V3482

ES-2 – FULL SCALE VEHICLE TESTS
REPORT NO. 3

FMVSS NO. 214
"SIDE IMPACT PROTECTION"

1996 Ford Taurus 4 door

MGA Research Corporation
5000 Warren Road
Burlington, WI 53105

Test Date August 15, 2000

Report Date August 20, 2000

FINAL REPORT

Prepared For

U.S. Department of Transportation
Volpe National Transportation System Center
55 Broadway, Kendall Square
Cambridge, MA 02142

This Final Report was prepared for the U S Department of Transportation, Volpe National Transportation System Center, under Contract No DTRS57-98-D-00041

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SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of Contract No DTRS57-98-D-00041 sponsored by the U S Department of Transportation, Volpe National Transportation System Center. The purpose of this test was to evaluate the response of the ES-2 dummies in a 1996 Ford Taurus 4 door when subjected to the FMVSS 214 test procedure (TP-214D-05, dated August 2, 1999). This test is one of six dynamic tests which were conducted on different test vehicles to observe ES-2 responses utilizing different impact devices and impact conditions: Specifically, two tests utilizing the European Moving Deformable Barrier, two tests utilizing the FMVSS No 214 Moving Deformable Barrier and two tests utilizing the FMVSS No. 214 Moving Deformable Barrier under NCAP test impact conditions.

Date	Test Type	Vehicle
August 8, 2000	European Side	1996 Geo Metro 3 Door
August 11, 2000	European Side	1996 Ford Taurus 4 Door
August 15, 2000	FMVSS 214	1996 Ford Taurus 4 Door
August 25, 2000	FMVSS 214	1996 Ford Taurus 4 Door
September 12, 2000	NCAP Side	1998 Chevrolet Cavalier 4 Door
September 14, 2000	NCAP Side	2000 Pontiac Grand Am 2 Door

MGA does not endorse or certify products The manufacturer's name appears solely for identification purposes

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 1996 Ford Taurus 4 door was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 53 3 kph (33 1 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on August 15, 2000 Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (ES-2s) are included in Appendix A

Two ES-2 side impact dummies were placed in the left front and left rear designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated August 2, 1999 The side impact event was documented by nine high speed cameras and one real-time camera Camera locations and other pertinent camera information can be found in this report

Appendix B contains the vehicle and dummy response data traces. A summary of the side impact dummy (ES-2) configuration and performance verification test data is shown in Appendix C Dummy and vehicle calibration data can be found in Appendix D of this report. Appendix E contains a copy of the dummy positioning procedure used Appendix F contains the ES-2 Peak Responses

The following tables summarize the results of the Left Side Impact test:

		Left Front Driver	Left Rear Passenger
1) Head Performance Criteria			
≤ 1000	T_1 (msec)	51 2	46
	T_2 (msec)	77 6	110
	HPC	185	88
2) Thorax Performance Criteria			
2 1) Chest Deflection ≤ 42 mm	Upper Rib Deflection	39	23
	Mid Rib Deflection	40	23
	Lower Rib Deflection	37	17
2.2) Viscous Criteria ≤ 1.0 m/sec	Upper Rib	0.65	0 17
	Mid Rib	0.58	0 23
	Lower Rib	0.59	0 14
3) Abdominal Protection Criterion			
Sum ≤ 2500 N	Front Abdominal Force	549	1310
	Mid Abdominal Force	575	698
	Rear Abdominal Force	584	409
	Sum of Abdominal Force	1551	2294
4) Pelvis Performance Criterion			
≤ 6000 N	Pubic Symphysis Force	927	2375

		Left Front Driver	Left Rear Passenger
HIC	T_1 (msec)	52 5	48.8
	T_2 (msec)	64 8	74.2
	$T_2 - T_1$ (msec)	12.3	25 4
	HIC	294	119

FIR Filtered	Left Front Driver	Left Rear Passenger
Upper Rib Y (g's)	131	46
Middle Rib Y (g's)	131	66
Lower Rib Y (g's)	134	76
Lower Spine Y (g's)	52	52
Pelvis Y (g's)	72	58
TTI (g's)	93	64

TEST NOTES

The data plots shown in Appendix B relate to the ES-2 injury criteria and the vehicle accelerations A complete data set, including all ES-2 instrumentation, can be found by accessing the electronic data from the U S Department of Transportation.

SECTION 3

SIDE IMPACT DUMMY (ES-2) AND VEHICLE TEST DATA

DATA SHEET NO. 1

GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION

Year/Make/Model/Body Style: 1996/Ford/Taurus/4 door

Vehicle Identification No (VIN): 1FALP52U1TG211344

Vehicle Body Color White

Build Date 2/96

Engine Data 6 cylinders, 3.0 liters,

Placement ___ longitudinal; X lateral

Transmission Data 4 speed

___ manual, X Automatic, X O/D

Final Drive: ___ rear wheel drive, X front wheel drive,

___ four wheel drive

Odometer Reading 136,547 km

Options X air conditioning, X power steering; X power brakes;

X power windows, X cruise control; X tilt wheel,

___ power door locks

DATA FROM TIRE PLACARD

Tire Pressure (at capacity) Front. 33 psi

Rear 33 psi

Recommended Tire Size P205/65R15

Tires on Test Vehicle: P205/65R15

Manufacturer: Continental

VEHICLE CAPACITY DATA.

Number of Occupants 3 Front; 3 Rear; ___ 3rd Seat; 6 Total

Type of Front Seats ___ Bucket, ___ Bench; X Split Bench

Type of Front Seat Back ___ Fixed, X Adjustable with.

X Lever; ___ Knob; ___ Power

Vehicle Maximum Capacity Loading 499.0 kg (A)

No of Occupants x 68 04 kg 408 2 kg (B)

Cargo Capacity (A-B) 90 8 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF VEHICLE WITH MAXIMUM FLUIDS AND FUEL

Right Front	492 2	kg	Right Rear	267.6	kg
Left Front	494 0	kg	Left Rear	271.7	kg
TOTAL FRONT	986 2	kg	TOTAL REAR	539 3	kg
% of Total Weight	64 6	%	% of Total Weight:	35 4	%
TOTAL WEIGHT	1525 5	kg			

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT

Total Test Vehicle Delivered Weight with Maximum Fluids	=	1525.5	kg
Cargo Carrying Capacity of Test Vehicle	=	90.8	kg
Weight of 2 Side Impact Dummies (2 x 80 7 kg)	=	161.4	kg
TEST VEHICLE TARGET WEIGHT	=	1777.7	kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO: (FULLY LOADED)

Right Front	500 8	kg	Right Rear	345 6	kg
Left Front	544 8	kg	Left Rear	384 7	kg
TOTAL FRONT	1045 6	kg	TOTAL REAR	730 3	kg
% of Total Weight	58 9	%	% of Total Weight	41 1	%
TOTAL WEIGHT	1775 9	kg			

TEST VEHICLE ATTITUDE

	Curb Weight	Fully Loaded Weight Attitude	Test Attitude
Right Front (mm)	698	689	690
Left Front (mm)	695	677	684
Right Rear (mm)	682	637	637
Left Rear (mm)	680	626	626

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase 2756 mm

C G As Tested 1137 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH

Right Side 4332 mm

Centerline 4986 mm

Left Side 4330 mm

FRONT SEAT CUSHION PLACEMENT

Total Length of Adjustment Travel 220 mm

Test Position 7th detent rearward of 13 total

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle 24 2 degrees

REAR SEAT

Total Length of Fore/Aft Adjustment Travel non-adjustable

Seat Back Adjustment Position non-adjustable

ADJUSTABLE STEERING COLUMN POSITION mid position

WINDOW POSITIONS

Left Front	Closed	Left Rear.	Removed
Right Front	Closed	Right Rear	Removed

AMOUNT OF WATER IN FUEL TANK

Test mass added = 56 8 kg

LOCATIONS OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase 2756 mm

Impact Point is 438 mm rearward of front axle centerline

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000

Overall Length 4986 mm, Overall Width: 1883 mm

TEST WEIGHT:

Right Front:	501.7	kg	Right Rear.	351.5	kg
Left Front	537.5	kg	Left Rear:	378.3	kg
TOTAL FRONT	1039.2	kg	TOTAL REAR.	729 8	kg
% of Total Weight	58 7	%	% of Total Weight	41.3	%
TOTAL WEIGHT	1769.0	kg			

Wheelbase 2756 mm

Longitudinal C G. from Center of Front Axle 1137 mm

Impact Angle with Respect to Impactor. 90 degrees

MAXIMUM EXTERIOR STATIC CRUSH

1	LEVEL 1 (350 mm above ground)	242	mm
2	LEVEL 2 (460 mm above ground).	400	mm
3	LEVEL 3 (598 mm above ground)	360	mm
4	LEVEL 4 (875 mm above ground)	274	mm
5	LEVEL 5 (1322 mm above ground)	85	mm
	Maximum Post-Test Intrusion:	400	mm @ Level 2

OCCUPANTS:	Left Front Driver	Left Rear Passenger
Type of Dummy	ES-2	ES-2
Restraints Used	Type II belt	Type II belt

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION

Number of Vehicle Data Channels 29

Number of Cameras

Onboard Vehicle	3
Offboard Vehicle	4
Deformable Barrier:	2
TOTAL	9

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Impactor FMVSS 214 Moving Deformable Barrier

Test Date August 15, 2000

POSITION OF IMPACT (MDB) ON MONORAIL

Crabbed 27 degrees to left

MDB DETAILS:

Overall Width of Framework Carriage:	1252	mm
Overall Length of MDB (incl Honeycomb impact face)	4115	mm
Wheelbase of Framework Carriage:	2591	mm
Tread of Framework Carriage (Front & Rear)	1880	mm
C G Location Rearward of Front Axle:	1100	mm
C G Location From Centerline	-10	mm
C.G Location Above Ground Level	477	mm
Tire Manufacturer:	Fidelity	
Tire Size	P215/75D15	
Tire Pressure	25 psi	

MDB WEIGHT

Right Front	458 8	kg	Right Rear:	230 3	kg
Left Front:	324.4	kg	Left Rear	350 6	kg
TOTAL FRONT:	783.2	kg	TOTAL REAR:	580 9	kg
TOTAL MDB WEIGHT	1364 1	kg			

Impact Angle (MDB C/L to Target Vehicle C/L) = 90 degrees

Impact Speed = Primary 33 1 mph (53 3 kph), Secondary: 32 9 mph (52.9 kph)

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS (Cont'd)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1	Row A Top of Stack (813 mm)	=	121	mm
2	Row B Mid Stack (686 mm)	=	75	mm
3.	Row C Top of Bumper (533 mm)	=	78	mm
4	Row D Center of Bumper (432 mm)	=	156	mm

INSTRUMENTATION

Number of MDB Data Channels: 5

DATA SHEET NO 4

POST TEST OBSERVATIONS

Year/Make/Model/Body Style: 1996/Ford/Taurus/4 door

Test Date August 15, 2000

VISIBLE DUMMY CONTACT POINTS

	Left Front Driver	Right Rear Passenger
Head	Side header	C post
Arm	Door above armrest	Window sill
Upper Rib	Door above armrest	Armrest
Mid Rib	Door above armrest	Armrest
Lower Rib	Door above armrest	Armrest
Abdomen	Door below armrest	Armrest
Pelvis	Door below armrest	Door below armrest

DOOR OPENING

	Left Side	Right Side
Front	Remained closed	Remained closed
Rear	Remained closed	Remained closed

MDB DISTANCE FROM TARGET IMPACT POINT

Horizontal 3 mm forward

Vertical 4 mm down

ARM REST LOCATIONS

Front 228 mm from bottom of window

Rear 214 mm from bottom of window

SEAT CRUSH

Front Seat Back 76 mm Front Seat Cushion 56 mm

Left Rear Seat Back: 86 mm Rear Seat Cushion 140 mm

POST TEST OBSERVATIONS (Cont'd)

GLAZING DAMAGE

Both left side windows broke, windshield cracked

PILLAR PERFORMANCE

No failures noted

SILL SEPARATION

None noted

OTHER NOTABLE IMPACT EFFECTS

None noted

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO 5

SIDE IMPACT DUMMY (ES-2) INSTRUMENTATION DATA

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

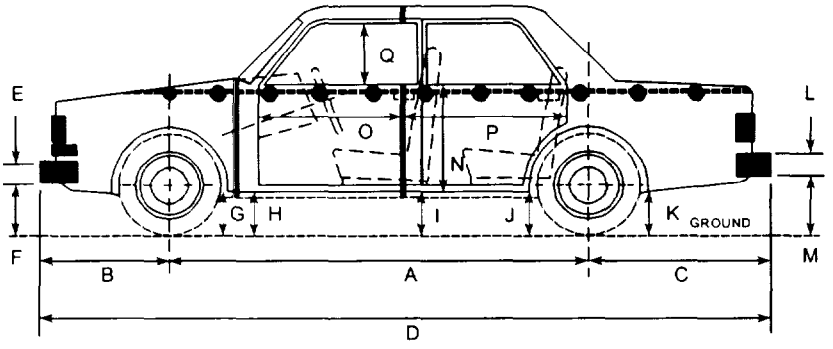
Test Date August 15, 2000

	LEFT FRONT DRIVER ID #001			
	Positive		Negative	
	Max	Time (msec)	Max	Time (msec)
RIB ACCELERATIONS (g's)				
Left Upper Rib (LUR) Y	131 5	39	27 0	44
Left Middle Rib (LMR) Y	130.8	36	23.2	86
Left Lower Rib (LLR) Y	134 0	35	31.0	81
SPINE ACCELERATIONS (g's)				
Lower Lateral Y	52 2	41	13.8	70
PELVIS ACCELERATIONS (g's)				
Lateral Y	72.2	32	18.5	56
	LEFT REAR PASSENGER ID#002			
	Positive		Negative	
	Max	Time (msec)	Max	Time (msec)
RIB ACCELERATIONS (g's)				
Left Upper Rib (LUR) Y	46 1	52	6 7	97
Left Middle Rib (LMR) Y	66 0	48	9.0	69
Left Lower Rib (LLR) Y	76 5	48	11 1	82
SPINE ACCELERATIONS (g's)				
Lower Lateral Y	52.2	47	4 6	85
PELVIS ACCELERATIONS (g's)				
Lateral Y	58 1	41	6 3	70

REFERENCE Positive Direction- Longitudinal (X) = forward
Lateral (Y) = to right
Vertical (Z) = down

DATA SHEET NO. 6

VEHICLE PRE AND POST-TEST MEASUREMENTS



LEFT SIDE VIEW

D=Length at Centerline R=Right Side Length S=Left Side Length
T=Width at B Post J1=To Pinch Weld J2= To Sill E&L=Bumper Thickness

	PRE-TEST	POST-TEST	Δ CHANGE
A	2756	2730	26
B	1040	1041	1
C	1190	1189	1
D	4986	4960	26
E	200	200	0
F	376	375	1
G	164	168	4
H	165	161	4
I	148	112	36
J1	140	141	1
J2	138	128	10
K	220	218	2
L	210	210	0
M	307	324	17
N	740	650	90
O	816	793	23
P	1195	1125	70
Q	490	470	20
R	4332	4335	3
S	4330	4274	56
T	1883	1442	441

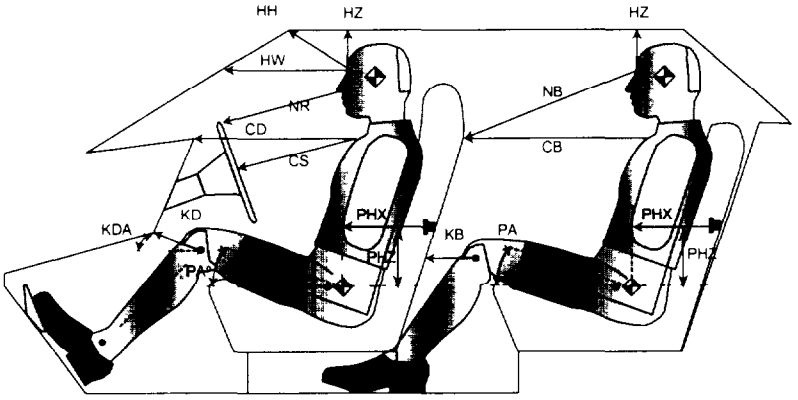
All measurements in millimeters

DATA SHEET NO. 7

SIDE IMPACT DUMMY (ES-2) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000



Note All dimensions are in millimeters with tolerance of ± 3 mm

	Left Front Driver ID #001	Left Rear Passenger ID #002
HH	290	NA
HW	525	NA
HZ	128	118
NR/NB	428	675
CD/CB	540	630
CS	330	NA
KDL/(KDA)	171 (0.0)	328 (0 0)
KDR/(KDA)	181 (0.0)	335 (0 0)
PA (longitudinal)	21 4	26 6
PA (lateral)	1 5	3 2
Spine Angle (longitudinal)	24 4	29 2
Spine Angle (lateral)	1.6	4 4
PHX	231	268
PHZ	112	294

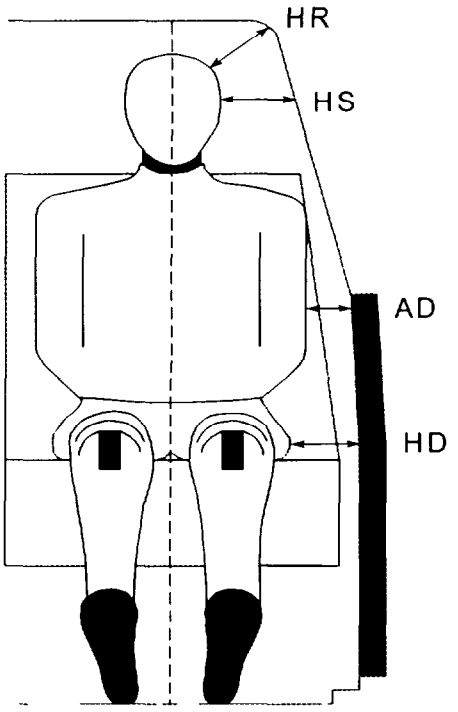
Two door vehicle shown Rear dummy PHX & PHZ measurements for 4-door vehicle use the C-Post striker as reference point

DATA SHEET NO 8

SIDE IMPACT DUMMY (ES-2) LATERAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000



Note All dimensions are in millimeters

	Left Front Driver ID #001	Left Rear Passenger ID #002
HR	194	180
HS	295	329
AD	115	95
HD	155	142
Shoulder to Window	205	187

Door Thickness (mm)	Thorax	Pelvis H Point
Front	190	210
Rear	205	190

DATA SHEET NO 9

DUMMY POSITIONING

	Left Front Driver ID #001		Left Rear Passenger ID #002	
	H-point	Dummy	H-point	Dummy
HP to Floor Z	163	185	50	54
HP to Hinge X	736	742	653	645
HP to Sill Y	197	204	200	210
HP to Striker X	377	370	485	480
HP to Dash X	487	489	624	613
HP to Header Z	743	726	714	710
HP to Front Axle		1253		2236
HP to Ground		519		532
H-POINT MACHINE (deg)				
Left Knee	125		109	
Right Knee	124		107	
Left Foot	109		127	
Right Foot	113		130	
Left Leg (mm)	84		148	
Right Leg (mm)	120		150	
Hip Angle	98		98	
Back Angle	24		25	

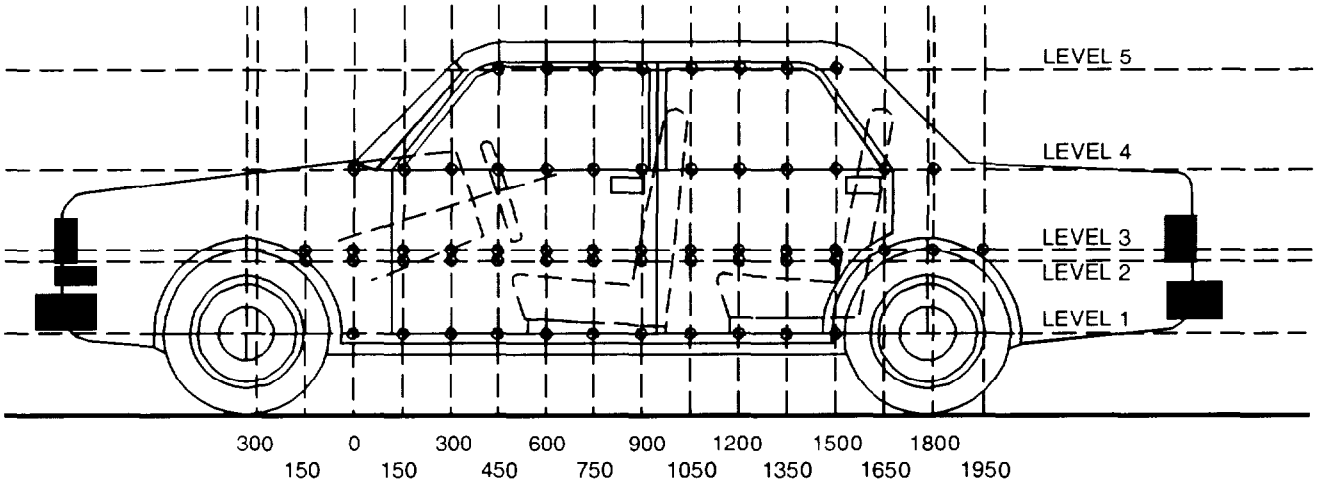
The H-Point measurements were obtained from the H-Point machine The dummy measurements are for the dummies H-Point

DATA SHEET NO. 10

VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000



LEFT SIDE VIEW

NOTE: All measurements are in millimeters (mm)

LEVEL 5 - WINDOW TOP
LEVEL 4 - WINDOW SILL
LEVEL 3 - MID-DOOR
LEVEL 2 - OCCUPANT H POINT
LEVEL 1 SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION
MEASUREMENTS ALONG THE VERTICAL 750 mm LINE SHOWN ABOVE

Level 1 @ Axle Centerline Height (or Sill Top Height)	350	mm
Level 2 @ Occupant H-Point	460	mm
Level 3 @ Mid Door.	598	mm
Level 4 @ Window Sill	875	mm
Level 5 @ Window Top	1322	mm

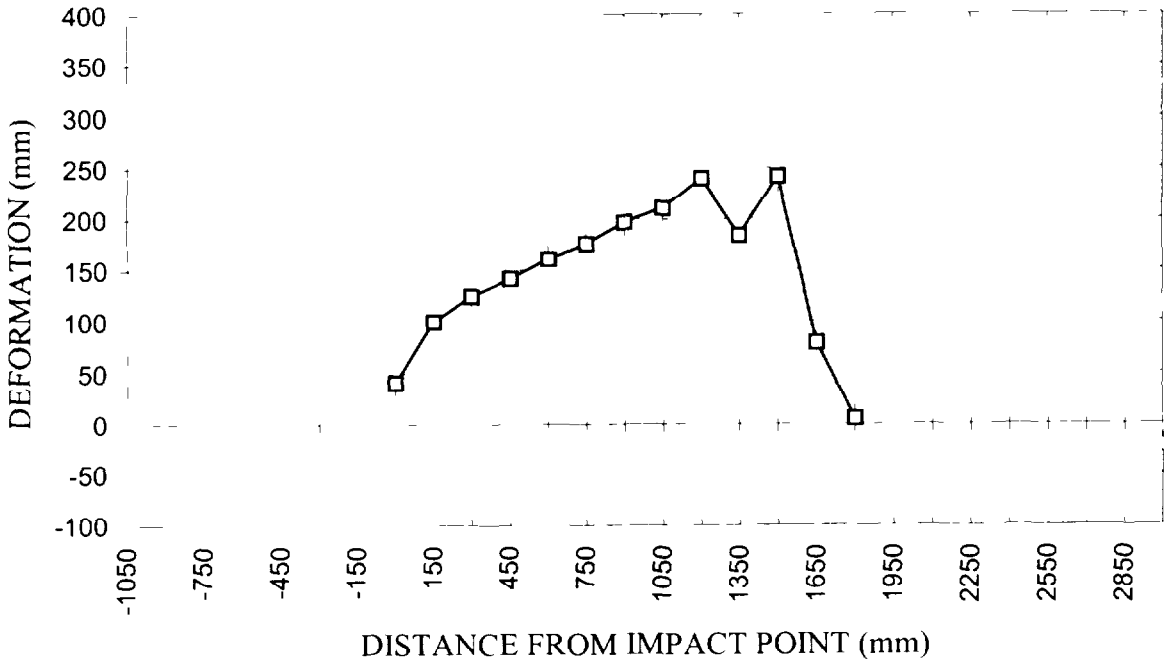
DATA SHEET NO. 11
VEHICLE EXTERIOR CRUSH PROFILES

	Level 1 – Axle Centerline		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	740	781	41
150	735	835	100
300	733	858	125
450	734	876	142
600	730	891	161
750	731	907	176
900	730	927	197
1050	732	943	211
1200	730	970	240
1350	735	919	184
1500	730	972	242
1650	735	814	79
1800	741	747	6
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			

Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

VEHICLE EXTERIOR CRUSH PROFILES (Cont'd)

LEVEL 1 – AXLE CENTERLINE



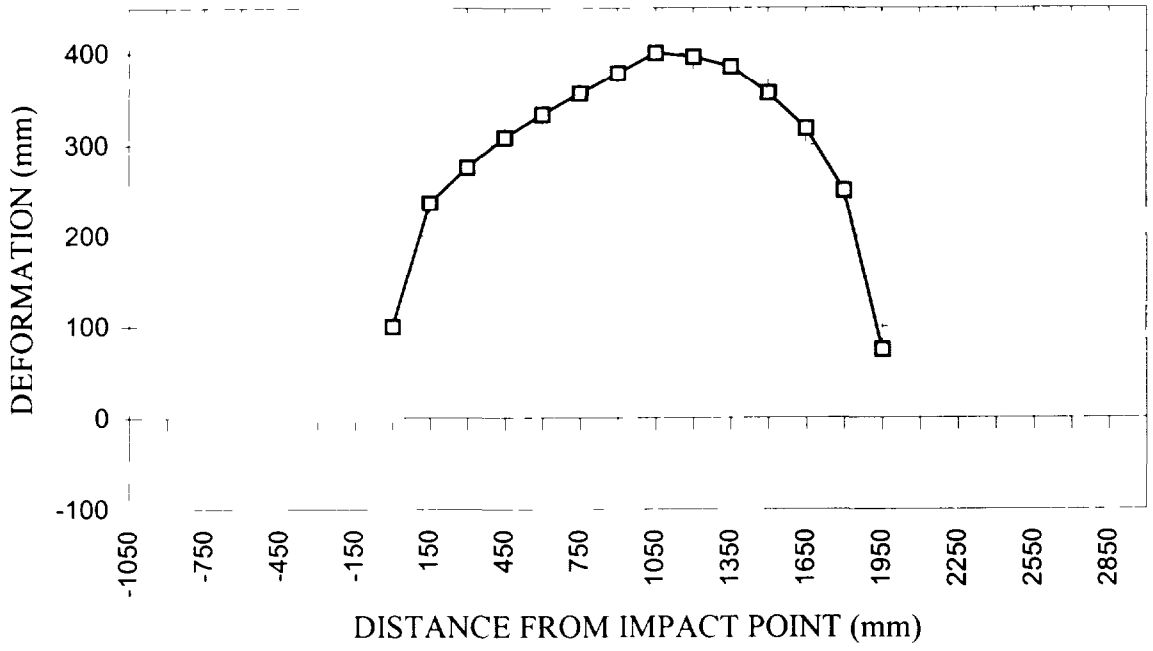
DATA SHEET NO. 11 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

	Level 2 – Occupant H Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	672	772	100
150	668	905	237
300	668	944	276
450	660	968	308
600	658	991	333
750	655	1011	356
900	653	1031	378
1050	651	1051	400
1200	651	1047	396
1350	650	1035	385
1500	650	1006	356
1650	651	969	318
1800	651	902	251
1950	654	728	74
2100			
2250			
2400			
2550			
2700			
2850			
3000			

Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

VEHICLE EXTERIOR CRUSH PROFILES (Cont'd)

LEVEL 2 – OCCUPANT H POINT



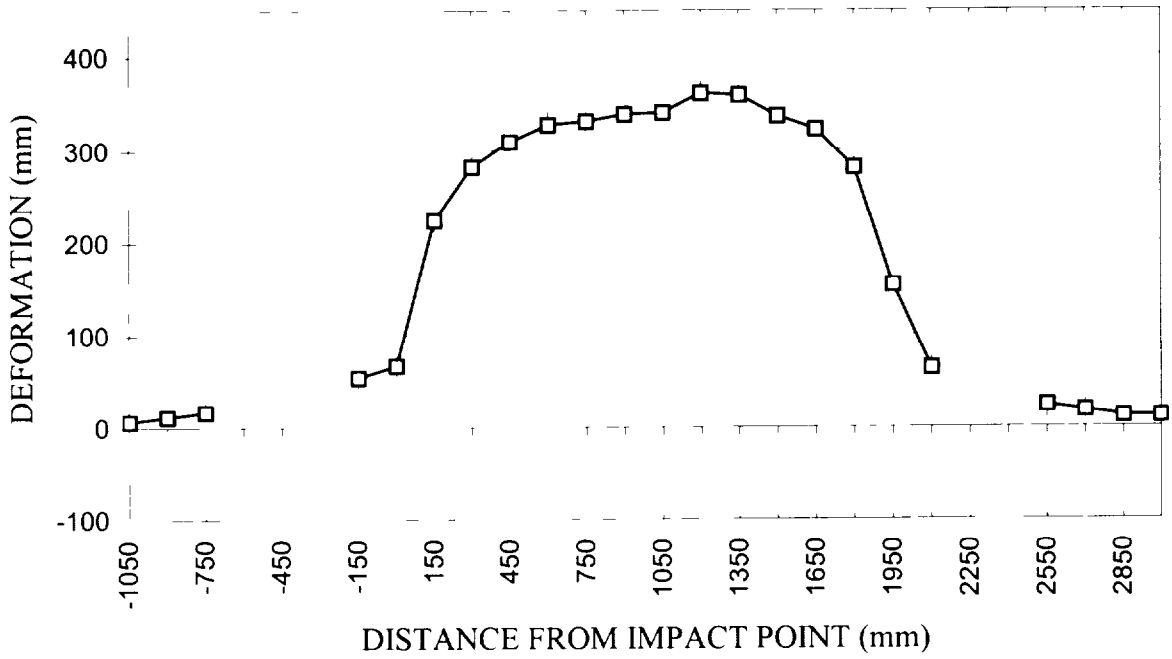
DATA SHEET NO 11 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

	Level 3 – Mid Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050	765	772	7
-900	728	740	12
-750	704	721	17
-600			
-450			
-300			
-150	677	731	54
0 (impact point)	674	741	67
150	671	895	224
300	668	950	282
450	666	975	309
600	664	991	327
750	663	994	331
900	661	999	338
1050	660	1000	340
1200	660	1020	360
1350	658	1016	358
1500	658	994	336
1650	658	980	322
1800	657	938	281
1950	655	808	153
2100	644	708	64
2250			
2400			
2550	665	689	24
2700	699	717	18
2850	730	742	12
3000	760	772	12

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = Reference plane to car body

VEHICLE EXTERIOR CRUSH PROFILES (Cont'd)

LEVEL 3 – MID DOOR



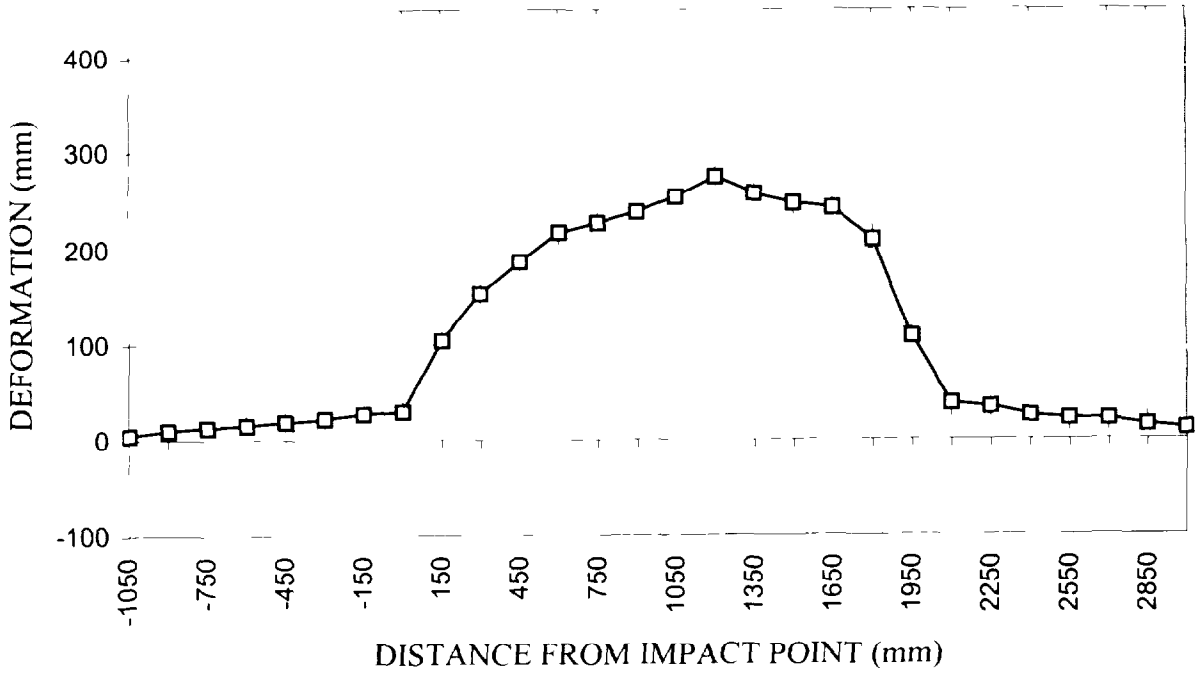
DATA SHEET NO 11 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

	Level 4 – Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050	821	826	5
-900	792	802	10
-750	773	786	13
-600	757	772	15
-450	745	764	19
-300	740	762	22
-150	730	757	27
0 (impact point)	727	757	30
150	720	824	104
300	715	869	154
450	715	902	187
600	715	932	217
750	710	937	227
900	707	945	238
1050	704	958	254
1200	705	979	274
1350	709	966	257
1500	709	956	247
1650	710	952	242
1800	714	924	210
1950	713	821	108
2100	712	750	38
2250	718	752	34
2400	727	752	25
2550	738	760	22
2700	754	775	21
2850	774	789	15
3000	801	812	11

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = Reference plane to car body

VEHICLE EXTERIOR CRUSH PROFILES (Cont'd)

LEVEL 4 – WINDOW SILL



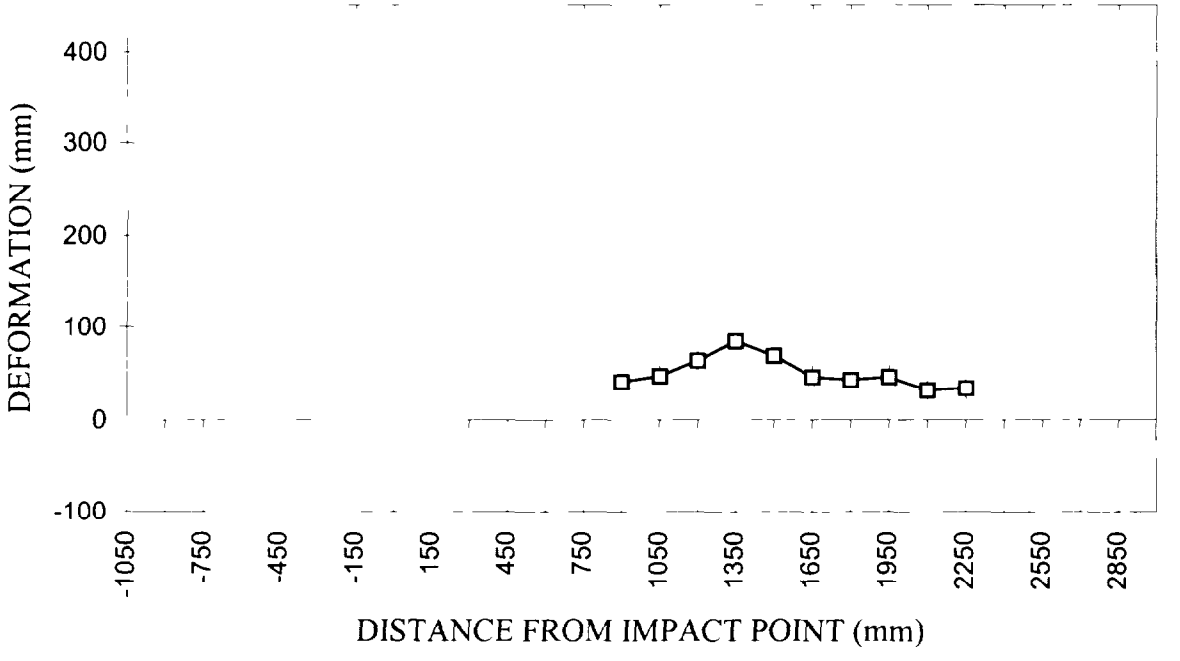
DATA SHEET NO. 11 (Cont'd)
VEHICLE EXTERIOR CRUSH PROFILES

	Level 5 – Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750			
900	1001	1042	41
1050	993	1040	47
1200	986	1050	64
1350	984	1069	85
1500	983	1052	69
1650	984	1030	46
1800	985	1028	43
1950	980	1026	46
2100	997	1029	32
2250	1004	1038	34
2400			
2550			
2700			
2850			
3000			

Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

VEHICLE EXTERIOR CRUSH PROFILES (Cont'd)

LEVEL 5 – WINDOW TOP

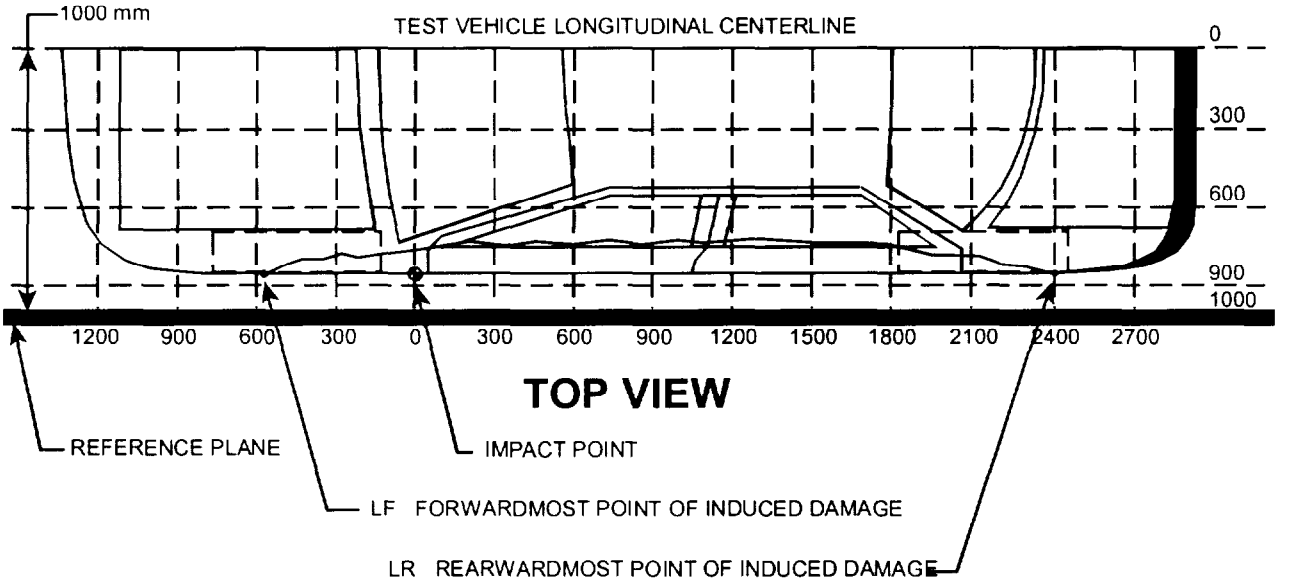


DATA SHEET NO 12

VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000



MEASUREMENT CONVENTIONS

Forward of the impact point (towards front of vehicle) is considered negative (—)

Rearward of the impact point (toward rearend of vehicle) is considered positive (+)

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1 (LR = 3150 mm)	812	805	7
2 2325 mm	755	722	33
3 1405 mm	1032	654	378
4 572 mm	1000	671	329
5 –258 mm	762	735	27
6 (LF = -1050 mm)	826	821	5

DATA SHEET NO. 13

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

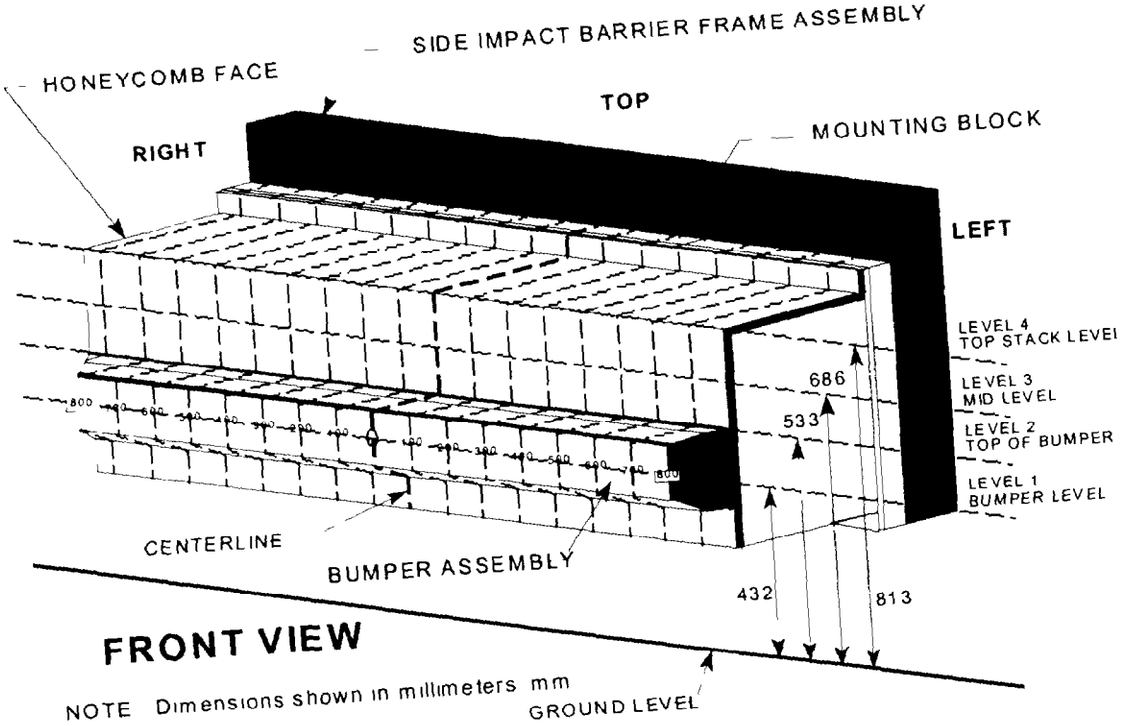
Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000

		Distance Right of Center (mm)									Distance Left of Center (mm)							
Location	Height At CL*	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level 4	813 mm	38	5	-2	-3	-3	-2	-2	-1	0	1	2	3	9	14	37	71	121
Mid Level Level 3	686 mm	16	5	4	1	0	0	0	3	1	3	4	4	5	7	9	24	75
Top Bumper Level 2	533 mm	74	53	33	9	10	10	1	2	3	7	9	22	38	50	63	89	78
Mid Bumper Level 1	432 mm	88	77	113	33	16	9	4	5	2	29	42	51	66	80	97	120	156

* See next page for Barrier Face Graphic

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR (Cont'd)

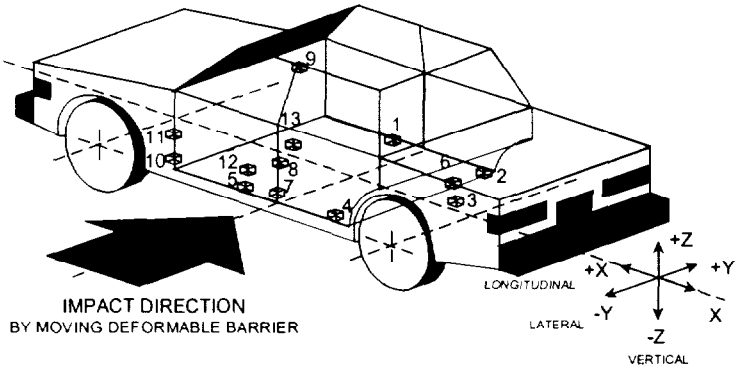


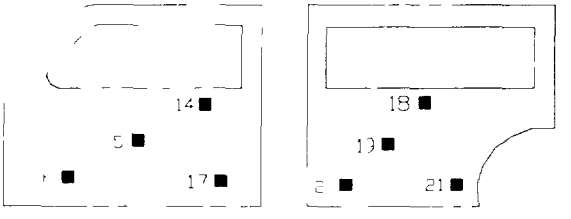
DATA SHEET NO. 14

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000





1 – Right Side Sill @ Front Seat
2 – Right Side Sill @ Rear Seat
3 – Rear Floorpan Above Axle
4 – Left Side Sill @ Rear Seat
5 – Left Side Sill @ Front Seat
6 – Right Rear Occ Compartment
7 – Left Lower B Post
8 – Left Mid B Post
9 – Left Upper B Post
10 – Left Lower A Post
11 – Left Mid A Post
12 – Driver Seat Track
13 – Vehicle C G
14 – Left Front Door Upper
15 – Left Front Door Mid
16 – Left Front Door Lower
17 – Left Front Door Rear Lower
18 – Left Rear Door Upper
19 – Left Rear Door Mid
20 – Left Rear Door Lower
21 – Left Rear Door Rear Lower

DATA SHEET NO 14 (Cont'd)

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date. August 15, 2000

Accel No	Description	Long (X) Maximums (g's) (CFC 60)		Lat (Y) Maximums (g's) (CFC 60)		Vert (Z) Maximums (g's) (CFC 60)		Resultant (g's) (CFC 60)
		Pos	Neg	Pos	Neg.	Pos	Neg	Max.
1	Right Side Sill @ Front Seat	3 9	5 2	20 0	2 8	5 6	8.8	20 8
2	Right Side Sill @ Rear Seat	4 7	4 3	25.0	3 0	3 1	4.3	25 1
3	Rear Floorpan Above Axle	2 6	5 3	14.5	1.7	9 4	7.9	15 6
4	Left Side Sill @ Rear Seat	---	---	35 9	3.8	---	---	---
5	Left Side Sill @ Front Seat	---	---	57.2	8.0	---	---	---
6	Right Rear Occ Compartment	---	---	22.7	1 8	---	---	---
7	Left Lower B Post	---	---	165 0	20.5	---	---	---
8	Left Mid B Post	---	---	118 9	27.3	---	---	---
9	Left Upper B Post	---	---	52.7	40 8	---	---	---
10	Left Lower A Post	---	---	26.8	2 0	---	---	---
11	Left Mid A Post	---	---	15.9	1 3	---	---	---
12	Driver Left Seat Track	---	---	59.1	11.7	---	---	---
13	Vehicle CG	4 7	9 2	24.6	1 9	14 4	9.8	24 9
14	Left Front Door Upper	---	---	108.0	35 1	---	---	---
15	Left Front Door Mid	---	---	*	*	---	---	---
16	Left Front Door Lower			201.5	61 8		---	---
17	Left Front Door Rear Lower	---	---	134.1	17.3	---	---	---
18	Left Rear Door Upper	---	---	104 8	122 2	---	---	---
19	Left Rear Door Mid	---	---	181.5	75.2	---	---	---
20	Left Rear Door Lower	---	---	173 0	91.6	---	---	---
21	Left Rear Door Rear Lower	---	---	191 7	114.4	---	---	---

* No Valid Data Collected

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY (Cont'd)

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000

Accel No	Description	Coordinates (mm)*		
		X	Y	Z
1	Right Side Sill @ Front Seat	2622	665	197
2	Right Side Sill @ Rear Seat	1659	617	198
3	Rear Floorpan Above Axle	1160	0	489
4	Left Side Sill @ Rear Seat	1666	-617	187
5	Left Side Sill @ Front Seat	2640	-665	196
6	Right Rear Occ Compartment	2022	325	313
7	Left Lower B Post	2273	-710	392
8	Left Mid B Post	2289	-732	770
9	Left Upper B Post	2262	-541	1303
10	Left Lower A Post	3337	-693	373
11	Left Mid A Post	3362	-826	888
12	Driver Left Seat Track	2033	-562	226
13	Vehicle CG	2876	0	320
14	Left Front Door Upper	2584	-765	860
15	Left Front Door Mid	2850	-777	650
16	Left Front Door Lower	3037	-759	524
17	Left Front Door Rear Lower	2570	-767	484
18	Left Rear Door Upper	1833	-764	790
19	Left Rear Door Mid	2002	-780	685
20	Left Rear Door Lower	2112	-780	555
21	Left Rear Door Rear Lower	1766	-797	494

* Reference X – Rear Bumper (+ Forward)

Y – Vehicle Centerline (+ to right)

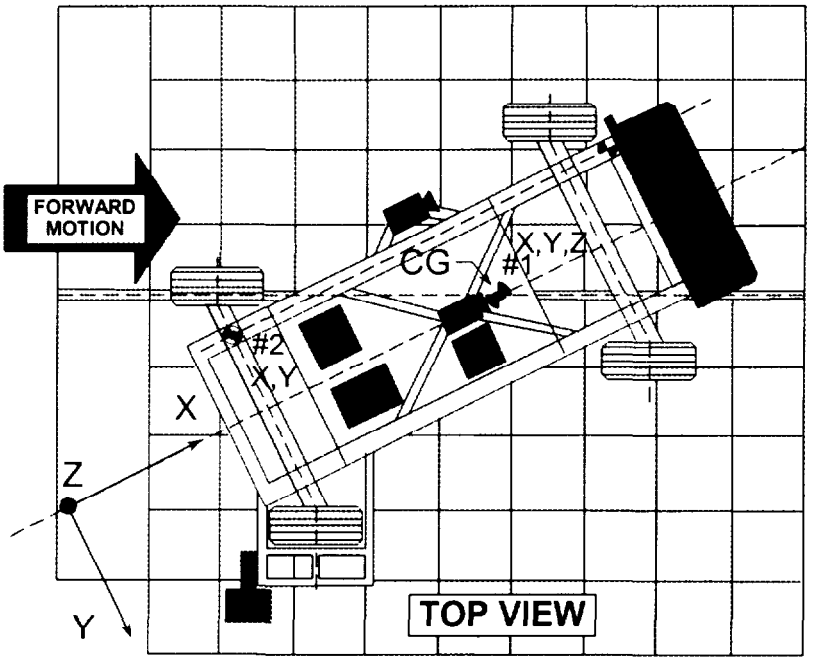
Z – Ground Level (+ up)

DATA SHEET NO 15

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000



		Coordinates (mm)*			(+) Positive		(-) Negative	
Accel No	Description	X	Y	Z	Max (g) (CFC 60)	Time (msec)	Max. (g) (CFC 60)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1 0	128	14 6	33
	Lateral (Y)	---	---	---	0 8	66	6 5	40
	Vertical (Z)	---	---	---	11.4	63	14 7	68
	Resultant (R)	---	---	---	18.0	52	--	--
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	2 0	116	18.0	41
	Lateral (Y)	---	---	---	2 7	38	2 1	75

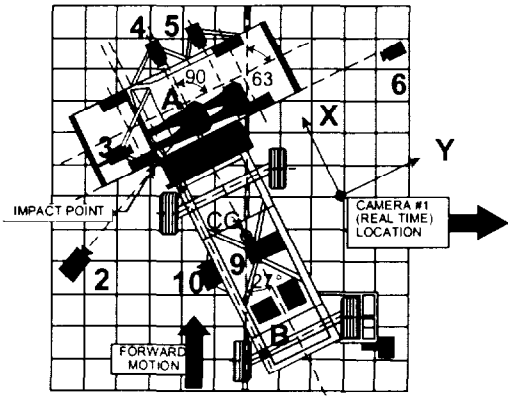
Reference X – Front Axle (+ Forward)
Y – Vehicle Centerline (+ to Right)
Z – Ground Level (+ Up)

DATA SHEET NO 16

HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style 1996/Ford/Taurus/4 door

Test Date August 15, 2000



Camera No	View	Coordinates (mm)*			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Real Time				10	24
2	Left Impact	-1120	-2420	1610	13	913
3	Onboard Hood				13	1010
4	Onboard Front Occupant				8	1000
5	Onboard Rear Occupant				8	948
6	Right Impact	-150	10400	1840	25	1000
7	Top Overall	-720	970	5000	8	870
8	Top Impact	-690	-340	5000	13	833
9	Cart Overall				13	743
10	Cart Impact				35	531

* Reference (from impact point)
+X = Forward
+Y = To Right
+Z = Upward from floor level

APPENDIX A – PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Photo No. A-1 – Pre-Test Front View of Test Vehicle

Photo No. A-2 – Post-Test Front View of Test Vehicle

Photo No. A-3 – Pre-Test Rear View of Test Vehicle

Photo No. A-4 – Post-Test Rear View of Test Vehicle

Photo No. A-5 – Pre-Test Left Side View of Test Vehicle

Photo No. A-6 – Post-Test Left Side View of Test Vehicle

Photo No. A-7 – Pre-Test MDB Positioned Against Vehicle (left side)

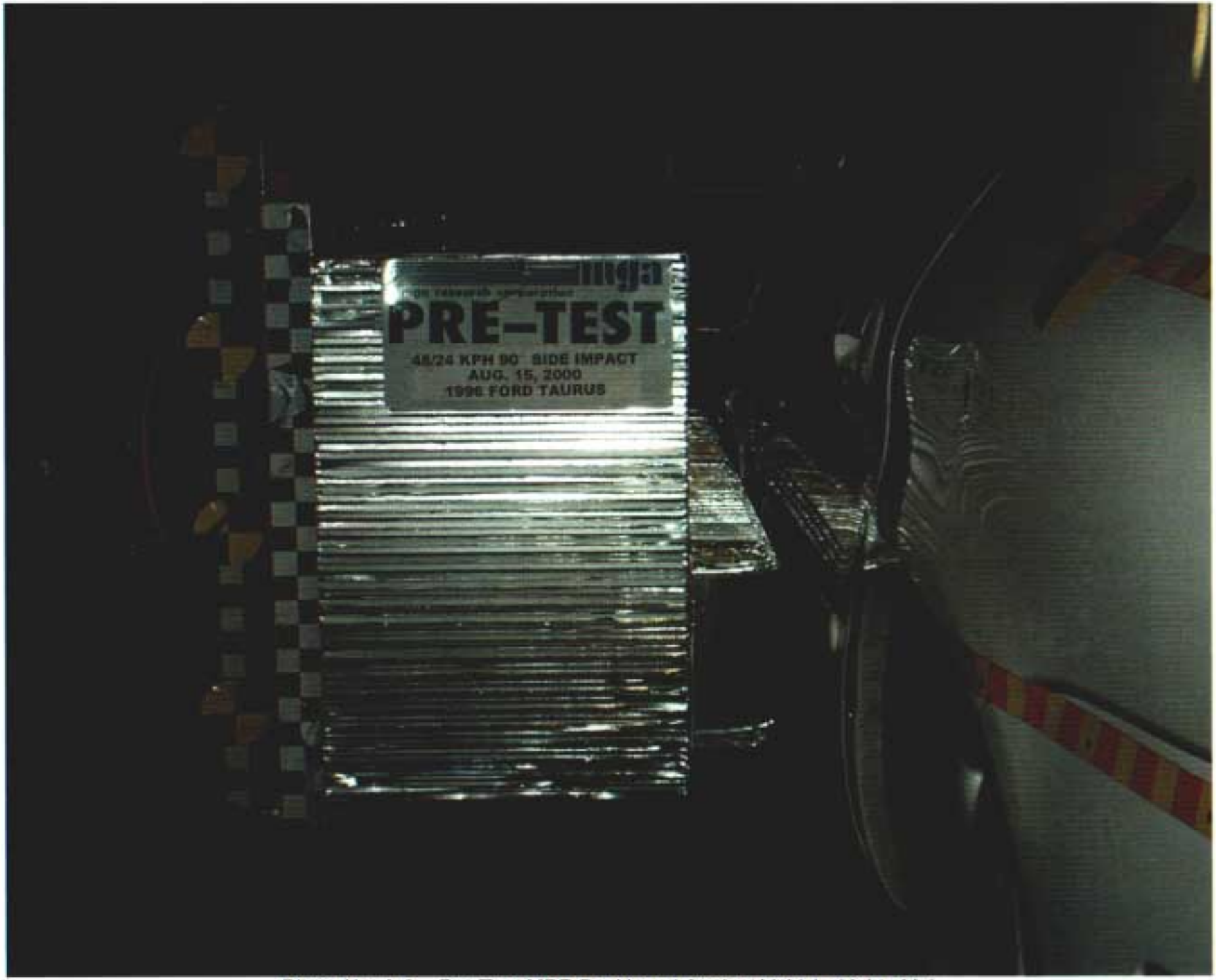


Photo No. A-8 – Pre-Test MDB Positioned Against Vehicle (right side)

Photo No. A-9 – Pre-Test MDB Positioned Against Vehicle Overhead View

Photo No. A-10 – Post-Test MDB Positioned Against Vehicle (left side)

Photo No. A-11 – Post-Test MDB Positioned Against Vehicle (right side)

