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

DOT HS 807 772
Final Report

October 1990

Final Report of 315° Contoured Moving Barrier Impact Into a 1982 Audi 5000 4-Door Sedan in Support of Crash III Damage Algorithm Reformation

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT HS 807 772		

4. Title and Subtitle	5. Report Date
FINAL REPORT OF 315° CONTOURED MOVING BARRIER IMPACT INTO A 1982 AUDI 5000 4-DOOR SEDAN IN SUPPORT OF CRASH III DAMAGE ALGORITHM REFORMATION	SEPT. - OCT., 1990
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
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9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Vehicle Research and Test Center 10820 State Route 347 East Liberty, Ohio 43319	11. Contract or Grant No. DTNH22-88-C-07292
12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh St., S.W., Washington, D.C. 20590	FINAL REPORT OCTOBER, 1990
	14. Sponsoring Agency Code DOT/NHTSA/VRTC

15. Supplementary Notes

16. Abstract

Four 315° contoured moving barrier impact tests were conducted for research and development in support of the crash III damage algorithm reformulation. These tests were conducted on a 1982 Audi 5000 4-door sedan, VIN, WAUGB043XCN061065, at the Transportation Research Center of Ohio. The following four tests were conducted on one vehicle:

TEST NO.	DATE	TIME	SPEED (mph)	MAXIMUM CUMULATIVE CRUSH (in.)
900912-1	9/12/90	1330	9.8	5.0
900912-2	9/12/90	1500	19.7	12.9
900913-1	9/13/90	1431	19.9	20.2
900913-2	9/13/90	1601	45.0	35.8

17. Key Words	18. Distribution Statement
315° Contoured Moving Barrier Impact Crash III Damage Algorithm Reformulation.	DOCUMENT IS AVAILABLE TO THE PUBLIC FROM THE NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified		

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

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SECTION 1.0
PURPOSE AND TEST SUMMARY

The purpose of the four 315° contoured moving barrier impact tests was research and development in support of the CRASH III damage algorithm reformulation.

The 1982 Audi 5000 was equipped with a 131 CID, 5-cylinder, longitudinal, gas engine with a 3-speed automatic transmission. The intended total test weight of the vehicle was 2723 pounds. The actual weight was 2724 pounds.

The contoured moving barrier actual weight was 2723 pounds, frontal width was 67.0 inches, barrier height was 31.5 inches, bumper width was 6.0 inches and height of the bumper centerline was 17.5 inches. The contoured moving barrier was intended to impact the driver's side of the vehicle at 315°. The leading edge of the contact was to be 17.1 inches rearward of the vehicle's front wheel centerline.

The test vehicle was equipped with center of gravity accelerometers oriented parallel and perpendicular to the line of impact and right front sill accelerometers oriented to measure vehicle X and Y-axis accelerations.

The moving barrier (impactor) was equipped with center of gravity accelerometers to measure X and Y-axis accelerations.

The crash test event was recorded by two (2) high speed motion picture cameras.

SECTION 2.0

VEHICLE INFORMATION

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Audi NSU Union AG West Germany

MAKE/MODEL: Audi 5000 VIN: WAUGB043XCN061065

BODY STYLE: 4-door sedan MODEL YEAR: 1982

NHTSA NO.: NA COLOR: Blue

ENGINE DATA: TYPE: inline CYLINDERS: 5 DISPLACEMENT: 131 CID

TRANSMISSION DATA: _3_SPEED, ___MANUAL, _X_AUTOMATIC, _X_FWD, ___RWD, ___4WD

DATE VEHICLE RECEIVED: 9/06/90 ODOMETER READING: 53,455

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

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

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Audi NSU Union AG West Germany

DATE OF MANUFACTURE: 2/82 VIN: WAUGB043XCN061065

GVWR: 3847 LBS

GAWR: FRONT: 2116 LBS., REAR: 1829 LBS.

TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Michelin MXL P185/70R14

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

SPARE TIRE (MFR., LINE, SIZE): NA

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Non-adjustable

MAXIMUM WIDTH: 69.8 INCHES

WHEELBASE: 105.8 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:*

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL: *

RECOMMENDED TIRE SIZE:

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

DESIGNATED SEATING CAPACITY: ___FRONT ___REAR ___TOTAL

VEHICLE CAPACITY WEIGHT: _____ LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 26.4 ;RF 26.1 ;LR 26.3 ;RR 26.2

PRE-TEST ATTITUDE: LF 27.3 ;RF 27.1 ;LR 26.6 ;RR 26.4

*THE VEHICLE DID NOT CONTAIN A "RECOMMENDED TIRE PRESSURE" LABEL.

TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE AS RECEIVED (WITHOUT MAXIMUM FLUIDS):

RIGHT FRONT	900 LBS.	RIGHT REAR	513 LBS.
LEFT FRONT	889 LBS.	LEFT REAR	523 LBS.
TOTAL FRONT WEIGHT	1789 LBS.	(63.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1036 LBS.	(36.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2825 LBS.		

TEST VEHICLE'S TARGET TEST WEIGHT: *

TARGET TEST WEIGHT = 2723 LBS

WEIGHT OF TEST VEHICLE:

RIGHT FRONT	867 LBS.	RIGHT REAR	498 LBS.
LEFT FRONT	851 LBS.	LEFT REAR	508 LBS.
TOTAL FRONT WEIGHT	1718 LBS.	(63.1% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1006 LBS.	(36.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2724 LBS.	(1 POUND OVER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: 20 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Rear seat

CG = 39.1 INCHES REARWARD OF FRONT WHEEL CENTERLINE

*VRTC requested that the vehicle test weight be set as close as possible to the moving barrier weight with the contoured barrier face.

VEHICLE FRONT CRUSH MEASUREMENTS AT VEHICLE BUMPER HEIGHT (20.5 INCHES)

LOCATION	0		1		2		3		4		5		6		7		8	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	
PRE-TEST	12.0	16.4	9.4	18.4	8.4	21.1	7.6	24.0	6.8	27.0	6.1	30.1	5.8	33.0	5.4	36.0	4.8	39
POST-TEST 1	12.0	16.4	9.5	18.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.
POST-TEST 2	12.4	17.5	10.6	19.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.
POST-TEST 3	12.9	16.1	14.1	15.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.
POST-TEST 4	22.8	3.8	14.1	15.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.

LOCATION	9		10		11		12		13		14		15		16		17	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	
PRE-TEST	4.8	42.0	4.6	45.0	4.5	48.0	4.6	50.7	4.8	53.6	5.1	57.0	5.5	60.0	5.6	62.6	6.4	65
POST-TEST 1	NA	NA	NA	NA	NA	NA	4.6	50.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.
POST-TEST 2	NA	NA	NA	NA	NA	NA	5.1	51.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.
POST-TEST 3	NA	NA	NA	NA	NA	NA	7.2	47.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.
POST-TEST 4	NA	NA	NA	NA	NA	NA	10.8	36.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	N.

LOCATION	18		19		20		21		22		23	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	7.4	68.5	8.0	71.3	8.6	74.4	9.8	77.3	11.5	80.0	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	11.0	79.8	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	10.8	80.8	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	12.5	79.6	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	11.5	66.0	NA	NA

All distances measured in inches. Column readings are three inches apart from left to right on vehicle.
All X-axis measurements taken from a reference plane 192 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerli

VEHICLE LEFT SIDE CRUSH MEASUREMENTS AT MOVING BARRIER BUMPER HEIGHT (17.5 INCHES)

LOCATION	1		2		3		4		5		6		7		8		9	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	14.6	16.1	17.6	16.0	20.6	15.2	23.6	15.1	26.6	15.0	29.6	15.5	32.6	14.8	35.4	13.4	38.2	13.9
POST-TEST 1	14.6	16.1	17.6	16.0	20.6	15.2	23.6	15.1	26.6	15.0	29.6	15.5	32.6	14.8	35.4	13.4	38.2	13.9
POST-TEST 2	15.4	17.2	18.4	17.0	21.4	16.4	24.4	16.2	27.1	16.0	30.7	16.4	33.3	15.8	35.9	15.1	39.4	14.9
POST-TEST 3	15.4	17.2	18.4	17.0	21.4	16.4	24.4	16.2	27.1	16.0	30.7	16.4	33.3	15.8	40.4	12.4	43.4	12.5
POST-TEST 4	25.8	4.6	28.4	4.0	31.9	5.1	34.4	5.6	37.2	6.1	41.6	7.9	45.2	7.6	48.2	9.1	50.5	10.8

LOCATION	10		11		12		13		14		15		16		17		18	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	41.2	13.4	44.2	13.1	47.6	13.1	50.0	12.9	53.0	13.0	56.2	13.1	59.8	14.4	62.9	14.9	65.9	14.5
POST-TEST 1	41.2	13.4	44.4	13.1	47.5	13.1	50.4	12.8	53.1	13.2	56.2	13.9	59.2	14.8	62.4	14.6	65.5	14.6
POST-TEST 2	42.4	14.9	45.4	14.7	48.5	15.1	51.2	15.5	54.3	15.9	57.5	16.8	60.4	18.2	63.5	18.4	66.5	18.5
POST-TEST 3	46.6	12.6	49.4	13.1	52.7	13.5	55.5	13.4	58.4	14.4	61.5	15.8	64.4	17.8	67.9	18.2	70.5	18.0
POST-TEST 4	53.5	11.8	56.5	12.6	59.2	14.0	61.2	15.8	64.3	17.5	68.5	19.6	71.5	21.2	74.5	22.4	77.5	26.6

LOCATION	19		20		21		22		23		24		25		26		27	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	68.9	14.3	71.9	14.3	74.9	14.2	77.9	14.2	80.9	14.1	83.9	14.2	86.9	14.1	89.9	14.1	92.9	14.2
POST-TEST 1	70.0	16.1	72.6	17.3	75.2	18.5	78.0	19.2	81.1	19.6	83.9	18.9	86.8	17.3	89.5	16.9	92.4	16.3
POST-TEST 2	72.2	21.8	74.5	23.8	76.2	25.2	79.2	26.3	82.2	27.9	85.2	29.1	88.4	29.9	90.4	30.1	93.4	29.9
POST-TEST 3	81.7	19.7	82.1	23.0	82.2	25.1	84.8	27.2	85.8	30.1	88.1	32.5	90.2	34.2	92.8	35.8	97.0	36.6
POST-TEST 4	80.5	32.5	83.5	34.0	86.5	35.4	89.5	46.1	92.5	48.0	95.5	28.0	98.5	26.6	109.9	49.5	NA	NA

All distances measured in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 192 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.

VEHICLE LEFT SIDE CRUSH MEASUREMENTS AT MOVING BARRIER BUMPER HEIGHT (17.5 INCHES) CONTINUED

LOCATION	28		29		30		31		32		33		34		35		36
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	95.8	14.3	98.8	14.2	101.8	14.1	104.8	14.0	107.8	14.3	110.8	14.4	113.8	14.4	116.8	14.6	119.8	14
POST-TEST 1	95.4	16.0	98.5	15.3	101.5	15.0	104.5	14.8	107.5	14.6	110.4	14.6	113.8	14.6	116.7	14.8	119.8	14
POST-TEST 2	95.7	29.2	98.8	27.8	100.4	26.4	102.2	23.4	107.2	19.0	110.7	18.3	113.2	18.1	116.2	17.8	119.2	17
POST-TEST 3	99.3	36.6	102.1	35.8	104.1	34.0	106.1	32.4	109.6	27.4	112.0	26.2	115.7	24.0	117.9	22.1	120.4	20
POST-TEST 4	NA	NA	NA	NA	NA	NA	113.0	48.1	114.5	46.9	119.5	47.0	122.0	44.9	123.8	43.2	126.1	41

LOCATION	37		38		39		40		41		42		43		44		45
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	122.8	14.6	125.8	14.8	128.8	14.8	131.8	14.9	134.8	15.1	137.8	14.2	140.5	13.7	143.5	13.5	146.8	13
POST-TEST 1	122.8	14.8	125.5	14.8	128.5	15.0	131.8	15.0	134.5	15.1	137.7	14.1	140.5	13.7	143.5	13.5	146.8	13
POST-TEST 2	122.2	16.9	125.2	16.5	128.1	16.2	131.2	15.8	134.2	15.9	137.1	15.4	140.5	14.9	143.4	14.5	146.6	14
POST-TEST 3	123.2	18.6	126.0	17.9	129.0	17.2	132.2	16.3	134.9	16.1	137.5	14.6	140.5	14.0	143.6	14.4	147.4	14
POST-TEST 4	127.5	39.2	130.5	37.0	131.4	34.9	133.2	34.0	135.0	31.3	139.5	28.5	142.0	20.4	143.8	20.8	145.9	20

LOCATION	46		47		48		49		50		51		52		53		54
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	149.6	13.5	152.6	13.8	155.6	14.0	158.6	14.2	161.6	15.1	164.8	17.1	167.8	17.4	170.8	17.9	173.8	16
POST-TEST 1	149.6	13.5	152.6	13.8	155.6	14.0	158.6	14.2	161.6	15.1	164.8	17.1	167.8	17.4	170.8	17.9	173.8	16
POST-TEST 2	149.4	14.4	152.3	14.6	155.4	14.8	158.4	14.9	161.4	15.5	164.5	17.6	167.2	17.9	170.2	18.0	173.2	16
POST-TEST 3	150.2	14.4	153.1	14.6	155.4	14.8	158.4	14.9	161.4	15.5	164.5	17.6	167.2	17.9	170.2	18.0	173.2	16
POST-TEST 4	151.5	18.1	155.8	17.5	157.5	16.8	160.8	16.5	162.5	17.6	163.5	17.6	166.5	17.9	169.5	18.4	173.2	16

All distances measured in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 192 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerli

VEHICLE LEFT SIDE CRUSH MEASUREMENTS AT MOVING BARRIER BUMPER HEIGHT (17.5 INCHES) CONTINUED

LOCATION	55		56		57		58		59		60		61		62		63	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	176.2	16.2	179.2	16.4	182.2	16.4	185.2	16.6	188.2	16.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	176.2	16.2	179.2	16.4	182.2	16.4	185.2	16.6	188.2	16.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	176.7	16.2	179.4	16.3	182.3	16.4	185.3	16.6	188.4	16.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	176.7	16.2	179.4	16.3	182.3	16.4	185.3	16.6	188.4	16.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	176.7	16.2	179.4	16.3	182.3	16.4	185.3	16.6	188.4	16.9	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	64		65	
	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA

All distances measured in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 192 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.

VEHICLE LEFT SIDE CRUSH MEASUREMENTS AT SILL HEIGHT (13.4 INCHES)

LOCATION	1		2		3		4		5		6		7		8		9	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	10		11		12		13		14		15		16		17		18	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.0	16.3	66.0	16.
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.1	16.9	65.9	16.
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.6	19.5	66.4	19.
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	67.5	19.5	71.2	17.
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	67.5	19.5	69.5	22.

LOCATION	19		20		21		22		23		24		25		26		27	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	69.0	16.3	72.0	16.2	75.0	16.2	78.0	16.1	81.0	16.1	84.0	16.1	87.0	16.7	90.0	16.2	93.0	16.
POST-TEST 1	69.0	16.6	71.9	16.8	75.1	16.9	78.1	17.1	81.0	17.1	83.8	17.0	86.9	16.9	89.9	17.0	92.8	16.
POST-TEST 2	69.9	19.6	72.8	20.2	76.8	70.9	78.7	21.9	81.2	21.8	84.0	21.5	87.1	21.6	90.2	21.4	93.4	21.
POST-TEST 3	74.5	18.8	76.3	20.2	79.7	20.6	82.6	21.6	85.2	23.1	88.2	23.1	91.5	23.2	94.5	23.4	97.5	24.
POST-TEST 4	72.5	23.2	75.5	25.5	78.5	30.9	81.5	32.8	84.5	33.4	87.5	34.4	90.4	34.9	96.5	34.6	99.5	34.

All distances measured in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 192 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerlin

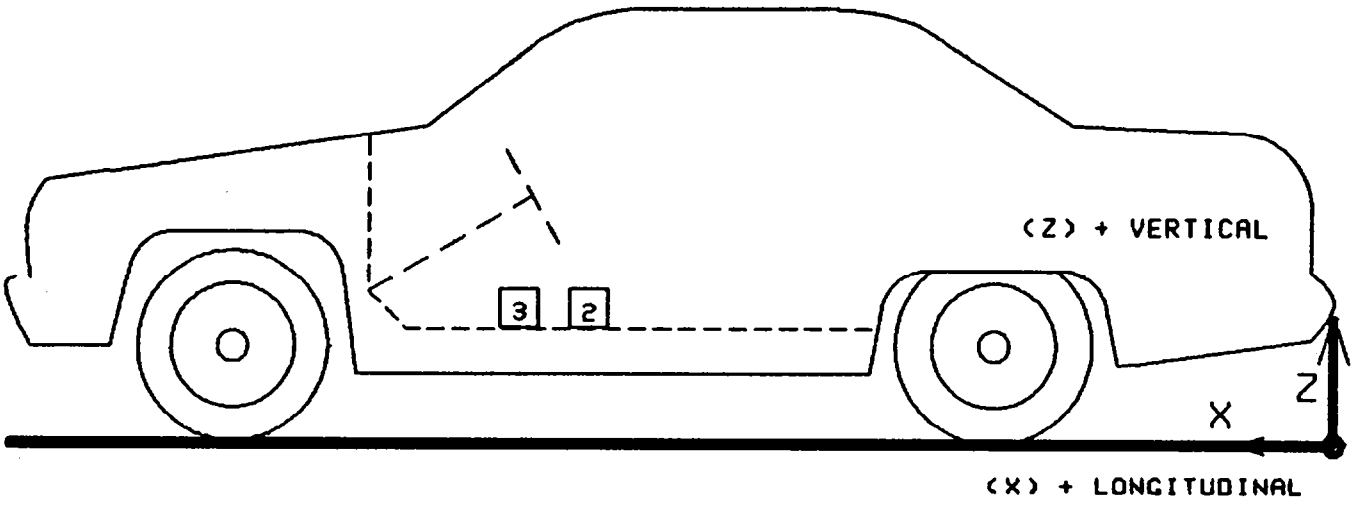
VEHICLE LEFT SIDE CRUSH MEASUREMENTS AT SILL HEIGHT (13.4 INCHES) CONTINUED

LOCATION	28		29		30		31		32		33		34		35		36	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	96.0	16.3	99.0	16.6	102.0	16.3	105.0	16.2	108.0	16.3	111.0	16.4	114.0	16.4	117.0	16.6	120.0	16.6
POST-TEST 1	95.7	17.0	98.7	16.9	101.6	16.8	104.6	16.7	108.0	16.8	110.6	16.8	114.0	16.4	117.0	16.6	120.0	16.6
POST-TEST 2	96.2	21.1	99.2	21.1	101.9	21.4	104.6	20.1	107.6	20.2	110.5	19.7	113.5	19.8	116.5	19.4	119.6	19.1
POST-TEST 3	100.1	24.4	103.1	25.0	106.0	25.9	107.0	25.4	110.5	26.4	112.2	25.9	115.0	24.6	117.5	22.8	120.5	21.2
POST-TEST 4	101.2	33.9	105.0	33.8	107.5	33.2	110.0	33.9	113.1	33.7	116.0	33.1	117.5	32.9	121.5	32.8	124.5	31.6

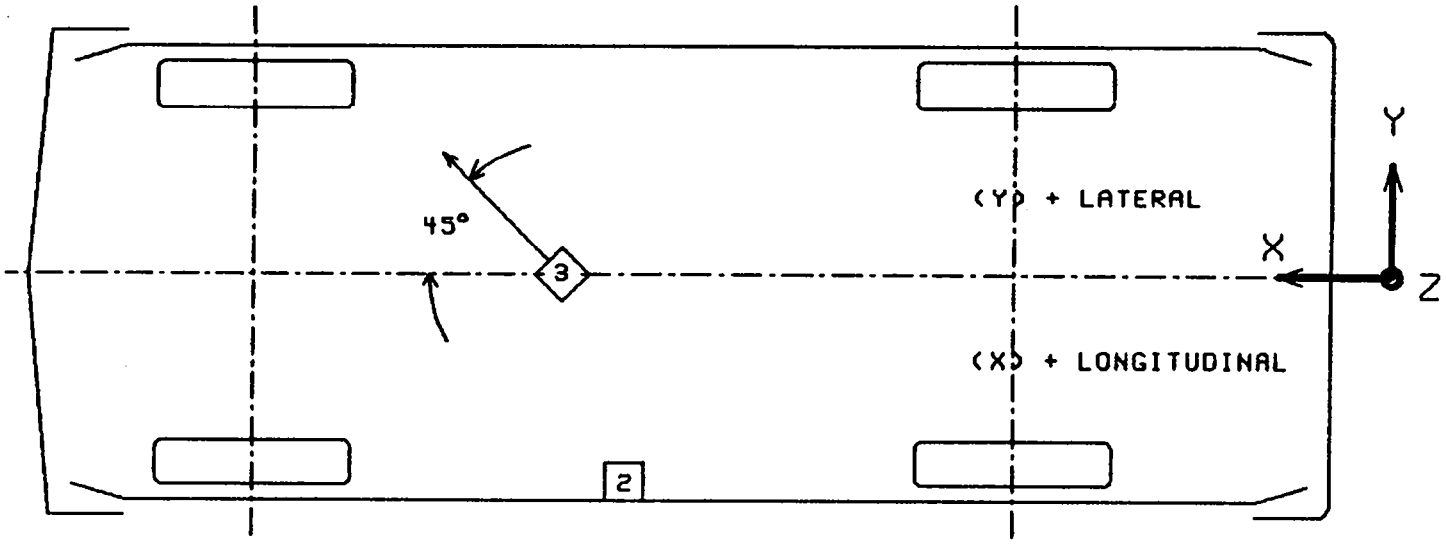
LOCATION	37		38		39		40		41		42		43		44		45	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	123.0	16.6	126.0	16.8	129.0	16.8	132.0	16.9	135.0	16.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	123.0	16.6	126.0	16.8	129.0	16.8	132.0	16.9	135.0	16.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	122.8	18.8	125.8	18.5	128.8	18.5	132.0	18.2	134.5	17.9	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	123.0	20.0	126.0	19.1	129.5	18.8	132.0	18.4	135.0	18.2	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	127.2	31.0	129.8	30.4	133.1	29.2	135.5	27.9	138.5	26.4	NA	NA	NA	NA	NA	NA	NA	NA

All distances measured in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 192 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.

VEHICLE ACCELEROMETER PLACEMENT

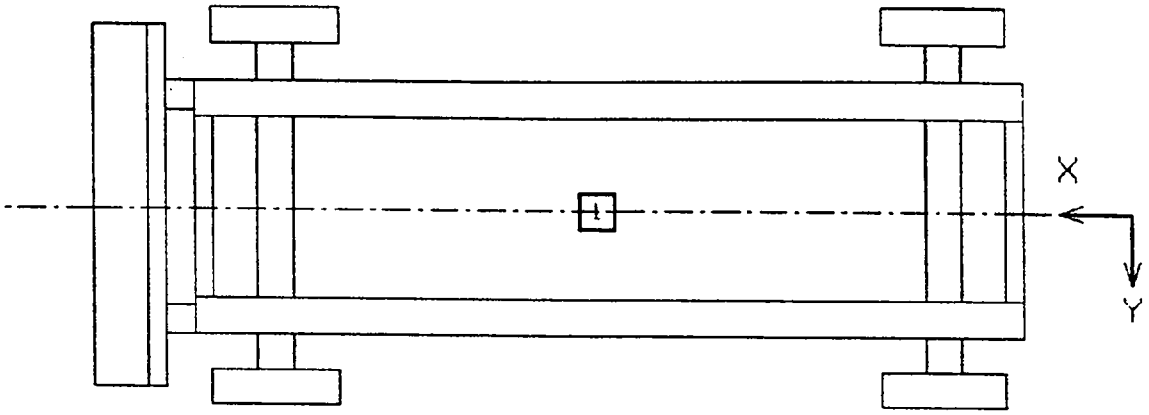


SIDE VIEW

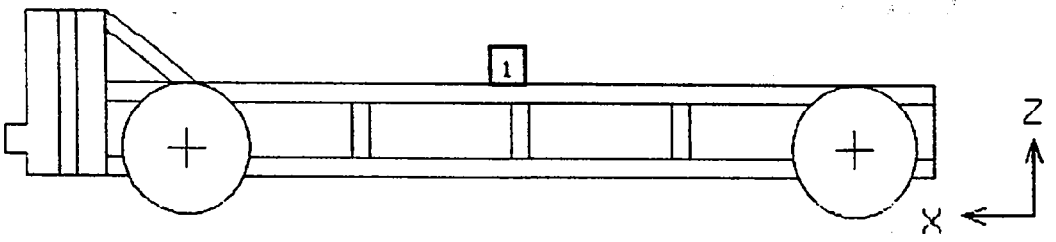


BOTTOM VIEW

MOVING BARRIER
ACCELEROMETER PLACEMENT

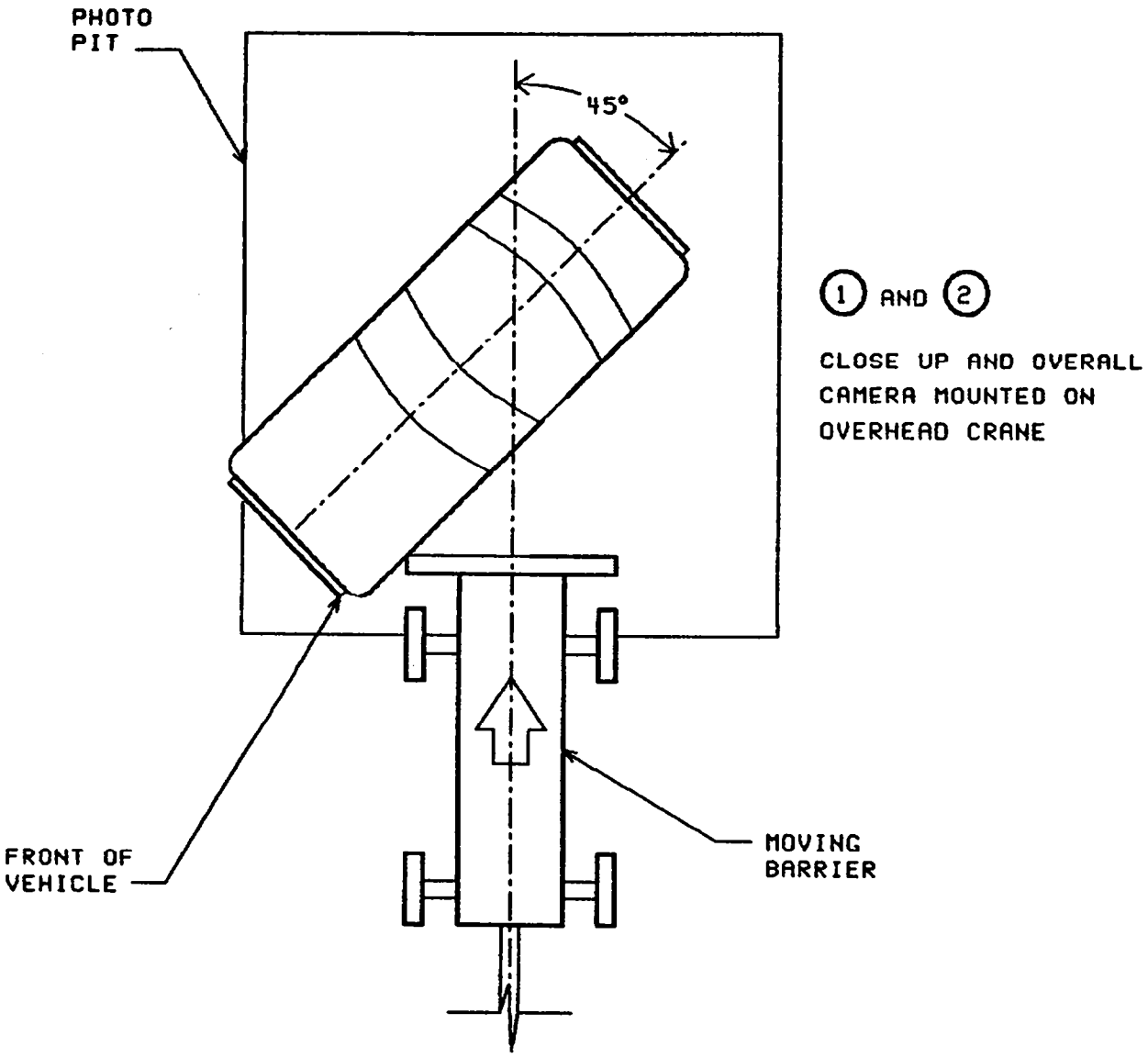


TOP VIEW



SIDE VIEW

CAMERA POSITIONS



① AND ②

CLOSE UP AND OVERALL
CAMERA MOUNTED ON
OVERHEAD CRANE

TEST ANOMALIES

TEST NO.: 900913-2

The vehicle center of gravity Y-axis acceleration (perpendicular to impact direction) data was lost at 103 milliseconds due to the vehicle's crush pinching the accelerometer cable.

The above anomaly affected the vehicle center of gravity resultant acceleration, VCGRG1, vehicle center of gravity Y-axis (perpendicular to impact direction) velocity, VCGYV1, and vehicle center of gravity resultant velocity, VCGRV1.

SECTION 3.0

TEST 900912-1 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900912-1

DATE OF TEST: 9/12/90

TIME OF TEST: 1330

AMBIENT TEMPERATURE AT IMPACT AREA:	72° F
INTENDED MOVING BARRIER VELOCITY:	10.0 MPH
ACTUAL MOVING BARRIER VELOCITY:	9.8 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	20.0
MAXIMUM CUMULATIVE CRUSH AT VEHICLE BUMPER HEIGHT	5.0
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	0.8

VEHICLE ATTITUDES:

POST-TEST: LF: 27.2; RF: 26.8; LR: 26.1; RR: 26.4

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 TEST NUMBER: 900912-1

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	189.0	189.0	0.0
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	176.5	176.5	0.0
X3	REAR SURFACE OF VEHICLE TO FIREWALL	149.0	149.0	0.0
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	125.3	125.0	0.3
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	125.3	125.1	0.2
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	126.7	126.2	0.5
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	126.5	124.9	1.6
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	85.6	85.5	1.1
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	85.6	85.4	0.2
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	86.2	86.2	0.0
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	86.6	86.3	0.3
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	126.0	126.0	0.0
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	126.2	125.5	0.7
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	144.2	144.2	0.0
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	144.2	144.1	0.1
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	114.5	114.0	0.5
X17	CENTER OF STEERING COLUMN TO "A" POST	16.0	16.0	0.0
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.2	18.2	0.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	183.6	183.6	0.0
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	183.8	183.5	0.3
X21	LENGTH OF ENGINE BLOCK	22.5	22.5	0.0

VEHICLE CRUSH

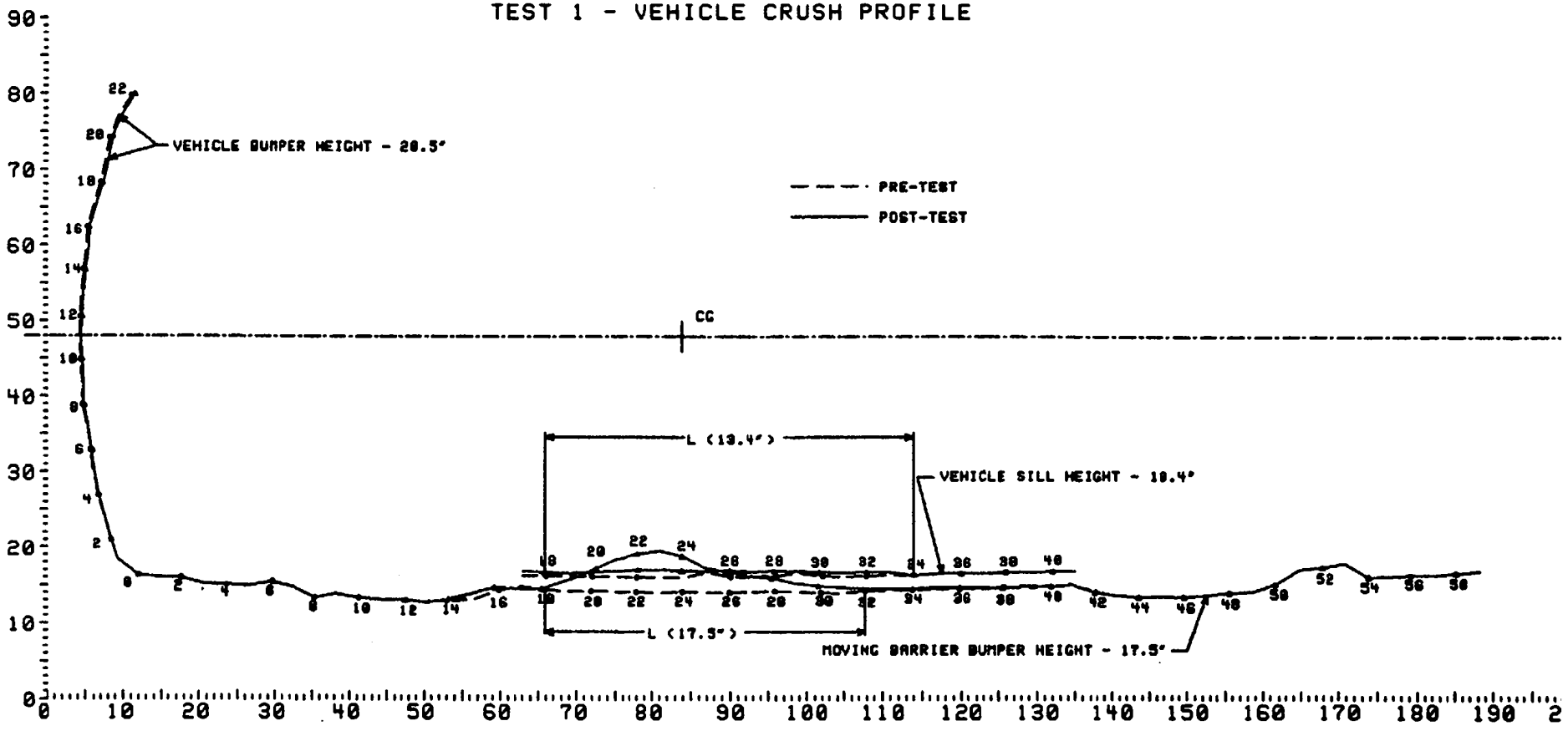
TEST NO. 900912-1

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	41.7	L	47.5
C1	0.0	S1	0.0
C2	0.8	S2	0.4
C3	2.5	S3	0.8
C4	5.0	S4	0.6
C5	3.3	S5	0.4
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface
C1 through C6 and S1 through S6 are spaced equally apart
ALL DISTANCES ARE IN INCHES



NOTE: L INDICATES THE LENGTH OF THE DAMAGED SURFACE

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900912-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
2	RIGHT FRONT SILL	88.0	-25.5	13.0				
	ACCELERATION							
	LONGITUDINAL				0.9	163.0	2.5	13.8
	LATERAL				1.7	23.8	3.7	13.9
	RESULTANT				4.5	13.9		
3	VEHICLE CG	106.5	0.0	15.4				
	ACCELERATION							
	PARALLEL TO IMPACT				1.3	18.8	4.2	13.3
	PERPENDICULAR TO IMPACT				1.5	40.6	2.8	22.6
	RESULTANT				4.5	13.3		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900912-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER	75.2	0.0	12.3				
	CG ACCELERATION							
	LONGITUDINAL				---	--- ×	2.4	97.6
	LATERAL				1.3	45.8	2.0	29.3
	RESULTANT				2.6	72.5		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

× No positive value in the time frame of interest.

TEST #900912-1

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	495	Impact overall
2	Overhead tight	Photosonic 1B	25	500	Impact close-up

SECTION 4.0

TEST 900912-2 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900912-2

DATE OF TEST: 9/12/90

TIME OF TEST: 1500

AMBIENT TEMPERATURE AT IMPACT AREA:	72° F
INTENDED MOVING BARRIER VELOCITY:	20.0 MPH
ACTUAL MOVING BARRIER VELOCITY:	19.7 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	42.4
MAXIMUM CUMULATIVE CRUSH AT VEHICLE BUMPER HEIGHT	12.9
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	2.9

VEHICLE ATTITUDES:

POST-TEST: LF: 27.1; RF: 27.2; LR: 26.1; RR: 25.8

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 TEST NUMBER: 900912-2

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST*	POST-TEST	DIFF
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	189.0	188.0	0.2
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	176.5	177.2	-0.7
X3	REAR SURFACE OF VEHICLE TO FIREWALL	149.0	148.3	0.7
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	125.3	125.0	0.3
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	125.3	123.0	2.3
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	126.7	127.0	-0.3
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	126.5	126.0	0.5
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	85.6	85.2	0.3
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	85.6	84.8	0.8
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	86.2	86.8	-0.6
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	86.6	86.8	-0.2
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	126.0	126.2	-0.2
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	126.2	125.0	1.2
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	144.2	144.8	-0.6
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	144.2	143.0	1.2
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	114.5	110.6	3.9
X17	CENTER OF STEERING COLUMN TO "A" POST	16.0	15.9	0.1
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.2	17.8	0.4
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	183.6	183.5	0.1
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	183.8	182.8	1.0
X21	LENGTH OF ENGINE BLOCK	22.5	22.5	0.0

*PRE-TEST MEASUREMENTS ARE FOR THE UNDEFORMED VEHICLE

VEHICLE CRUSH

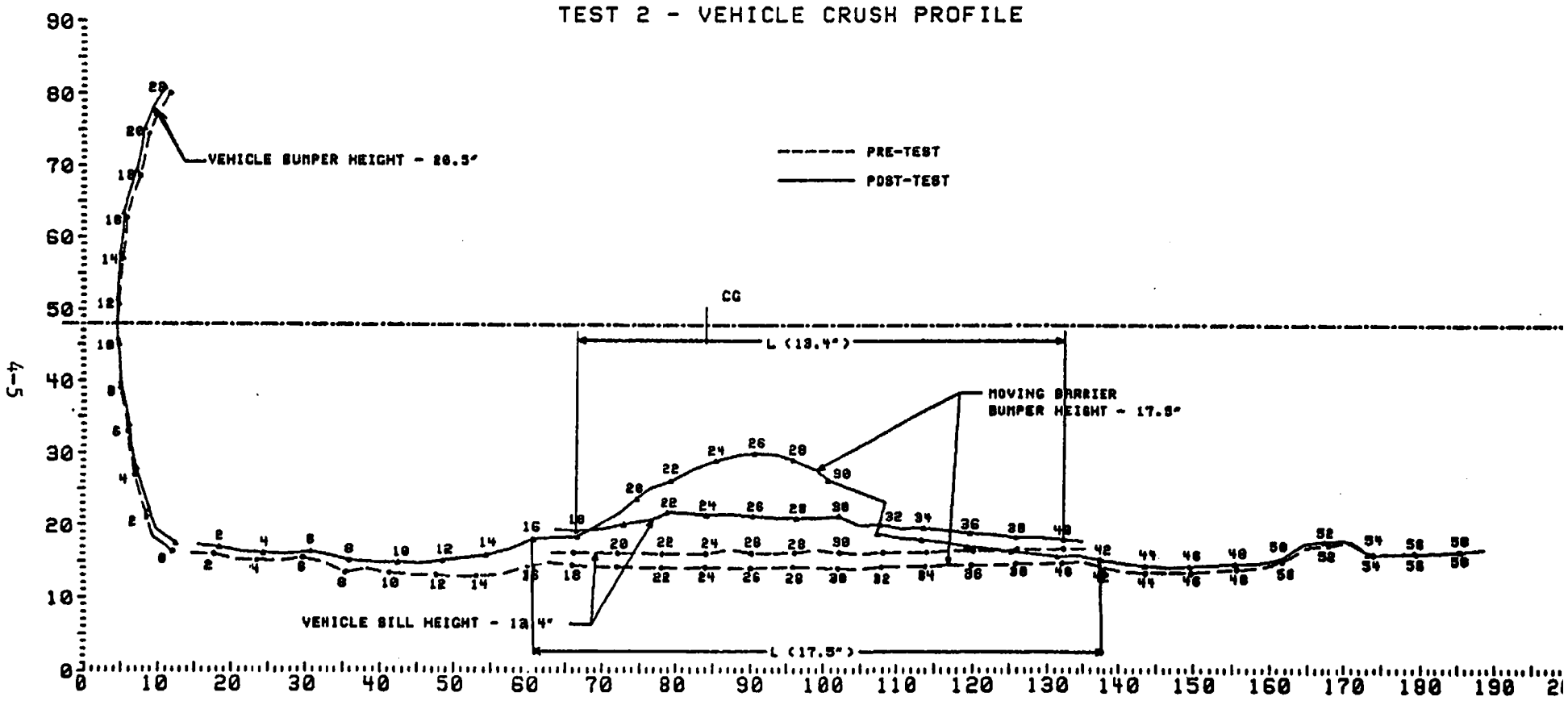
TEST NO. 900912-2

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	75.4	L	65.0
C1	0.0	S1	0.0
C2	0.8	S2	0.8
C3	2.5	S3	1.7
C4	12.9	S4	2.3
C5	7.5	S5	2.9
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface
C1 through C6 and S1 through S6 are spaced equally apart
ALL DISTANCES ARE IN INCHES



NOTE: L INDICATES THE LENGTH OF THE DAMAGED SURFACE

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900912-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
2	RIGHT FRONT SILL	88.0	-25.5	13.0				
	ACCELERATION							
	LONGITUDINAL				1.6	246.8	5.0	88.4
	LATERAL				1.9	40.0	3.7	13.8
	RESULTANT				5.4	88.4		
3	VEHICLE CG	106.5	0.0	15.4				
	ACCELERATION							
	PARALLEL TO IMPACT				5.4	106.8	7.4	87.5
	PERPENDICULAR TO IMPACT				6.8	106.5	5.2	22.4
	RESULTANT				8.6	106.6		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900912-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER CG ACCELERATION	75.2	0.0	12.3				
	LONGITUDINAL				0.4	281.9	4.6	85.8
	LATERAL				1.3	171.5	2.9	23.8
	RESULTANT				4.7	85.6		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900912-2

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	500	Impact close-up

SECTION 5.0

TEST 900913-1 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900913-1

DATE OF TEST: 9/13/90

TIME OF TEST: 1431

AMBIENT TEMPERATURE AT IMPACT AREA: 72° F

INTENDED MOVING BARRIER VELOCITY: 20.0 MPH

ACTUAL MOVING BARRIER VELOCITY: 19.9 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH 44.0

MAXIMUM CUMULATIVE CRUSH AT VEHICLE BUMPER HEIGHT 20.2

MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT 5.2

VEHICLE ATTITUDES:

POST-TEST: LF: 27.9; RF: 27.4; LR: 26.4; RR: 25.9

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 TEST NUMBER: 900913-1

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST*	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	189.0	186.6	2.4
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	176.5	NA	NA
X3	REAR SURFACE OF VEHICLE TO FIREWALL	149.0	NA	NA
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	125.3	125.2	0.1
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	125.3	117.0	8.3
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	126.7	126.5	0.2
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	126.5	111.0	15.5
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	85.6	85.4	0.2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	85.6	80.2	5.4
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	86.2	86.4	-0.2
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	86.6	81.2	5.4
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	126.0	126.0	0.0
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	126.2	121.2	5.0
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	144.2	NA	NA
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	144.2	NA	NA
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	114.5	110.8	3.7
X17	CENTER OF STEERING COLUMN TO "A" POST	16.0	16.8	-0.8
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.2	18.2	0.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	183.6	183.9	-0.3
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	183.8	179.5	4.3
X21	LENGTH OF ENGINE BLOCK	22.5	22.5	0.0

