maintenance label (S4.5 1(b)(3)) and/or rollover warning label specified in 49 CFR Part 575 §575 105?

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☐ No air bag ☒ Yes-Pass ☐ **No-Fail**

4.9 Is the sun visor free of other information about air bags or the need to wear seat belts with the exception of the air bag alert label or the utility vehicle label?

Driver side ☒ Yes-Pass ☐ **No-Fail**

Passenger side ☐ No air bag ☒ Yes-Pass ☐ **No-Fail**

5 Air Bag Alert Label

5 1 Is the Sun Visor Warning Label visible when the sun visor is in the stowed position?

Driver ☒ Yes ☐ No Passenger ☒ Yes ☐ No **If yes, go to 6**

5 2 Does the label conform in content to the label shown in Figure 6c? (S4.5.1(c)(2))

☐ Yes-Pass ☐ **No-Fail**

SUN VISOR LABEL VISIBLE WHEN VISOR IS IN UP POSITION

Circle and Line Red with White Background

Artwork Black with White Background

Text Yellow with Black Background

Figure 6c
(S4 5 1(c)(2))

FMVSS 208 Air Bag Labels, Cont'd.

5.3 Is the message area black with yellow text? (S4.5.1(c)(2)(i))

☐ Yes-Pass ☐ **No-Fail**

5.4 Is the message area at least 20 cm^2? (S4.5.1(c)(2)(i))

Actual message area ___ cm^2 ☐ Yes-Pass ☐ **No-Fail**

5.5 Is the pictogram black with a red circle and slash on a white background? (S4.5.1(c)(2)(ii))

For vehicles with driver side air bag ONLY ☐ N/A

☐ Yes-Pass ☐ **No-Fail**

5.6 Is the pictogram at least 20 mm in diameter? (S4.5.1(c)(2)(ii))

Actual diameter is ___ mm

For vehicles with driver side air bag ONLY ☐ N/A

☐ Yes-Pass ☐ **No-Fail**

6 Label On the Dash

6.1 Does the vehicle have a passenger air bag?

☒ Yes ☐ No

If no, this check list is complete.

6.2 Does the vehicle have a label on the dash or steering wheel hub? (S4.5.1(e))

☒ Yes-Pass ☐ **No-Fail**

6.3 Does the label conform in content **(vehicles without back seats may omit the statement: "The back seat is the safest place for children 12 and under.")** (S4.5.1(e)(iii)) to the label shown in Figure 7? (S4.5.1(e))

☒ Yes-Pass ☐ **No-Fail**

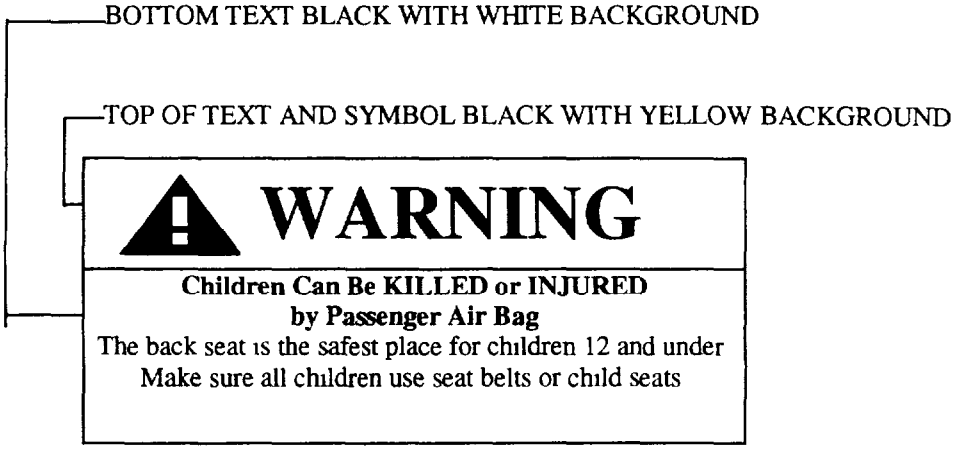


Figure 7
(S4.5.1(e))

FMVSS 208 Air Bag Labels, Cont'd.

6 4 Is the heading area yellow with the word "warning" and the alert symbol in black? (S4 5 1(e)(i))

☒ Yes-Pass ☐ **No-Fail**

6 5 Is the message white with black text? (S4 5.1(e)(ii))

☒ Yes-Pass ☐ **No-Fail**

6 6 Is the message area at least 30 cm^2? (S4 5 1(e)(ii))
Actual message area **32.6** cm^2 ☒ Yes-Pass ☐ **No-Fail**

FMVSS 208 Rear Outboard Seating Position Seat Belts

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No.: C10600 Technician: Ronald D. Stoner Date: 03/06/01

Do all rear outboard seating positions have type 2 seat belts?

Yes-☒; No-☐; N/A ☐ (No Back Seat)

If No, describe the seat belt installed, the seat location, and any other information about the seat that would explain why a type 2 belt was not installed.

FMVSS 208 Lap Belt Lockability

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less (S7.1 1 5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic retractors (S7 1 1 5(c))

Vehicle Model Year/Make/Model/Body Style 2001/Land Rover/Discovery/MPV

NHTSA No · C10600 Technician· S Bell and N Kinney Date· 02/19/2001

Designated Seating Position Right Front

☒1 Record test seat position· Mid
(S7 1 1 5(c)(1)) (Any position is acceptable.)

☒2 Buckle the seat belt. (S7 1 1 5(c)(1))

☒3 Complete any procedures recommended in the vehicle owner's manual to activate any locking feature (S7 1 1 5(c)(1))

☒4 Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7 1 1 5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒5 Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7 1 1 5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒6 Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?

If yes, go to 6 1. If no, go to 7. ☒ Yes ☐ No

6 1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1 5(b)) ☒ Yes-Pass ☐ **No-Fail**

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No.: C10600 Technician: S. Bell and N. Kinney Date: 02/19/2001

Designated Seating Position: Right Front

☒7. Locate a reference point A on the seat belt buckle. (S7.1.1.5(c)(2))

☒8 Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly (S7.1.1.5(c)(2))

☒9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7 1 1.5(c)(2))

☒10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7 1 1 5(c)(2)) Measured distance between A and B **66.9** inches

☒11 Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing (S7.1.1.5(c)(3))

☒12 To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7 1 1 5(c)(4)) Measured force application angle **10** degrees (Spec. 5~15 degrees)

☒13 Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1.5(c)(4)) Measured distance between A and B **30.7** inches.

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No: C10600 Technician: S Bell and N Kinney Date: 02/19/2001

Designated Seating Position: Right Front

☒14 Increase the load to 50 pounds at a rate of no more than 50 pounds per second Attain the load in not more than 5 seconds (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing (S7 1 1 5(c)(5))

Record onset rate **25** lbs/sec (spec 10 ~50 lb/sec)

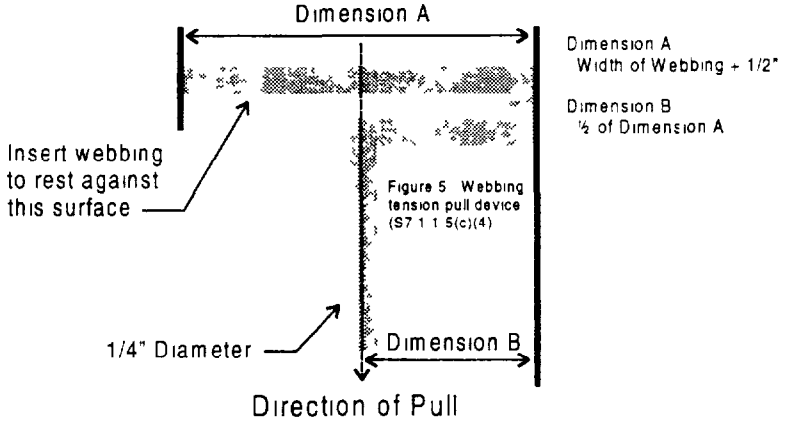
The measured distance between A and B is **31.1** inches (S7 1 1.5(c)(6))

☒15 Subtract the measurement in 13 from the measurement in 14 Is the difference 2 inches or less? (S7 1 1.5 (c)(7))

14-13= **0.4** inches ☒ Yes-Pass ☐ **No-Fail**

☒16 Subtract the measurement in 14 from the measurement in 10 Is the difference 3 inches or more? (S7 1 1.5(c)(8))

10-14= **35.8** inches ☒ Yes-Pass ☐ **No-Fail**



FMVSS 208 Lap Belt Lockability

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7 1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic retractors (S7.1.1.5(c))

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No : C10600 Technician: S. Bell and N Kinney Date: 02/19/2001

Designated Seating Position: Left Rear

☒1. Record test seat position: Non-adjustable (S7 1 1 5(c)(1)) (Any position is acceptable)

☒2 Buckle the seat belt (S7 1.1 5(c)(1))

☒3 Complete any procedures recommended in the vehicle owner's manual to activate any locking feature (S7 1 1 5(c)(1))

☒4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7.1.1.5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7.1.1.5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?

If yes, go to 6.1 If no, go to 7. ☒ Yes ☐ No

6 1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system (S7.1.1.5(b)) ☒ Yes-Pass ☐ **No-Fail**

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No · C10600 Technician: S Bell and N Kinney Date· 02/19/2001

Designated Seating Position· Left Rear

☒7 Locate a reference point A on the seat belt buckle (S7 1 1 5(c)(2))

☒8 Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly (S7 1 1 5(c)(2))

☒9 Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system (S7 1 1 5(c)(2))

☒10 Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly (S7 1 1 5(c)(2)) Measured distance between A and B **69.3** inches

☒11 Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing (S7 1 1 5(c)(3))

☒12 To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5 Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7 1 1 5(c)(4)) Measured force application angle **10** degrees (Spec 5~15 degrees)

☒13 Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7 1 1 5(c)(4)) Measured distance between A and B **30.4** inches

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No.: C10600 Technician: S Bell and N. Kinney Date: 02/19/2001

Designated Seating Position: Left Rear

☒14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1 1.5(c)(5))

Record onset rate **25** lbs/sec (spec. 10 ~50 lb/sec)

The measured distance between A and B is **30.7** inches (S7.1.1.5(c)(6))

☒15 Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5 (c)(7))

14-13= **0.3** inches ☒ Yes-Pass ☐ **No-Fail**

☒16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more? (S7.1.1 5(c)(8))

10-14= **38.6** inches ☒ Yes-Pass ☐ **No-Fail**

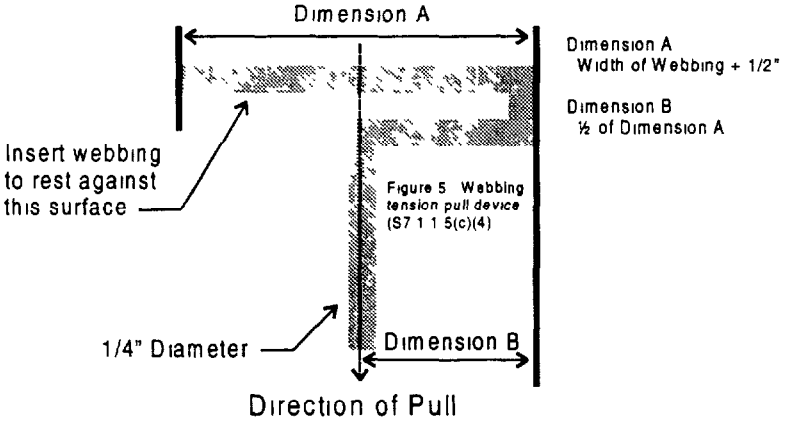


Figure 5 Webbing tension pull device (S7 1 1 5(c)(4)

FMVSS 208 Lap Belt Lockability

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1 1 5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic retractors (S7 1 1 5(c))

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No C10600 Technician: S Bell and N Kinney Date: 02/19/2001

Designated Seating Position Center Rear

☒1 Record test seat position Non-adjustable (S7 1 1 5(c)(1)) (Any position is acceptable)

☒2 Buckle the seat belt (S7 1 1 5(c)(1))

☒3 Complete any procedures recommended in the vehicle owner's manual to activate any locking feature (S7 1 1 5(c)(1))

☒4 Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7 1 1 5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒5 Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7 1.1 5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?

If yes, go to 6 1 If no, go to 7. ☒ Yes ☐ No

6 1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1 5(b)) ☒ Yes-Pass ☐ **No-Fail**

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No : C10600 Technician: S. Bell and N Kinney Date: 02/19/2001

Designated Seating Position: Center Rear

☒7. Locate a reference point A on the seat belt buckle. (S7 1.1 5(c)(2))

☒8 Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly. (S7.1.1.5(c)(2))

☒9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7 1.1 5(c)(2))

☒10 Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly. (S7.1.1 5(c)(2)) Measured distance between A and B **60.2** inches.

☒11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing (S7.1.1.5(c)(3))

☒12 To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. (S7.1 1 5(c)(4)) Measured force application angle **10** degrees. (Spec. 5~15 degrees)

☒13 Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1.1 5(c)(4)) Measured distance between A and B **20.5** inches.

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No · C10600 Technician· S Bell and N Kinney Date· 02/19/2001

Designated Seating Position Center Rear

☒14 Increase the load to 50 pounds at a rate of no more than 50 pounds per second Attain the load in not more than 5 seconds (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing (S7 1 1 5(c)(5))

Record onset rate **25** lbs/sec (spec 10 ~50 lb/sec)

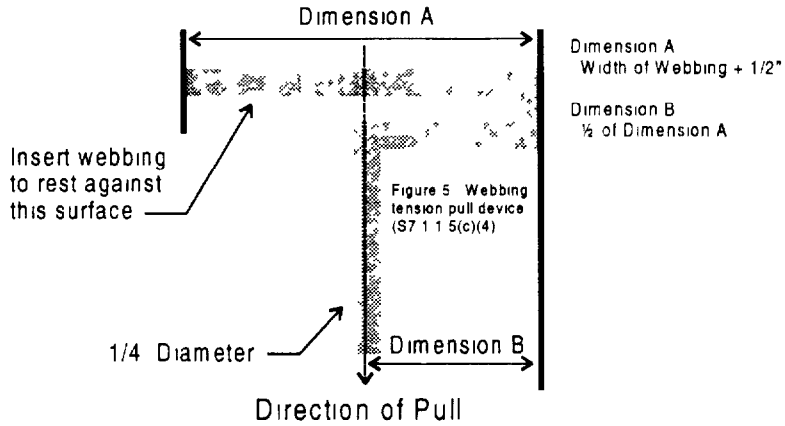
The measured distance between A and B is **21.5** inches (S7 1 1.5(c)(6))

☒15 Subtract the measurement in 13 from the measurement in 14 Is the difference 2 inches or less? (S7 1.1 5 (c)(7))

14-13= **1.0** inches ☒ Yes-Pass ☐ **No-Fail**

☒16 Subtract the measurement in 14 from the measurement in 10 Is the difference 3 inches or more? (S7 1 1 5(c)(8))

10-14= **38.7** inches ☒ Yes-Pass ☐ **No-Fail**



FMVSS 208 Lap Belt Lockability

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic retractors. (S7.1.1 5(c))

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No.: C10600 Technician: S Bell and N. Kinney Date: 02/19/2001

Designated Seating Position. Right Rear

☒1 Record test seat position: Non-adjustable (S7.1 1.5(c)(1)) (Any position is acceptable.)

☒2. Buckle the seat belt (S7 1.1 5(c)(1))

☒3 Complete any procedures recommended in the vehicle owner's manual to activate any locking feature (S7.1.1 5(c)(1))

☒4 Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part to the vehicle? (S7.1.1 5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒5 Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing? (S7 1.1.5(a)) ☒ Yes-Pass ☐ **No-Fail**

☒6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?

If yes, go to 6 1. If no, go to 7. ☒ Yes ☐ No

6.1 Does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system. (S7.1.1.5(b)) ☒ Yes-Pass ☐ **No-Fail**

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No : C10600 Technician: S Bell and N. Kinney Date: 02/19/2001

Designated Seating Position: Right Rear

☒7 Locate a reference point A on the seat belt buckle (S7 1 1 5(c)(2))

☒8 Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly (S7 1.1 5(c)(2))

☒9 Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system. (S7 1 1 5(c)(2))

☒10 Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly (S7 1 1 5(c)(2)) Measured distance between A and B **67.6** inches

☒11 Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing (S7 1 1 5(c)(3))

☒12 To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device in figure 5. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal (S7 1 1 5(c)(4)) Measured force application angle **10** degrees (Spec. 5~15 degrees)

☒13 Measure the length between points A and B along the longitudinal centerline of the webbing while the preload is being applied. (S7.1 1 5(c)(4)) Measured distance between A and B **32.8** inches

FMVSS 208 Lap Belt Lockability, Cont'd.

Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV

NHTSA No · C10600 Technician: S Bell and N. Kinney Date: 02/19/2001

Designated Seating Position· Right Rear

☒14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing. (S7.1.1.5(c)(5))

Record onset rate **25** lbs/sec (spec 10 ~50 lb/sec)

The measured distance between A and B is **32.8** inches (S7.1.1 5(c)(6))

☒15. Subtract the measurement in 13 from the measurement in 14. Is the difference 2 inches or less? (S7.1.1.5 (c)(7))

14-13= **0.0** inches ☒Yes-Pass ☐**No-Fail**

☒16. Subtract the measurement in 14 from the measurement in 10. Is the difference 3 inches or more? (S7.1.1.5(c)(8))

10-14= **34.8** inches. ☒Yes-Pass ☐**No-Fail**

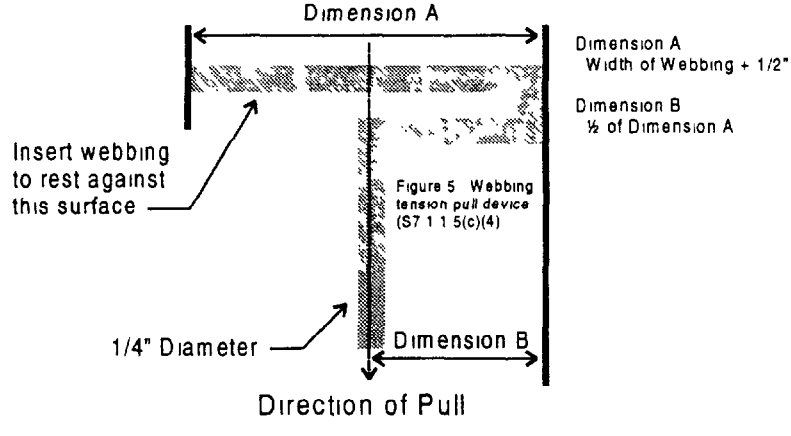


Figure 5 Webbing tension pull device (S7 1 1 5(c)(4)

FMVSS 208 Seat Belt Comfort And Convenience Test

Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No : C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Left Front
Date of Comfort and Convenience Check: 02/19/2001
Technician Performing Check: S Bell, N. Kinney, R Stoner
GVWR: 6064 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Does the vehicle incorporate a webbing tension-relieving device?

☐ Yes-go to latchplate access
☒ No-continue with this check sheet

2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8 1 2)

☒ Check
☐ N/A

3 If separately adjustable in a vertical direction, the seats are at the lowest position

☒ Check
☐ N/A

4. Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.

☒ Check
☐ N/A

5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR

☒ Check
☐ N/A

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Belt Contact Force (S7.4.3)

6. Place each adjustable head restraint in its highest adjustment position.

☒ Check
☐ N/A

7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8 1 3)

☒ Check
☐ N/A

8 Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure.

☒ Check

9. Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest (S10 8) Measure the contact force exerted by the belt webbing on the dummy's chest Contact the COTR if the contact force exceeds 0.7 pounds. Contact force is **0.5** pounds.

☒ 0.0 to 0.7 pounds - Pass
☐ **greater than 0.7 pounds - FAIL***

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

FMVSS 208 Seat Belt Comfort And Convenience Test

Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No.: C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Right Front
Date of Comfort and Convenience Check 02/19/2001
Technician Performing Check: S Bell, N Kinney, R Stoner
GVWR: 6064 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Does the vehicle incorporate a webbing tension-relieving device?

☐ Yes-go to latchplate access
☒ No-continue with this check sheet

2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions If an adjustment position does not exist midway between the forward most and rearmost positions the next closest adjustment position to the rear of the midpoint is used (S8 1 2)

☒ Check
☐ N/A

3 If separately adjustable in a vertical direction, the seats are at the lowest position

☒ Check
☐ N/A

4 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.

☒ Check
☐ N/A

5. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant This information will be furnished by the COTR

☒ Check
☐ N/A

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Belt Contact Force (S7.4.3)

6 Place each adjustable head restraint in its highest adjustment position.

☒ Check
☐ N/A

7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8.1.3)

☒ Check
☐ N/A

8. Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure.

☒ Check

9. Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest. (S10.8) Measure the contact force exerted by the belt webbing on the dummy's chest Contact the COTR if the contact force exceeds 0.7 pounds Contact force is **0.5** pounds.

☒ 0.0 to 0.7 pounds - Pass
☐ **greater than 0.7 pounds - FAIL***

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

FMVSS 208 Seat Belt Comfort And Convenience Test

Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No : C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Left Rear
Date of Comfort and Convenience Check: 02/19/2001
Technician Performing Check: S Bell, N. Kinney, R. Stoner
GVWR: 6064 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt

1 Does the vehicle incorporate a webbing tension-relieving device?

☐ Yes-go to latchplate access
☒ No-continue with this check sheet

2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8 1 2)

☐ Check
☒ N/A

3 If separately adjustable in a vertical direction, the seats are at the lowest position

☐ Check
☒ N/A

4. Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.

☐ Check
☒ N/A

5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.

☐ Check
☒ N/A

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Belt Contact Force (S7.4.3)

6. Place each adjustable head restraint in its highest adjustment position.

☒ Check
☐ N/A

7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position (S8 1 3)

☐ Check
☒ N/A

8 Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure

☒ Check

9 Fasten the seat belt latch Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest (S10.8) Measure the contact force exerted by the belt webbing on the dummy's chest Contact the COTR if the contact force exceeds 0.7 pounds. Contact force is **0.4** pounds.

☒ 0.0 to 0.7 pounds - Pass
☐ **greater than 0.7 pounds - FAIL***

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

FMVSS 208 Seat Belt Comfort And Convenience Test

Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No · C10600
Vehicle Model Year/Make/Model/Body Style· 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested· Center Rear
Date of Comfort and Convenience Check. 02/19/2001
Technician Performing Check· S Bell, N. Kinney, R Stoner
GVWR· 6064 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Does the vehicle incorporate a webbing tension-relieving device?

☐ Yes-go to latchplate access
☒ No-continue with this check sheet

2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpo nt is used. (S8 1 2)

☐ Check
☒ N/A

3 If separately adjustable in a vertical direction, the seats are at the lowest position

☐ Check
☒ N/A

4 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.

☐ Check
☒ N/A

5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR.

☐ Check
☒ N/A

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Belt Contact Force (S7.4.3)

6 Place each adjustable head restraint in its highest adjustment position.

☒ Check
☐ N/A

7 Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8 1 3)

☐ Check
☒ N/A

8 Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure.

☒ Check

9 Fasten the seat belt latch. Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest (S10.8) Measure the contact force exerted by the belt webbing on the dummy's chest. Contact the COTR if the contact force exceeds 0 7 pounds
Contact force is **0.4** pounds.

☒ 0.0 to 0.7 pounds - Pass
☐ **greater than 0.7 pounds - FAIL***

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

FMVSS 208 Seat Belt Comfort And Convenience Test

Belt Contact Force (S7.4.3)

Test Vehicle NHTSA No C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Right Rear
Date of Comfort and Convenience Check: 02/19/2001
Technician Performing Check: S Bell, N Kinney, R Stoner
GVWR 6064 pounds

Test all Type 2 seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Does the vehicle incorporate a webbing tension-relieving device?

☐ Yes-go to latchplate access
☒ No-continue with this check sheet

2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8 1 2)

☐ Check
☒ N/A

3 If separately adjustable in a vertical direction, the seats are at the lowest position.

☐ Check
☒ N/A

4. Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer.

☐ Check
☒ N/A

5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant This information will be furnished by the COTR

☐ Check
☒ N/A

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Belt Contact Force (S7.4.3)

6 Place each adjustable head restraint in its highest adjustment position

☒ Check
☐ N/A

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position (S8.1 3)

☐ Check
☒ N/A

8 Position the test dummy according to the dummy position placement instructions in Appendix B of the Laboratory Test Procedure

☒ Check

9. Fasten the seat belt latch Pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest Locate the point where the centerline of the upper torso belt webbing crosses the midsagittal line on the dummy's chest. At that point pull the belt webbing out 3 inches from the dummy's chest and release until it is within one inch from the dummy's chest (S10.8) Measure the contact force exerted by the belt webbing on the dummy's chest Contact the COTR if the contact force exceeds 0.7 pounds. Contact force is **0.4** pounds.

☒ 0.0 to 0 7 pounds - Pass
☐ **greater than 0.7 pounds - FAIL***

* If the seat belts are voluntarily installed by the manufacturer they do not have to comply.

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Latchplate Access (S7.4.4)

Test Vehicle NHTSA No.: C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Left Front
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check: S Bell, N Kinney, R Stoner
GVWR: 6064 pounds

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Position the seat in its forward most adjustment position ☒Check

2. Position the test dummy using the procedures in Appendix B of the Laboratory Test Procedure (Some modifications to the positioning procedure may need to be made because the seat s in its forward most position) ☒Check

3 Position the adjustable seat belt anchorage in the manufacturer's nominal design position for a 50th percentile adult male occupant ☒ Check

4 Attach the inboard and outboard reach string following the instructions on Figure 1C of the Laboratory Test Procedure ☒ Check

5 Place the latch plate in the stowed position ☒ Check

6 Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy's arms Is the latchplate within the reach envelope?

Yes-☒ Pass; No- ☐ **Fail**

7. Using the clearance test block, specified in Figure 2C of the Laboratory Test Procedu e, determine if there is sufficient clearance between the vehicle seat and the side of vehicle to allow the test block to move unhindered to the latchplate or buckle

Yes-☒ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Latchplate Access (S7.4.4)

Test Vehicle NHTSA No.: C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Right Front
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check: S Bell, N. Kinney, R. Stoner
GVWR: 6064 pounds

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt.

1 Position the seat in its forward most adjustment position. ☒Check

2. Position the test dummy using the procedures in Appendix B of the Laboratory Test Procedure. (Some modifications to the positioning procedure may need to be made because the seat is in its forward most position) ☒Check

3. Position the adjustable seat belt anchorage in the manufacturer's nominal design position for a 50th percentile adult male occupant. ☒ Check

4 Attach the inboard and outboard reach string following the instructions on Figure 1C of the Laboratory Test Procedure. ☒ Check

5 Place the latch plate in the stowed position. ☒ Check

6. Extend each line backward and outboard to generate arcs of the reach envelope of the test dummy's arms. Is the latchplate within the reach envelope?

Yes-☒ Pass; No- ☐ **Fail**

7. Using the clearance test block, specified in Figure 2C of the Laboratory Test Procedure, determine if there is sufficient clearance between the vehicle seat and the side of vehicle to allow the test block to move unhindered to the latchplate or buckle.

Yes-☒ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Retraction (S7.4.5)

Test Vehicle NHTSA No : C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Left Front
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check: S Bell and N Kinney
GVWR 6064 pounds

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Is the vehicle a passenger car or walk-in van-type vehicle? ☐ Yes ☒ No

If yes, go to seat belt guides and hardware.

2 Adjustable seats are in the adjustment position midway between the forward most and rearmost positions. If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8 1 2) ☒ Check

3 If separately adjustable in a vertical direction, the seats are at the lowest position ☒ Check

4 Place any adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer ☒ Check

5. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR ☒ Check

6. Place each adjustable head restraint in its highest adjustment position. ☒ Check

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Retraction (S7.4.5)

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8.1 3) ☒ Check

8. Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B of the Laboratory Test Procedure ☒ Check

9 Restrain the dummies using the belt systems for the position being tested ☒ Check

10. Stow outboard armrests that are capable of being stowed ☒ Check

11 Check the statement that applies to this test vehicle:

(A) The torso and lap belt webbing of the seat belt system automatically retracts to a stowed position when the adjacent vehicle door is in an open position and the seat belt latchplate is released ☒ Pass

(B) The torso and lap belt webbing of the seat belt system automatically retracts when the seat belt latchplate is released ☒ Pass

(C) Neither A or B apply. ☐ **Fail**

12. With the webbing and hardware in the stowed position are the webbing and hardware prevented from being pinched when the door is closed?

Yes-☒ Pass; No- ☐ **Fail**

13. If this test vehicle has an open body (without doors) and has a belt system with a tension-relieving device, does the belt system fully retract when the tension-relieving device is deactivated? ☒ N/A

Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Retraction (S7.4.5)

Test Vehicle NHTSA No.: C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Right Front
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check: S. Bell and N Kinney
GVWR: 6064 pounds

Test all front outboard seat belts other than those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

1 Is the vehicle a passenger car or walk-in van-type vehicle? ☐ Yes ☒ No

If yes, go to seat belt guides and hardware

2. Adjustable seats are in the adjustment position midway between the forward most and rearmost positions If an adjustment position does not exist midway between the forward most and rearmost positions, the next closest adjustment position to the rear of the midpoint is used (S8 1 2) ☒ Check

3 If separately adjustable in a vertical direction, the seats are at the lowest position. ☒ Check

4 Place any adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer. ☒ Check

5 Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male (50M) occupant. This information will be furnished by the COTR ☒ Check

6. Place each adjustable head restraint in its highest adjustment position. ☒ Check

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Retraction (S7.4.5)

7. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. (S8.1 3) ☒ Check

8 Use anthropomorphic test dummies whose arms have been removed and position the dummies in the front outboard designated seating positions according to instructions in Appendix B ☒ Check

9. Restrain the dummies using the belt systems for the position being tested. ☒ Check

10 Stow outboard armrests that are capable of being stowed ☒ Check

11 Check the statement that applies to this test vehicle:

(A) The torso and lap belt webbing of the seat belt system automatically retracts to a stowed position when the adjacent vehicle door is in an open position and the seat belt latchplate is released. ☒ Pass

(B) The torso and lap belt webbing of the seat belt system automatically retracts when the seat belt latchplate is released. ☒ Pass

(C) Neither A or B apply. ☐ **Fail**

12 With the webbing and hardware in the stowed position are the webbing and hardware prevented from being pinched when the door is closed?

Yes-☒ Pass; No- ☐ **Fail**

13. If this test vehicle has an open body (without doors) and has a belt system with a tension-relieving device, does the belt system fully retract when the tension-relieving device is deactivated? ☒ N/A

Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

Test Vehicle NHTSA No.· C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Left Front
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check S Bell and N Kinney
GVWR: 6064 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

The requirements for accessibility **DO NOT APPLY** to:

A Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7 4.6 1(b))

B Seats which are removable

C Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function

If the seats in this vehicle are different than the criteria above, determine the following·

1 Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?

☐ Yes· go to 2

☒ No: this form is complete

2 Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i.e , conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupan)?

Yes-☐ Pass; No- ☐ **Fail**

3. Are the remaining two seat belt parts accessible under normal conditions?

Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

4 The buckle and latchplate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:

(A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched.

☐ Check

(B) The seat is moved to any position to which it is designed to be adjusted

☐ Check

(C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position ☐ Check

Yes-☐ Pass; No- ☐ **Fail**

5 Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)? Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

Test Vehicle NHTSA No : C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Right Front
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check S Bell and N Kinney
GVWR 6064 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars Complete a form for each applicable seat belt

The requirements for accessibility **DO NOT APPLY** to:

A Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7 4 6 1(b))

B Seats which are removable

C Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function.

If the seats in this vehicle are different than the criteria above, determine the following

1 Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?

☐ Yes go to 2

☒ No: this form is complete

2 Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i e , conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)?

Yes-☐ Pass; No- ☐ **Fail**

3. Are the remaining two seat belt parts accessible under normal conditions?

Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

4 The buckle and latchplate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:

(A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched.

☐ Check

(B) The seat is moved to any position to which it is designed to be adjusted

☐ Check

(C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position ☐ Check

Yes-☐ Pass; No- ☐ **Fail**

5. Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)? Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.
Seat Belt Guides And Hardware (S7.4.6)

Test Vehicle NHTSA No · C10600
Vehicle Model Year/Make/Model/Body Style: 2001/Land Rover/Discovery/MPV
Designated Seating Position Tested: Not applicable to Right, Left, and Center Rear seats due to items A and C below
Date of Comfort and Convenience Check: 02/20/2001
Technician Performing Check· S Bell and N Kinney
GVWR· 6064 pounds

Test seat belts except those in walk-in van-type vehicles and those at front outboard designated seating positions in passenger cars. Complete a form for each applicable seat belt

The requirements for accessibility **DO NOT APPLY** to:

A Seats whose seat cushions are movable so that the seat back serves a function other than seating (S7 4 6.1(b))

B Seats which are removable

C Seats that are movable so that the space formerly occupied by the seat can be used for a secondary function

If the seats in this vehicle are different than the criteria above, determine the following·

1. Is the webbing designed to pass through the seat cushion or between the seat cushion and seat back?
☐ Yes· go to 2
☐ No· this form is complete.

2 Does one of the following three parts, the seat belt latchplate, the buckle, or the seat belt webbing, stay on top of or above the seat cushion under normal conditions (i e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant)?
Yes-☐ Pass; No- ☐ **Fail**

3. Are the remaining two seat belt parts accessible under normal conditions?
Yes-☐ Pass; No- ☐ **Fail**

FMVSS 208 Seat Belt Comfort And Convenience Test Summary, Cont'd.

Seat Belt Guides And Hardware (S7.4.6)

4 The buckle and latchplate do not pass through the guides or conduits provided and fall behind the seat when the following events occur in order:

(A) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched

☐ Check

(B) The seat is moved to any position to which it is designed to be adjusted.

