1989 NISSAN PICKUP
V 1393

VEHICLE AND DUMMY KINEMATICS IN A CONTROLLED ROLLOVER CRASH 1989 NISSAN PICK-UP TRUCK

PREPARED BY:
THE TRANSPORTATION RESEARCH CENTER OF OHIO
U.S. RT. 33, LOGAN COUNTY
EAST LIBERTY, OHIO 43319

TEST REPORT
NOVEMBER - DECEMBER, 1989

PREPARED FOR:
SYSTEMS RESEARCH LABORATORIES, INC.
2800 INDIAN RIPPLE ROAD
DAYTON, OHIO 45440

ERRATA (as of Nov 93)
Test Number 891116

1. The following channel on the Sign Convention Sheet at the end of Appendix D should read:

   Neck Load Cells: +Y Force: Head Pushed Leftward

2. All neck load cell moments should be labeled lb-ft, instead of lb-in, including:

   Dummy Data Summary Sheet, page 4-4.
   Plots, Appendix B
   - Driver Neck Moment About X Axis
   - Driver Neck Moment About Y Axis
   - Driver Neck Moment About Z Axis

NOTICE

The Transportation Research Center of Ohio does not endorse or certify products of manufacturers. The manufacturer's name appears solely to identify the test article. The Transportation Research Center assumes no liability for the report or use thereof. It is responsible for the facts and the accuracy of the data presented herein. This report does not constitute a standard, specification, or regulation.

Report Prepared By:

Najih A. ElHabash Date 12/14/89
N.A. El-Habash
Project Engineer

Report Approved By:

John C Stultz Date 12/20/89
J.C. Stultz
Chief Engineer Impact Laboratory

John F. Shultis Date 12/19/89
J.F. Shultis
Manager Impact Laboratory

Dennis Elliot Date 12/19/89
T.E. Elliot
Project Manager

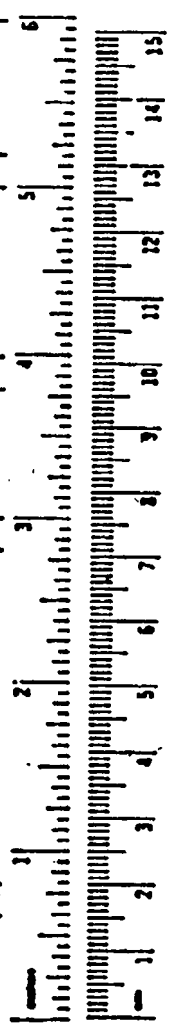
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	metric ton	t
	VOLUME			
tsp	teaspoons	5	milliliters	mL
Tbsp	tablespoons	15	milliliters	mL
in^3	cubic inches	16	milliliters	mL
fl oz	fluid ounces	30	milliliters	mL
c	cups	0.24	liters	L
pt	pints	0.47	liters	L
qt	quarts	0.95	liters	L
gal	gallons	3.8	liters	L
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	degrees Fahrenheit	5/9 (after subtracting 32)	degrees Celsius	°C

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	kilometers	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)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton (1000 kg)	1.1	short tons	
	VOLUME			
mL	milliliters	0.03	fluid ounces	fl oz
mL	milliliters	0.06	cubic inches	in^3
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	degrees Celsius	9/5 (then add 32)	degrees Fahrenheit	°F



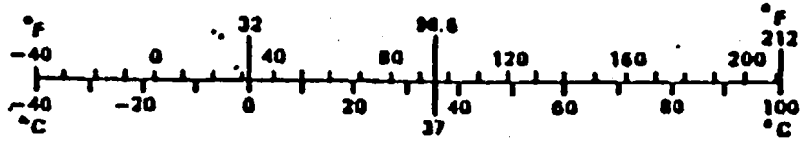


TABLE OF CONTENTS

LIST OF PHOTOGRAPHS

SECTION 1.0

PURPOSE AND TEST PROCEDURE

This rollover crash test has the main objective to investigate both vehicle and occupant dynamics during automobile rollover crashes.

This test was conducted by placing a 1989 Nissan Pick-up Truck on the NHTSA rollover cart at an angle 30° above the horizontal, crabbing the rollover cart 0°, towing the rollover cart to 30 mph and releasing the test vehicle with its roll axis perpendicular to the direction of the rollover cart motion. The test vehicle contained an instrumented Part 572E dummy with a three-point unibelt restraint system. The vehicle was oriented to first contact its right side.

SECTION 2.0

SUMMARY OF ROLLOVER CRASH TEST

A 1989 Nissan pick-up truck containing one Part 572E instrumented test dummy was placed upon the rollover test device at 30 degrees above the horizontal and was released when the device had reached 30 mph. The device was attached to the tow cable of the drive system. After the vehicle had been released the device was brought to a stop with an auxiliary brake system. After release the vehicle impacted the ground on its right side. The vehicle made one full roll and came to rest on its tires. The rollover crash test was conducted by the Transportation Research Center of Ohio in East Liberty, Ohio on November 16, 1989.

The Part 572E 50th percentile adult male anthropomorphic test device (ATD) was placed in the drvier's designated seating position according to the seating procedure in FMVSS 208 Notice 45. The ATD was instrumented with head, chest, and pelvis traixial accelerometers, a six-axis neck load cell, and a chest displacement potentiometer. The crash event was recorded by thirty-four channels of data on one 14-track tape drive. The analog data was digitally sampled at 8000 samples per second. The data was digitally filtered per SAE J211.

The crash event was filmed by six high-speed motion picture cameras operating at approximately 500 frames per second and one real-time panning motion picture camera.

Section 1.0 contains the purpose and test procedure. Section 2.0 contains a summary of the rollover crash test. Section 3.0 contains the general test and vehicle parameter data. Section 4.0 contains the occupant information. Appendix A contains the pre-test and post-test still photographs. Appendix B contains the final data plots. Appendix C contains the pre-test and post-test IPMD vehicle data sheet.

TEST NUMBER 891116

ROLL CART DATA SUMMARY

No.	LOCATION	POSITIVE DIRECTION MAX	POSITIVE DIRECTION SEC	NEGATIVE DIRECTION MAX	NEGATIVE DIRECTION SEC
1	CENTER OF GRAVITY ACCELERATION (g)				
	LONGITUDINAL	3.2	0.5	4.7	1.0
	LATERAL	4.2	0.5	7.8	1.6
	VERTICAL	6.2	1.7	4.8	1.8
	RESULTANT	8.0	1.6		
2	PLATFORM DISPLACEMENT (in)				
	LEFT SIDE	23.8	3.2	0.1	0.5
	RIGHT SIDE	24.7	1.0	0.1	0.5

VEHICLE/ROLL CART SEPARATION TIMES:

UPPER SWITCH: 0.7 SEC
LOWER SWITCH: 0.7 SEC

POSITIVE DIRECTION		NEGATIVE DIRECTION	
LONGITUDINAL:	FORWARD	LONGITUDINAL:	REARWARD
LATERAL:	LEFTWARD	LATERAL:	RIGHTWARD
VERTICAL:	UPWARD	VERTICAL:	DOWNWARD
DISPLACEMENT:	OUTWARD	DISPLACEMENT:	INWARD

See TEST ANOMALIES FOR INFORMATION RELATIVE TO ALL OF THE ABOVE DATA CHANNELS.

FINAL RESTING PLACES OF PARTS AND CARS

DESCRIPTION OF PART	X, FT*	Y, FT*
1989 Nissan pick-up truck	137.3	6.2
Rear window rubber frame	58.9	0.0

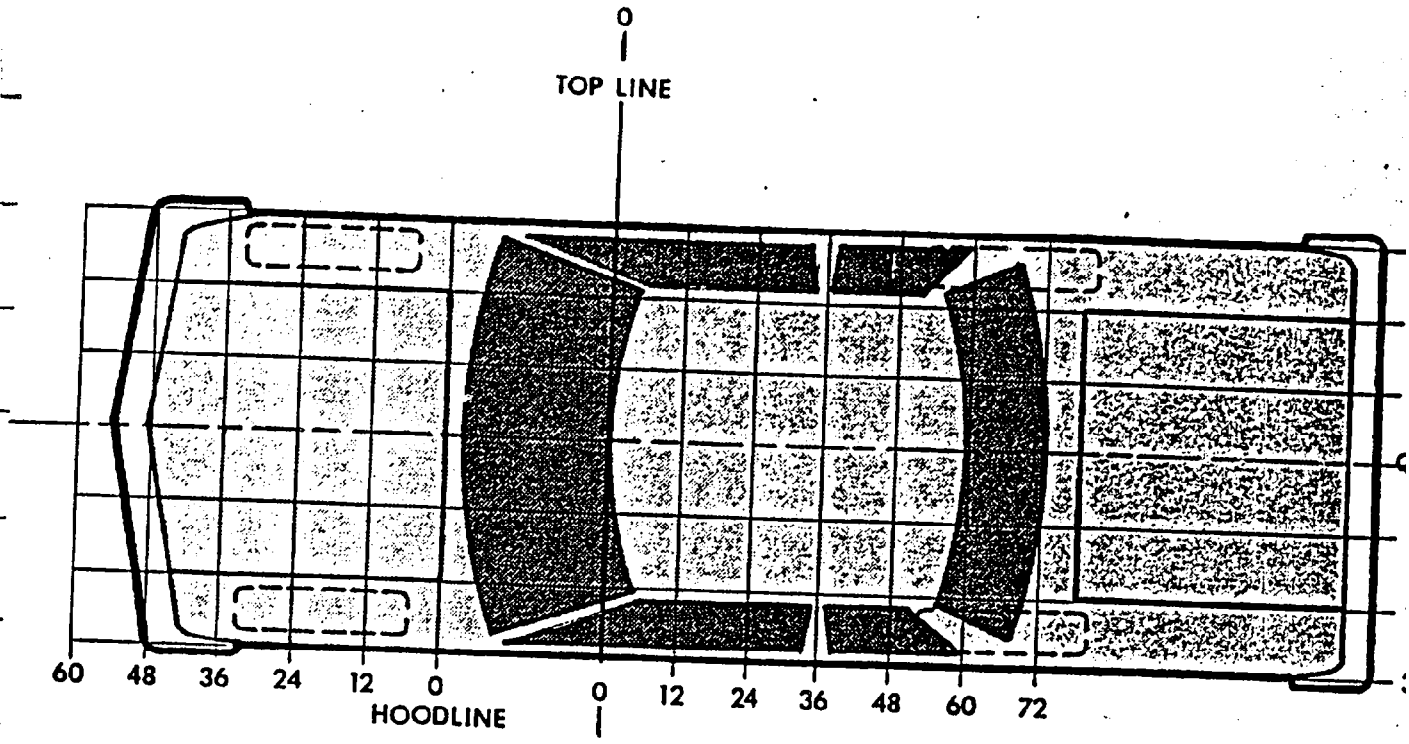
*REFERENCE: +X: FORWARD FROM RELEASE BLOCK

+Y: LEFTWARD FROM CENTER RELEASE BLOCK

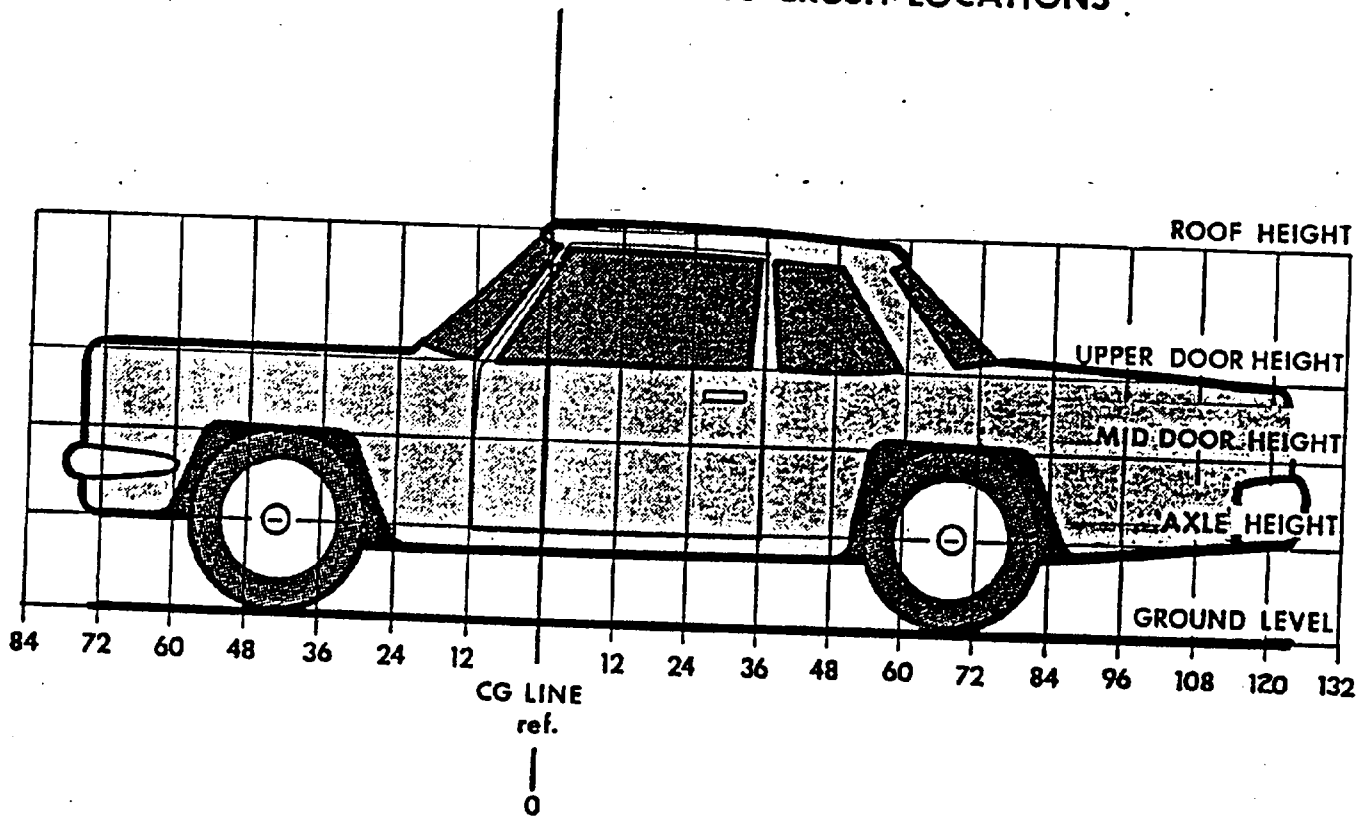
VEHICLE INTERIOR MEASUREMENTS

DESCRIPTION	PRE	POST	DIFF
Floor board to top of left "A" post	39.9	27.1	12.8
Floor board to top of right "A" post	40.0	32.0	8.0
Door sill to top of left "B" post	41.1	33.1	8.0
Door sill to top of right "B" post	41.8	35.2	6.6
Door sill to top of left door opening	42.6	30.5	12.1
Door sill to top of right door opening	42.0	34.0	8.0
Floor tunnel to windshield header	36.0	23.8	12.2
Floor tunnel to center of roof	38.8	23.8	15.0
Rear of floor tunnel to roof	41.8	29.1	12.7
Maximum width at "B" post	64.4	54.0	10.4
Maximum width at "A" post	61.2	53.0	8.2
Maximum width at top of door opening	46.9	47.0	-0.1

ALL MEASUREMENTS ARE IN INCHES



HOOD AND ROOF STATIC CRUSH LOCATIONS



LEFT AND RIGHT SIDE STATIC CRUSH LOCATIONS

VEHICLE HOOD EXTERIOR PROFILES
ZERO DISTANCE AT VEHICLE HOOD CENTERLINE*

LOCATION	30	20	10	0	10	20	30
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)							
Trailing edge of cowl at centerline	X	41.6	41.9	42.2	41.6	41.2	X
Trailing edge of cowl + 12 inches***	X	39.9	40.5	40.9	40.3	39.8	X
Trailing edge of cowl + 24 inches	X	37.9	38.4	38.6	38.2	37.5	X
Trailing edge of cowl + 36 inches	X	X	X	X	X	X	X
Trailing edge of cowl + 48 inches	X	X	X	X	X	X	X
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)							
Trailing edge of cowl at centerline	X	41.4	42.2	42.2	42.0	41.4	X
Trailing edge of cowl + 12 inches	X	40.0	40.5	40.5	40.4	40.0	X
Trailing edge of cowl + 24 inches	X	38.2	38.5	38.8	38.0	37.8	X
Trailing edge of cowl + 36 inches	X	X	X	X	X	X	X
Trailing edge of cowl + 48 inches	X	X	X	X	X	X	X
STATIC CRUSH (IN)							
Trailing edge of cowl at centerline	X	-0.2	0.3	0.0	0.4	0.2	X
Trailing edge of cowl + 12 inches	X	0.1	0.0	-0.4	0.1	0.2	X
Trailing edge of cowl + 24 inches	X	0.3	0.1	0.2	-0.2	0.3	X
Trailing edge of cowl + 36 inches	X	X	X	X	X	X	X
Trailing edge of cowl + 48 inches	X	X	X	X	X	X	X

* Column readings are left to right from left to right on vehicle.
** Reference plane is a horizontal plane at ground level.
***Longutudinal distance from trailing edge of cowl at centerline forward to measurement plane.
\+ Static crush means vehicle structure is bowed upward.
\- Static crush means vehicle structure is crushed.

VEHICLE ROOF EXTERIOR PROFILES
ZERO DISTANCE AT VEHICLE ROOF CENTERLINE*

LOCATION	20	10	0	10	20
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)					
Longitudinal Center of Gravity - 12 inches	59.4	60.1	60.1	59.9	58.9
Longitudinal Center of Gravity	60.4	60.9	61.1	60.9	60.1
Longitudinal Center of Gravity + 12 inches	60.9	61.2	61.0	61.0	60.3
Longitudinal Center of Gravity + 24 inches	X	X	X	X	X
Longitudinal Center of Gravity + 36 inches	X	X	X	X	X
Longitudinal Center of Gravity + 48 inches	X	X	X	X	X
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)					
Longitudinal Center of Gravity - 12 inches	45.5	46.0	46.9	48.2	49.8
Longitudinal Center of Gravity	47.5	50.0	50.5	51.0	52.5
Longitudinal Center of Gravity + 24 inches	47.5	50.2	51.0	52.2	53.8
Longitudinal Center of Gravity + 36 inches	X	X	X	X	X
Longitudinal Center of Gravity + 48 inches	X	X	X	X	X
Longitudinal Center of Gravity + 60 inches	X	X	X	X	X
STATIC CRUSH (IN)					
Longitudinal Center of Gravity -12 inches	-13.9	-14.1	-13.2	-11.7	-9.1
Longitudinal Center of Gravity	-12.9	-10.9	-10.6	-9.9	-7.6
Longitudinal Center of Gravity + 12 inches	-13.4	-11.0	-10.0	-8.8	-6.5
Longitudinal Center of Gravity + 24 inches	X	X	X	X	X
Longitudinal Center of Gravity + 36 inches	X	X	X	X	X
Longitudinal Center of Gravity + 48 inches	X	X	X	X	X

* Column readings are left to right from left to right on vehicle.
** Reference plane is a horizontal plane at ground level.
***Longitudinal distance from center of gravity rearward to measurement plane.
\+ Static crush means vehicle structure is bowed upward.
\- Static crush means vehicle structure is crushed.

VEHICLE LEFT SIDE EXTERIOR PROFILES AND STATIC CRUSH
ZERO DISTANCE AT VEHICLE LONGITUDINAL CENTER OF GRAVITY*

LOCATION	HEIGHT(IN)	72	60	48	36	24	12	0	12	24	36	48	60	72	84	96
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Roof Height	58.8	X	X	X	X	X	24.5	23.9	23.9	X	X	X	X	X	X	X
Upper Door	39.5	X	X	18.2	17.8	17.5	17.1	17.0	17.3	17.4	17.2	17.4	17.1	17.3	17.5	X
Mid Door	27.4	17.6	X	X	15.9	15.9	15.7	15.6	15.9	16.0	15.8	X	X	16.2	16.2	X
Axle Height	14.0	X	X	X	X	19.1	18.9	18.8	19.1	18.7	18.3	X	X	X	X	X
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Roof Height	58.8	X	X	X	X	X	25.9	27.2	30.5	X	X	X	X	X	X	X
Upper Door	39.5	X	X	19.8	19.0	18.1	17.5	17.5	17.0	19.0	19.1	19.2	19.4	19.1	19.5	X
Mid Door	27.4	17.2	X	X	16.9	16.5	16.4	15.5	15.2	16.5	16.6	X	16.8	17.1	X	X
Axle Height	14.0	X	X	X	X	19.4	19.2	19.2	19.4	18.9	18.8	X	X	X	X	X
STATIC CRUSH (IN)																
Roof Height	58.8	X	X	X	X	X	1.4	3.3	6.6	X	X	X	X	X	X	X
Upper Door	39.5	X	X	1.6	1.2	0.6	0.4	0.5	-0.3	1.6	1.9	1.8	2.3	1.8	2.0	X
Mid Door	27.4	-0.2	X	X	-1.0	0.6	0.7	-0.1	-0.7	0.5	0.8	X	X	0.9	X	X
Axle Height	14.0	X	X	X	X	0.3	0.3	0.4	0.3	-0.2	0.5	X	X	X	X	X

* Center of gravity is located 51.7 inches rearward of vehicle front wheels. Column readings are left to right from front to rear on vehicle.

** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.
+ Static crush means that vehicle structure is crushed.
- Static crush means that vehicle stucture is bowed outward.

VEHICLE RIGHT SIDE EXTERIOR PROFILES AND STATIC CRUSH
ZERO DISTANCE AT VEHICLE LONGITUDINAL CENTER OF GRAVITY*

LOCATION	HEIGHT(IN)	72	60	48	36	24	12	0	12	24	36	48	60	72	84	96
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Roof Height	58.4	X	X	X	X	X	23.0	22.6	22.6	X	X	X	X	X	X	X
Upper Door	39.5	X	X	17.1	17.4	16.8	16.8	16.8	17.0	16.9	16.8	17.1	17.3	17.2	17.1	X
Mid Door	27.4	17.3	X	X	15.9	16.5	15.6	15.6	15.9	15.6	15.6	X	X	16.1	16.1	X
Axle Height	14.0	X	X	X	X	18.4	18.6	18.7	18.9	18.8	18.8	X	X	X	X	X
POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Roof Height	58.8	X	X	X	X	X	22.0	21.5	23.4	X	X	X	X	X	X	X
Upper Door	39.5	X	X	16.6	16.4	15.5	14.0	12.8	12.2	16.5	16.4	16.2	16.2	16.6	16.0	X
Mid Door	27.4	16.9	X	X	15.2	15.1	15.0	14.0	13.2	15.5	15.1	X	X	15.4	15.5	X
Axle Height	14.0	X	X	X	X	18.4	18.4	18.2	18.5	18.8	19.5	X	X	X	X	X
STATIC CRUSH (IN)																
Roof Height	58.8	X	X	X	X	X	-1.0	-1.1	0.8	X	X	X	X	X	X	X
Upper Door	39.5	X	X	-0.5	-1.0	-1.3	-2.8	-4.0	-4.8	-0.4	-0.4	-0.9	-1.1	-0.6	-1.1	X
Mid Door	27.4	-0.4	X	X	-0.7	-1.4	-0.6	-1.6	-2.7	-0.1	-0.5	X	X	-0.7	-0.6	X
Axle Height	14.0	X	X	X	X	0.0	-0.2	-0.5	-0.4	0.0	0.7	X	X	X	X	X

* Center of gravity is located 51.7 inches rearward of vehicle front wheels. Column readings are left to right from front to rear on vehicle.

** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.
+ Static crush means that vehicle structure is crushed.
- Static crush means that vehicle stucture is bowed outward.

IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Nissan Pickup Truck TEST NUMBER: 891116

NO.	TYPE OF MEASUREMENT	DIMENSIONS IN INCHES PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	174.6	175.2	-0.6
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	156.0	157.0	-1.0
X3	REAR SURFACE OF VEHICLE TO FIREWALL	137.1	137.2	-0.1
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	127.1	127.5	-0.4
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	127.0	125.8	1.2
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	126.2	126.6	-0.4
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	126.3	126.0	0.3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	81.9	82.2	-0.3
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	81.9	81.4	0.5
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	81.9	82.2	-0.3
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	81.9	81.5	0.4
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	126.4	124.5	1.9
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	125.9	125.2	0.7
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	136.8	137.2	-0.4
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	136.8	136.0	0.8
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	108.1	106.8	1.3
X17	CENTER OF STEERING COLUMN TO "A" POST	13.0	12.5	0.5
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.9	4.8	13.1
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	173.2	173.1	0.1
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	173.2	173.2	0.0
X21	LENGTH OF ENGINE BLOCK	18.2	18.2	0.0

TEST ANOMALIES

The following data channels contains an anomalous noise spikes between 0 and 0.4 seconds. Only the data from 0.41 to 4.8 seconds is included on the data summary.

- VCGXG2, Roll Cart Center of Gravity X-axis Accelerometer
- VCGYG2, Roll Cart Center of Gravity Y-axis Accelerometer
- VCGZG2, Roll Cart Center of Gravity Z-axis Accelerometer
- RCPDL, Roll Cart Left Cylinder Displacement
- RCPDR, Roll Cart Right Cylinder Displacement
- OTH1, Vehicle/Roll Cart Separation Time - Upper Switch
- OTH2, Vehicle/Roll Cart Separation Time - Lower Switch

SECTION 3.0

GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Nissan Motor Company, Ltd.

MAKE/MODEL: Nissan/Pickup VIN: 1N6ND11S5KC405284

BODY STYLE: Truck MODEL YEAR: 1989

NHTSA NO.: NA COLOR: Charcoal

ENGINE DATA: TYPE: Inline CYLINDERS: 4 DISPLACEMENT: 2.4 liter

TRANSMISSION DATA: 5 SPEED, X MANUAL, ____AUTOMATIC, ____FWD, X RWD, ____4WD

DATE VEHICLE RECEIVED: 10/30/89 ODOMETER READING: 53

DEALER'S NAME AND ADDRESS: Nissan North
8645 North High Street
Columbus, Ohio

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	No
OTHER	None		

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: OK

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Nissan Motor Company Ltd.

DATE OF MANUFACTURE: 8/89

GVWR: 4400 LBS

GAWR: FRONT 2200 LBS., REAR 2544 LBS.

TEST VEHICLE INFORMATION CONT'D

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 26 psi; REAR 35 psi

RECOMMENDED TIRE SIZE: P195/75R14 LOAD RANGE____B, ___C, ___D

TIRES ON VEHICLE (MFR., LINE, SIZE): Firestone WR12 P195/75R14

IS SPARE TIRE A "SPACE SAVER": Yes

IS SPARE TIRE STANDARD EQUIPMENT: Yes

VEHICLE CAPACITY: TYPES OF SEATS: FRONT: Bench, Manual adjustable
REAR: NA

**NUMBER OF OCCUPANTS____FRONT ____REAR ____TOTAL

**CARGO LOAD_____LBS. TOTAL_____LBS.

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	780 lbs.	RIGHT REAR	580 lbs.
LEFT FRONT	760 lbs.	LEFT REAR	570 lbs.

TOTAL FRONT WEIGHT 1540 lbs. (57.2% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1150 lbs. (42.8% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2690 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2690 LBS)

VCW = VEHICLE CAPACITY WEIGHT (LBS)

DSC = DESIGNATED SEATING CAPACITY ( )

RCLW = VCW - 150 (DCS) = 300 LBS*

TARGET TEST WEIGHT = UDW + RCLW + (1 DUMMY X 167 LBS/DUMMY)

= 2690 + 300 + 167 LBS

TARGET TEST WEIGHT = 3157 LBS

* FOR MULTI-PURPOSE VEHICLES, TRUCKS, AND BUSES A RATED CARGO AND LUGGAGE WEIGHT OF 300 POUNDS WAS USED.
**THE VEHICLE CONTAINED NO RECOMMENDED CARGO LOAD ON THE TIRE PRESSURE LABEL.

TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 297 LBS. CARGO

RIGHT FRONT	793 lbs.	RIGHT REAR	782 lbs.
LEFT FRONT	802 lbs.	LEFT REAR	777 lbs.
TOTAL FRONT WEIGHT	1595 lbs.	(50.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1559 lbs.	(49.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3154 lbs.	(0.1% UNDER TARGET WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 100 LBS.

COMPONENTS REMOVED TO MEET TARGET WEIGHT: None

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	LF 30.3	;RF 30.1	;LR 31.4	;RR 31.0
PRE-TEST ATTITUDE:	LF 28.8	;RF 28.1	;LR 29.0	;RR 28.7
POST-TEST ATTITUDE:	LF 28.6	;RF 28.0	;LR 29.6	;RR 27.5

WHEELBASE: 104.5 INCHES

CG = 51.7 INCHES REARWARD OF FRONT WHEEL CENTERLINE

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES):

OVERALL LENGTH OF TEST VEHICLE:	PRE-TEST:	L	173.2	;C	174.6	;R 173.2
	POST-TEST:	L	173.2	;C	175.2	;R 173.1
	TOTAL CRUSH:	L	0.0	;C	-0.6	;R 0.1