*PRE-TEST MEASUREMENTS ARE FOR THE UNDEFORMED VEHICLE

VEHICLE CRUSH

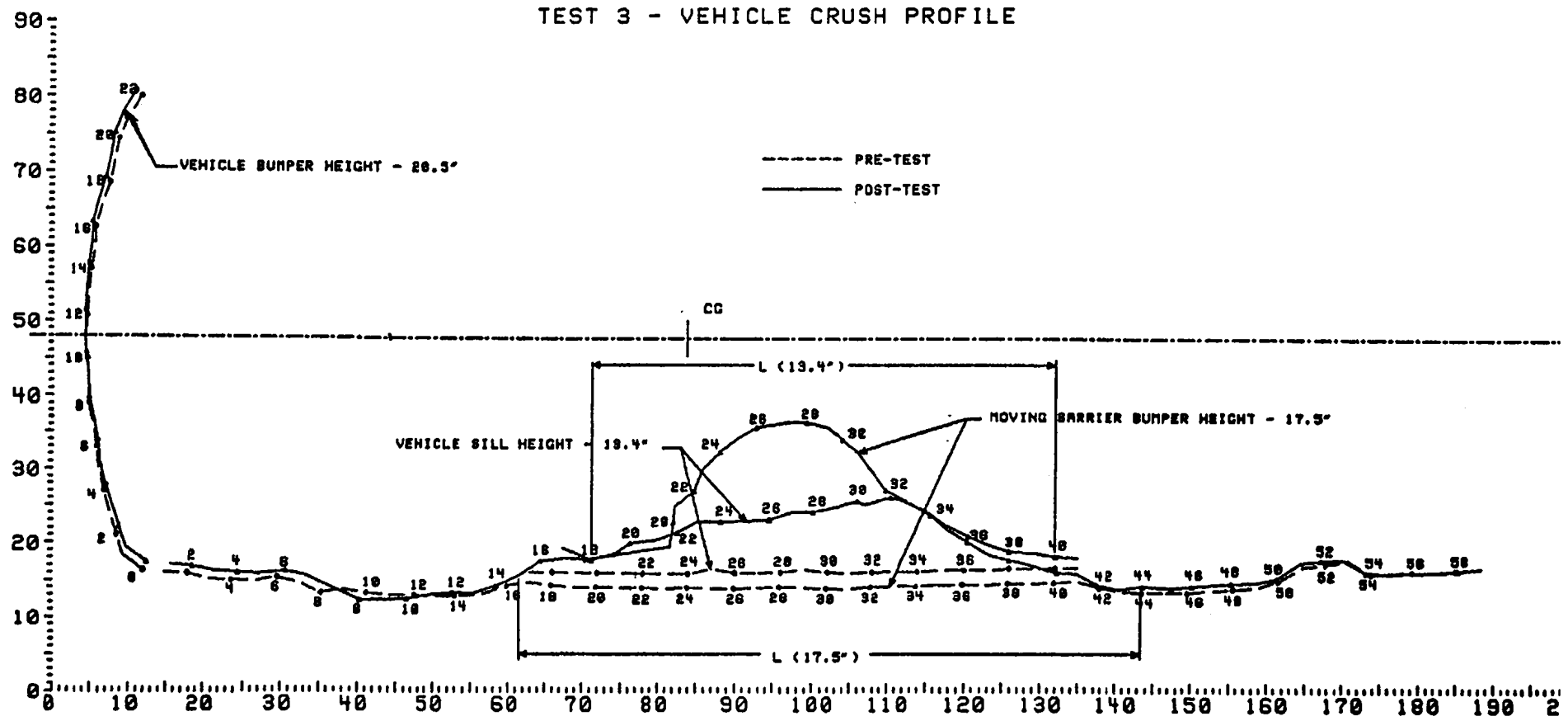
TEST NO. 900913-1

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	80.8	L	60.4
C1	0.0	S1	0.0
C2	3.1	S2	3.3
C3	12.1	S3	5.2
C4	20.2	S4	3.3
C5	3.3	S5	2.3
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface
C1 through C6 and S1 through S6 are spaced equally apart
ALL DISTANCES ARE IN INCHES



NOTE: L INDICATES THE LENGTH OF THE DAMAGED SURFACE

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900913-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
2	RIGHT FRONT SILL	88.0	-25.5	13.0				
	ACCELERATION							
	LONGITUDINAL				2.4	55.3	5.8	8.9
	LATERAL				1.0	129.9	3.5	33.4
	RESULTANT				5.8	8.9		
3	VEHICLE CG	106.5	0.0	15.4				
	ACCELERATION							
	PARALLEL TO IMPACT				5.7	16.1	16.0	2.9
	PERPENDICULAR TO IMPACT				5.6	16.8	11.0	3.0
	RESULTANT				19.4	2.9		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900913-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER	75.2	0.0	12.3				
	CG ACCELERATION							
	LONGITUDINAL				1.0	210.0	4.5	3.4
	LATERAL				1.8	260.6	1.0	0.0
	RESULTANT				4.5	3.5		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900913-1

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	498	Impact close-up

SECTION 6.0

TEST 900913-2 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900913-2

DATE OF TEST: 9/13/90

TIME OF TEST: 1601

AMBIENT TEMPERATURE AT IMPACT AREA:	72° F
INTENDED MOVING BARRIER VELOCITY:	45.0 MPH
ACTUAL MOVING BARRIER VELOCITY:	45.0 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	76.0
MAXIMUM CUMULATIVE CRUSH AT VEHICLE BUMPER HEIGHT	35.8
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	12.1

VEHICLE ATTITUDES:

POST-TEST: LF: 26.7; RF: 27.6; LR: 25.6; RR: 25.5

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 TEST NUMBER: 900913-2

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST*	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	189.0	183.4	5.6
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	176.5	171.4	5.1
X3	REAR SURFACE OF VEHICLE TO FIREWALL	149.0	143.2	5.8
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	125.3	125.9	-0.6
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	125.3	92.5	32.8
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	126.7	127.8	-1.1
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	126.5	84.2	42.3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	85.6	86.2	-0.6
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	85.6	70.9	14.7
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	86.2	87.0	-0.8
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	86.6	80.0	6.6
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	126.0	126.5	-0.5
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	126.2	115.5	10.7
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	144.2	145.5	-1.3
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	144.2	131.9	12.3
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	114.5	106.0	8.5
X17	CENTER OF STEERING COLUMN TO "A" POST	16.0	13.5	2.5
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.2	19.2	-1.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	183.6	185.0	-1.4
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	183.8	171.0	12.8
X21	LENGTH OF ENGINE BLOCK	22.5	22.5	0.0

*PRE-TEST MEASUREMENTS ARE FOR THE UNDEFORMED VEHICLE

VEHICLE CRUSH

TEST NO. 900913-2

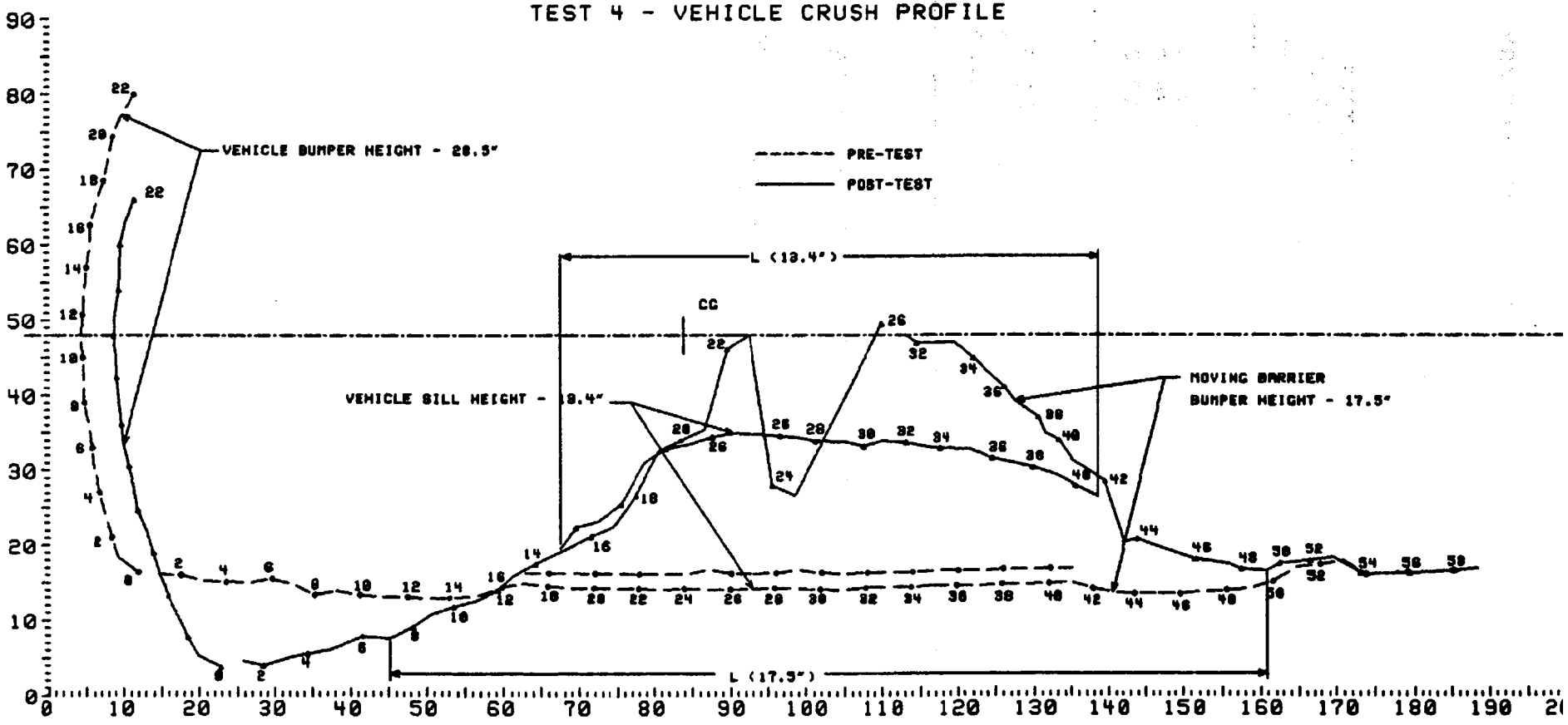
AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	114.2	L	70.0
C1	0.0	S1	0.0
C2	17.5	S2	6.7
C3	35.8	S3	9.8
C4	27.9	S4	12.1
C5	9.2	S5	11.2
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface
C1 through C6 and S1 through S6 are spaced equally apart
ALL DISTANCES ARE IN INCHES

TEST 4 - VEHICLE CRUSH PROFILE



NOTE: L INDICATES THE LENGTH OF THE DAMAGED SURFACE

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900913-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
2	RIGHT FRONT SILL	88.0	-25.5	13.0				
	ACCELERATION							
	LONGITUDINAL				2.5	156.6	11.9	13.3
	LATERAL				2.9	34.8	10.9	90.5
	RESULTANT				13.2	13.0		
3	VEHICLE CG	106.5	0.0	15.4				
	ACCELERATION							
	PARALLEL TO IMPACT				16.1	81.3	25.9	57.9
	PERPENDICULAR TO IMPACT				---	---Y	---	---Y
	RESULTANT				---	---Y		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

Y See TEST ANOMALIES

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900913-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER	75.2	0.0	12.3				
	CG ACCELERATION							
	LONGITUDINAL				8.7	237.5	13.6	83.4
	LATERAL				22.5	12.8	5.9	65.1
	RESULTANT				22.9	12.5		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHILCE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900913-2

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	498	Impact close-up

APPENDIX A

PHOTOGRAPHS

TEST #900912-1

LIST OF PHOTOGRAPHS

1 PRE-TEST FRONT VIEW

2. POST-TEST FRONT VIEW

3. PRE-TEST LEFT SIDE VIEW

4. POST-TEST LEFT SIDE VIEW

5. POST-TEST LEFT SIDE CLOSEUP - VIEW 1

6. POST-TEST LEFT SIDE CLOSEUP - VIEW 2

7. PRE-TEST RIGHT SIDE VIEW

8. POST-TEST RIGHT SIDE VIEW

9. PRE-TEST LEFT REAR THREE-QUARTER VIEW

10. POST-TEST LEFT REAR THREE-QUARTER VIEW

11. PRE-TEST LEFT FRONT THREE-QUARTER - VIEW 1

12. PRE-TEST LEFT FRONT THREE-QUARTER - VIEW 2

13. POST-TEST LEFT FRONT THREE-QUARTER VIEW

14. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

15. PRE-TEST REAR VIEW

16. POST-TEST REAR VIEW

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. POST-TEST LEFT SIDE CLOSEUP - VIEW 1

Figure A-6. POST-TEST LEFT SIDE CLOSEUP - VIEW 2

Figure A-7. PRE-TEST RIGHT SIDE VIEW

Figure A-8. POST-TEST RIGHT SIDE VIEW

Figure A-9. PRE-TEST LEFT REAR THREE-QUARTER VIEW

Figure A-10. POST-TEST LEFT REAR THREE-QUARTER VIEW

Figure A-11. PRE-TEST LEFT FRONT THREE-QUARTER - VIEW 1

Figure A-12. PRE-TEST LEFT FRONT THREE-QUARTER - VIEW 2

Figure A-13. POST-TEST LEFT FRONT THREE-QUARTER VIEW

Figure A-14. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-15. PRE-TEST REAR VIEW

Figure A-16. POST-TEST REAR VIEW

TEST #900912-2

LIST OF PHOTOGRAPHS

1. POST-TEST FRONT VIEW
2. POST-TEST LEFT SIDE VIEW
3. POST-TEST LEFT SIDE CLOSEUP - VIEW 1
4. POST-TEST LEFT SIDE CLOSEUP - VIEW 2
5. POST-TEST RIGHT SIDE VIEW
6. POST-TEST LEFT REAR THREE-QUARTER VIEW
7. POST-TEST LEFT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. POST-TEST REAR VIEW

Figure A-1. POST-TEST FRONT VIEW

Figure A-2. POST-TEST LEFT SIDE VIEW

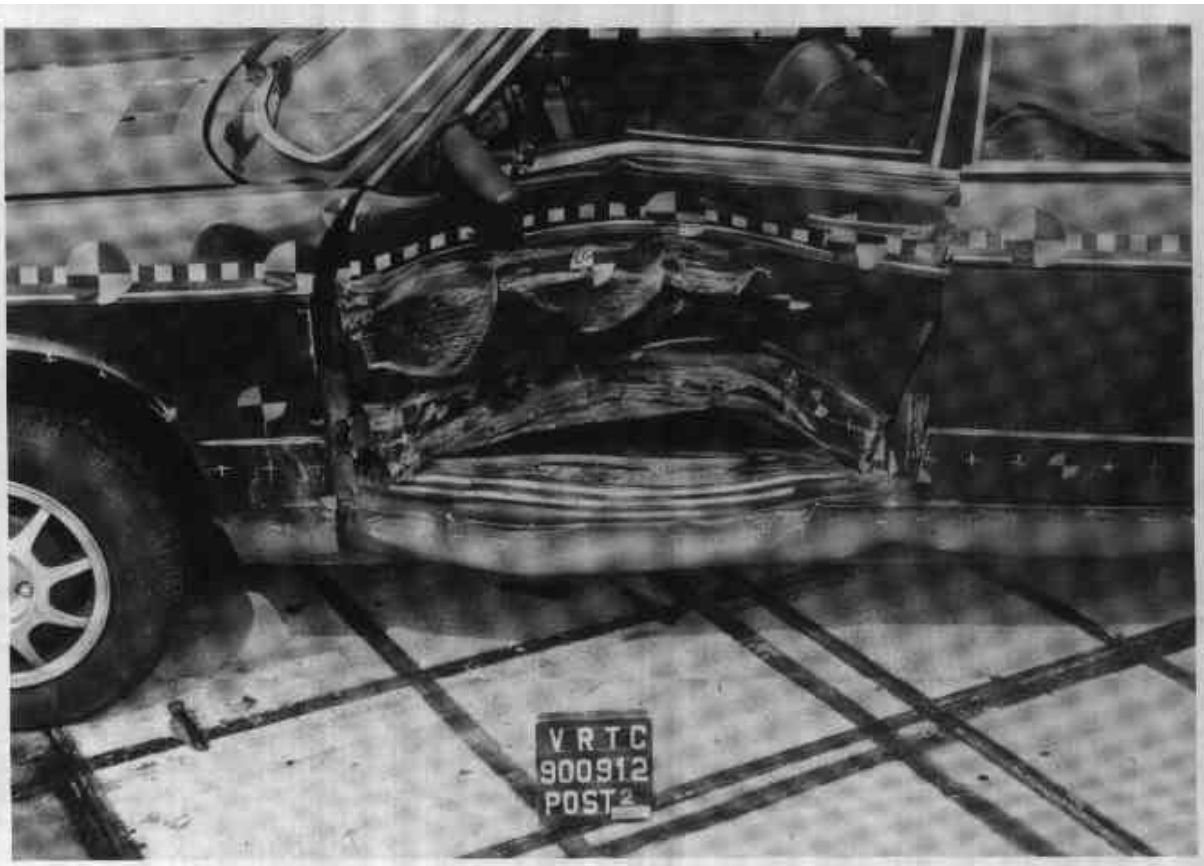


Figure A-3. POST-TEST LEFT SIDE CLOSEUP - VIEW 1

Figure A-4. POST-TEST LEFT SIDE CLOSEUP - VIEW 2

Figure A-5. POST-TEST RIGHT SIDE VIEW

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

Figure A-7. POST-TEST LEFT FRONT THREE-QUARTER VIEW

Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-9. POST-TEST REAR VIEW

TEST #900913-1

LIST OF PHOTOGRAPHS

1 POST-TEST FRONT VIEW

2. POST-TEST LEFT SIDE VIEW

3. POST-TEST LEFT SIDE CLOSEUP - VIEW 1

4. POST-TEST LEFT SIDE CLOSEUP - VIEW 2

5. POST-TEST RIGHT SIDE VIEW

6. POST-TEST LEFT REAR THREE-QUARTER VIEW

7. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

8. POST-TEST LEFT FRONT THREE-QUARTER VIEW

9. POST-TEST REAR VIEW

Figure A-1. POST-TEST FRONT VIEW

Figure A-2. POST-TEST LEFT SIDE VIEW

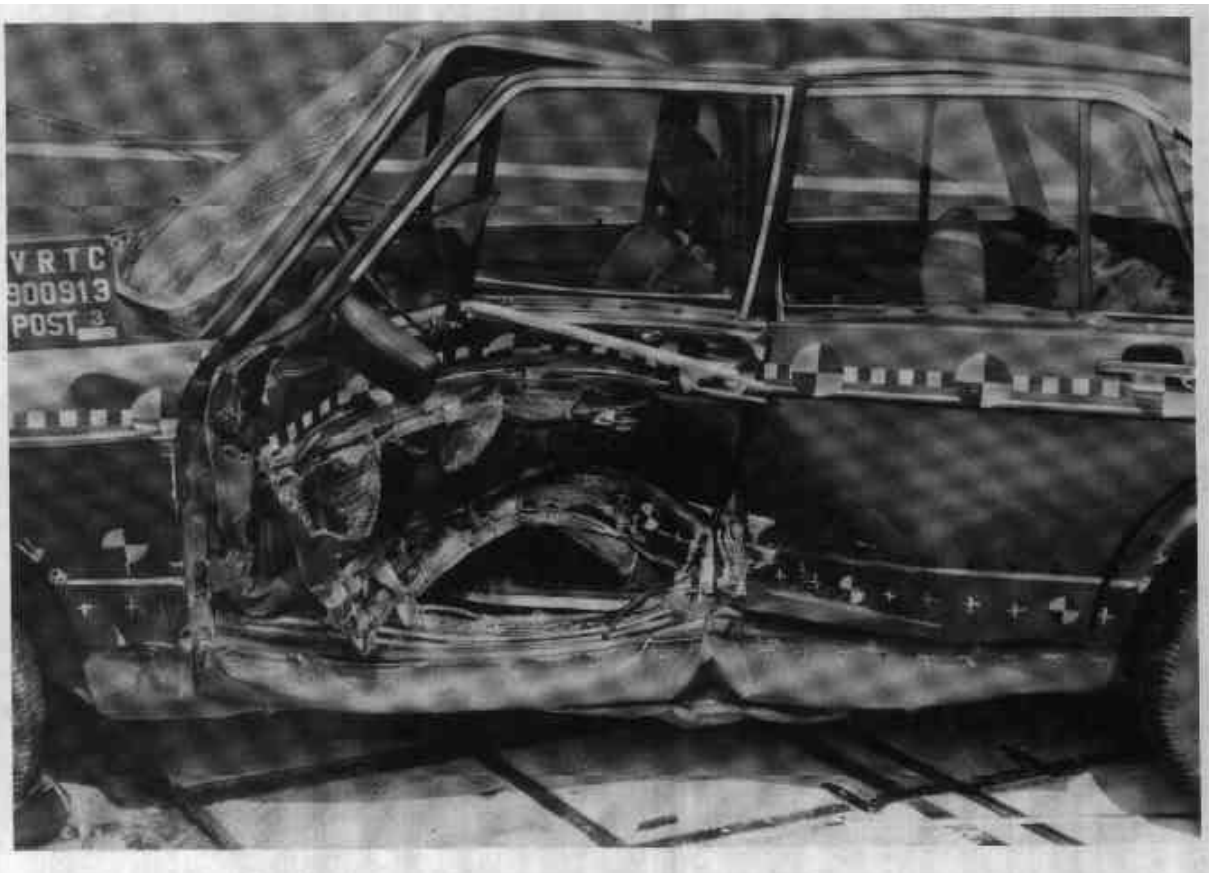


Figure A-3. POST-TEST LEFT SIDE CLOSEUP - VIEW 1

Figure A-4. POST-TEST LEFT SIDE CLOSEUP - VIEW 2

Figure A-5. POST-TEST RIGHT SIDE VIEW

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

Figure A-7. POST-TEST LEFT FRONT THREE-QUARTER VIEW

Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure A-9. POST-TEST REAR VIEW

TEST #900913-2

LIST OF PHOTOGRAPHS

1. POST-TEST FRONT VIEW
2. PRE-TEST LEFT SIDE VIEW
3. POST-TEST LEFT SIDE CLOSEUP - VIEW 1
4. POST-TEST LEFT SIDE CLOSEUP - VIEW 2
5. POST-TEST RIGHT SIDE VIEW
6. POST-TEST LEFT REAR THREE-QUARTER VIEW
7. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST LEFT FRONT THREE-QUARTER VIEW
9. POST-TEST REAR VIEW

Figure A-1. POST-TEST FRONT VIEW

Figure A-2. POST-TEST LEFT SIDE VIEW

Figure A-3. POST-TEST LEFT SIDE CLOSEUP - VIEW 1

Figure A-4. POST-TEST LEFT SIDE CLOSEUP - VIEW 2

Figure A-5. POST-TEST RIGHT SIDE VIEW

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

Figure A-7. POST-TEST LEFT FRONT THREE-QUARTER VIEW

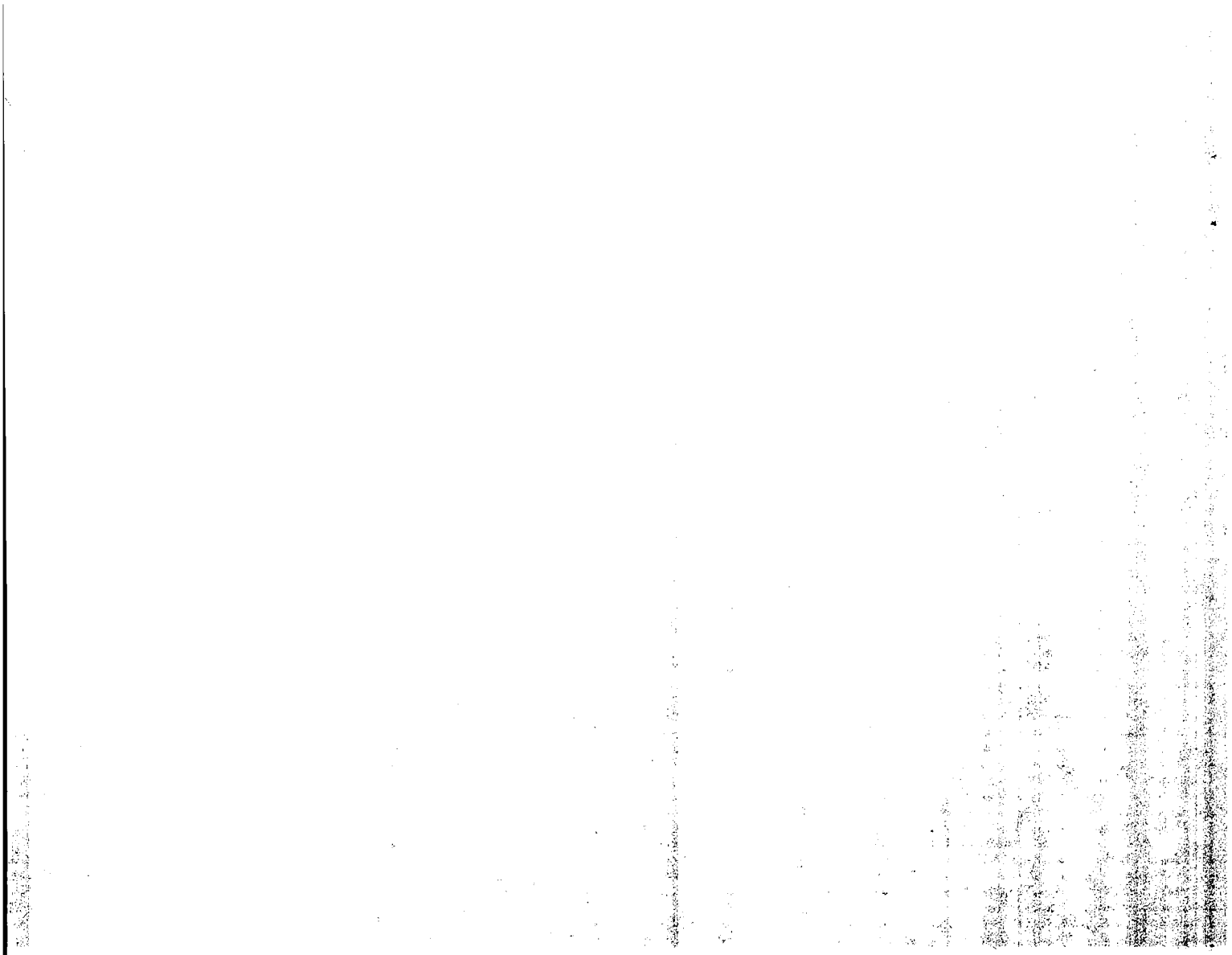
Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

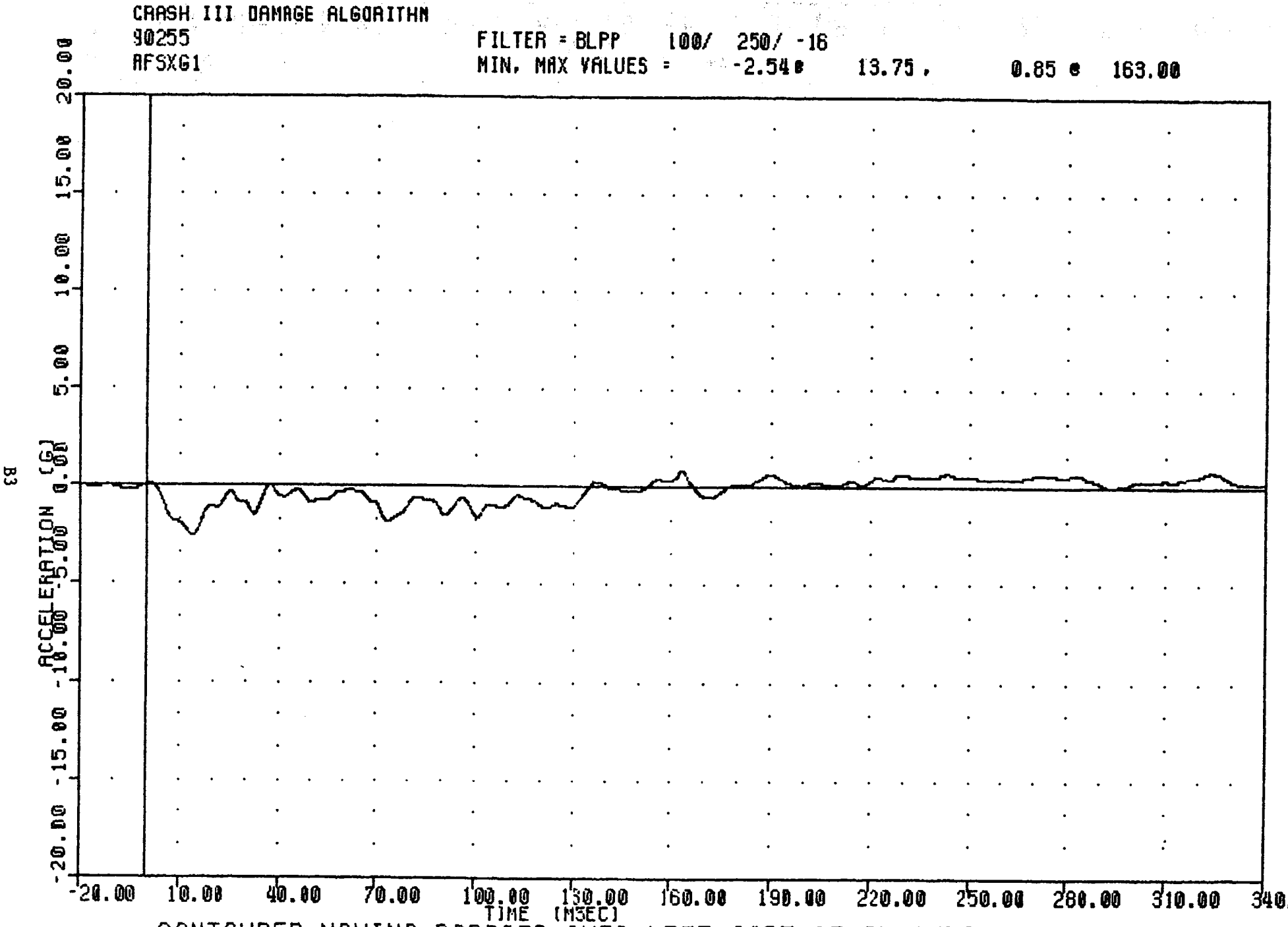
Figure A-9. POST-TEST REAR VIEW

APPENDIX B

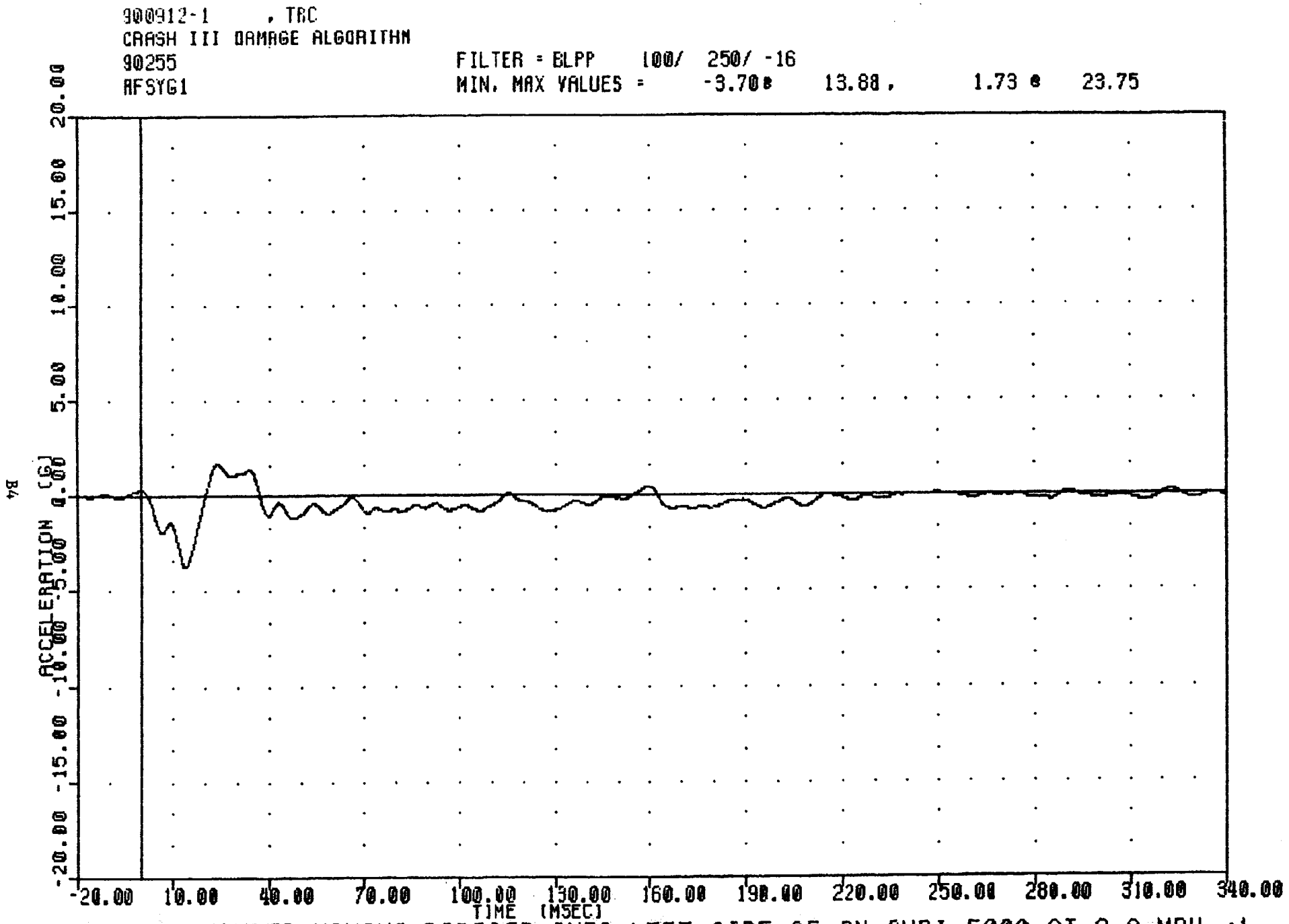
DATA PLOTS

TEST #900912-1

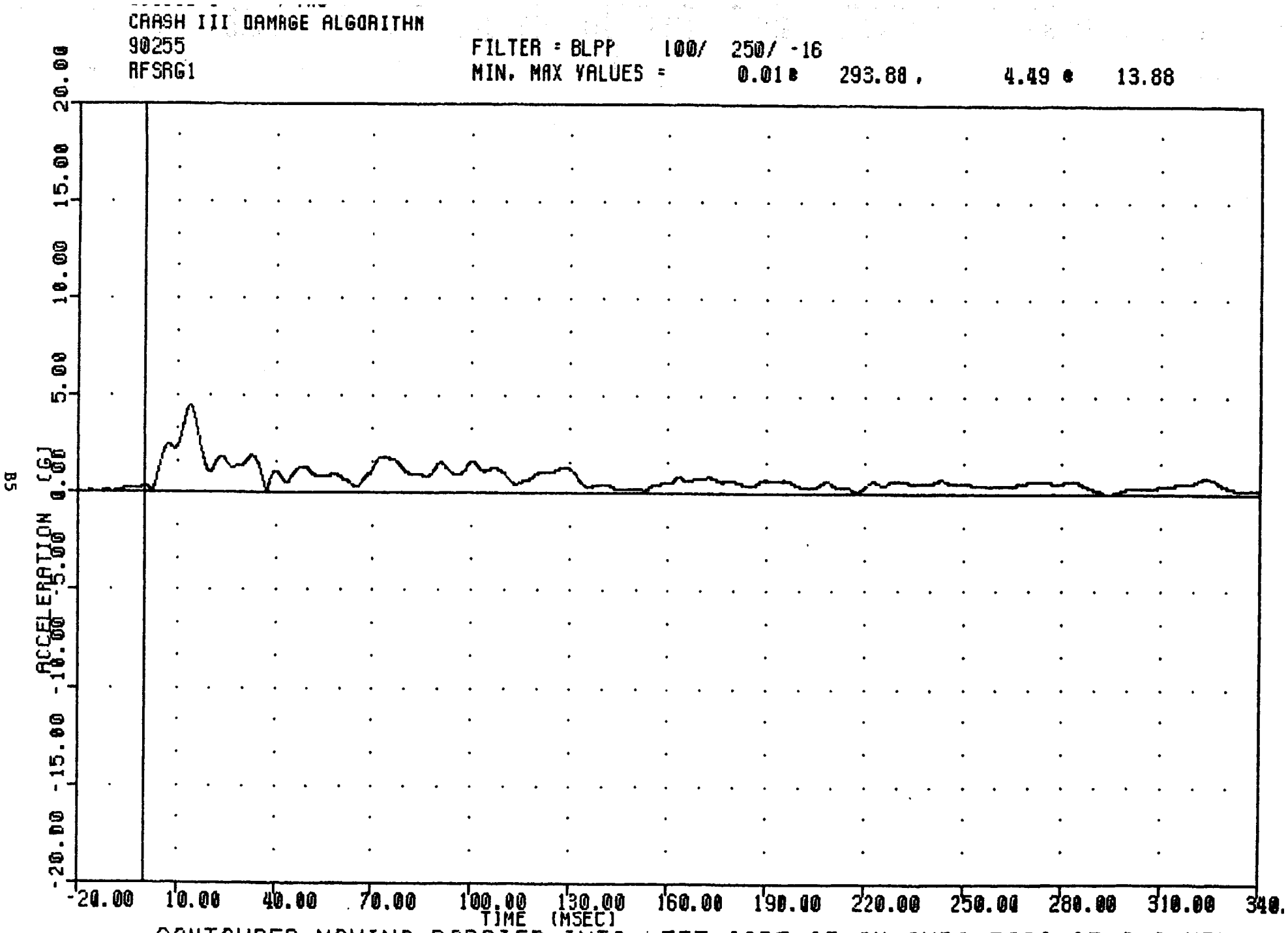




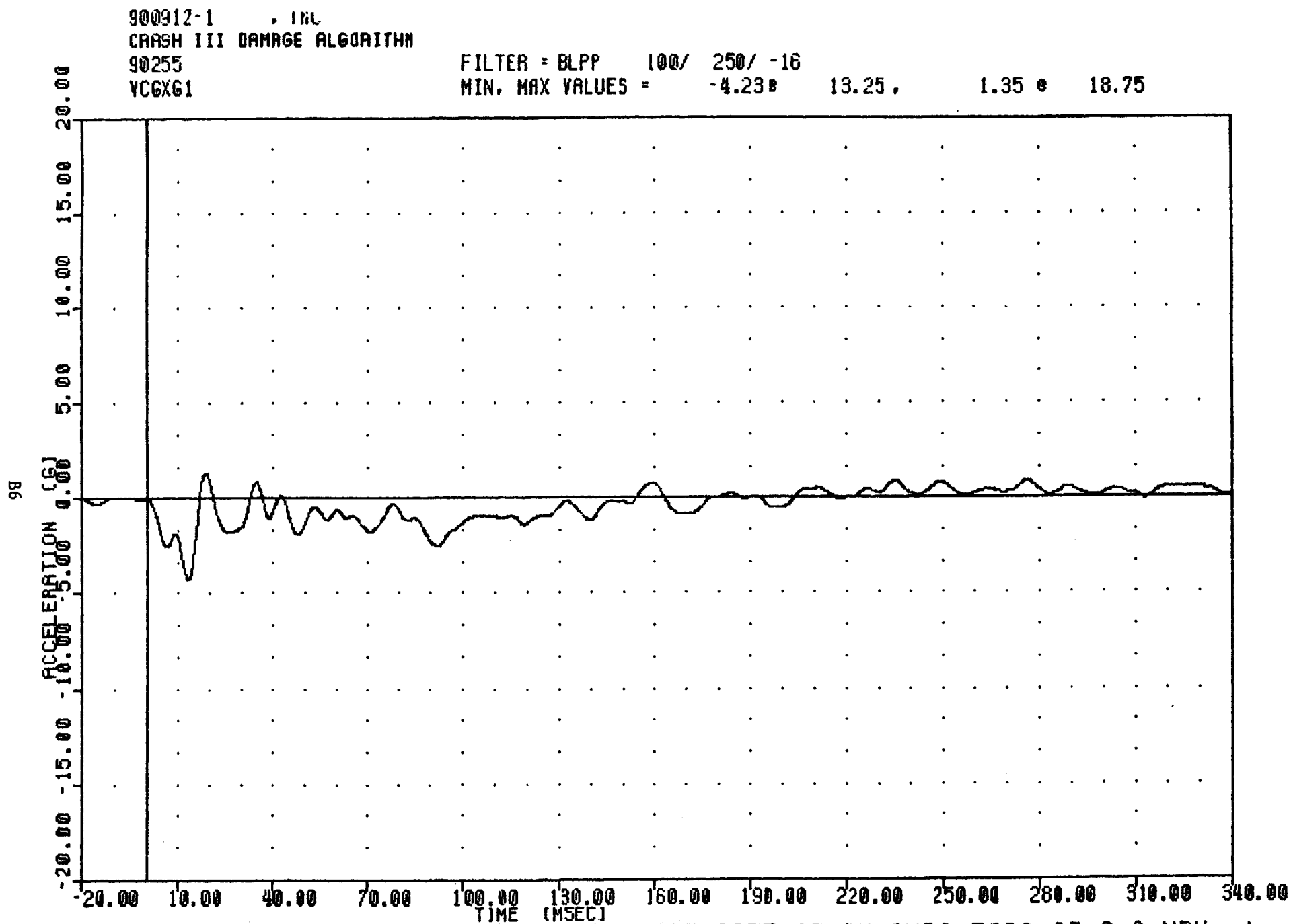
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
RIGHT FRONT SILL X-AXIS ACCELERATION