☐ Check

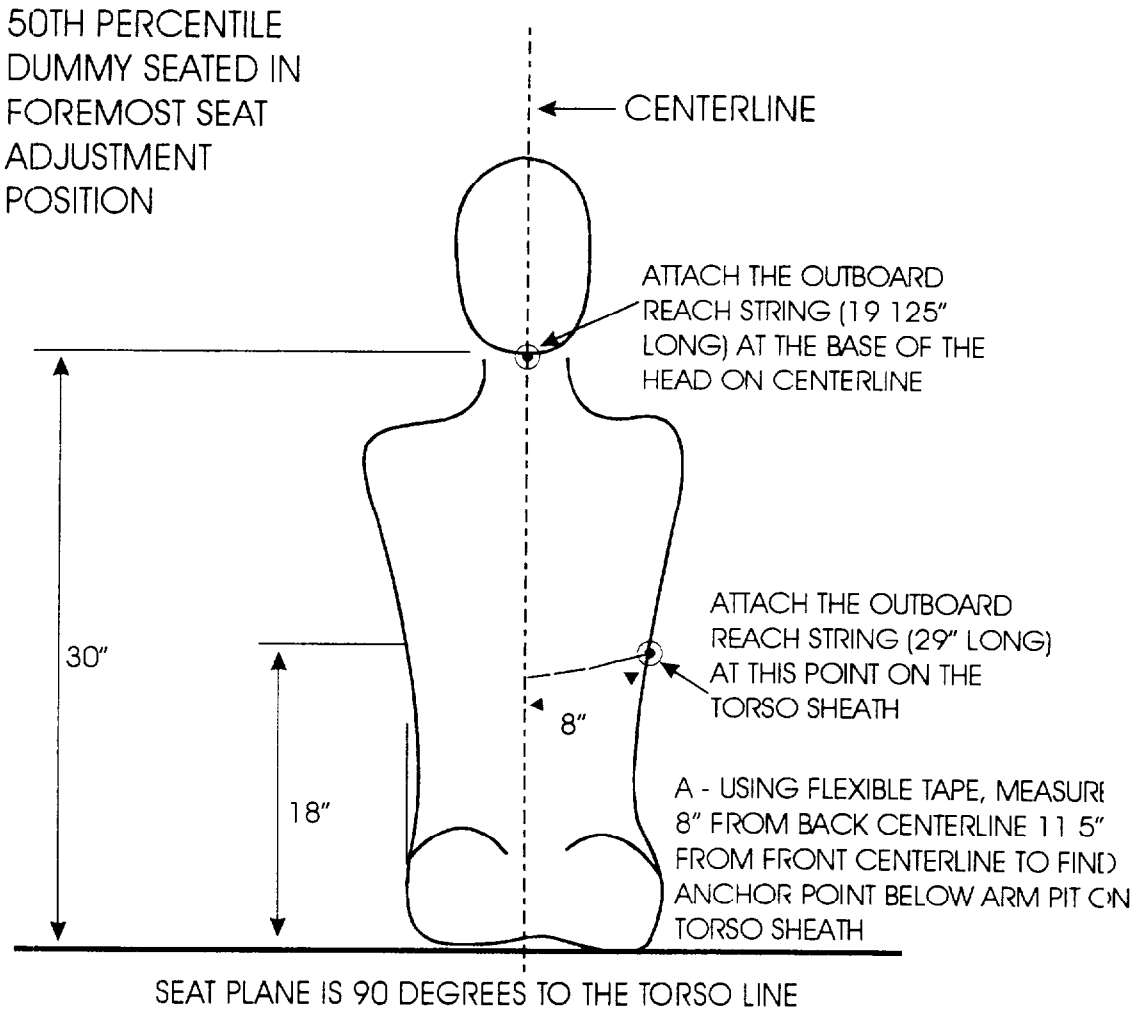
(C) The seat back, if foldable, is folded forward as far as possible and then moved backward into position ☐ Check

Yes-☐ Pass; No- ☐ **Fail**

5 Is the inboard receptacle end of the seat belt assembly, installed in the outboard designated seating position, accessible with the center arm rest in any position to which it can be adjusted (without moving the armrest)? Yes-☐ Pass; No- ☐ **Fail**

LOCATION OF ANCHORING POINTS FOR LATCHPLATE REACH LIMITING CHAINS OR STRINGS TO TEST FOR LATCHPLATE ACCESSIBILITY

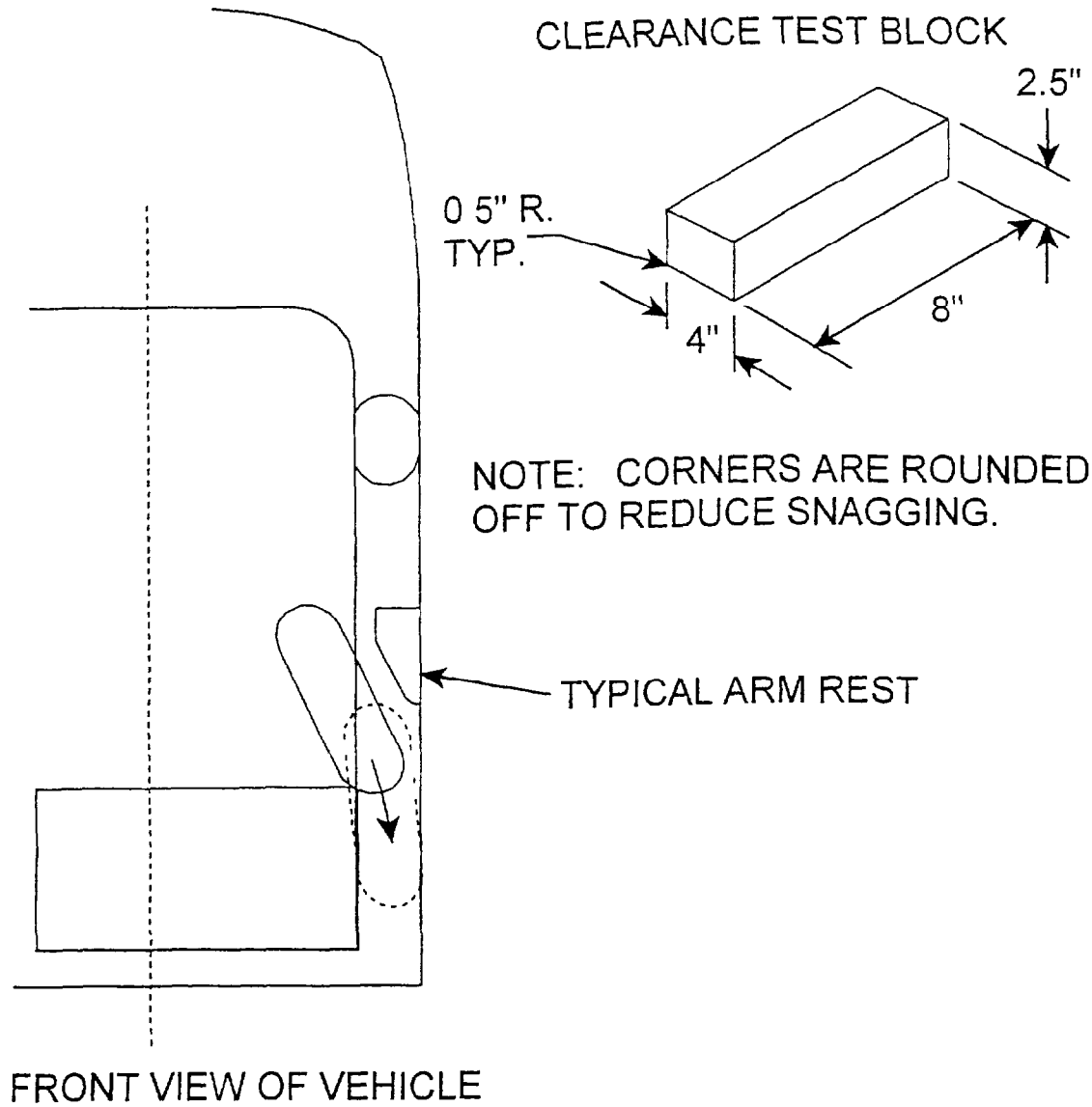
PART 572E DUMMY



REAR VIEW

Laboratory Test Procedure Figure 1C

USE OF CLEARANCE TEST BLOCK TO DETERMINE HAND/ARM ACCESS



Laboratory Test Procedure Figure 2C

Appendix A

Photographs

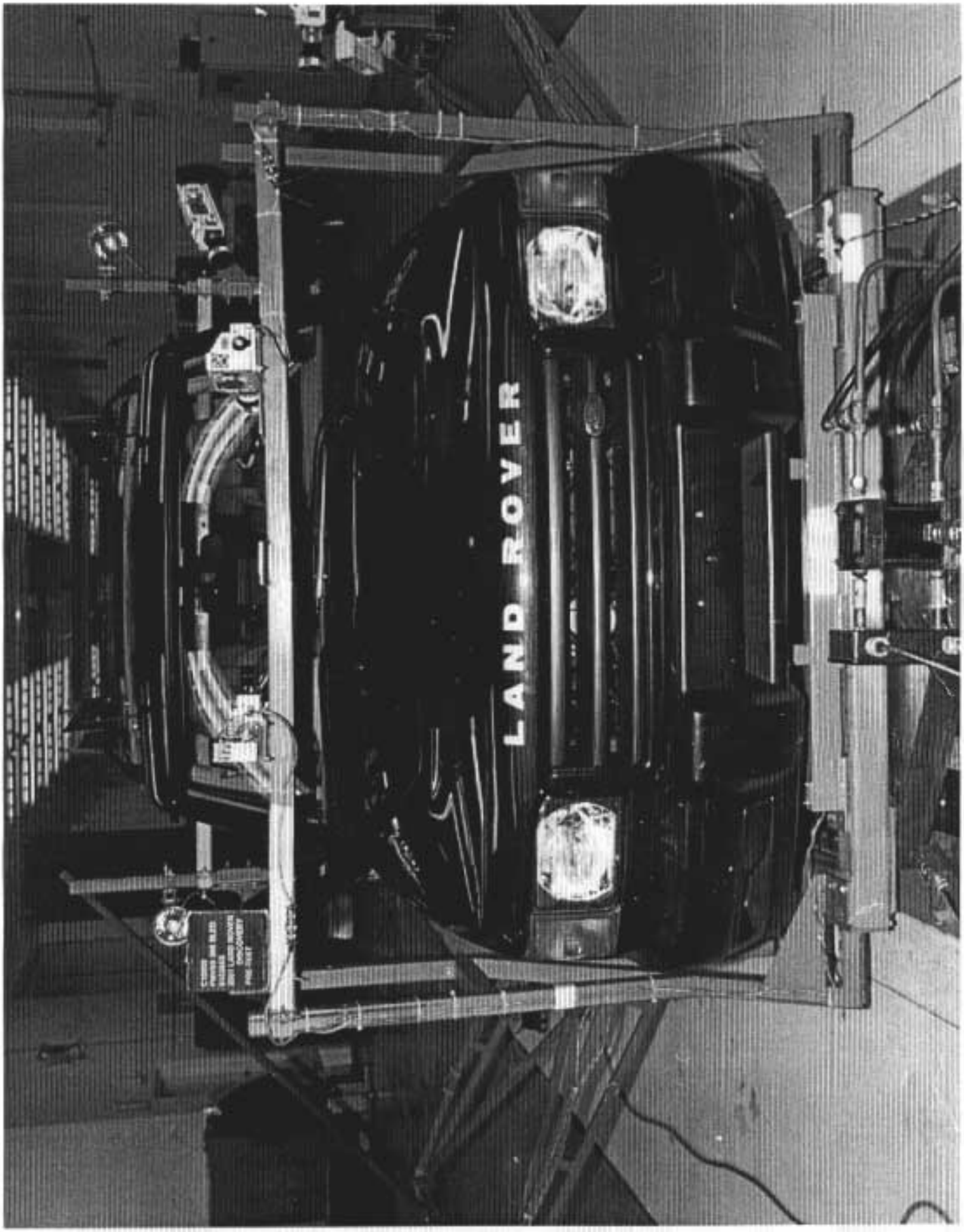


Figure A-1 Pre-Test Front View of Test Vehicle Mounted to Sled

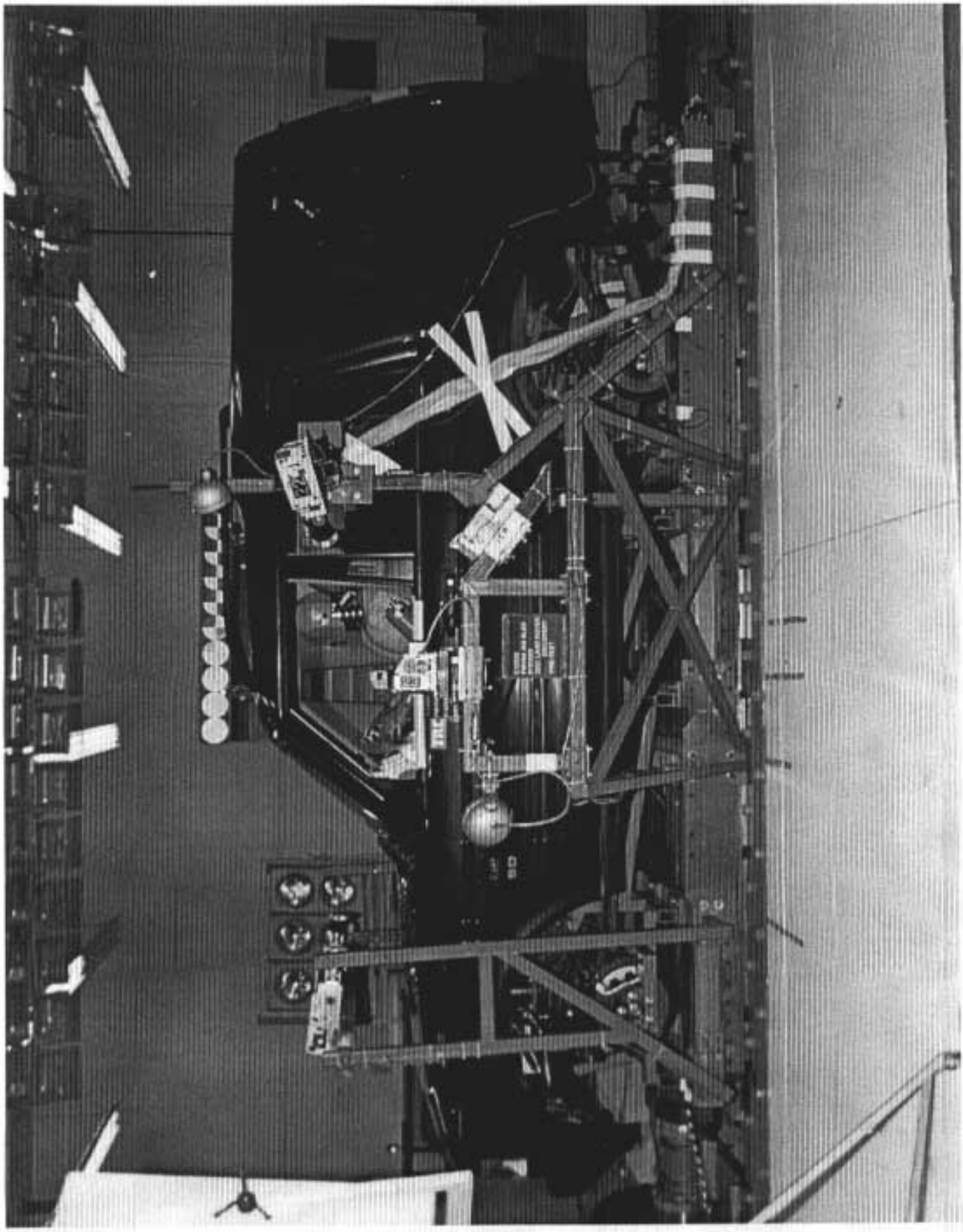


Figure A-2 Pre-Test Left Side View of Test Vehicle Mounted to Sled

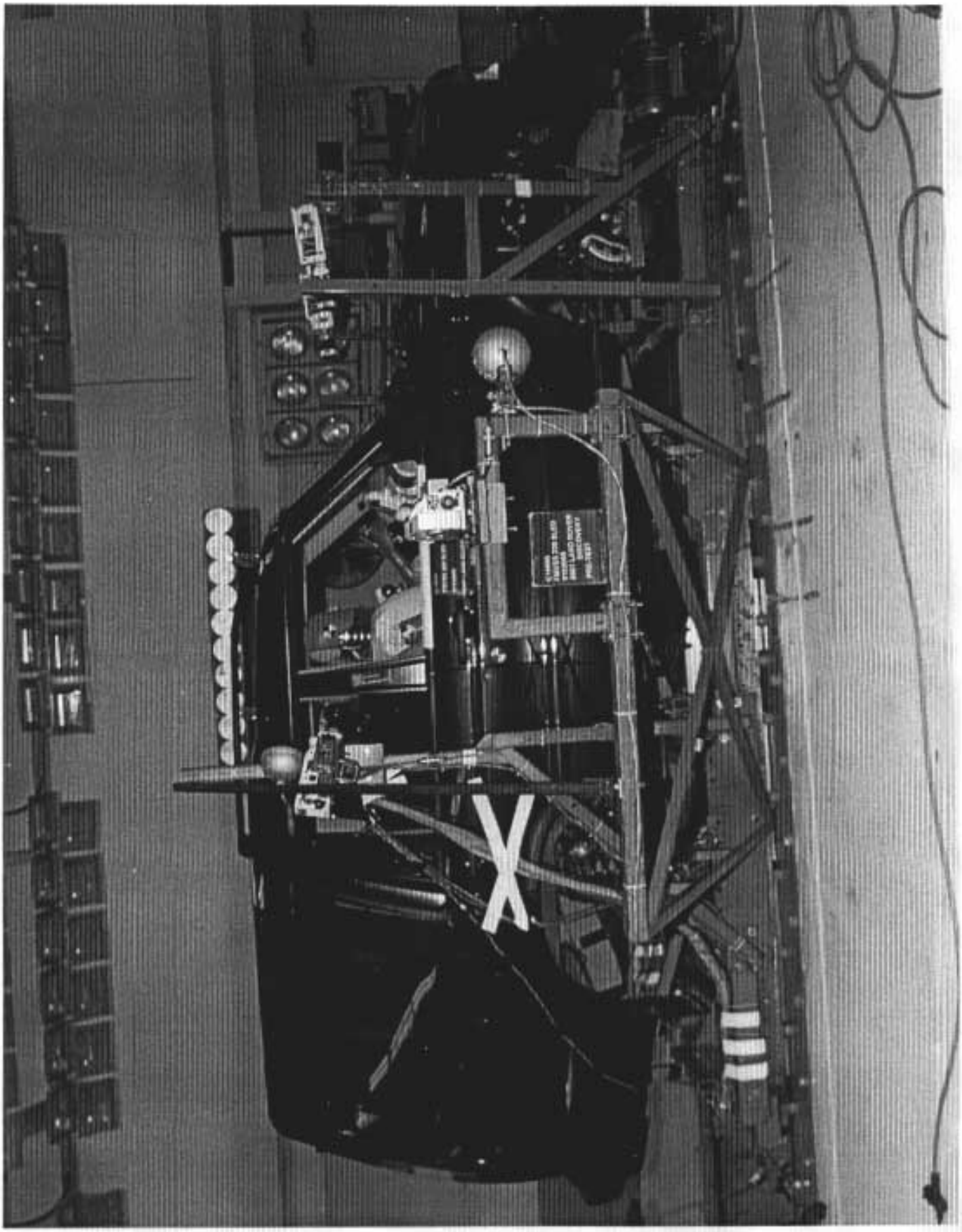


Figure A-3 Pre-Test Right Side View of Test Vehicle Mounted to Sled

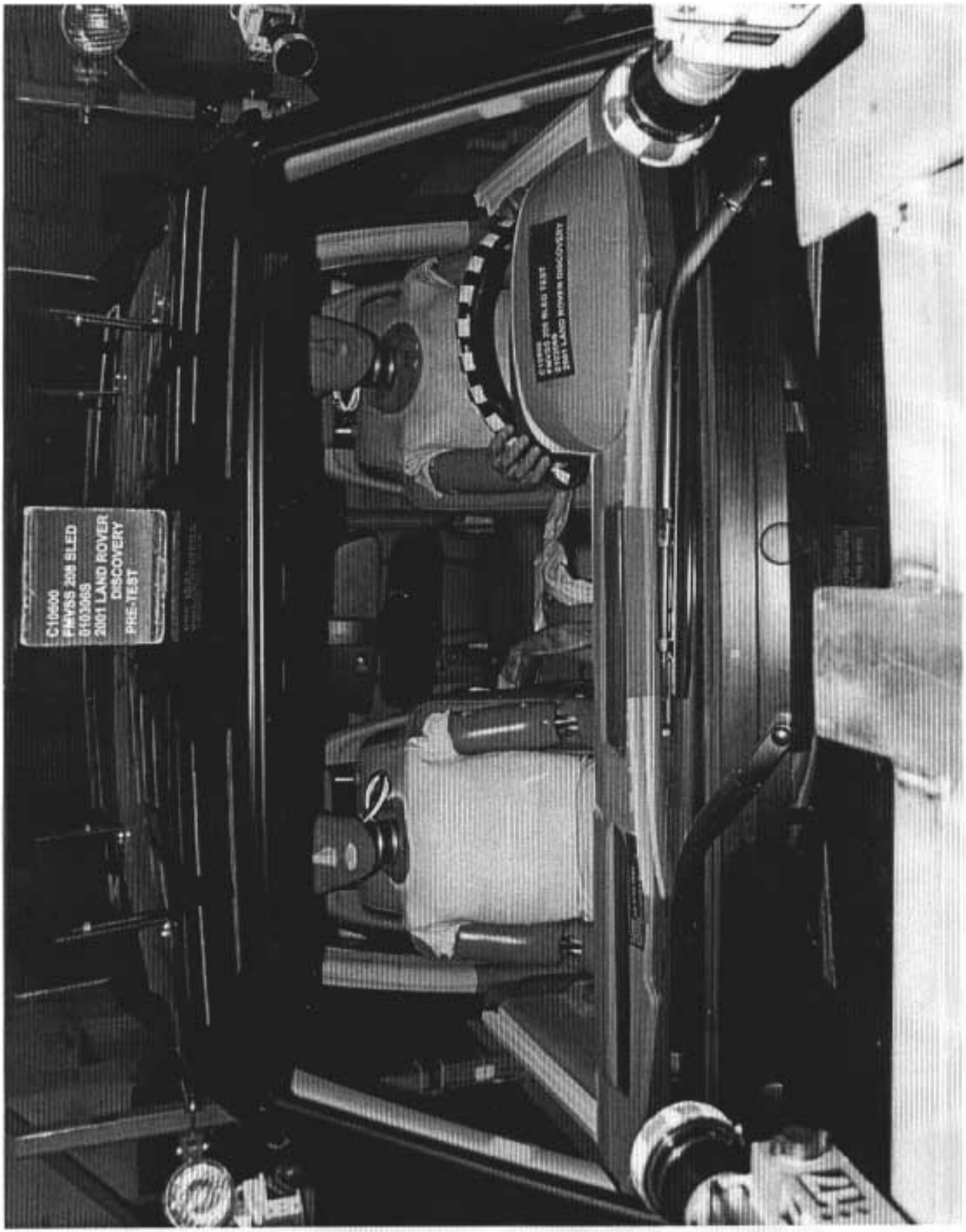


Figure A-4 Pre-Test Windshield View

S010306

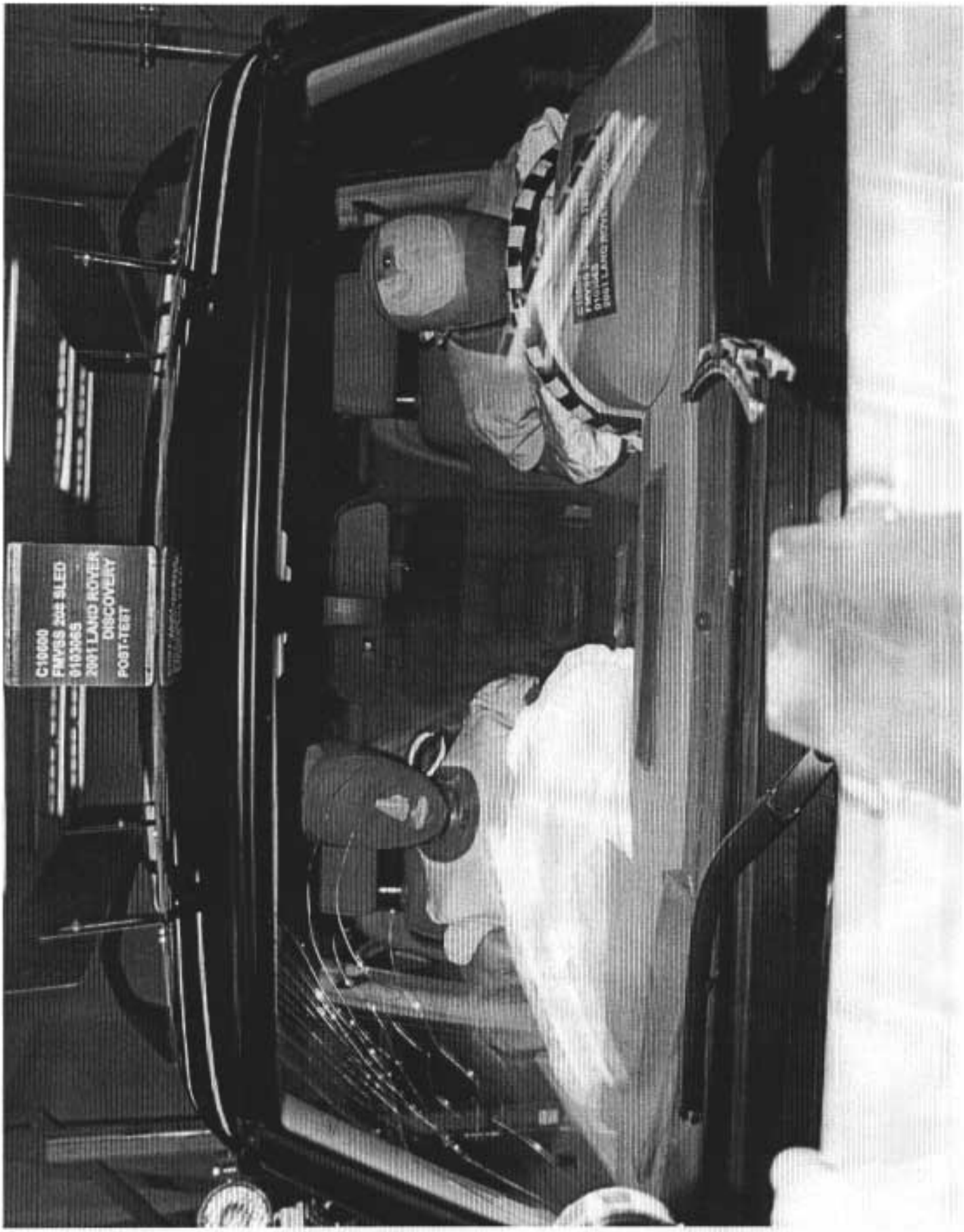


Figure A-5 Post-Test Windshield View

S010306

Figure A-6 Pre-Test Driver Dummy Position View with Door Open

Figure A-7 Post-Test Driver Dummy Position View with Door Open

Figure A-8 Pre-Test Driver Seat Track Position View

Figure A-10 Pre-Test Driver Dummy Position Front View

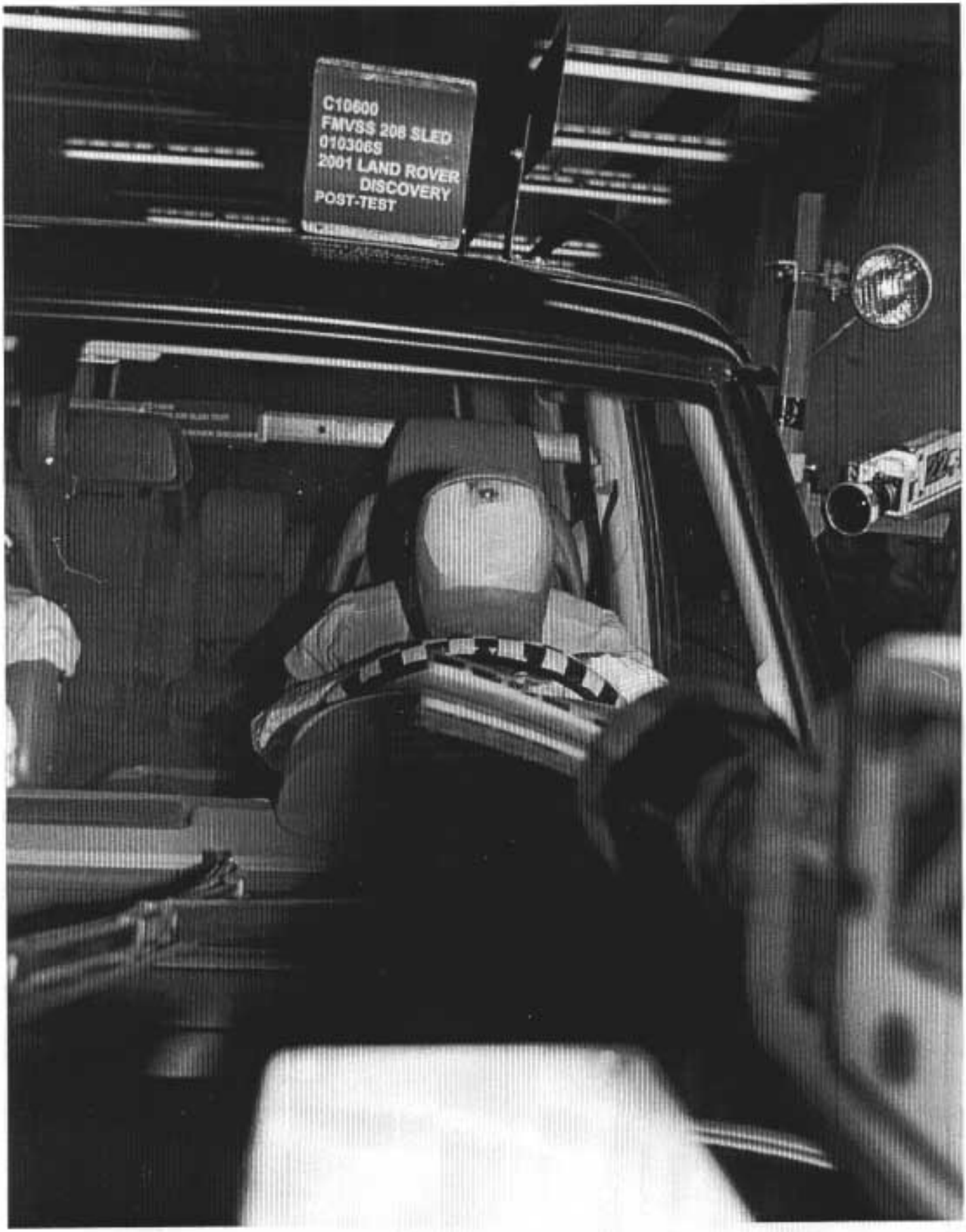


Figure A-11 Post-Test Driver Dummy Position Front View

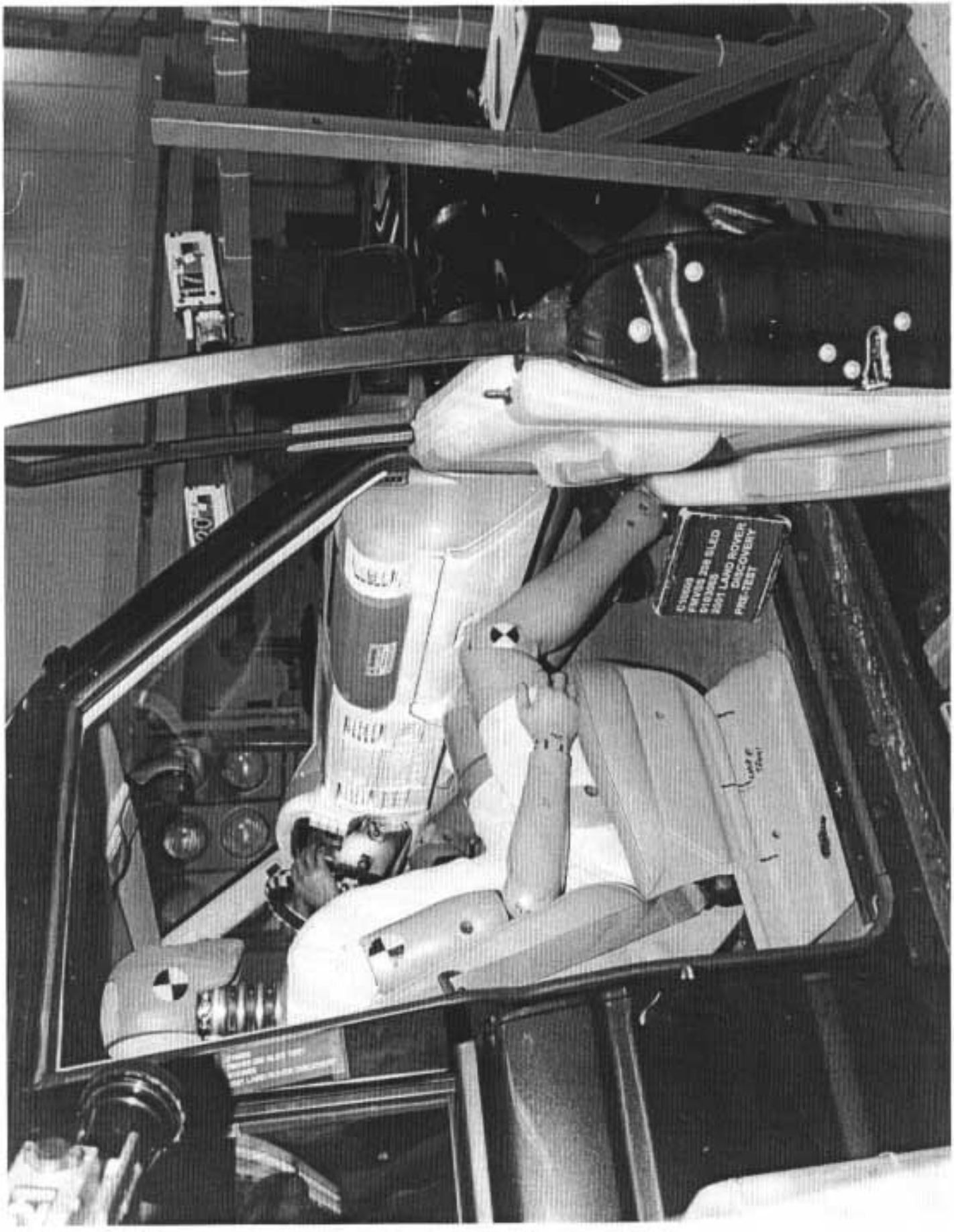


Figure A-12 Pre-Test Passenger Dummy Position View with Door Open

S010306

Figure A-18 Post-Test Driver Airbag View

Figure A-19 Post-Test Driver Dummy Removed from Vehicle Overall View

Figure A-20 Post-Test Driver Dummy Head Contact View

Figure A-21 Post-Test Passenger Airbag View

Figure A-22 Post-Test Passenger Dummy Removed from Vehicle Overall View

S010306

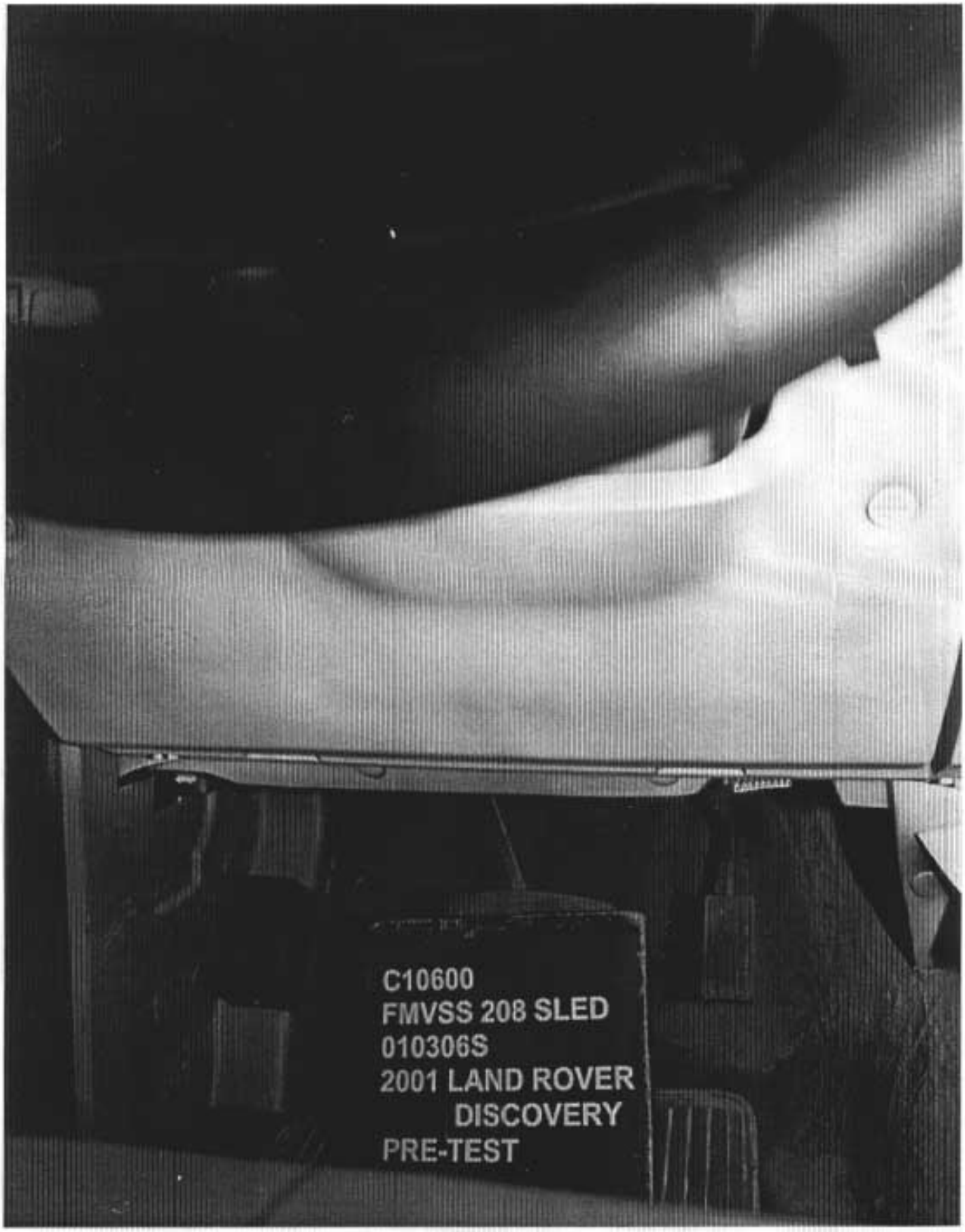


Figure A-23 Pre-Test Driver Knee Bolster View

Figure A-24 Post-Test Driver Knee Bolster View

Figure A-25 Pre-Test Passenger Glove Box View

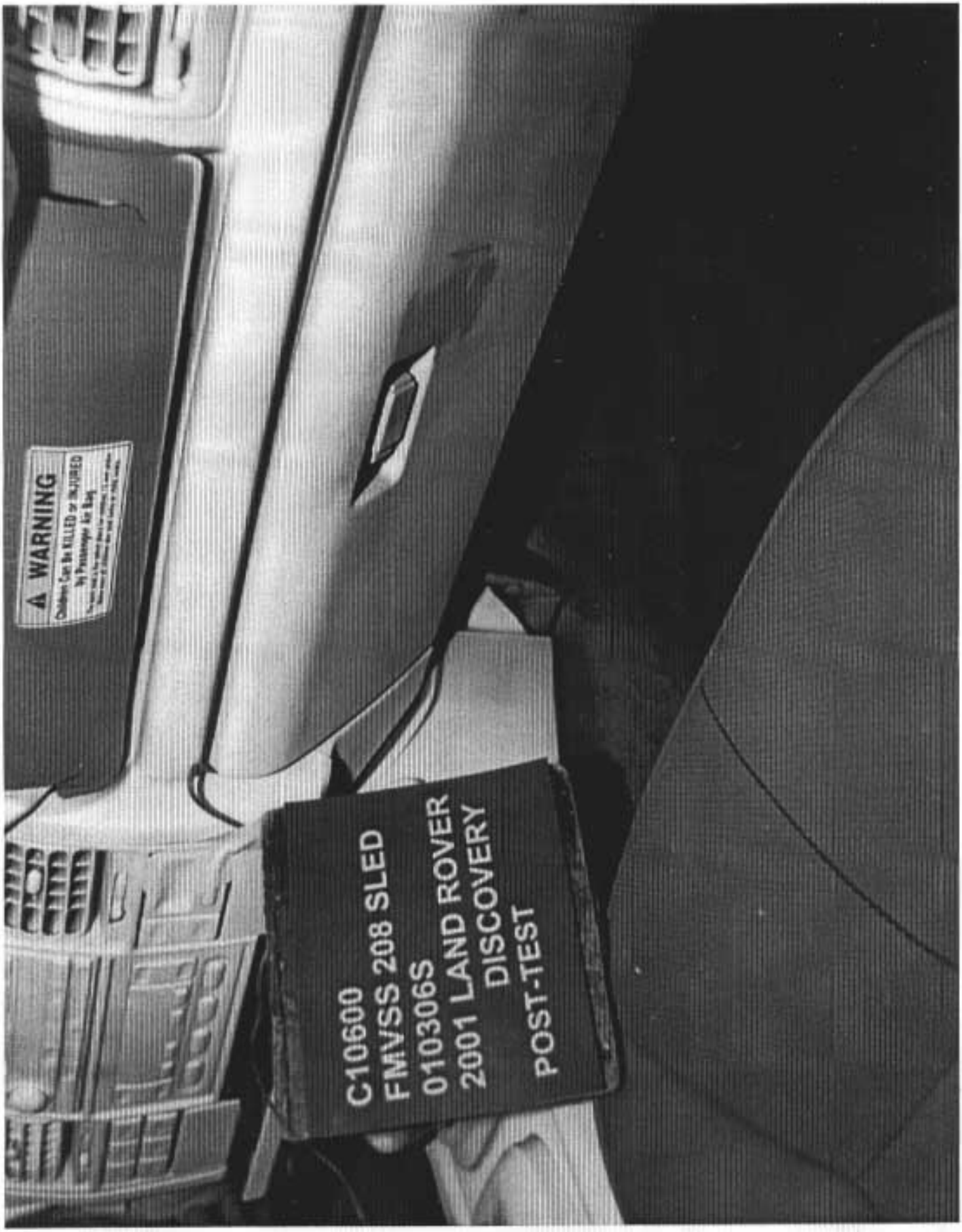


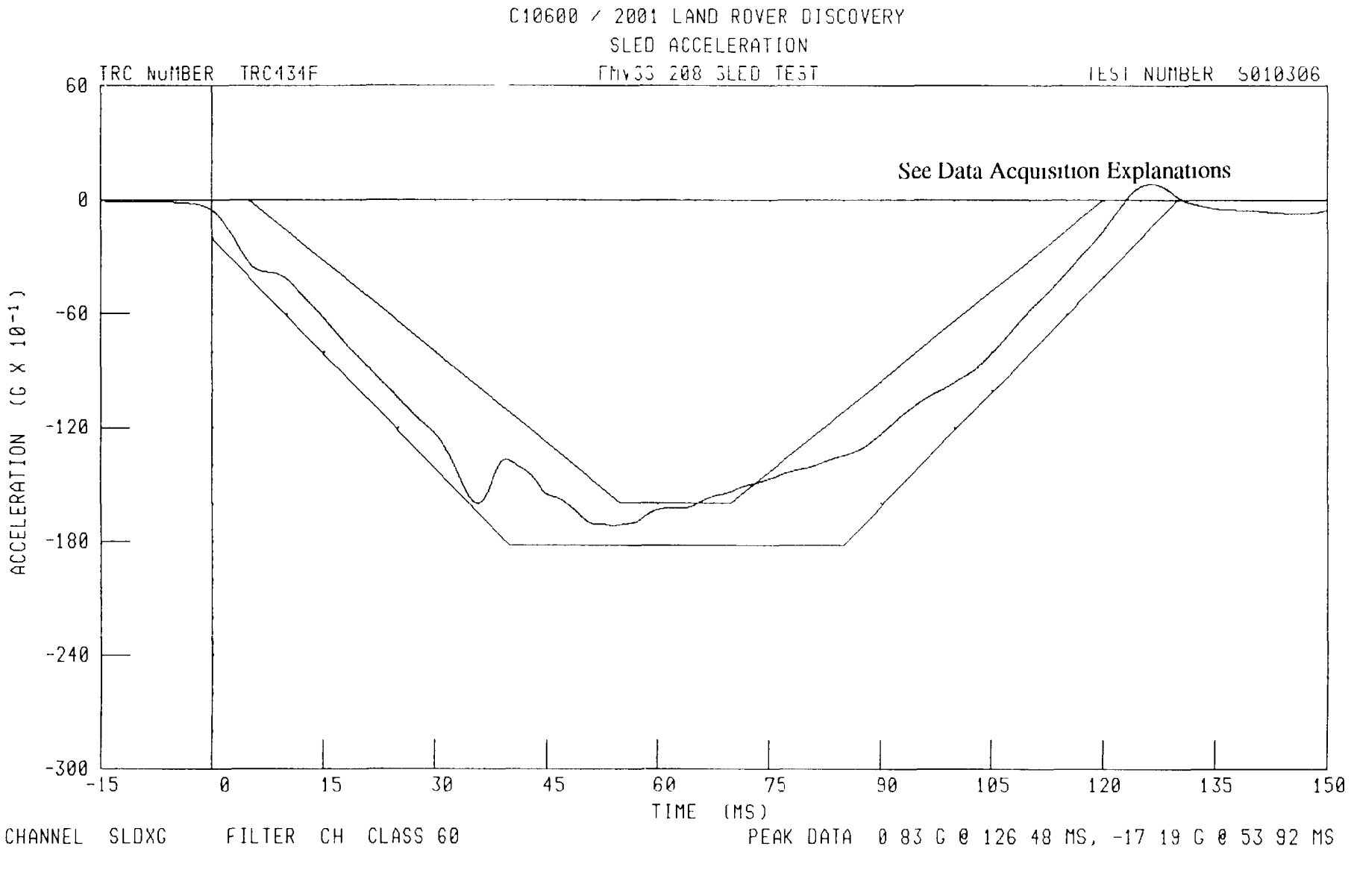
Figure A-26 Post-Test Passenger Glove Box View