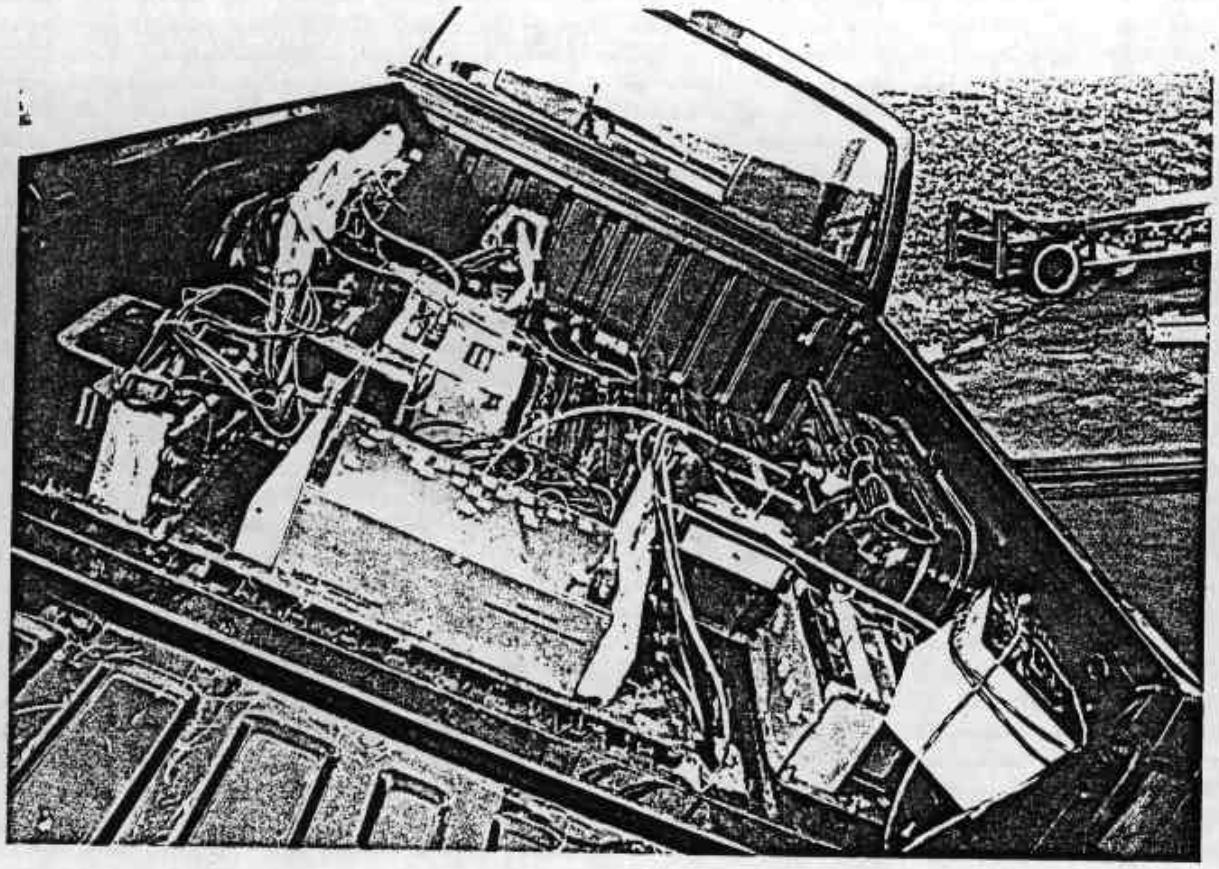


Figure A-11. PRE-TEST VEHICLE INSTRUMENTATION AND BALLAST LOCATION

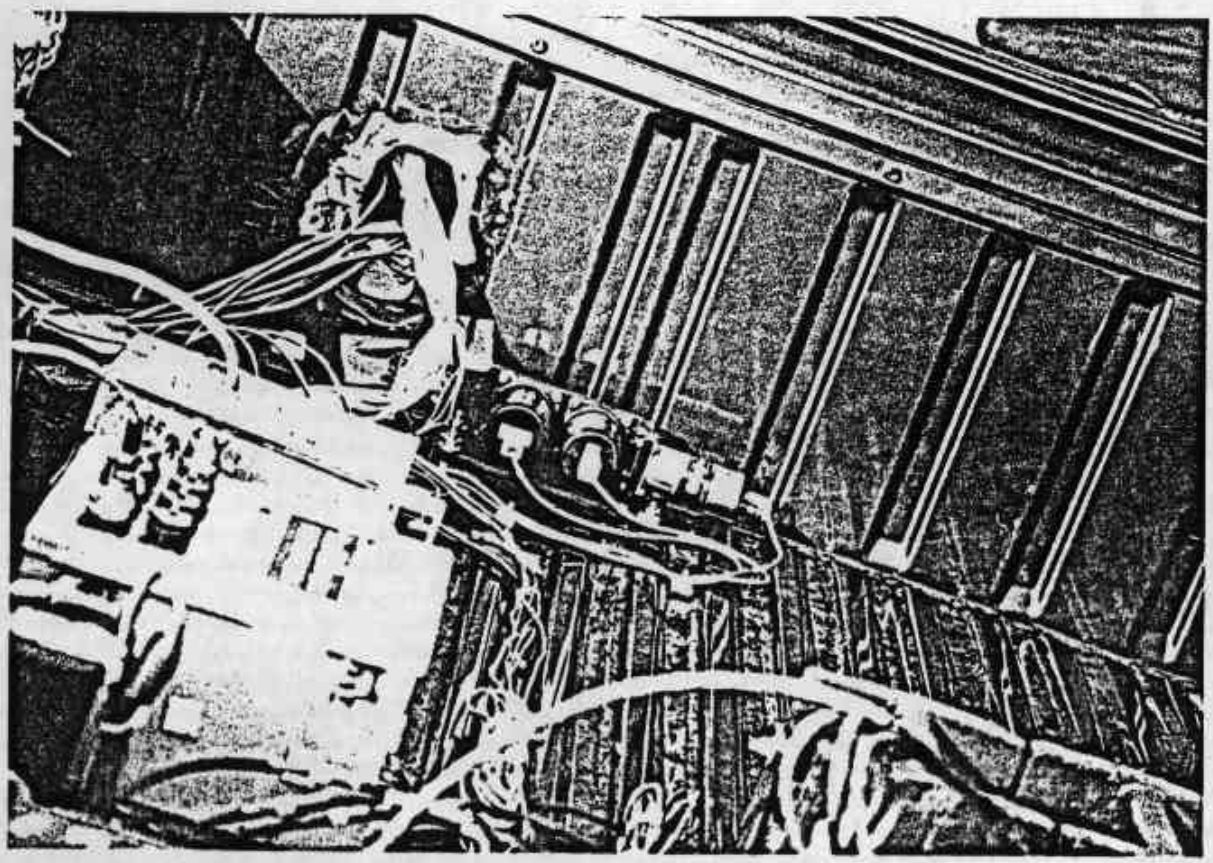


Figure A-12. PRE-TEST GYRO PLACEMENT VIEW

Figure A-13. POST-TEST OVERALL FRONT VIEW

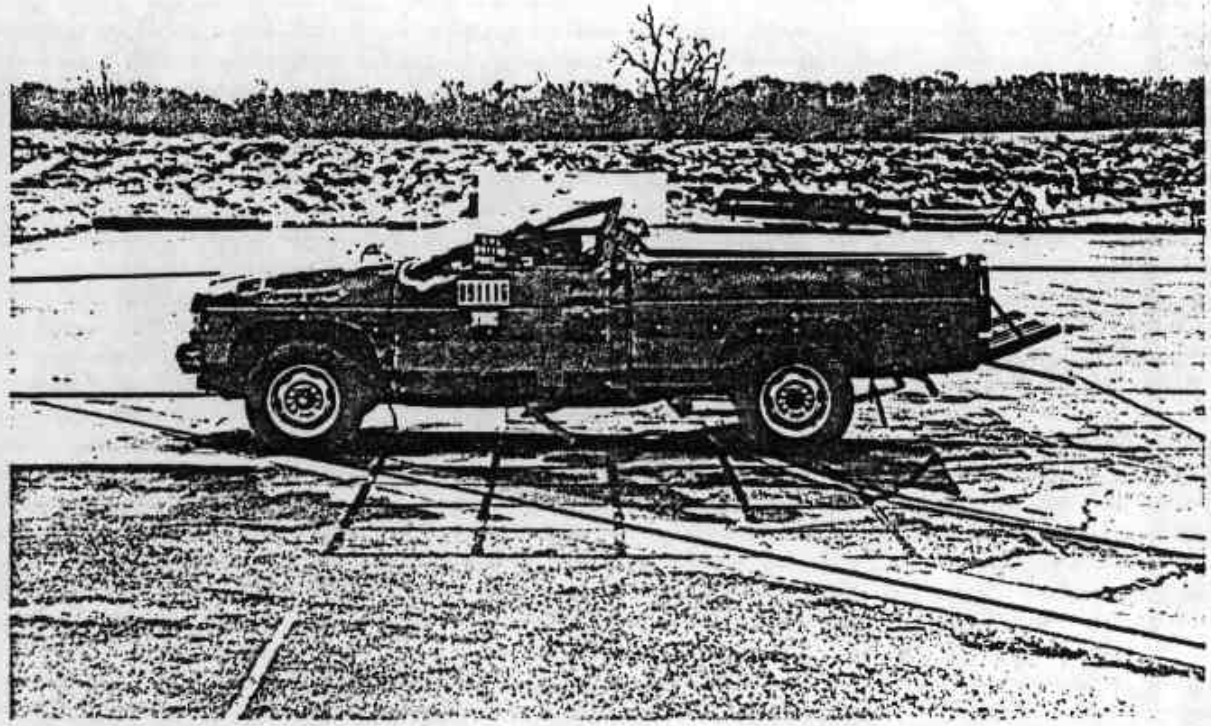


Figure A-14. PRE-TEST OVERALL LEFT VIEW

Figure A-15. POST-TEST OVERALL REAR - VIEW 1

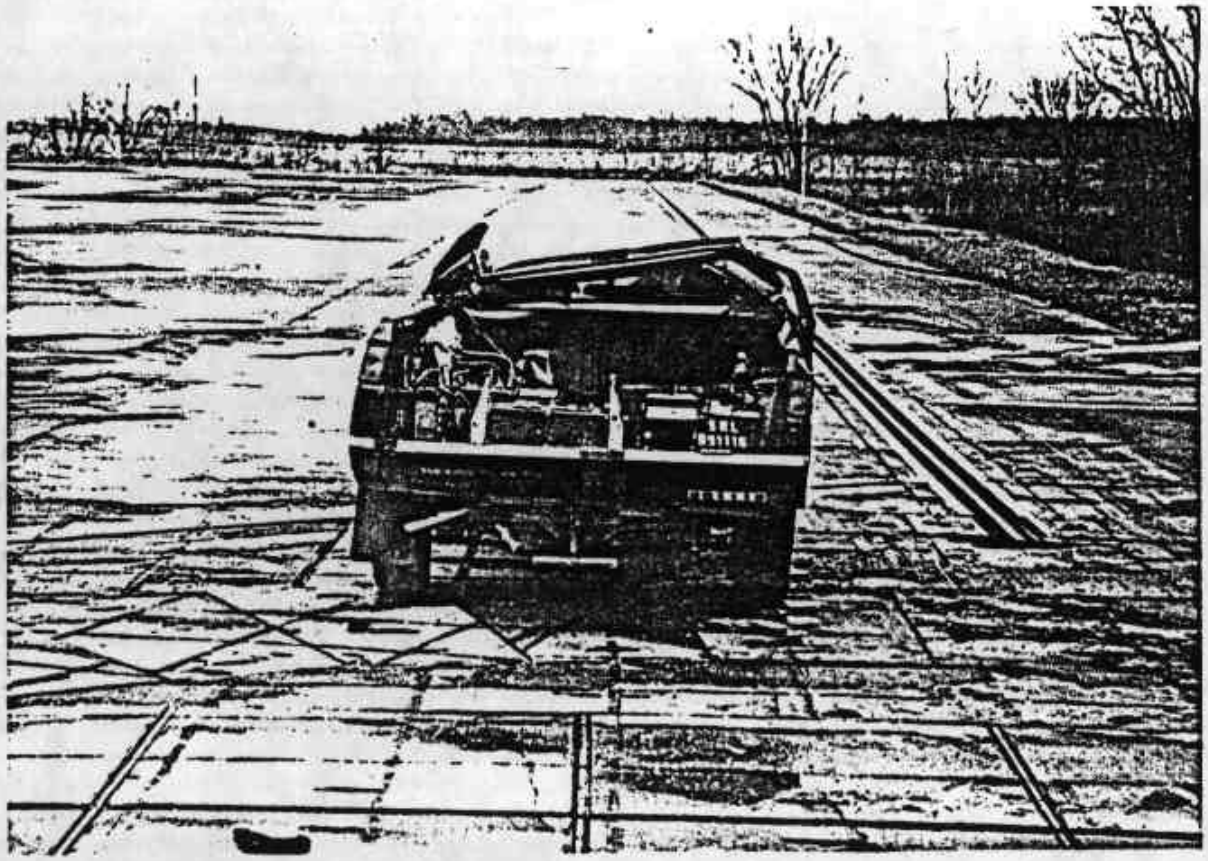


Figure A-16. POST-TEST OVERALL REAR - VIEW 2

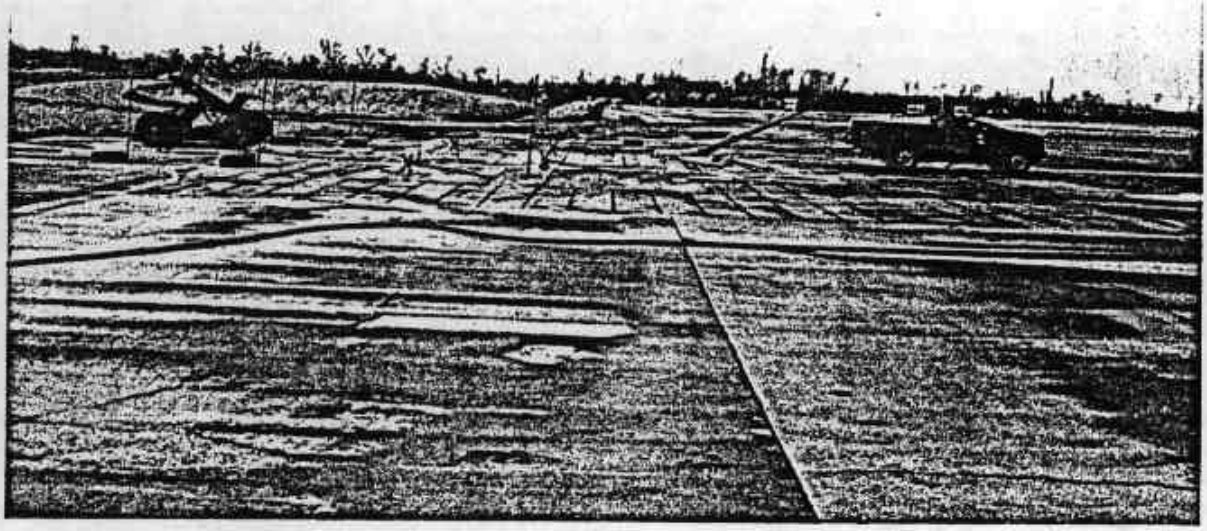


Figure A-17. POST-TEST OVERALL RIGHT - VIEW 1

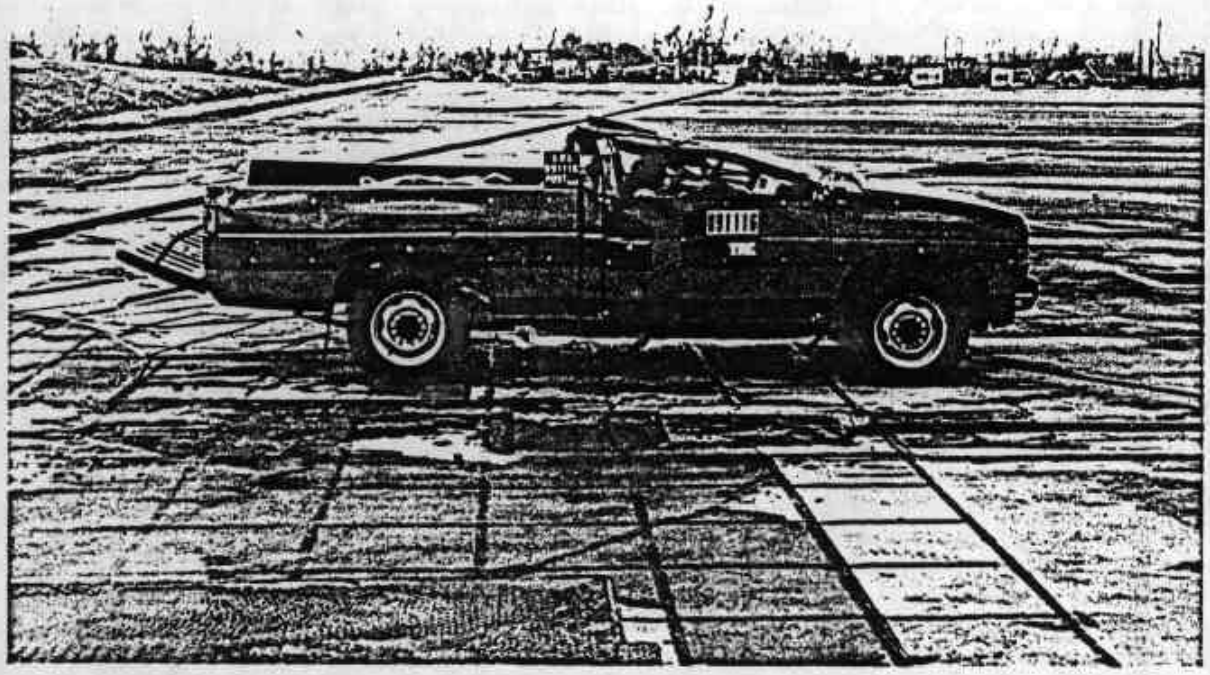


Figure A-18. POST-TEST OVERALL RIGHT - VIEW 2

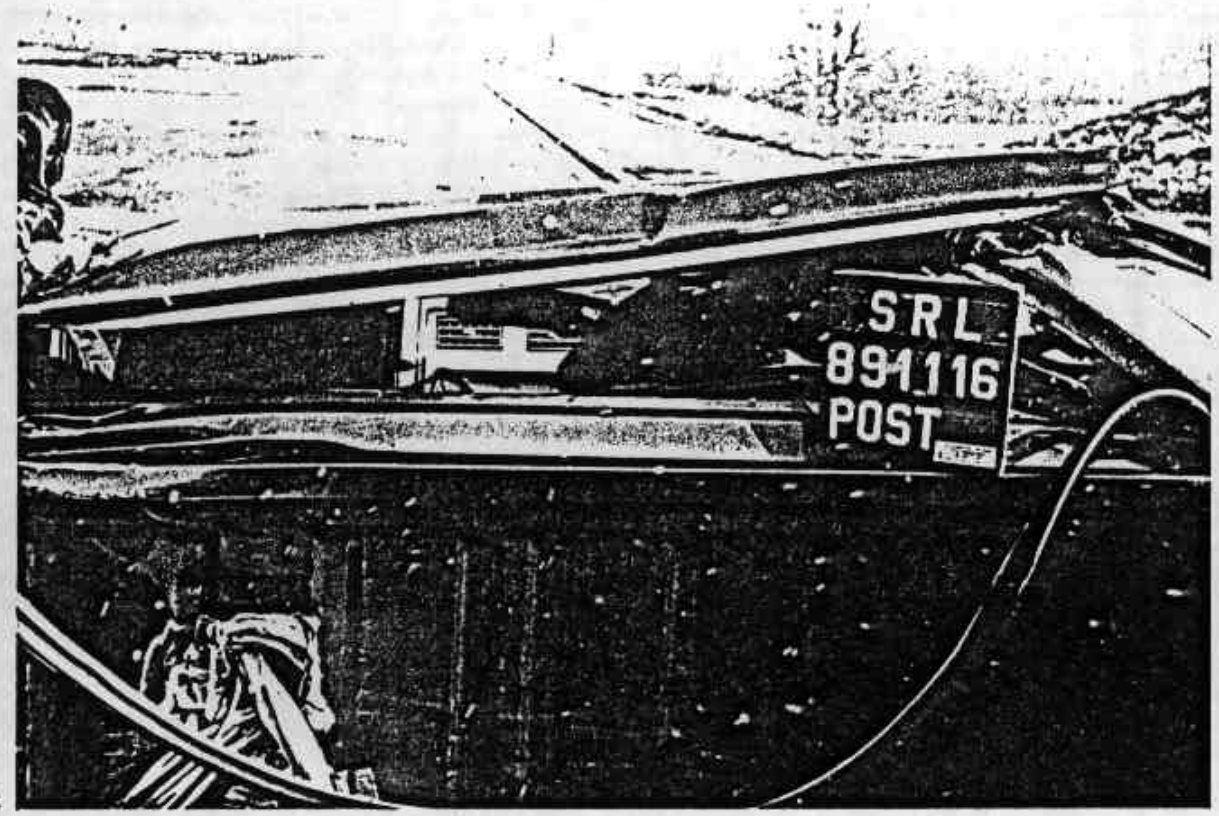


Figure A-19. POST-TEST DUMMY AND VEHICLE - VIEW 1

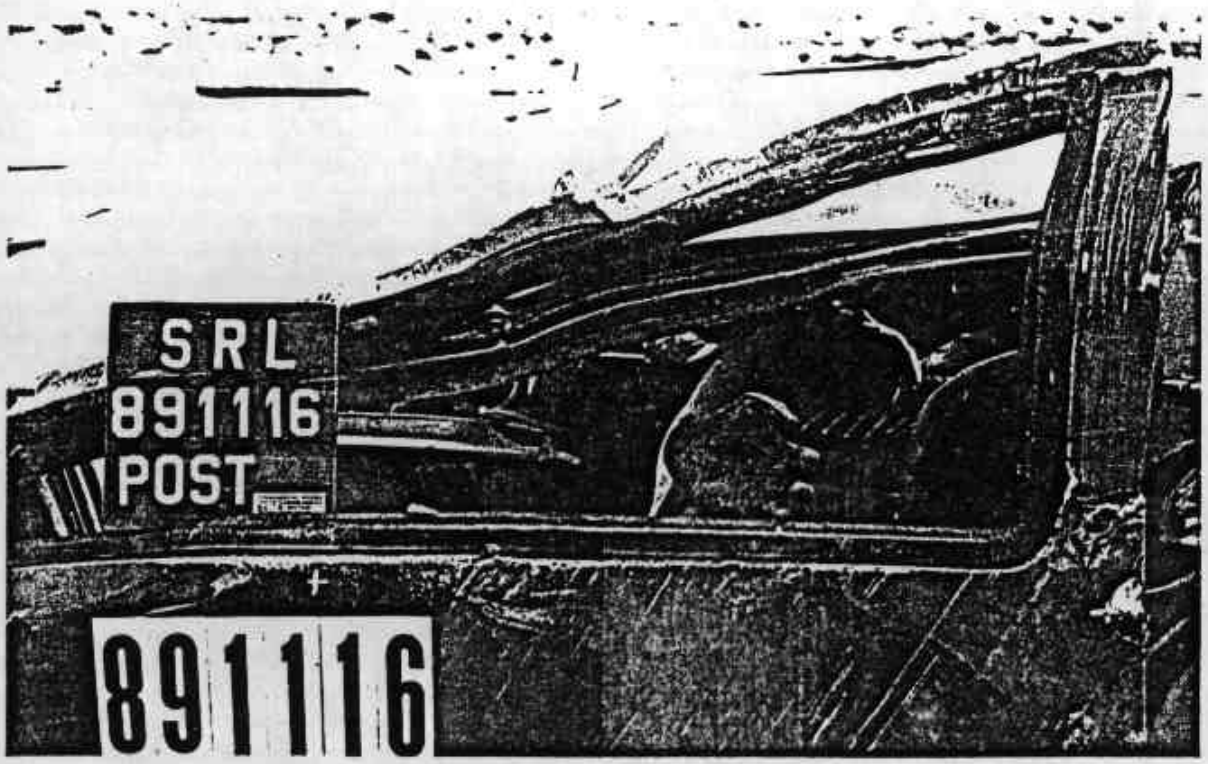


Figure A-20. POST-TEST DUMMY AND VEHICLE - VIEW 2

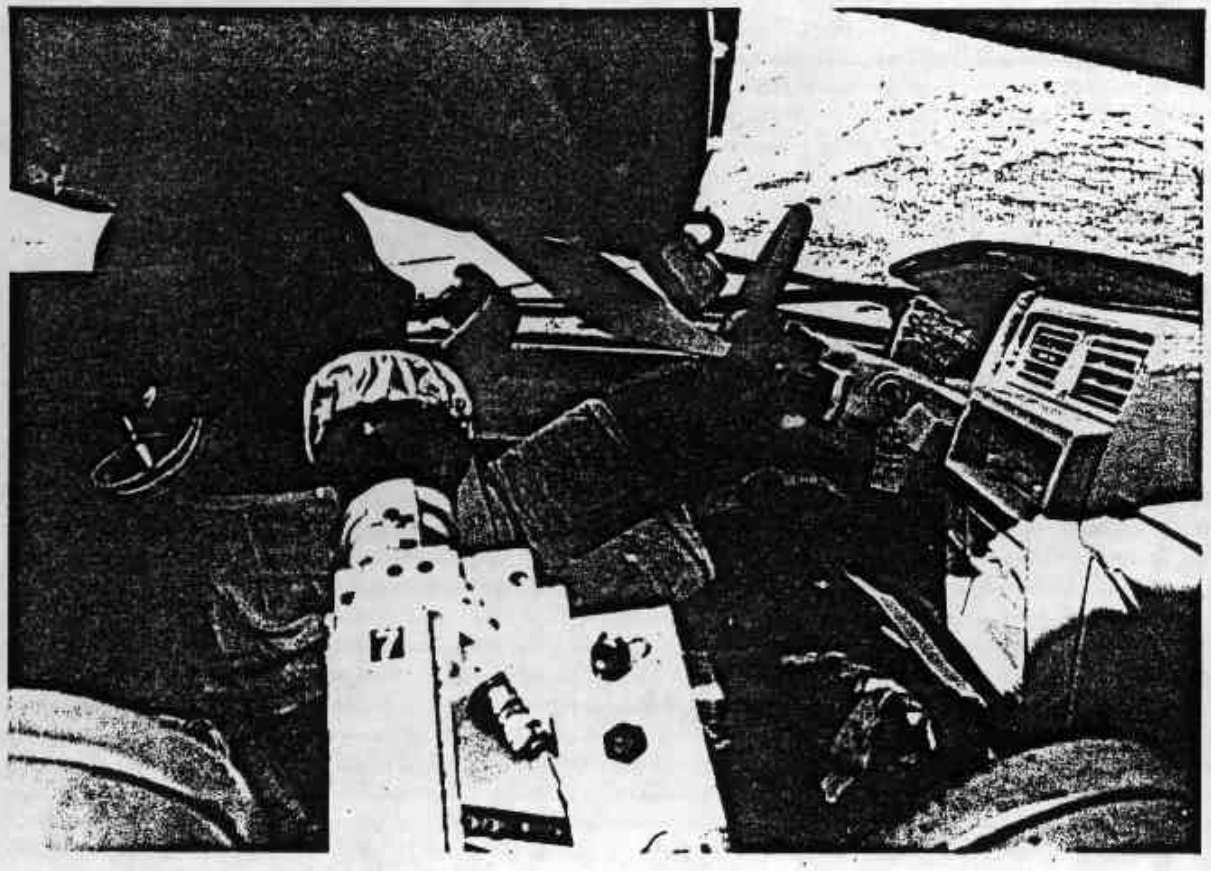


Figure A-21. POST-TEST DUMMY AND VEHICLE - VIEW 3

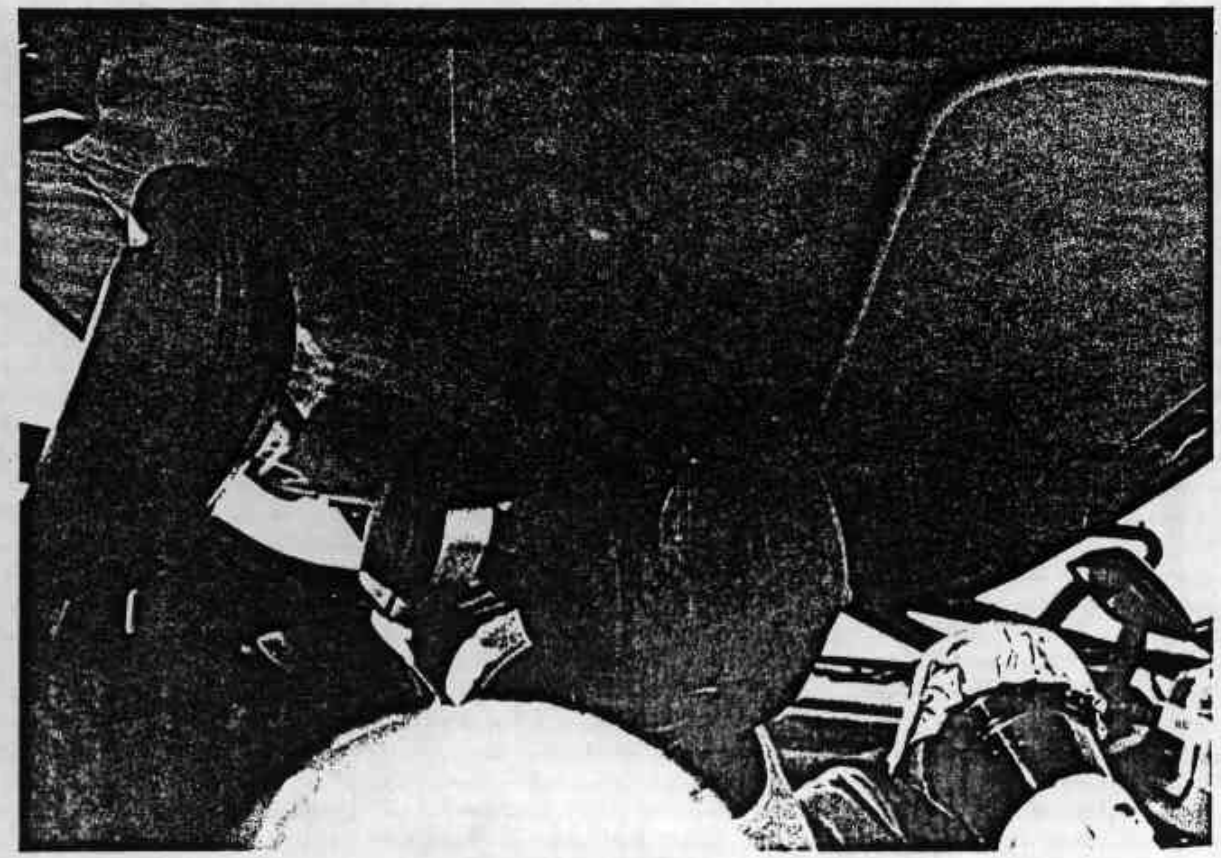


Figure A-22. POST-TEST DUMMY AND VEHICLE - VIEW 4

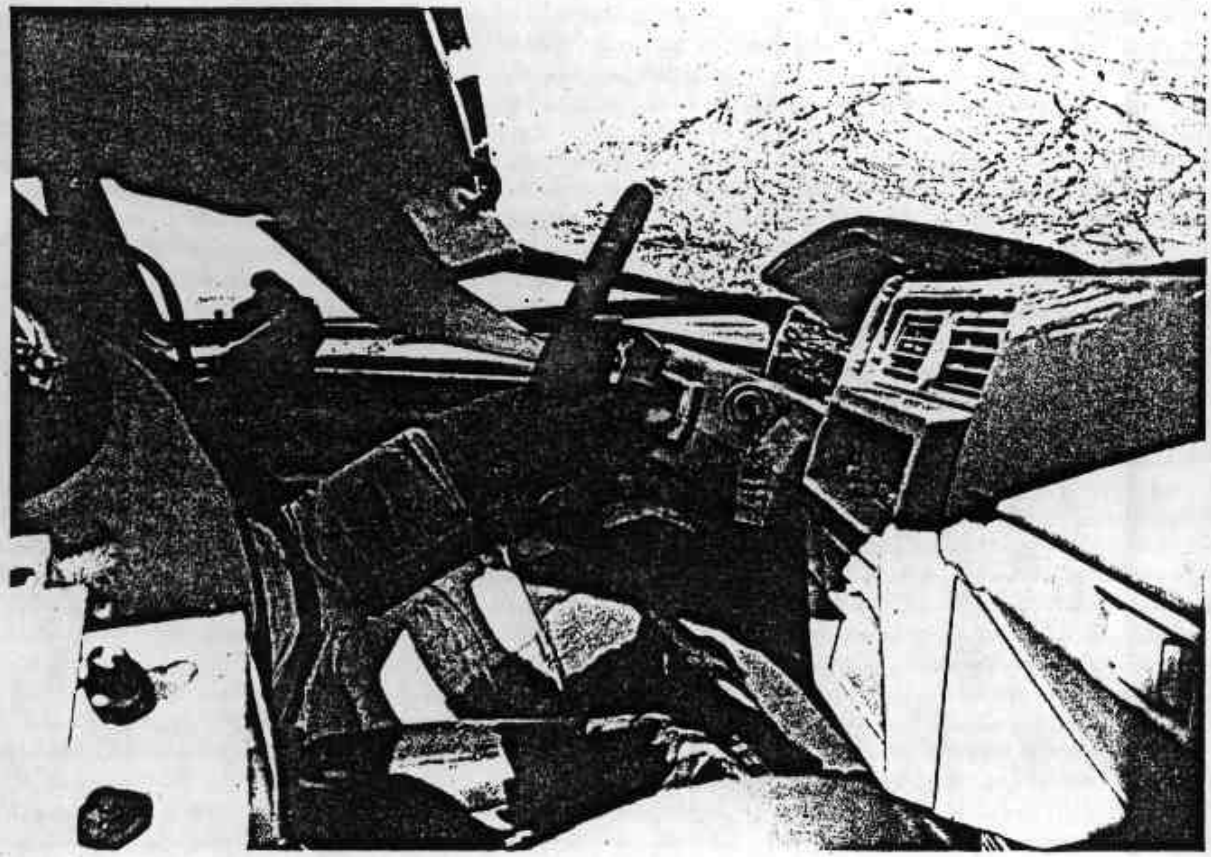
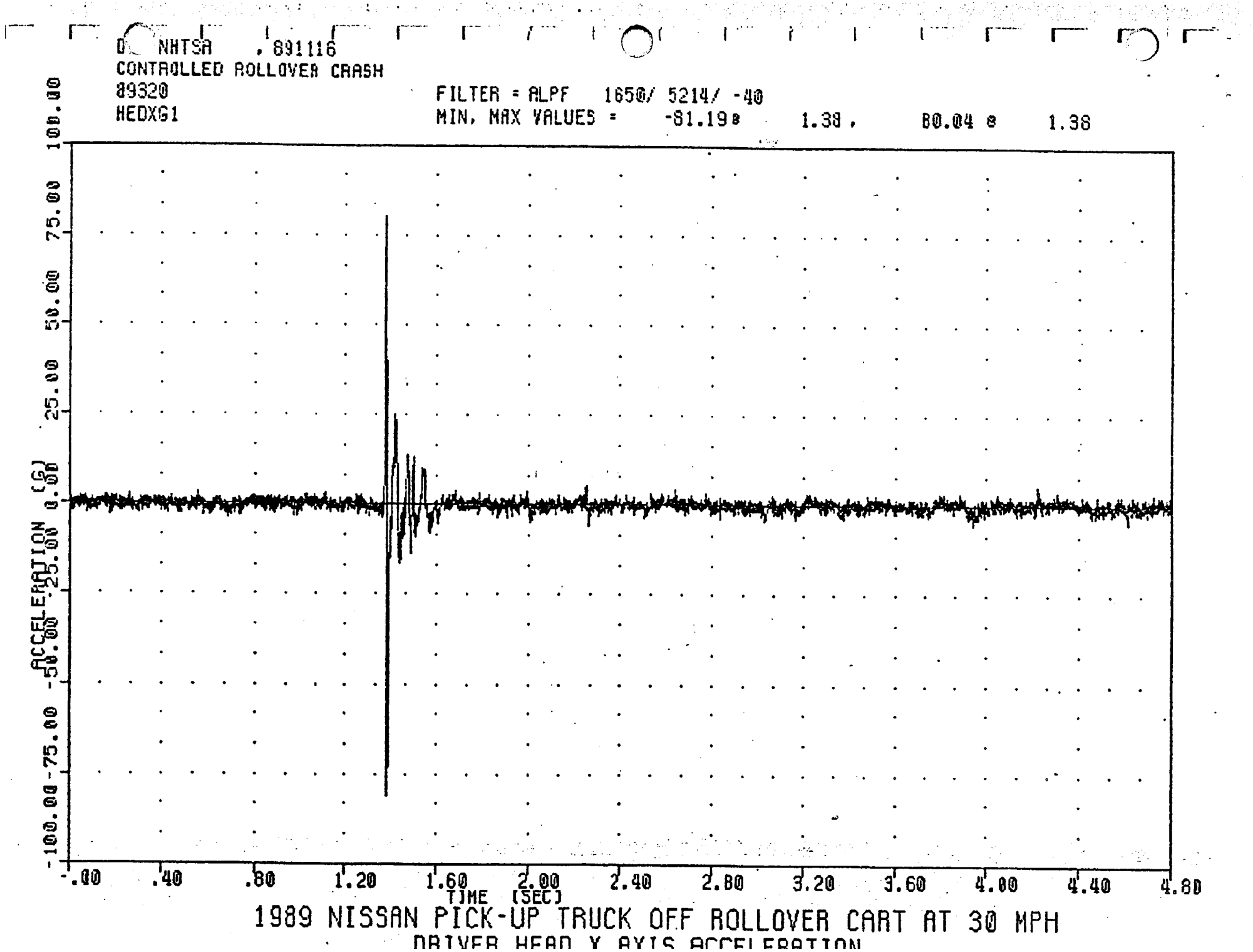


