

DEMONSTRATION TESTS (TTD #1)
INSTRUMENTED BARRIER (MDB)
TO STATIONARY BARRIER IMPACT TEST

Demo Test No. 1 - V2819
Impact Angle: 90°
MDB Wheel Crab Angle: 26°
Towing Velocity: 41.5 kph

Demo Test No. 2 - V2818
Impact Angle: 60°
MDB Wheel Crab Angle: 19°
Towing Velocity: 32.2 kph

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Test Date: Dec. 23, 1996 & Feb. 26, 1997

Report Date: April 29, 1997

FINAL REPORT

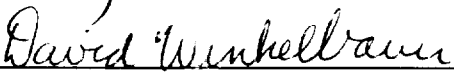
Prepared For:

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This final report was prepared for the U.S. Department of Transportation, VOLPE National Transportation Systems Center under Contract No. DTRS-57-95-C-00010.

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FINAL REPORT ACCEPTED BY (OVSC):

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SECTION 1

INTRODUCTION

The purpose of this report is to document the results of the two dynamic demonstration tests performed with an instrumented moving barrier. This testing was conducted prior to conducting the full scale tests as outlined in contract DTRS57-95-C-00010, TTD #1. The objective of this testing was to demonstrate the feasibility of using an instrumented moving barrier face to measure local dynamic loads and displacements on the FFMVSS 214 D deformable barrier face. Due to the volume of data generated with these tests, Appendix A, B and C (data and still photographs) are presented as an entirely separate document in a three-ring binder.

SECTION 2
BARRIER INFORMATION

The instrumented moving barrier used for this testing was constructed to duplicate as closely as possible the physical and dynamic specifications of a FMVSS 214D moving barrier. Instrumentation on this barrier included a 44 tri-axial load cell face and 44 displacement transducers. The addition of this instrumentation was to measure dynamic forces and displacement characteristics of the deformable honeycomb face which is used for FMVSS 214D side impacts. A report detailing the design of the moving deformable barrier has been submitted for this project.

Prior to conducting the first demonstration test, the barrier center of gravity and rotational inertias were determined. These measurements are shown in Figure 1. Due to the weight of the load cells (approximately 674 lbs) the center of gravity location and rotational inertias of the moving barrier could not be brought into the requirements as specified in the FMVSS 214D test procedure.

Moving Deformable Barrier		
Details	FMVSS 214D Requirements	Test No. 1 TTD #1 Barrier
CGx (mm)	1098 - 1148	866.6
CGy (mm)	-32.8 - 17.4	4.5
CGz (mm)	475 - 525	517.9
Ix (kgm ²)	482.6 - 533.4	541.5
Iy (kgm ²)	2149.9 - 2376.2	2641.1
Iz (kgm ²)	2443.4 - 2700.6	2987.3
Total Weight (kg)	1356.5 - 1365.5	1358.5

FIGURE 1

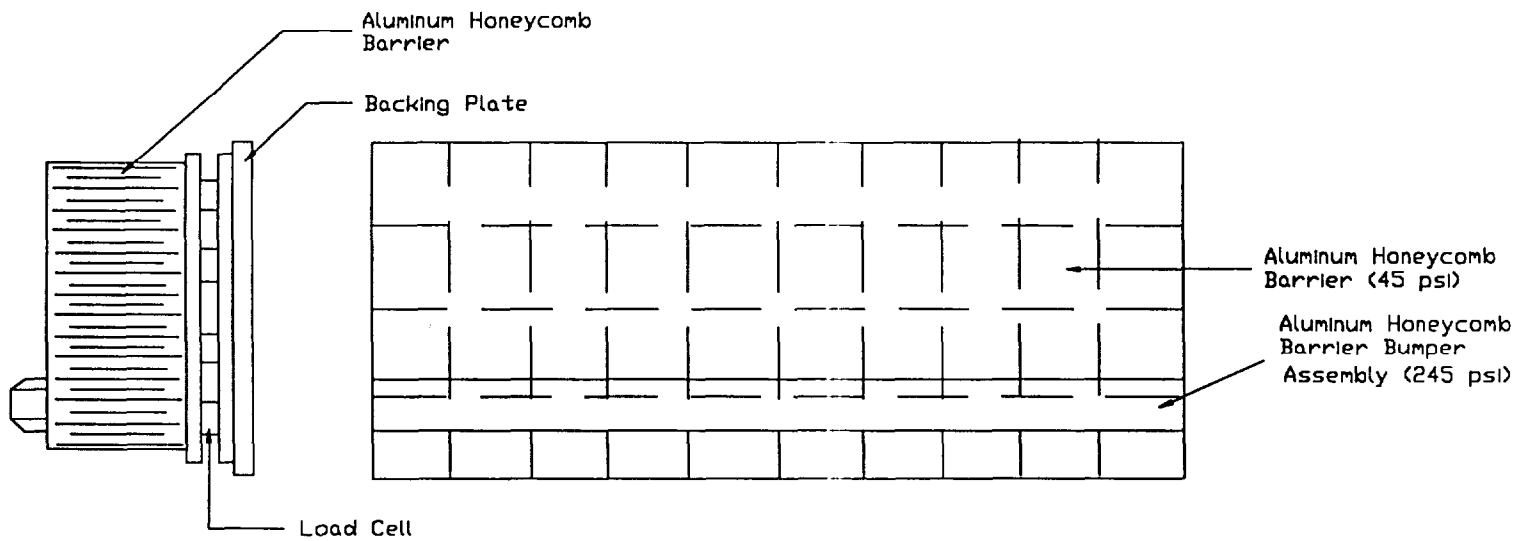
Following execution of demonstration test No. 1, the barrier was modified to try to achieve a better correlation with the FMVSS 214D center of gravity requirements. These modifications involved removing the three structures that support the load cells and mounting plate. These three steel posts were replaced with aluminum posts which allowed the load cell face to be moved rearward (2 inches) without rubbing on the MDB tires when they were crabbed at 27° with respect to the longitudinal axis of the MDB. The instrumentation mounting (displacement transducers) were also moved rearward (18 inches) to achieve the CG requirements (Figure 2). These modifications allowed the CG requirements of FMVSS 214D MDB to be satisfied, but the rotational inertias are not. To attain both the center of gravity and moment of inertia simultaneously would require extensive modifications, and fabrication of a new MDB would seem more feasible than modifying the existing cart.

This instrumented cart configuration was used for demonstration test No. 2 and all subsequent testing. At this time, the influence of the inertial properties on the dynamic tests has not been determined.

Moving Deformable Barrier		
Details	FMVSS 214D Requirements	Test No. 1 TTD #1 Barrier
CGx (mm)	1098 - 1148	1101.7
CGy (mm)	-32.8 - 17.4	-1.8
CGz (mm)	475 - 525	514.8
Ix (kgm ²)	482.6 - 533.4	537.6
Iy (kgm ²)	2149.9 - 2376.2	3159.1
Iz (kgm ²)	2443.4 - 2700.6	3518.4
Total Weight (kg)	1356.5 - 1365.5	1358.9

FIGURE 2

LOAD CELL AND DISPLACEMENT MEASUREMENT DESIGNATION AND CONFIGURATION



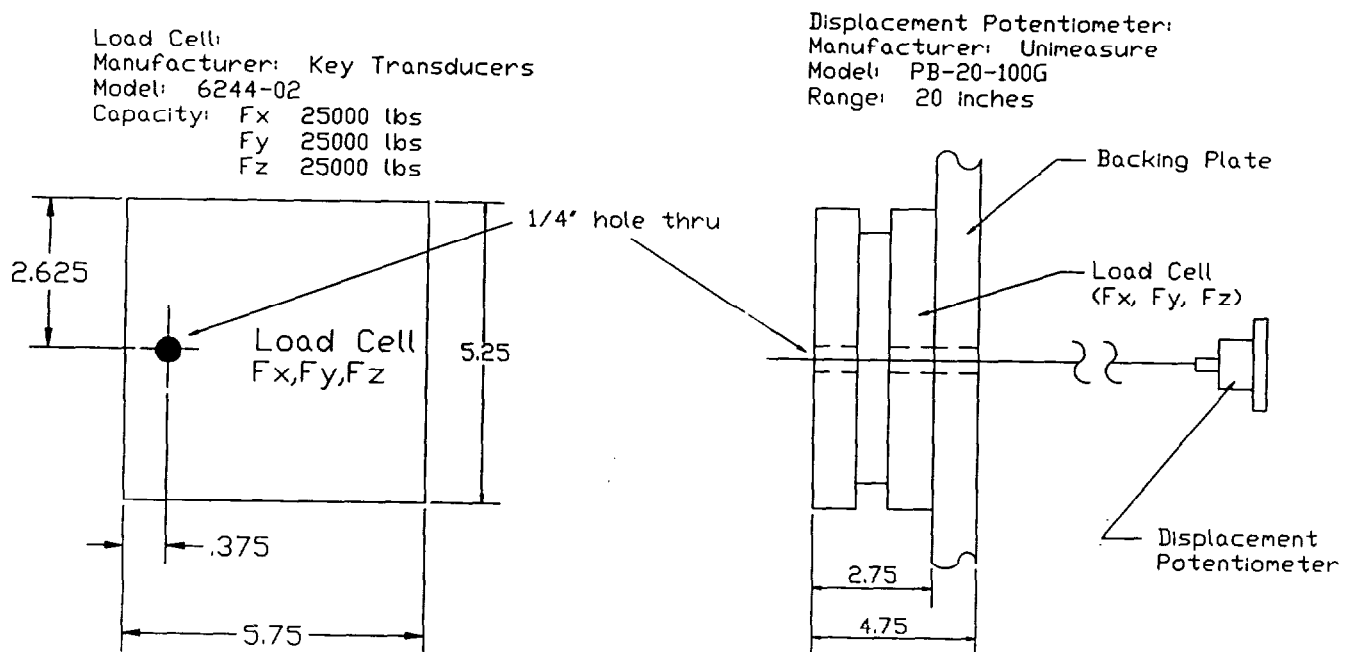
Aluminum Honeycomb Barrier Mounted on Load Cell Backing Plate

Load Cell and Displacement Measurement Designation

1	5	9	13	17	21	25	29	33	37	41
2	6	10	14	18	22	26	30	34	38	42
3	7	11	15	19	23	27	31	35	39	43
4	8	12	16	20	24	28	32	36	40	44

As viewed from front of barrier face

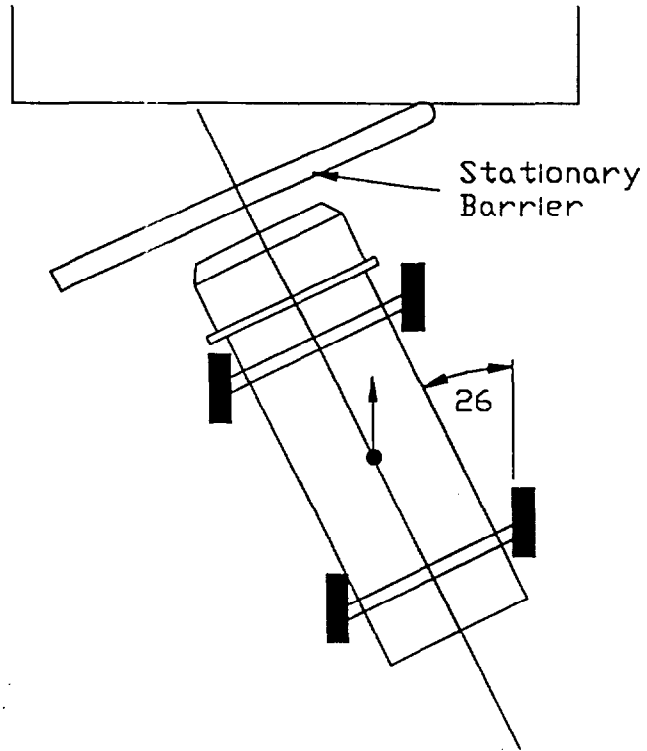
LOAD CELL AND DISPLACEMENT MEASUREMENT DESIGNATION AND CONFIGURATION



Typical Load Cell

SECTION 3
DEMONSTRATION TEST NO. 1

The parameters for this dynamic test into a stationary barrier were as follows:



MDB Impact Angle: 90°
MDB Wheel Crab Angle: 26°
MDB Towing Velocity: 25.8 mph

The load cell triaxial forces and dynamic displacements recorded during this test are presented in this section.

Prior to the test, the estimated crush of the barrier face was determined.

Estimated Crush:

Cart:

$$V_x = V (\cos 26^\circ) = (25.8 \text{ mph}) (\cos 26^\circ) = 23.2 \text{ mph (34.0 ft/sec)}$$

$$\text{Energy} = \frac{1}{2} m v^2 = (\frac{1}{2}) (2996 \text{ lbf/32.2 ft/s}^2) (34.0 \text{ ft/s})^2 = 53,779 \text{ lbf} \cdot \text{ft}$$

Barrier:

$$\text{Bumper Area} = (8 \text{ in})(66 \text{ in}) = 528 \text{ in}^2$$

$$\text{Load} = (528 \text{ in}^2)(45 \text{ lbf/in}^2) = 23,760 \text{ lbf}$$

$$\begin{aligned}\text{Energy to push bumper to face} &= 23,760 \text{ lbf} \cdot (4/12) \text{ ft} \\ &= 7920 \text{ ft} \cdot \text{lbf}\end{aligned}$$

$$\begin{aligned}\text{Energy left to crush face} &= 53,779 \text{ ft} \cdot \text{lbf} - 7920 \text{ ft} \cdot \text{lbf} \\ &= 45,859 \text{ ft} \cdot \text{lbf}\end{aligned}$$

$$\text{Barrier area} = (66 \text{ in})(22 \text{ in}) = 1452 \text{ in}^2$$

$$\text{Load} = (1452 \text{ in}^2)(45 \text{ lbf/in}^2) = 65340 \text{ lbf}$$

Estimated Crush:

$$\text{Energy Remaining} = \text{Load} \times \text{Displacement}$$

$$45,859 \text{ lbf} = 65340 \text{ lbf} \cdot x \text{ ft}$$

$$.70 \text{ ft} = X$$

Estimated Barrier face crush = 8.4 in (213 mm)

Average Post-Test Static Barrier Crush = 5.3 in (135 mm)

Assumptions:

- a. Only V_x contributes to barrier crush
- b. No rotation of barrier
- c. Linear loads only
- d. No bumper crush

This actual crush measured is approximately 69% of the crush that was anticipated. It is assumed that rotation, impact angle, bumper crush, side loading, and rebound energy could account for the this discrepancy.

BARRIER FACE LOAD CELL MAXIMUM VALUES

Load Cell	Negative Maximum (N)						Positive Maximum (N)					
	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)
LC #1	-5052	33	-771	163	-1078	61	288	7	1203	58	1055	40
LC #2	-7067	50	-1159	55	-910	14	317	5	3357	64	2738	55
LC #3	-8030	8	-873	57	-2401	17	537	126	1940	67	1513	57
LC #4	-6660	60	-1573	125	-1129	12	5041	124	1779	101	1424	57
LC #5	-5187	33	-510	20	-1233	34	2042	139	532	58	1264	122
LC #6	-8967	54	-3888	54	-1765	14	7584	139	876	199	985	57
LC #7	-9771	8	-2442	56	-3179	8	917	163	1386	64	1393	116
LC #8	-11562	42	-2884	54	-1578	24	4975	121	1178	97	866	59
LC #9	-5904	35	-546	19	-2520	42	947	133	1503	43	1525	153
LC #10	-8975	42	-1342	28	-738	13	2064	106	2131	58	1239	19
LC #11	-10711	7	-2679	51	-1971	15	701	176	1700	60	1379	103
LC #12	-8205	44	-2616	48	7502	24	1014	199	2096	60	185	137
LC #13	-5735	36	-1031	189	-1122	47	289	7	2310	36	252	189
LC #14	-7632	45	-443	14	-593	12	588	199	2963	56	2039	18
LC #15	-8169	51	-1477	7	-647	14	227	175	2274	57	1396	53
LC #16	-6822	50	-2002	50	-626	30	643	110	1358	59	396	142
LC #17	-6856	36	-485	18	-1207	46	412	11	2493	36	1111	53

BARRIER FACE LOAD CELL MAXIMUM VALUES

Load Cell	Negative Maximum (N)						Positive Maximum (N)					
	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)
LC #18	-8767	50	-231	174	-651	12	372	109	3334	54	2130	18
LC #19	-9820	6	-1316	7	-1408	6	203	126	2788	55	1756	51
LC #20	-6917	50	-622	12	-672	147	140	109	2113	57	586	18
LC #21	-6912	38	-432	69	-672	44	507	11	2695	38	2637	172
LC #22	-11760	51	-919	5	-783	11	3604	91	3025	50	1819	17
LC #23	-8403	6	-591	90	-1674	132	401	126	2494	49	2422	61
LC #24	-9105	51	-834	79	-776	10	1504	112	1875	55	684	61
LC #25	-6516	42	-276	155	-1787	111	432	114	2040	34	1870	118
LC #26	-11579	44	-1129	100	-749	11	3799	115	3776	46	1584	16
LC #27	-8000	6	-632	96	-2479	83	234	170	3047	49	2579	61
LC #28	-6935	45	-2565	68	-1029	75	414	160	3151	24	1602	192
LC #29	-6638	43	-135	62	-668	136	658	10	2148	46	648	50
LC #30	-9152	47	-1174	104	-746	10	4016	104	3166	47	1662	16
LC #31	-10220	5	-357	62	-2027	147	402	102	2965	44	2460	142
LC #32	-7084	29	-680	97	-926	8	156	137	2098	25	320	104
LC #33	-6400	40	-377	62	-480	32	346	10	1741	37	357	15
LC #34	-7007	41	-178	60	-977	9	212	86	2265	42	1177	15

BARRIER FACE LOAD CELL MAXIMUM VALUES

Load Cell	Negative Maximum (N)						Positive Maximum (N)					
	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)
LC #35	-7827	5	-315	58	-636	10	226	80	2479	33	664	32
LC #36	-6592	27	-257	58	*	*	140	84	2428	26	*	*
LC #37	-8441	41	-8084	51	-2246	44	1704	160	1474	19	1288	71
LC #38	-9379	38	-876	101	-2041	9	875	195	2789	45	1844	16
LC #39	-10327	4	-412	61	-1430	23	420	181	3074	42	155	64
LC #40	-8025	24	-617	126	-1457	25	277	179	2542	42	220	179
LC #41	-7215	43	-447	15	-748	45	203	9	855	49	591	16
LC #42	-8199	37	-1542	39	-906	10	281	78	1172	49	1451	16
LC #43	-9397	35	-2113	24	-1533	45	121	107	1594	48	729	4
LC #44	-8123	27	-511	2	*	*	2195	190	2097	46	*	*

* No valid data collected

Conclusion:

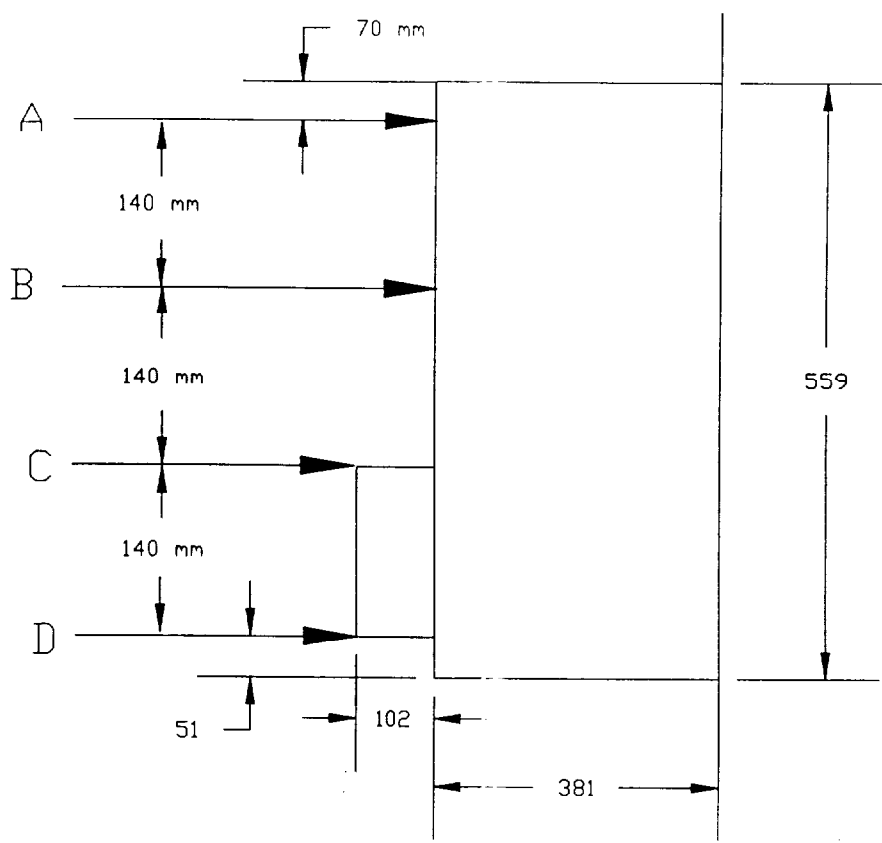
The displacement recorded by transducer #14 is low when compared to the adjacent displacement transducers. Following this impact, it was recalibrated and found to agree with the pre-test calibration. It is possible that this displacement transducer wire became trapped during the impact. After removal of the honeycomb face, it was noticed that the face had shifted upward and to the right (as viewed from rear) on the load cells and many of the displacement wires may have become trapped. This also would account for the discrepancy between the post-test measurements and the electronic displacement data. Film indicates that the crush continued for approximately 40 to 45 msec. following contact. Barrier (MDB) rotation during this time of crush was very minimal but increased after barrier longitudinal crush had stopped.

For future tests, the holes in the honeycomb barrier backing plate and bumper assembly will be enlarged to help prevent trapping in these areas. It will still be possible for the displacement wire to become trapped in the aluminum honeycomb as it crushes through. A permanent solution to this problem has not been determined that would not affect the crush characteristics of the barrier cells. Closer examination of the honeycomb material after crushing indicates that the individual cells, if loaded axially, will not present a problem in this respect, but lateral loads may allow these displacement wires to become trapped.

For all future tests also, it has been decided to make measurements of the aluminum honeycomb face at locations as outlined in the FMVSS 214D test procedure to give a more accurate assessment of the barrier static deformation. The pre/post test deformation measurements of the Demonstration Test No. 1 were only made at the locations the displacement transducer wires were attached.

During impact, the film indicates the left side of the bumper contacted the stationary barrier first. This indicates an impact angle of approximately 89° with respect to the longitudinal centerline of the moving barrier. Due to this contact of the left bumper first, the entire bumper assembly shifted to the left approximately 1 inch. Post-test inspection also revealed the

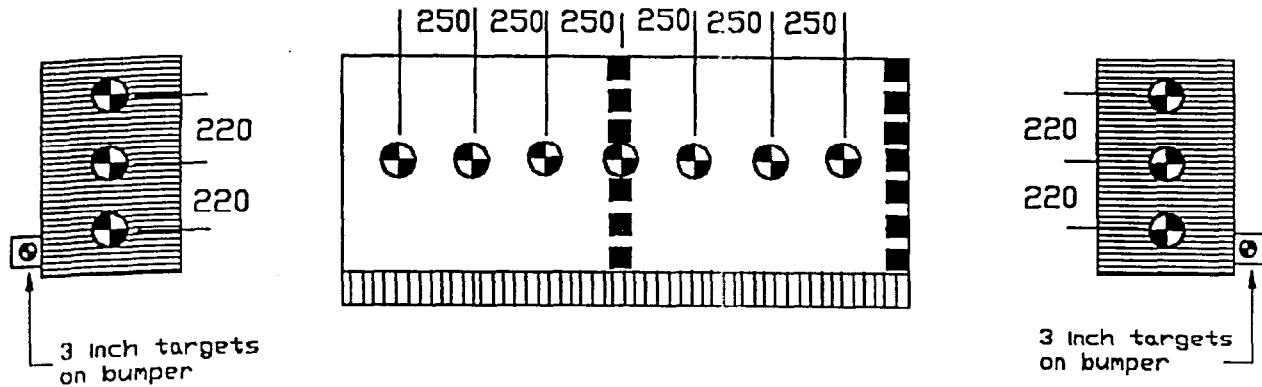
deformable barrier assembly shifted approximately 1/8" to 1/4" upward on the load cells. Due to this shifting, the displacement rods became captive between the load cells and backing plate.



Post-Test Static Deformation (mm)

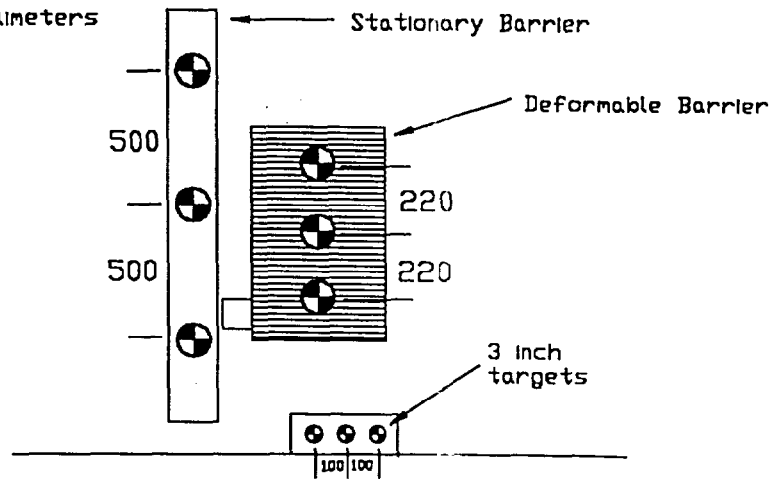
140	132	128	124	122	128	127	124	128	126	130
146	142	137	137	136	137	128	123	132	132	130
272	239	236	232	230	226	225	224	222	221	219
324	246	244	243	242	241	236	234	232	232	232
Right					Left					

PHOTOGRAPHIC TARGET LOCATIONS



All Targets 5' unless otherwise noted

All dimensions in millimeters



PHOTOGRAPHIC COVERAGE

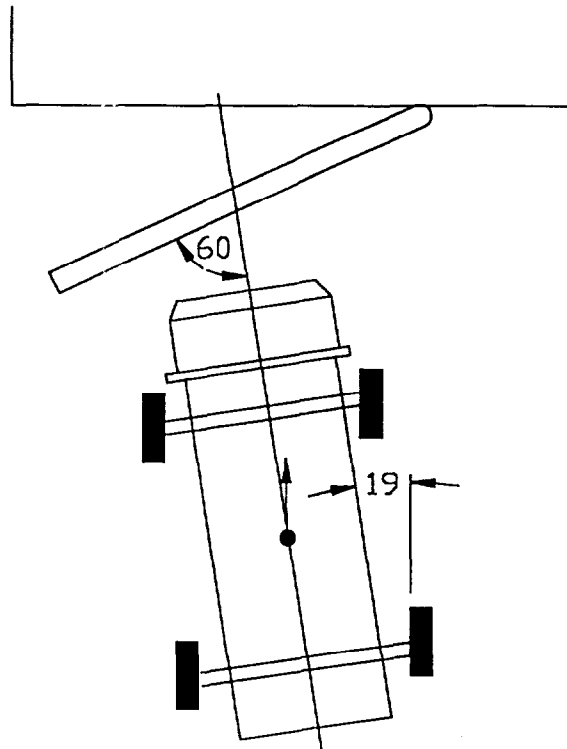
Cameral Locations and Speeds

Location	X Position	Y Position	Z Position	Angle	Lens	Speed
Left Barrier Impact Low	-2710	-2340	730	90°	25	1005
Left Barrier Impact High	-1290	-940	1840	90°	13	775
Right Front Close-up	4710	6730	790	90°	35	922
Right Overall	-700	9500	1155	90°	13	1015
Top Wide	-190	1360	5200	90°	8	922
Top Front Half	710	1360	5050		13	1020
Pit	920	1360	-3155		13	971

SECTION 4
DEMONSTRATION TEST NO. 2

The parameters for this dynamic test into a stationary barrier were as follows:

MDB Impact Angle: 60°
MDB Wheel Crab Angle: 19°
MDB Towing Velocity: 20.0 mph

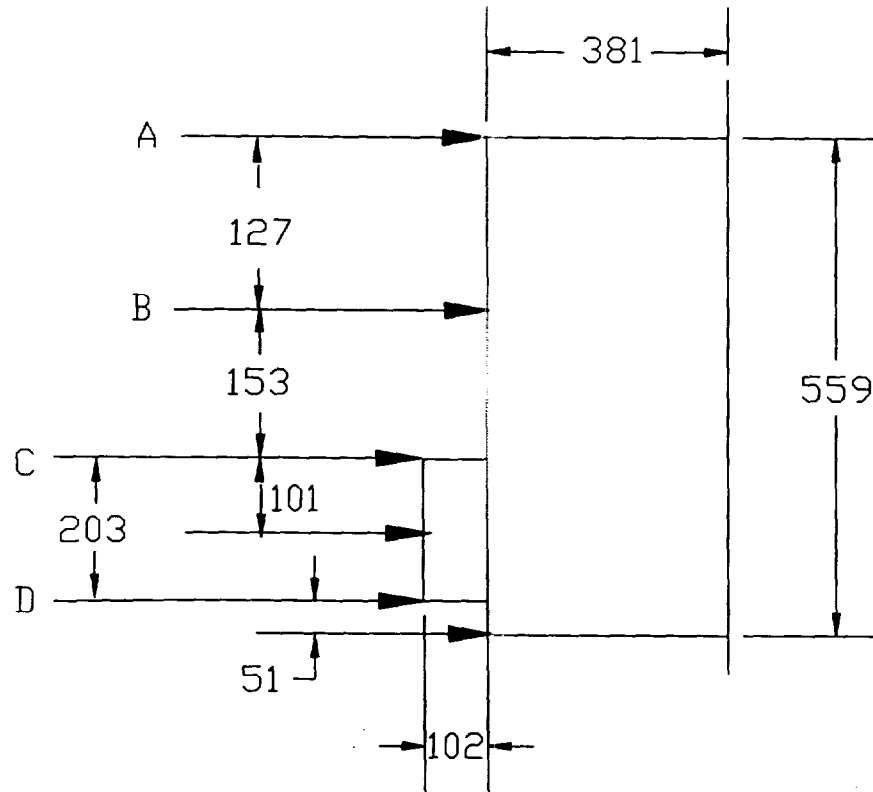


The data recorded from this demonstration test is presented in this section along with the pre and post-test still photographs and static displacement measurements.

Upon contact with the stationary barrier, the left side of the deformable barrier face crushed and the bumper assembly bent along the stationary barrier. The MDB then slid down the stationary barrier face with very little rotation about the CG.

After sliding the entire length of the stationary barrier, the deformable face contacted the barrier support structure. This caused the static deformation of the bumper assembly and barrier face at D1 through D11 and C3 through C11.

POST-TEST STATIC DEFORMATION (MM)



Post-Test Static Deformation (mm)

0	0	2	1	2	2	0	1	4	4	4	5	14	44	98	138	189
3	3	3	3	3	3	4	4	4	4	4	5	15	46	91	140	194
0	0	1	7	13	23	40	49	53	49	37	28	37	83	143	200	239
-60	-39	-20	0	19	56	94	96	83	72	61	50	66	124	179	234	273

Right

Left

BARRIER FACE LOAD CELL MAXIMUM VALUES

Load Cell	Negative Maximum (N)						Positive Maximum (N)					
	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)
LC #1	-283	32	-63	1	*	*	1908	118	417	71	*	*
LC #2	-435	30	-186	10	-315	1	530	92	503	104	995	139
LC #3	-165	2	-464	62	-3415	27	453	75	96	138	765	113
LC #4	-3082	32	-698	107	-25	7	1170	92	883	71	574	98
LC #5	-1668	48	-684	68	-2192	23	2019	143	587	142	1039	138
LC #6	-5022	70	-3911	75	-1099	49	2436	154	330	108	1083	147
LC #7	-1426	135	-429	85	-3091	34	420	112	867	27	1055	153
LC #8	-1921	80	-1323	28	-204	35	1773	146	951	165	296	93
LC #9	-780	2	-458	185	-983	34	1029	128	109	27	893	145
LC #10	-1554	84	-1095	25	-204	3	759	126	1356	128	217	164
LC #11	-695	19	-221	3	-1181	38	523	177	520	112	1002	143
LC #12	-440	2	-941	35	-272	152	413	199	591	130	202	94
LC #13	-459	185	-936	123	-264	19	347	27	591	21	475	93
LC #14	-276	34	-194	101	-303	2	298	127	338	192	683	104
LC #15	-563	135	-157	168	-241	18	387	10	300	26	326	176
LC #16	-545	19	-525	100	-290	2	518	142	405	199	528	142
LC #17	-445	184	-242	168	-744	45	348	199	155	145	388	132

* No valid data collected

BARRIER FACE LOAD CELL MAXIMUM VALUES

Load Cell	Negative Maximum (N)						Positive Maximum (N)					
	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)
LC #18	-442	52	-276	39	-465	134	257	199	239	87	438	20
LC #19	-203	118	-537	25	-191	191	249	14	439	100	260	87
LC #20	-303	39	-607	23	-833	196	210	199	423	98	877	32
LC #21	-211	119	-334	33	-641	36	483	106	317	96	395	119
LC #22	-4094	90	-1043	14	-224	23	3820	119	2263	155	504	93
LC #23	-210	18	-324	122	-791	8	227	142	1077	135	2274	99
LC #24	-2890	90	-777	18	-217	151	850	122	851	114	121	94
LC #25	-166	18	-204	35	-747	148	599	125	361	146	1634	91
LC #26	-4642	28	-1667	35	-236	14	4592	152	1993	148	896	157
LC #27	-994	101	-454	91	-1898	184	723	77	472	180	1302	150
LC #28	-728	16	-6737	31	-246	29	1045	91	6073	151	326	172
LC #29	-997	97	-609	100	*	*	208	58	108	86	*	*
LC #30	-8829	68	-2006	79	-353	82	2868	191	1609	97	584	95
LC #31	-10646	65	-2780	52	-513	29	652	156	1017	114	1097	104
LC #32	-7523	57	-1279	50	-3723	106	185	160	621	64	4523	65
LC #33	-3901	80	-1342	83	-631	29	55	37	662	126	807	165
LC #34	-7546	52	-1585	65	-217	100	588	103	592	105	591	54

* No valid data collected

BARRIER FACE LOAD CELL MAXIMUM VALUES

Load Cell	Negative Maximum (N)						Positive Maximum (N)					
	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)	X	Time (msec.)	Y	Time (msec.)	Z	Time (msec.)
LC #35	-9101	41	-1040	91	-191	21	53	162	794	48	672	37
LC #36	-7794	50	-441	22	-804	94	267	178	1742	53	857	46
LC #37	-5477	70	-1173	92	-184	102	302	161	405	145	880	59
LC #38	-8765	75	-2317	94	-131	22	-39	1	58	1	1200	62
LC #39	-11798	29	-1425	63	-303	61	754	179	272	178	306	24
LC #40	-8354	39	-1151	20	-600	95	430	146	399	183	641	35
LC #41	-6312	33	-1514	58	*	*	145	196	227	183	*	*
LC #42	-7293	24	-1988	59	-251	10	763	162	260	165	2144	82
LC #43	-10033	20	-1779	59	-373	107	431	177	287	189	868	69
LC #44	-6861	63	-1730	66	-431	105	696	160	-48	113	497	76

* No valid data collected

Conclusion:

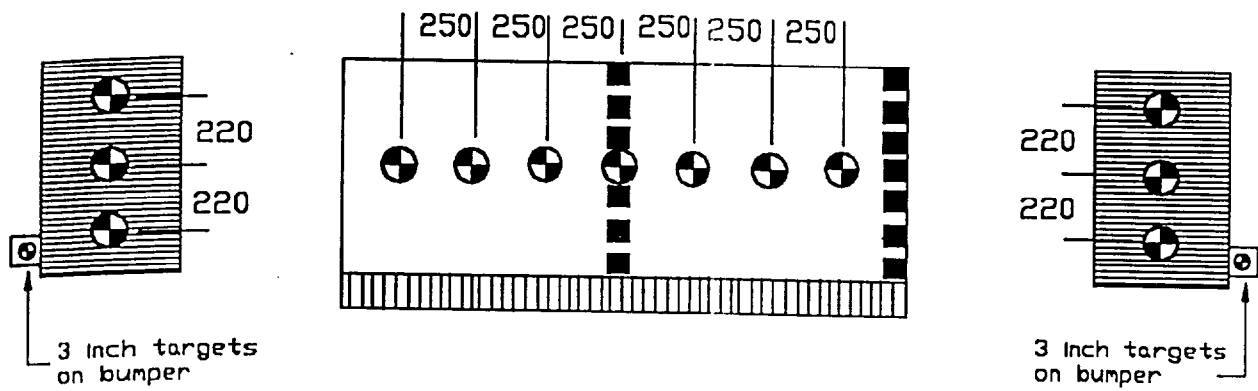
The objective of this test was to determine the feasibility of using the instrumented MDB for angular impact testing. The impact speed was chosen to produce an interesting amount of deformation without damaging the barrier or backing plate. This impact can also be used to determine the kinematics of the MDB on a 60° included angle impact vs. perpendicular impact. It should be noted that the MDB center of gravity for this test matches the FMVSS 214D requirements.

Upon impact, the left corner of the deformable barrier crushed approximately 9 inches at the bumper assembly. During the impact, the barrier slid down the face of the stationary barrier with very little rotation.

The barrier loads measured during impact would seem reasonable, but again, the displacement wires became trapped in the aluminum honeycomb during barrier collapse and bumper longitudinal displacement.

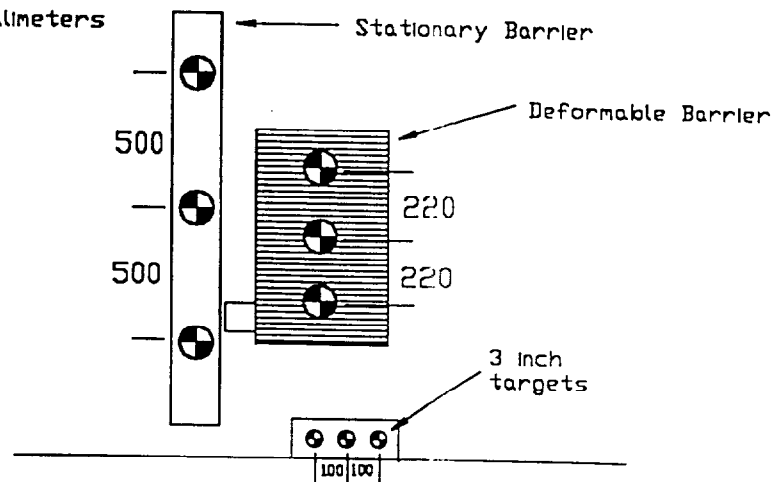
The post-test static displacement measurements in row D columns 1 through 10 and row C columns 1 through 10 are not representative of the impact, but are caused by the post-test impact with the barrier support structure.

PHOTOGRAPHIC TARGET LOCATIONS



All Targets 5' unless otherwise noted

All dimensions in millimeters



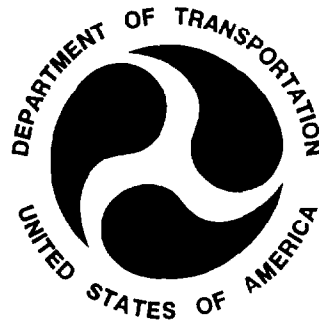
PHOTOGRAPHIC COVERAGE

Camera Locations and Speeds

Location	X Position	Y Position	Z Position	Angle	Lens	Speed
Left Barrier Impact Low	-2710	-2340	730	90°	25	1031
Left Barrier Impact High	-1290	-940	1840	90°	13	1010
Right Front Close-up	4710	6730	790	90°	35	1010
Right Overall	-700	9500	1155	90°	13	976
Top Wide	-190	1360	5200	90°	8	909
Top Front Half	710	1360	5050		13	1015
Pit	920	1360	-3155		13	1020

APPENDICES A, B & C
DATA AND STILL PHOTOGRAPHS

TTD #1 TESTING
DEMONSTRATION TEST NO. 1 - V 2819
DEMONSTRATION TEST NO. 2 - V 2818



TEST DATES: DECEMBER 23, 1996 & FEBRUARY 27, 1997

APPENDIX A
DEMONSTRATION TEST NO. 1 DATA

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* No valid data collected

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* No valid data collected

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Data PlotPage No.

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A-229

Figure A-230 - Force X Load Cell #33 vs. String Pot #33

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Figure A-231 - Force X Load Cell #34 vs. String Pot #34

A-231

Figure A-232 - Force X Load Cell #35 vs. String Pot #35

A-232

Figure A-233 - Force X Load Cell #36 vs. String Pot #36

A-233

Figure A-234 - Force X Load Cell #37 vs. String Pot #37

A-234

Figure A-235 - Force X Load Cell #38 vs. String Pot #38

A-235

Figure A-236 - Force X Load Cell #39 vs. String Pot #39

A-236

Figure A-237 - Force X Load Cell #40 vs. String Pot #40

A-237

Figure A-238 - Force X Load Cell #41 vs. String Pot #41

A-238

Figure A-239 - Force X Load Cell #42 vs. String Pot #42

A-239

Figure A-240 - Force X Load Cell #43 vs. String Pot #43

A-240

Figure A-241 - Force X Load Cell #44 vs. String Pot #44

A-241

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

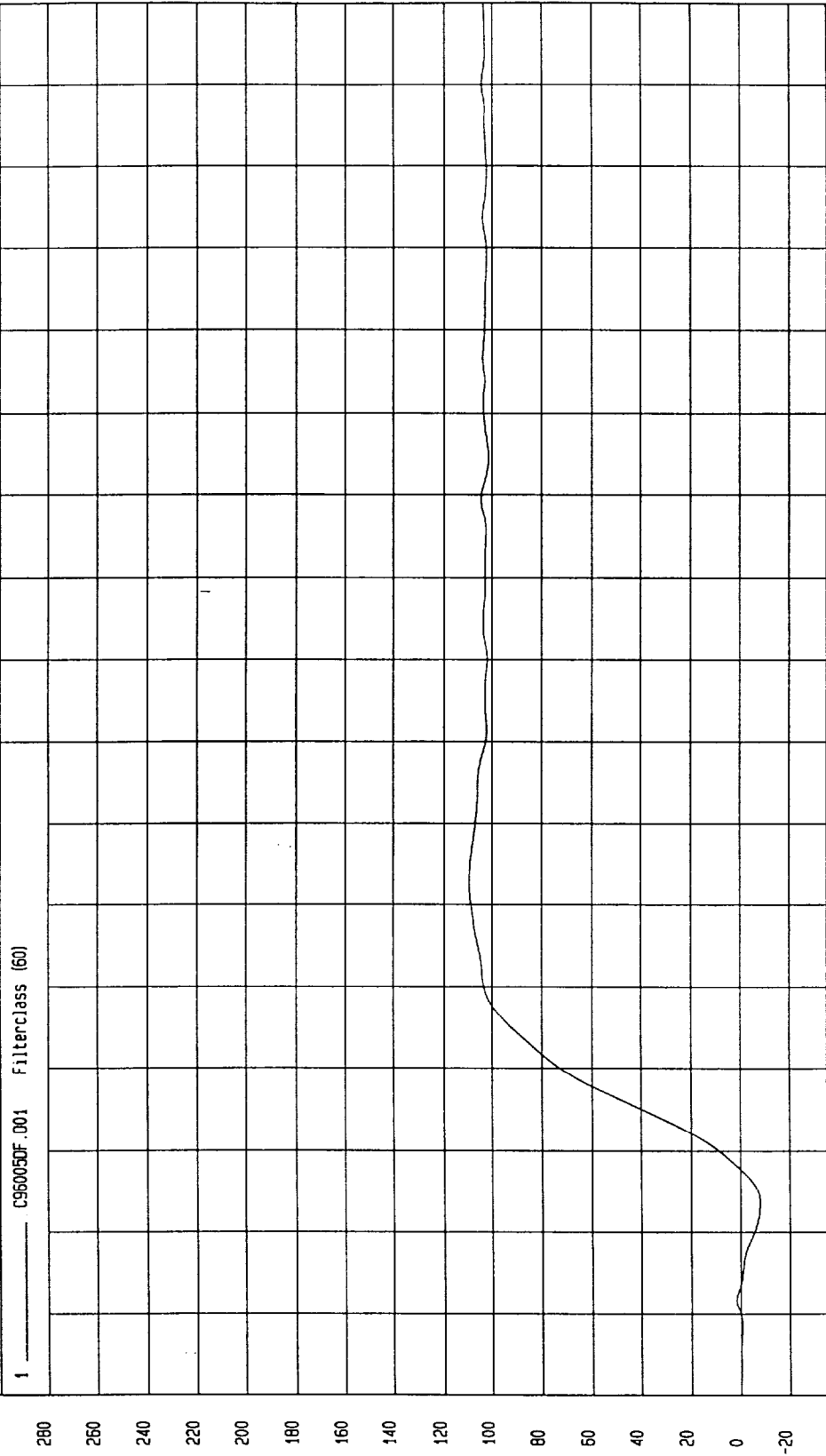
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 109.79 MM at 52 msec

Minimum = -7.97 MM at 14 msec

STRING POT 1



NCA Research
06-02-1998 14.04

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -1.27 MM at 11 msec

Maximum = 66.15 MM at 77 msec

STRING POT 2

1 C960050F.002 Filterclass (60)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (seconds)

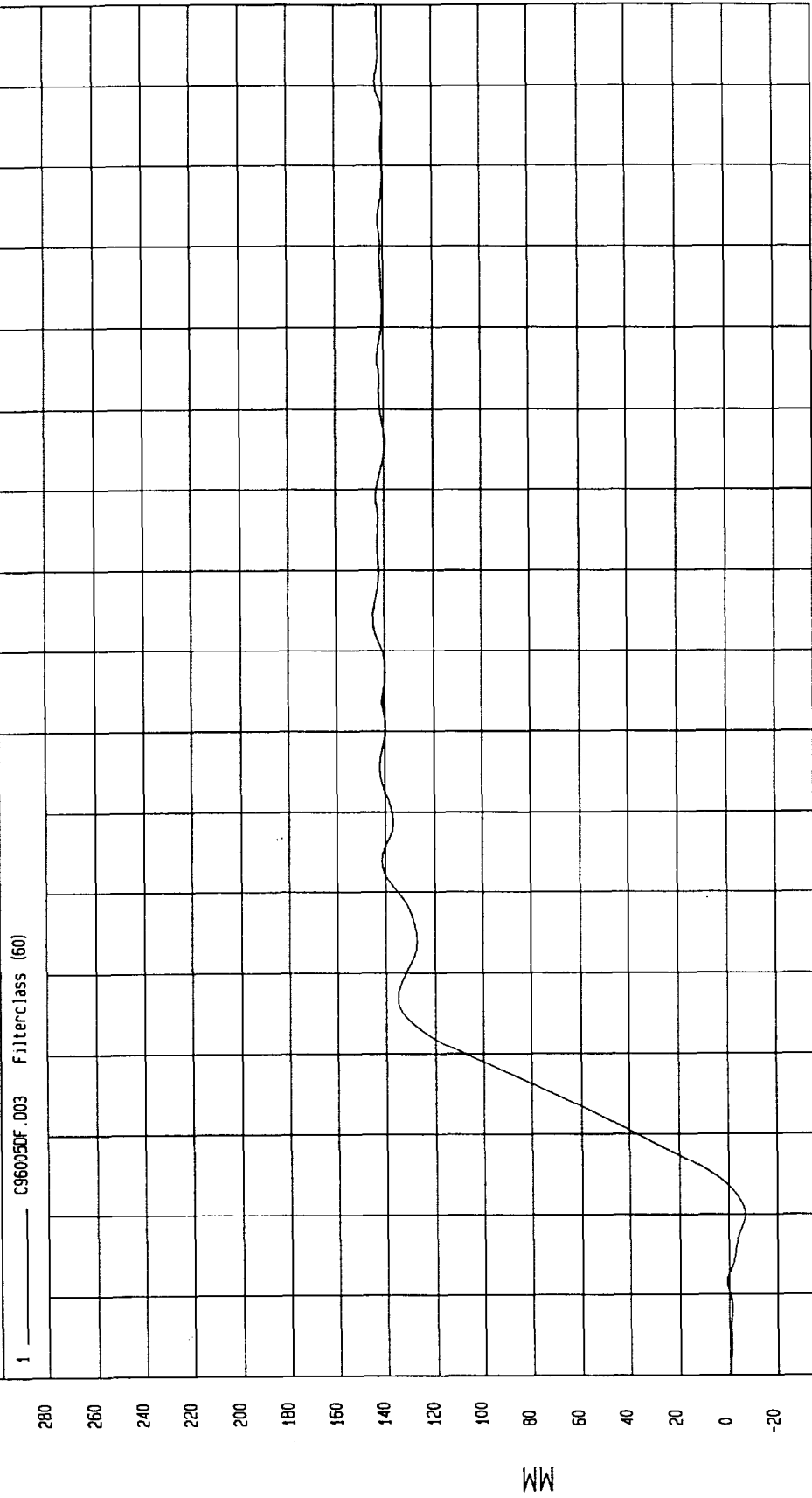
MGA Research
06-02-1996 14:04

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6.84 MM at 10 msec Maximum = 144.59 MM at 84 msec

STRING POT 3



MCA Research
06-02-1998 14:04

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

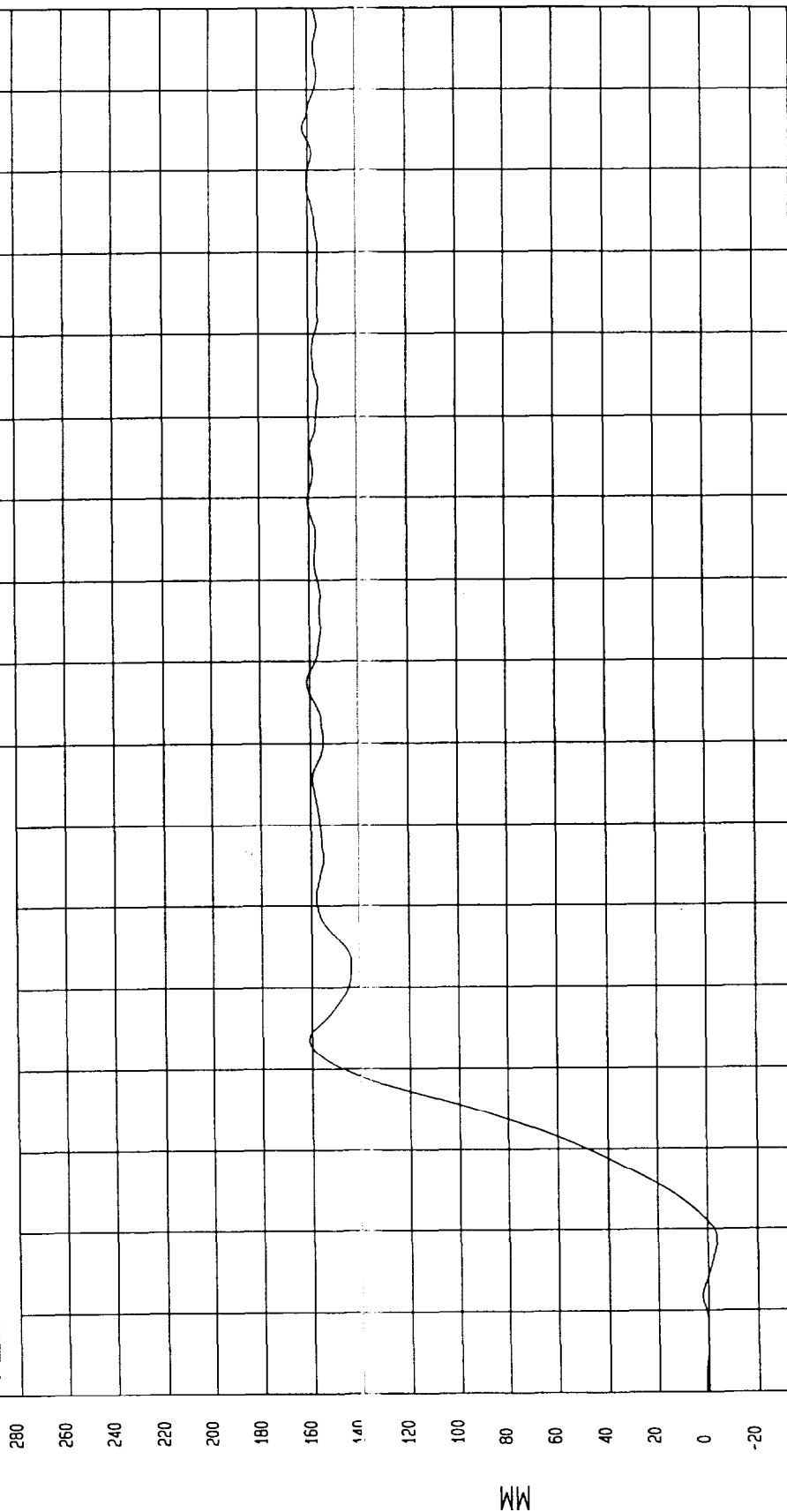
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 162.17 MM at 145 msec

Minimum = -3.66 MM at 9 msec

STRING POT 4

1 _____ C960050F.004 Filterclass (60)



MCA Research
06-02-1998 14:06

TIME (seconds)

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -14.31 MM at 15 msec Maximum = 114.23 MM at 56 msec

STRING POT 5

1 C960050F.D05 Filterclass (60)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (seconds)

MCA Research
06-02-1998 14:06

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

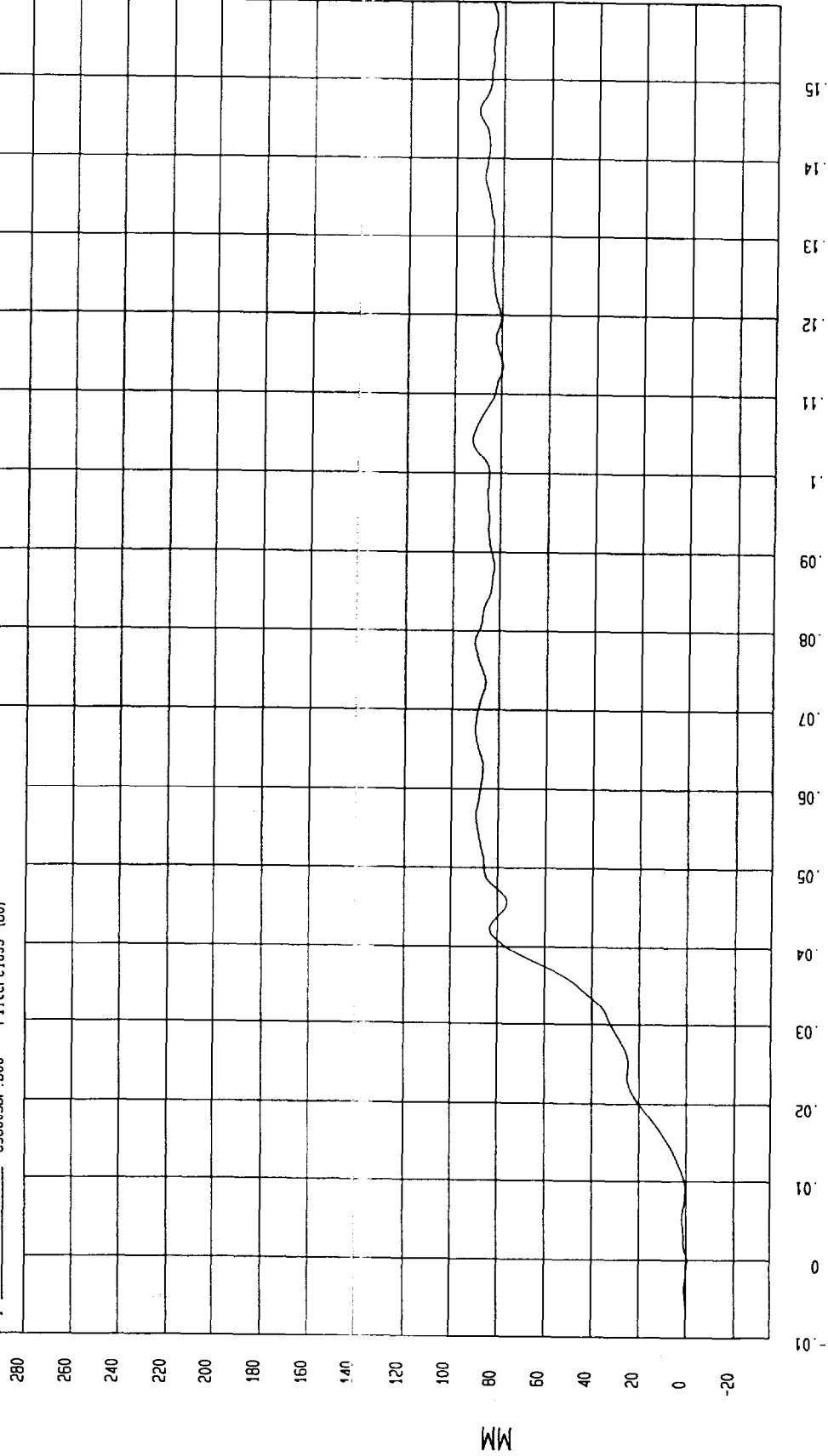
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -46 MM at 0 msec

Maximum = 91.86 MM at 104 msec

STRING POT #6

1 C96005DF.D06 Filterclass (60)



MCA Research
06-02-1998 14.06

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

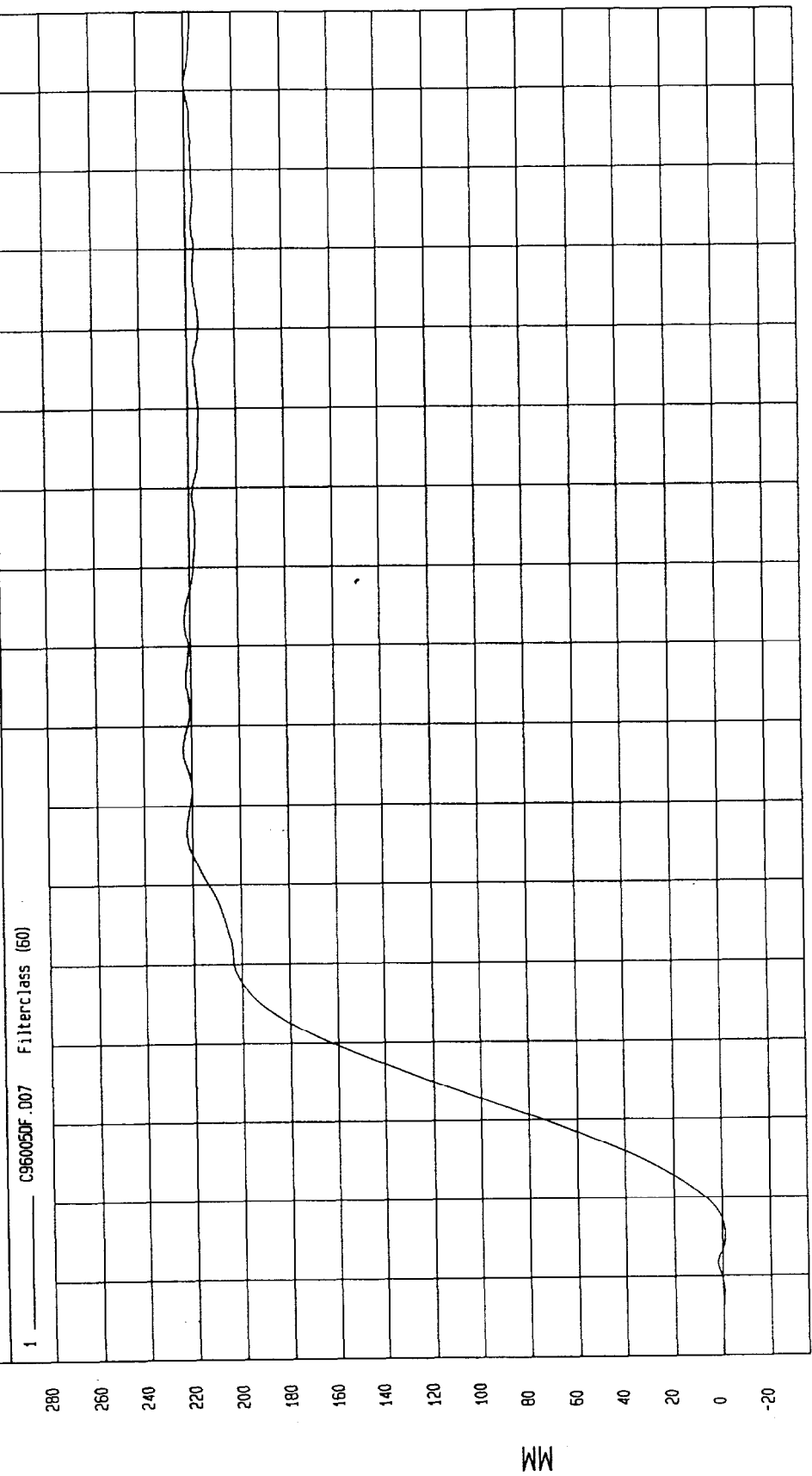
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 223.62 MM at 67 msec

Minimum = -1.14 MM at 5 msec

STRING POT #7



MCA Research
06-02-1998 14:06

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

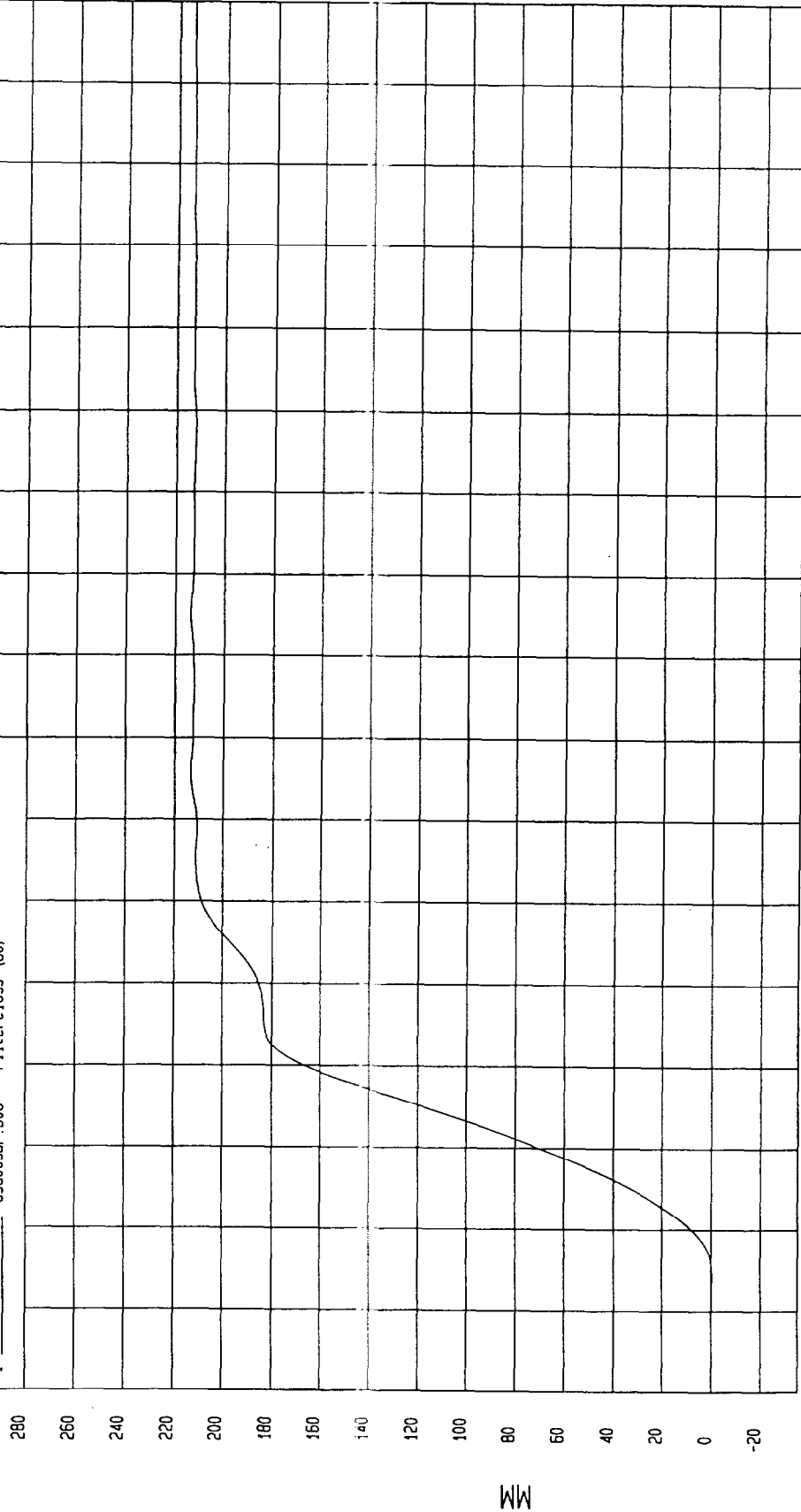
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = - 33 MM at 4 msec

Maximum = 213.81 MM at 197 msec

STRING POT #8

1 C960050F.D08 FilterClass (60)



MSA Research
05-02-1996 14:07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

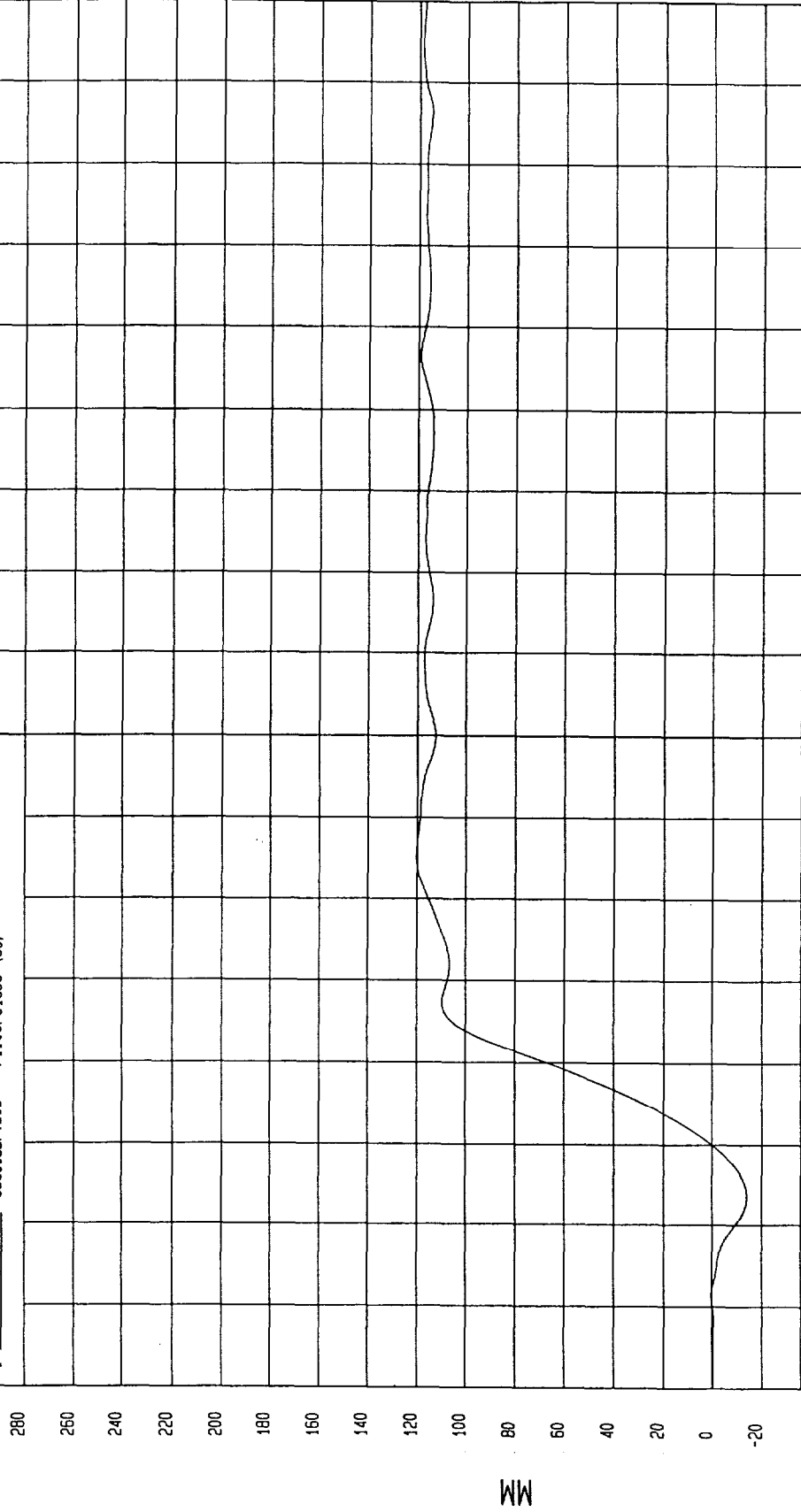
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 120.47 MM at 55 msec

Minimum = -14.16 MM at 14 msec

STRING POT #9

1 C960050F.D09 Filterclass (60)



NGA Research
06-02-1998 14.07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1.3 MM at 10 msec

Maximum = 85.2 MM at 60 msec

STRING POT 10

1 C96005DF.D10 Filterclass (50)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-10

TIME (seconds)

MCA Research
06-02-1998 14:07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 251.79 MM at 84 msec

Minimum = -1.48 MM at -1 msec

STRING POT 11

1 C960050F.011 Filterclass (60)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (seconds)

MCA Research
06-02-1998 14.07

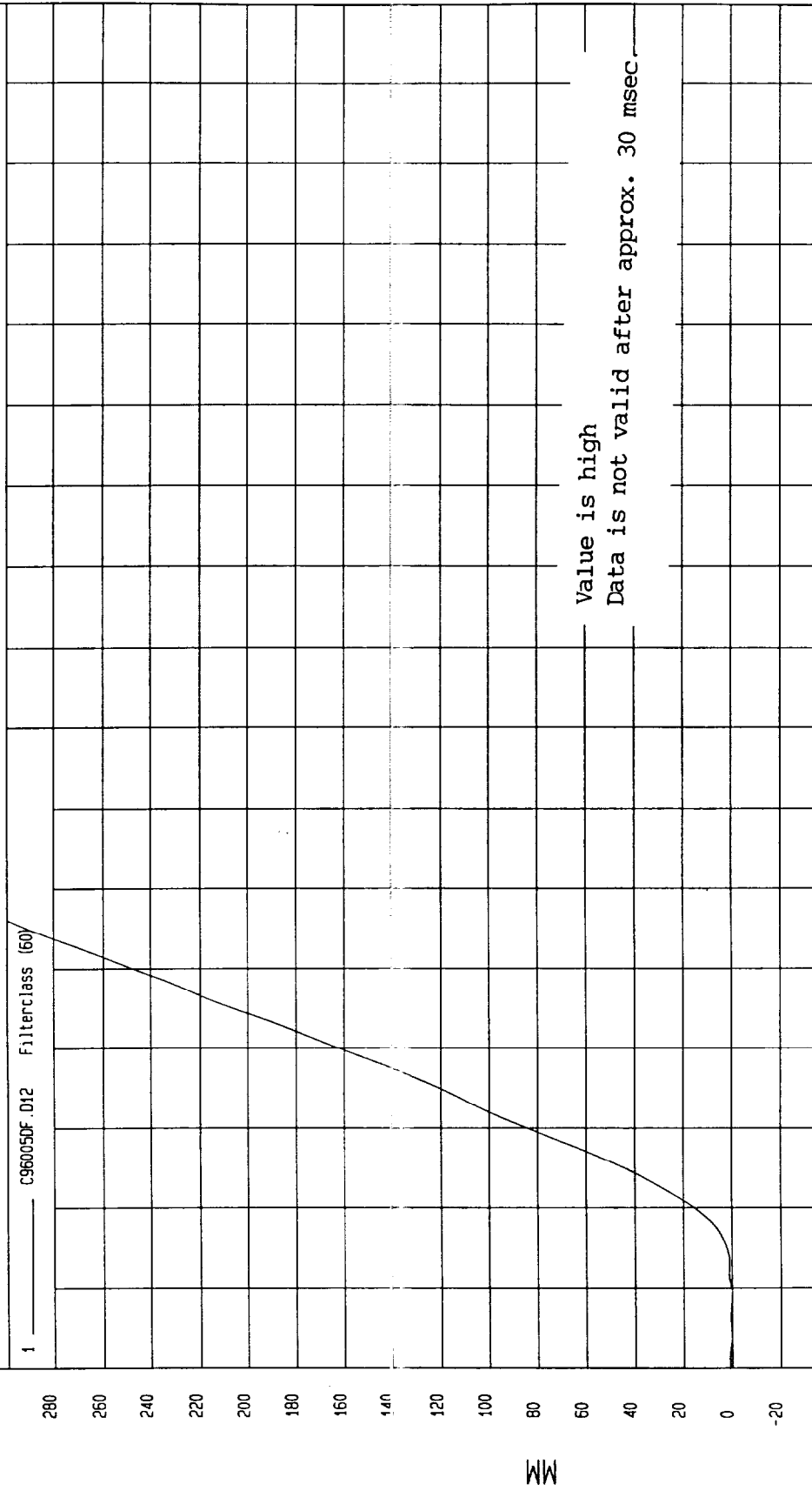
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

Maximum = 343.29 MM at 104 msec

Minimum = -1.91E-02 MM at -1 msec

STRING POT 12

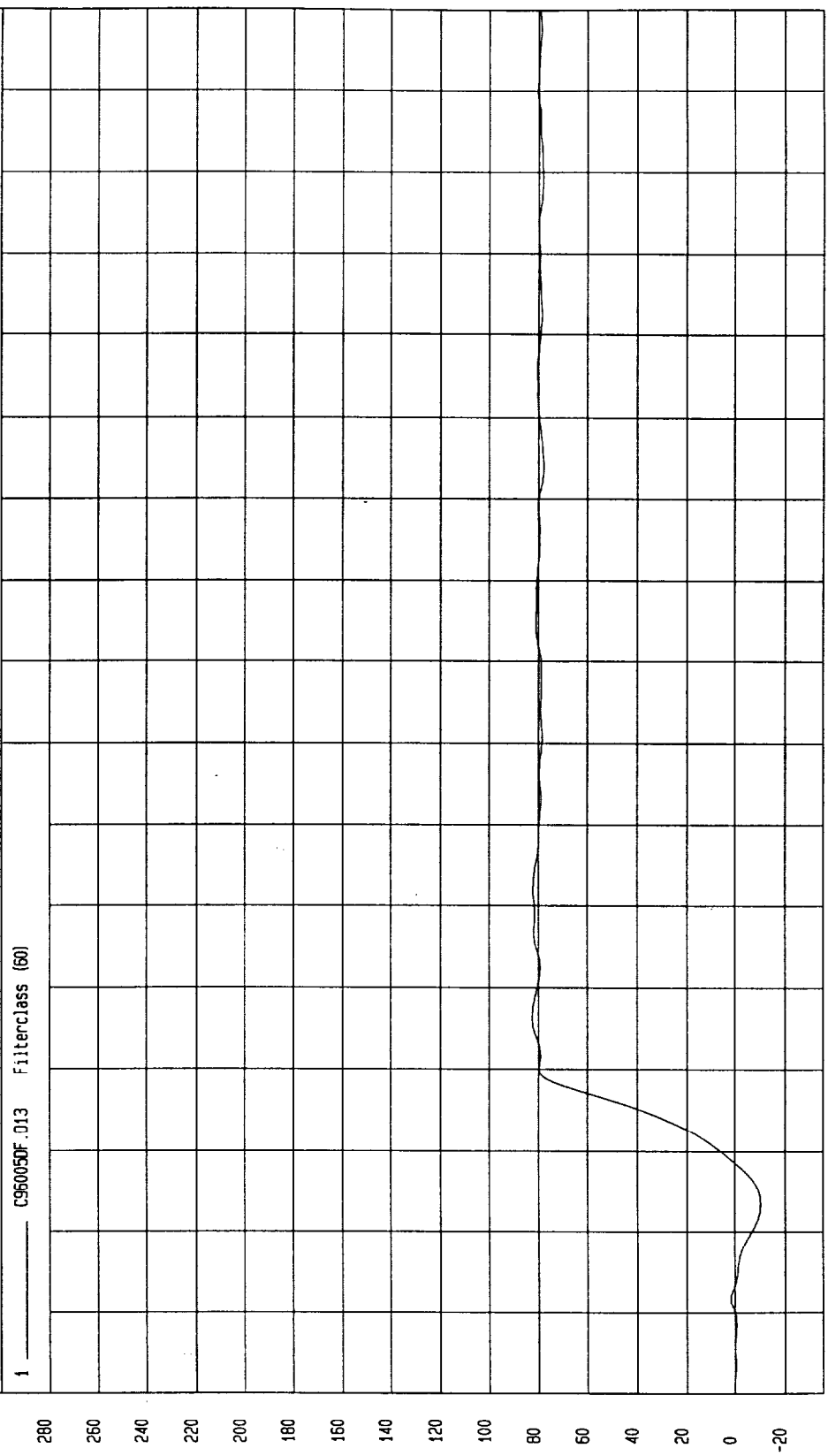


TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -10.35 MM at 13 msec Maximum = 82.6 MM at 36 msec

STRING POT 13



MGA Research
06-02-1998 14.07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

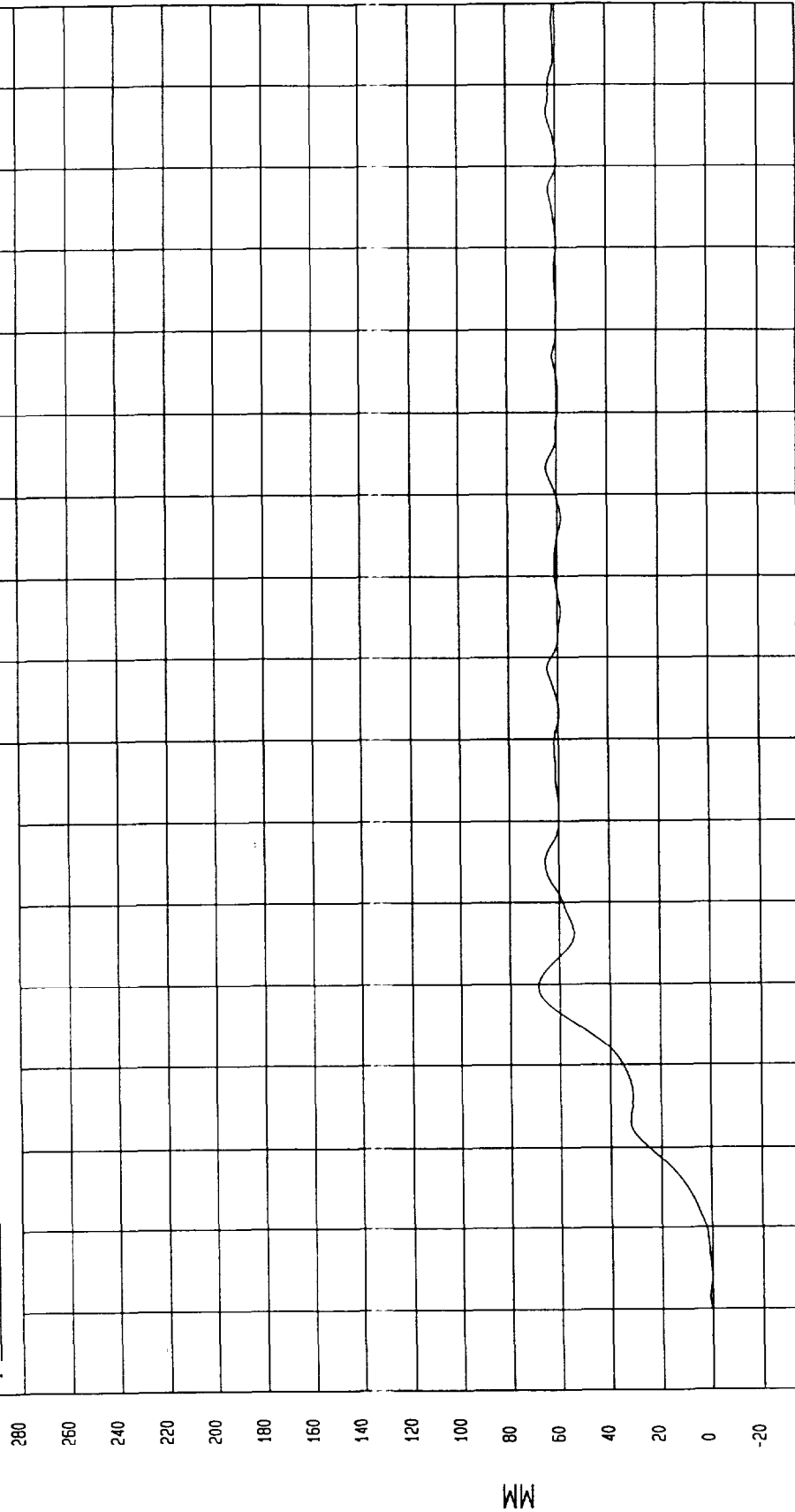
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Maximum = 68.82 MM at 40 msec

Minimum = -.15 MM at -14 msec

STRING POT 14

1 C960050F.D14 Filterclass (60)



MGA Research
06-02-1998 14:07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 25.8 MPH 41.5 KPH

Minimum = -.67 MM at .1 msec

Maximum = 208.36 MM at 48 msec

STRING POT 15

1 C960050F.D15 Filterclass (60)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

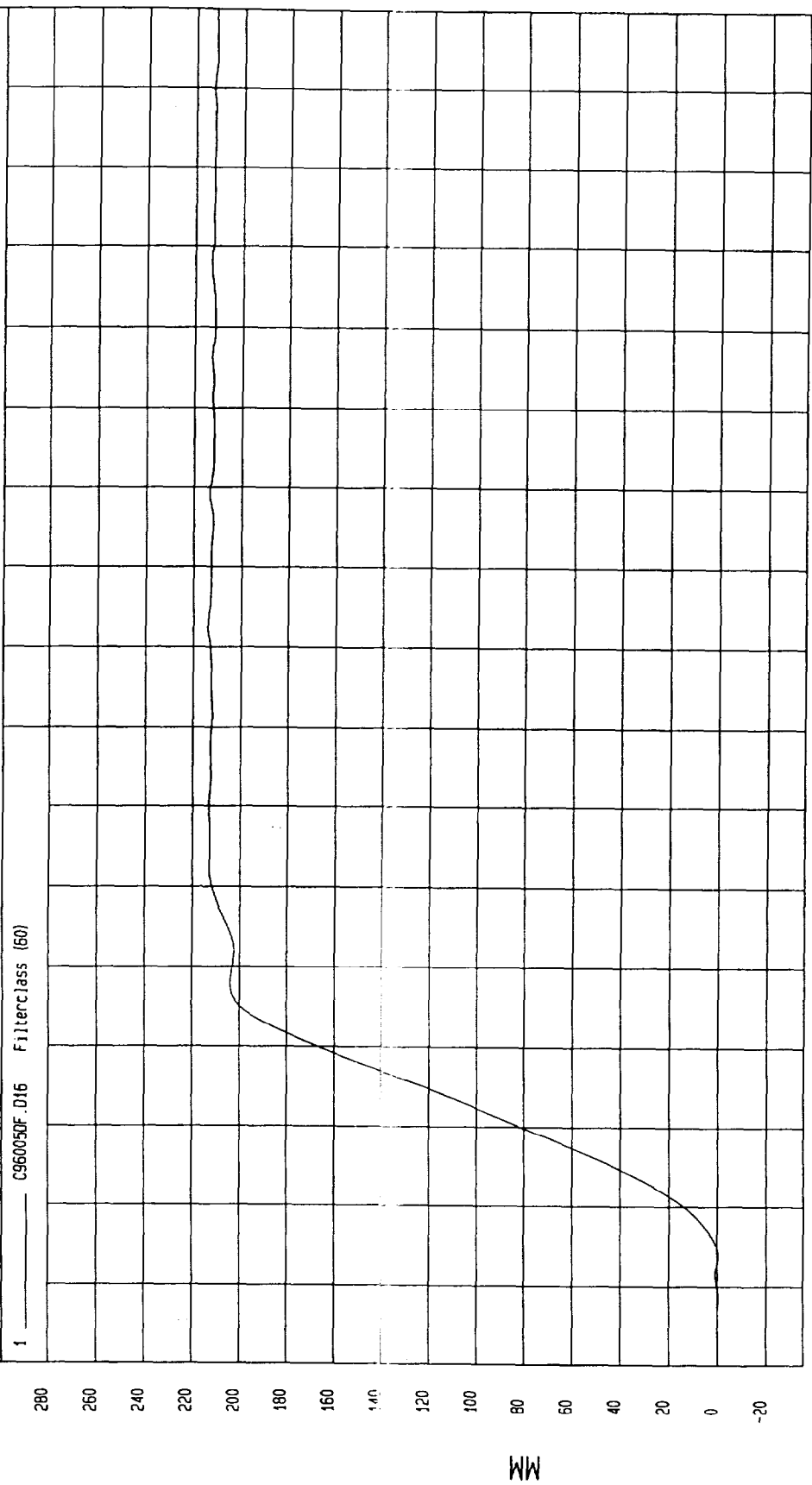
MGA Research
06-02-1998 14:07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -38 MM at 4 msec Maximum = 214.03 MM at 83 msec

STRING POT 16



MCA Research
06-02-1998 14:07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7.9 MM at 14 msec

Maximum = 110.8 MM at 52 msec

STRING POT 17

1 C960050F.D17 Filterclass (60)

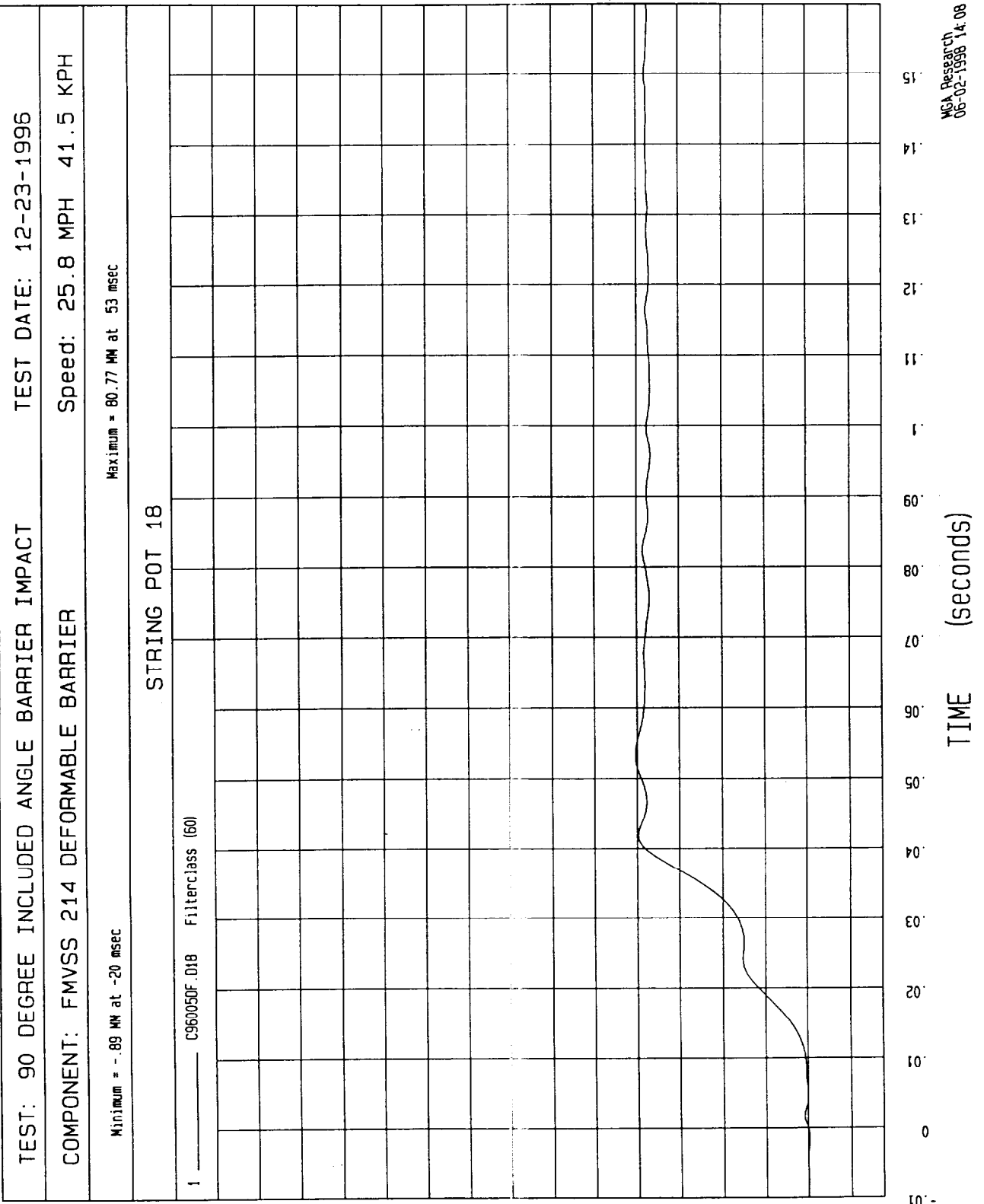
MM

280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
-20

TIME (seconds)

0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.1
.11
.12
.13
.14
.15

MCA Research
06-02-1998 14.08



TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

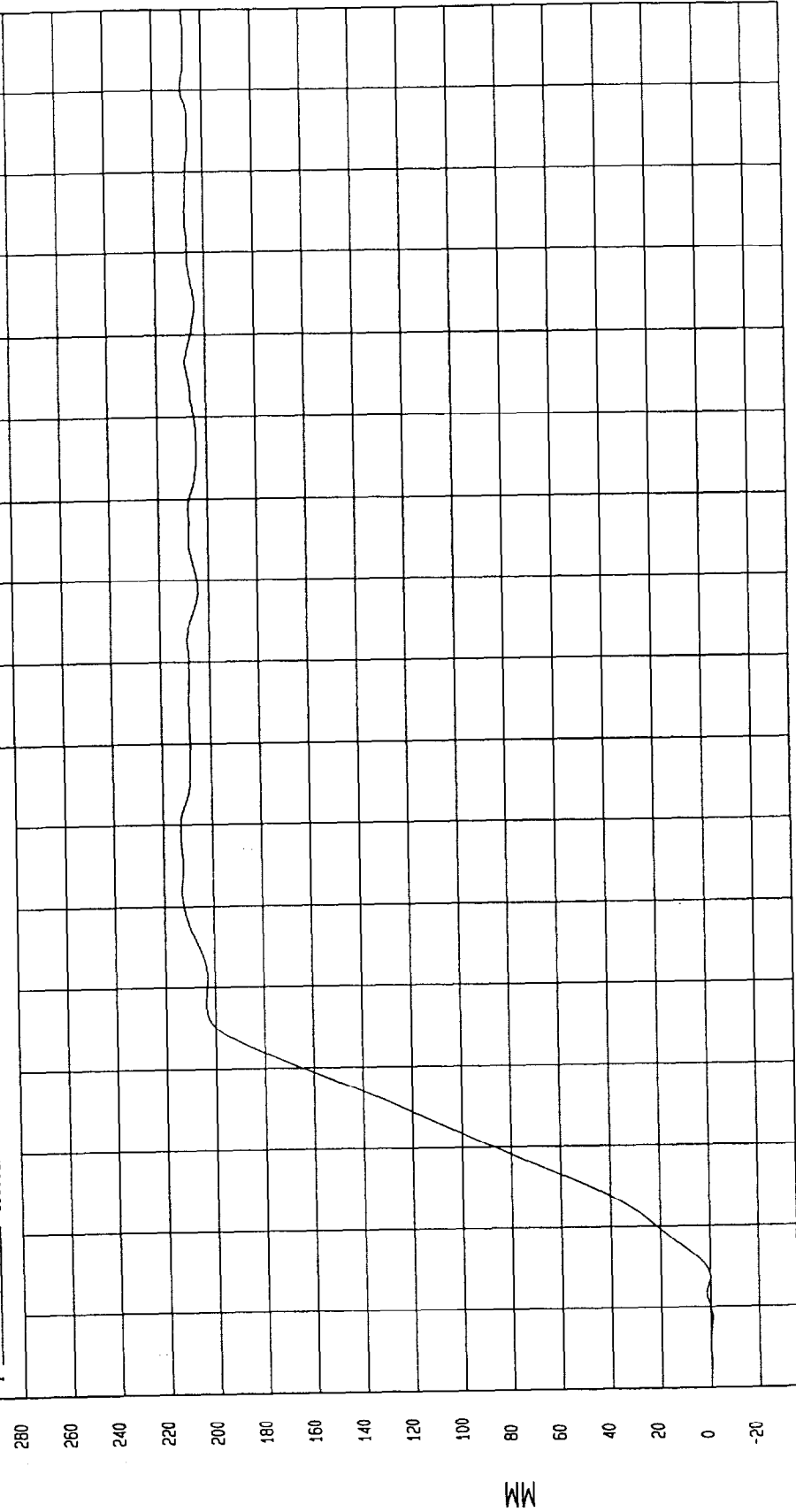
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 213.07 MM at 59 msec

Minimum = -63 MM at -1 msec

STRING POT 19

1 C960050F D19 Filterclass (60)



MCA Research
06-02-1998 14:08

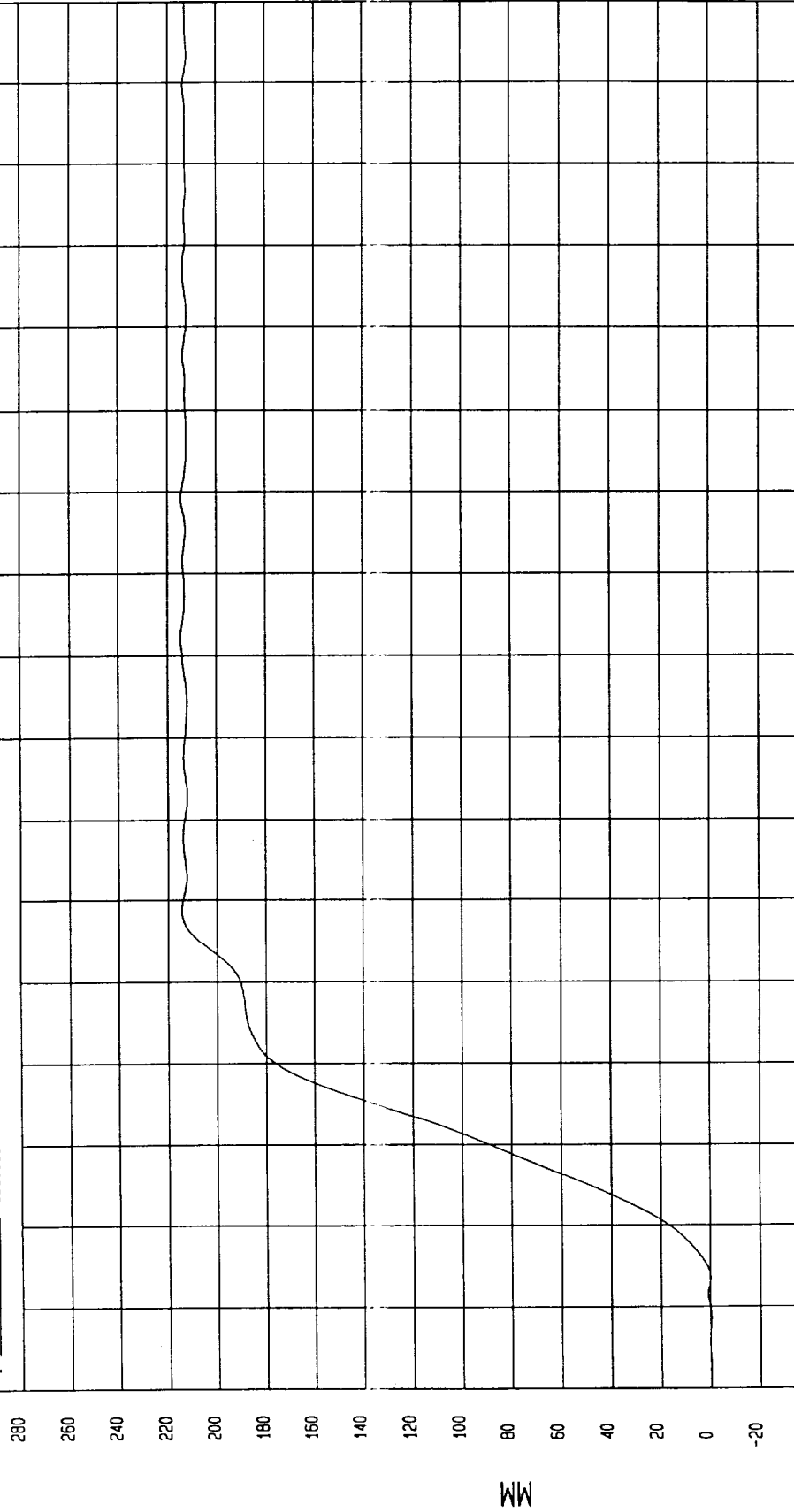
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -38 MM at -1 msec Maximum = 214.69 MM at 82 msec

STRING POT 20

1 C960050F.D20 Filterclass (60)



TIME (seconds)

MGA Research
06-02-1998 14:08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1995

SPEED: 25.8 MPH 41.5 KPH

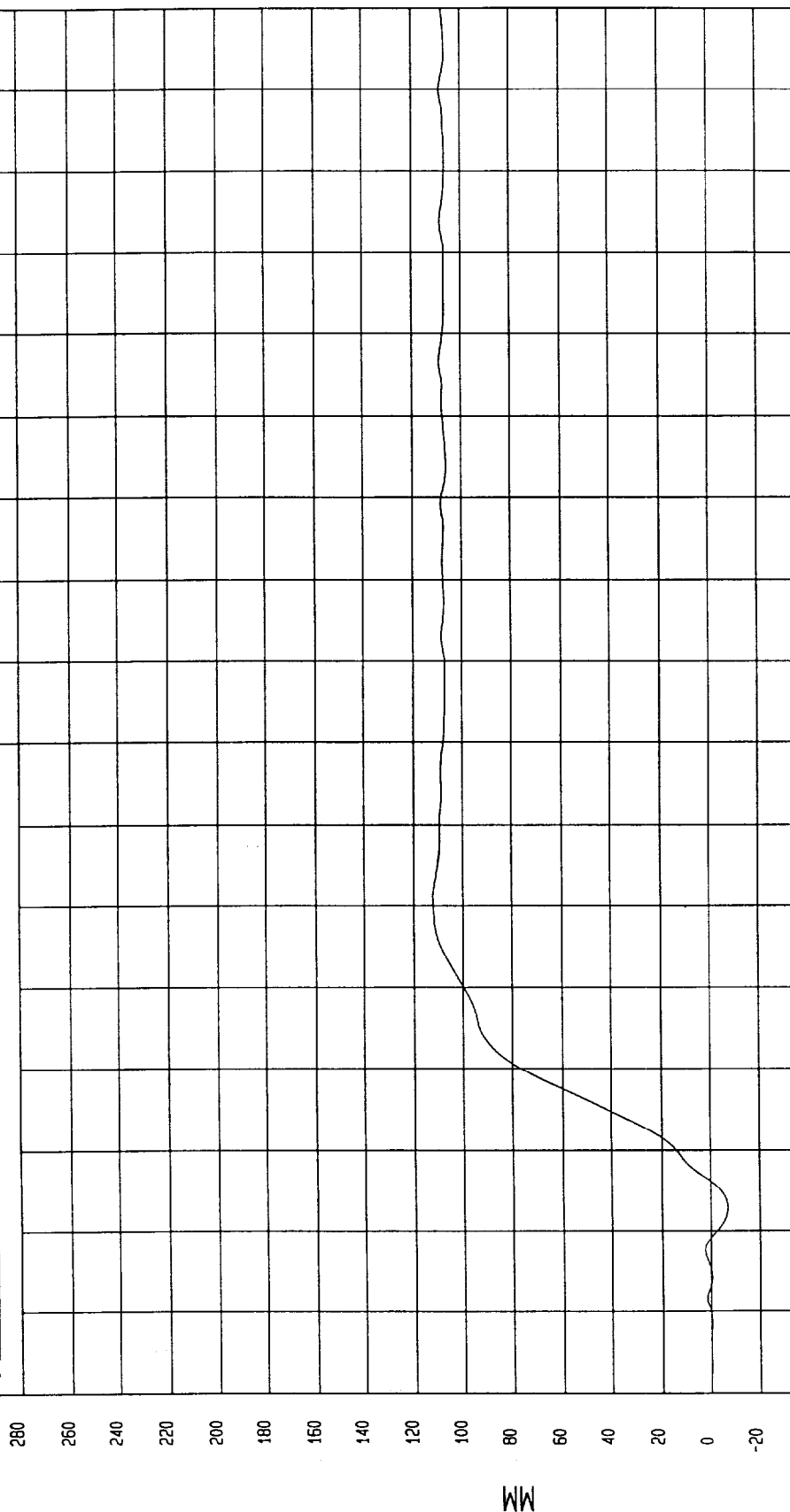
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 112.44 MM at 51 msec

Minimum = -7.05 MM at 13 msec

STRING POT 21

1 C960050F.021 Filterclass (60)



TIME (seconds)

MCA Research
06-02-1998 14:08

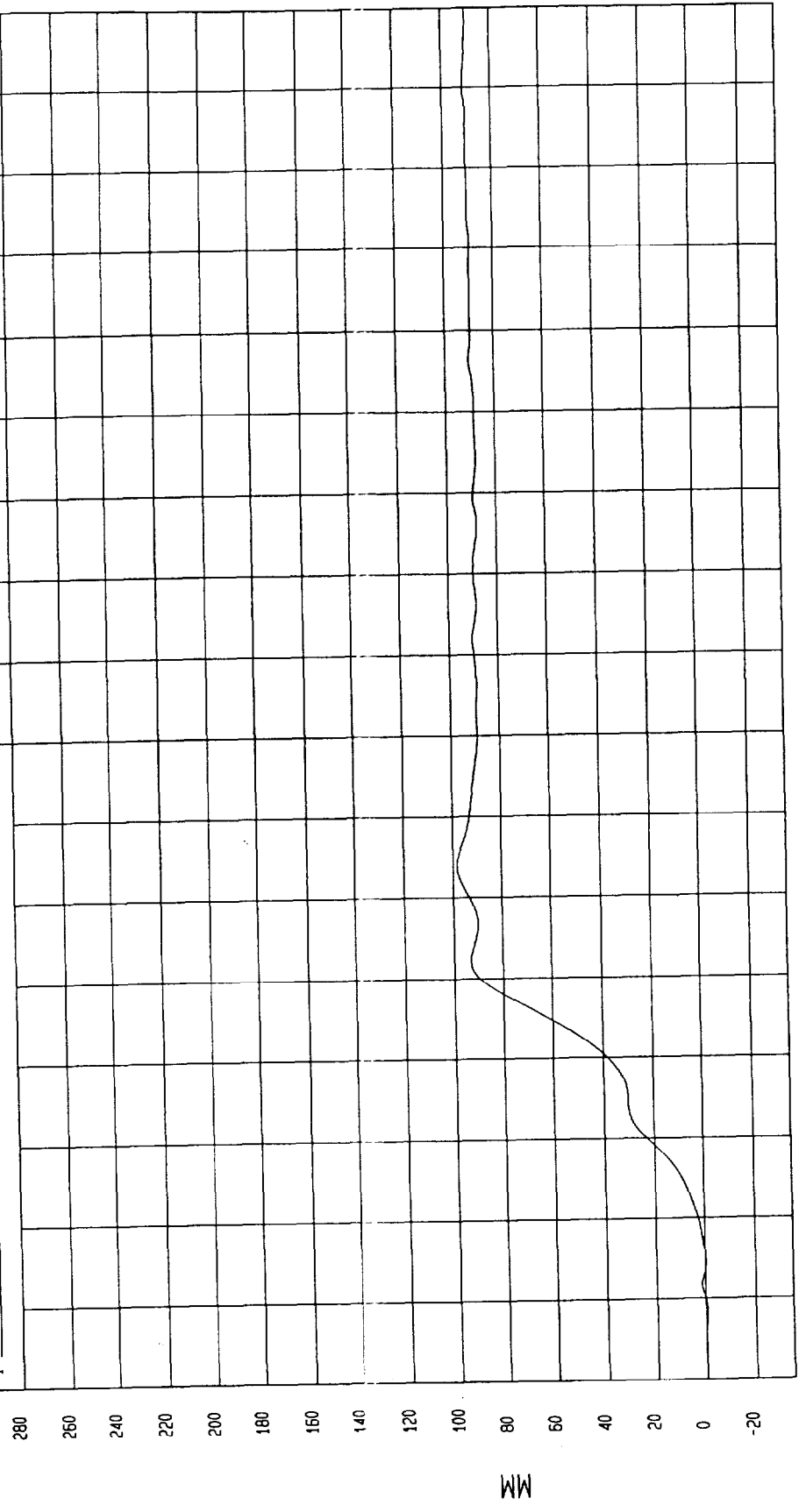
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -.67 MM at -.2 msec Maximum = 98.44 MM at 54 msec

STRING POT 22

1 _____ C96005DF.D22 Filterclass (60)



MCA Research
06-02-1998 14.08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

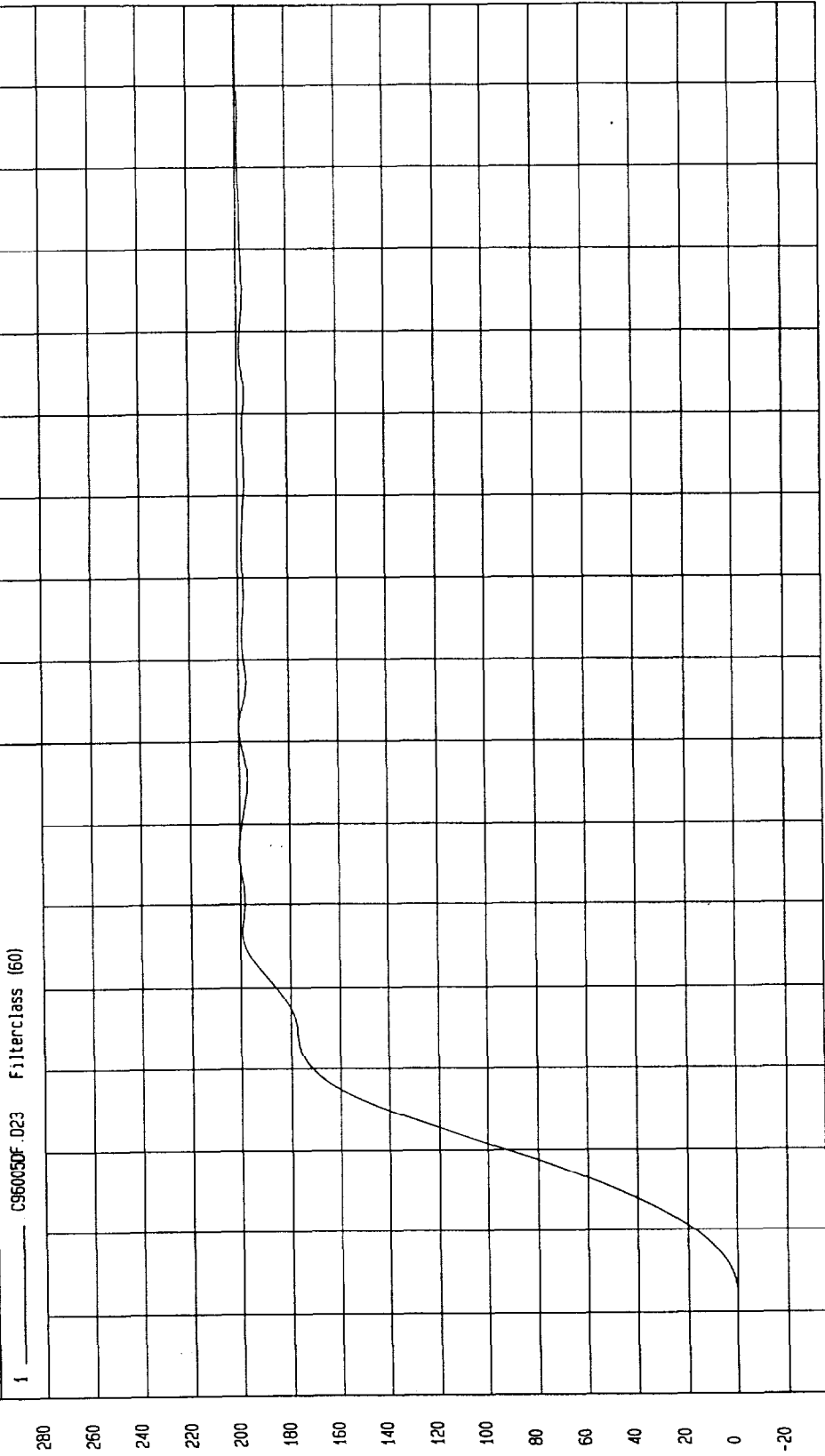
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 200.3 MM at 56 msec

Minimum = -8.54E-04 MM at -20 msec

STRING POT 23

1 C96005DF .023 Filterclass (60)



TIME (seconds)

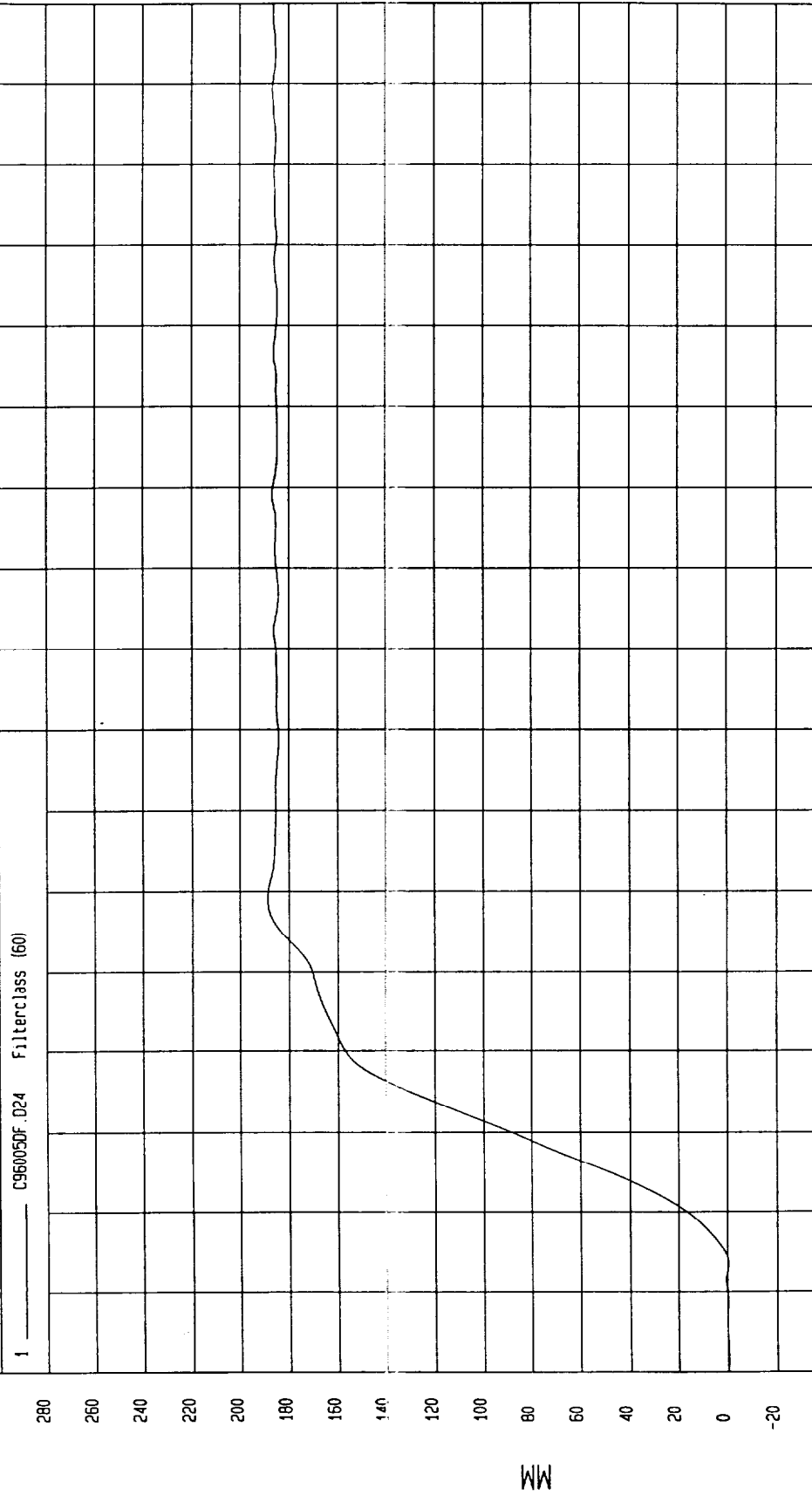
MGA Research
06-02-1998 14:08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -.5 MM at -18 msec Maximum = 188.61 MM at 49 msec

STRING POT 24



TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

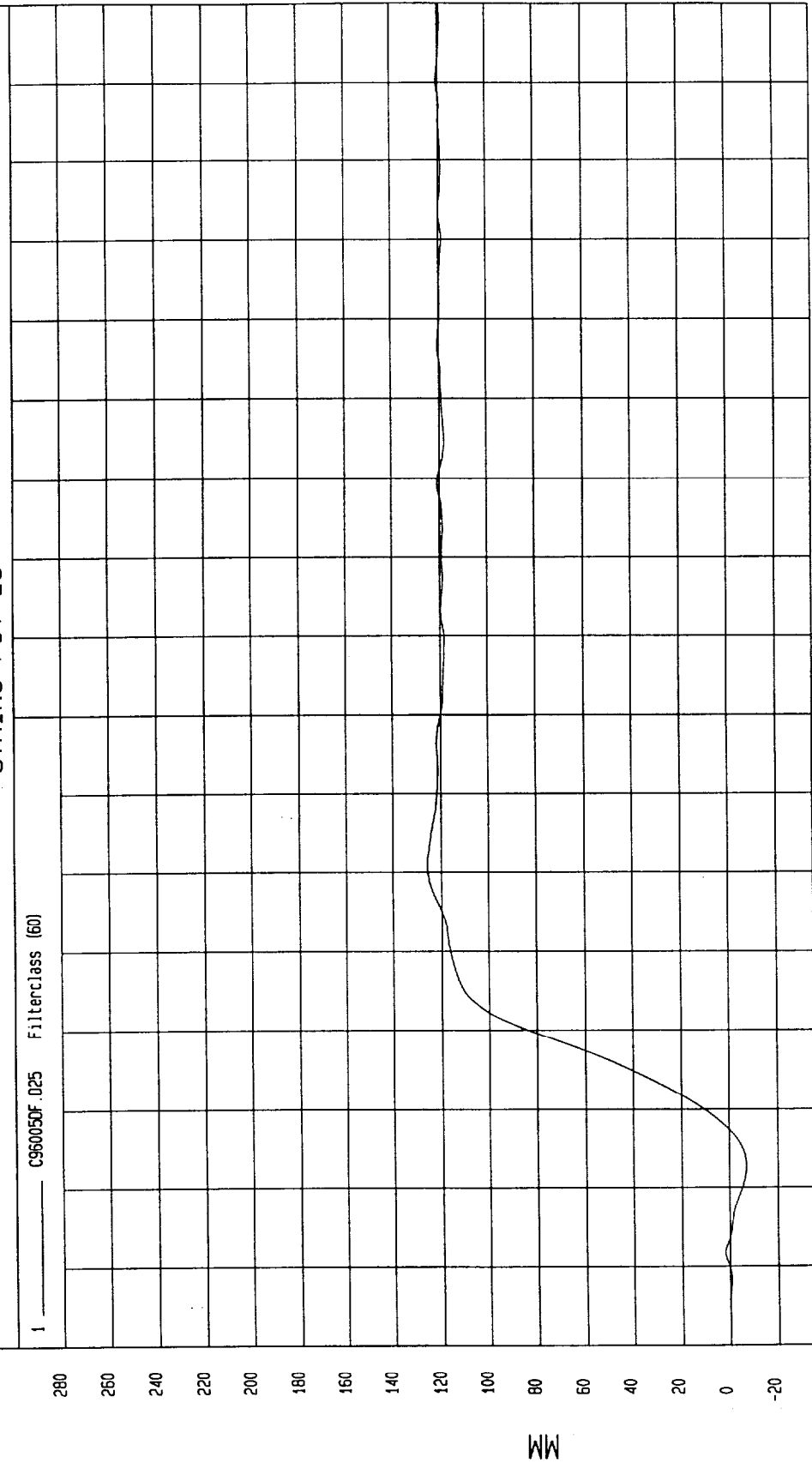
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 125.8 MM at 51 msec

Minimum = -7.06 MM at 13 msec

STRING POT 25

1 C960050F.025 Filterclass (60)



MCA Research
06-02-1998 14.08

TIME (seconds)

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

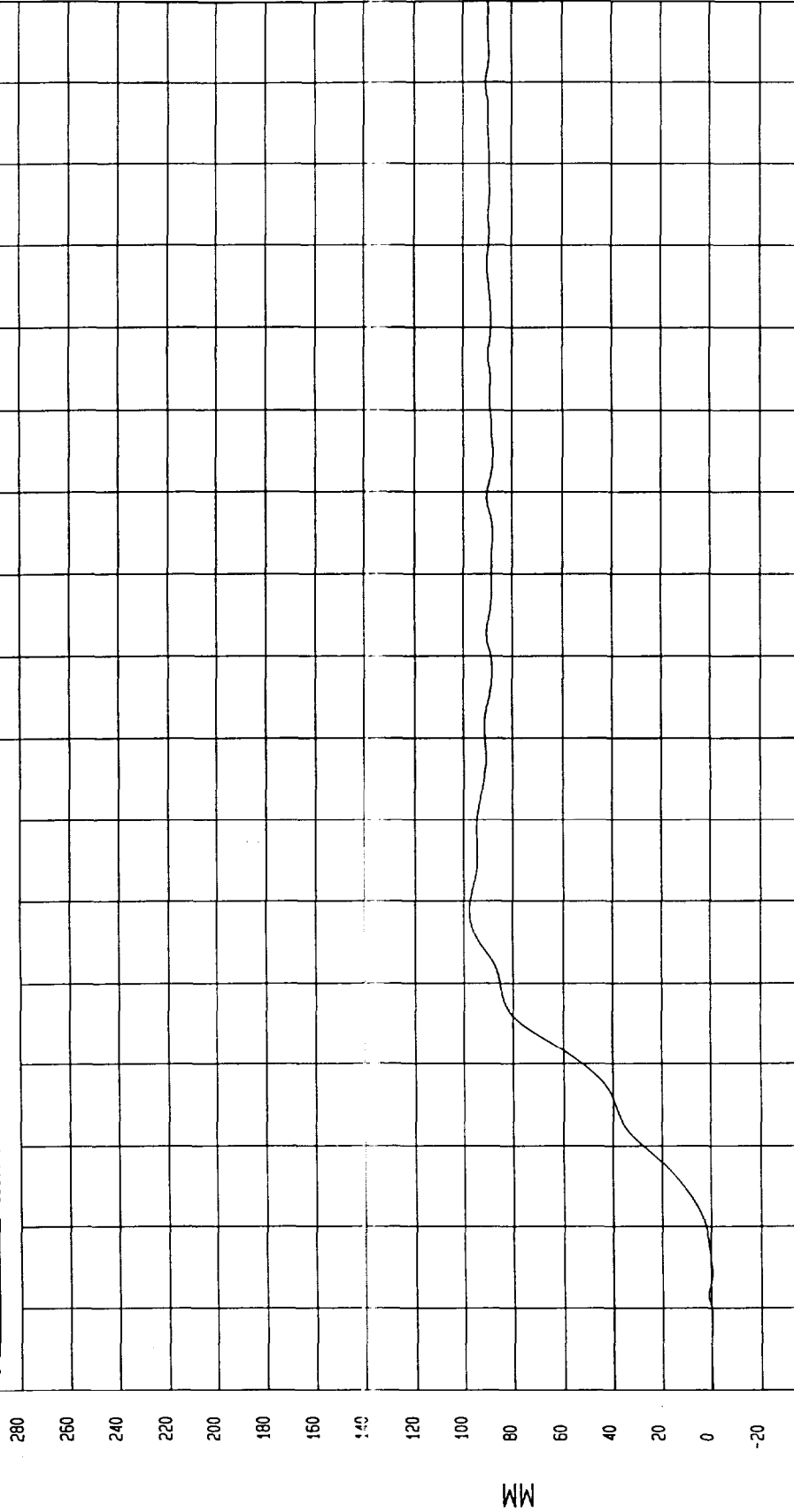
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 97.59 MM at 49 msec

Minimum = -51 MM at 4 msec

STRING POT 26

1 _____ C960050F.026 FilterClass (60)



MGA Research
06-02-1998 14:08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

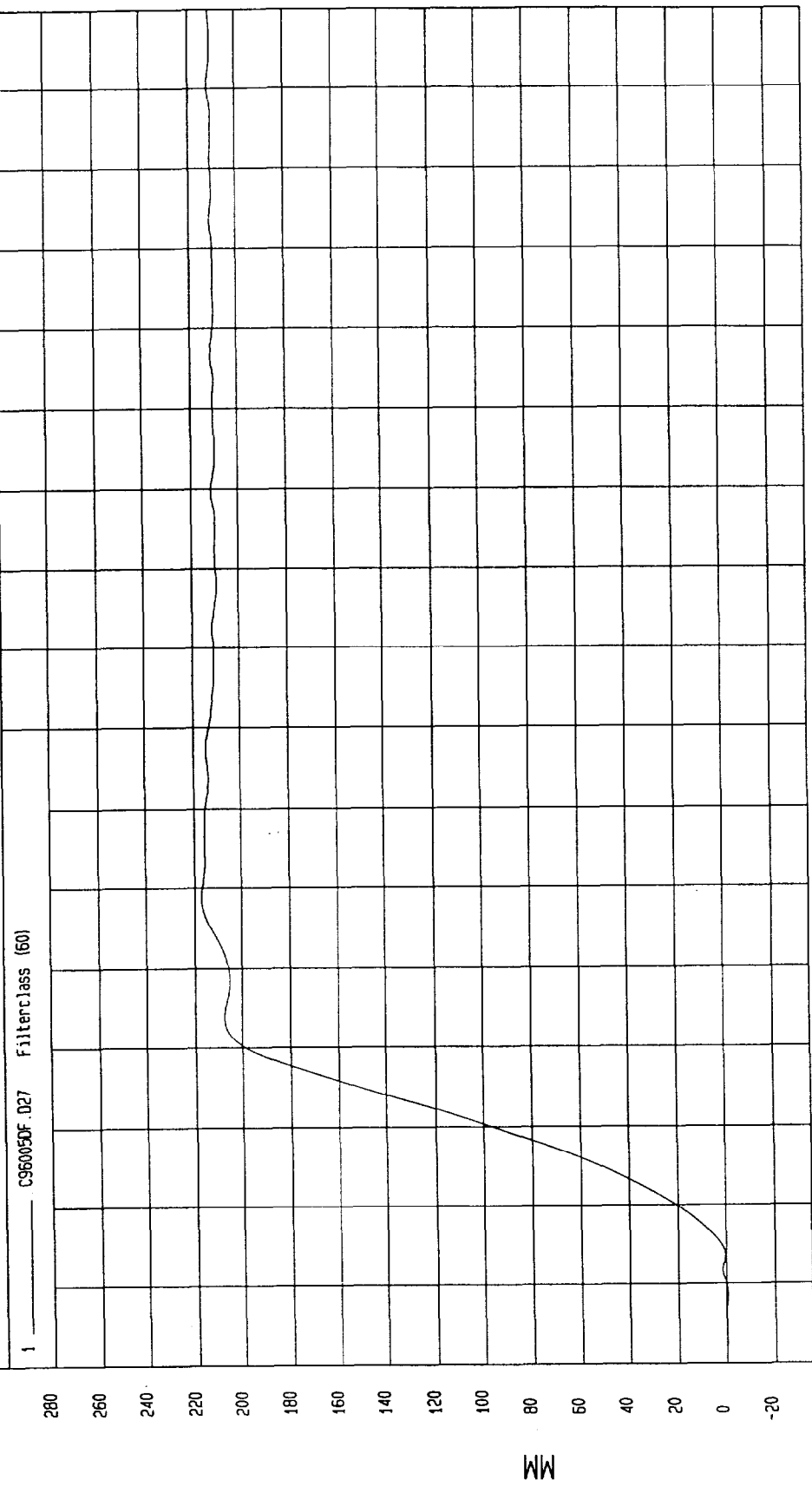
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -.61 MM at .1 msec

Maximum = 217.22 MM at 49 msec

STRING POT 27



MGA Research
06-02-1998 14.09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

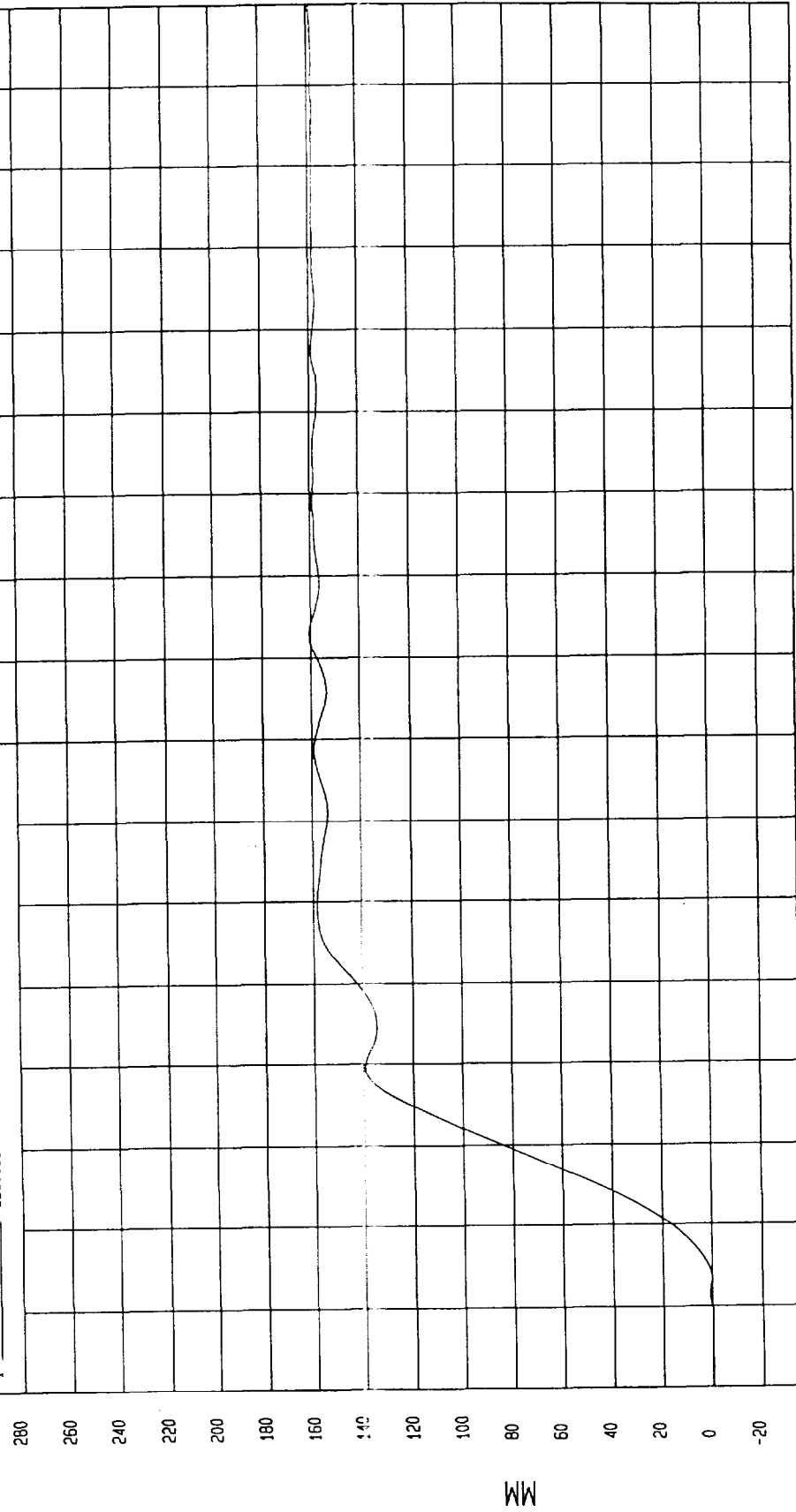
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 160.73 MM at 83 msec

Minimum = -31 MM at -1 msec

STRING POT 28

1 C960050F.028 Filterclass (60)



MCA Research
06-02-1998 14.09

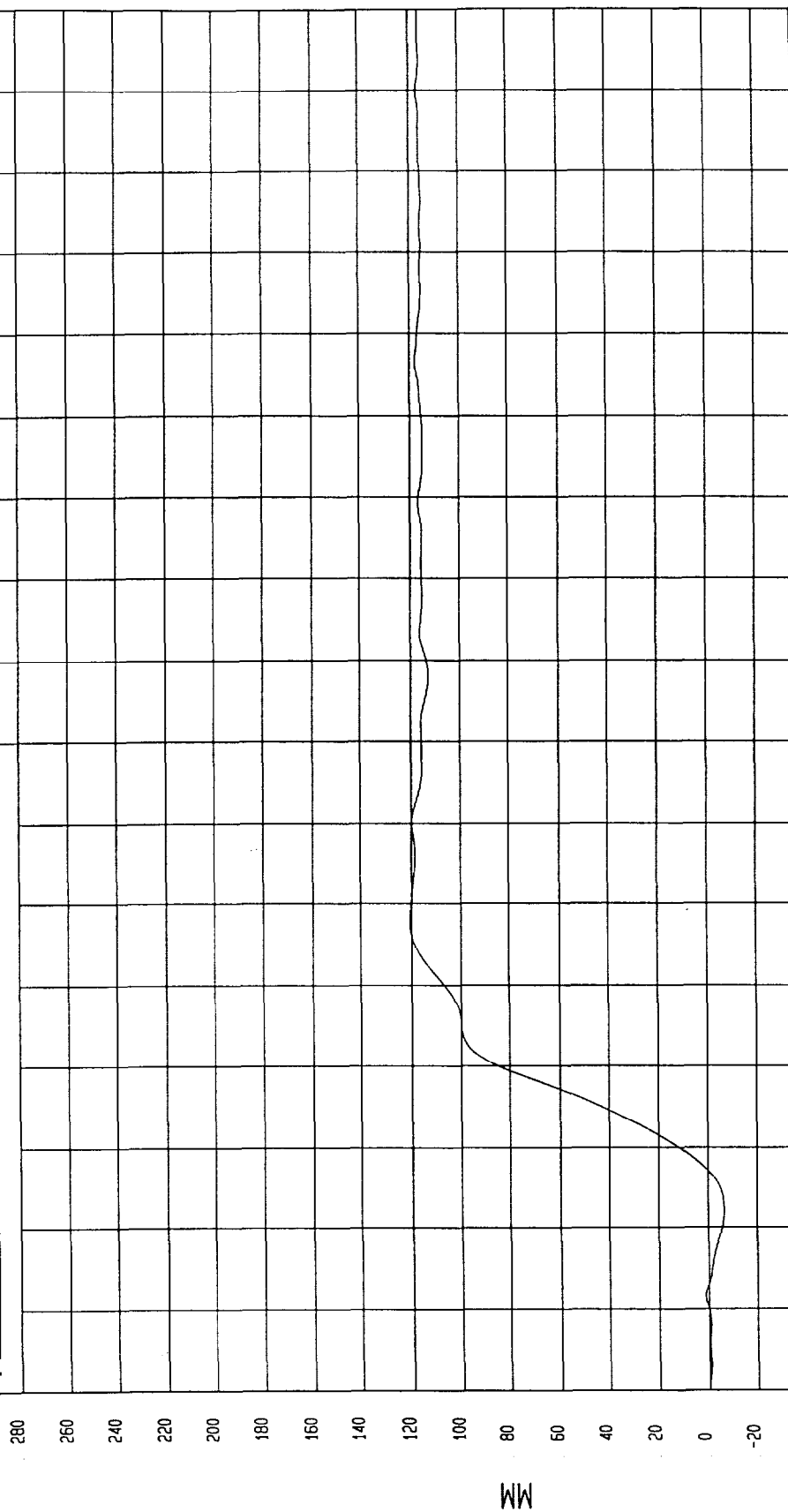
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6.48 MM at 12 msec Maximum = 120.62 MM at 48 msec

STRING POT 29

1 C960050F .029 Filterclass (50)



MGA Research
06-02-1998 14.09

TIME (seconds)

MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1.04 MM at 5 msec Maximum = 100.12 MM at 48 msec

STRING POT 30

1 C96005DF.030 Filterclass (50)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

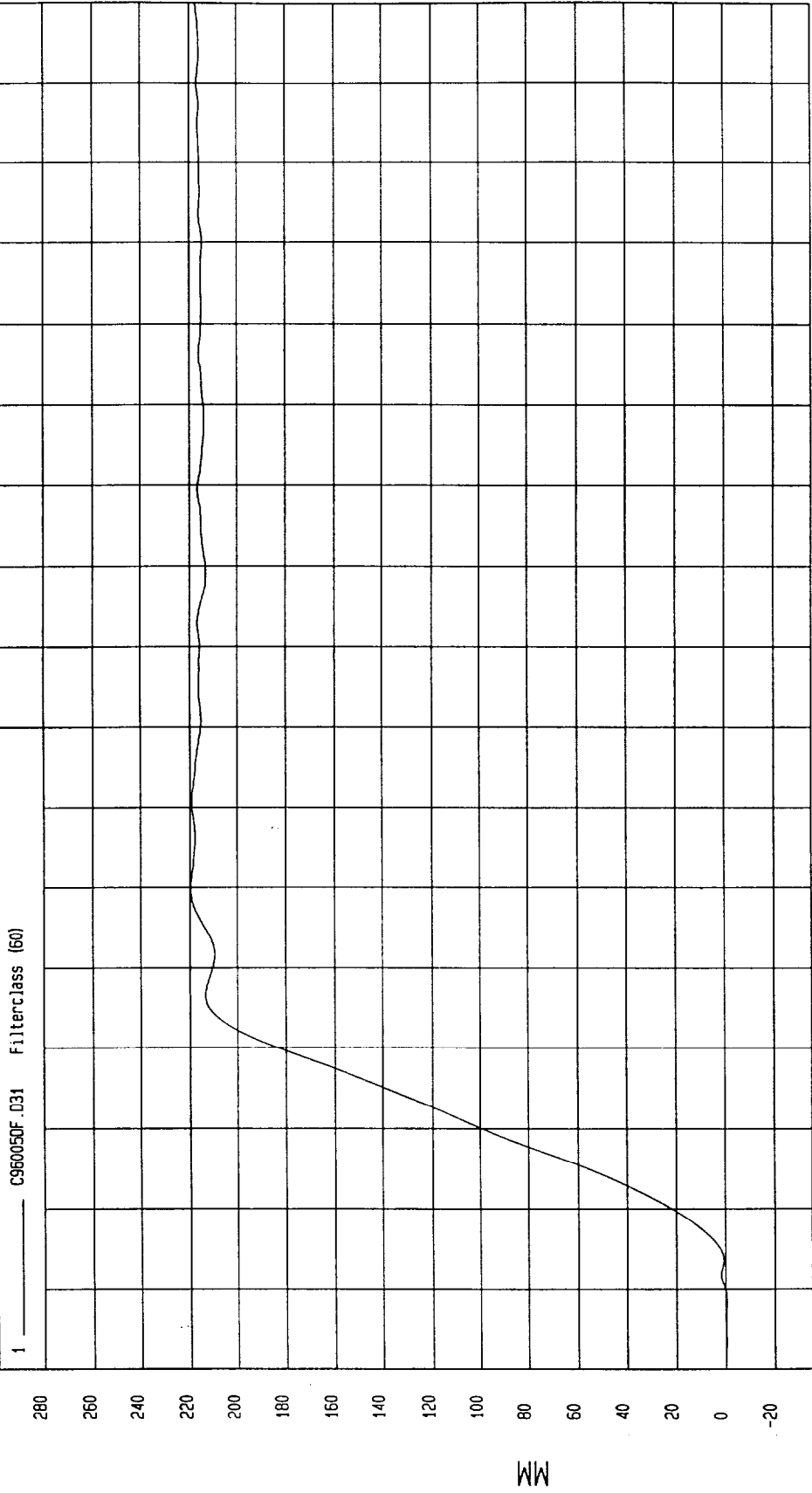
MGA Research
06-02-1998 14:09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -.57 MM at -2 msec Maximum = 219.69 MM at 50 msec

STRING POT 31



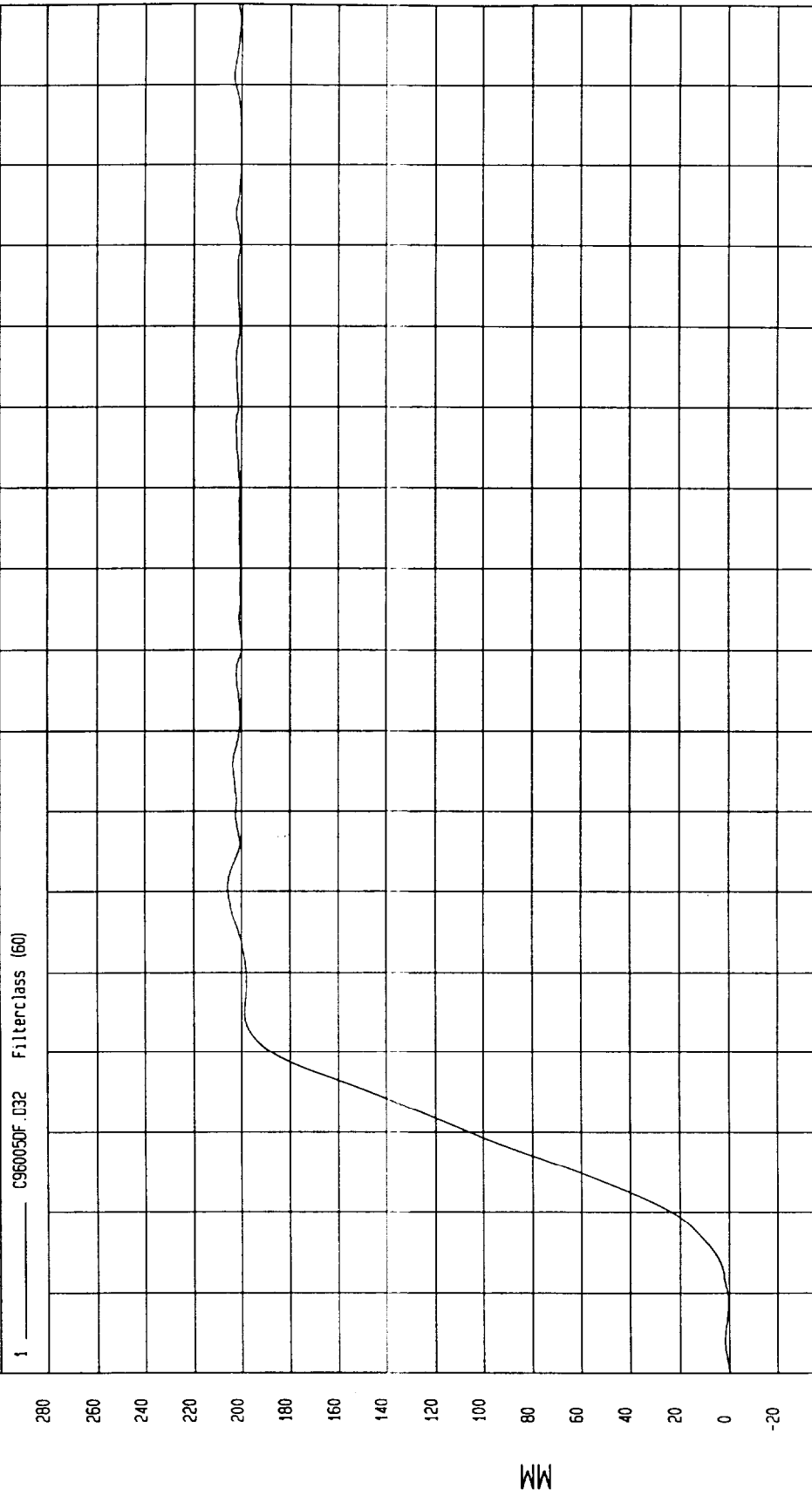
MGA Research
06-02-1998 14:09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1.55 MM at -20 msec Maximum = 205.93 MM at 50 msec

STRING POT 32



MCA Research
05-02-1998 14:09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7.52 MM at 12 msec Maximum = 383.56 MM at 167 msec

STRING POT 33

1 ——— C960050F .033 Filterclass (60)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

Value is high
Data is not valid after approx. 30 msec.

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (seconds)

MEA Research
06-02-1998 14:09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

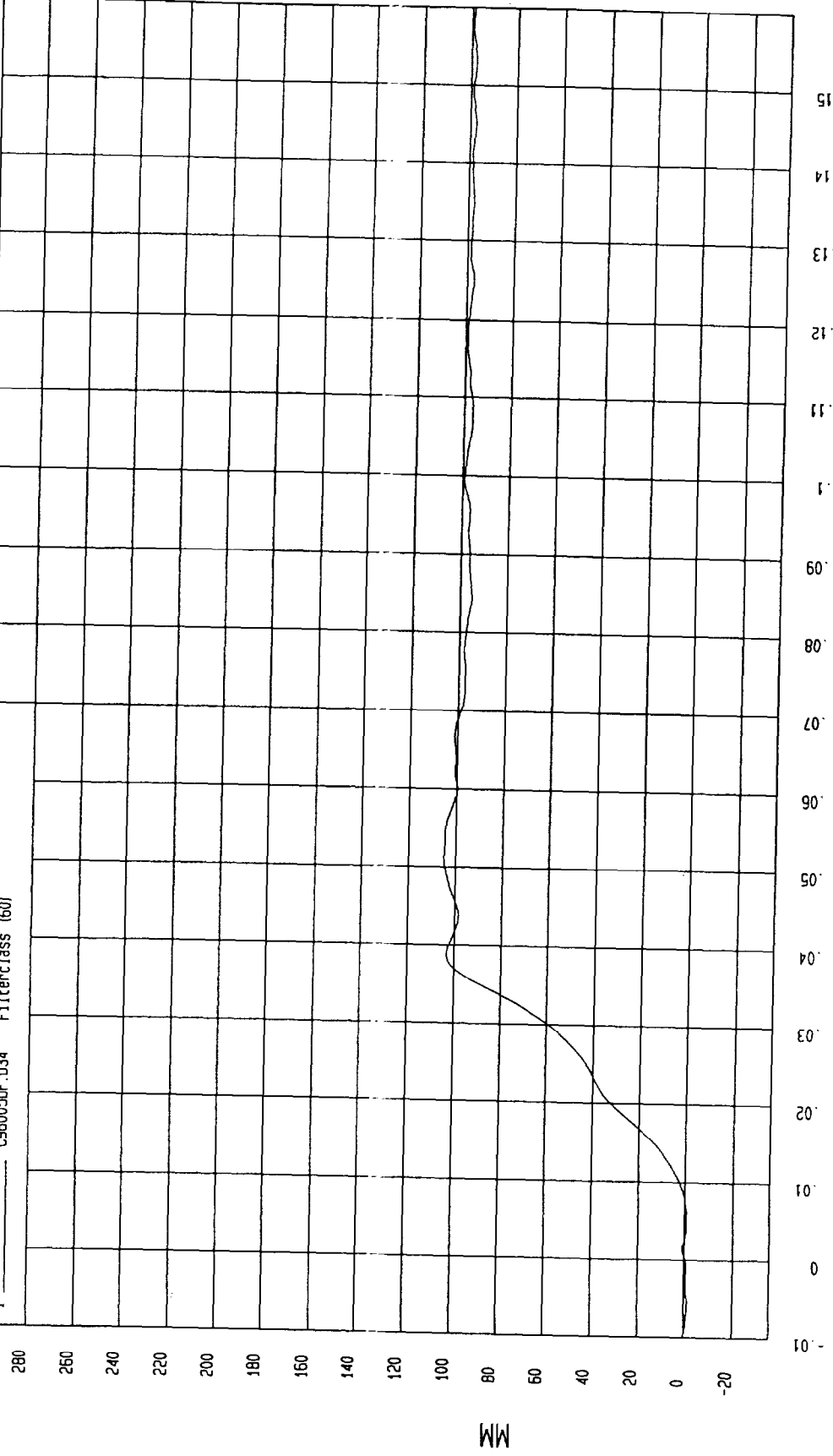
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1.23 MM at -6 msec

Maximum = 105.16 MM at 51 msec

STRING POT 34

1 C96005DF.034 Filterclass (60)



MGA Research
06-02-1998 14:09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -.58 MM at -.1 msec

Maximum = 200.43 MM at .34 msec

STRING POT 35

1 C960050F.035 Filterclass (50)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

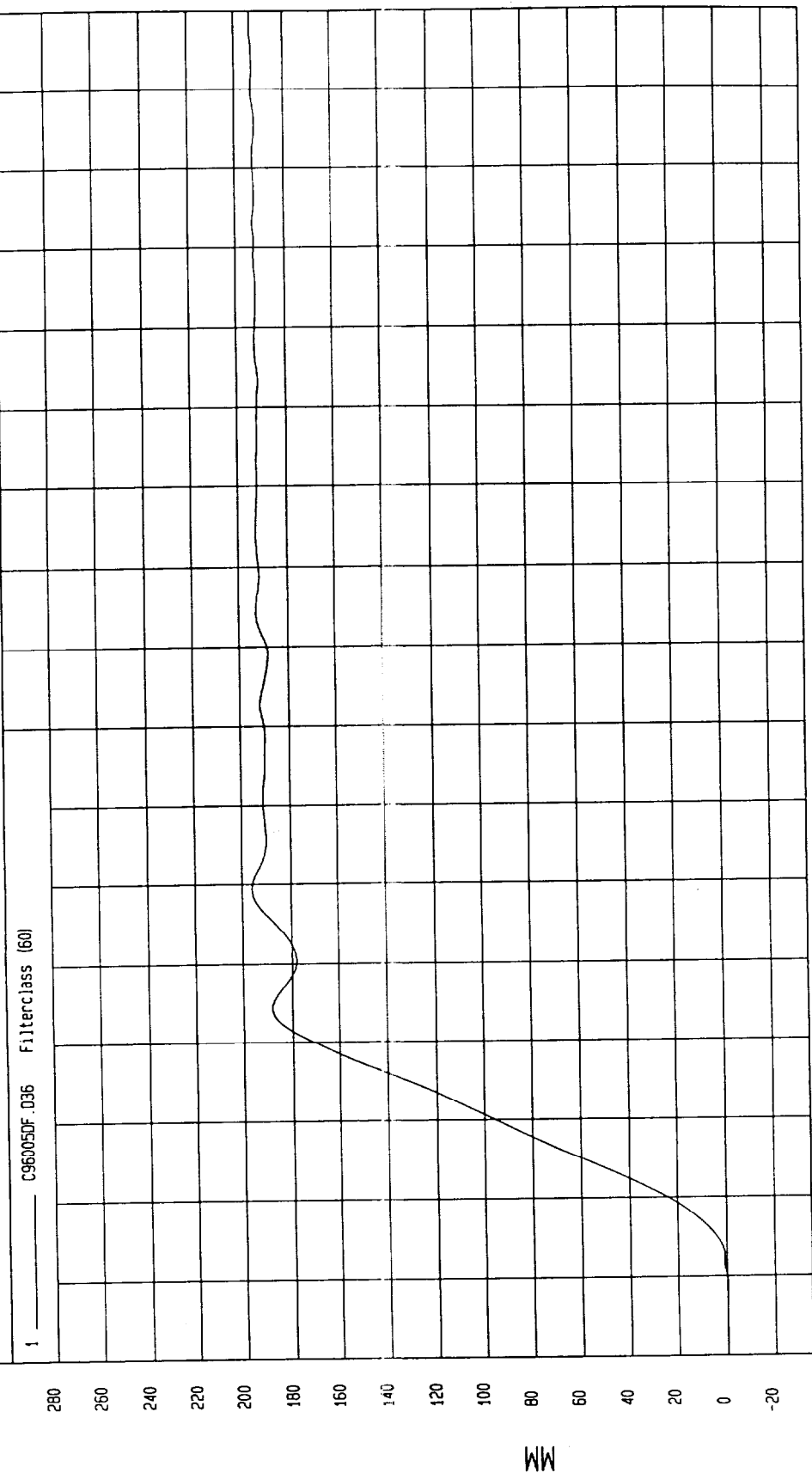
MCA Research
06-02-1998 14:09

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -.35 MM at -2 msec Maximum = 195.88 MM at 49 msec

STRING POT 36



TIME (seconds)

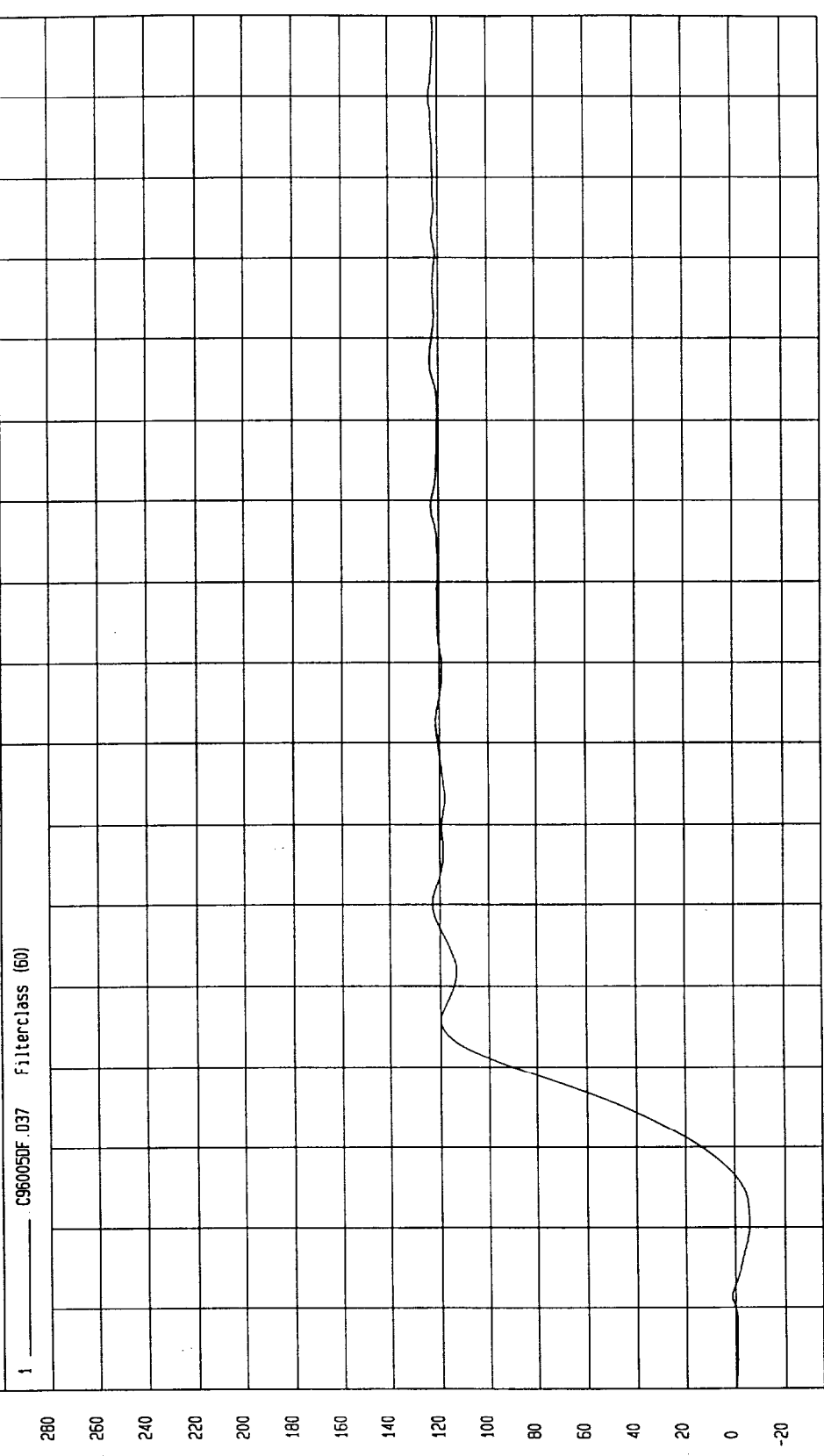
MCA Research
06-02-1998 14.10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5.72 MM at 10 msec Maximum = 123.88 MM at 183 msec

STRING POT 37



MCA Research
06-02-1998 14.10

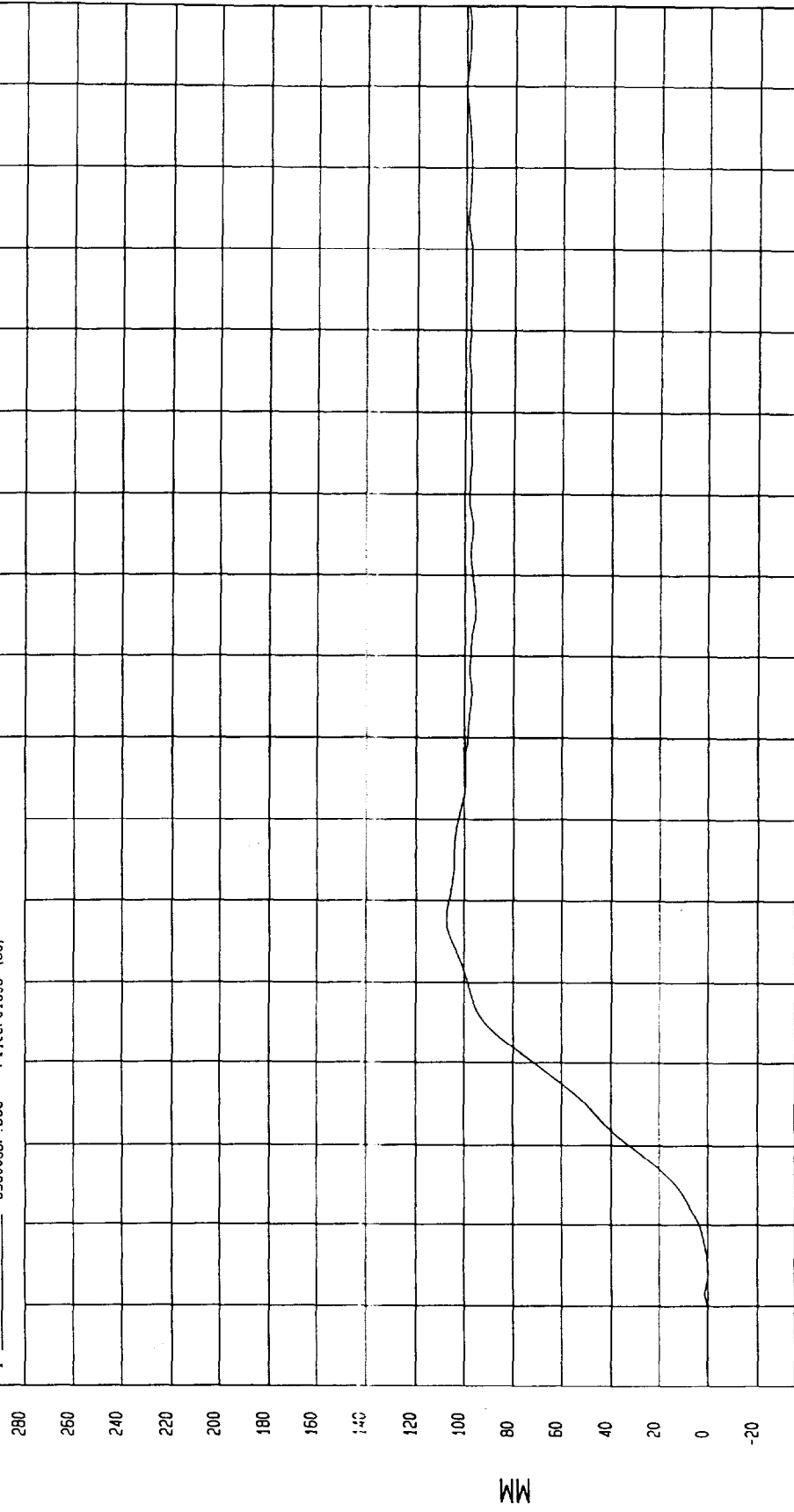
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -91 MM at -20 msec Maximum = 107.32 MM at 48 msec

STRING POT 38

1 C960050F 038 Filterclass (60)



MSA Research
06-02-1998 14:10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

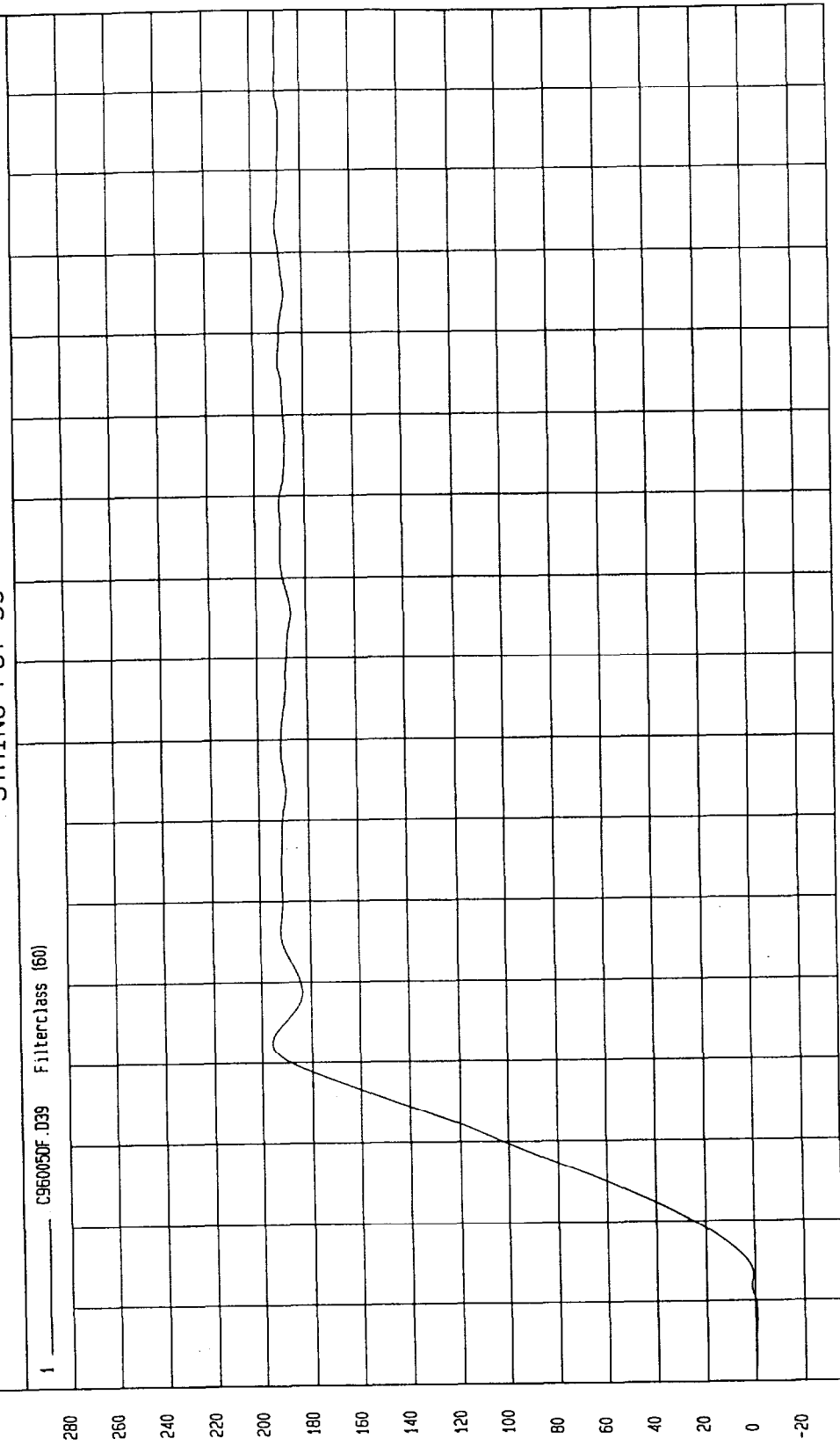
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 195.6 MM at 32 msec

Minimum = -78 MM at -1 msec

STRING POT 39

1 C960050F.D39 Filterclass (50)



TIME (seconds)

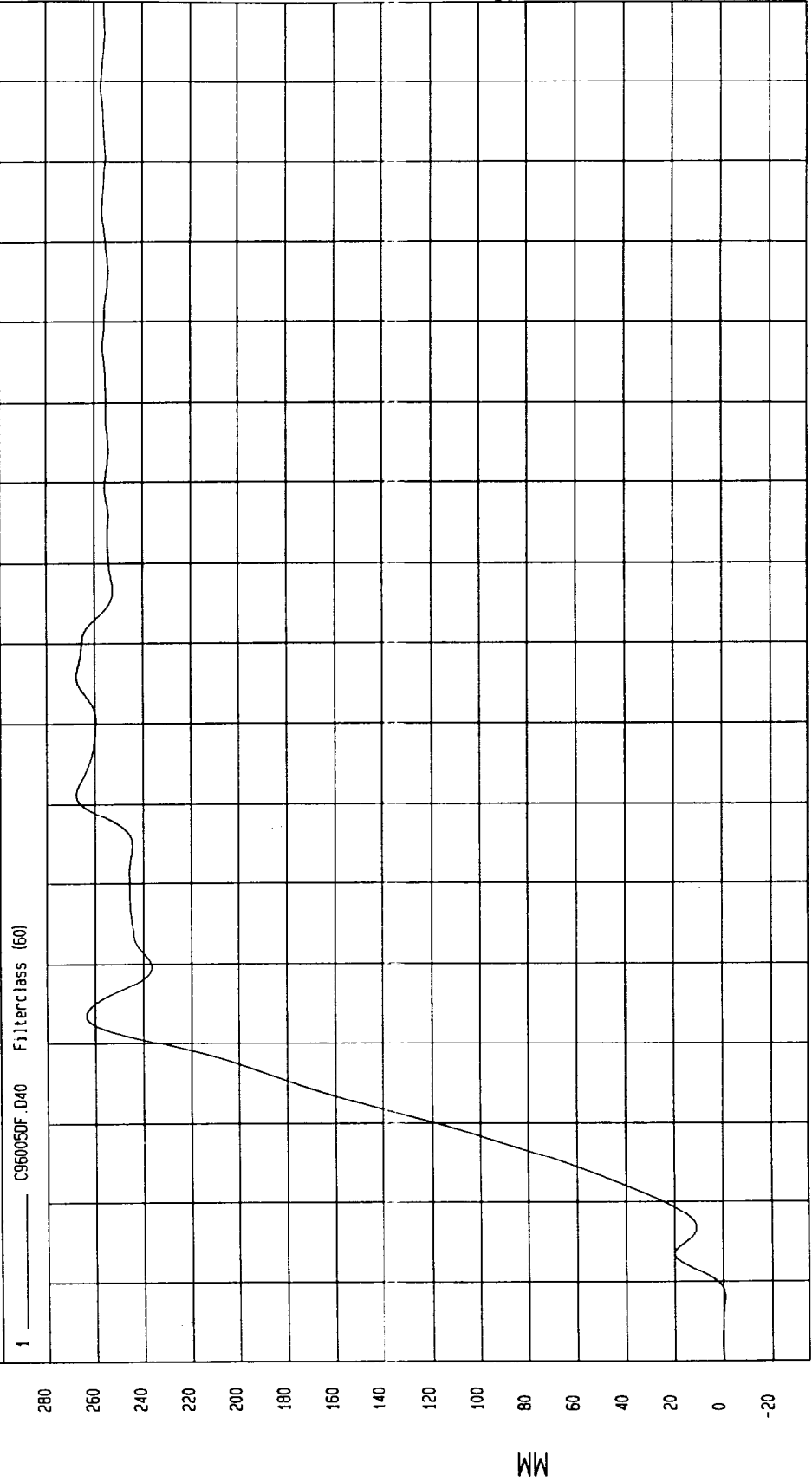
MGA Research
06-02-1998 14:10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -.77 MM at -.2 msec Maximum = 267.75 MM at 51 msec

STRING POT 40



MCA Research
06-02-1998 14.10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

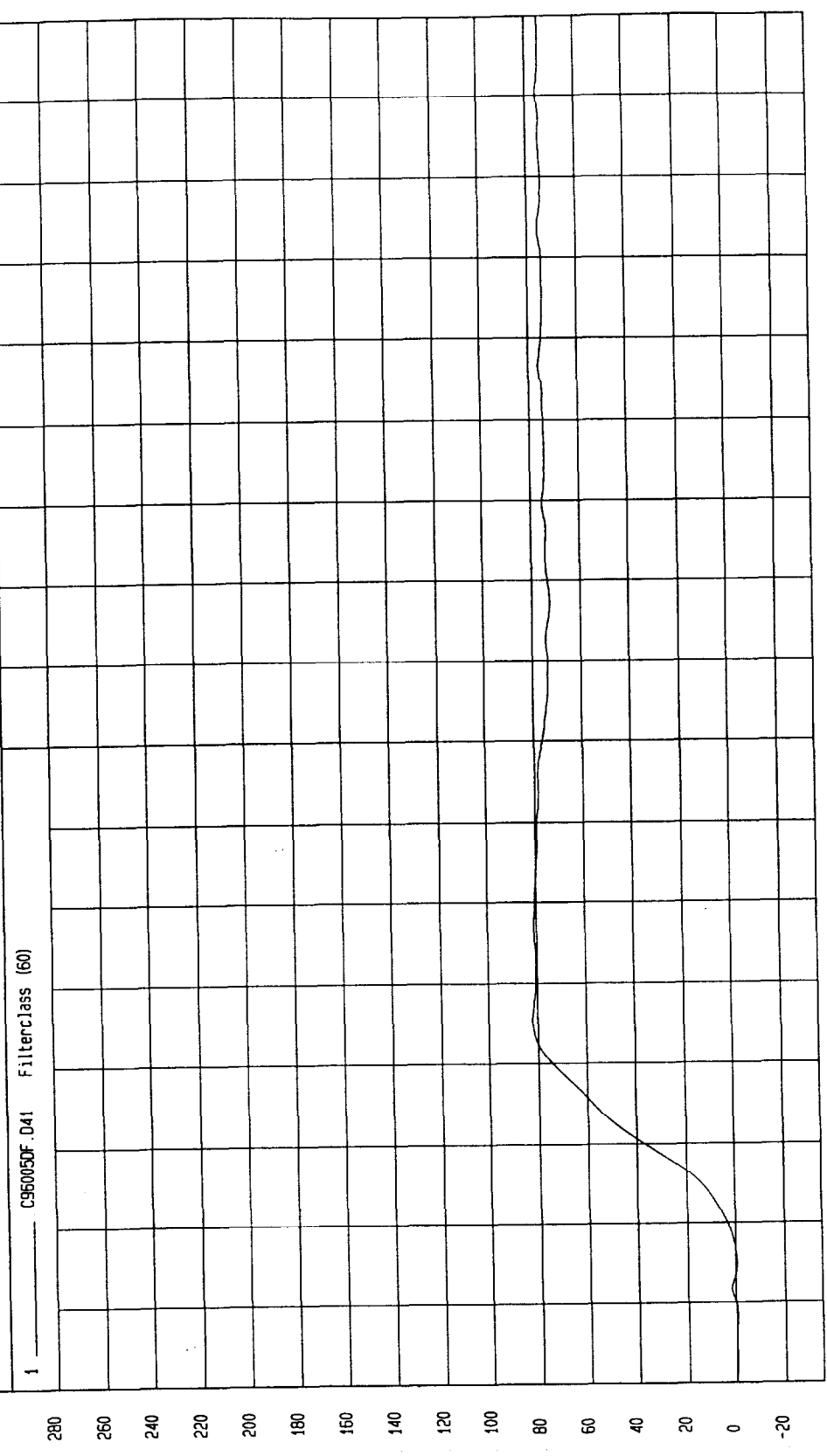
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 82.09 MM at 35 msec

Minimum = -5 MM at -2 msec

STRING POT 41

1 C96005DF.D41 Filterclass (60)



MCA Research
06-02-1998 14:10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

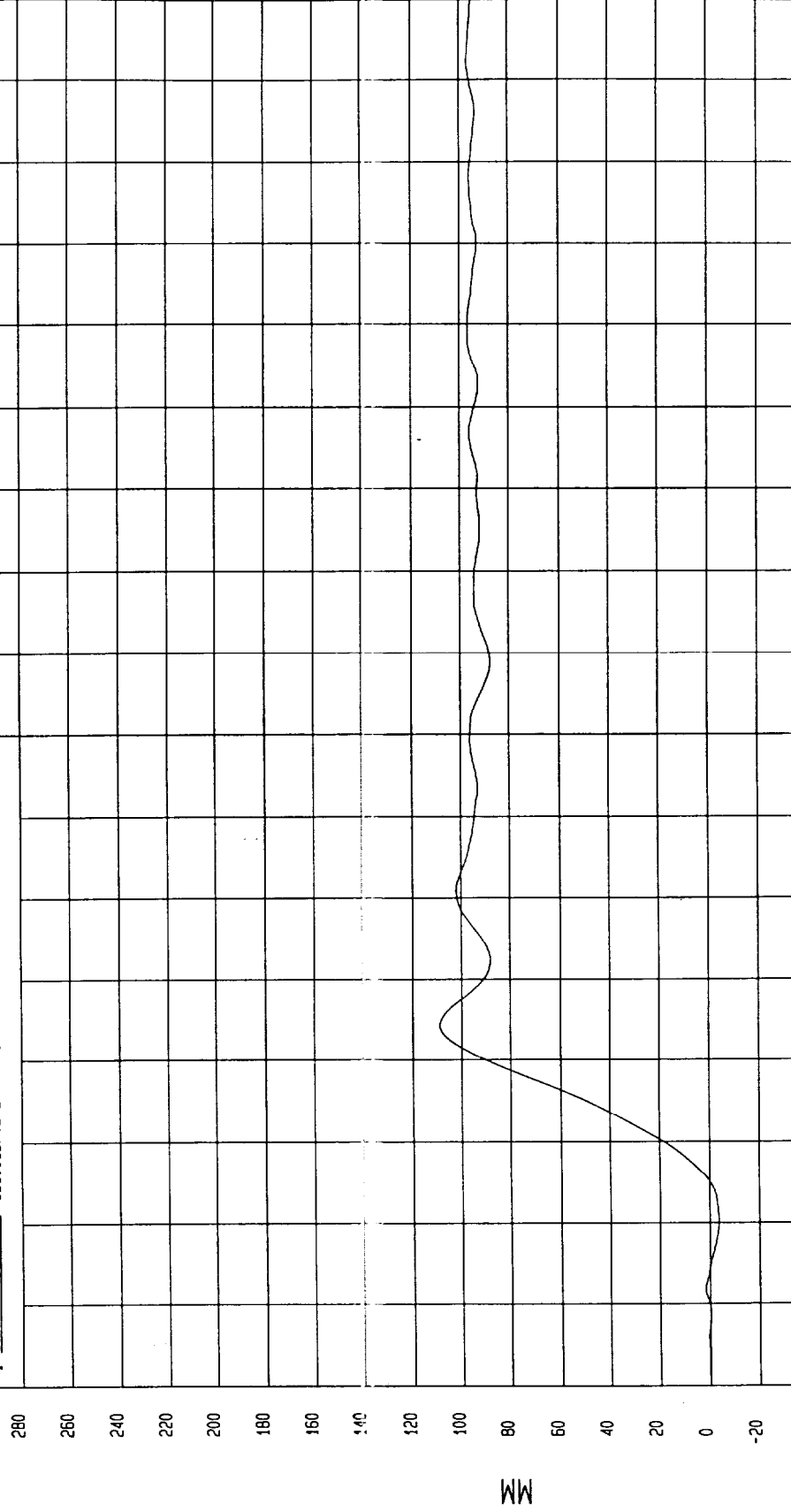
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 109.09 MM at 34 msec

Minimum = -3.55 MM at 10 msec

STRING POT 42

1 C960050F.042 Filterclass (60)



TIME (seconds)

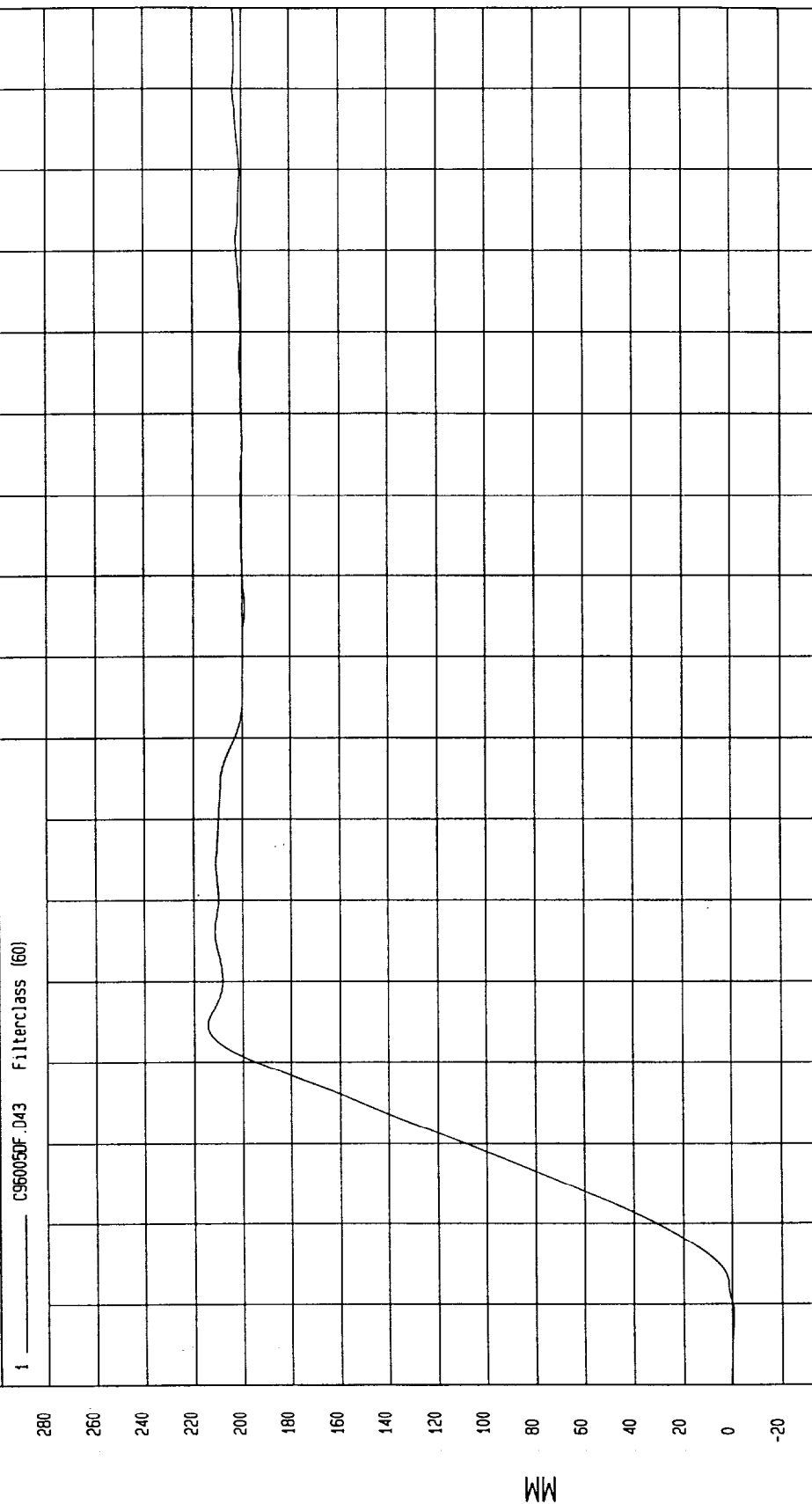
MCA Research
06-02-1998 14:10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7 MM at -1 msec Maximum = 214.51 MM at 34 msec

STRING POT 43



MSA Research
06-02-1998 14:10

TIME (seconds)

MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 179.72 MM at 30 msec

Minimum = -41 MM at -1 msec

STRING POT 44

1 C960050F.D44 Filterclass (60)

280

260

240

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

13

12

11

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07

06

05

04

03

02

01

0

-01

TIME (seconds)

MCA Research
06-02-1998 14.10

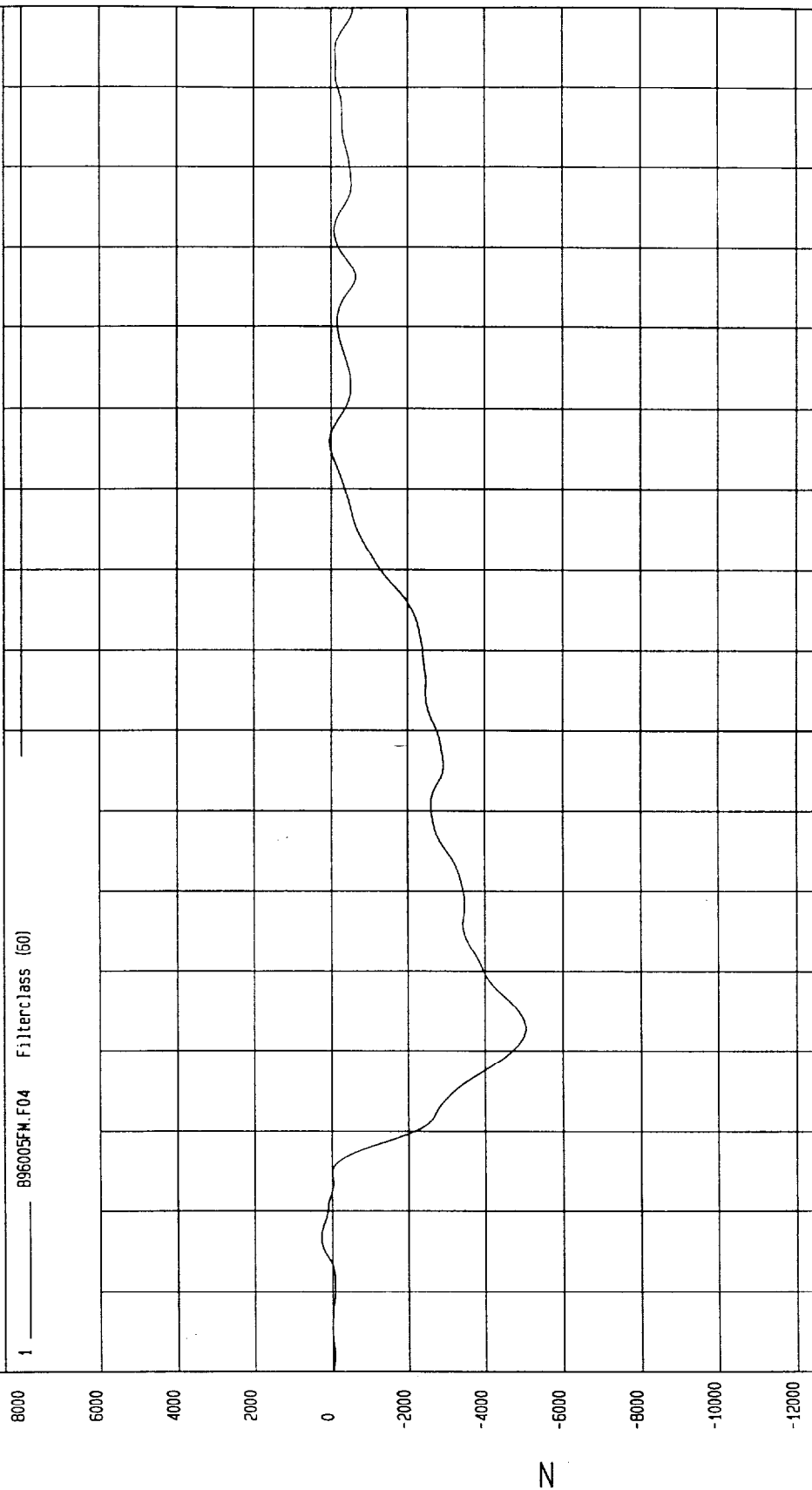
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5052.01 N at 33 msec Maximum = 288.41 N at 7 msec

LC #1 FX

1 896005FM.F04 FilterClass (50)



MGA Research
06-02-1998 13.13

TIME (SECONDS)

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

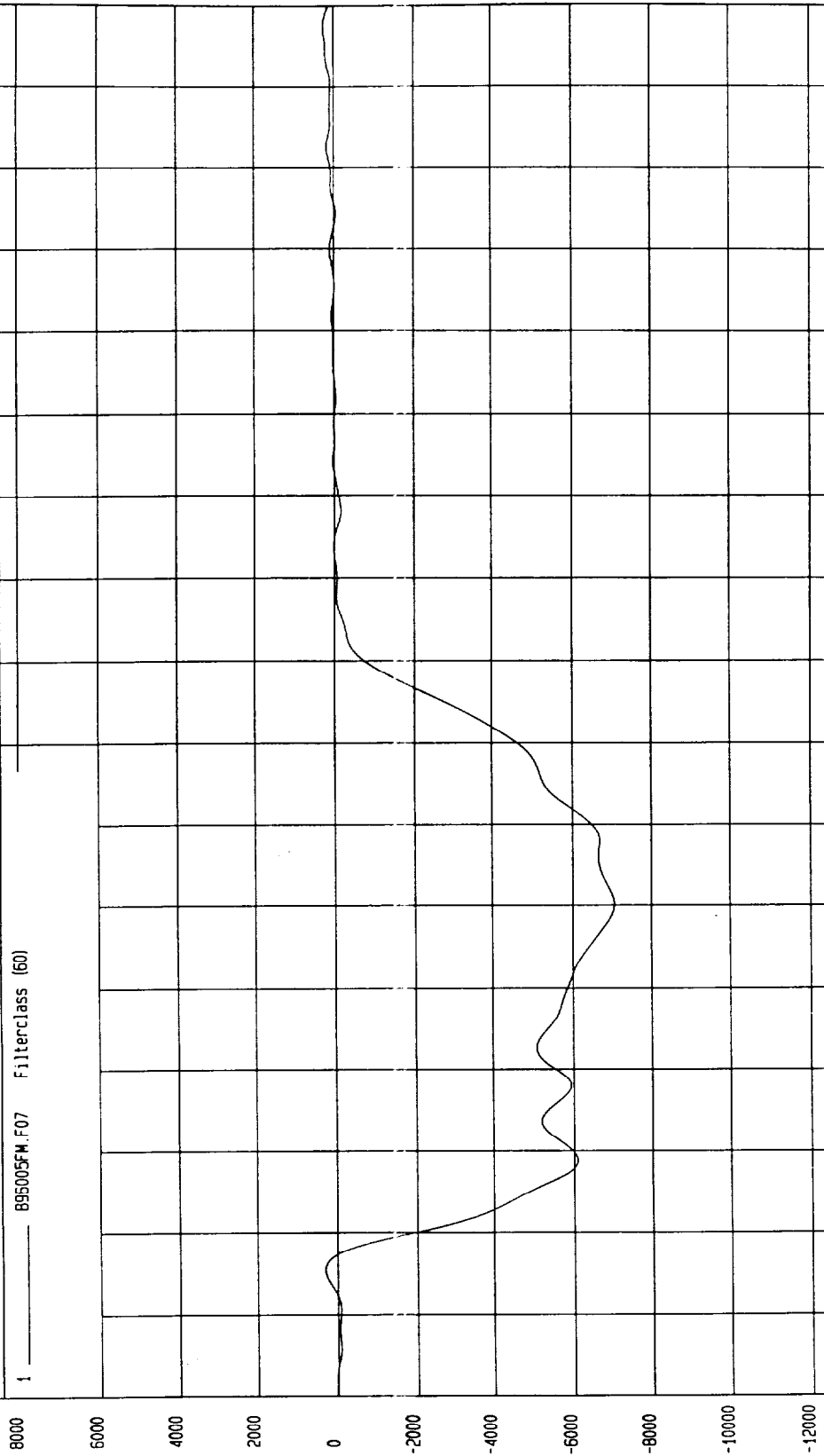
SPEED: 25.8 MPH 41.5 KPH

Maximum = 317.09 N at 5 msec

Minimum = -7067.49 N at 50 msec

LC #2 FX

1 _____ 895005FM.F07 Filterclass (60)

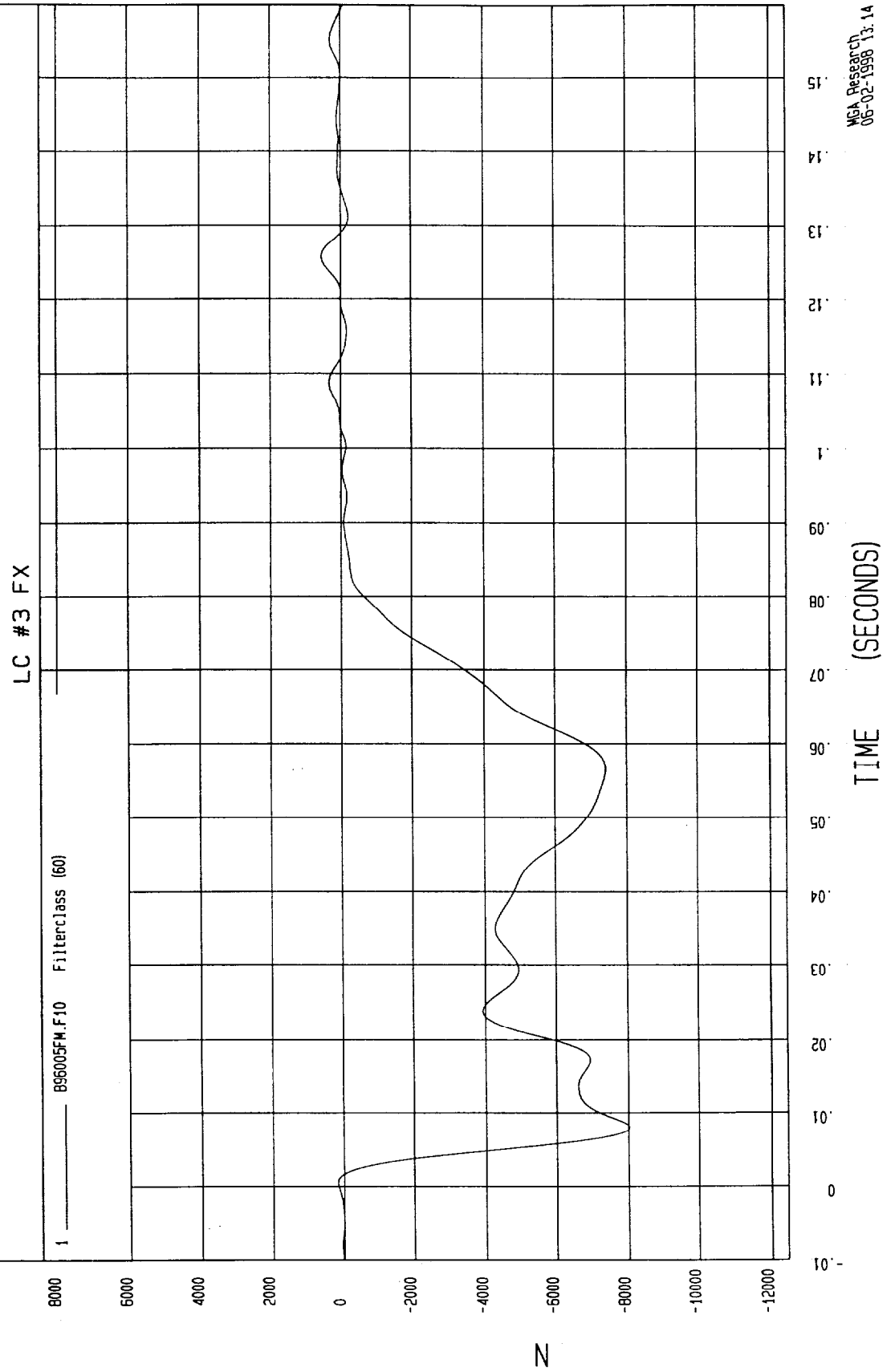


MCA Research
06-02-1998 13.14

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8030.46 N at 8 msec Maximum = 536.65 N at 126 msec