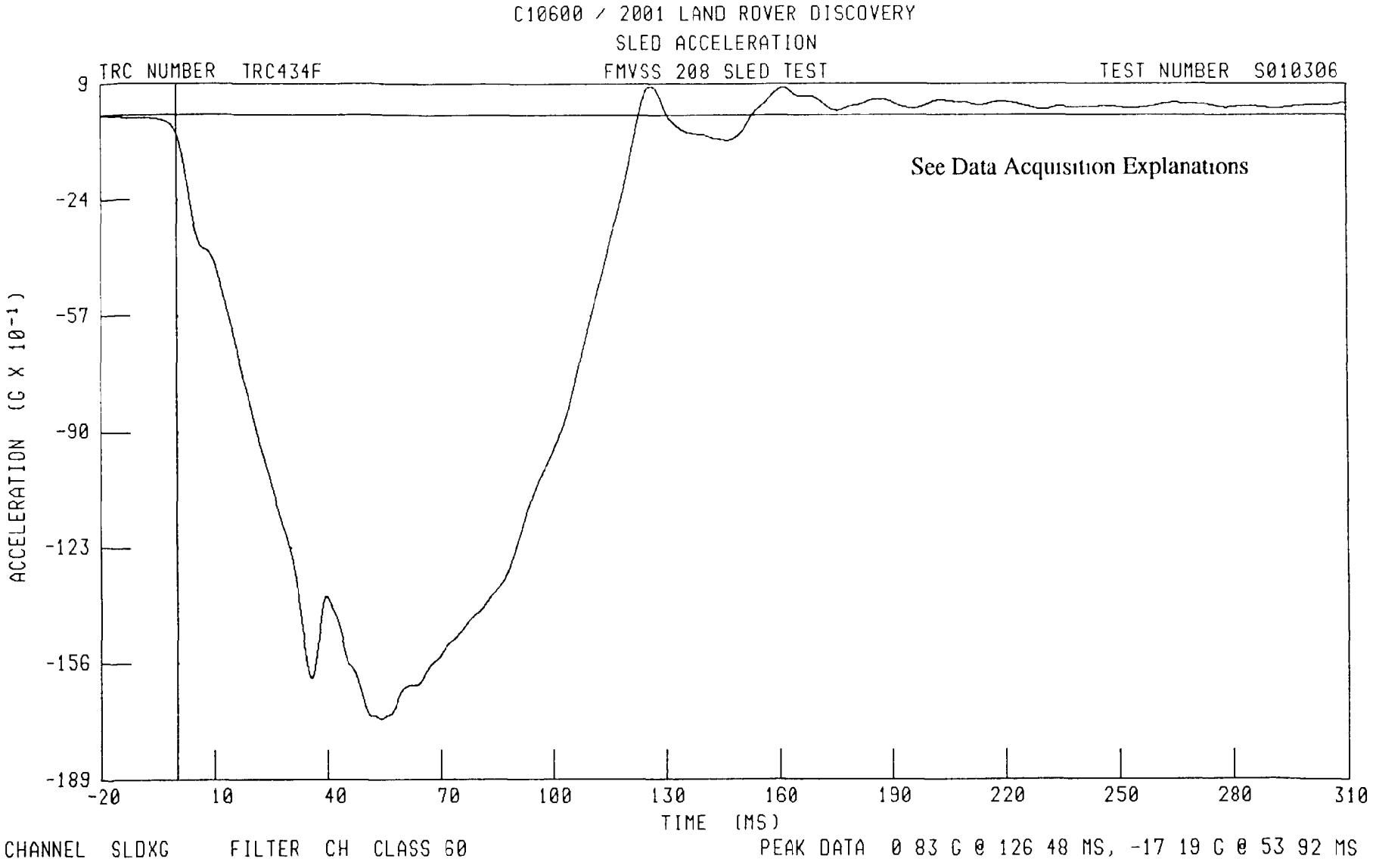
Figure A-27 Pre-Test Vehicle Certification Label View

S010306

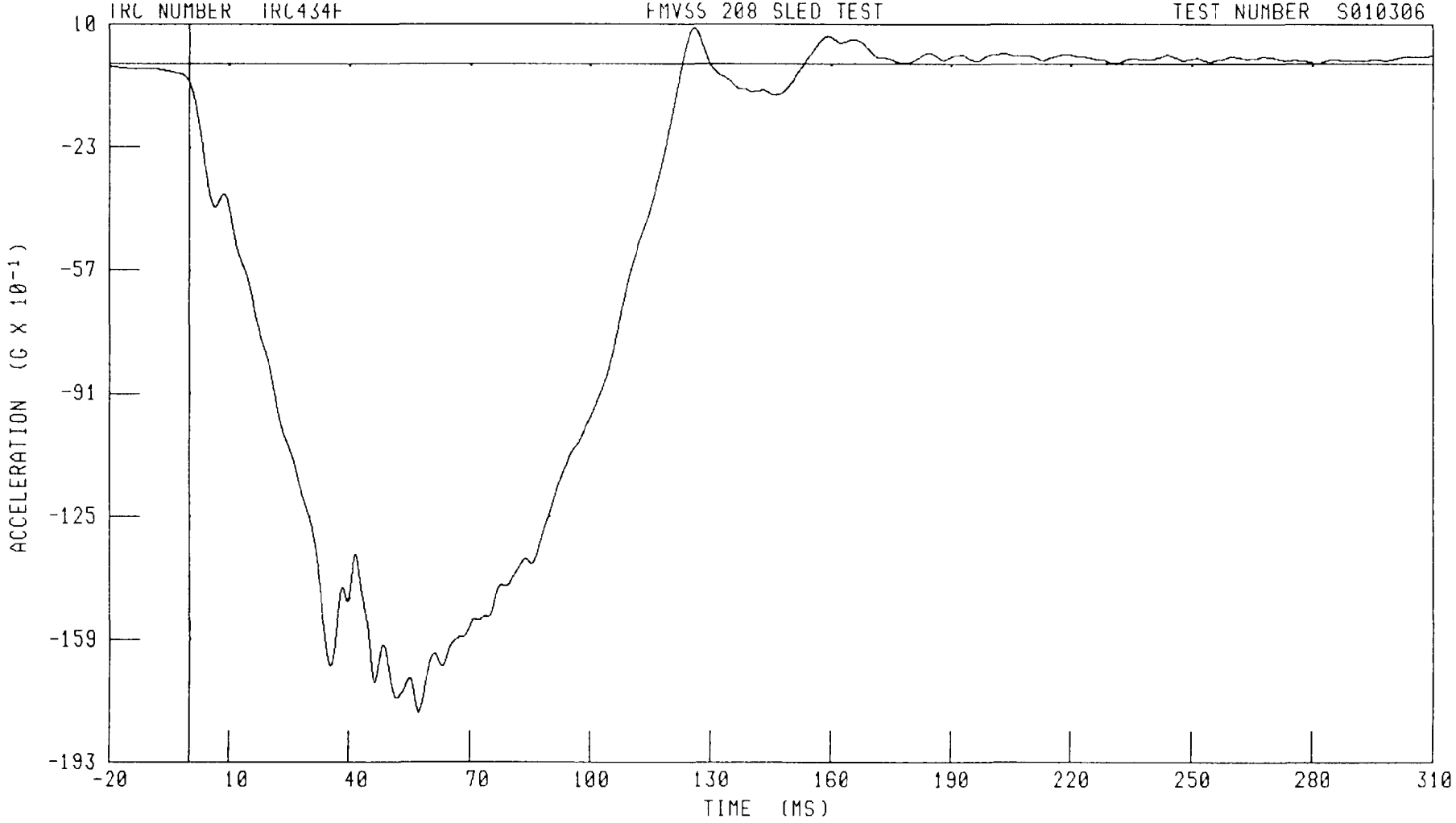
Appendix B

Data Plots


C10600 / 2001 LAND ROVER DISCOVERY
SLED ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
60
0
-60
-120
-180
-240
-300
ACCELERATION (G X 10⁻¹)
-15
0
15
30
45
60
75
90
105
120
135
150
TIME (MS)
CHANNEL SLDXG
FILTER CH CLASS 60
PEAK DATA 0 83 G @ 126 48 MS, -17 19 G @ 53 92 MS

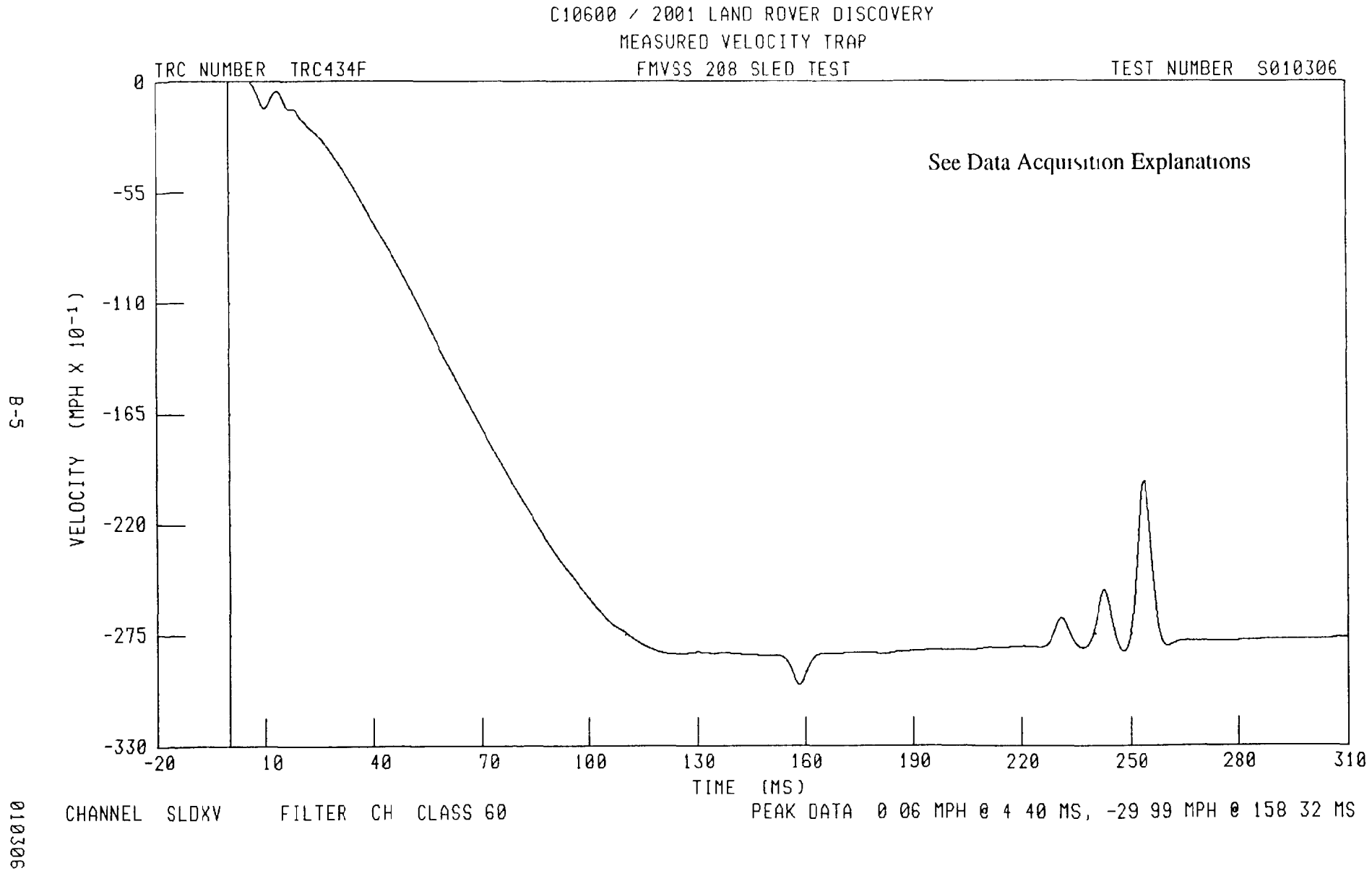

C10600 / 2001 LAND ROVER DISCOVERY
SLED ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
ACCELERATION (G X 10-1)
9
-24
-57
-90
-123
-156
-189
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL SLDXG FILTER CH CLASS 60
PEAK DATA 0 83 G @ 126 48 MS, -17 19 G @ 53 92 MS

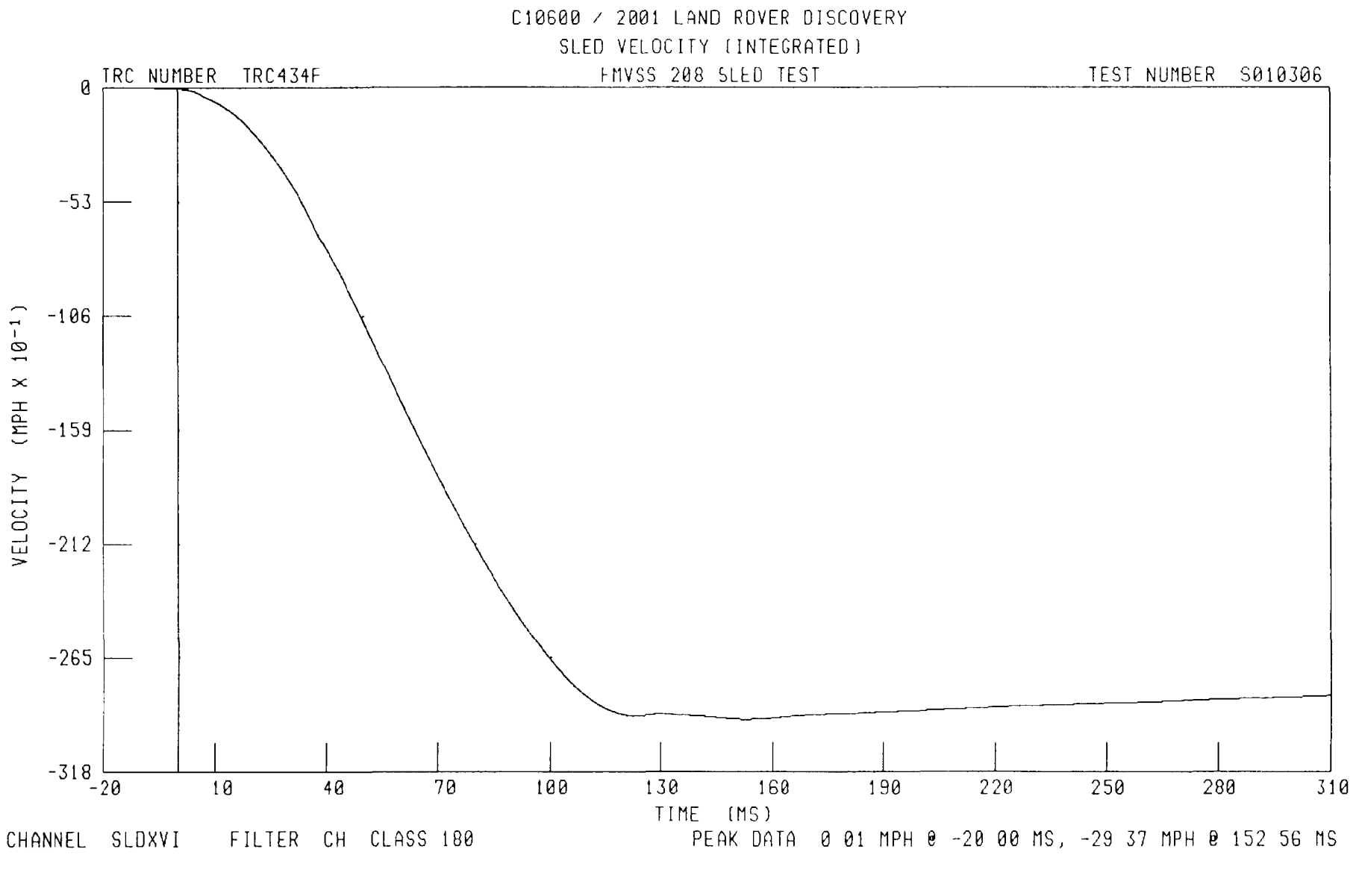
C10600 / 2001 LAND ROVER DISCOVERY
SLED ACCELERATION - BACKUP



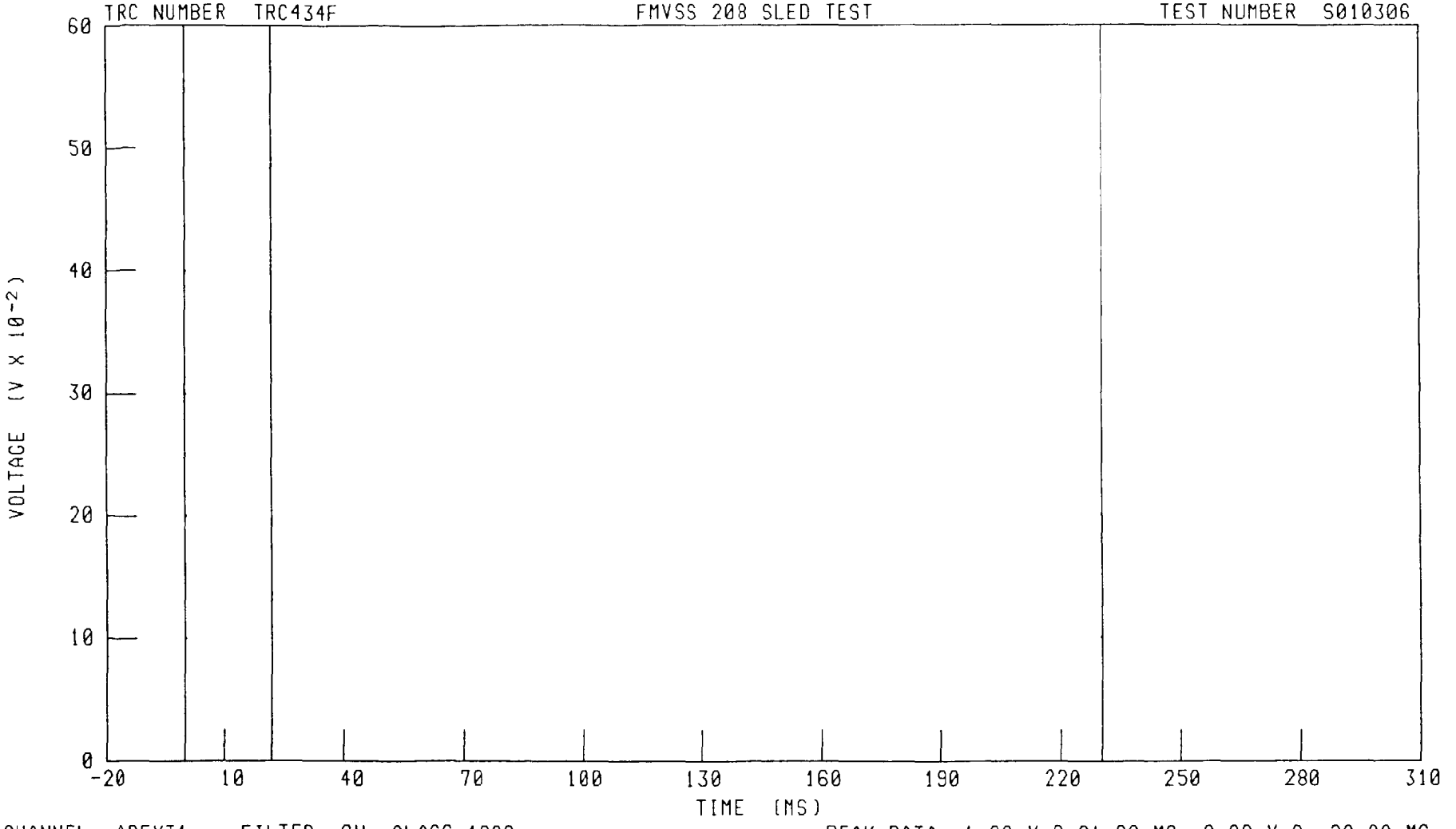
CHANNEL SLDXGA FILTER CH CLASS 60

PEAK DATA 1 00 G @ 126 08 MS, -17 91 G @ 57 12 MS


C10600 / 2001 LAND ROVER DISCOVERY
MEASURED VELOCITY TRAP
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
VELOCITY (MPH X 10-1)
0
-55
-110
-165
-220
-275
-330
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL SLDXV
FILTER CH CLASS 60
PEAK DATA 0 06 MPH @ 4 40 MS, -29 99 MPH @ 158 32 MS


C10600 / 2001 LAND ROVER DISCOVERY
SLED VELOCITY (INTEGRATED)
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
0
-53
-106
-159
-212
-265
-318
VELOCITY (MPH X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL SLDXVI FILTER CH CLASS 180
PEAK DATA 0 01 MPH @ -20 00 MS, -29 37 MPH @ 152 56 MS

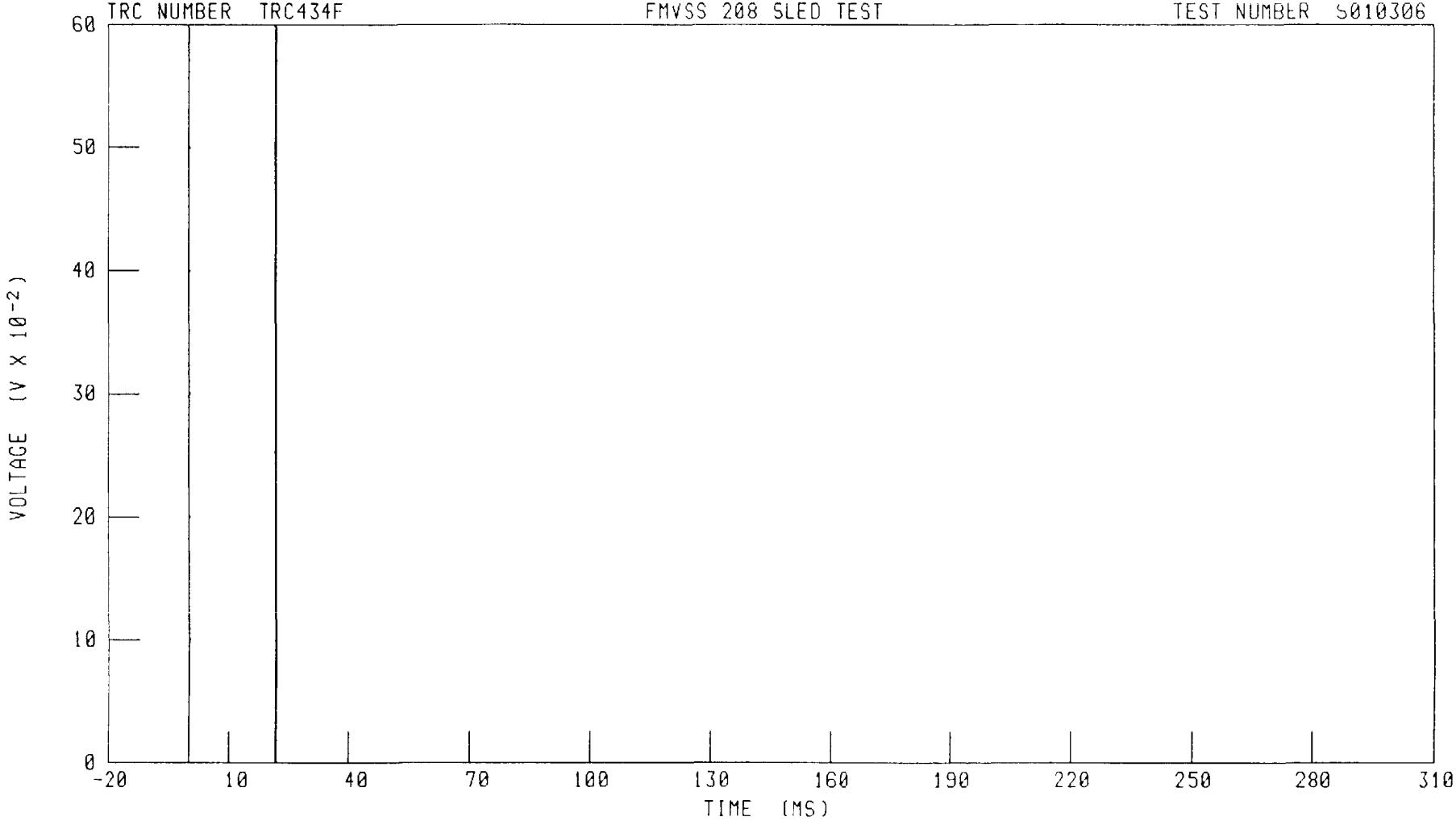
C10600 / 2001 LAND ROVER DISCOVERY
DRIVER AIRBAG EVENT
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



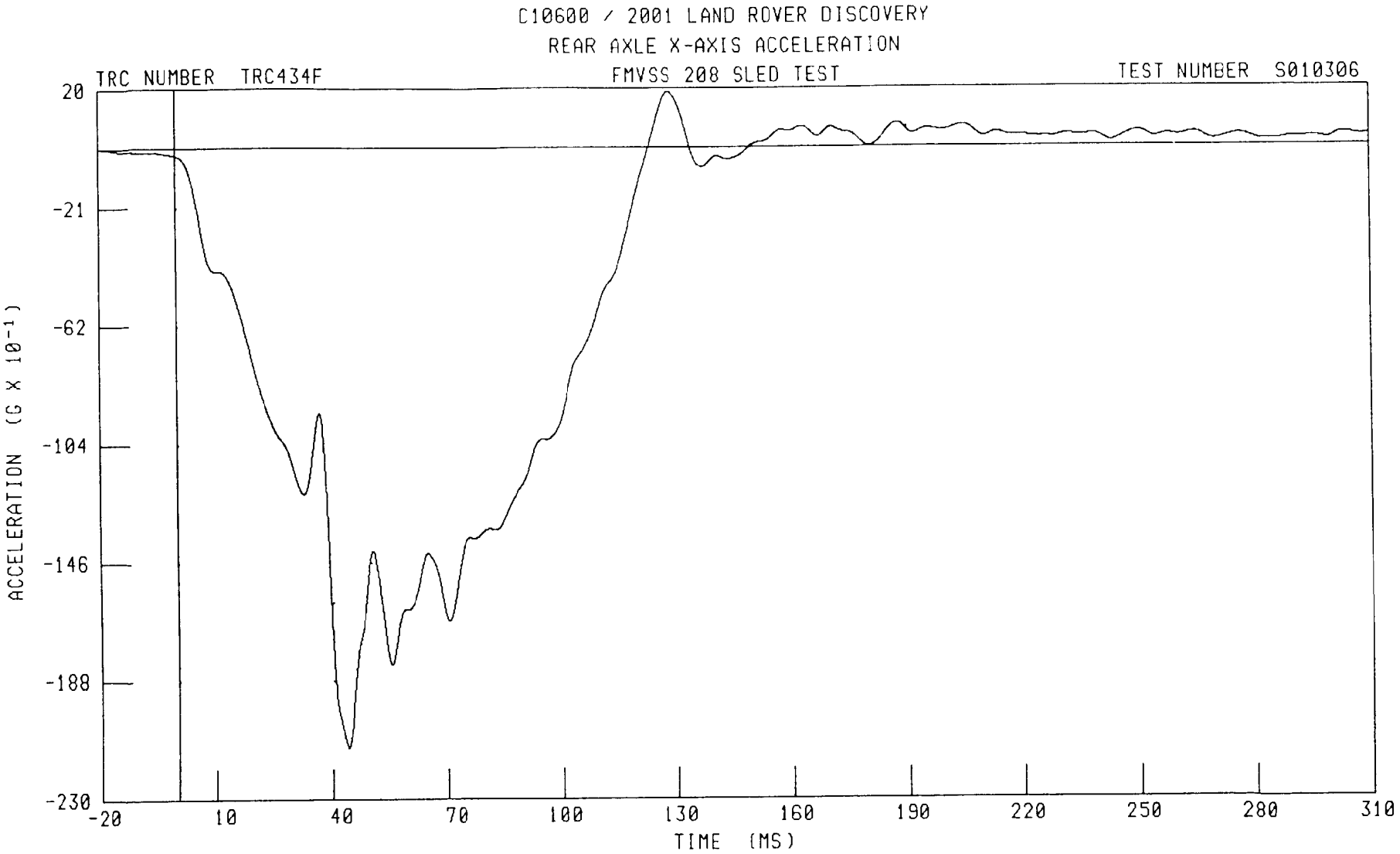
CHANNEL ABEVT1 FILTER CH CLASS 1000 PEAK DATA 1 00 V @ 21 60 MS, 0 00 V @ -20 00 MS

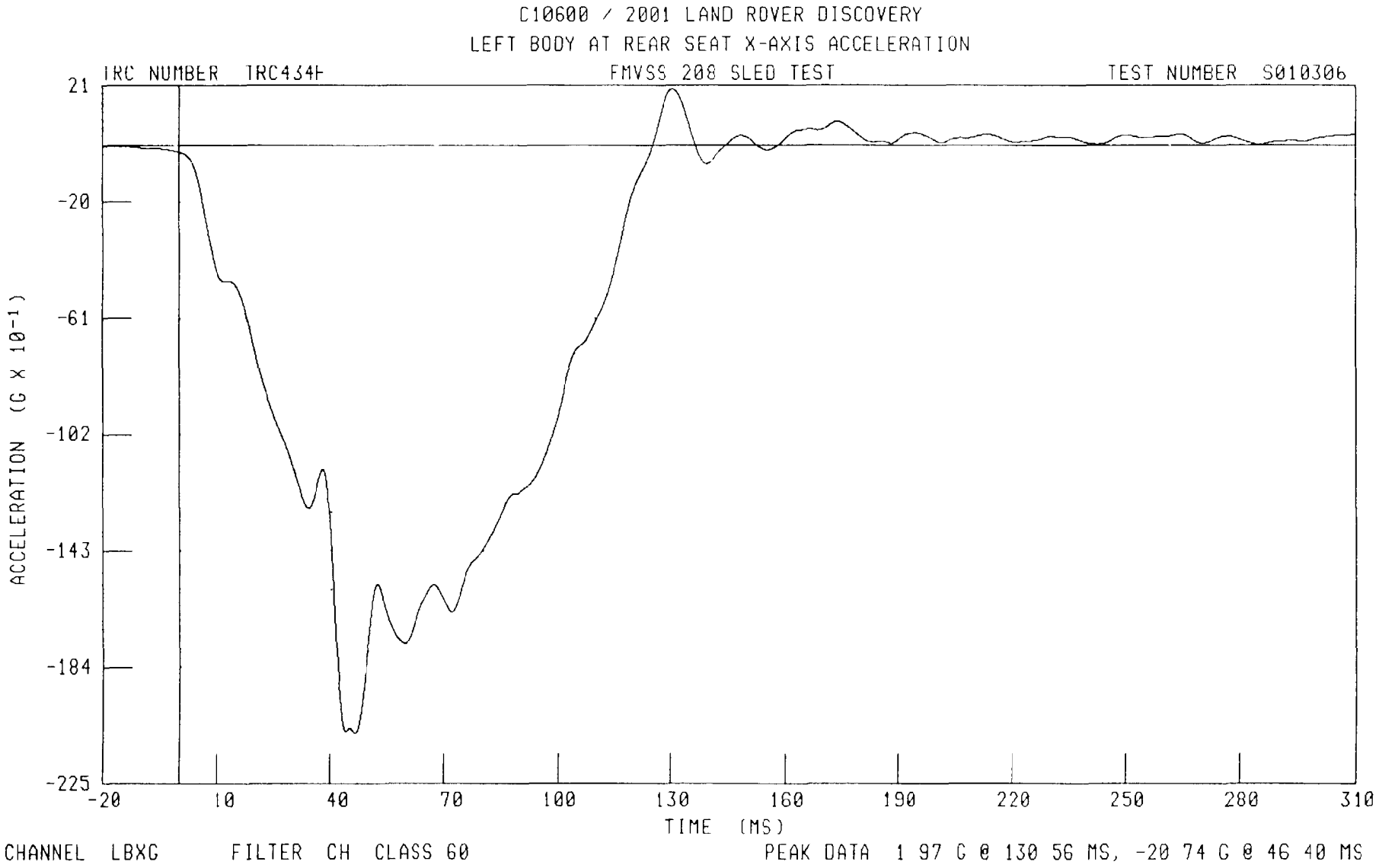
010306

C10600 / 2001 LAND ROVER DISCOVERY
PASSENGER AIRBAG EVENT
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



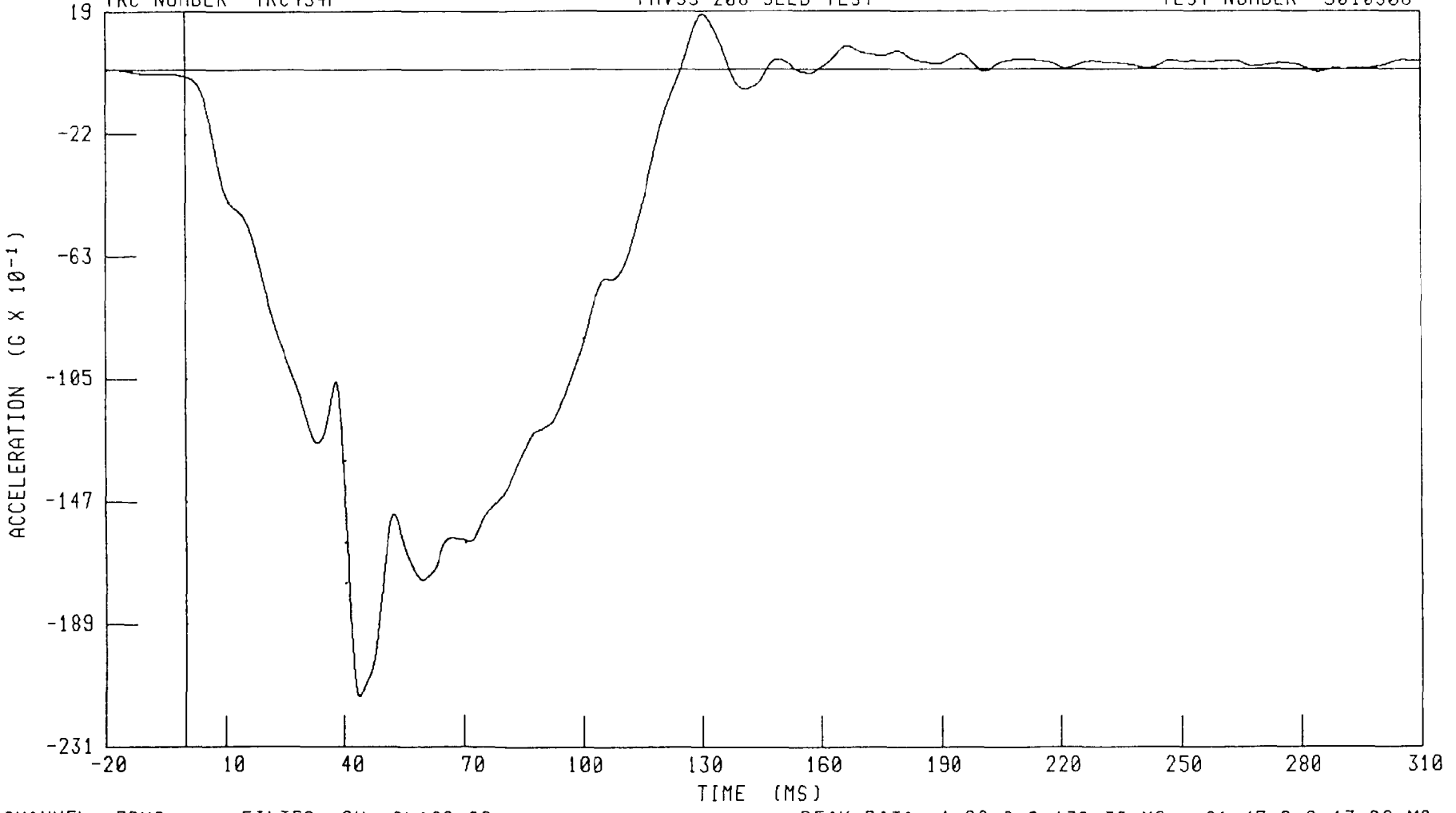
CHANNEL ABEVT2 FILTER CH CLASS 1000 PEAK DATA 1 00 V @ 21 60 MS, 0 00 V @ -20 00 MS


C10600 / 2001 LAND ROVER DISCOVERY
REAR AXLE X-AXIS ACCELERATION
FMVSS 208 SLED TEST
TRC NUMBER TRC434F
TEST NUMBER S010306
20
-21
-62
-104
-146
-188
-230
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL RAXG
FILTER CH CLASS 60
PEAK DATA 1 98 G @ 128 40 MS, -21 27 G @ 43 92 MS


C10600 / 2001 LAND ROVER DISCOVERY
LEFT BODY AT REAR SEAT X-AXIS ACCELERATION
IRC NUMBER IRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
21
-20
-61
-102
-143
-184
-225
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL LBXG
FILTER CH CLASS 60
PEAK DATA 1 97 G @ 130 56 MS, -20 74 G @ 46 40 MS