Photo No. A-12 – Post-Test MDB Top View

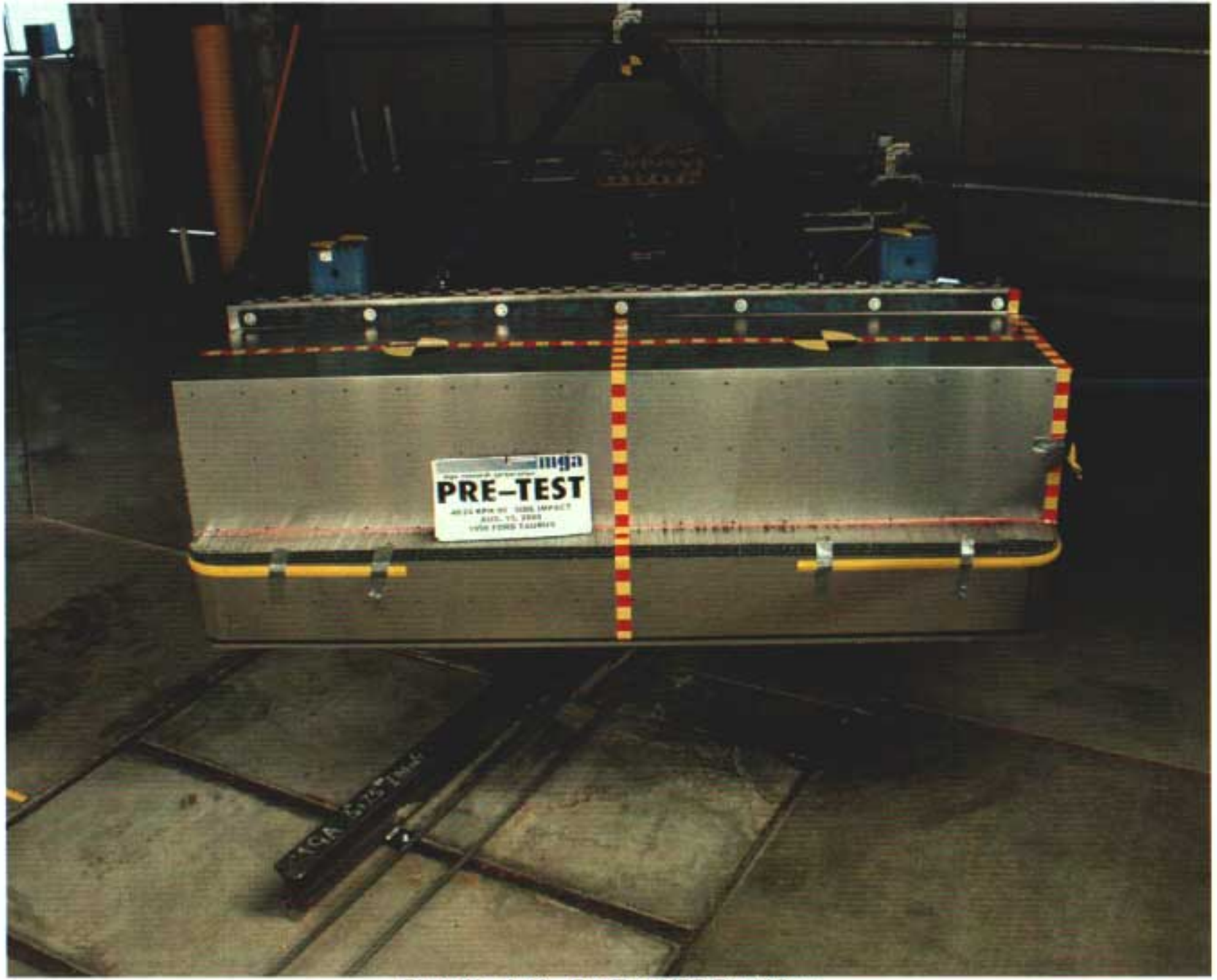


Photo No. A-13 – Pre-Test MDB Front View

Photo No. A-14 – Post-Test MDB Front View

Photo No. A-15 – Post-Test MDB Left Side View

Photo No. A-16 – Post-Test MDB Right Side View

Photo No. A-17 – Pre-Test Driver Dummy Right Side View

Photo No. A-18 – Post-Test Driver Dummy Right Side View

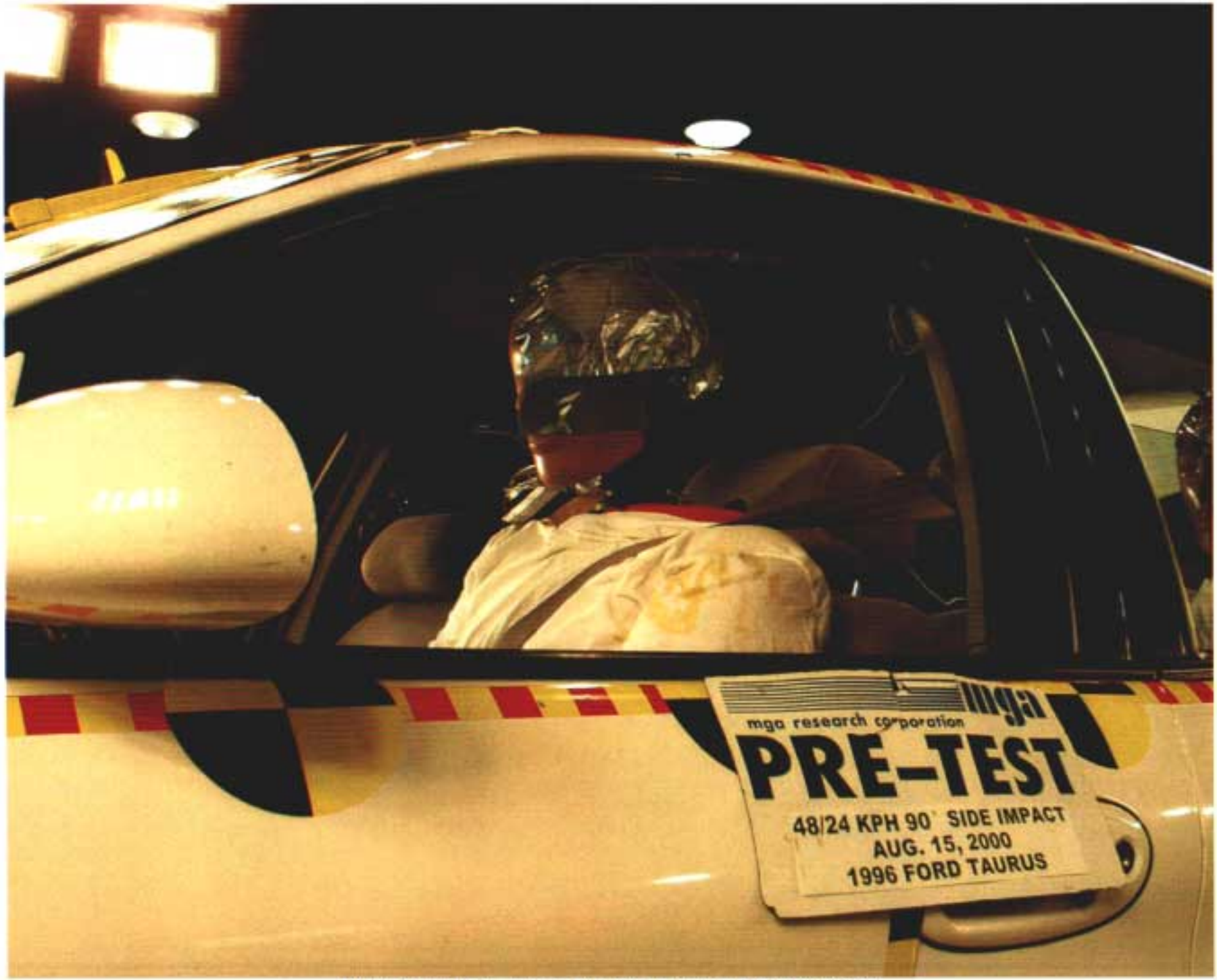


Photo No. A-19 – Pre-Test Driver Dummy Left Side View

Photo No. A-20 – Post-Test Driver Dummy Left Side View

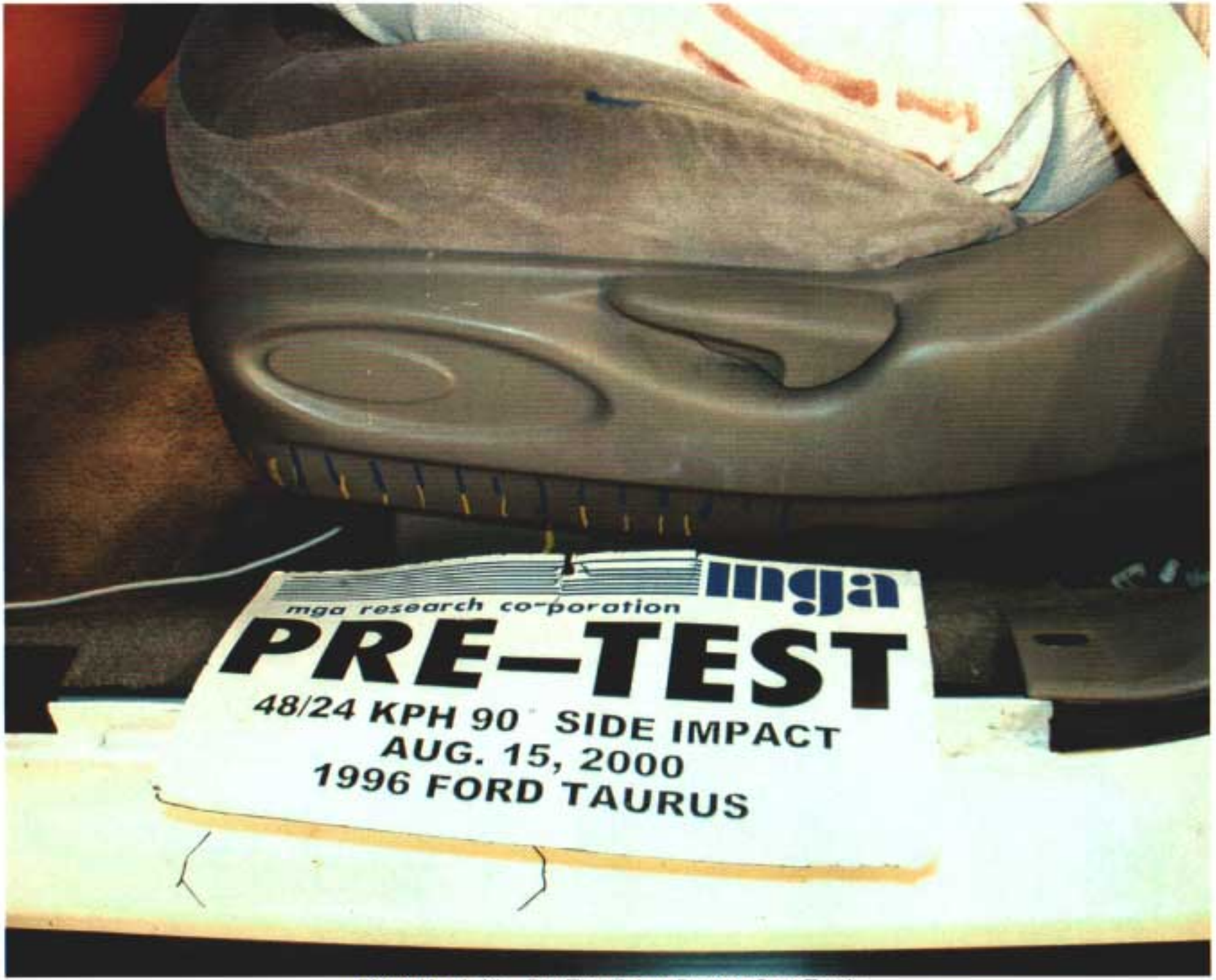


Photo No. A-21 – Pre-Test Driver Dummy Seat Track

Photo No. A-22 - Pre-Test Driver Dummy Left Side View (Door Open)

Photo No. A-23 – Pre-Test Driver Shoulder and Door Top View

Photo No. A-24 – Post –Test Driver Shoulder and Door Top View

Photo No. A-25 – Post-Test Driver Dummy Contact

Photo No. A-26 – Pre-Test Left Rear Passenger Dummy Right Side View

Photo No. A-27 – Post-Test Left Rear Passenger Dummy Right Side View

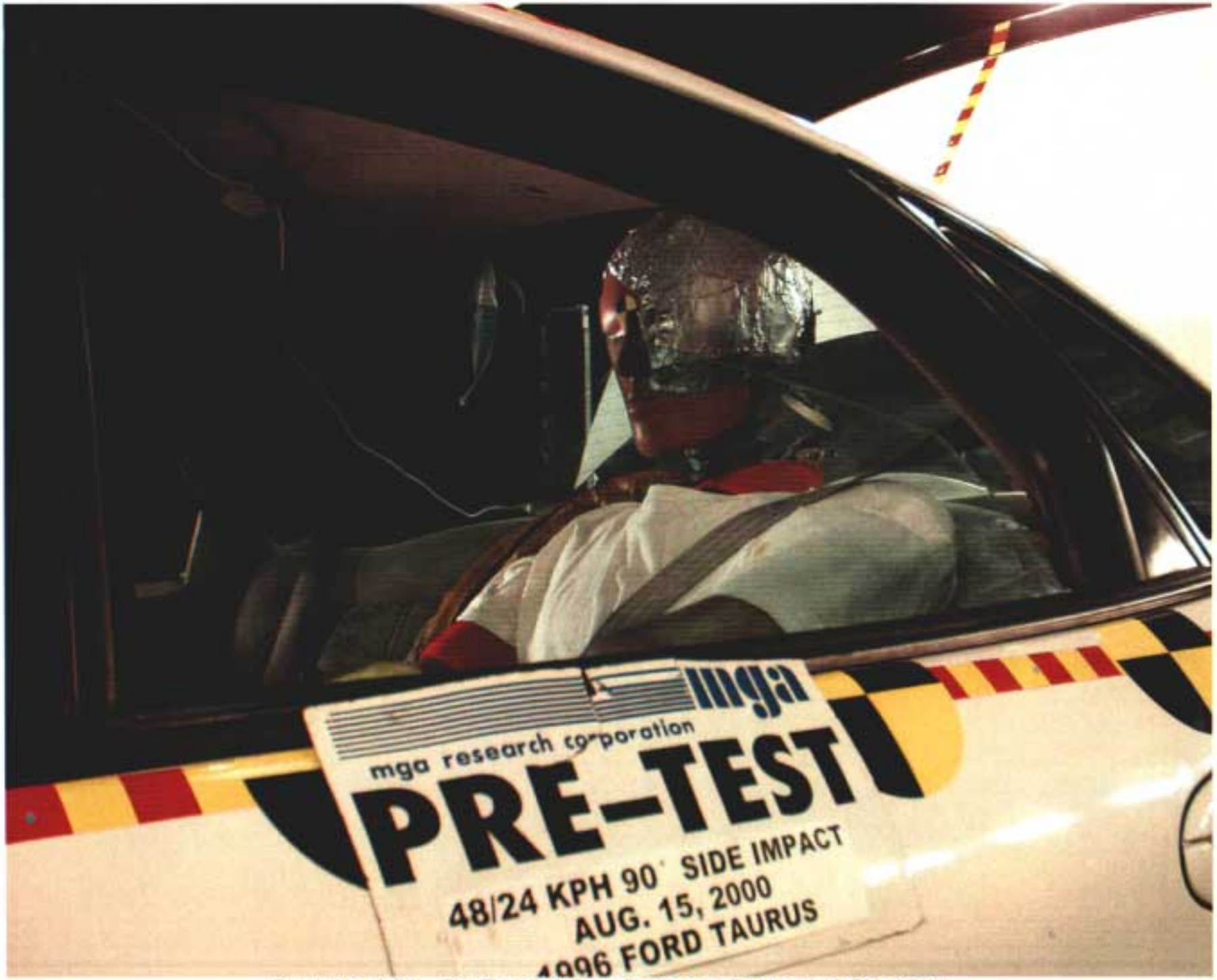


Photo No. A-28 – Pre-Test Left Rear Passenger Dummy Left Side View

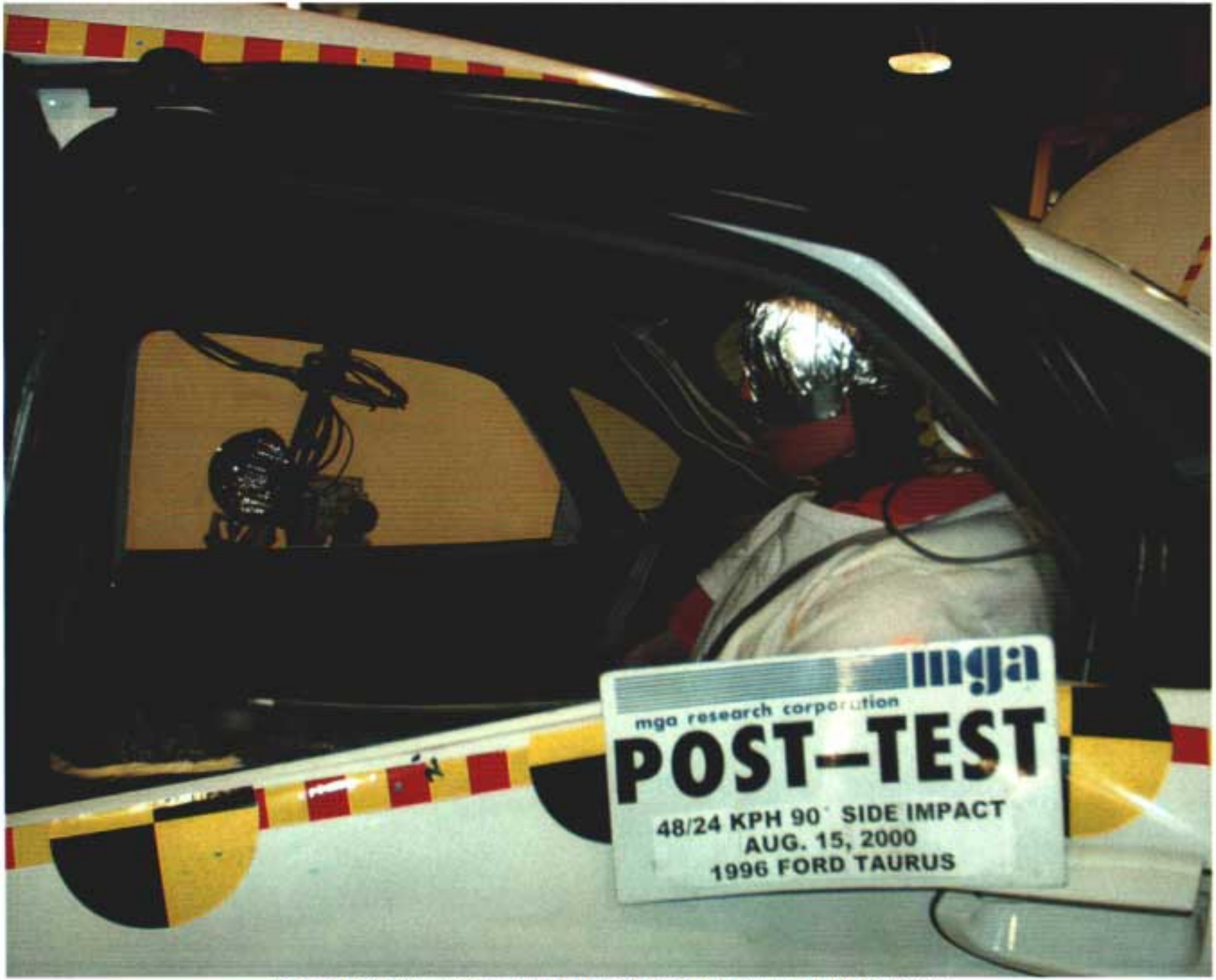


Photo No. A-29 – Post-Test Left Rear Passenger Dummy Left Side View

Photo No. A-30 – Pre-Test Left Rear Passenger Dummy Left Side View (Door Open)

Photo No. A-31 – Pre-Test Left Rear Passenger Shoulder and Door Top View

Photo No. A-32 – Post-Test Left Rear Passenger Shoulder and Door Top View

Photo No. A-33 – Post-Test Left Rear Passenger Dummy Contact

Photo No. A-34 – Post-Test Left Rear Passenger Dummy Head Contact

Photo No. A-35 – Pre-Test Left Front Impact Point on Vehicle

Photo No. A-36 – Left Front Attitude Point

Photo No. A-37 – Right Front Attitude Point

Photo No. A-38 – Left Rear Attitude Point

Photo No. A-39 – Right Rear Attitude Point

Photo No. A-40 – Left Front Sill Accelerometer

Photo No. A-41 – Left Rear Sill Accelerometer

Photo No. A-42 – Right Front Sill Accelerometer

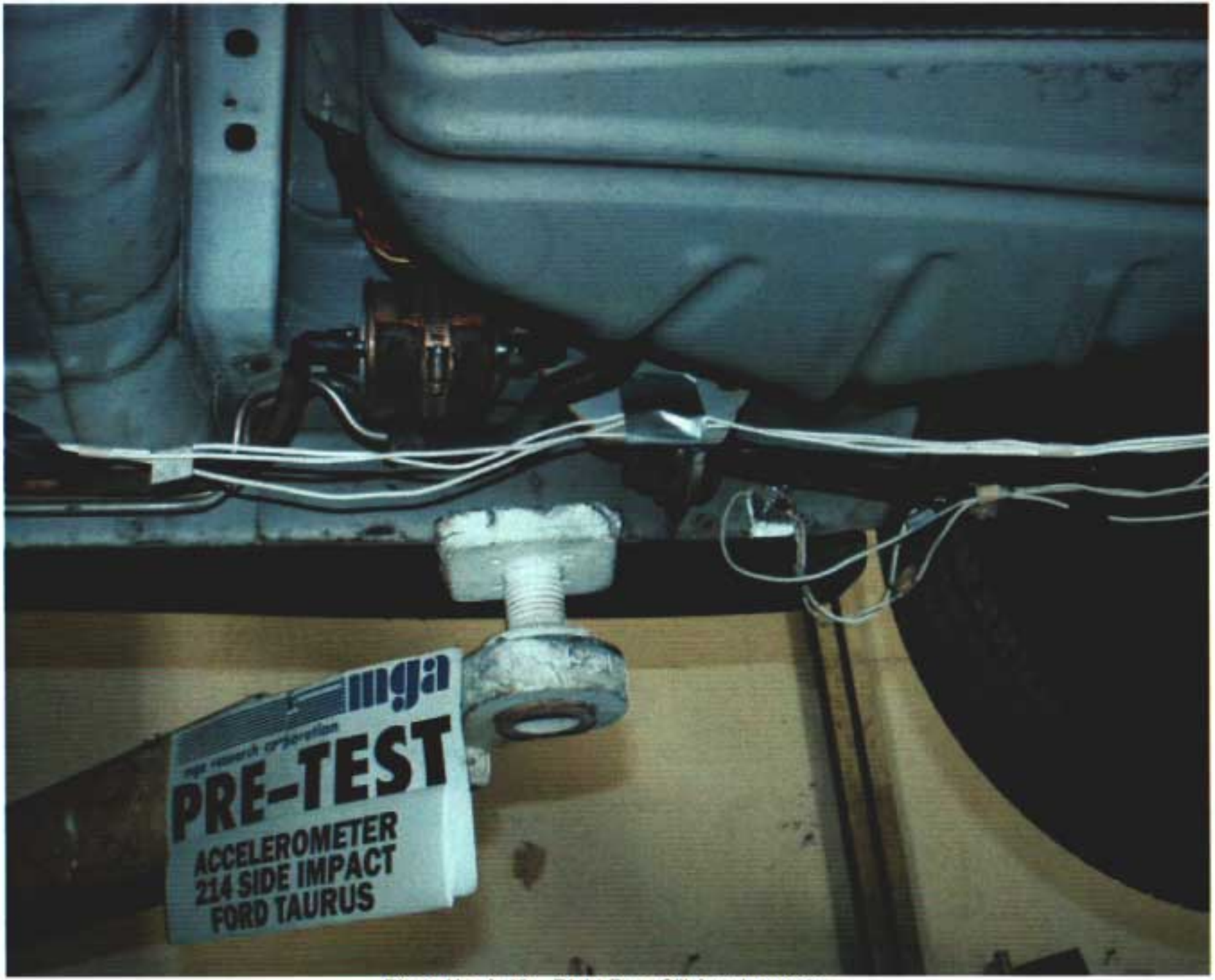


Photo No. A-43 – Right Rear Sill Accelerometer

Photo No. A-44 – Left Lower A Post Accelerometer

Photo No. A-45 – Left Mid A Post Accelerometer

Photo No. A-46 – Left Front Door Accelerometers

Photo No. A-47 – Left Upper B Post Accelerometer

Photo No. A-48 – Left Mid B Post Accelerometer

Photo No. A-49 – Left Lower B Post Accelerometer

Photo No. A-50 – Left Rear Door Accelerometer

Photo No. A-51 – Right Rear Occupant Compartment Accelerometer

Photo No. A-52 – Rear Floorpan Accelerometer

Photo No. A-53 – Vehicle Center of Gravity Accelereometer

APPENDIX B – VEHICLE AND ES-2 RESPONSE DATA

TABLE OF DATA PLOTS

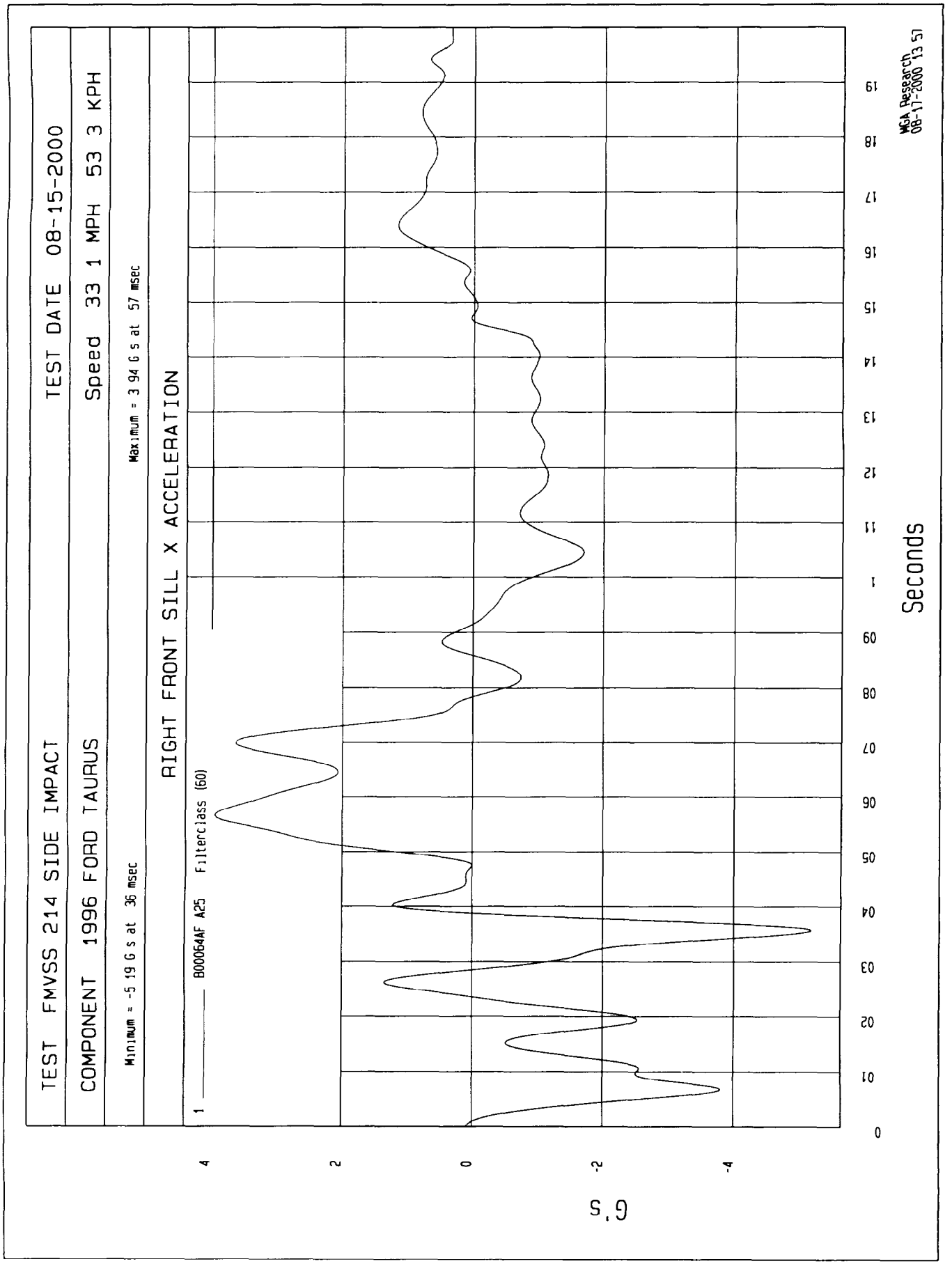
* No Valid Data Collected

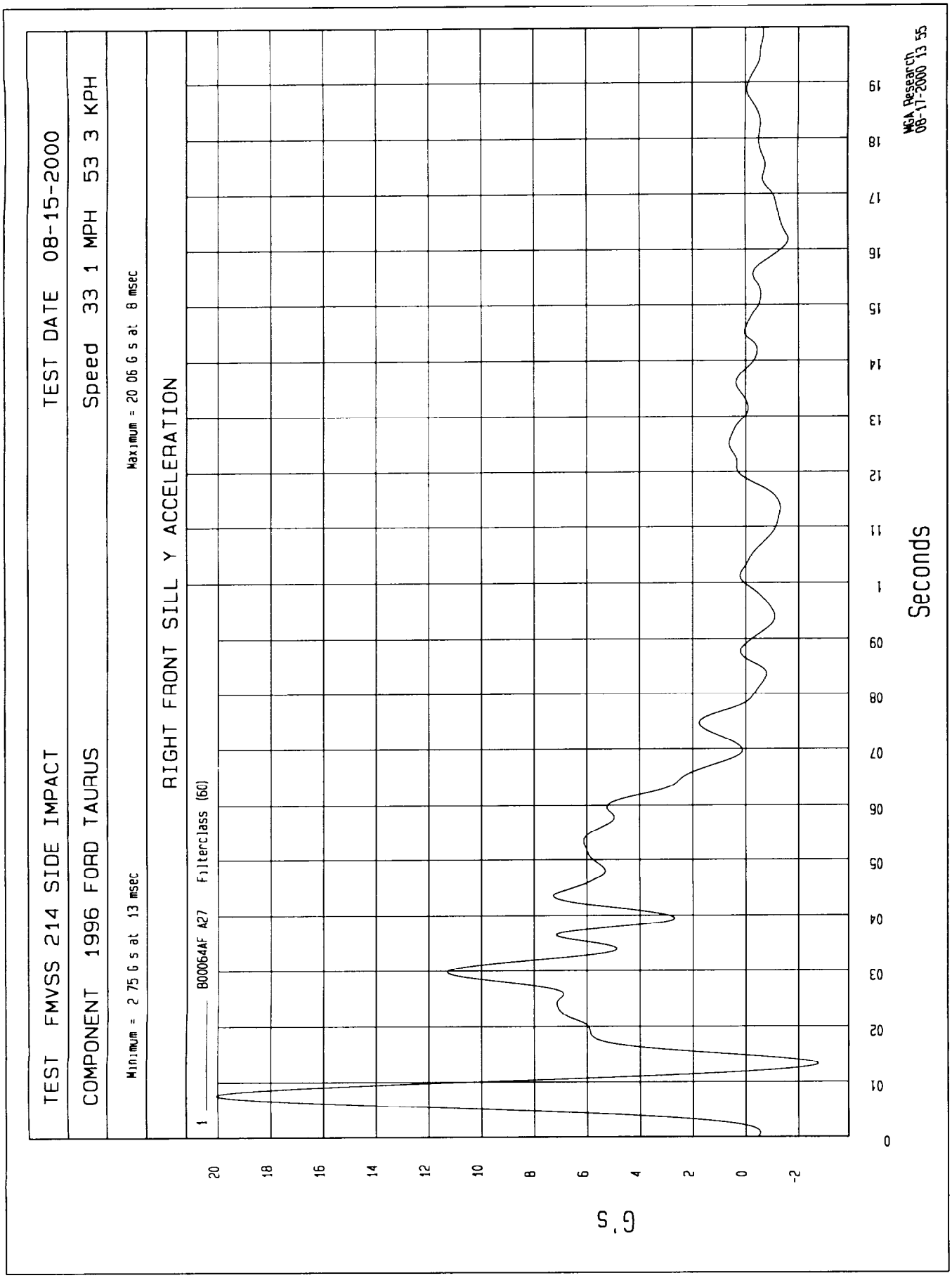
** No Valid Data After 14 msec

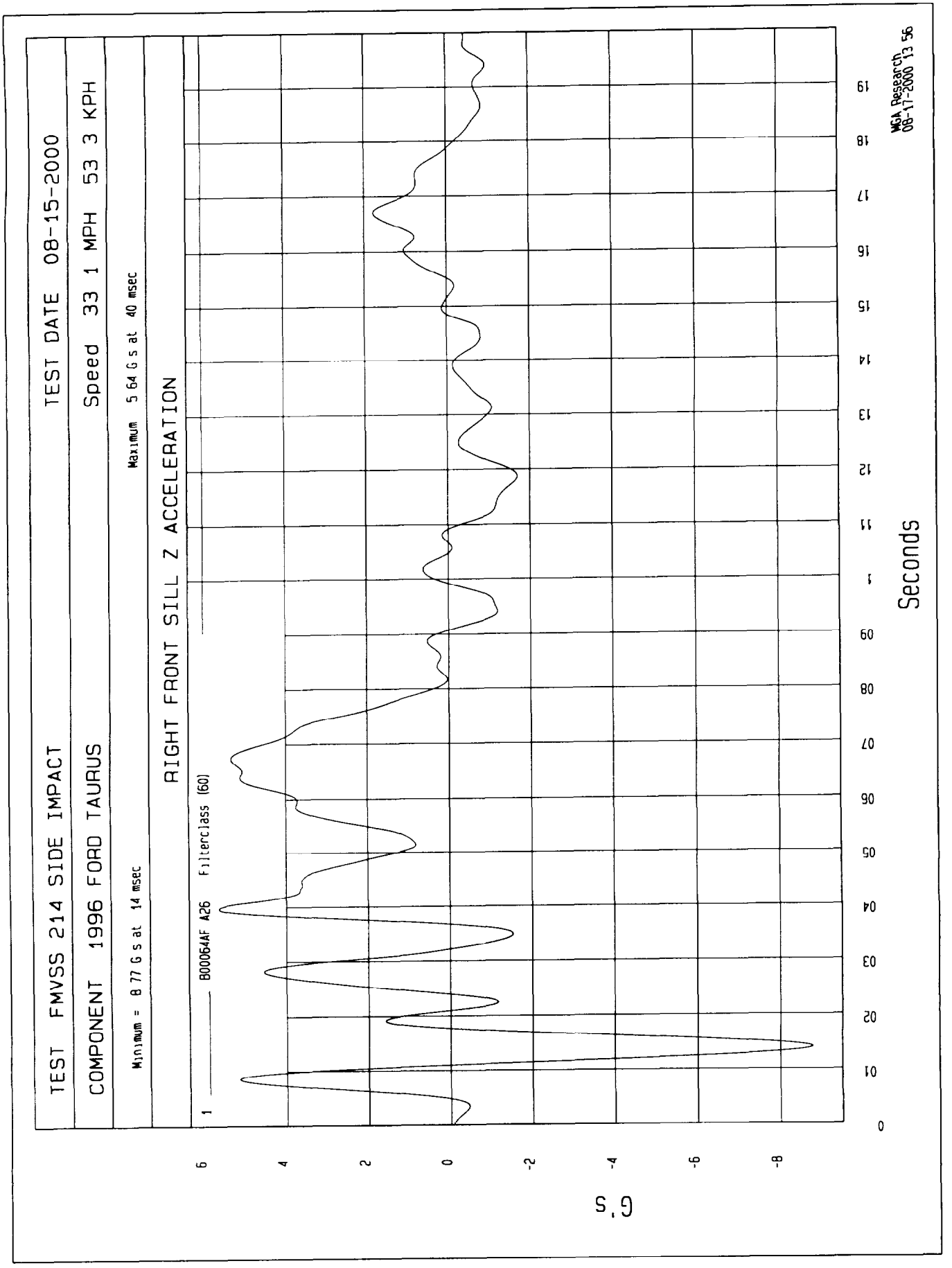
TABLE OF DATA PLOTS (Cont'd)

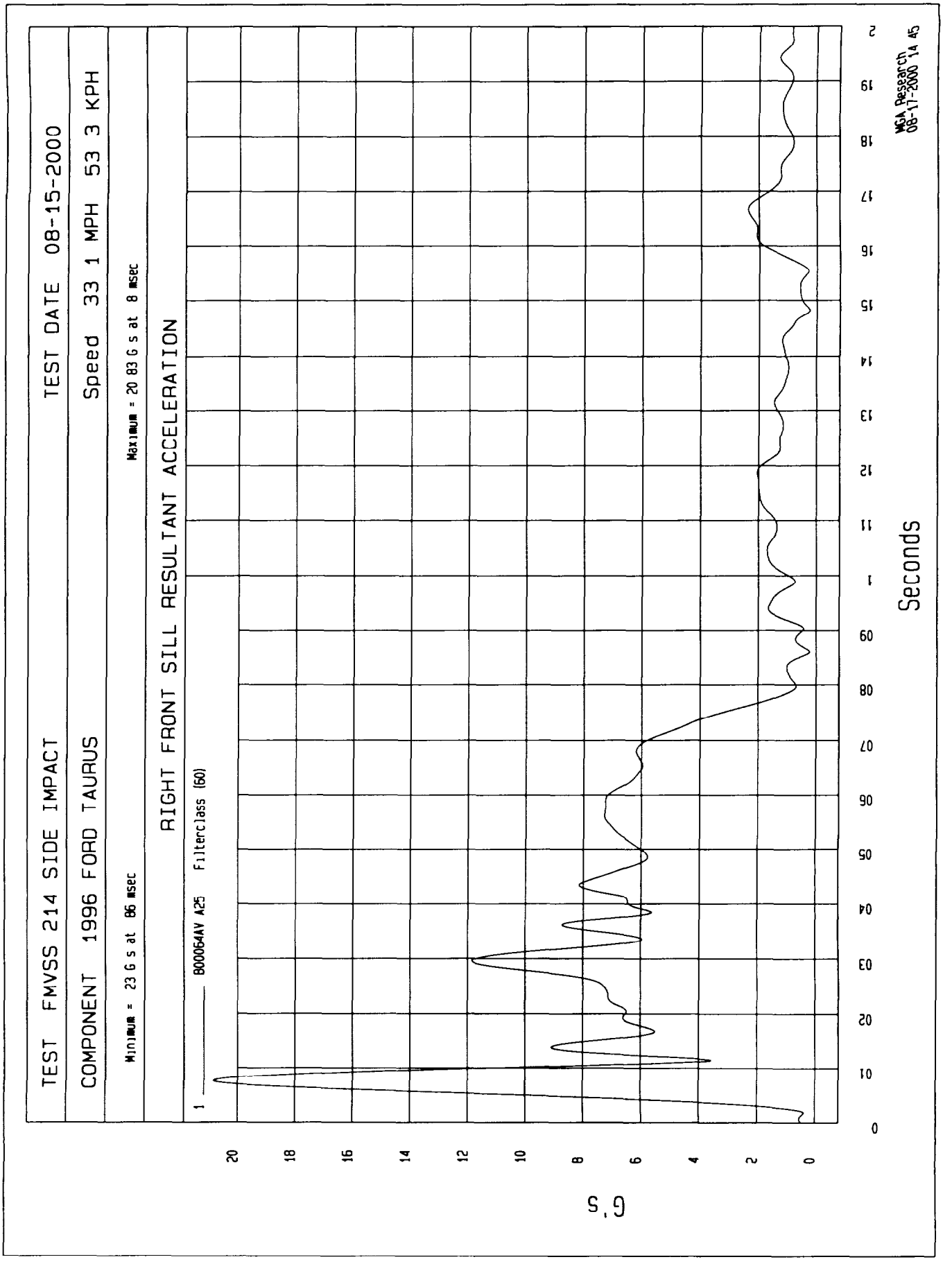
* No Valid Data After 20 msec

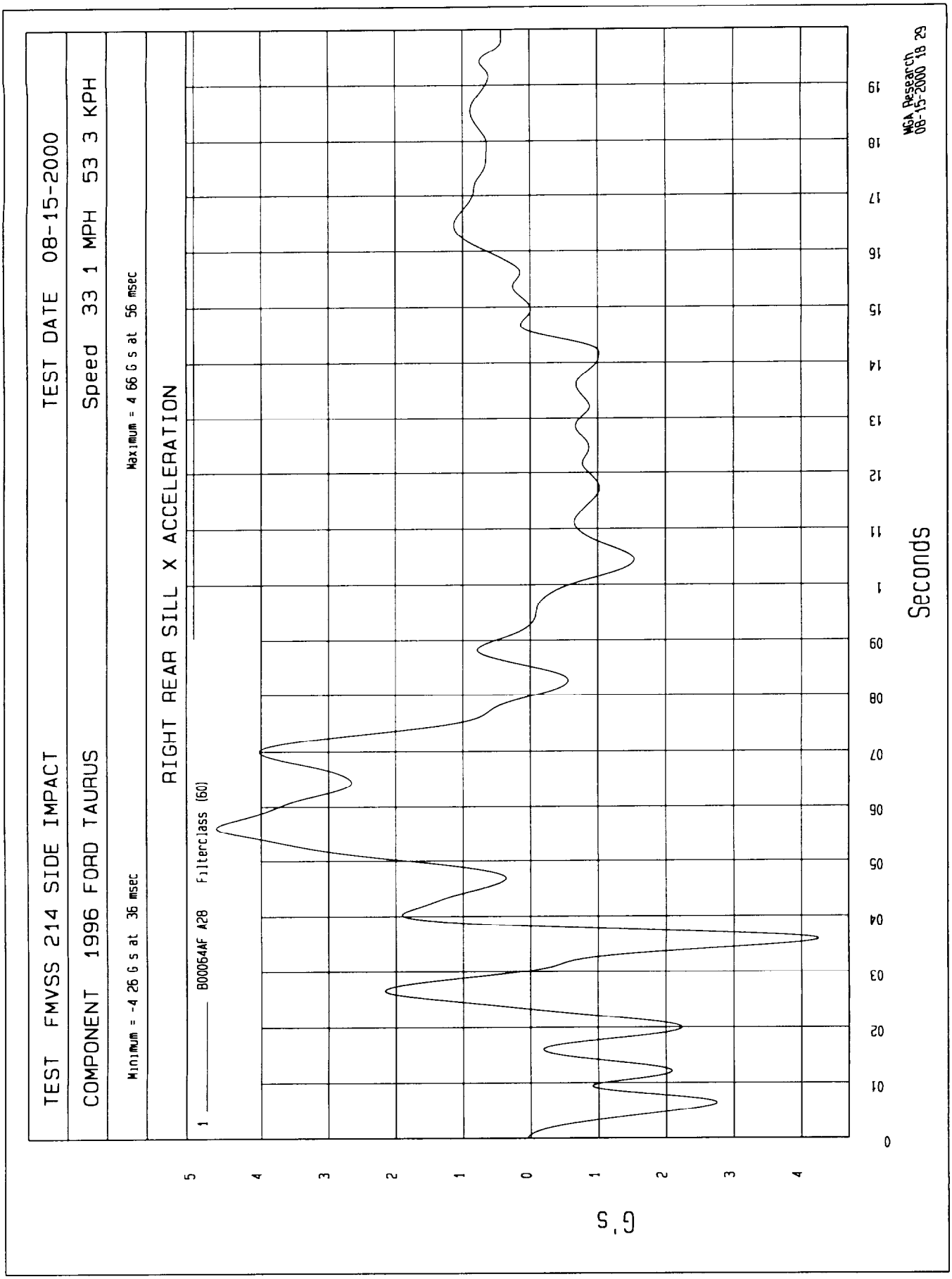
TABLE OF DATA PLOTS (Cont'd)

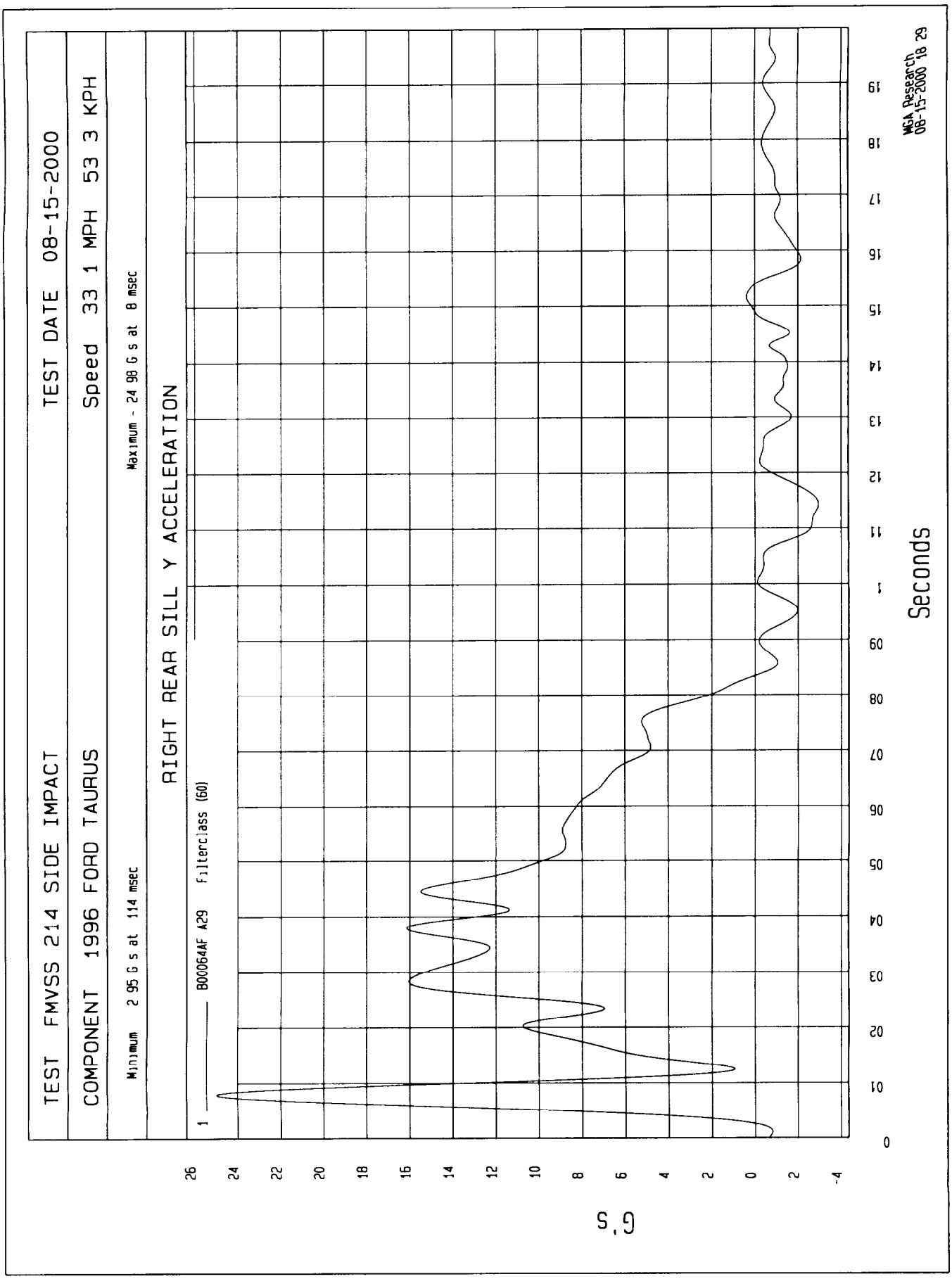

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -5 19 G s at 36 msec
Maximum = 3 94 G s at 57 msec
RIGHT FRONT SILL X ACCELERATION
1 B000644F A25 Filterclass (60)
MGA Research
08-17-2000 13 51
G's
4
2
0
-2
-4
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

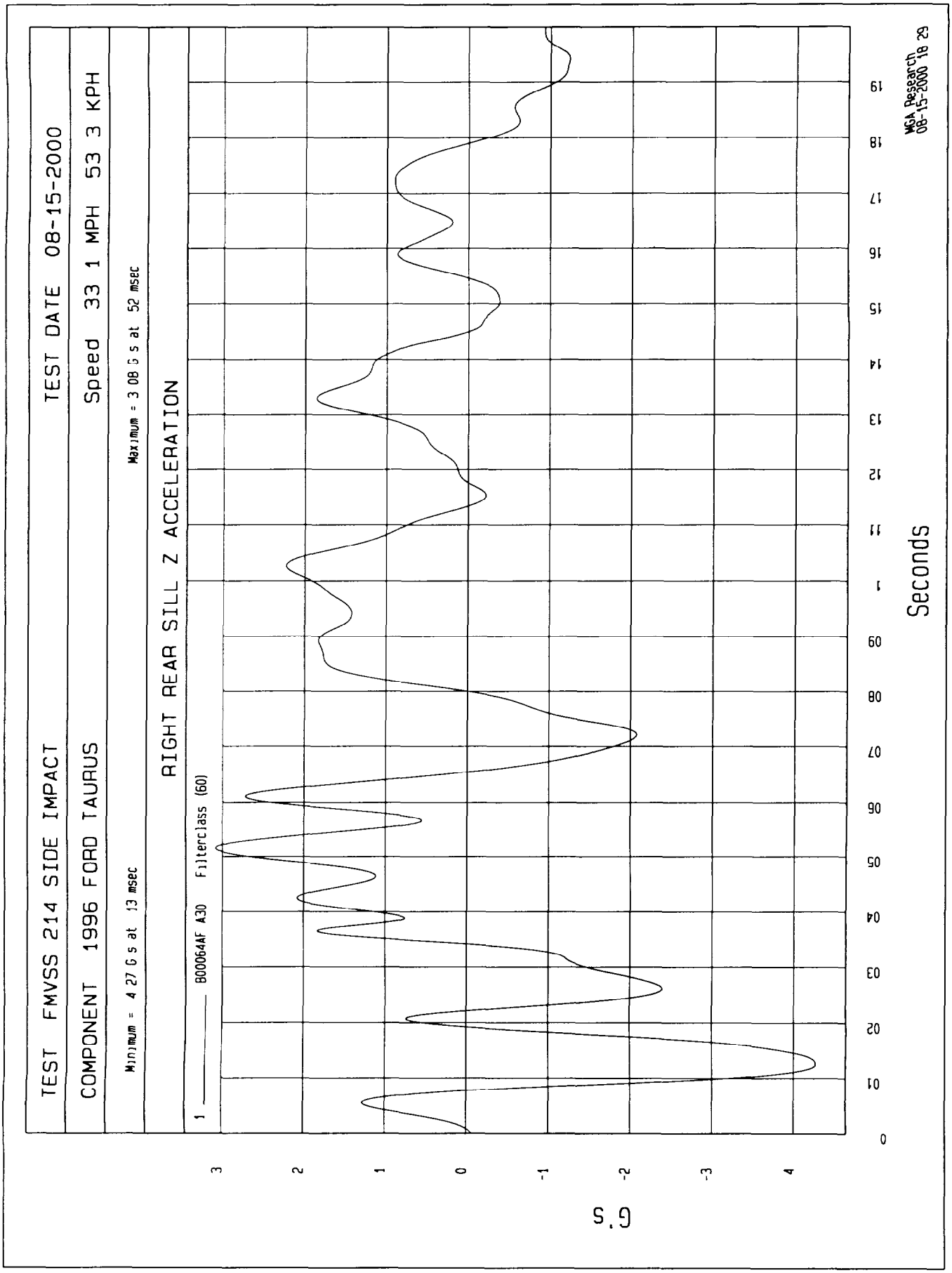

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 2 75 G s at 13 msec
Maximum = 20 06 G s at 8 msec
RIGHT FRONT SILL Y ACCELERATION
1 B00064AF A27 Filterclass (60)
G's
Seconds
MGA Research
08-17-2000 13 55

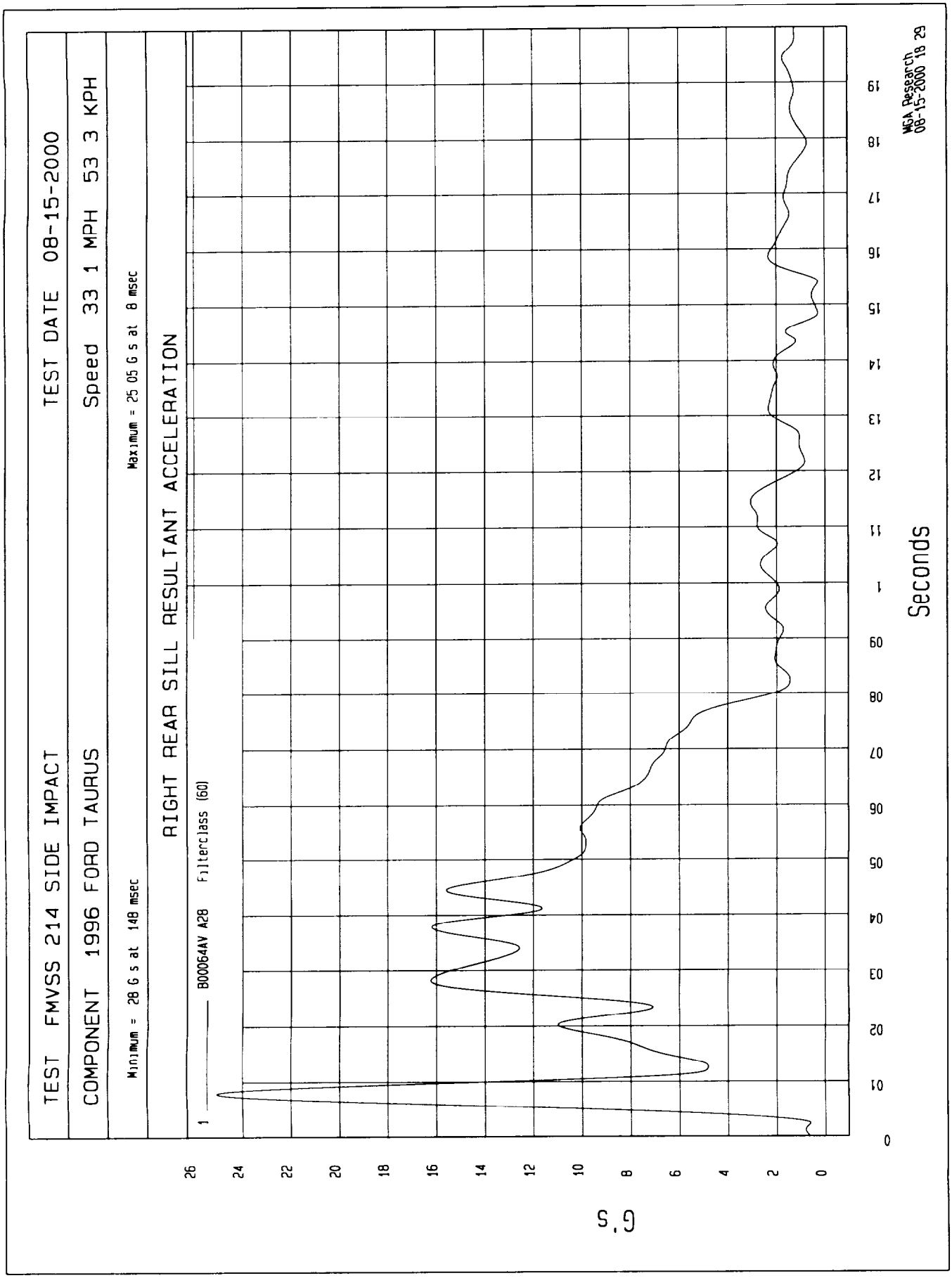

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 8 77 G s at 14 msec
Maximum 5 64 G s at 40 msec
RIGHT FRONT SILL Z ACCELERATION
1 B000G4AF A26 Filterclass (60)
MGA Research
08-17-2000 13 56
6
4
2
0
-2
-4
-6
-8
G's
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

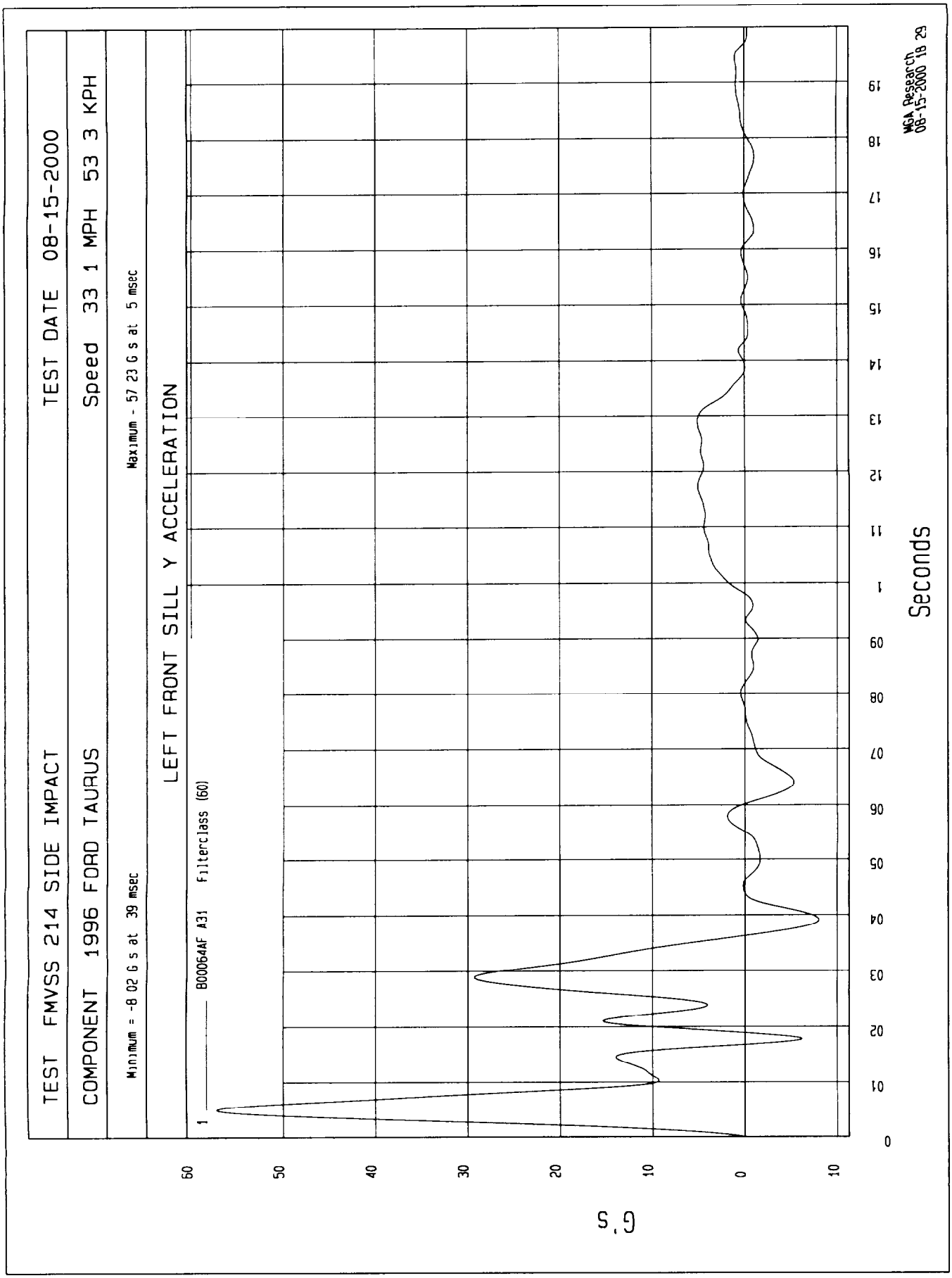

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 23 G s at 86 msec
Maximum = 20 83 G s at 8 msec
RIGHT FRONT SILL RESULTANT ACCELERATION
1 B0006AAV A25 Filterclass (60)
G's
Seconds
MGA Research
08-17-2000 14 45

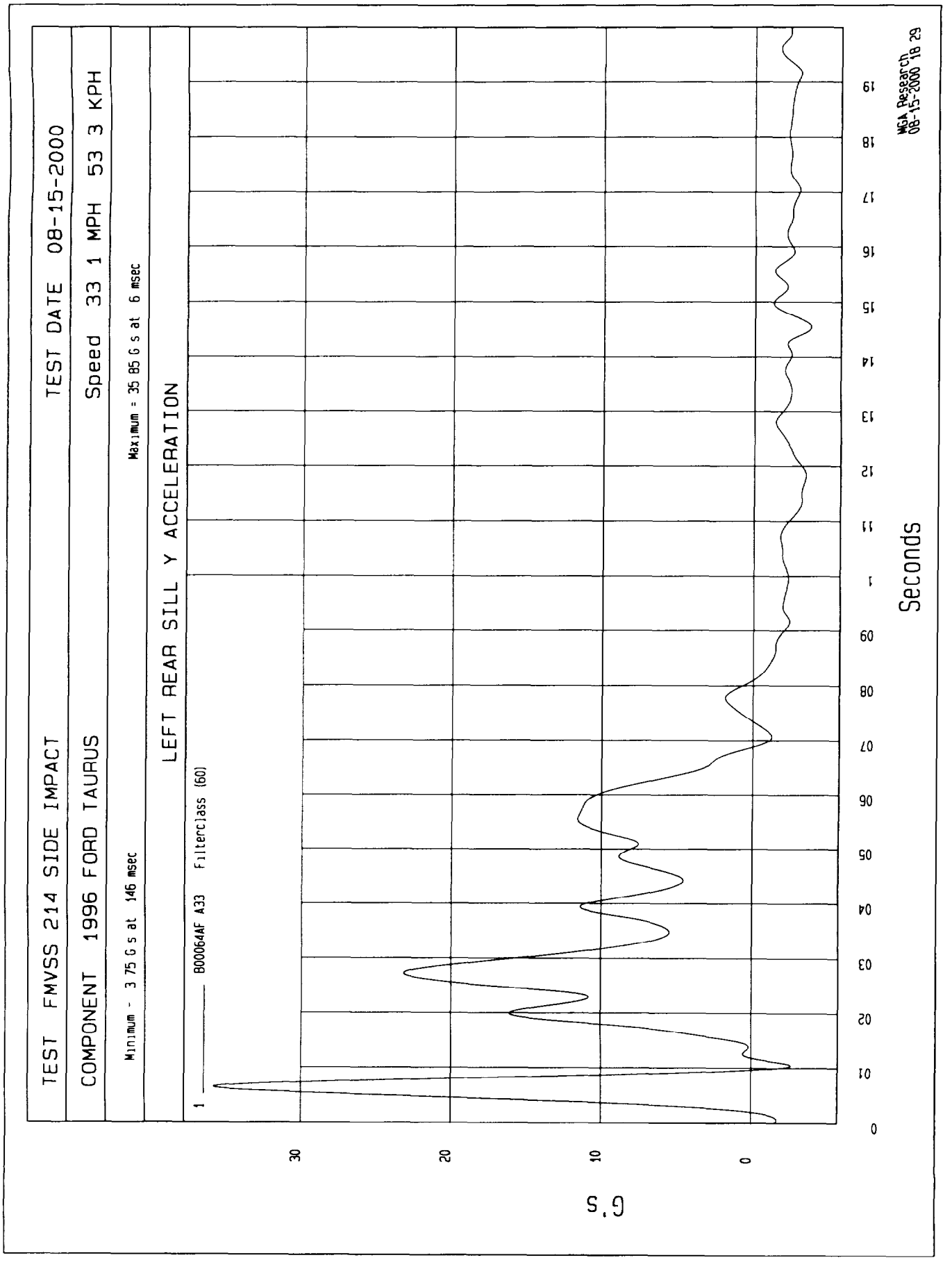

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -4 26 G s at 36 msec
Maximum = 4 66 G s at 56 msec
RIGHT REAR SILL X ACCELERATION
1 B00064AF A28 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 29