NGA Research
06-02-1998 13.14

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

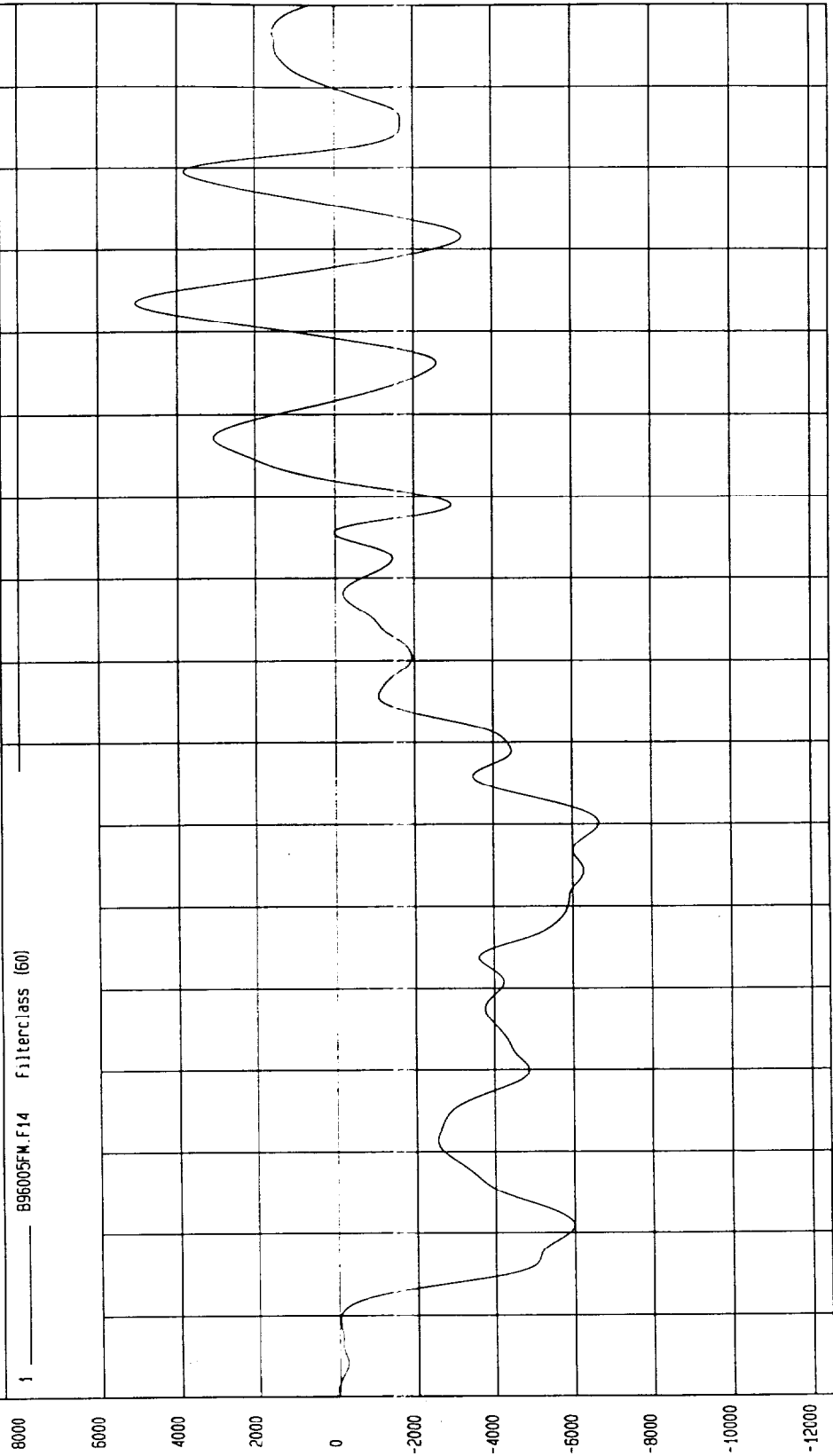
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 5041.02 N at 124 msec

Minimum = -6660.3 N at 60 msec

LC #4 FX

1 _____ B96005FM.F14 Filterclass (60)



MCA Research
06-02-1998 13:14

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5187.15 N at 33 msec Maximum = 2042.36 N at 139 msec

LC #5 FX

1 896005FM.F17 Filterclass (50)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.01 0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15

TIME (SECONDS)

WGA Research
06-02-1998 13.15

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

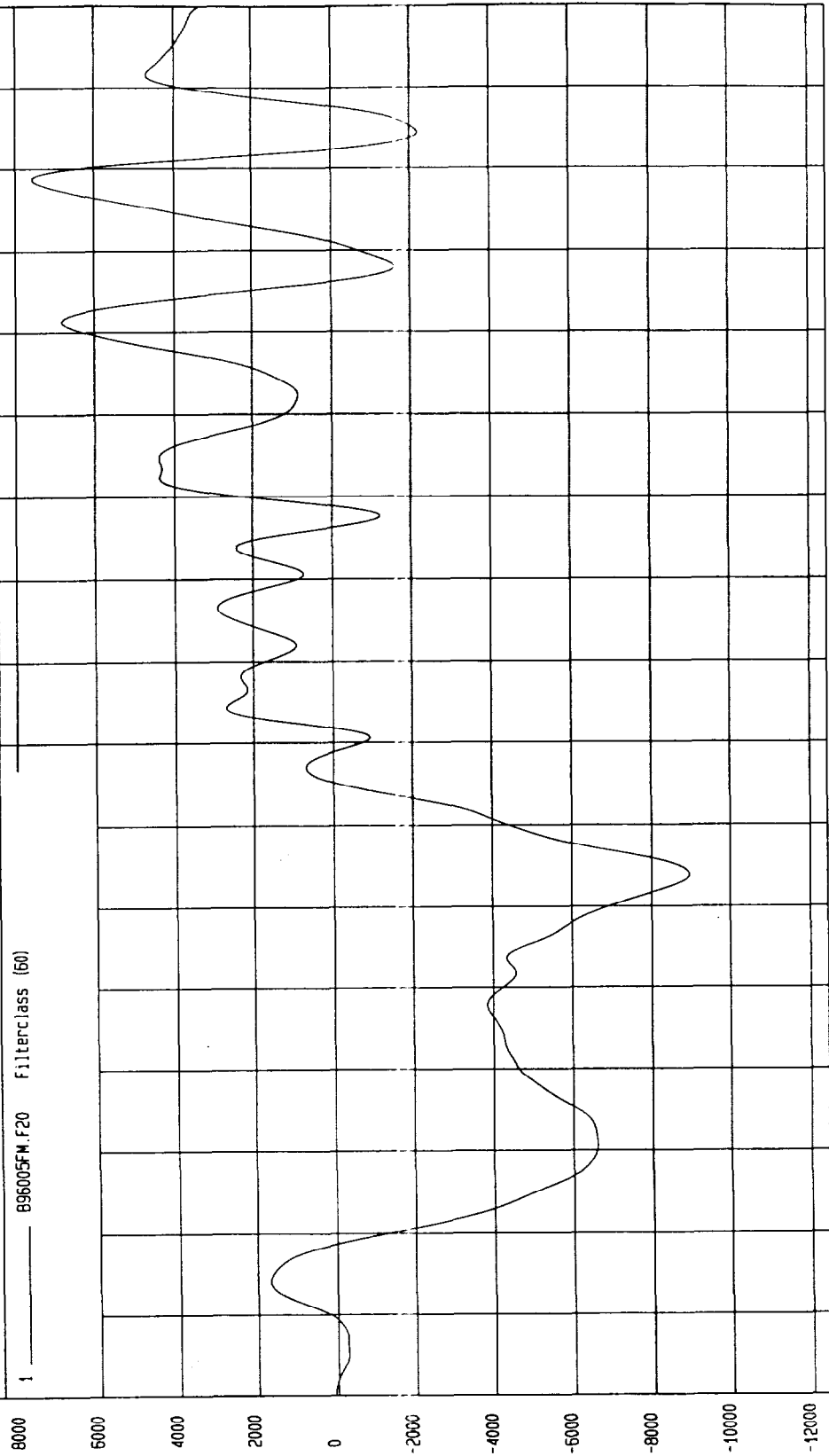
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -8966.96 N at 54 msec

Maximum = 7583.5 N at 139 msec

LC #6 FX

1 _____ 896005FM.F20 Filterclass (60)



MSA Research
06-02-1998 13:15

TIME (SECONDS)

N

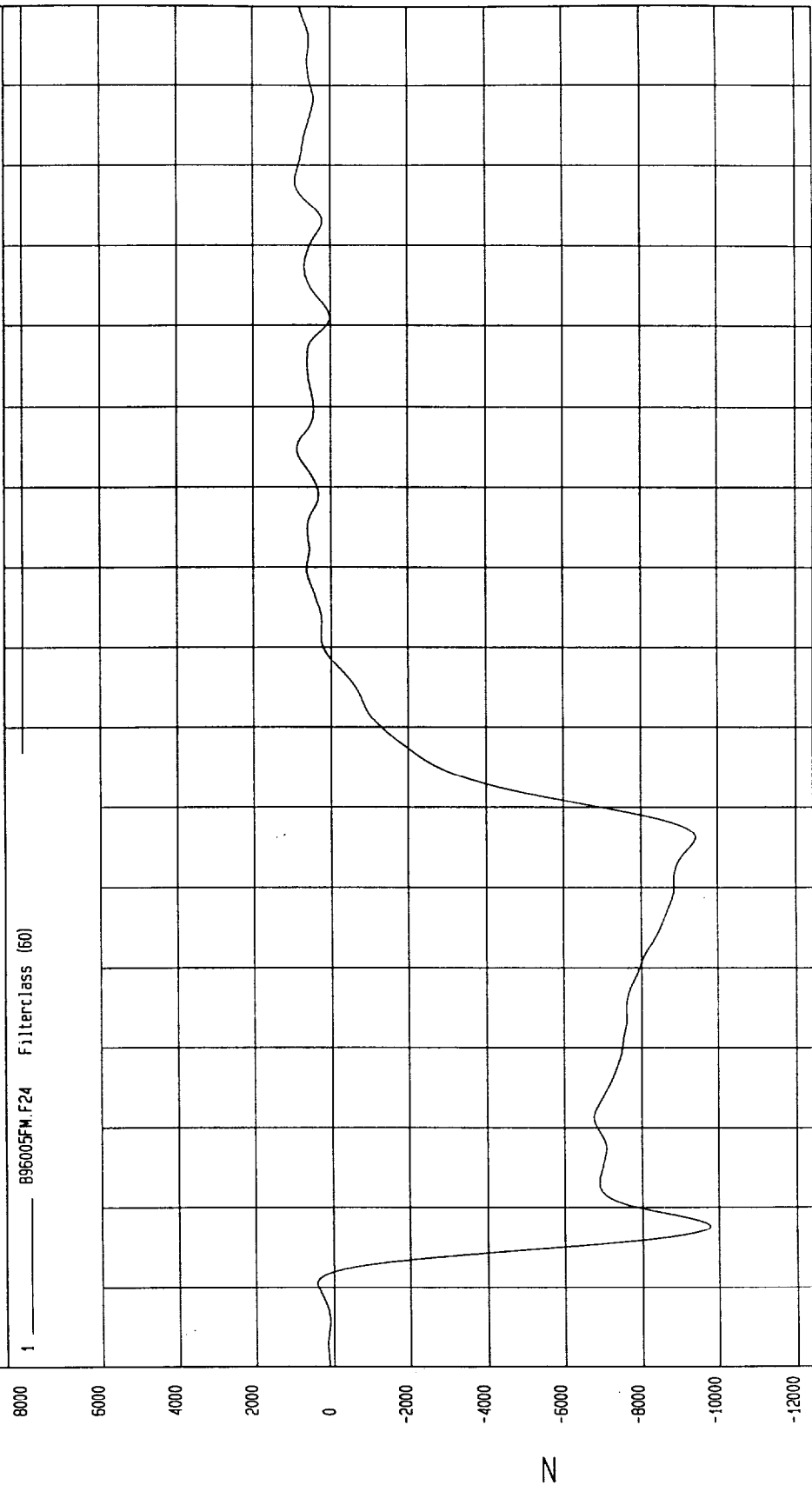
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

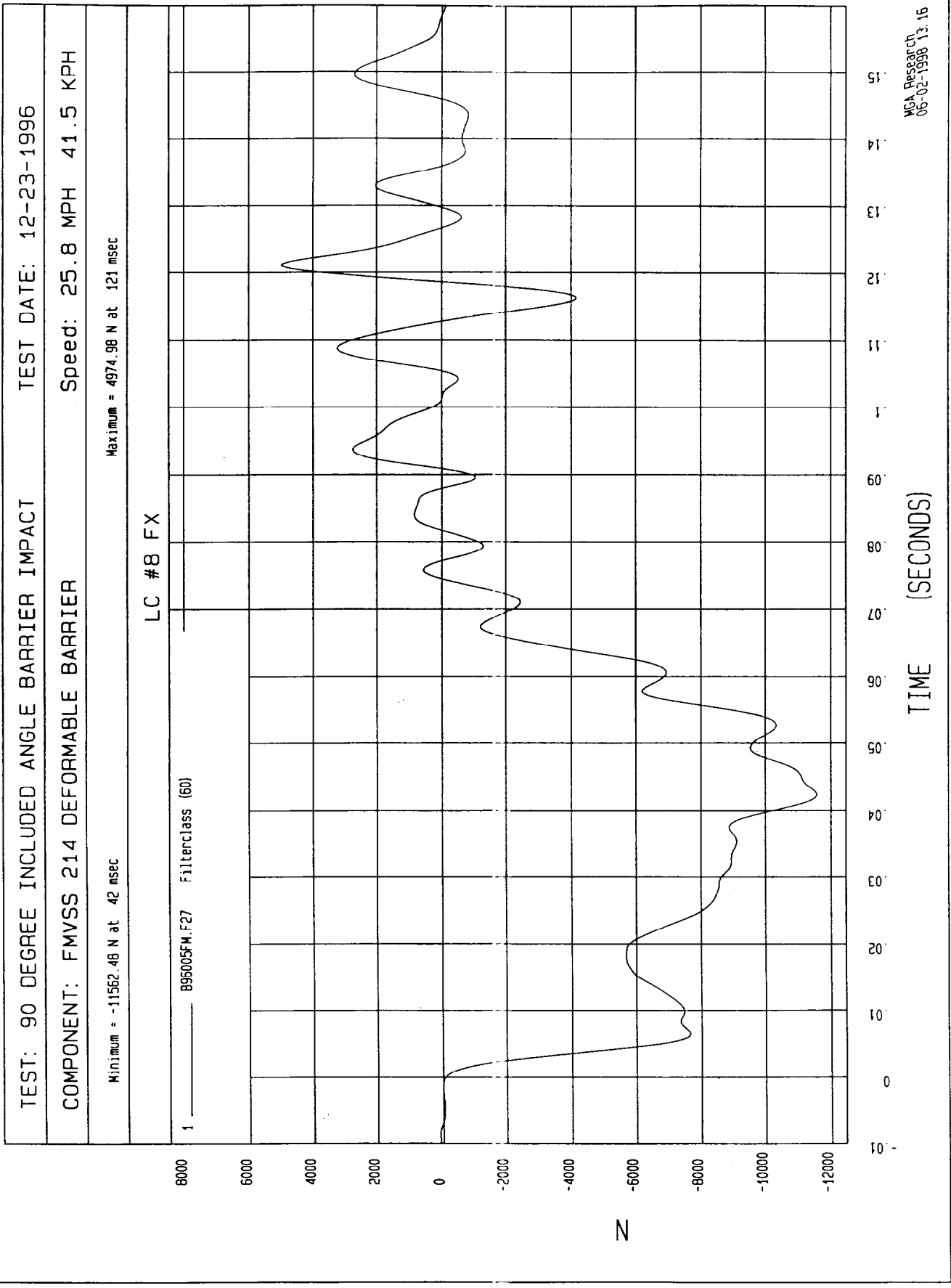
Minimum = -9771.01 N at 8 msec Maximum = 917.26 N at 163 msec

LC #7 FX

1 896005FM.F24 Filterclass (50)



MCA Research
06-02-1998 13:15



TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

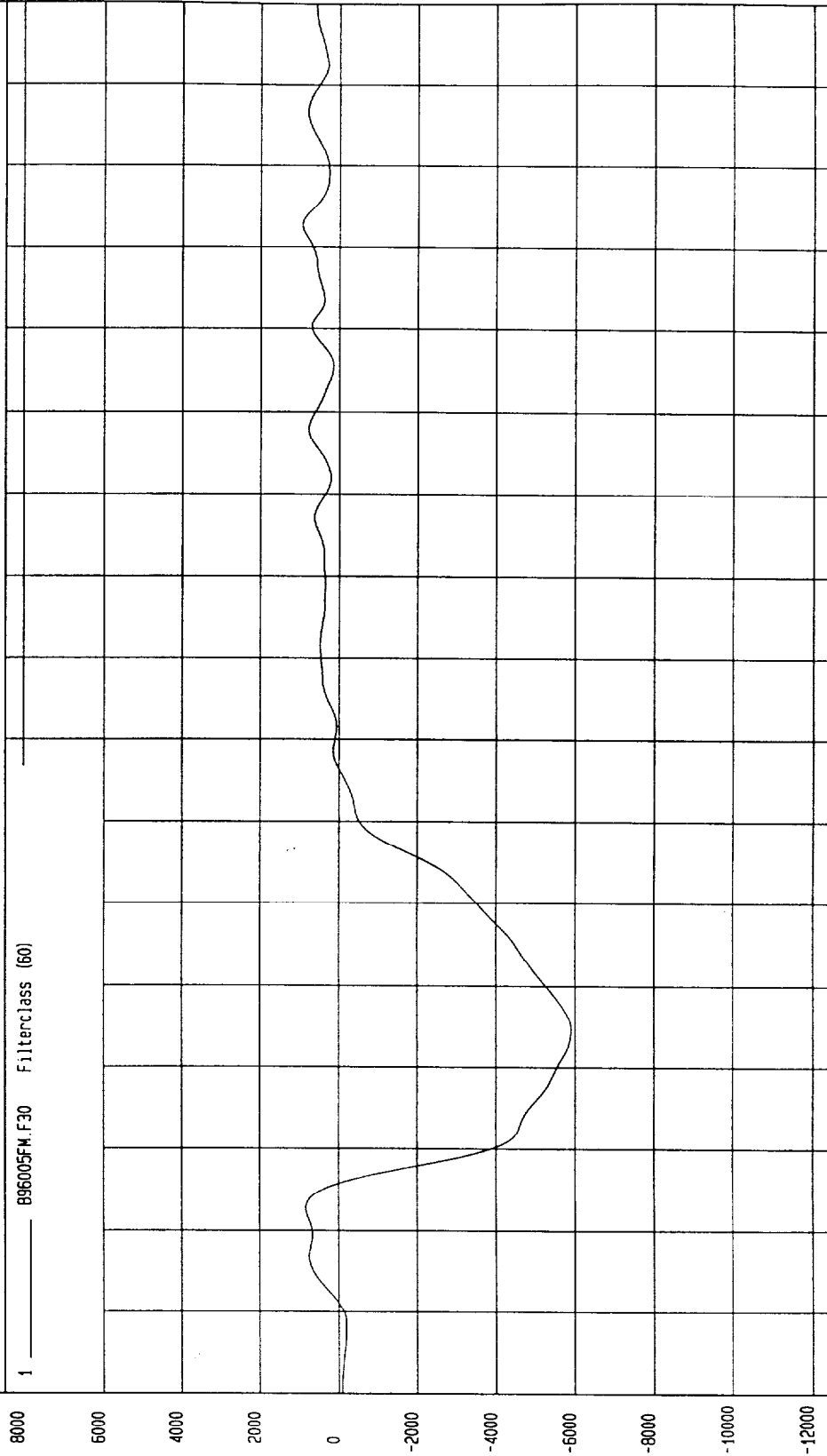
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5903.94 N at 35 msec

Maximum = 946.75 N at 133 msec

LC #9 FX

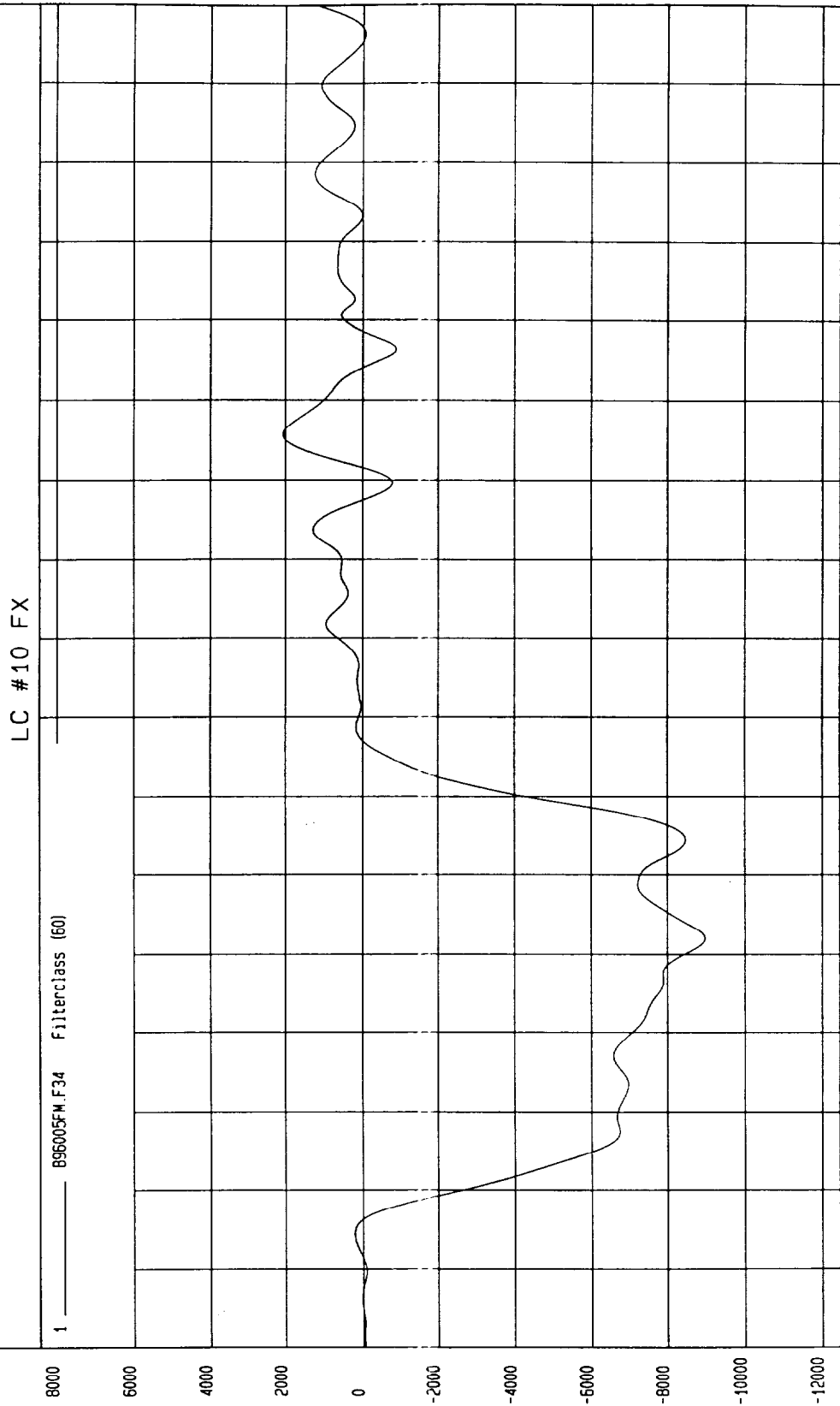
1 ——— B96005FM.F30 Filterclass (60)



TIME (SECONDS)

MCA Research
06-02-1998 13.16

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8975.37 N at 42 msec	
Maximum = 2063.93 N at 106 msec	



TIME (SECONDS)

15
14
13
12
11
10
09
08
07
06
05
04
03
02
01
0

MGA Research
06-02-1998 13:17

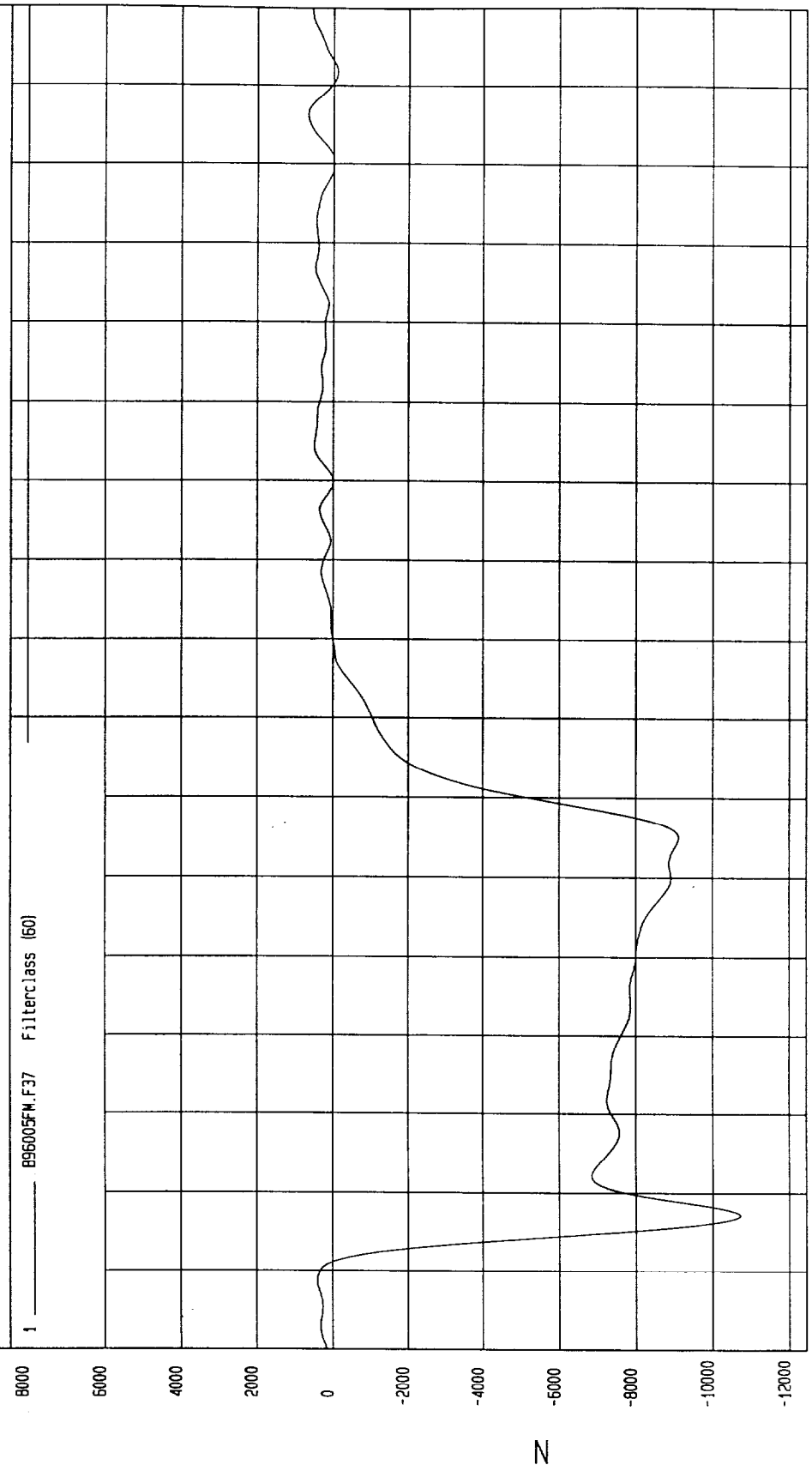
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -10711.25 N at 7 msec Maximum = 700.88 N at 175 msec

LC #11 FX

1 B96005FM.F37 Filterclass (50)



MGA Research
06-02-1998 13: 17

TIME (SECONDS)

N

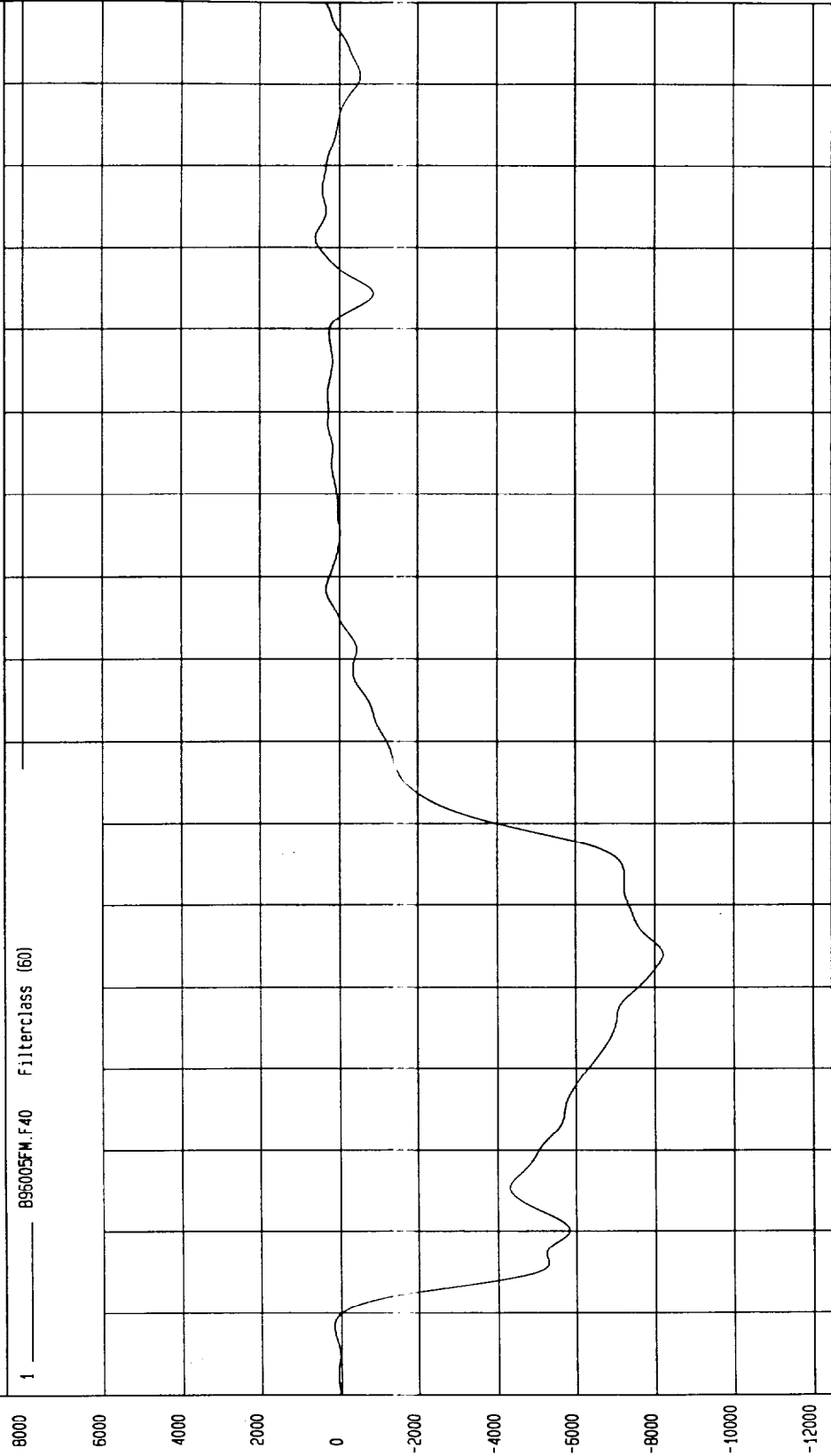
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8204.9 N at 44 msec Maximum = 1014.41 N at 199 msec

LC #12 FX

1 _____ B95005FM.F40 Filterclass (60)



MCA Research
06-02-1998 13:17

TIME (SECONDS)

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5735.05 N at 36 msec

LC #13 FX

1 _____ 856005FM.F44 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-10

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

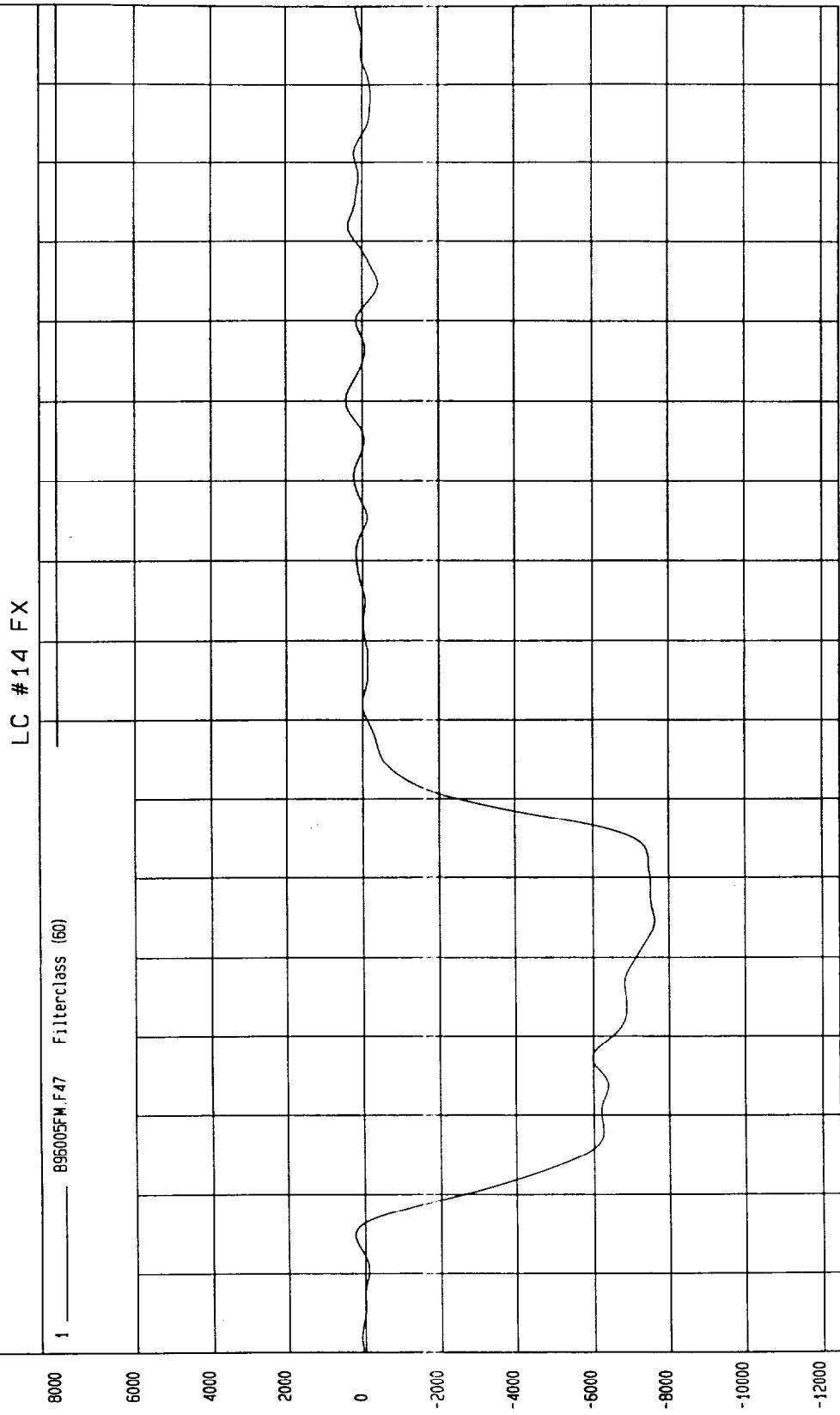
TIME (SECONDS)

MCA Research
06-02-1998 13.18

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

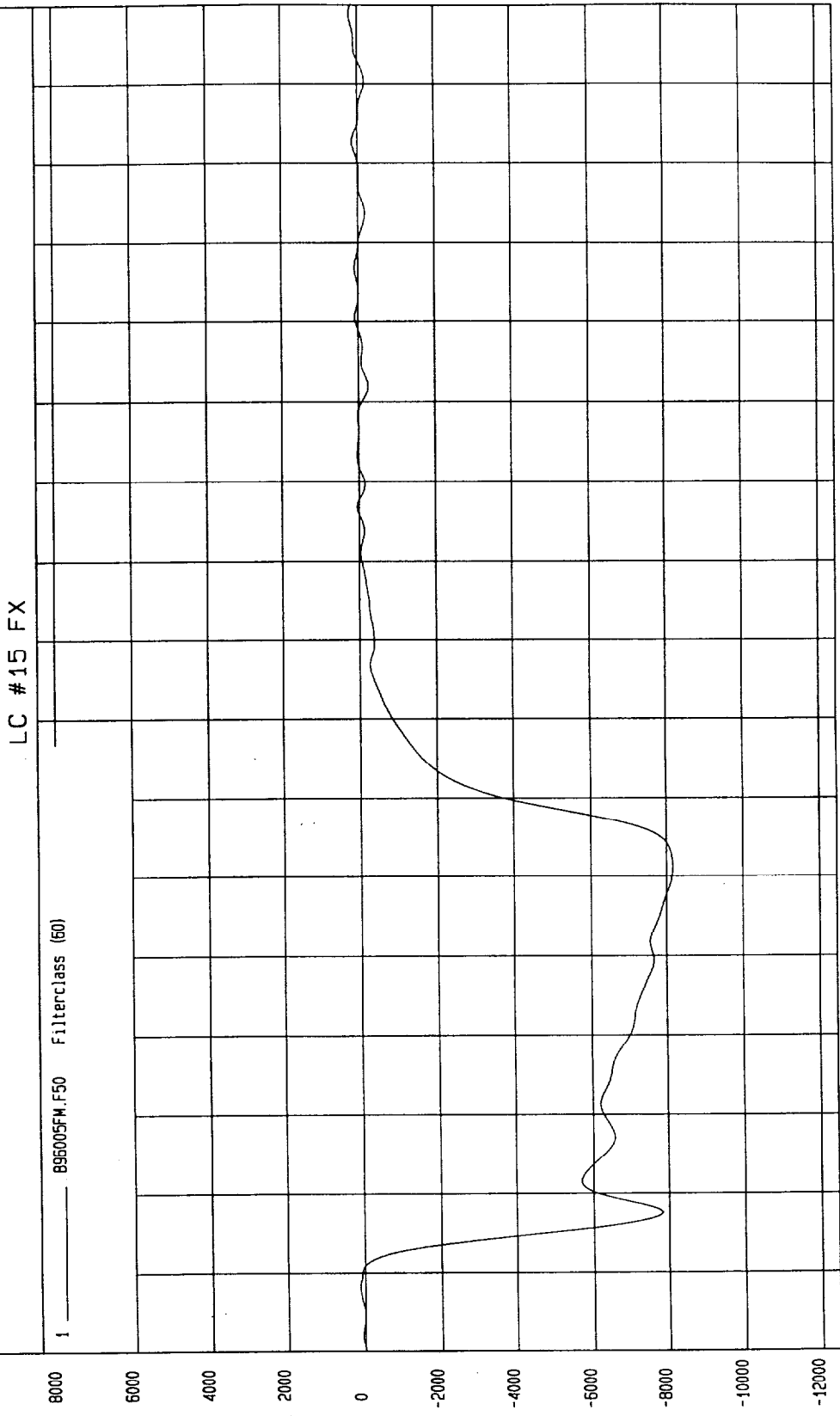
Minimum = -7632.04 N at 45 msec Maximum = 588.23 N at 199 msec



TIME (SECONDS)

MCA Research
06-02-1998 13:18

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8168.84 N at 51 msec	
Maximum = 226.66 N at 175 msec	



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0

MCA Research
06-02-1998 13.18

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

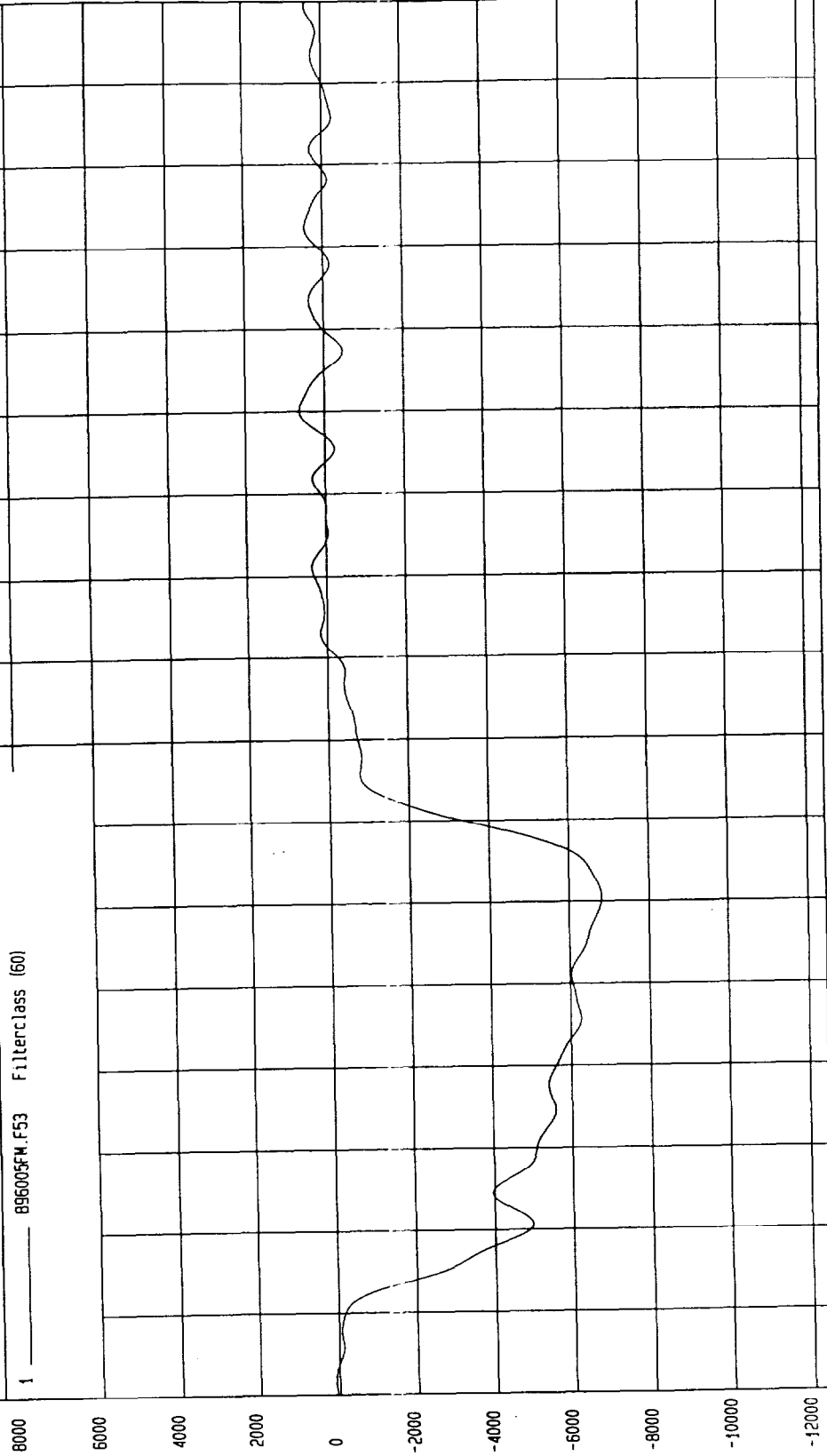
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 642.85 N at 110 msec

Minimum = -6821.82 N at 50 msec

LC #16 FX

1 896005FM.F53 Filterclass (60)



TIME (SECONDS)

MCA Research
06-02-1998 13:19

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

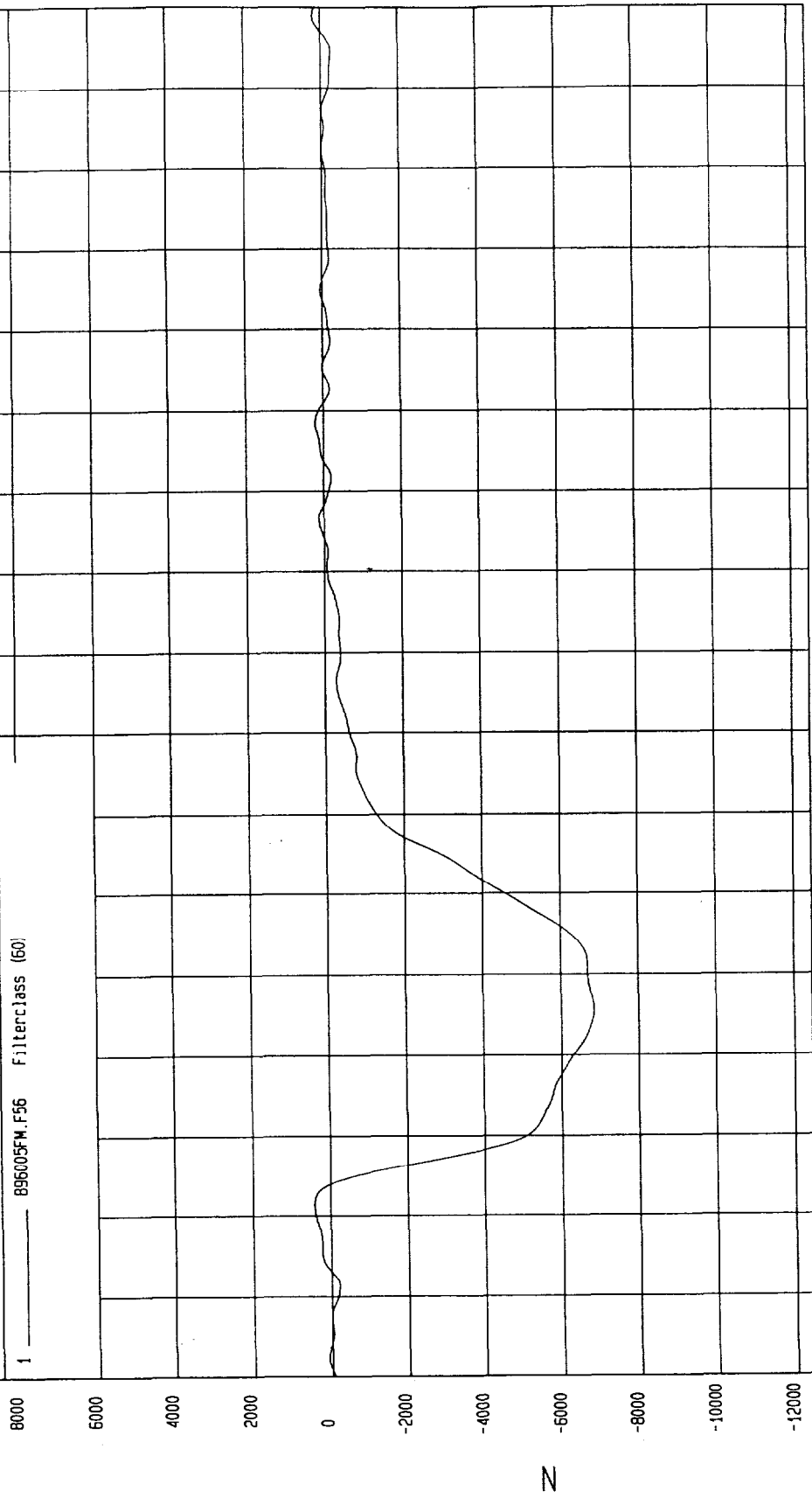
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6856.93 N at 36 msec

Maximum = 412.14 N at 11 msec

LC #17 FX

1 ——— B96C05FM.F56 Filterclass (50)



MGA Research
06-02-1998 13:19

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

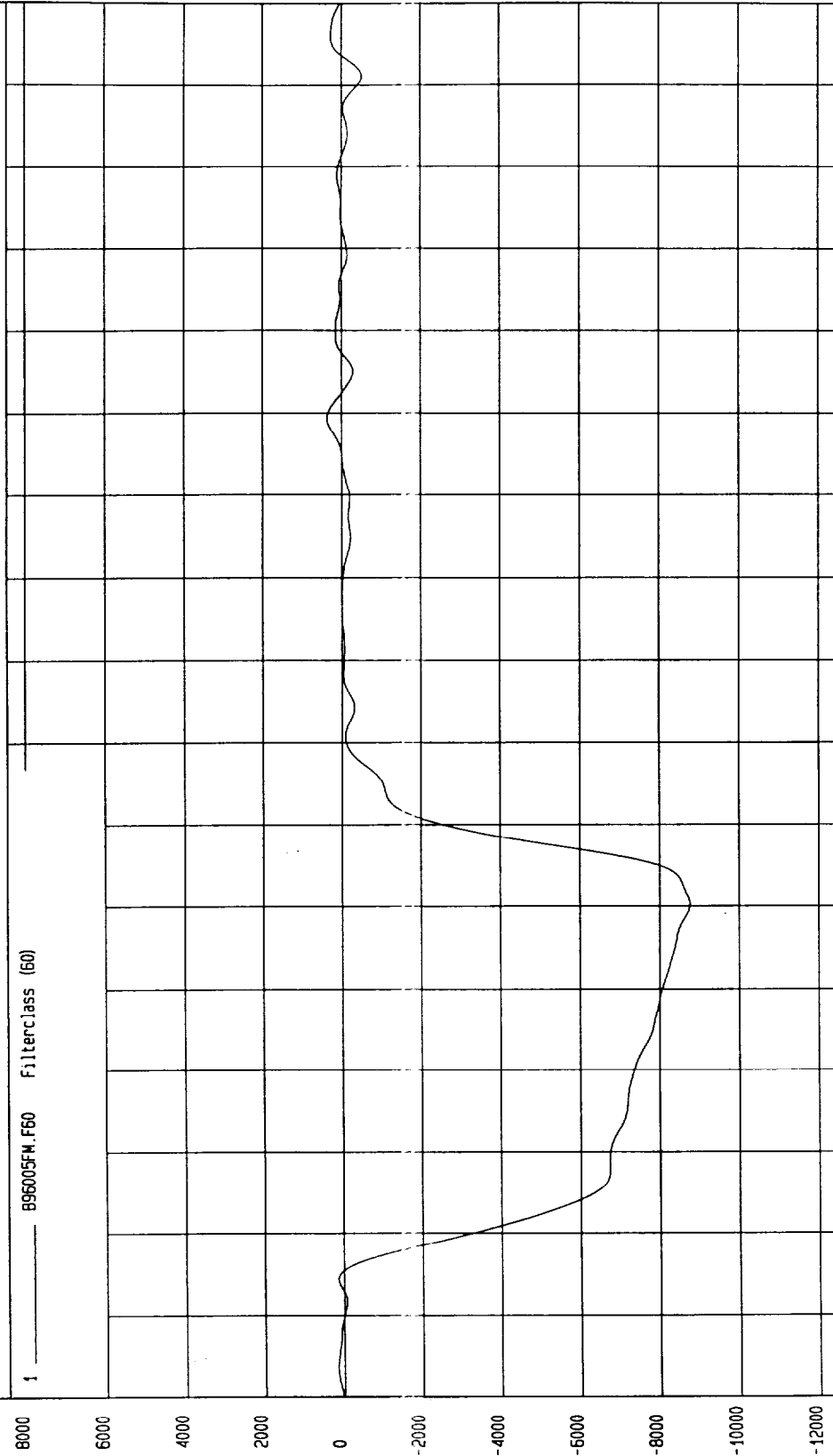
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 371.64 N at 109 msec

Minimum = -8767.03 N at 50 msec

LC #18 FX

1 _____ B96005FM.F60 Filterclass (60)

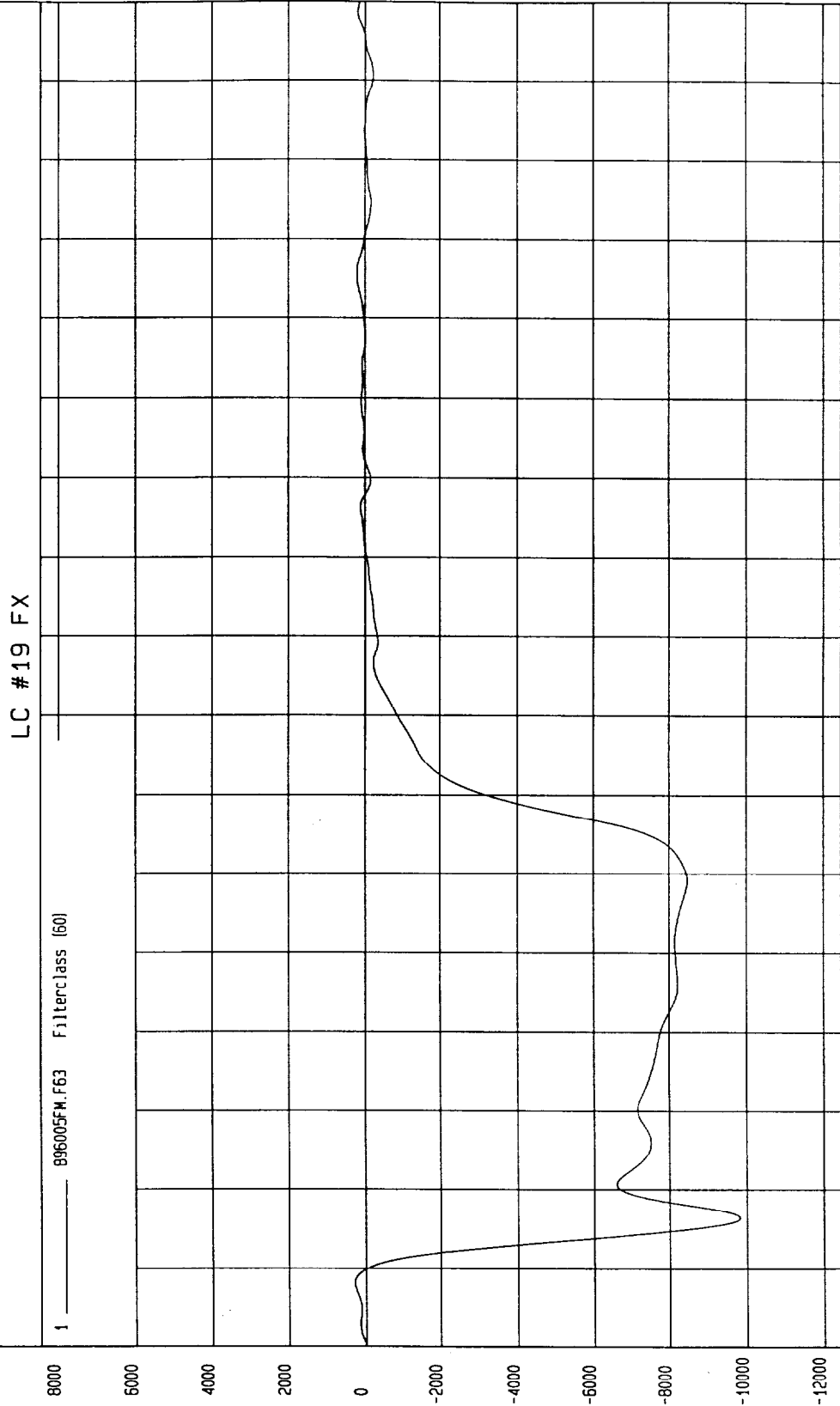


MCA Research
05-02-1998 13:19

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -9819.69 N at 6 msec Maximum = 284.28 N at -2 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

MCA Research
06-02-1998 13:20

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

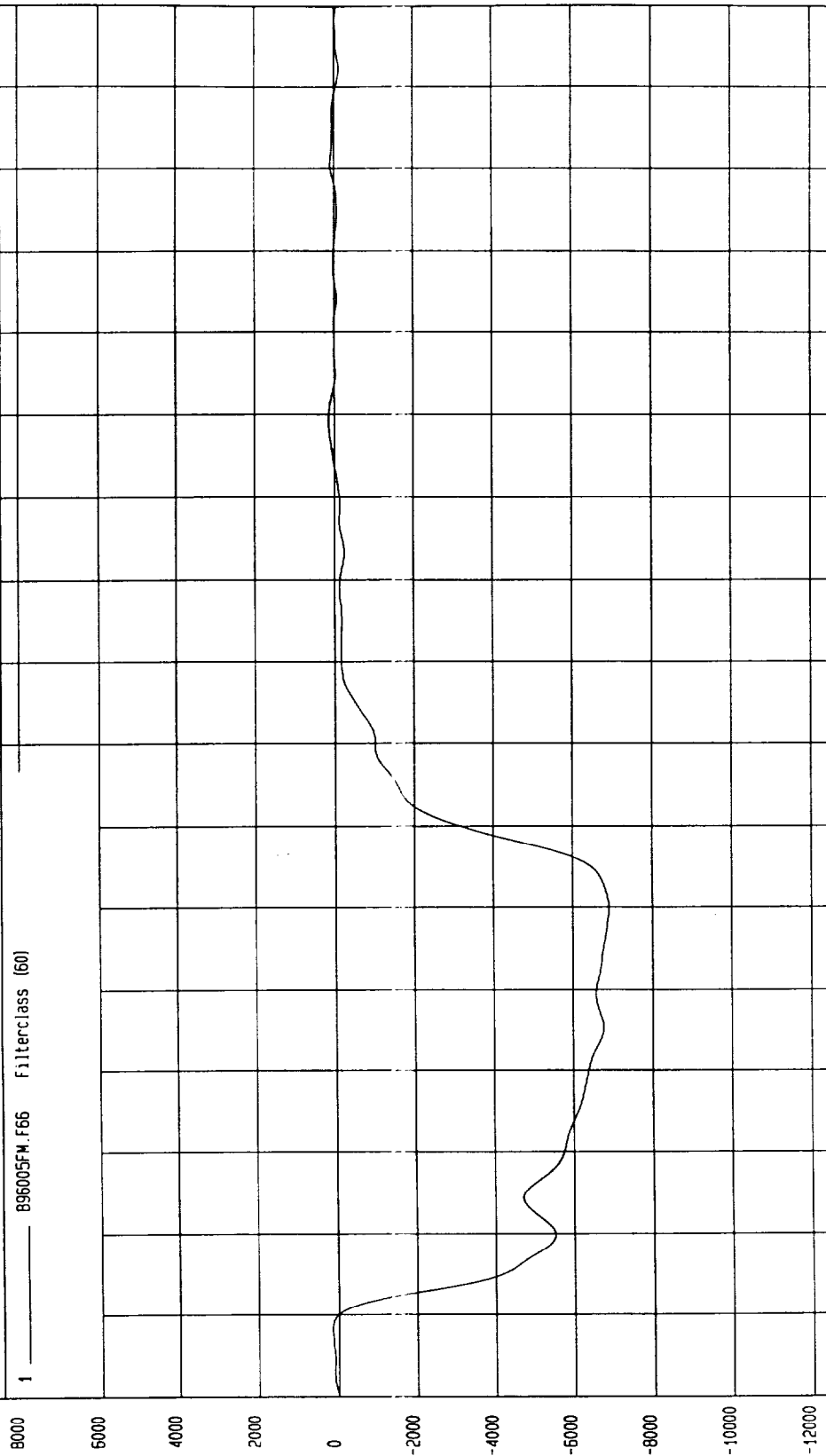
SPEED: 25.8 MPH 41.5 KPH

Maximum = 151.8 N at -2 msec

Minimum = -6917.12 N at 50 msec

LC #20 FX

1 B96005FM.F66 Filterclass (60)



TIME (SECONDS)

WCA Research
06-02-1998 13:20

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6912.1 N at 38 msec Maximum = 506.57 N at 11 msec

LC #21 FX

1 _____ 896005FM.F69 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

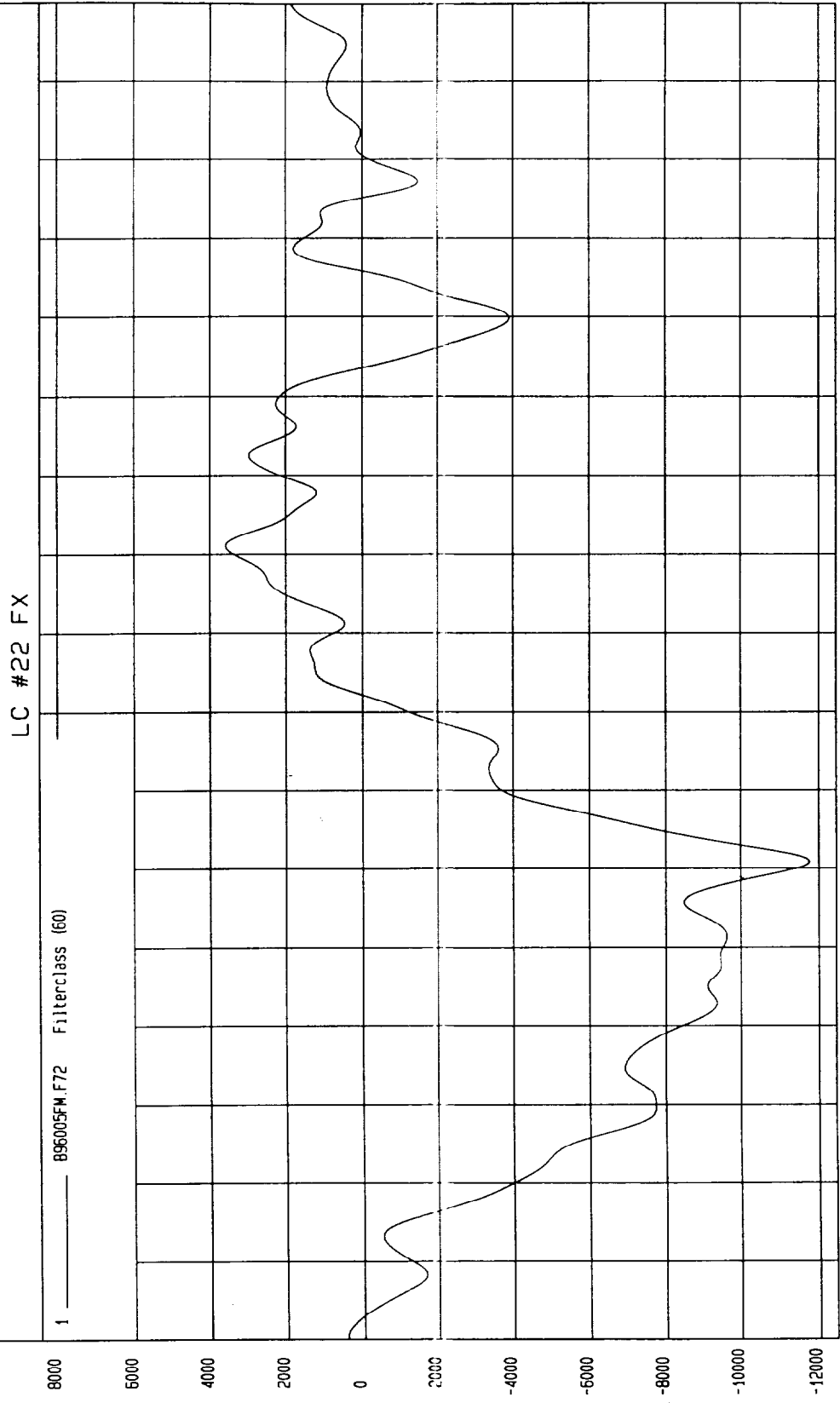
TIME (SECONDS)

MGA Research
06-02-1998 13:21

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -11760.04 N at 51 msec Maximum = 3604.1 N at 91 msec



TIME (SECONDS)

MGA Research
06-02-1998 13.21

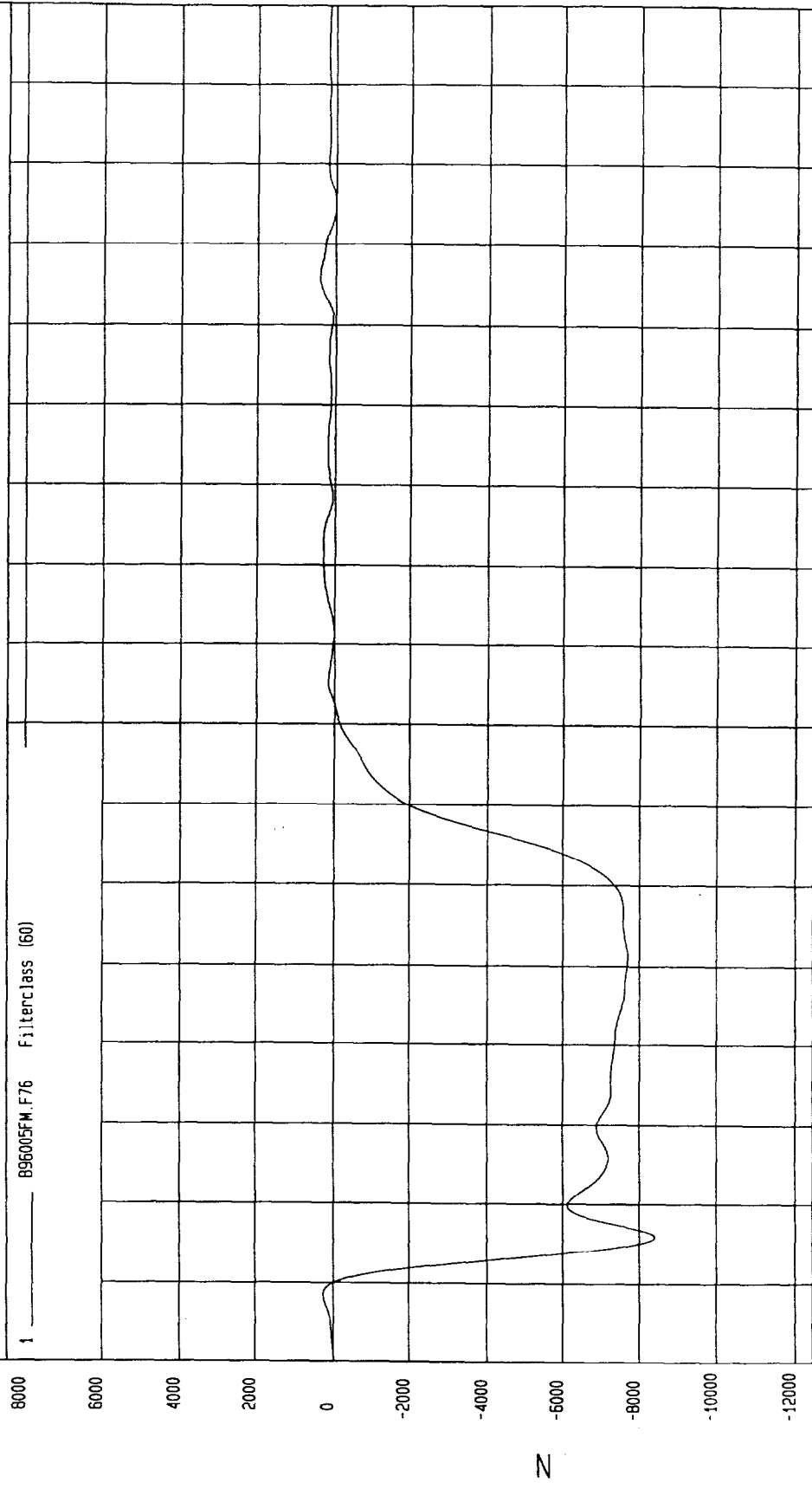
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8403.13 N at 6 msec Maximum = 400.8 N at 126 msec

LC #23 FX

1 896005FM.F76 Filterclass (60)



MCA Research
06-02-1998 13:21

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

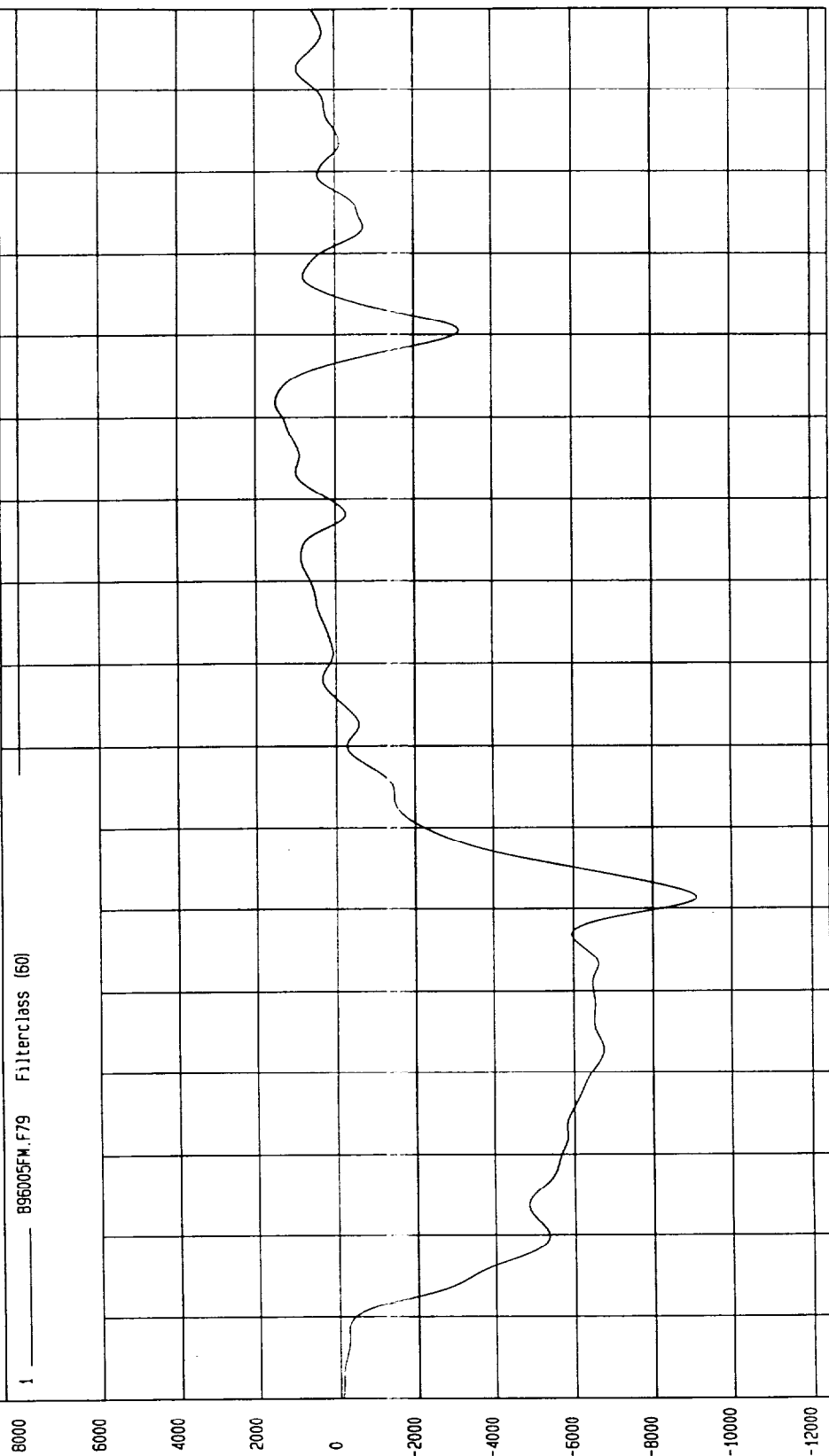
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -9105.14 N at 51 msec

Maximum = 1503.55 N at 112 msec

LC #24 FX

1 896005FM.F79 Filterclass (60)



MGA Research
06-02-1998 13:22

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -6515.81 N at 42 msec

Maximum = 432.26 N at 114 msec

LC #25 FX

1 ——— B96005FM.F02 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

NSA Research
06-02-1998 13:22

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

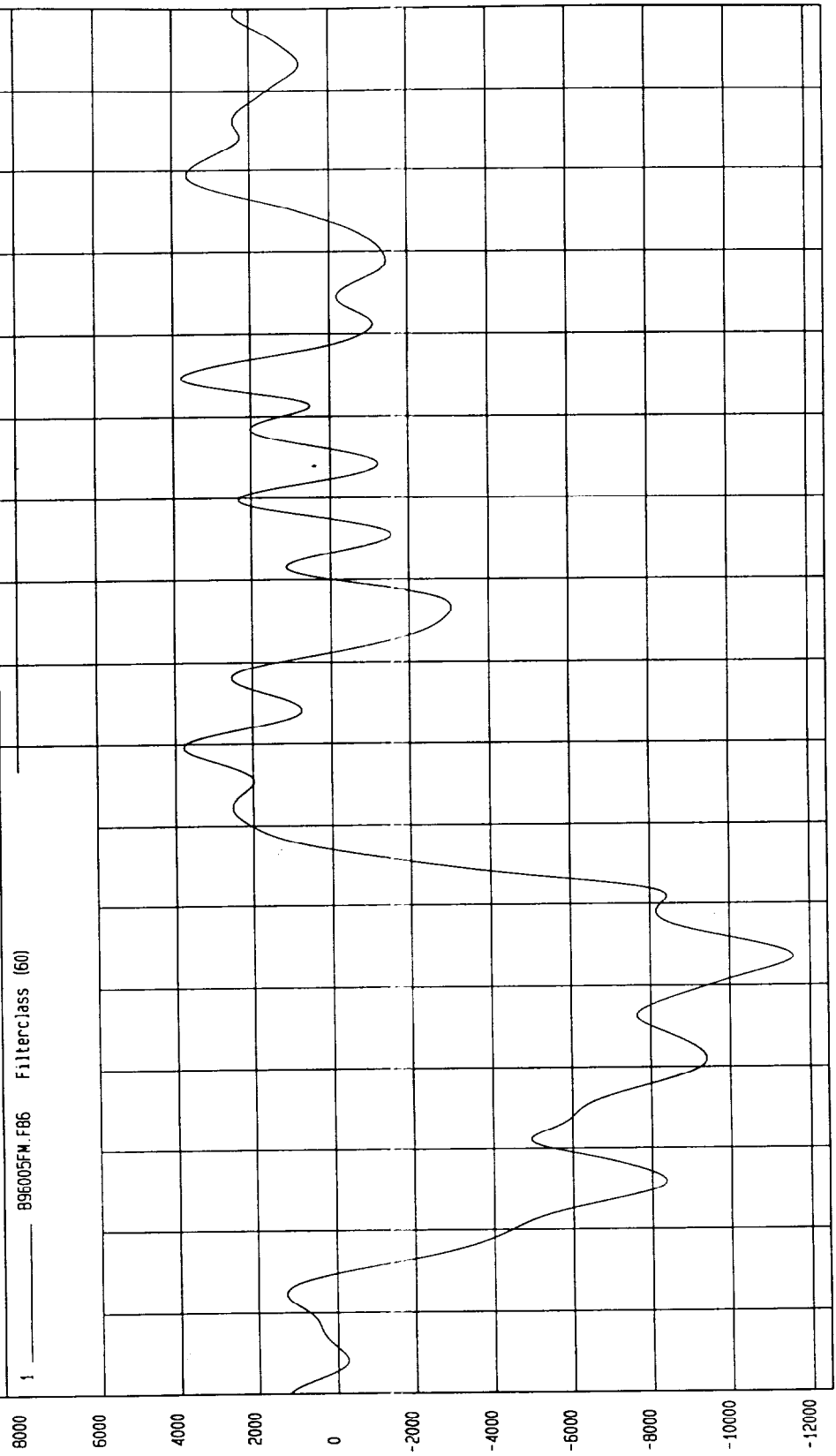
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 3798.87 N at 115 msec

Minimum = -11579.51 N at 44 msec

LC #26 FX

1 896005FM.F86 Filterclass (60)



TIME (SECONDS)

MCA Research
06-02-1998 13:23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8000.23 N at 6 msec Maximum = 233.55 N at 170 msec

LC #27 FX

1 896005FM.F89 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

10

0

10

20

30

40

50

60

70

80

90

1

11

12

13

14

15

TIME (SECONDS)

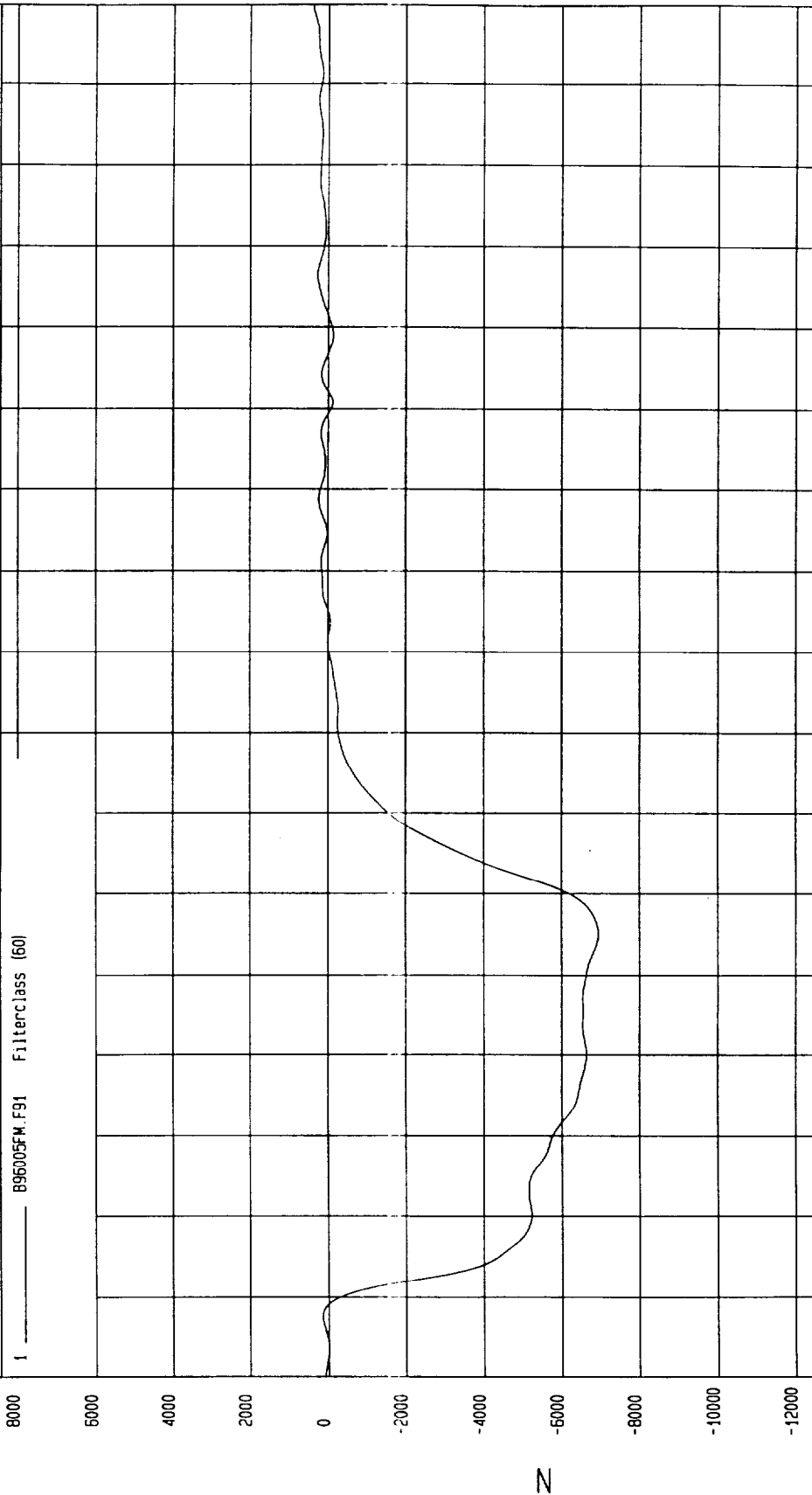
MGA Research
06-02-1998 13:23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6934.94 N at 45 msec Maximum = 414.46 N at 160 msec

LC #28 FX



MCA Research
06-02-1998 13:13

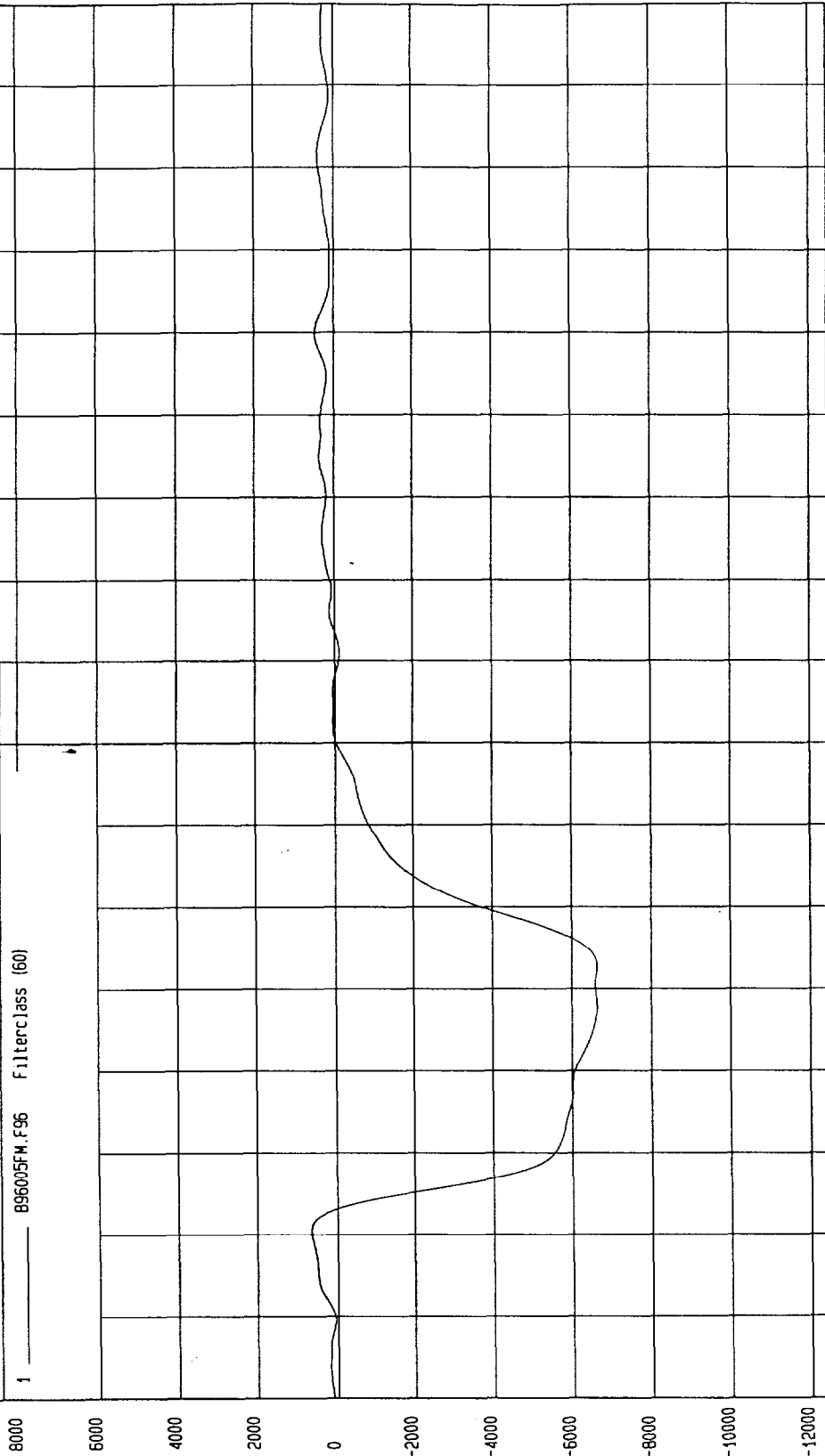
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6637.68 N at 43 msec Maximum = 657.62 N at 10 msec

LC #29 FX

1 — B96005FM.F96 Filterclass (60)



MCA Research
06-02-1996 13:23

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

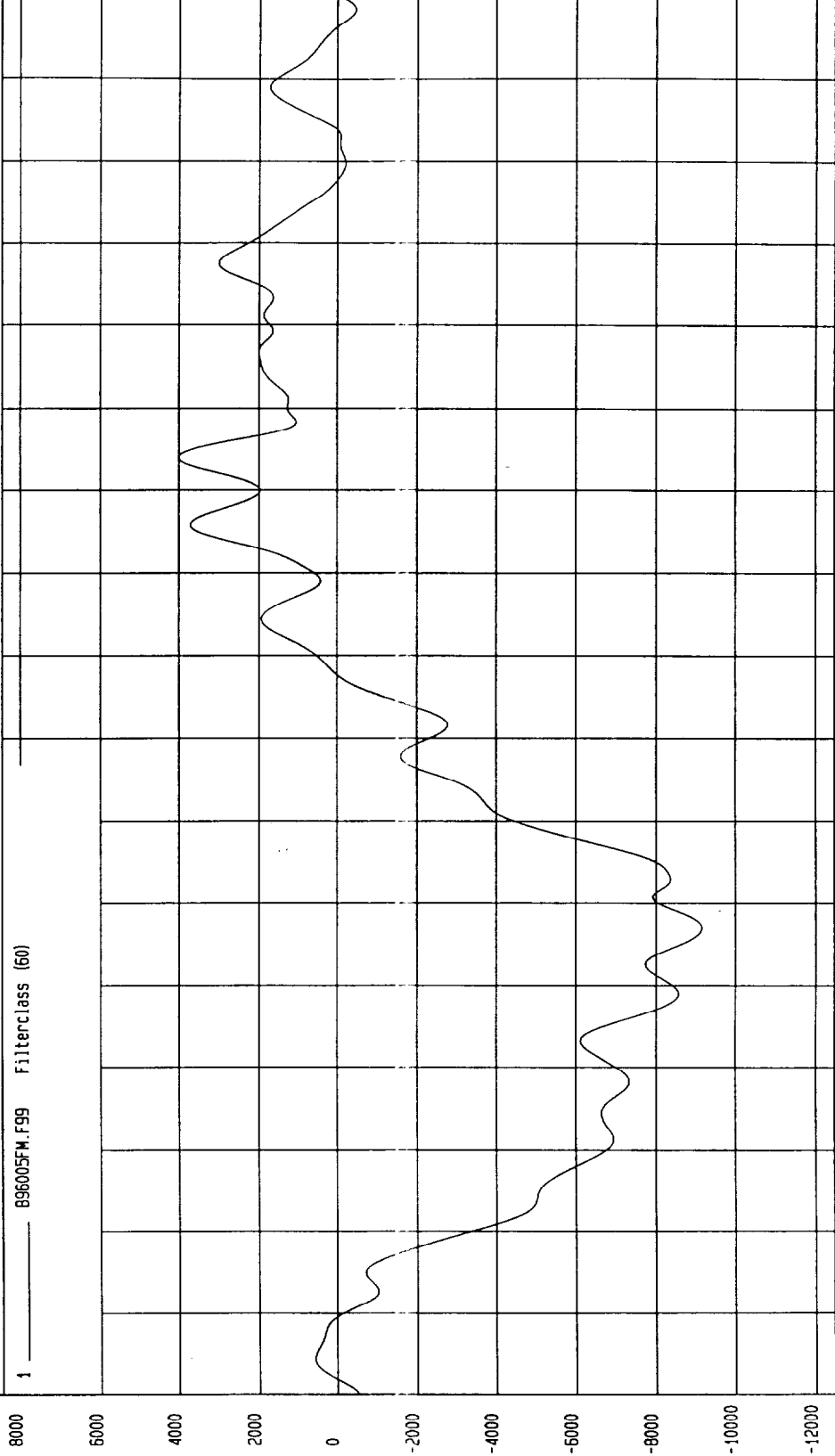
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 4015.92 N at 104 msec

Minimum = -9152.27 N at 47 msec

LC #30 FX

1 _____ 896005FM.F99 Filterclass (60)



MCA Research
06-02-1998 13:24

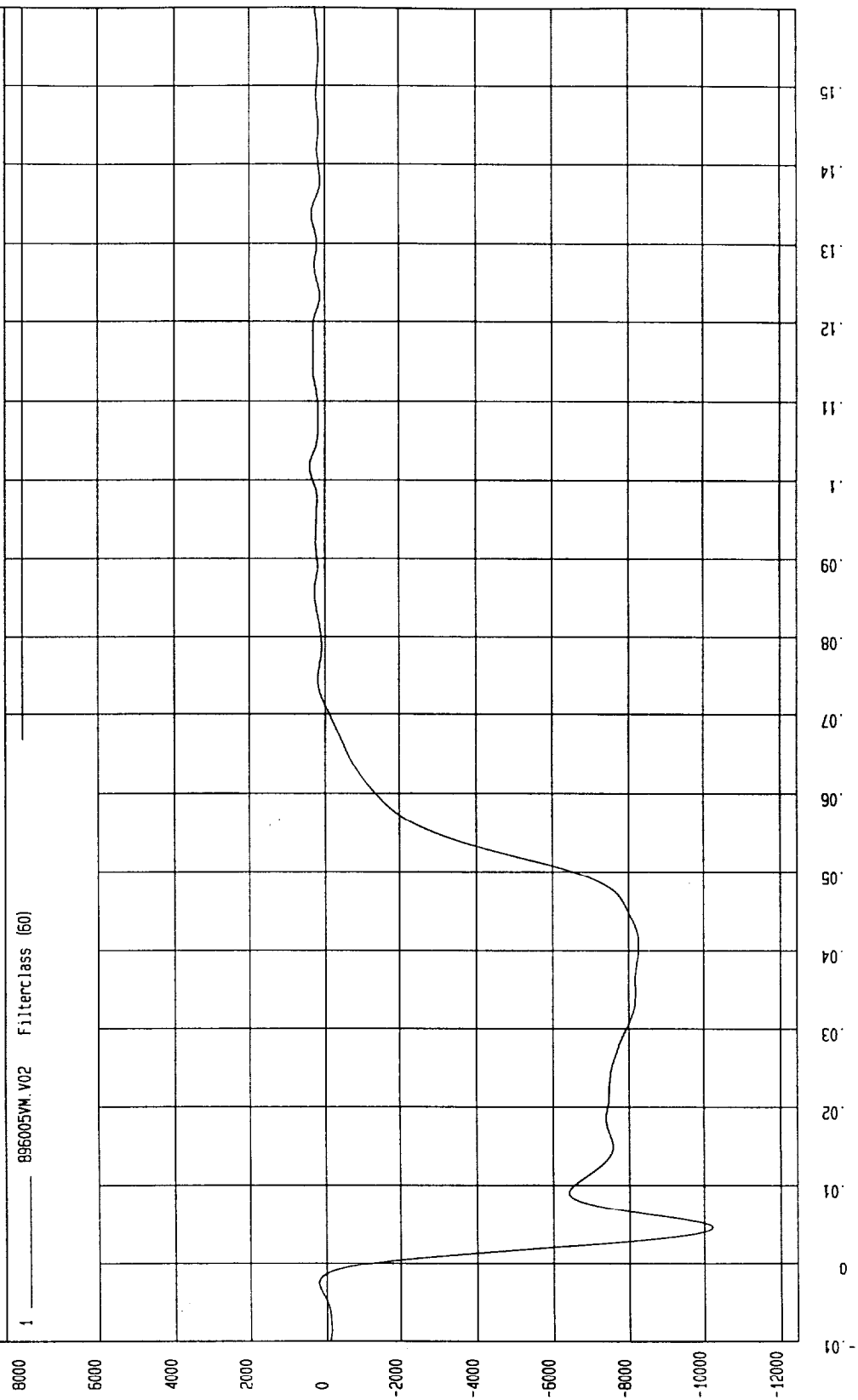
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -10220.51 N at 5 msec Maximum = 402.28 N at 102 msec

LC #31 FX

1 896005VM.V02 Filterclass (50)



NCA Research
06-02-1998 13:12

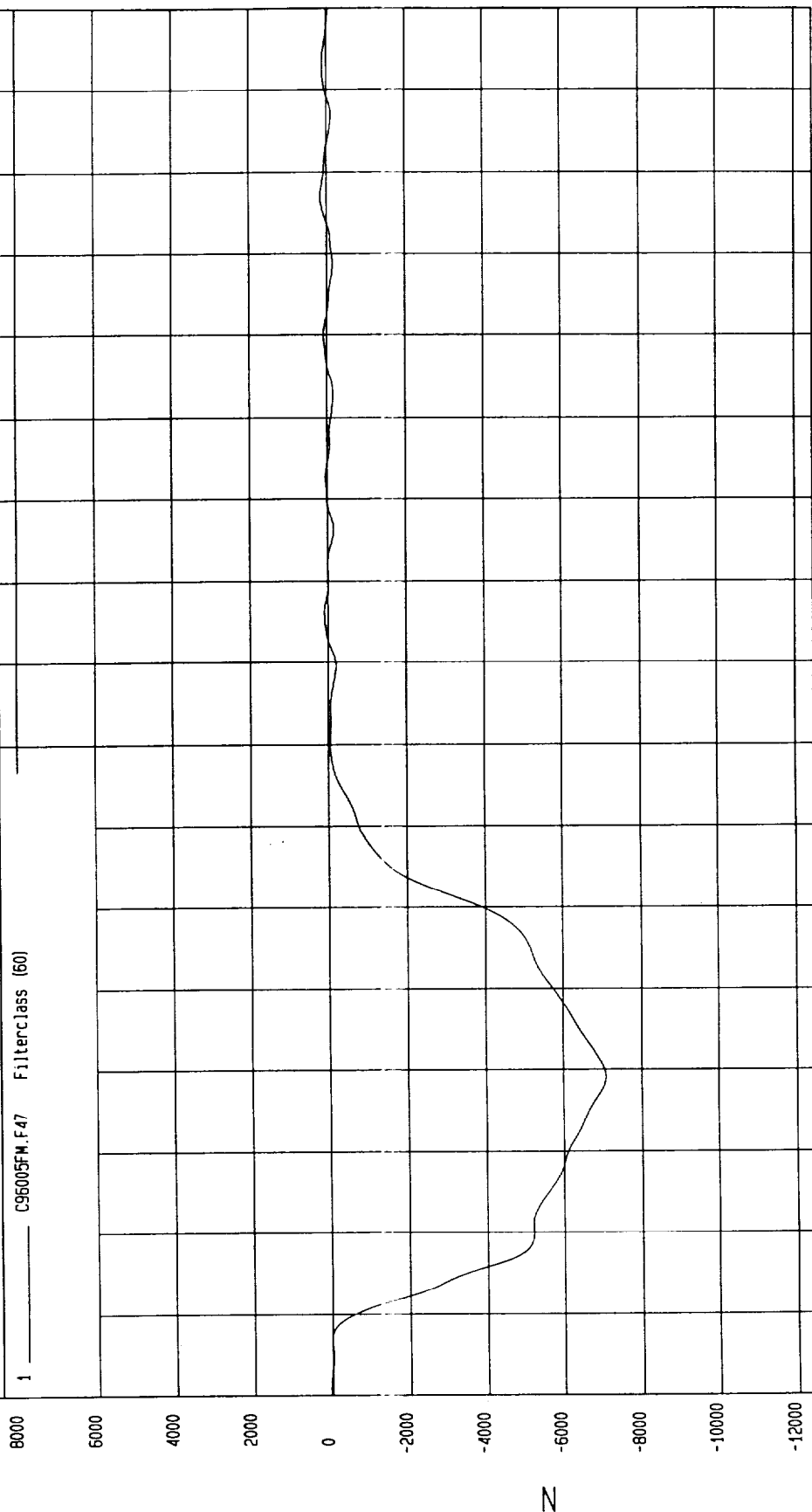
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7084.12 N at 29 msec Maximum = 155.62 N at 137 msec

LC #32 FX

1 C95005FM.F47 Filterclass (60)



MCA Research
06-02-1996 13:52

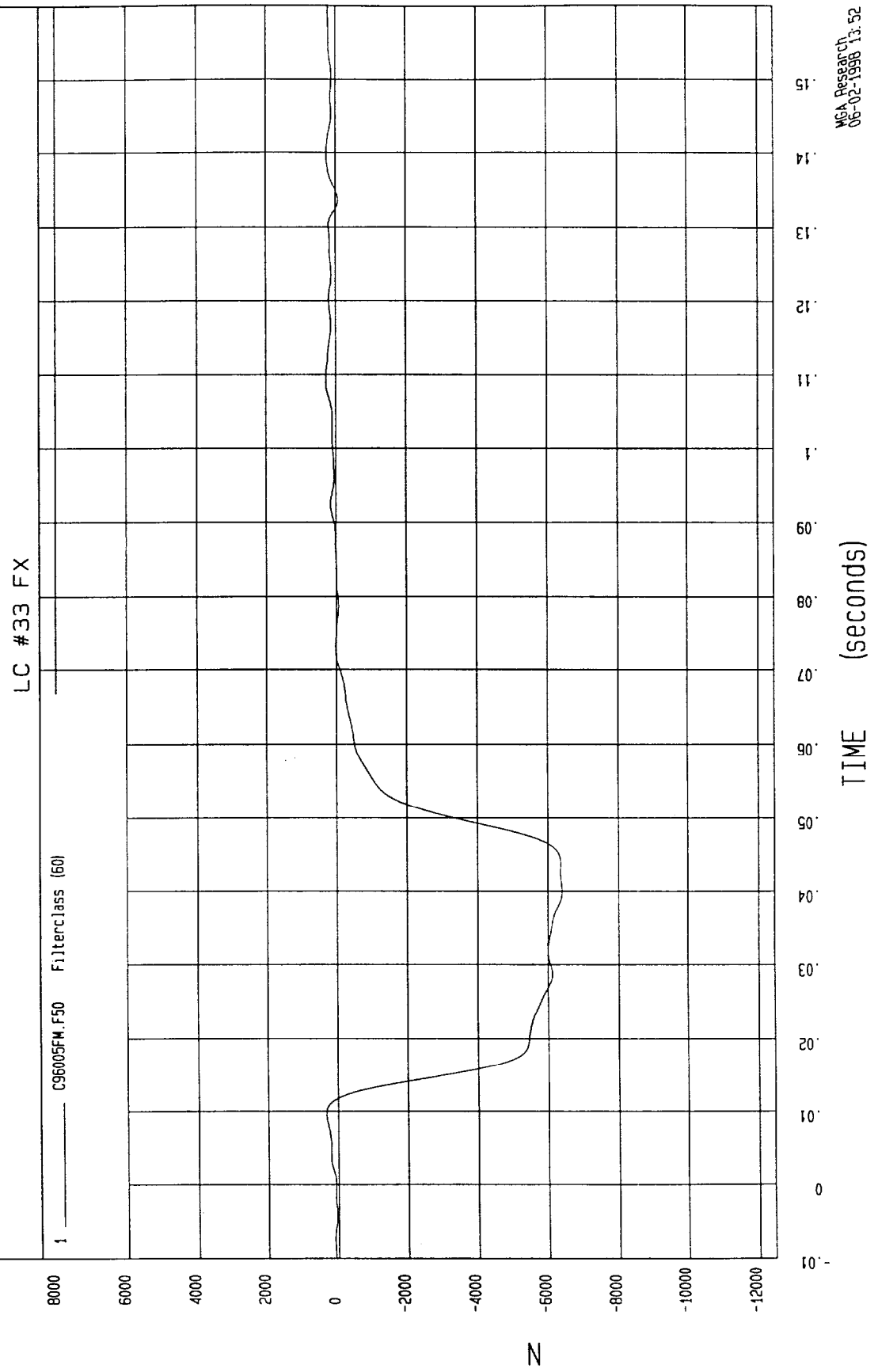
TIME (seconds)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6400.42 N at 40 msec Maximum = 346.01 N at 10 msec



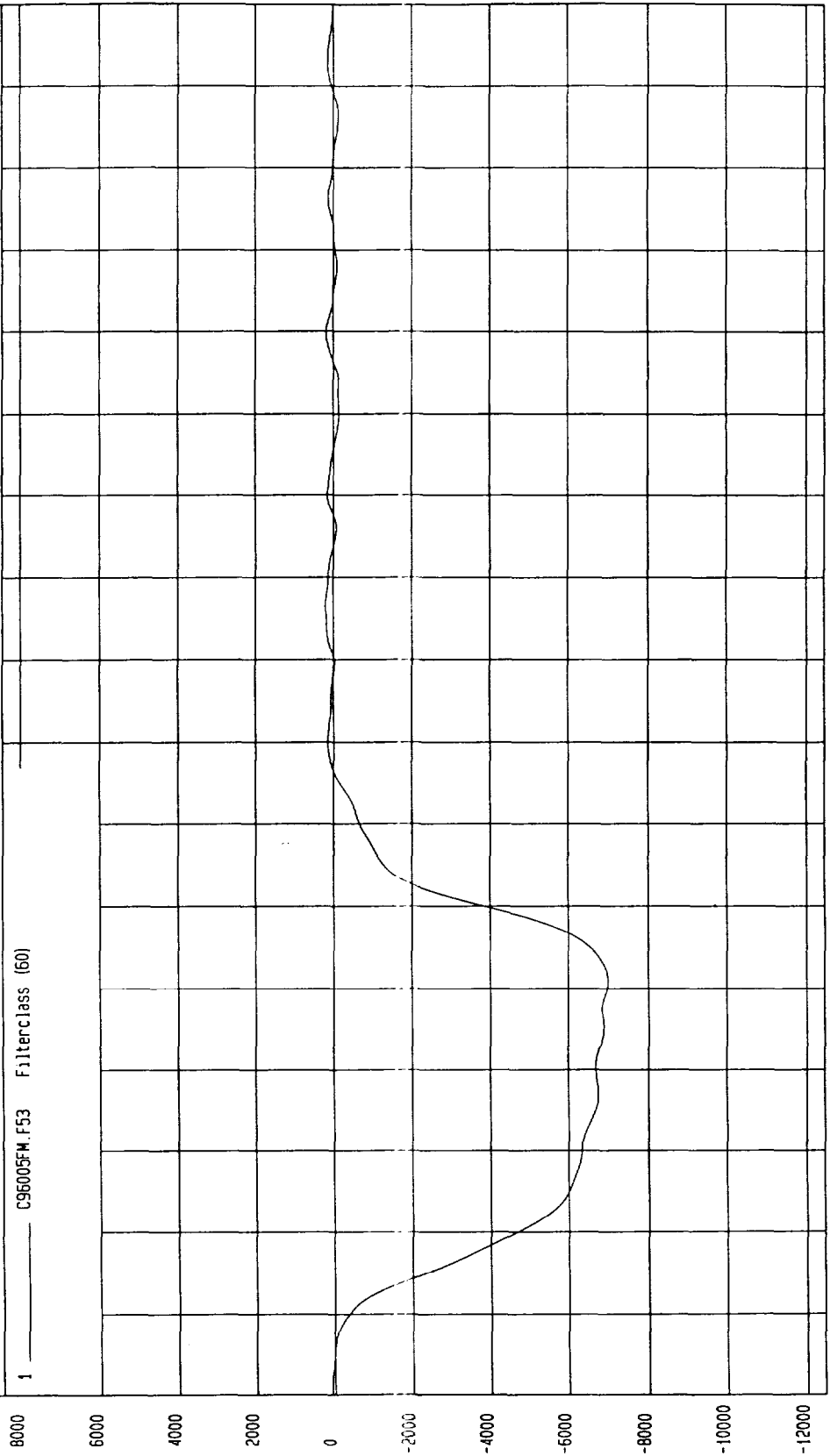
MCA Research
06-02-1996 13.52

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7007.28 N at 41 msec Maximum = 211.99 N at 86 msec

LC #34 FX



MCA Research
06-02-1998 13.52

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

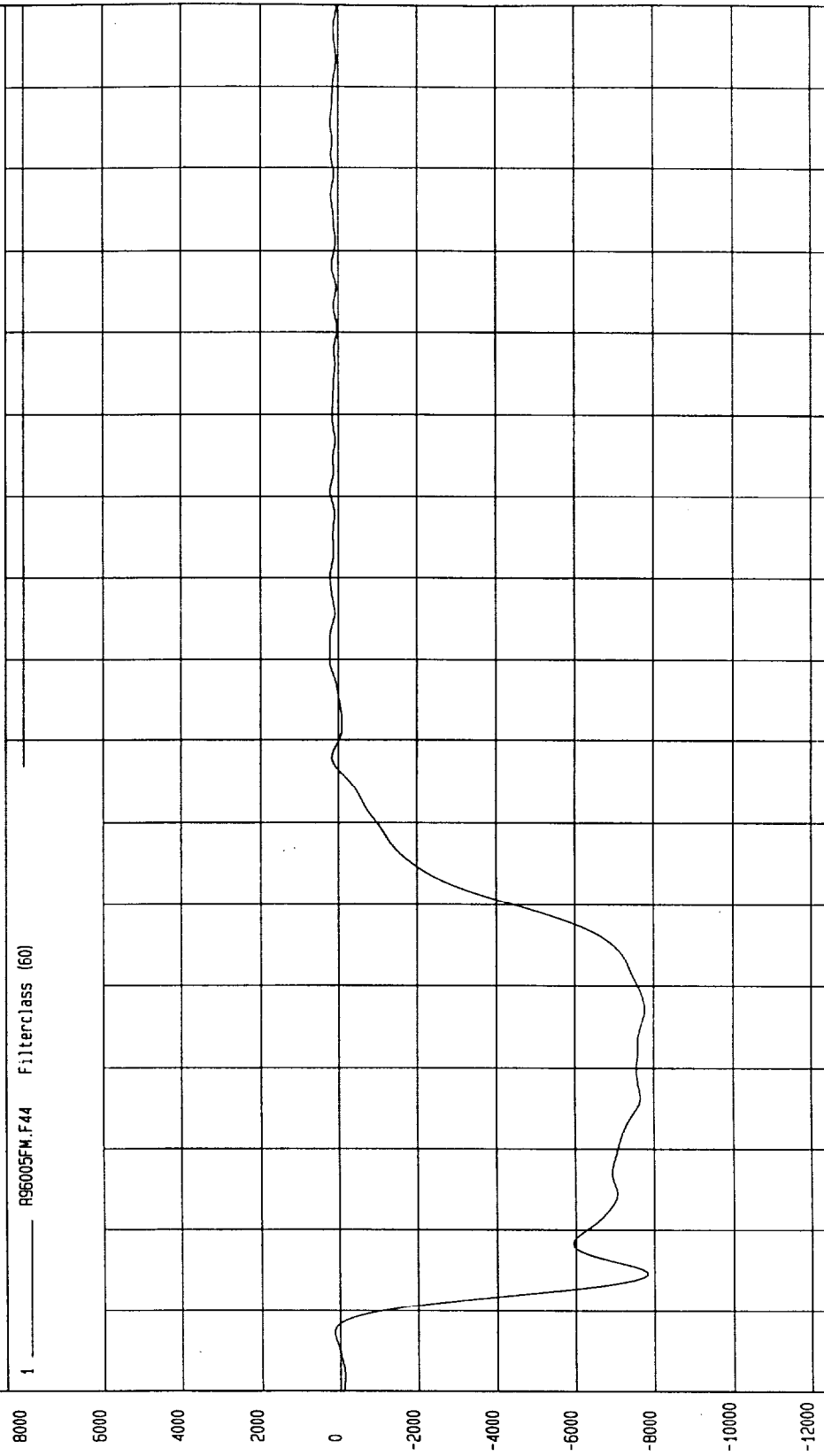
SPEED: 25.8 MPH 41.5 KPH

Maximum = 226.4 N at 80 msec

Minimum = -7826.81 N at 5 msec

LC #35 FX

1 RS6005FM.F44 Filterclass (60)



MGA Research
06-02-1998 13:40

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 140.47 N at 84 msec

Minimum = -6592.28 N at 27 msec

LC #36 FX

1 _____ R96005FM.F47 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

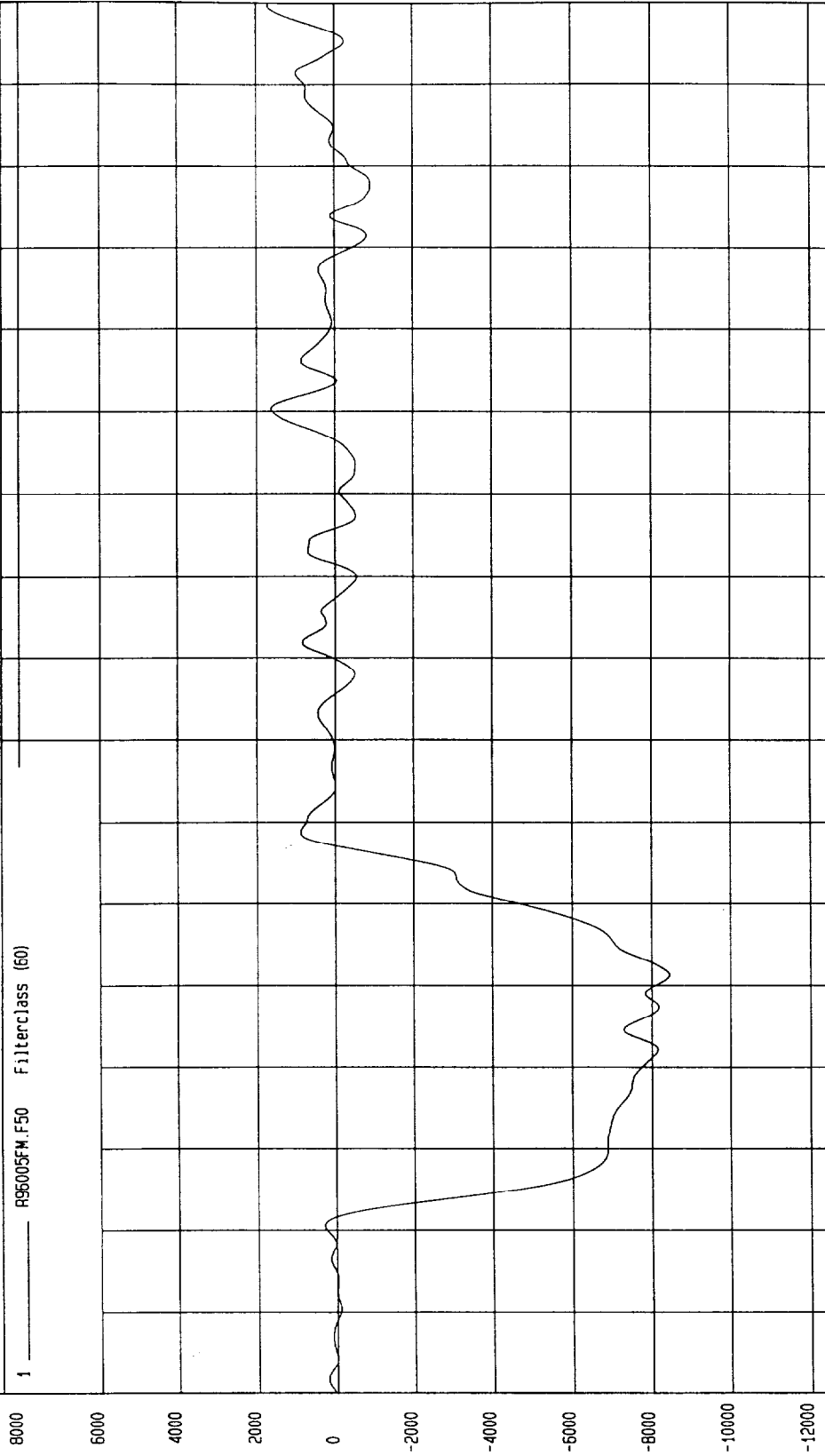
-01

TIME (SECONDS)

NCA Research
06-02-1996 13:40

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8441.19 N at 41 msec	
Maximum = 1703.5 N at 160 msec	

LC #37 FX



N

TIME (SECONDS)

MCA Research
06-02-1998 13.41

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -9378.6 N at 38 msec Maximum = 874.86 N at 195 msec

LC #38 FX

1 R96005FM.F53 Filterclass (50)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MCA Research
06-02-1998 13:41

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 420.22 N at 181 msec

Minimum = -10327.09 N at 4 msec

LC #39 FX

1 _____ P95005FM.F56 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

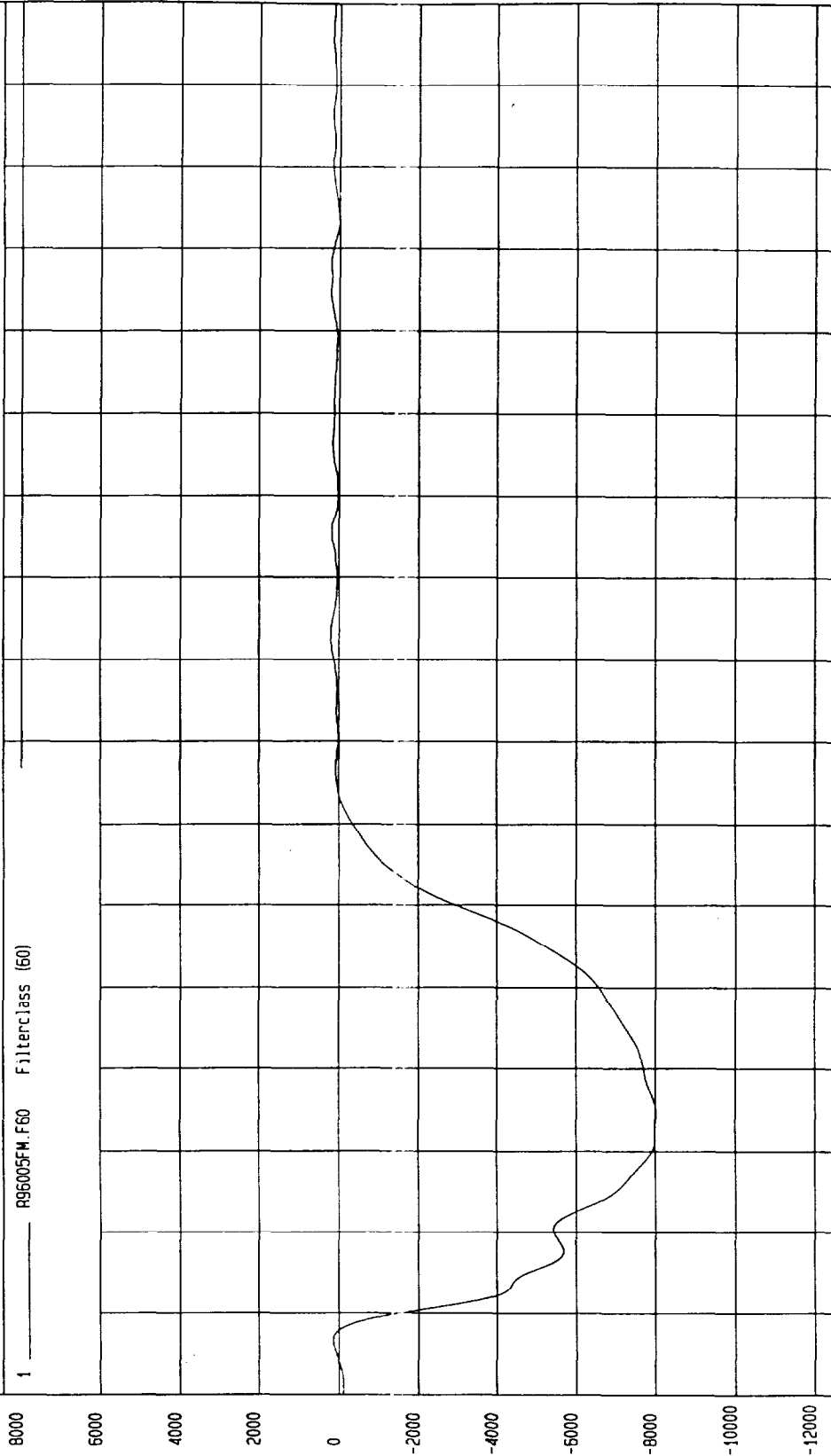
MCA Research
06-02-1998 13:41

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8024.56 N at 24 msec Maximum = 276.79 N at 179 msec

LC #40 FX



MCA Research
06-02-1998 13:42

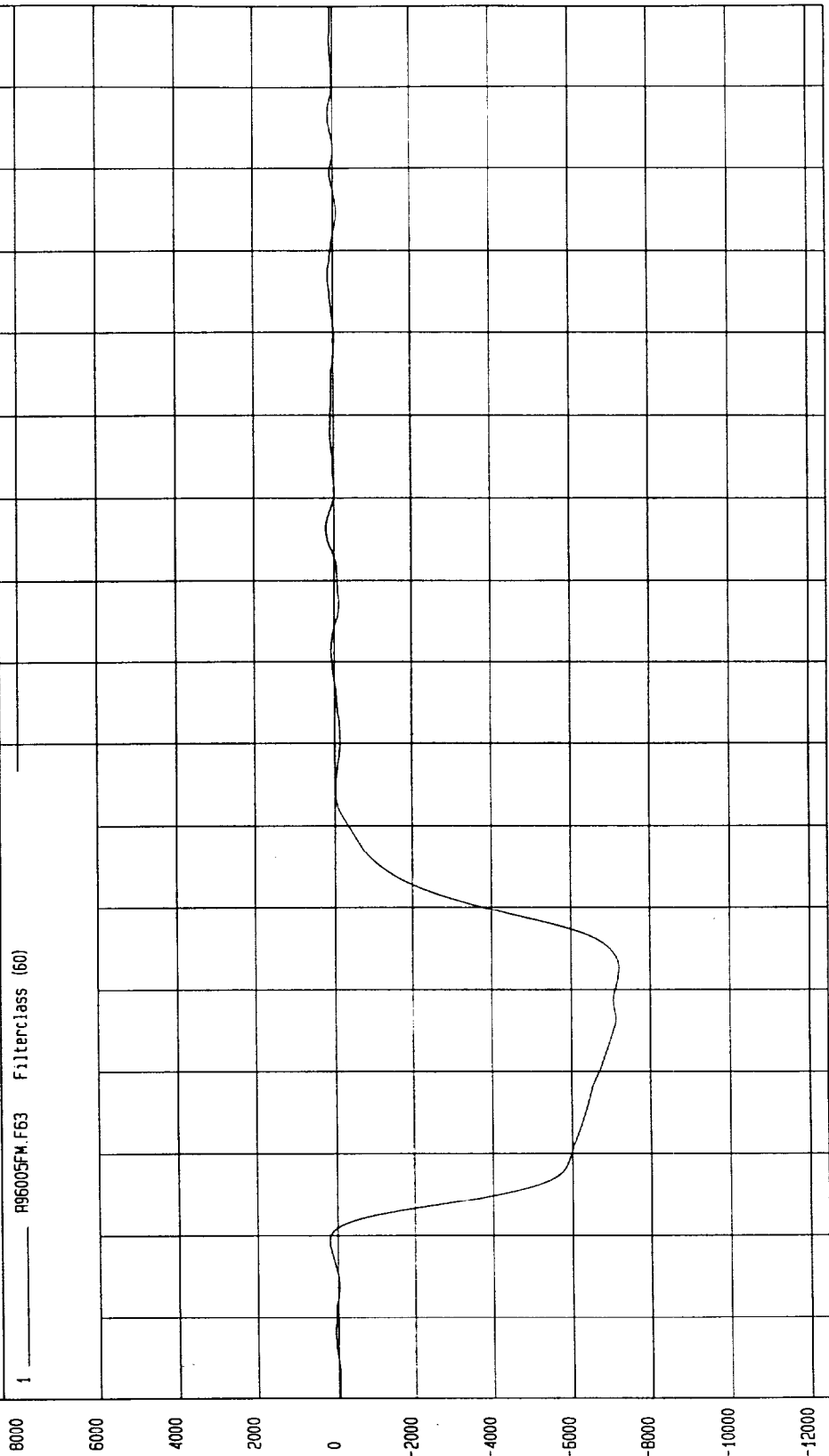
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7214.97 N at 43 msec Maximum = 202.56 N at 9 msec

LC #41 FX

1 R96005FM.F63 Filterclass (60)



MCA Research
06-02-1998 13:42

TIME (SECONDS)

N

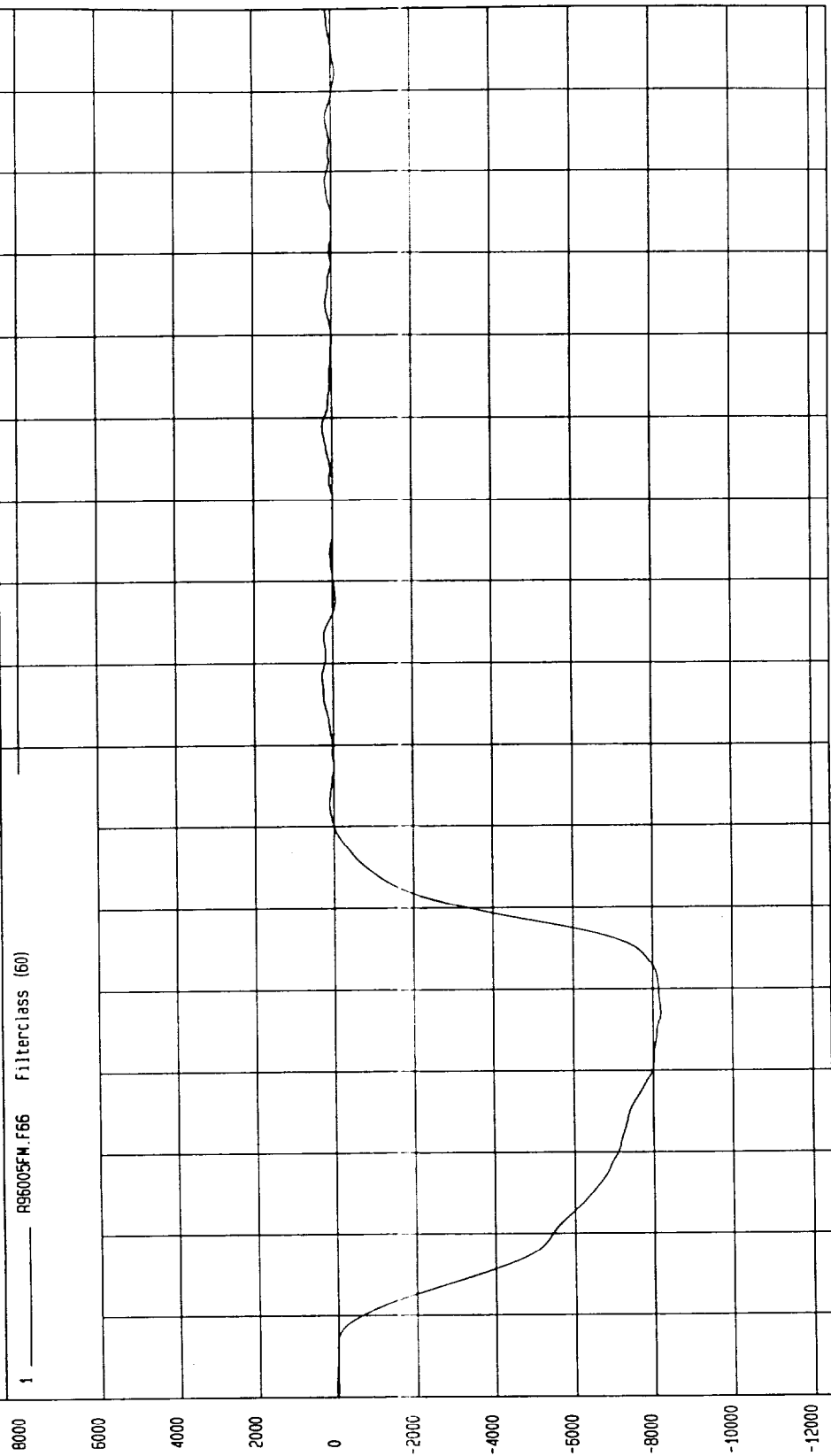
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8199.43 N at 37 msec Maximum = 281.29 N at 78 msec

LC #42 FX

1 — R96005FM.F66 Filterclass (60)



MGA Research
06-02-1998 13:42

TIME (SECONDS)

N

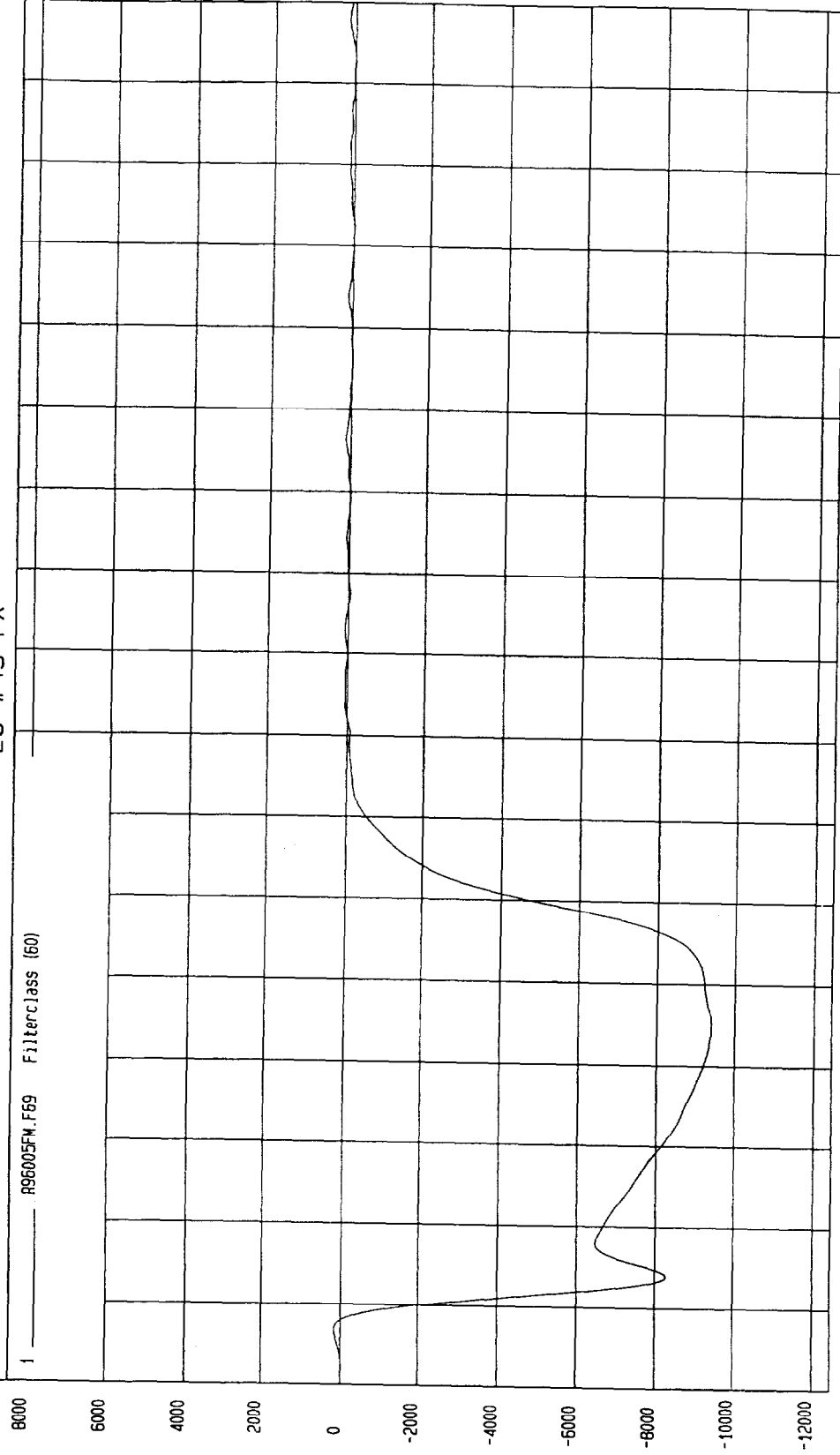
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -9397 N at 35 msec Maximum = 172.87 N at -3 msec

LC #43 FX

1 ——— R96005FM.F69 Filterclass (60)



MCA Research
06-02-1998 13:43

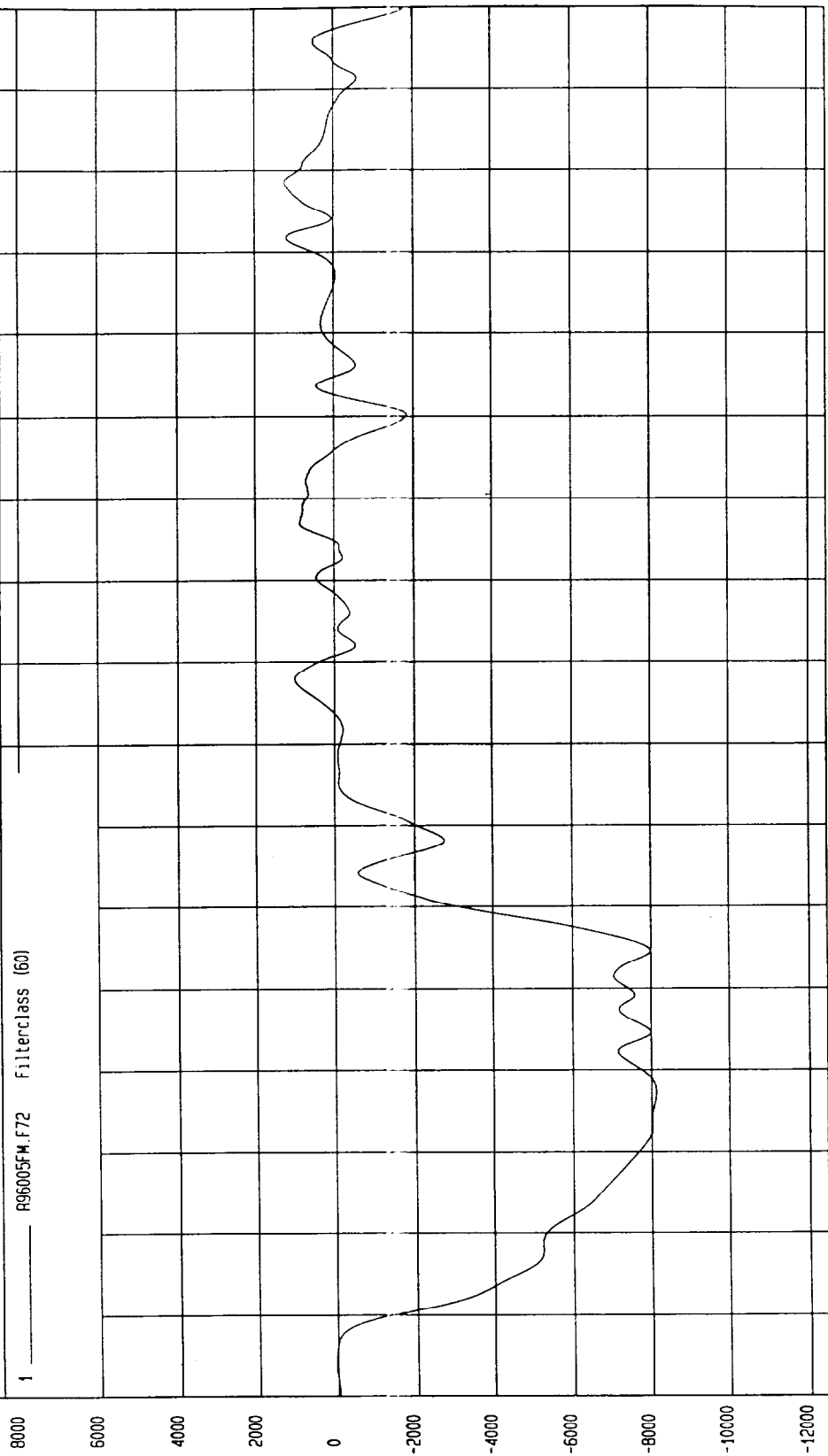
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8122.86 N at 27 msec Maximum = 2195.08 N at 190 msec

LC #44 FX

1 _____ R96005FM.F72 Filterclass (60)



MGA Research
06-02-1998 13.43

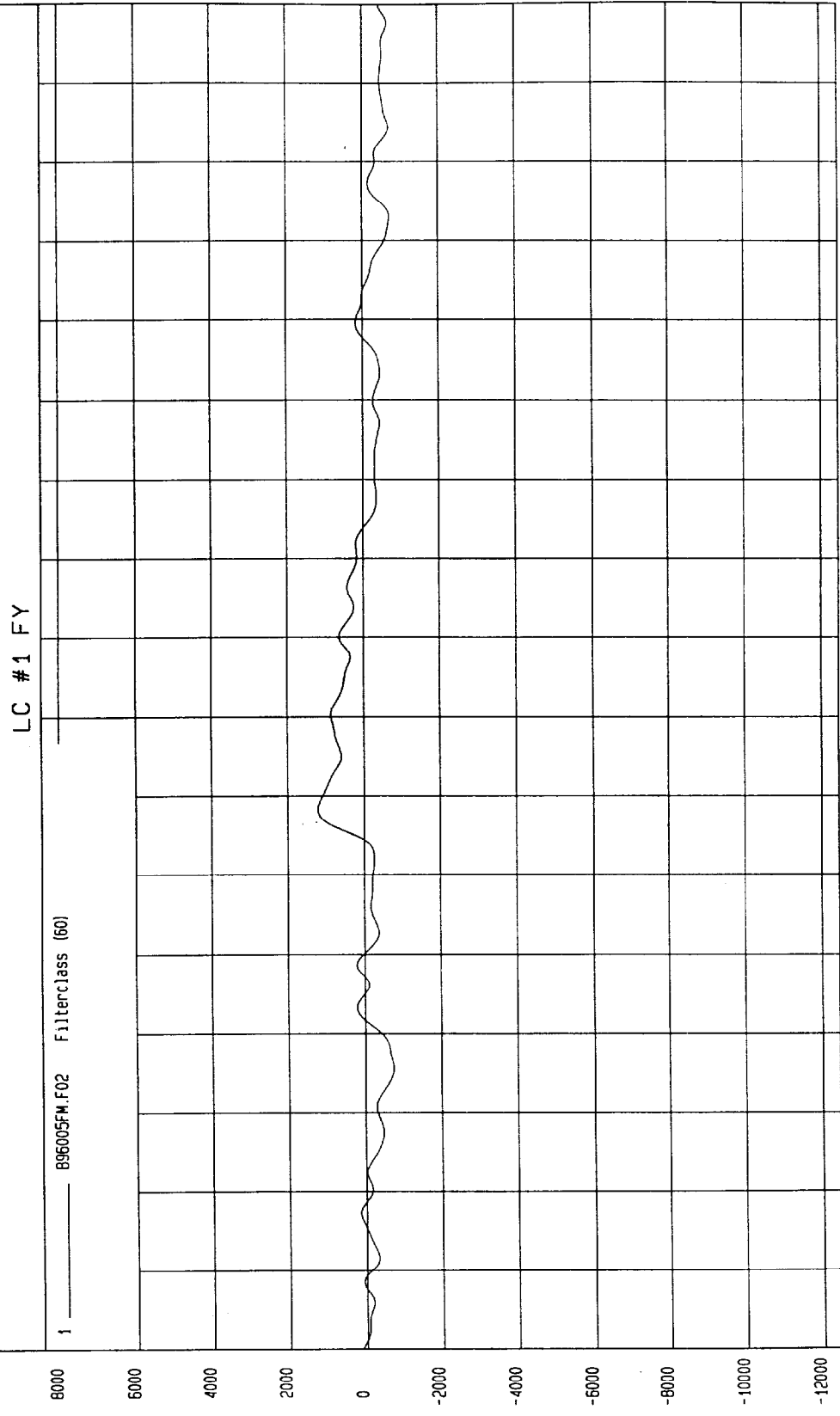
TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -771.49 N at 163 msec Maximum = 1202.77 N at 58 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

MGA Research
06-02-1998 13.13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

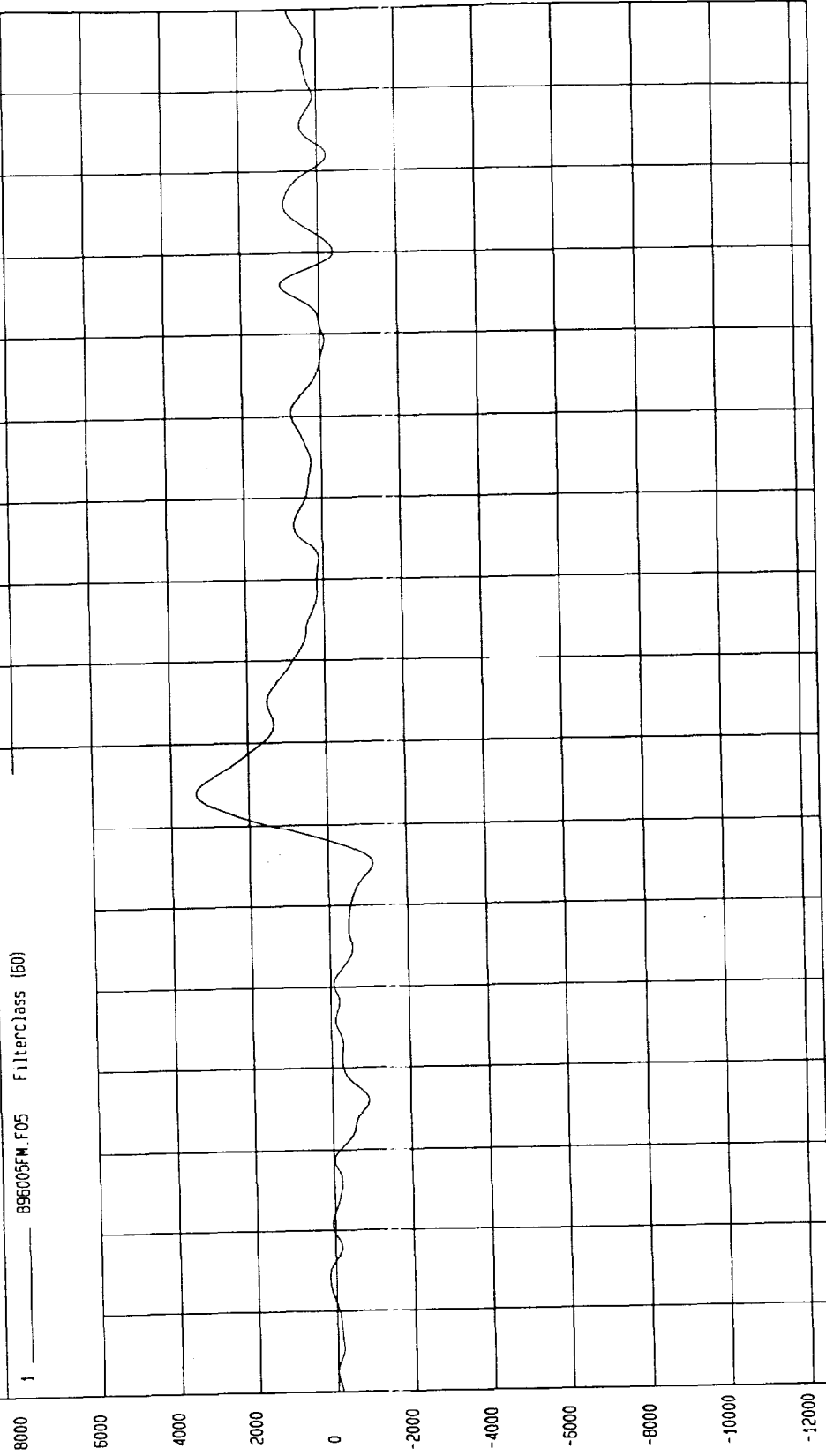
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 3357.1 N at 54 msec

Minimum = -1158.65 N at 55 msec

LC #2 FY

1 _____ B96005FM.F05 Filterclass (60)



MGA Research
06-02-1998 13:13

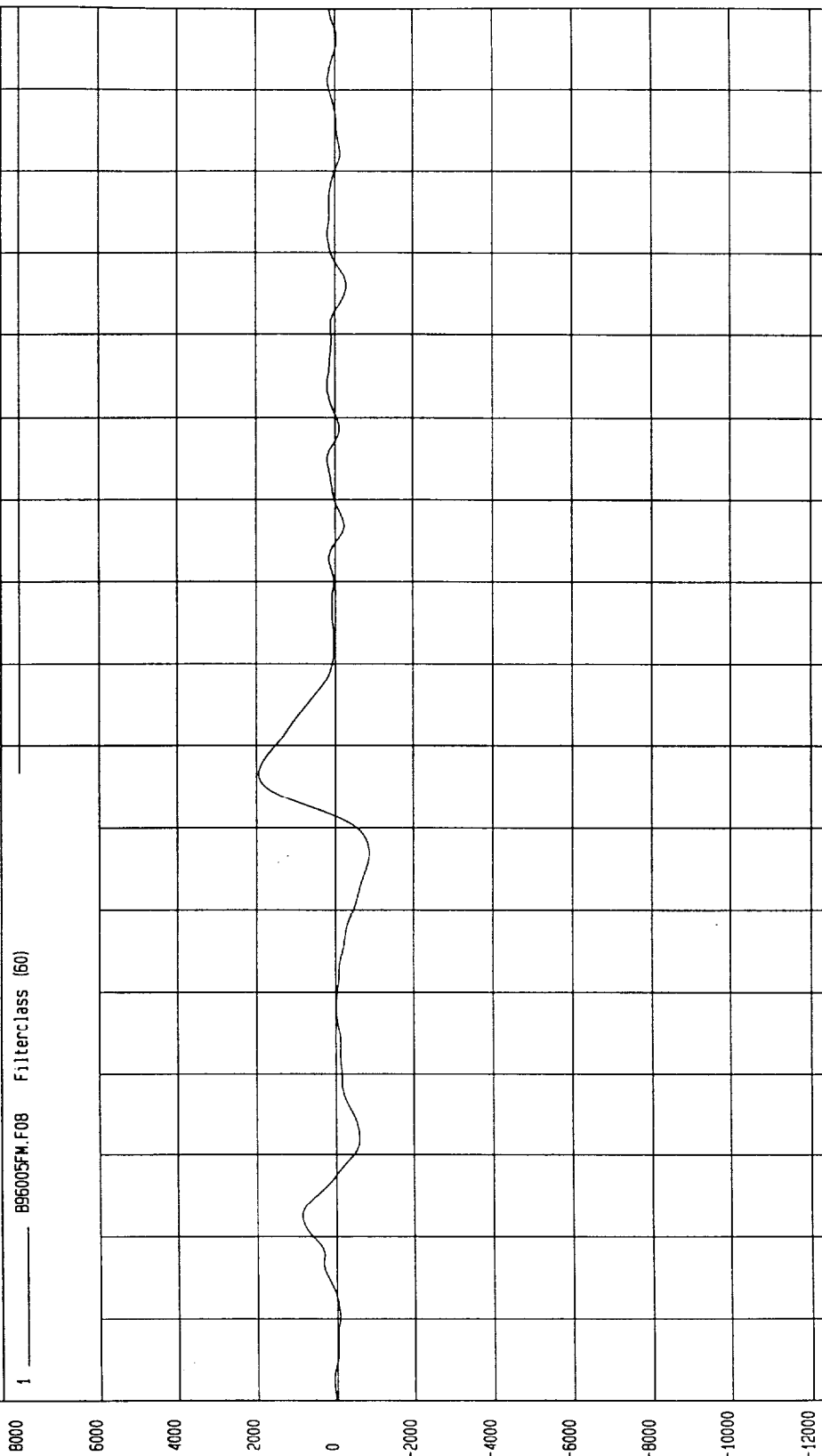
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -873.12 N at 57 msec Maximum = 1939.96 N at 67 msec

LC #3 FY

1 B96005FM.F08 Filterclass (60)



MCA Research
06-02-1998 13:14

TIME (SECONDS)

N

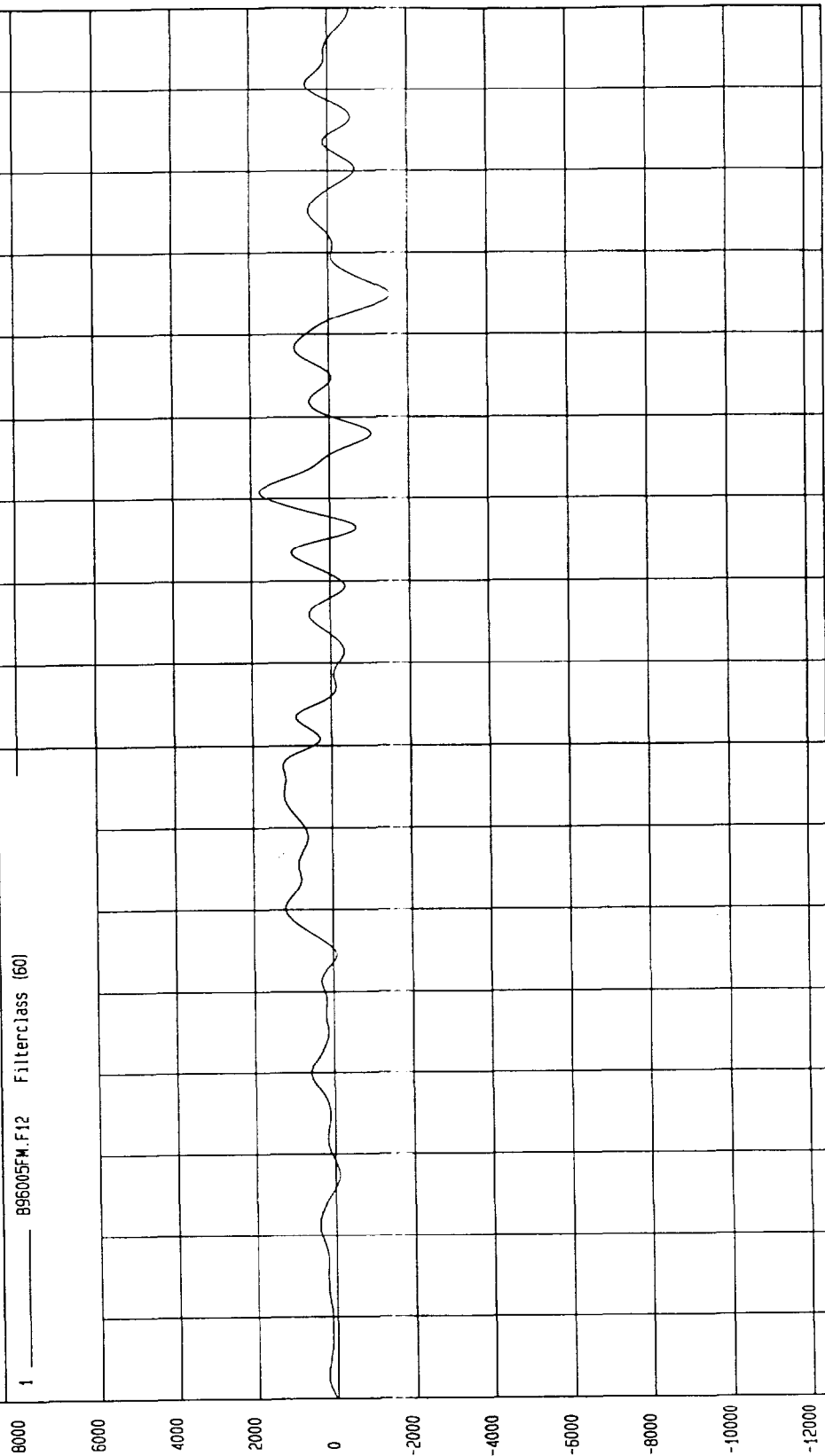
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -4573.26 N at 125 msec Maximum = 1778.53 N at 101 msec

LC #4 FY

1 _____ B96005FM.F12 Filterclass (60)



MCA Research
06-02-1998 13.14

TIME (SECONDS)

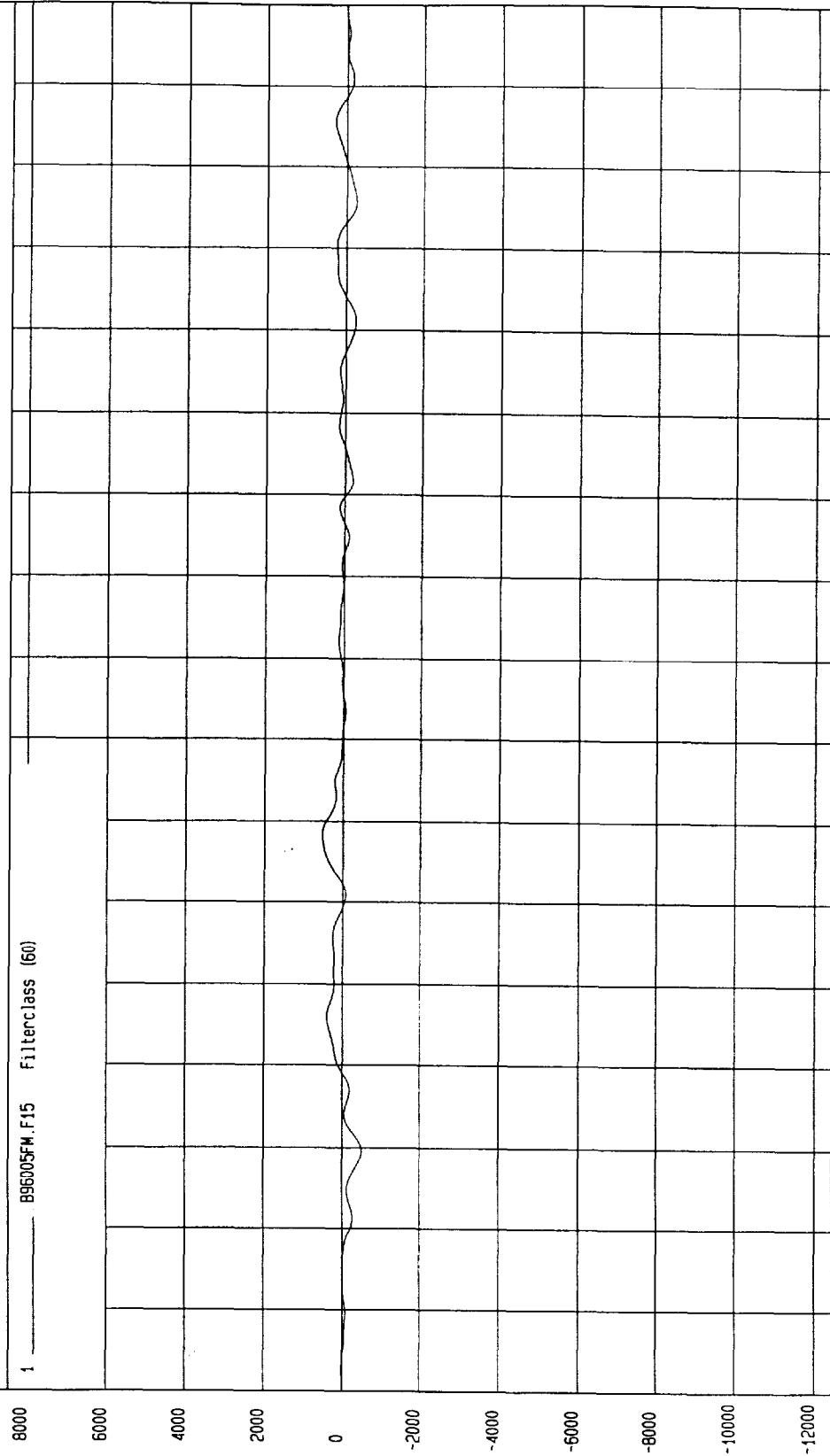
N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -510.17 N at 20 msec Maximum = 532.2 N at 58 msec

LC #5 FY



TIME (SECONDS)

MCA Research
06-02-1998 13:15

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

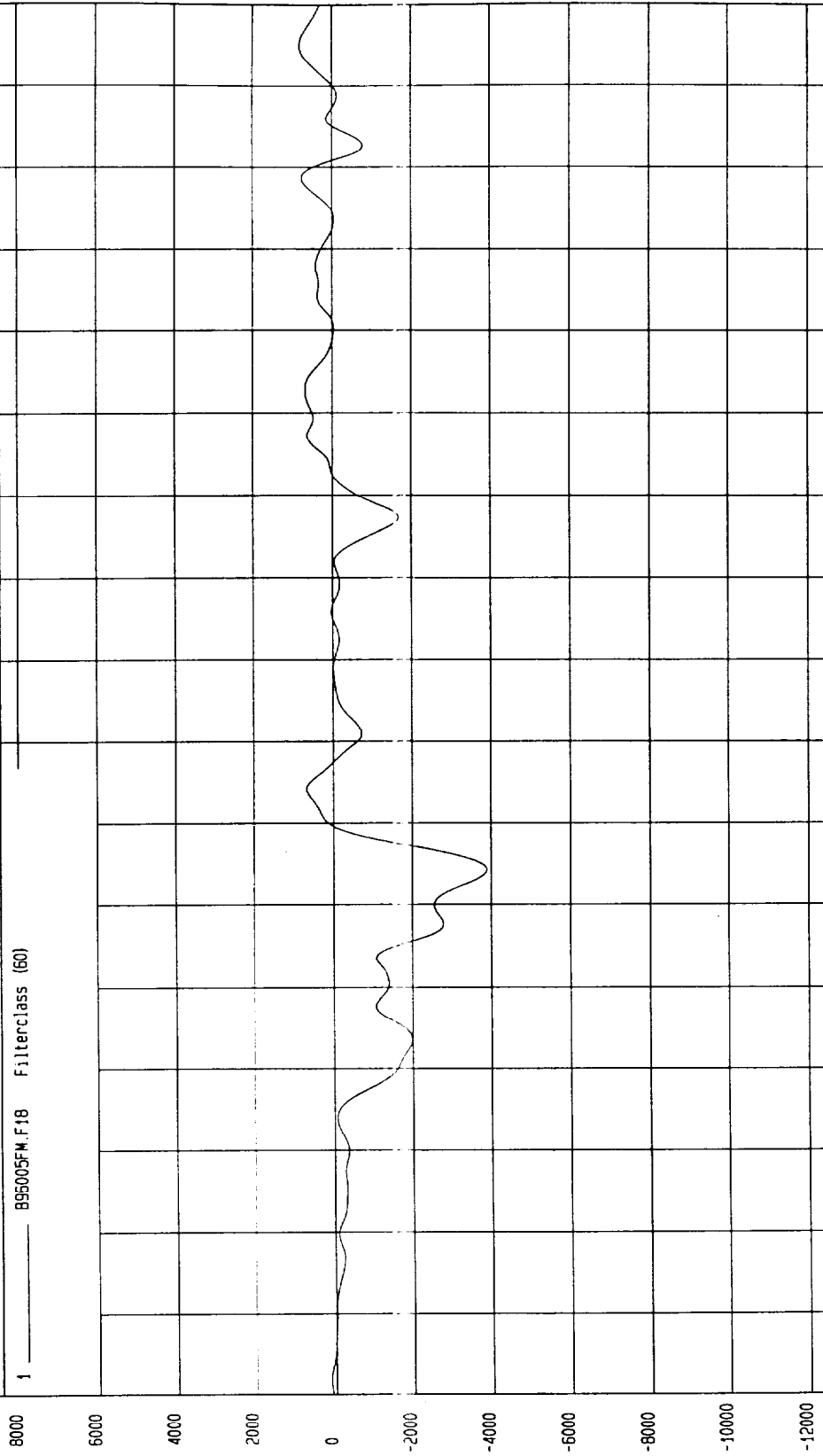
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -3888.05 N at 54 msec

Maximum = 876.2 N at 199 msec

LC #6 FY

1 _____ B95005FM.F18 Filterclass (60)



MCA Research
06-02-1998 13:15

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

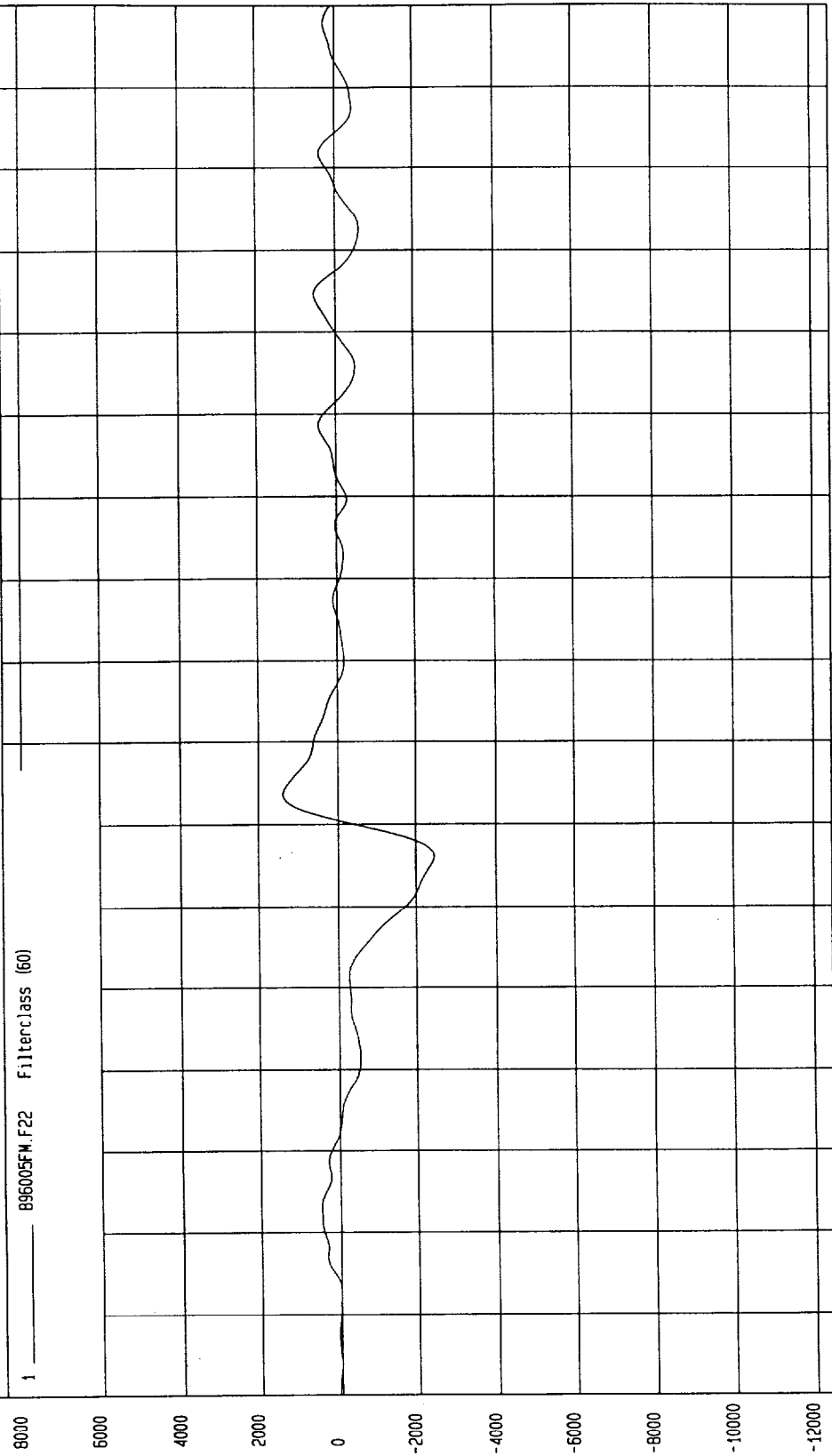
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2442.1 N at 56 msec

Maximum = 1386.37 N at 64 msec

LC #7 FY

1 _____ B96005FM.F22 Filterclass (60)



NCA Research
06-02-1998 13:15

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -2884.02 N at 54 msec

Maximum = 1178.15 N at 97 msec

LC #8 FY

1 ——— B96005FM.F25 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

TIME (SECONDS)

15
14
13
12
11
10
09
08
07
06
05
04
03
02
01
0
-01

NCA Research
06-02-1996 13.15

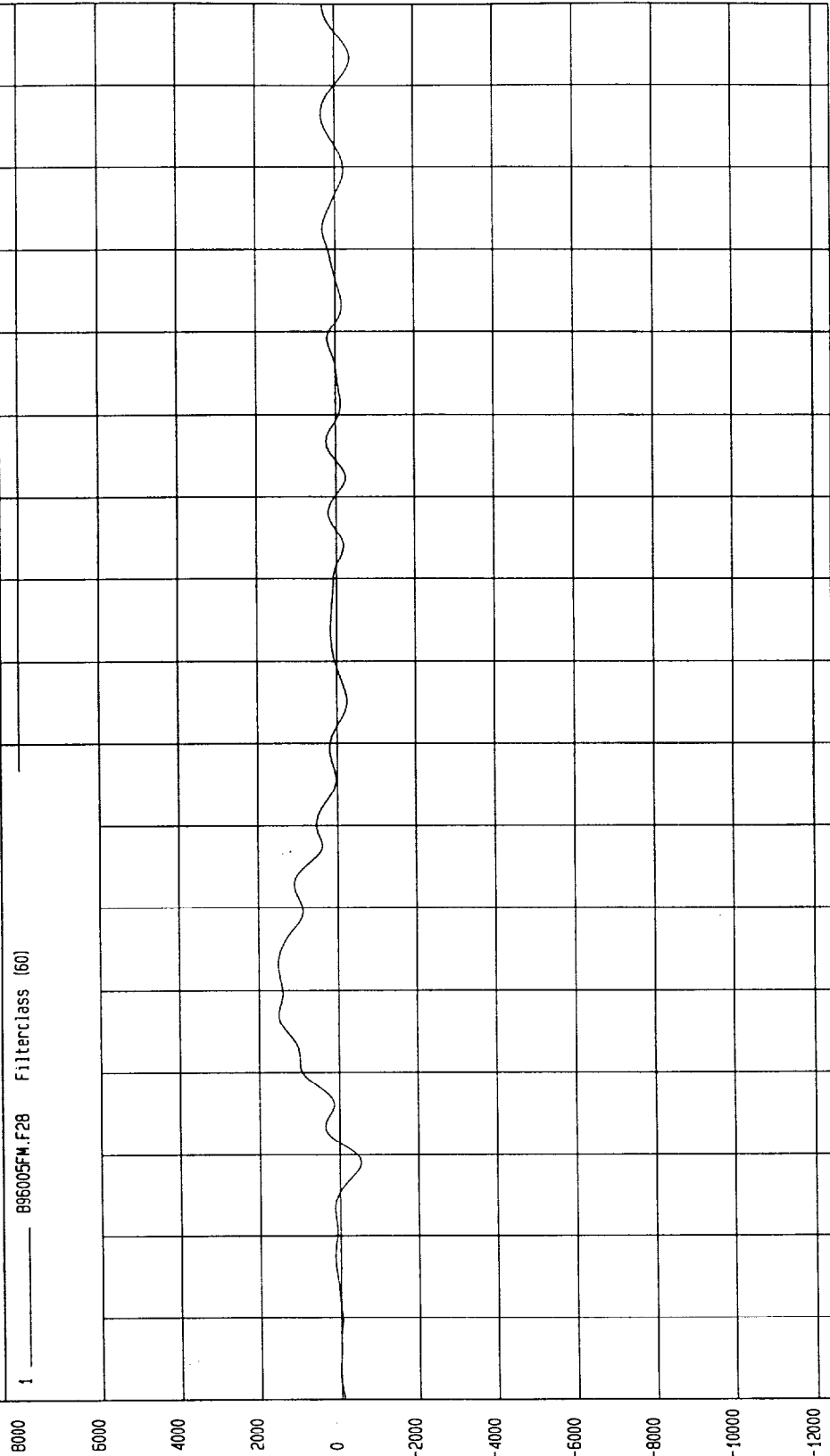
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -545.57 N at 19 msec Maximum = 1503.32 N at 43 msec

LC #9 FY

1 896005FM.F28 Filterclass (60)



WGA Research
06-02-1998 13.16

TIME (SECONDS)

N

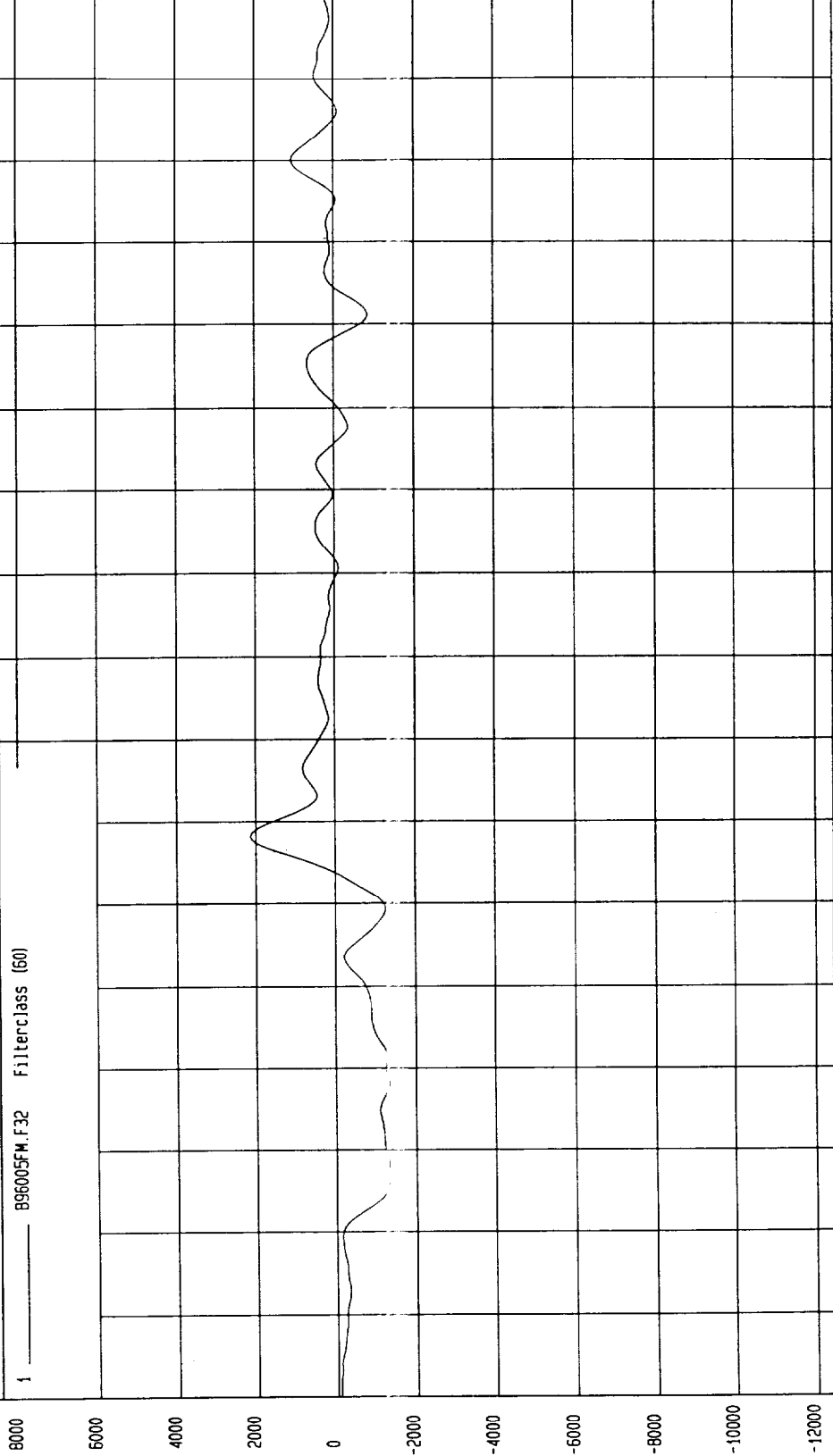
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1341.68 N at 28 msec Maximum = 2131.24 N at 58 msec

LC #10 FY

1 896005FM.F32 Filterclass (60)



TIME (SECONDS)

MGA Research
06-02-1998 13:16

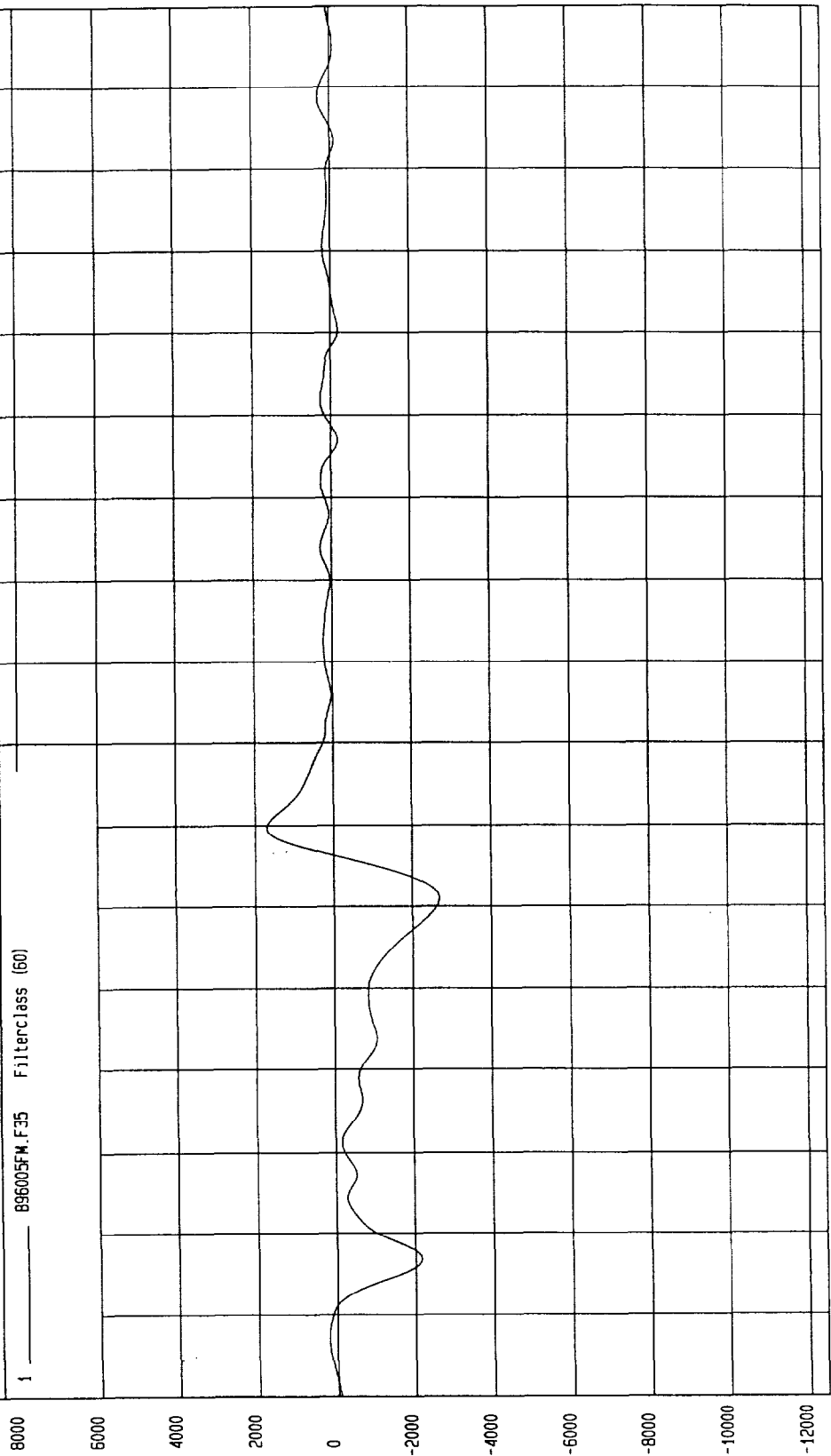
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2579.11 N at 51 msec Maximum = 1699.63 N at 60 msec

LC #11 FY

1 896005FM.F35 Filterclass (60)



TIME (SECONDS)

MCA Research
06-02-1998 13.17

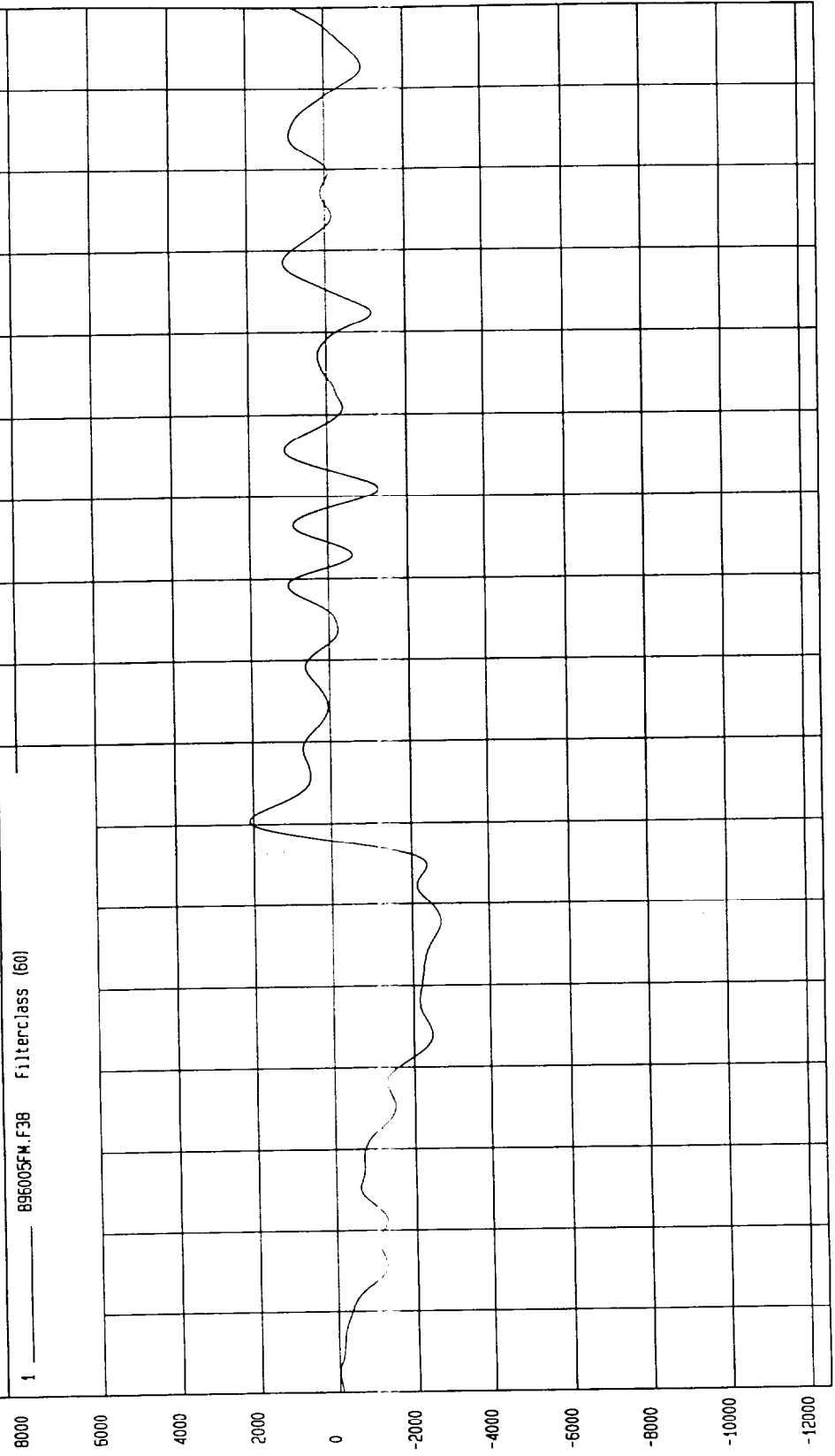
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2715.5 N at 48 msec Maximum = 2095.96 N at 60 msec

LC #12 FY

1 89E005FM.F38 Filterclass (60)



TIME (SECONDS)

MCA Research
06-02-1998 13: 17

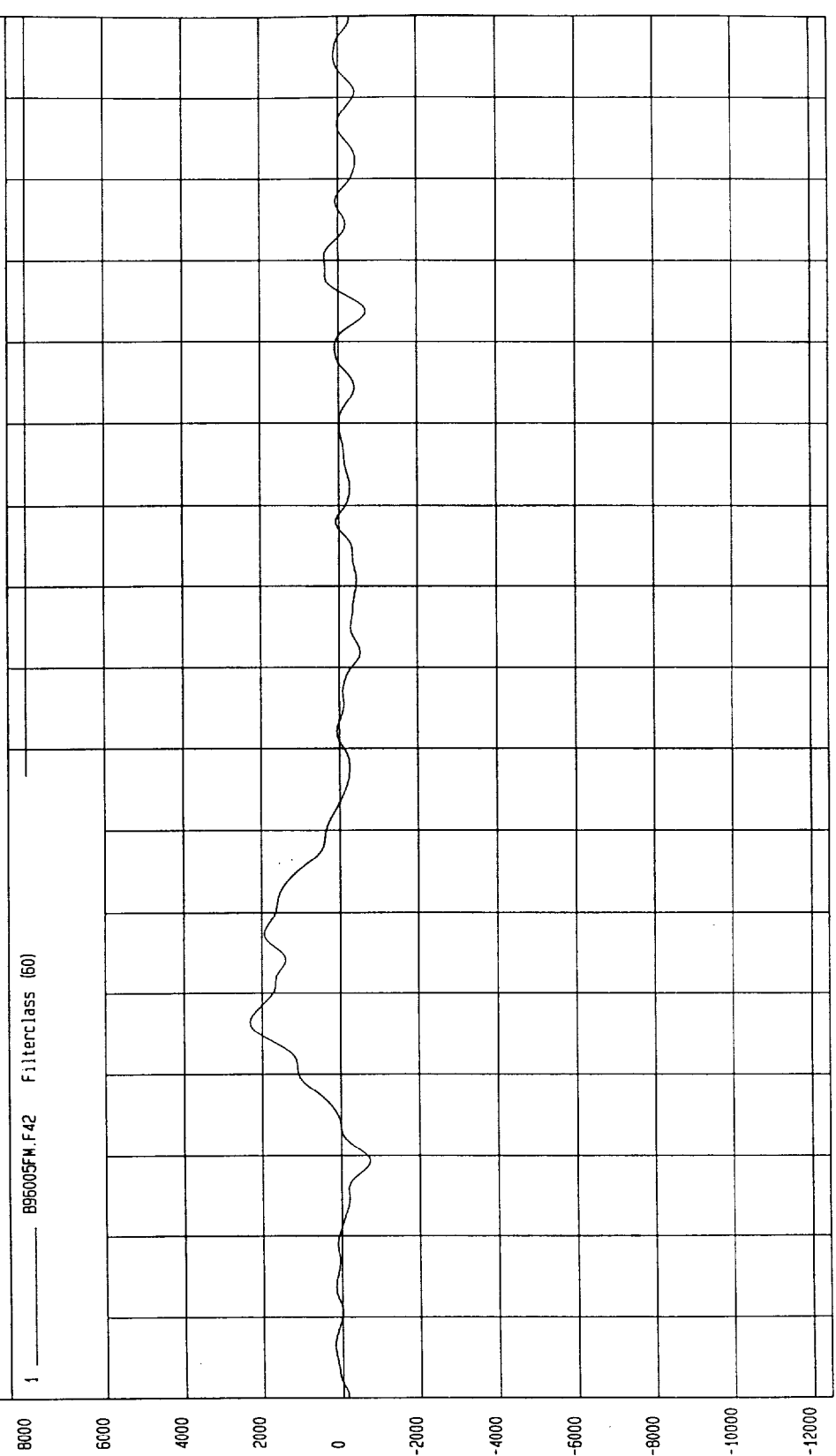
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1031.13 N at 189 msec Maximum = 2310.38 N at 36 msec

LC #13 FY

1 B95005FM.F42 Filterclass (60)



MGA Research
06-02-1998 13:17

TIME (SECONDS)

N

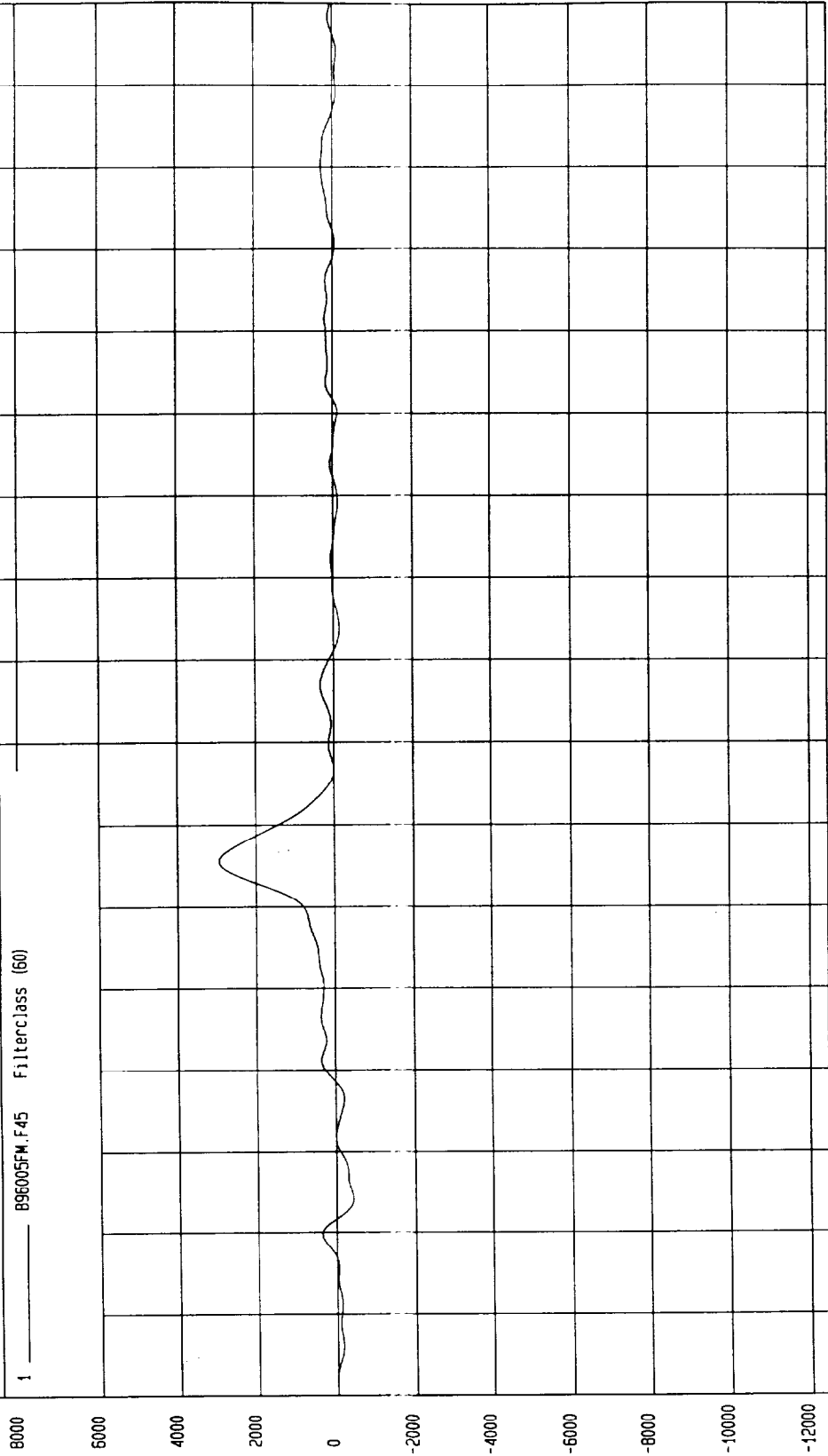
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -443.32 N at 14 msec Maximum = 2963.05 N at 56 msec

LC #14 FY

1 _____ B96005FM.F45 Filterclass (60)



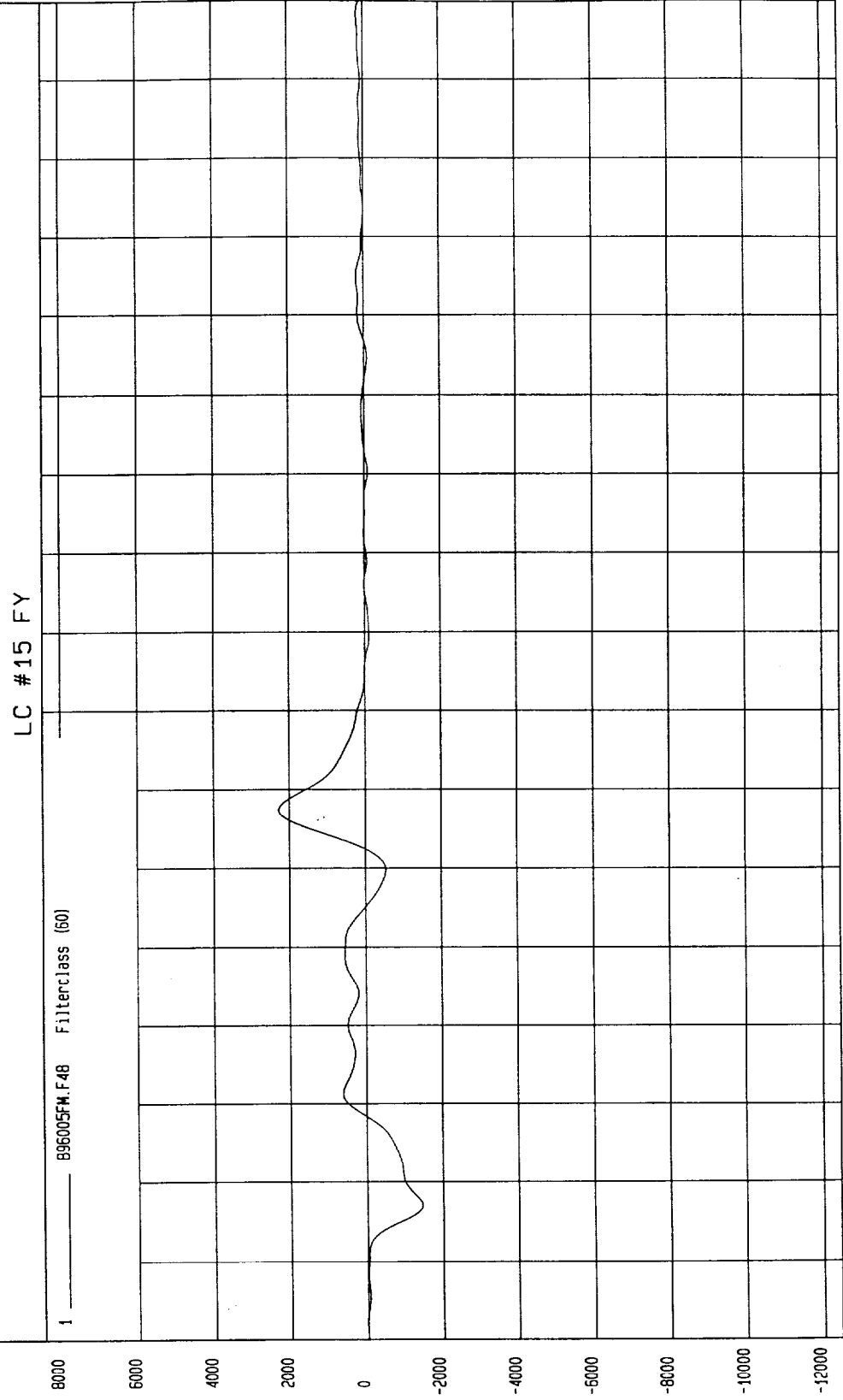
TIME (SECONDS)

MGA Research
06-02-1998 13:18

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1477.06 N at 7 msec Maximum = 2274.47 N at 57 msec



TIME (SECONDS)