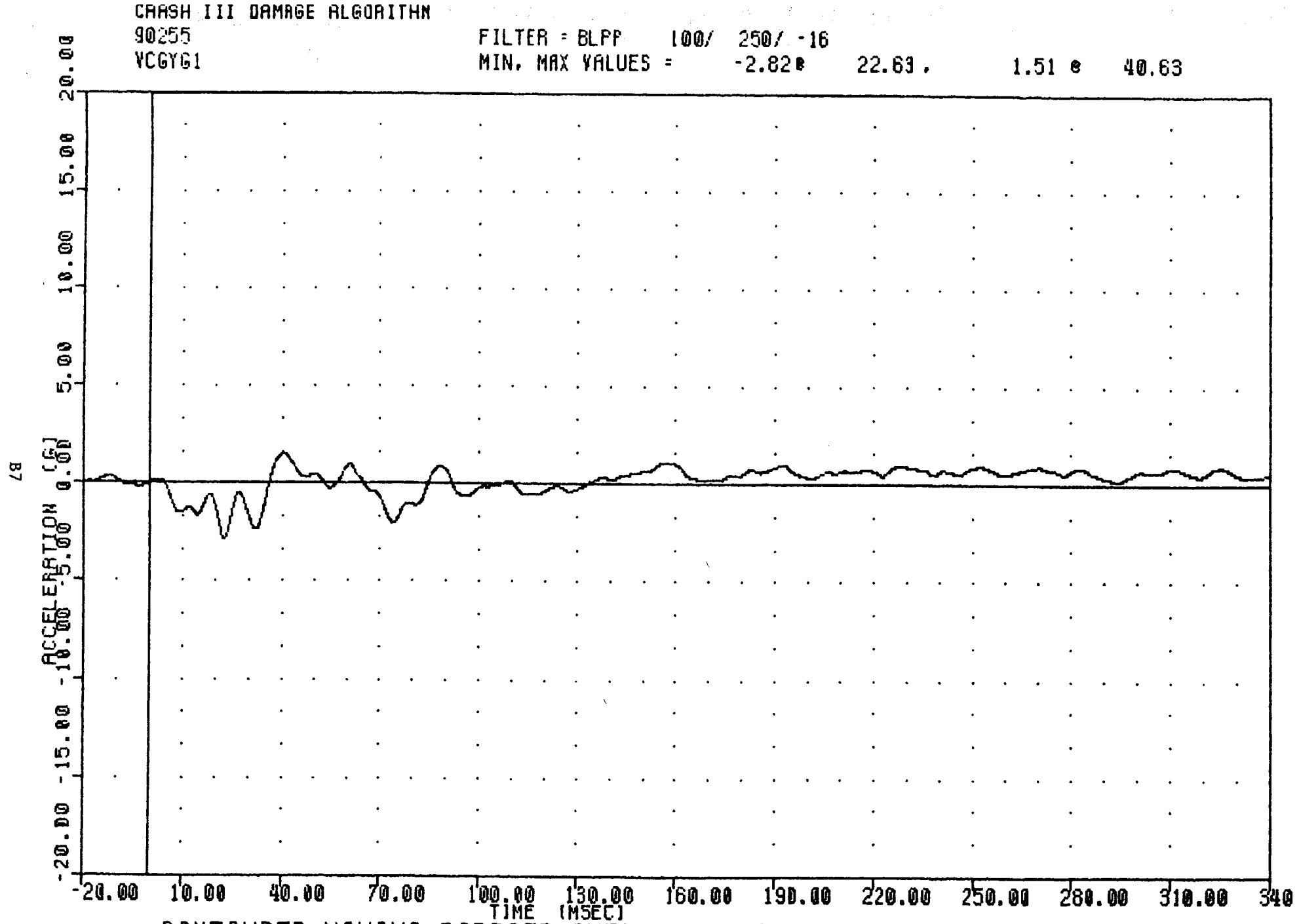
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
RIGHT FRONT SILL Y-AXIS ACCELERATION



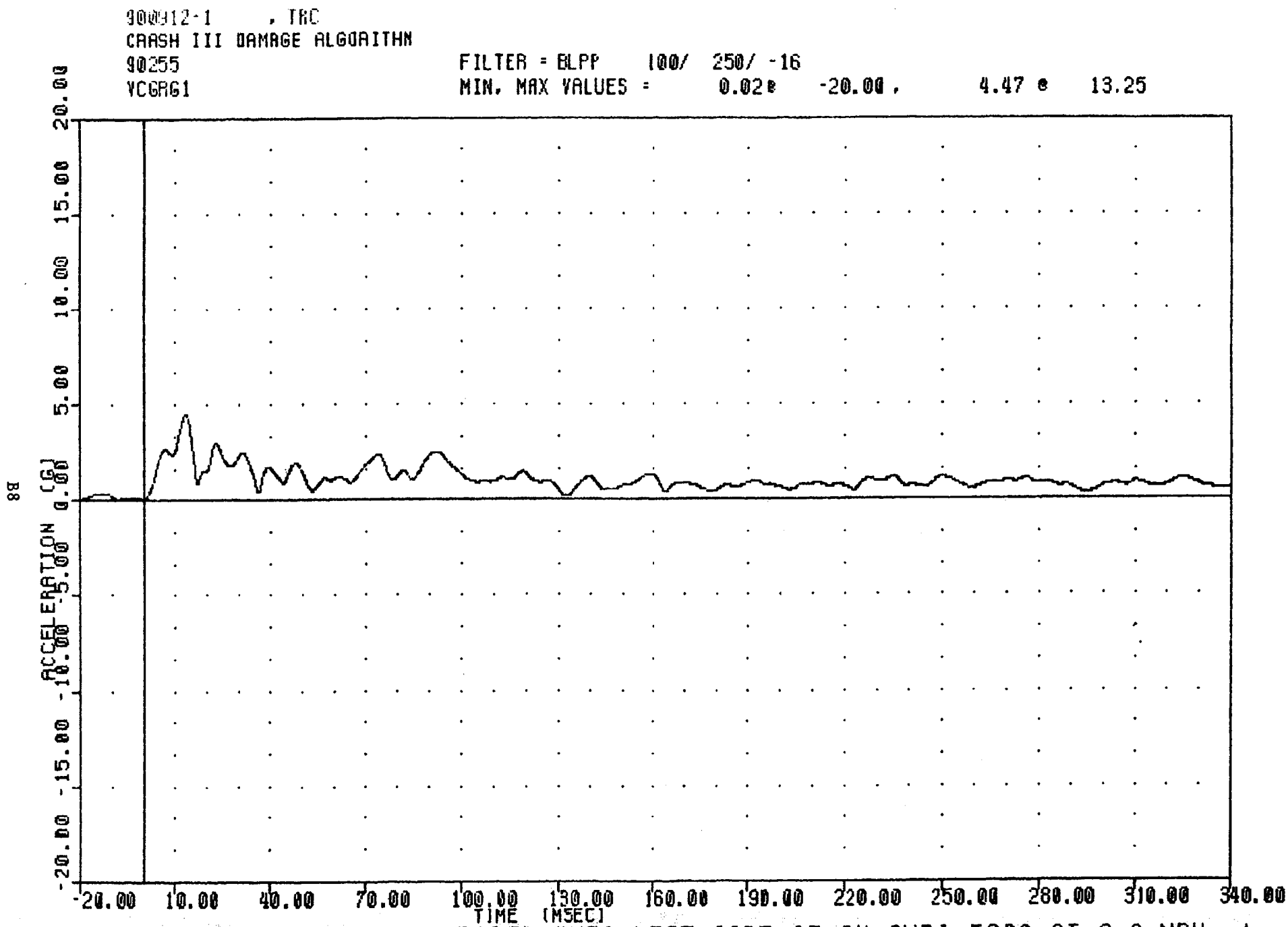
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
RIGHT FRONT SILL RESULTANT ACCELERATION



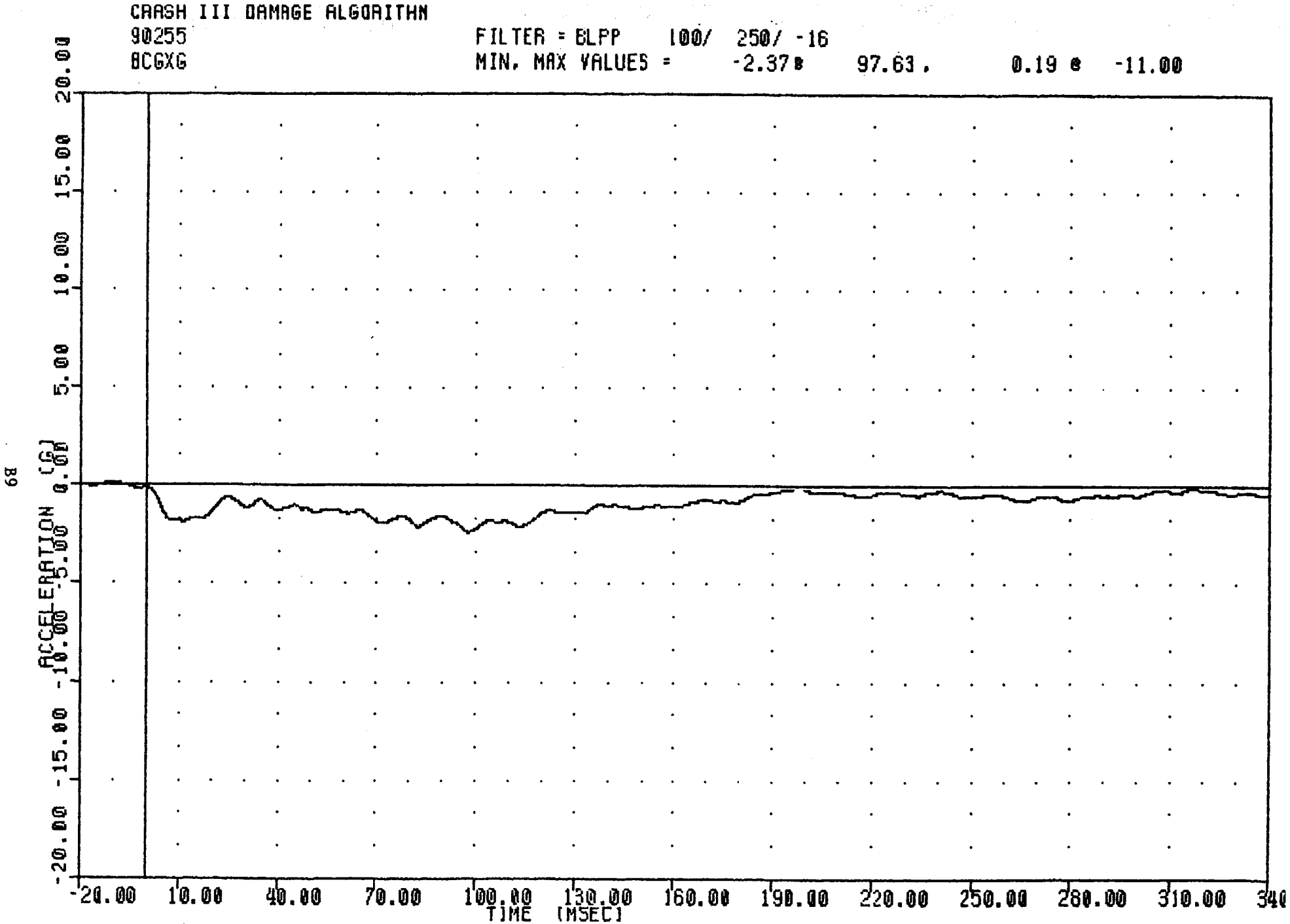
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
VEHICLE CG X-AXIS ACCELERATION (IMPACT DIRECTION)



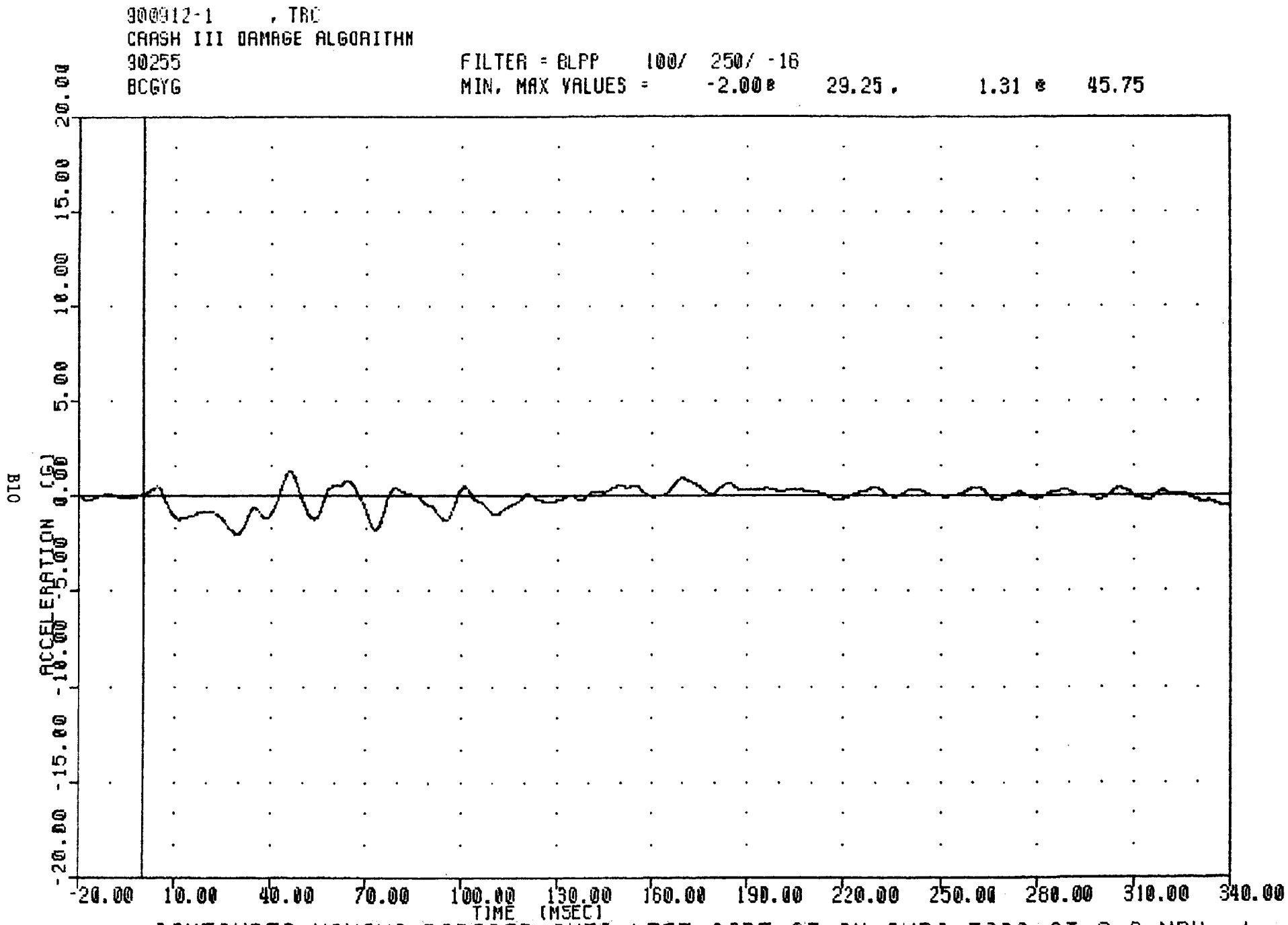
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
VEHICLE CG Y-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)



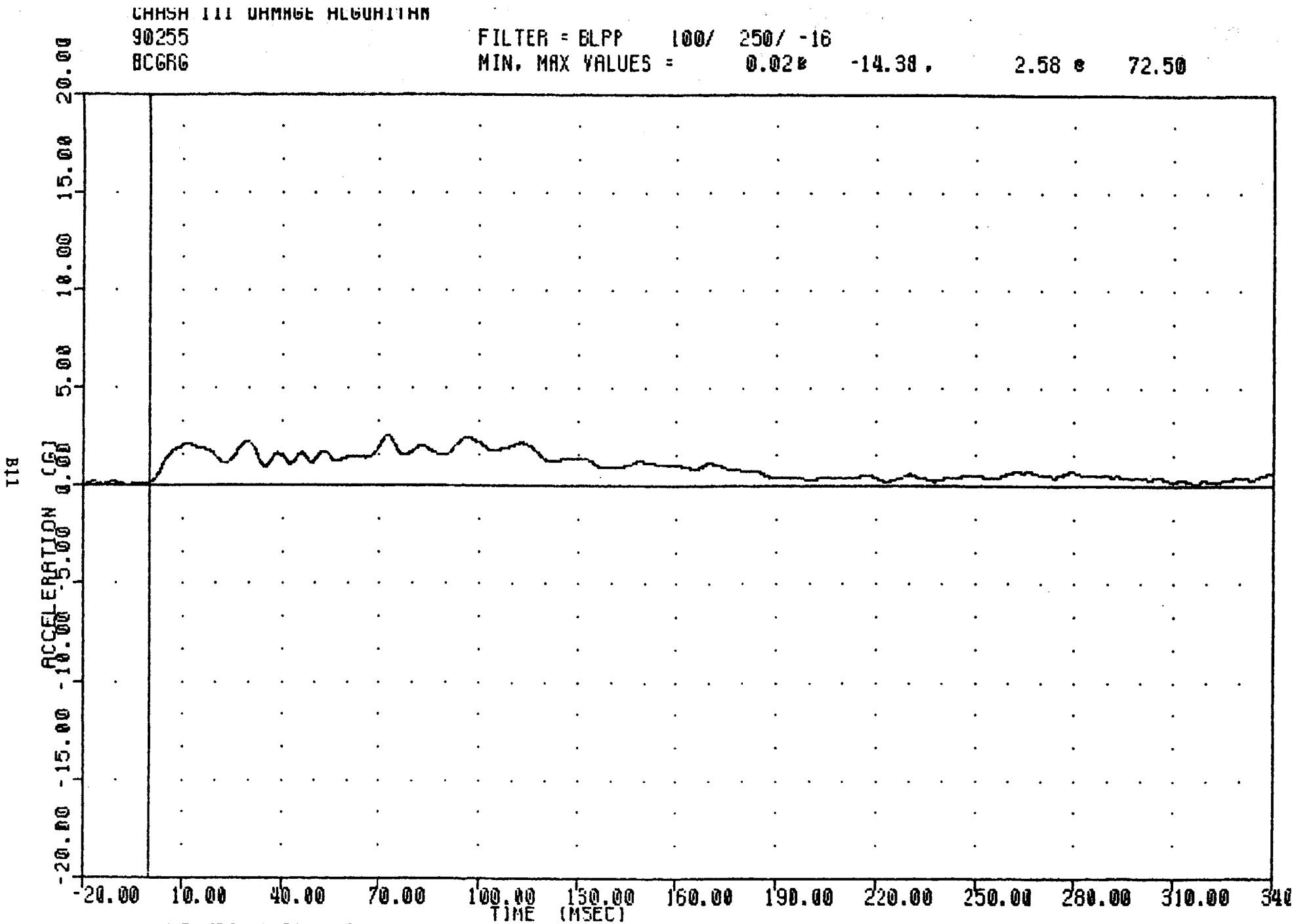
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
VEHICLE CG RESULTANT ACCELERATION



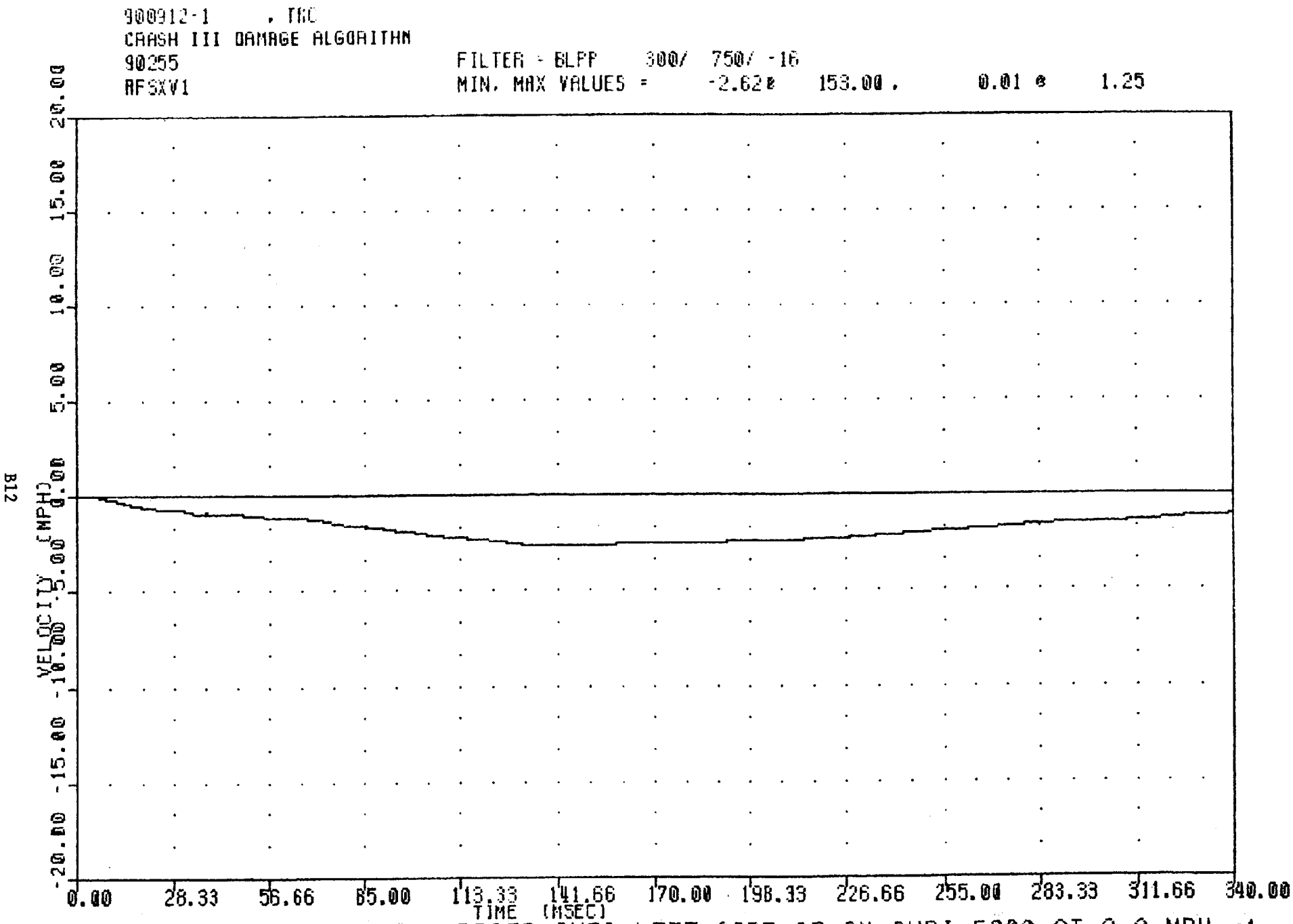
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION



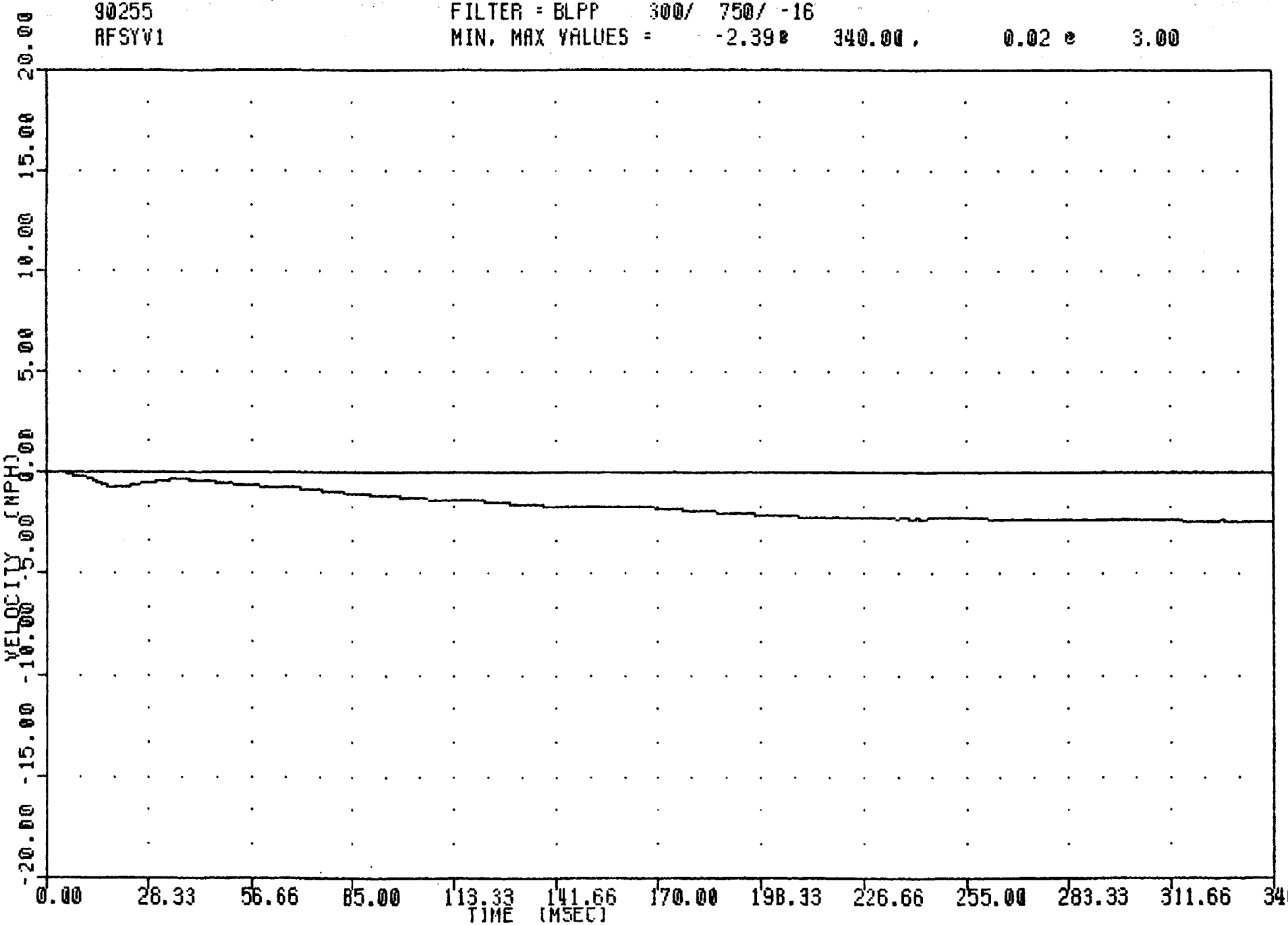
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION



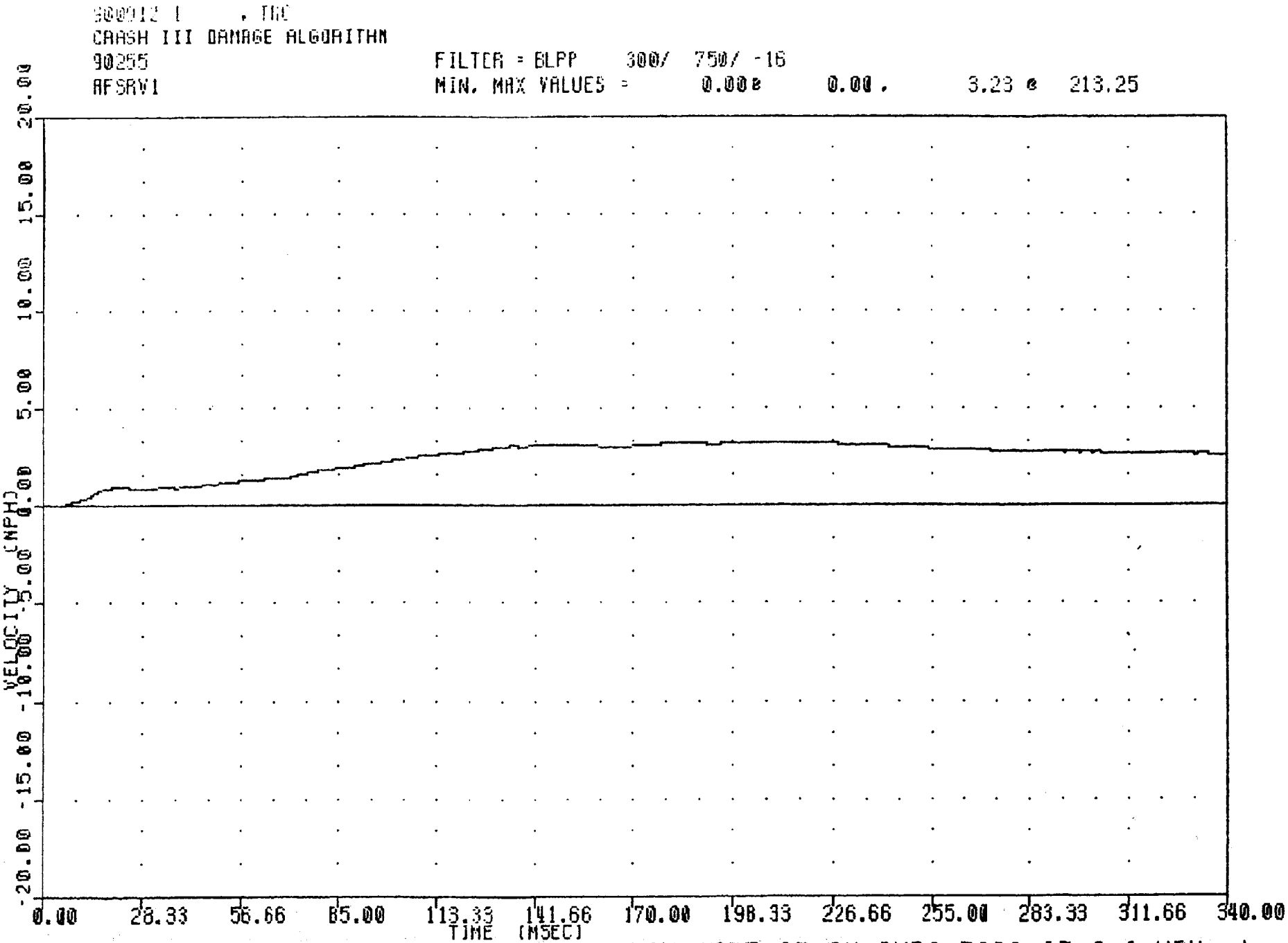
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH *1
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION



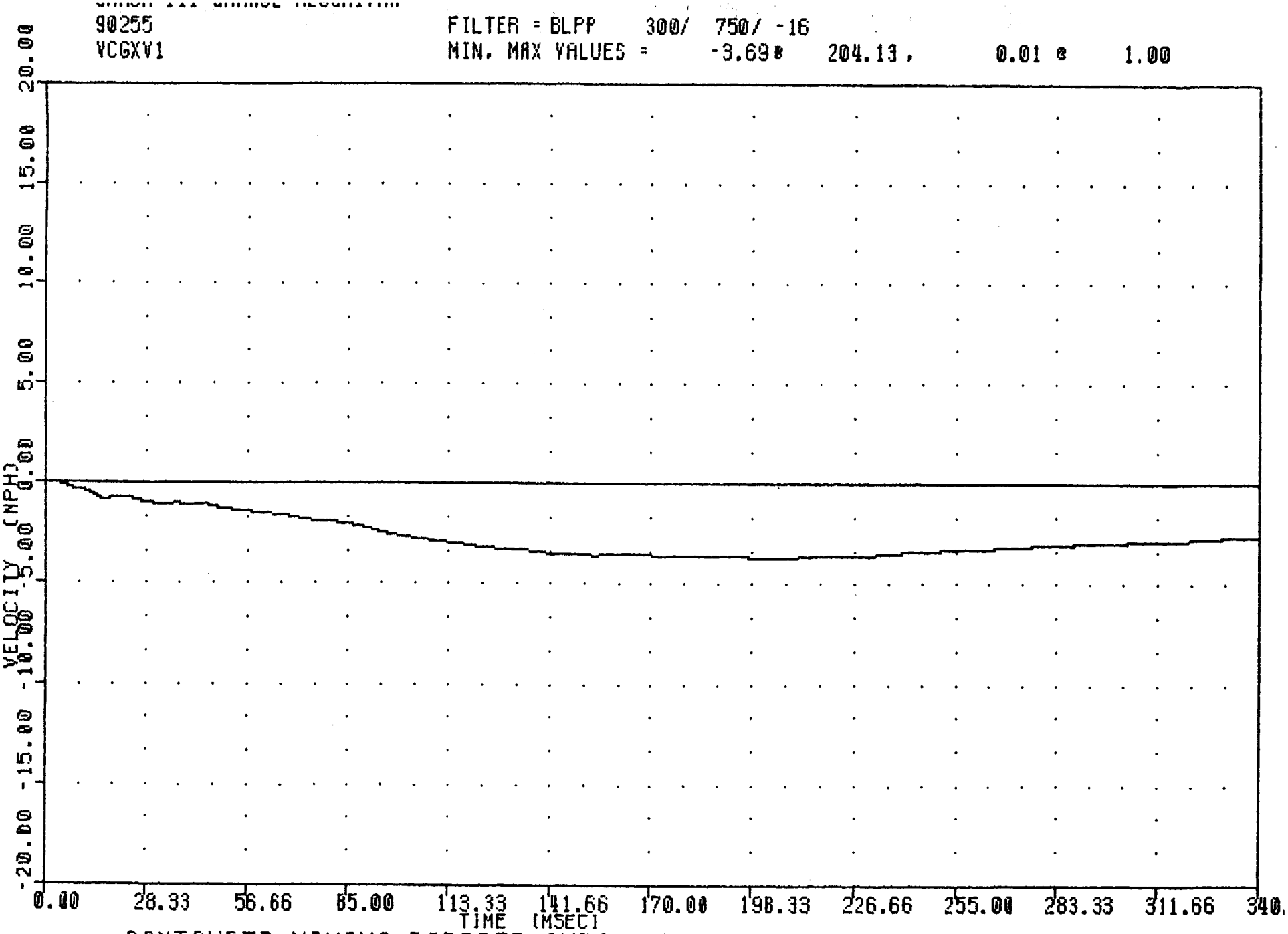
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
RIGHT FRONT SILL X-AXIS VELOCITY



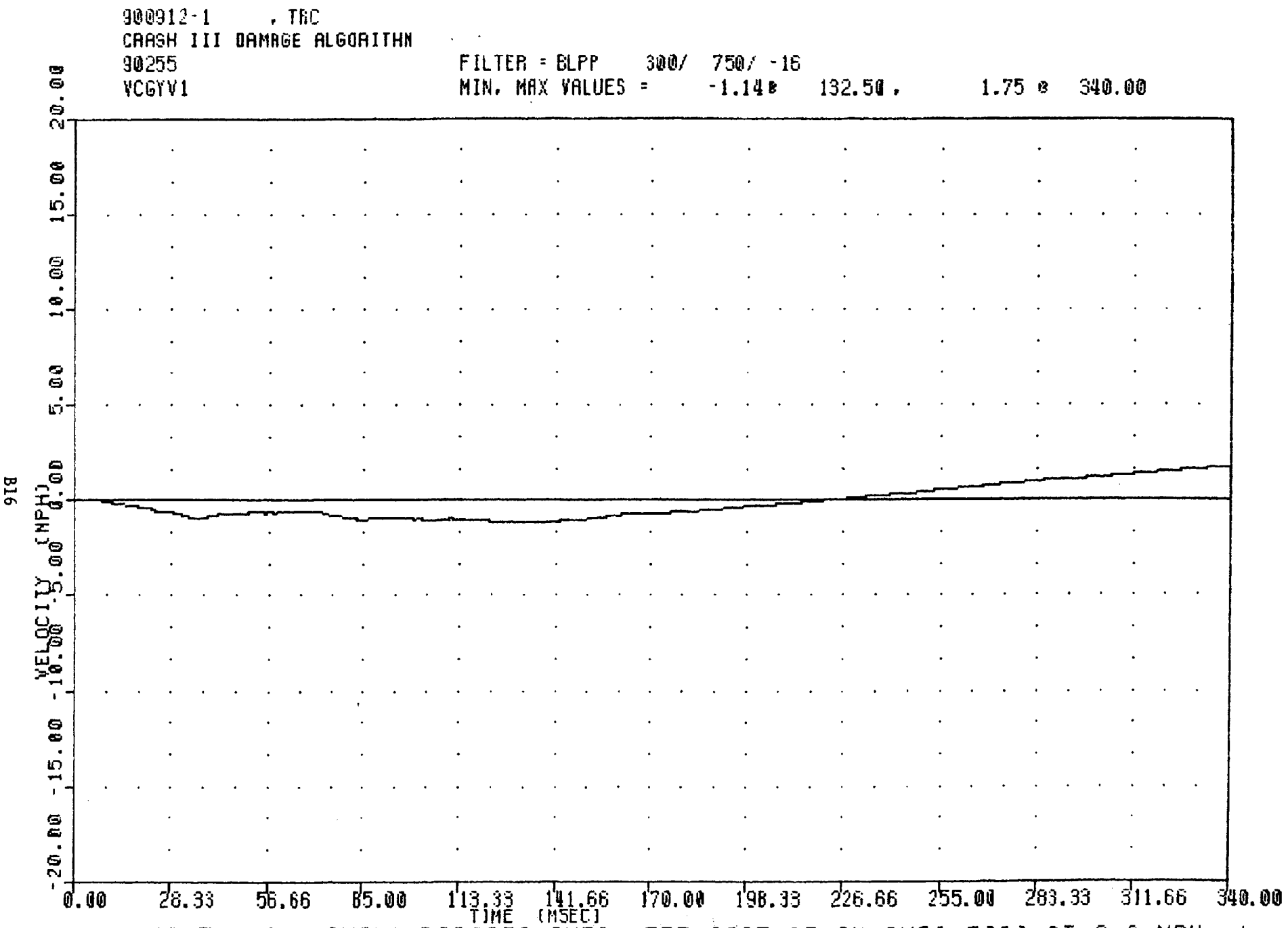
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH *1
RIGHT FRONT SILL Y-AXIS VELOCITY



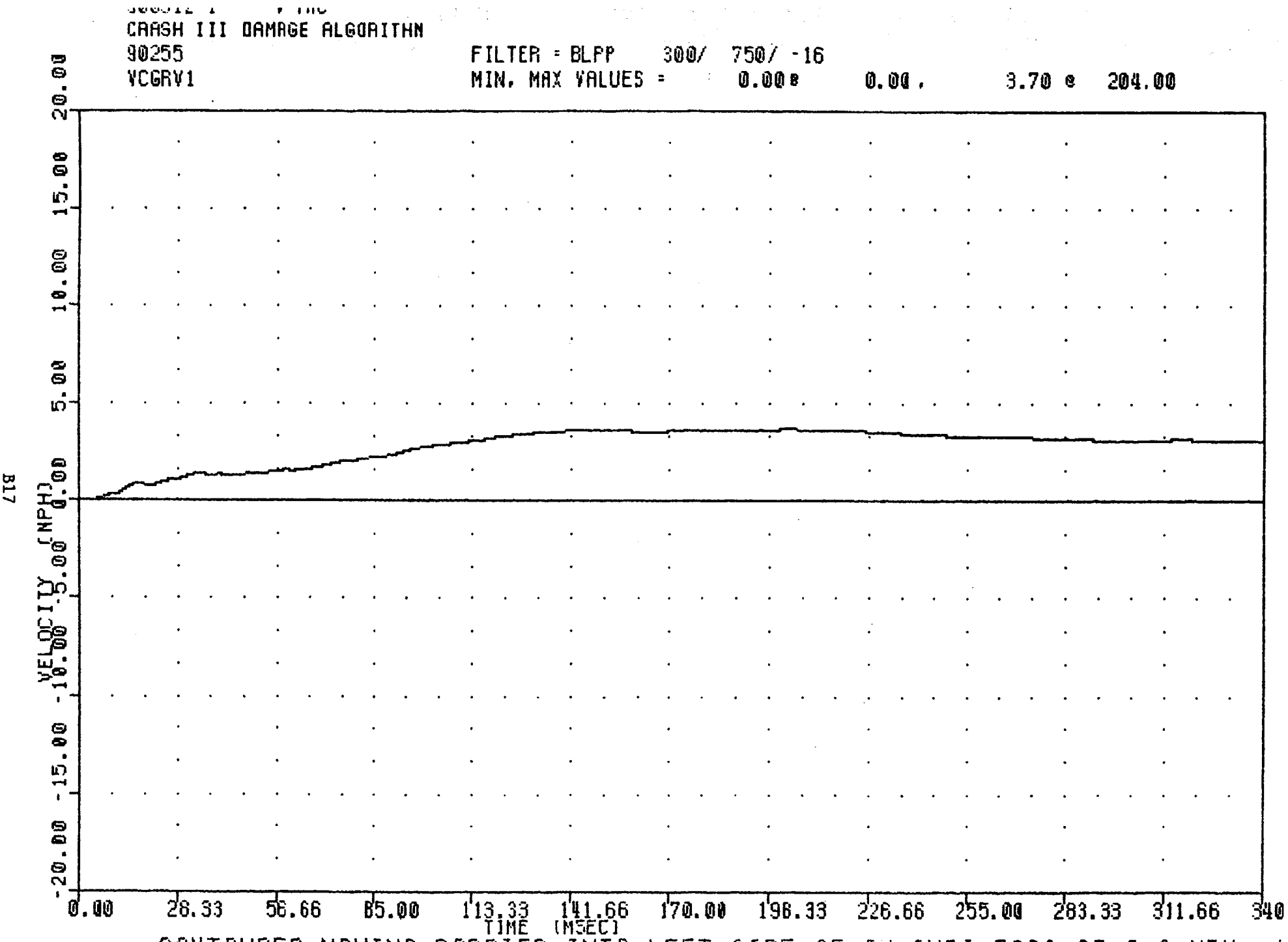
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH *1
RIGHT FRONT SILL RESULTANT VELOCITY



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
VEHICLE CG X-AXIS VELOCITY (IMPACT DIRECTION)



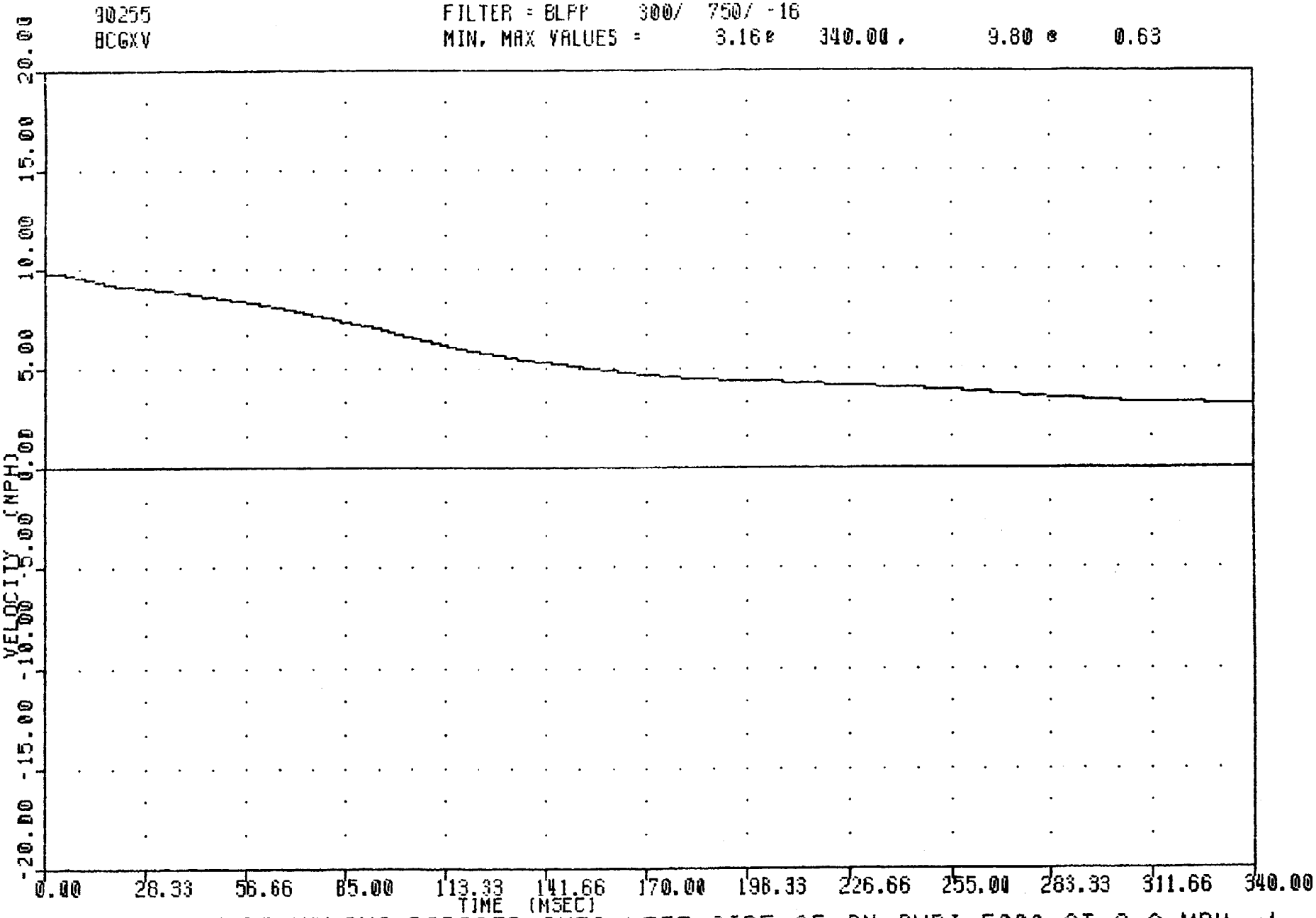
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH *1
VEHICLE CG Y-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)