Figure A-23. POST-TEST DUMMY AND VEHICLE - VIEW 5

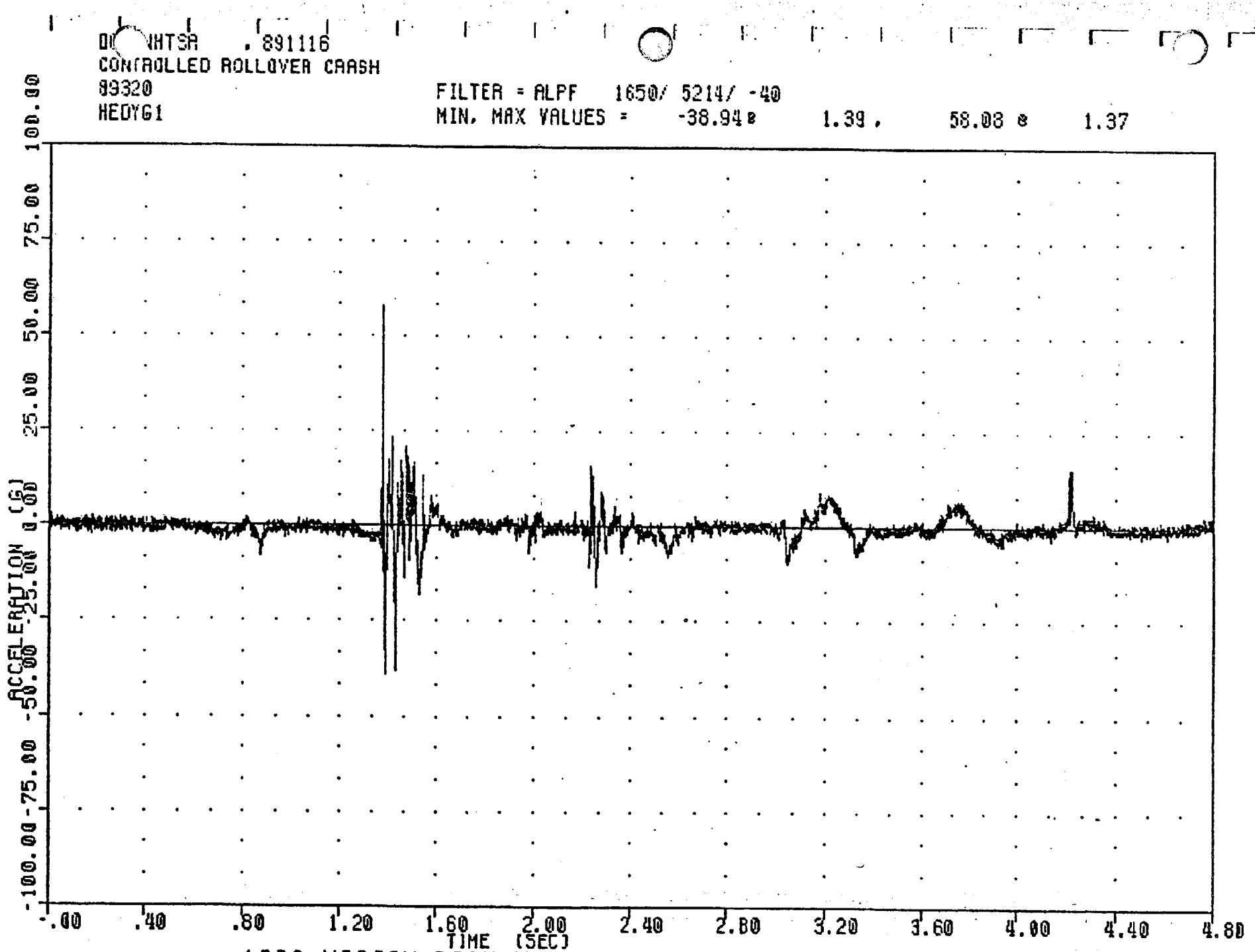
APPENDIX B

DATA PLOT PRESENTATION

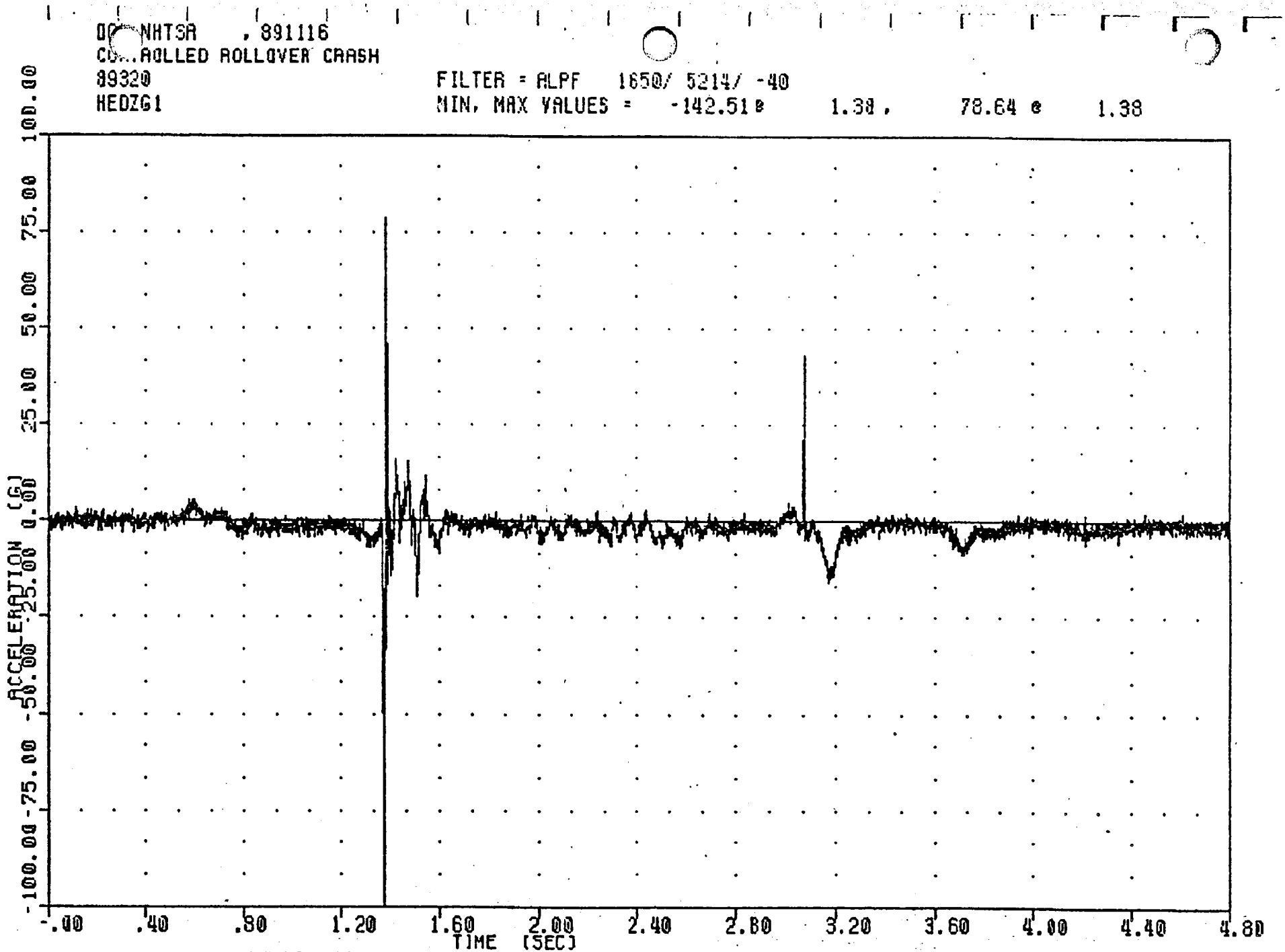


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

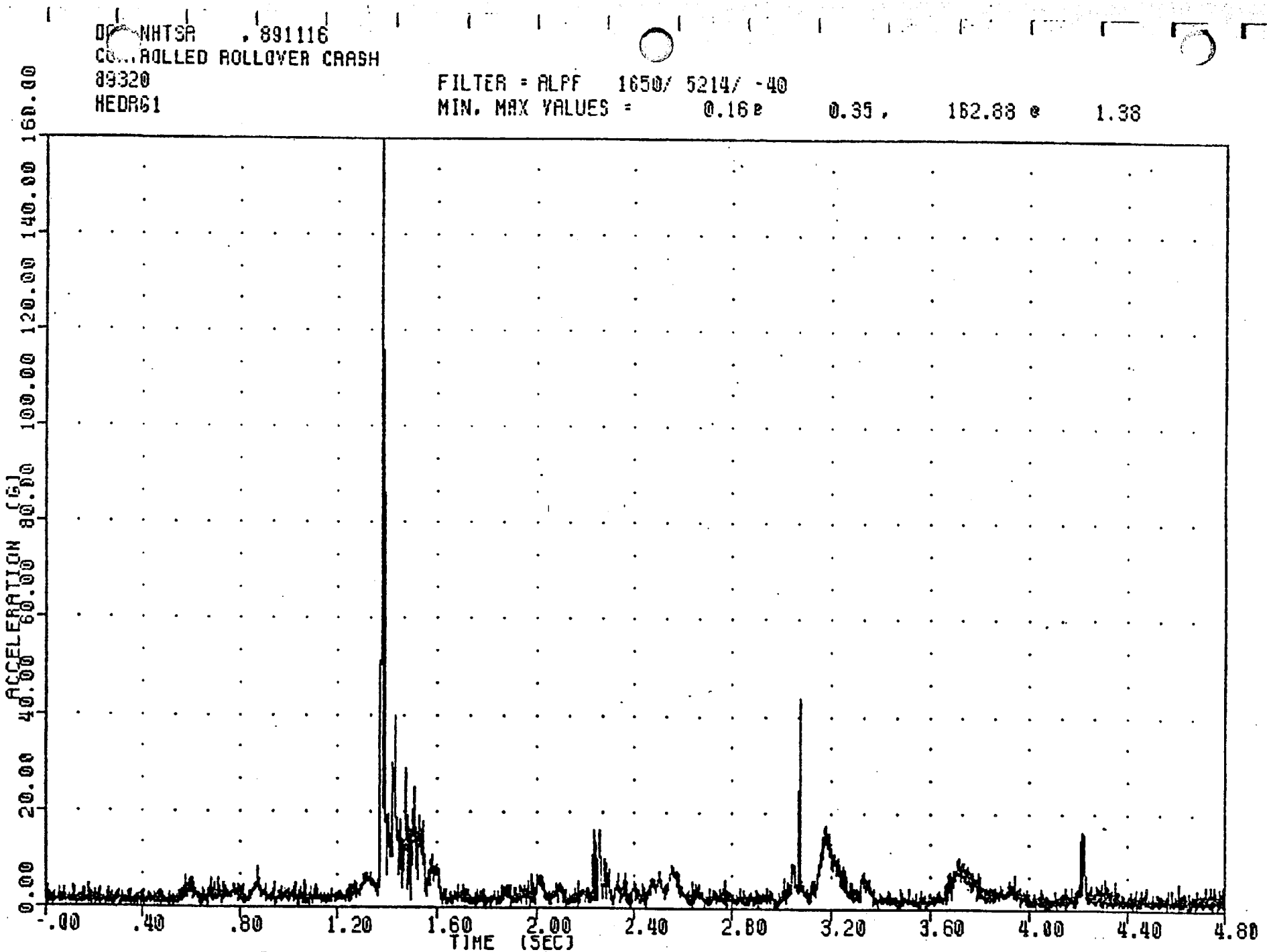
DRIVER HEAD X AXIS ACCELERATION



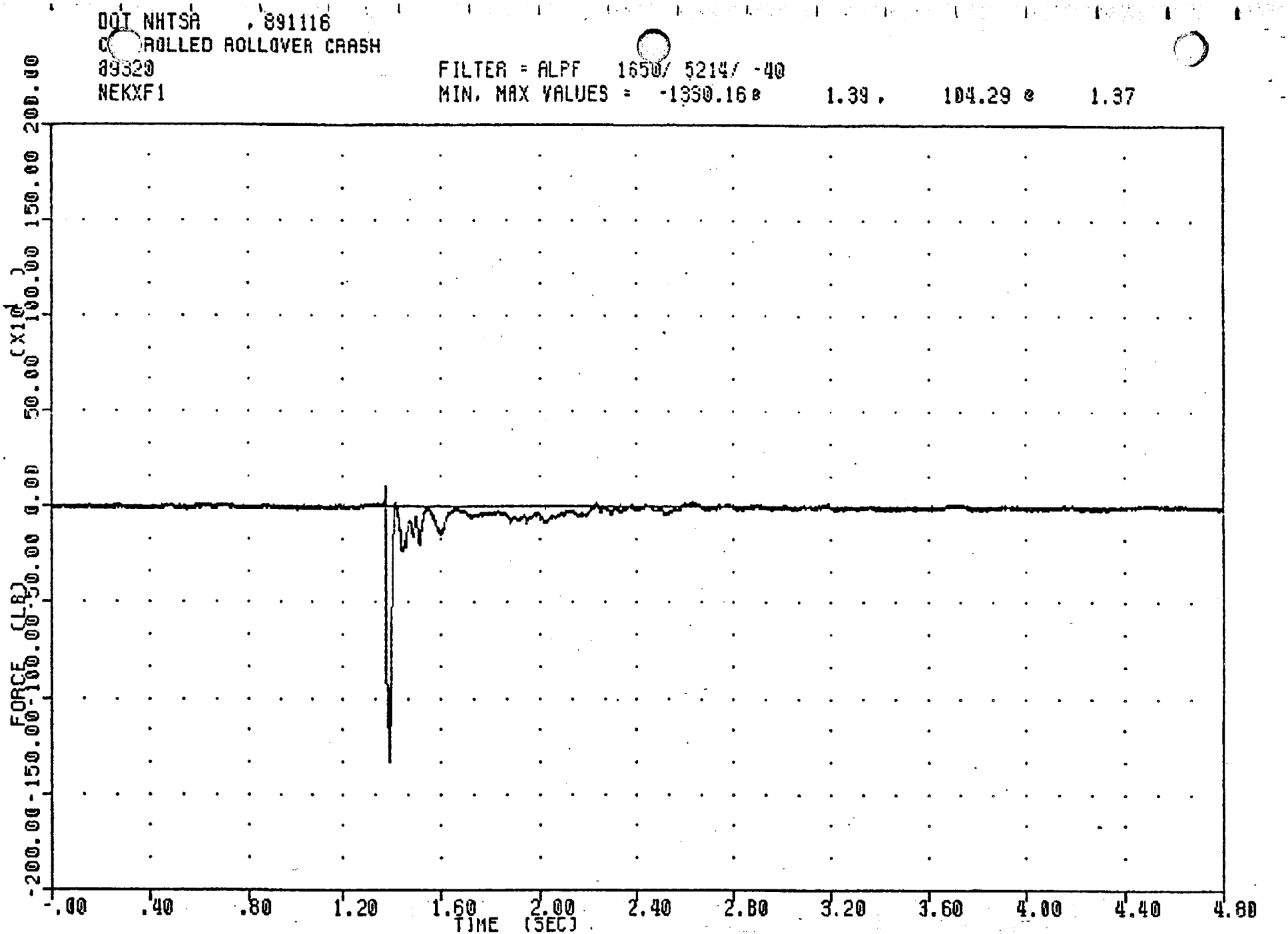
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER HEAD Y AXIS ACCELERATION



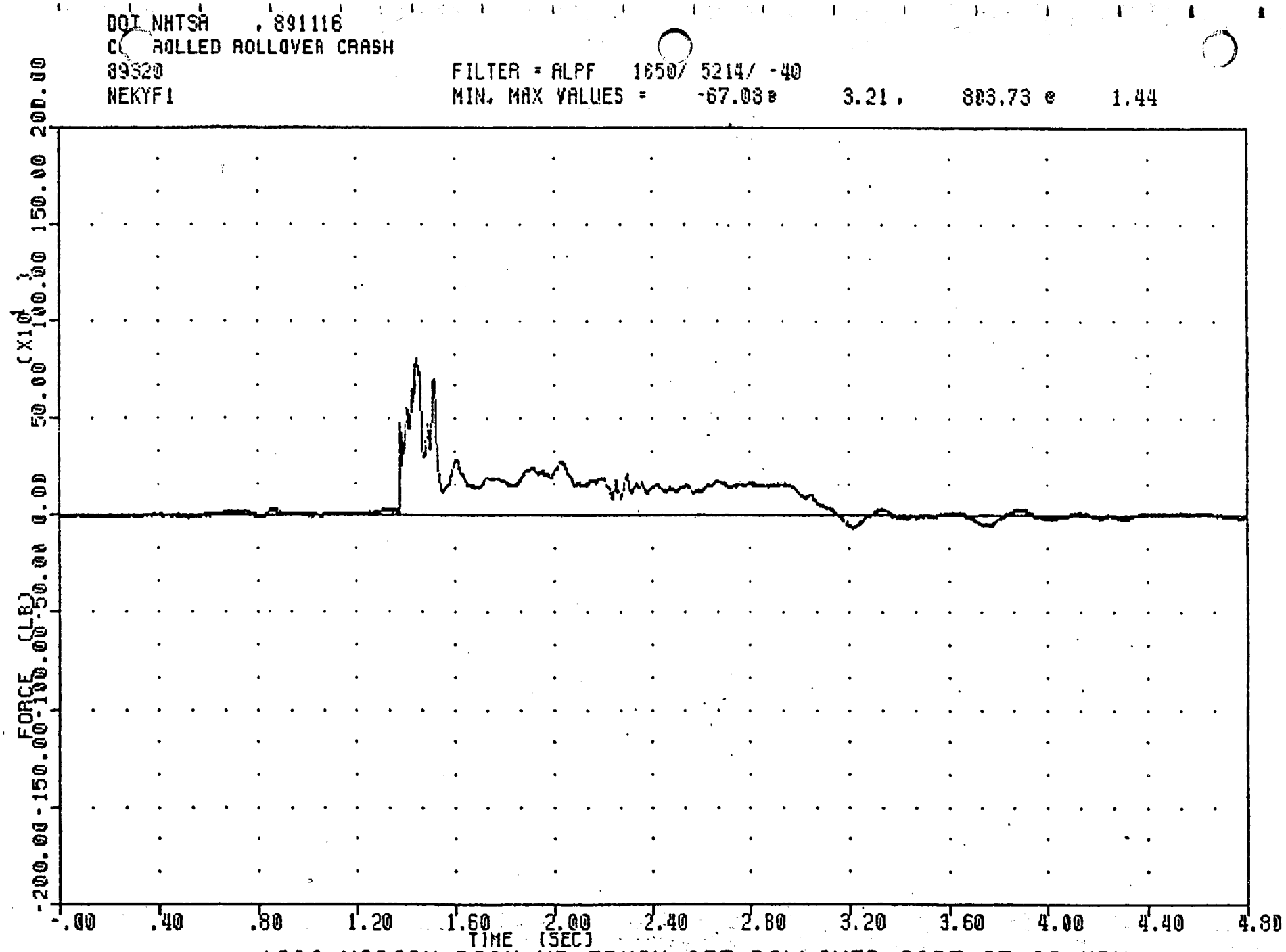
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER HEAD Z AXIS ACCELERATION



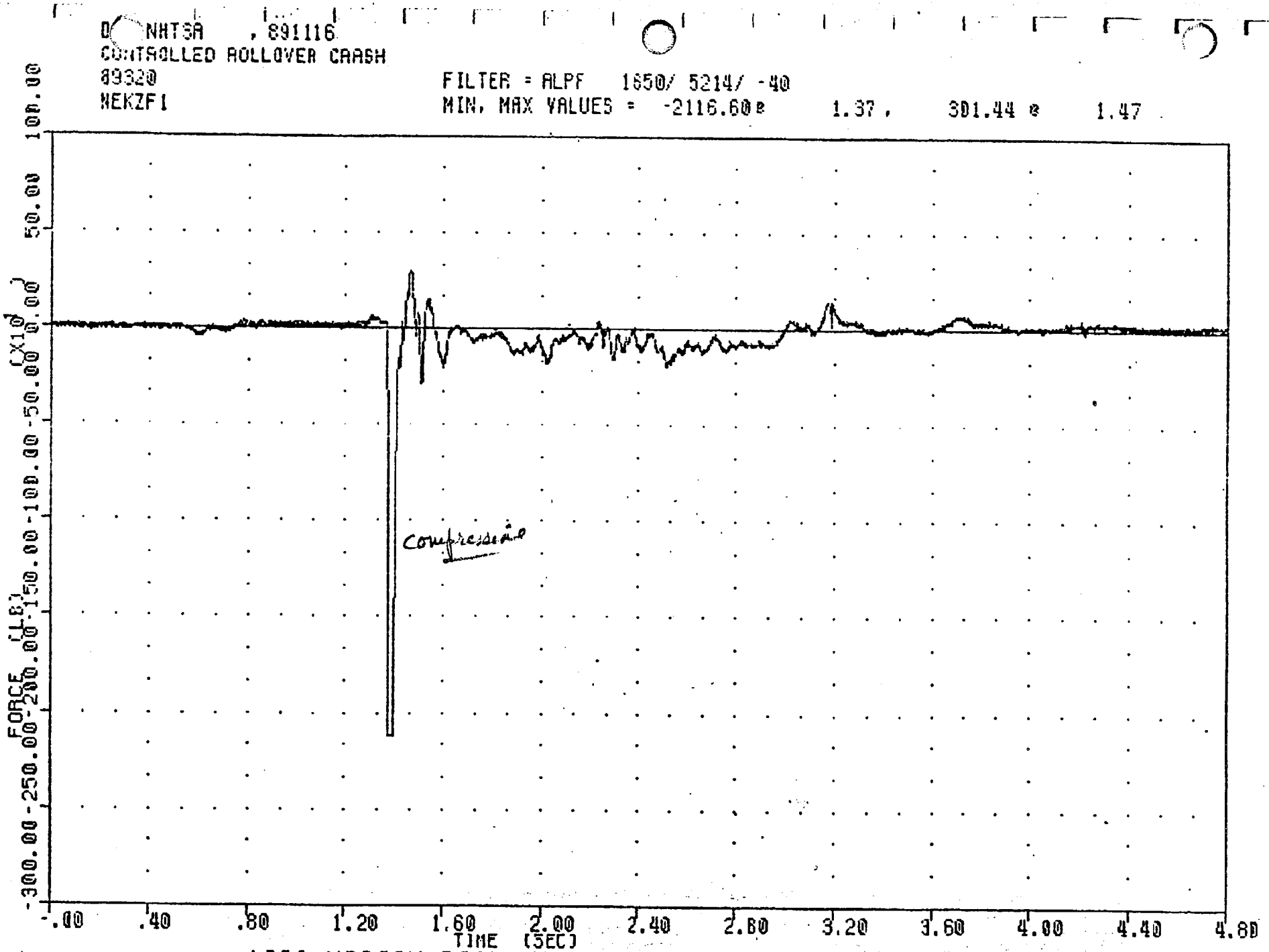
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER HEAD RESULTANT ACCELERATION



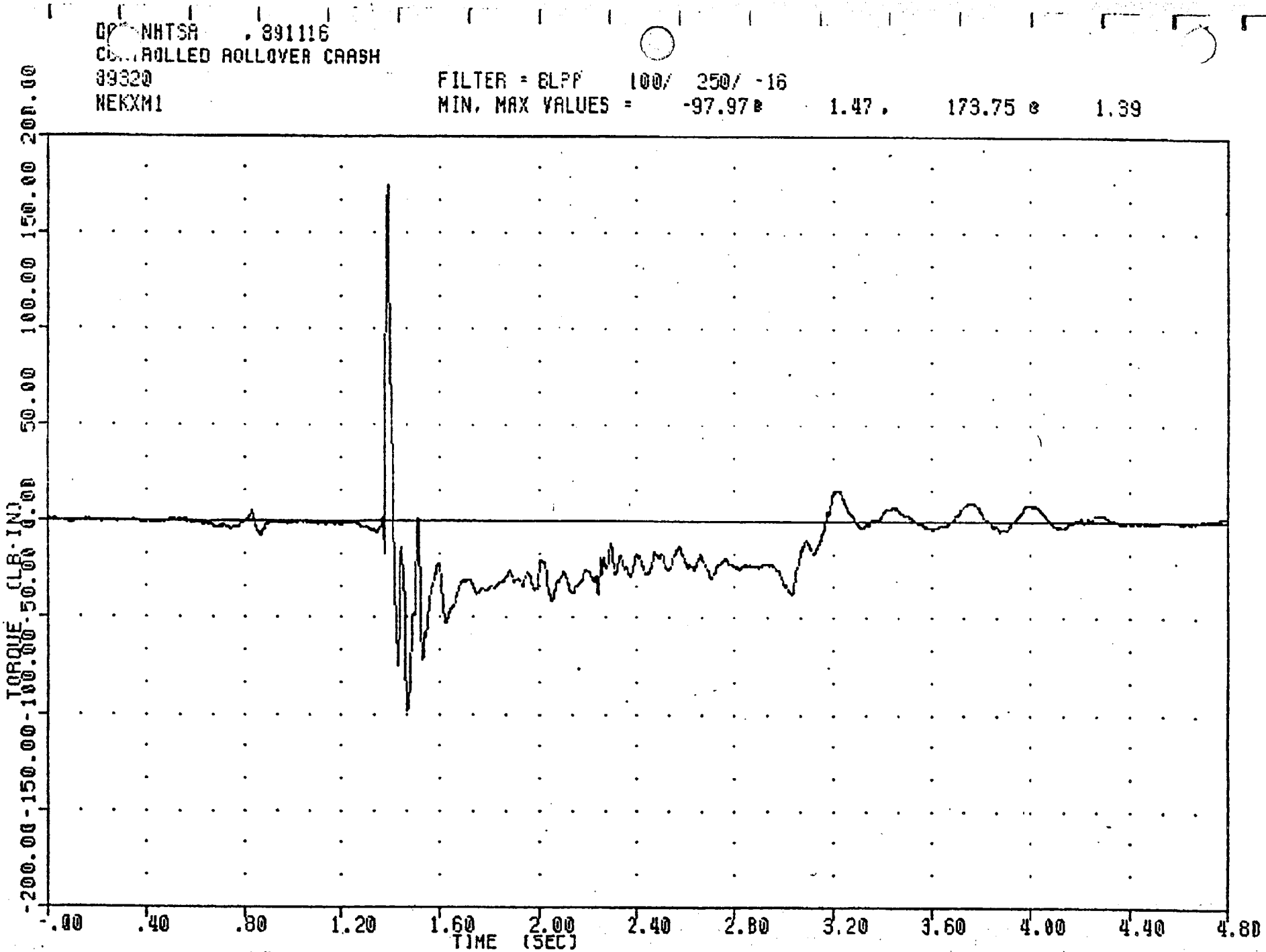
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER NECK SHEAR FORCE X AXIS



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER NECK SHEAR FORCE Y AXIS



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER NECK AXIAL FORCE Z AXIS



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER NECK MOMENT ABOUT X AXIS

TEST CONDITIONS

TEST NUMBER: 891116

DATE OF TEST: 11/16/89 TIME OF TEST: 1400

WIND VELOCITY: NA HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 32°F

TEMPERATURE IN OCCUPANT COMPARTMENT: 60°F

DRIVER DUMMY TEMPERATURE: 63°F

SUBJECT VEHICLE DATA

	ACTUAL	INTENDED
TEST WEIGHT (lbs.)	3154	3157
VEHICLE ORIENTATION (deg.) YAW*	270	270
VEHICLE ORIENTATION (deg.) ROLL**	30	30
VEHICLE VELOCITY (mph)	30	30

DUMMIES

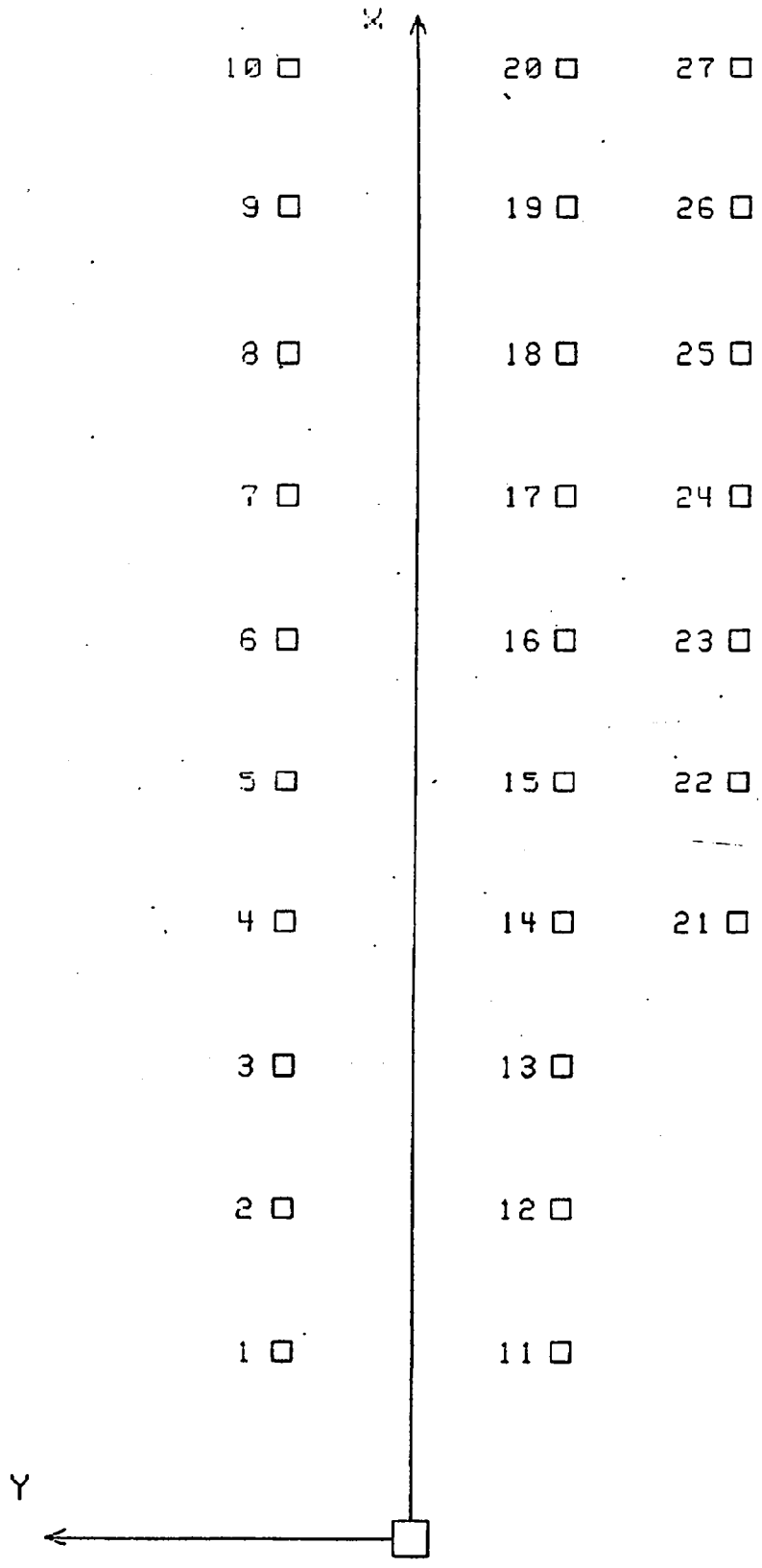
DRIVER

TYPE:	Part 572E
SERIAL NO.:	245
INSTRUMENTATION:	
HEAD ACCEL.:	3
NECK L.C.'C.:	6
CHEST ACCEL.:	3
PELVIS ACCEL.:	3
CHEST DISPLACEMENT POTENTIOMETER:	1
RESTRAINT SYSTEM:	3-point unibelt

REMARKS:

*AS MEASURED CLOCKWISE FROM THE DIRECTION OF TRAVEL.

**AS MEASURED FROM THE HORIZONTAL.



STADIA POLE LAYOUT AND NUMBERING SYSTEM

STADIA POLE LOCATIONS

POLE NO.	X DISTANCE, FT. *	Y DISTANCE, FT. *
1	34.0	8.0
2	42.0	8.0
3	50.0	8.0
4	58.0	8.0
5	66.0	8.0
6	74.0	8.0
7	82.0	8.0
8	90.0	8.0
9	98.0	8.0
10	106.0	8.0
11	34.0	-8.0
12	42.0	-8.0
13	50.0	-8.0
14	58.0	-8.0
15	66.0	-8.0
16	74.0	-8.0
17	82.0	-8.0
18	90.0	-8.0
19	98.0	-8.0
20	106.0	-8.0
21	58.0	-18.0
22	66.0	-18.0
23	74.0	-18.0
24	82.0	-18.0
25	90.0	-18.0
26	98.0	-18.0
27	106.0	-18.0

*REFERENCE: +X: FORWARD FROM RELEASE BLOCK

+Y: LEFTWARD FROM CENTER RELEASE BLOCK

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Right panning	Kodak	16	24	Real Time
2	Left wide	Photosonic 1B	25	495	Vehicle Kinematics
3	Left wide (mid)	Photosonic 1B	13	495	Vehicle Kinematics
4	Left angle	Photosonic 1B	25	505	Vehicle Kinematics
5	Downstream	Photosonic 1B	50	502	Vehicle Kinematics
6	Onboard - floor	Photosonic 1B	8	501	Dummy Kinematics
7	Onboard - rear	Photosonic 1B	8	495	Dummy Kinematics
8	Documentary	Bealieu	12-120	24	Pre-test and Post-test Documentation

HIGH SPEED CAMERA INFORMATION

GROUND LEVEL

CAMERA NO.	X* (ft.)	Y* (ft.)	Z* (ft.)
2	107.6	420.8	5.0
3	107.6	195.0	5.1
4	240.8	81.9	3.8
5	221.2	0.4	2.5

*Reference:

+X = Forward from release block

+Y = Leftward from center release block

+Z = Upward from ground level

ONBOARD

CAMERA NO.	X**(inch)	Y**(inch)	Z**(inch)
6	-3.5	14.2	10.5
7	-10.5	17.8	22.6

**Reference:

+X = Forward from dash panel

+Y = Leftward from the right door sill

+Z = Upward from the vehicle floor level

SECTION 4.0

OCCUPANT INFORMATION

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #245	PASSENGER #NA
Head	Roof	NA
Chest	Head	NA
Abdomen	None	NA
Left knee	Left door padding and steering wheel	NA
Right knee	Steering wheel	NA

DOOR OPENING:

	LEFT	RIGHT
Front	Easy	Easy
Rear	NA	NA

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	None	None
Rear	NA	NA

GLAZING DAMAGE:

The entire windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

The entire rear glass and left and right front door glasses were shattered upon impact.

DUMMY KINEMATIC SUMMARY

Driver Dummy

Upon the vehicle's impact with the ground, the driver dummy's head struck the roof continuously. As the vehicle rolled onto its roof, the dummy's head remained in contact with the roof and the dummy's upper torso remained near the left door. The vehicle came to rest on its tires after one full roll, with the driver dummy's head resting against the roof. The dummy was restrained with three-point unibelt.

DUMMY DATA SUMMARY

TEST NUMBER 891116

DRIVER DUMMY
SN: 192

	POSITIVE DIRECTION MAX	SEC	NEGATIVE DIRECTION MAX	SEC
HEAD ACCELERATION (g)				
LONGITUDINAL	80.0	1.4	81.2	1.4
LATERAL.	58.1	1.4	38.9	1.4
VERTICAL	78.6	1.4	142.5	1.4
RESULTANT	162.9	1.4		
HIC 36 MSEC	1049.3 FROM 1.369 TO 1.388			
NECK FORCES (lbs)				
LONGITUDINAL	104.3	1.4	1330.2	1.4
LATERAL	803.7	1.4	67.1	3.2
VERTICAL	301.4	1.5	2116.6	1.4
NECK MOMENT (in-lbs)				
ABOUT LONG.	173.8	1.4	98.0	1.5
ABOUT LATERAL	17.0	1.5	229.8	1.4
ABOUT VERTICAL	42.8	1.5	69.5	1.4
CHEST ACCELERATION (g)				
LONGITUDINAL	25.6	1.4	35.4	1.4
LATERAL	11.8	1.4	25.1	1.4
VERTICAL	10.5	1.4	90.3	1.4
RESULTANT	96.1	1.4		
3 MSEC	73.9 FROM 1.375 TO 1.378			
CHEST DISPLACEMENT (in)				
LONGITUDINAL	0.4	1.4	0.3	1.4
PELVIS ACCELERATION (g)				
LONGITUDINAL	21.0	1.4	26.4	1.4
LATERAL	10.7	3.1	13.4	1.5
VERTICAL	13.1	1.4	58.0	1.4
RESULTANT	60.0	1.4		

POSITIVE DIRECTION	
LONGITUDINAL:	FORWARD
LATERAL:	LEFTWARD
VERTICAL:	UPWARD
FORCE:	OUTWARD

NEGATIVE DIRECTION	
LONGITUDINAL:	REARWARD
LATERAL:	RIGHTWARD
VERTICAL:	DOWNWARD
FORCE:	INWARD

See APPENDIX D for neck load cell polarities.