MGA Research
06-02-1998 13:18

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

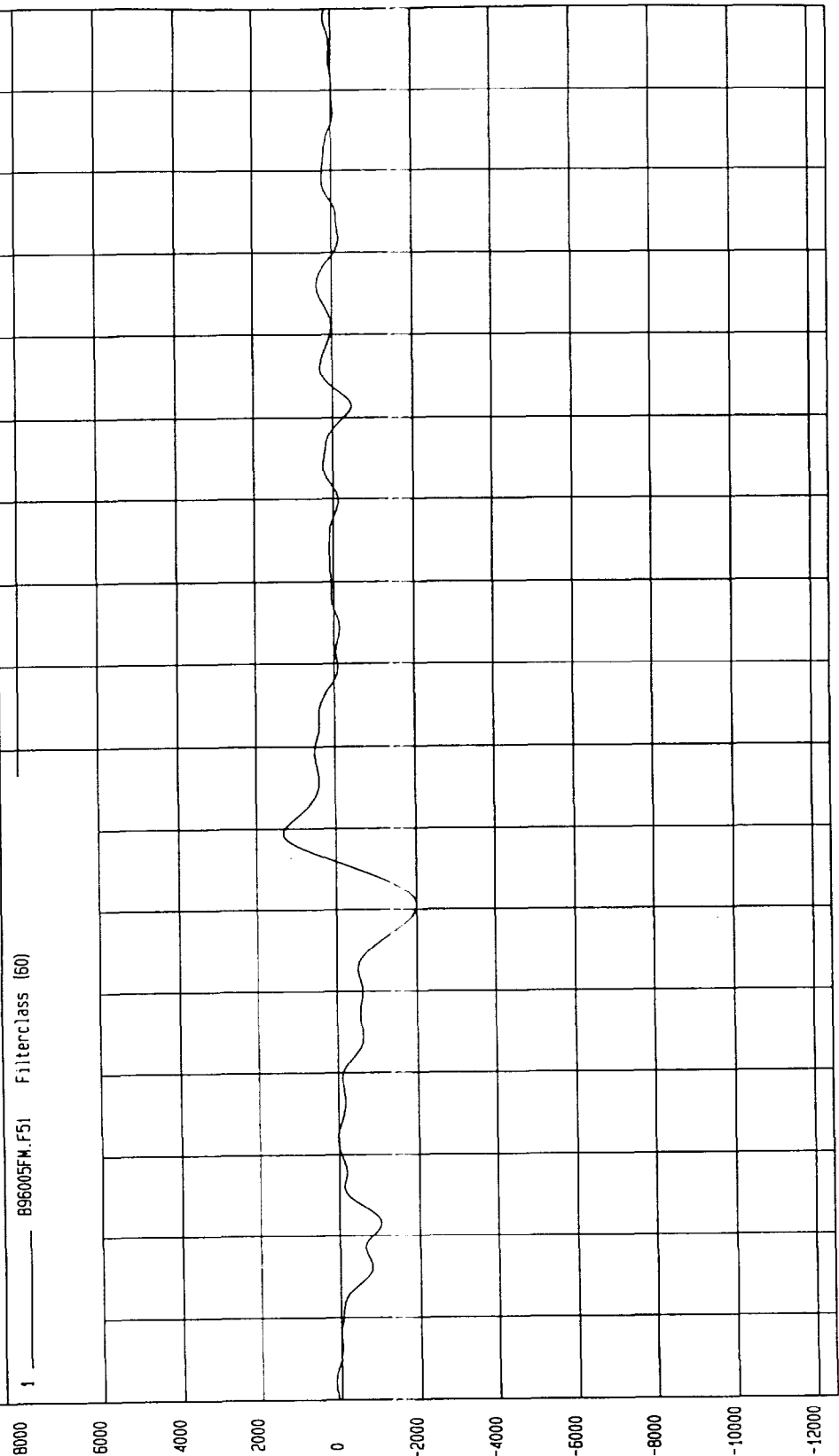
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1358.32 N at 59 msec

Minimum = -2002.2 N at 50 msec

LC #16 FY

1 B96005FM.F51 Filterclass (60)



MSA Research
06-02-1998 13:19

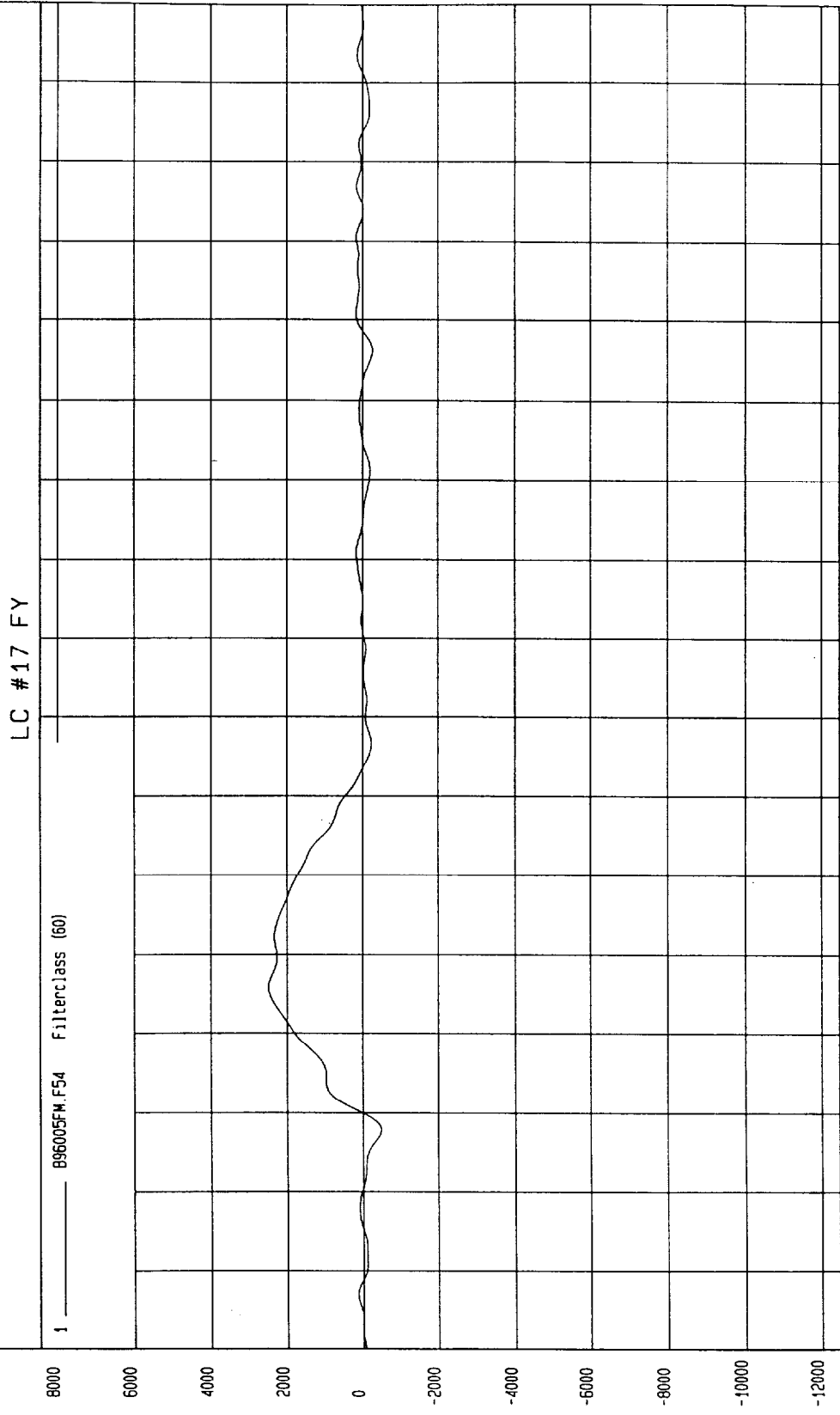
TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -485.38 N at 18 msec Maximum = 2492.91 N at 36 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

MCA Research
06-02-1998 13.19

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 3334.49 N at 54 msec

Minimum = -230.86 N at 174 msec

LC #18 FY

1 _____ B96005FM.F58 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1

0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15

TIME (SECONDS)

MGA Research
06-02-1998 13:19

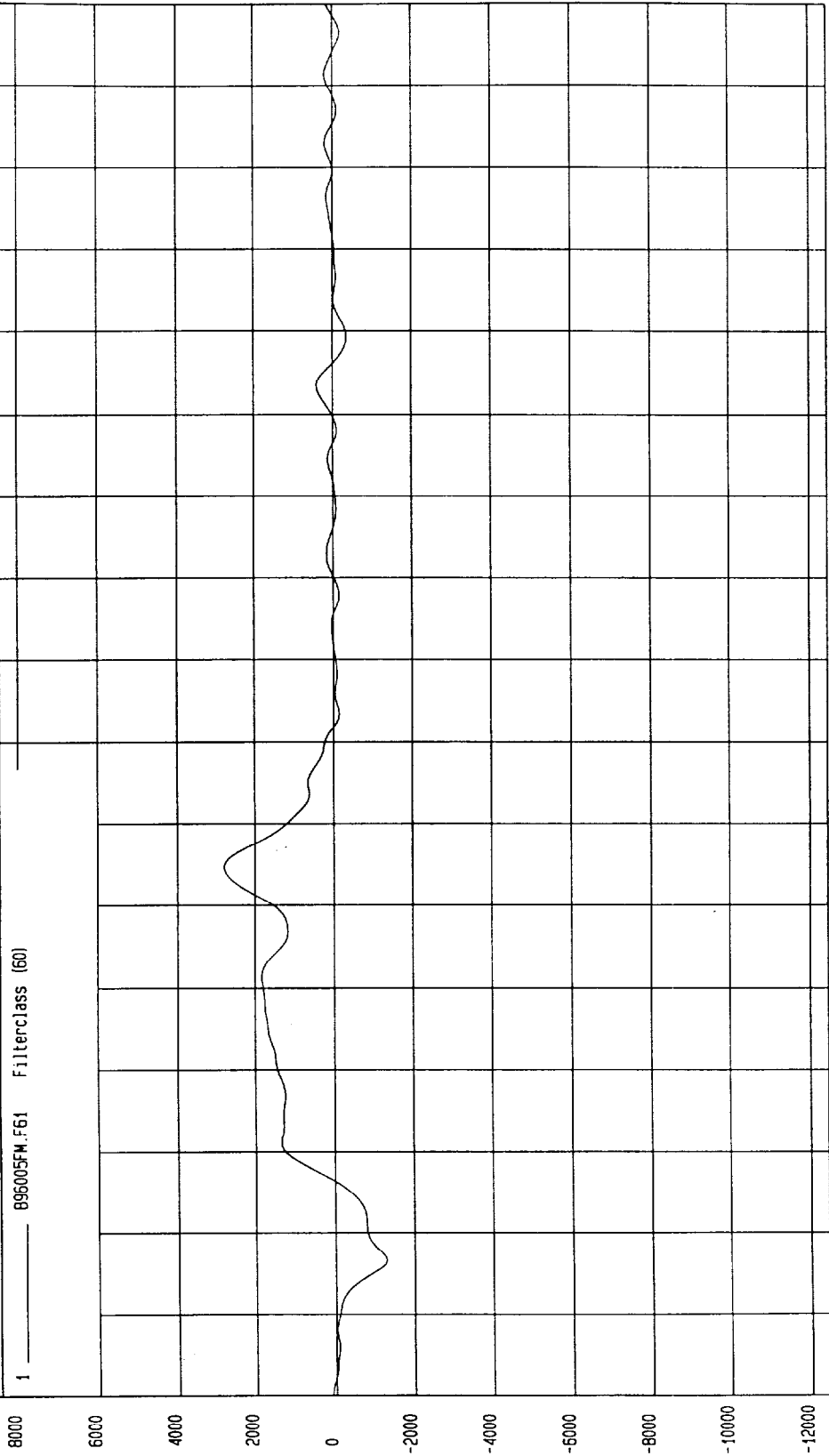
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1316.44 N at 7 msec Maximum = 2787.57 N at 55 msec

LC #19 FY

1 896005FM.F61 Filterclass (60)



MGA Research
06-02-1998 13:20

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

Maximum = 2112.91 N at 57 msec

Minimum = -621.51 N at 12 msec

LC #20 FY

1 896005FM.F64 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

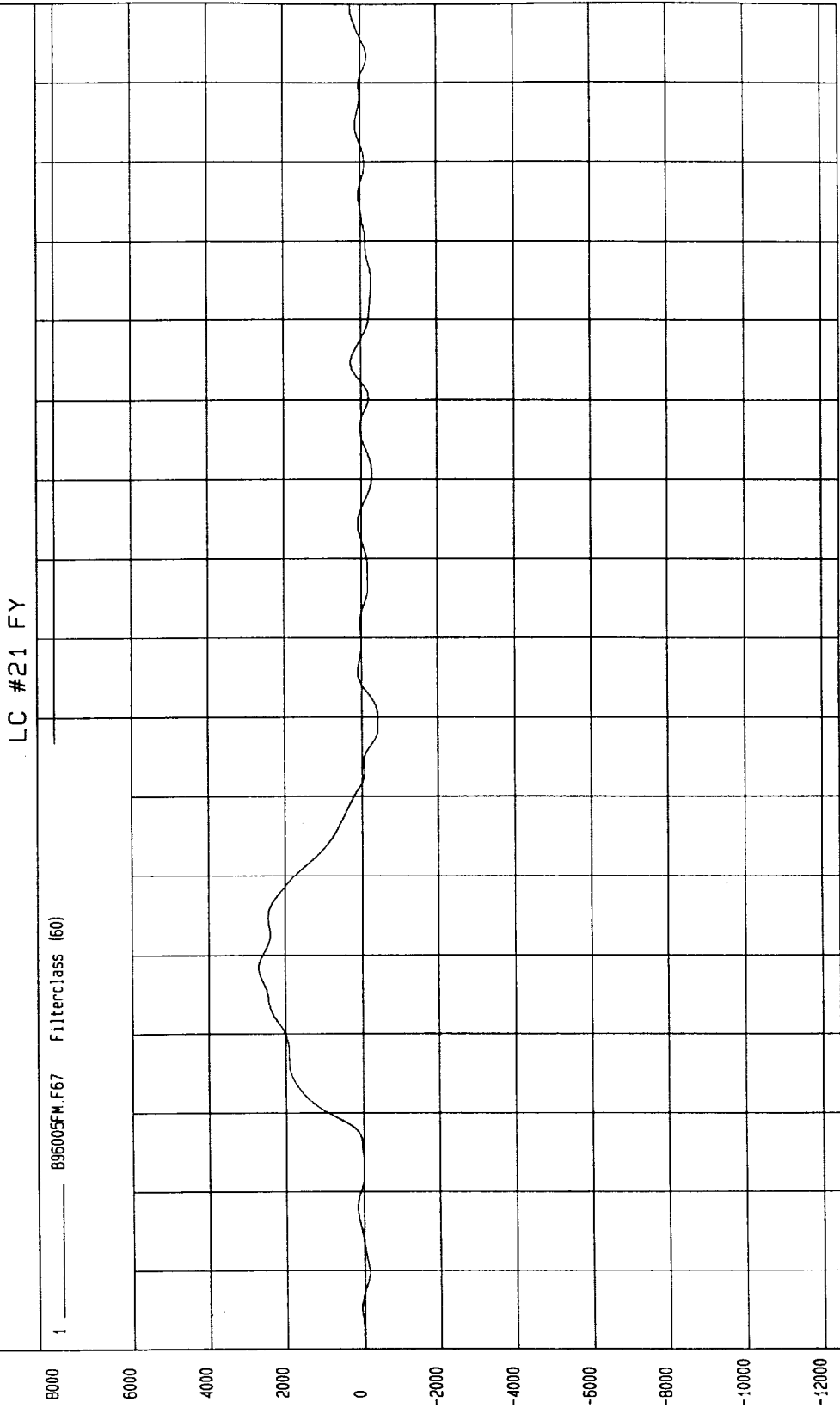
TIME (SECONDS)

MCA Research
06-02-1998 13:20

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -432.1 N at 69 msec Maximum = 2694.54 N at 38 msec

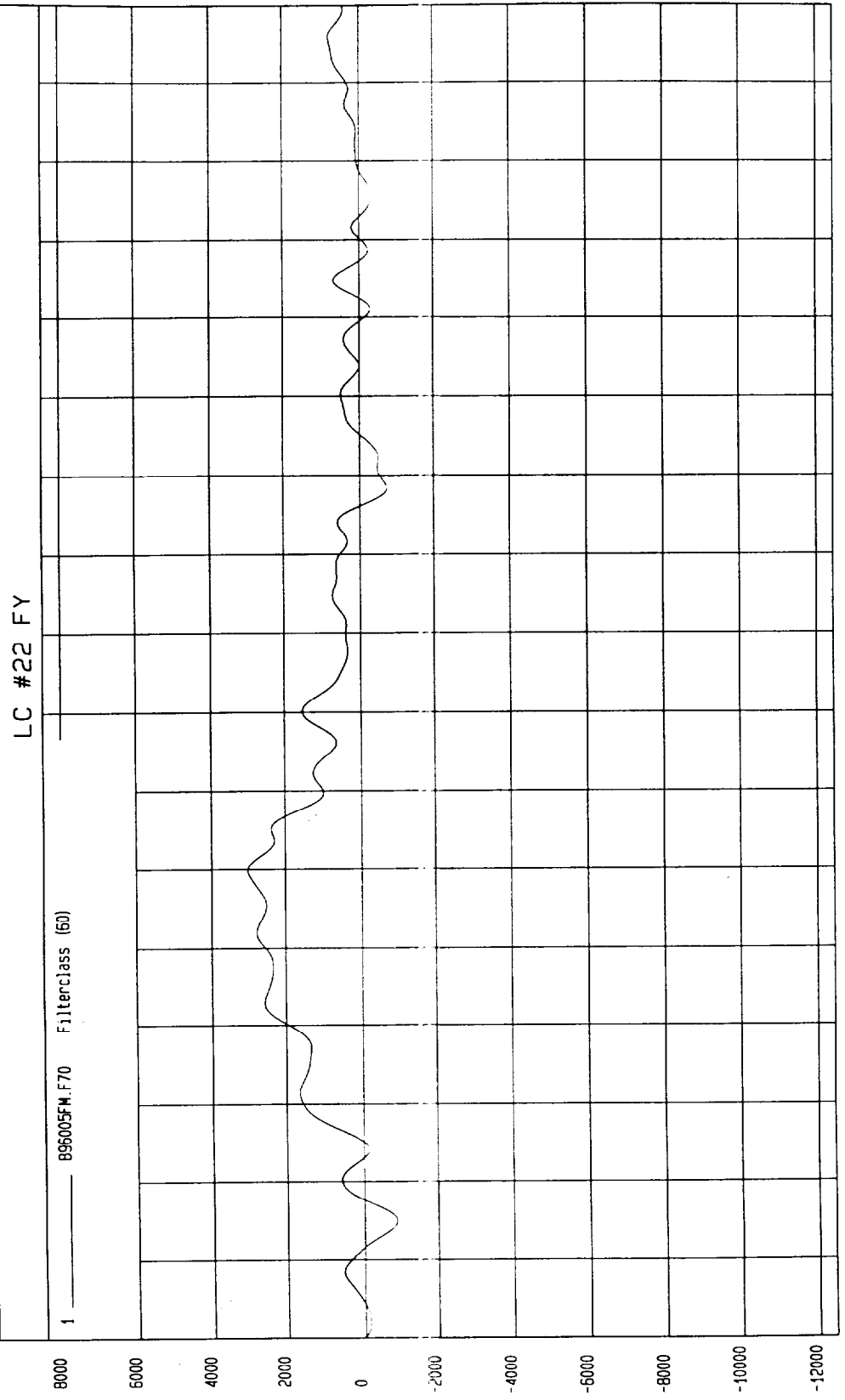


TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

MSA Research
06-02-1998 13:20

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -918.52 N at 5 msec	
Maximum = 3025.41 N at 50 msec	



TIME (SECONDS)

WCA Research
06-02-1998 13.21

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

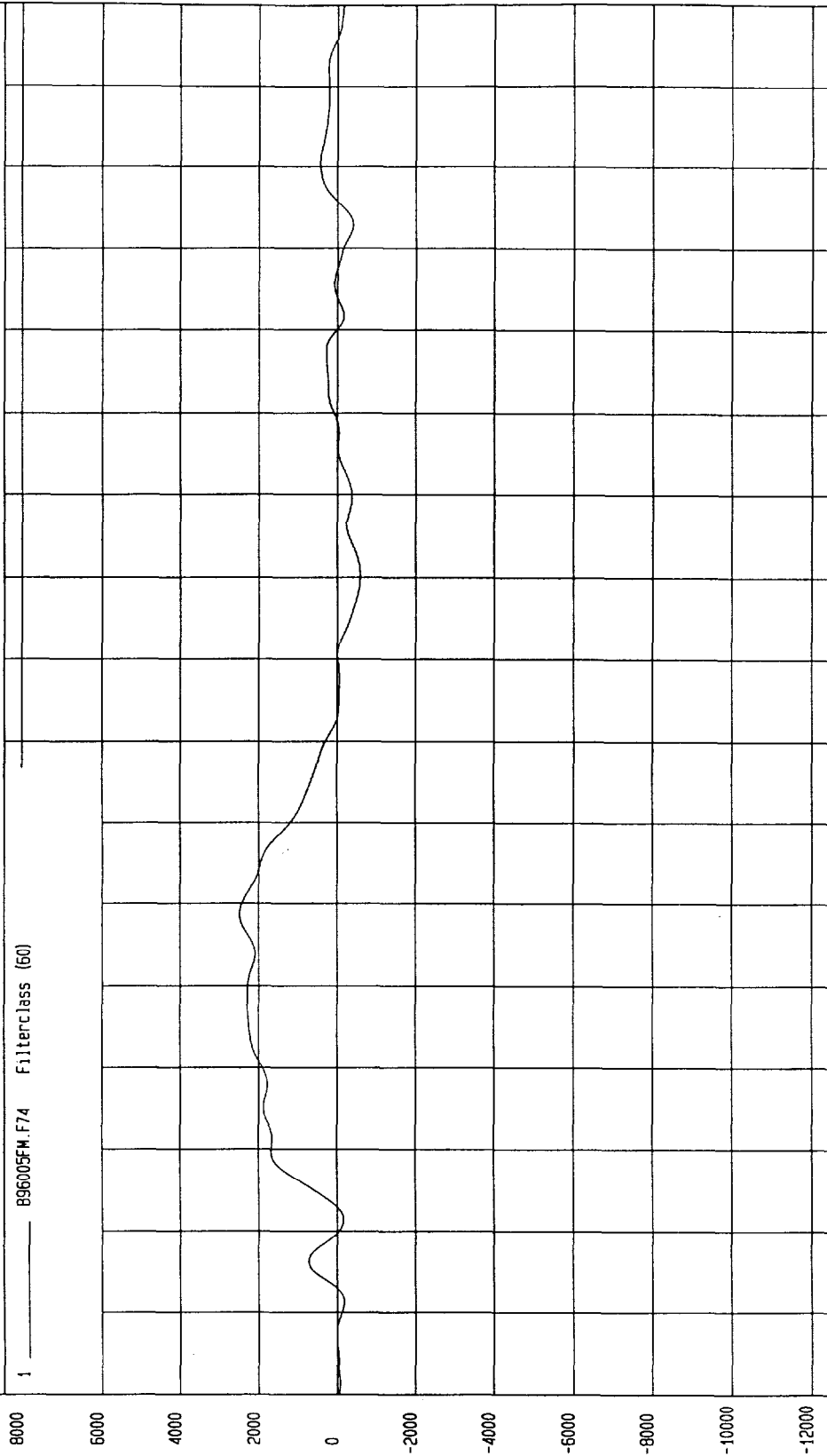
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -591.06 N at 90 msec

Maximum = 2494.38 N at 49 msec

LC #23 FY

1 — B96005FM.F74 Filterclass (60)



MCA Research
06-02-1996 13:21

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

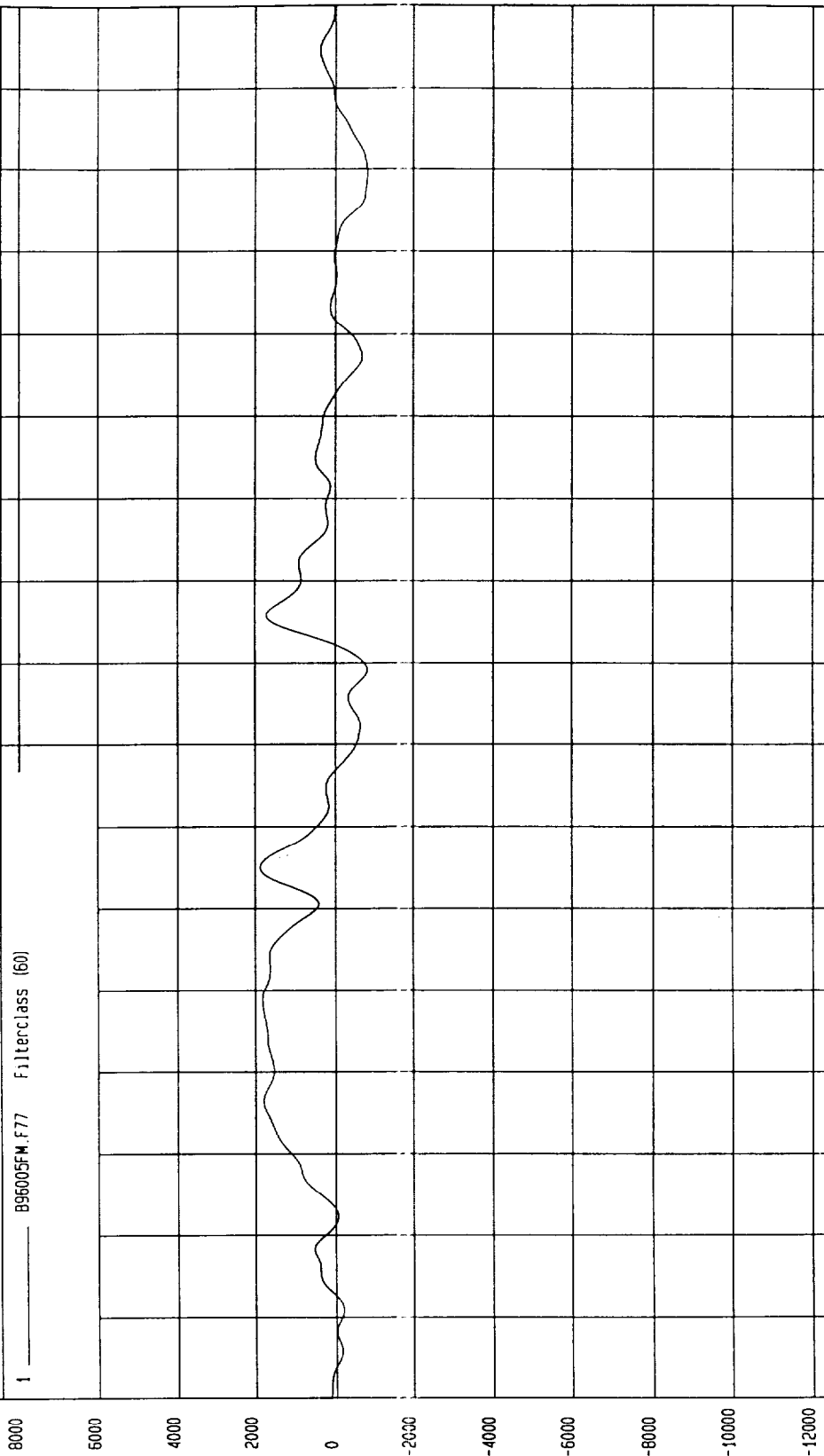
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1875.17 N at 55 msec

Minimum = -834.05 N at 79 msec

LC #24 FY

1 B96005FM.F77 Filterclass (60)



MGA Research
06-02-1998 13:22

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

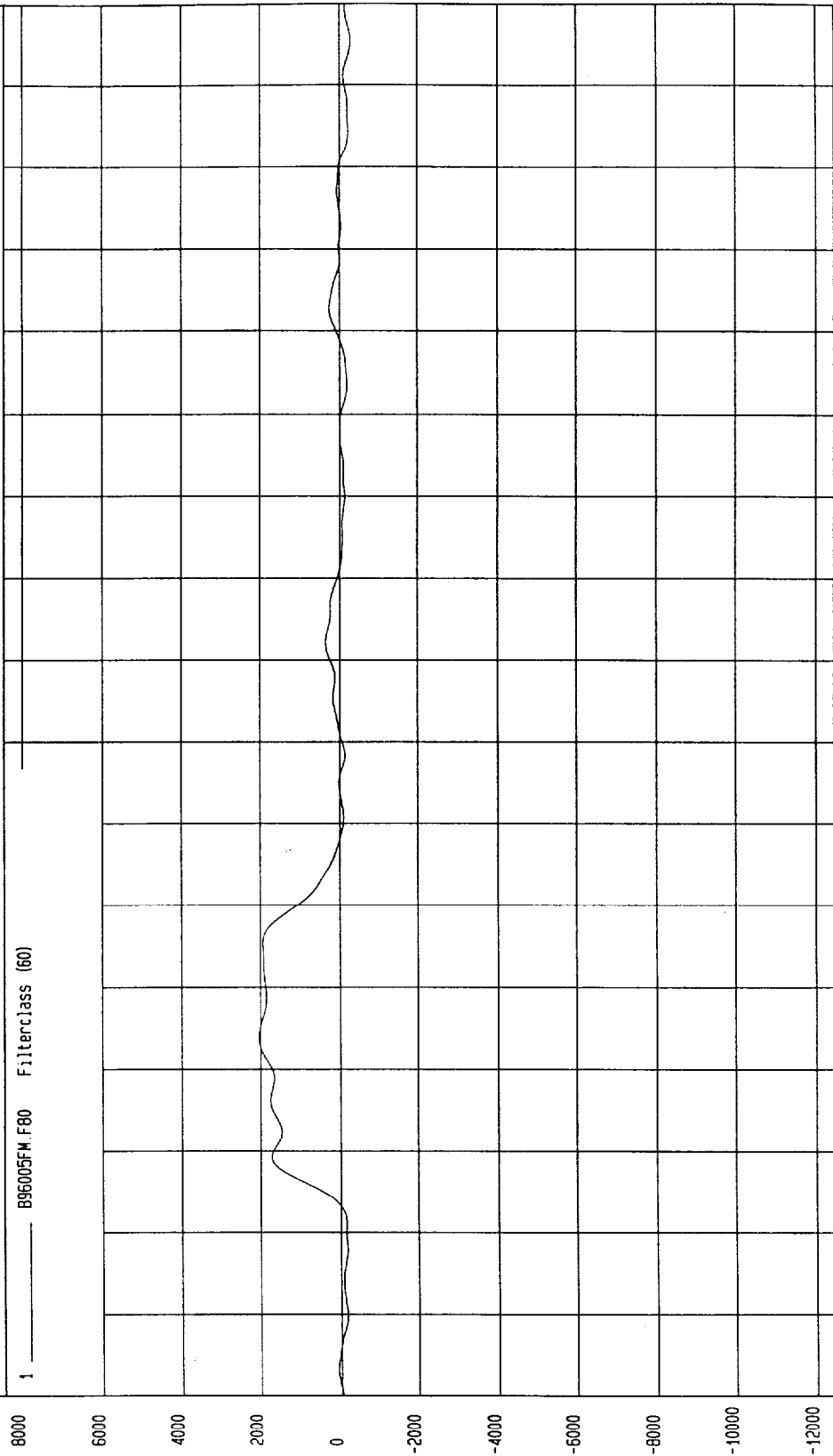
SPEED: 25.8 MPH 41.5 KPH

Maximum = 2040.32 N at 34 msec

Minimum = -276.73 N at 155 msec

LC #25 FY

1 _____ B96005FM.F80 Filterclass (60)



MGA Research
06-02-1998 13:22

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

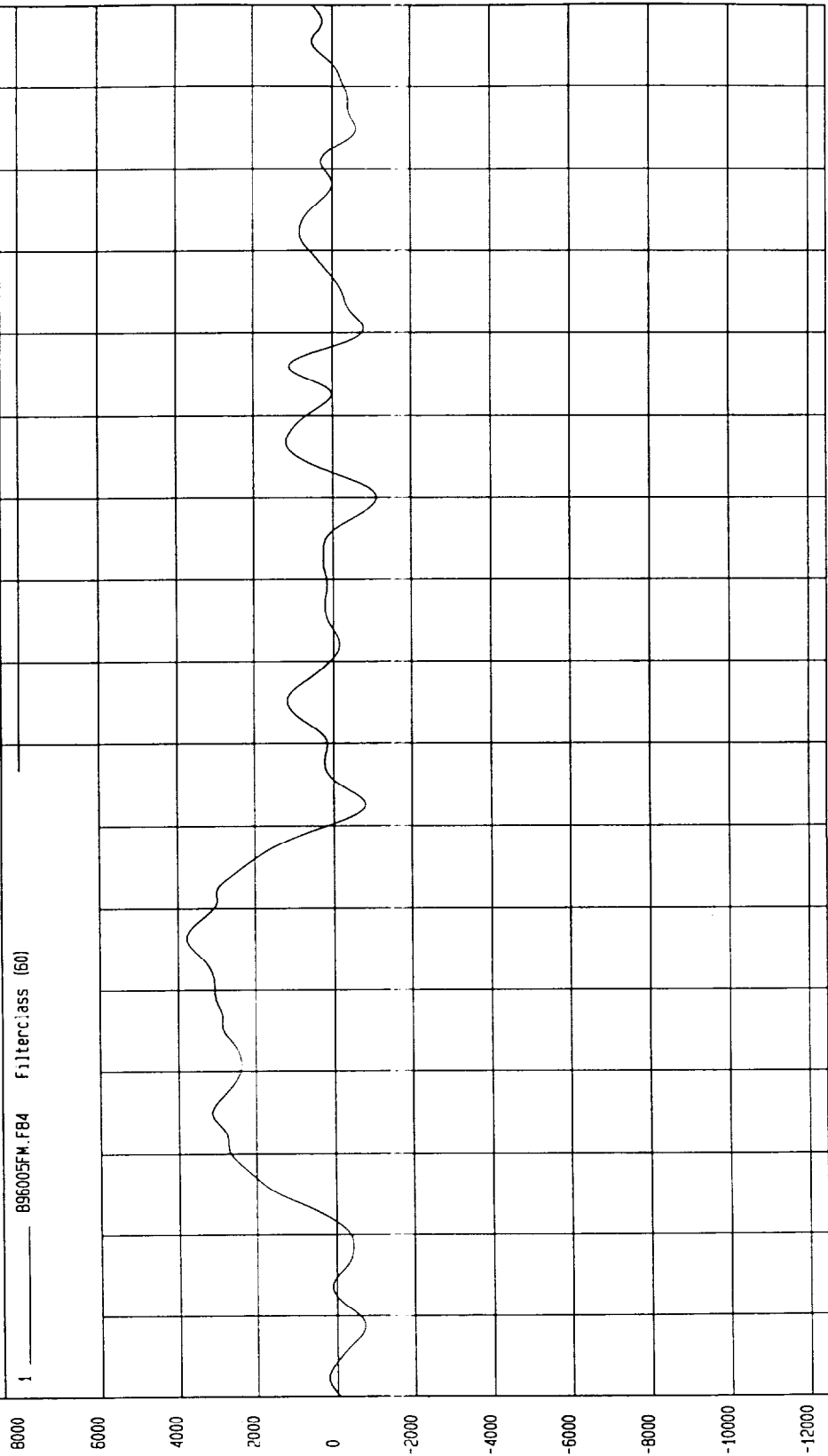
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -1129.75 N at 100 msec

Maximum = 3776.34 N at 46 msec

LC #26 FY

1 _____ B96005FM.FB4 Filterclass (60)



WGA Research
06-02-1998 13:22

TIME (SECONDS)

N

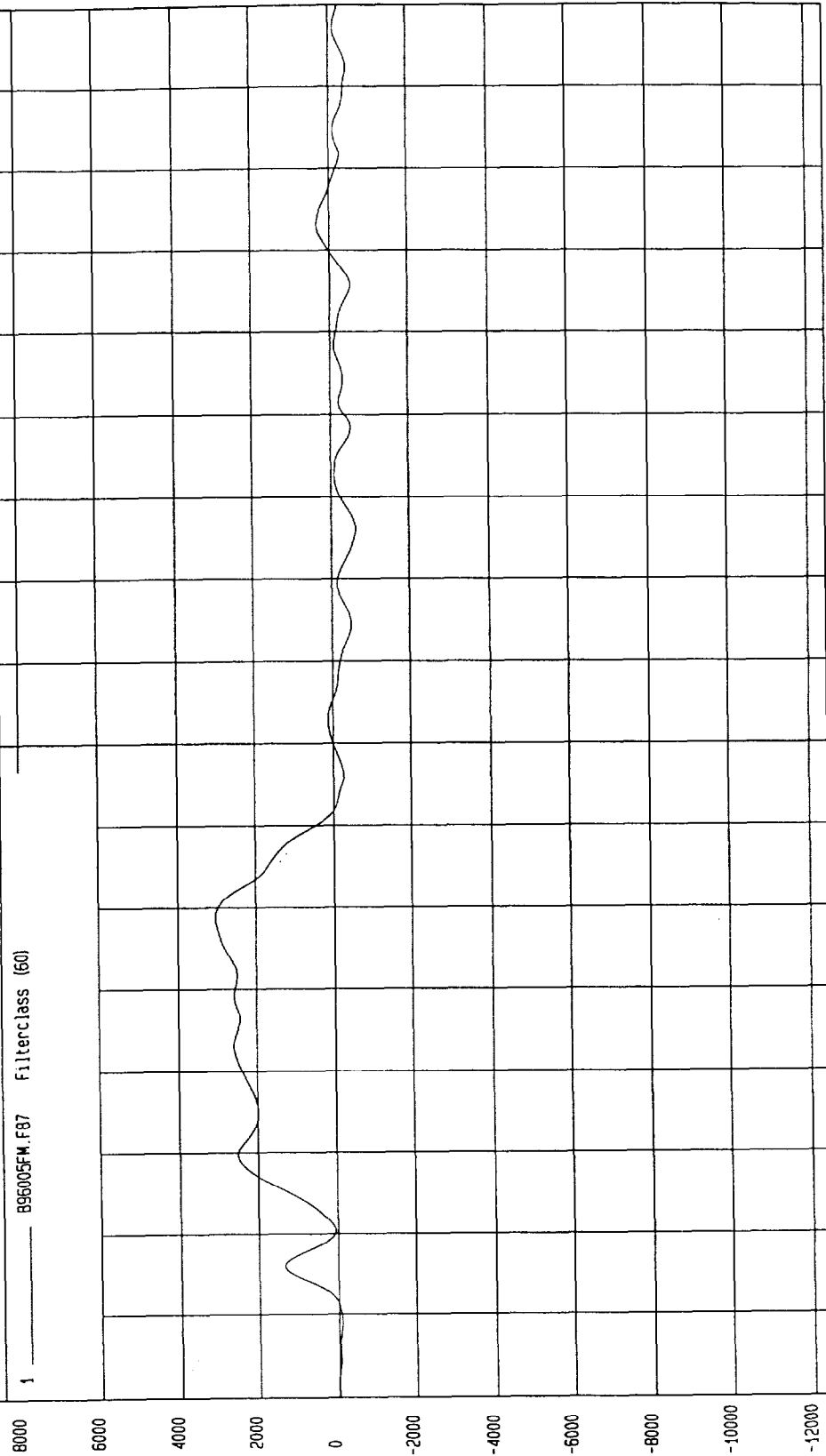
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -632.16 N at 96 msec Maximum = 3046.91 N at 49 msec

LC #27 FY

1 B96005FM.F87 Filterclass (60)



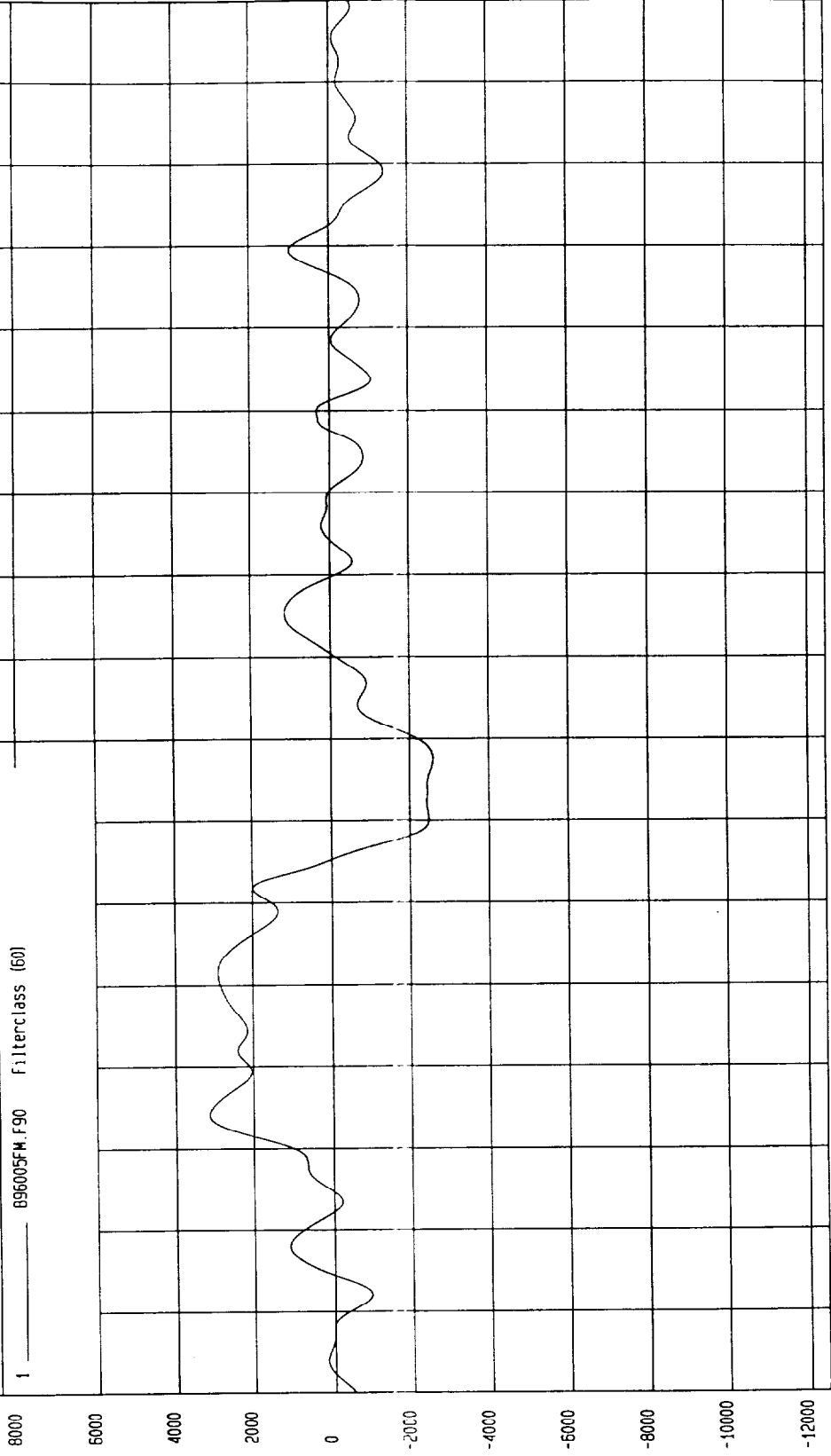
MCA Research
06-02-1998 13:12

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2565.11 N at 68 msec Maximum = 3151.51 N at 24 msec

LC #28 FY



TIME (SECONDS)

WGA Research
06-02-1998 13:12

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 2148.45 N at 46 msec

Minimum = -134.67 N at 62 msec

LC #29 FY

1 _____ B96005FM.F94 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

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02

01

0

-01

TIME (SECONDS)

MGA Research
06-02-1998 13:13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1174.26 N at 104 msec Maximum = 3165.76 N at 47 msec

LC #30 FY

1 _____ 856005FM.F97 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15

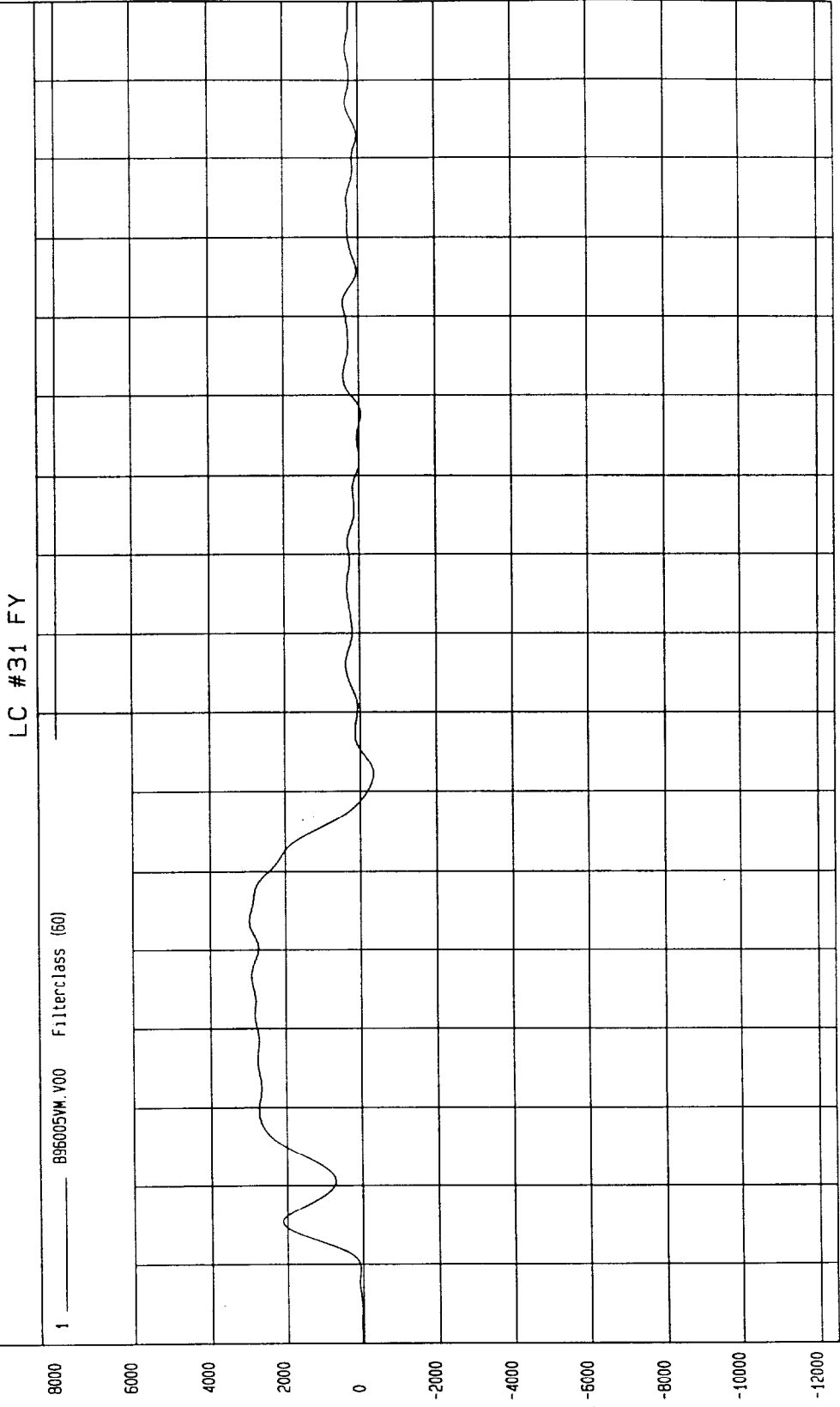
TIME (SECONDS)

MGA Research
06-02-1998 13:23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -357.2 N at 62 msec Maximum = 2964.85 N at 44 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

NCA Research
06-02-1998 13:12

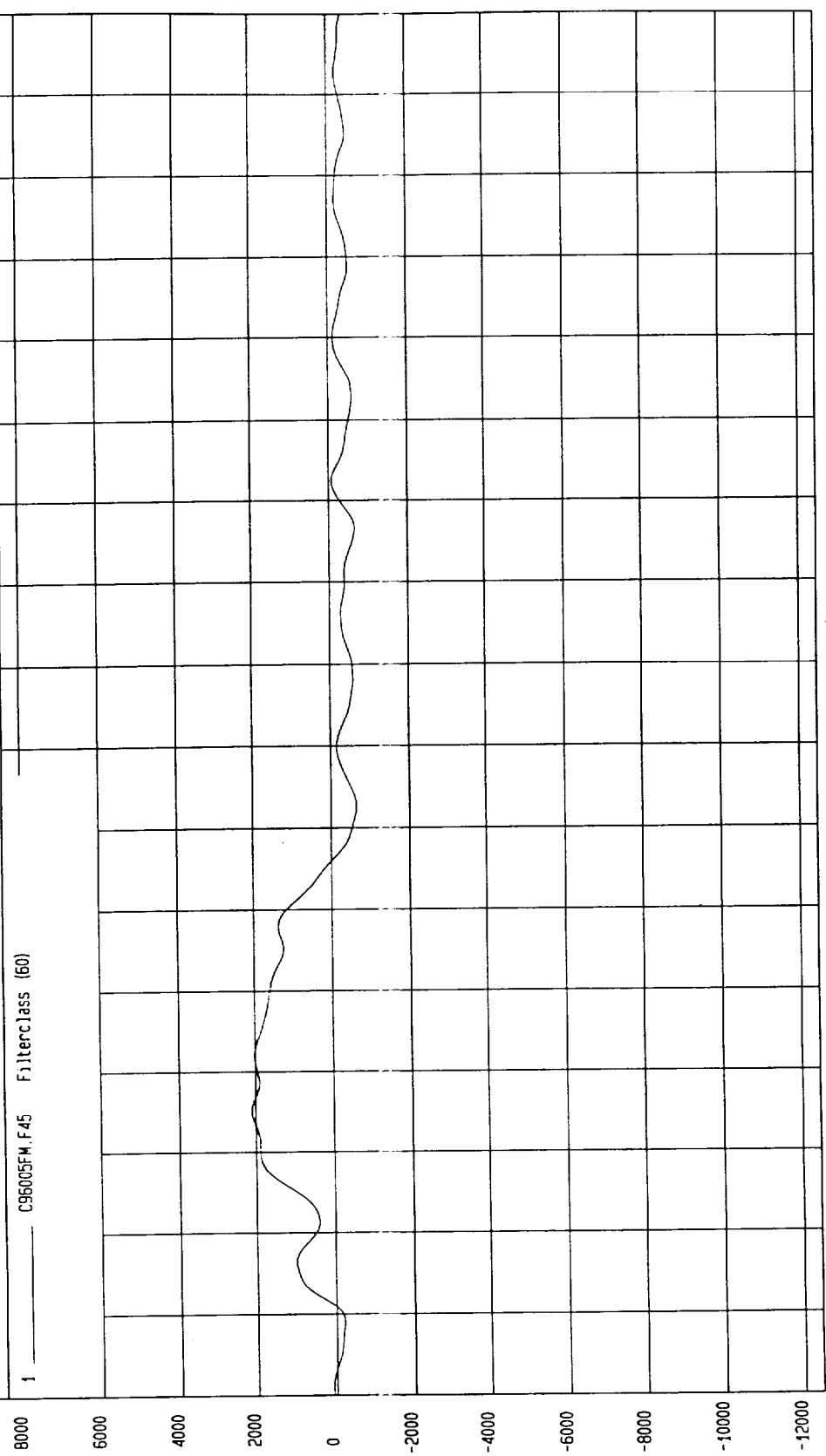
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -679.8 N at 97 msec Maximum = 2097.99 N at 25 msec

LC #32 FY

1 C96005FM.F45 Filterclass (60)



MCA Research
06-02-1998 13.52

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1740.89 N at 37 msec

Minimum = -376.52 N at 62 msec

LC #33 FY

1 _____ C96005FM.F48 FilterClass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

.15
.14
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.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01

TIME (seconds)

MCA Research
06-02-1998 13:52

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

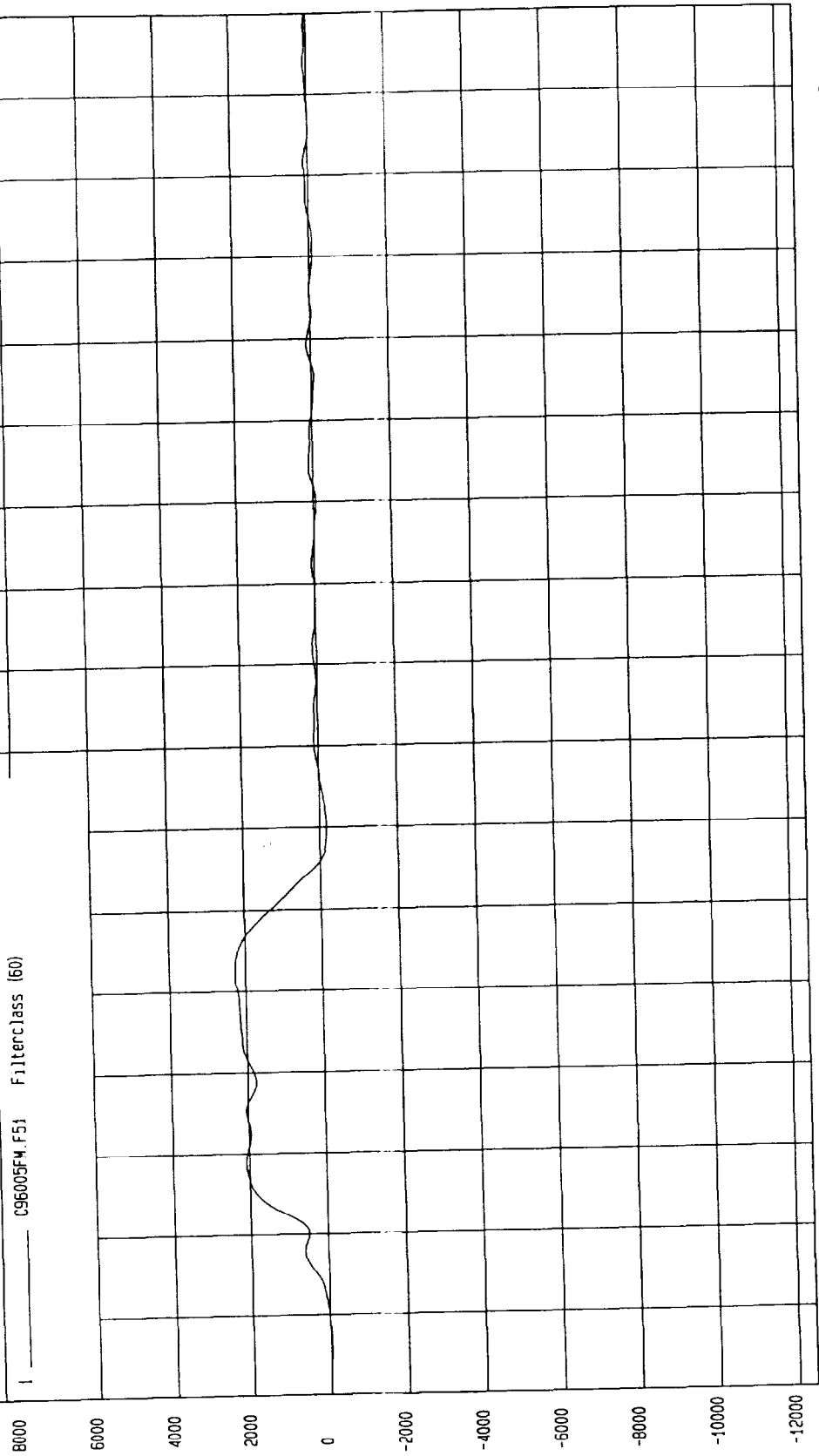
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 2265.4 N at 42 msec

Minimum = -177.76 N at 60 msec

LC #34 FY

1 _____ C96005FW F51 Filterclass (60)

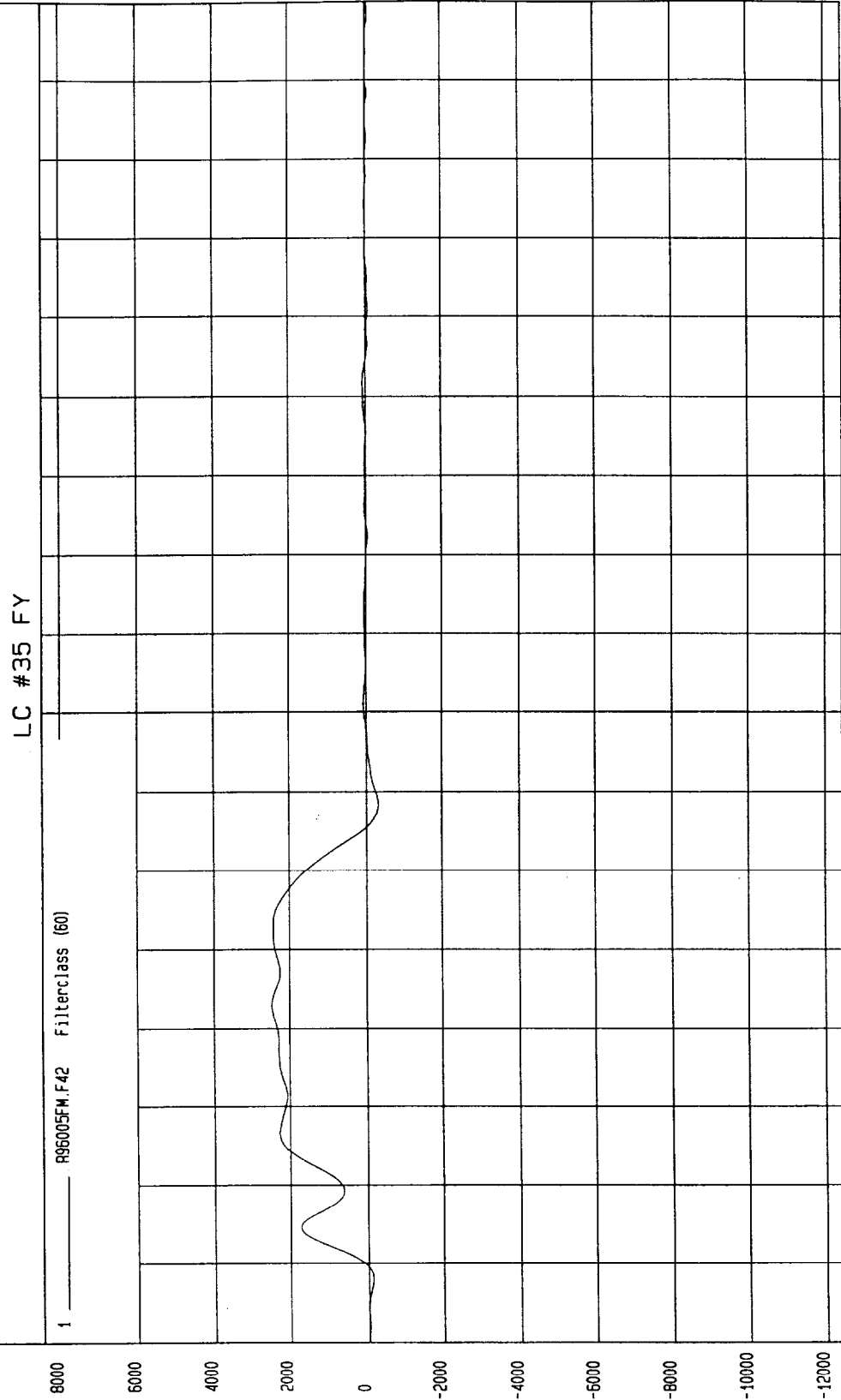


MGA Research
06-02-1998 13:52

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -314.88 N at 58 msec Maximum = 2478.58 N at 33 msec



TIME (SECONDS)

MGA Research
06-02-1998 13: 40

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

Maximum = 2428.03 N at 26 msec

Minimum = -257.44 N at 58 msec

LC #36 FY

1 R96005FM.F45 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

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14

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01

0

-01

TIME (SECONDS)

MGA Research
05-02-1998 13:40

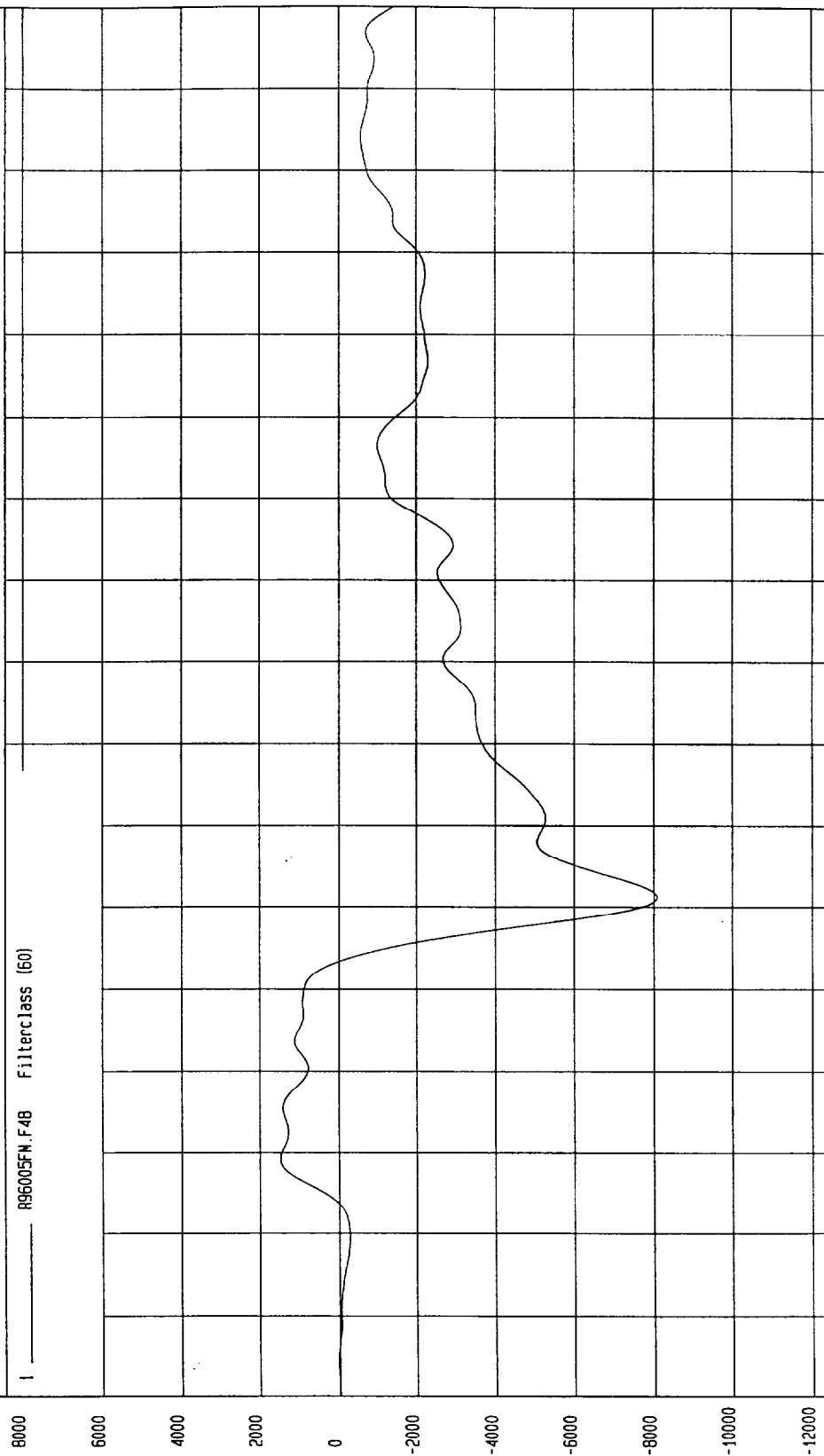
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8084.4 N at 51 msec Maximum = 1473.54 N at 19 msec

LC #37 FY

1 _____ R96005FM.F48 Filterclass (60)



MCA Research
06-02-1998 13:40

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

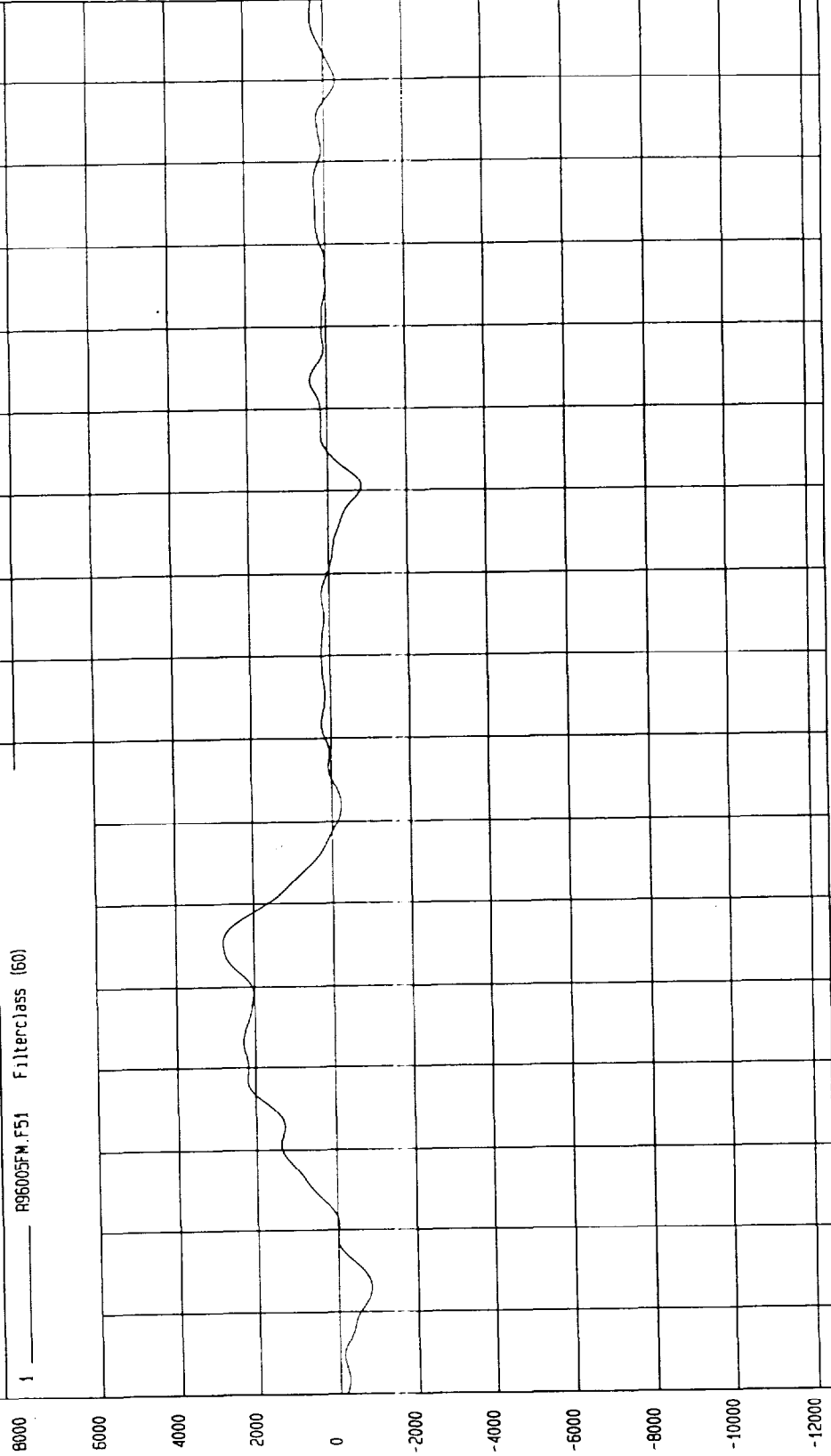
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 2789.54 N at 45 msec

Minimum = -875.81 N at 101 msec

LC #38 FY

1 _____ R96005FM.F51 Filterclass (60)



MCA Research
06-02-1998 13:41

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -411.79 N at 61 msec Maximum = 3074.48 N at 42 msec

LC #39 FY

1 _____ R96005FM F54 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MGA Research
06-02-1998 13: 41

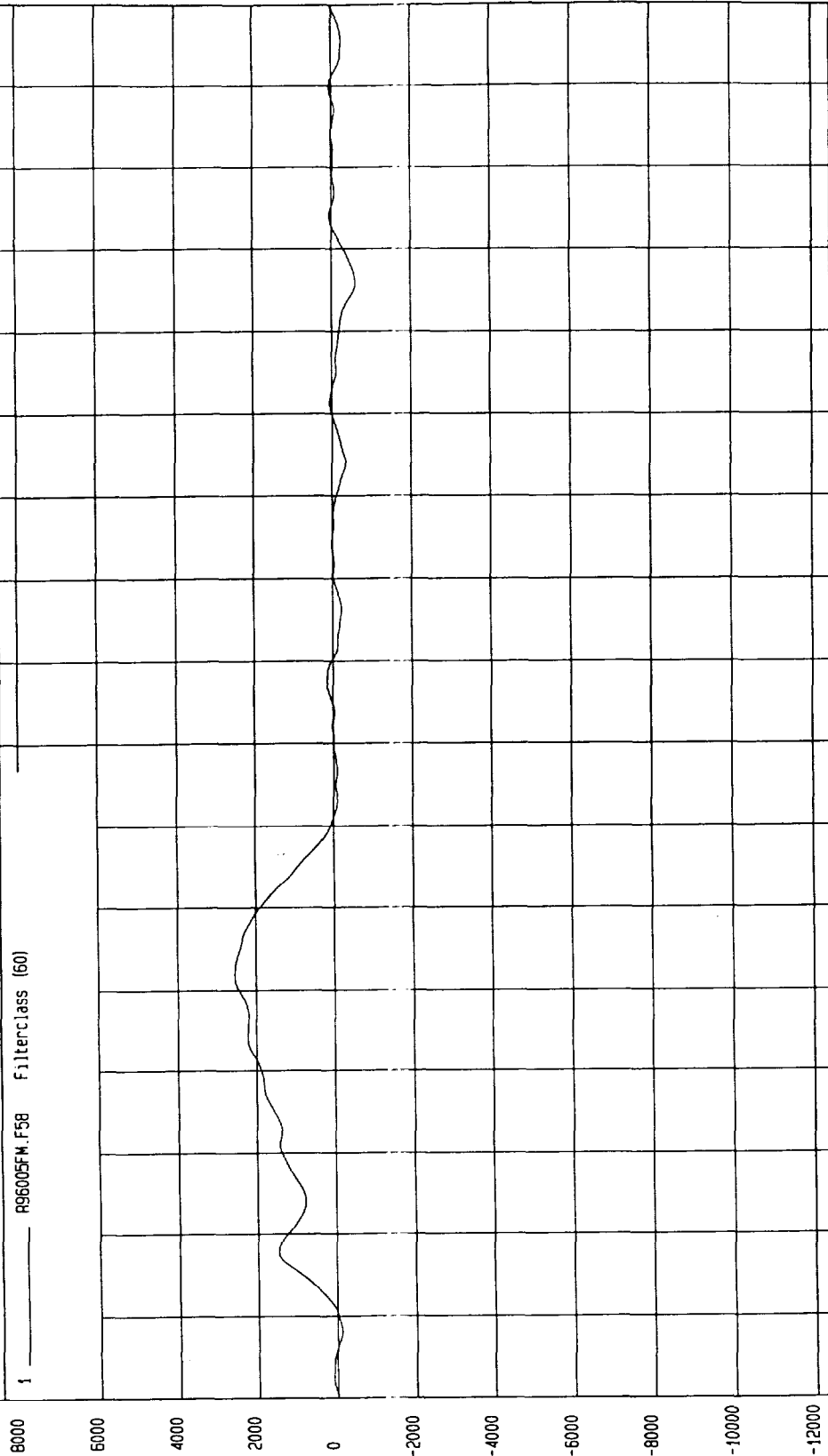
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -616.81 N at 126 msec Maximum = 2542.22 N at 42 msec

LC #40 FY

1 _____ R96005FM.F58 Filterclass (60)



TIME (SECONDS)

MCA Research
06-02-1998 13:41

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

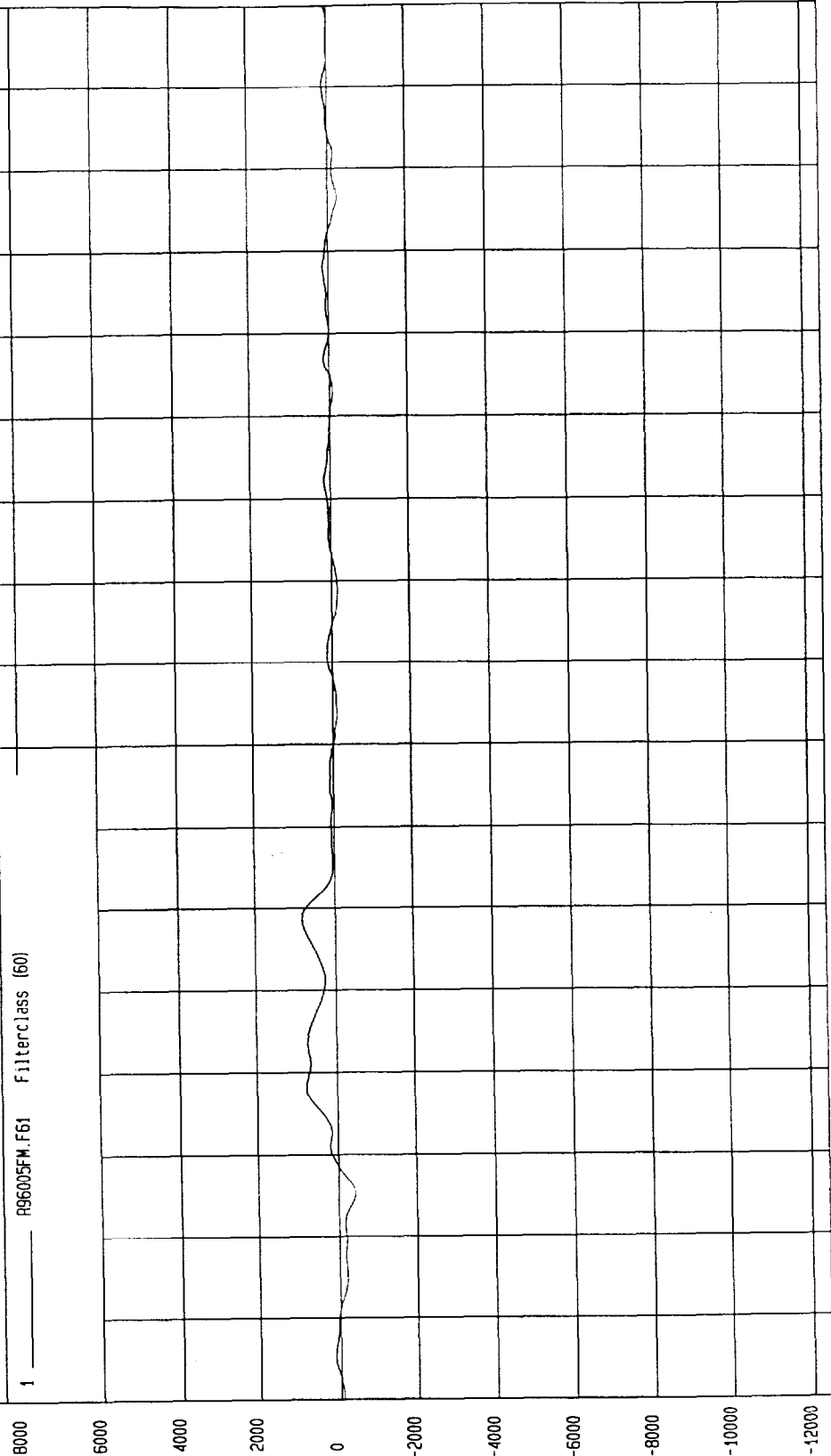
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 855.31 N at 49 msec

Minimum = -447.81 N at 15 msec

LC #41 FY

1 _____ R96005FM.F61 Filterclass (60)



MGA Research
06-02-1998 13:42

TIME (SECONDS)

N

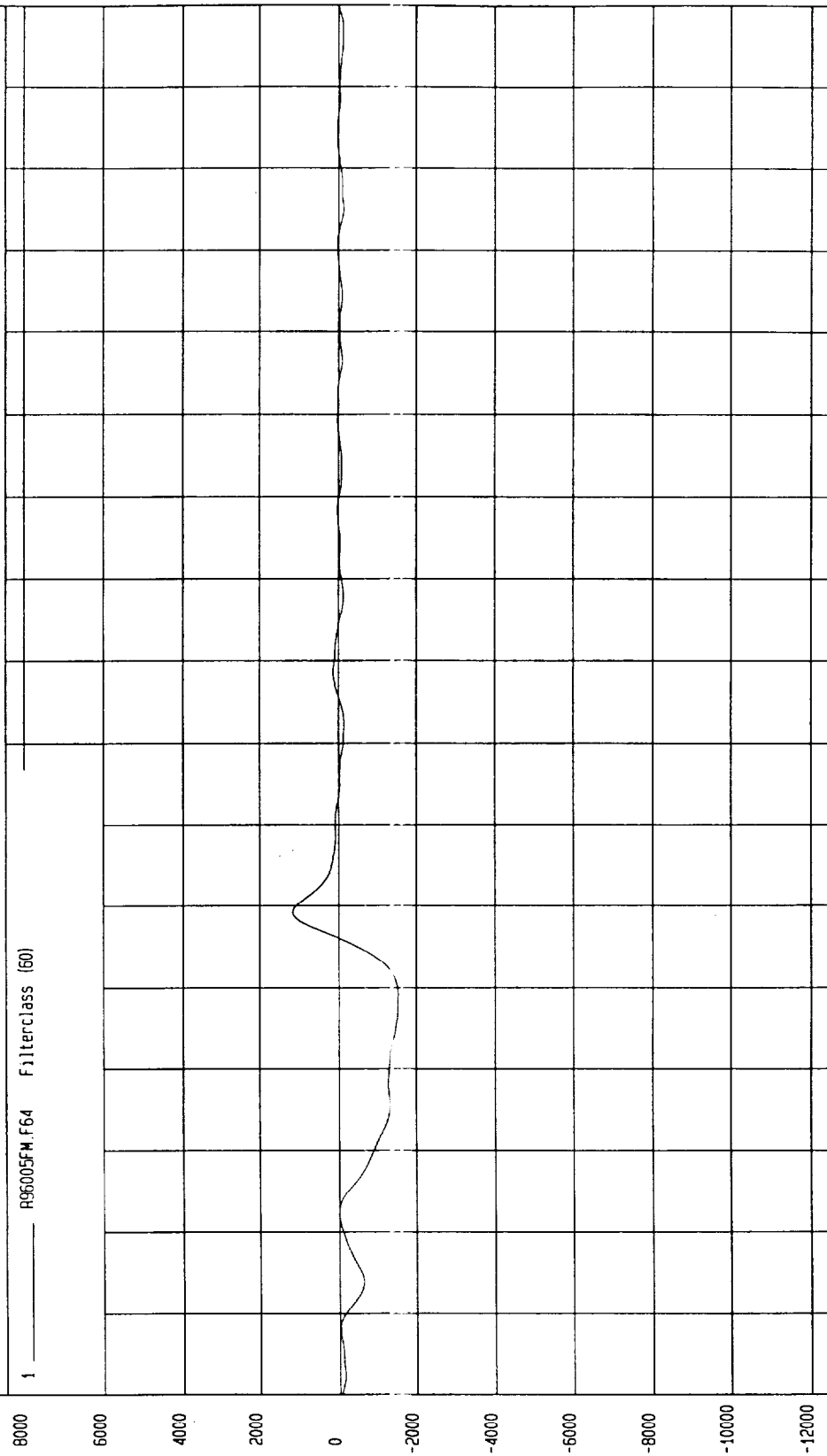
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1542.56 N at 39 msec Maximum = 1172.32 N at 49 msec

LC #42 FY

1 R96005FM.F64 Filterclass (60)



MSA Research
06-02-1998 13:42

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1593.88 N at 48 msec

Minimum = -2112.55 N at 24 msec

LC #43 FY

1 _____ P95005FM.F67 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

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07

06

05

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03

02

01

0

-01

TIME (SECONDS)

MCA Research
06-02-1998 13:42

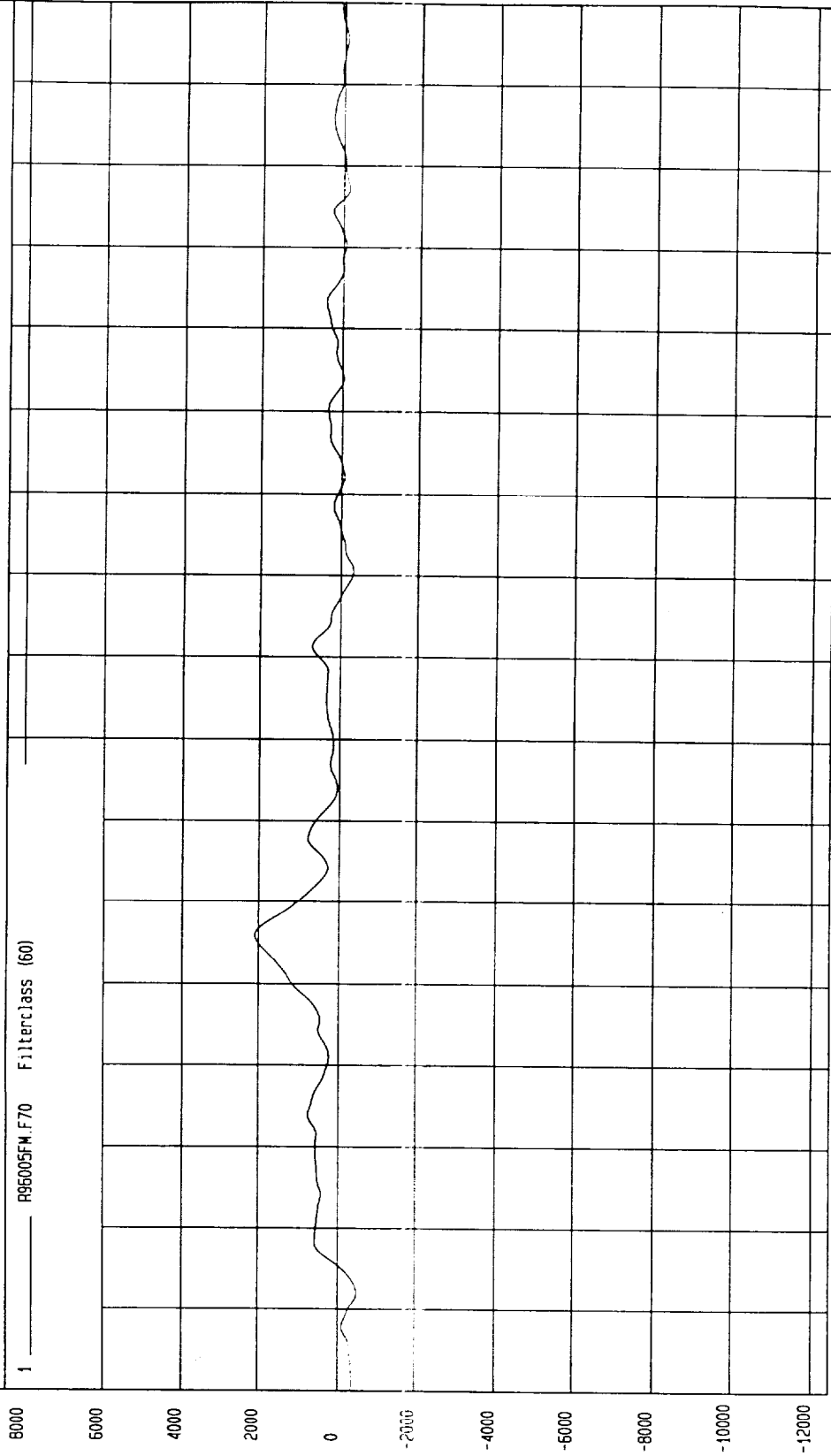
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -511.12 N at 2 msec Maximum = 2095.81 N at 46 msec

LC #44 FY

1 R96005FM.F70 Filterclass (60)

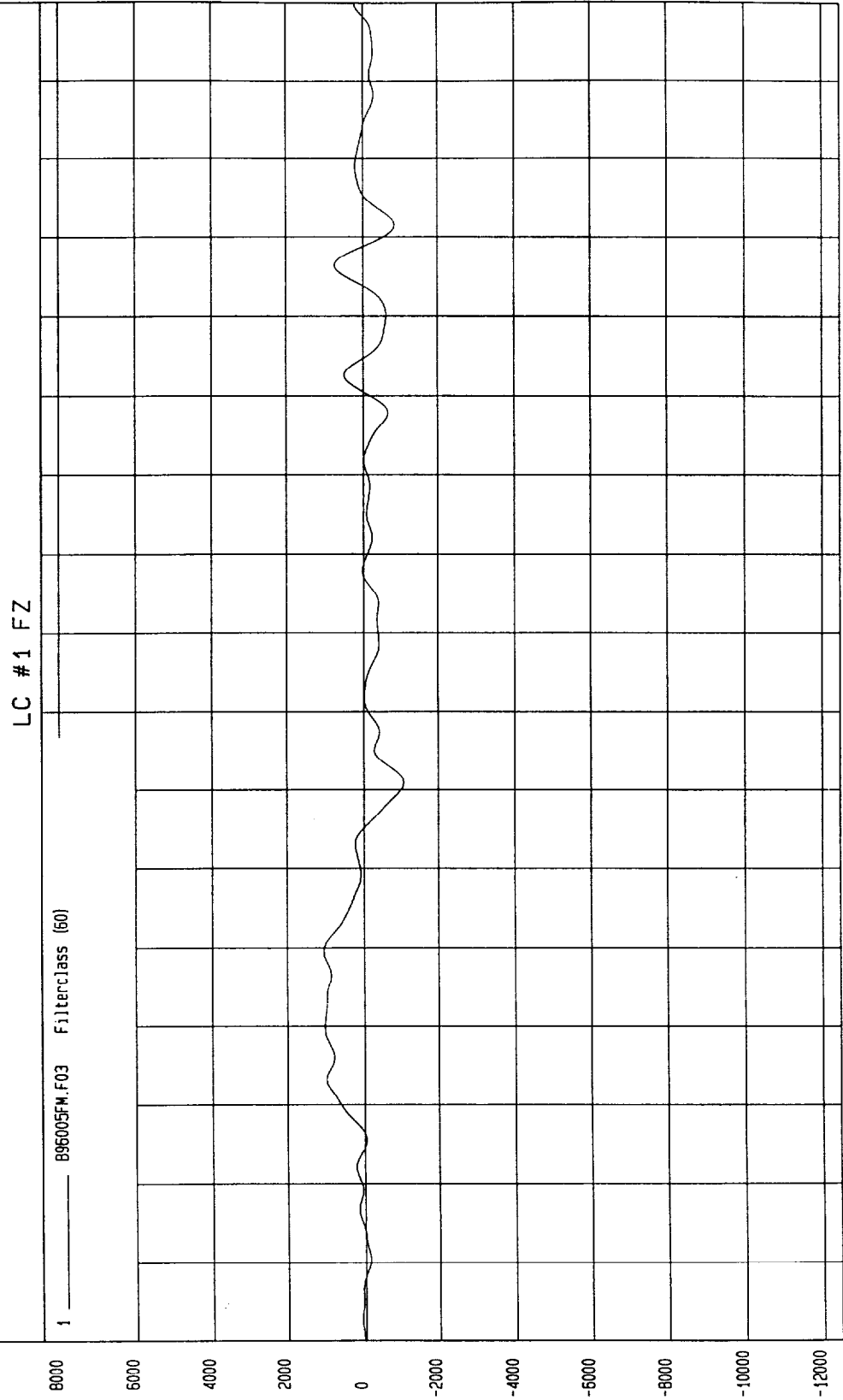


MCA Research
06-02-1998 13:43

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1078.23 N at 61 msec Maximum = 1054.56 N at 40 msec



TIME (SECONDS)

MGA Research
06-02-1998 13:13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -910.14 N at 14 msec Maximum = 2738.53 N at 55 msec

LC #2 FZ

1 896005FM.F06 Filterclass (50)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-02-1998 13:14

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

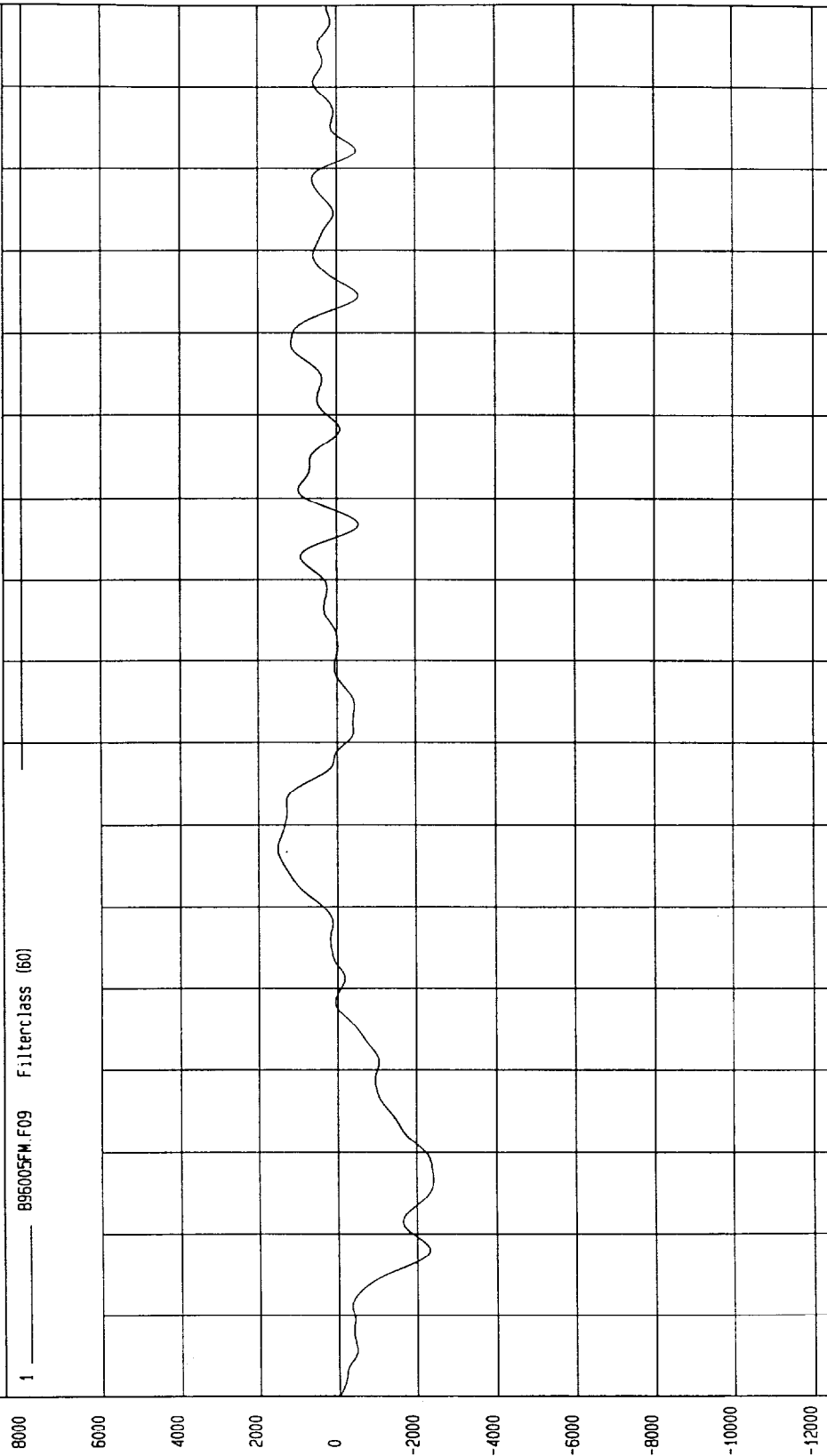
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2400.97 N at 17 msec

Maximum = 1513.32 N at 57 msec

LC #3 FZ

1 _____ 895005FM.F09 Filterclass (60)



MGA Research
06-02-1998 13:14

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

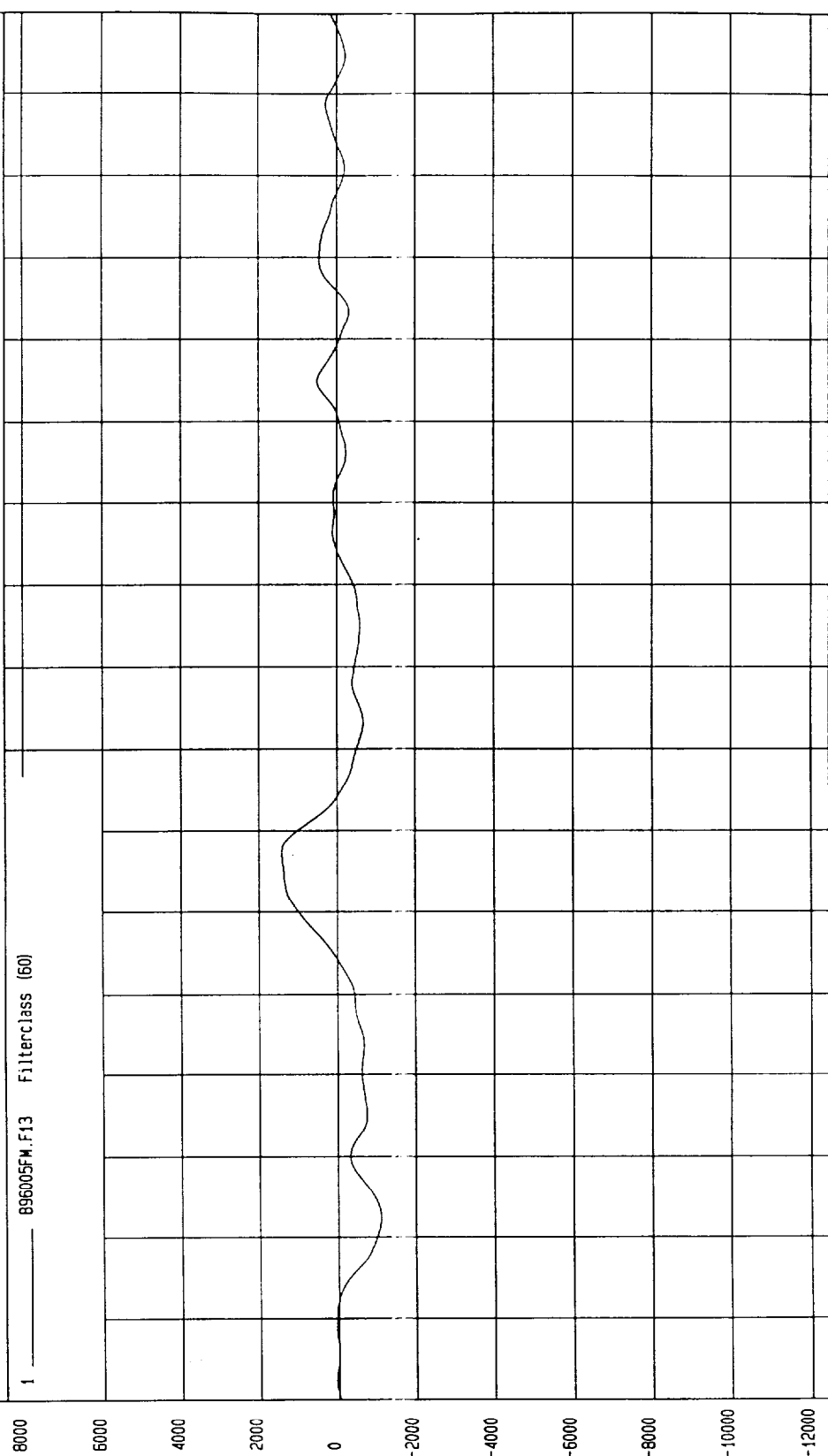
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1424.3 N at 57 msec

Minimum = -1120.53 N at 12 msec

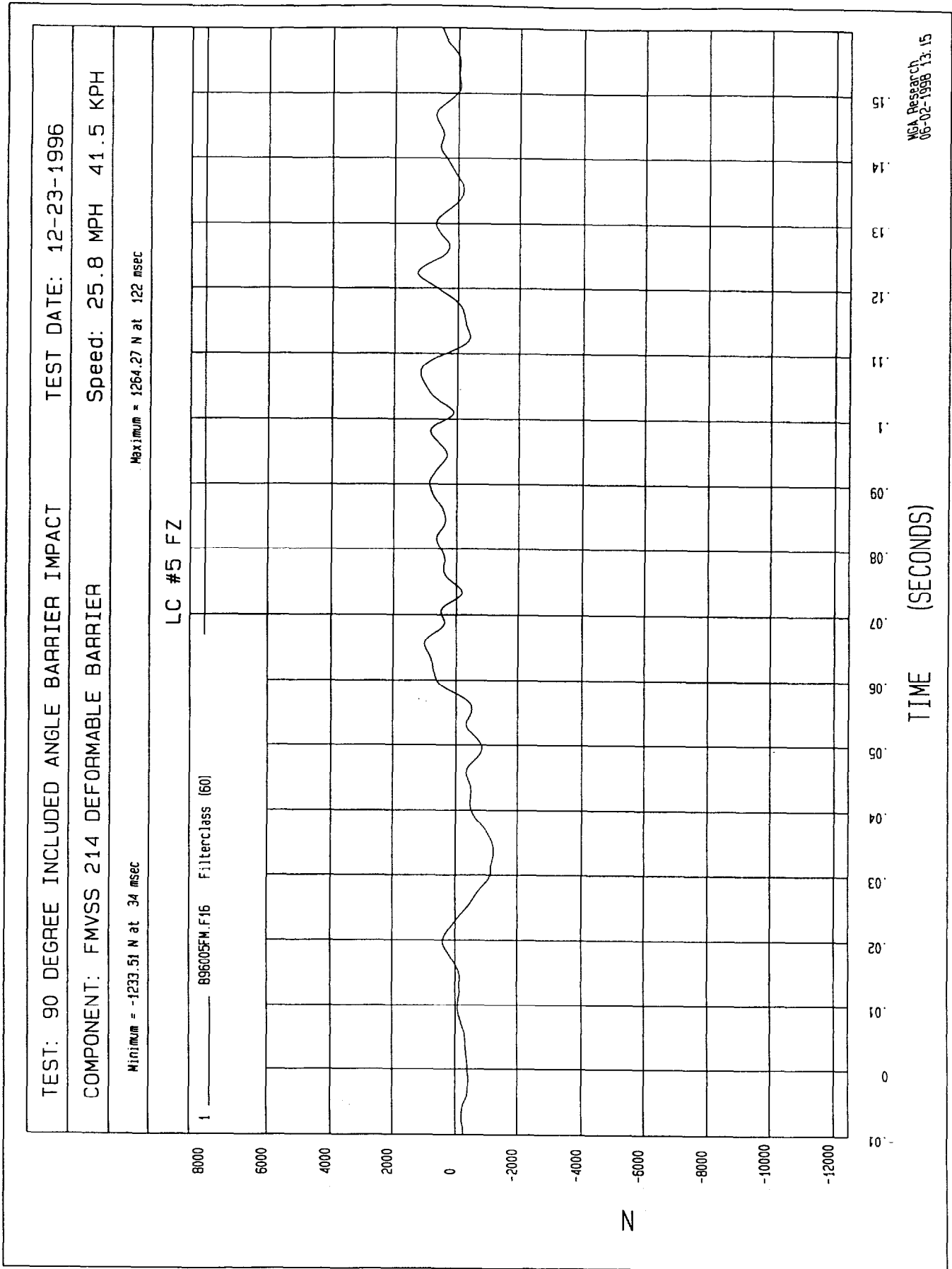
LC #4 FZ

1 896005FM.F13 Filterclass (60)

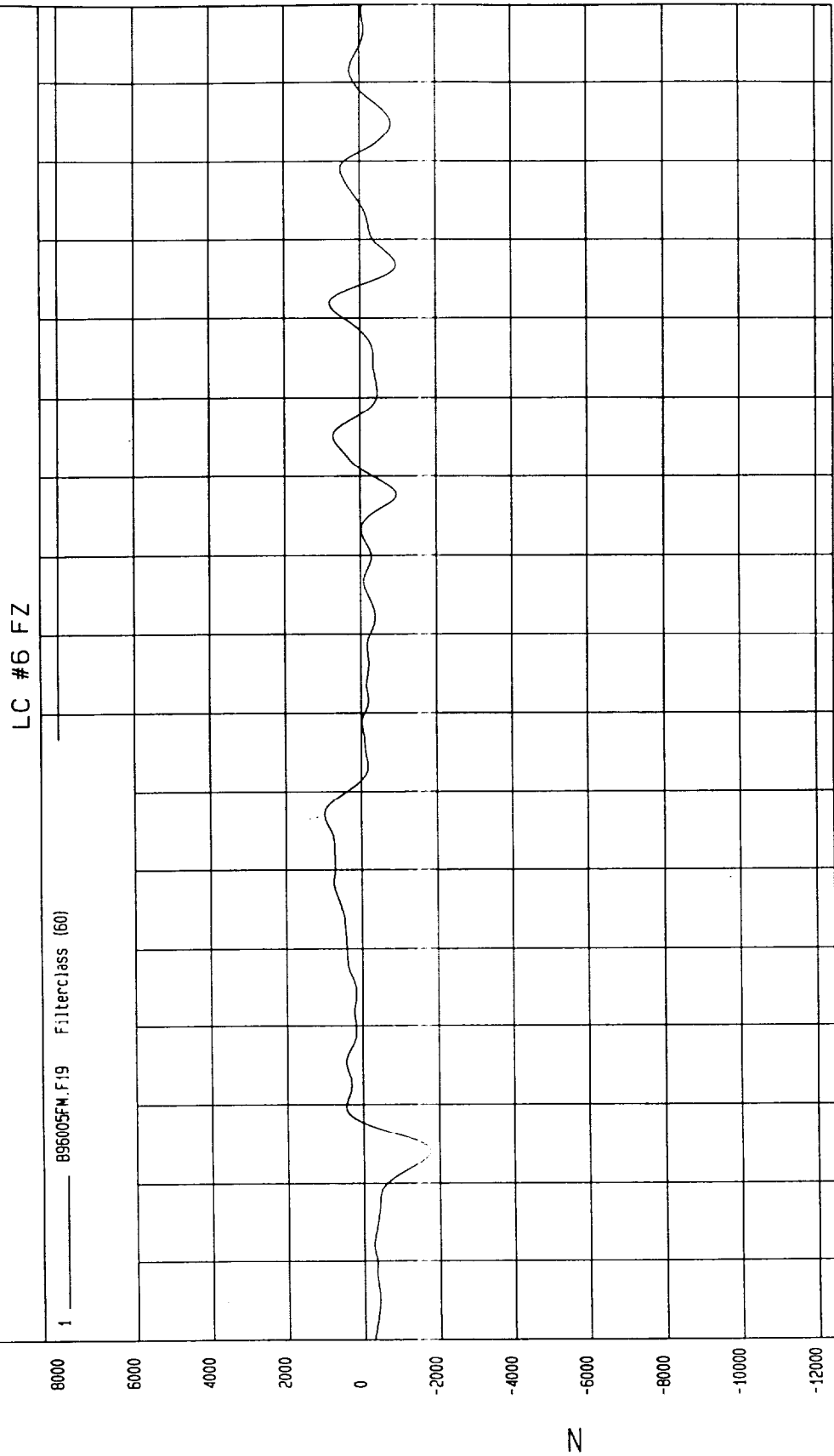


MCA Research
06-02-1998 13:14

TIME (SECONDS)



TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -1765.47 N at 14 msec	Maximum = 984.71 N at 57 msec



TIME (SECONDS)

MGA Research
06-02-1998 13:15

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

Maximum = 1393.48 N at 116 msec

Minimum = -3179.1 N at 8 msec

LC #7 FZ

1 _____ B56005FM.F23 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MCA Research
06-02-1998 13.15

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

Maximum = 865.79 N at 59 msec

Minimum = -1578.16 N at 24 msec

LC #8 FZ

1 _____ 895005FM F26 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

TIME (SECONDS)

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

WGA Research
06-02-1998 13.16

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

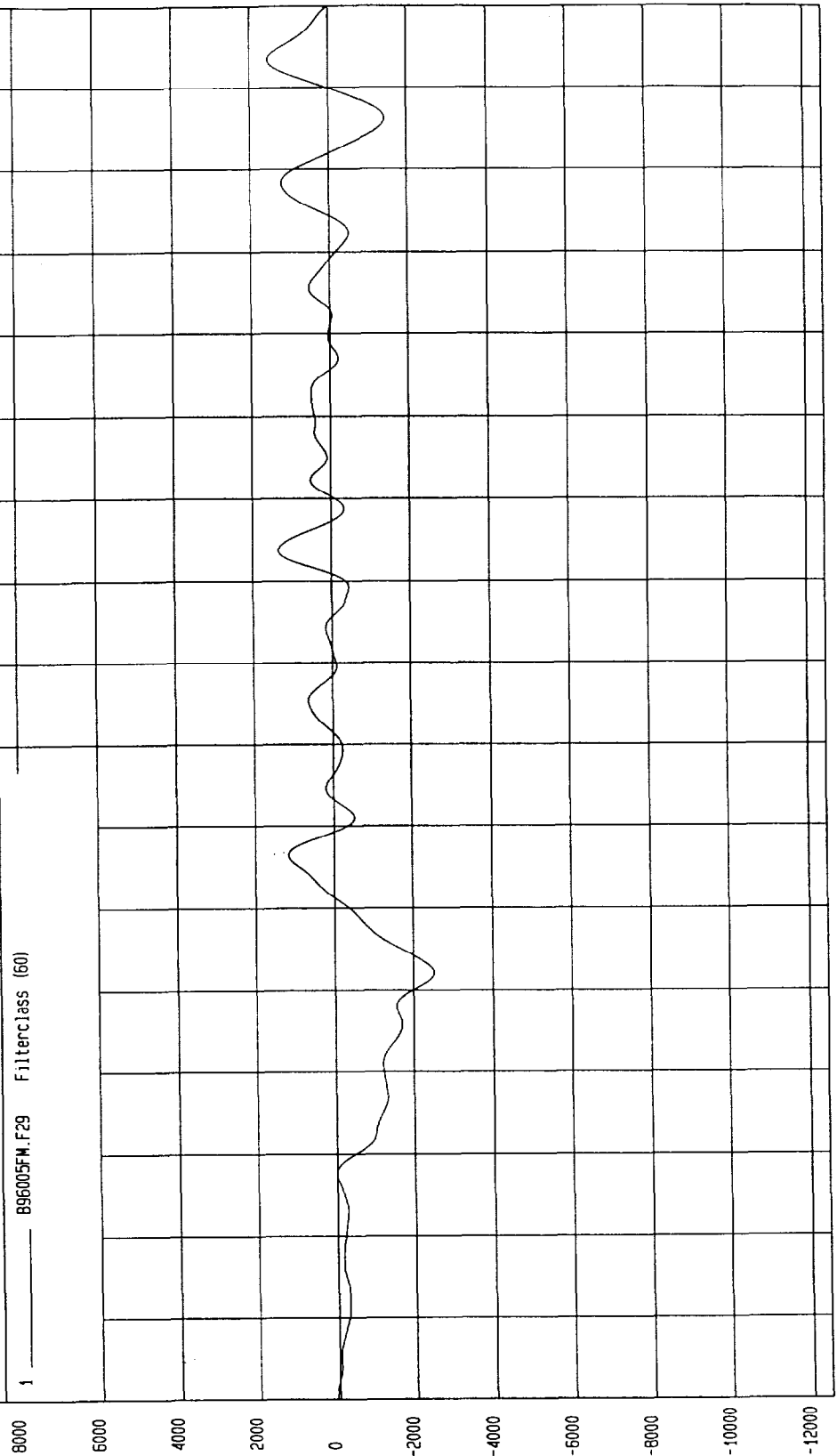
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -2520.23 N at 42 msec

Maximum = 1525.1 N at 153 msec

LC #9 FZ

1 B96005FM.F29 Filterclass (50)



MGA Research
06-02-1998 13.16

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1239.37 N at 19 msec

Minimum = -738.04 N at 13 msec

LC #10 FZ

1 _____ B96005FM.F33 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

MCA Research
06-02-1998 13:16

TIME (SECONDS)

0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 1.0 11.0 12.0 13.0 14.0 15.0

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1971.05 N at 15 msec Maximum = 1378.59 N at 103 msec

LC #11 FZ

1 896005FM.F36 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-10

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

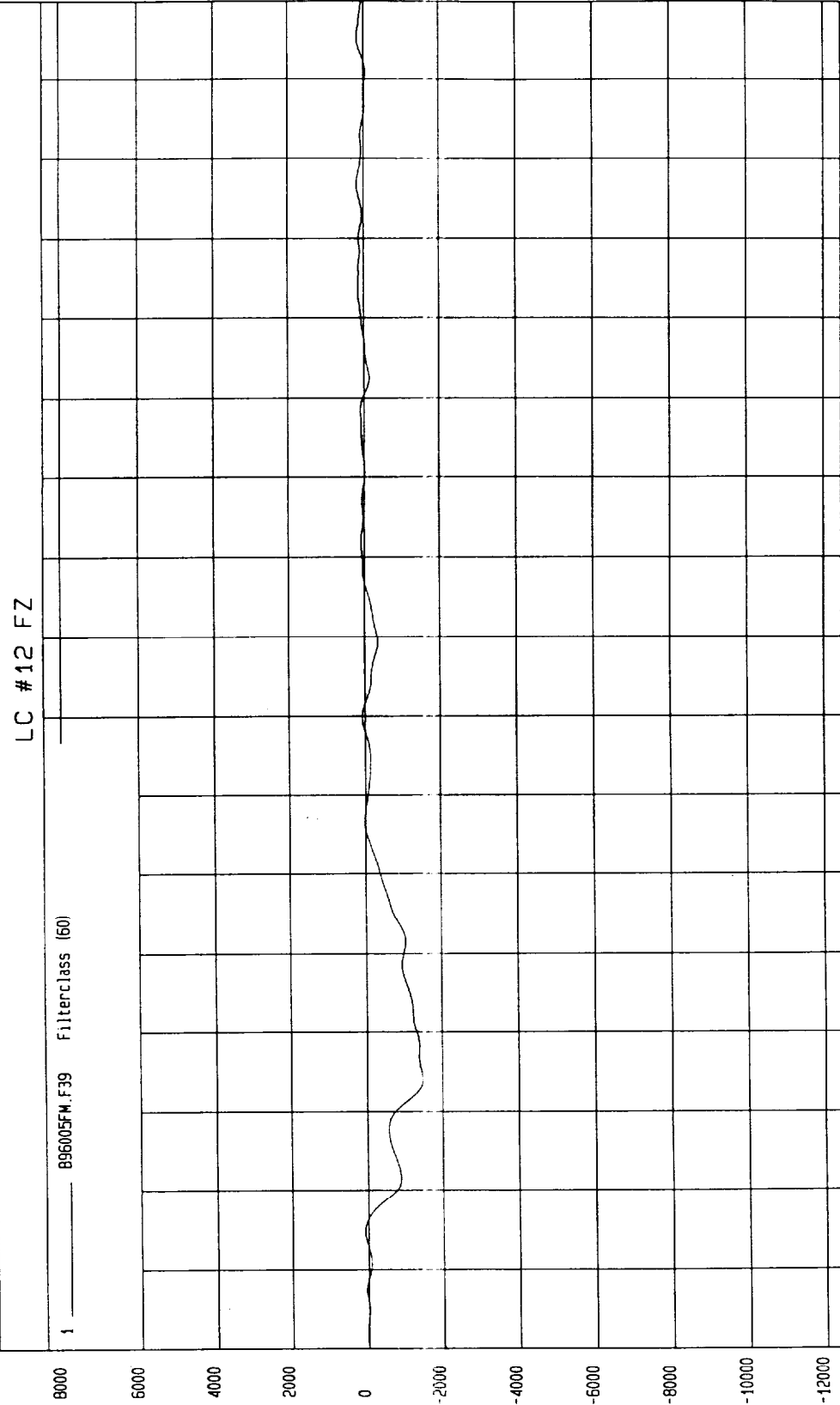
TIME (SECONDS)

MGA Research
06-02-1998 13.17

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1501.56 N at 24 msec Maximum = 185.44 N at 137 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

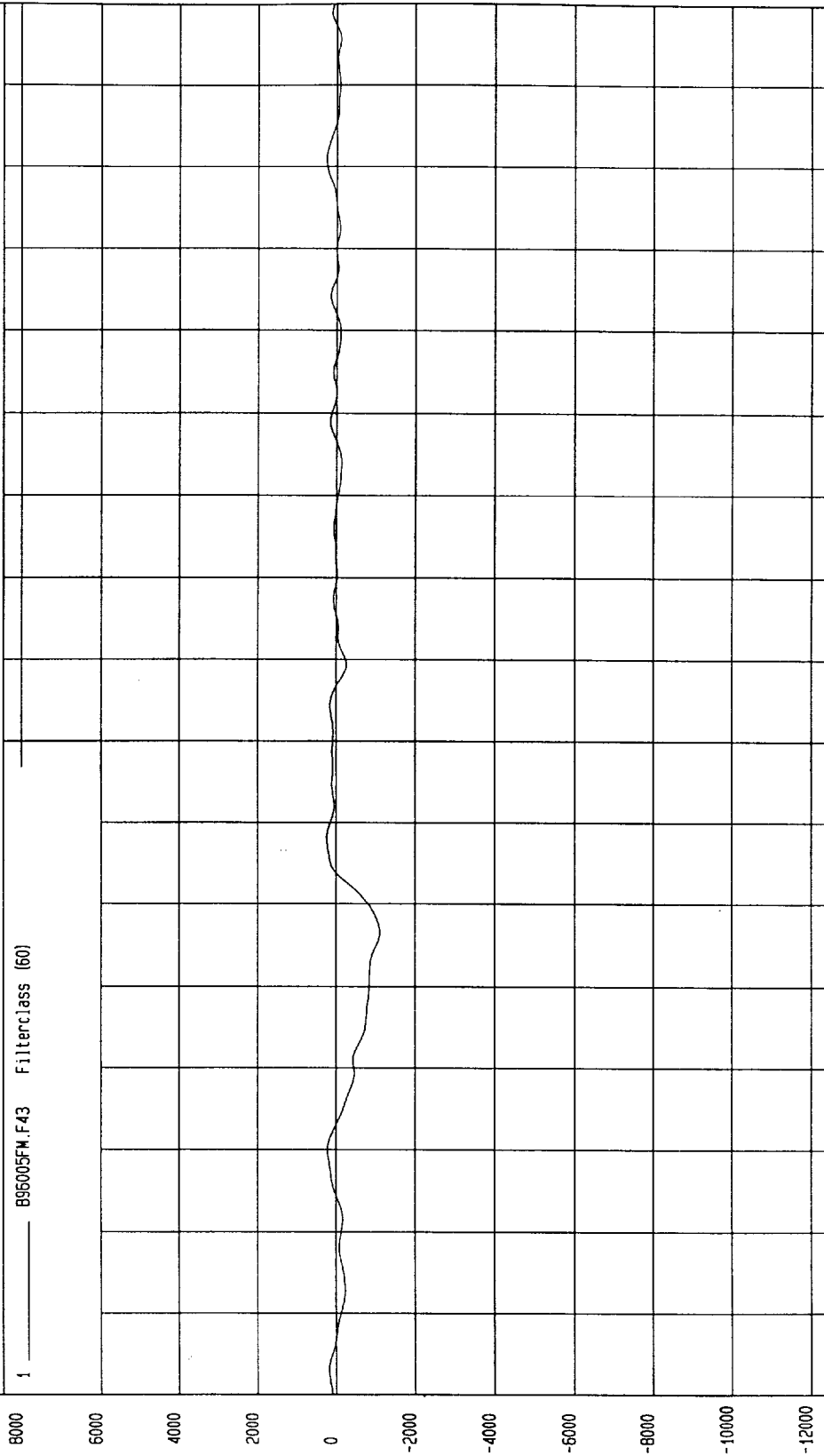
MGA Research
06-02-1998 13:17

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1122.48 N at 47 msec Maximum = 252.16 N at 189 msec

LC #13 FZ

1 _____ B95005FM.F43 Filterclass (60)



NSA Research
06-02-1996 13.17

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

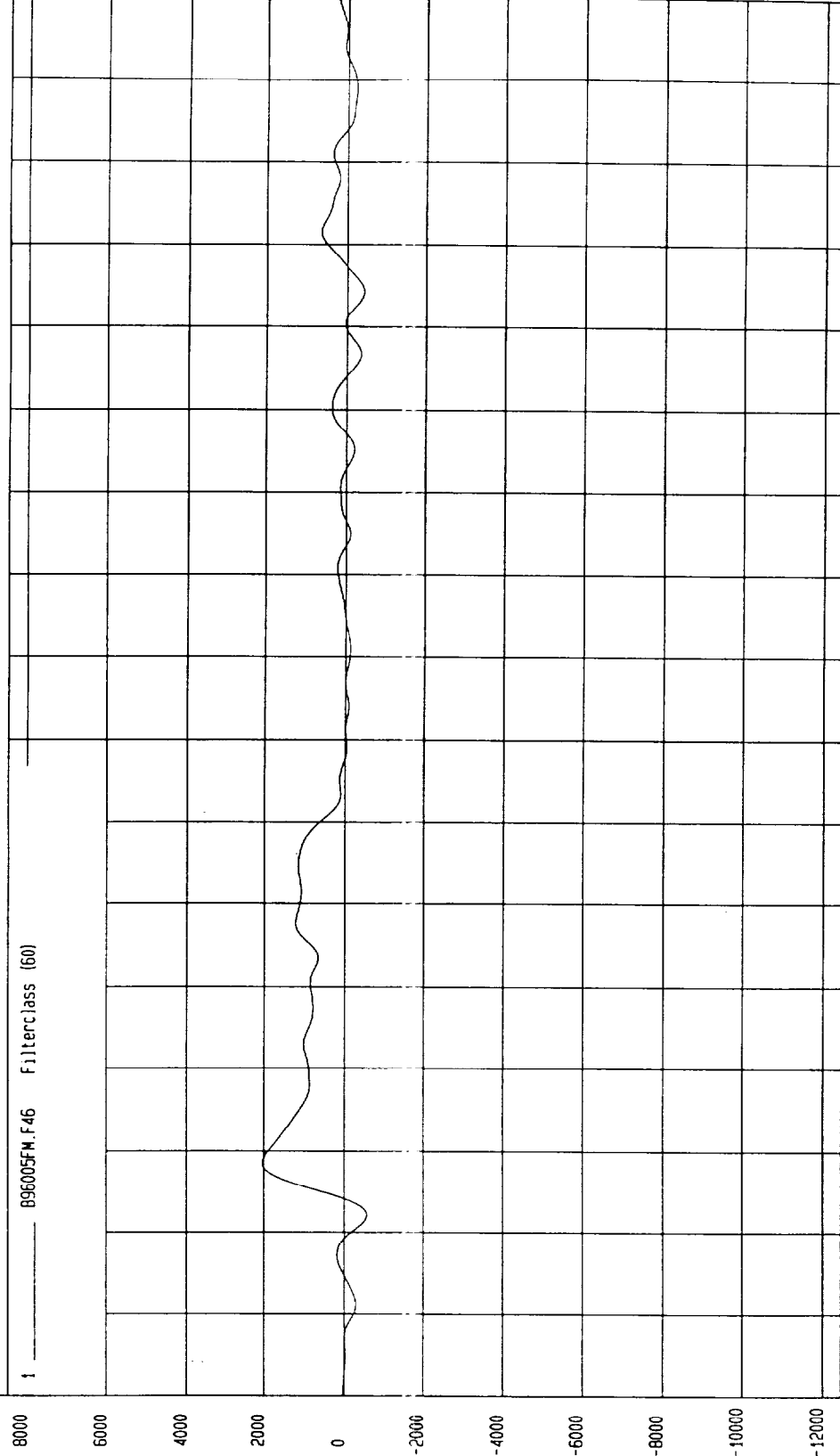
Speed: 25.8 MPH 41.5 KPH

Minimum = -592.87 N at 12 msec

Maximum = 2038.76 N at 18 msec

LC #14 FZ

1 _____ 896005FM.F46 Filterclass (60)



MGA Research
06-02-1998 13:18

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

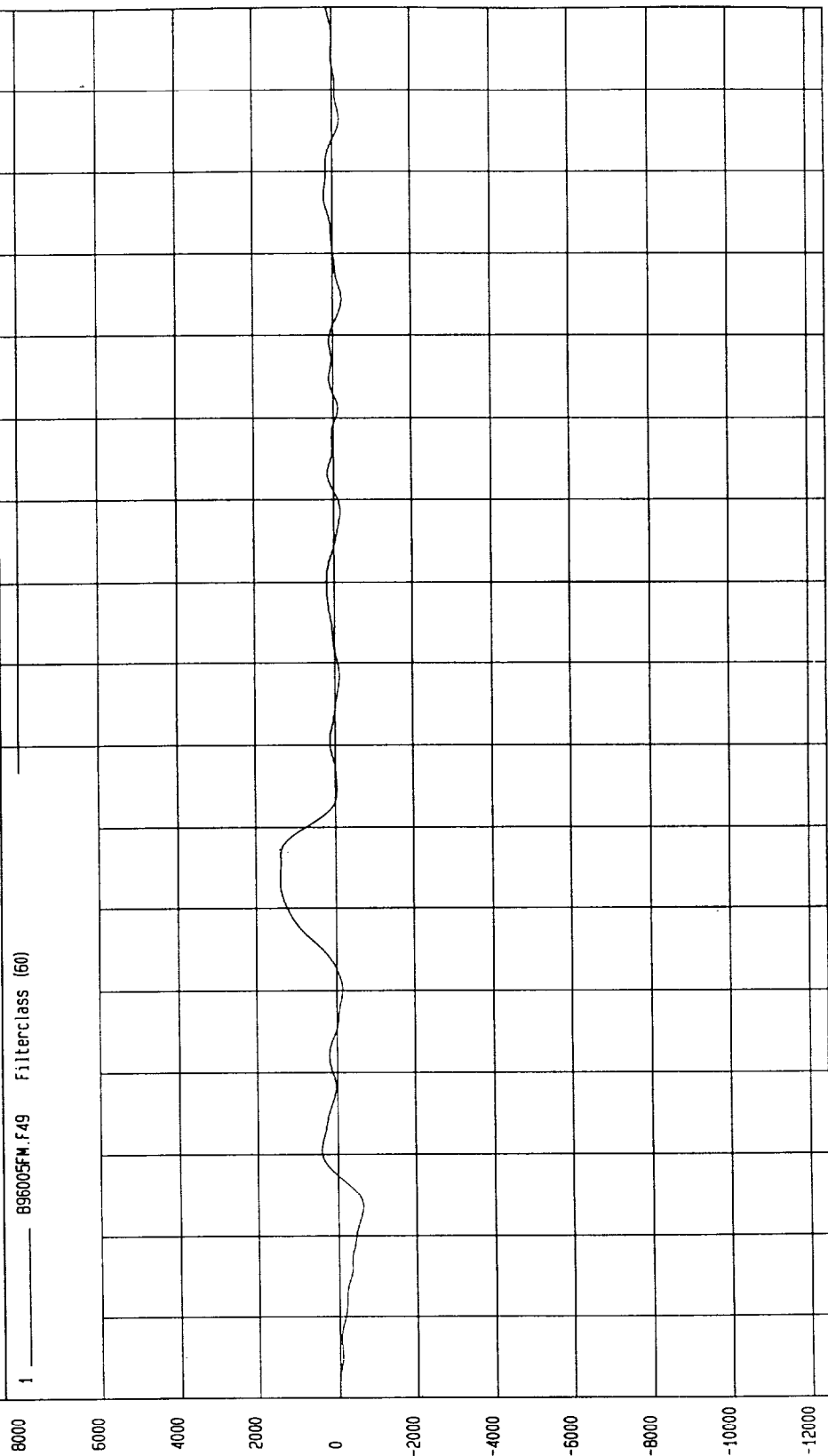
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1396.08 N at 53 msec

Minimum = -646.92 N at 14 msec

LC #15 FZ

1 896005FM.F49 Filterclass (60)



MGA Research
06-02-1998 13.18

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 396.13 N at 142 msec

Minimum = -626.31 N at 30 msec

LC #16 FZ

1 896005FW.F52 FilterClass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

MGA Research
06-02-1998 13:19

TIME (SECONDS)

15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
-13
-14
-15

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1207.46 N at 46 msec Maximum = 1111.89 N at 53 msec

LC #17 FZ

1 B96005FM.F55 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MGA Research
06-02-1998 13:19

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

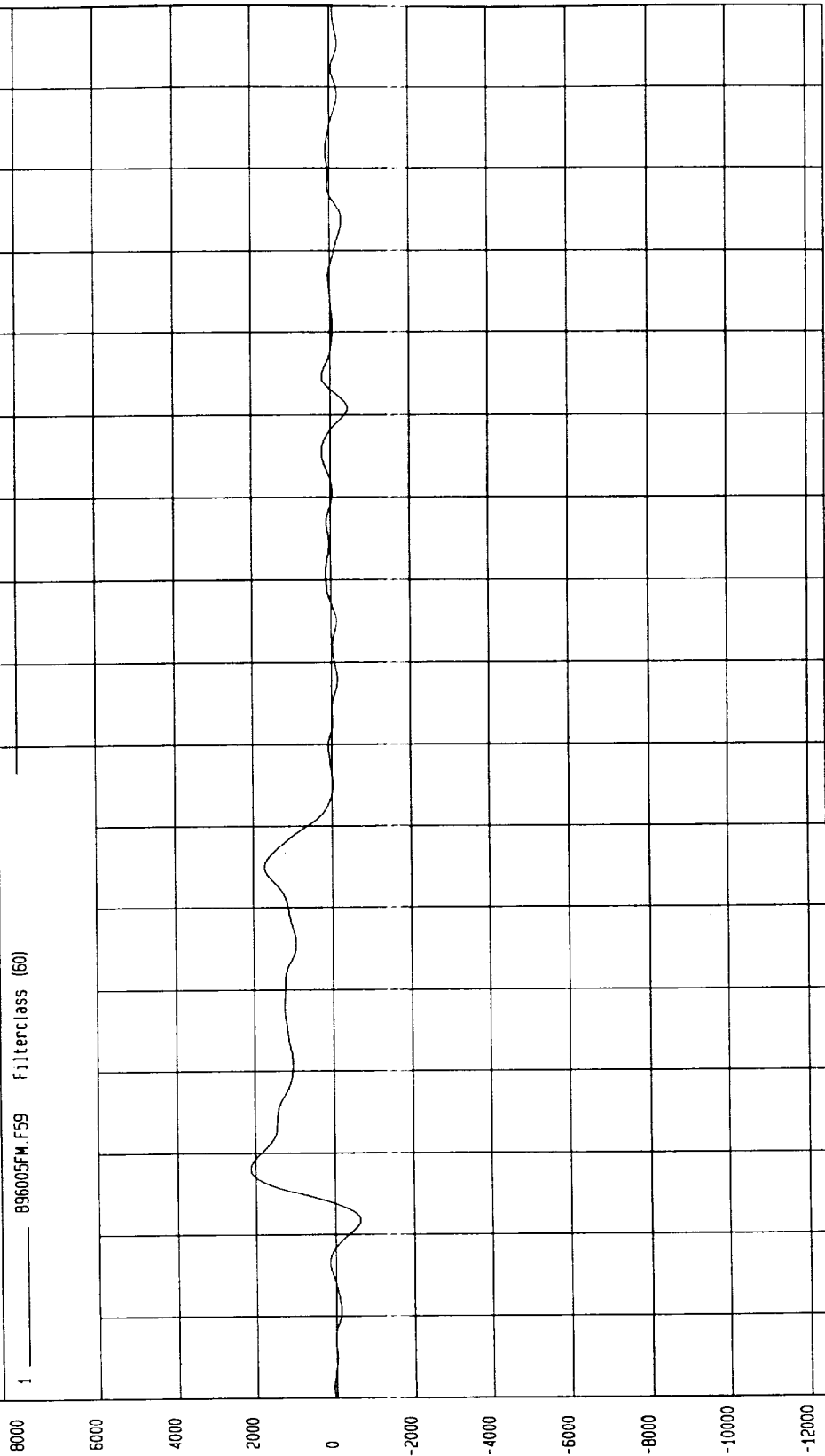
SPEED: 25.8 MPH 41.5 KPH

Maximum = 2129.87 N at 18 msec

Minimum = -650.71 N at 12 msec

LC #18 FZ

1 896005FM.F59 Filterclass (60)



MCA Research
06-02-1998 13:19

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1407.87 N at 6 msec Maximum = 1756.45 N at 51 msec

LC #19 FZ

1 896005FM.F62 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MGA Research
06-02-1998 13:20

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

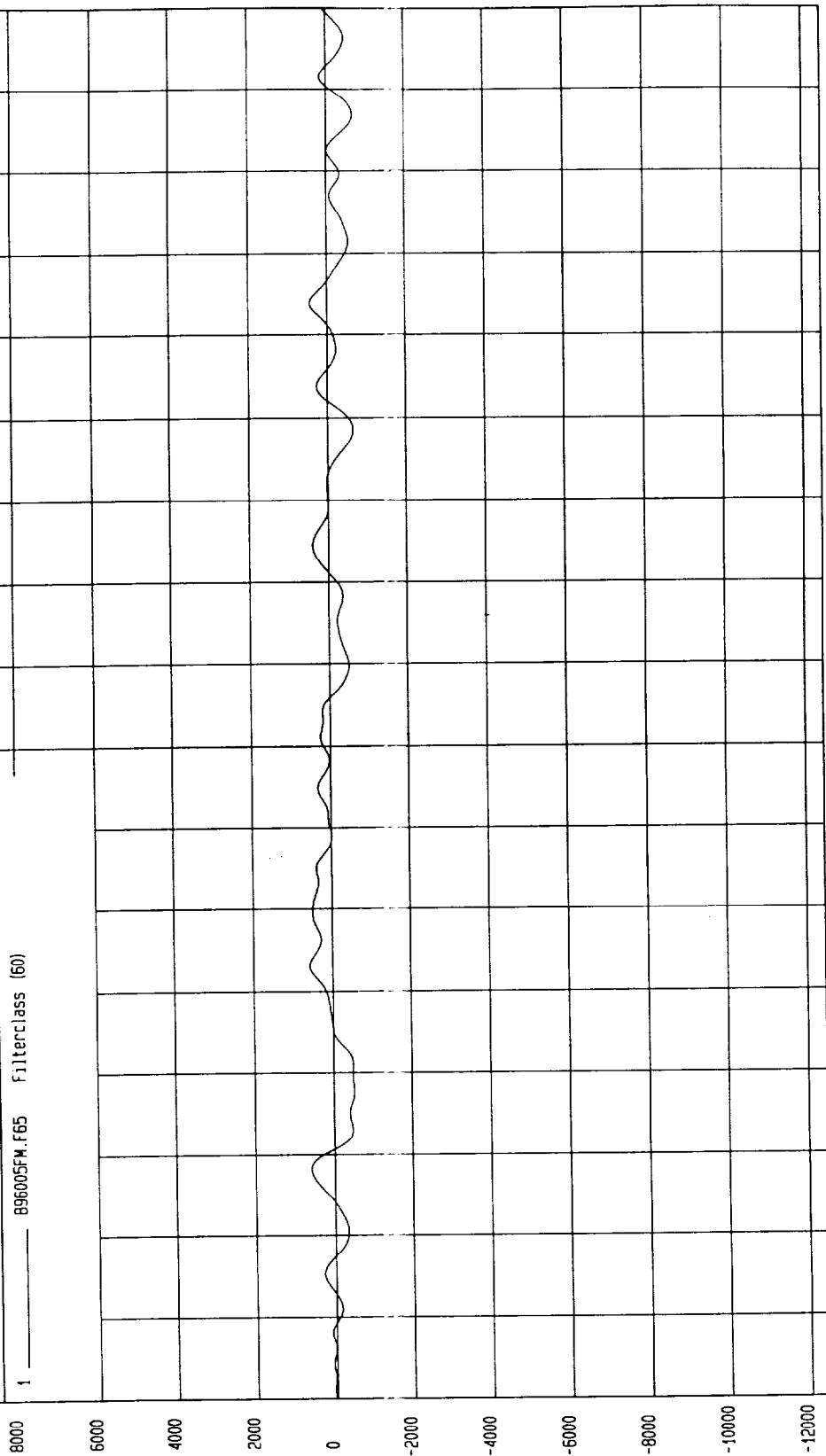
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 586.04 N at 18 msec

Minimum = -672.54 N at 147 msec

LC #20 FZ

1 896005FM.F65 Filterclass (60)



MCA Research
06-02-1998 13:20

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 25.8 MPH 41.5 KPH

Minimum = -672.14 N at 44 msec

Maximum = 2637.09 N at 172 msec

LC #21 FZ

1 _____ 896005FM.F68 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MGA Research
06-02-1998 13:20

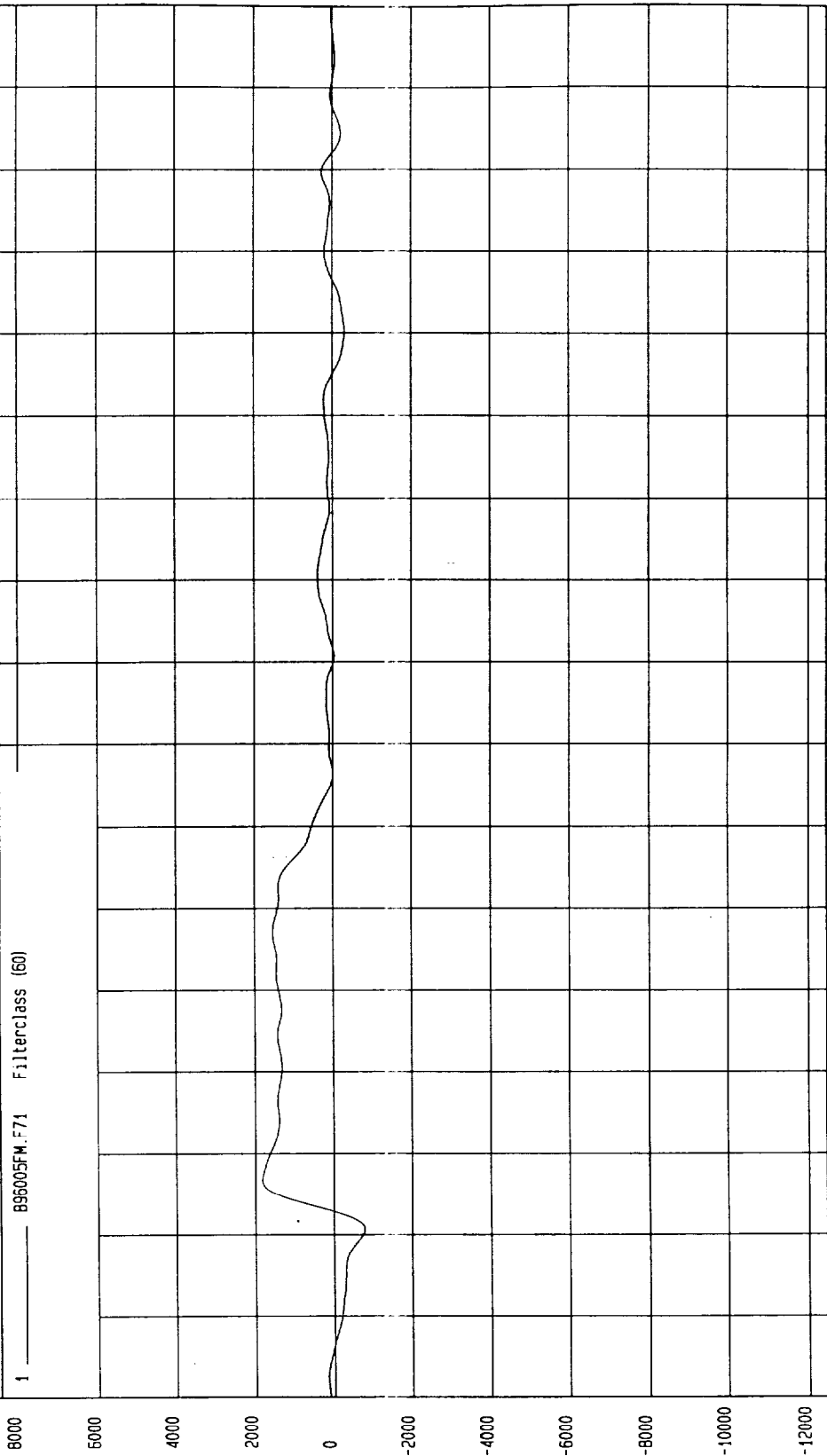
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -782.6 N at 11 msec Maximum = 1818.93 N at 17 msec

LC #22 FZ

1 B96005FM.F71 Filterclass (60)



MCA Research
06-02-1998 13:21

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 2422.4 N at 61 msec

Minimum = -1673.76 N at 132 msec

LC #23 FZ

1 896005FM.F75 Filterclass (60)

1

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MGA Research
05-02-1998 13: 21

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

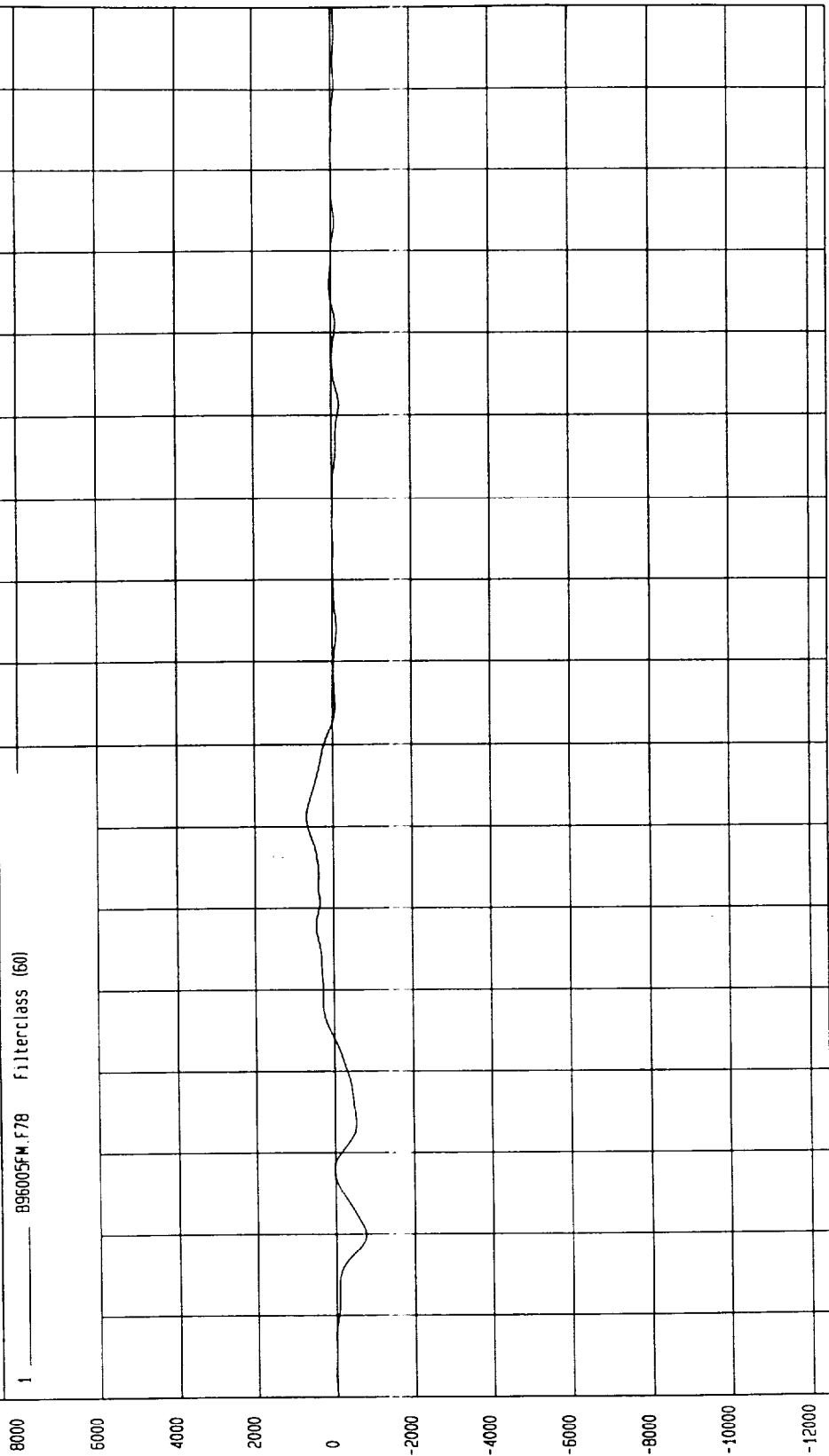
SPEED: 25.8 MPH 41.5 KPH

Maximum = 683.98 N at 61 msec

Minimum = -776.36 N at 10 msec

LC #24 FZ

1 896005FM F78 filterclass (60)



MCA Research
06-02-1998 13:22

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

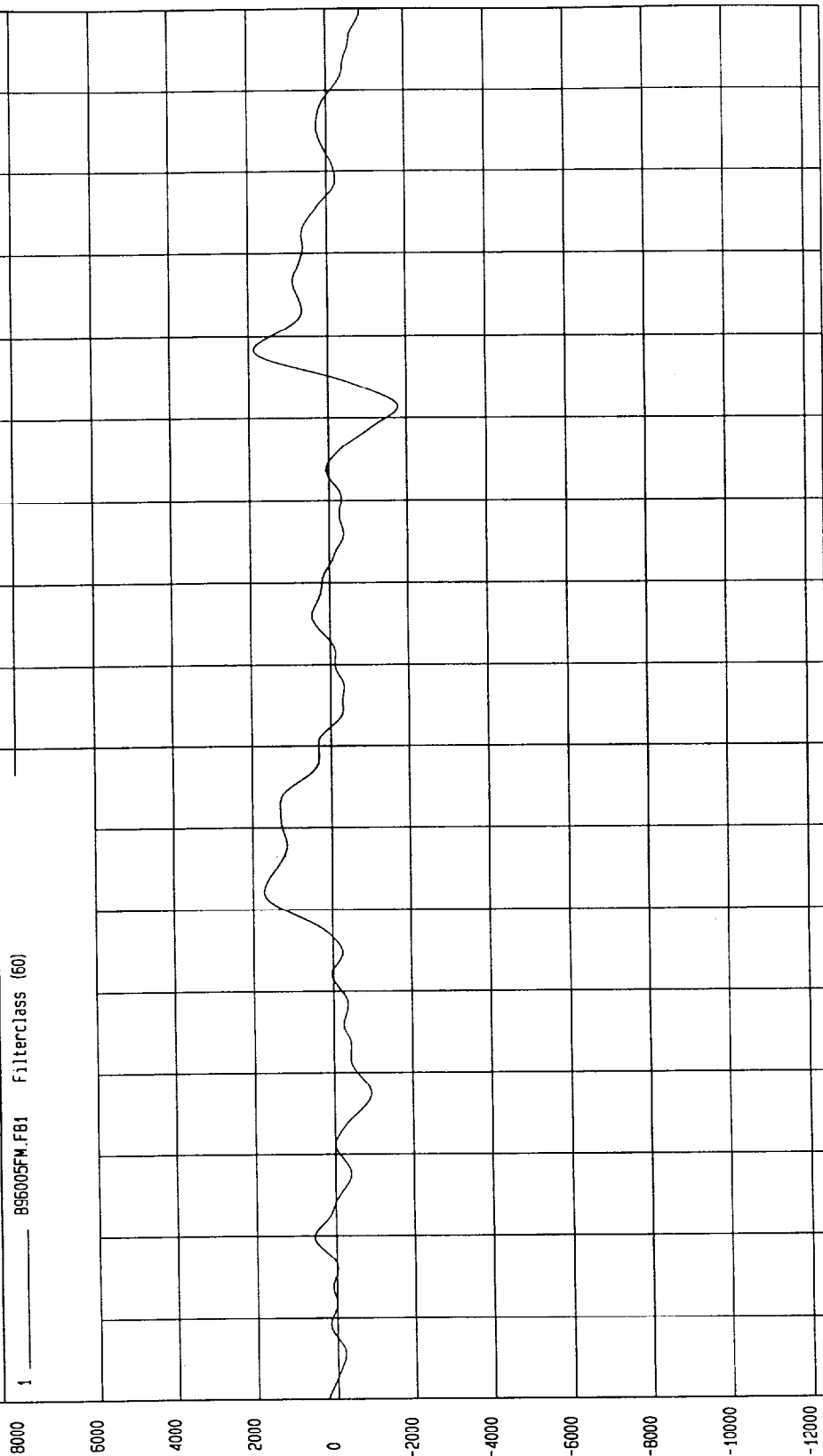
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1869.84 N at 118 msec

Minimum = -1787.27 N at 111 msec

LC #25 FZ

1 896005FM.FB1 FilterClass (60)



MCA Research
06-02-1998 13:22

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -748.51 N at 11 msec Maximum = 1583.58 N at 16 msec

LC #26 FZ

1 896005FM.F85 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

0 .01 .02 .03 .04 .05 .06 .07 .08 .09 .1 .11 .12 .13 .14 .15

TIME (SECONDS)

MCA Research
05-02-1998 13:23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

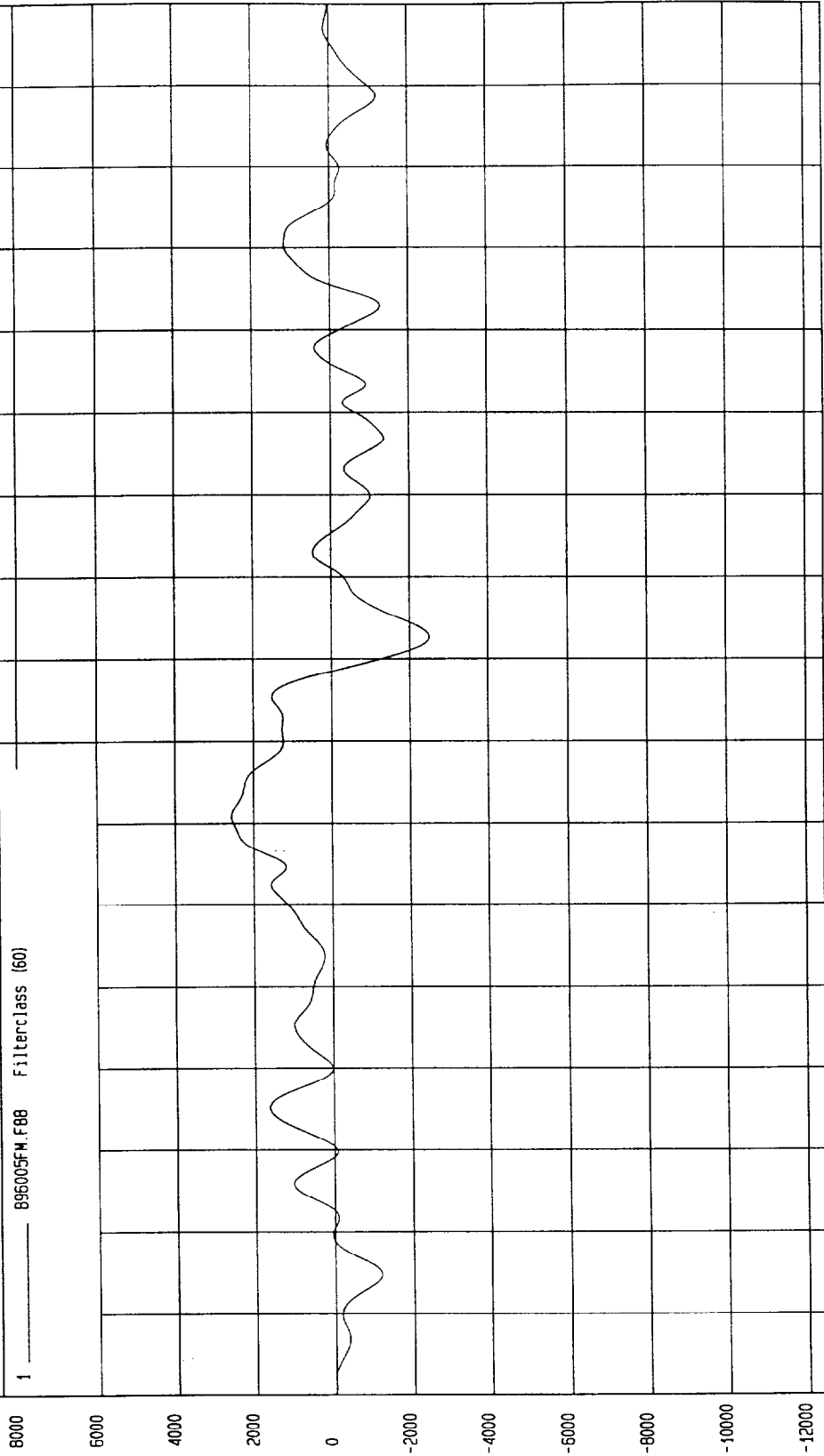
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -2478.59 N at 83 msec

Maximum = 2579.13 N at 61 msec

LC #27 FZ

1 896005FM.F88 Filterclass (60)



MCA Research
06-02-1998 13: 23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1602.14 N at 192 msec

Minimum = -1029.35 N at 75 msec

LC #28 FZ

1 _____ B96005FM.F92 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.10

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-02-1998 13:13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -668.41 N at 136 msec

Maximum = 648.32 N at 50 msec

LC #29 FZ

1 896005FM.F95 Filterclass (60)

8000

6000

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (SECONDS)

MGA Research
06-02-1998 13:23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 25.8 MPH 41.5 KPH

Minimum = -746.27 N at 10 msec

Maximum = 1662.54 N at 16 msec

LC #30 FZ

1 896005FM.F98 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

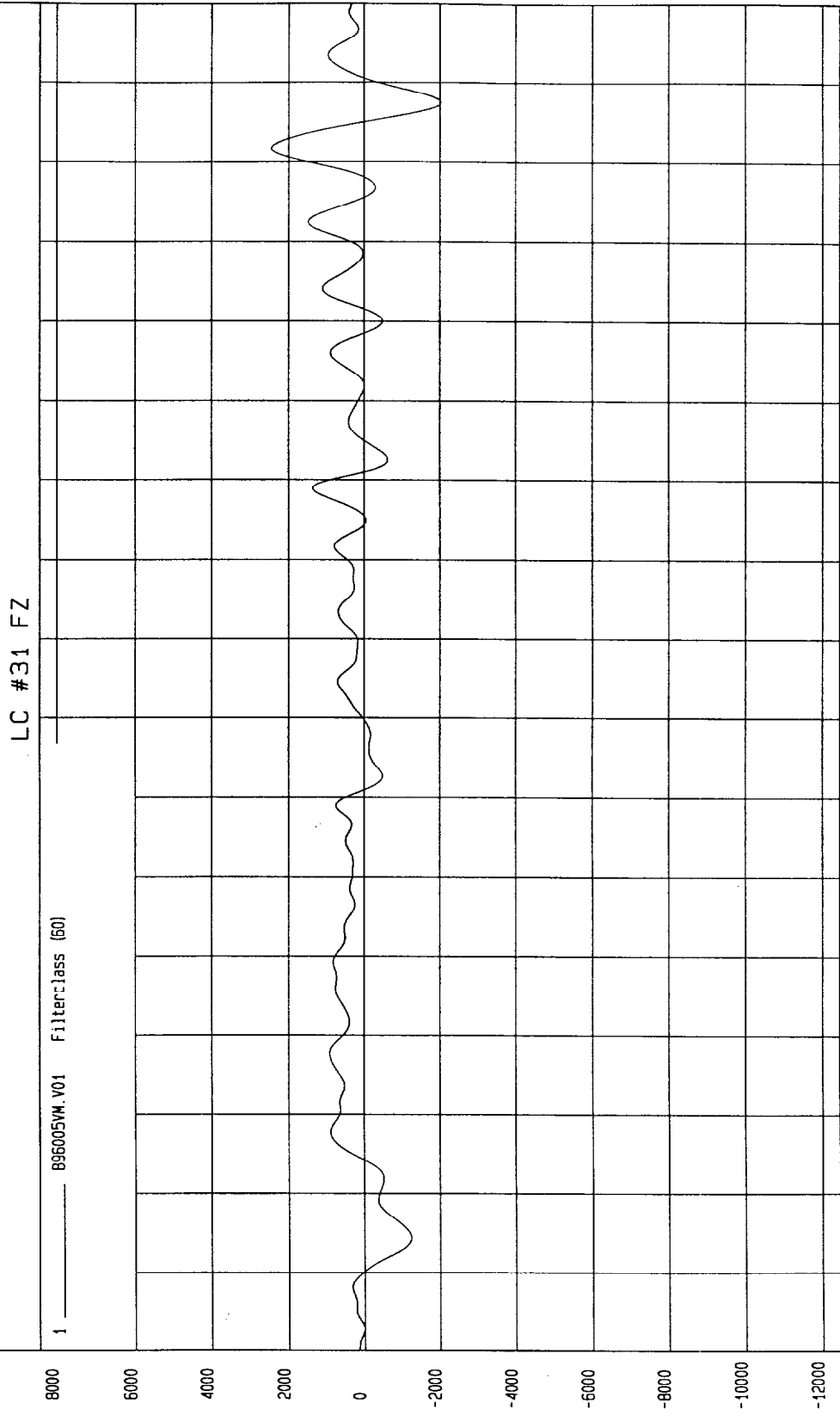
N

0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15

TIME (SECONDS)

MCA Research
06-02-1998 13:23

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -2027.2 N at 147 msec	Maximum = 2460.41 N at 142 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

MCA Research
06-02-1998 13:12

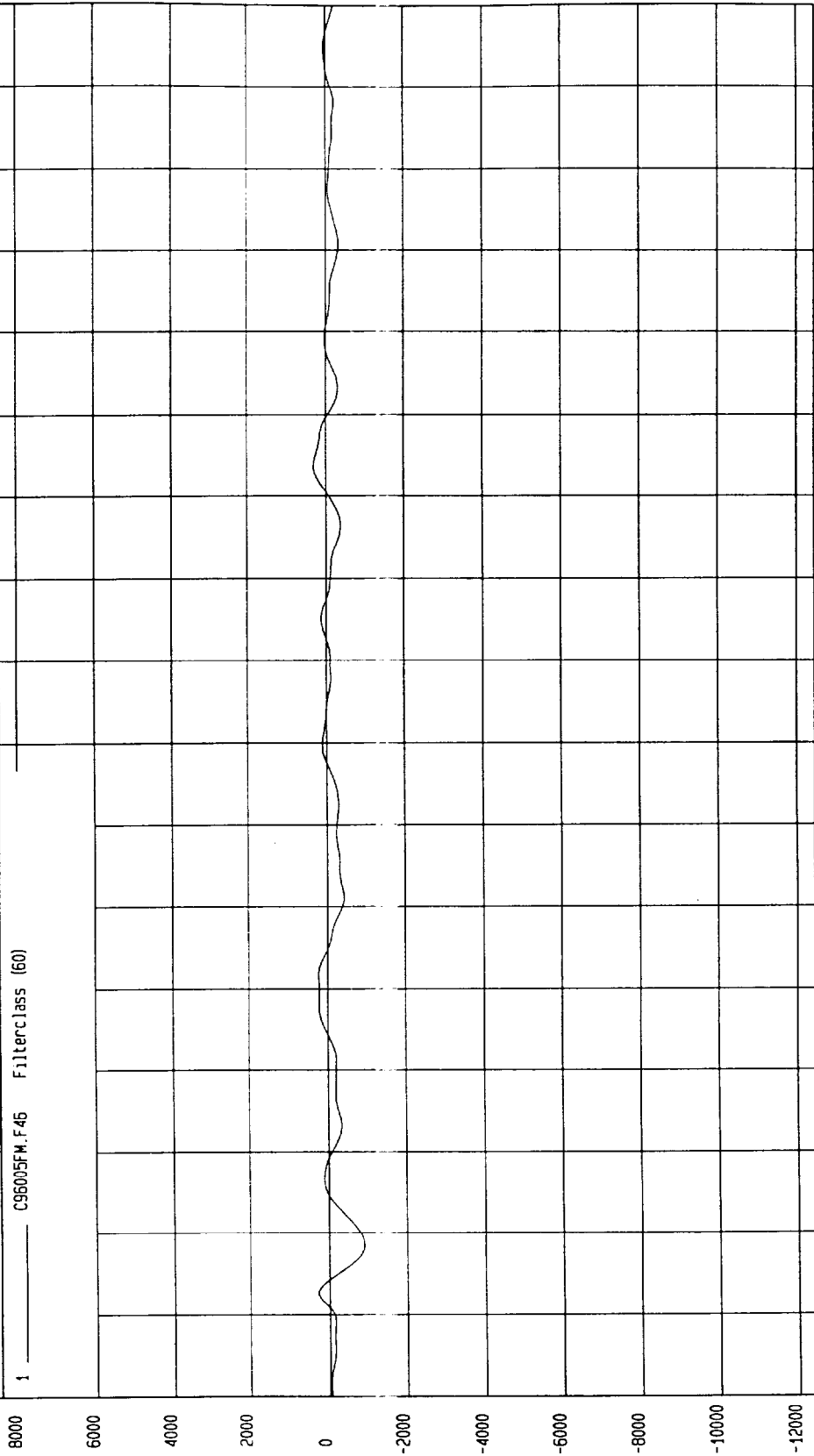
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -926 N at 8 msec Maximum = 319.81 N at 104 msec

LC #32 FZ

1 _____ C96005FM.F46 Filterclass (60)



TIME (seconds)

MCA Research
06-02-1998 13:52

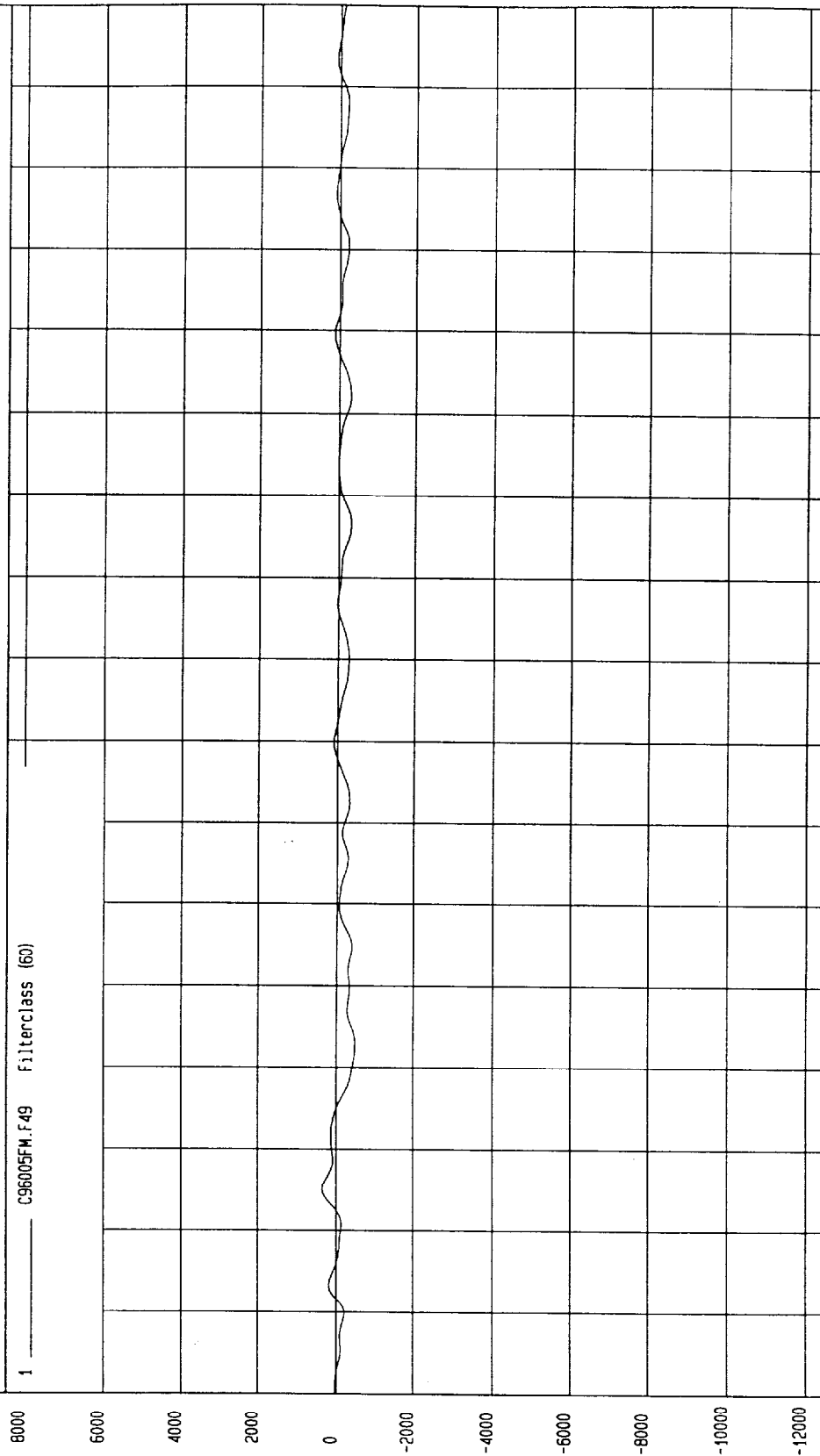
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -480.31 N at 32 msec Maximum = 357.29 N at 15 msec

LC #33 FZ

1 — C96005FM.F49 Filterclass (60)



WCA Research
06-02-1996 13:52

TIME (seconds)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -977.18 N at 9 msec Maximum = 1177.26 N at 15 msec

LC #34 FZ

1 C96005FM.F52 Filterclass (60)

8000
6000
4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

TIME (seconds)

WCA Research
06-02-1998 13.52

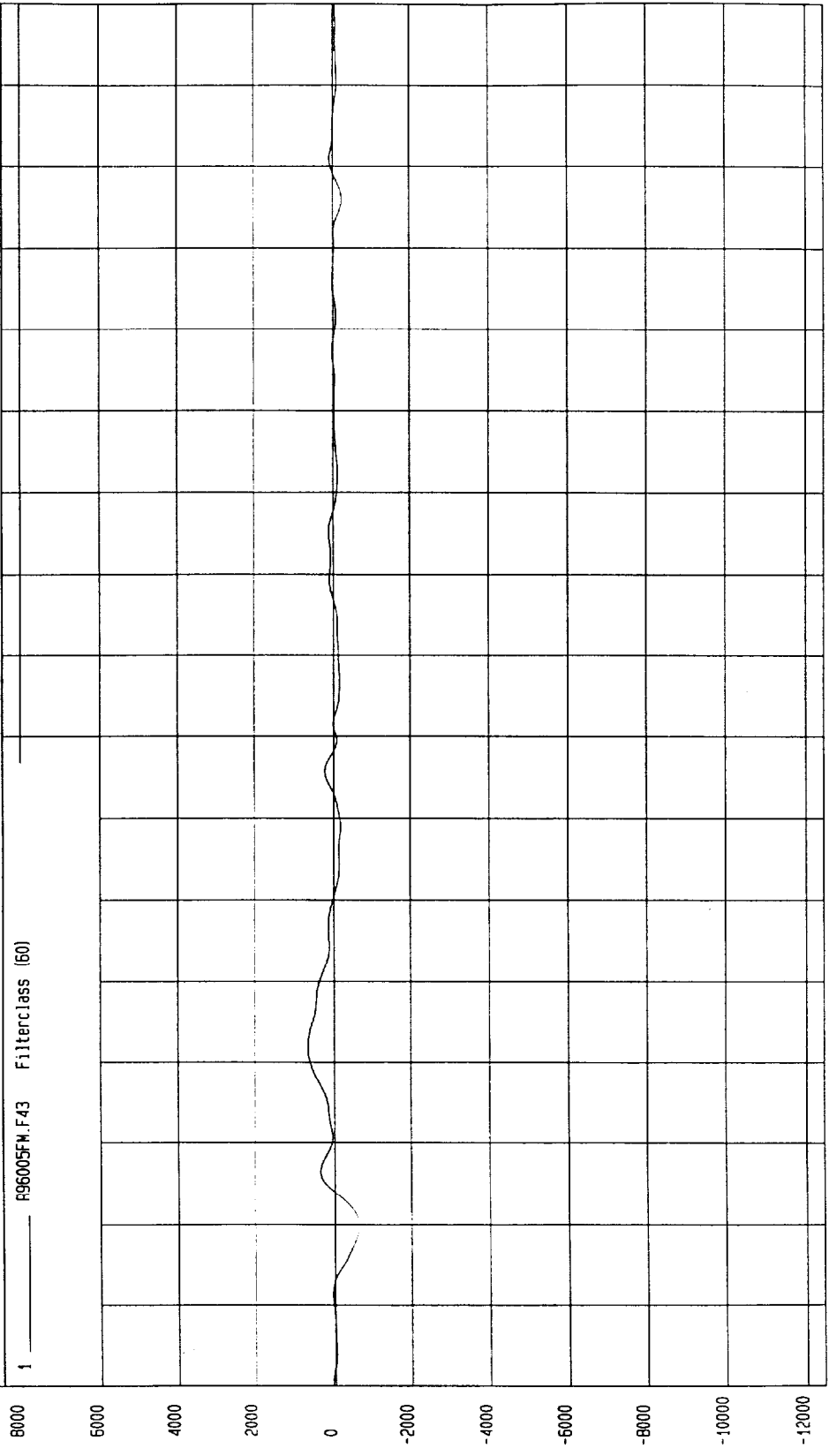
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -636.3 N at 10 msec Maximum = 663.52 N at 32 msec

LC #35 FZ

1 R96005FM.F43 Filterclass (60)



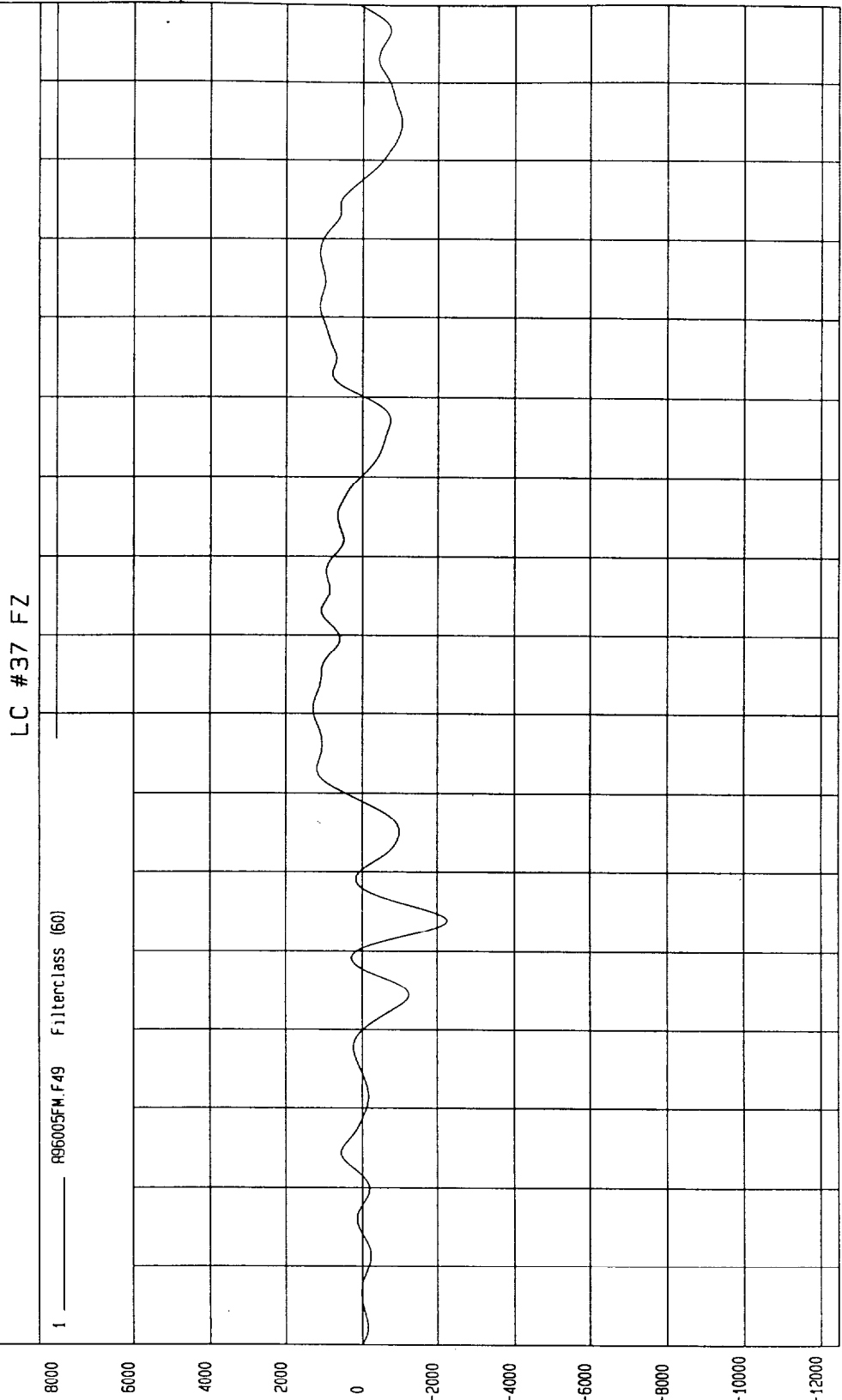
MCA Research
06-02-1998 13.40

TIME (SECONDS)

LC #36 FZ

NO VALID DATA COLLECTED

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -2246.3 N at 44 msec	
Maximum = 1287.51 N at 71 msec	



TIME (SECONDS)

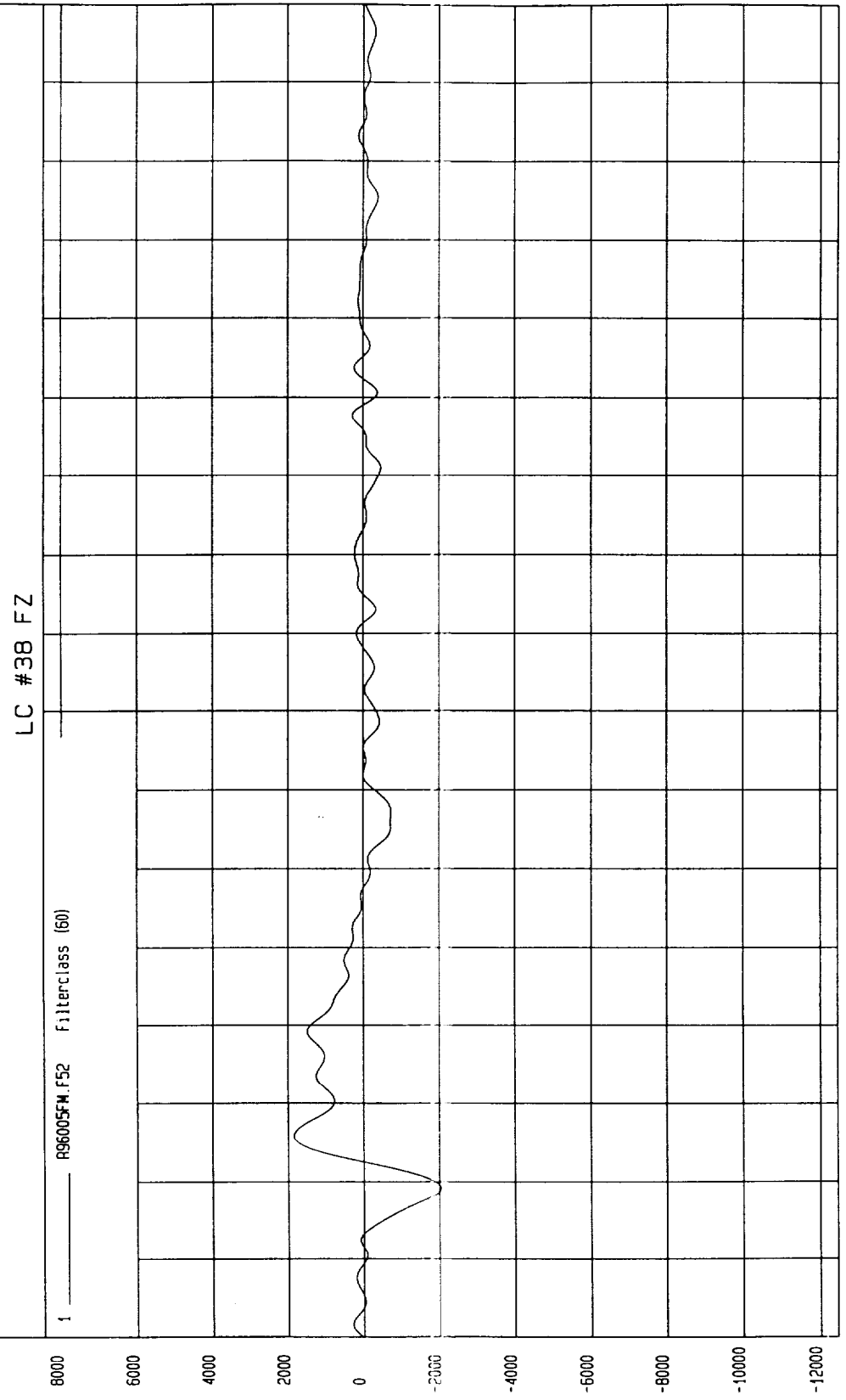
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0

MGA Research
06-02-1998 13:40

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2041.24 N at 9 msec Maximum = 1844.39 N at 16 msec



TIME (SECONDS)

0.15 0.14 0.13 0.12 0.11 0.1 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01 0 -0.01

WCA Research
06-02-1998 13.41

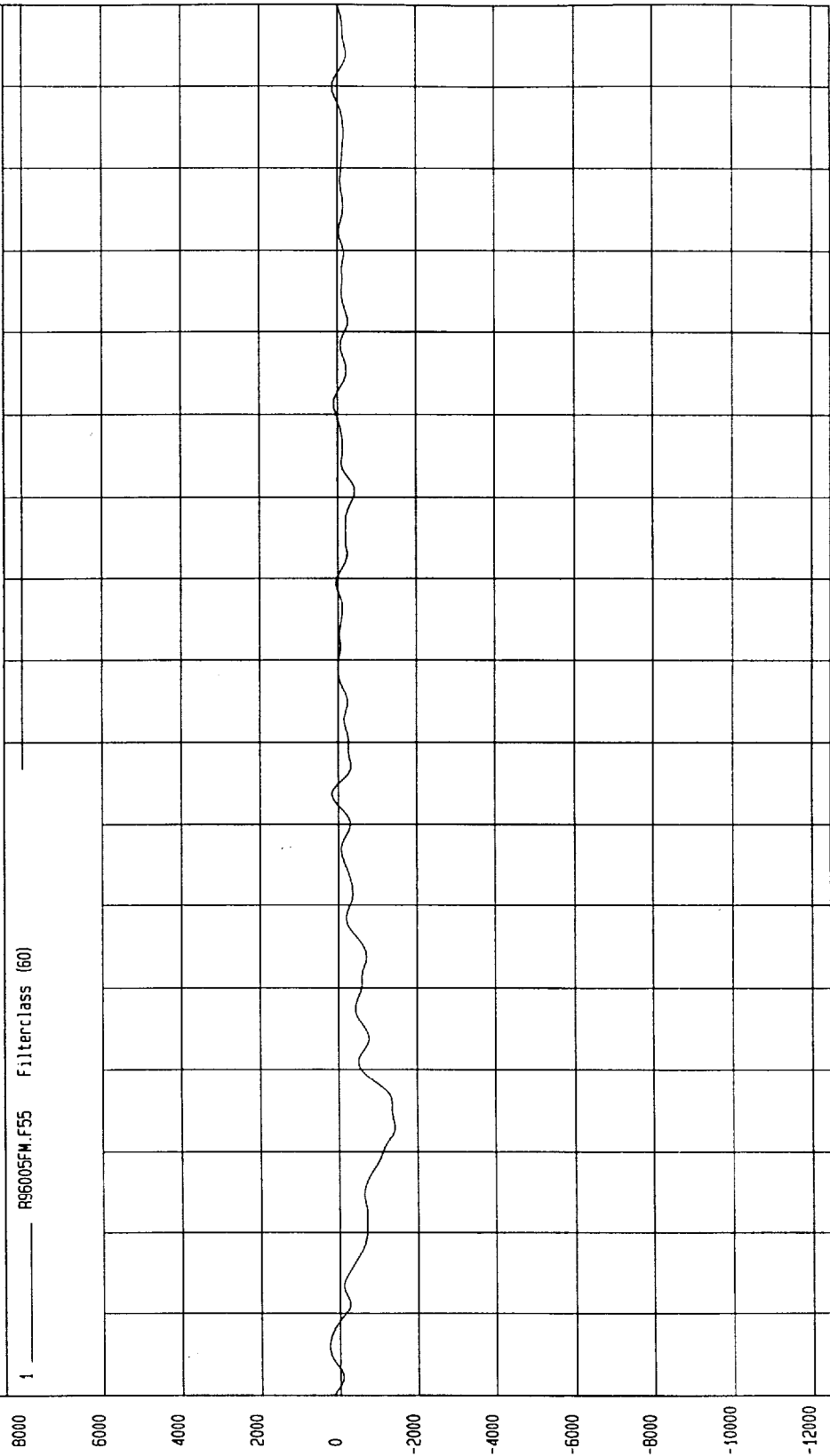
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1430.22 N at 23 msec Maximum = 259.19 N at -4 msec

LC #39 FZ

1 RS6005FM.F55 Filterclass (60)



NCA Research
06-02-1998 13:41

TIME (SECONDS)

N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

Speed: 25.8 MPH 41.5 KPH

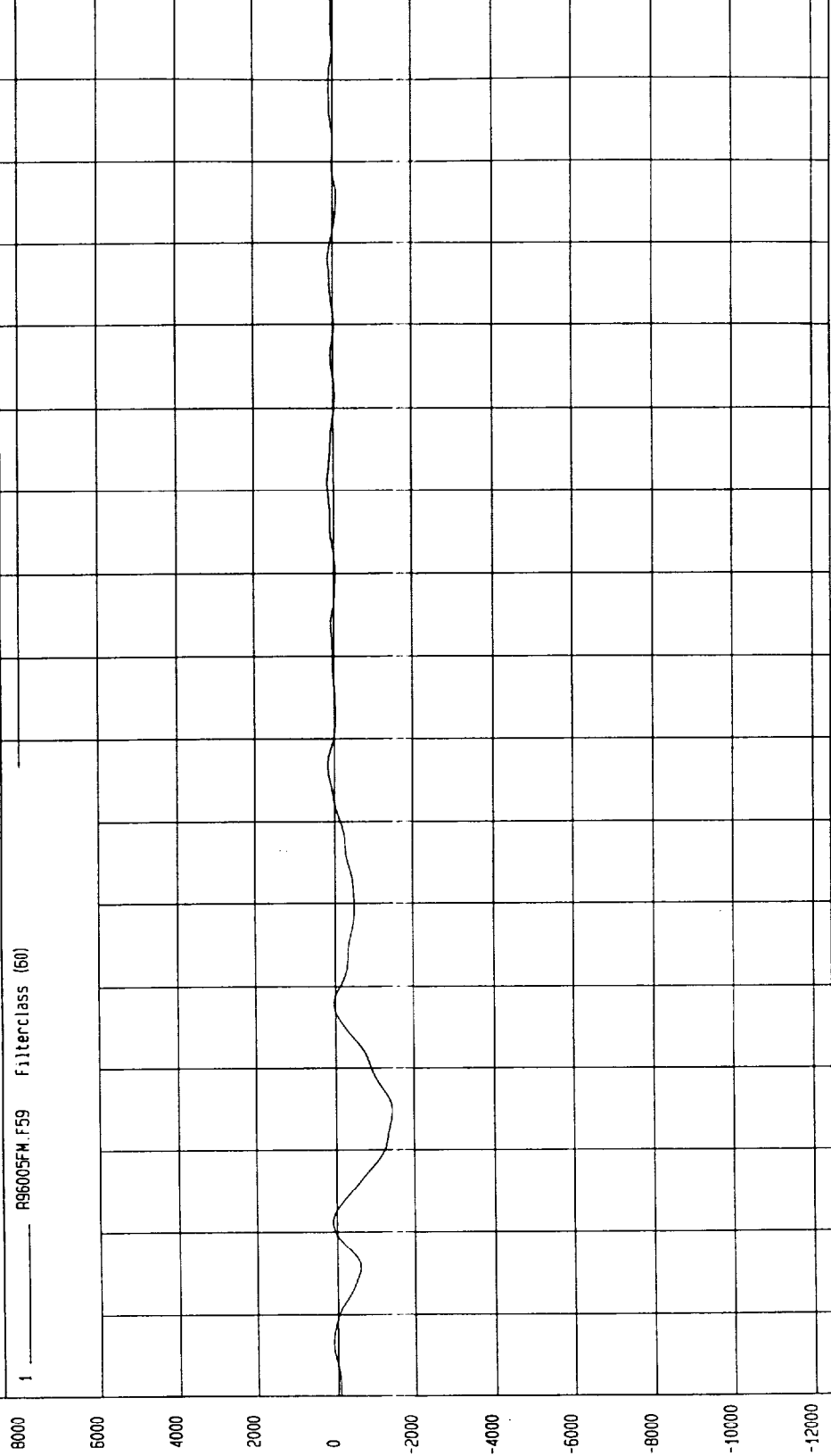
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 219.85 N at 179 msec

Minimum = -1457.07 N at 25 msec

LC #40 FZ

1 _____ R96005FM.F59 Filterclass (60)



MCA Research
06-02-1998 13:41

TIME (SECONDS)

N

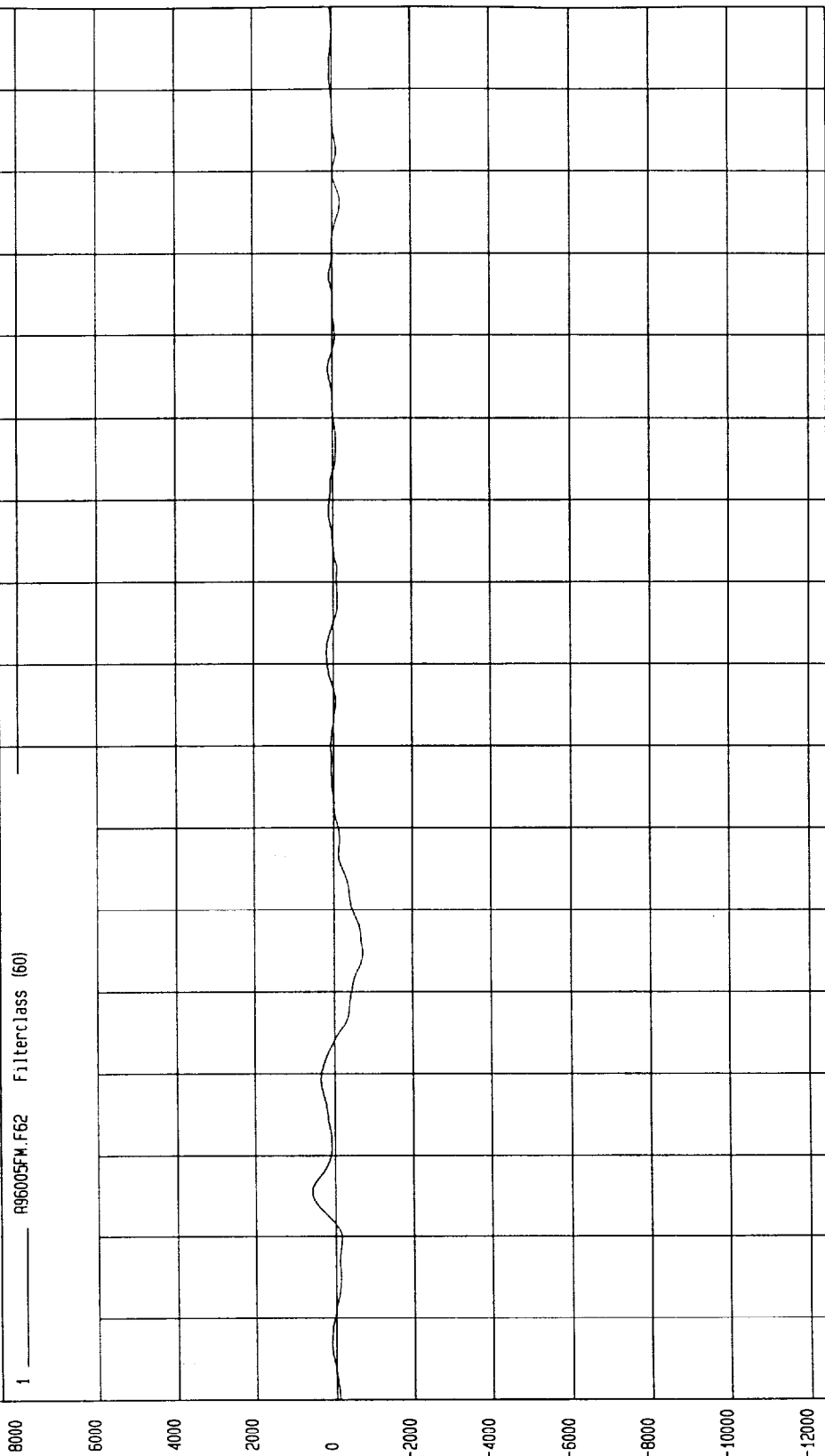
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -748.08 N at 45 msec Maximum = 591.12 N at 16 msec

LC #41 FZ

1 _____ R96005FM.F62 Filterclass (60)



MCA Research
06-02-1998 13:42

TIME (SECONDS)

N

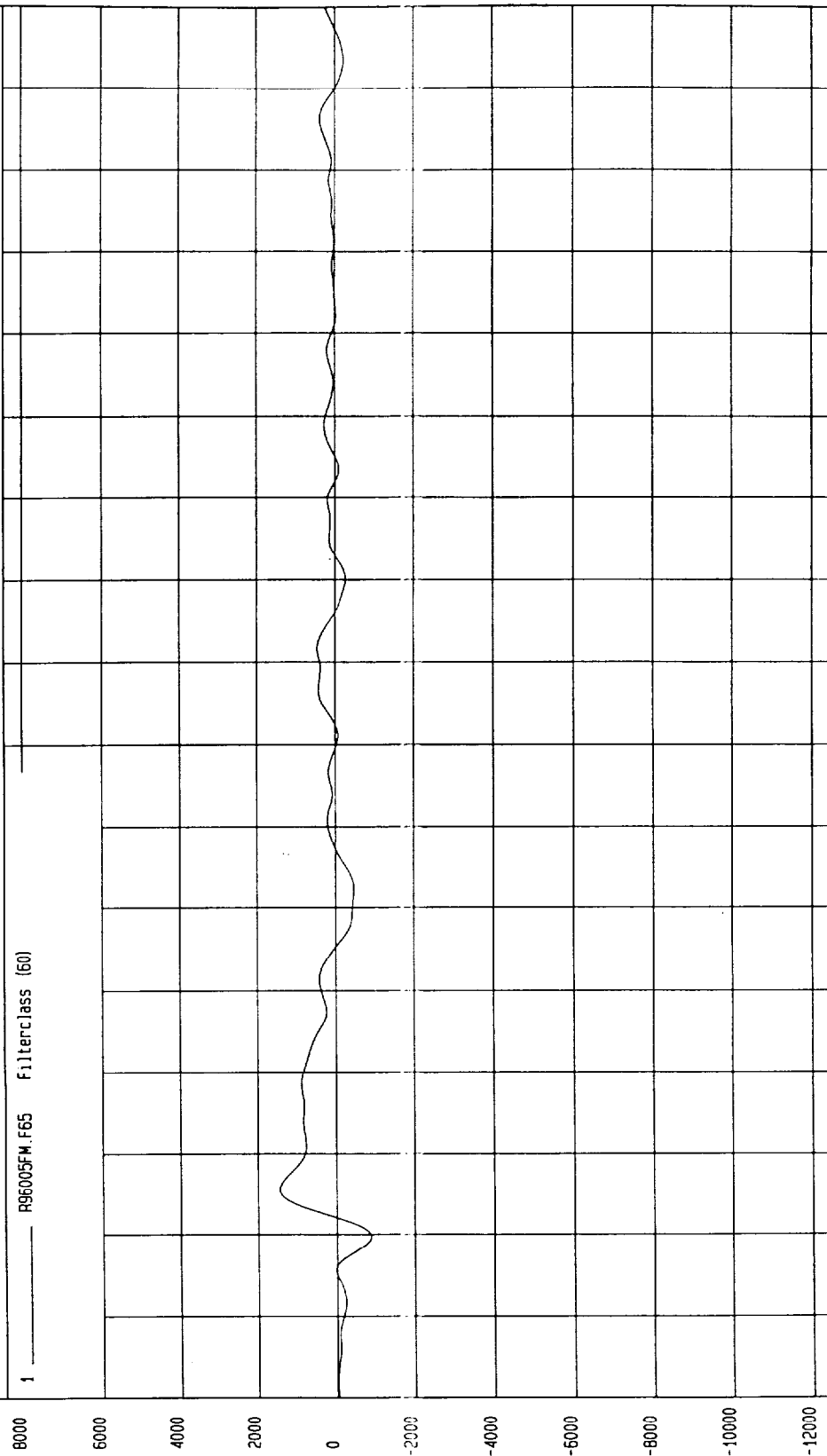
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -905.72 N at 10 msec Maximum = 1451.47 N at 16 msec