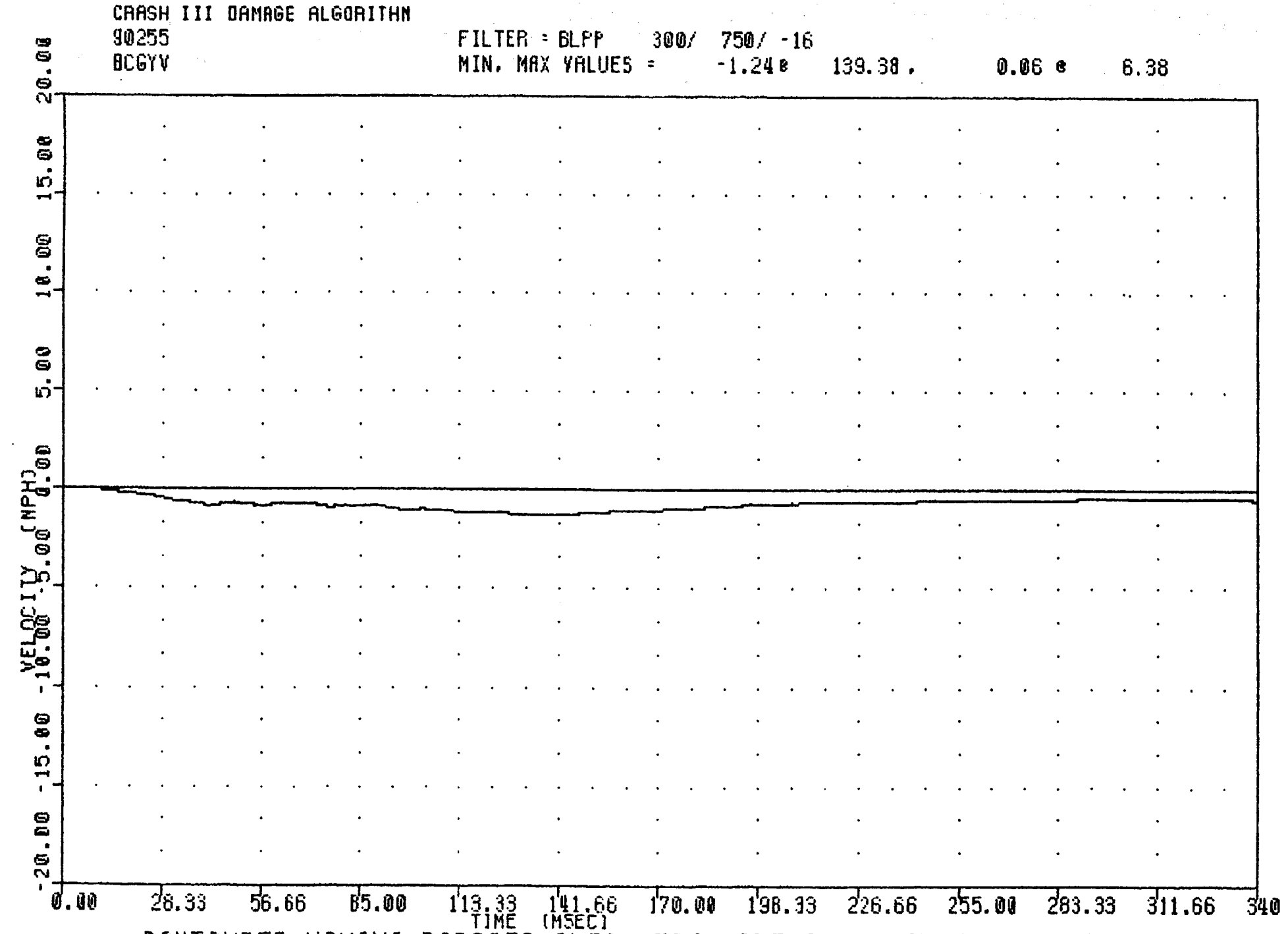
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
VEHICLE CG RESULTANT VELOCITY

900912-1 , INC
CRASH III DAMAGE ALGORITHM
90255
BCGXV

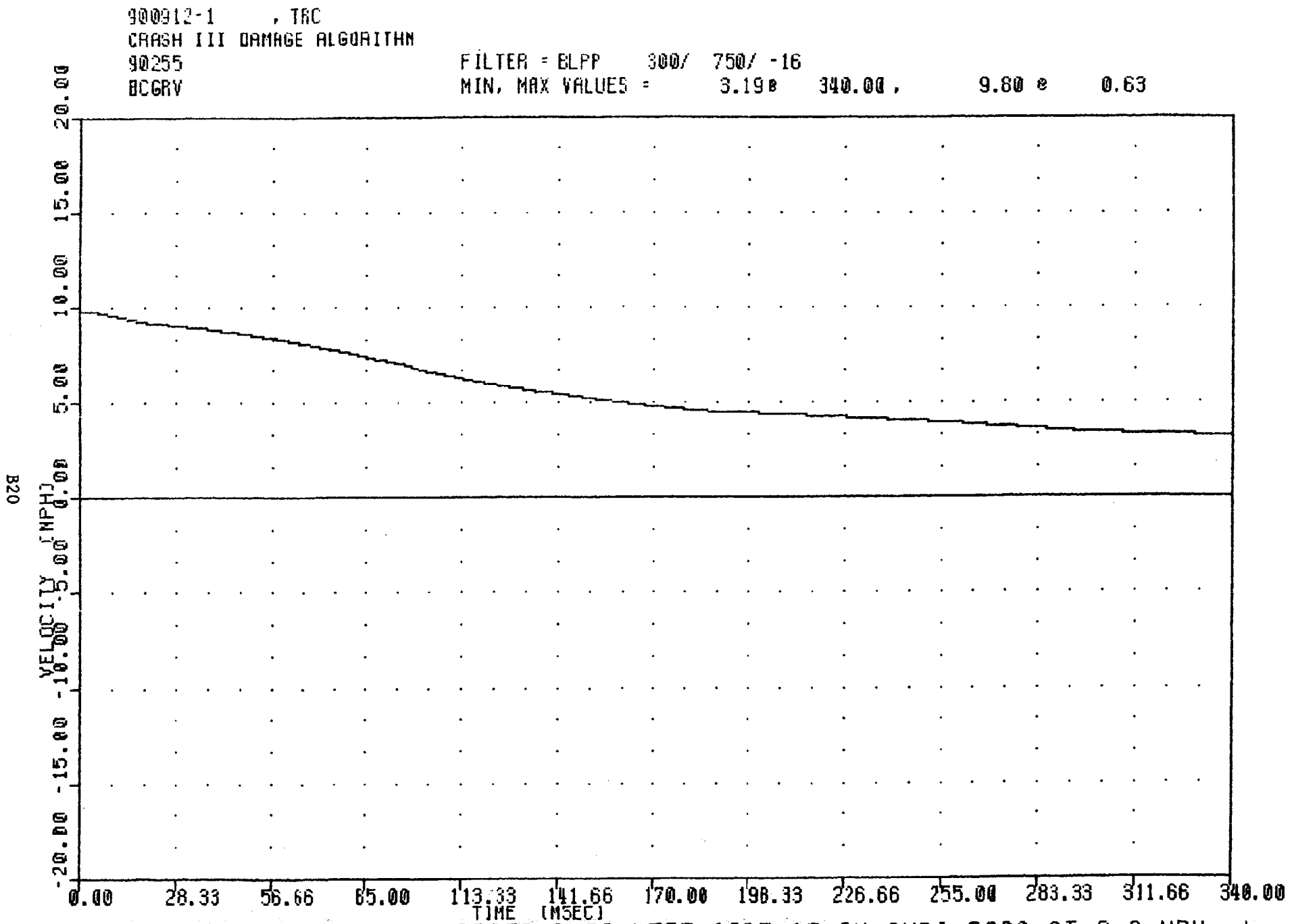
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 3.16 @ 340.00 , 9.80 @ 0.63



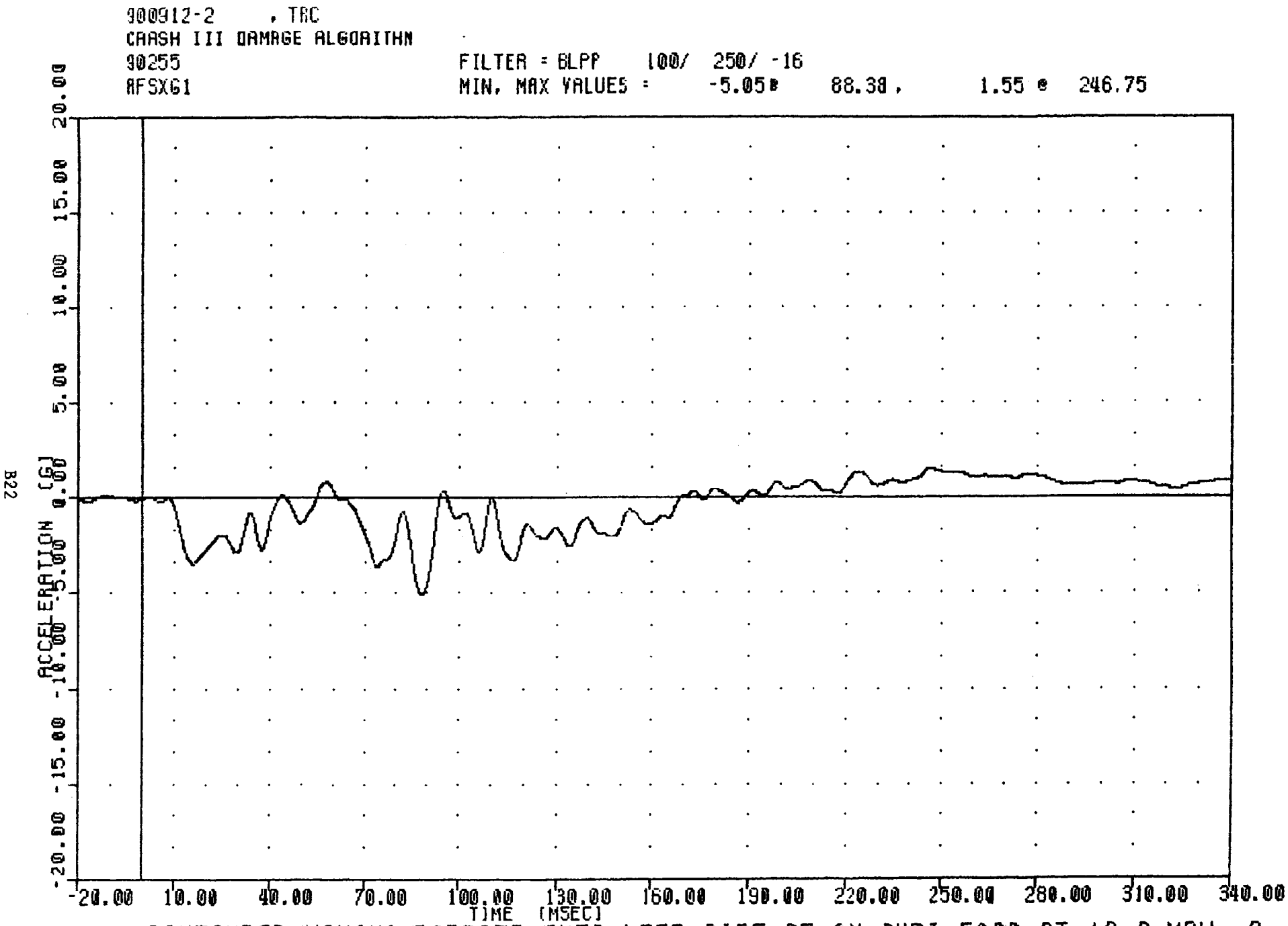
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY



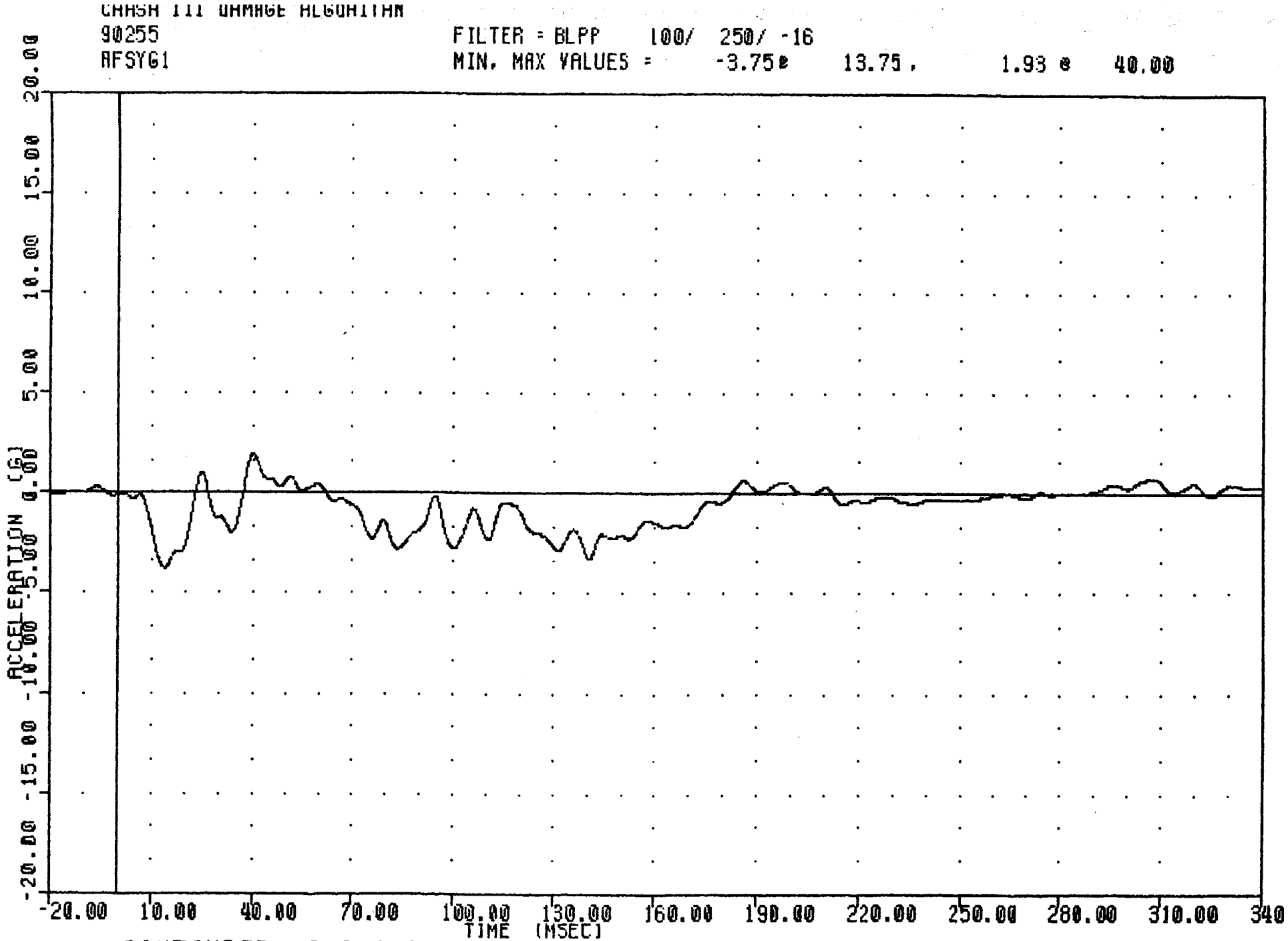
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH #1
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY



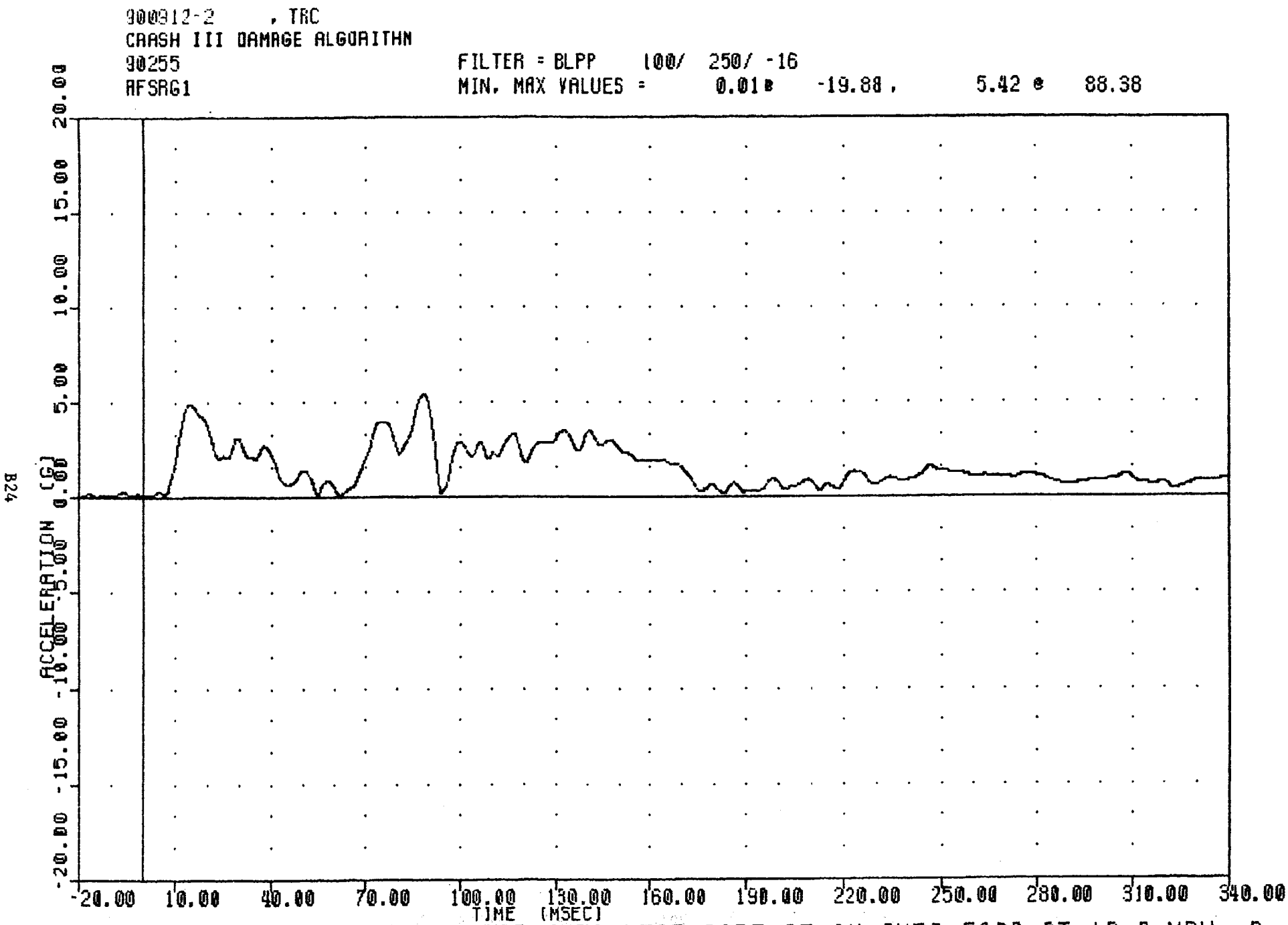
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 9.8 MPH *1
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY



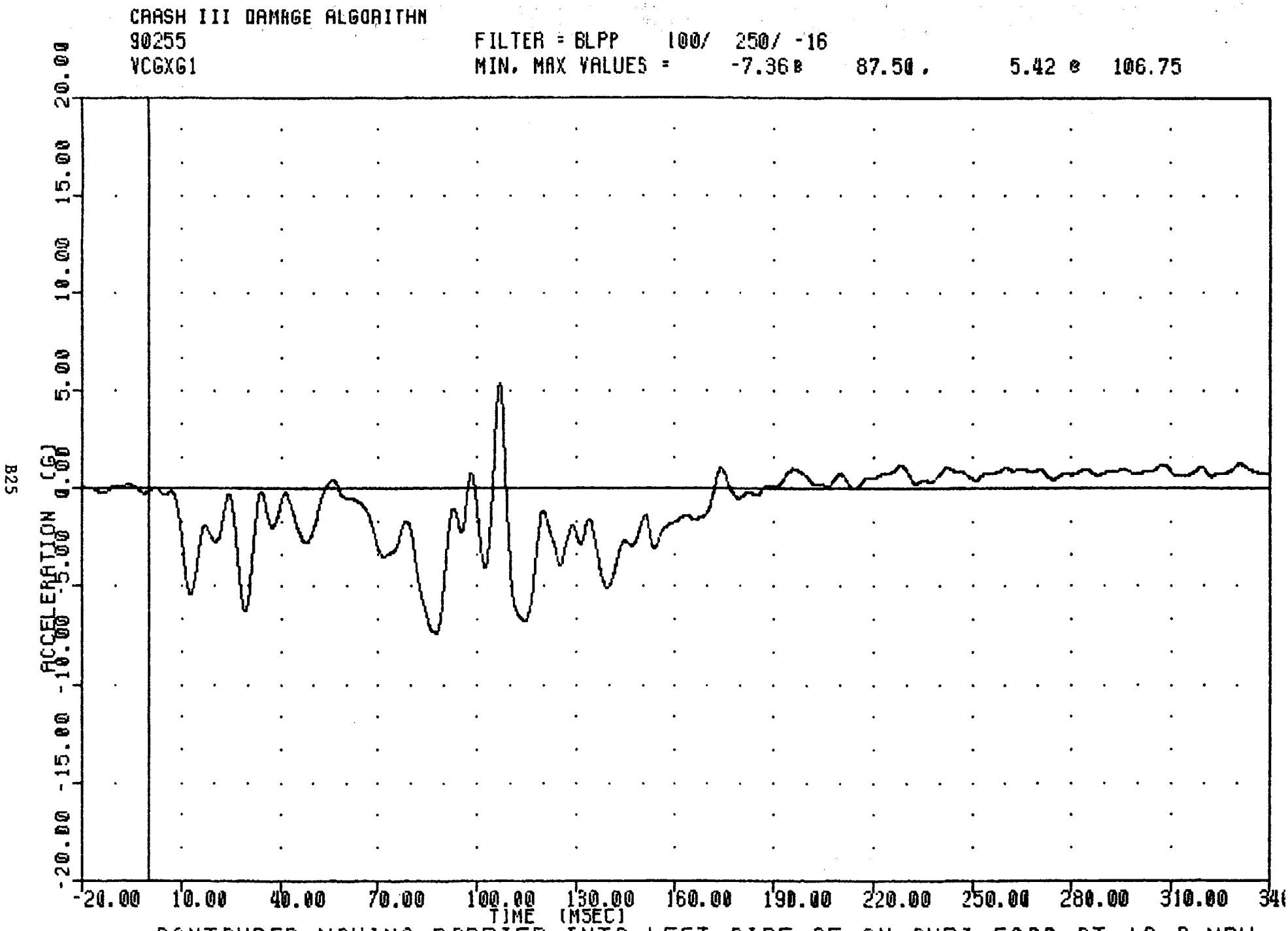
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH #2
RIGHT FRONT SILL X-AXIS ACCELERATION



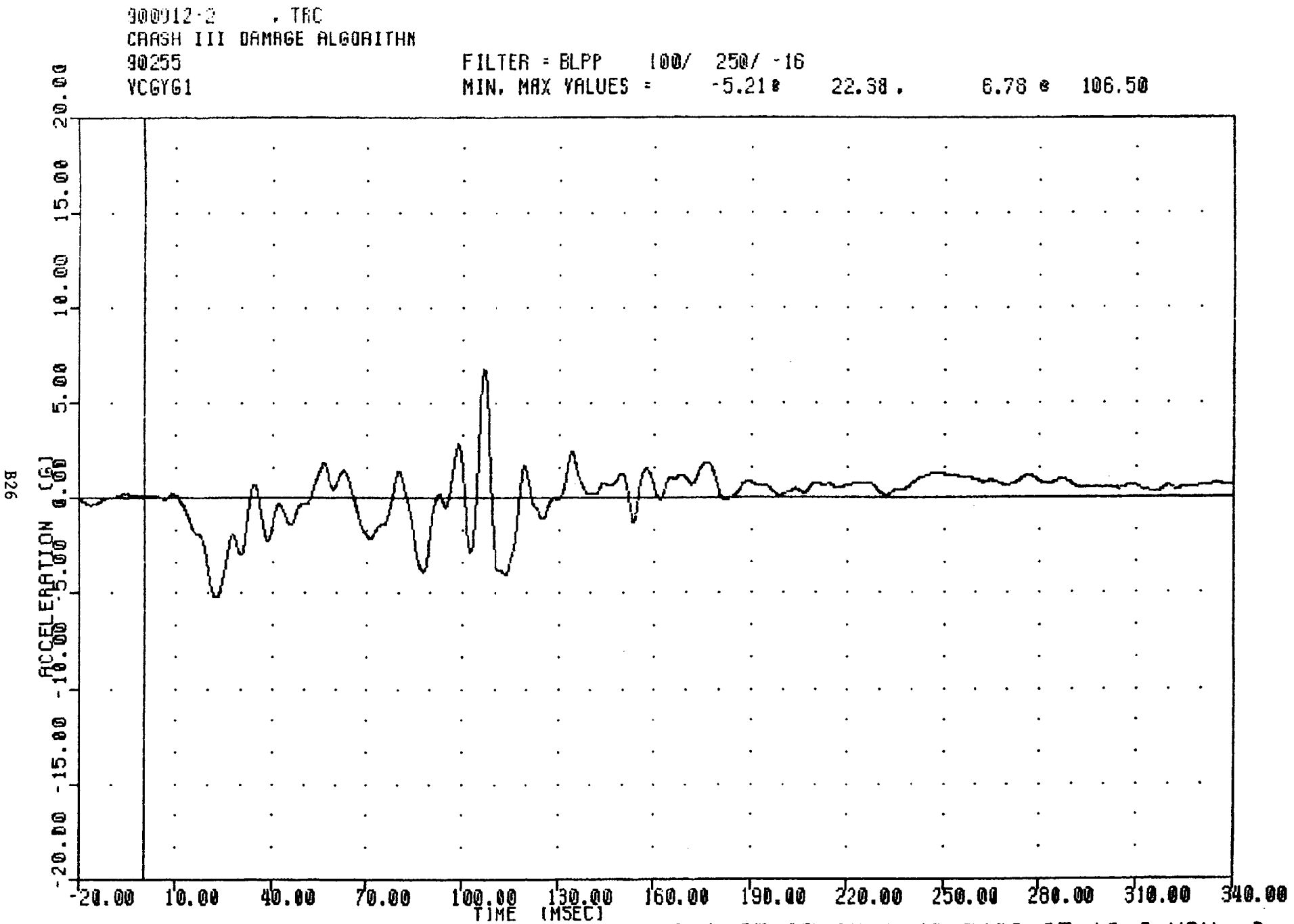
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH
RIGHT FRONT SILL Y-AXIS ACCELERATION



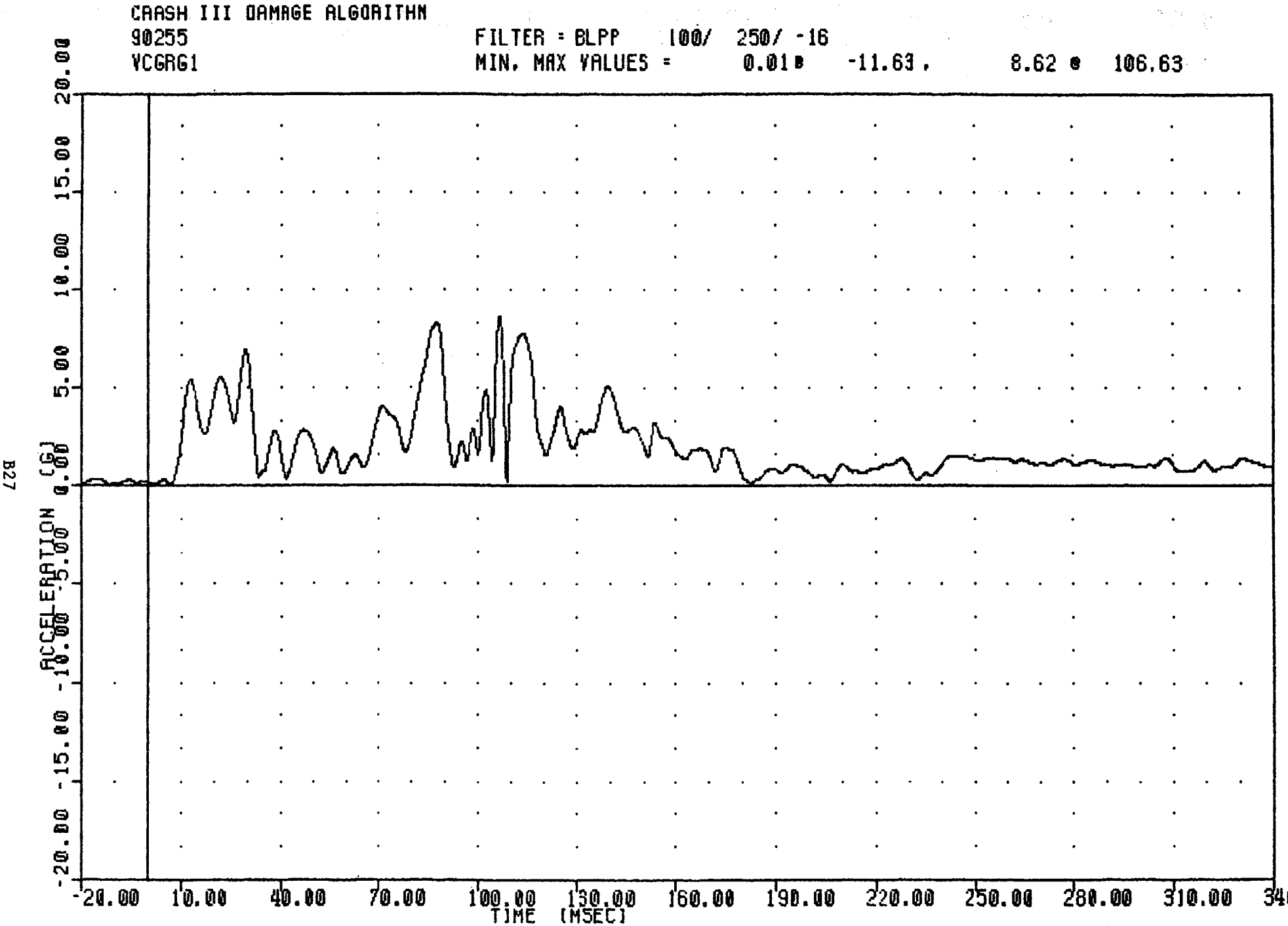
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *2
RIGHT FRONT SILL RESULTANT ACCELERATION



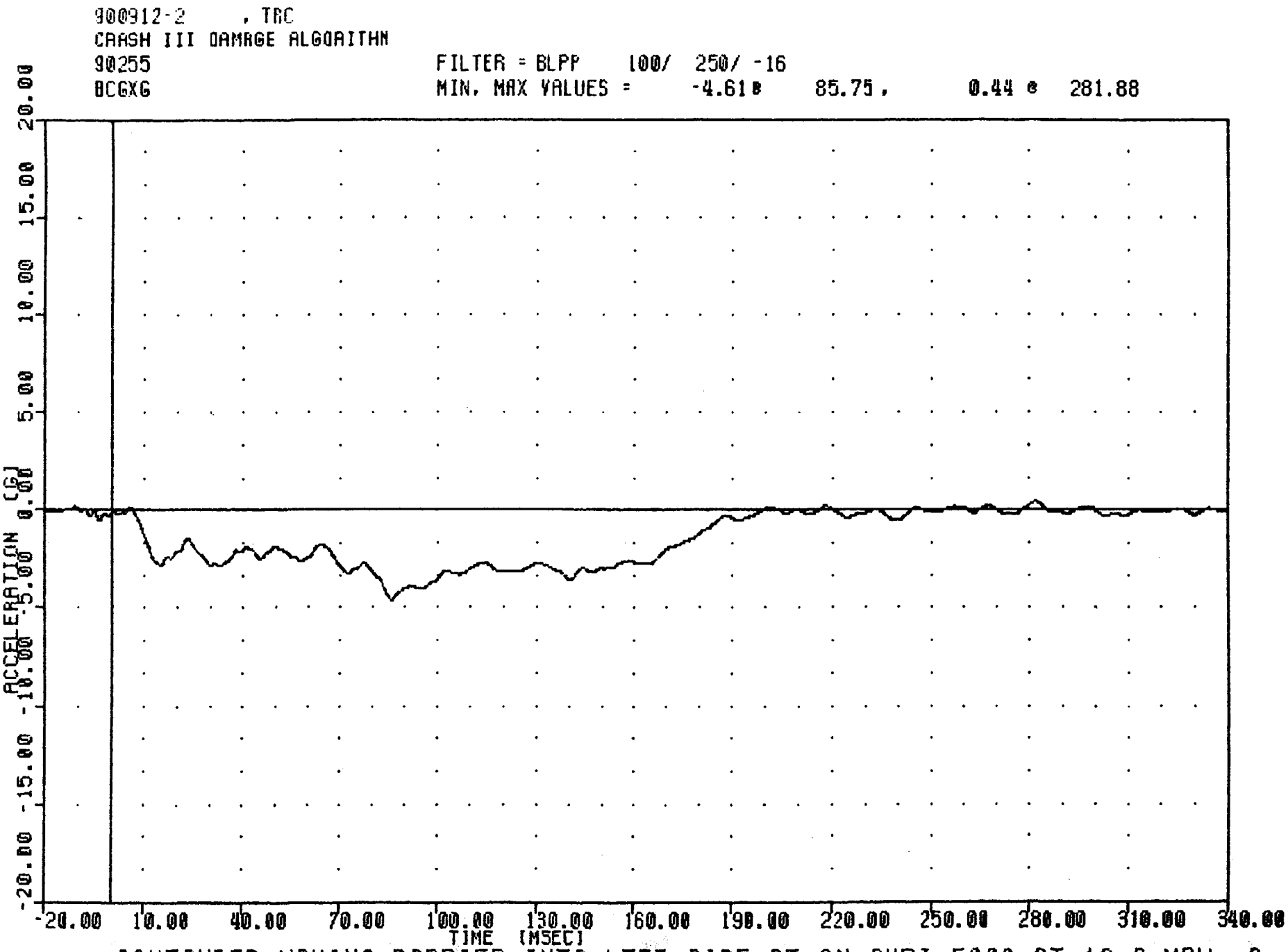
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *
VEHICLE CG X-AXIS ACCELERATION (IMPACT DIRECTION)



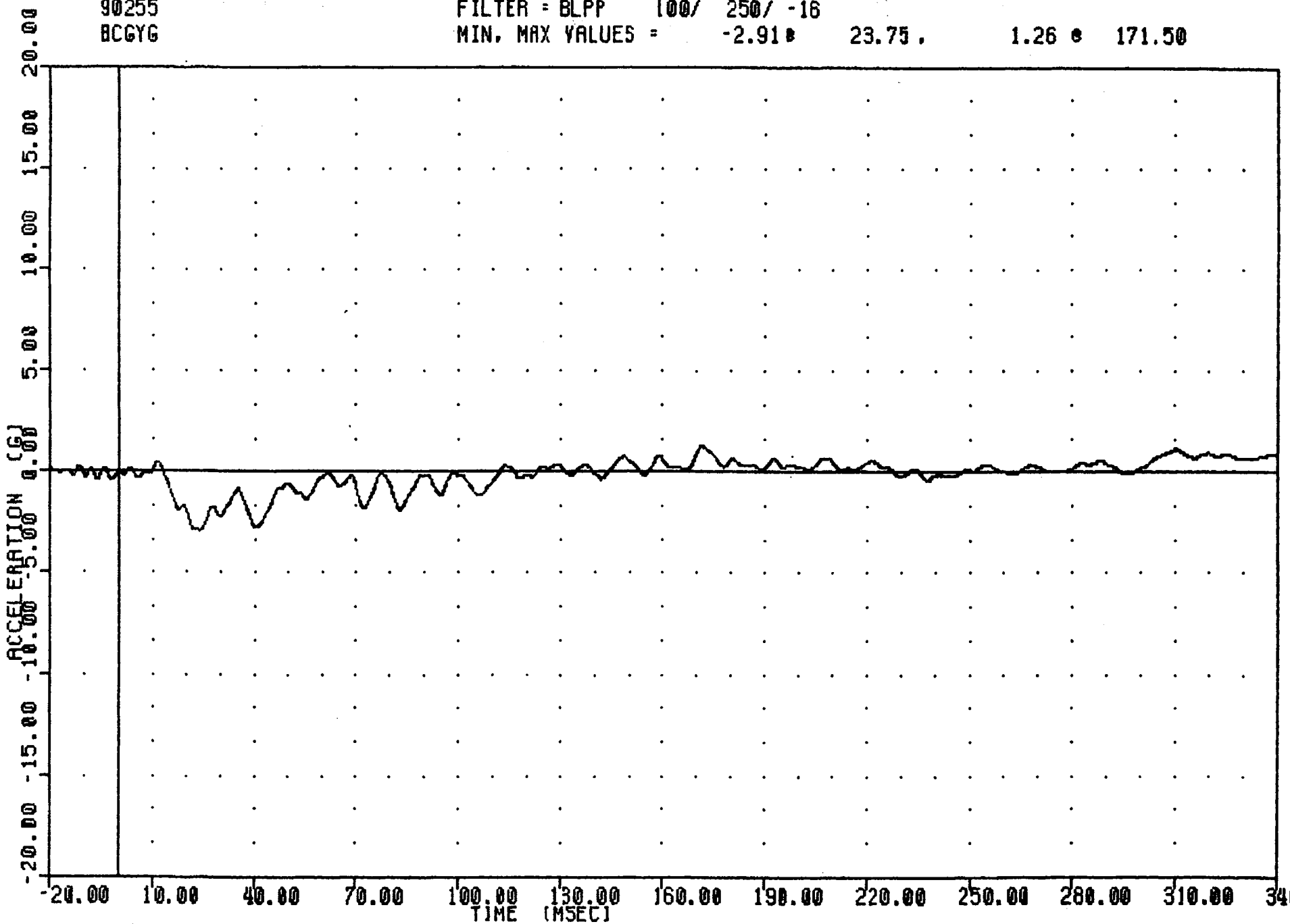
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *2
VEHICLE CG Y-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *
VEHICLE CG RESULTANT ACCELERATION

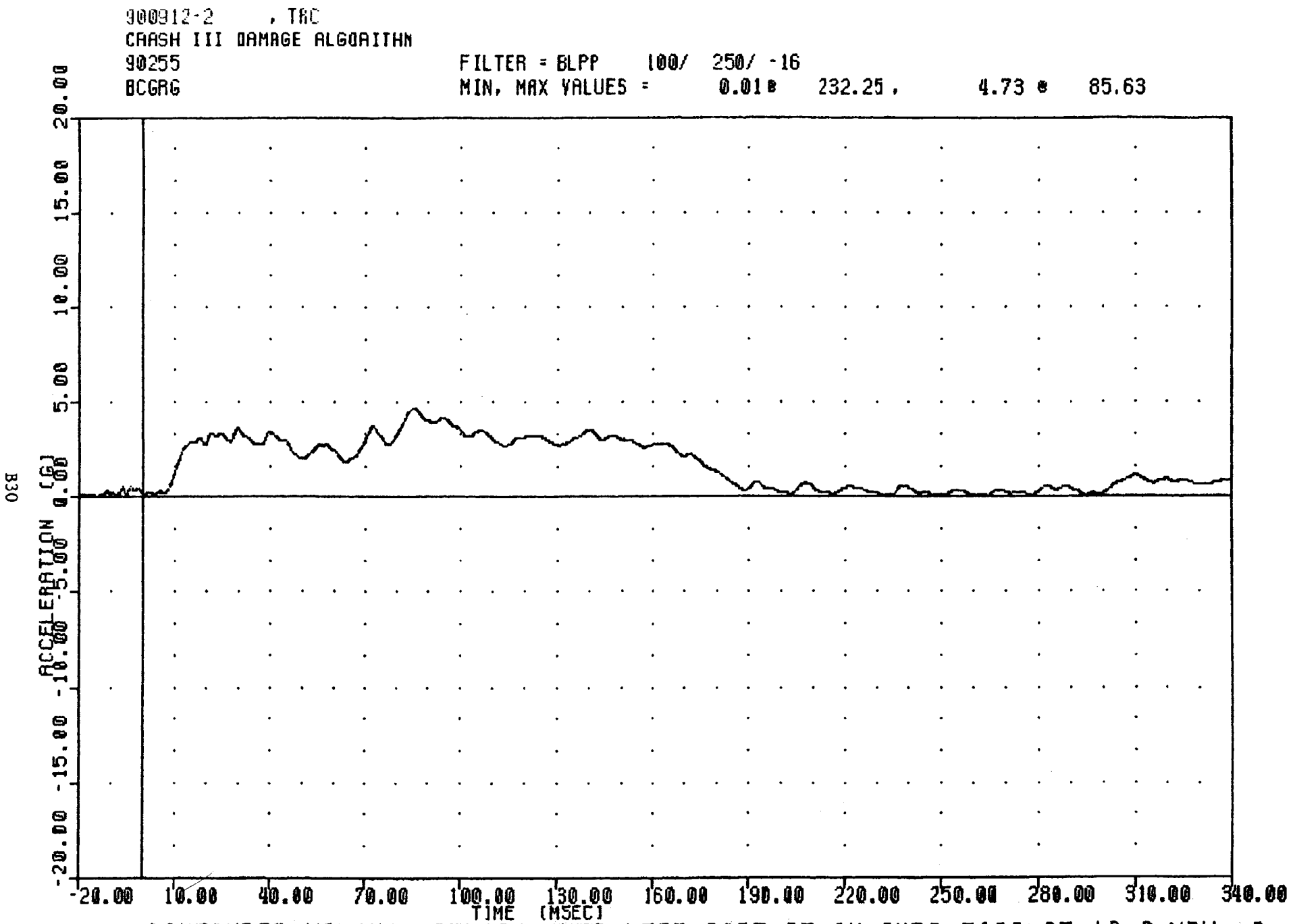


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH #2
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