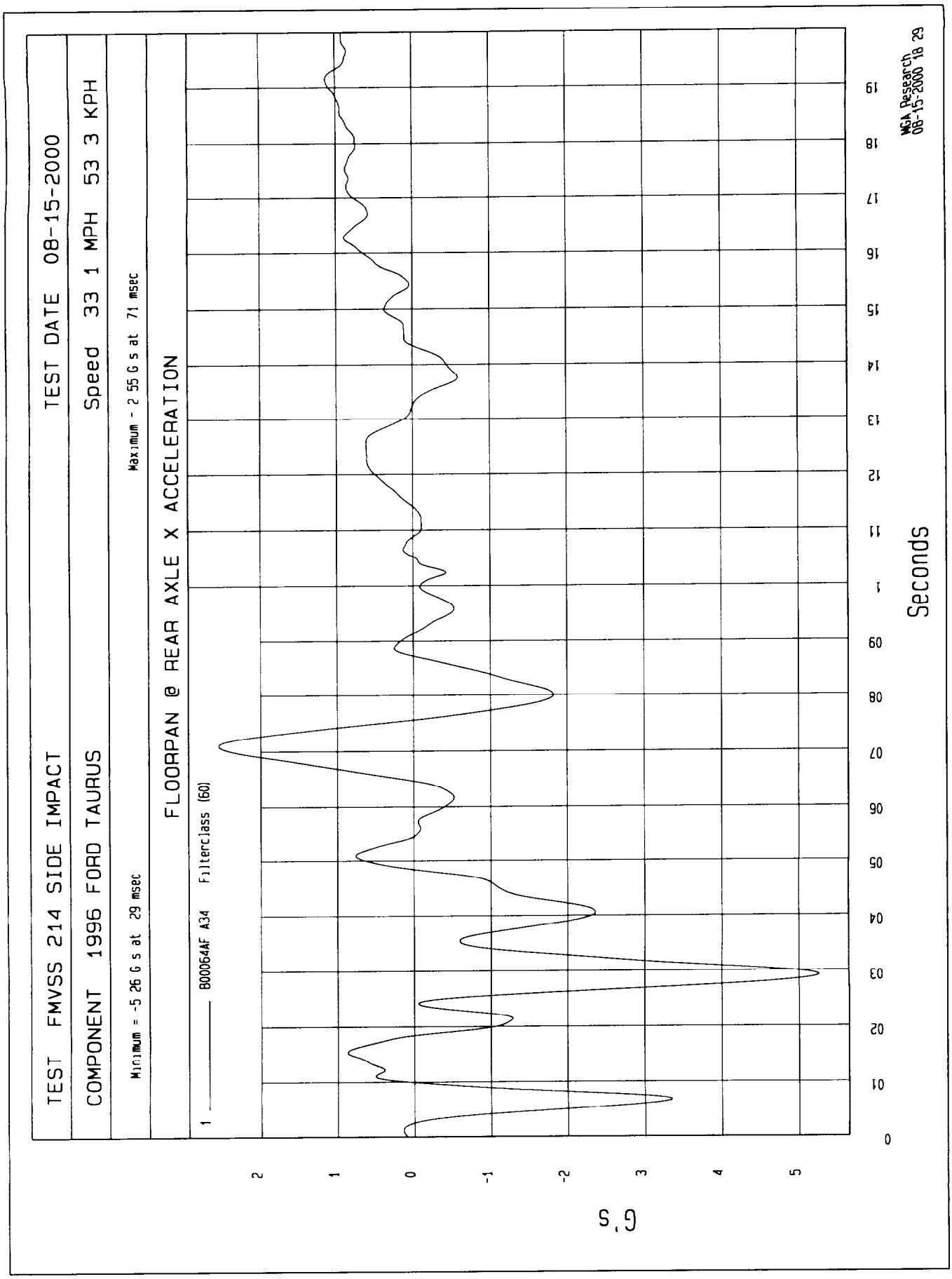

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 2 95 G s at 114 msec
Maximum - 24 98 G s at 8 msec
RIGHT REAR SILL Y ACCELERATION
1 B00064AF A29 Filterclass (60)
MGA Research
08-15-2000 18 29
G's
Seconds
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

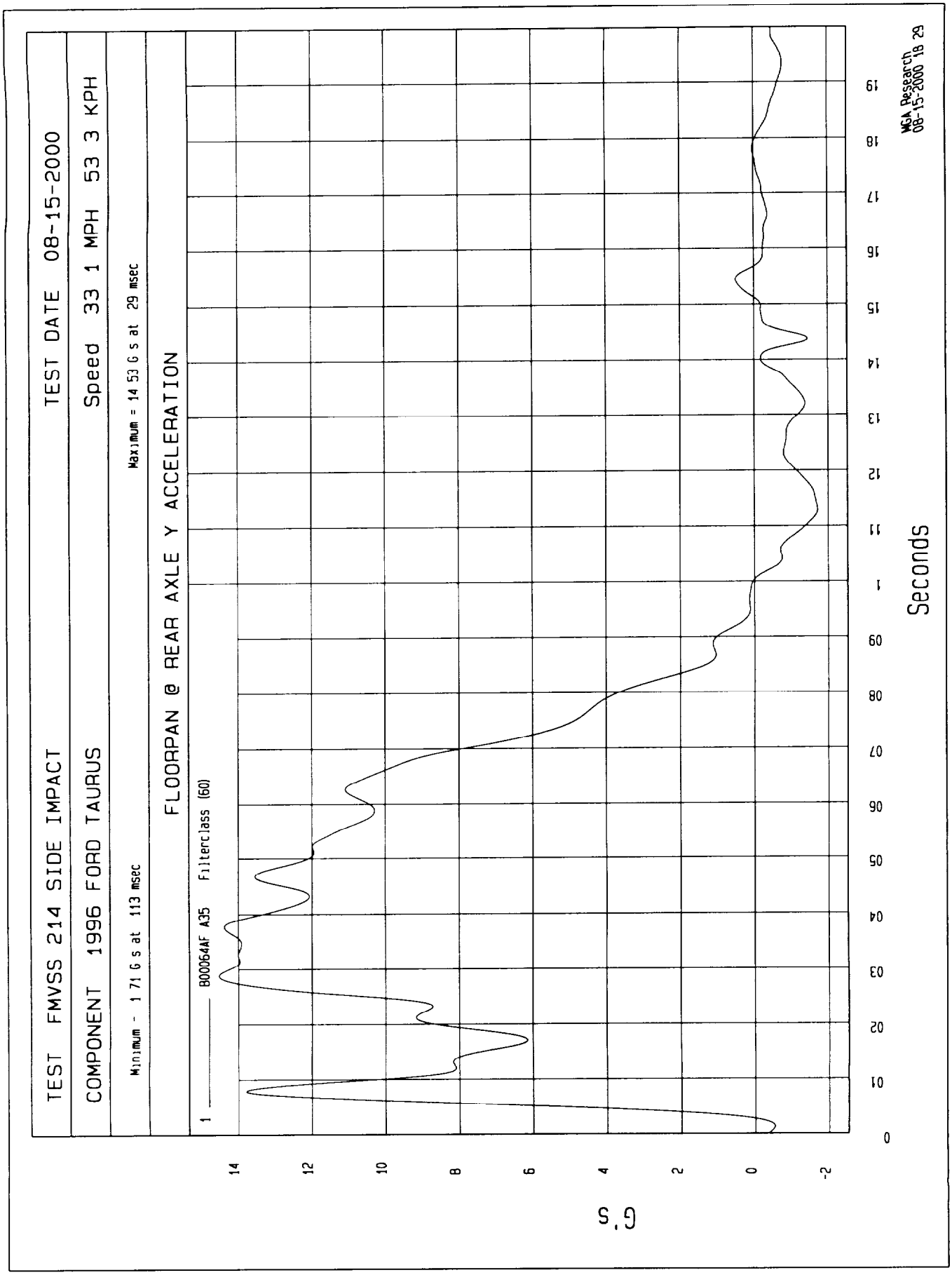

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 4 27 G s at 13 msec
Maximum = 3 08 G s at 52 msec
RIGHT REAR SILL Z ACCELERATION
1 B00064AF A30 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 10 29

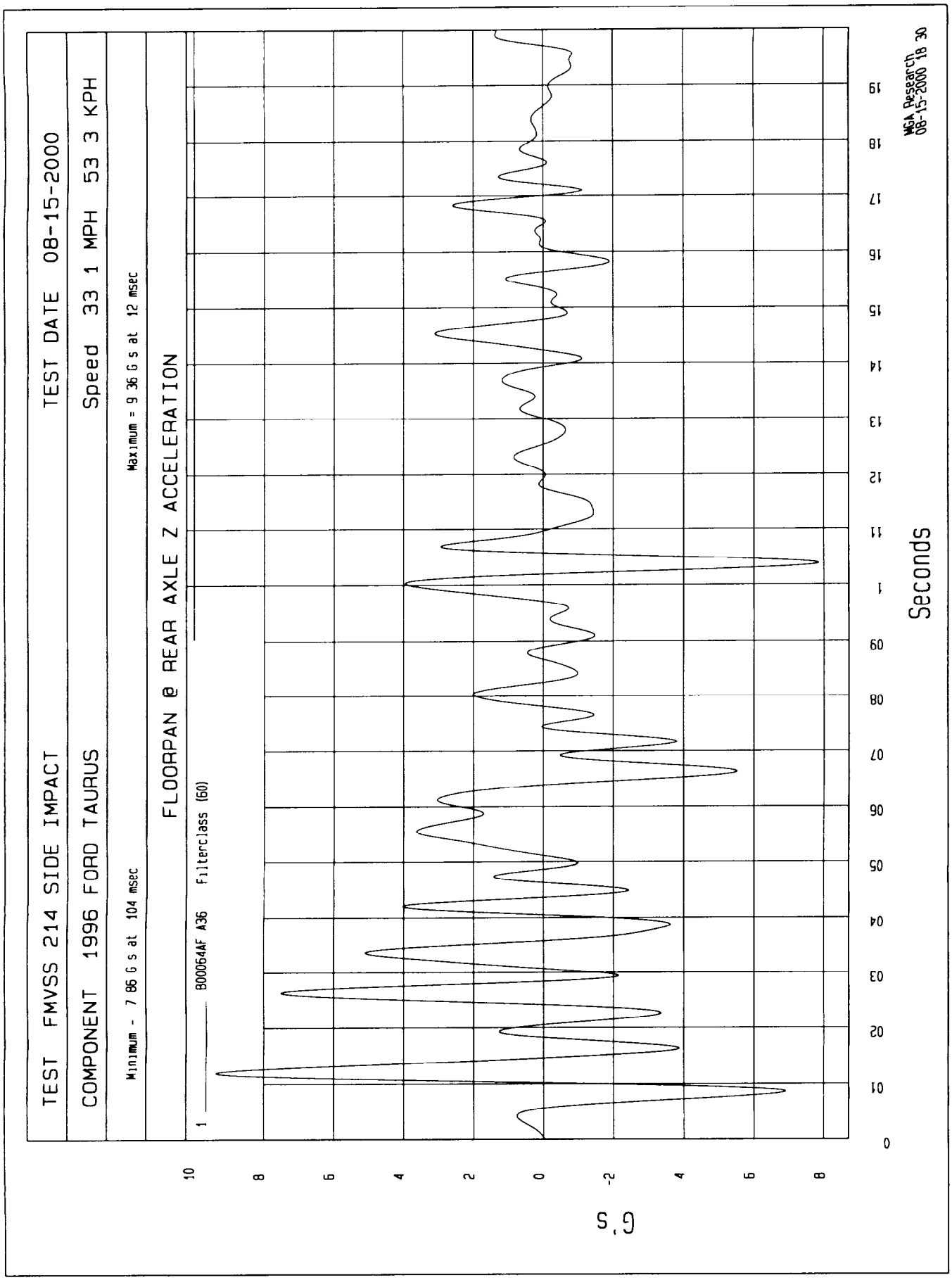

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 28 G s at 148 msec
Maximum = 25 05 G s at 8 msec
RIGHT REAR SILL RESULTANT ACCELERATION
1 B00064AV A28 Filterclass (60)
MGA Research
08-15-2000 18 29
G's
Seconds

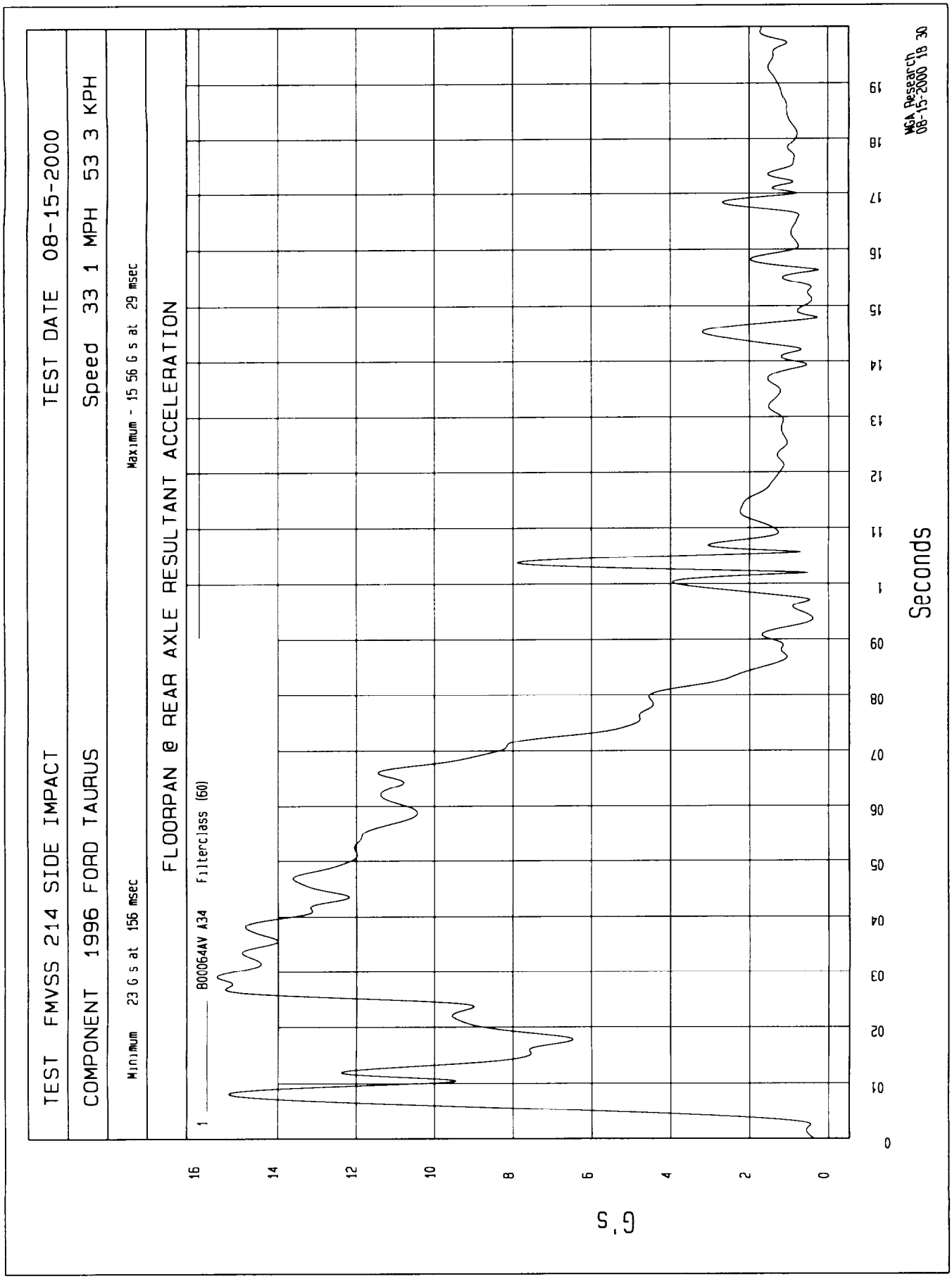

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -8 02 G s at 39 msec
Maximum = 57 23 G s at 5 msec
LEFT FRONT SILL Y ACCELERATION
1 B00064AF A31 Filterclass (60)
MGA Research
08-15-2000 18 29
G's
Seconds
60
50
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

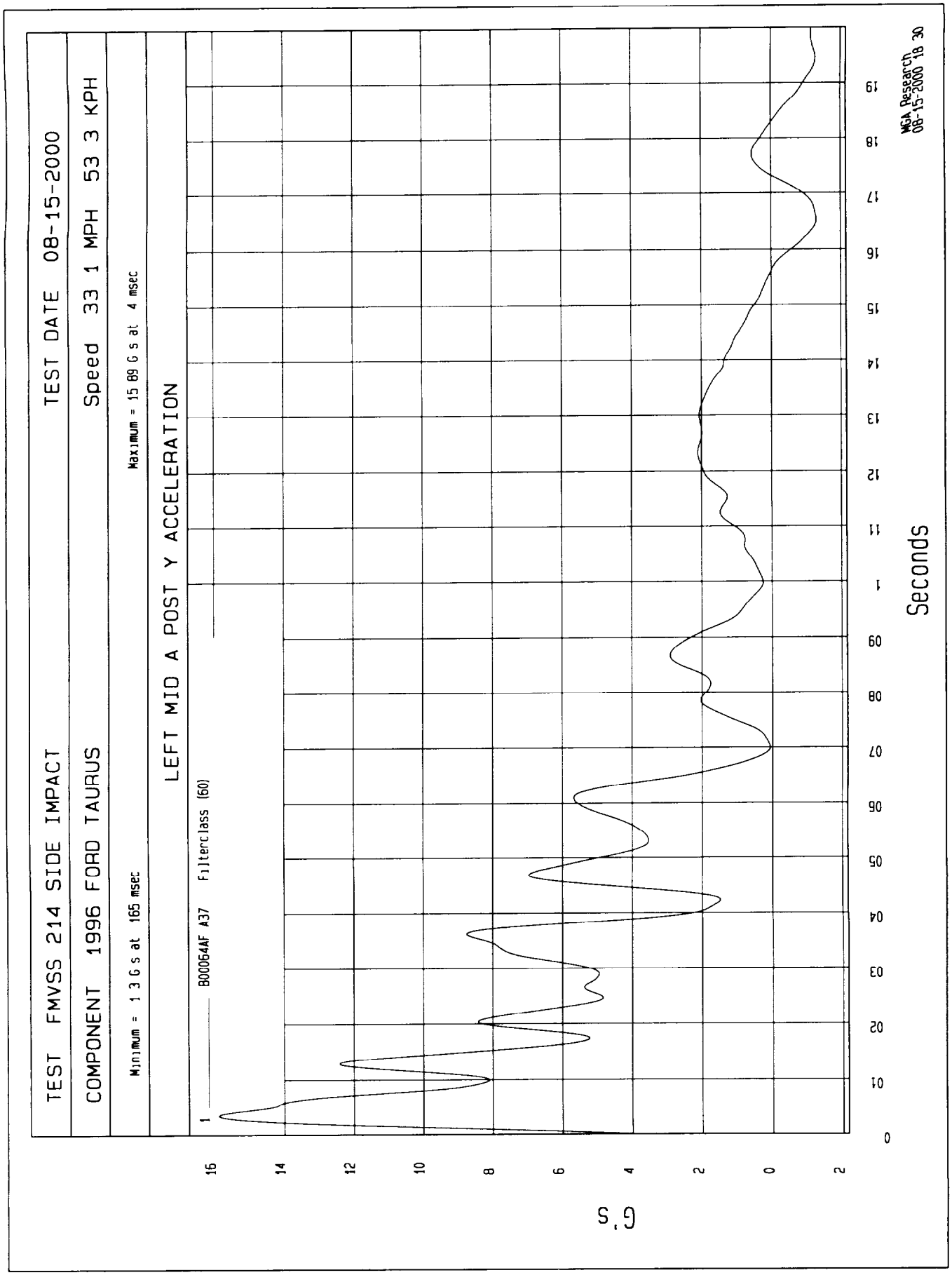

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 3 75 G s at 146 msec
Maximum = 35 85 G s at 6 msec
LEFT REAR SILL Y ACCELERATION
1 B00064AF A33 Filterclass (60)
G's
30
20
10
0
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
MGA Research
08-15-2000 18 29

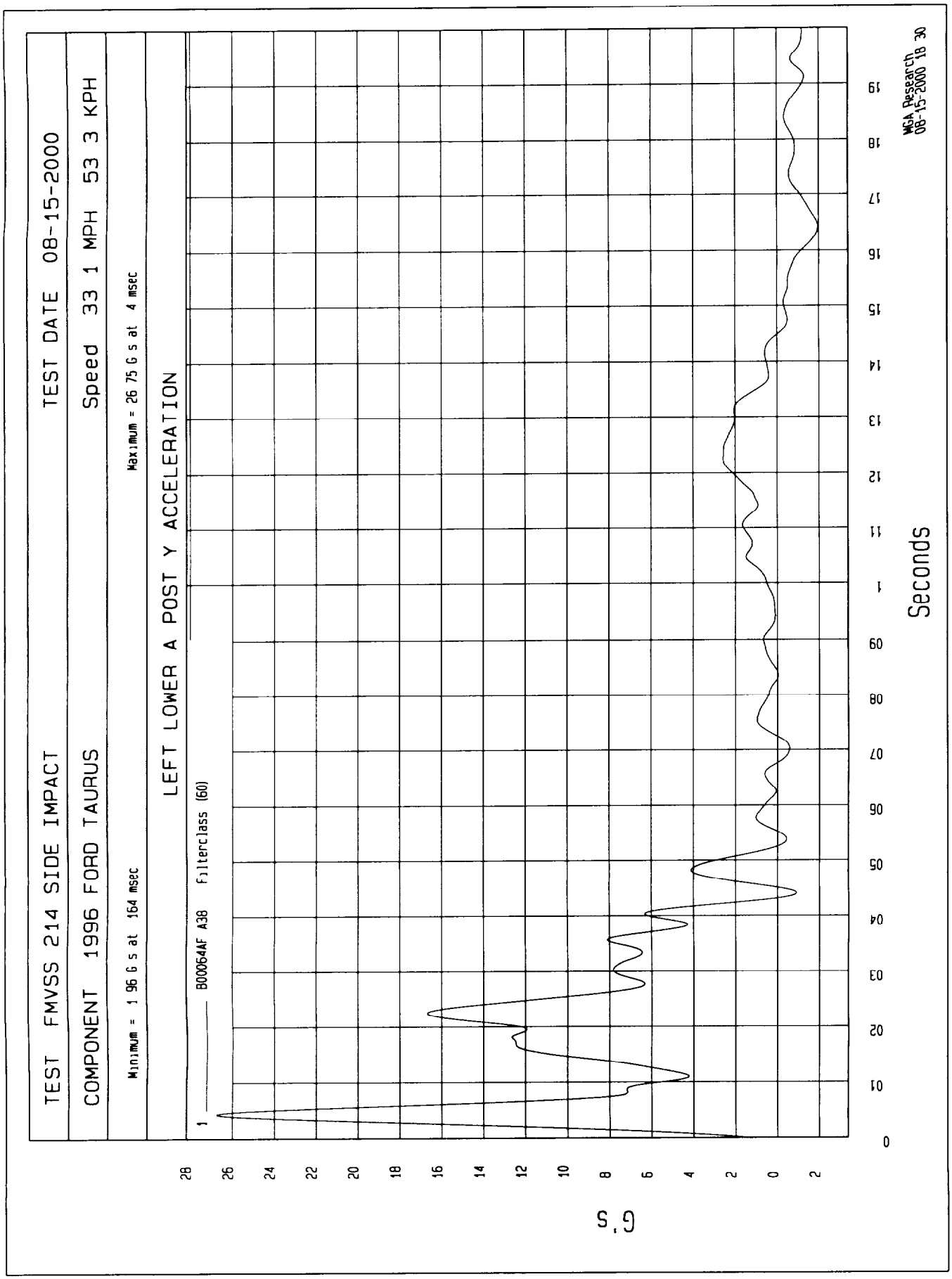

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -5 26 G s at 29 msec
Maximum = 2 55 G s at 71 msec
FLOORPAN @ REAR AXLE X ACCELERATION
1 B00064AF A34 Filterclass (60)
MGA Research
08-15-2000 18 29
G's
Seconds
2
1
0
-1
-2
3
4
5
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

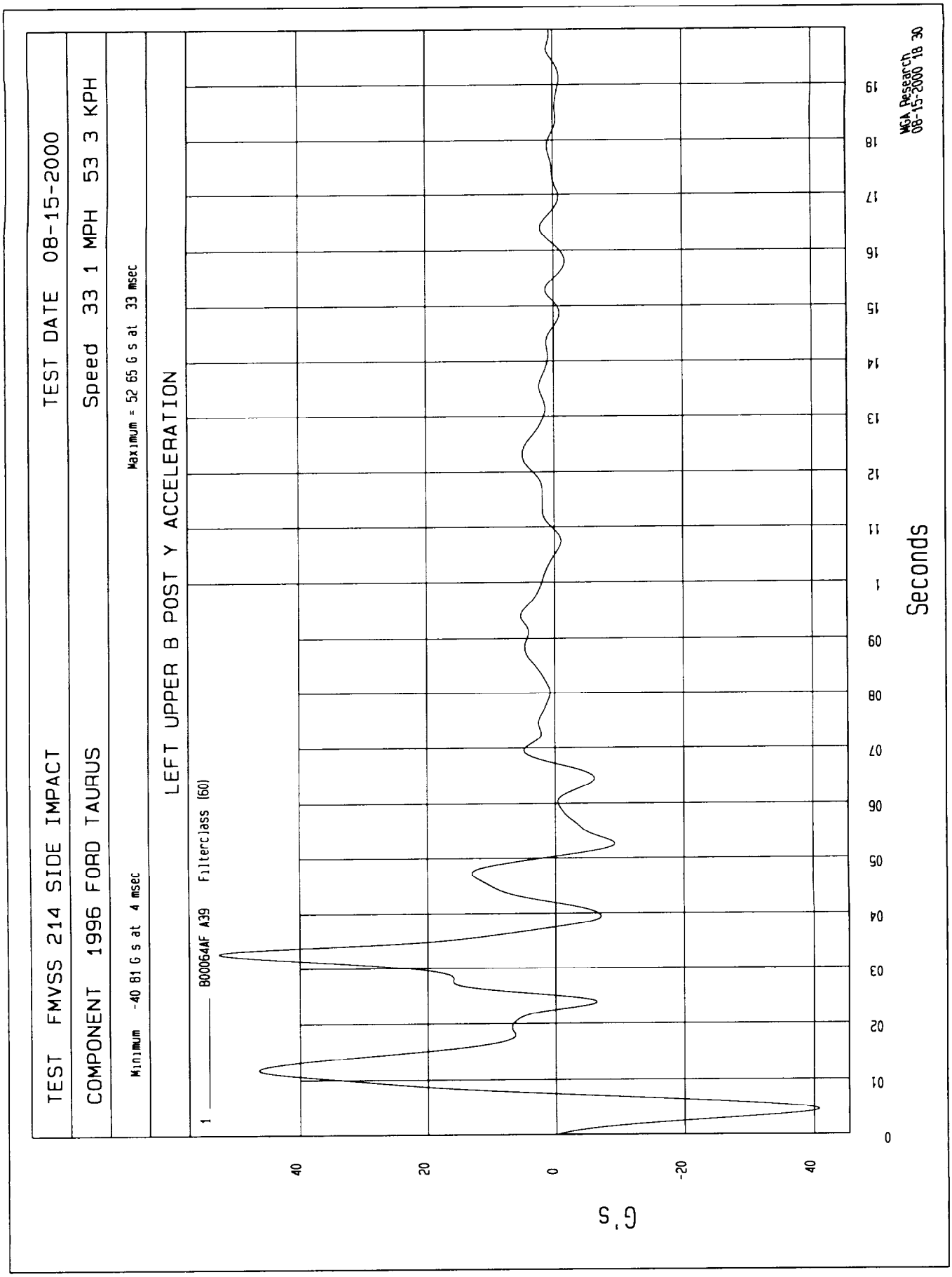

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 1 71 G s at 113 msec
Maximum = 14 53 G s at 29 msec
FLOORPAN @ REAR AXLE Y ACCELERATION
1 B00064AF A35 Filterclass (60)
MGA Research
08-15-2000 18 29
G's
Seconds

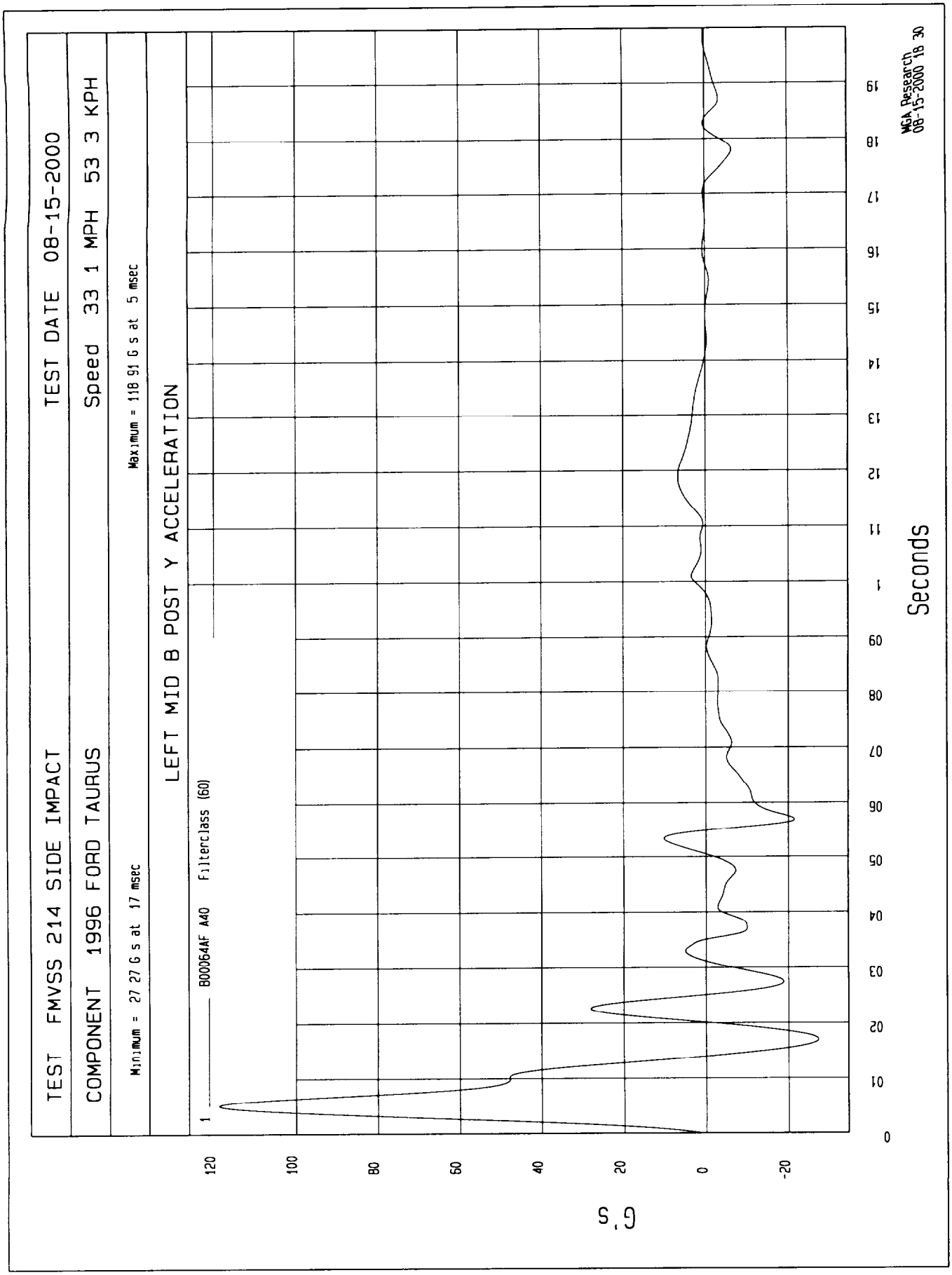

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 7 86 G s at 104 msec
Maximum = 9 36 G s at 12 msec
FLOORPAN @ REAR AXLE Z ACCELERATION
1 B00064AF A36 Filterclass (60)
MGA Research
08-15-2000 18 30
G's
Seconds

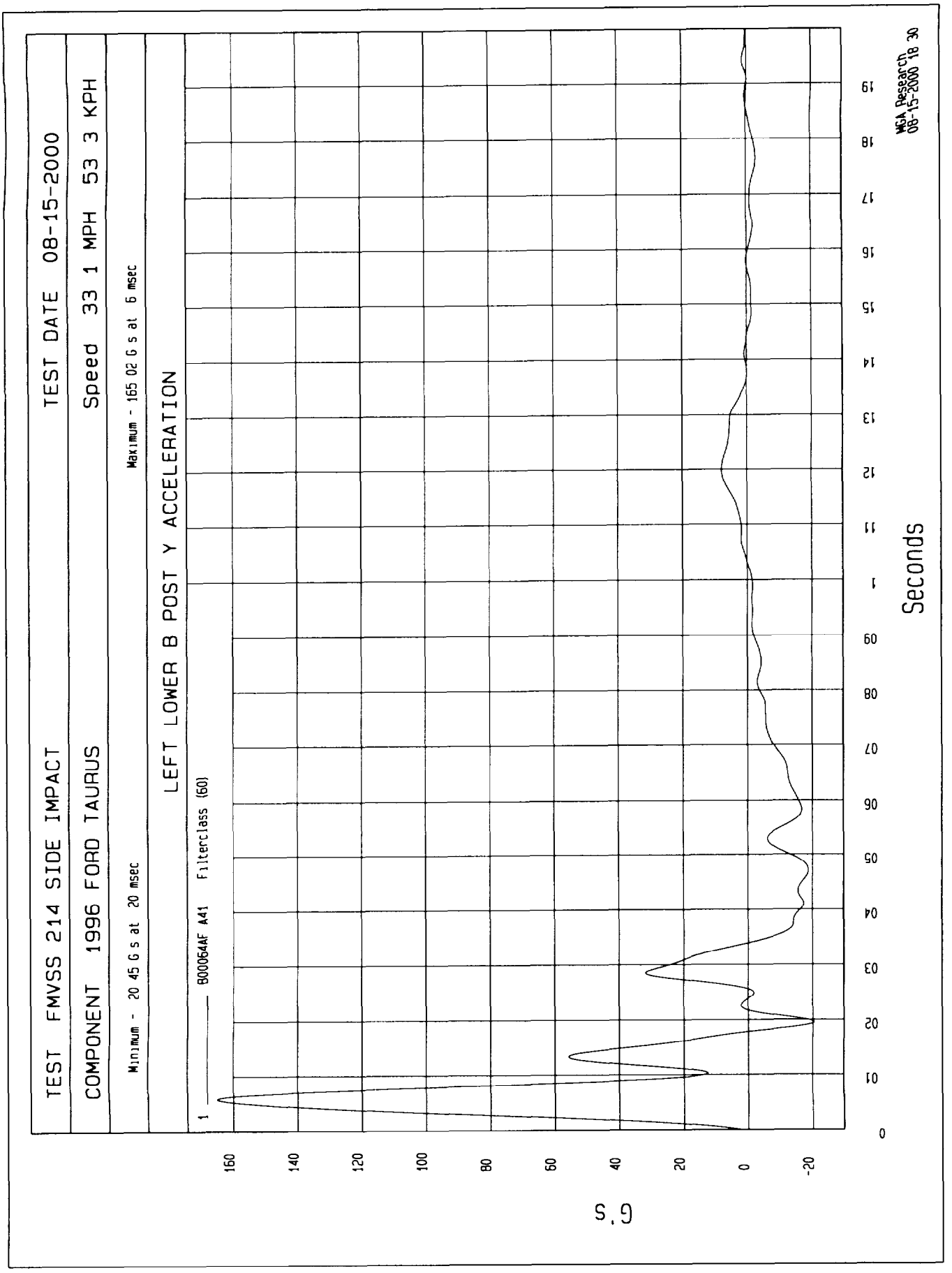

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 23 G s at 156 msec
Maximum - 15 56 G s at 29 msec
FLOORPAN @ REAR AXLE RESULTANT ACCELERATION
1 B0006AV A34 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 30

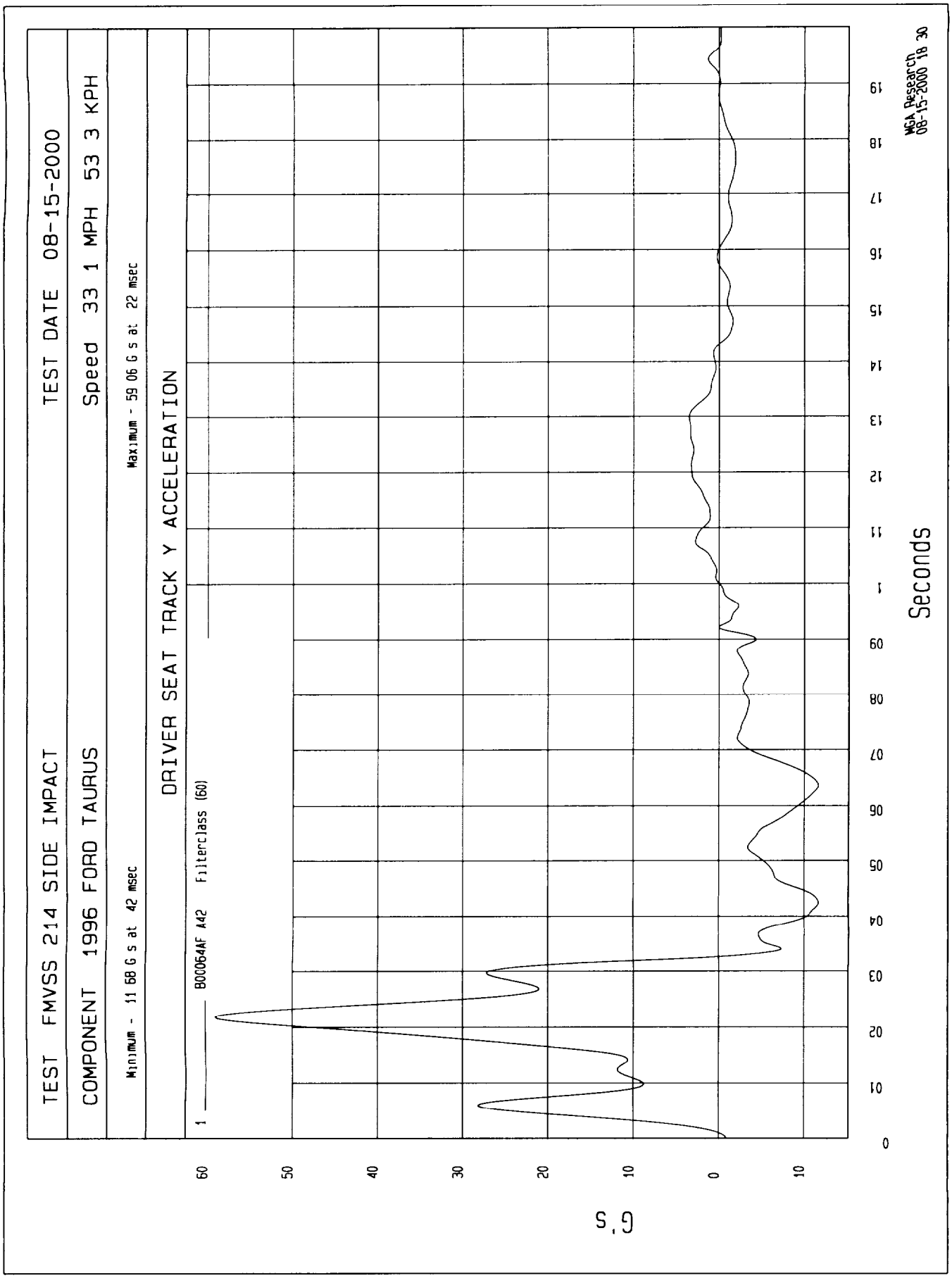

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 1 3 G s at 165 msec
Maximum = 15 89 G s at 4 msec
LEFT MID A POST Y ACCELERATION
1 B00064AF A37 Filterclass (60)
MGA Research
08-15-2000 18 30
G's
Seconds

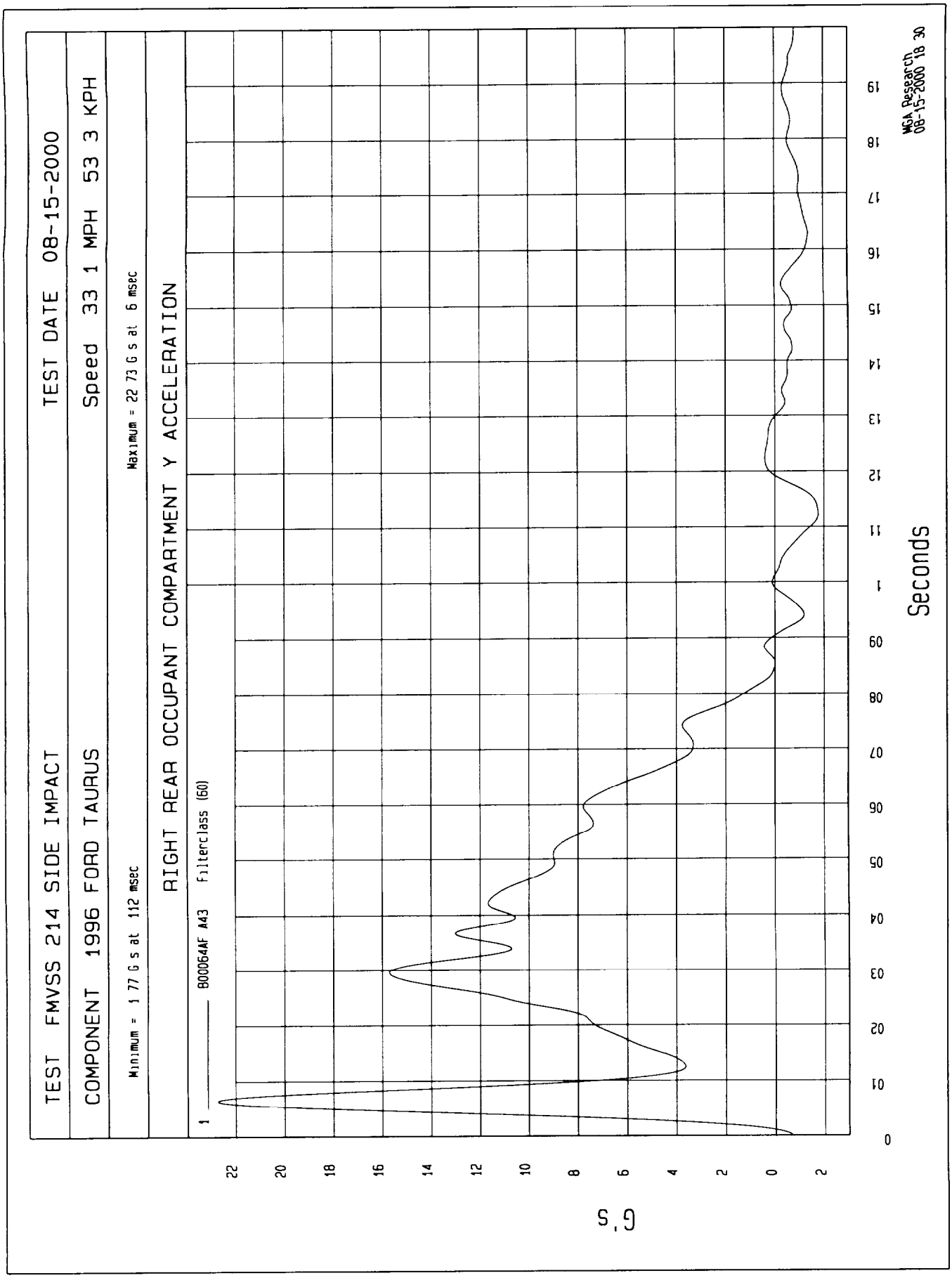

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 1 96 G s at 164 msec
Maximum = 26 75 G s at 4 msec
LEFT LOWER A POST Y ACCELERATION
1 B00064AF A3B Filterclass (60)
MGA Research
08-15-2000 18 30
G's
Seconds

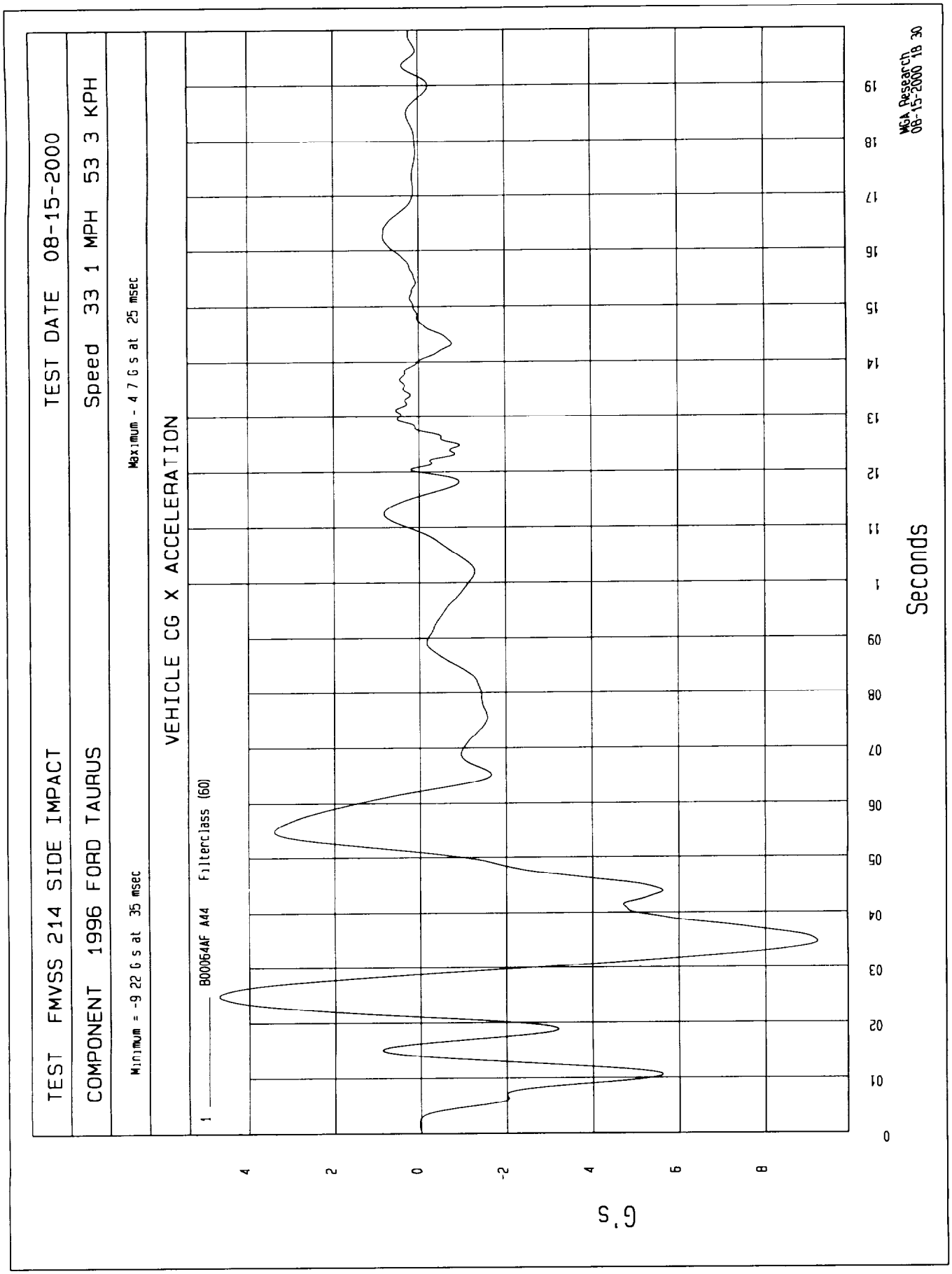

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum -40 81 G s at 4 msec
Maximum = 52 65 G s at 33 msec
LEFT UPPER B POST Y ACCELERATION
1 B00064AF A39 Filterclass (60)
G's
40
20
0
-20
40
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
MGA Research
08-15-2000 18 30

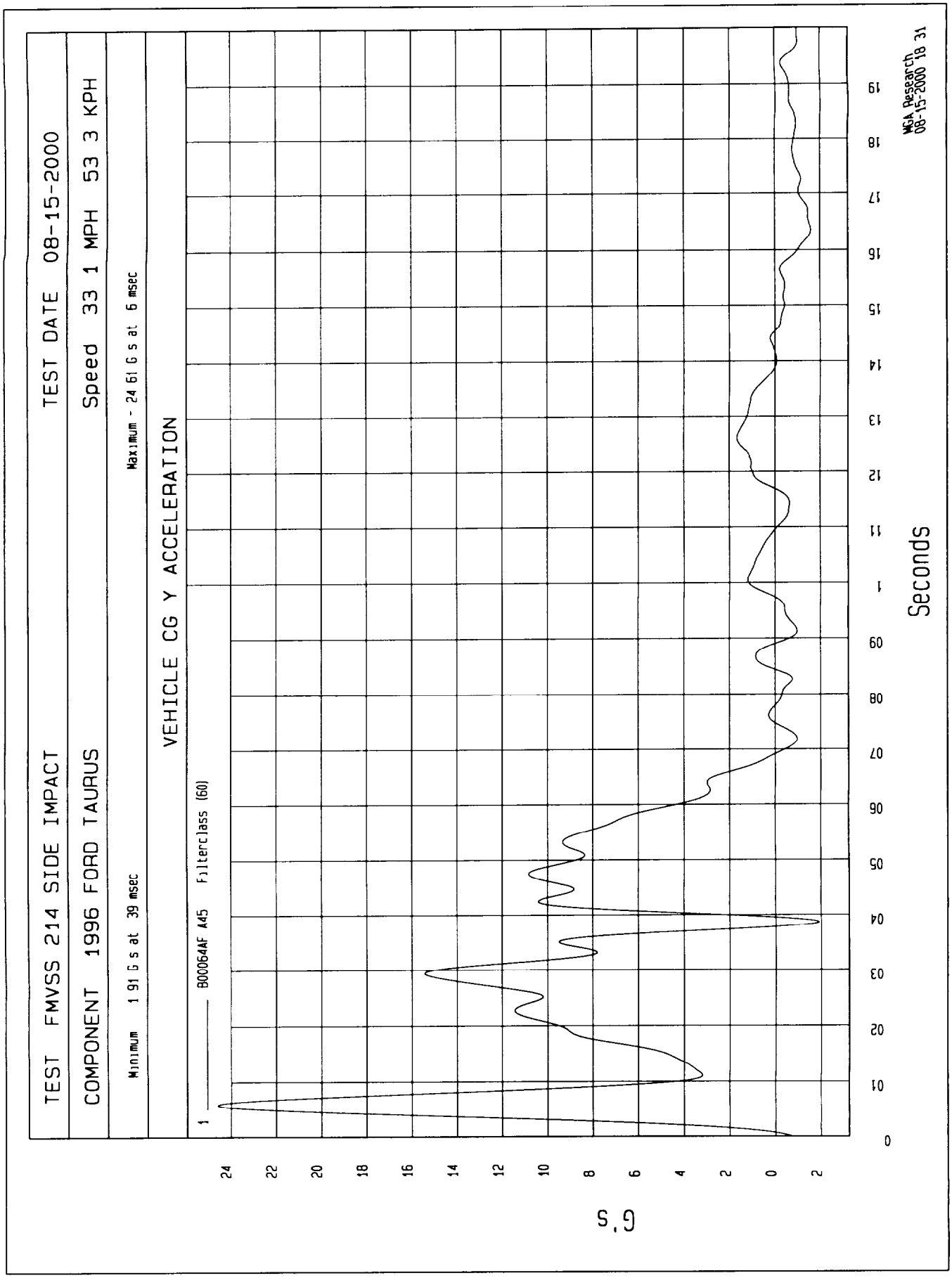

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 27 27 G s at 17 msec
Maximum = 118 91 G s at 5 msec
LEFT MID B POST Y ACCELERATION
1 B00064AF A40 Filterclass (60)
MGA Research
08-15-2000 18 30
G's
120
100
80
60
40
20
0
-20
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

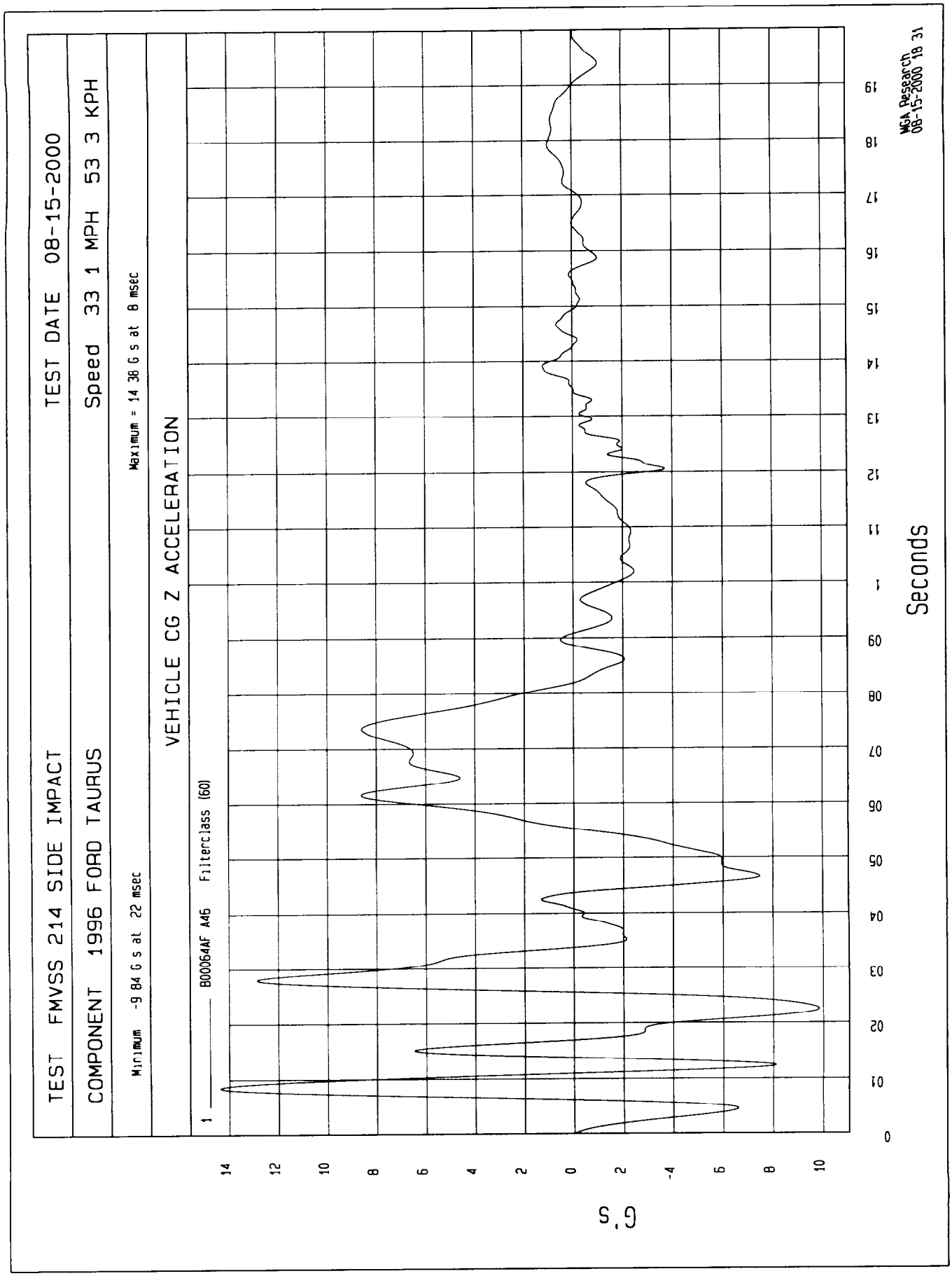

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 20 45 G s at 20 msec
Maximum - 165 02 G s at 6 msec
LEFT LOWER B POST Y ACCELERATION
1 B00064AF A41 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 30

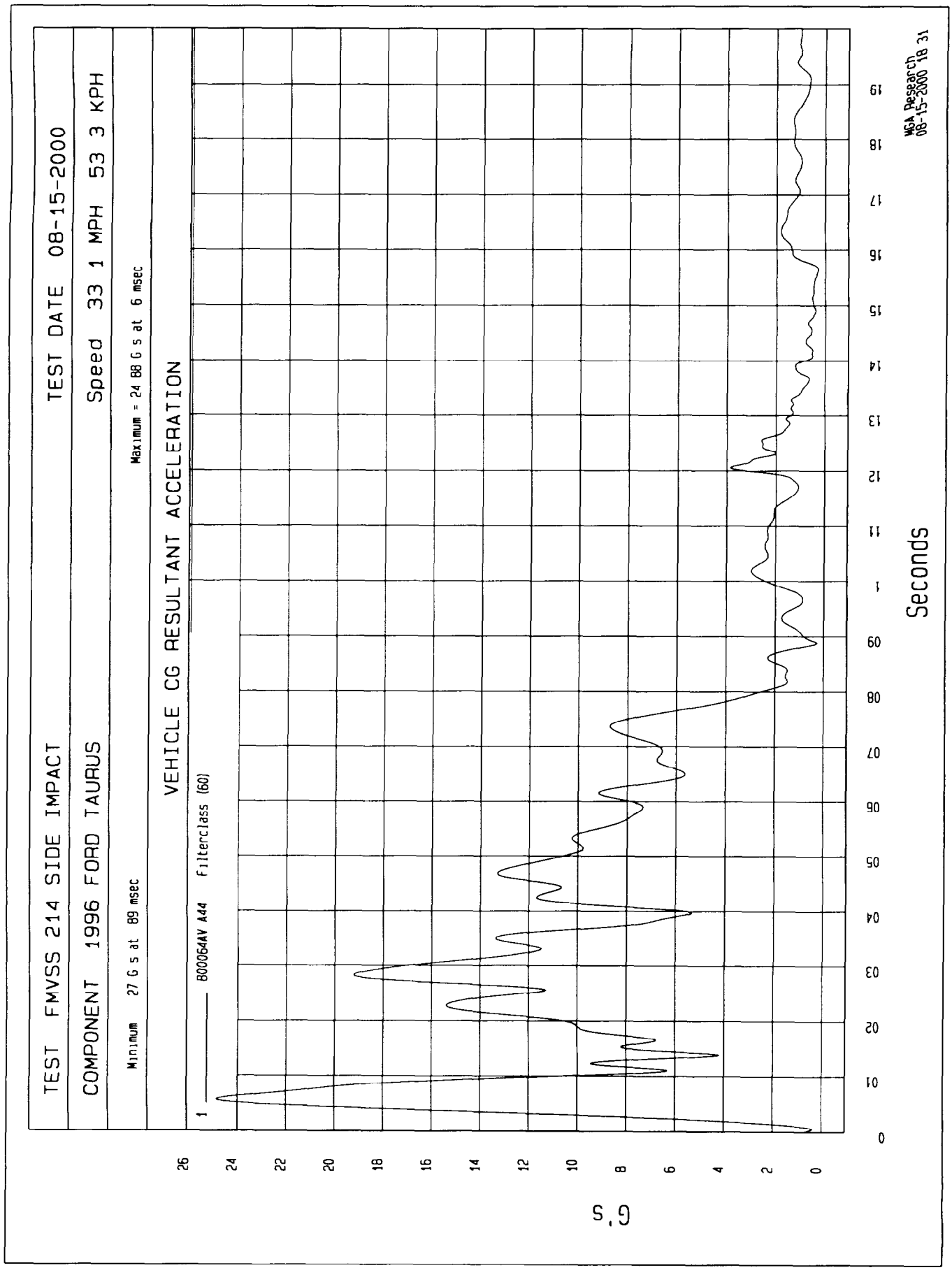

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 11 68 G s at 42 msec
Maximum - 59 06 G s at 22 msec
DRIVER SEAT TRACK Y ACCELERATION
1 B00064AF A42 Filterclass (60)
MGA Research
08-15-2000 18 30
G's
Seconds