LC #42 FZ

1 R96005FM.F65 Filterclass (60)



MCA Research
06-02-1998 13.42

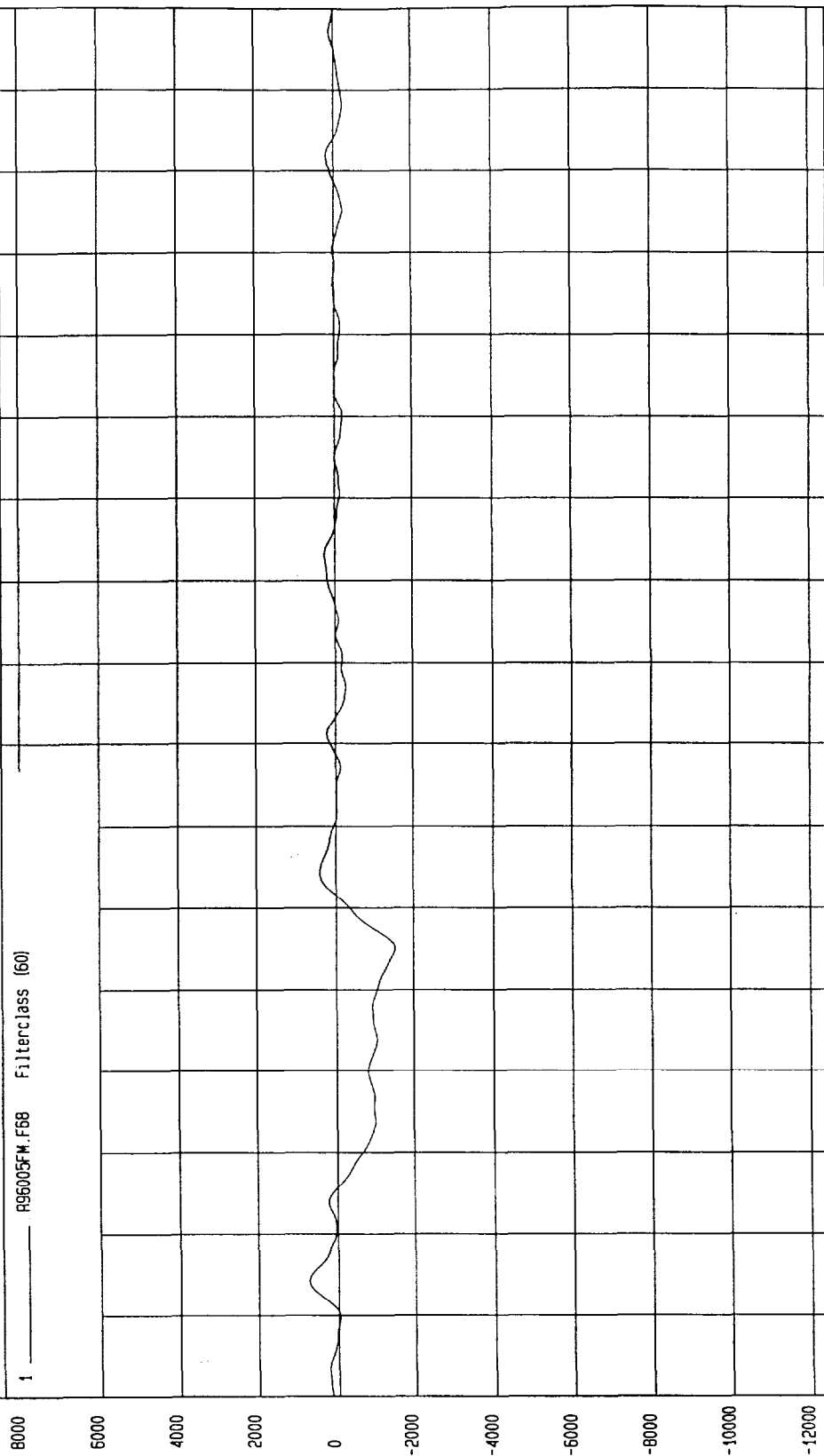
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -1533.14 N at 45 msec Maximum = 728.88 N at 4 msec

LC #43 FZ

1 _____ R96005FM.F68 Filterclass (60)



MCA Research
06-02-1998 13: 43

TIME (SECONDS)

N

LC #44 FZ

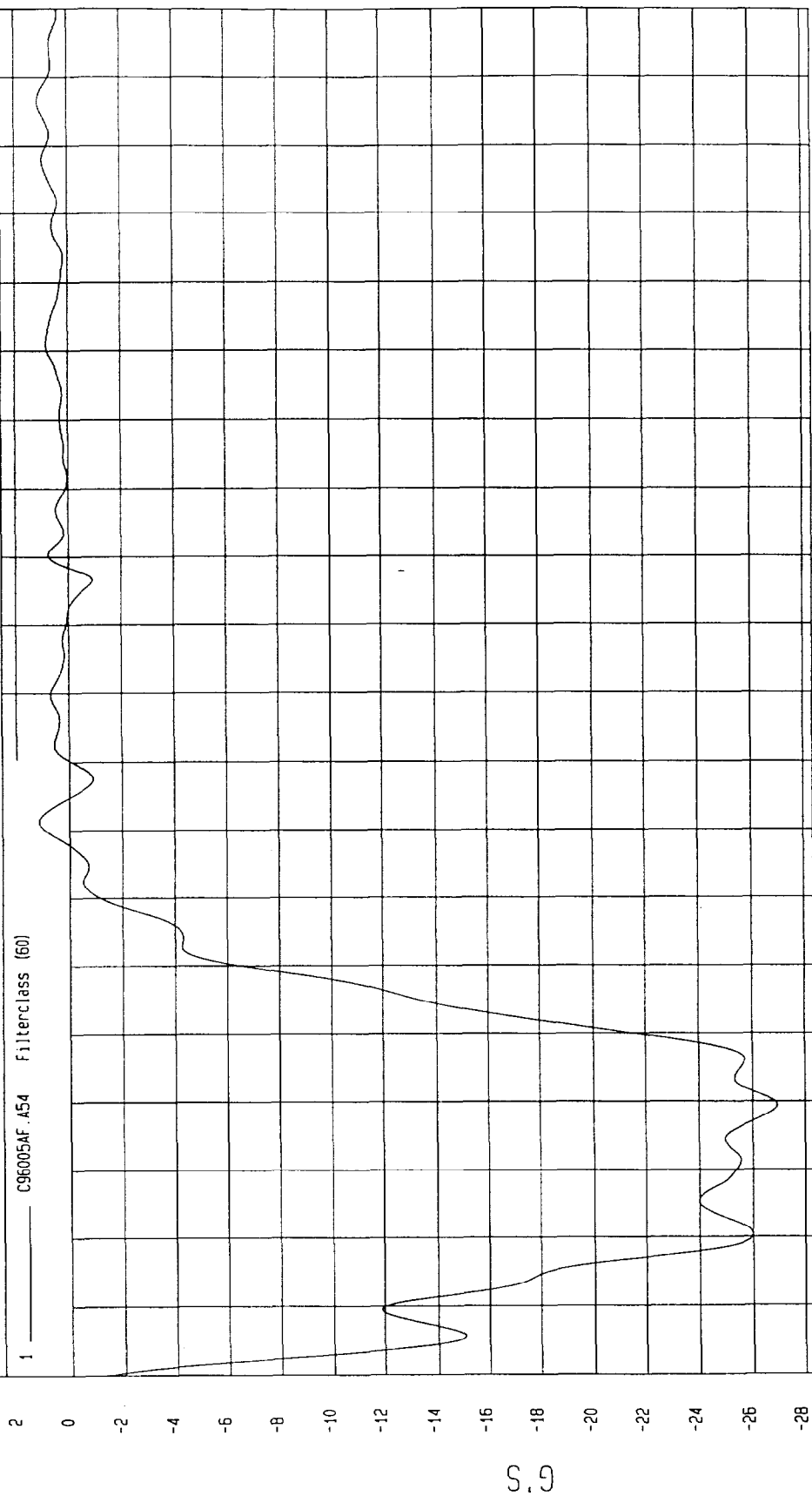
NO VALID DATA COLLECTED

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -26.95 G'S at 40 msec Maximum = 1.14 G'S at 81 msec

CART CG X



MCA Research
04-09-1997 14:58

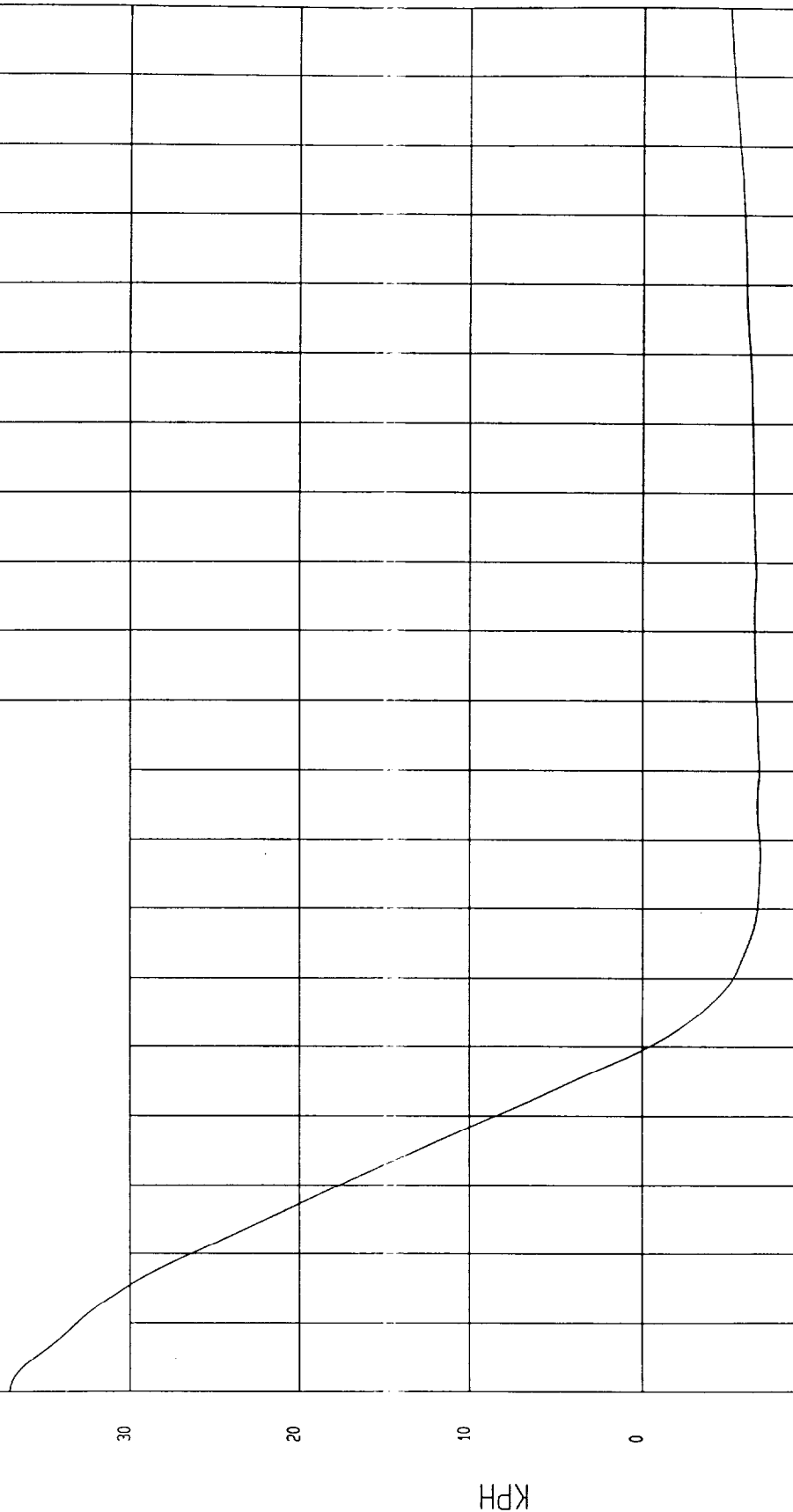
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6.77 KPH at 78 msec Maximum = 3 KPH at -20 msec

CART CG X VELOCITY

1 ——— C95005AI.V54 Filterclass (60)



WCA Research
04-09-1997 17:24

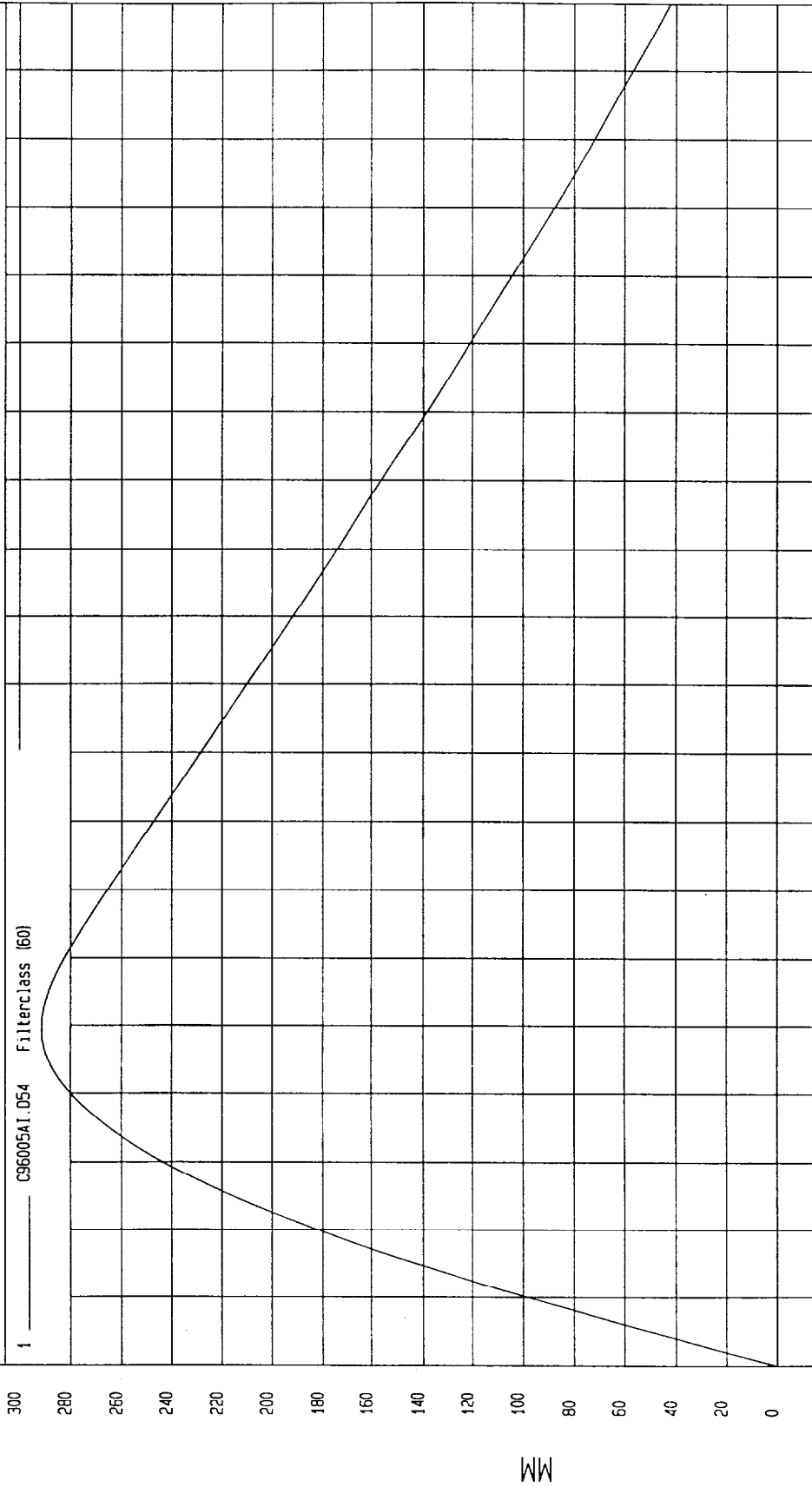
TIME Seconds

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = 0 MM at 0 msec Maximum = 291.27 MM at 50 msec

CART CG X DISPLACEMENT



TIME Seconds

MCA Research
04-09-1997 17:24

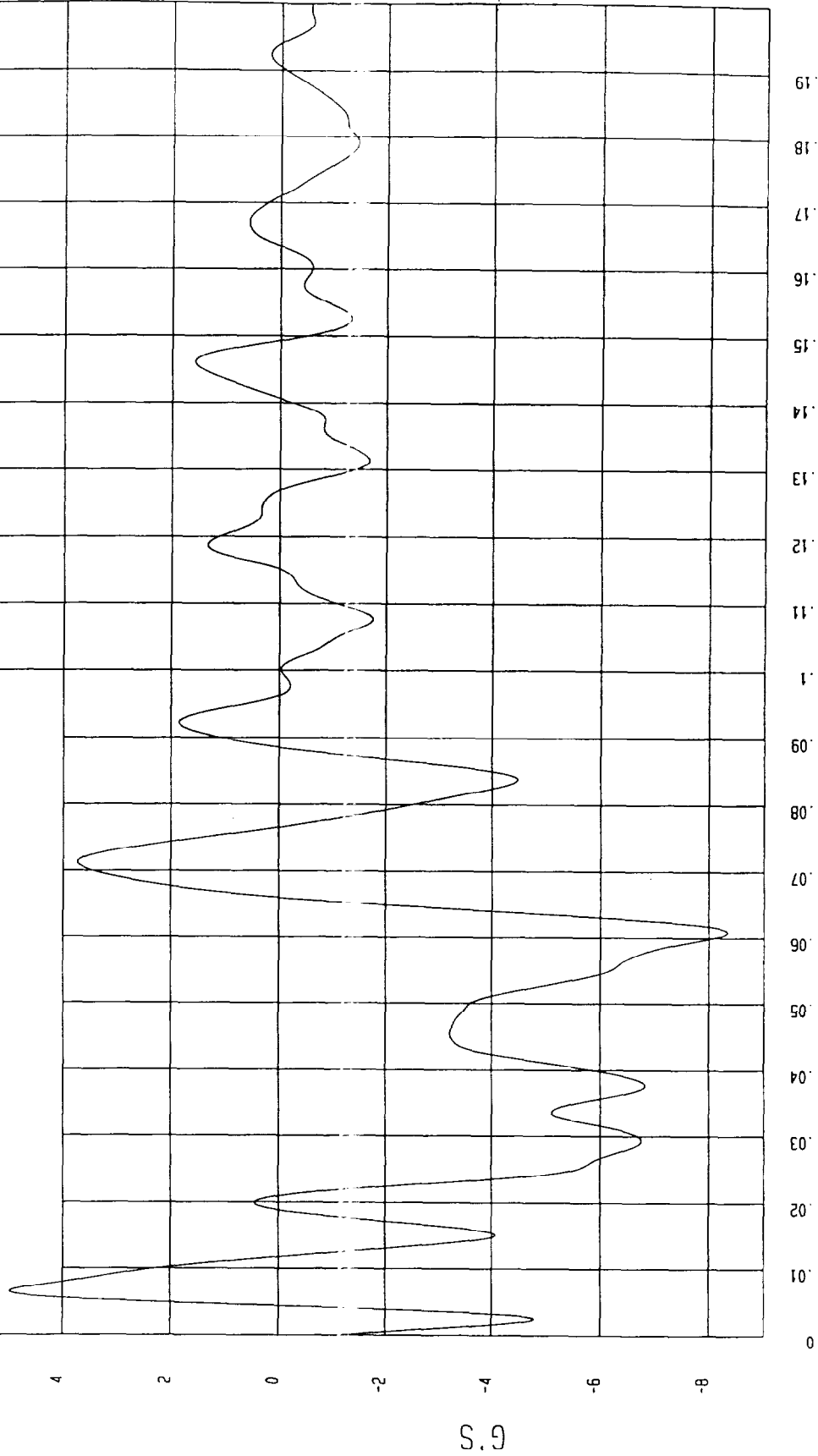
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8.34 G'S at 61 msec Maximum = 4.98 G'S at 6 msec

CART CG Y

1 ——— C96005AF .A55 Filterclass (60)



MCA Research
04-09-1997 14:58

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

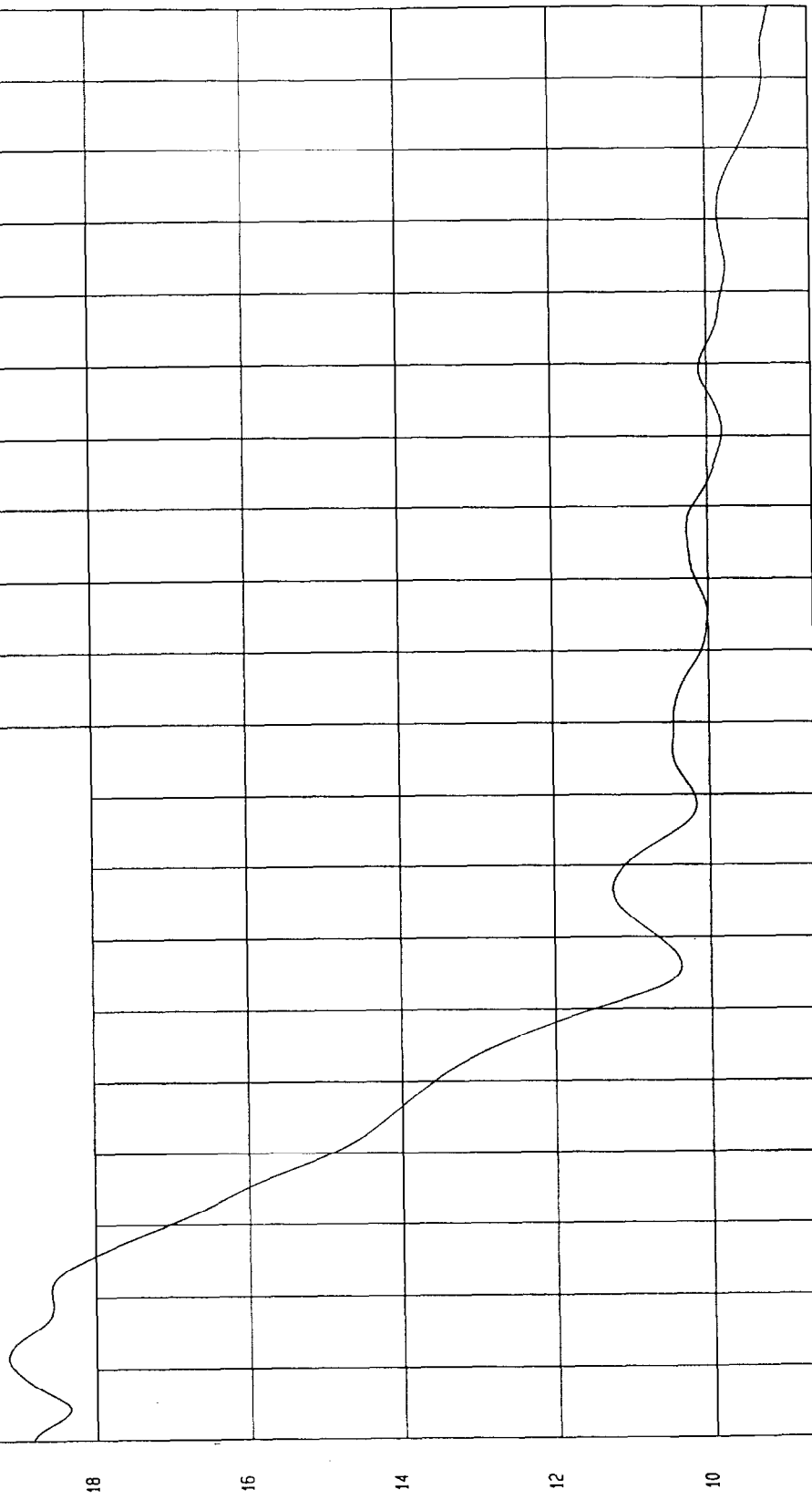
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 19.13 KPH at 12 msec

Minimum = 9.15 KPH at 200 msec

CART CG Y VELOCITY

1 C96005A1.V55 Filterclass (60)



TIME Seconds
MCA Research
04-09-1997 17:24

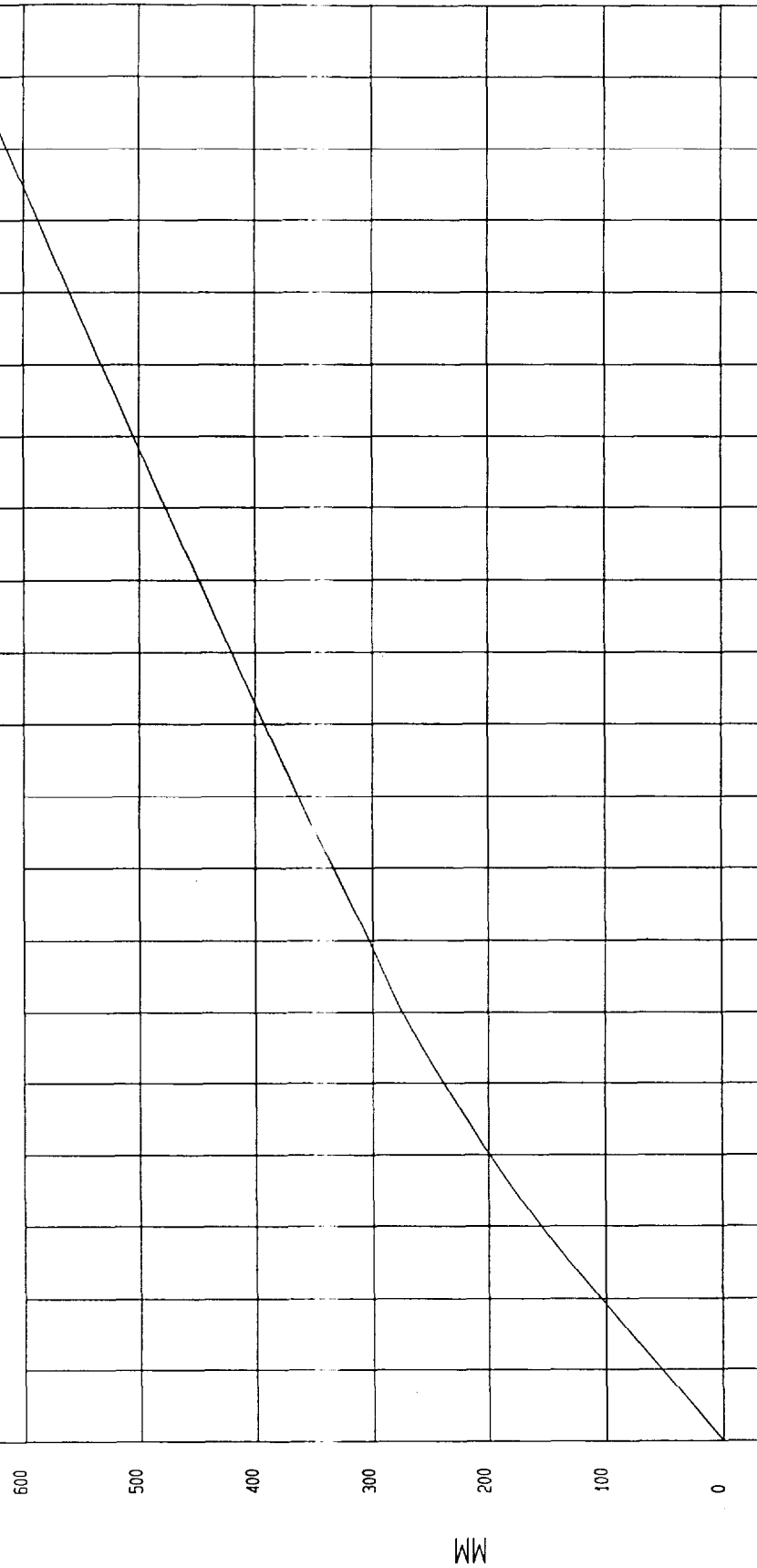
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = 0 MM at 0 msec Maximum = 665.67 MM at 200 msec

CART CG Y DISPLACEMENT

1 — C96005A1.055 Filterclass (60)

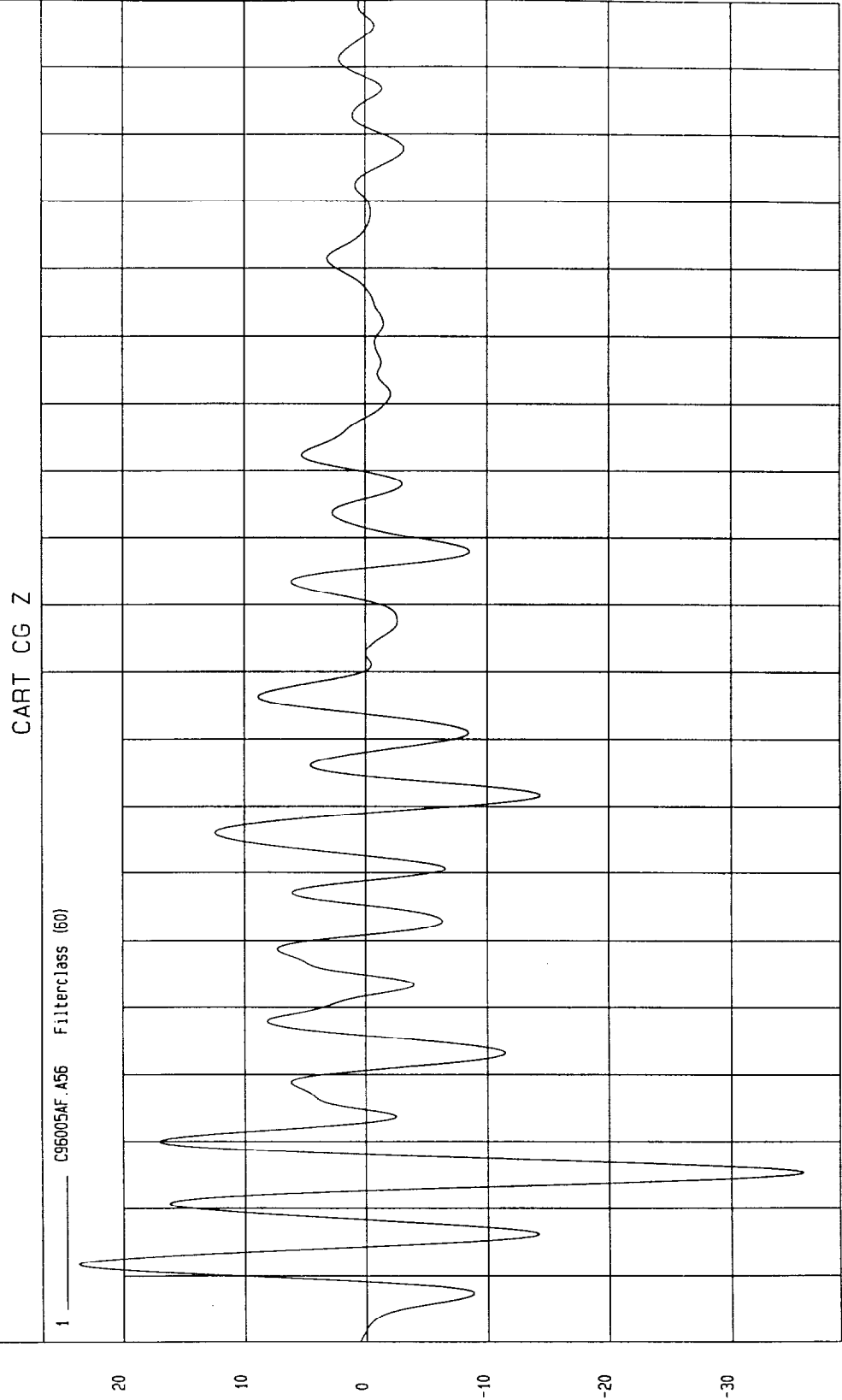


NGA Research
04-09-1997 17:24

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -35.60 G'S at 25 msec Maximum = 23.64 G'S at 12 msec



NCA Research
04-09-1997 14:58

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

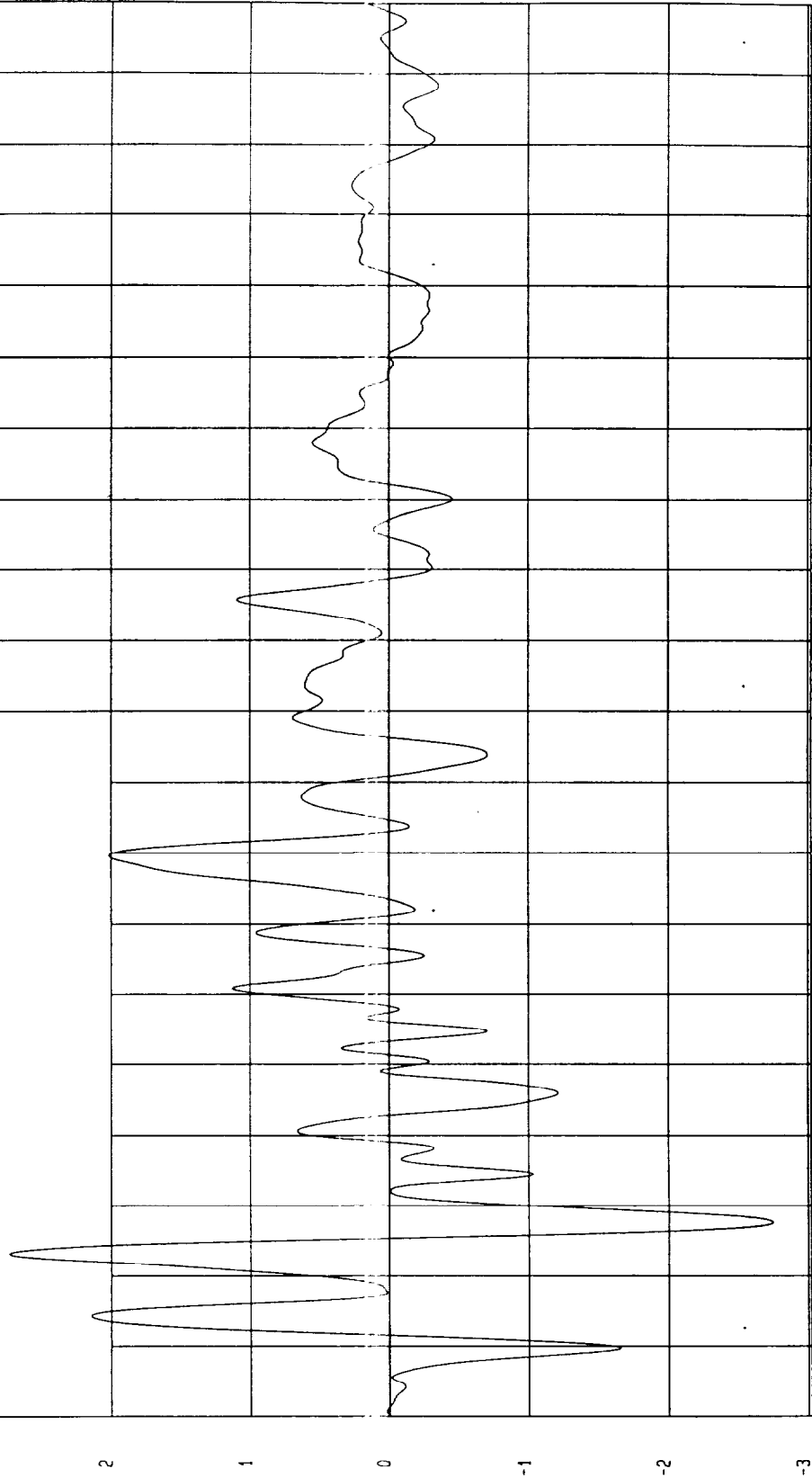
SPEED: 25.8 MPH 41.5 KPH

Maximum = 2.73 KPH at 23 msec

Minimum = -2.74 KPH at 28 msec

CART CG Z VELOCITY

1 C96005A1.V56 Filterclass (180)



NCA Research
04-08-1997 12.46

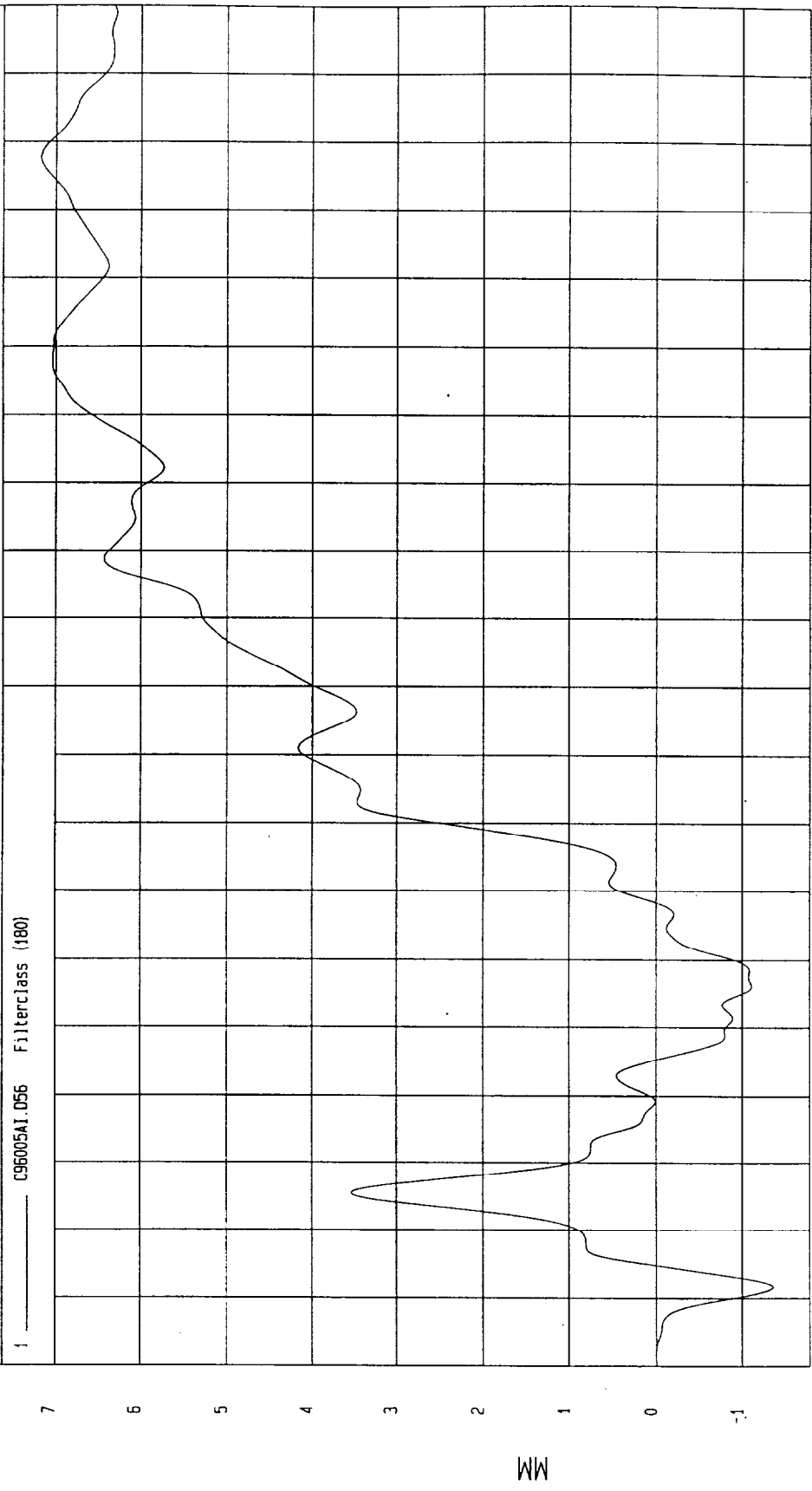
TIME Seconds

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: Speed: 25.8 MPH 41.5 KPH

Minimum = -1.35 MM at 12 msec Maximum = 7.16 MM at 178 msec

CART CG Z DISPLACEMENT



TIME Seconds

MCA Research
04-08-1997 12:46

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

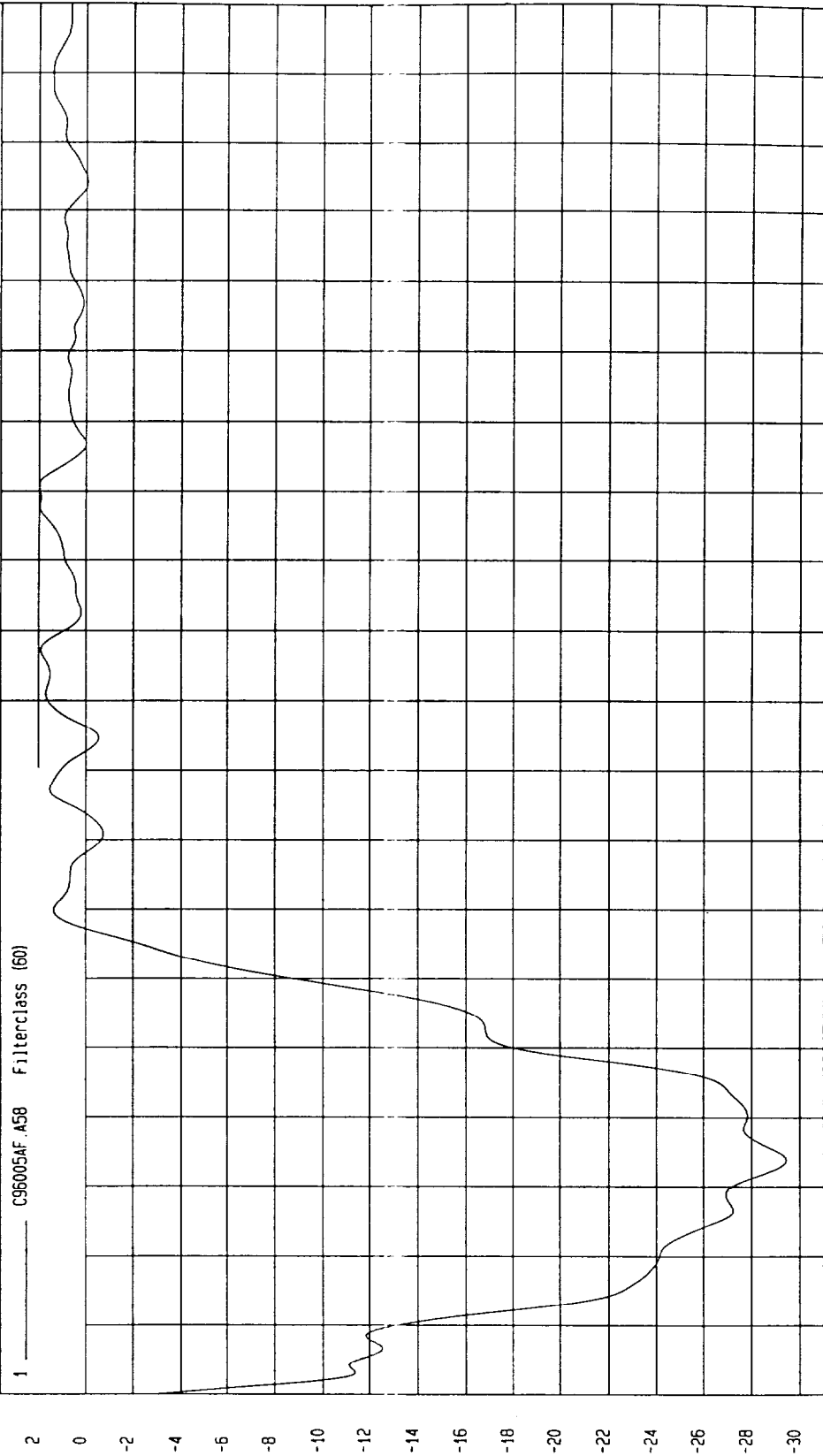
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -29.43 G'S at 34 msec

Maximum = 1.98 G'S at 131 msec

CART REAR X

1 ——— C96005AF.A58 Filterclass (60)



MCA Research
04-09-1997 14:58

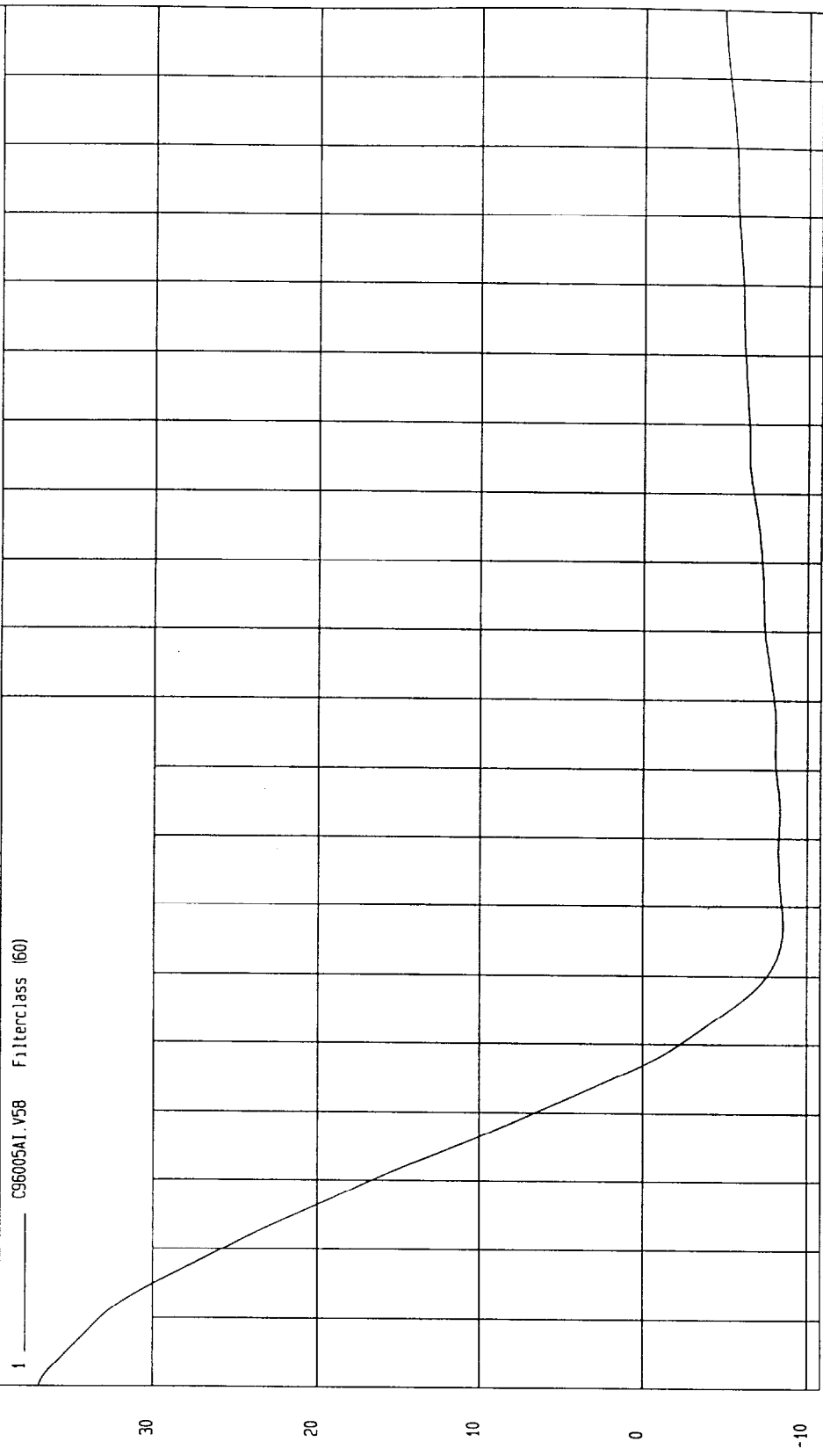
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8.54 KPH at 67 msec Maximum = 37.06 KPH at -2 msec

CART REAR X VELOCITY

1 C96005A1.V58 Filterclass (60)



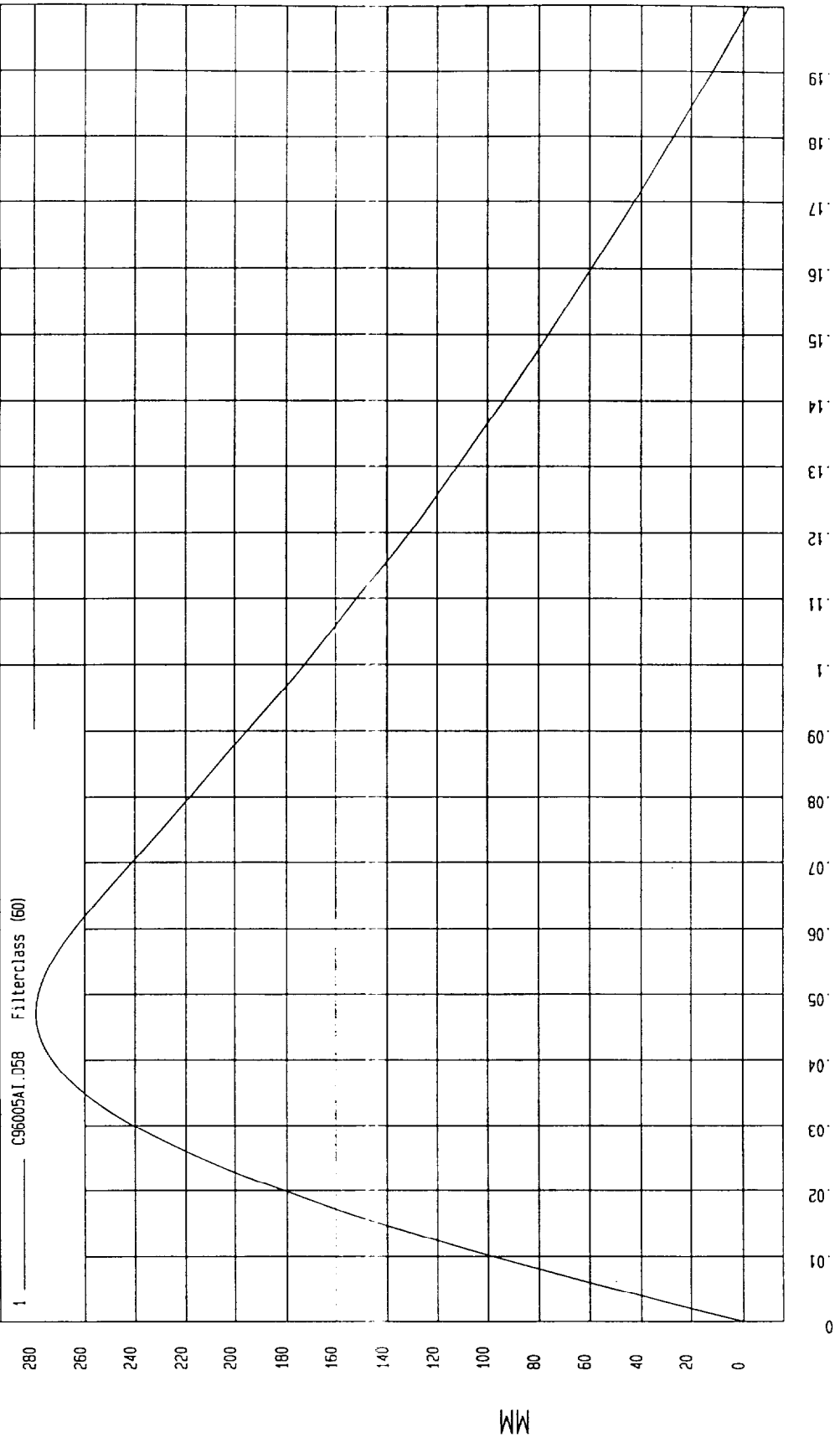
TIME Seconds
MGA Research
04-09-1997 17:24

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -2.00 MM at 200 msec Maximum = 279.40 MM at 47 msec

CART REAR X DISPLACEMENT



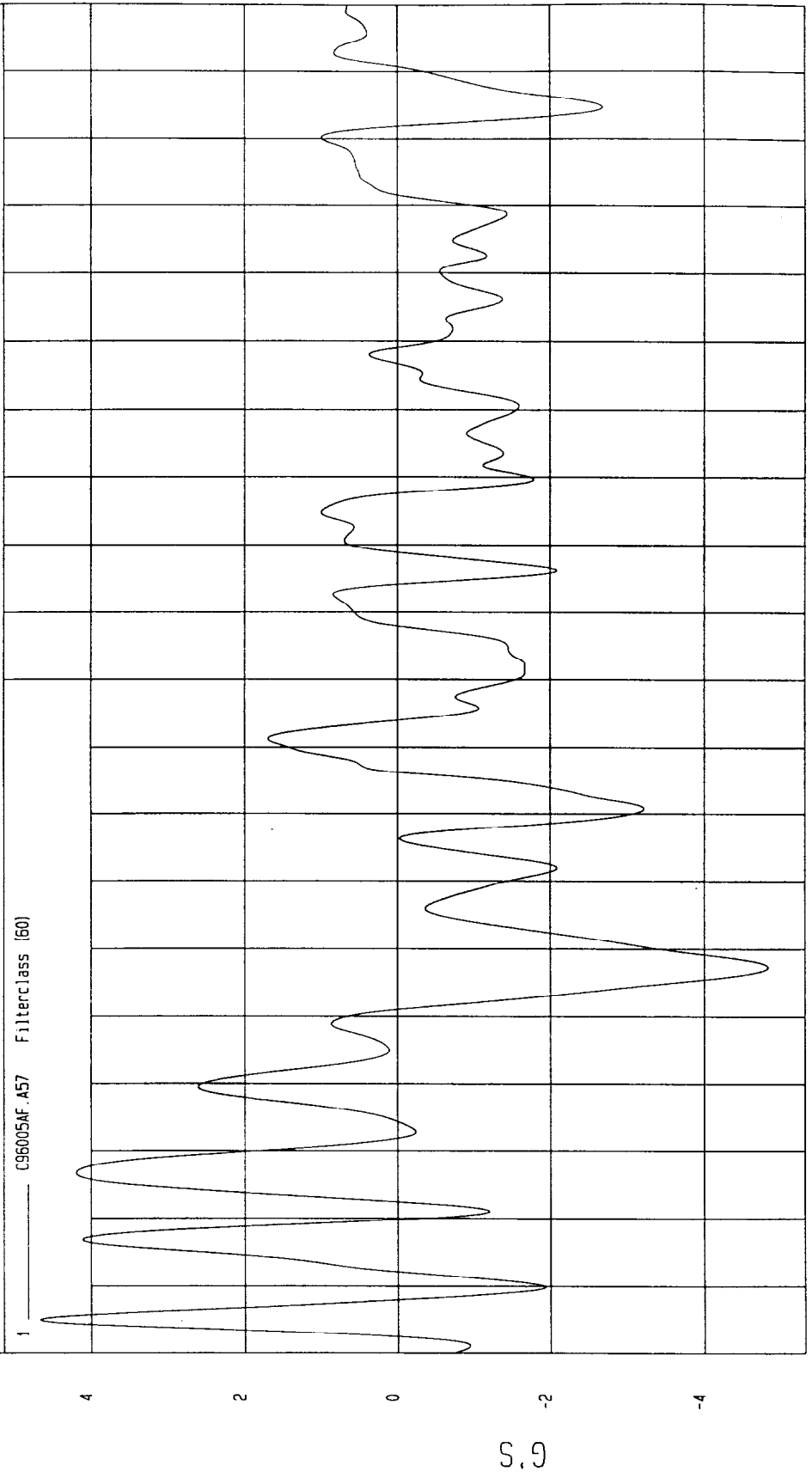
MGA Research
04-09-1997 17:24

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -4.82 G'S at 57 msec Maximum = 4.66 G'S at 5 msec

CART REAR Y



0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19

TIME (seconds)

MCA Research
04-09-1997 14:58

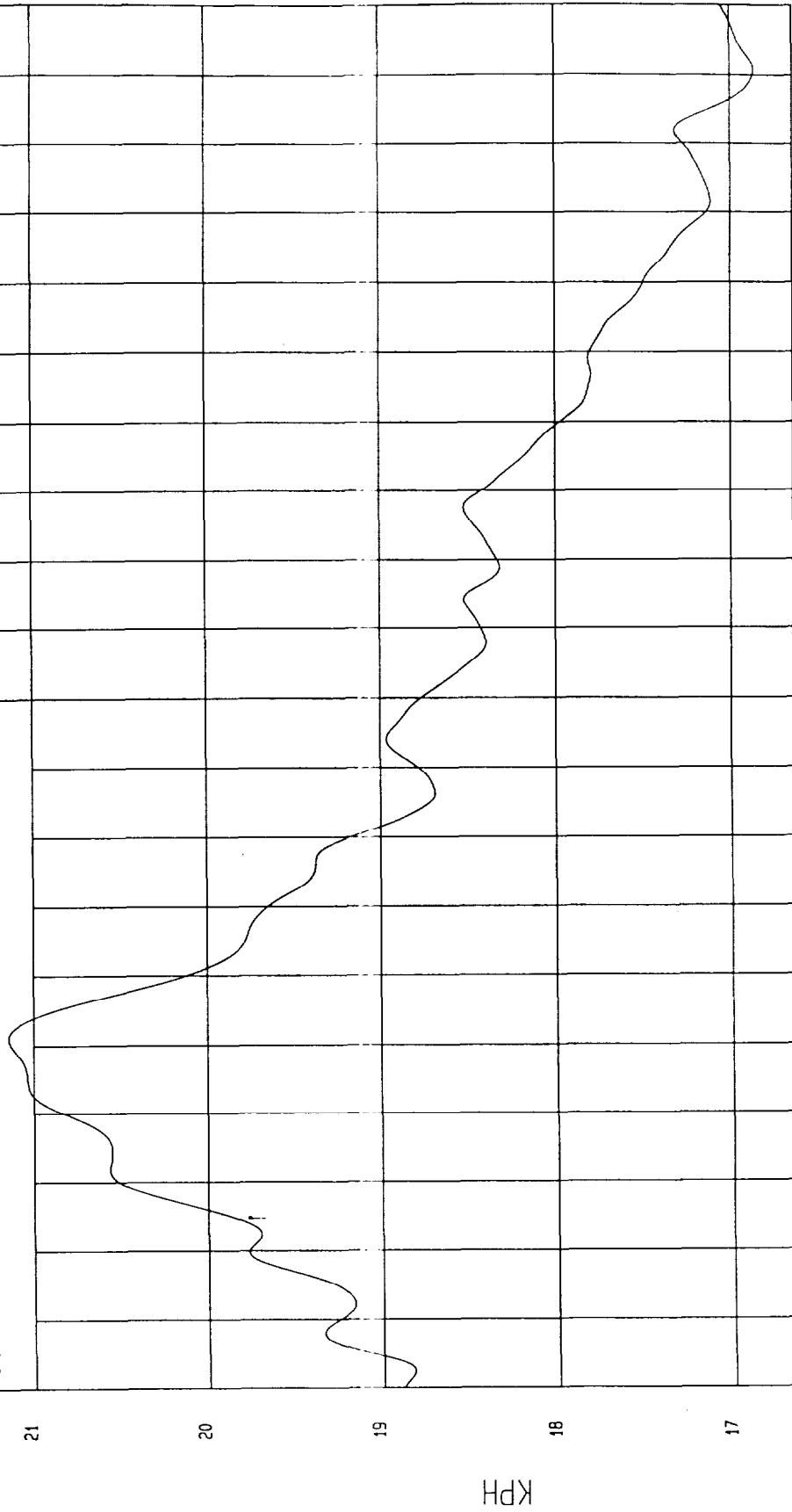
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = 16.86 KPH at 191 msec Maximum = 21.14 KPH at 51 msec

CART REAR Y VELOCITY

1 — C96005AI.V57 Filterclass (60)



0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19

TIME Seconds

MCA Research
04-09-1997 17:24

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

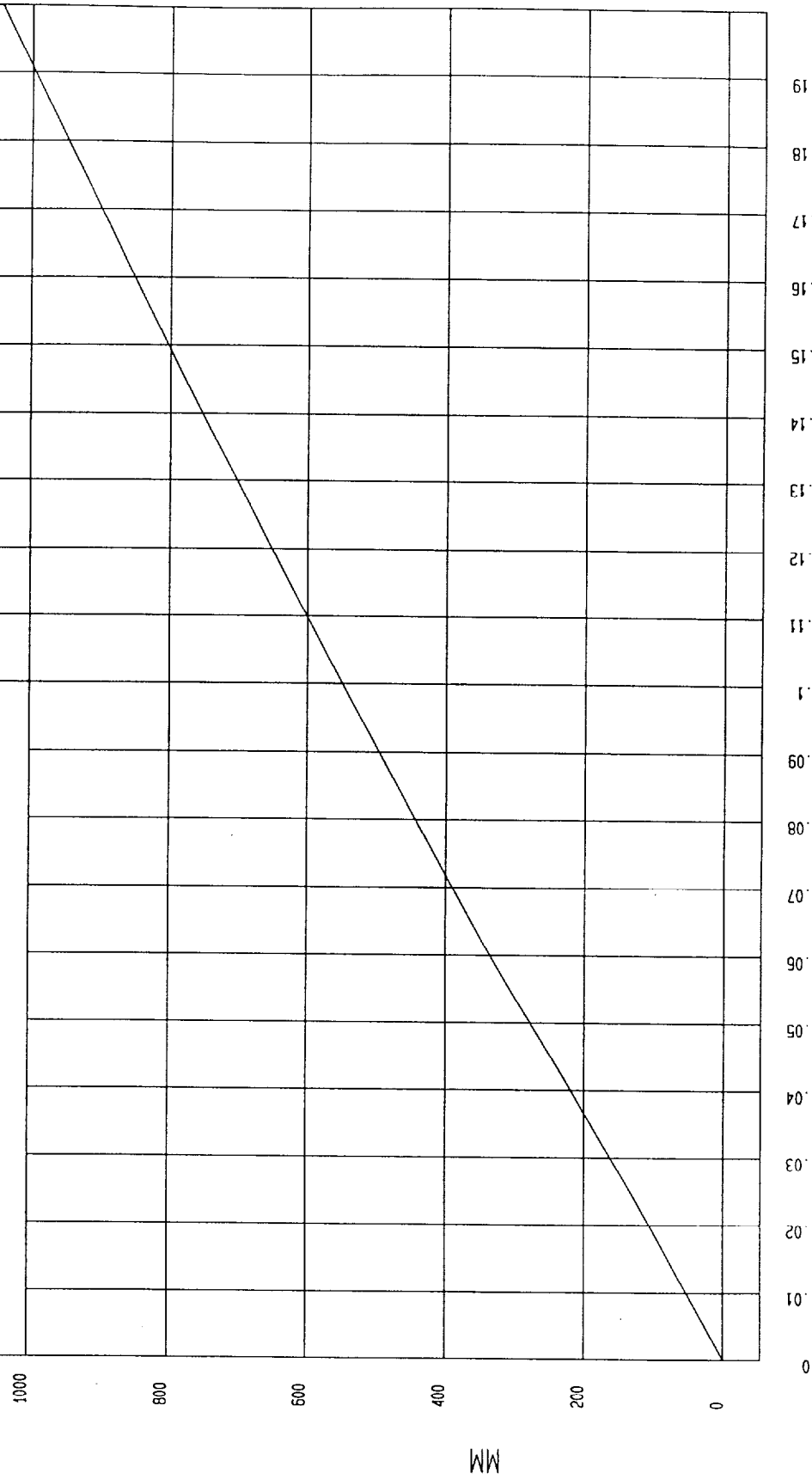
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = 0 MM at 0 msec

Maximum = 1042.33 MM at 200 msec

CART REAR Y DISPLACEMENT

1 ——— C96005A1.D57 Filterclass (60)



NCA Research
04-09-1997 17:24

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -68921.52 N at 36 msec Maximum = 5484.76 N at 10 msec

SUMMED X AXIS FORCES - ROW #1

1 _____ B96005FX.R01 Filterclass (60)

20000

0

-20000

-40000

-60000

-80000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-03-1998 13:53

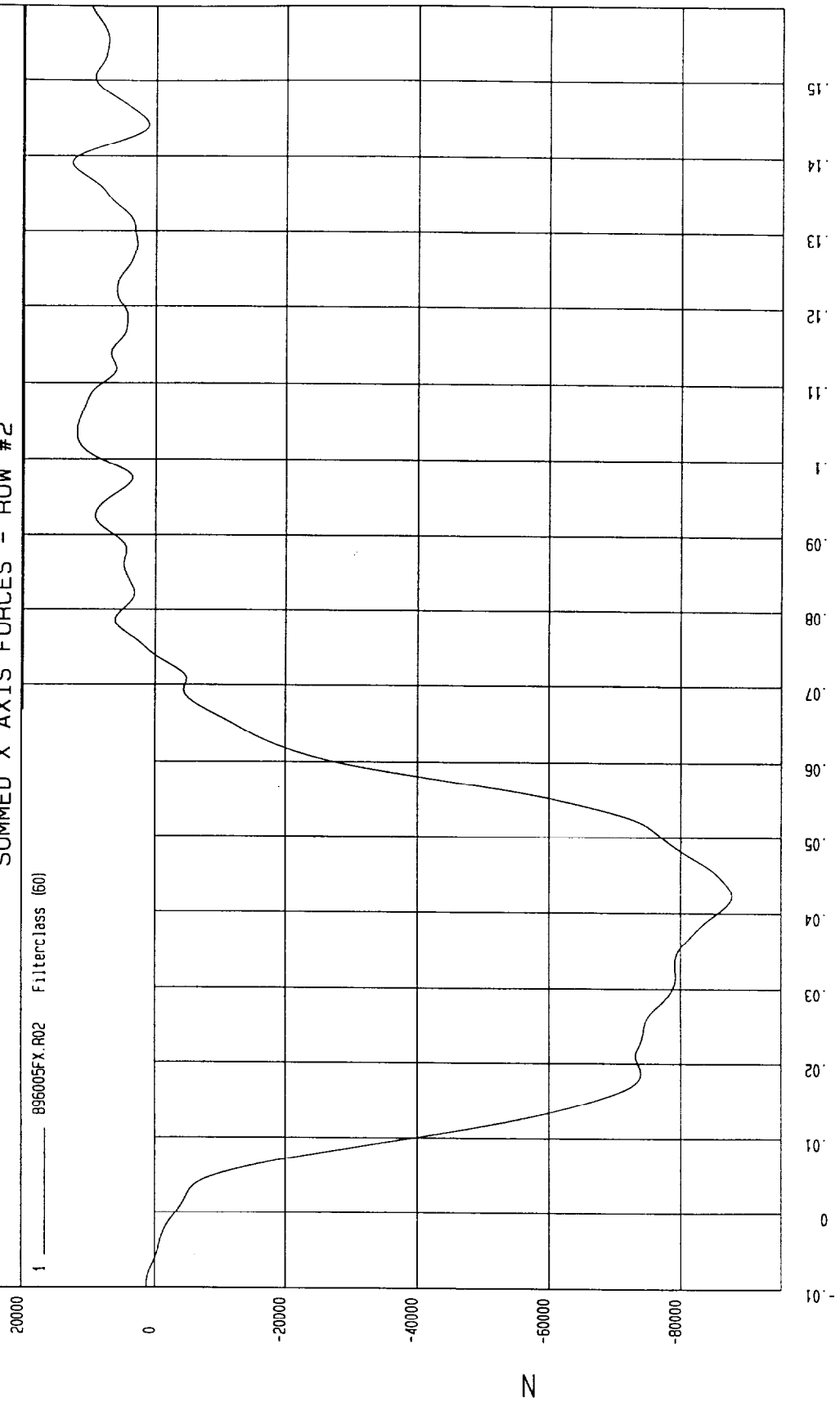
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -87769.84 N at 42 msec Maximum = 12805.68 N at 139 msec

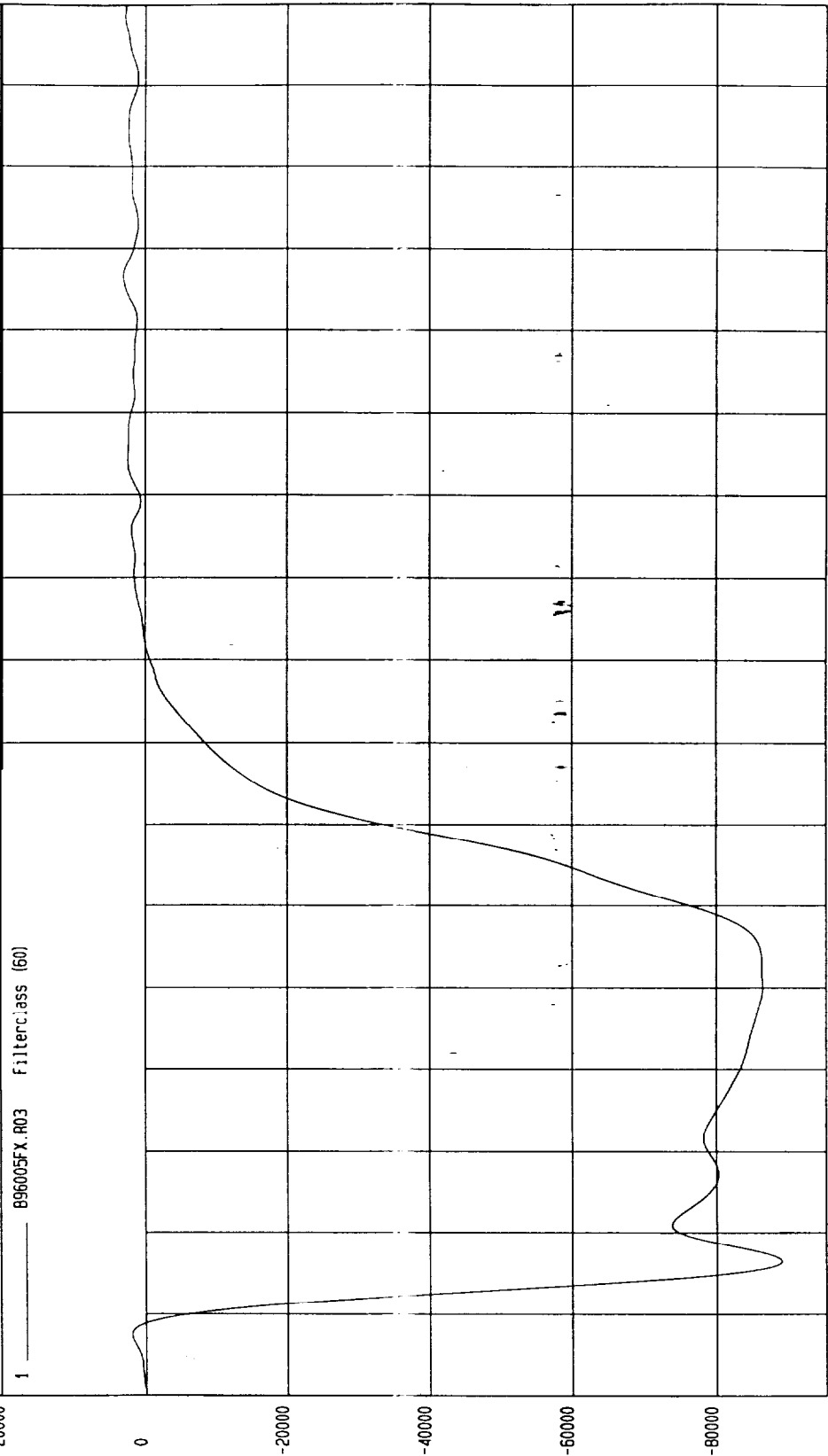
SUMMED X AXIS FORCES - ROW #2

1 896005FX.R02 Filterclass (60)



MGA Research
06-03-1998 13:53

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -89102.77 N at 6 msec	
Maximum = 3136.5 N at 126 msec	
SUMMED X AXIS FORCES - ROW #3	



TIME (SECONDS)

MCA Research
06-03-1998 13:53

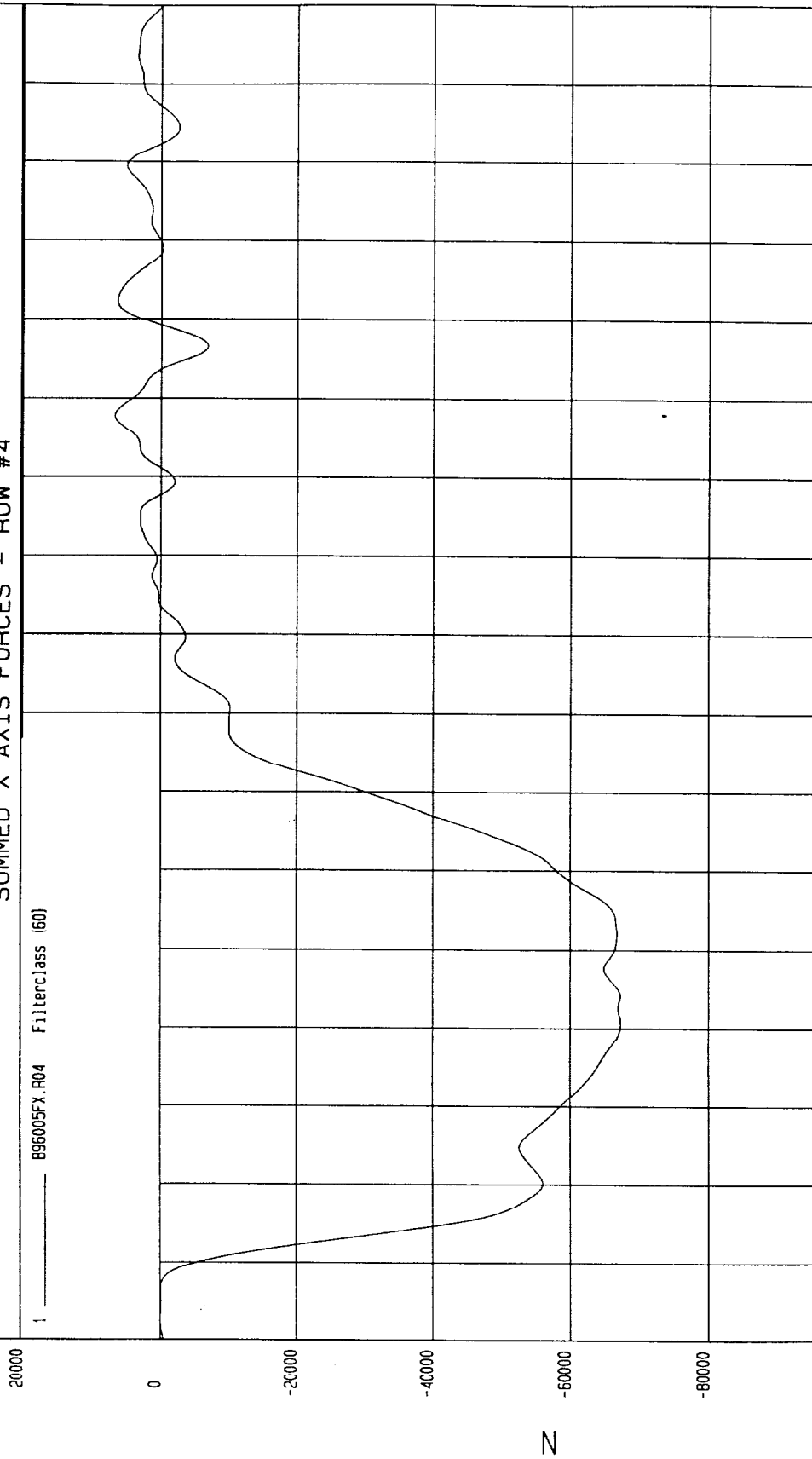
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -67385.33 N at 31 msec Maximum = 6792.89 N at 108 msec

SUMMED X AXIS FORCES - ROW #4

1 ——— B96005FX.R04 Filterclass (60)



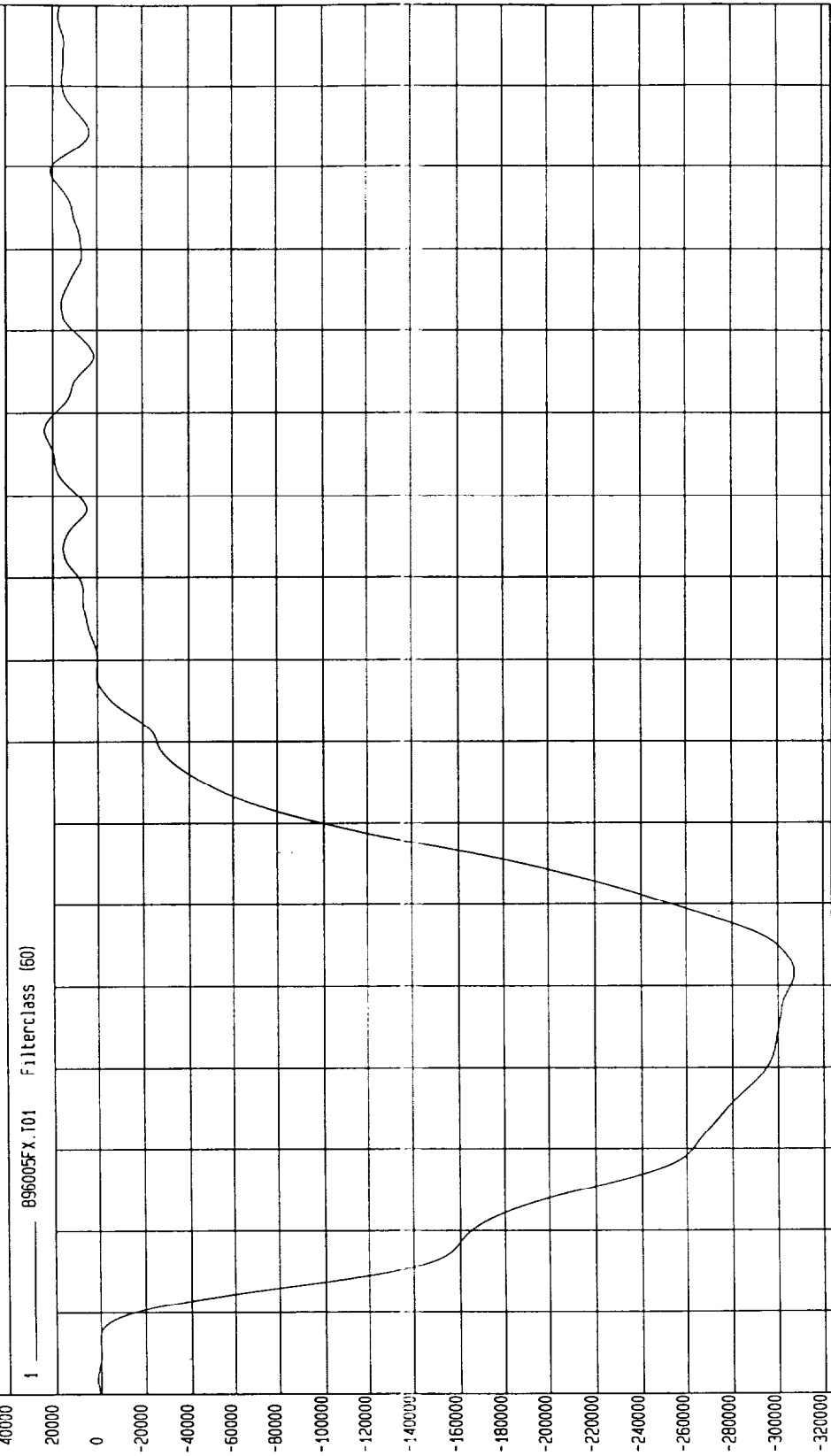
MCA Research
06-03-1998 13:53

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -307194 N at 42 msec Maximum = 23692.68 N at 108 msec

SUM OF ALL X AXIS FORCES



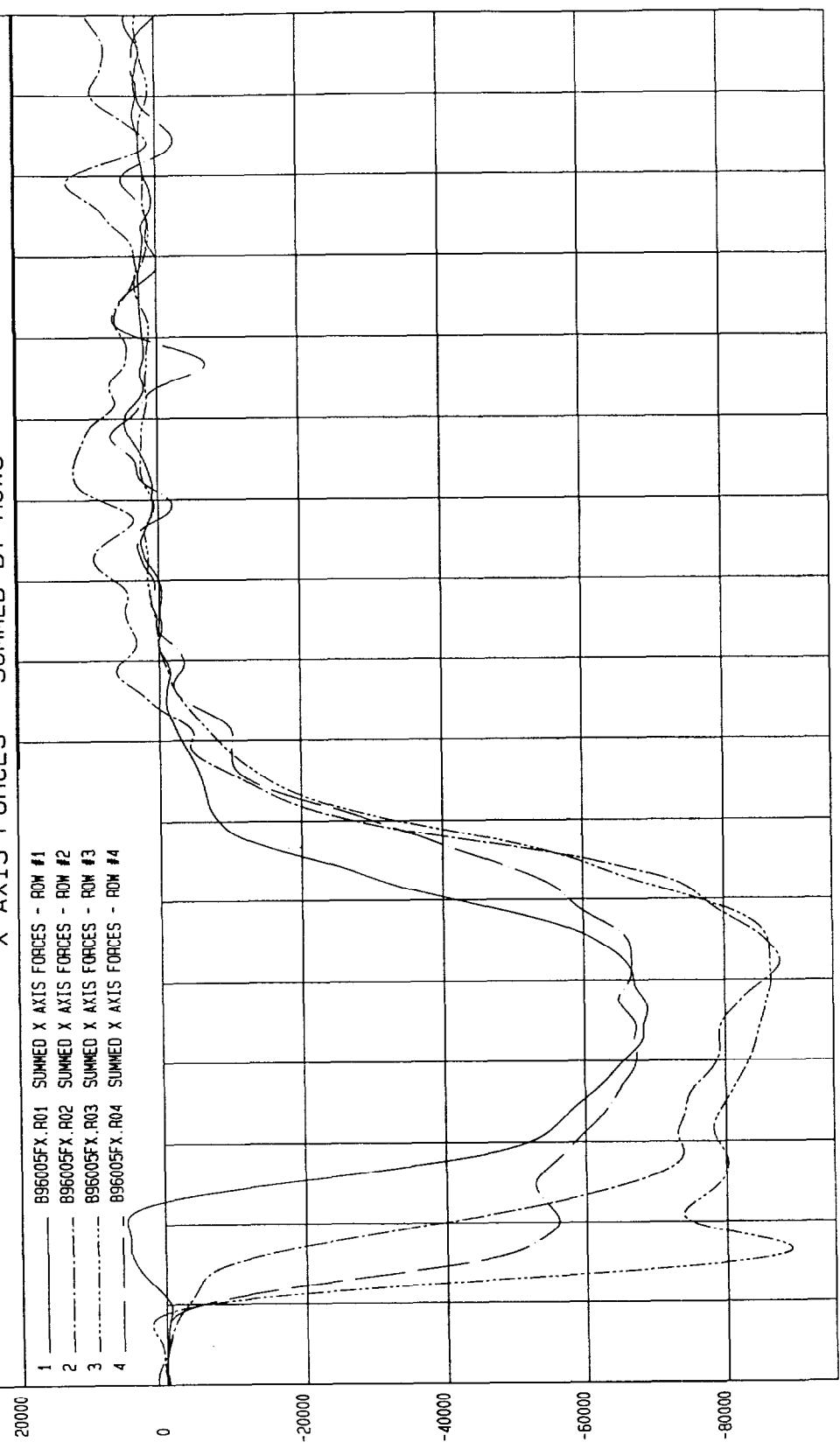
TIME (SECONDS)

MCA Research
06-03-1998 14:05

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

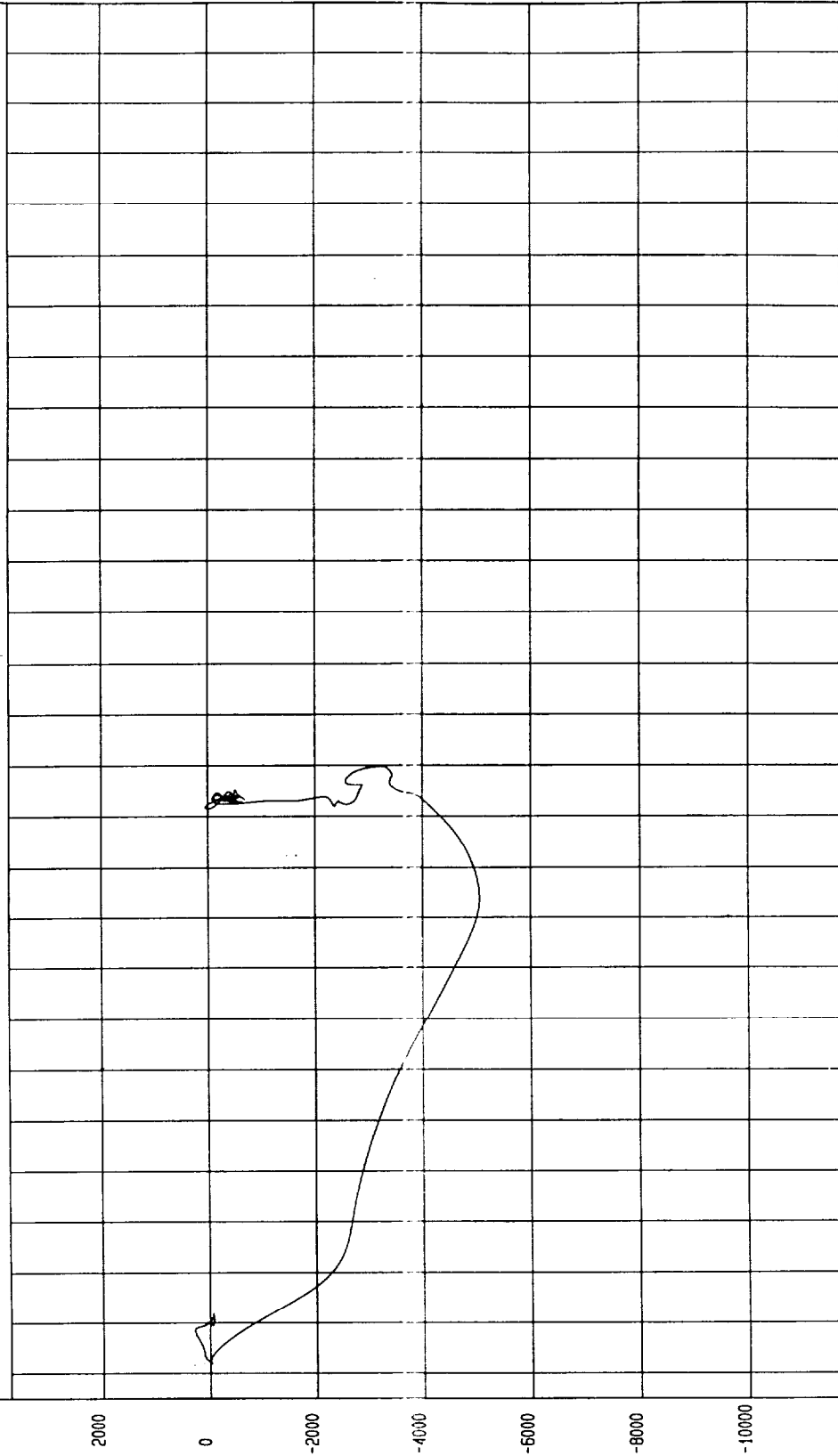
X AXIS FORCES - SUMMED BY ROWS



MGA Research
06-03-1998 14:07

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -5052.01 N at 84 MM	
Maximum = 288.41 N at -1 MM	

FORCE X LOAD CELL #1 VS STRINGPOT #1



STRING POT 1 MM

MCA Research
05-02-1998 15.08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

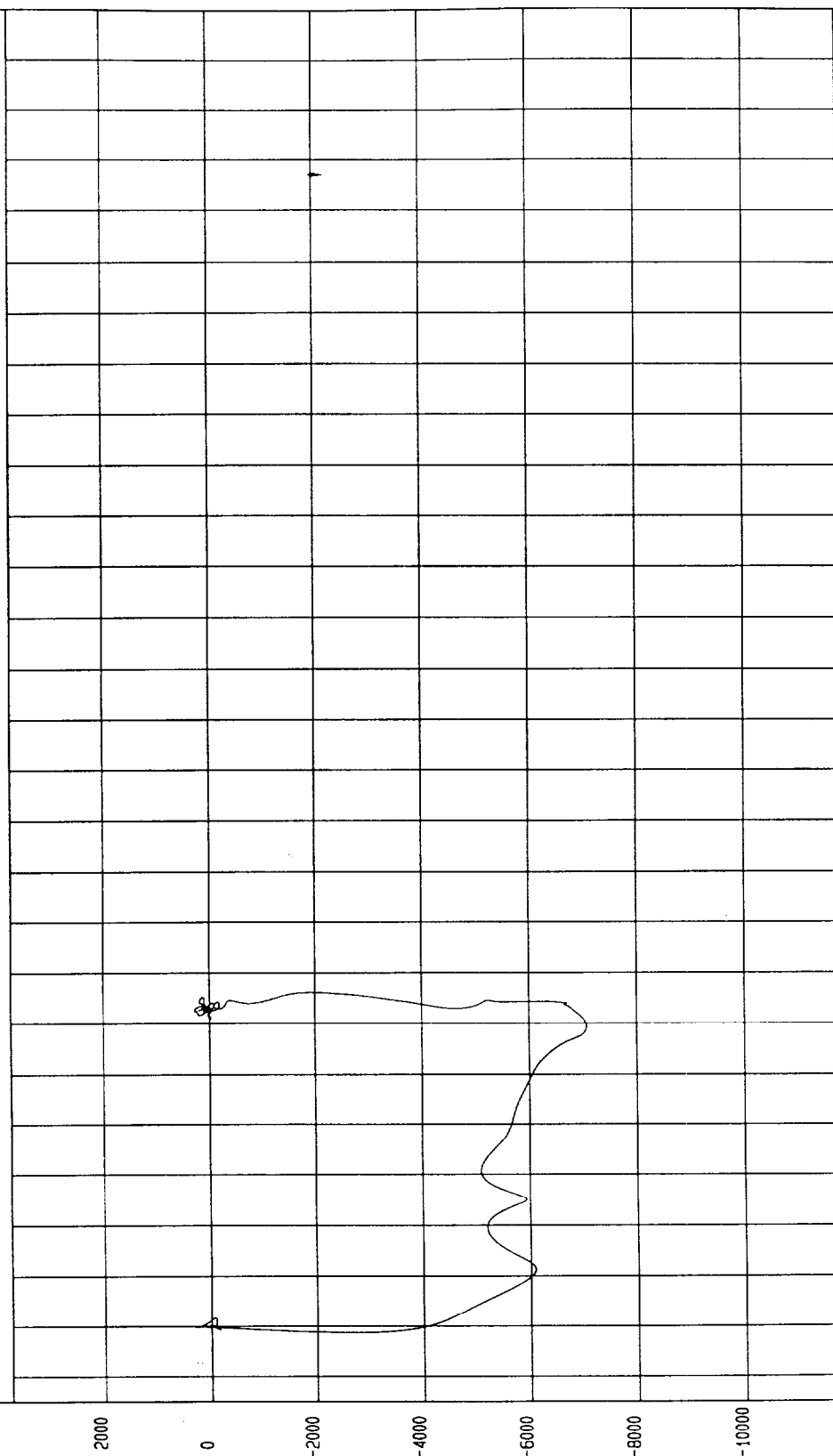
Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 317.08 N at 0 MM

Minimum = -7067.48 N at 59 MM

FORCE X LOAD CELL #2 VS STRINGPOT #2



MCA Research
06-02-1998 15:08

STRING POT 2 MM

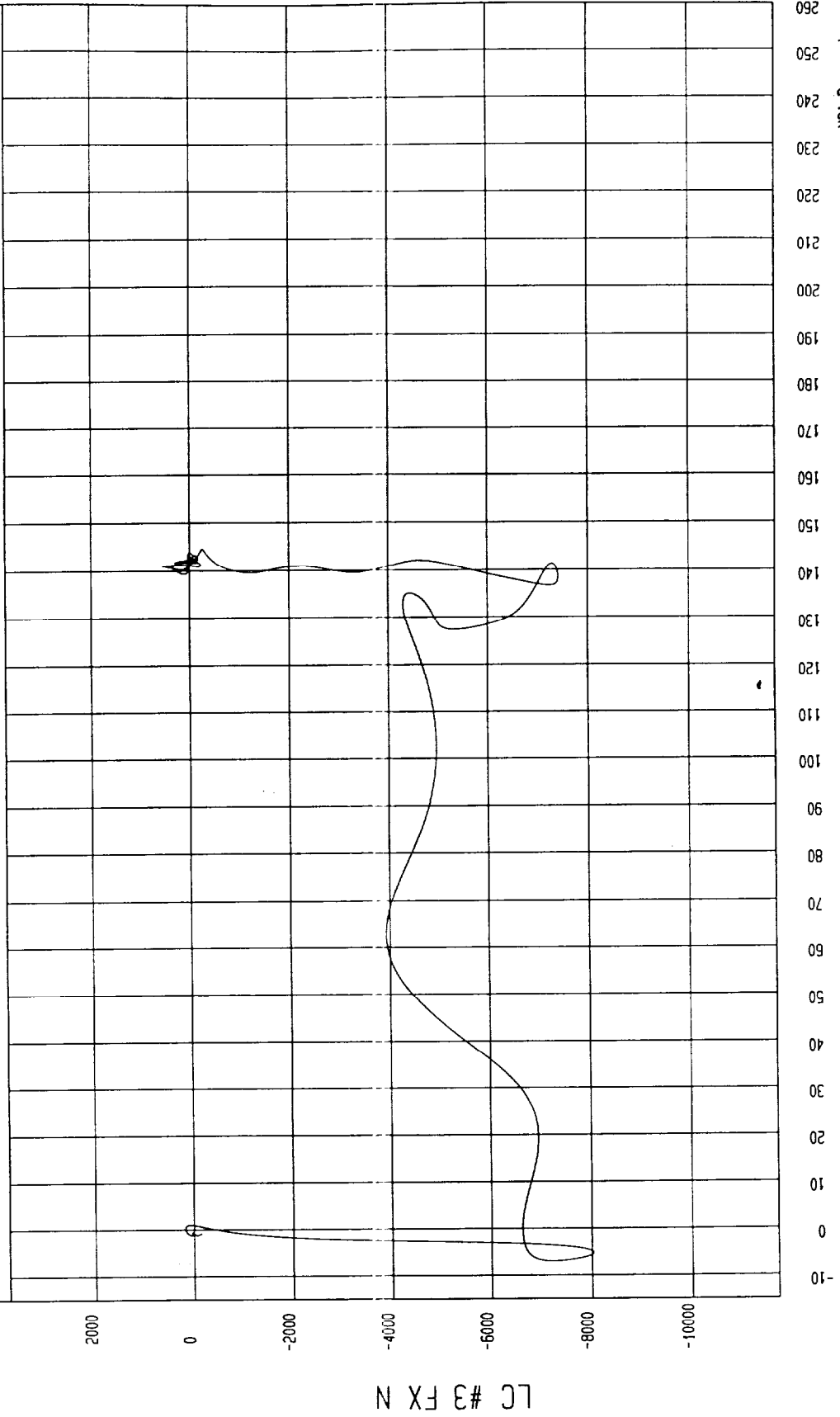
LC #2 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8030.46 N at -5 MM Maximum = 536.64 N at 141 MM

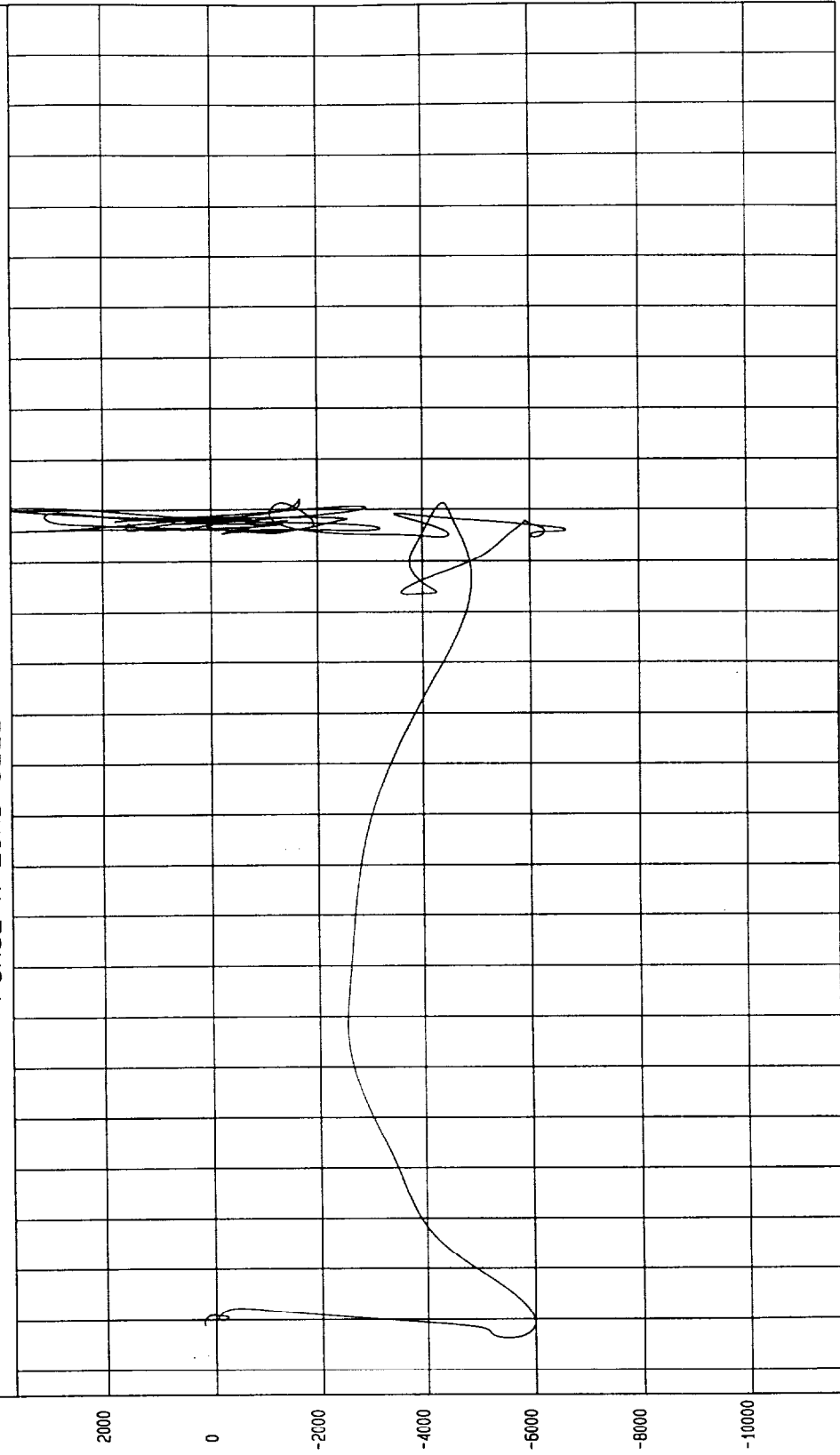
FORCE X LOAD CELL #3 VS STRINGPOT #3



STRING POT 3 MM MGA Research 06-02-1998 15:08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -6660.30 N at 156 MM	
Maximum = 5041.01 N at 156 MM	

FORCE X LOAD CELL #4 VS STRINGPOT #4



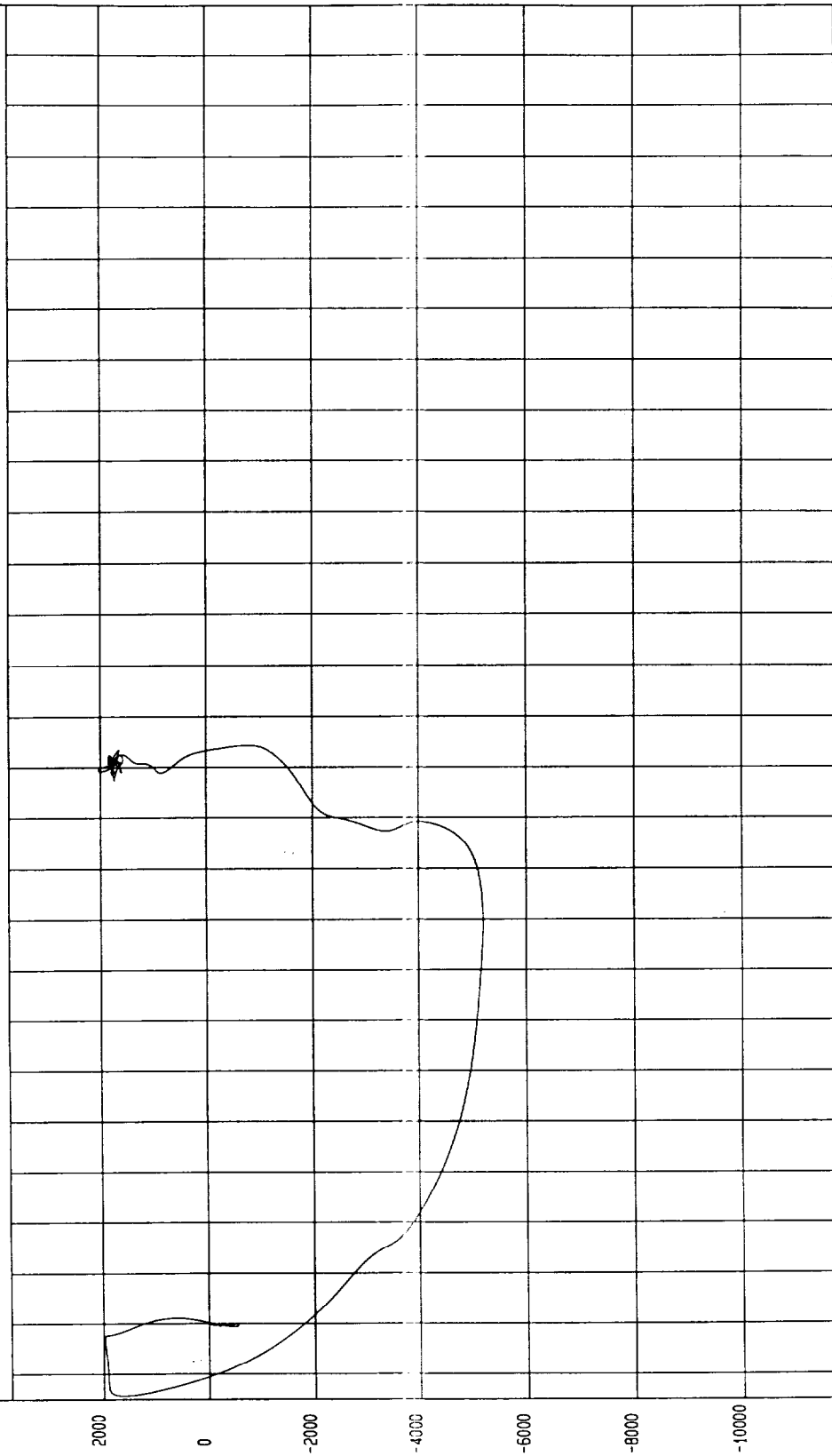
MGA Research
06-02-1998 15:08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5187.15 N at 79 MM Maximum = 2042.36 N at 109 MM

FORCE X LOAD CELL #5 VS STRINGPOT #5



STRING POT 5 MM
MGA Research
06-02-1998 15:08

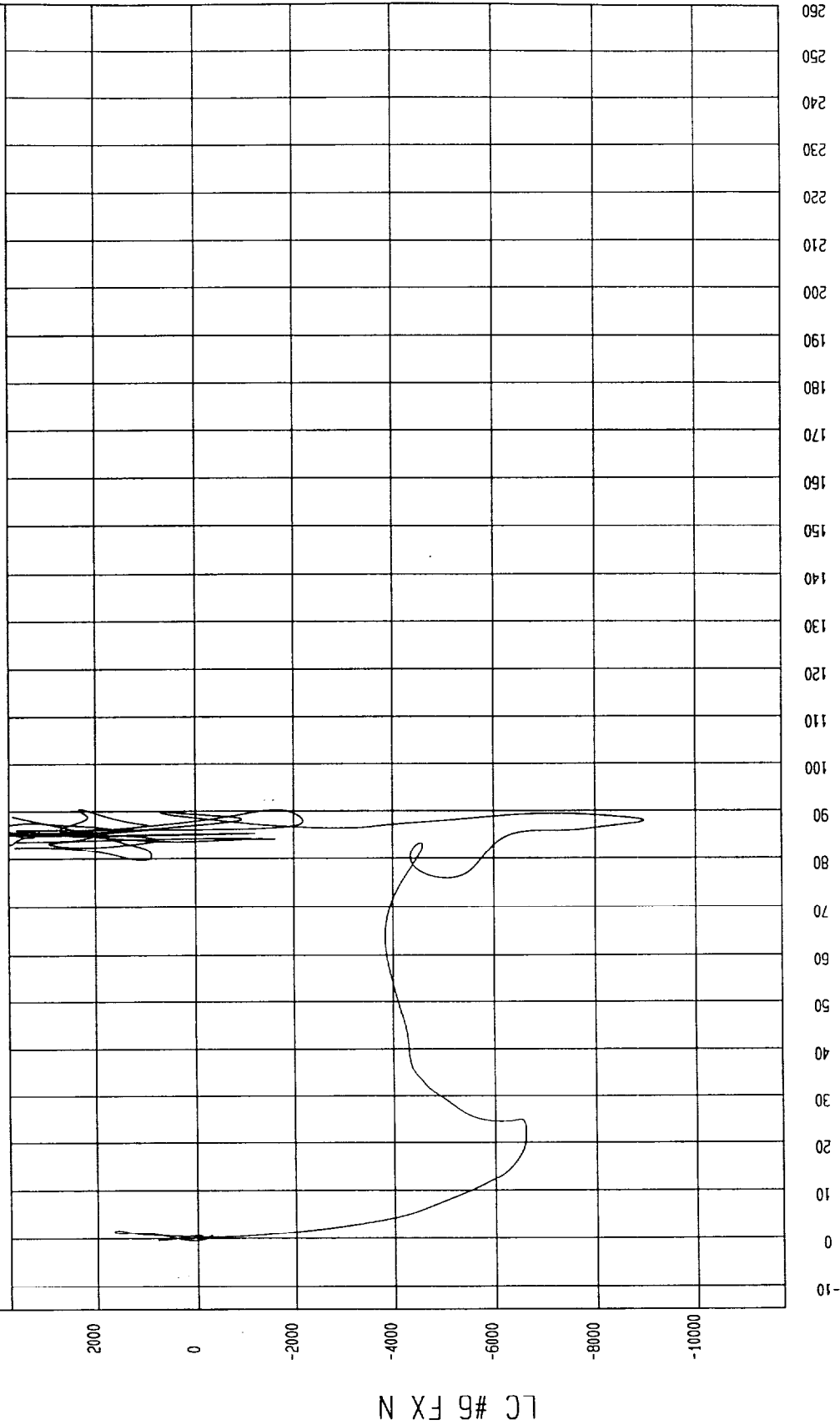
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8966.95 N at 88 MM

Maximum = 7583.50 N at 87 MM

FORCE X LOAD CELL #6 VS STRINGPOT #6



STRING POT #6 MM

MCA Research
06-02-1998 15.08

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

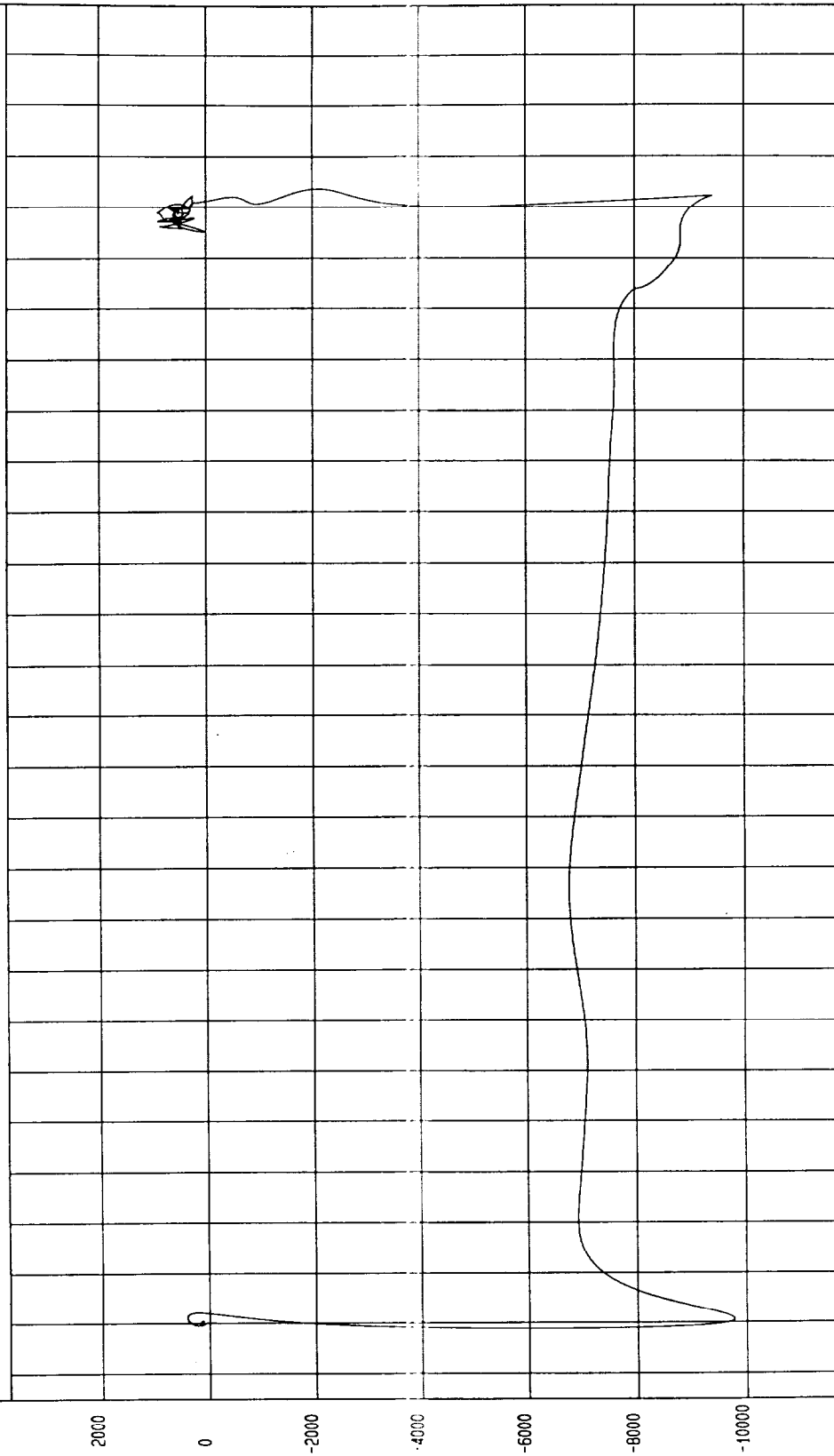
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -9771.01 N at 0 MM

Maximum = 917.26 N at 219 MM

FORCE X LOAD CELL #7 VS STRINGPOT #7



STRING POT #7 MM

MSA Research
06-02-1998 15:08

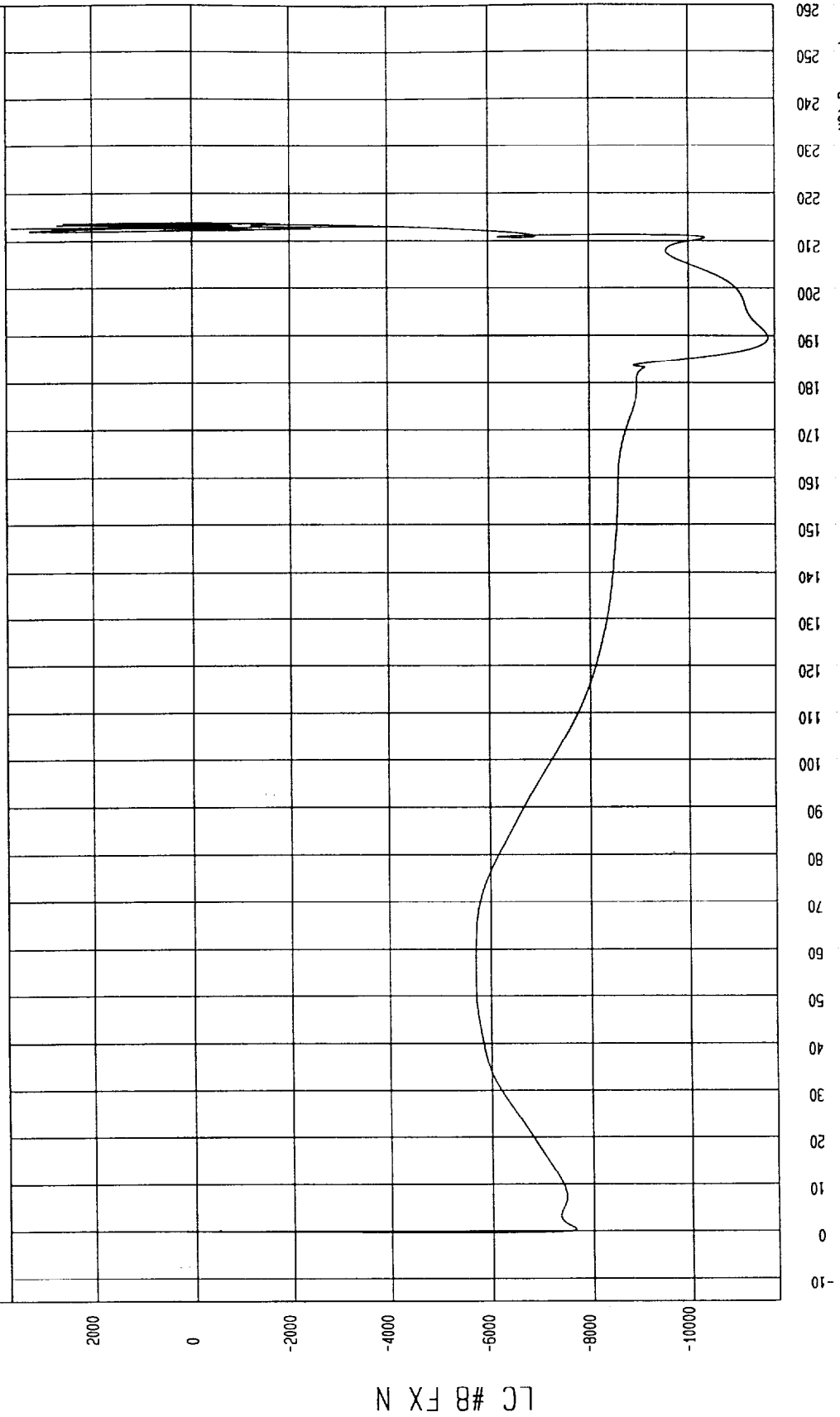
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -11562.48 N at 189 MM

Maximum = 4974.97 N at 213 MM

FORCE X LOAD CELL #8 VS STRINGPOT #8



MCA Research
06-02-1998 15:09

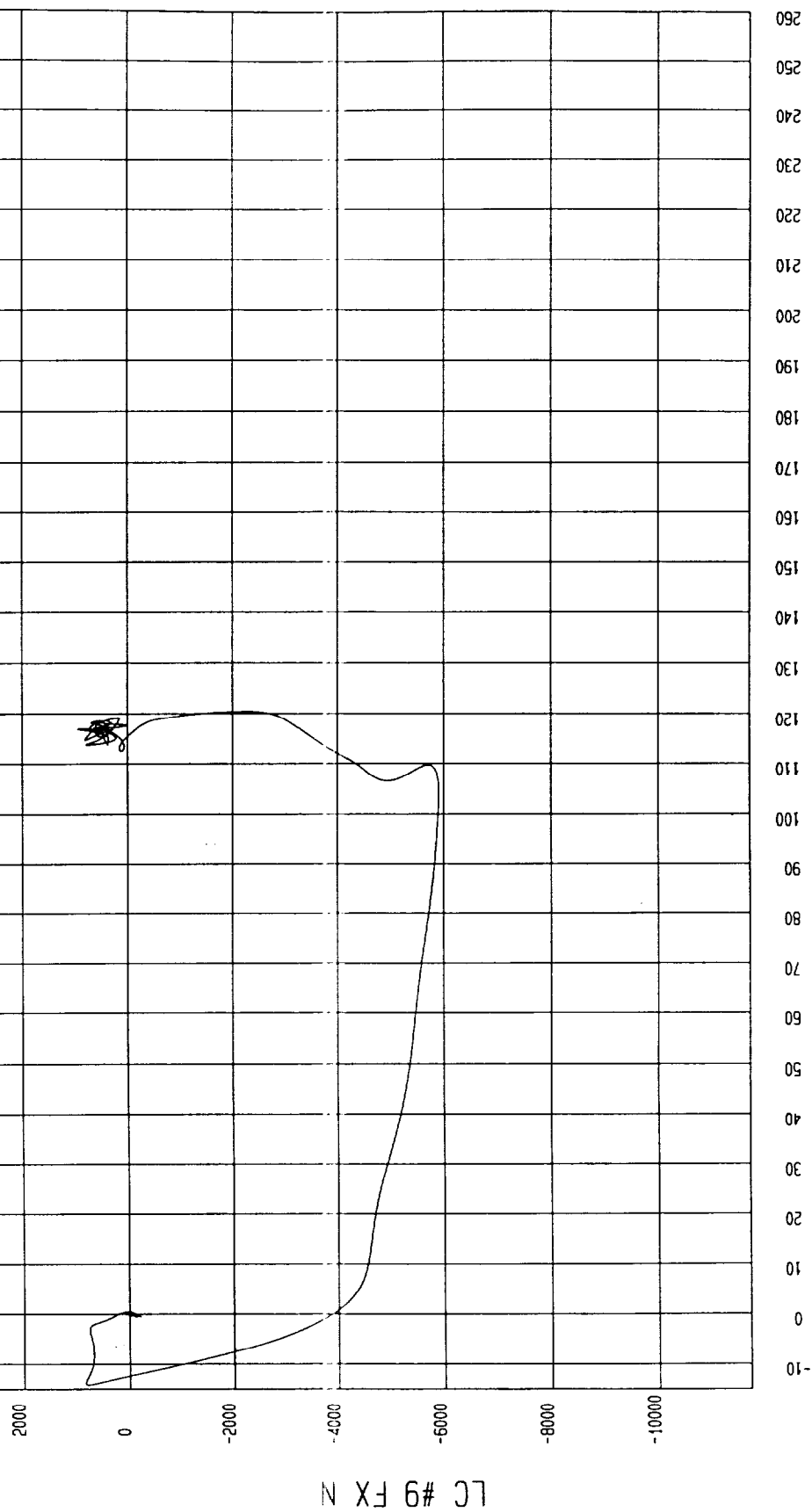
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -5903.93 N at 104 MM

Maximum = 946.75 N at 117 MM

FORCE X LOAD CELL #9 VS STRINGPOT #9



MGA Research
06-02-1998 15:09

STRING POT #9 MM

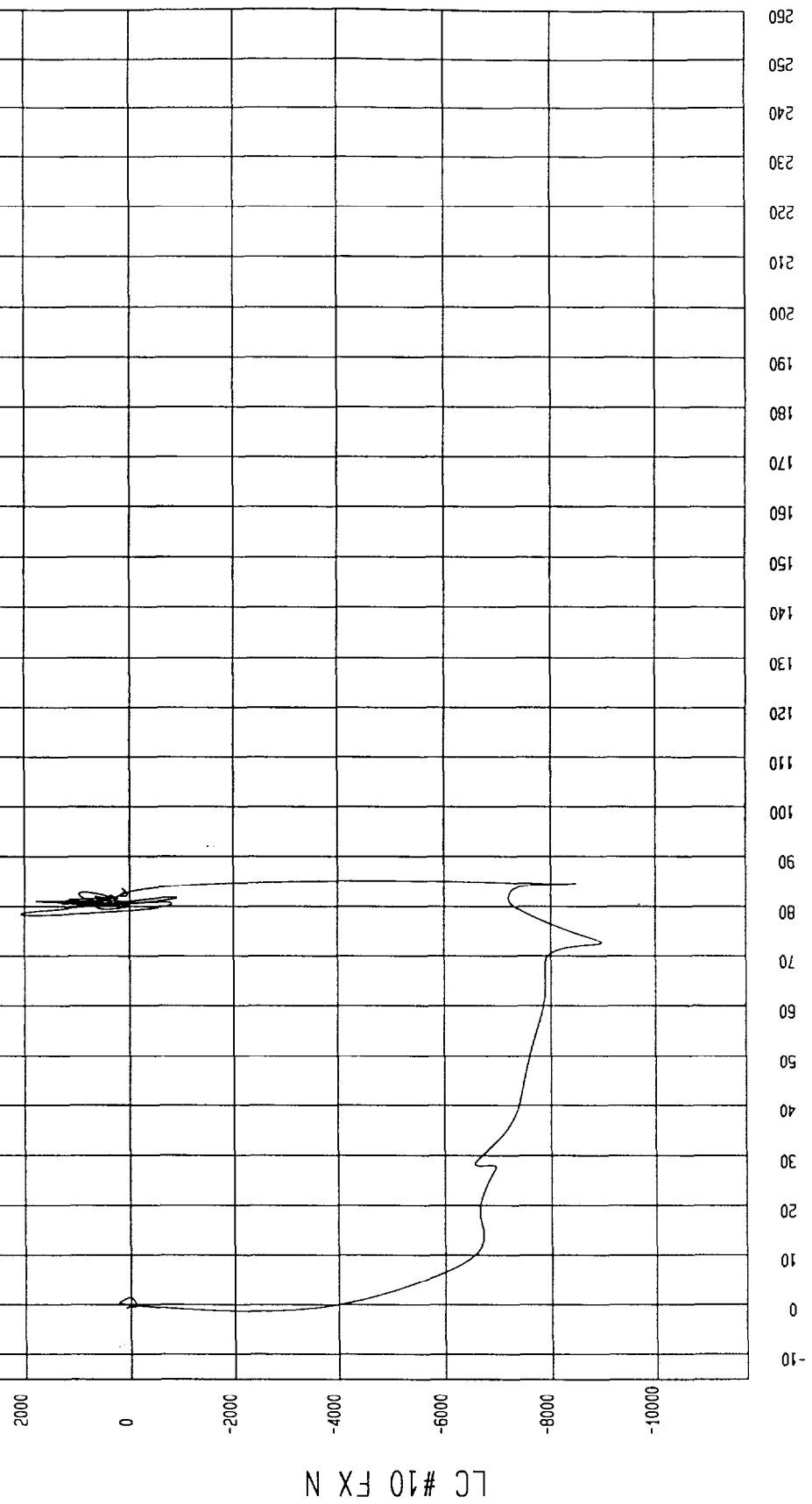
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8975.37 N at 73 MM

Maximum = 2063.92 N at 78 MM

FORCE X LOAD CELL #10 VS STRINGPOT #10



MCA Research
06-02-1998 15:09

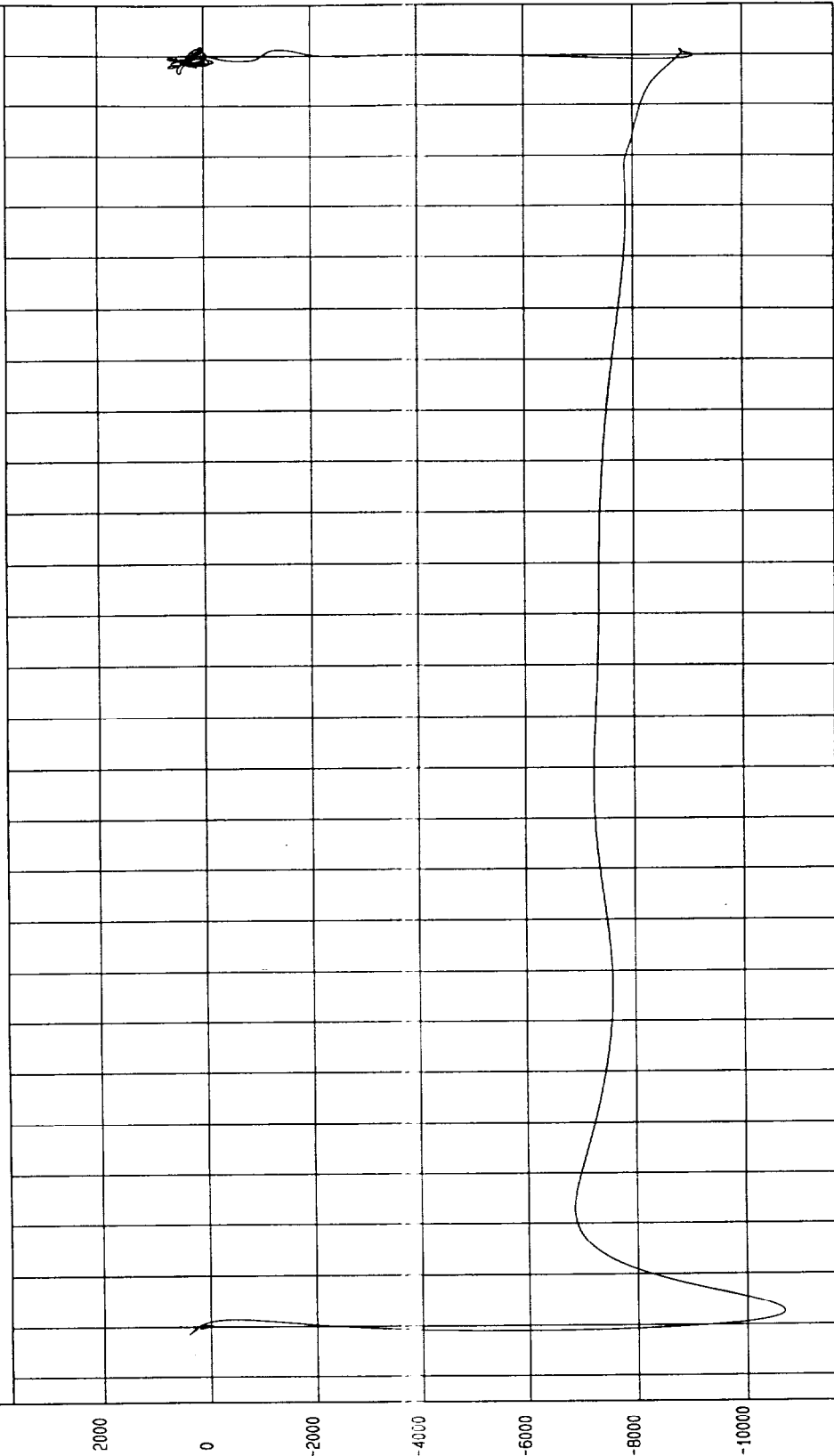
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

SPEED: 25.8 MPH 41.5 KPH

Maximum = 700.87 N at 249 MM

Minimum = -10711.25 N at 2 MM

FORCE X LOAD CELL #11 VS STRINGPOT #11



MGA Research
06-02-1998 15:09

STRING POT 11 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

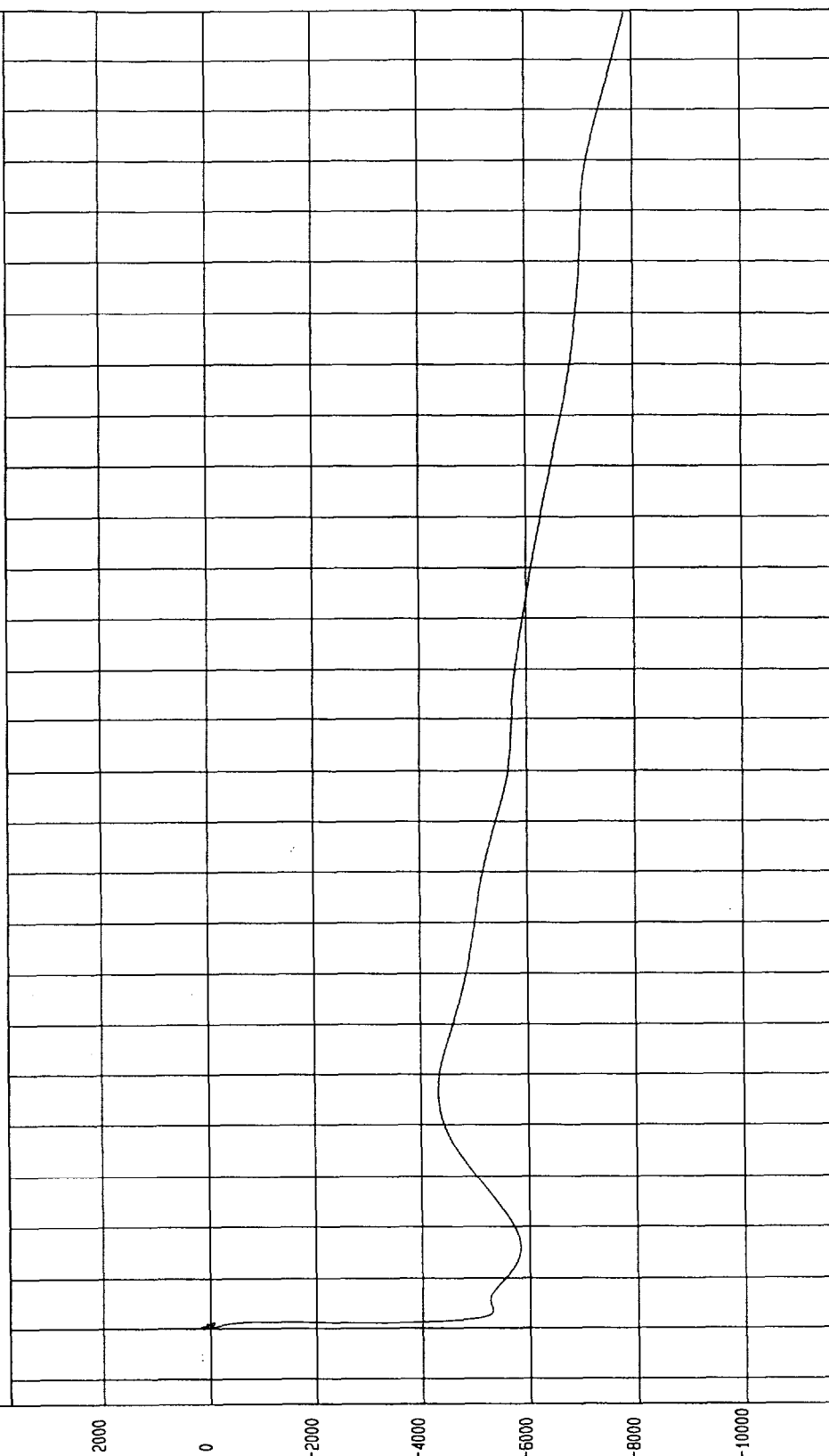
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1014.41 N at 336 MM

Minimum = -8204.89 N at 281 MM

FORCE X LOAD CELL #12 VS STRINGPOT #12

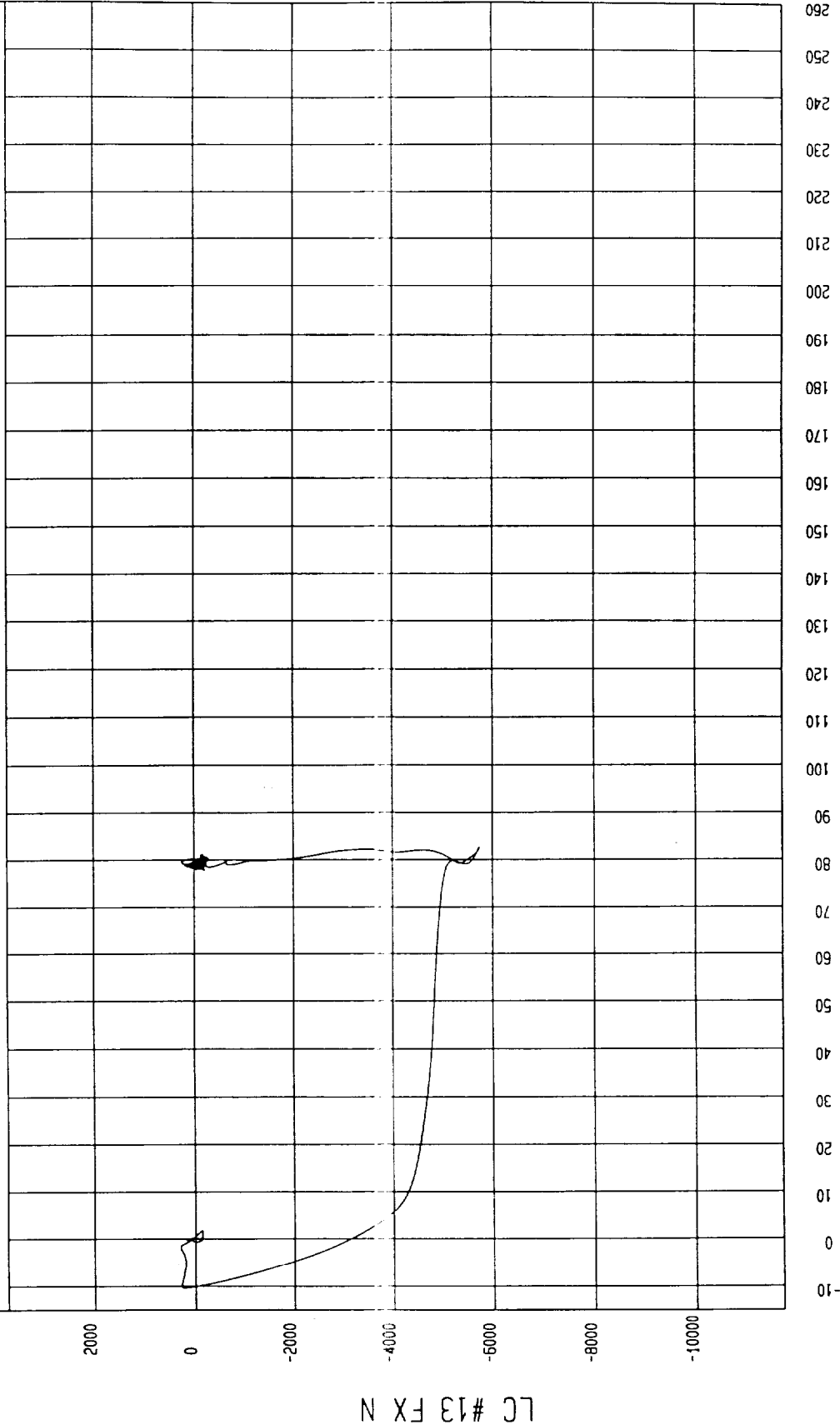


MCA Research
06-02-1998 15:09

STRING POT 12 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -5735.05 N at 83 MM	
Maximum = 288.74 N at -2 MM	

FORCE X LOAD CELL #13 VS STRINGPOT #13



NSA Research
06-02-1998 15:10

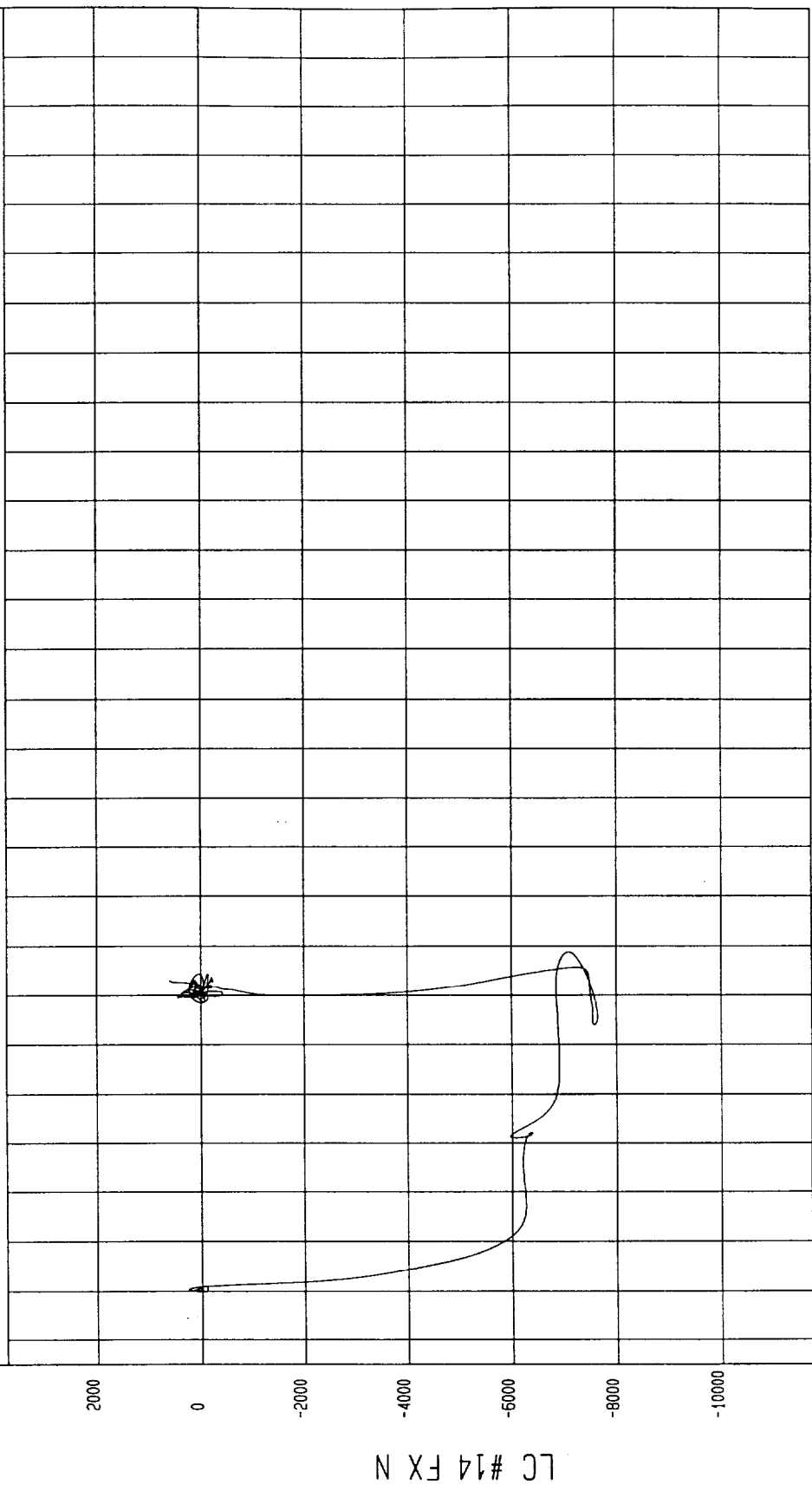
STRING POT 13 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7632.04 N at 56 MM Maximum = 588.23 N at 63 MM

FORCE X LOAD CELL #14 VS STRINGPOT #14



STRING POT 14 MM MCA Research 06-02-1998 15:10

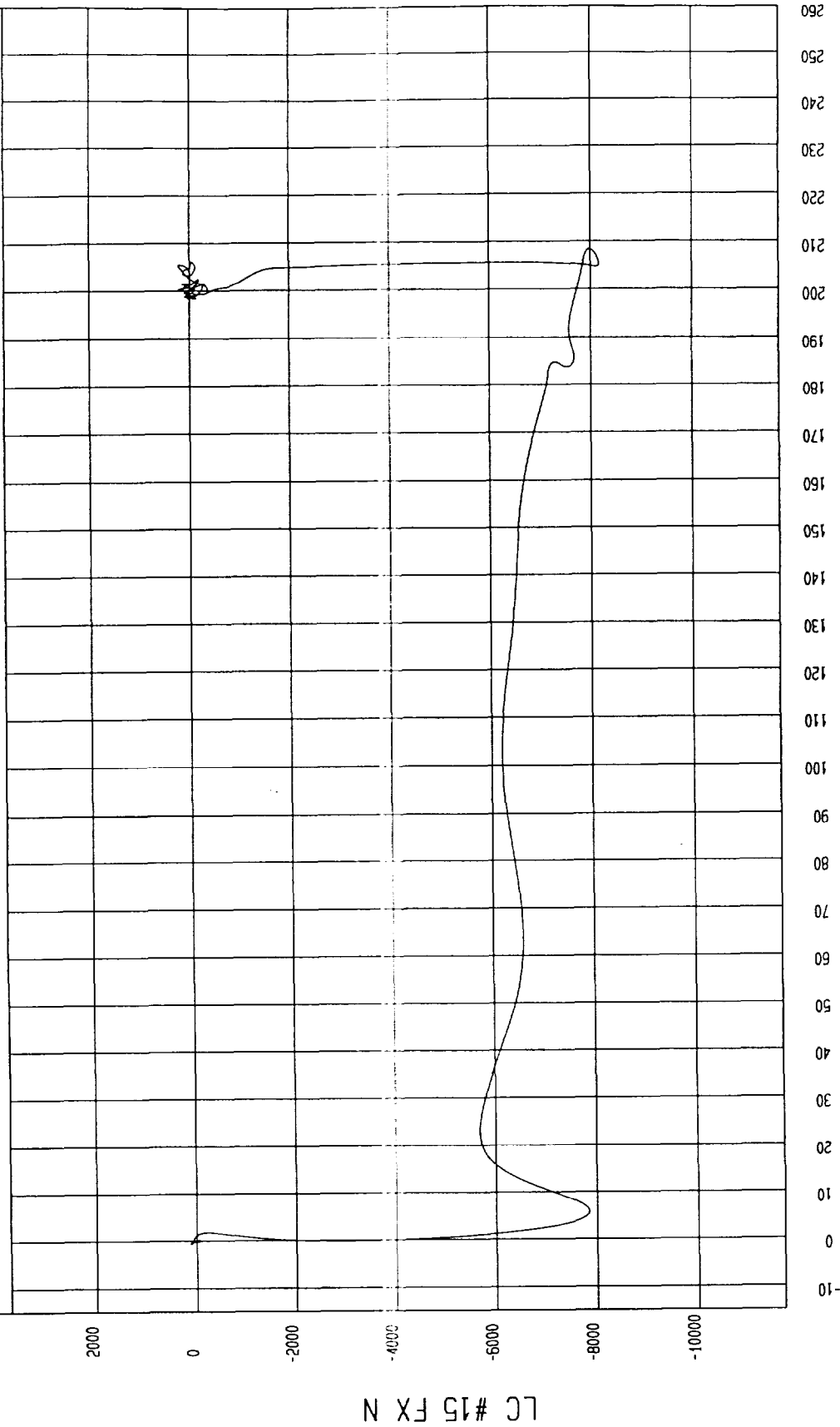
LC #14 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8168.84 N at 205 MM Maximum = 226.65 N at 205 MM

FORCE X LOAD CELL #15 VS STRINGPOT #15



WGA Research
06-02-1998 15:10

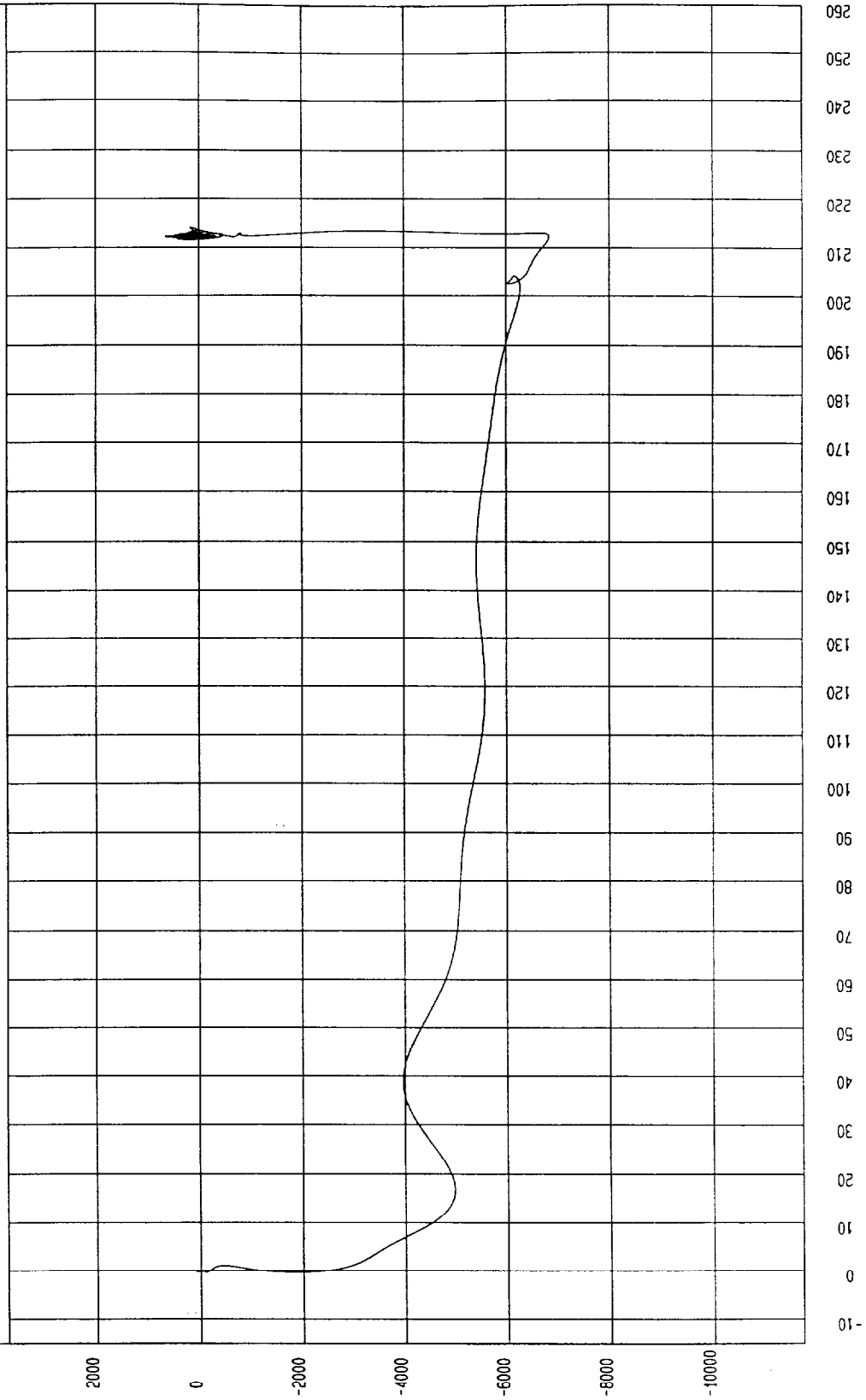
STRING POT 15 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6821.81 N at 212 MM Maximum = 642.85 N at 212 MM

FORCE X LOAD CELL #16 VS STRINGPOT #16



WCA Research
06-02-1996 15:10

STRING POT 16 MM

LC #16 FX N

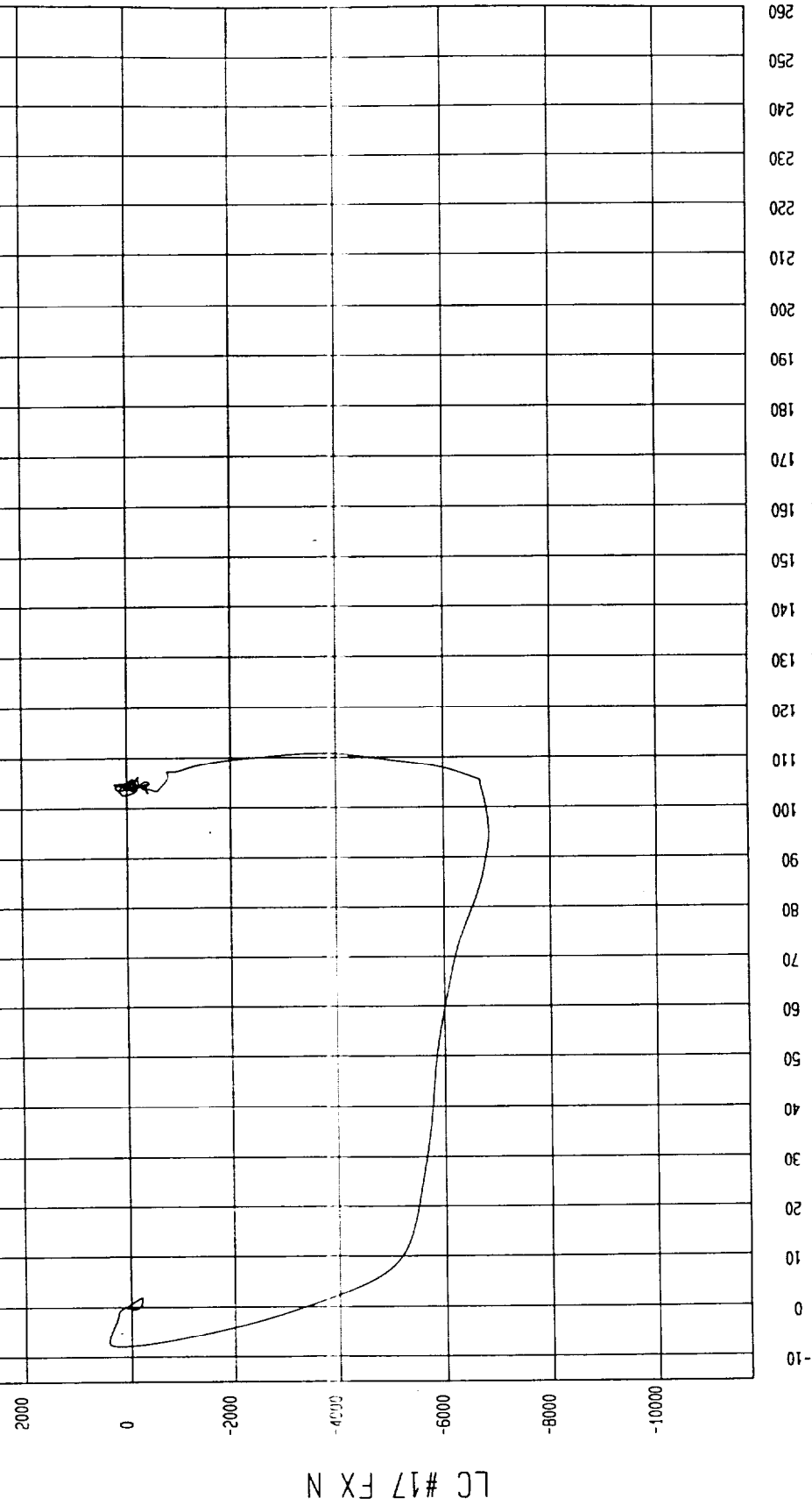
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6856.92 N at 94 MM

Maximum = 412.14 N at -7 MM

FORCE X LOAD CELL #17 VS STRINGPOT #17



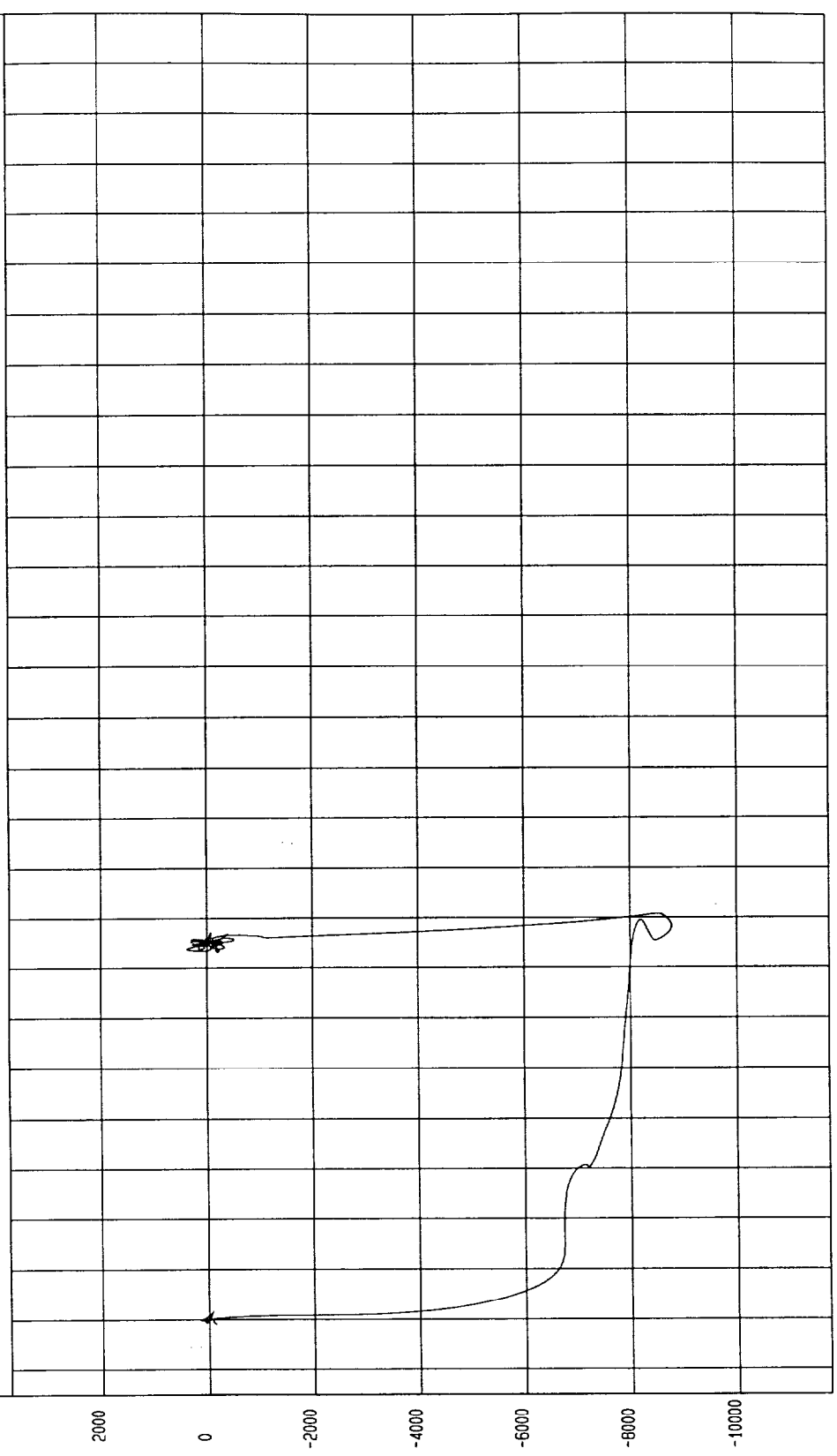
MGA Research
06-02-1998 15:10

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -8767.03 N at 78 MM Maximum = 371.64 N at 74 MM

FORCE X LOAD CELL #18 VS STRINGPOT #18



STRING POT 18 MM

MGA Research
06-02-1998 15:11

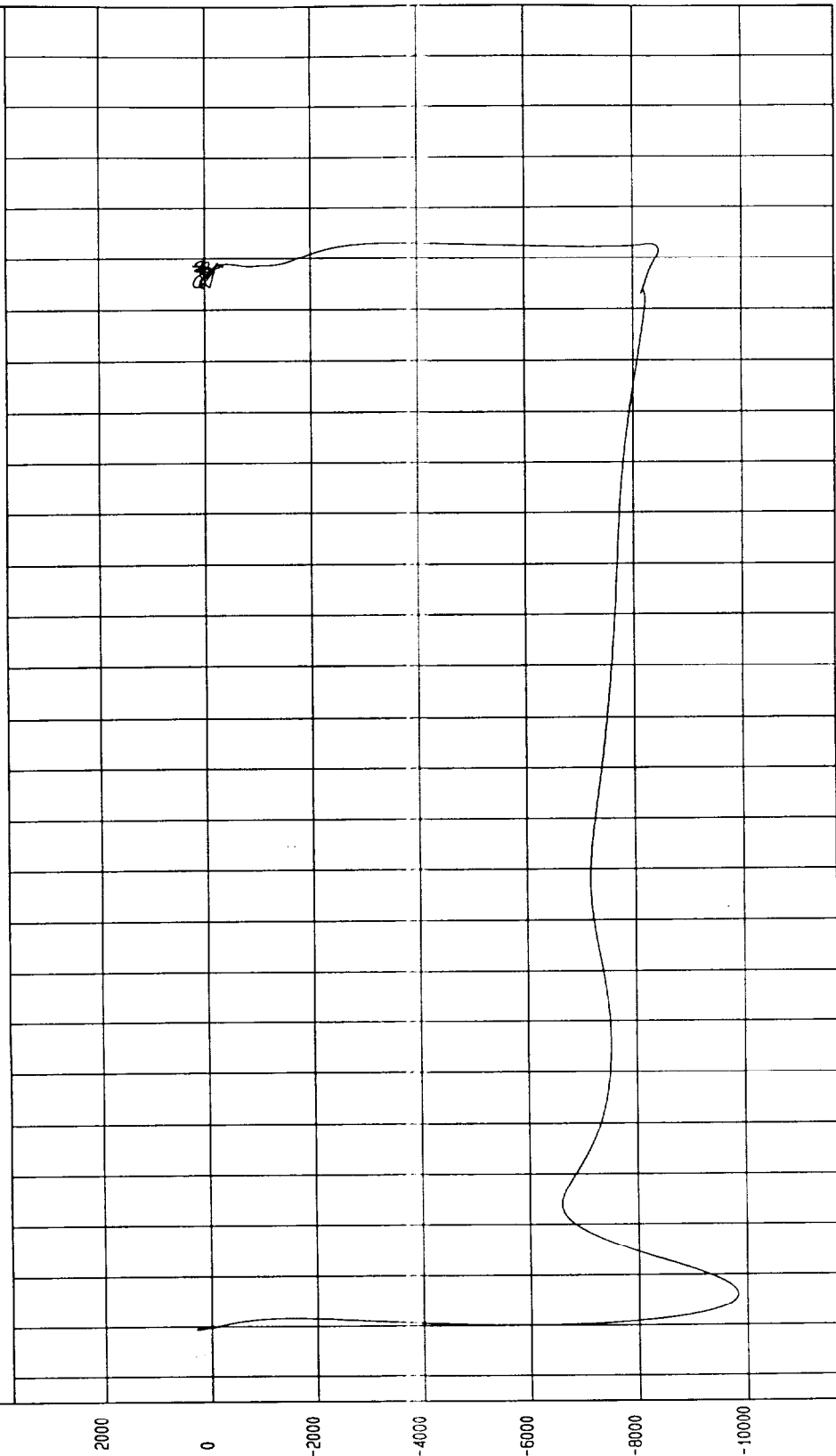
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -9819.69 N at 6 MM

Maximum = 284.27 N at -1 MM

FORCE X LOAD CELL #19 VS STRINGPOT #19



STRING POT 19 MM

MCA Research
06-02-1998 15:11

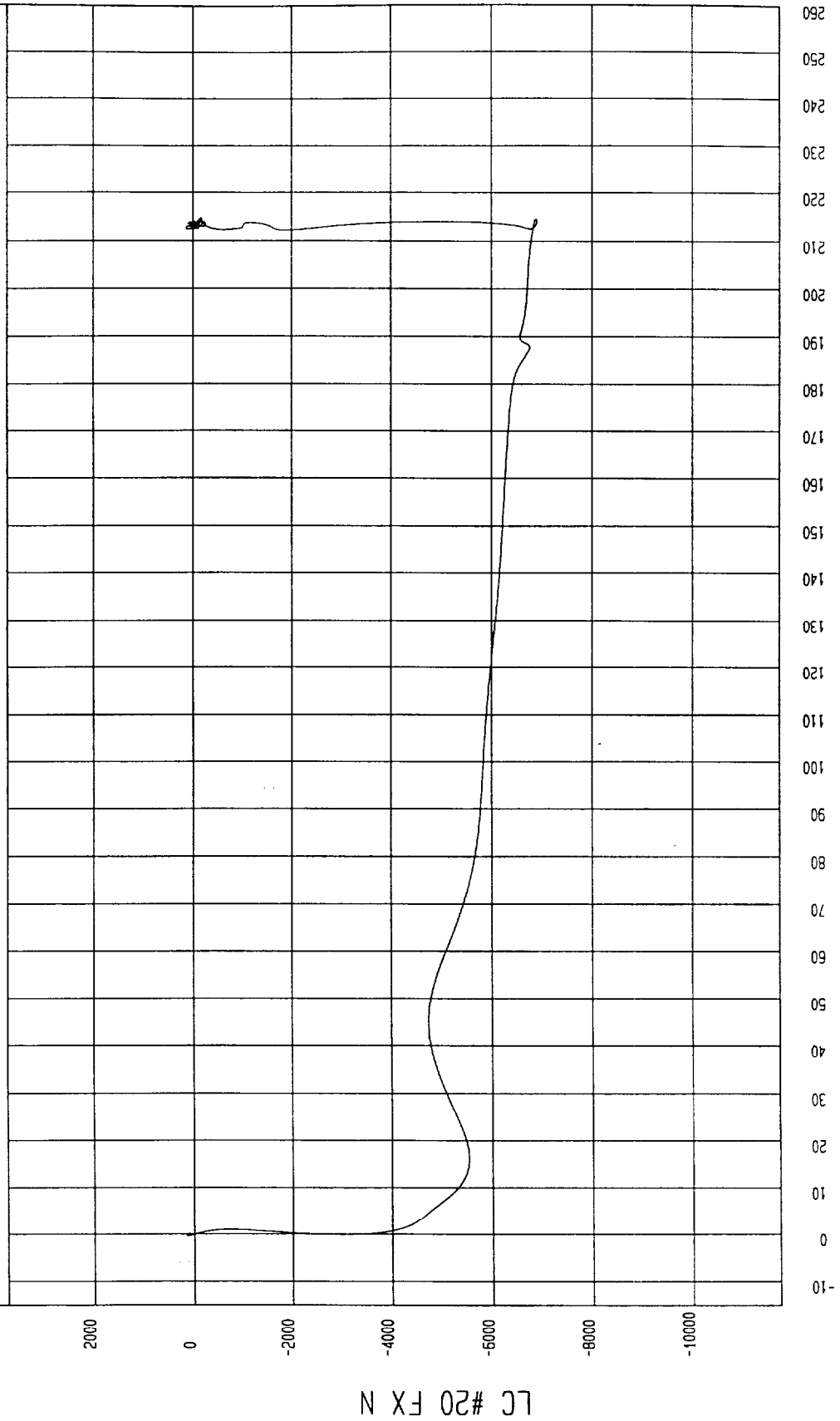
LC #19 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -6917.12 N at 214 MM Maximum = 151.80 N at 0 MM

FORCE X LOAD CELL #20 VS STRINGPOT #20



MCA Research
06-02-1998 15:11

STRING POT 20 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

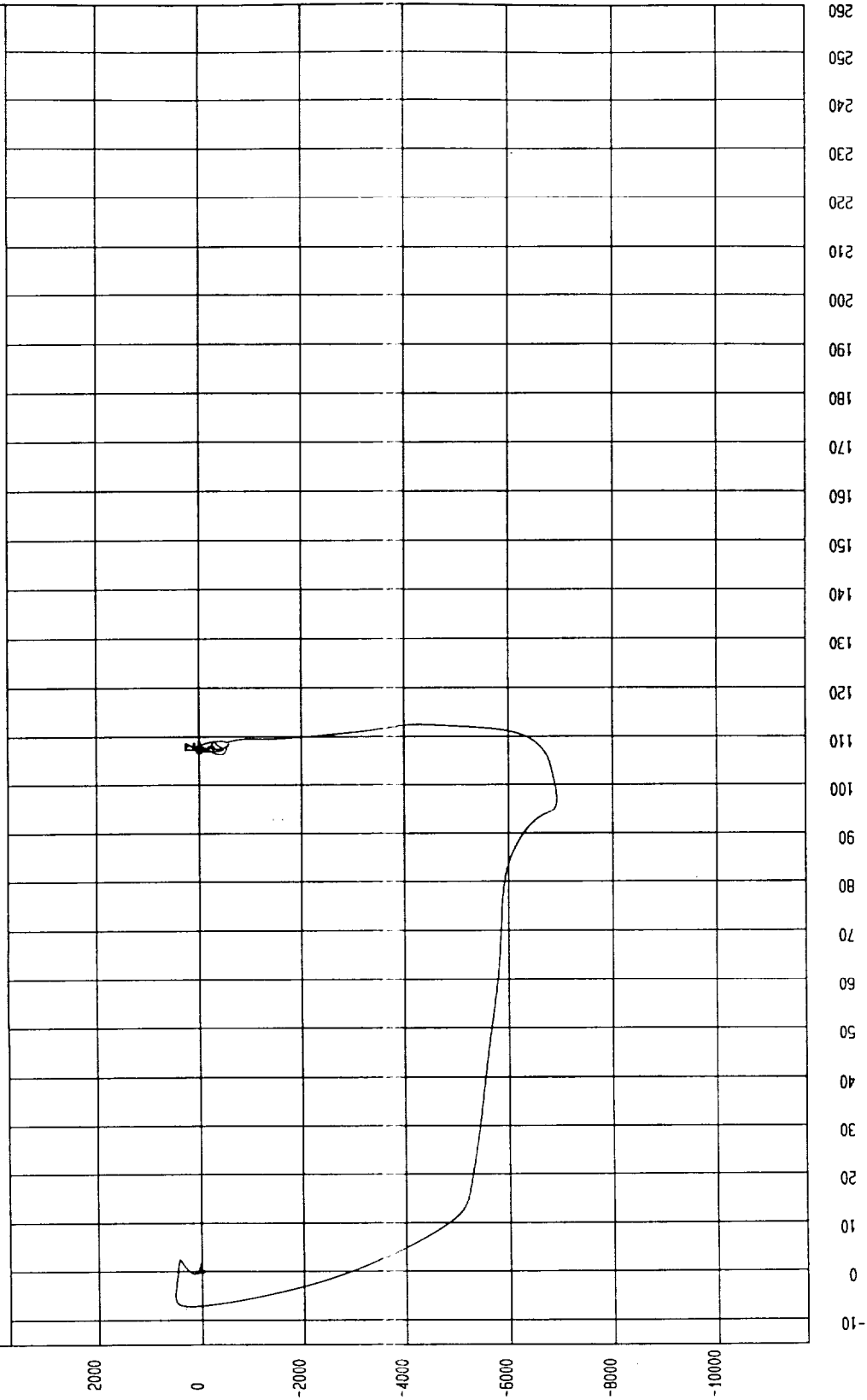
Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 506.57 N at -5 MM

Minimum = -6912.10 N at 97 MM

FORCE X LOAD CELL #21 VS STRINGPOT #21



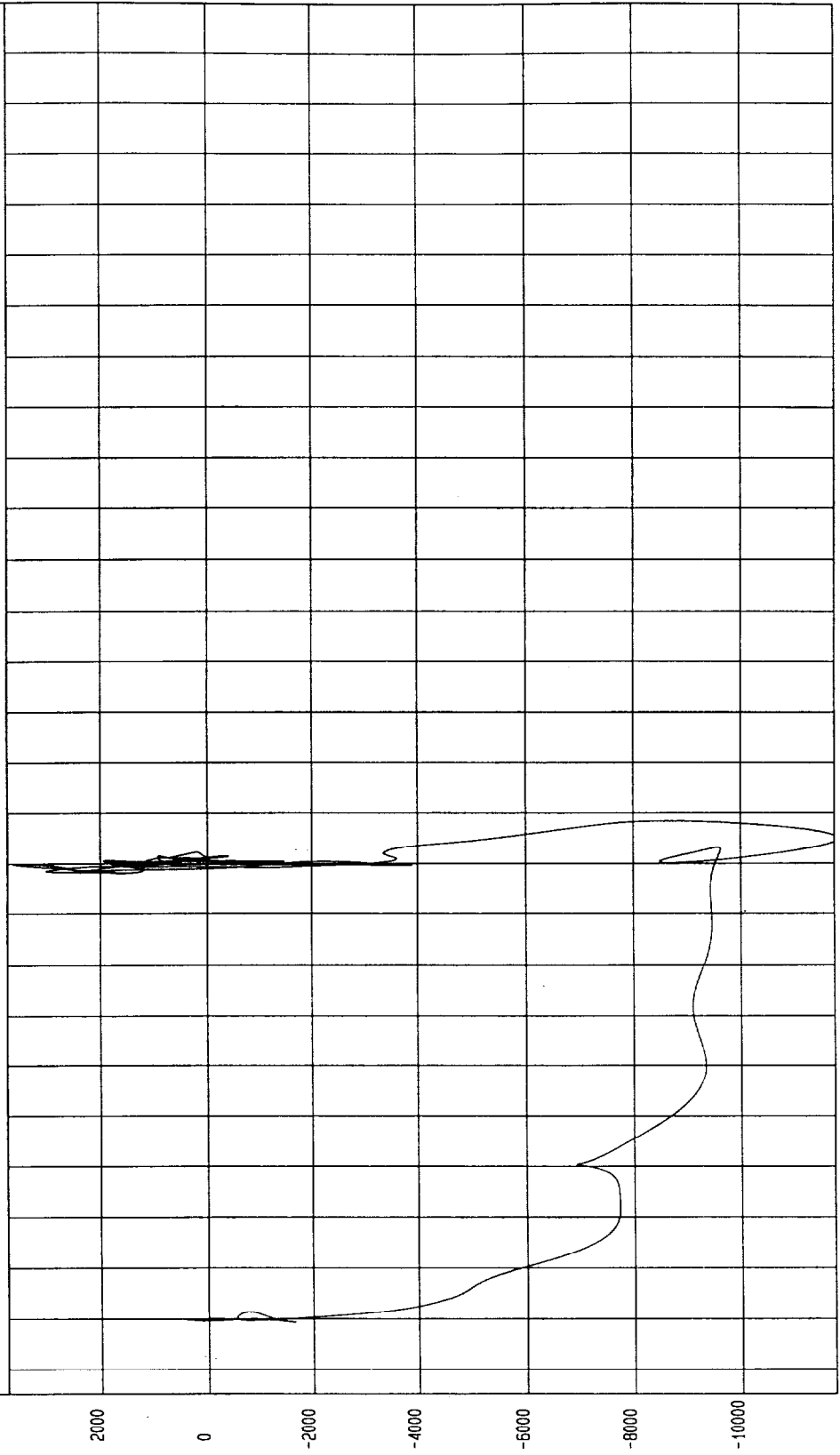
WCA Research
06-02-1996 15: 11

STRING POT 21 MM

LC #21 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -11760.04 N at 95 MM	Maximum = 3604.10 N at 90 MM

FORCE X LOAD CELL #22 VS STRINGPOT #22

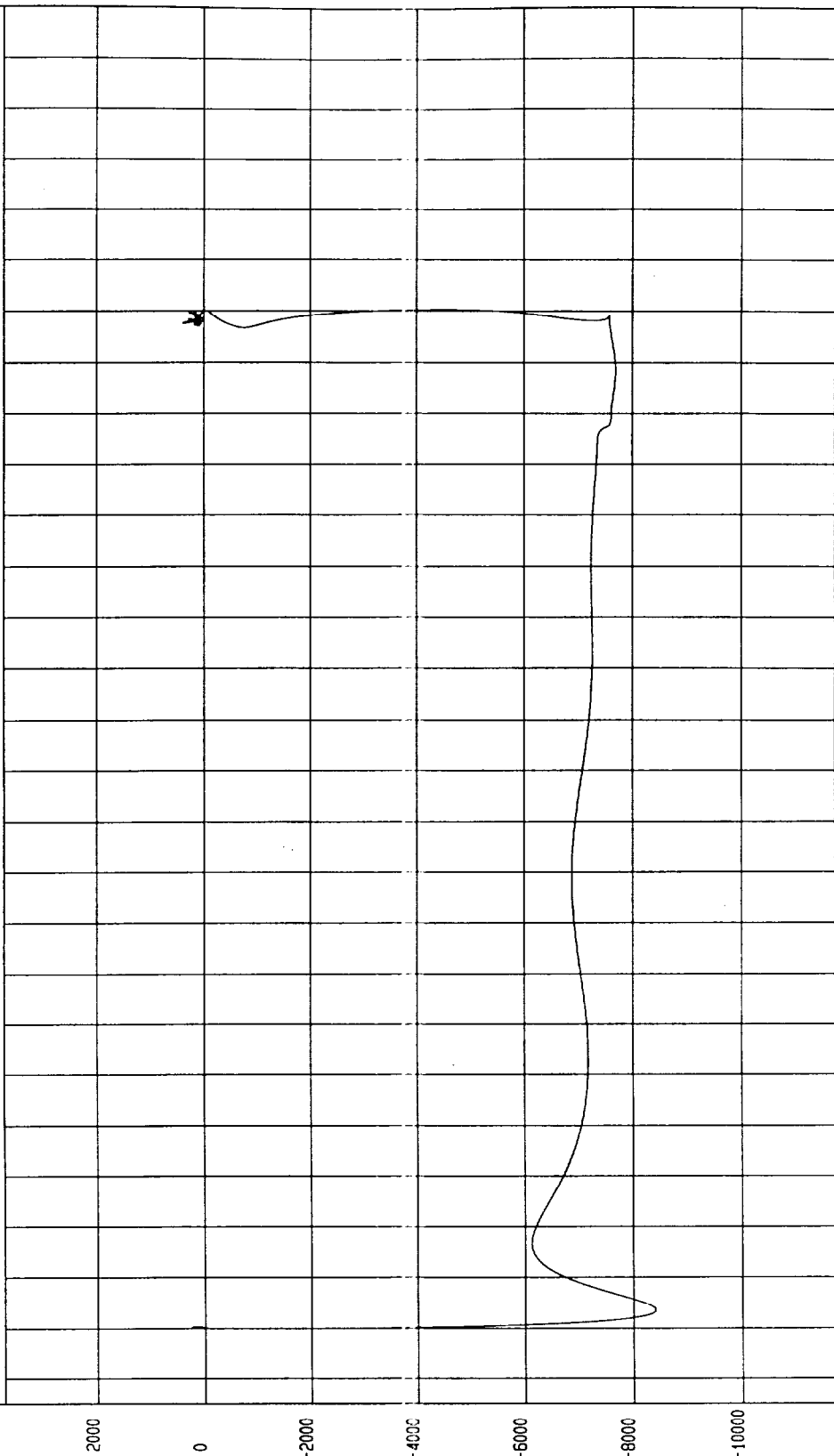


STRING POT 22 MM

MGA Research
06-02-1998 15:11

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8403.12 N at 3 MM	
Maximum = 400.79 N at 198 MM	

FORCE X LOAD CELL #23 VS STRINGPOT #23



STRING POT 23 MM

WCA Research
06-02-1998 15:11

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

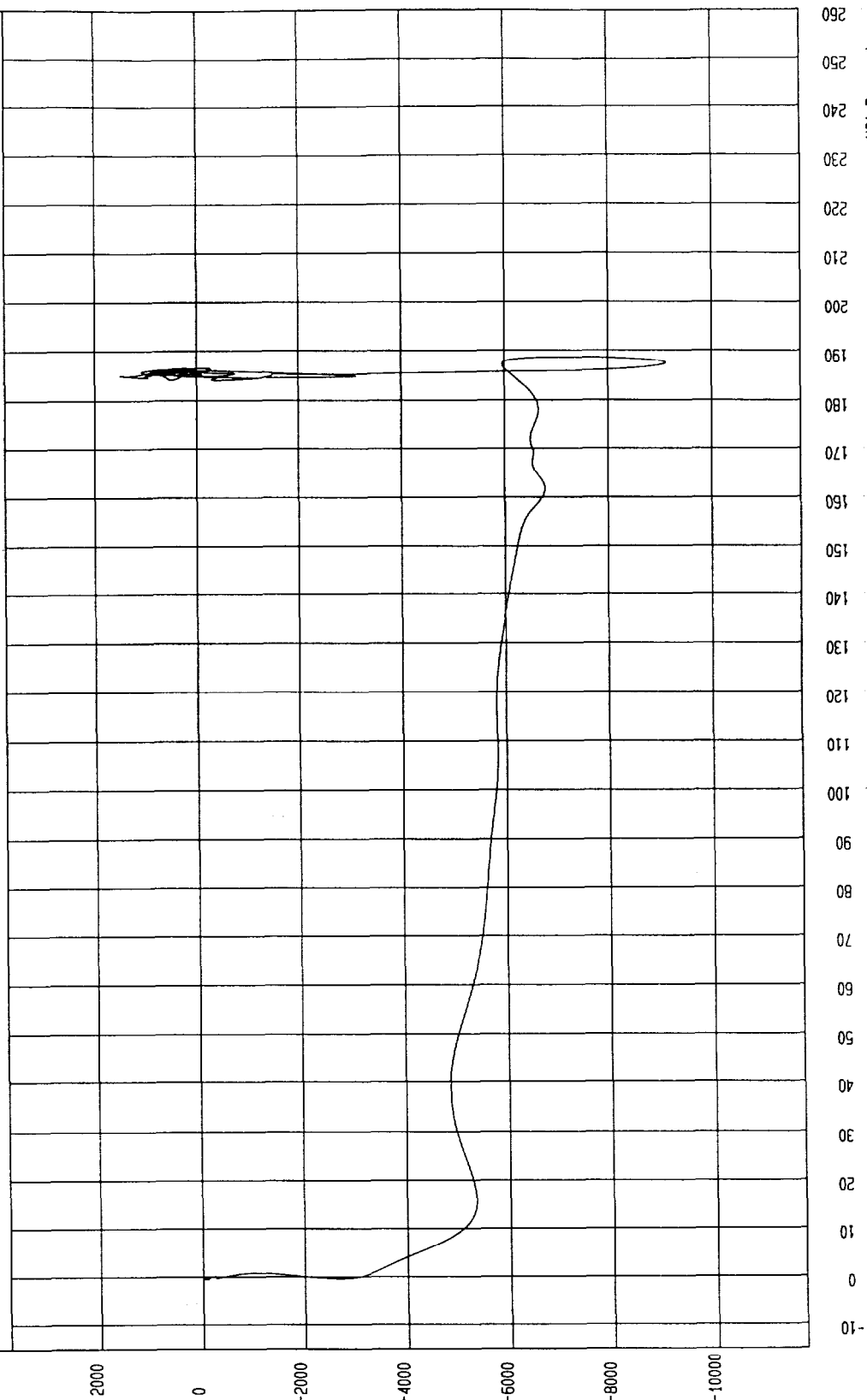
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 1503.55 N at 185 MM

Minimum = -9105.13 N at 188 MM

FORCE X LOAD CELL #24 VS STRINGPOT #24



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06-02-1998 15:12

STRING POT 24 MM

LC #24 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

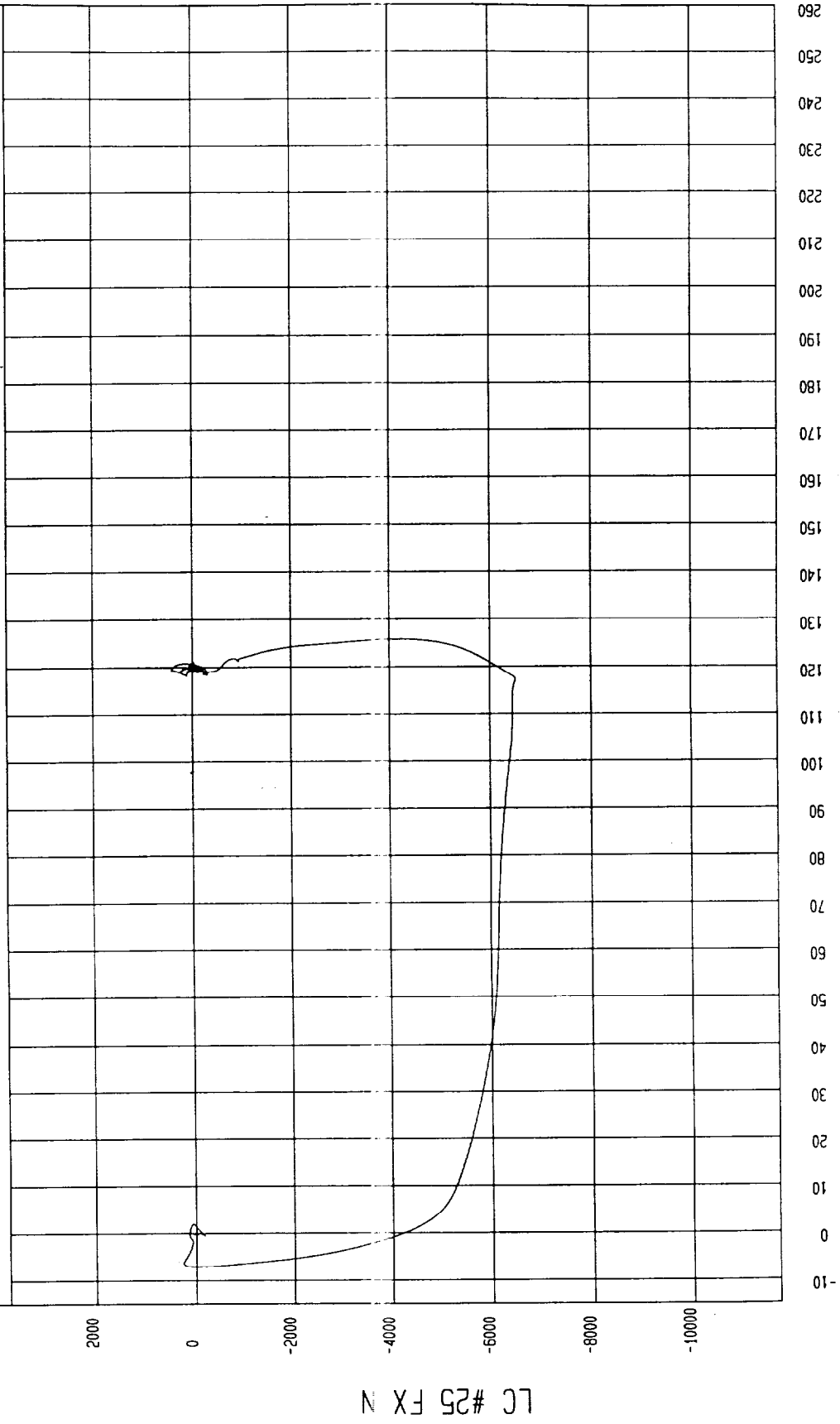
Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 432.25 N at 119 MM

Minimum = -6515.60 N at 117 MM

FORCE X LOAD CELL #25 VS STRINGPOT #25



MGA Research
06-02-1998 15:12

STRING POT 25 MM

LC #25 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

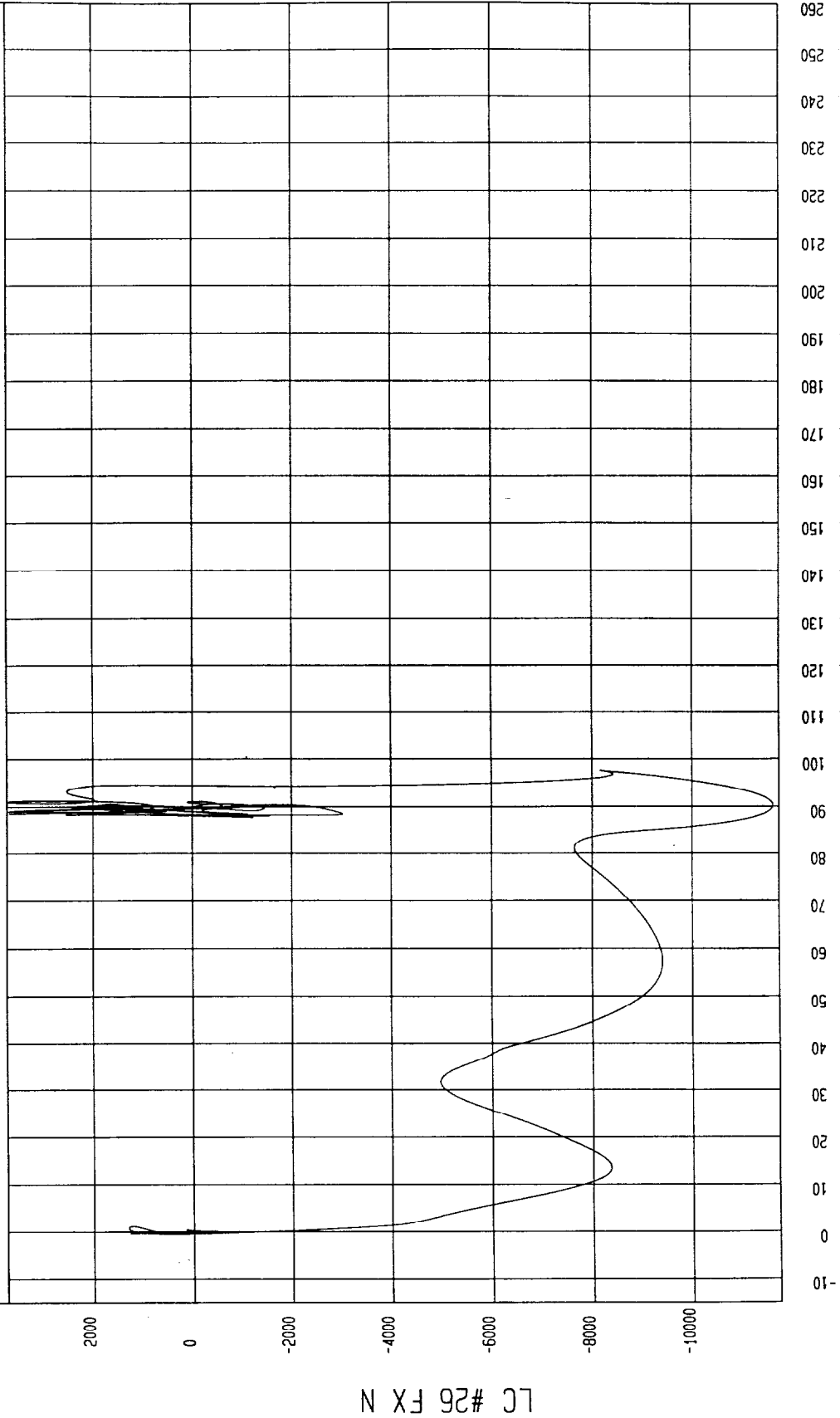
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 25.8 MPH 41.5 KPH

Minimum = -11579.51 N at 90 MM

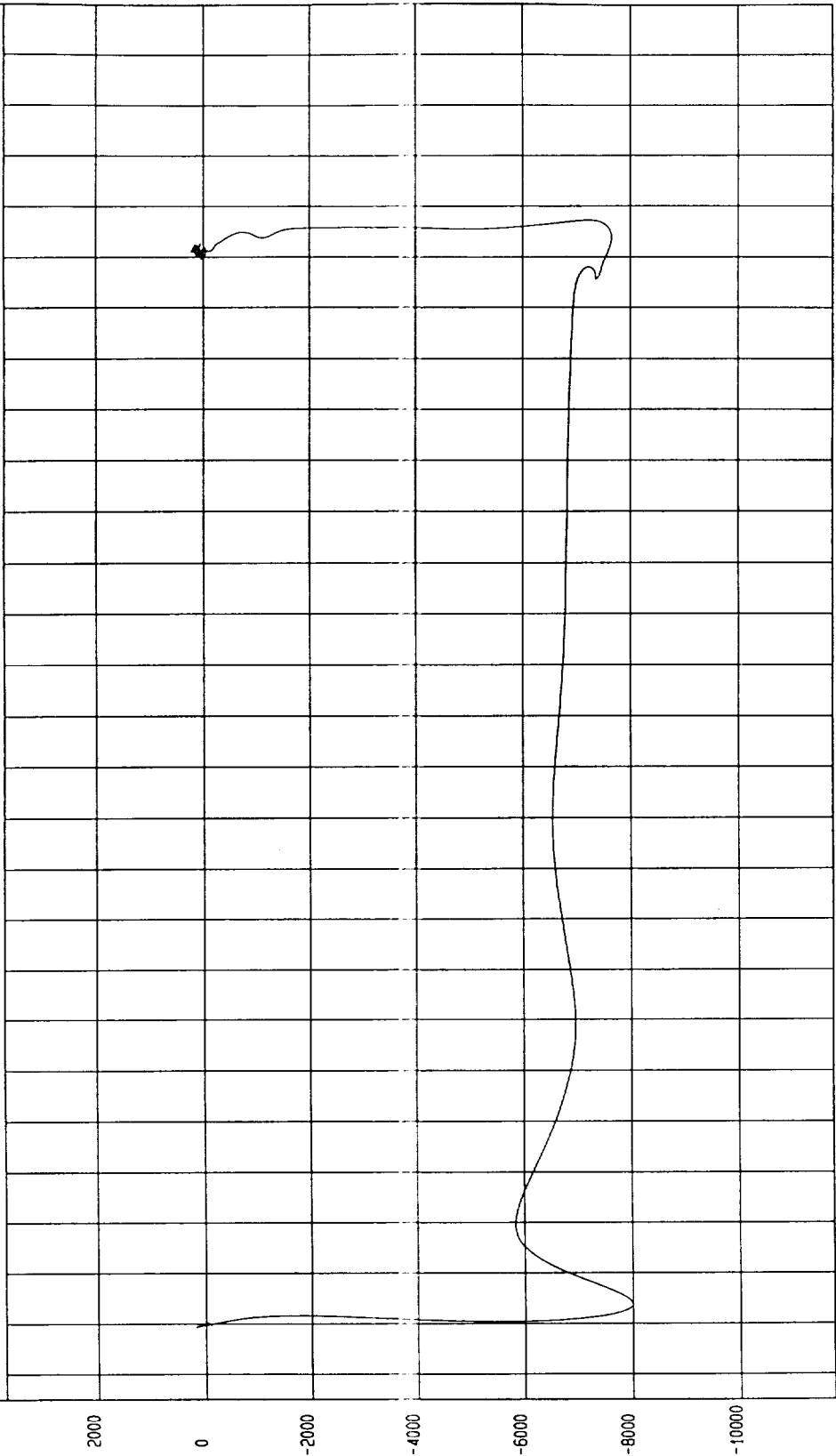
Maximum = 3798.86 N at 89 MM

FORCE X LOAD CELL #26 VS STRINGPOT #26



MECA Research
06-02-1998 15.12

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8000.23 N at 3 MM	
Maximum = 233.55 N at 211 MM	
FORCE X LOAD CELL #27 VS STRINGPOT #27	