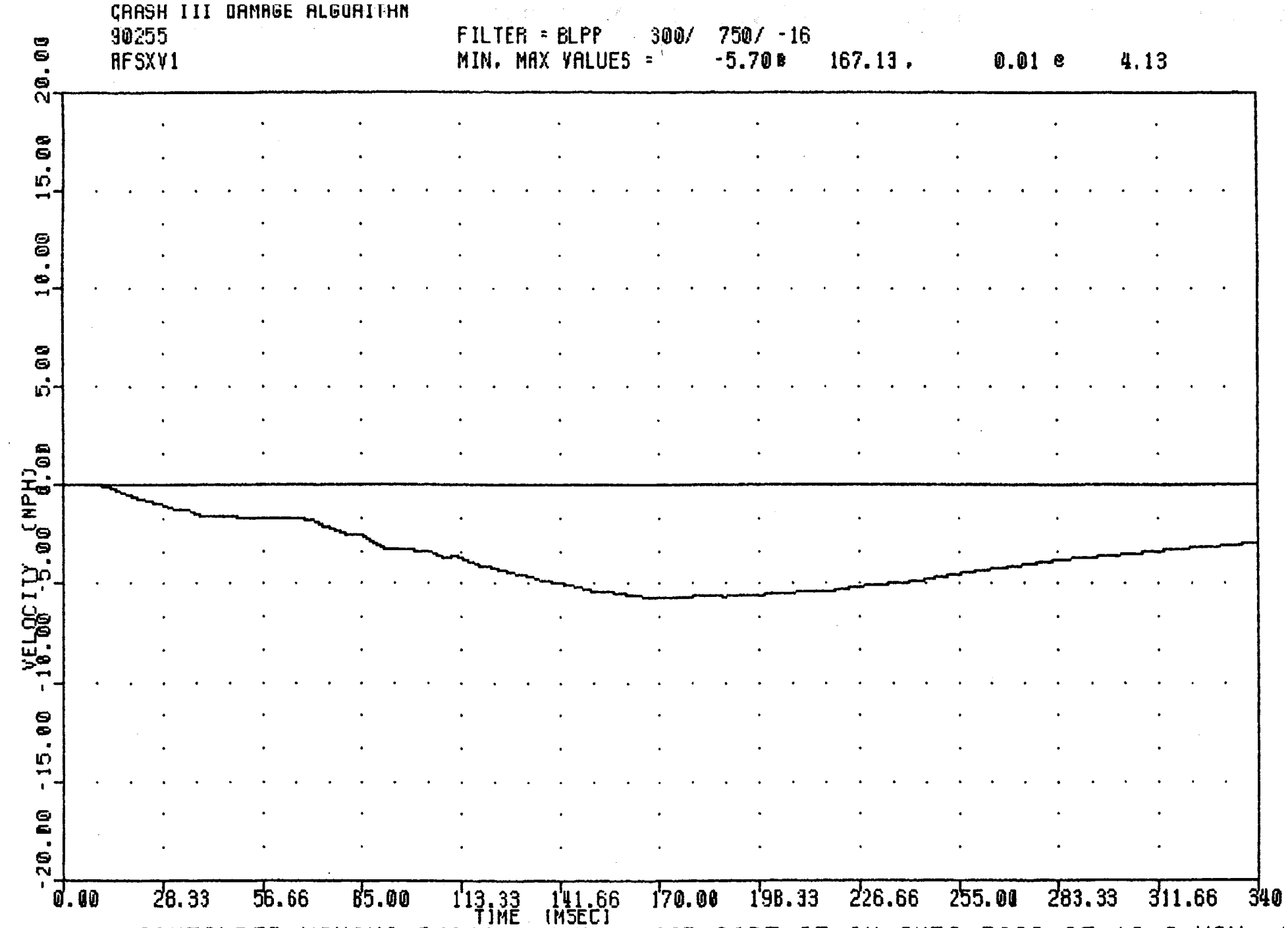


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *

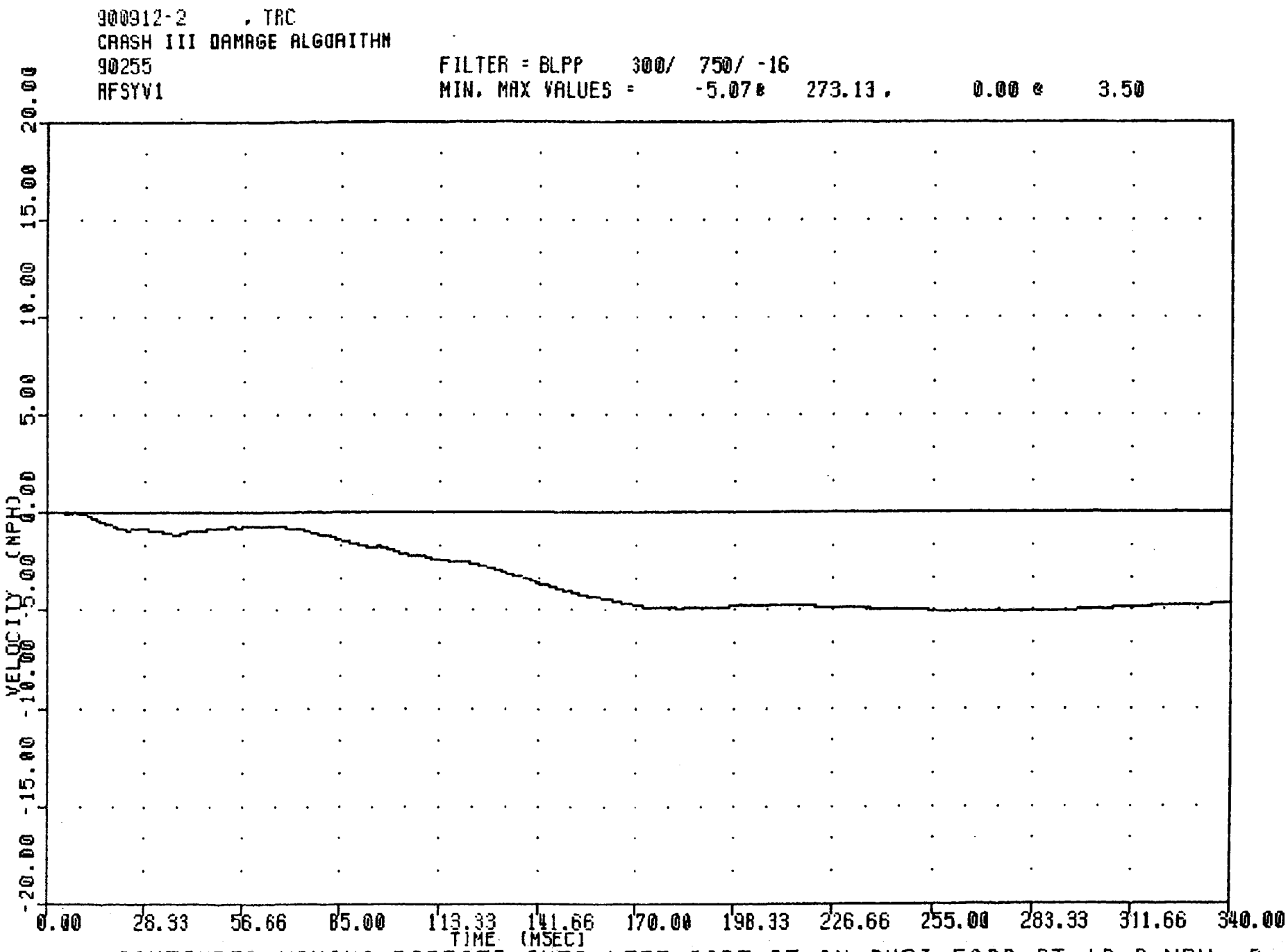
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION



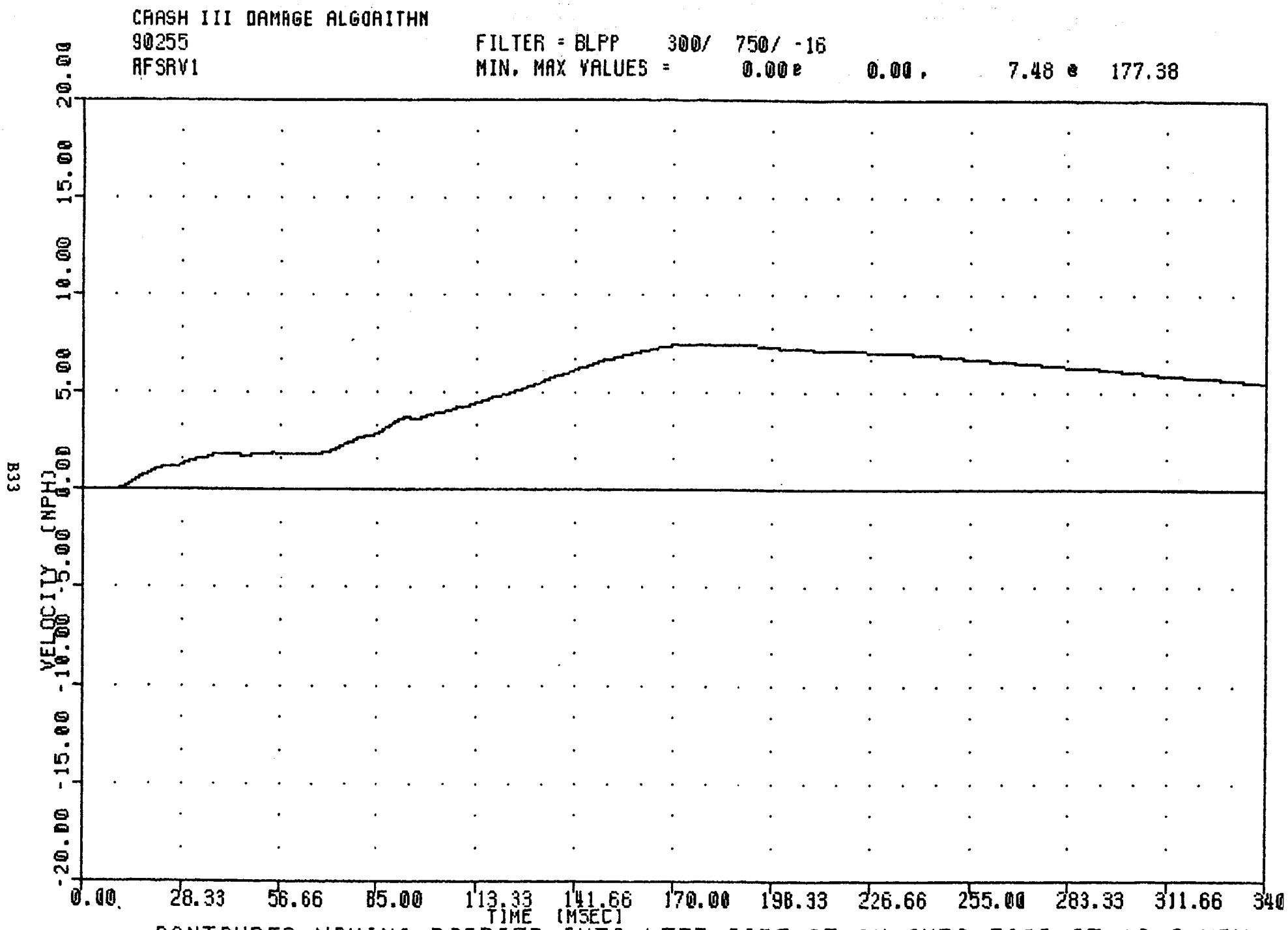
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH #2
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION



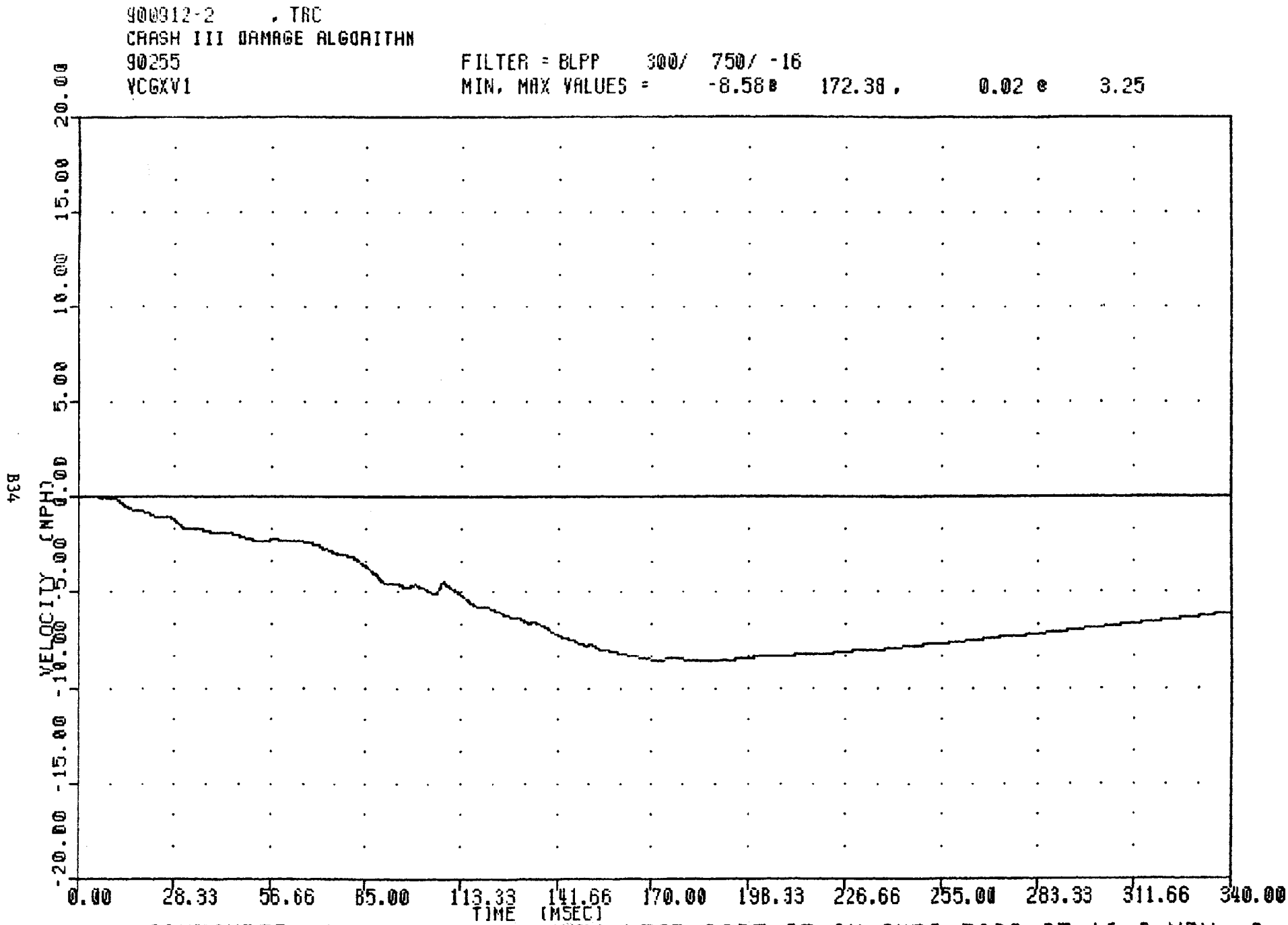
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *2
RIGHT FRONT SILL X-AXIS VELOCITY



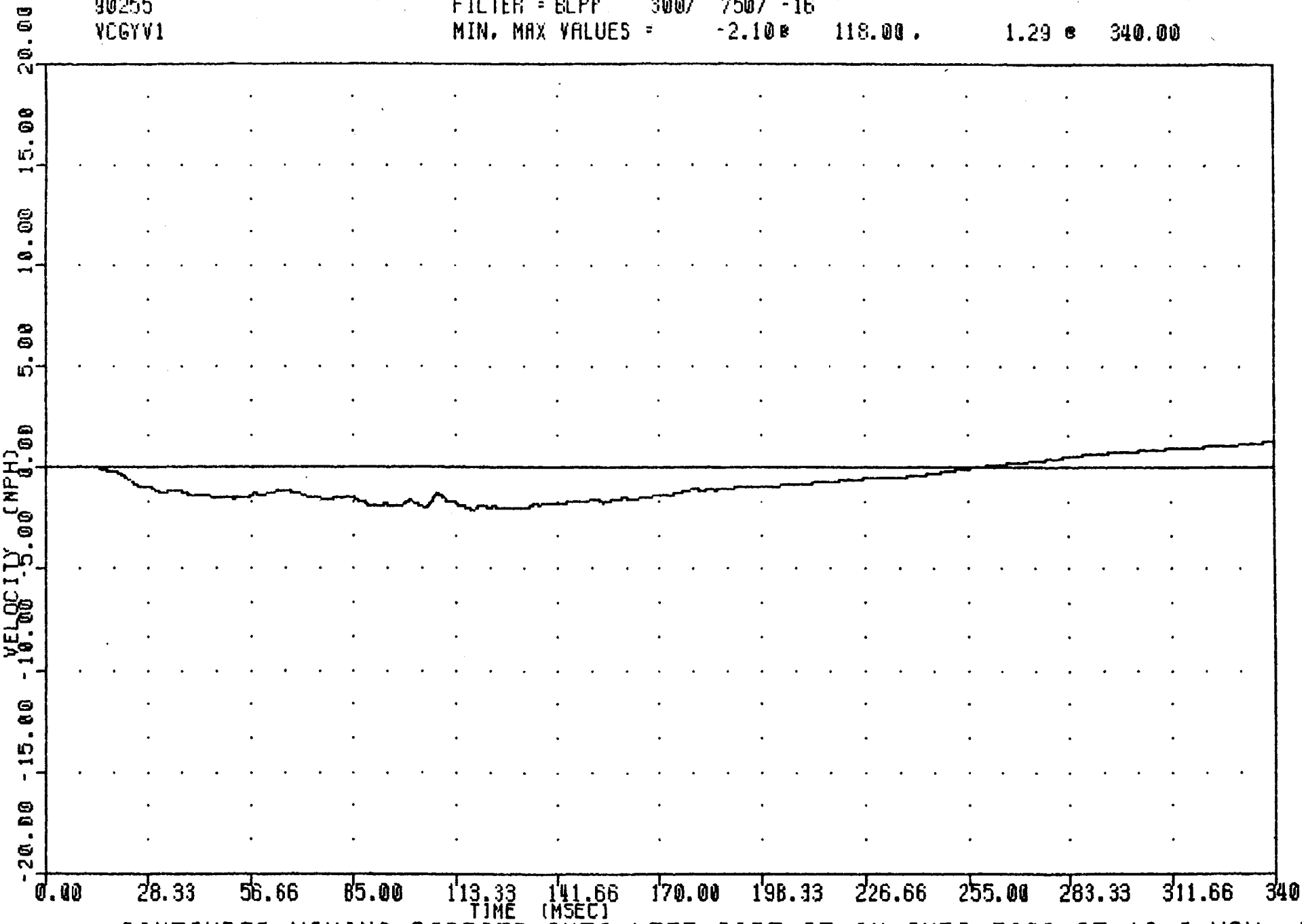
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH #2
RIGHT FRONT SILL Y-AXIS VELOCITY



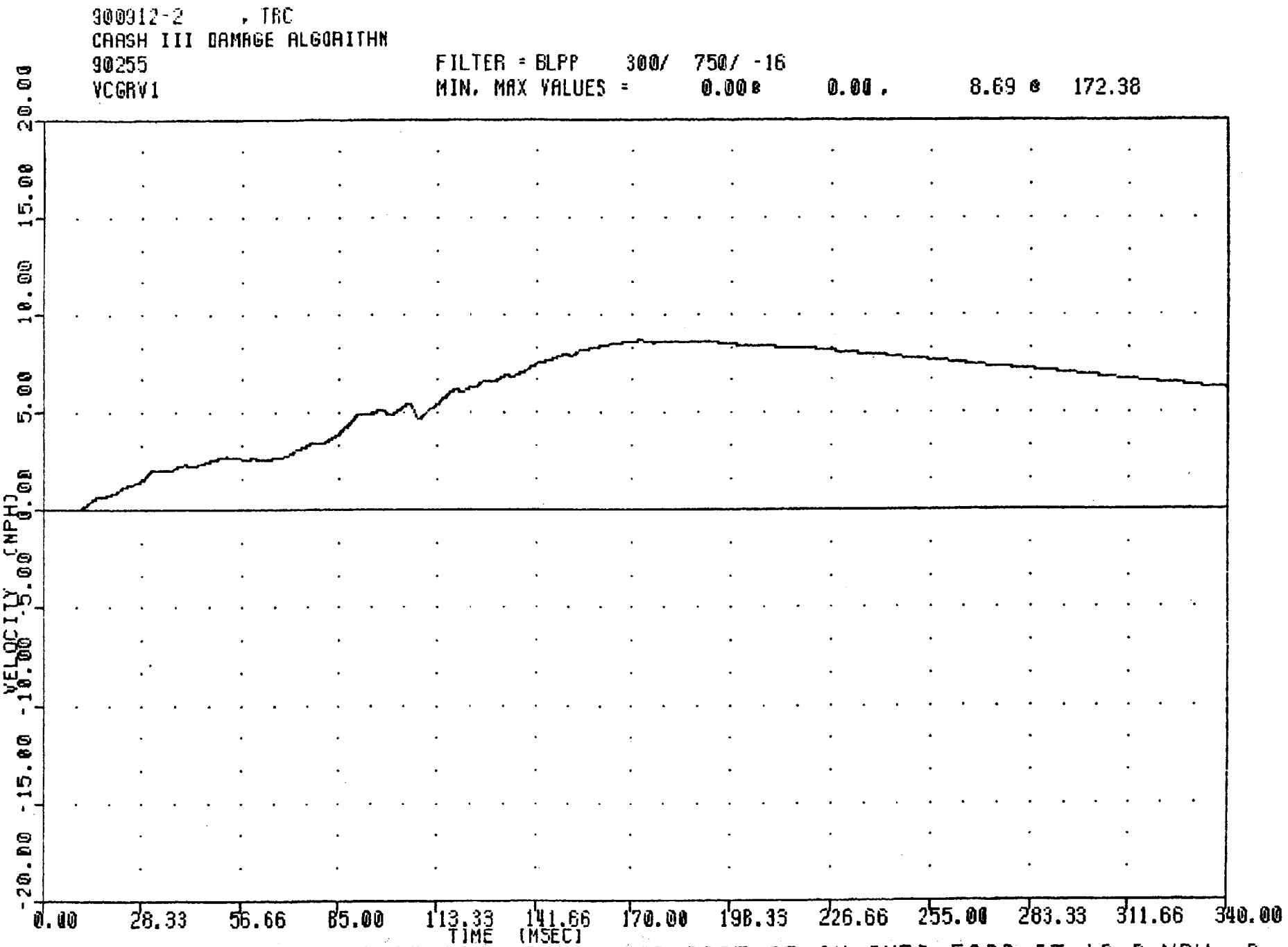
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH
RIGHT FRONT SILL RESULTANT VELOCITY



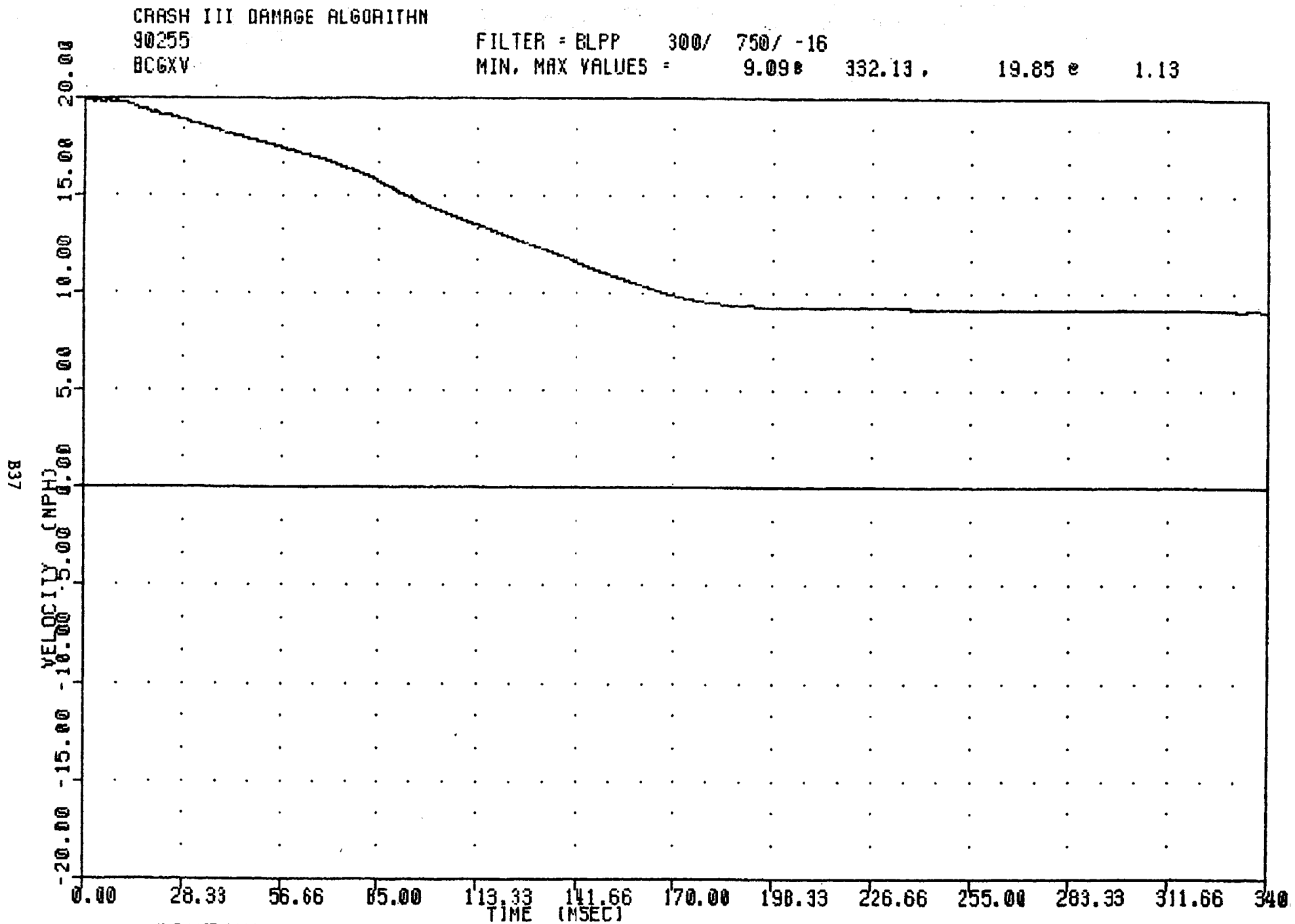
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH #2
VEHICLE CG X-AXIS VELOCITY (IMPACT DIRECTION)



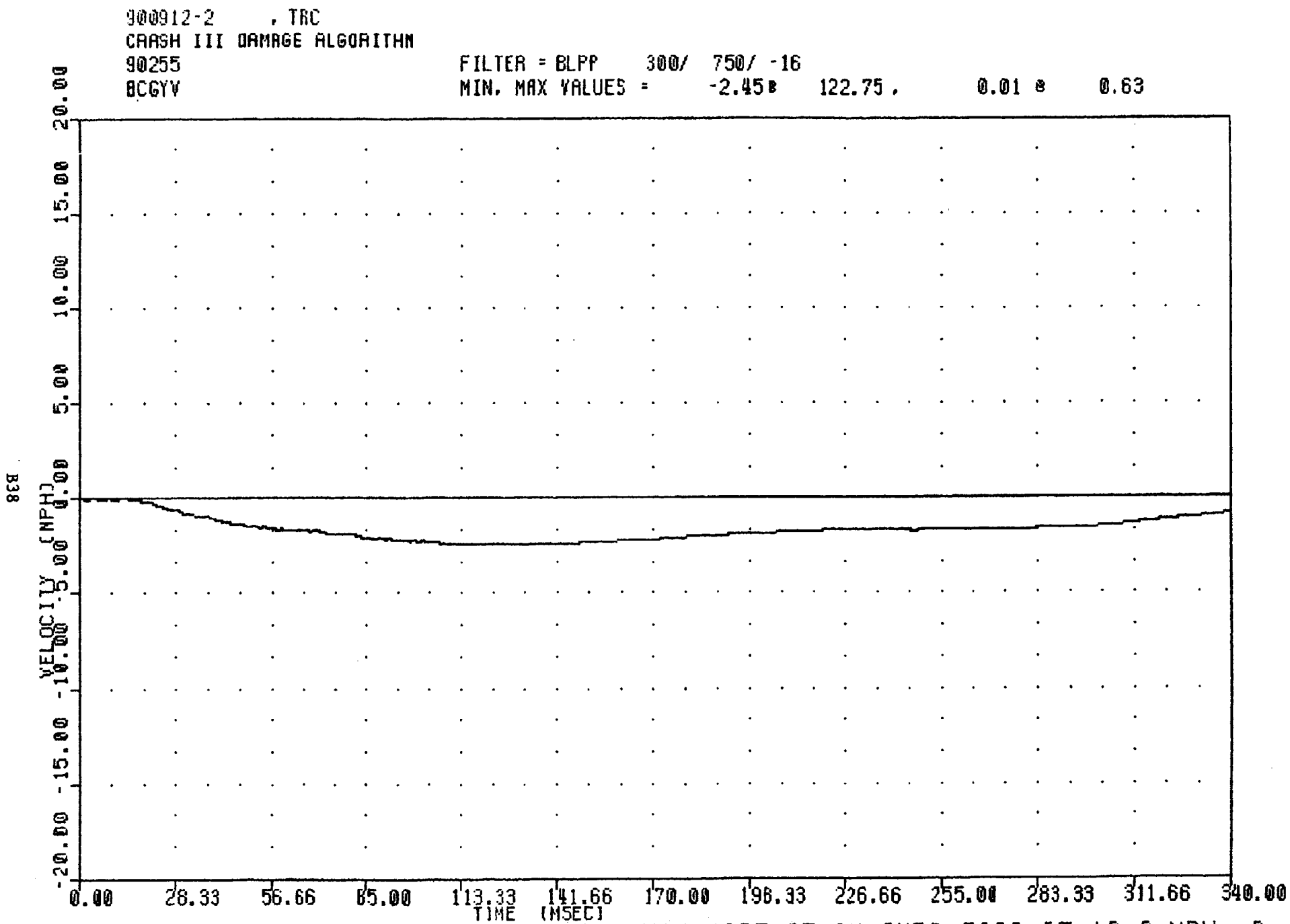
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH
VEHICLE CG Y-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)



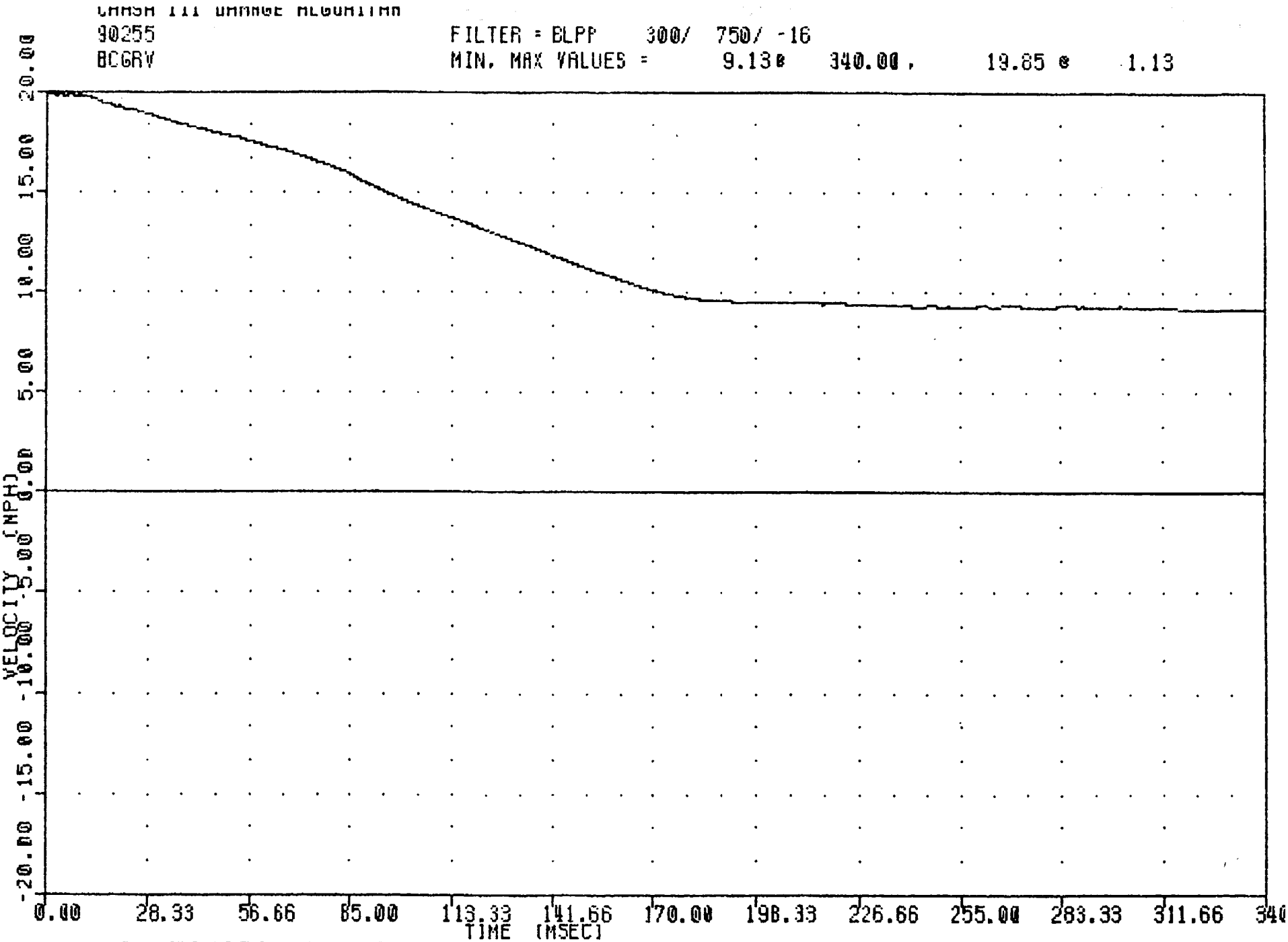
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *2
VEHICLE CG RESULTANT VELOCITY



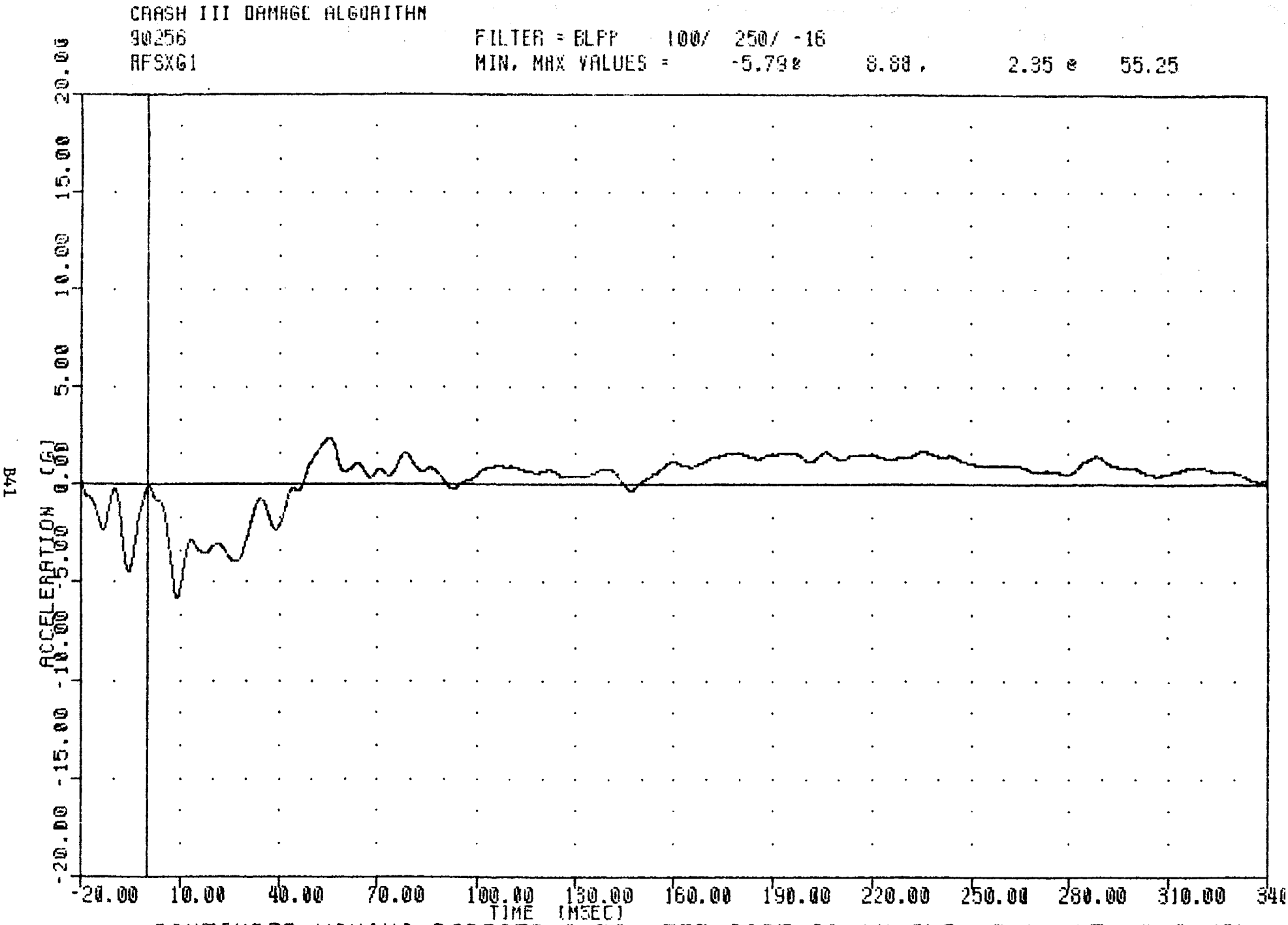
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH #2
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY

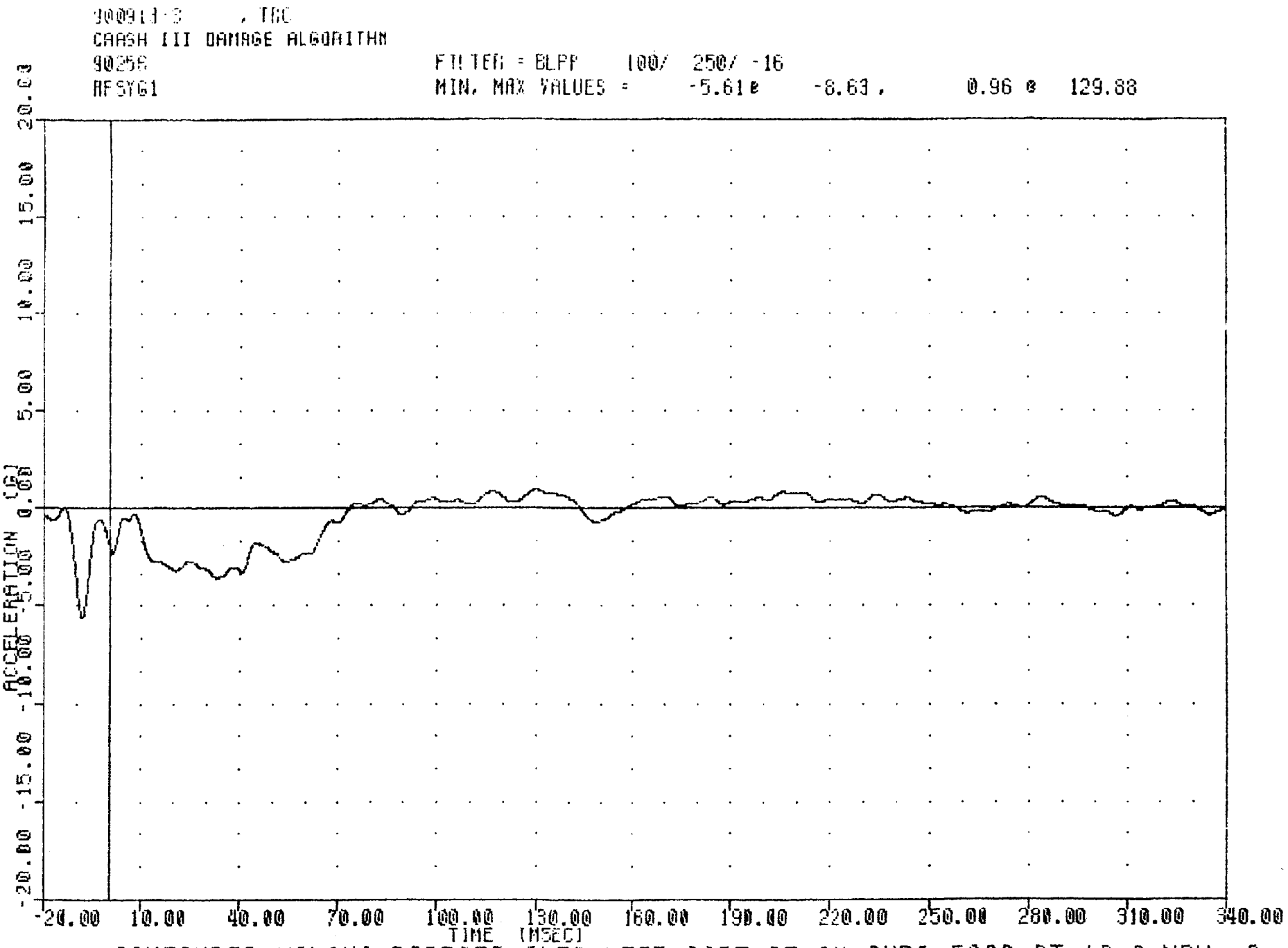


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.8 MPH *
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