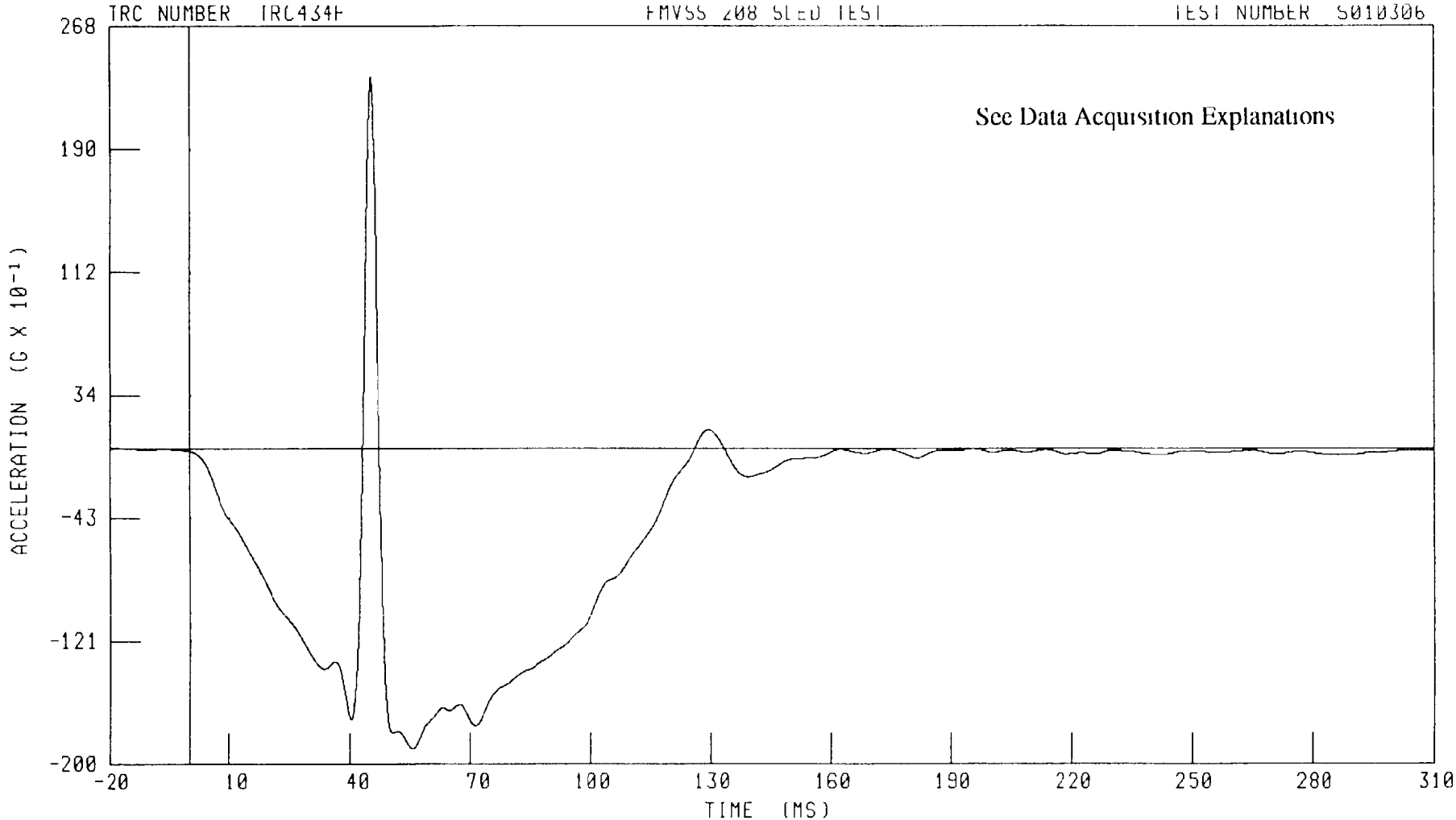
C10600 / 2001 LAND ROVER DISCOVERY
RIGHT BODY AT REAR SEAT X-AXIS ACCELERATION

TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306

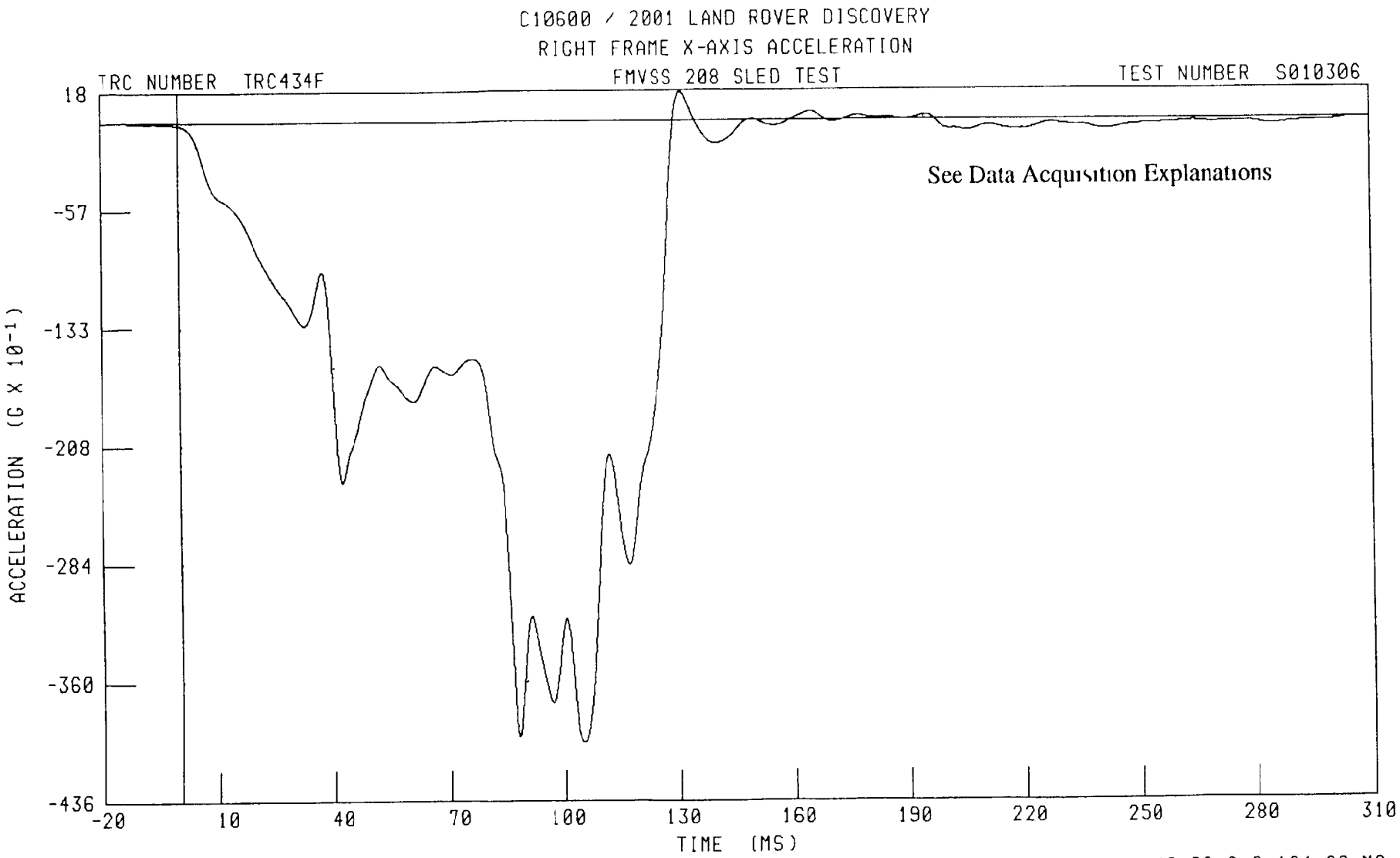


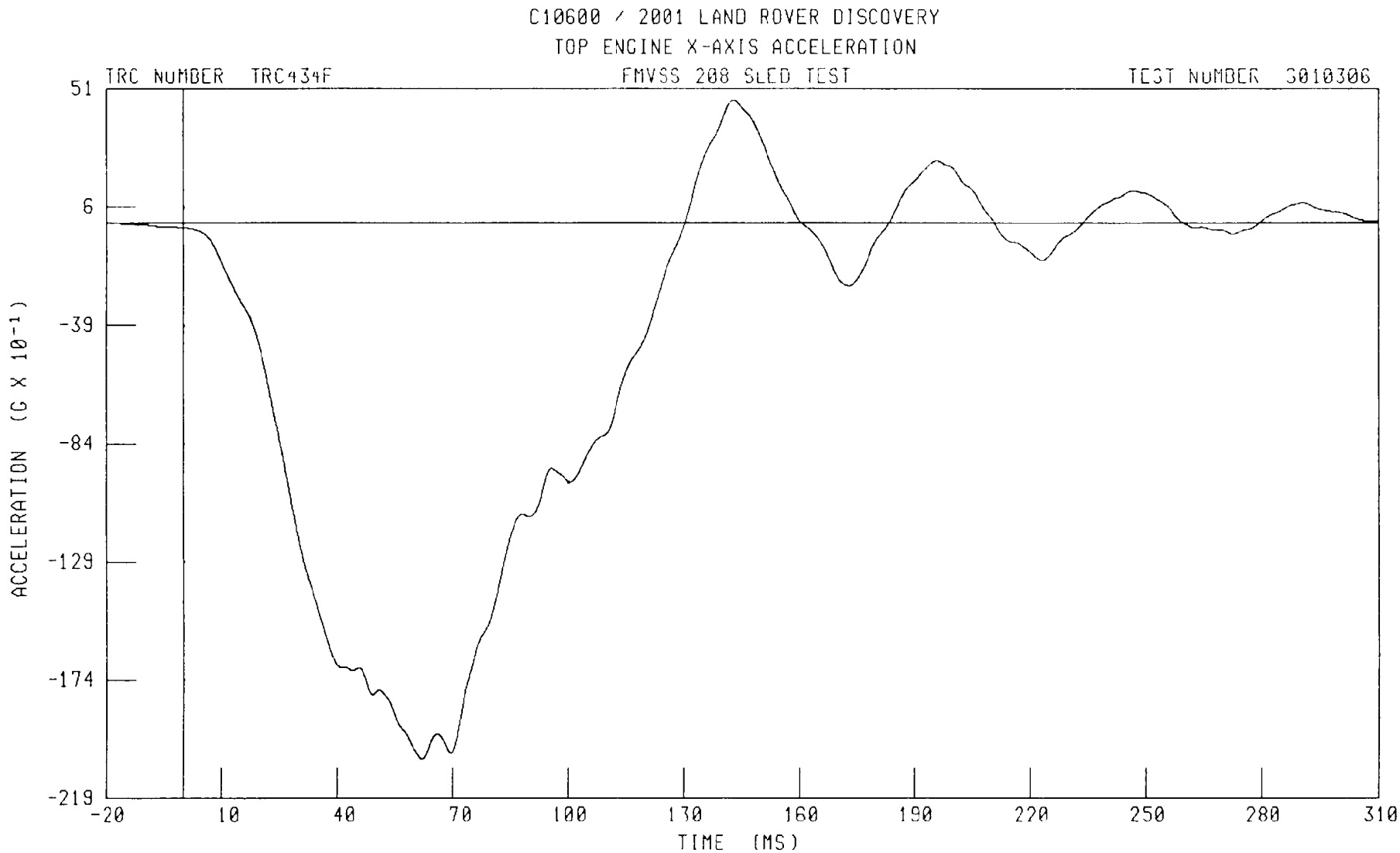
CHANNEL RBXG FILTER CH CLASS 60 PEAK DATA 1 89 G @ 130 32 MS, -21 47 G @ 43 68 MS

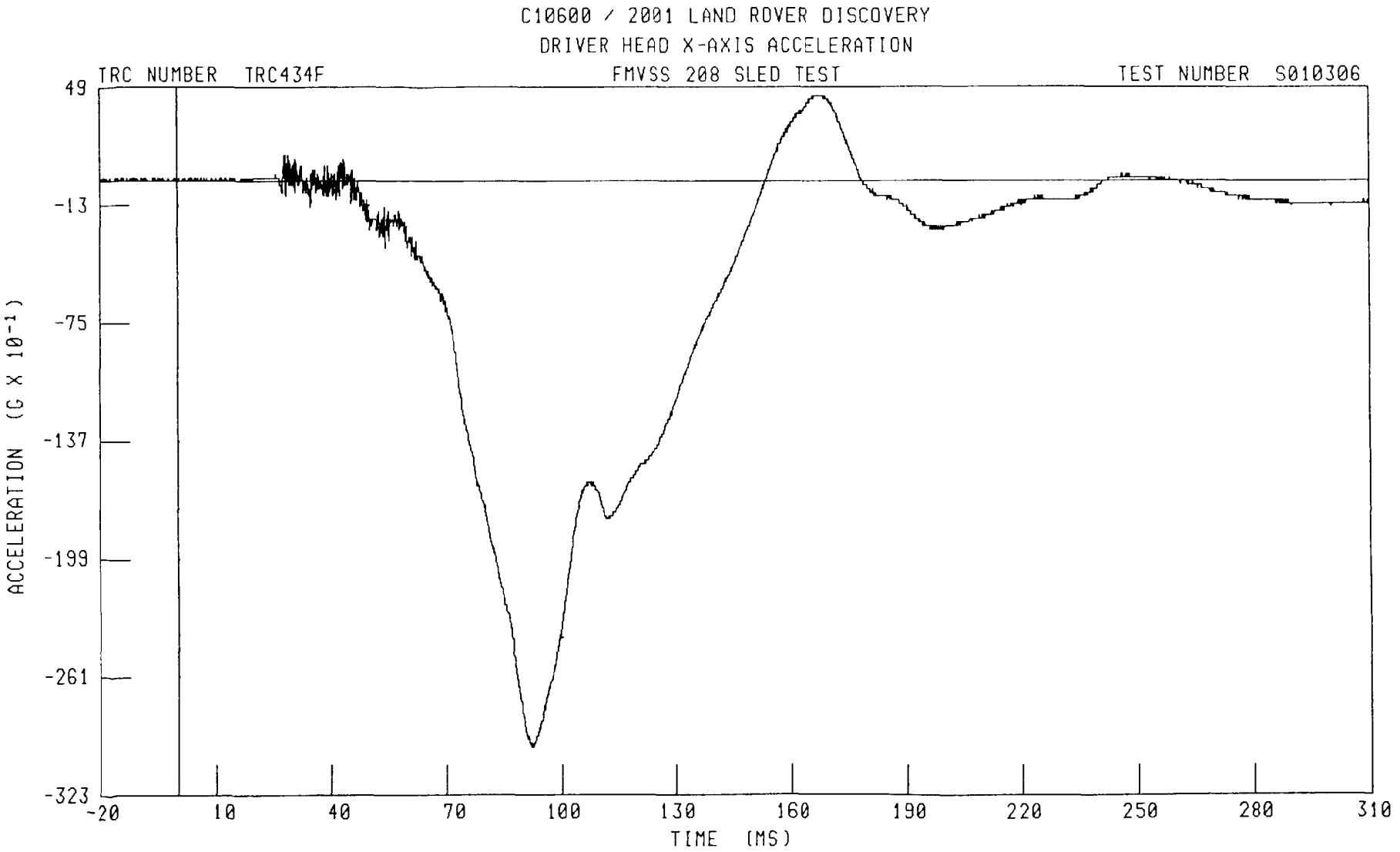
C10600 / 2001 LAND ROVER DISCOVERY
LEFT FRAME X-AXIS ACCELERATION

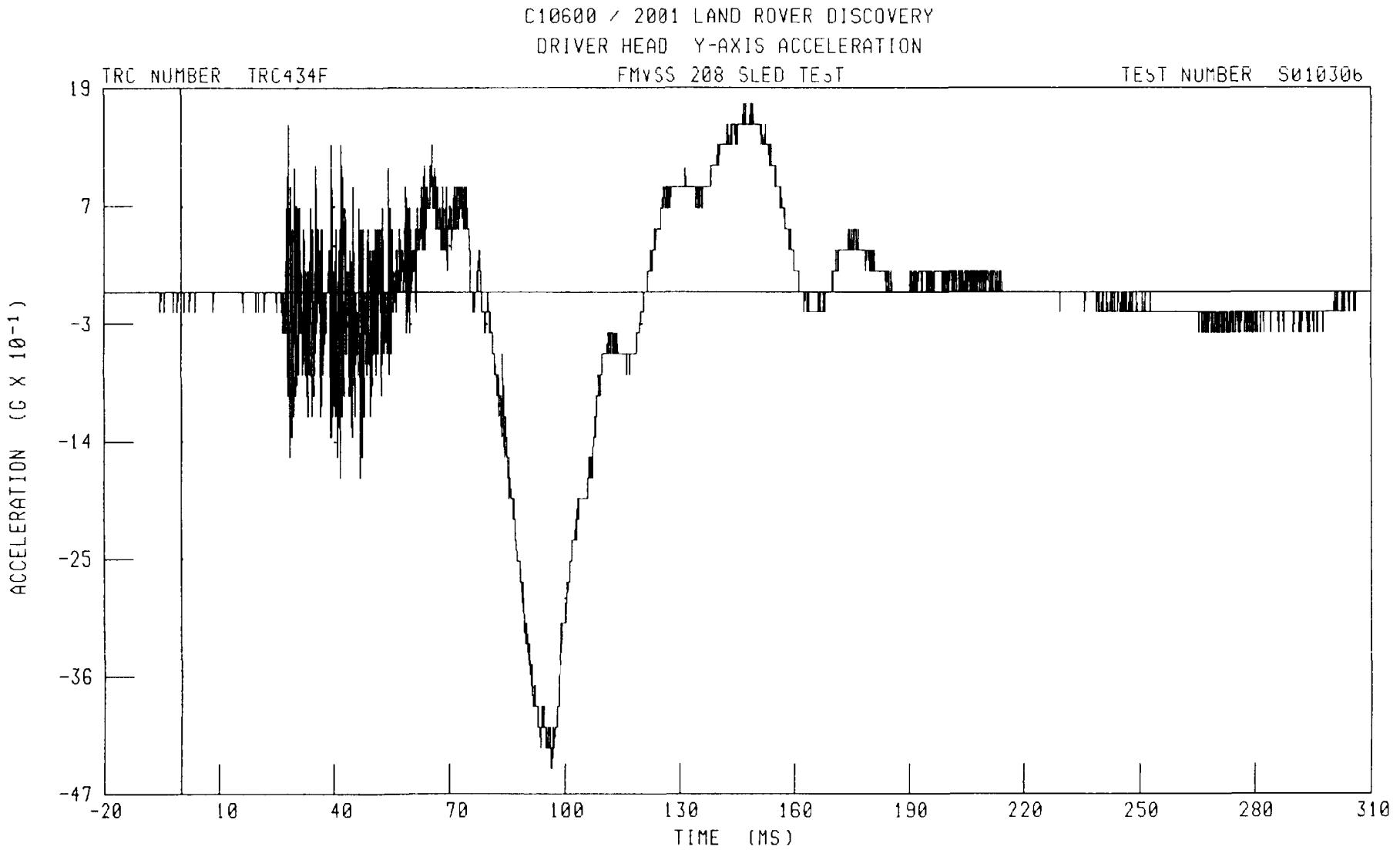


CHANNEL LFXG FILTER CH CLASS 60 PEAK DATA 23 61 G @ 45 20 MS, -19 04 G @ 55 60 MS


C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRAME X-AXIS ACCELERATION
FMVSS 208 SLED TEST
TRC NUMBER TRC434F
TEST NUMBER S010306
See Data Acquisition Explanations
ACCELERATION (G X 10-1)
18
-57
-133
-208
-284
-360
-436
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL RFXG
FILTER CH CLASS 60
PEAK DATA 1 81 G @ 131 28 MS, -40 00 G @ 104 80 MS

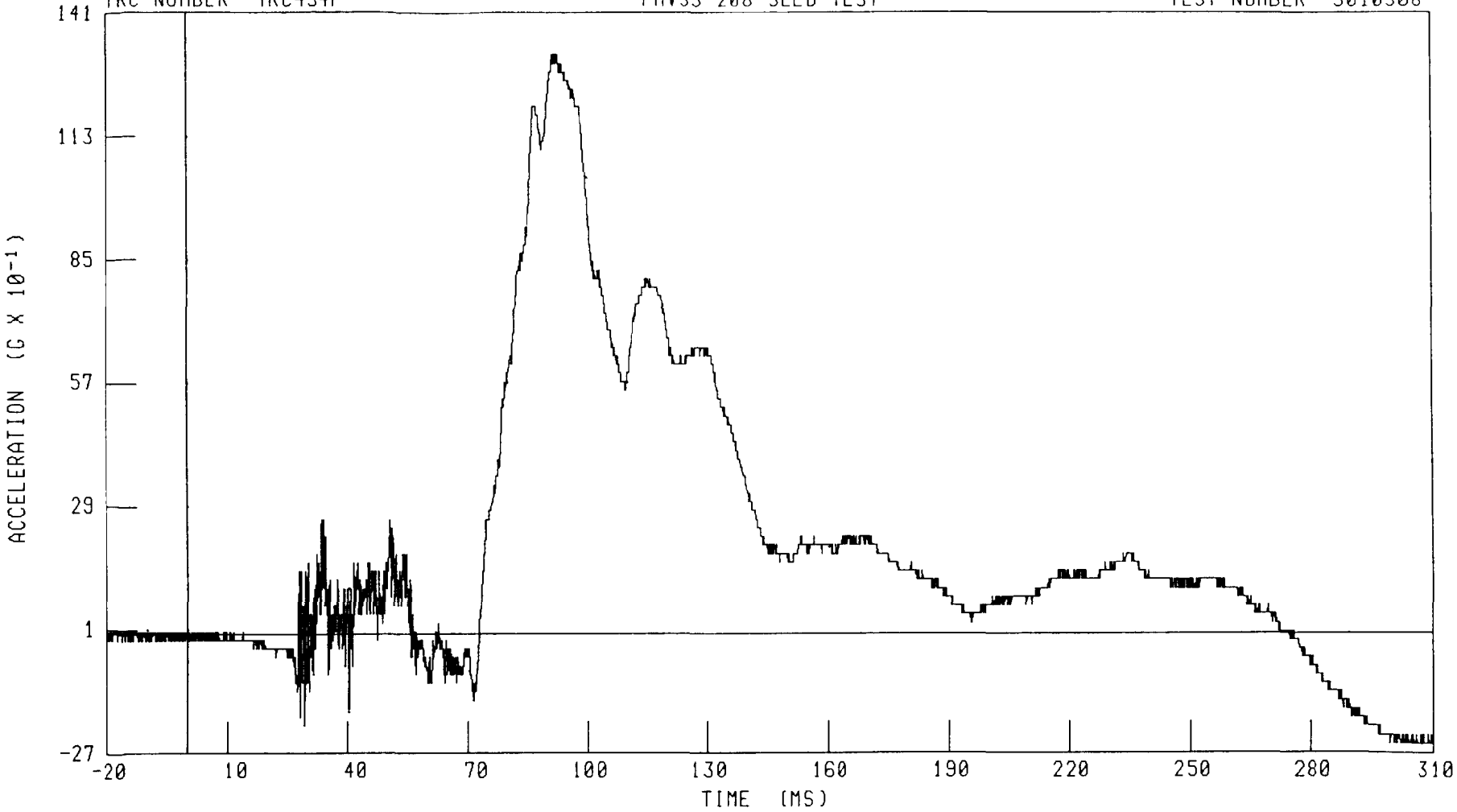

C10600 / 2001 LAND ROVER DISCOVERY
TOP ENGINE X-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER 3010306
51
6
-39
-84
-129
-174
-219
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL TEXG
FILTER CH CLASS 60
PEAK DATA 4 67 G @ 142 88 MS, -20 42 G @ 62 16 MS


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER HEAD X-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
49
-13
-75
-137
-199
-261
-323
ACCELERATION (G X 10⁻¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL HEDXG1 FILTER CH CLASS 1000
PEAK DATA 4 46 G @ 166 16 MS, -29 77 G @ 91 92 MS


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER HEAD Y-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
19
7
-3
-14
-25
-36
-47
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL HEDYG1 FILTER CH CLASS 1000
PEAK DATA 1 76 G @ 146 72 MS, -4 46 G @ 96 40 MS

C10600 / 2001 LAND ROVER DISCOVERY
DRIVER HEAD Z-AXIS ACCELERATION

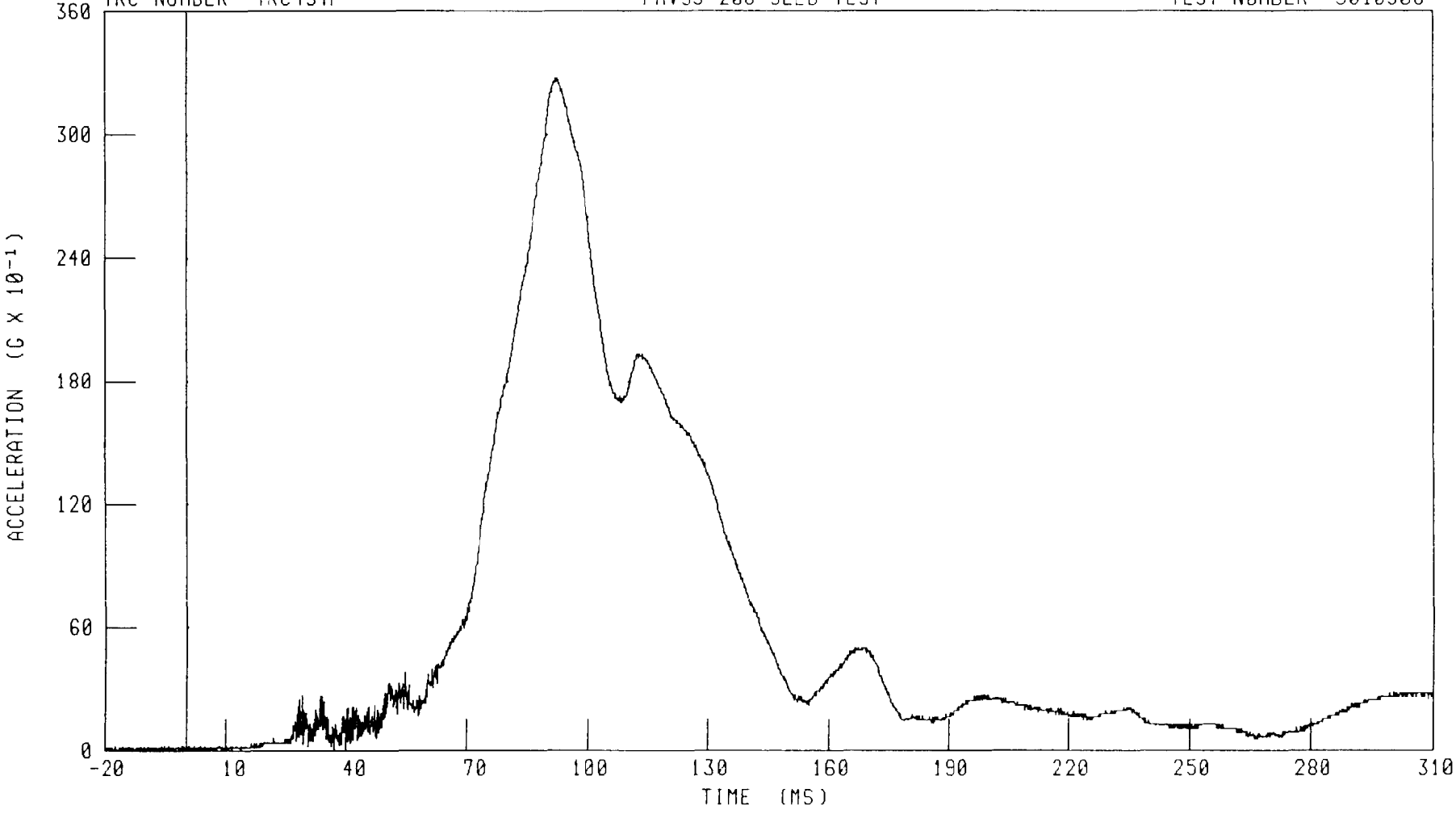
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



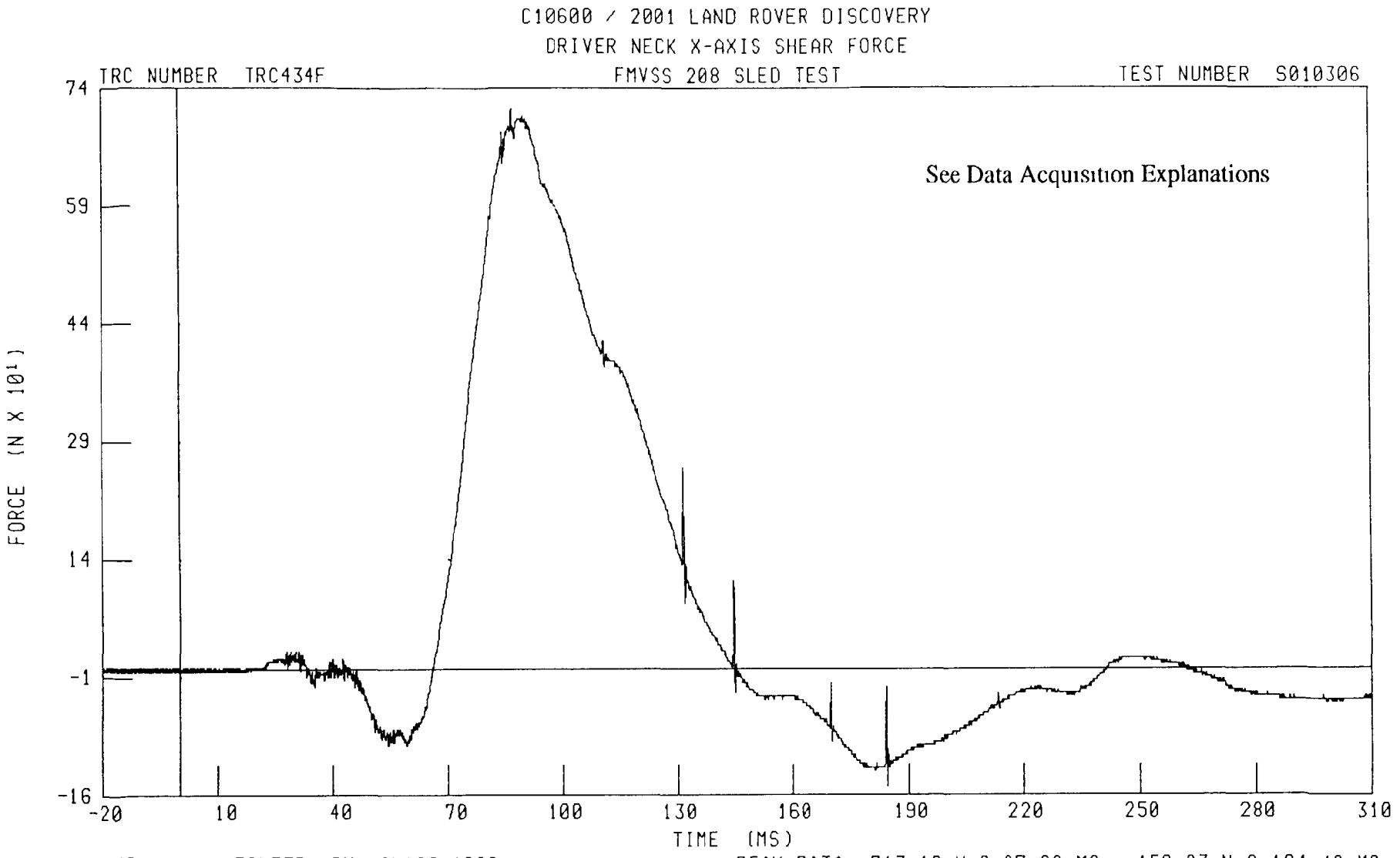
CHANNEL HEDZG1 FILTER CH CLASS 1000 PEAK DATA 13 15 G @ 91 36 MS, -2 49 G @ 299 36 MS

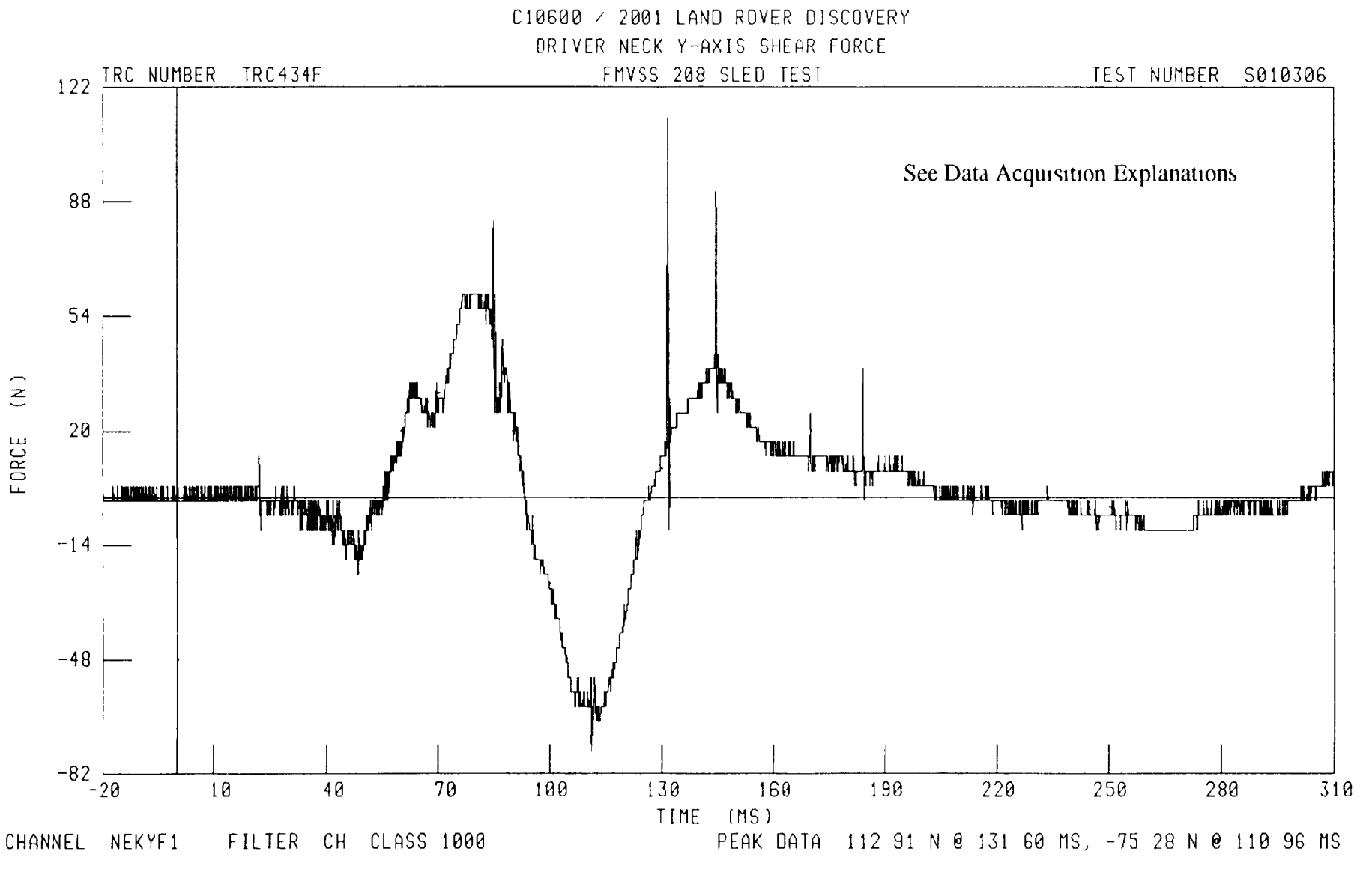
C10600 / 2001 LAND ROVER DISCOVERY
DRIVER HEAD RESULTANT ACCELERATION

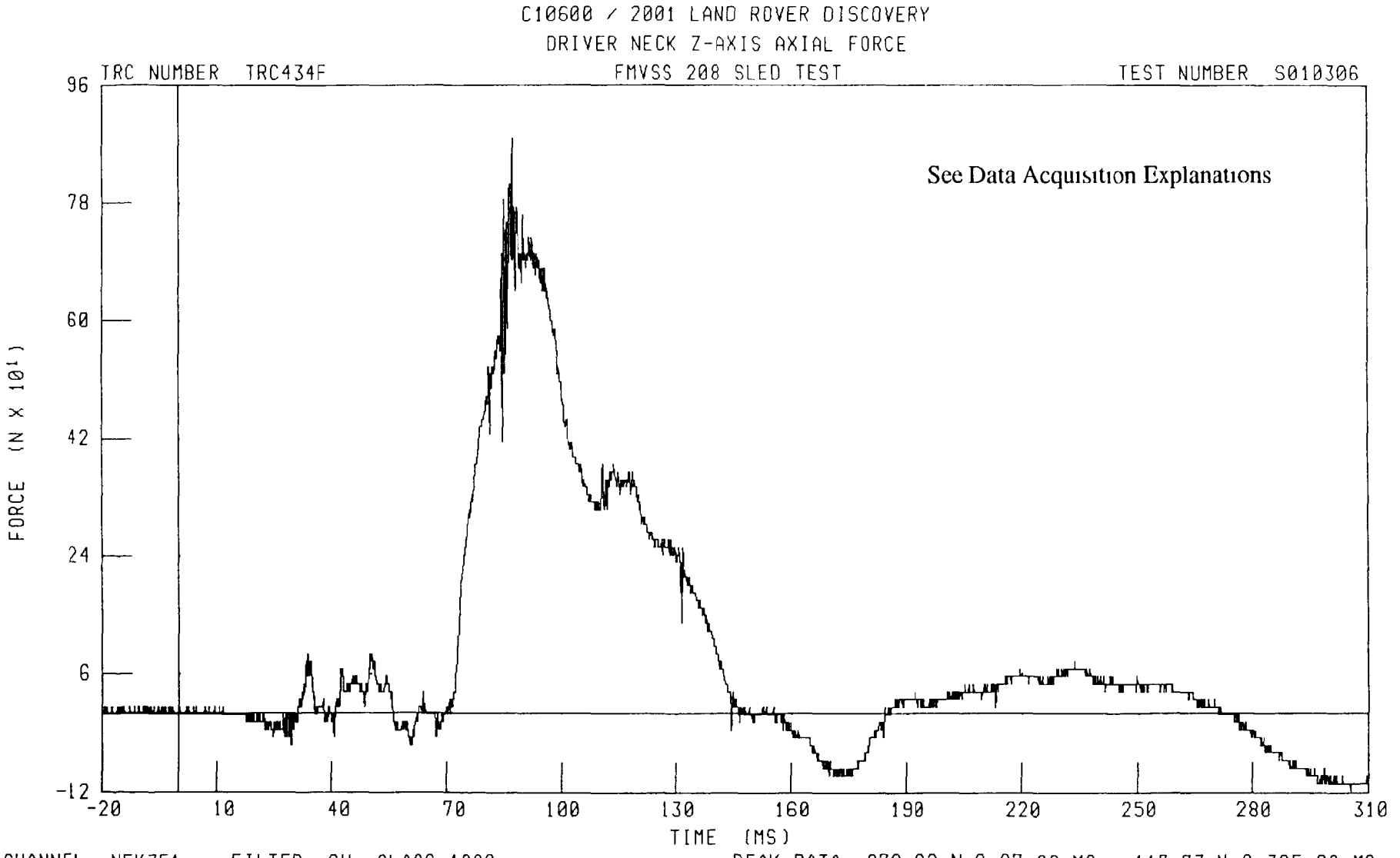
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER 5010306