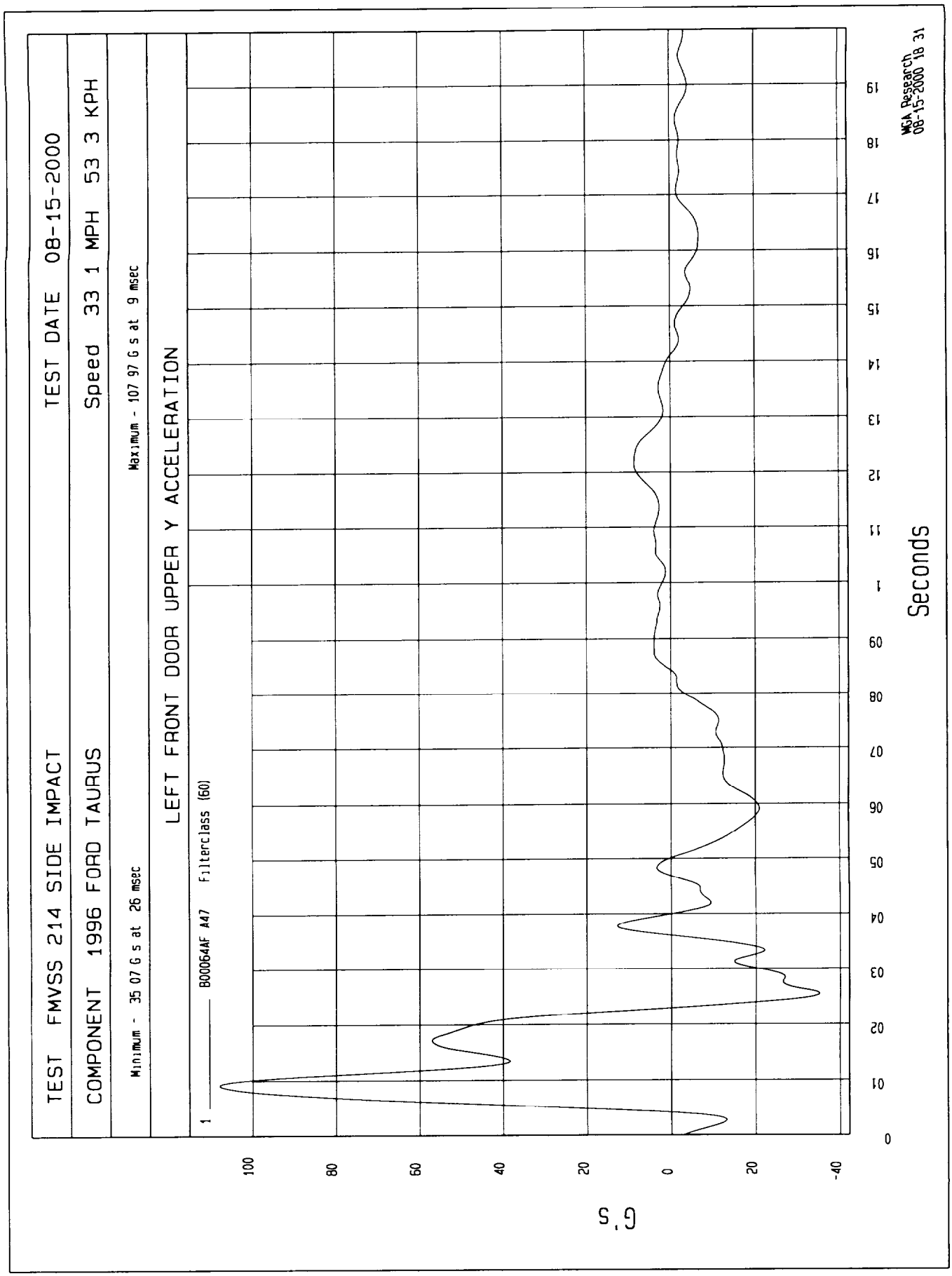

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 1 77 G s at 112 msec
Maximum = 22 73 G s at 6 msec
RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION
1 B00064AF A43 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 30


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -9 22 G s at 35 msec
Maximum = 4 7 G s at 25 msec
VEHICLE CG X ACCELERATION
1 B000064AF A44 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 30


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 1 91 G s at 39 msec
Maximum - 24 61 G s at 6 msec
VEHICLE CG Y ACCELERATION
1 B00064AF A45 Filterclass (60)
MGA Research
08-15-2000 18 31
G's
Seconds

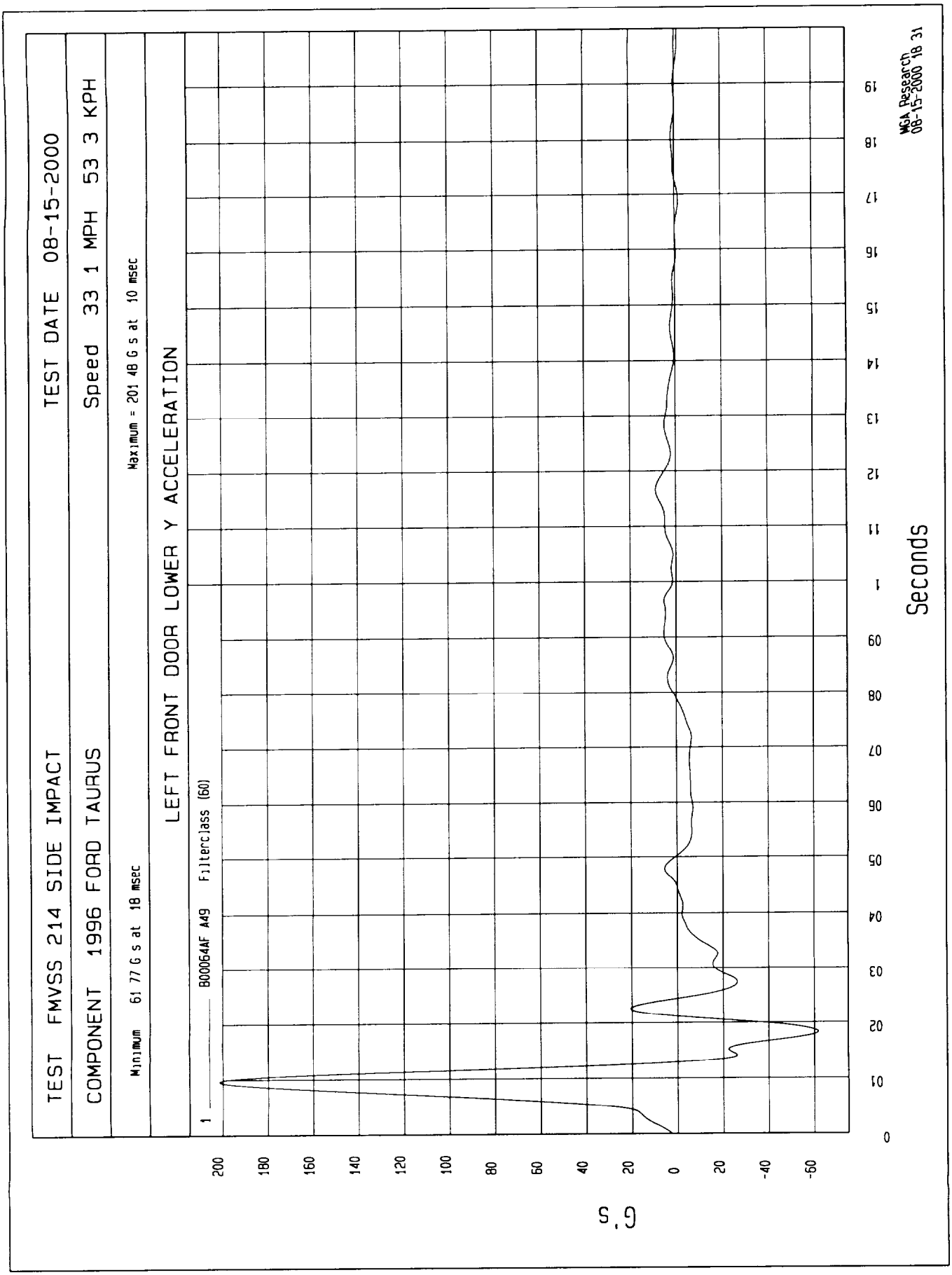

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum -9 84 G s at 22 msec
Maximum = 14 38 G s at 8 msec
VEHICLE CG Z ACCELERATION
1 B00064AF A46 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 31

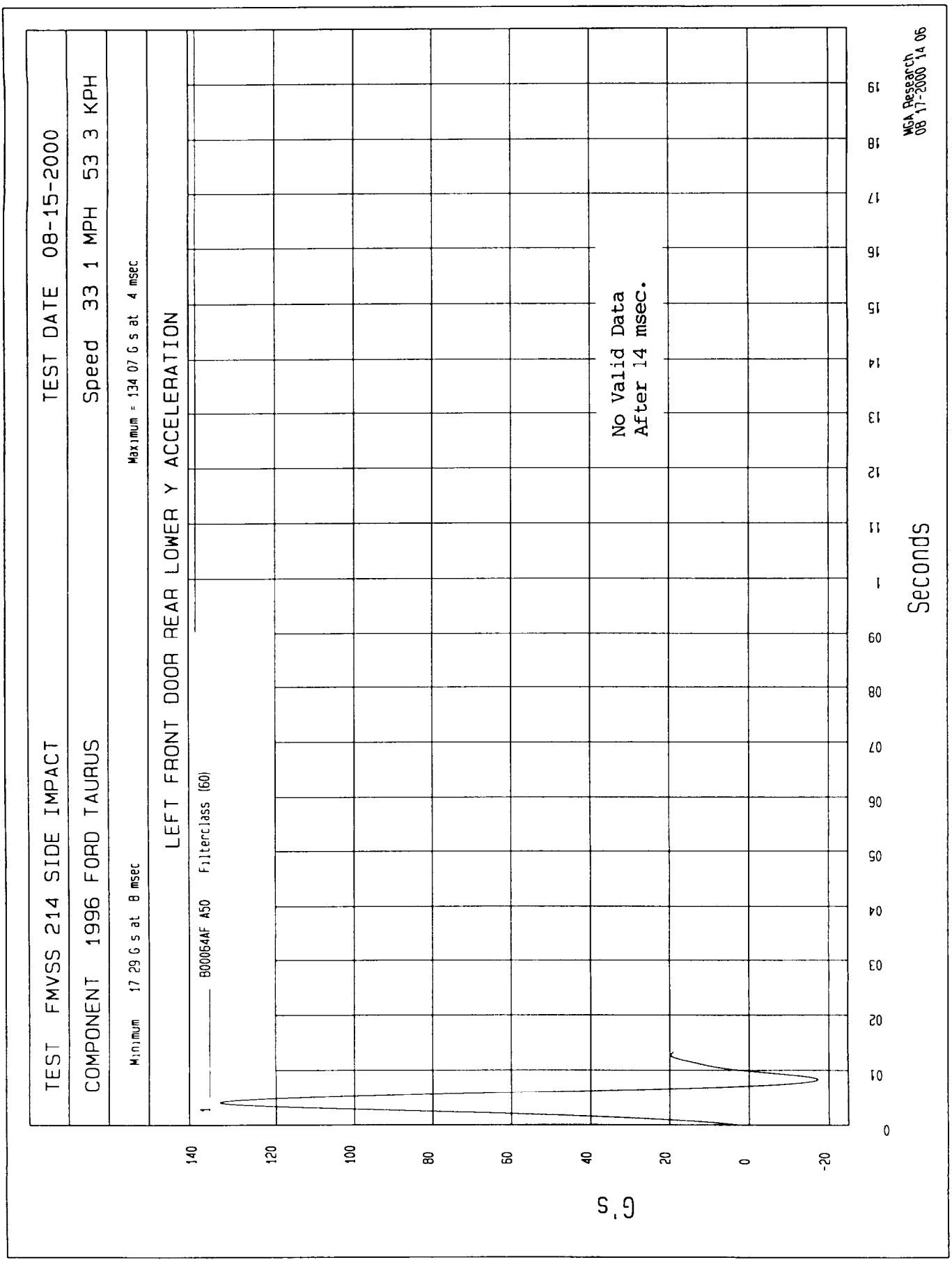

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 27 G s at 89 msec
Maximum = 24 88 G s at 6 msec
VEHICLE CG RESULTANT ACCELERATION
1 B00064AV A44 Filterclass (60)
MGA Research
08-15-2000 18 31
Seconds
G's

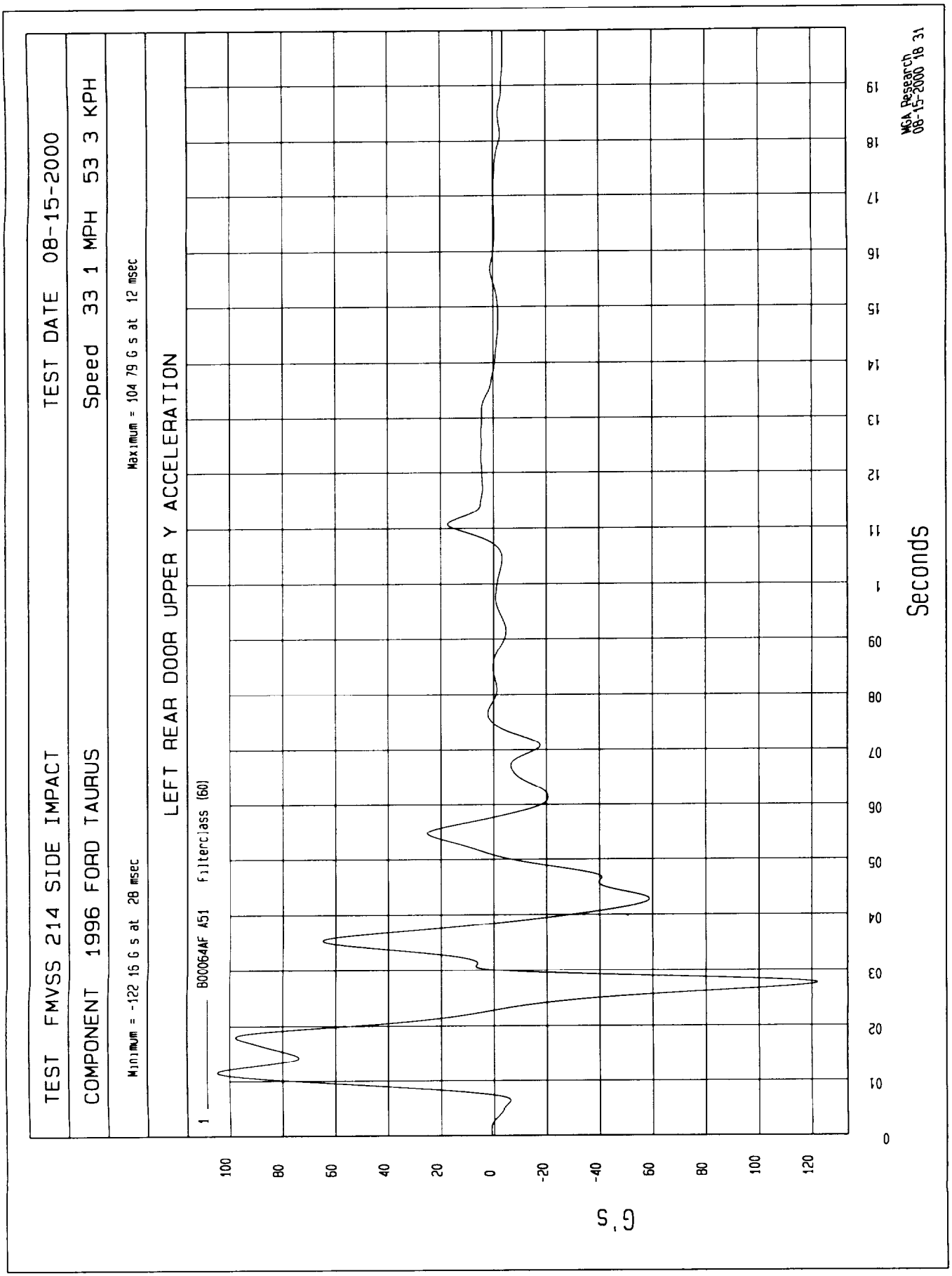

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 35 07 G s at 26 msec
Maximum - 107 97 G s at 9 msec
LEFT FRONT DOOR UPPER Y ACCELERATION
1 B00064AF A47 Filterclass (60)
G's
100
80
60
40
20
0
-20
-40
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 18 31

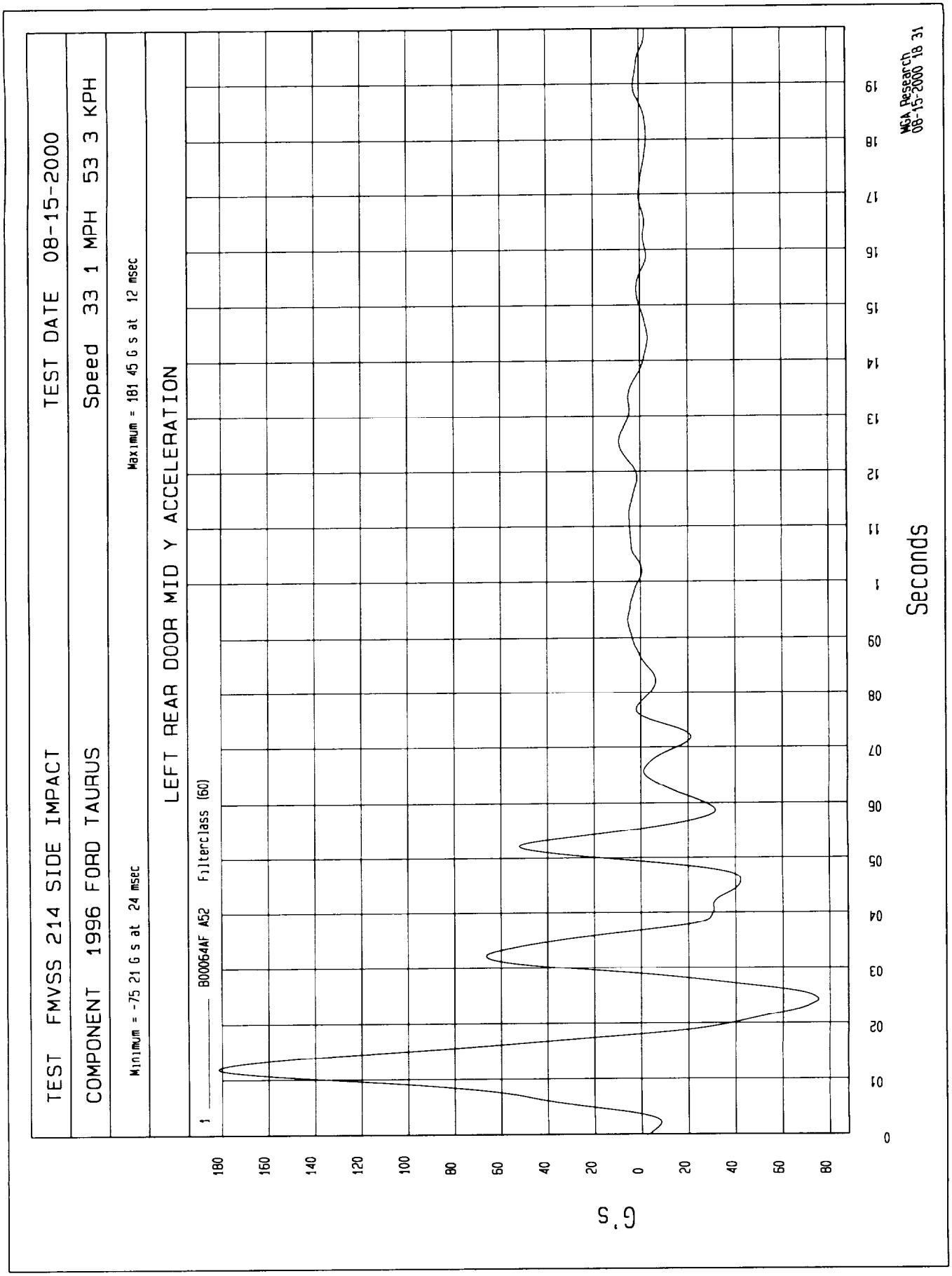
LEFT FRONT DOOR MID Y ACCELERATION VS TIME

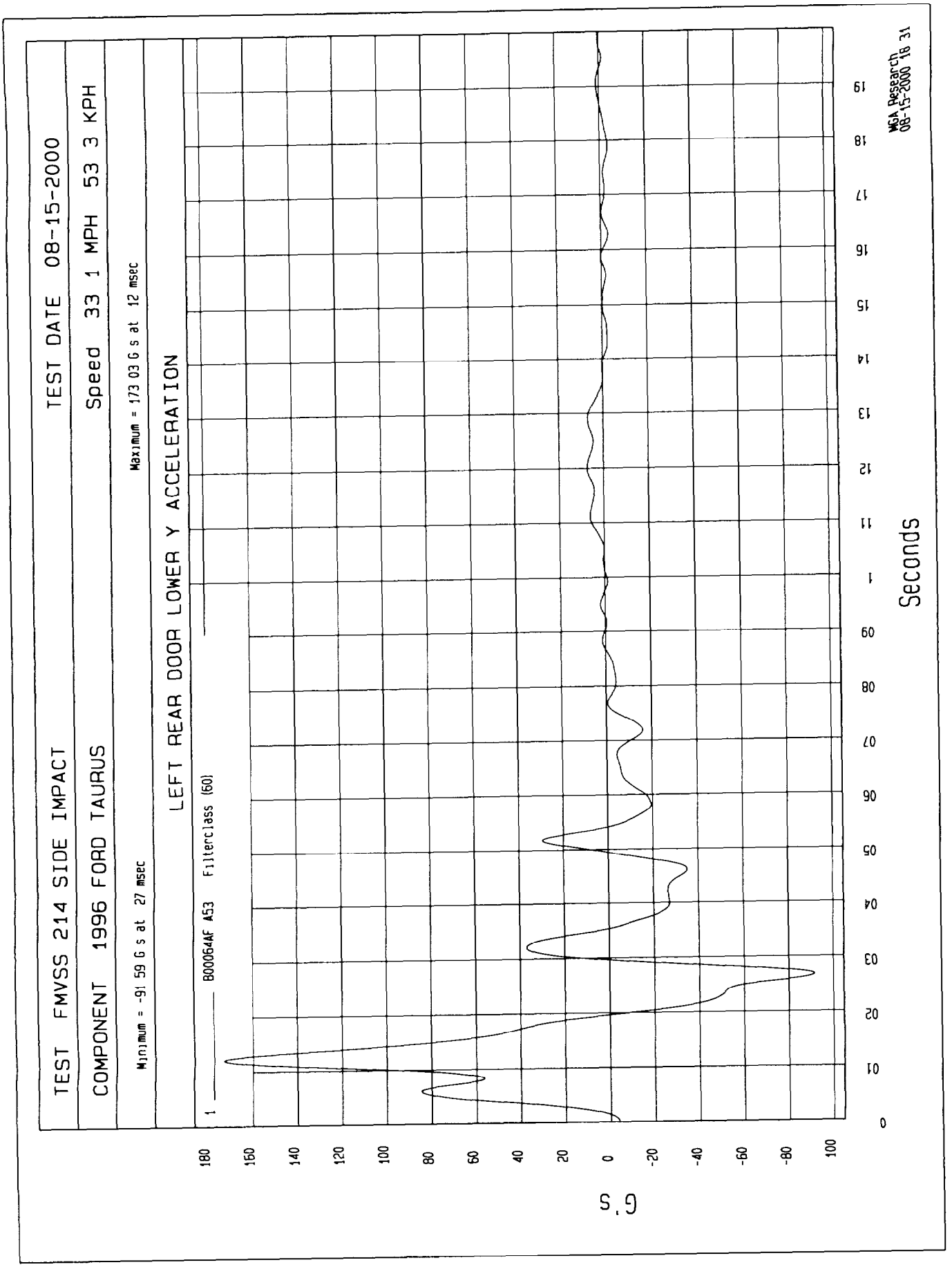
NO VALID DATA COLLECTED

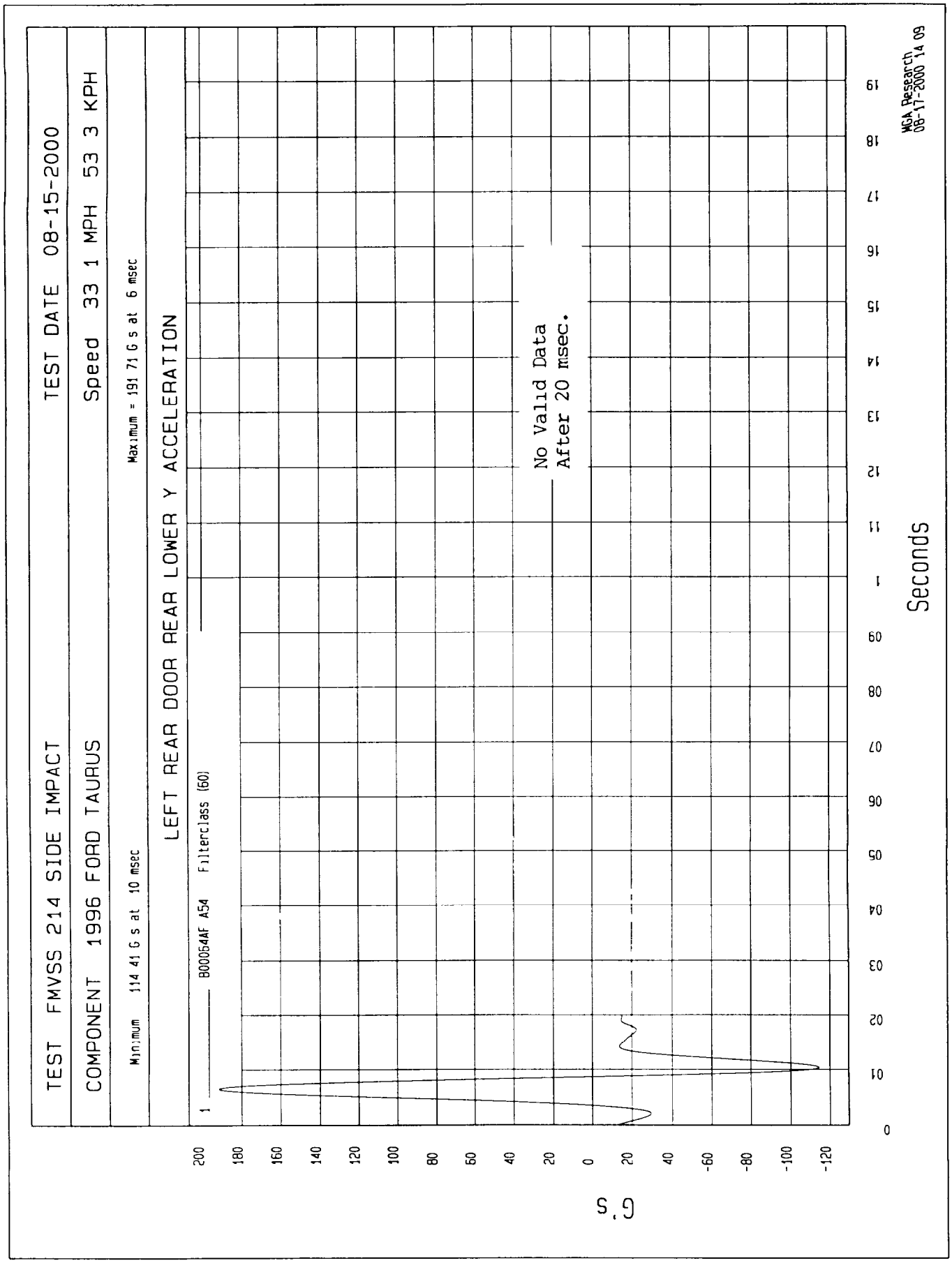

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 61 77 G s at 18 msec
Maximum = 201 48 G s at 10 msec
LEFT FRONT DOOR LOWER Y ACCELERATION
1 B00064AF A49 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 31

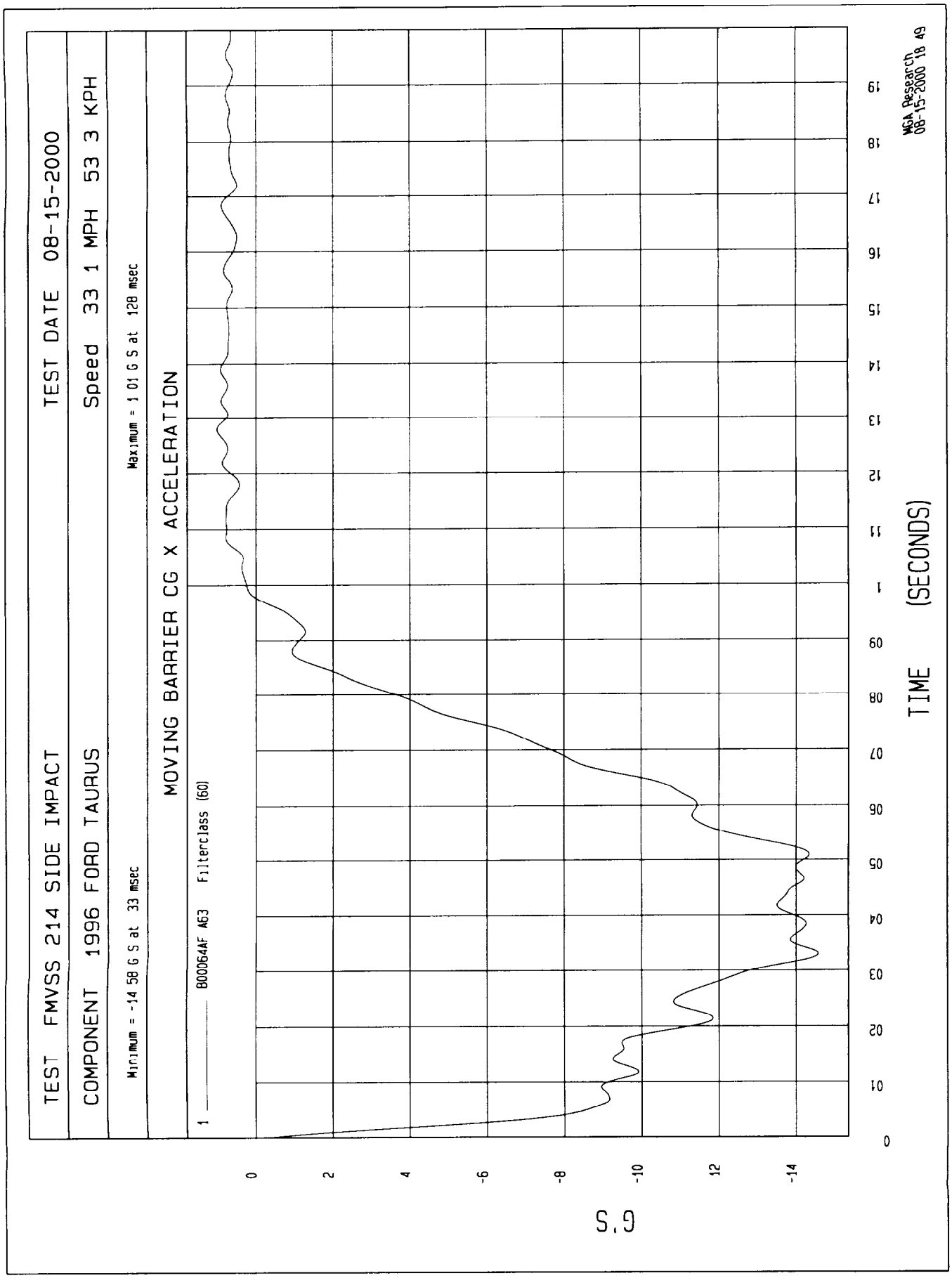

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 17 29 G s at 8 msec
Maximum = 134 07 G s at 4 msec
LEFT FRONT DOOR REAR LOWER Y ACCELERATION
1 B000644F A50 Filterclass (60)
No Valid Data
After 14 msec.
G's
Seconds
MGA Research
08 17-2000 14 06

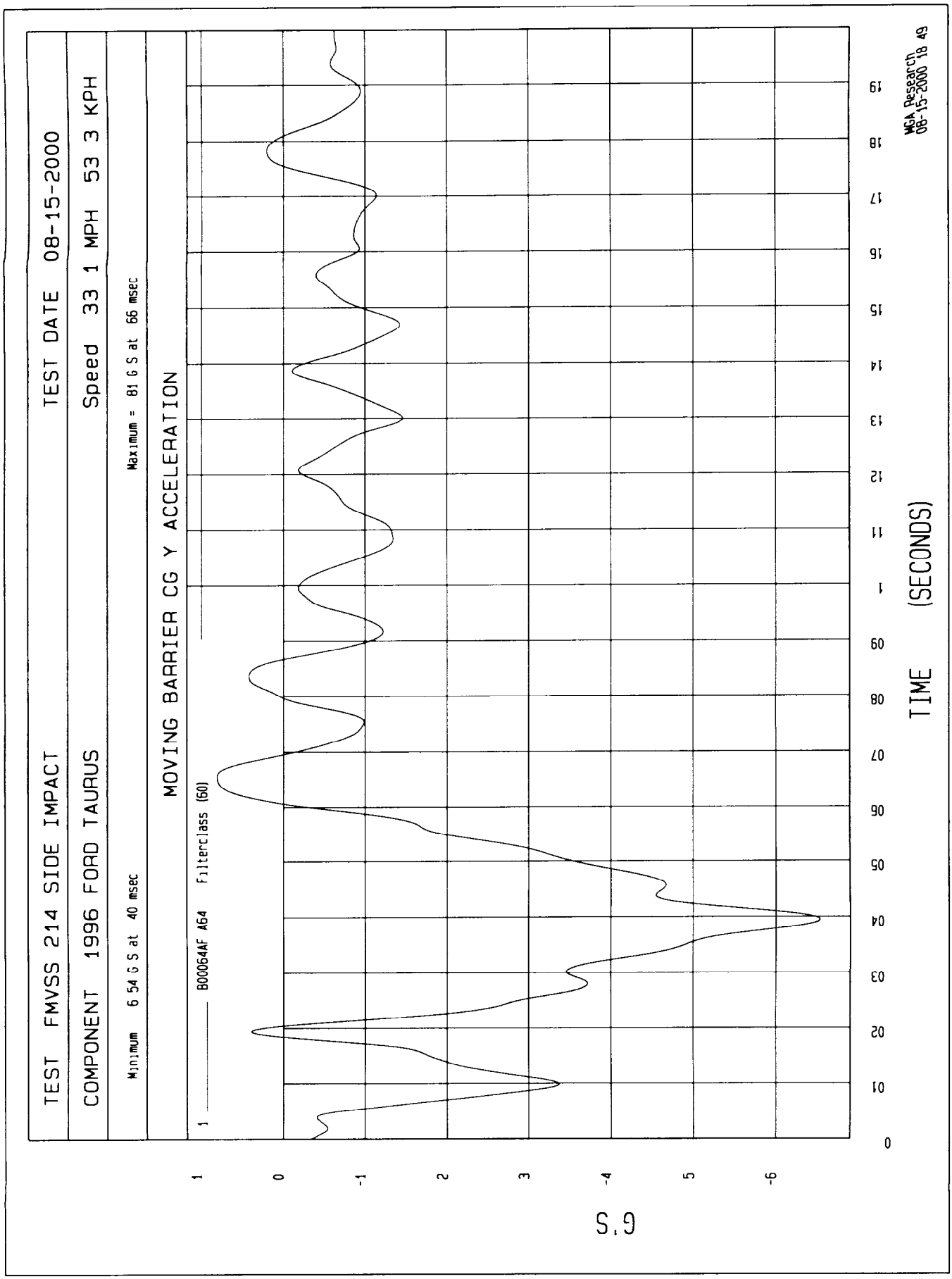

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -122 16 G s at 28 msec
Maximum = 104 79 G s at 12 msec
LEFT REAR DOOR UPPER Y ACCELERATION
1 B00064AF A51 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 31

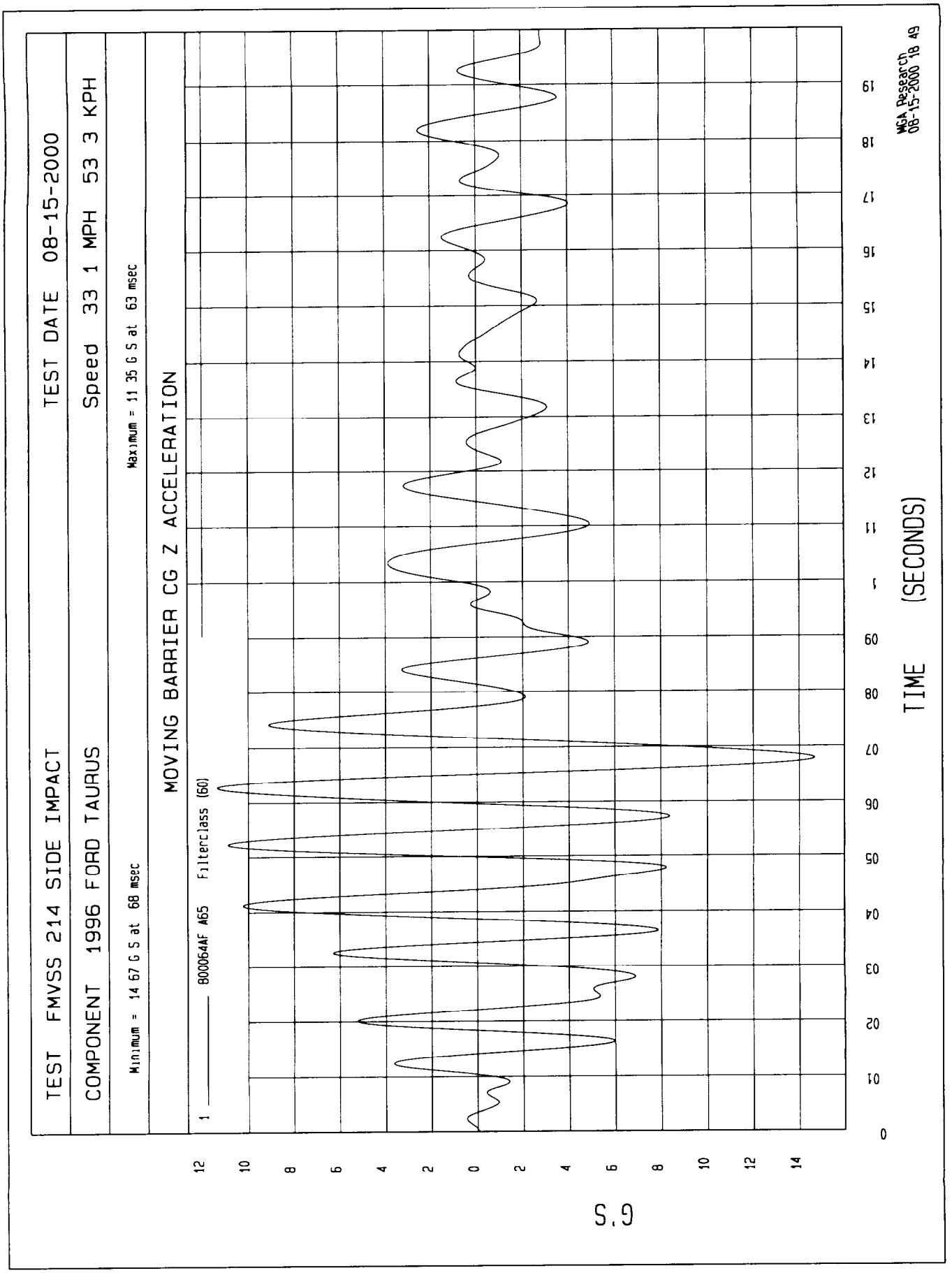

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -75 21 G s at 24 msec
Maximum = 181 45 G s at 12 msec
LEFT REAR DOOR MID Y ACCELERATION
1 B00064AF A52 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 18 31

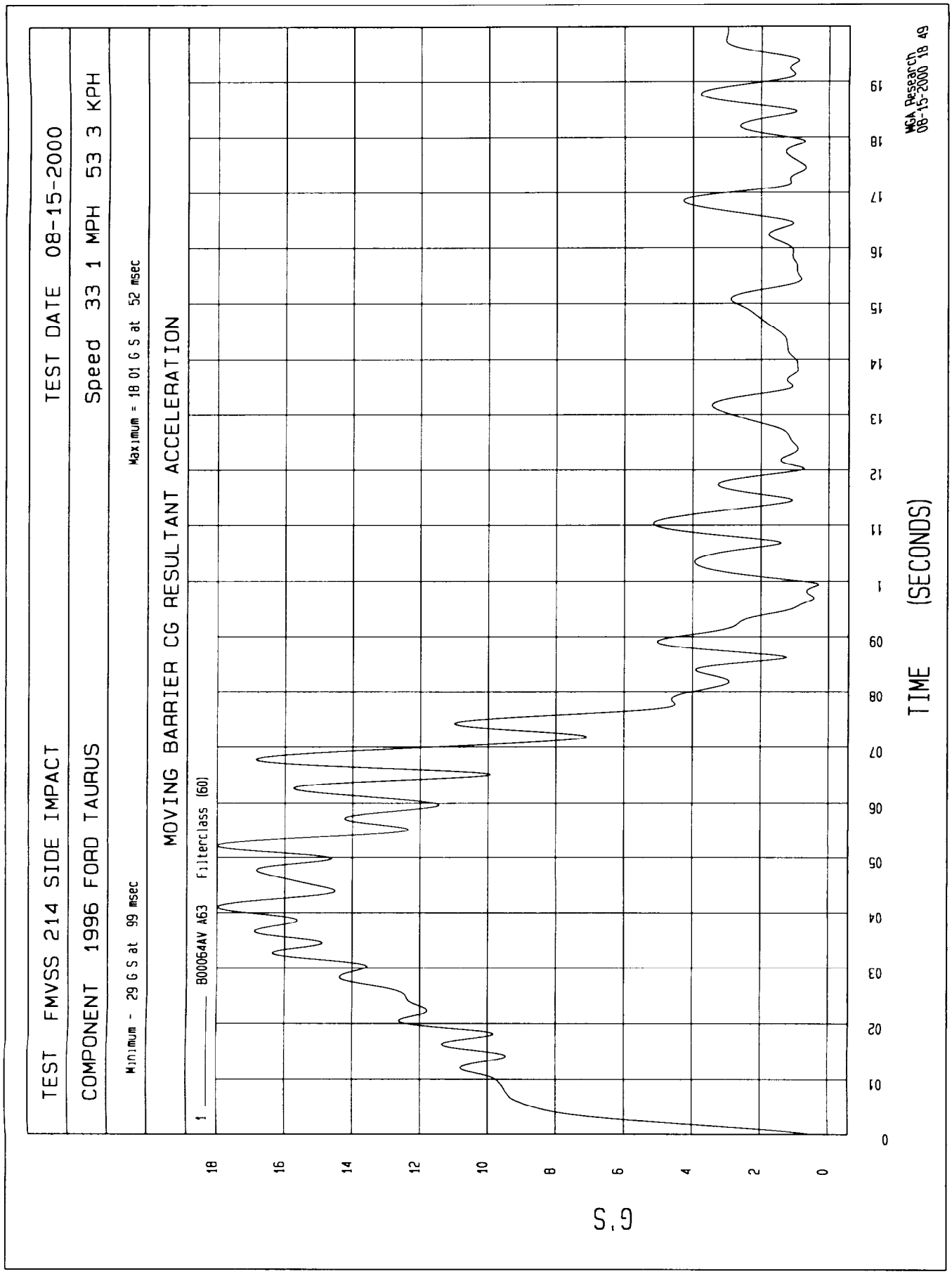

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -91 59 G s at 27 msec
Maximum = 173 03 G s at 12 msec
LEFT REAR DOOR LOWER Y ACCELERATION
1 B000G4AF A53 Filterclass (60)
G's
Seconds
MGA Research
08-15-2000 16 31

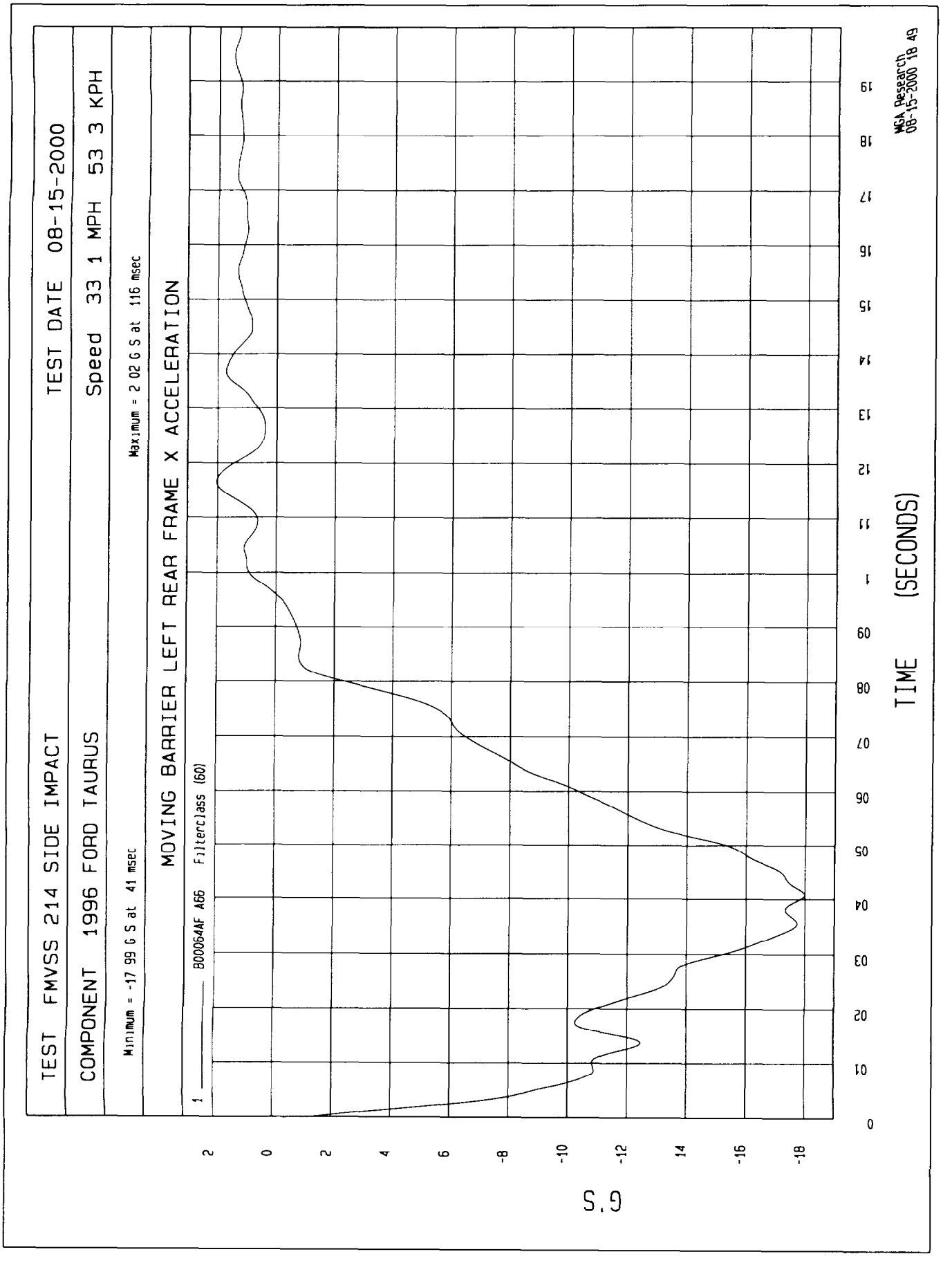

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 114 41 G s at 10 msec
Maximum = 191 71 G s at 6 msec
LEFT REAR DOOR REAR LOWER Y ACCELERATION
1 B0006AAF A54 Filterclass (60)
No Valid Data
After 20 msec.
G's
Seconds
MGA Research
08-17-2000 14 09

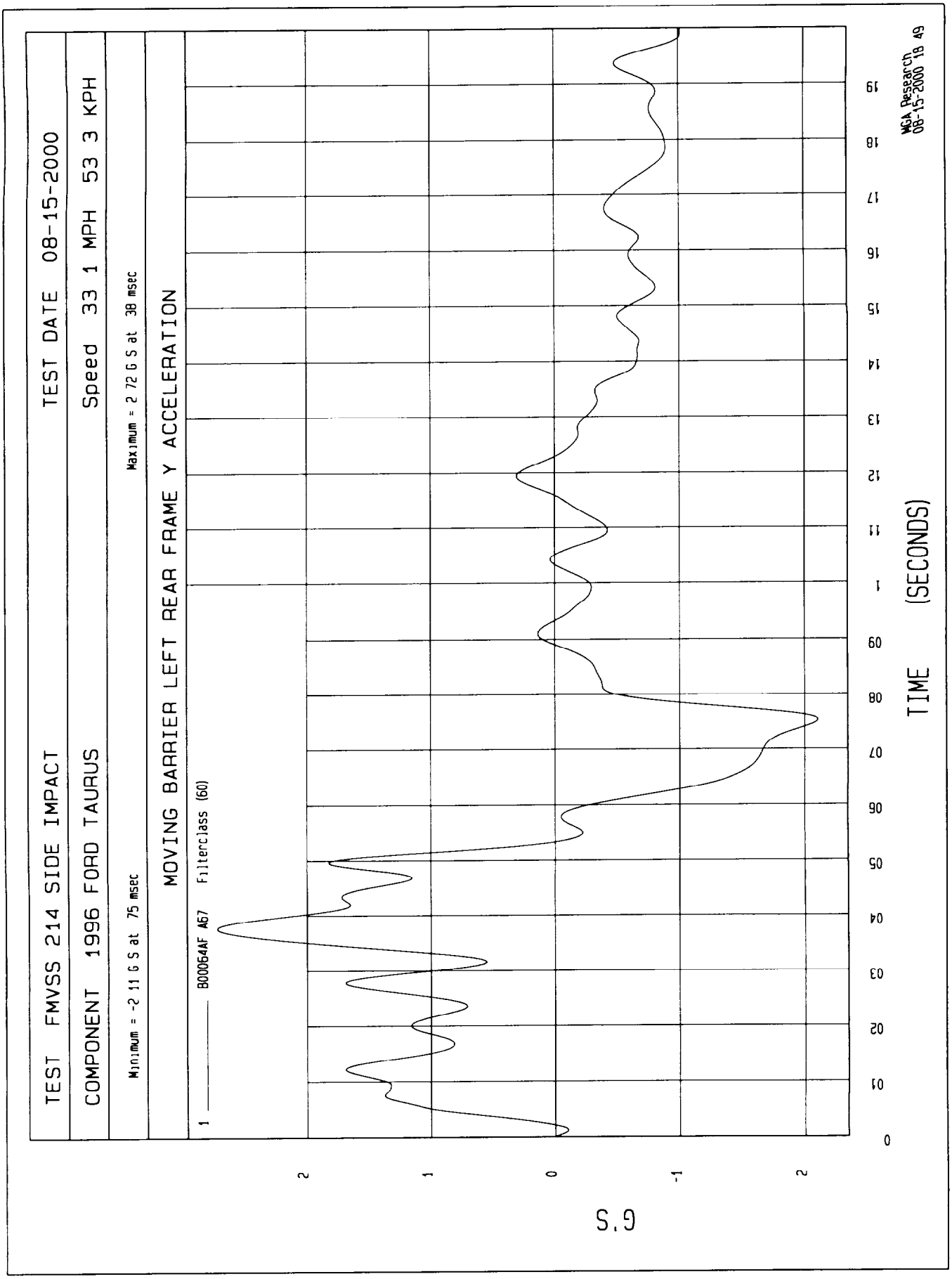

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -14 58 G S at 33 msec
Maximum = 1 01 G S at 128 msec
MOVING BARRIER CG X ACCELERATION
1 B00064AF A63 Filterclass (60)
MGA Research
08-15-2000 18 49
G's
0
2
4
-6
-8
-10
12
-14
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
TIME (SECONDS)

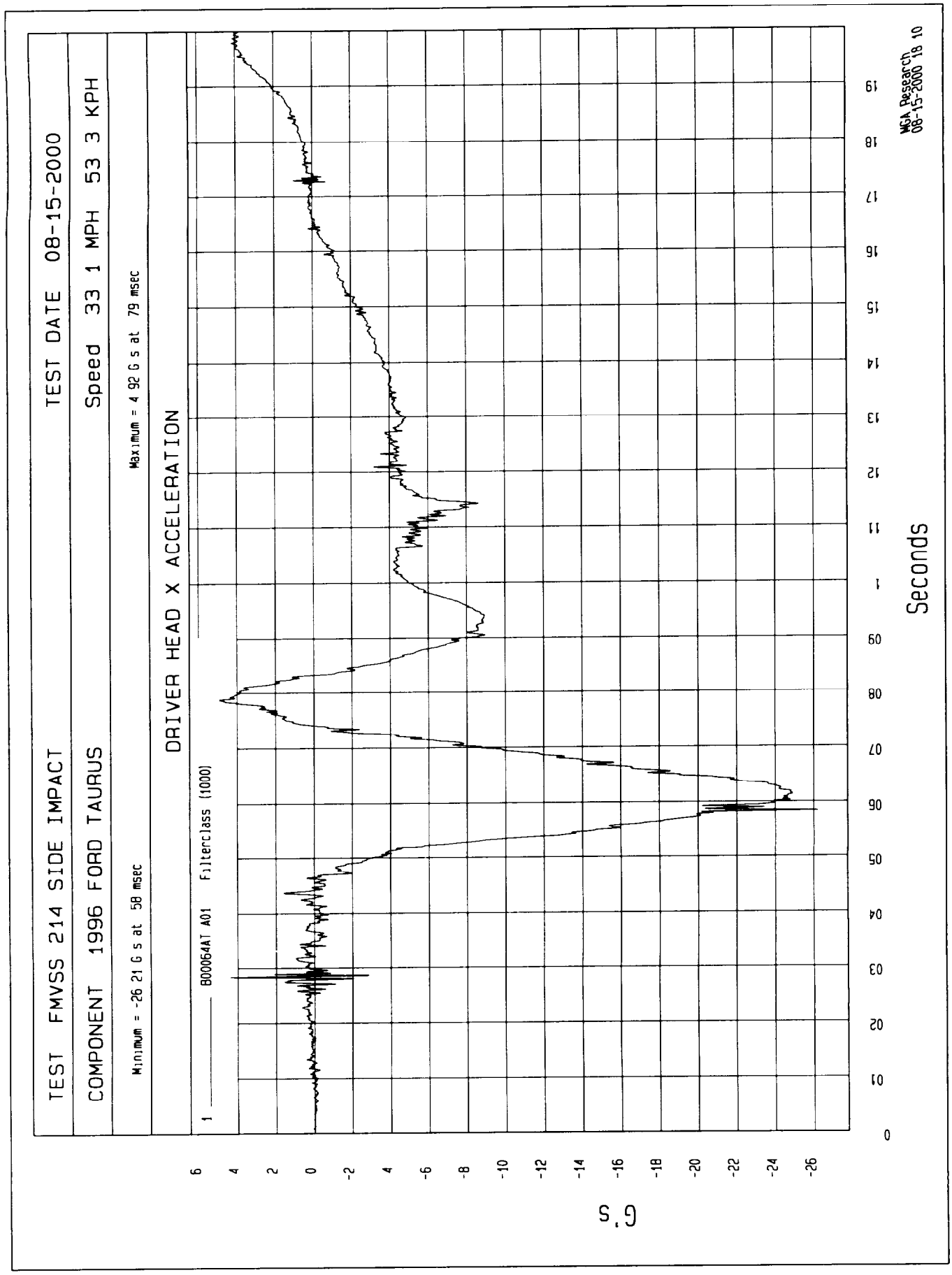

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 6 54 G S at 40 msec
Maximum = 81 G S at 66 msec
MOVING BARRIER CG Y ACCELERATION
1 B00064AF AG4 Filterclass (60)
MGA Research
08-15-2000 18 49
G'S
TIME (SECONDS)

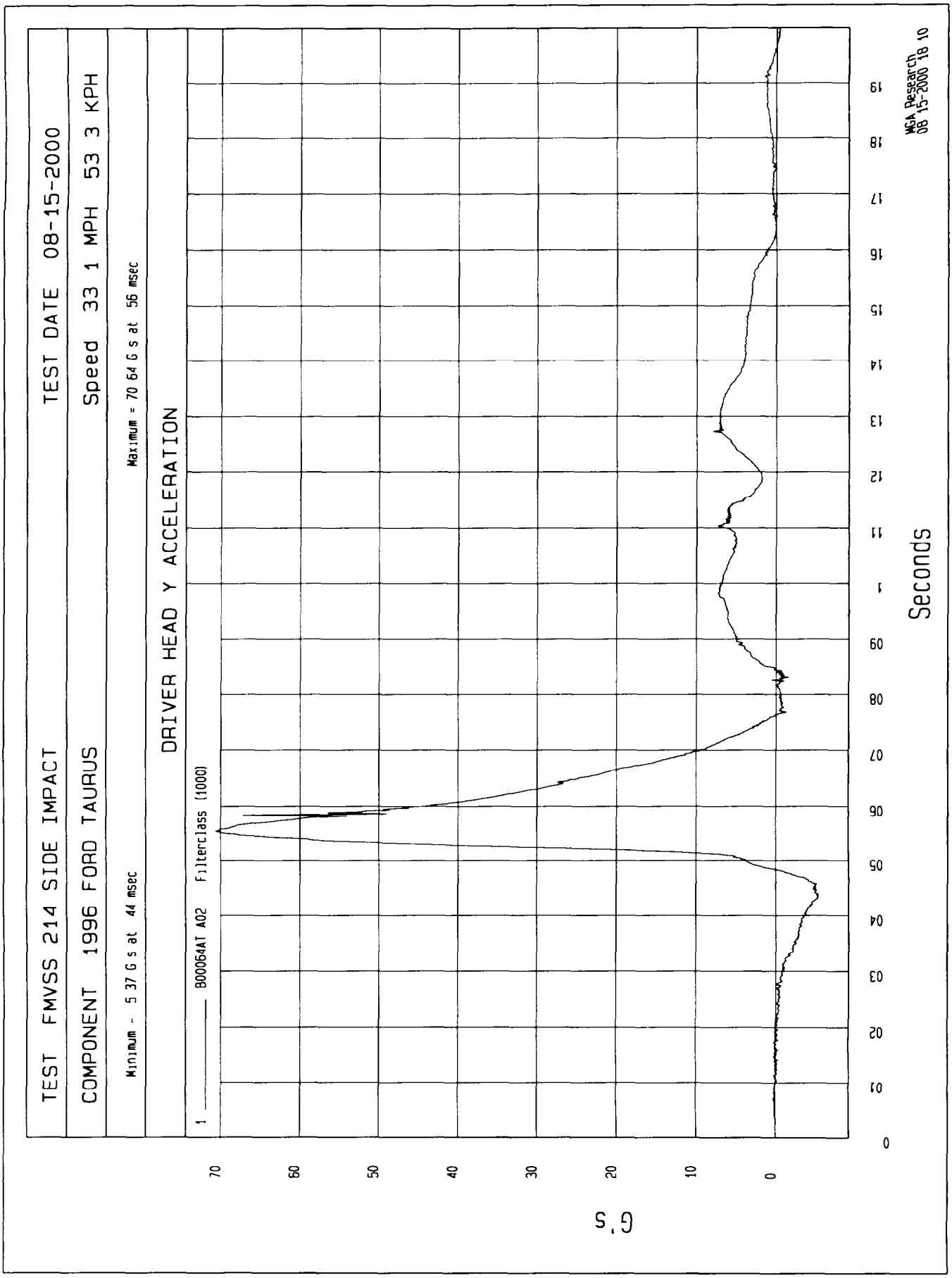

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 14 67 G S at 68 msec
Maximum = 11 35 G S at 63 msec
MOVING BARRIER CG Z ACCELERATION
1 B00064AF A65 Filterclass (60)
MGA Research
08-15-2000 18 49
12 10 8 6 4 2 0 2 4 6 8 10 12 14
G's
0 01 02 03 04 05 06 07 08 09 1 11 12 13 14 15 16 17 18 19
TIME (SECONDS)