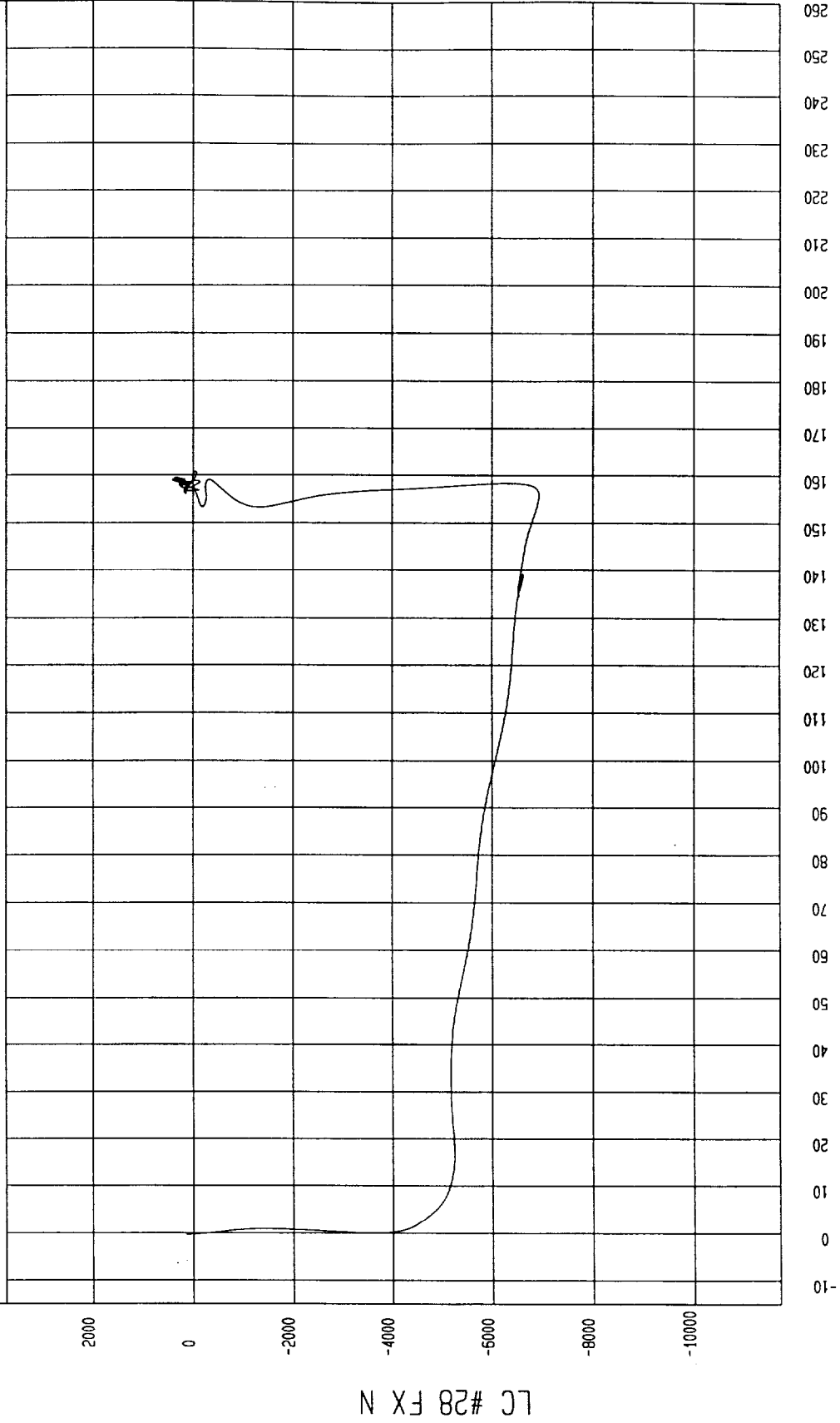


STRING POT 27 MM

MCA Research
06-02-1998 15:12

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -6934.93 N at 156 MM	Maximum = 414.46 N at 159 MM

FORCE X LOAD CELL #28 VS STRINGPOT #28



MCA Research
06-02-1998 15:12

STRING POT 28 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

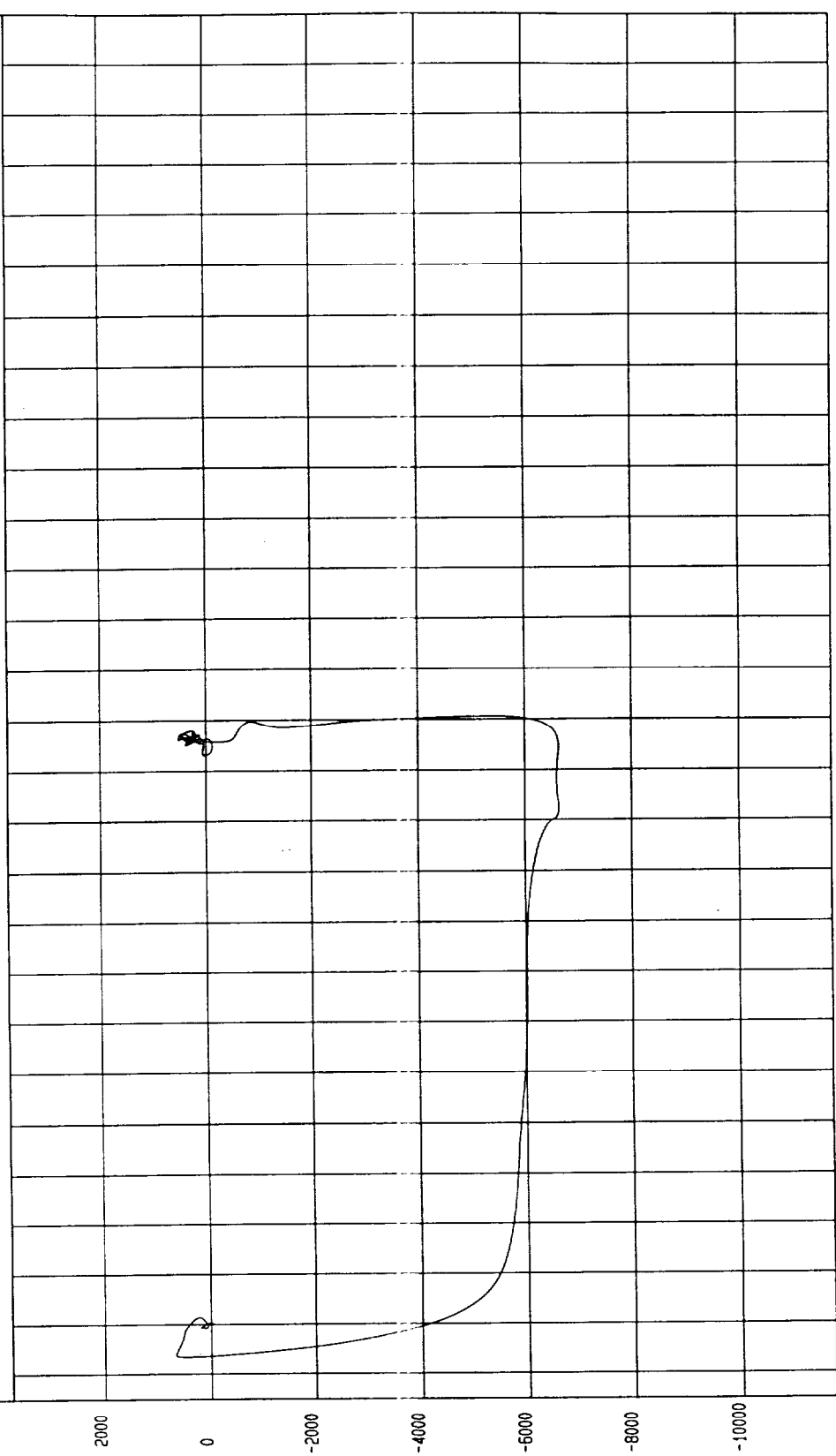
Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 657.62 N at -6 MM

Minimum = -6637.67 N at 114 MM

FORCE X LOAD CELL #29 VS STRINGPOT #29



STRING POT 29 MM

MCA Research
06-02-1998 15: 13

LC #29 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

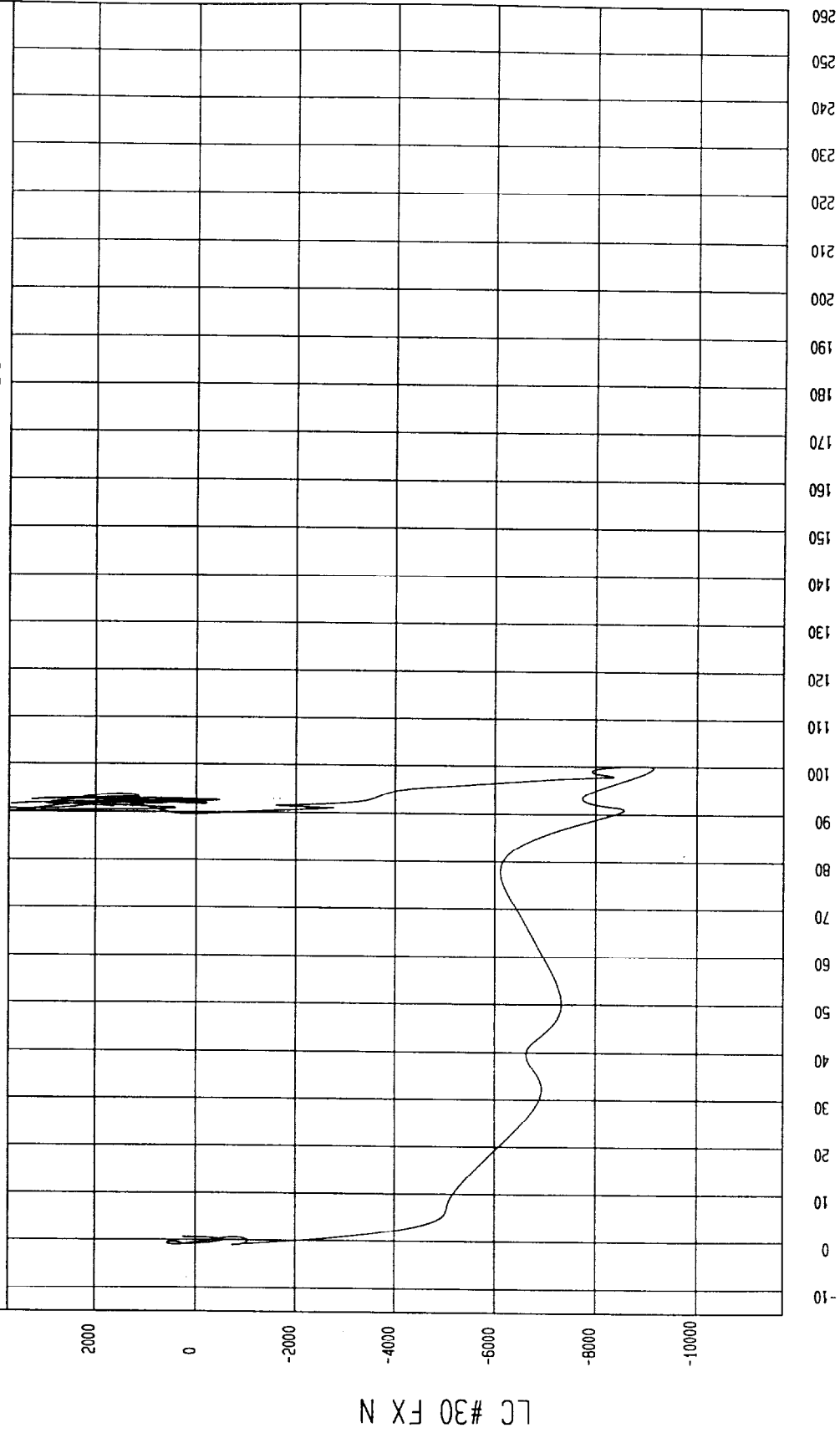
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -9152.26 N at 100 MM

Maximum = 4015.92 N at 91 MM

FORCE X LOAD CELL #30 VS STRINGPOT #30



STRING POT 30 MM

MGA Research
06-02-1998 15:13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

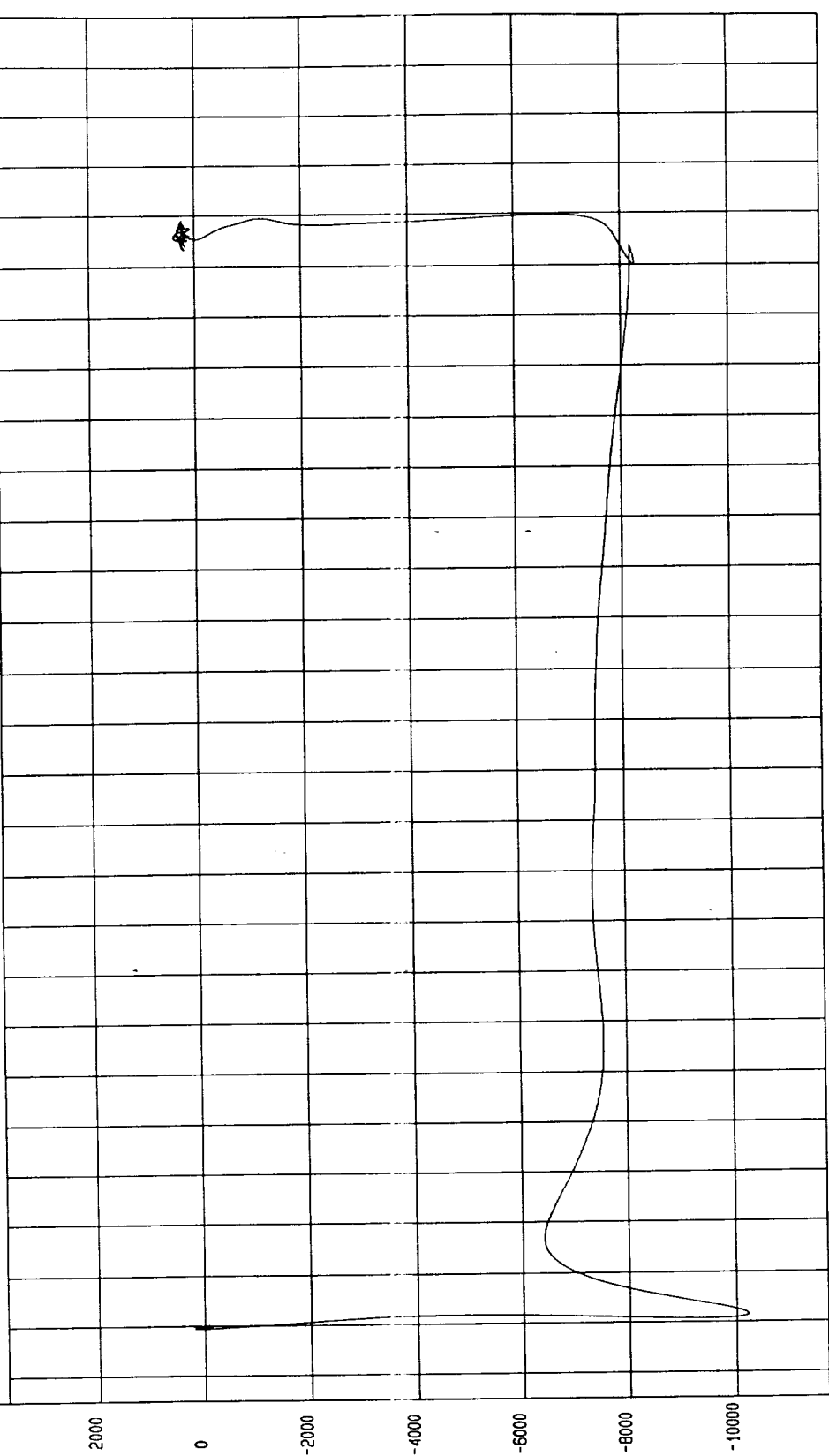
Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 402.27 N at 216 MM

Minimum = -10220.51 N at 1 MM

FORCE X LOAD CELL #31 VS STRINGPOT #31



STRING POT 31 MM

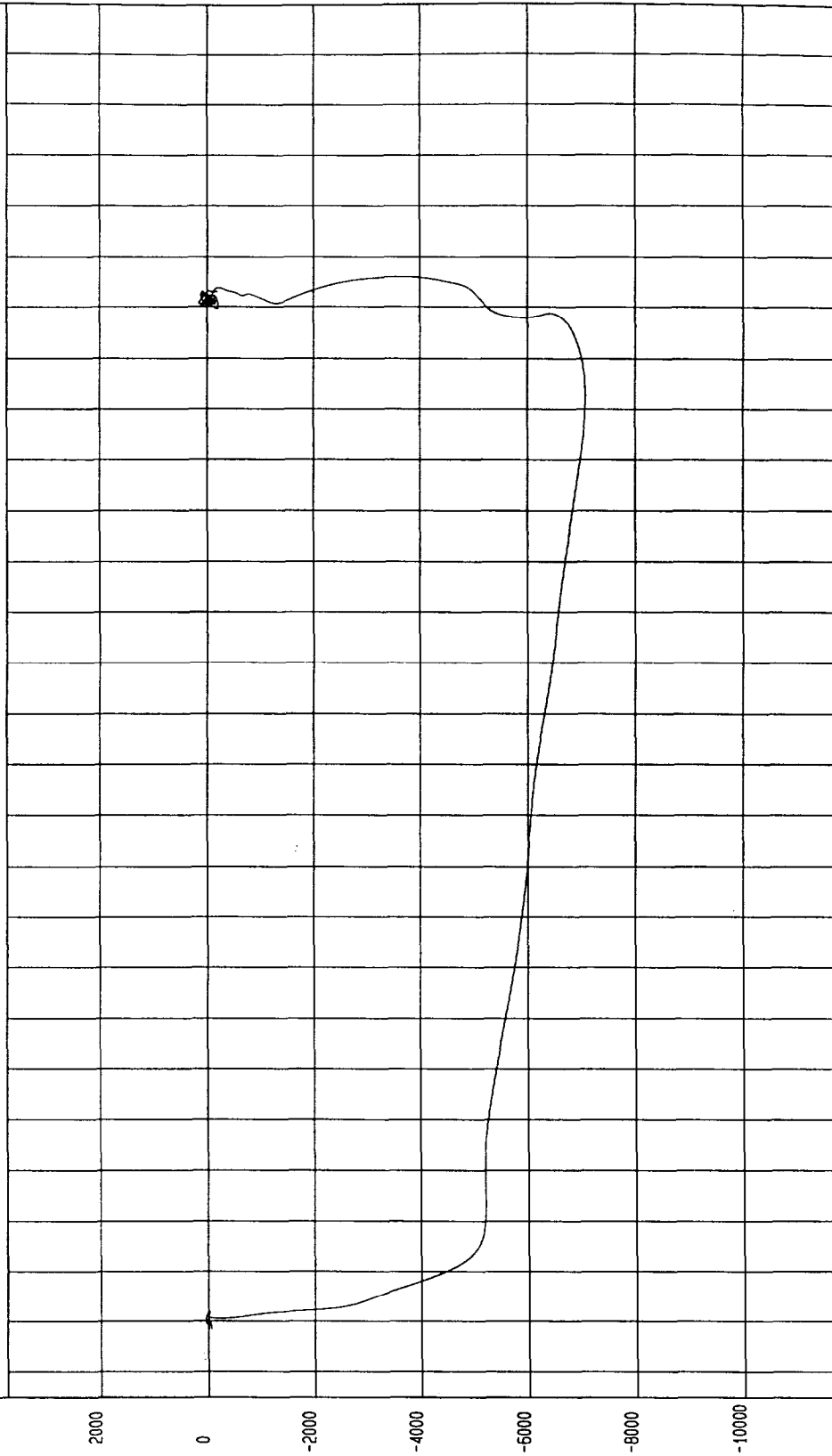
NSA Research
06-02-1998 15:13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -7084.11 N at 182 MM Maximum = 155.61 N at 201 MM

FORCE X LOAD CELL #32 VS STRINGPOT 32



MGA Research
06-02-1998 15:13

STRING POT 32 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

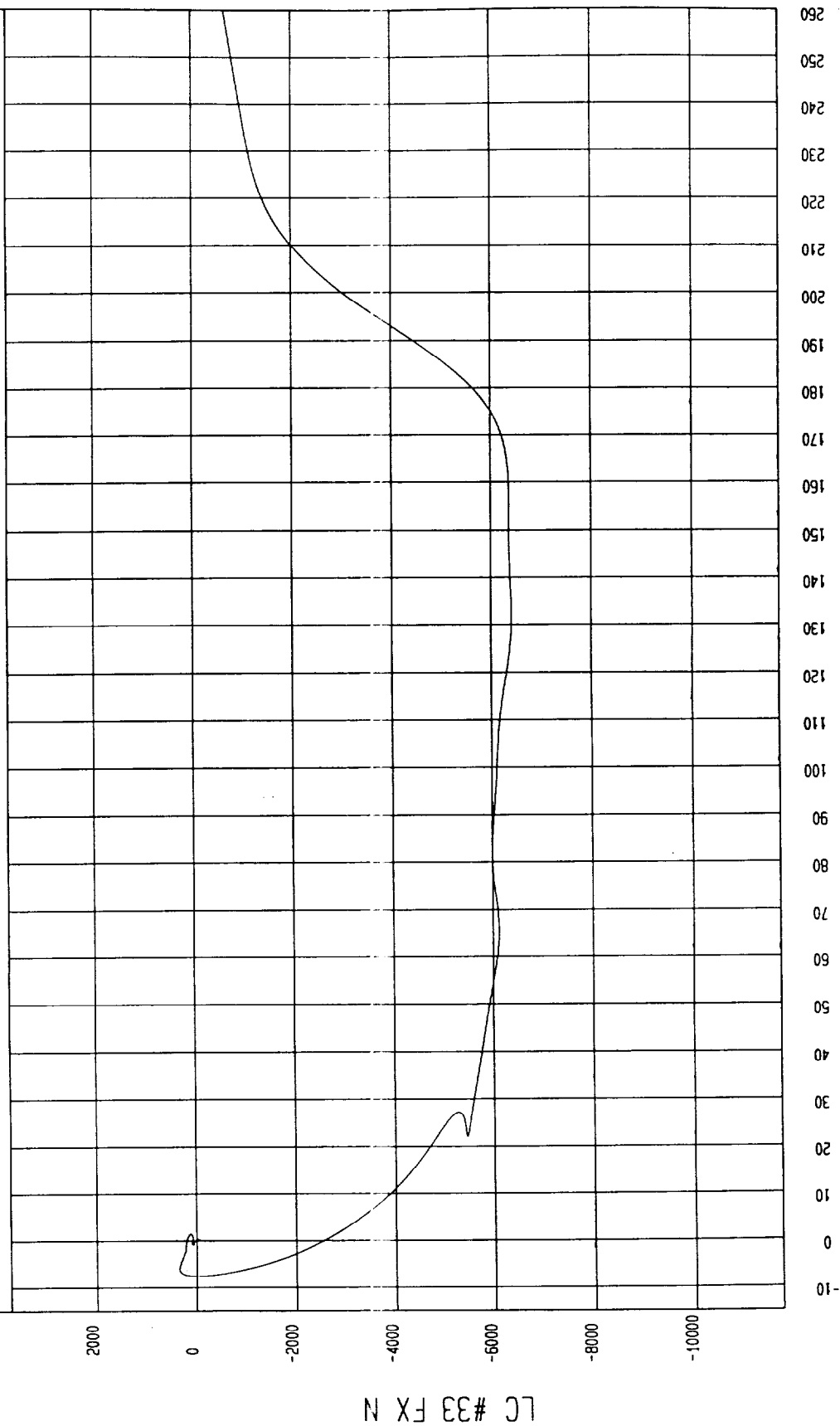
SPEED: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 346.00 N at -6 MM

Minimum = -6400.41 N at 131 MM

FORCE X LOAD CELL #33 VS STRINGPOT #33

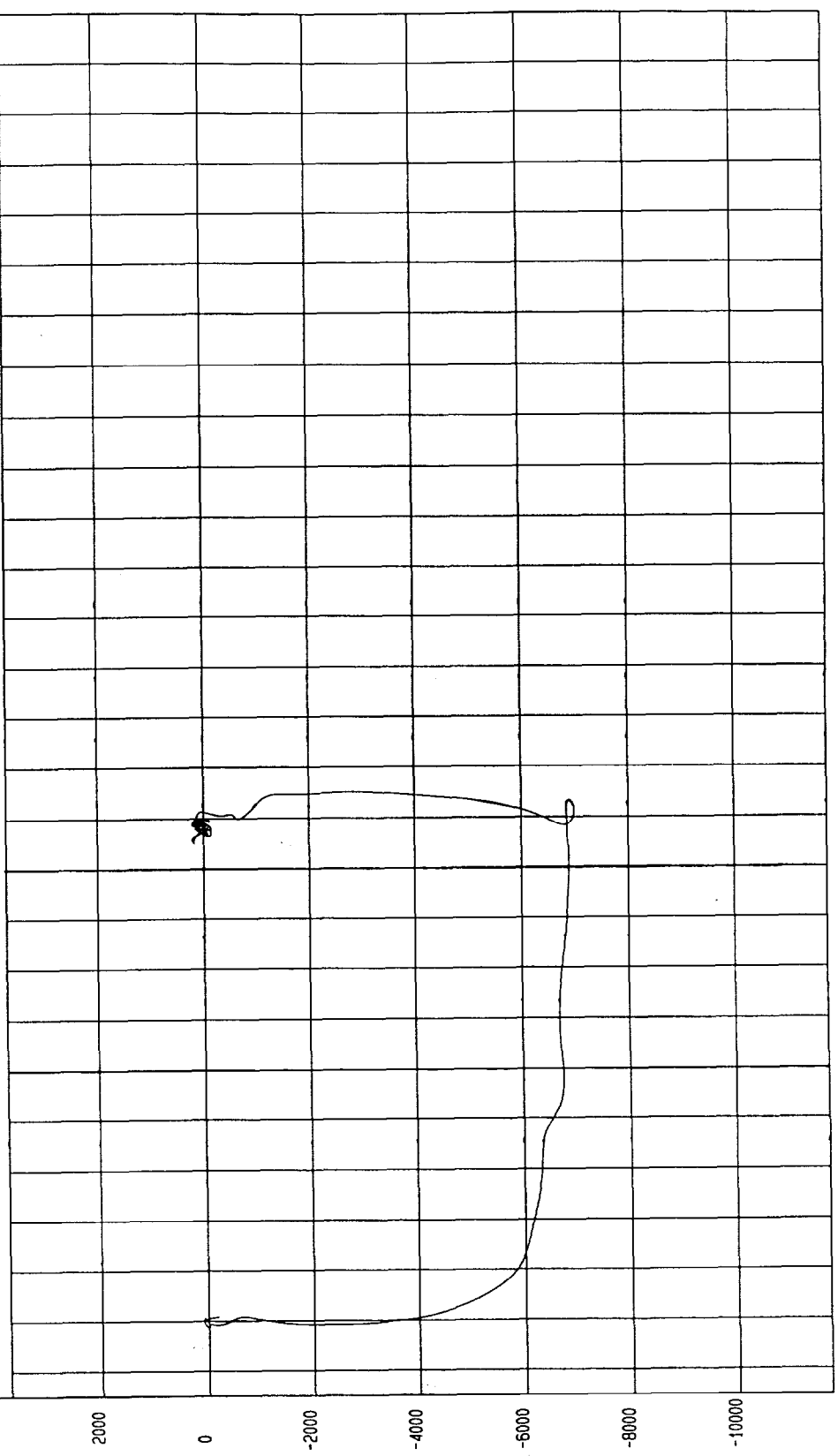


NCA Research
06-02-1998 15:13

STRING POT 33 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -7007.27 N at 101 MM	
Maximum = 211.98 N at 96 MM	

FORCE X LOAD CELL #34 VS STRINGPOT #34

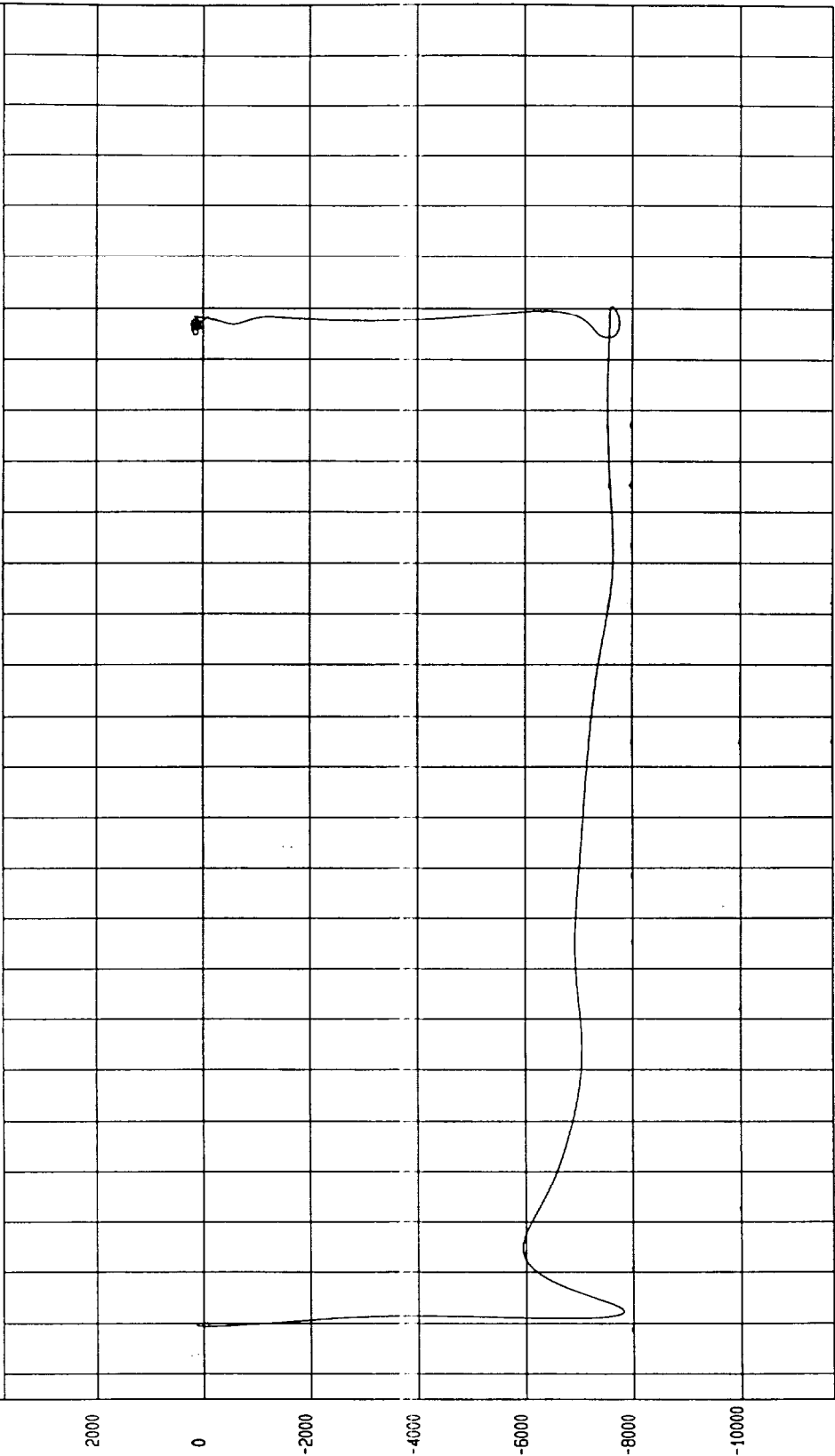


STRING POT 34 MM

WGA Research
06-02-1998 15.13

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -7826.81 N at 2 MM	
Maximum = 226.40 N at 197 MM	

FORCE X LOAD CELL #35 VS STRINGPOT #35

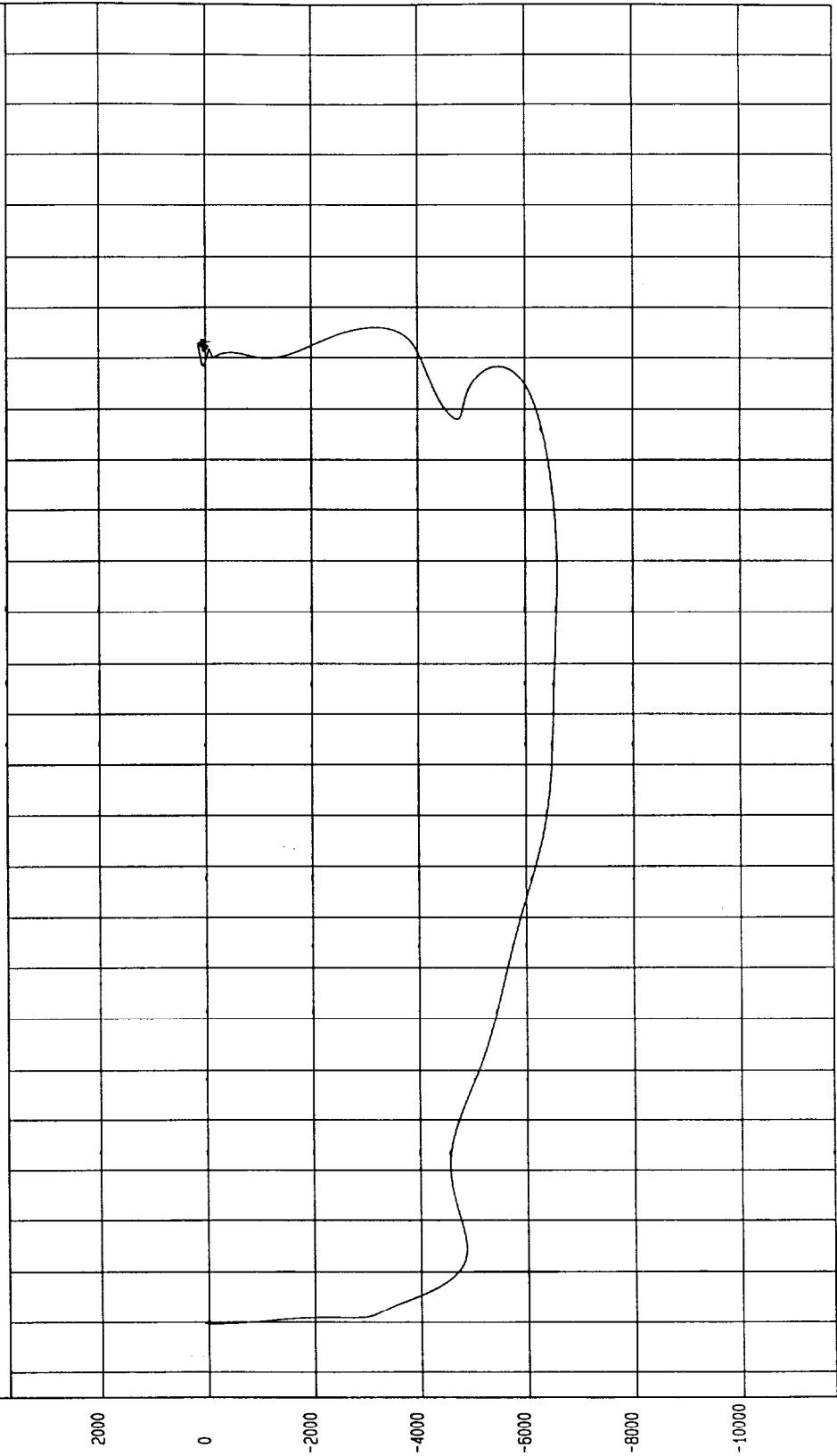


STRING POT 35 MM

MGA Research
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TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -6592.28 N at 147 MM	
Maximum = 140.46 N at 193 MM	

FORCE X LOAD CELL #36 VS STRINGPOT #36



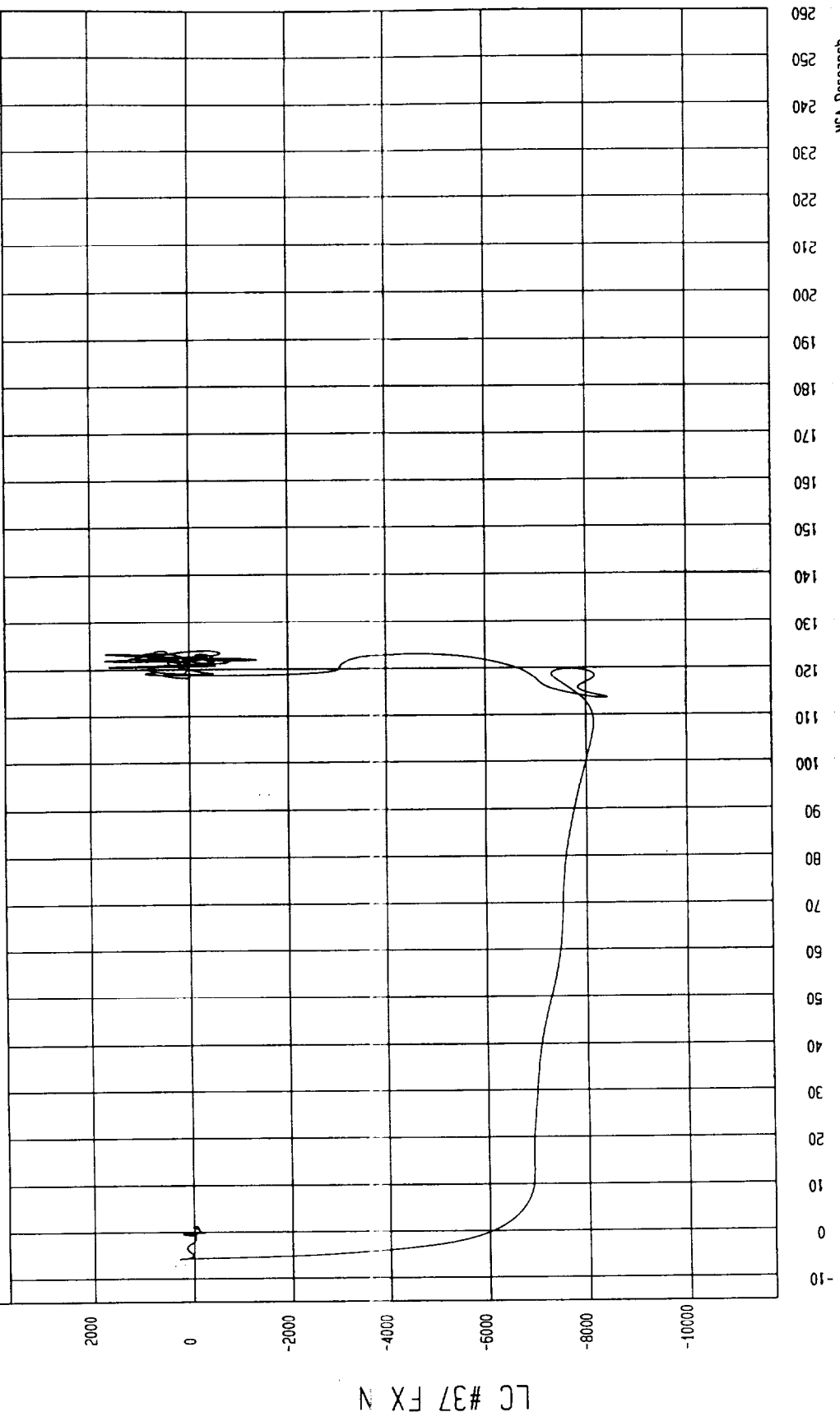
STRING POT 36 MM

WSA Research
06-02-1996 15.14

LC #36 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8441.18 N at 114 MM	Maximum = 1703.49 N at 122 MM

FORCE X LOAD CELL #37 VS STRINGPOT #37



MGA Research
06-02-1996 15:14

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

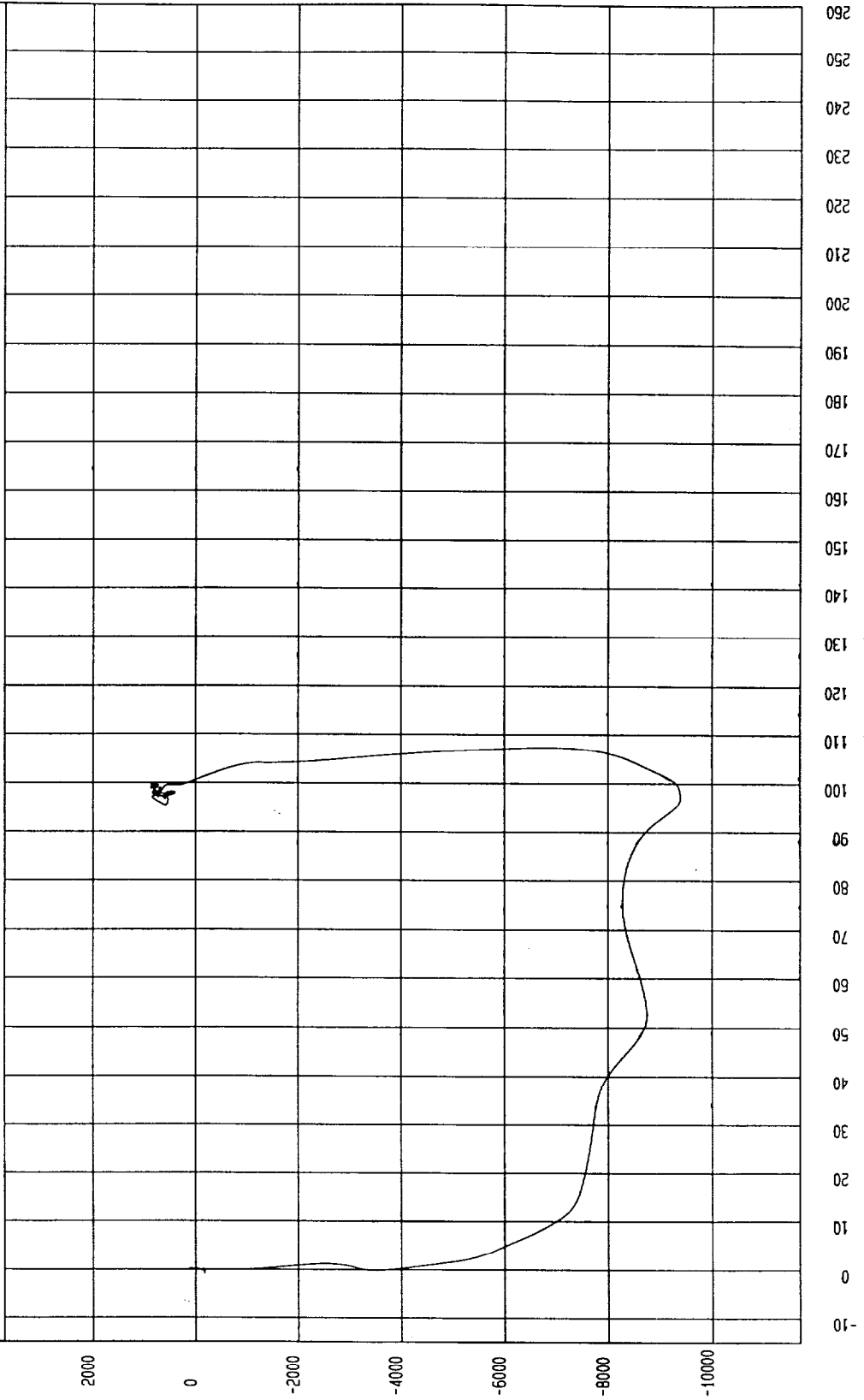
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 25.8 MPH 41.5 KPH

Minimum = -9378.6 N at 97 MM

Maximum = 874.85 N at 100 MM

FORCE X LOAD CELL #38 VS STRINGPOT #38



MGA Research
06-02-1998 15:14

STRING POT 38 MM

LC #38 FX N

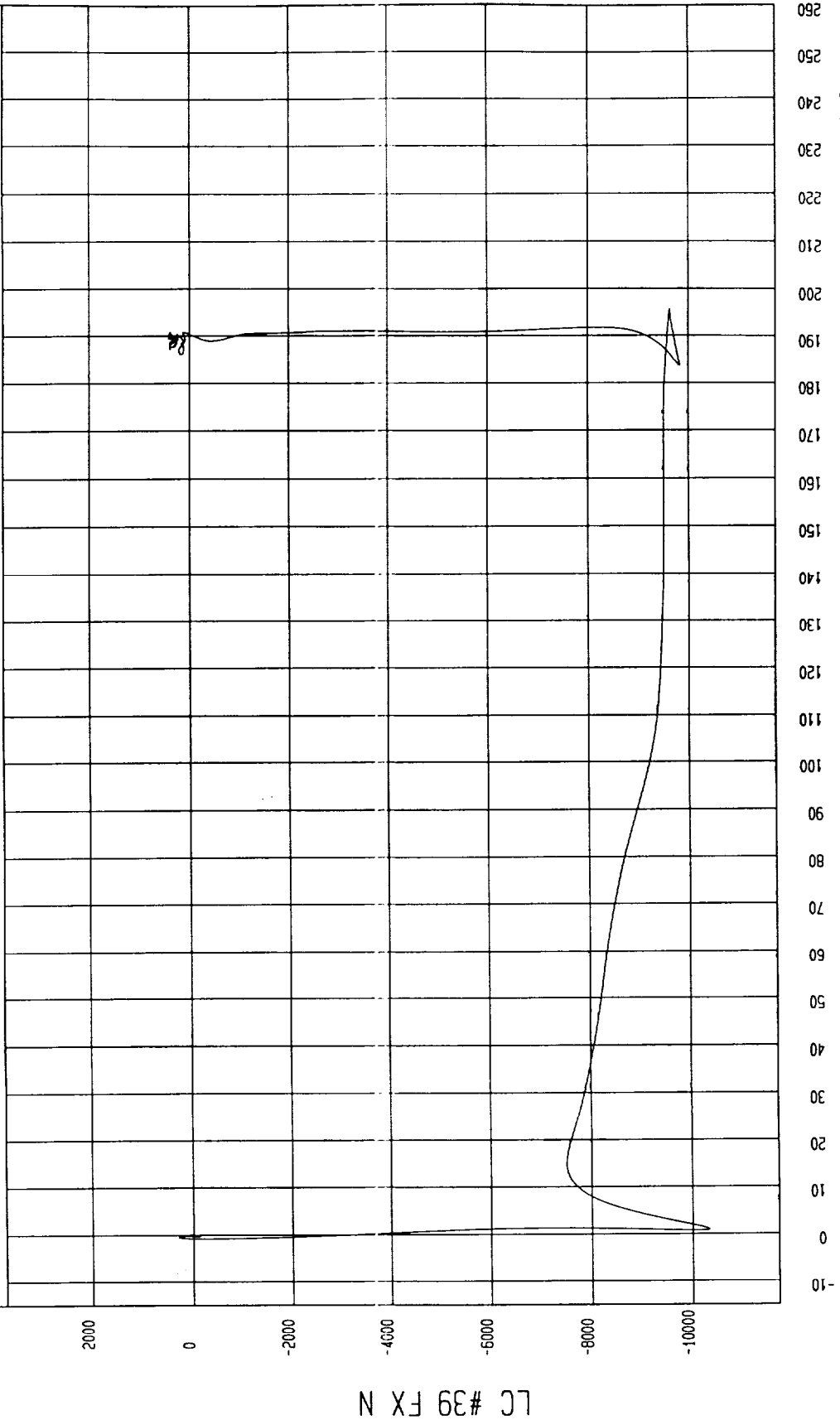
TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT TEST DATE: 12-23-1996

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 25.8 MPH 41.5 KPH

Minimum = -10327.09 N at 1 MM

Maximum = 420.22 N at 190 MM

FORCE X LOAD CELL #39 VS STRINGPOT #39

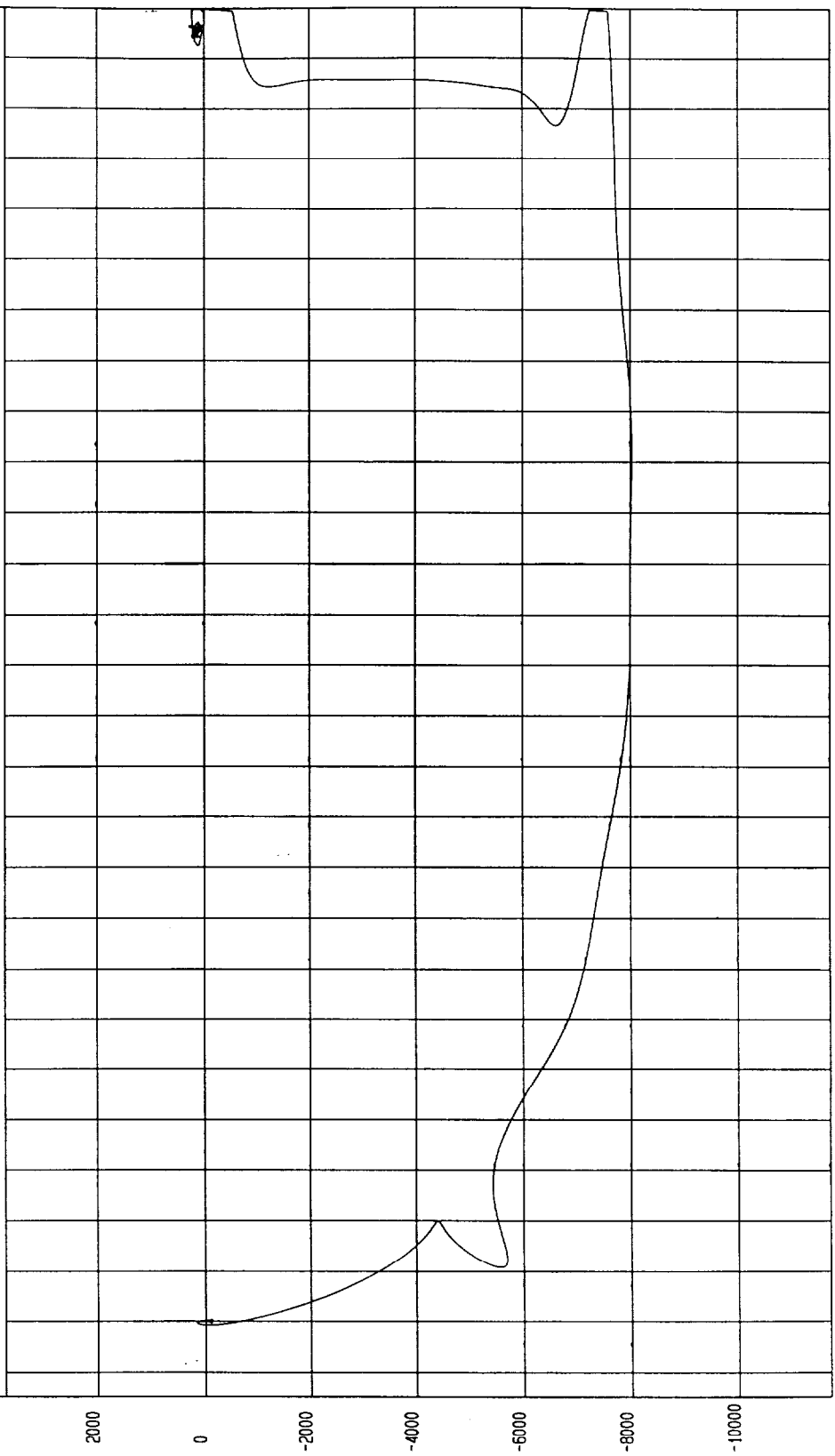


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06-02-1998 15:14

STRING POT 39 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8024.56 N at 171 MM	
Maximum = 276.79 N at 257 MM	

FORCE X LOAD CELL #40 VS STRINGPOT #40

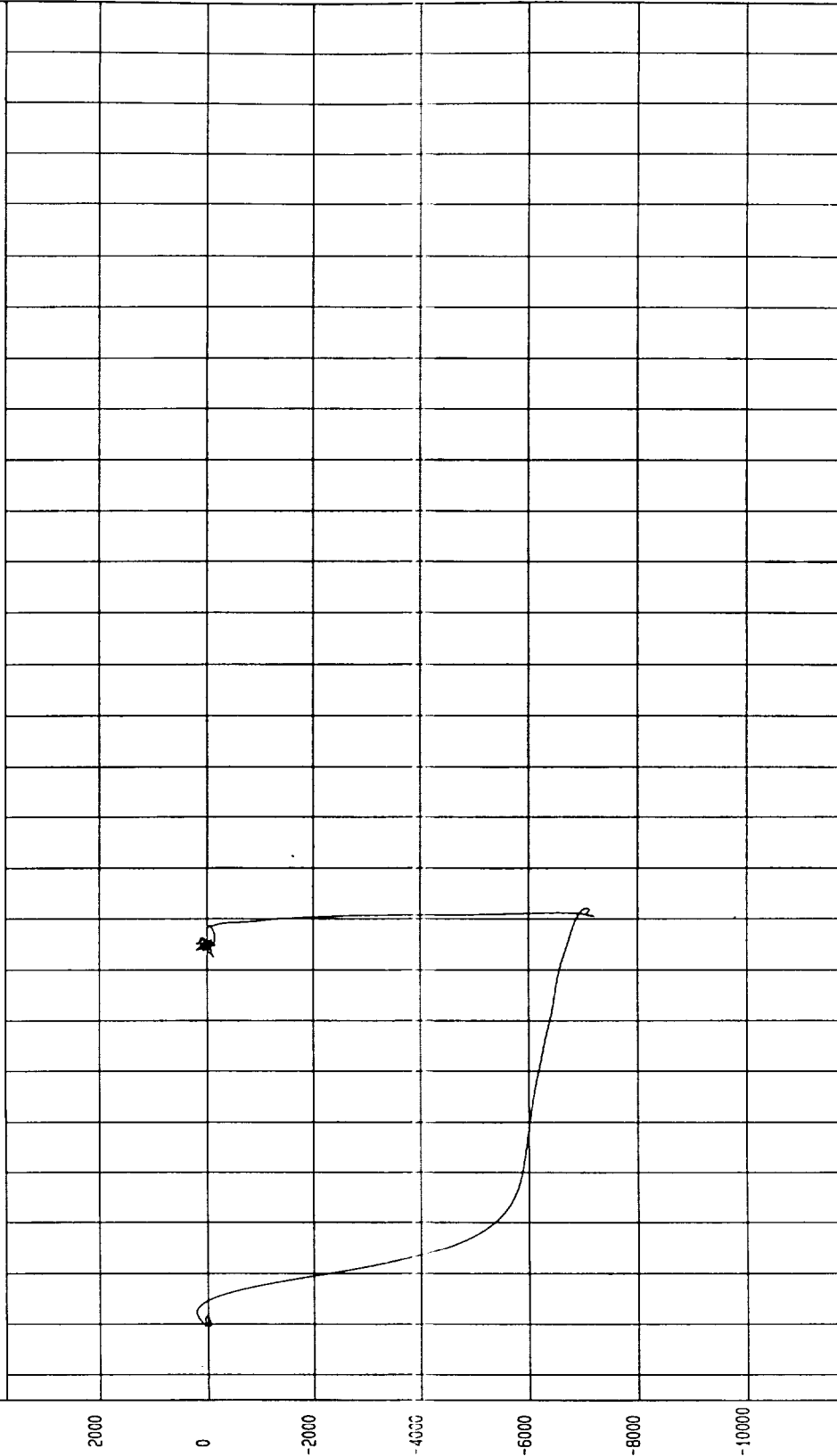


STRING POT 40 MM

MCA Research
06-02-1998 15:14

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -7214.97 N at 81 MM	
Maximum = 202.56 N at 2 MM	

FORCE X LOAD CELL #41 VS STRINGPOT #41



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06-02-1996 15.14

STRING POT 41 MM

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

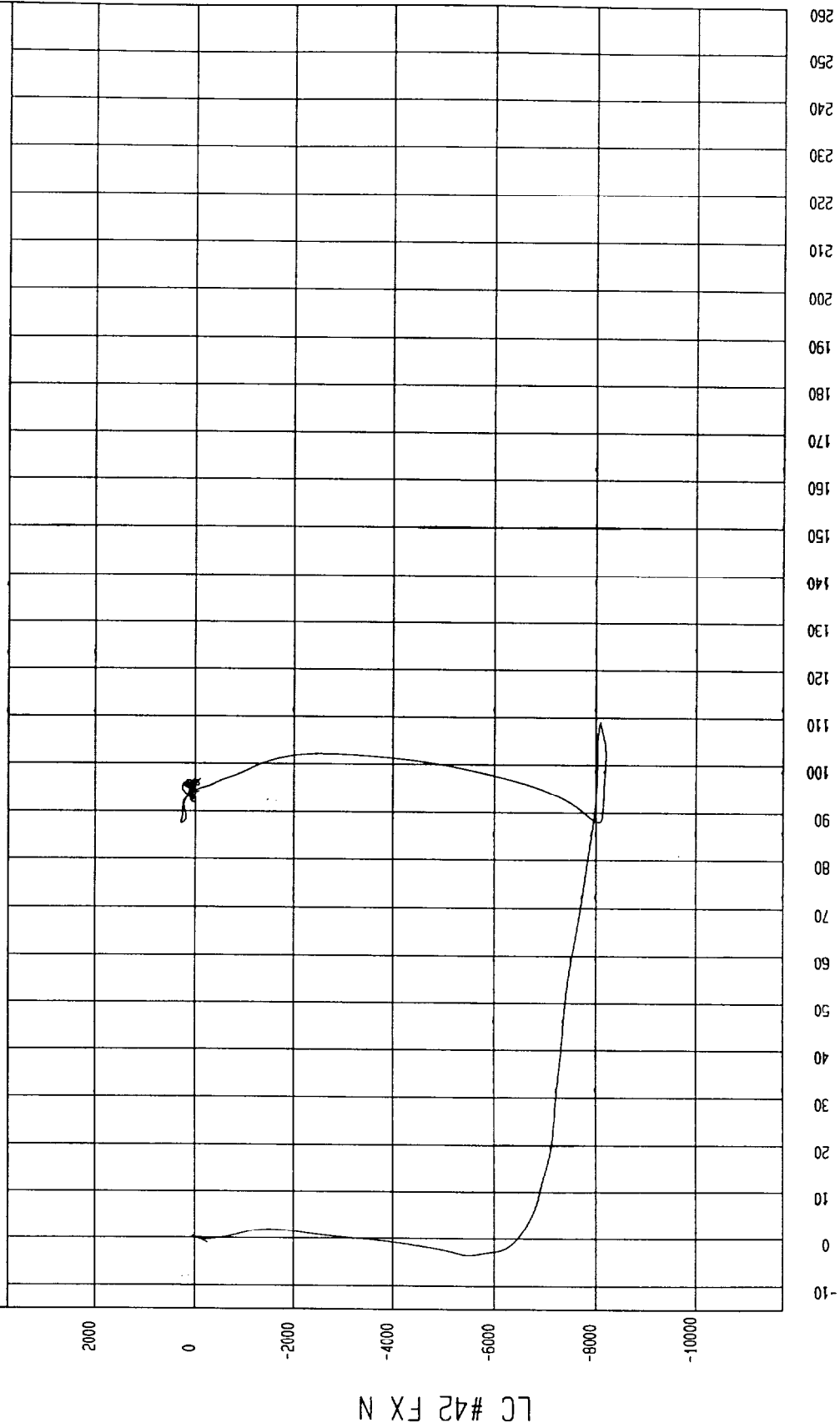
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 25.8 MPH 41.5 KPH

Minimum = -8199.43 N at 102 MM

Maximum = 281.28 N at 88 MM

FORCE X LOAD CELL #42 VS STRINGPOT #42



WGA Research
06-02-1996 15.14

TEST: 90 DEGREE INCLUDED. ANGLE BARRIER IMPACT

TEST DATE: 12-23-1996

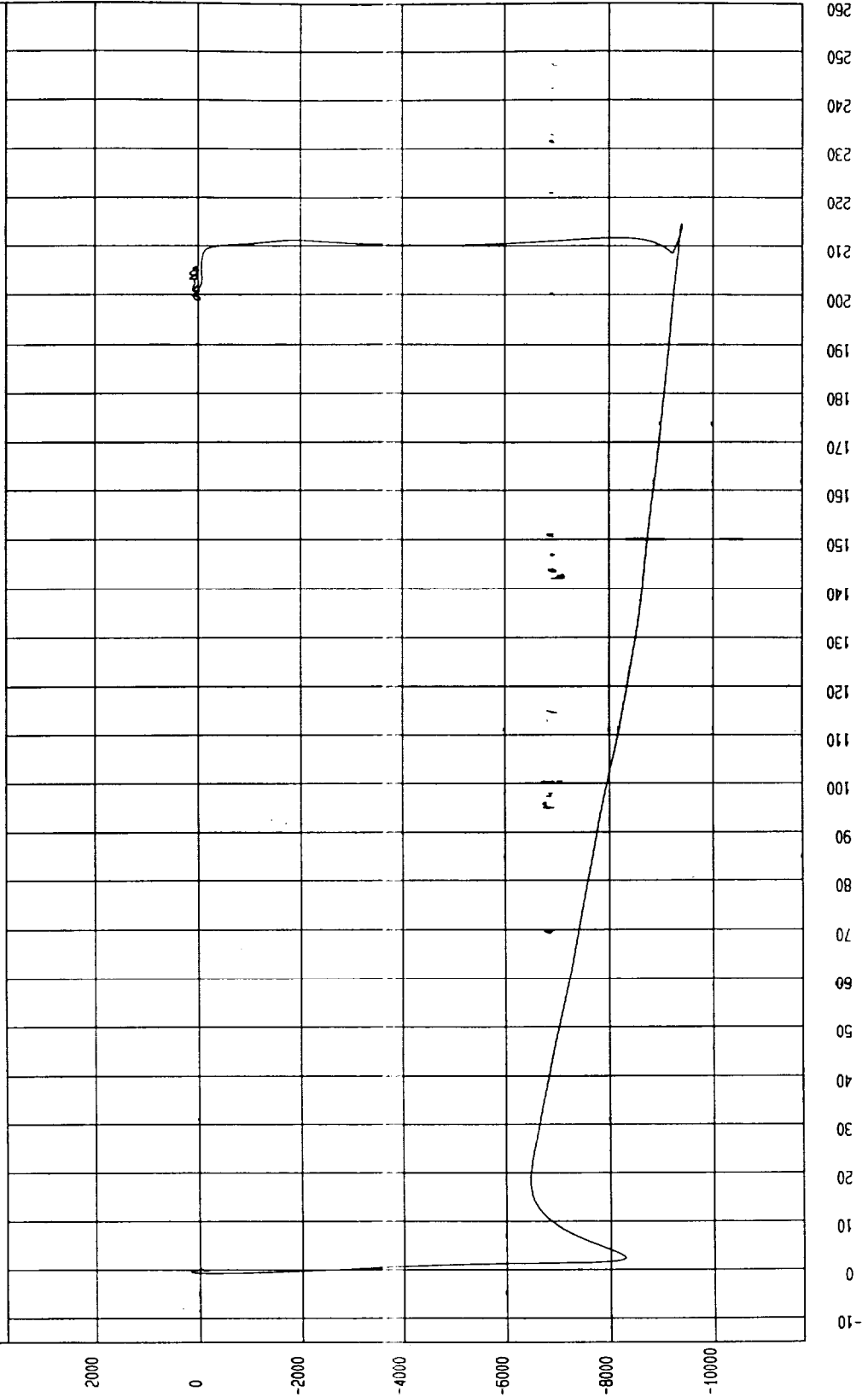
Speed: 25.8 MPH 41.5 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 172.87 N at 0 MM

Minimum = -9396.99 N at 214 MM

FORCE X LOAD CELL #43 VS STRINGPOT #43



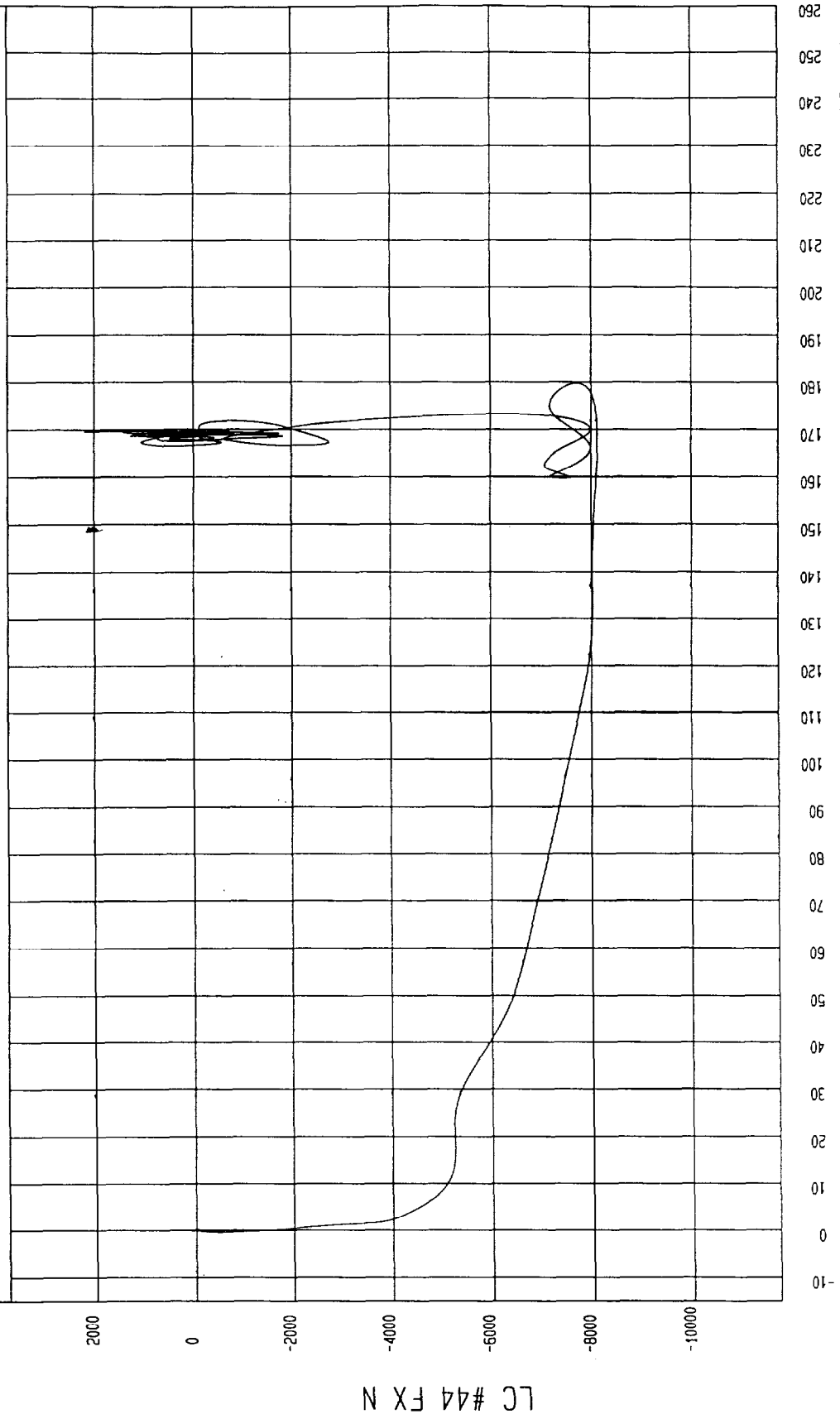
MCA Research
06-02-1998 15.15

STRING POT 43 MM

LC #43 FX N

TEST: 90 DEGREE INCLUDED ANGLE BARRIER IMPACT	TEST DATE: 12-23-1996
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 25.8 MPH 41.5 KPH
Minimum = -8122.85 N at 167 MM	Maximum = 2195.07 N at 170 MM

FORCE X LOAD CELL #44 VS STRINGPOT #44



MGA Research
06-02-1998 15:15

APPENDIX B
DEMONSTRATION TEST NO. 2 DATA

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* No valid data collected

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* No valid data collected

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TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.19 MM at 199 msec
Maximum = 2.54 MM at 55 msec

STRING POT 1

1 _____ C970300F.001 Filterclass (50)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

13

12

11

10

09

08

07

06

05

04

03

02

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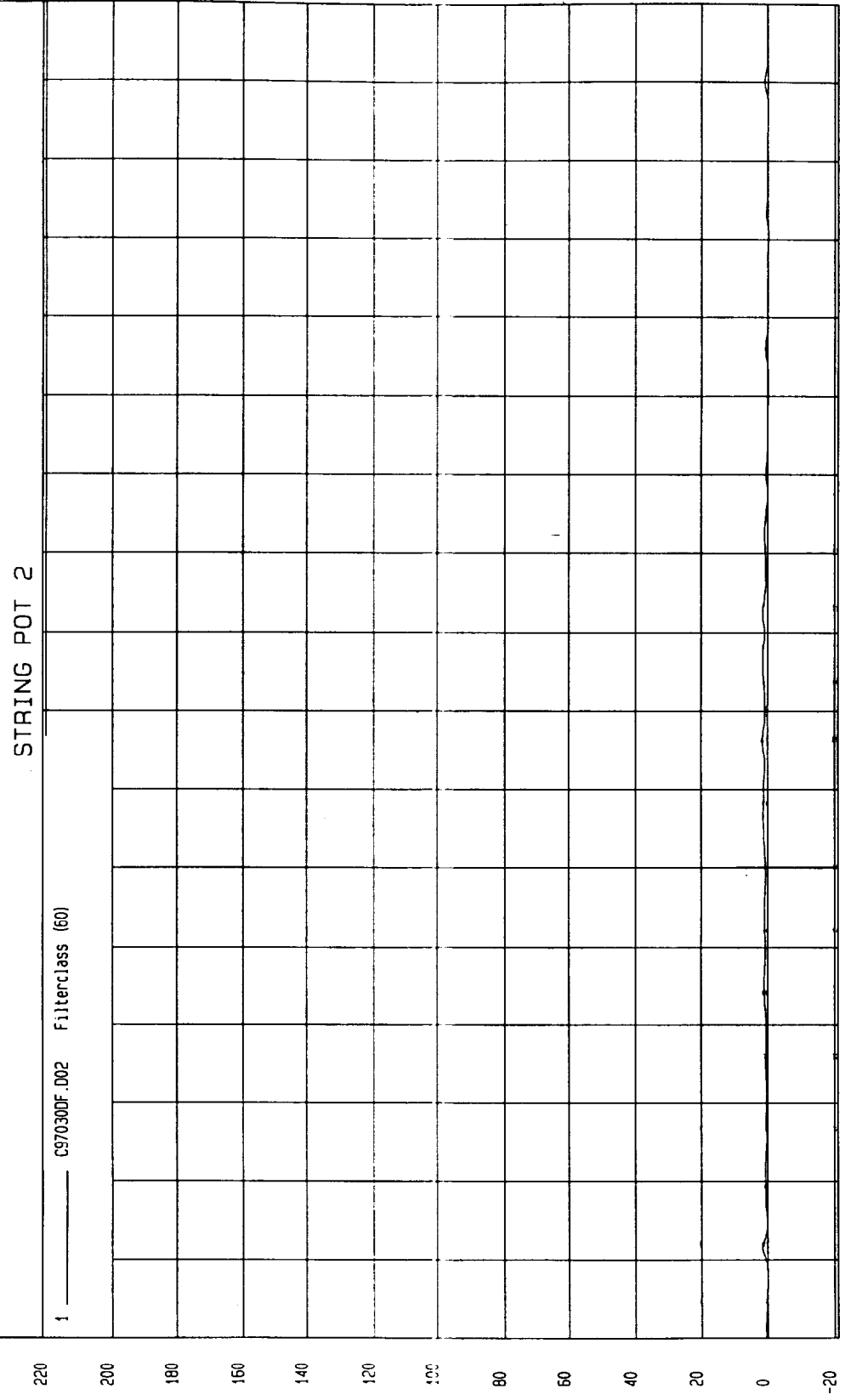
TIME (seconds)

MCA Research
05-04-1998 13:46

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.8 MM at 199 msec Maximum = 1.57 MM at 66 msec



MGA Research
06-04-1998 13:46

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.53 MM at -18 msec Maximum = 4.31 MM at 150 msec

STRING POT 3

1 C970300F.D03 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

15

14

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09

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05

04

03

02

01

0

-10

TIME (seconds)

MGA Research
06-04-1998 13:46

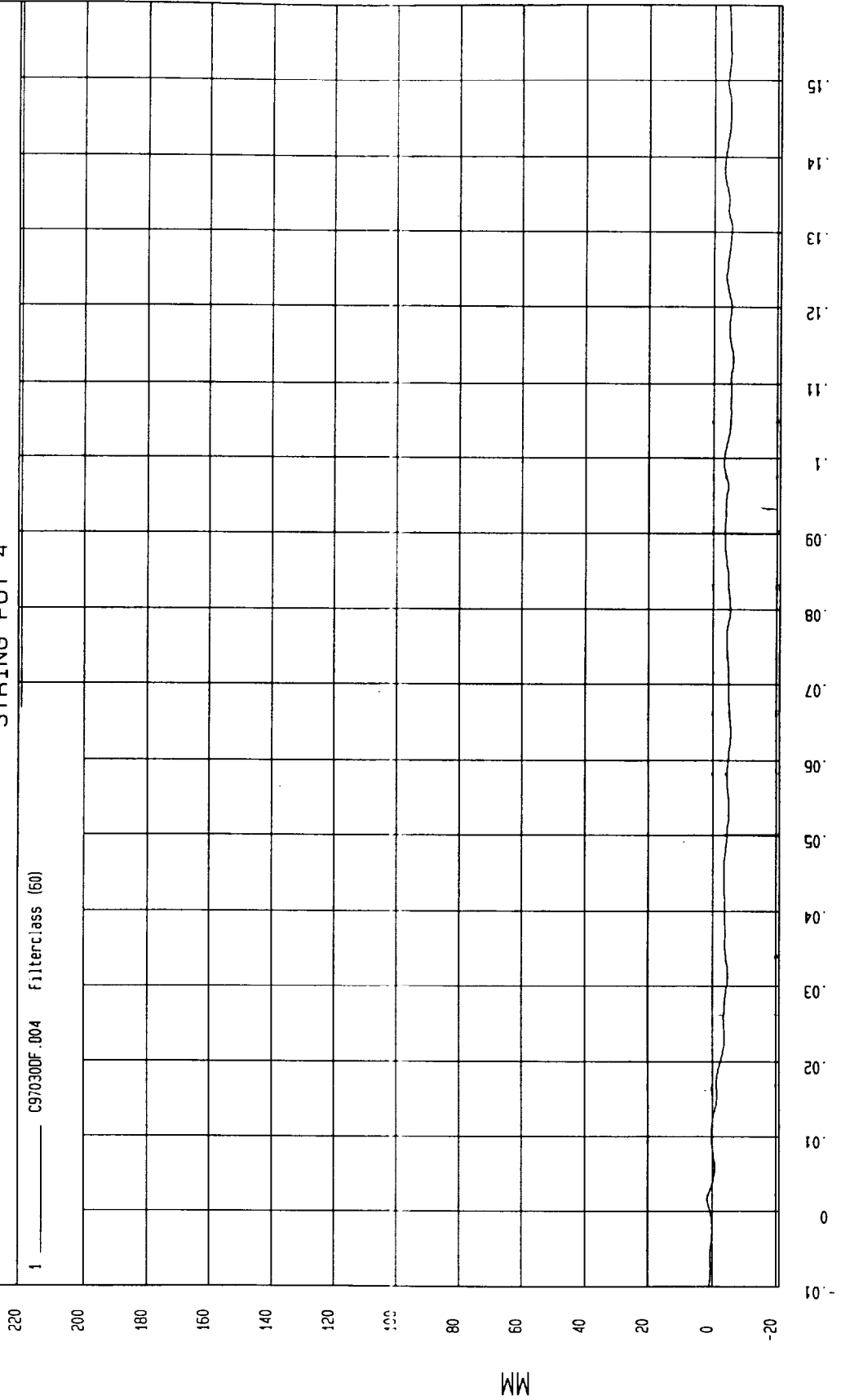
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6.11 MM at 113 msec

Maximum = 1.61 MM at 2 msec

STRING POT 4



MOA Research
06-04-1998 13:46

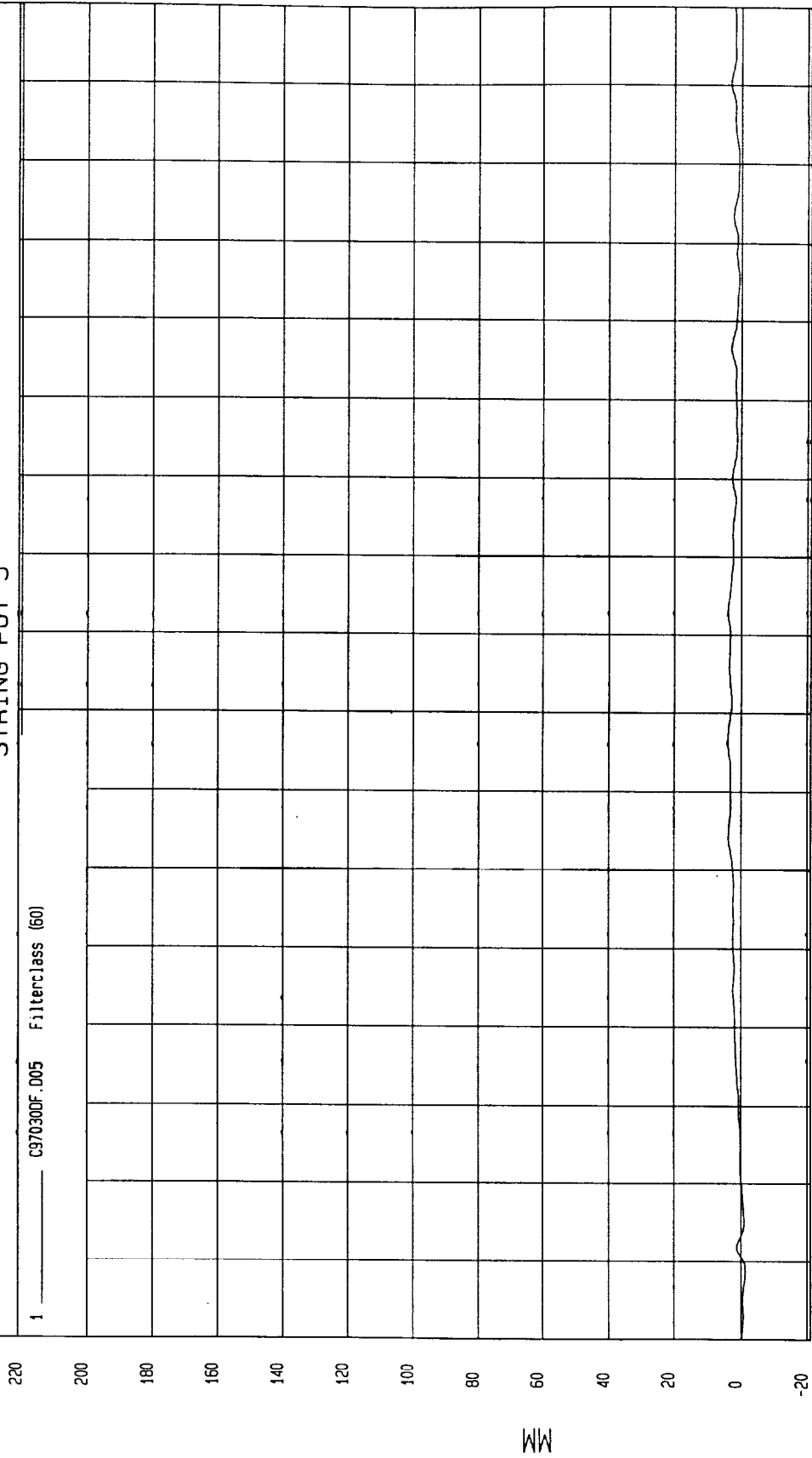
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.29 MM at -1 msec

Maximum = 4.11 MM at 83 msec

STRING POT 5



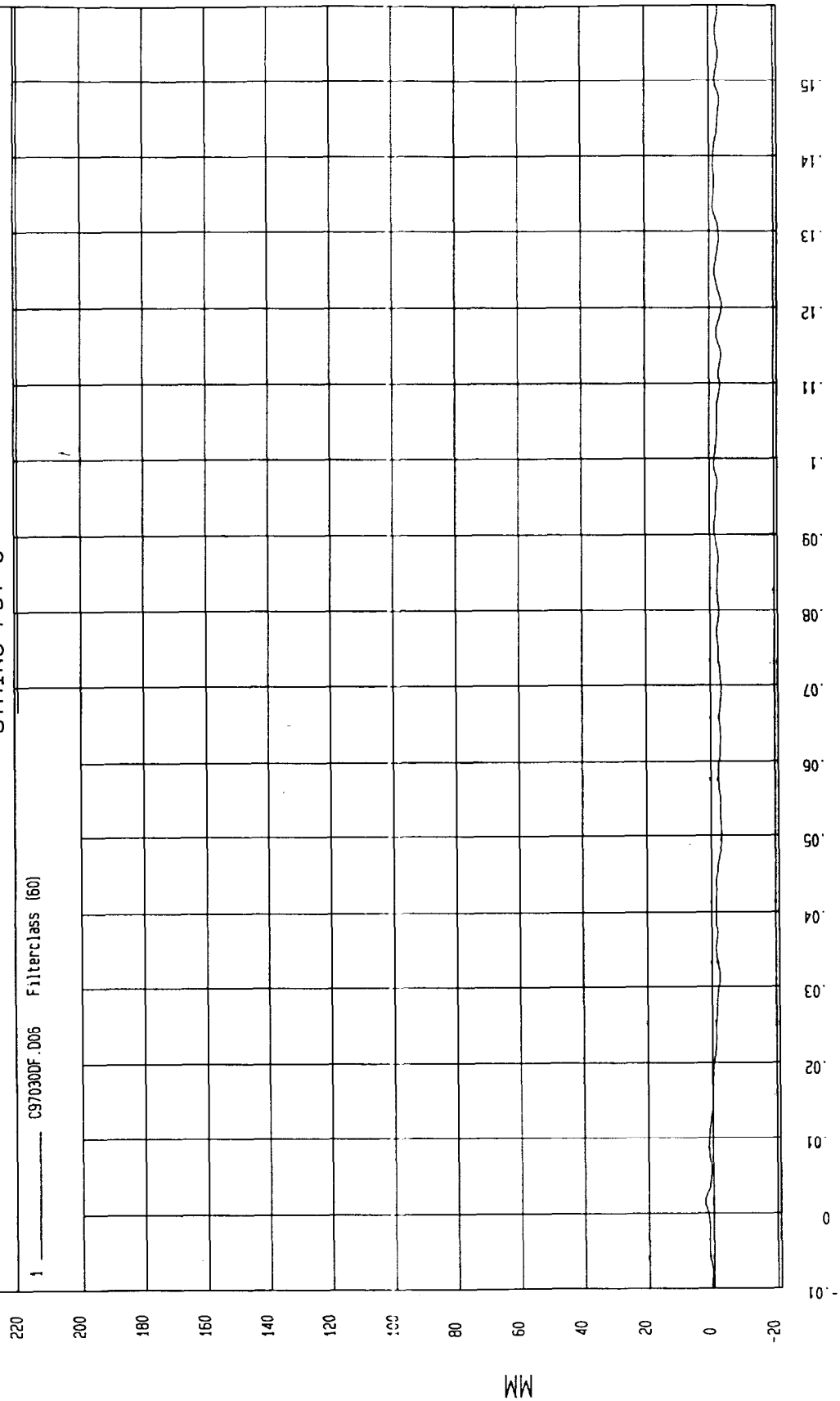
MCA Research
06-04-1998 13:46

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3.88 MM at 120 msec Maximum = 2.63 MM at 2 msec

STRING POT 6



WEA Research
06-04-1998 13.46

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.43 MM at 122 msec

Maximum = 1.41 MM at 100 msec

STRING POT 7

1 _____ C97030DF.D07 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

TIME (seconds)

MCA Research
06-04-1998 13.47

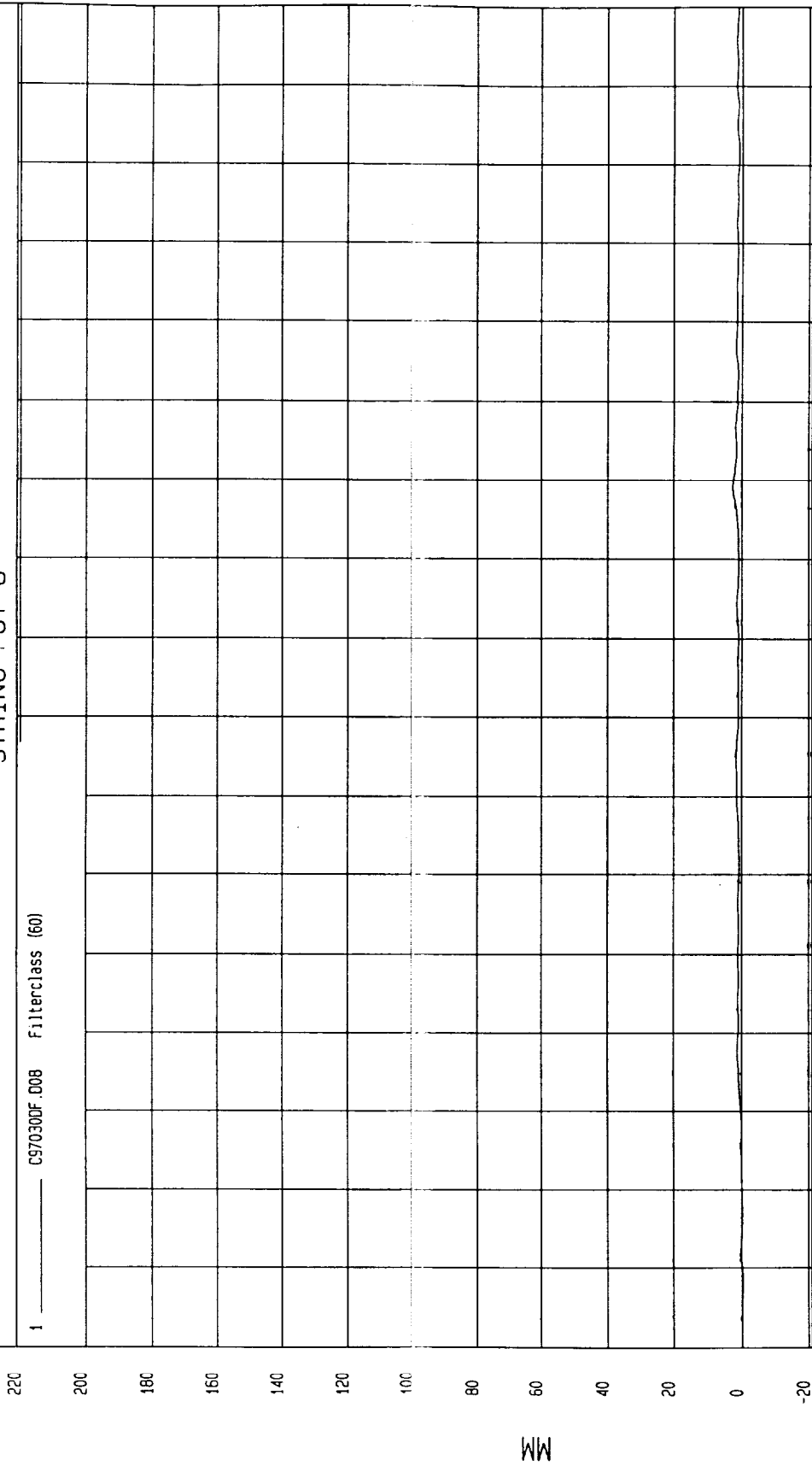
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.33 MM at -2 msec Maximum = 2.75 MM at 99 msec

STRING POT 8

1 _____ C97030DF.D08 Filterclass (60)



TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.01 MM at -20 msec Maximum = 5.41 MM at 66 msec

STRING POT 9

1 _____ C970300F.D09 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

TIME (seconds)

MCA Research
06-04-1998 13.47

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.49 MM at 159 msec

Maximum = 1.72 MM at 83 msec

STRING POT 10

1 — C97030DF.010 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.1

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.13

.14

.15

TIME (seconds)

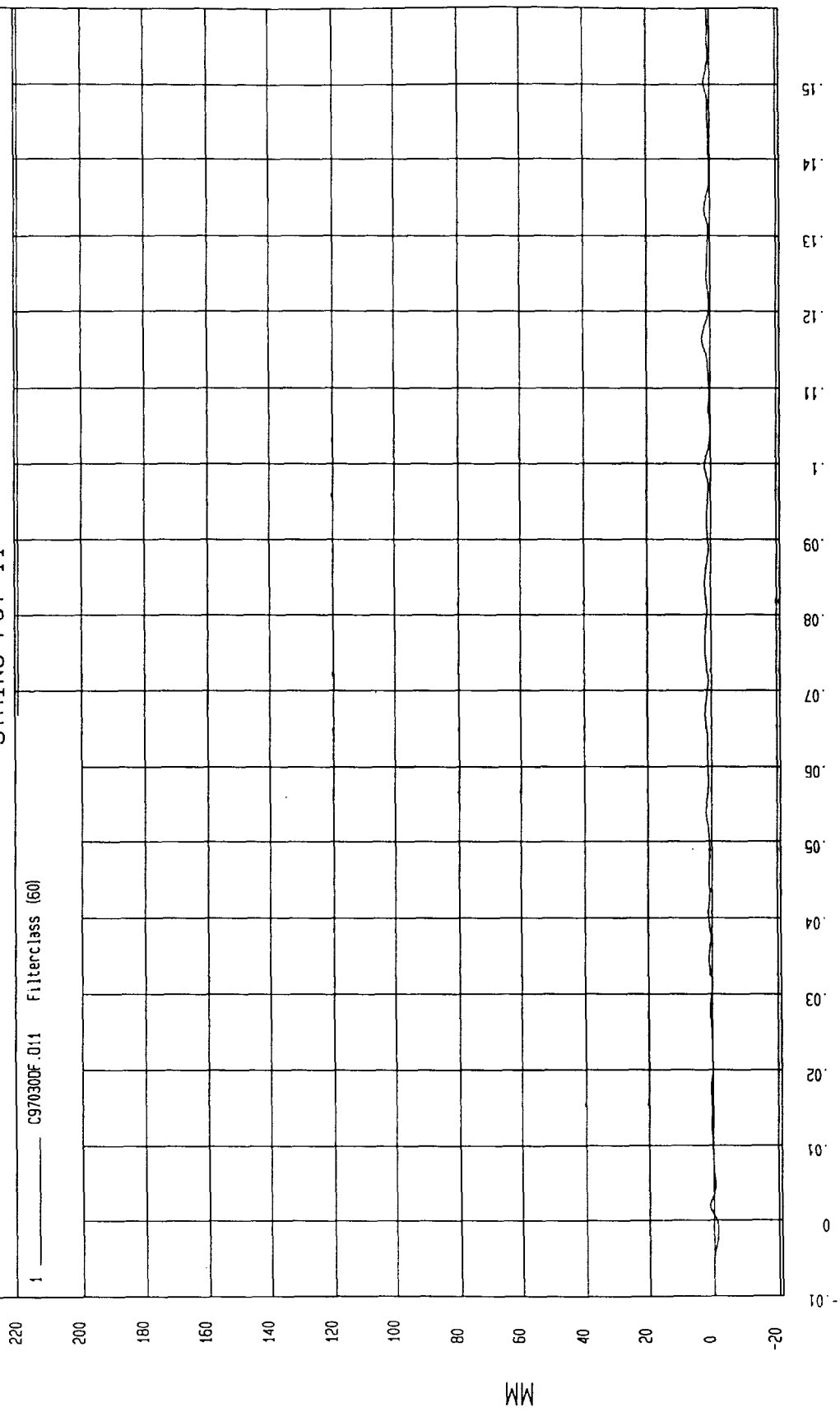
MCA Research
06-04-1998 13:47

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

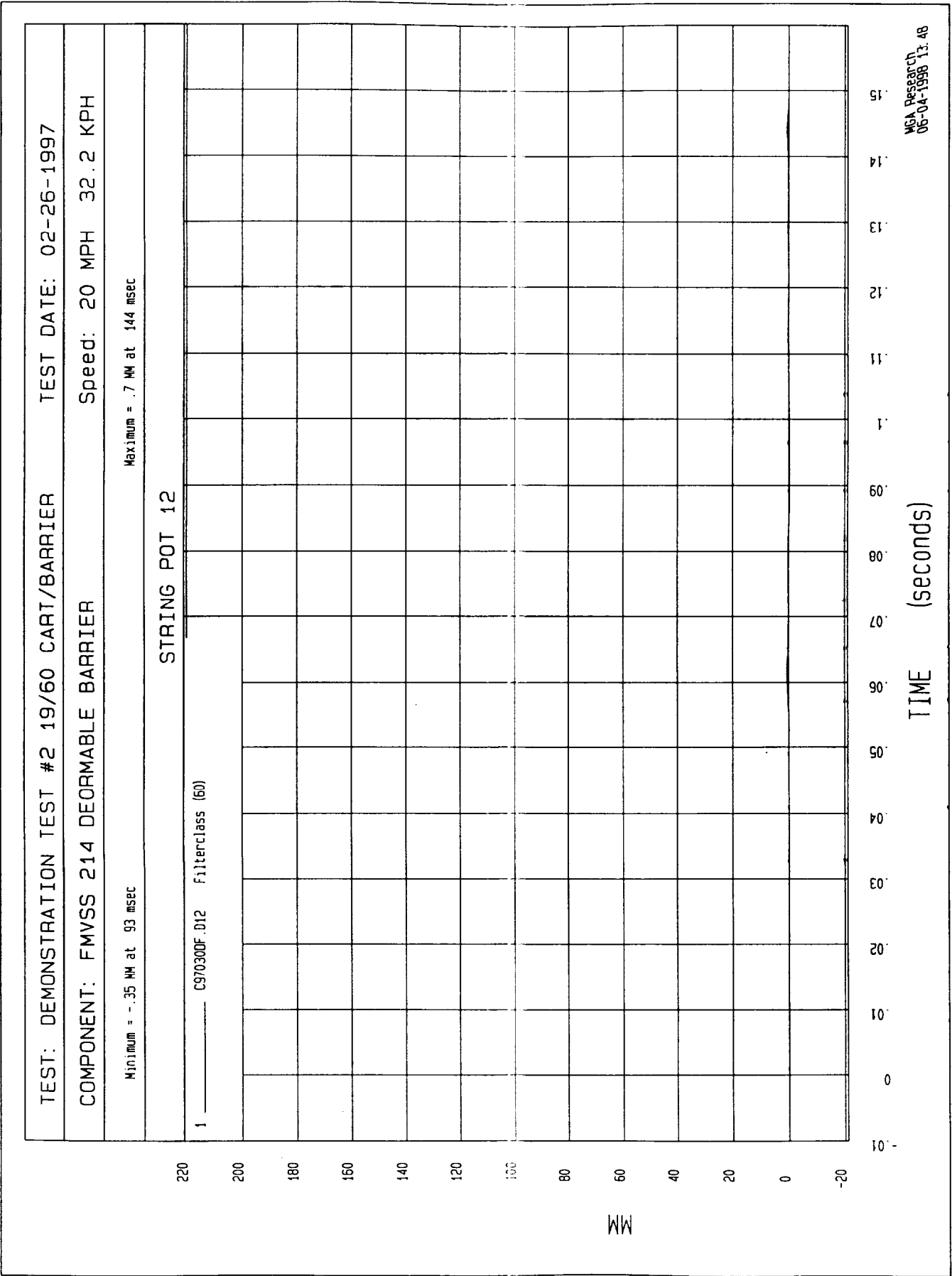
COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.4 MM at -1 msec Maximum = 2.68 MM at 115 msec

STRING POT 11



MCA Research
06-04-1998 13:47



TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.74 MM at 124 msec
Maximum = 2.95 MM at 66 msec

STRING POT 13

1 _____ C970300F.D13 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-01

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07

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05

04

03

02

01

0

-01

TIME (seconds)

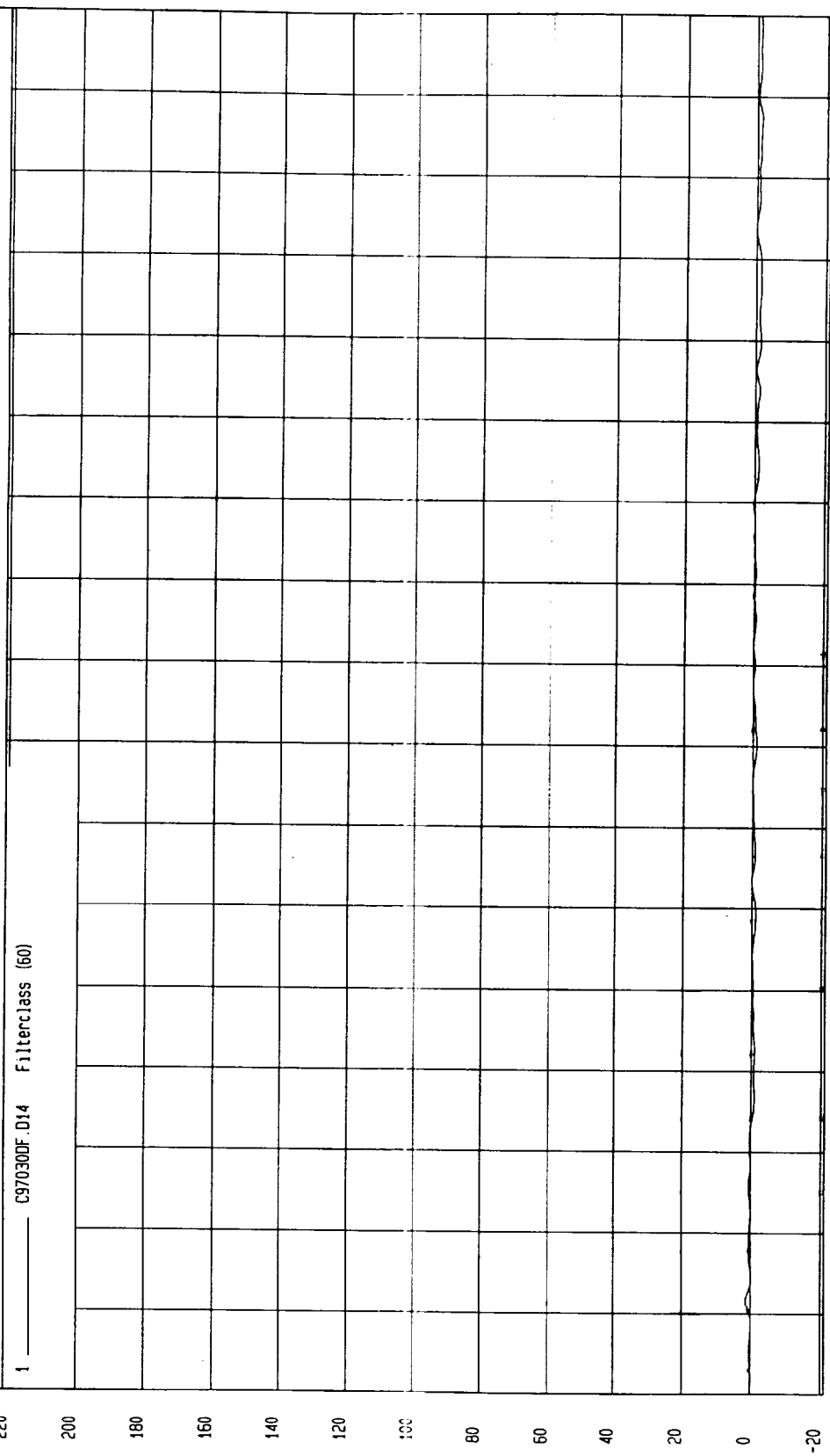
NCA Research
06-04-1998 13.48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -2.05 MM at 176 msec Maximum = 1.4 MM at 2 msec

STRING POT 14

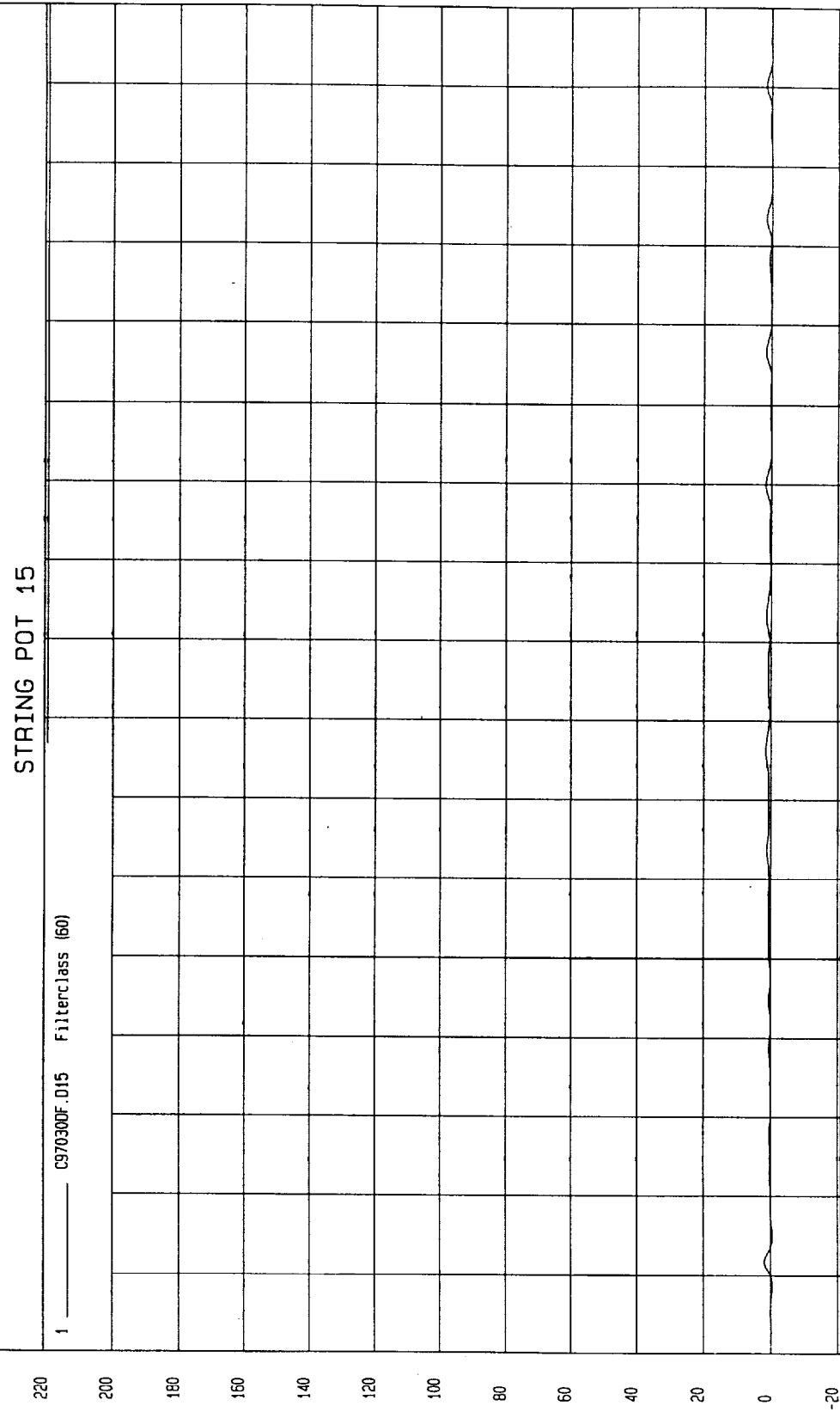


MCA Research
06-04-1998 13:48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.64 MM at 199 msec Maximum = 1.9 MM at 2 msec



MCA Research
06-04-1998 13.48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.77 MM at 199 msec

Maximum = 1.43 MM at 100 msec

STRING POT 16

1 _____ C970300F .016 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-01

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.1

.11

.12

.13

.14

.15

TIME (seconds)

WCA Research
06-04-1998 13:48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.02 MM at 199 msec Maximum = 2.55 MM at 66 msec

STRING POT 17

1 C97030DF.D17 Filterclass (50)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (seconds)

MCA Research
06-04-1998 13:48

TEST DATE: 02-26-1997

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

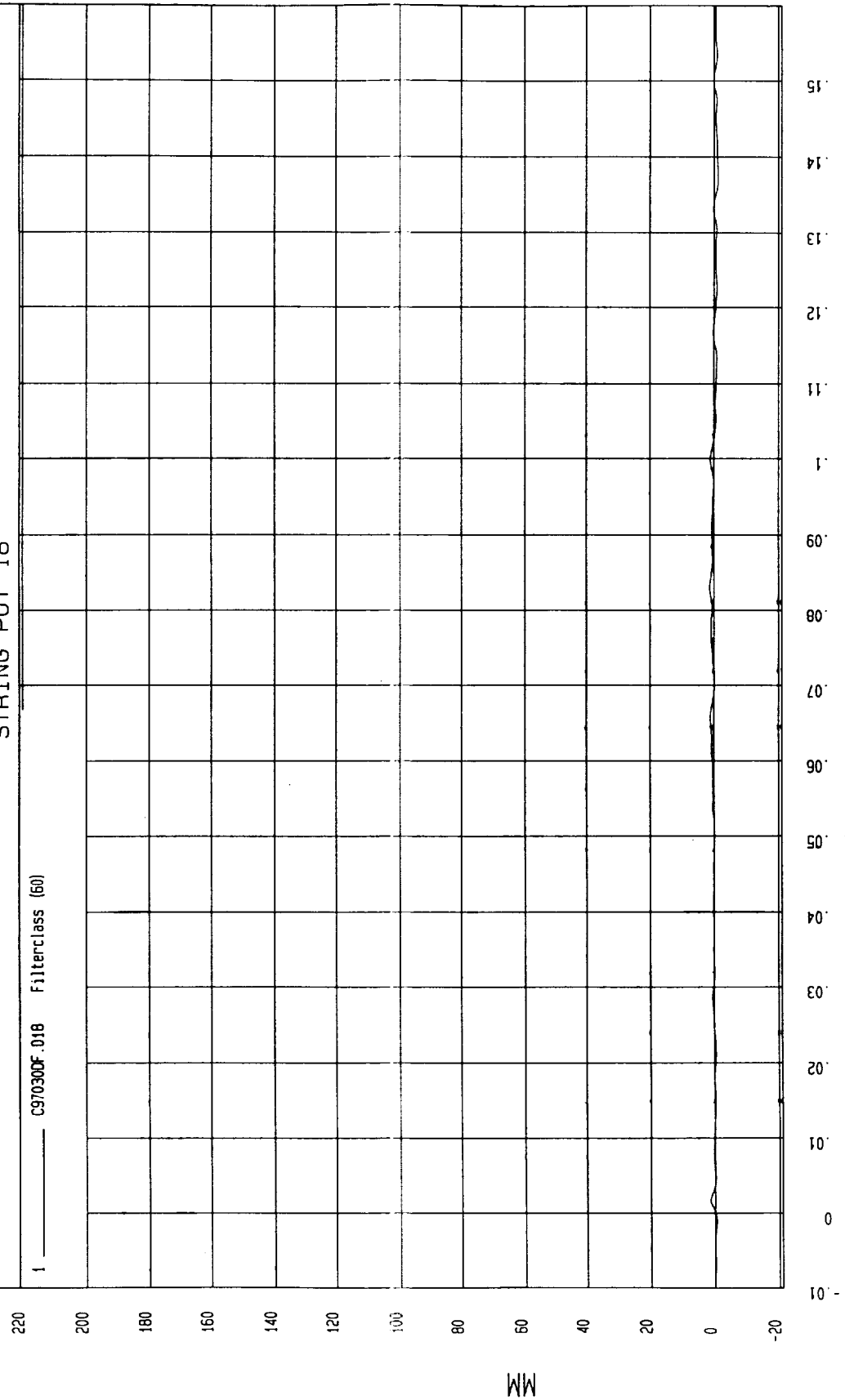
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -1.36 MM at 199 msec

Maximum = 1.4 μ M at 2 msec

STRING POT 18

1	C970300F.018	Filterclass (60)



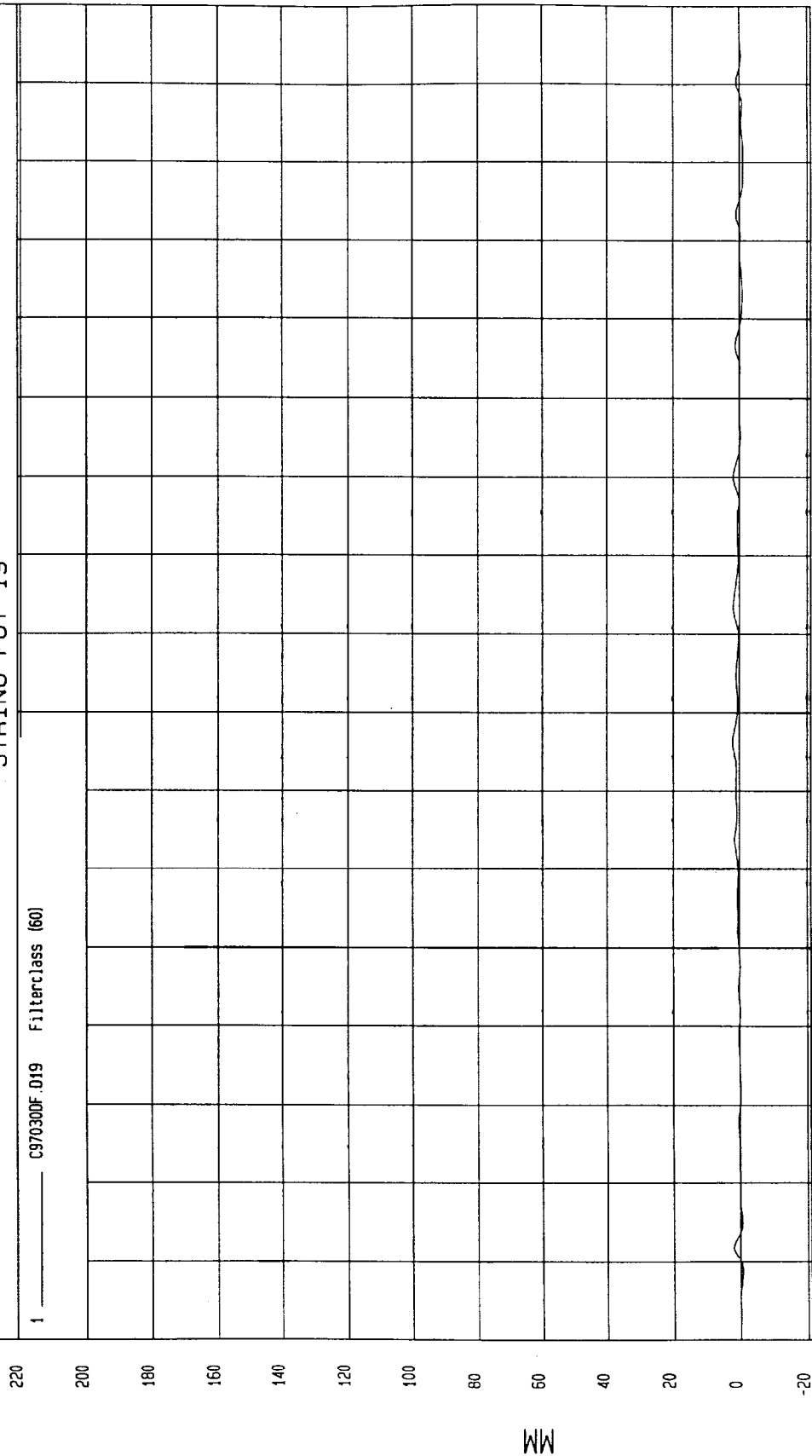
MGA Research
06-04-1998 13:48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.47 MM at 199 msec Maximum = 2.08 MM at 66 msec

STRING POT 19



NCA Research
06-04-1998 13.48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.5 MM at -8 msec

Maximum = 3.51 MM at 82 msec

STRING POT 20

1 ——— C97030DF.020 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-10

15

14

13

12

11

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05

04

03

02

01

0

TIME (seconds)

MCA Research
06-04-1998 13:48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER

Speed: 20 MPH 32.2 KPH

Minimum = -71 MM at -1 msec

Maximum = 3.49 MM at 66 msec

STRING POT 21

1 ——— C970300F.021 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

TIME (seconds)

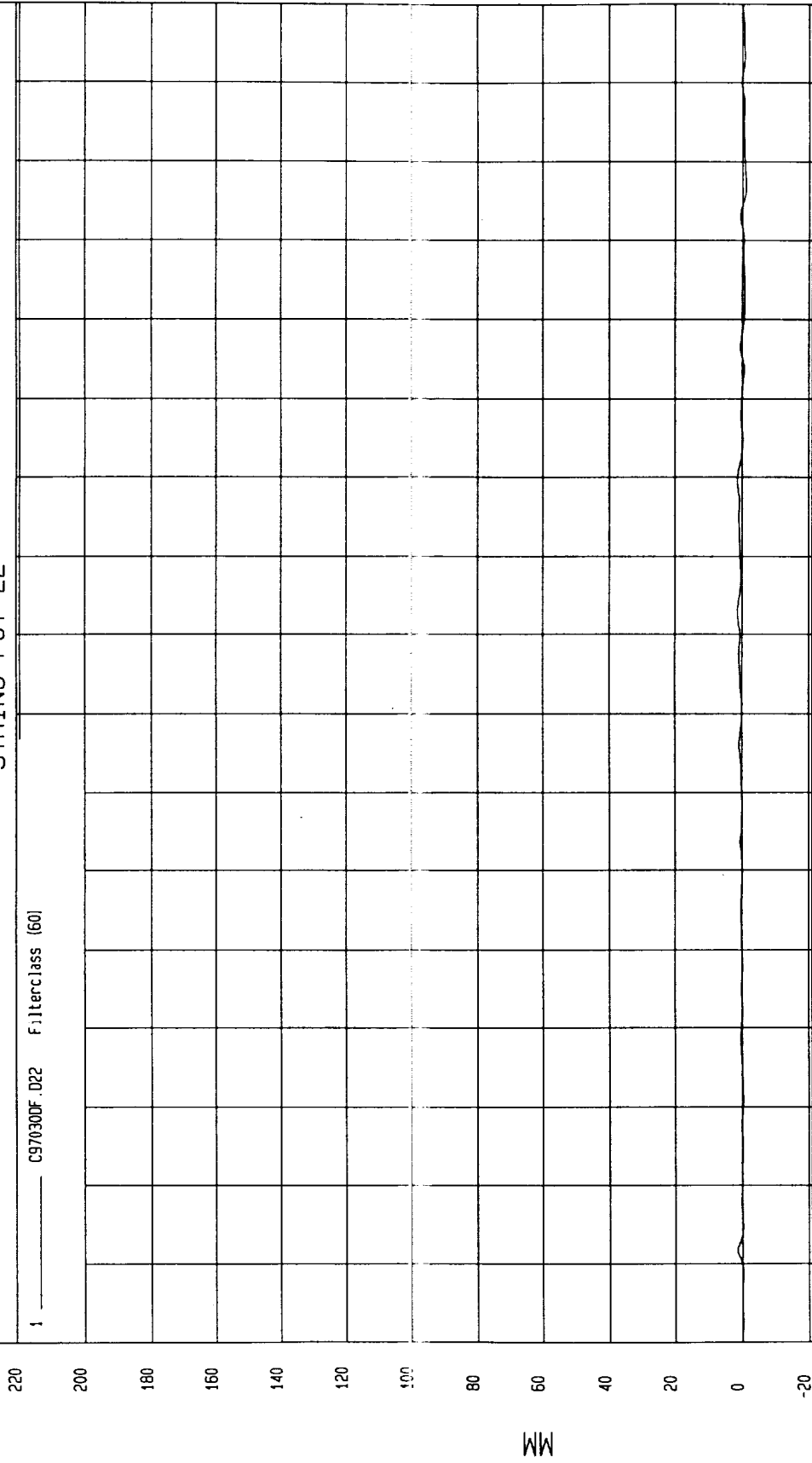
NCA Research
06-04-1998 13:48

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.25 MM at 199 msec Maximum = 1.49 MM at 100 msec

STRING POT 22



MGA Research
06-04-1998 13.49

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

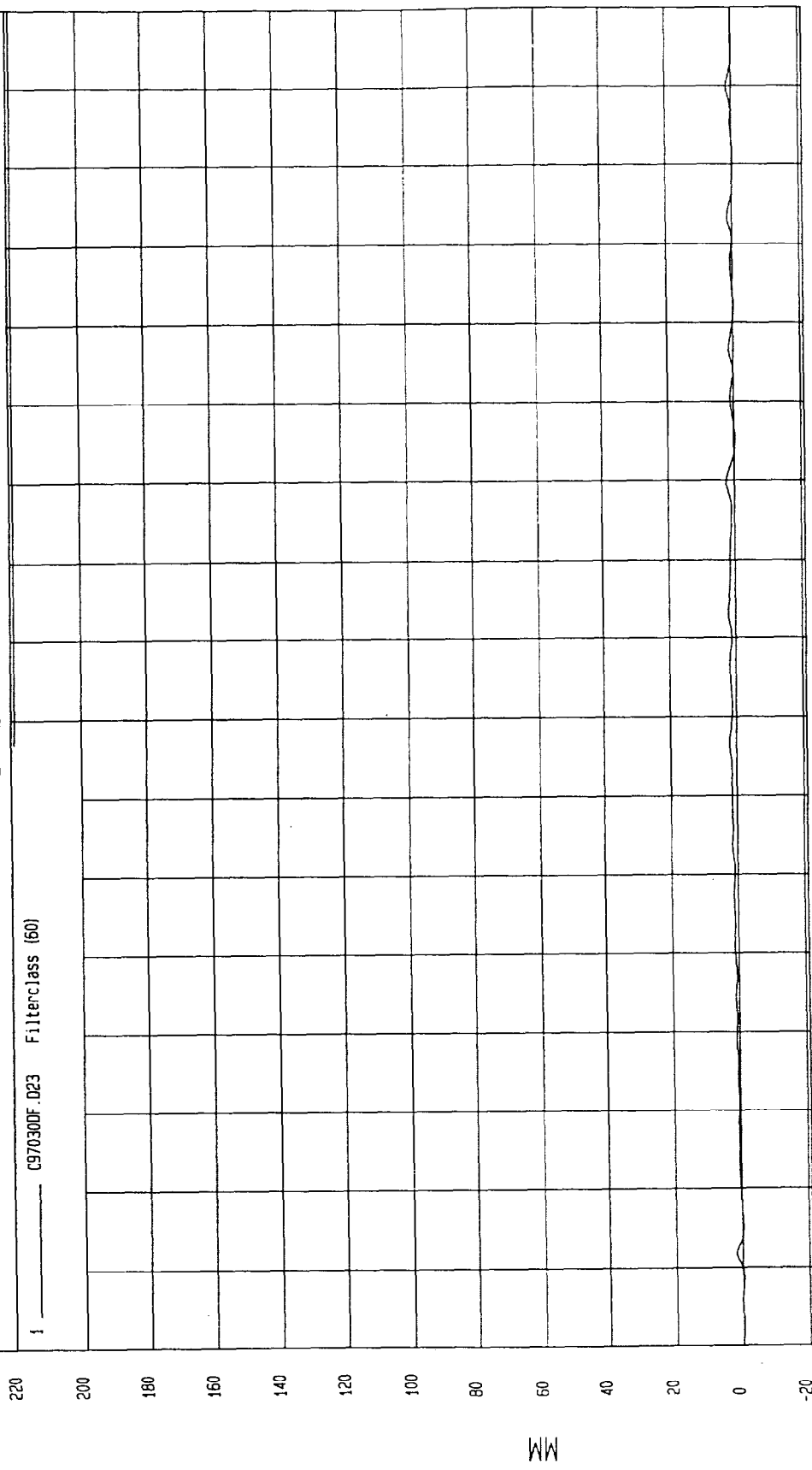
SPEED: 20 MPH 32.2 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 2.39 MM at 100 msec

Minimum = -1 MM at 199 msec

STRING POT 23



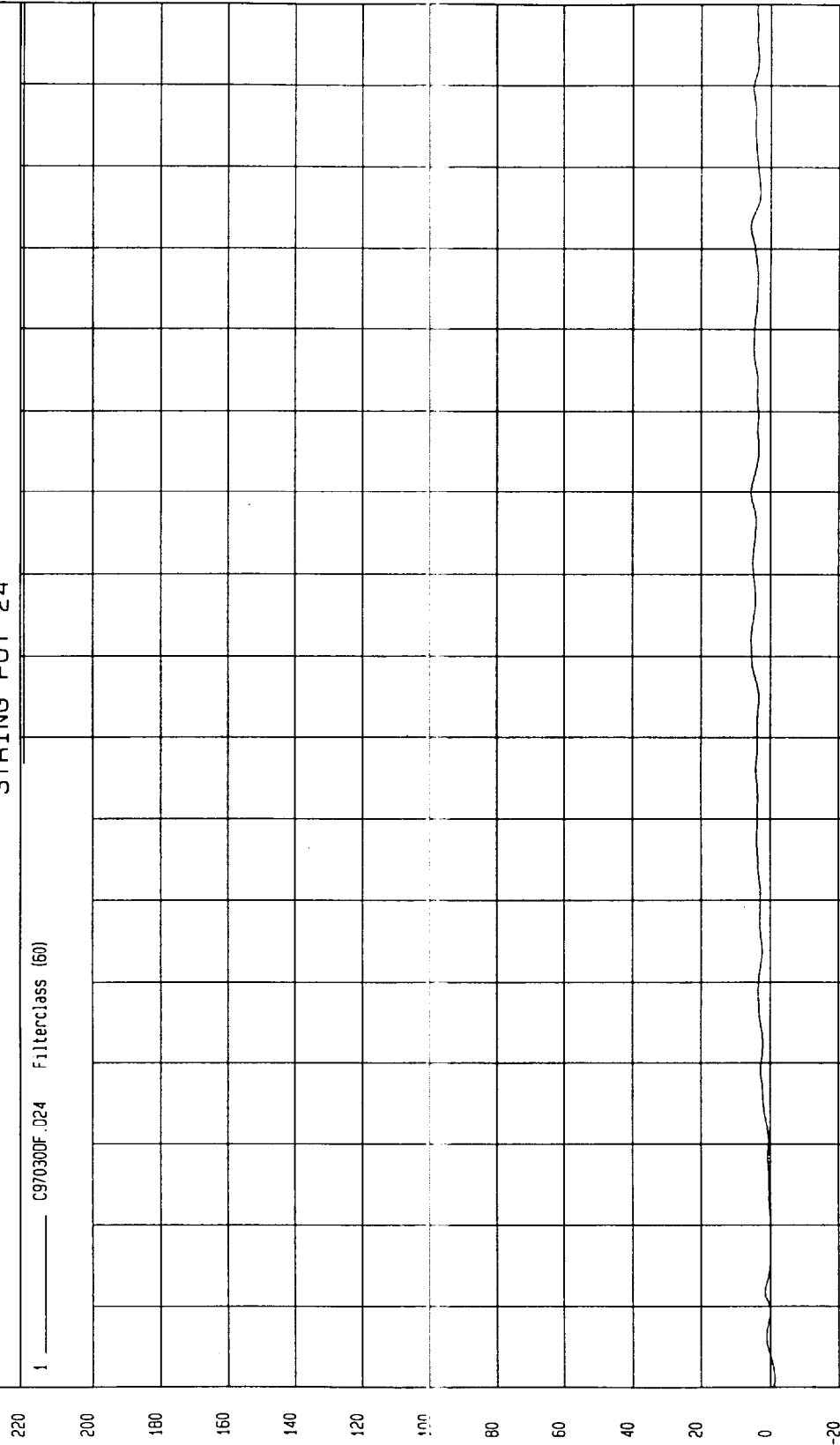
MGA Research
06-04-1998 13:49

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.14 MM at -9 msec Maximum = 5.76 MM at 133 msec

STRING POT 24



MCA Research
06-04-1996 13.49

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.68 MM at .199 msec Maximum = 2.05 MM at 100 msec

STRING POT 25

1 _____ CS97030DF.025 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

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05

04

03

02

01

0

-01

TIME (seconds)

MCA Research
08-04-1998 13:49

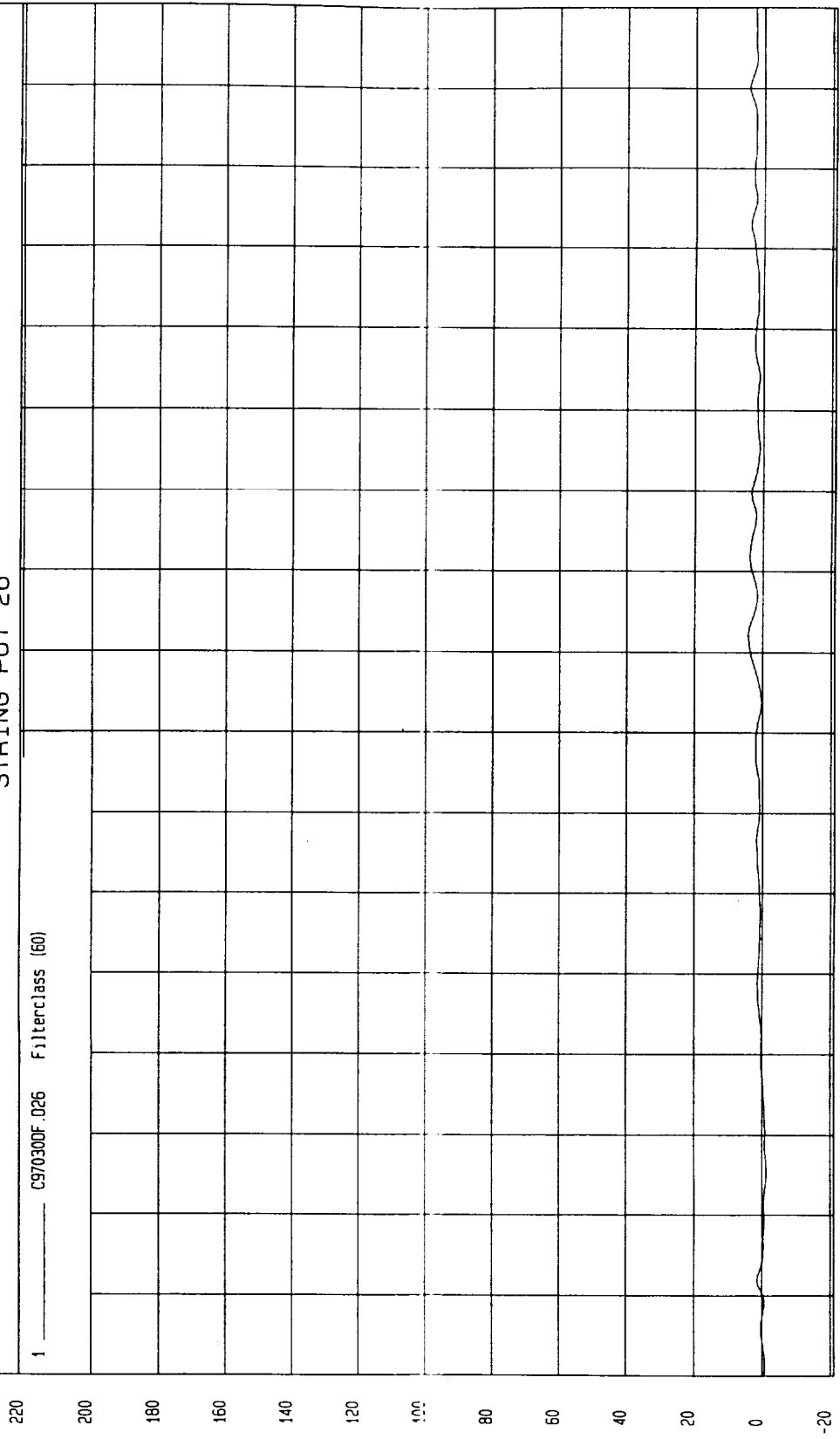
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.15 MM at 16 msec Maximum = 4.25 MM at 82 msec

STRING POT 26

1 _____ C970300F D26 Filterclass (60)



NCA Research
06-04-1996 13.49

TIME (seconds)

MM

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.76 MM at 199 msec Maximum = 2.33 MM at 83 msec

STRING POT 27

1 _____ C97030DF.D27 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.10

0.11

0.12

0.13

0.14

0.15

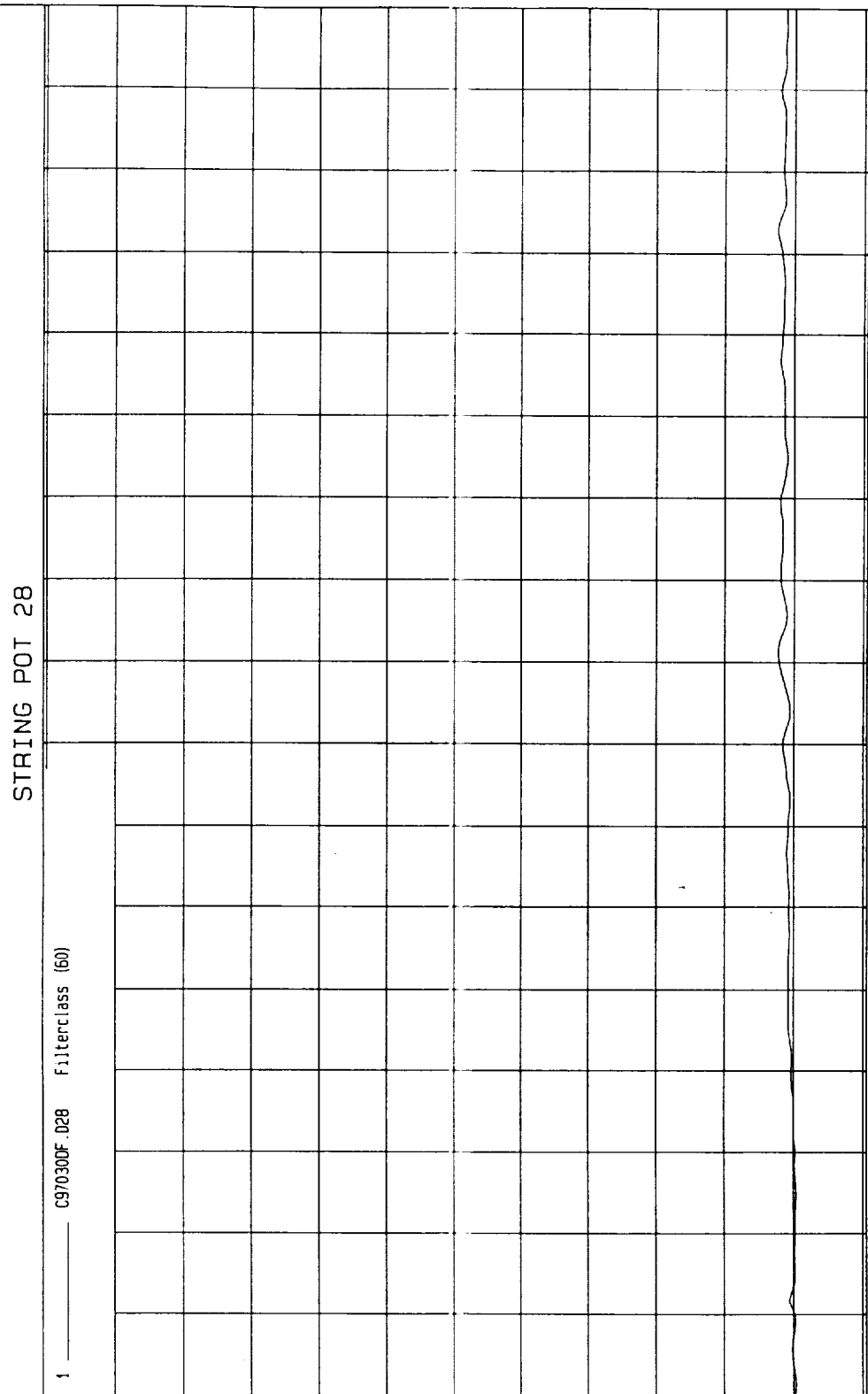
TIME (seconds)

MCA Research
06-04-1998 13.49

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.85 MM at -20 msec Maximum = 4.92 MM at 133 msec



MM

TIME (seconds)

MCA Research
06-04-1998 13:49

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6.37 MM at -2 msec

Maximum = 13.23 MM at 105 msec

STRING POT 29

1 — C970300F .029 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

MCA Research
06-04-1998 13.49

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.39 MM at 191 msec

Maximum = 3.47 MM at 73 msec

STRING POT 30

1 C970300F.030 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

0

10

20

30

40

50

60

70

80

90

1

11

12

13

14

15

TIME (seconds)

MCA Research
06-04-1998 13:49

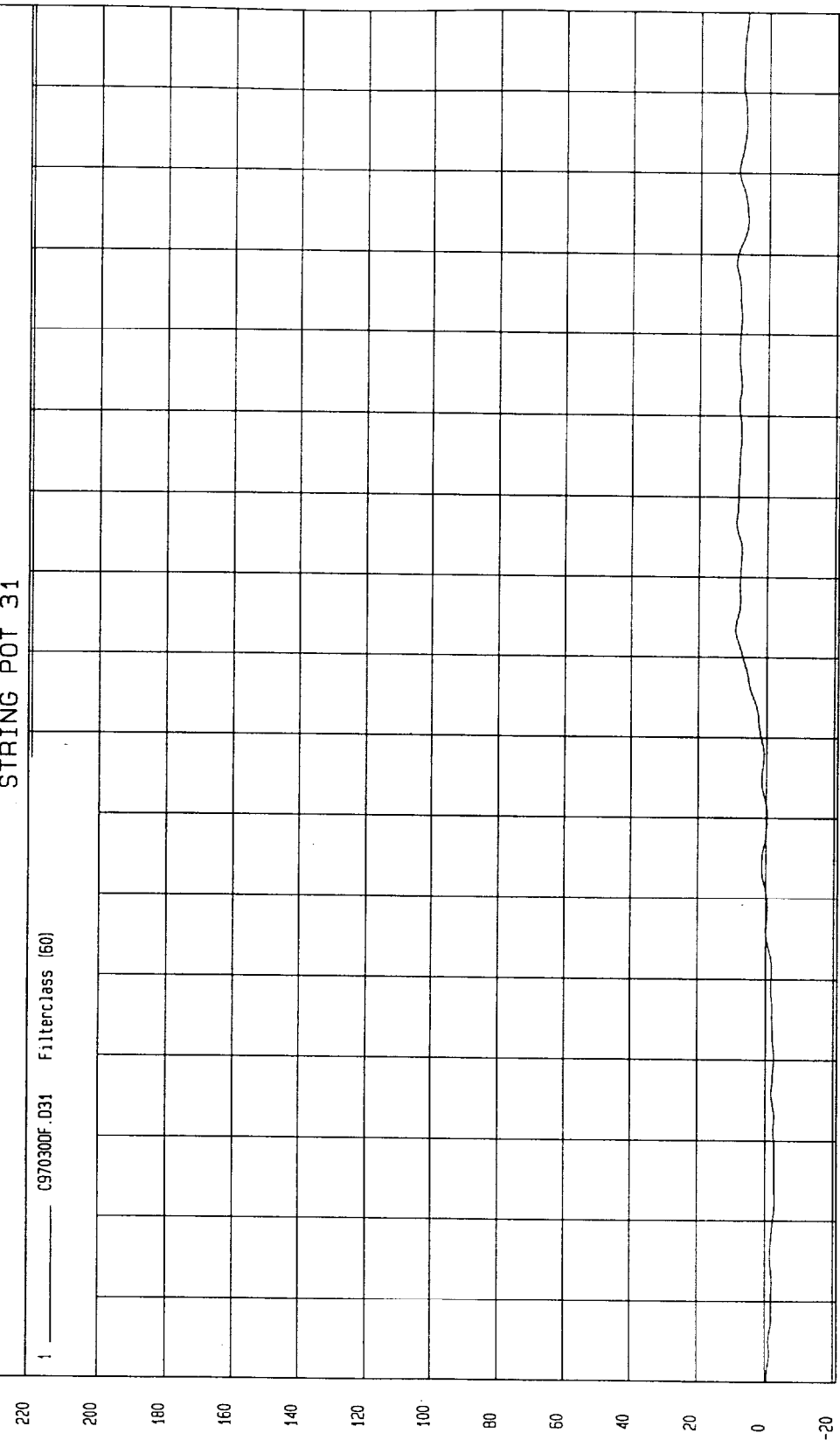
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -2.78 MM at 12 msec Maximum = 9.4 MM at 129 msec

STRING POT 31

1 _____ C970300F.031 Filterclass (60)



MSA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -2.41 MM at 38 msec
Maximum = 12.2 MM at 107 msec

STRING POT 32

1 _____ C970300F.032 Filterclass (50)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.10

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (seconds)

MCA Research
05-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3.38 MM at 45 msec

Maximum = 12.82 MM at 88 msec

STRING POT 33

1 C970300F.033 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (seconds)

MGA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

Speed: 20 MPH 32.2 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -83 MM at -20 msec

Maximum = 19.38 MM at 88 msec

STRING POT 34

1 C970300F.034 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.1

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (seconds)

MCA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 4.86E-02 MM at -17 msec
Maximum = 68.14 MM at 102 msec

STRING POT 35

1 ——— CS70300F.035 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

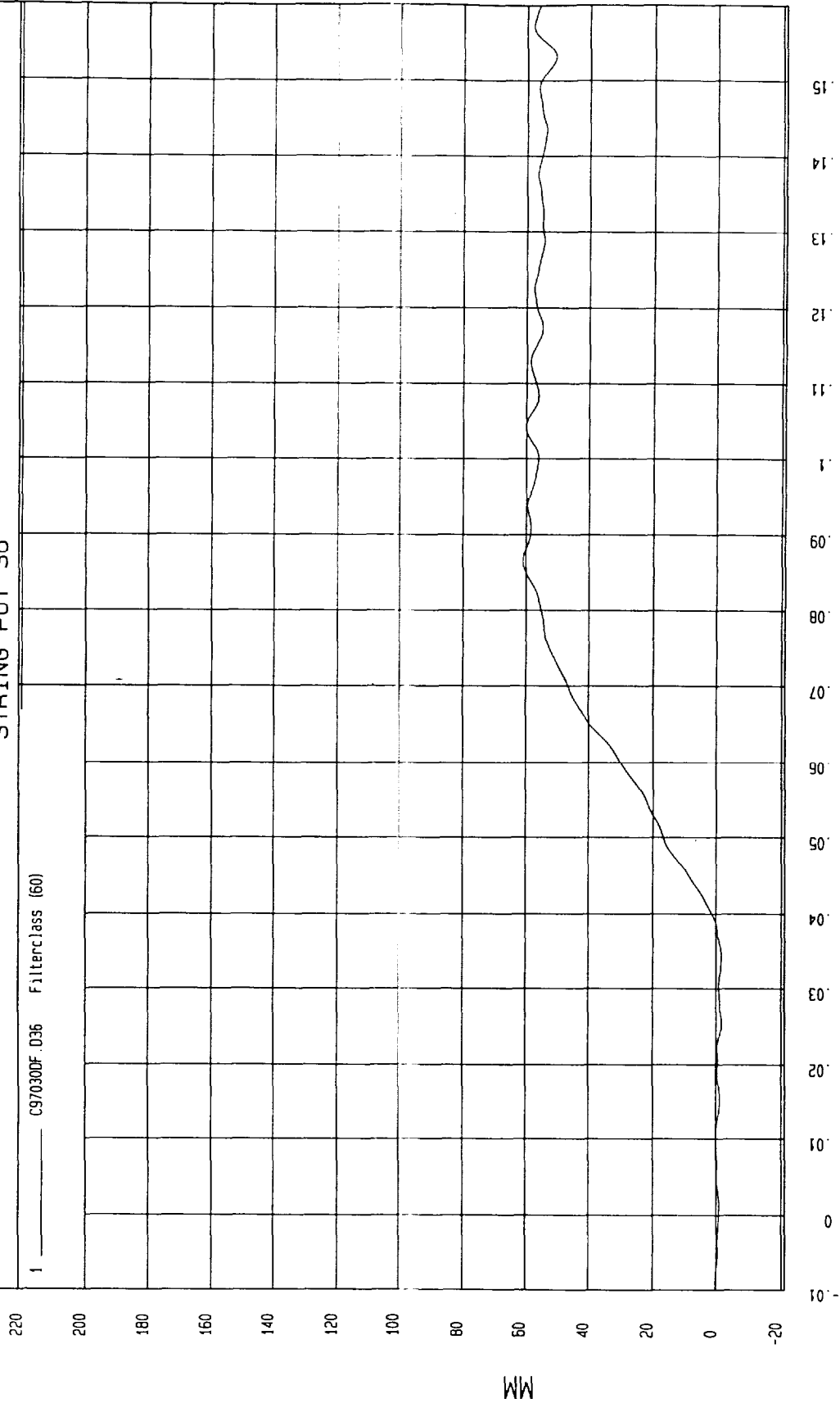
MGA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.66 MM at 25 msec Maximum = 60.91 MM at 86 msec

STRING POT 36



MGA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

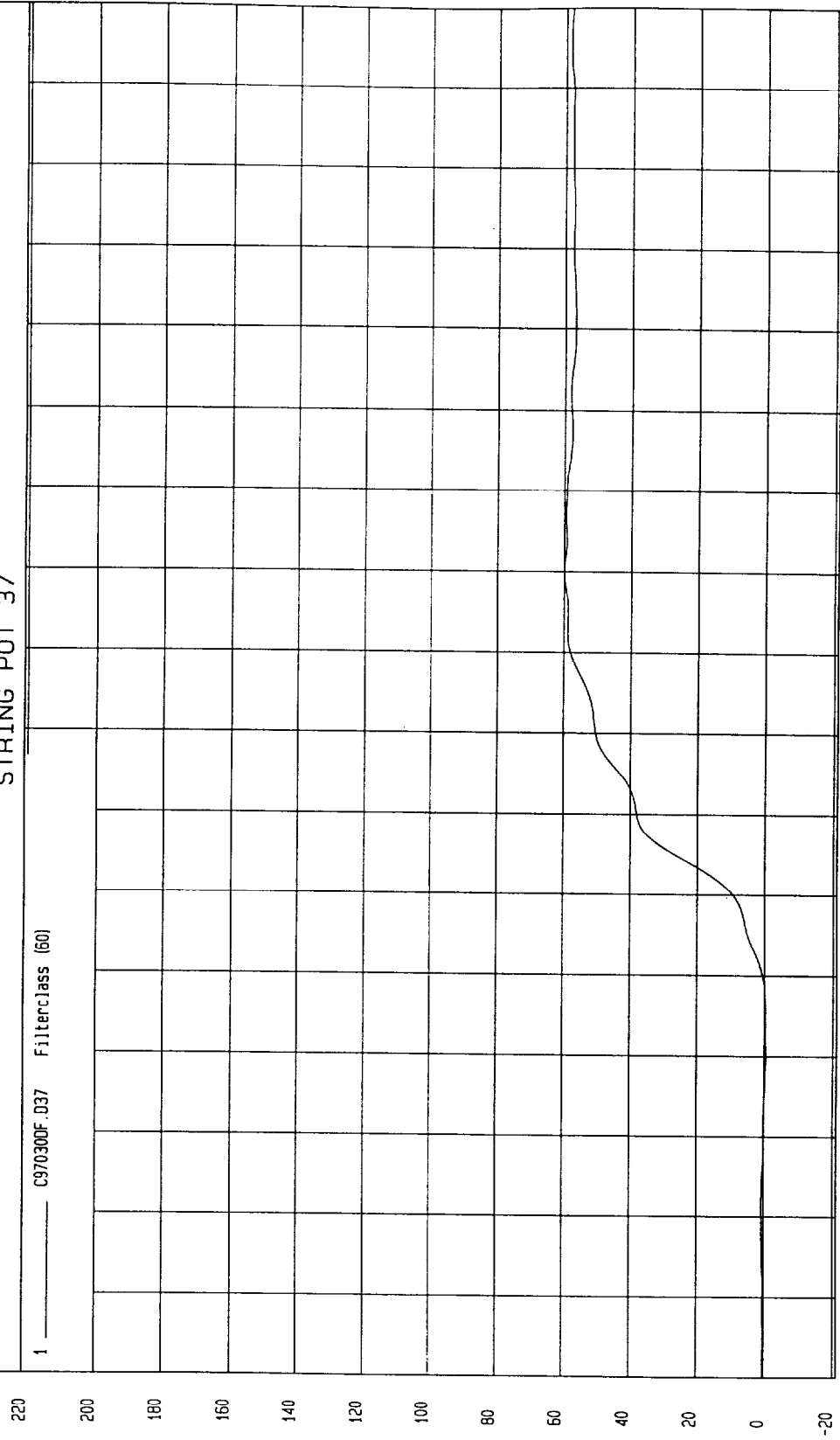
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.5 MM at 30 msec

Maximum = 59.86 MM at 90 msec

STRING POT 37

1 C970300F.037 Filterclass (60)



MSA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.56 MM at 19 msec
Maximum = 62.84 MM at 195 msec

STRING POT 38

1 _____ C970300F.038 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

MSA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -.42 MM at -10 msec Maximum = 122.28 MM at 89 msec

STRING POT 39

1 C970300F.039 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (seconds)

MCA Research
06-04-1998 13.50

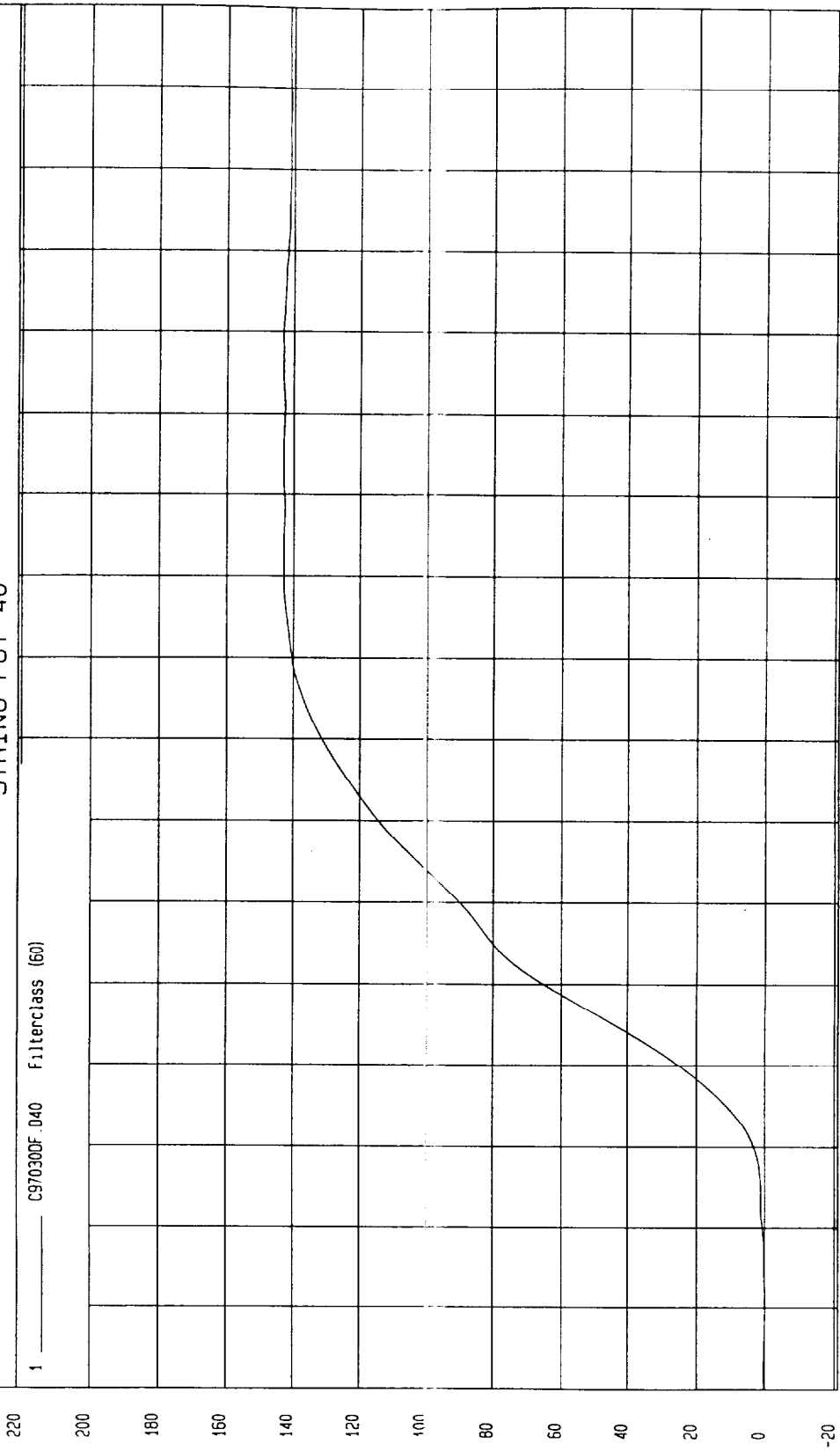
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -17 MM at -20 msec Maximum = 143.15 MM at 120 msec

STRING POT 40

1 ——— C970300F 040 Filterclass (60)



MCA Research
06-04-1998 13:50

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.66 MM at -9 msec

Maximum = 127.64 MM at 119 msec

STRING POT 41

1 C970300F.041 Filterclass (60)

220

200

180

160

140

120

100

80

60

40

20

0

-20

MM

-10

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

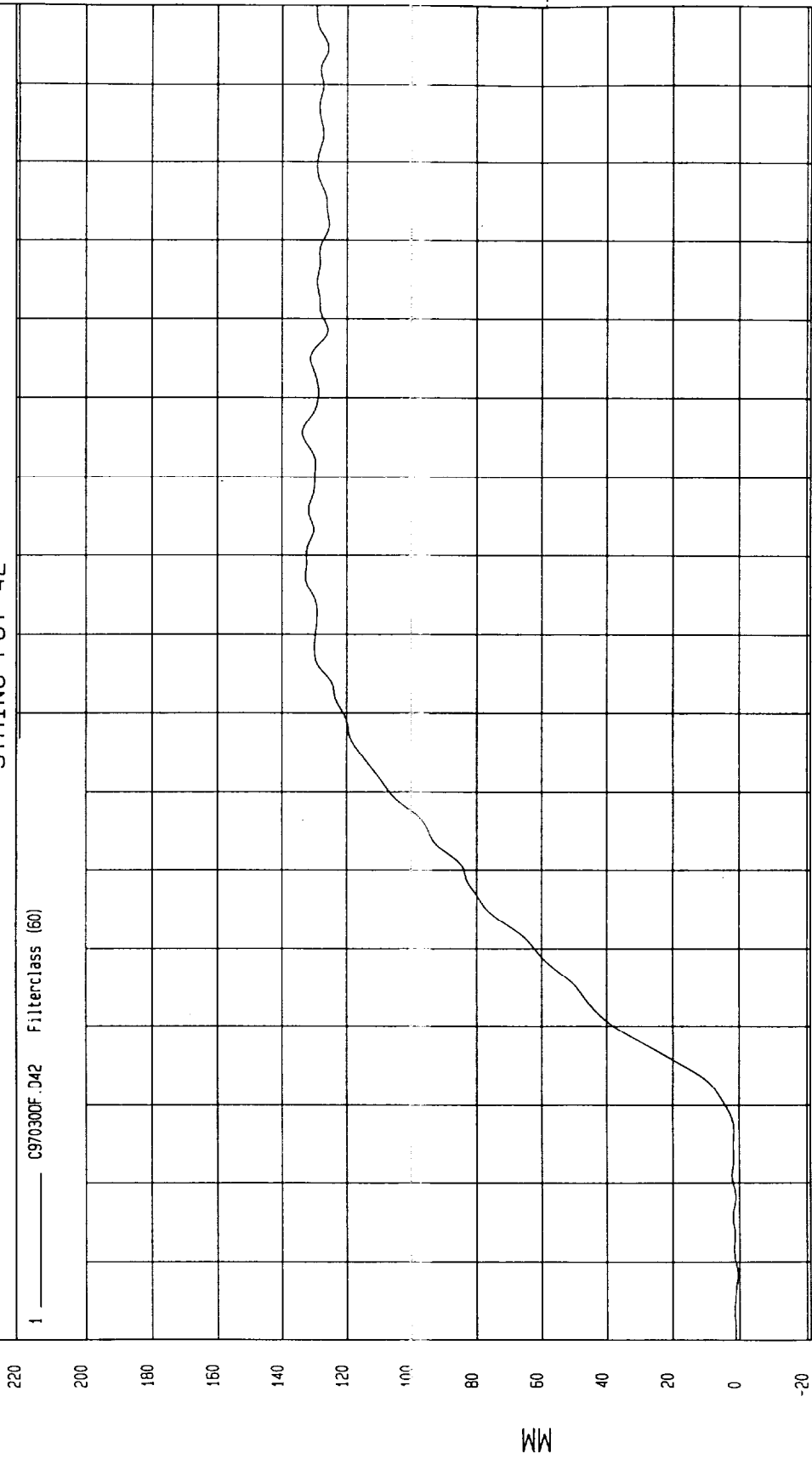
150

TIME (seconds)

MSA Research
06-04-1998 13:51

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -.23 MM at -20 msec	
Maximum = 133.68 MM at 106 msec	

STRING POT 42



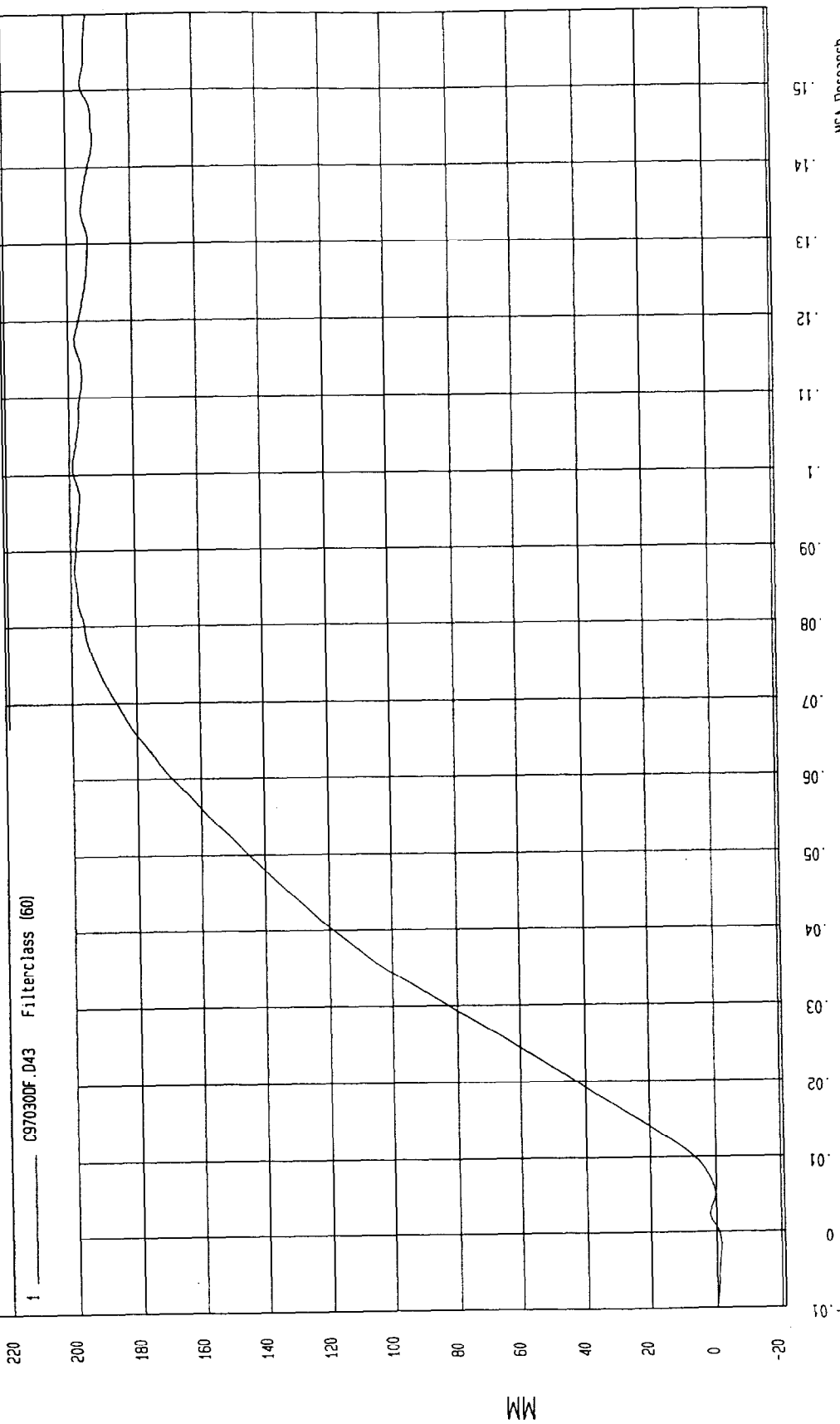
MGA Research
06-04-1998 13:51

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.33 MM at -2 msec Maximum = 198.94 MM at 101 msec

STRING POT 43



MCA Research
06-04-1998 13:51

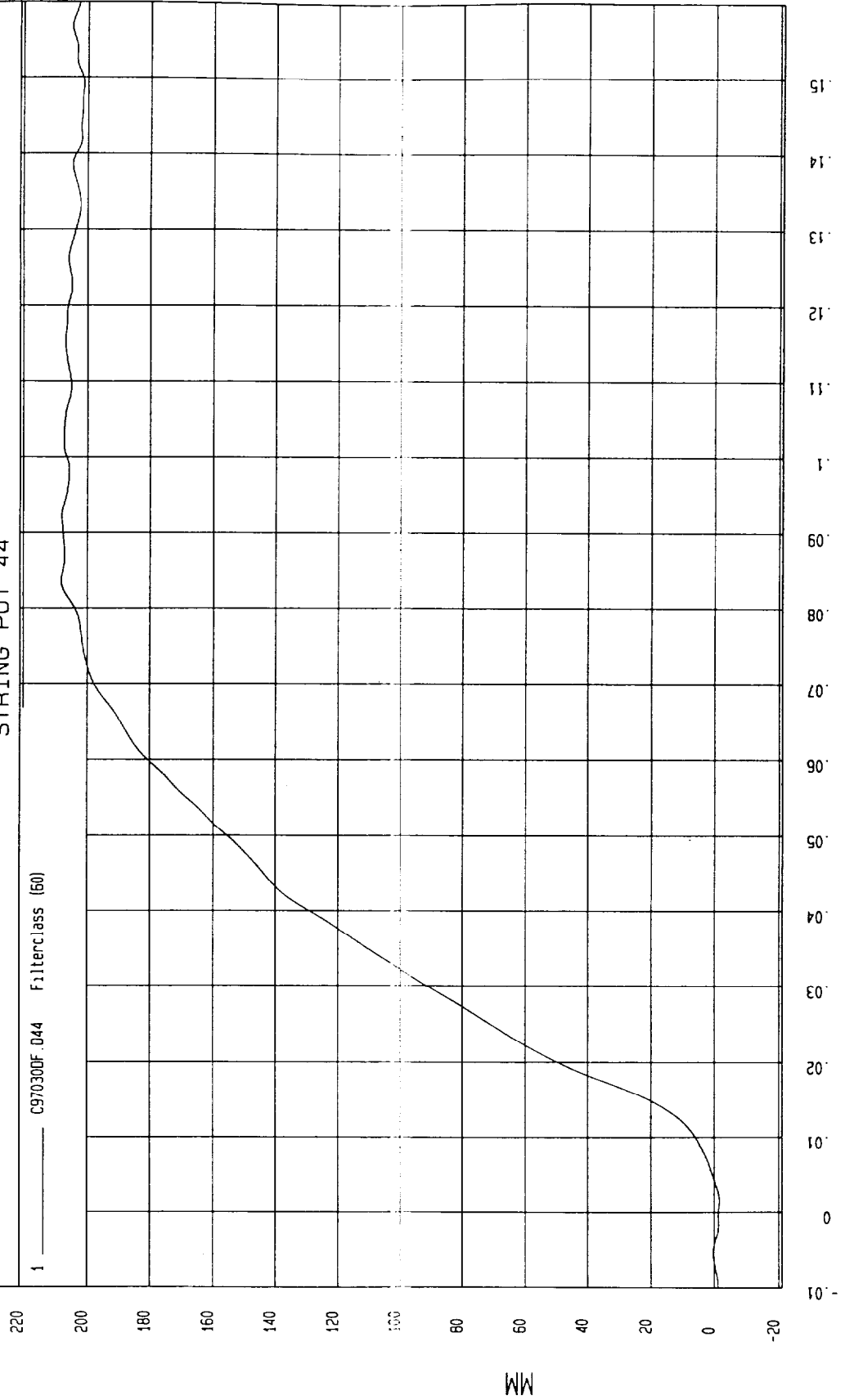
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.52 MM at 2 msec

Maximum = 208.25 MM at 84 msec

STRING POT 44



NCA Research
06-04-1998 13:51

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

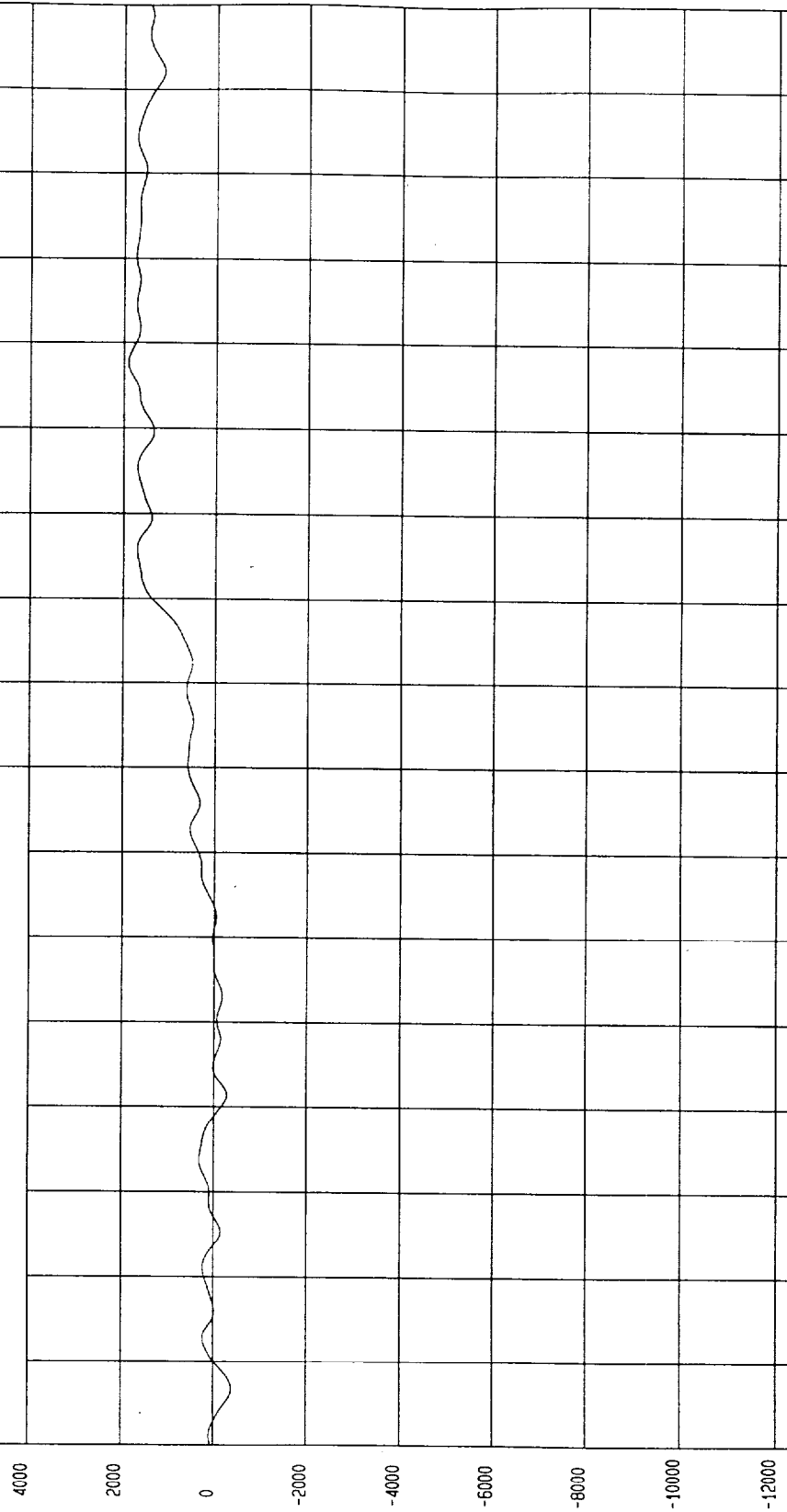
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -384.73 N at -3 msec

Maximum = 1908.23 N at 118 msec

LC #1 FX

1 _____ 897030FM.F04 Filterclass (60)



TIME (SECONDS)

MCA Research
06-04-1998 13:08

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -434.94 N at 30 msec

Maximum = 530.27 N at 92 msec

LC #2 FX

1 _____ 897030FM.F07 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-101

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (SECONDS)

MCA Research
06-04-1998 13:08

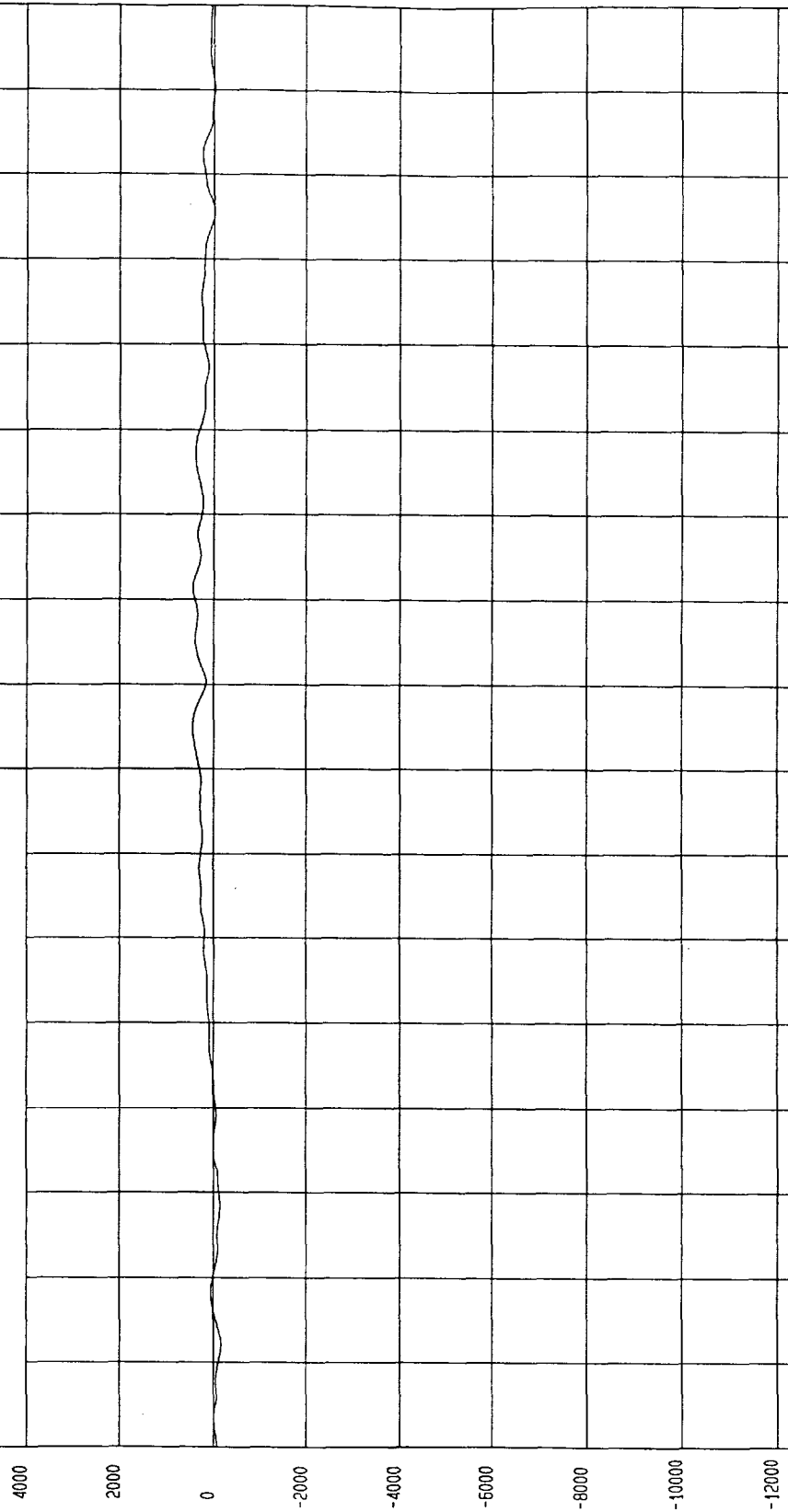
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -165.41 N at 2 msec Maximum = 452.49 N at 75 msec

LC #3 FX

1 ——— B97030FM.F10 Filterclass (60)



TIME (SECONDS)

MCA Research
06-04-1998 13:09

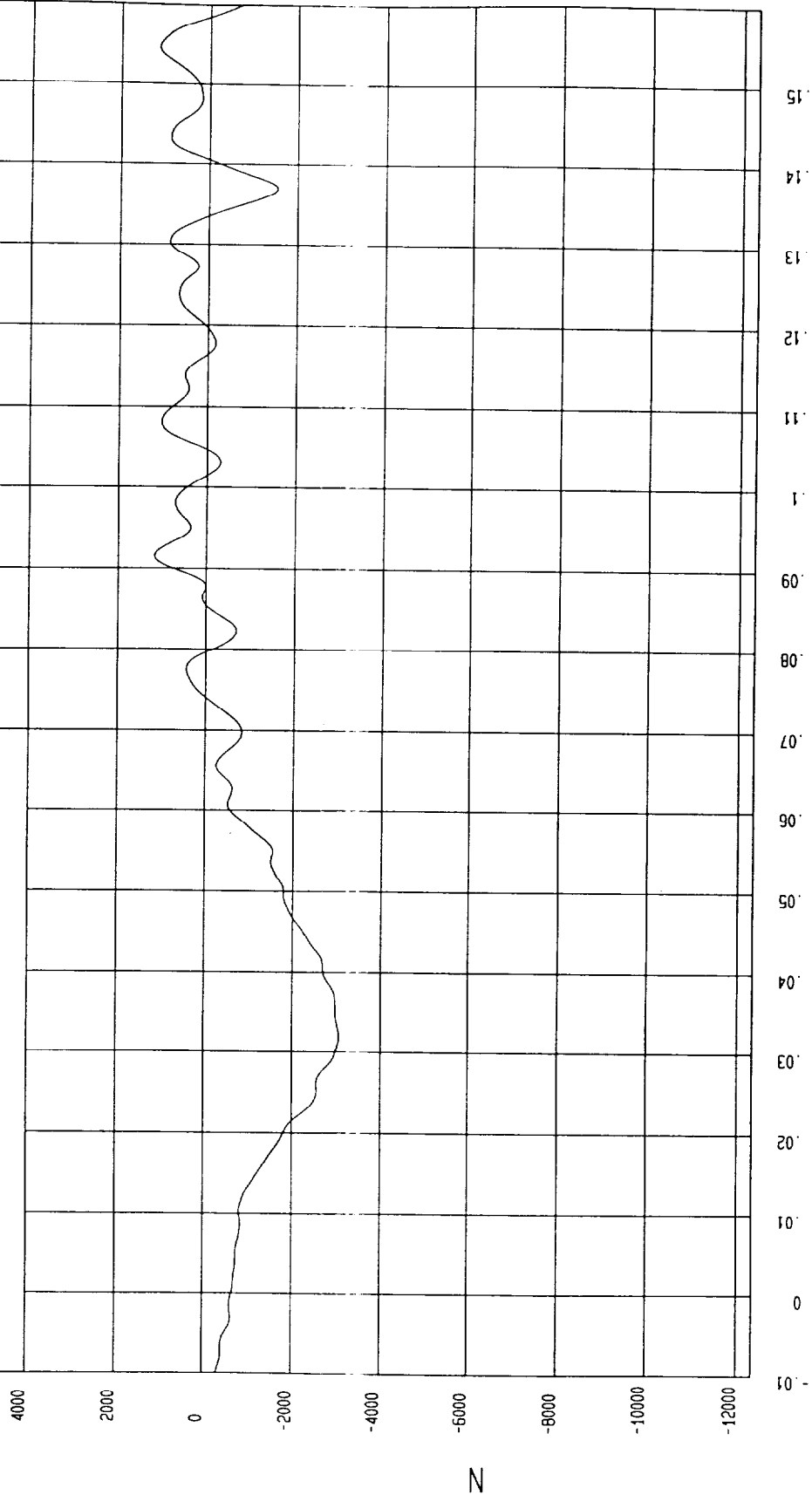
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3081.49 N at 32 msec Maximum = 1170.18 N at 92 msec

LC #4 FX

1 ——— B97030FW.F14 Filterclass (50)



WCA Research
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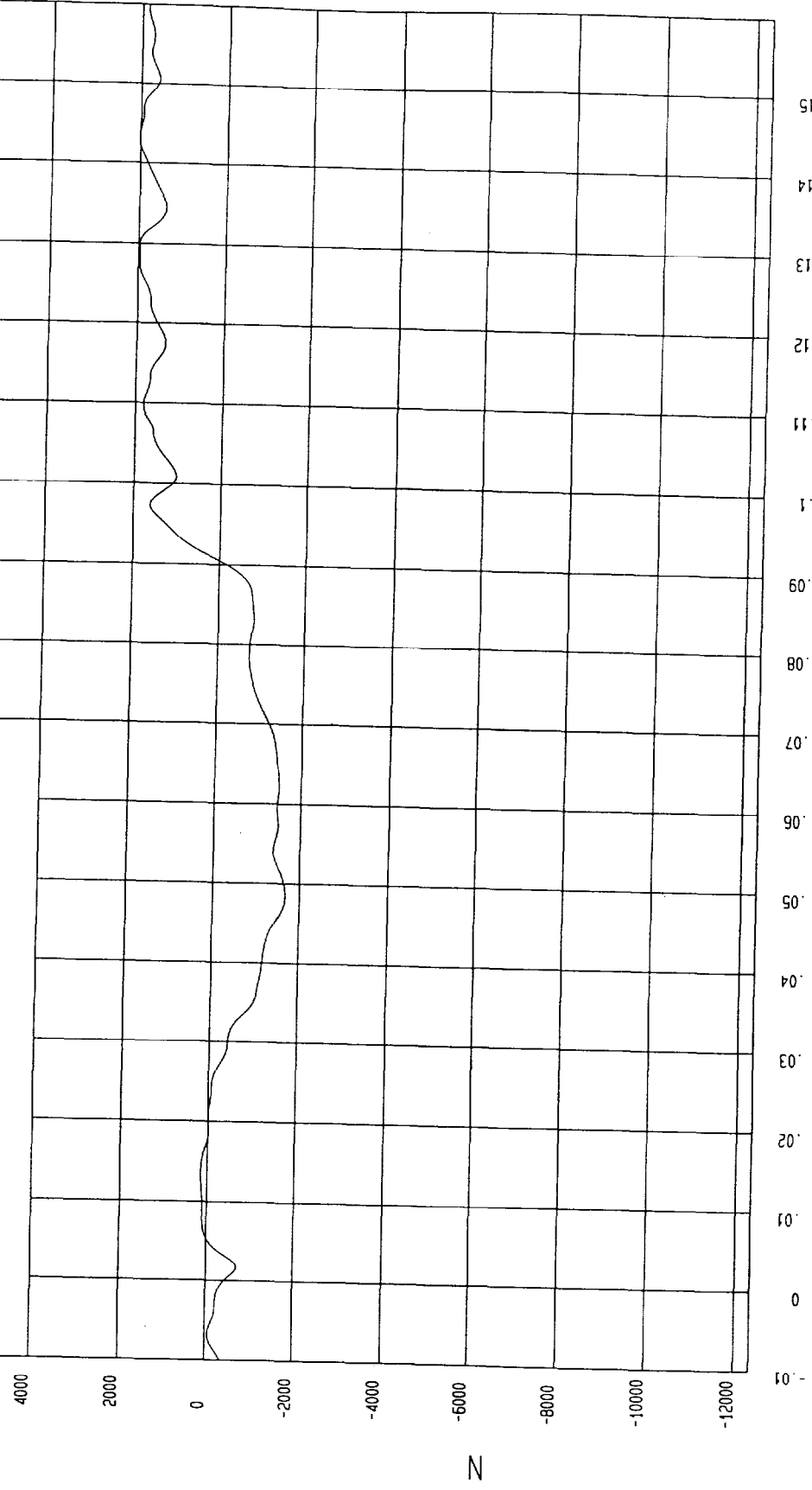
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1667.64 N at 48 msec Maximum = 2019.28 N at 143 msec

LC #5 FX

1 897030FM.F17 Filterclass (60)



WCA Research
06-04-1998 13:09

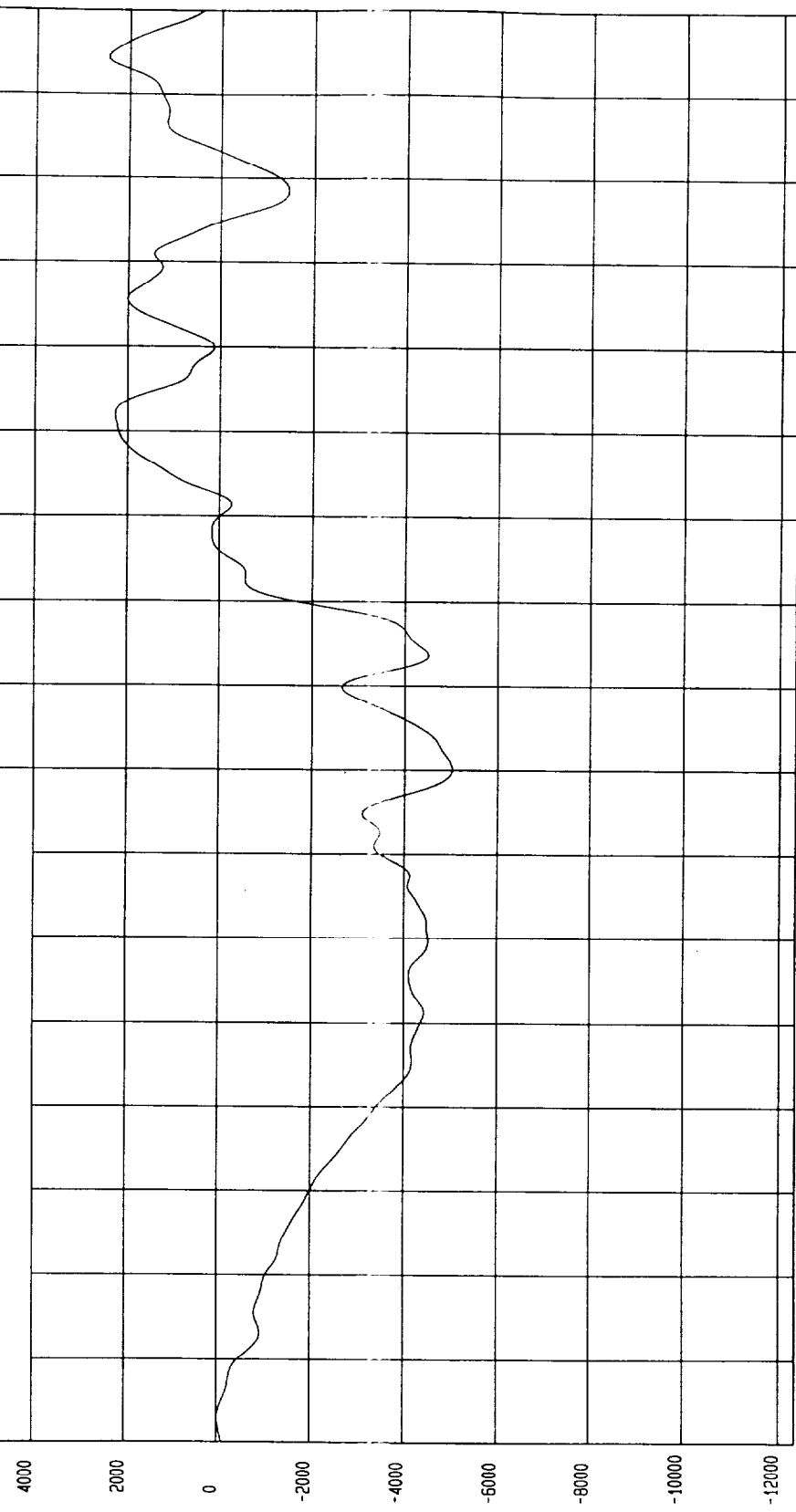
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -5021.66 N at 70 msec Maximum = 2435.91 N at 154 msec

LC #6 FX

1 B97030FM.F20 Filterclass (50)



MCA Research
06-04-1998 13.10

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1426.41 N at 135 msec

Maximum = 419.83 N at 112 msec

LC #7 FX

1 ——— B97030FM.F24 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

TIME (SECONDS)
0 .01 .02 .03 .04 .05 .06 .07 .08 .09 .1 .11 .12 .13 .14 .15
MGA Research
06-04-1998 13:10

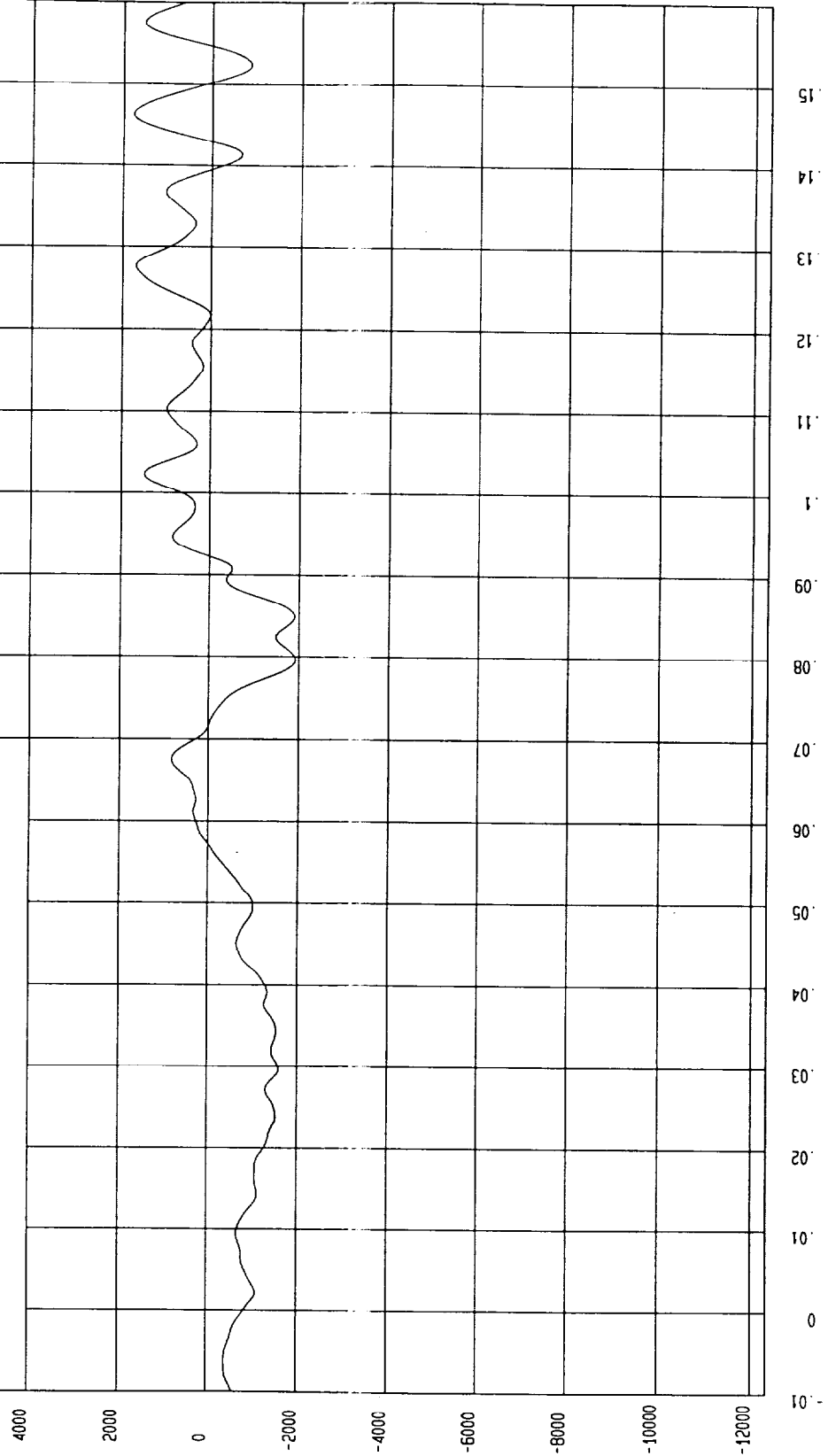
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1921.11 N at 80 msec Maximum = 1772.56 N at 146 msec

LC #8 FX

1 — B97030FM.F27 Filterclass (60)