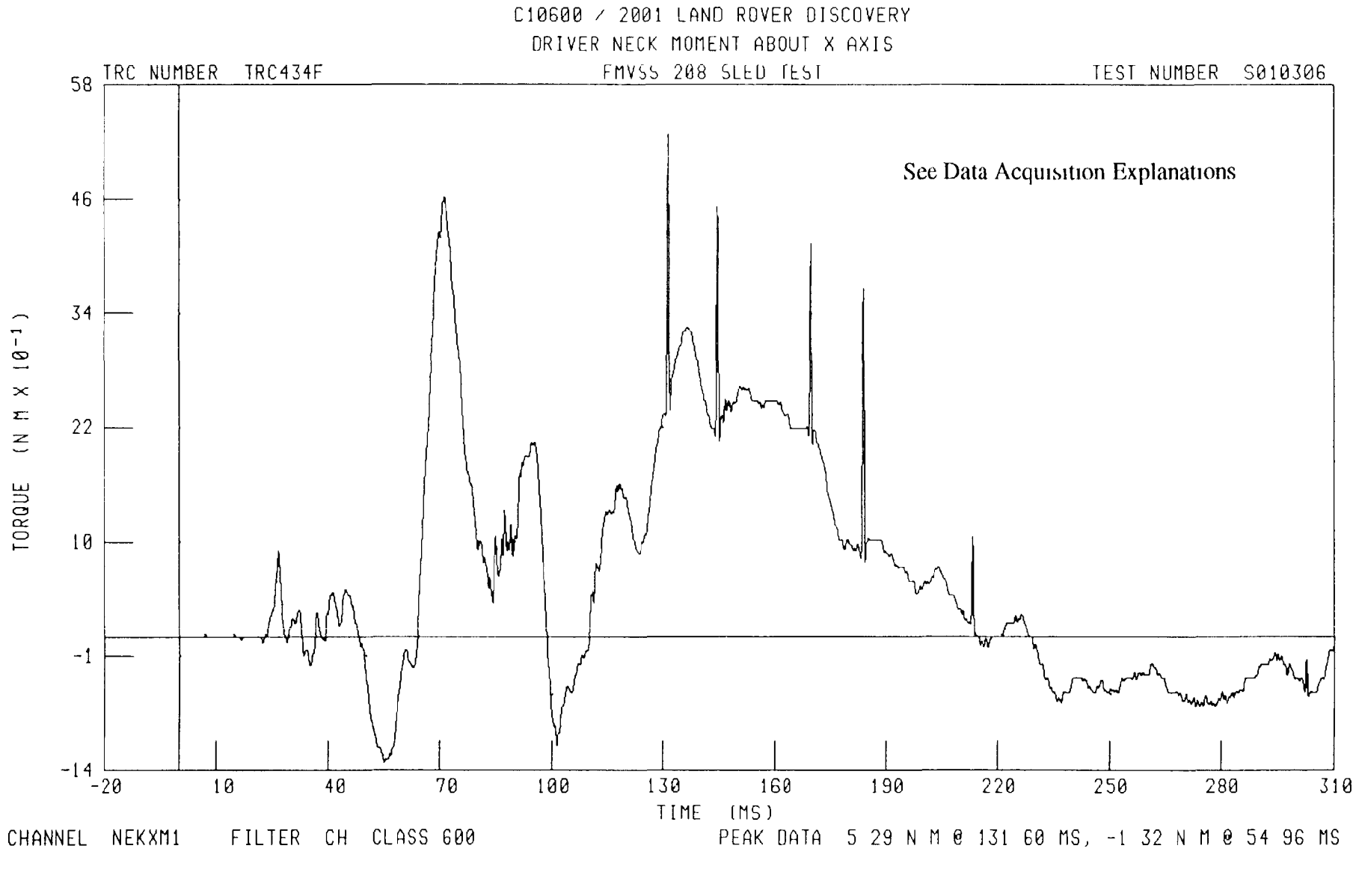
CHANNEL HEDRG1 FILTER CH CLASS 1000 PEAK DATA 32 78 G @ 91 92 MS, 0 07 G @ -19 92 MS


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK X-AXIS SHEAR FORCE
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
FORCE (N X 10¹)
74
59
44
29
14
-1
-16
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKXF1 FILTER CH CLASS 1000
PEAK DATA 713 10 N @ 87 28 MS, -150 03 N @ 184 40 MS


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK Y-AXIS SHEAR FORCE
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
FORCE (N)
122
88
54
20
-14
-48
-82
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKYF1 FILTER CH CLASS 1000
PEAK DATA 112 91 N @ 131 60 MS, -75 28 N @ 110 96 MS

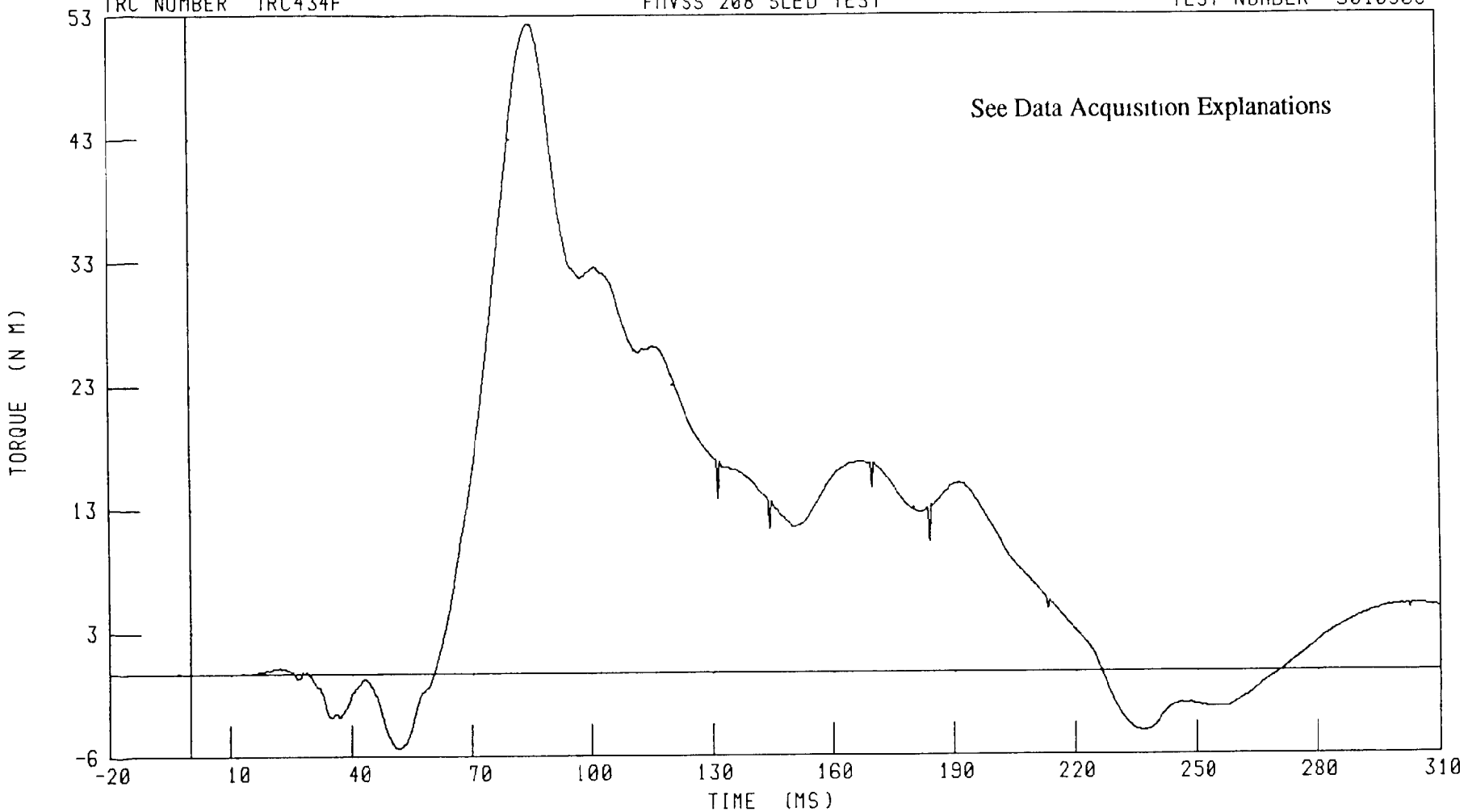

C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK Z-AXIS AXIAL FORCE
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
FORCE (N X 10¹)
96
78
60
42
24
6
-12
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKZF1 FILTER CH CLASS 1000
PEAK DATA 878 92 N @ 87 28 MS, -117 73 N @ 305 28 MS

010306


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK MOMENT ABOUT X AXIS
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
TORQUE (N M X 10-1)
58
46
34
22
10
-1
-14
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKXM1 FILTER CH CLASS 600
PEAK DATA 5 29 N M @ 131 60 MS, -1 32 N M @ 54 96 MS

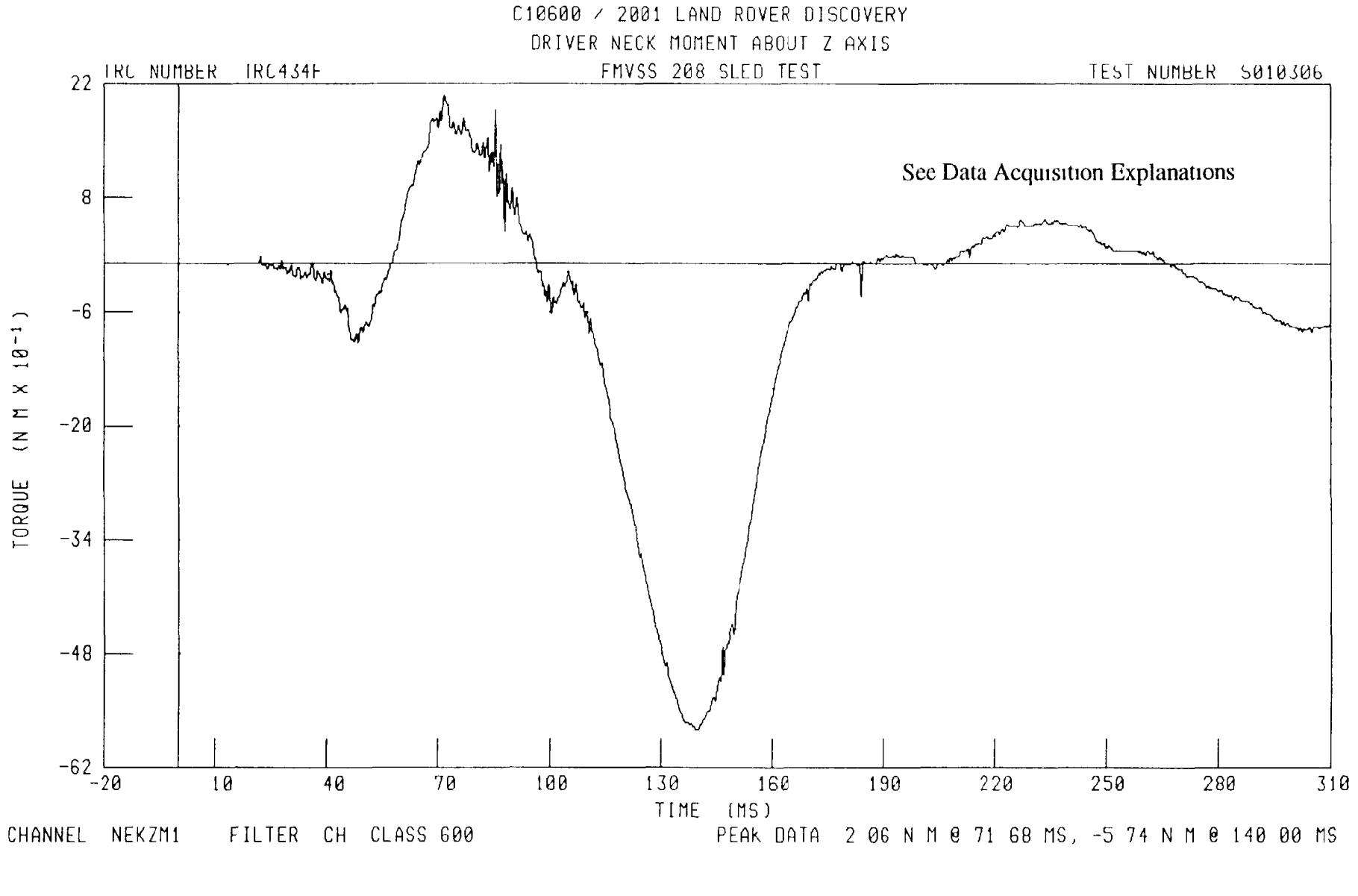
C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK MOMENT ABOUT Y AXIS

TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



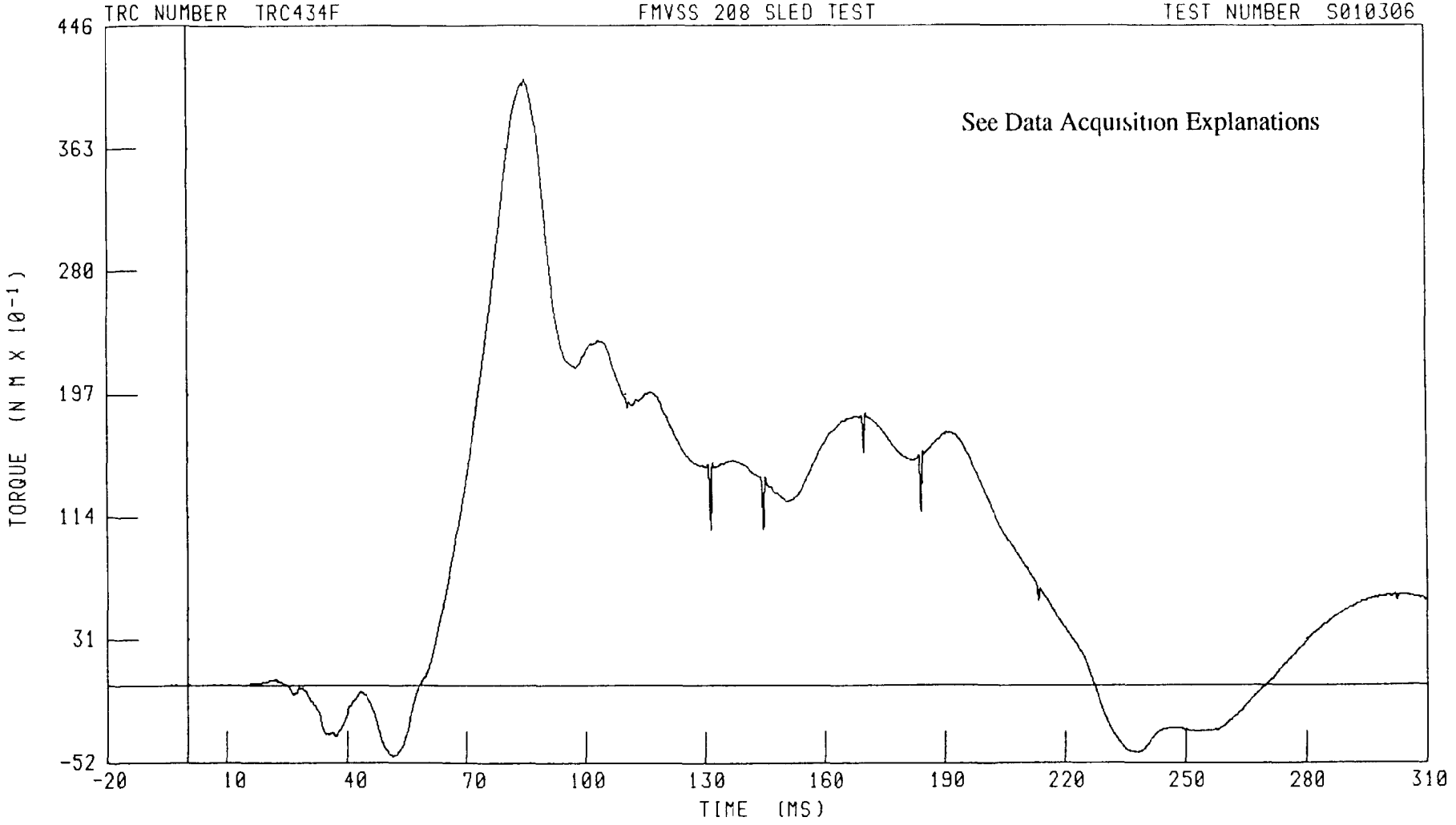
CHANNEL NEKYM1 FILTER CH CLASS 600 PEAK DATA 52 68 N M @ 85 20 MS, -6 12 N M @ 51 84 MS

010306


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK MOMENT ABOUT Z AXIS
IRC NUMBER IRC434F
FMVSS 208 SLED TEST
TEST NUMBER 5010306
See Data Acquisition Explanations
TORQUE (N M X 10-1)
22
8
-6
-20
-34
-48
-62
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKZM1 FILTER CH CLASS 600
PEAK DATA 2 06 N M @ 71 68 MS, -5 74 N M @ 140 00 MS

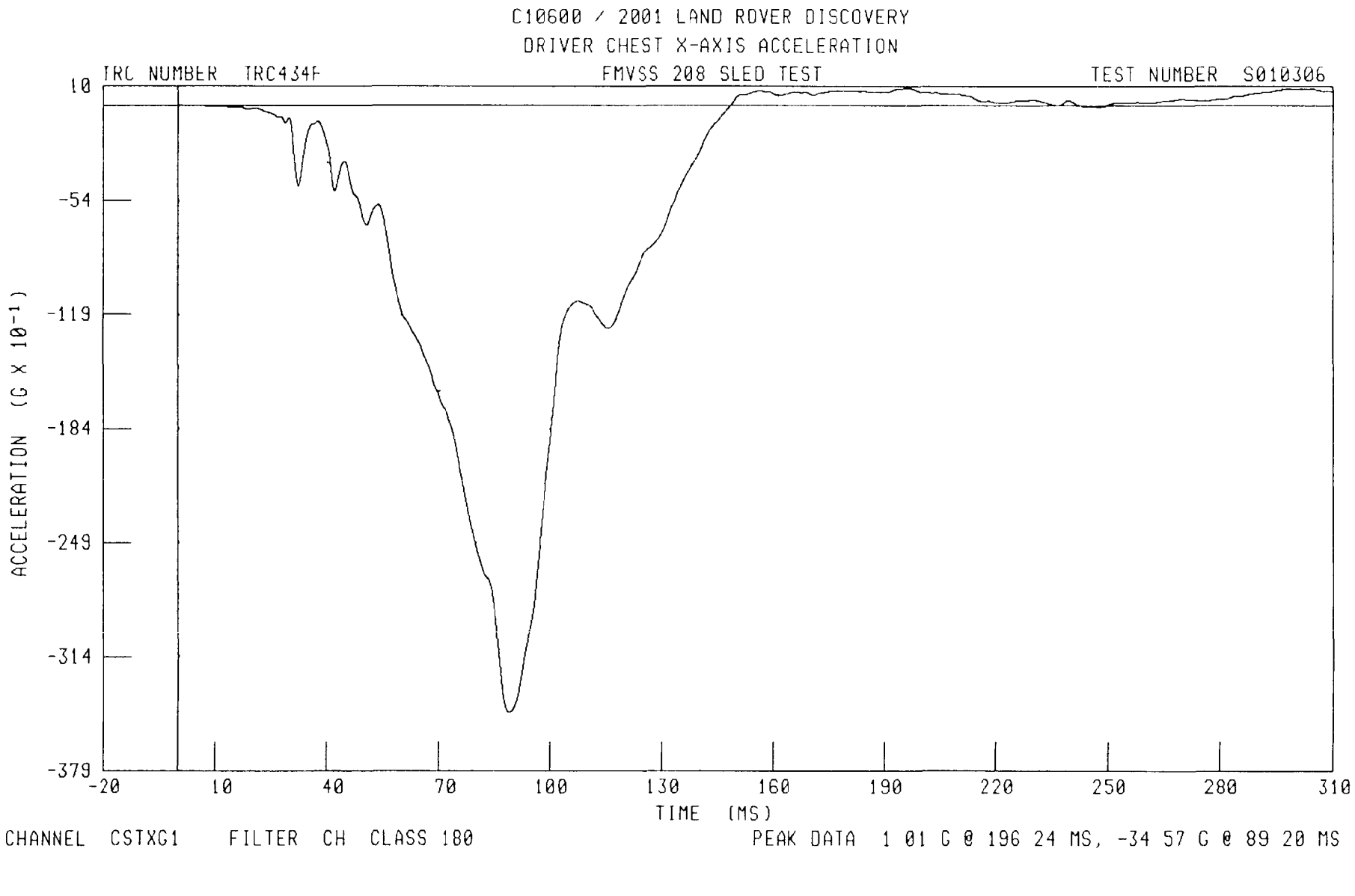
C10600 / 2001 LAND ROVER DISCOVERY
DRIVER NECK MOMENT ABOUT Y AXIS OCCIPITAL CONDYLE

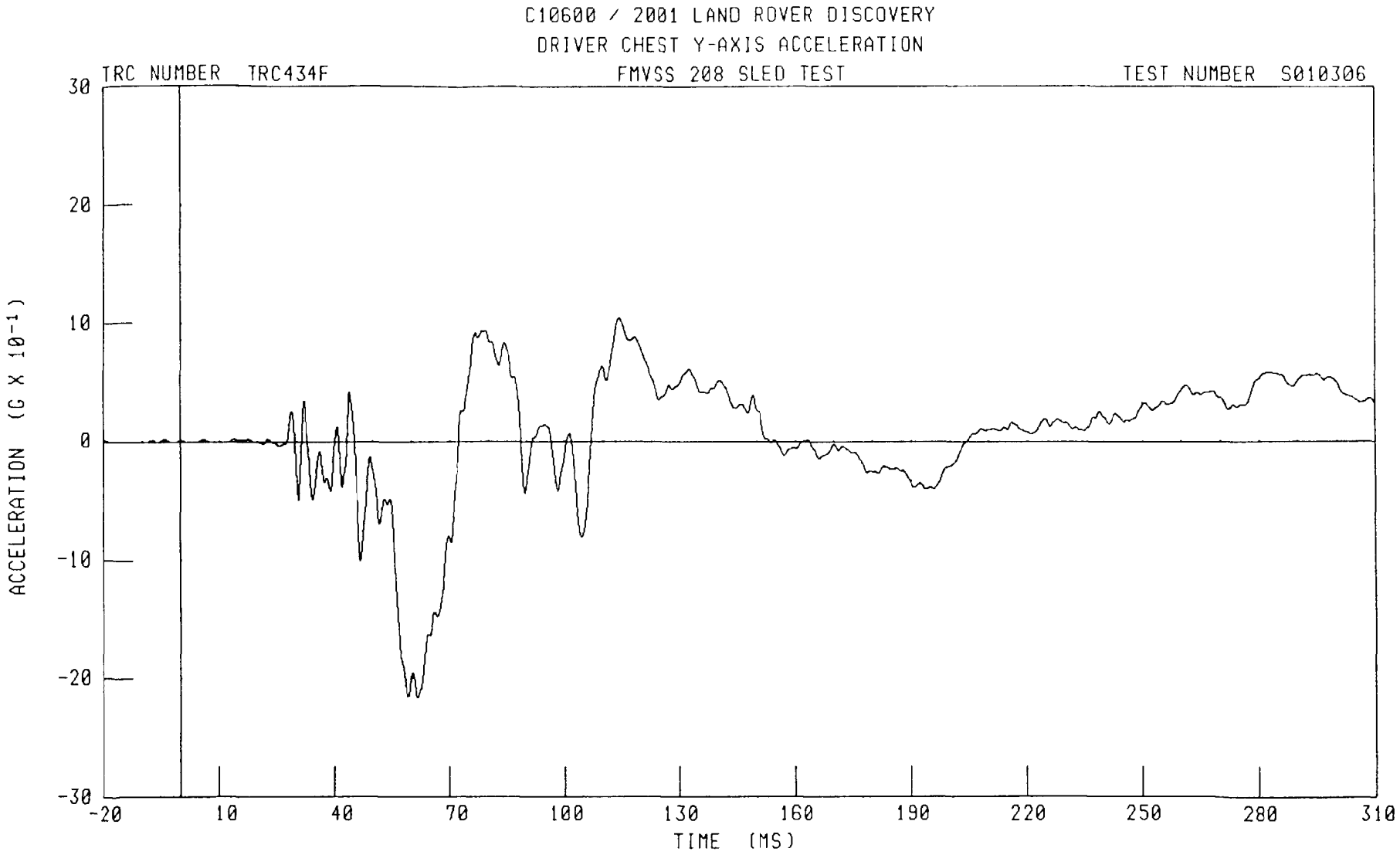
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306

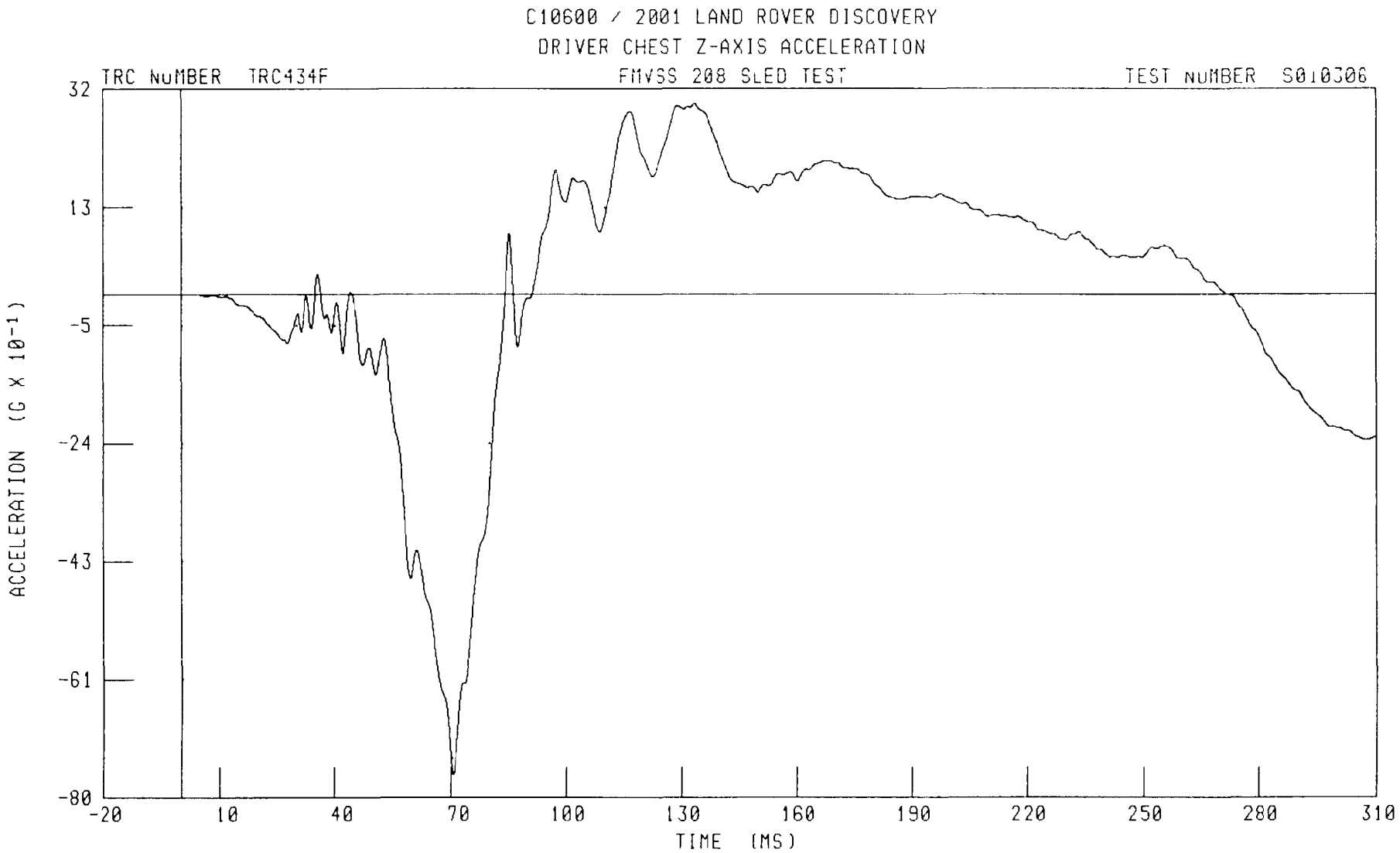


CHANNEL NEKOM1 FILTER CH CLASS 600 PEAK DATA 40 97 N M @ 84 96 MS, -4 80 N M @ 51 12 MS

010306

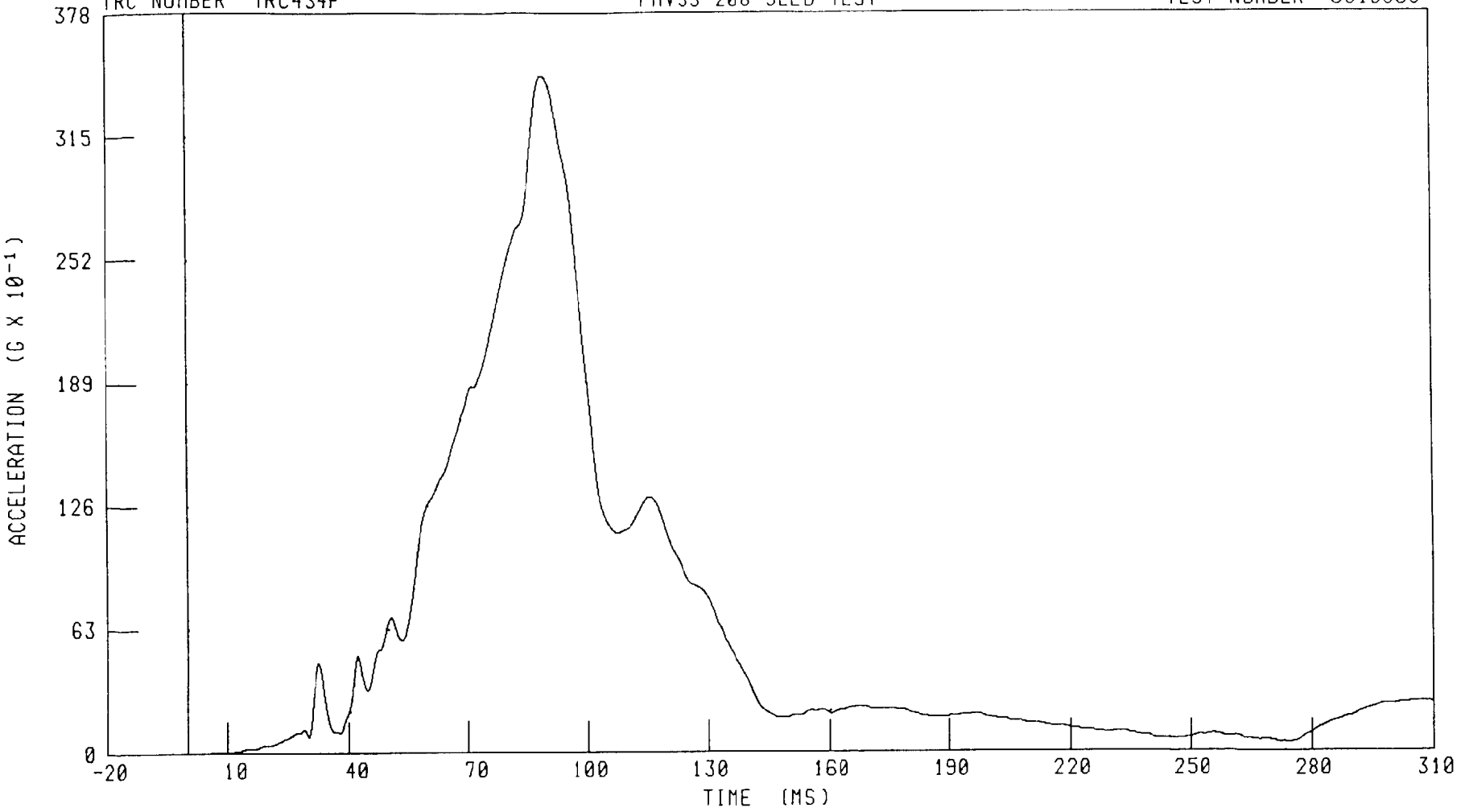

C10600 / 2001 LAND ROVER DISCOVERY
DRIVER CHEST X-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
10
-54
-119
-184
-249
-314
-379
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL CSTXG1 FILTER CH CLASS 180
PEAK DATA 1 01 G @ 196 24 MS, -34 57 G @ 89 20 MS


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER CHEST Y-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
ACCELERATION (G X 10-1)
30
20
10
0
-10
-20
-30
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL CSTYG1 FILTER CH CLASS 180
PEAK DATA 1 04 G @ 114 40 MS, -2 16 G @ 61 60 MS


C10600 / 2001 LAND ROVER DISCOVERY
DRIVER CHEST Z-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
32
13
-5
-24
-43
-61
-80
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL CSTZG1 FILTER CH CLASS 180
PEAK DATA 3 07 G @ 133 52 MS, -7 73 G @ 70 56 MS

C10600 / 2001 LAND ROVER DISCOVERY
DRIVER CHEST RESULTANT ACCELERATION

TRC NUMBER TRC434F — FMVSS 208 SLED TEST — TEST NUMBER S010306

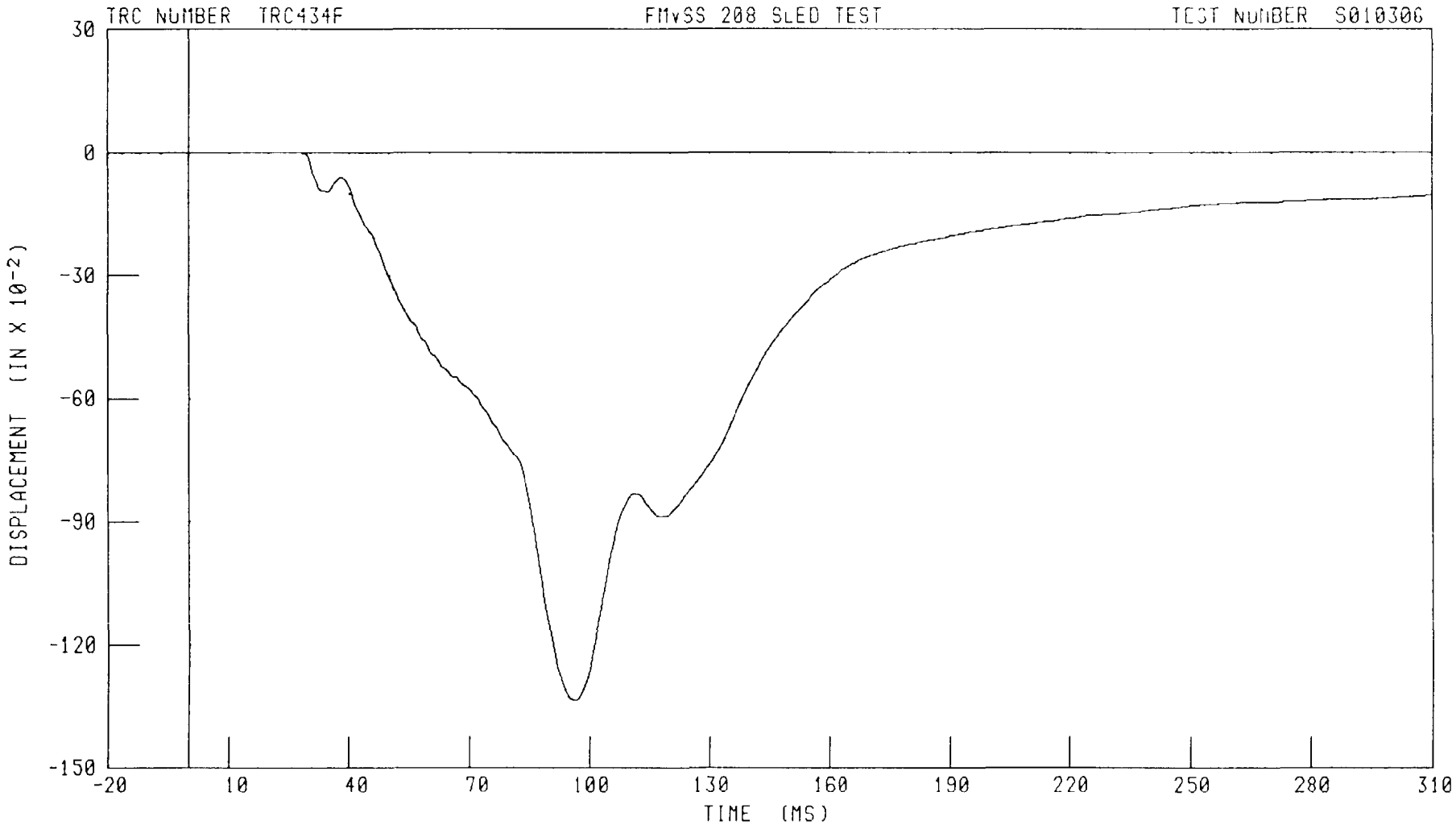


CHANNEL CSTRG1 FILTER CH CLASS 180

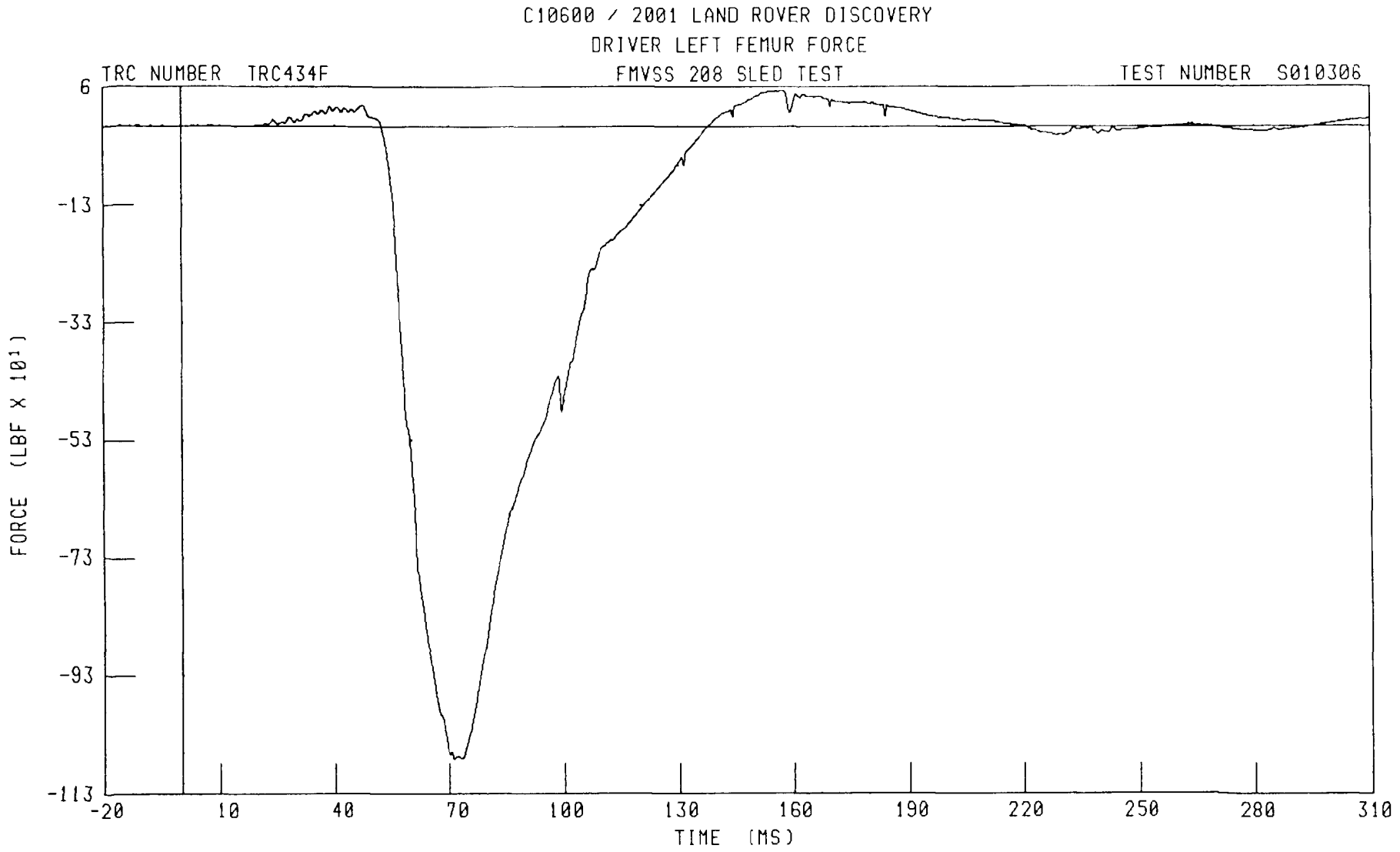
PEAK DATA 34 57 G @ 89 20 MS, 0 00 G @ 4 72 MS