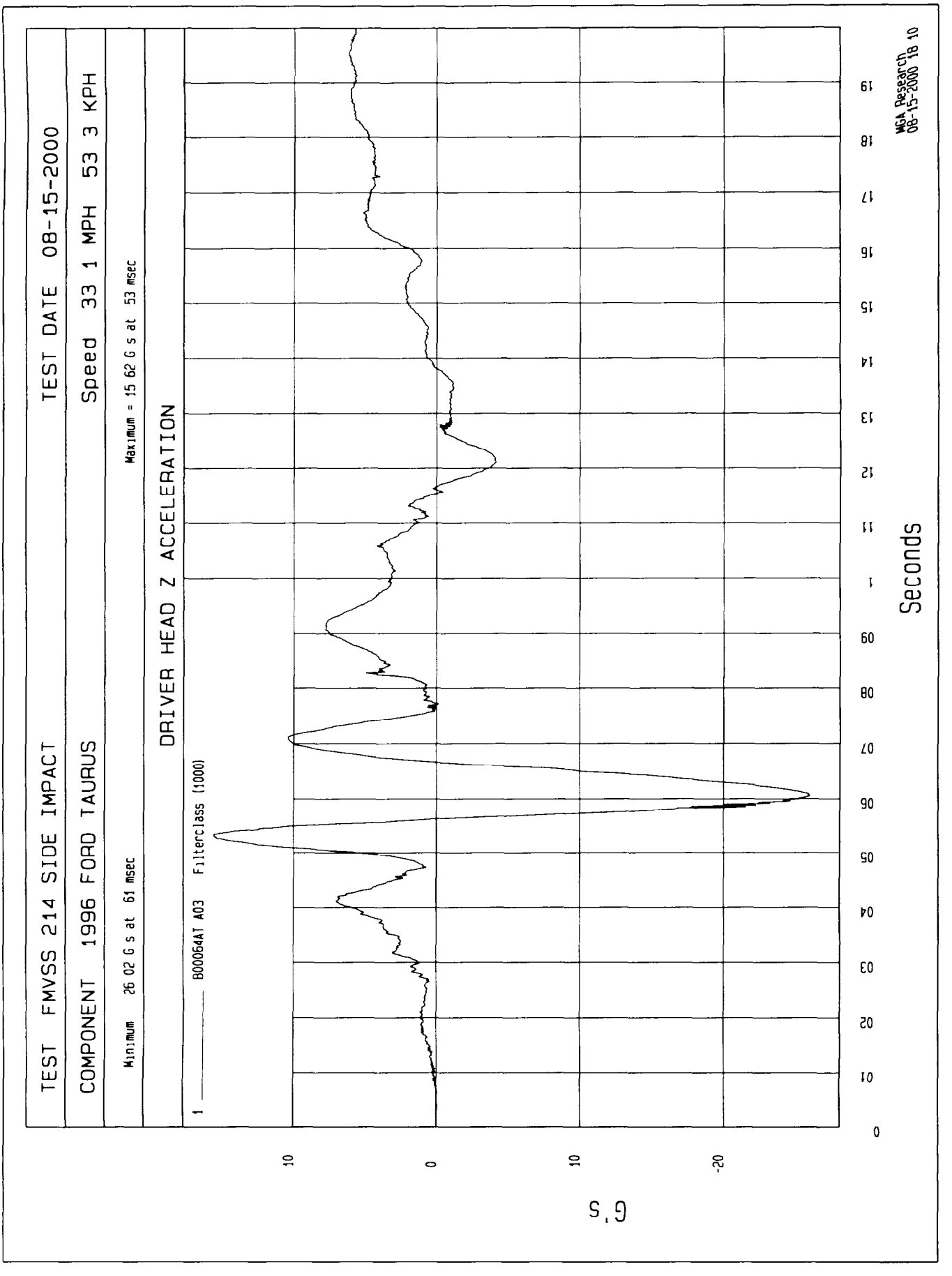

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 29 G S at 99 msec
Maximum = 18 01 G S at 52 msec
MOVING BARRIER CG RESULTANT ACCELERATION
1 B00064AV A63 Filterclass (60)
MGA Research
08-15-2000 18 49
G's
TIME (SECONDS)

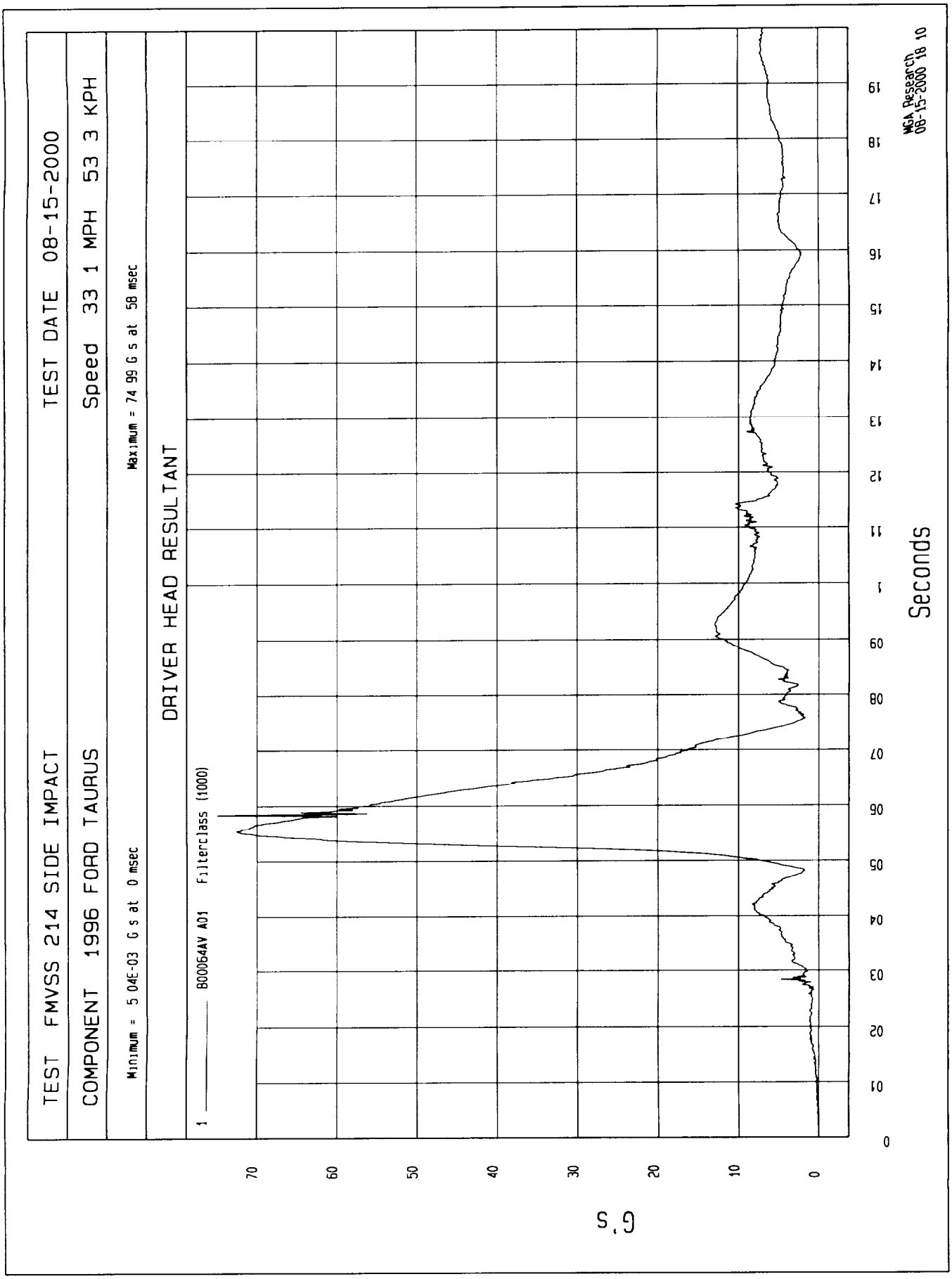

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -17 99 G S at 41 msec
Maximum = 2 02 G S at 116 msec
MOVING BARRIER LEFT REAR FRAME X ACCELERATION
1 B00064AF A66 Filterclass (60)
MGA Research
08-15-2000 18 49
G'S
TIME (SECONDS)
2
0
2
4
6
-8
-10
-12
14
-16
-18
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

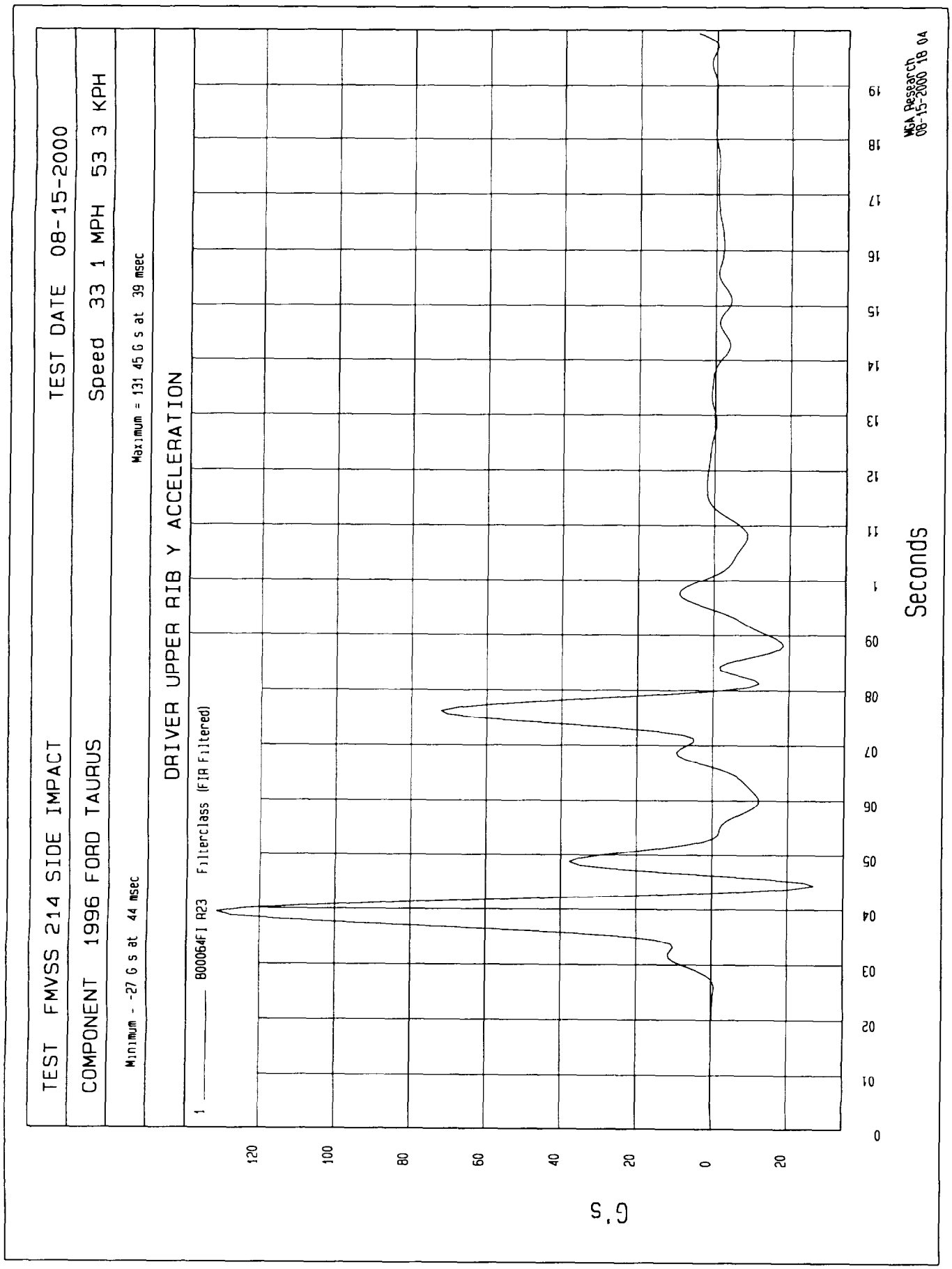

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -2 11 G S at 75 msec
Maximum = 2 72 G S at 38 msec
MOVING BARRIER LEFT REAR FRAME Y ACCELERATION
1 B00064AF A67 Filterclass (60)
MGA Research
08-15-2000 18 49
G's
2
1
0
-1
2
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
TIME (SECONDS)

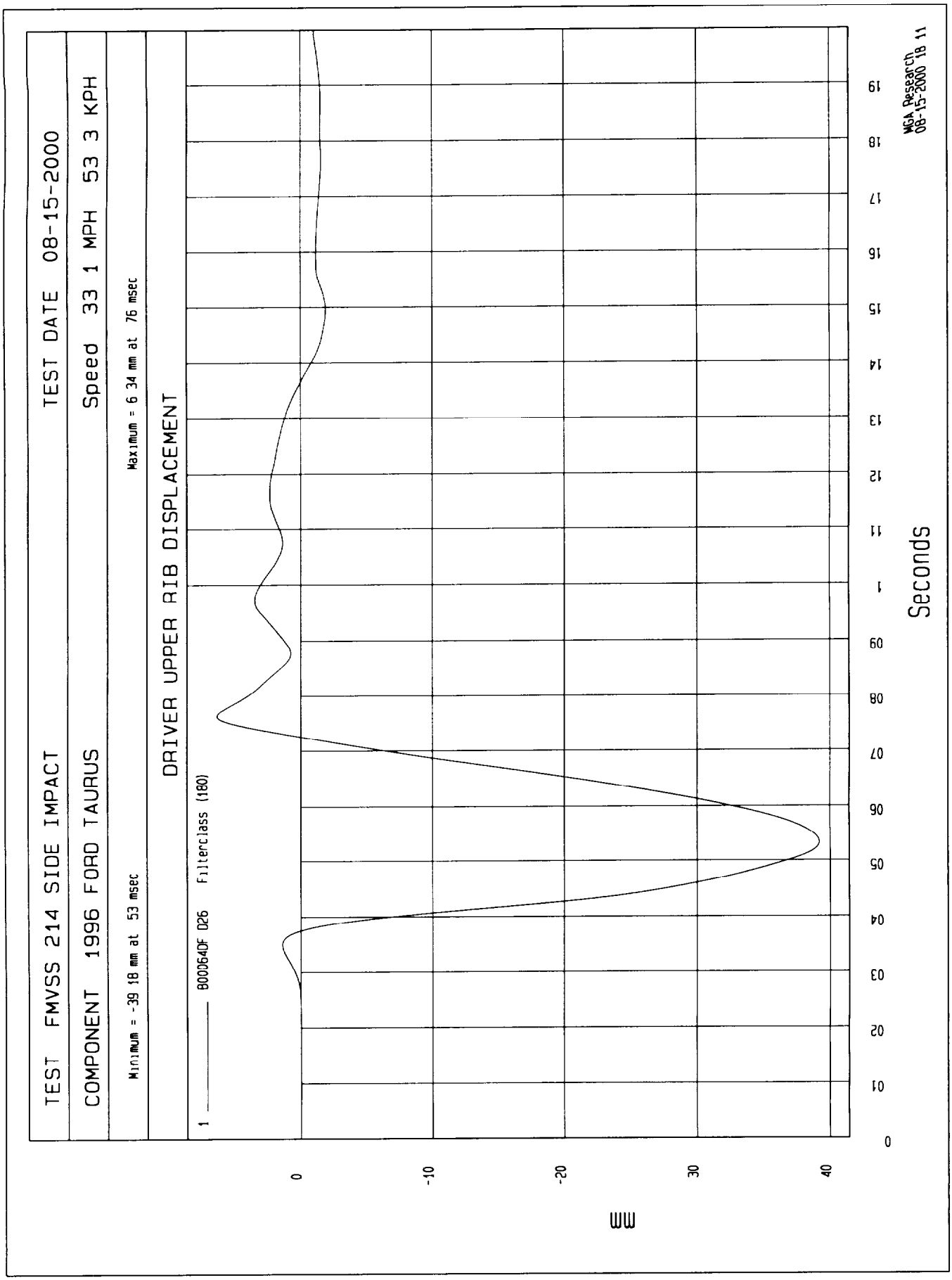

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -26 21 G s at 58 msec
Maximum = 4 92 G s at 79 msec
DRIVER HEAD X ACCELERATION
1 B00064A1 A01 Filterclass (1000)
MGA Research
08-15-2000 18 10
G's
Seconds

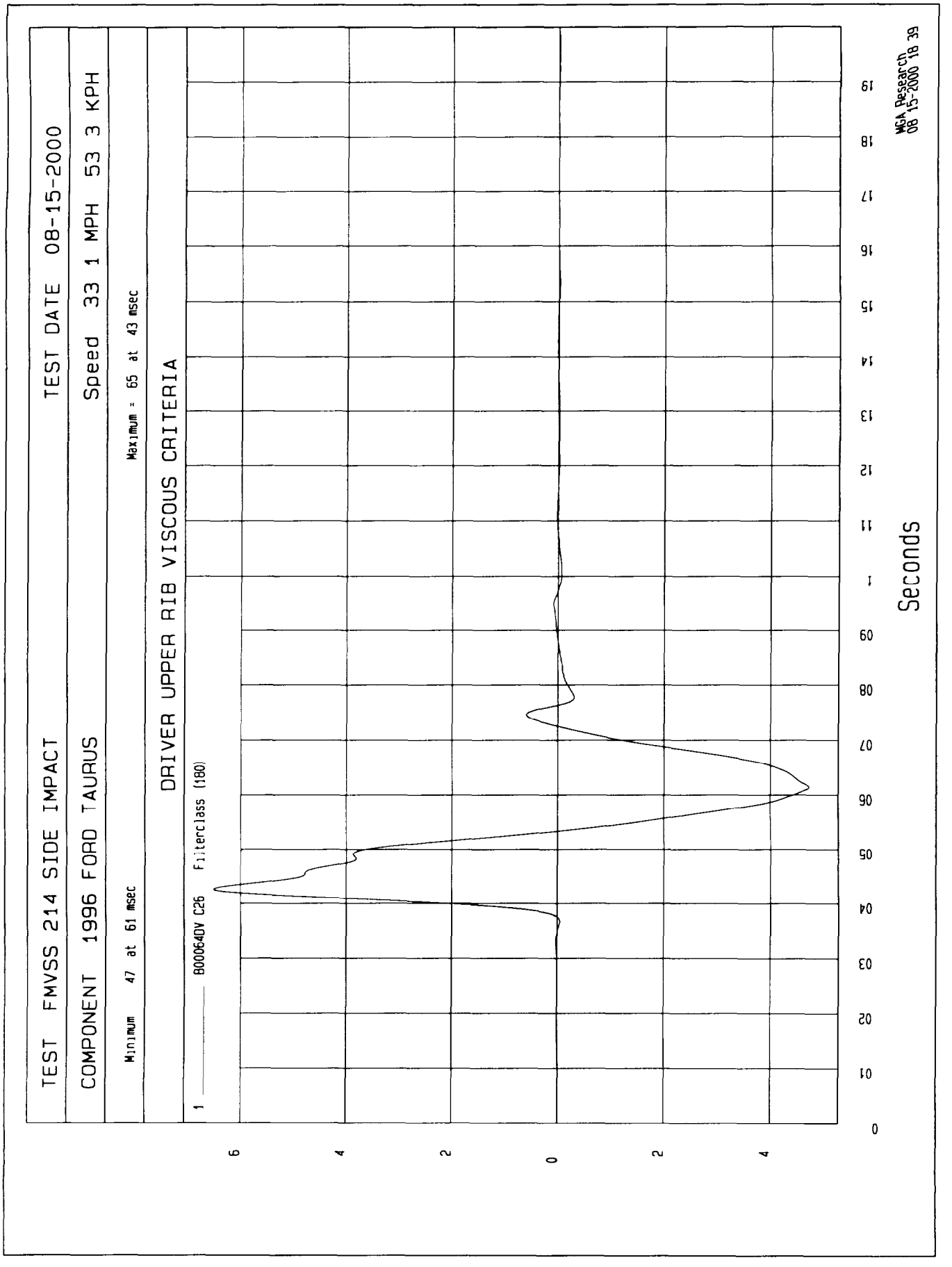

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 5 37 G s at 44 msec
Maximum = 70 64 G s at 56 msec
DRIVER HEAD Y ACCELERATION
1 B00064AT A02 Filterclass (1000)
MGA Research
08 15-2000 18 10
G's
Seconds
70
60
50
40
30
20
10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

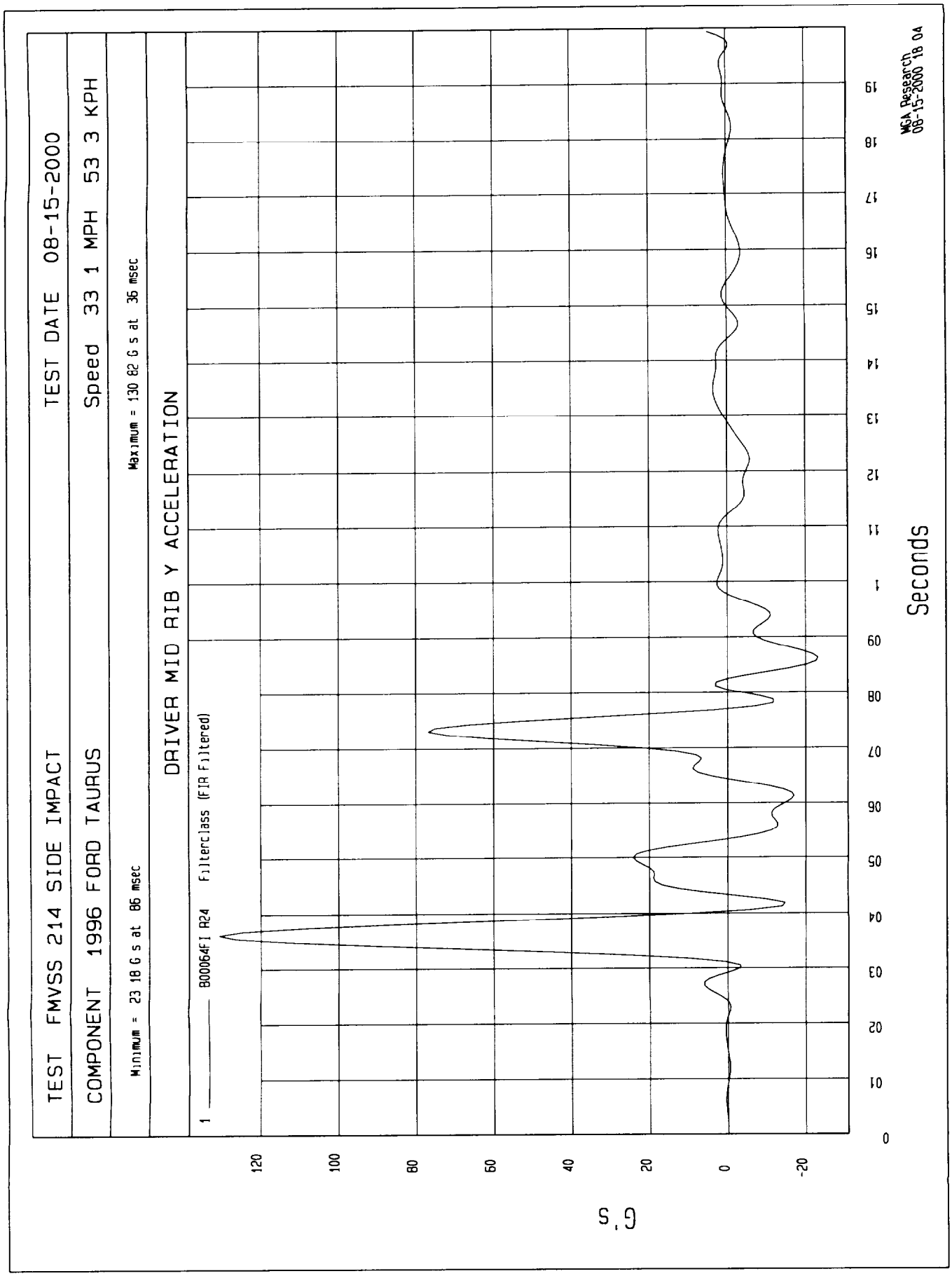

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 26 02 G s at 61 msec
Maximum = 15 62 G s at 53 msec
DRIVER HEAD Z ACCELERATION
1 B000064AT A03 Filterclass (1000)
MGA Research
08-15-2000 18 10
G's
10
0
10
-20
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

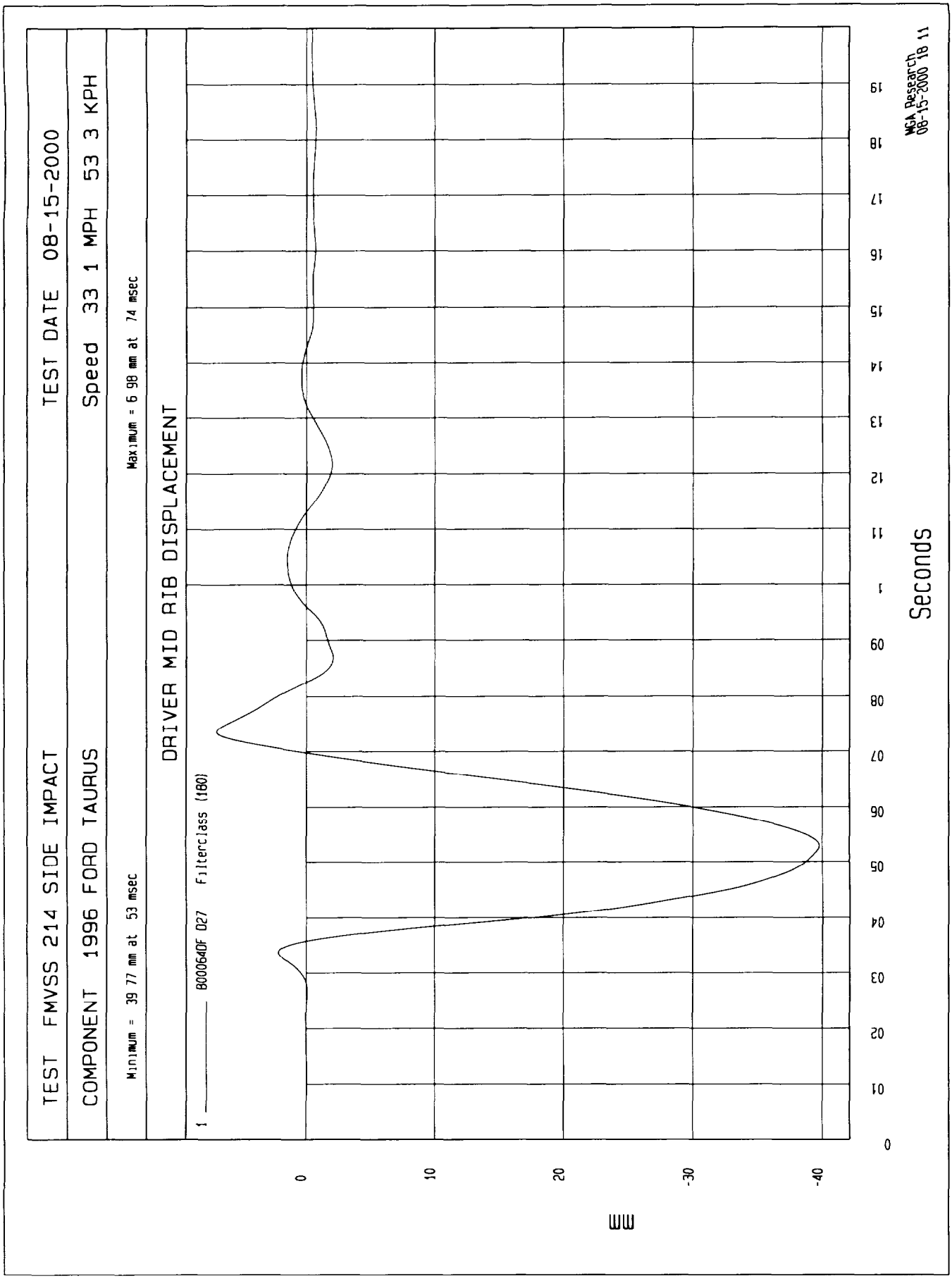

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 5 04E-03 G s at 0 msec
Maximum = 74 99 G s at 58 msec
DRIVER HEAD RESULTANT
1 B00064AV A01 Filterclass (1000)
MGA Research
08-15-2000 16 10
G's
Seconds

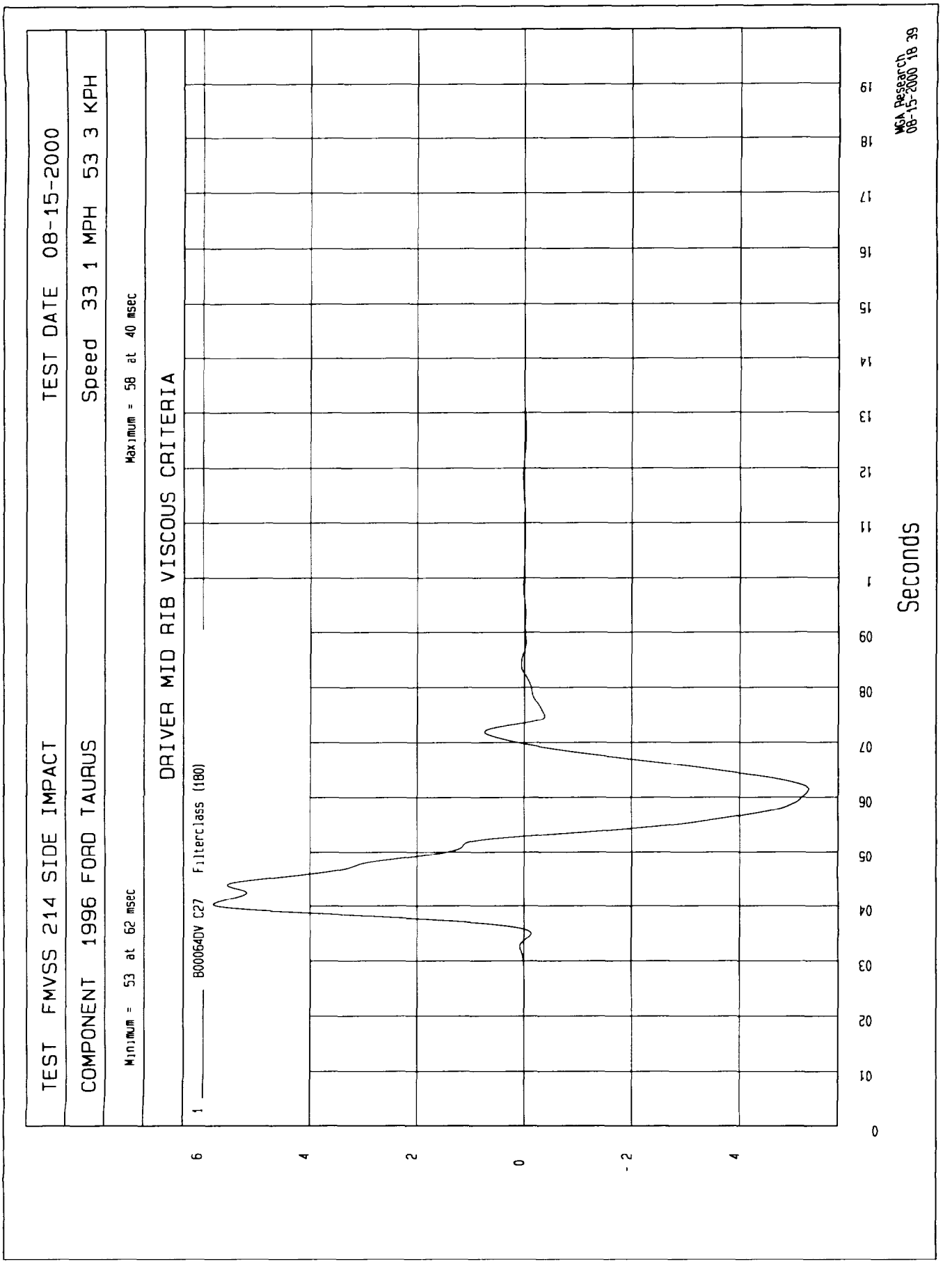

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -27 G s at 44 msec
Maximum = 131 45 G s at 39 msec
DRIVER UPPER RIB Y ACCELERATION
1 ——— B00064FI R23 Filterclass (FIR Filtered)
MGA Research
08-15-2000 18 04
G's
120
100
80
60
40
20
0
20
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

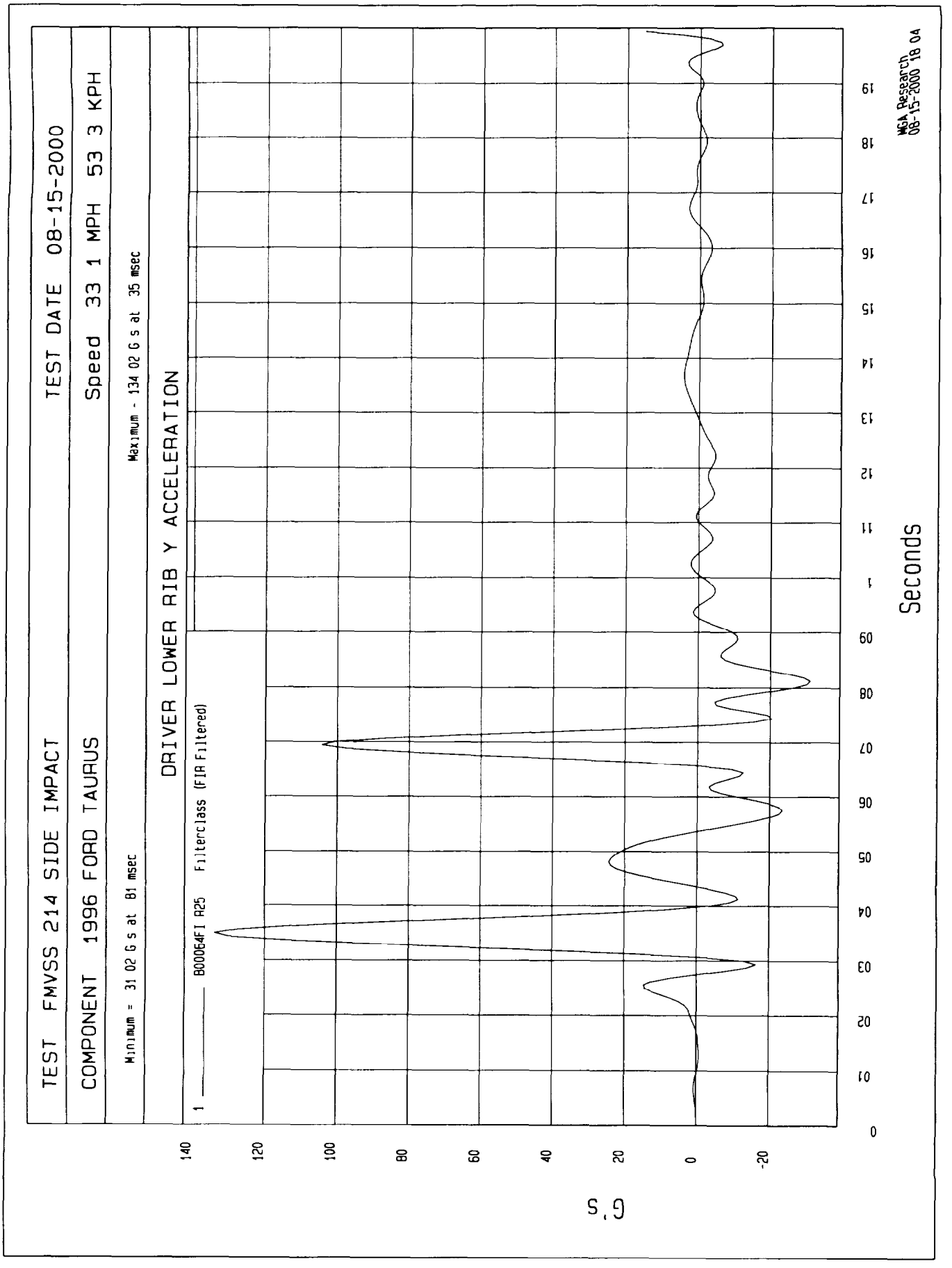

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -39 18 mm at 53 msec
Maximum = 6 34 mm at 76 msec
DRIVER UPPER RIB DISPLACEMENT
1 B00064DF D26 Filterclass (180)
mm
0
-10
-20
30
40
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
MGA Research
08-15-2000 18 11

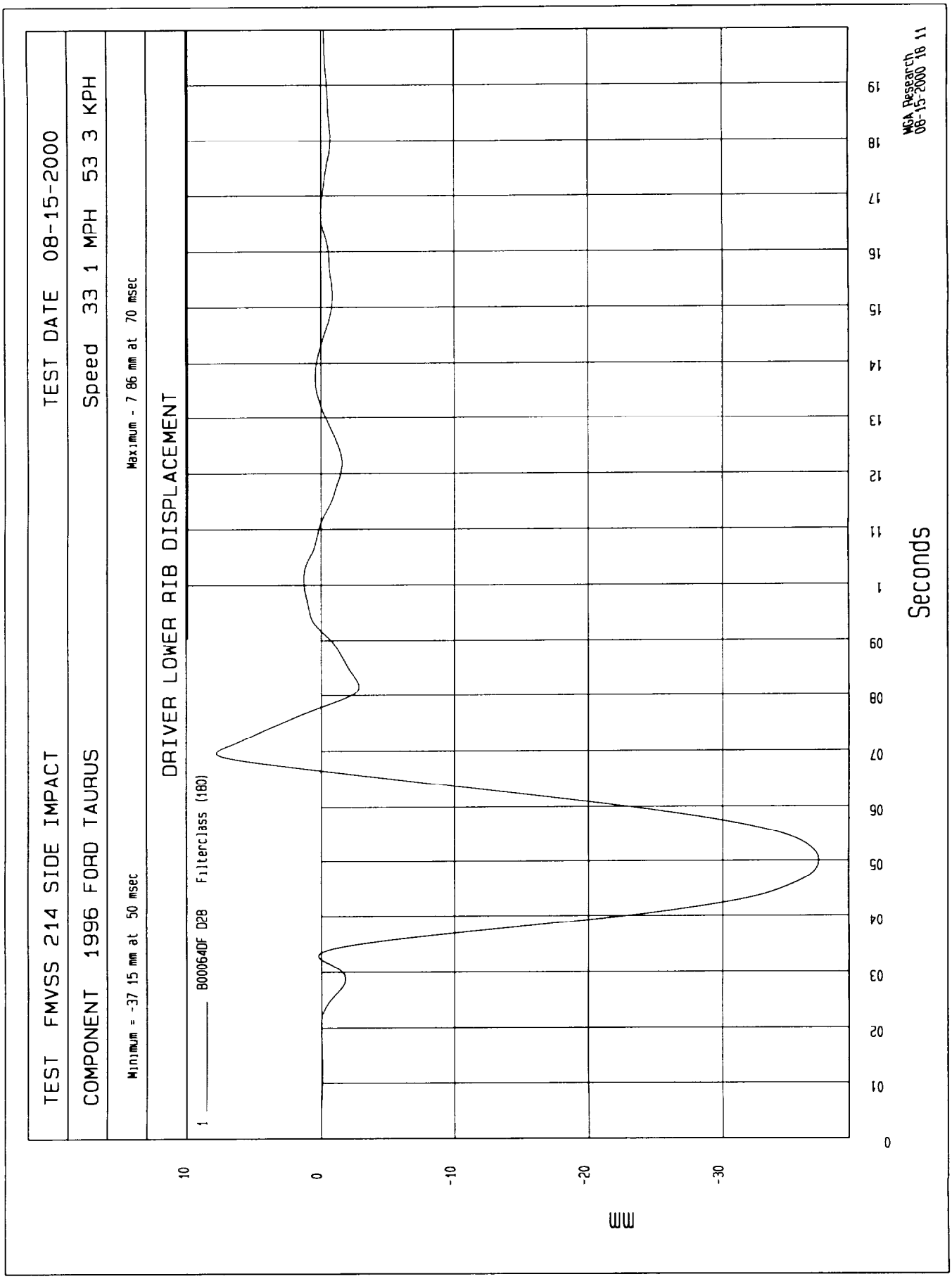

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 47 at 61 msec
Maximum = 65 at 43 msec
DRIVER UPPER RIB VISCOUS CRITERIA
1 B0006400 C26 Filterclass (180)
6
4
2
0
2
4
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 10 39

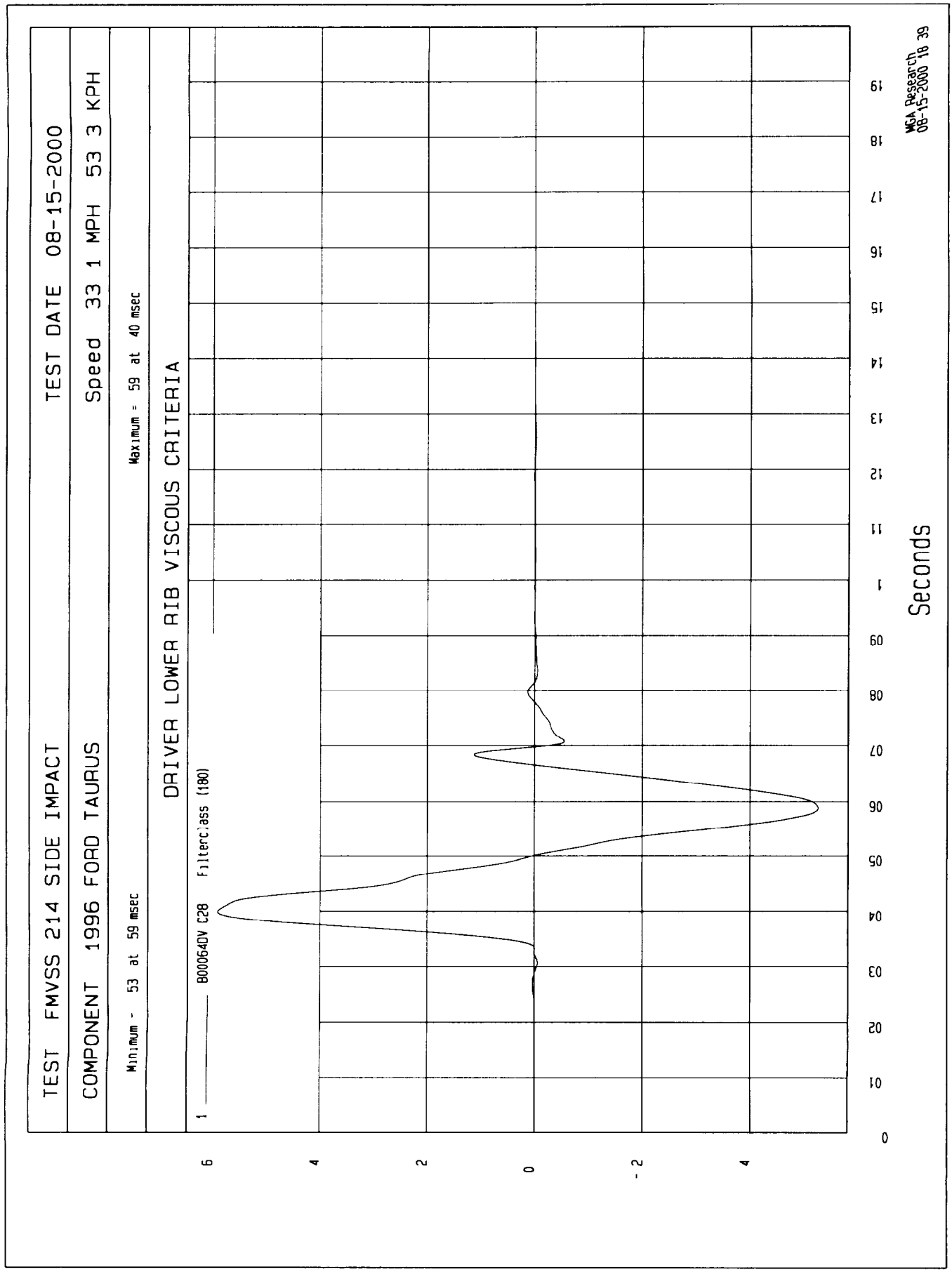

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 23 18 G s at 86 msec
Maximum = 130 82 G s at 36 msec
DRIVER MID RIB Y ACCELERATION
1 B00064FI R24 Filterclass (FIR Filtered)
G's
120
100
80
60
40
20
0
-20
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 18 04

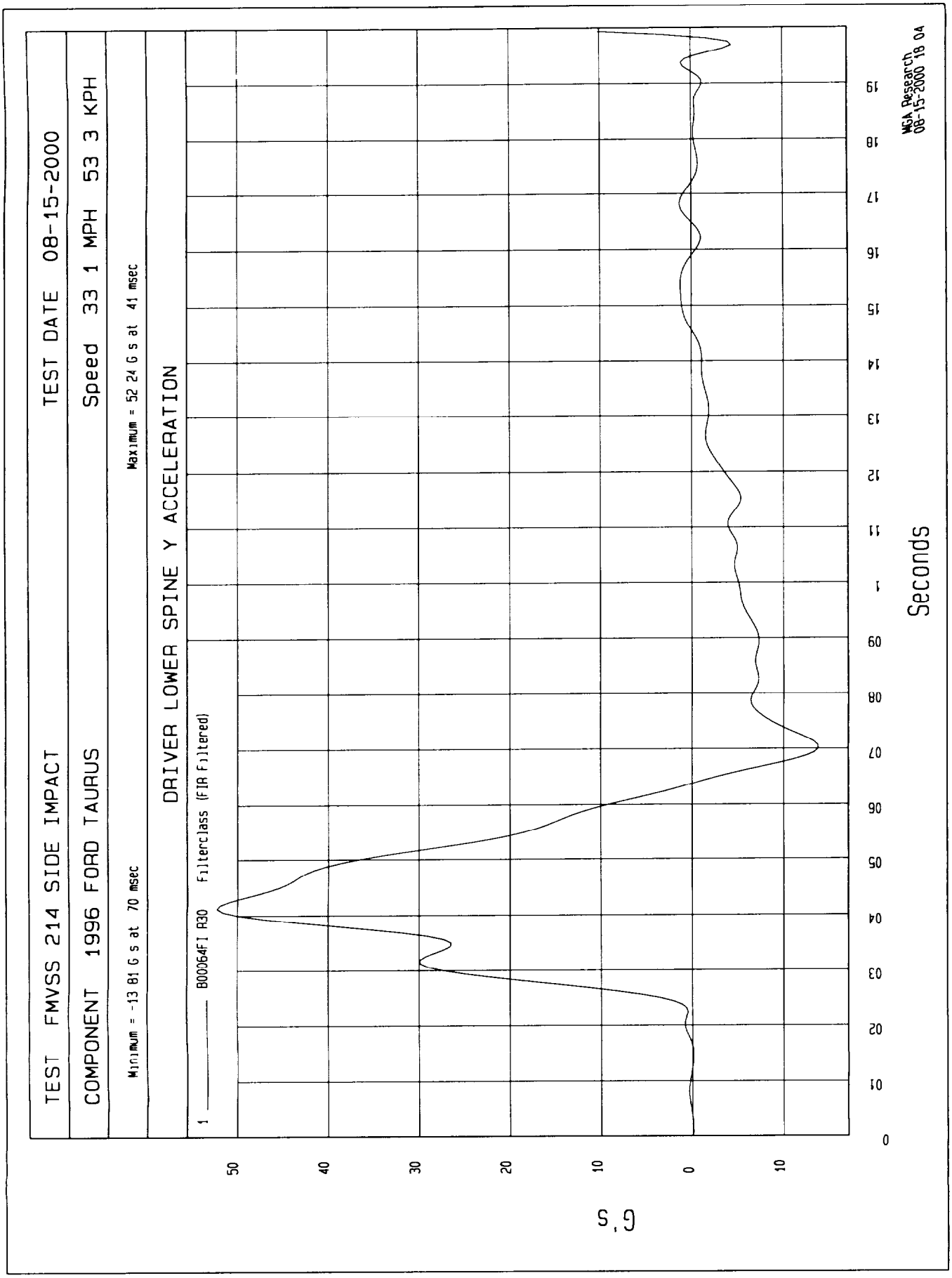

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 39 77 mm at 53 msec
Maximum = 6 98 mm at 74 msec
DRIVER MID RIB DISPLACEMENT
1 B000640F 027 Filterclass (180)
MGA Research
08-15-2000 18 11
mm
0
10
20
-30
-40
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

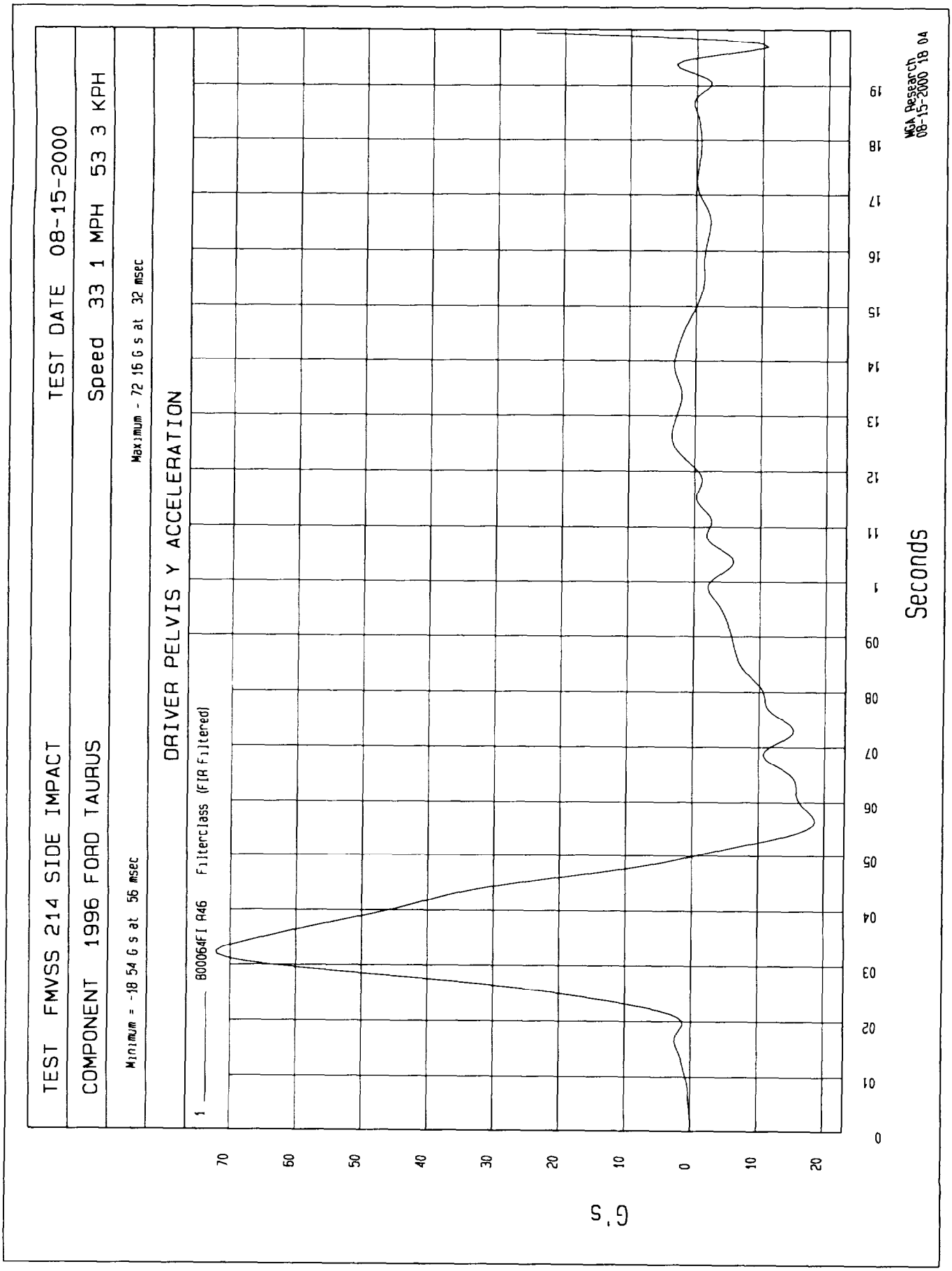

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 53 at 62 msec
Maximum = 58 at 40 msec
DRIVER MID RIB VISCOUS CRITERIA
1 B00064DV C27 Filterclass (180)
6
4
2
0
-2
4
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 18 39

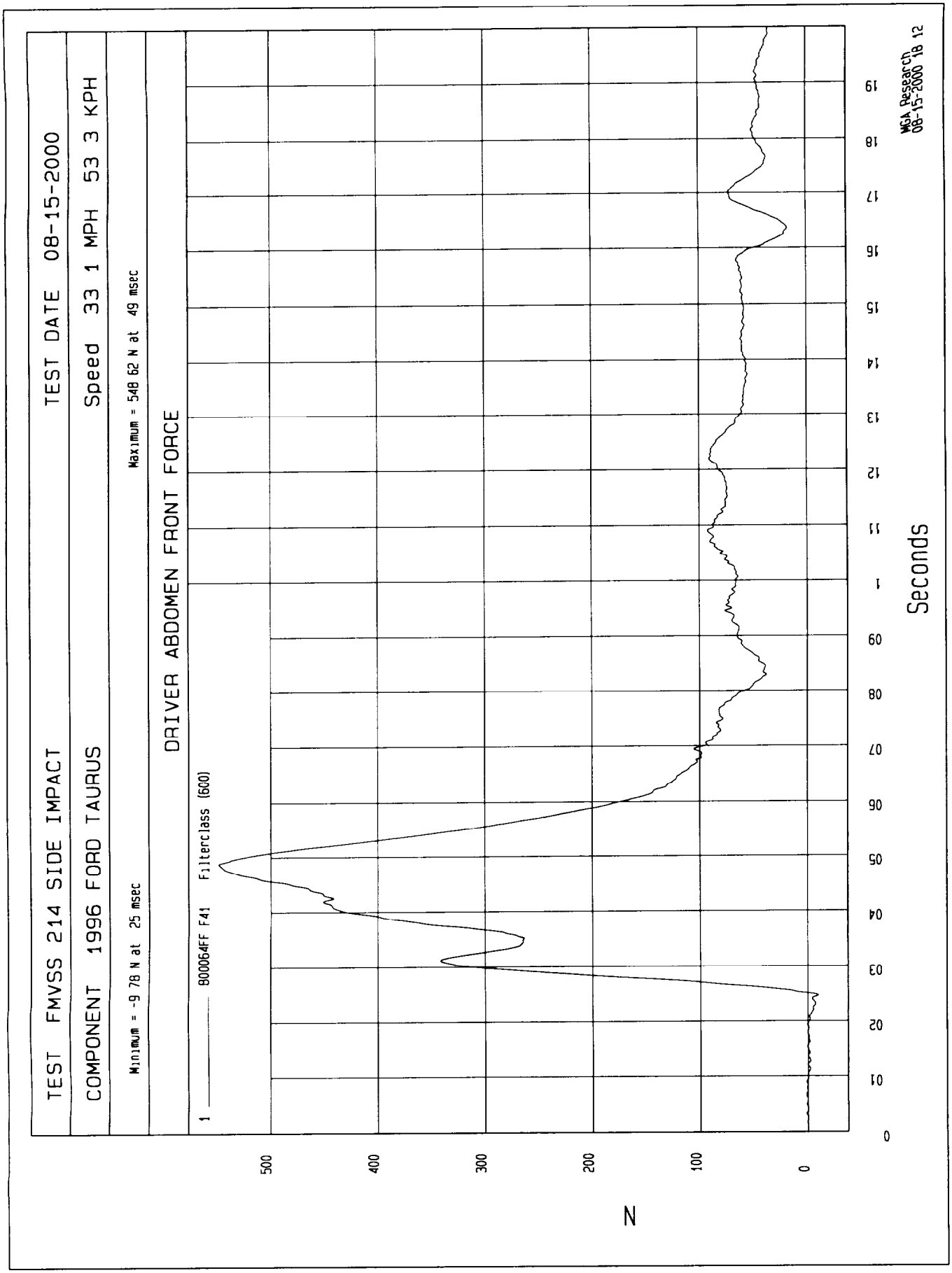

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 31 02 G s at 81 msec
Maximum = 134 02 G s at 35 msec
DRIVER LOWER RIB Y ACCELERATION
1 B000E4FI R25 Filterclass (FIR Filtered)
MGA Research
08-15-2000 10 04
Seconds
G's
140
120
100
80
60
40
20
0
-20
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

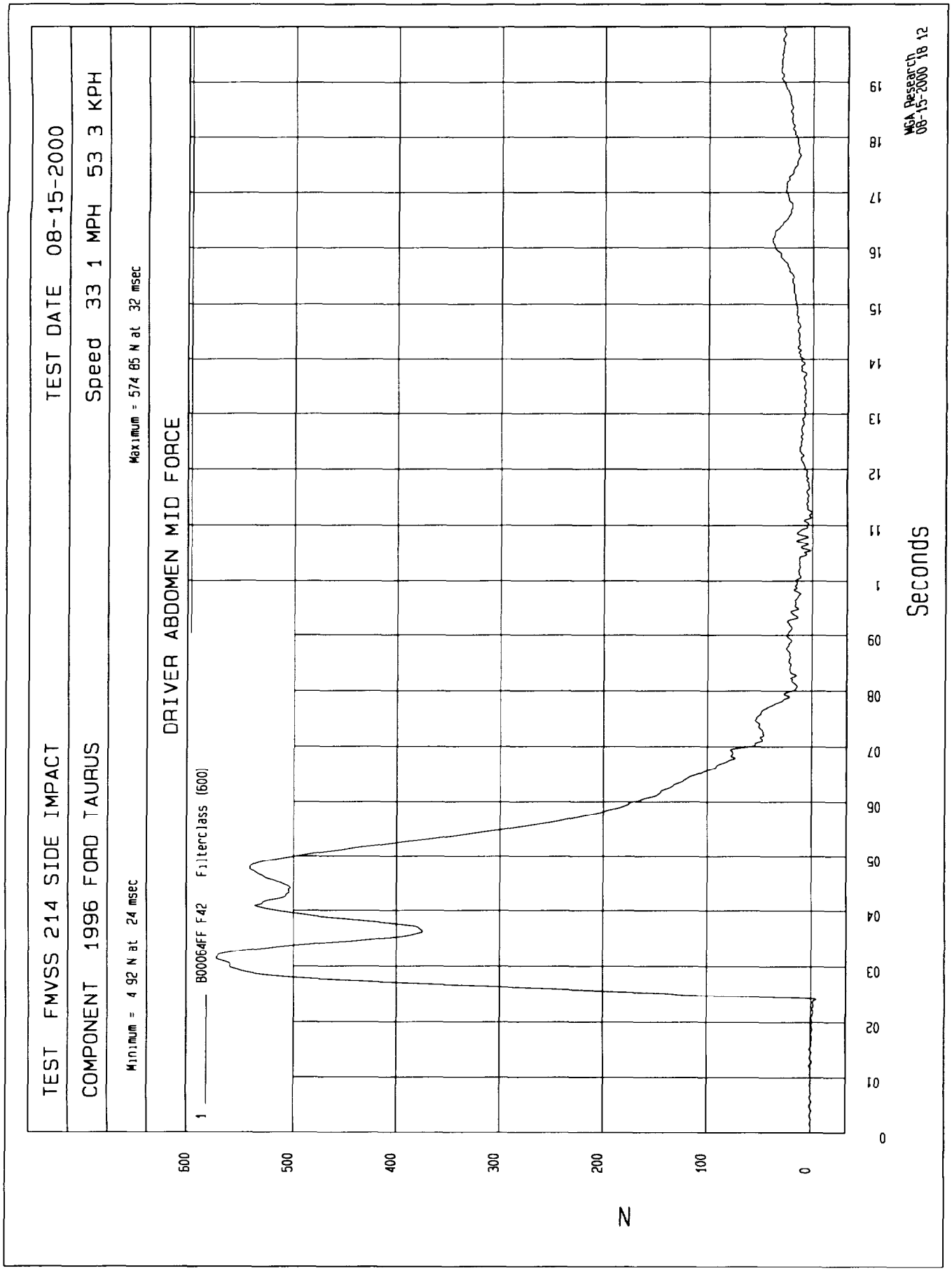

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -37 15 mm at 50 msec
Maximum - 7 86 mm at 70 msec
DRIVER LOWER RIB DISPLACEMENT
1 B000640F 028 Filterclass (180)
MGA Research
08-15-2000 16 11
mm
10
0
-10
-20
-30
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