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle and dummy were left inside the temperature controlled building eight hours prior to the time the dummy was loaded into the vehicle. After the vehicle had been positioned on the rollover device it was towed outside for launch.

One Part 572E dummy was instrumented for this test. The dummy instrumentation consisted of triaxial accelerometers in the head, chest, and pelvis, a displacement potentiometer in the chest, and six (6) load cells in the neck. Prior to seating the dummy, the driver's seat was positioned in the mid-adjustment notch of the seat track. The seat back angle was non-adjustable. The dummy was positioned in the seat using NHTSA's Notice #45 seating procedure. The H-point location of the seat was obtained by using the SAE J826 H-point machine as specified in the Notice #45. The driver dummy was restrained with three-point unibelt.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

MFR./MAKE/MODEL: Nissan/Pick-up Truck

SEAT TYPE: X Bench
____ Bucket
____ Split bench

ADJUSTER TYPE: X Manual
____ Power
____ Non-adjustable

BUCKET SEAT BACK TYPE: X Non-adjustable
____ Adjustable reclining

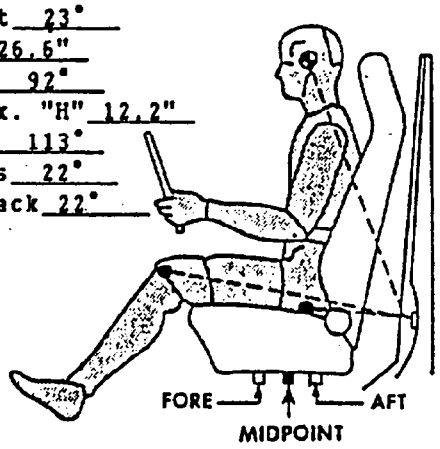
POSITIONING DATE: 11/15/89

AMBIENT TEMP. 32°F TIME: 1400

TECHNICIANS:
1. B. Miller
2. S. Ericksen
3. _____
4. _____

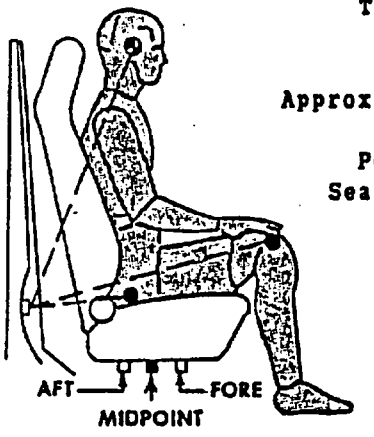
DRIVER DUMMY* # 245 TYPE: HIII

Head 20.1"
Target 23°
Knee 26.6"
Joint 92°
Approx. "H" 12.2"
Point 113°
Pelvis 22°
Seatback 22°

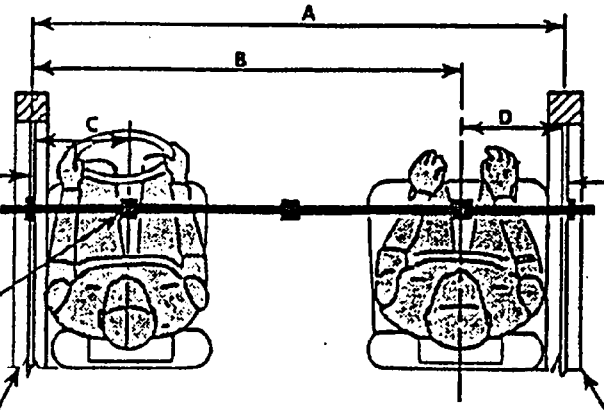


PASSENGER DUMMY* # NA TYPE: _____

Head _____
Target _____
Knee _____
Joint _____
Approx. "H" _____
Point _____
Pelvis _____
Seatback _____



A = 53.2"
B = NA
C = 13.0"
D = NA



DOOR GLASS HEIGHT = 9.5"

LATERAL BAR

ADJUSTABLE POINTER

DOOR GLASS HEIGHT = 9.5"

LEFT FRONT DOOR

DRIVER DUMMY

PASSENGER DUMMY

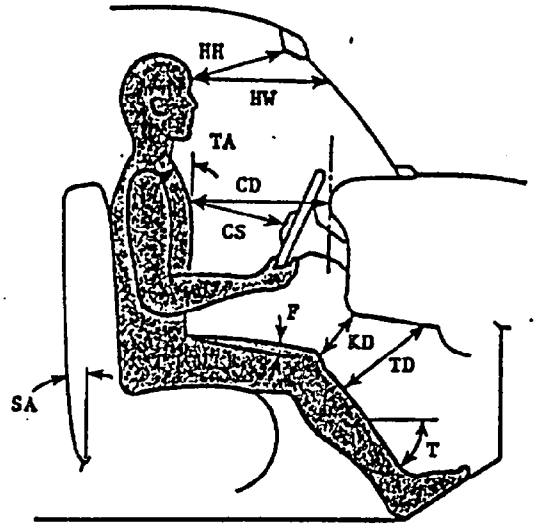
RIGHT FRONT DOOR

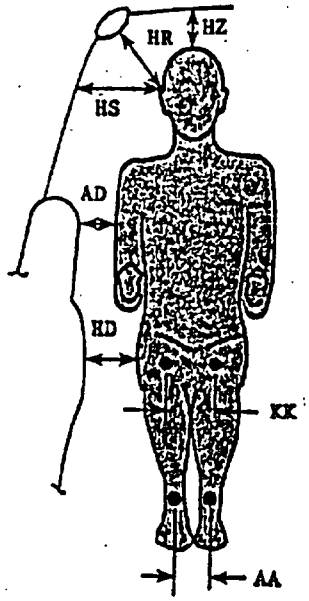
*Dummy measurements are referenced to top of striker bolt and all angles are referenced to vertical.

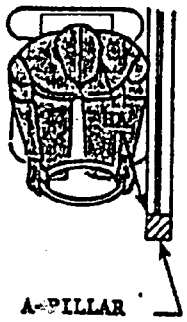
DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER	PASSENGER
HH	15.5	NA
HW	20.6	NA
CD	21.5	NA
CS	11.0	NA
KDL	5.2	NA
KDR	5.4	NA
TA	24°	NA
SA	22°	NA
HA	15.5	NA
FL	20°	NA
FR	22°	NA
TDL	4.2	NA
TDR	4.0	NA
TL	33°	NA
TR	36°	NA
HZ	4.5	NA
HR	8.4	NA
HS	10.2	NA
AD	3.8	NA
HD	5.2	NA
KK	8.8	NA
AA	8.5	NA

Knee outer clevis to outer clevis:
Driver = 10.6 Passenger = NA







HH = Head to Windshield Header
HW = Head to Windshield
CD = Chest to Dash
CS = Chest to Steering Wheel
KD = Knee to Dash
TA = Torso Angle
SA = Seat Back Angle
HA = Head to A-Pillar
FL = Femur Left
FR = Femur Right
TDL = Tibia Dash Left
TDR = Tibia Dash Right
TL = Tibia Left
TR = Tibia Right
HZ = Head to Roof
HR = Head to Side Roof
HS = Head to Side Window
AD = Arm to Door
HD = Hip to Door
KK = Knee to Knee
AA = Ankle to Ankle

Torso and seat back angles are relative to vertical.
Femur and tibia angles are relative to horizontal.
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

