



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

DOT HS 807 933
Final Report

June 1992

Reducing Heavy Truck Aggressiveness Moving Heavy Truck into a 1986 Ford Taurus 4-Door Sedan at 64.9 KPH

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1. Report No. DOT HS 807 933		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle REDUCING HEAVY TRUCK AGGRESSIVENESS MOVING HEAVY TRUCK INTO A 1986 FORD TAURUS 4-DOOR SEDAN AT 64.9 KPH				5. Report Date MAY - JUNE 1992	
				6. Performing Organization Code	
				8. Performing Organization Report No. 920507	
7. Author(s) S. A. Johnston, Project Engineer, TRC				10. Work Unit No. (TRAIS)	
9. Performing Organization Name and Address Vehicle Research and Test Center 10820 State Route 347 East Liberty, Ohio 43319				11. Contract or Grant No. DTNH22-88-C-07292	
				13. Type of Report and Period Covered FINAL REPORT MAY - JUNE 1992	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh St., S.W. Washington, D.C. 20590				14. Sponsoring Agency Code DOT/NHTSA/VRTC	
15. Supplementary Notes					
16. Abstract This test report documents a crash test that was conducted for research and development in support of reducing heavy truck aggressiveness. This test was conducted with a 1986 Ford Taurus 4-door sedan, VIN 1FABP29U1GA190083, at the Transportation Research Center Inc. on May 7, 1992. The test vehicle was impacted in the front at 0° with 50% engagement of the vehicle by the heavy truck. The struck vehicle contained seven (7) accelerometers and one instrumented Hybrid III driver dummy.					
17. Key Words Heavy Truck Aggressiveness Occupant Response			18. Distribution Statement Available from: Technical Reference Division Service Springfield, Virginia 22161		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 160	22. Price

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	meters	m
yd	yards	0.9	kilometers	km
mi	miles	1.6		
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square kilometers	km ²
mi ²	square miles	2.6	hectares	ha
	acres	0.4		
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	tonnes	t
	(2000 lb)			
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.96	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

* 1 in = 2.54 (exact). For other exact conversions and more detailed tables, see NBS Misc. Publ. 296, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.1-0-296.

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
km	kilometers	1.1	yards	yd
		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	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 temperature	9/5 (then add 32)	Fahrenheit temperature	°F
-40				-40
0				32
20				68
37				98.6
40				104
80				176
98.6				200
120				248
160				320
200				392

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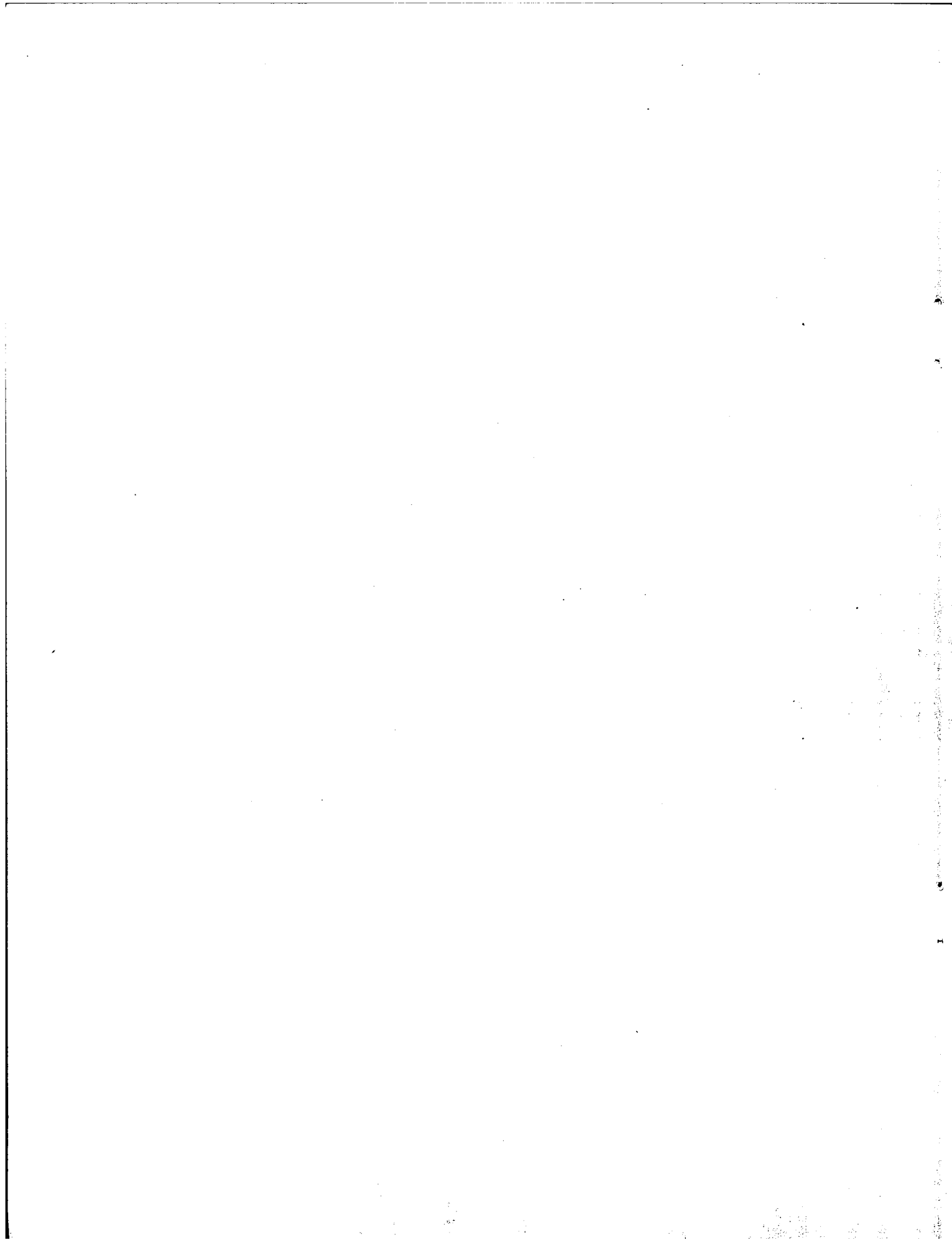
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SECTION 1.0

PURPOSE AND TEST SUMMARY

This test was conducted as research in support of reducing heavy truck aggressiveness. This test was conducted on May 7, 1992.

The stationary vehicle, a 1986 Ford Taurus 4-door sedan, was equipped with a 3.0 liter, 6-cylinder, transverse gasoline engine and a 3-speed automatic transmission. The test weight of the vehicle was 1581 kg. The vehicle was instrumented with seven (7) longitudinal axis accelerometers and two (2) seat belt force load cells. One (1) Part 572E dummy was seated in the left front outboard seating position according to the dummy placement procedure specified in Appendix B and Optional Appendix C of Laboratory Procedure TP-208-08. The dummy was instrumented in the head, chest, and pelvis with longitudinal, lateral, and vertical accelerometers. The dummy was also instrumented with a 6-axis neck load cell, two (2) femur load cells, and a chest deflection potentiometer.

The stationary vehicle was impacted in the front at 0 degrees by a moving heavy truck at 64.9 kph. The intended impact engagement was 50% of the vehicle on the driver's side.

The moving heavy truck's test weight was 19001 kg. The truck was equipped with a standard truck bumper. The truck was instrumented with two (2) longitudinal and vertical axis accelerometers and one (1) vertical axis accelerometer.

The dummy's head injury criterion, HIC, was 501. The dummy's chest deceleration with 3 milliseconds minimum duration was 33.5 g. The dummy's maximum left and right femur forces were 4944 N and 7416 N, respectively.

The vehicle, dummy, and heavy truck data were multiplexed and recorded on a 14-channel analog tape deck. The analog data was digitally sampled at 8000 samples per second. The data was digitally filtered as per SAE J211 OCT88.

The test was filmed by one (1) real-time panning motion picture camera and five (5) high-speed motion picture cameras operating at approximately 500 frames per second.

Section 2.0 contains the vehicle, dummy, truck, and test data. Appendix A contains the pre- and post-test still photographs. Appendix B contains the final test data plots. Appendix C contains miscellaneous test information.

SECTION 2.0

VEHICLE, DUMMY, TRUCK AND TEST DATA

TEST ANOMALIES

The engine top X-axis accelerometer, ENGXG1, data was lost between 64 and 92 milliseconds because the accelerometer cable was pinched by the vehicle's crush.

The engine bottom X-axis acceleration, ENGXG2, data was lost after 149 milliseconds because the accelerometer cable was cut by the vehicle's crush.

The left brake caliper X-axis acceleration, BCLXG1, data was lost after 122 milliseconds because the accelerometer cable was cut by the vehicle's crush.

TABLE 1 CRASH TEST SUMMARY

TEST TYPE: Heavy Truck into Stationary Vehicle

TEST DATE: 05/07/92 TEST TIME: 1512 AMBIENT TEMP. (°C): 19

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1986/Ford/Taurus/4-door sedan

VEHICLE TEST WEIGHT (KG): 1581

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (KPH)**: PRIMARY = 64.9 SECONDARY = 64.9

MAXIMUM STATIC CRUSH (MM): 324

DUMMY: Driver #048

TYPE: Part 572E

LOCATION: Left front

RESTRAINT: 3-point unbelt

NUMBER OF DATA CHANNELS: 32

NUMBER OF CAMERAS: HIGH-SPEED 5 REAL-TIME 1

*With respect to tow track centerline.

**Speed trap measurement ($\pm$.08 kph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford/Taurus

VIN: 1FABP29U1GA190083

BODY STYLE: 4-door sedan

MODEL YEAR: 1986

COLOR: Red

ENGINE DATA: TYPE: transverse CYLINDERS: 6 DISPLACEMENT: 3.0 liters

TRANSMISSION DATA: 3 SPEED, MANUAL, X AUTOMATIC, X FWD, RWD, 4WD

DATE VEHICLE RECEIVED: NA

ODOMETER READING: 70432.0

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	Yes	TILTING STEERING WHEEL	Yes
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	Yes
OTHER			

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: Good

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Ford Motor Company

DATE OF MANUFACTURE: 06/86 VIN: 1FABP29U1GA190083

GVWR: 4550 LBS

GAWR: FRONT: 2514 LBS., REAR: 2071 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Dean, Alpha, P195/75R14

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 35 PSI
REAR: 35 PSI

SPARE TIRE (MFR., LINE, SIZE): Michelin, P135/80R14

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Adjustable

MAXIMUM WIDTH: 1815 MILLIMETERS

WHEELBASE: 2680 MILLIMETERS

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the passenger's side C-pillar.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P195/70R14

RECOMMENDED COLD TIRE PRESSURE: FRONT: 35 PSI; REAR: 35 PSI

DESIGNATED SEATING CAPACITY: 2 FRONT 3 REAR 5 TOTAL

VEHICLE CAPACITY WEIGHT: 900 LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN MILLIMETERS):

DELIVERED ATTITUDE: LF 698; RF 702; LR 648; RR 648

PRE-TEST ATTITUDE: LF 695; RF 694; LR 615; RR 619

POST-TEST ATTITUDE: LF NA; RF 638; LR 542; RR 656

TABLE 2 TEST VEHICLE INFORMATION CONT'D

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

RIGHT FRONT	454 KG	RIGHT REAR	265 KG
LEFT FRONT	470 KG	LEFT REAR	263 KG
TOTAL FRONT WEIGHT	924 KG	(63.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	528 KG	(36.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	1452 KG		

WEIGHT OF TEST VEHICLE: *

RIGHT FRONT	464 KG	RIGHT REAR	318 KG
LEFT FRONT	481 KG	LEFT REAR	318 KG
TOTAL FRONT WEIGHT	945 KG	(59.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	636 KG	(40.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	1581 KG		

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: None

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 1077 MILLIMETERS REARWARD OF FRONT WHEEL CENTERLINE

*The prepared vehicle was weighed with one Hybrid III dummy, the required instrumentation, and two high-speed cameras. This weight became the target test weight for the remainder of the test program.

TABLE 2A TRUCK INFORMATION

WEIGHT DISTRIBUTION

FRONT: 4772 KG

REAR: 14229 KG

AXLE SPACING

FRONT: 3835 MM

REAR: 1308 MM

DISTANCE OF C.G. BEHIND FRONT AXLE: 3363 MM

BUMPER DESCRIPTION: Stock truck bumper

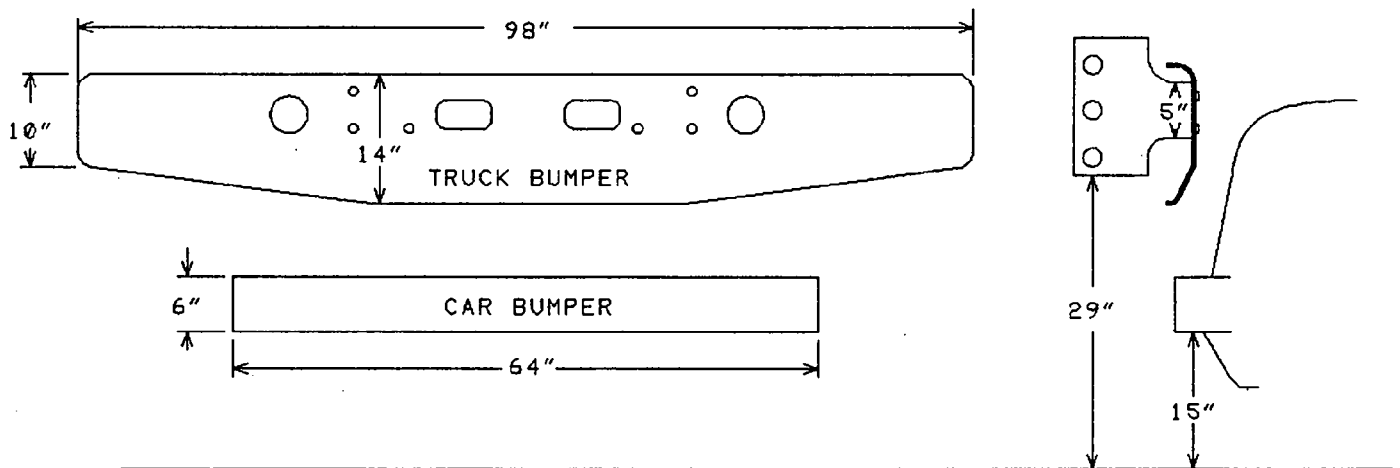


TABLE 3 POST-IMPACT DATA

TEST NUMBER: 920507

TEST DATE: 05/07/92

TEST TIME: 1512

TEST TYPE: Heavy Truck into Stationary Vehicle

IMPACT ANGLE: 0

AMBIENT TEMPERATURE AT IMPACT AREA: 19° C

TEMPERATURE IN OCCUPANT COMPARTMENT: 19° C

IMPACT VELOCITY: PRIMARY = 64.9 KPH

SECONDARY = 64.9 KPH

(SPECIFIED RANGE = 63.6 TO 65.2 KPH)

DISTANCE FROM VEHICLE TO BARRIER: ENTERING VELOCITY TRAP = 660 MM

EXITING VELOCITY TRAP = 51 MM

TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN MILLIMETERS):

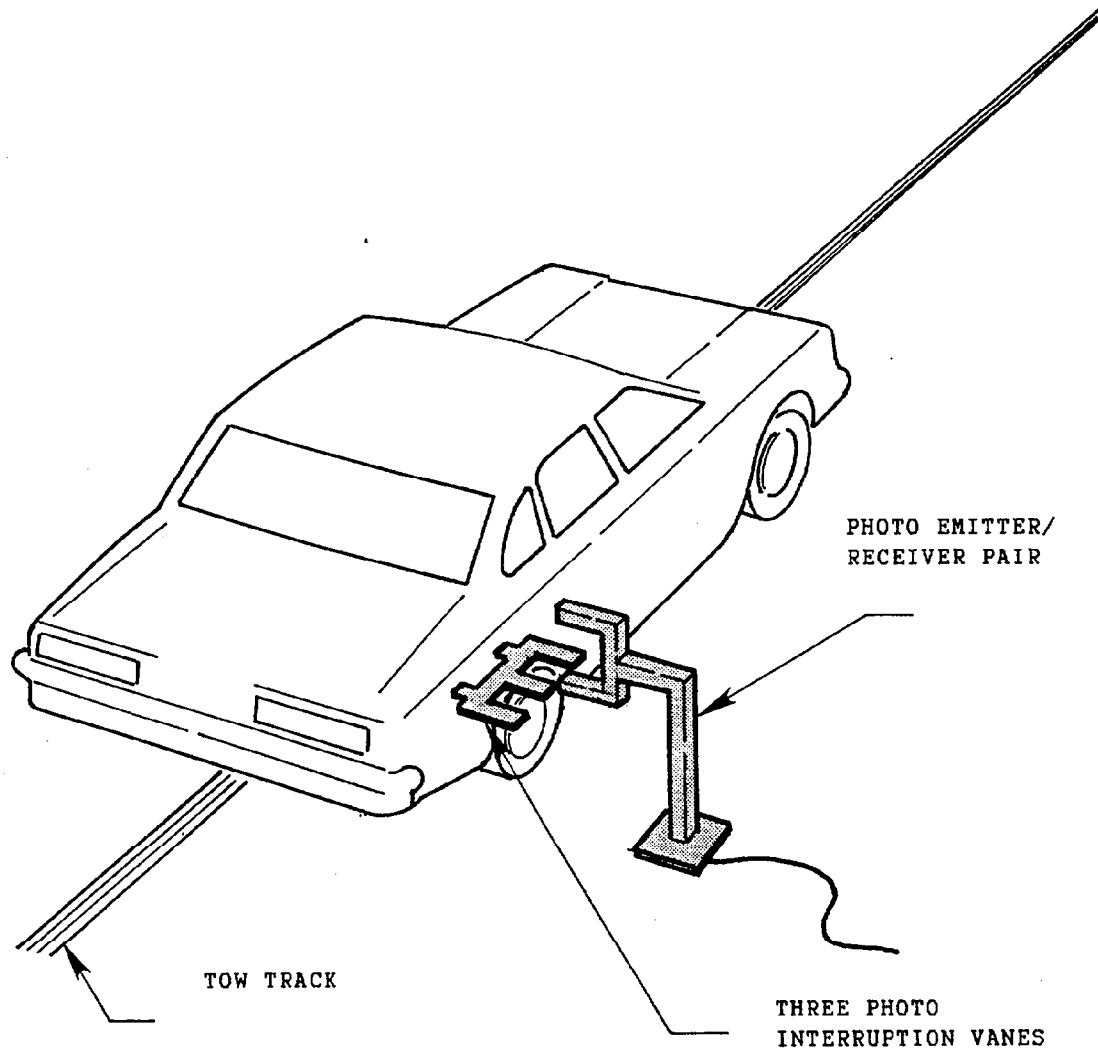
OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 4675; C 4799; R 4671

POST-TEST: L 4550; C 4522; R 4691

TOTAL CRUSH: L 125; C 277; R -20

AVERAGE CRUSH: 127

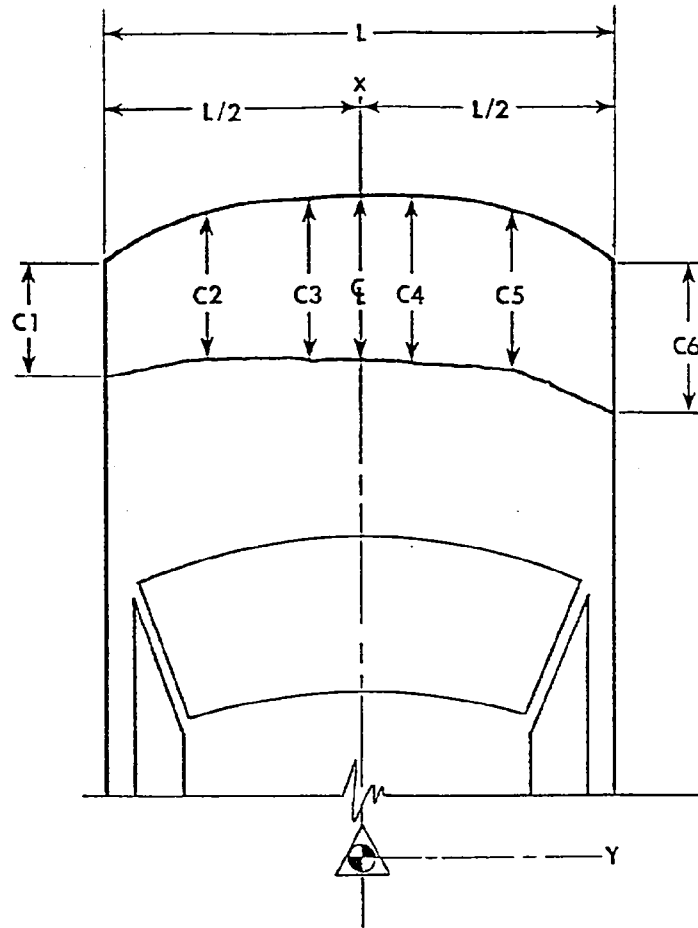
FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver 51 millimeters before impact.

The vanes have 305 millimeter spacing.

FIGURE 2 VEHICLE CRUSH



NOTES: L is pre-test length of contact surface.
 C1 through C6 are spaced equally apart.
 CL is vehicle centerline.
 All measurements are in millimeters.

Vehicle Ford Taurus

PRE-TEST		POST-TEST		CRUSH	
L	<u>1457</u>				
C1	<u>4675</u>	C1	<u>4550</u>	C1	<u>125</u>
C2	<u>4747</u>	C2	<u>4544</u>	C2	<u>203</u>
C3	<u>4799</u>	C3	<u>4475</u>	C3	<u>324</u>
C4	<u>4799</u>	C4	<u>4612</u>	C4	<u>187</u>
C5	<u>4752</u>	C5	<u>4656</u>	C5	<u>96</u>
C6	<u>4671</u>	C6	<u>4691</u>	C6	<u>-20</u>
CL	<u>4799</u>	CL	<u>4522</u>	CL	<u>277</u>

FIGURE 3

PRE-TEST AND POST-TEST MEASUREMENT POINTS

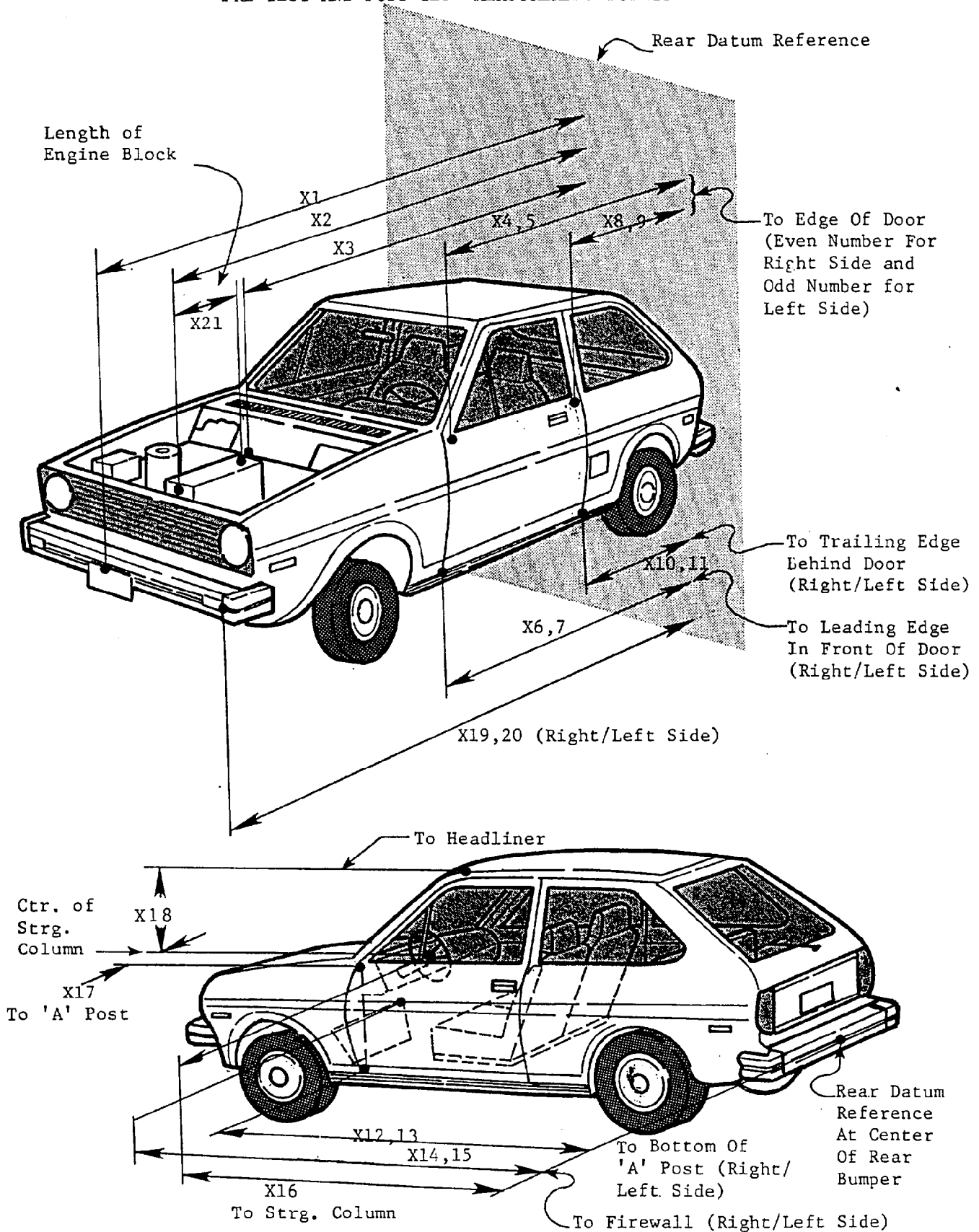


TABLE 4 IMPACTED VEHICLE MEASUREMENTS

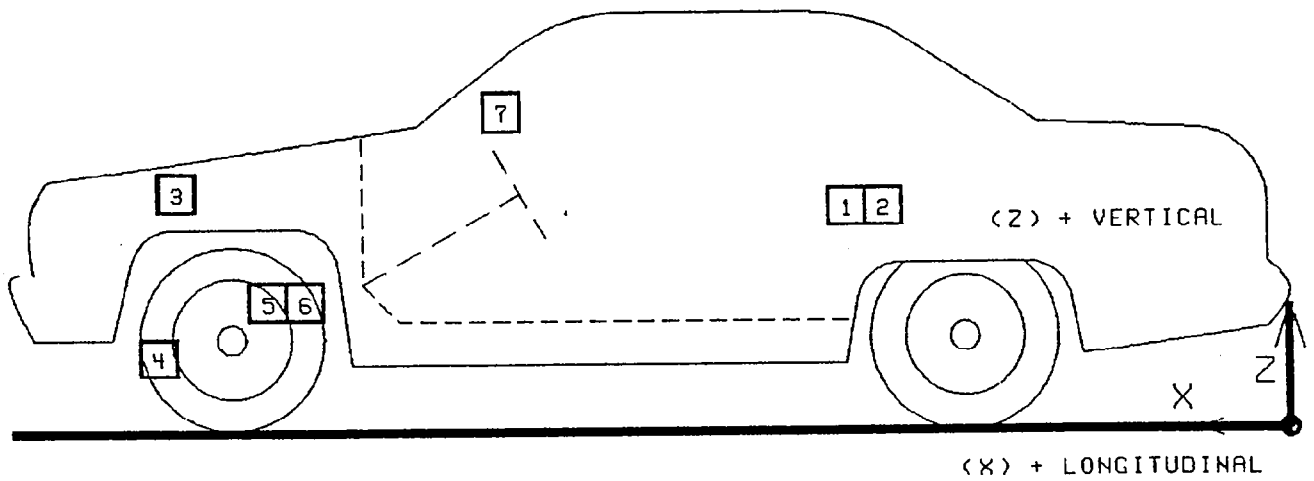
VEHICLE MAKE/MODEL: Ford/Taurus

TEST NUMBER: 920507

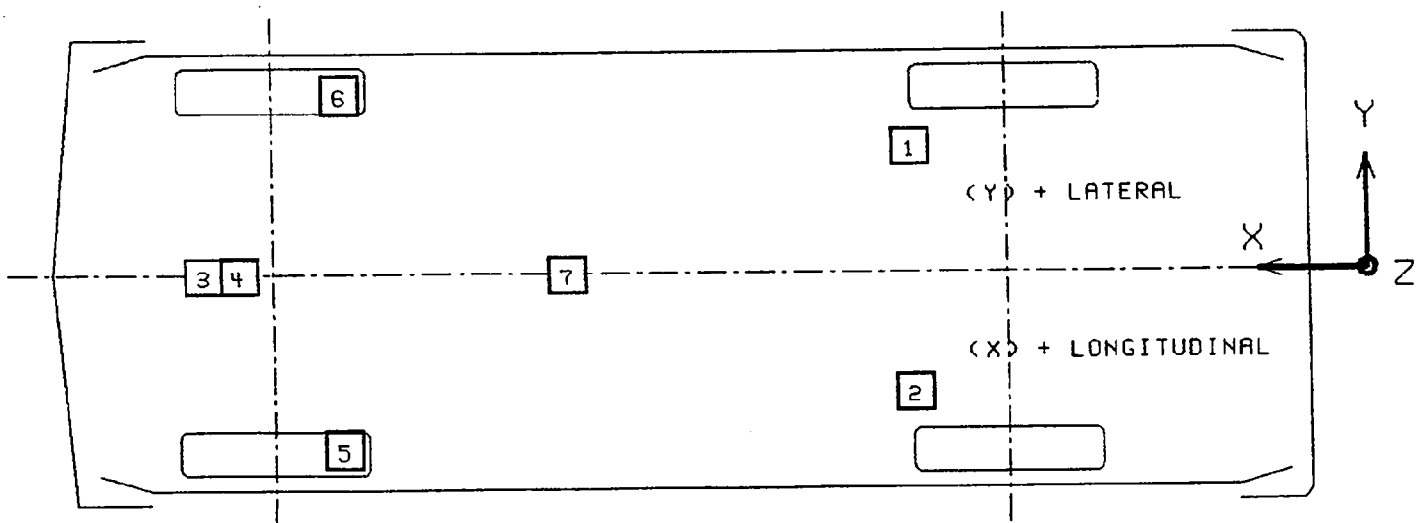
ALL MEASUREMENTS ARE IN MILLIMETERS

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	4799	4522	277
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	4239	4127	112
X3	REAR SURFACE OF VEHICLE TO FIREWALL	3625	3450	175
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	3307	3321	-14
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	3310	3208	102
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	3247	3244	3
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	3250	3200	50
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	2225	2241	-16
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	2225	2223	2
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	2208	2205	3
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	2208	2164	44
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	3209	3232	-23
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	3202	3121	81
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	3561	3605	-44
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	3565	3264	301
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	2824	2664	160
X17	CENTER OF STEERING COLUMN TO "A" POST	283	345	-62
X18	CENTER OF STEERING COLUMN TO HEADLINER	408	625	-217
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	4671	4691	-20
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	4675	4550	125
X21	LENGTH OF ENGINE BLOCK	410	410	0

FIGURE 4
VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 5

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 920507

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G	MSEC	MAX G	MSEC
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	1827	530	380	2.0	312.1	25.2	59.4
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	1845	545	394	2.2	262.5	25.7	60.4
3	ENGINE TOP LONGITUDINAL	4174	-125	745	50.4	30.8	---	--- Y
4	ENGINE BOTTOM LONGITUDINAL	3957	-62	217	---	--- Y	35.0	44.3
5	RIGHT BRAKE CALIPER LONGITUDINAL	3875	-690	312	11.4	54.5	41.5	61.1
6	LEFT BRAKE CALIPER LONGITUDINAL	3897	690	320	---	--- Y	---	--- Y
7	INSTRUMENT PANEL CENTER LONGITUDINAL	3223	8	956	25.3	110.8	66.1	91.9

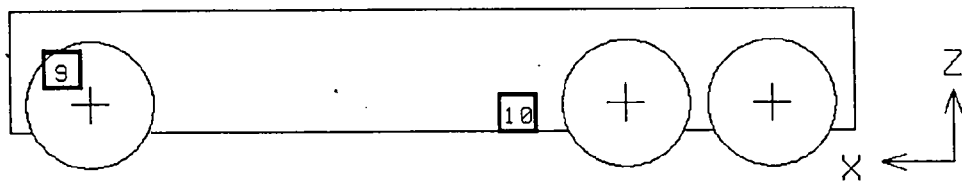
* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS.

REFERENCE: X: + FORWARD ACCELERATION
 Y: + LEFT FROM VEHICLE CENTERLINE
 Z: + UP FROM GROUND LEVEL

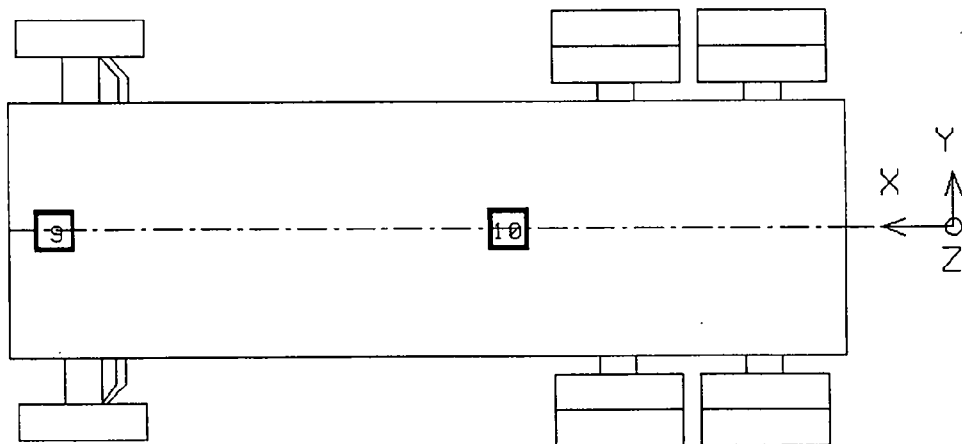
Y See TEST ANOMALIES

FIGURE 5

HEAVY TRUCK ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 6

TRUCK ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 920507

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
				MAX G	MSEC	MAX G	MSEC
9 FRONT FRAME	2527	0	1050				
CROSSMEMBER							
LONGITUDINAL				15.6	42.0	16.2	46.3
LATERAL				8.5	93.5	13.7	68.6
VERTICAL				13.4	67.5	12.3	37.4
RESULTANT				18.4	68.4		
10 CENTER OF GRAVITY	6160	0	658				
LONGITUDINAL				1.5	69.3	3.5	78.3
LATERAL				1.5	111.5	2.6	89.9

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS.

REFERENCE: X: + FORWARD FROM TRAILING EDGE OF TRUCK
 Y: + LEFT FROM TRUCK CENTERLINE
 Z: + UP FROM GROUND LEVEL

TABLE 7

DUMMY DATA SUMMARY

TEST NUMBER 920507

DRIVER DUMMY

SN: 048

POSITIVE DIRECTION		NEGATIVE DIRECTION	
MAX	MSEC	MAX	MSEC

HEAD ACCELERATION (g)

LONGITUDINAL	3.3	270.0	90.6	127.5
LATERAL	6.8	294.4	19.8	127.8
VERTICAL	2.7	35.4	39.5	111.4
RESULTANT	96.4	127.5		
HIC	501	FROM 108.5	TO 144.5	

NECK FORCE (N)

LONGITUDINAL	751.2	102.4	68.3	226.3
LATERAL	422.5	150.0	161.5	287.4
VERTICAL	1727.1	110.8	168.9	149.5
RESULTANT	1880.5	110.8		

NECK MOMENT (N-M)

ABOUT X	9.1	115.8	26.8	131.4
ABOUT Y	89.4	131.5	48.0	101.6
ABOUT Z	6.9	227.1	15.9	139.5
RESULTANT	93.4	131.5		

CHEST ACCELERATION (g)

LONGITUDINAL	2.4	296.6	33.4	92.6
LATERAL	3.3	84.1	13.9	113.3
VERTICAL	15.5	129.1	13.4	101.4
RESULTANT	34.7	94.9		
3 MSEC	33.5			

CHEST DEFLECTION (mm)

LONGITUDINAL	0.2	22.0	50.7	109.6
--------------	-----	------	------	-------

PELVIS ACCELERATION (g)

LONGITUDINAL	8.3	124.6	77.8	82.6
LATERAL	14.8	80.8	23.0	120.4
VERTICAL	15.2	116.8	6.3	78.9
RESULTANT	78.8	82.6		

TABLE 7

DUMMY DATA SUMMARY CONTINUED

TEST NUMBER 920507

DRIVER DUMMY

SN: 048

POSITIVE		NEGATIVE	
DIRECTION		DIRECTION	
MAX	MSEC	MAX	MSEC

FEMUR LOAD (N)

LEFT	209.0	320.4	4944.1	90.4
RIGHT	732.7	145.0	7416.4	82.8

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD
FORCE: TENSION

NEGATIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD
FORCE: COMPRESSION

TABLE 8 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #048	PASSENGER # NA
HEAD	<u>Instrument panel</u>	<u></u>
CHEST	<u>Steering wheel</u>	<u></u>
ABDOMEN	<u>Steering wheel</u>	<u></u>
LEFT KNEE	<u>Instrument panel</u>	<u></u>
RIGHT KNEE	<u>Instrument panel</u>	<u></u>

DOOR OPENING:

	LEFT	RIGHT
FRONT	<u>Easy</u>	<u>Easy</u>
REAR	<u>Easy</u>	<u>Easy</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	<u>None</u>	<u>None</u>
REAR	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

The entire front windshield and driver's door
glass cracked on impact.

OTHER NOTABLE IMPACT EFFECTS:

The vehicle battery ejected at impact.

DUMMY KINEMATIC SUMMARY

The dummy head and torso translated forward at impact. The head contacted the top of the instrument panel and the hands and knees contacted the front of the instrument panel. The dummy torso impacted the steering wheel. The dummy rebounded into the seat, restrained by the 3-point unbelt.

FIGURE 6 DUMMY AND SEAT POSITIONING DATA

PRE-IMPACT DATA:

MAKE/MODEL: Ford/Taurus
 BODY STYLE: 4-door sedan MODEL YEAR: 1986
 COLOR: Red

DATA FROM CERTIFICATION LABEL:

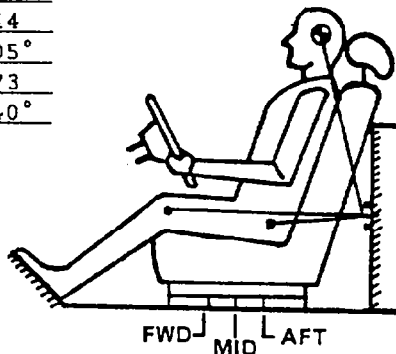
VEHICLE MANUFACTURER: Ford Motor Company
 DATE OF MANUFACTURE: 06/86 VIN: 1FABP29U1GA1900833
 GVWR: 4550 LBS.; GAWR: FRONT = 2514 LBS.; REAR = 2071 LBS.

POST-IMPACT DATA:

DATE OF TEST: 05/07/92 TIME: 1512 TEMPERATURE: 19 ° C
 IMPACT VELOCITY: PRIMARY = 64.9 MPH SECONDARY = 64.9 MPH
 REQUIRED IMPACT VELOCITY RANGE: 63.9 TO 64.9 MPH
 SEAT TYPE: Bucket ADJUSTER TYPE: Power
 FRONT SEAT BACK TYPE: Reclining
 TECHNICIANS: _____

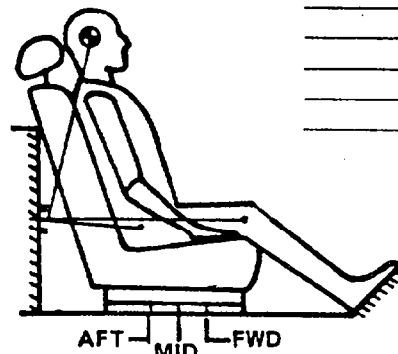
DRIVER DUMMY # 048 TYPE: HIII

HEAD 450
 TARGET 9°
 KNEE 614
 JOINT 105°
 APPROX- 273
 IMATE 140°
 "H"
 POINT

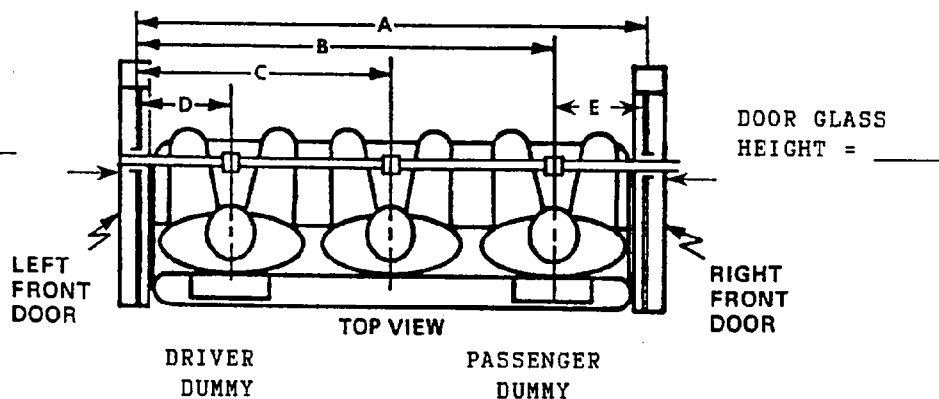


PASSENGER DUMMY # NA TYPE: _____

HEAD
 TARGET
 KNEE
 JOINT
 APPROX-
 IMATE
 "H"
 POINT



A = 1305
 B = NA
 C = NA
 D = 375
 E = NA
 DOOR GLASS
 HEIGHT = 193



ALL ANGLES ARE RELATIVE TO VERTICAL PLANE THROUGH DOOR STRIKER.
 ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 7 DUMMY IN VEHICLE POSITIONING DATA

	DRIVER	PASSENGER
	048	NA
HH	374	
HW	570	
CD	579	
CS	355	
KDL	137	
KDR	135	
TA	18°	
SA	23°	
HSW	470	

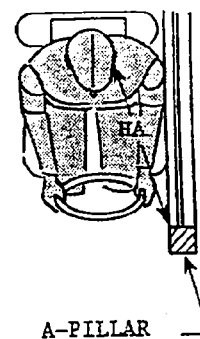
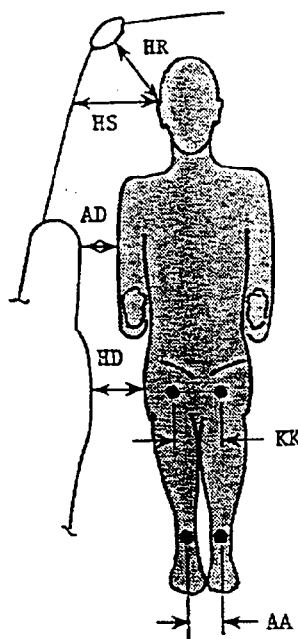
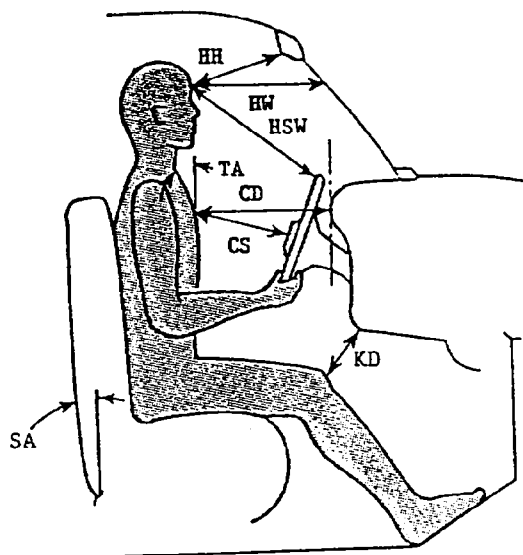
	DRIVER	PASSENGER
	048	NA
HR	193	
HS	265	
AD	122	
HD	200	
KK	210	
AA	250	
HA	562	

KNEE OUTER CLEVIS TO OUTER
CLEVIS SPACING:

DRIVER = 270

PELVIS ANGLE:

DRIVER = 24°

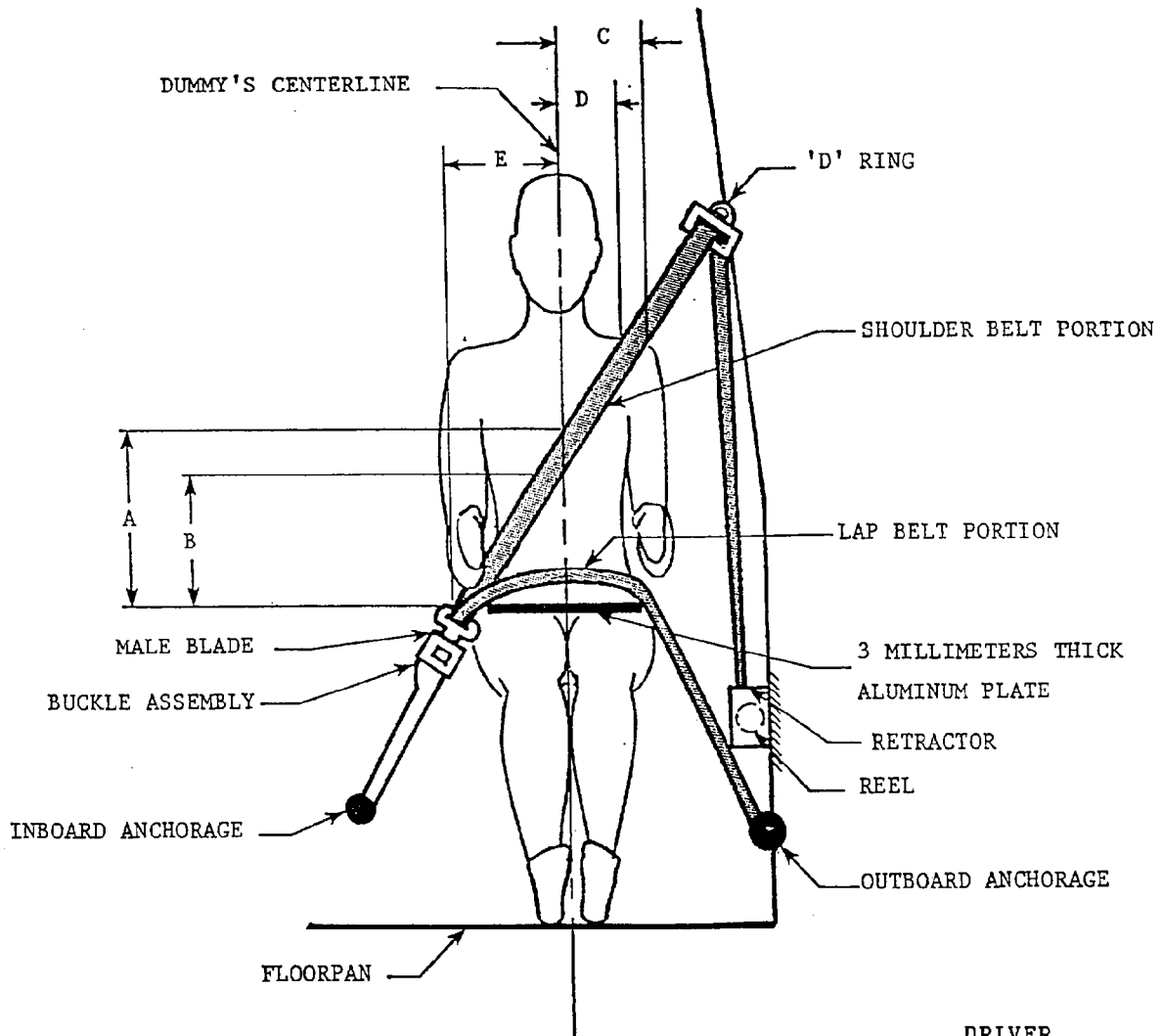


HH = HEAD TO WINDSHIELD HEADER
HW = HEAD TO WINDSHIELD
CD = CHEST TO DASH
CS = CHEST TO STEERING WHEEL
KD = KNEE TO DASH
TA = TORSO ANGLE
SA = SEAT BACK ANGLE
HSW = HEAD TO STEERING WHEEL

HR = HEAD C.G. TARGET TO SIDE ROOF HEADER
HS = HEAD C.G. TARGET TO SIDE WINDOW
AD = ARM TO DOOR
HD = HIP TO DOOR
KK = KNEE TO KNEE
AA = ANKLE TO ANKLE
HA = HEAD C.G. TARGET TO A-PILLAR

TORSO AND SEAT BACK ANGLES ARE RELATIVE TO VERTICAL.
ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

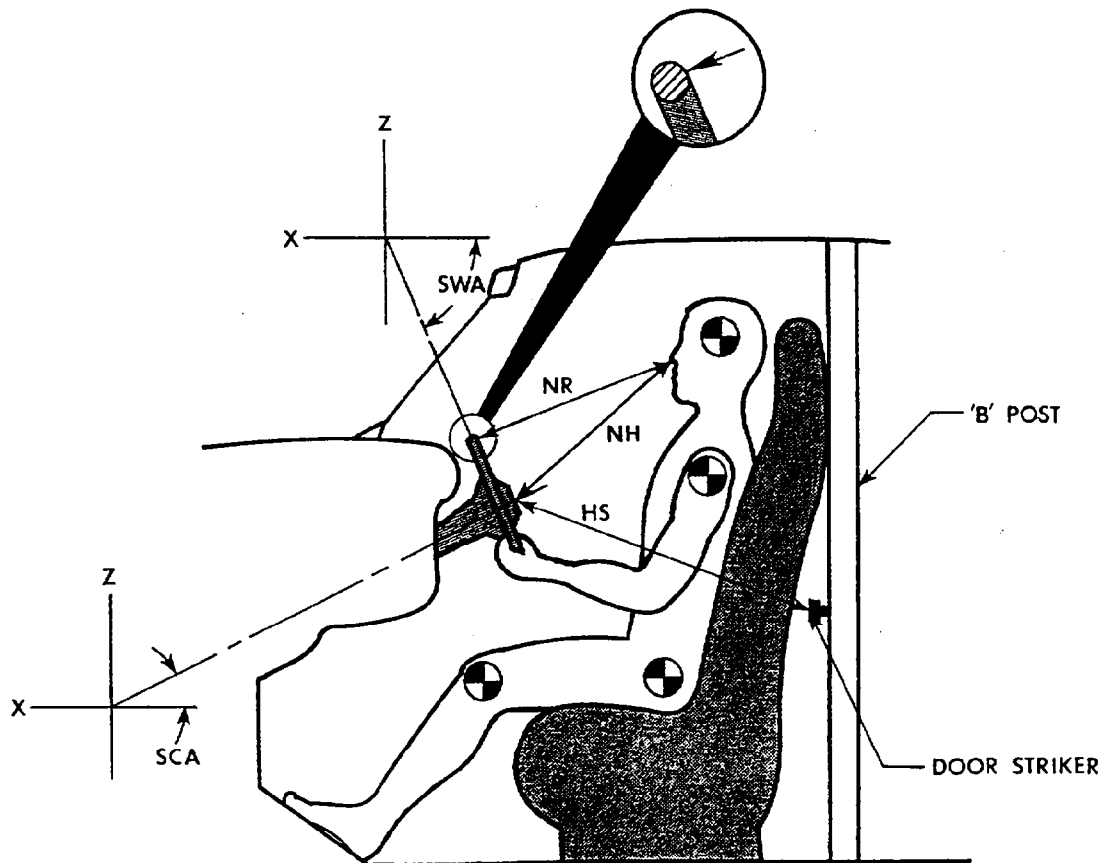
FIGURE 8 SEAT BELT POSITIONING DATA



	DRIVER DUMMY
A - TOP SURFACE OF ALUMINUM PLATE TO BELT UPPER EDGE	350
B - TOP SURFACE OF ALUMINUM PLATE TO BELT LOWER EDGE	260
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	138
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	80
E - DUMMY CENTERLINE TO INTERSECTION OF UPPER TORSO BELT AND LAP BELT	170

ALL MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 9 DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSEMBLY DATA



POSITION OF STEERING COLUMN TILTING AND TELESCOPING ADJUSTMENTS, IF ANY:
The steering column was fastened in the 3rd adjustment position from the bottom.

MEASUREMENTS

NR	- DISTANCE FROM TIP OF DUMMY'S NOSE TO TOP REAR SURFACE OF STEERING WHEEL RIM.	435
NH	- DISTANCE FROM TIP OF DUMMY'S NOSE TO CENTER OF STEERING COLUMN HUB.	440
HS	- DISTANCE FROM CENTER OF STEERING COLUMN HUB TO THE FORWARD SURFACE OF THE DOOR LOCK STRIKER PIN.	580
SCA	- ANGLE OF STEERING COLUMN RELATIVE TO THE HORIZONTAL X AXIS	22°
SWA	- ANGLE OF STEERING WHEEL RELATIVE TO THE HORIZONTAL X AXIS	68°

ALL DISTANCE MEASUREMENTS ARE IN MILLIMETERS.