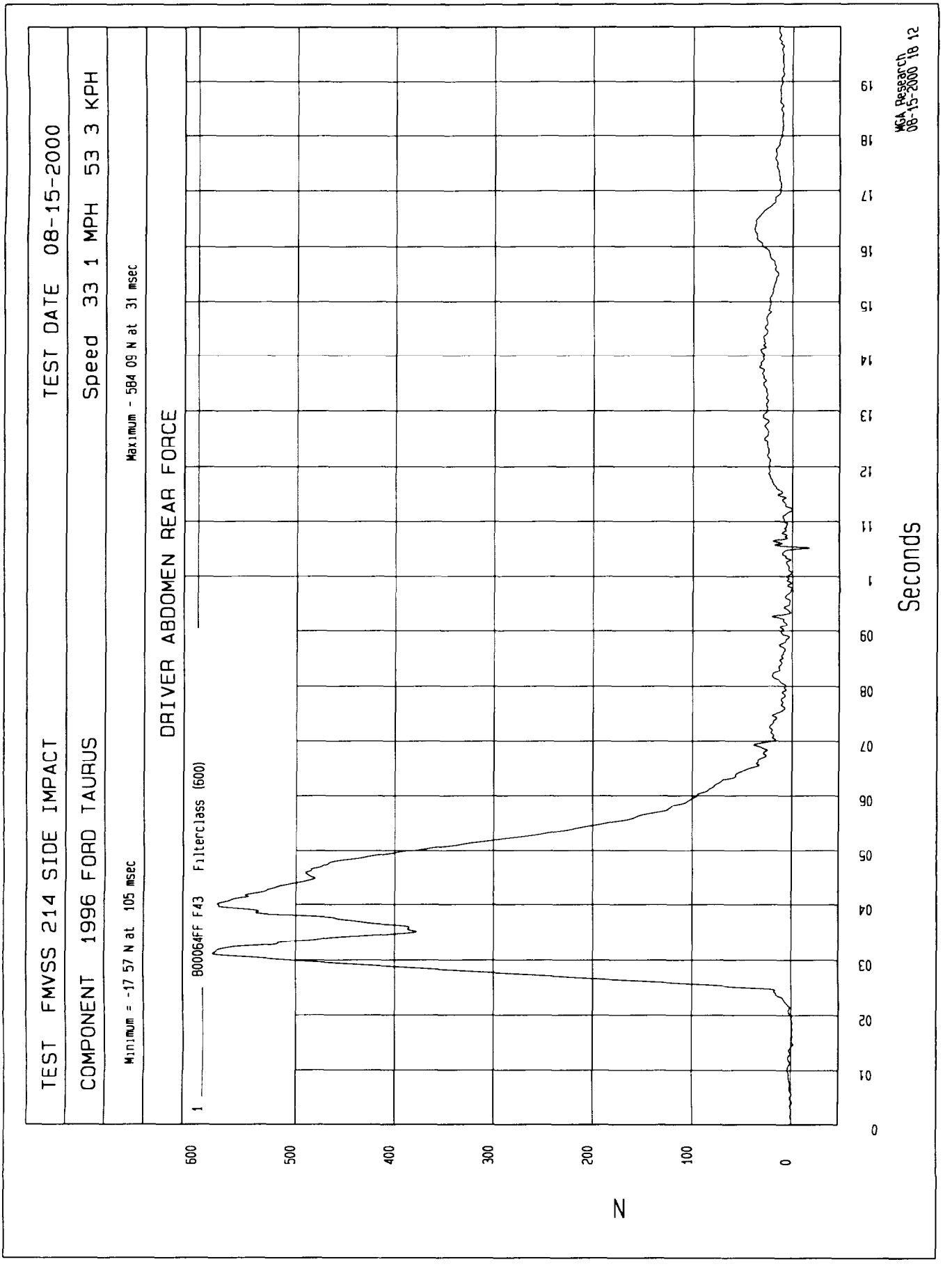

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 53 at 59 msec
Maximum = 59 at 40 msec
DRIVER LOWER RIB VISCOUS CRITERIA
1 B0006DV C28 Filter Class (180)
6
4
2
0
- 2
4
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 10 39

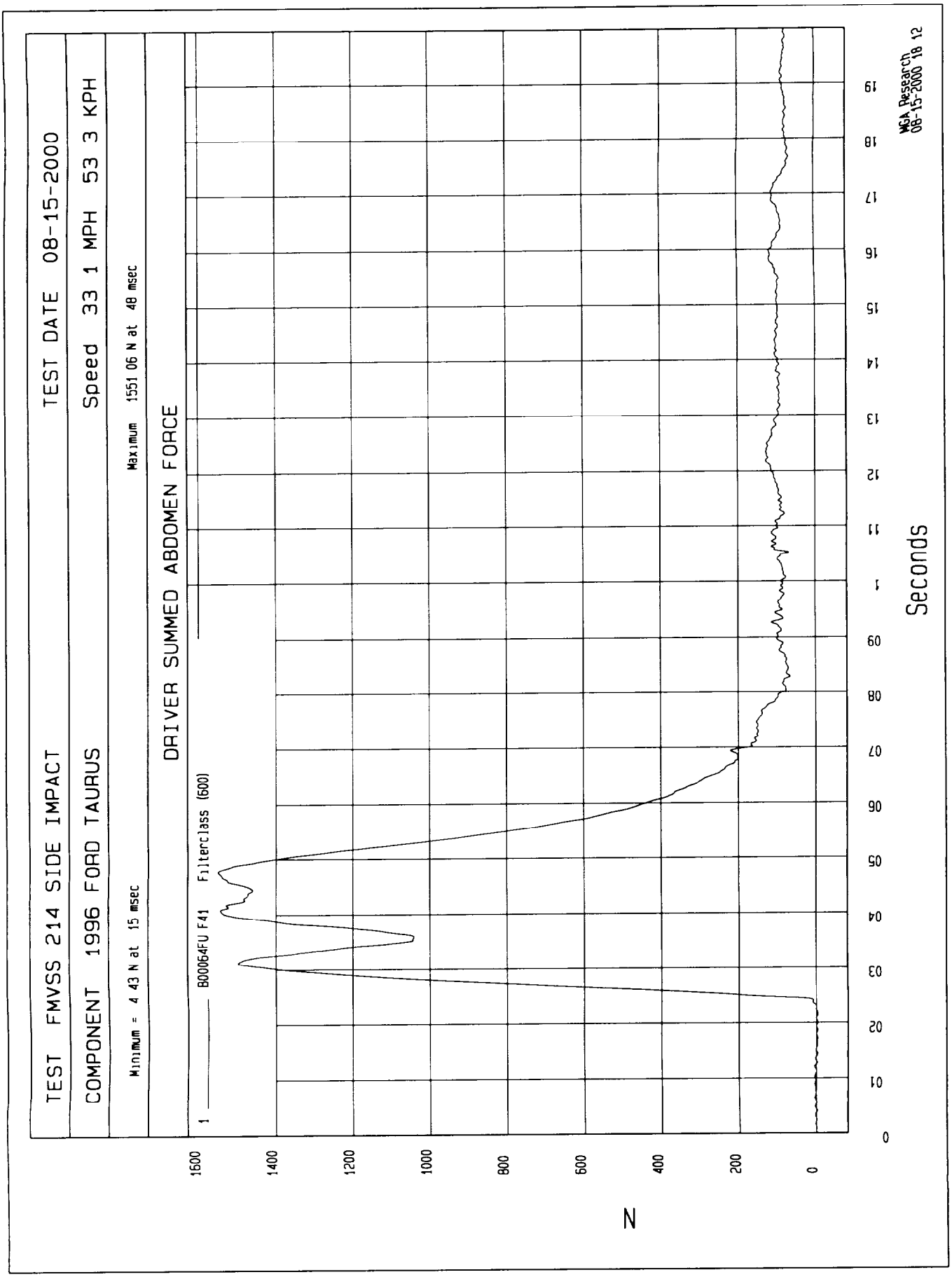

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -13 81 G s at 70 msec
Maximum = 52 24 G s at 41 msec
DRIVER LOWER SPINE Y ACCELERATION
1 B00064FI R30 Filterclass (FIR Filtered)
G's
Seconds
MGA Research
08-15-2000 18 04

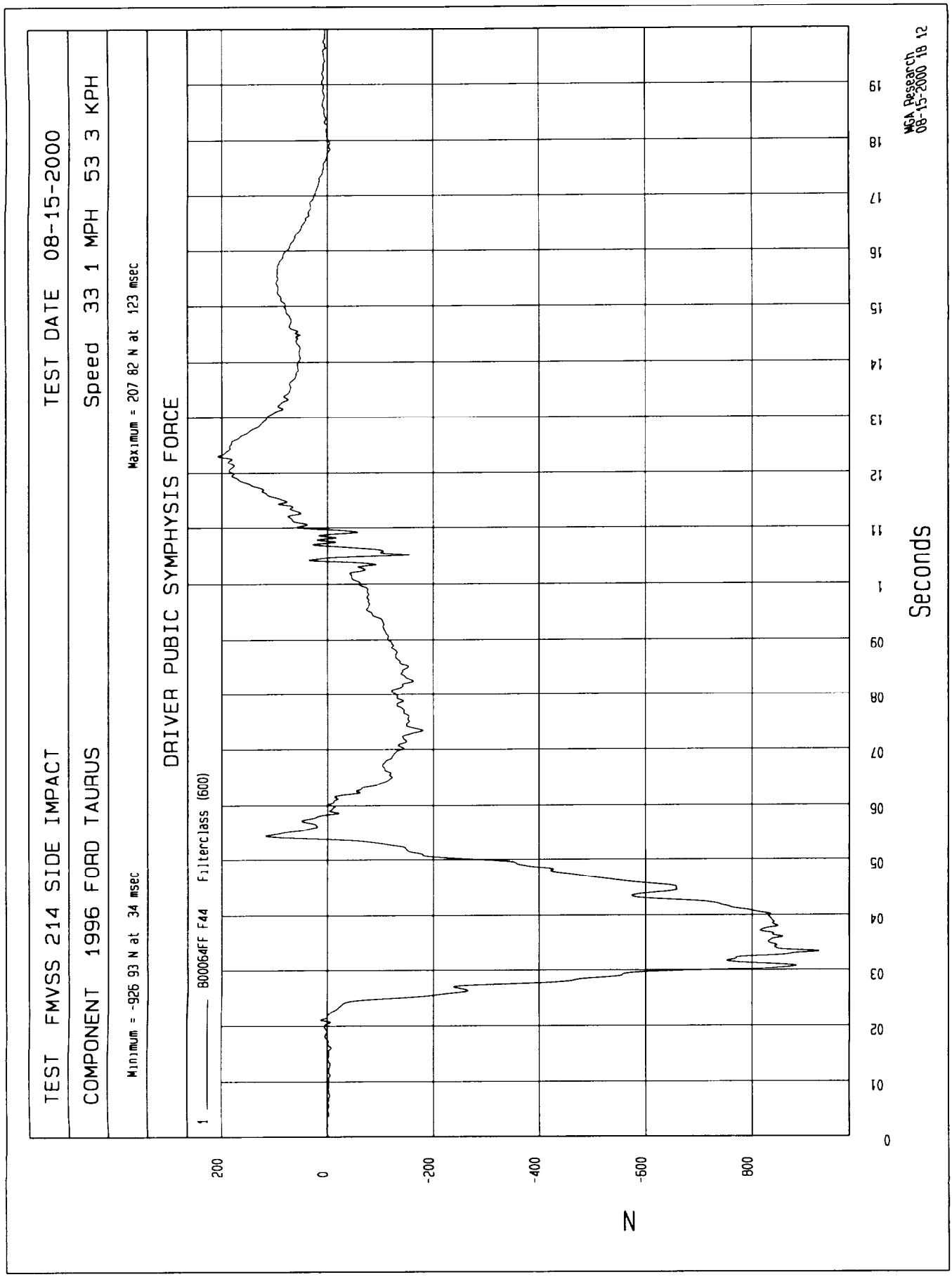

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -18 54 G s at 56 msec
Maximum = 72 16 G s at 32 msec
DRIVER PELVIS Y ACCELERATION
1 ——— 800064FI R46 Filterclass (FIR Filtered)
MGA Research
08-15-2000 18 04
G's
Seconds

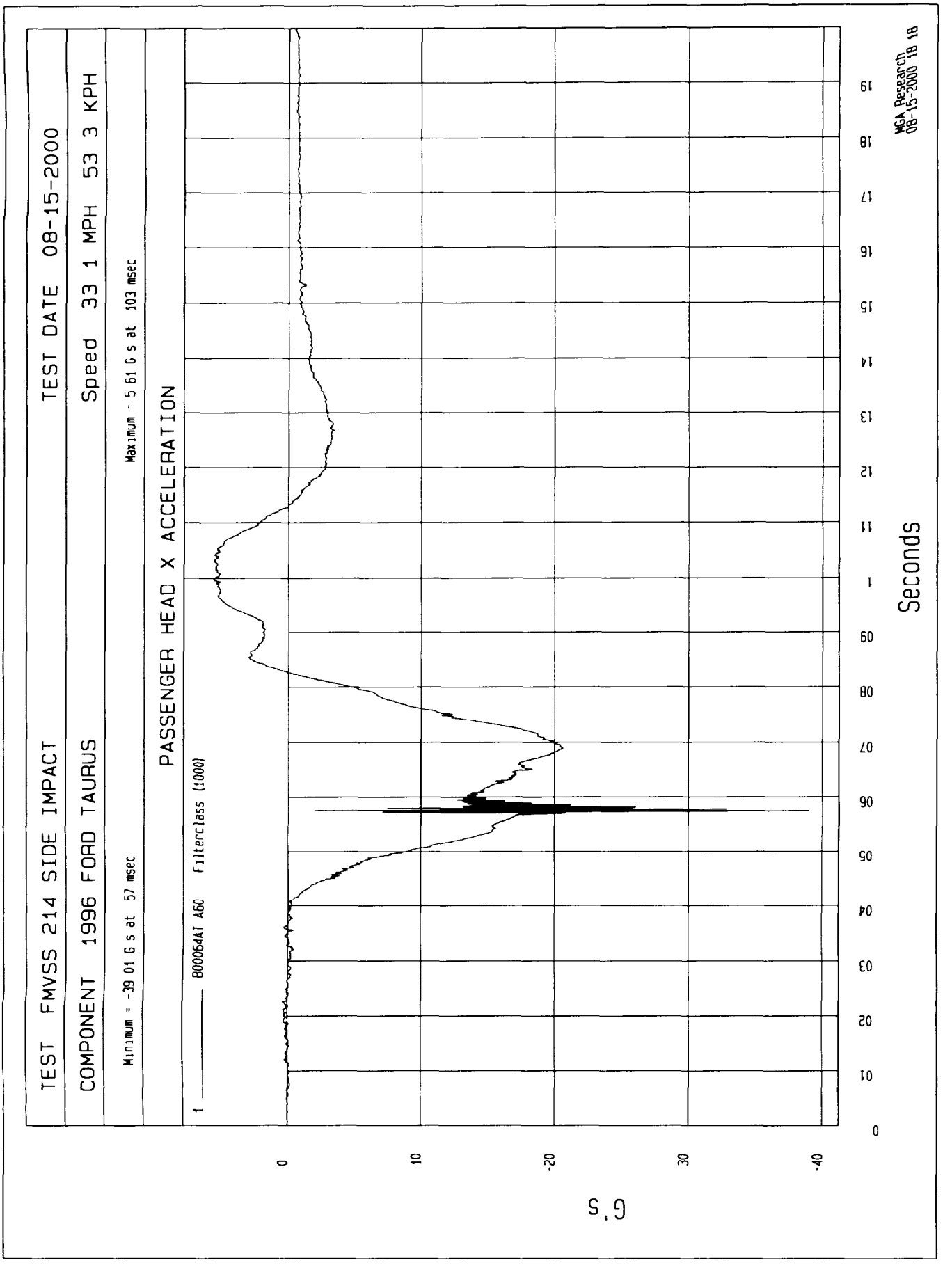

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -9 78 N at 25 msec
Maximum = 548 62 N at 49 msec
DRIVER ABDOMEN FRONT FORCE
1 800064FF F41 Filterclass (600)
N
500
400
300
200
100
0
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
MGA Research
08-15-2000 18 12

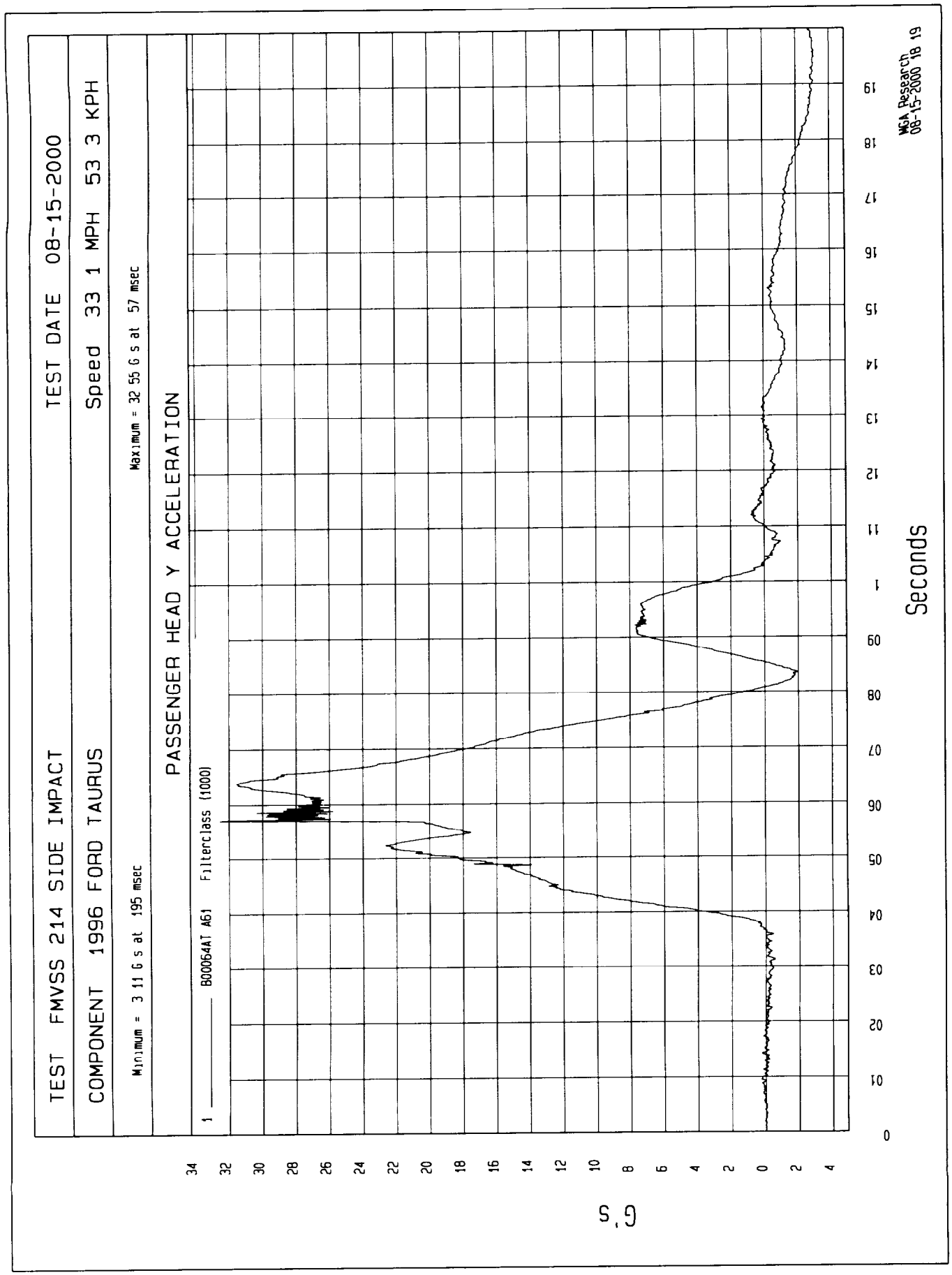

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 4 92 N at 24 msec
Maximum = 574 85 N at 32 msec
DRIVER ABDOMEN MID FORCE
1 B00064FF F42 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 12

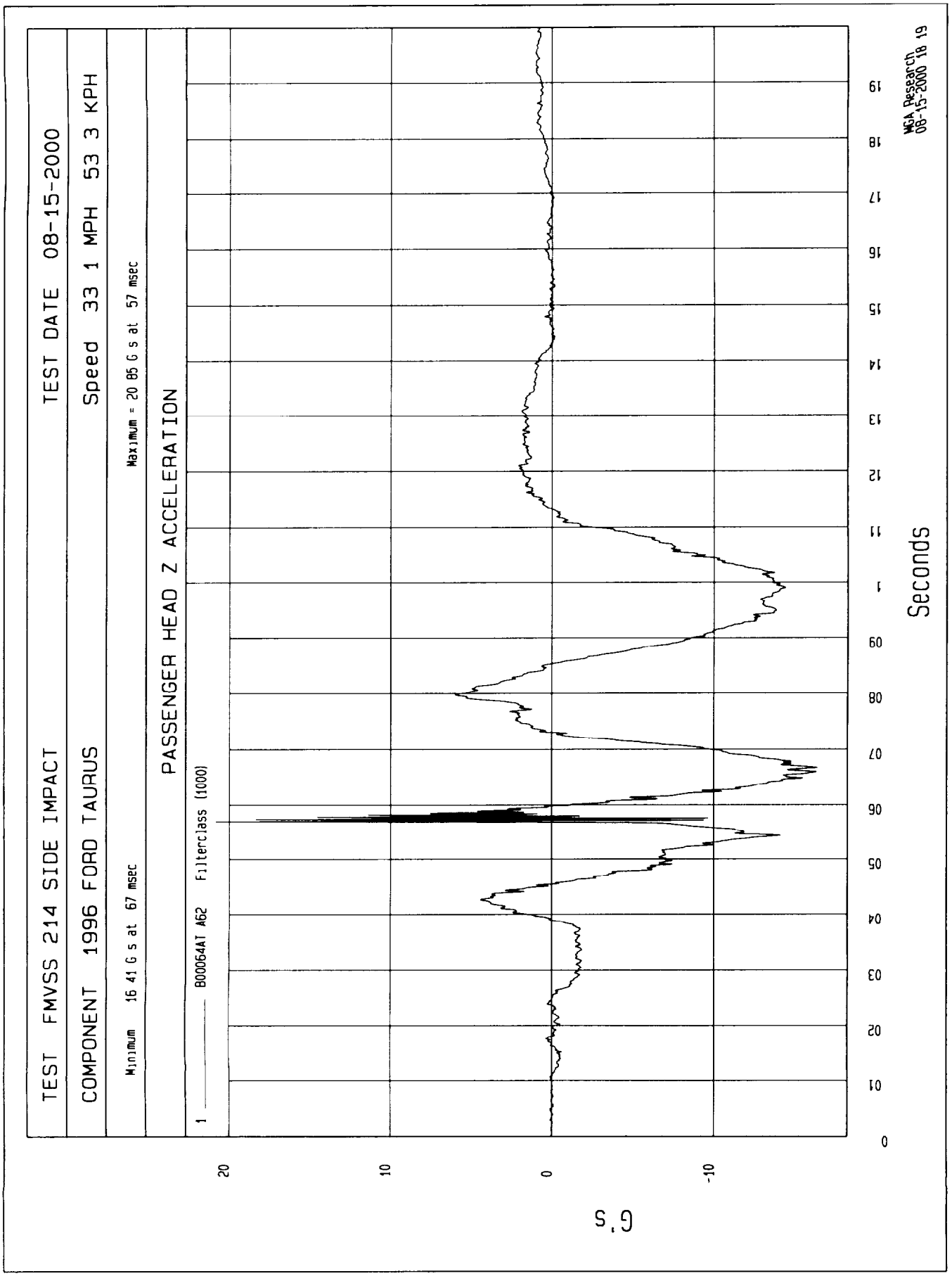

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -17 57 N at 105 msec
Maximum = 584 09 N at 31 msec
DRIVER ABDOMEN REAR FORCE
1 B00064FF F43 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 12

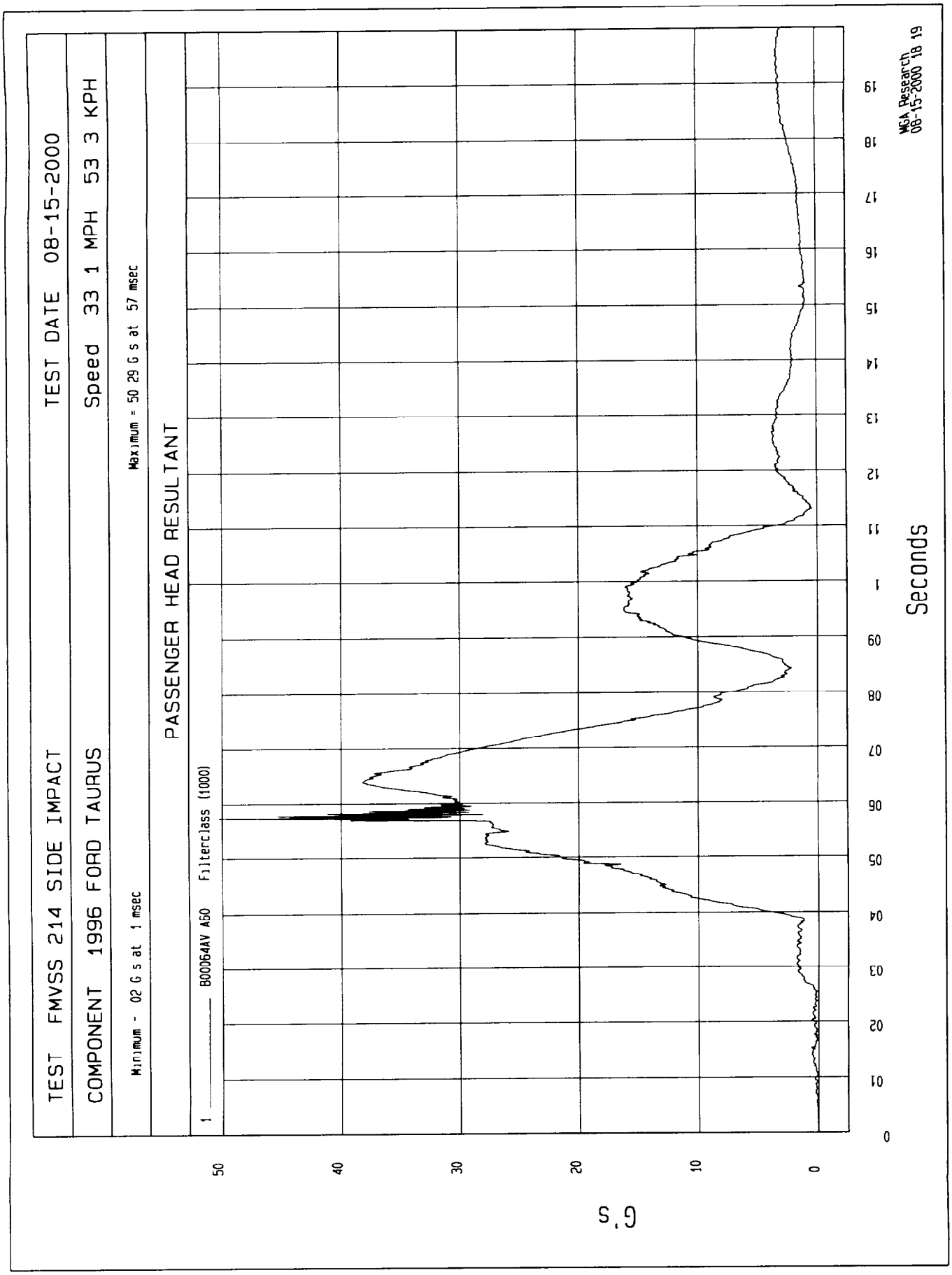

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 4 43 N at 15 msec
Maximum 1551 06 N at 48 msec
DRIVER SUMMED ABDOMEN FORCE
1 B00064FU F41 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 12

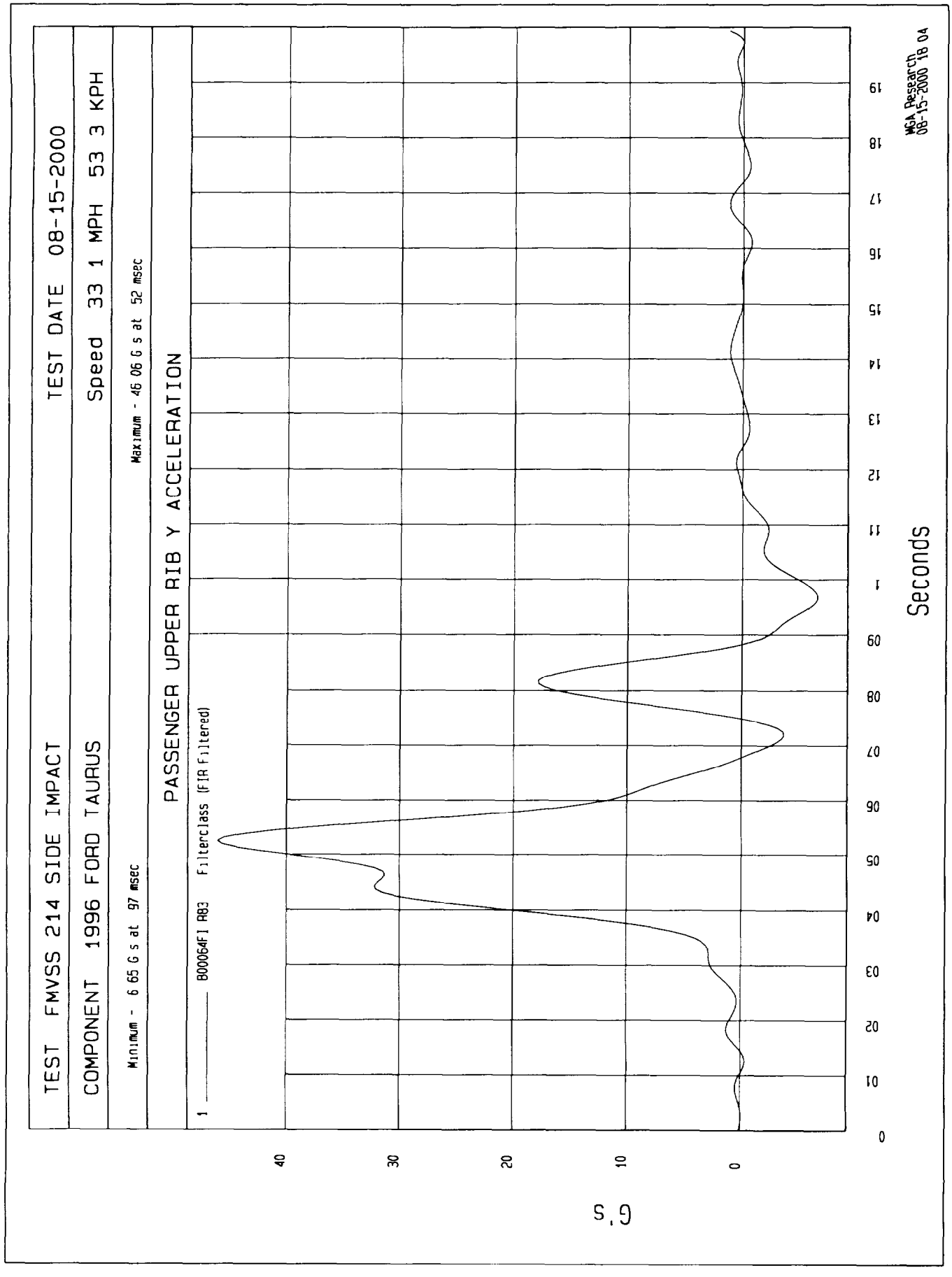

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -926 93 N at 34 msec
Maximum = 207 82 N at 123 msec
DRIVER PUBIC SYMPHYSIS FORCE
1 B00064FF F44 Filterclass (600)
200
0
-200
-400
-600
800
N
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 18 12

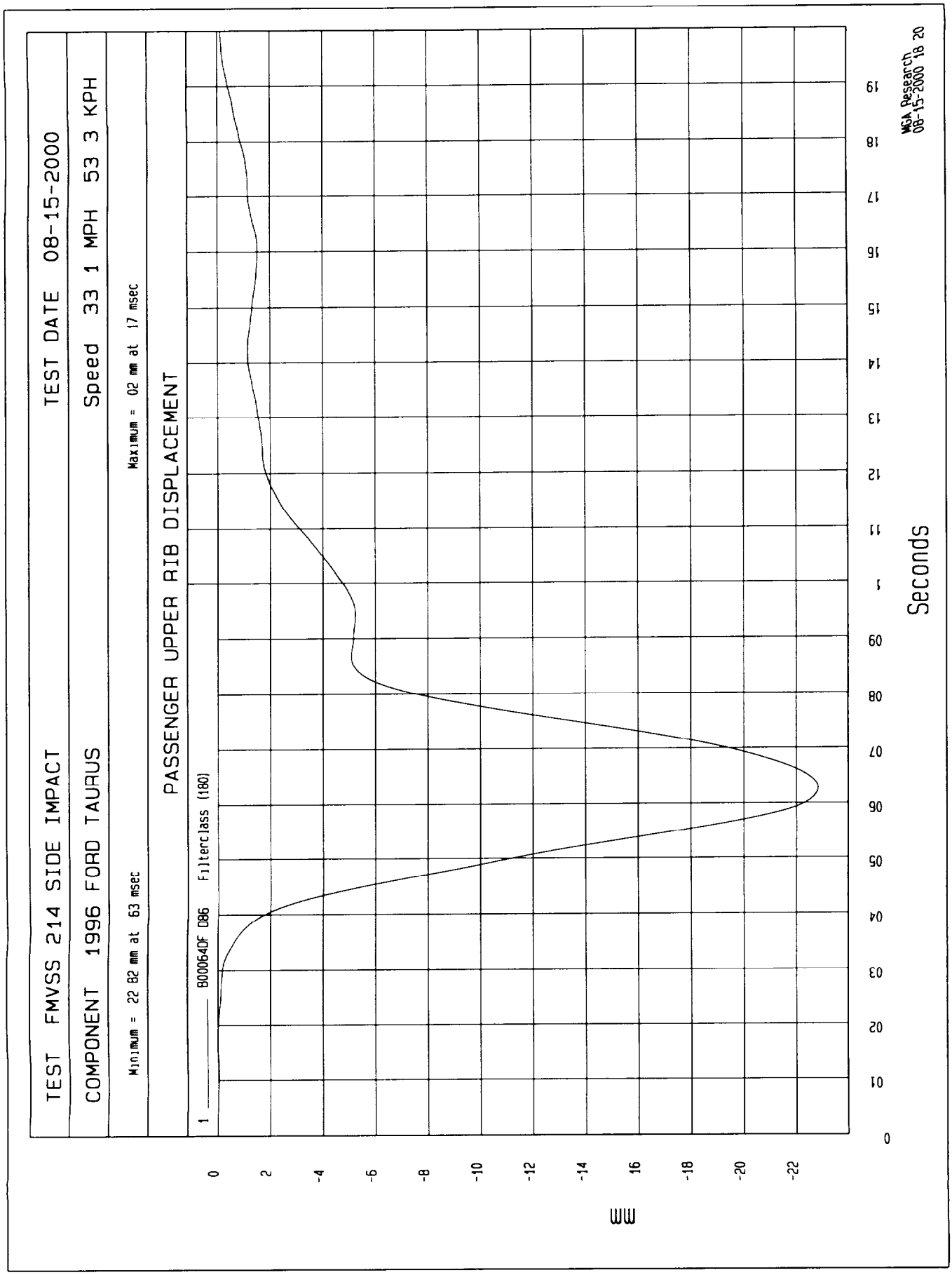

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -39 01 G s at 57 msec
Maximum = 5 61 G s at 103 msec
PASSENGER HEAD X ACCELERATION
1 B0006AAT A6C Filterclass (1000)
G's
0
10
-20
30
-40
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
MGA Research
08-15-2000 18 18

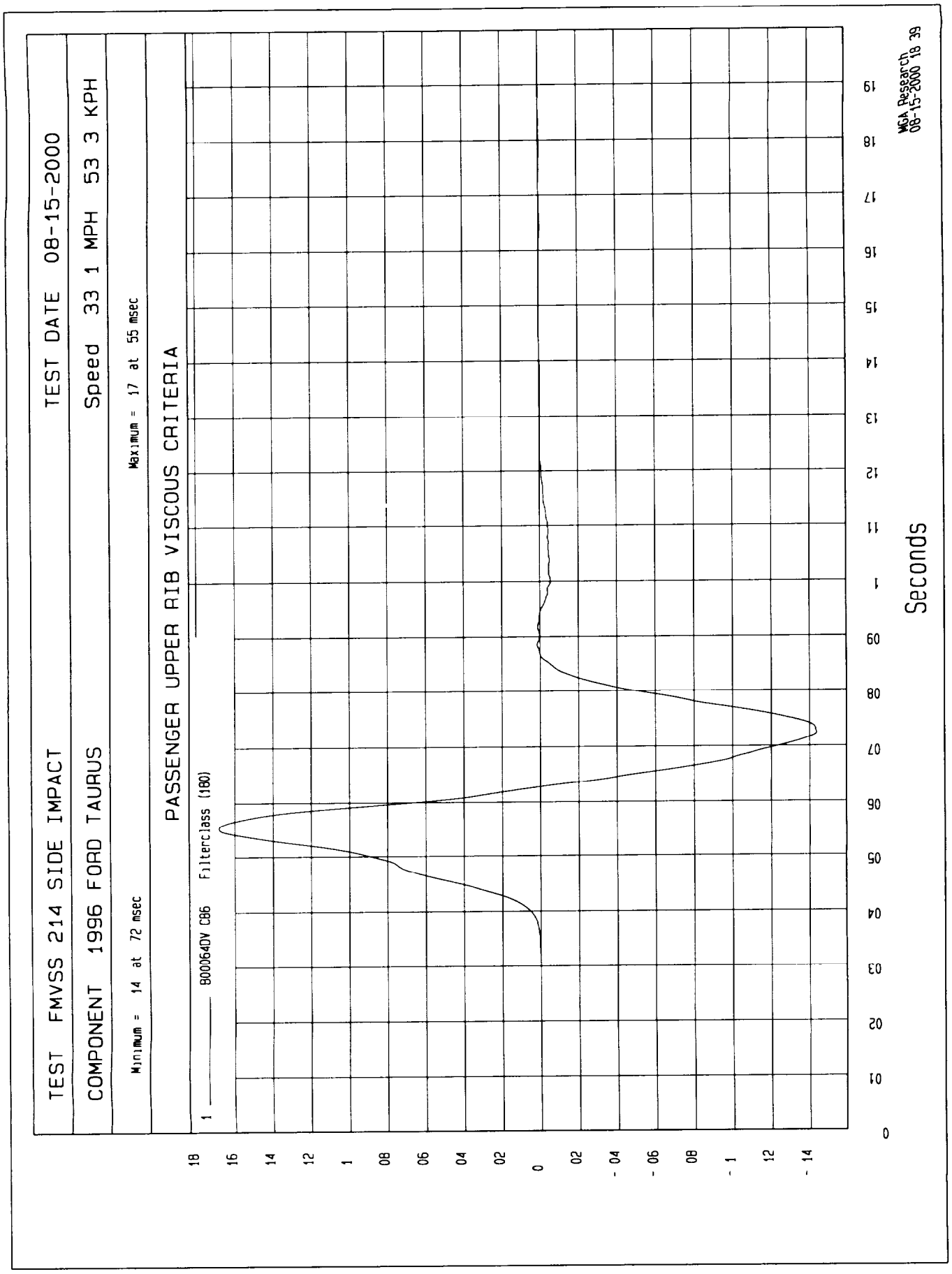

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 3 11 G s at 195 msec
Maximum = 32 55 G s at 57 msec
PASSENGER HEAD Y ACCELERATION
1 B00064AT A61 Filterclass (1000)
MGA Research
08-15-2000 18 19
G's
Seconds

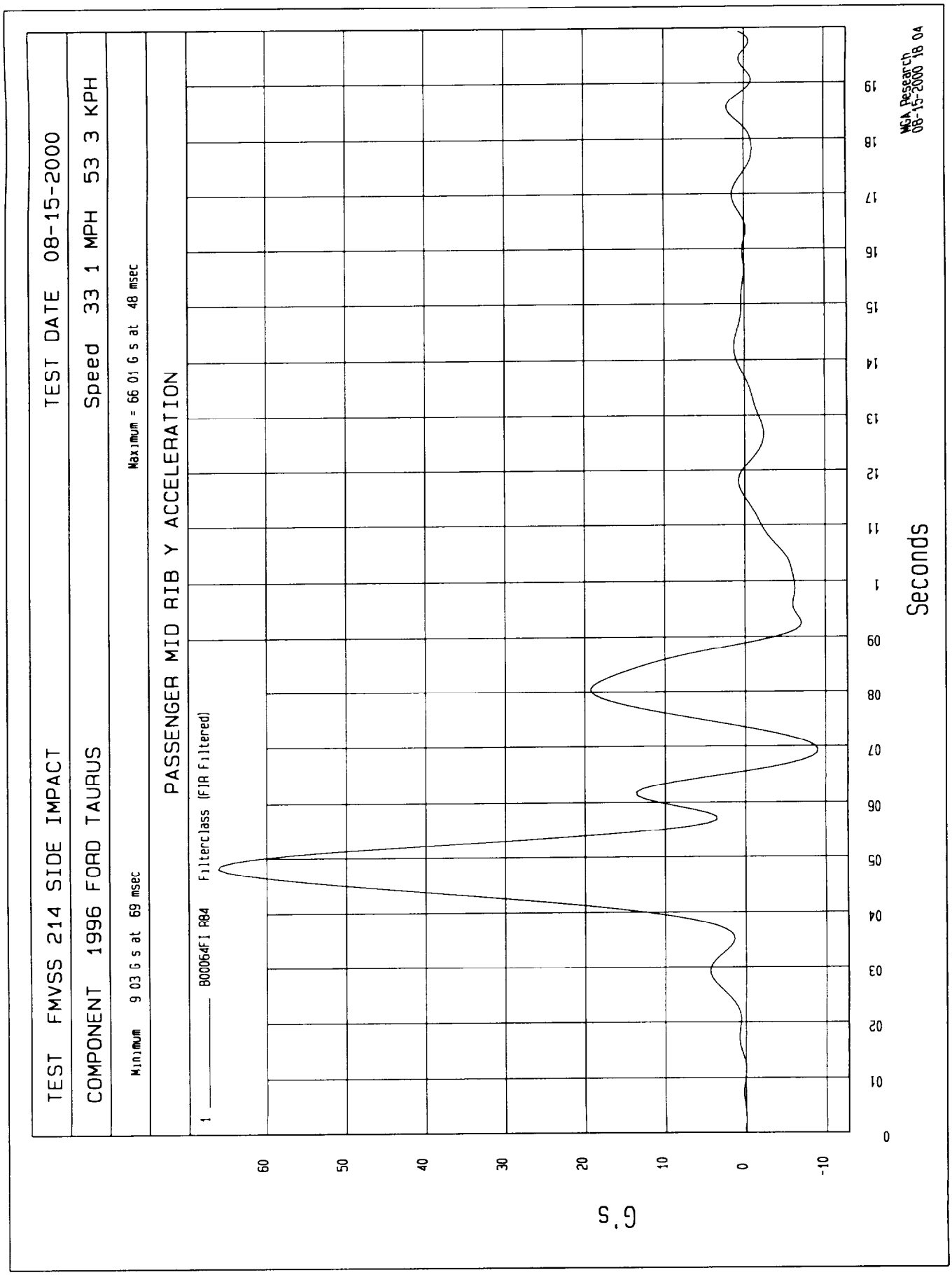

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 16 41 G s at 67 msec
Maximum = 20 85 G s at 57 msec
PASSENGER HEAD Z ACCELERATION
1 B00064AT A62 Filterclass (1000)
MGA Research
08-15-2000 18 19
G's
20
10
0
-10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

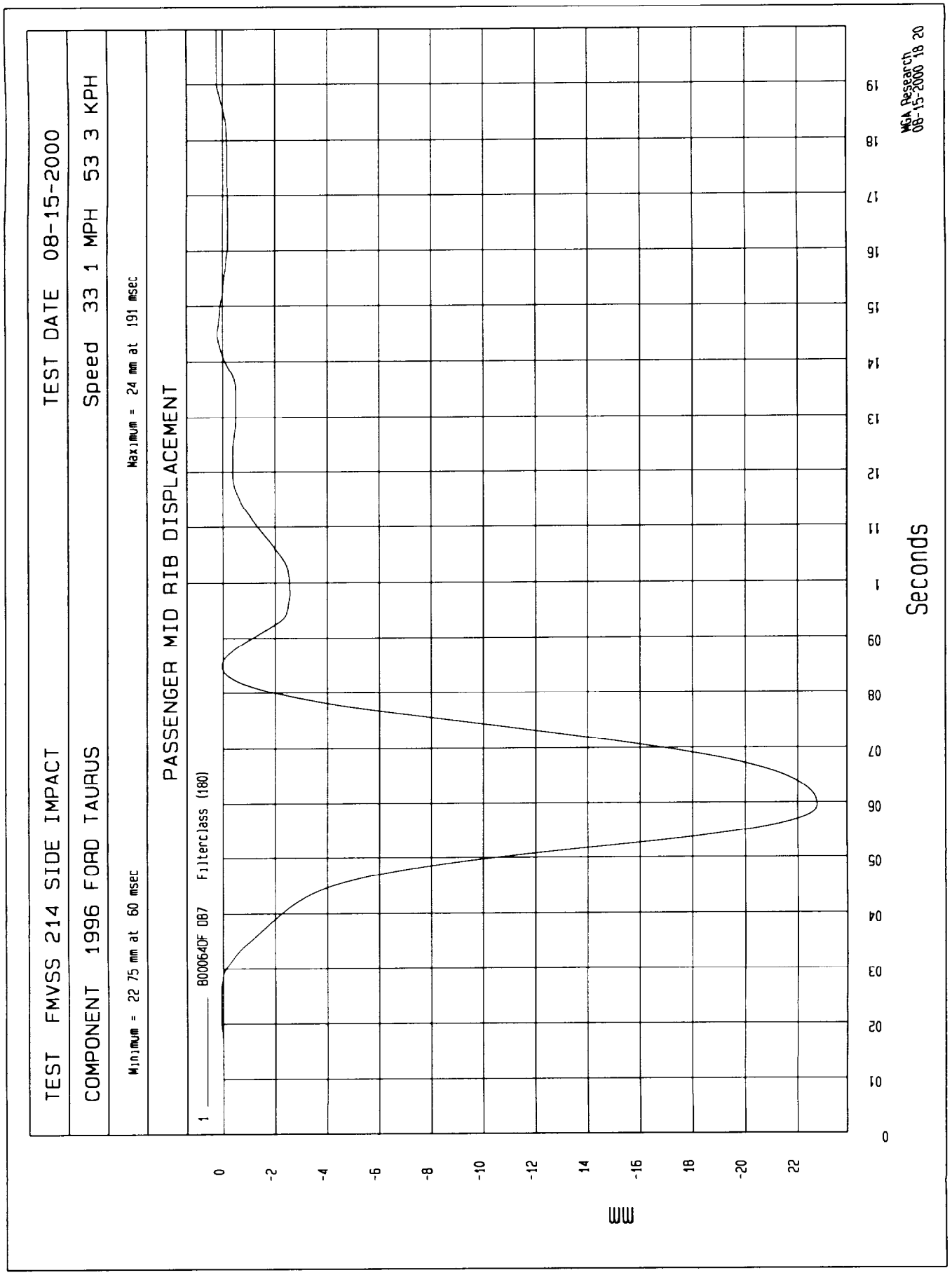

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 02 G s at 1 msec
Maximum = 50 29 G s at 57 msec
PASSENGER HEAD RESULTANT
1 B0006AAV A60 Filterclass (1000)
G's
Seconds
MGA Research
08-15-2000 18 19

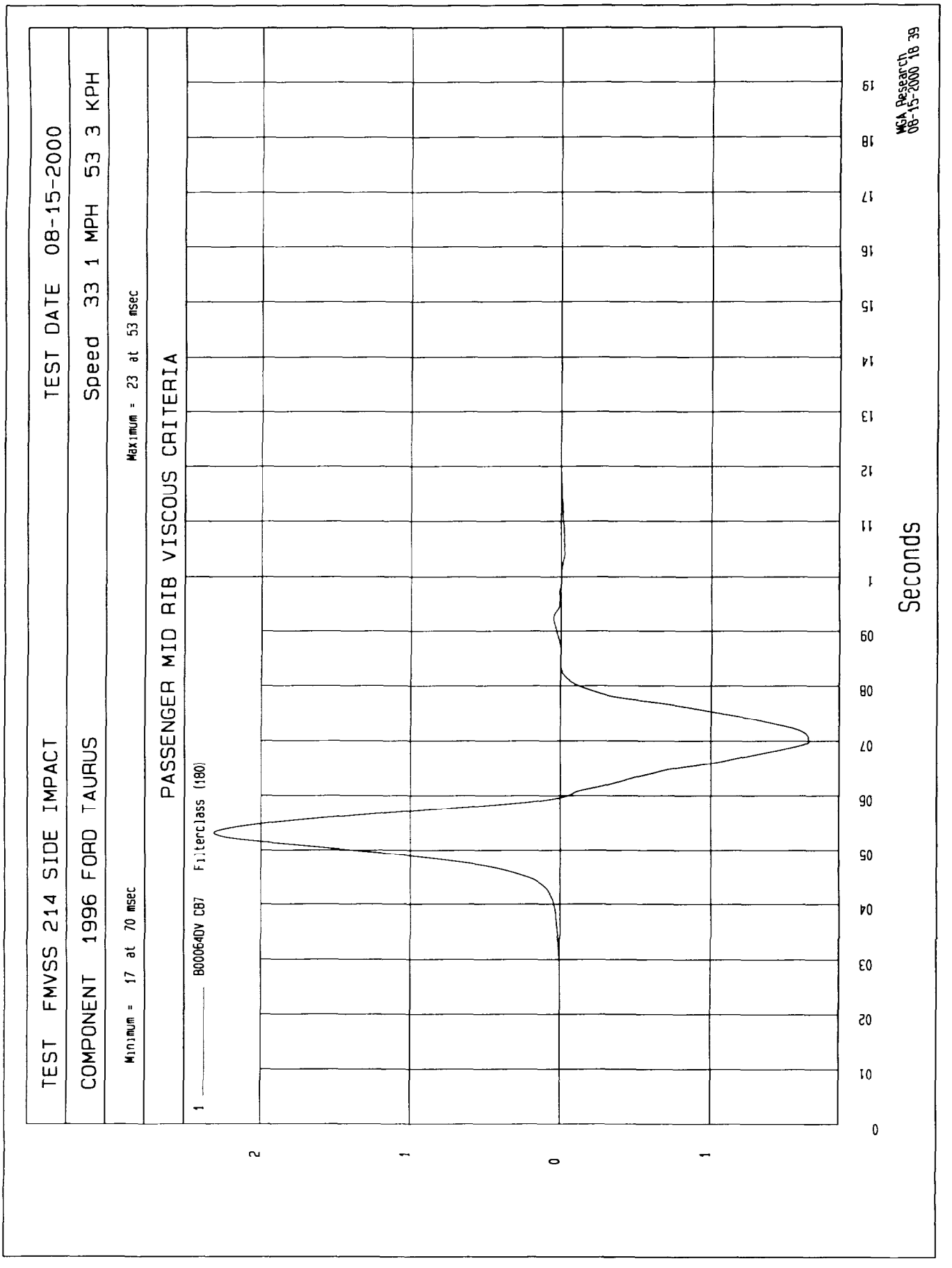

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 6 65 G s at 97 msec
Maximum - 46 06 G s at 52 msec
PASSENGER UPPER RIB Y ACCELERATION
1 B00064FI RB3 Filterclass (FIR Filtered)
MGA Research
08-15-2000 18 04
G's
40
30
20
10
0
Seconds
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

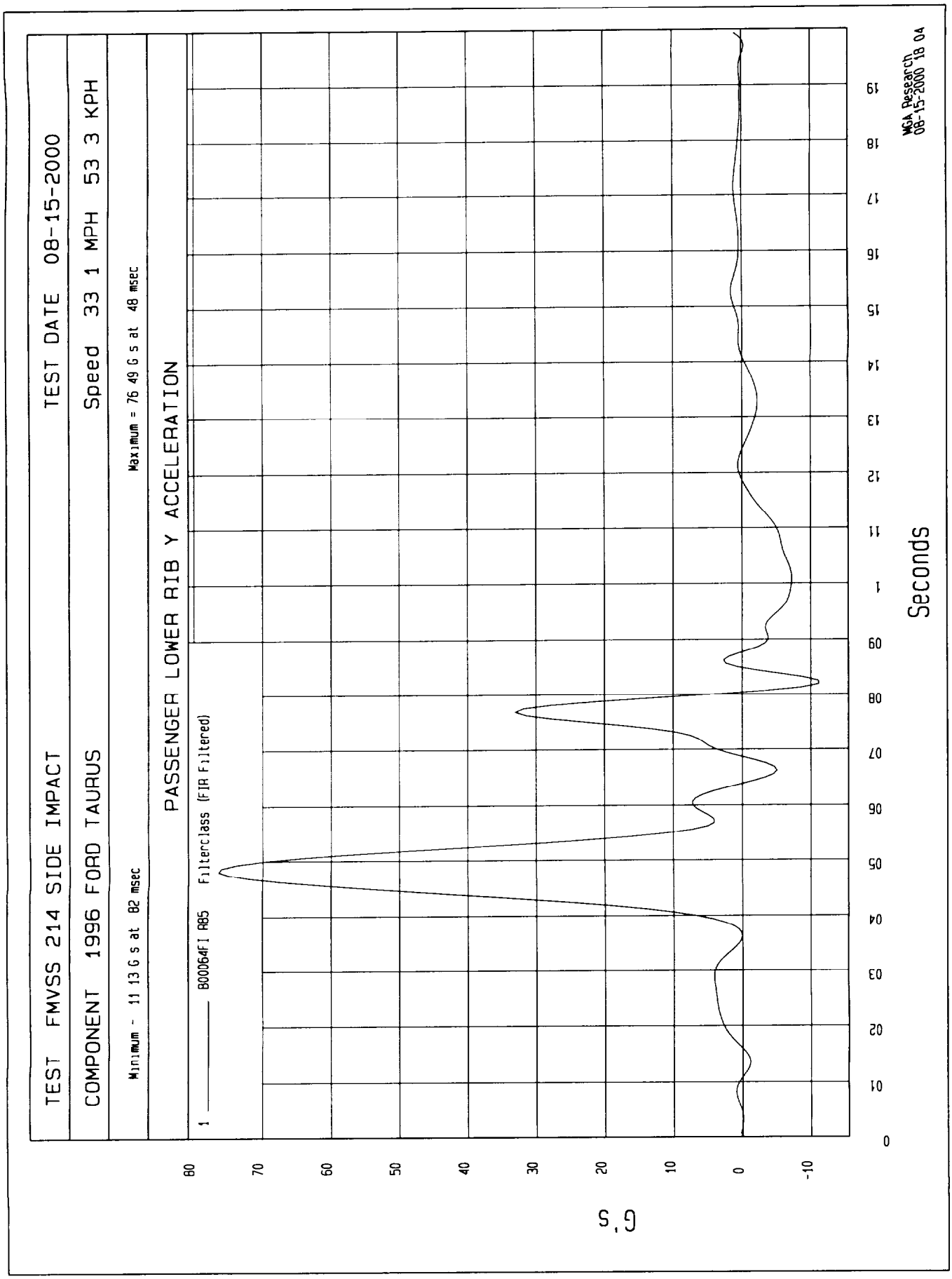

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 22 82 mm at 63 msec
Maximum = 02 mm at 17 msec
PASSENGER UPPER RIB DISPLACEMENT
1 B000640F 086 Filterclass (180)
mm
0
2
-4
-6
-8
-10
-12
-14
16
-18
-20
-22
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 18 20

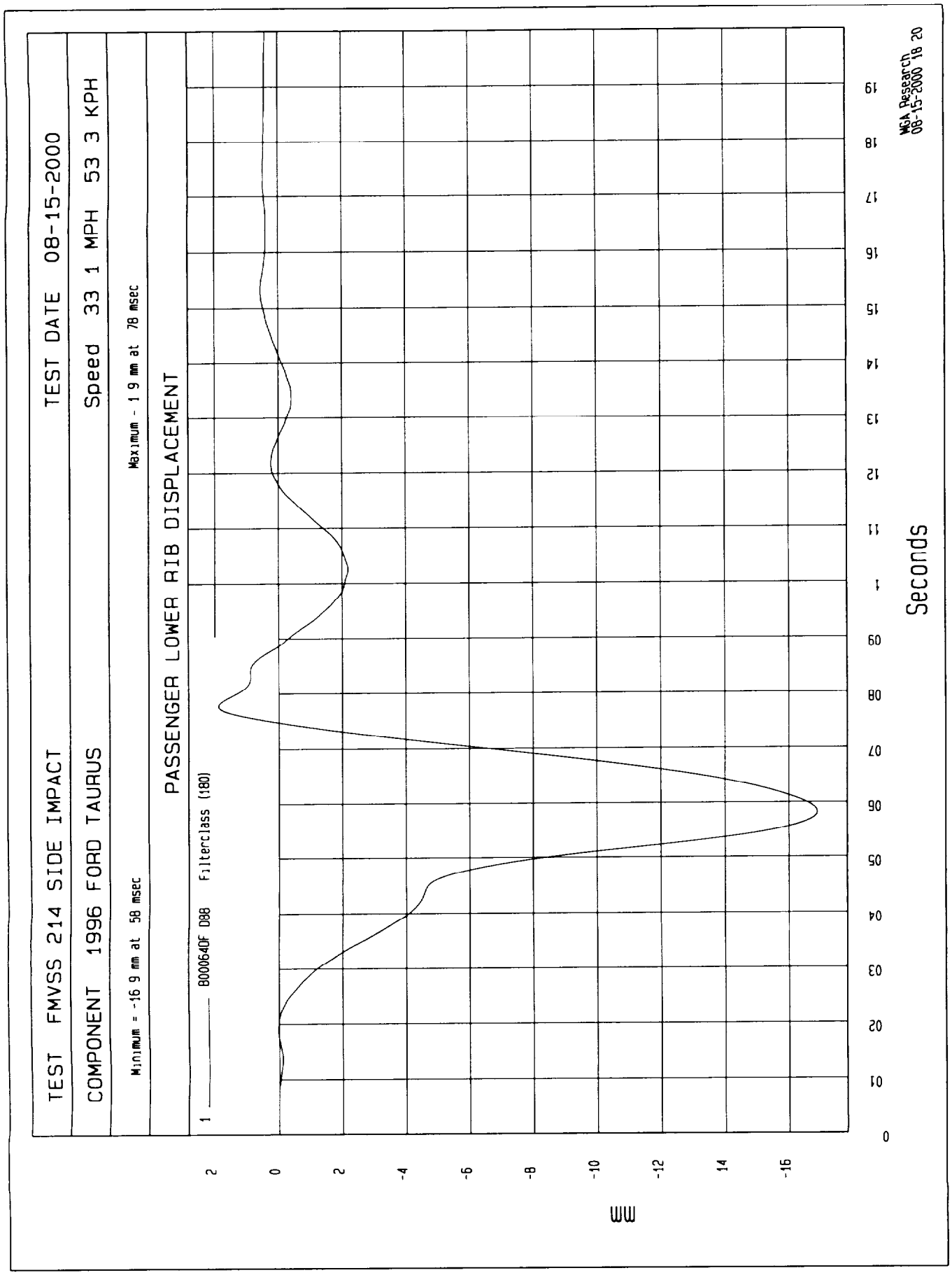

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 14 at 72 msec
Maximum = 17 at 55 msec
PASSENGER UPPER RIB VISCOUS CRITERIA
1 B00064DV CB6 Filterclass (180)
MGA Research
08-15-2000 18 39
Seconds