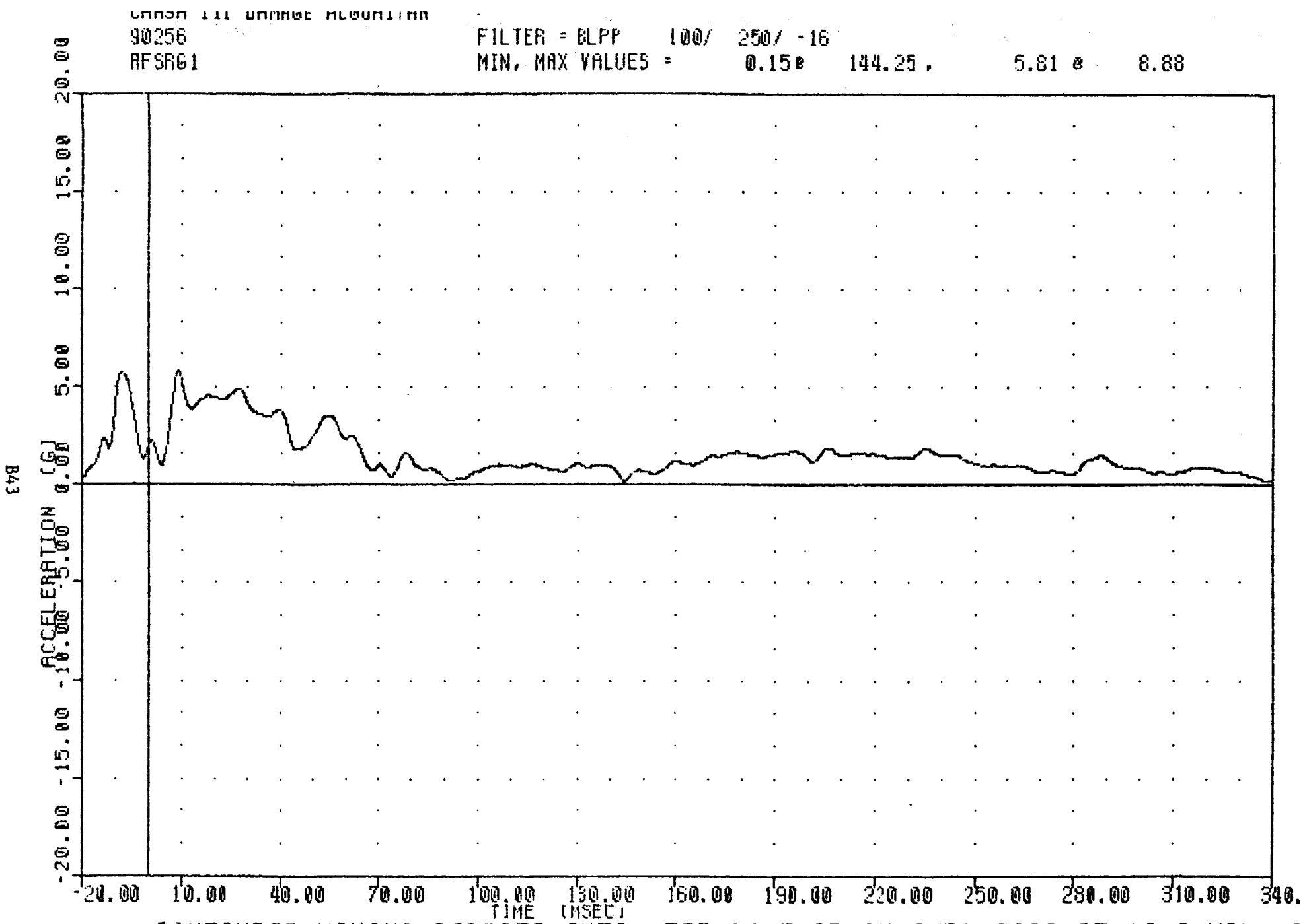


B41

CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH *
RIGHT FRONT SILL X-AXIS ACCELERATION

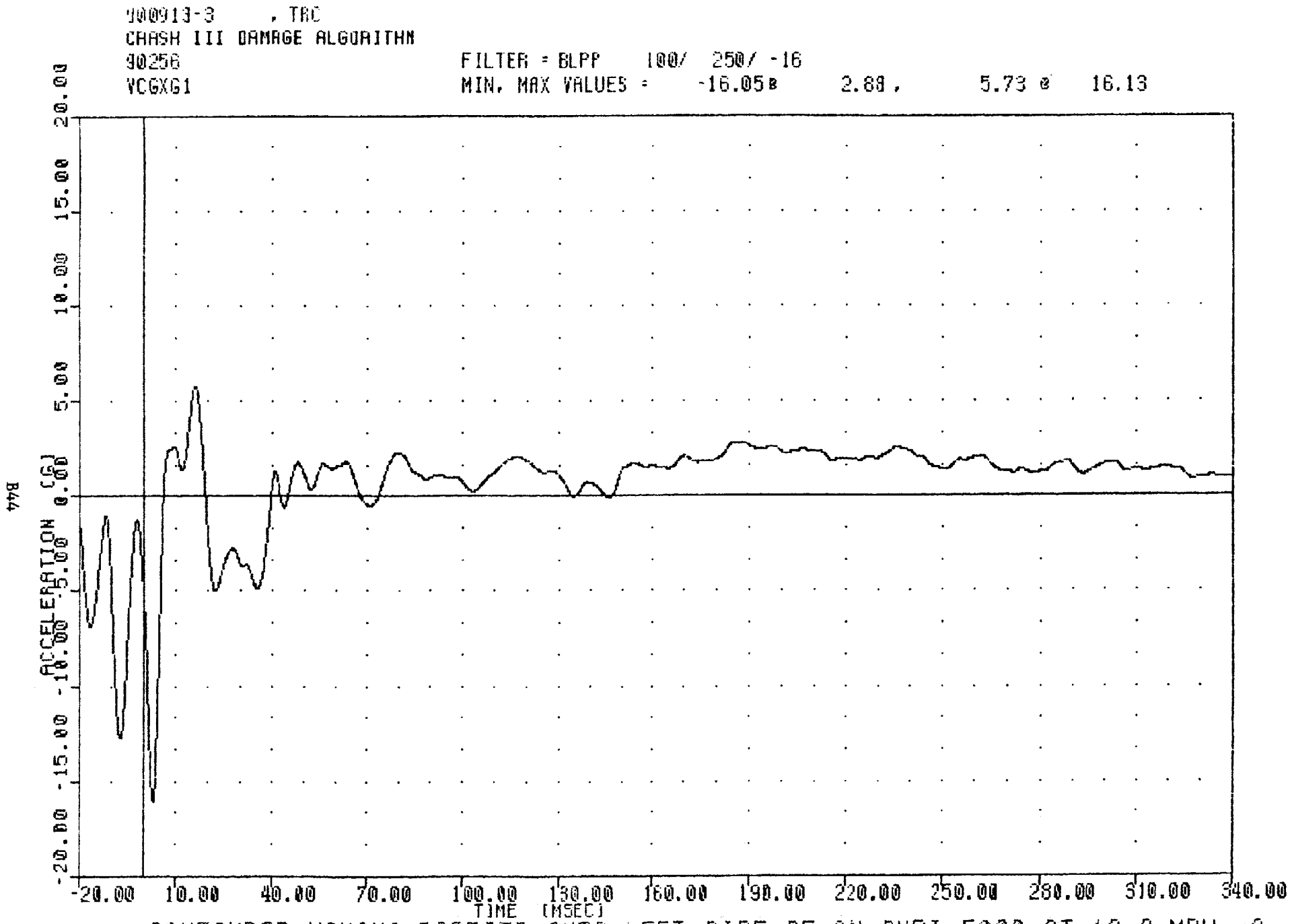


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
RIGHT FRONT SILL Y-AXIS ACCELERATION

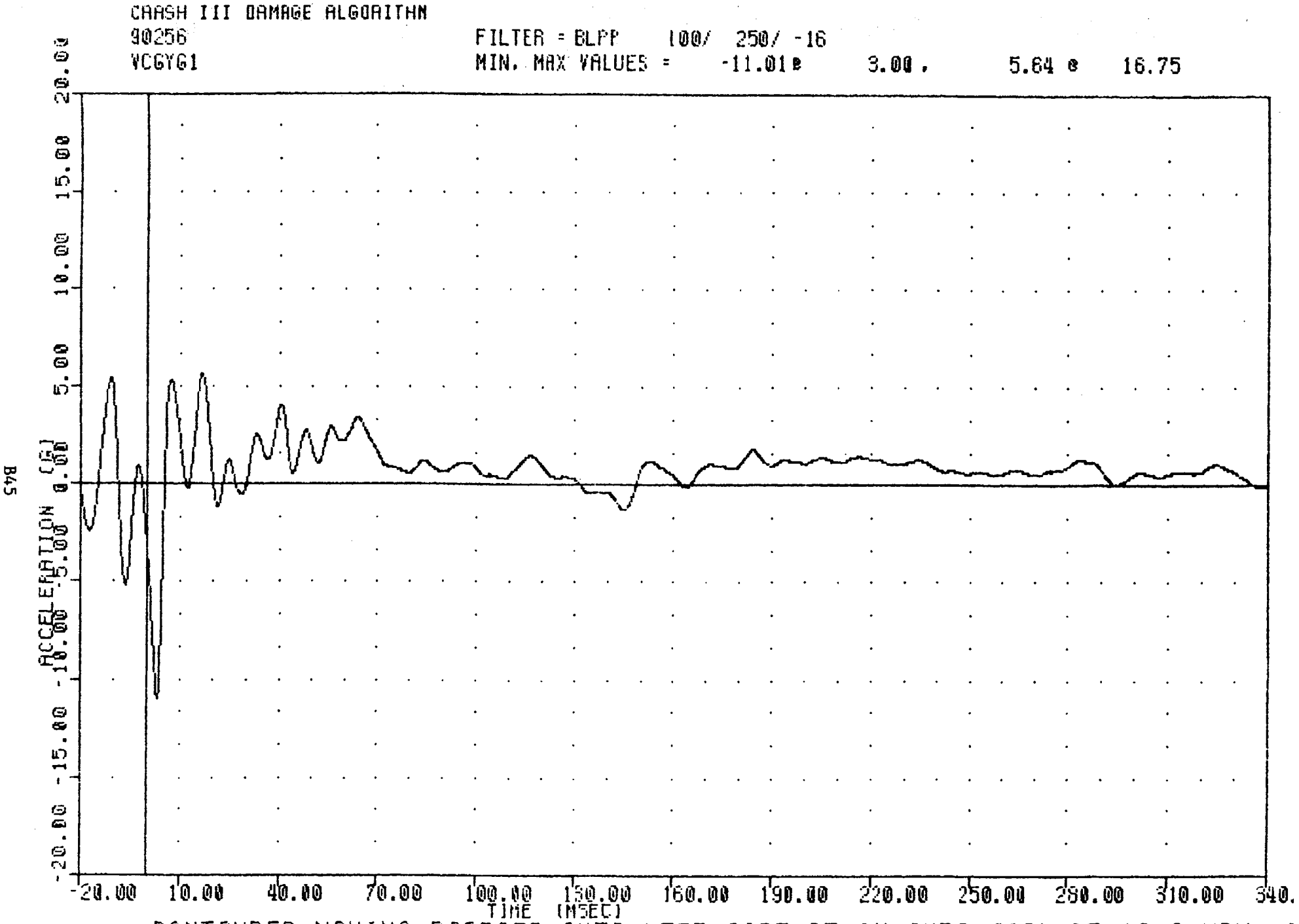


B43

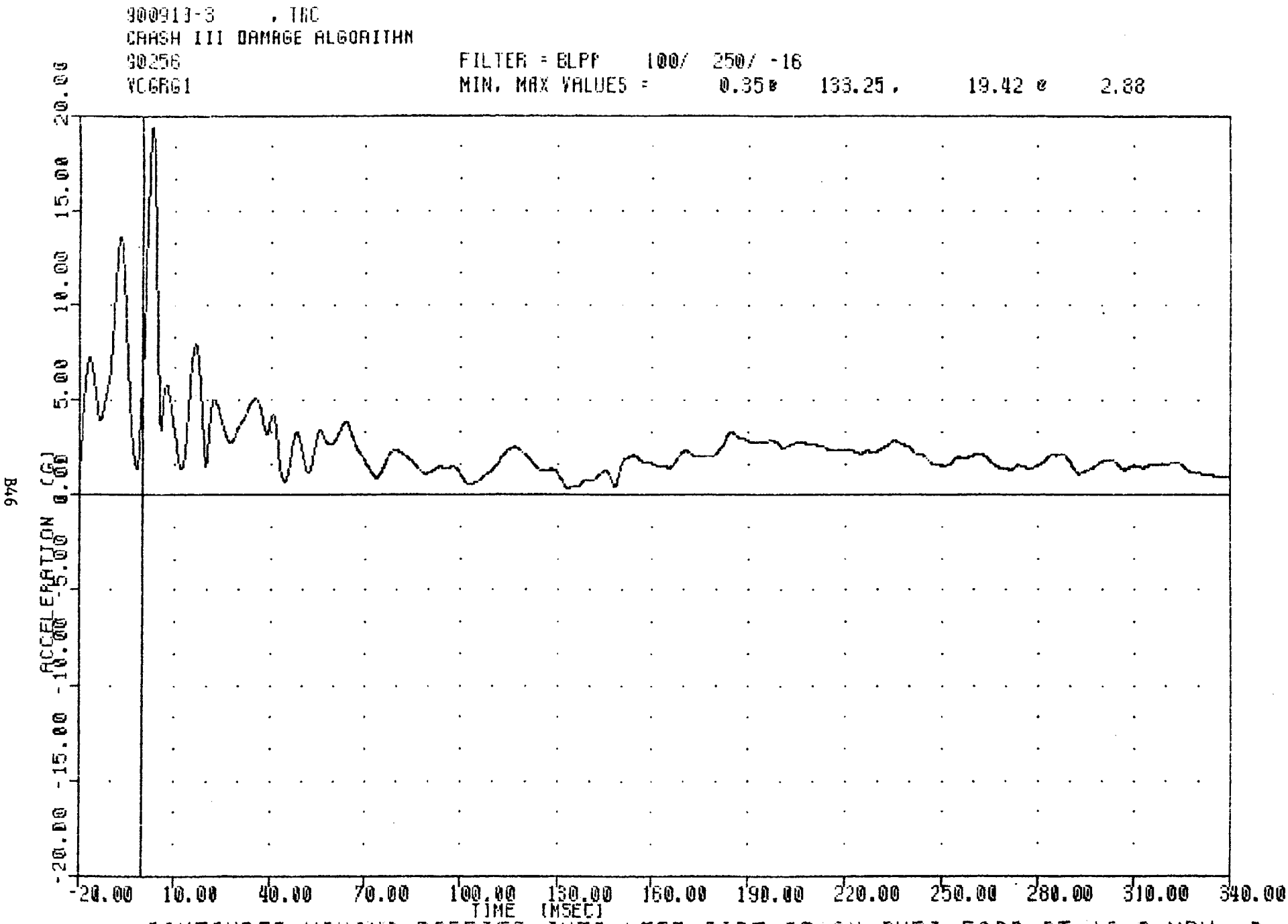
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
RIGHT FRONT SILL RESULTANT ACCELERATION



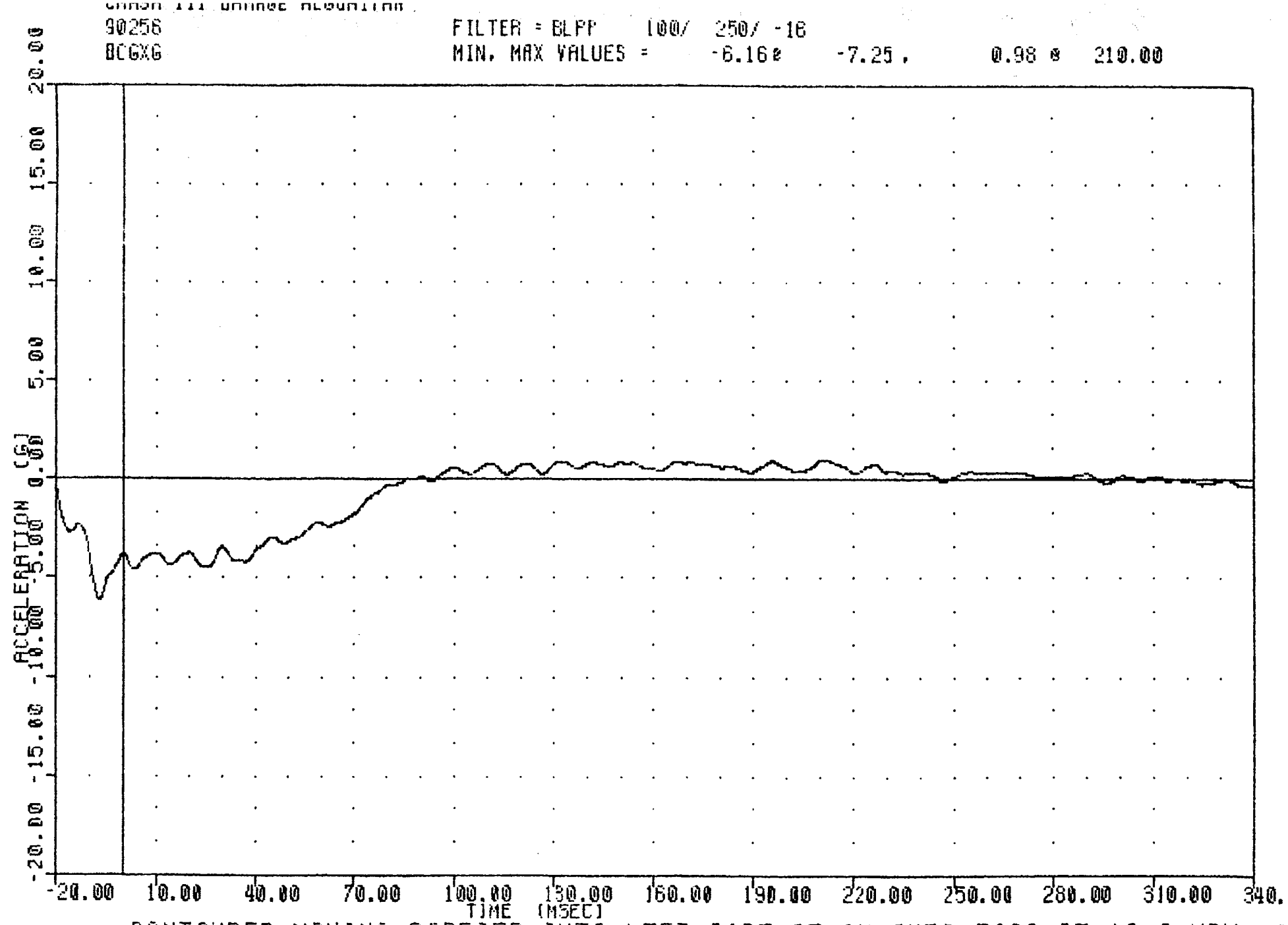
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
VEHICLE CG X-AXIS ACCELERATION (IMPACT DIRECTION)



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH *
VEHICLE CG Y-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)

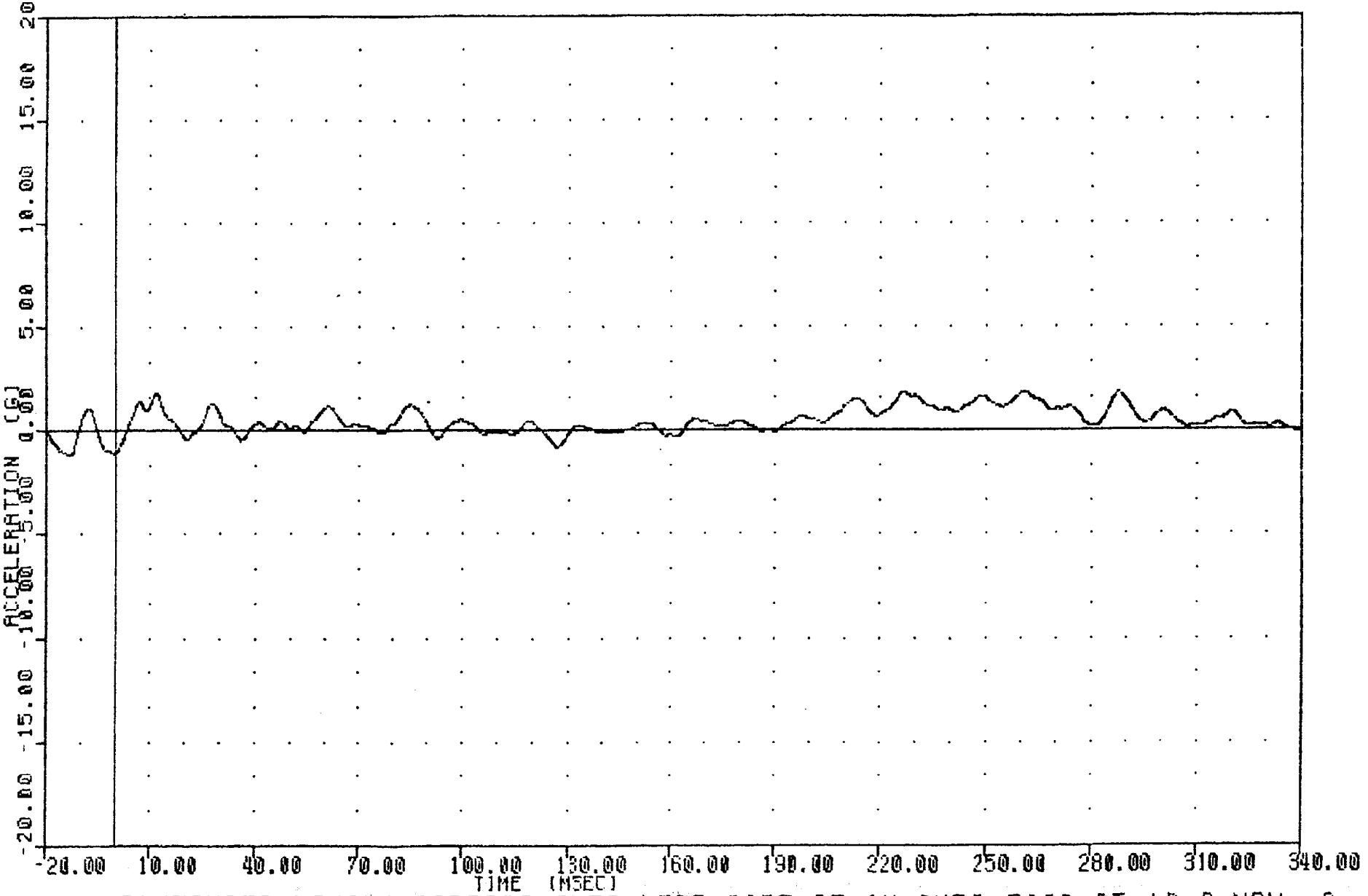


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
VEHICLE CG RESULTANT ACCELERATION



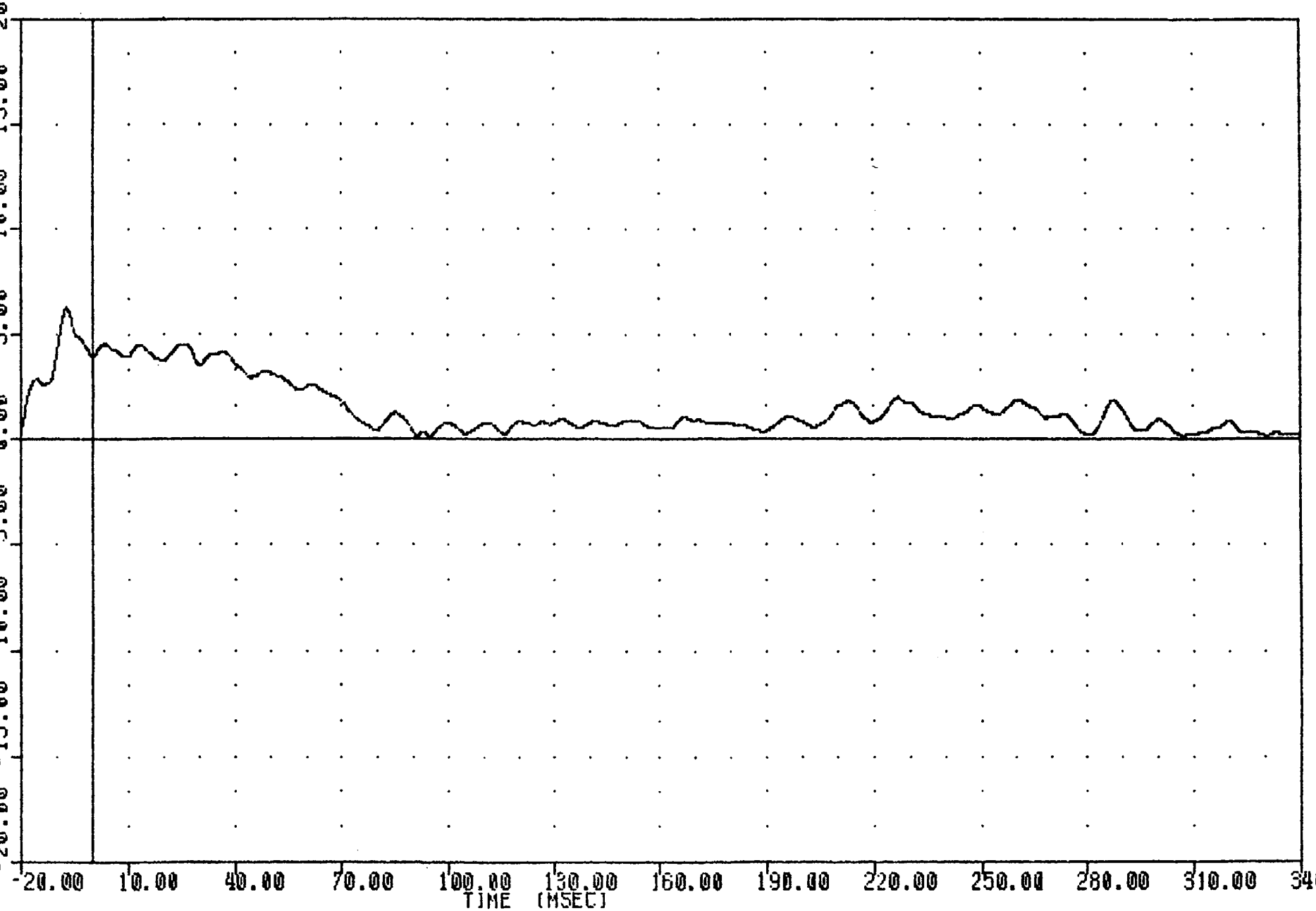
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

900913-3 , TRC
CRASH III DAMAGE ALGORITHM
90256 FILTER = BLPP 100/ 250/ -16
BCGYG MIN, MAX VALUES = -1.19@ -13.38 , 1.84 @ 260.63

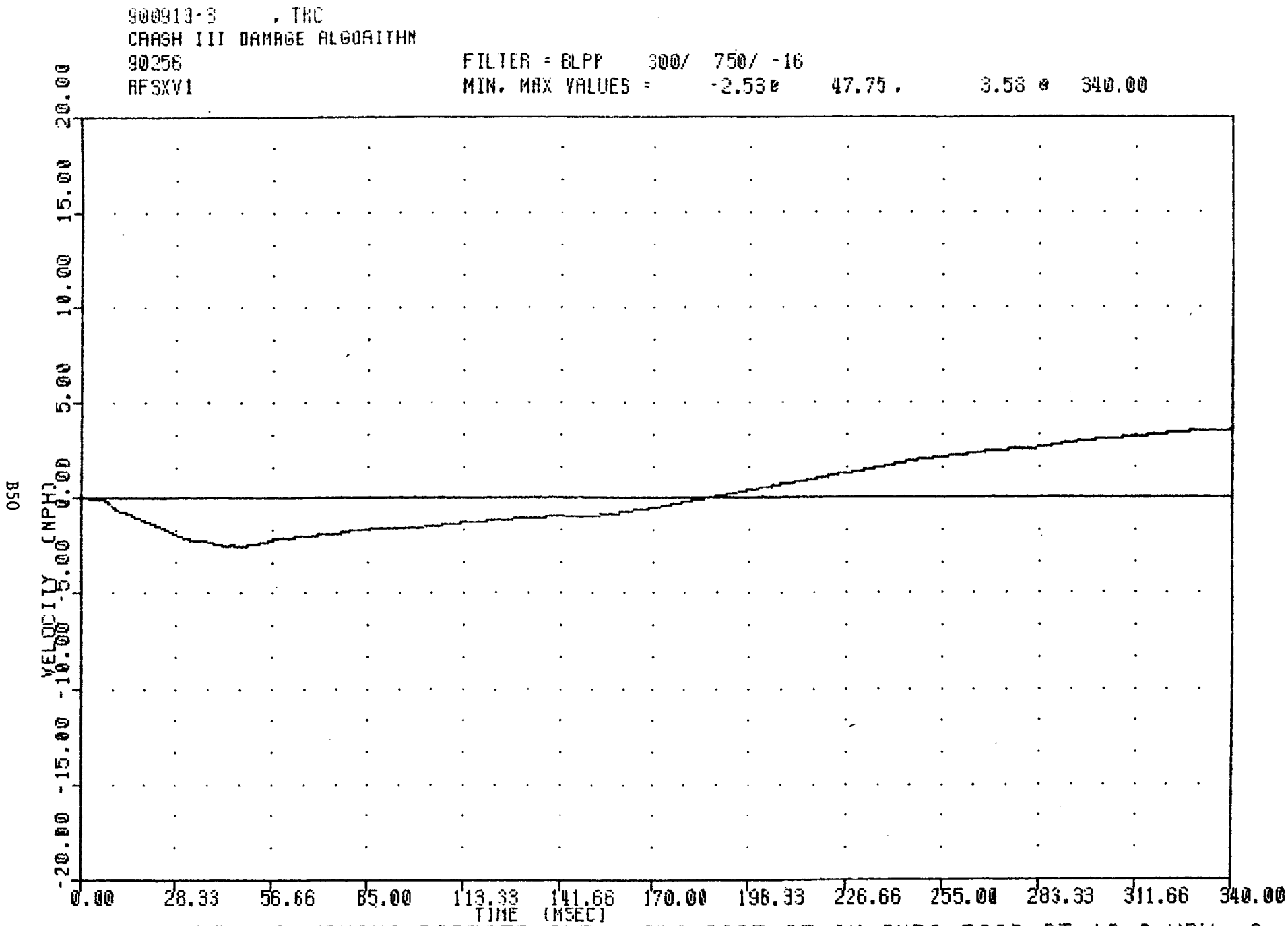


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

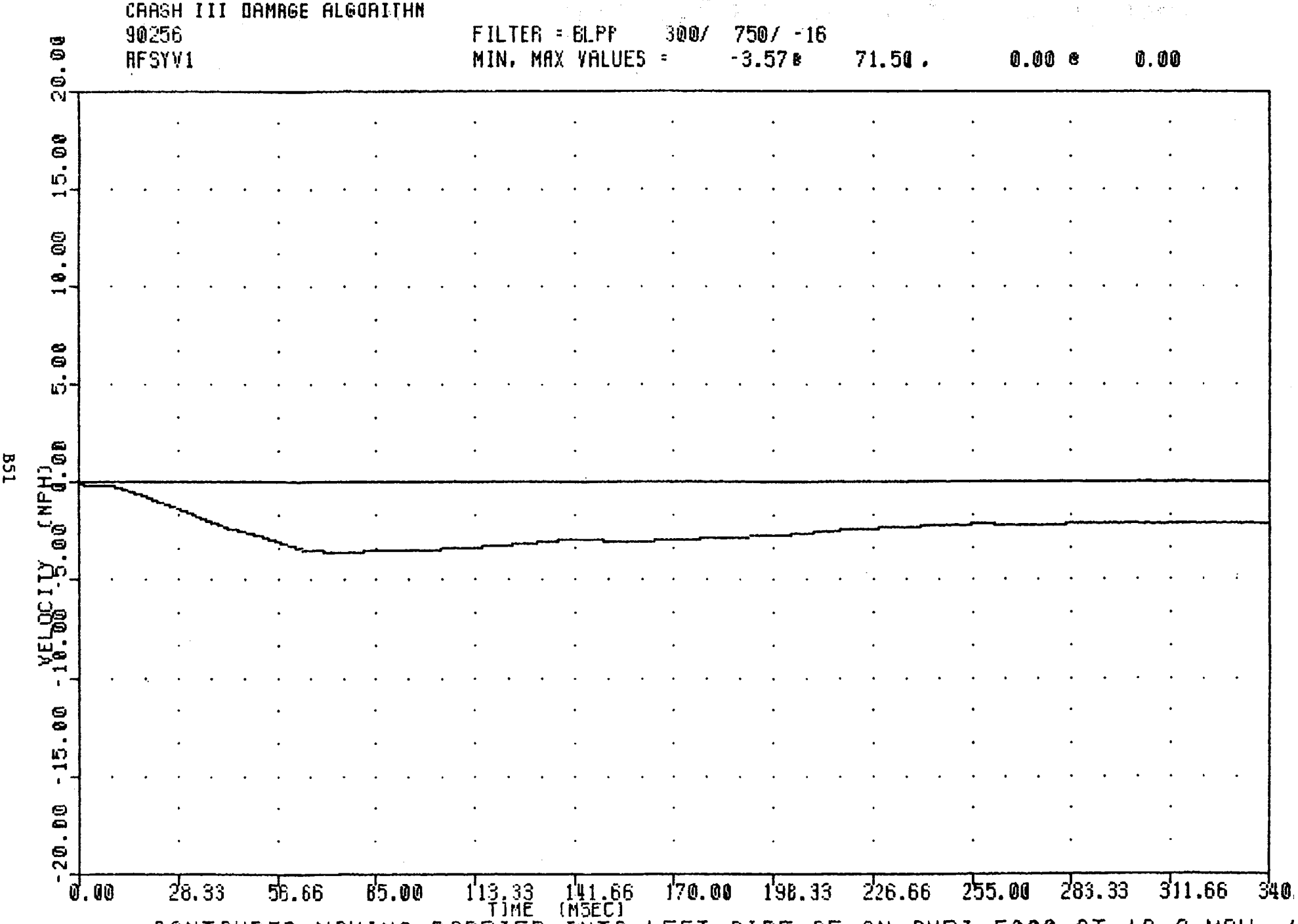
CRASH III DAMAGE ALGORITHM
90256
BCGRG
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = 0.08 @ 94.75 , 6.24 @ -7.25



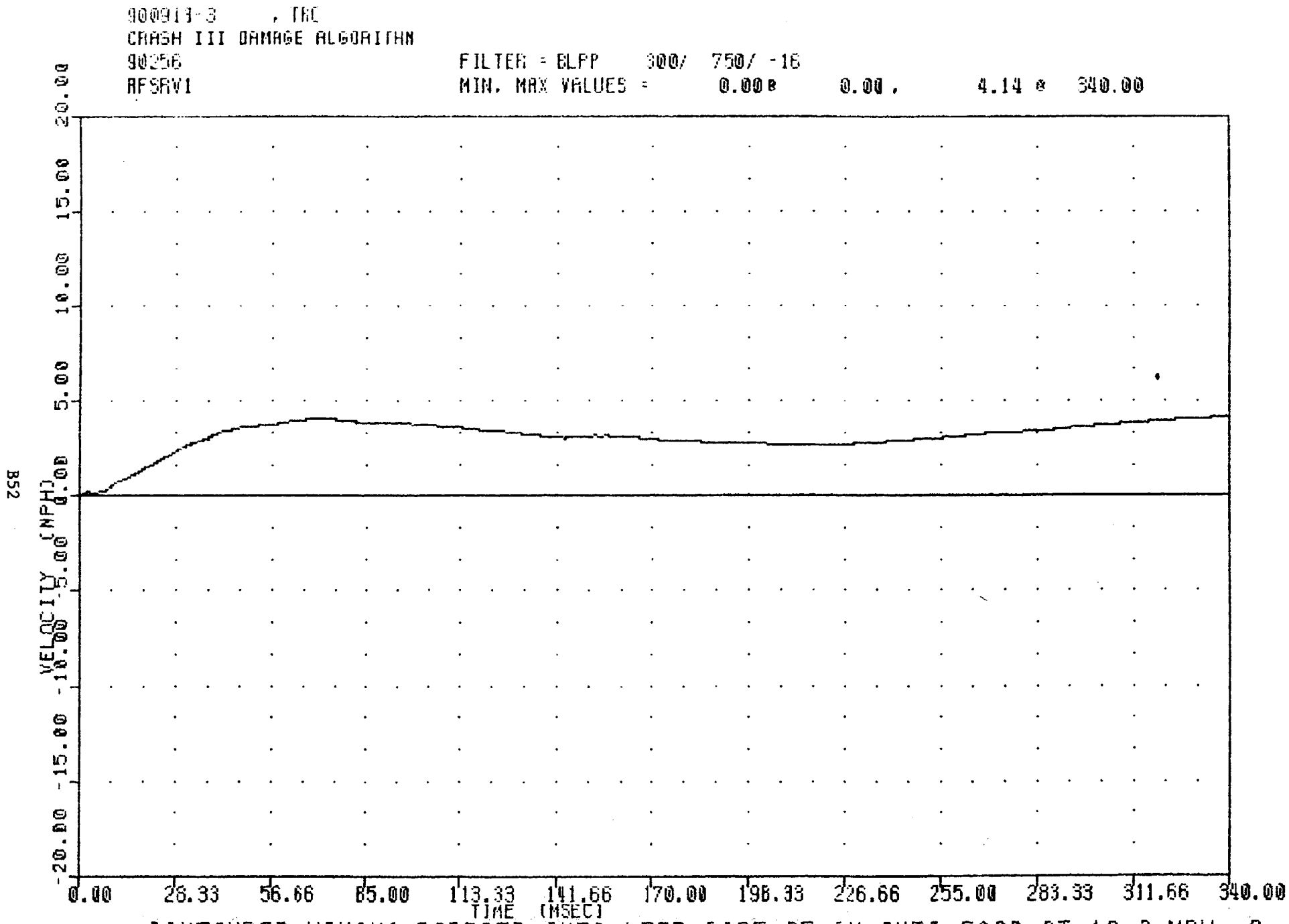
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
RIGHT FRONT SILL X-AXIS VELOCITY

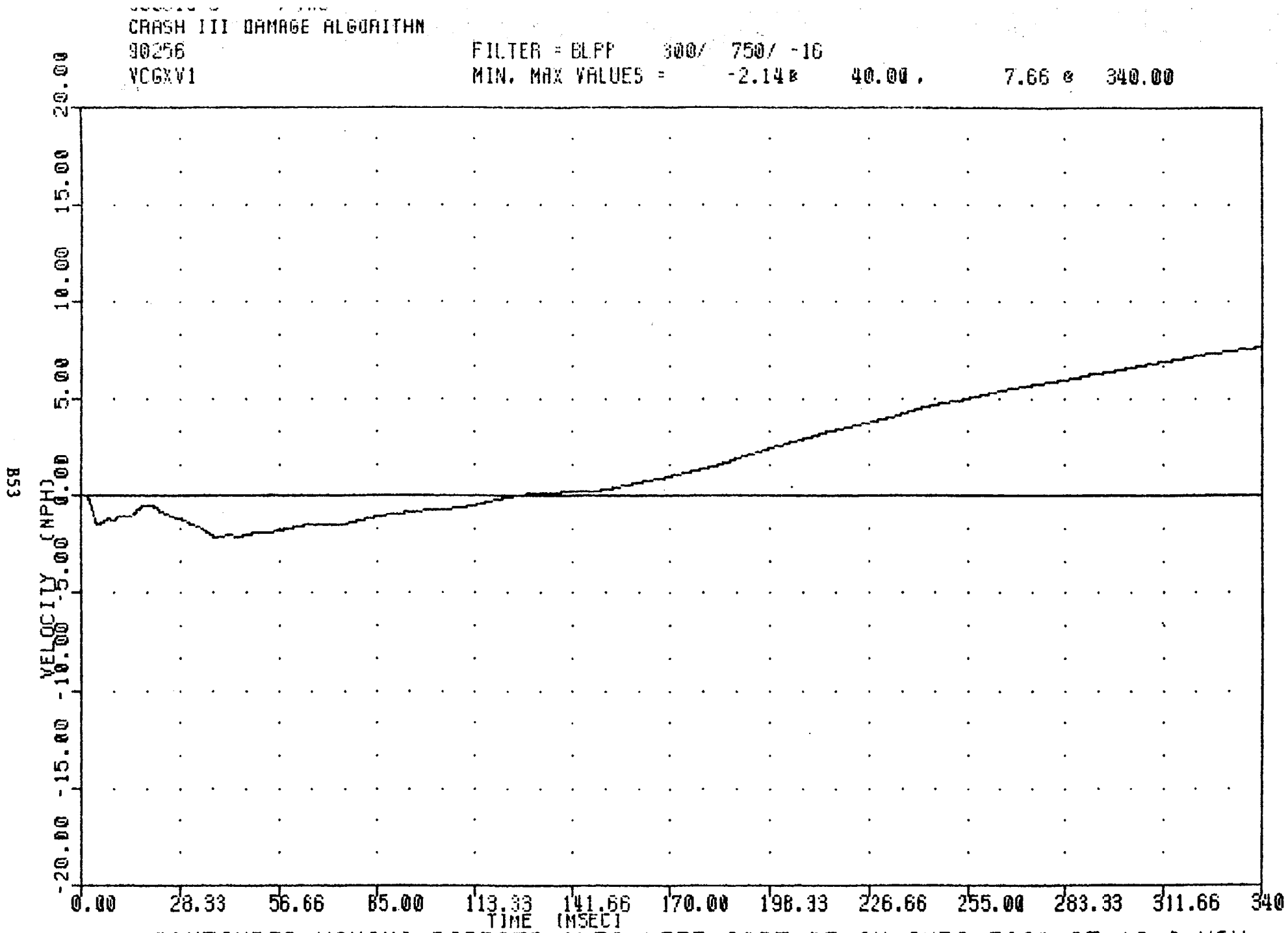


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH *
RIGHT FRONT SILL Y-AXIS VELOCITY

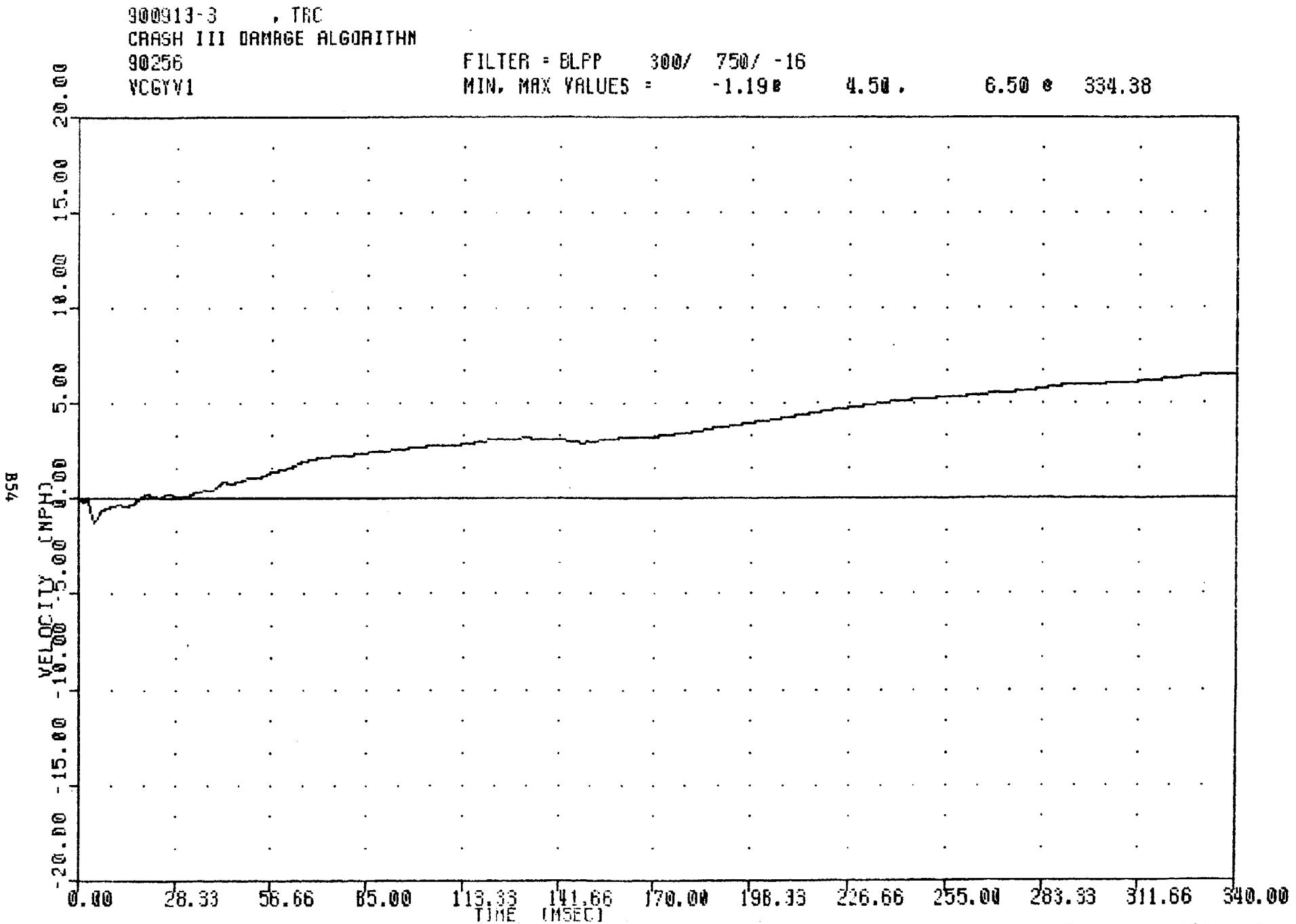


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
RIGHT FRONT SILL RESULTANT VELOCITY