FIGURE 10
CAMERA POSITIONS

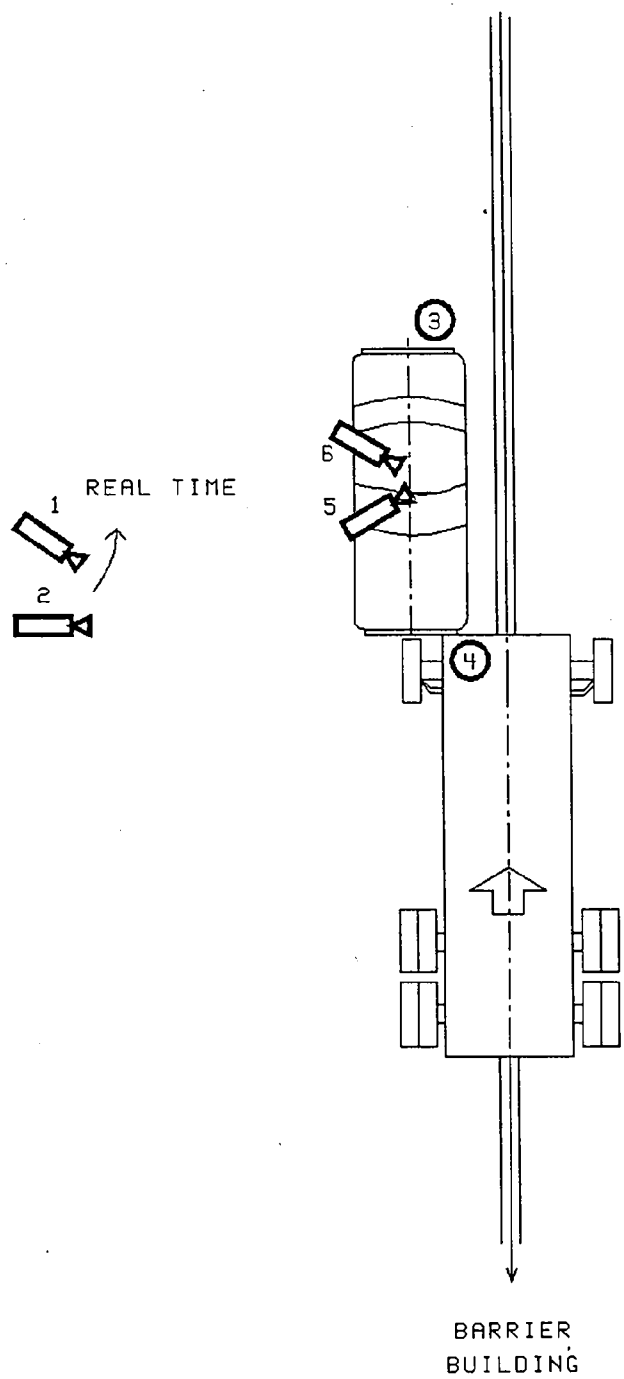


TABLE 9 MOTION PICTURE CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Left panning	Bolex	13	24	Real-time documentation
2	Left wide	Photosonic	13	1000	Vehicle dynamics
3	Overhead wide	Photosonic	8	998	Vehicle dynamics
4	Onboard truck	Photosonic	13	1000	Dummy kinematics
5	Onboard car front	Photosonic	8	498	Dummy kinematics
6	Onboard car rear	Photosonic	8	498	Dummy kinematics

APPENDIX A

PHOTOGRAPHS



Figure A-1. PRE-TEST FRONT VIEW



Figure A-2. POST-TEST FRONT VIEW



Figure A-3. PRE-TEST LEFT SIDE VIEW



Figure A-4. POST-TEST LEFT SIDE VIEW



Figure A-5. PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-6. POST-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-7. PRE-TEST REAR VIEW



Figure A-8. POST-TEST REAR VIEW



Figure A-9. PRE-TEST RIGHT SIDE VIEW



Figure A-10. POST-TEST RIGHT SIDE VIEW



Figure A-11. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-12. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

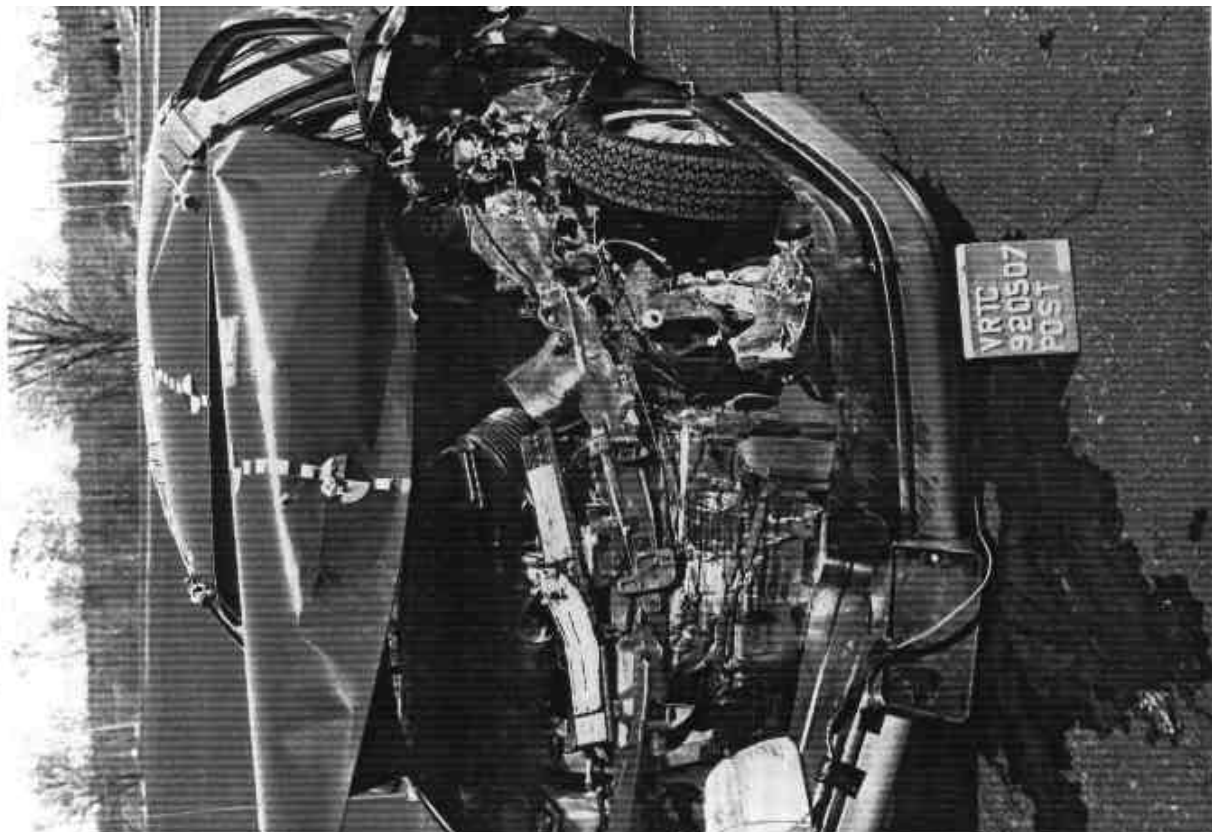


Figure A-13. POST-TEST VEHICLE DAMAGE CLOSE-UP - VIEW 1



Figure A-14. POST-TEST VEHICLE DAMAGE CLOSE-UP - VIEW 2



Figure A-15. POST-TEST VEHICLE DAMAGE CLOSE-UP - VIEW 3



Figure A-16. PRE-TEST BUMPER ENGAGEMENT - VIEW 1

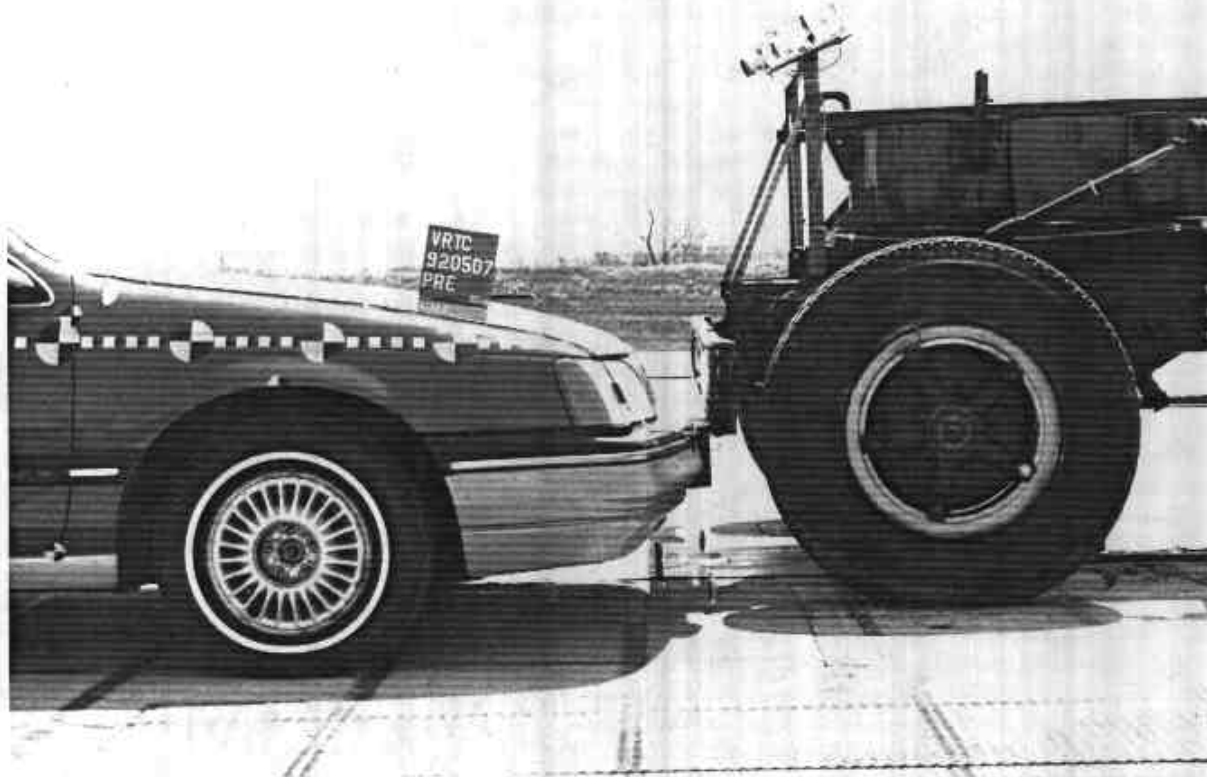


Figure A-17. PRE-TEST BUMPER ENGAGEMENT - VIEW 2



Figure A-18. PRE-TEST BUMPER ENGAGEMENT - VIEW 3

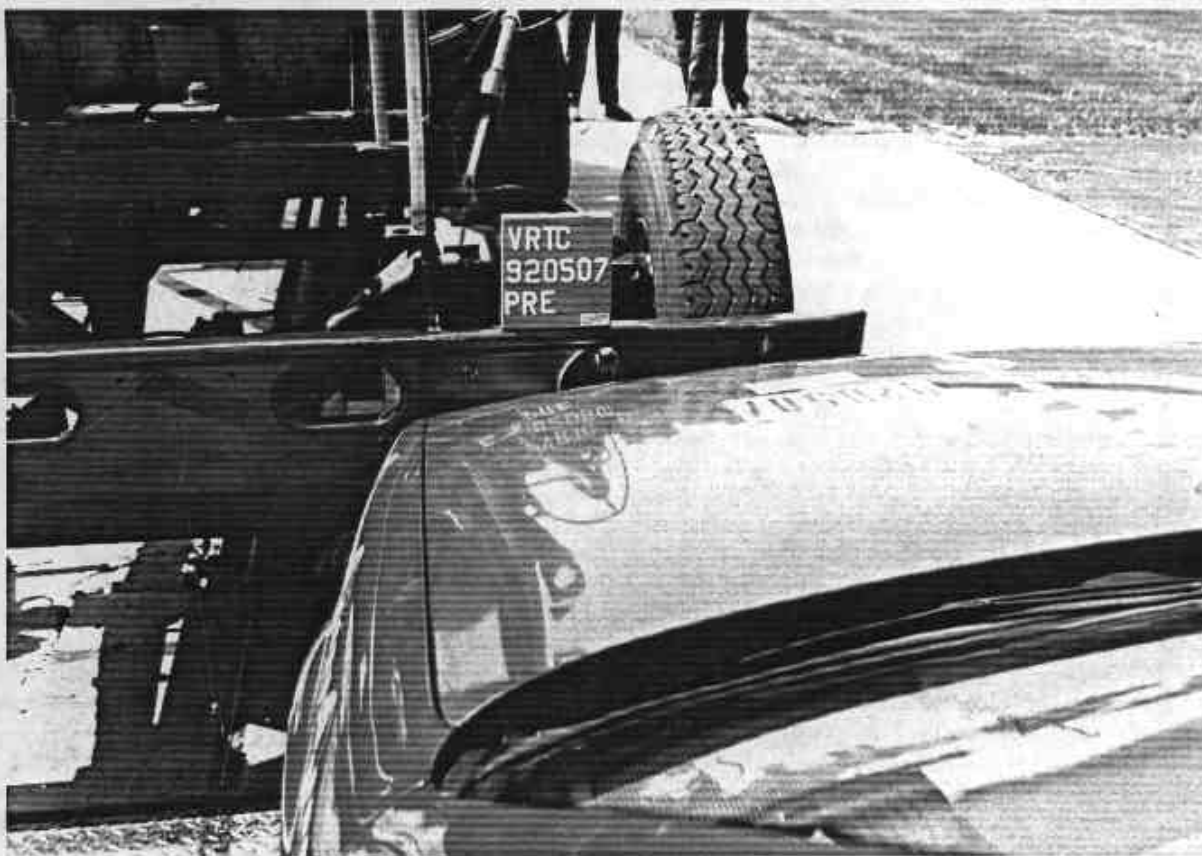


Figure A-19. PRE-TEST BUMPER ENGAGEMENT - VIEW 4

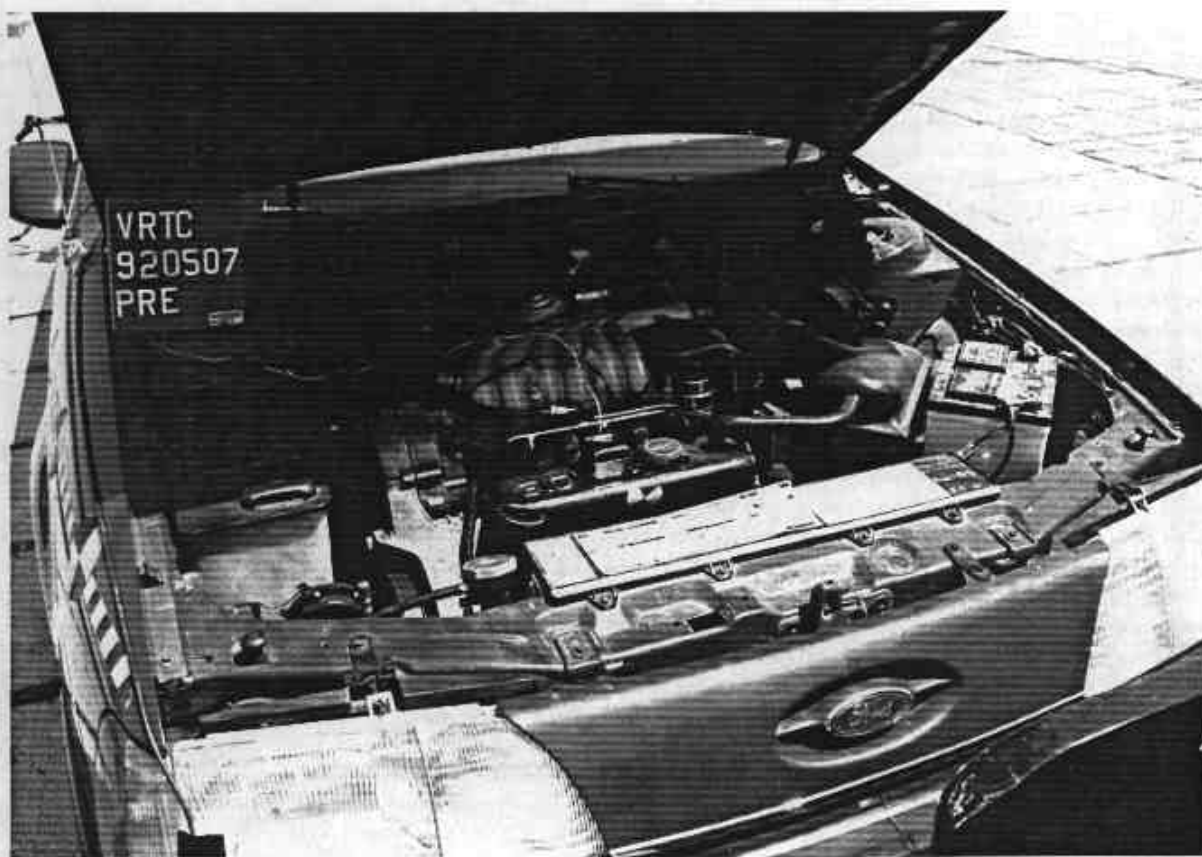


Figure A-20. PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-21. PRE-TEST WINDSHIELD VIEW