010306

C10600 / 2001 LAND ROVER DISCOVERY
DRIVER CHEST DEFLECTION

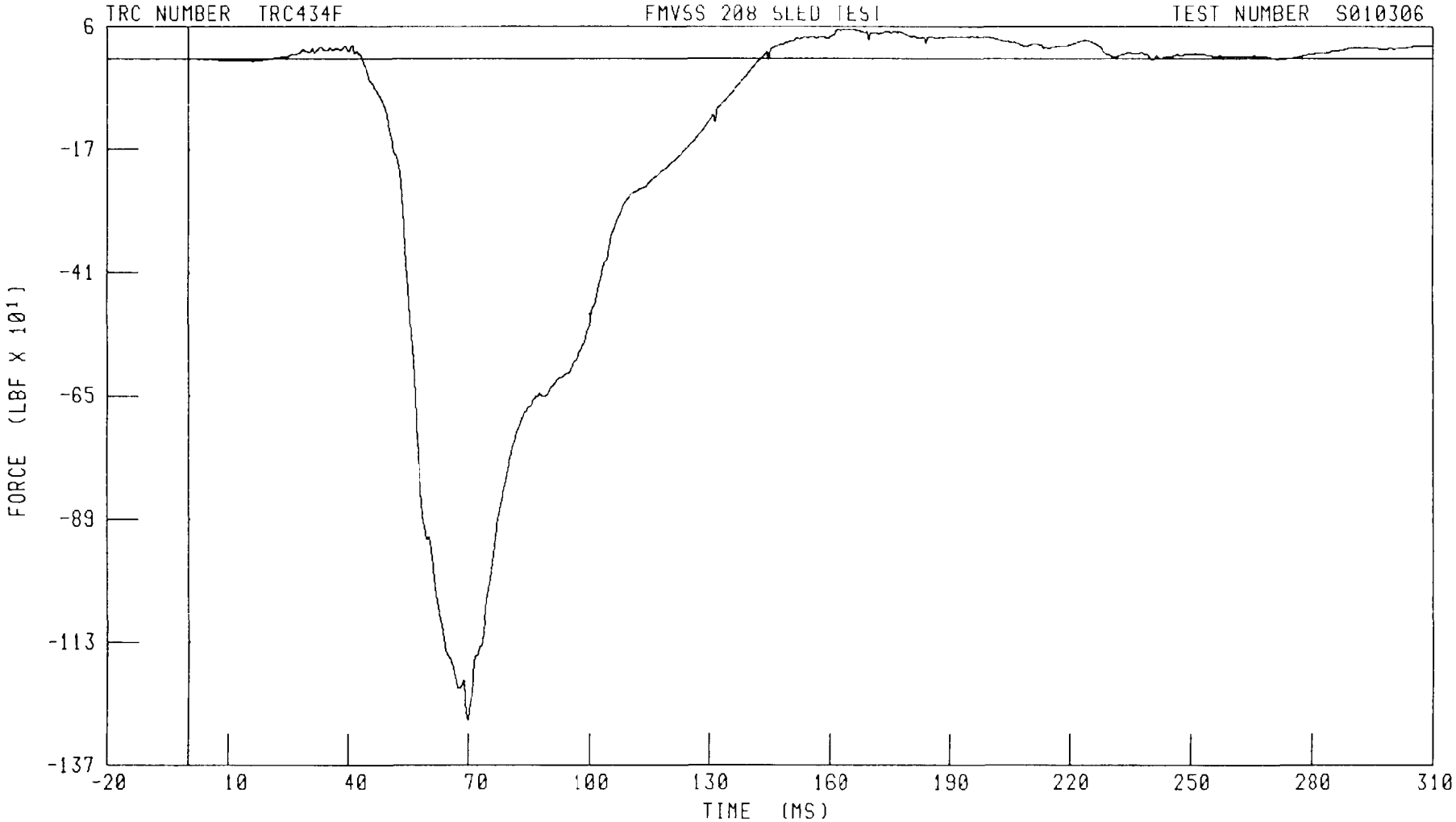


CHANNEL CSTXD1 FILTER CH CLASS 600 PEAK DATA 0 00 IN @ 27 52 MS, -1 33 IN @ 95 84 MS

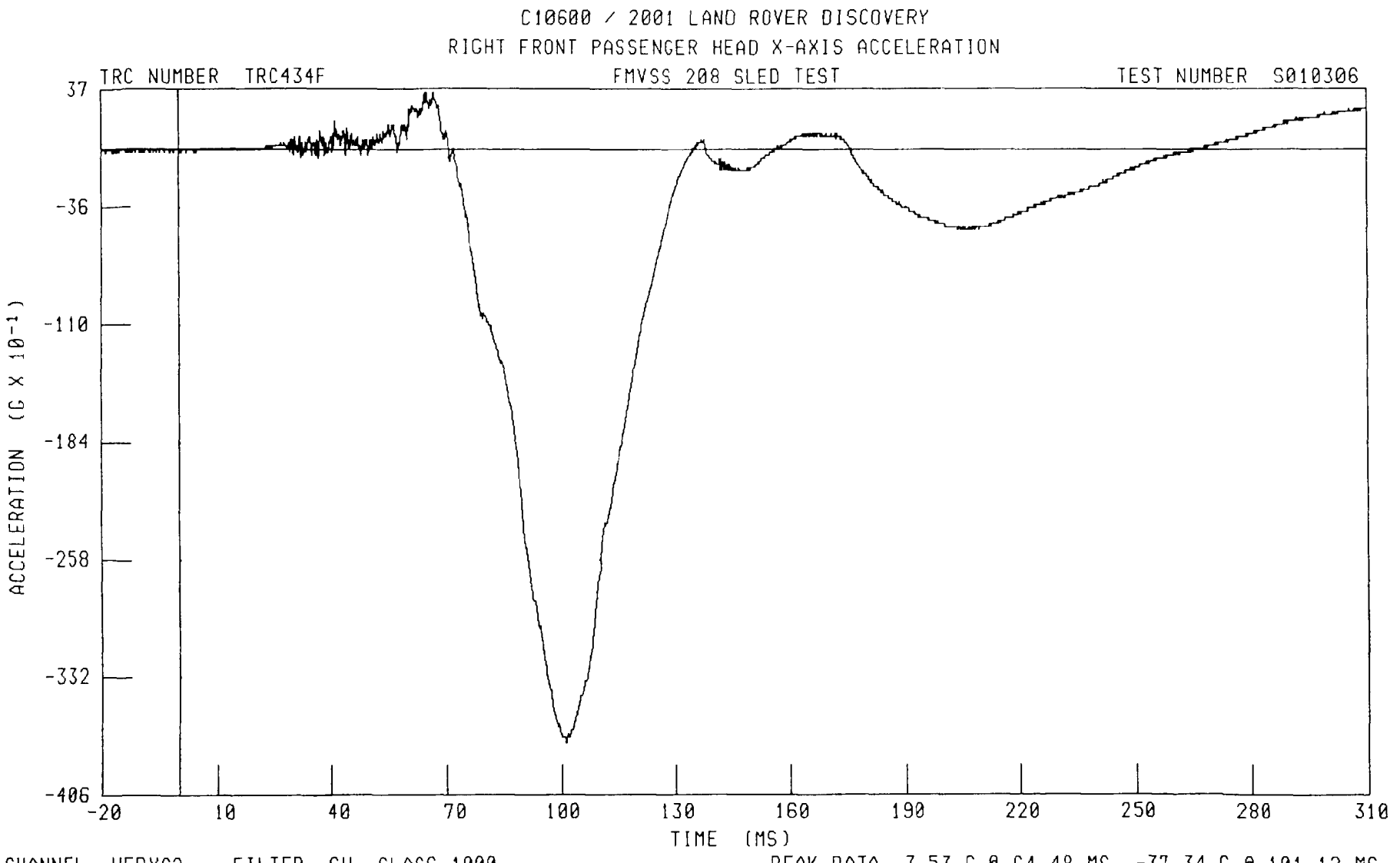

C10600 / 2001 LAND ROVER DISCOVERY
DRIVER LEFT FEMUR FORCE
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
6
-13
-33
-53
-73
-93
-113
FORCE (LBF X 10¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL LFMZF1 FILTER CH CLASS 600
PEAK DATA 61 11 LBF @ 157 44 MS, -1074 86 LBF @ 71 12 MS

010306

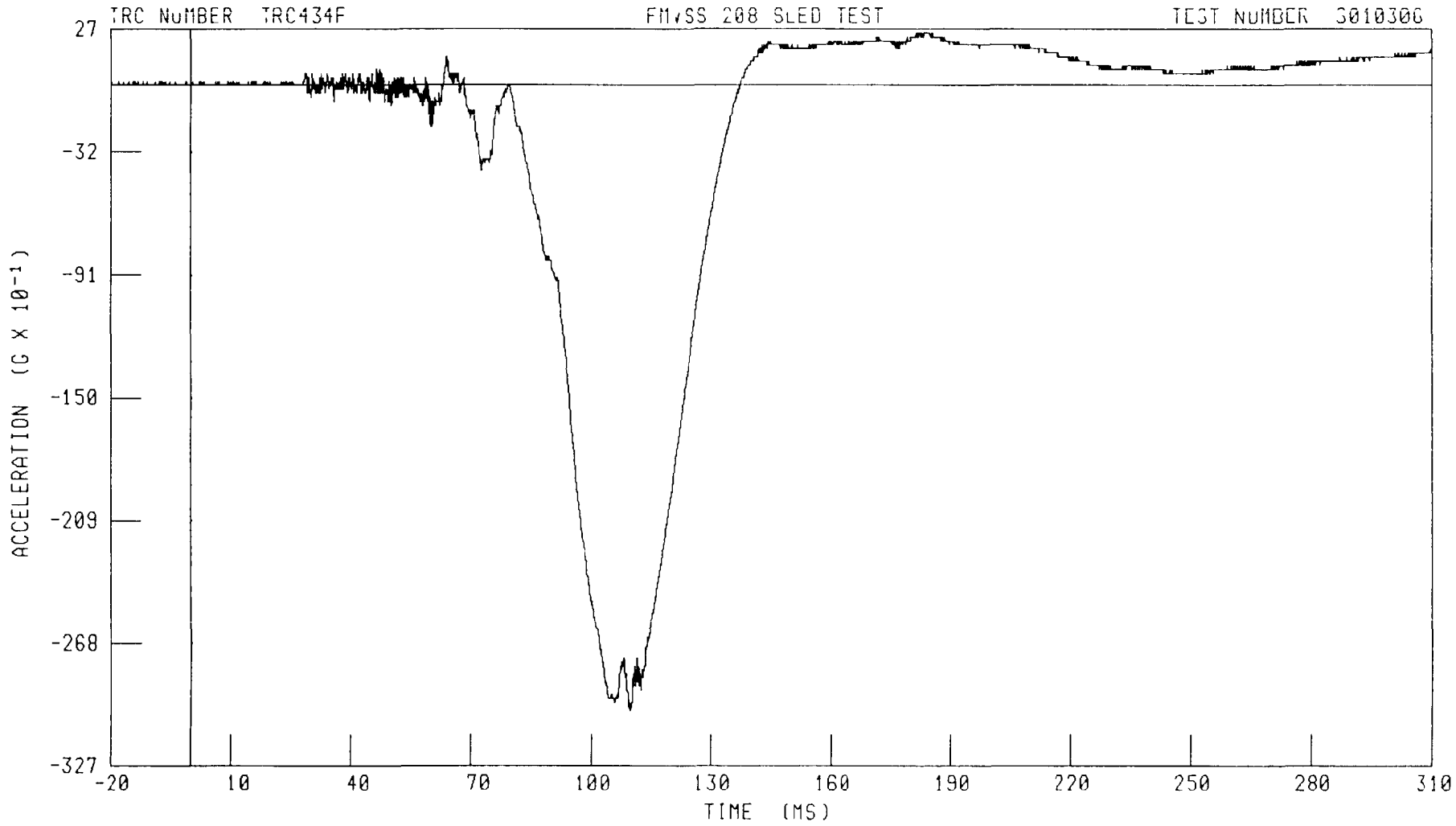
C10600 / 2001 LAND ROVER DISCOVERY
DRIVER RIGHT FEMUR FORCE



CHANNEL RFMZF1 FILTER CH CLASS 600 PEAK DATA 58 13 LBF @ 161 92 MS, -1290 23 LBF @ 69 76 MS


C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
37
-36
-110
-184
-258
-332
-406
ACCELERATION (G X 10⁻¹)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL HEDXG2 FILTER CH CLASS 1000
PEAK DATA 3 53 G @ 64 48 MS, -37 34 G @ 101 12 MS

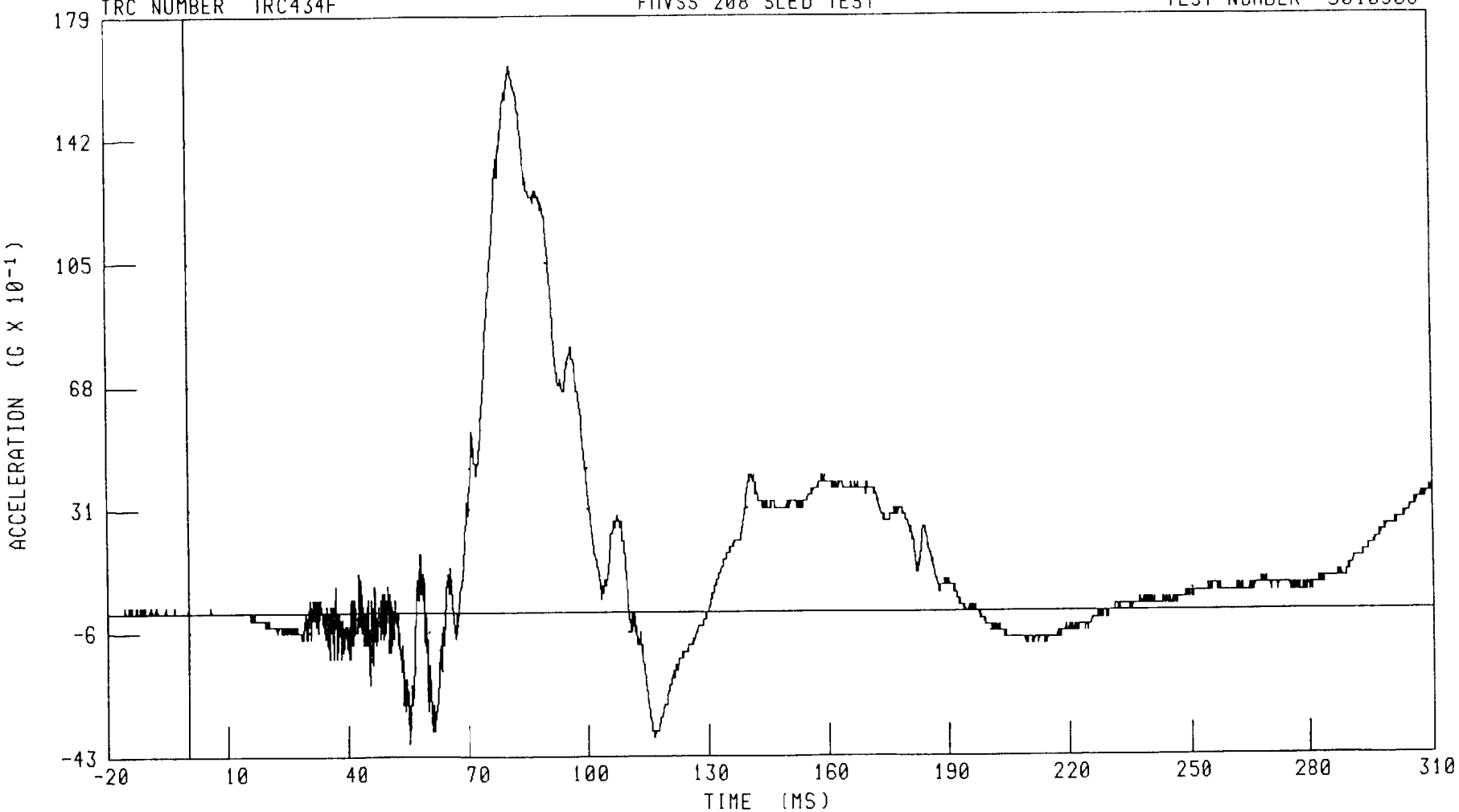
C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION



CHANNEL HEDYG2 FILTER CH CLASS 1000 PEAK DATA 2 52 G @ 181 52 MS, -30 03 G @ 109 68 MS

010336

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



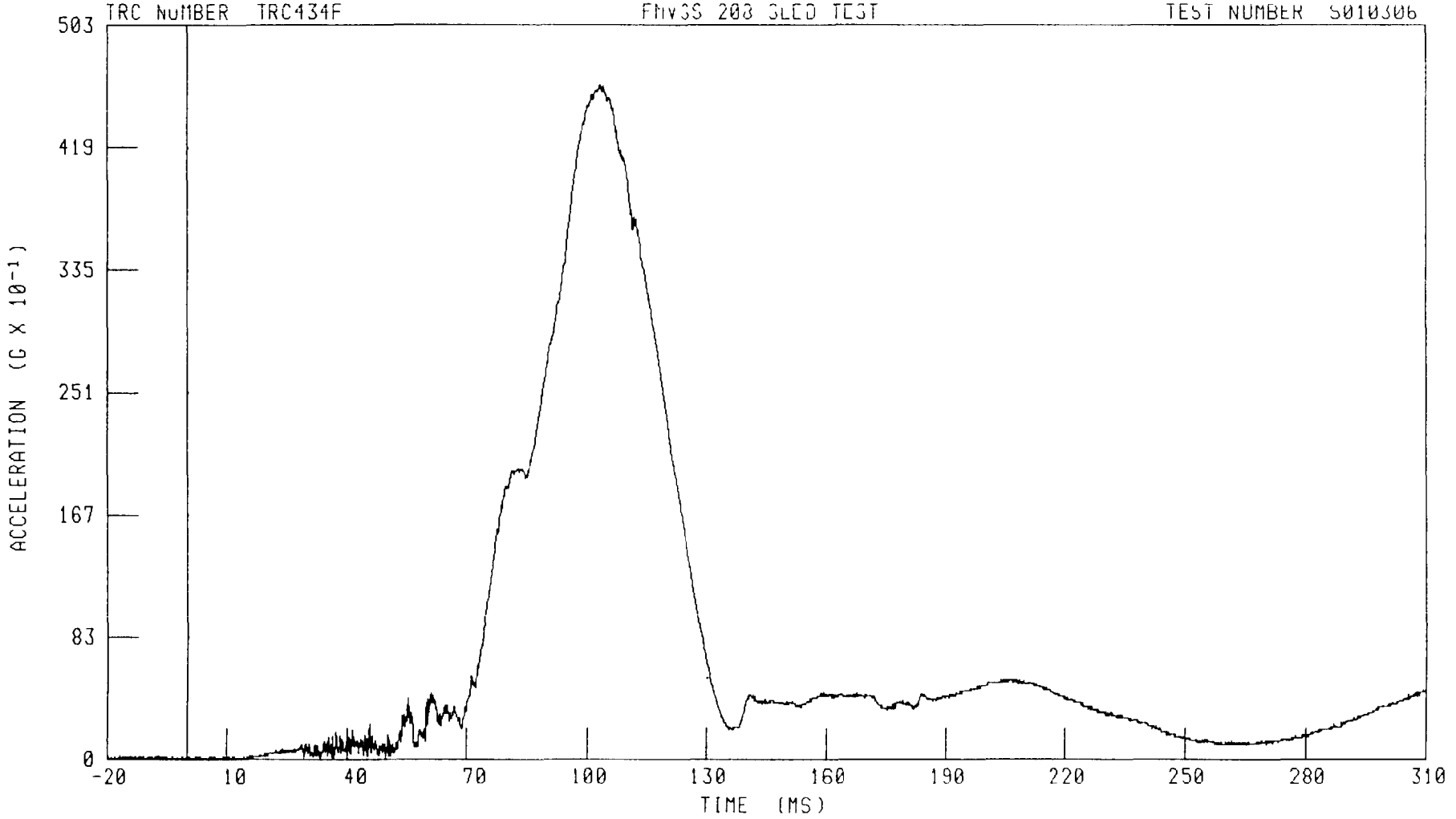
CHANNEL HEDZG2 FILTER CH CLASS 1000 PEAK DATA 16 39 G @ 81 04 MS, -3 93 G @ 55 12 MS

B-35

010306

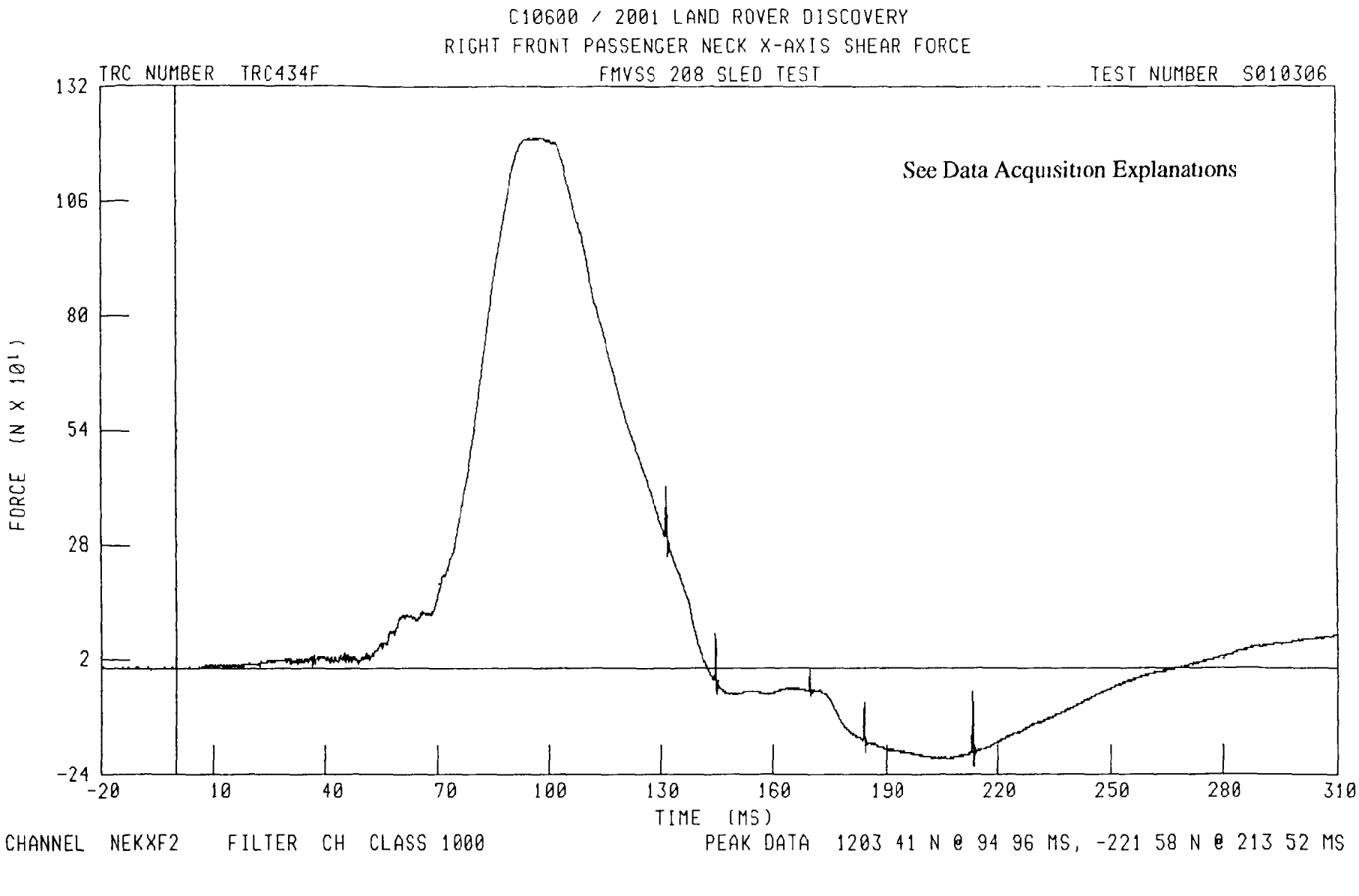
C10600 / 2001 LAND ROVER DISCOVERY

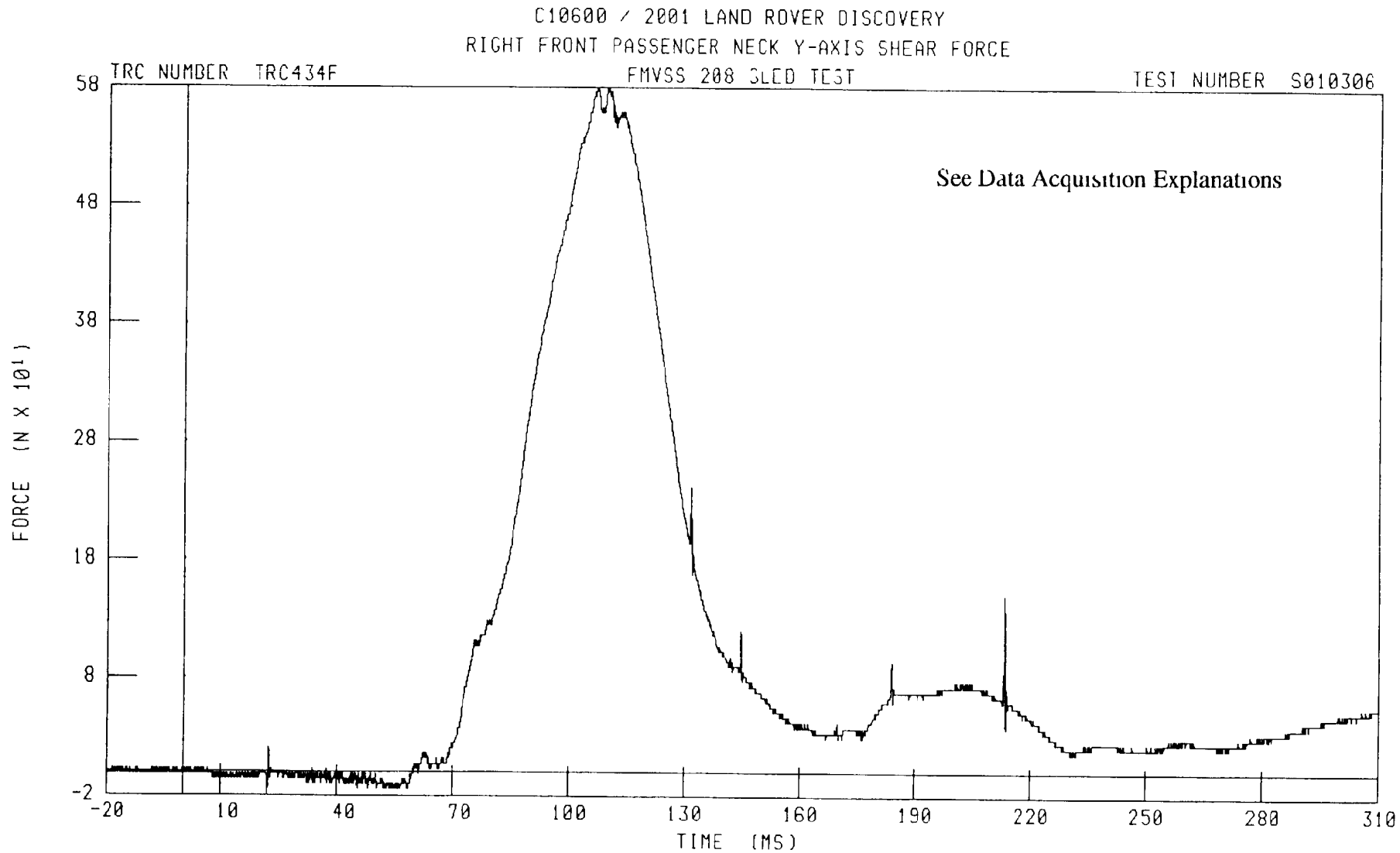
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION



CHANNEL HEDRG2 FILTER CH CLASS 1000 PEAK DATA 46 31 G @ 103 44 MS, 0 04 G @ -20 00 MS

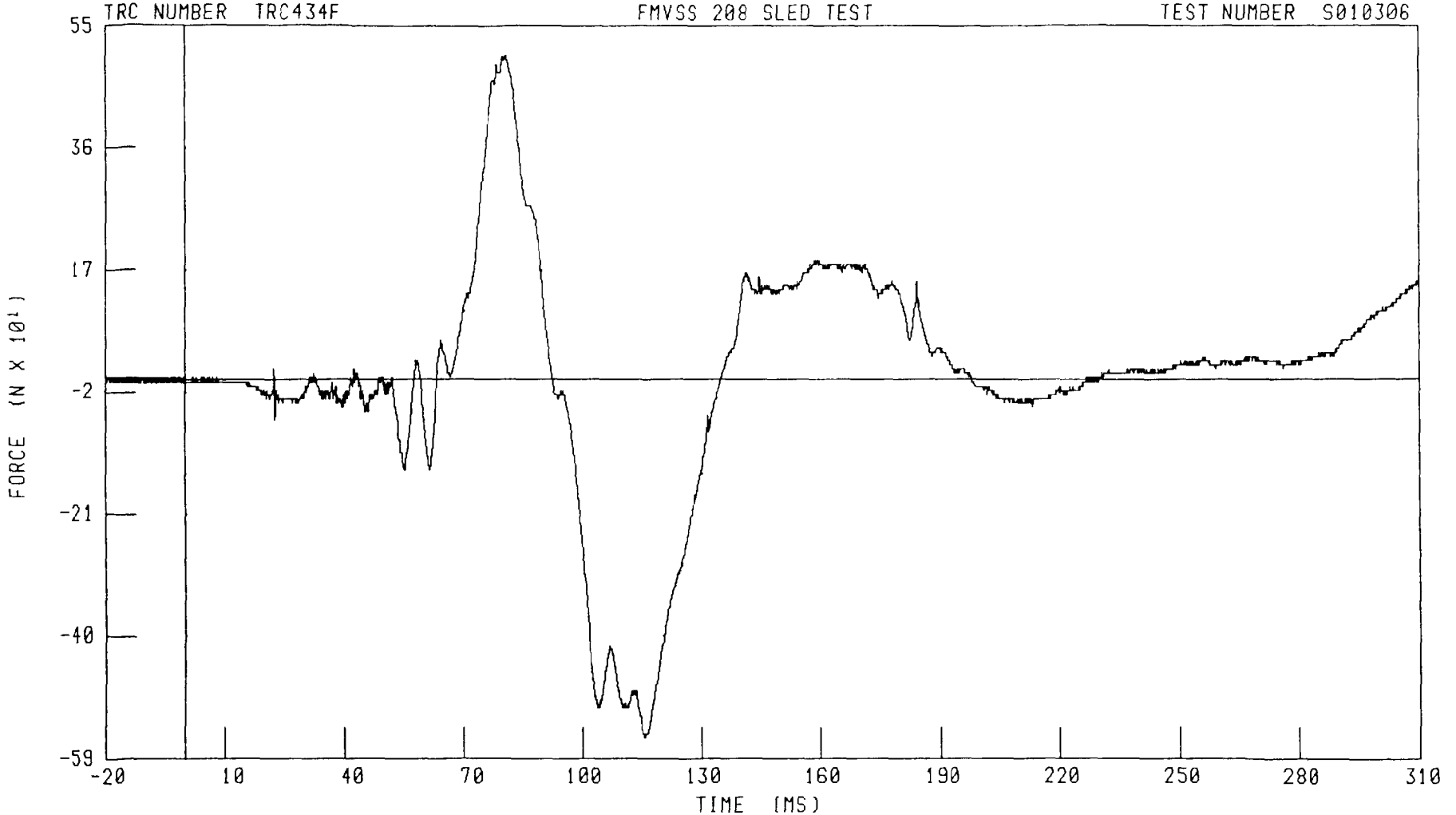
010326


C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
FORCE (N X 10¹)
132
106
80
54
28
2
-24
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKXF2 FILTER CH CLASS 1000
PEAK DATA 1203 41 N @ 94 96 MS, -221 58 N @ 213 52 MS


C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
See Data Acquisition Explanations
FORCE (N X 10¹)
58
48
38
28
18
8
-2
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL NEKYF2 FILTER CH CLASS 1000
PEAK DATA 580 93 N @ 106 48 MS, -18 67 N @ 22 24 MS

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE

TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



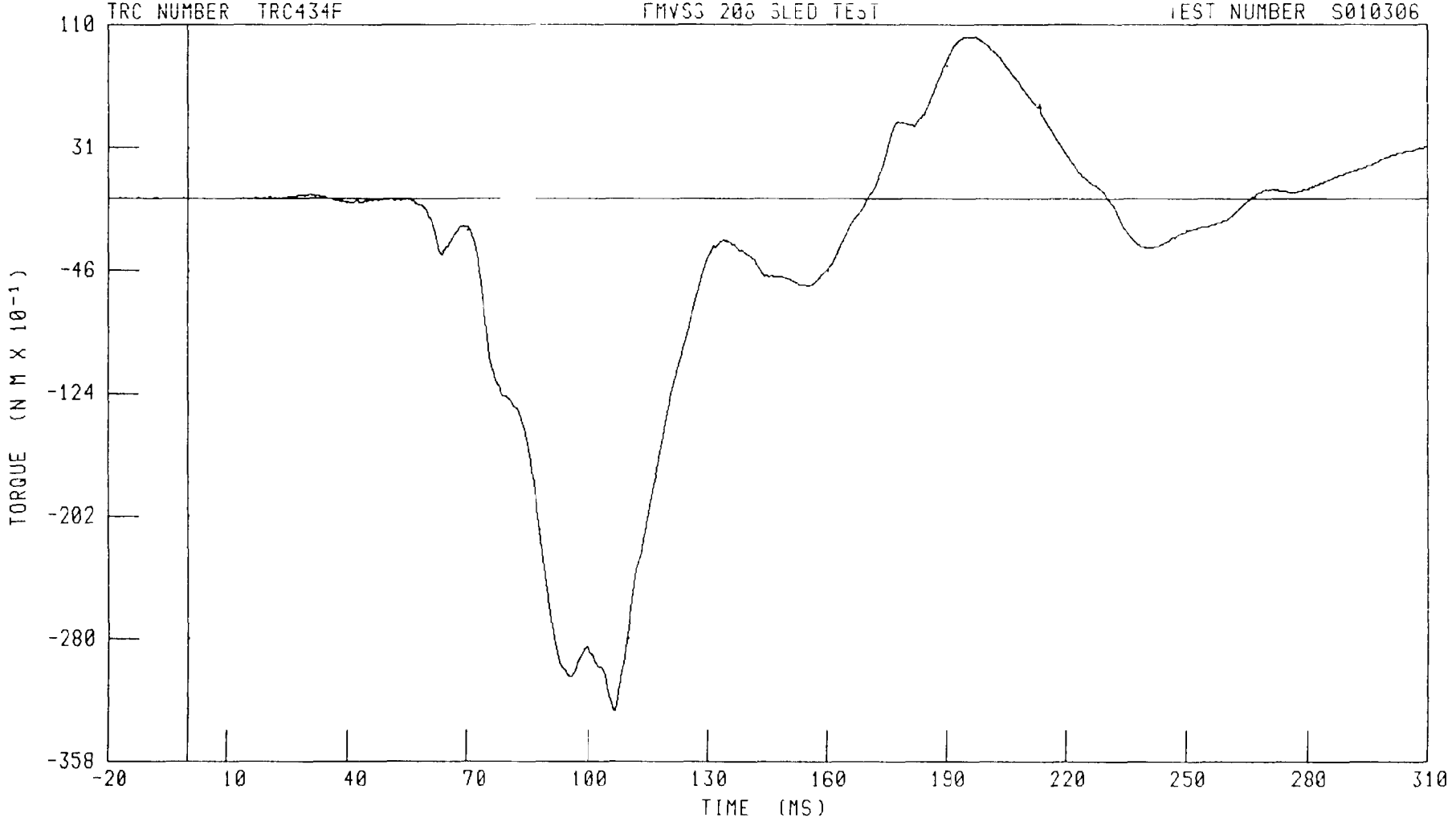
CHANNEL NEKZF2 FILTER CH CLASS 1000 PEAK DATA 504 22 N @ 79 92 MS, -557 56 N @ 115 68 MS

010306

C10600 / 2001 LAND ROVER DISCOVERY

RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS

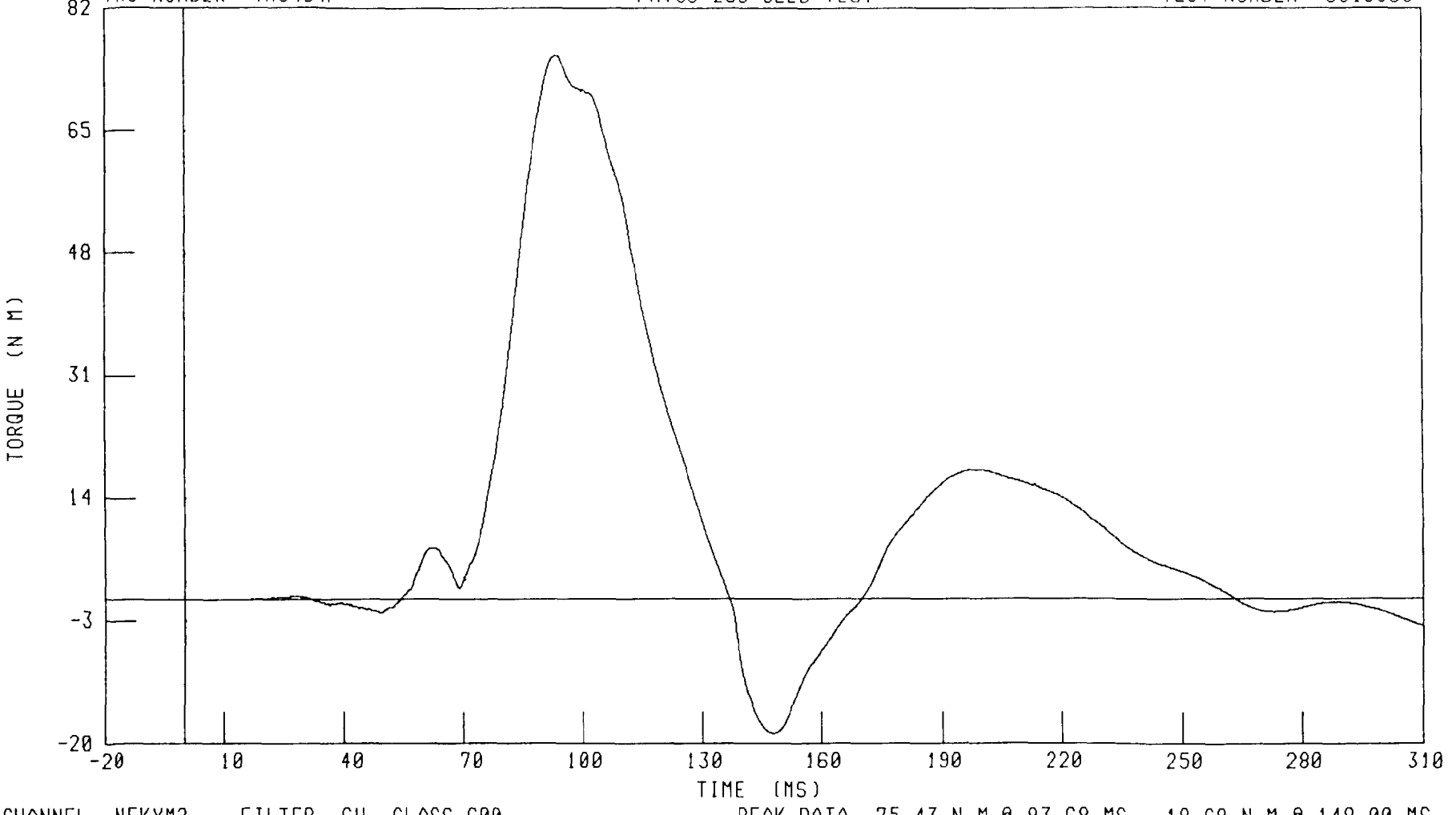
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