APPENDIX A

PHOTOGRAPHS

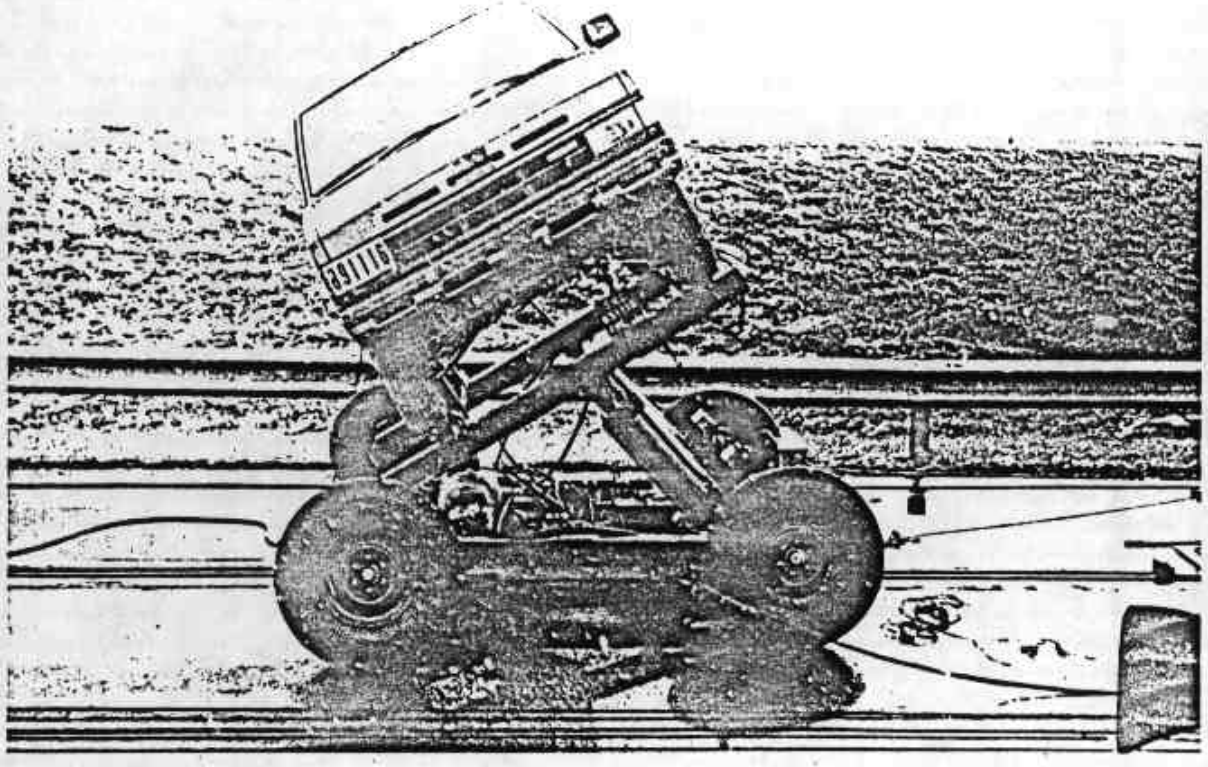


Figure A-1. PRE-TEST OVERALL FRONT VIEW

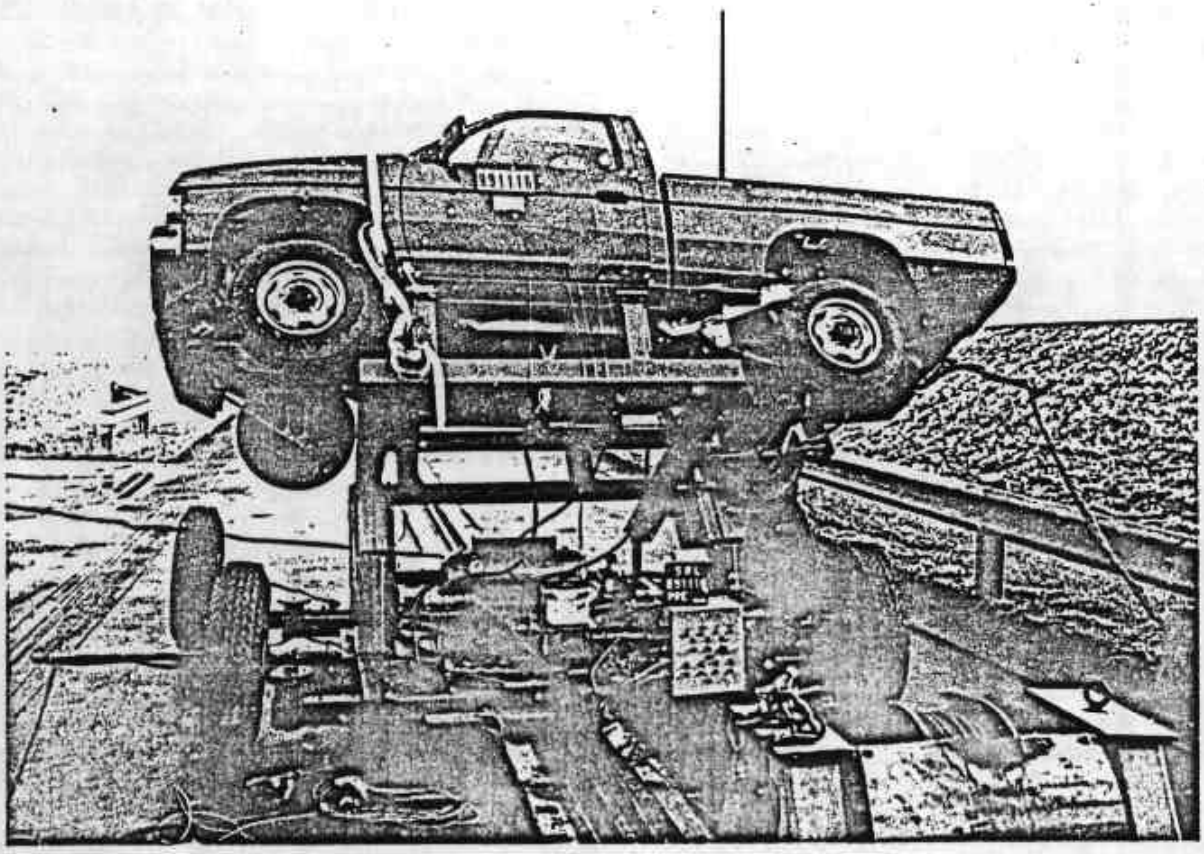


Figure A-2. PRE-TEST OVERALL LEFT VIEW

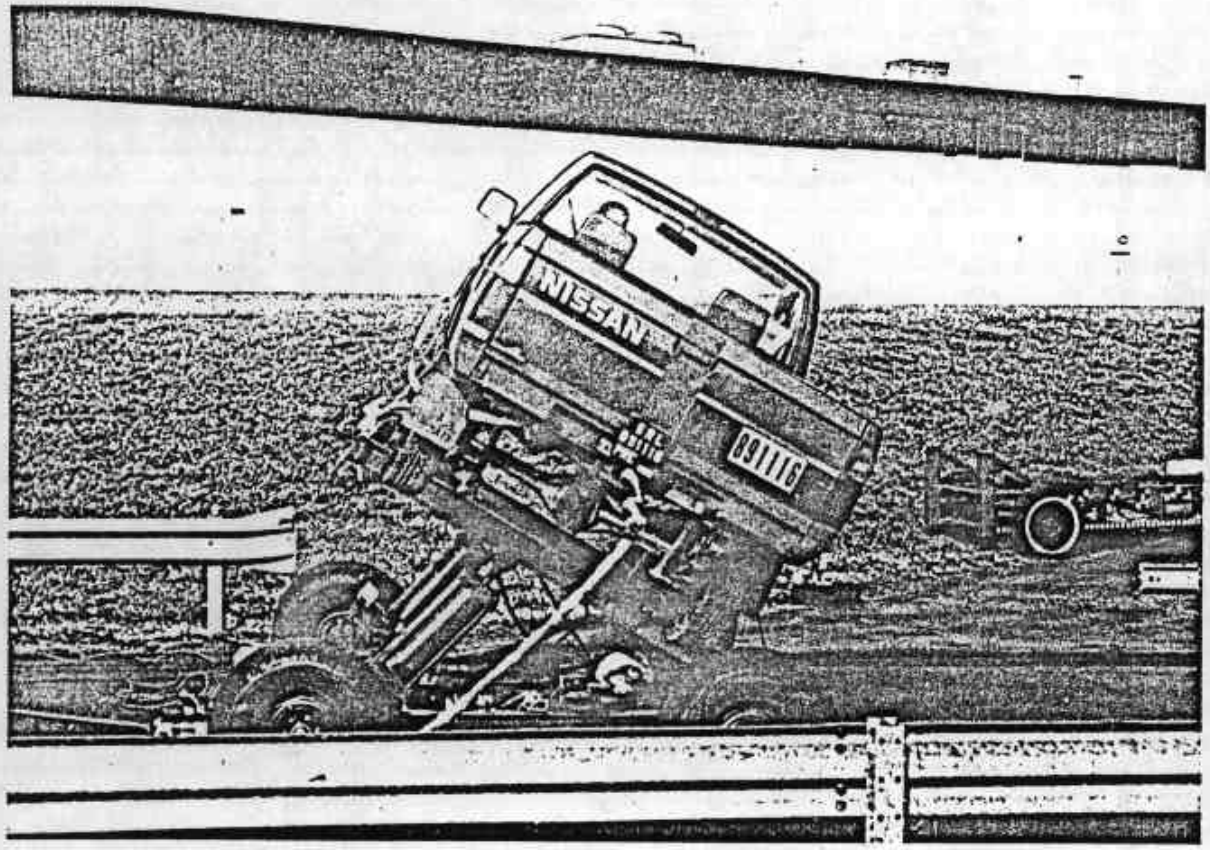


Figure A-3. PRE-TEST OVERALL REAR VIEW

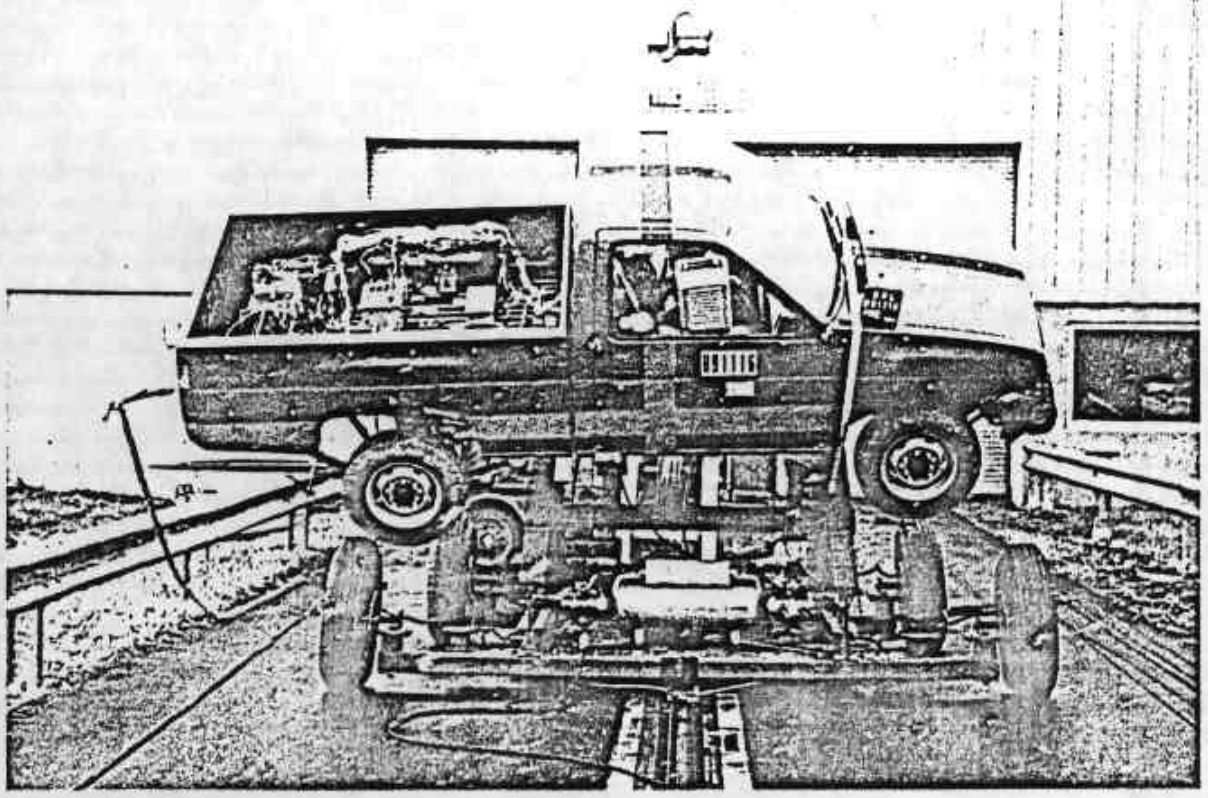


Figure A-4. PRE-TEST OVERALL RIGHT VIEW

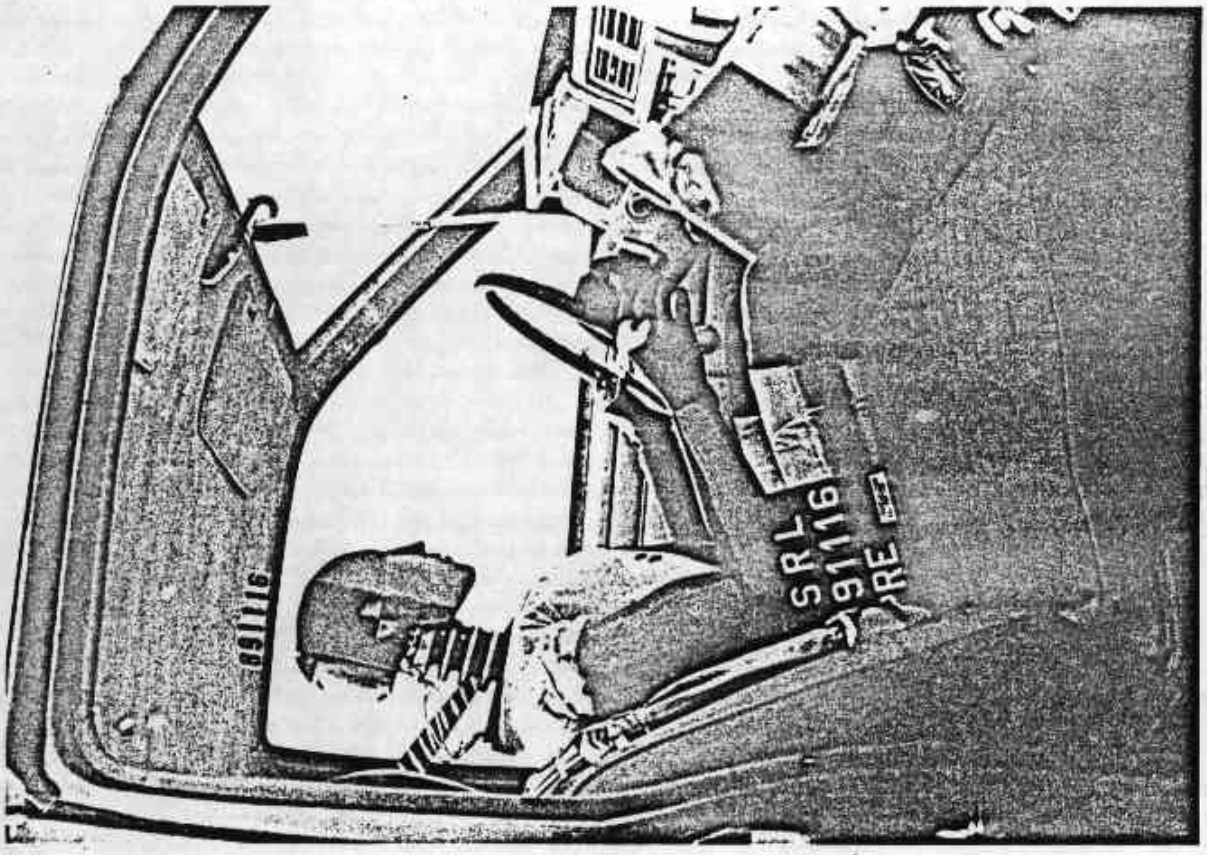


Figure A-5. PRE-TEST DRIVER DUMMY - VIEW 1

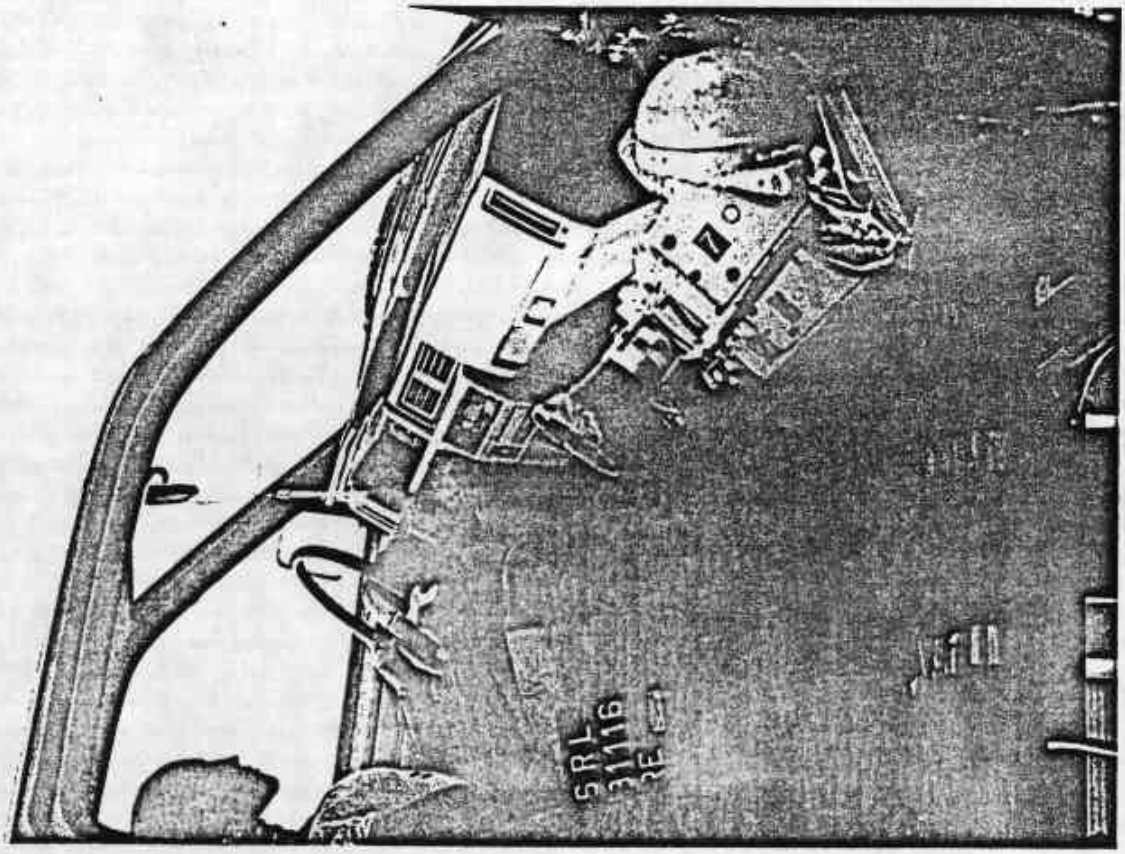


Figure A-6. PRE-TEST DRIVER DUMMY - VIEW 2

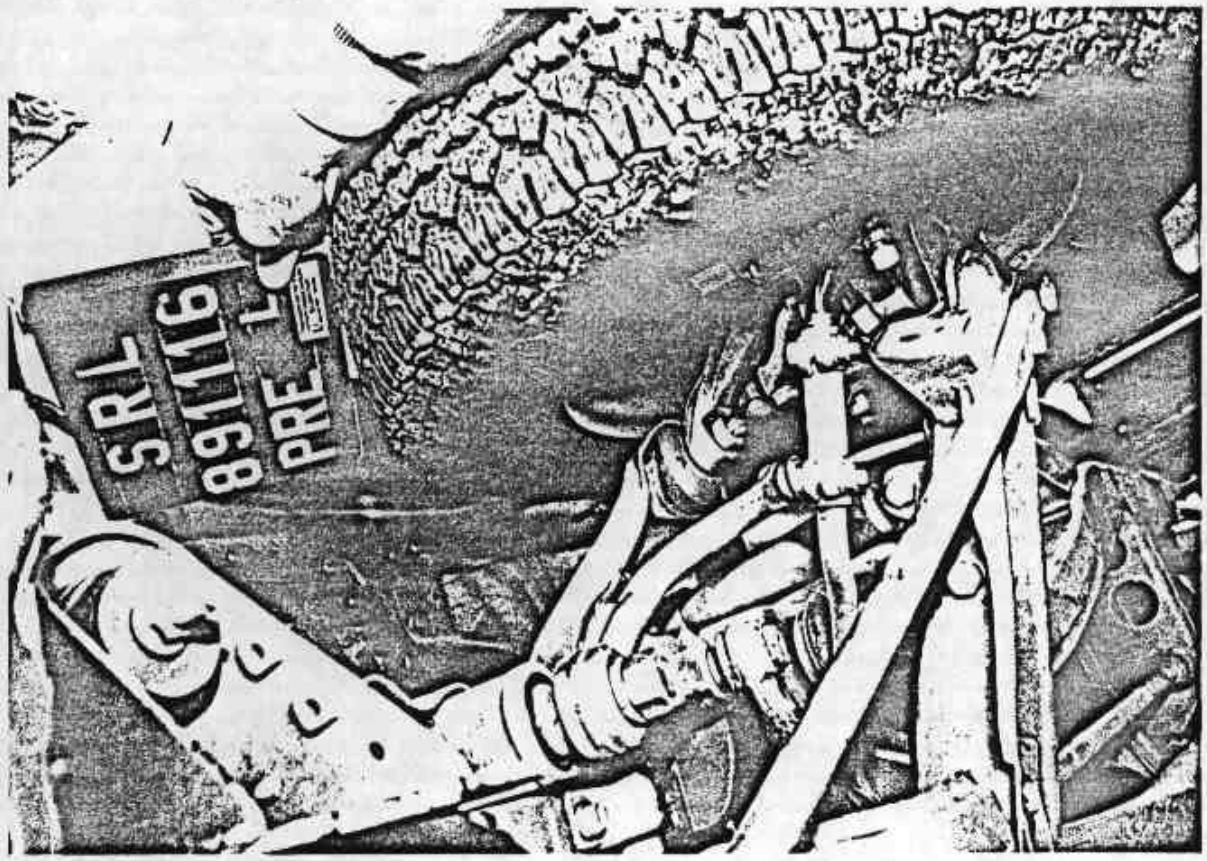


Figure A-7. PRE-TEST LEFT FRONT SUSPENSION STRING POTENTIOMETER VIEW

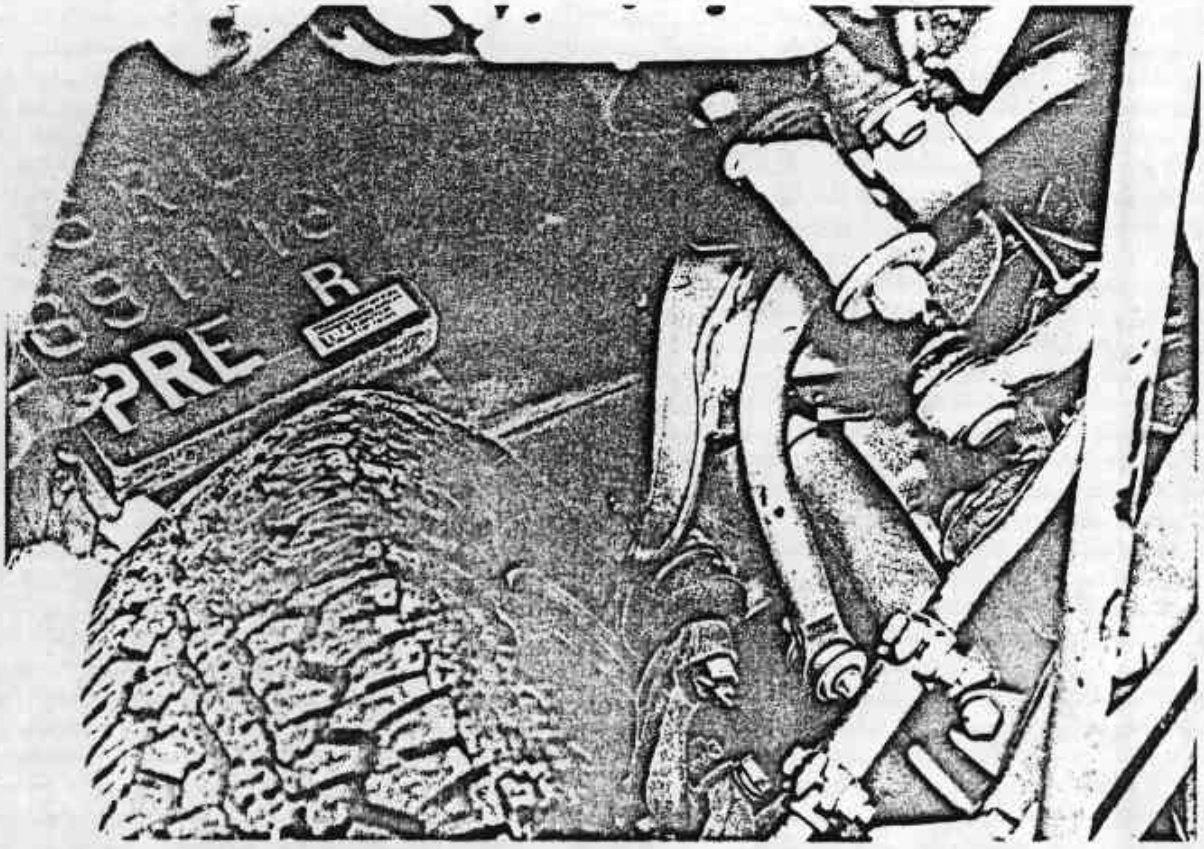


Figure A-8. PRE-TEST RIGHT FRONT SUSPENSION STRING POTENTIOMETER VIEW

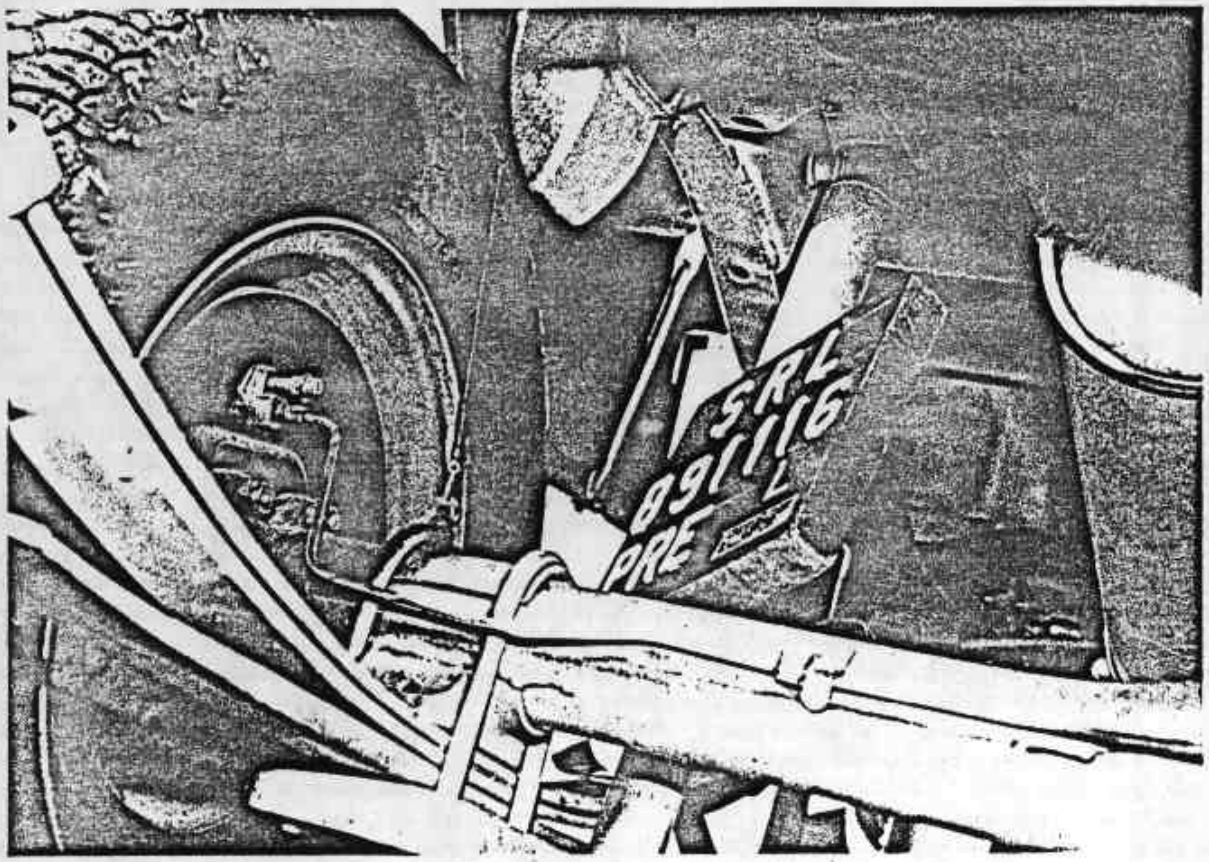


Figure A-9. PRE-TEST LEFT REAR SUSPENSION STRING POTENTIOMETER VIEW

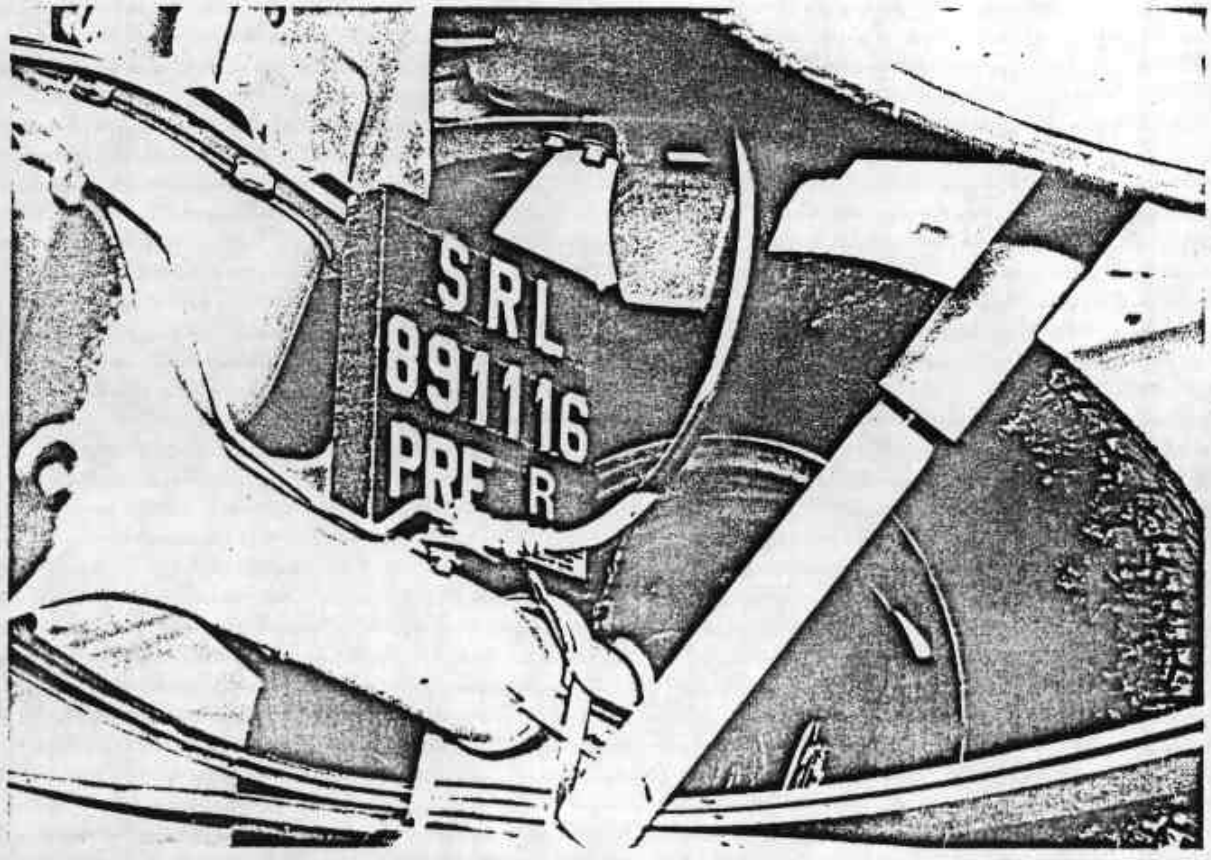
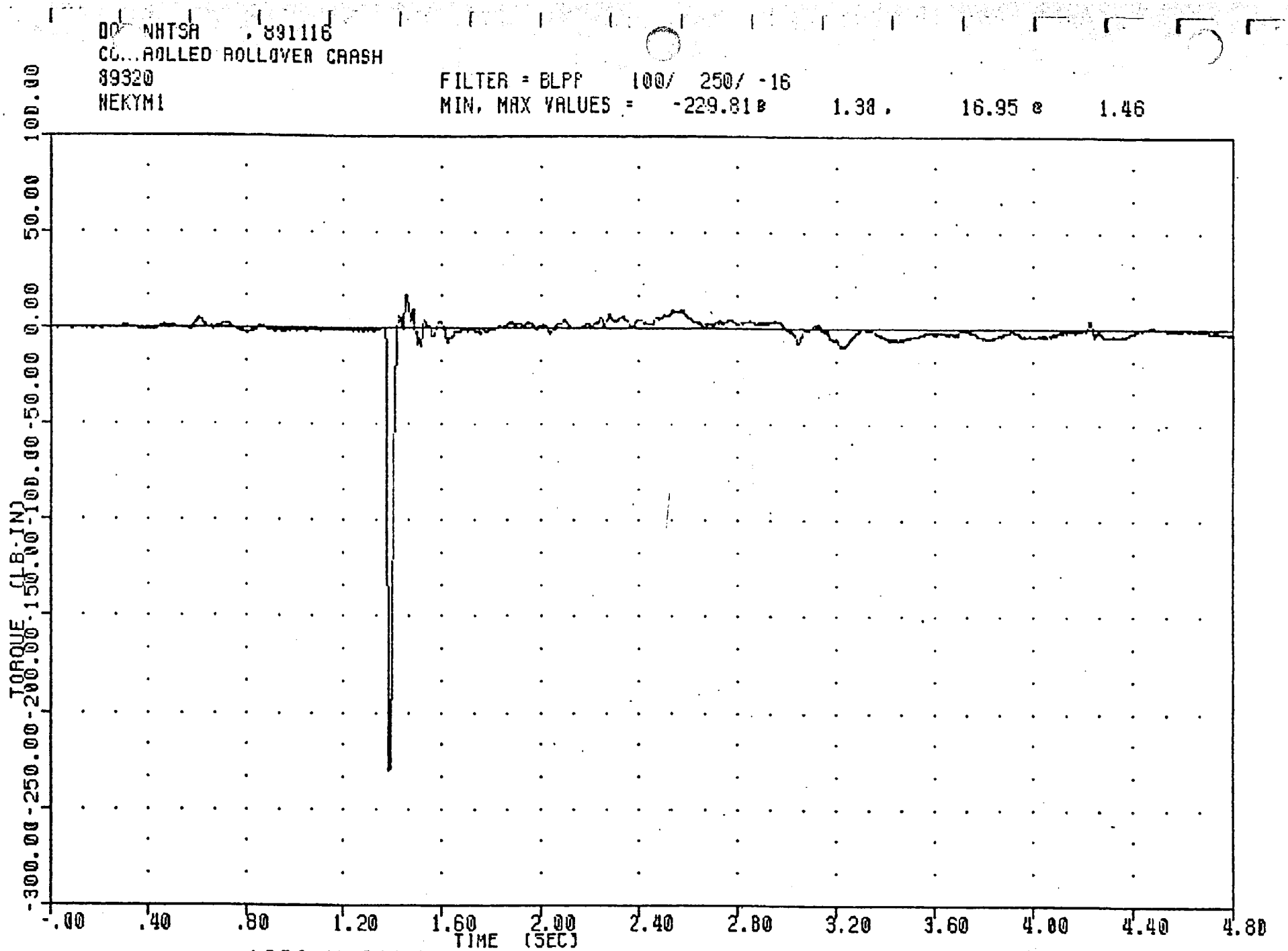
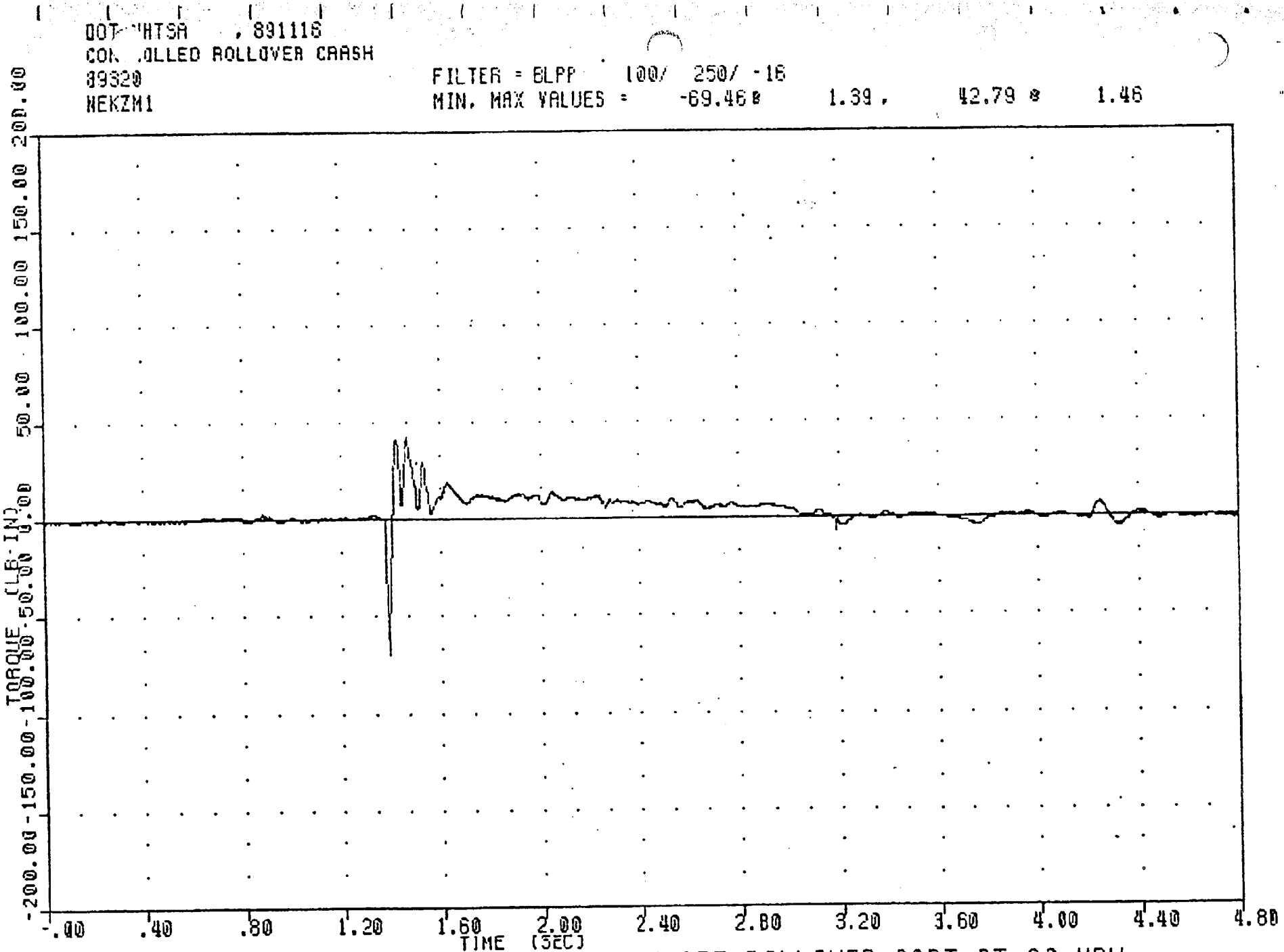


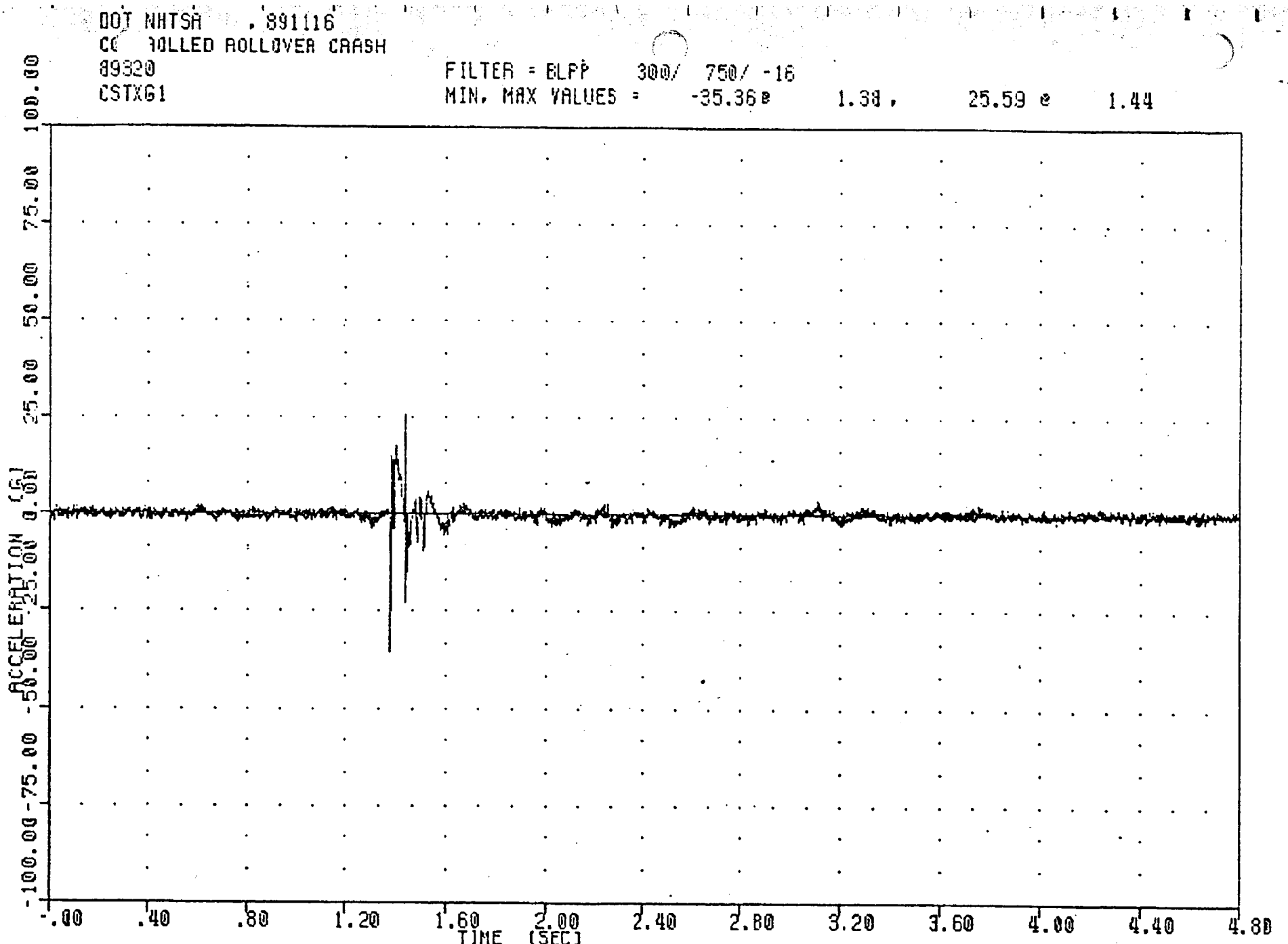
Figure A-10. PRE-TEST RIGHT REAR SUSPENSION STRING POTENTIOMETER VIEW



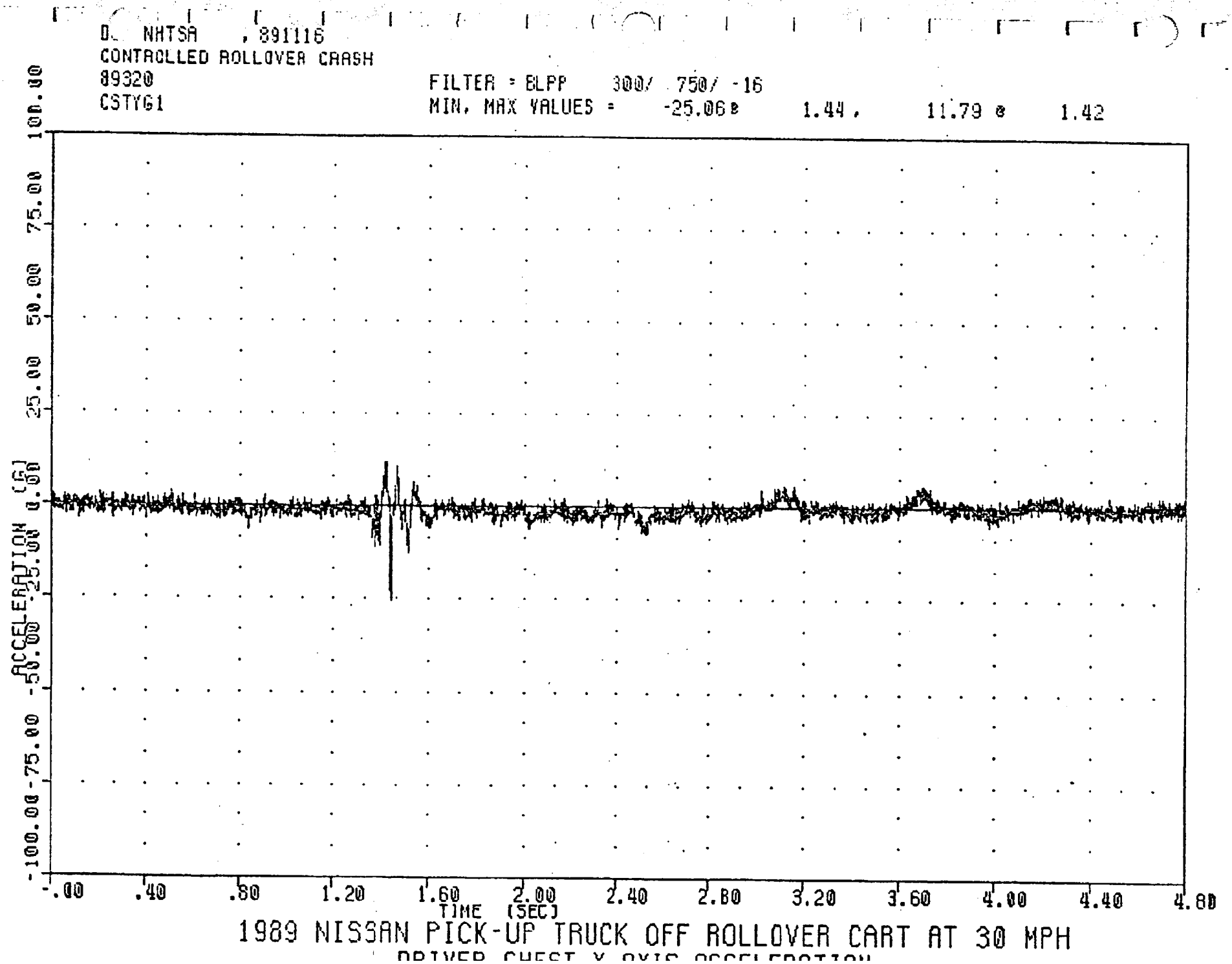
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER NECK MOMENT ABOUT Y AXIS



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER NECK MOMENT ABOUT Z AXIS

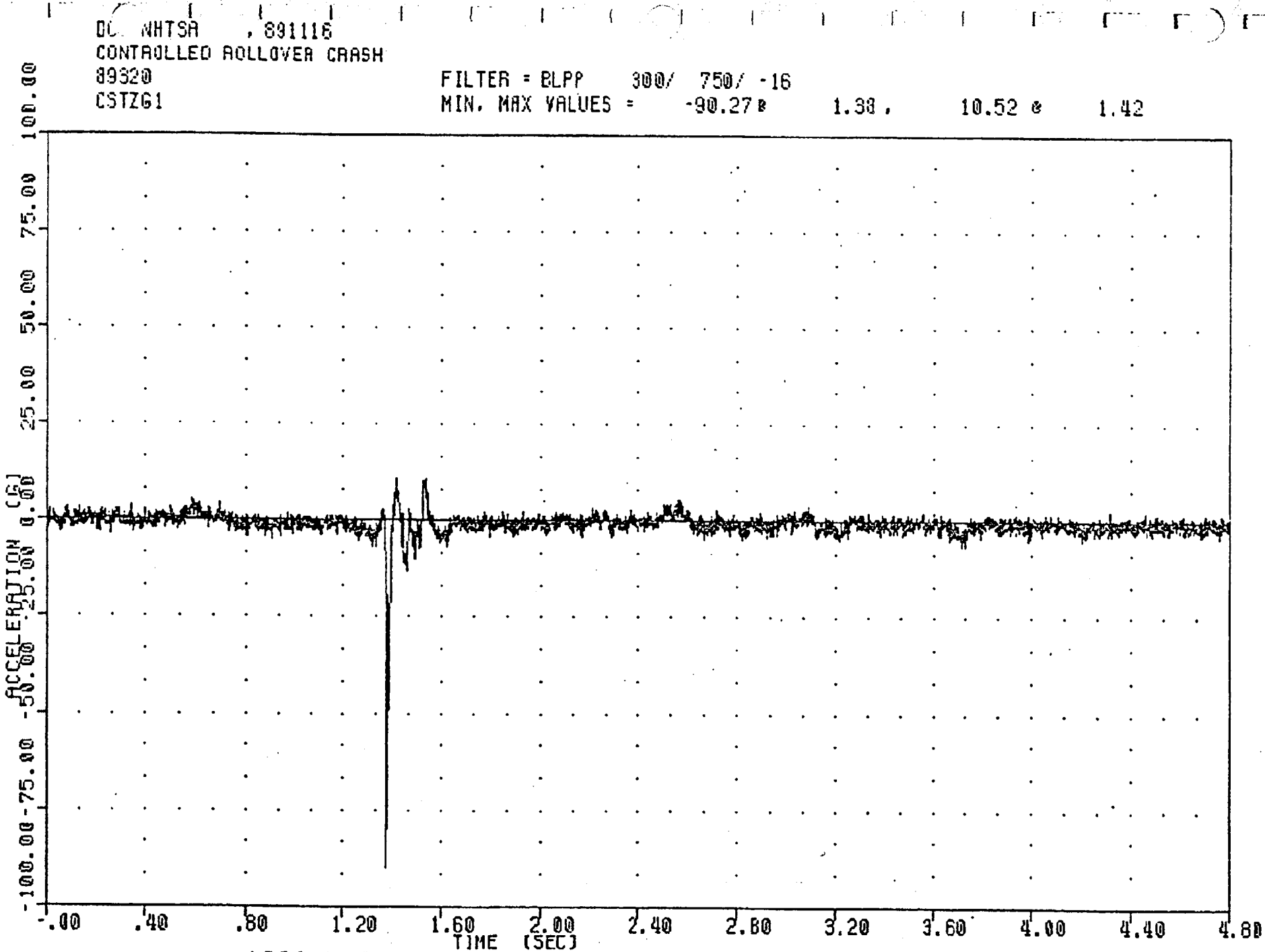


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER CHEST X AXIS ACCELERATION



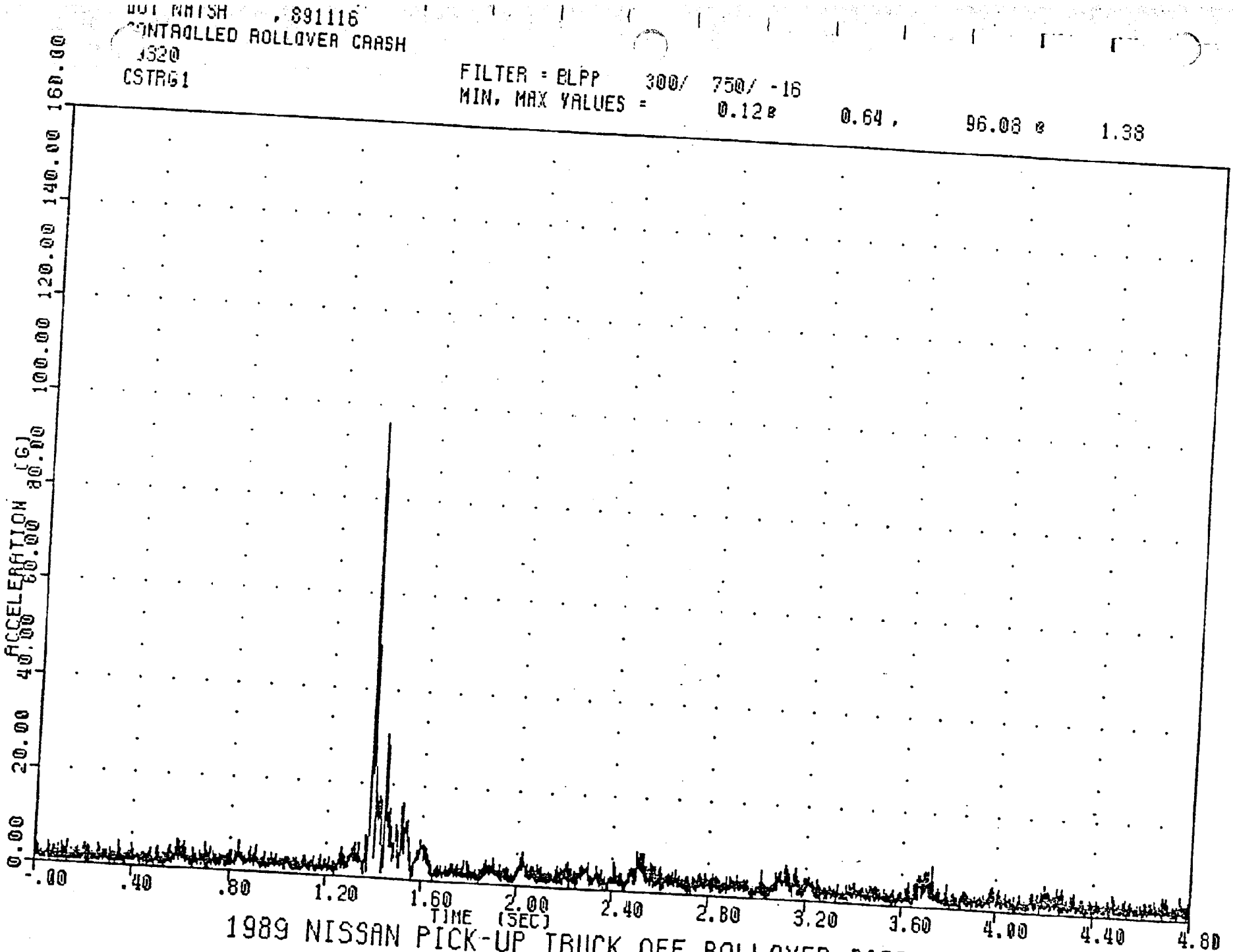
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

DRIVER CHEST X AXIS ACCELERATION

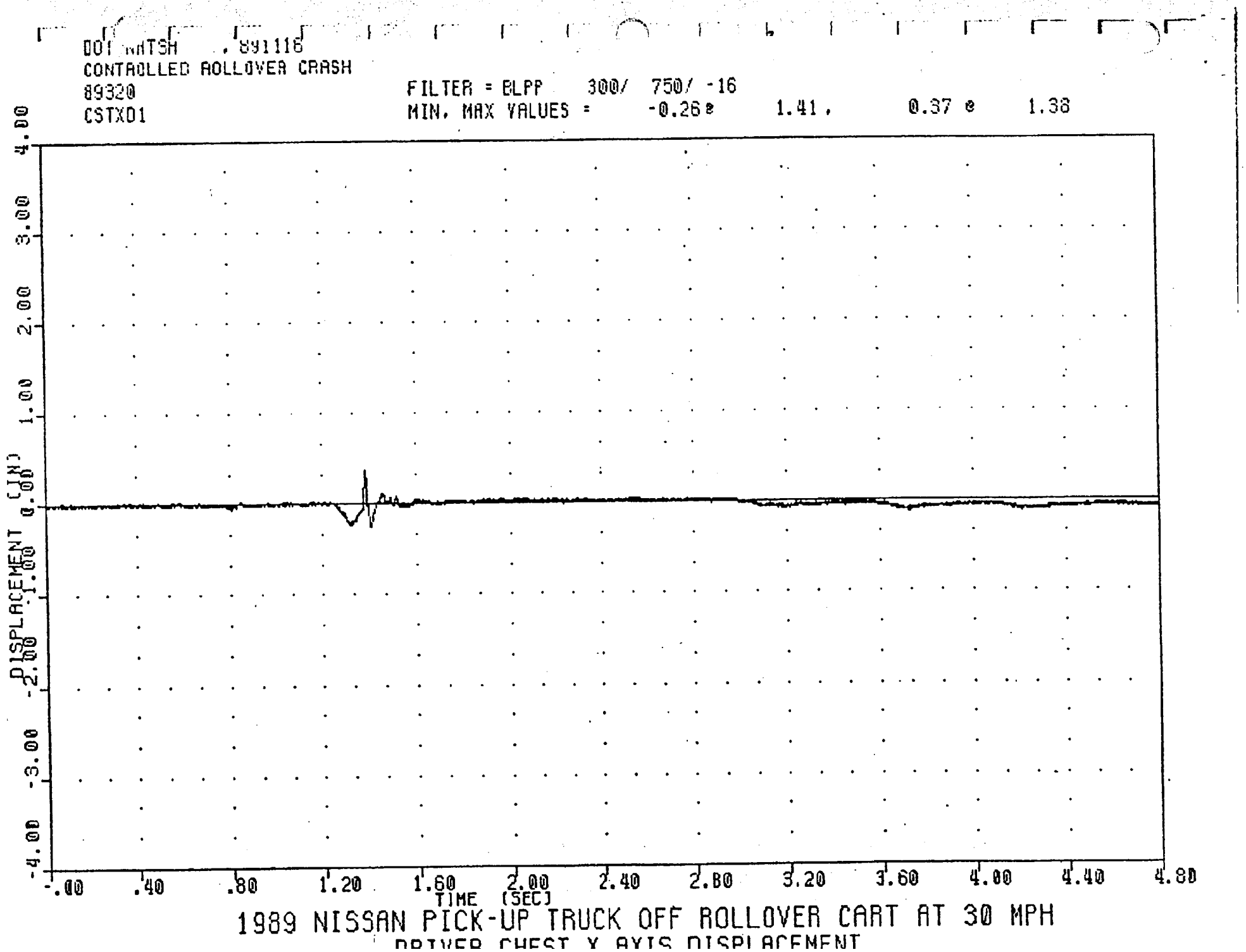


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

DRIVER CHEST Z AXIS ACCELERATION

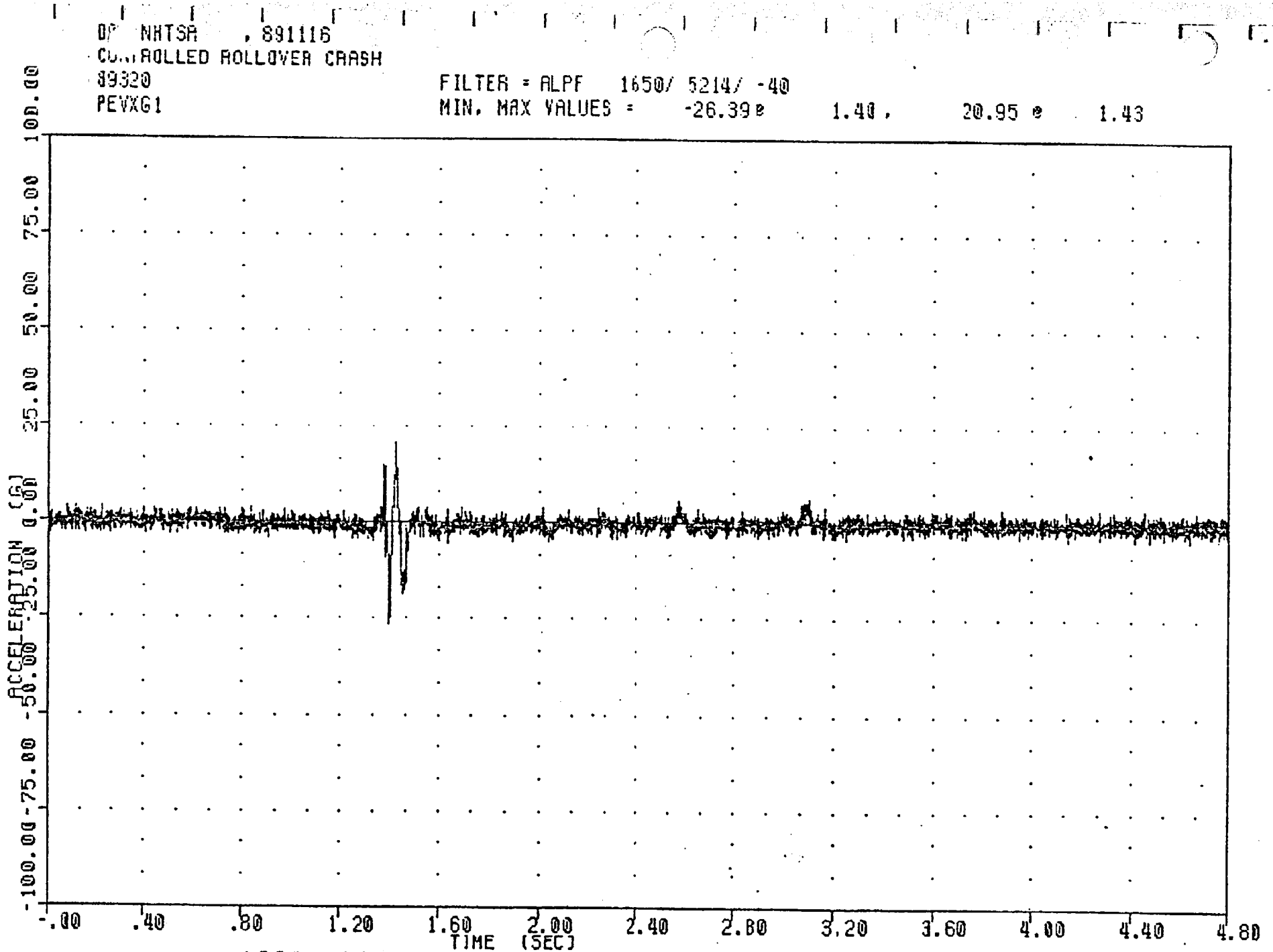


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER CHEST RESULTANT ACCELERATION