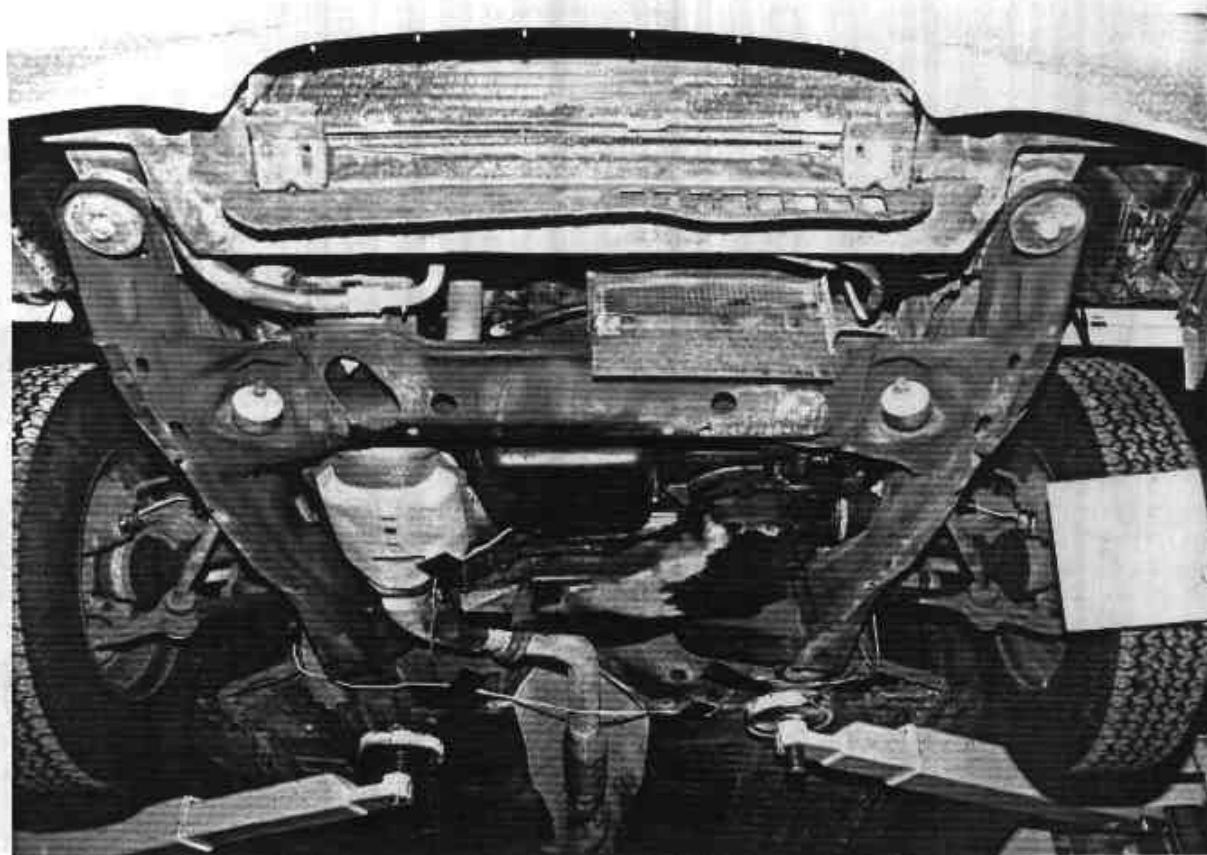


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW

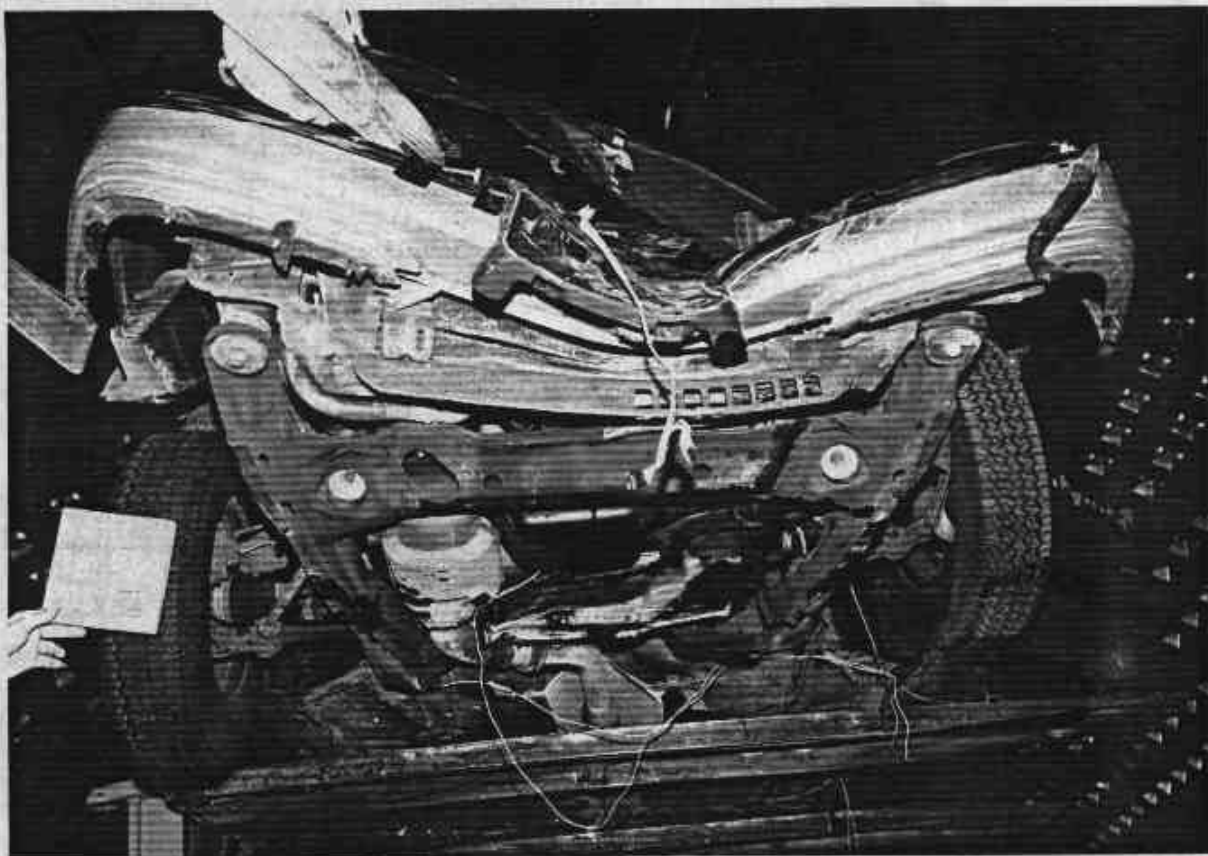


Figure A-23. POST-TEST FRONT UNDERBODY VIEW

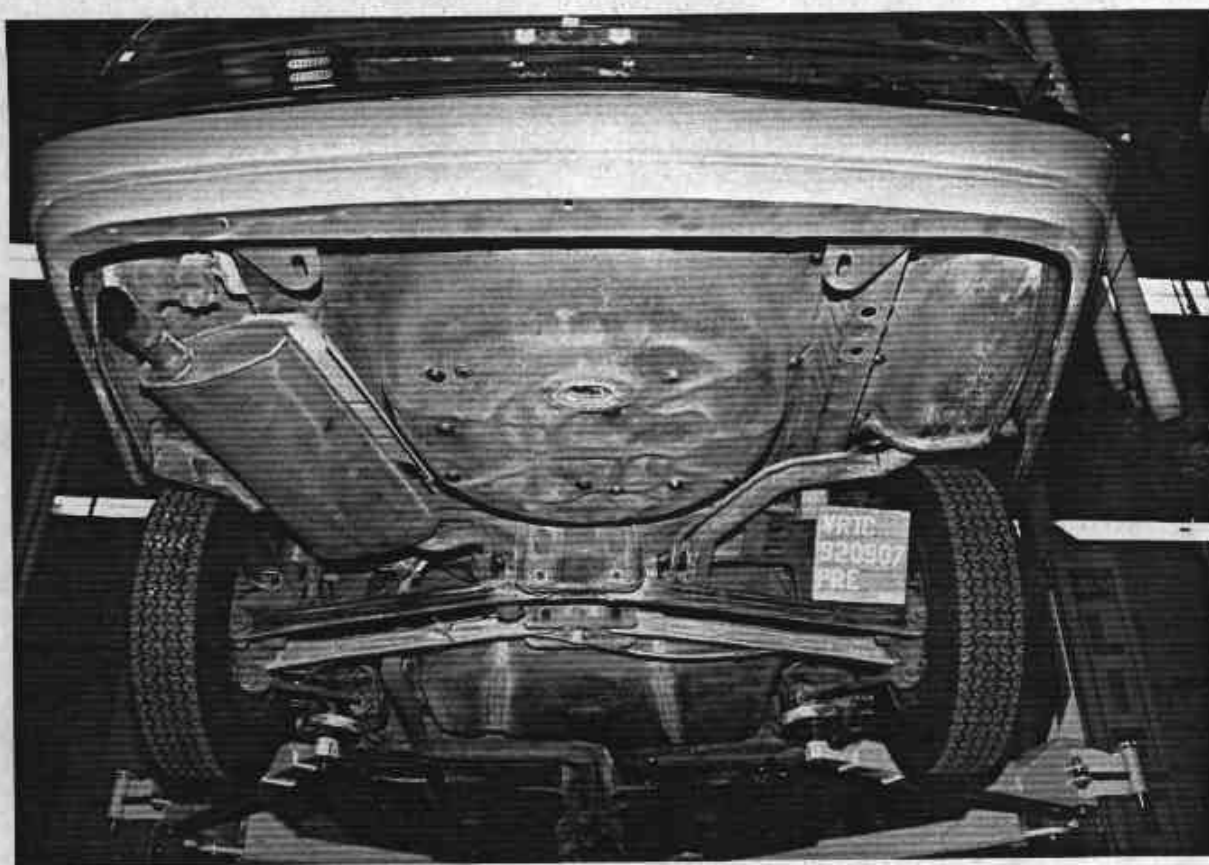


Figure A-24. PRE-TEST REAR UNDERBODY VIEW

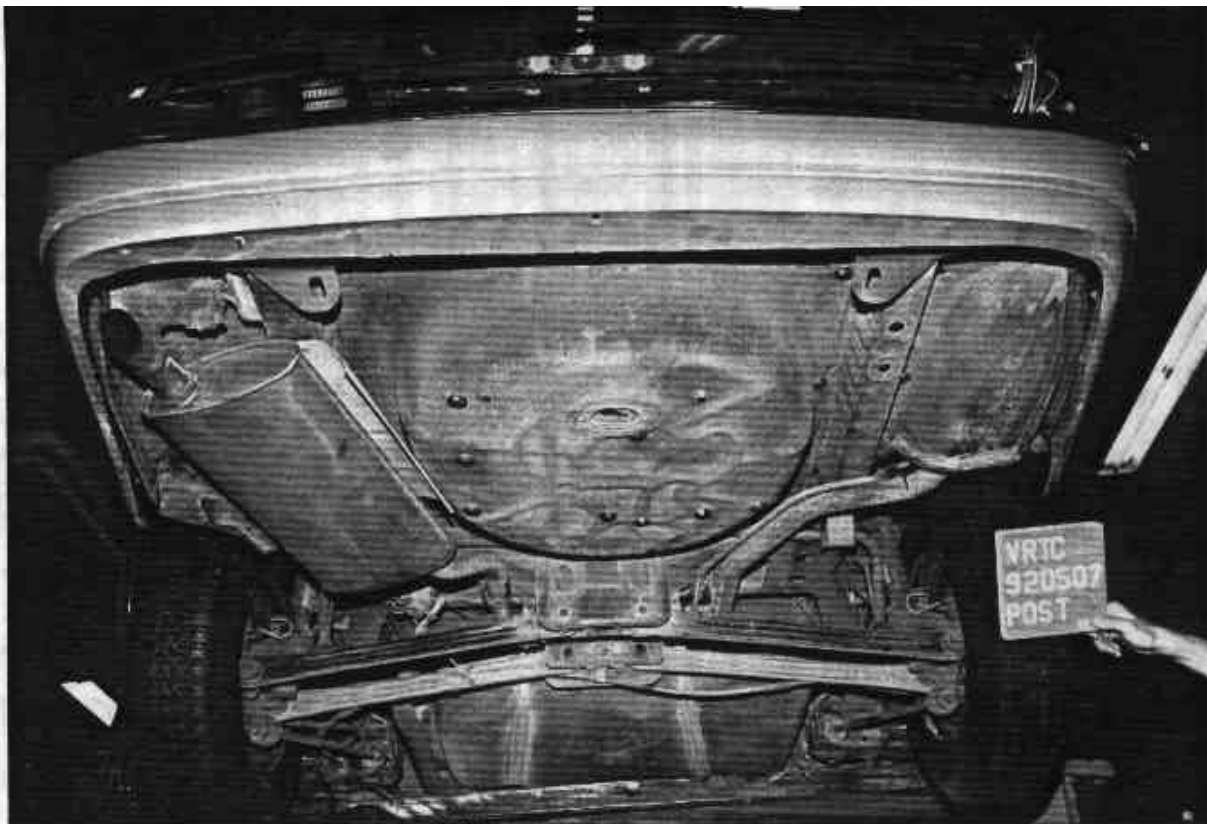


Figure A-25. POST-TEST REAR UNDERBODY VIEW



Figure A-26. PRE-TEST TRUCK FRONT VIEW

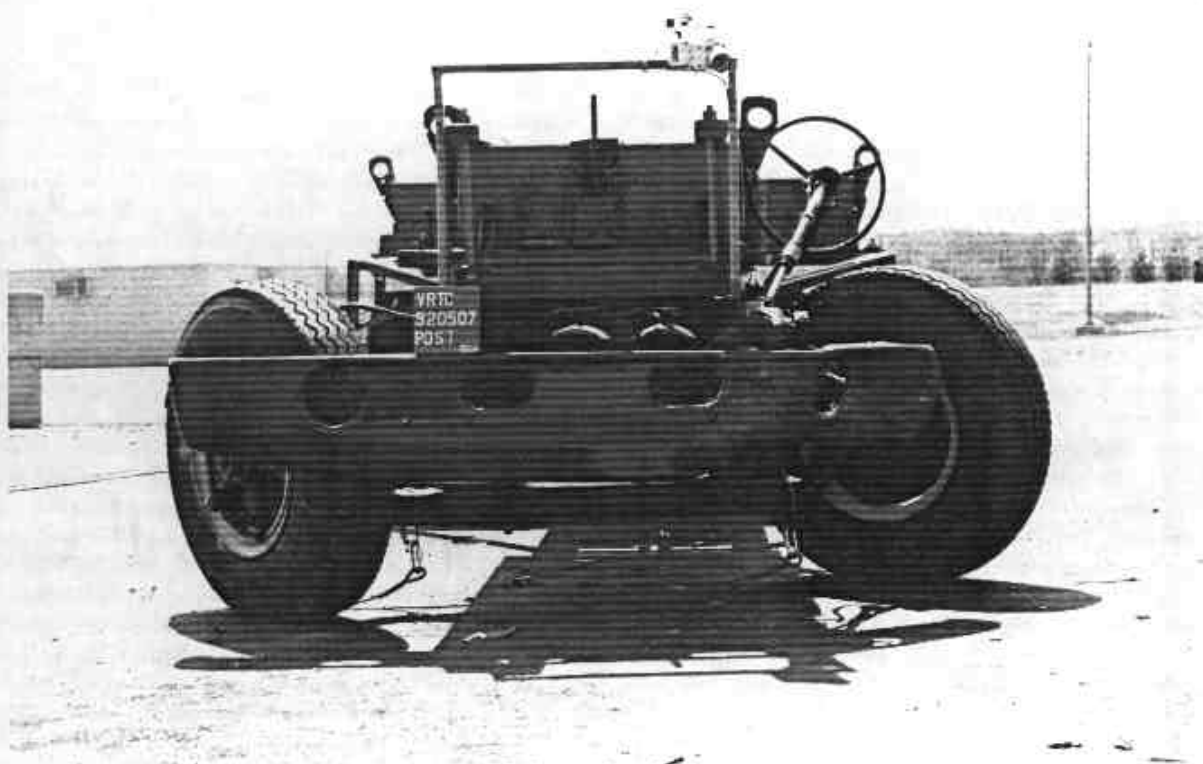


Figure A-27. POST-TEST TRUCK FRONT VIEW

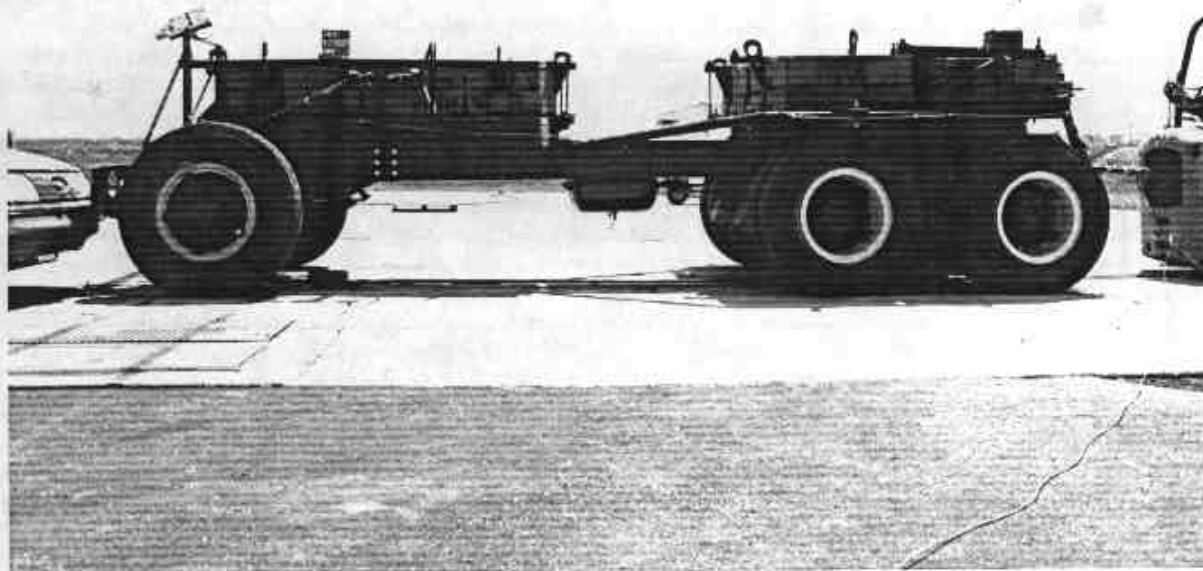


Figure A-28. PRE-TEST TRUCK LEFT SIDE VIEW

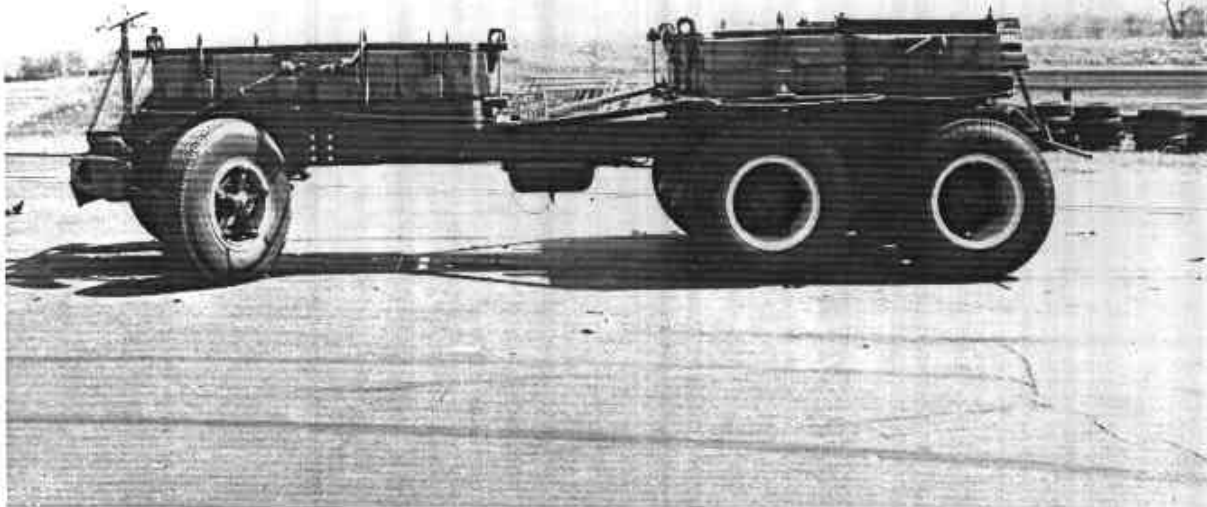


Figure A-29. POST-TEST TRUCK LEFT SIDE VIEW



Figure A-30. POST-TEST TRUCK DAMAGE CLOSE-UP - VIEW 1



Figure A-31. POST-TEST TRUCK DAMAGE CLOSE-UP - VIEW 2

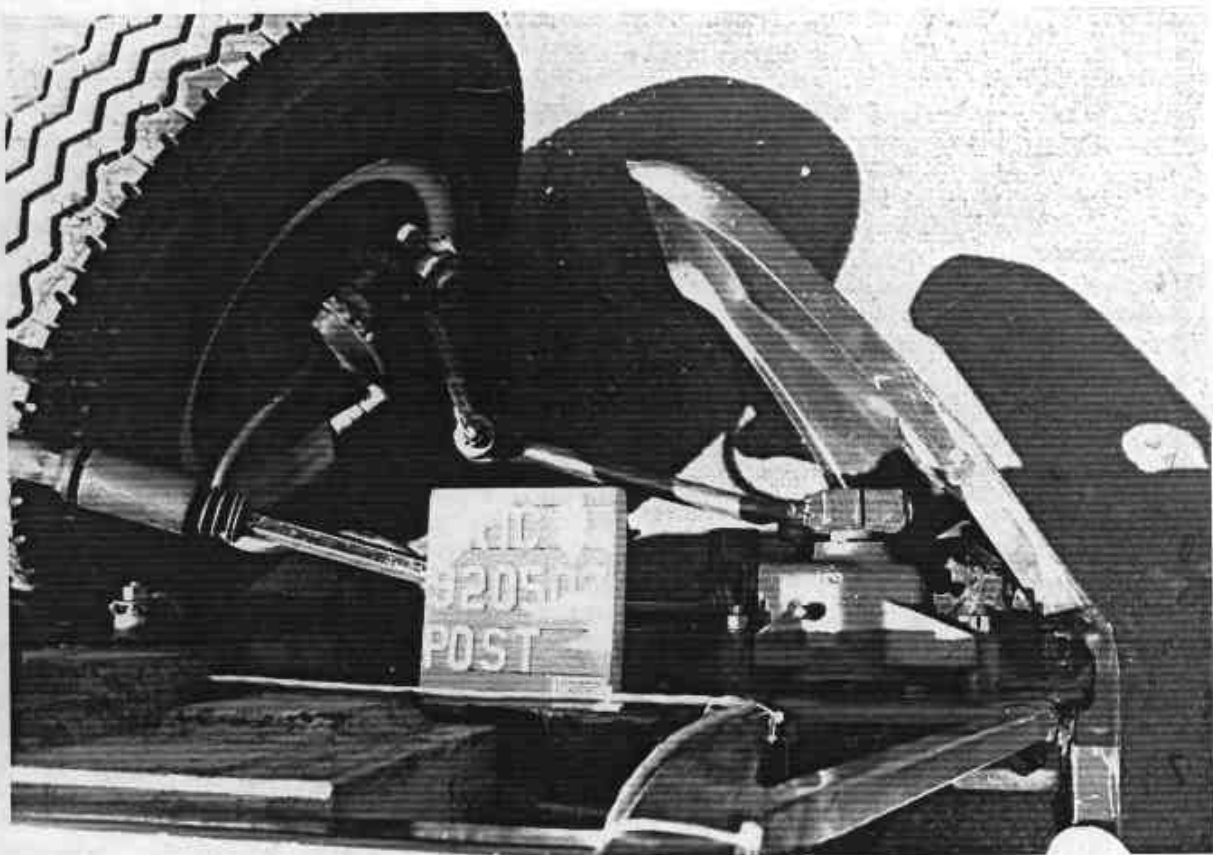


Figure A-32. POST-TEST TRUCK DAMAGE CLOSE-UP - VIEW 3



Figure A-33. PRE-TEST DUMMY VIEW



Figure A-34. POST-TEST DUMMY VIEW



Figure A-35. PRE-TEST VEHICLE INTERIOR AND DUMMY - VIEW 1

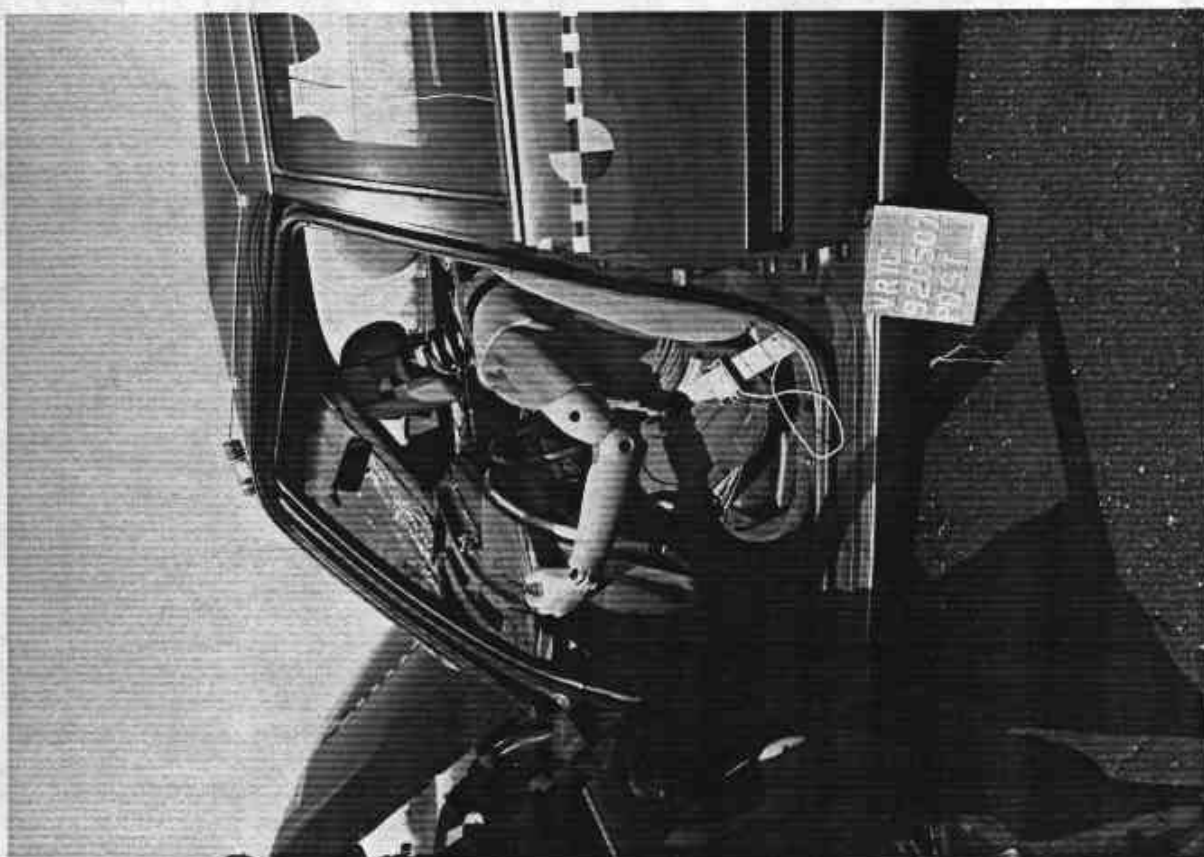


Figure A-36. POST-TEST VEHICLE INTERIOR AND DUMMY - VIEW 1



Figure A-37. PRE-TEST VEHICLE INTERIOR AND DUMMY - VIEW 2



Figure A-38. POST-TEST VEHICLE INTERIOR AND DUMMY - VIEW 2

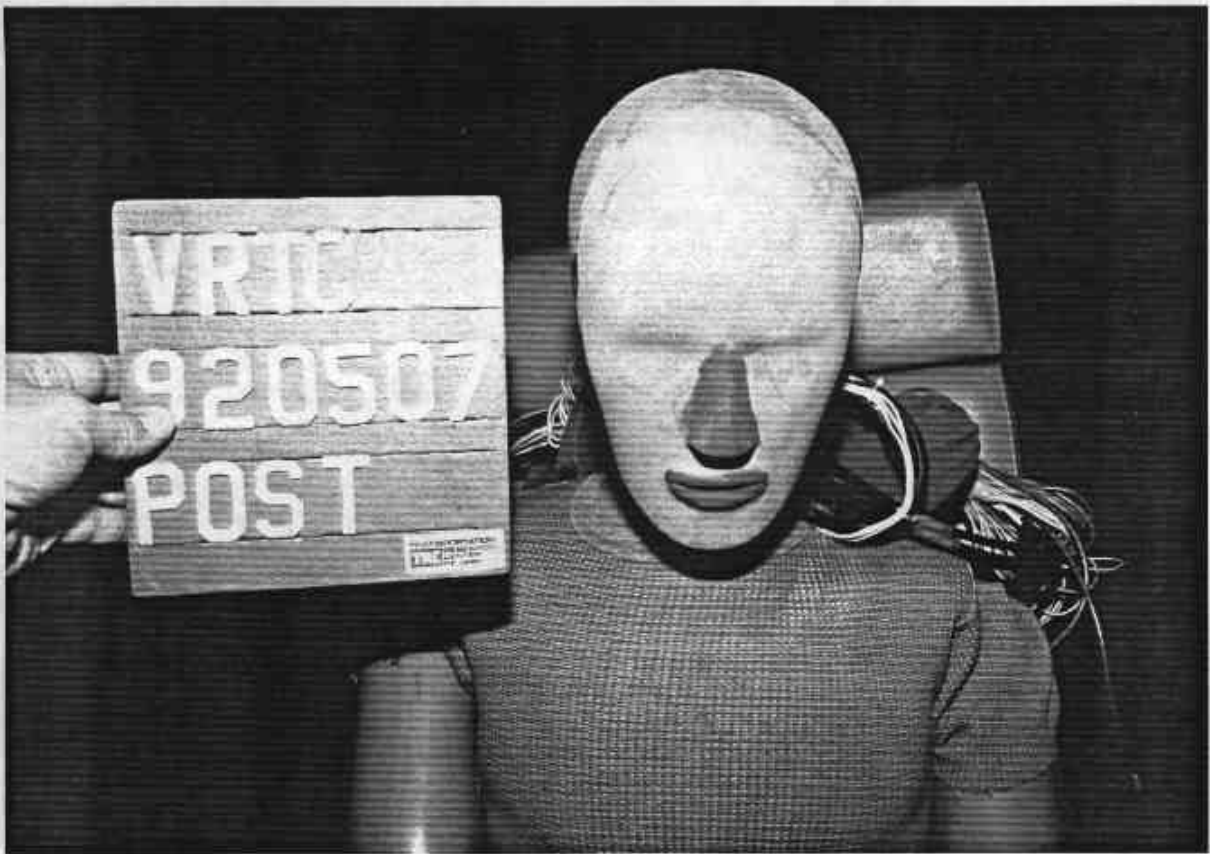


Figure A-39. POST-TEST DUMMY HEAD CONTACT - VIEW 1

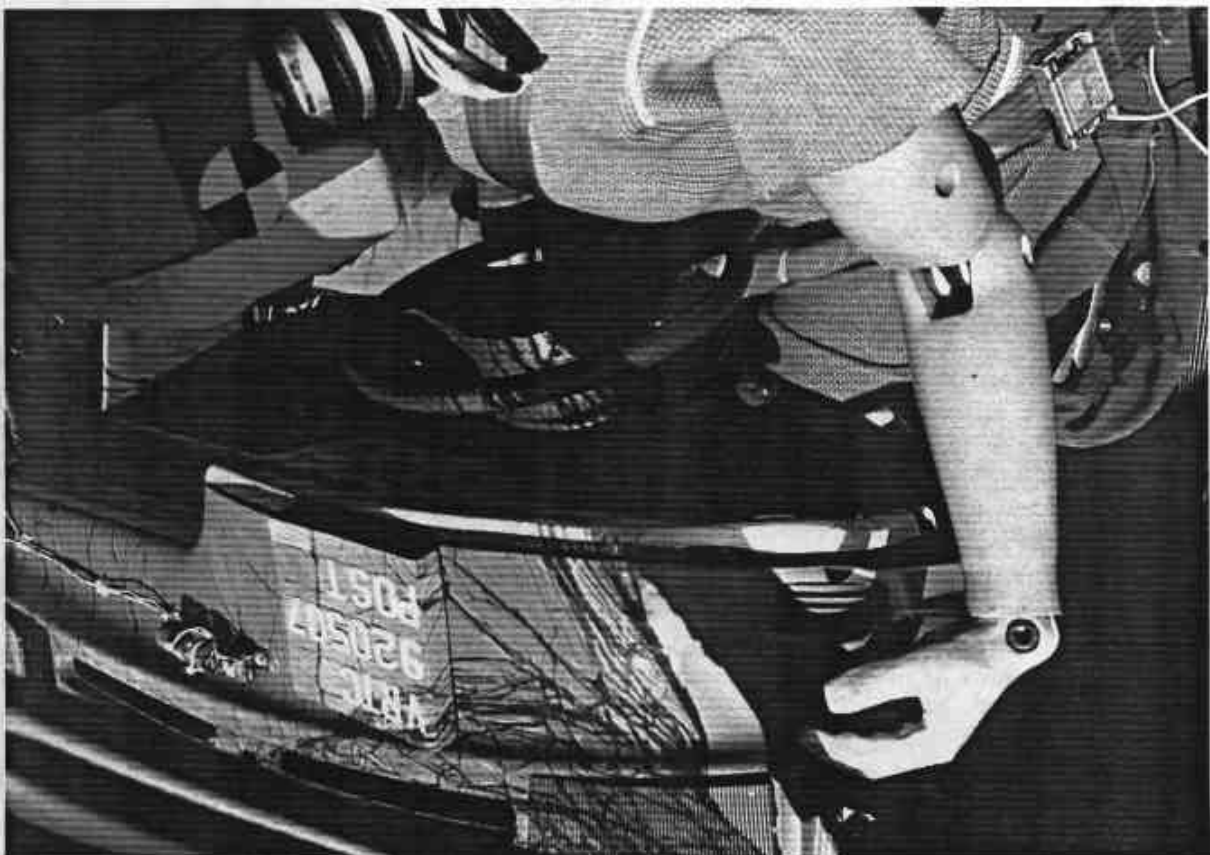


Figure A-40. POST-TEST DUMMY HEAD CONTACT - VIEW 2



Figure A-41. POST-TEST DUMMY HEAD CONTACT - VIEW 3



Figure A-42. POST-TEST DUMMY KNEE CONTACT - VIEW 1

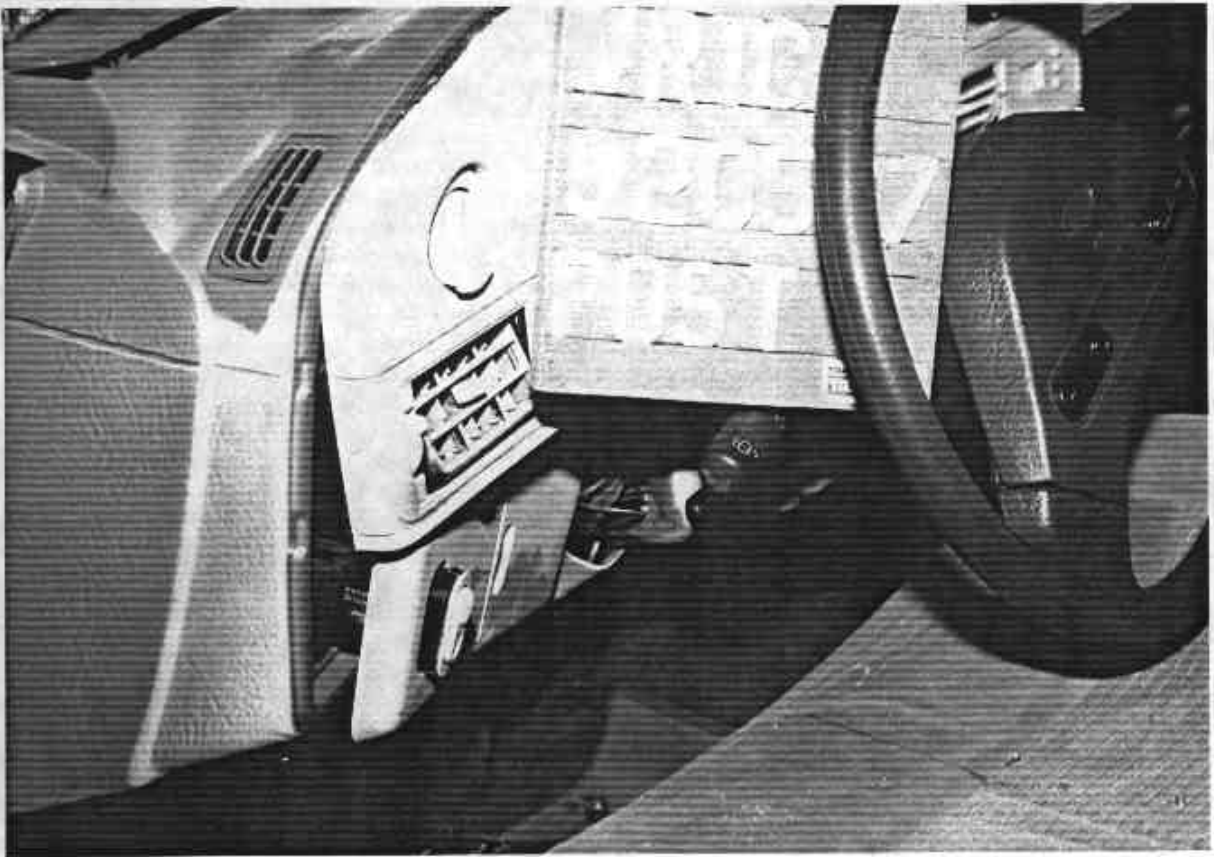


Figure A-43. POST-TEST DUMMY KNEE CONTACT - VIEW 2

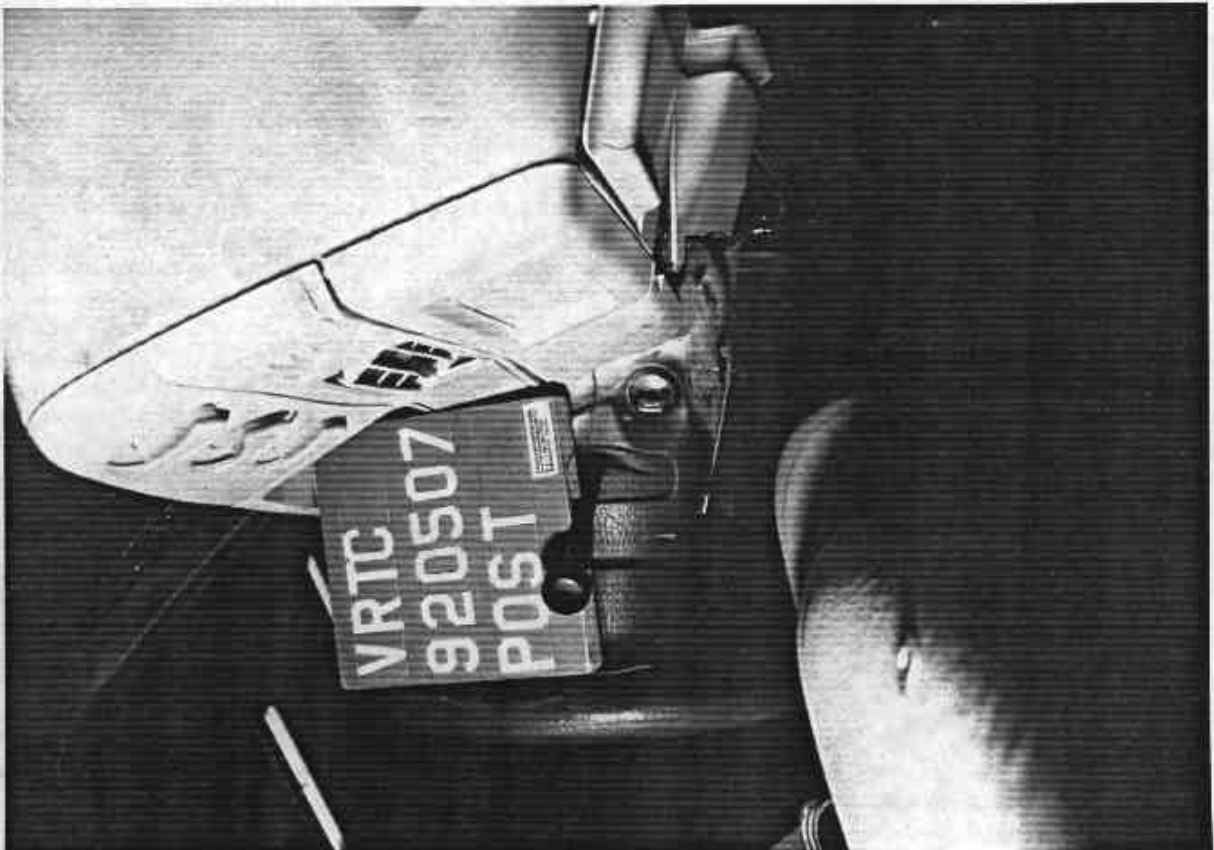


Figure A-44. POST-TEST DUMMY KNEE CONTACT - VIEW 3



Figure A-45. POST-TEST VEHICLE SKID MARKS - VIEW 1



Figure A-46. POST-TEST VEHICLE SKID MARKS - VIEW 2

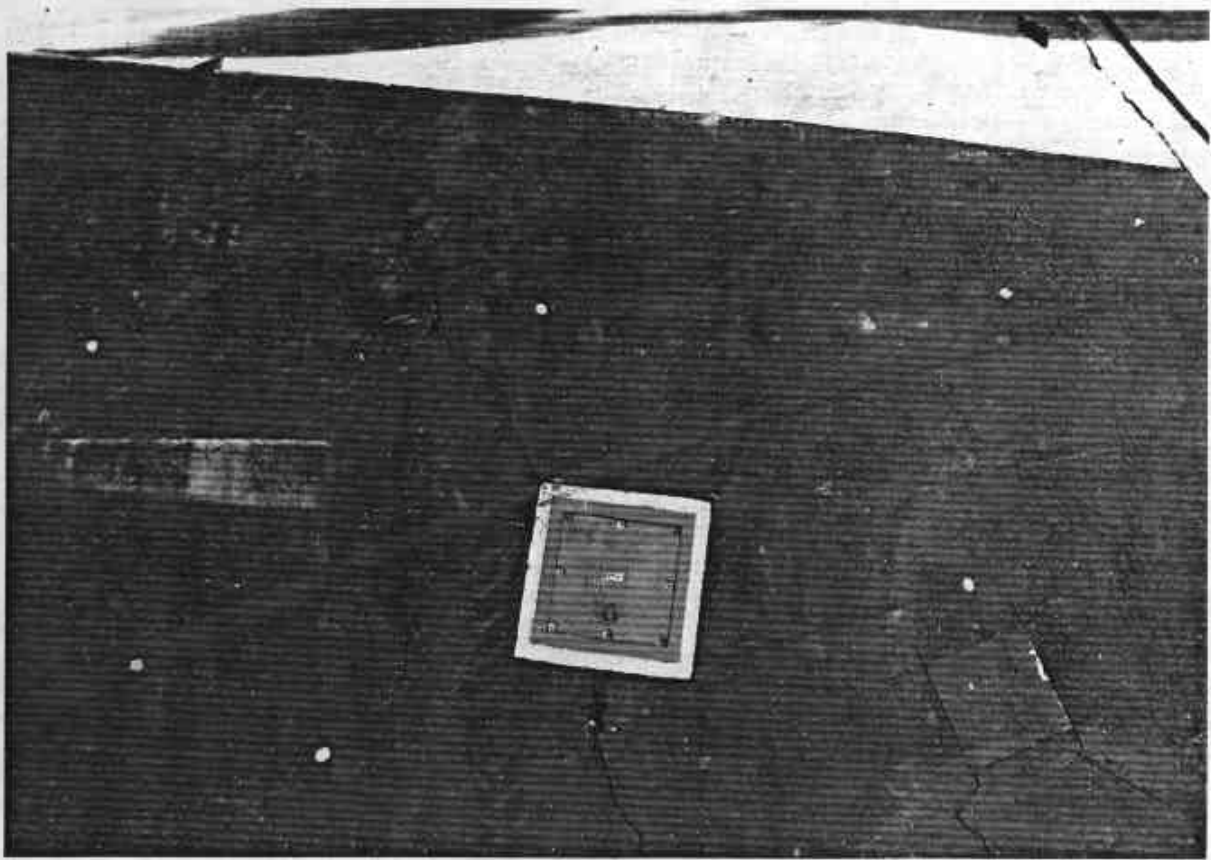


Figure A-47. POST-TEST VEHICLE SKID MARKS - VIEW 3

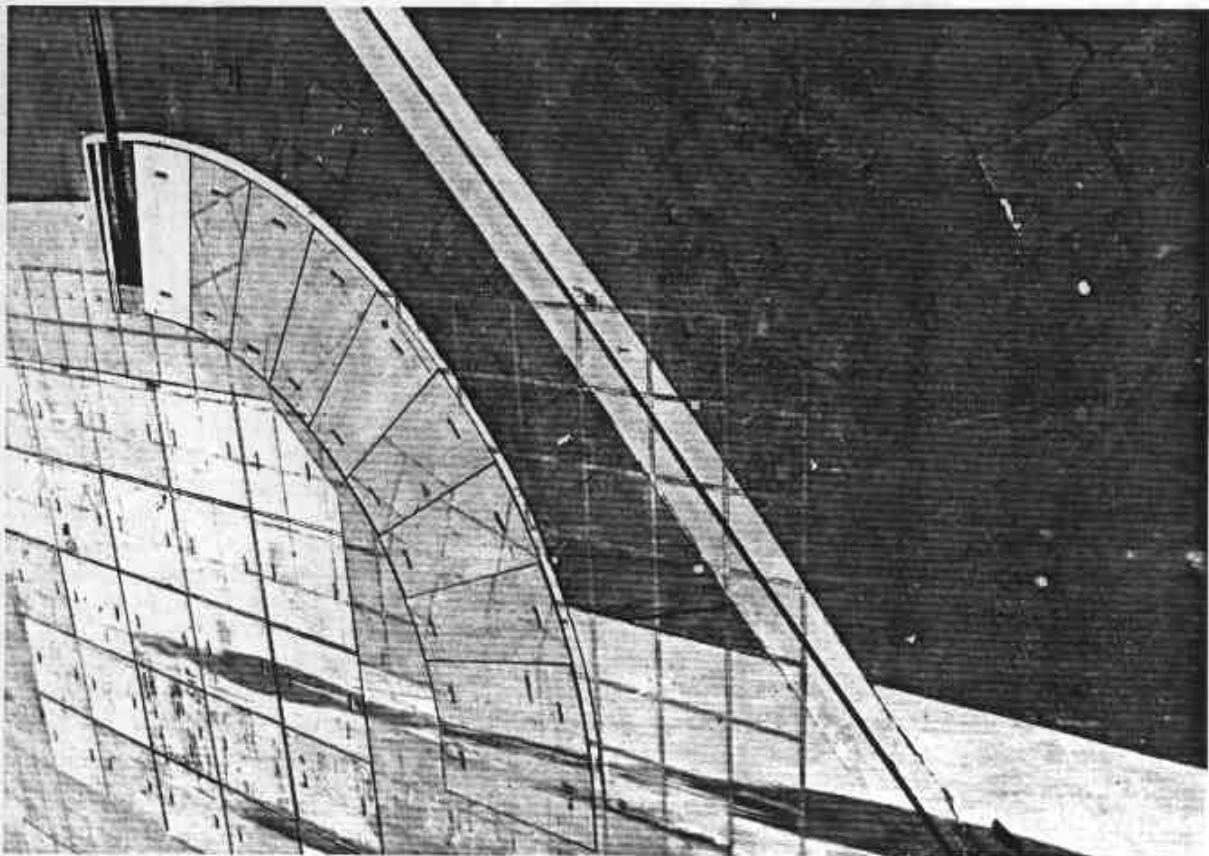


Figure A-48. POST-TEST VEHICLE SKID MARKS - VIEW 4

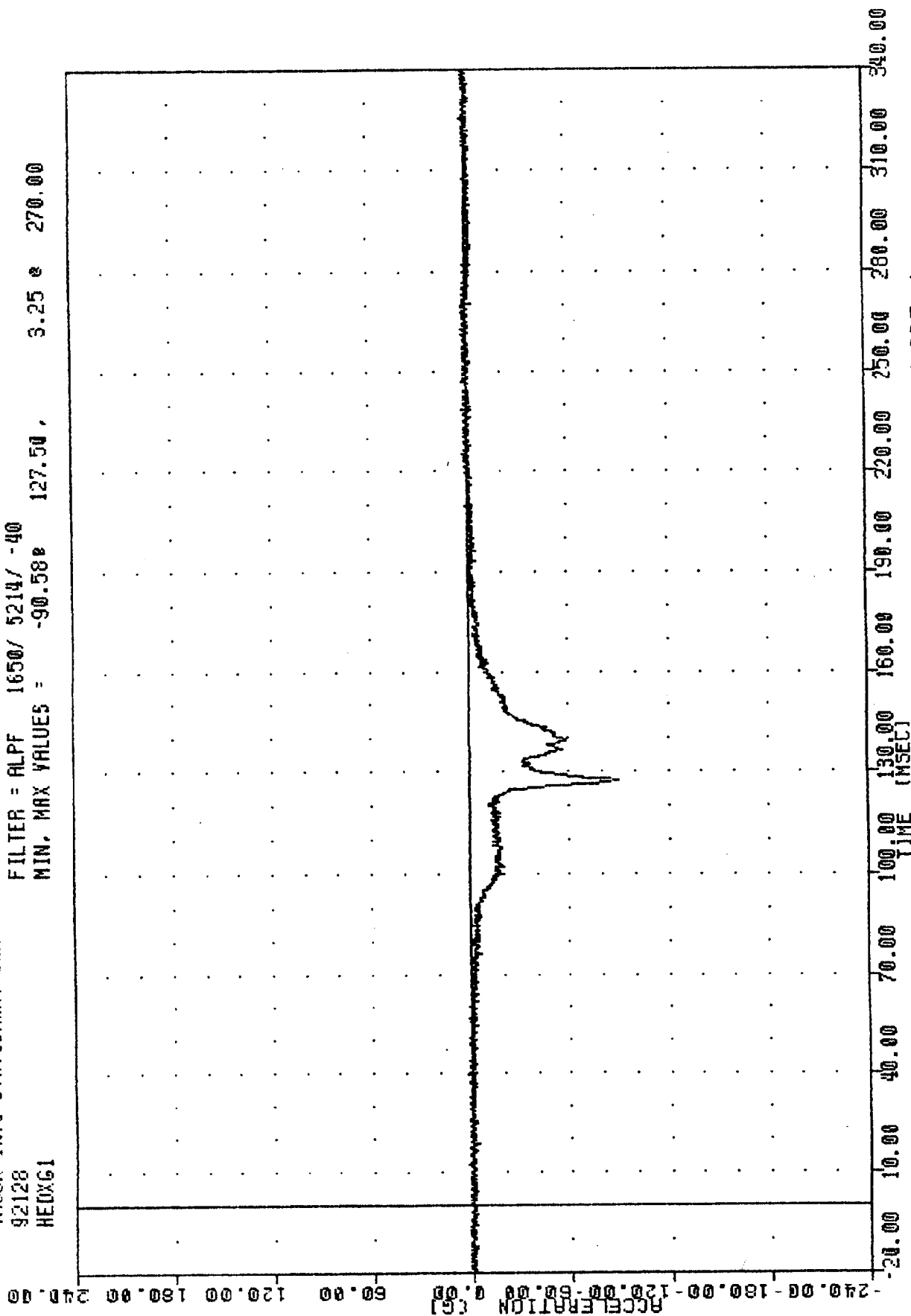
APPENDIX B

DATA PLOTS

TRC
TRUCK INTO STATIONARY CAR
92128
HE0XG1

920507

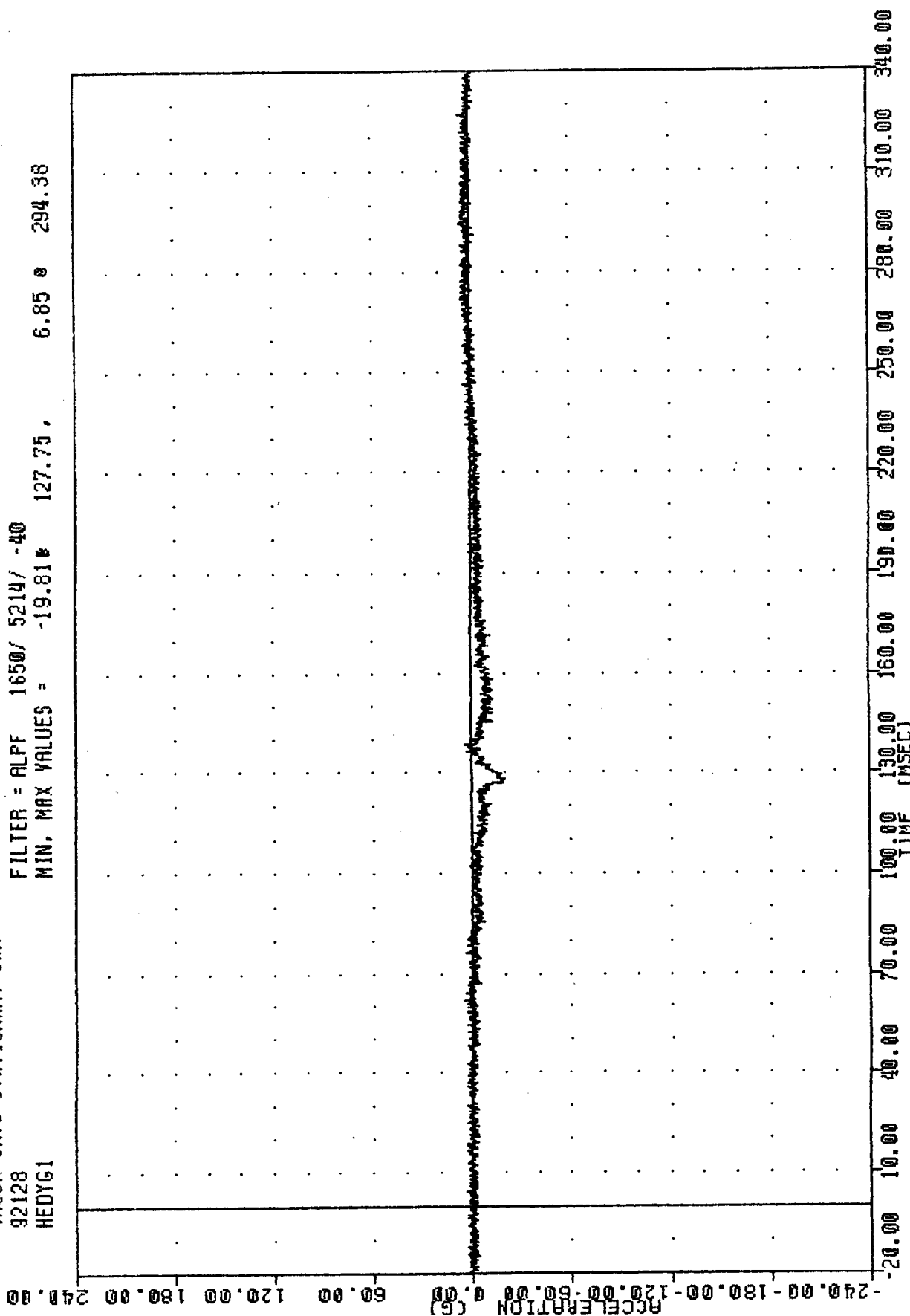
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -90.58 127.50 3.25 270.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER HEAD X-AXIS ACCELERATION

TRC . 920507
 TRUCK INTO STATIONARY CAR
 92128
 HEDYG1

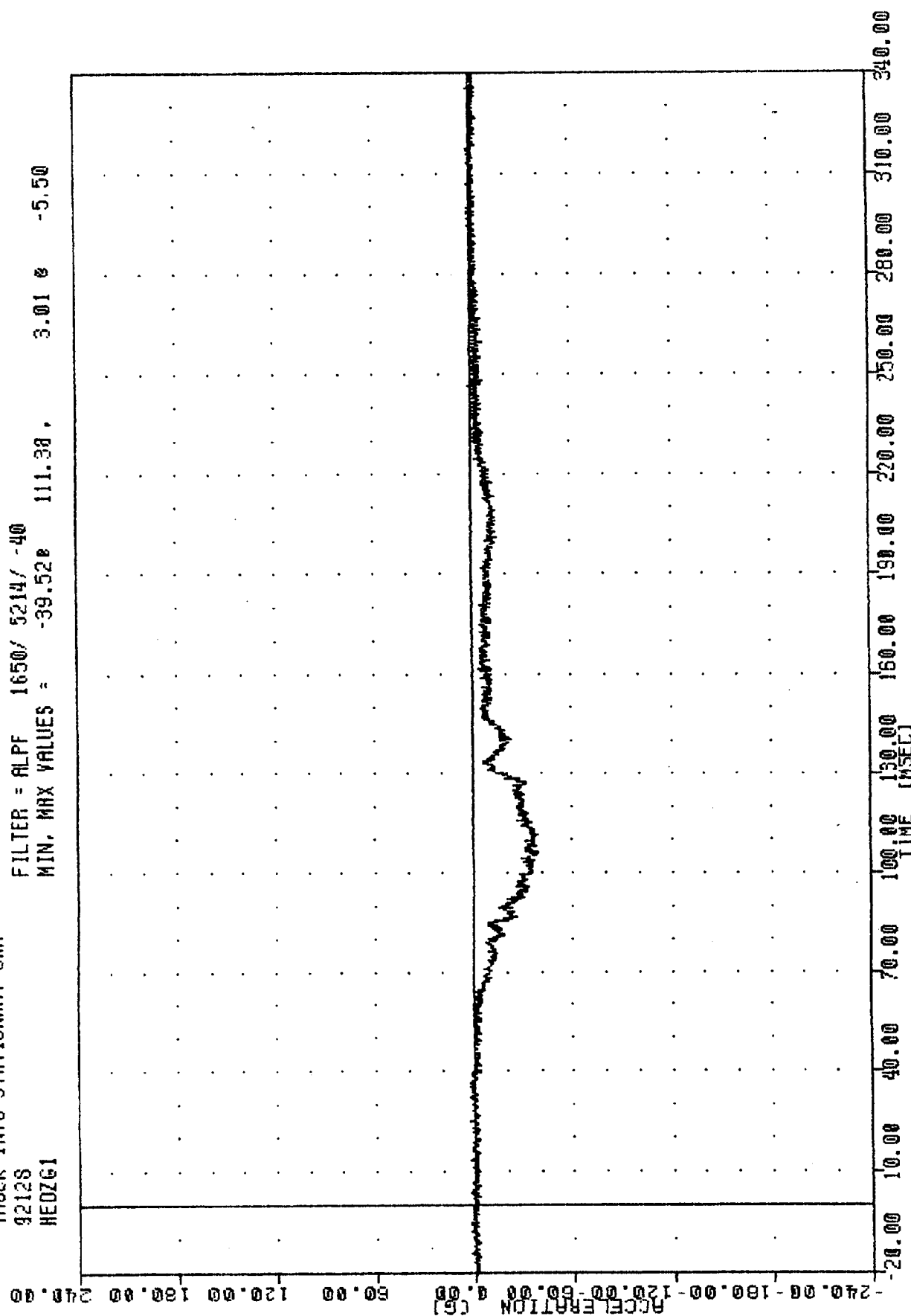
FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -19.81 127.75, 6.85 294.38



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER HEAD Y-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
HE0261

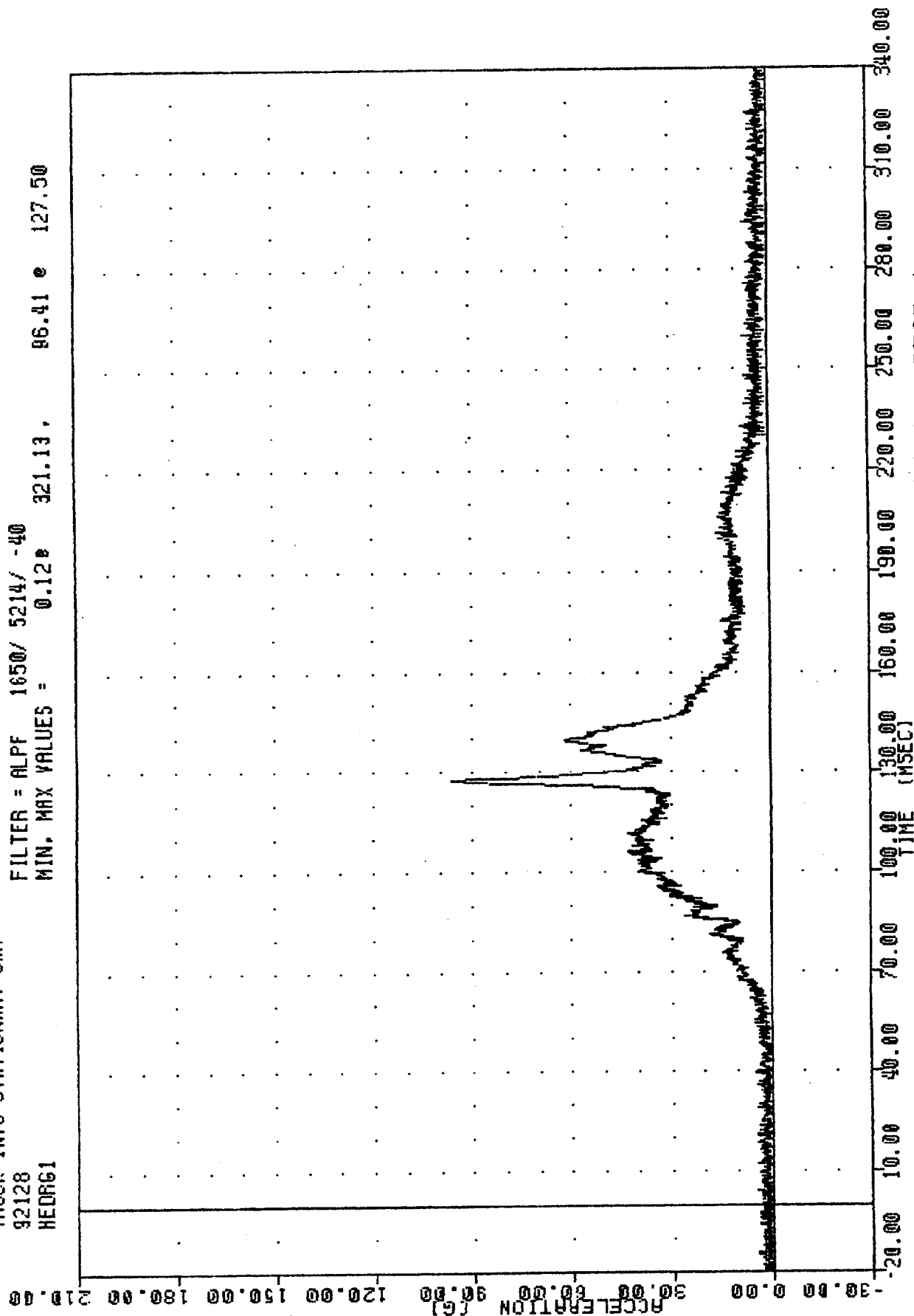
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -39.528 111.38, 3.01 8 -5.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER HEAD Z-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
HEADG1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.12e 321.13, 86.41 e 127.50

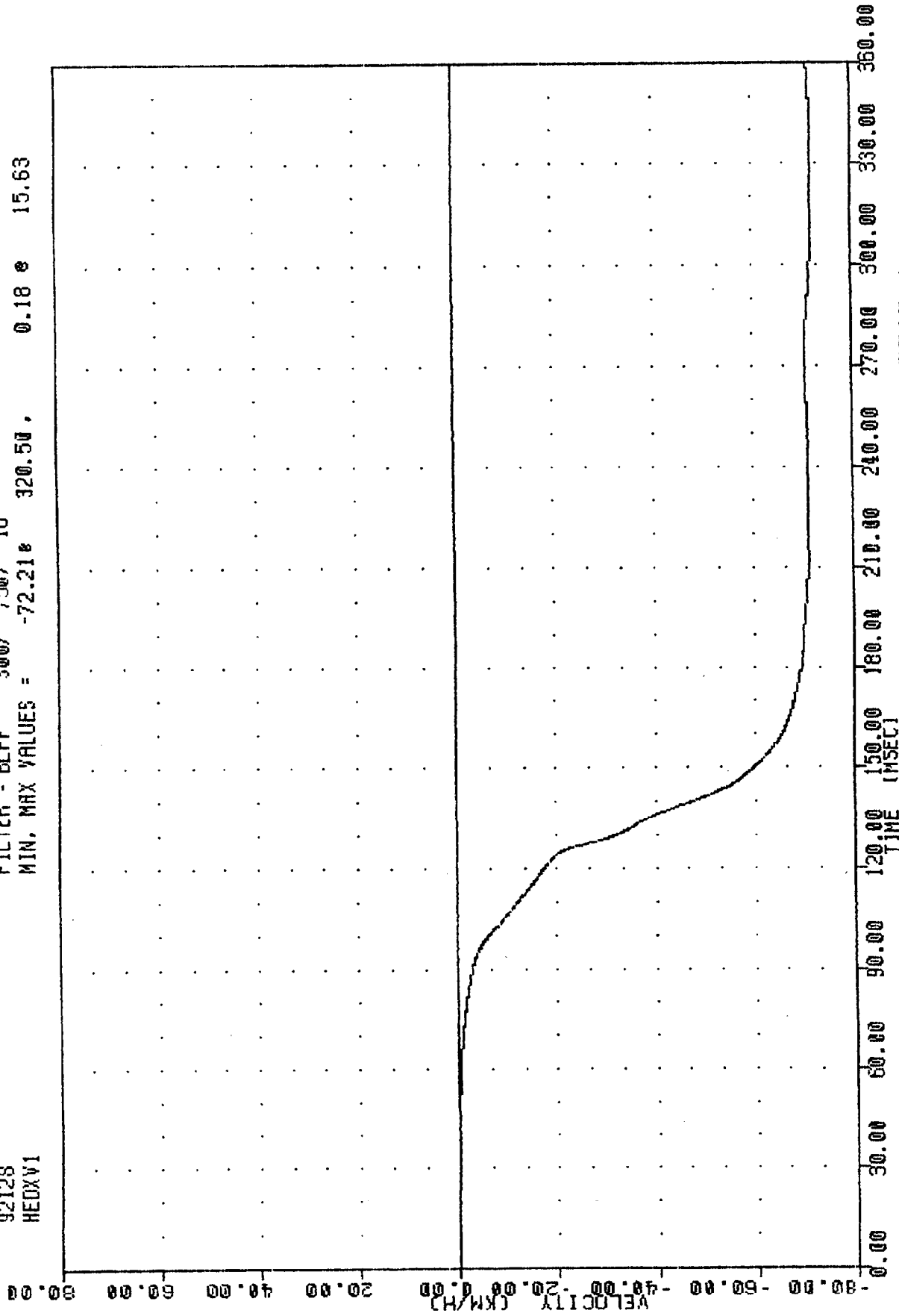


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER HEAD RESULTANT ACCELERATION

TRC
TRUCK INTO STATIONARY CAR
92128
HEDXV1

920507

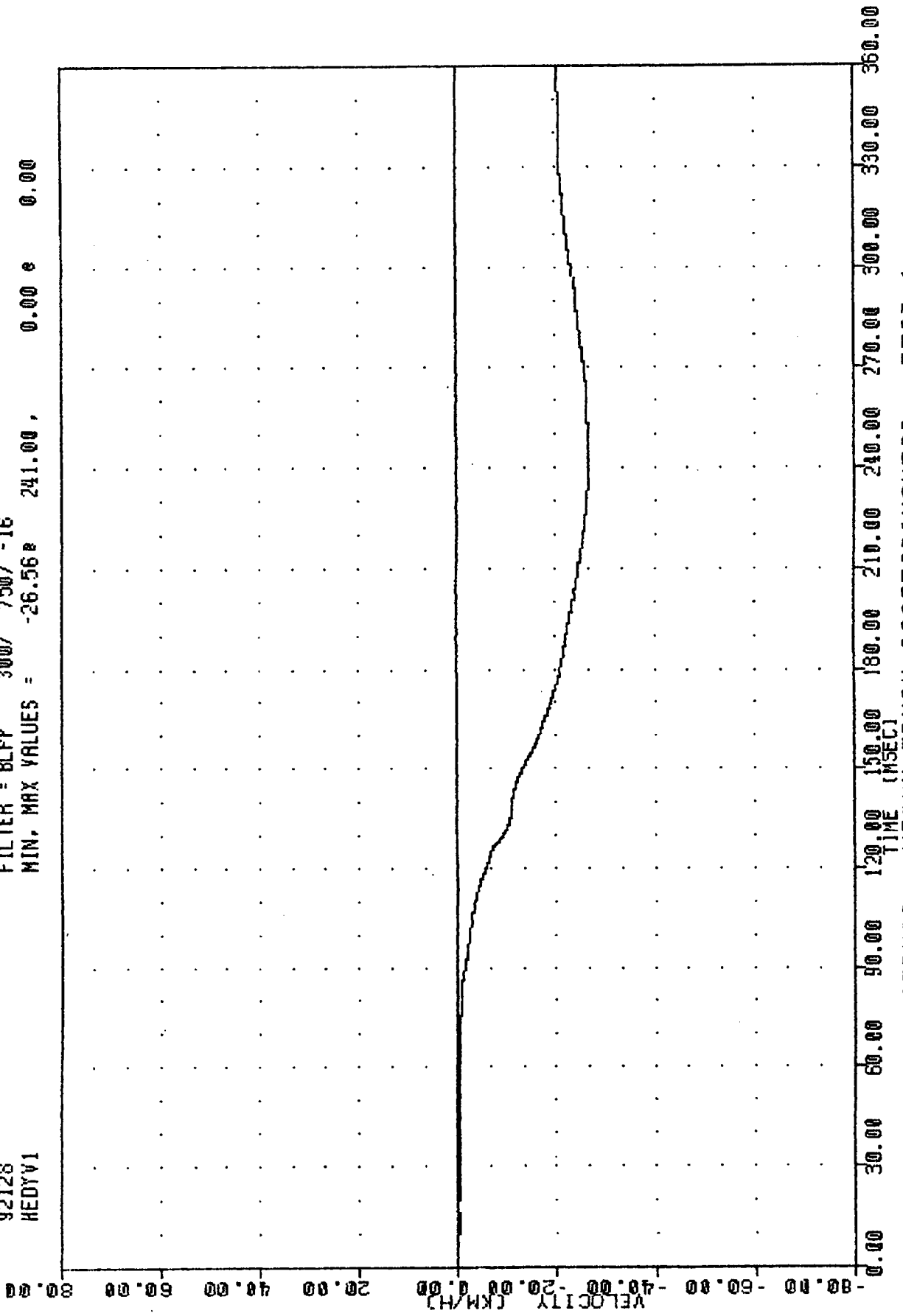
FILTER = BLPP 300/ 750/ -18
MIN, MAX VALUES = -72.218 320.50, 0.18 15.63



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER HEAD X-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
HEDYV1

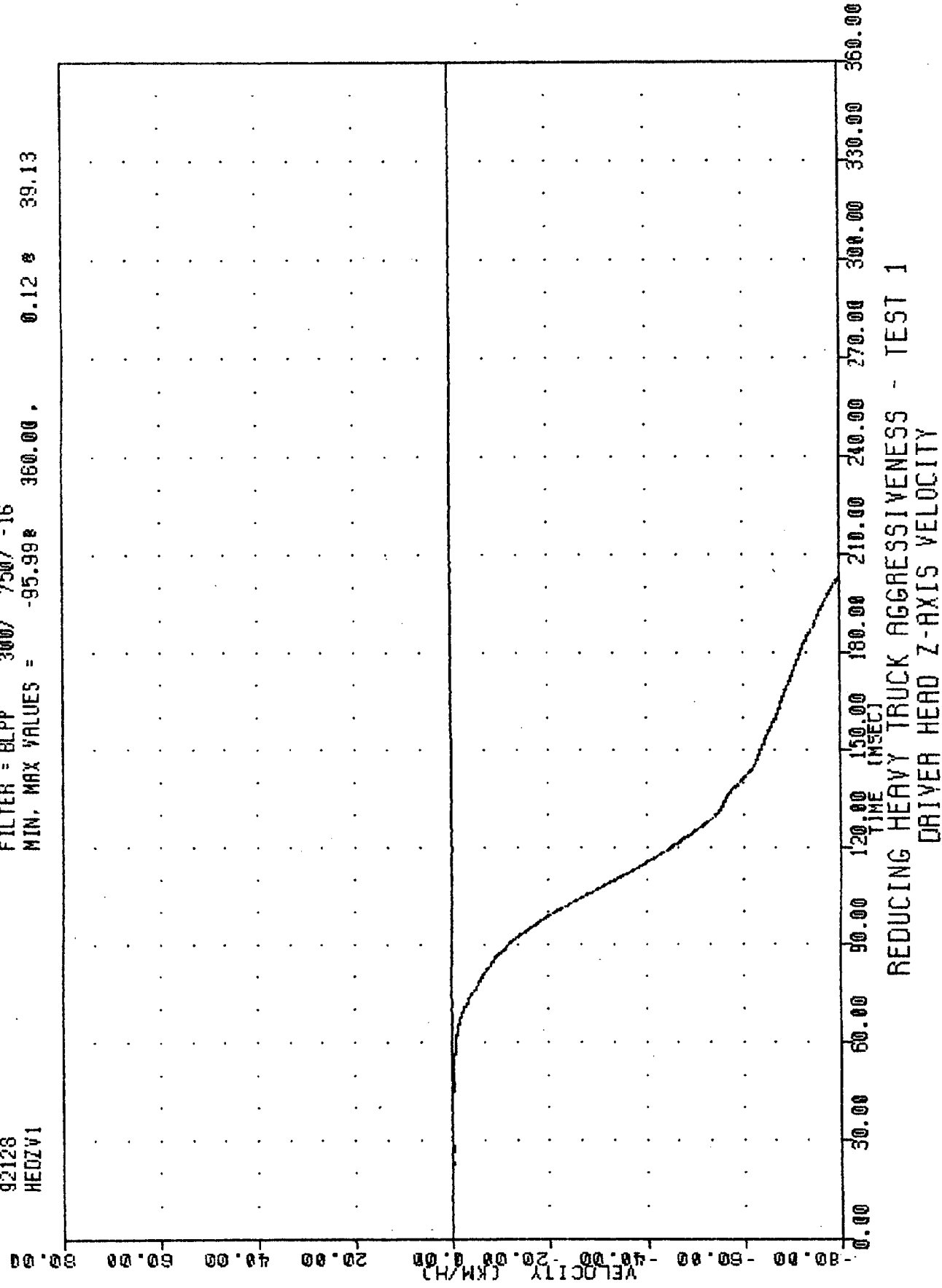
FILTER = BLPP 300/ 750/ -18
MIN, MAX VALUES = -26.56 241.00, 0.00 0.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER HEAD Y-AXIS VELOCITY

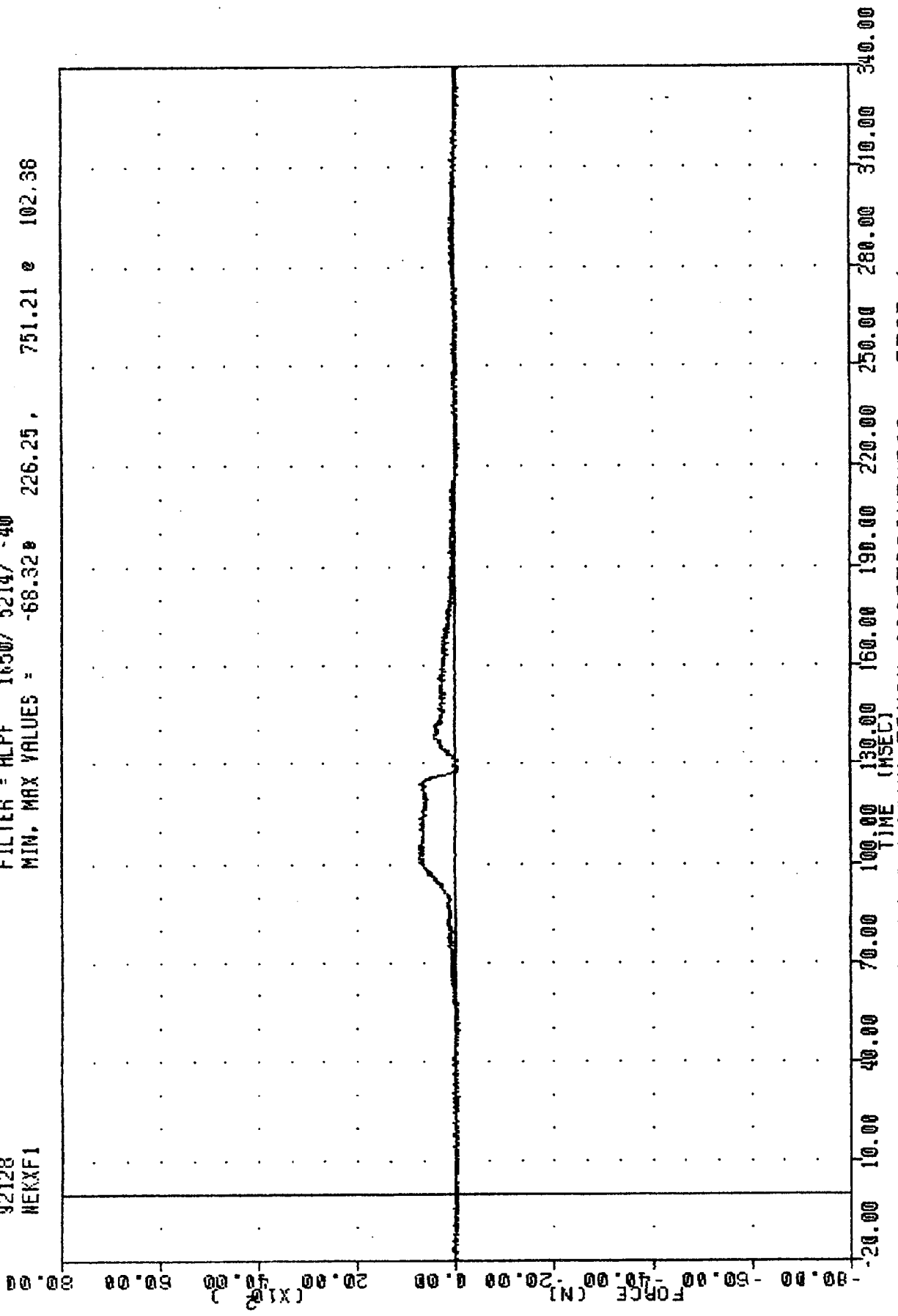
TAC , 920507
TRUCK INTO STATIONARY CAR
92128
HEDZV1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -95.99 360.00 , 0.12 39.13



TRC 920507
 TRUCK INTO STATIONARY CAR
 92128
 HEKXF1

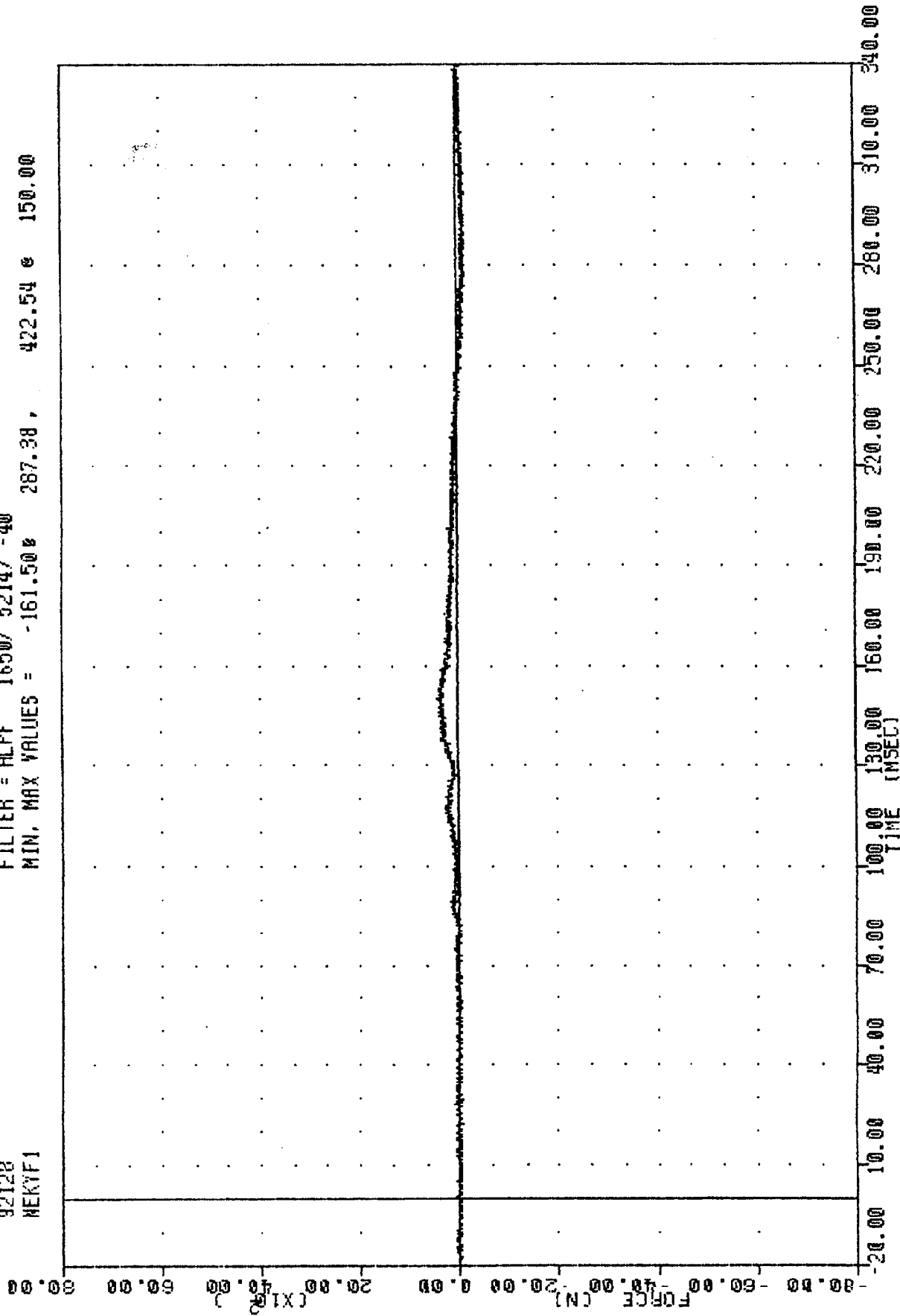
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -68.32 226.25 751.21 102.38



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER NECK X-AXIS SHEAR FORCE

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
NEKVF1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -161.50% 287.38 , 422.54 @ 150.00

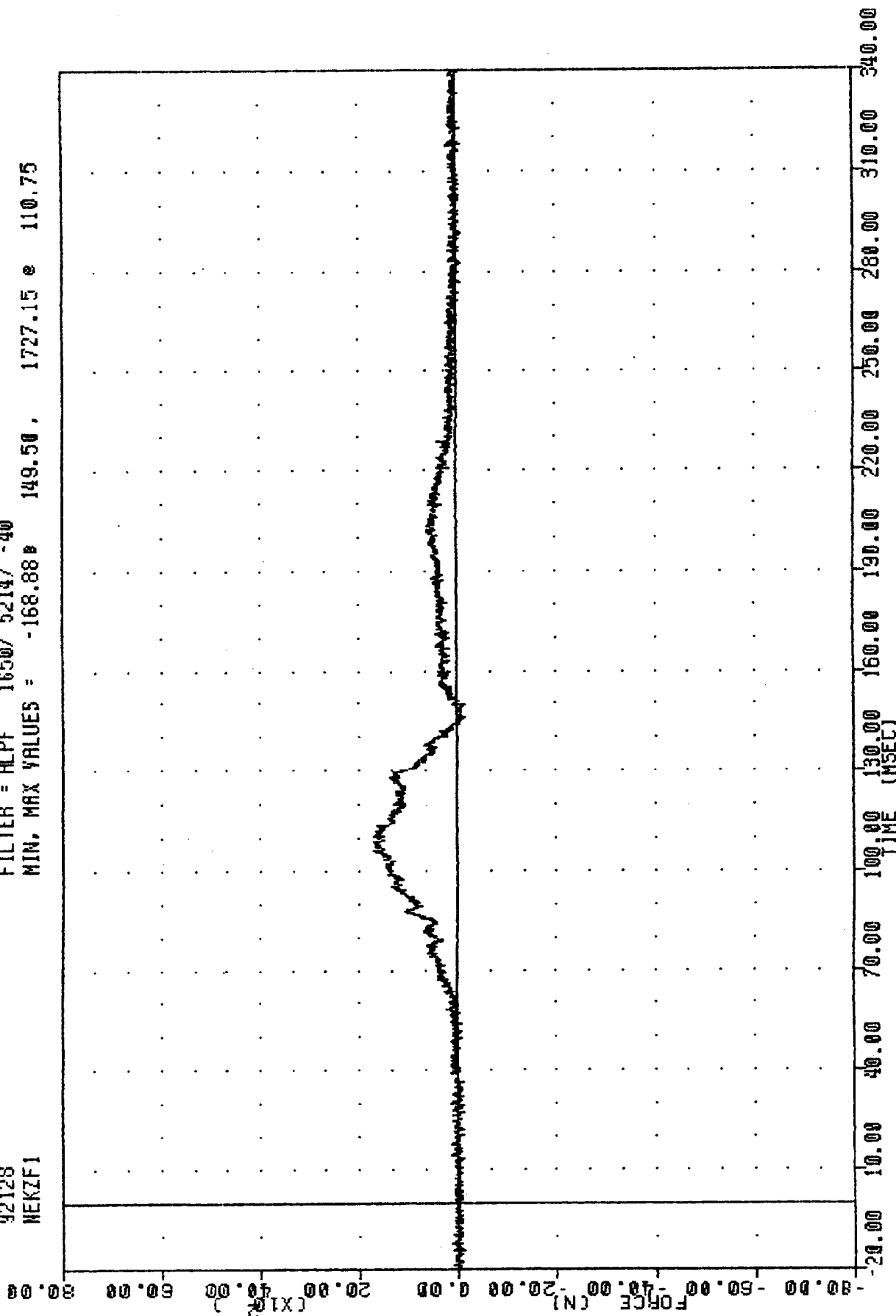


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER NECK Y-AXIS SHEAR FORCE

TRC
 TRUCK INTO STATIONARY CAR
 92128
 HEKZF1

, 920507

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -168.88 149.50, 1727.15 e 110.75

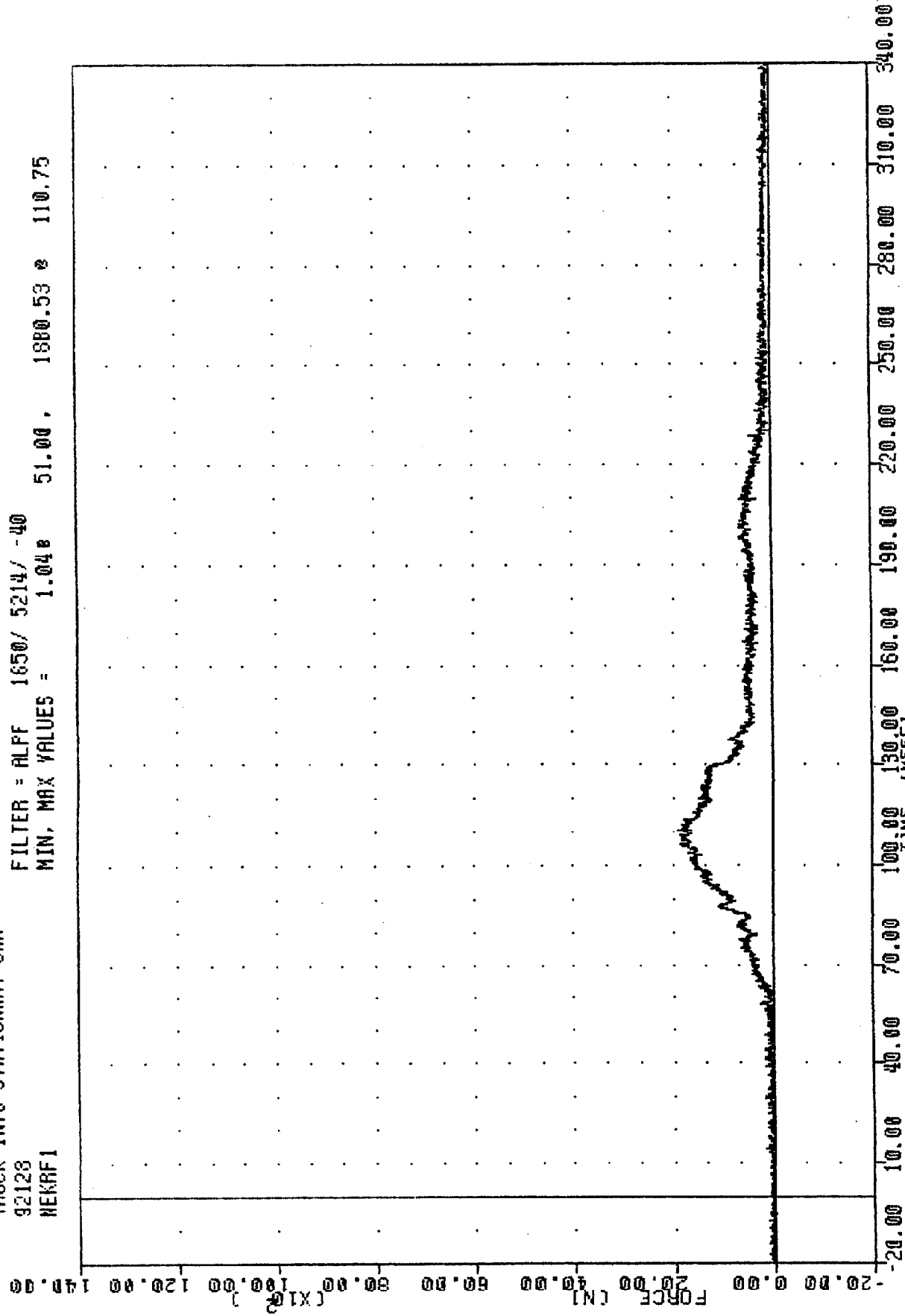


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER NECK Z-AXIS AXIAL FORCE

TAC
TRUCK INTO STATIONARY CAR
92128
REKRF1

920507

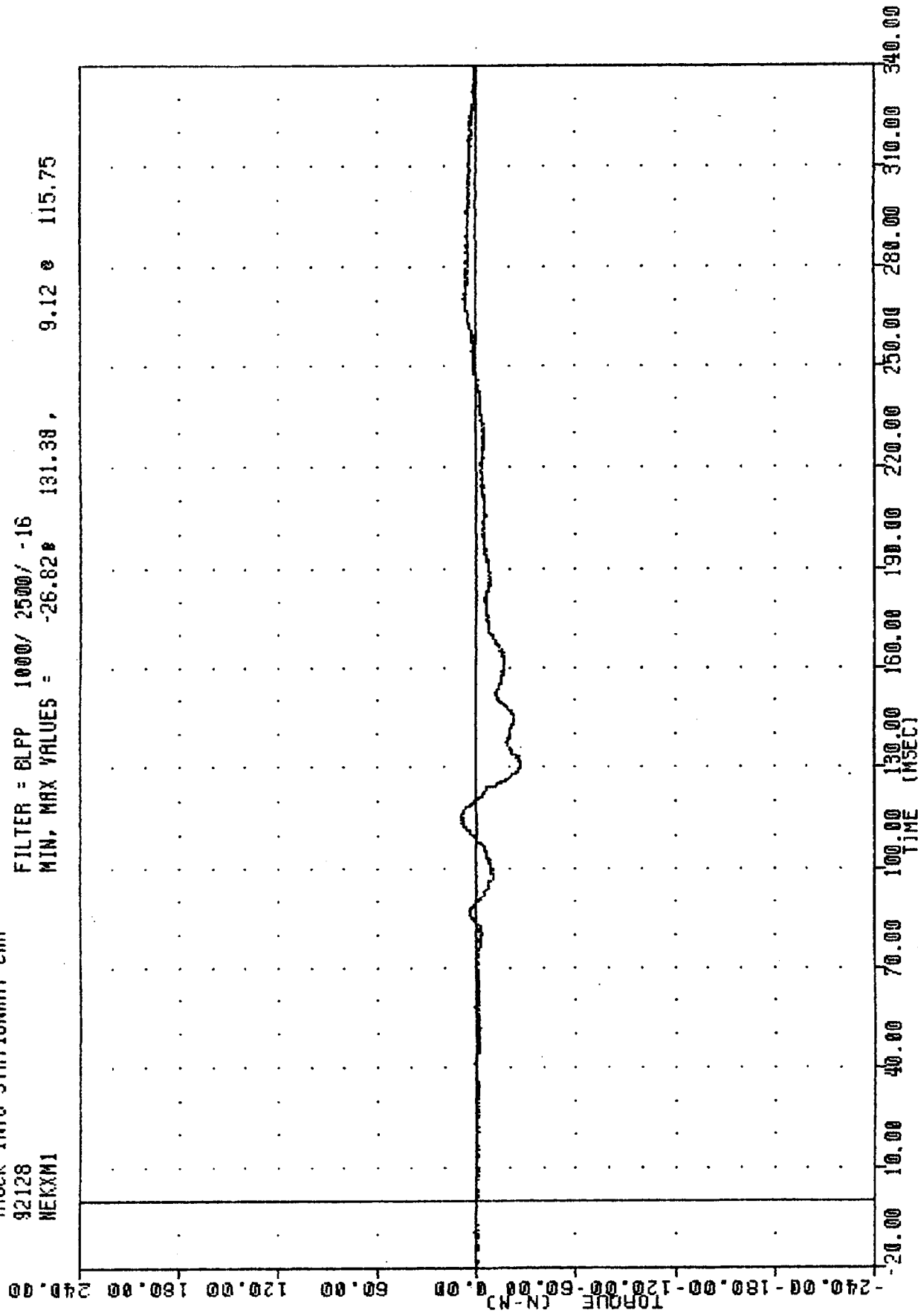
FILTER = ALFF 1650/ 5214/ -40
MIN, MAX VALUES = 1.04e 51.00, 1880.53 e 110.75



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER NECK RESULTANT FORCE

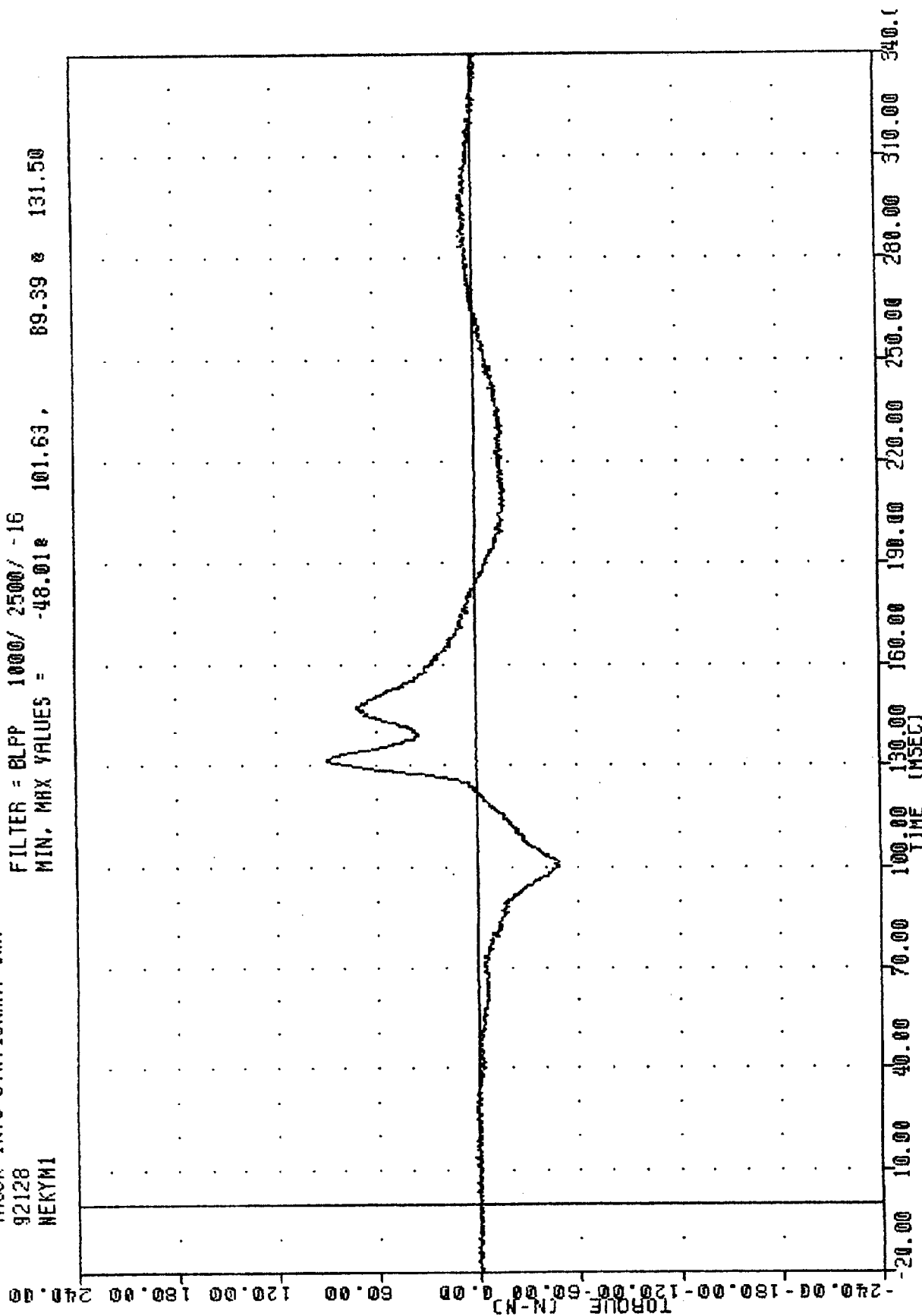
TRC , 920507
TRUCK INTO STATIONARY CAR
92128
NEKXMI

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -26.82 131.38, 9.12 115.75



TRC , 920507
TRUCK INTO STATIONARY CAR
92128
NEKYM1

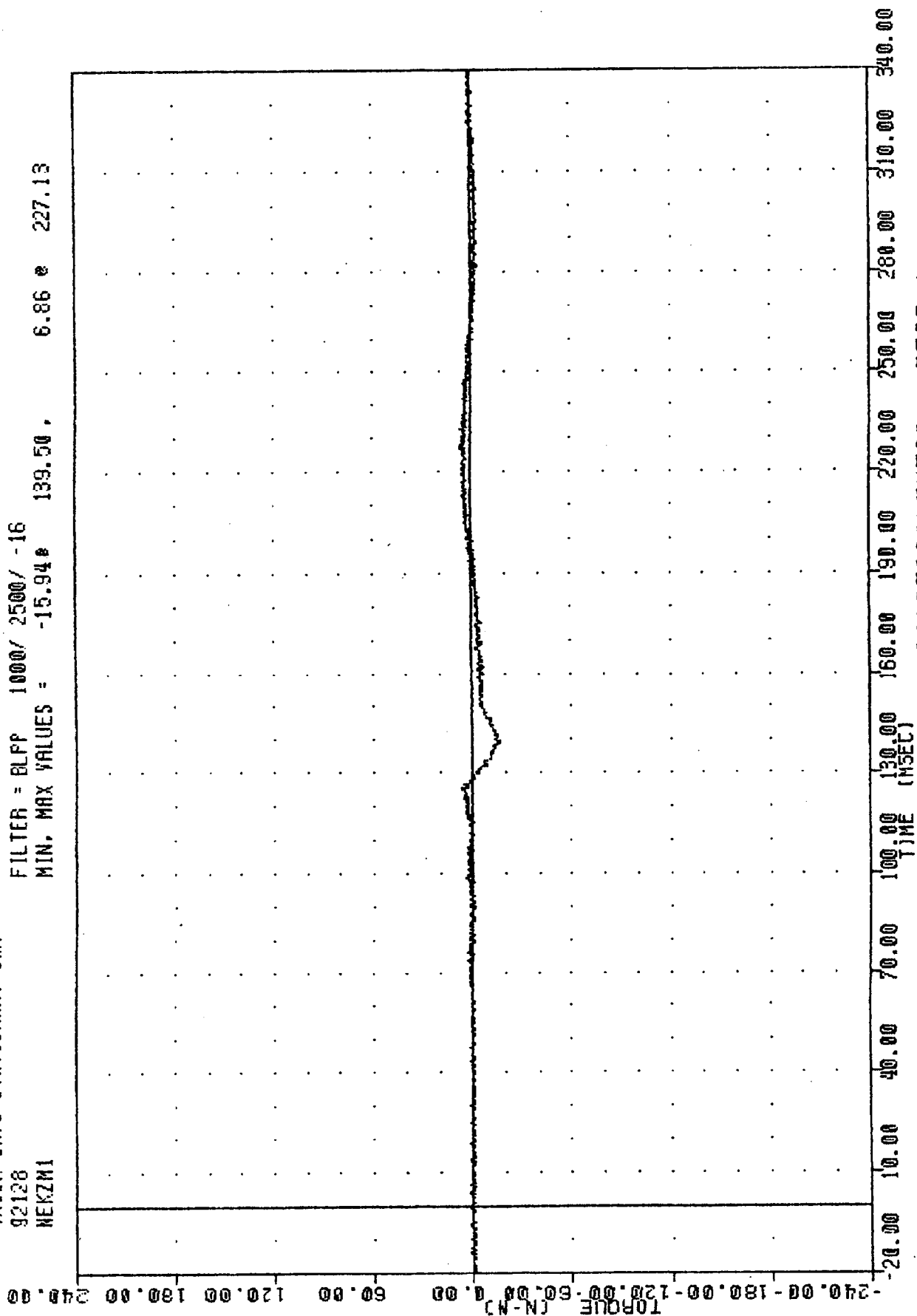
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -48.01e 101.63, 89.39 e 131.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER NECK MOMENT ABOUT Y AXIS