MGA Research
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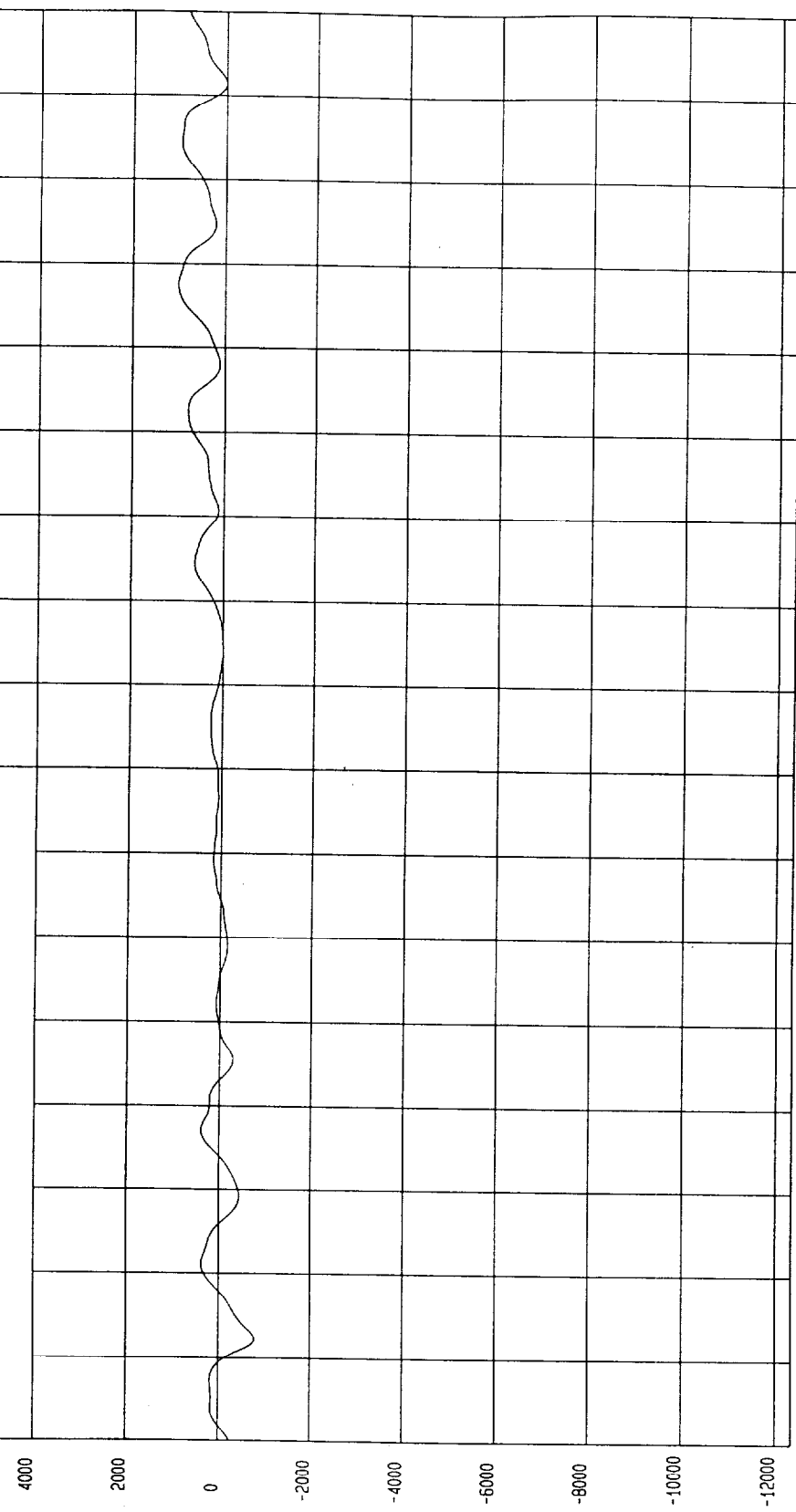
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -780.12 N at 2 msec Maximum = 1028.82 N at 128 msec

LC #9 FX

1 _____ B97030FM.F30 Filterclass (60)



MGA Research
06-04-1998 13:11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

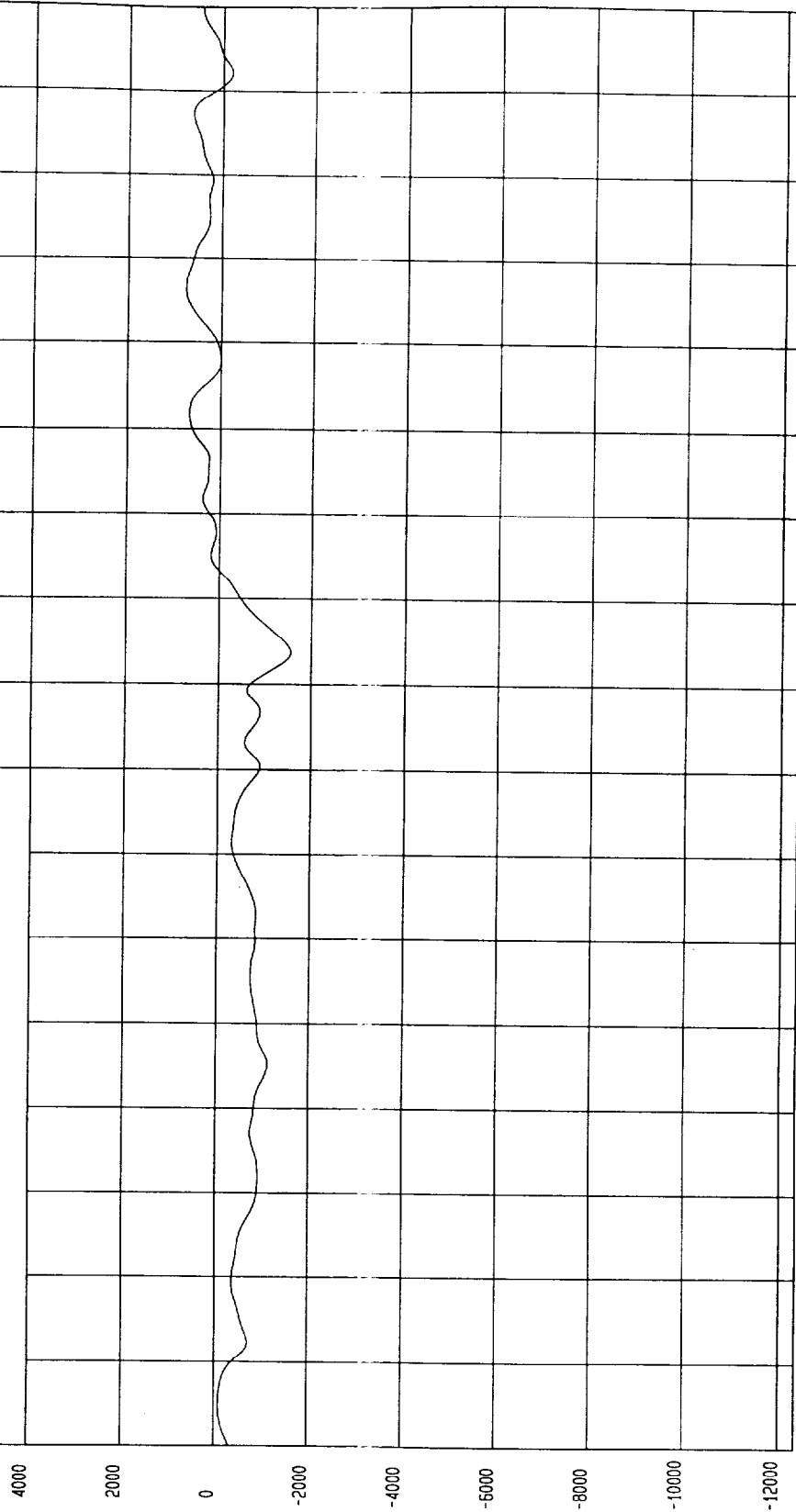
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1554.05 N at 84 msec

Maximum = 759.06 N at 126 msec

LC #10 FX

1 _____ B97030FM.F34 Filterclass (60)



MCA Research
06-04-1998 13:11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

SPEED: 20 MPH 32.2 KPH

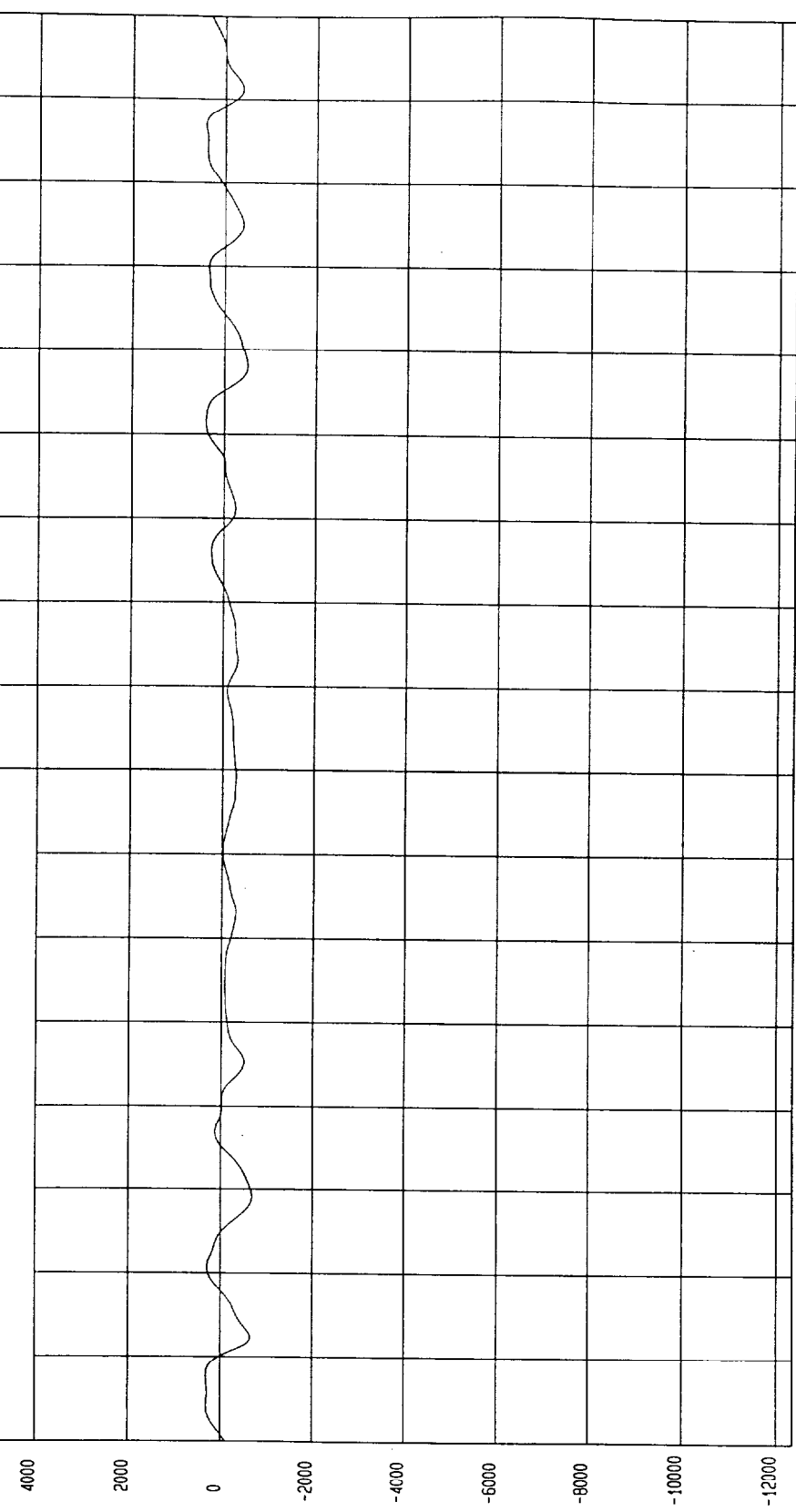
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -695.28 N at 19 msec

Maximum = 523.38 N at 177 msec

LC #11 FX

1 ——— 897030FM.F37 Filterclass (60)



MGA Research
06-04-1998 13.11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -439.93 N at 2 msec

Maximum = 413.39 N at 199 msec

LC #12 FX

1 ——— 897030FM.F40 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-04-1998 13.12

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -459.41 N at 185 msec

Maximum = 346.73 N at 27 msec

LC #13 FX

1 ——— B97030FH.F44 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

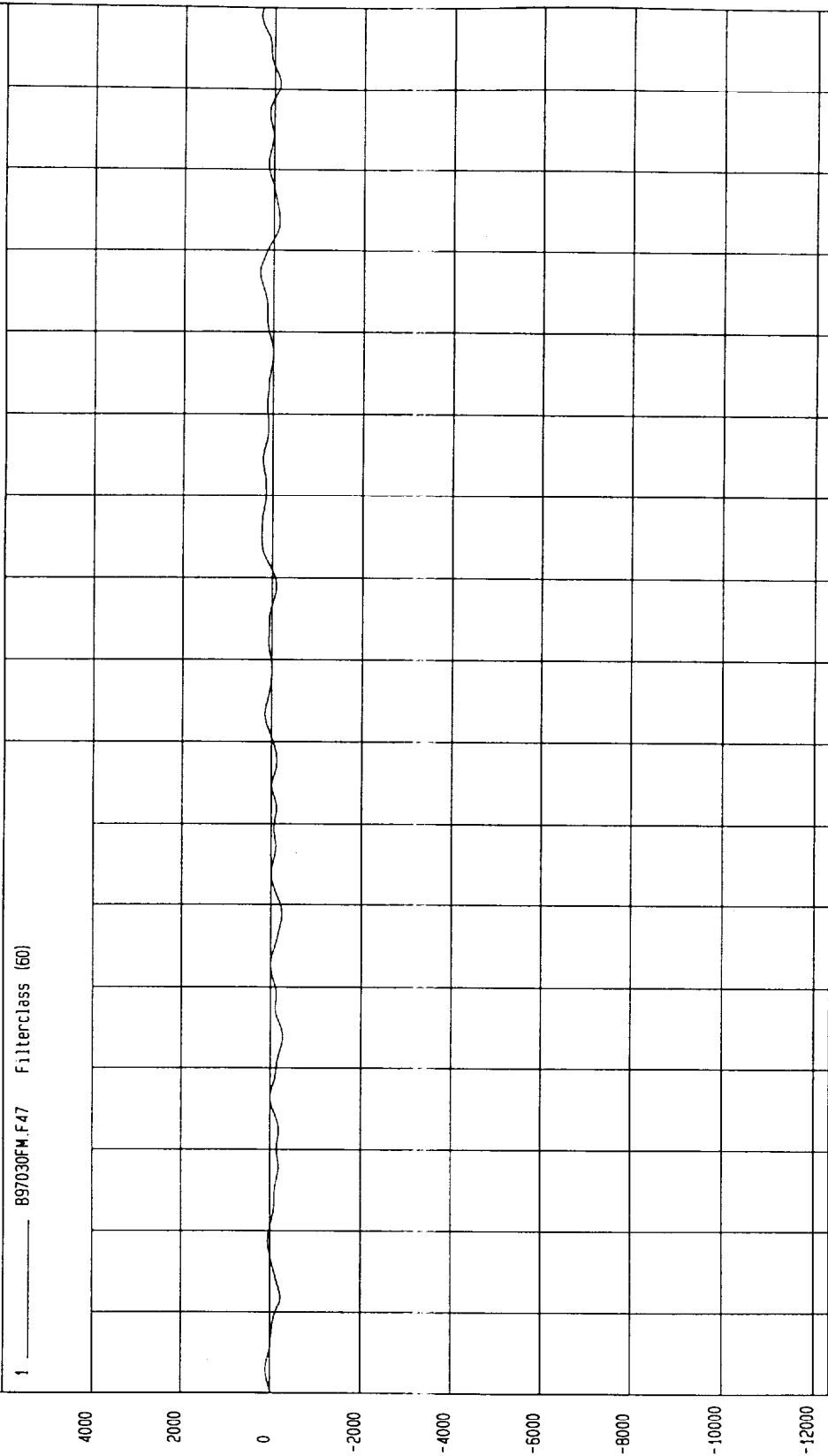
NCA Research
06-04-1998 13:12

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -275.78 N at 34 msec Maximum = 297.67 N at 127 msec

LC #14 FX



MGA Research
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TIME (SECONDS)

N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

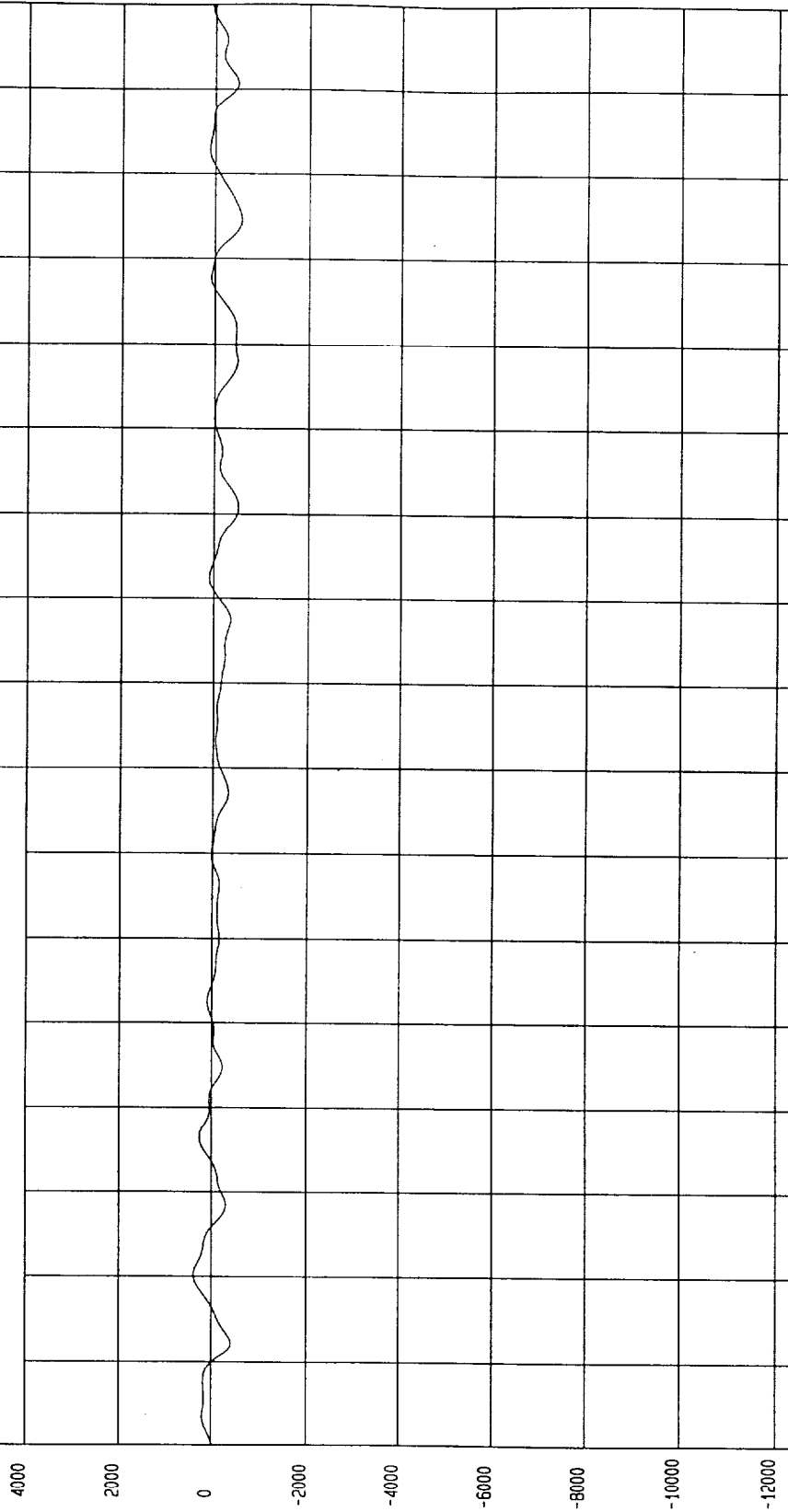
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -563.38 N at 135 msec

Maximum = 387.11 N at 10 msec

LC #15 FX

1 _____ 897030FM.F50 Filterclass (60)

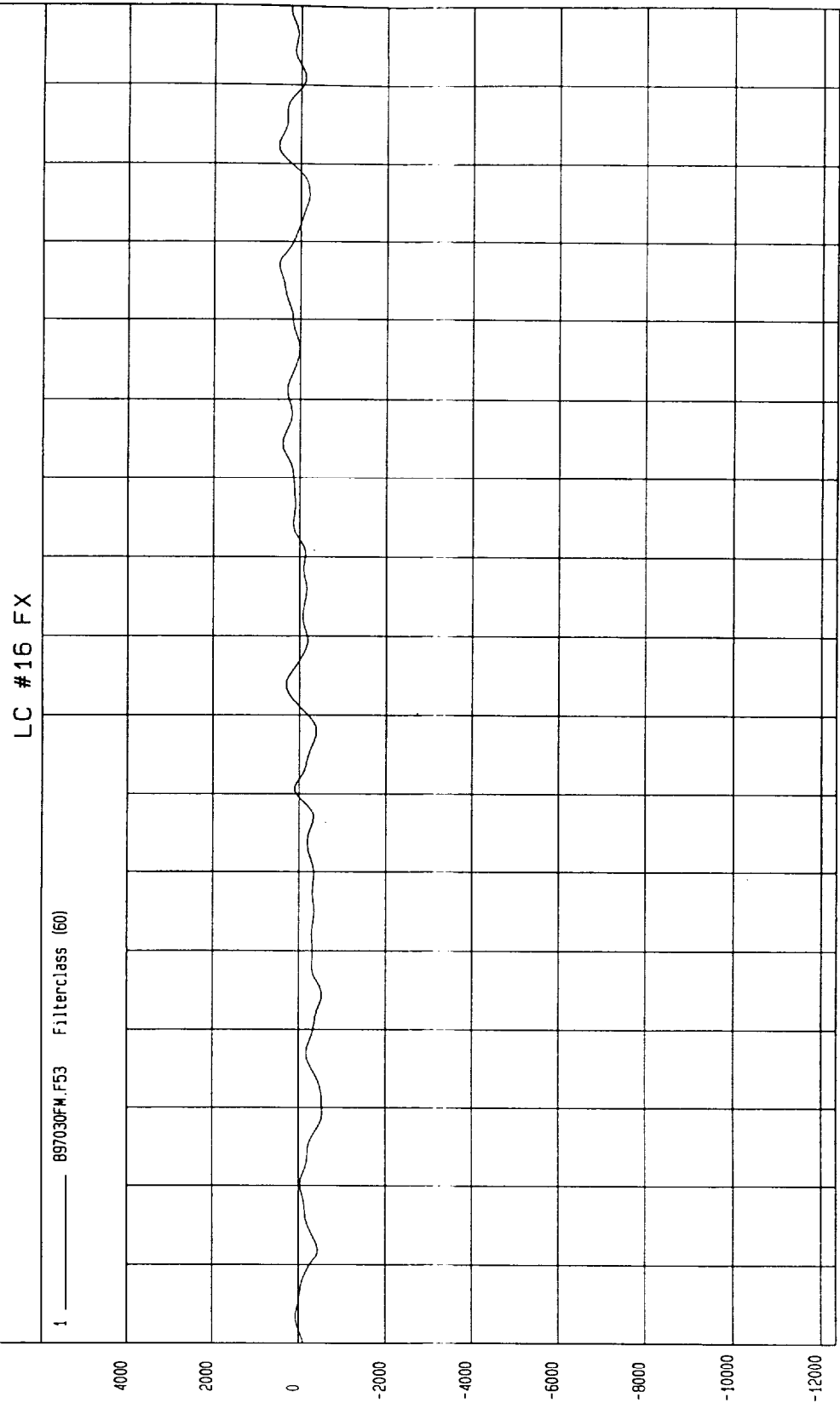


MCA Research
06-04-1998 13:13

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -544.95 N at 19 msec Maximum = 517.58 N at 142 msec



TIME (SECONDS)

MCA Research
06-04-1998 13.13

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

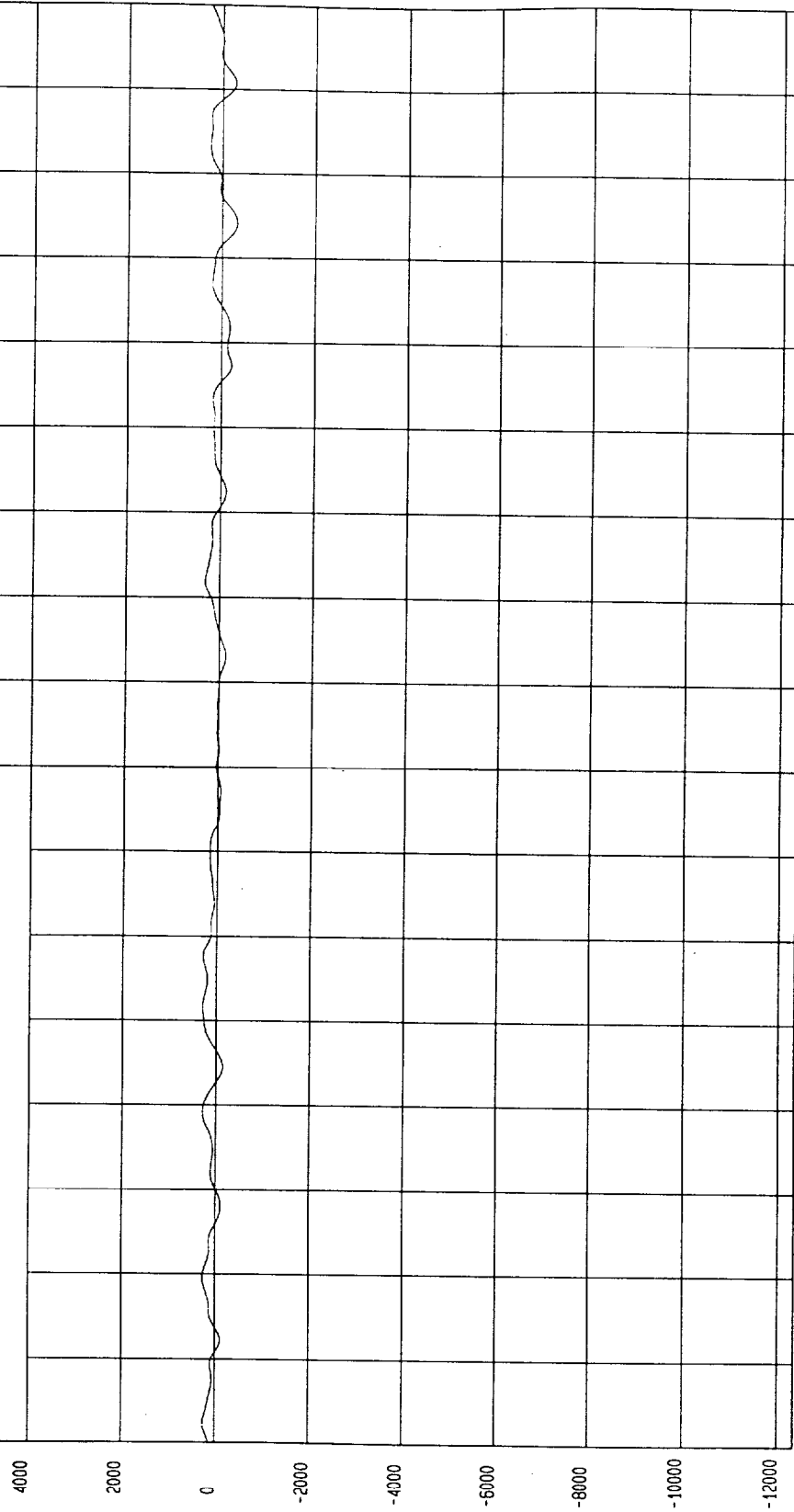
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -444.49 N at 184 msec

Maximum = 348.28 N at 199 msec

LC #17 FX

1 _____ B97030FM.F56 Filterclass (60)



MGA Research
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TIME (SECONDS)

N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -441.53 N at 52 msec

Maximum = 257.37 N at 199 msec

LC #18 FX

1 _____ 897030FM F60 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

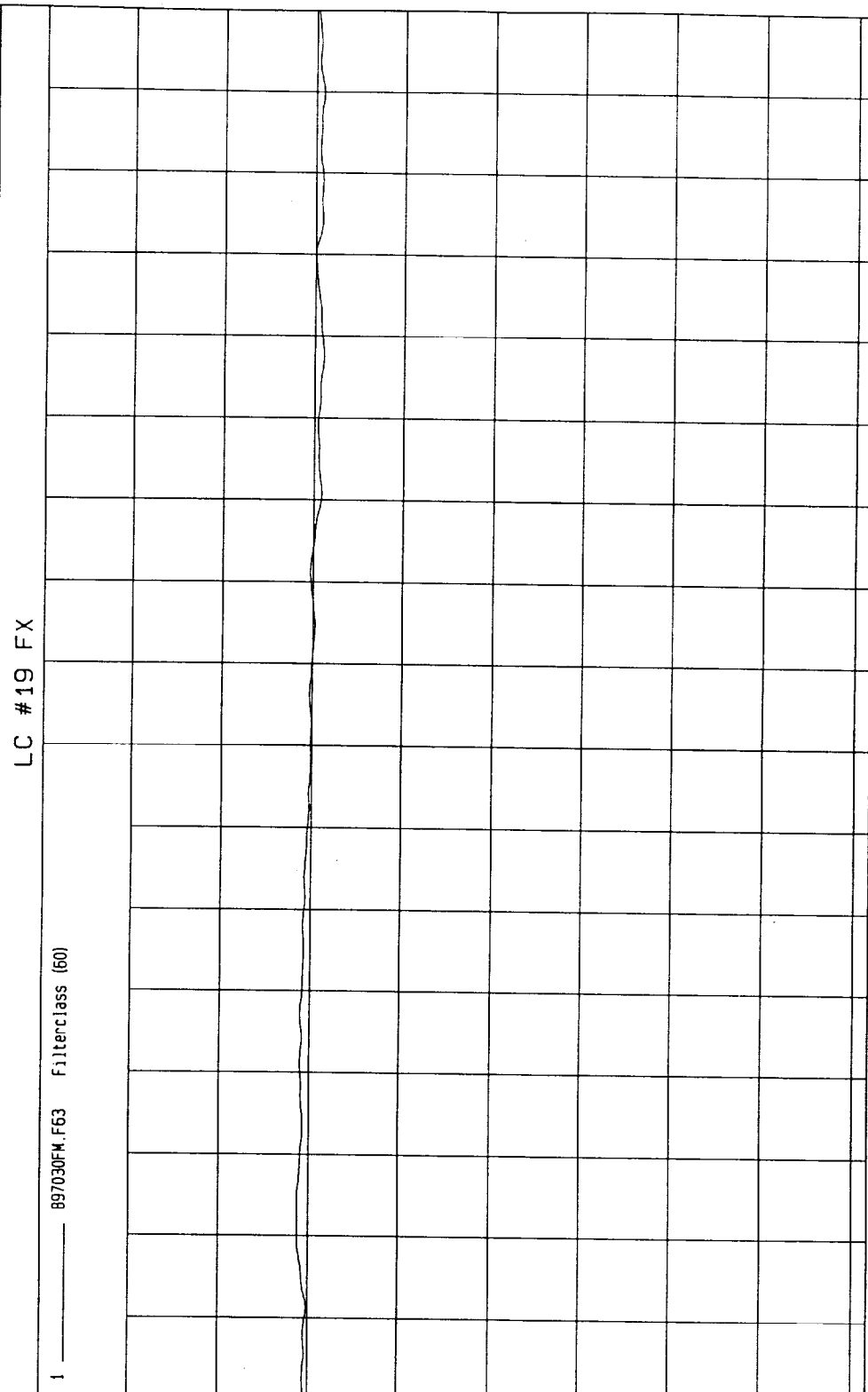
TIME (SECONDS)

MGA Research
06-04-1998 13.14

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -202.9 N at 118 msec Maximum = 248.79 N at 14 msec



TIME (SECONDS)

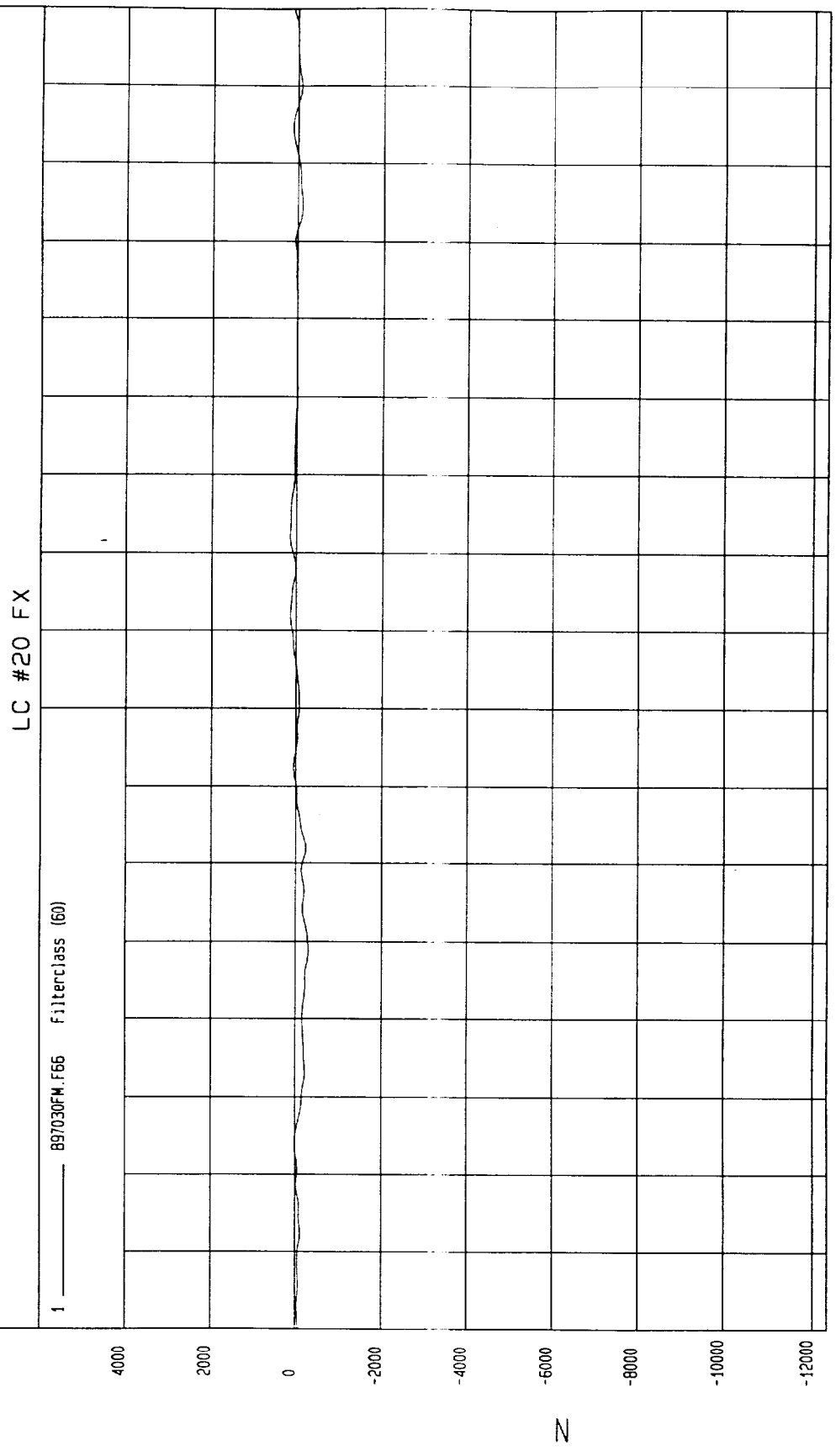
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15

MGA Research
06-04-1998 13.14

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -302.69 N at 39 msec Maximum = 209.68 N at 199 msec



TIME (SECONDS)

0.15 0.14 0.13 0.12 0.11 0.1 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01 0 -0.01

MGA Research
06-04-1998 13:14

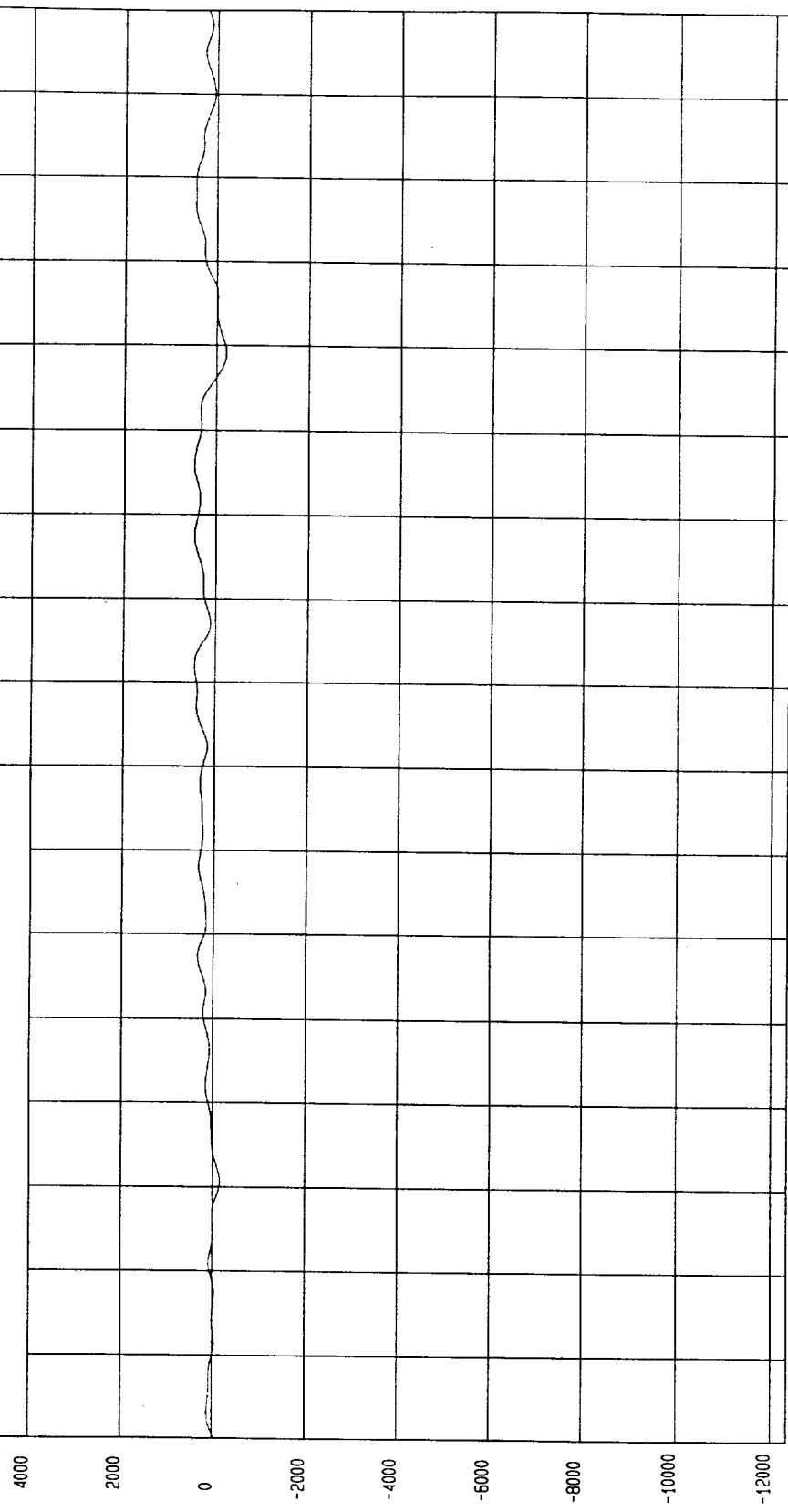
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -211.43 N at 119 msec Maximum = 483.04 N at 106 msec

LC #21 FX

1 ——— B97030FM.F69 Filterclass (60)

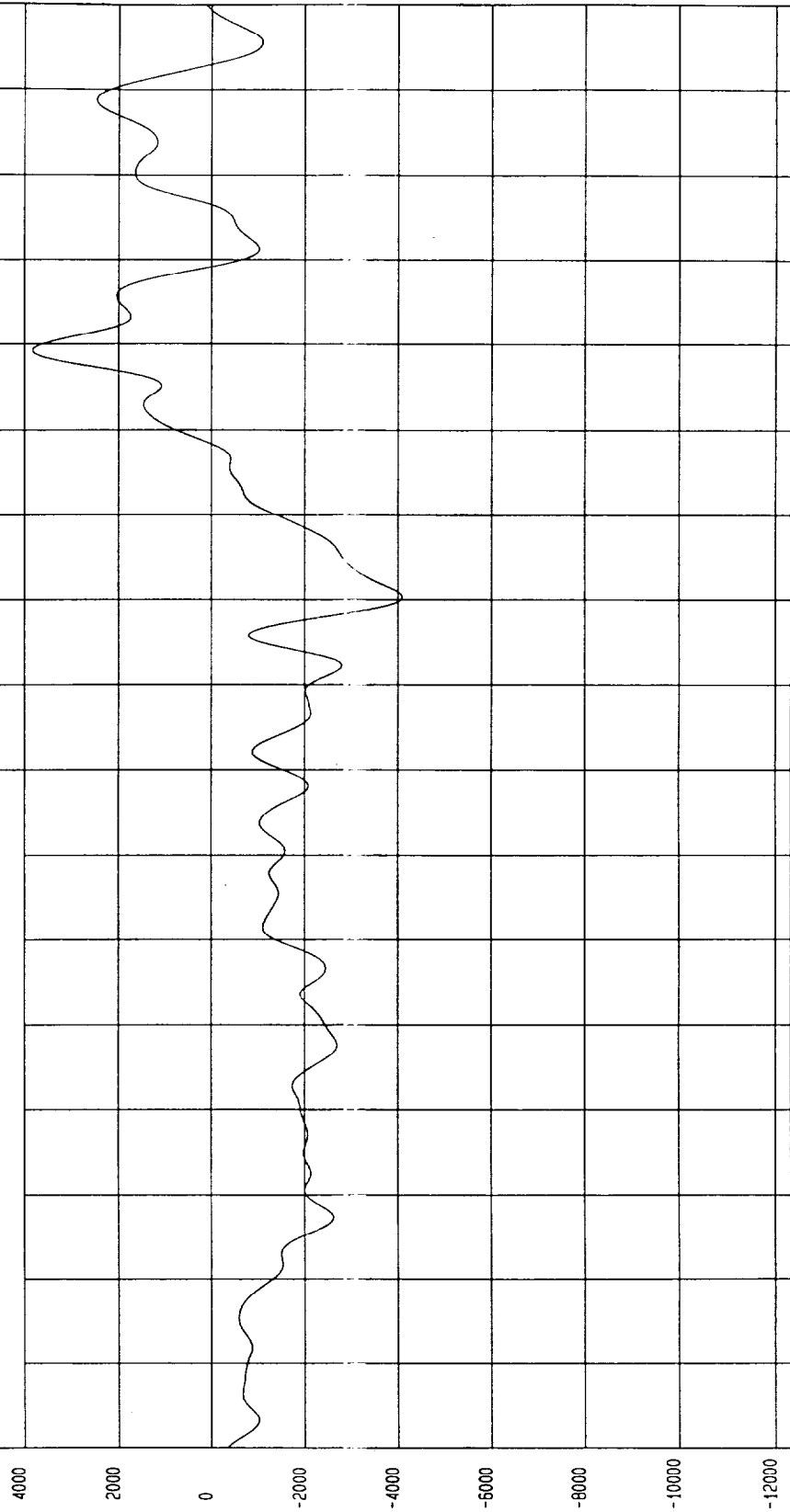


MGA Research
06-04-1998 13:15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -4093.83 N at 90 msec	Maximum = 3820.48 N at 119 msec

LC #22 FX

1 ——— B97030FM.F72 Filterclass (60)



MCA Research
06-04-1996 13.15

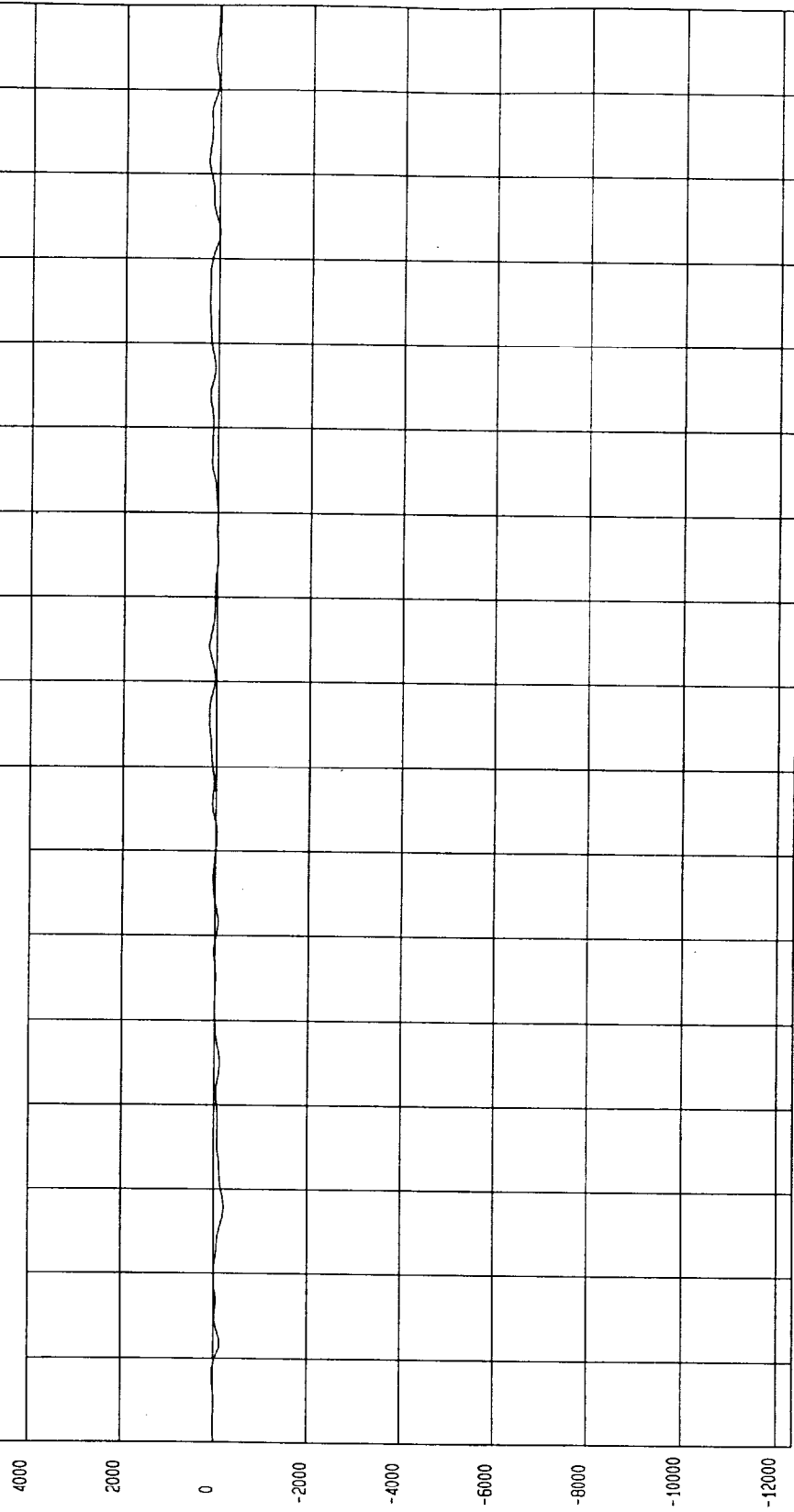
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -210.47 N at 18 msec
Maximum = 226.52 N at 142 msec

LC #23 FX

1 _____ B97030FM.F76 Filterclass (60)



MCA Research
06-04-1998 13:16

TIME (SECONDS)

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

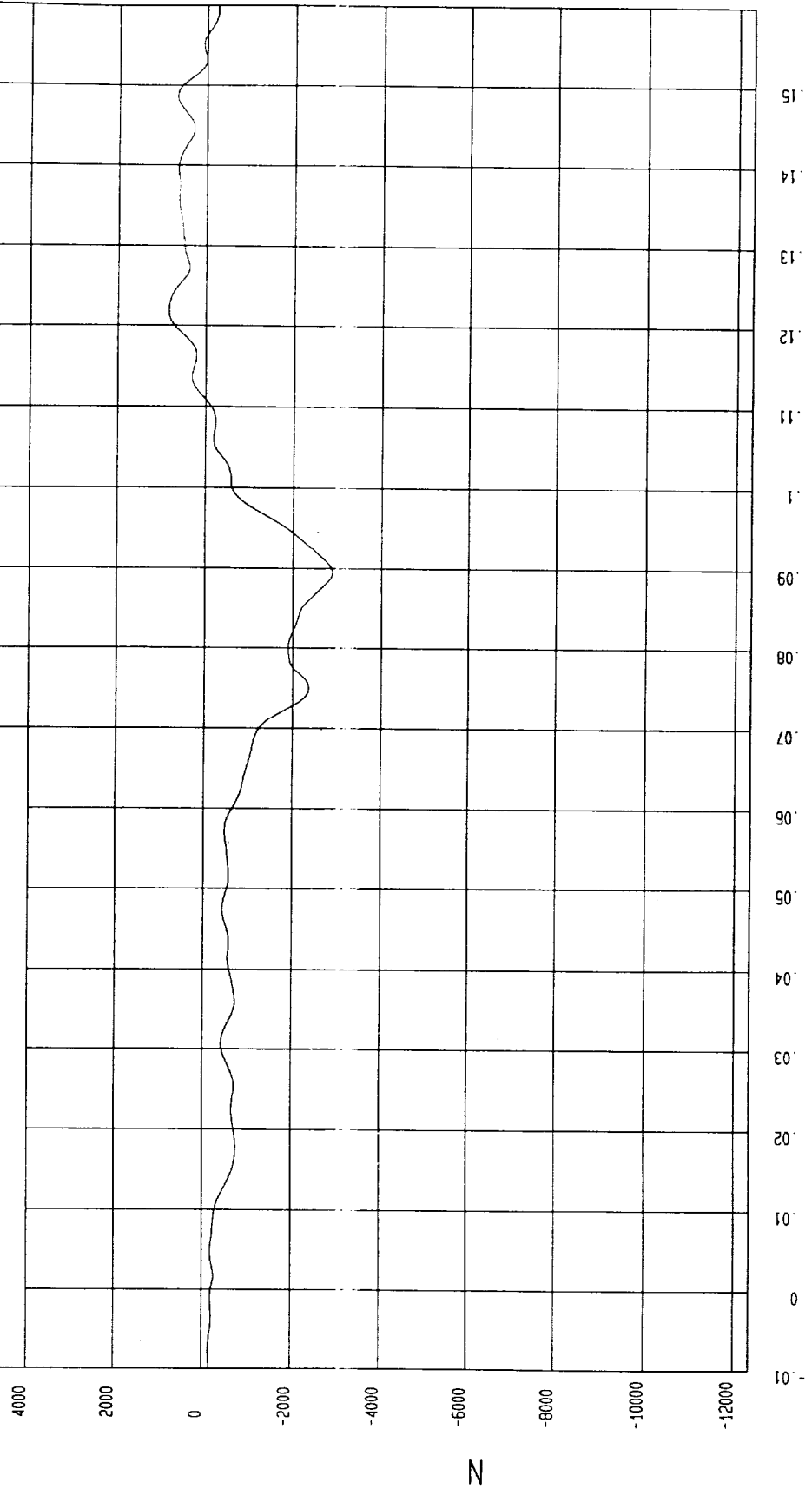
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -2885.97 N at 90 msec

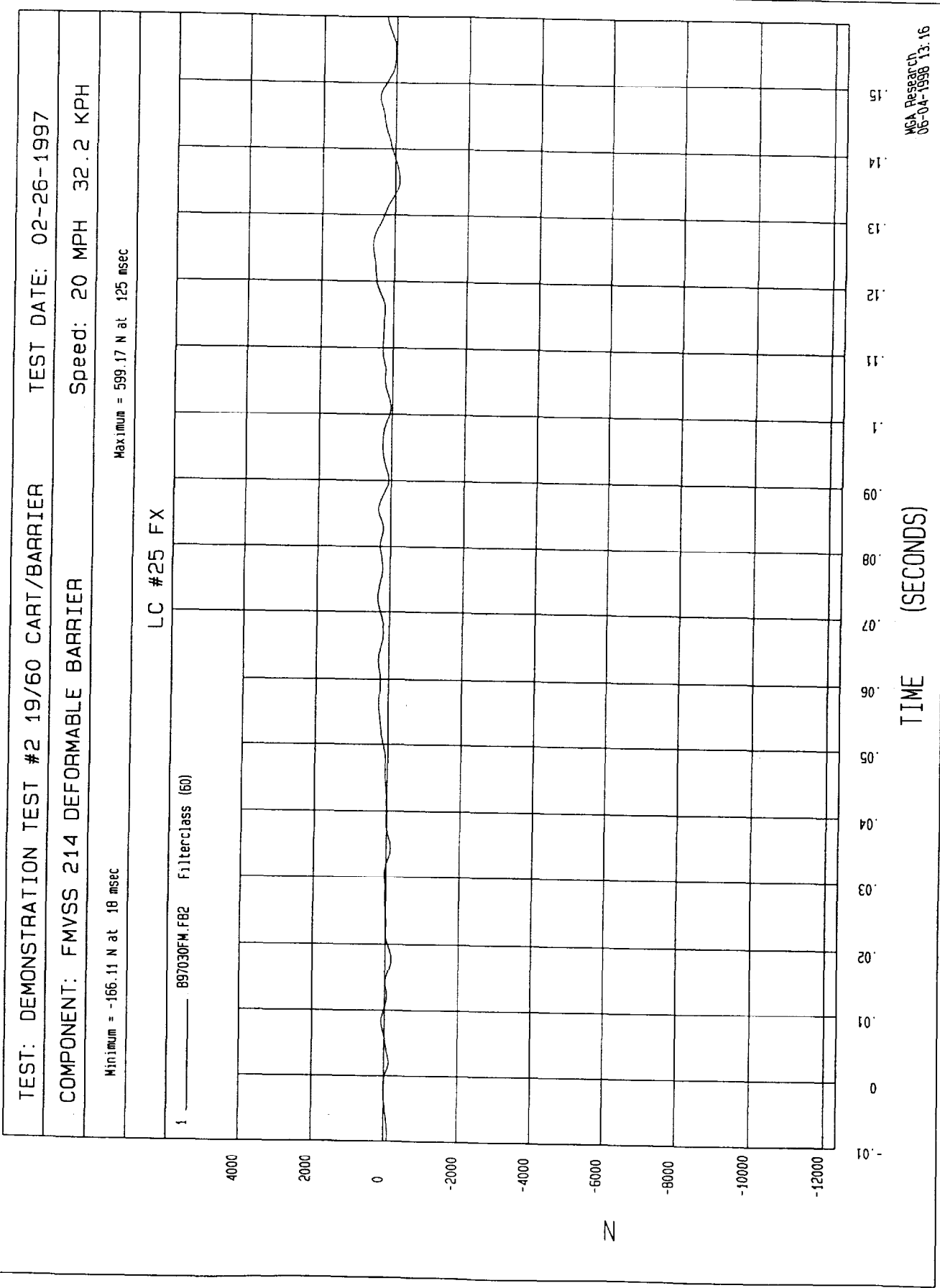
Maximum = 849.71 N at 122 msec

LC #24 FX

1 _____ B97030FM.F79 Filterclass (60)



MGA Research
06-04-1998 13.16



TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

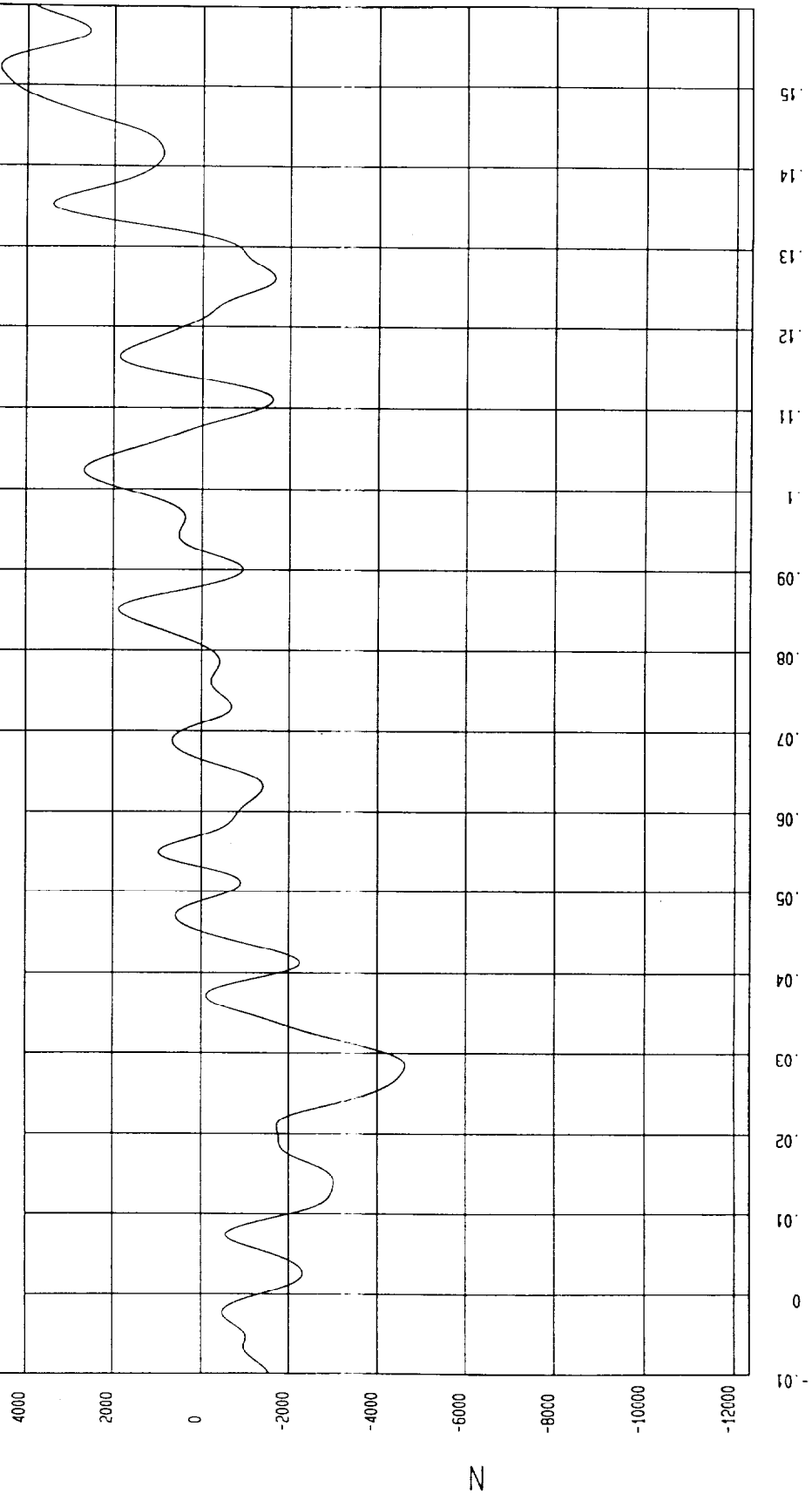
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -4641.7 N at 28 msec

Maximum = 4592.15 N at 152 msec

LC #26 FX

1 _____ B97030FM.F86 Filterclass (60)



MCA Research
06-04-1998 13.17

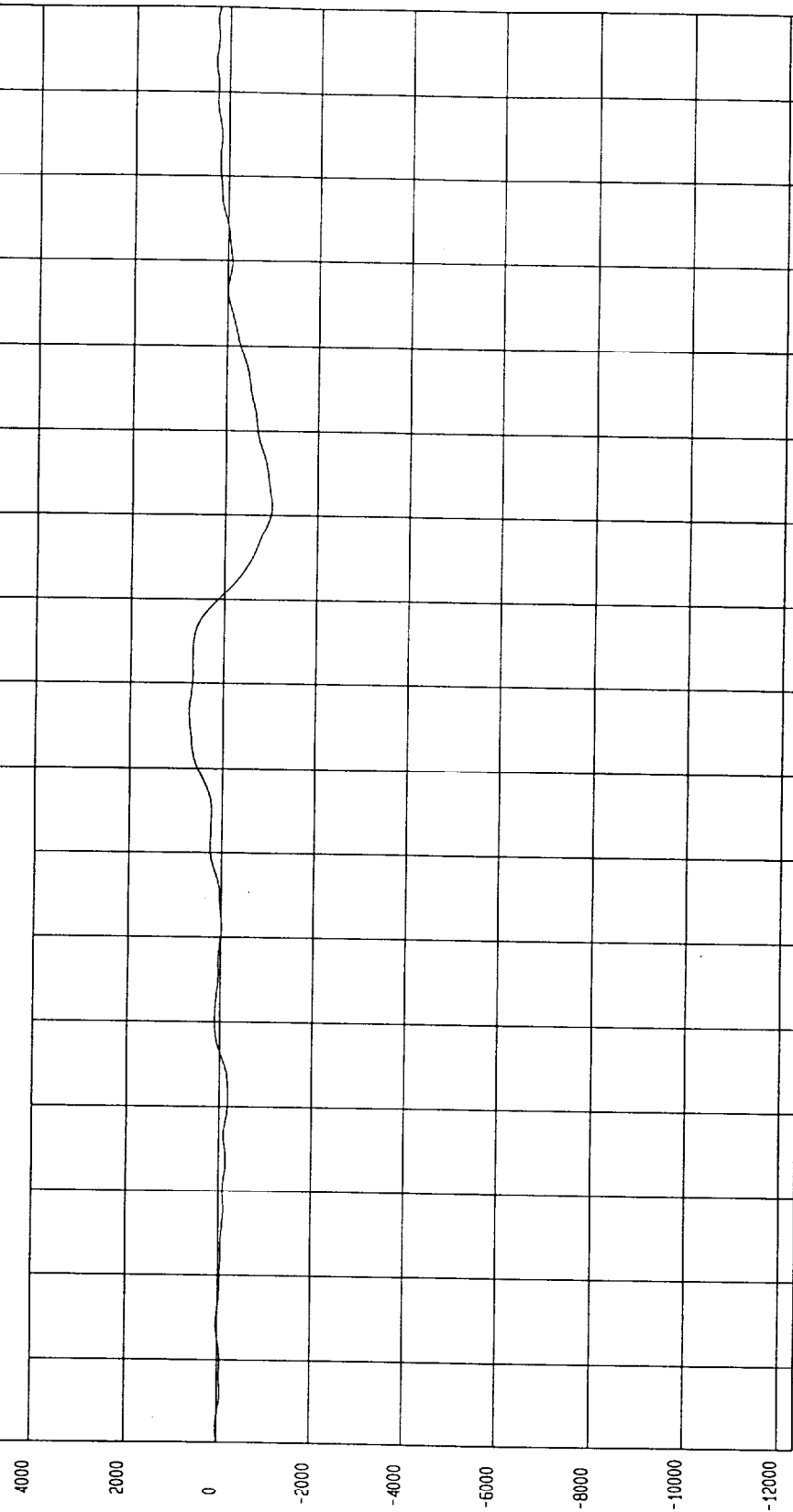
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -994.48 N at 101 msec Maximum = 722.53 N at 77 msec

LC #27 FX

1 ——— 897030FM.F89 Filterclass (60)



MCA Research
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TIME (SECONDS)

N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

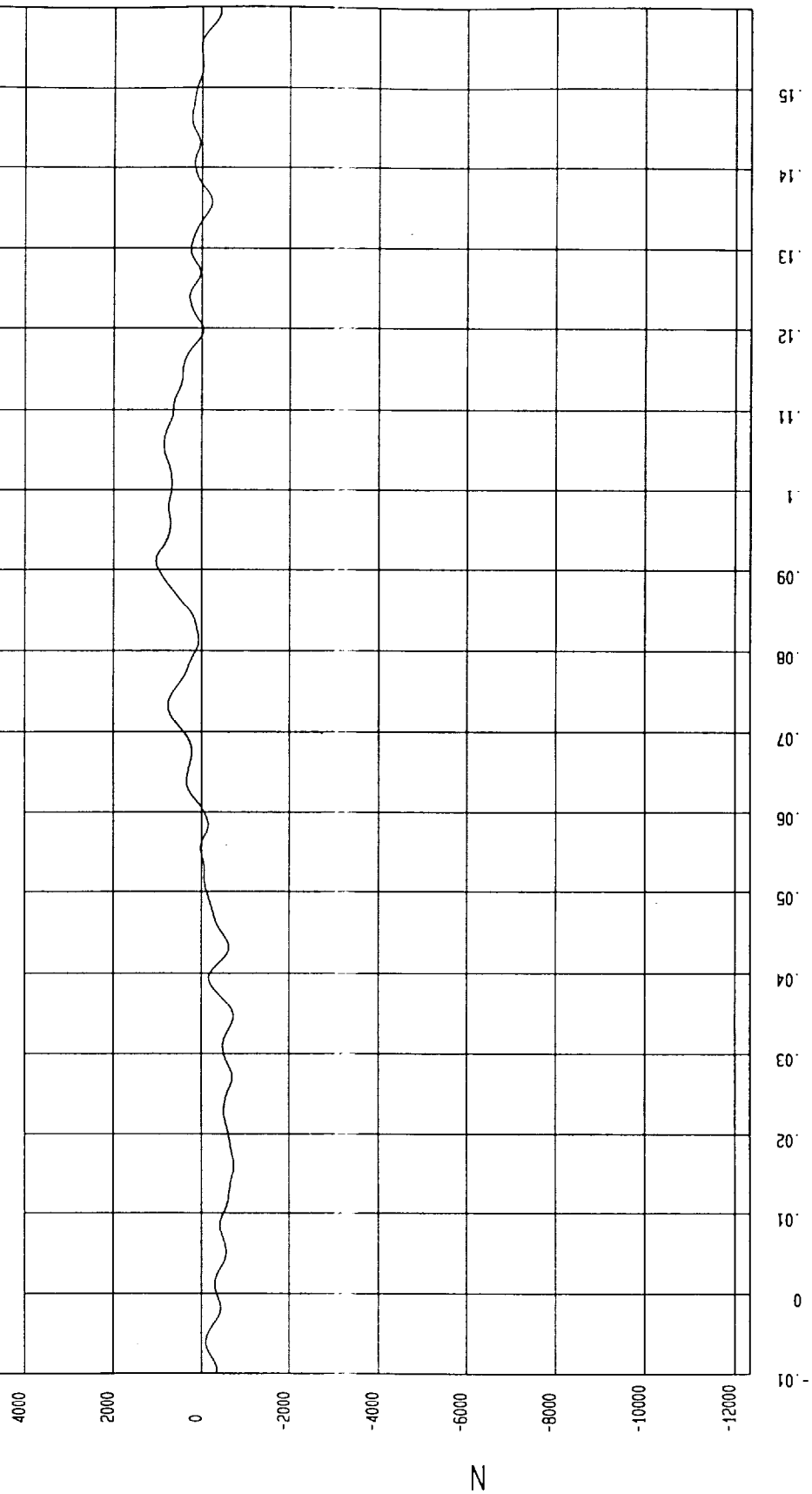
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -728.16 N at 16 msec

Maximum = 1044.76 N at 91 msec

LC #28 FX

1 ——— B97030FM.F92 Filterclass (60)



WGA Research
06-04-1998 13:18

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -996.85 N at 97 msec

Maximum = 207.78 N at 58 msec

LC #29 FX

1 ——— 897030FM.F96 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

TIME (SECONDS)

MCA Research
06-04-1998 13.18

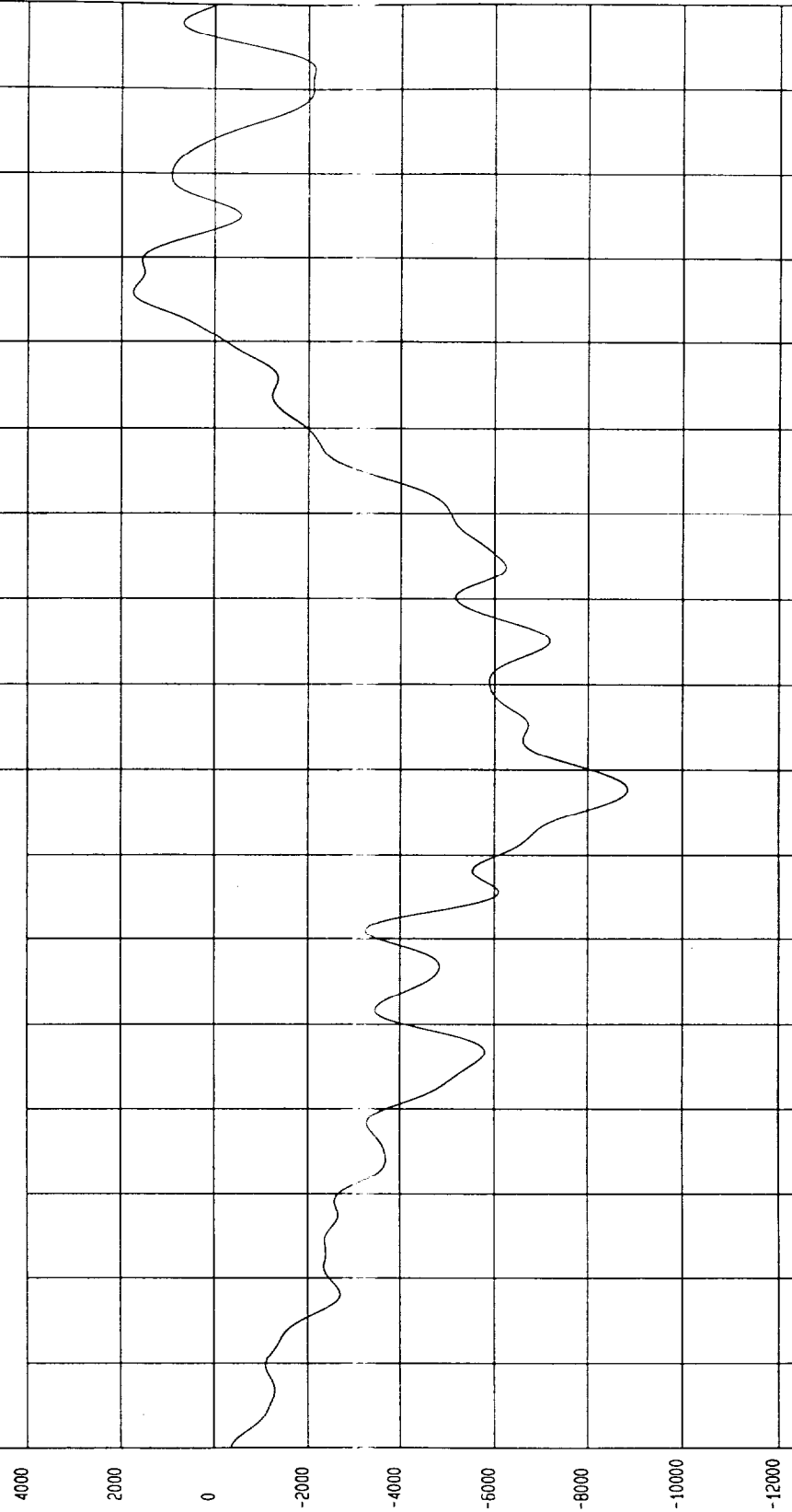
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -8828.6 N at 69 msec Maximum = 2868.07 N at 191 msec

LC #30 FX

1 B97030FM.F99 FilterClass (60)



TIME (SECONDS)

MGA Research
06-04-1998 13:18

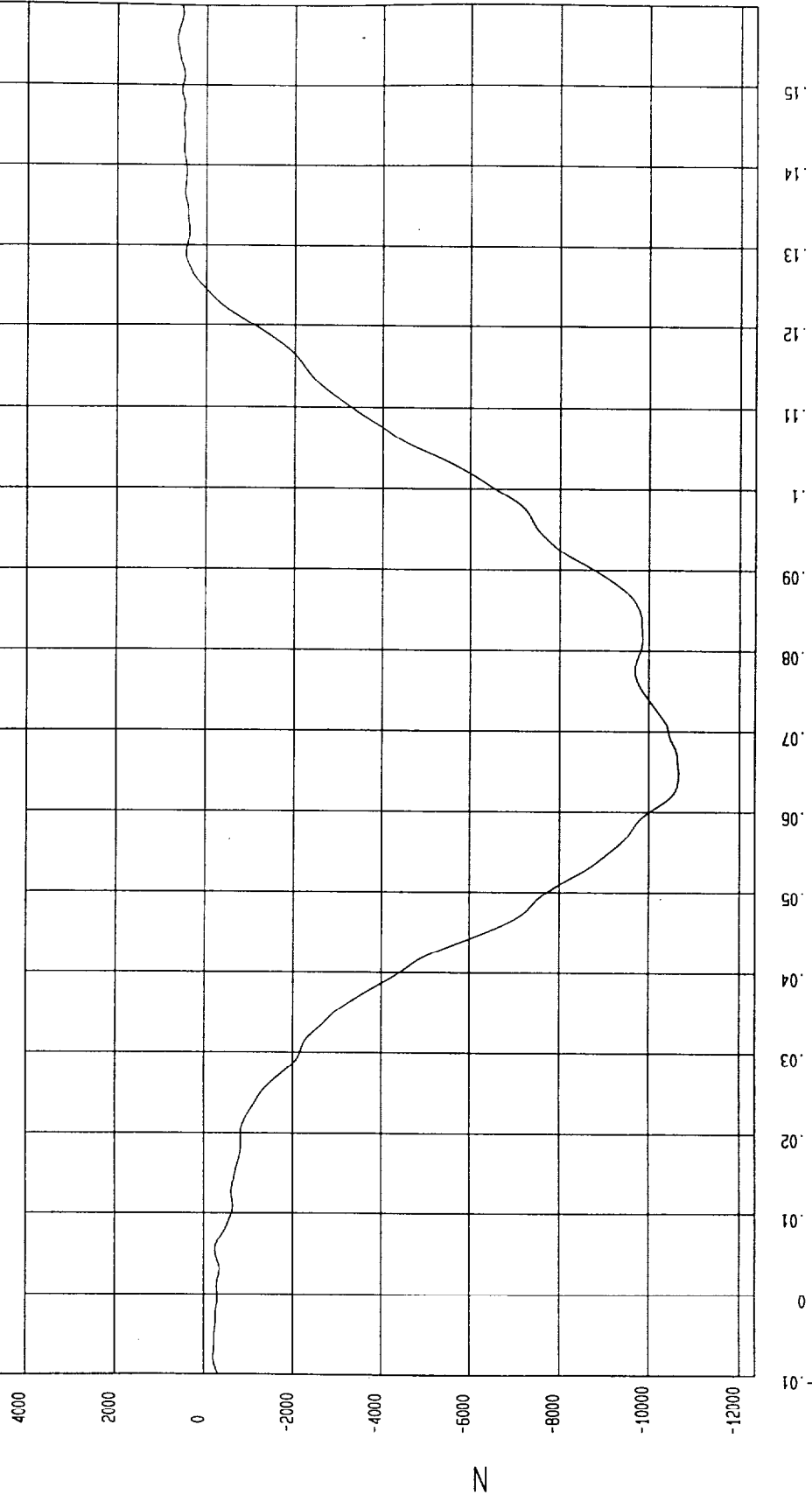
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

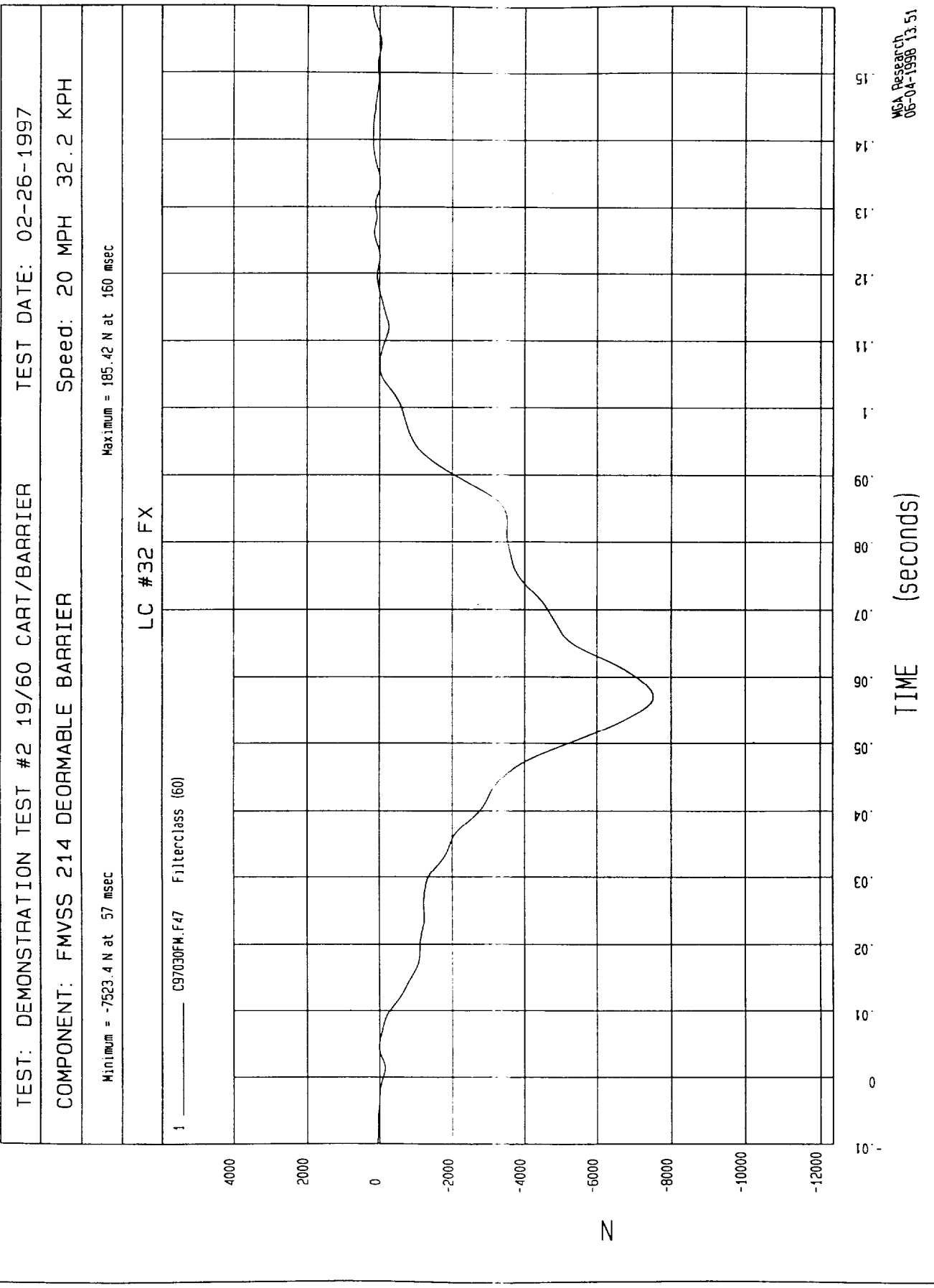
Minimum = -10645.9 N at 65 msec Maximum = 652.14 N at 156 msec

LC #31 FX

1 ——— B97030W.V02 Filterclass (60)



MGA Research
06-04-1998 13:19



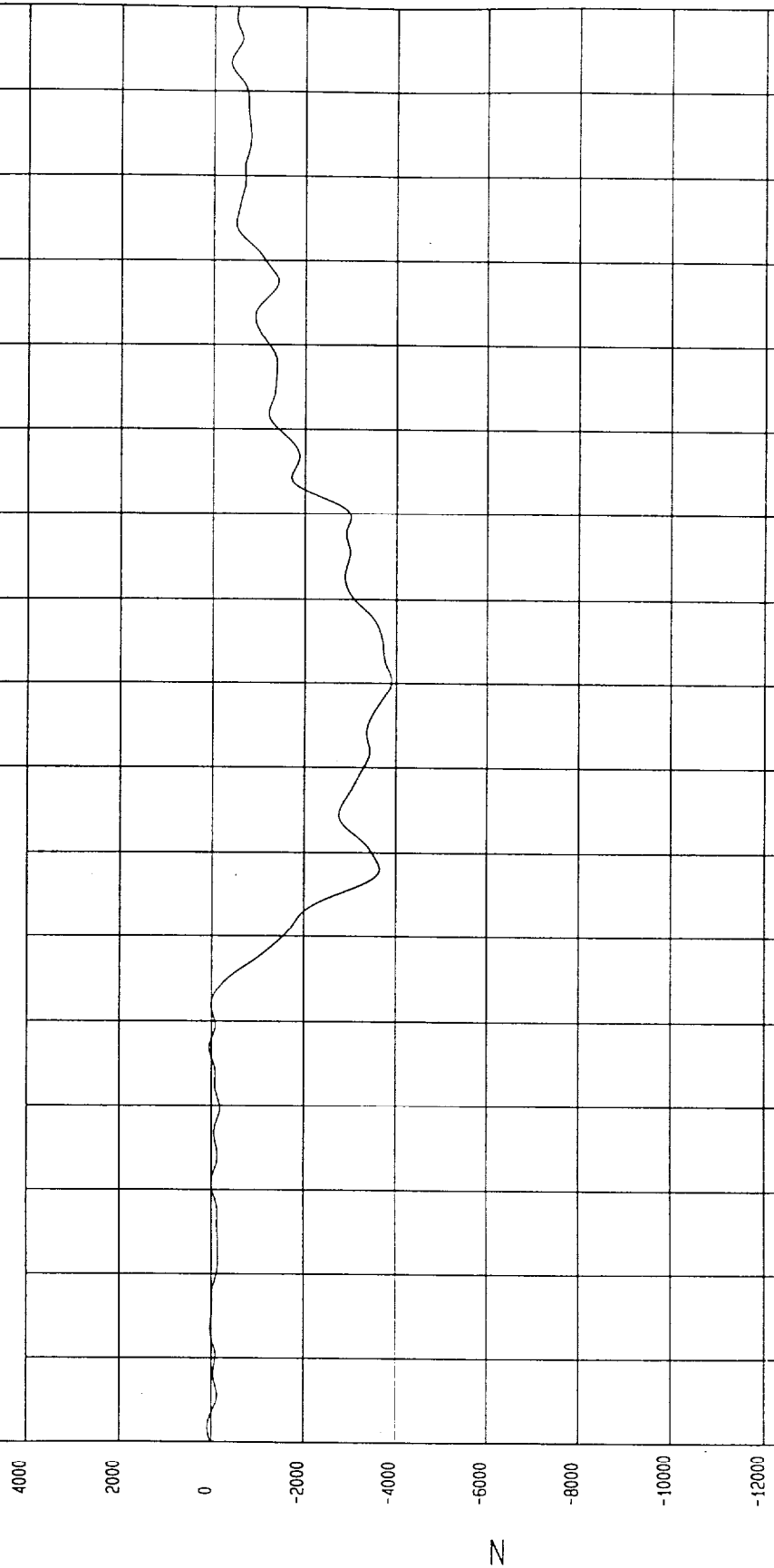
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3901.46 N at 80 msec Maximum = 87.91 N at -8 msec

LC #33 FX

1 C97030FM.F50 Filterclass (60)



WSA Research
06-04-1998 13:52

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

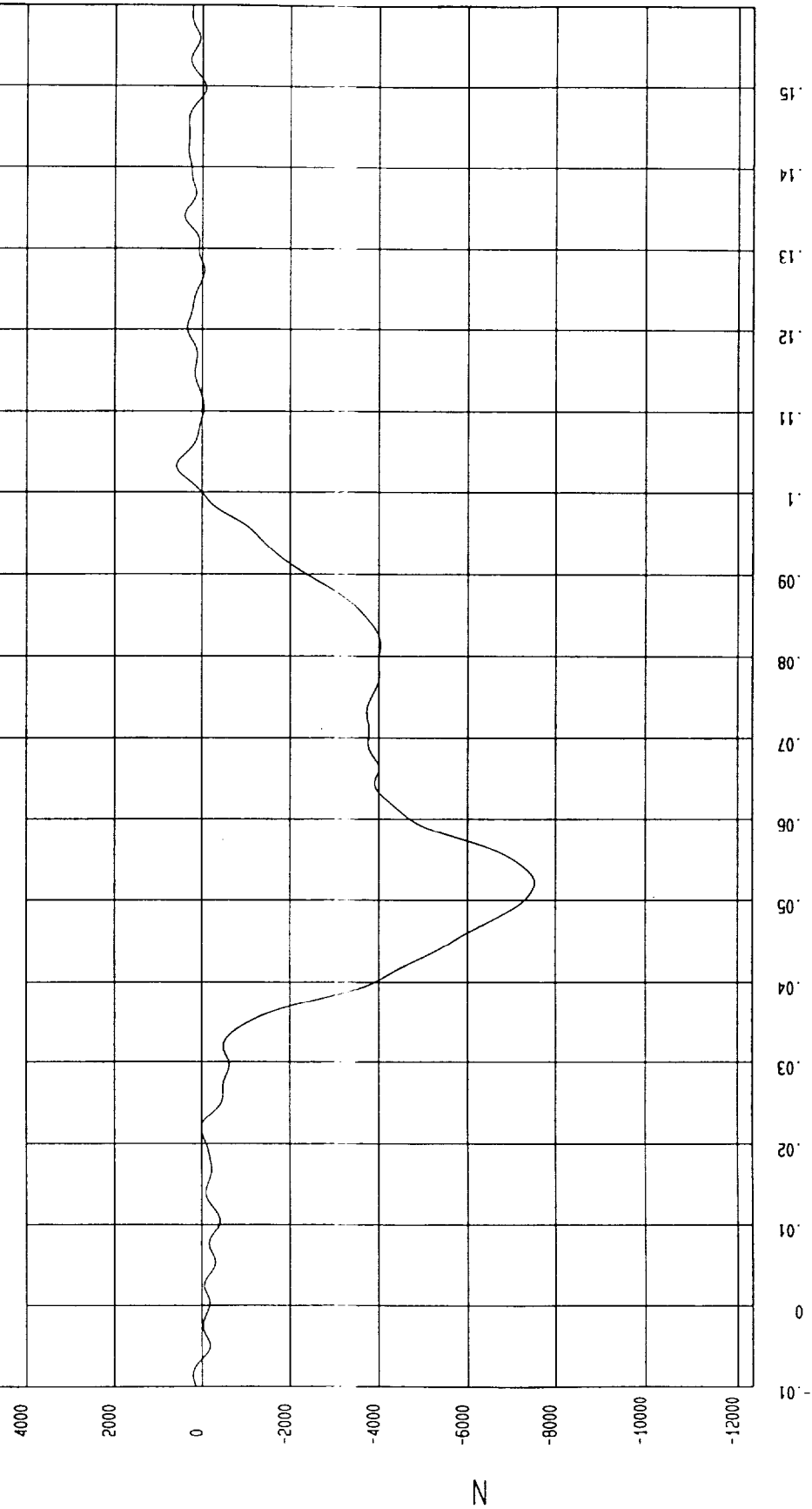
COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -7545.51 N at 52 msec

Maximum = 587.63 N at 103 msec

LC #34 FX

1 C97030FM.F53 Filterclass (60)



MGA Research
06-04-1998 13:52

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -9100.59 N at 41 msec

Maximum = 52.66 N at 162 msec

LC #35 FX

1 _____ R97030FM F44 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

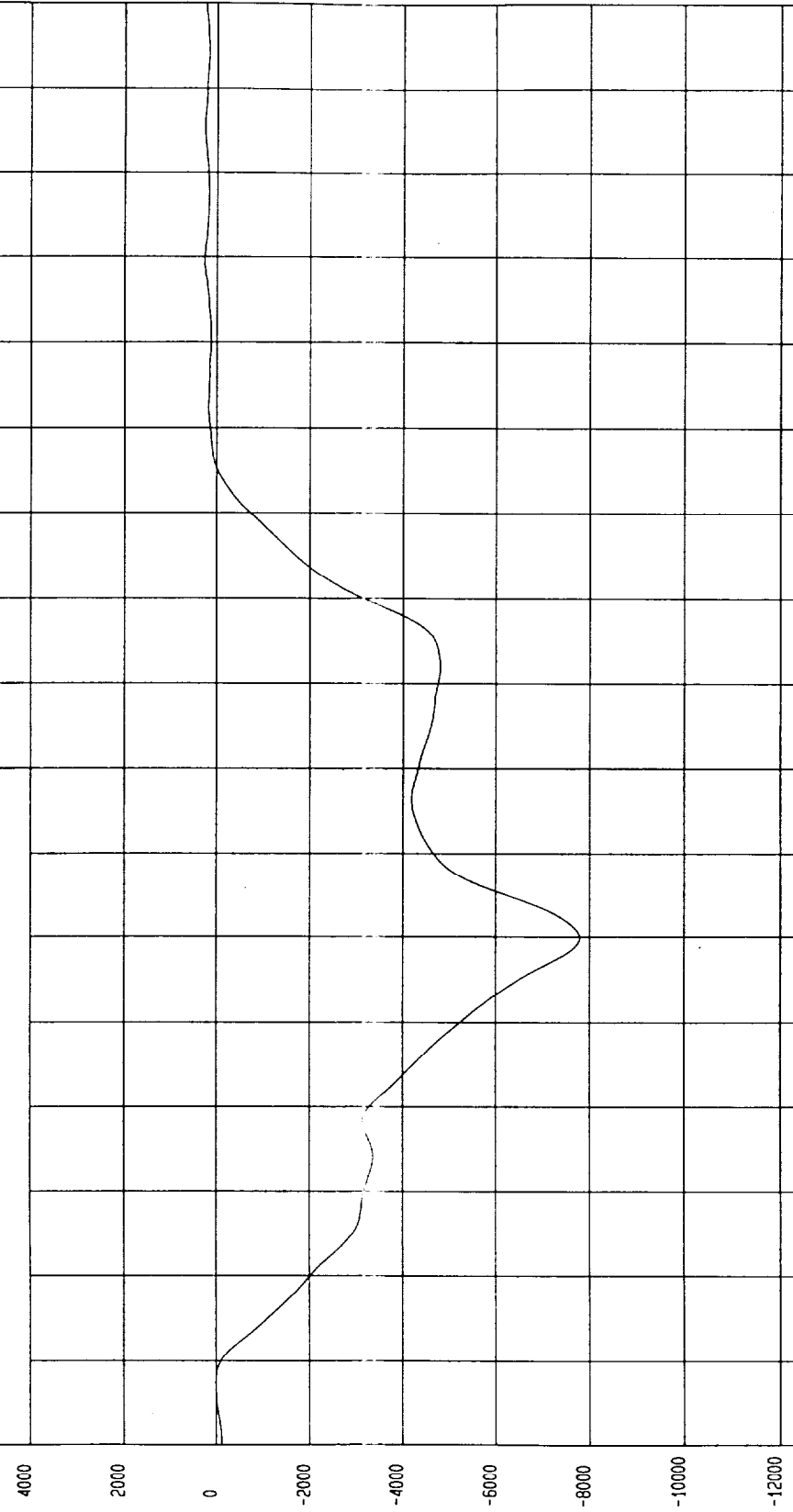
TIME (SECONDS)

MGA Research
06-04-1998 13:39

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -7793.5 N at 50 msec	Maximum = 267.37 N at 178 msec

LC #36 FX

1 ——— RS7030FM.F47 Filterclass (60)



TIME (SECONDS)

MCA Research
06-04-1998 13:39

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

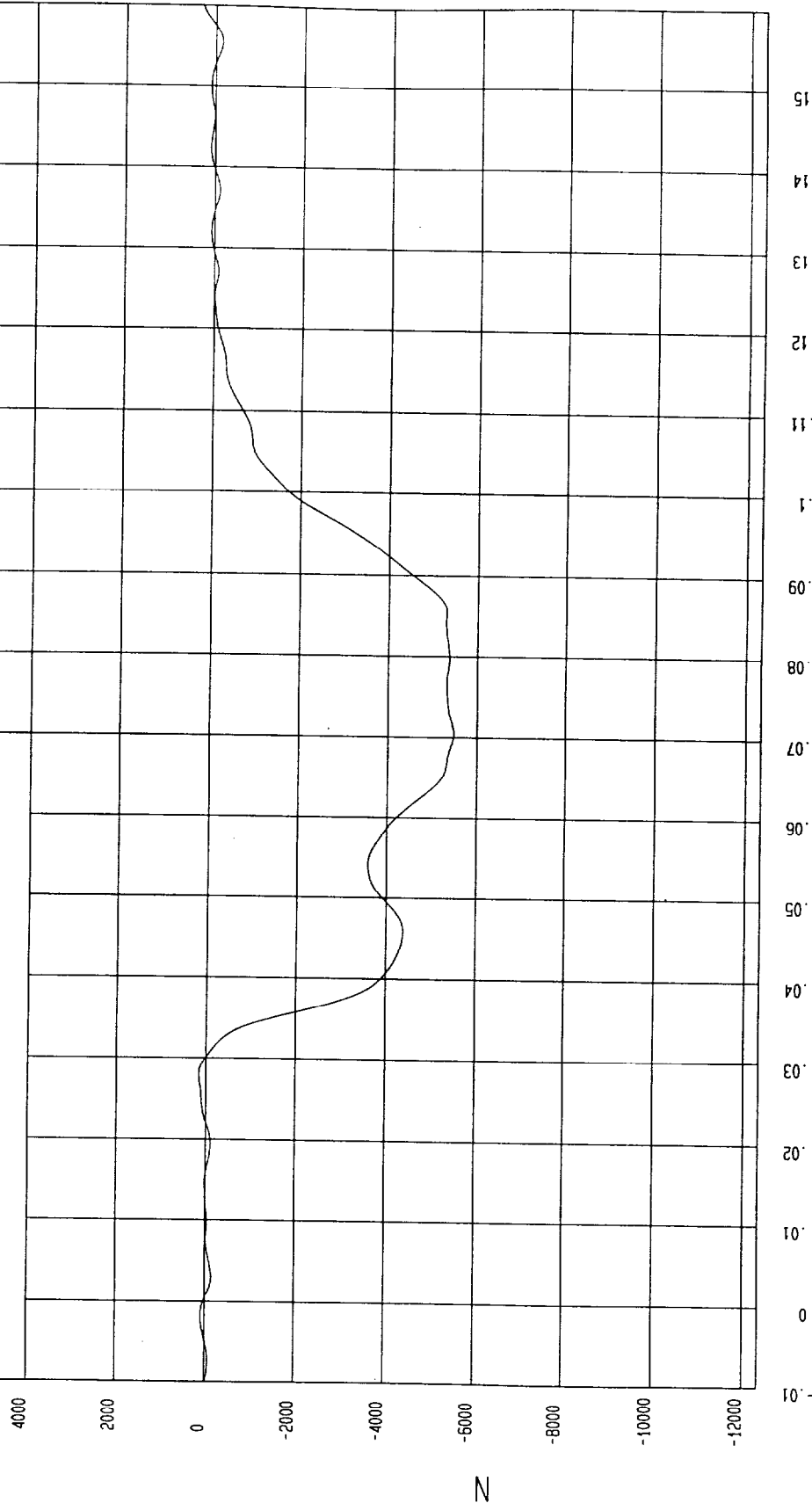
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -5477.48 N at 70 msec

Maximum = 301.7 N at 161 msec

LC #37 FX

1 ——— R87030FM.F50 Filterclass (60)



MGA Research
06-04-1998 13:40

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

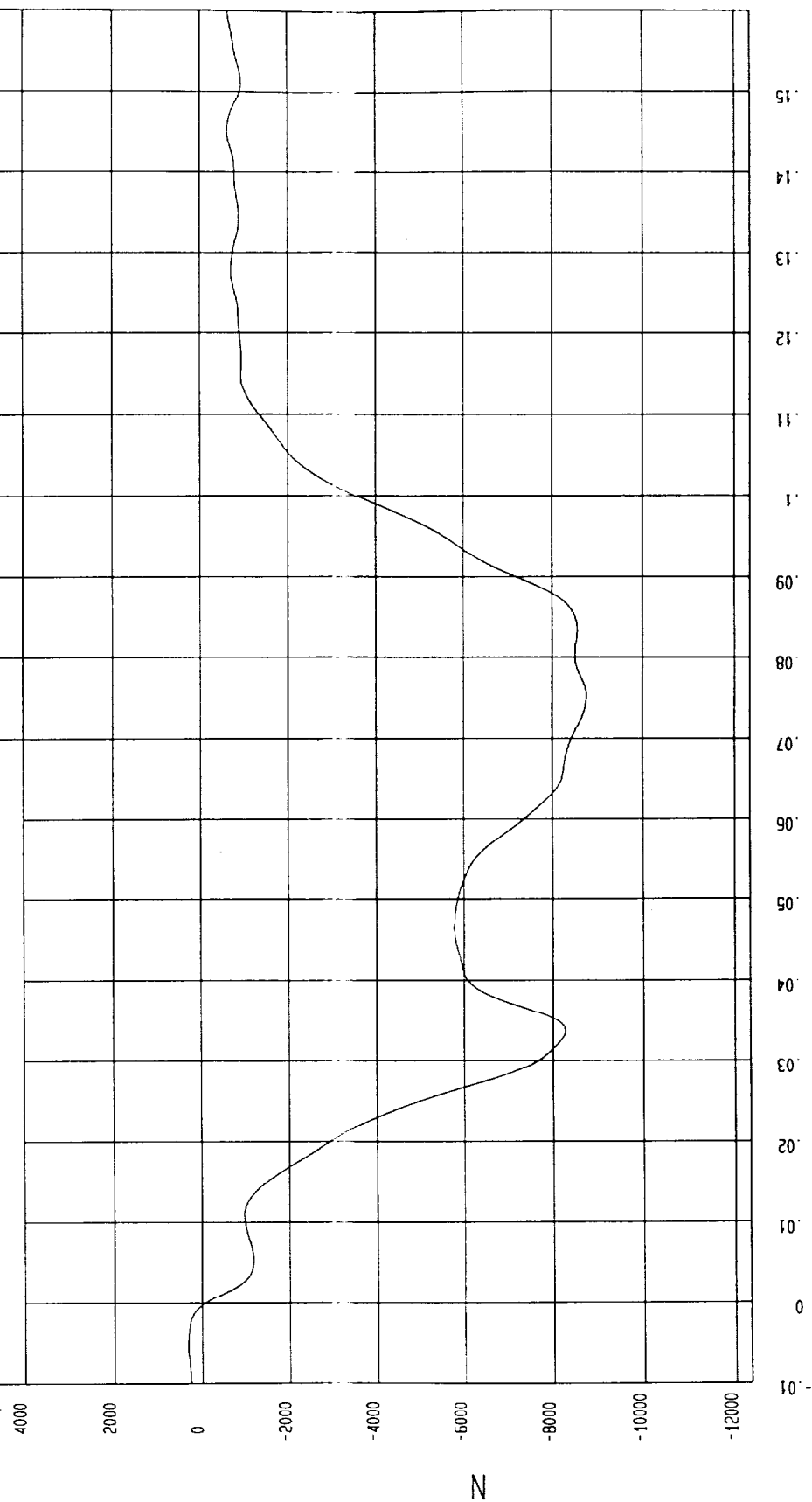
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Maximum = 315.43 N at -5 msec

Minimum = -8764.56 N at 75 msec

LC #38 FX

1 _____ R97030FM.F53 Filterclass (60)



WGA Research
06-04-1998 13:40

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

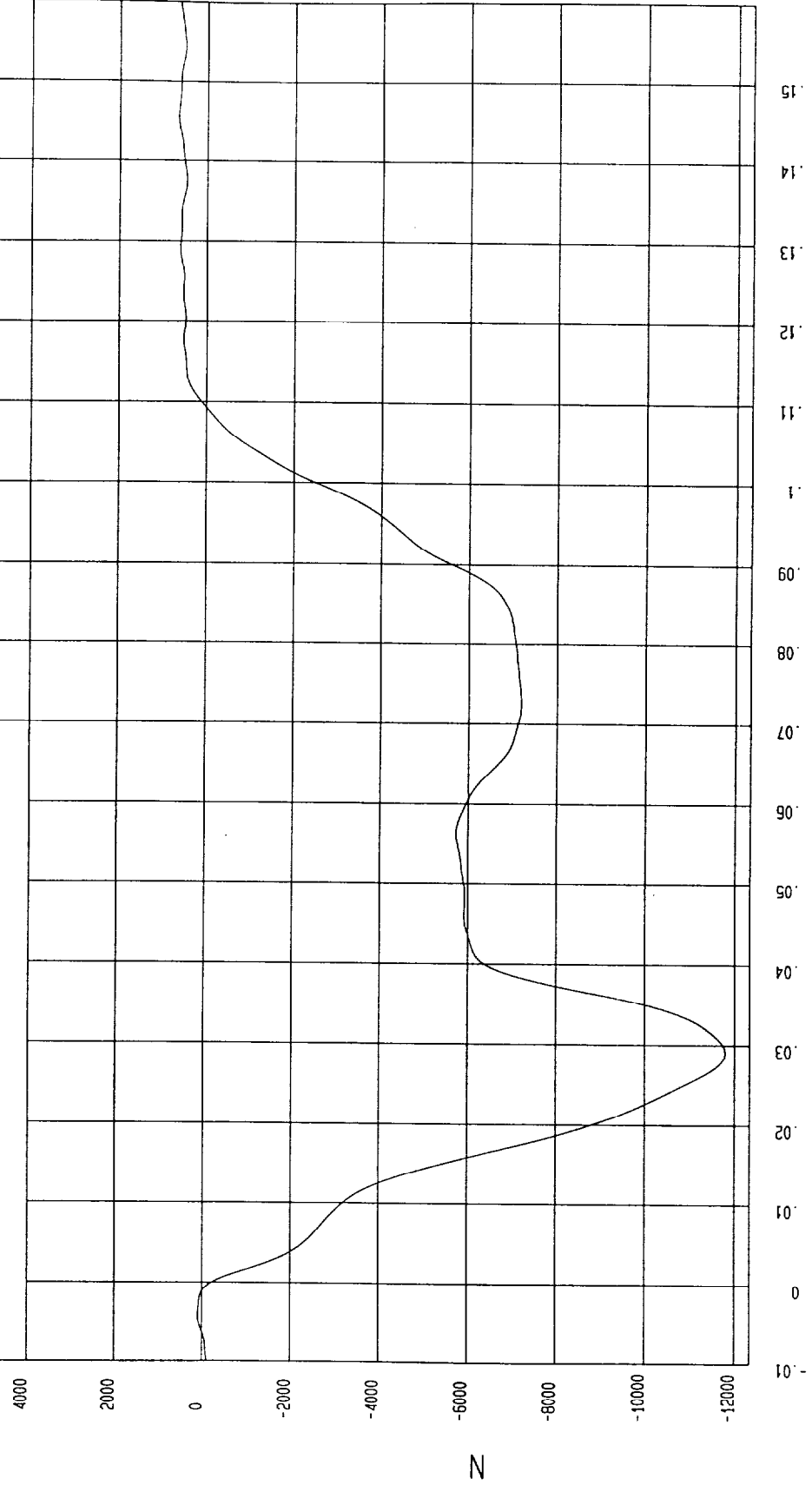
Speed: 20 MPH 32.2 KPH

Minimum = -11797.85 N at 29 msec

Maximum = 754.39 N at 179 msec

LC #39 FX

1 ——— R97030FM.F56 Filterclass (60)



MGA Research
06-04-1998 13:40

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

Speed: 20 MPH 32.2 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 430.29 N at 146 msec

Minimum = -8354.34 N at 39 msec

LC #40 FX

1 _____ R97030FM.F60 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-10

0

10

20

30

40

50

60

70

80

TIME (SECONDS)

MCA Research
06-04-1998 13.41

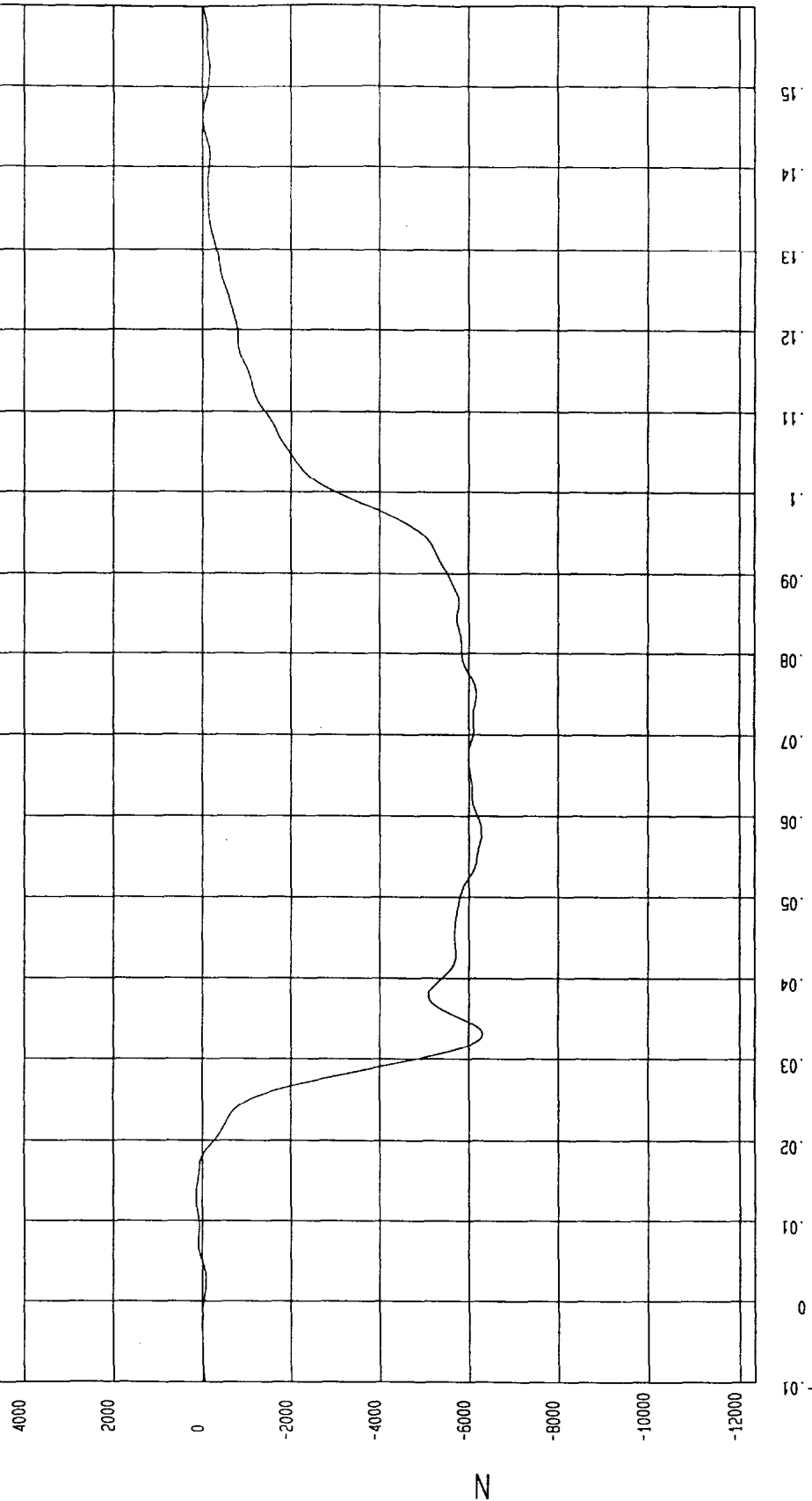
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6312.41 N at 33 msec Maximum = 145.34 N at 196 msec

LC #41 FX

1 _____ R97030FM.F63 Filterclass (60)



MGA Research
06-04-1998 13:41

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

Speed: 20 MPH 32.2 KPH

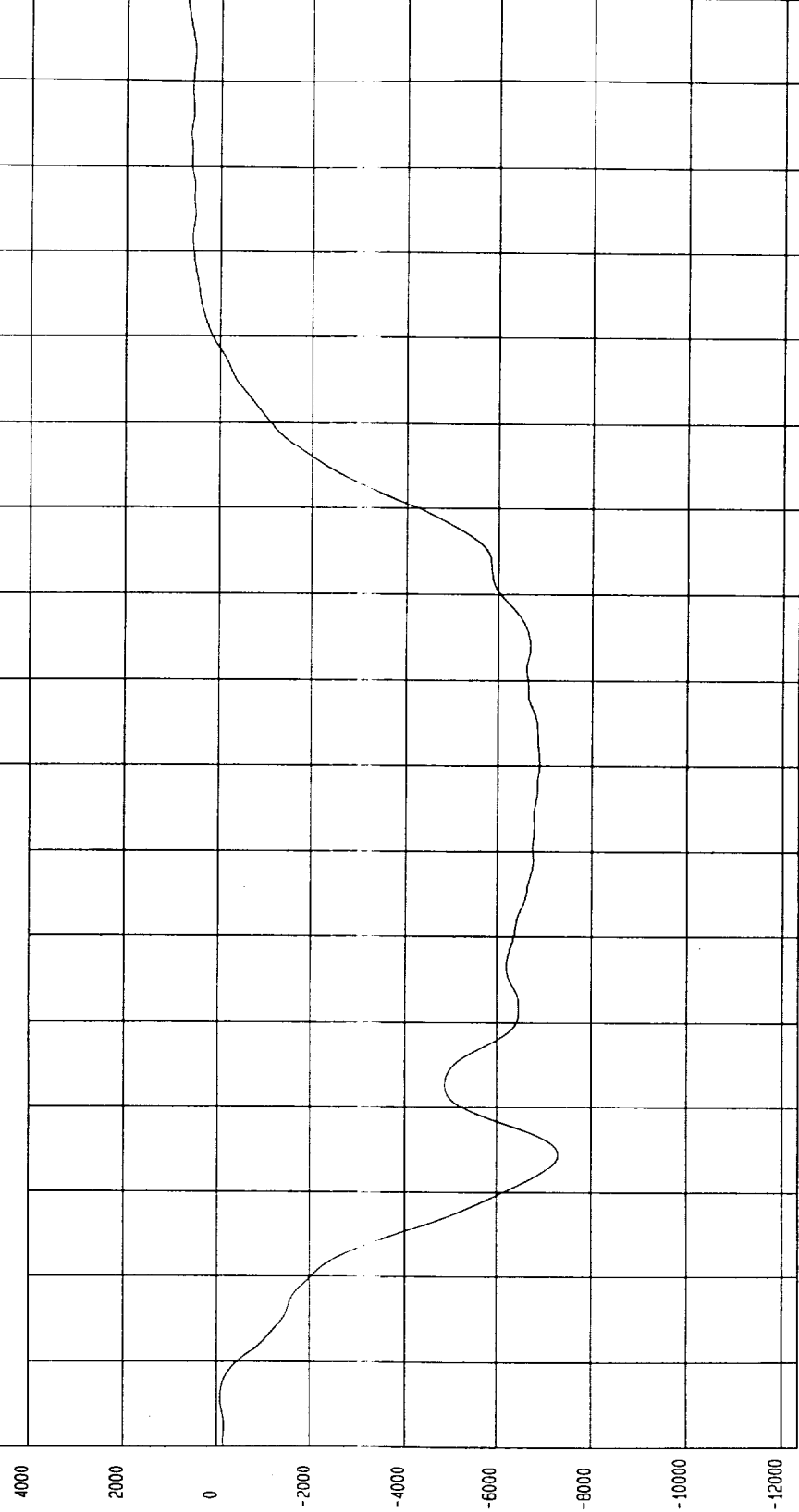
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -7293.05 N at 24 msec

Maximum = 762.63 N at 162 msec

LC #42 FX

1 _____ R97030FM.F66 Filterclass (60)



MCA Research
06-04-1998 13:41

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

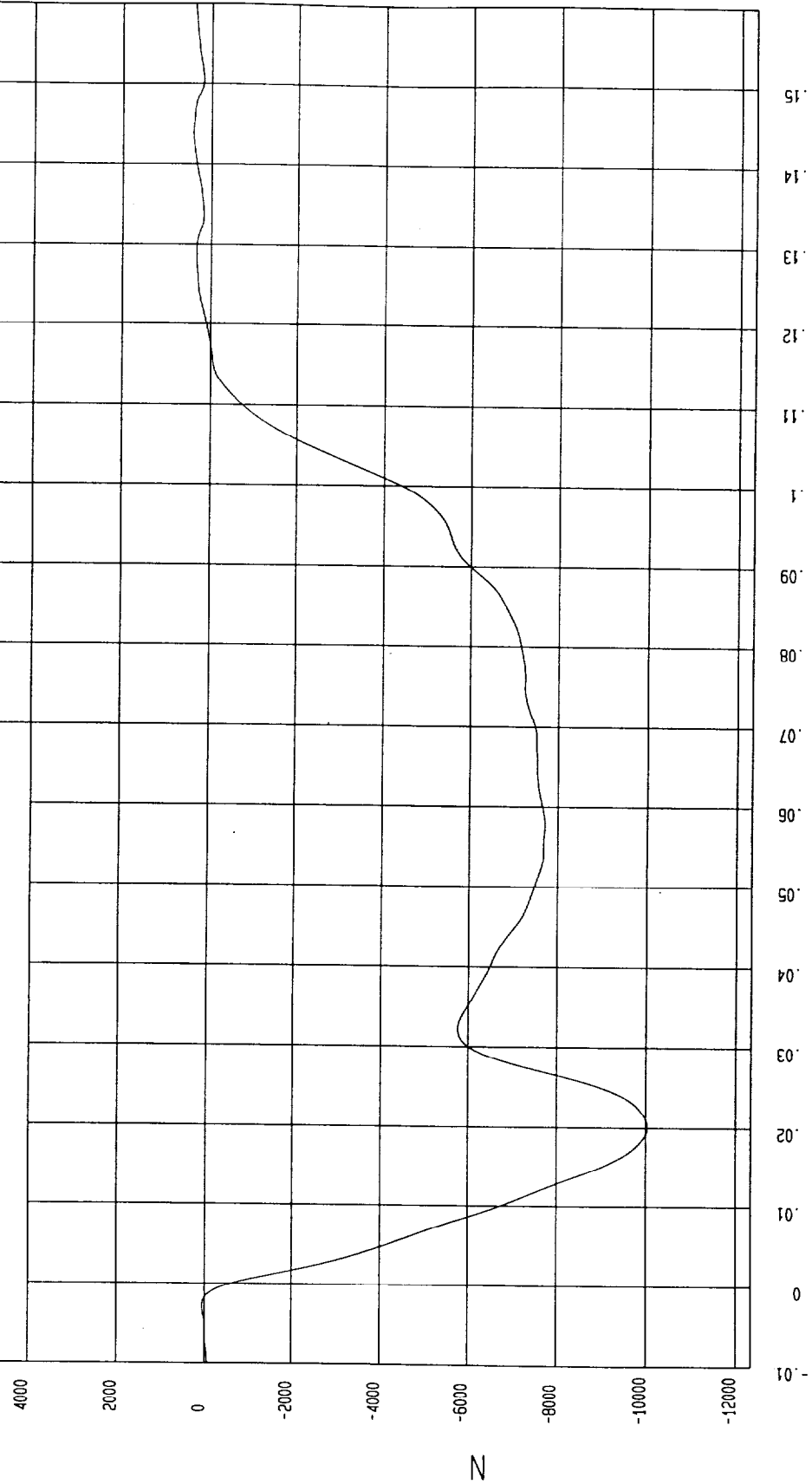
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -10032.54 N at 20 msec

Maximum = 431.35 N at 177 msec

LC #43 FX

1 ——— R97030FW.F69 Filterclass (60)



MGA Research
06-04-1998 13:42

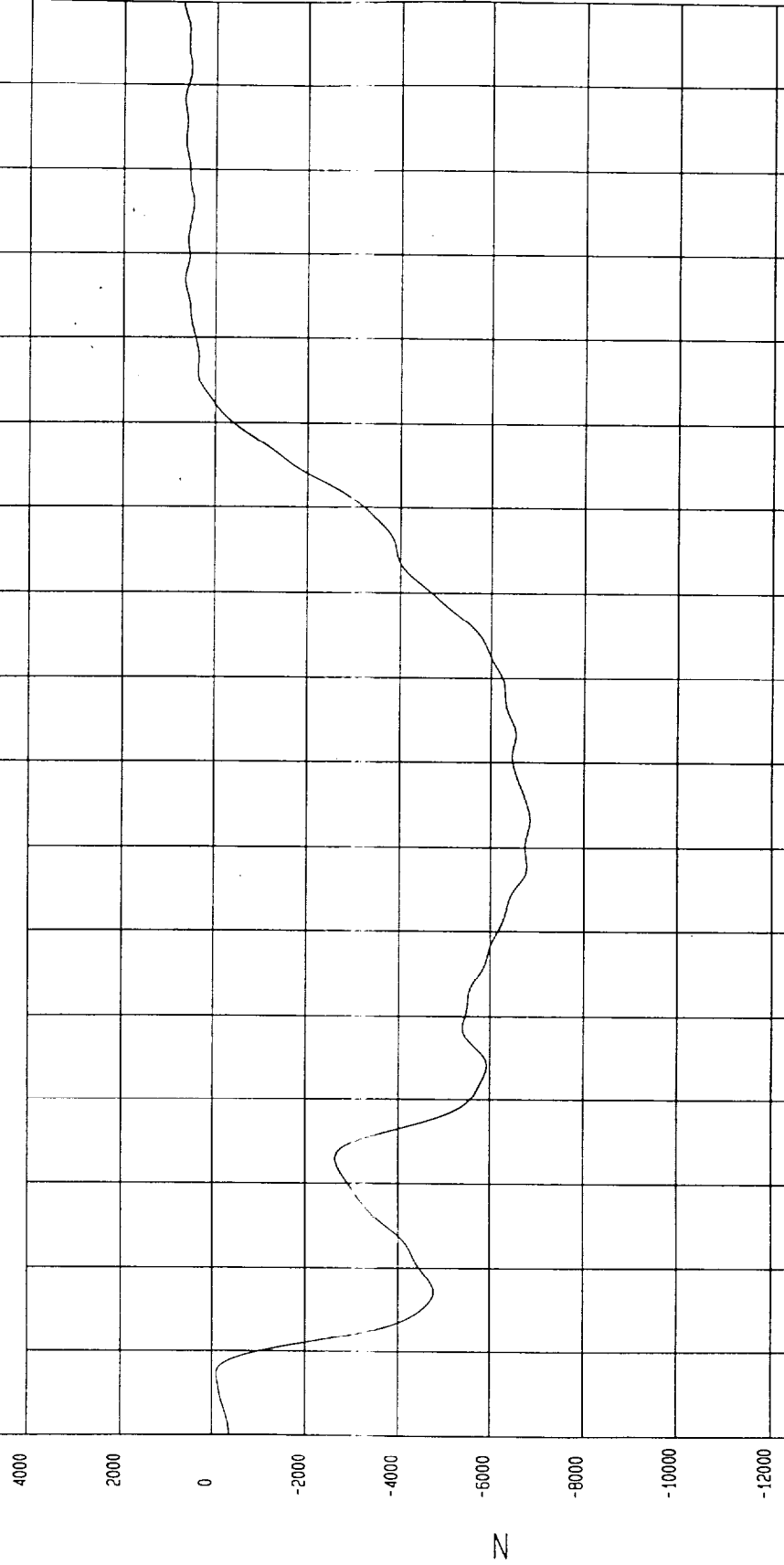
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6860.94 N at 63 msec

LC #44 FX

1 _____ R97030FM.F72 Filterclass (60)



MGA Research
06-04-1998 13:42

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -140.15 N at -20 msec

Maximum = 415.95 N at 71 msec

LC #1 FY

1 ——— 897030FM.F02 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-1

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (SECONDS)

MGA Research
06-04-1998 13:08

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

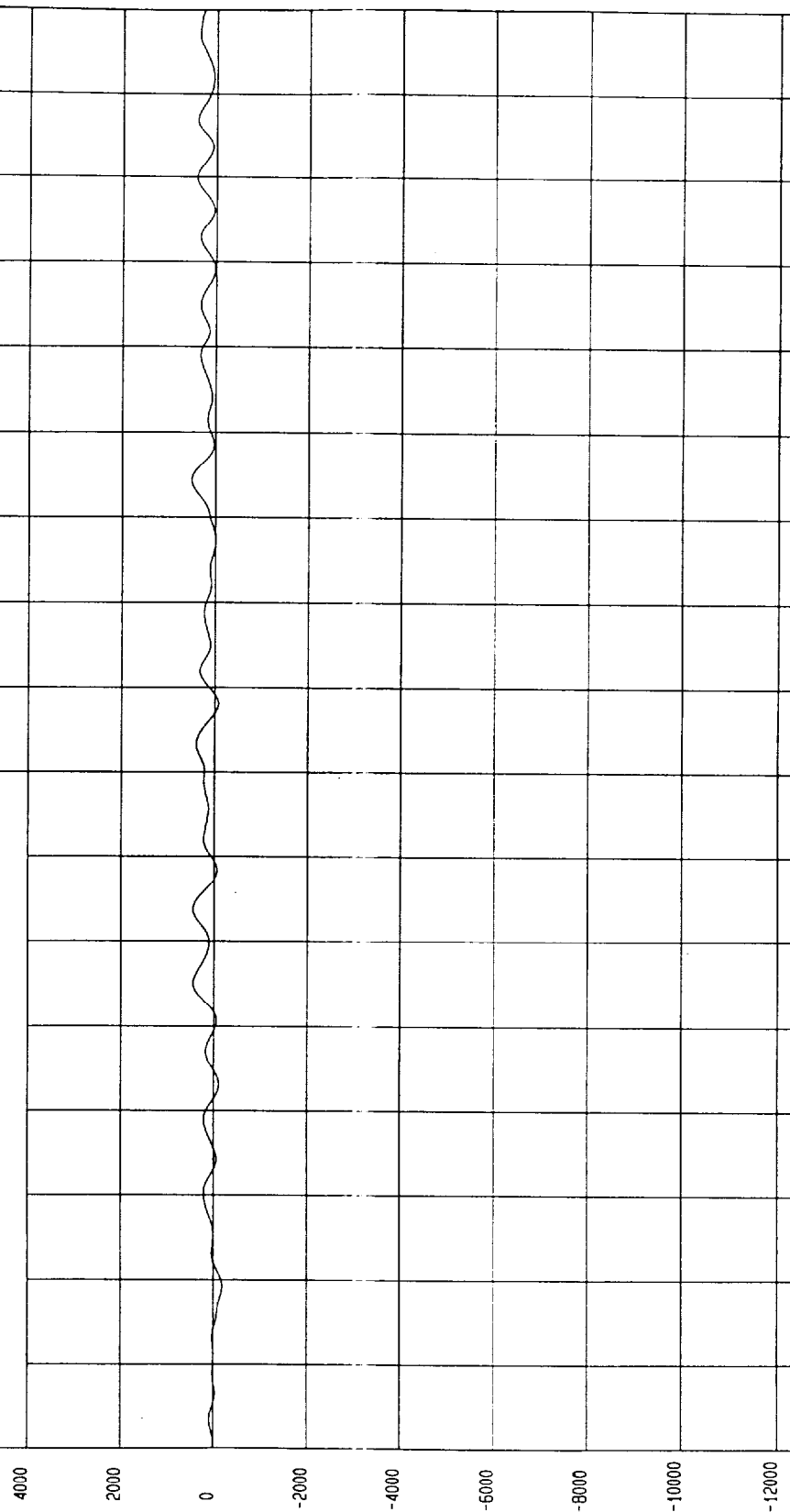
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -224.72 N at -14 msec

Maximum = 502.66 N at 104 msec

LC #2 FY

1 _____ B97030FM.F05 Filterclass (60)



MCA Research
06-04-1998 13:08

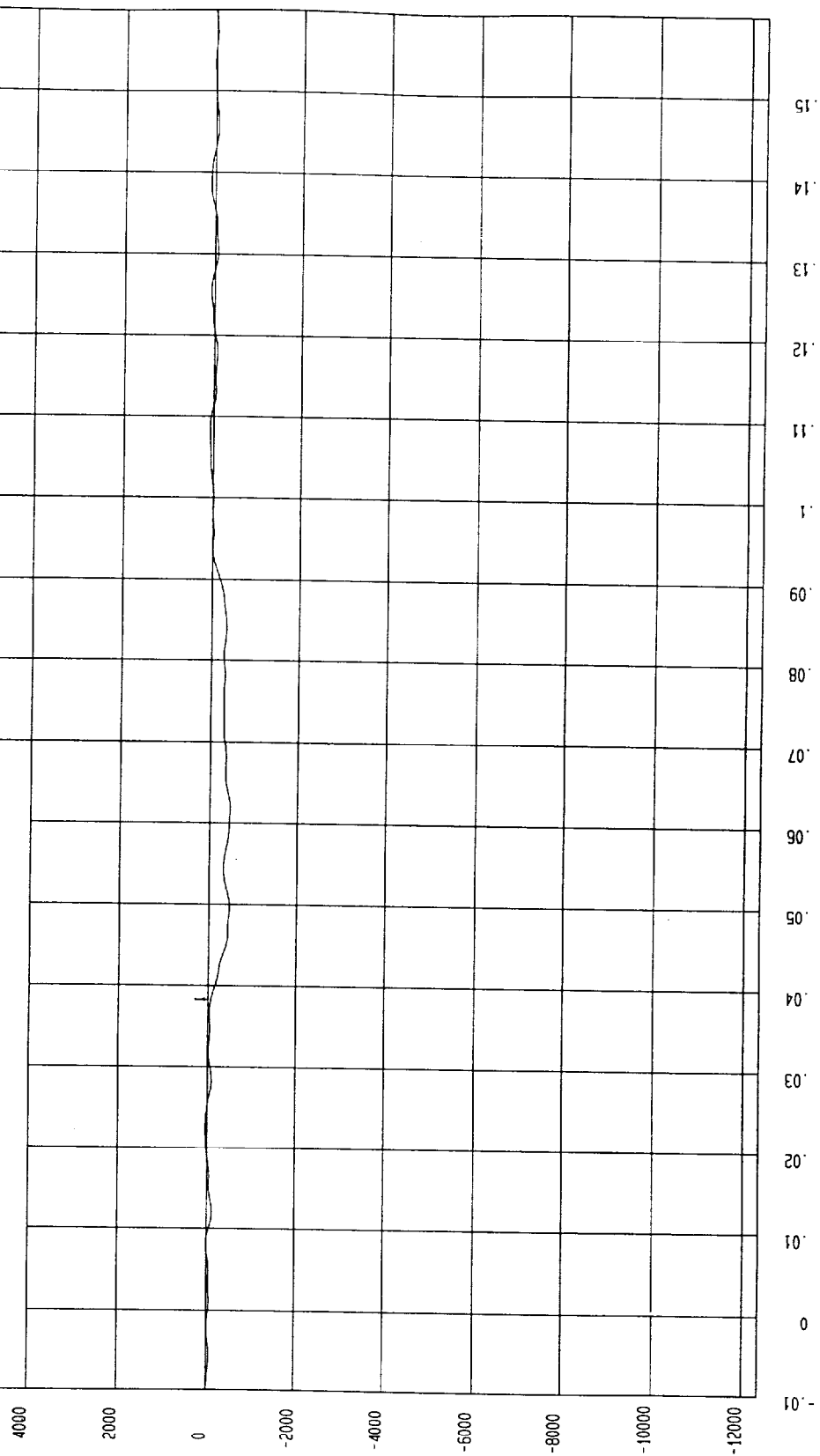
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -463.97 N at 62 msec Maximum = 95.63 N at 138 msec

LC #3 FY

1 _____ 897030FM.F08 Filterclass (60)



MCA Research
06-04-1998 13:09

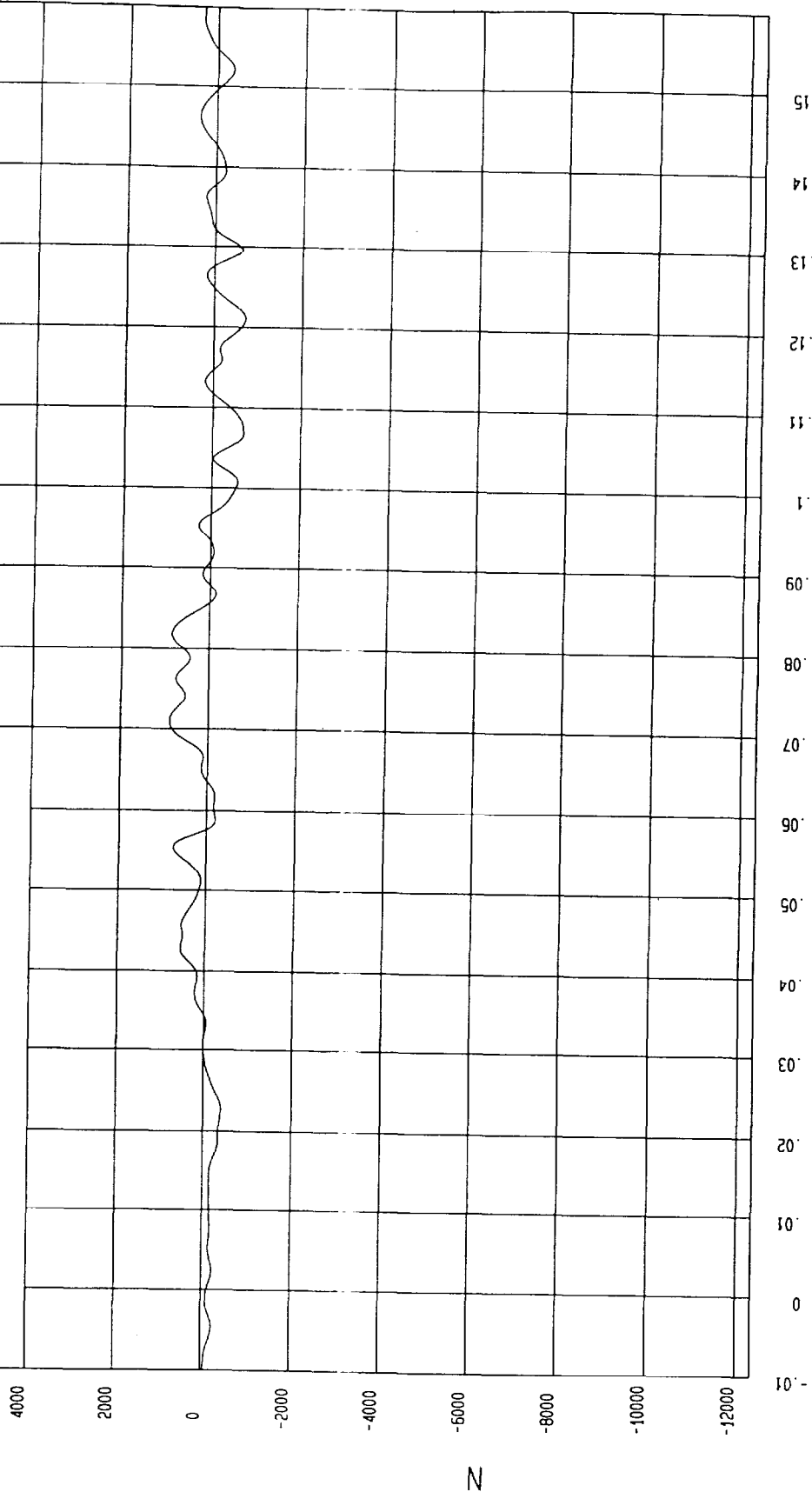
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -697.6 N at 107 msec Maximum = 882.8 N at 71 msec

LC #4 FY

1 _____ B97030FM.F12 Filterclass (60)



WCA Research
05-04-1998 13:09

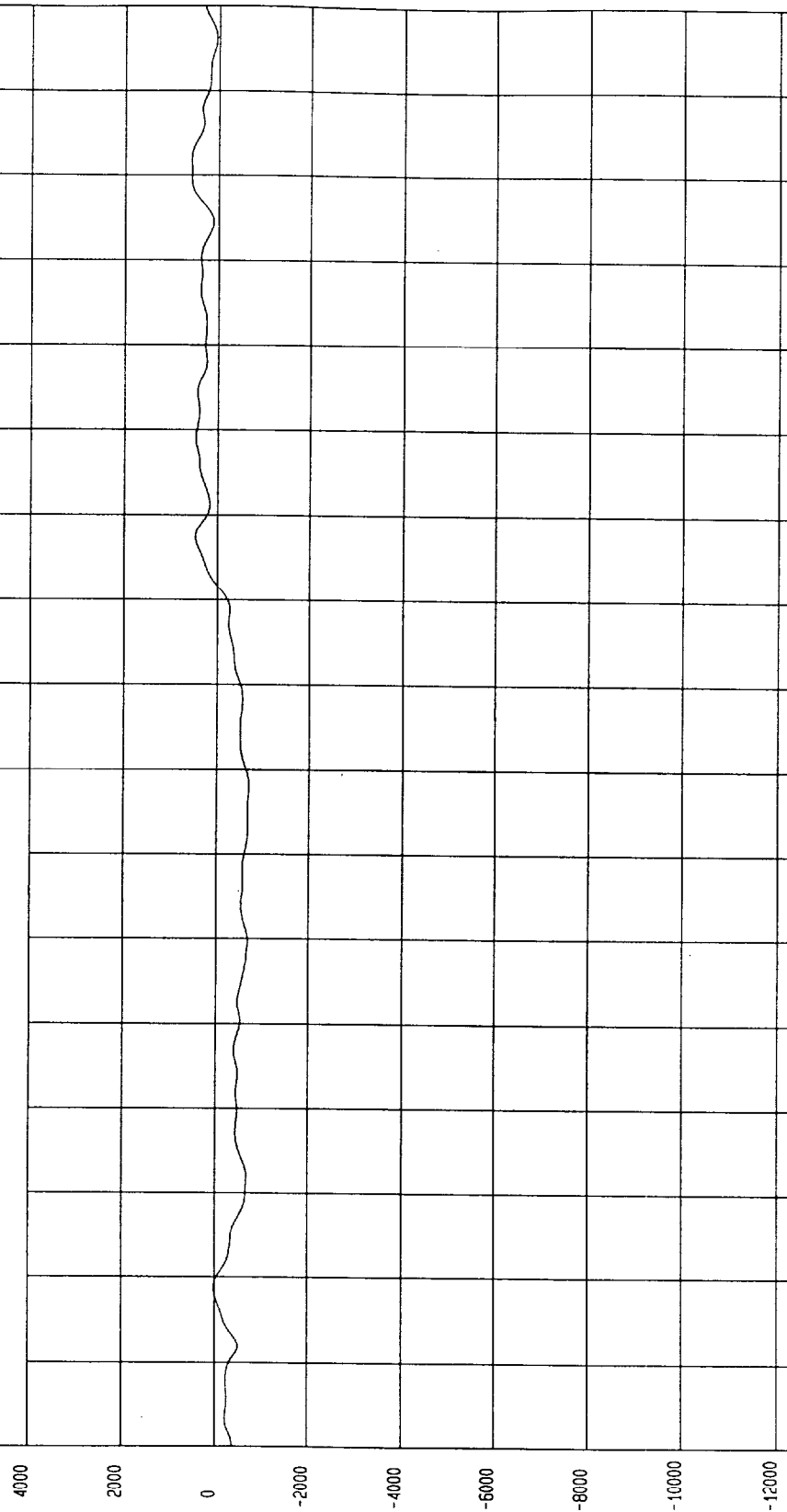
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -684.32 N at 68 msec Maximum = 587.34 N at 142 msec

LC #5 FY

1 _____ 897030FM.F15 Filterclass (60)



MCA Research
06-04-1998 13:09

TIME (SECONDS)

N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3911.46 N at 75 msec

Maximum = 330.17 N at 108 msec

LC #6 FY

1 _____ 897030FM.F18 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

10

0

10

20

30

40

50

60

70

80

90

1

11

12

13

14

15

TIME (SECONDS)

MGA Research
06-04-1998 13:10

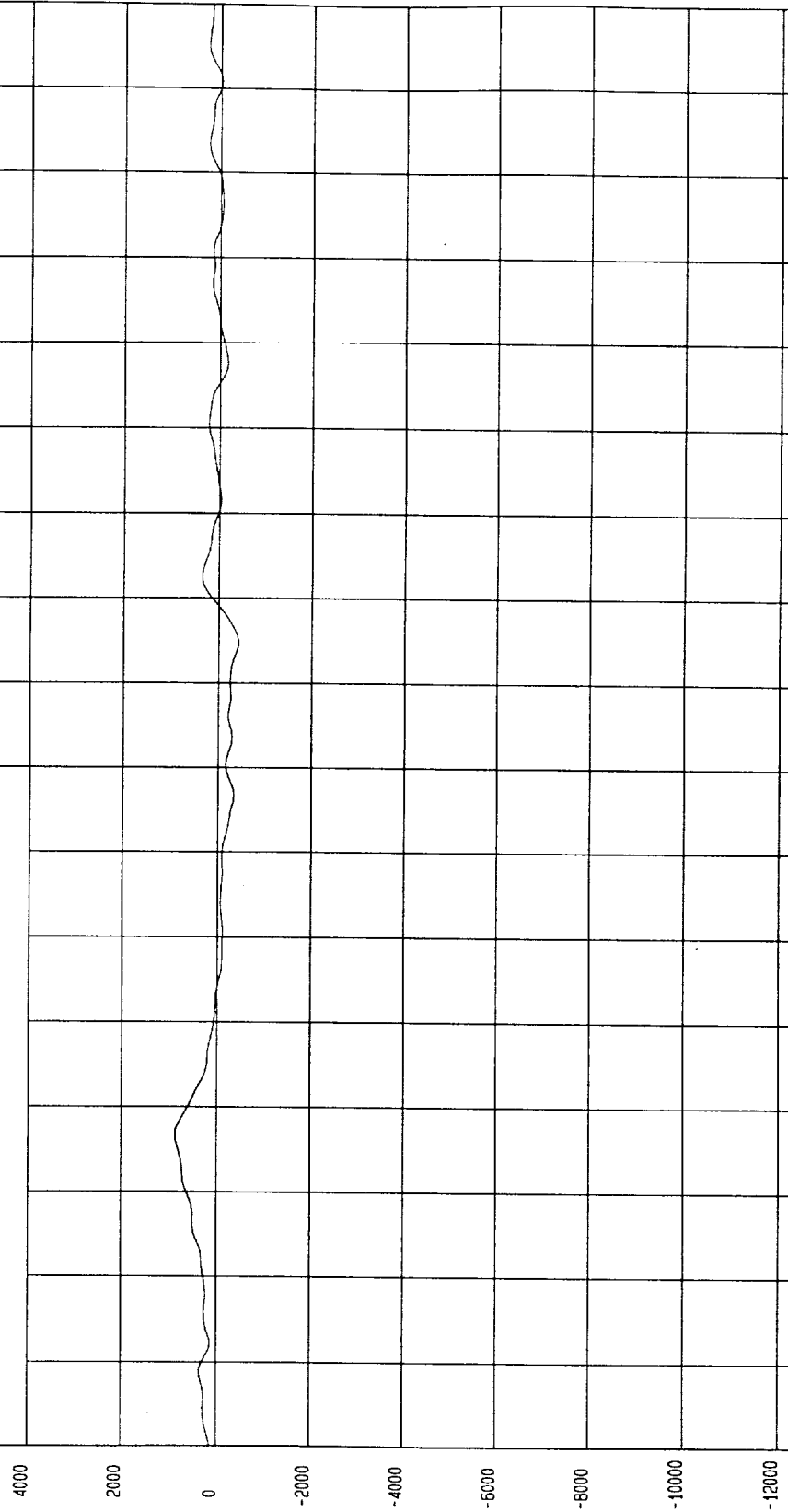
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -429.37 N at 85 msec Maximum = 867.02 N at 27 msec

LC #7 FY

1 ——— B97030FM.F22 FilterClass (60)



NGA Research
06-04-1998 13:10

TIME (SECONDS)

N

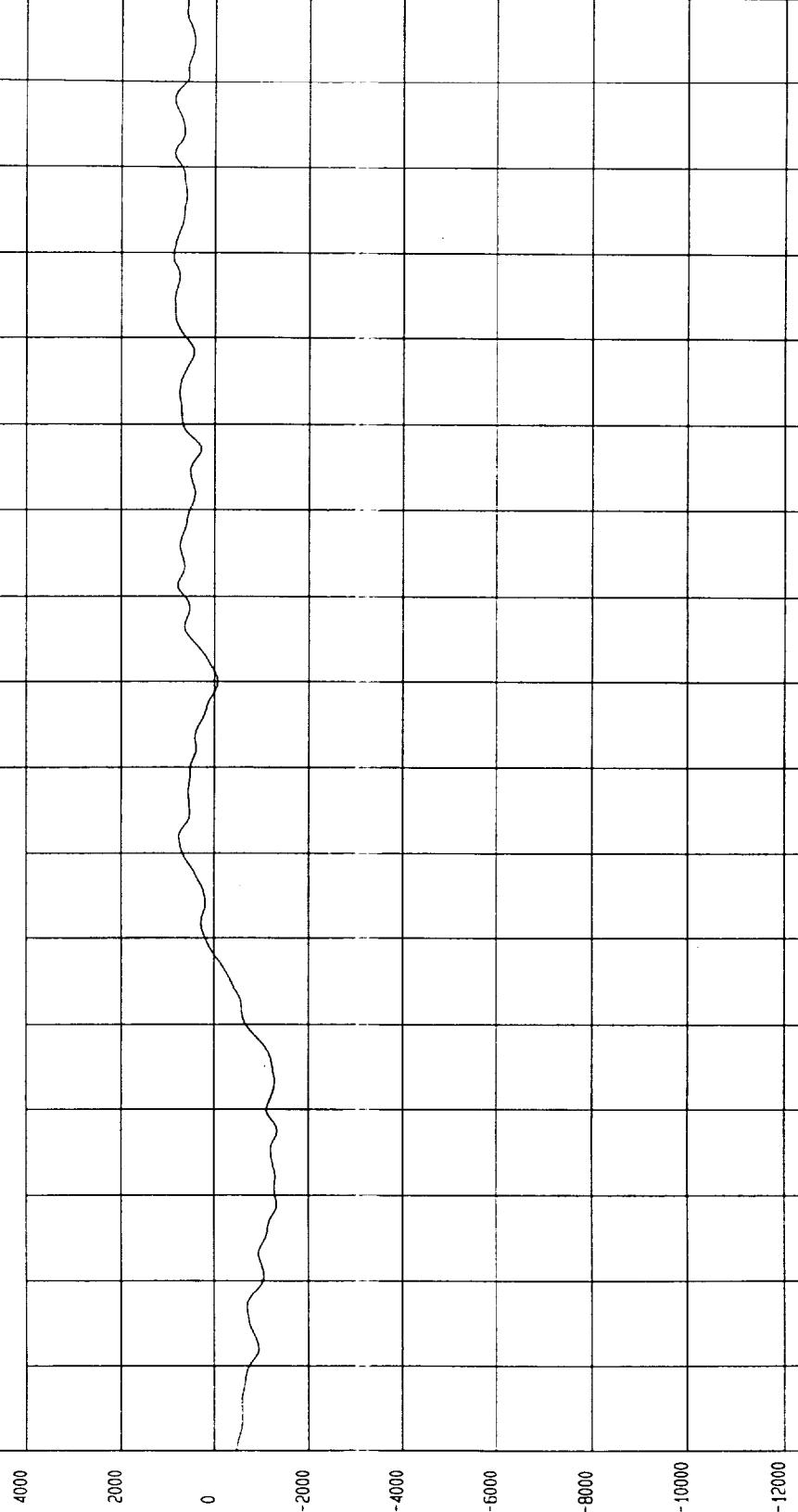
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1322.5 N at 28 msec Maximum = 950.61 N at 165 msec

LC #8 FY

1 897030FM.F25 Filterc.ass (60)



TIME (SECONDS)

MGA Research
06-04-1998 13:10

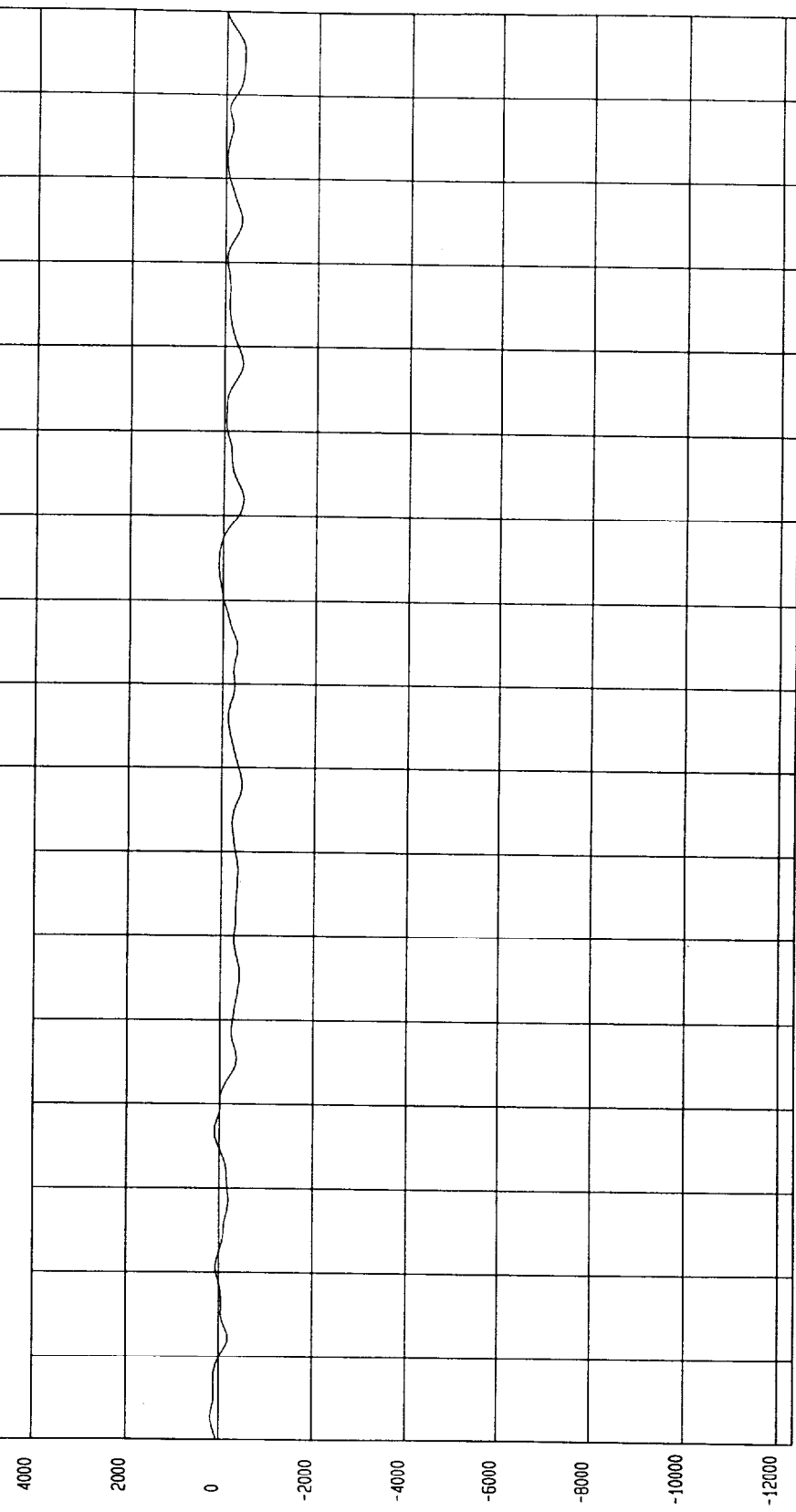
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -458.39 N at 185 msec Maximum = 174.3 N at -7 msec

LC #9 FY

1 _____ 897030FM.F28 Filterclass (50)



NCA Research
06-04-1998 13.11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1094.6 N at 25 msec

Maximum = 1356.43 N at 128 msec

LC #10 FY

1 ——— B97030FM.F32 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

TIME (SECONDS)

MCA Research
06-04-1998 13:11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

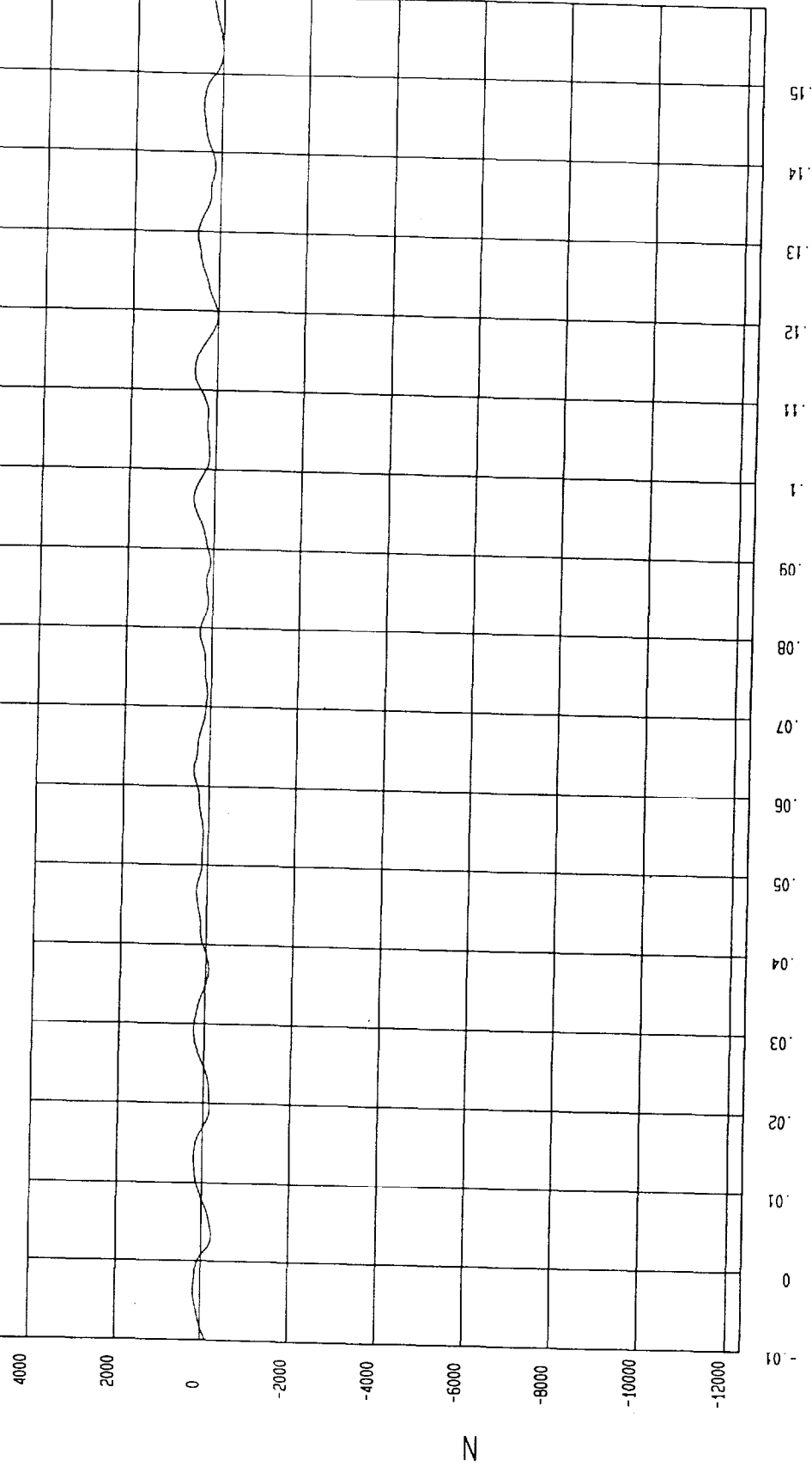
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -221.2 N at 3 msec

Maximum = 520.49 N at 112 msec

LC #11 FY

1 ——— 897030FM.F35 Filterclass (60)



MCA Research
06-04-1996 13.11

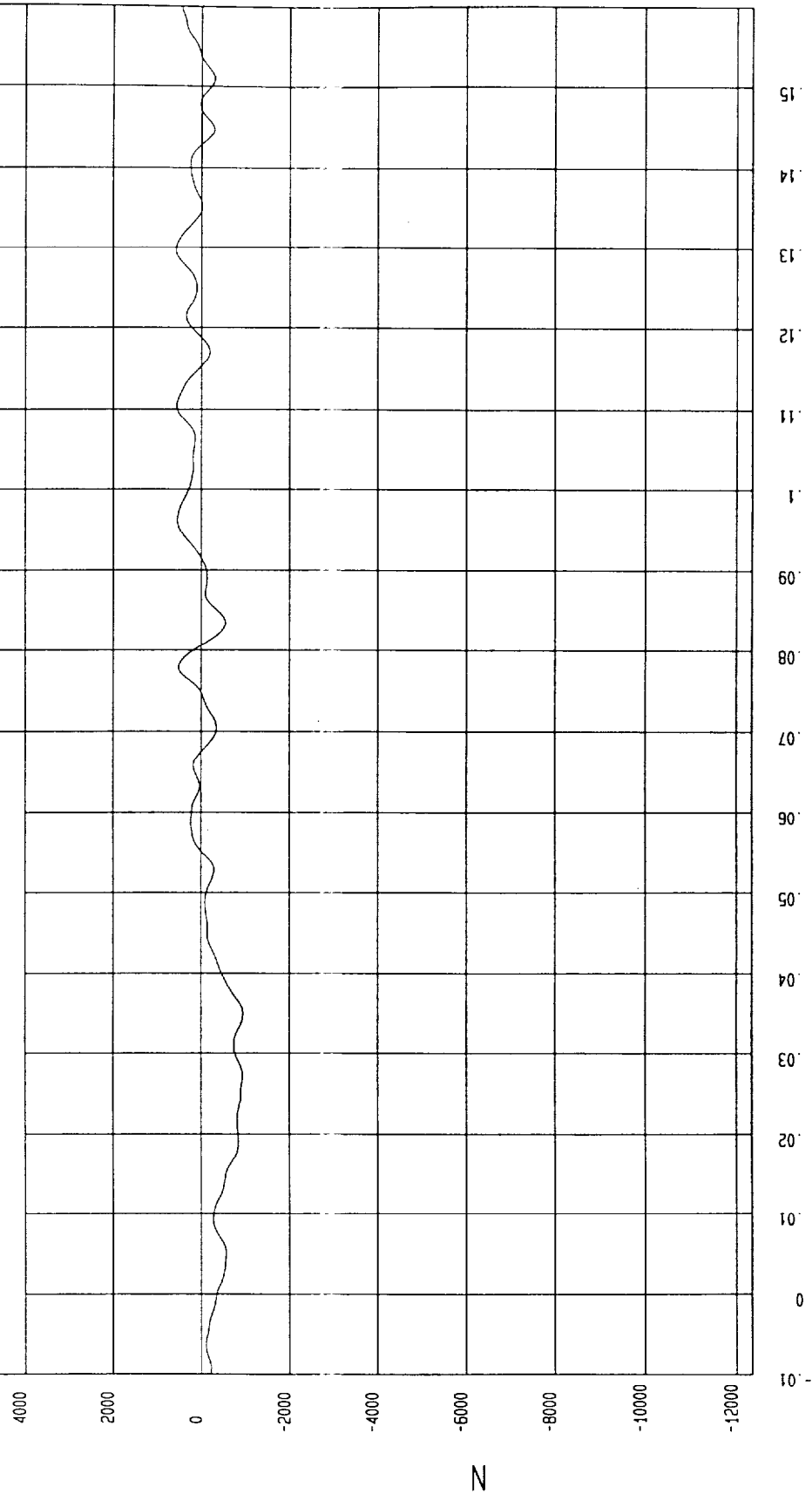
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -941.25 N at 35 msec Maximum = 590.77 N at 130 msec

LC #12 FY

1 _____ B97030FM.F38 Filterclass (60)



MGA Research
06-04-1998 13:12

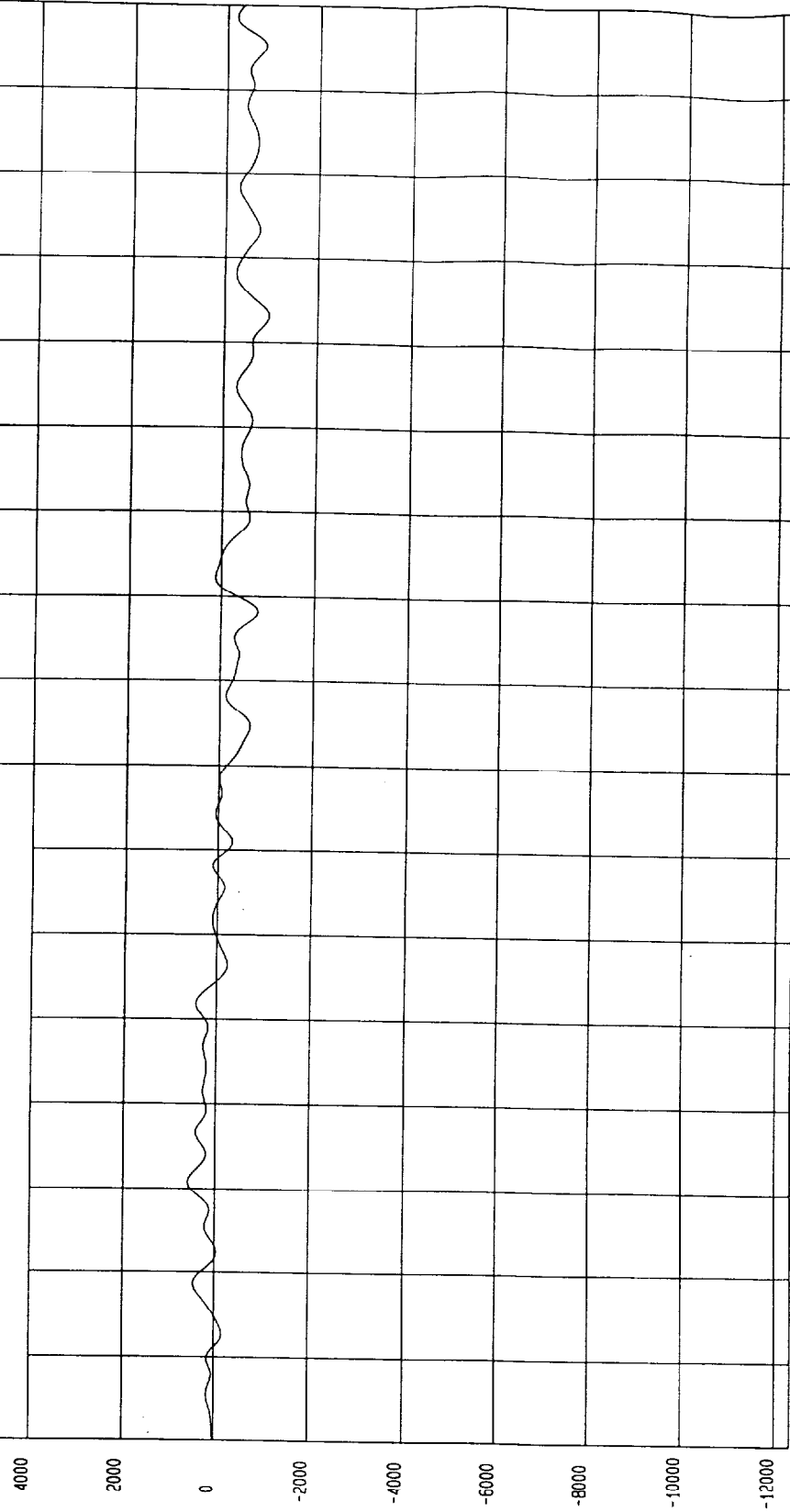
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -936.47 N at 123 msec Maximum = 591.14 N at 21 msec

LC #13 FY

1 _____ 897030FM.F42 Filterclass (50)

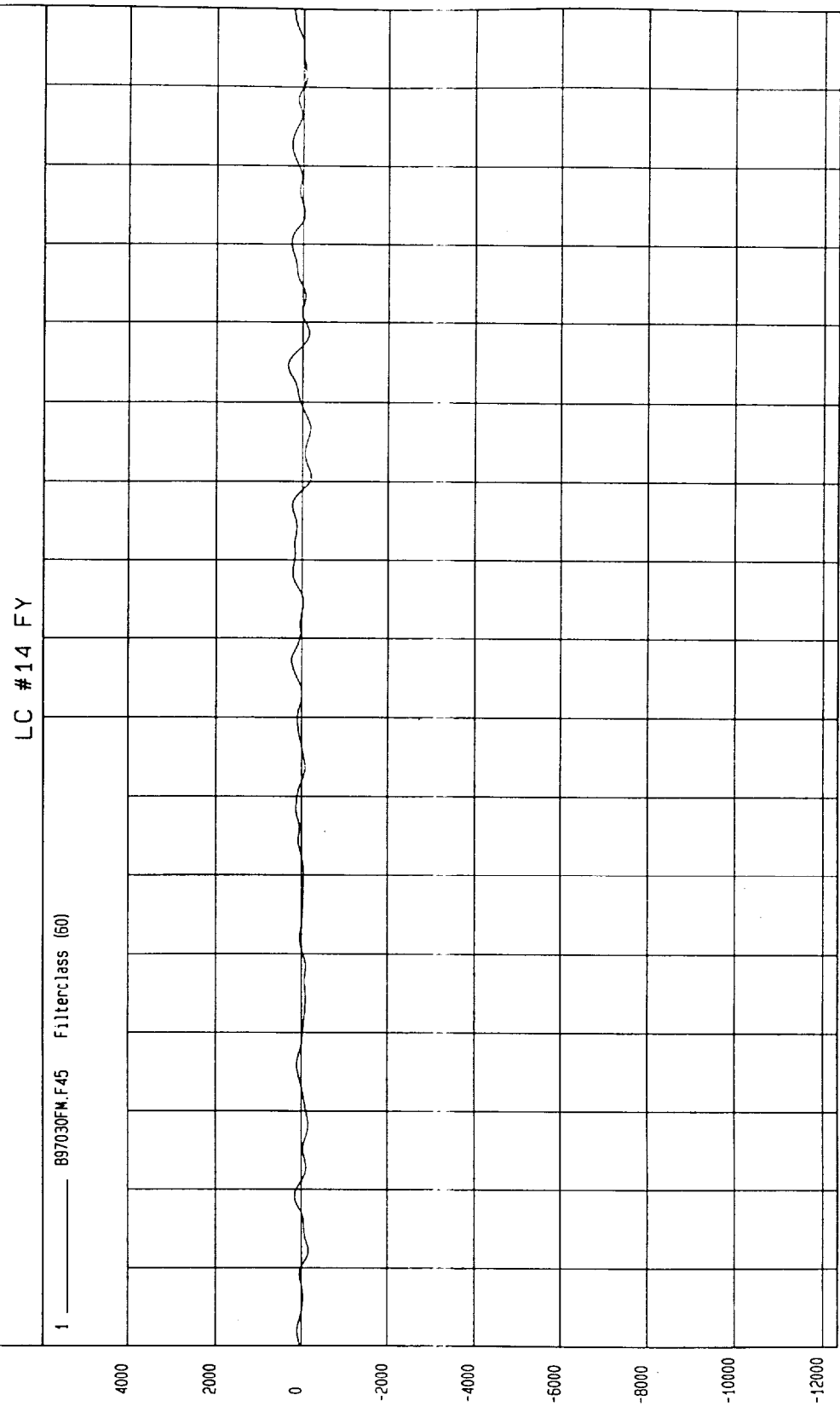


MGA Research
06-04-1998 13:12

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -193.57 N at 101 msec Maximum = 337.63 N at 192 msec



MGA Research
06-04-1998 13:12

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

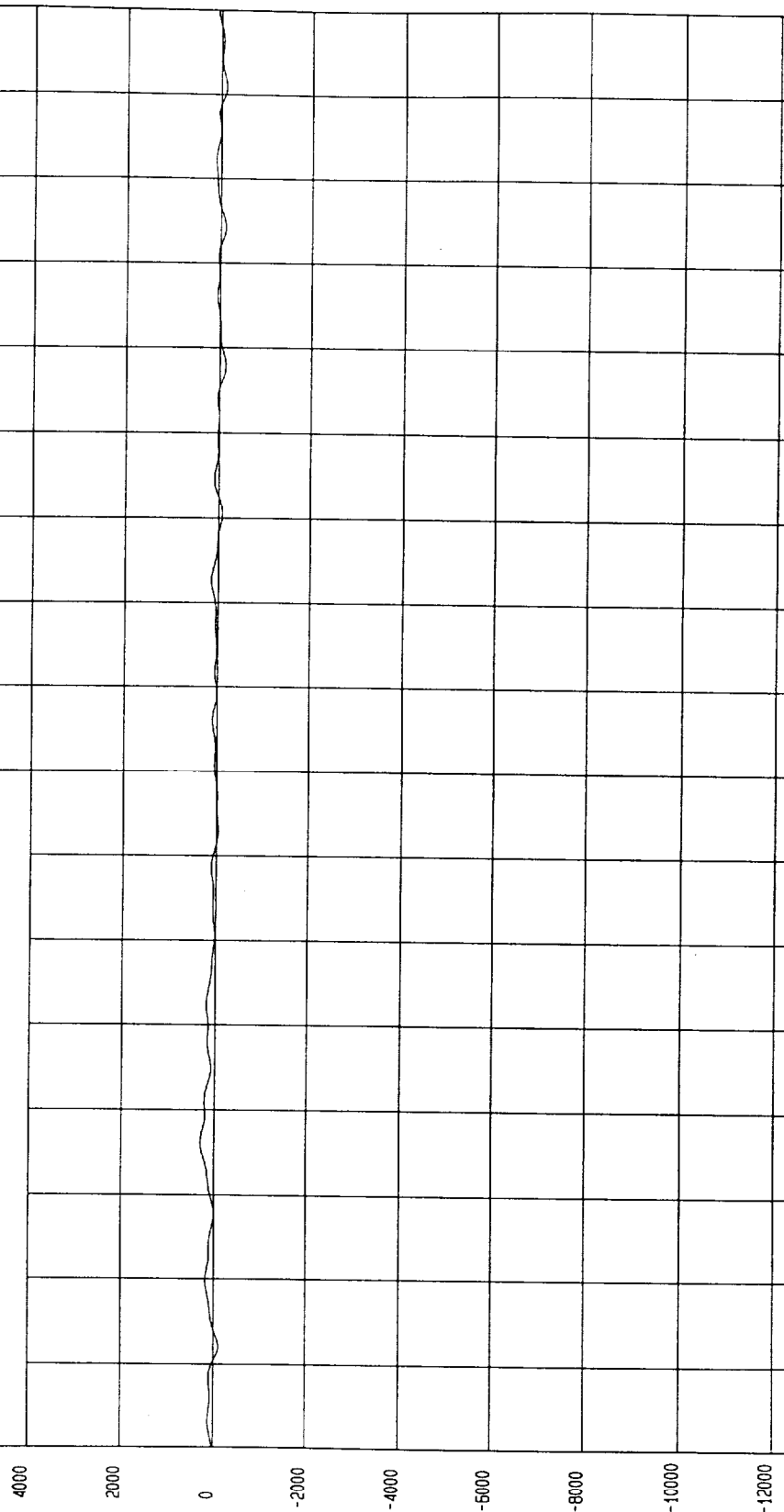
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -157.47 N at 168 msec

Maximum = 300.03 N at 26 msec

LC #15 FY

1 — 897030FM.F48 Filterclass (60)

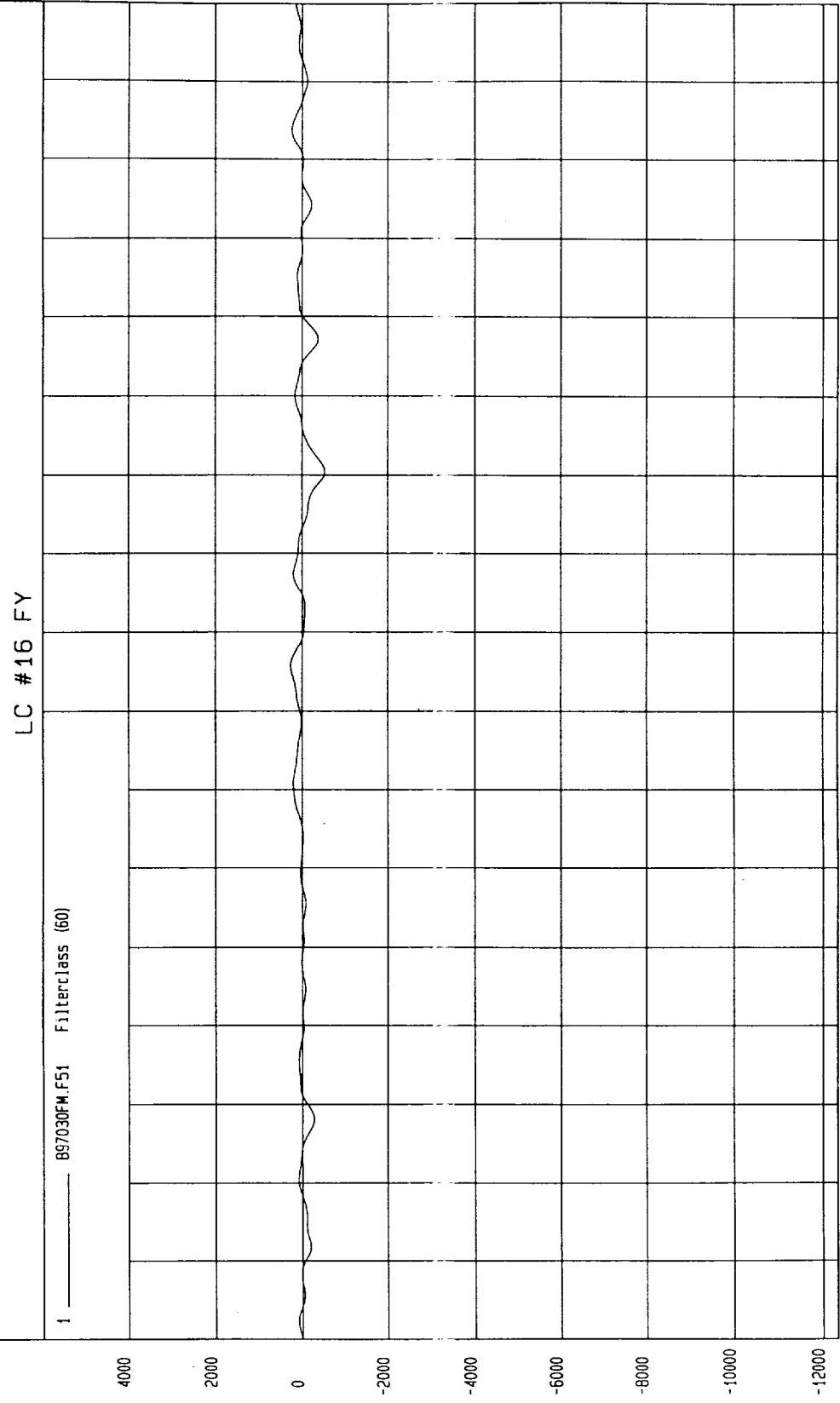


MCA Research
06-04-1998 13:13

TIME (SECONDS)

N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -525.39 N at 100 msec	
Maximum = 405.15 N at 199 msec	



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0

MSA Research
06-04-1998 13.13

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

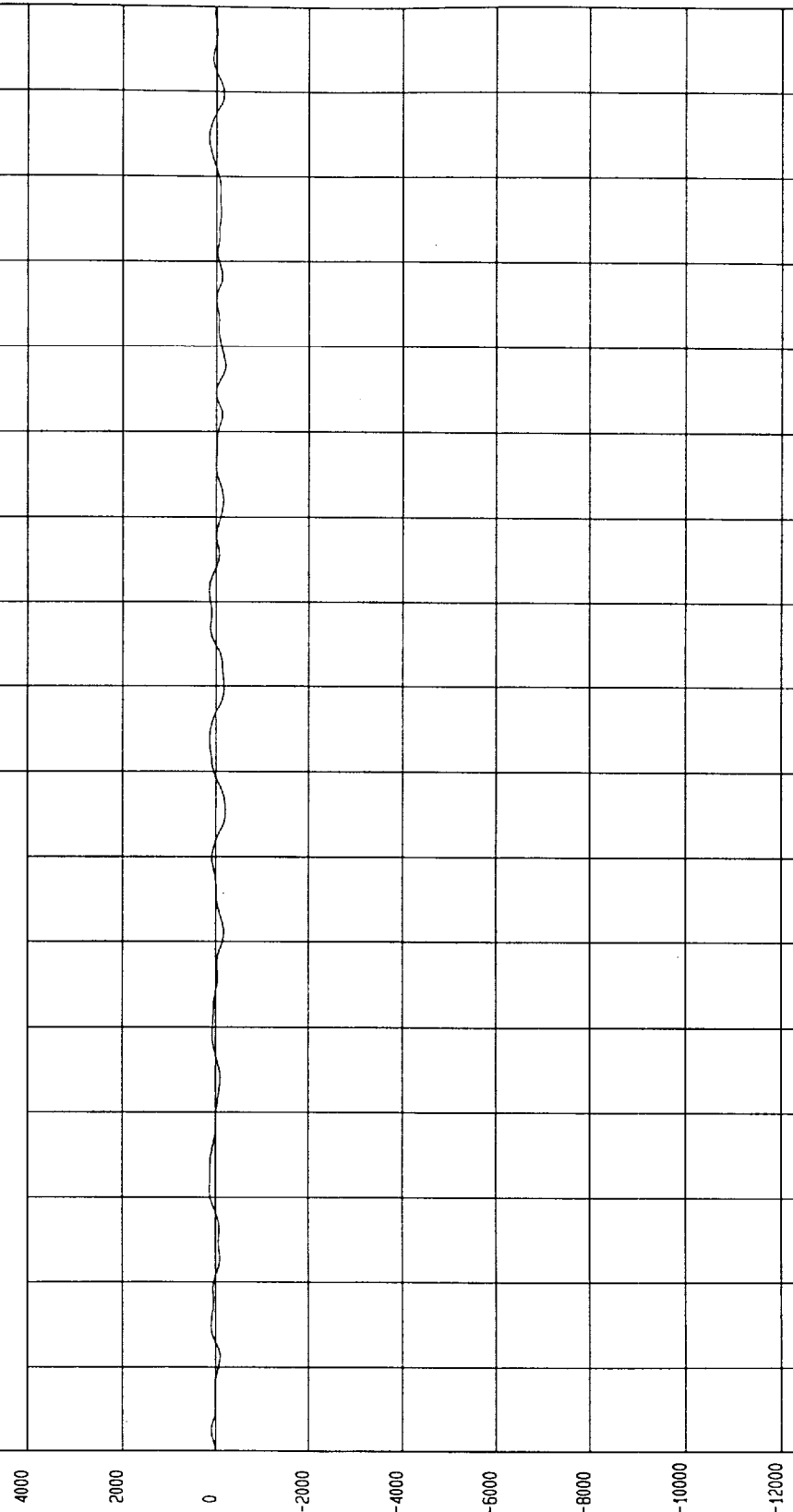
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -241.86 N at 168 msec

Maximum = 155.45 N at 145 msec

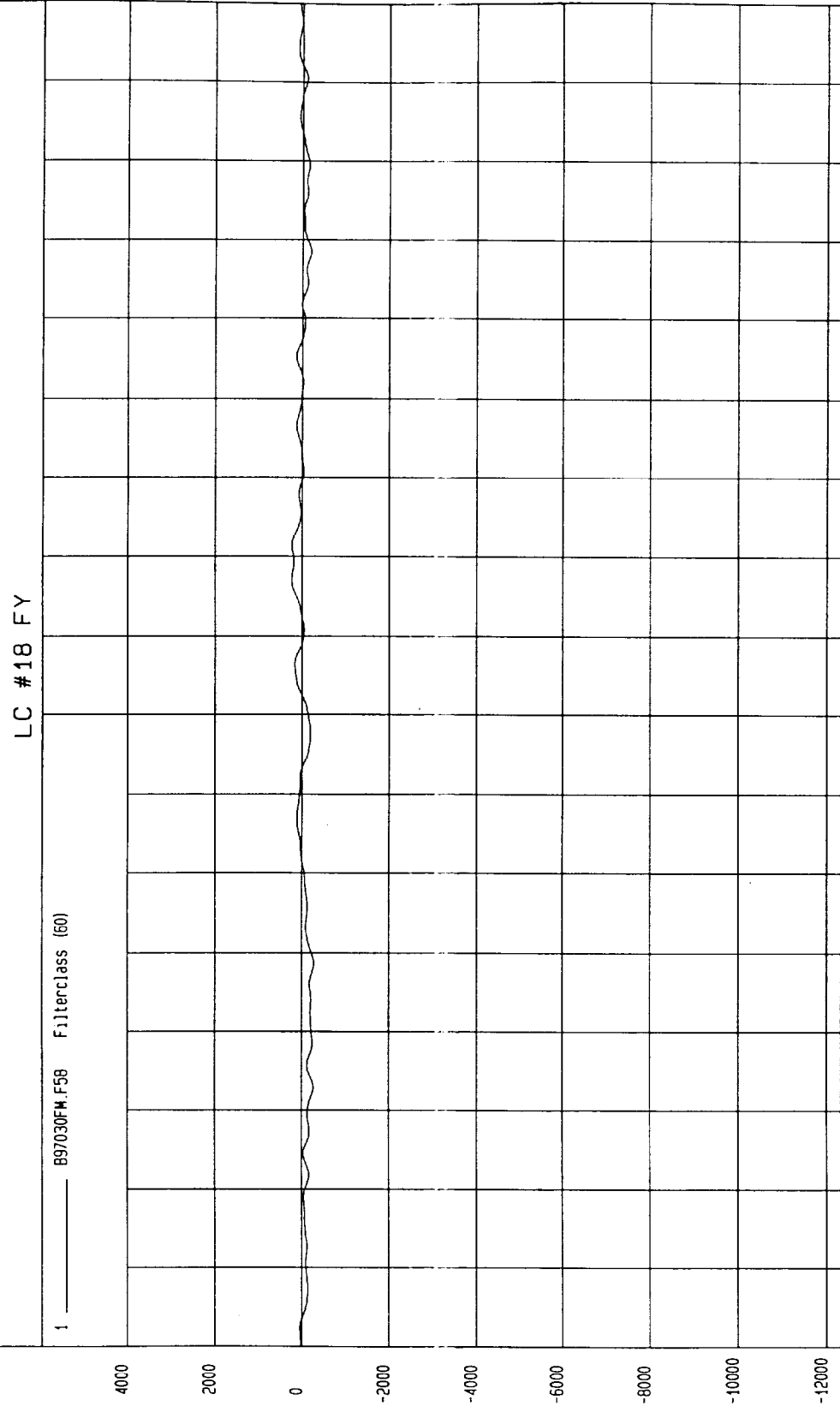
LC #17 FY

1 _____ 897030FM.F54 Filterclass (60)



MGA Research
06-04-1998 13:13

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -276.2 N at 39 msec	Maximum = 239.08 N at 87 msec



TIME (SECONDS)

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01

N

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

MCA Research
06-04-1998 13.14

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -537.04 N at 25 msec

Maximum = 438.93 N at 100 msec

LC #19 FY

1 ——— B97030FM.F61 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (SECONDS)

MGA Research
06-04-1998 13:14

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -607.18 N at 23 msec

Maximum = 422.61 N at 98 msec

LC #20 FY

1 _____ B97030FM.F64 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

TIME (SECONDS)

MCA Research
06-04-1998 13.14

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -334.22 N at 33 msec

Maximum = 317.42 N at 96 msec

LC #21 FY

1 _____ 897030FM.F67 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

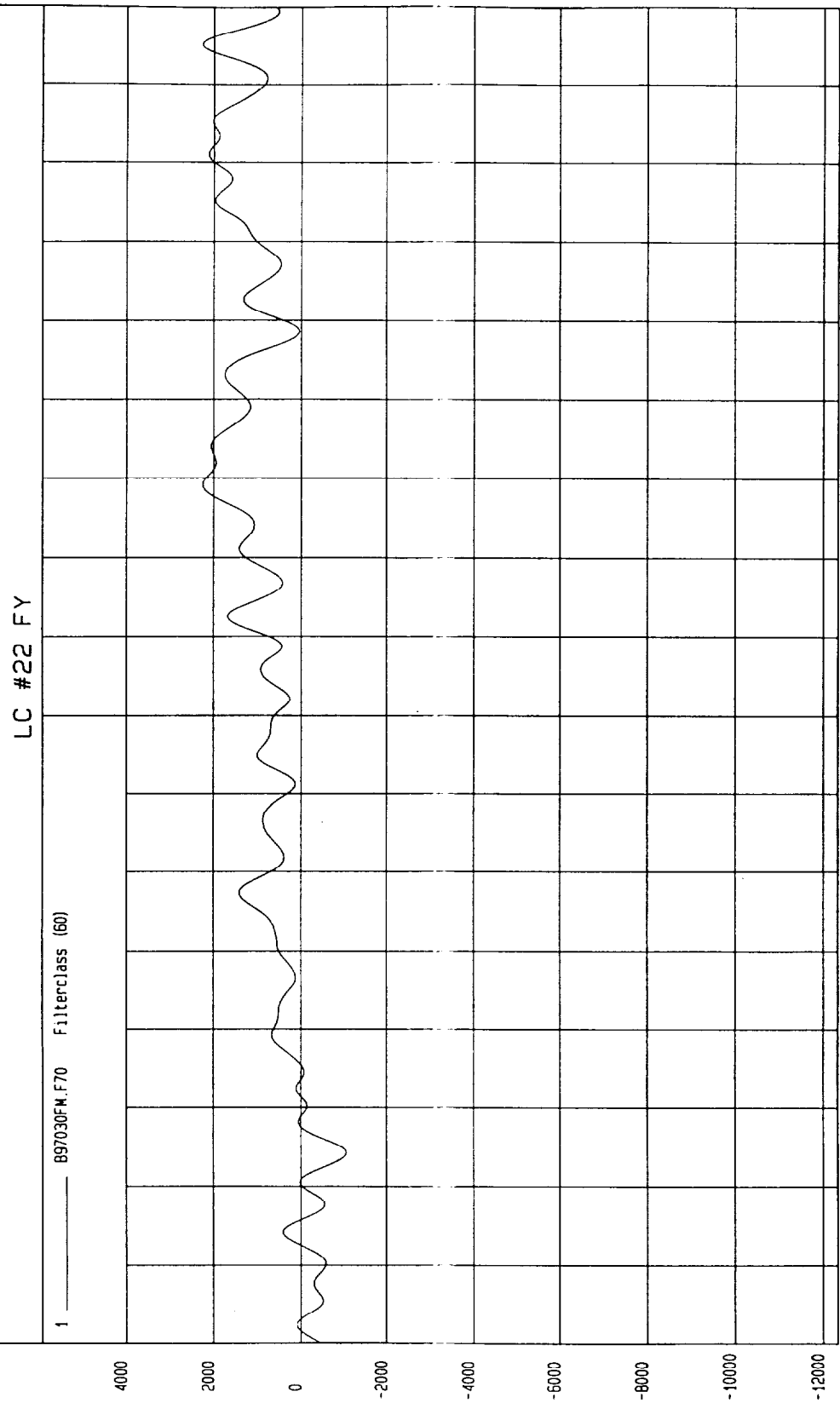
TIME (SECONDS)

MCA Research
06-04-1998 13.15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1042.7 N at 14 msec Maximum = 2262.62 N at 155 msec



TIME (SECONDS)

MCA Research
06-04-1998 13:15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -324.02 N at 122 msec

Maximum = 1076.52 N at 135 msec

LC #23 FY

1 ——— B97030FM.F74 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-04-1998 13.15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

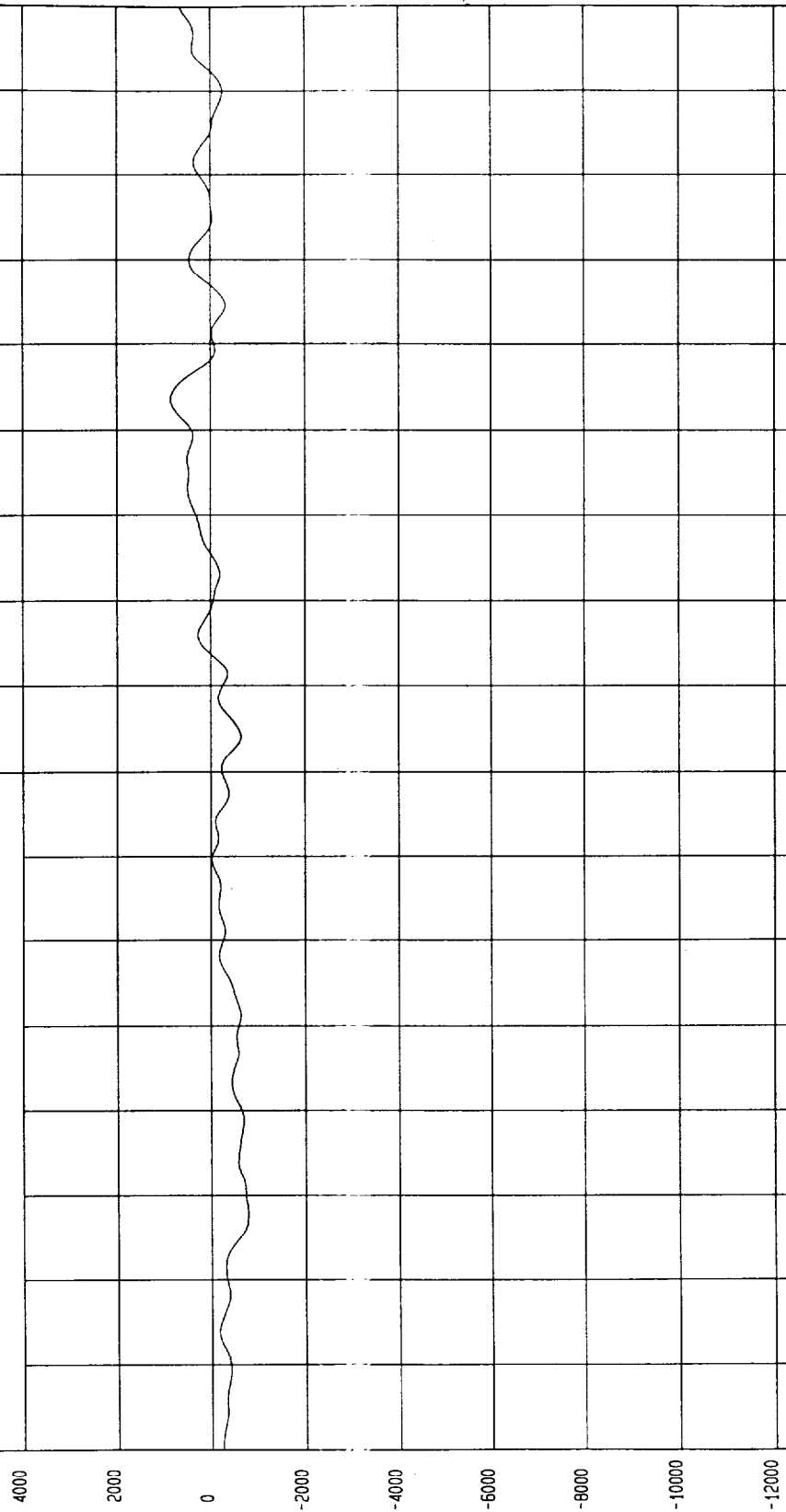
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -776.57 N at 18 msec

Maximum = 850.86 N at 114 msec

LC #24 FY

1 _____ 897030FM.F77 Filterclass (60)



TIME (SECONDS)

MGA Research
06-04-1998 13:16

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -204.06 N at 35 msec

Maximum = 361.01 N at 146 msec

LC #25 FY

1 _____ B97030FM.F80 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-10

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (SECONDS)

MCA Research
06-04-1998 13:16

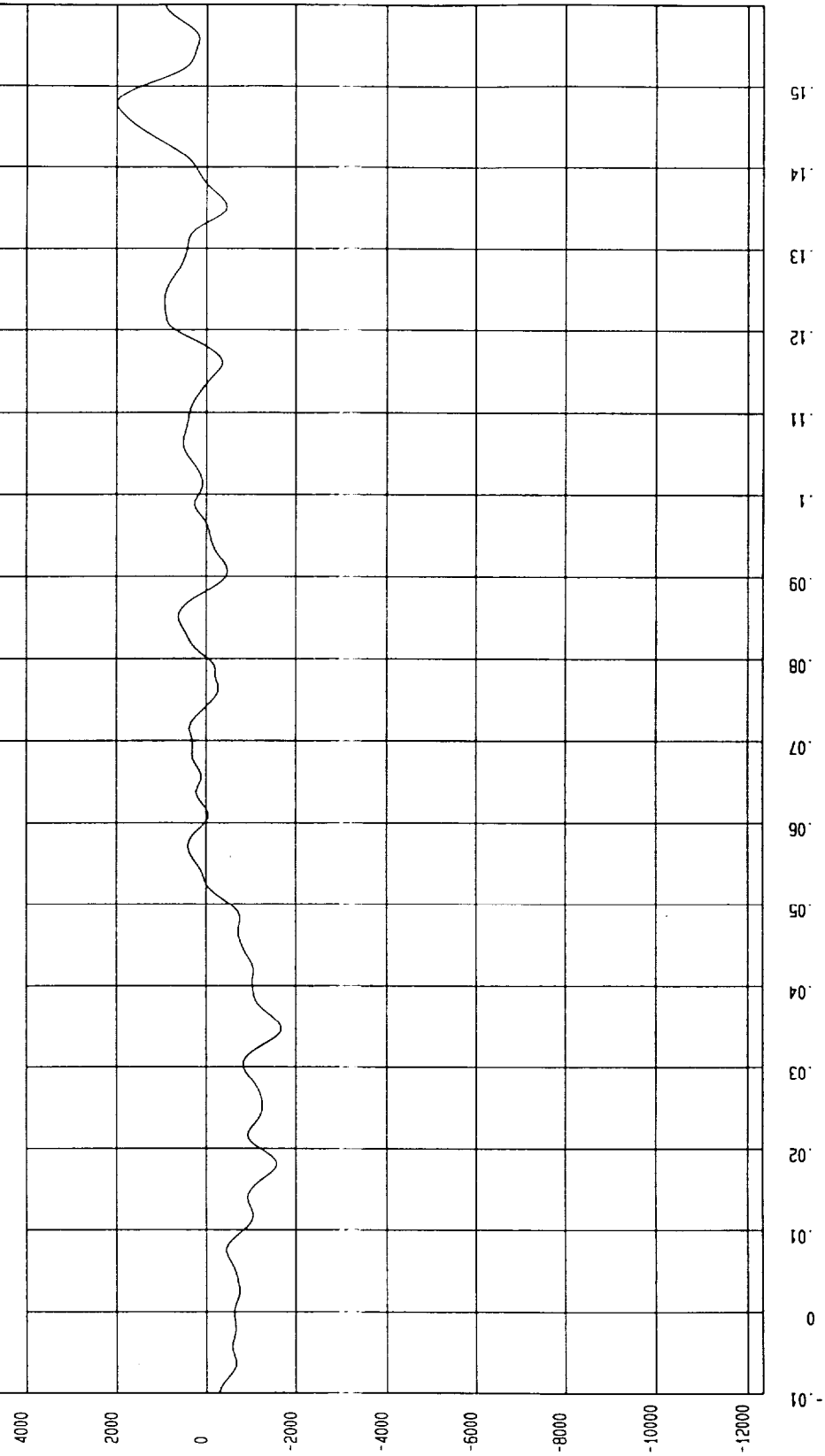
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1666.95 N at 35 msec Maximum = 1992.58 N at 148 msec