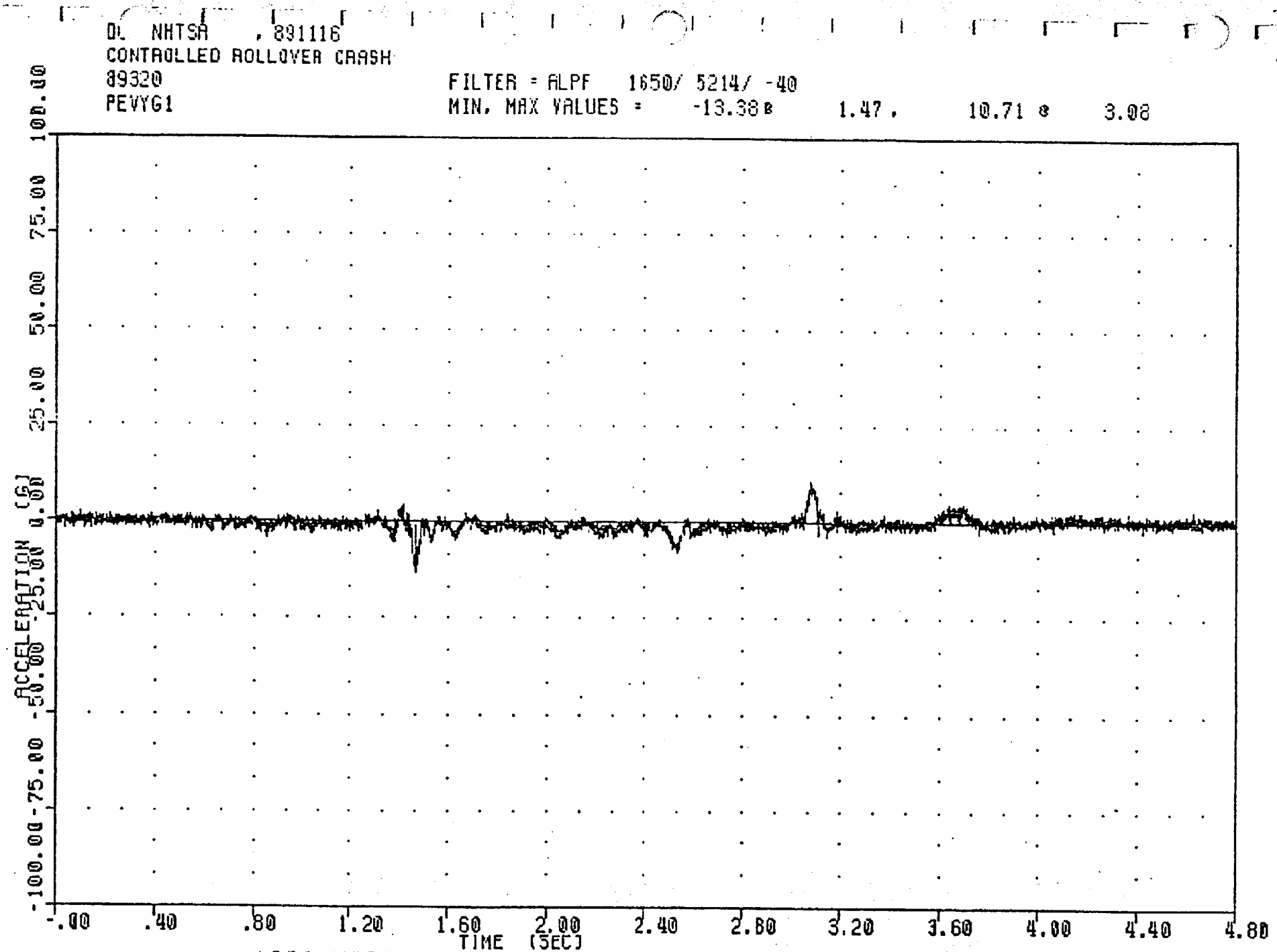


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

DRIVER CHEST Y AXIS DISPLACEMENT

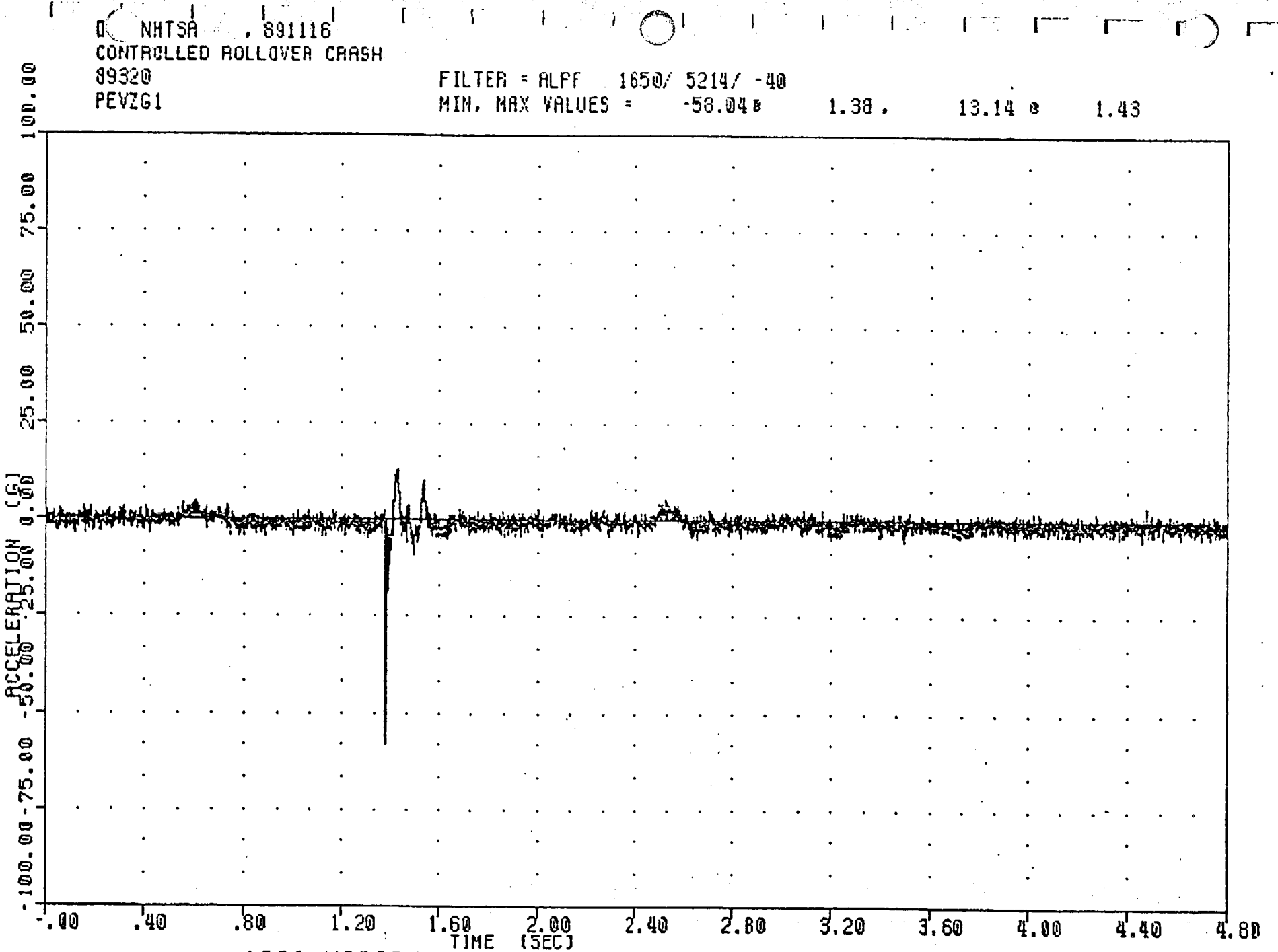


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
DRIVER PELVIS X AXIS ACCELERATION



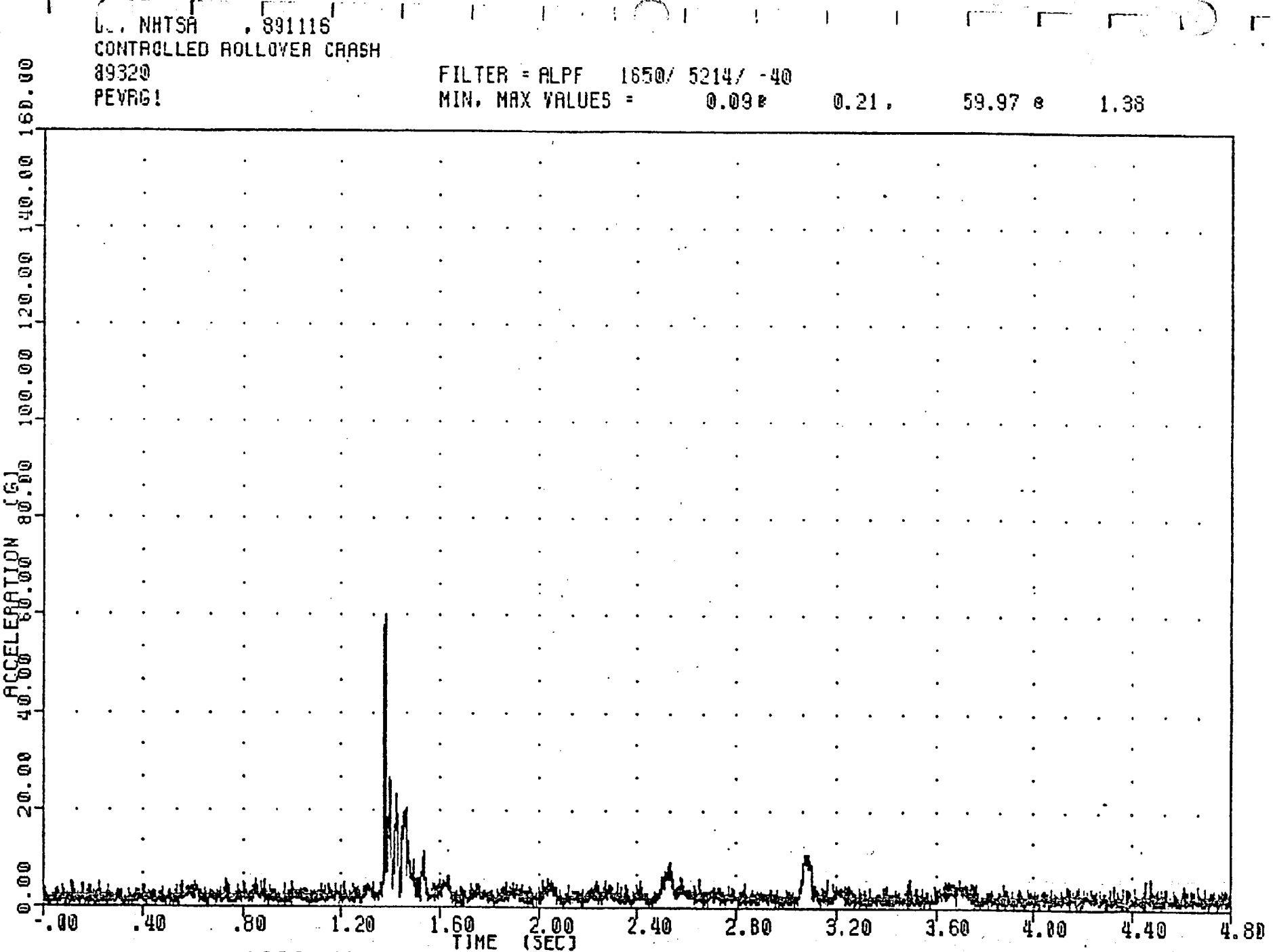
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

DRIVER PELVIS Y AXIS ACCELERATION



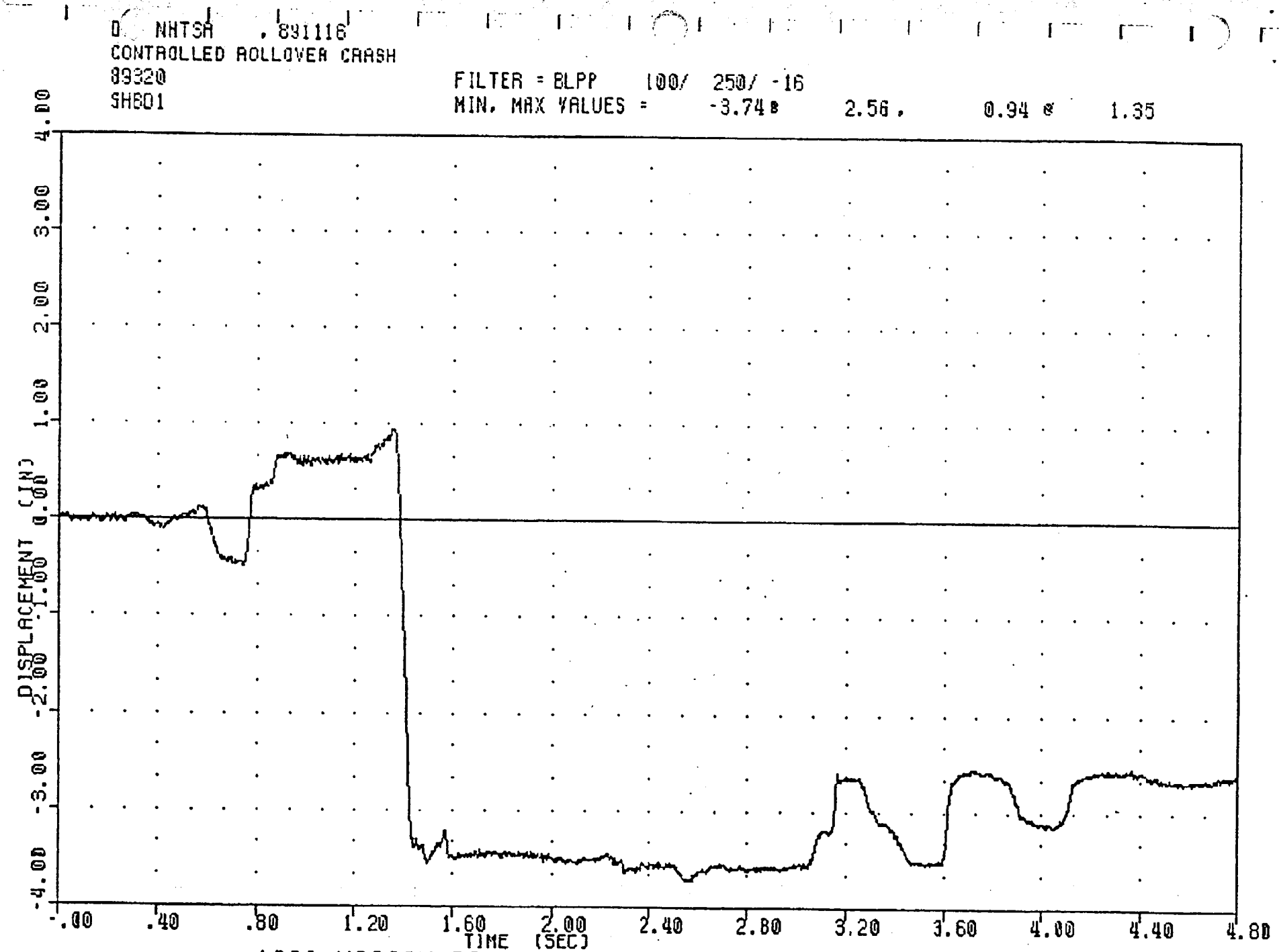
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

DRIVER PELVIS Z AXIS ACCELERATION



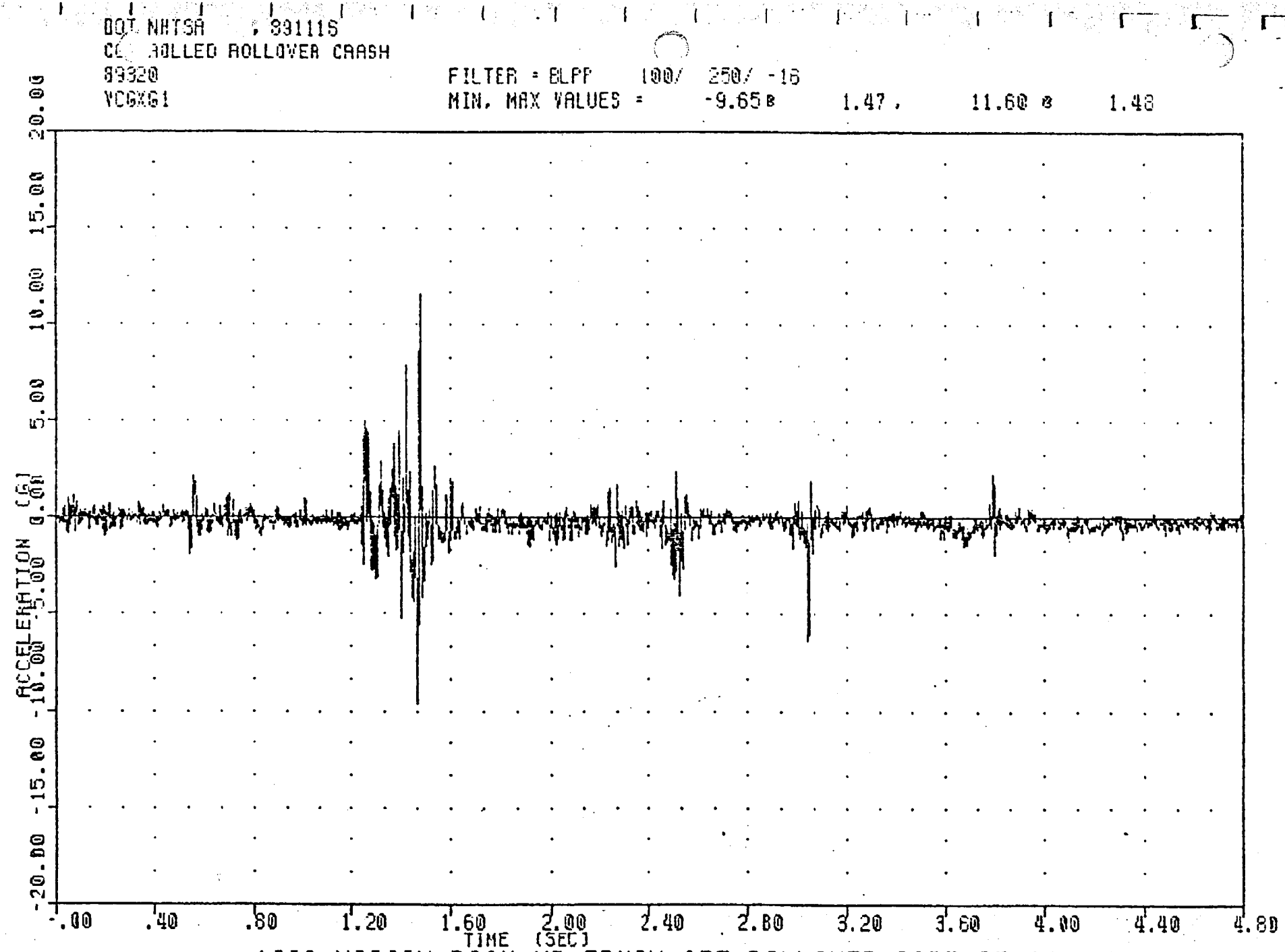
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

DRIVER PELVIS RESULTANT ACCELERATION

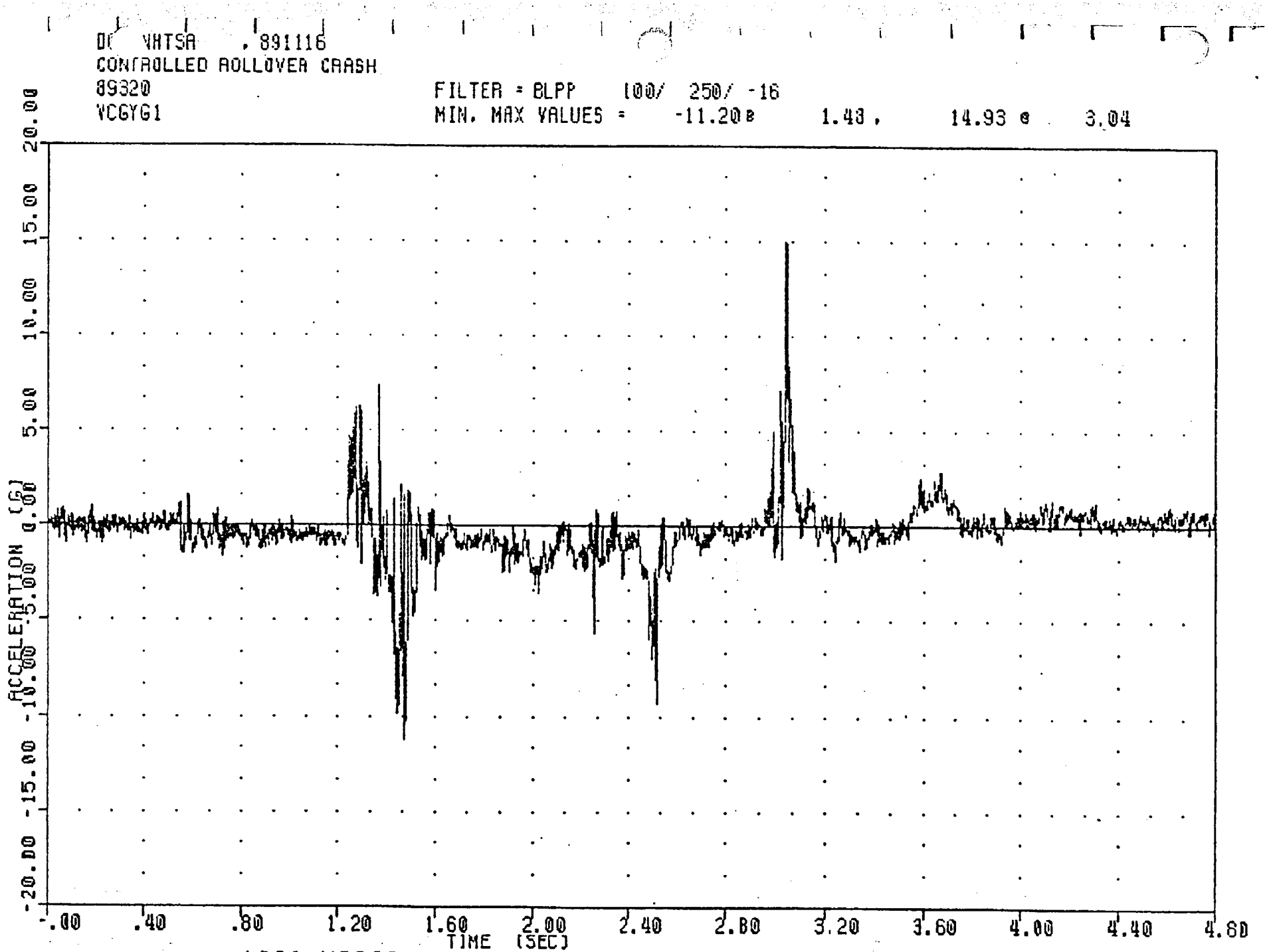


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

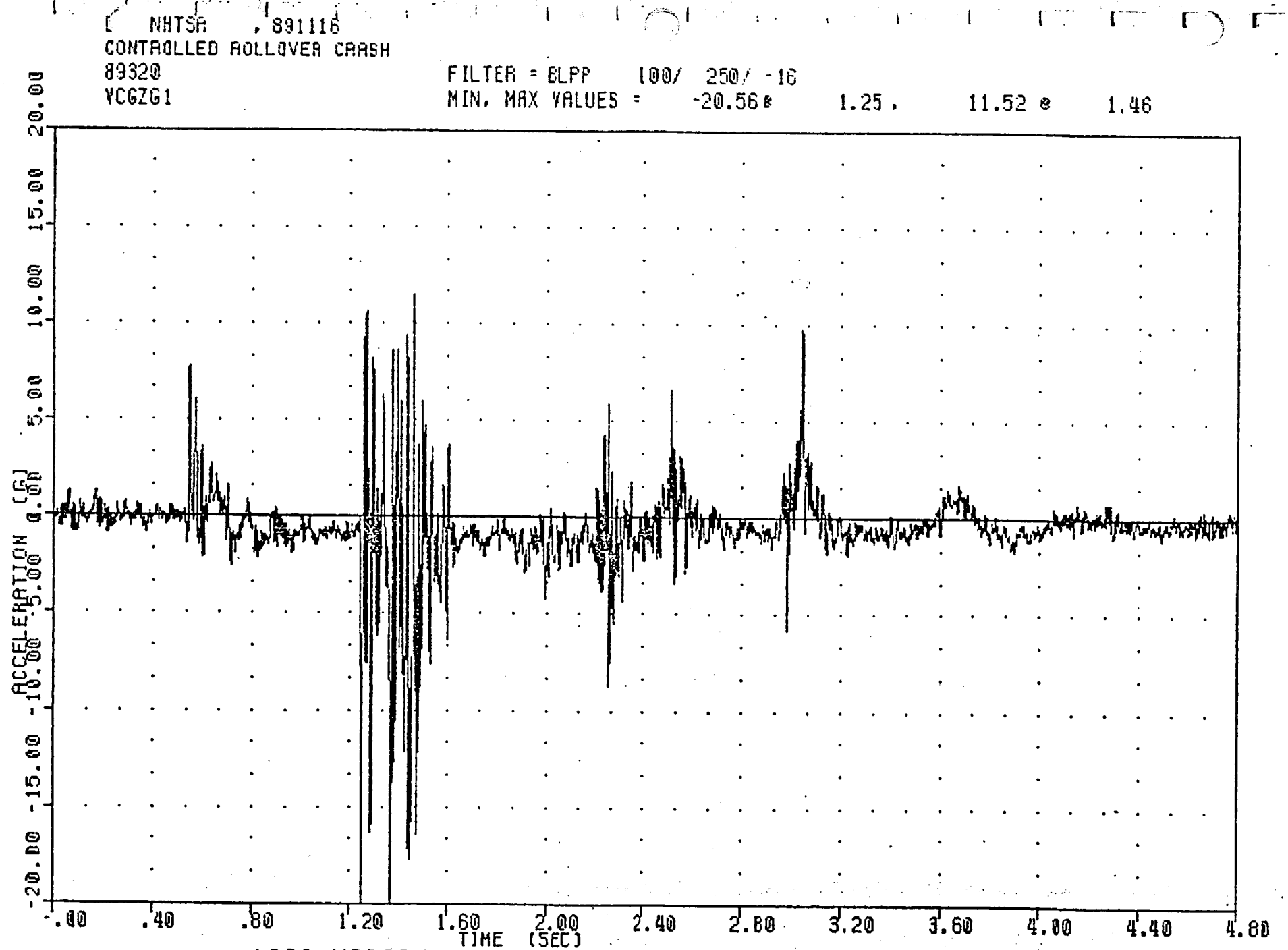
DRIVER SHOULDER BELT DISPLACEMENT



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
VEHICLE CENTER OF GRAVITY X AXIS ACCELERATION

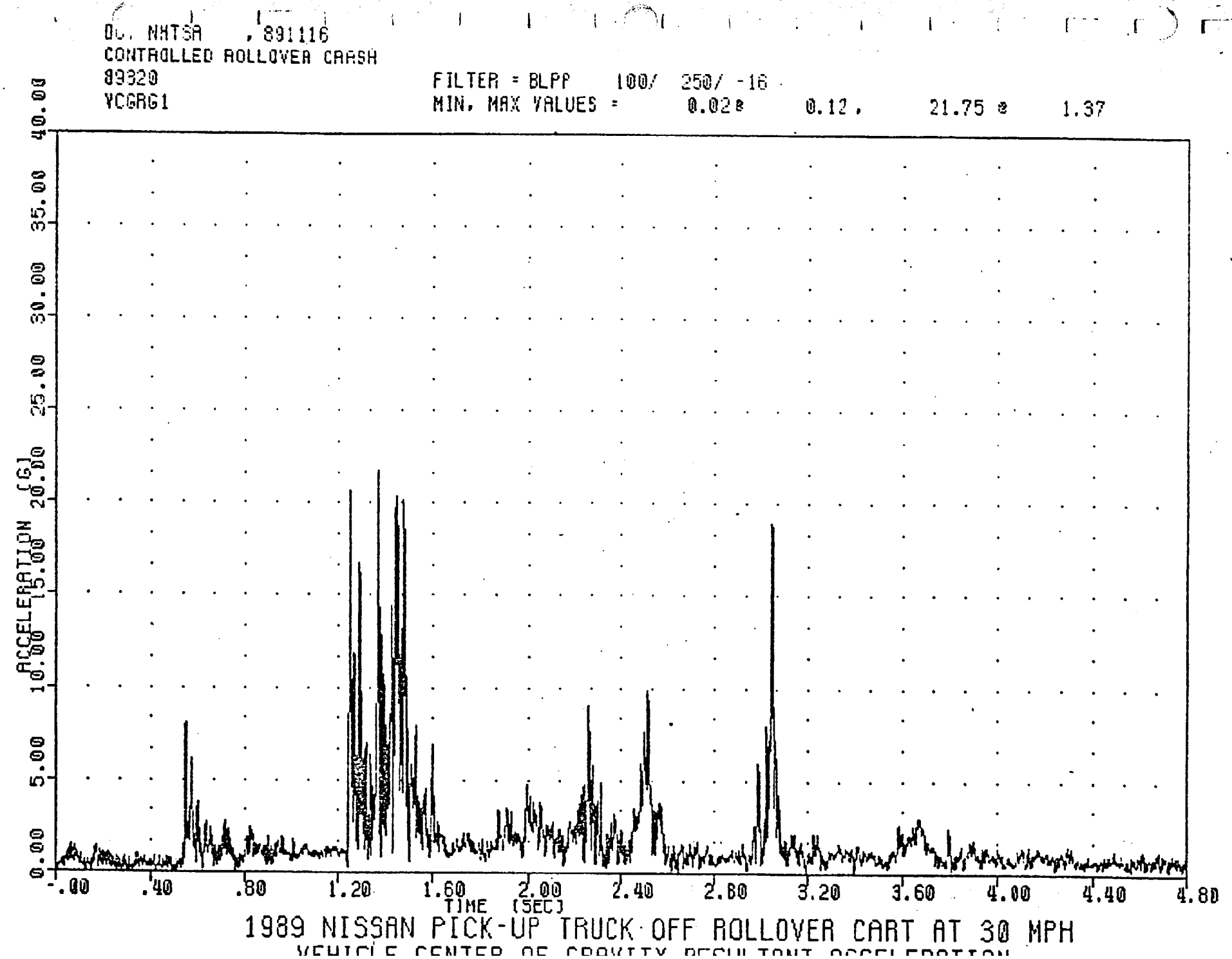


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
VEHICLE CENTER OF GRAVITY Y AXIS ACCELERATION



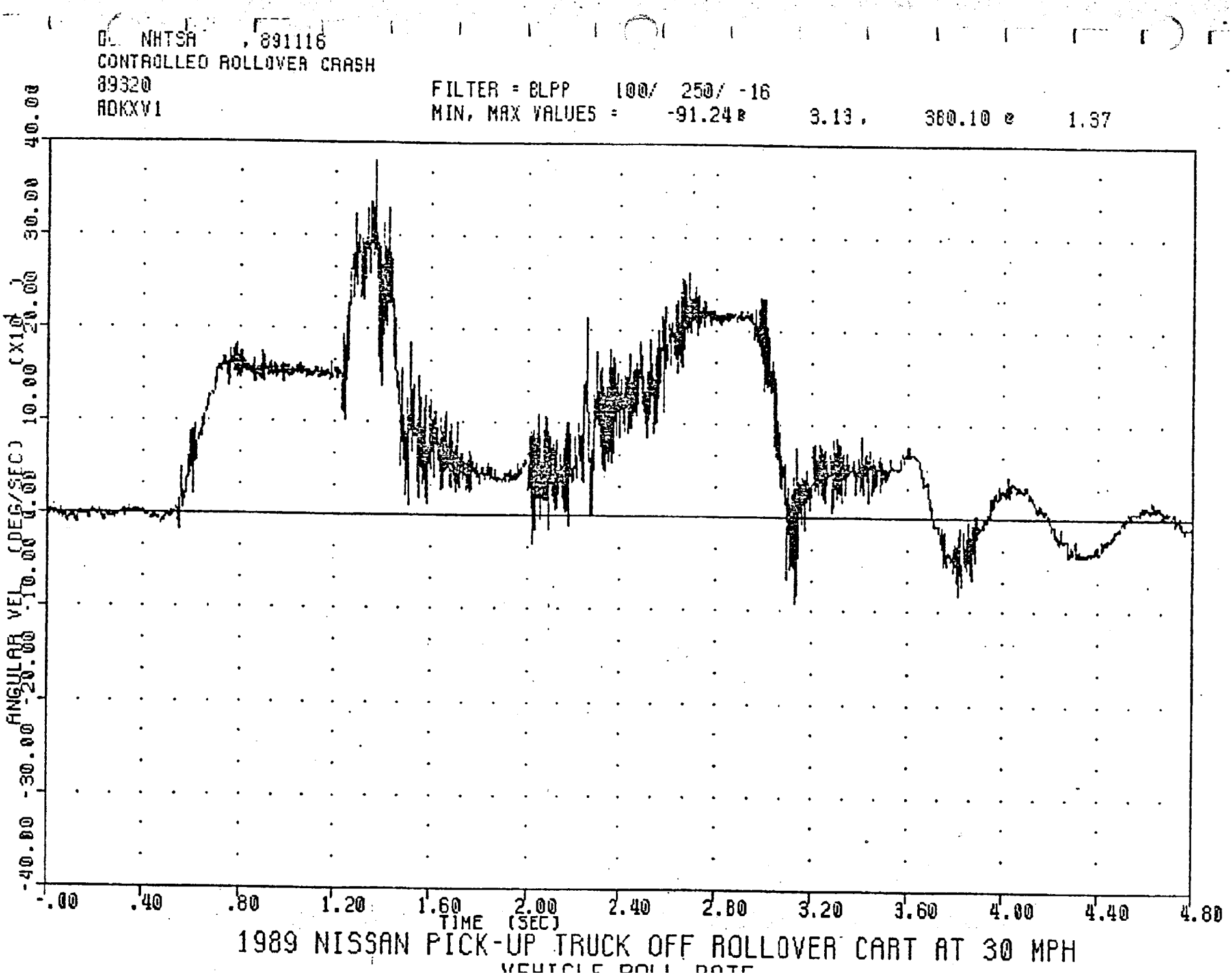
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE CENTER OF GRAVITY Z AXIS ACCELERATION