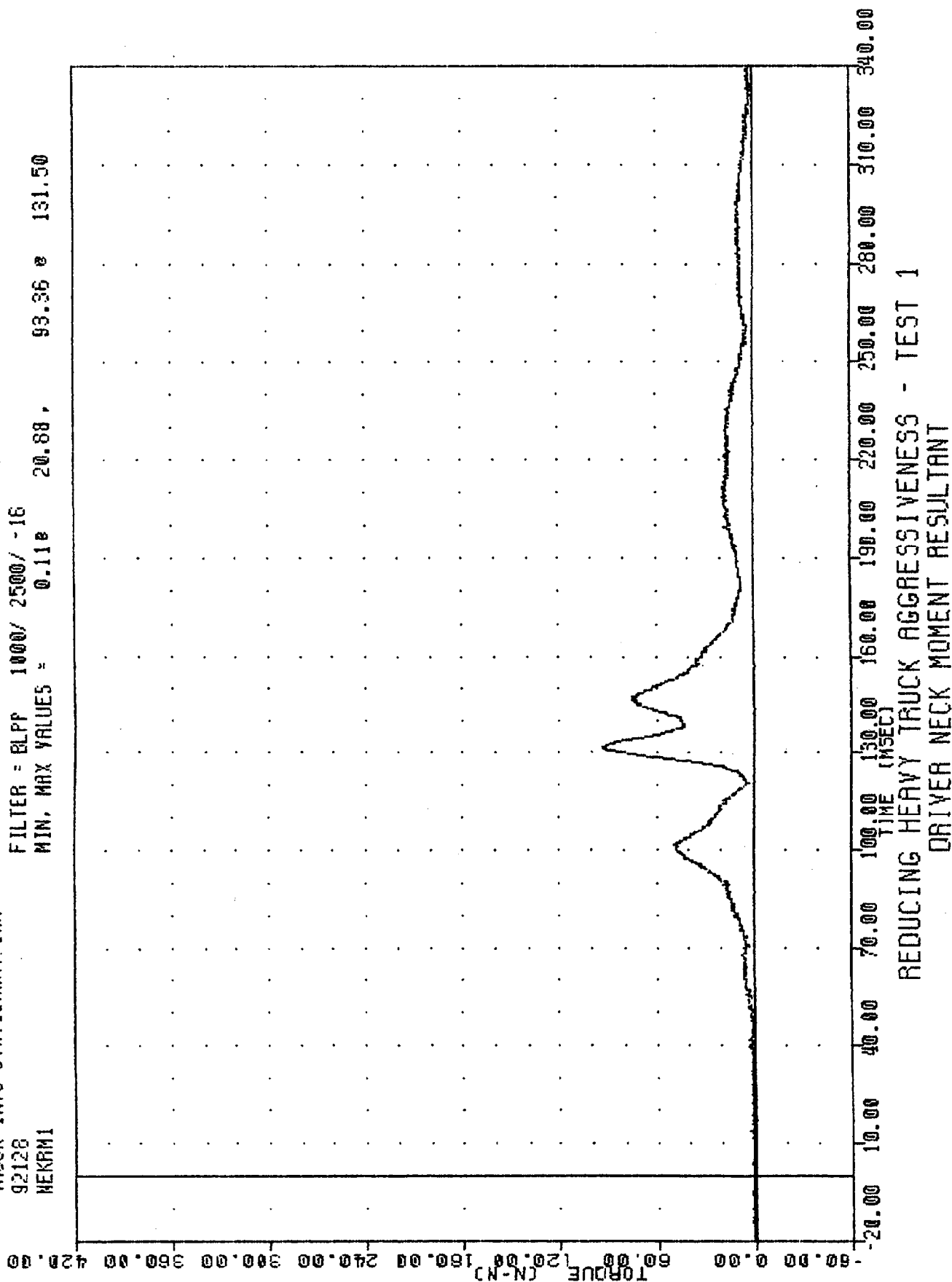
TRC 920507
TRUCK INTO STATIONARY CAR
92128
WEKZM1

FILTER = BLFP 1000/ 2500/ -16
MIN. MAX VALUES = -15.94 139.50 6.86 227.13



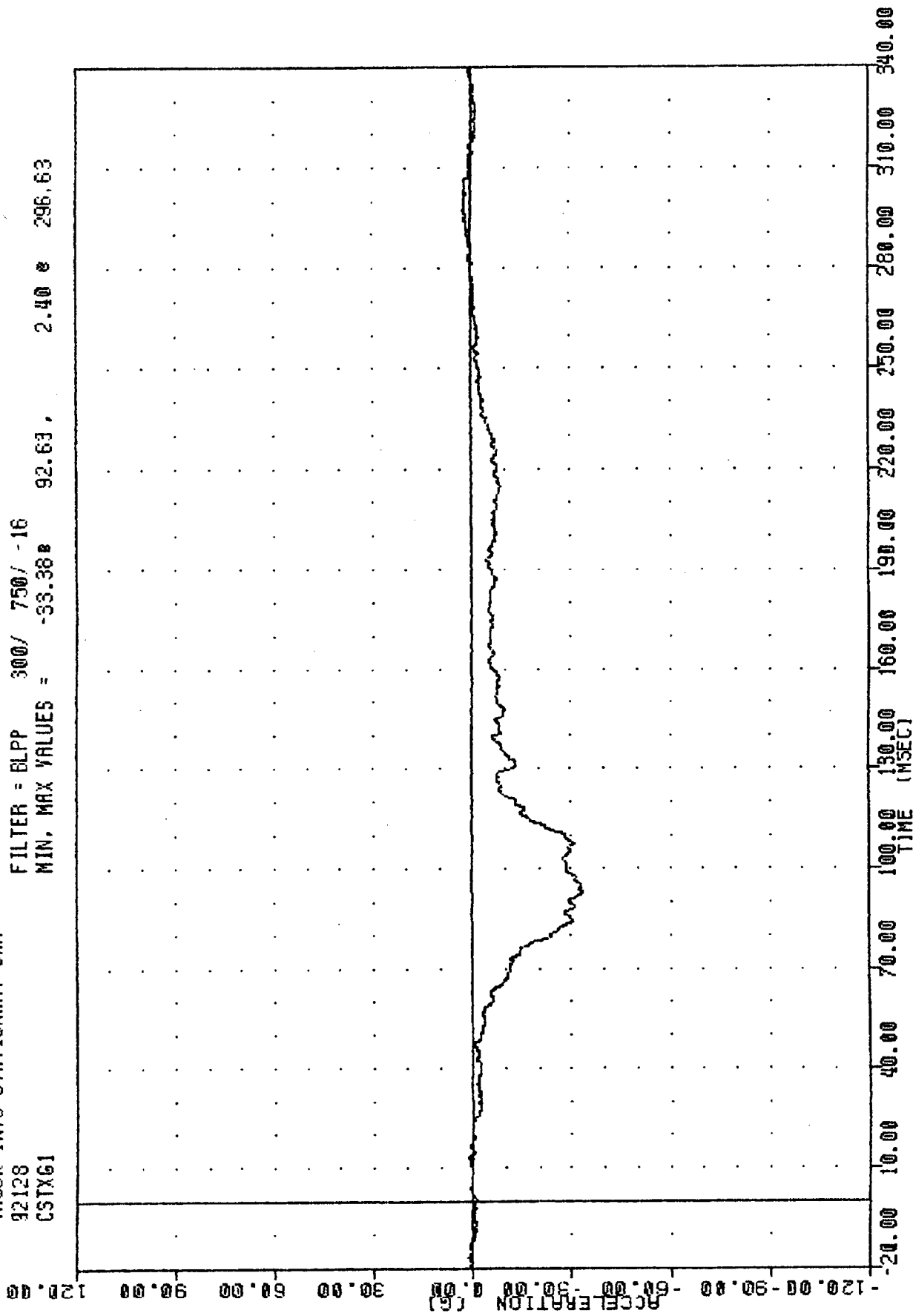
TRC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 NEKRM1

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = 0.11e 20.88, 93.36 e 131.50



TRC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 CSTX61

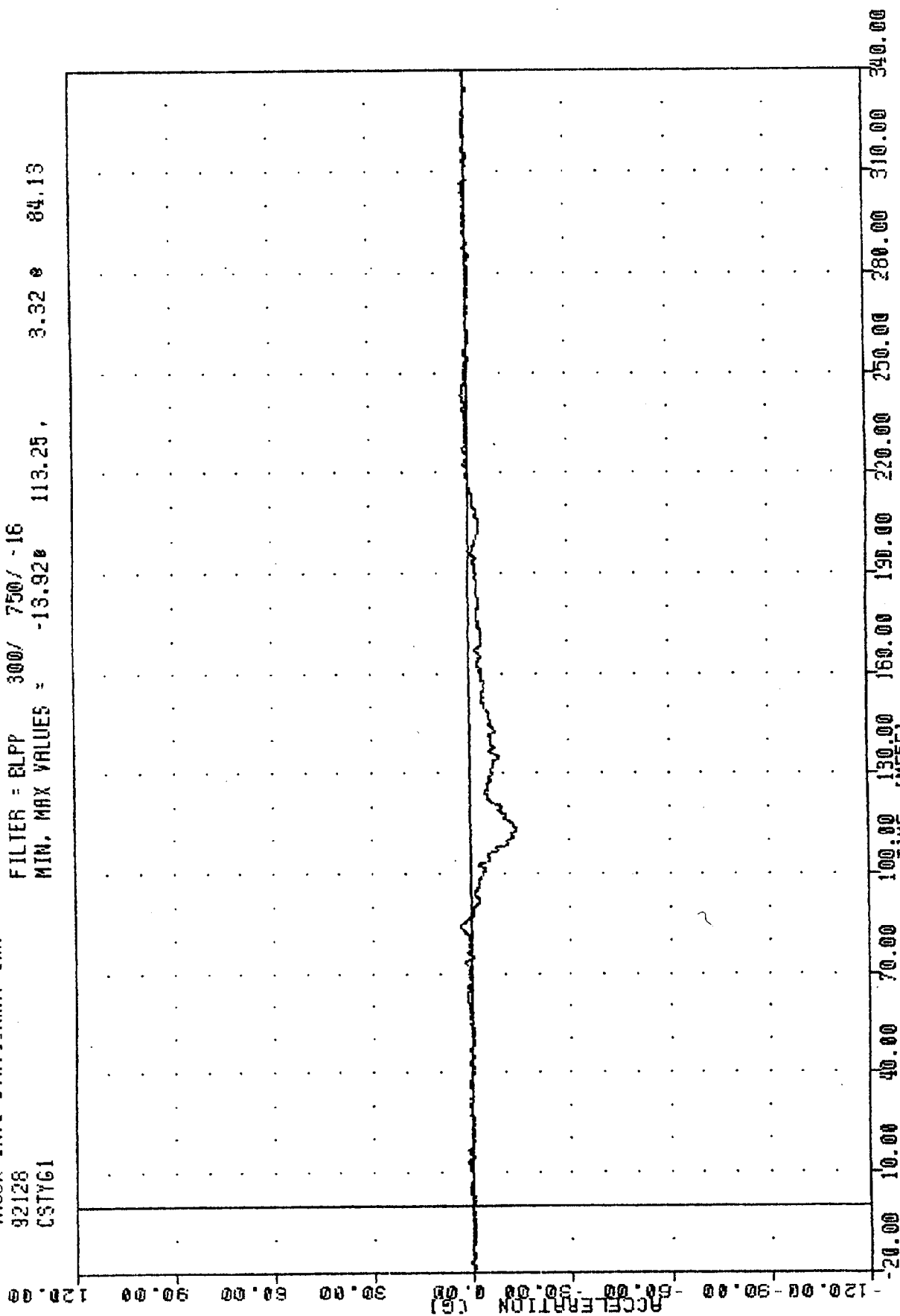
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -33.36 92.63, 2.40 296.63



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER CHEST X-AXIS ACCELERATION

TRC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 CSTY61

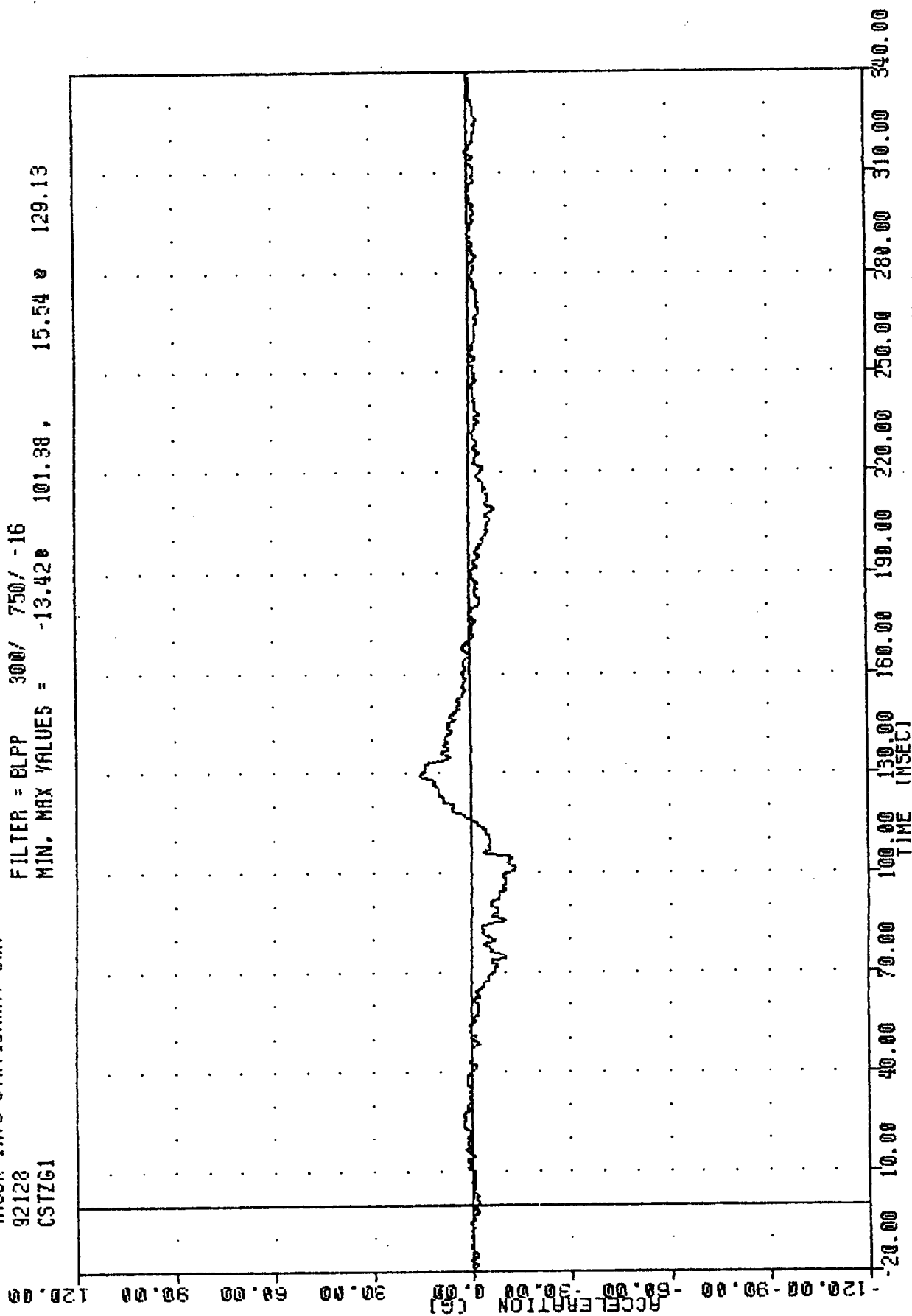
FILTER = ELPP 300/ 750/ -16
 MIN. MAX VALUES = -13.92 113.25 3.32 84.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER CHEST Y-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
CSTZ61

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -13.42e 101.38 , 15.54 e 129.13



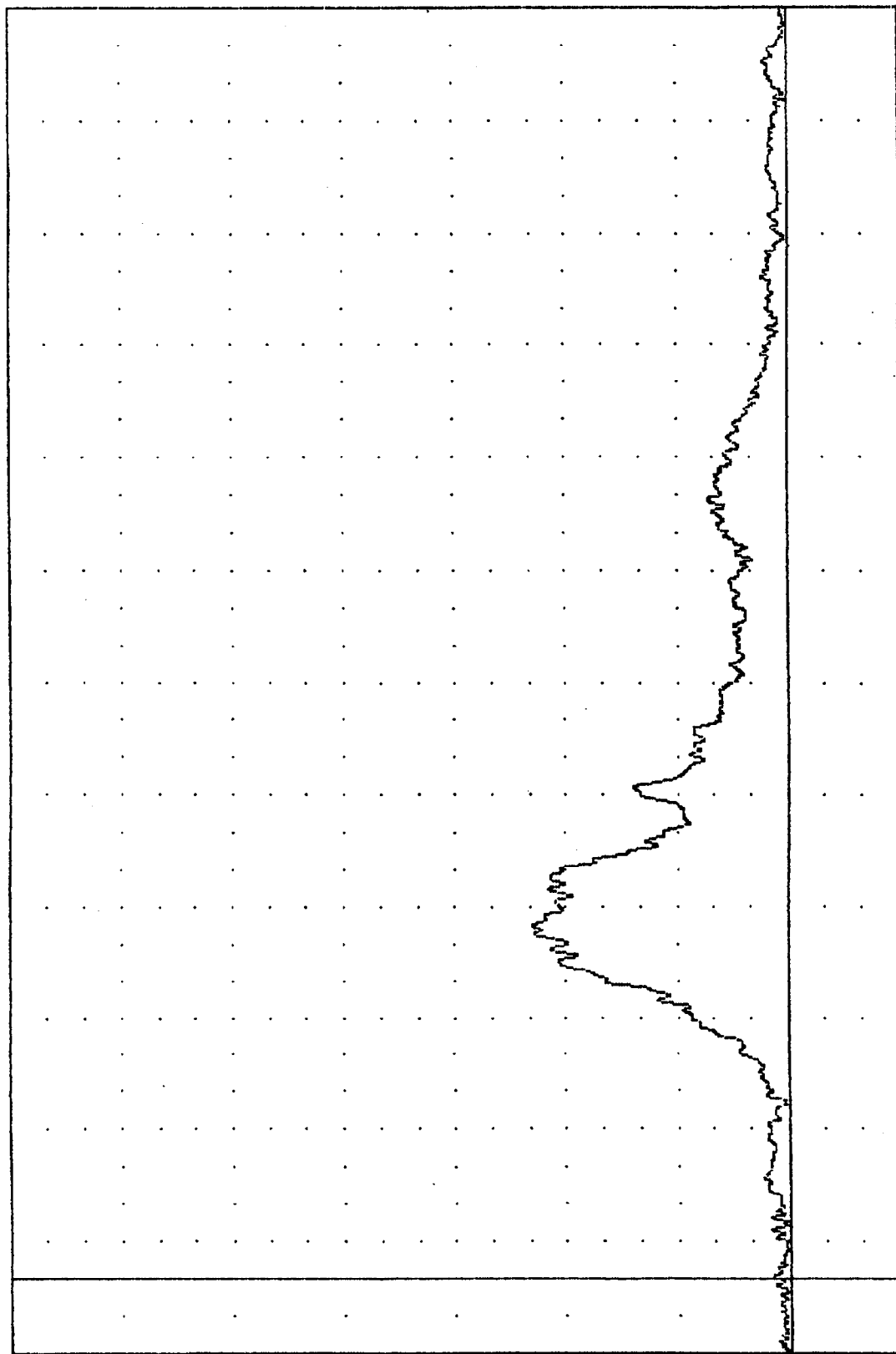
REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER CHEST Z-AXIS ACCELERATION

TRC
 TRUCK INTO STATIONARY CAR
 92128
 CSTAG1

920507

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.098 -20.00, 34.71 8 94.88

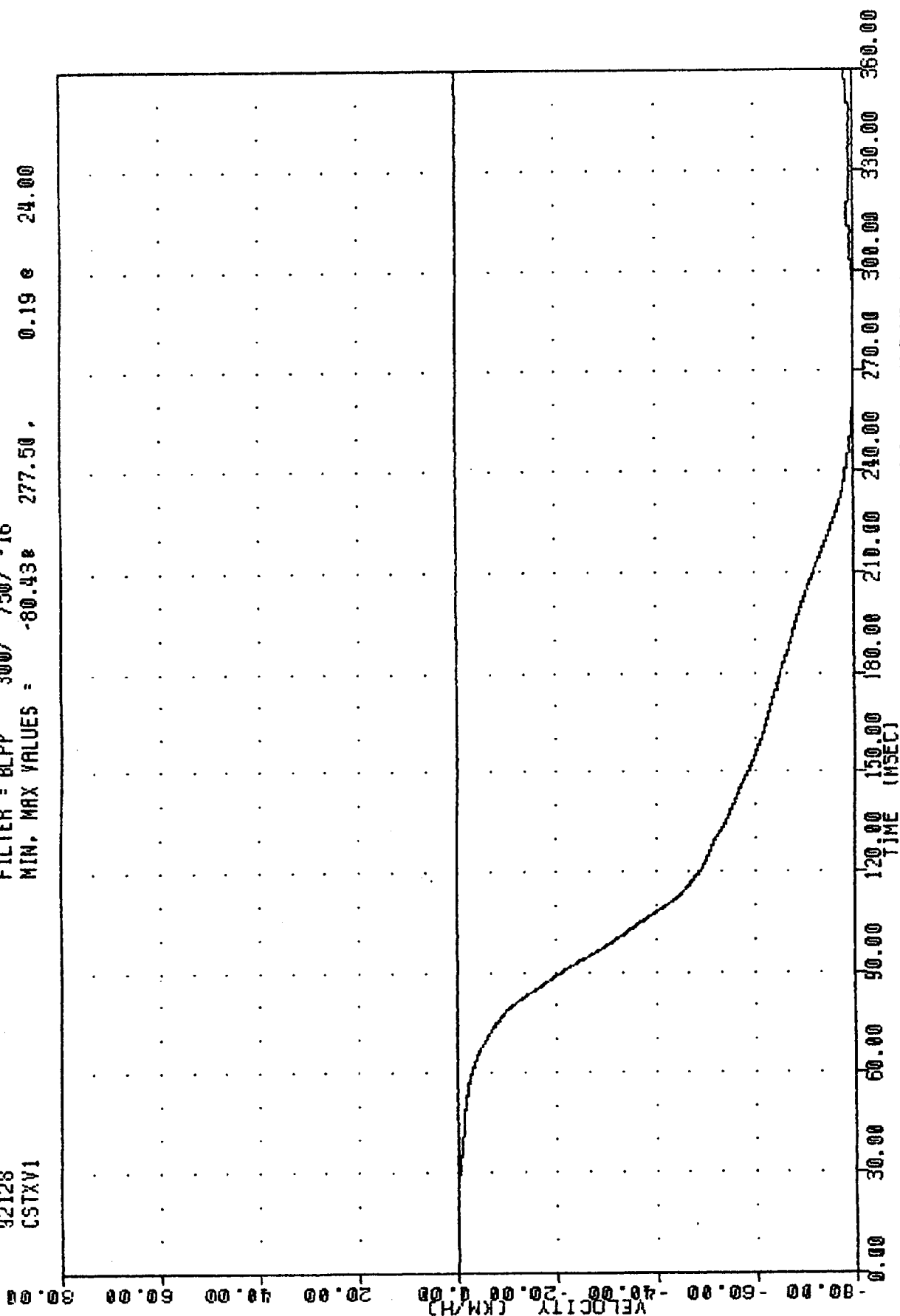
ACCELERATION (G)



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER CHEST RESULTANT ACCELERATION

TRC 920507
TRUCK INTO STATIONARY CAR
92128
CSTXV1

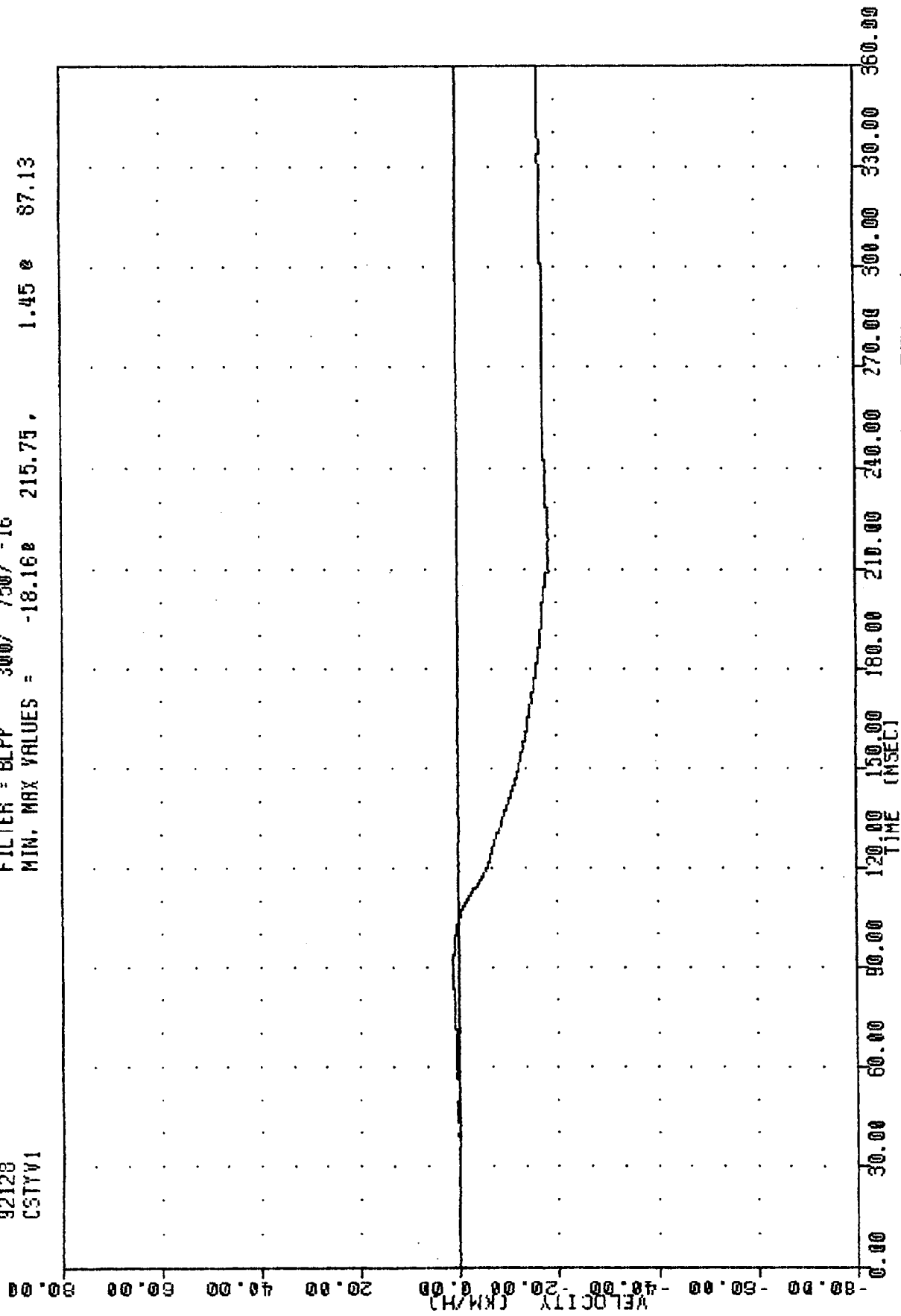
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -80.43e 277.50, 0.19 e 24.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER CHEST X-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
CSTTV1

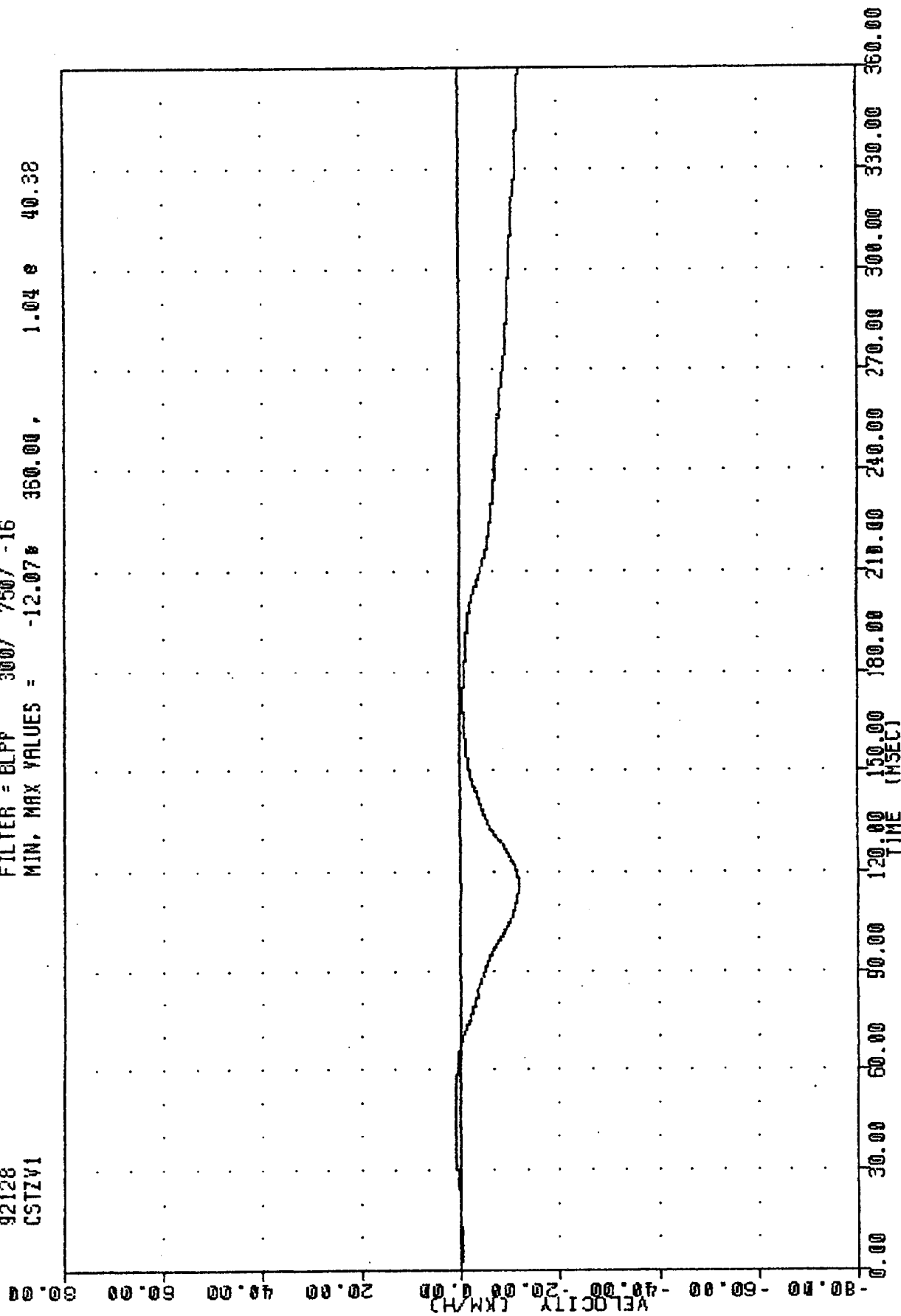
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -18.160 215.75, 1.45 0 87.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER CHEST Y-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
CSTZV1

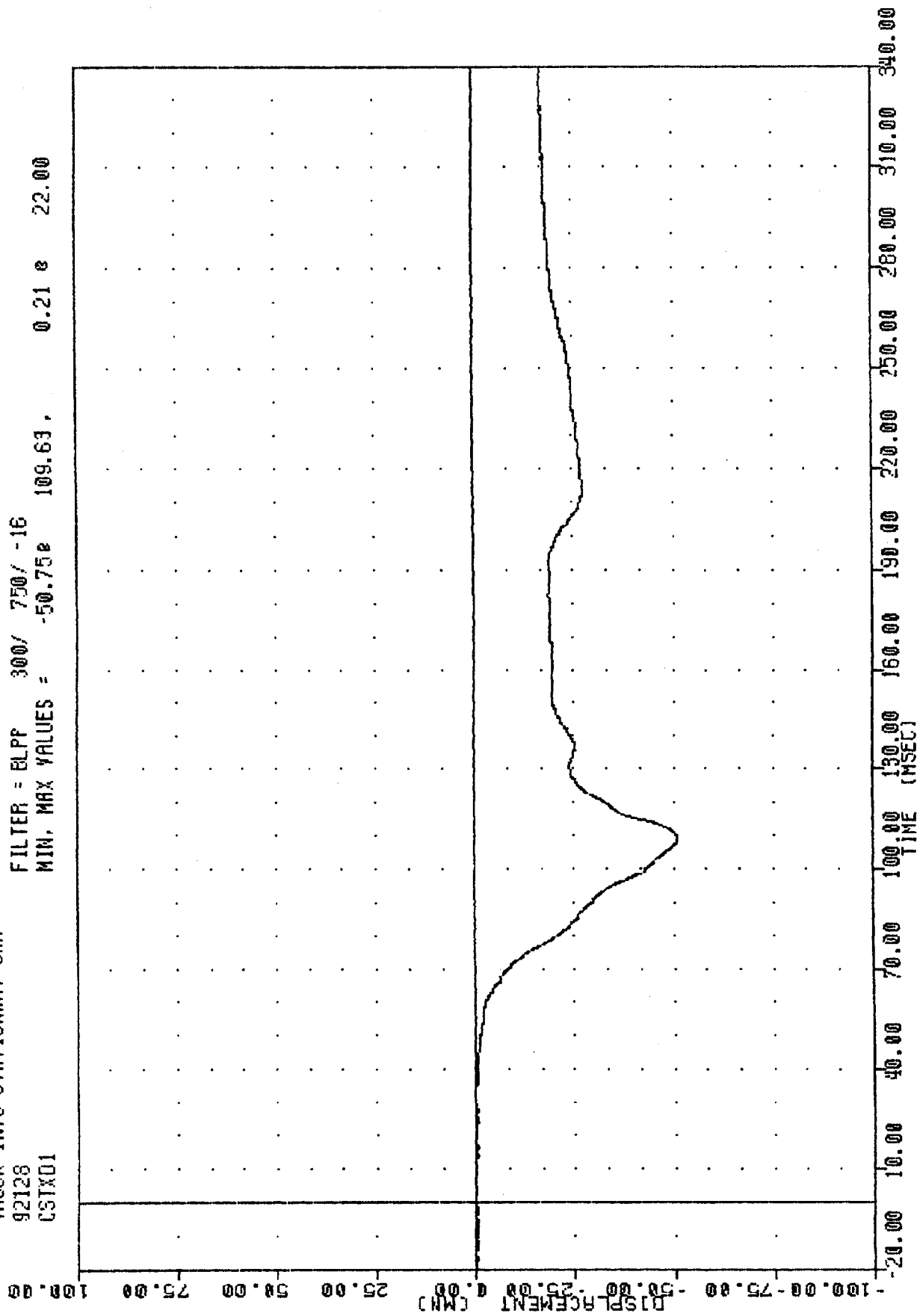
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -12.07% 350.00, 1.04 s 40.38



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER CHEST Z-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
CSTX01

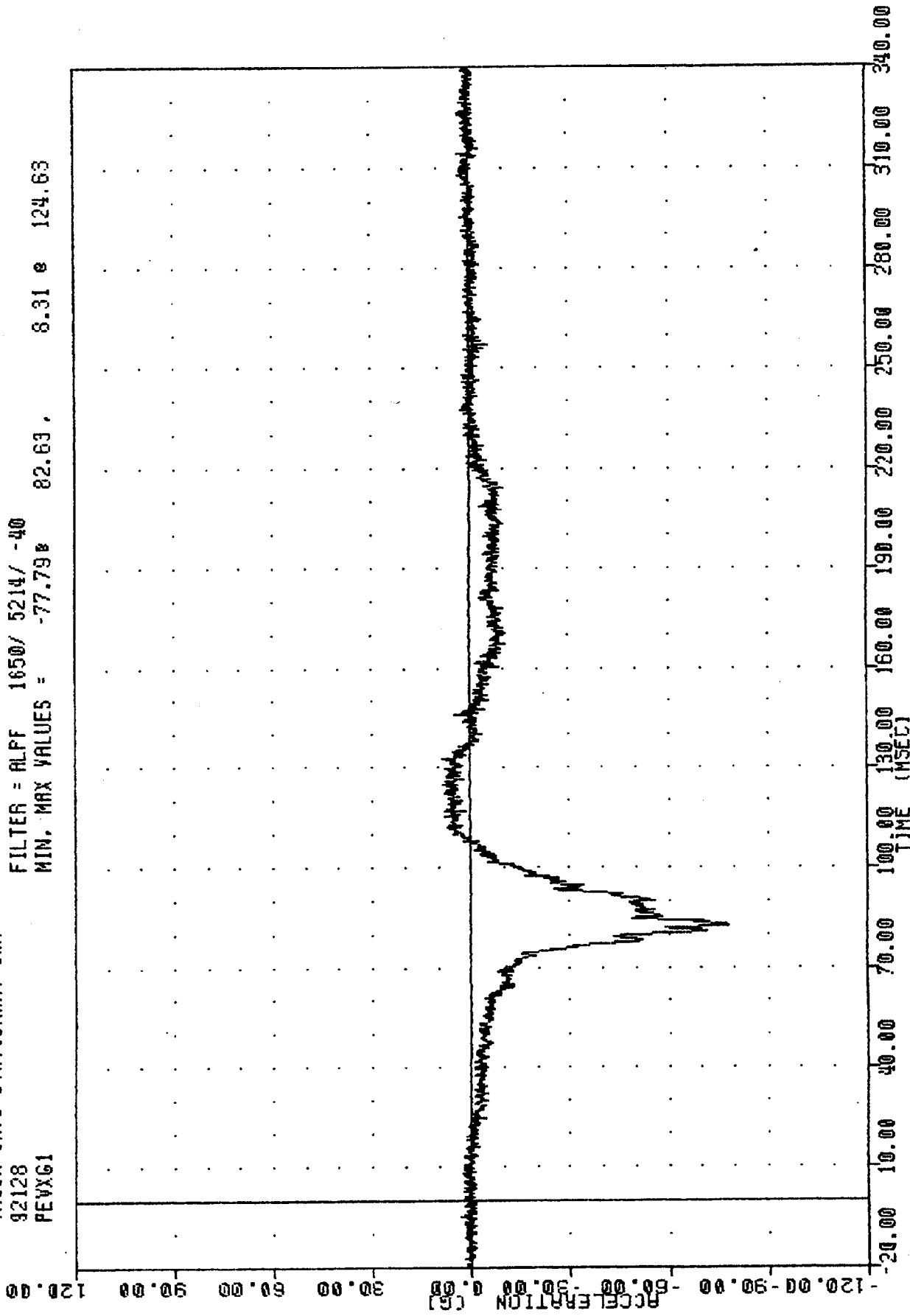
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -50.75e 109.63, 0.21 e 22.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER CHEST DEFLECTION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
PEVXG1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -77.79 82.63 8.31 124.63

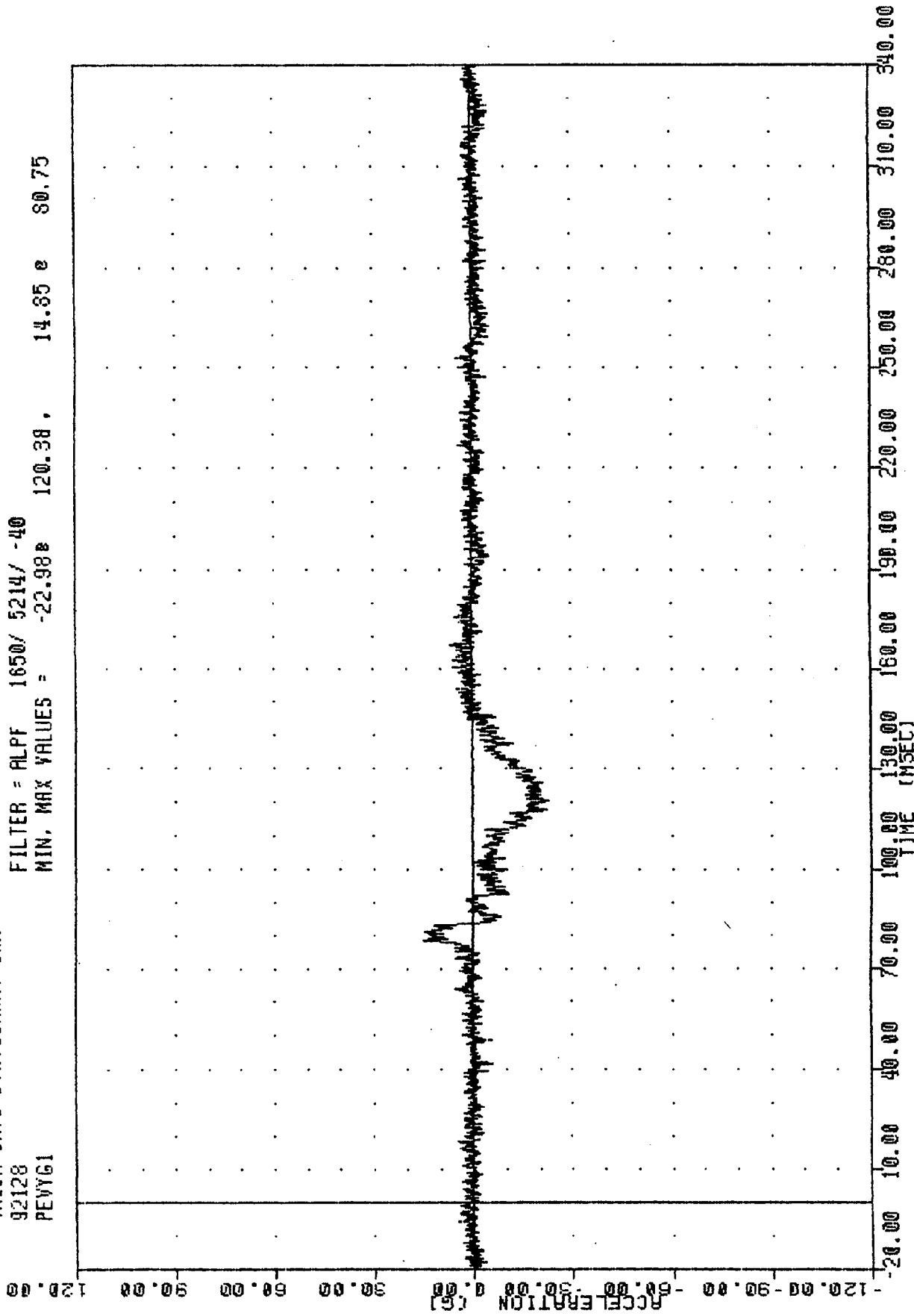


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER PELVIS X-AXIS ACCELERATION

TPC
TRUCK INTO STATIONARY CAR
92128
PEVY61

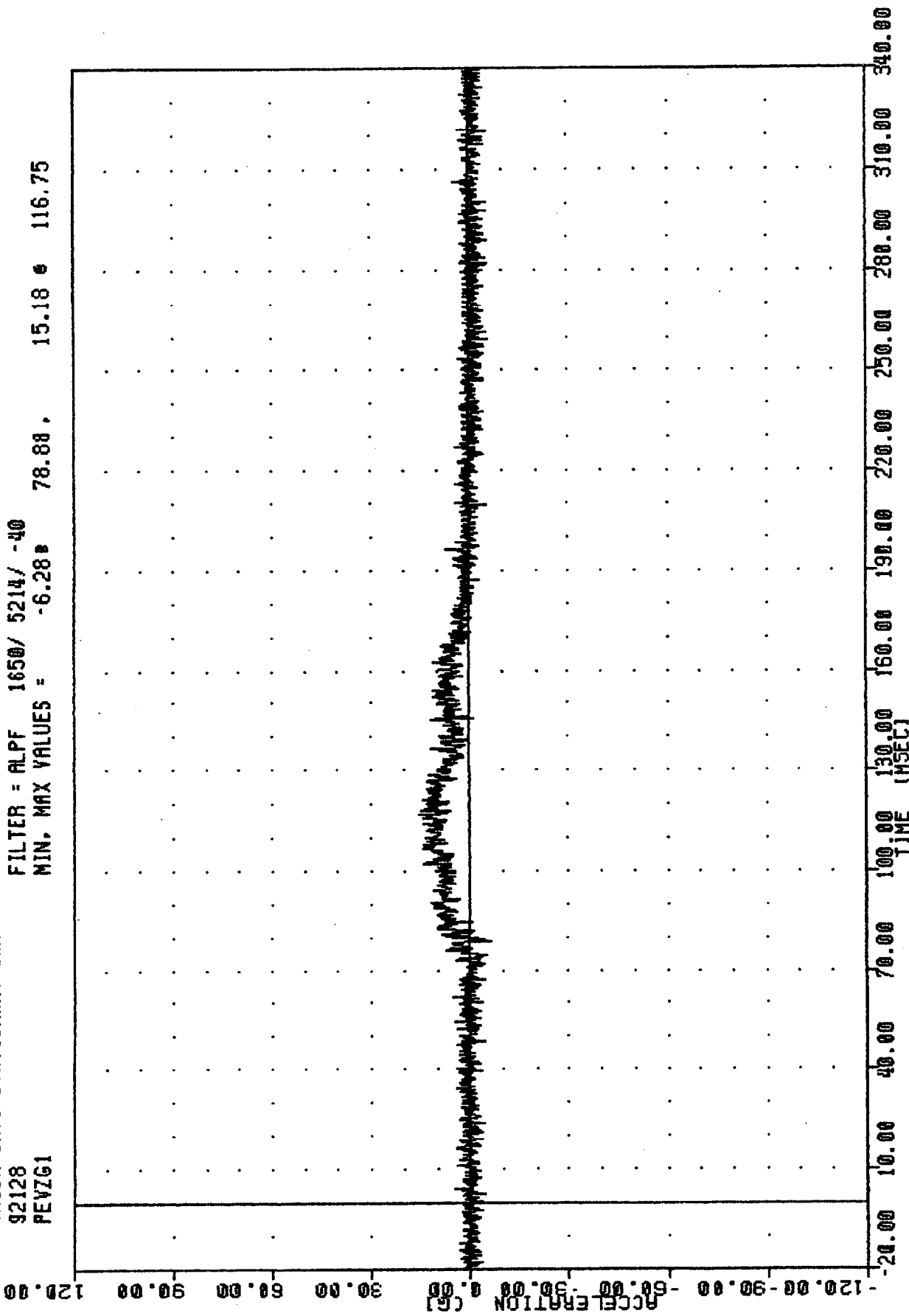
920507

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -22.98 120.38 , 14.85 e 80.75



TAC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 PEVZG1

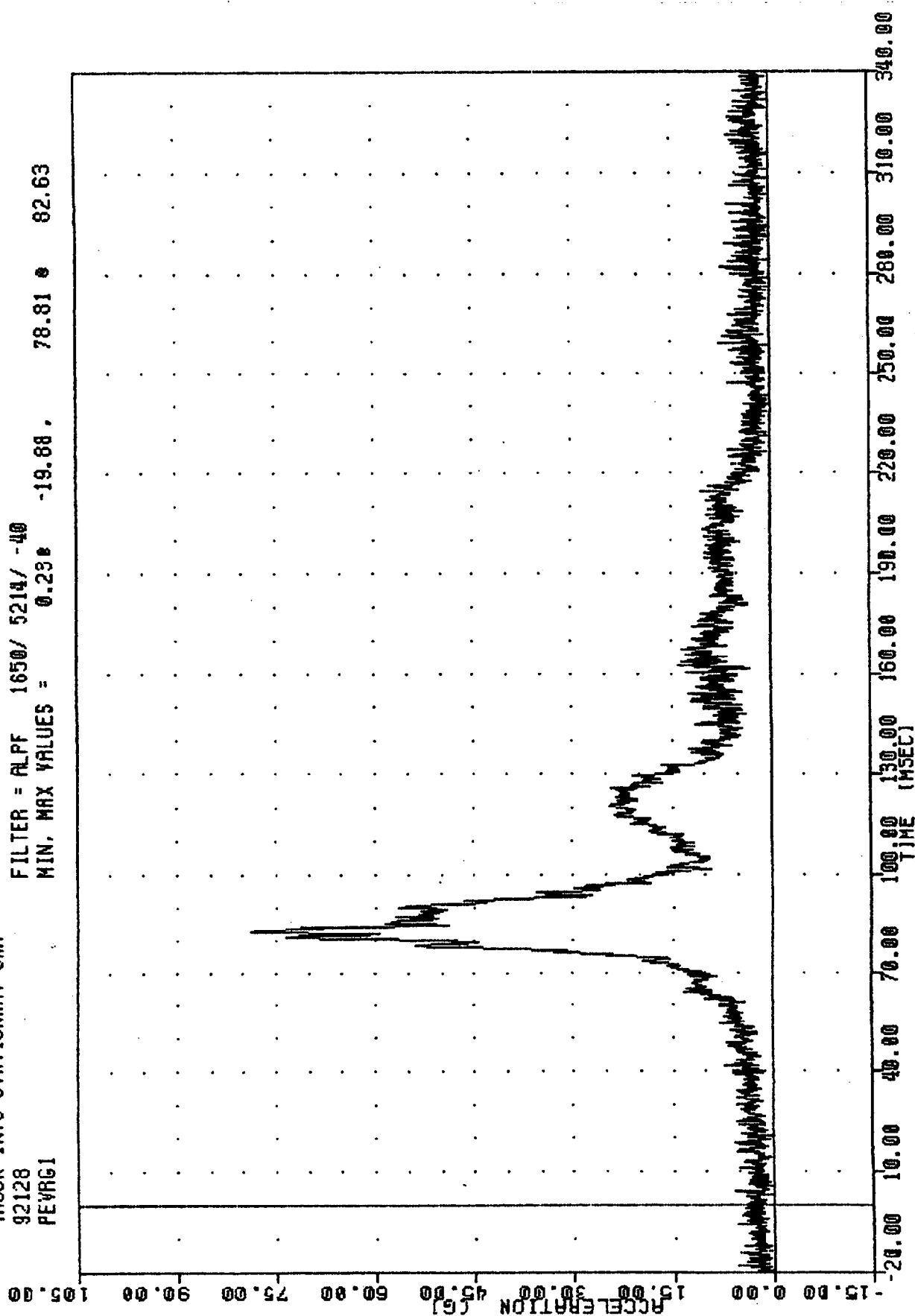
FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -6.28 78.88 15.18 116.75



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER PELVIS Z-AXIS ACCELERATION

TRC 920507
TRUCK INTO STATIONARY CAR
92128
PEVRG1

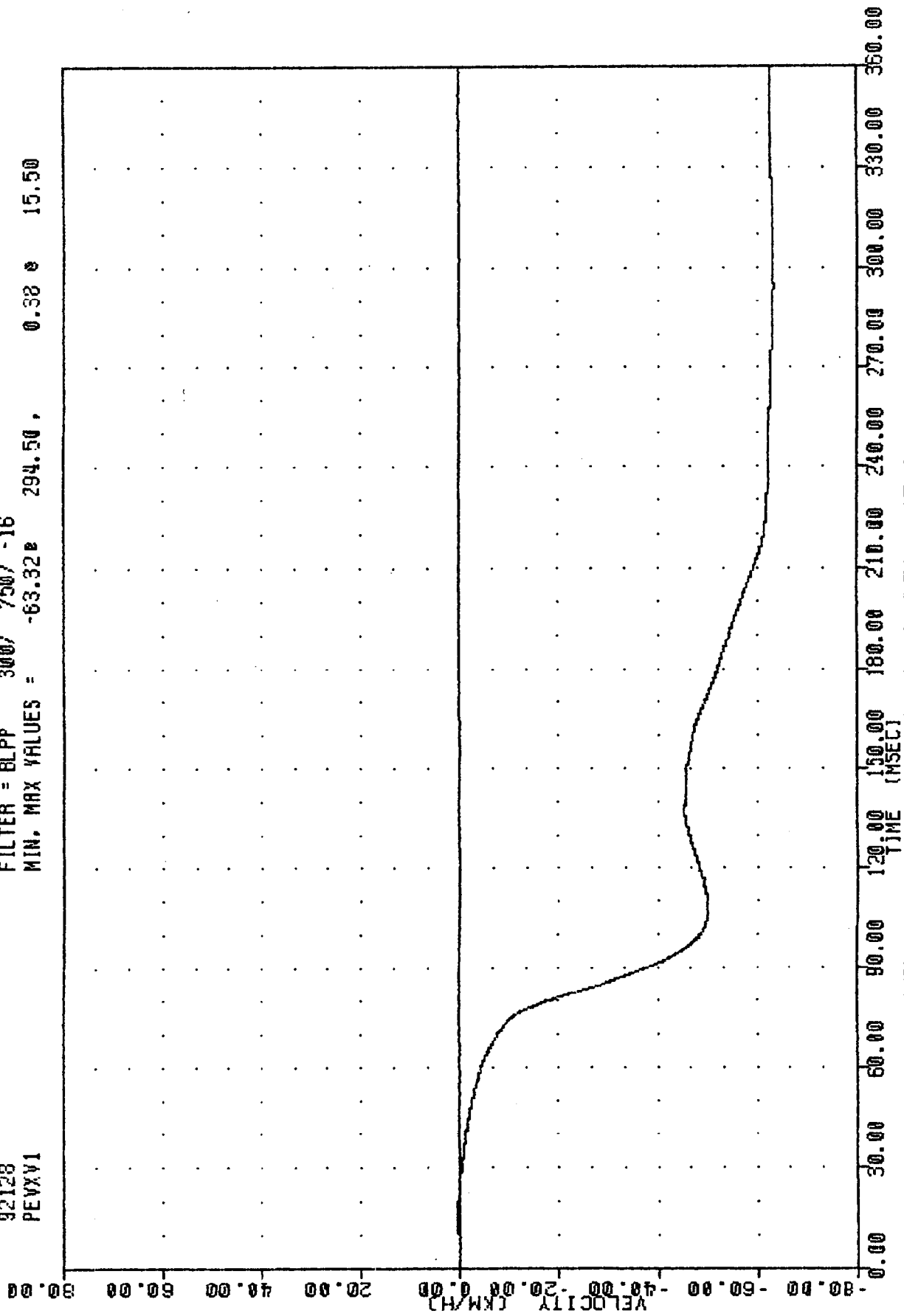
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.23 -19.68 78.81 82.63



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER PELVIS RESULTANT ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
PEVXV1

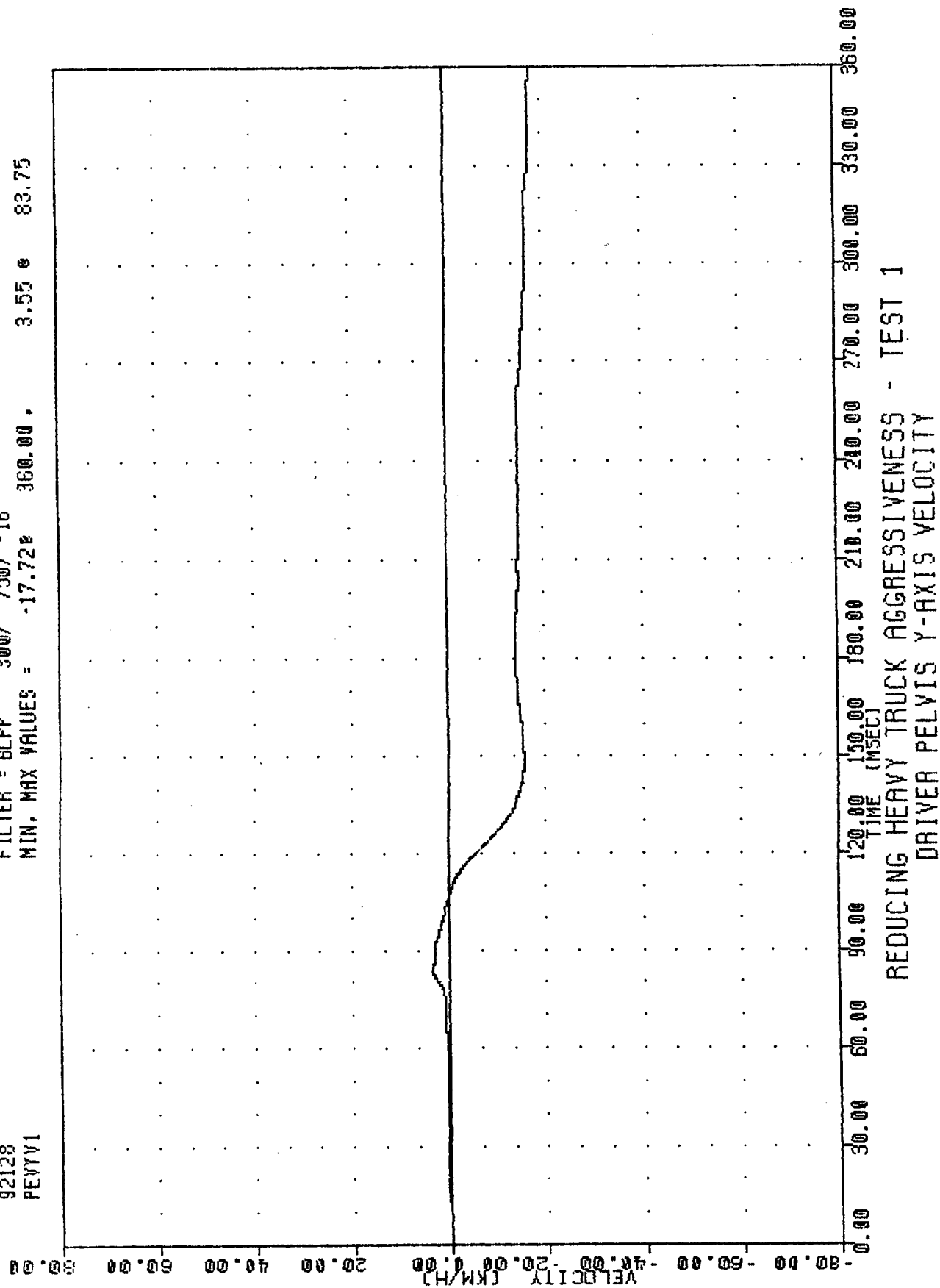
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -63.32 294.50 , 0.30 15.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER PELVIS X-AXIS VELOCITY