CHANNEL NEKXM2 FILTER CH CLASS 600 PEAK DATA 10 26 N M @ 196 08 MS, -32 59 N M @ 106 72 MS

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS

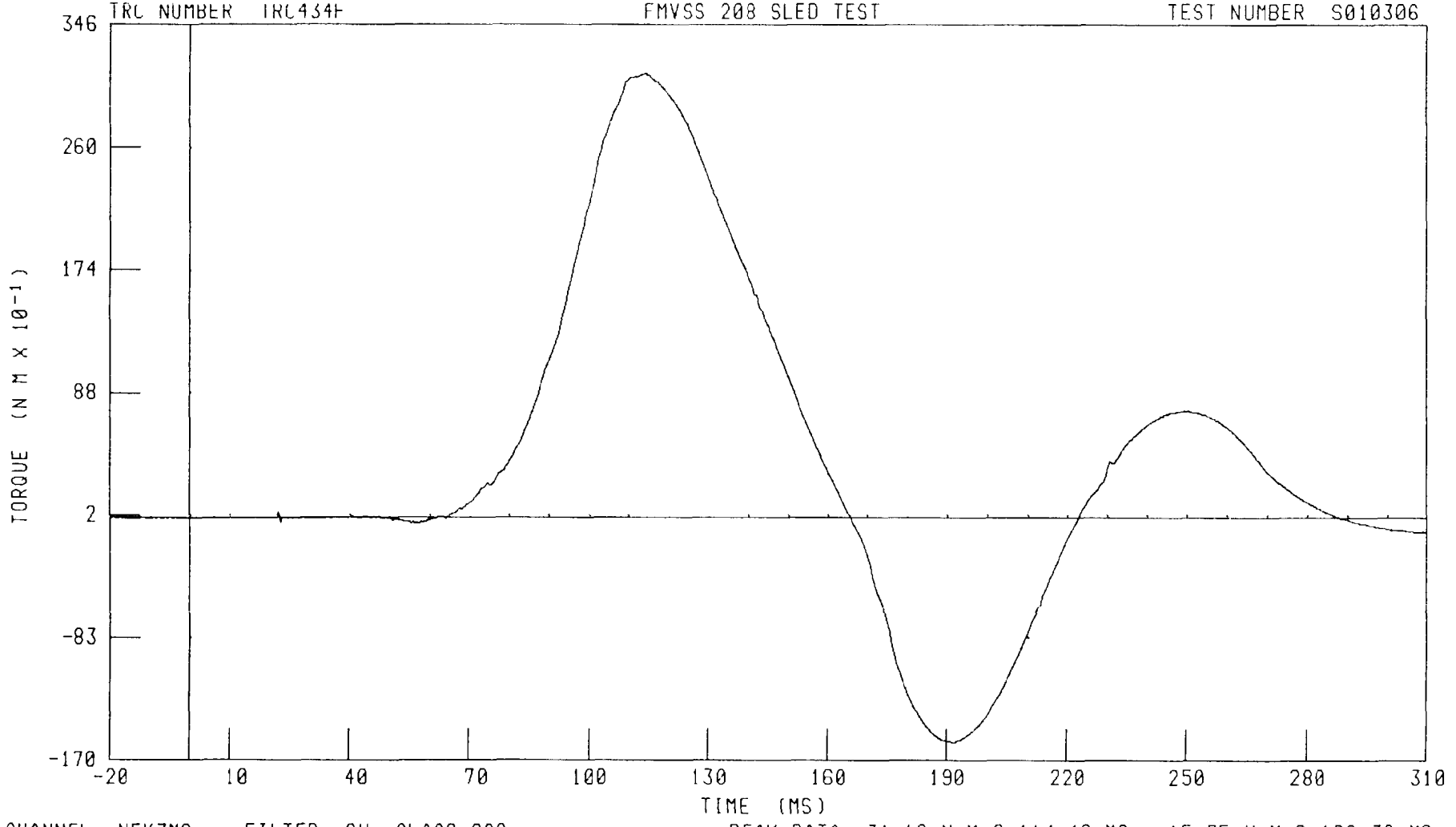
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



CHANNEL NEKYM2 FILTER CH CLASS 600 PEAK DATA 75 43 N M @ 93 68 MS, -18 69 N M @ 148 00 MS

010306

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS

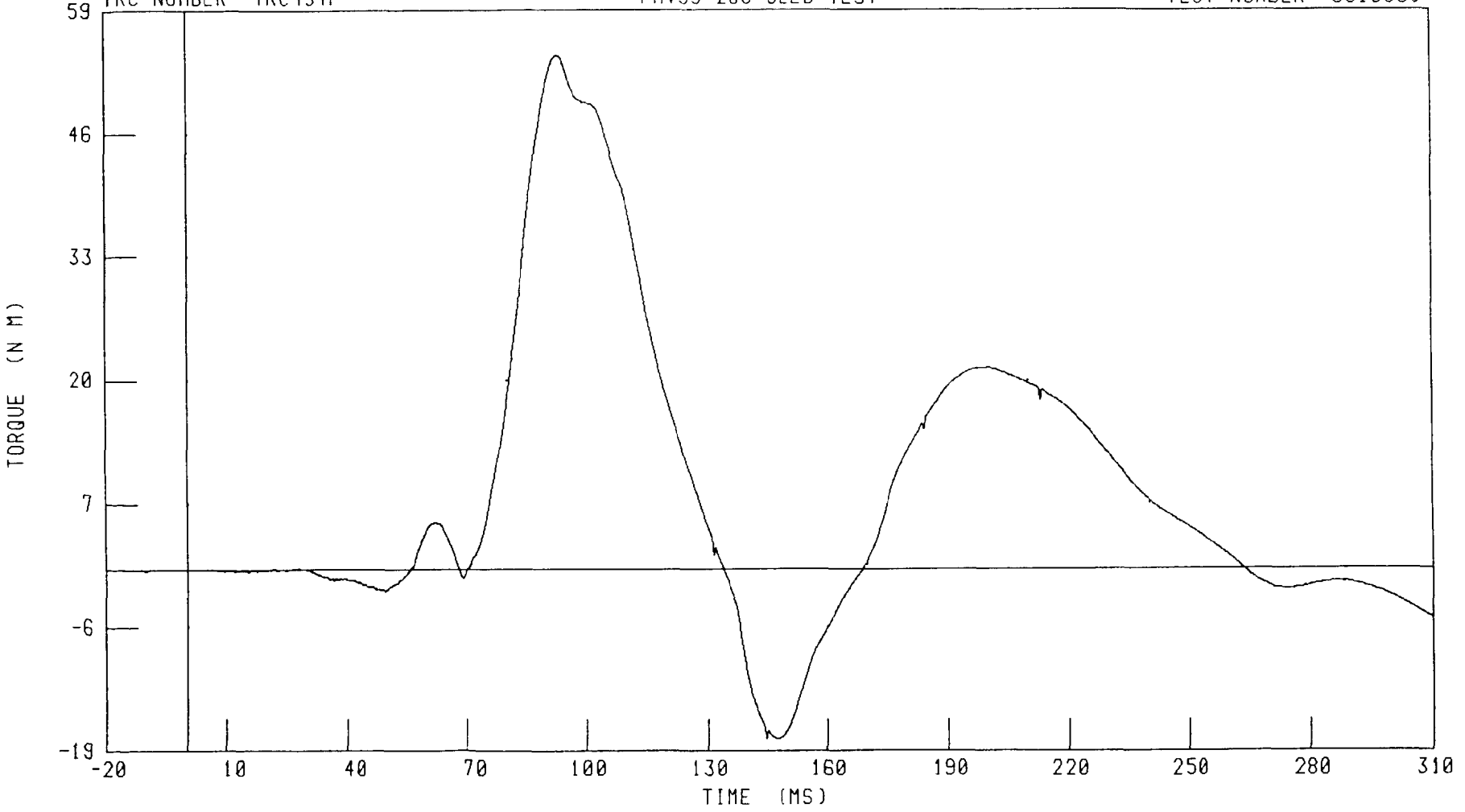


CHANNEL NEKZM2 FILTER CH CLASS 600 PEAK DATA 31 19 N M @ 114 48 MS, -15 75 N M @ 192 32 MS

C10600 / 2001 LAND ROVER DISCOVERY

RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS OCCIPITAL CONDYLE

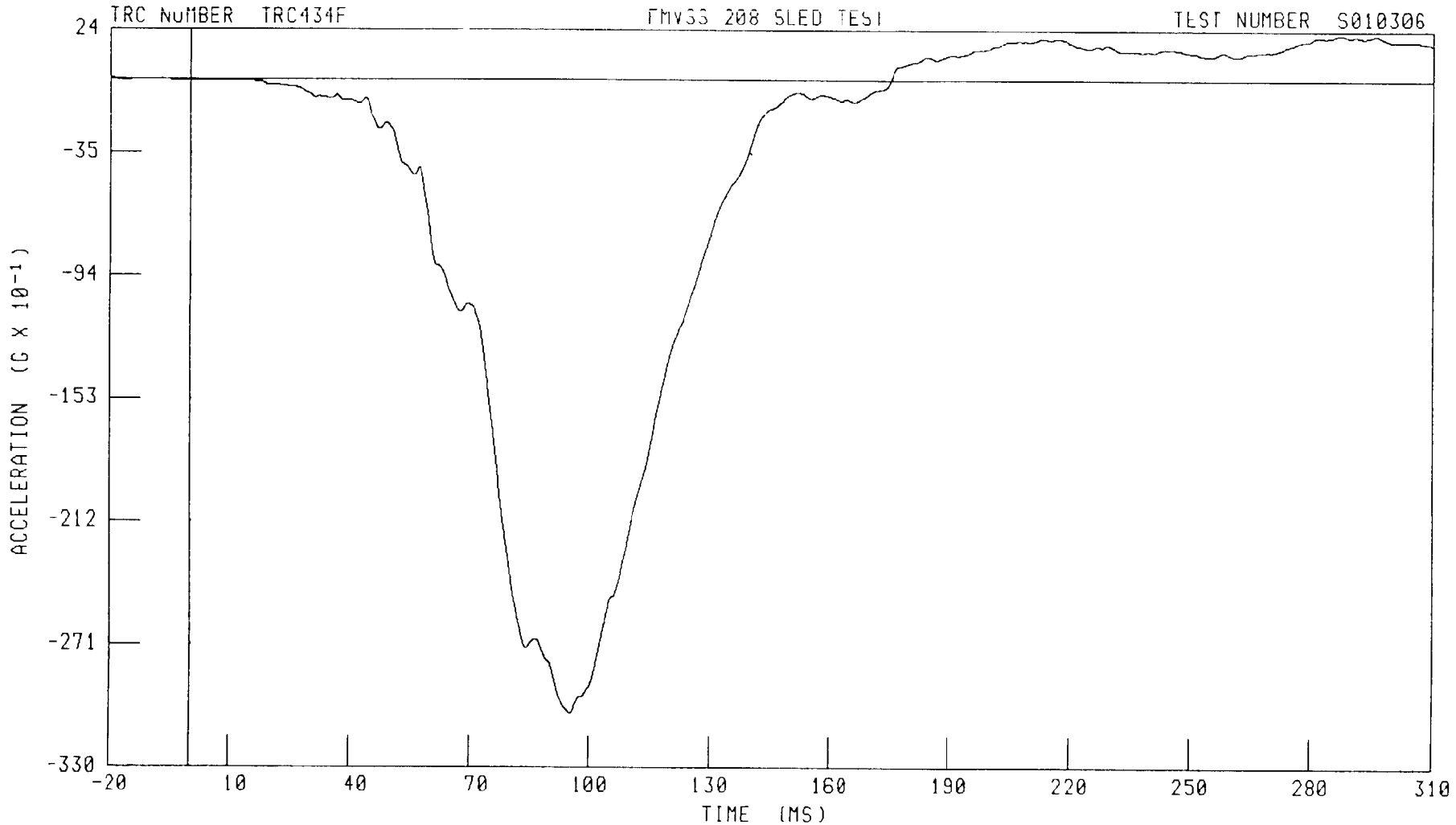
TRC NUMBER TRC434F FMVSS 208 SLED TEST TEST NUMBER S010306



CHANNEL NEKOM2 FILTER CH CLASS 600 PEAK DATA 54 25 N M @ 93 20 MS, -17 70 N M @ 144 64 MS

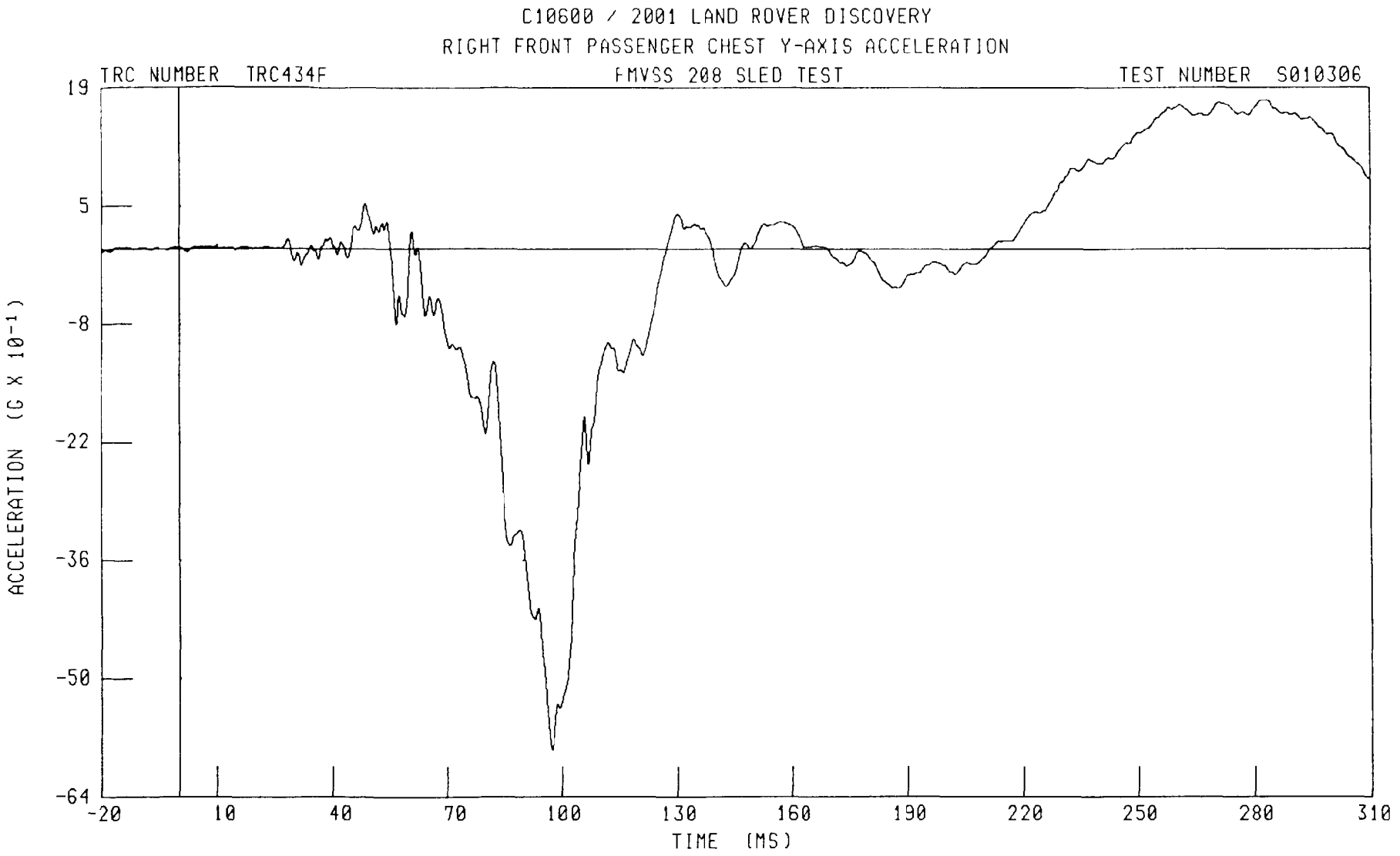
010306

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

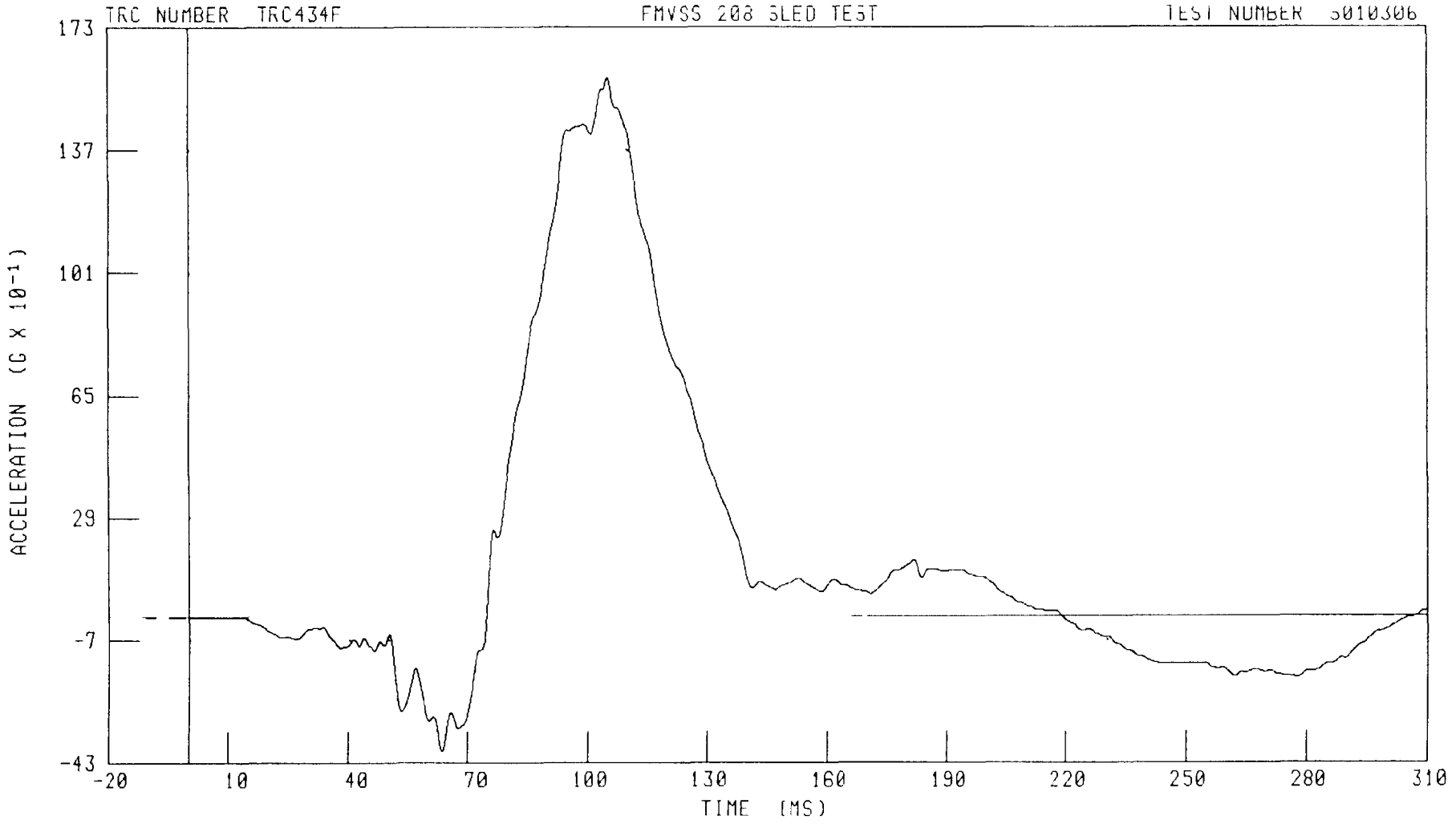


CHANNEL CSTXG2 FILTER CH CLASS 180

PEAK DATA 2 23 G @ 287 04 MS, -30 42 G @ 95 20 MS

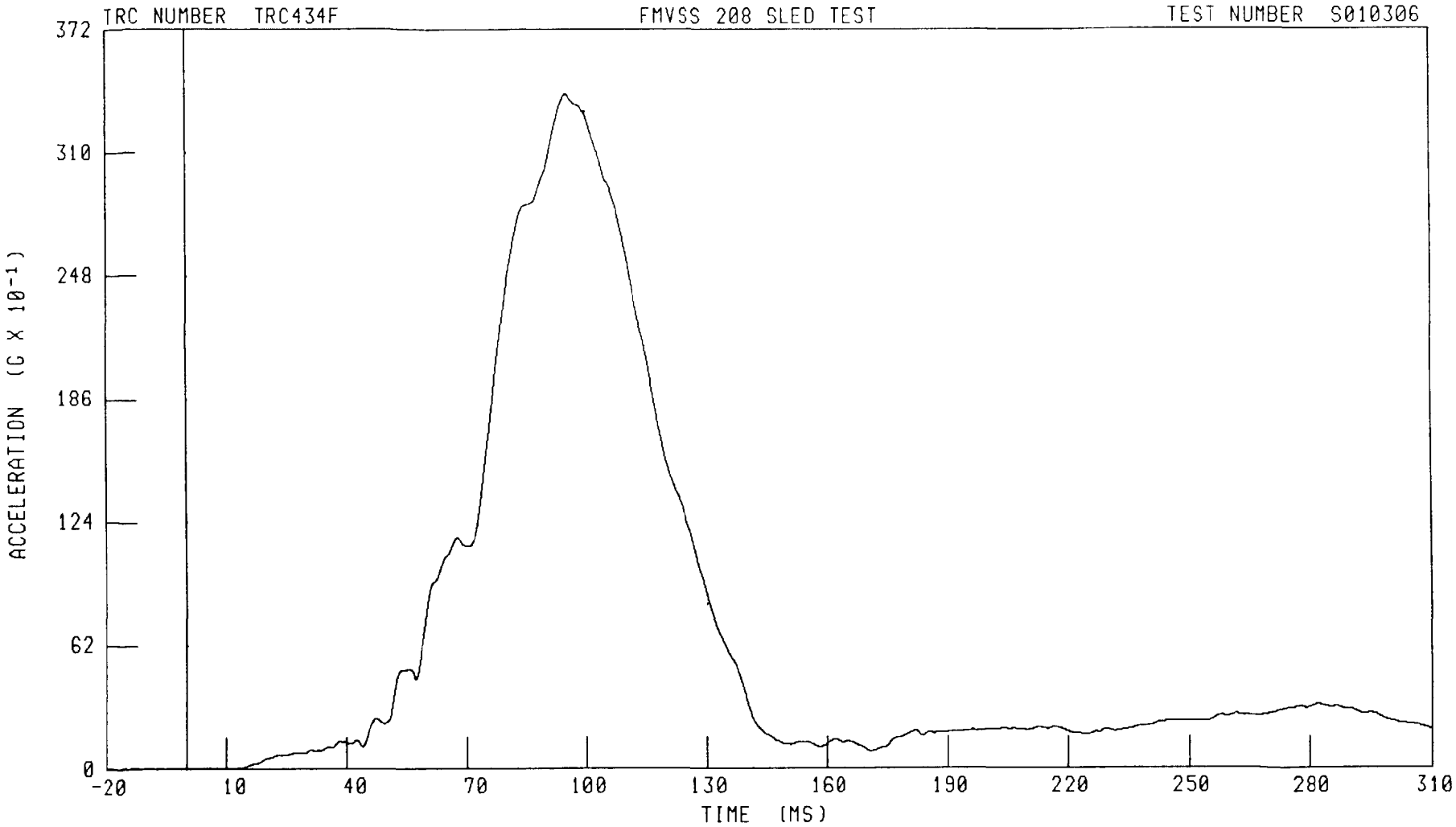

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION
TRC NUMBER TRC434F
FMVSS 208 SLED TEST
TEST NUMBER S010306
19
5
-8
-22
-36
-50
-64
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL CSTYG2 FILTER CH CLASS 180
PEAK DATA 1 75 G @ 283 84 MS, -5 95 G @ 97 44 MS

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION



CHANNEL CSTZG2 FILTER CH CLASS 180
PEAK DATA 15 81 G @ 105 28 MS, -3 97 G @ 63 76 MS

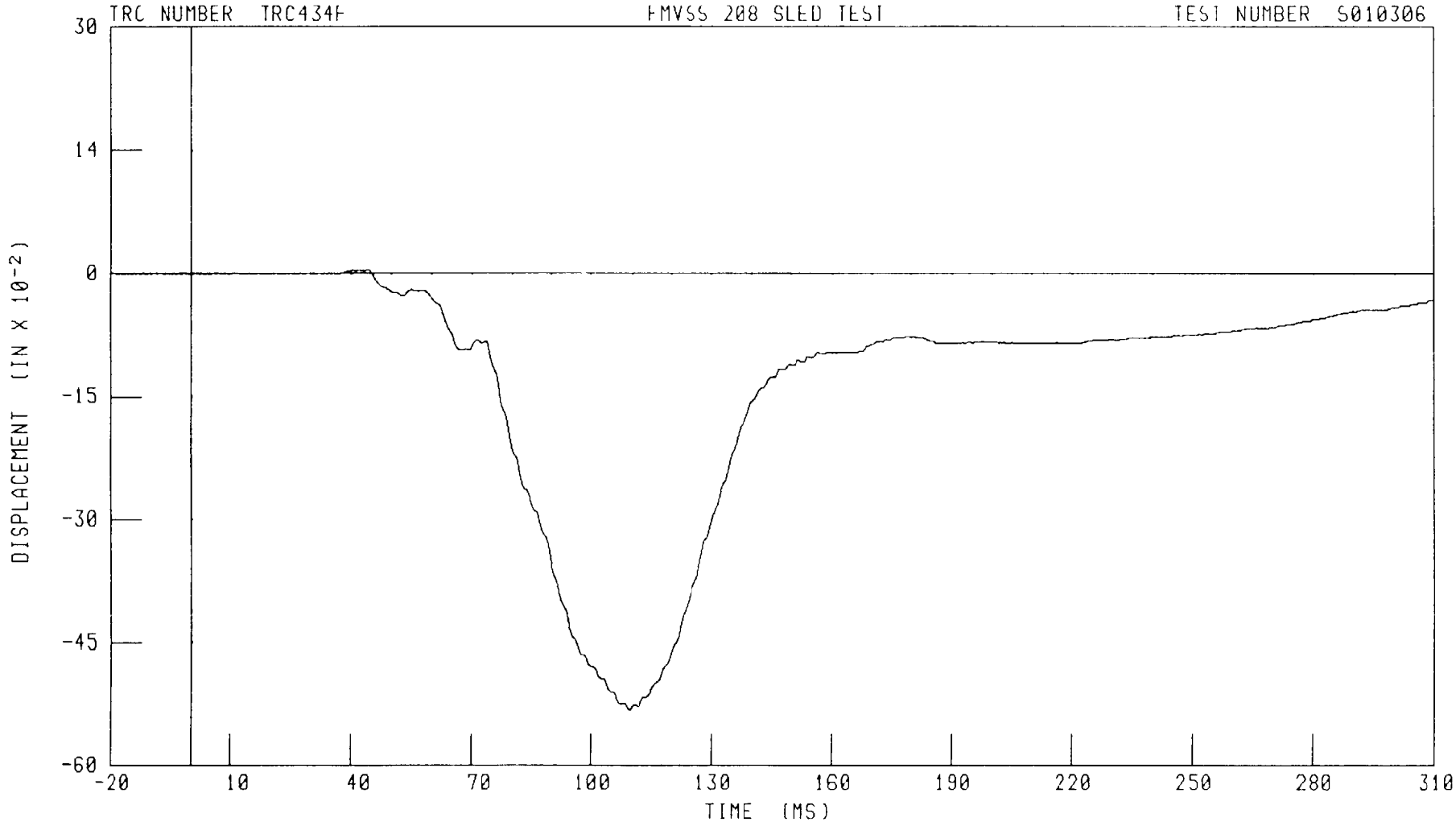
C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION



CHANNEL CSTRG2 FILTER CH CLASS 180 PEAK DATA 33 95 G @ 95 28 MS, 0 00 G @ -14 64 MS

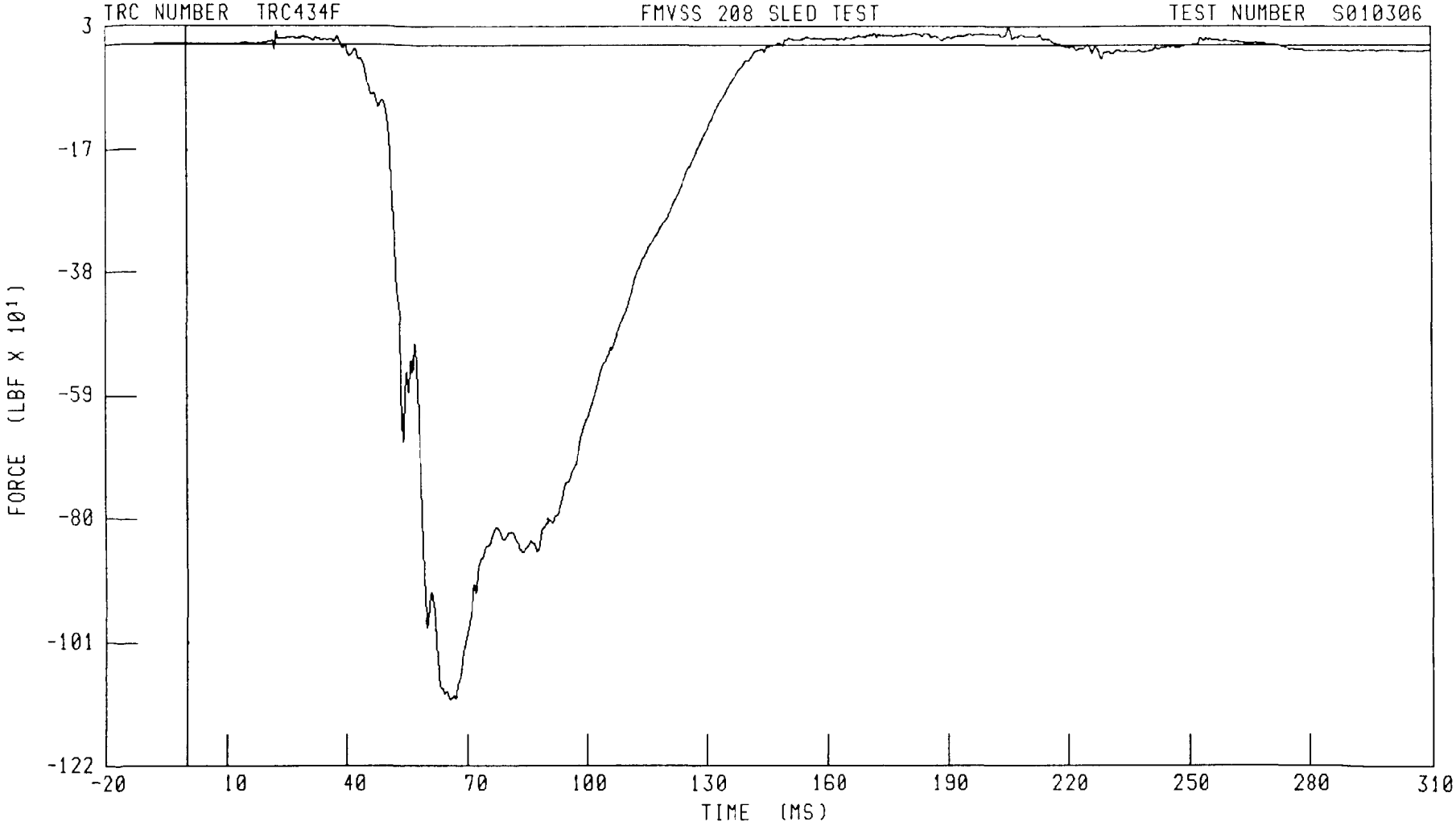
010306

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER CHEST DEFLECTION



CHANNEL CSTXD2 FILTER CH CLASS 600 PEAK DATA 0 00 IN @ 42 08 MS, -0 53 IN @ 109 44 MS

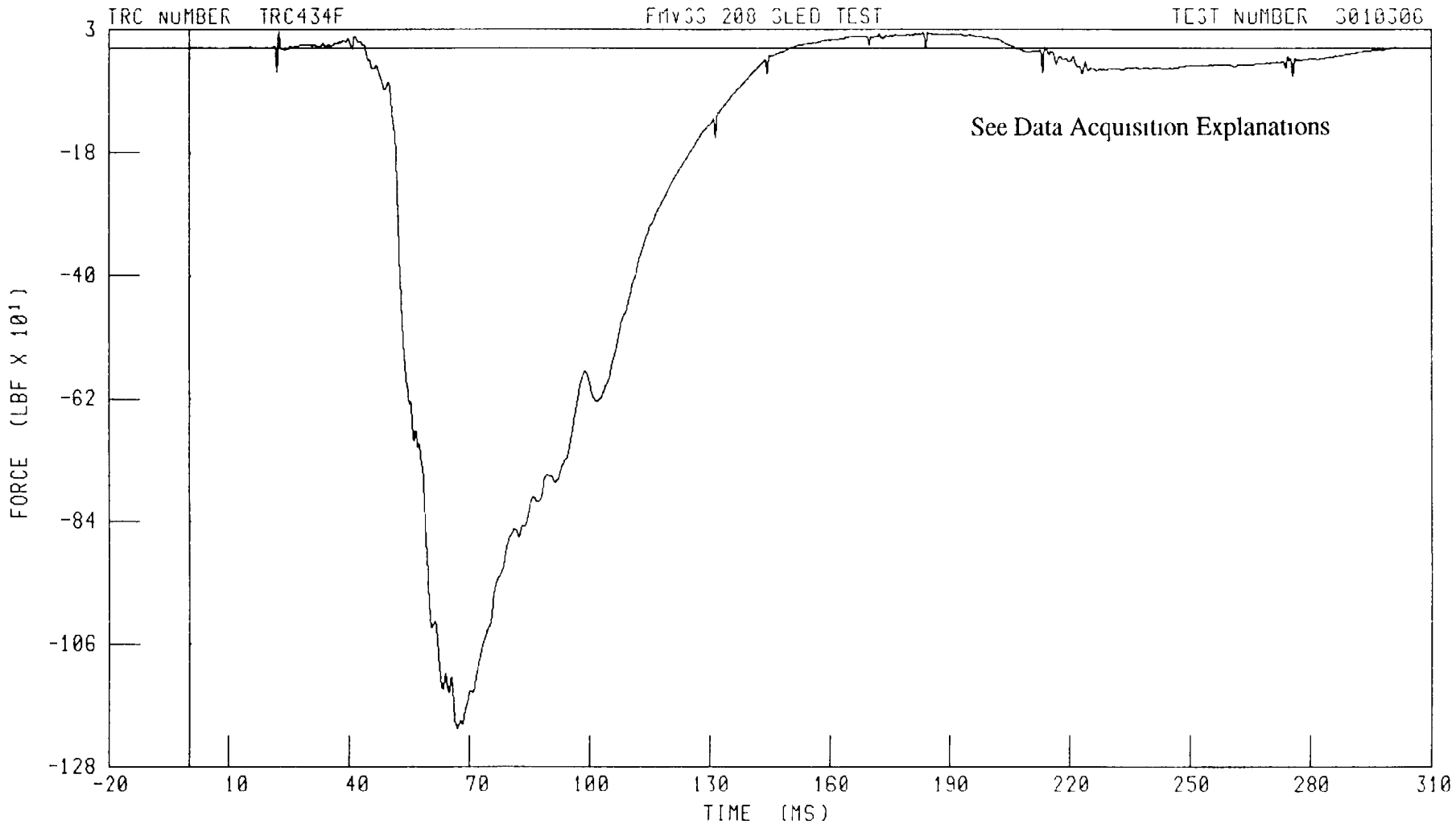
C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER LEFT FEMUR FORCE



CHANNEL LFMZF2 FILTER CH CLASS 600 PEAK DATA 28 79 LBF @ 205 52 MS, -1117 97 LBF @ 65 52 MS

010306

C10600 / 2001 LAND ROVER DISCOVERY
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



CHANNEL RFMZF2 FILTER CH CLASS 600 PEAK DATA 30 25 LBF @ 22 56 MS, -1217 74 LBF @ 66 88 MS

Appendix C

Manufacturer's Vehicle Information

Office of Vehicle Safety Compliance

FMVSS 208 -- Land Rover Discovery 2001 MY

1 The Land Rover Discovery 2001 MY vehicle is certified to meet the requirements of S13

The certification test reports conducted with manual safety belts fastened are -
Frontal Barrier - 'MIRA-00-432106'
LH Angled Barrier - 'MIRA-00- 432201'

A RH Angled barrier test was not conducted with the revised inflators and bag materials as the LH Angled barrier test was considered to be worse case

The certification test report conducted with manual safety belts unfastened is -
Dynamic Test Platform (AAMA) - "MIRA-00-427119'

The reports are to be found in ***Appendix 2.***

2
Part (1) The difference between the Land Rover Discovery 2001 MY and the 2000 MY airbag system is as follows -

	2000 MY		2001 MY	
	Inflator	Bag Material	Inflator	Bag Material
Driver	Type DI1	700 Dtex with 2x23 mm vents	Type FG"-NA	580 Dtex without vent holes and new permeability
Passenger	Type P4 0	700 Dtex with 1x70 mm vent	Type PHI-2	580 Dtex with 1x20 mm vent hole and new permeability

Part (2) There have not been any other changes to the restraint system
Part (3) There have not been any other changes to the vehicle
Part (4) There have not been any other changes to the restraint system or the vehicle that might affect performance with respect to children and out of position occupants.

3 The method used by the Motor Industry Research Association (MIRA) to describe how to disconnect the airbags from the vehicle sensors and connect them to the triggering mechanism used in the test is to be found in ***Appendix 3*** The method used in certification to determine when to trigger the airbag and the system used to trigger the airbag is also found in ***Appendix 3***

The Land Rover Discovery 2001 MY does not have dual stage or multistage inflators.

4. The safety belt system in this vehicle is not equipped with tension-relieving devices

5 During certification testing the windows were open for frontal and angled tests This was to allow better camera visibility of events inside the vehicle However, in carrying out CVSC compliance tests it is Land Rover's request that windows should be closed for all tests.

6 Details of dummy placement measures are to found in ***Appendix 4***

The vehicle does have footrest for driver.