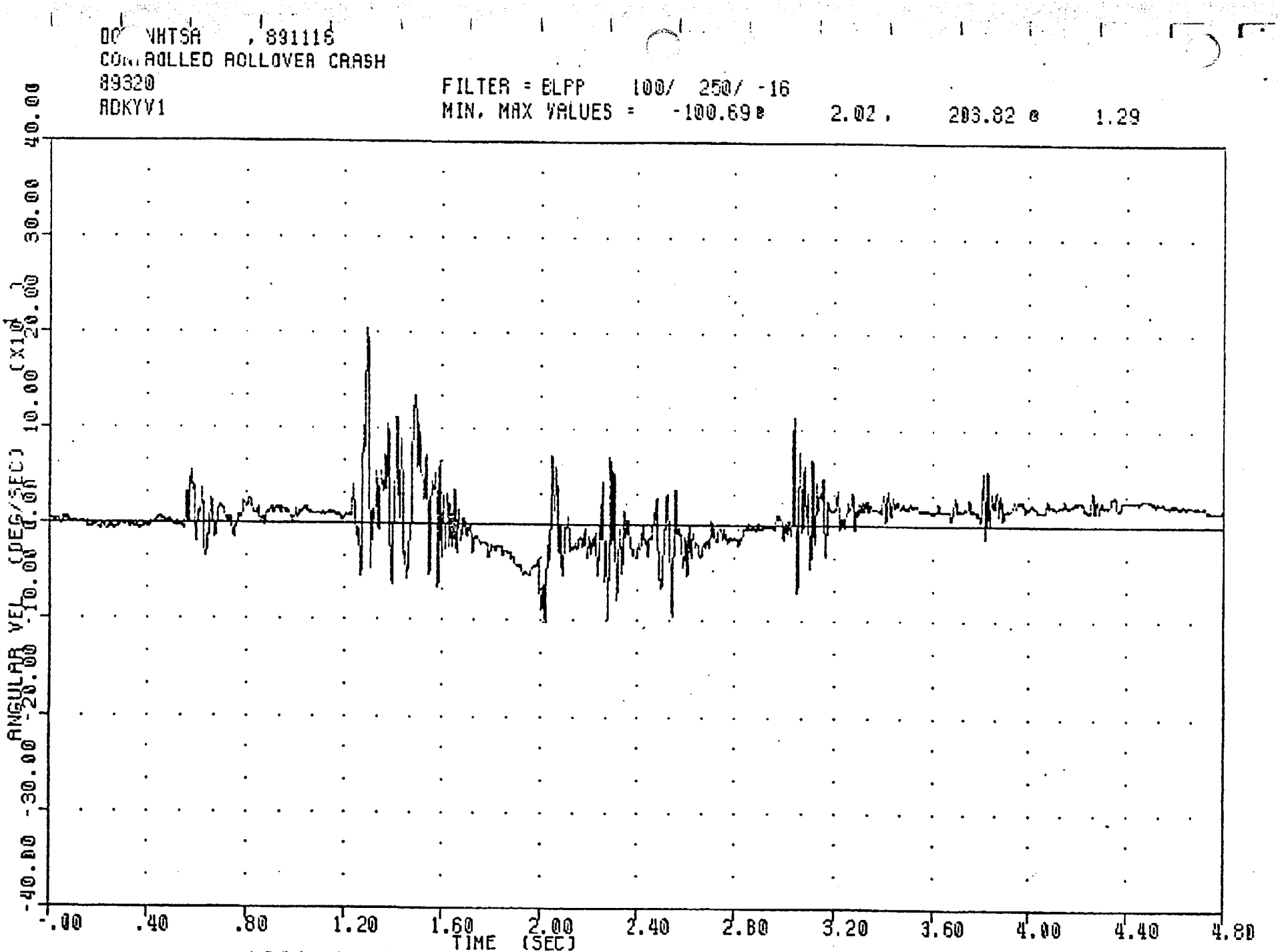
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

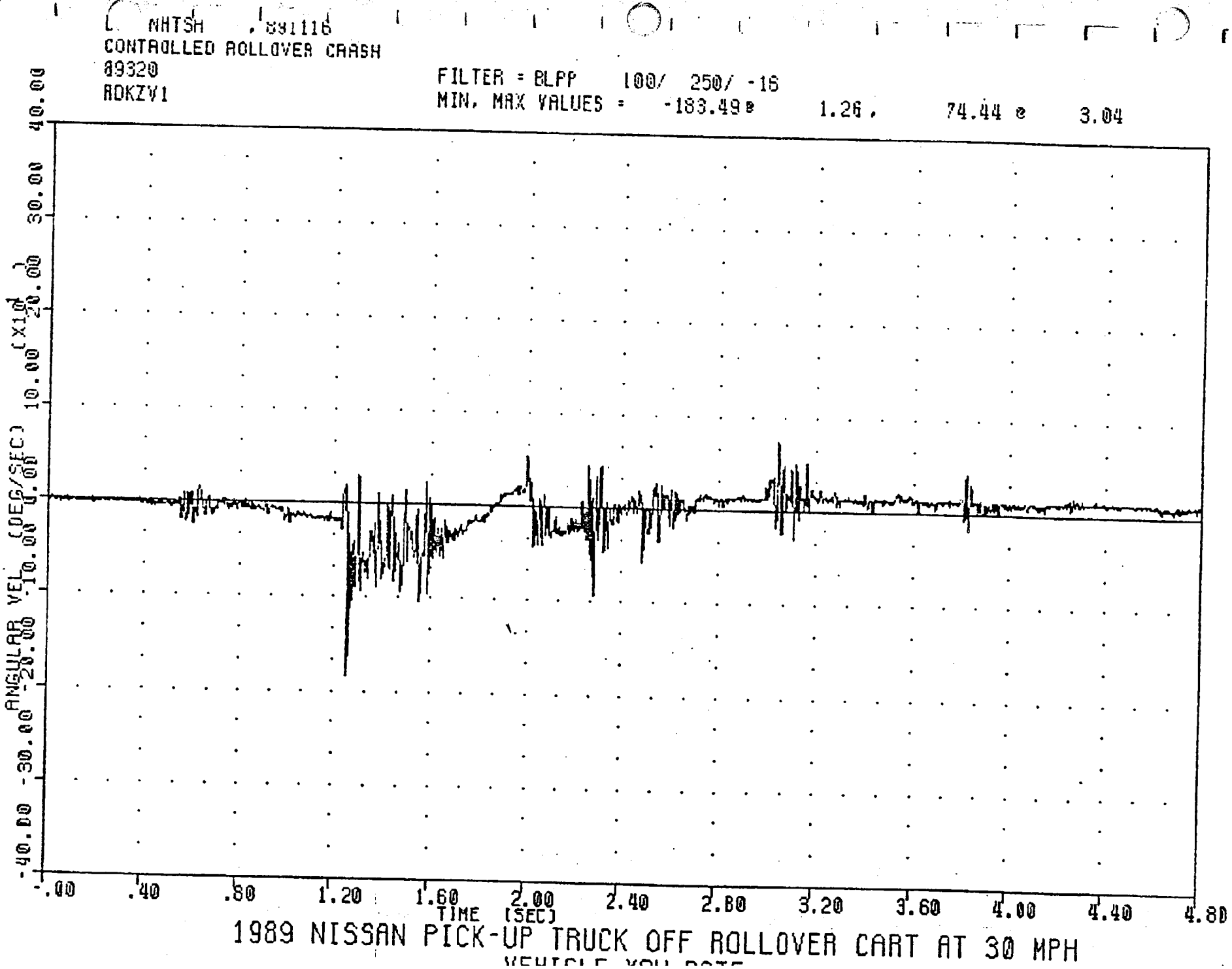


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

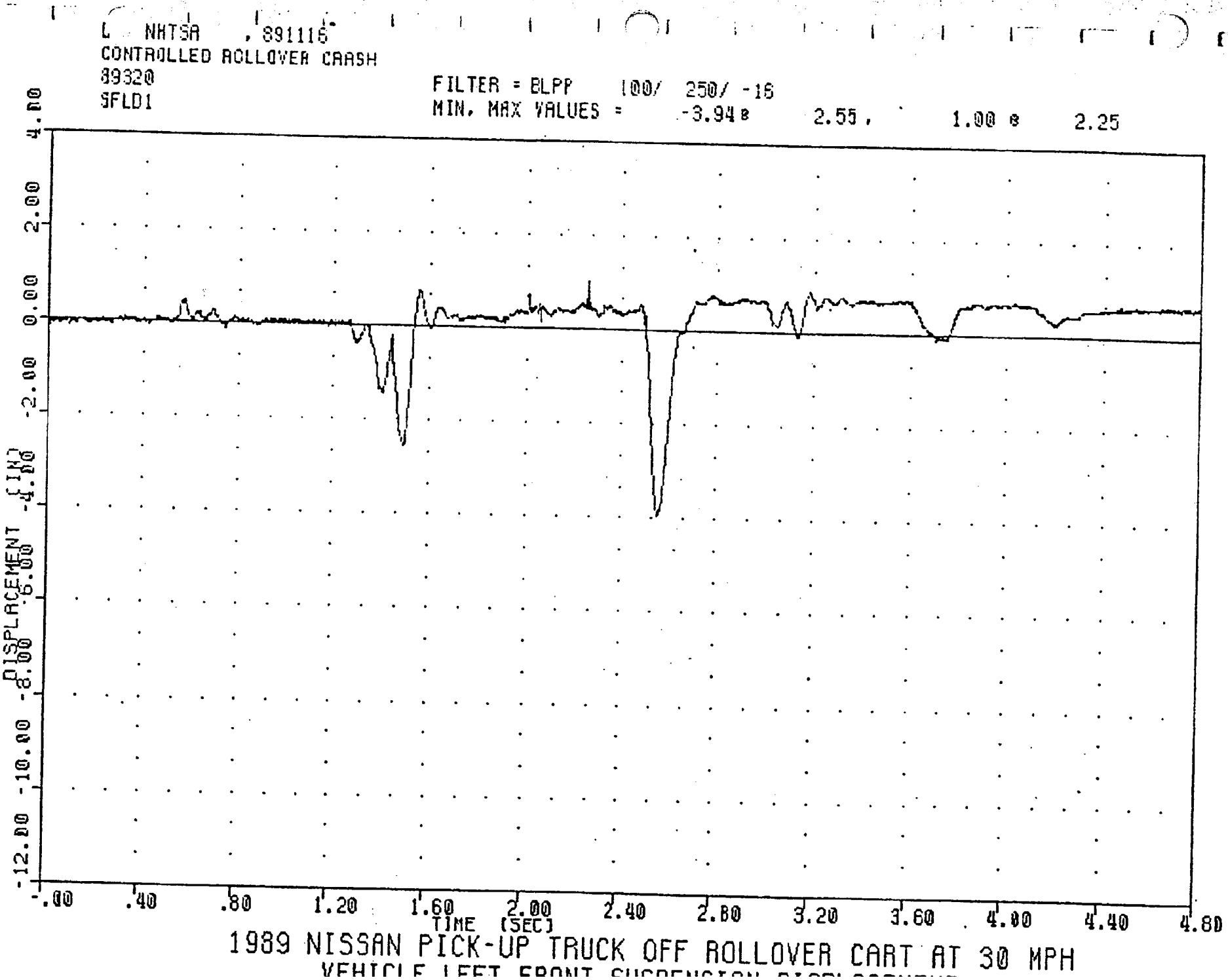
VEHICLE ROLL RATE



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
VEHICLE PITCH RATE



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

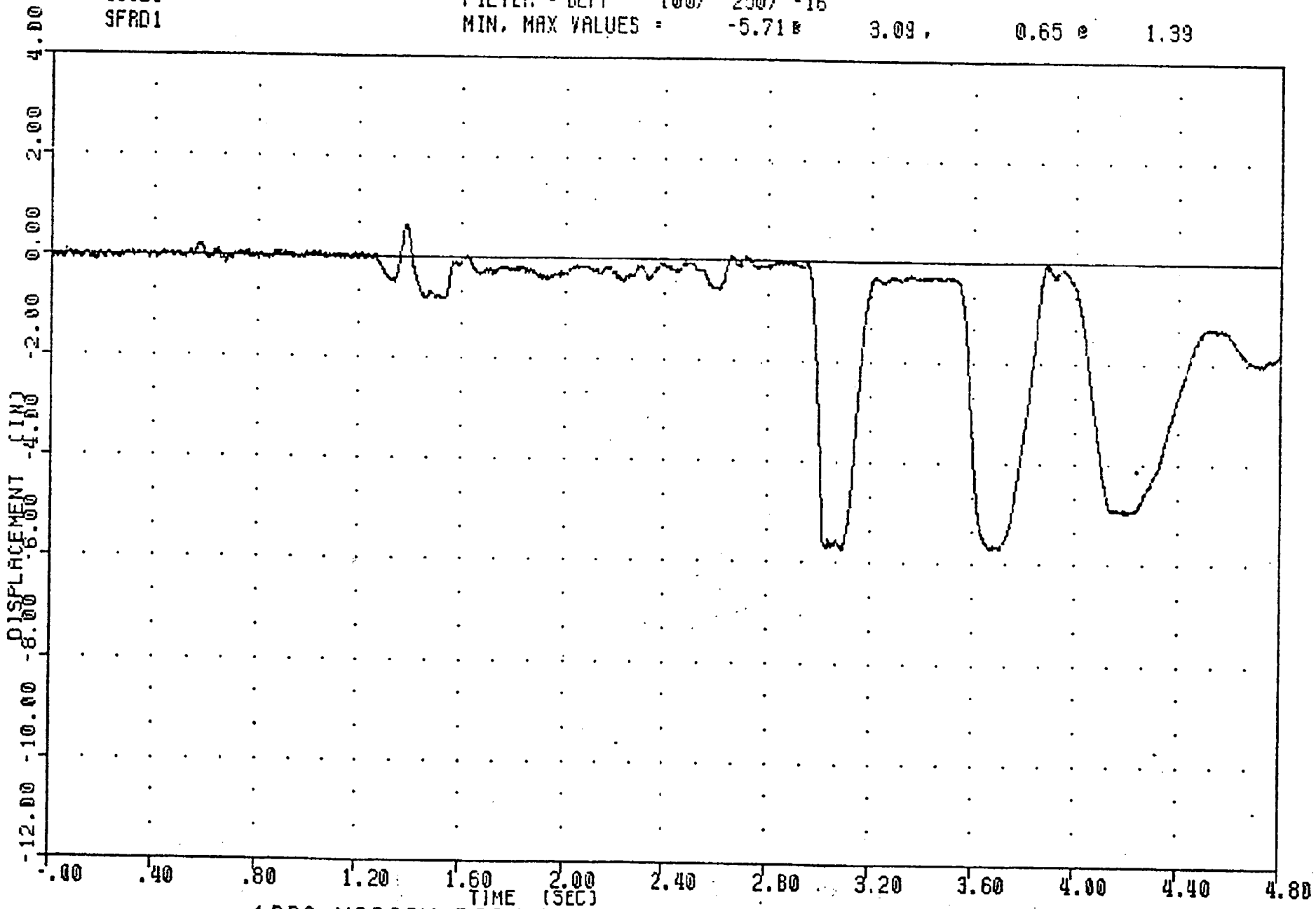


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE LEFT FRONT SUSPENSION DISPLACEMENT

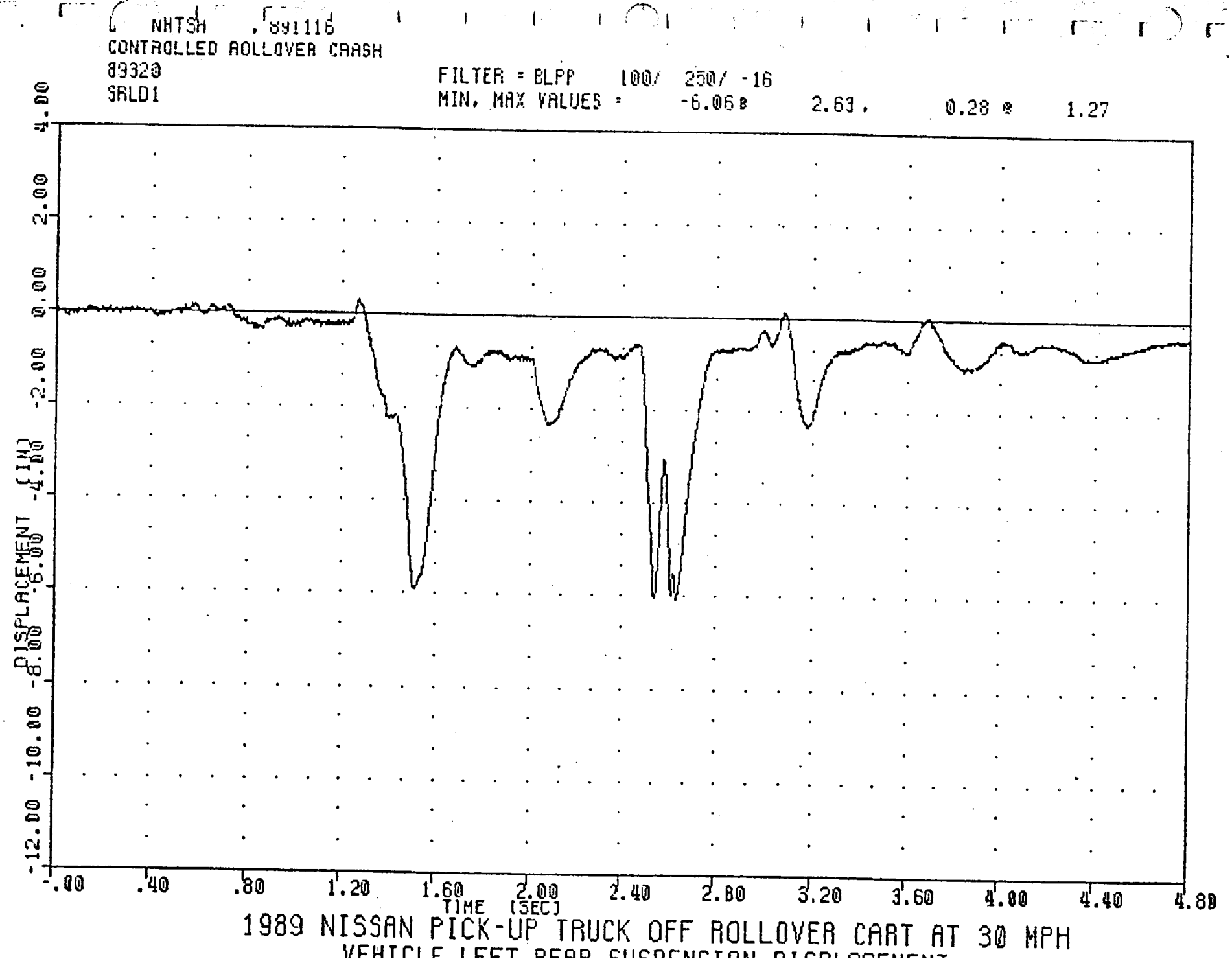
D.. NHTSA .891116
CONTROLLED ROLLOVER CRASH
89320
SFRD1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -5.71 @ 3.09 , 0.65 @ 1.39



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE RIGHT FRONT SUSPENSION DISPLACEMENT

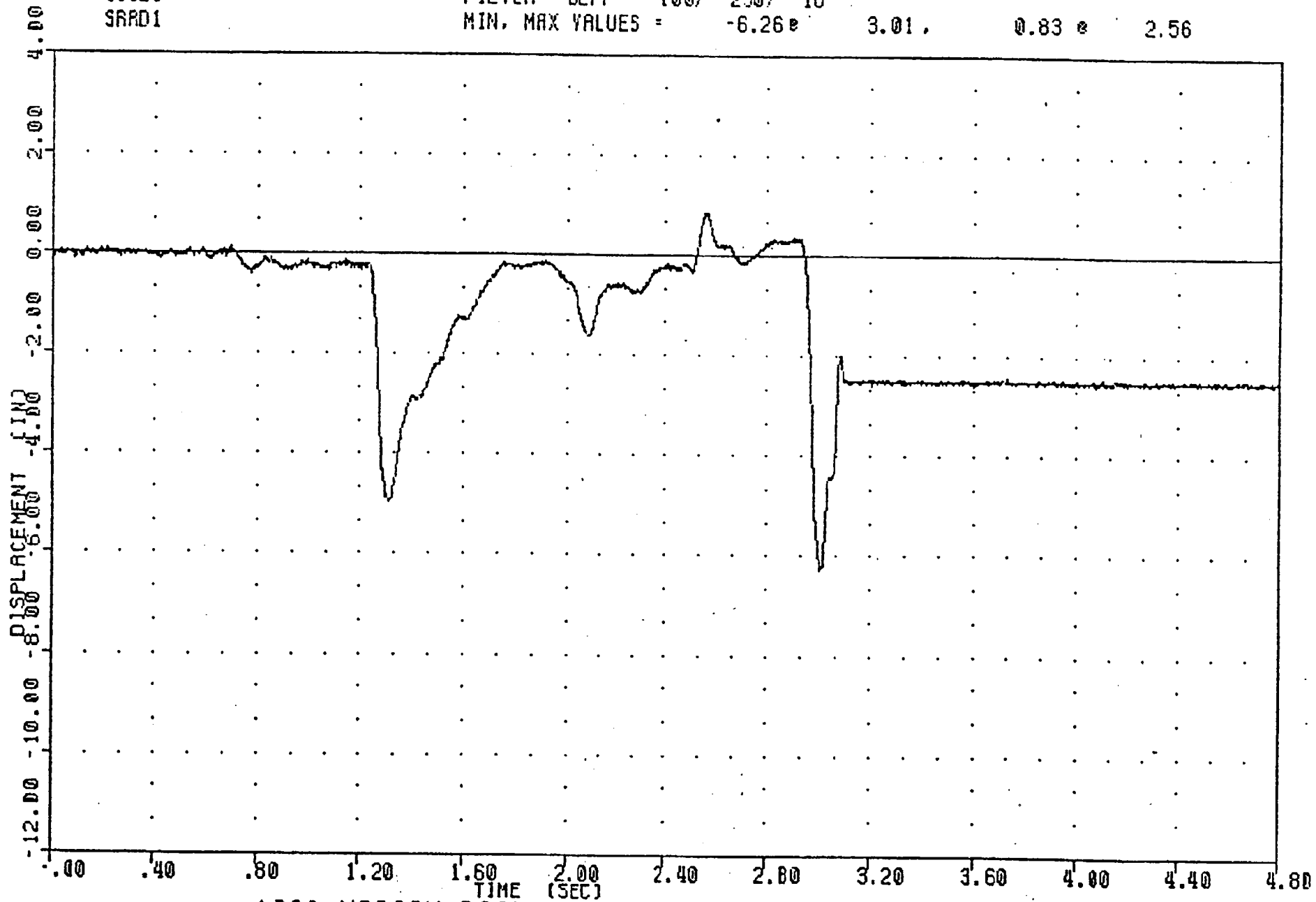


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE LEFT REAR SUSPENSION DISPLACEMENT

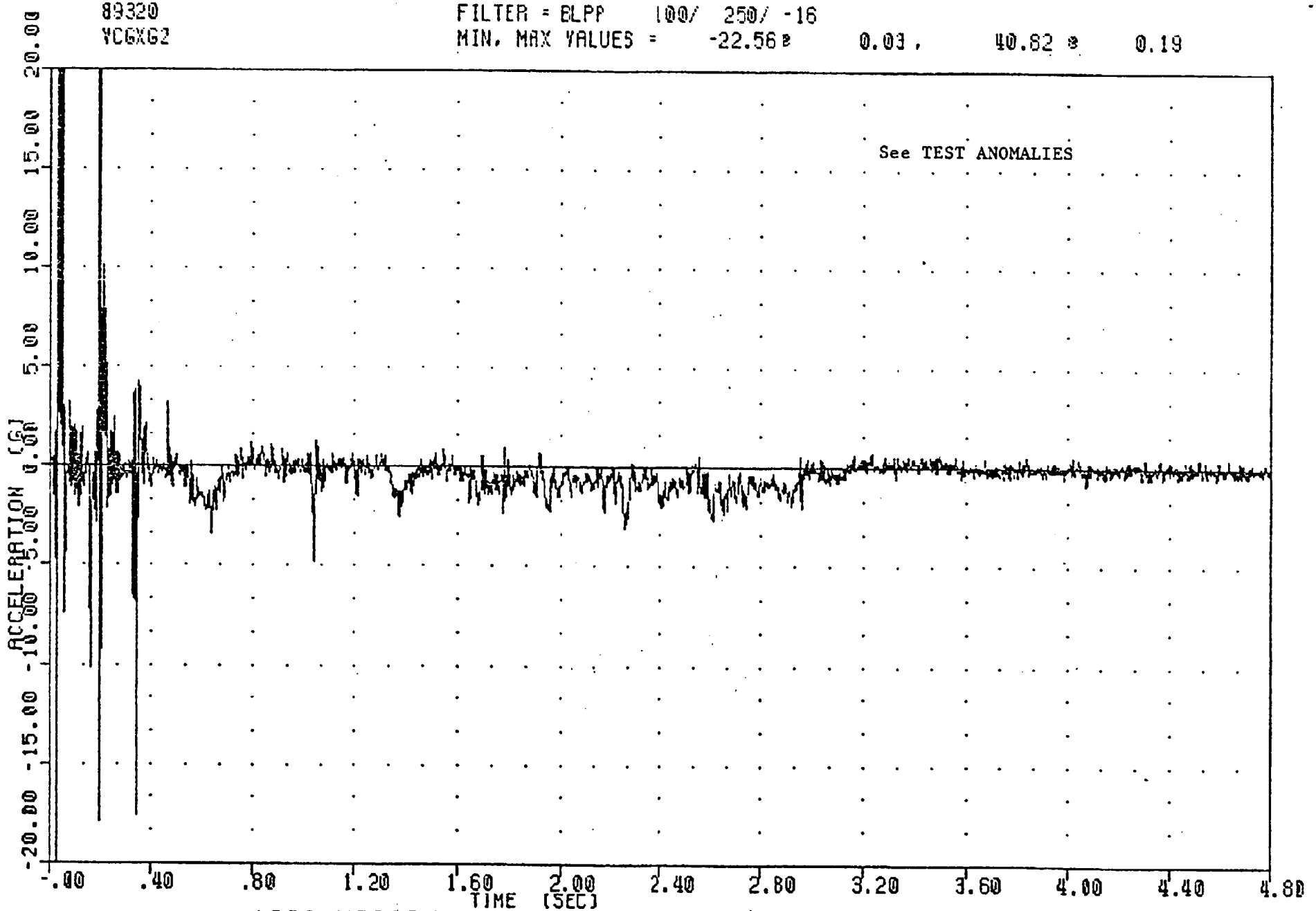
D. NHTSA ,891116
CONTROLLED ROLLOVER CRASH
89320
SRRD1

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -6.26 @ 3.01 , 0.83 @ 2.56

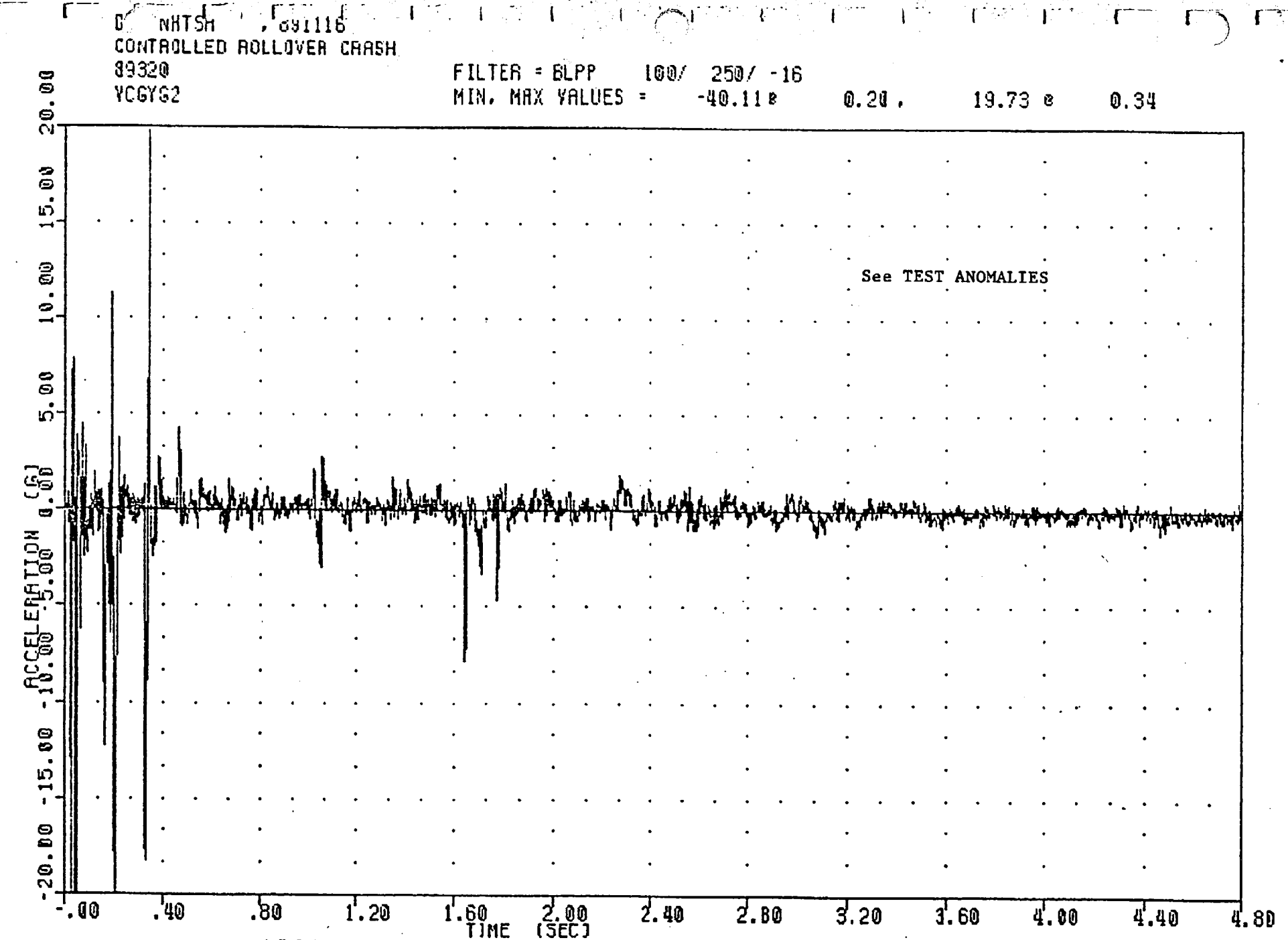


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
VEHICLE RIGHT REAR SUSPENSION DISPLACEMENT

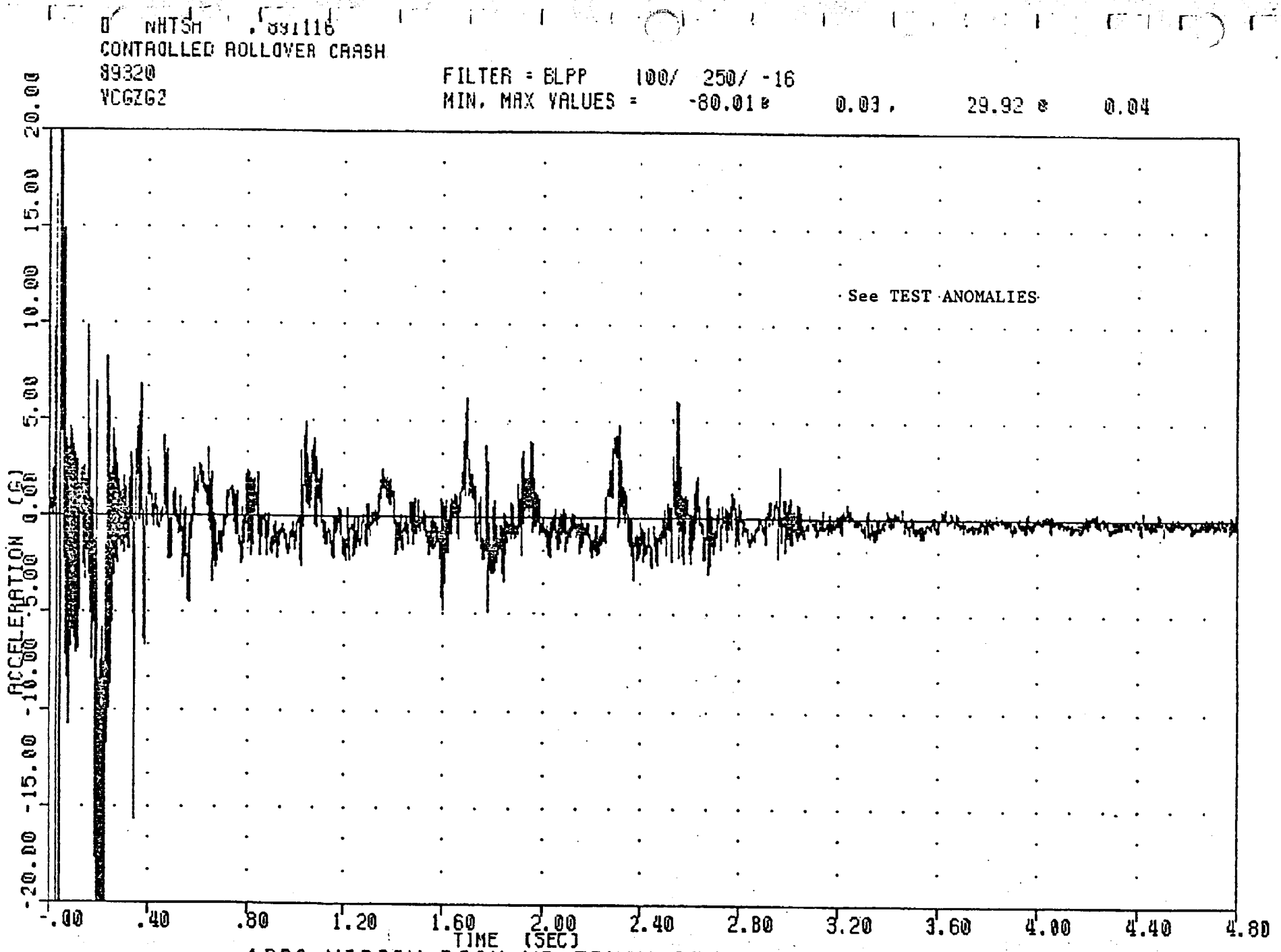
DOT NHTSA 891116
CONTROLLED ROLLOVER CRASH
89320
YCGXG2
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -22.56 @ 0.03 , 40.82 @ 0.19