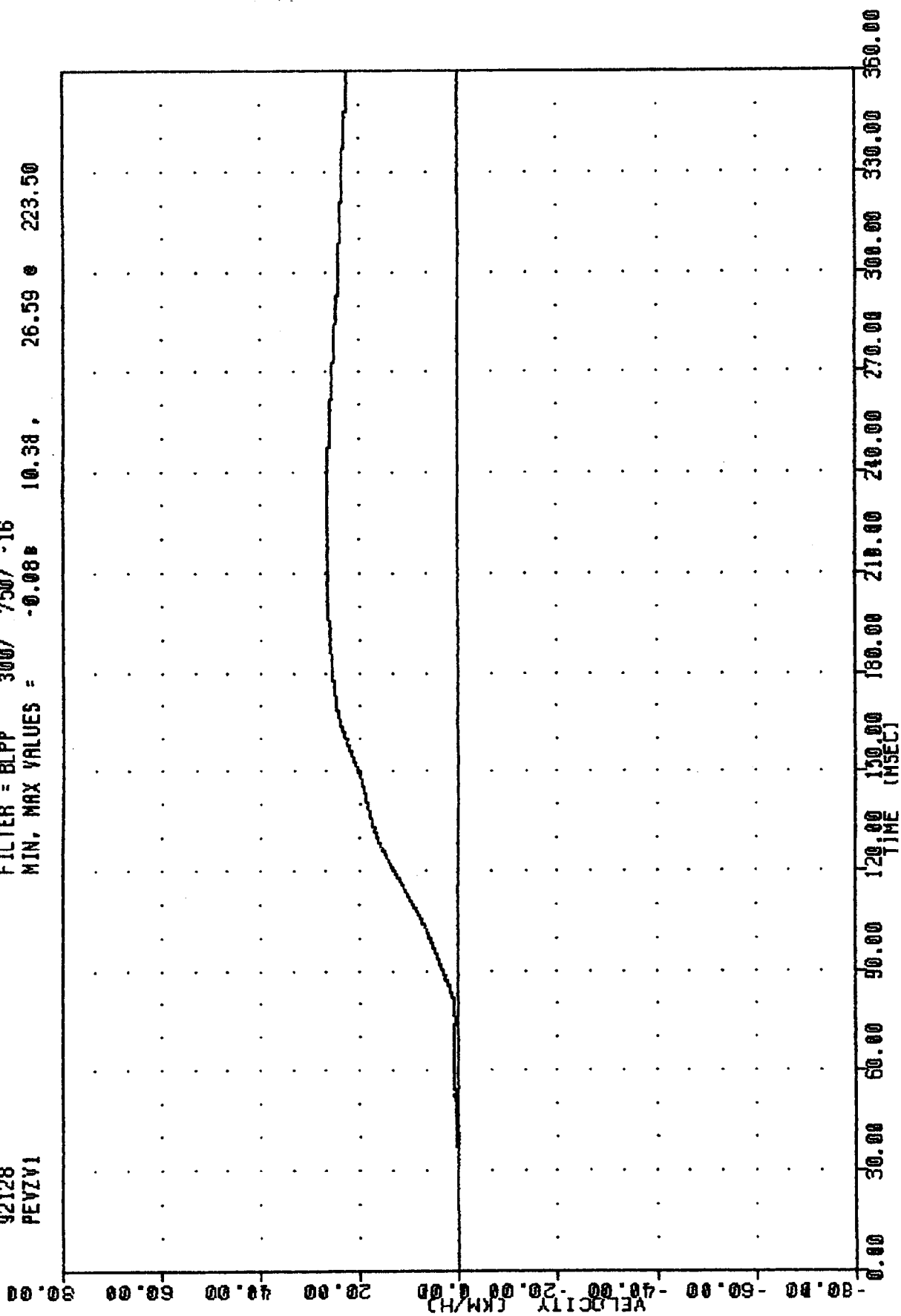
TRC 920507
TRUCK INTO STATIONARY CAR
92128
PEVYV1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -17.72 360.00 3.55 83.75



TRC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 PEZV1

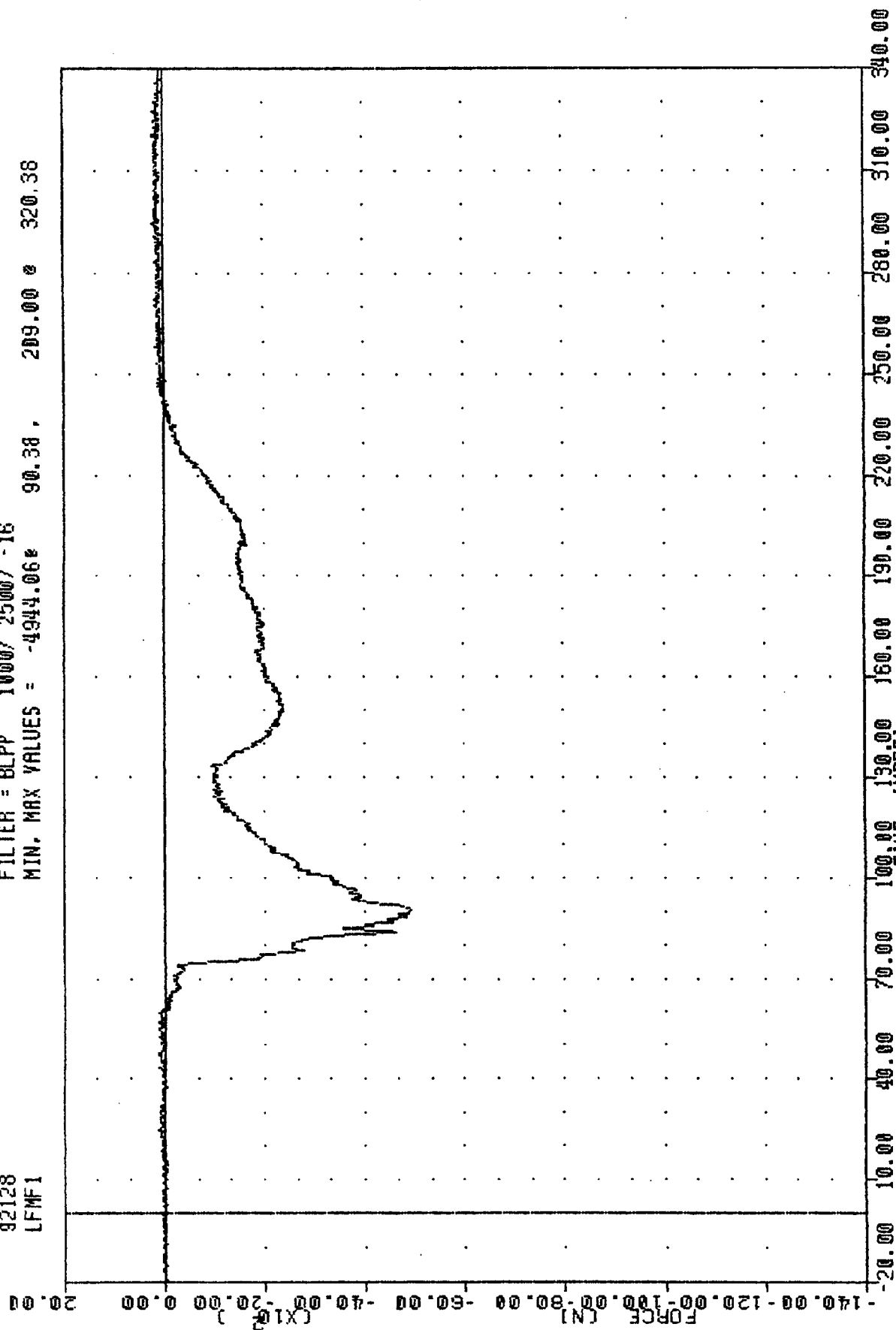
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -0.08 10.38, 26.59 223.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER PELVIS Z-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
LFMF1

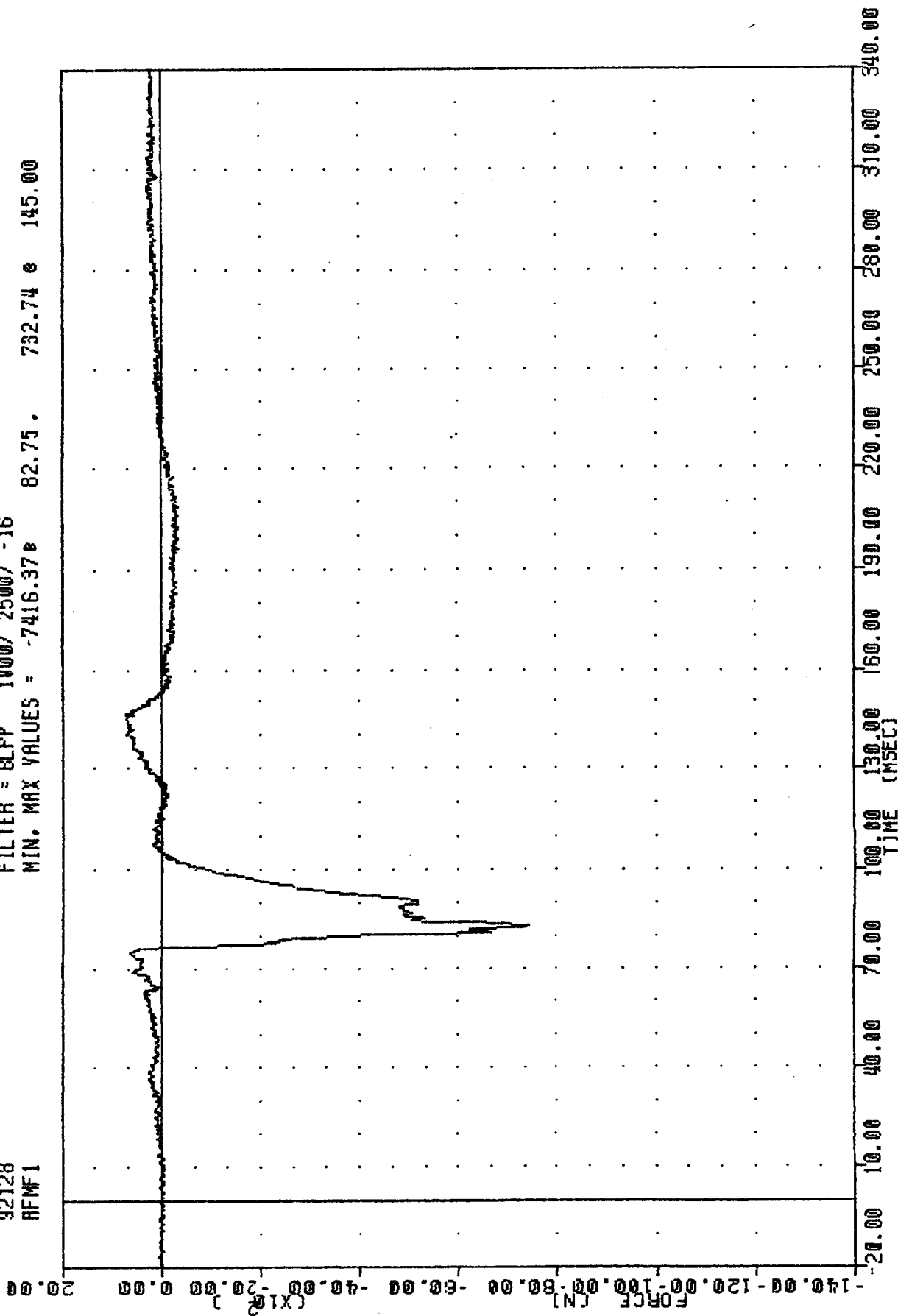
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -4944.06# 90.38 , 209.00 @ 320.38



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER LEFT FEMUR FORCE

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
AFMF1

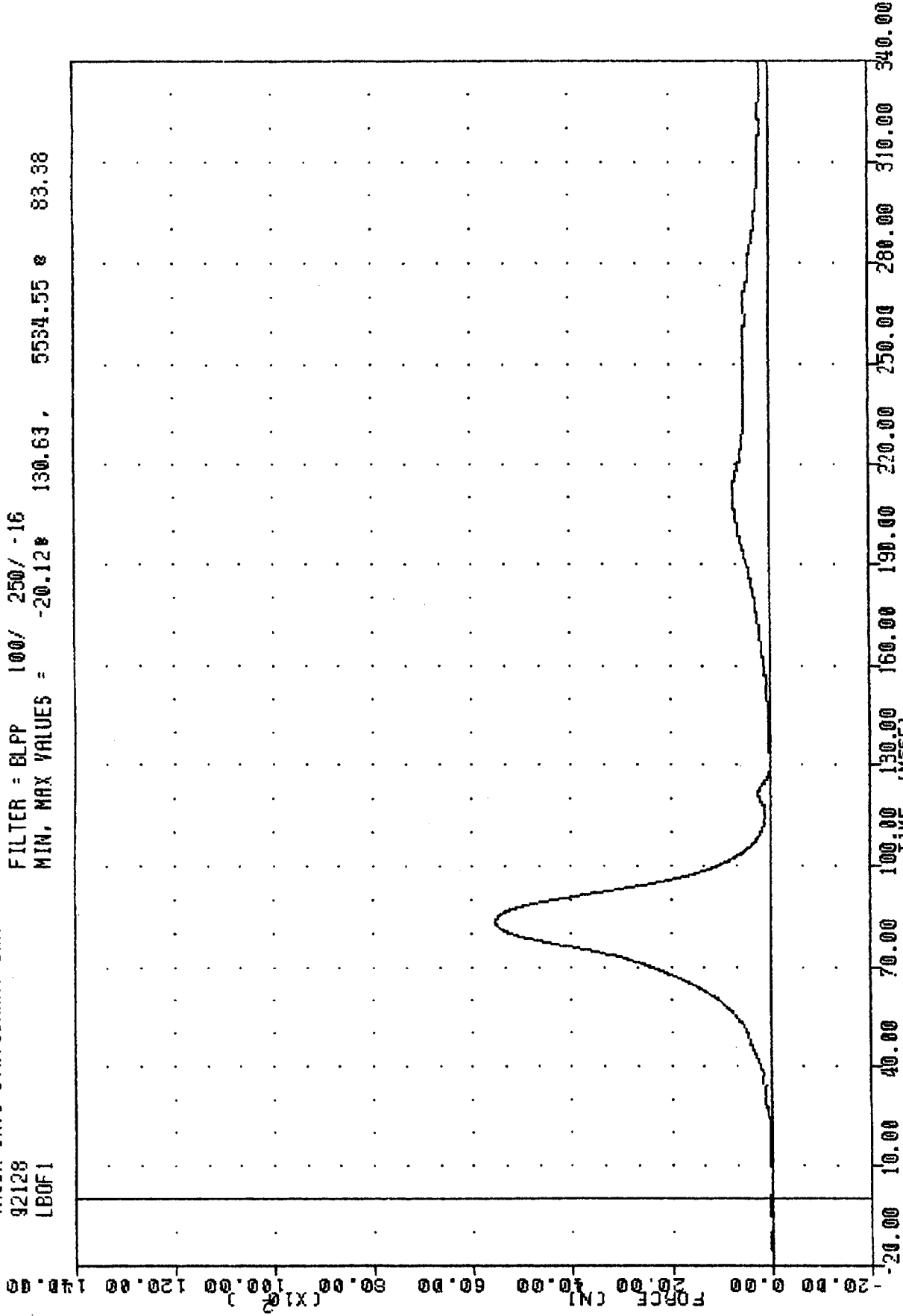
FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -7416.37e 82.75 . 732.74 e 145.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
DRIVER RIGHT FEMUR FORCE

TRC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 LBOF1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -20.128 130.63, 5534.55 83.38

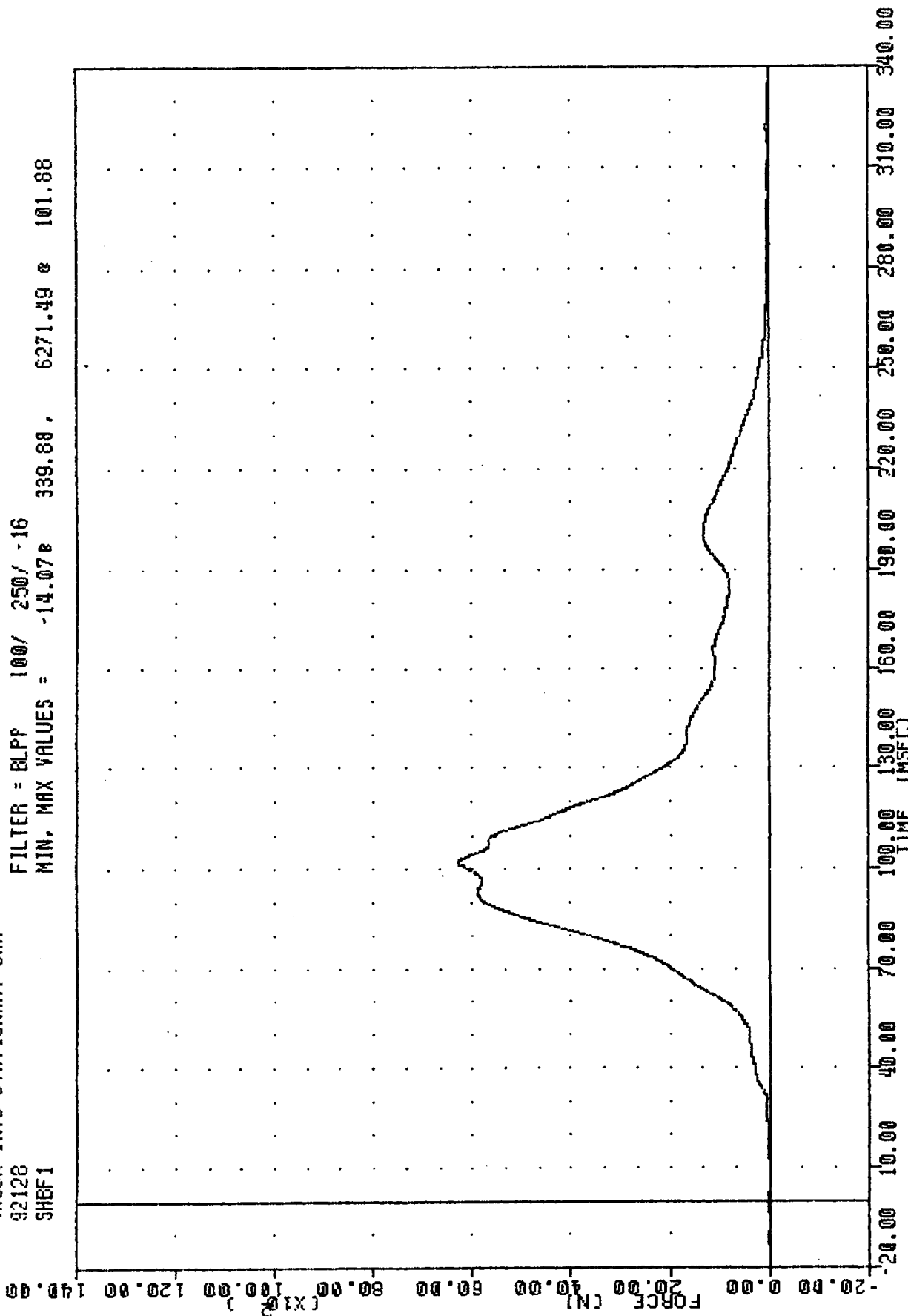


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER LAP BELT OUTBOARD FORCE

TRC
 TRUCK INTO STATIONARY CAR
 92128
 SHEF1

920507

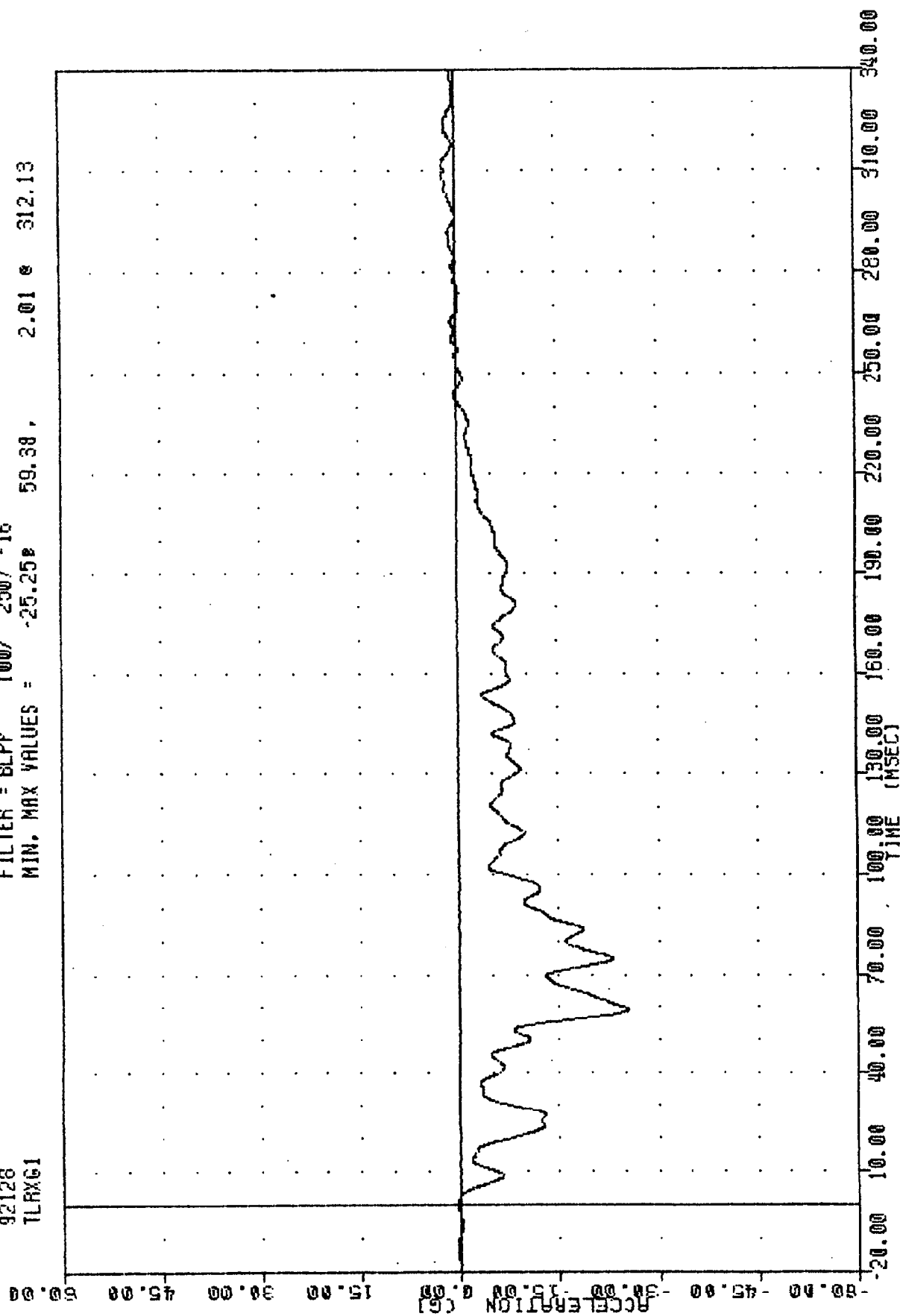
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -14.07 339.88, 6271.49 @ 101.88



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 DRIVER SHOULDER BELT FORCE

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
TLRXG1

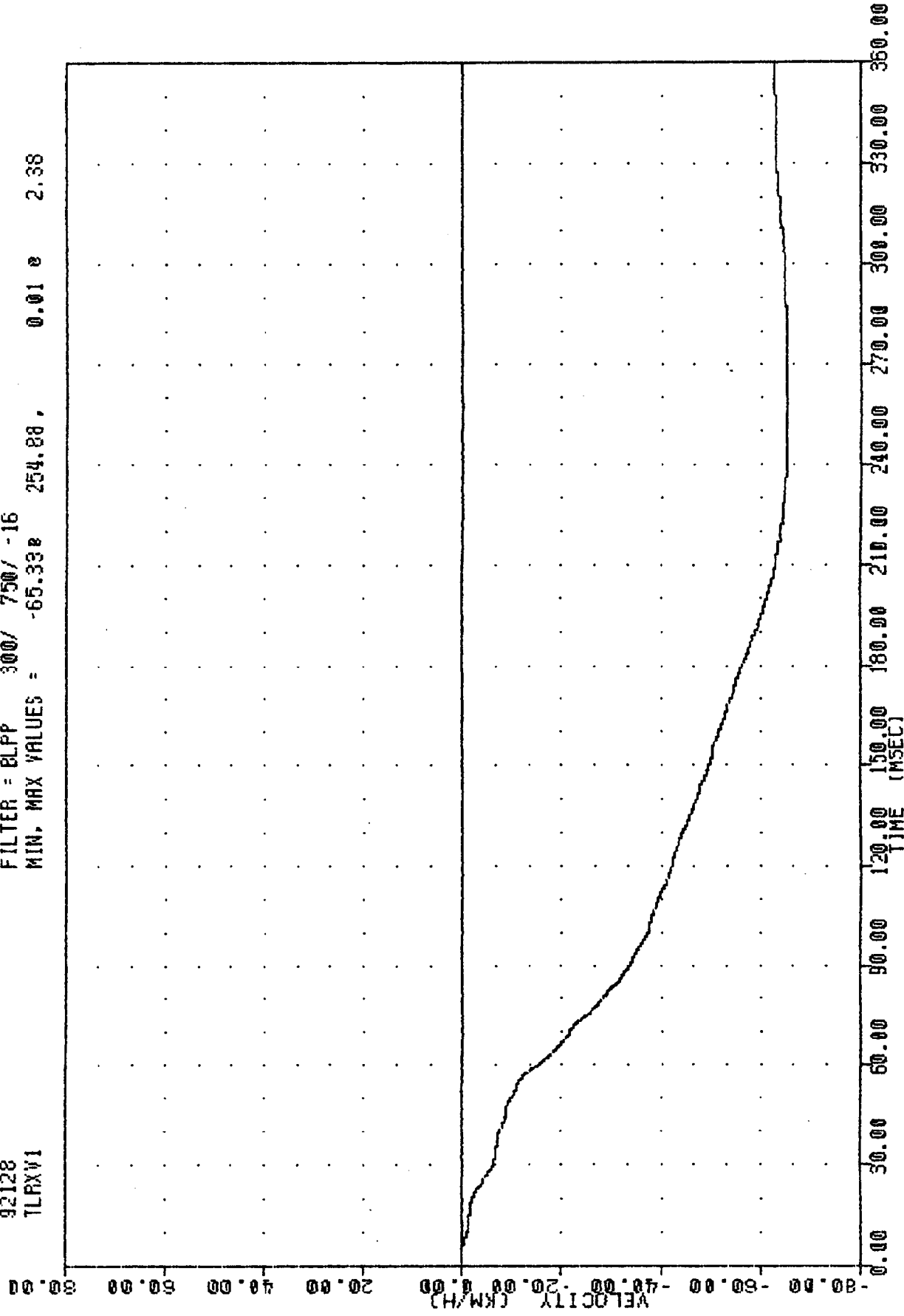
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -25.25 59.38 2.01 312.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
LEFT REAR SEAT X-AXIS ACCELERATION

TRC 920507
TRUCK INTO STATIONARY CAR
92128
TLRXV1

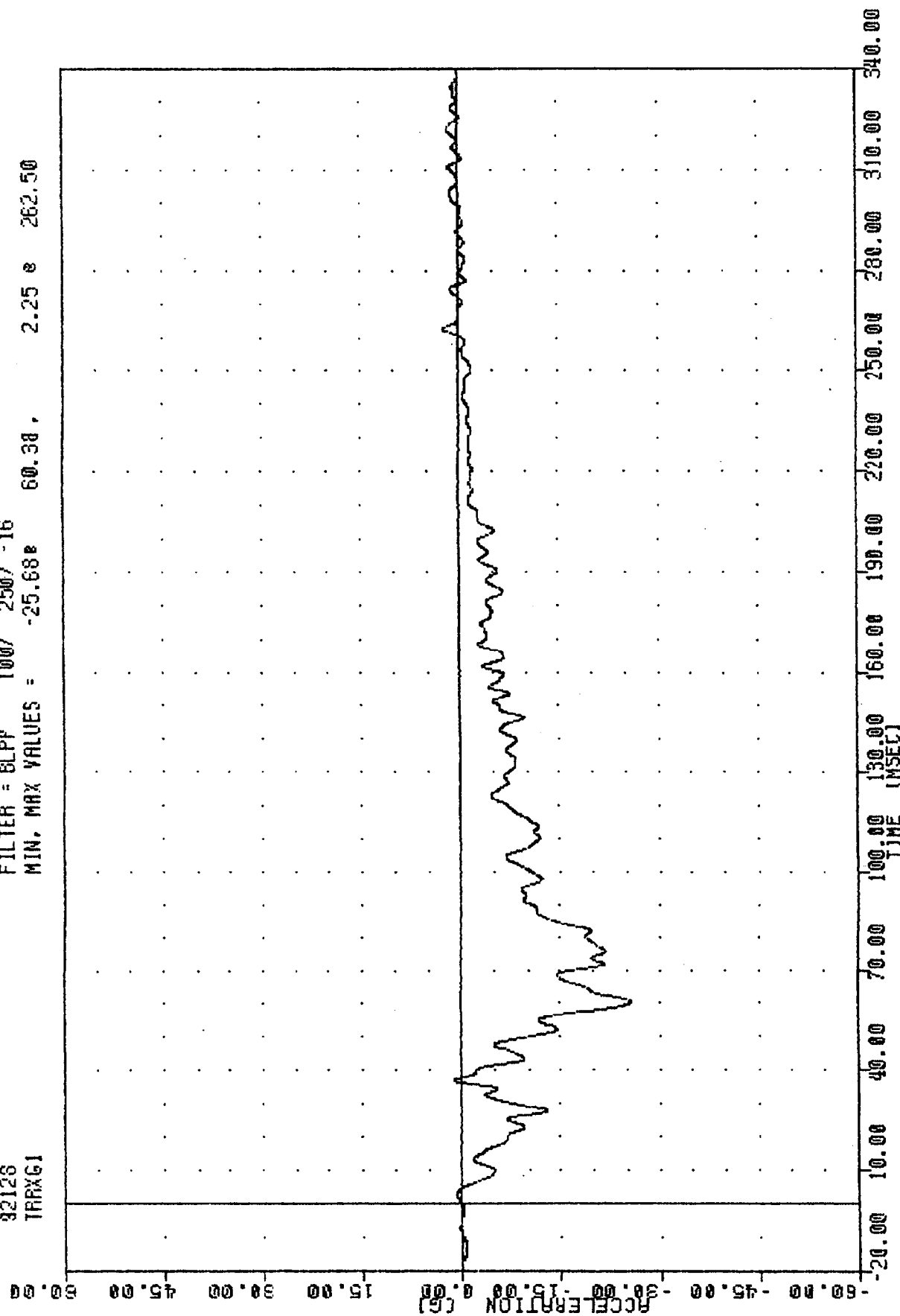
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -65.33 254.88 0.01 2.38



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
LEFT REAR SEAT X-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
32128
TRXG1

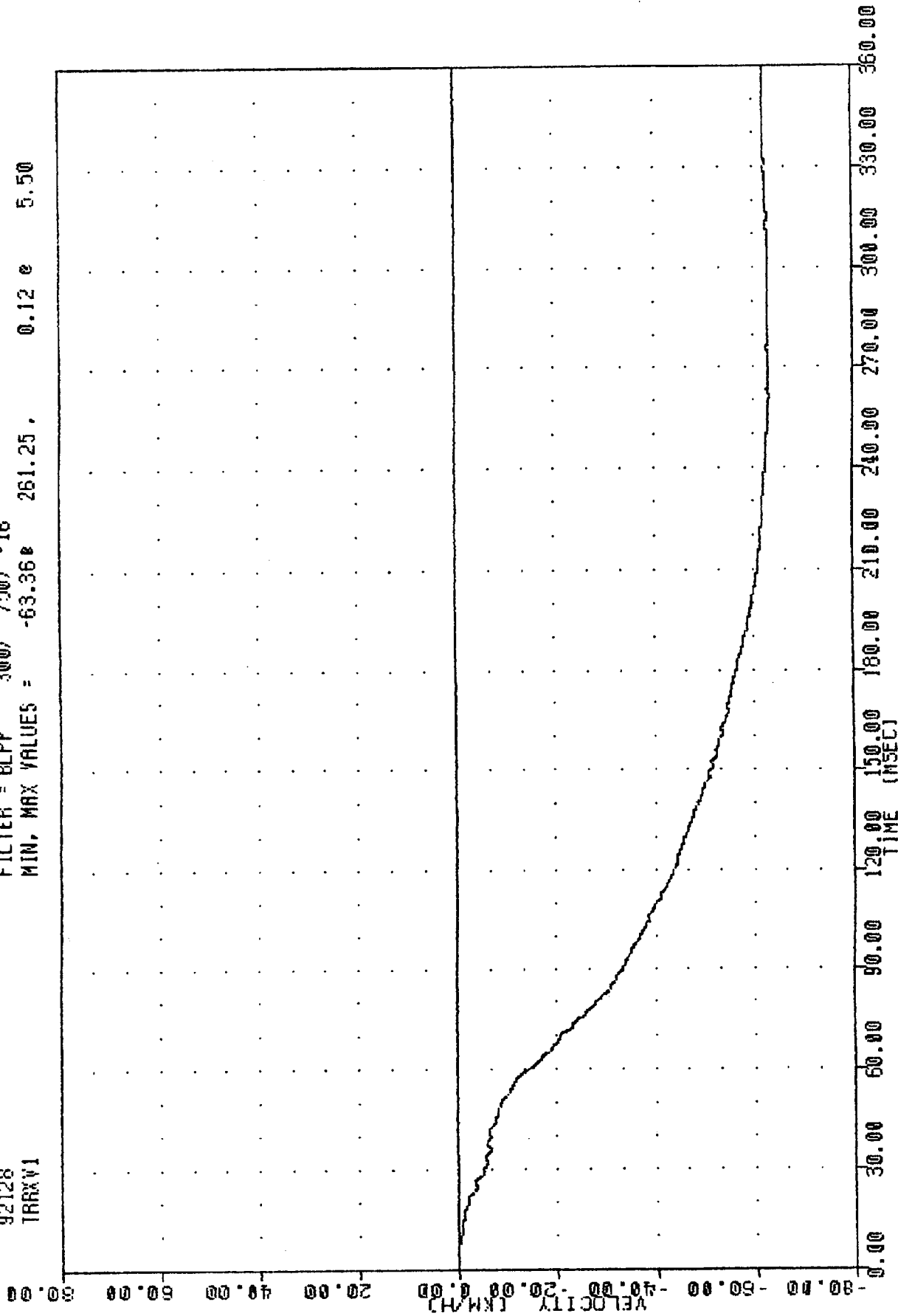
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -25.68 60.38, 2.25 262.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
RIGHT REAR SEAT X-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
TRRXV1

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -63.36 261.25, 0.12 e 5.50

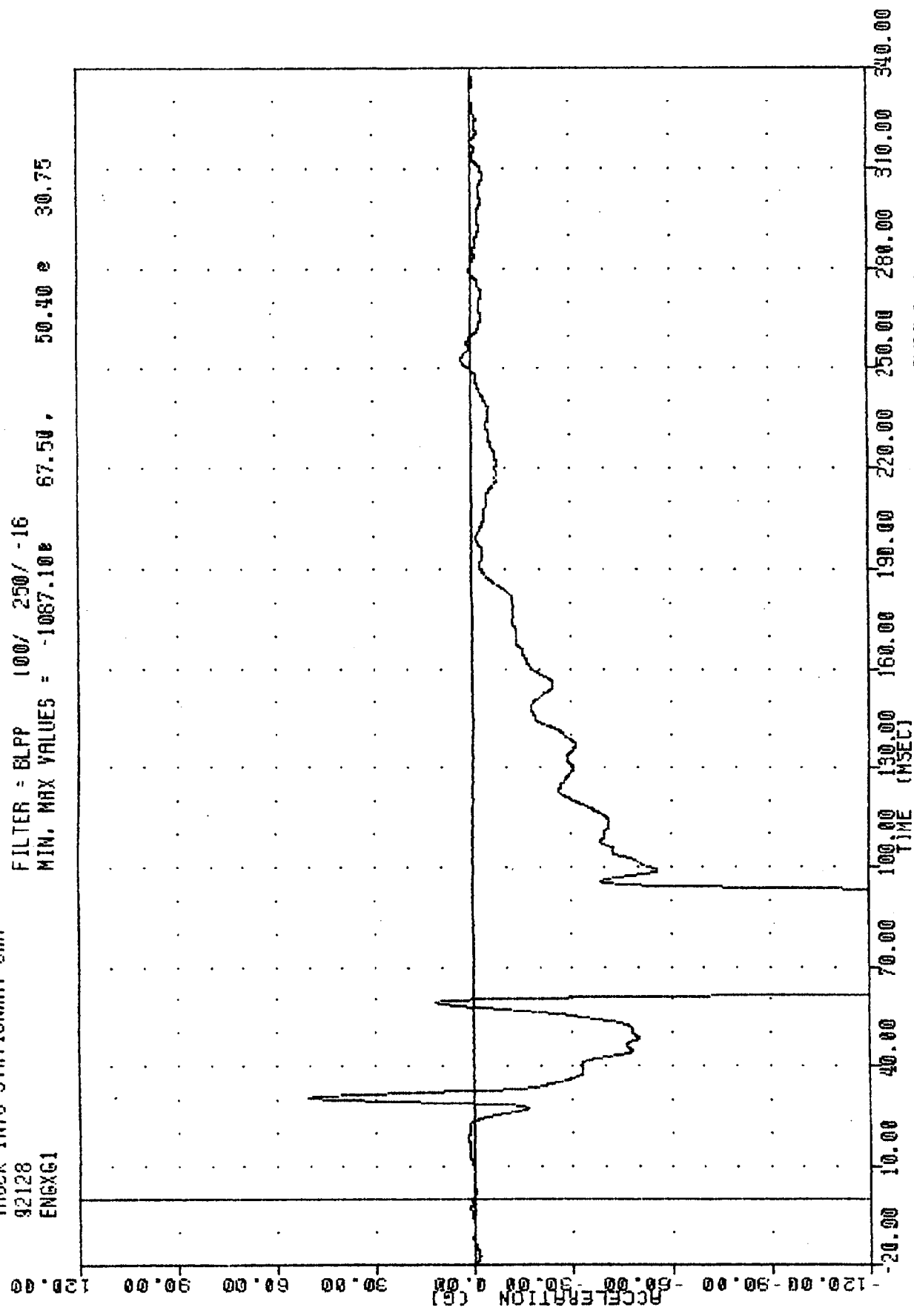


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
RIGHT REAR SEAT X-AXIS VELOCITY

TRC
TRUCK INTO STATIONARY CAR
92128
ENGXG1

, 920507

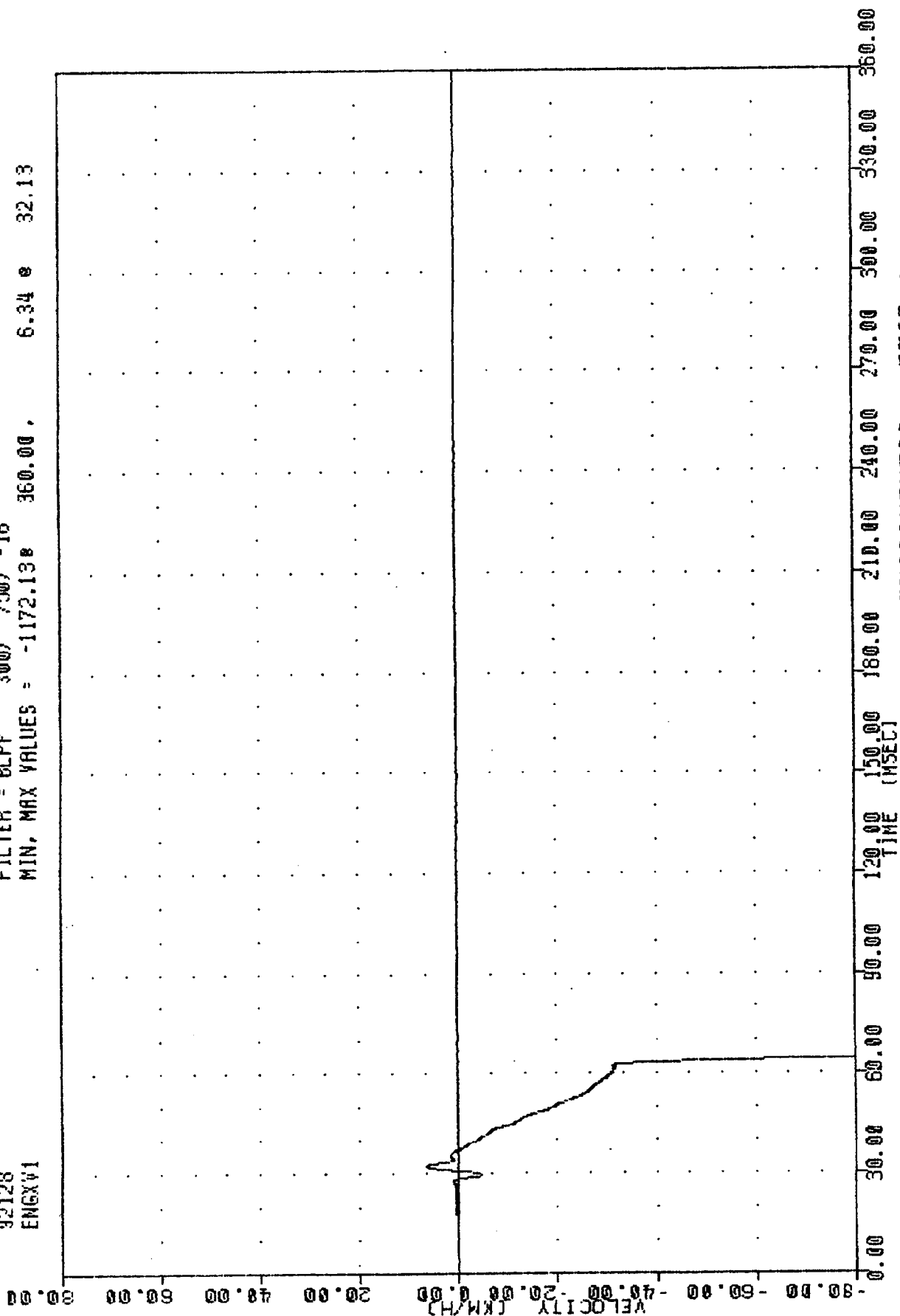
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -1087.10e 67.50, 50.40 e 30.75



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
ENGINE TOP X-AXIS ACCELERATION

TAC . 920507
TRUCK INTO STATIONARY CAR
92128
ENGXV1

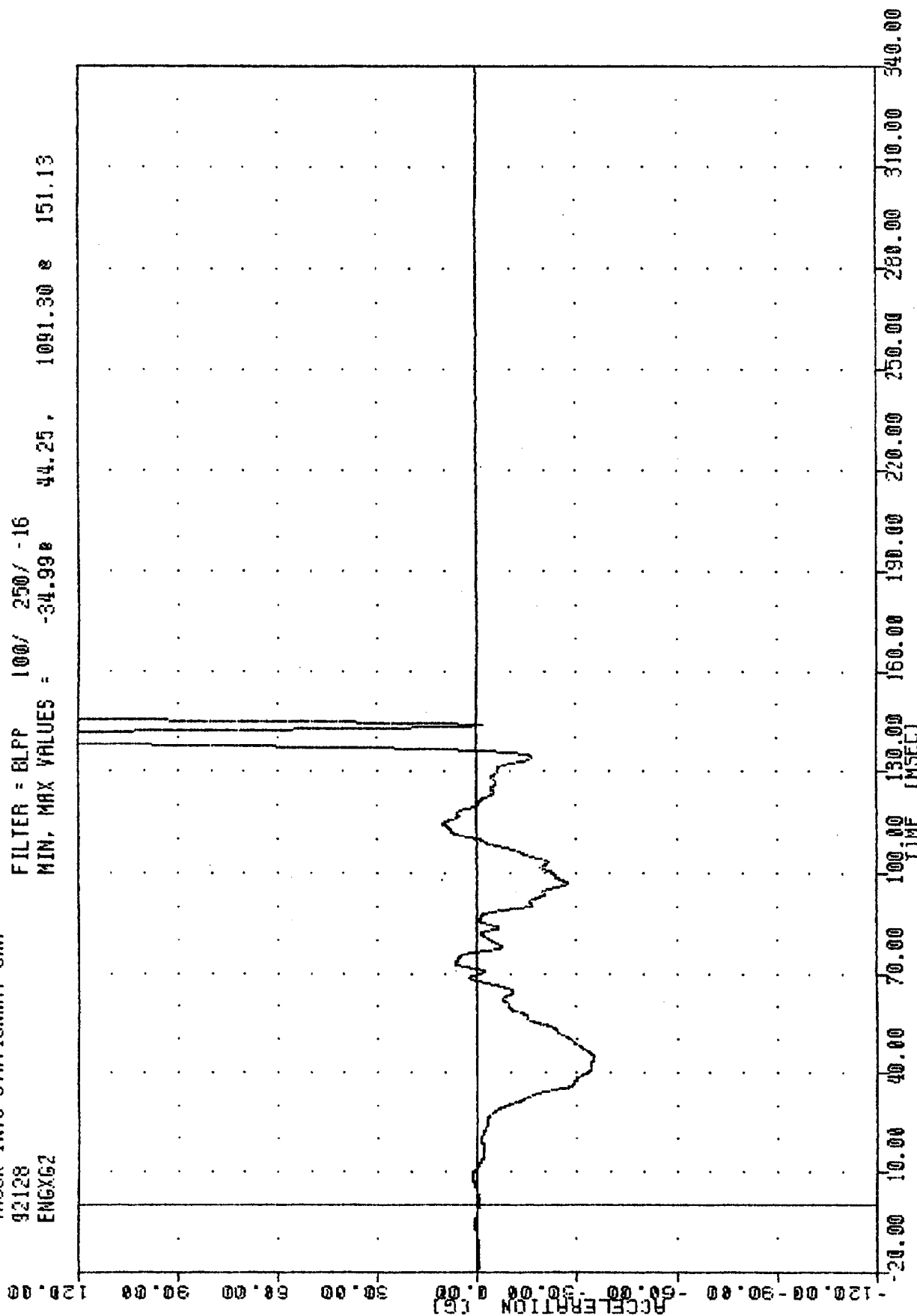
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -1172.13 360.00, 6.34 32.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
ENGINE TOP X-AXIS VELOCITY

TAC , 920507
TRUCK INTO STATIONARY CAR
92128
ENGX62

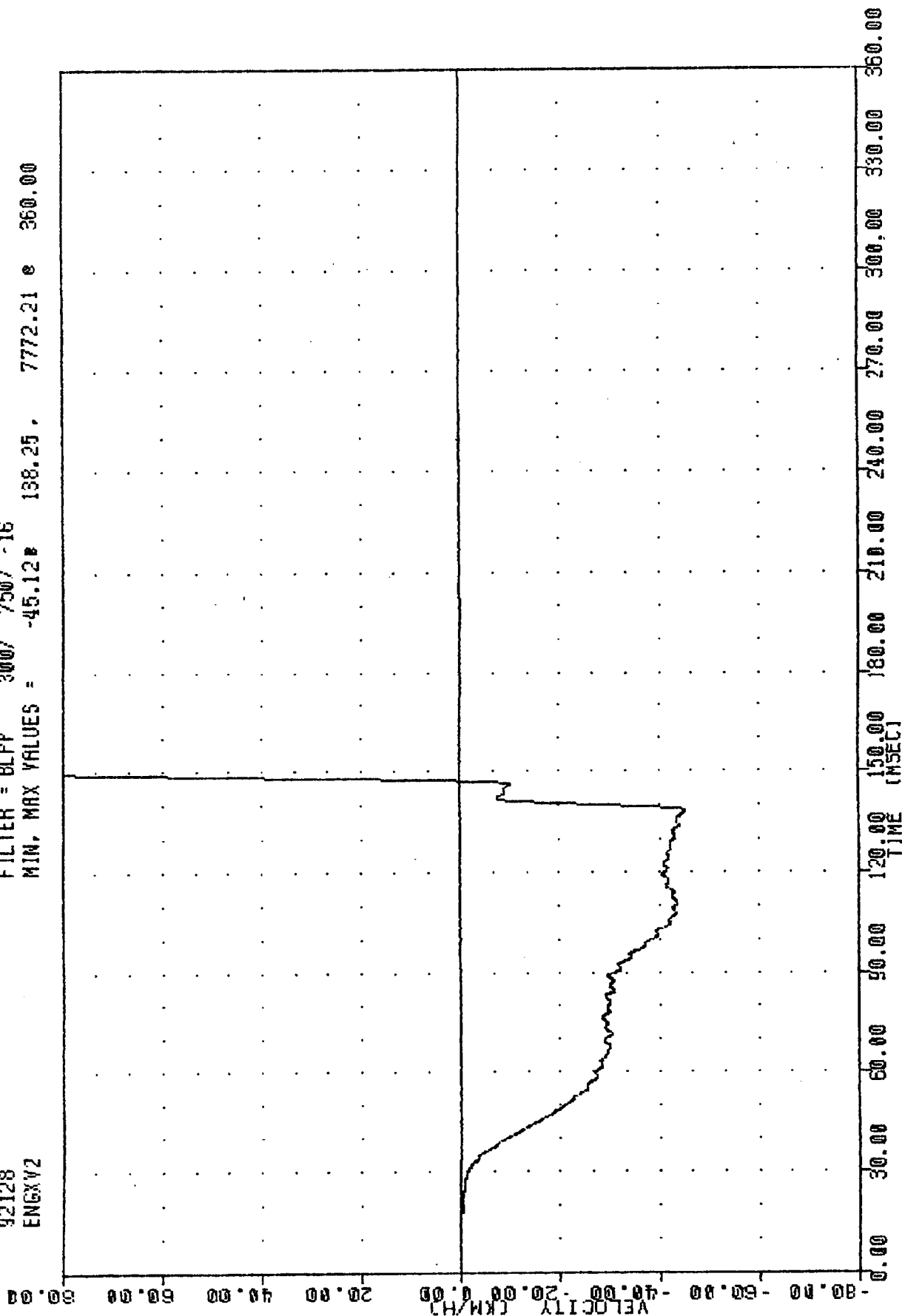
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -34.99e 44.25, 1091.30 e 151.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
ENGINE BOTTOM X-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
ENGXV2

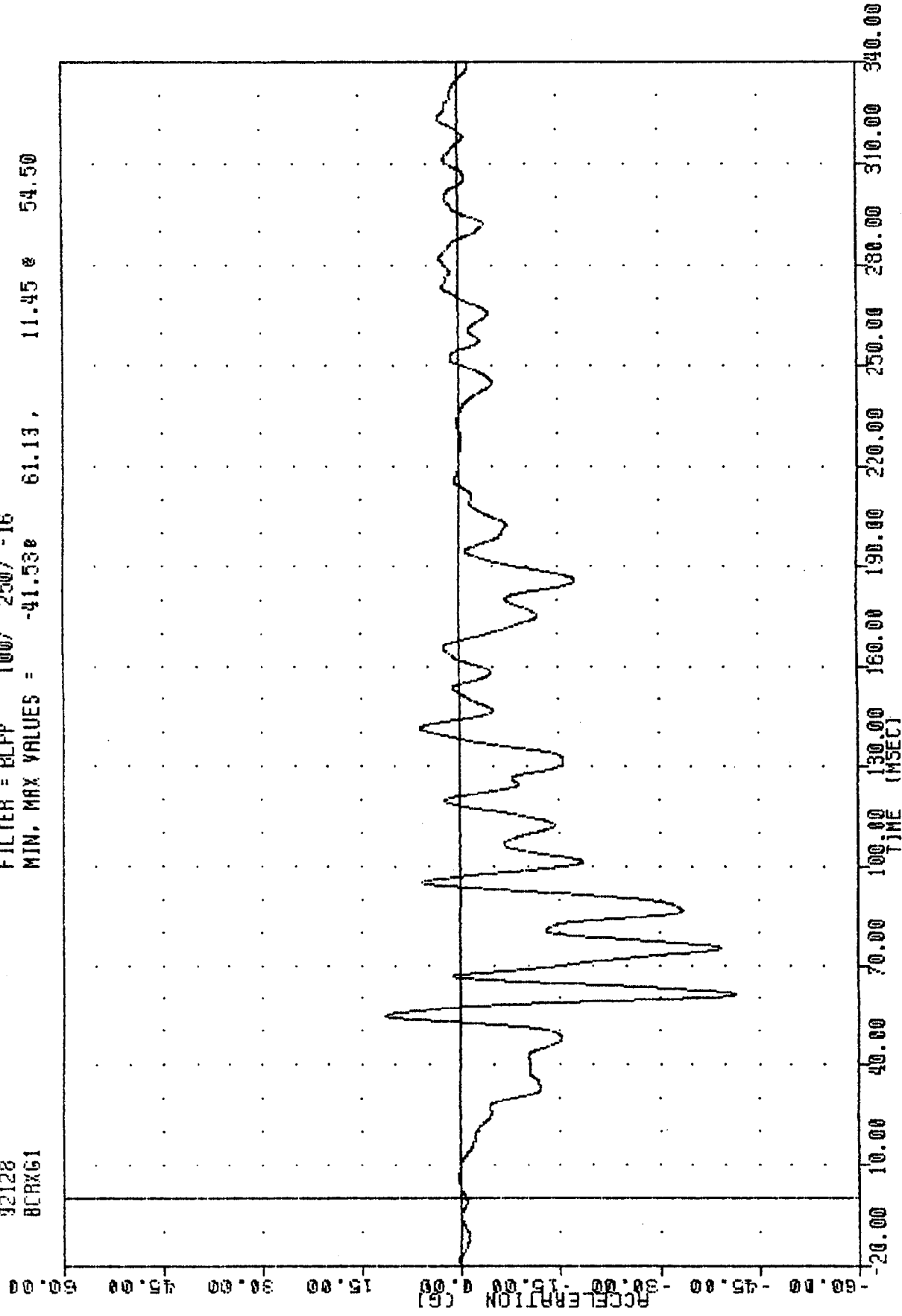
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -45.12 138.25, 7772.21 e 360.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
ENGINE BOTTOM X-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
BCRX61

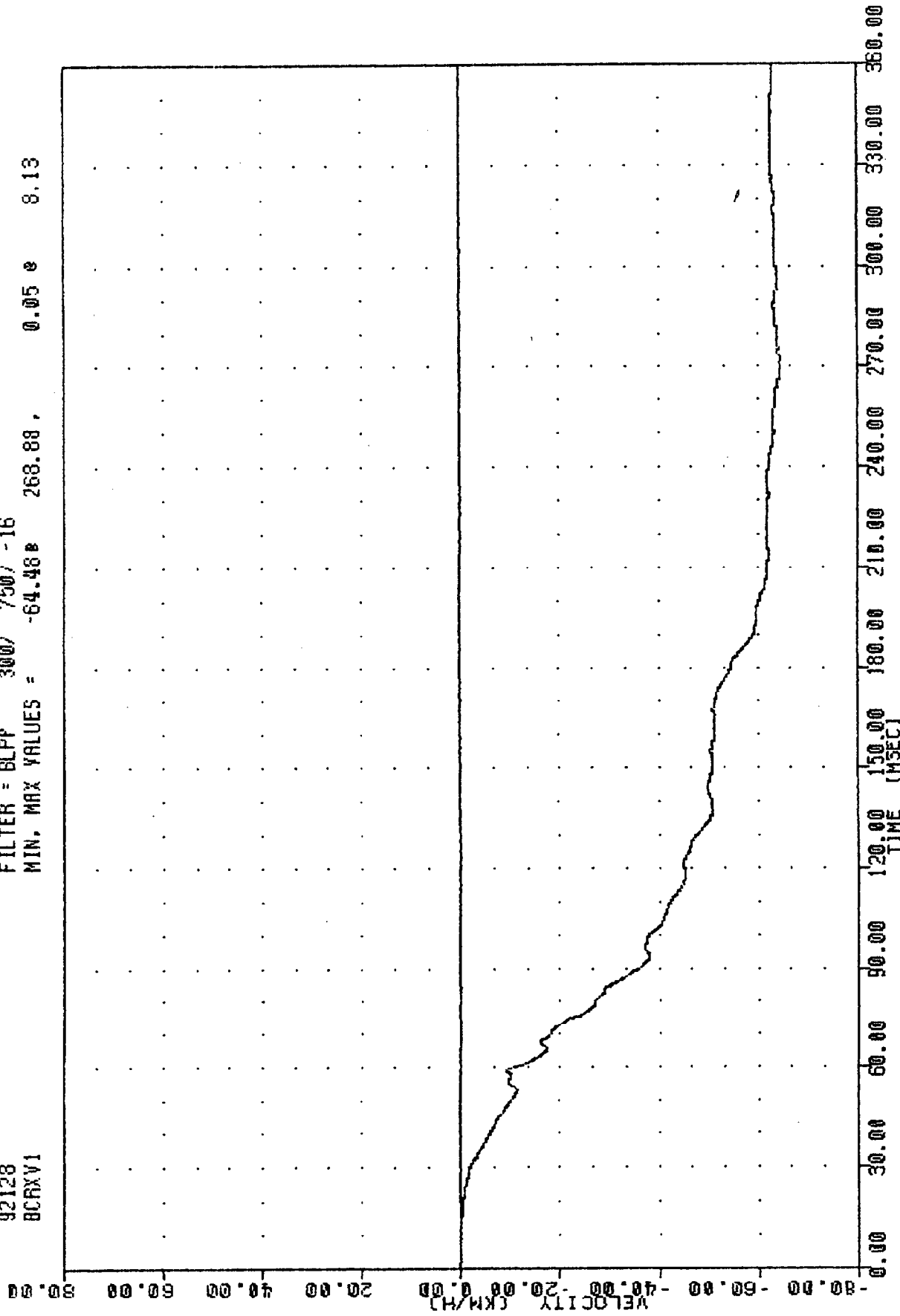
FILTER = BLFP 100/ 250/ -16
MIN. MAX VALUES = -41.53 61.13 , 11.45 54.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
BCRXV1