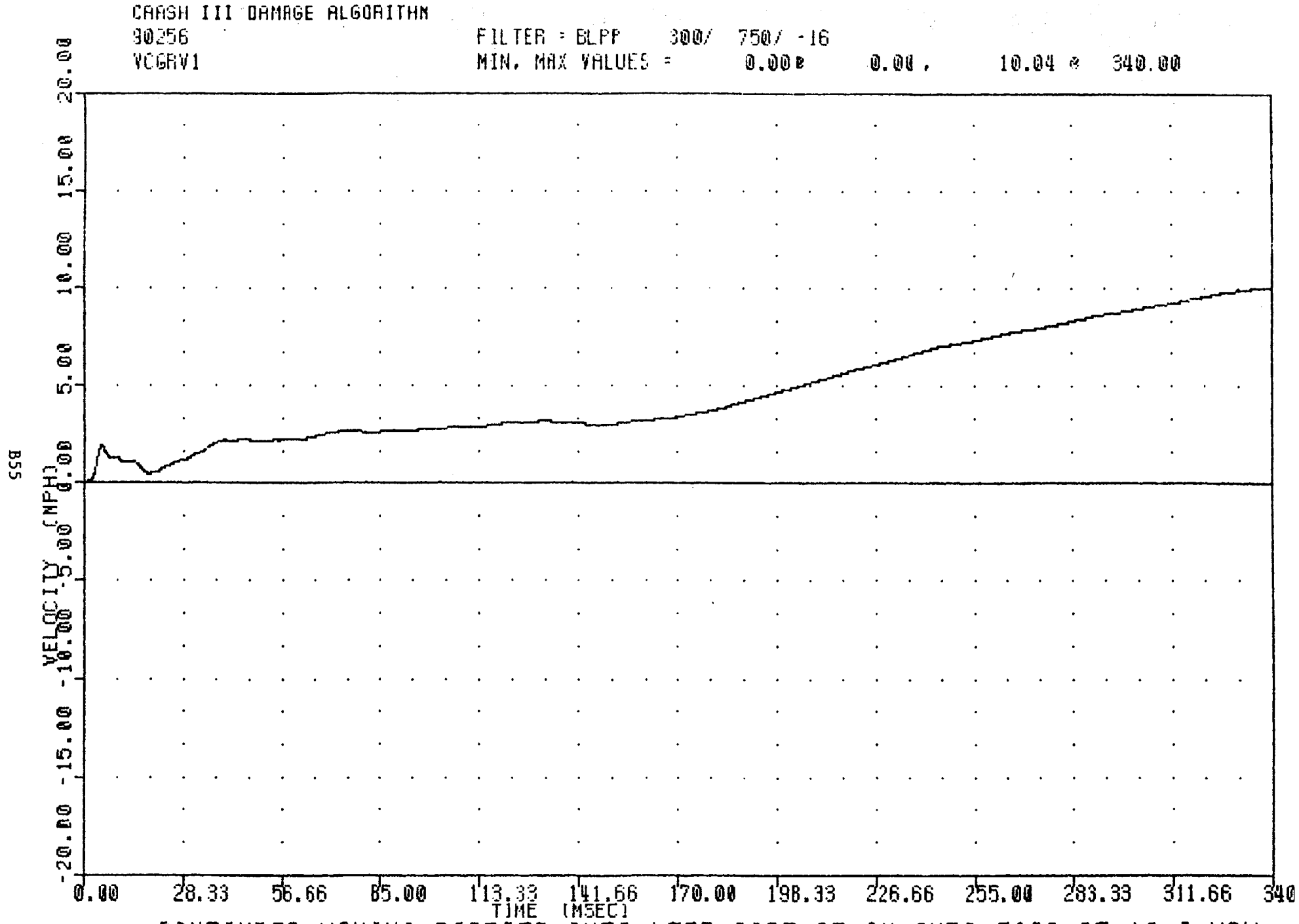
B52



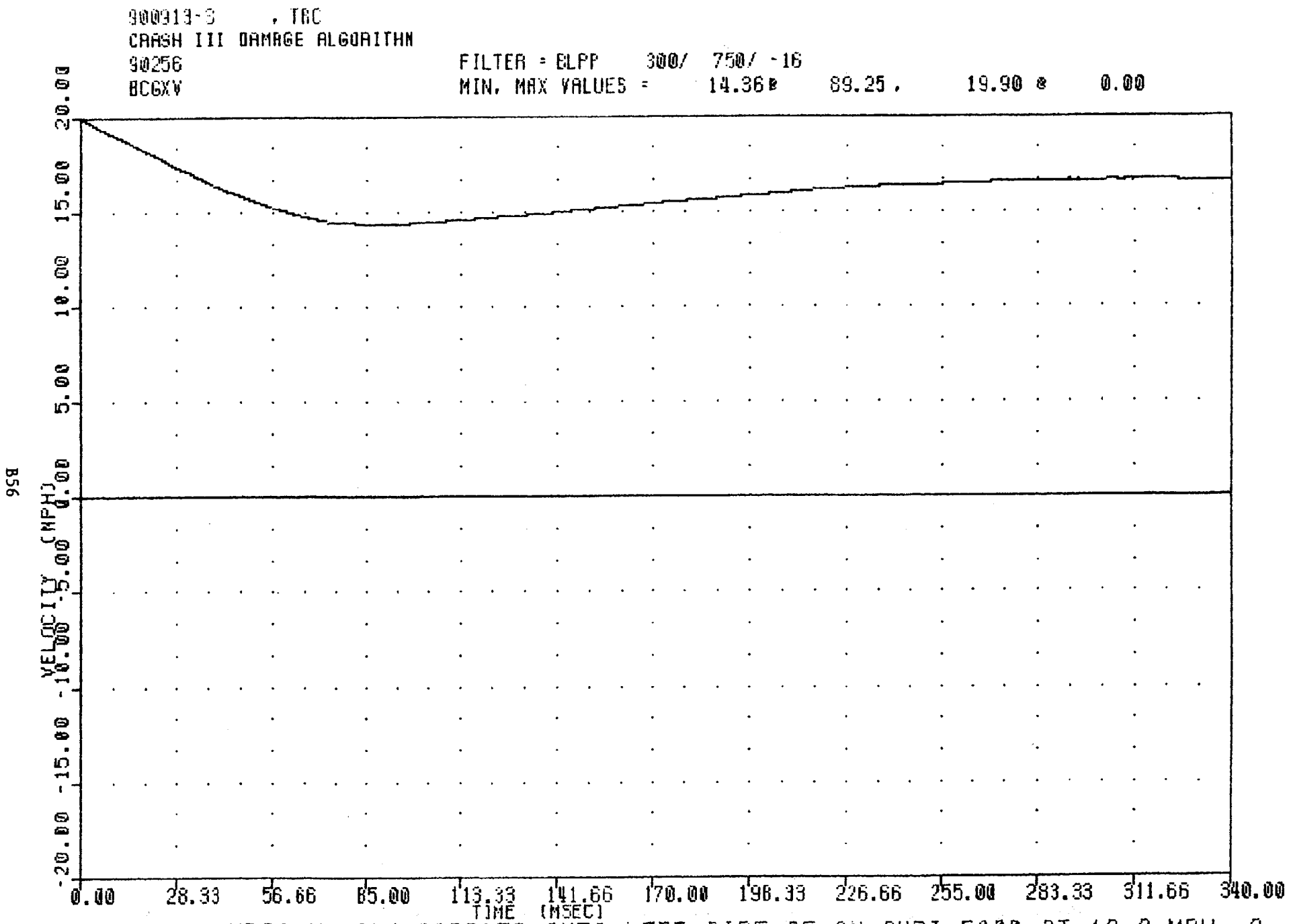
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH *
VEHICLE CG X-AXIS VELOCITY (IMPACT DIRECTION)



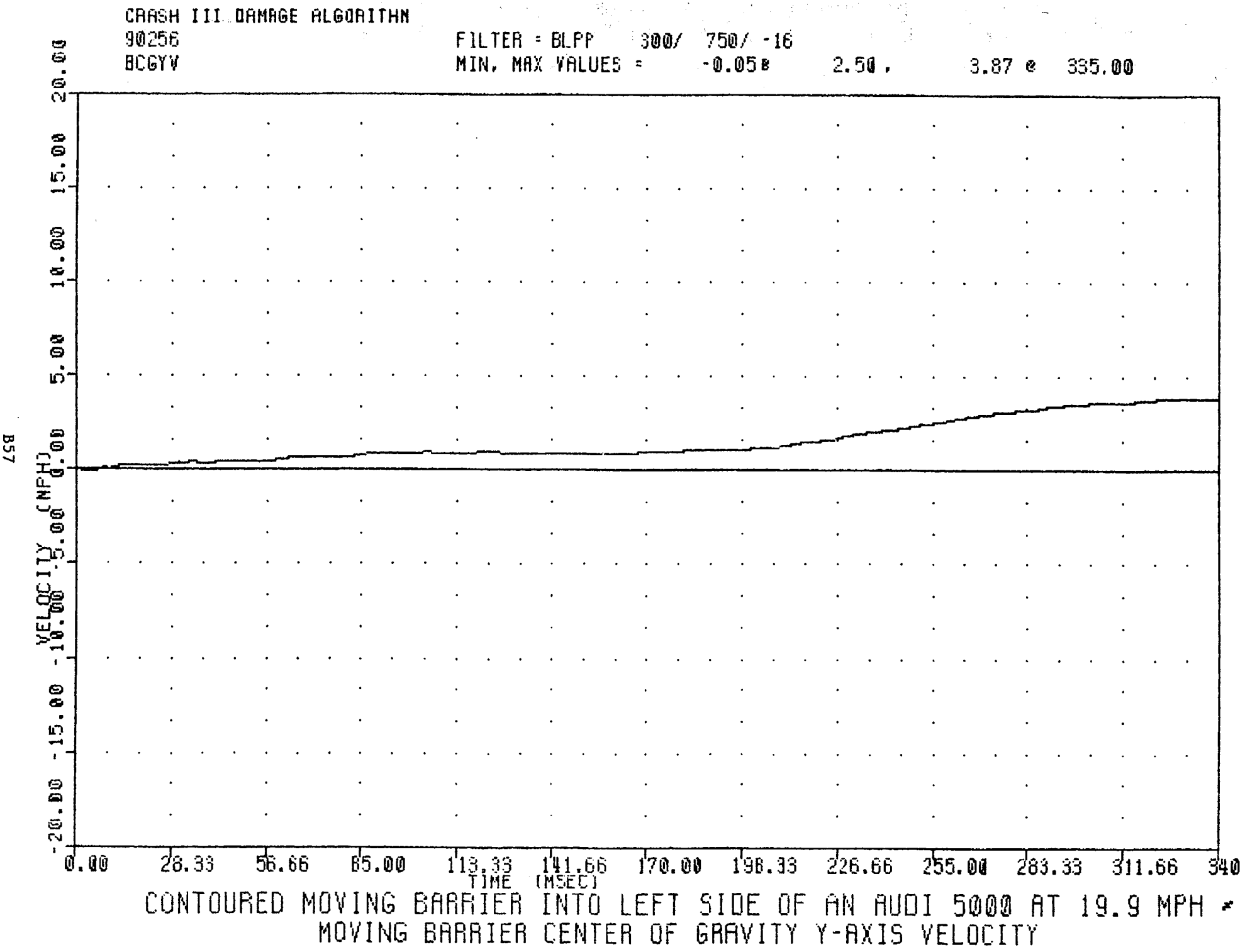
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
VEHICLE CG Y-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)



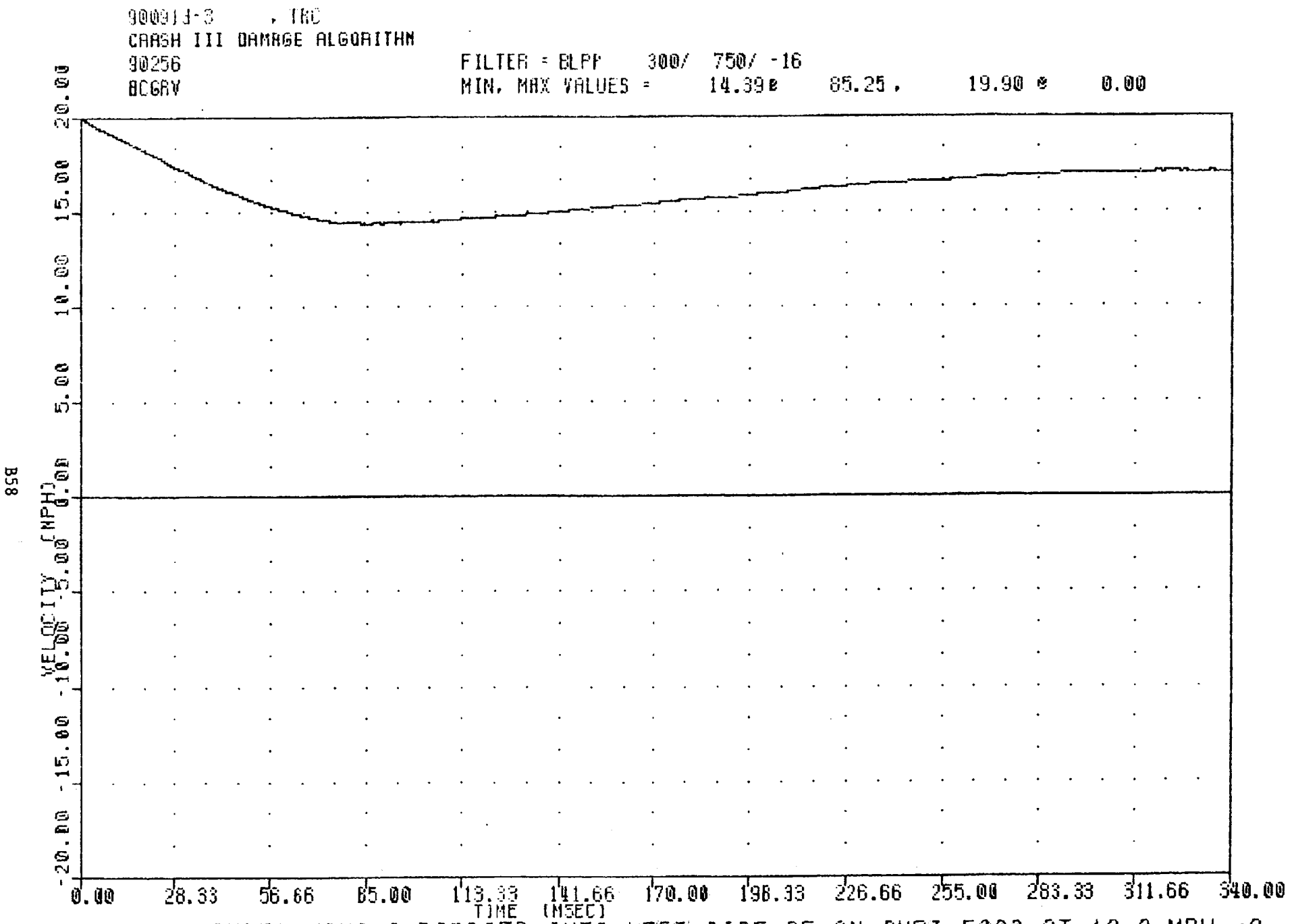
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH
VEHICLE CG RESULTANT VELOCITY



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

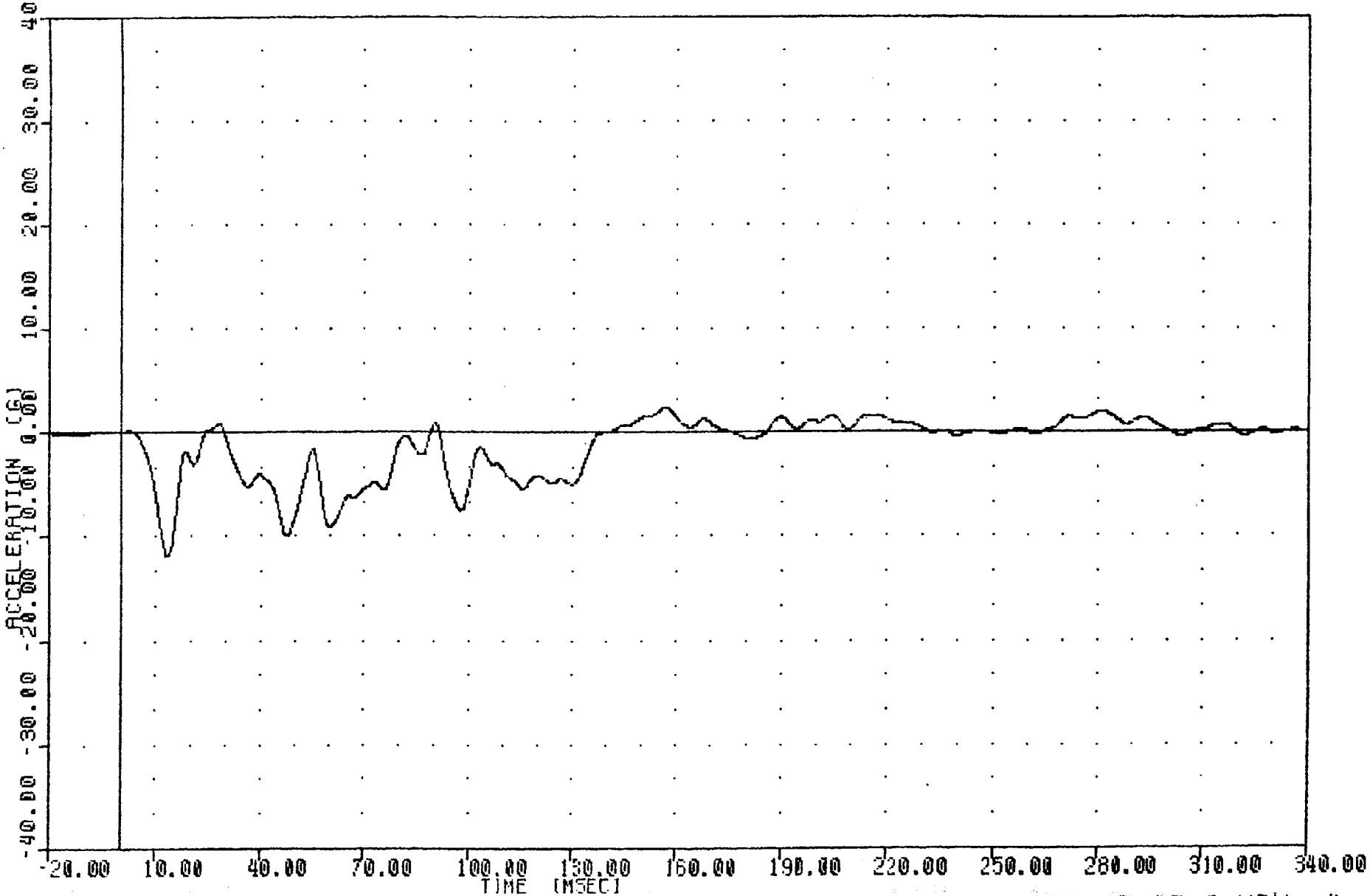


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY

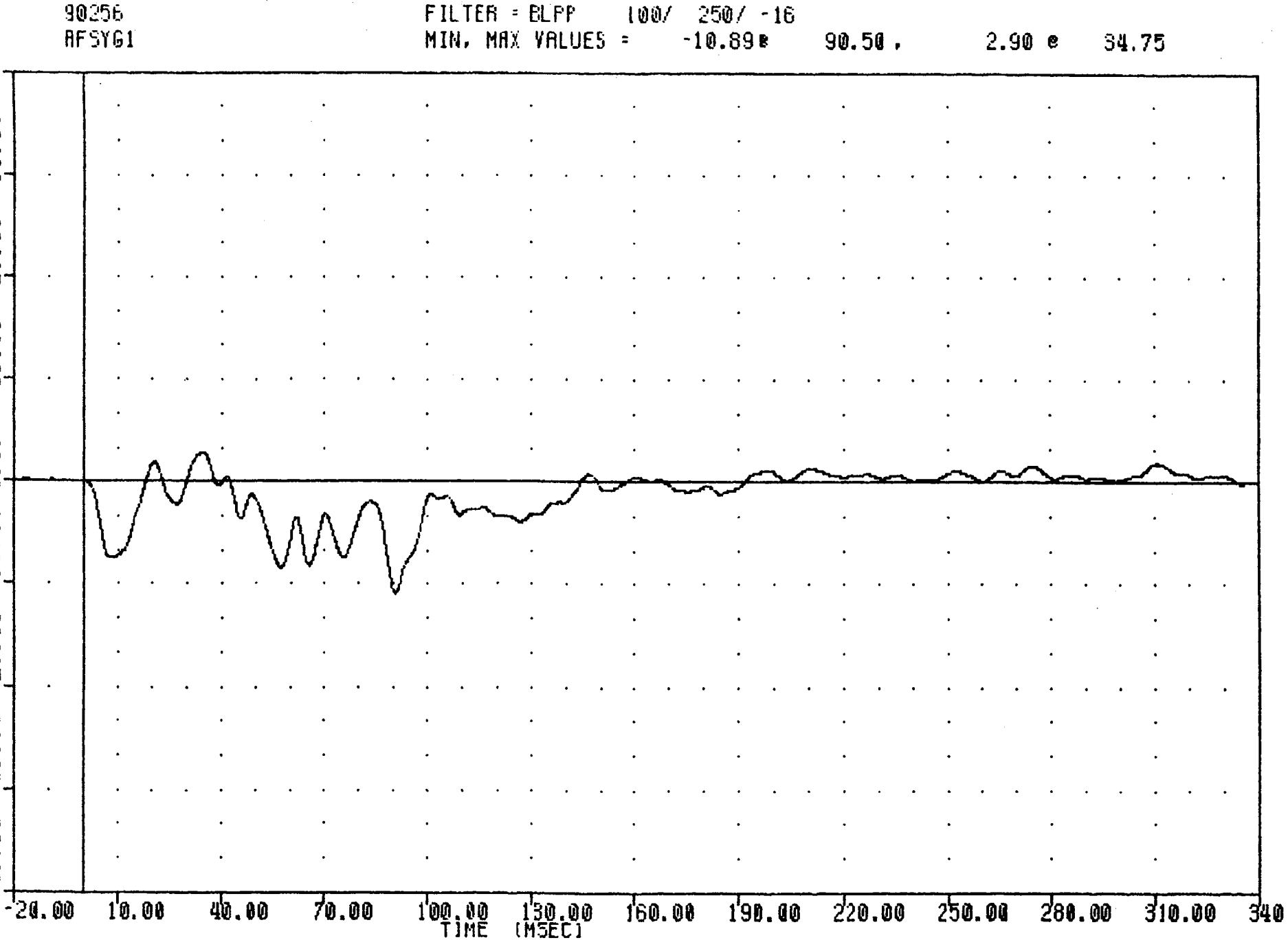


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 19.9 MPH #3
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

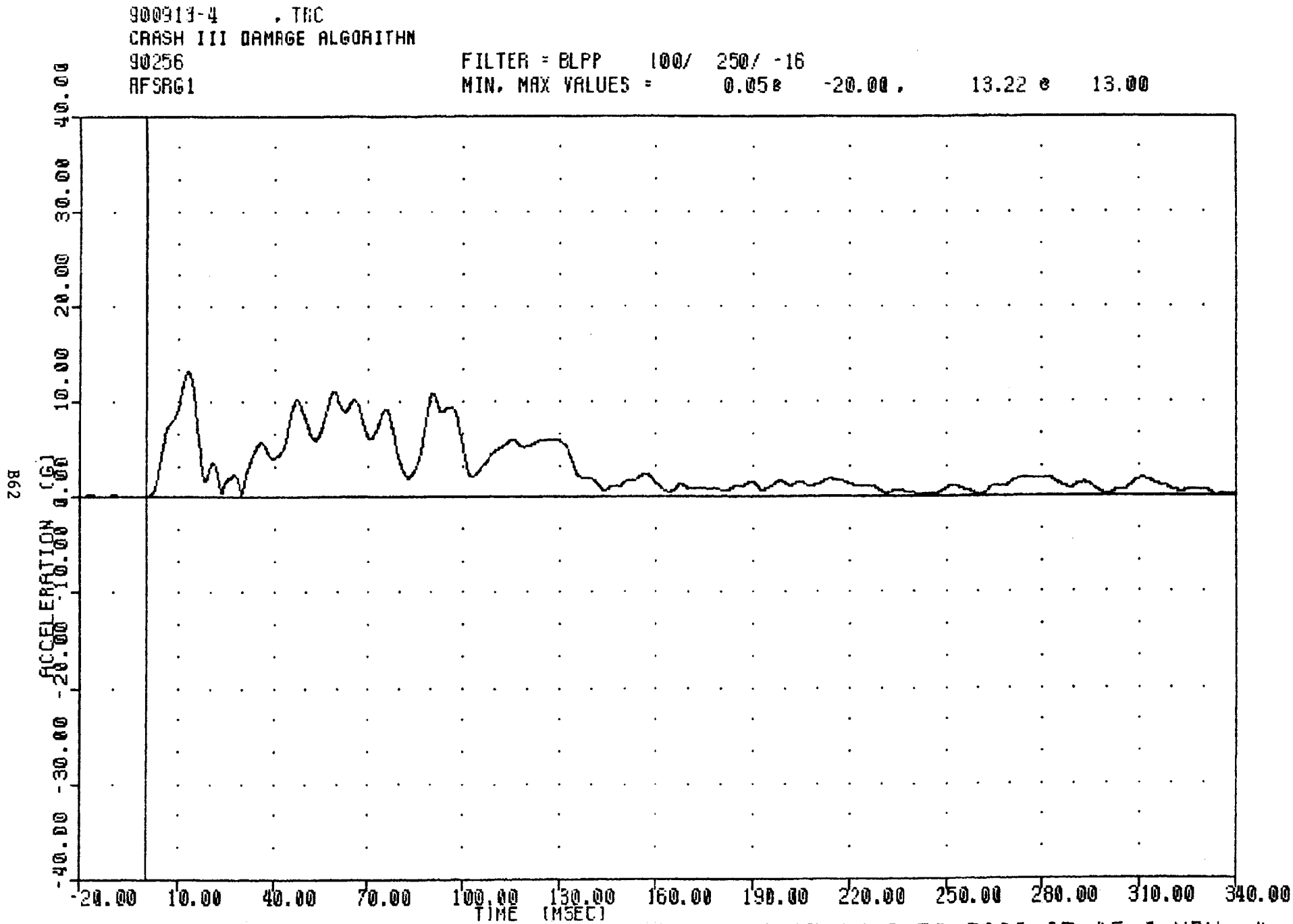
900913-4 , TRC
CRASH III DAMAGE ALGORITHM
90256 FILTER = BLPF 100/ 250/ -16
RFSXG1 MIN, MAX VALUES = -11.88 @ 13.25 , 2.46 @ 156.63



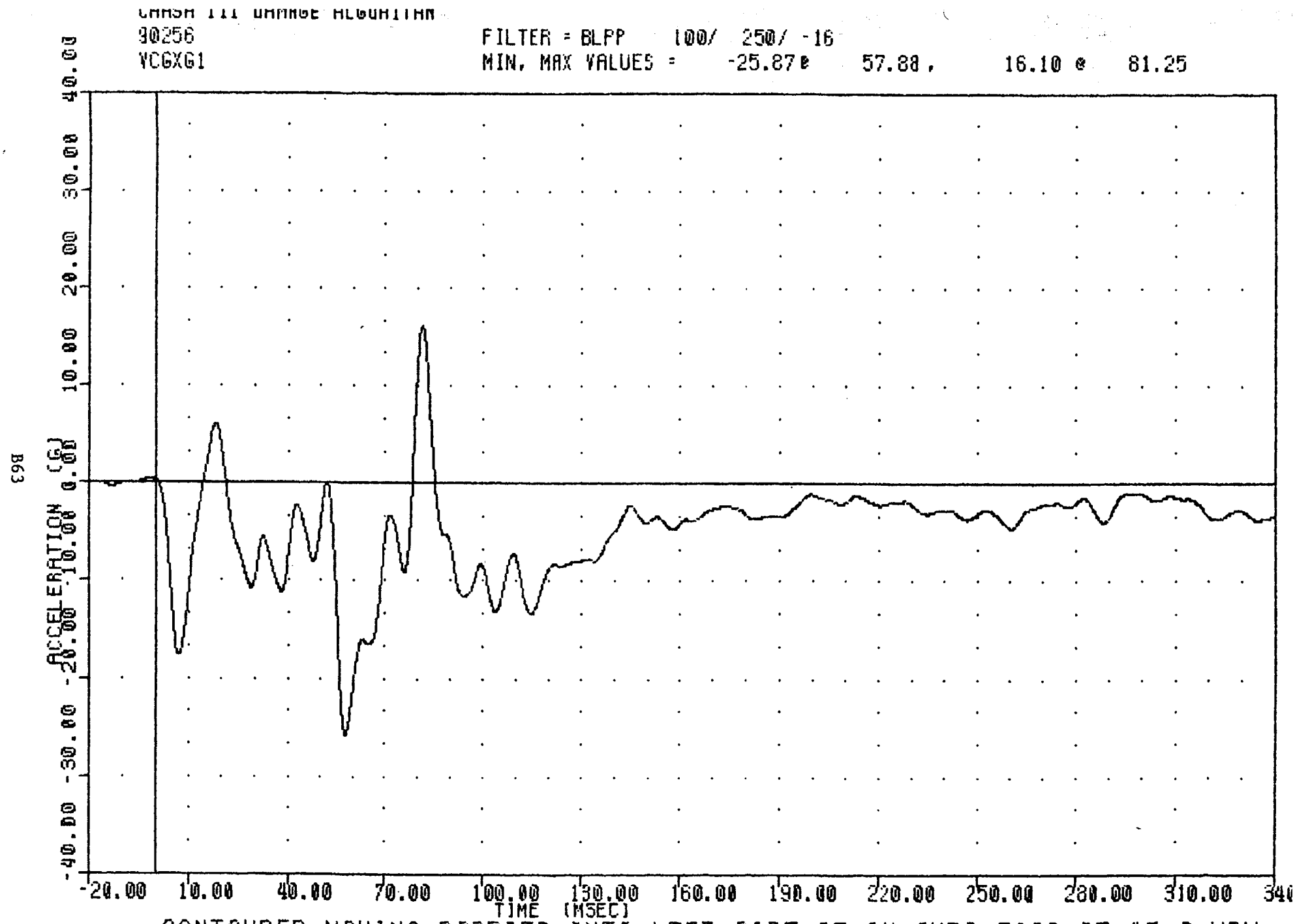
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
RIGHT FRONT SILL X-AXIS ACCELERATION



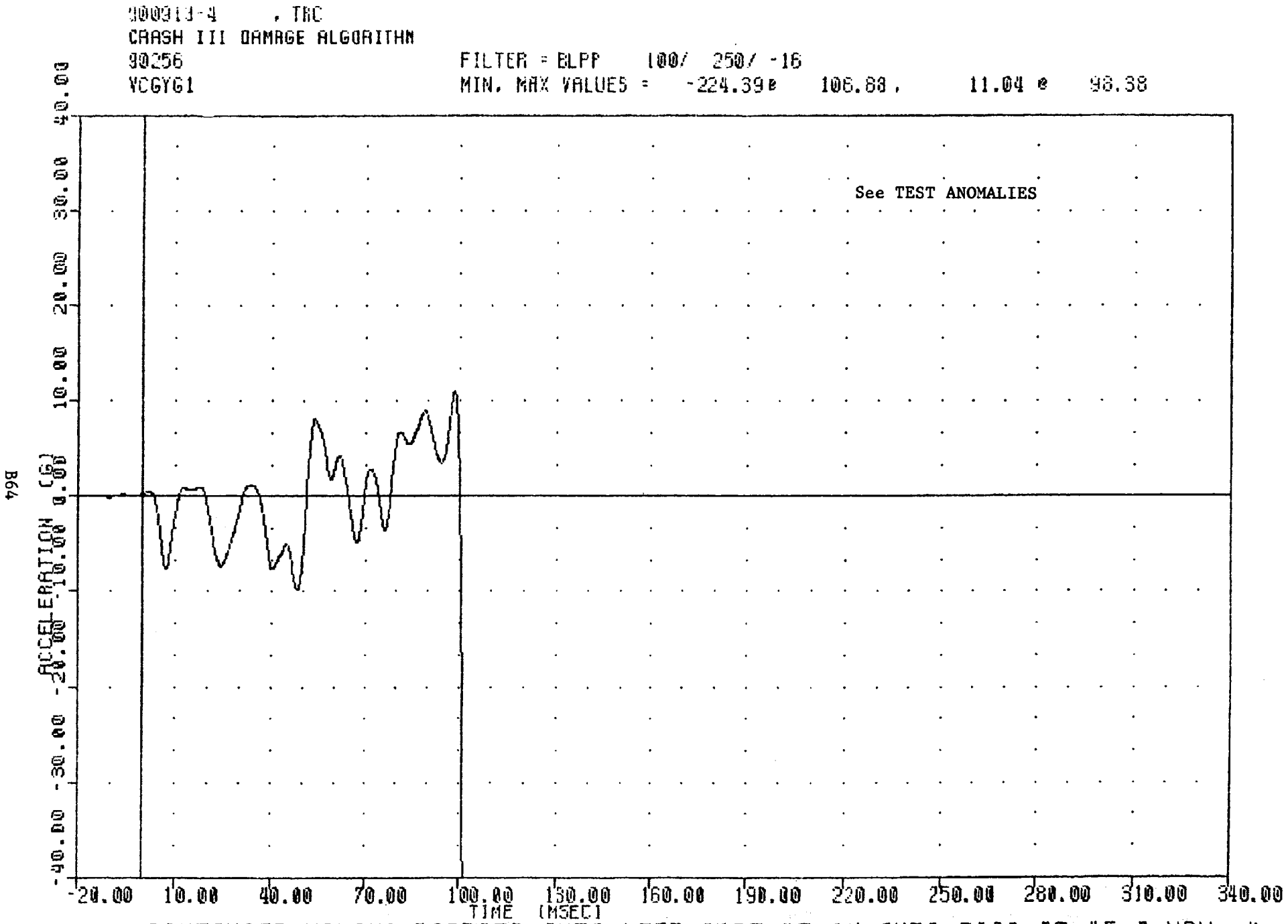
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH
RIGHT FRONT SILL Y-AXIS ACCELERATION



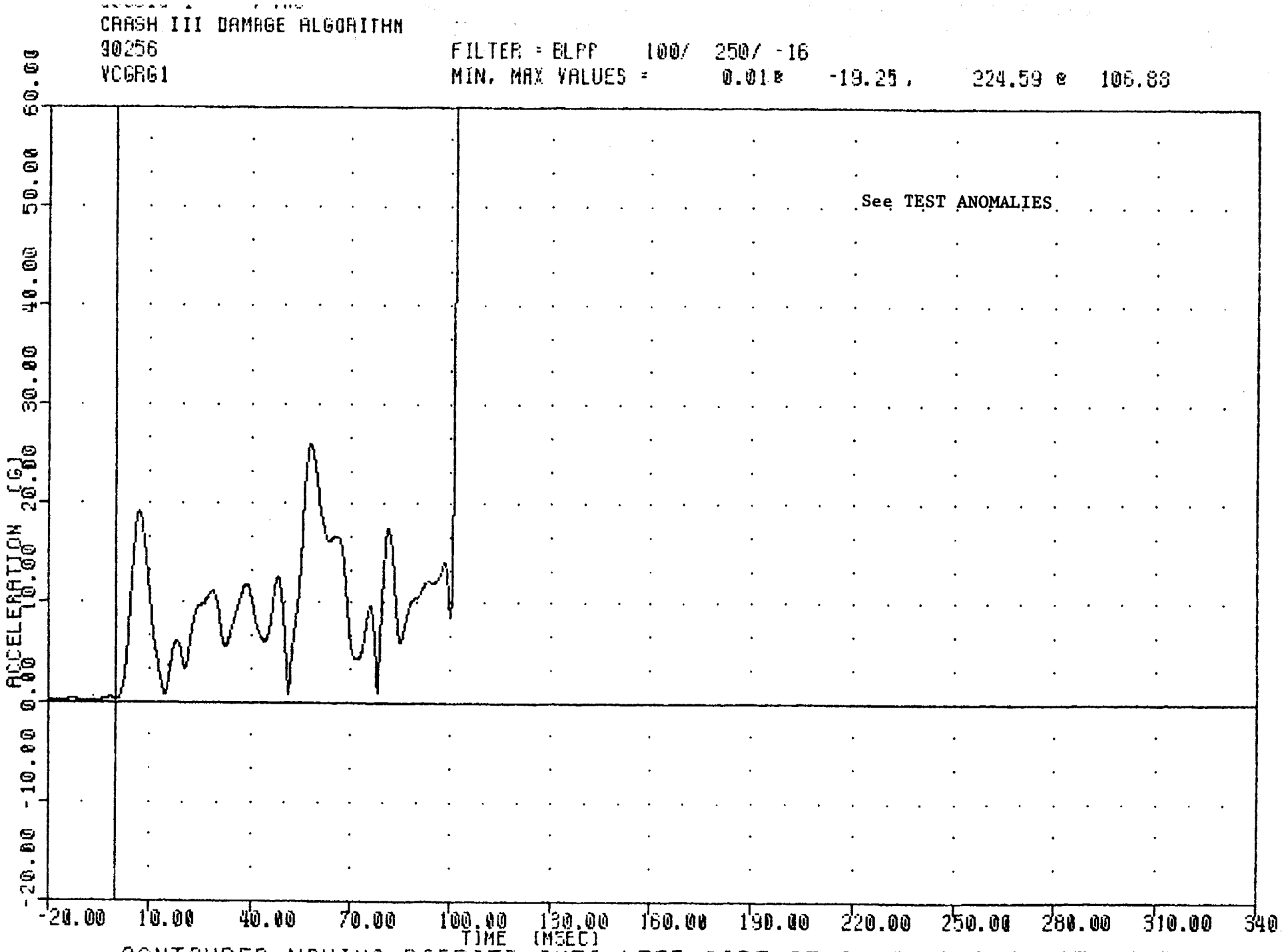
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
RIGHT FRONT SILL RESULTANT ACCELERATION



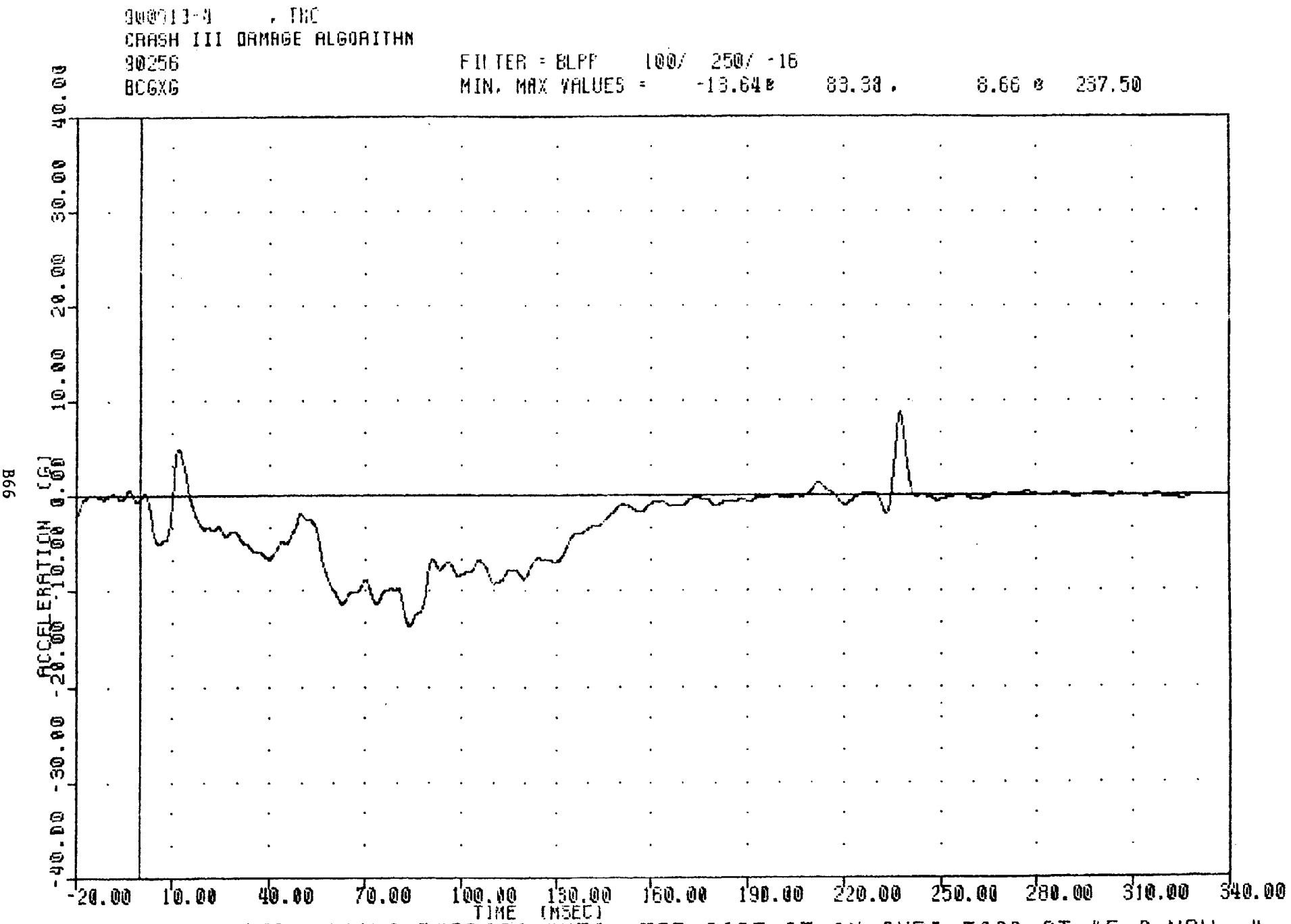
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH *
VEHICLE CG X-AXIS ACCELERATION (IMPACT DIRECTION)