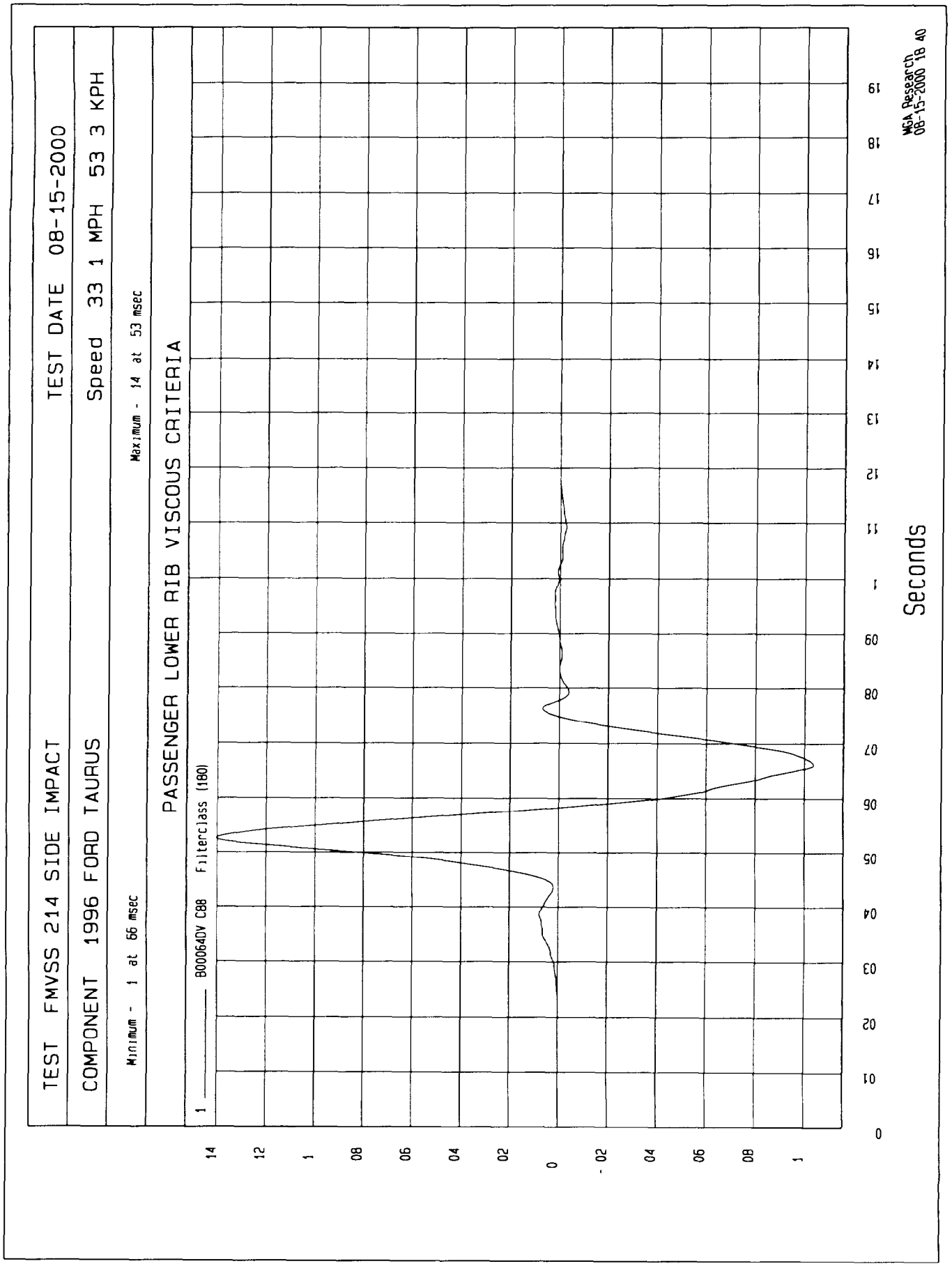

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 9 03 G s at 69 msec
Maximum = 66 01 G s at 48 msec
PASSENGER MID RIB Y ACCELERATION
1 B00064F1 R84 Filterclass (FIR Filtered)
MGA Research
08-15-2000 18 04
G's
60
50
40
30
20
10
0
-10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

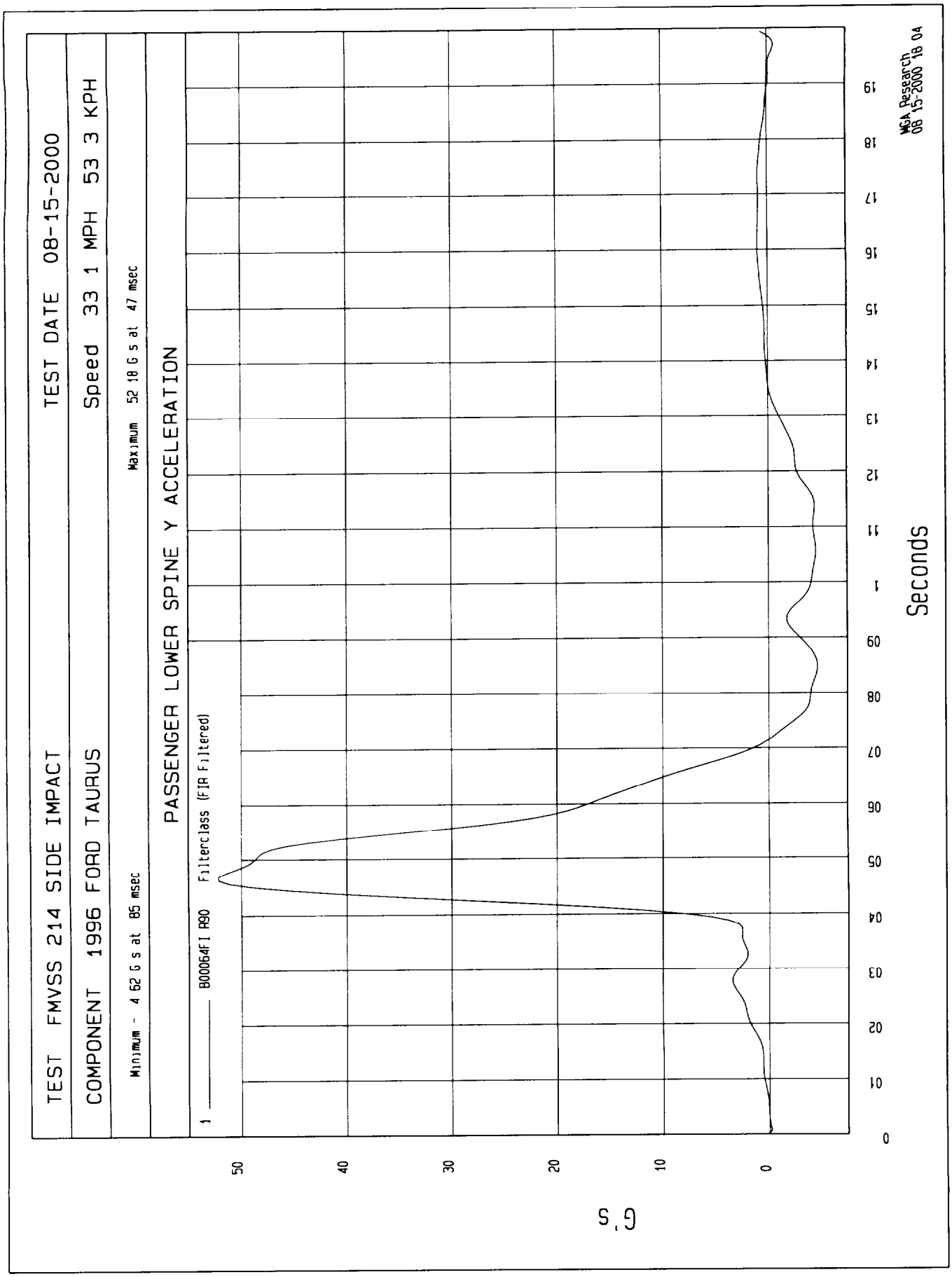

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 22 75 mm at 60 msec
Maximum = 24 mm at 191 msec
PASSENGER MID RIB DISPLACEMENT
1 B000640F 087 Filterclass (180)
MGA Research
08-15-2000 18 20
mm
Seconds
0
-2
-4
-6
-8
-10
-12
14
-16
18
-20
22
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

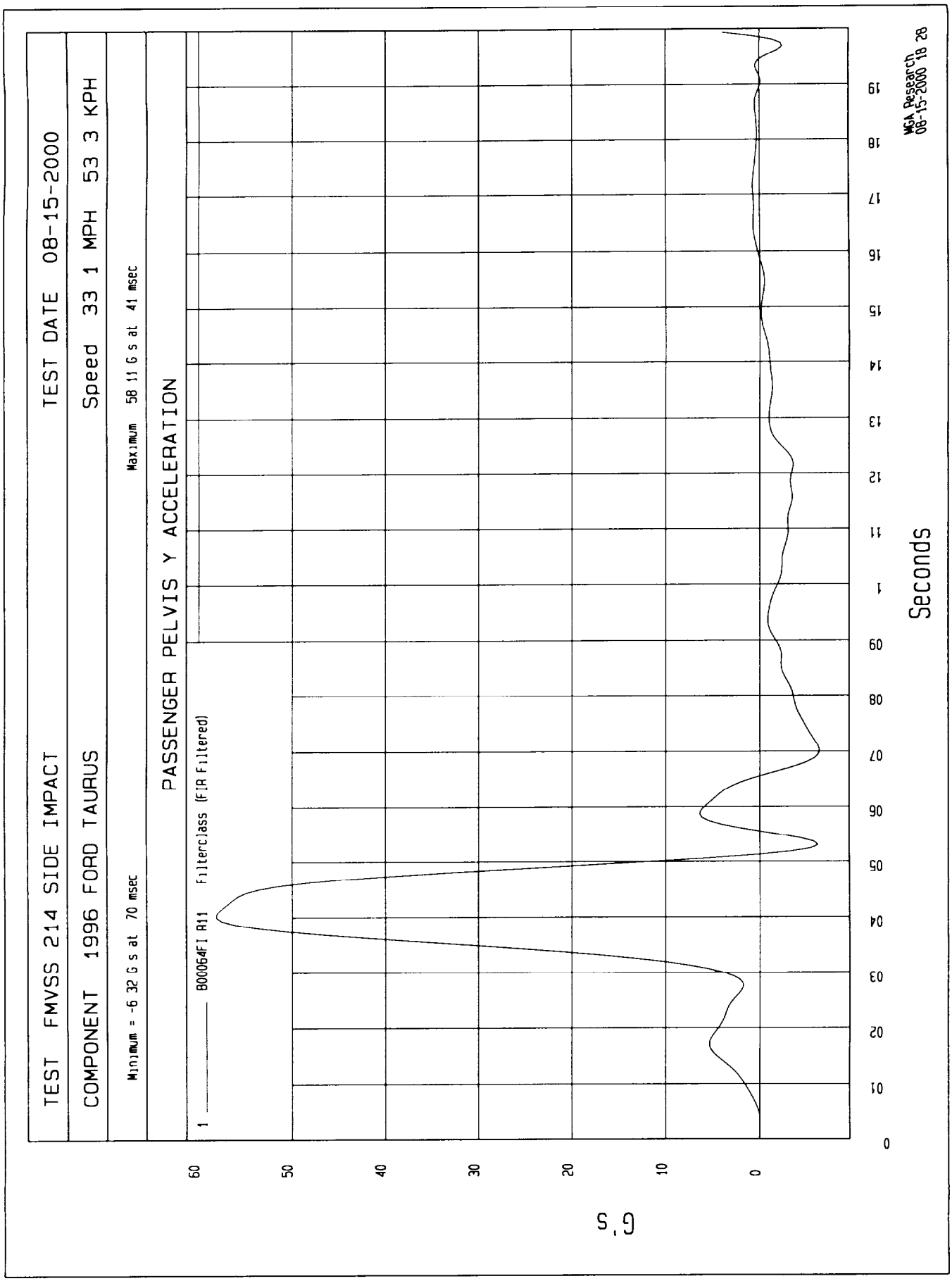

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 17 at 70 msec
Maximum = 23 at 53 msec
PASSENGER MID RIB VISCOUS CRITERIA
1 B0006DV CB7 Filterclass (180)
MGA Research
08-15-2000 18 39
Seconds
2
1
0
1
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

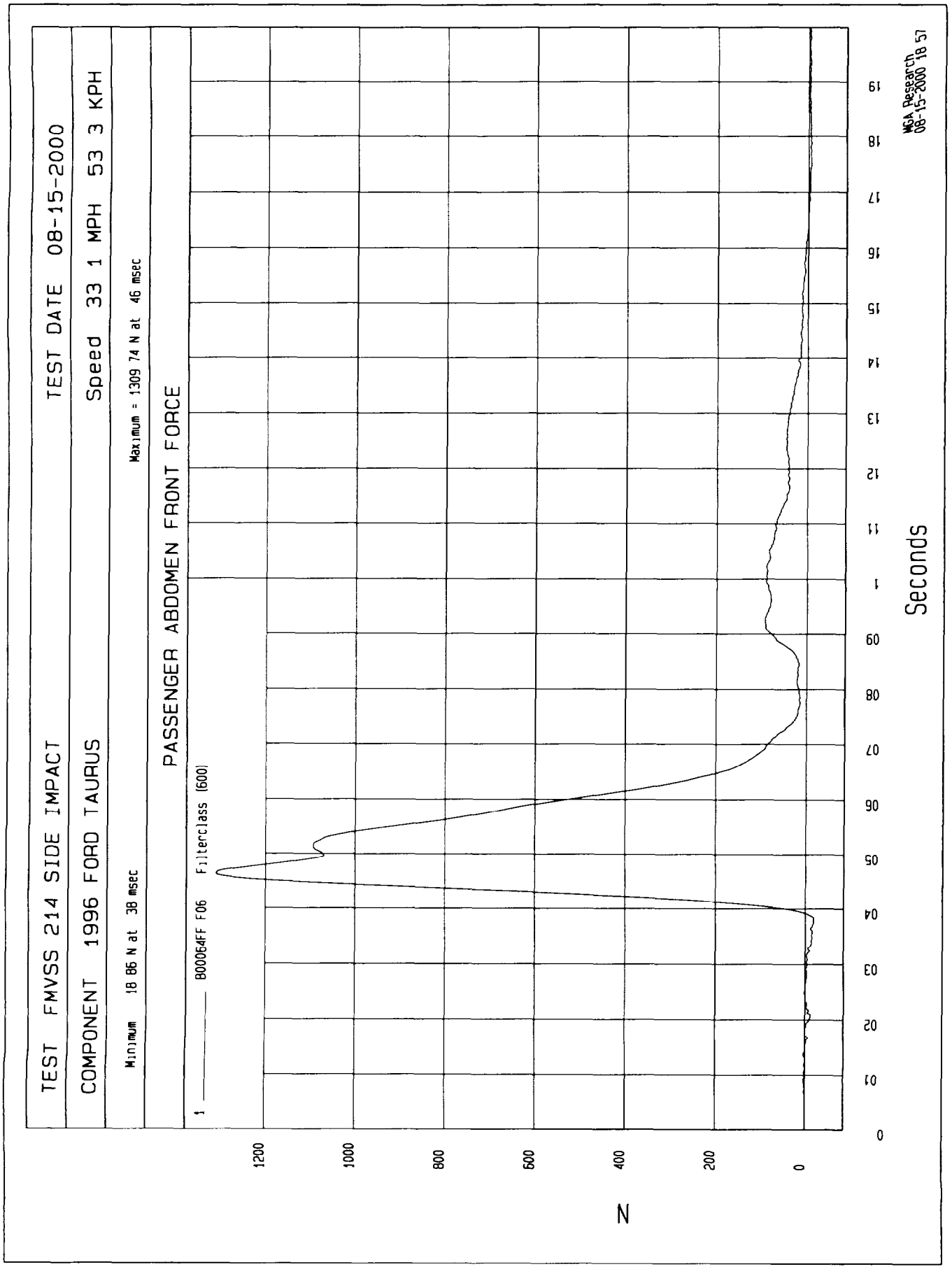

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 11 13 G s at 82 msec
Maximum = 76 49 G s at 48 msec
PASSENGER LOWER RIB Y ACCELERATION
1 B00064FI RB5 Filterclass (FIR Filtered)
MGA Research
08-15-2000 18 04
G's
Seconds
80
70
60
50
40
30
20
10
0
-10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19

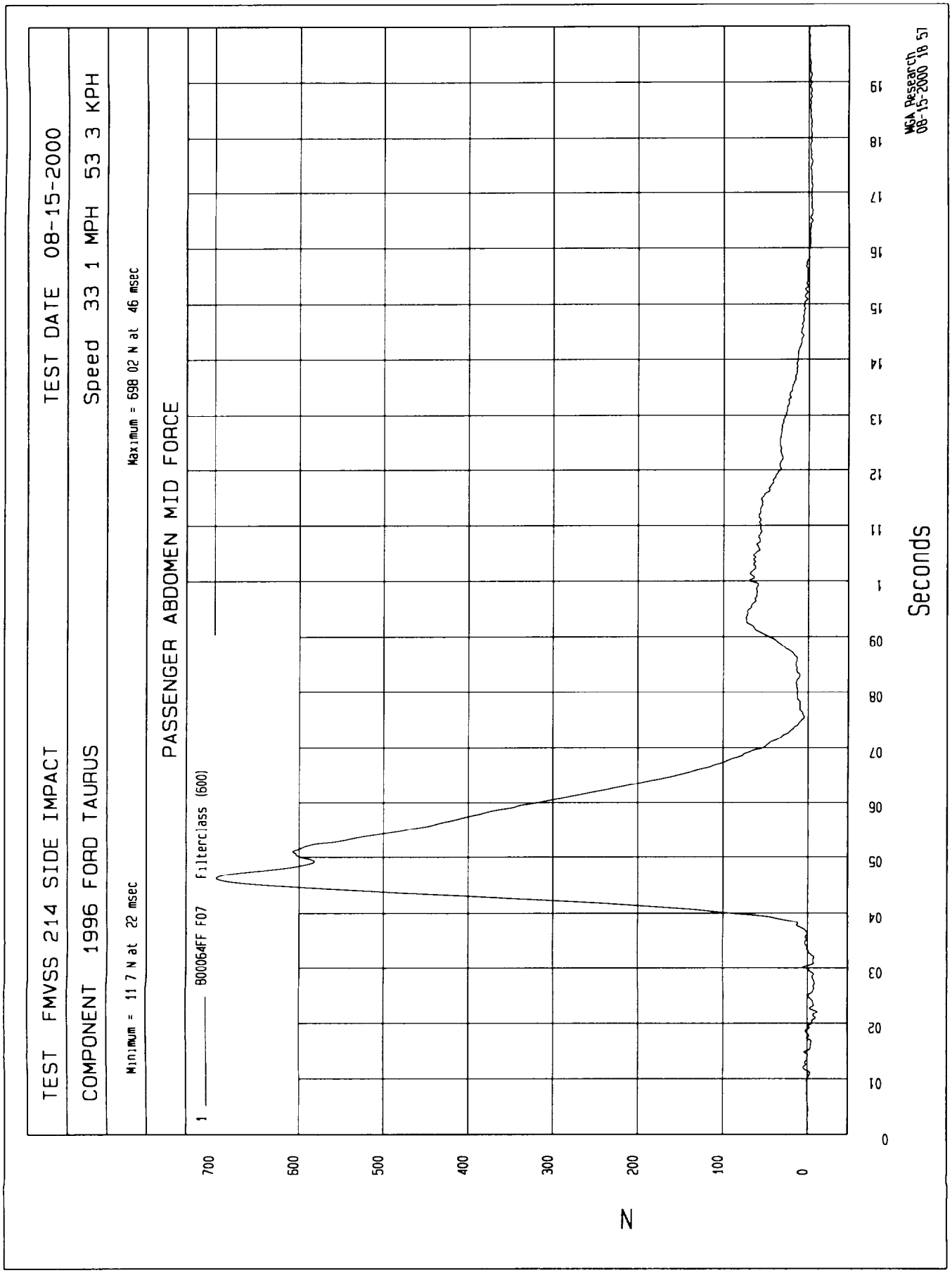

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -16 9 mm at 58 msec
Maximum = 1 9 mm at 78 msec
PASSENGER LOWER RIB DISPLACEMENT
1 B000640F D88 Filterclass (180)
mm
Seconds
MGA Research
08-15-2000 18 20

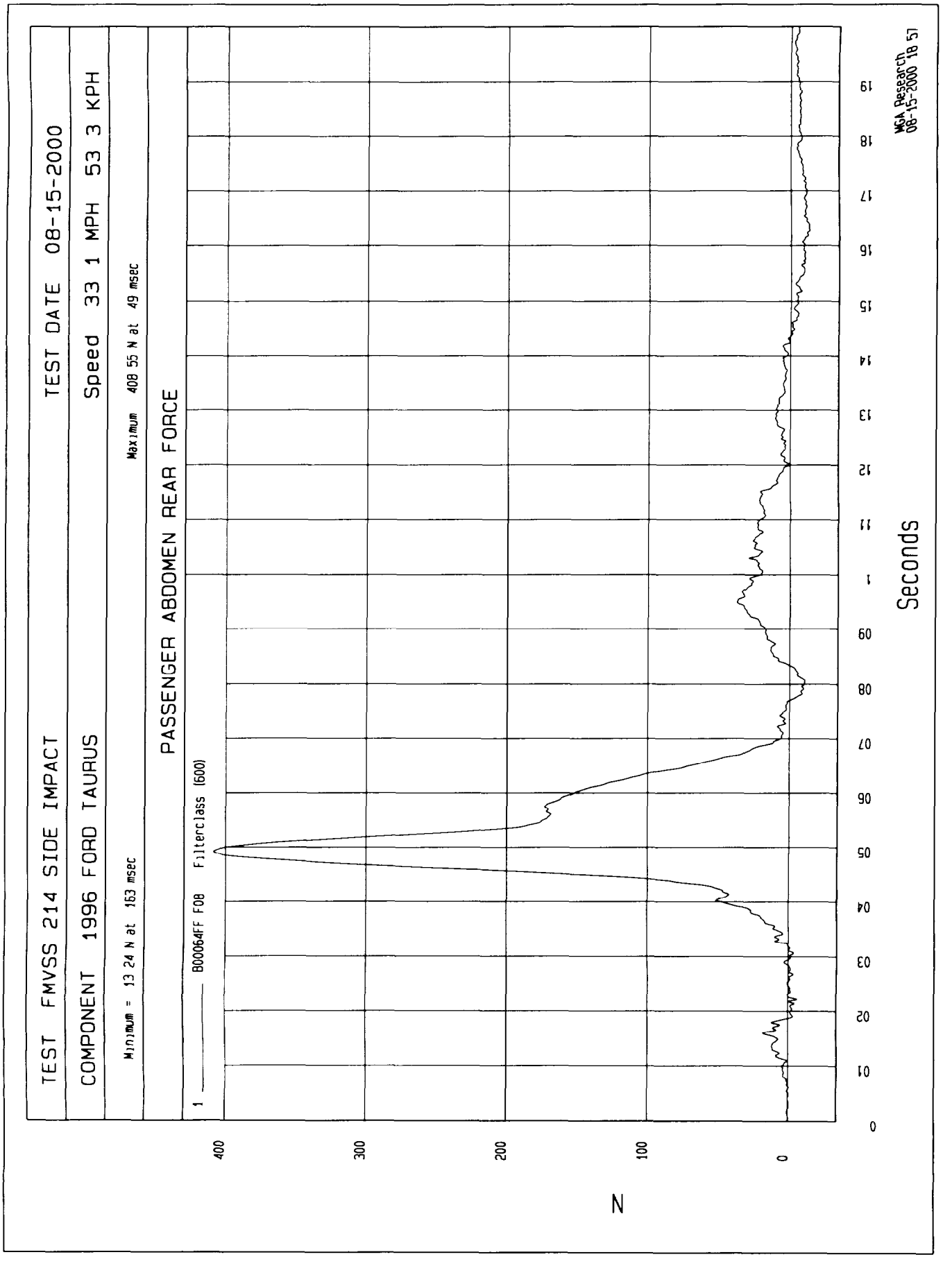

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 1 at 66 msec
Maximum - 14 at 53 msec
PASSENGER LOWER RIB VISCOUS CRITERIA
1 B000640V C88 Filterclass (180)
14
12
1
08
06
04
02
0
- 02
04
06
08
1
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds
MGA Research
08-15-2000 18 40

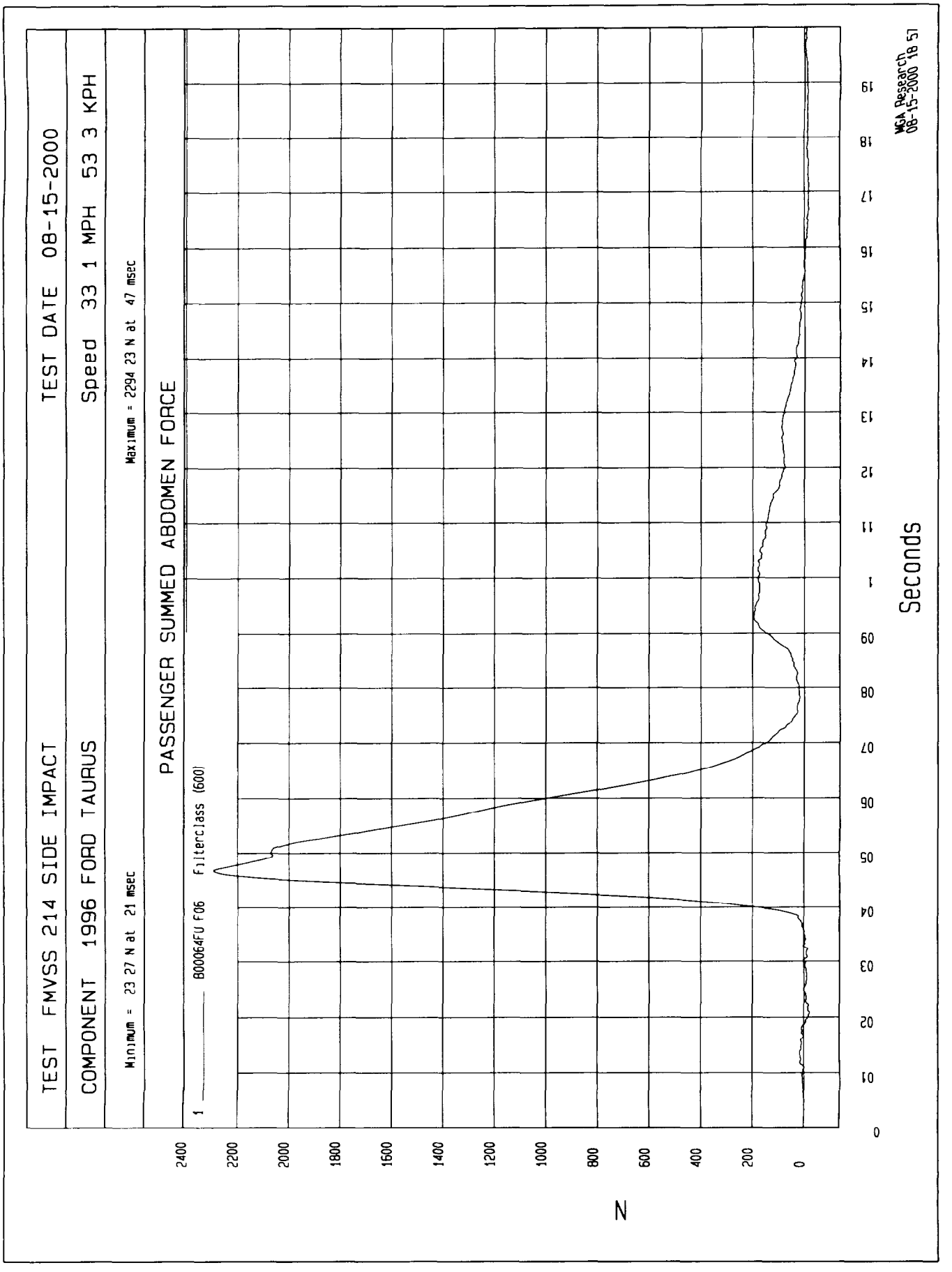

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum - 4 62 G s at 85 msec
Maximum 52 18 G s at 47 msec
PASSENGER LOWER SPINE Y ACCELERATION
1 B00064FI A90 Filterclass (FIR Filtered)
MGA Research
08 15-2000 18 04
G's
50
40
30
20
10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
Seconds

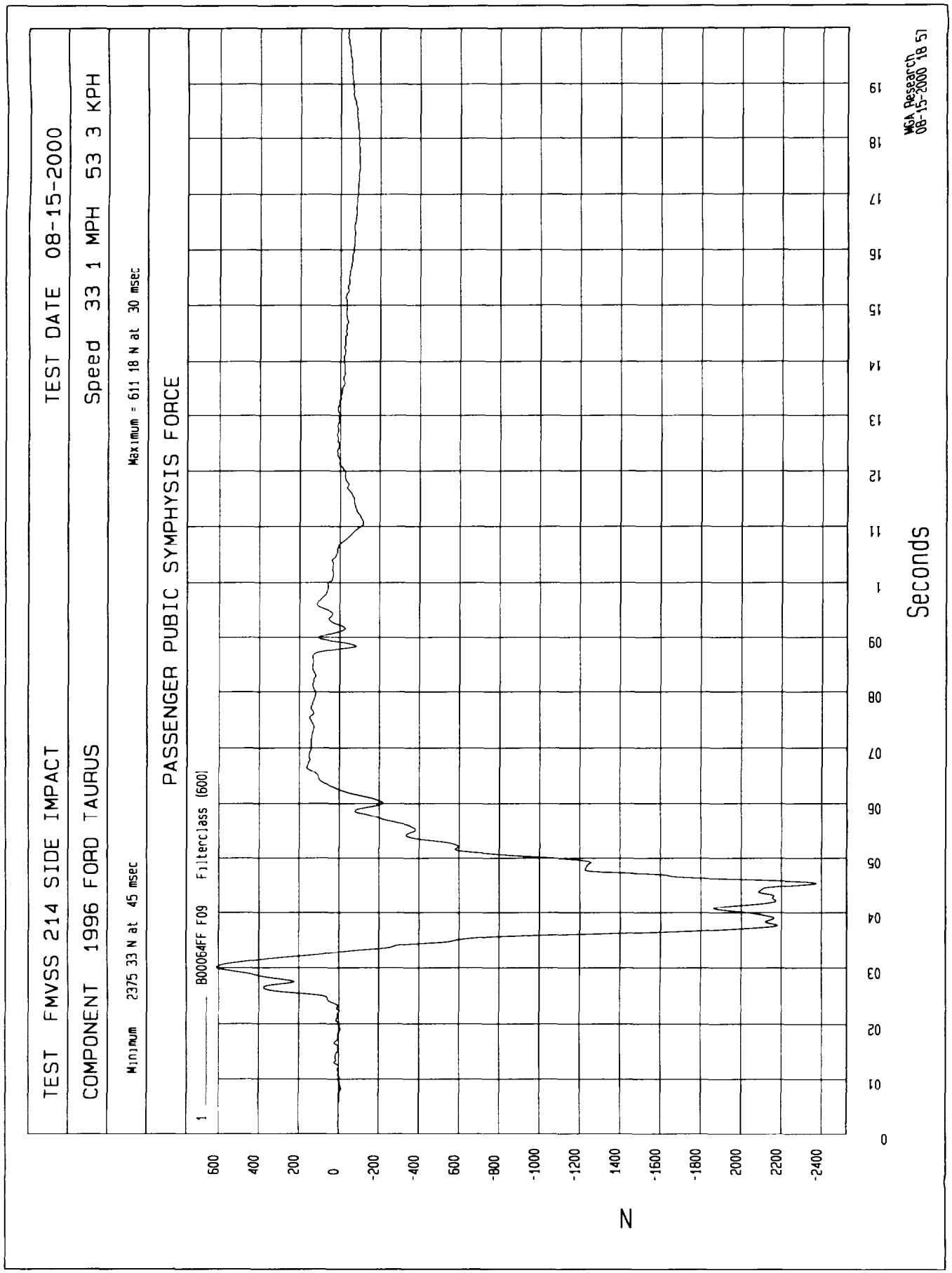

TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = -6 32 G s at 70 msec
Maximum 58 11 G s at 41 msec
PASSENGER PELVIS Y ACCELERATION
1 B00064FI R11 Filterclass (FIR Filtered)
MGA Research
08-15-2000 18 28
G's
Seconds
60
50
40
30
20
10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 18 86 N at 38 msec
Maximum = 1309 74 N at 46 msec
PASSENGER ABDOMEN FRONT FORCE
1 B00064FF F06 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 57


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 11 7 N at 22 msec
Maximum = 698 02 N at 46 msec
PASSENGER ABDOMEN MID FORCE
1 B00064FF F07 Filterclass (600)
N
Seconds
WSA Research
08-15-2000 18 57


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 13 24 N at 163 msec
Maximum 408 55 N at 49 msec
PASSENGER ABDOMEN REAR FORCE
1 B00064FF F08 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 57


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum = 23 27 N at 21 msec
Maximum = 2294 23 N at 47 msec
PASSENGER SUMMED ABDOMEN FORCE
1 B00064FU F06 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 57


TEST FMVSS 214 SIDE IMPACT
TEST DATE 08-15-2000
COMPONENT 1996 FORD TAURUS
Speed 33 1 MPH 53 3 KPH
Minimum 2375 33 N at 45 msec
Maximum = 611 18 N at 30 msec
PASSENGER PUBIC SYMPHYSIS FORCE
1 B00064FF F09 Filterclass (600)
N
Seconds
MGA Research
08-15-2000 18 57

APPENDIX C – ES-2 CONFIGURATION AND PERFORMANCE VERIFICATION

CERTIFICATION DATA

Dummy Serial Number ES2-001

Calibration Test Results Summary

Dummy Serial Number ES2-001

Pre-Test Calibration

External Dimensions	The dummy passed all external dimension requirements
Head Drop Test	The head passed all drop test requirements
Neck Pendulum Test	The neck passed all impact test requirements
Shoulder Impact Test	The shoulder passed all impact test requirements
Rib Tests	All ribs did not pass all impact test requirements
Abdomen Test	The abdomen passed all impact test requirements
Lumbar Spine Test	The lumbar spine passed all impact test requirements
Pelvis Test	The pelvis passed all impact test requirements

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HEAD DROP TEST

EUROSID 2 DUMMY

Date. August 14, 2000

Dummy Serial Number ES2-001

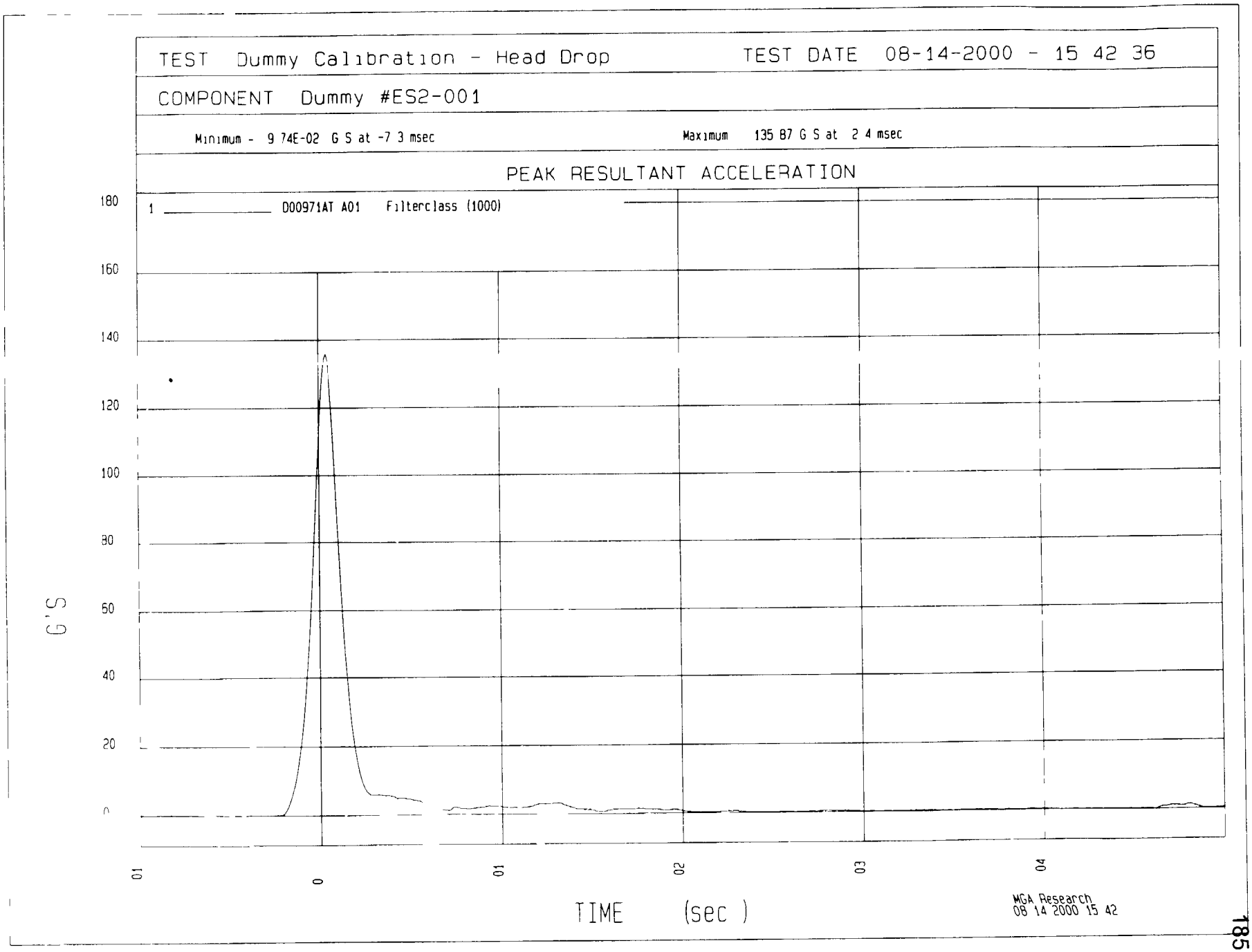
Test Number D00971

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Peak Resultant Acceleration	100 – 150 g's	136
Time of Max Res Acceleration		2 4 ms

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By David Winkelbauer


TEST Dummy Calibration - Head Drop
TEST DATE 08-14-2000 - 15 42 36
COMPONENT Dummy #ES2-001
Minimum - 9 74E-02 G S at -7 3 msec
Maximum 135 87 G S at 2 4 msec
PEAK RESULTANT ACCELERATION
1 D00971AT A01 Filterclass (1000)
180
160
140
120
100
80
60
40
20
0
G'S
01
0
01
02
03
04
TIME (sec)
MGA Research
08 14 2000 15 42

MGA RESEARCH CORPORATION

NECK PENDULUM TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-001

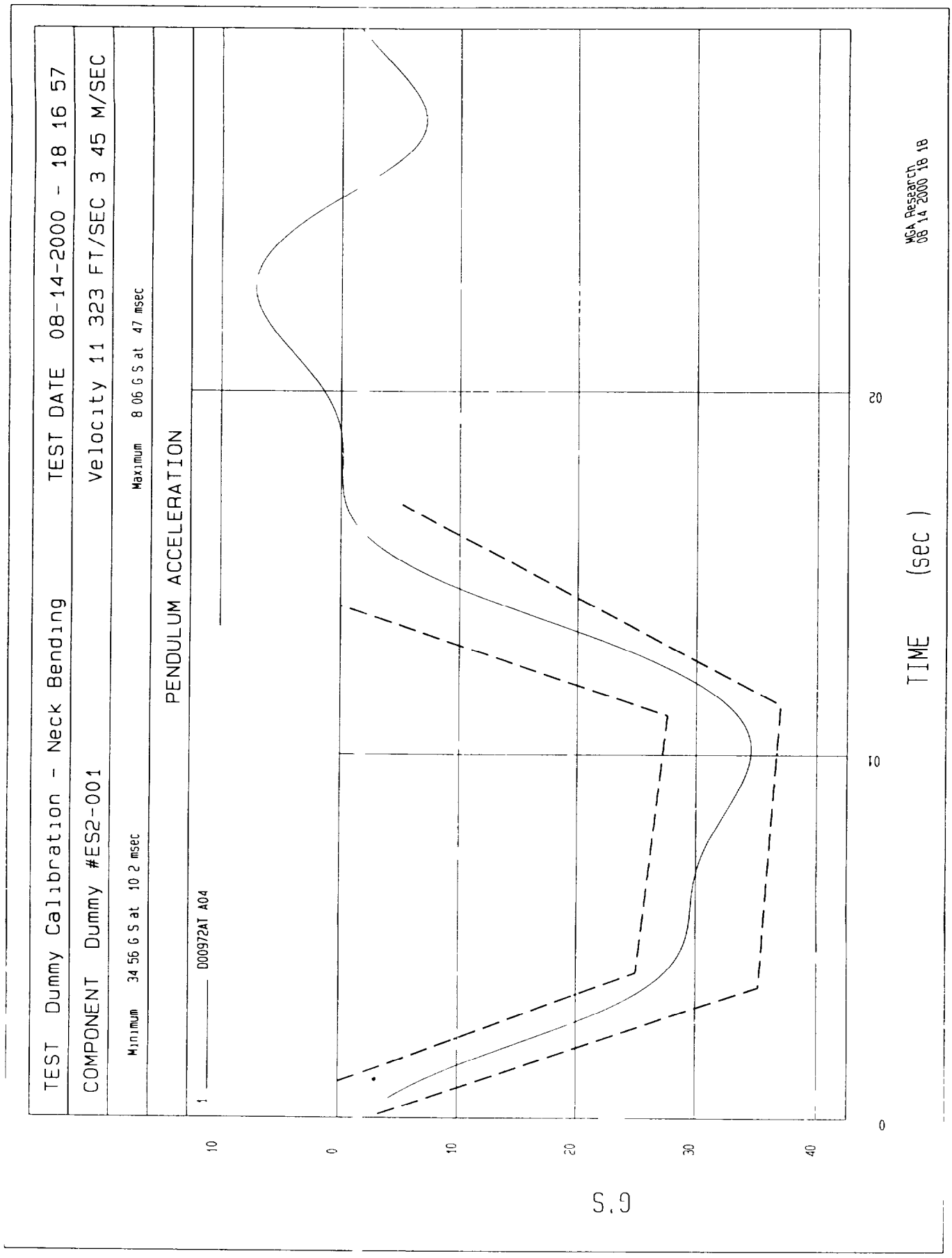
Test Number D00972

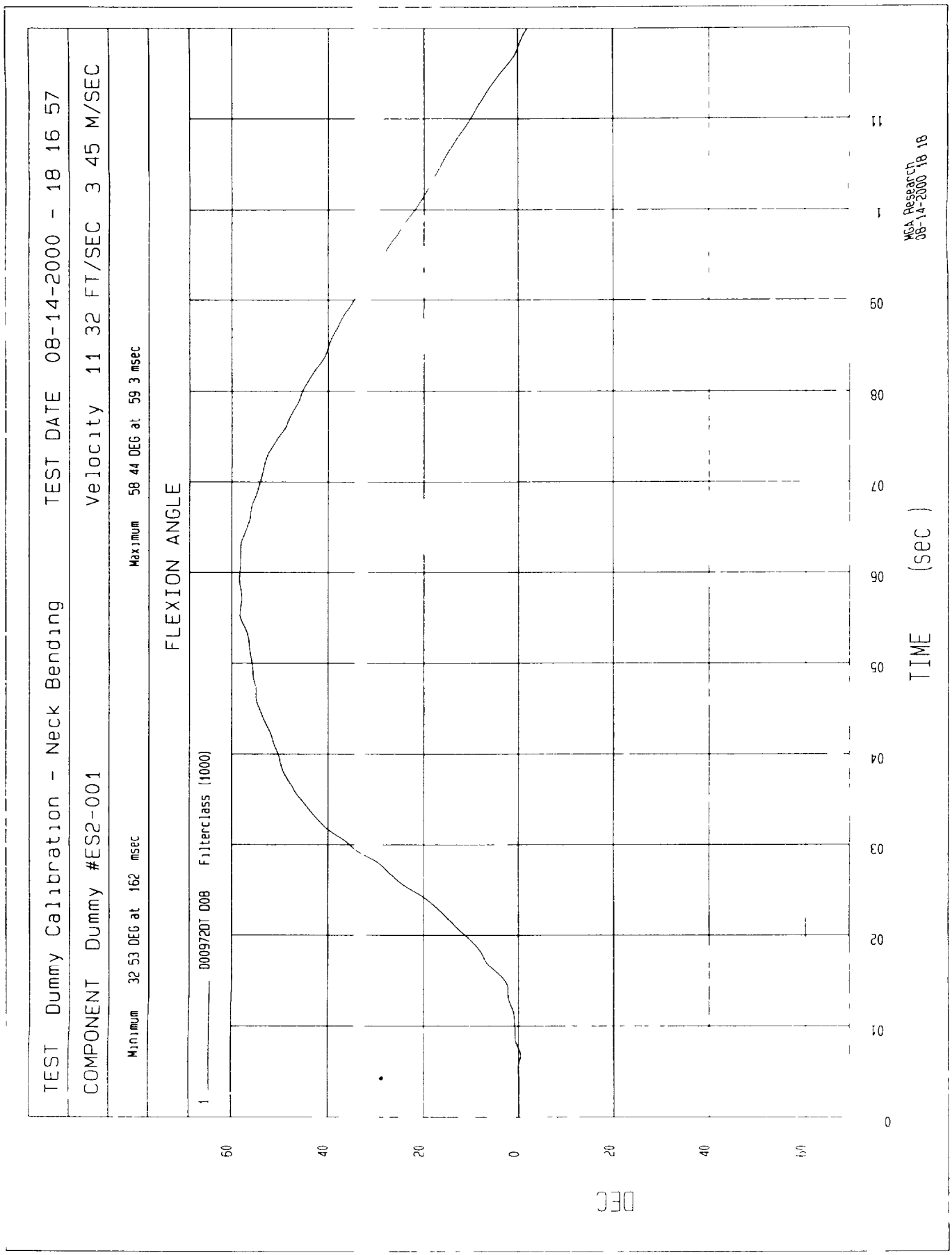
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	22
Relative Humidity (%)	10 – 70	54
Pendulum Speed	3 3 - 3 5	3 5
Max Pendulum Acceleration		-34 6 g's
Time Max Pendulum Acceleration		10 2 ms
Maximum Flexion Angle	51 0 – 59 0 deg	58.4
Time of Max Flexion Angle	53 0 – 65 0 ms	59.3
Maximum Angle Theta (A)	32 5 – 36.5 deg	35.1
Time of Max. Theta (A)	54 0 – 64.0 ms	60 3
Maximum Angle Theta (B)	28 0 – 32 0 deg	30 8
Time of Max Theta (B)	54 0 – 64.0 ms	59 2

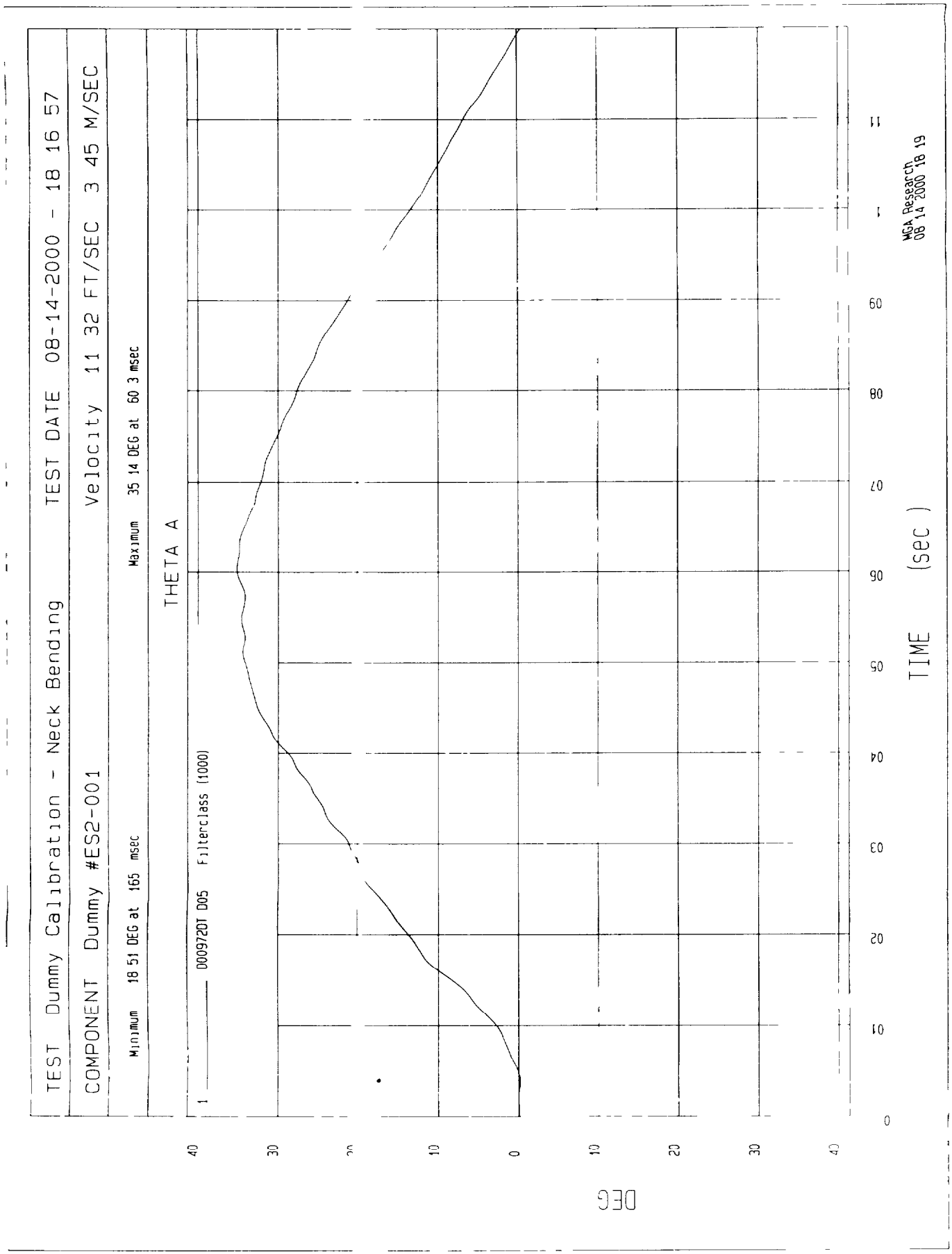
TEST MEETS SPECIFICATIONS

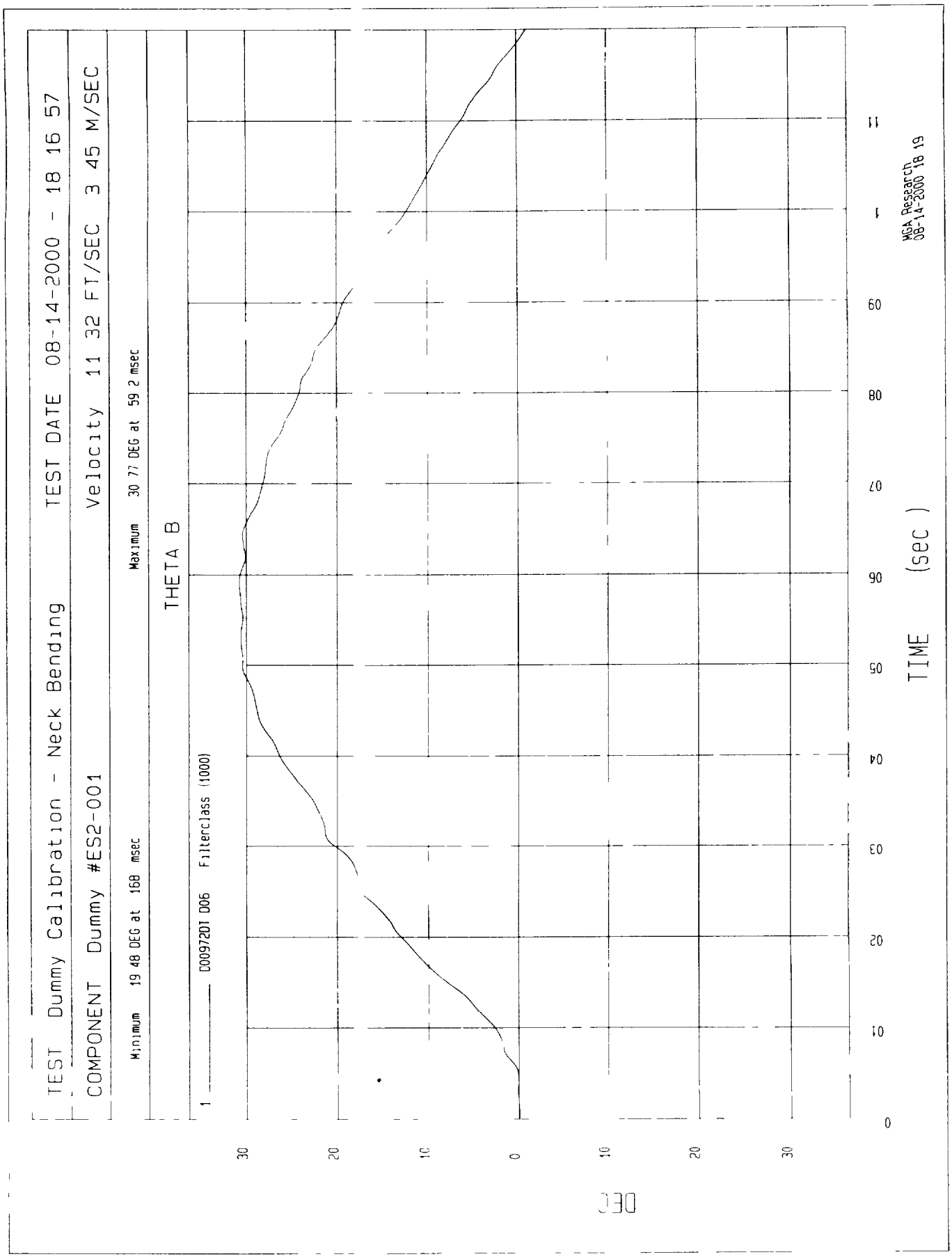
Technician _____

Approved By David Winkelbauer


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 16 57
COMPONENT Dummy #ES2-001
Velocity 11 323 FT/SEC 3 45 M/SEC
Minimum 34 56 G S at 10 2 msec
Maximum 8 06 G S at 47 msec
PENDULUM ACCELERATION
1 D00972AT A04
MGA Research
08 14 2000 18 18
TIME (sec)
10
0
10
20
30
40
0
10
20
G's


TEST Dummy Calibration - Neck Bending TEST DATE 08-14-2000 - 18 16 57
COMPONENT Dummy #ES2-001 Velocity 11 32 FT/SEC 3 45 M/SEC
Minimum 32 53 DEG at 162 msec Maximum 58 44 DEG at 59 3 msec
FLEXION ANGLE
1 D009720I 00B Filterclass (1000)
DEG
TIME (sec)
MGA Research 08-14-2000 18 18


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 16 57
COMPONENT Dummy #ES2-001
Velocity 11 32 FT/SEC 3 45 M/SEC
Minimum 18 51 DEG at 165 msec
Maximum 35 14 DEG at 60 3 msec
THETA A
1 ——— 0009720T D05 Filterclass (1000)
DEG
TIME (sec)
MGA Research
08 14 2000 18 19


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 16 57
COMPONENT Dummy #ES2-001
Velocity 11 32 FT/SEC 3 45 M/SEC
Minimum 19 48 DEG at 168 msec
Maximum 30 77 DEG at 59 2 msec
THETA B
1 C009720I D06 Filterclass (1000)
DEG
TIME (sec)
MGA Research
08-14-2000 18 19

MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-001

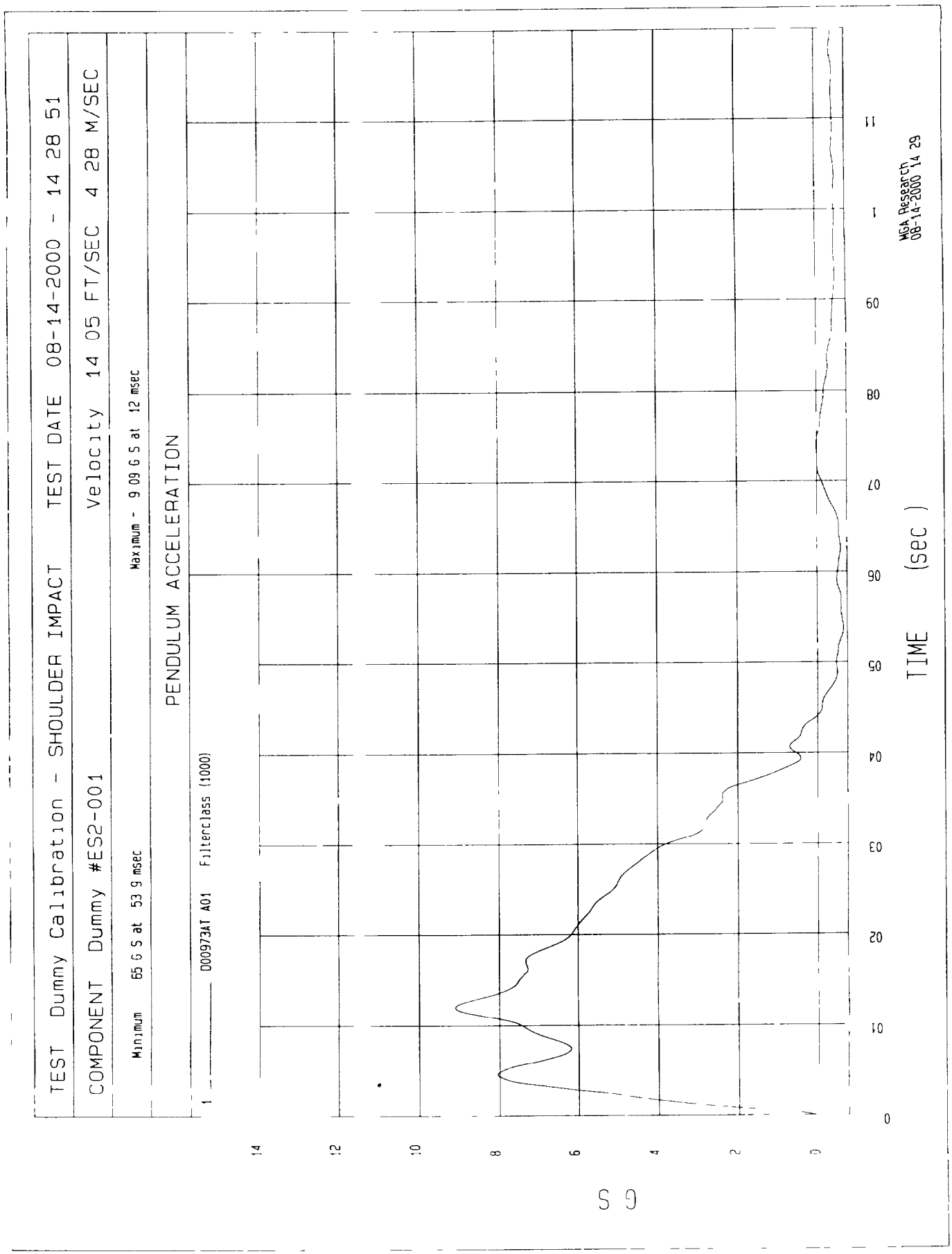
Test Number D00973

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Pendulum Speed	4 2 – 4 4 m/s	4.3
Max Resultant Acceleration	7 5 – 10.5 g's	9.1
Time of Max Pendulum Acceleration		12 ms