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -64.48 268.88 , 0.05 8.13

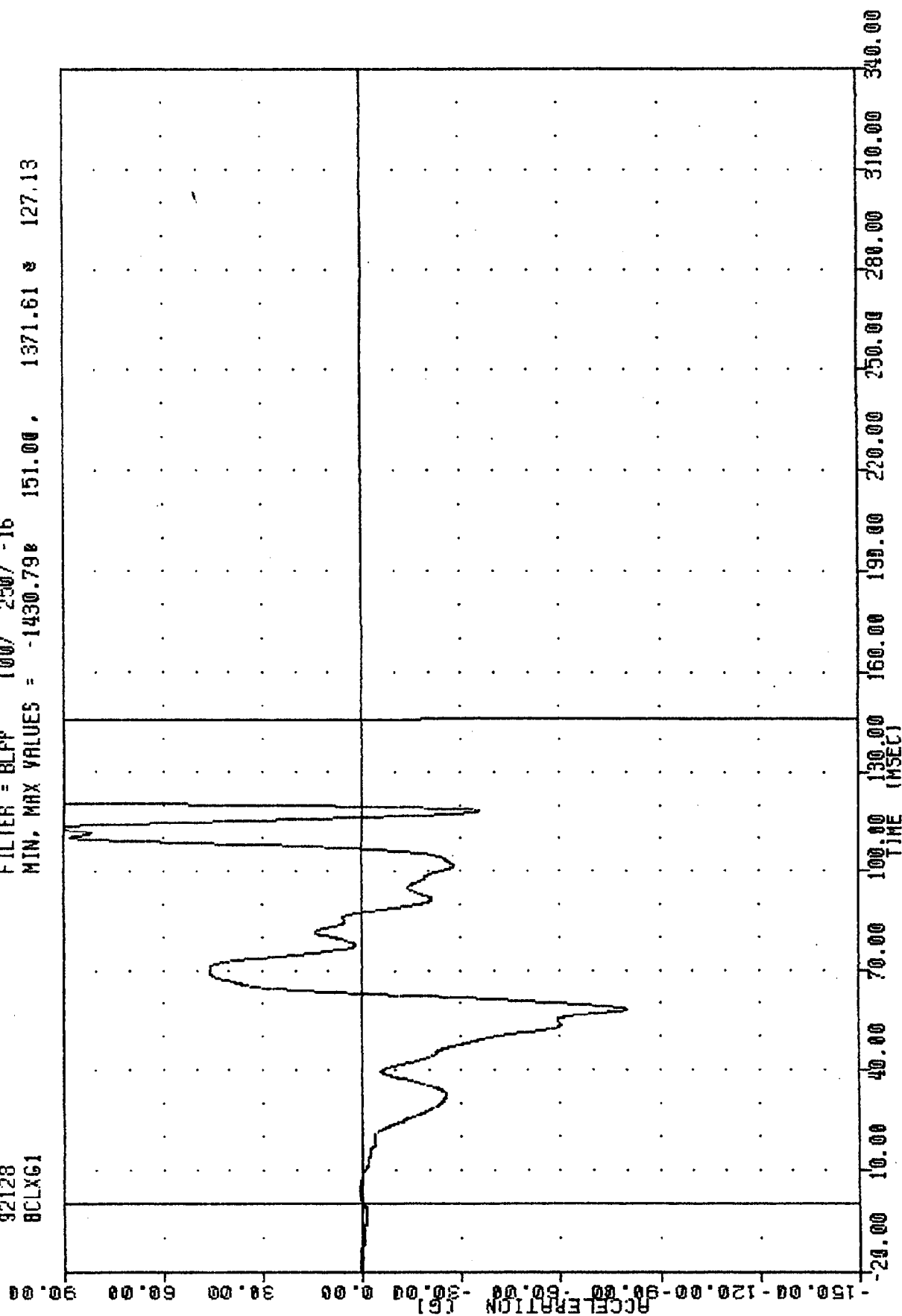


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
RIGHT BRAKE CALIPER X-AXIS VELOCITY

TRC
TRUCK INTO STATIONARY CAR
92128
8CLX61

, 920507

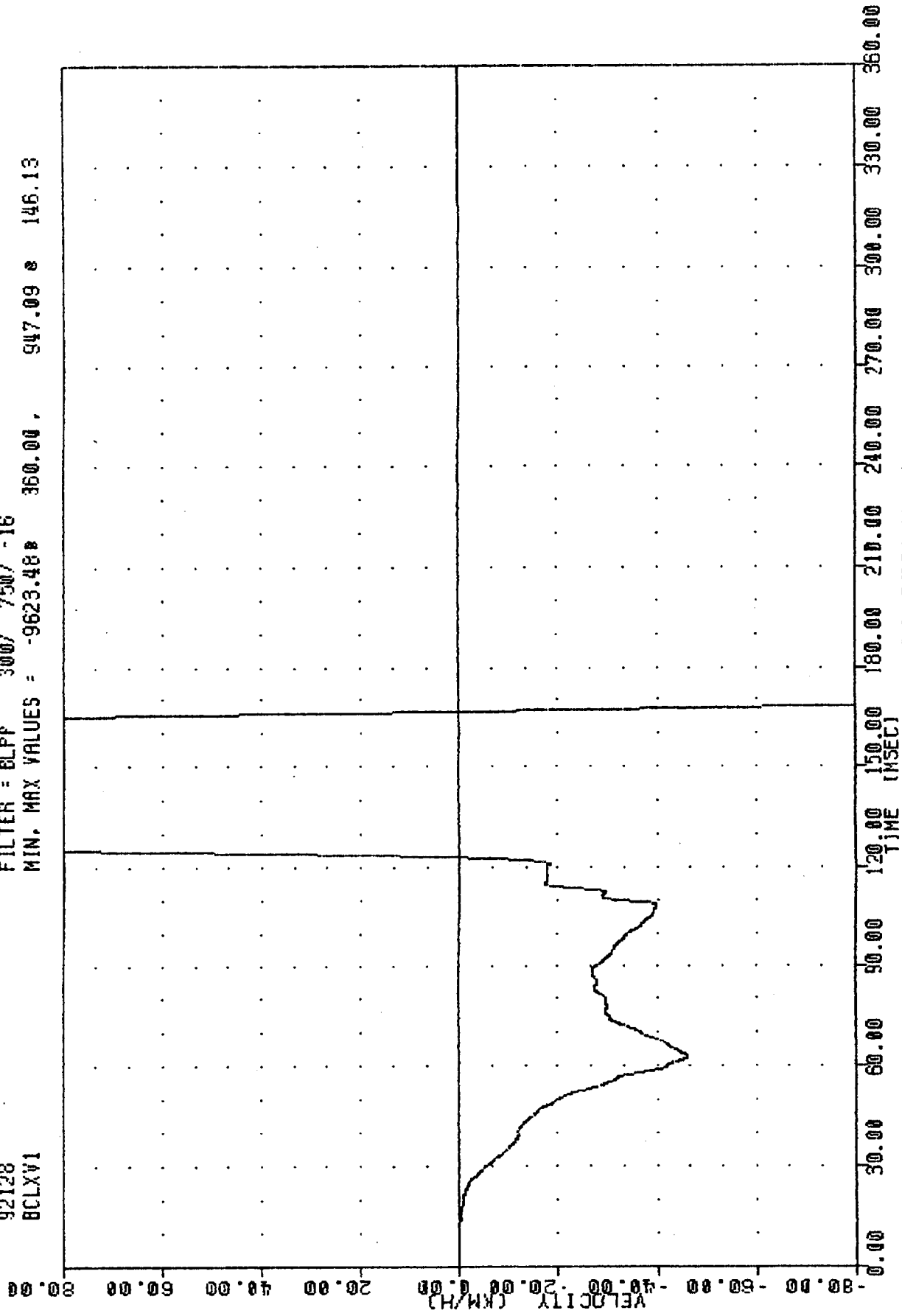
FILTER = BLFF 100/ 250/ -16
MIN. MAX VALUES = -1430.790 151.00, 1371.61 & 127.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC . 920507
TRUCK INTO STATIONARY CAR
92128
BCLXV1

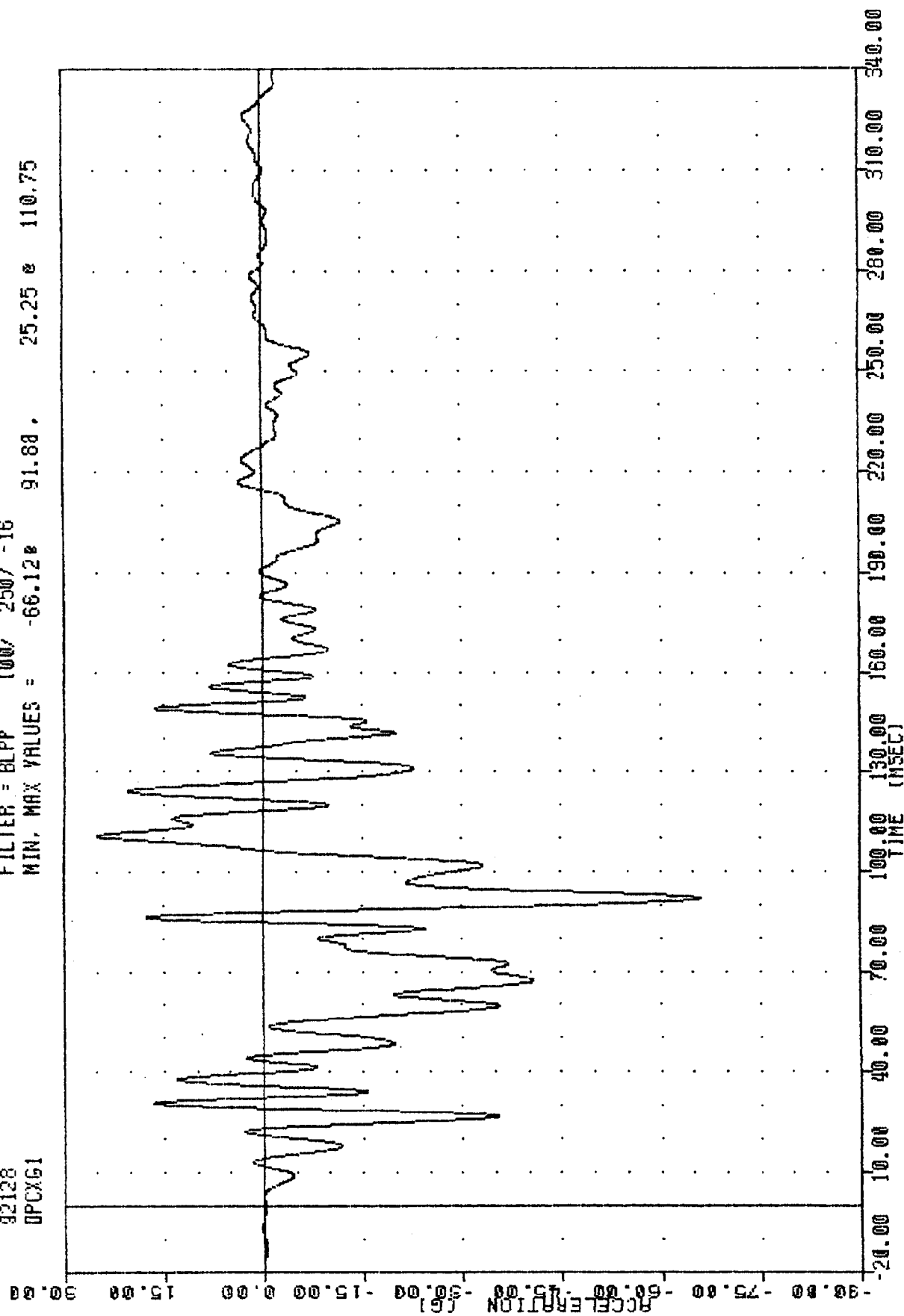
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -9623.48 360.00 , 947.09 146.13



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
LEFT BRAKE CALIPER X-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
DPCX61

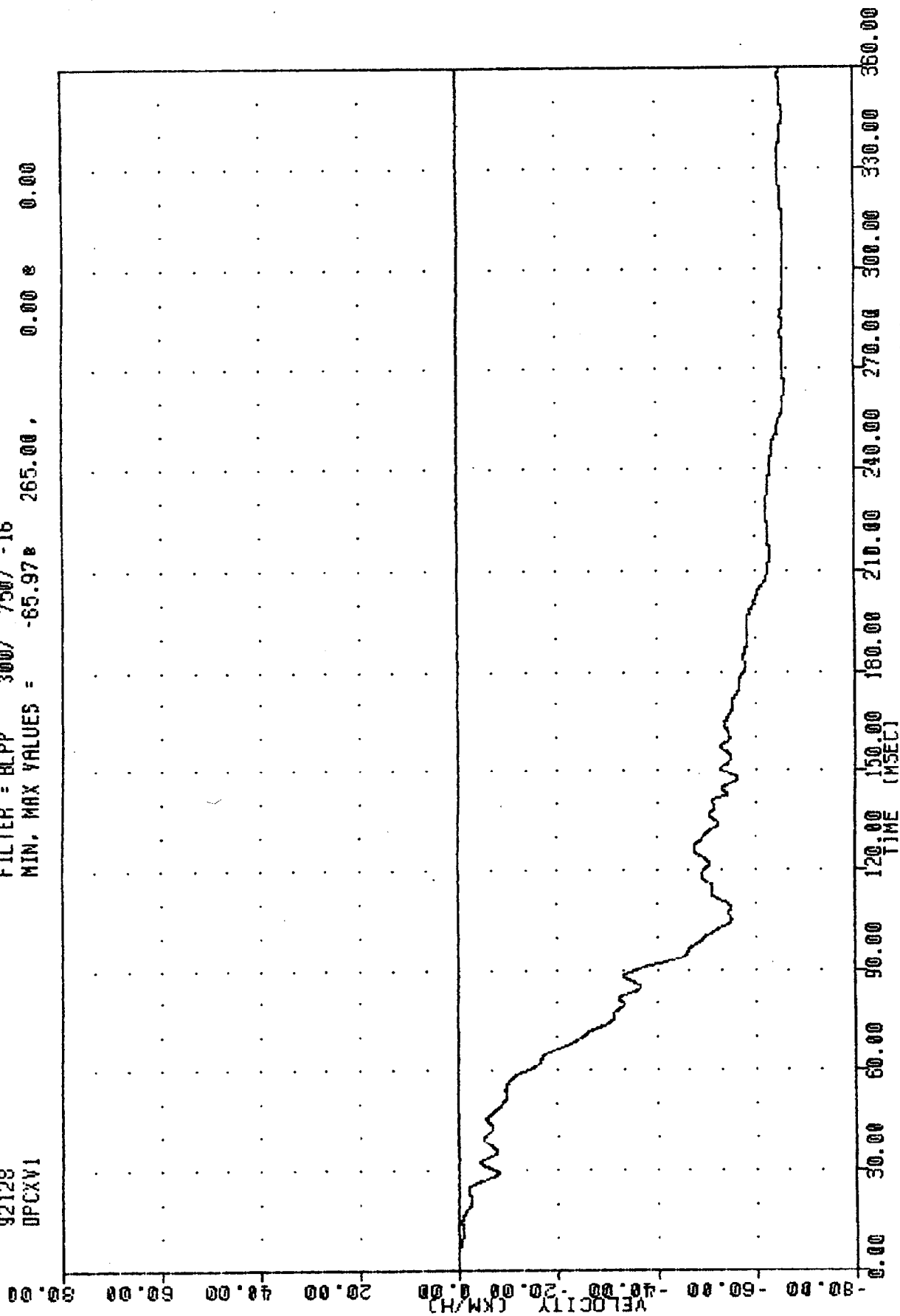
FILTER = BLPP 100/ 250/ -18
MIN, MAX VALUES = -66.128 91.88 25.25 @ 110.75



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
DPCXV1

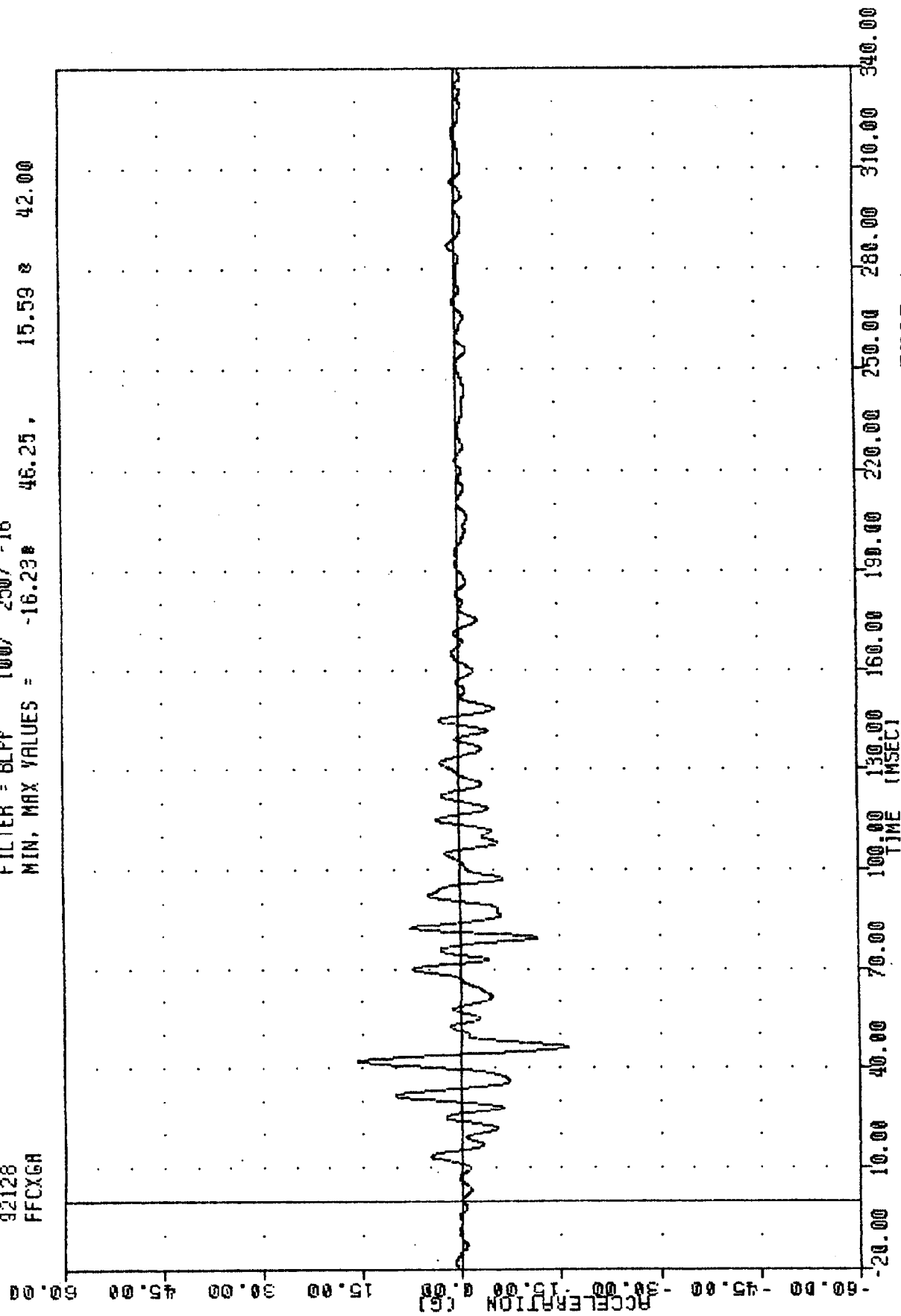
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -65.97 265.00 0.00 0.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
INSTRUMENT PANEL CENTER X-AXIS VELOCITY

TAC , 920507
TRUCK INTO STATIONARY CAR
92128
FFCXGA

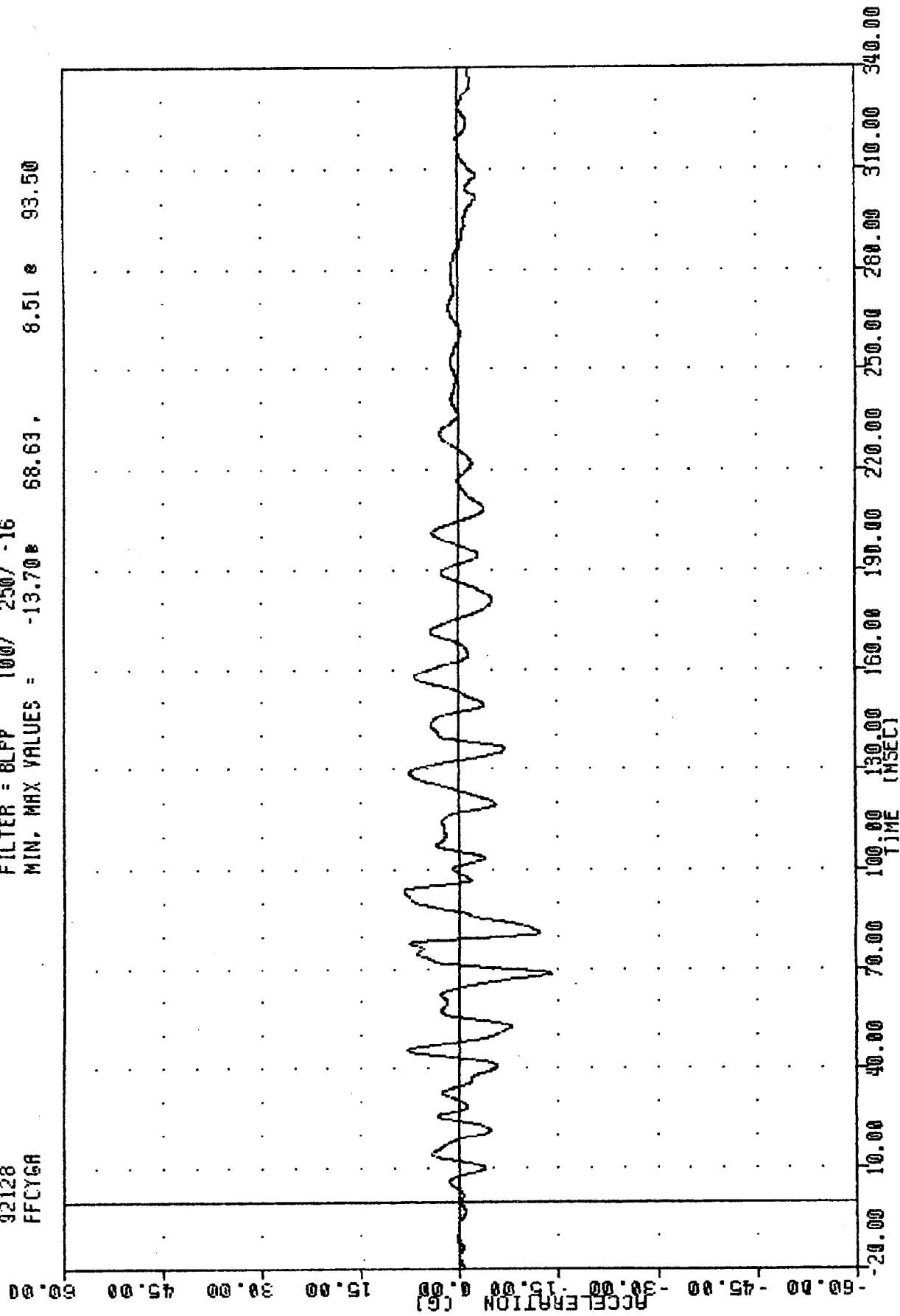
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -16.23 46.25 15.59 42.00



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
TRUCK FRONT FRAME CROSSMEMBER X-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
FFCYGA

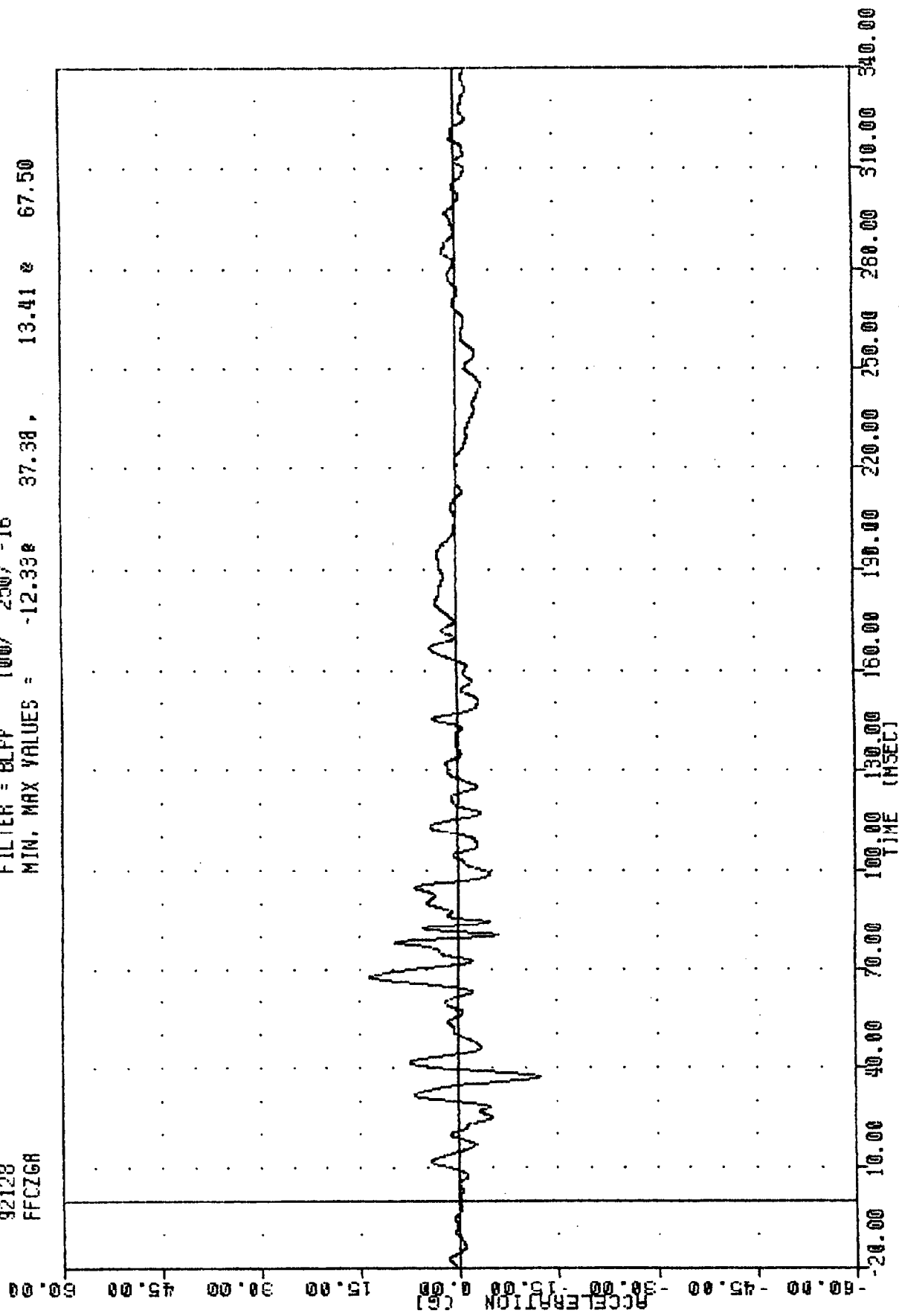
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -13.70 8.51 8.51 93.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
TRUCK FRONT FRAME CROSSMEMBER Y-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
FFCZGA

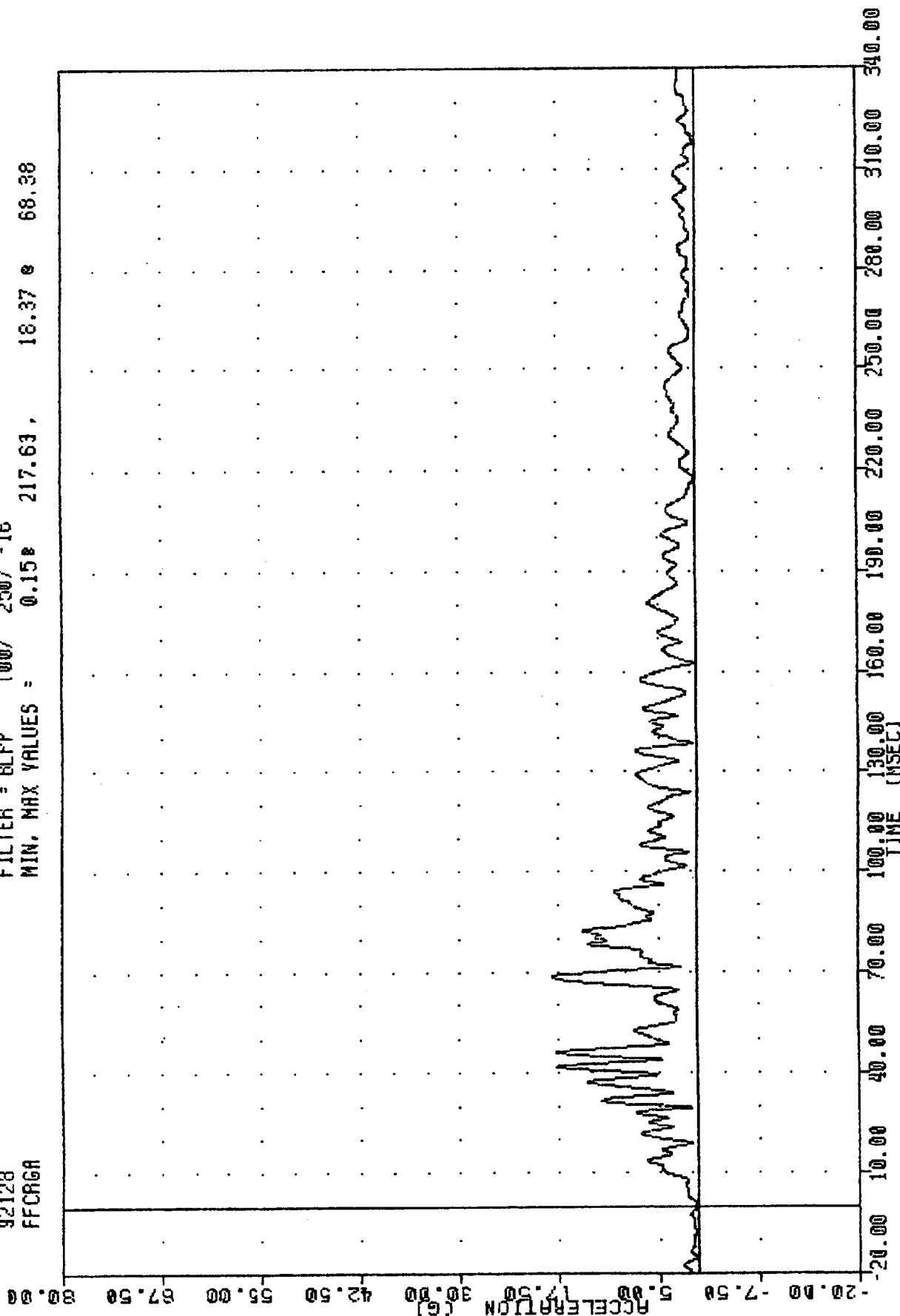
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -12.338 37.38 , 13.41 & 67.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
TRUCK FRONT FRAME CROSSMEMBER Z-AXIS ACCELERATION

TRC . 920507
 TRUCK INTO STATIONARY CAR
 92128
 FFCRGA

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = 0.15e 217.63, 18.37 e 68.38

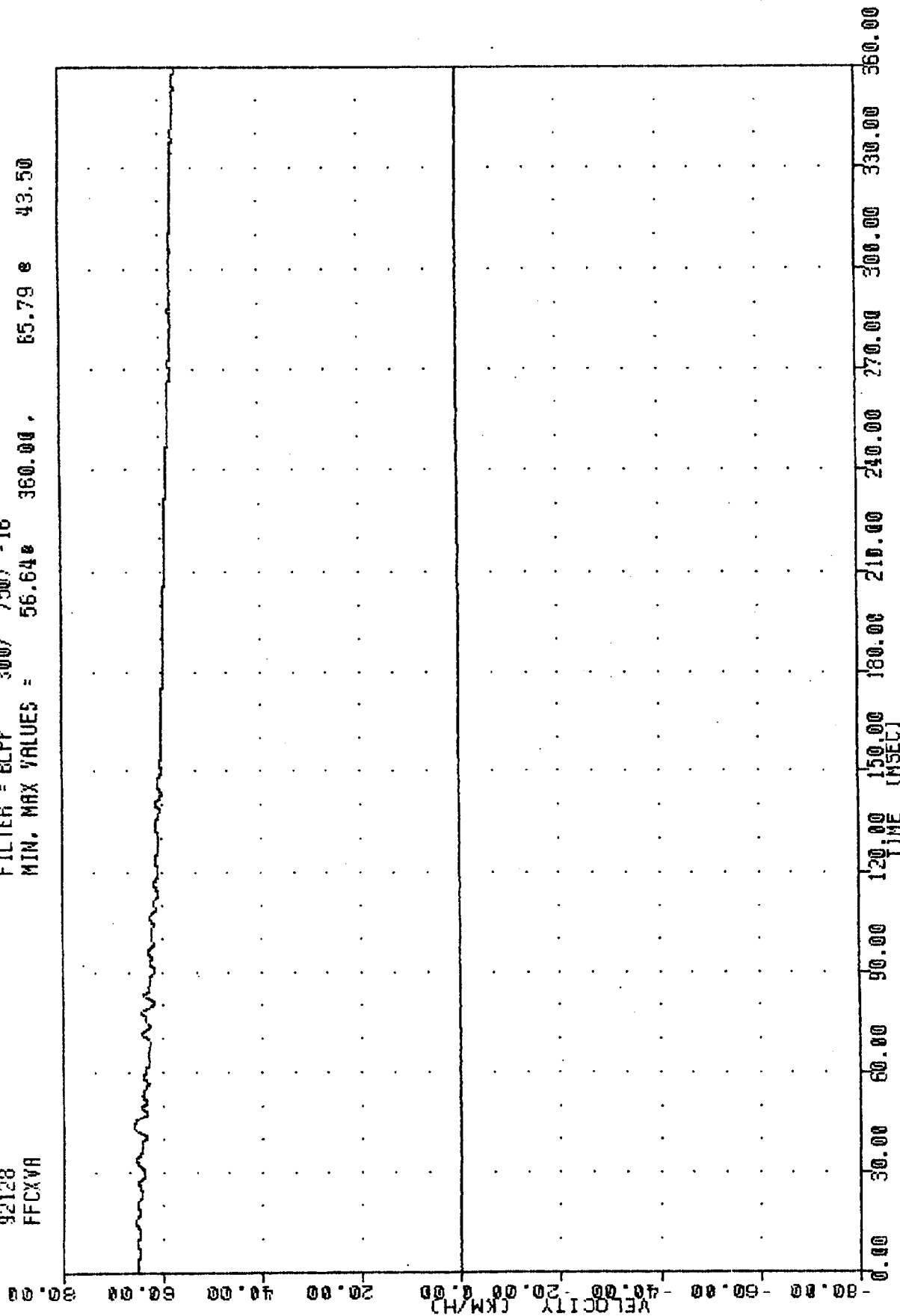


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 TRUCK FRONT FRAME CROSSMEMBER RESULTANT ACCELERATION

TRC
 TRUCK INTO STATIONARY CAR
 92128
 FFCXVR

, 920507

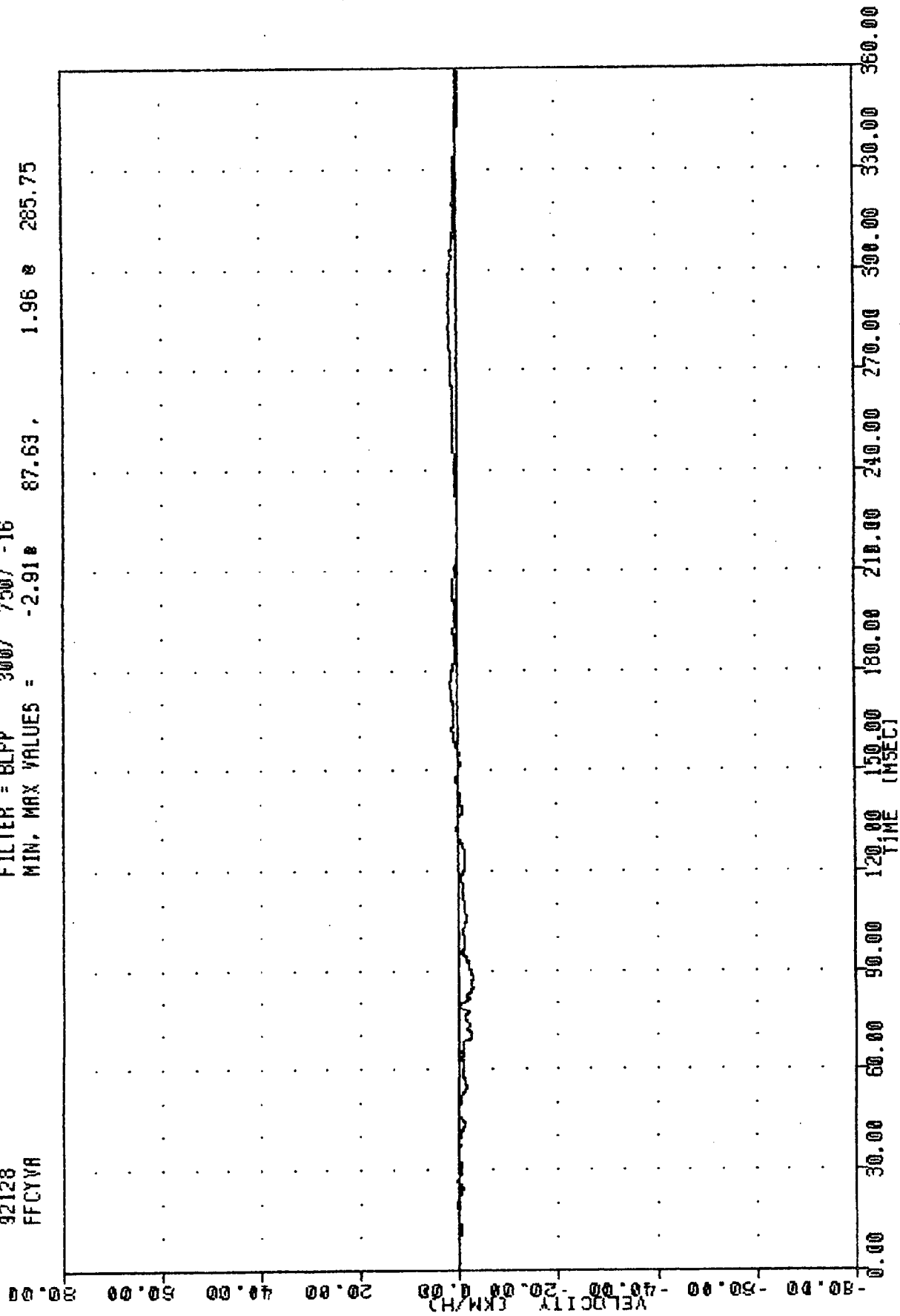
FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = 56.64 360.00 85.79 43.50



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 TRUCK FRONT FRAME CROSSMEMBER X-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
FFCYVA

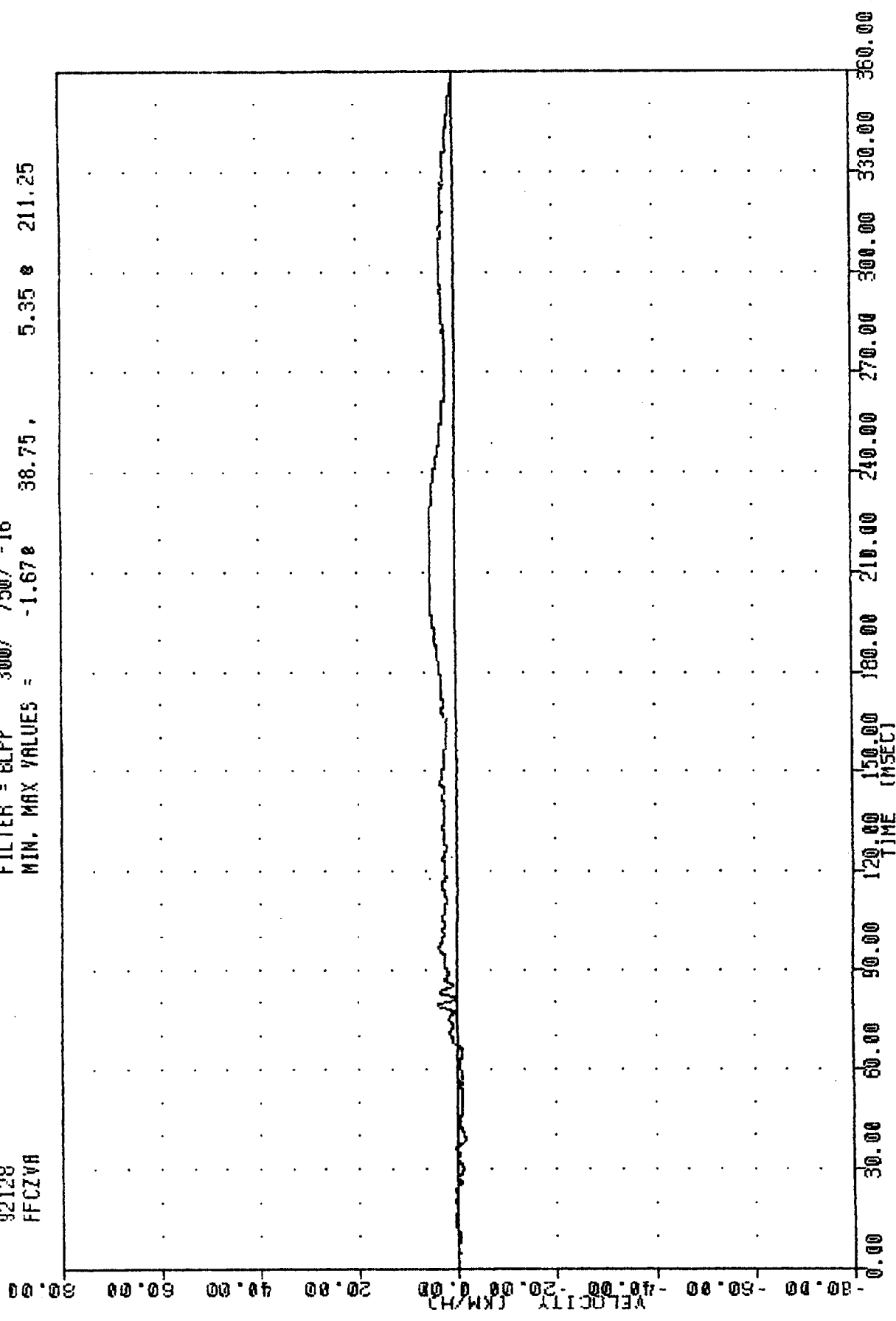
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -2.91e 87.63, 1.96 e 285.75



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
TRUCK FRONT FRAME CROSSMEMBER Y-AXIS VELOCITY

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
FFCZVA

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -1.67e 38.75, 5.35e 211.25

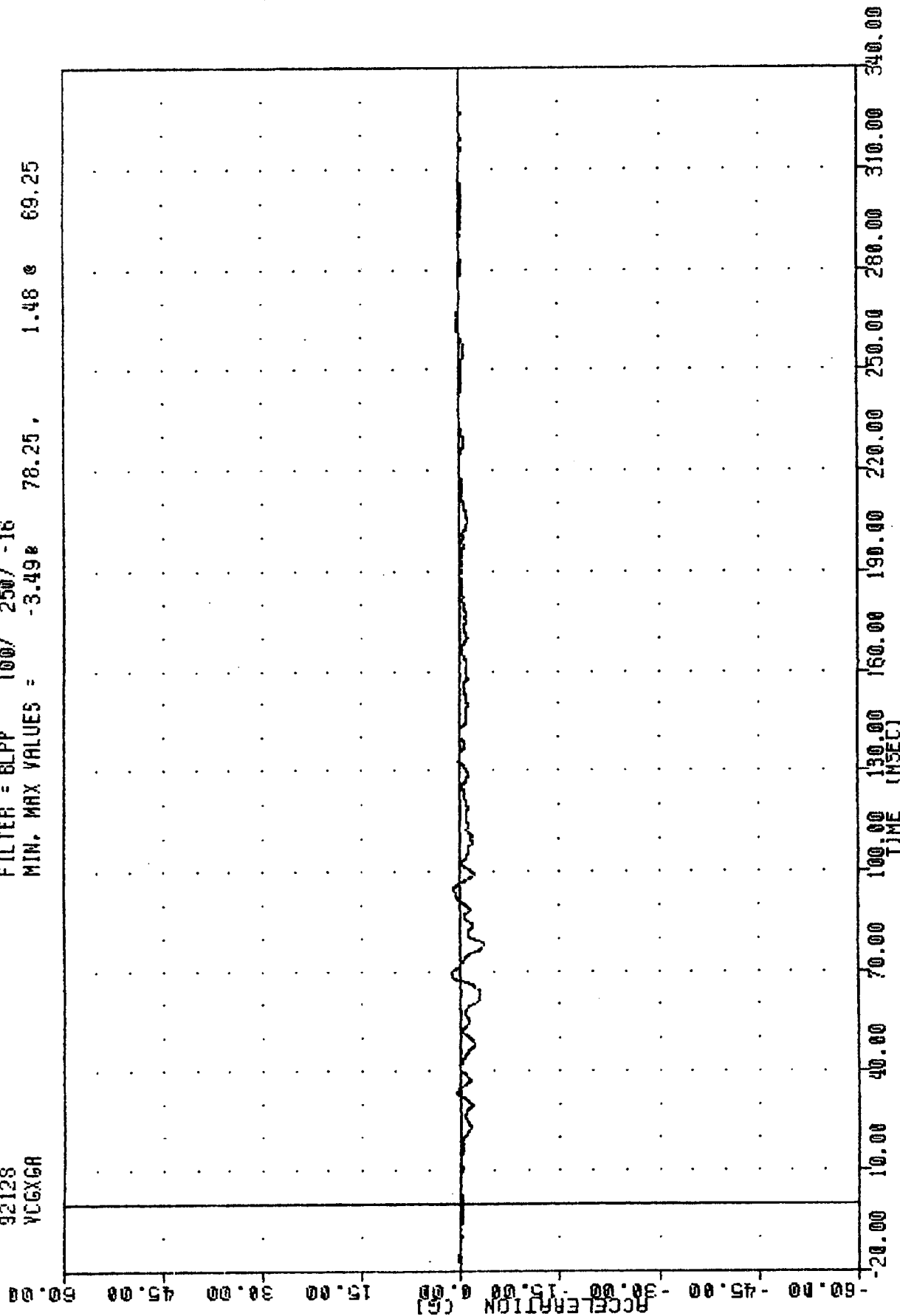


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
TRUCK FRONT FRAME CROSSMEMBER Z-AXIS VELOCITY

TRC
 TRUCK INTO STATIONARY CAR
 92128
 VCGXGA

920507

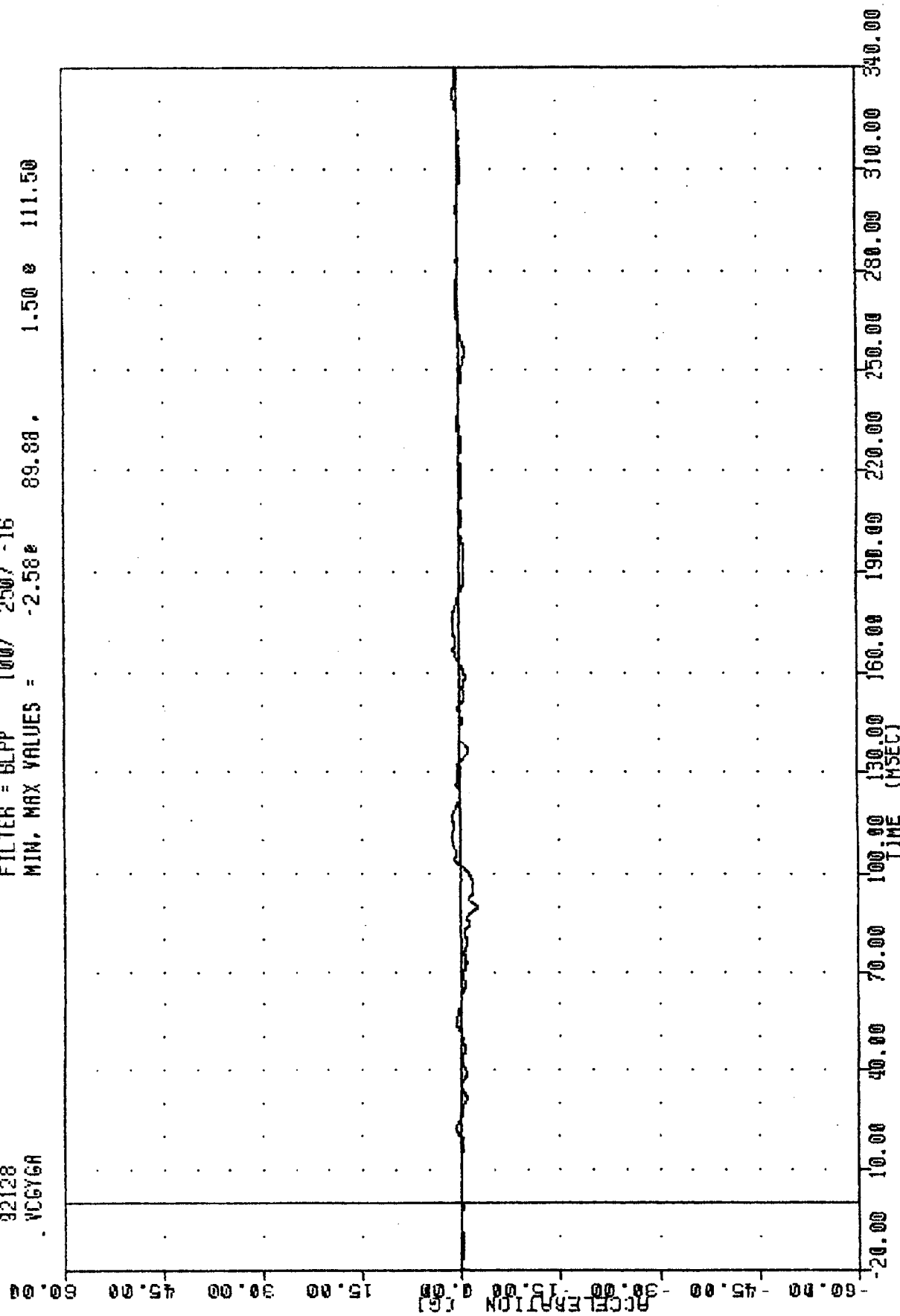
FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -3.49 78.25 1.48 69.25



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 TRUCK CENTER OF GRAVITY X-AXIS ACCELERATION

TRC , 920507
TRUCK INTO STATIONARY CAR
92128
VCG16A

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -2.58e 89.88, 1.50 e 111.50

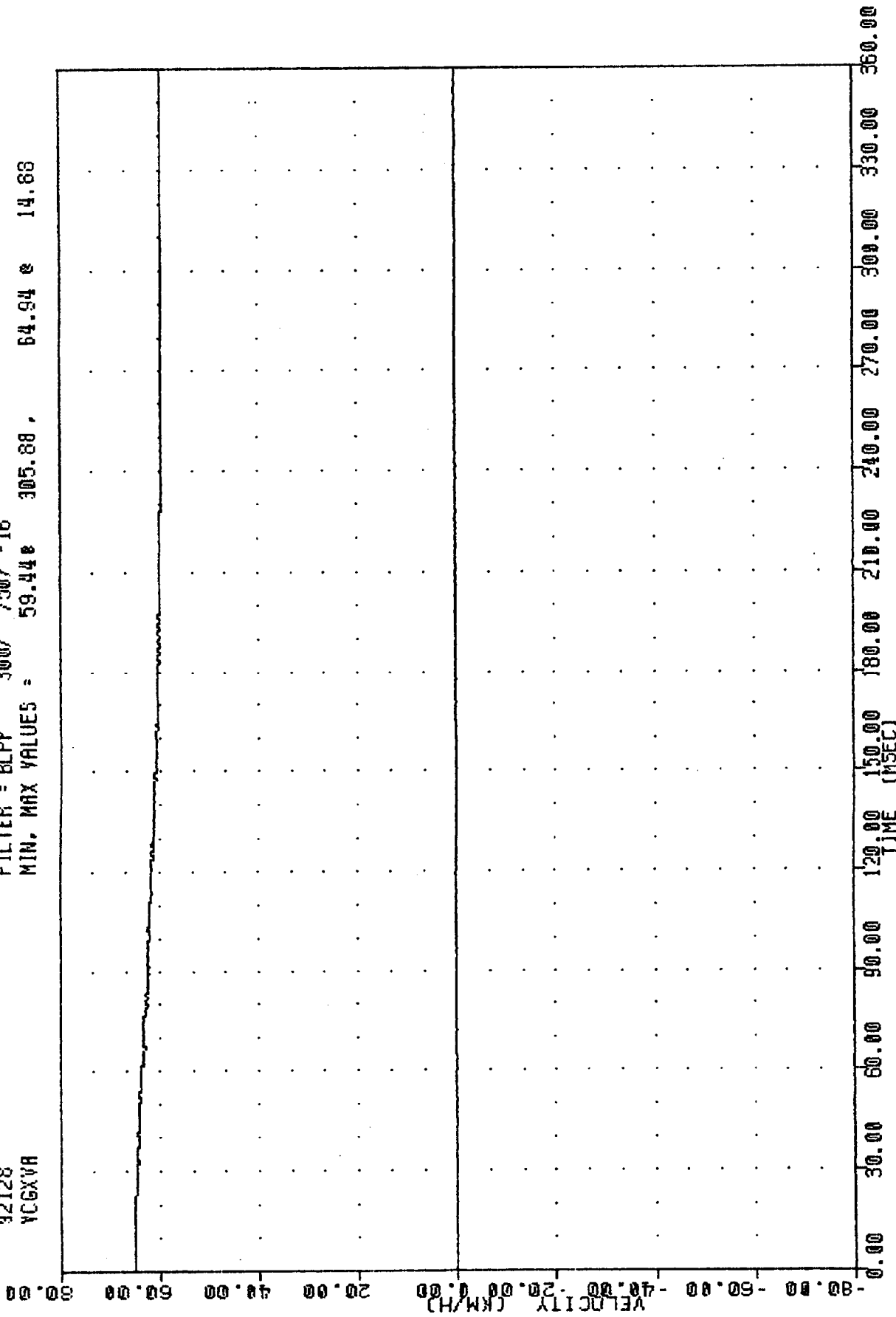


REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
TRUCK CENTER OF GRAVITY Y-AXIS ACCELERATION

TRC
 TRUCK INTO STATIONARY CAR
 92128
 YCGXVA

920507

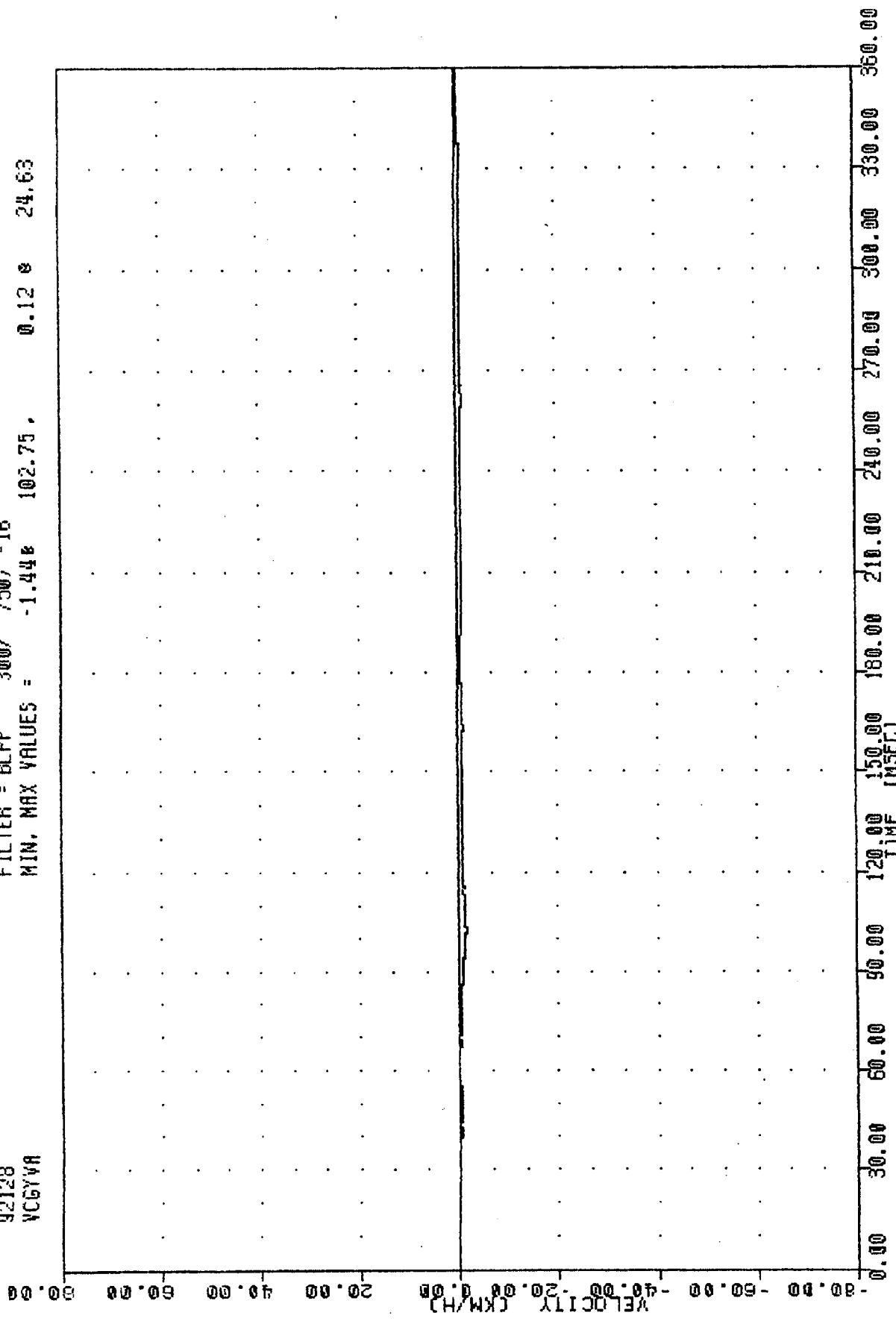
FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 59.44 305.88 64.94 14.88