LC #26 FY

1 897030FM.F84 Filterclass (60)

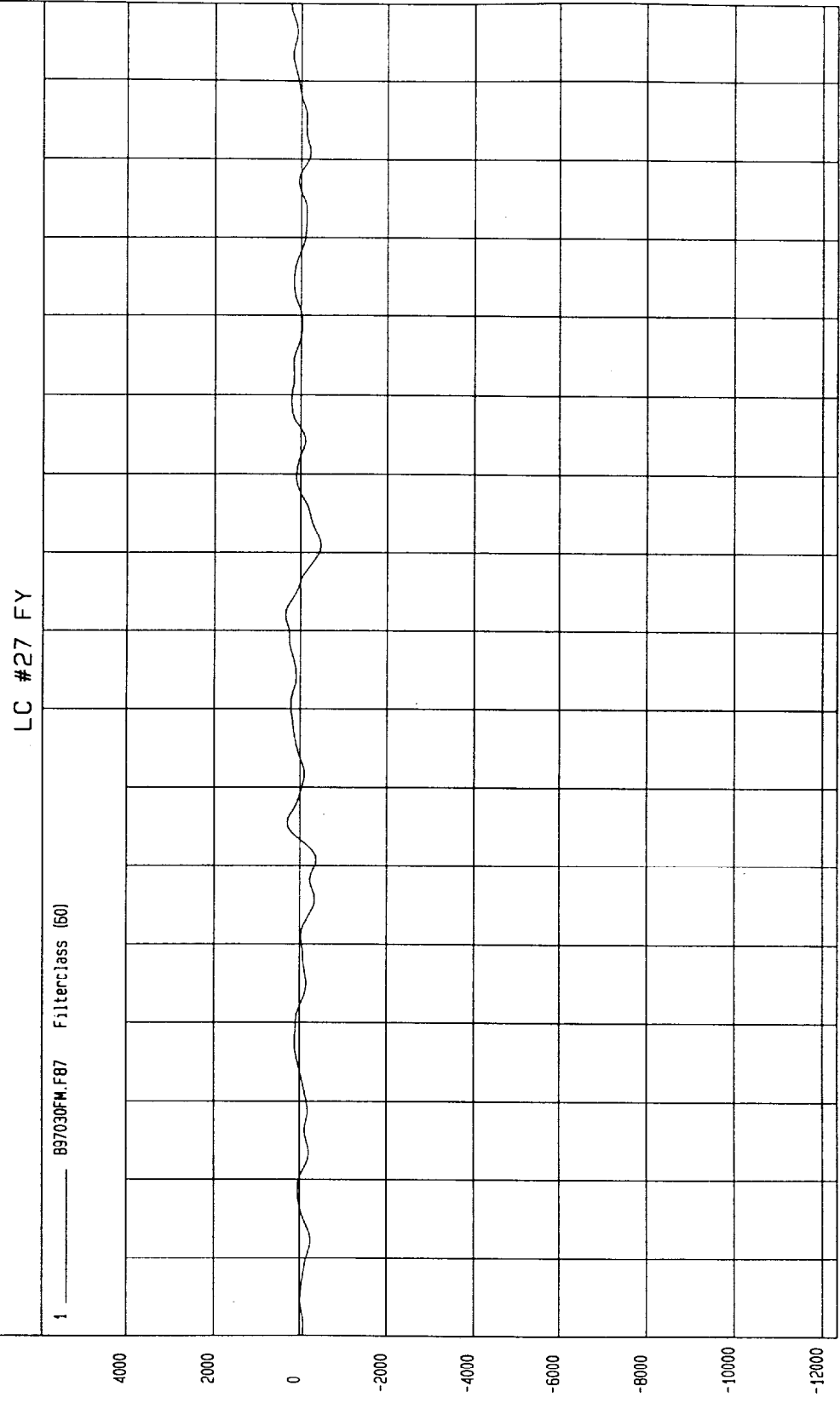


MGA Research
06-04-1998 13: 16

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -454.45 N at 91 msec Maximum = 472.08 N at 180 msec



TIME (SECONDS)

WCA Research
06-04-1998 13.17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

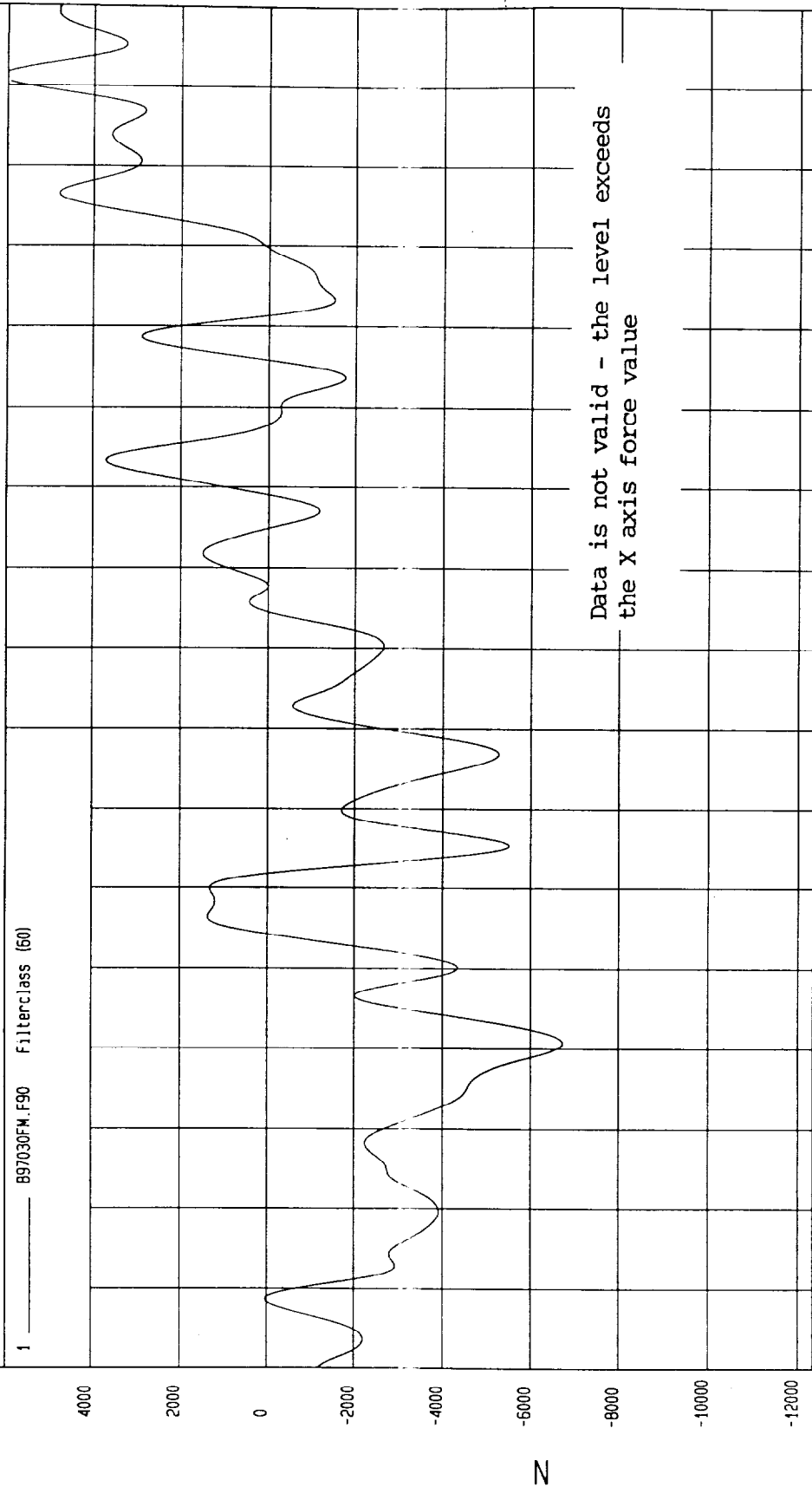
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6736.63 N at 31 msec

Maximum = 6073.49 N at 151 msec

LC #28 FY

1 _____ 897030FM.F90 Filterclass (60)



TIME (SECONDS)

MGA Research
06-04-1998 13:17

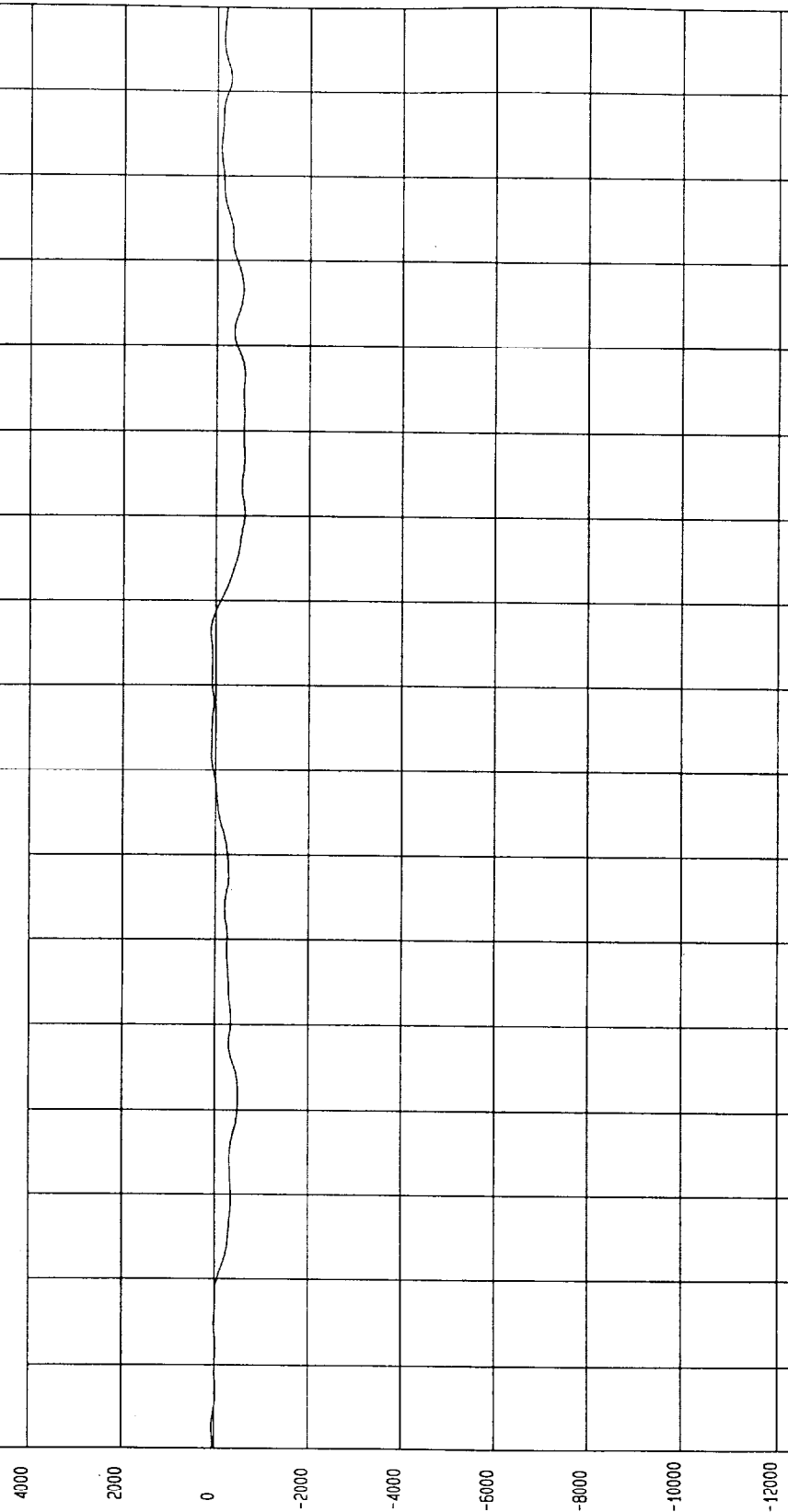
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -609.11 N at 100 msec Maximum = 108.25 N at 86 msec

LC #29 FY

1 ——— 897030FM.F94 Filterclass (60)



TIME (SECONDS)

MGA Research
05-04-1998 13:18

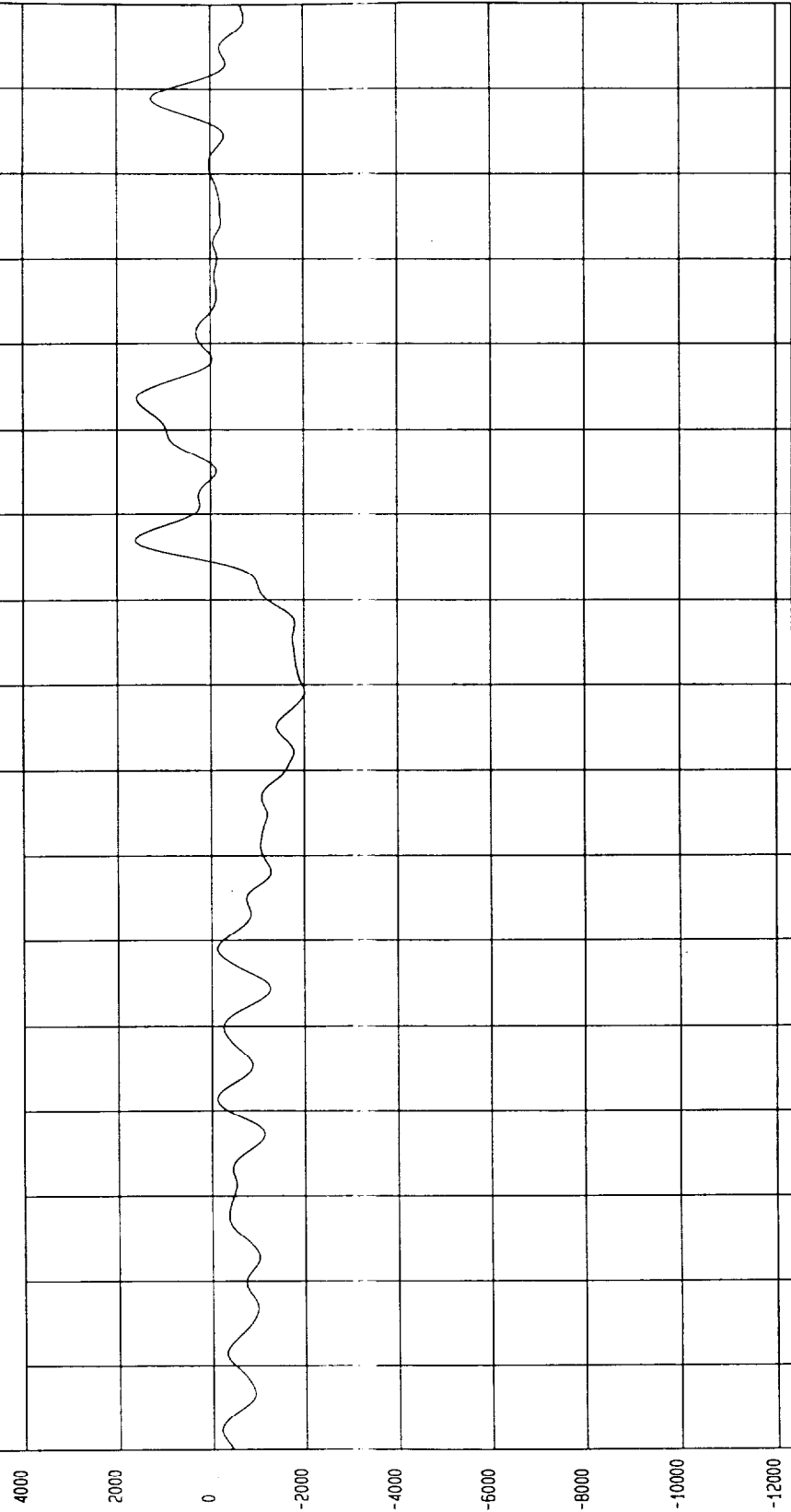
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -2006.15 N at 79 msec Maximum = 1608.53 N at 97 msec

LC #30 FY

1 _____ 897030FM.F97 Filterclass (60)



MCA Research
06-04-1998 13.18

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -2780.24 N at 52 msec

LC #31 FY

1 — 897030VM.V10 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (SECONDS)

MGA Research
06-04-1998 13:18

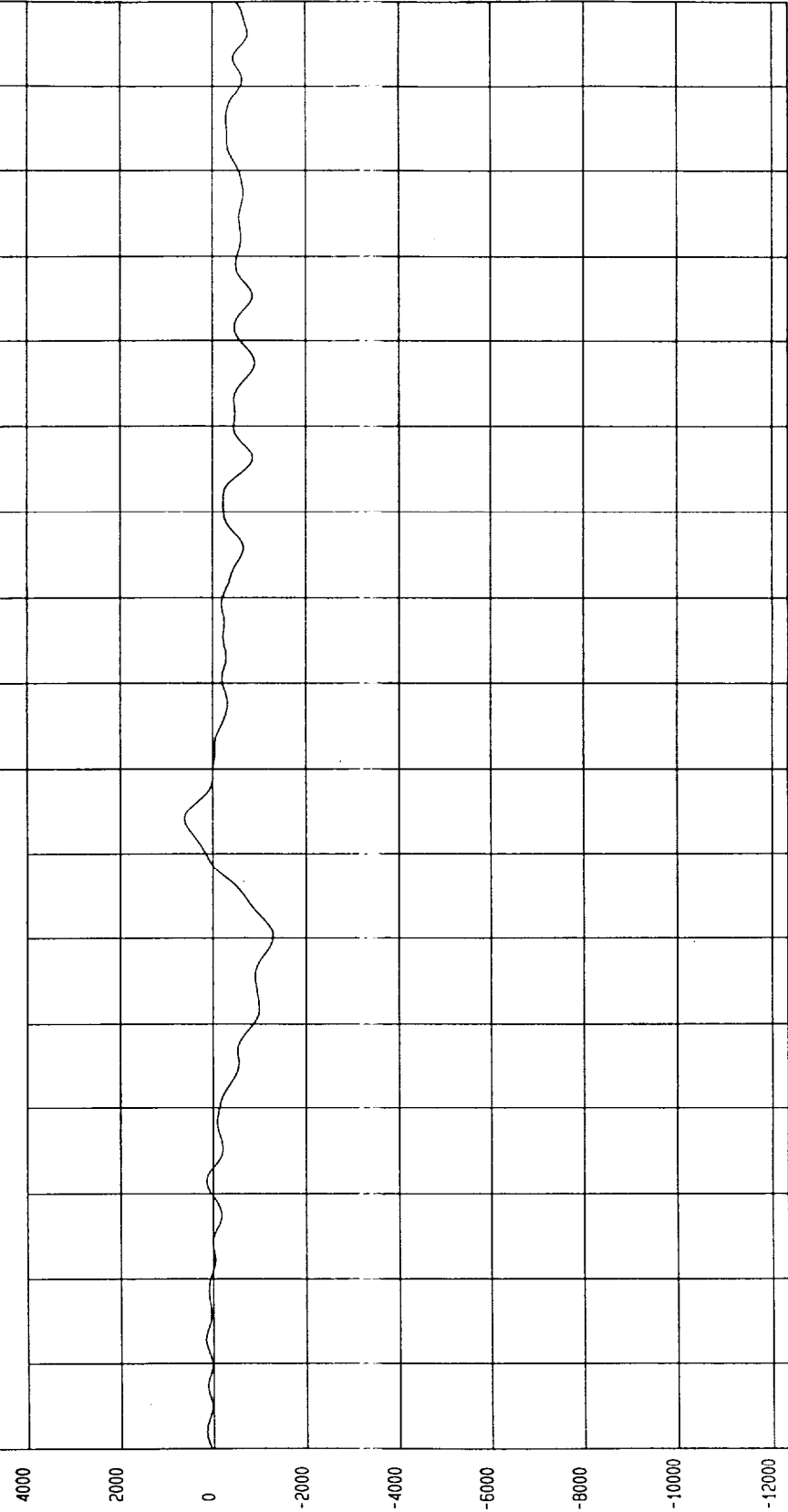
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1279.43 N at 50 msec Maximum = 620.67 N at 64 msec

LC #32 FY

1 ——— C97030FM.F45 Filterclass (60)

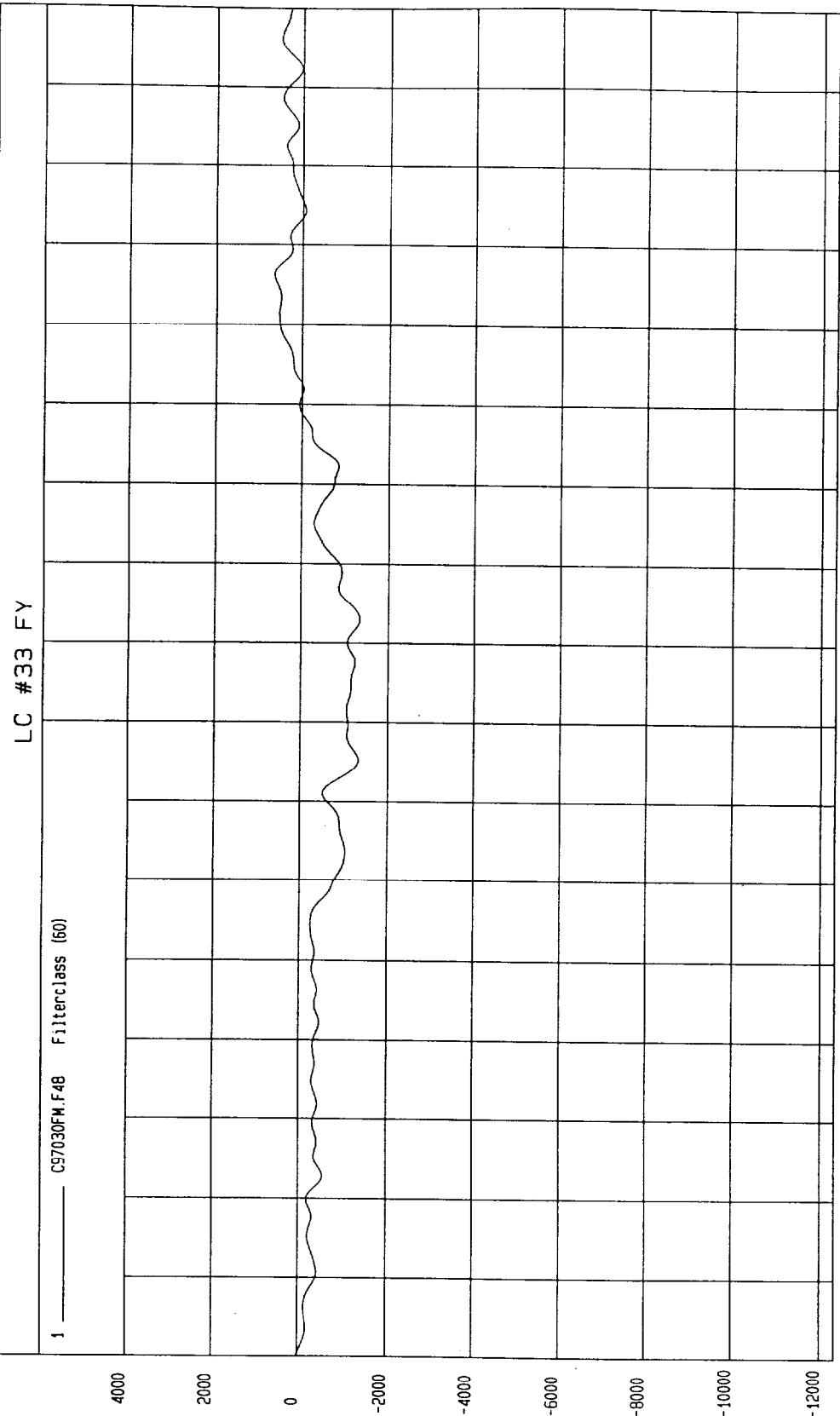


MCA Research
06-04-1998 13:51

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1341.84 N at 83 msec Maximum = 661.91 N at 126 msec



TIME (seconds)

0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15

MGA Research
06-04-1998 13:51

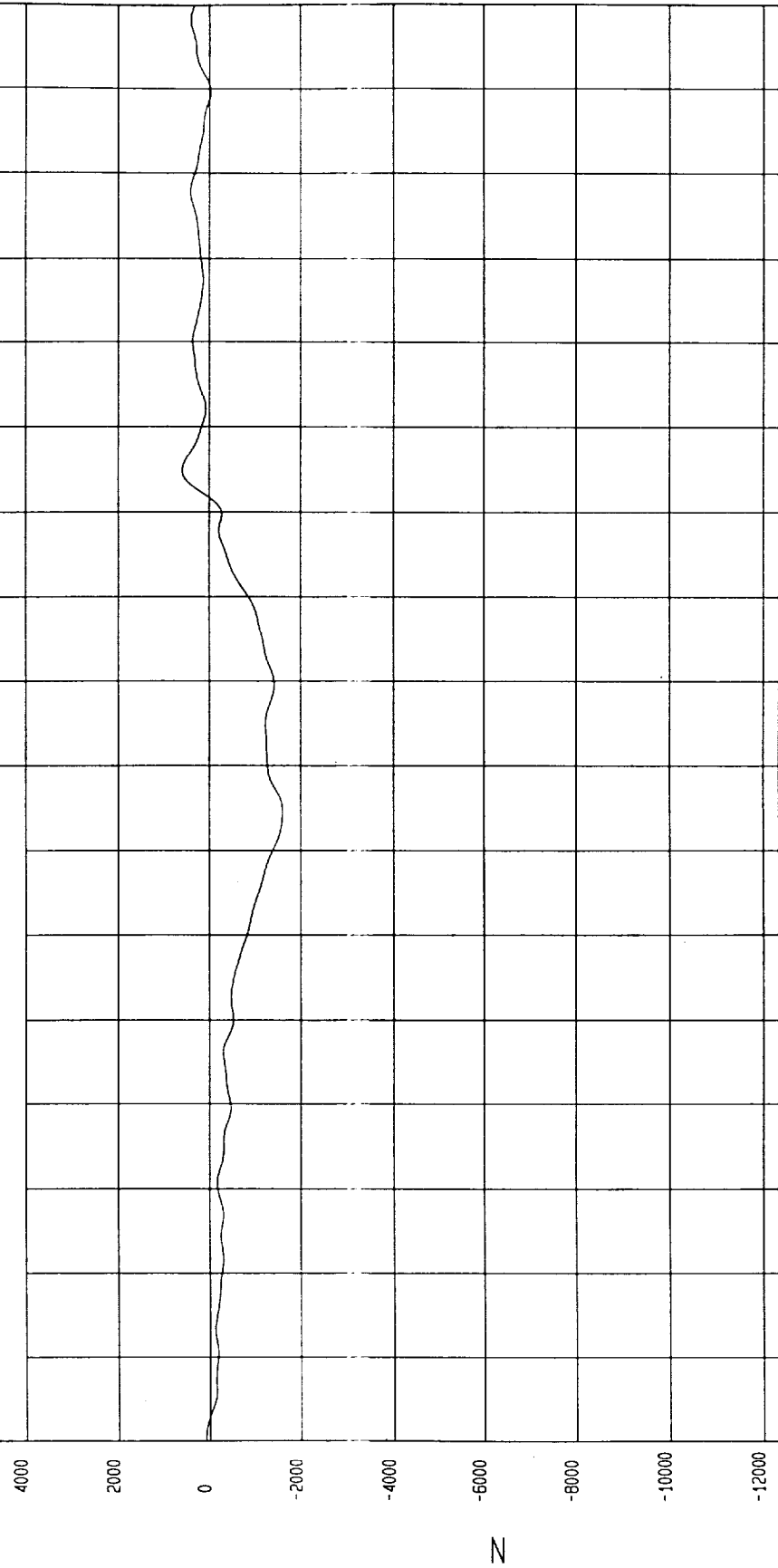
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1584.77 N at 65 msec Maximum = 592.19 N at 105 msec

LC #34 FY

1 C97030FM.F51 Filterclass (60)



MCA Research
06-04-1998 13:52

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1039.56 N at 91 msec

Maximum = 794.16 N at 48 msec

LC #35 FY

1 _____ A97030FM.F42 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-101

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

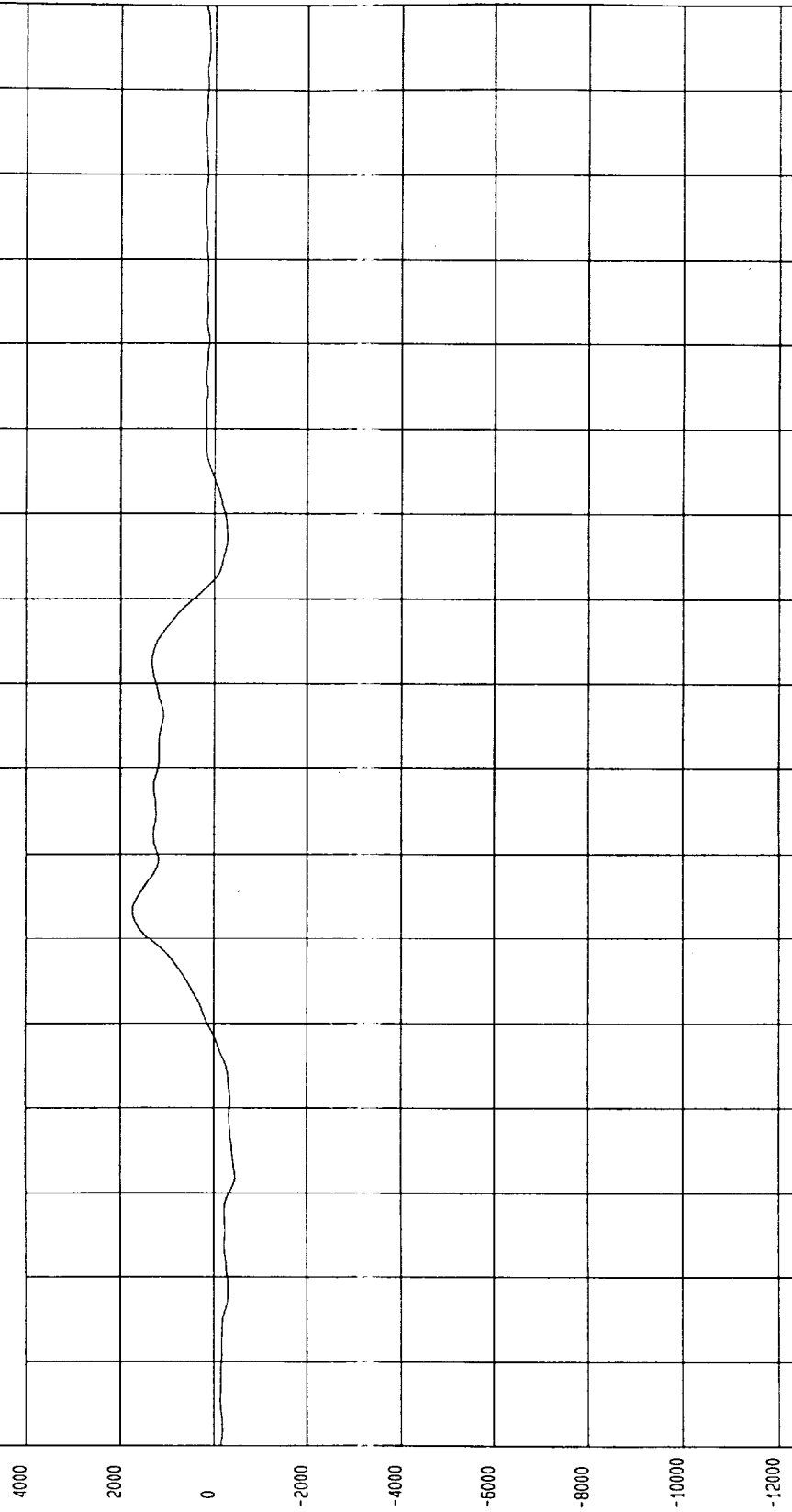
TIME (SECONDS)

MCA Research
06-04-1996 13:39

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -441.16 N at 22 msec	Maximum = 1742.07 N at 53 msec

LC #36 FY

1 ——— R97030FM.F45 Filterclass (60)



MGA Research
06-04-1998 13:39

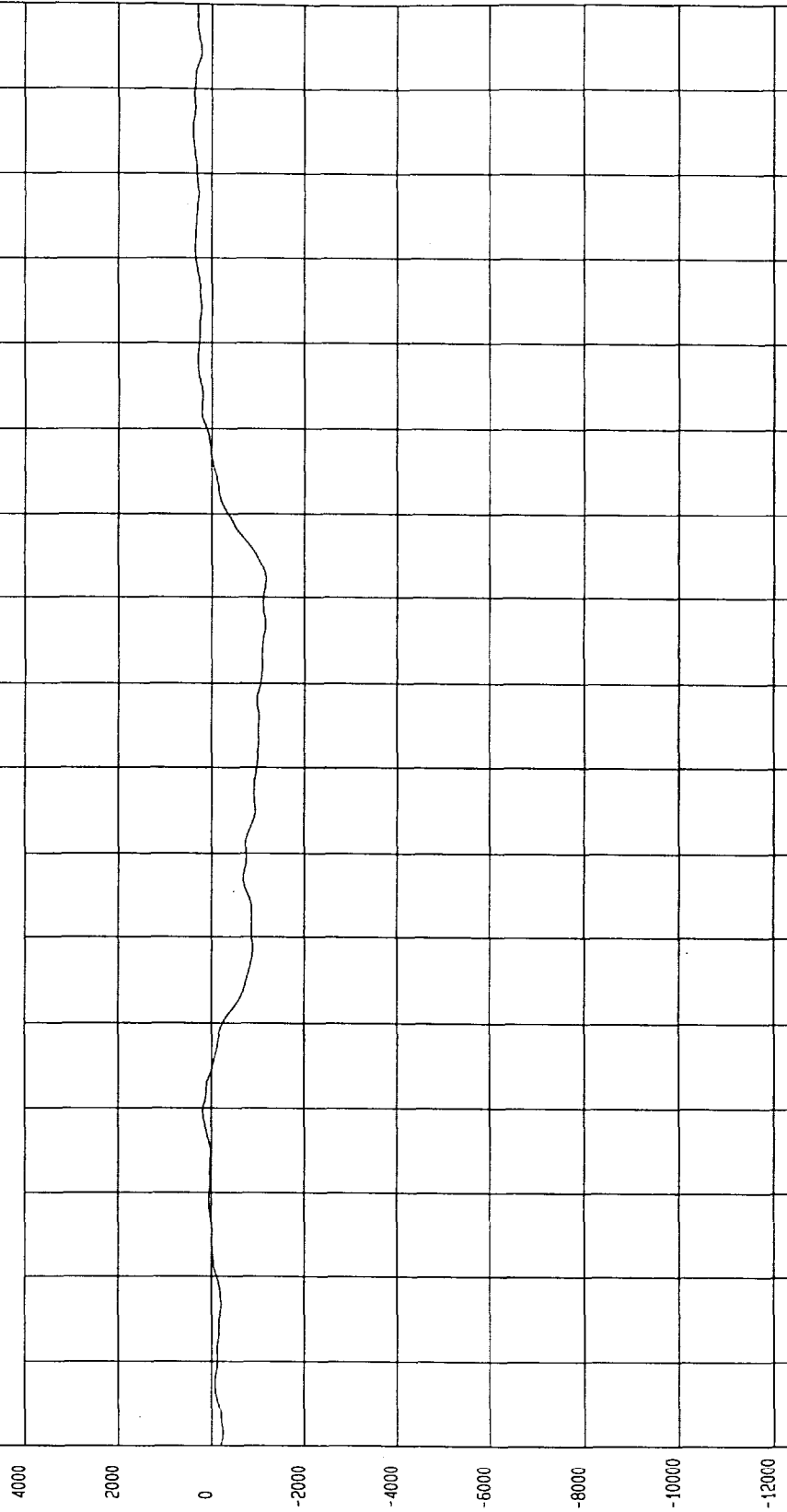
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1173 N at 92 msec Maximum = 405.24 N at 145 msec

LC #37 FY

1 R97030FM.F48 Filterclass (60)



TIME (SECONDS)

MGA Research
06-04-1998 13:39

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

Speed: 20 MPH 32.2 KPH

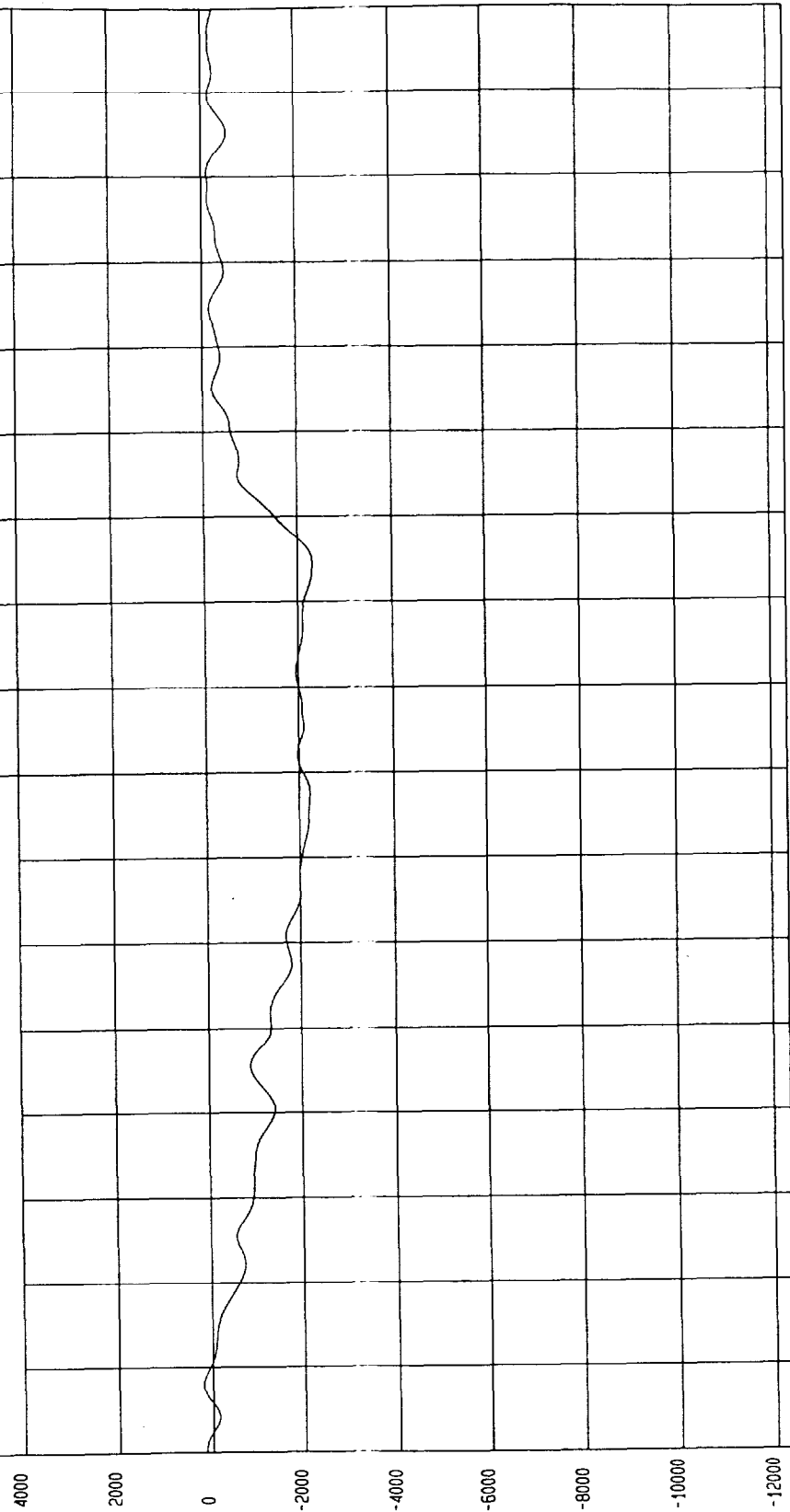
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 240.35 N at -13 msec

Minimum = -2315.67 N at 94 msec

LC #38 FY

1 _____ R97030FM.F51 Filterclass (60)



MGA Research
06-04-1998 13:40

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

SPEED: 20 MPH 32.2 KPH

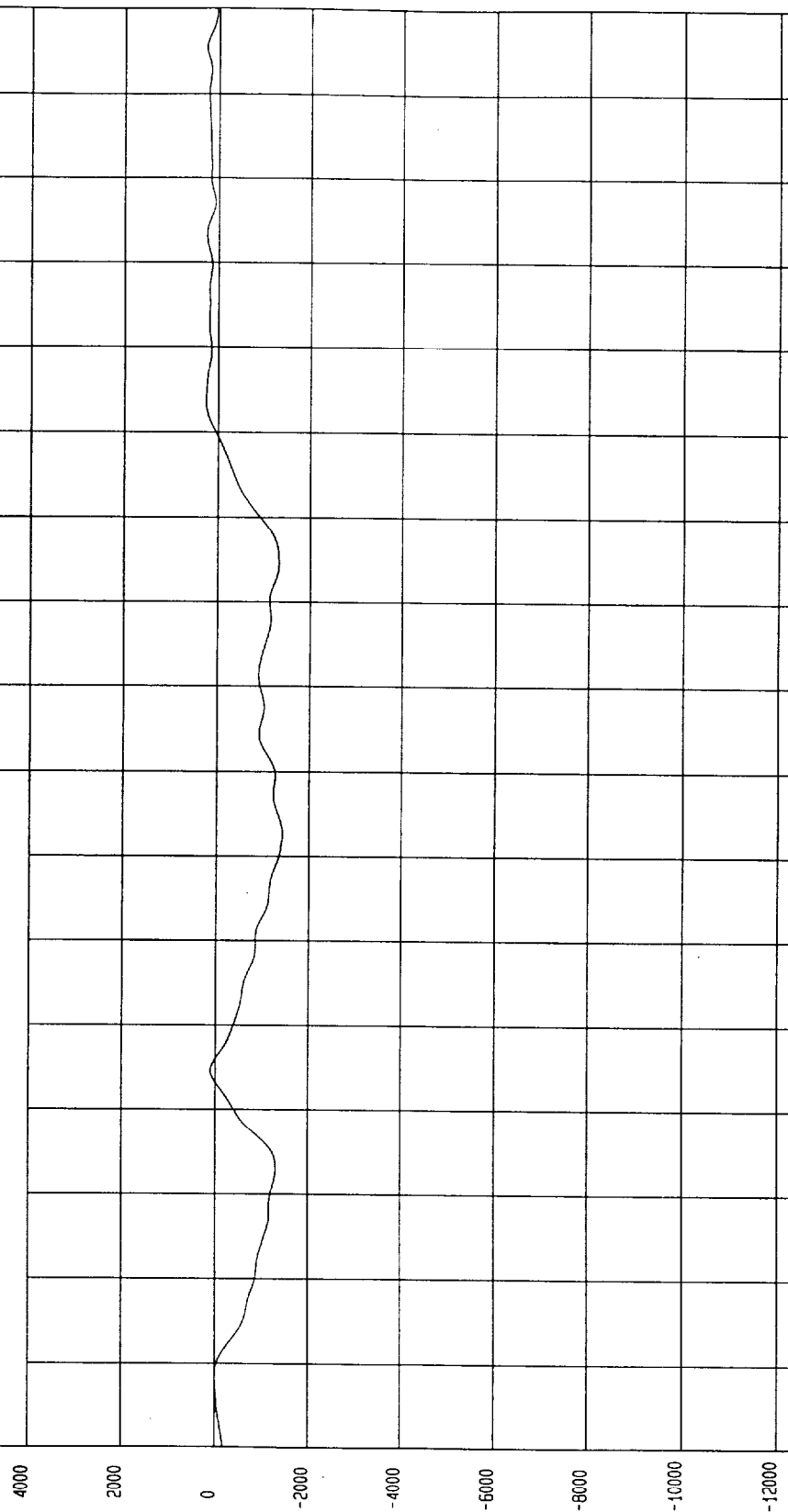
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 272.06 N at 178 msec

Minimum = -1425.39 N at 63 msec

LC #39 FY

1 _____ R97030FM.F54 Filterclass (60)



MGA Research
06-04-1998 13:40

TIME (SECONDS)

N

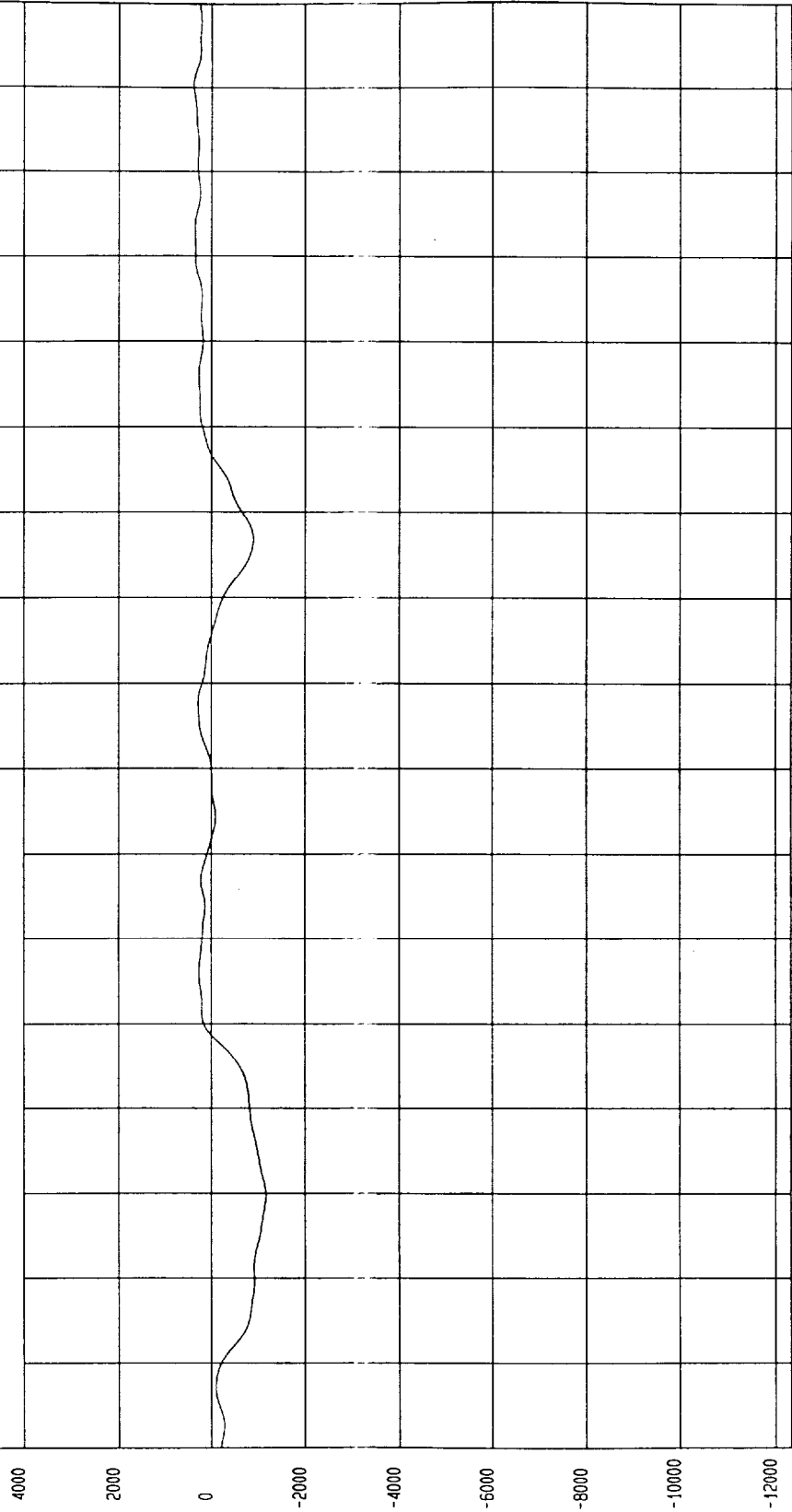
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1151.44 N at 20 msec Maximum = 398.73 N at 183 msec

LC #40 FY

1 _____ R97030FM.F58 Filterclass (60)



MGA Research
06-04-1998 13:40

TIME (SECONDS)

N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1513.7 N at 58 msec

Maximum = 226.77 N at 183 msec

LC #41 FY

1 ——— R97030FM.F61 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.1

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

1.4

1.5

TIME (SECONDS)

MSA Research
06-04-1998 13:41

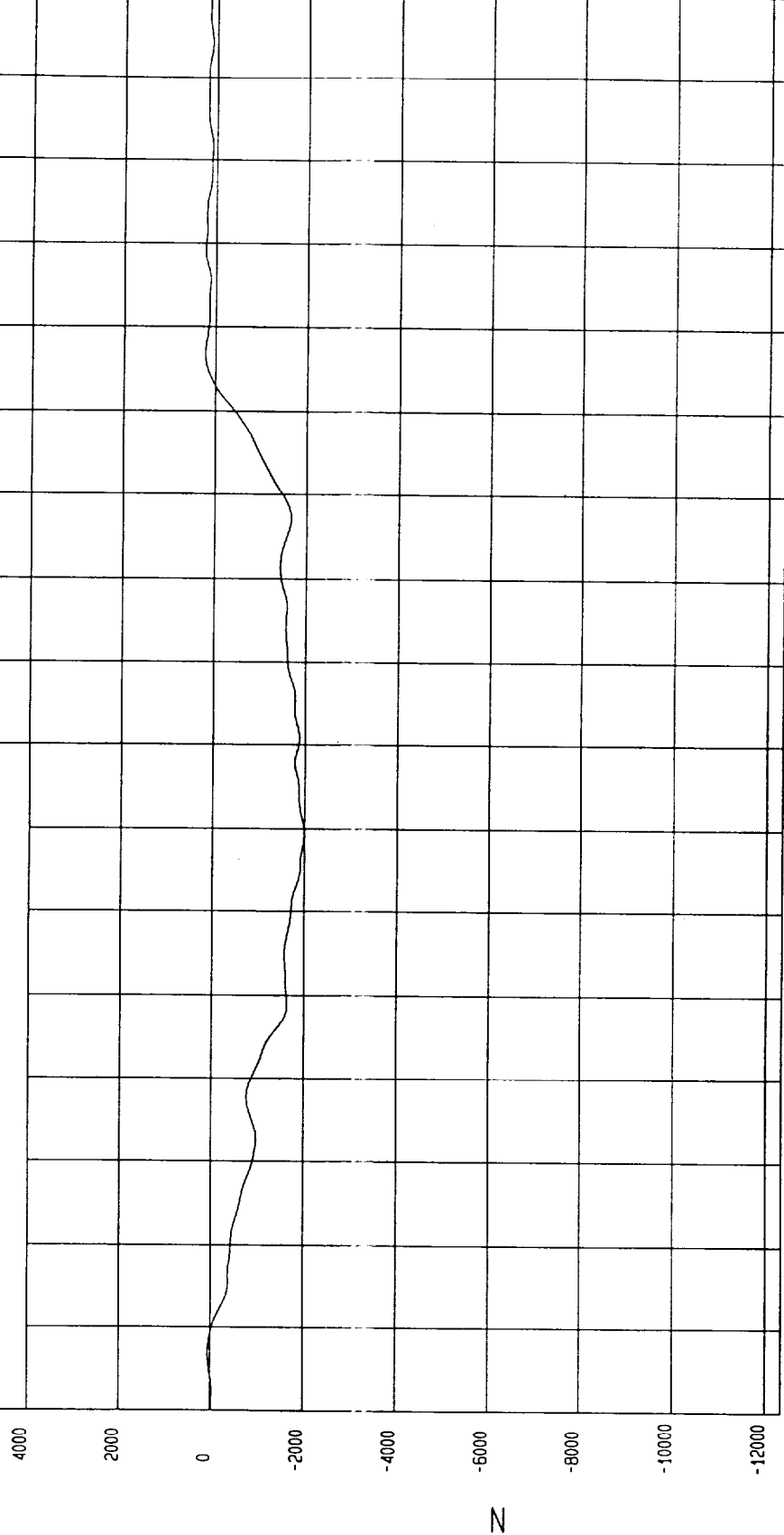
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1987.79 N at 59 msec Maximum = 259.98 N at 165 msec

LC #42 FY

1 — R97030FM.F64 Filterclass (60)



MGA Research
06-04-1998 13:41

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 20 MPH 32.2 KPH

Minimum = -1779.44 N at 59 msec

Maximum = 286.55 N at 189 msec

LC #43 FY

1 _____ R97030FM.F67 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

TIME (SECONDS)

MGA Research
06-04-1998 13:41

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1730.04 N at 66 msec

Maximum = 68.55 N at -18 msec

LC #44 FY

1 _____ R97030FM.F70 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

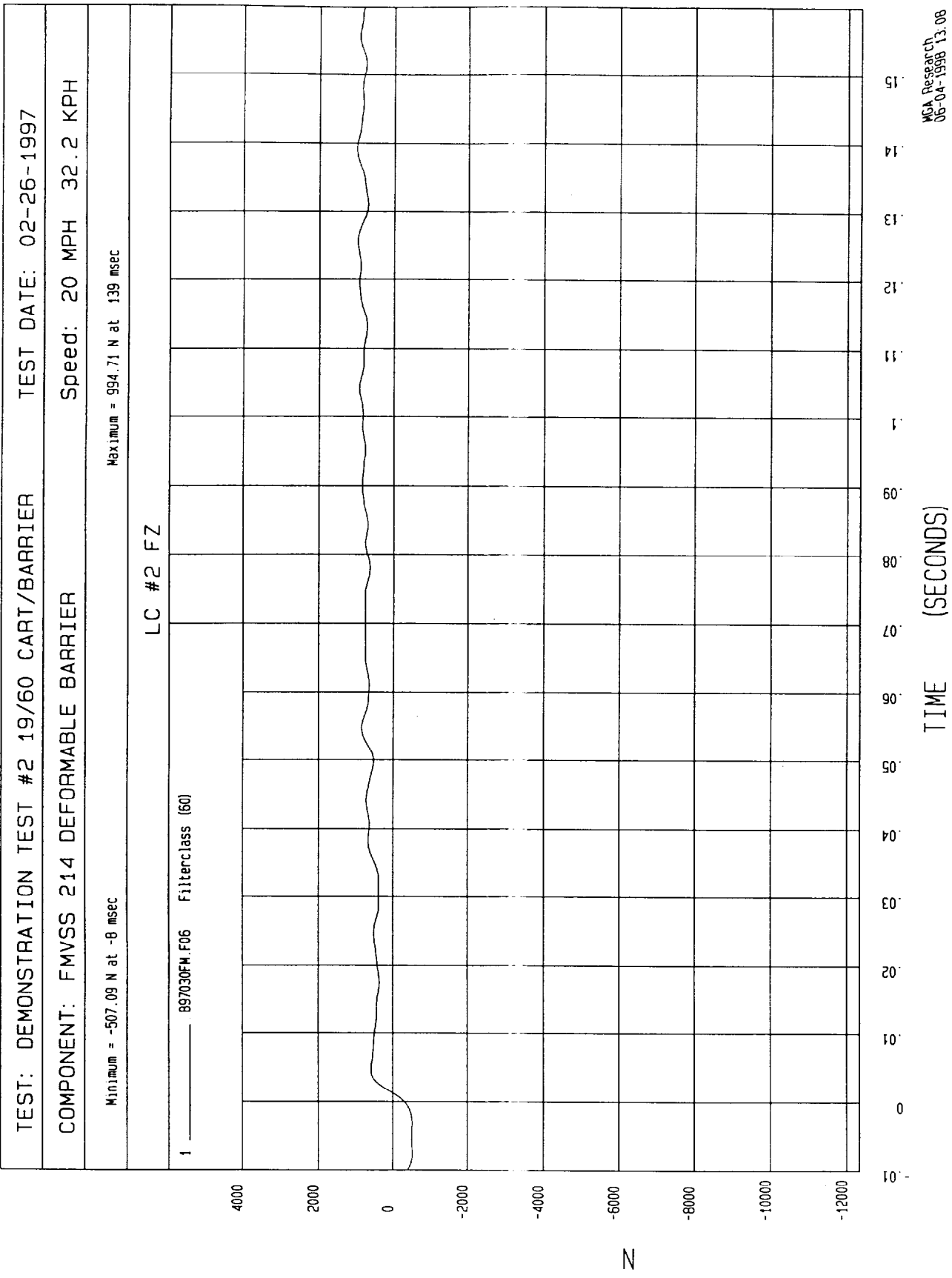
0.15

TIME (SECONDS)

MGA Research
06-04-1998 13:42

LC #1 FZ

NO VALID DATA COLLECTED



TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

SPEED: 20 MPH 32.2 KPH

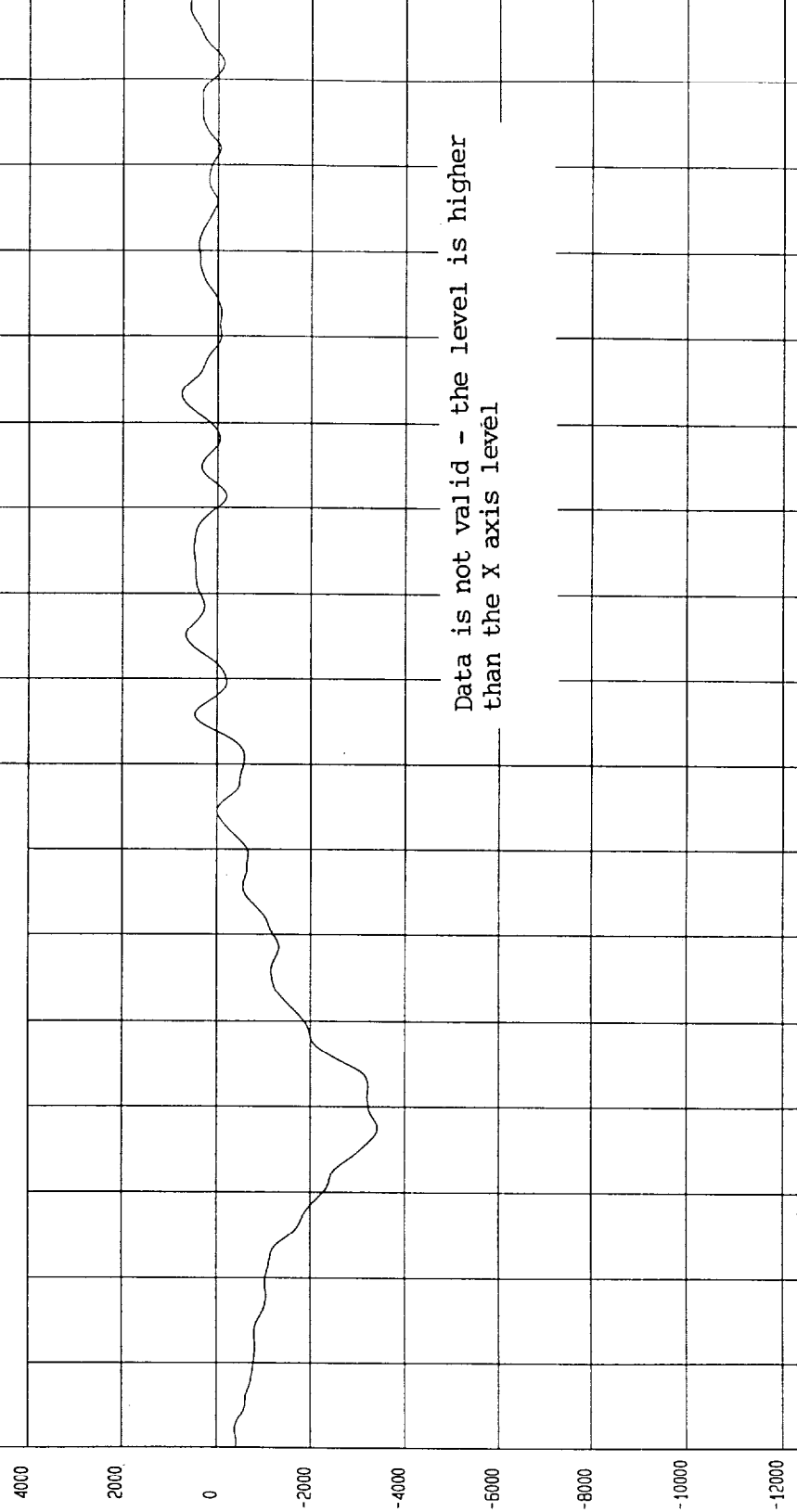
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 765.43 N at 113 msec

Minimum = -3415.31 N at 27 msec

LC #3 FZ

1 _____ B97030FM.F09 Filterclass (60)



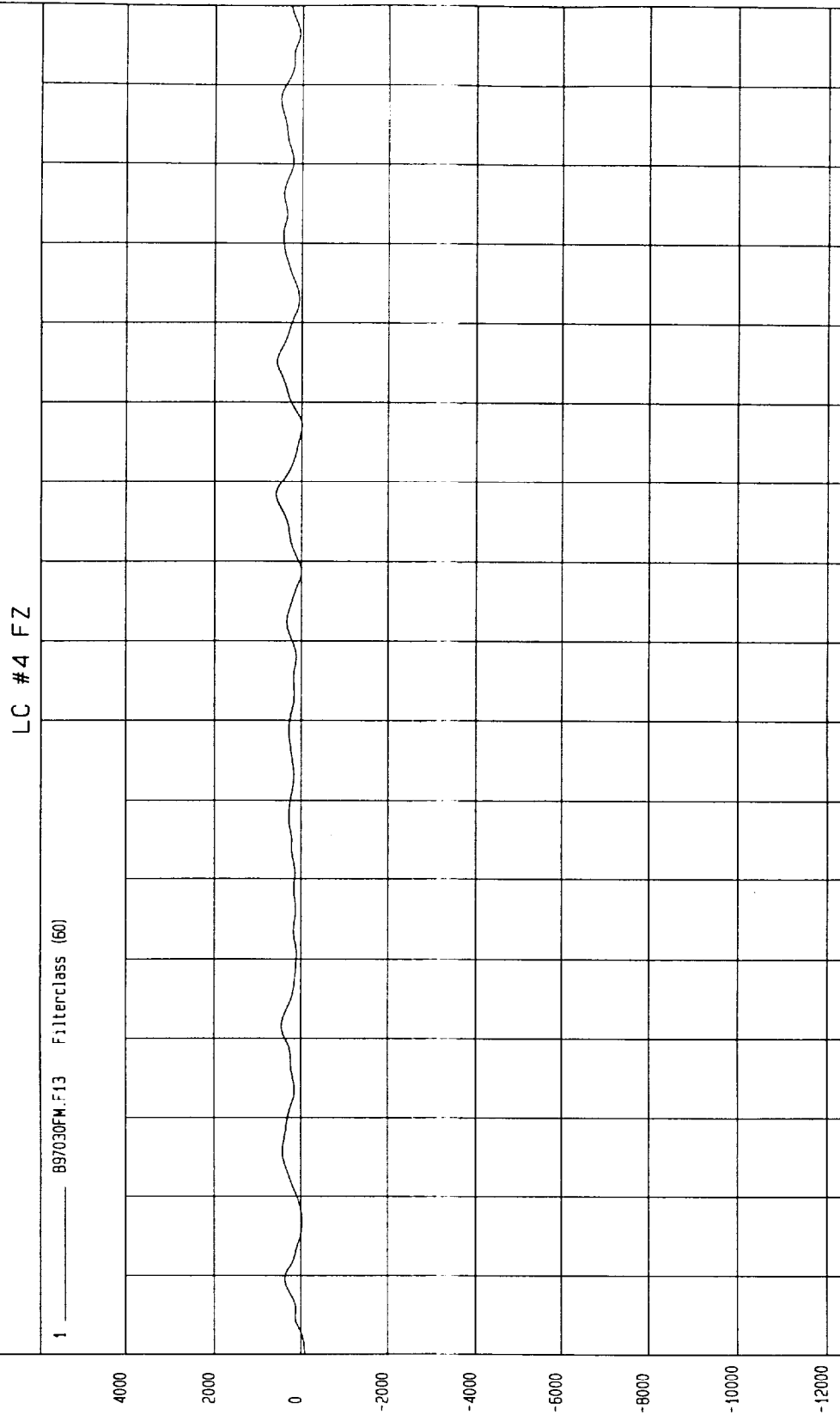
Data is not valid - the level is higher than the X axis level

MCA Research
06-04-1998 13:09

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -89.36 N at -10 msec Maximum = 574.43 N at 98 msec



TIME (SECONDS)

NCA Research
06-04-1998 13.09

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

SPEED: 20 MPH 32.2 KPH

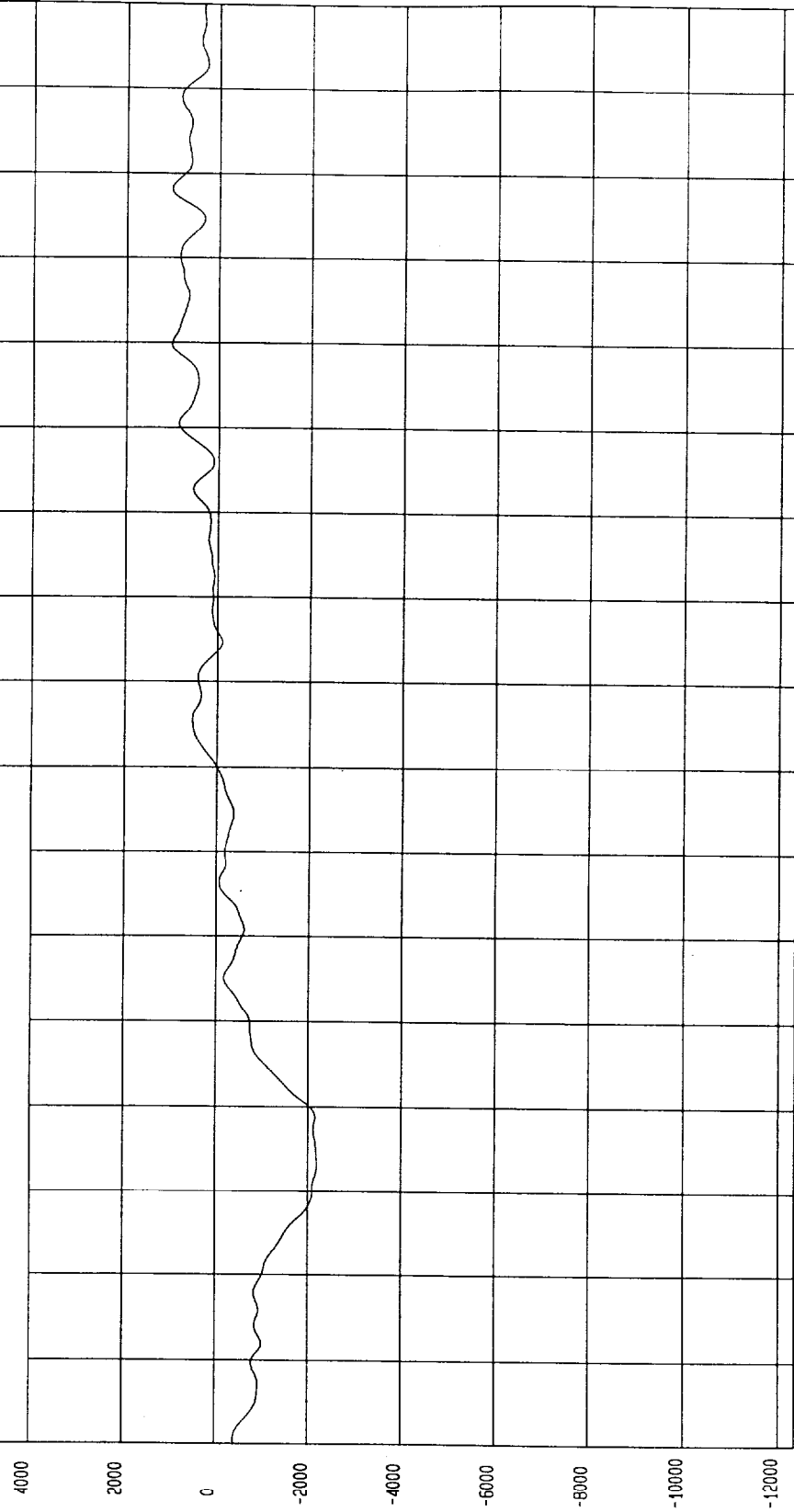
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -2192.14 N at 23 msec

Maximum = 1039.44 N at 138 msec

LC #5 FZ

1 _____ B97030FM.F16 Filterclass (60)



MGA Research
06-04-1998 13:09

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1099.49 N at 49 msec

Maximum = 1083.59 N at 147 msec

LC #6 FZ

1 _____ B97030FM.F19 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

TIME (SECONDS)

MCA Research
06-04-1998 13.10

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

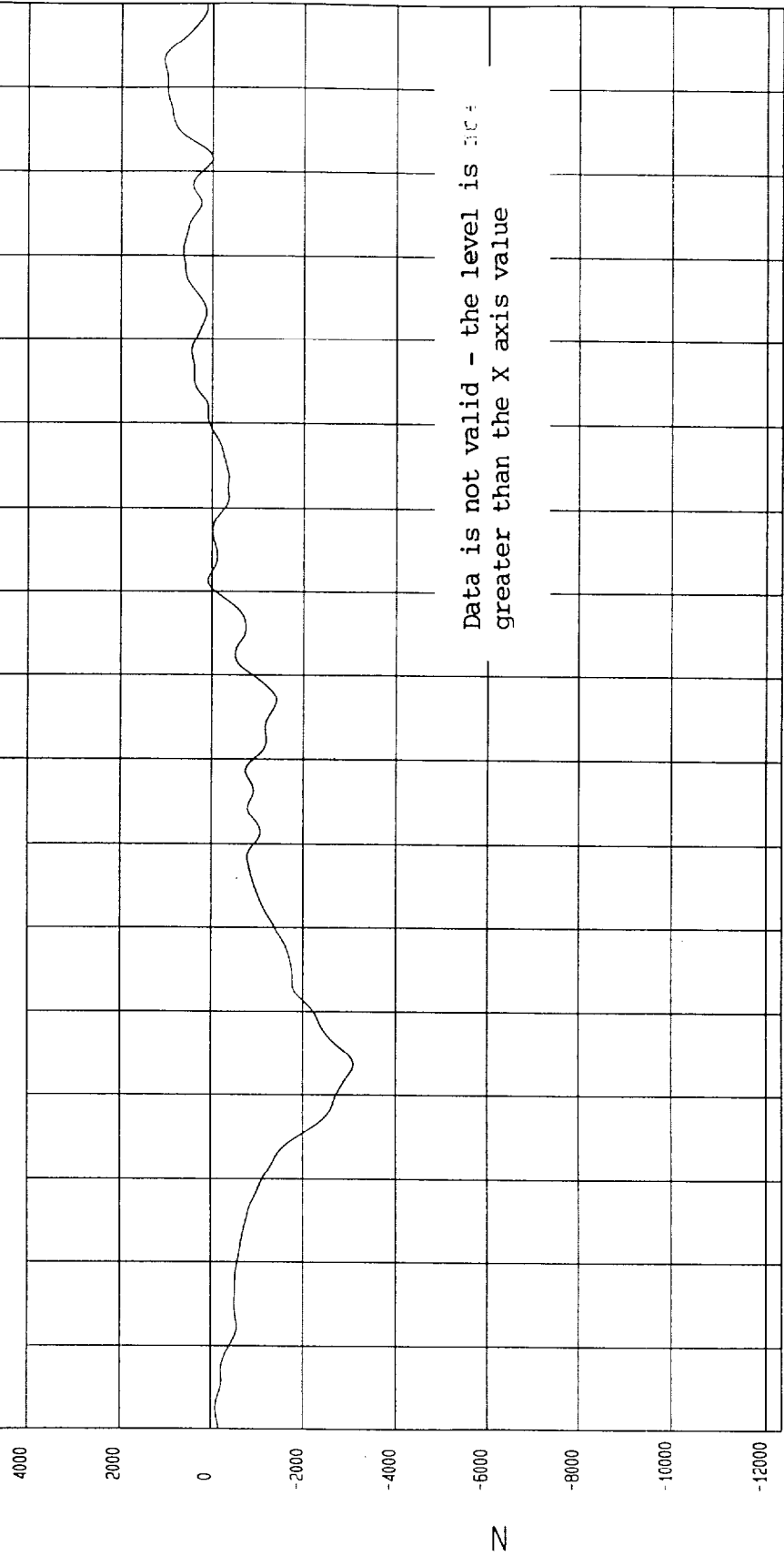
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3091.42 N at 34 msec

Maximum = 1055.6 N at 153 msec

LC #7 FZ

1 _____ 897030FM.F23 Filterclass (60)



MCA Research
06-04-1998 13:10

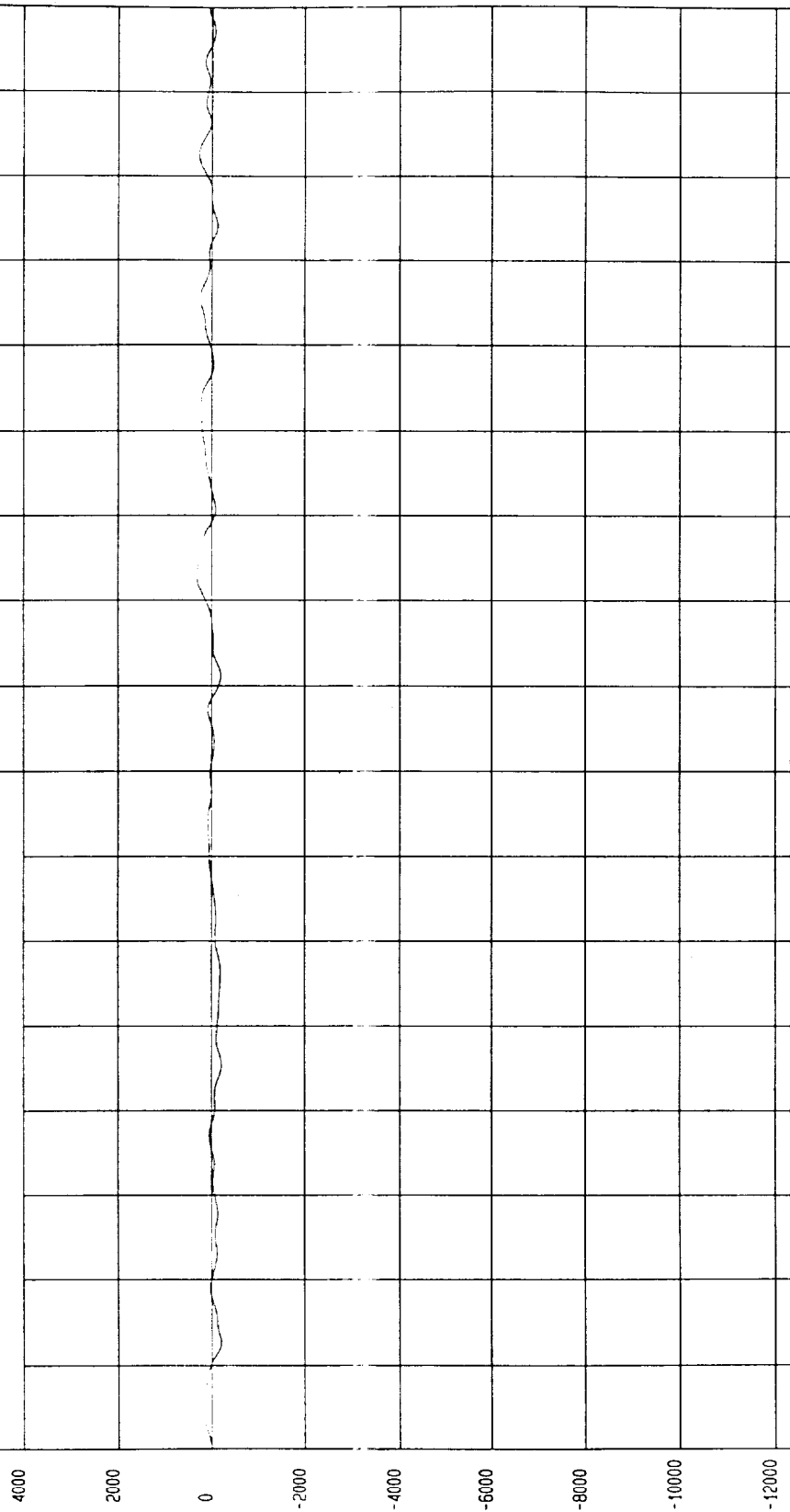
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -203.95 N at 35 msec Maximum = 296.11 N at 93 msec

LC #8 FZ

1 _____ 897030FM F26 Filterclass (60)



MCA Research
06-04-1998 13:10

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

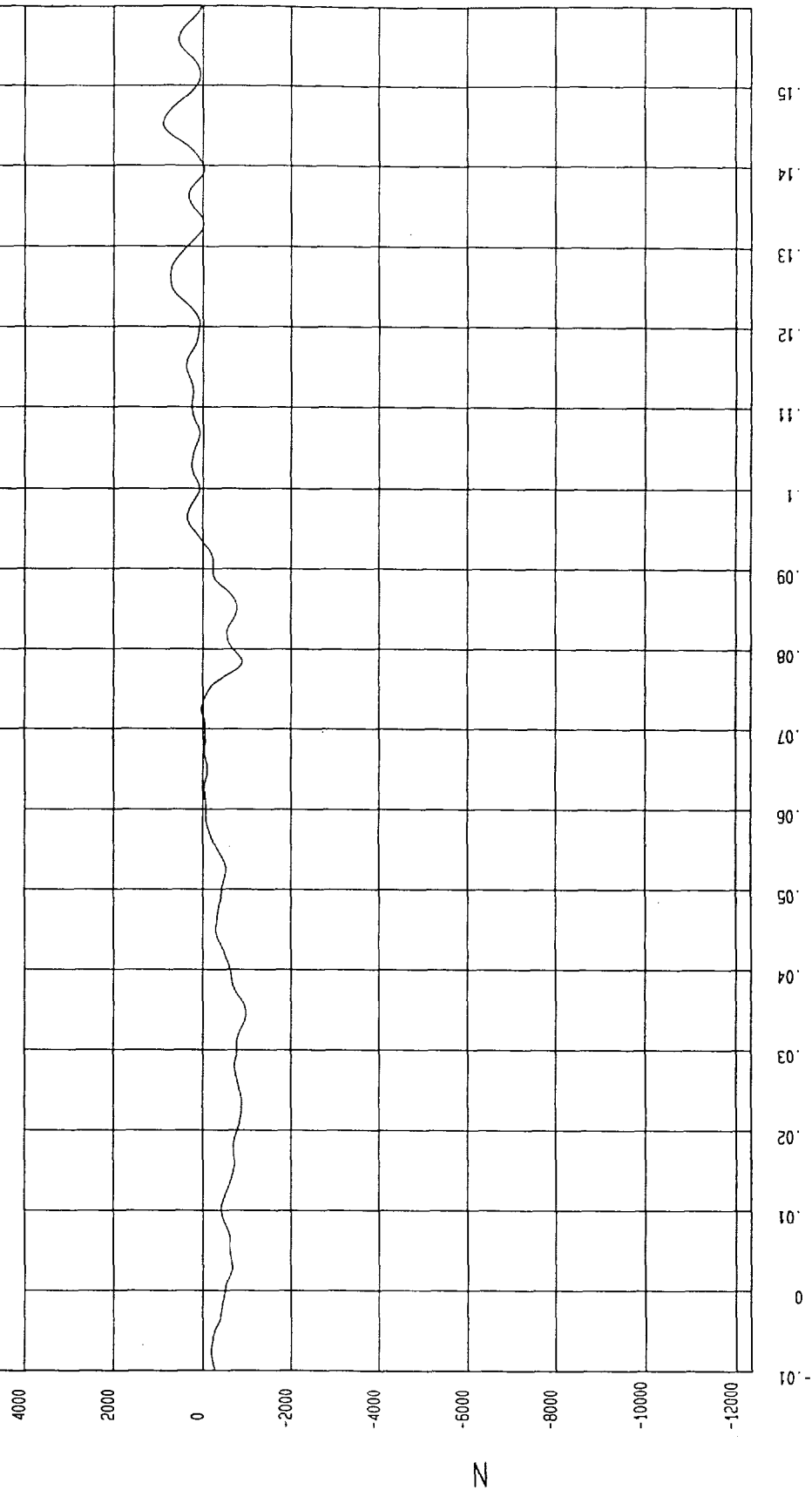
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -982.67 N at 34 msec

Maximum = 893.48 N at 145 msec

LC #9 FZ

1 ——— B97030FM.F29 Filterclass (60)

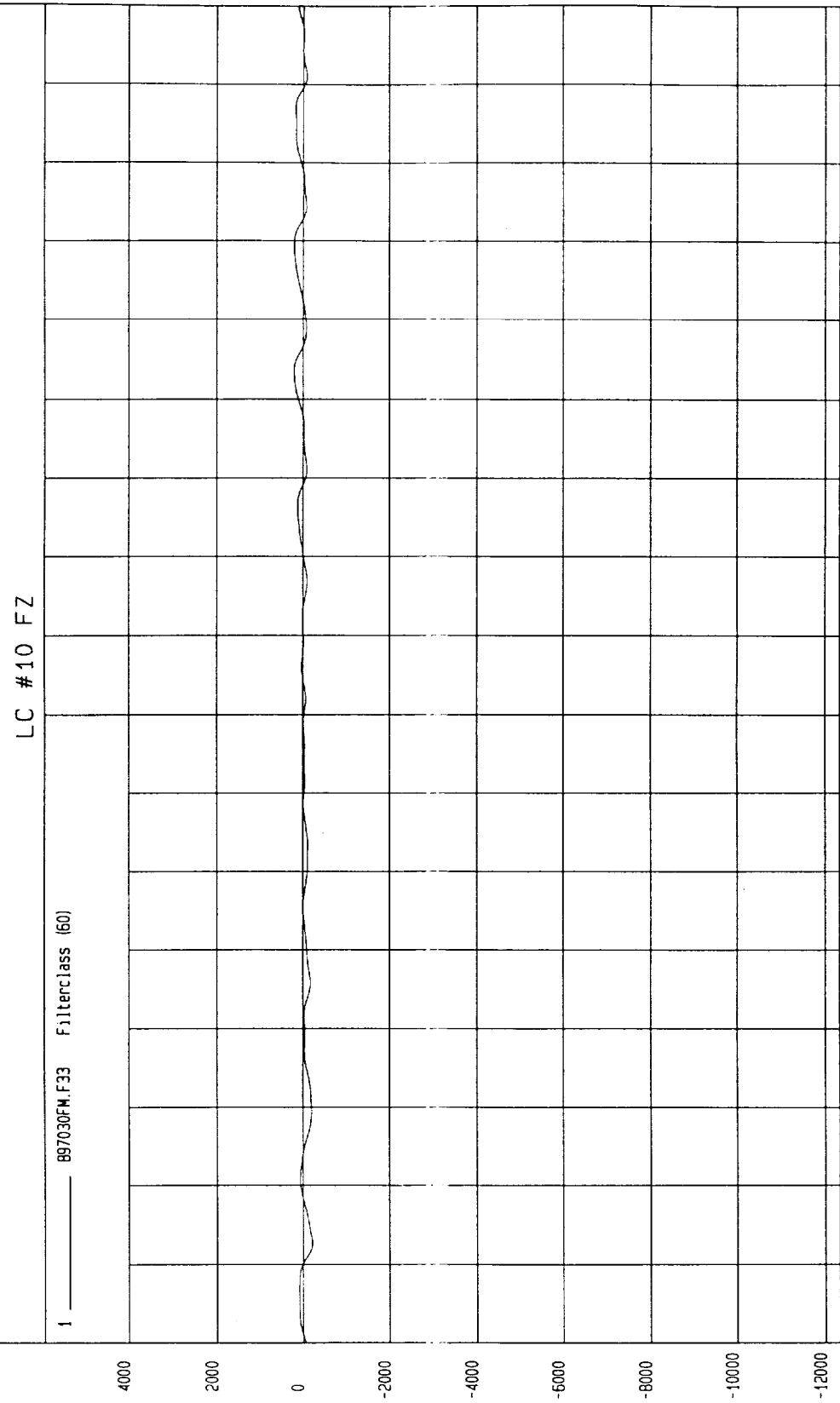


MOA Research
06-04-1998 13:11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -204.4 N at 3 msec Maximum = 215.98 N at 164 msec



TIME (SECONDS)

0.15 0.14 0.13 0.12 0.11 0.1 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01 0 -0.01

4000 2000 0 -2000 -4000 -6000 -8000 -10000 -12000

N

MCA Research
06-04-1998 13:11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1180.52 N at 38 msec

Maximum = 1002.32 N at 143 msec

LC #11 FZ

1 _____ 897030FM.F36 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

Data is not valid - the level is greater than the X axis value

-10

0

10

20

30

40

50

60

70

80

90

1

11

12

13

14

15

TIME (SECONDS)

MCA Research
06-04-1998 13.11

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -272.3 N at 152 msec

Maximum = 202.48 N at 94 msec

LC #12 FZ

1 ——— B97030FM.F39 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-04-1998 13:12

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

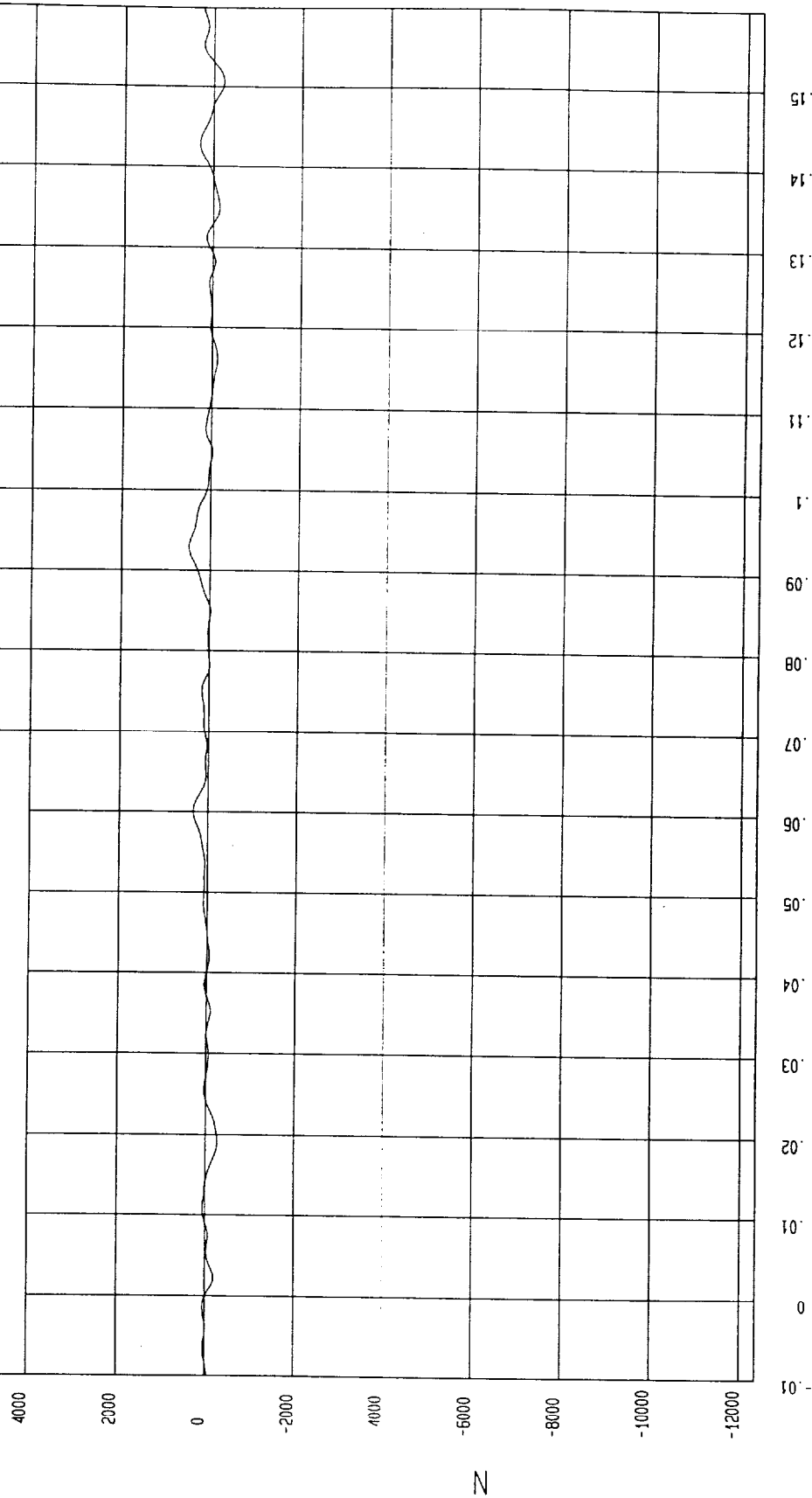
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -263.87 N at 19 msec

Maximum = 474.85 N at 93 msec

LC #13 FZ

1 — 897030FM.F43 Filterclass (60)

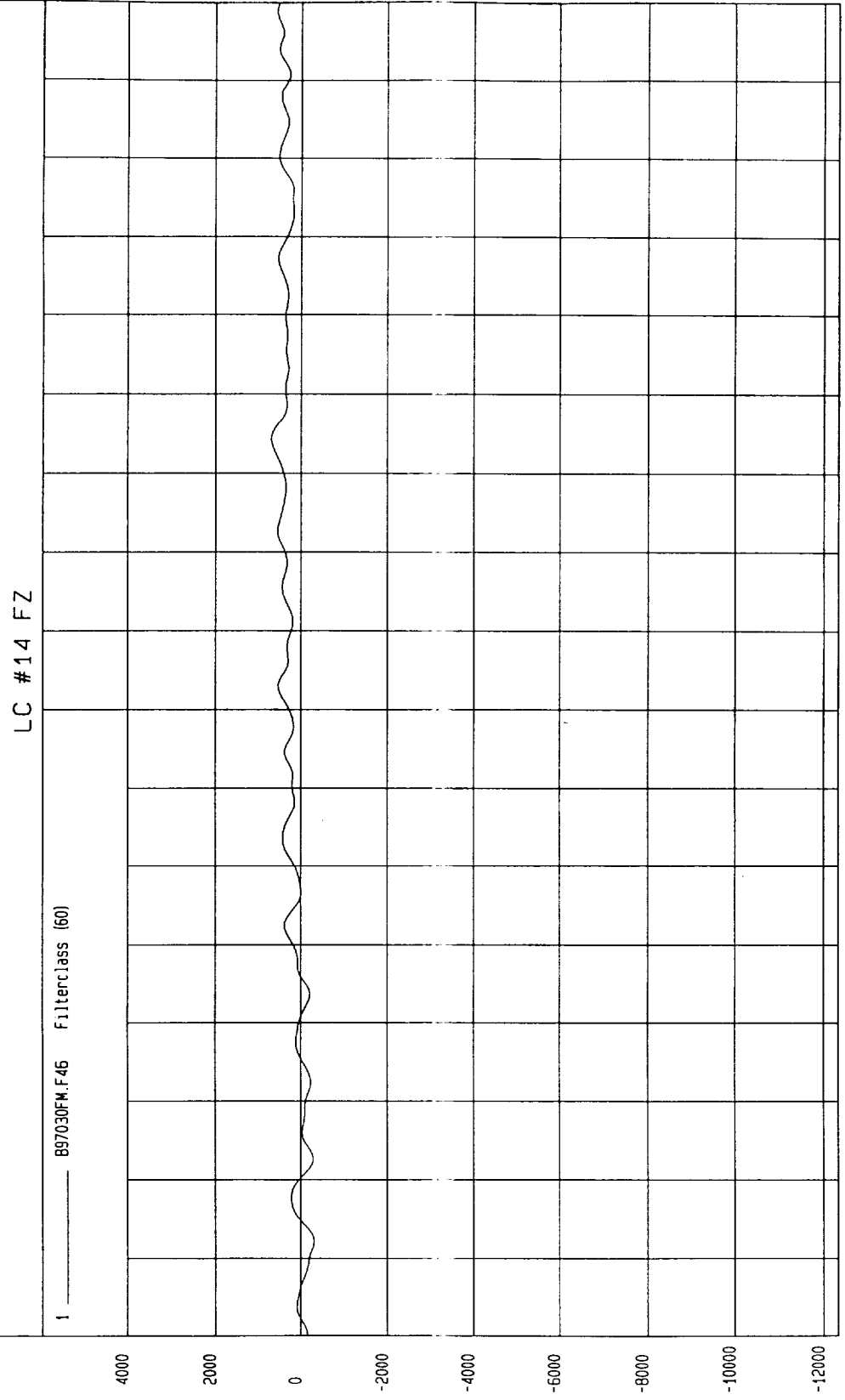


MGA Research
06-04-1998 13: 12

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

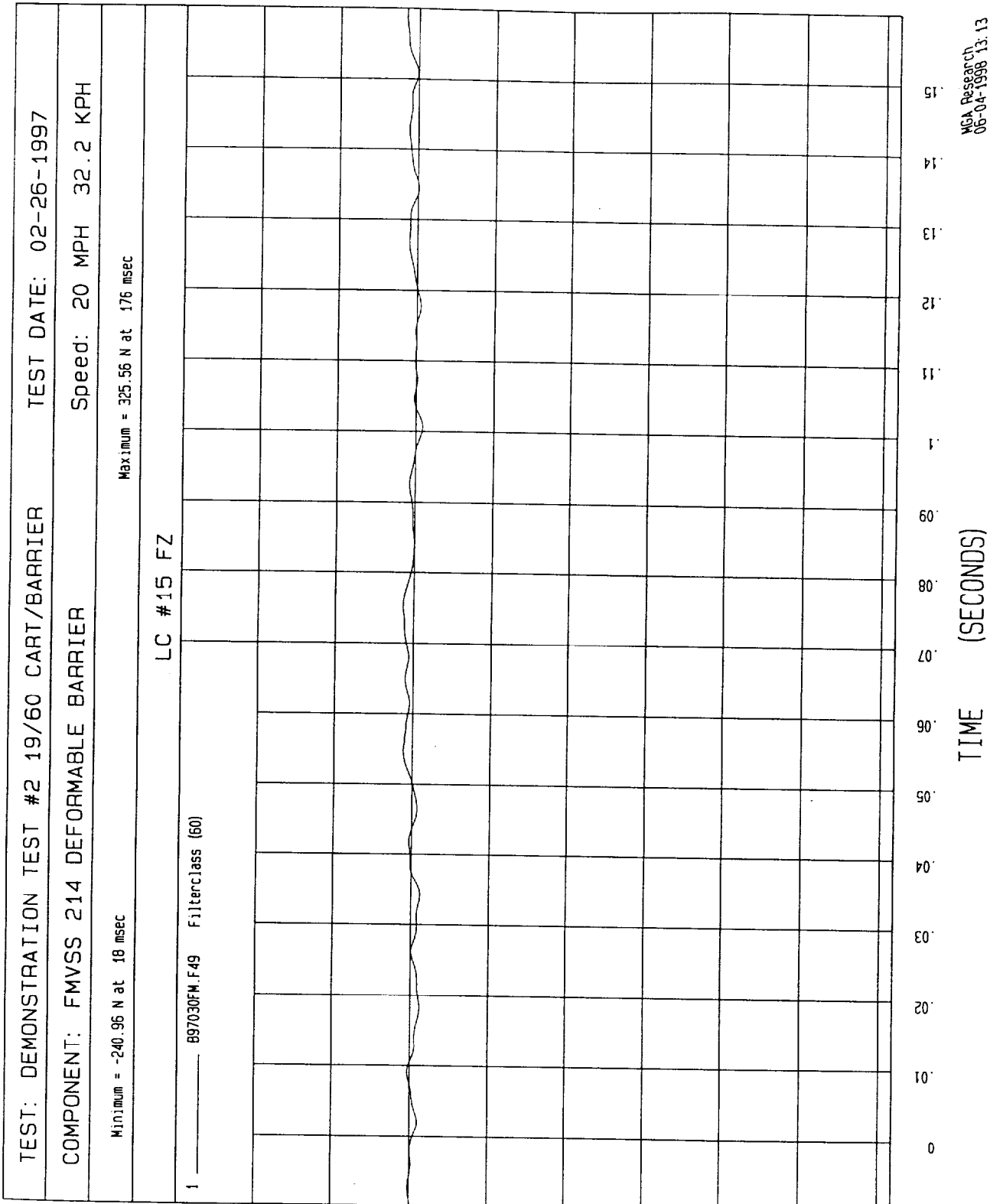
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -303.2 N at 2 msec Maximum = 682.94 N at 104 msec

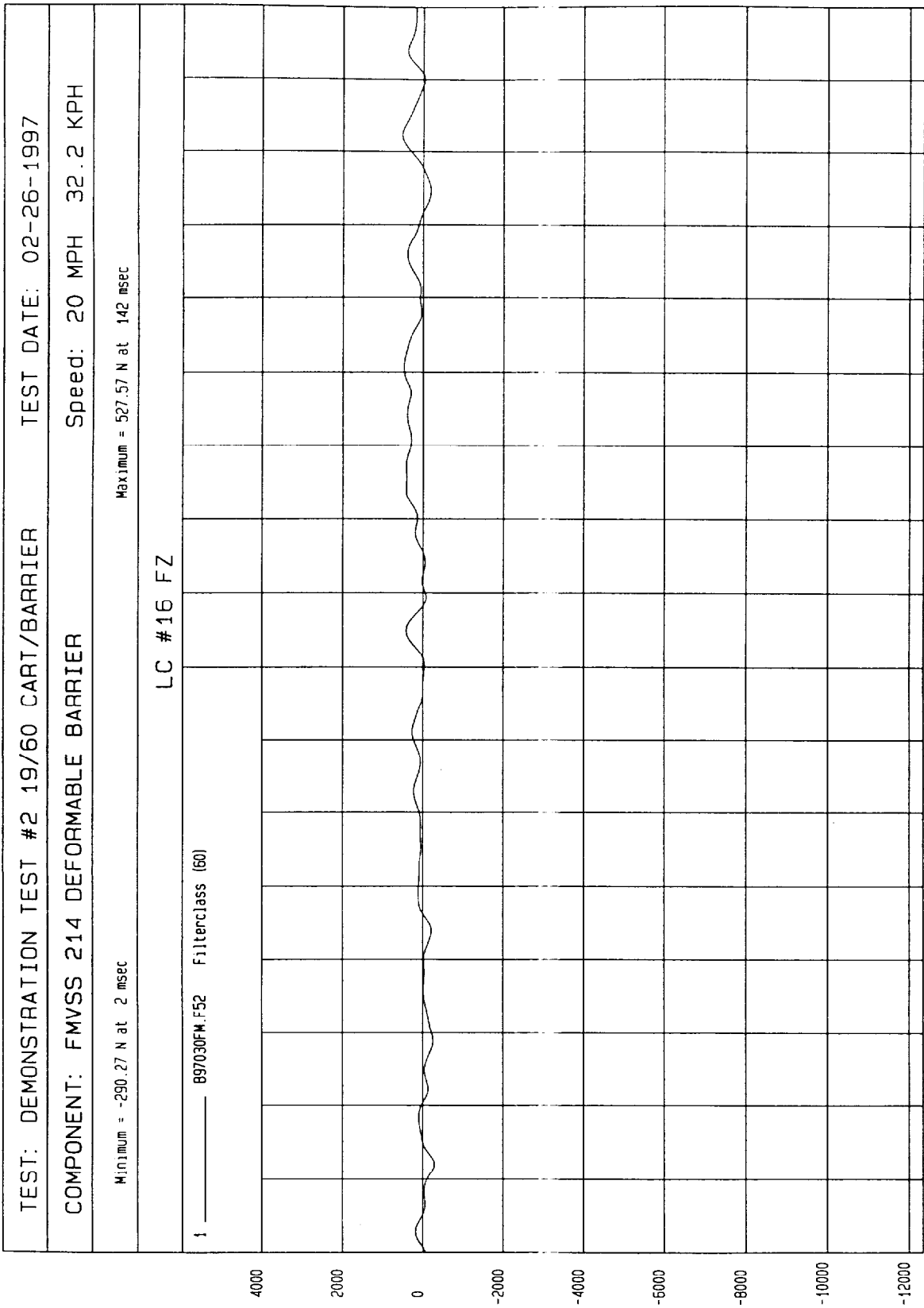


TIME (SECONDS)

MSA Research
06-04-1998 13:12



MGA Research
06-04-1998 13:13



MCA Research
06-04-1998 13.13

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Speed: 20 MPH 32.2 KPH

Minimum = -743.62 N at 45 msec

Maximum = 387.51 N at 132 msec

LC #17 FZ

1 ——— B97030FM.F55 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-10

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

1

.11

.12

.13

.14

.15

TIME (SECONDS)

MCA Research
06-04-1998 13.13

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -464.66 N at 134 msec

Maximum = 438 N at 20 msec

LC #18 FZ

1 _____ B97030FM.F59 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-10

0

10

20

30

40

50

60

70

80

90

1

11

12

13

14

15

TIME (SECONDS)

MCA Research
06-04-1998 13.14

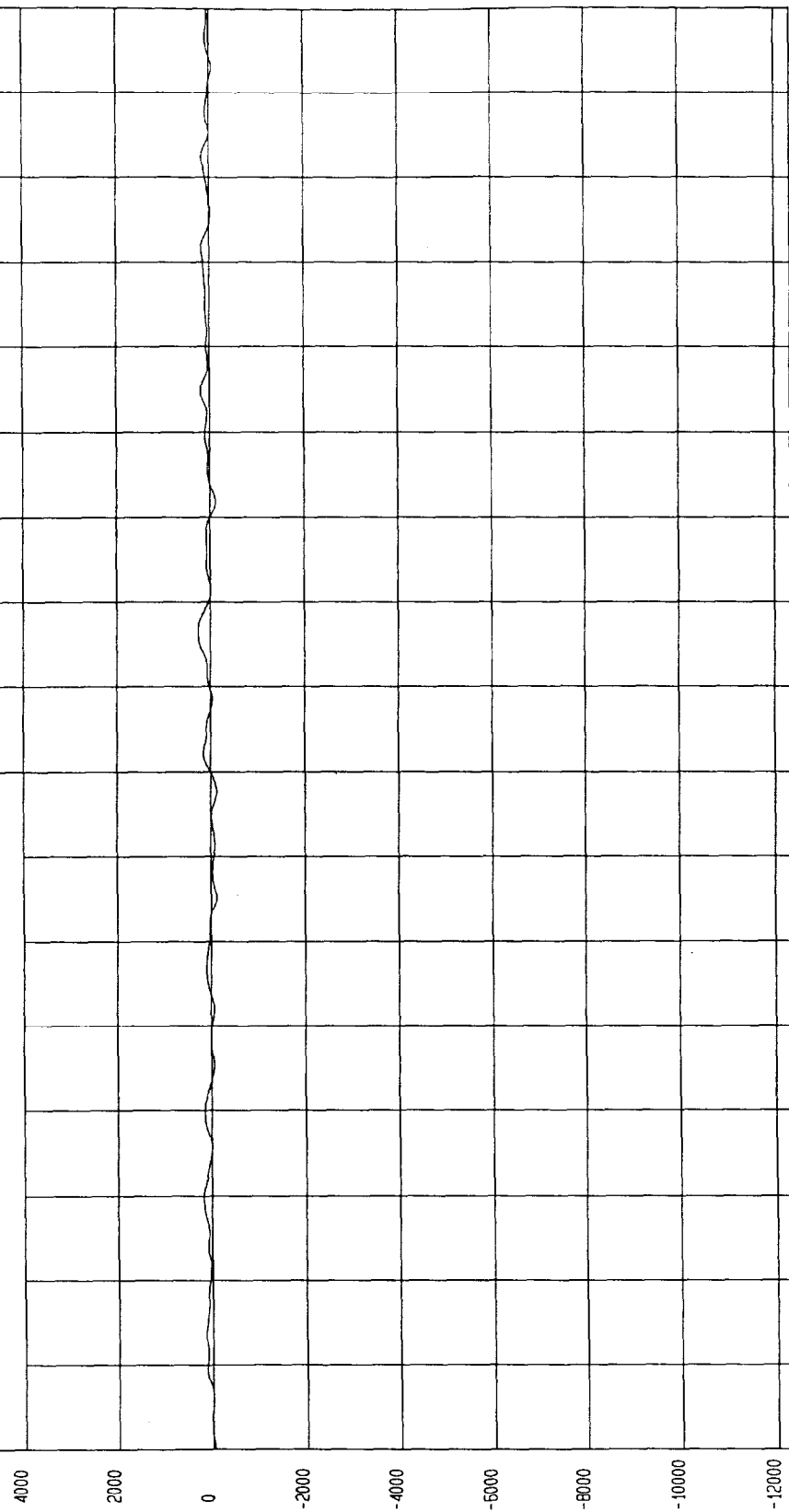
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -190.6 N at 191 msec Maximum = 260.33 N at 87 msec

LC #19 FZ

1 _____ 897030FM.F62 Filterclass (60)



WCA Research
06-04-1998 13:14

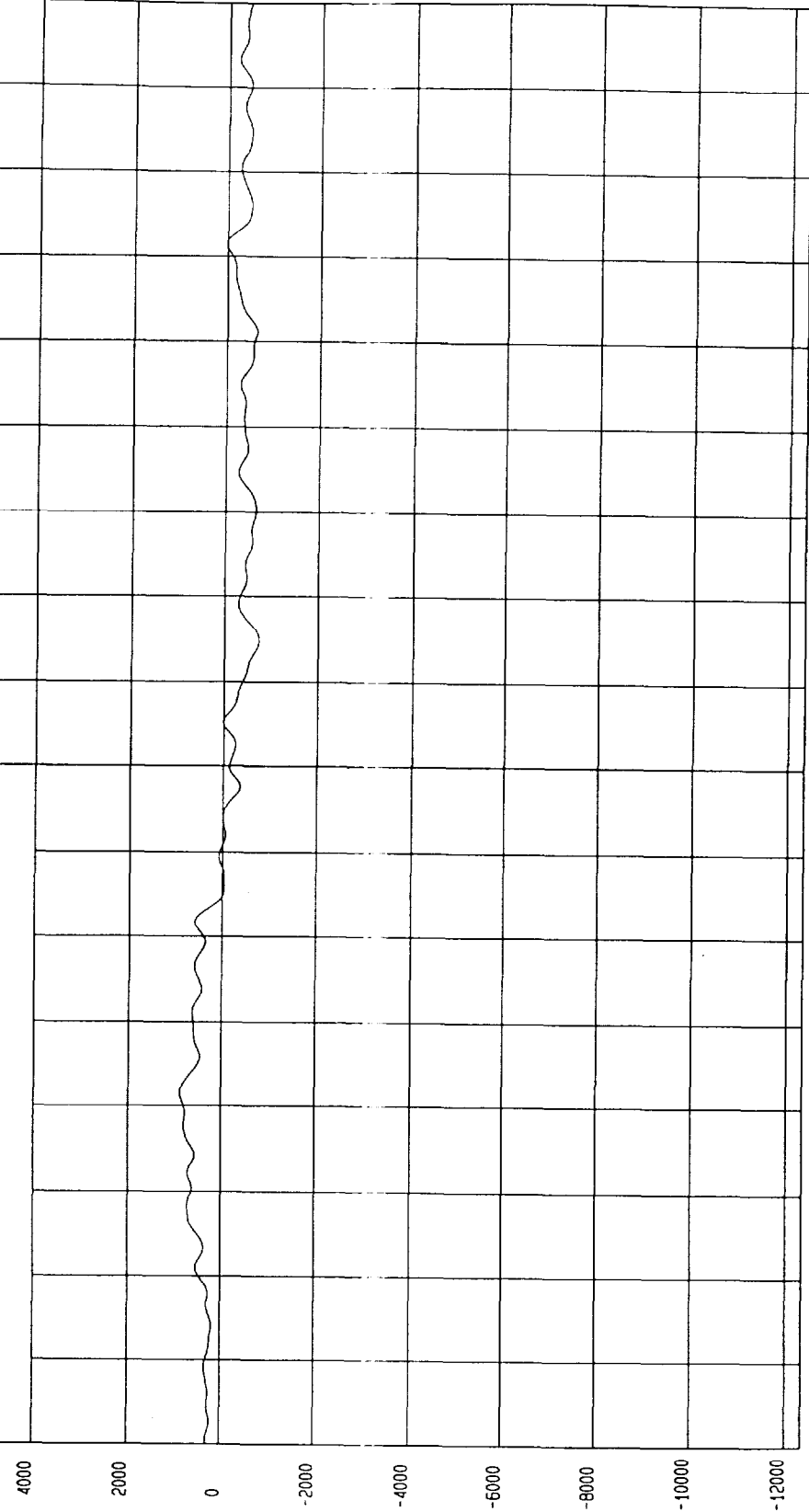
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -833.42 N at 196 msec Maximum = 877.19 N at 32 msec

LC #20 FZ

1 ——— B97030FM.F65 Filterclass (60)



MECA Research
06-04-1996 13.14

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

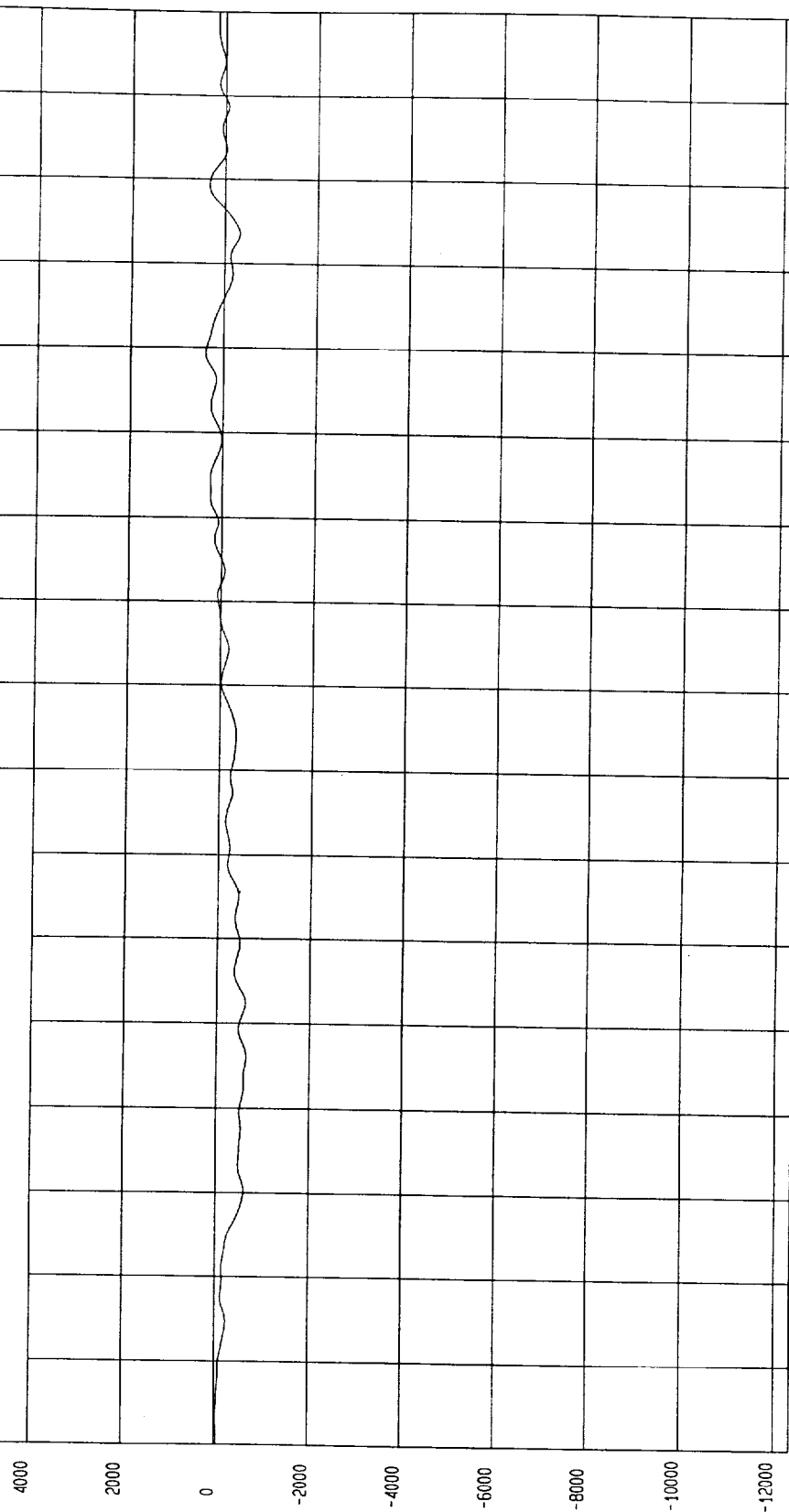
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -640.6 N at 36 msec

Maximum = 395.48 N at 119 msec

LC #21 FZ

1 _____ 997030FM.F68 Filterclass (60)

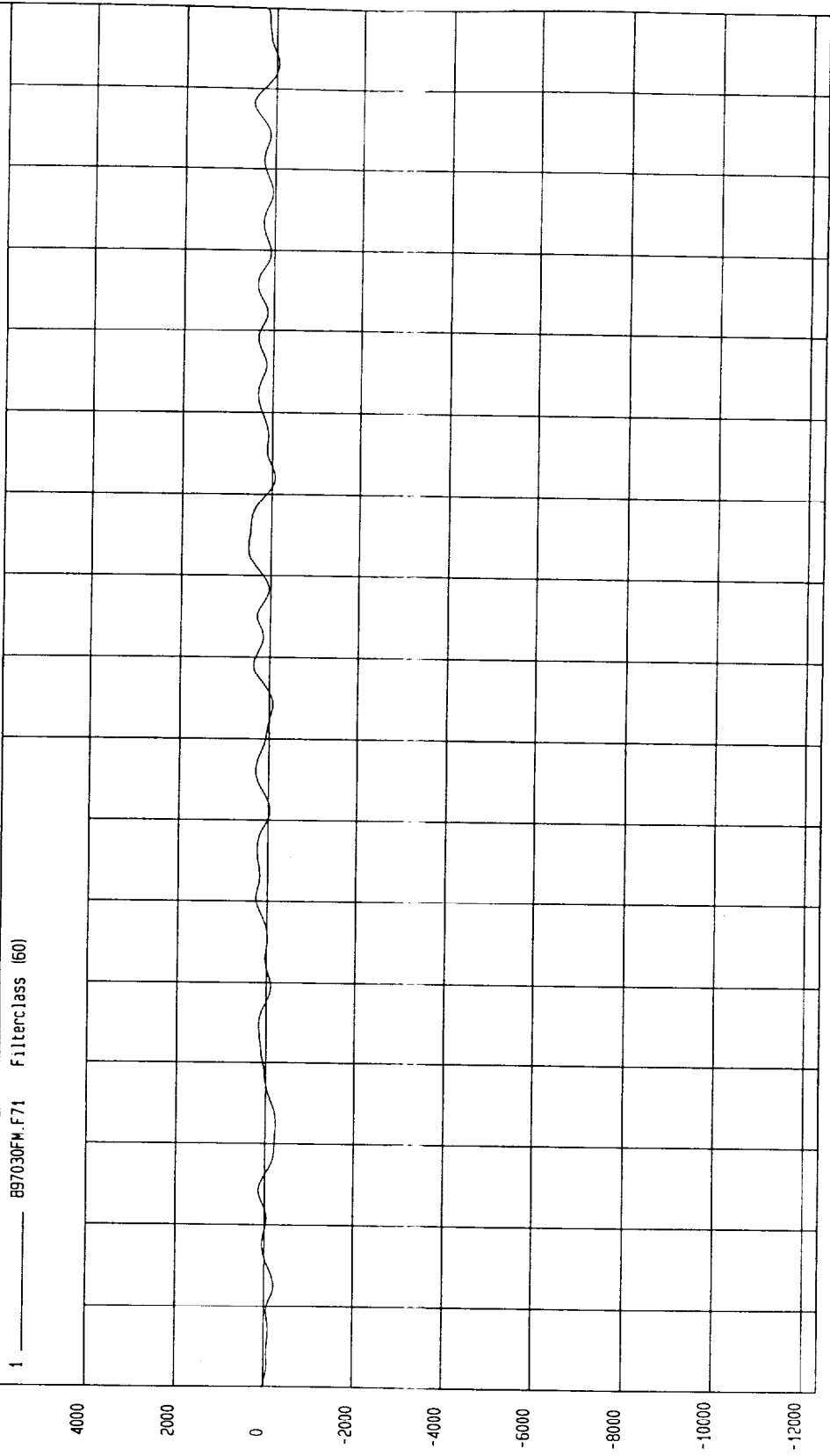


TIME (SECONDS)

15
14
13
12
11
10
09
08
07
06
05
04
03
02
01
0

WCA Research
06-04-1998 13.15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER		TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER		Speed: 20 MPH 32.2 KPH
Minimum = -272.17 N at -16 msec		Maximum = 503.62 N at 93 msec
LC #22 FZ		
1 ——— 897030FM.F71 Filterclass (60)		



MCA Research
06-04-1998 13.15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

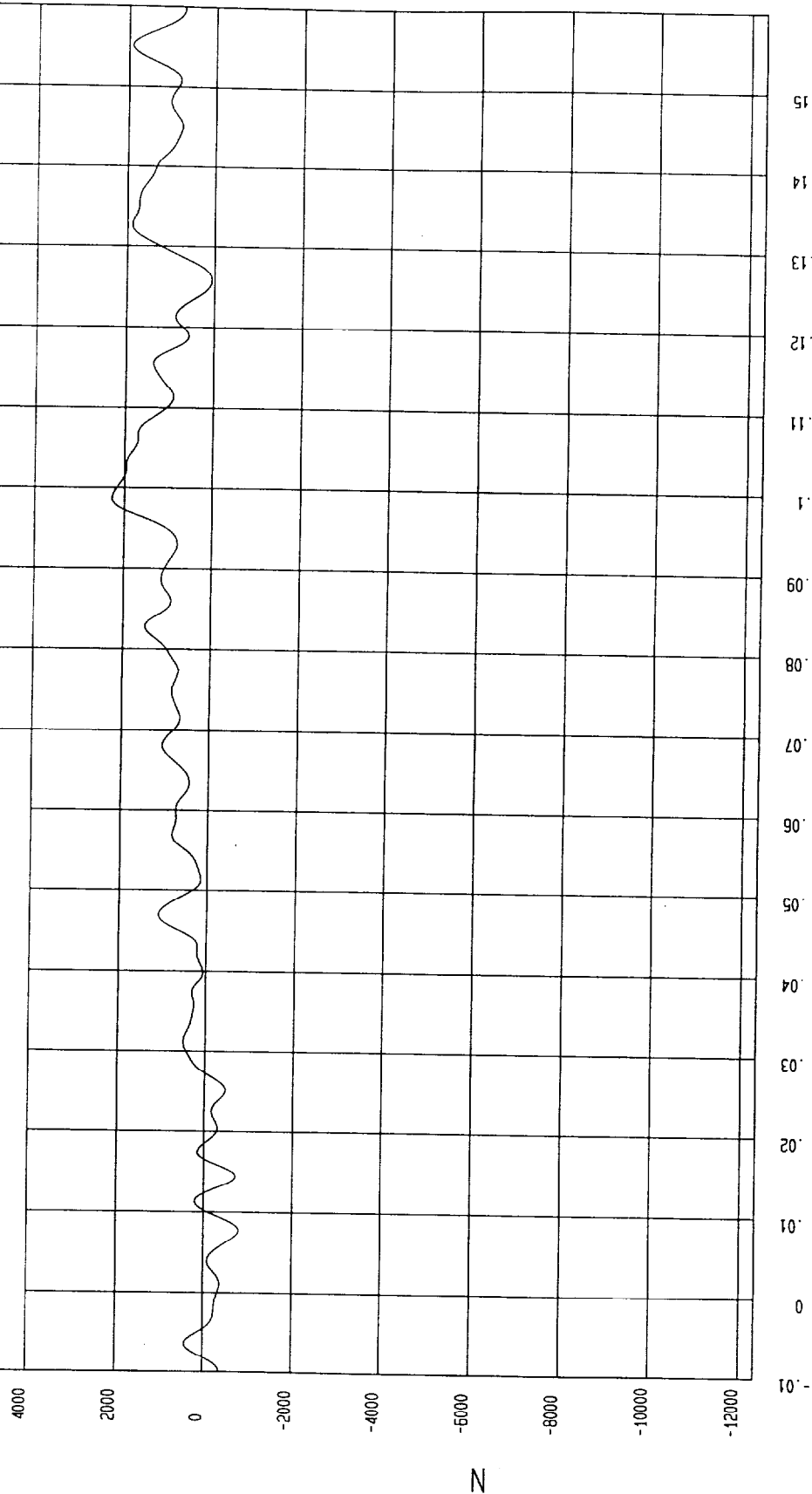
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -791.12 N at 8 msec

Maximum = 2273.61 N at 99 msec

LC #23 FZ

1 ——— B97030FM.F75 Filterclass (60)

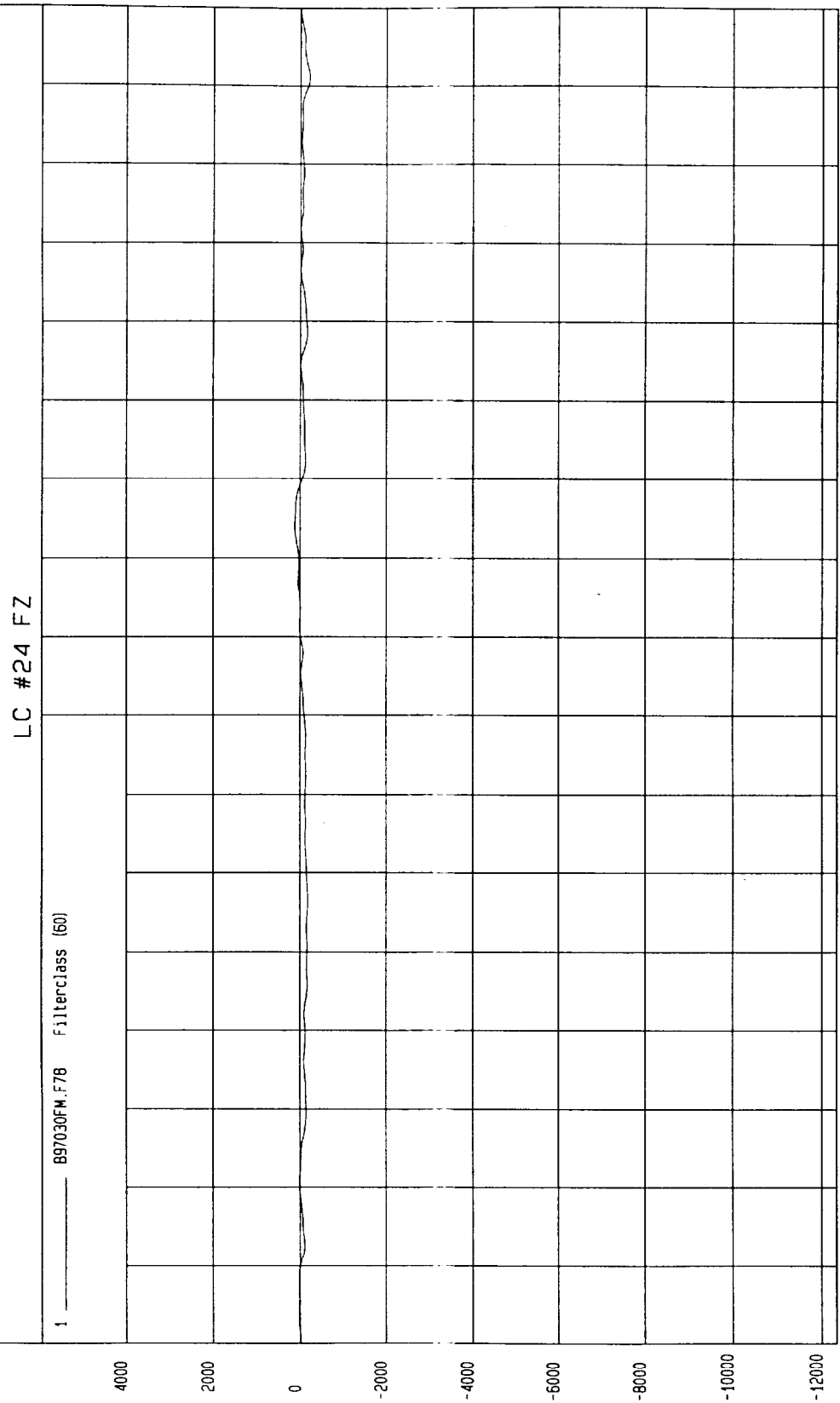


MCA Research
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TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -216.97 N at 151 msec Maximum = 120.82 N at 94 msec



TIME (SECONDS)

MCA Research
06-04-1998 13:16

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

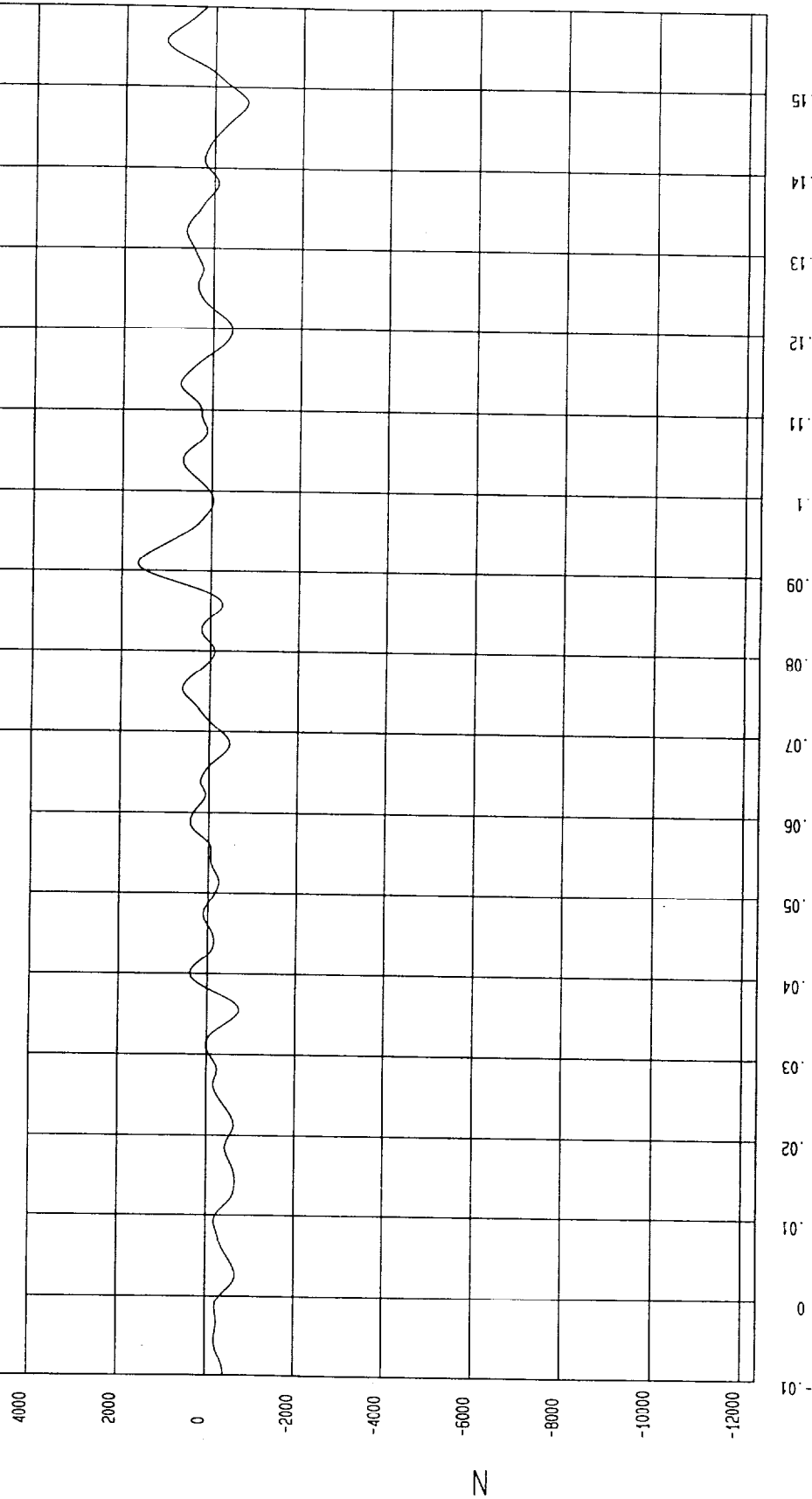
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -747.42 N at 148 msec

Maximum = 1633.76 N at 91 msec

LC #25 FZ

1 ——— B97030FM.F81 Filterclass (60)



MSA Research
06-04-1998 13:16

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

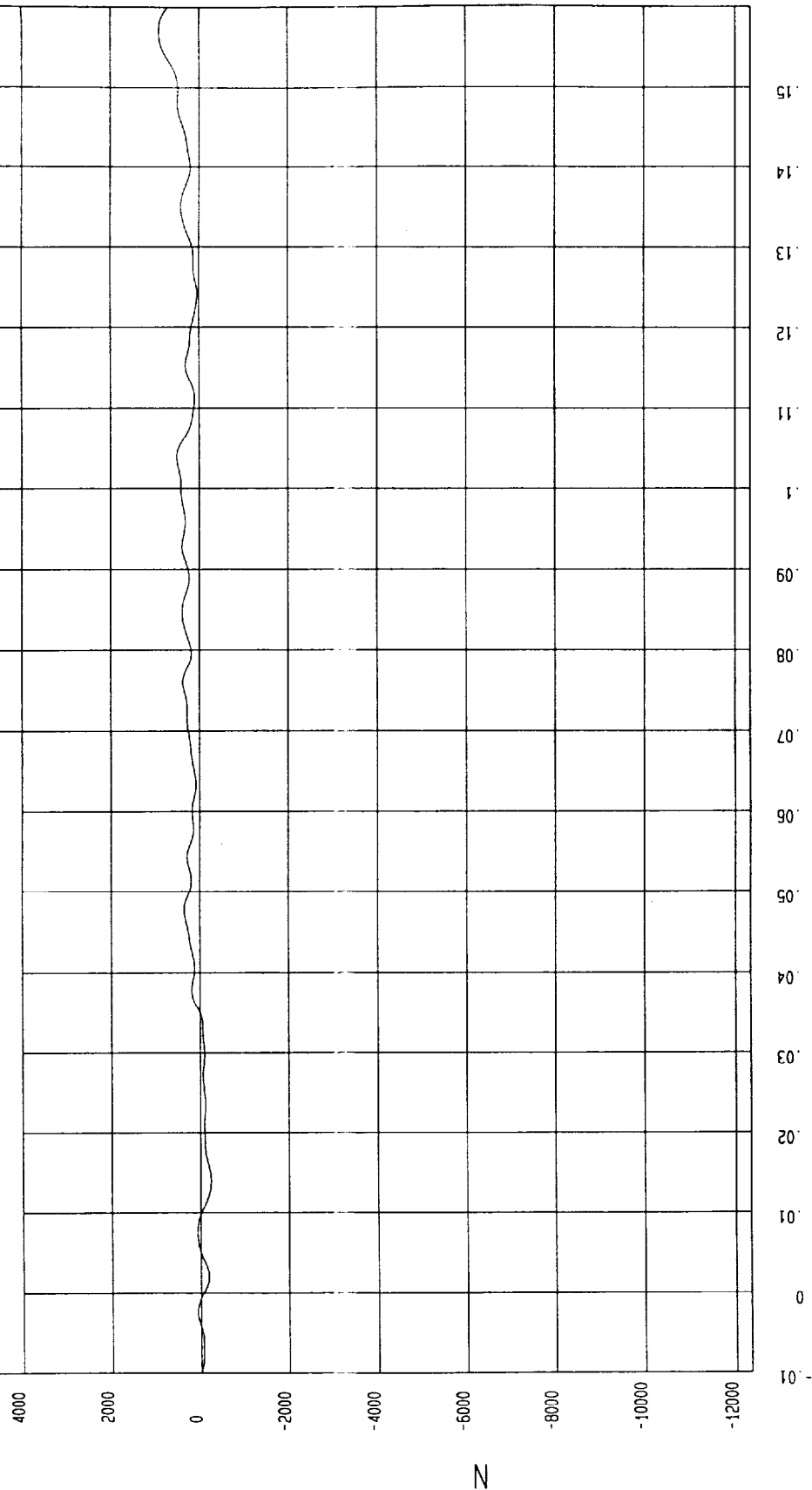
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -266.59 N at -16 msec

Maximum = 896.18 N at 157 msec

LC #26 FZ

1 897030FM.FB5 Filterclass (60)



MCA Research
06-04-1998 13:17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1898.08 N at 184 msec

Maximum = 1301.7 N at 150 msec

LC #27 FZ

1 _____ B97030FM.F88 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-101

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

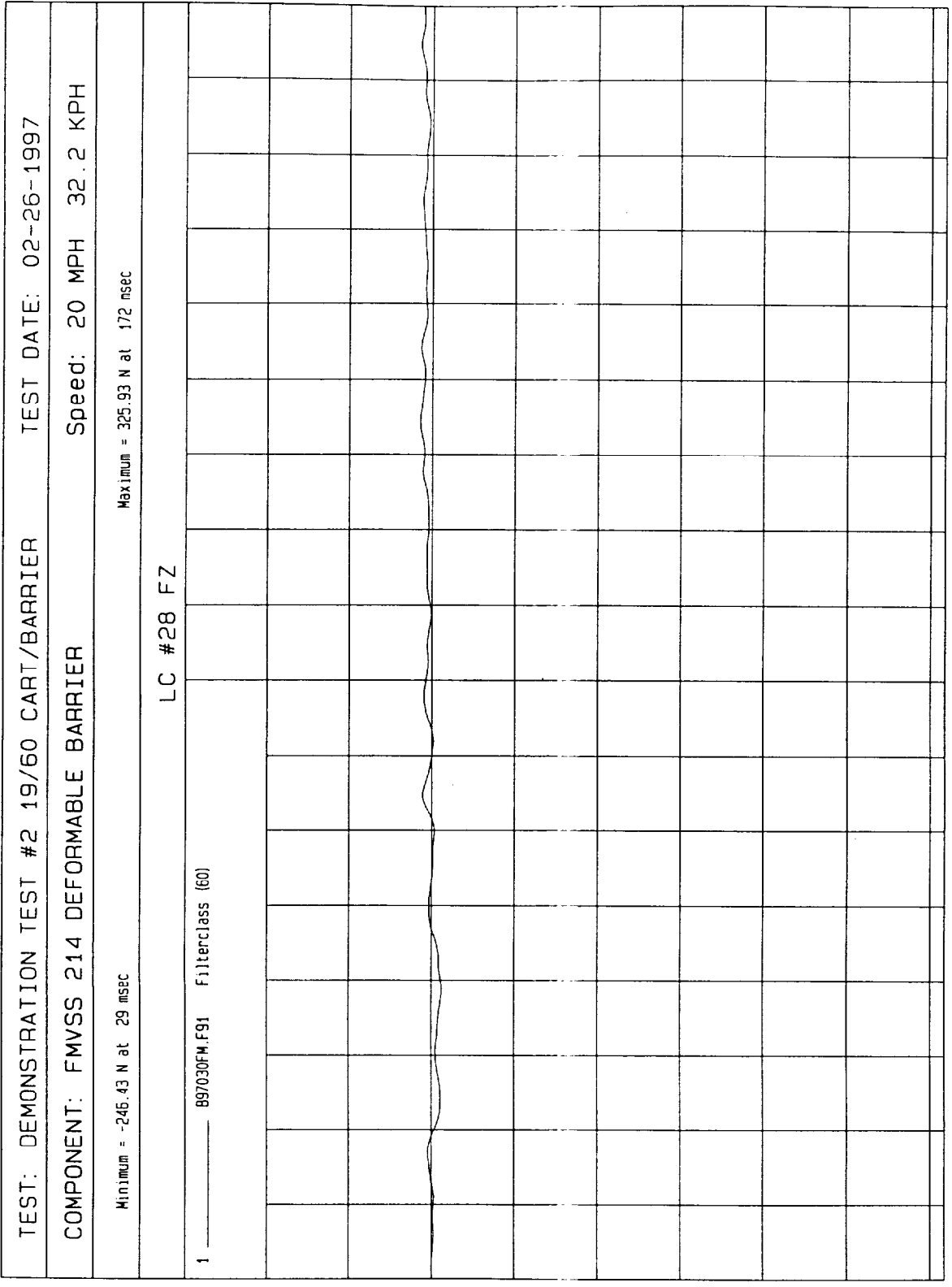
.13

.14

.15

TIME (SECONDS)

MGA Research
06-04-1998 13:17



TIME (SECONDS)

WCA Research
06-04-1998 13:17

LC #29 FZ

NO VALID DATA COLLECTED

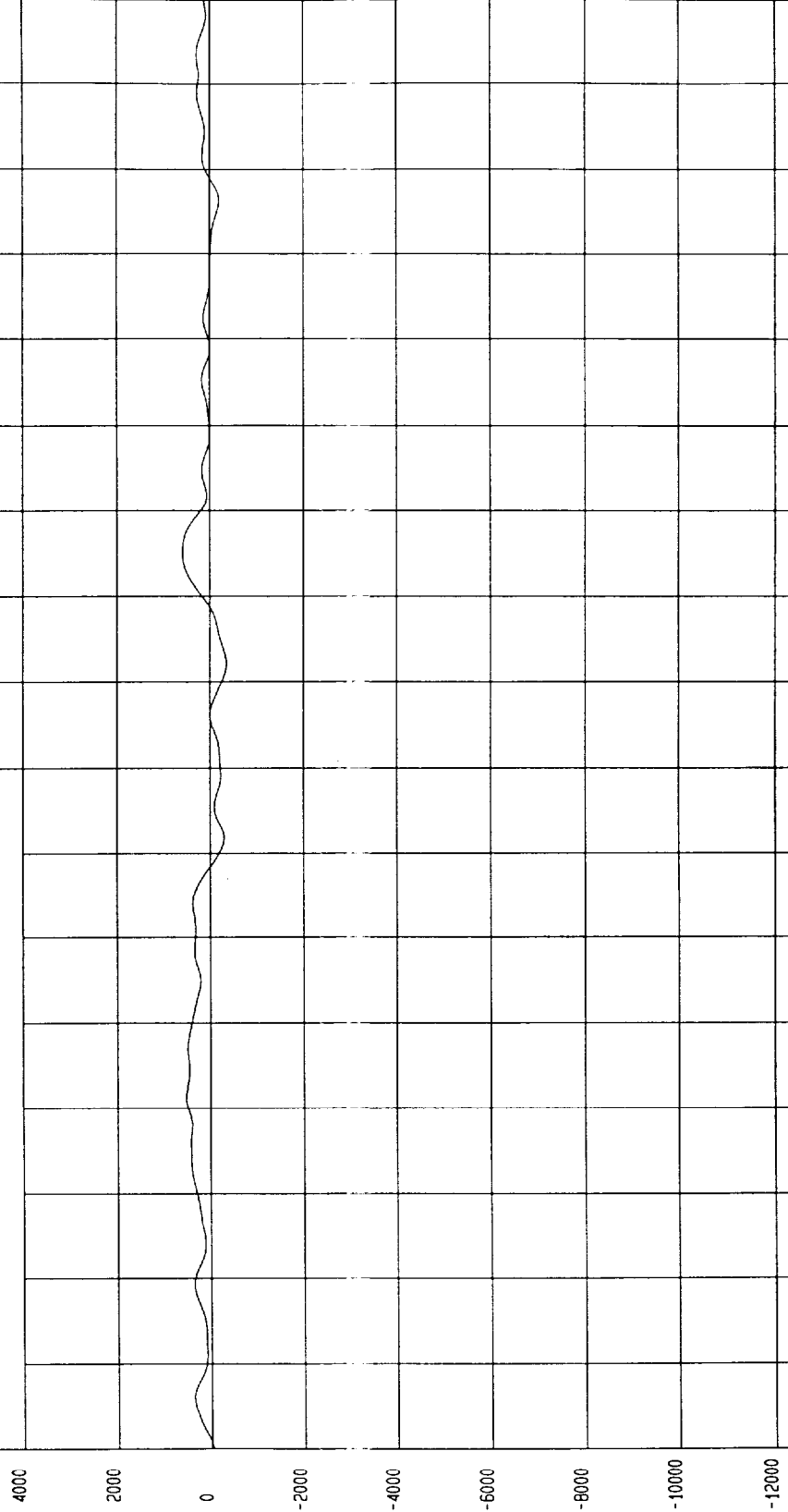
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -353.18 N at 82 msec Maximum = 583.88 N at 95 msec

LC #30 FZ

1 _____ 897030FM.F98 Filterclass (50)



TIME (SECONDS)

MGA Research
06-04-1998 13:18

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

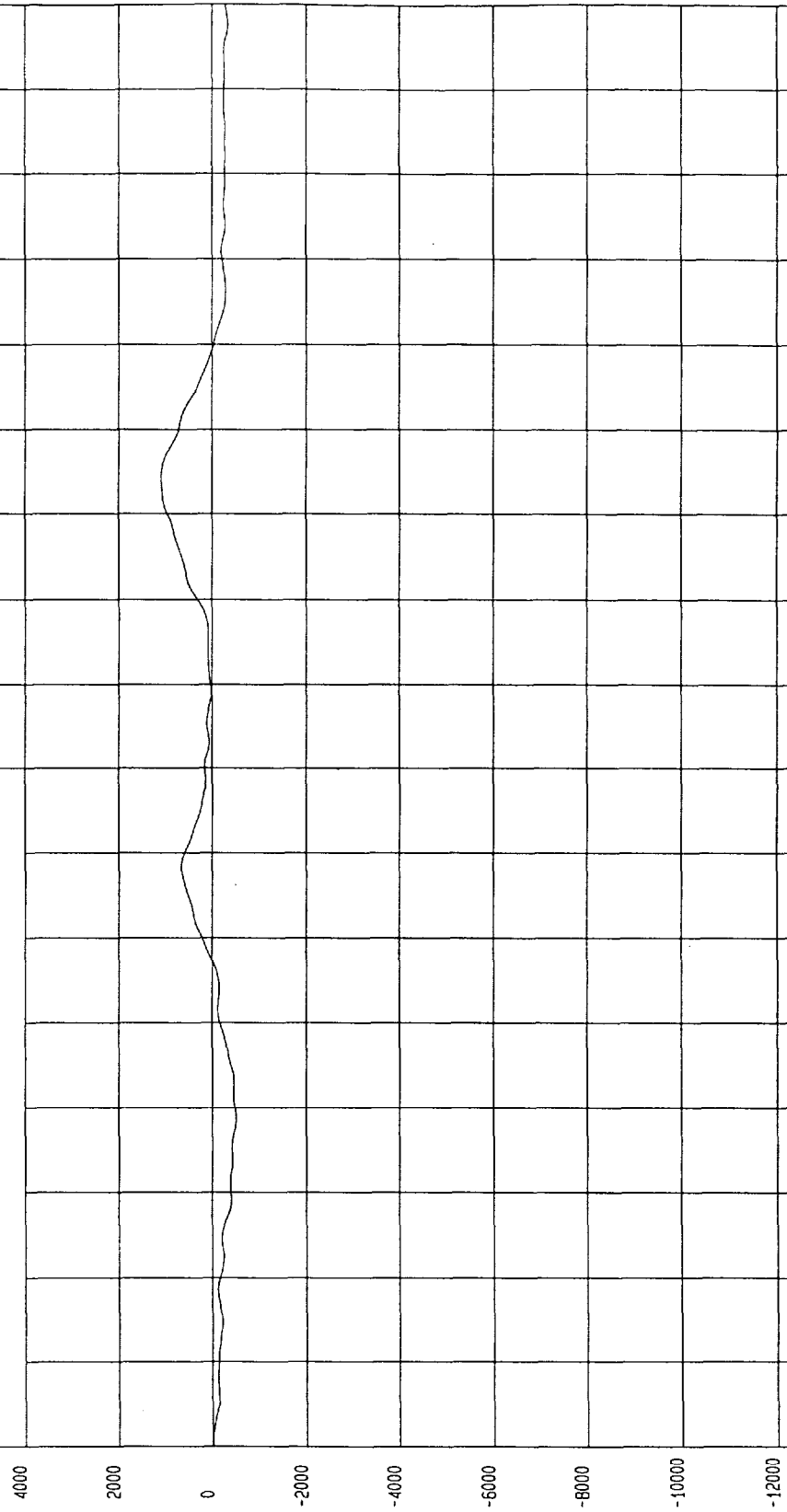
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -512.99 N at 29 msec

Maximum = 1097.07 N at 104 msec

LC #31 FZ

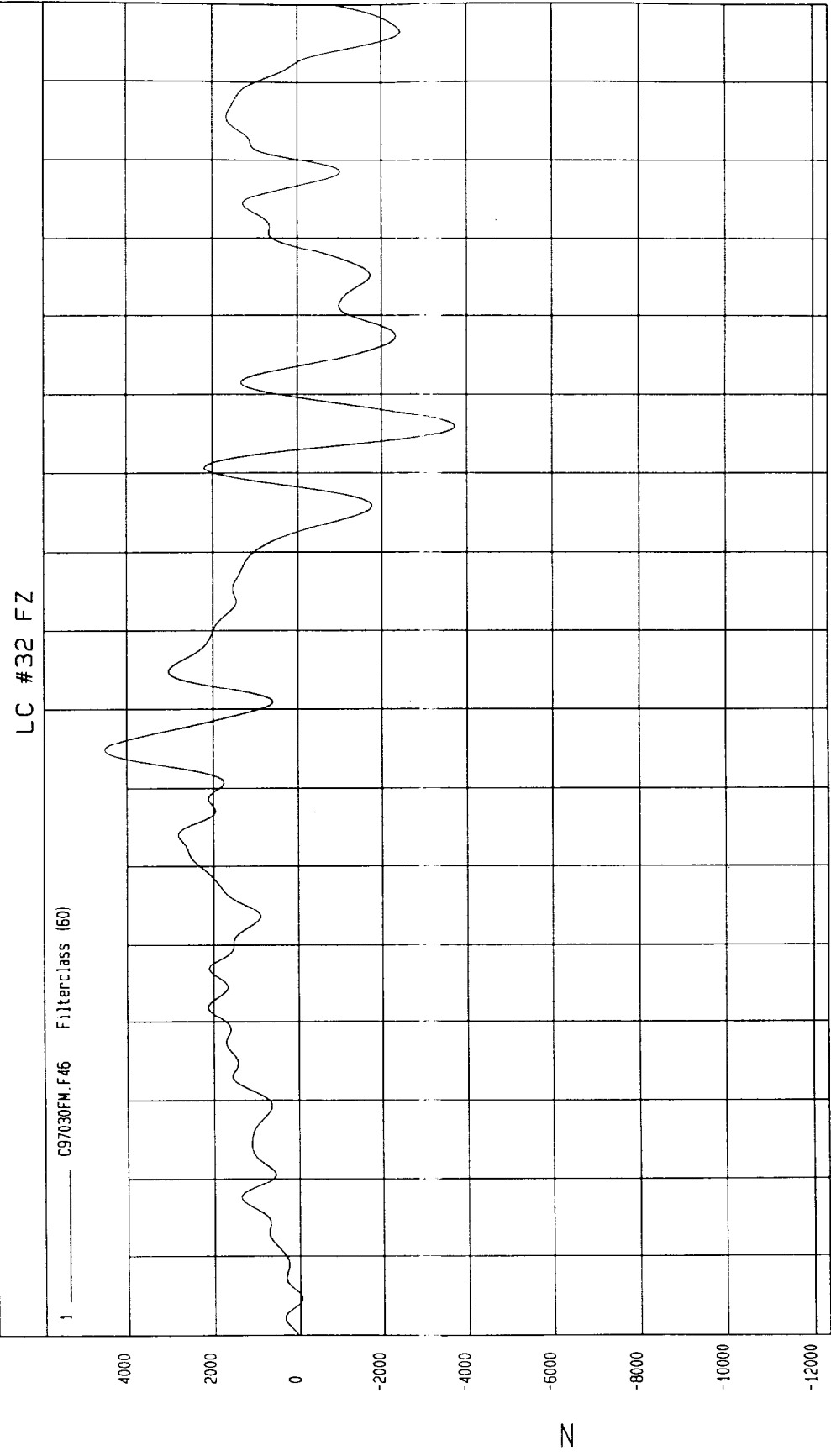
1 ——— B97030VM.V01 Filterclass (60)



MGA Research
06-04-1998 13:18

TIME (SECONDS)

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -3723.71 N at 106 msec	
Maximum = 4522.86 N at 65 msec	



TIME (seconds)

WCA Research
06-04-1998 13:51

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

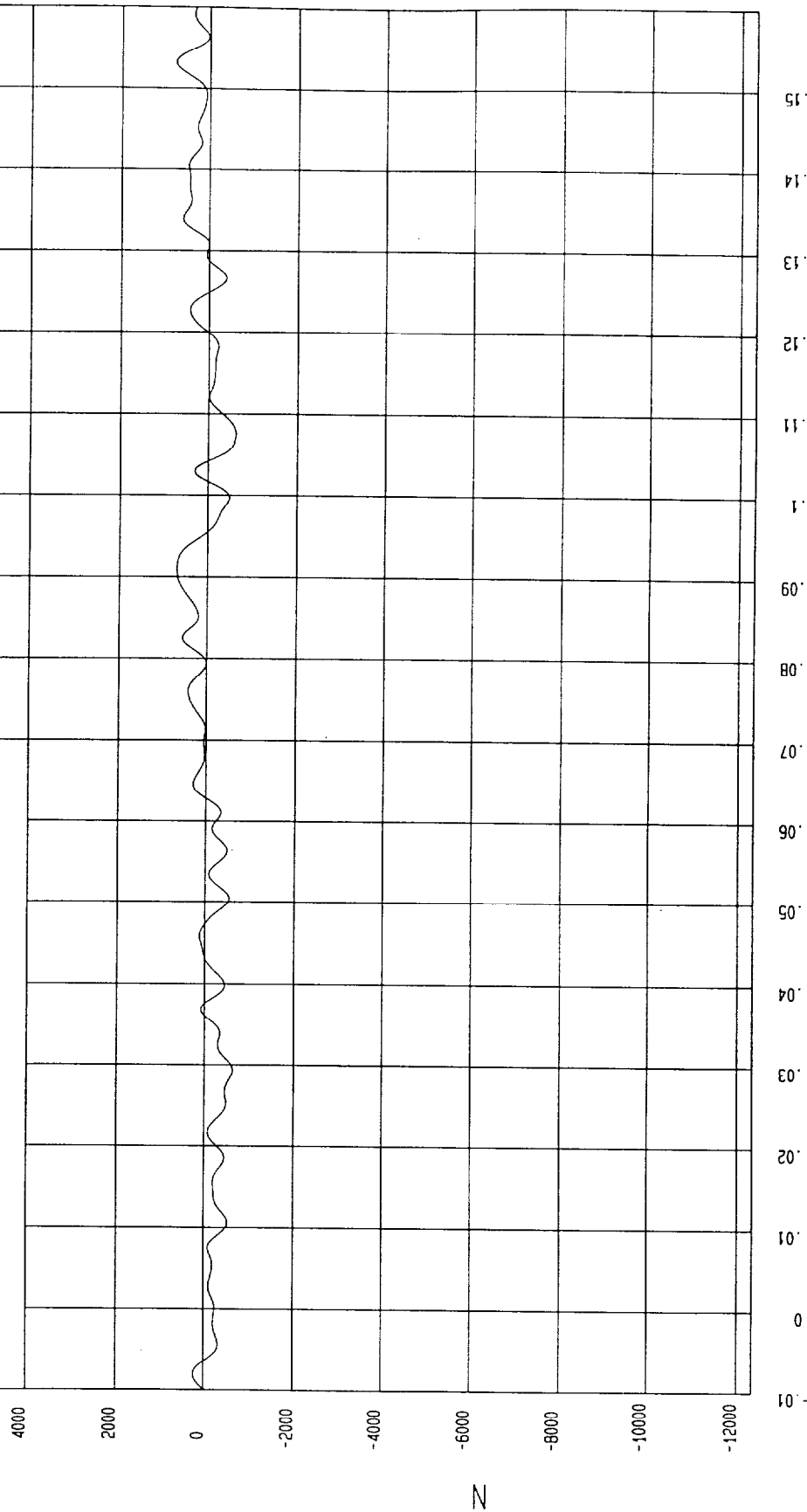
COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -631.35 N at 29 msec

Maximum = 806.92 N at 165 msec

LC #33 FZ

1 _____ C97030FM.F49 Filterclass (60)

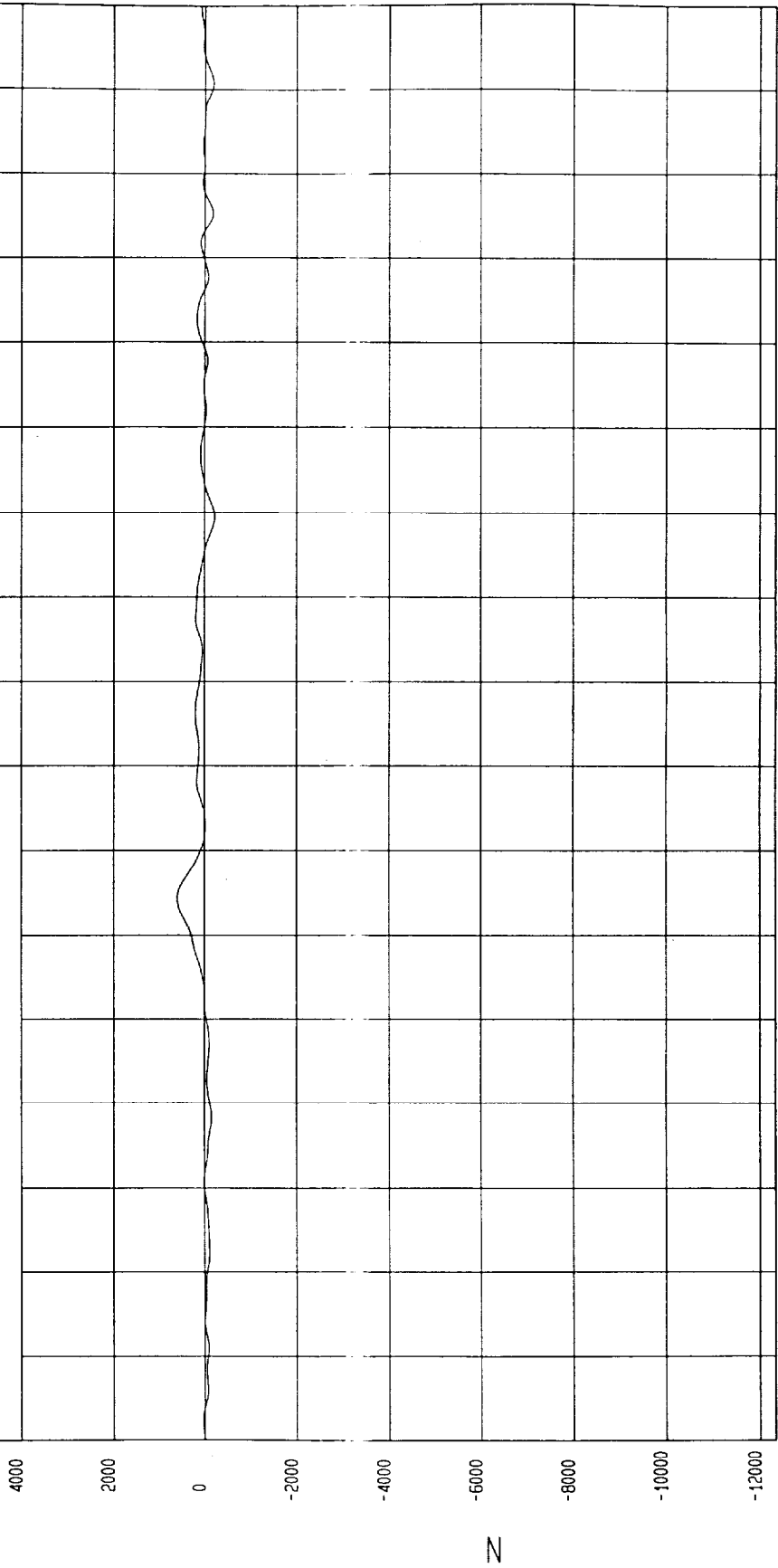


MCA Research
06-04-1998 13:52

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -217.47 N at 100 msec	Maximum = 590.63 N at 54 msec

LC #34 FZ

1 ——— C97030FM.F52 Filterclass (60)



MGA Research
06-04-1998 13:52

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

Speed: 20 MPH 32.2 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -191 N at 21 msec

Maximum = 672.38 N at 37 msec

LC #35 FZ

1 _____ R97030FM.F43 Filterclass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

-0.1

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

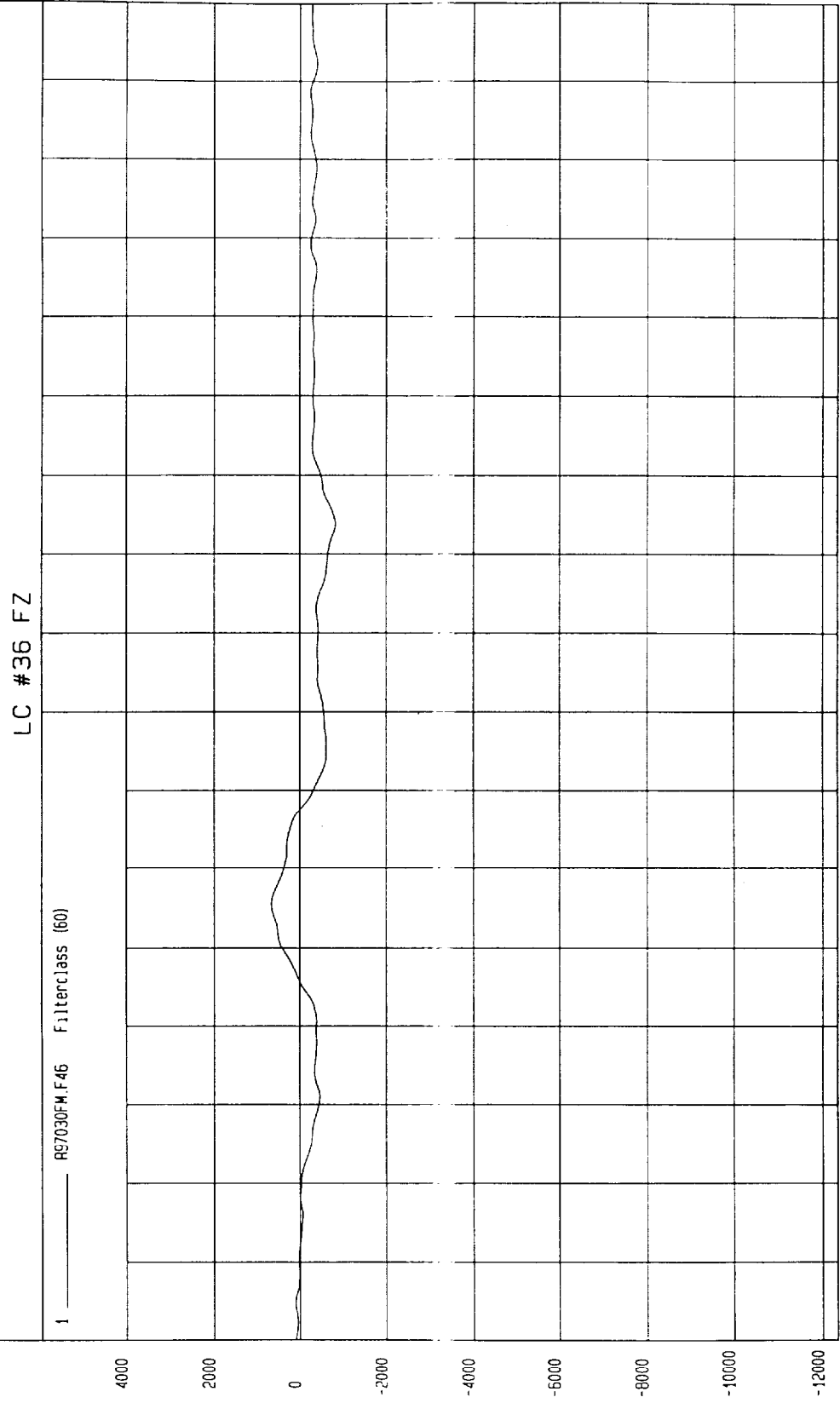
TIME (SECONDS)

MGA Research
06-04-1998 13:39

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -804.33 N at 94 msec Maximum = 656.6 N at 46 msec



TIME (SECONDS)

0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15

WGA Research
06-04-1998 13:39

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

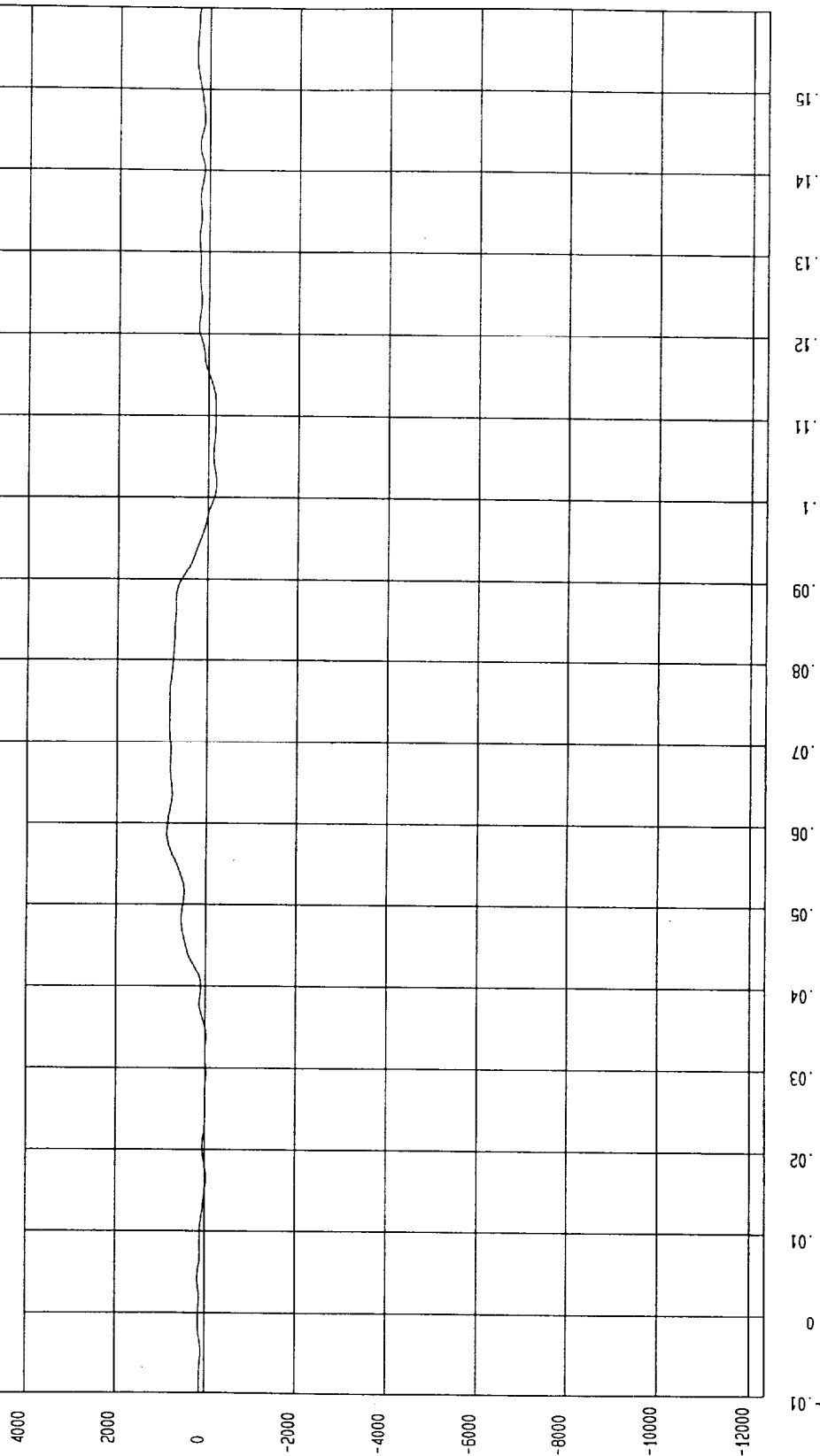
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -183.61 N at 102 msec

Maximum = 879.56 N at 59 msec

LC #37 FZ

1 ——— R97030FM.F49 Filterclass (60)



MGA Research
06-04-1998 13:39

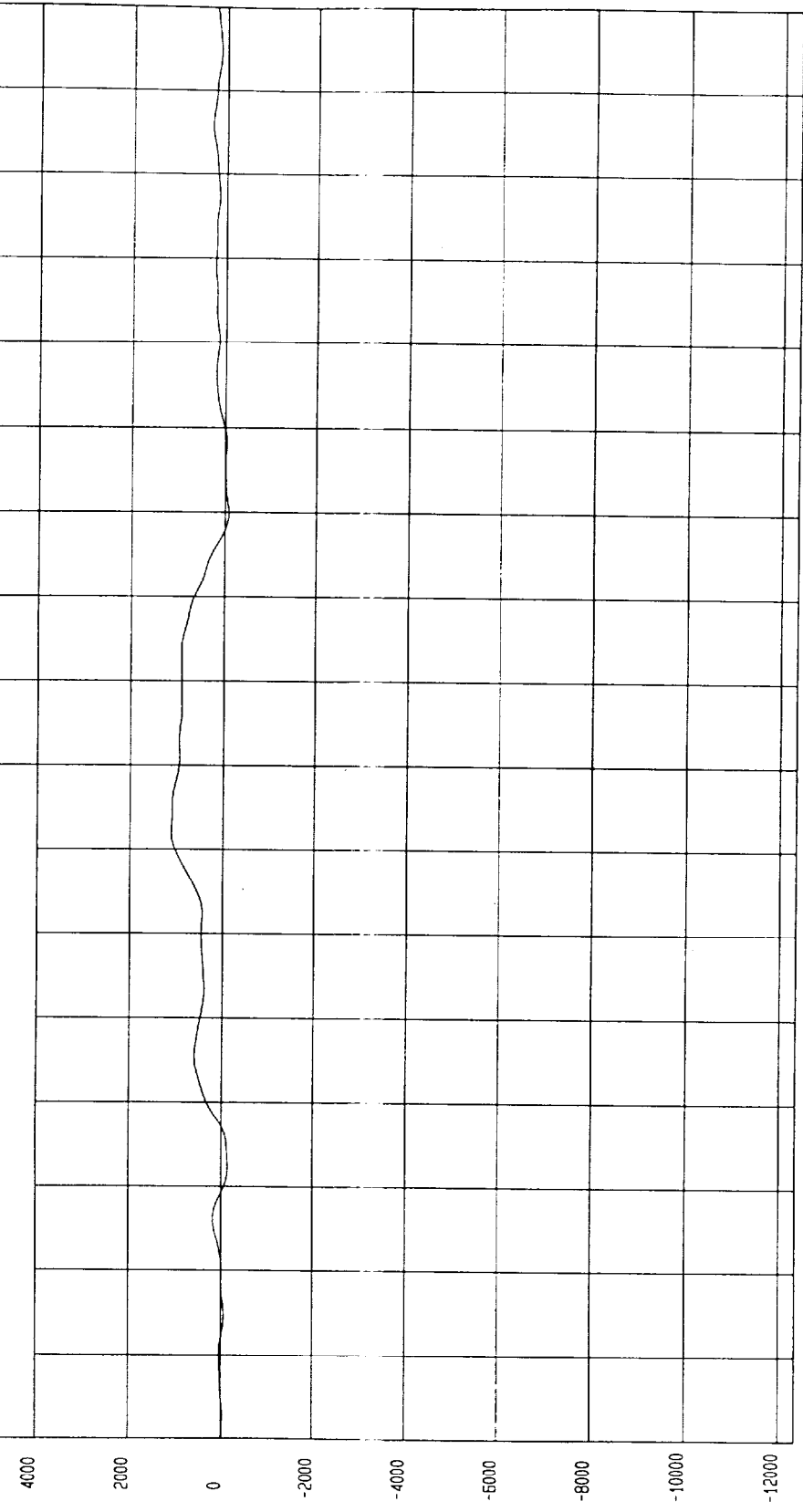
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -131.25 N at 22 msec Maximum = 1099.88 N at 62 msec

LC #38 FZ

1 ——— R97030FM.F52 Filterclass (60)



MCA Research
06-04-1998 13:40

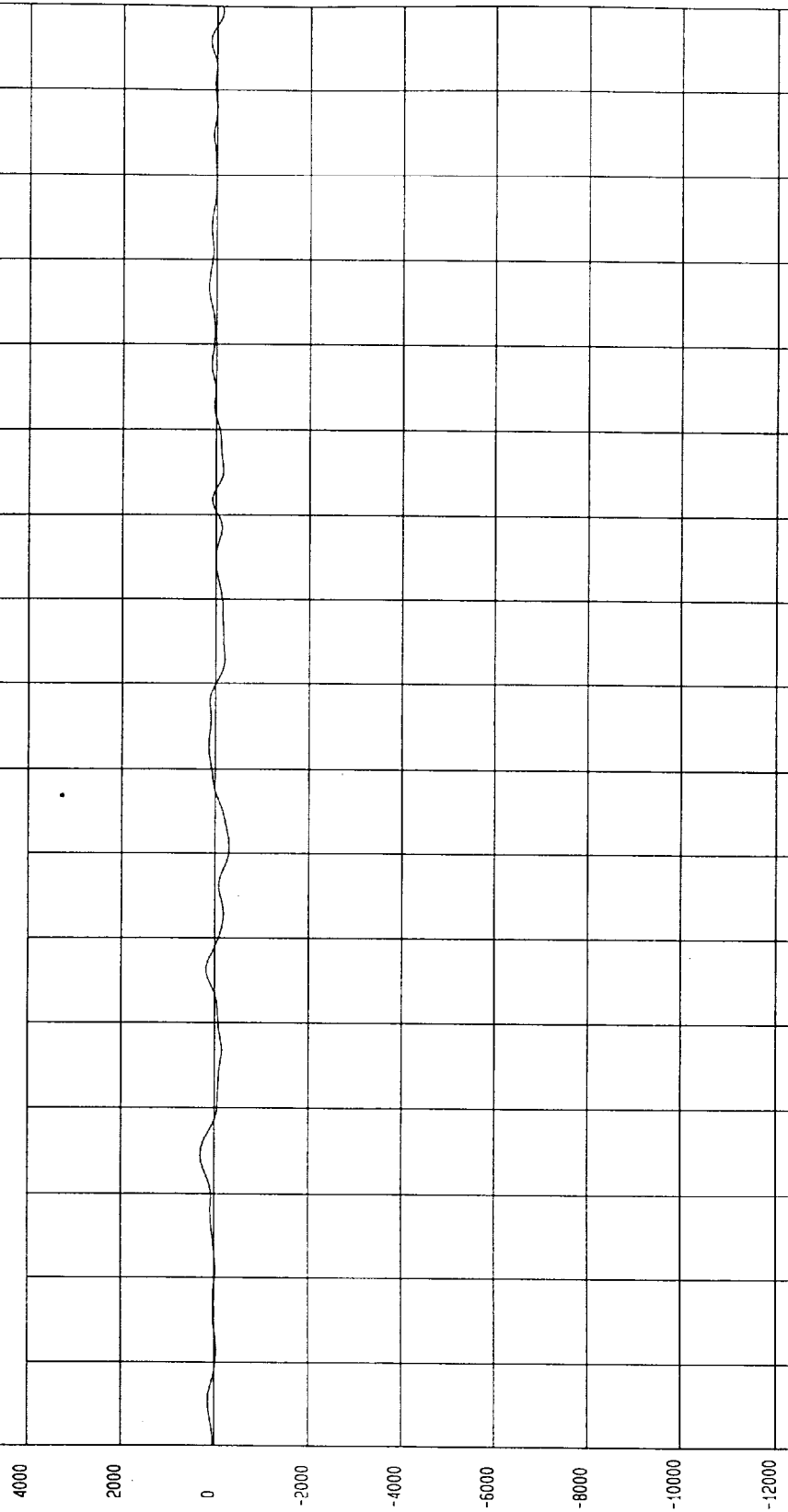
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -302.96 N at 61 msec Maximum = 306.44 N at 24 msec

LC #39 FZ

1 _____ R97030FM.F55 Filterclass (60)



TIME (SECONDS)

MGA Research
06-04-1998 13:40

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -600.64 N at 95 msec

Maximum = 641.33 N at 35 msec

LC #40 FZ

1 _____ RS7030FM.F59 FilterClass (60)

4000
2000
0
-2000
-4000
-6000
-8000
-10000
-12000

N

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MGA Research
06-04-1998 13:40

LC #41 FZ

NO VALID DATA COLLECTED

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -251.27 N at -10 msec

Maximum = 2144.07 N at 82 msec

LC #42 FZ

1 ——— R97030FM.F65 Filterclass (60)

4000

2000

0

-2000

-4000

-6000

-8000

-10000

-12000

N

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

TIME (SECONDS)

MCA Research
06-04-1998 13:41

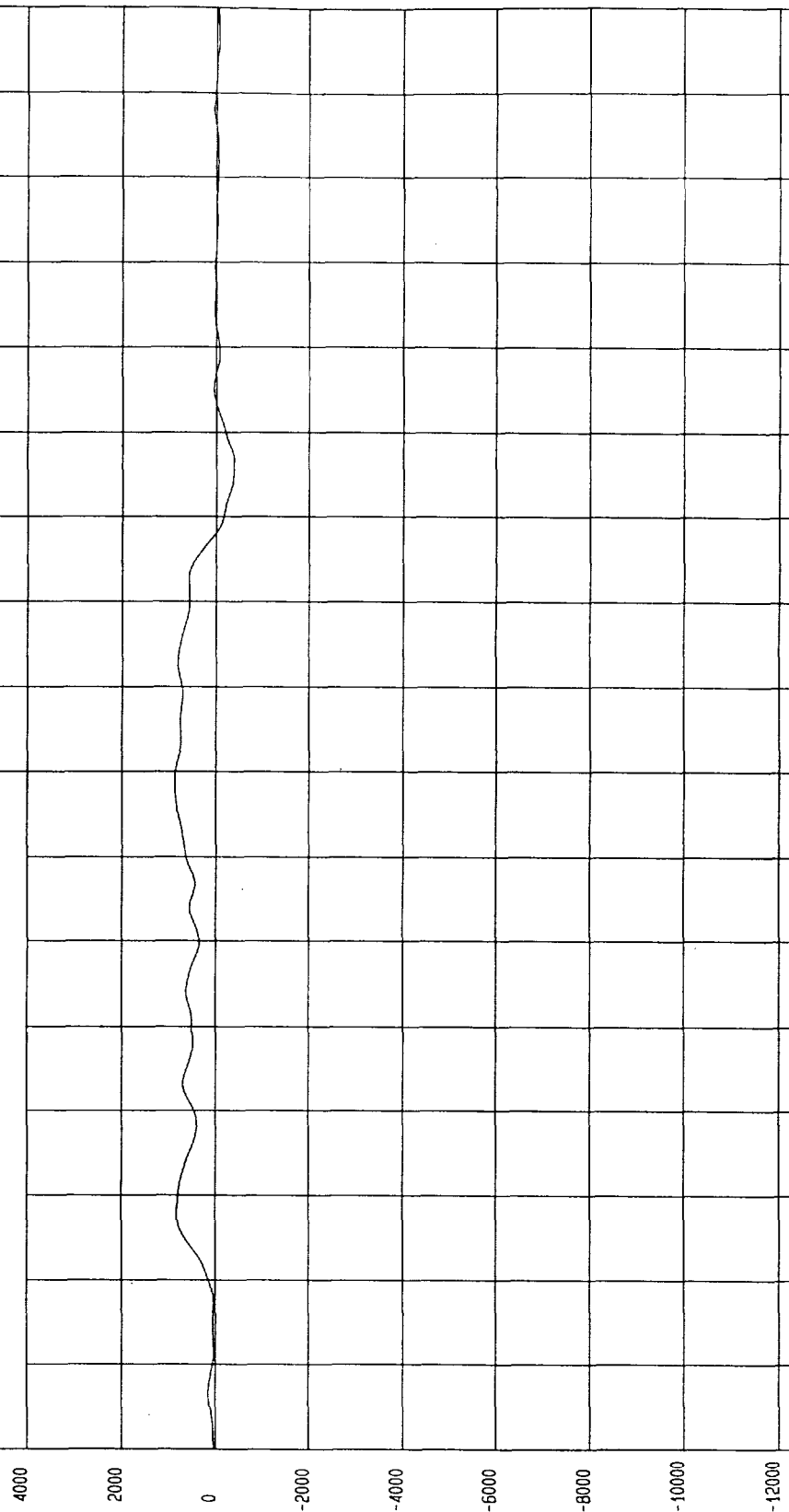
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

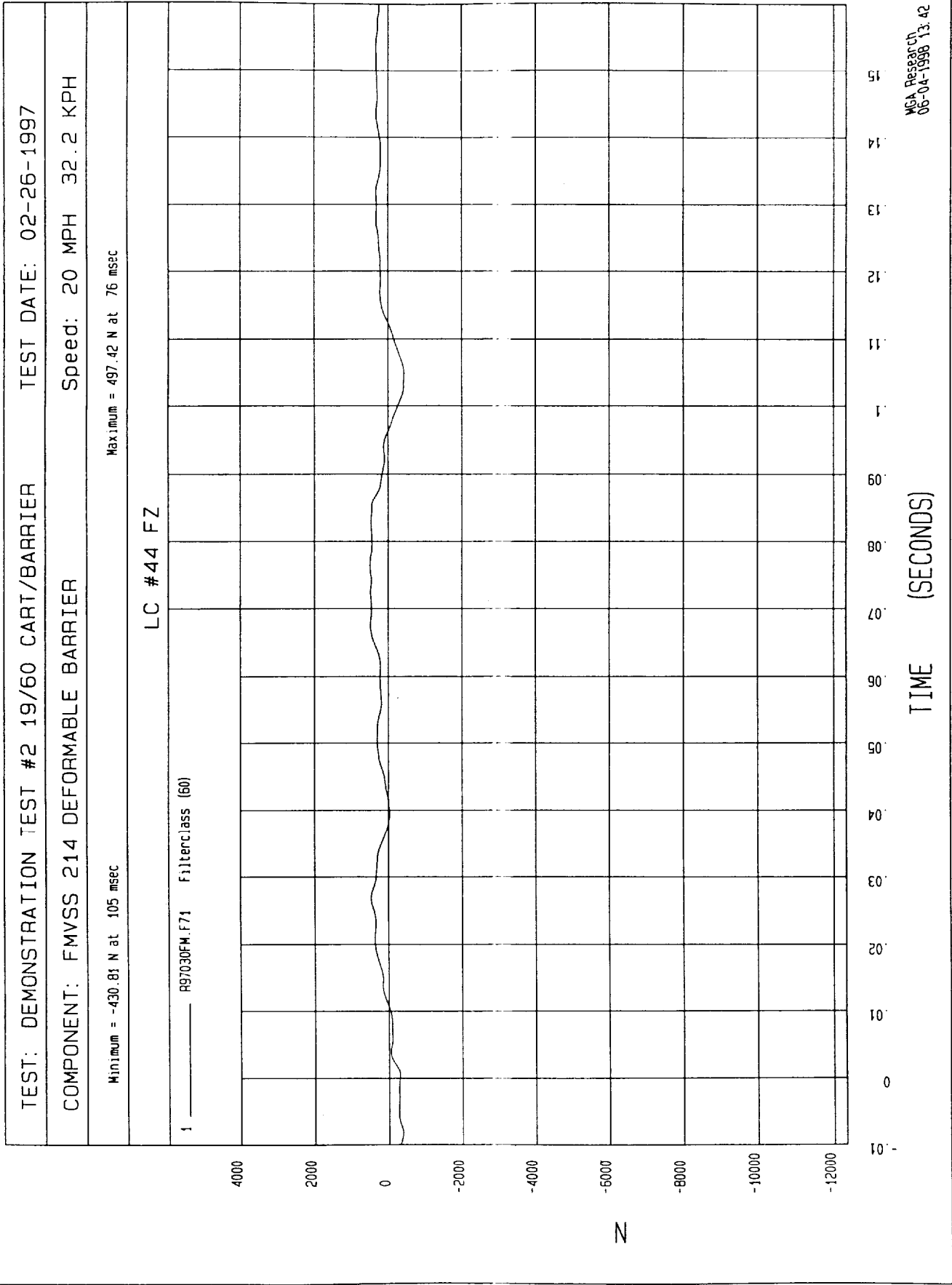
Minimum = -372.9 N at 107 msec Maximum = 867.53 N at 69 msec

LC #43 FZ

1 ——— R97030FM.F68 Filterclass (60)



MGA Research
06-04-1998 13:41



TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -8.56 G'S at 78 msec Maximum = .99 G'S at 184 msec

CART CG X

1 — C97030AF.A54 Filterclass (60)

0

-2

-4

-6

-8

G.S

0 .01 .02 .03 .04 .05 .06 .07 .08 .09 .1 .11 .12 .13 .14 .15 .16 .17 .18 .19

TIME (seconds)

WGA Research
04-20-1997 12:07

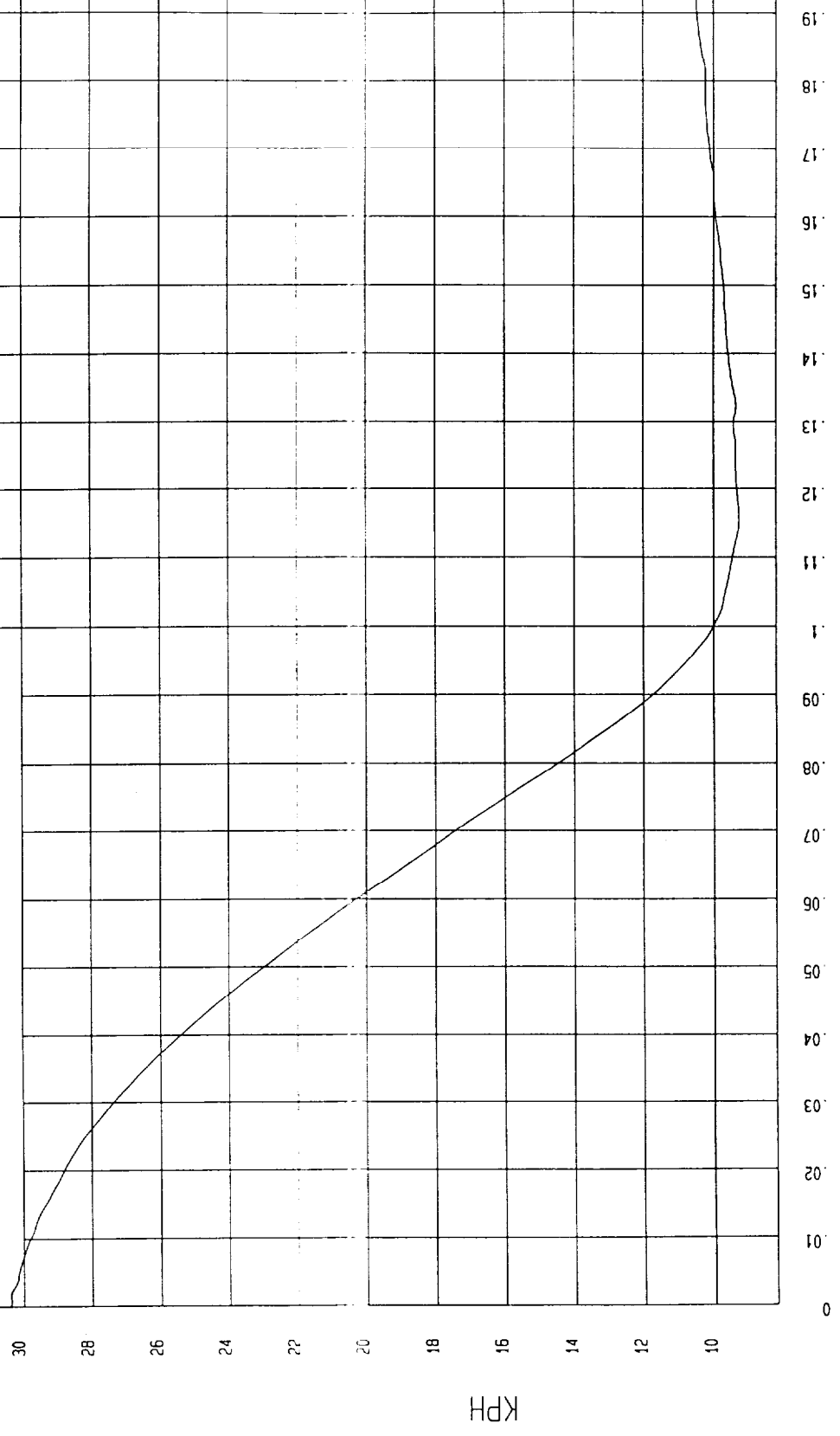
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 9.27 KPH at 116 msec Maximum = 30.42 KPH at -9 msec