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
VEHICLE CG Y-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)

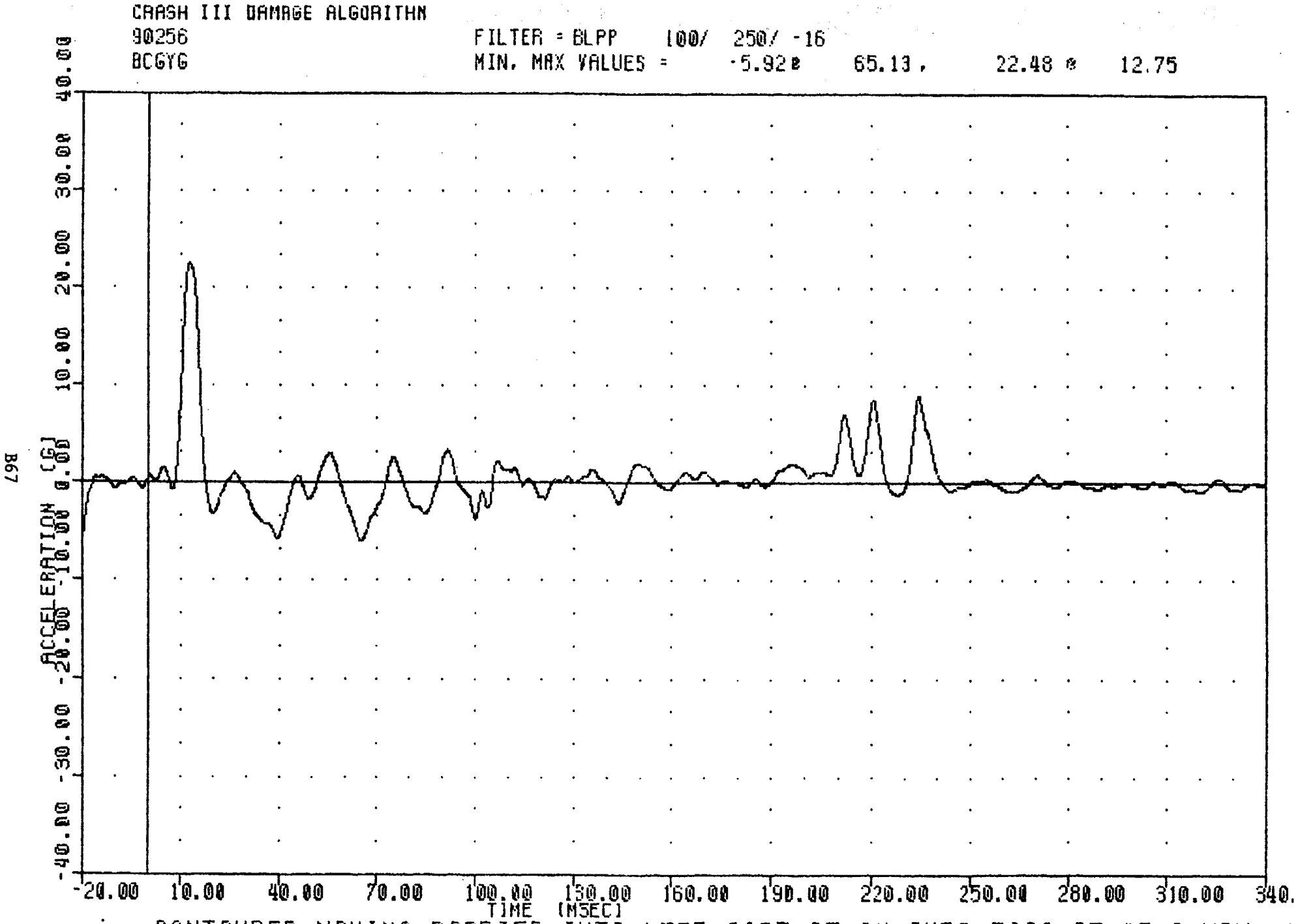


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH
VEHICLE CG RESULTANT ACCELERATION

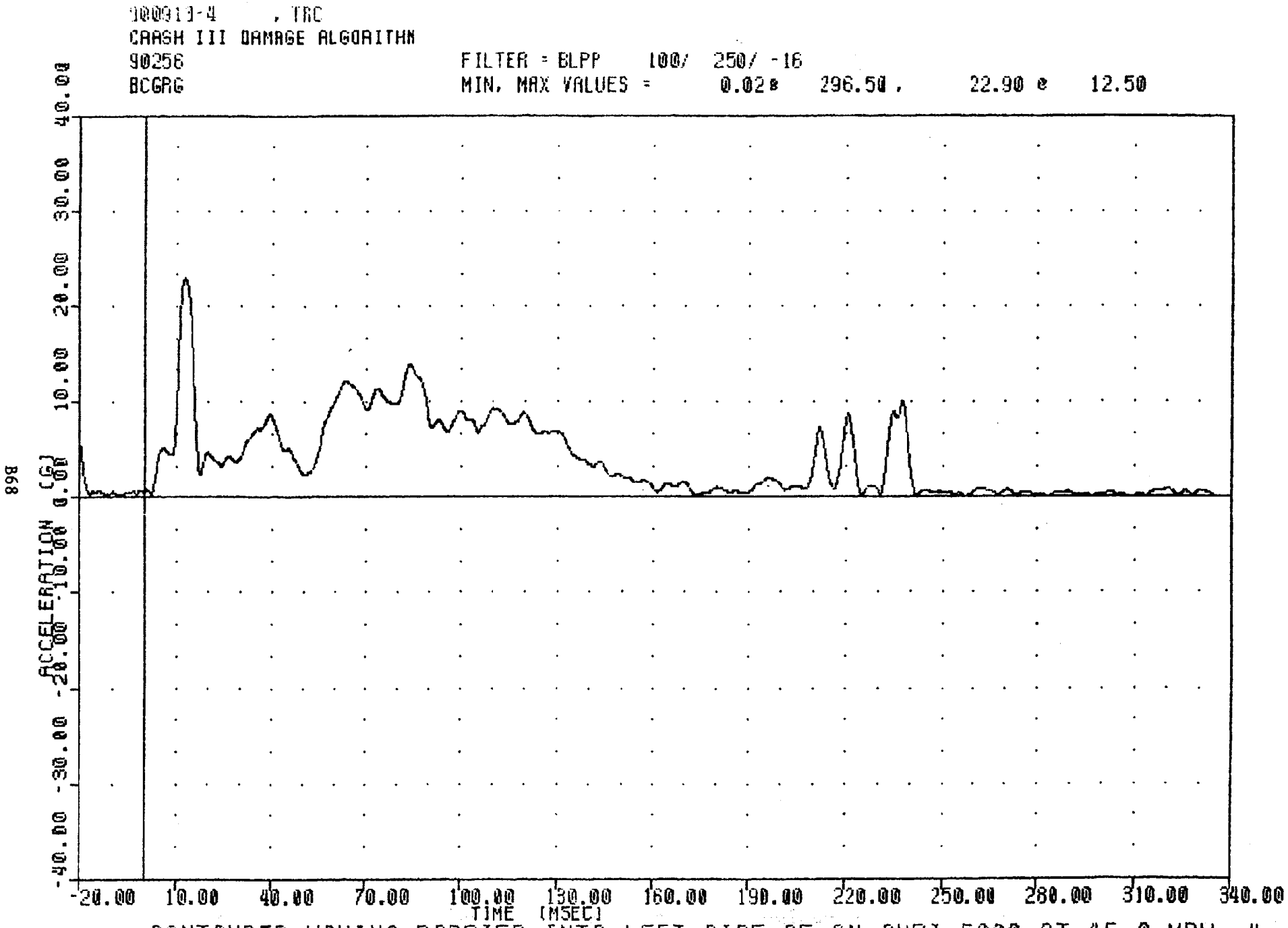


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH *4

MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

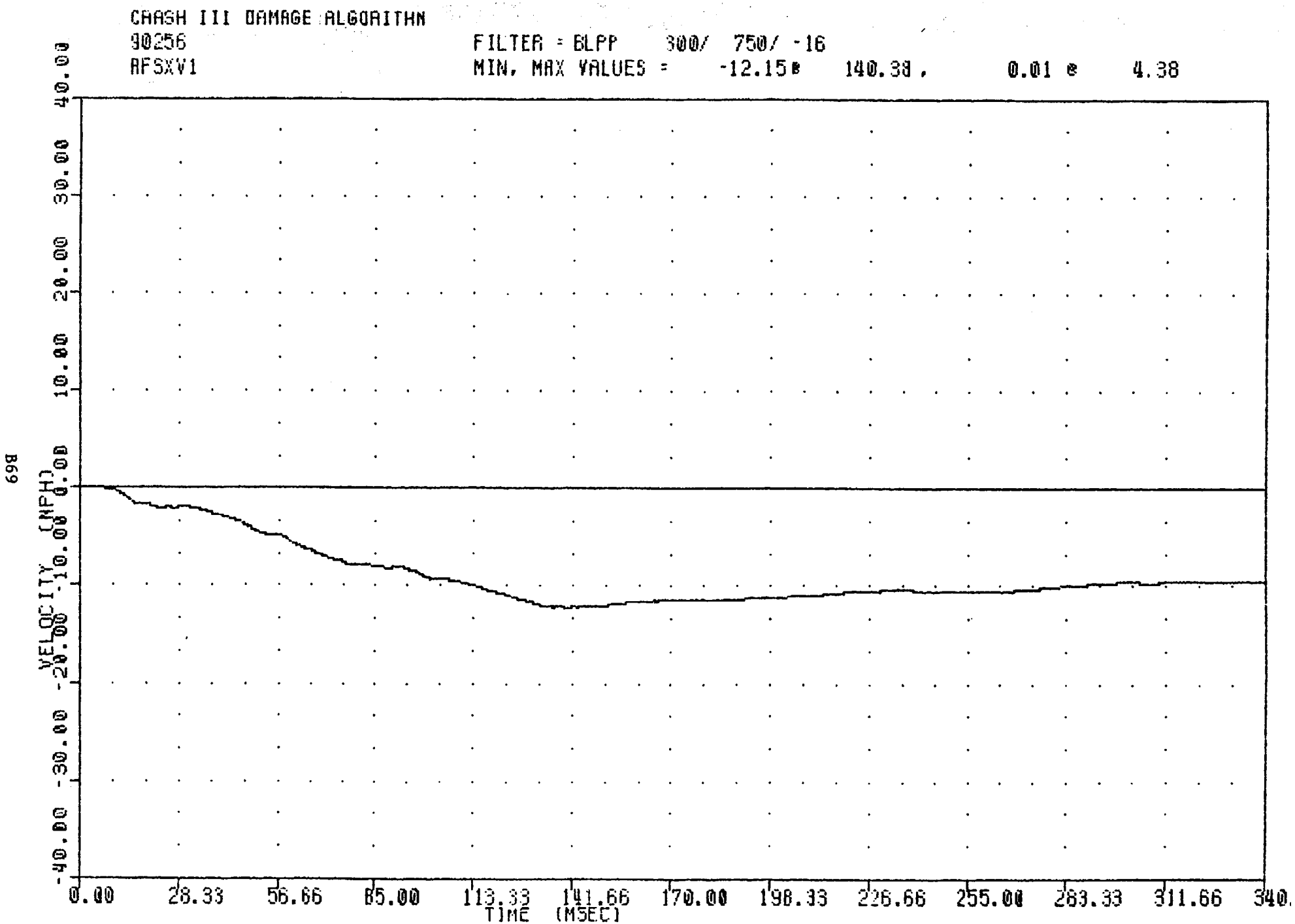


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION



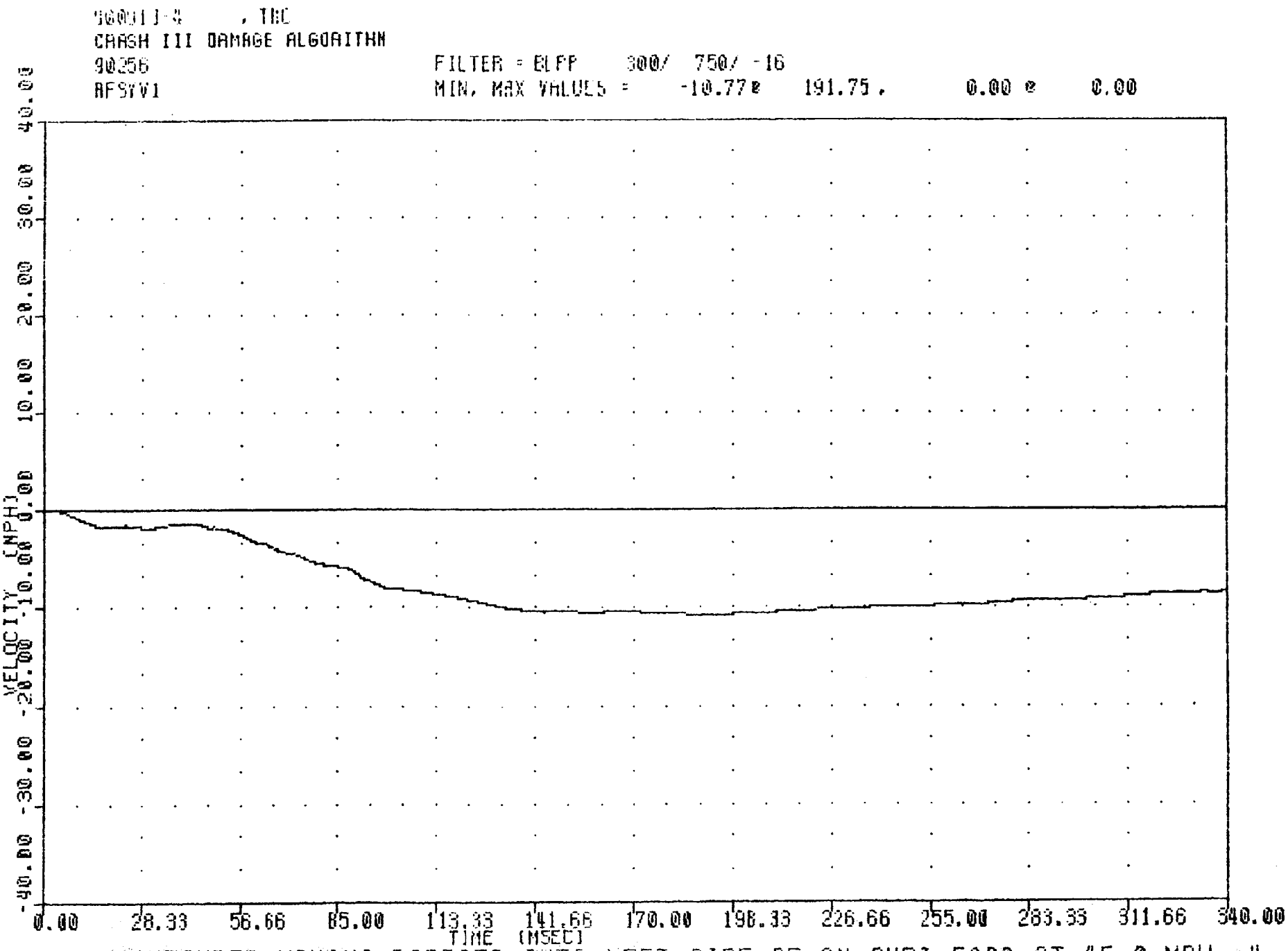
868

CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

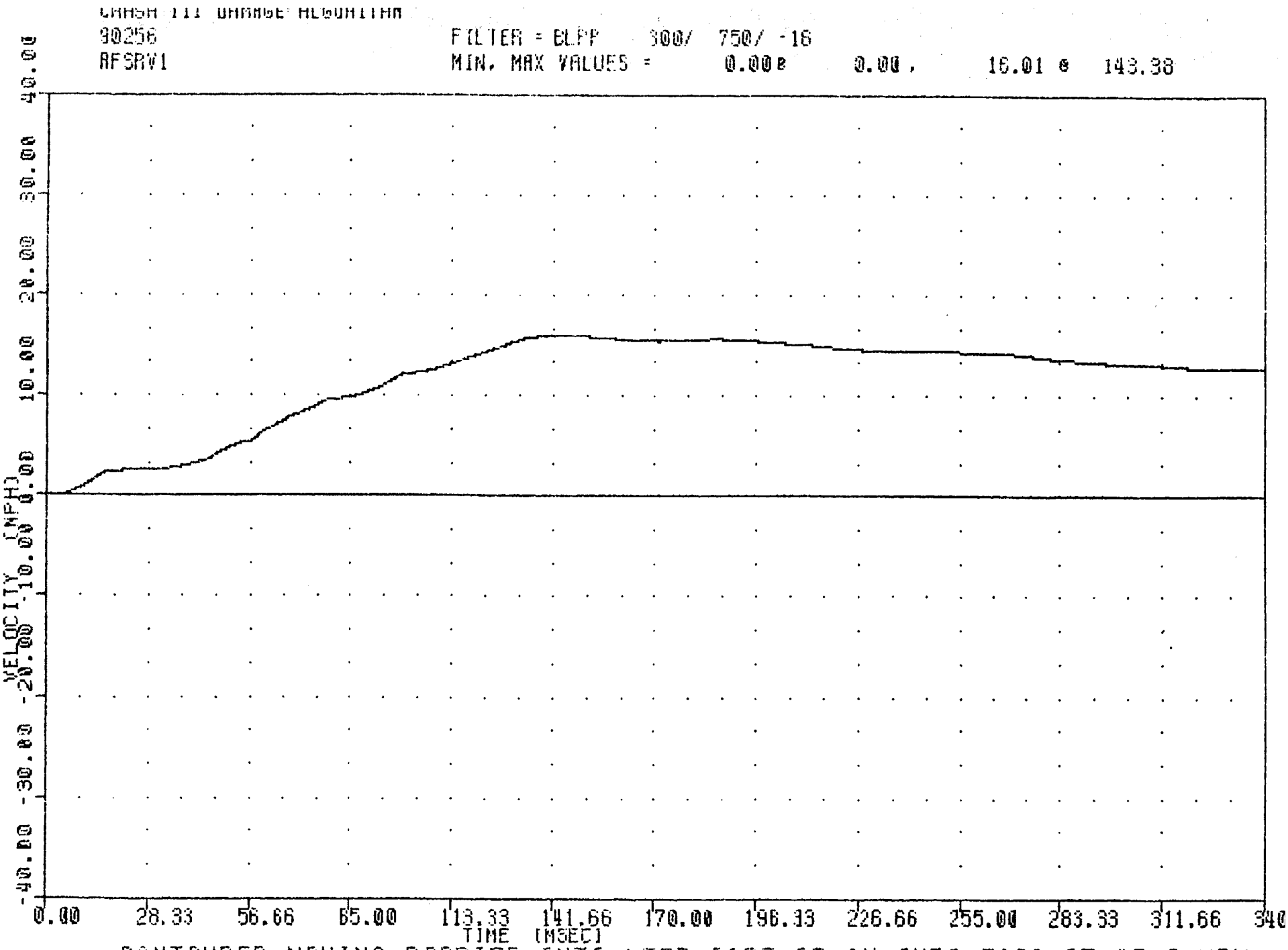


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH
RIGHT FRONT SILL X-AXIS VELOCITY

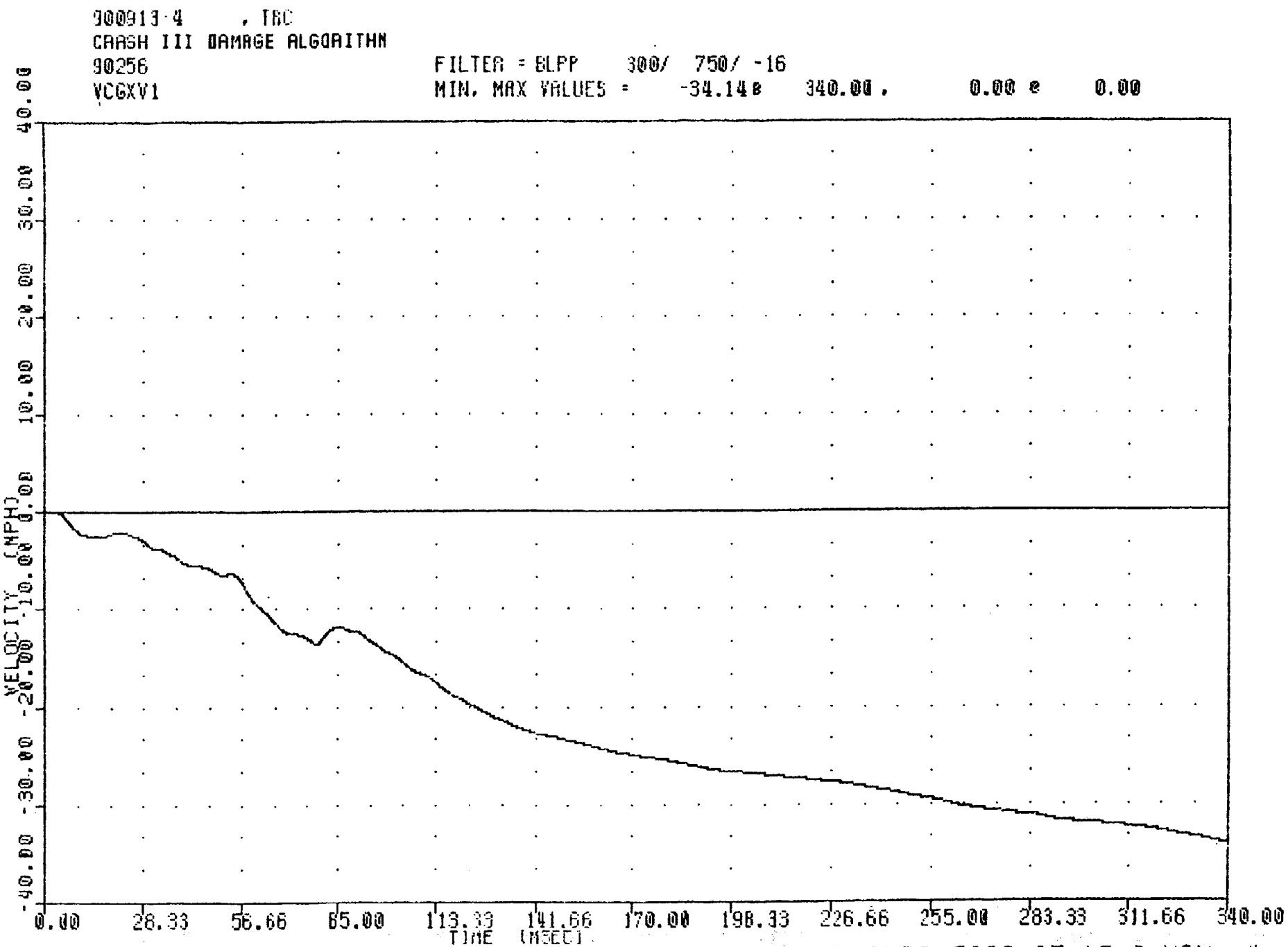
869



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
RIGHT FRONT SILL Y-AXIS VELOCITY

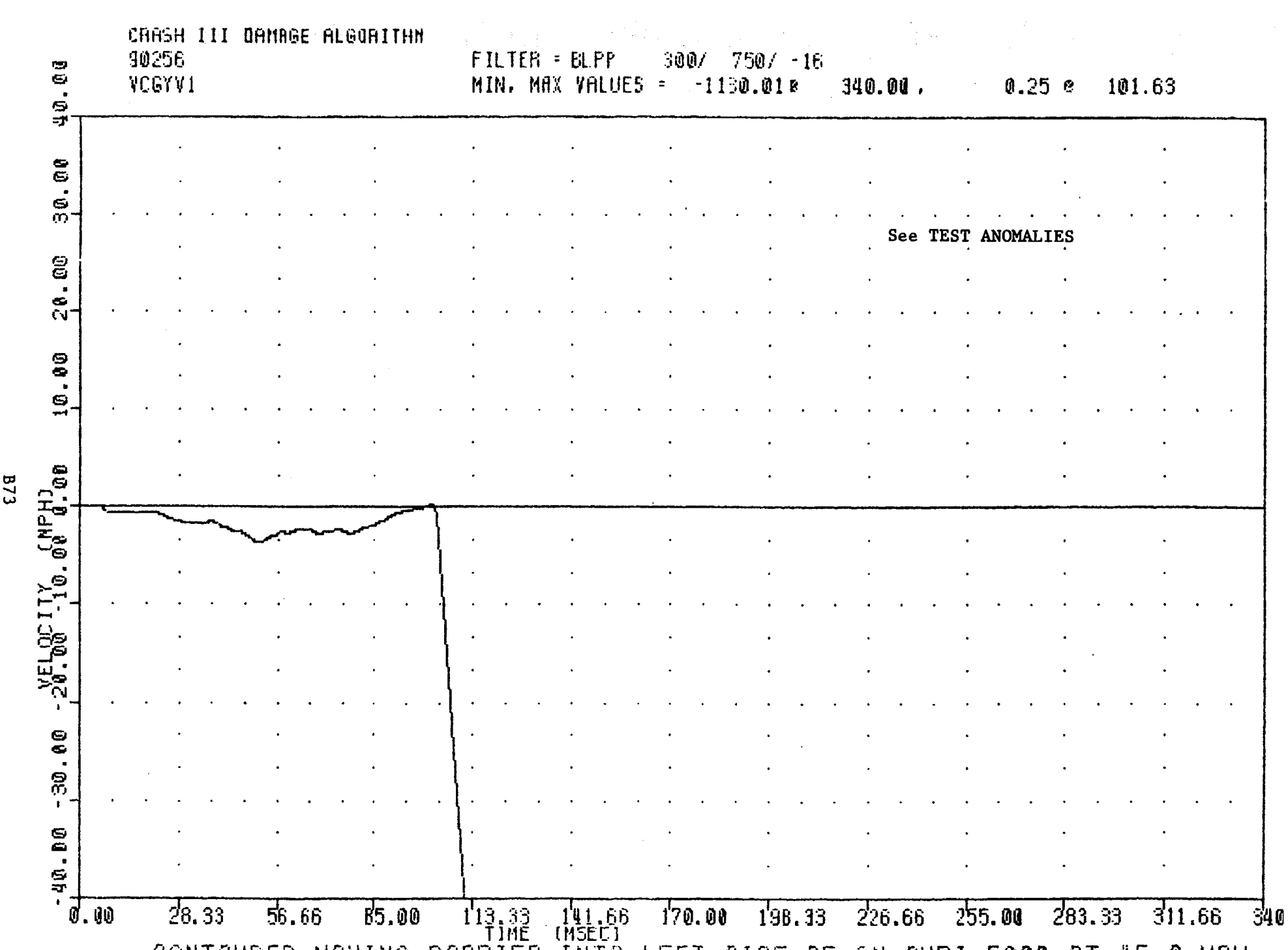


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH *
RIGHT FRONT SILL RESULTANT VELOCITY

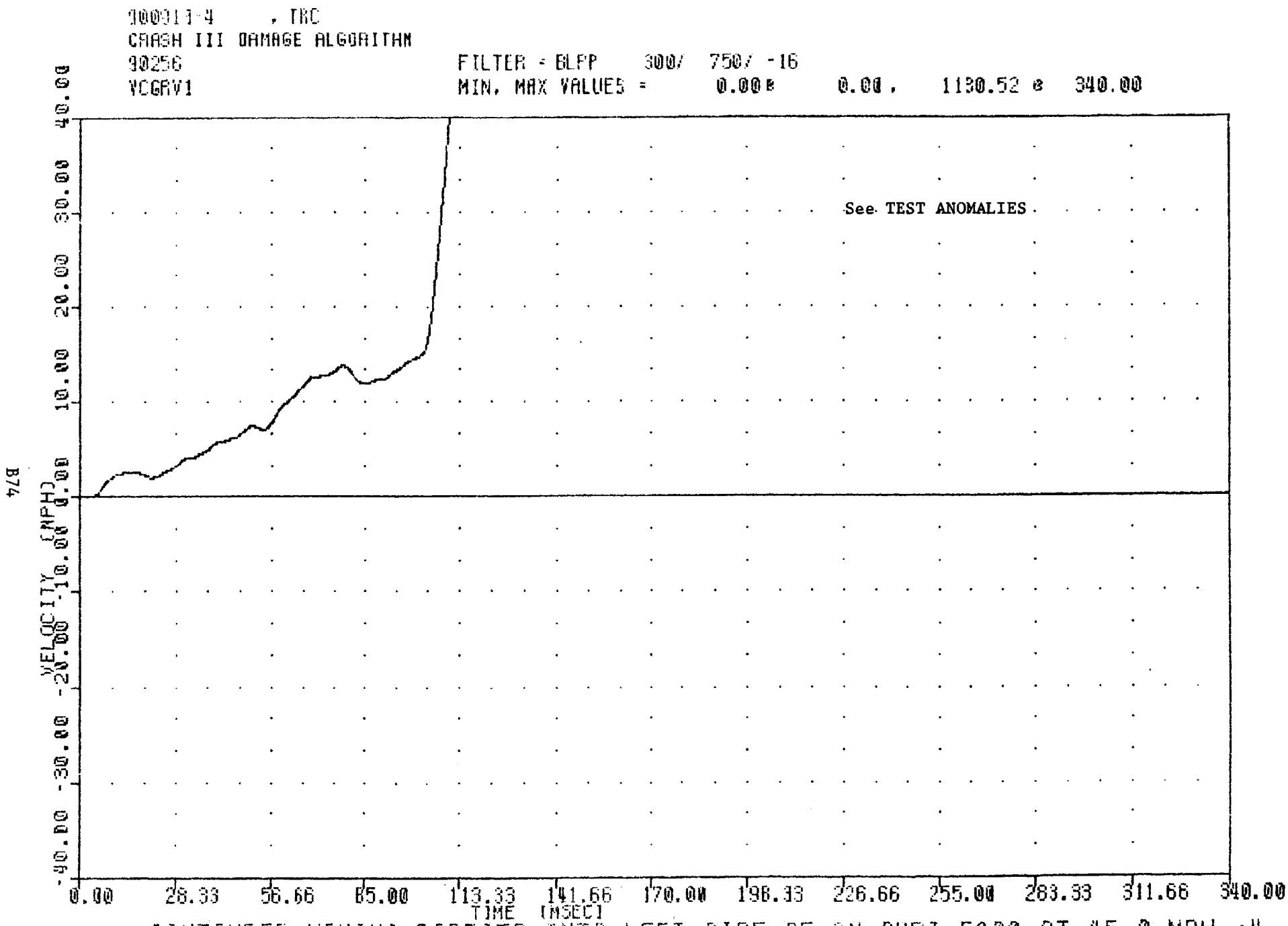


CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4

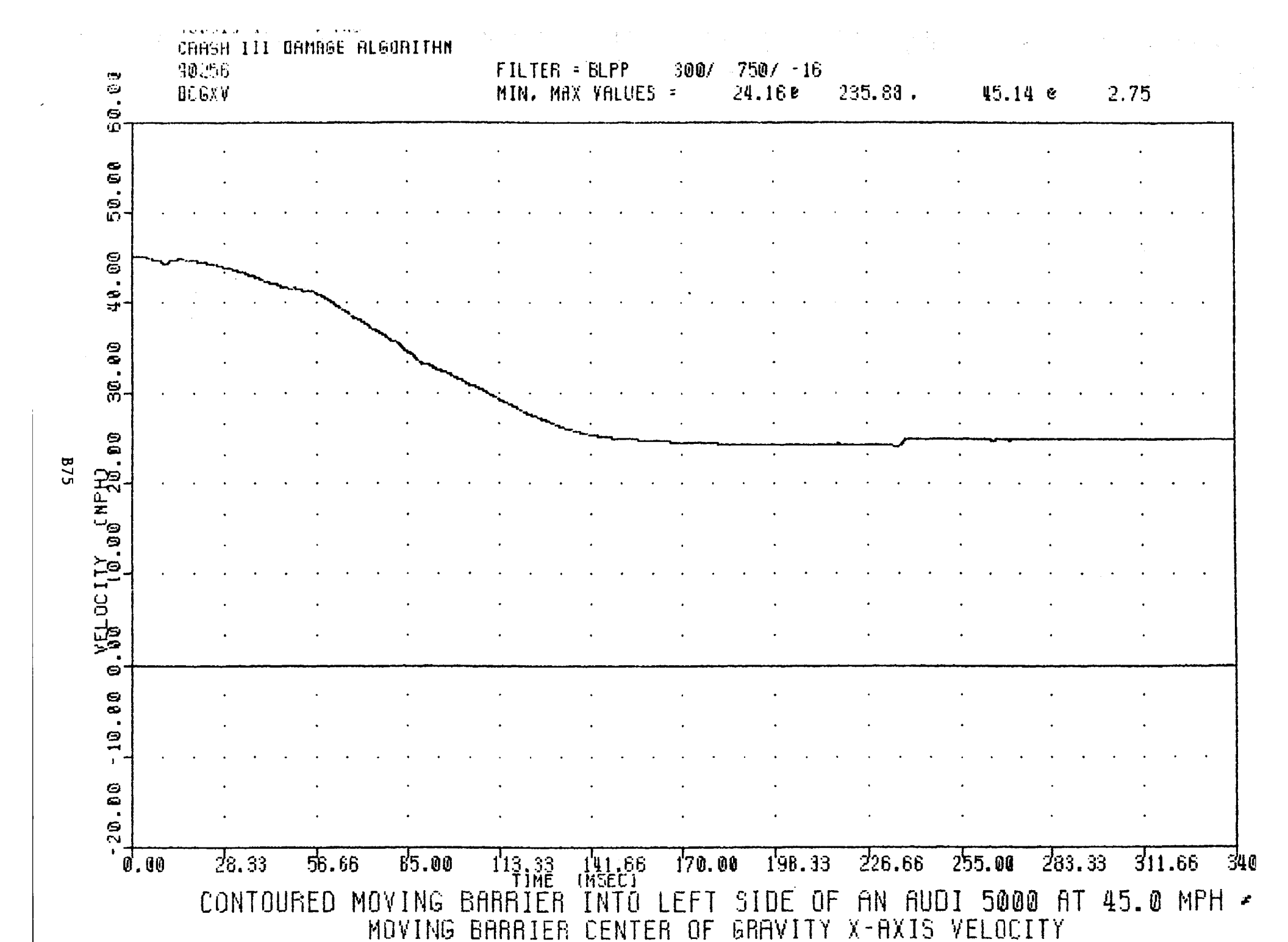
VEHICLE CG X-AXIS VELOCITY (IMPACT DIRECTION)



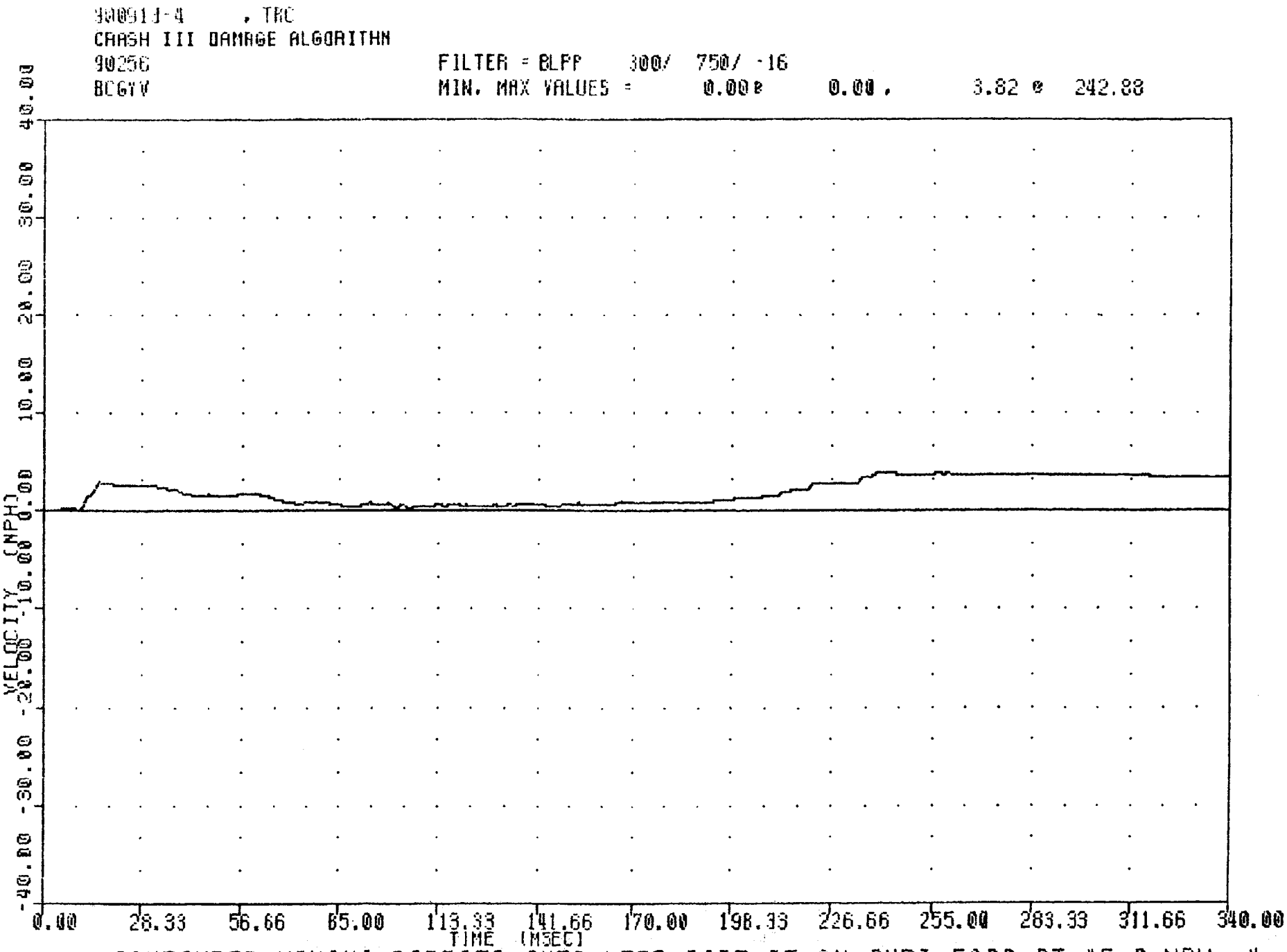
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH *
VEHICLE CG Y-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)



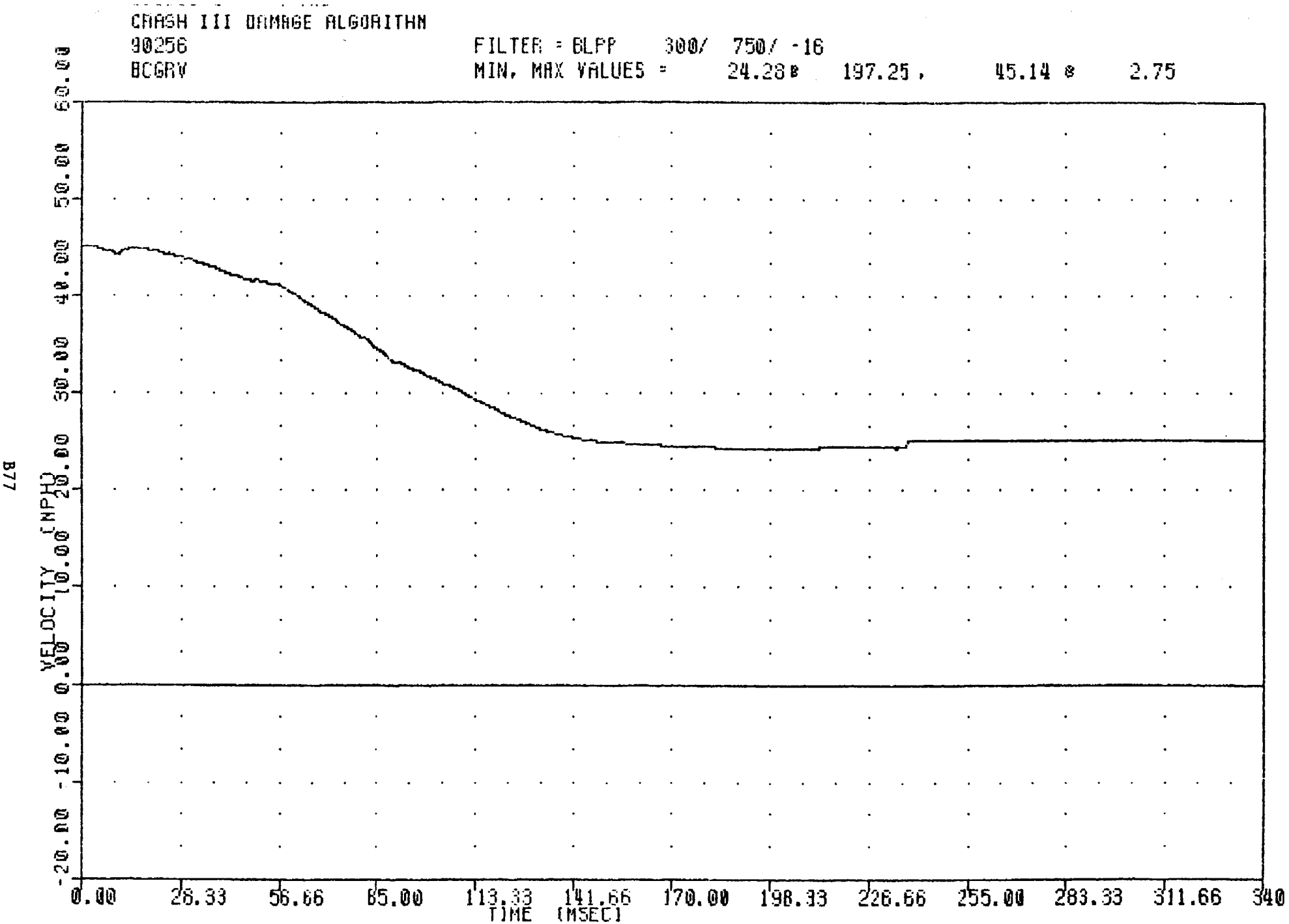
CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH #4
VEHICLE CG RESULTANT VELOCITY



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH *4
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY



CONTOURED MOVING BARRIER INTO LEFT SIDE OF AN AUDI 5000 AT 45.0 MPH *
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

APPENDIX C

MISCELLANEOUS TEST INFORMATION

VEHICLE ACCELEROMETER INFORMATION

NO.	LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
2	RIGHT FRONT SILL	X	ENDEVCO	7264	BP34J	FORWARD
	RIGHT FRONT SILL	Y	ENDEVCO	7264	CC83H	LEFT
3	VEHICLE CENTER/GRAVITY	IMPACT DIRECTION		7264	CJ04H	FORWARD
	VEHICLE CENTER/GRAVITY	PERPENDICULAR TO IMPACT DIRECTION		7264	CL79H	LEFT

MOVING BARRIER ACCELEROMETER INFORMATION

NO.	LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
1	MOVING BARRIER CENTER OF GRAVITY	X	ENDEVCO	7264	CL73H	FORWARD
	MOVING BARRIER CENTER OF GRAVITY	Y	ENDEVCO	7264	CJ34H	LEFT

SIGN CONVENTION

ALL DUMMY, BARRIER AND VEHICLE CHANNELS:

+X: FORWARD

+Y: LEFTWARD

+Z: UPWARD

+FORCE: TENSION