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 TRUCK CENTER OF GRAVITY X-AXIS VELOCITY

TRC , 920507
 TRUCK INTO STATIONARY CAR
 92128
 VCGYVA

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -1.448 102.75, 0.12 8 24.63



REDUCING HEAVY TRUCK AGGRESSIVENESS - TEST 1
 TRUCK CENTER OF GRAVITY Y-AXIS VELOCITY

APPENDIX C

DUMMY CERTIFICATION

TRANSPORTATION RESEARCH CENTER OF OHIO
HYBRID III EXTERNAL DIMENSIONS
048 HUMANOID

22-APR-92

TRC 48C1ED1 572E SNO48 EXT. DIMENSION CAL01

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
TEMPERATURE			21.1 DEG. C
RELATIVE HUMIDITY			43.0 %
LOCATION FOR CHEST CIRCUMFERENCE (AA)		429- 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)		226- 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)		970-1001 MM	986. MM
WAIST CIRCUMFERENCE (Z)		836- 866 MM	851. MM
CHEST DEPTH (O)		213- 229 MM	218. MM
H-POINT HEIGHT (C)		84- 89 MM	86. MM
H-POINT FROM SEATBACK (D)		135- 140 MM	137. MM
SKULL CAP TO BACKLINE (H)		41- 46 MM	43. MM
TOTAL SITTING HEIGHT (A)		879- 889 MM	884. MM
THIGH CLEARANCE (F)		140- 155 MM	155. MM
BUTTOCK KNEE LENGTH (K)		579- 605 MM	597. MM
BUTTOCK POPLITEAL LENGTH (N)		452- 478 MM	471. MM
POPLITEAL HEIGHT (L)		429- 455 MM	434. MM
KNEE PIVOT HEIGHT (M)		485- 500 MM	493. MM
FOOT LENGTH (P)		252- 267 MM	259. MM
FOOT BREADTH (W)		91- 107 MM	99. MM
SHOULDER PIVOT FROM BACKLINE (E)		84- 94 MM	91. MM
SHOULDER BREADTH (V)		422- 437 MM	427. MM
SHOULDER PIVOT HEIGHT (B)		506- 521 MM	511. MM
ELBOW REST HEIGHT (J)		191- 211 MM	202. MM
SHOULDER-ELBOW LENGTH (I)		330- 345 MM	343. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290- 305 MM	295. MM

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Foster

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

22-APR-92

TRC

48C1HD1

572E SN48 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	43.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	230.63 G
PEAK LATERAL ACCELERATION	15 G MAX	-1.76 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

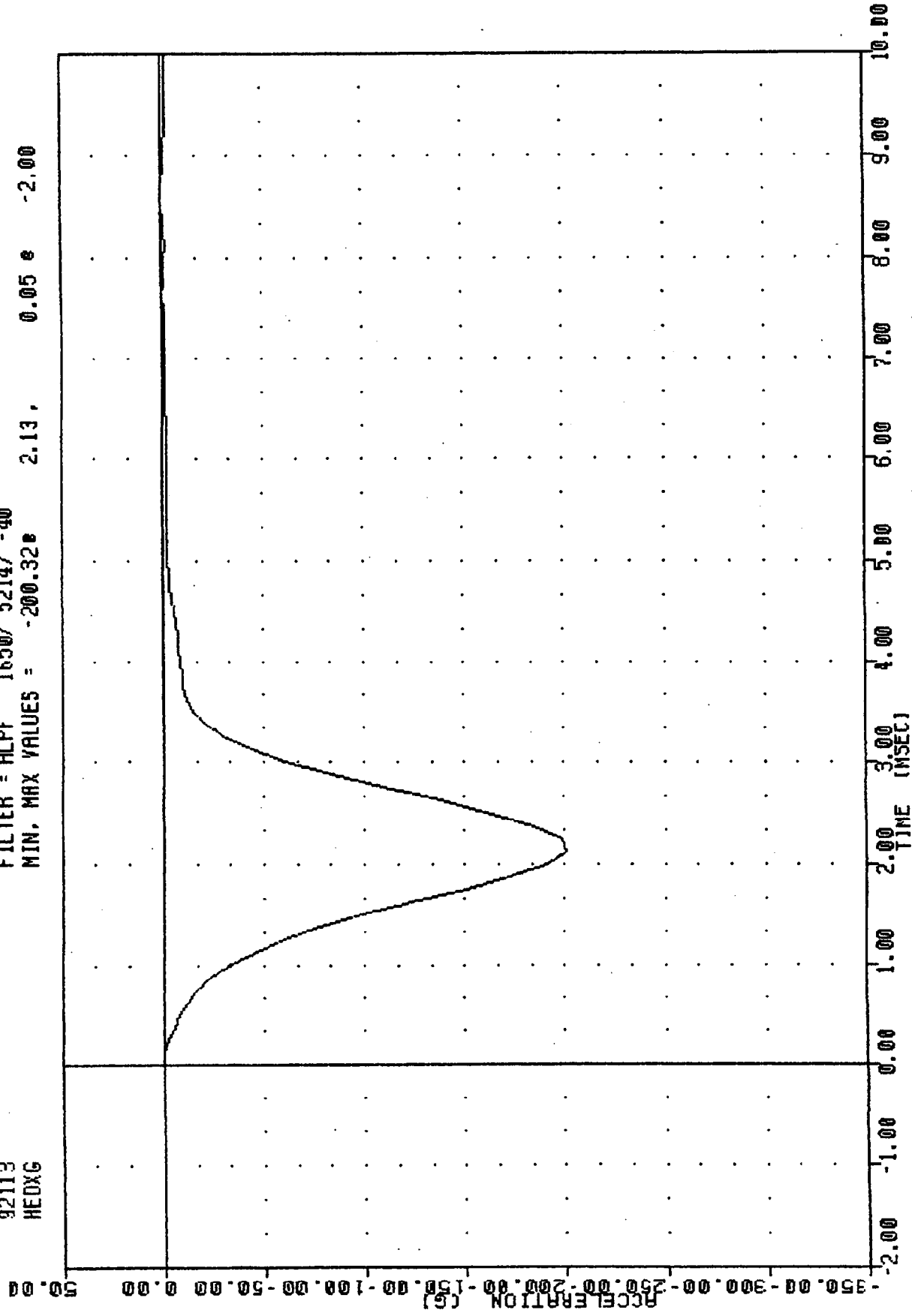
[Signature]

TRC
572E SN48 HEAD DROP CAL 01
92113
HEADXG

48C1HD1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -200.32 2.13

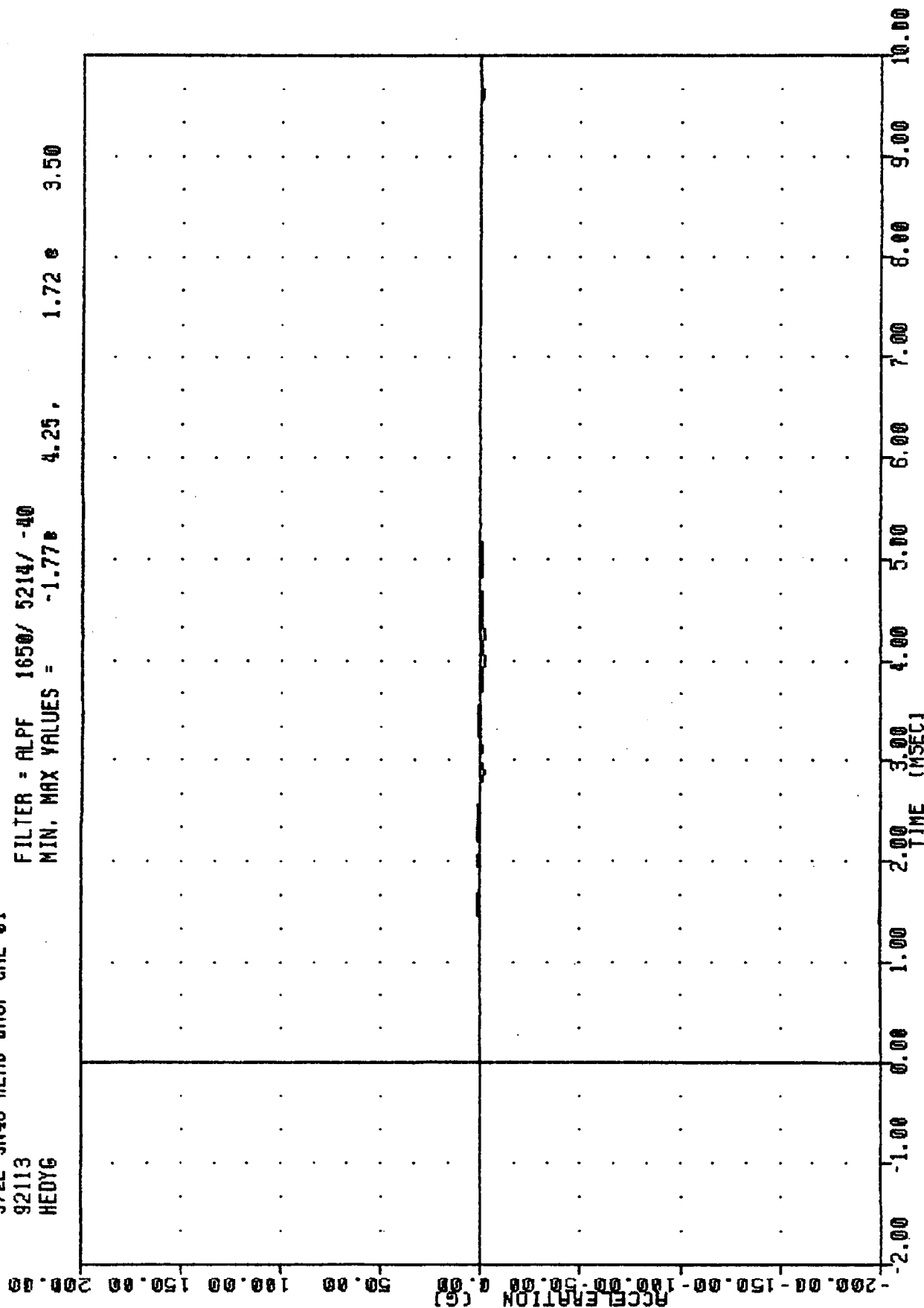
0.05 e -2.00



PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

TRC , 48C1HD1
572E SN40 HEAD DROP CAL 01
92113
HEDYG

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -1.77 4.25 , 1.72 3.50

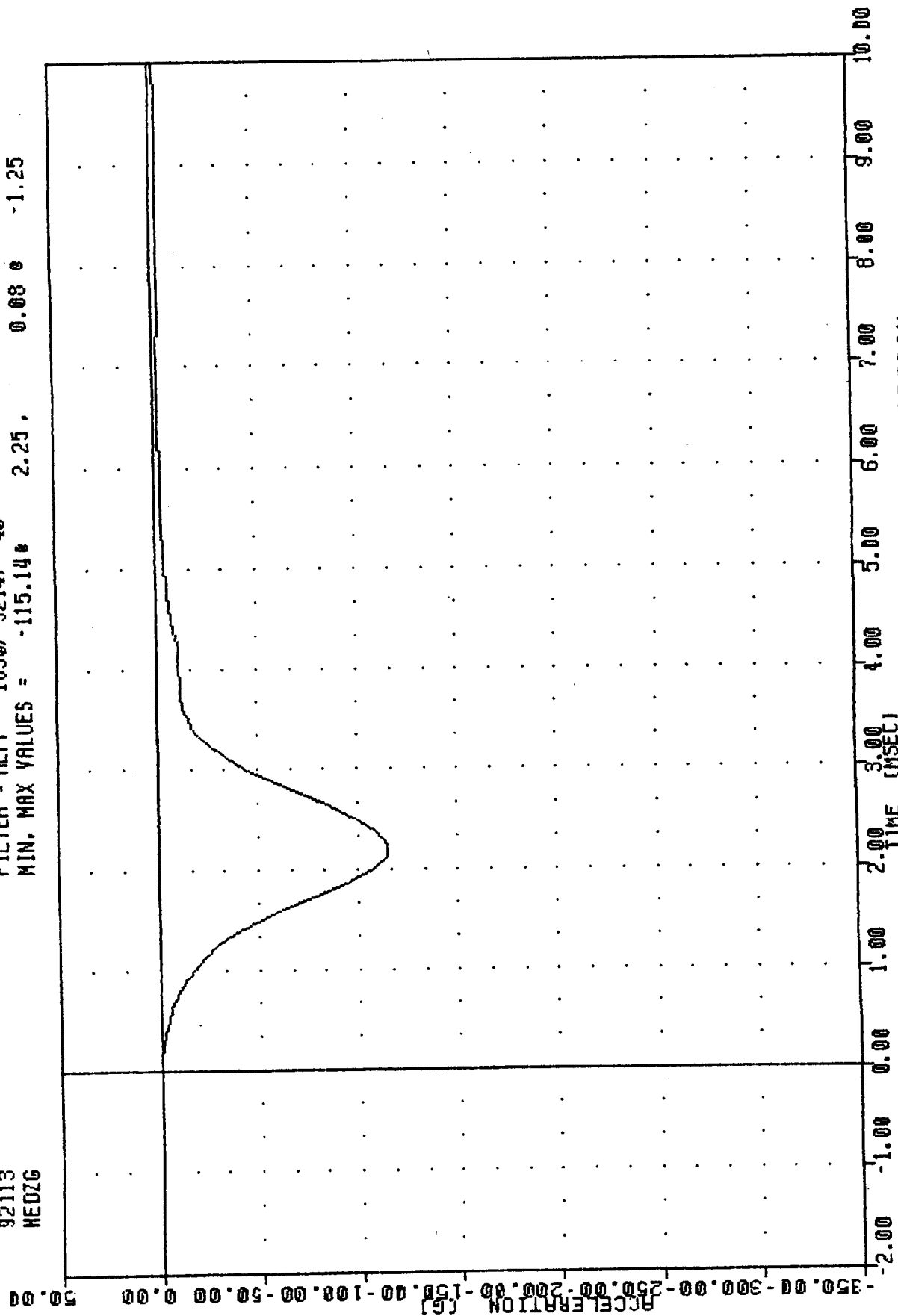


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Y AXIS

TRC
572E SN40 HEAD DROP CAL 01
92113
HEDZG

, 48C1HD1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -115.14# 2.25, 0.08 # -1.25

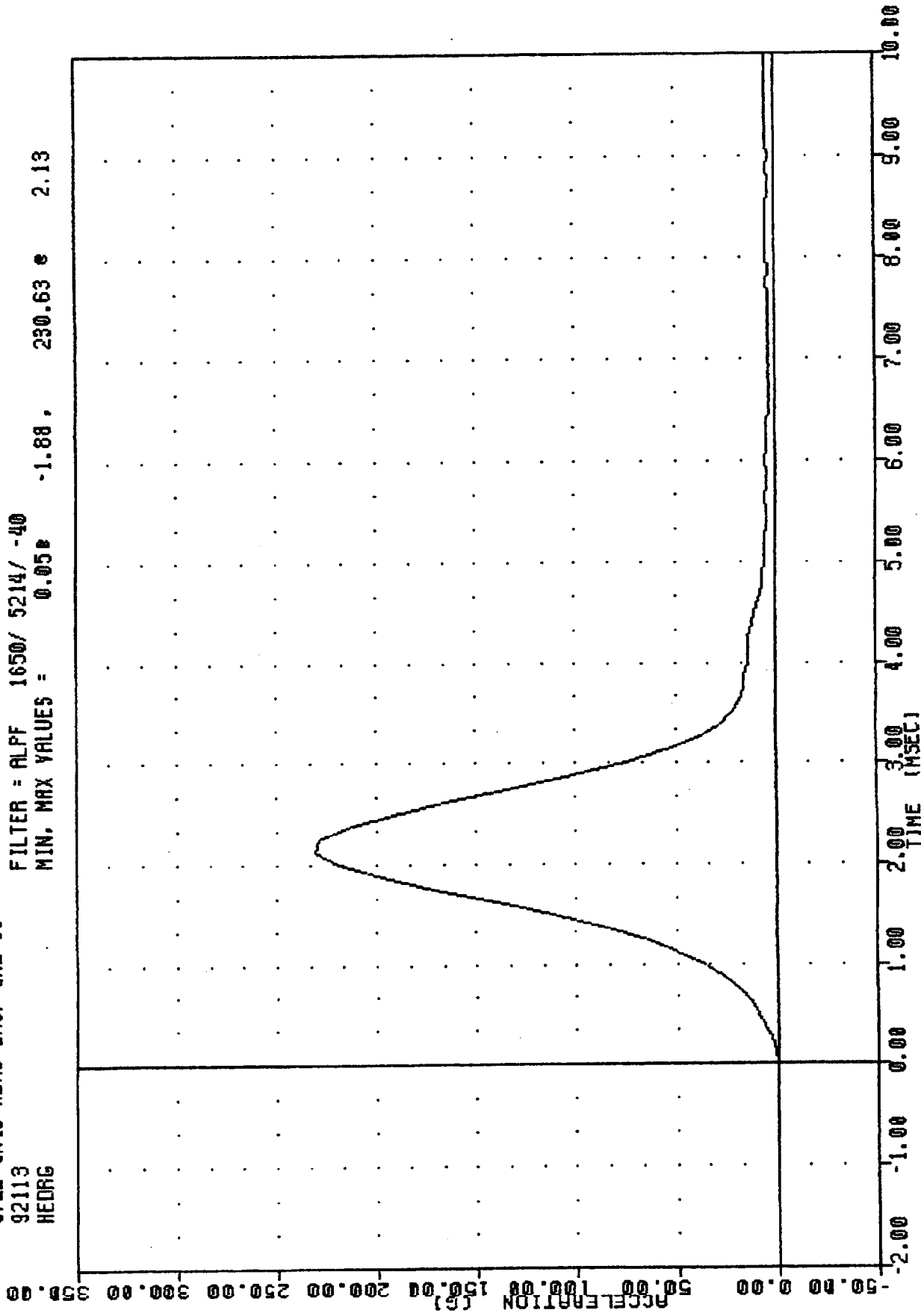


PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

TRC
572E SN48 HEAD DROP CAL 01
92113
HEADRG

48C1HD1

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.05 230.63 2.13
-1.88



PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

23-APR-92

6 AXIS NECK TRANSDUCER
TRC 48C1NF1

572E SN48 NECK FLEXION CAL01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	42.0 %
IMPACT VELOCITY	6.89 - 7.13 M/SEC	7.03 M/SEC
PENDULUM	10 MS 22.50 - 27.50 G	23.03 G
DECELERATION	20 MS 17.60 - 22.60 G	19.33 G
	30 MS 12.50 - 18.50 G	16.30 G
MAX PENDULUM G ABOVE 30 MS	29 G MAX	16.34 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	34 - 42 MS	38.38 MS
D PLANE	MAX 64 - 78 DEG.	65.96 DEG.
ROTATION	TIME 57 - 64 MS	58.75 MS
MOMENT ABOUT OCCIPITAL	MAX 88.2 - 108.5 NM	99.51 NM
CONDYLE	TIME 47 - 58 MS	50.75 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	113 - 128 MS	113.25 MS
POSITIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	97 - 107 MS	97.13 MS

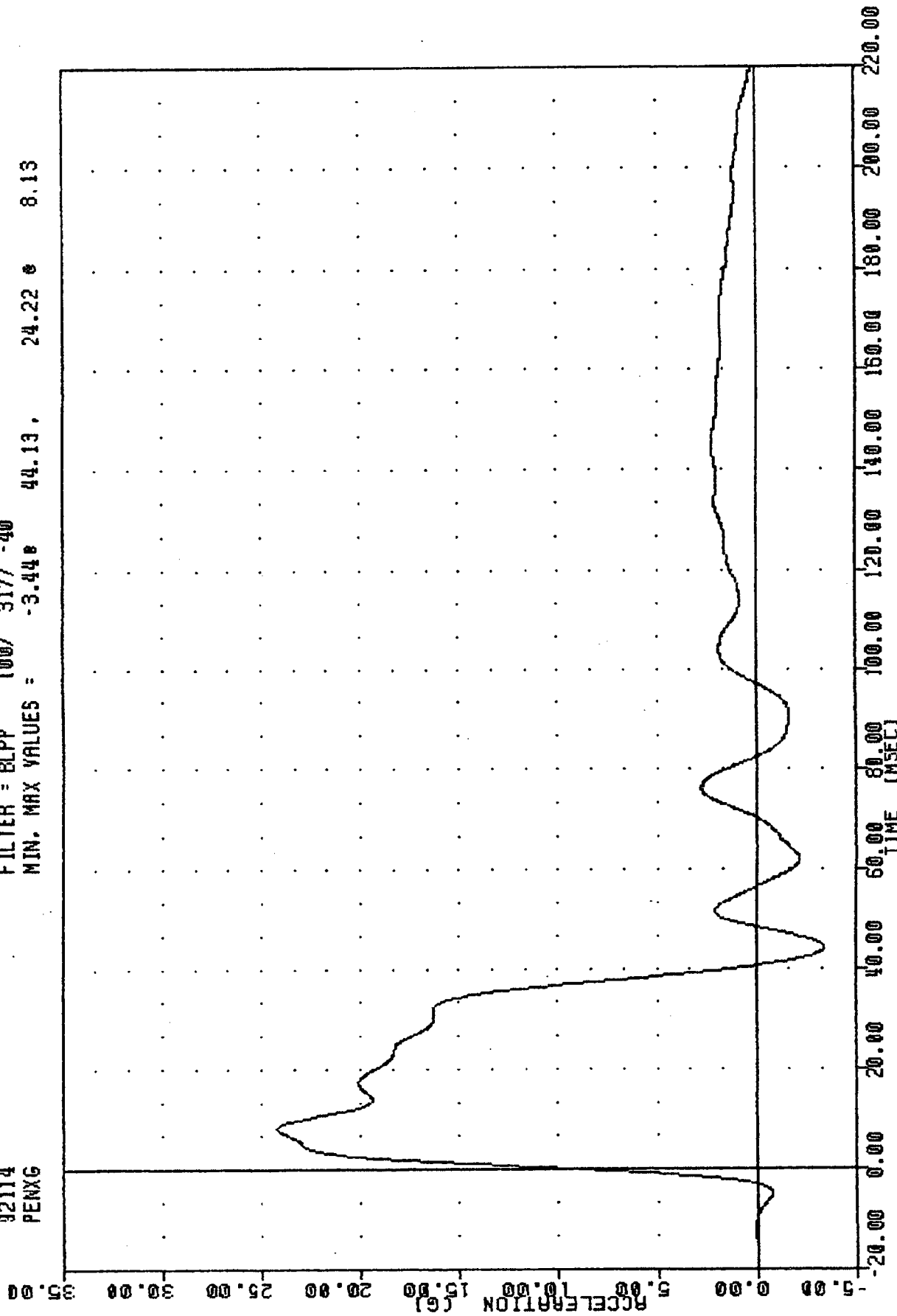
TEST MEETS SPECIFICATIONS

TECHNICIAN *Pete East*

TRC
 572E SN40 NECK FLEXION CAL01
 92114
 PENXG

. 48C1NF1

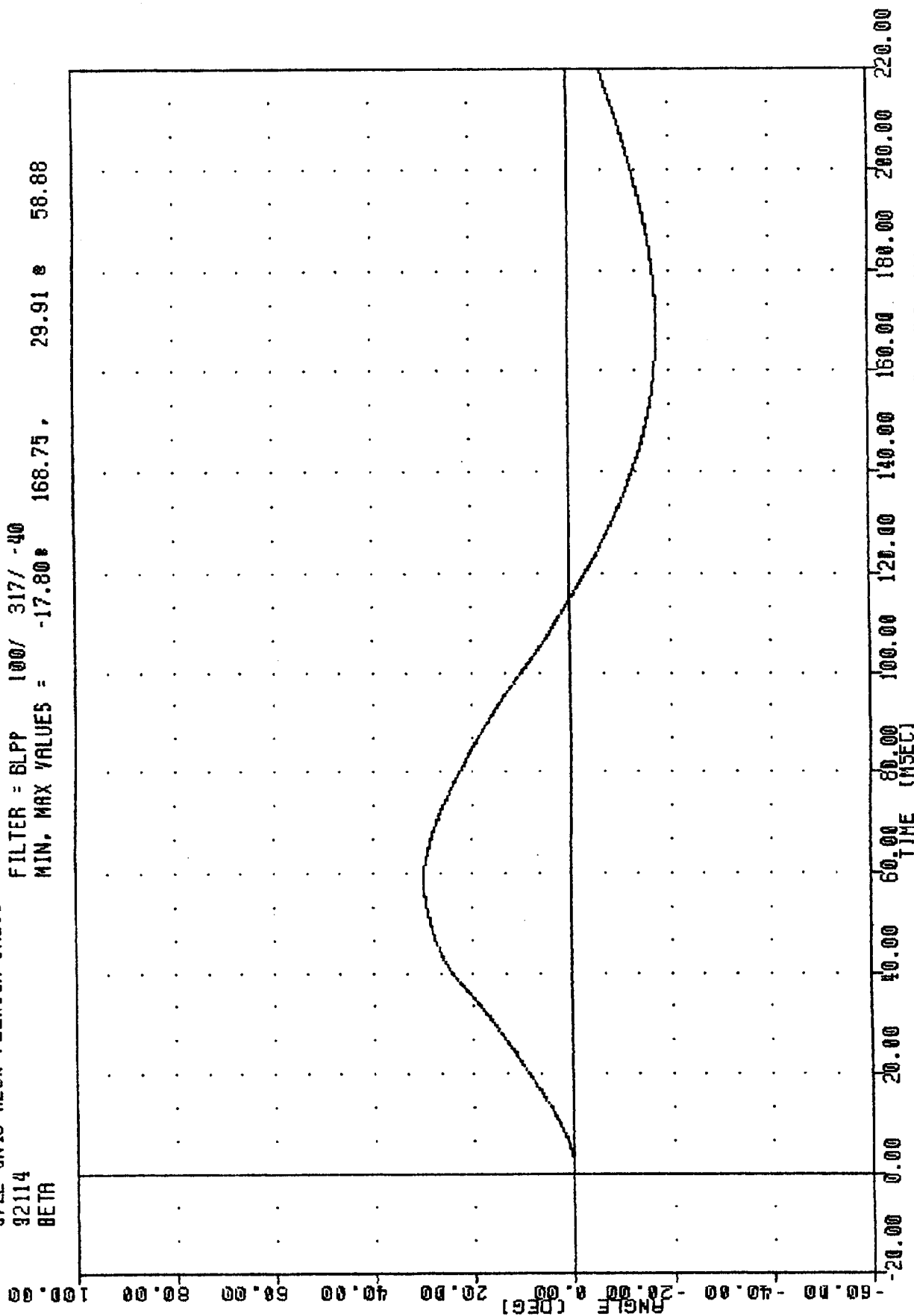
FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -3.44 44.13, 24.22 8.13



PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC , 48C1NF1
 572E SN48 NECK FLEXION CAL01
 92114
 BETA

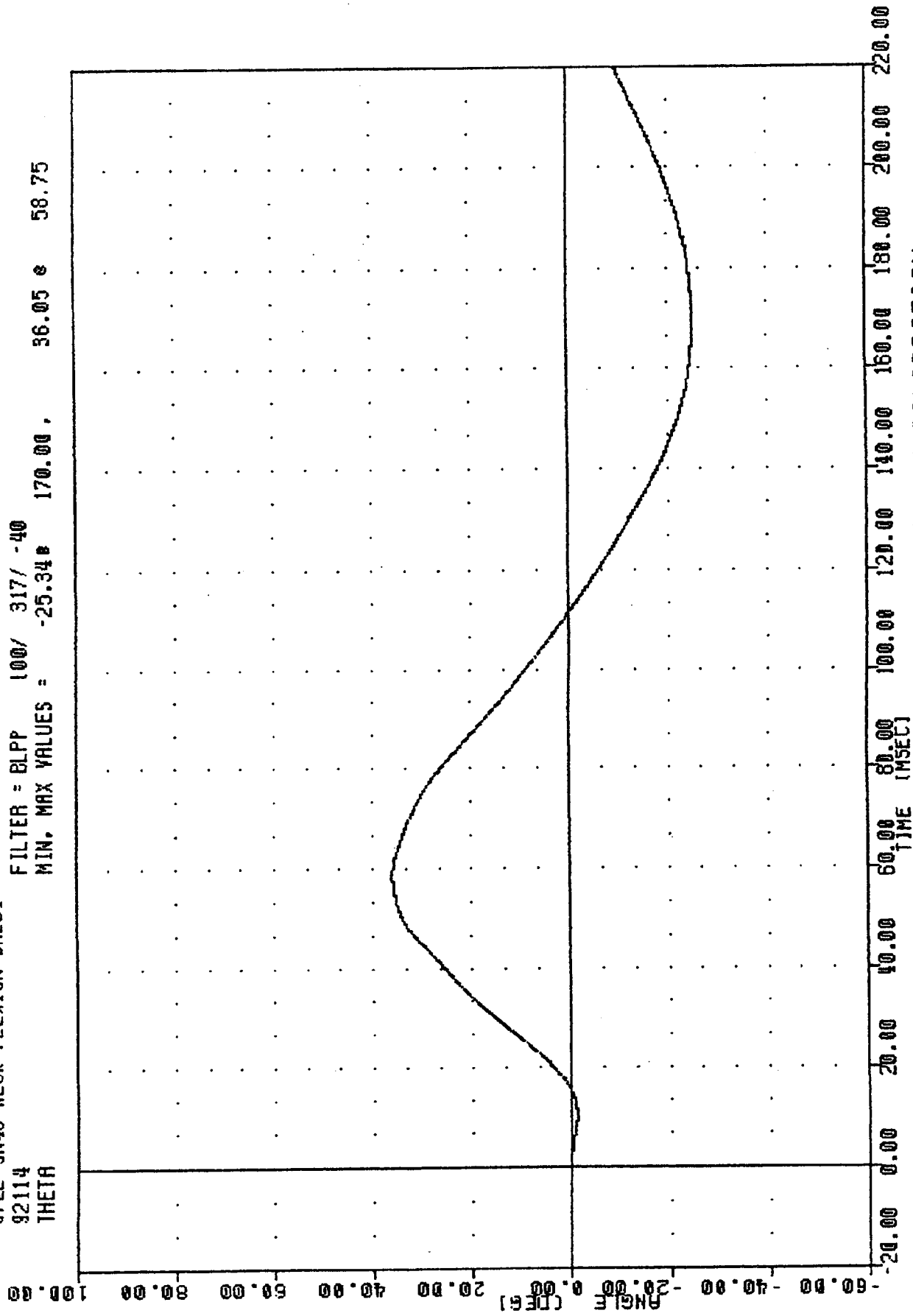
FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -17.80 168.75 29.91 58.88



PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT BASE OF NECK

TRC , 48C1NF1
 572E SN48 NECK FLEXION CAL01
 92114
 THETA

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -25.34 170.00 , 36.05 58.75

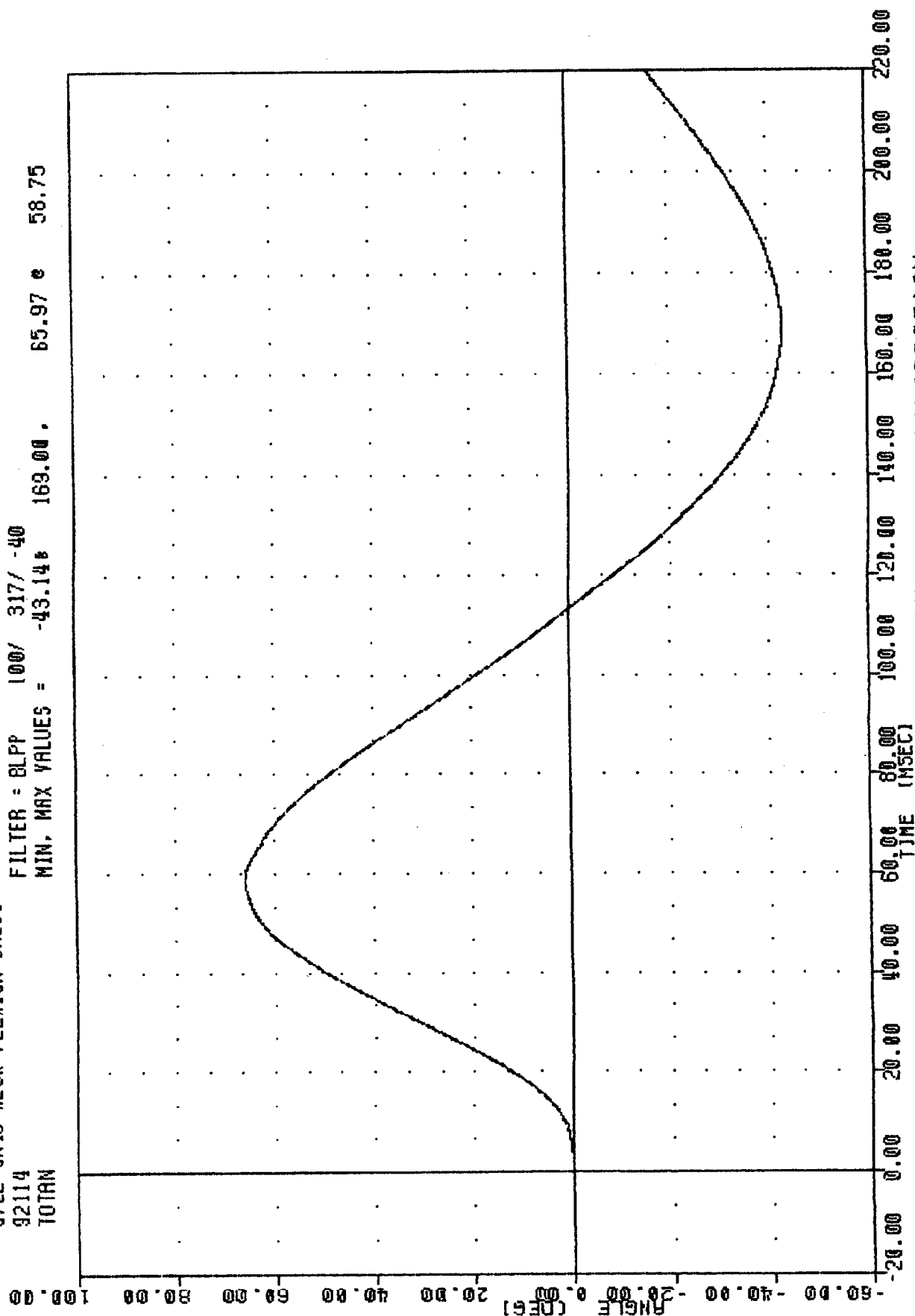


PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE

TRC
572E SN48 NECK FLEXION CAL01
92114
TOTAL

* 48CINF1

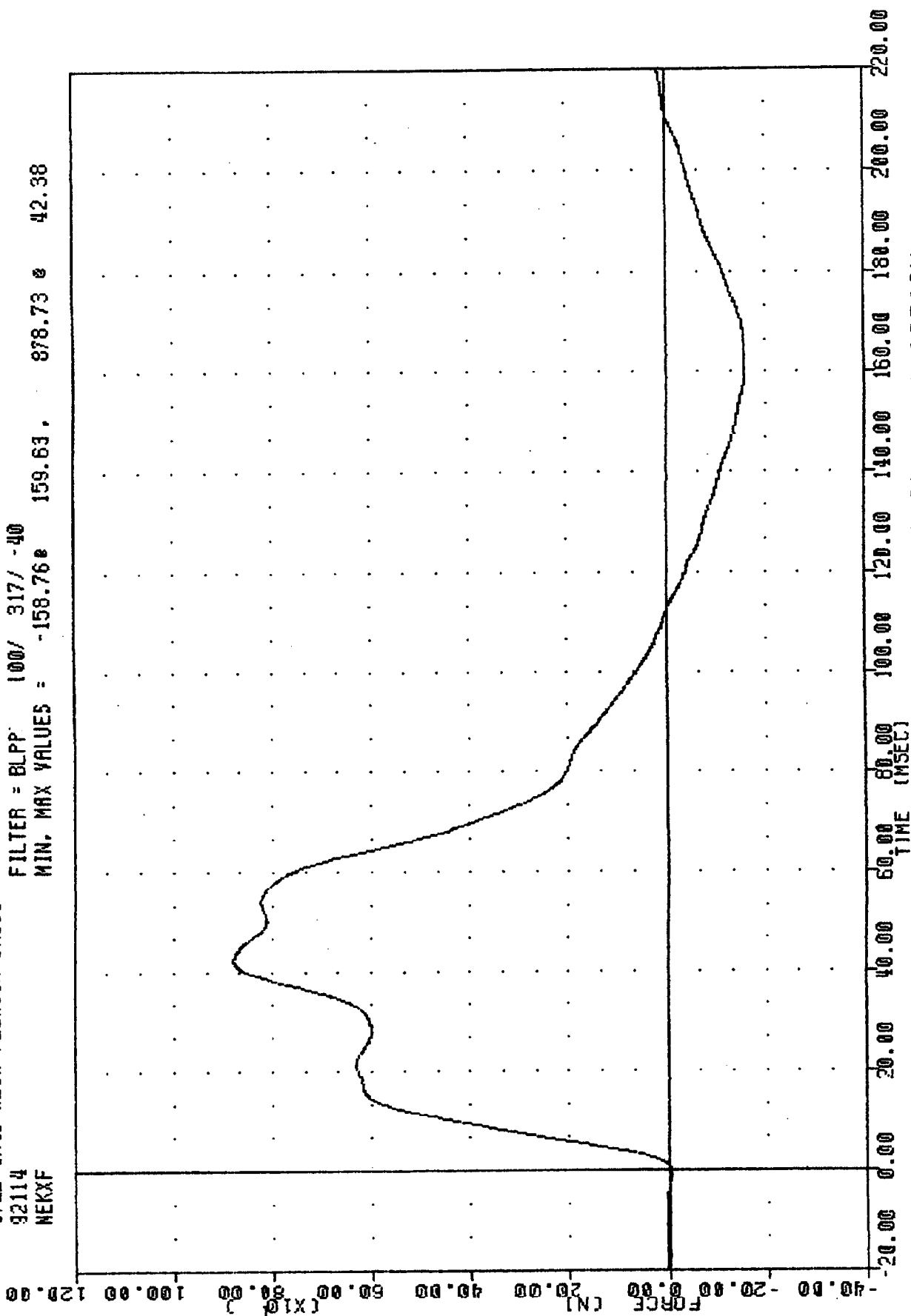
FILTER = BLPP 100/ 317/ -40
MIN. MAX VALUES = -43.14 169.00 65.97 58.75



PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION

TRC , 48C1NF1
 572E SN48 NECK FLEXION CAL01
 92114
 NEKXF

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -158.76e 159.63, 878.73 e 42.38

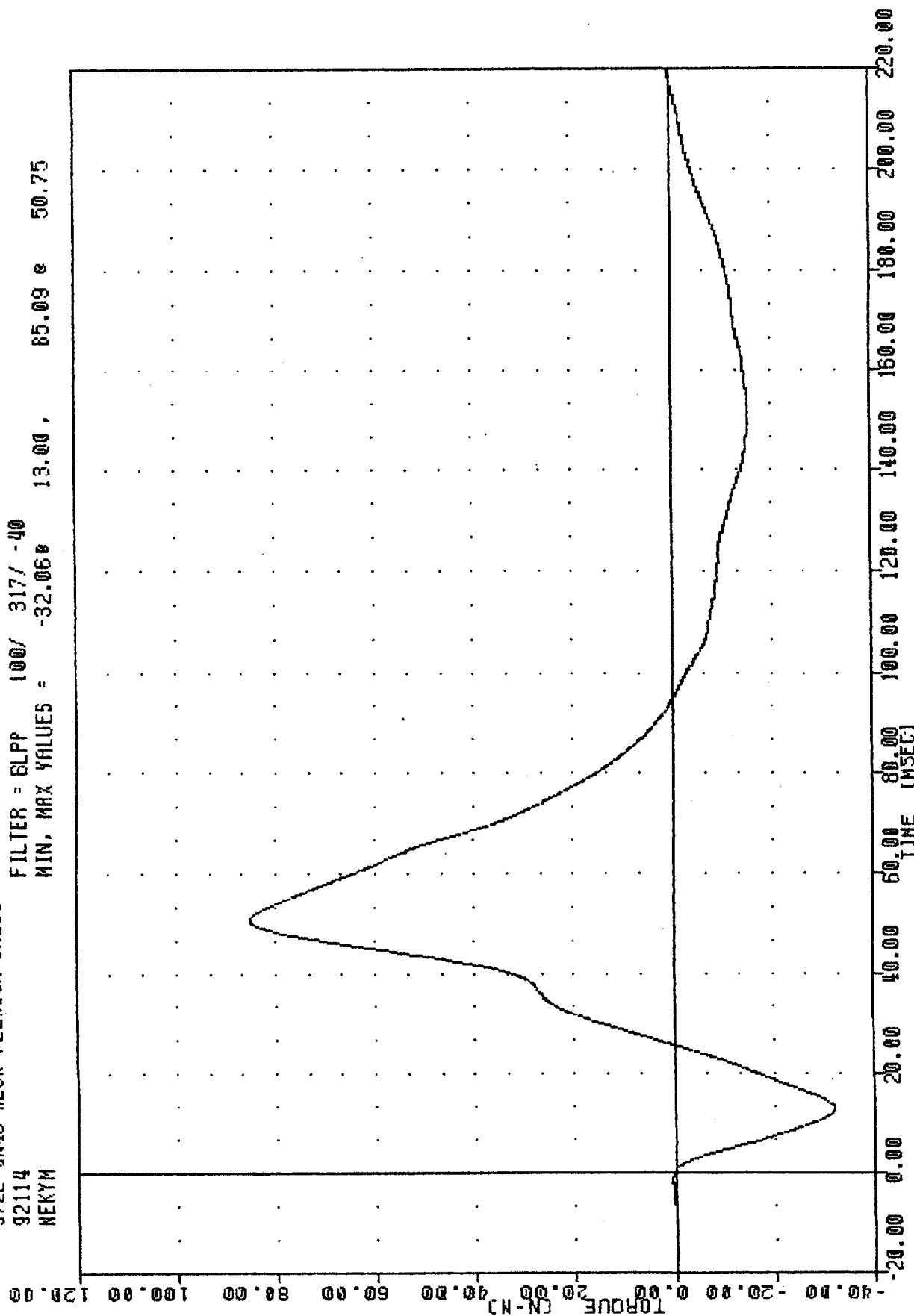


PART 572-E HYBRID III NECK FLEXION CALIBRATION
 NECK FORCE X AXIS

TRC
572E SN48 NECK FLEXION CAL01
92114
NEKYM

, 48C1NF1

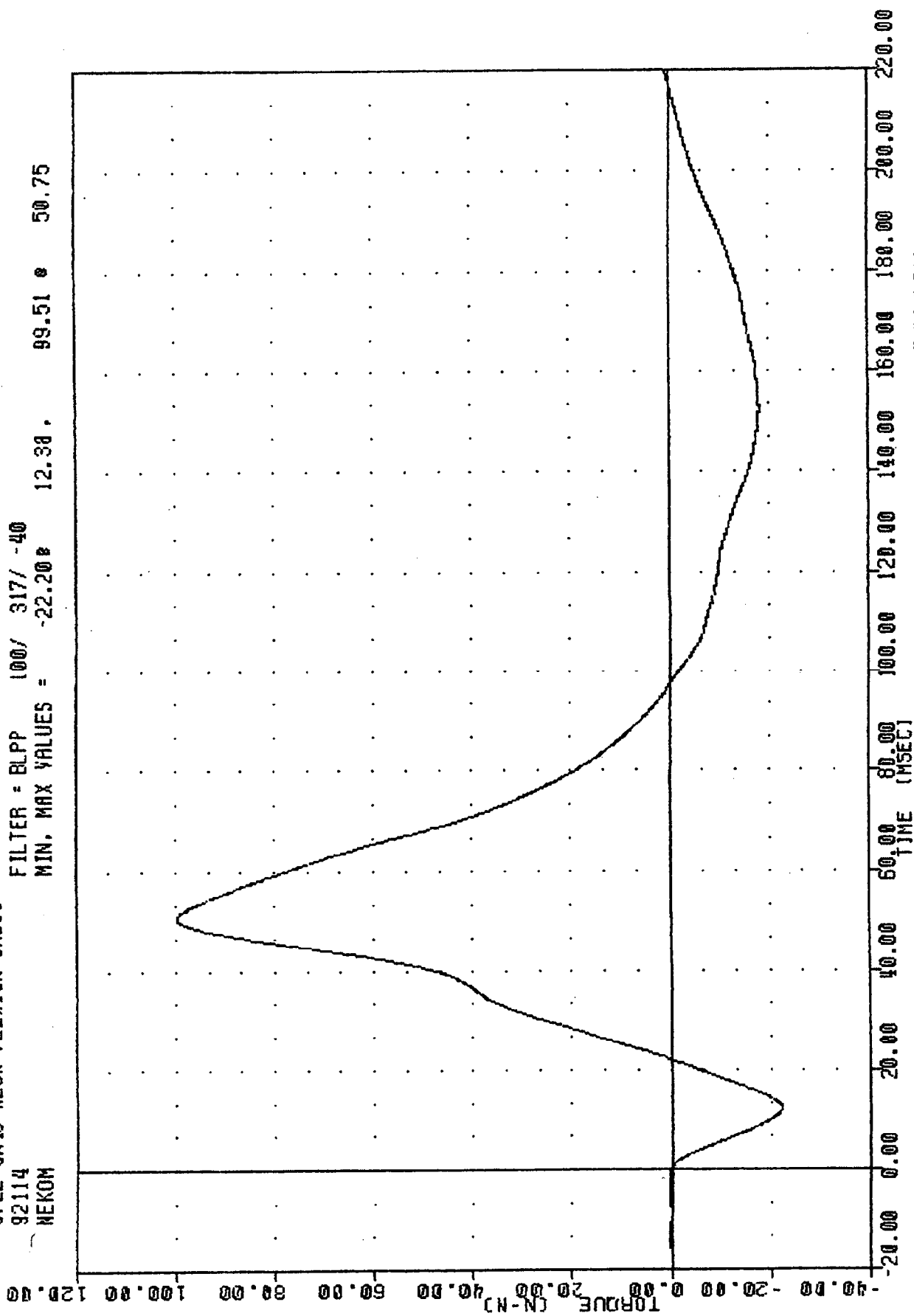
FILTER = BLPP 100/ 317/ -40
MIN, MAX VALUES = -32.06% 13.00, 85.09 e 50.75



PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS

TRC , 48CINF1
 572E SN48 NECK FLEXION CAL01
 92114
 NEKOM

FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -22.20 12.38, 99.51 50.75



PART 572-E HYBRID III NECK FLEXION CALIBRATION
 TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

22-APR-92

6 AXIS NECK TRANSDUCER
TRC 48C1NE1

572E SN48 NECK EXT. CAL01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	42.0 %
IMPACT VELOCITY	5.95 - 6.19 M/SEC	6.05 M/SEC
PENDULUM	10 MS 17.20 - 21.20 G	19.63 G
DECELERATION	20 MS 14.00 - 19.00 G	17.31 G
	30 MS 11.00 - 16.00 G	14.79 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	14.73 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	38.00 MS
D PLANE	MAX 81 - 106 DEG.	94.80 DEG.
ROTATION	TIME 72 - 82 MS	74.75 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN -80.0/-52.9 NM	-66.88 NM
	TIME 65 - 79 MS	70.38 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	155.75 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	138.25 MS

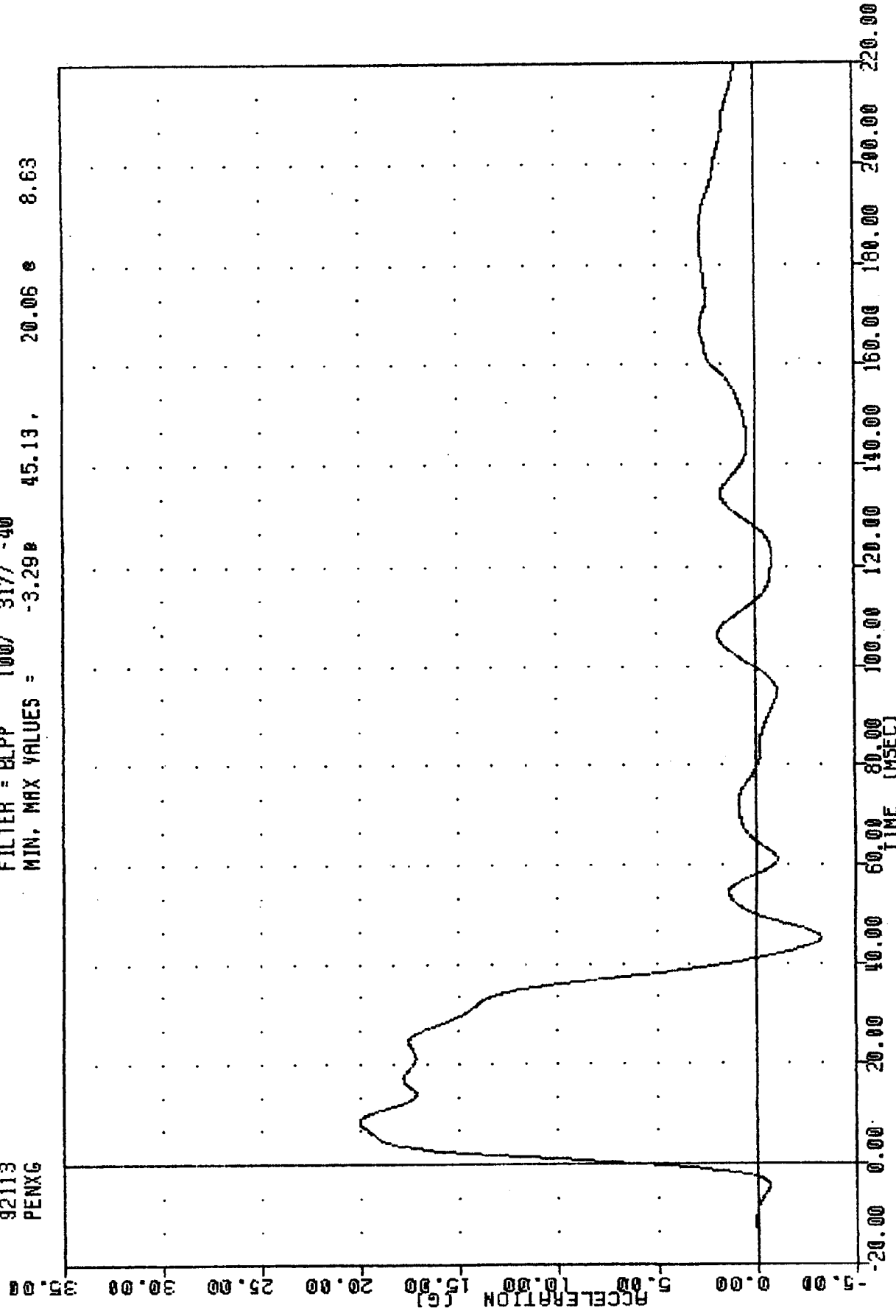
TEST MEETS SPECIFICATIONS

TECHNICIAN

Pete Ford

TRC
572E SN40 NECK EXT. CALD01
92113
PENXG

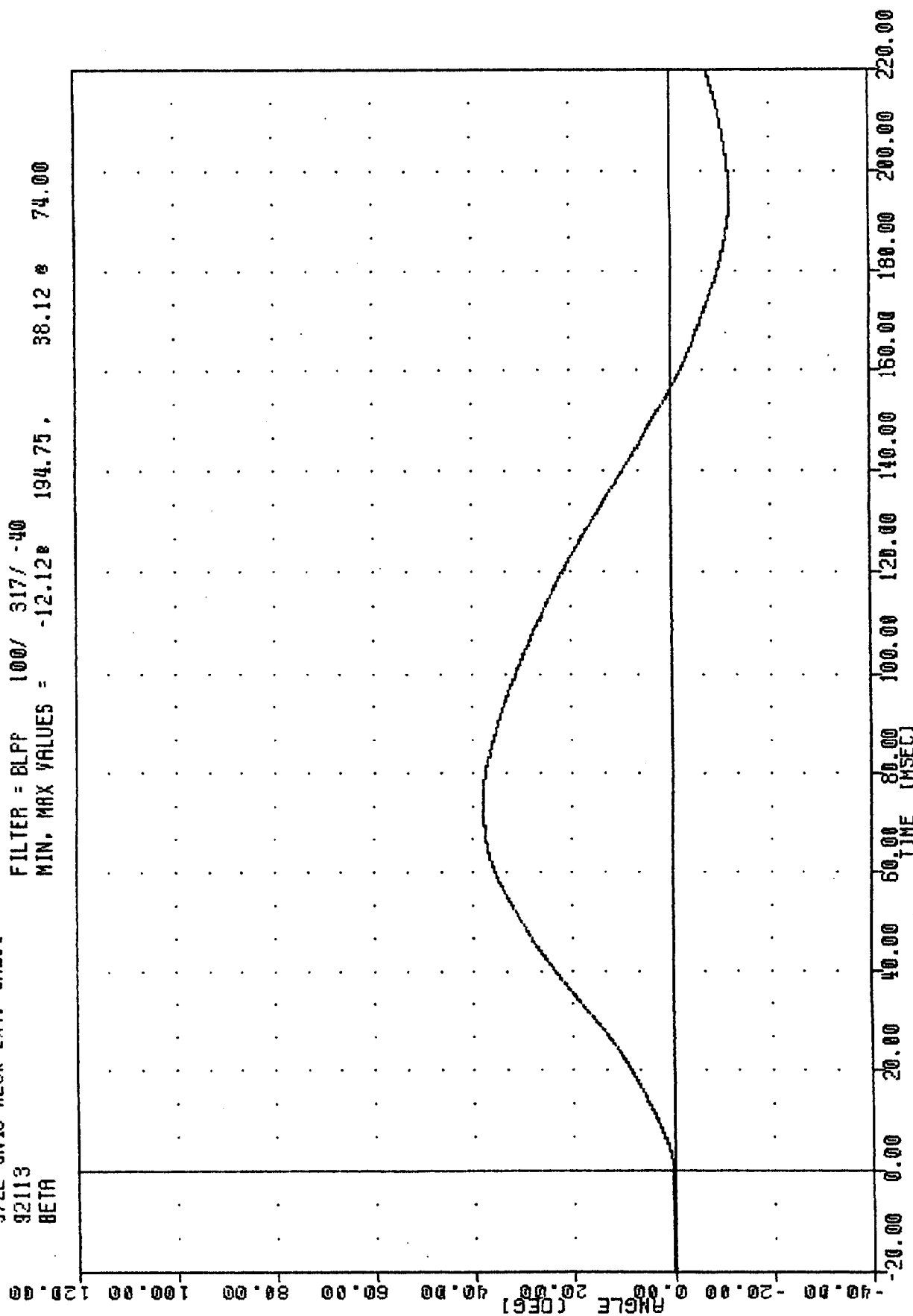
FILTER = BLPP 100/ 317/ -40
MIN, MAX VALUES = -3.29 45.13 20.06 8.63



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC , 48CINE1
 572E SN48 NECK EXT. CALD1
 32113
 BETA