CART CG X VELOCITY

1 CS7030A1.V54 Filterclass (180)



WGA Research
04-20-1997 12:06

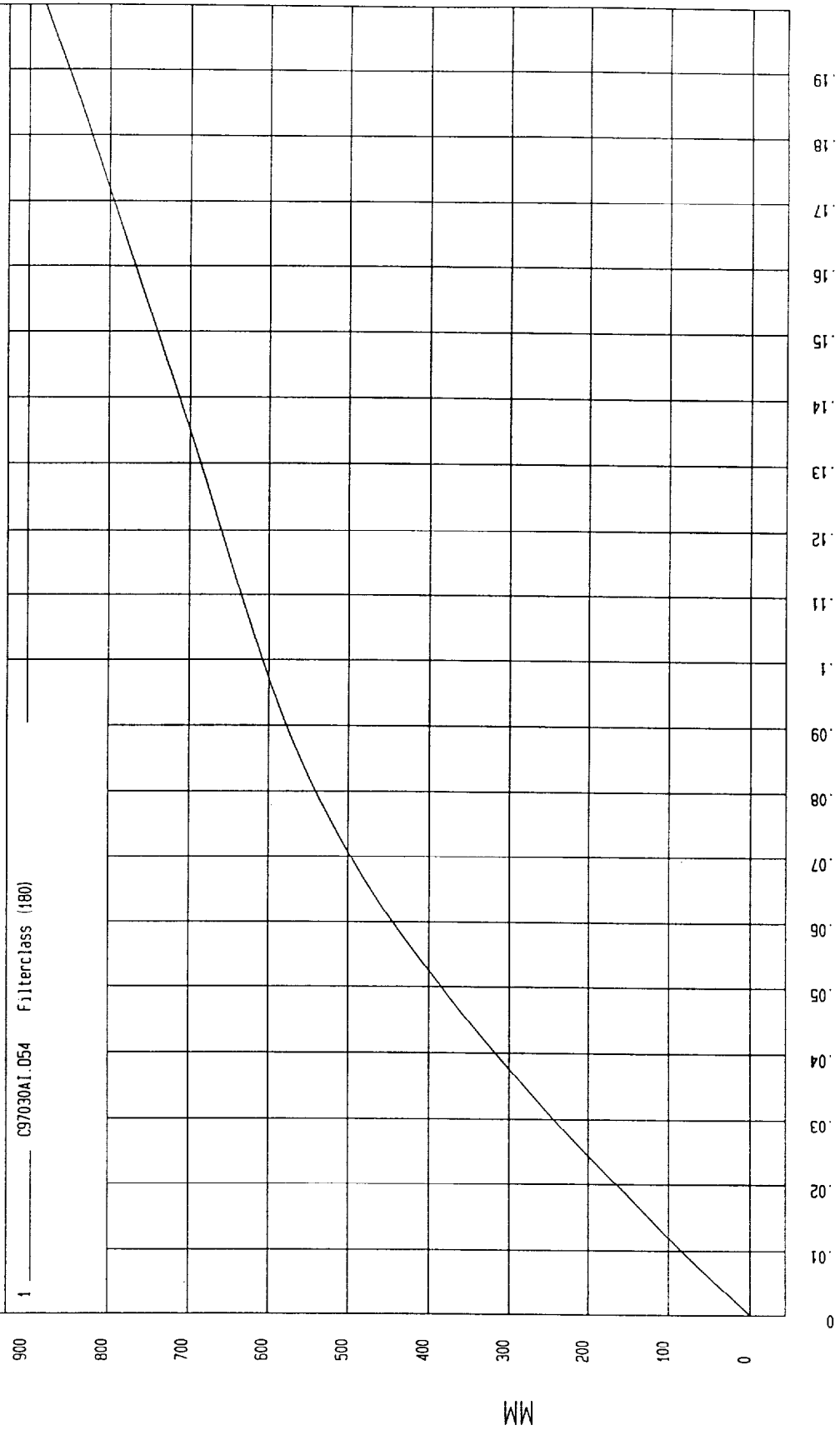
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 0 MM at 0 msec Maximum = 880.65 MM at 200 msec

CART CG X DISPLACEMENT

1 C97030A1.054 Filterclass (180)



WGA Research
04-20-1997 12:07

TIME Seconds

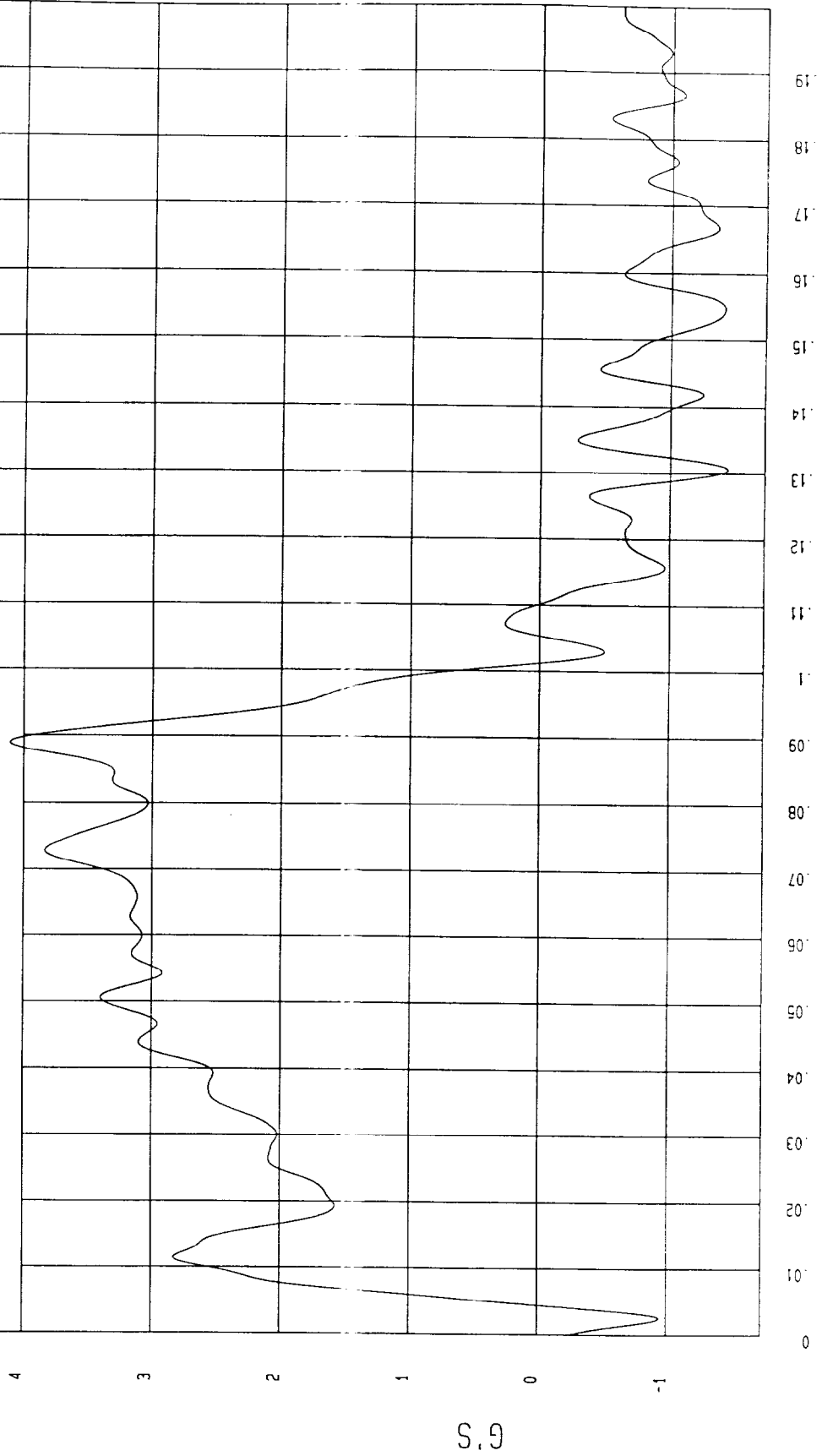
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -1.44 G'S at 131 msec Maximum = 4.10 G'S at 89 msec

CART CG Y

1 C97030AF.A55 Filterclass (60)



MCA Research
04-20-1997 12:07

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 10.32 KPH at 4 msec

Maximum = 19.50 KPH at 101 msec

CART CG Y VELOCITY

1 — C97030A1.V55 Filterclass (180)

18

16

14

12

10

KPH

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

TIME Seconds

WCA Research
04-20-1997 12:06

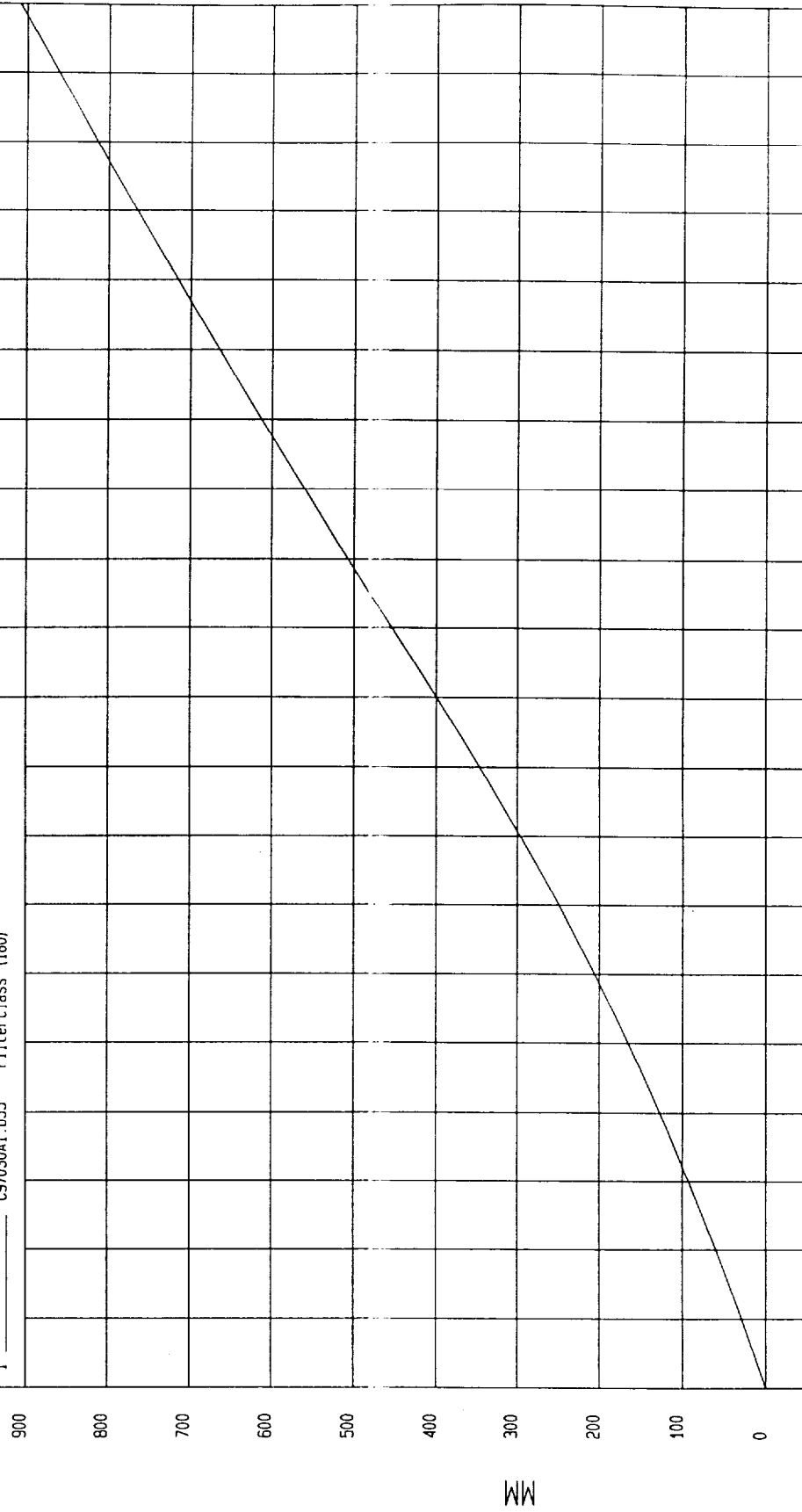
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 0 MM at 0 msec Maximum = 907.61 MM at 200 msec

CART CG Y DISPLACEMENT

1 _____ C97030A1.055 Filterclass (180)



MGA Research
04-20-1997 12:07

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

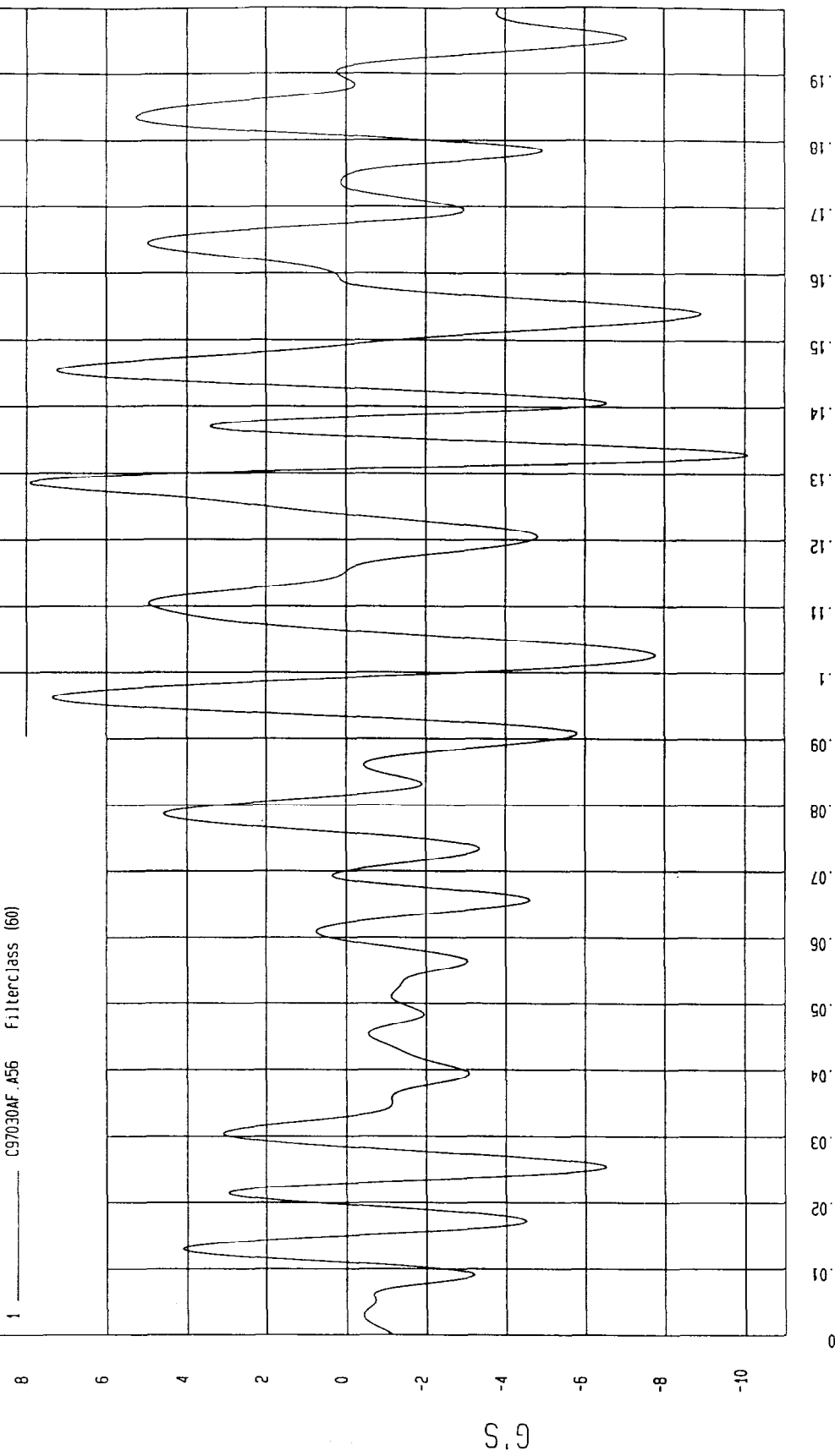
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -10.07 G'S at 133 msec

Maximum = 7.92 G'S at 128 msec

CART CG Z

1 C97030AF .A56 Filterclass (60)



MCA Research
04-20-1997 12:08

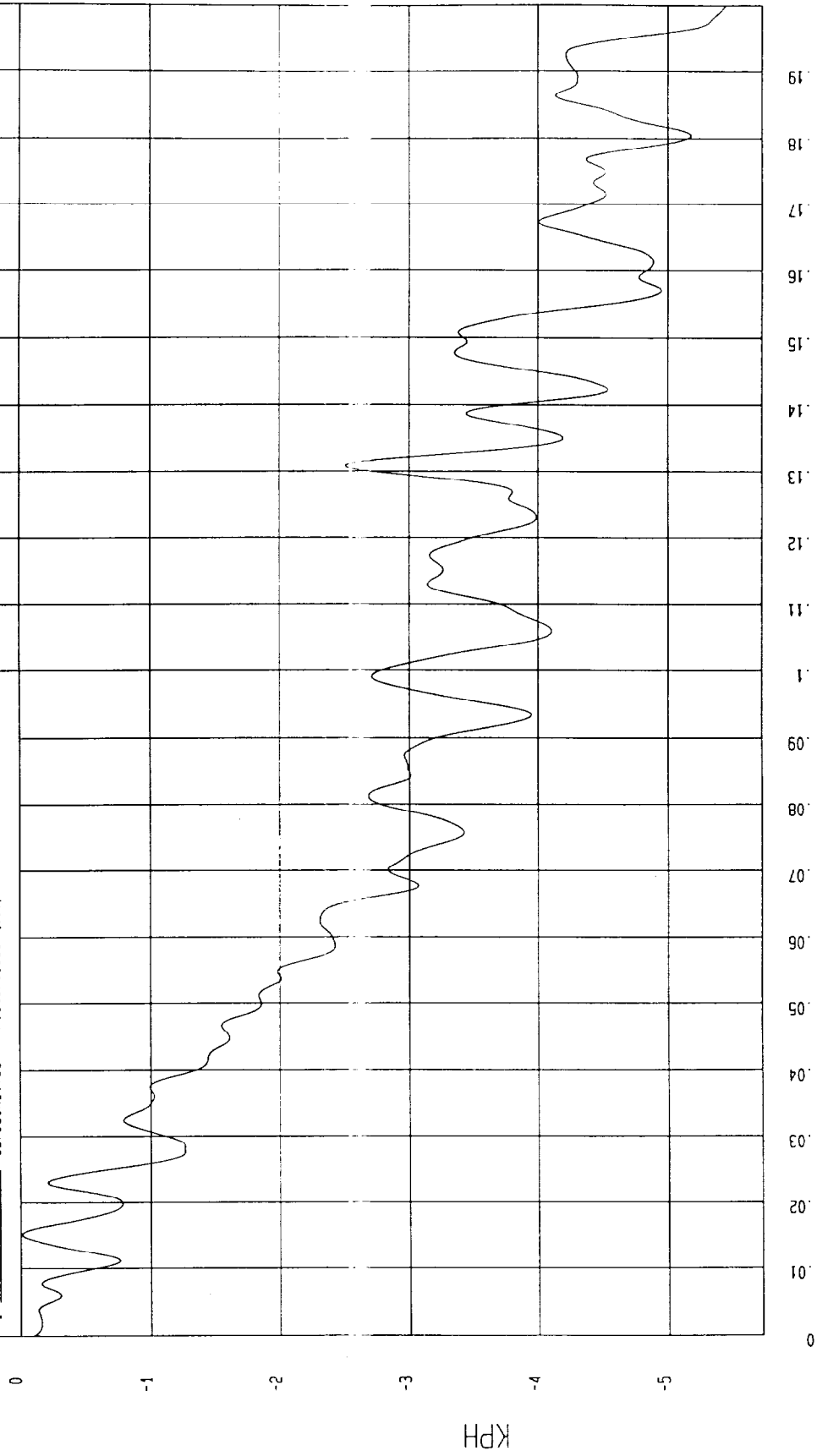
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -5.43 KPH at 200 msec Maximum = 6.26E-02 KPH at -18 msec

CART CG Z VELOCITY

1 _____ CS7030A1.V56 Filterclass (180)



MCA Research
04-20-1997 12:05

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

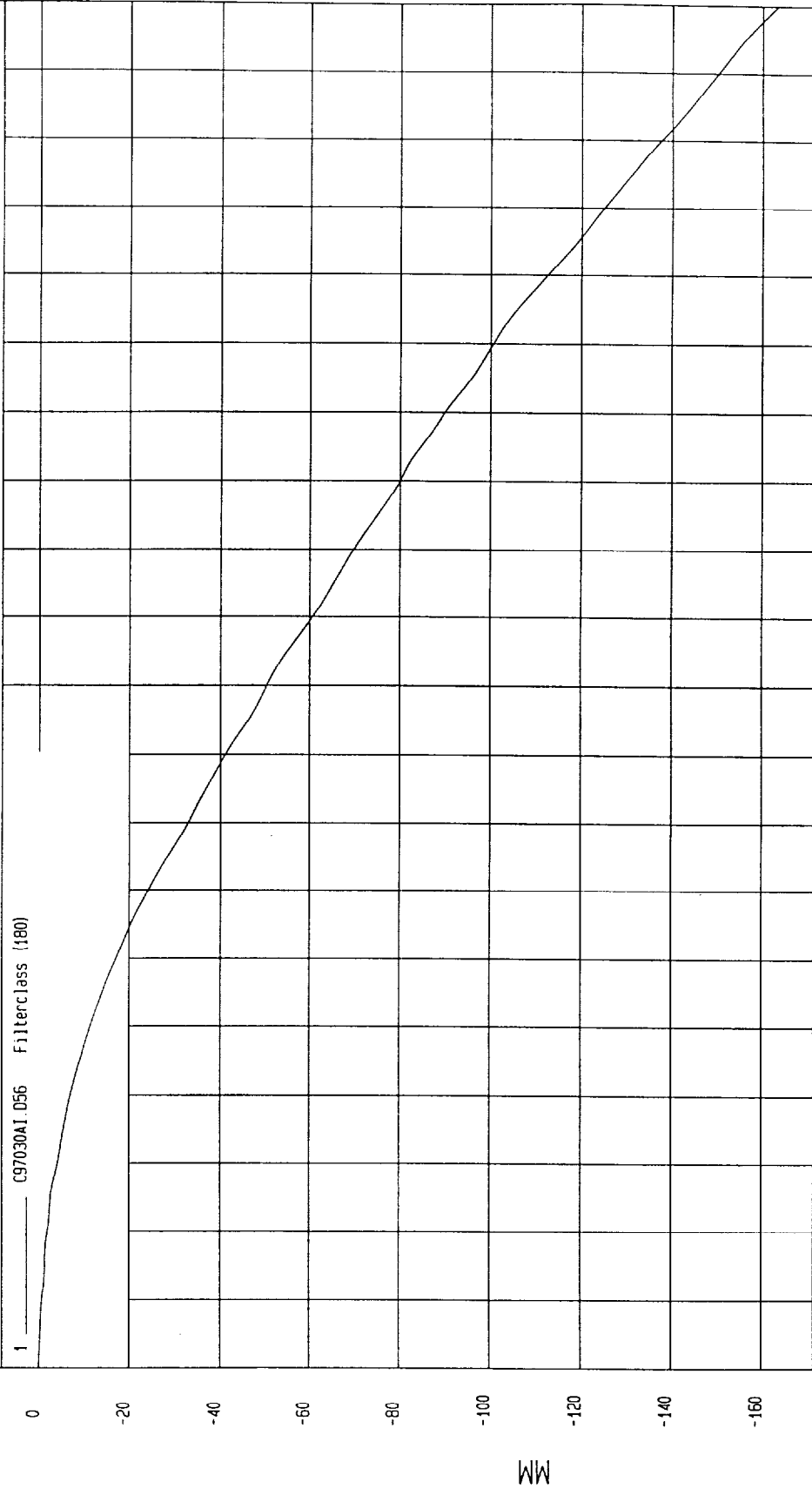
COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -163.24 MM at 200 msec

Maximum = 0 MM at 0 msec

CART CG Z DISPLACEMENT

1 — C97030A1 D56 Filterclass (180)



TIME Seconds
NQA Research
04-20-1997 12:07

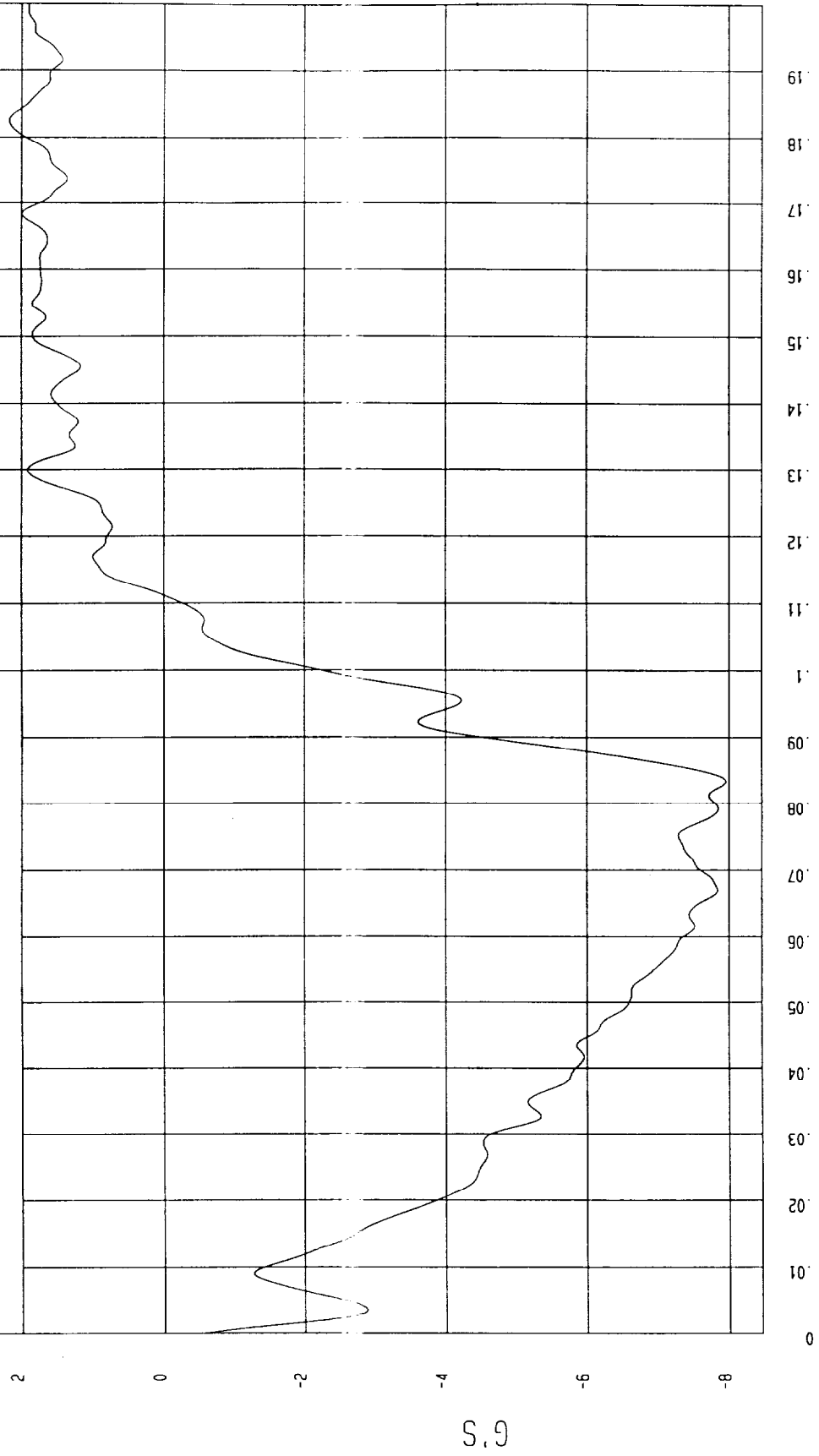
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -7.95 G'S at 83 msec Maximum = 2.16 G'S at 182 msec

CART REAR X

1 C97030AF .457 Filterclass (60)



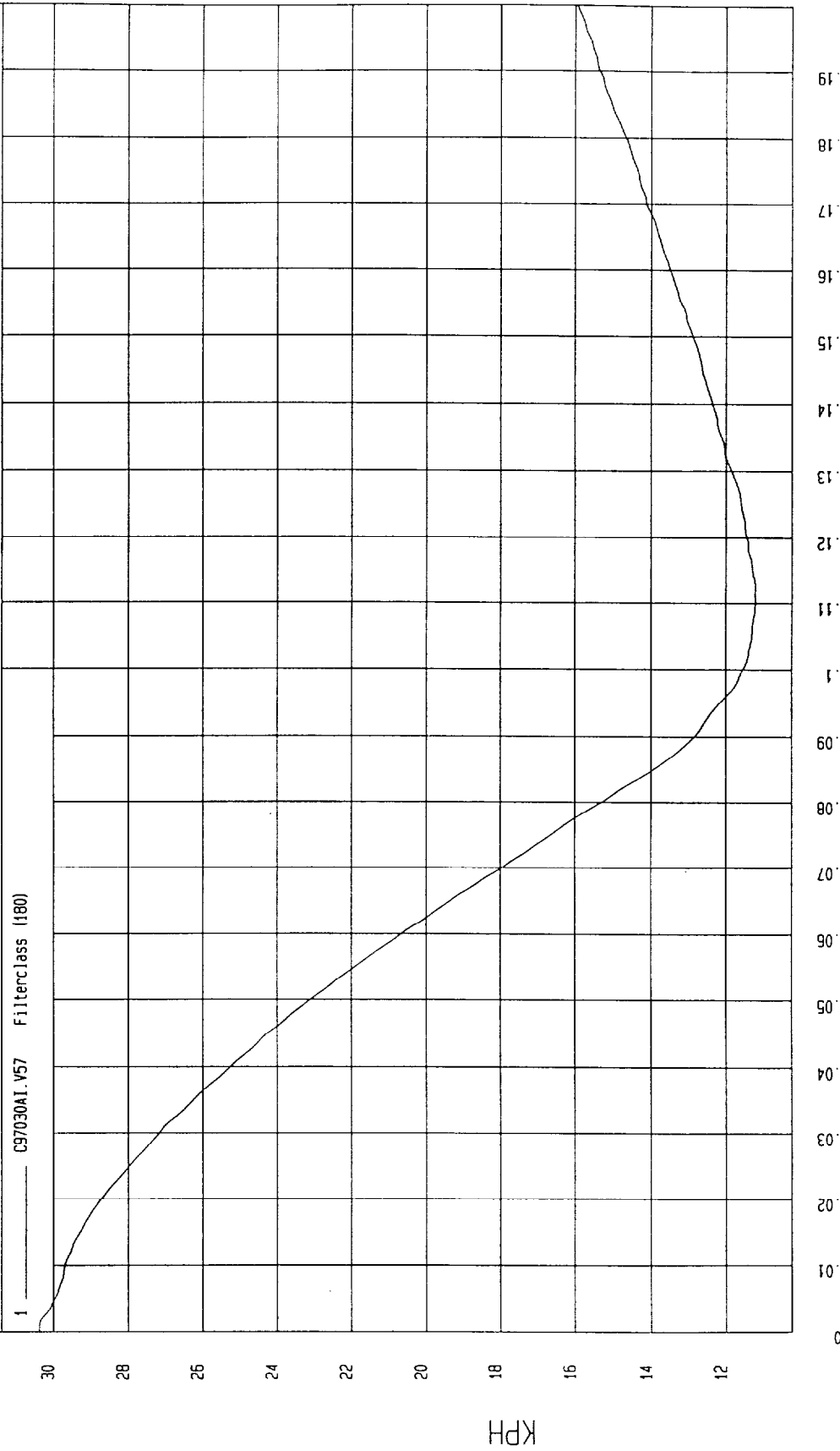
MCA Research
04-20-1997 12:08

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 11.23 KPH at 112 msec Maximum = 30.40 KPH at -18 msec

CART REAR X VELOCITY



WCA Research
04-20-1997 12:17

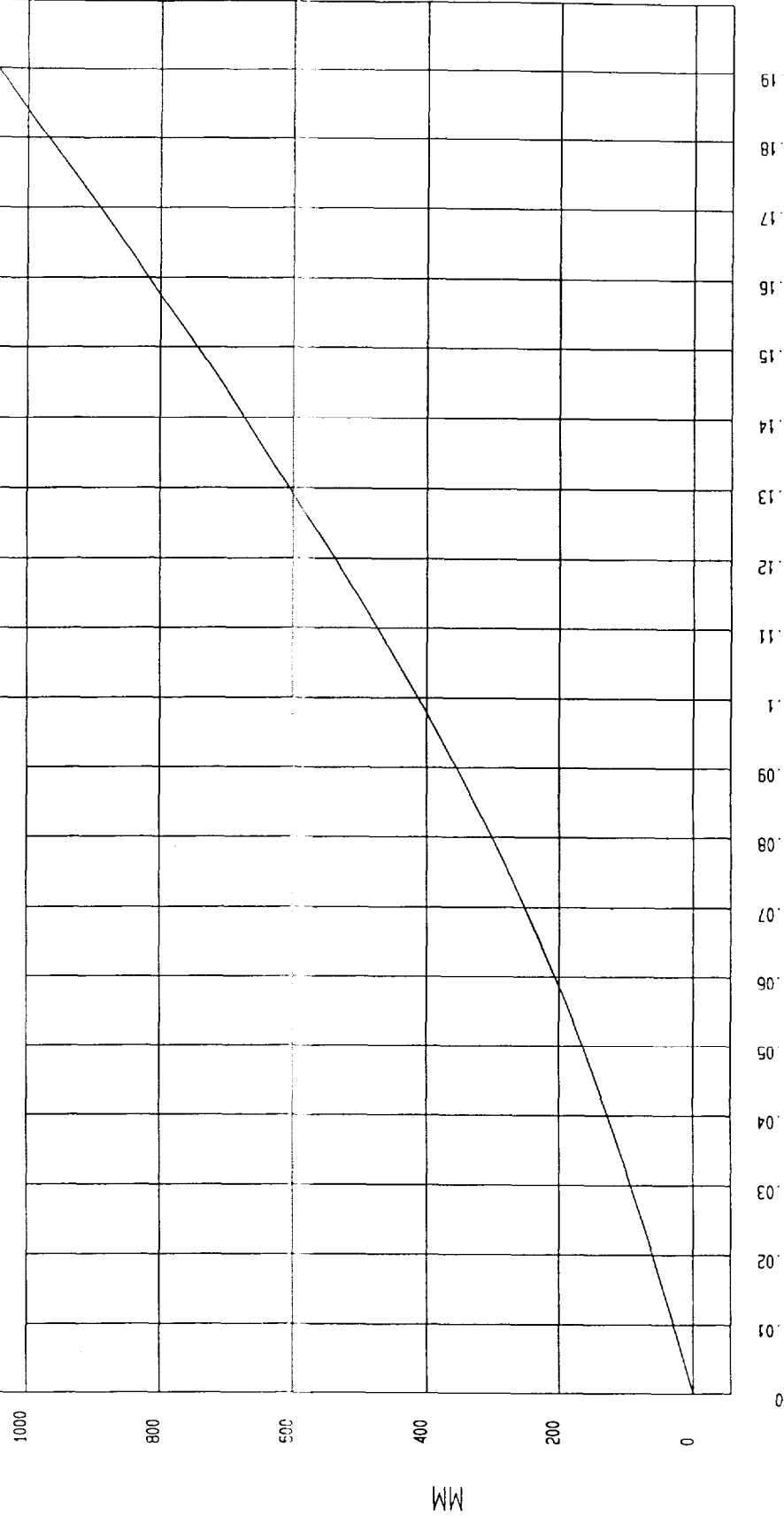
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 0 MM at 0 msec Maximum = 1125.32 MM at 200 msec

CART REAR X DISPLACEMENT

1 _____ C97030AT.058 Filterclass (180)



MGA Research
04-20-1997 12:17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

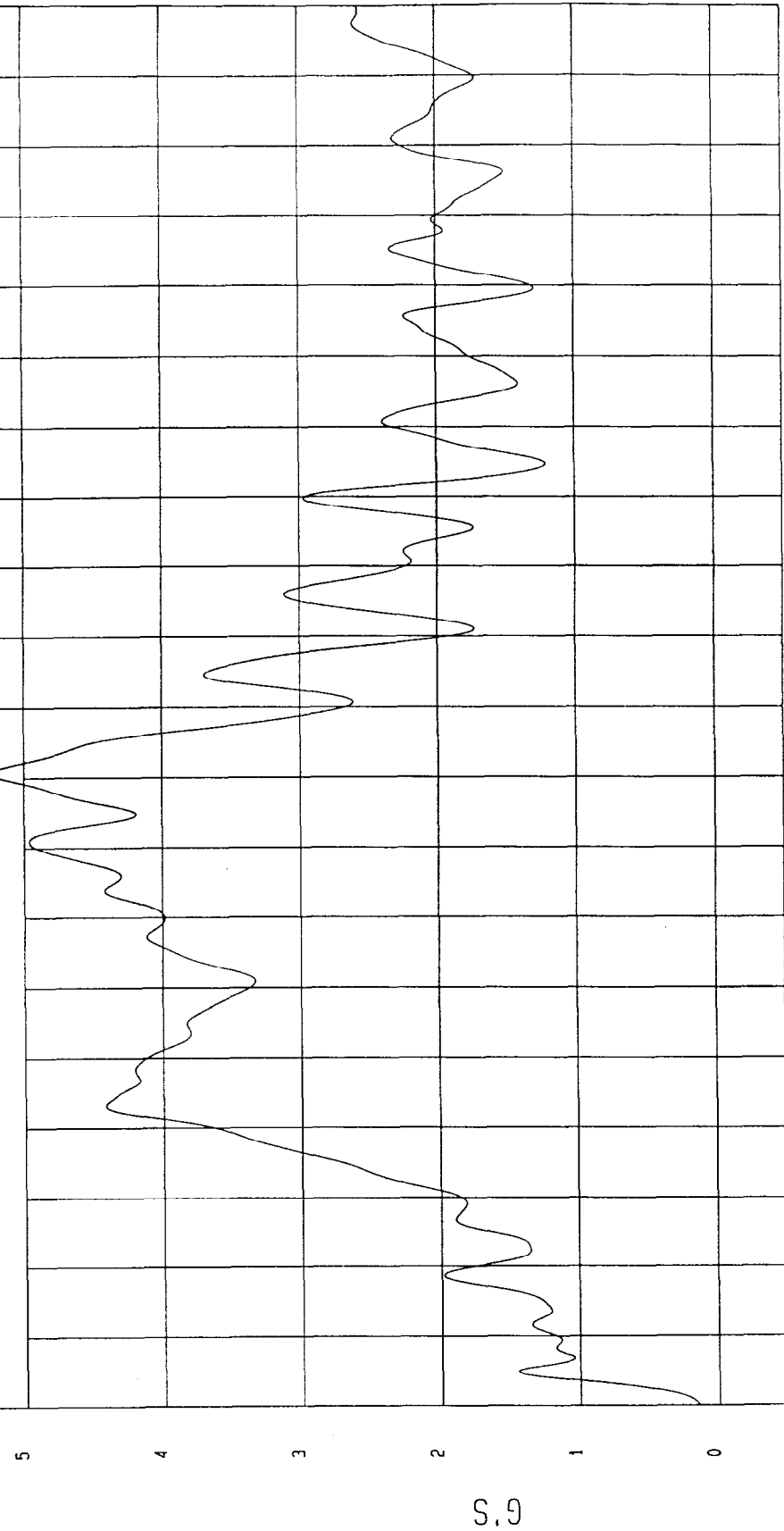
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = - .22 G'S at -10 msec

Maximum = 5.22 G'S at 91 msec

CART REAR Y

1 _____ C97030AF .A58 Filterclass (60)



WCA Research
04-20-1997 12.08

TIME (seconds)

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

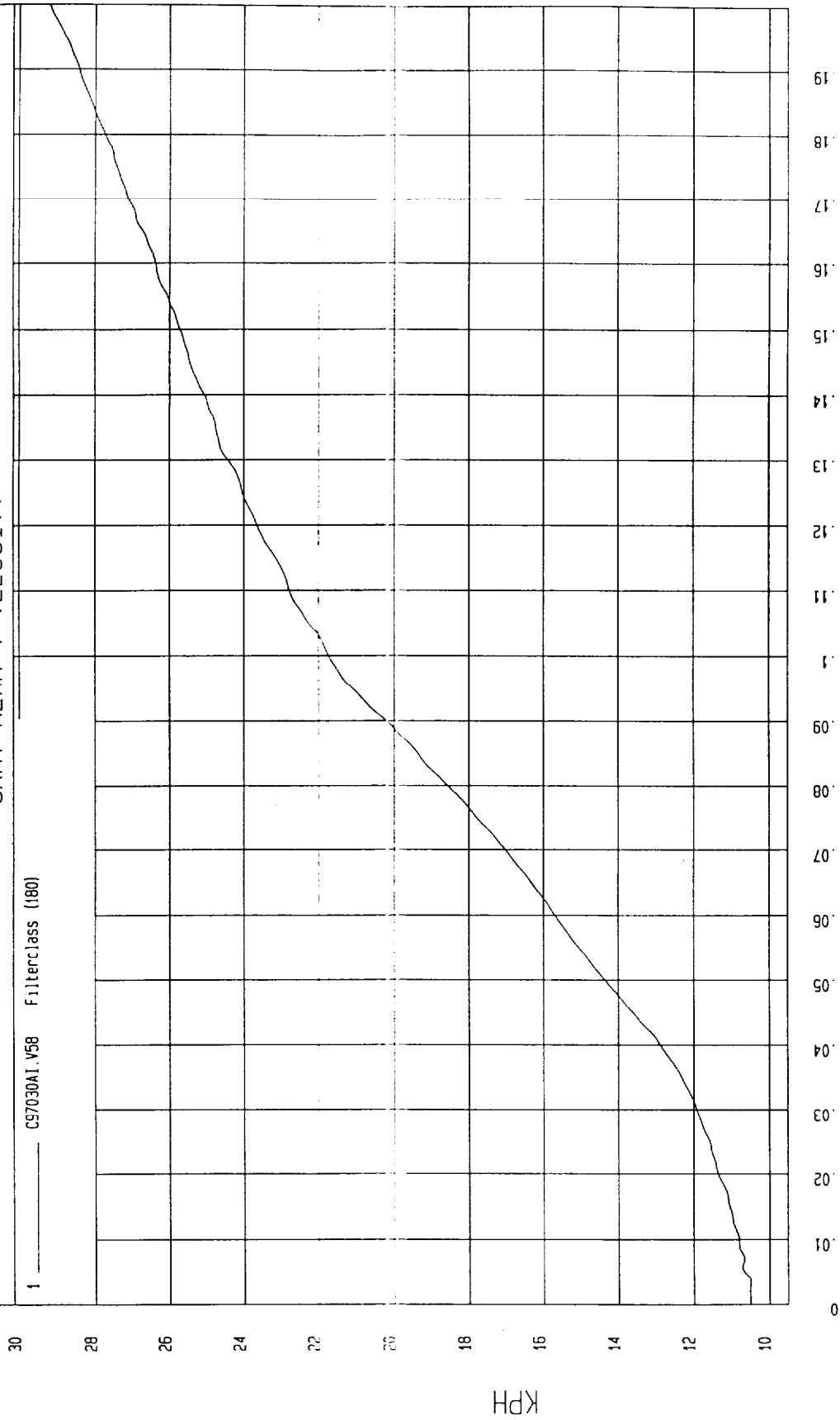
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 10.45 KPH at -7 msec

Maximum = 29.21 KPH at 200 msec

CART REAR Y VELOCITY

1 _____ CS7030AI.V58 Filterclass (180)



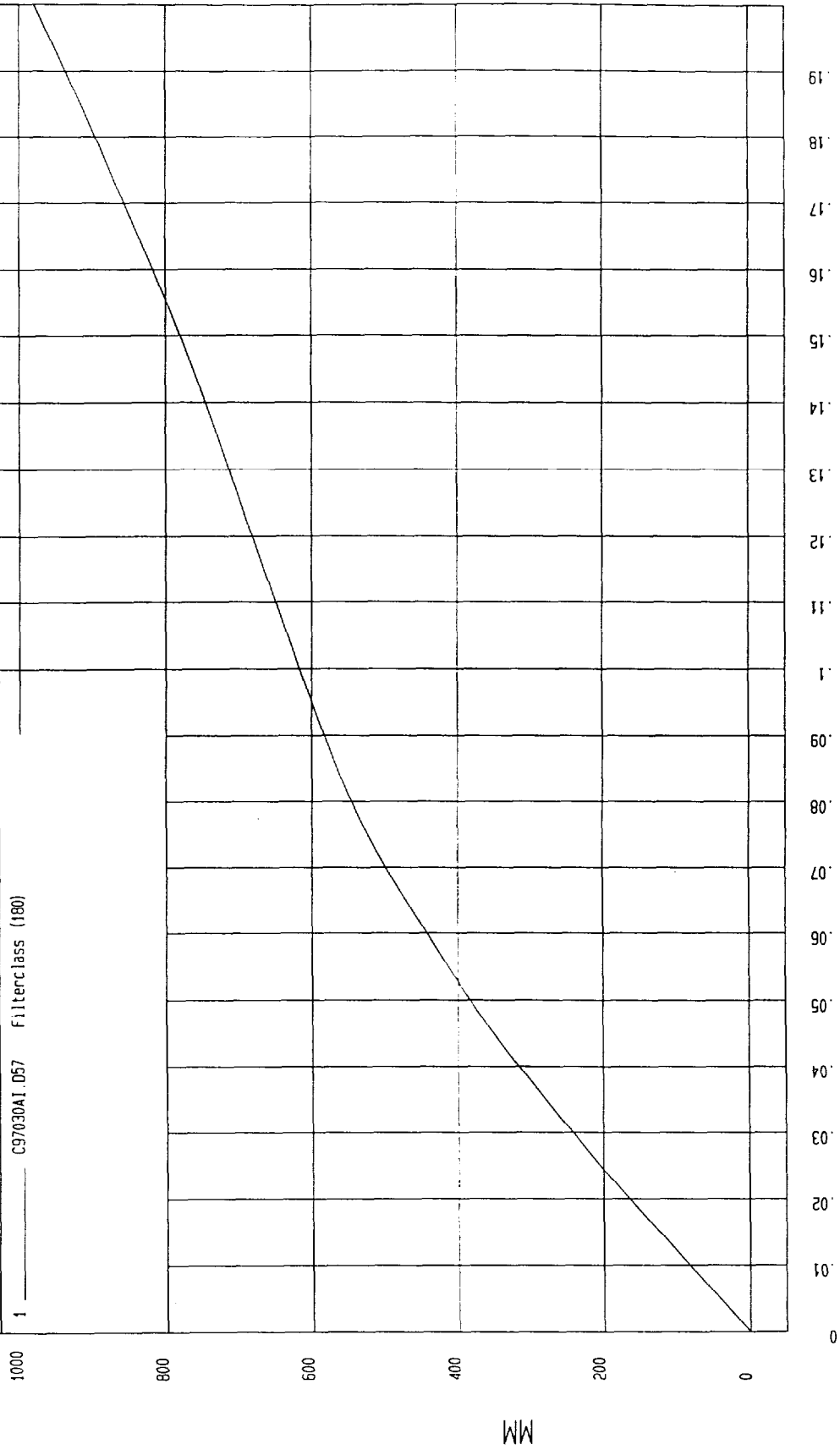
WCA Research
04-20-1997 12:47

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = 0 MM at 0 msec Maximum = 979.79 MM at 200 msec

CART REAR Y DISPLACEMENT



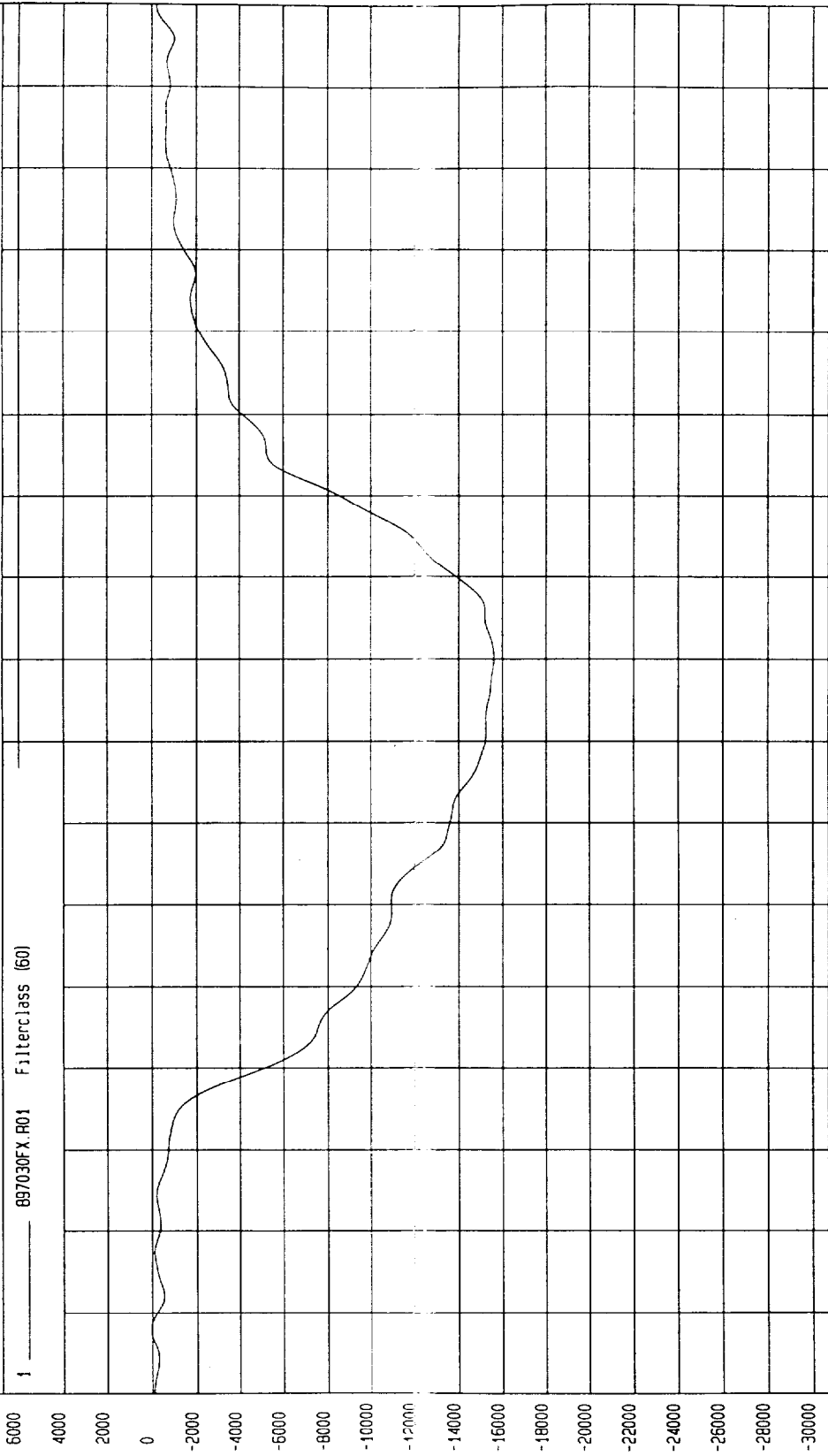
NCA Research
04-20-1997 12:17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -15606.14 N at 80 msec Maximum = 77 N at 175 msec

SUMMED X AXIS FORCES - ROW #1



TIME (SECONDS)

MCA Research
05-04-1998 14: 41

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

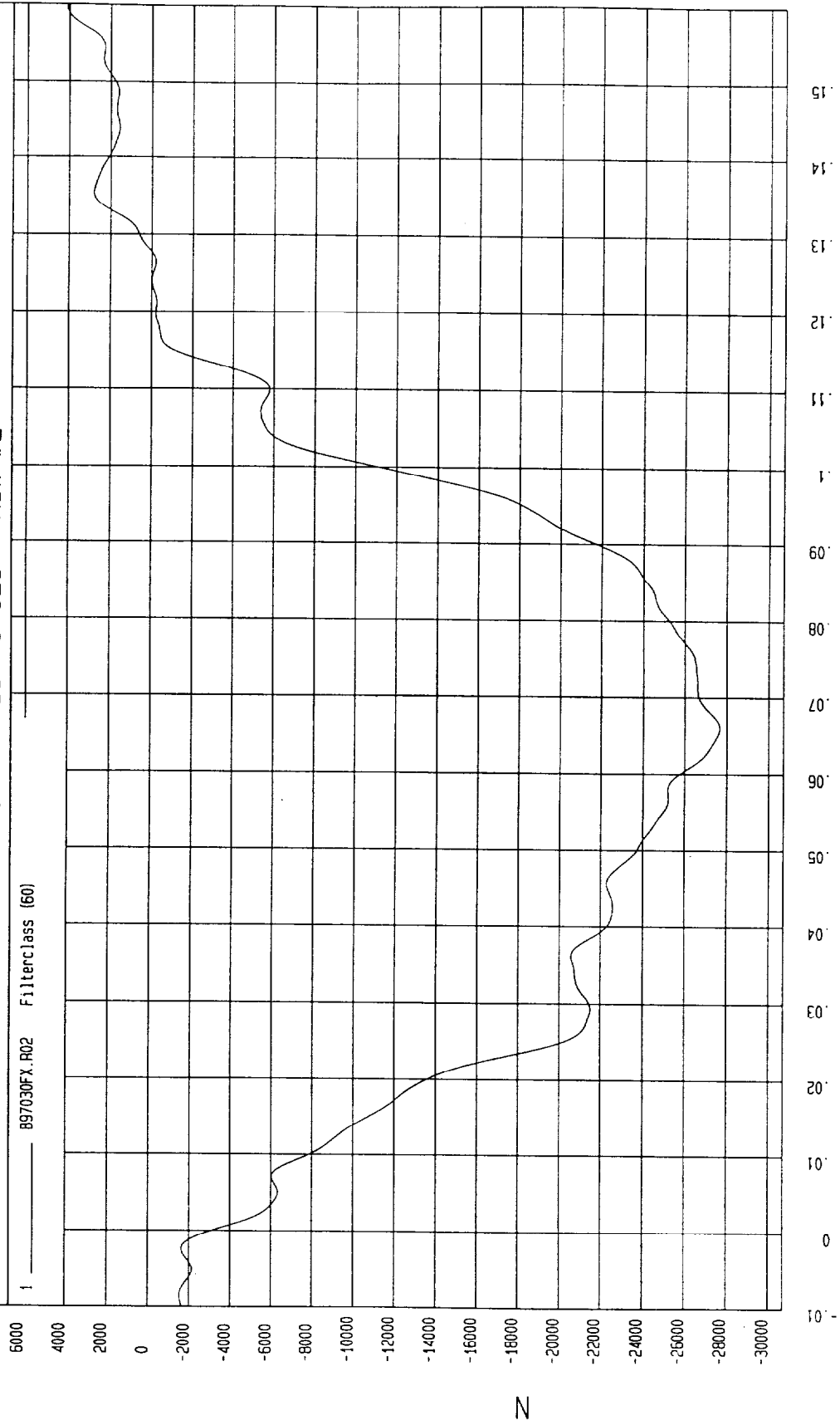
COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -27673.02 N at 66 msec

Maximum = 4089.13 N at 160 msec

SUMMED X AXIS FORCES - ROW #2

1 — 897030FX.R02 FilterClass (60)



MGA Research
06-04-1998 14: 41

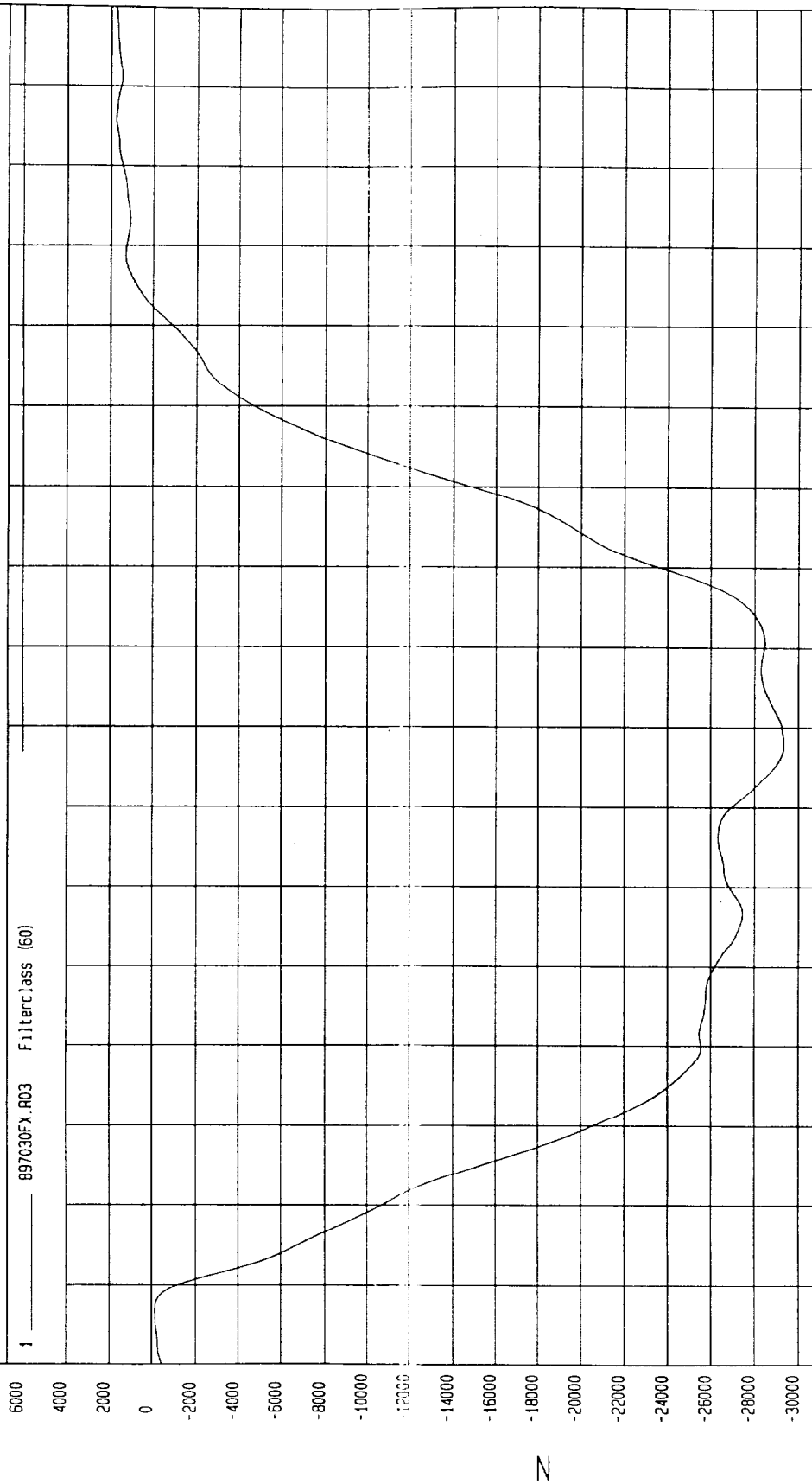
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -29333.23 N at 68 msec Maximum = 1816.31 N at 161 msec

SUMMED X AXIS FORCES - ROW #3

1 897030FX.R03 Filterclass (60)



TIME (SECONDS)

MGA Research
05-04-1998 14: 41

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

SPEED: 20 MPH 32.2 KPH

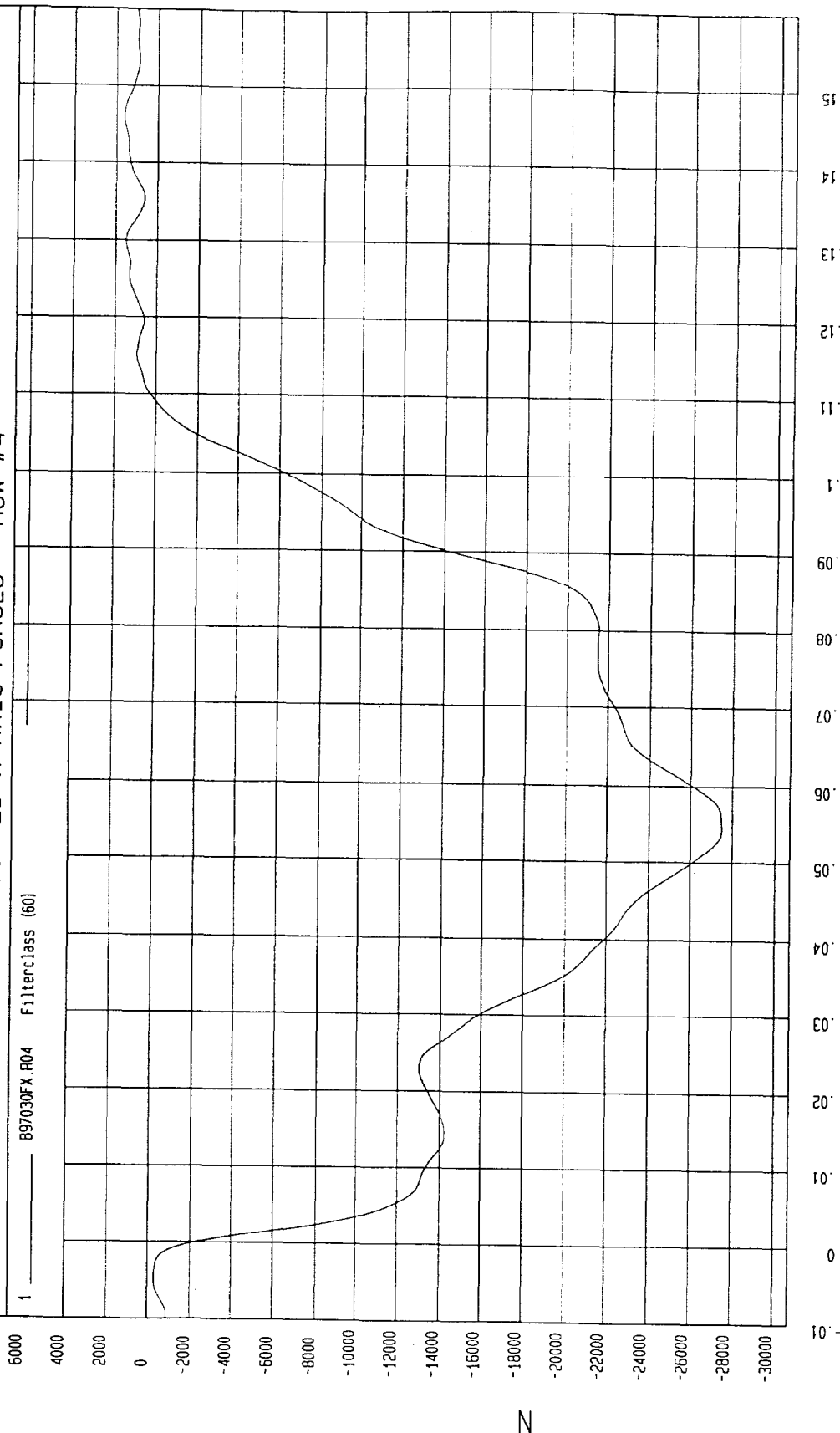
COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Minimum = -27498.33 N at 54 msec

Maximum = 1803.06 N at 177 msec

SUMMED X AXIS FORCES - ROW #4

1 ——— B97030FX.R04 Filterclass (60)



MGA Research
06-04-1998 14.42

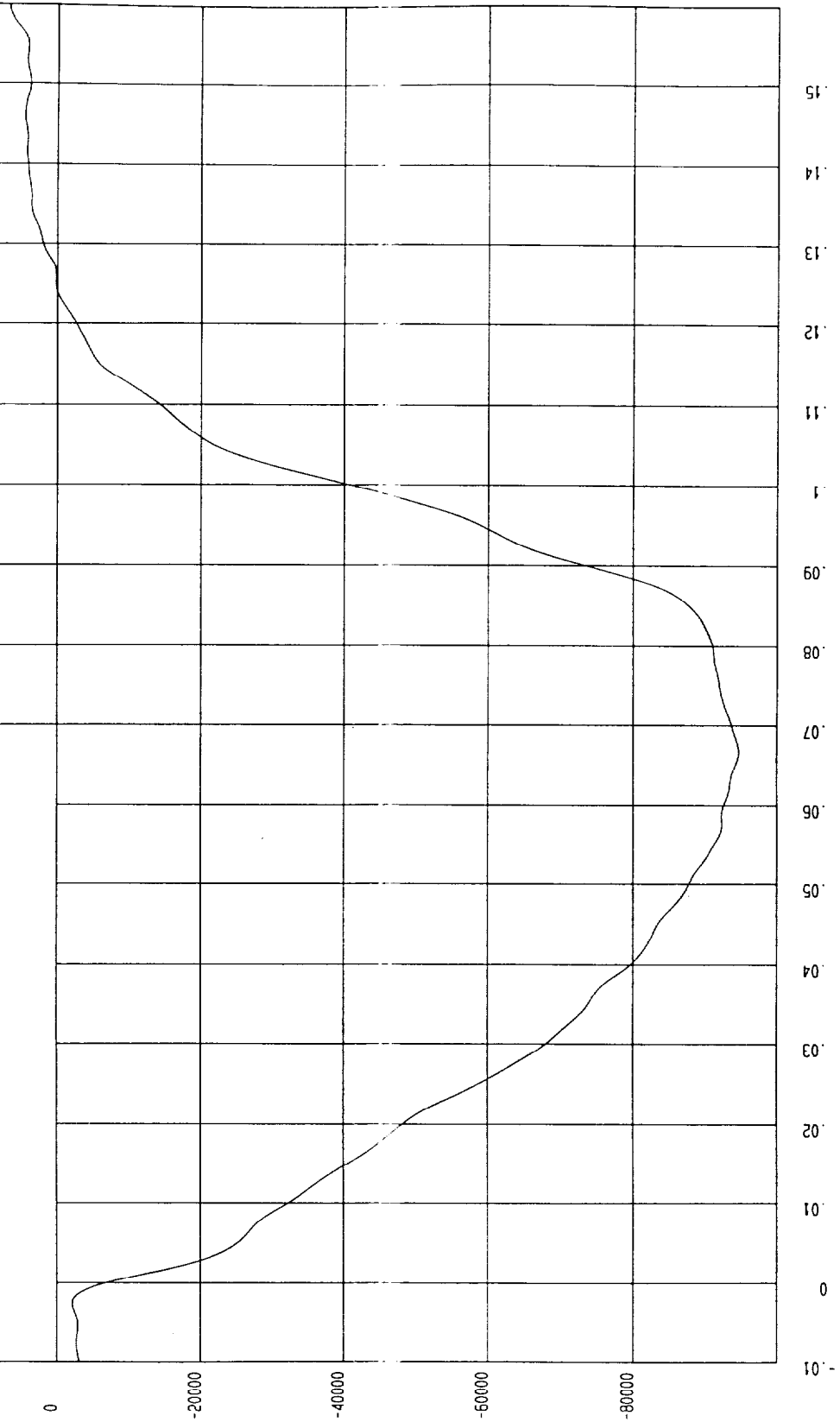
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -94502.95 N at 67 msec Maximum = 6630.46 N at 160 msec

SUM OF ALL X AXIS FORCES

1 ——— BS7030FU.X01 Filterclass (60)



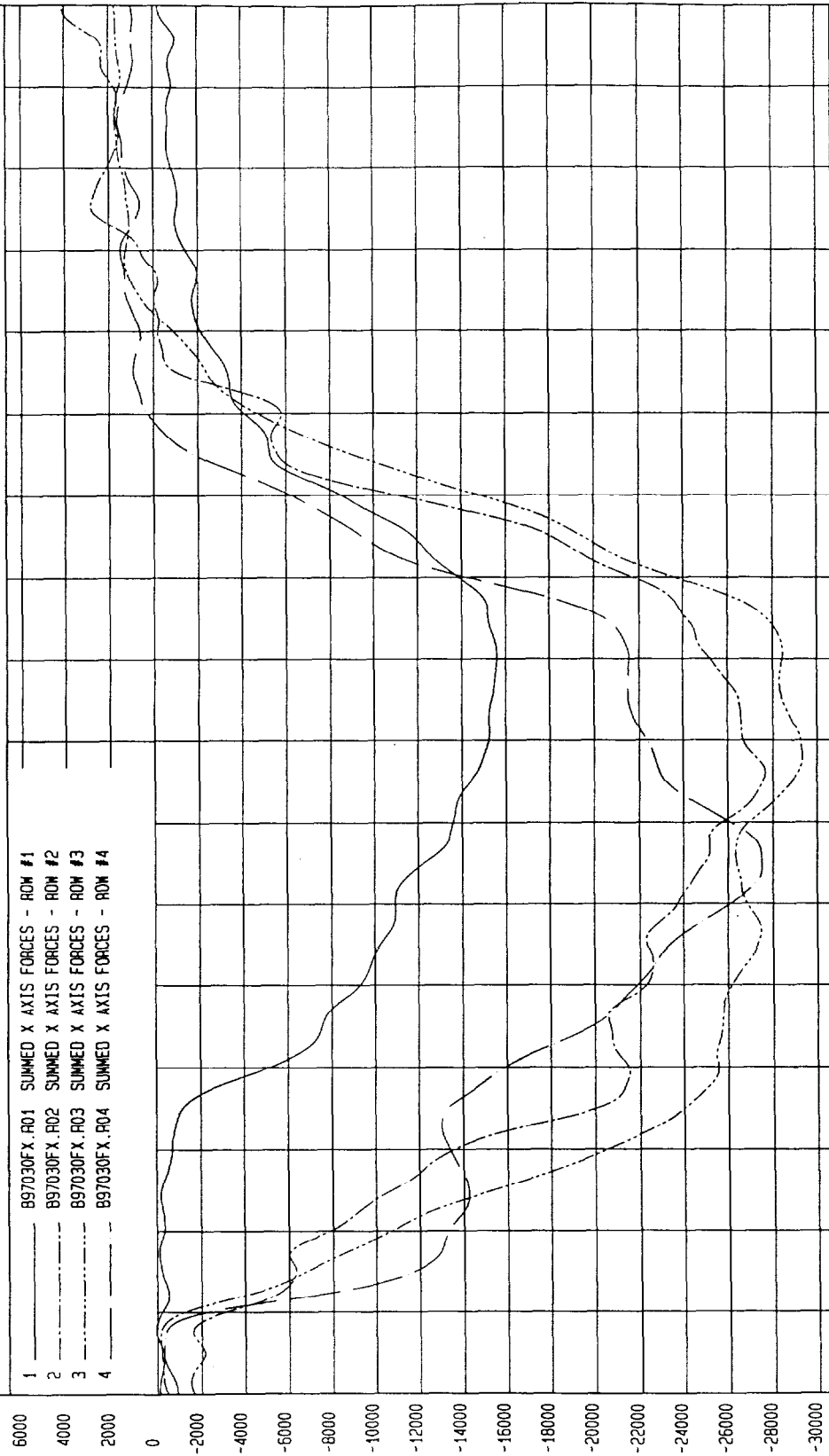
MSA Research
06-04-1998 14:53

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

X AXIS FORCES - SUMMED BY ROWS

- 1 ——— B97030FX.R01 SUMMED X AXIS FORCES - ROW #1
- 2 - - - B97030FX.R02 SUMMED X AXIS FORCES - ROW #2
- 3 - - - B97030FX.R03 SUMMED X AXIS FORCES - ROW #3
- 4 - - - B97030FX.R04 SUMMED X AXIS FORCES - ROW #4



MCA Research
06-04-1996 14.43

TIME (SECONDS)

N

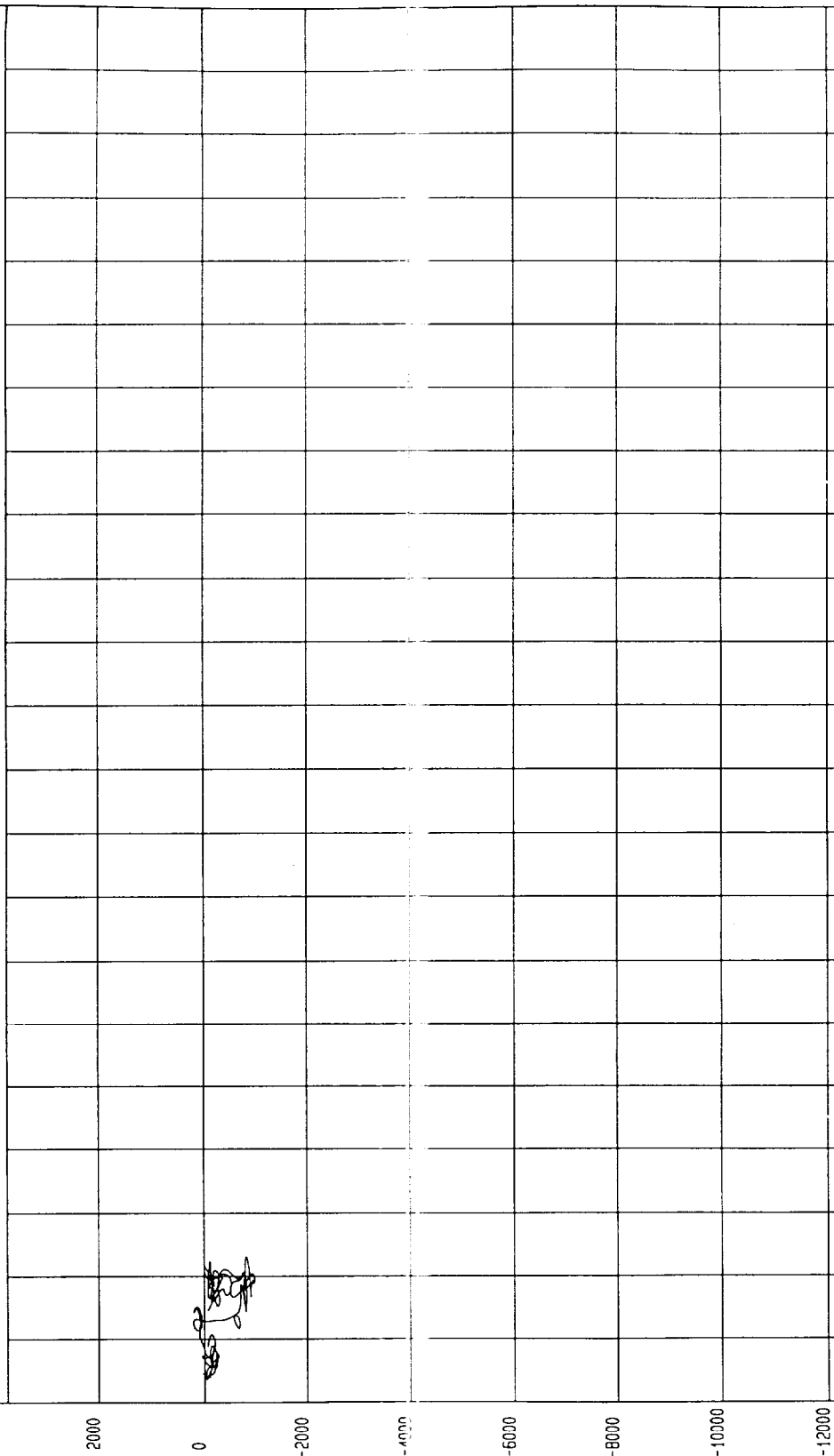
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -996.84 N at 10 MM

Maximum = 207.78 N at 2 MM

FORCE X LOAD CELL #29 VS STRINGPOT #29



MGA Research
06-04-1998 14: 16

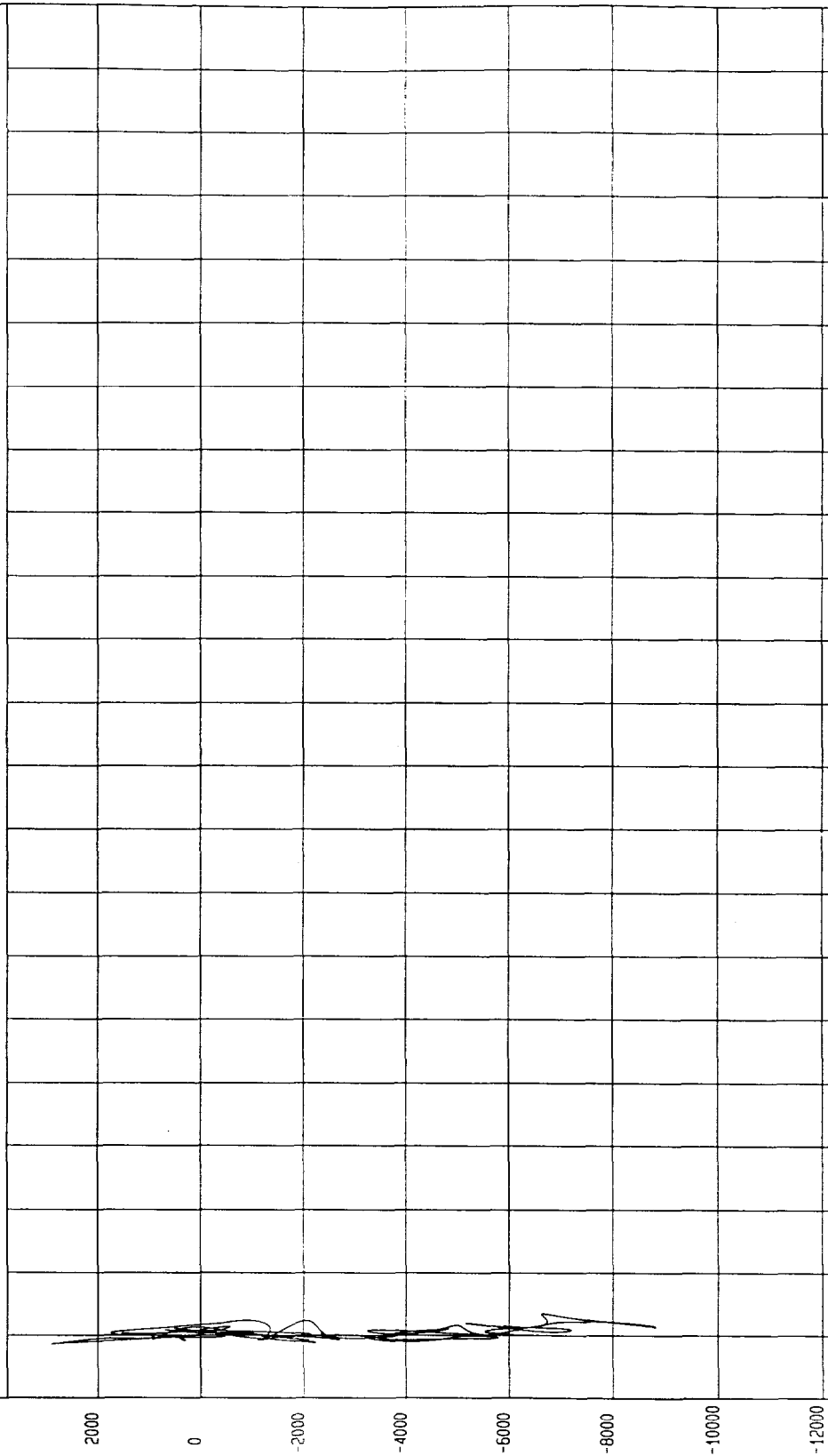
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -8828.60 N at 1 MM

Maximum = 2868.06 N at -1 MM

FORCE X LOAD CELL #30 VS STRINGPOT #30



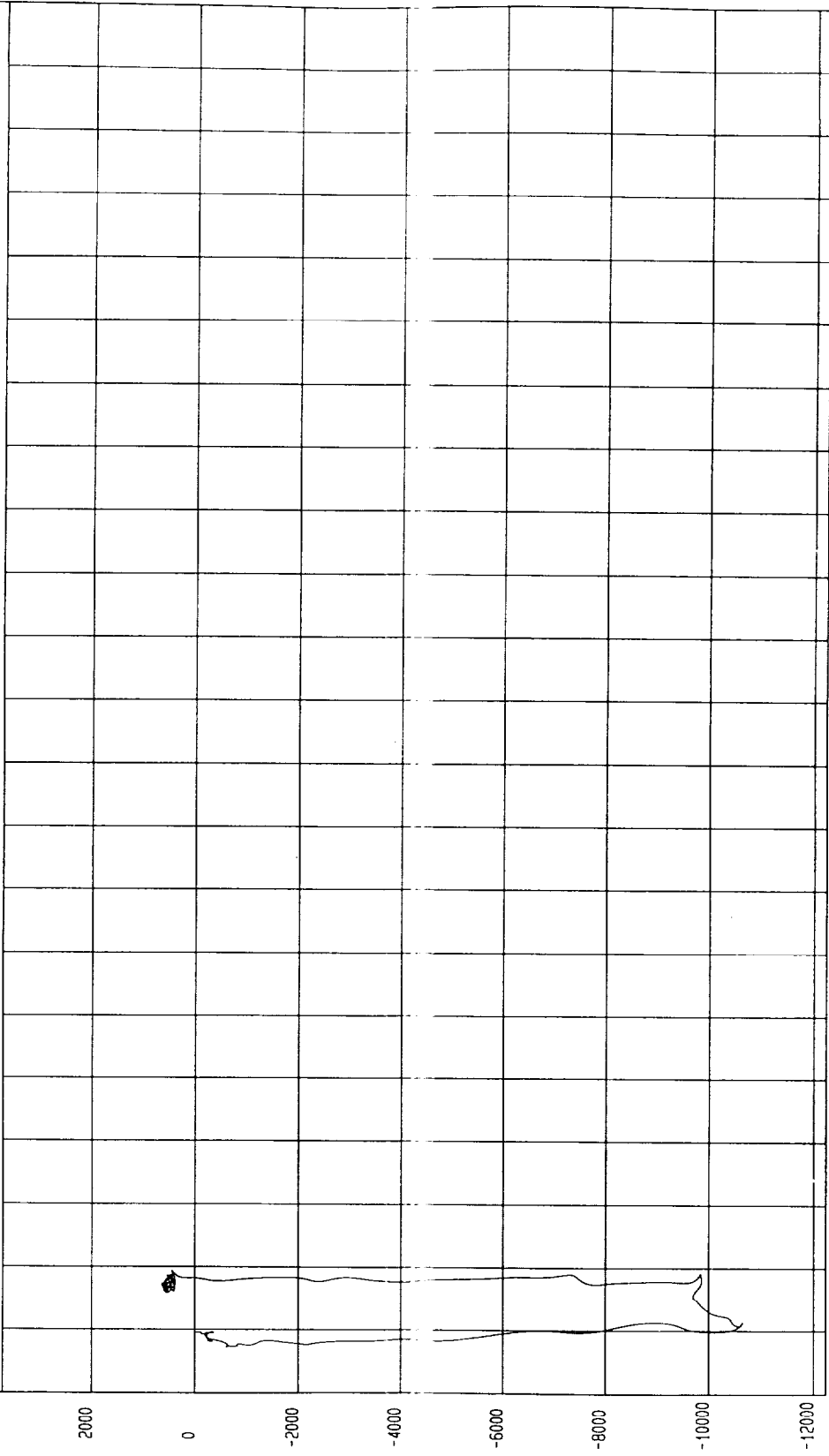
MGA Research
06-04-1998 14: 16

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -10645.9 N at 1 MM Maximum = 652.13 N at 7 MM

FORCE X LOAD CELL #31 VS STRINGPOT #31



STRING POT 31 MM

MCA Research
06-04-1998 14.16

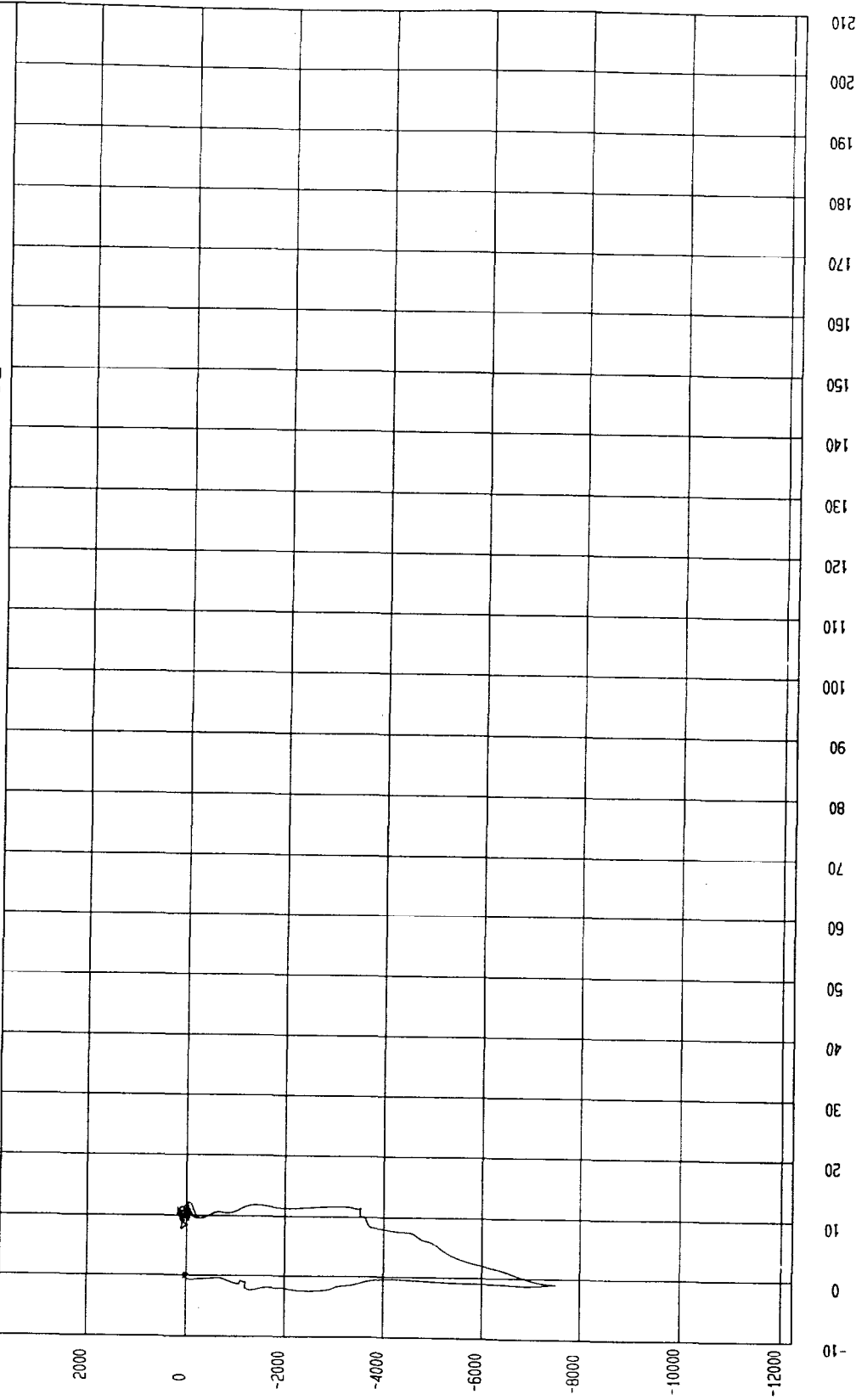
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -7523.4 N at -1 MM

Maximum = 185.41 N at 10 MM

FORCE X LOAD CELL #32 VS STRINGPOT #32



STRING POT 32 MM

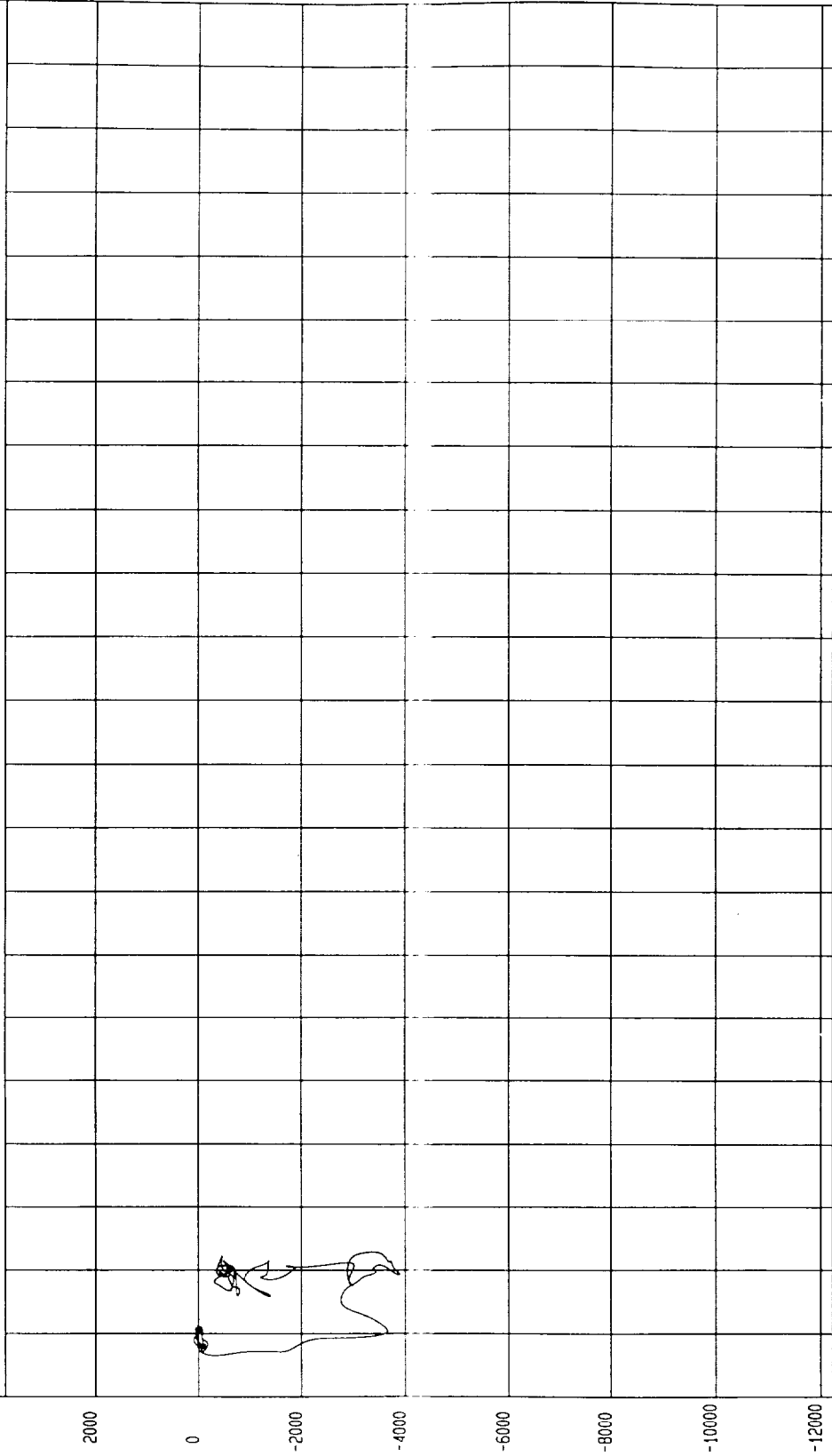
MCA Research
05-04-1998 14:15

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -3901.45 N at 9 MM Maximum = 87.90 N at -1 MM

FORCE X LOAD CELL #33 VS STRINGPOT #33



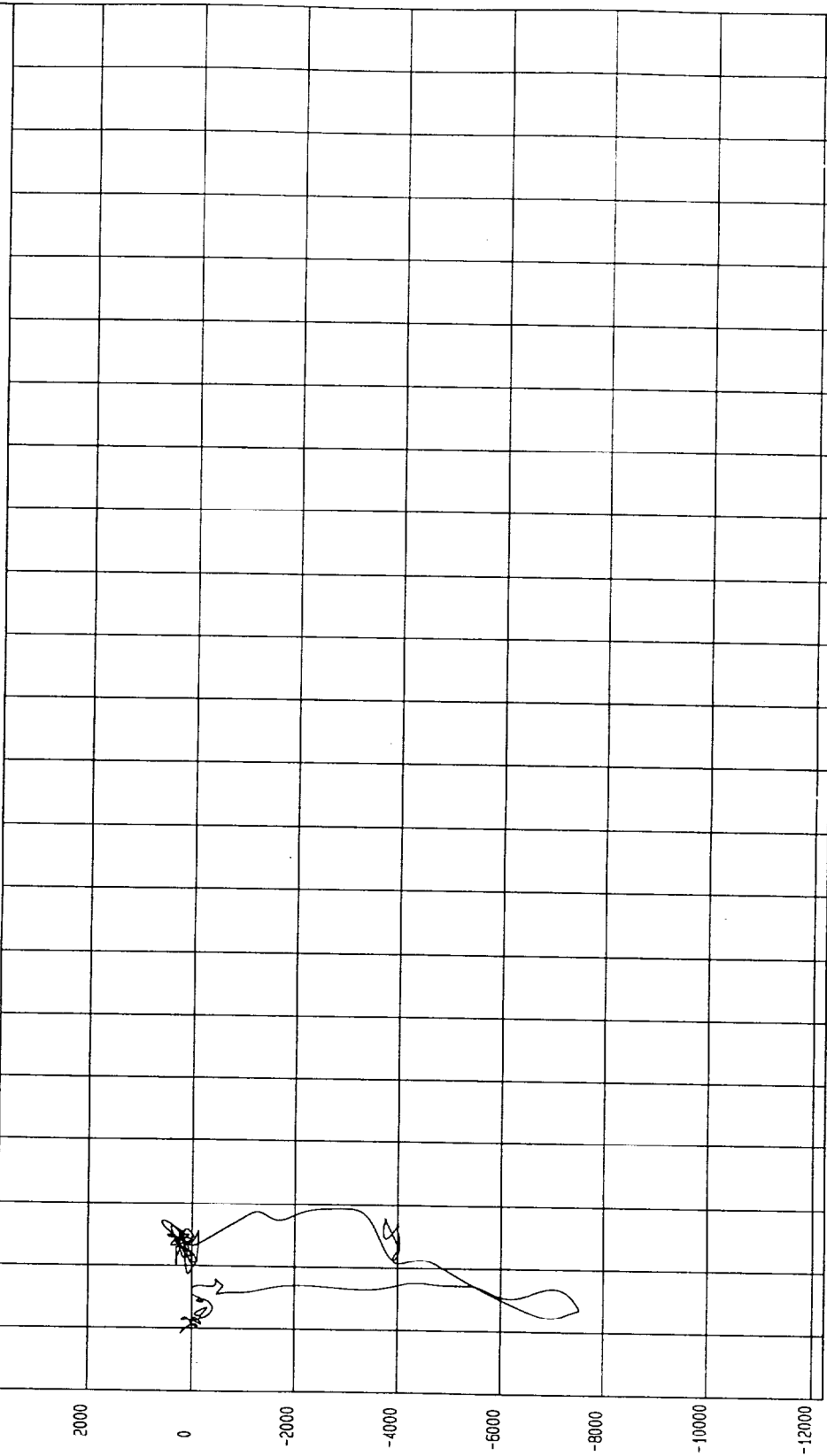
NSA Research
06-04-1996 14.16

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -7545.50 N at 4 MM Maximum = 587.62 N at 17 MM

FORCE X LOAD CELL #34 VS STRINGPOT #34



STRING POT 34 MM
MGA Research
06-04-1998 14: 16

LC #34 FX N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER

TEST DATE: 02-26-1997

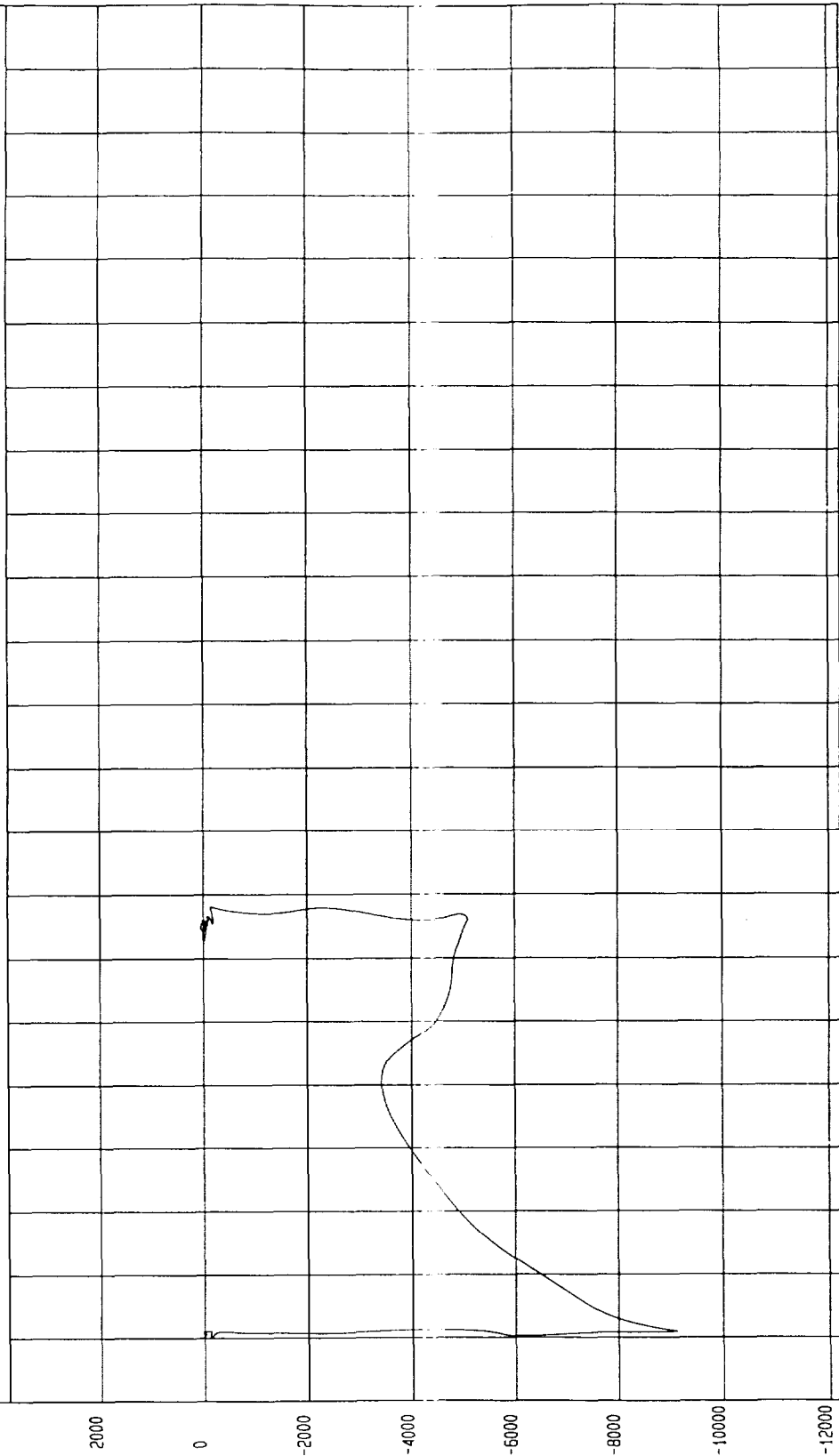
SPEED: 20 MPH 32.2 KPH

COMPONENT: FMVSS 214 DEFORMABLE BARRIER

Maximum = 52.65 N at 65 MM

Minimum = -9100.68 N at 1 MM

FORCE X LOAD CELL #35 VS STRINGPOT #35



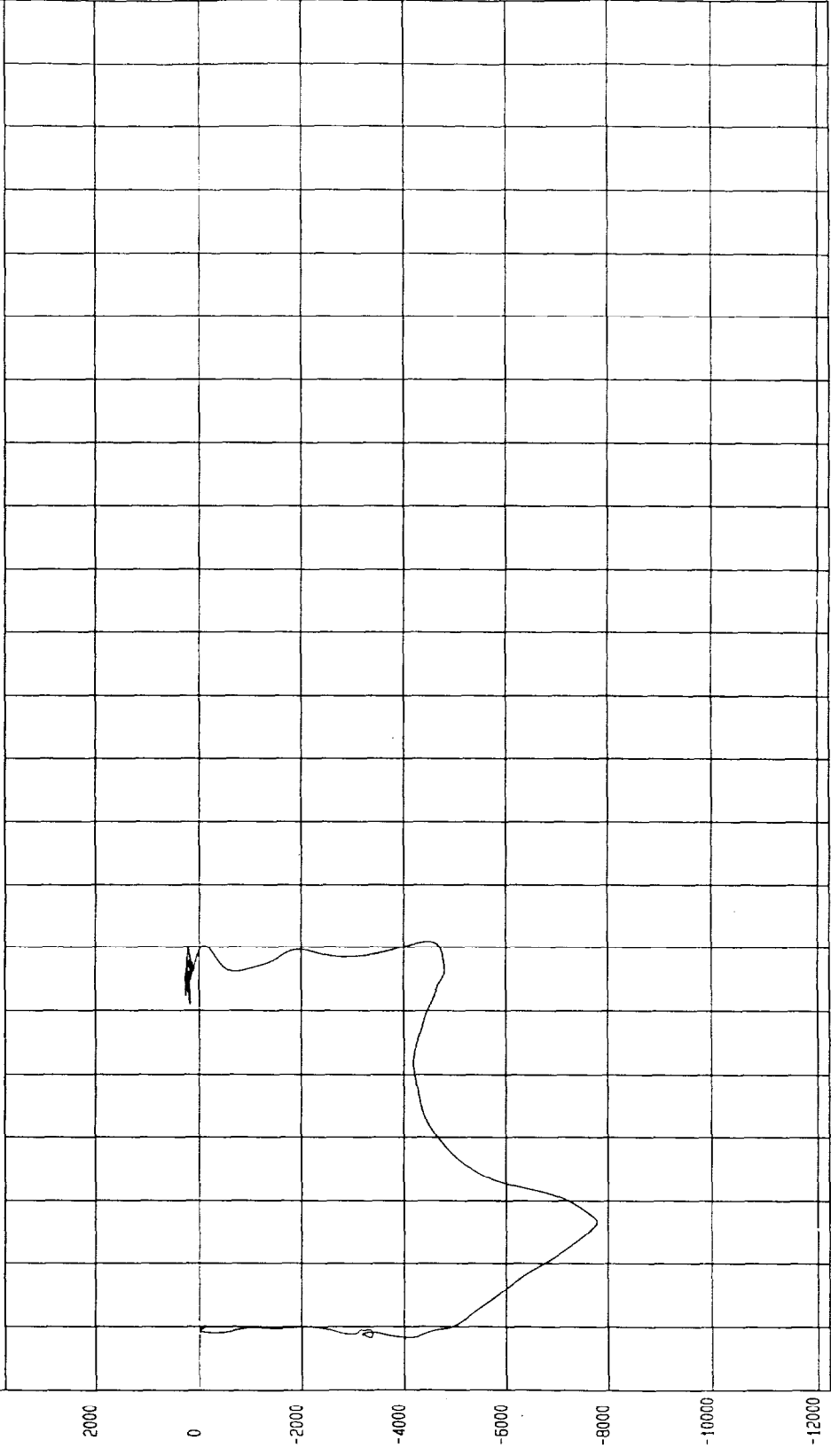
MCA Research
06-04-1998 14:17

STRING POT 35 MM

LC #35 FX N

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER	TEST DATE: 02-26-1997
COMPONENT: FMVSS 214 DEFORMABLE BARRIER	Speed: 20 MPH 32.2 KPH
Minimum = -7793.49 N at 17 MM	
Maximum = 267.36 N at 55 MM	

FORCE X LOAD CELL #36 VS STRINGPOT #36



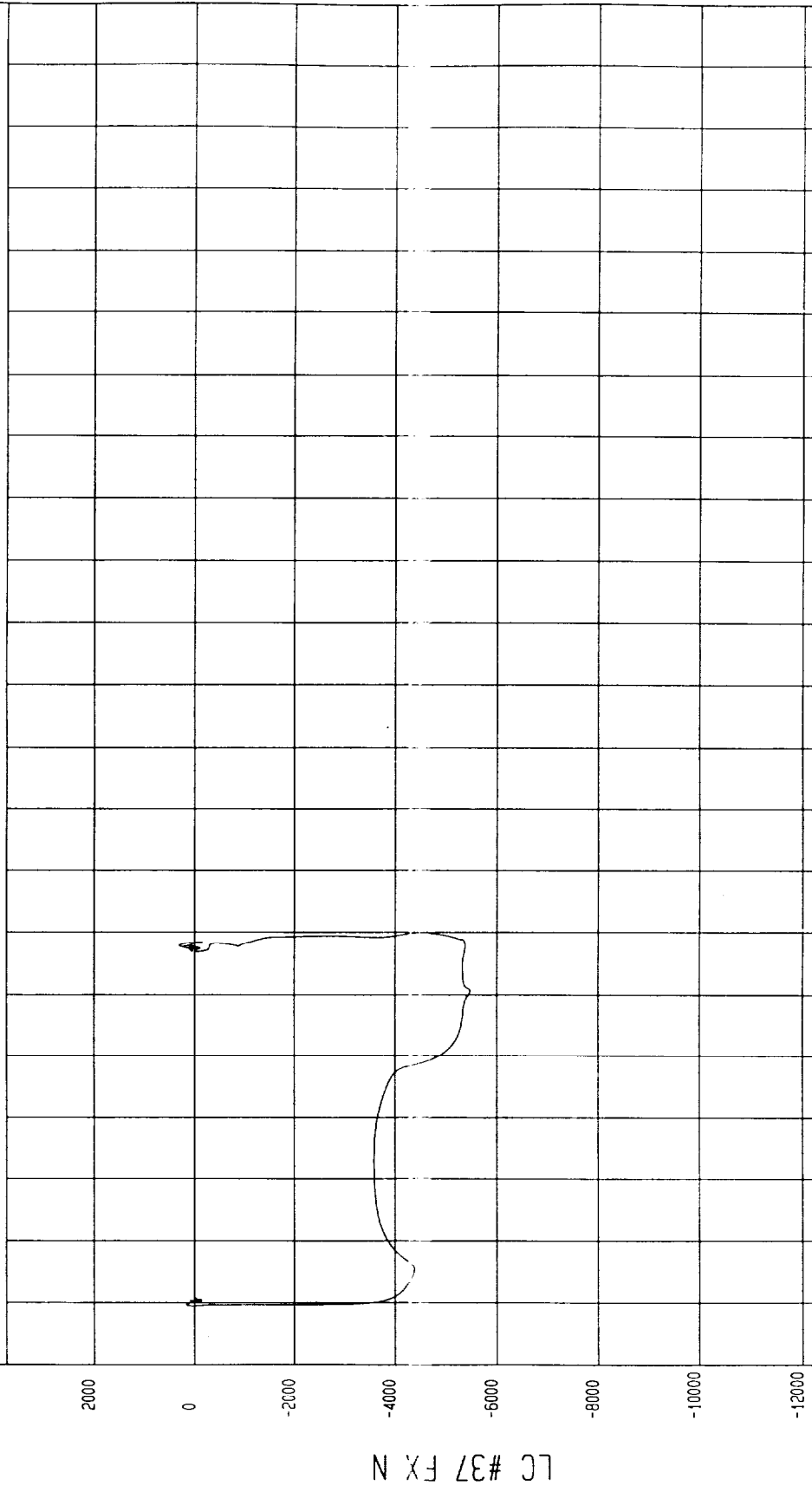
MGA Research
06-04-1998 14:17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -5477.47 N at 51 MM Maximum = 301.69 N at 58 MM

FORCE X LOAD CELL #37 VS STRINGPOT #37



STRING POT 37 MM

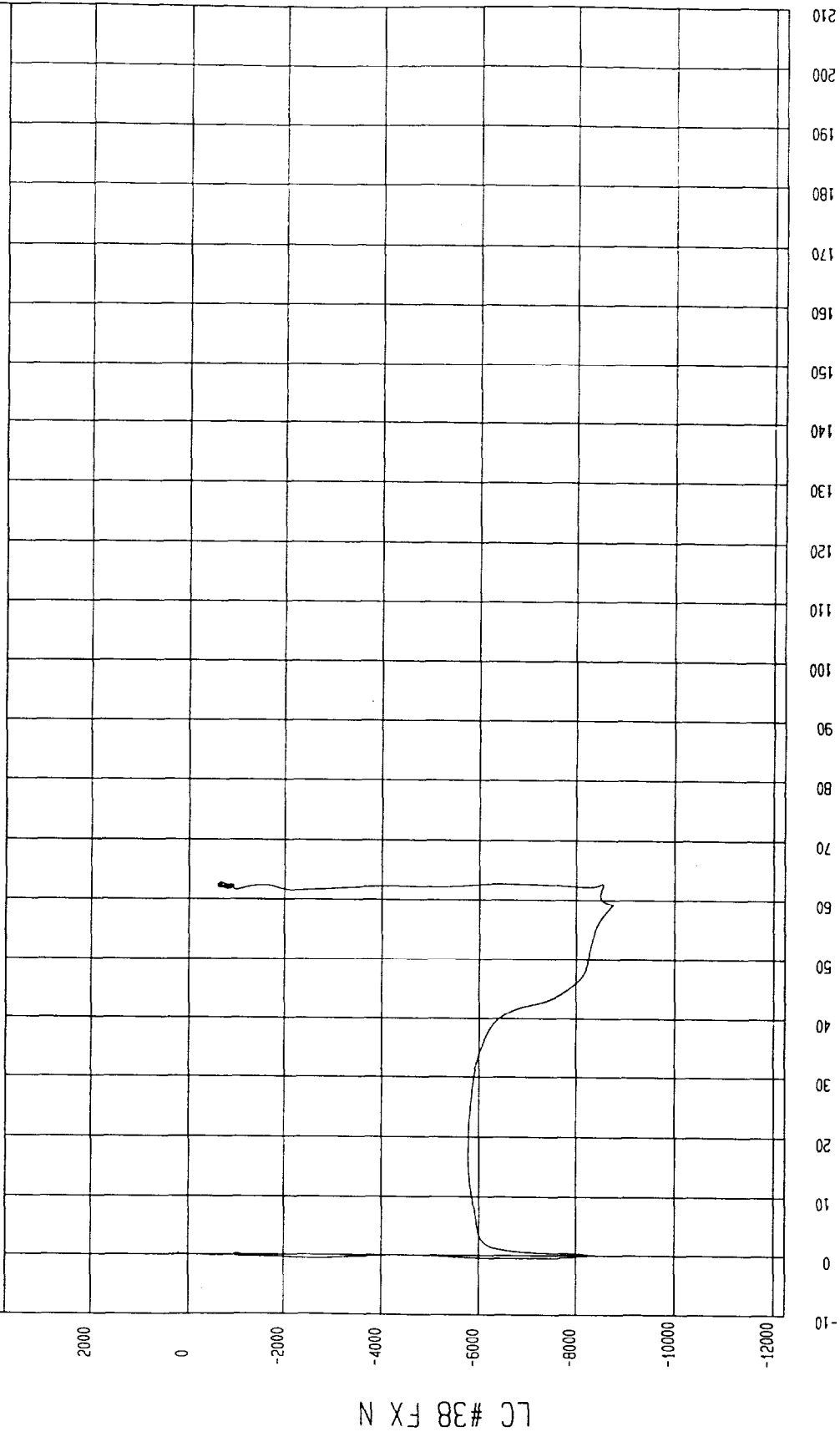
MGA Research
06-04-1998 14: 17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -8754.56 N at 59 MM Maximum = 315.43 N at 0 MM

FORCE X LOAD CELL #38 VS STRINGPOT #38



MSA Research
06-04-1998 14.17

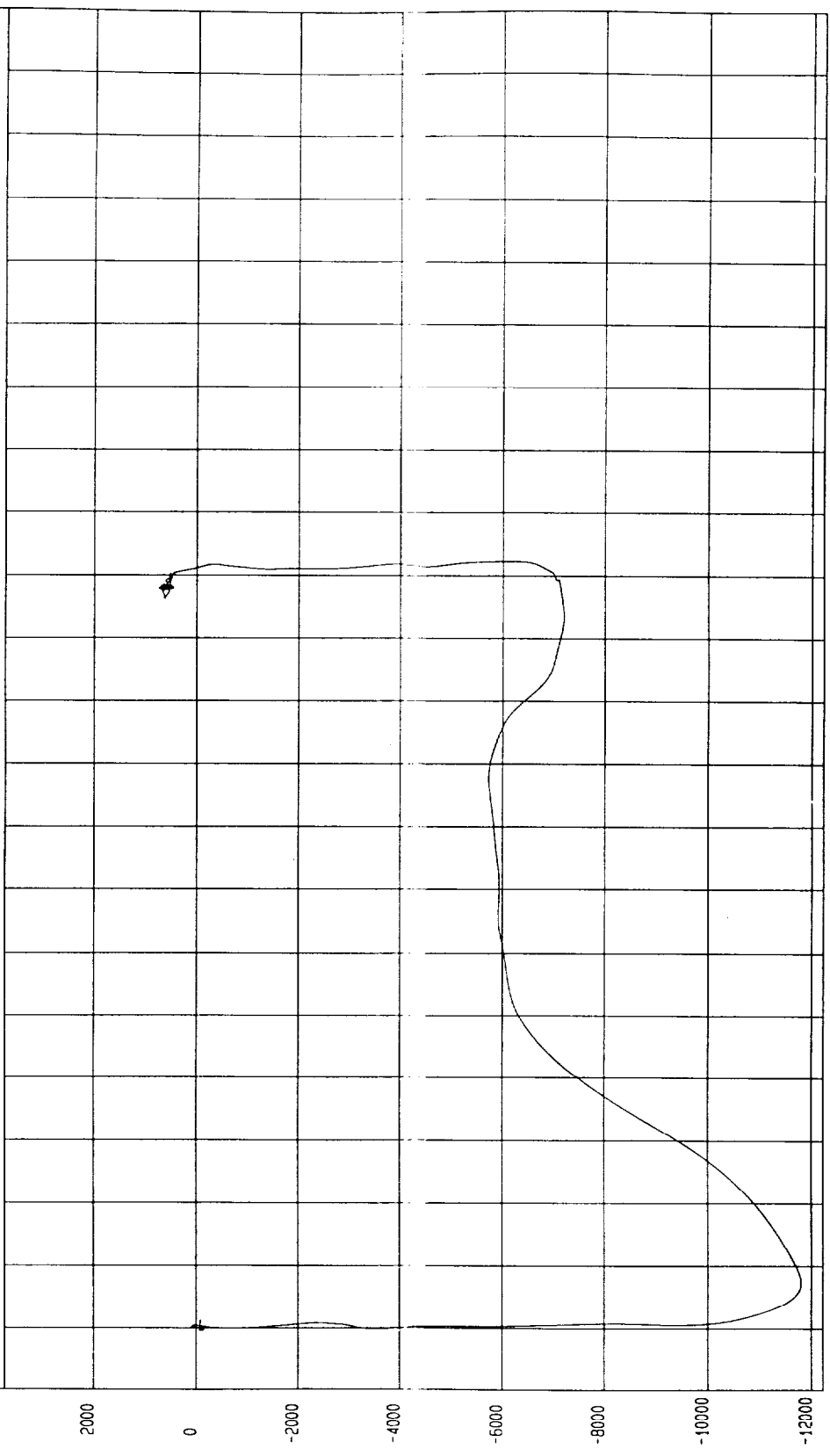
STRING POT 38 MM

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -11797.85 N at 7 MM Maximum = 754.39 N at 118 MM

FORCE X LOAD CELL #39 VS STRINGPOT #39



STRING POT 39 MM MGA Research 06-04-1998 14.17

LC #39 FX N

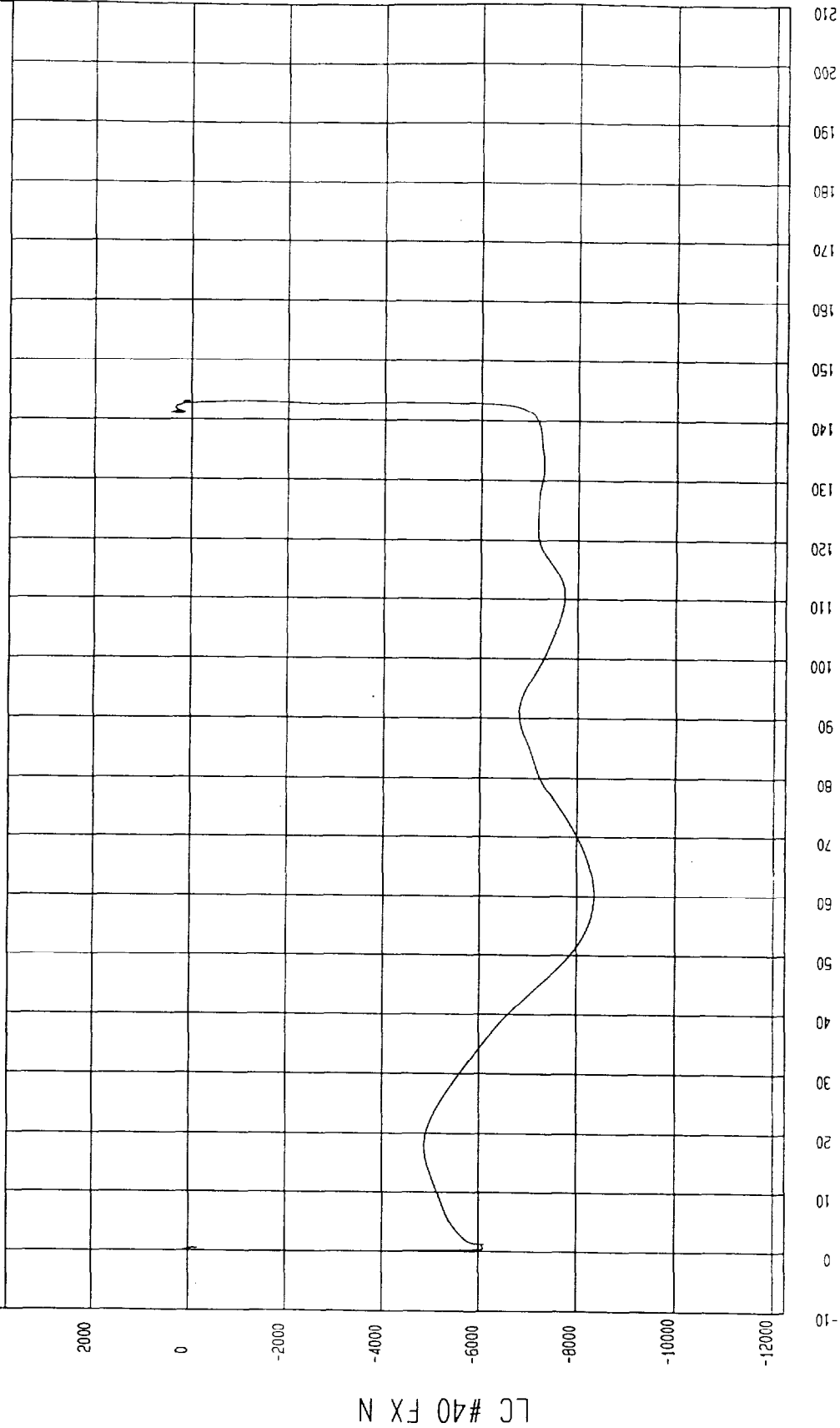
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -8354.34 N at 59 MM

Maximum = 430.28 N at 141 MM

FORCE X LOAD CELL #40 VS STRINGPOT #40



STRING POT 40 MM
MGA Research
06-04-1998 14:17

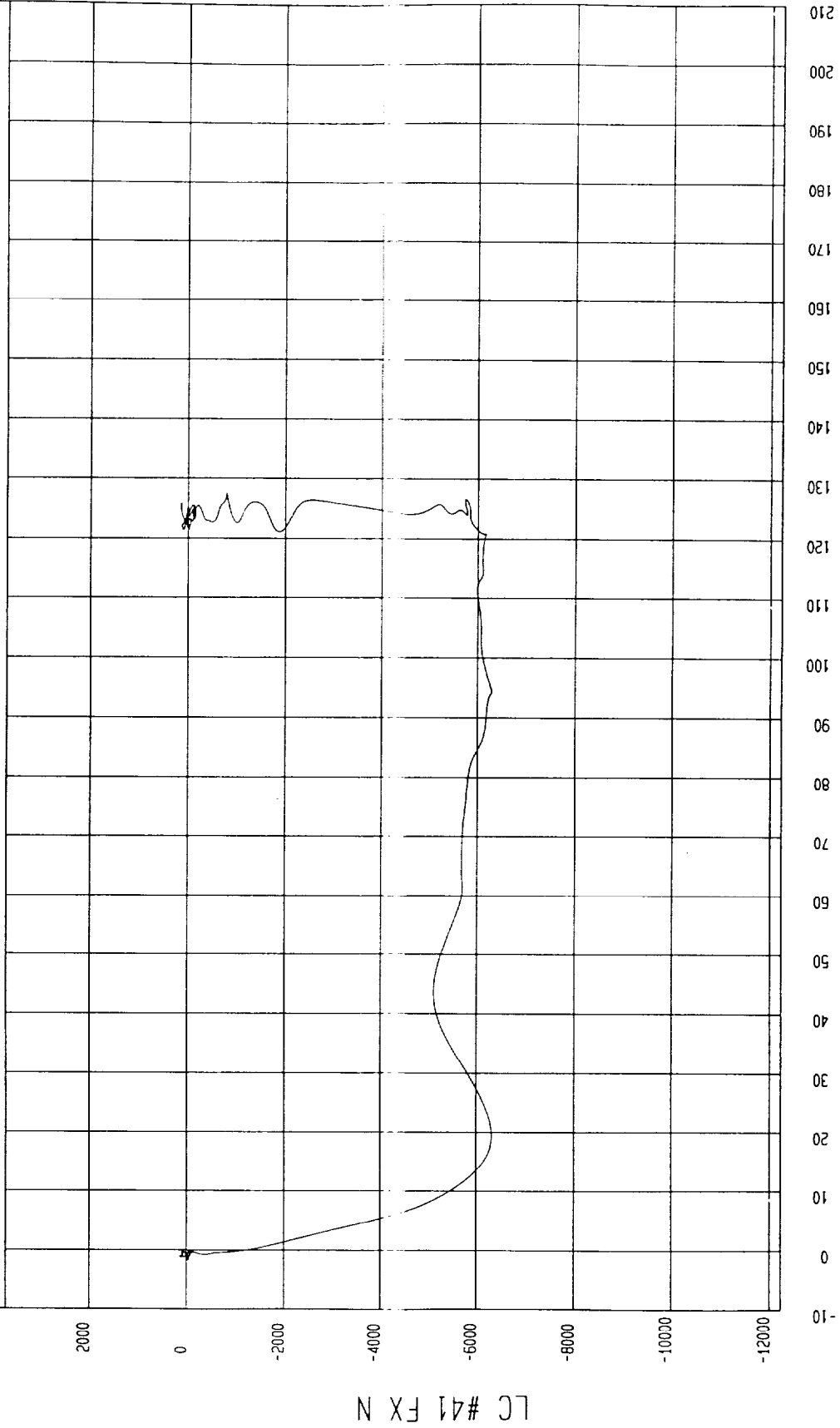
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6312.41 N at 19 MM

Maximum = 145.33 N at 125 MM

FORCE X LOAD CELL #41 VS STRINGPOT #41



MGA Research
06-04-1998 14:17

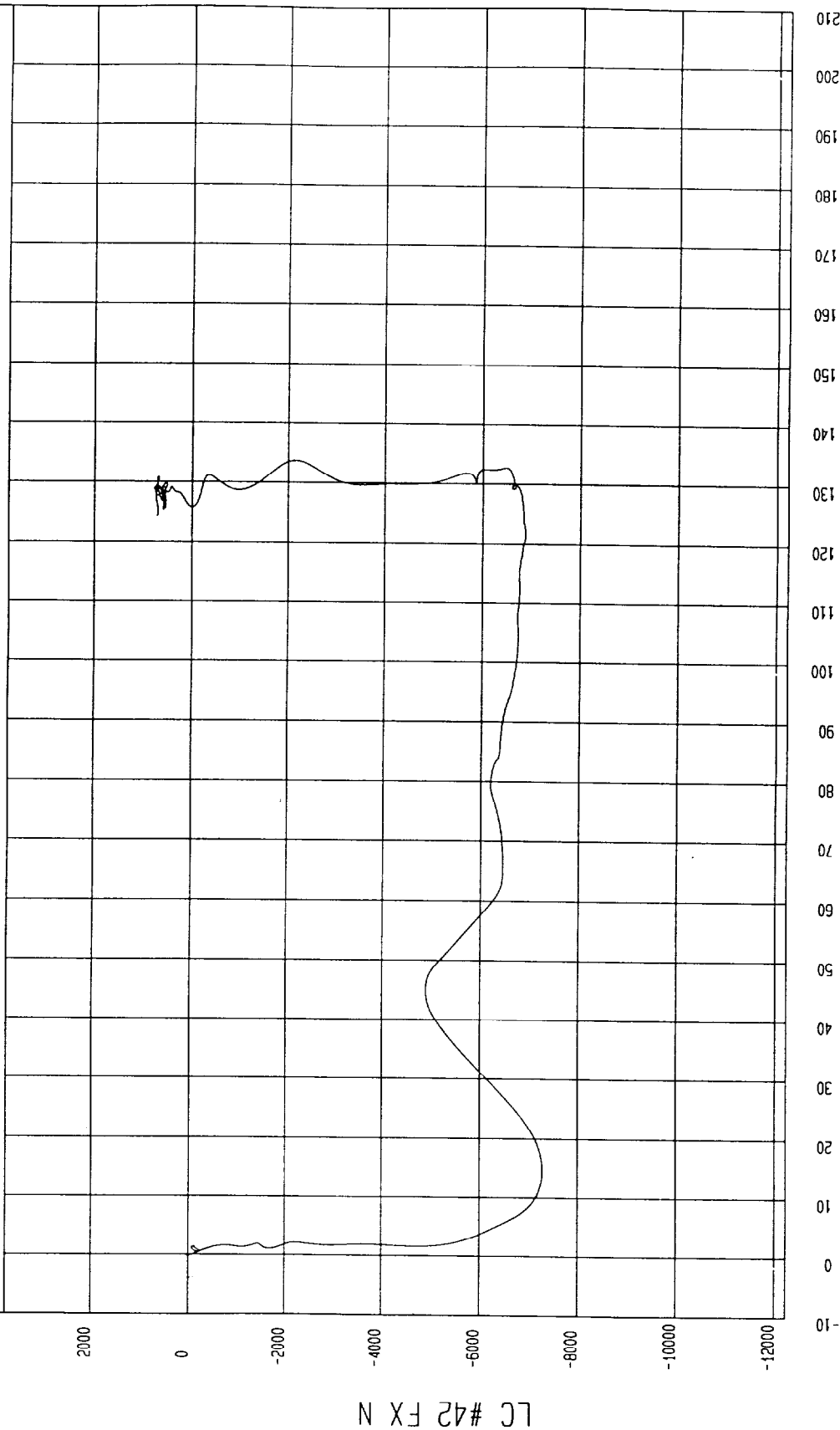
TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -7293.04 N at 14 MM

Maximum = 762.62 N at 129 MM

FORCE X LOAD CELL #42 VS STRINGPOT #42



STRING POT 42 MM

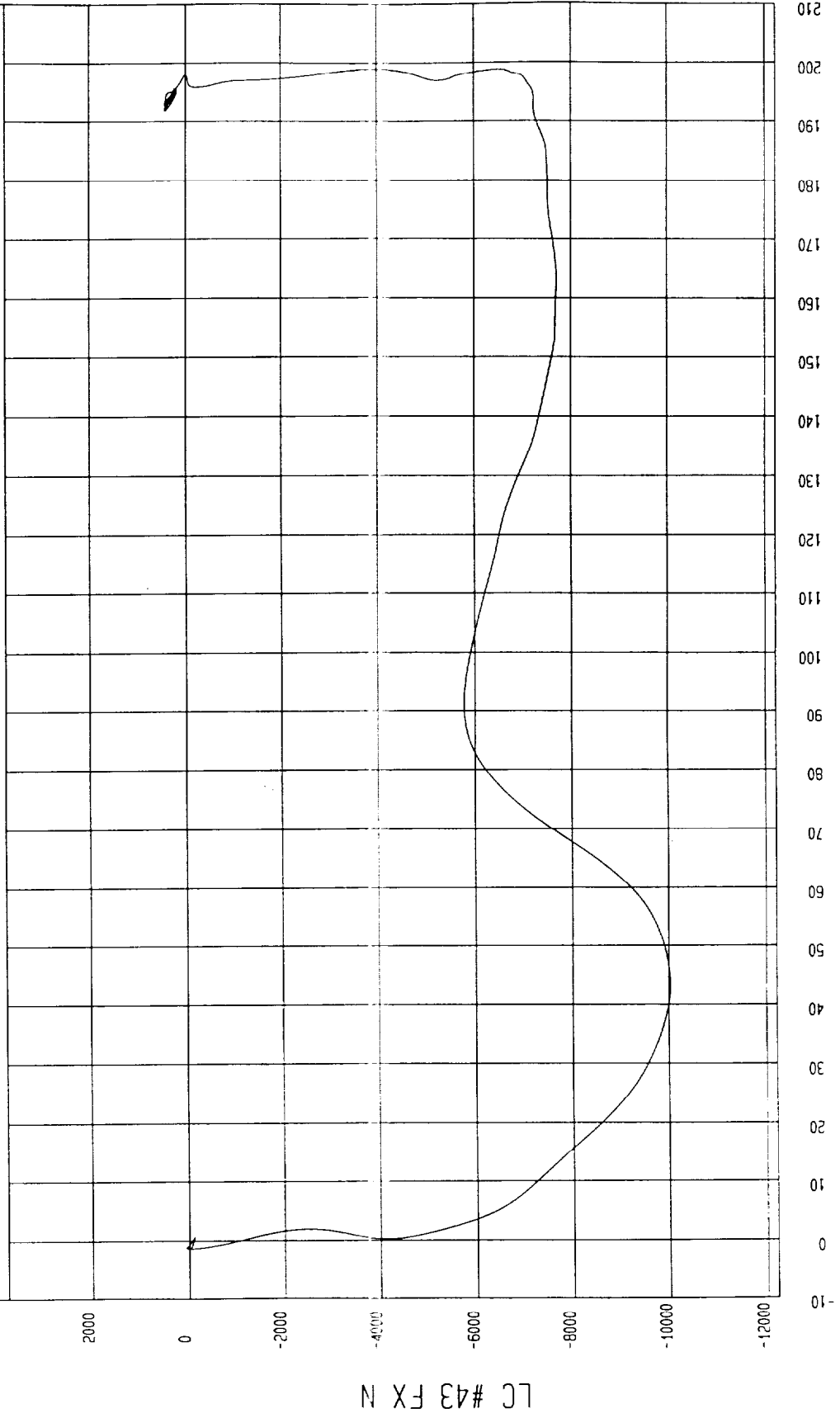
MGA Research
06-04-1998 14.17

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -10032.54 N at 43 MM Maximum = 431.35 N at 193 MM

FORCE X LOAD CELL #43 VS STRINGPOT #43



MCA Research
06-04-1998 14:17

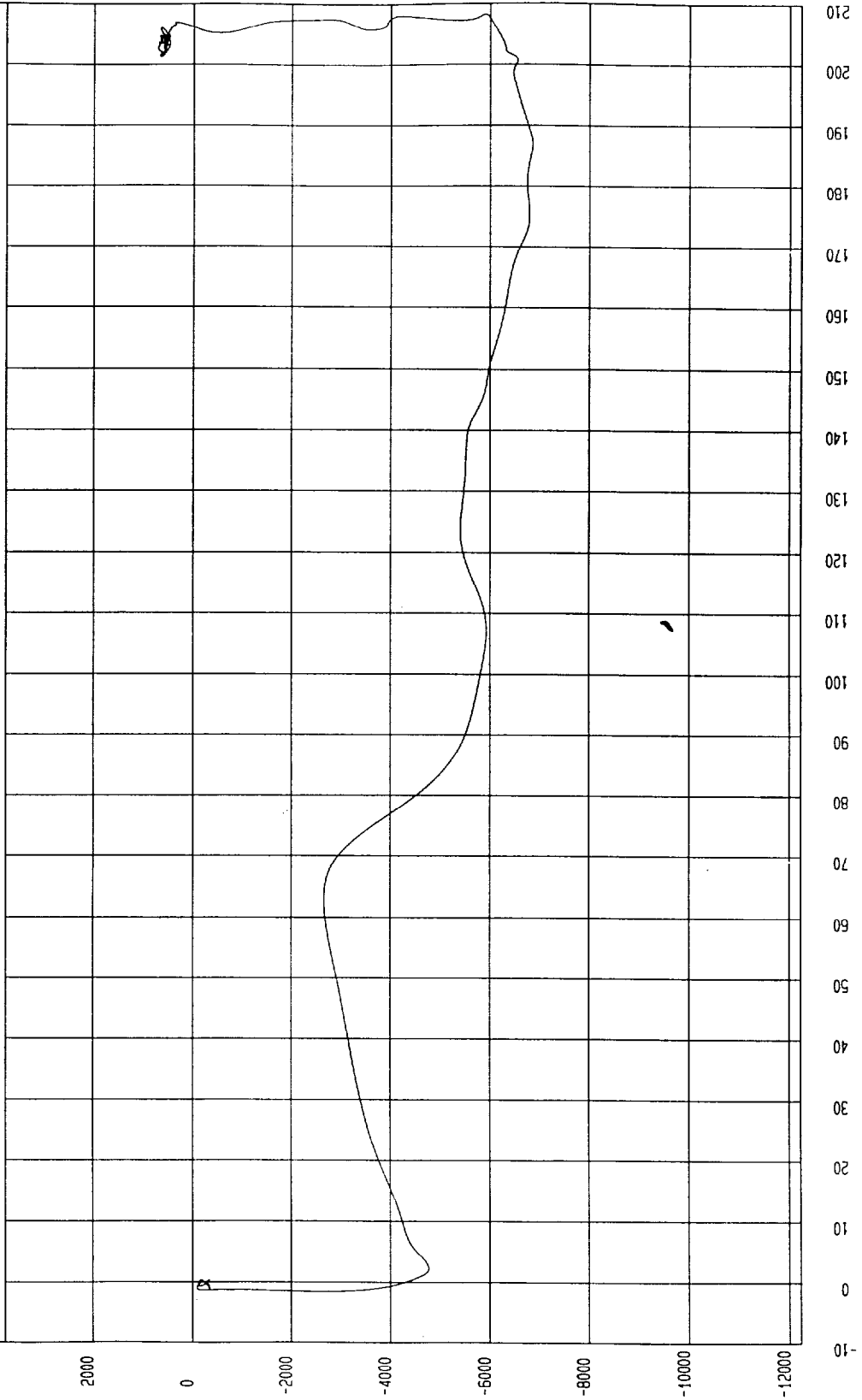
STRING POT 43 MM

TEST: DEMONSTRATION TEST #2 19/60 CART/BARRIER TEST DATE: 02-26-1997

COMPONENT: FMVSS 214 DEFORMABLE BARRIER Speed: 20 MPH 32.2 KPH

Minimum = -6860.93 N at 187 MM Maximum = 695.95 N at 203 MM

FORCE X LOAD CELL #44 VS STRINGPOT #44

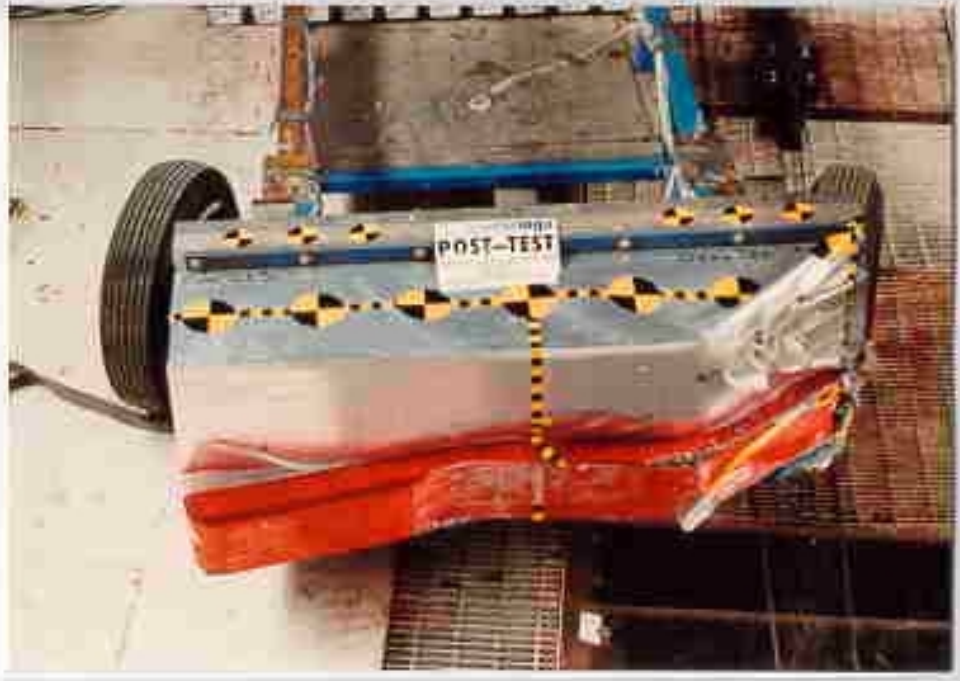
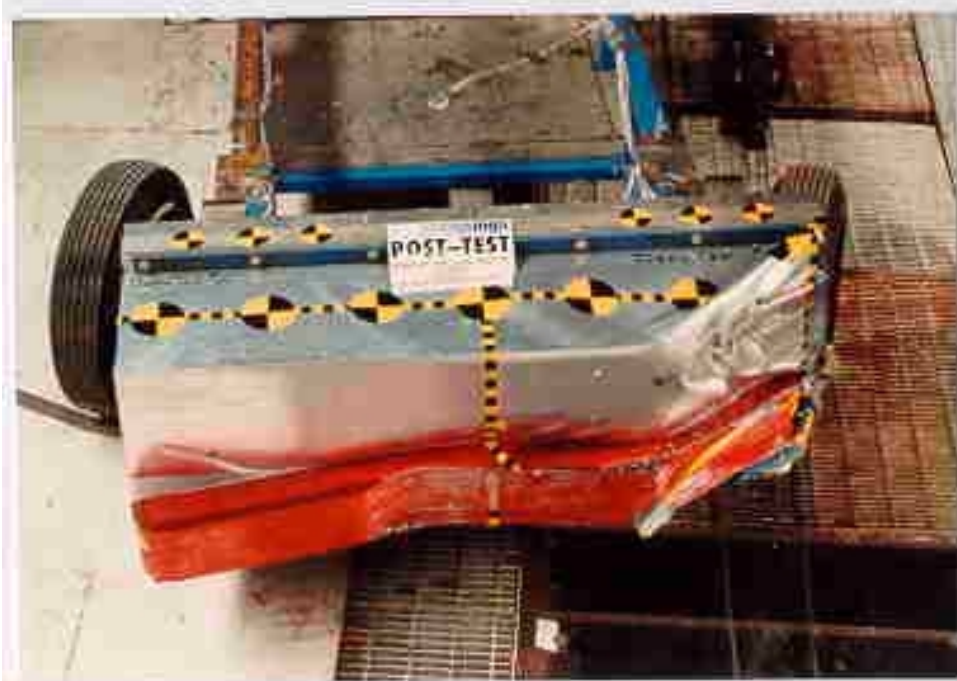
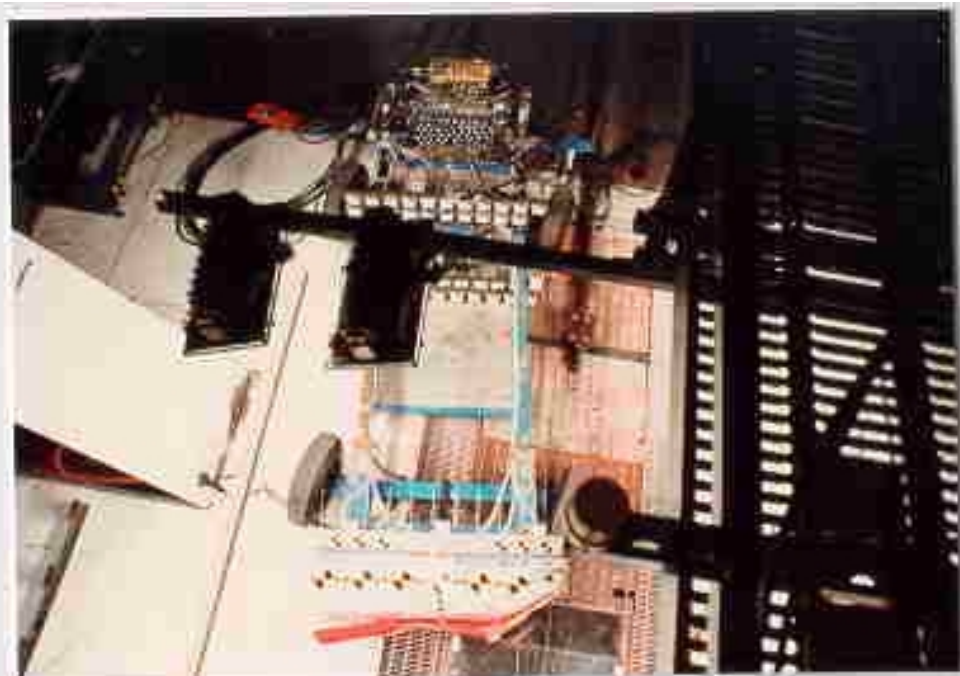
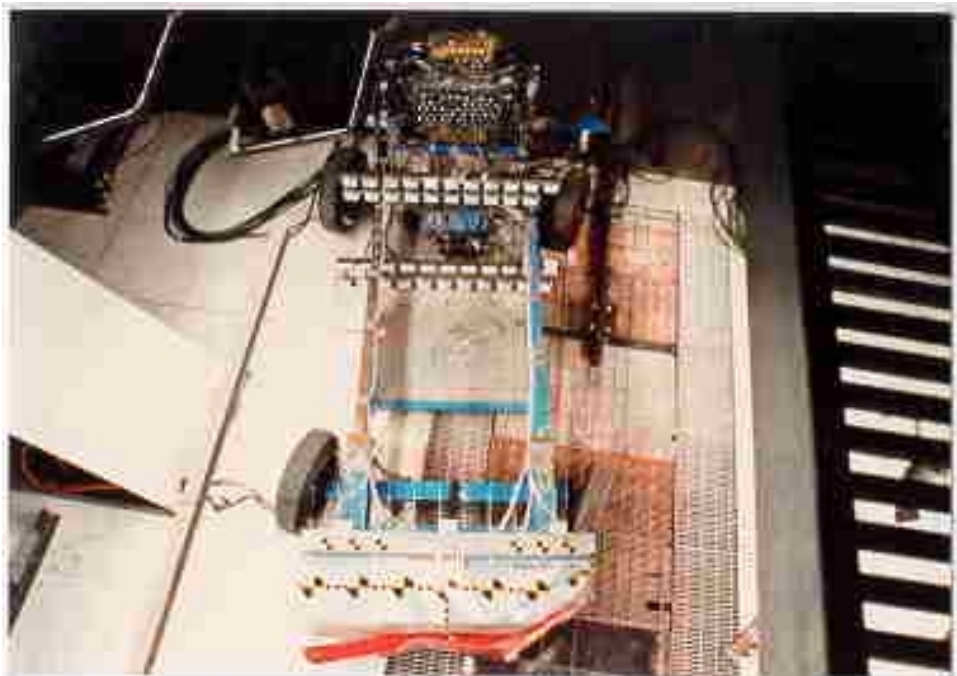


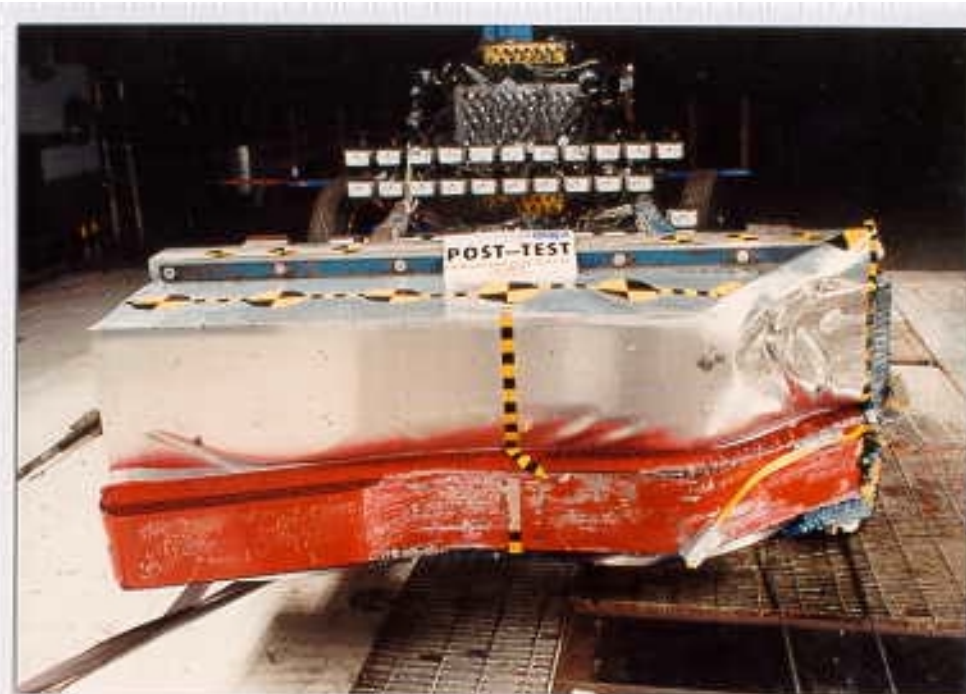
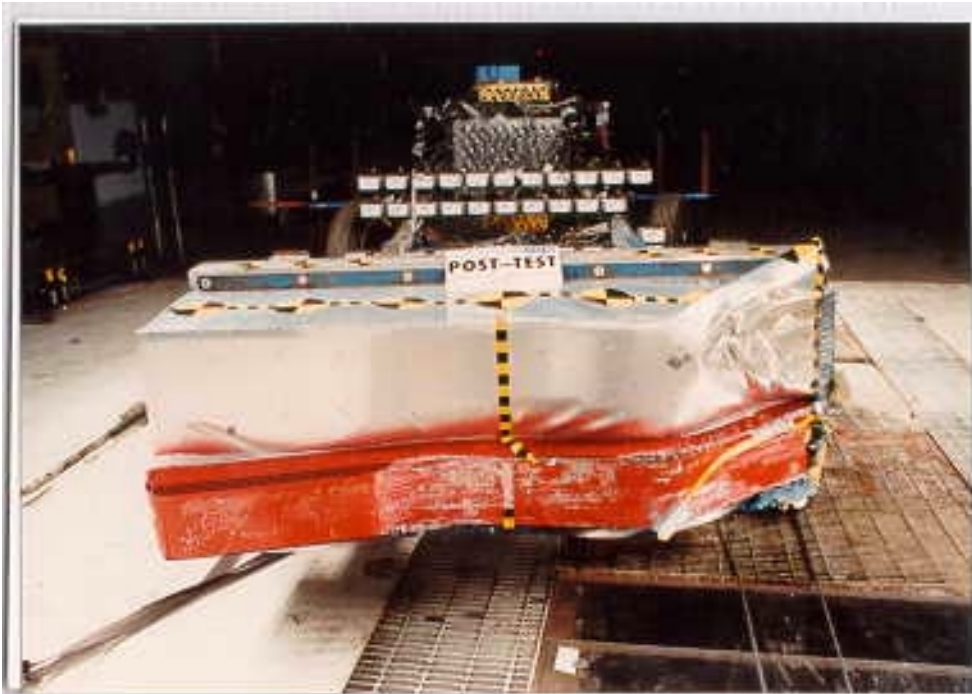
MGA Research
06-04-1998 14:18

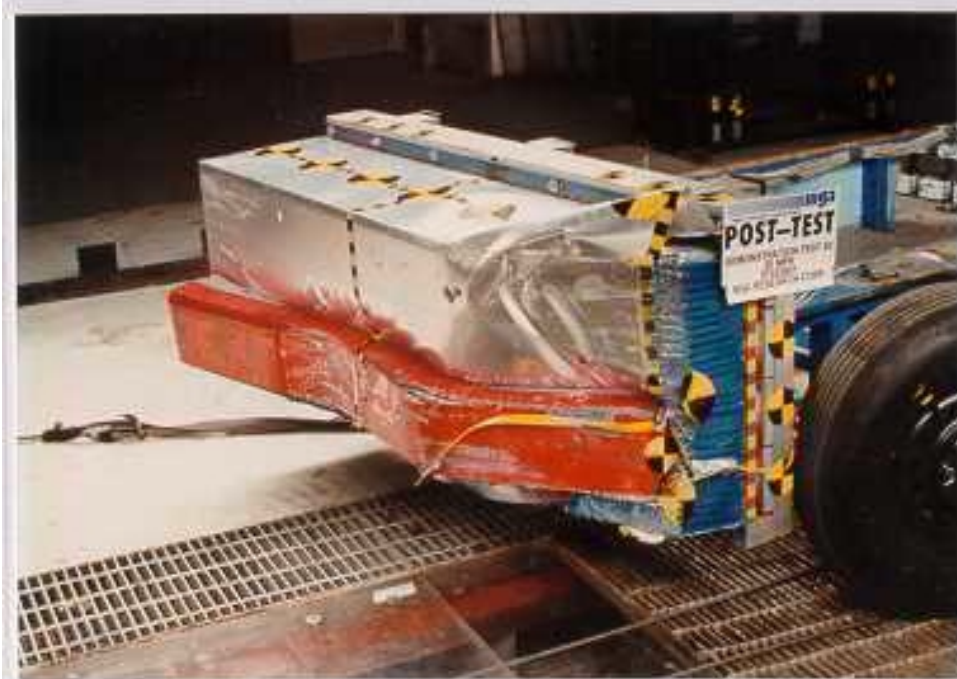
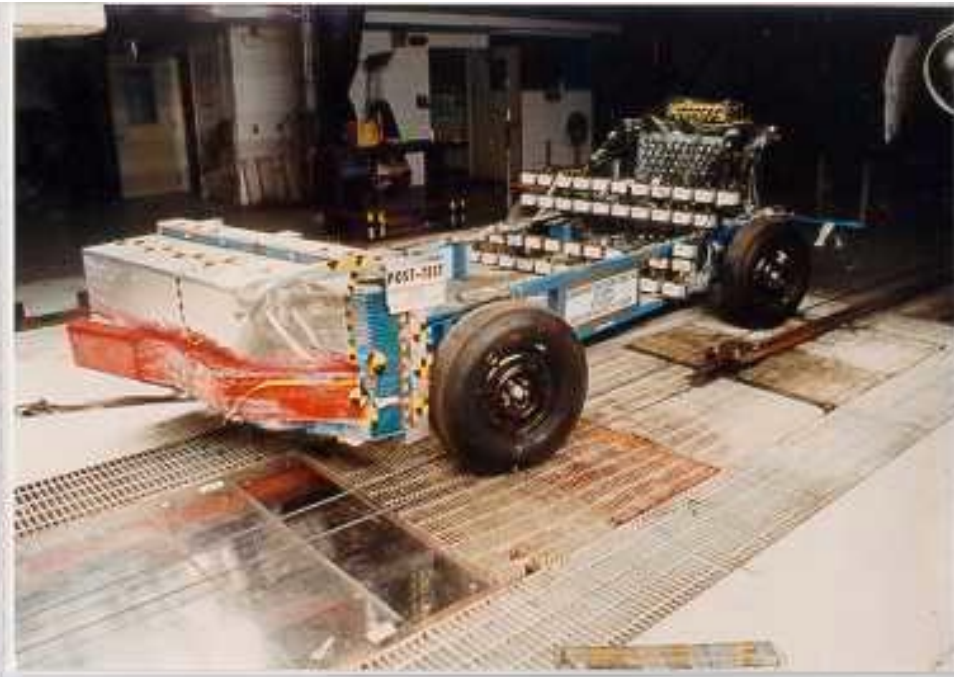
STRING POT 44 MM

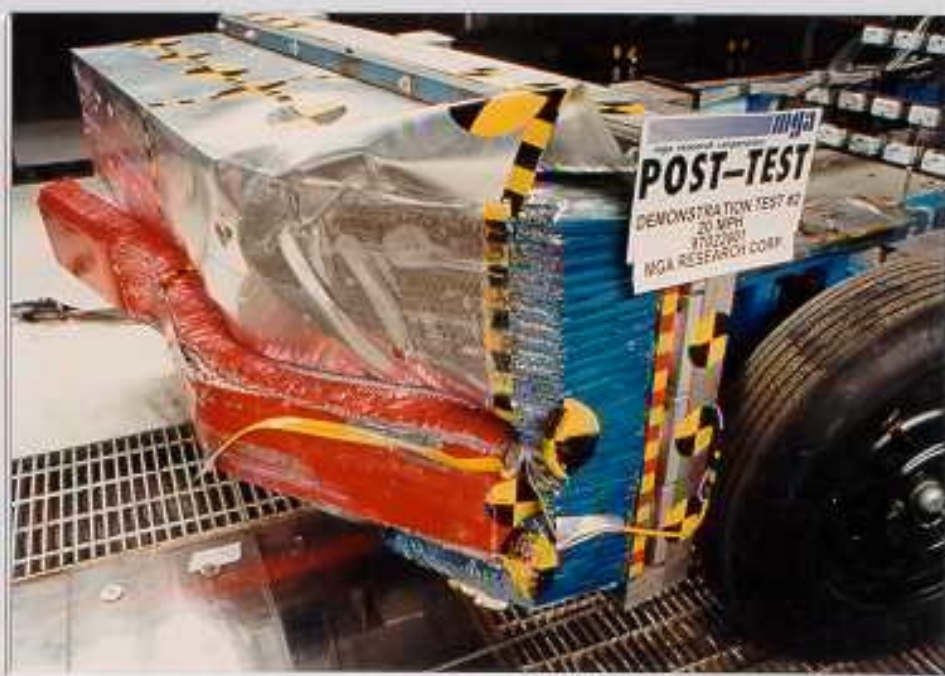
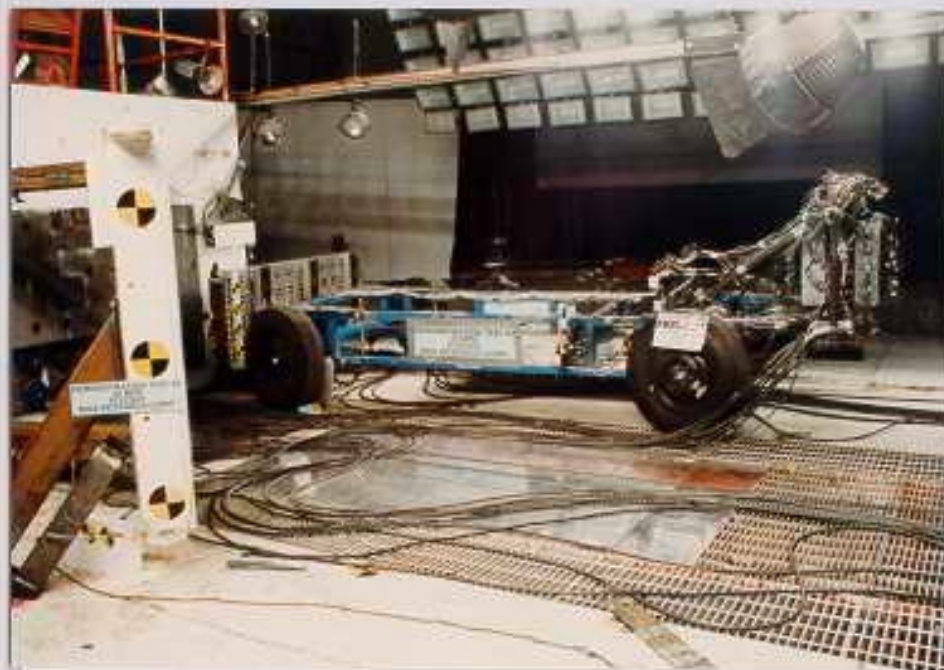
LC #44 FX N

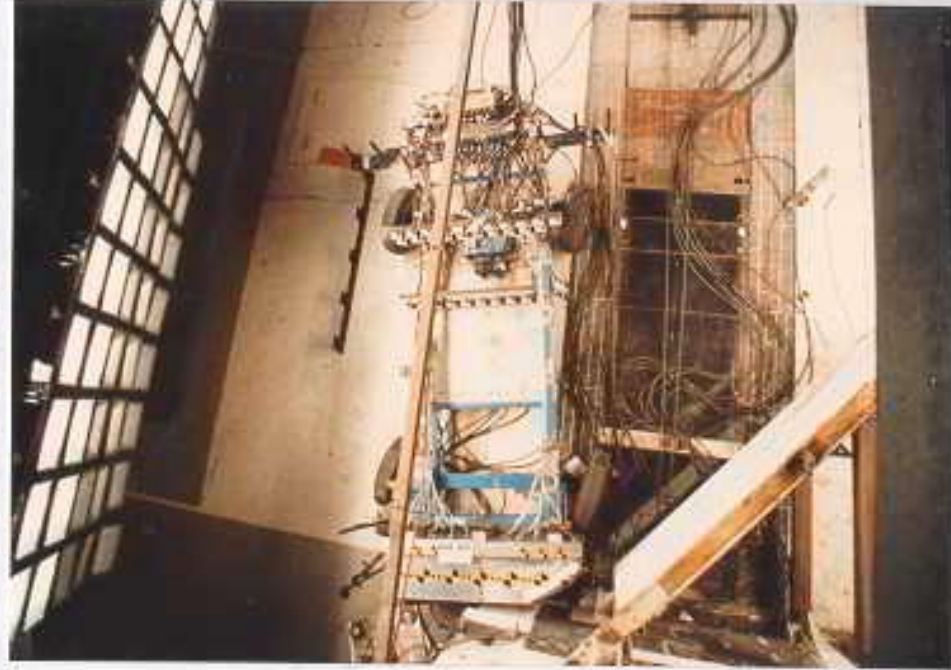
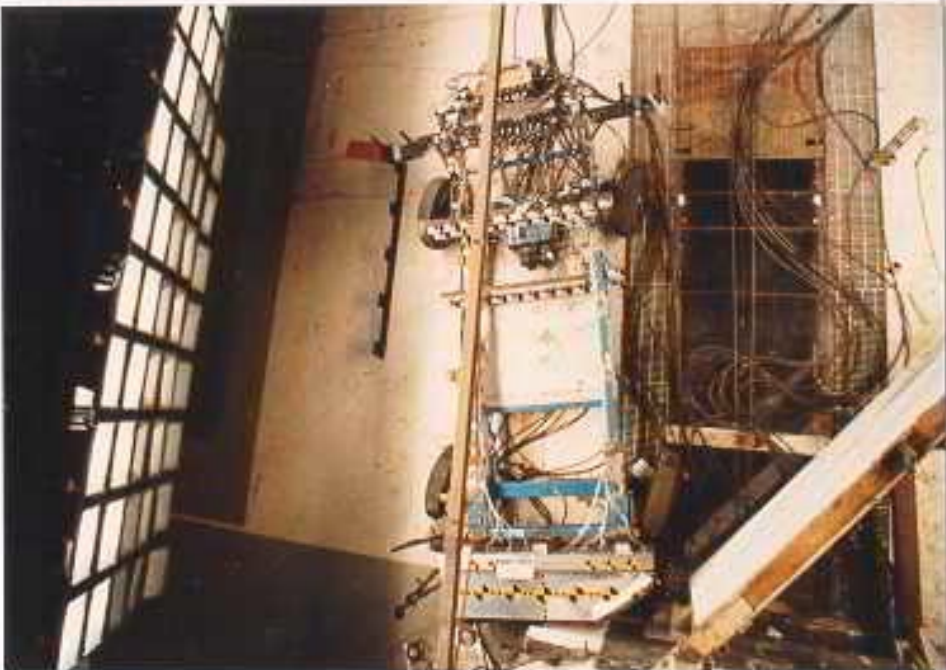
APPENDIX C
PHOTOGRAPHS

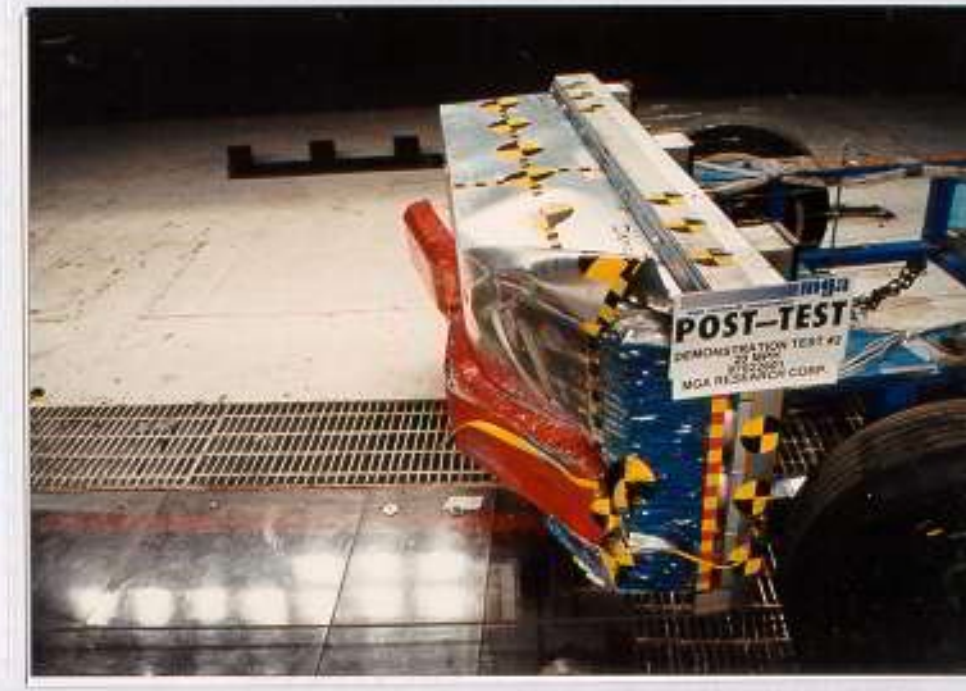
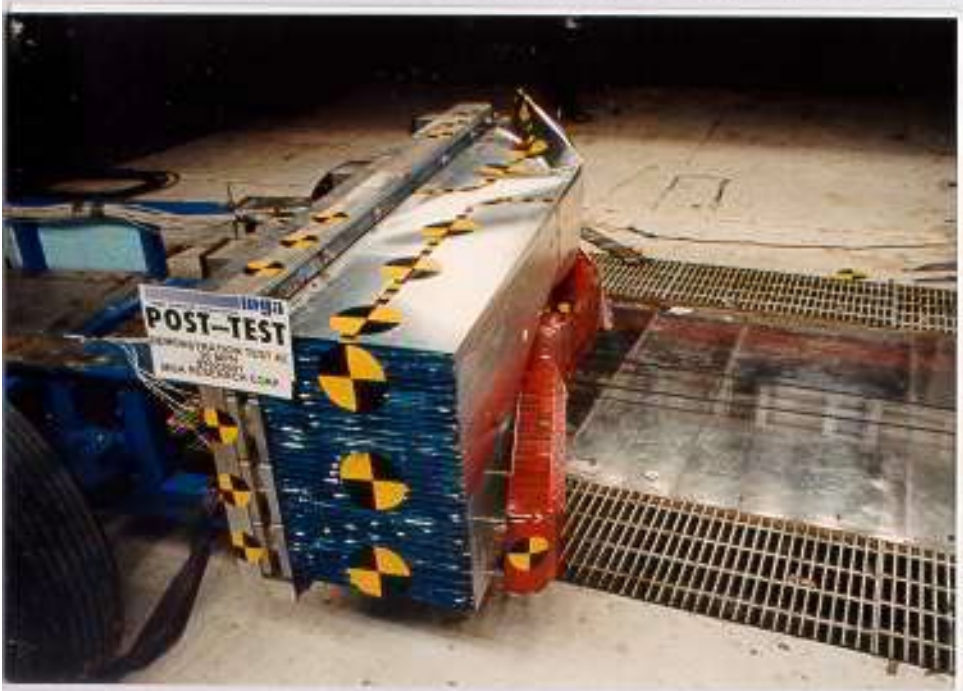
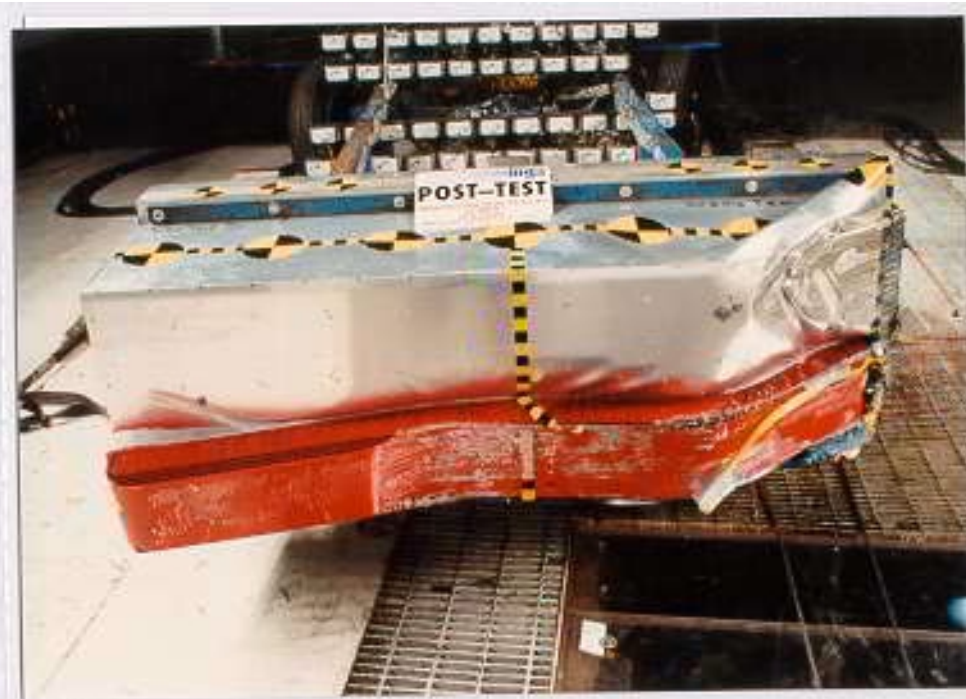




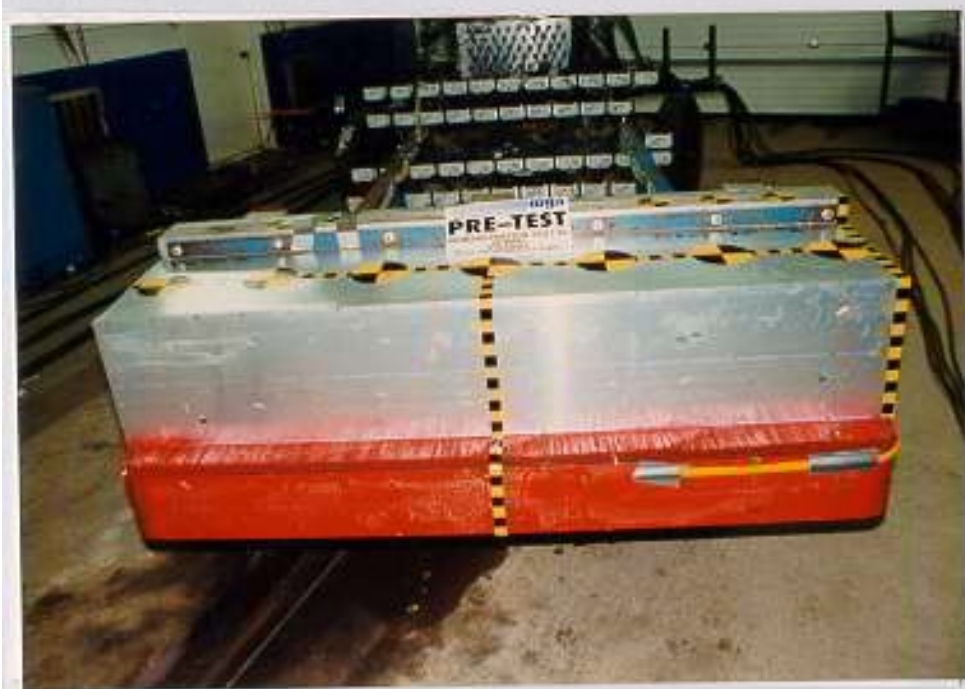


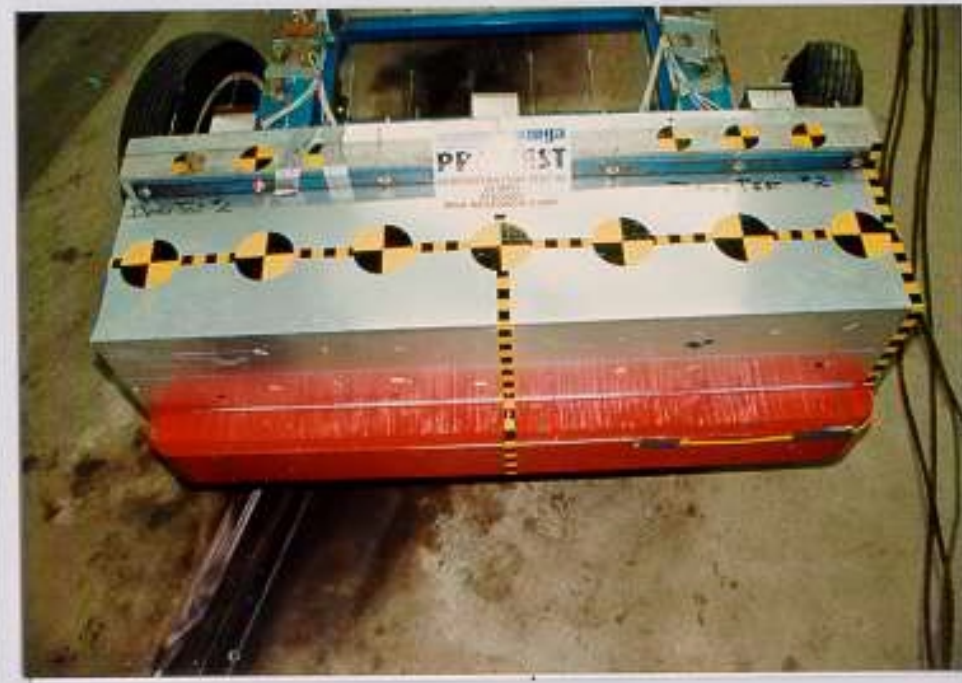
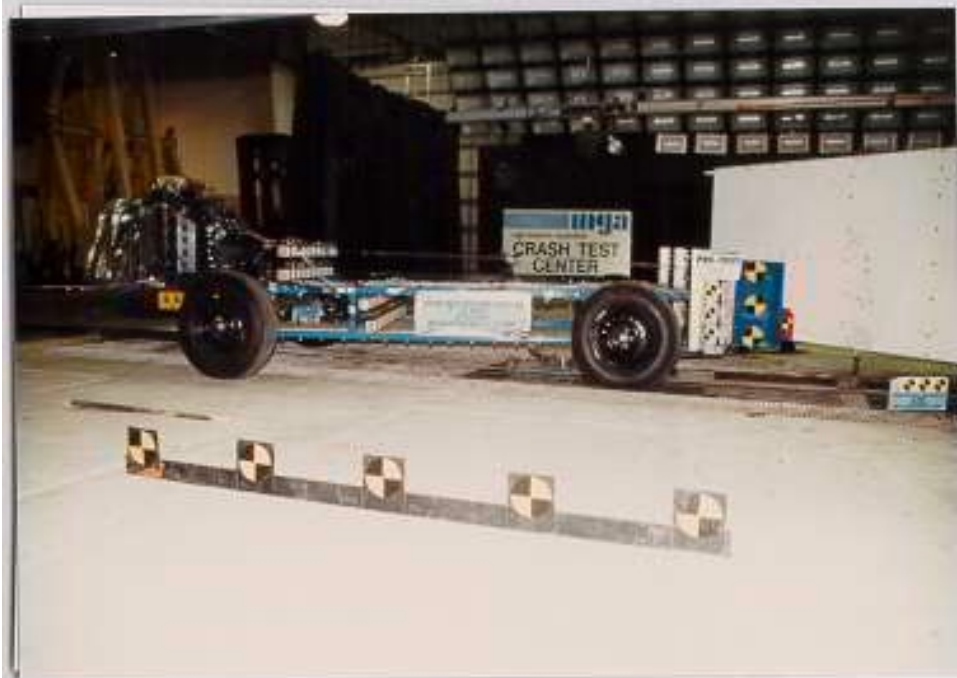


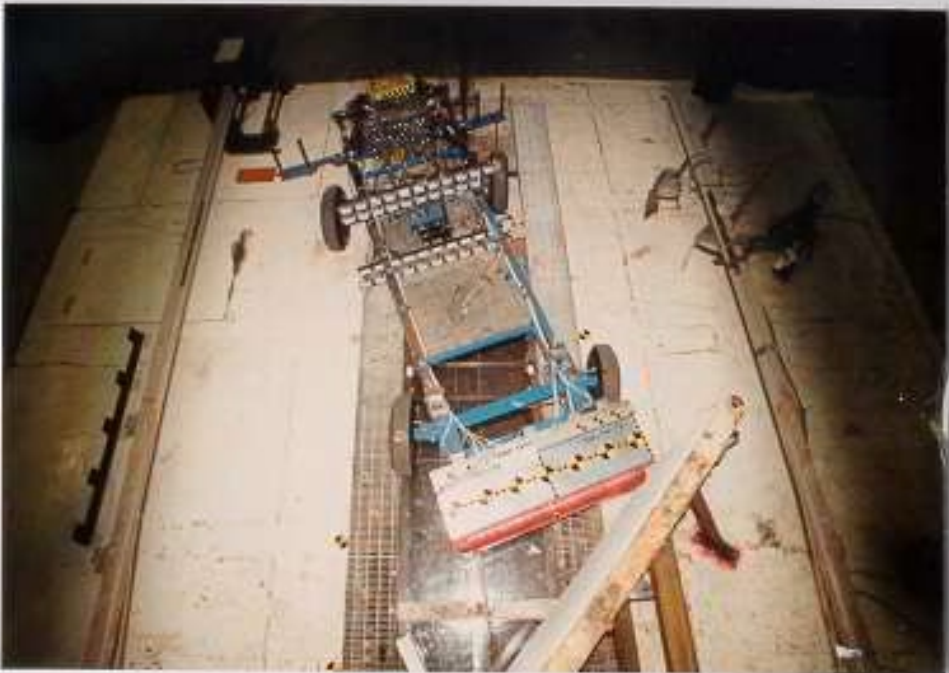


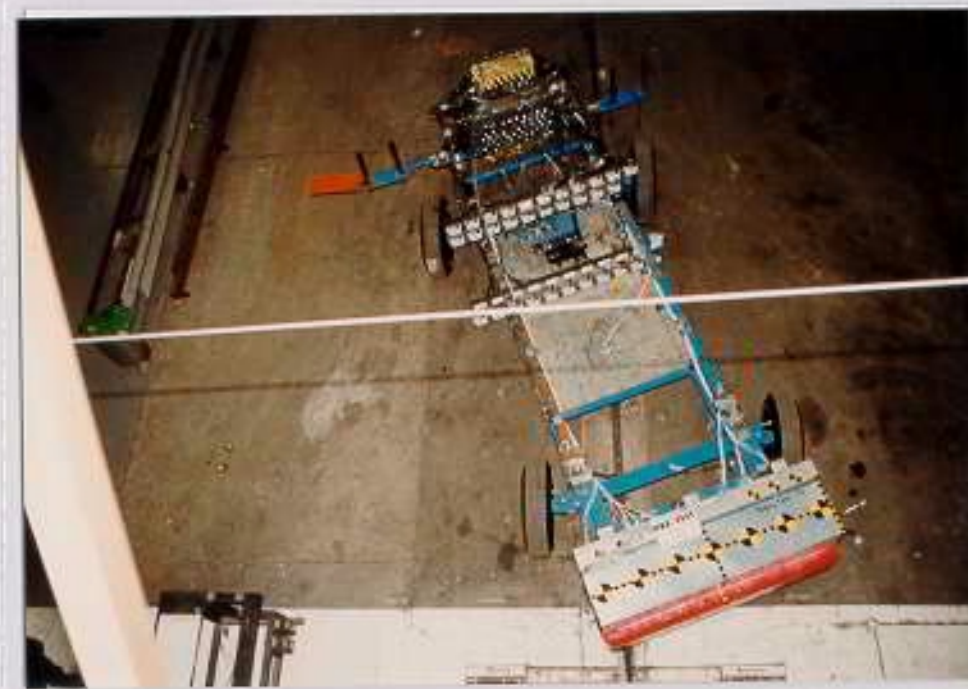
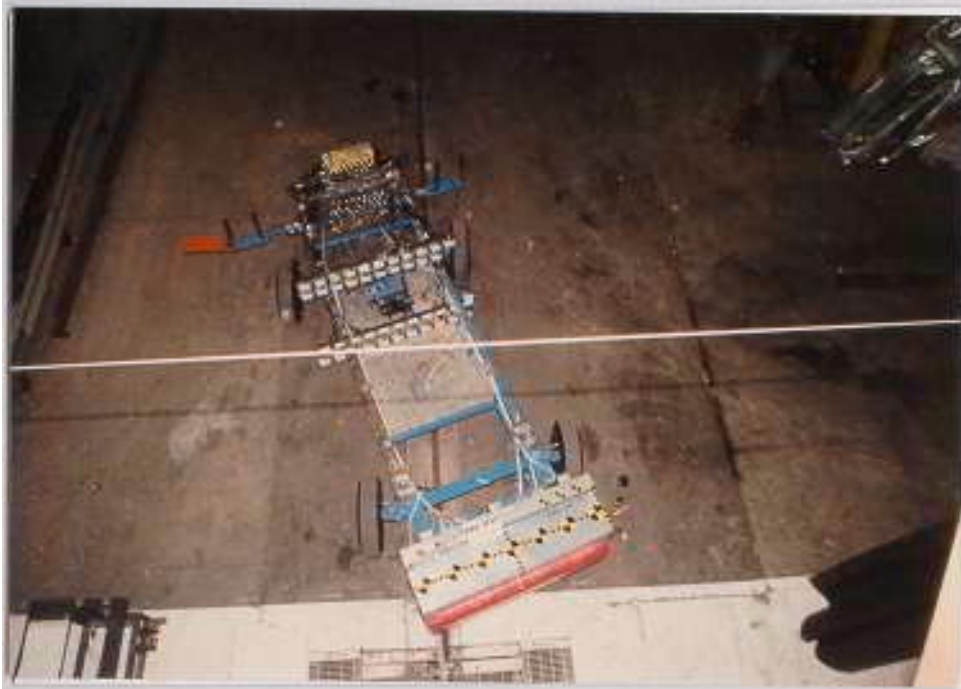
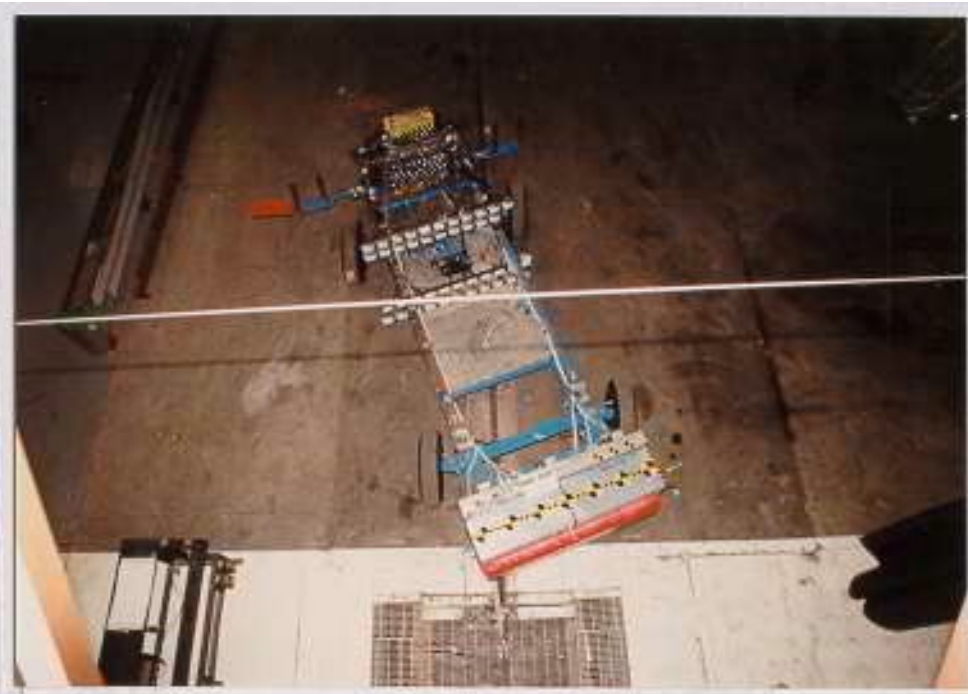
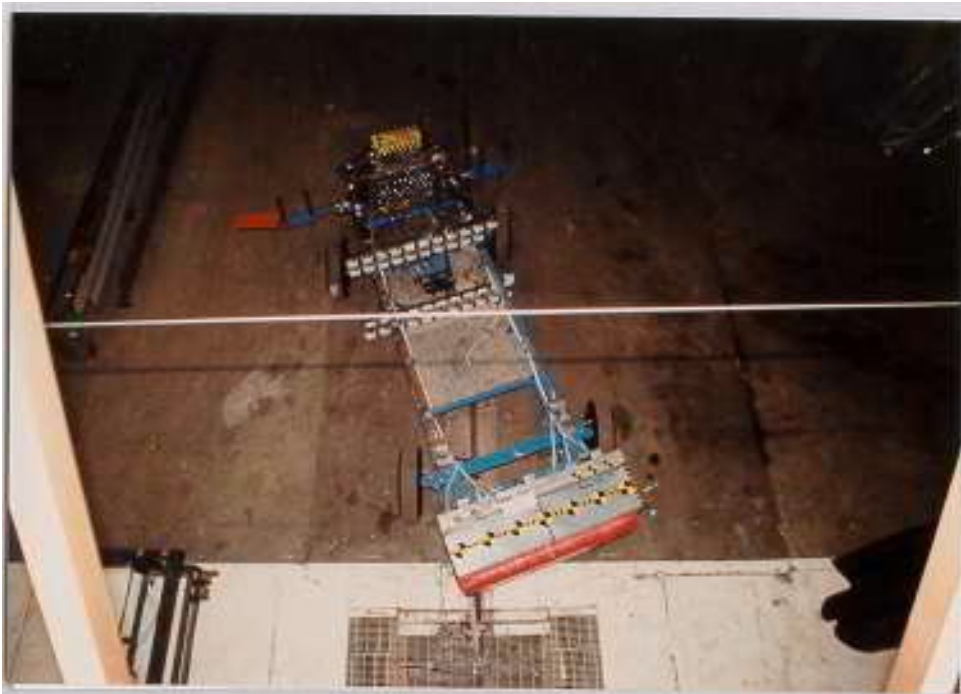


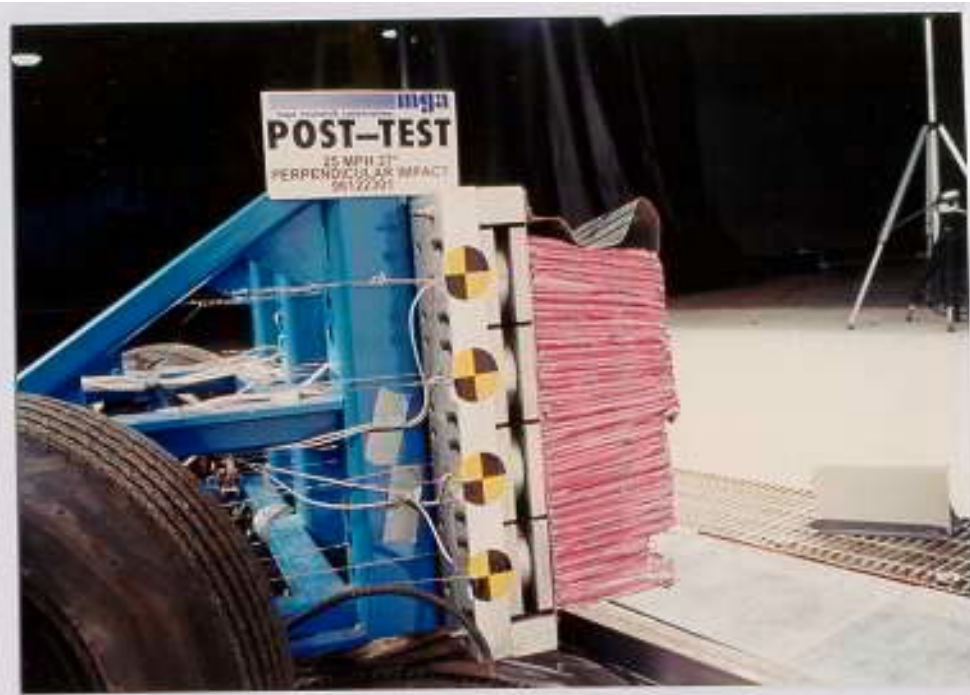


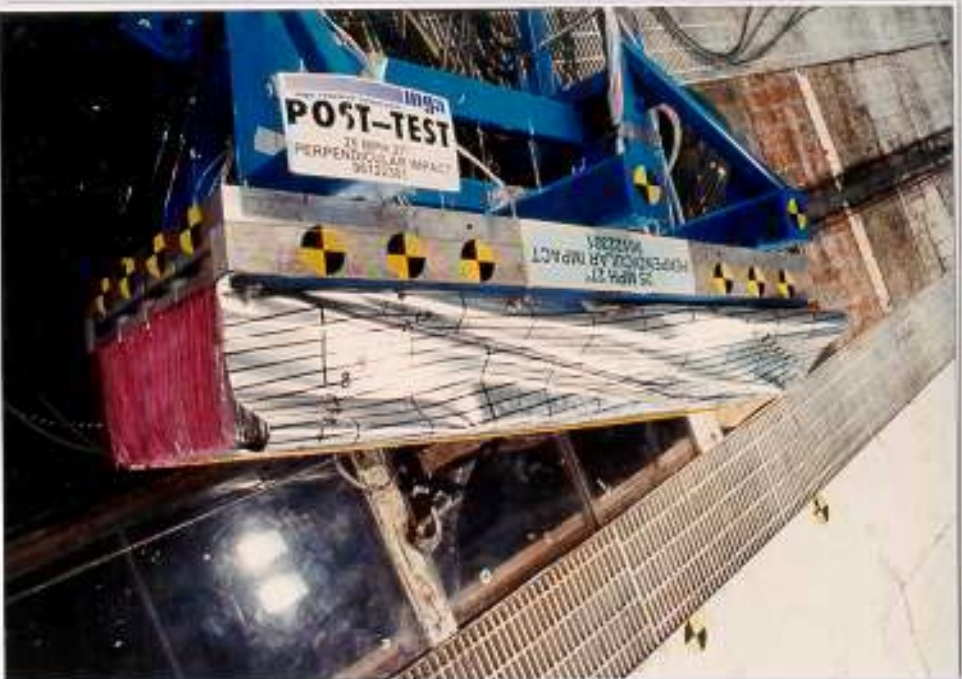






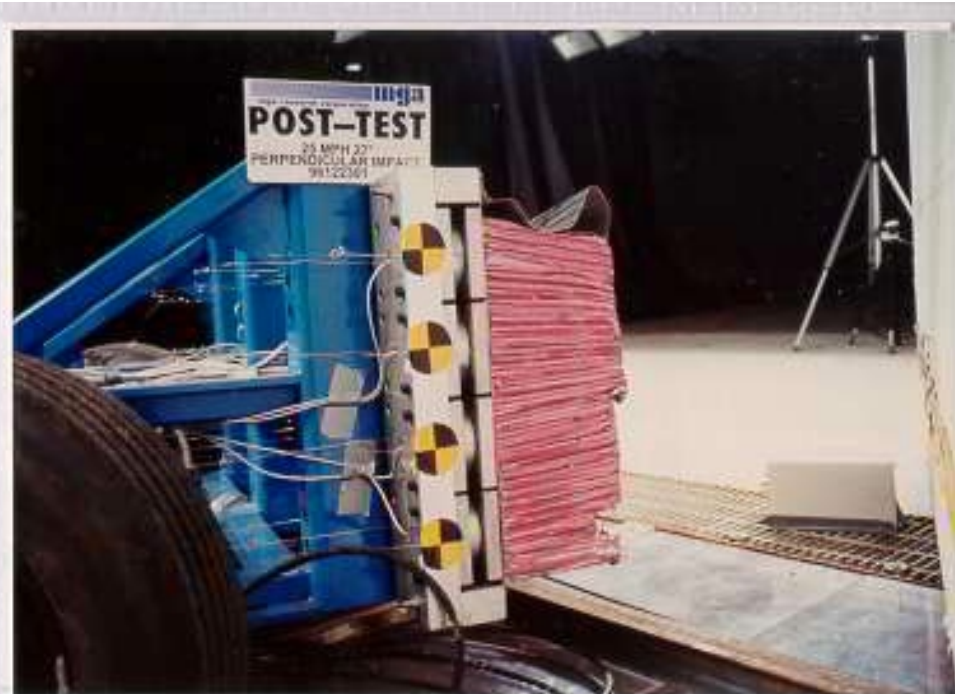






No. 690 11 413 0162 N H H H H 092

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