7 Refer to sheet in ***Appendix 5.***

Seating position – Mid position fully down. ***Roger Gledhill already has this data.***

Steering wheel angle – Angular adjustment is via 3 detents To set to mid-point lift the column adjustment ever, identify top and bottom detents, then select the middle detent

Fuel tank data – refer to ***Appendix 5***

8 The nominal design height position for a 50th % ile male adult is 'Position 2' as detailed in ***Appendix 6***

9 The resulting injury criteria for the certification tests was:-

	30/0		30/30 LH		30/30 RH		AAM A Sled	
	Driver	Pass	Driver	Pass	Driver	Pass	Driver	Pass
HIC	351	463	149	337	A RH Angled barrier test was not conducted with the revised inflators and bag materials as the LH Angled barrier test was considered to be worse case		255	161
Chest acceleration	37	35	30	27			31	30
Chest compression	33	31	34	31			35	10
RH Femur Load	3.3	3.7	2 4	2.8			5 4	6 5
LH Femur Load	2.9	3 5	2 4	3 5			5 5	6 0
Neck Moments	N/A	N/A	N/A	N/A			Refer to plots in Appendix 2	

10 When testing the Land rover Discovery 2001 MY, it is recommended that the vehicle test instrumentation is fitted in the luggage compartment of the test vehicle.

Should it be necessary to remove components from the vehicle to achieve the required test weight, the following list of components may be removed without detriment to either the test procedure or the vehicle -

1. Spare wheel
2. Vehicle tool kit
3. Carpet in luggage area
4 Acoustic attenuation material below carpet in luggage area
5 Rear lights
6. Rear inward facing seats
7 Rear end door trim
8 Rear mounted radio speakers
9 All floor and door trim rear of B post
10 Rear air conditioning system (if fitted)

11 A copy of the U S Department of Transport 'Classification of Explosives' for the pressure vessel (passenger side inflator) has been supplied by TRW Refer to ***Appendix 7.***

12 A copy of the U S Department of Transport 'Classification of Explosives' for the explosive device (driver side inflator) has been supplied by TRW Refer to ***Appendix 7.***

H948C1 Airbag firing FMVSS 208 Sled Test

Test House –The Motor Industry Research Association (MIRA)
Watling Street, Nuneaton,
Warwickshire CV10 0TU

Method employed by MIRA for disconnecting the airbags from the vehicle sensors:-

The wiring leads to both the driver and passenger airbags are disconnected from the main harness.

MIRA then wires their leads direct from their firing box to the leads of the airbag modules.

To fire the Airbags on a test, MIRA uses an Airbag firing delay which is mounted on their instrumentation trolley in front of the vehicle.

Method used by MIRA in certification to determine when to trigger the airbag and the system used to trigger the airbags:-

On MIRA's computer they set in a time delay of 16ms.

The trigger used to start our Data Acquisition Unit is an accelerometer, the Data Acquisition Unit is triggered at 2g.

16 ms after 2g a charge of up to 10 amps is sent to the Airbags.

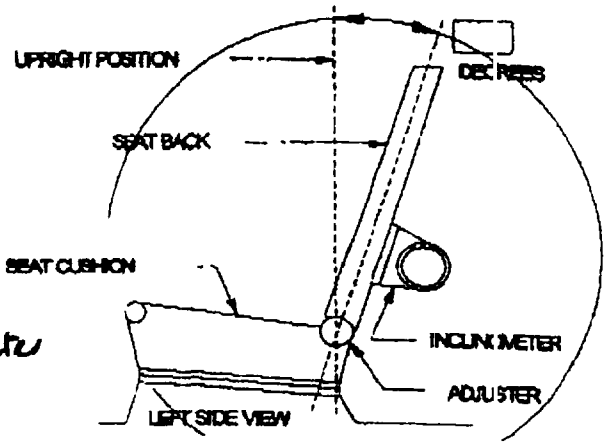
These signals are recorded on the Data Acquisition Unit. Channel Numbers 5 & 6.

Enclosure 3

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 2001 MY LAND ROVER
Vehicle Model & Body Style: DISCOVERY 5 DOOR

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. Indicate, if applicable, how the detents are numbered (Is the first detent "0" of "1"?) Indicate if the seat back angle is measured with the dummy in the seat.



Seat back angle for driver's seat = 23 degrees.
Measurement instructions:
Remove cover & foam to reveal part of rear seat back frame. Position the inclinometer on side of frame and check angle.

Seat back angle for passenger's seat = 23 degrees.
Measurement instructions:
As above.

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, 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:
Manual & Electric seats: Inner slide to protrude 31mm (1.22 inches) from outer slide at outboard runner. On manual seats this equates to 9 clear notches behind trigger at outboard runner.

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

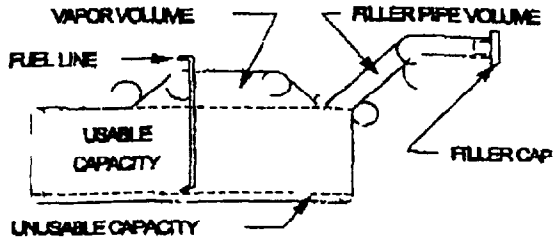
Rev 7/11/94

3. FUEL TANK CAPACITY DATA - -

3.1 A "Usable Capacity" of standard equipment fuel tank = 25.09 gallons.

B. "Usable Capacity" of optional equipment fuel tank = N/A gallons.

C. "Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 23.08 gallons.



VEHICLE FUEL TANK ASSEMBLY

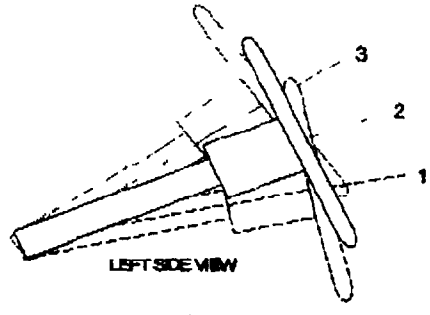
Operational Instructions:
Conventional filling procedure

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 22.72 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.
The fuel pump will pump fuel with the ignition in the "II" position. The fuel pump will continue to operate until the fuel system reaches the required pressure proving the fuel cut off switch is set to the down position.

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?



STEERING COLUMN ASSEMBLY

Operational Instructions
Angular adjustment is via 3 detents. To set to mid-point lift the column adjustment lever, identify top and bottom detents, then select the middle detent.

Land Rover North America, Inc.

VIA FAX

To. Charlie Case – NHTSA
Ginny Watters – TRC

Date 16 Feb 2001

From Dennis Johnston – Land Rover

Subject Seat Positioning for Land Rover Discovery Series II – FMVSS 208

Charlie/Ginny

Following please find further definition of the seat back and seat midpoint settings for testing a 2001 Discovery Series II for FMVSS 208

If you have any further questions please do not hesitate to call or fax

Sincerely,

Dennis Johnston
Manager, Regulatory Compliance
Phone. (301) 731-6583
Fax. (301) 731-5408

Land Rover North America Inc
4371 Parliament Place
PO Box 1503
Lanham Maryland 20706
United States of America
Telephone 301 731 9040
Fax 301 731-9054

TELEFAX TRANSMISSION

Land Rover

Date :16/02/01 **Fax** Ext : 01926 643005 Int : 43005 **Telephone** Ext : 01926 643227 Int : 43227

e-mail rgledhil@landrover.com

From : Roger Gledhill Discovery homologation

At :Building 231, Gaydon Test Centre, Lighthorne, Warwick CV35 0RG

To: Dennis Johnston, LRNA

Subject: NHTSA FMVSS 208 test

Hi Dennis,

It appears that my email is not receiving messages from you. I don't know if its because you have used a capital "L" in Landrover? Please see my email address above.

With regard to the seat back angle of 23°, it is a torso angle. This can be set by installing a 3DH manikin, and ensuring the torso angle is 23°.

For the seat mid position, I have attached a drawing from seating which I had them make up. It shows where to take the dimensions from.

If they remove the cover around the seat slide to set the dimension (its easier to see the slide), then refit prior to test

I trust these answer the questions raised.

If you have any more, please let me know.

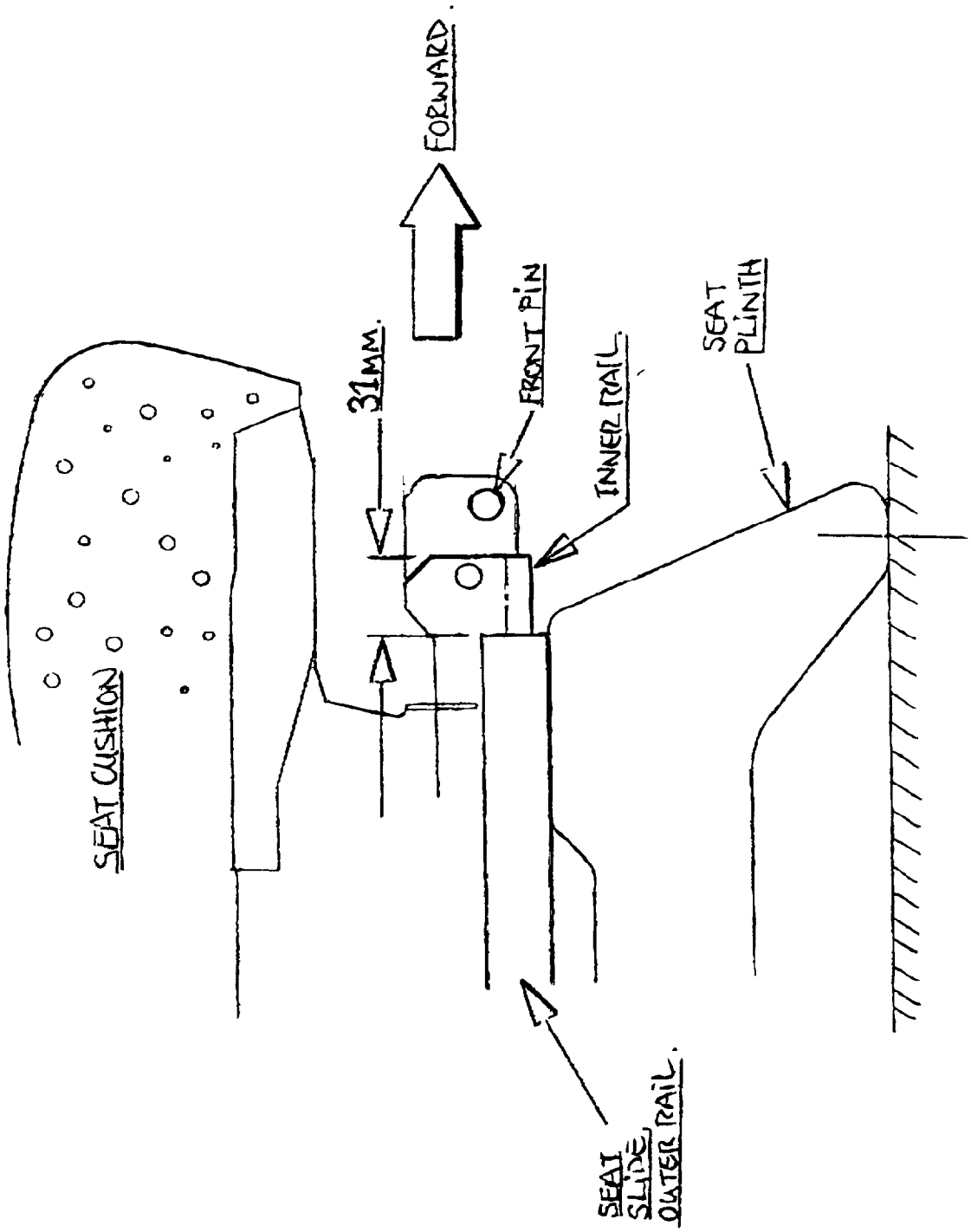
Best regards,

Roger

Roger Gledhill
Product Assurance

15/2/01

DISCOVERY II SEAT SLIDE MID-POSITION



Appendix D

Miscellaneous Test Information

Seat Belts

SEAT BELT SAFETY

WARNING

Seat belts are life saving equipment In a collision, occupants not wearing a seat belt will be thrown around inside, or possibly thrown out of the vehicle This is likely to result in more serious injuries than would have been the case had a seat belt been worn It may even result in loss of life!

Don't take chances with safety!

- *DO make sure ALL occupants are securely strapped in at all times - even for the shortest journeys.*
- *The airbag supplemental restraint system (SRS) is designed to add to the overall effectiveness of the seat belts It does not replace them SEAT BELTS MUST ALWAYS BE WORN!*
- *Ensure that all seat belts are worn correctly - an improperly worn seat belt increases the risk of death or serious injury in the event of a collision*
- *DO use the seat belts to secure items of luggage that are to be carried on the seats - In the event of an accident, loose items become flying missiles capable of causing serious injury, or even death.*

WARNING

- *DO NOT fit more than one person into a belt; this could result in the occupants striking each other and causing injury in the event of a crash.*
- *DO NOT use, or attempt to fit, a seat belt that is twisted or obstructed in any way that could impede its smooth operation If a belt is twisted, it must be straightened before use Using a twisted or obstructed seat belt could increase the risk of injury in a crash*
- *ALWAYS use the seat belt lock (buckle) nearest the wearer If the belt is locked in the wrong place, the seat belt will not fit correctly and may ride up over the abdomen, causing serious internal injury in a crash.*

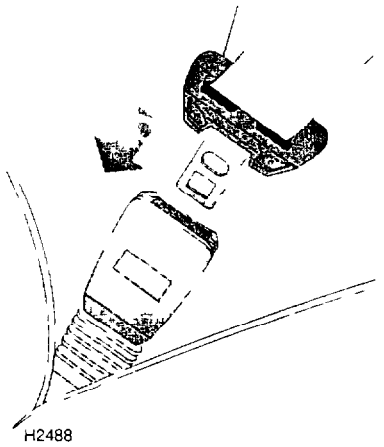
Seat Belts

WEARING SEAT BELTS CORRECTLY

Fastening the seat belts

WARNING

Maladjustment of the seat belt could reduce its effectiveness in a crash, thereby increasing the risk of serious injury or death.



Inertia reel belts are fitted to all front and rear seating positions, and also to the occasional rear seats*

Draw the belt over the shoulder and across the chest and, ensuring that the webbing is not twisted insert the metal tongue plate into the buckle nearest the wearer - a 'CLICK' indicates that the belt is securely locked

In some circumstances, perhaps due to the vehicle being parked on a slope, the inertia mechanism may engage, preventing the initial extension of a belt This is not a fault - ease the belt free and use it

Adjust the seat belt to eliminate any slack in the webbing DO NOT slacken the webbing by holding the belt away from the body - to be fully effective, the seat belt must remain in full contact with the body at all times Also, ensure that the lap belt fits as low on the hips as possible and that the shoulder belt passes across the shoulder without slipping off or pressing on the neck

Positioning the belt

WARNING

Seat belts are designed to bear upon the bony structure of the body (pelvis, chest and shoulders), and can only be worn safely with the seats in a normal, upright, position

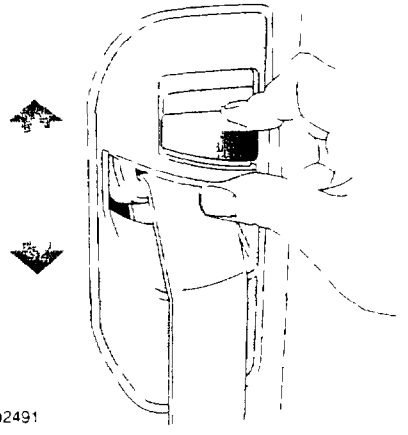
- ***ALWAYS fit the lap strap as low on the hips as possible (never across the abdomen) and ensure that the diagonal belt passes across the shoulder without slipping off or pressing on the neck.***
- ***DO NOT travel with the seat backs reclined steeply rearwards Optimum benefit from the seat belt is obtained with the seat back set to an angle of 15 degrees from the upright. Seat belts are only effective when they are properly positioned on the body - a steeply reclined seat could allow a passenger to slip under either the shoulder or the lap belt.***
- ***DO NOT wear the shoulder belt under your arm. In an accident this could increase your chances of being injured.***

Seat Belts

Wearing seat belts during pregnancy
The seat belts have been designed for all adults including pregnant women In a crash situation any occupant is less likely to be injured while correctly restrained by a seat belt However, pregnant women should wear the lap belt as low on the hips as possible to avoid pressure on the abdomen

Women should consult their doctor to establish the best use of seat belts during pregnancy

Upper anchorage adjustment (front seats only)



The height of the seat belt upper anchorage can be adjusted for comfort AND safety Squeeze the control between finger and thumb to raise or lower the anchorage For safety, the seat belt should always be worn with the webbing crossing the shoulder MIDWAY BETWEEN THE NECK AND THE EDGE OF THE SHOULDER

Misadjustment of the seat belt could reduce its effectiveness in a crash Always ensure that the anchorage is correctly located in one of the height positions before driving

Where possible rear seat passengers should adjust their position on the seat to enable the seat belt webbing to cross the shoulder without pressing on the neck

For children and young adults where the seat belt cannot be properly positioned the use of a booster seat appropriate to the age and size of the occupant is recommended

Releasing the belt
Press the RED button on the seat belt buckle

Seat Belts

SEAT BELT PRE-TENSIONERS

The seat belt pre-tensioners activate in conjunction with the airbag SRS and provide additional protection in the event of a severe frontal impact on the vehicle (see *'HOW THE AIRBAG SRS WORKS page 40*) The pre-tensioners automatically retract the seat belts fitted to the front seats This reduces any slack in both the lap and diagonal portions of the belts, thereby reducing forward movement of the belt wearer in the event of a severe frontal collision

The airbag SRS warning light on the instrument panel will alert you to any malfunction of the seat belt pre-tensioners

If the pre-tensioners have been activated, the seat belts will still function as restraints, and must be worn in the event that the vehicle remains in a driveable condition

NOTE: *The seat belt pre-tensioners will NOT be activated by rear side or minor frontal impacts*

IMPORTANT INFORMATION
The seat belt pre-tensioners will only be activated once and then MUST BE REPLACED by a Land Rover dealer Failure to replace the pre-tensioners will reduce the efficiency of the vehicle s front restraint systems
After any frontal impact, always have the seat belts and pre-tensioners checked and, if necessary, replaced by a Land Rover dealer
In the interests of safety, it is recommended that removal or replacement of the front seats and seat belts, with the use of factory-specified parts, should ONLY be carried out by a Land Rover retailer

CARING FOR SEAT BELTS

WARNING

- ***DO NOT allow foreign matter (particularly sugary food and drink particles) to enter the seat belt locks - such substances can render the locks inoperative***
- ***Regularly inspect the belt webbing for signs of fraying, cuts and wear, and also pay particular attention to the condition of the fixing points and adjusters***
- ***DO NOT bleach or dye the webbing. Clean the webbing using warm water and non-detergent soap only - allow to dry naturally and DO NOT retract or use the belts until they are completely dry***
- ***Always replace a seat belt that shows signs of webbing wear or has withstood the strain of a severe vehicle impact.***

Testing inertia reel belts

- With the seat belt fastened, give the webbing near the buckle a quick upward pull The buckle must remain securely locked
- With the seat belt unfastened, unreel the webbing to the limit of its travel Check that unreeling is free from snatches and snags and then allow the belt to FULLY retract
- Partially unreel the webbing, then hold the tongue plate and give it a quick forward pull The mechanism must lock automatically and prevent any further unreeling

If a seat belt should fail any of these tests, contact your dealer immediately

Child Restraints

CHILD RESTRAINTS FOR SMALL CHILDREN AND BABIES

Infants and children too small for adult seat belts should be restrained in a child safety seat or restraint system appropriate to their age and/or size, and which is approved for use in your vehicle

Child seats and restraint systems are designed to be secured in vehicle seats by lap belts (or the lap belt portion of a lap/shoulder belt) Some child restraint systems also incorporate a tether strap which can be attached to an anchorage point on the vehicle Information about tether strap attachment points and the seat belt locking mechanism, which is used to restrain child seats and restraints is shown later in this section

When fitting child seats and restraint systems always ensure that the manufacturer s fitting instructions are followed exactly Note that crash statistics show that children are safer when properly restrained in the rear (2nd row) seating positions than in the front

WARNING

- ***DO NOT allow a baby or infant to be carried on the lap The force of a crash can increase effective body weight by as much as 30 times, making it impossible to hold on to the child***
- ***Young adults and children typically require the use of a booster seat appropriate to their age and size, thereby enabling the seat belts to be properly fitted, reducing the risk of injury in a crash***
- ***Children could be endangered in a crash if their child restraints are not properly secured in the vehicle***
- ***DO NOT use a child seat that hooks over the seat back. This type of seat cannot be satisfactorily secured, and is unlikely to be safe for your child***
- ***Never leave a child unattended in your vehicle***

Child Restraints

Vehicles fitted with a passenger airbag
For optimum safety, children should travel in the rear of the vehicle at all times However, if it is essential that a child travel in the front, set the seat fully rearward and seat the child in an approved, FORWARD FACING child seat

The above symbol affixed to the passenger side fascia panel of your vehicle, warns against the use of a REAR FACING child seat in the front passenger seat, when a passenger airbag is fitted This type of child seat could cause serious injury to a child in the event of an airbag deployment

WARNING

UNDER NO CIRCUMSTANCES SHOULD A REARWARD FACING CHILD SEAT BE INSTALLED IN ANY FRONT PASSENGER SEAT POSITION. INFLATION OF THE AIRBAG COULD RESULT IN SERIOUS INJURY OR DEATH TO THE CHILD.

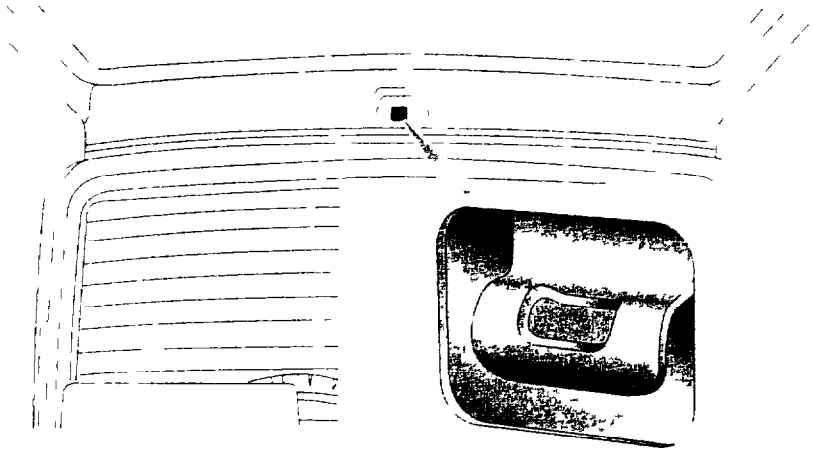
Seat belt locking mechanism
All front passenger and second row seat belts have a special locking mechanism which aids the securing of child restraints The mechanism is used to secure a child restraint as follows

1. Attach the seat belt to the child restraint in accordance with the manufacturer's instructions
2. Insert the metal tongue of the seat belt into the lock ensuring that it engages with a 'click
3. Pull on the shoulder section of the belt until it is fully extended
4. Allow the belt to retract A 'clicking' sound will confirm that the mechanism has engaged
5. Remove all slack from the mechanism, by pulling upwards on the shoulder belt, immediately above the child restraint
6. Evaluate the tightness of the installation by rocking the child seat back and forth to ensure it is tight and stable
7. If the child seat needs to be tightened further, remove the metal tongue of the seat belt from the buckle and feed some of the shoulder belt webbing back into the reel (thereby shortening the belt) Then reattach the metal tongue into the buckle (if the belt has been tightened correctly, this will take some effort)
8. Re-evaluate the tightness of the installation If the child seat is still too loose, repeat the above procedure, making the belt incrementally shorter (and therefore tighter) It may be necessary to put your weight onto the seat (to compress the seat cushion) in order to fasten the belt

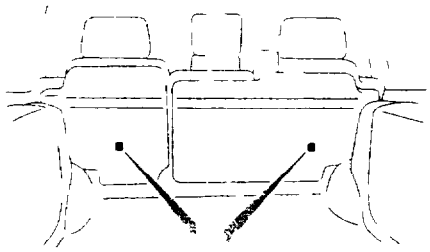
To deactivate the locking mechanism, unlatch the seat belt and allow it to fully retract

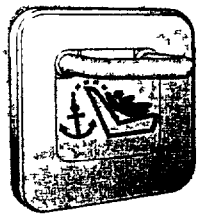
Child Restraints

Tether strap anchorages*



H3587





H3586

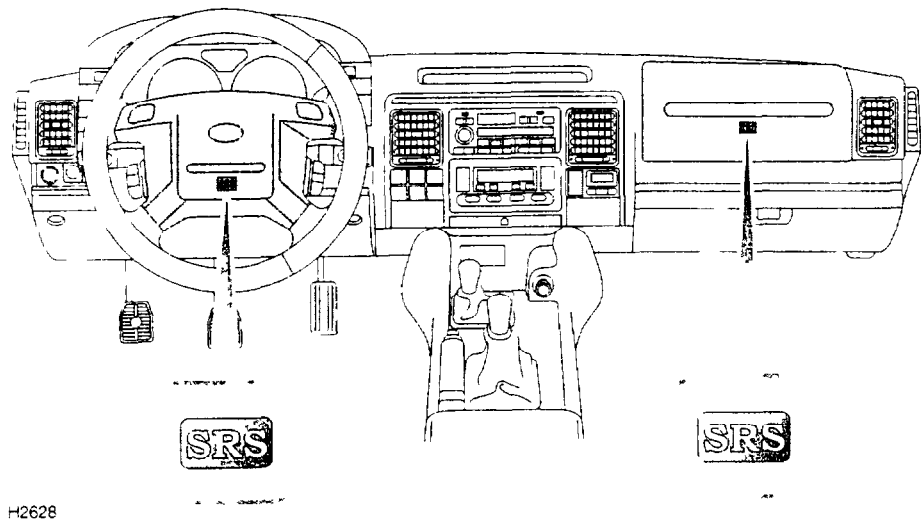
Provision is made for the fitting of up to three child seats or restraint systems in the rear (second row) seats of the type that require tether strap anchorage points

There are three tether strap anchorage points These should be used to attach tether straps from child seats or restraint systems Two anchorage points are fitted to the back of the second row seat, these should be used for the two outer seating positions A third single anchorage point is located in the centre of the rear header rail (above the tail door) for attaching a tether strap from the centre seat position The anchorage points are shown in the accompanying illustrations

WARNING

- ***Always follow the child seat or restraint system manufacturer's instructions when fitting tether straps***
- ***When fitting a child seat or restraint system, always pass the tether strap over the top of the seat back and beneath the underside of the head restraint.***
- ***If a child seat or restraint system is to be fitted in the centre seating position, the centre armrest must be in the stowed position (folded into the seat).***

Airbag SRS



H2628

AIRBAG SRS

The airbag supplemental restraint system (SRS) provides additional protection for the driver and front seat passenger, in the event of a collision or severe frontal impact on the vehicle

Provided the front seat occupants are correctly seated, with seat belts properly worn, the airbags will provide additional protection to the chest and facial areas in the event of the car receiving a severe frontal impact

NOTE: *Inflation and deflation of the airbags takes place very quickly and will not protect against the effects of secondary impacts that can occur during multiple vehicle collisions*

The airbags are located in the centre pad of the steering wheel and the fascia panel above the glovebox

Airbag SRS

To ensure correct deployment of the airbags it is essential that obstructions are not allowed to intervene between an airbag and the occupant The following are examples of the type of obstructions that could either, impede correct operation of the airbags, or jeopardise personal safety in the event of an airbag deployment

- Accessories attached to or obscuring an airbag cover
- Items of hand luggage, or other objects placed on an airbag cover
- Feet, knees or any other part of the anatomy in contact with, or in close proximity to an airbag cover

WARNING

Always remember; the SRS/airbags are a supplemental restraint system providing ADDITIONAL protection in certain types of frontal impact collisions only - they DO NOT replace the need to wear a seat belt. To minimize the risk of severe injury or death in the event of a crash, all occupants in all seating positions including the driver should always wear their seat belt whether or not an airbag is present in that seating position!

Airbag SRS

WARNING

Following inflation, some SRS/airbag components are hot - DO NOT touch until they have cooled.

Even with SRS/airbag equipment fitted, seat belts must ALWAYS be worn because:

- *An airbag will only provide additional protection in certain types of frontal collisions. NO protection is afforded against the effects of side or rear impacts, roll over accidents, or minor frontal impacts.*
- *Inflation and deflation take place instantaneously and will not provide protection against the effects of secondary impacts that can occur during multiple vehicle collisions.*

WARNING

The airbag module inflates with considerable speed and force. For your safety.

An inflating airbag can cause facial abrasions and other injuries. THe injurious effects of airbag inflation can be minimized, by ensuring driver and passenger are seated correctly, with the seat moved back as far as is practical, and the seat belts worn correctly

NEVER attach accessory items to an airbag module cover, or place items of hand luggage or any objects on the top of a module cover; these could interfere with the inflation of the airbag, or if the airbag inflates, be propelled inside the vehicle causing injury or death to the occupants.

DO NOT allow occupants to obstruct the operation of the airbag modules by placing their feet, knees or any part of their person in contact with, or close to, an airbag module whilst the vehicle is moving.

Activation of an airbag creates dust, causing possible breathing difficulties for asthma sufferers or other people with respiratory problems. If an airbag is activated, any occupant who suffers from brathing difficulties should; eiither leave the vehicle as quickly as possible, or obtain fresh air by fully opening the windows or doors.

Both fron seating positions are equipped with knee bolsters to provide knee protection in the event of an impact. DO NOT modify the bolsters, or mount after market equipment on or behind them.

Seating positions
In order to provide optimum protection in the event of a severe impact it is necessary for the airbags to deploy with considerable speed

An inflating airbag can cause facial abrasions and other injuries if the occupant is too close to the airbag at the time of its deployment

WARNING

- ***To minimize the risk of accidental injury from inflating airbags, seat belts should be correctly worn at all times In addition, both driver and front seat passenger should adjust their seat to provide the maximum practical distance from the airbags***
- ***Occupants not seated correctly in allocated seats are subject to serious injury or death upon airbag deployment***
- ***Both front seating positions are equipped with knee bolsters to provide knee protection in the event of an impact. DO NOT modify the bolsters, or mount after market equipment on or behind them***

HOW THE AIRBAG SRS WORKS

In the event of a collision the airbag control unit monitors the rate of deceleration or acceleration induced by the collision, to determine whether the airbags should be deployed

Operation of the airbag SRS is dependent entirely on the rate at which the vehicle's passenger compartment changes speed as a result of a collision The circumstances affecting different collisions (vehicle speed angle of impact type and size of object hit for example) vary considerably and will affect the rate of acceleration or deceleration accordingly

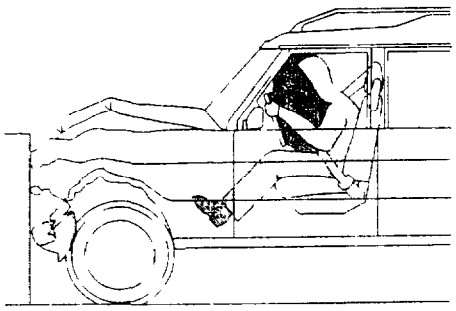
NOTE *The SRS/airbag is not designed to activate in all frontal impacts most minor frontal impacts heavy braking and driving over pot holes will not result in sufficient deceleration to cause the airbags to inflate This does not indicate that there is a fault with the system However if as a result of an impact you believe the airbags should have deployed and they failed to do so please call 1(800)637 6837 for advice or to arrange for a Land Rover representative to inspect the vehicle to determine whether the system operated correctly*

It follows therefore that significant superficial damage can occur without the airbags deploying or conversely, that a relatively small amount of structural damage may cause the airbags to be deployed

Airbags will only deploy when they are required to supplement the restraining force of the seat belts.

In the case of a severe frontal collision both front airbags and seat belt pre-tensioners will be deployed

Airbag SRS



H2474

Airbag inflation is virtually instantaneous and occurs with considerable force, accompanied by a loud noise The inflated bag, together with the seat belt restraint system, limit the movement of a front seat occupant, thereby reducing the risk of injury to the head and upper torso

When an airbag inflates, a fine powder is released This is not an indication of a malfunction, however, the powder may cause irritation to the skin and should be thoroughly flushed from the eyes and any cuts or abrasions of the skin After inflation the airbags deflate immediately This provides a gradual cushioning effect for the occupant and also ensures that the driver's forward vision is not impaired

NOTE. *After inflation, some airbag components are hot - DO NOT touch until they have cooled*

Airbag SRS warning light

Whenever the starter switch is turned to position 'II', the diagnostic control unit monitors the readiness of the system's electrical circuits The elements of the system being monitored include

- SRS warning light
- Rotary coupler
- Airbag modules
- Airbag diagnostic control unit
- Airbag wiring harness

A warning light mounted on the instrument panel will alert you to any malfunction of the SRS/airbag The system should always be checked by a dealer if any of the following symptoms occur These indicate a fault, which may result in the SRS/airbag not operating as required in the event of a frontal impact

- The warning light fails to illuminate when the starter switch is turned to position 'II'
- The warning light fails to extinguish within approximately four seconds after the starter switch is turned to position 'II'
- The warning light illuminates after the engine is started, or while the vehicle is being driven

Airbag SRS

CHILD SEATS

Children aged 12 years and under are more likely than adult occupants to receive injuries from inflating airbags For this reason, it is recommended that children should always be seated in the second row of seats in a child safety seat or restraint system apporopriate to their age and size, see *CHILD RESTRAINTS FOR SMALL CHILDREN AND BABIES' page 34*

If it is necessary for a child to travel in the front set the seat fully rearwards and use a front facing child seat ONLY

WARNING

DO NOT USE A REAR FACING CHILD SEAT IN ANY FRONT PASSENGER SEAT LOCATION. If the passenger airbag inflates, a child in a rear facing child restraint could result in serious injury or death.

Children could be endangered in a crash if their child restraints are not properly secured in the vehicle Be sure to install child restraints according to the manufacturer's instructions.

Under no circumstances should a rear facing child seat be installed facing forward in any seating position.

SERVICE INFORMATION

WARNING

DO NOT attempt to service, repair, replace, modify or tamper with any part of the airbag SRS, or wiring in the vicinity of an airbag SRS component, this could cause the system to activate, resulting in personal injury.

Certain components of the SRS/airbag must be replaced by a Land Rover dealer after 10 years from the date of manufacture (shown on the certification plate on the rear face of the left hand front door)

In addition ALWAYS contact your dealer if

- an airbag inflates
- the front of the vehicle is damaged even if the airbag has not inflated
- any part of an airbag module cover (the steering wheel centre pad or fascia panel) shows signs of cracking or damage

Airbag SRS

IMPORTANT INFORMATION

The components that make up the airbag SRS are sensitive to electrical or physical interference, either of which could easily damage the system and cause inadvertent operation or a malfunction of the airbag

For your safety it is recommended that you seek the assistance of a Land Rover dealer to carry out any of the following

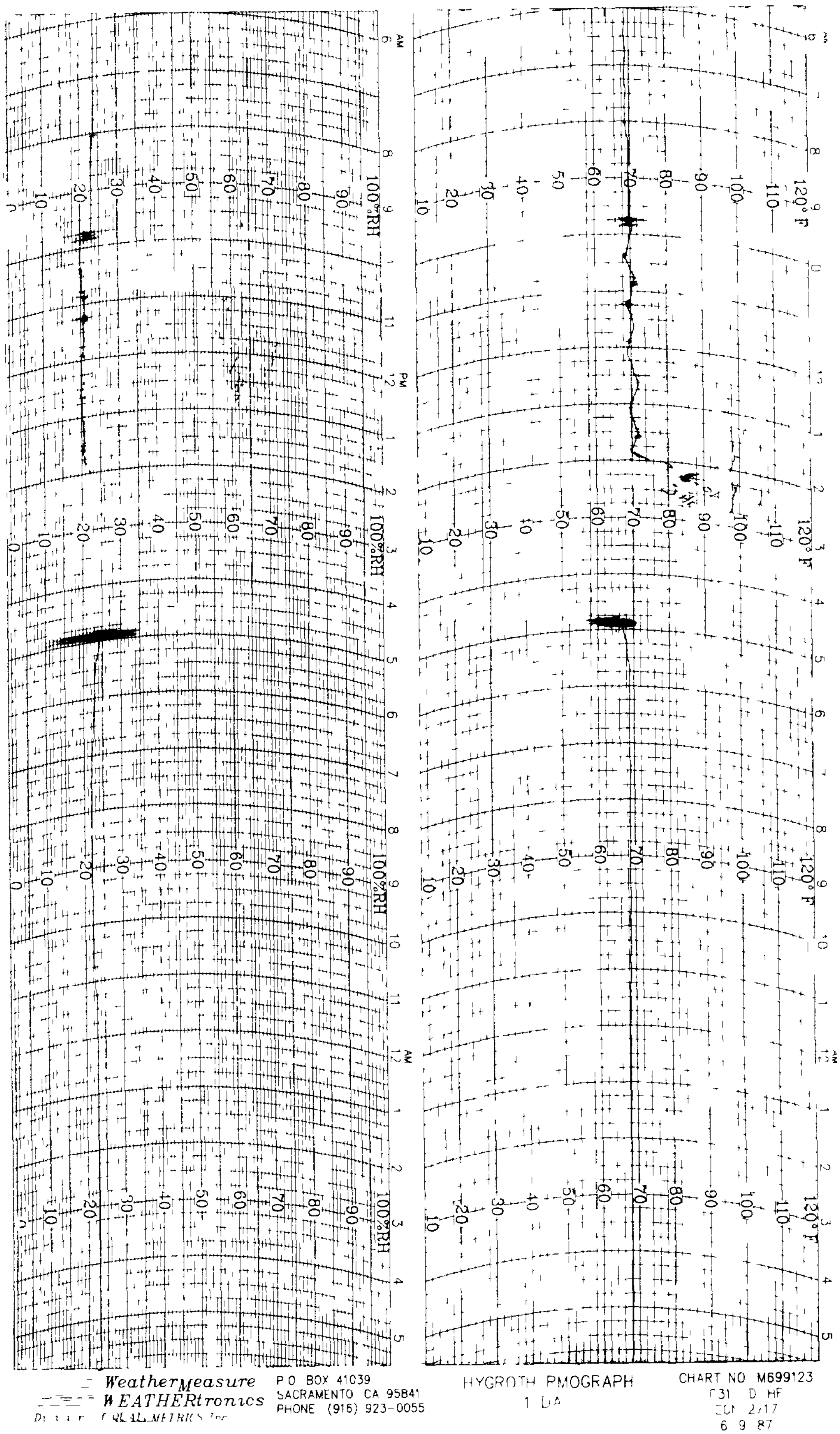
- Removal or repair of any wiring or component in the vicinity of any of the SRS components (yellow wiring harness), including the steering wheel, steering column, instrument and fascia panels
- Installation of electronic equipment such as a mobile phone, two-way radio or in-car entertainment system
- Modification to the front of the vehicle, including the bumper and chassis
- Attachment of accessories to the front of the vehicle such as a winch or brushbar

Disposing of vehicles

If you sell your vehicle, be sure to inform the new owner that the vehicle has an SRS/airbag system, and make the new owner aware of the airbag module replacement date shown in the Passport to Service

If the vehicle is to be scrapped, uninflated airbags are potentially very dangerous and must be safely deployed in a controlled environment before a vehicle is scrapped

See your Land Rover retailer for advice on safe deployment of SRS/airbags



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