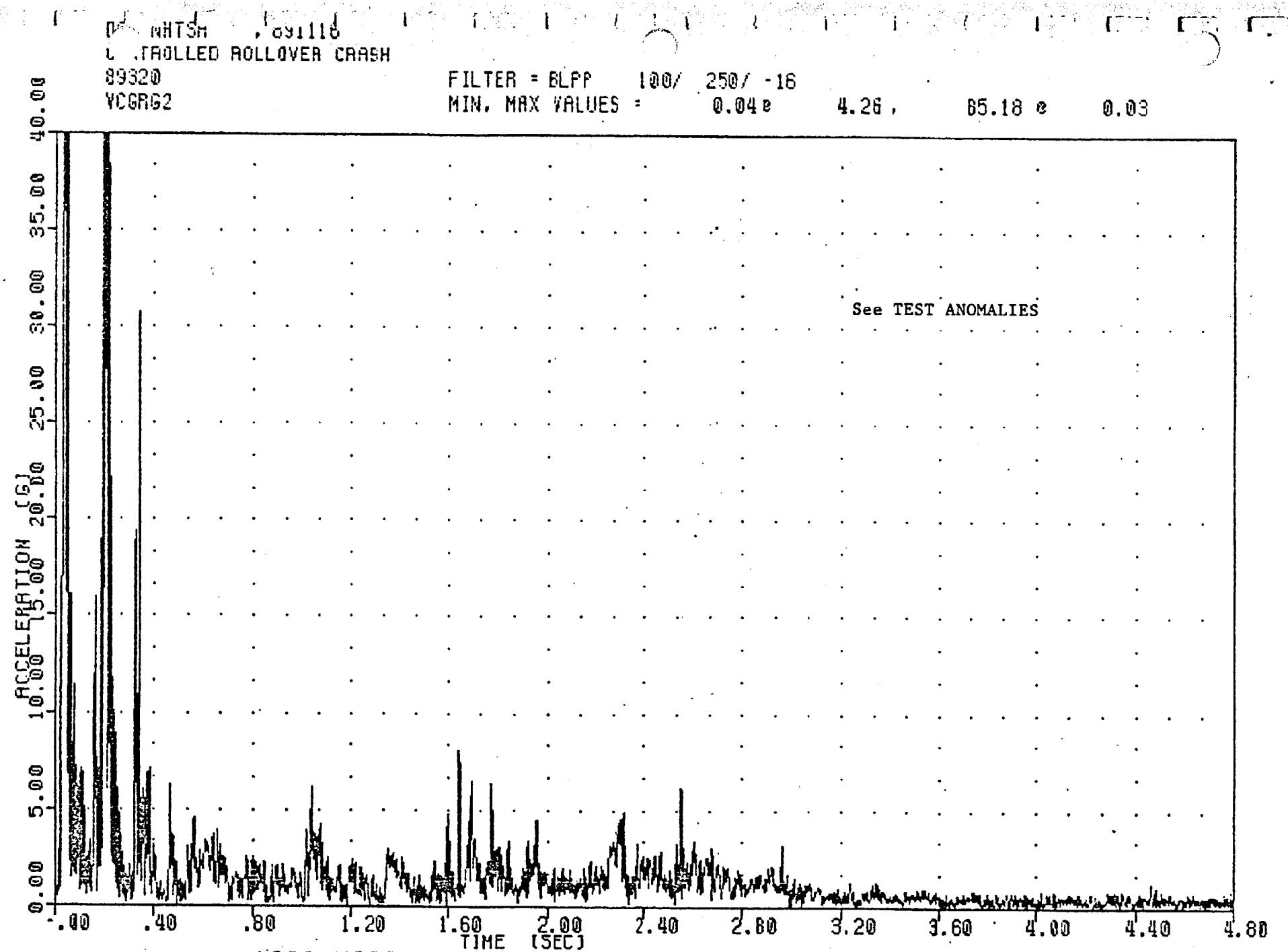
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
ROLL CART CENTER OF GRAVITY X AXIS ACCELERATION



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
ROLL CART CENTER OF GRAVITY Y AXIS ACCELERATION

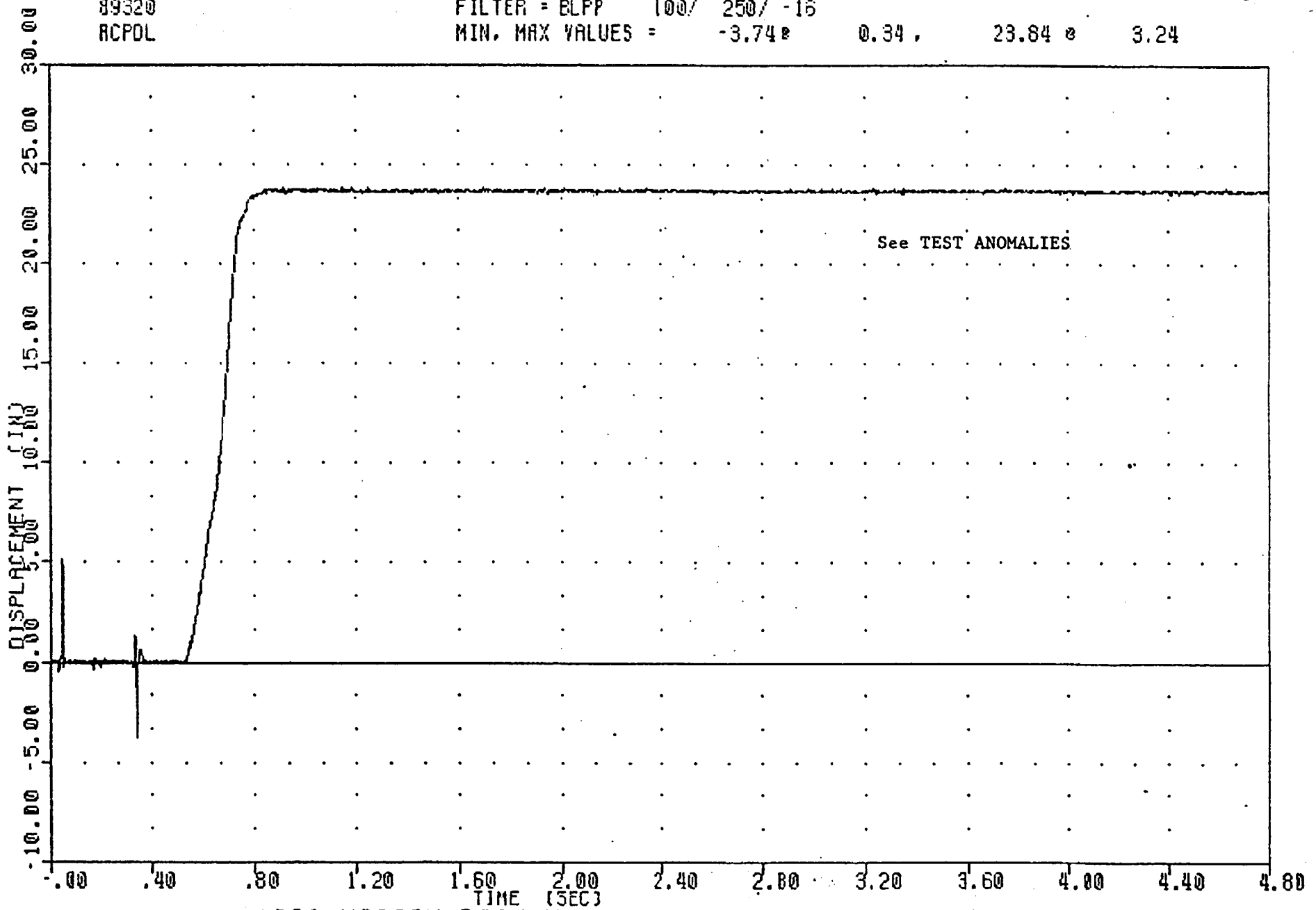


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
ROLL CART CENTER OF GRAVITY Z AXIS ACCELERATION

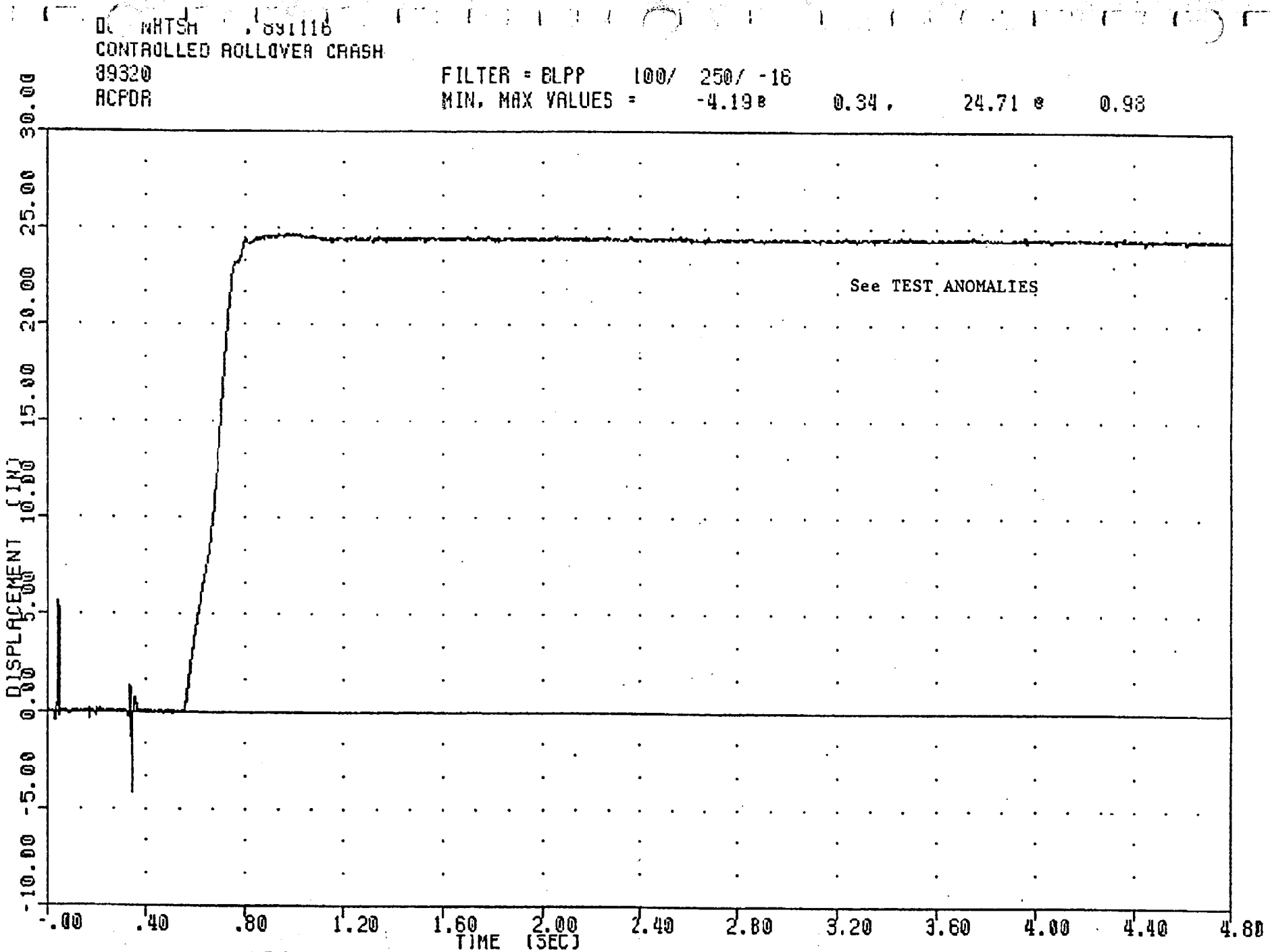


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
ROLL CART CENTER OF GRAVITY RESULTANT ACCELERATION

DO NHTSH ,091116
C ROLLED ROLLOVER CRASH
89320 FILTER = BLPP 100/ 250/ -16
RCPOL MIN, MAX VALUES = -3.74 @ 0.34 , 23.84 @ 3.24

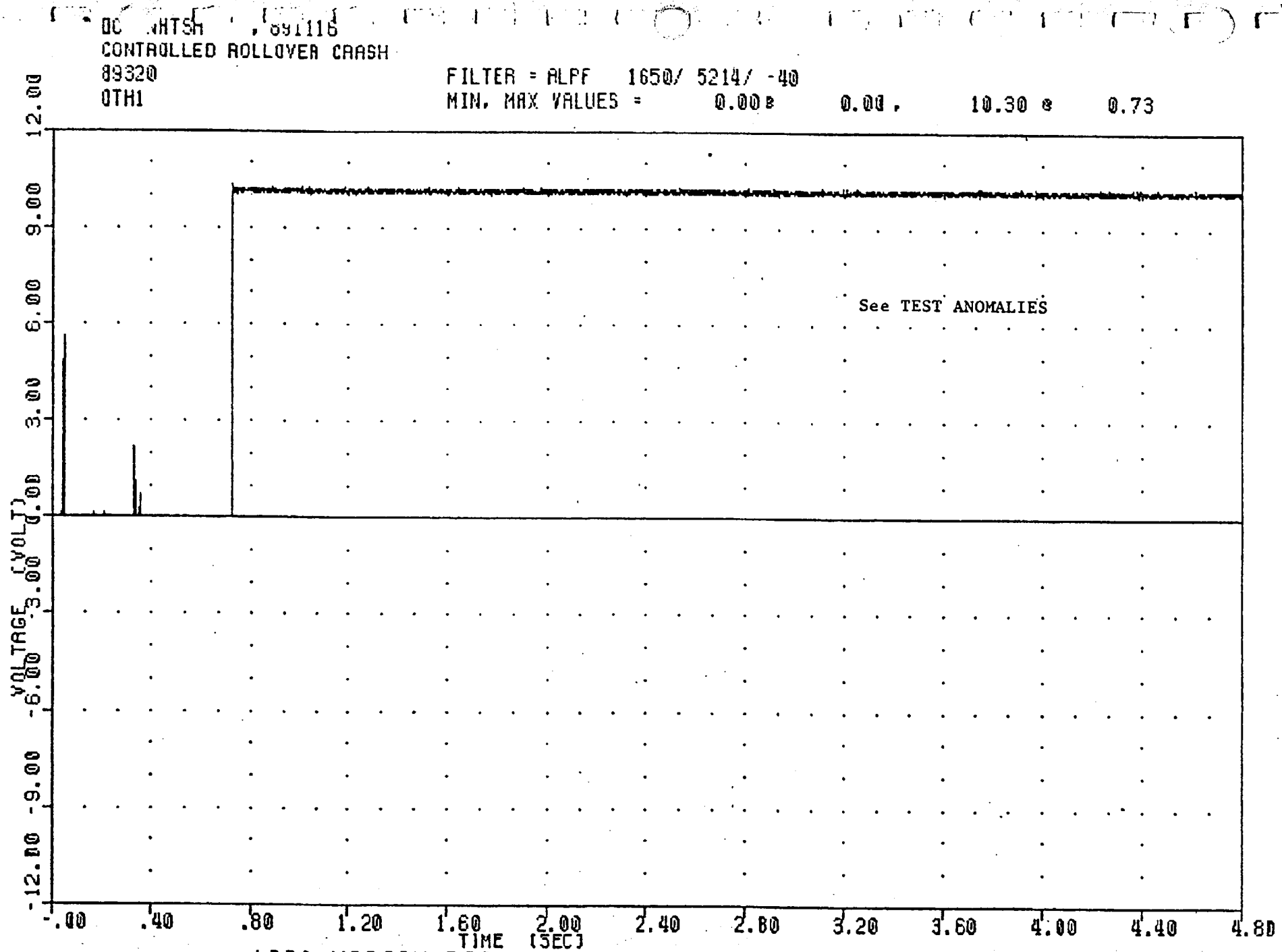


1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH
ROLL CART LEFT CYLINDER DISPLACEMENT



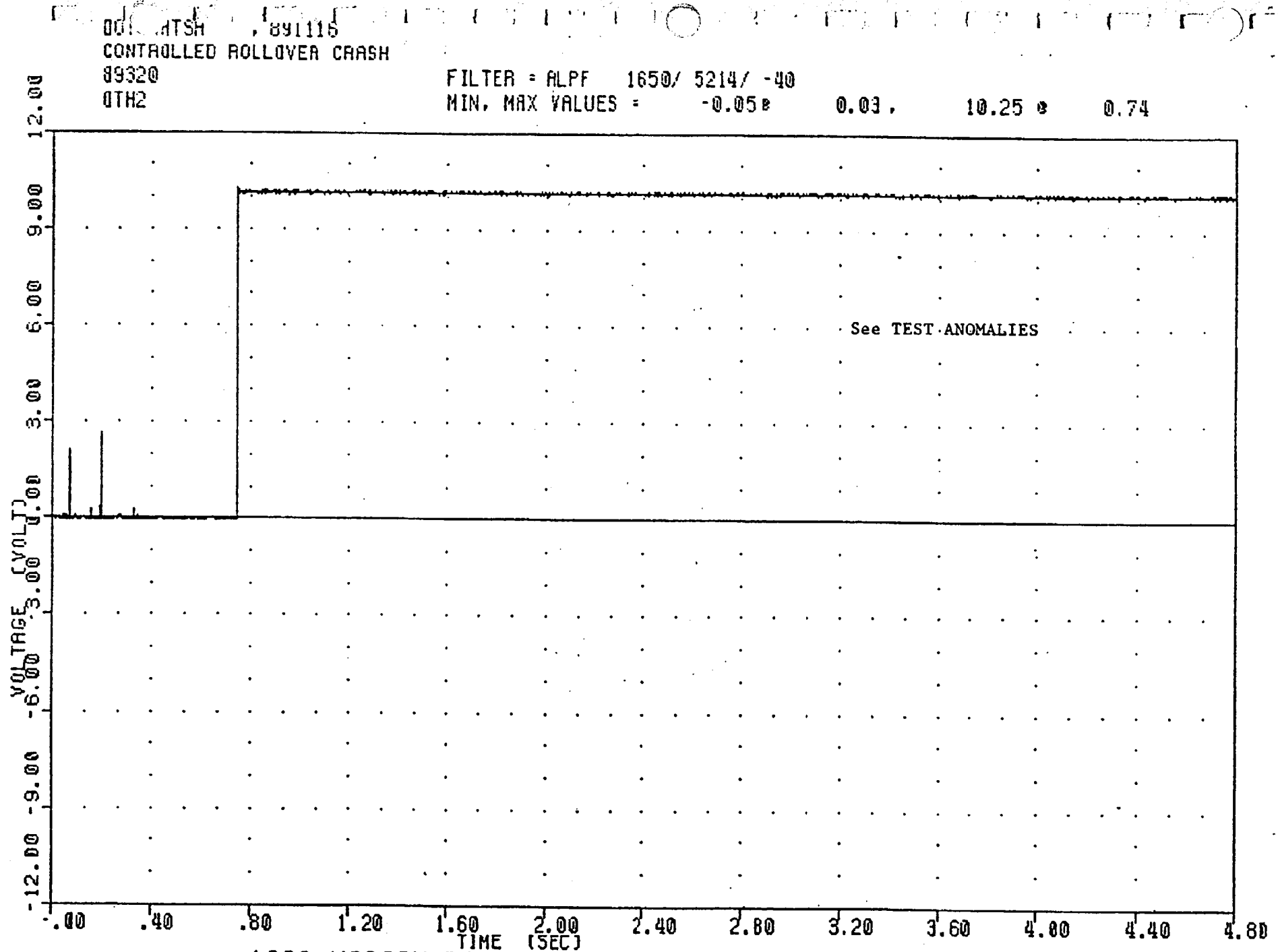
1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

ROLL CART RIGHT CYLINDER DISPLACEMENT



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE/ROLL CART SEPARATION TIME - UPPER SWITCH



1989 NISSAN PICK-UP TRUCK OFF ROLLOVER CART AT 30 MPH

VEHICLE/ROLL CART SEPARATION TIME - LOWER SWITCH

APPENDIX C

MISCELLANEOUS TEST INFORMATION

PRE-TEST INERTIA PARAMETERS DATA

IPMD VEHICLE DATA SHEET

Filled Out By: B. Dotson Date: 11/09/89

Checked By: J. Chrstos Date: 11/16/89

VEHICLE DATA

Vehicle Make and Model (written out): 1989 Nissan Pickup Truck

NHTSA ID Code (7 characters): V89236A / Model Year (2 digits): 89

Vehicle Make (2 characters): 64

11 - American	02 - Ford	64 = Nissan
12 = Audi	40 = GMC	48 = Odyssey
53 = Battronics	23 = Honda	06 = Oldsmobile
27 = BMW	34 = Hyundai	14 = Peugeot
04 = Buick	41 = IH	05 = Plymouth
10 = Cadillac	42 = Isuzu	03 = Pontiac
35 = Champion	44 = Jeep	17 = Renault
36 = Checker	54 = Jet	30 = Saab
01 = Chevrolet	22 = Lectra	26 = Subaru
37 = Chinook	59 = Lectric	33 = Suzuki
21 = Chrysler	13 = Lincoln	16 = Toyota
29 = Comuta	18 = Mazda	31 = Triumph
15 = Datsun	28 = Mercedes	56 = UM
38 = Delorean	09 = Mercury	08 = Volkswagen
07 = Dodge	25 = MG	20 = Volvo
58 = Eva	62 = Mitsubishi	60 = Winnebago
19 = Fiat	32 = NHTSA	24 = Yugo
99 = Other:		

Vehicle Model (2 characters = see appendix B): 99

Body Style (2 characters): PU

2C = 2 Door Coupe	SW = Stationwagon
2S = 2 Door Sedan	PU = Pickup Truck
3H = 3 Door Hatchback	TR = Truck
4S = 4 Door Sedan	VN = Van
5H = 5 Door Hatchback	BU = Bus
OH = Other:	MP = Multipurpose
	UT = Utility

VIN Number (20 characters): 1N6ND11S5KC405284

Odometer Reading: 56.5 Thousands of Miles: 0.0565

Overall Length: 175.1 (in) x 25.4 =: 4448 (mm)

Wheelbase: 104.4 (in) x 25.4 =: 2652 (mm)

Front Track: 55.1 (in) x 25.4 =: 1400 (mm)

Rear Track: 54.5 (in) x 25.4 =: 1384 (mm)

Roof Height: 61.4 (in) x 25.4 =: 1560 (mm)

IPMD VEHICLE DATA SHEET

G.V.W.R.: 4400 (lbs) x 4.45 =: 19580 (N)

FRONT G.A.W.R.: 2200 (lbs) x 4.45 =: 9790 (N)

REAR G.A.W.R.: 2544 (lbs) x 4.45 =: 11321 (N)

The following tire loadings are measured with vehicle at Curb Weight.

Weight on RF Tire: 788 (lbs) x 4.45 =: 3507 (N)

Weight on LF Tire: 785 (lbs) x 4.45 =: 3493 (N)

Weight on LR Tire: 768 (lbs) x 4.45 =: 3418 (N)

Weight on RR Tire: 769 (lbs) x 4.45 =: 3422 (N)

Vehicle Test Weight: 3110 (lbs) x 4.45 =: 13840 (N)

Lateral and Longitudinal Center of Gravity Location.

From Front Axle: 51.60 (in) x 25.4 =: 1310.6 (mm)

From Center Line: 0.04 (in) x 25.4 =: 1.0 (mm)

Engine Displacement: 145.8 (cu in) x 0.0164 =: 2.4 (L)

Engine Type (2 characters): L4

L3	F4	L4
V4	F6	L6
V6	V8	RT = Rotary
L5	OT = Other:	

Engine Location (1 character): F

F = Front M = Mid R = Rear

Engine Orientation (1 character): L

L = Longitudinal T = Transverse

Transmission Type: M

M = Manual A = Automatic

Drive Axle (1 character): R

F = Front R = Rear 4 = Four Wheel Drive

Vehicle Comments (30 characters): Pre rollover test.

IPMD VEHICLE DATA SHEET

FRONT SUSPENSION

Suspension Number (4 digits): F233

Front/Rear Flag (1 character): F

Axle Type (1 character): I
I = Independent S = Solid

Suspension Type (1 character): A

A = Unequal A Arm
L = Leaf
M = Multiple Link
Q = Torque Arm
S = Strut
O = Other: _____
T = Semi-Trailing Arm
W = Twist
4 = 4 Link
3 = 3 Link
I = Twin I Beam

Spring Type (2 characters): TB

CO = Coil
LL = Longitudinal Leaf
OT = Other: _____
TB = Torsion Bar
TL = Transverse Leaf

Brake Type (2 characters): DI

DI = Disk
DS = Duo-Servo Shoe
OT = Other: _____
LT = Leading-Trailer Shoe

Suspension Modified (1 character): N

N = No Y = Yes

Suspension Modification

R = Raised L = Lowered
S = Stiffened W = Widened
O = Other

1 = _____
2 = _____

IPMD VEHICLE DATA SHEET

REAR SUSPENSION

Suspension Number (4 digits): R233

Front/Rear Flag (1 character): R

Axle Type (1 character): S

I = Independent S = Solid

Suspension Type (1 character): L

A = Unequal A Arm
L = Leaf
M = Multiple Link
Q = Torque Arm
S = Strut
O = Other: _____

T = Semi-Trailing Arm
W = Twist
4 = 4 Link
3 = 3 Link
I = Twin I Beam

1pring Type (2 characters): LL

CO = Coil
LL = Longitudinal Leaf
OT = Other: _____

TB = Torsion Bar
TL = Transverse Leaf

Brake Type (2 characters): LT

DI = Disk
DS = Duo-Servo Shoe
OT = Other: _____

LT = Leading-Trailer Shoe

Suspension Modified (1 character): N

N = No Y = Yes

Suspension Modification

R = Raised L = Lowered
S = Stiffened W = Widened
O = Other

1 = _____
2 = _____

IPMD VEHICLE DATA SHEET

REAR SUSPENSION

Tire Manufacturer (10 characters): Firestone

Tire Size Code (10 characters): 195/75R14

Tire Construction (2 characters): SB

BB = Bias Belted
BP = Bias Ply
OT = Other: _____

GP = Glass Belted Radial
SP = Steel Belted Radial

Tire Rim Width: 5.0 (in) X 25.4 =: 127.0 (mm)

Axle Height: 11.8 (in) X 25.4 =: 299.7 (mm)

Tire Pressure: 34.0 (psi) X 6.897 =: 234.5 (kpa)

IPMD MEASURED DATA

IPMD Calibration Check (no vehicle):

Applied Weight (lbs)	Schaevitz Output (Volts)
0	0.114
+100	1.055
+200	1.967
0	0.114
-100	-0.827
-200	-1.744
0	0.111

C.G. HEIGHT:

Applied Weight (lbs)	Schaevitz Output (Volts)	Resultant Longitudinal Movement (mv)
0	0.047	3.243
+100	0.676	3.310
+200	1.299	3.395
0	0.056	3.254
-100	-0.586	3.182
-200	-1.223	3.076
0	0.041	3.244

Calculated C.G. Height (in): 23.646

Pitch Inertia:

Run	Period (sec)	*Amplitude (mv)	Relative Motion Amplitude (mv)
1	4.03	281	183
2	4.03	280	181
3	4.03	275	167

Pitch Inertia (ft. lb. sec2): 2058.671

IPMD VEHICLE DATA SHEET

FRONT SUSPENSION

Tire Manufacturer (10 characters): Firestone

Tire Size Code (10 characters): 195/75R14

Tire Construction (2 characters): SB

BB = Bias Belted
BP = Bias Ply
OT = Other: _____
GP = Glass Belted Radial
SB = Steel Belted Radial

Tire Rim width: 5.0 (in) X 25.4 =: 127.0 (mm)

Axle Height: 11.5 (in) X 25.4 =: 292.1 (mm)

Pressure: 26.0 (psi) X 6.897 =: 179.3 Tire (kpa)

POST-TEST INERTIA PARAMETERS DATA

IPMD VEHICLE DATA SHEET

Filled Out By: B. Dotson Date: 11/16/89

Checked By: J. Chrstos Date: 12/06/89

VEHICLE DATA

Vehicle Make and Model (written out): 1989 Nissan Pickup Truck

NHTSA ID Code (7 characters): V89236B / Model Year (2 digits): 89

Vehicle Make (2 characters): 64

11 - American	02 - Ford	64 = Nissan
12 = Audi	40 = GMC	48 = Odyssey
53 = Battronics	23 = Honda	06 = Oldsmobile
27 = BMW	34 = Hyundai	14 = Peugeot
04 = Buick	41 = IH	05 = Plymouth
10 = Cadillac	42 = Isuzu	03 = Pontiac
35 = Champion	44 = Jeep	17 = Renault
36 = Checker	54 = Jet	30 = Saab
01 = Chevrolet	22 = Lectra	26 = Subaru
37 = Chinook	59 = Lectric	33 = Suzuki
21 = Chrysler	13 = Lincoln	16 = Toyota
29 = Comuta	18 = Mazda	31 = Triumph
15 = Datsun	28 = Mercedes	56 = UM
38 = Delorean	09 = Mercury	08 = Volkswagen
07 = Dodge	25 = MG	20 = Volvo
58 = Eva	62 = Mitsubishi	60 = Winnebago
19 = Fiat	32 = NHTSA	24 = Yugo
99 = Other:		

Vehicle Model (2 characters = see appendix B): 99

Body Style (2 characters): PU

2C = 2 Door Coupe	SW = Stationwagon
2S = 2 Door Sedan	PU = Pickup Truck
3H = 3 Door Hatchback	TR = Truck
4S = 4 Door Sedan	VN = Van
5H = 5 Door Hatchback	BU = Bus
OH = Other:	MP = Multipurpose
	UT = Utility

VIN Number (20 characters): 1N6ND11S5KC405284

Odometer Reading: 61.5 Thousands of Miles: 0.0615

Overall Length: 175.1 (in) x 25.4 =: 4448 (mm)

Wheelbase: 104.4 (in) x 25.4 =: 2652 (mm)

Front Track: 55.1 (in) x 25.4 =: 1400 (mm)

Rear Track: 54.5 (in) x 25.4 =: 1384 (mm)

Roof Height: 53.5 (in) x 25.4 =: 1359 (mm)

IPMD VEHICLE DATA SHEET

G.V.W.R.: 4400 (lbs) x 4.45 =: 19580 (N)

FRONT G.A.W.R.: 2200 (lbs) x 4.45 =: 9790 (N)

REAR G.A.W.R.: 2544 (lbs) x 4.45 =: 11321 (N)

The following tire loadings are measured with vehicle at Curb Weight.

Weight on RF Tire: 753 (lbs) x 4.45 =: 3351 (N)

Weight on LF Tire: 800 (lbs) x 4.45 =: 3560 (N)

Weight on LR Tire: 720 (lbs) x 4.45 =: 3204 (N)

Weight on RR Tire: 780 (lbs) x 4.45 =: 3471 (N)

Vehicle Test Weight: 3053 (lbs) x 4.45 =: 13586 (N)

Lateral and Longitudinal Center of Gravity Location.

From Front Axle: 51.29 (in) x 25.4 =: 1302.8 (mm)

From Center Line: 0.12 (in) x 25.4 =: 3.0 (mm)

Engine Displacement: 145.8 (cu in) x 0.0164 =: 2.4 (L)

Engine Type (2 characters): L4

L3	F4	L4
V4	F6	L6
V6	V8	RT = Rotary
L5	OT = Other:	

Engine Location (1 character): F

F = Front M = Mid R = Rear

Engine Orientation (1 character): L

L = Longitudinal T = Transverse

Transmission Type: M

M = Manual A = Automatic

Drive Axle (1 character): R

F = Front R = Rear 4 = Four Wheel Drive

Vehicle Comments (30 characters): Post rollover test.

IPMD VEHICLE DATA SHEET

FRONT SUSPENSION

Suspension Number (4 digits): F233

Front/Rear Flag (1 character): F

Axle Type (1 character): I

I = Independent S = Solid

Suspension Type (1 character): A

A = Unequal A Arm
L = Leaf
M = Multiple Link
Q = Torque Arm
S = Strut
O = Other: _____
T = Semi-Trailing Arm
W = Twist
4 = 4 Link
3 = 3 Link
I = Twin I Beam

Spring Type (2 characters): TB

CO = Coil
LL = Longitudinal Leaf
OT = Other: _____
TB = Torsion Bar
TL = Transverse Leaf

Brake Type (2 characters): DI

DI = Disk
DS = Duo-Servo Shoe
OT = Other: _____
LT = Leading-Trailer Shoe

Suspension Modified (1 character): N

N = No Y = Yes

Suspension Modification

R = Raised L = Lowered
S = Stiffened W = Widened
O = Other

1 = _____
2 = _____