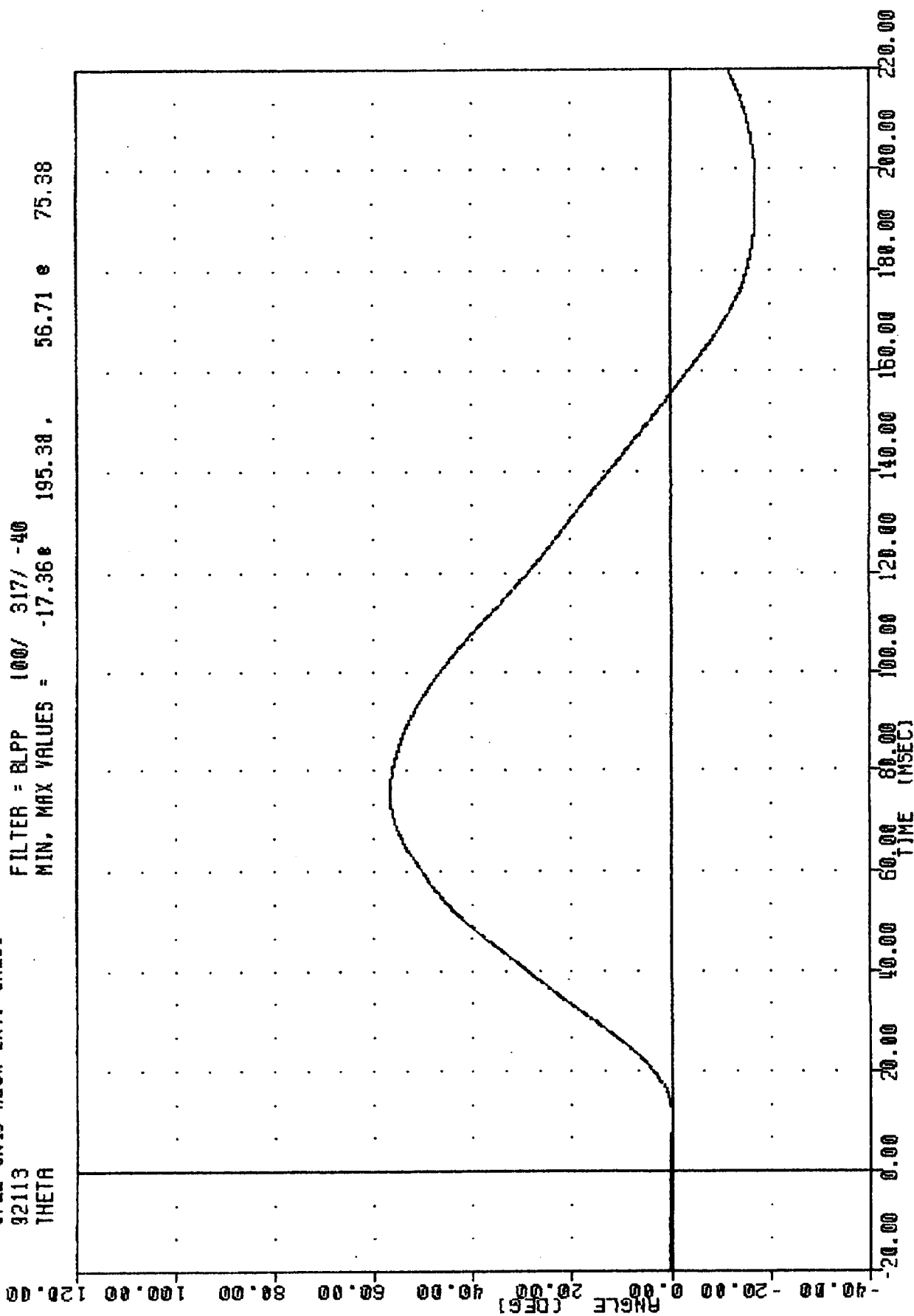
FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -12.12e 194.75, 38.12 e 74.00



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT BASE OF NECK

TRC , 48CINEJ
 572E SN48 NECK EXT. CAL01
 92113
 THETA

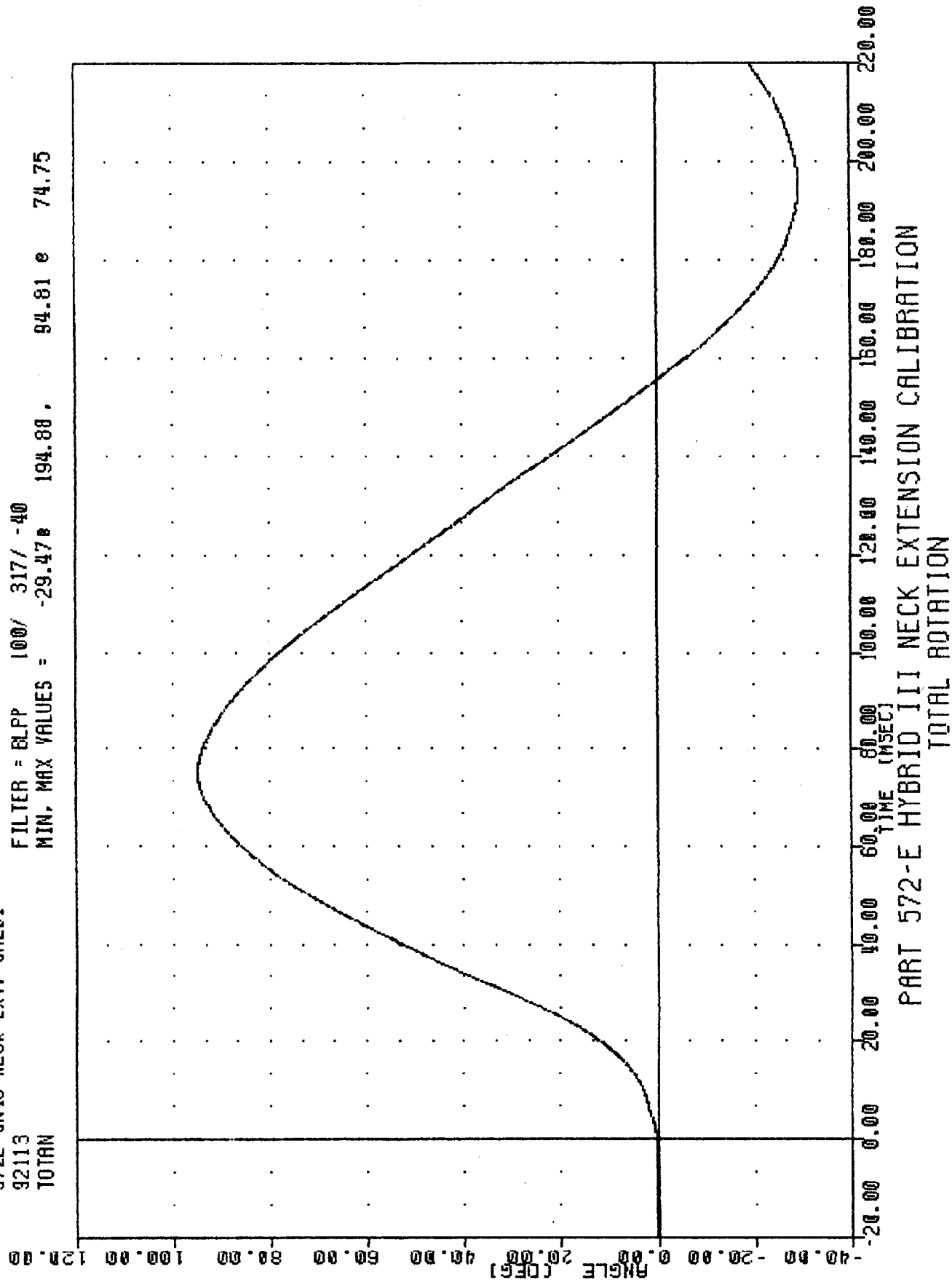
FILTER = BLPP 100/ 317/ -40
 MIN, MAX VALUES = -17.36 e 195.38 , 56.71 e 75.38



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE

TRC , 48C1NE1
 572E SN48 NECK EXT. CALIB1
 92113
 TOTAL

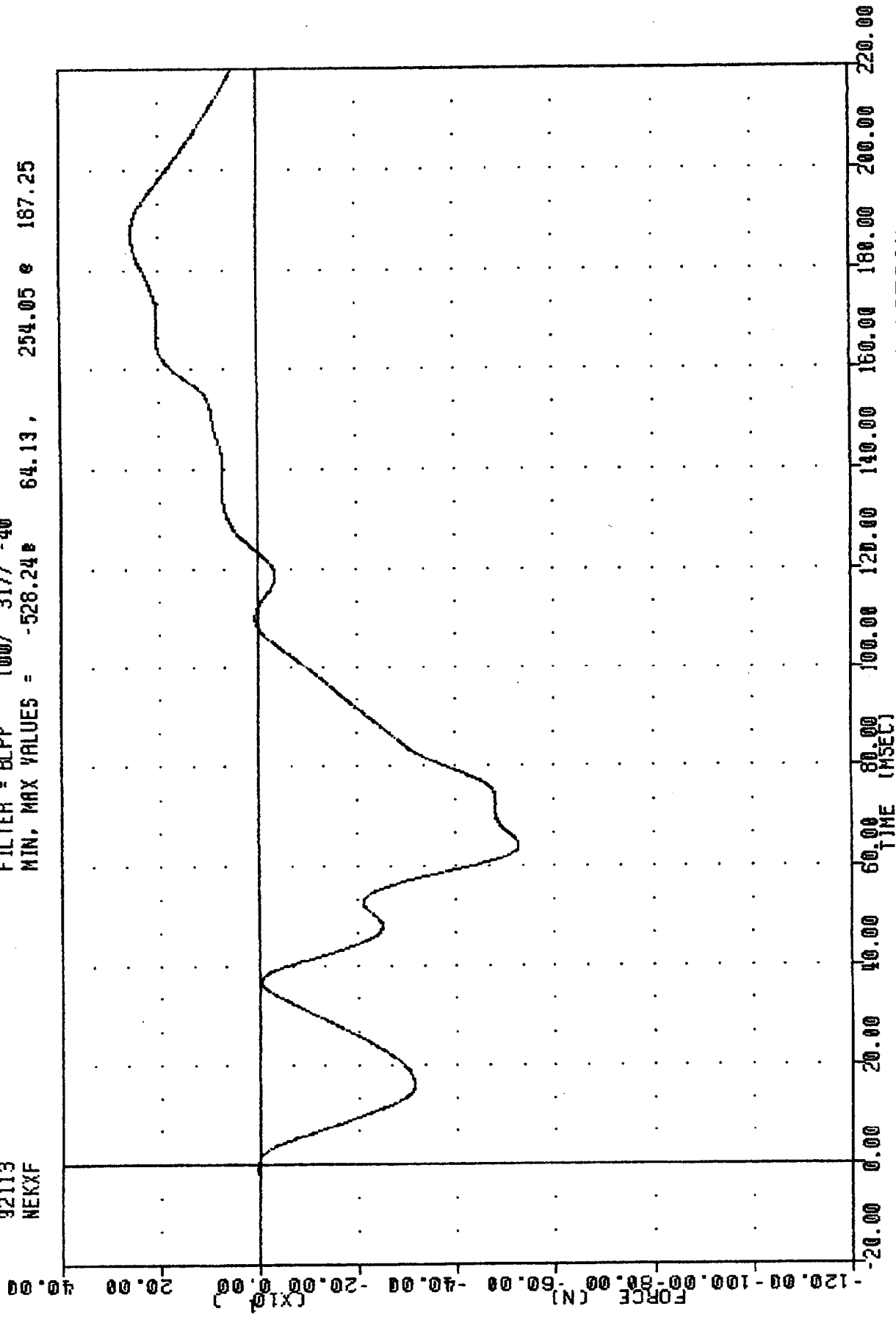
FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -29.478 194.88, 94.81 e 74.75



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 TOTAL ROTATION

TRC , 48C1NE1
572E SN48 NECK EXT. CALD1
92113
NEKXF

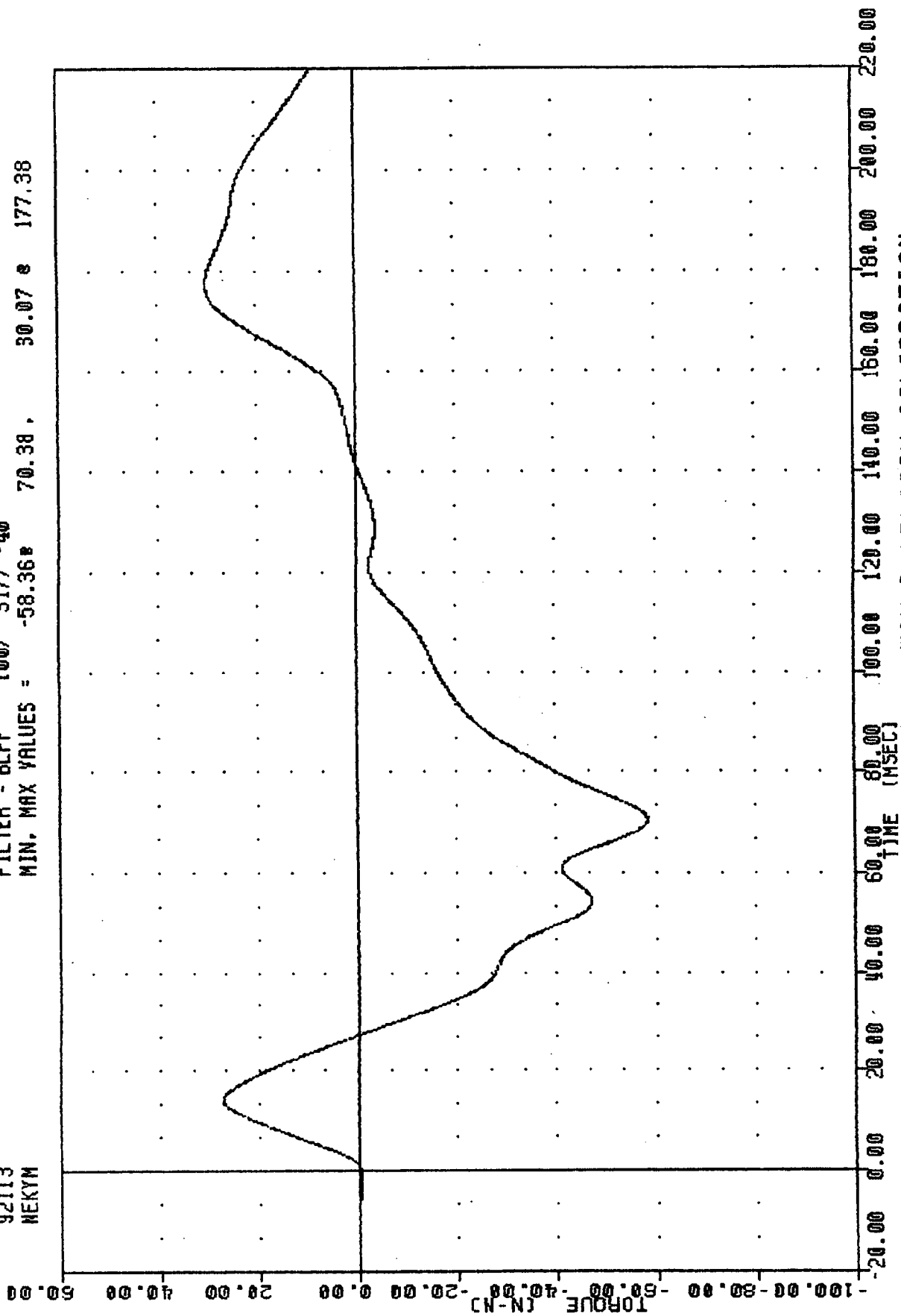
FILTER = BLPP 100/ 317/ -40
MIN, MAX VALUES = -528.24 64.13, 254.05 187.25



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS

TRC , 48C1NE1
572E SN48 NECK EXT. CAL01
92113
NEKYM

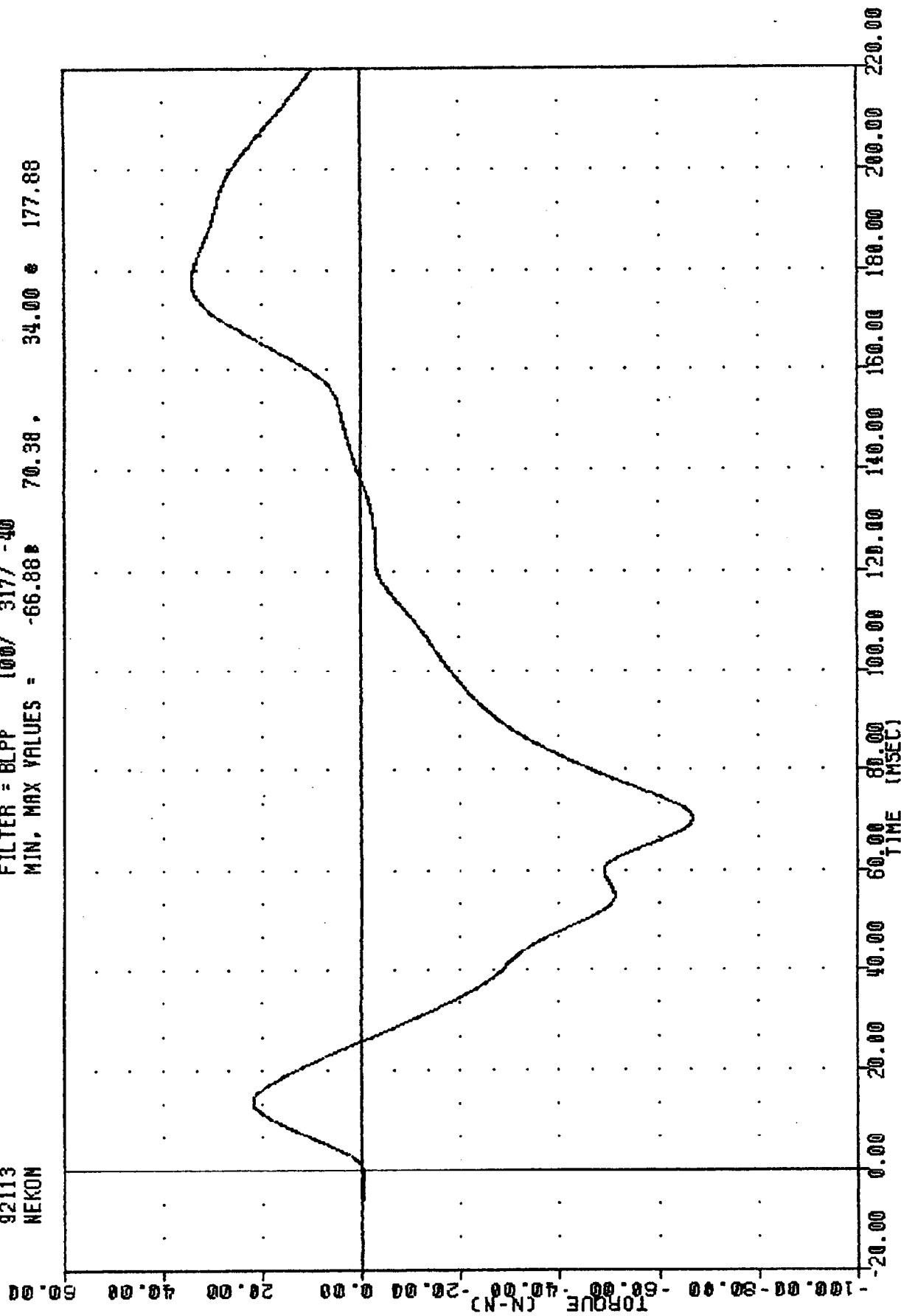
FILTER = BLPP 100/ 317/ -40
MIN, MAX VALUES = -58.36 70.38 30.07 177.38



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS

TRC , 48C1NE1
 572E SN40 NECK EXT. CAL01
 92113
 NEKON

FILTER = BLPP 100/ 317/ -40
 MIN. MAX VALUES = -66.88 70.38 34.00 177.88



PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

23-APR-92

TRC

48C1TH1

572E SN48 H.S.THORAX CAL01

HIGH SPEED TEST		
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	42.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/SEC	6.68 M/SEC
MAXIMUM DEFLECTION	63.5 - 72.6 MM	69.5 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5275. N
INTERNAL HYSTERESIS	69% - 85%	74.0%

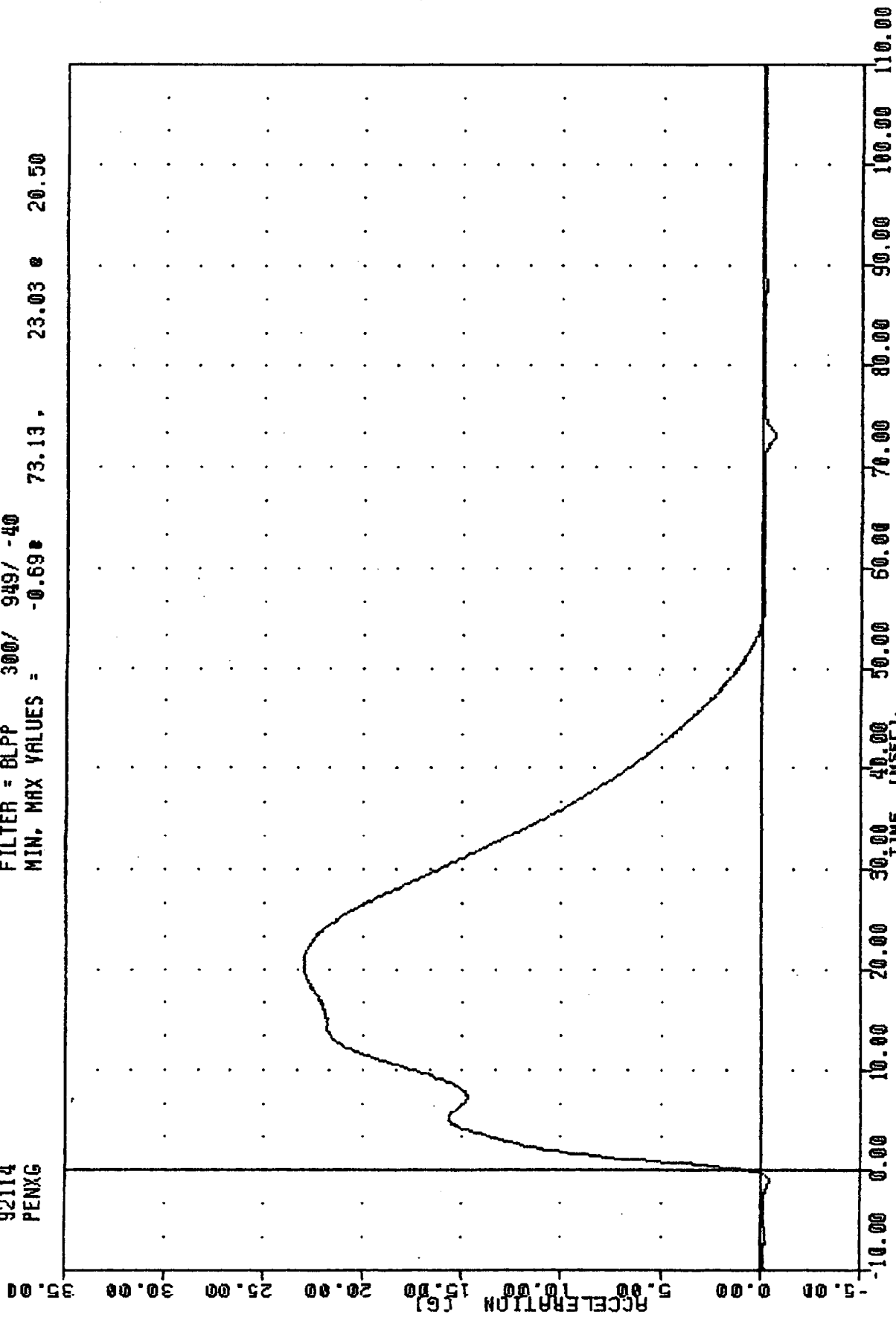
TEST MEETS SPECIFICATIONS

TECHNICIAN



TRC , 48C1TH1
572E SN48 H.S. THORAX CAL01
92114
PENXG

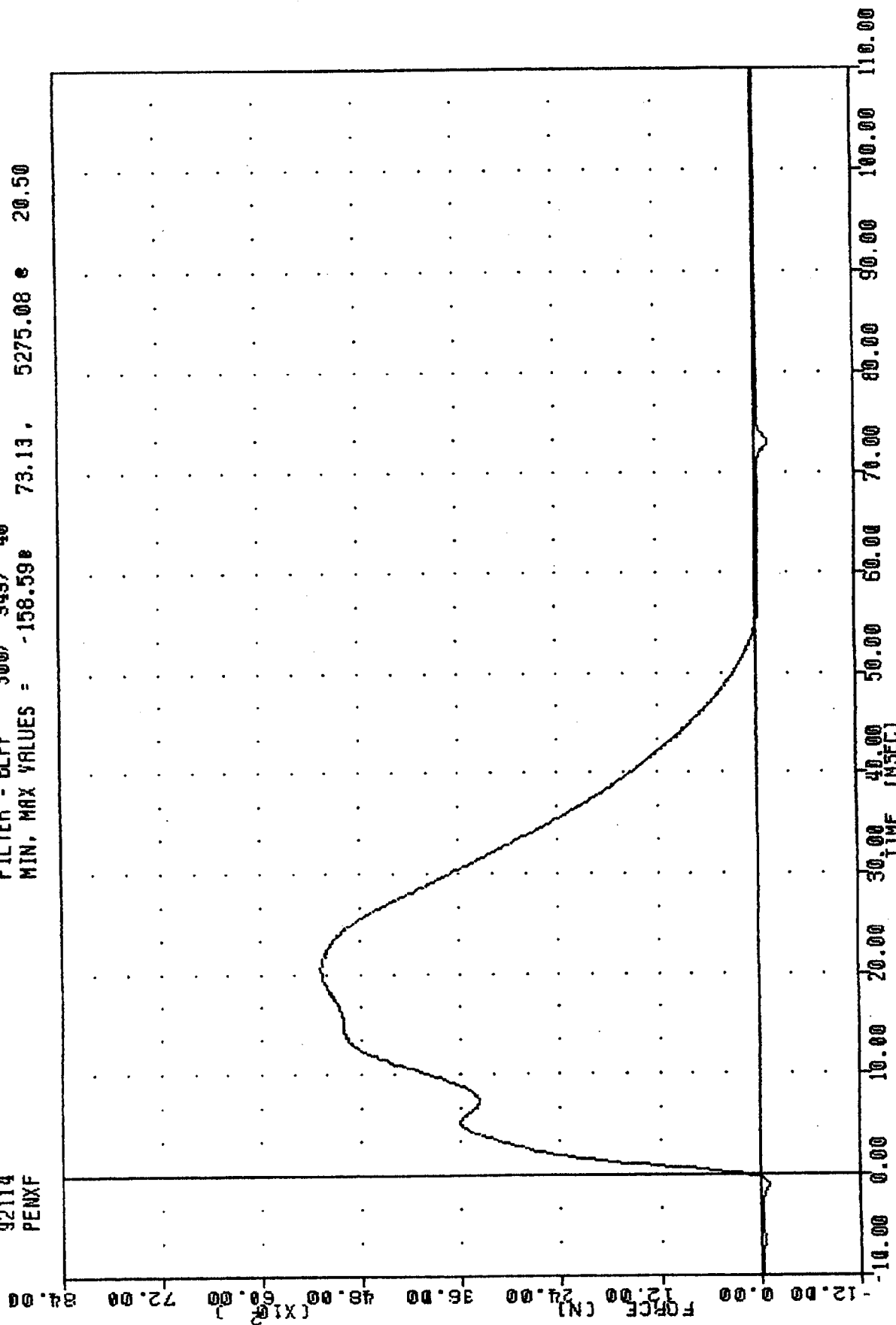
FILTER = BLPP 300/ 949/ -40
MIN, MAX VALUES = -0.69 73.13, 23.03 20.50



PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC
572E SN48 H.S. THORAX CAL01
92114
PENXF

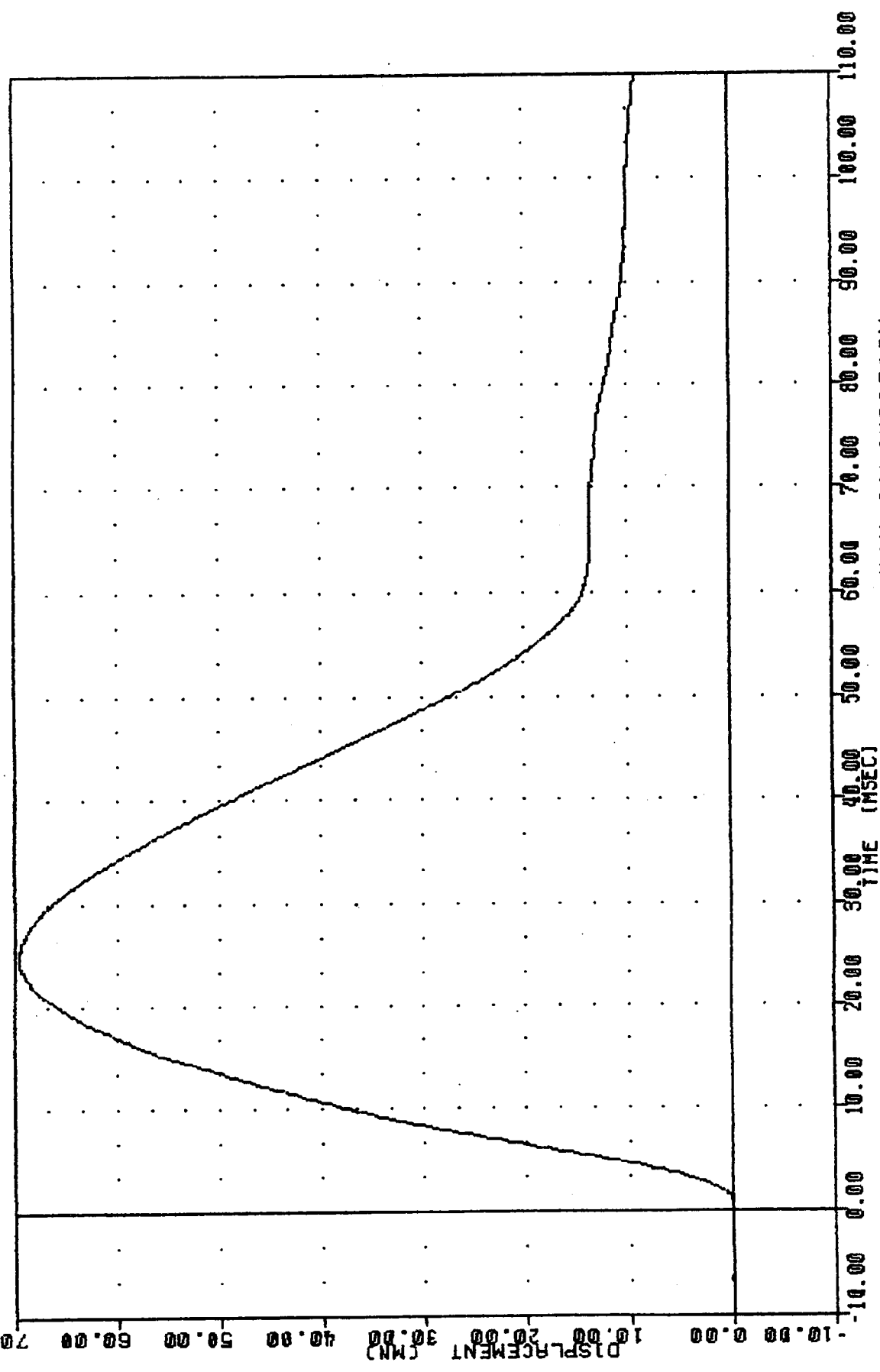
FILTER = BLPP 300/ 949/ -40
MIN, MAX VALUES = -158.590 73.13, 5275.08 e 20.50



PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC
572E SN40 H.S. THORAX CAL01
92114
CSTXD

FILTER = BLPP 300/ 949/ -40
MIN. MAX VALUES = -0.08 0.38 69.50 24.75



PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC
 CSTXD
 PENXF

46C1TH1
 FILTER = BLPP
 FILTER = BLPP

572E SN48 H.S. THORAX CAL01
 300/ 949/ -40
 300/ 949/ -40

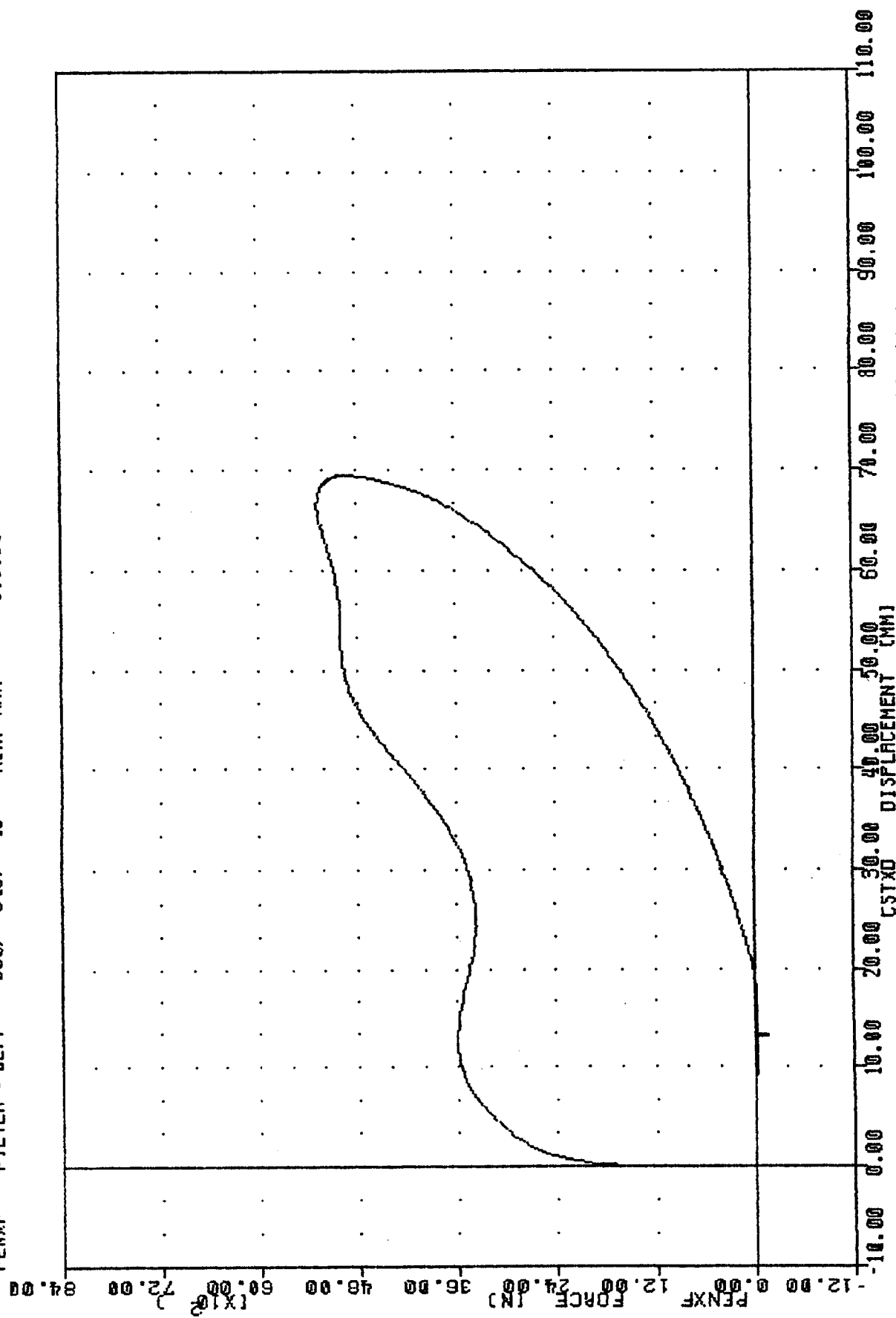
MIN. MAX =
 MIN. MAX =

92114
 -0.008
 -158.59

0.38
 73.13

69.50
 5275.88

24.75
 20.50



PART 572-E HYBRID III THORAX CALIBRATION
 CHEST DISPLACEMENT VS PENDULUM FORCE

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

22-APR-92

RIGHT KNEE
TRC

4BC1RK1

572E SN48 RIGHT KNEE CAL 01

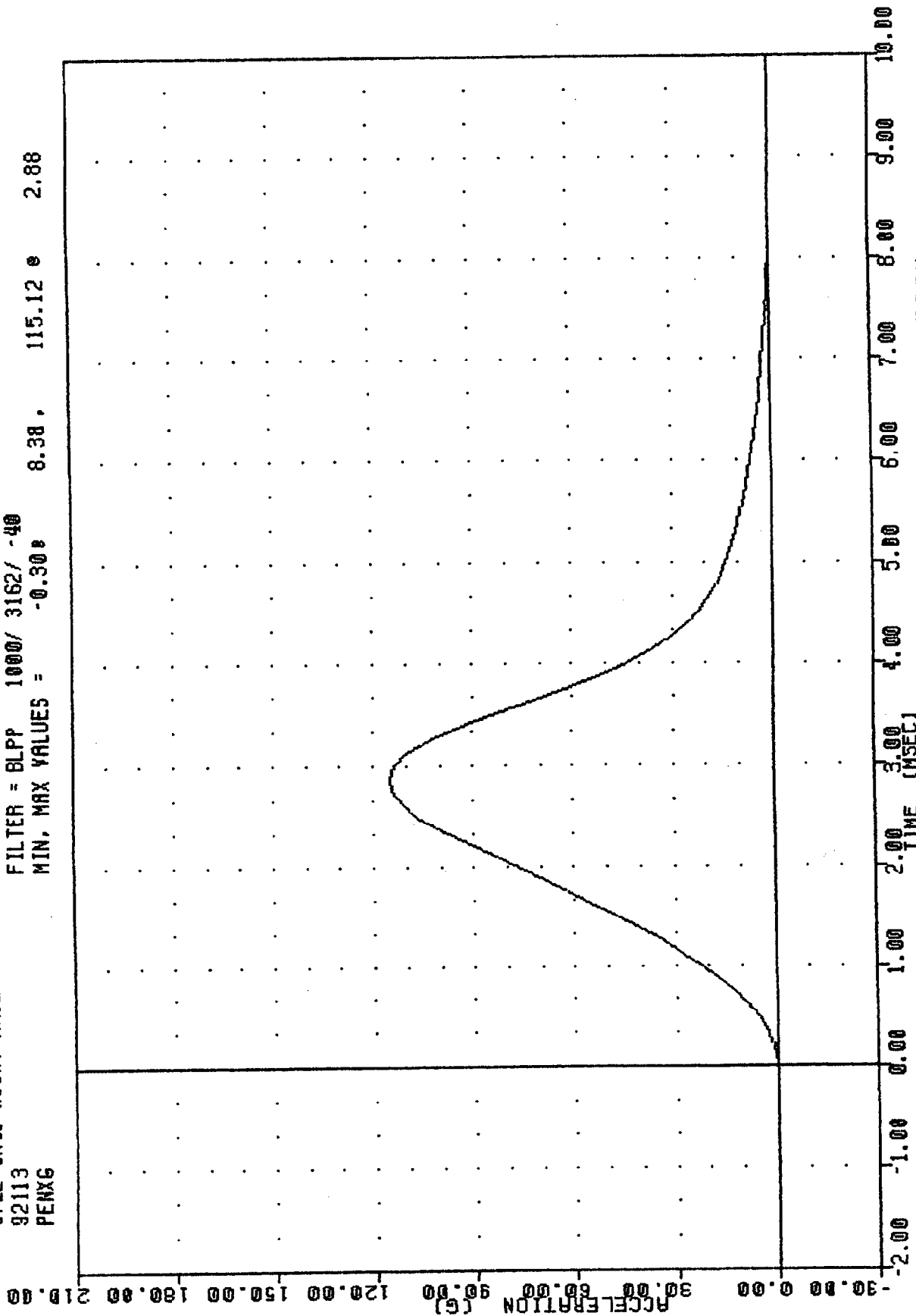
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	43.0 %
PROBE VELOCITY	2.07 - 2.13 M/SEC	2.10 M/SEC
PEAK KNEE IMPACT FORCE	4714-5783 N	5644.8 N
PROBE WEIGHT	5.0 KG	

TEST MEETS SPECIFICATIONS

TECHNICIAN Pete Smith

TRC
 572E SN48 RIGHT KNEE CAL 01
 92113
 PENXG

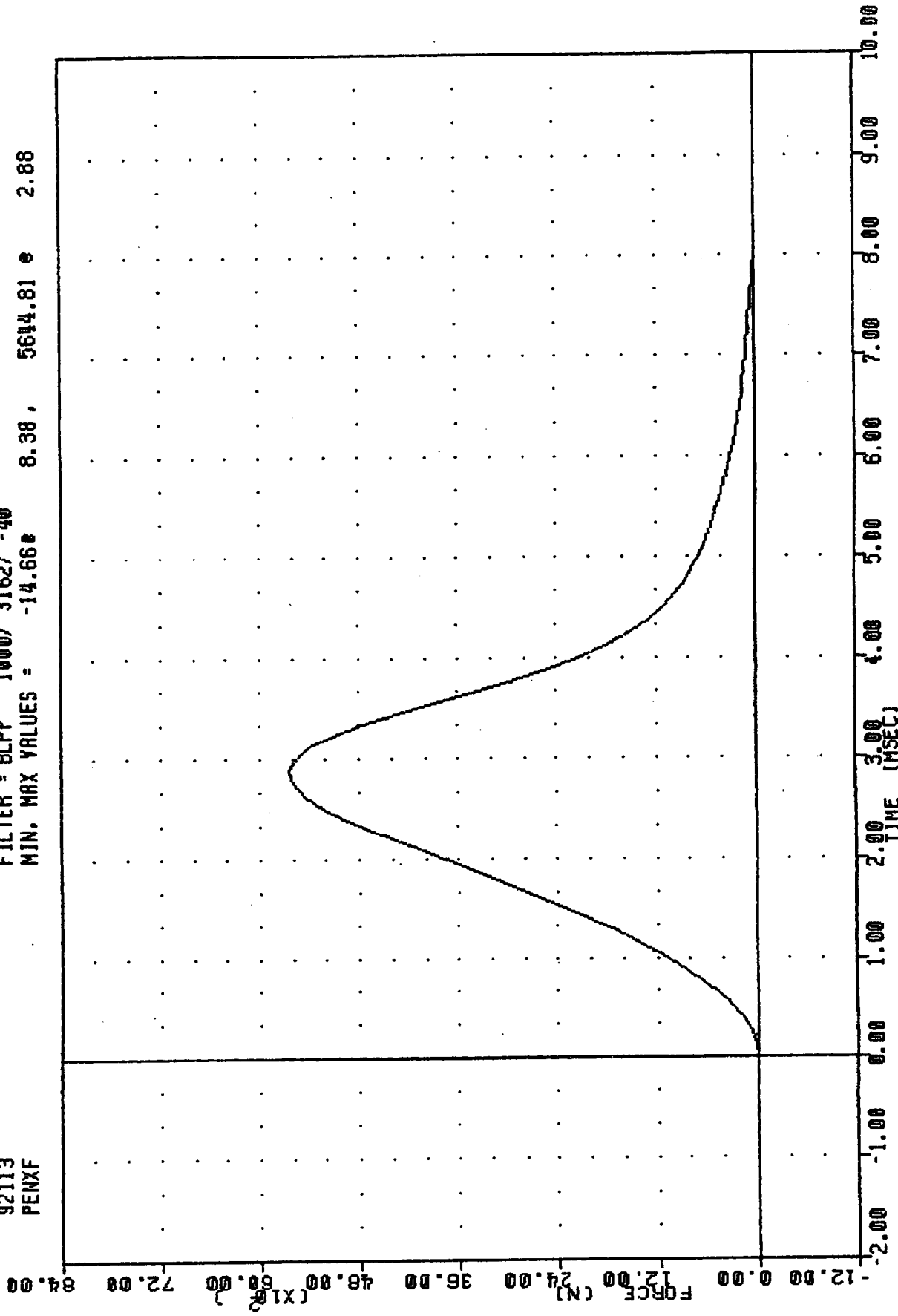
FILTER = BLPP 1000/ 3162/ -40
 MIN, MAX VALUES = -0.308 8.38, 115.12 0 2.88



PART 572-E HYBRID III RIGHT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND.)

TRC , 48C1RK1
572E SN48 RIGHT KNEE CAL 01
92113
PENXF

FILTER = BLPP 1000/ 3162/ -40
MIN. MAX VALUES = -14.66 8.38 , 5644.81 2.88



PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

22-APR-92

LEFT KNEE
TRC

48C1LK1

572E SN48 LEFT KNEE CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10% - 70%	43.0 %
PROBE VELOCITY	2.07 - 2.13 M/SEC	2.10 M/SEC
PEAK KNEE IMPACT FORCE	4714-5783 N	5136.4 N
PROBE WEIGHT	5.0 KG	

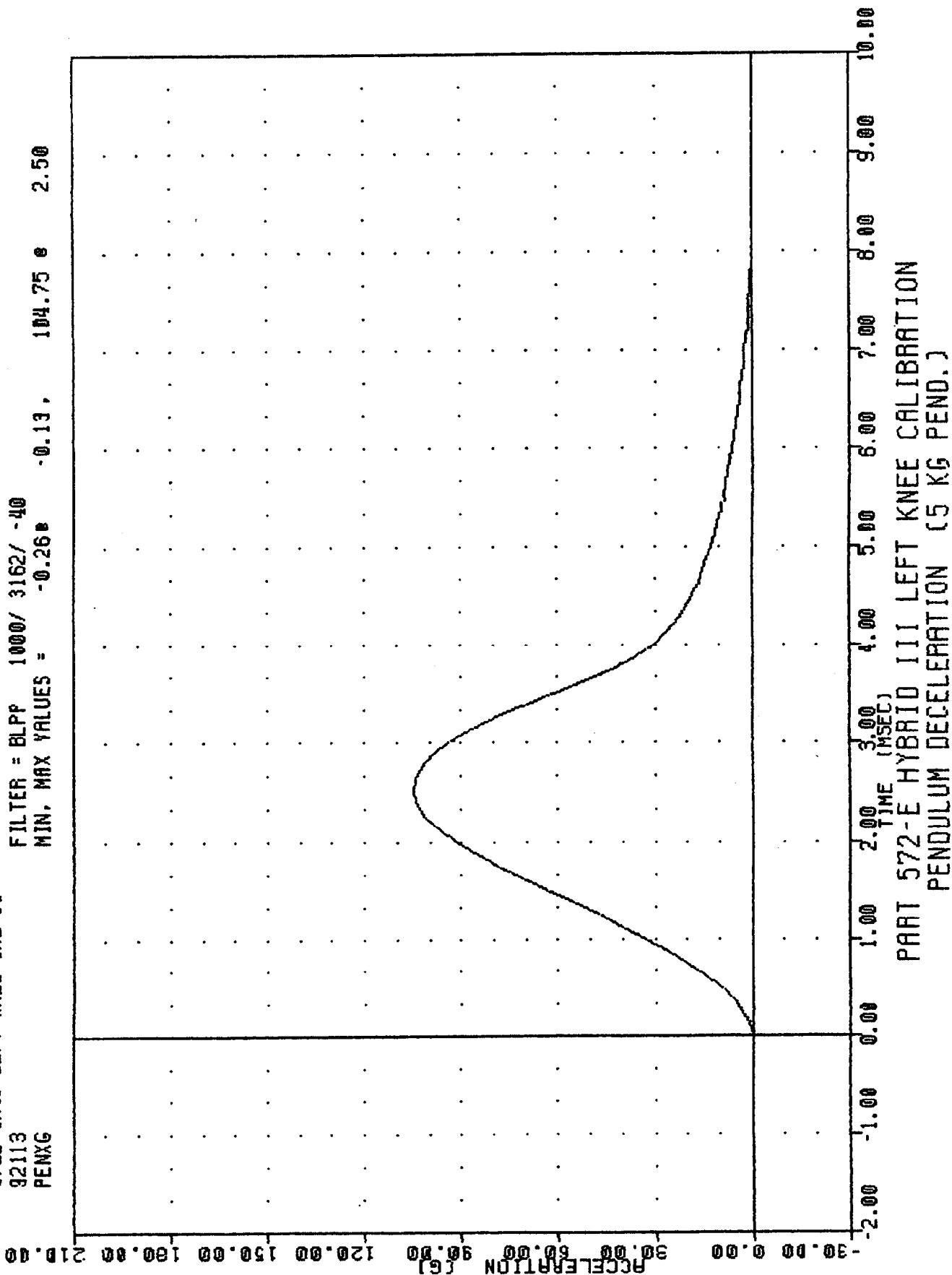
TEST MEETS SPECIFICATIONS

TECHNICIAN

Pete Fast

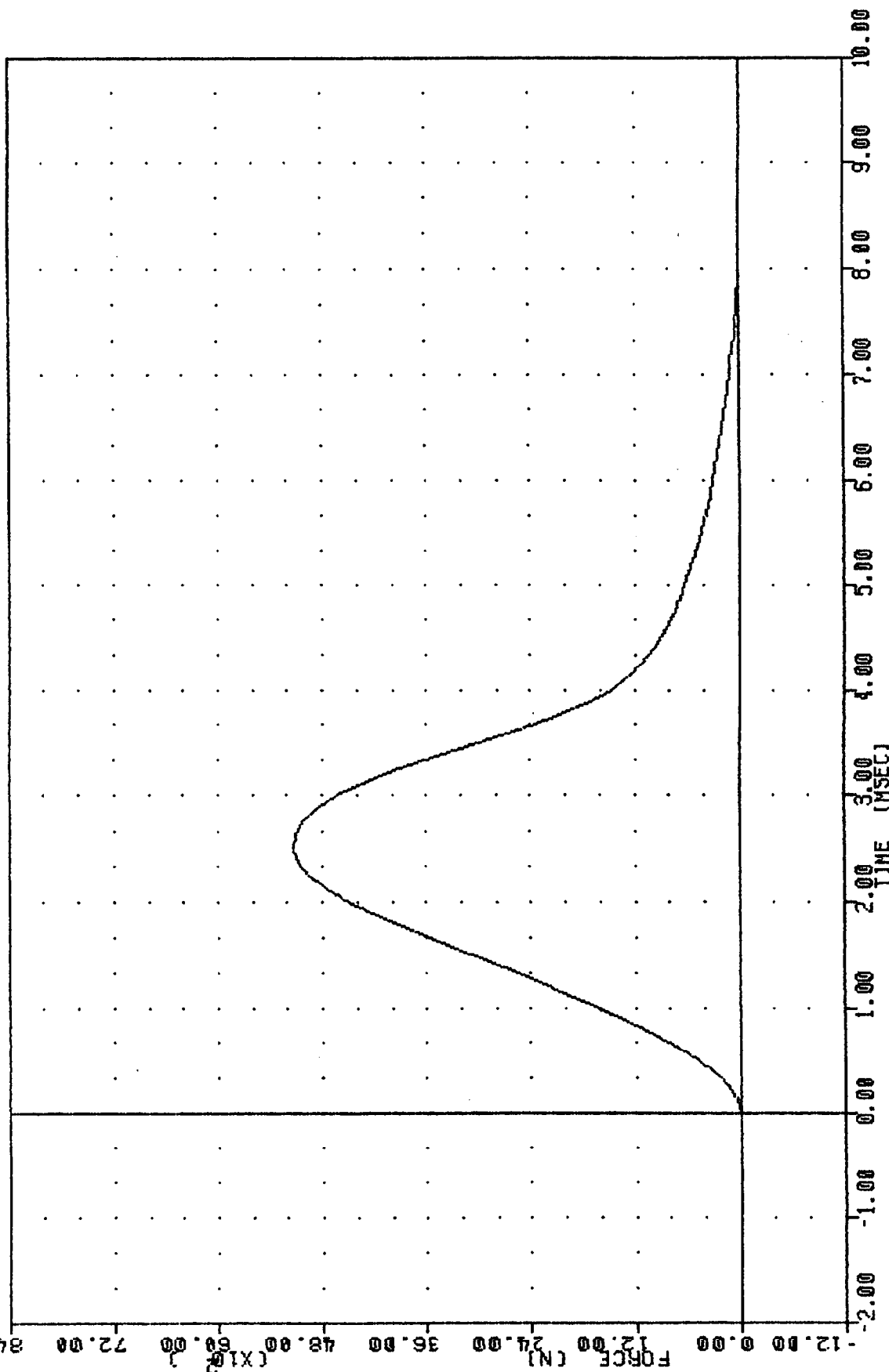
TRC
572E SN48 LEFT KNEE CAL 01
92113
PENXG

FILTER = BLPP 1000/ 3162/ -40
MIN, MAX VALUES = -0.26 104.75 2.50



TRC
572E SN48 LEFT KNEE CAL 01
92113
PENXF

FILTER = BLPP 1000/ 3162/ -40
MIN, MAX VALUES = -12.73* -0.13, 5136.39* 2.50



PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)

APPENDIX D

MISCELLANEOUS TEST INFORMATION

VEHICLE INSTRUMENTATION INFORMATION

TEST NO. 920507

NO.	LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
1	LEFT REAR SEAT					
	CROSSMEMBER LONGITUDINAL	X	ENDEVCO	7264	CW11H	FRONT
2	RIGHT REAR SEAT					
	CROSSMEMBER LONGITUDINAL	X	ENDEVCO	7264	CH81H	REAR
3	ENGINE TOP LONGITUDINAL	X	ENDEVCO	7264	DK59J	FRONT
4	ENGINE BOTTOM LONGITUDINAL	X	ENDEVCO	7264	CF27H	REAR
5	RIGHT BRAKE CALIPER					
	LONGITUDINAL	X	ENDEVCO	7264	CH3H	REAR
6	LEFT BRAKE CALIPER					
	LONGITUDINAL	X	ENDEVCO	7264	CY78H	REAR
7	INSTRUMENT PANEL CENTER					
	LONGITUDINAL	X	ENDEVCO	7264	CW79H	REAR
	LAP BELT OUTBOARD FORCE		LEBOW	3419	610	TENSION
	SHOULDER BELT OUTBOARD FORCE		LEBOW	3419	590	TENSION

HEAVY TRUCK ACCELEROMETER INFORMATION

TEST NO. 920507

NO.	LOCATION	AXIS	MFR	MODEL	ORIENTATION	
					S/N	(+ SENSING)
9	FRONT FRAME CROSSMEMBER	X	ENDEVCO	7264	CF11H	FRONT
		Y	ENDEVCO	7264	CL73H	LEFT
		Z	ENDEVCO	7264	CH97H	UP
10	TRUCK CENTER OF GRAVITY	X	ENDEVCO	7264	CJ04H	REAR
		Y	ENDEVCO	7264	CJ37H	RIGHT

DUMMY INSTRUMENTATION PLACEMENT

DUMMY MFR. & S/N: HUMANOID/048

SEATING POSITION: DRIVER

LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
HEAD ACCELERATION	X	ENDEVCO	7264	EH78J	REAR
HEAD ACCELERATION	Y	ENDEVCO	7264	DH37J	LEFT
HEAD ACCELERATION	Z	ENDEVCO	7264	DD17J	UP
NECK FORCE	X	DENTON	1716	0106	*
NECK FORCE	Y	DENTON	1716	0106	*
NECK FORCE	Z	DENTON	1716	0106	*
NECK MOMENT	X	DENTON	1716	0106	*
NECK MOMENT	Y	DENTON	1716	0106	*
NECK MOMENT	Z	DENTON	1716	0106	*
CHEST ACCELERATION	X	ENDEVCO	7264	EH92J	FRONT
CHEST ACCELERATION	Y	ENDEVCO	7264	CC24H	LEFT
CHEST ACCELERATION	Z	ENDEVCO	7264	FG28J	UP
CHEST DEFLECTION	X	VERNITECH	81422A	9041	OUTWARD
PELVIS ACCELERATION	X	ENDEVCO	7264	BC75J	REAR
PELVIS ACCELERATION	Y	ENDEVCO	7264	FC43J	LEFT
PELVIS ACCELERATION	Z	ENDEVCO	7264	AP87	UP
LEFT FEMUR FORCE		GSE	2435	014	TENSION
RIGHT FEMUR FORCE		GSE	2430	756	TENSION

*See SIGN CONVENTION sheet for positive sensing orientation of neck load channels.

SIGN CONVENTION
NHTSA DATA TAPE REFERENCE GUIDE

ACCELEROMETERS:

+X: FORWARD
+Y: LEFTWARD
+Z: UPWARD

POTENTIOMETERS:

+CHEST LONGITUDINAL DEFLECTION: OUTWARD
+CHEST LATERAL DEFLECTION: LEFTWARD
+SEAT BELT DISPLACEMENT: OUTWARD
+SEAT BELT EXTENSION: ENLONGATION
+KNEE SLIDER DISPLACEMENT: DISTANCE BETWEEN FEMUR
AND TIBIA INCREASED
(IN RELATION TO A
SEATED DUMMY)

LOAD CELLS:

+FEMUR FORCE: TENSION
+SEAT BELT FORCE: TENSION
+BARRIER FORCE: TENSION

NECK LOAD CELLS:

+X FORCE: HEAD PUSHED FORWARD
+Y FORCE: HEAD PUSHED LEFTWARD
+Z FORCE: HEAD PULLED UPWARD (TENSION ON NECK)
+X MOMENT: RIGHT EAR ROTATING TOWARD RIGHT SHOULDER
+Y MOMENT: CHIN ROTATING TOWARD CHEST
+Z MOMENT: CHIN ROTATING TOWARD LEFT SHOULDER

TIBIA LOAD CELLS:

+X FORCE: TENSION
+Y FORCE: TENSION
+Z FORCE: TENSION
+X MOMENT: BOTTOM OF TIBIA MOVING LEFTWARD
+Y MOMENT: BOTTOM OF TIBIA MOVING REARWARD