TEST MEETS SPECIFICATIONS

Technician _____

Approved By David Winkelbauer


TEST Dummy Calibration - SHOULDER IMPACT TEST DATE 08-14-2000 - 14 28 51
COMPONENT Dummy #ES2-001 Velocity 14 05 FT/SEC 4 28 M/SEC
Minimum 65 G S at 53 9 msec
Maximum - 9 09 G S at 12 msec
PENDULUM ACCELERATION
1 ____ 000973AT A01 Filterclass (1000)
G S
TIME (sec)
MGA Research
08-14-2000 14 29

MGA RESEARCH CORPORATION

UPPER/MIDDLE/LOWER RIB TESTS

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-001

Test Number D00974/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Displacement at 2 m/s	23 5 – 27 5 mm	27 4
Displacement at 3 m/s	36 0 – 40 0 mm	39 3
Displacement at 4 m/s	46.0 – 51 0 mm	50 9

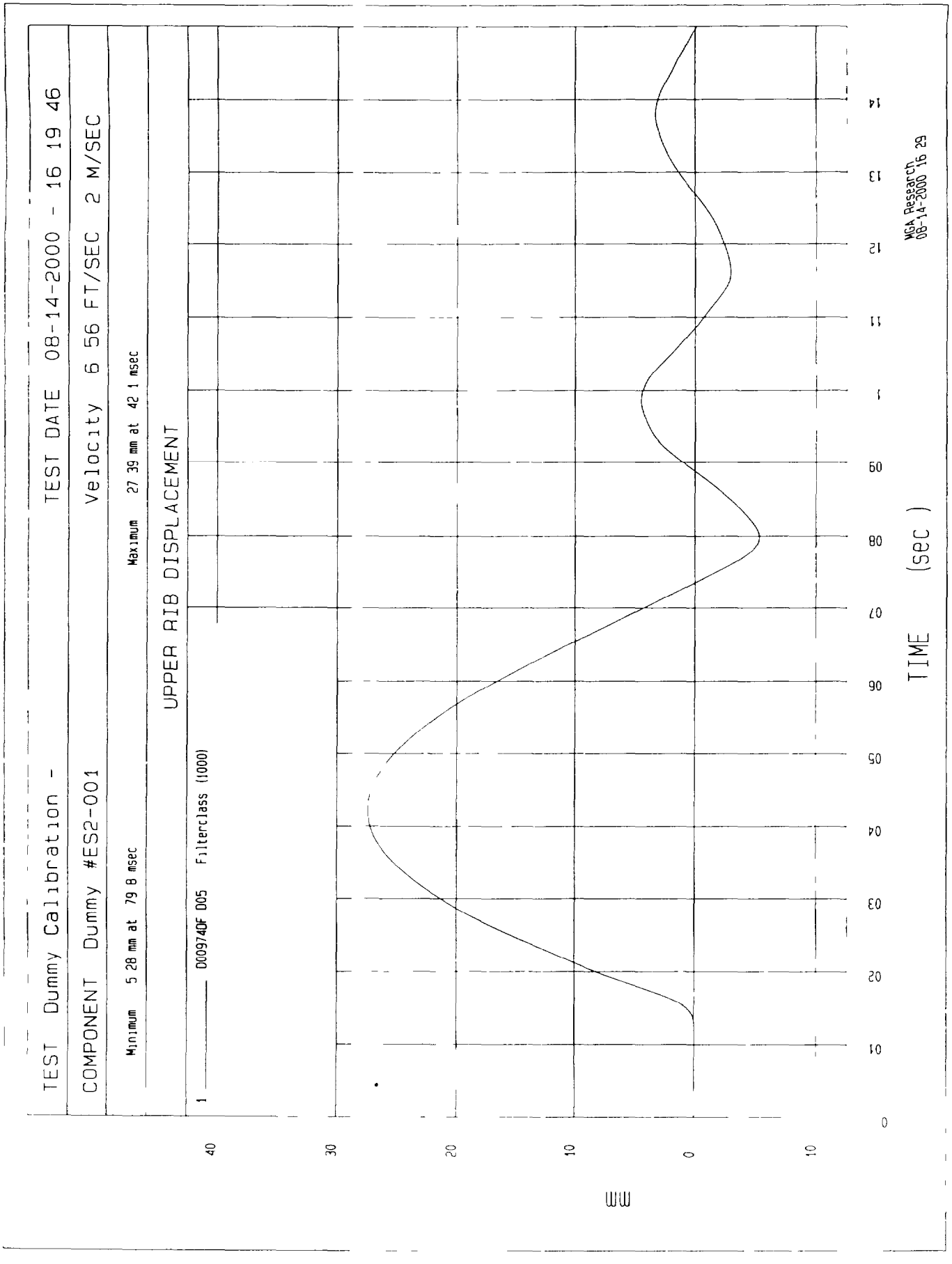
MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Displacement at 2 m/s	23 5 – 27 5 mm	26 7
Displacement at 3 m/s	36 0 – 40 0 mm	38 9
Displacement at 4 m/s	46 0 – 51 0 mm	50 8

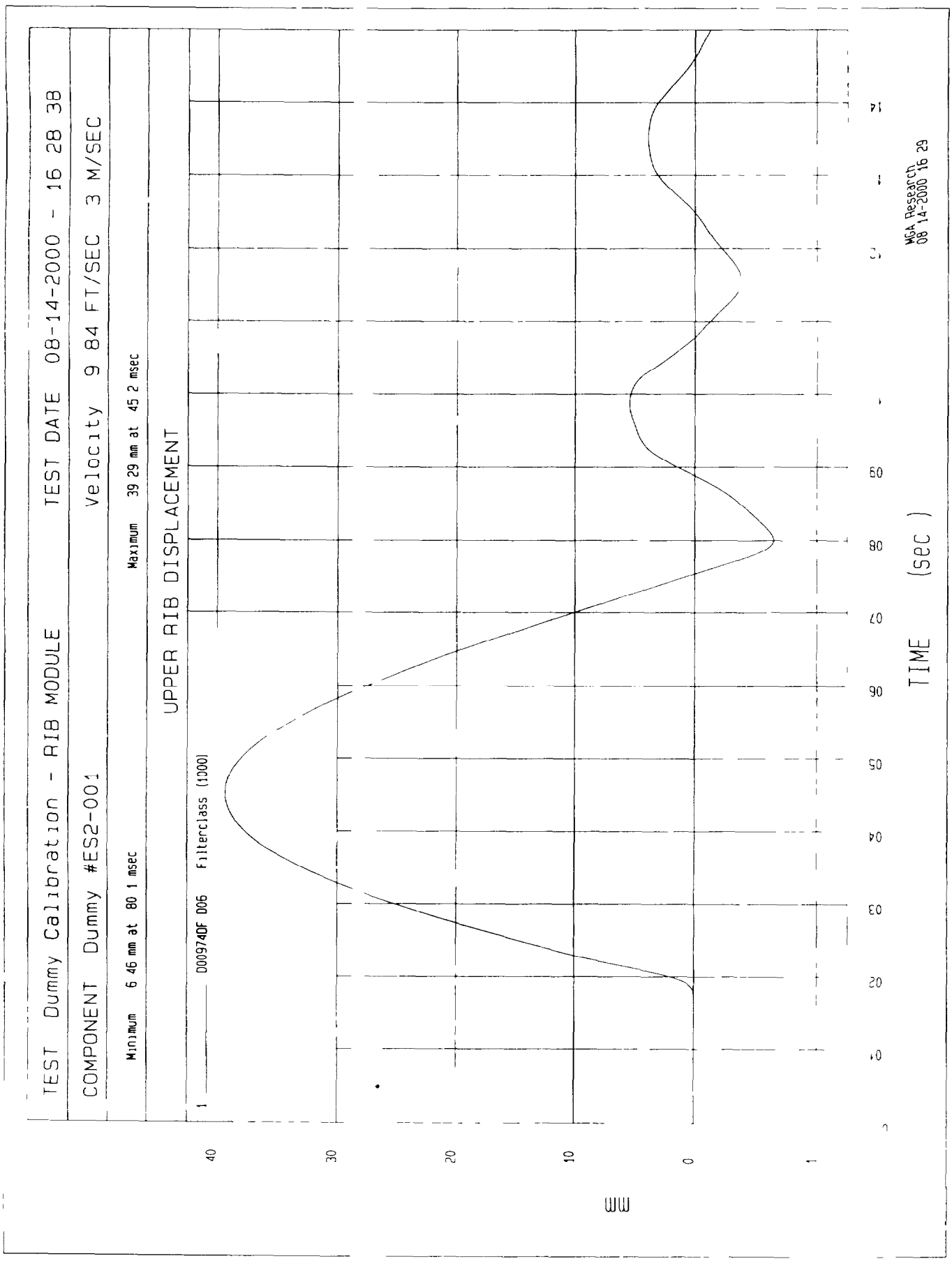
LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Displacement at 2 m/s	23.5 – 27 5 mm	27.8*
Displacement at 3 m/s	36 0 – 40 0 mm	40 1*
Displacement at 4 m/s	46 0 – 51.0 mm	51 6 *

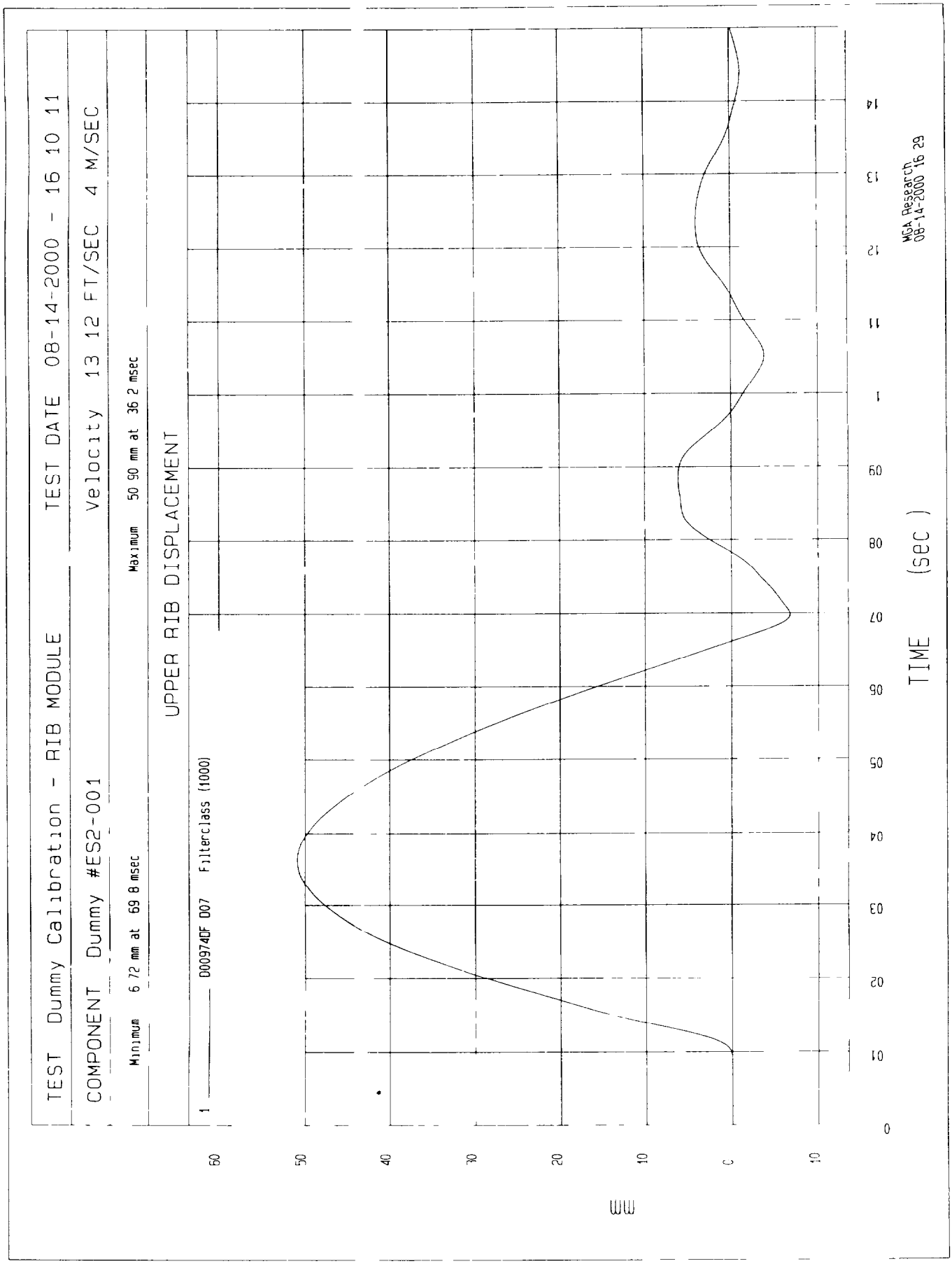
* DOES NOT MEET SPECIFICATIONS

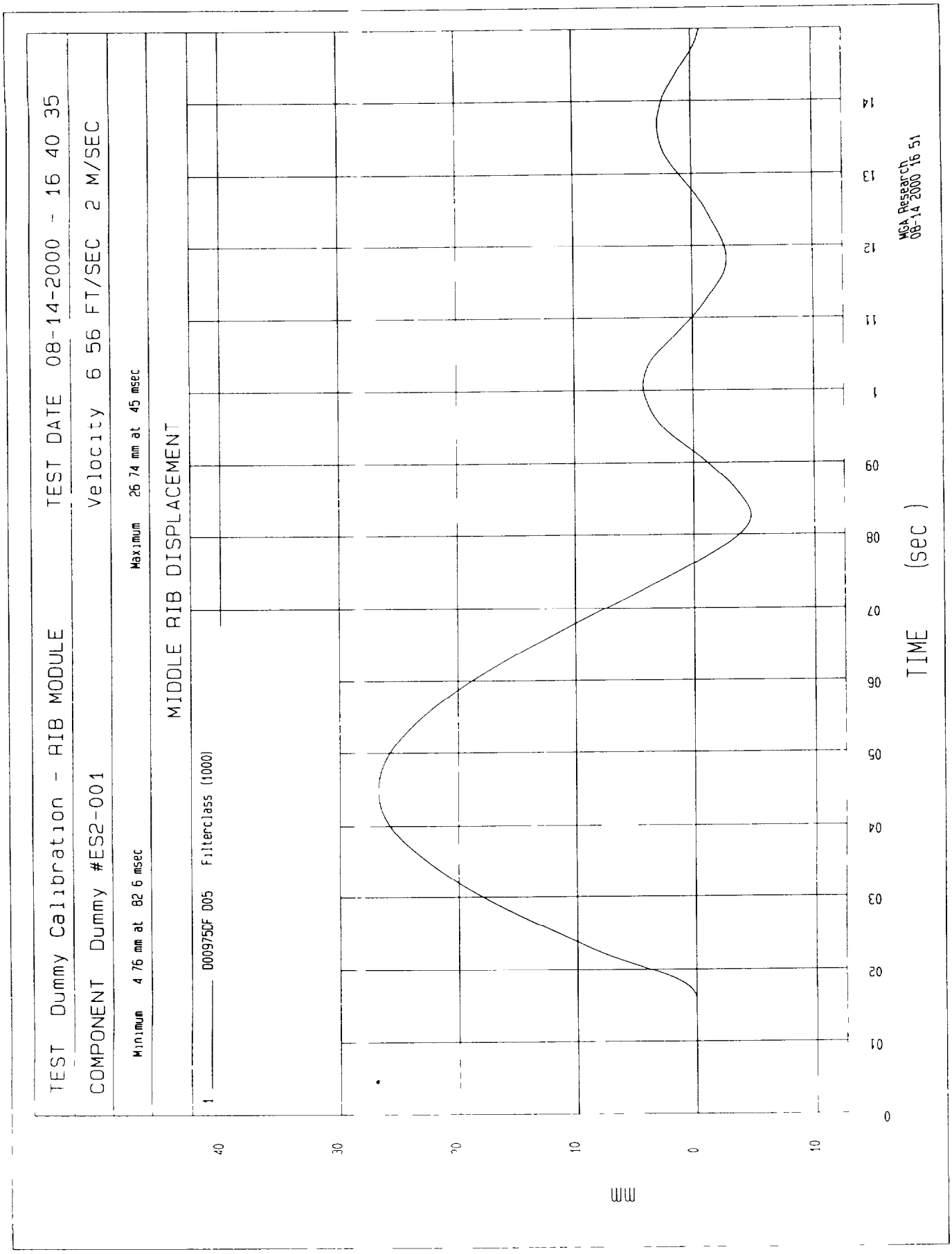
Technician _____

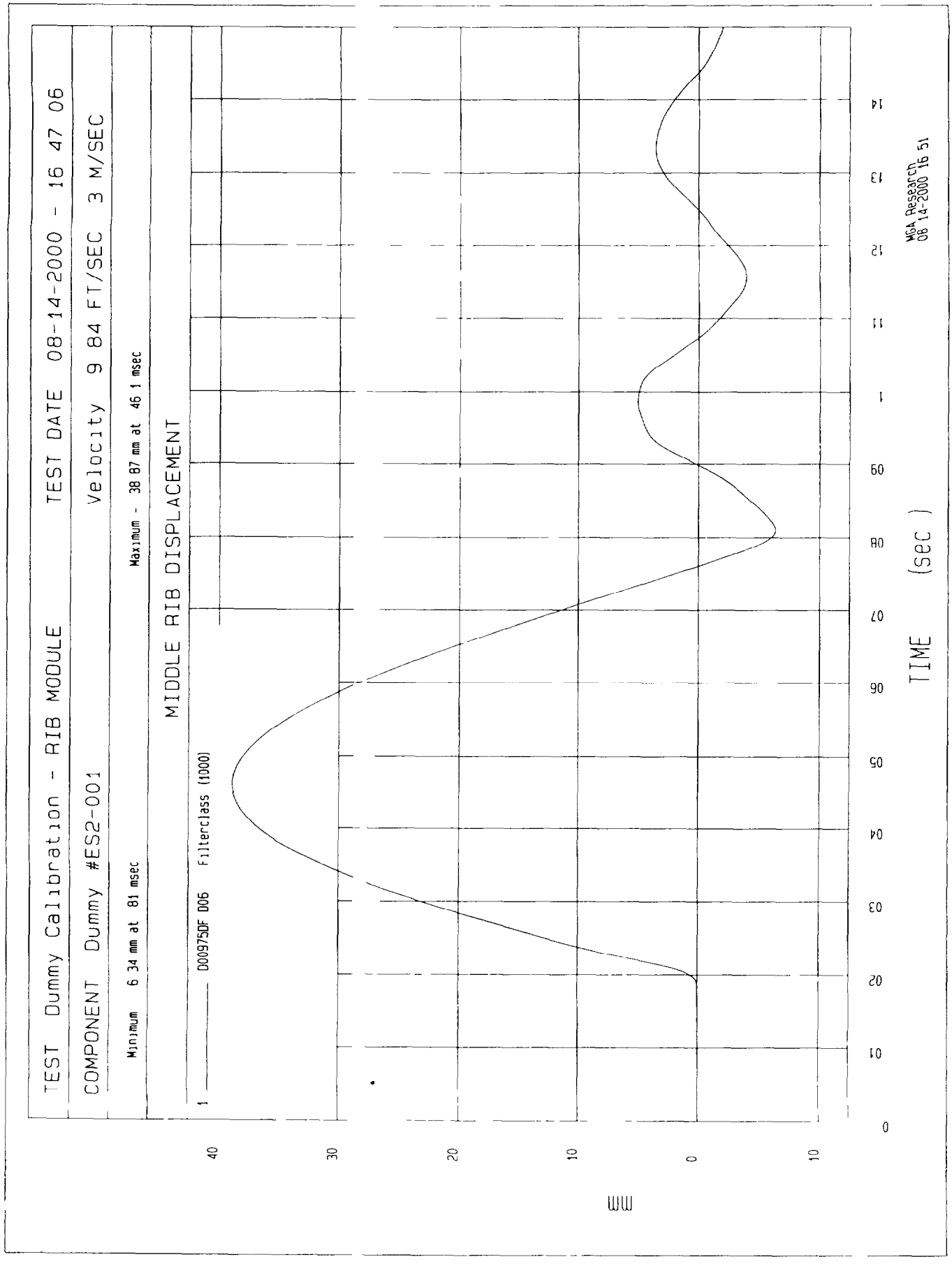
Approved By David Winkelbauer

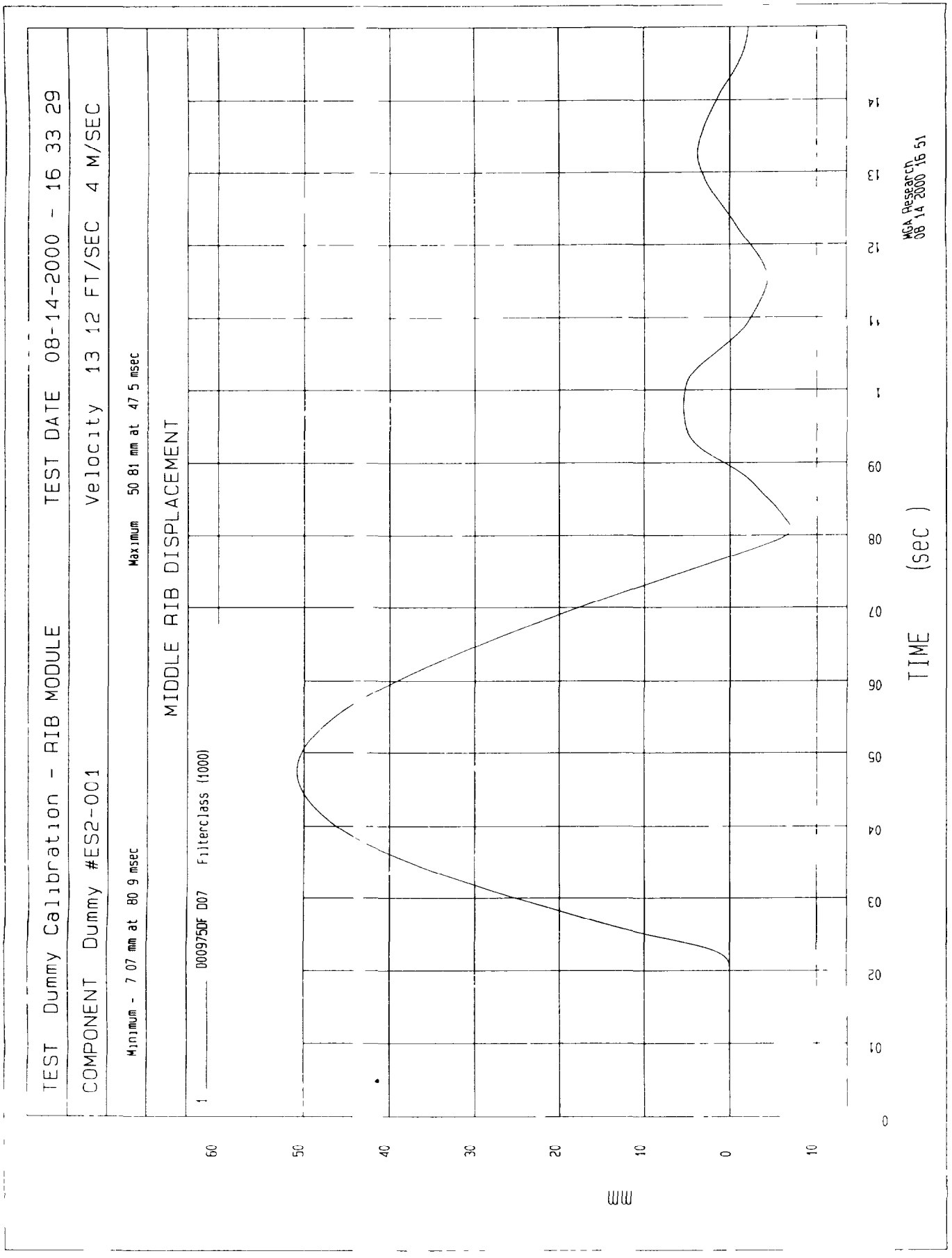

TEST Dummy Calibration -
TEST DATE 08-14-2000 - 16 19 46
COMPONENT Dummy #ES2-001
Velocity 6 56 FT/SEC 2 M/SEC
Minimum 5 28 mm at 79 8 msec
Maximum 27 39 mm at 42 1 msec
UPPER RIB DISPLACEMENT
1 ——— 000974DF 005 Filterclass (1000)
MM
TIME (sec)
WGA Research
08-14-2000 16 29

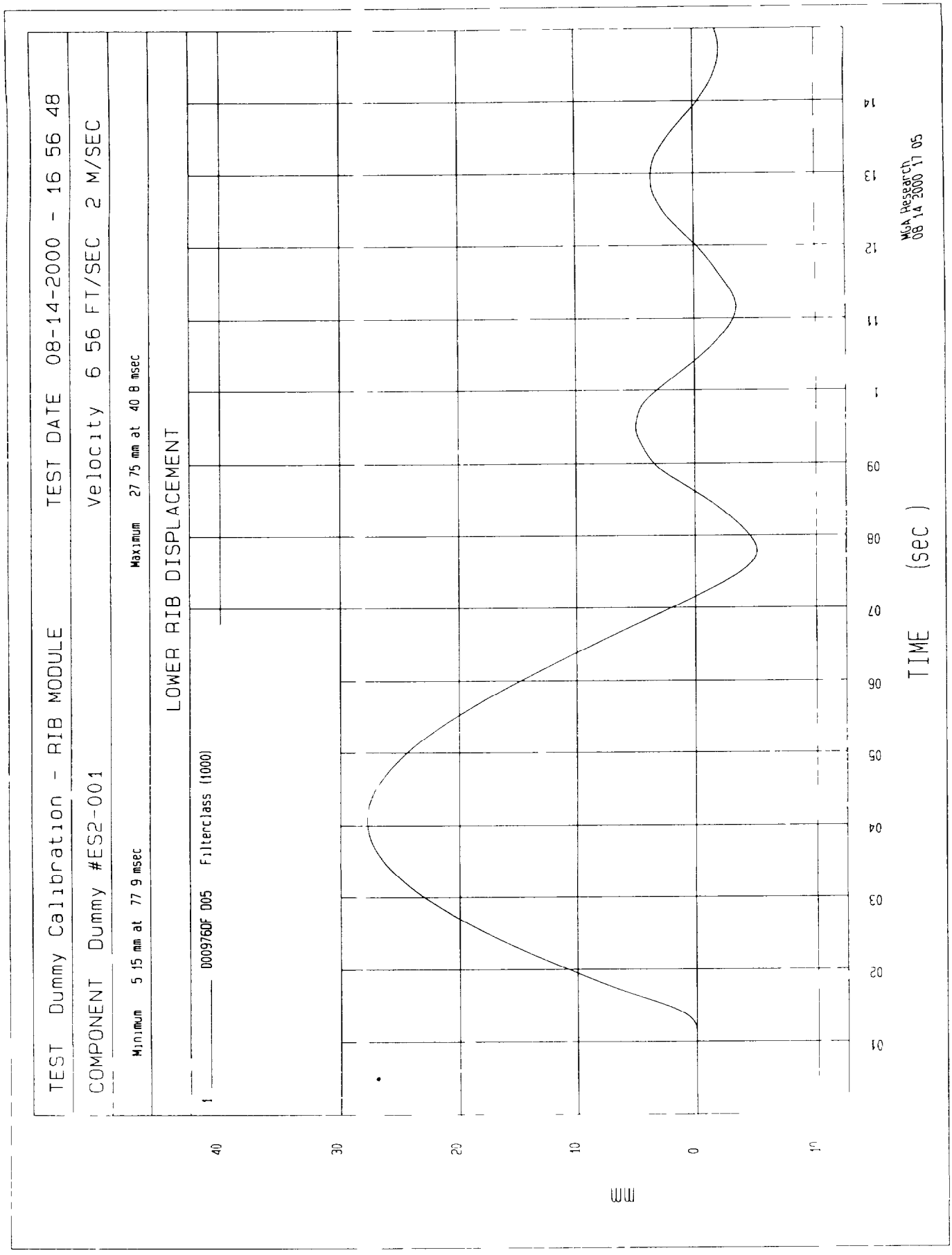

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 28 38
COMPONENT Dummy #ES2-001
Velocity 9 84 FT/SEC 3 M/SEC
Minimum 6 46 mm at 80 1 msec
Maximum 39 29 mm at 45 2 msec
UPPER RIB DISPLACEMENT
1 D00974OF D06 Filterclass (1000)
MGA Research
08 14-2000 16 29
MM
TIME (SEC)
40
30
20
10
0
1
60
80
90
50
40
30
20
10

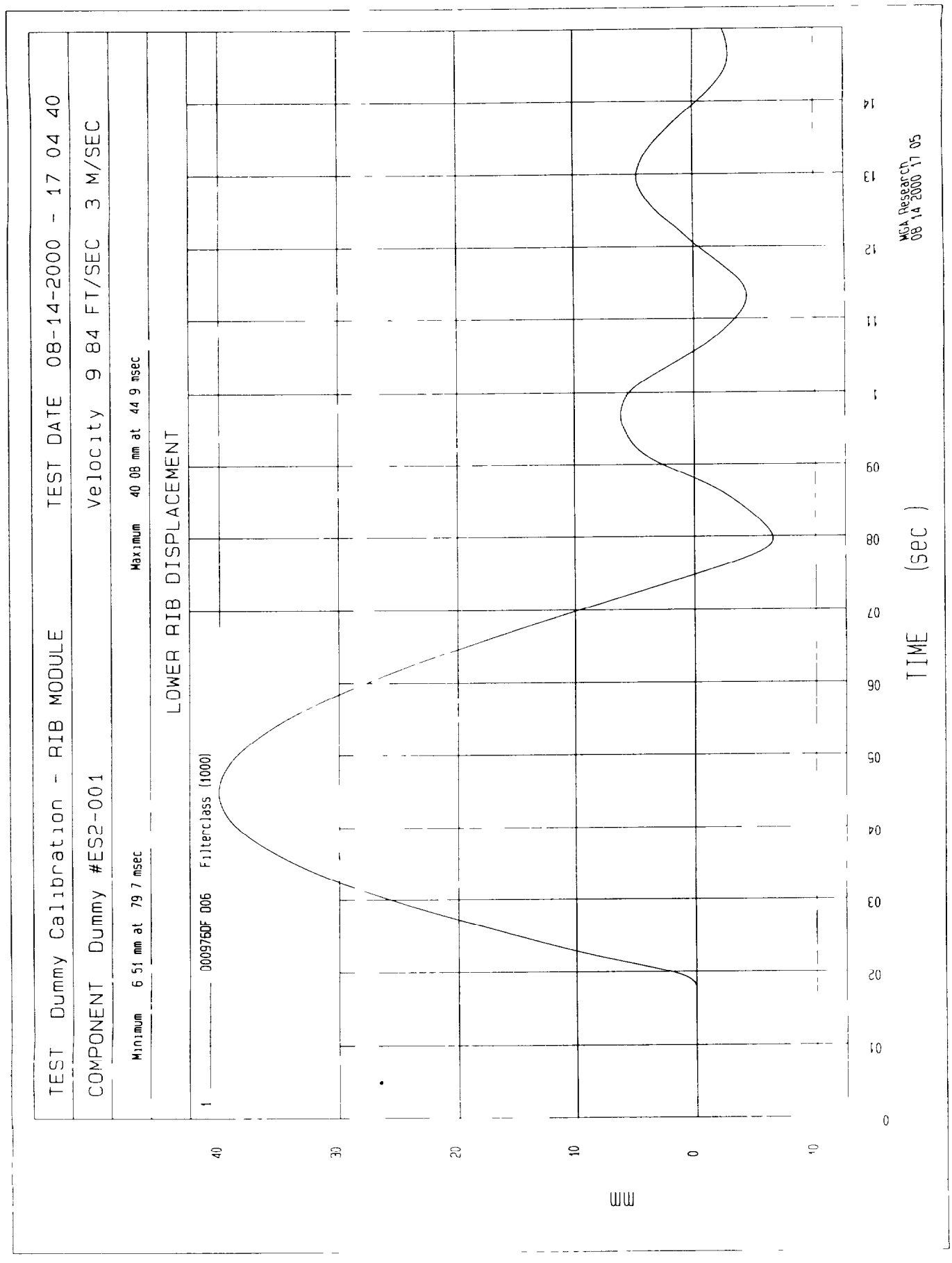

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 10 11
COMPONENT Dummy #ES2-001
Velocity 13 12 FT/SEC 4 M/SEC
Minimum 6 72 mm at 69 8 msec
Maximum 50 90 mm at 36 2 msec
UPPER RIB DISPLACEMENT
1 D00974DF 007 Filterclass (1000)
MGA Research
08-14-2000 16 29
mm
TIME (sec)
60
50
40
30
20
10
0
-10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14

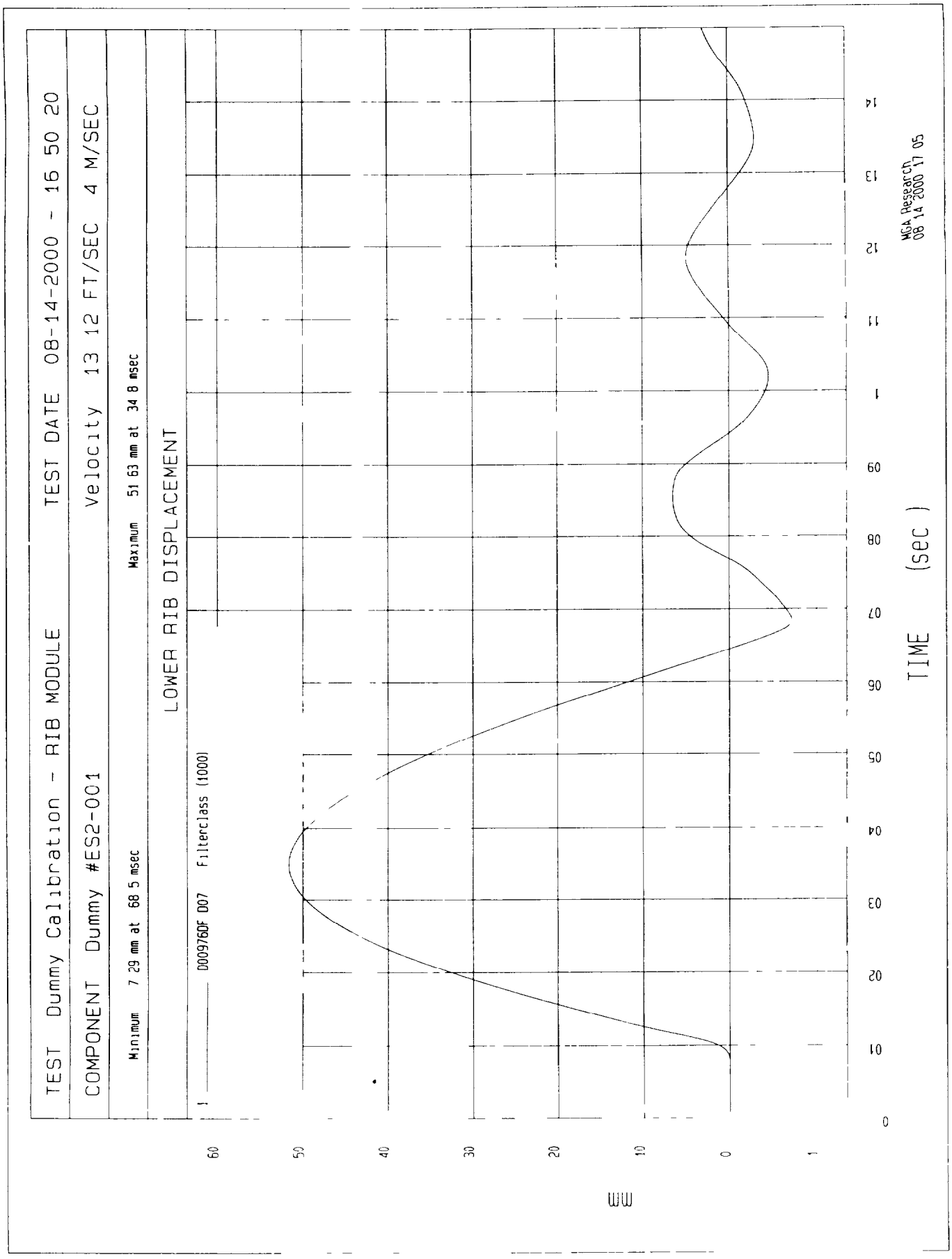

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 40 35
COMPONENT Dummy #ES2-001
Velocity 6 56 FT/SEC 2 M/SEC
Minimum 4 76 mm at 82 6 msec
Maximum 26 74 mm at 45 msec
MIDDLE RIB DISPLACEMENT
1 D00975DF D05 Filterclass (1000)
MGA Research
08-14-2000 16 51
mm
TIME (sec)
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 47 06
COMPONENT Dummy #ES2-001
Velocity 9 84 FT/SEC 3 M/SEC
Minimum 6 34 mm at 81 msec
Maximum - 38 87 mm at 46 1 msec
MIDDLE RIB DISPLACEMENT
1 000975DF 006 Filterclass (1000)
MGA Research
08 14-2000 16 51
mm
TIME (sec)
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
1
11
12
13
14


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 33 29
COMPONENT Dummy #ES2-001
Velocity 13 12 FT/SEC 4 M/SEC
Minimum - 7 07 mm at 80 9 msec
Maximum 50 81 mm at 47 5 msec
MIDDLE RIB DISPLACEMENT
1 D009750F D07 Filterclass (1000)
MGA Research
08 14 2000 16 51
mm
TIME (sec)
60
50
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 56 48
COMPONENT Dummy #ES2-001
Velocity 6 56 FT/SEC 2 M/SEC
Minimum 5 15 mm at 77 9 msec
Maximum 27 75 mm at 40 8 msec
LOWER RIB DISPLACEMENT
1 D009760F 005 Filterclass (1000)
MGA Research
08 14 2000 17 05
mm
TIME (sec)


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 04 40
COMPONENT Dummy #ES2-001
Velocity 9 84 FT/SEC 3 M/SEC
Minimum 6 51 mm at 79 7 msec
Maximum 40 08 mm at 44 9 msec
LOWER RIB DISPLACEMENT
1 000976DF 006 Filterclass (1000)
MM
TIME (sec)
MGA Research
08 14 2000 17 05


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 16 50 20
COMPONENT Dummy #ES2-001
Velocity 13 12 FT/SEC 4 M/SEC
Minimum 7 29 mm at 68 5 msec
Maximum 51 63 mm at 34 8 msec
LOWER RIB DISPLACEMENT
1 ——— D009760F D07 Filterclass (1000)
MM
TIME (sec)
MGA Research
08 14 2000 17 05

MGA RESEARCH CORPORATION

ABDOMEN TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-001

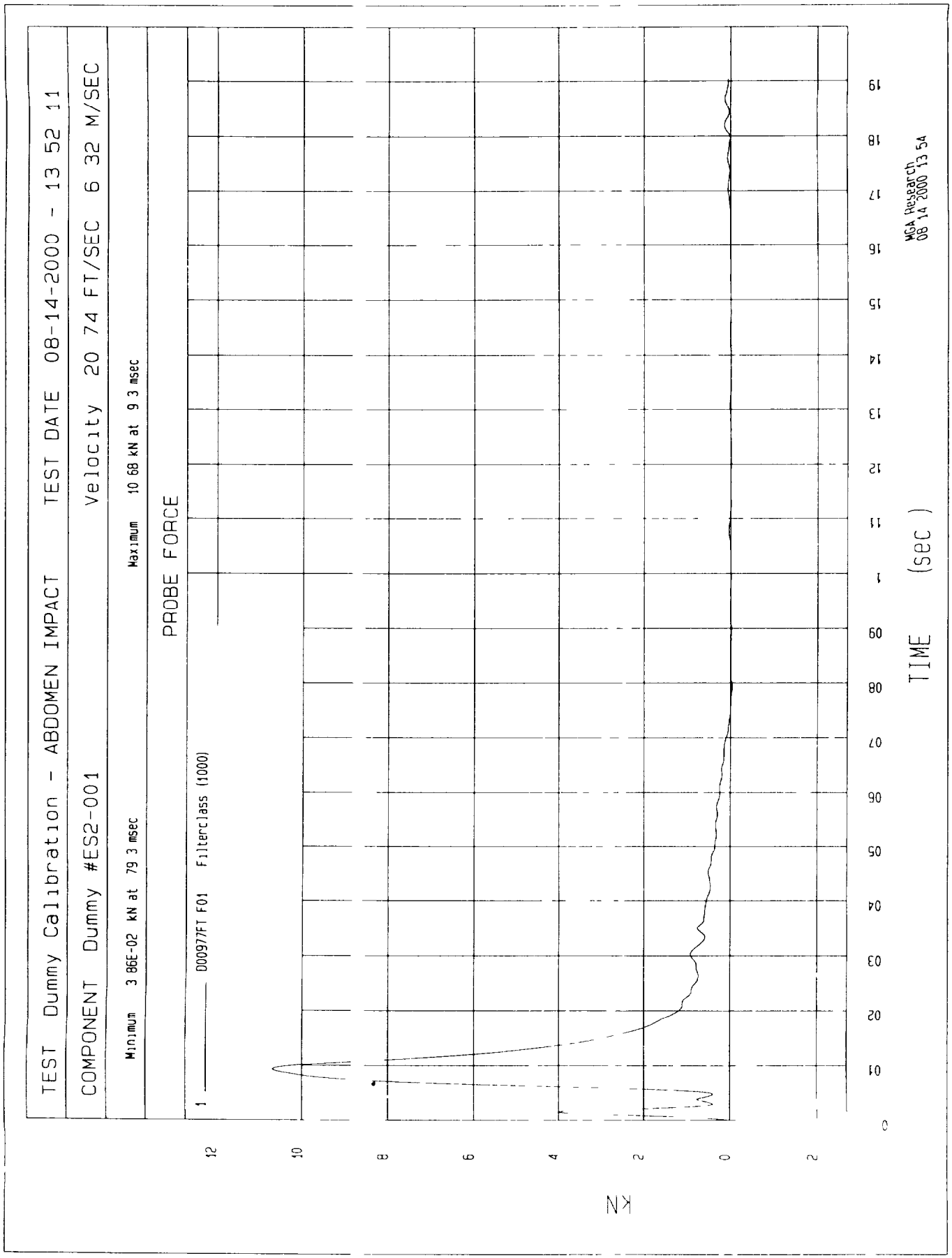
Test Number D00977

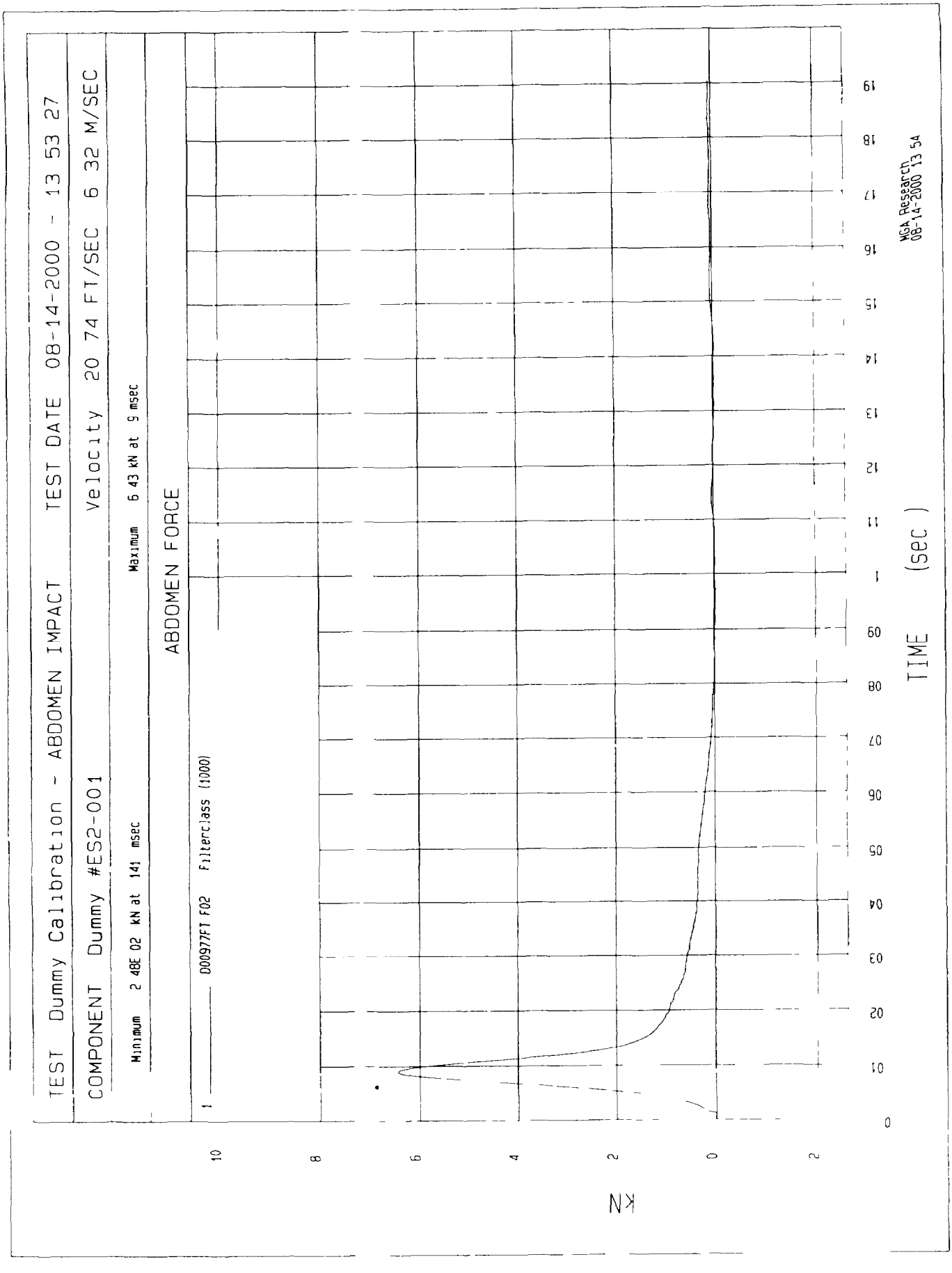
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Probe Speed (m/s)	6 2 – 6 4	6.3
Maximum Impact Force	9 5 – 11 1 kN	10 7
Time of Maximum Force	8 8 – 10.4 ms	9 3
Maximum Total Abdomen Force	5 9 – 7 9 kN	6.4
Time of Max Total Force	8 5 – 10.1 ms	9 0

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By David Winkelbauer


TEST Dummy Calibration - ABDOMEN IMPACT TEST DATE 08-14-2000 - 13 52 11
COMPONENT Dummy #ES2-001 Velocity 20 74 FT/SEC 6 32 M/SEC
Minimum 3 86E-02 kN at 79 3 msec
Maximum 10 68 kN at 9 3 msec
PROBE FORCE
1 ——— 00097FT F01 Filterclass (1000)
KN
TIME (sec)
MGA Research
08 14 2000 13 54


TEST Dummy Calibration - ABDOMEN IMPACT TEST DATE 08-14-2000 - 13 53 27
COMPONENT Dummy #ES2-001 Velocity 20 74 FT/SEC 6 32 M/SEC
Minimum 2 48E 02 kN at 141 msec Maximum 6 43 kN at 9 msec
ABDOMEN FORCE
1 D00977FT F02 Filterclass (1000)
KN
TIME (sec)
MGA Research 08-14-2000 13 54

MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-001

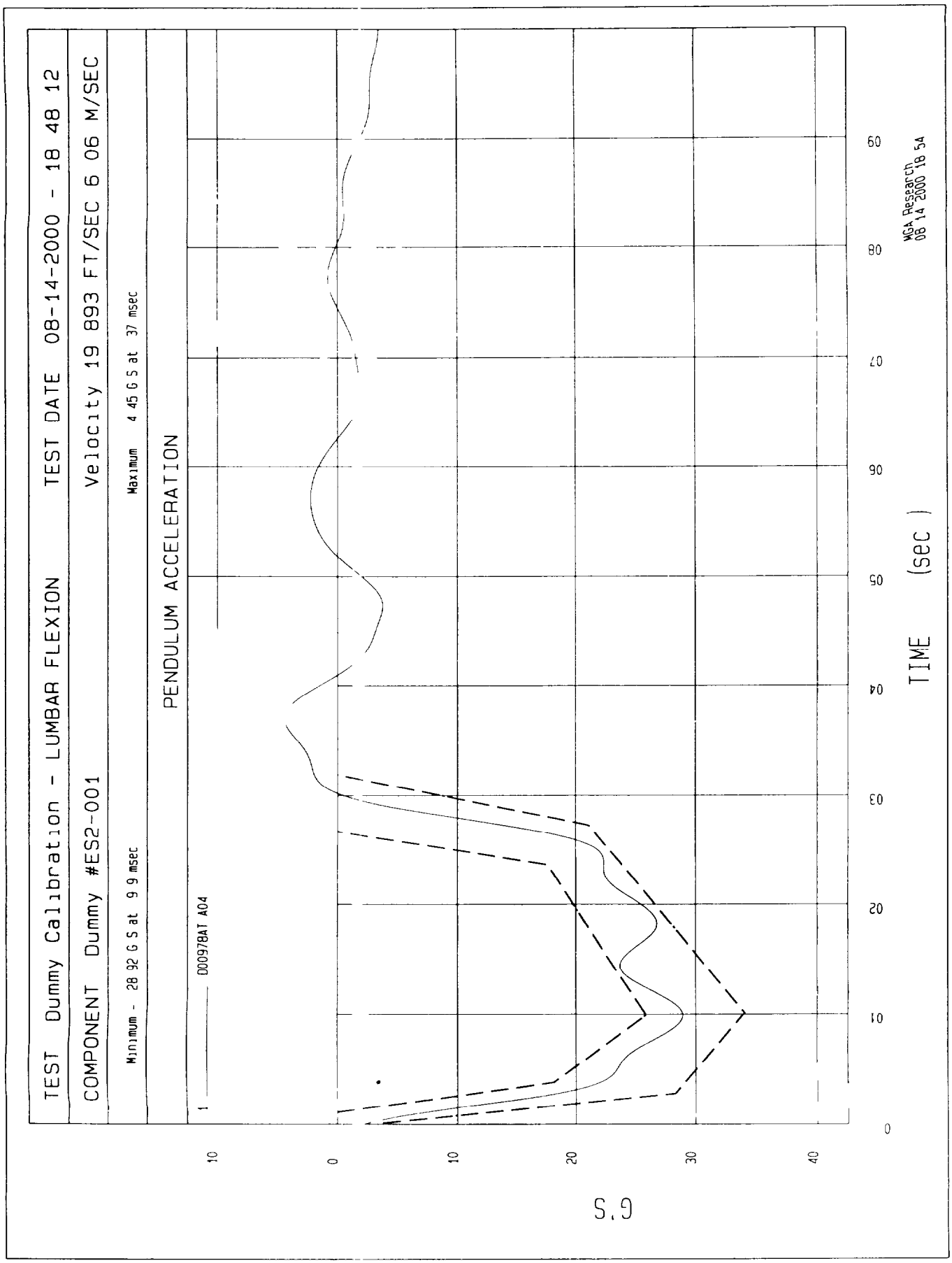
Test Number D00978

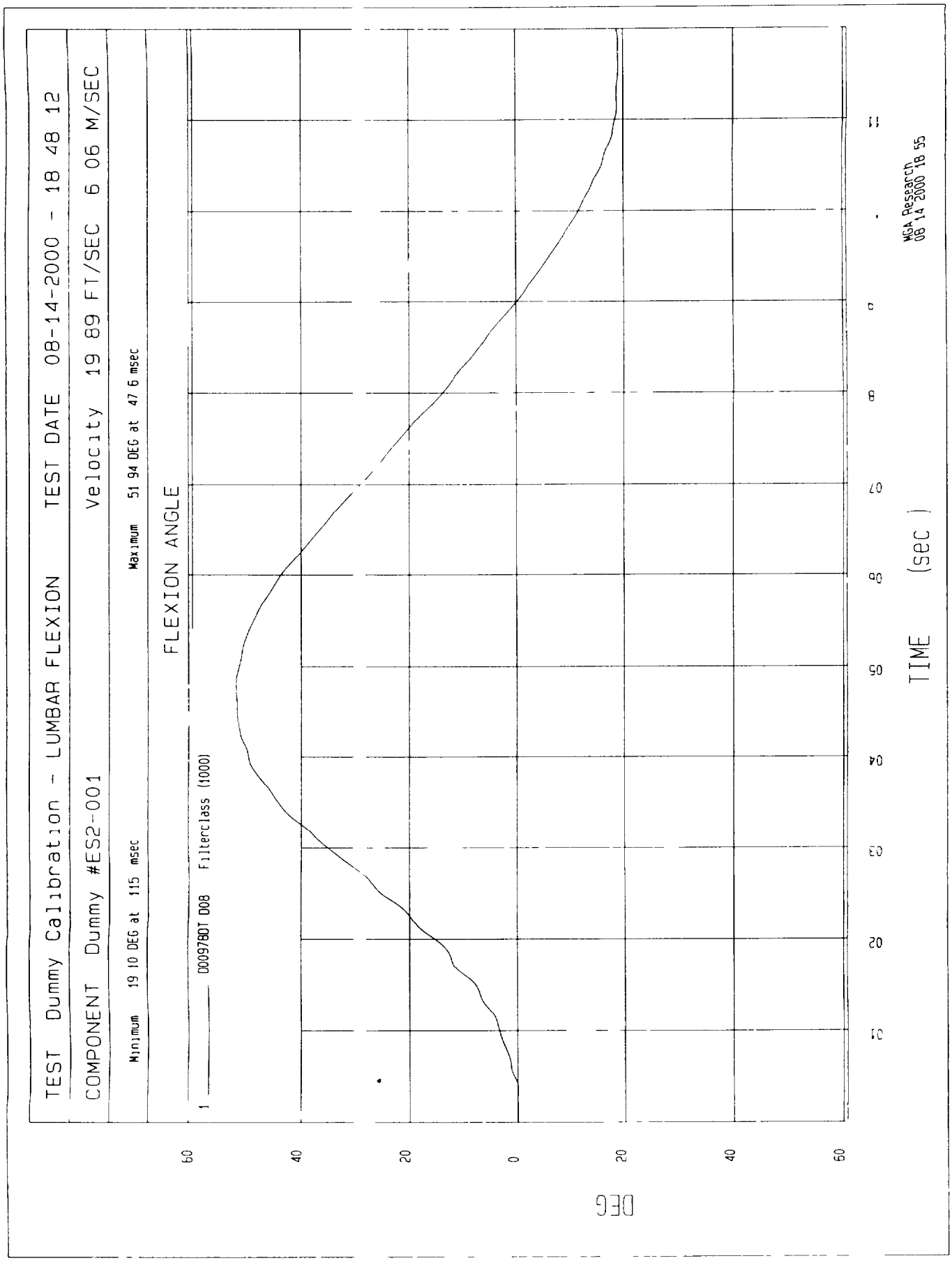
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	22
Relative Humidity (%)	10 – 70	54
Pendulum Speed	5 95 – 6 15 m/s	6 06
Max Pendulum Acceleration		-28.9 g's
Time Max Pendulum Acceleration		9.9 ms
Maximum Flexion Angle	45.0 – 55 0 deg	51 9
Time of Max Flexion Angle	39 0 – 53 0 ms	47 6
Maximum Angle Theta (A)	31 0 – 35 0 deg	33 1
Time of Max Theta (A)	45 0 – 55 0 ms	47 9
Maximum Angle Theta (B)	27 0 – 31 0 deg	29.3
Time of Max Theta (B)	45 0 – 55.0 ms	45.2

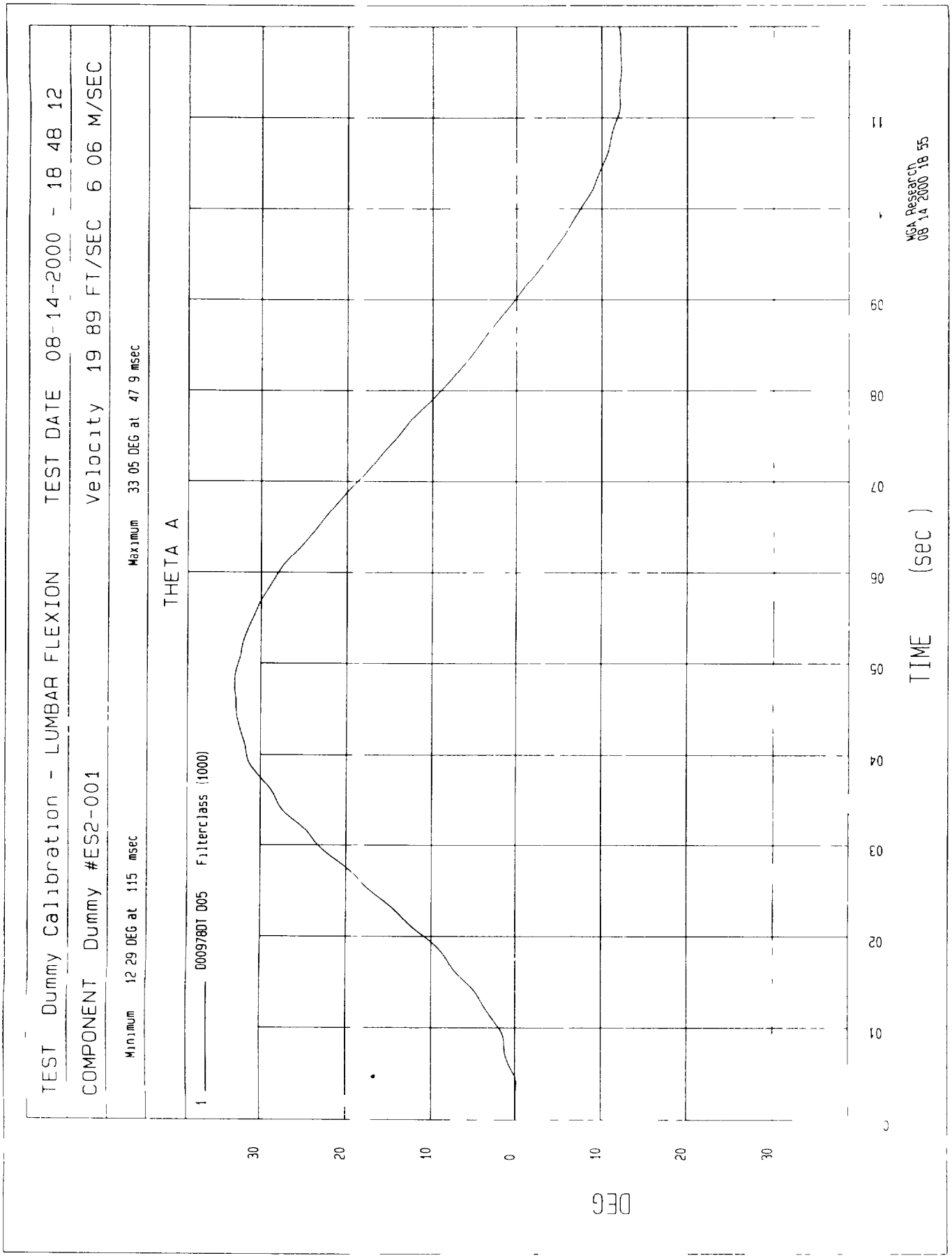
TEST MEETS SPECIFICATIONS

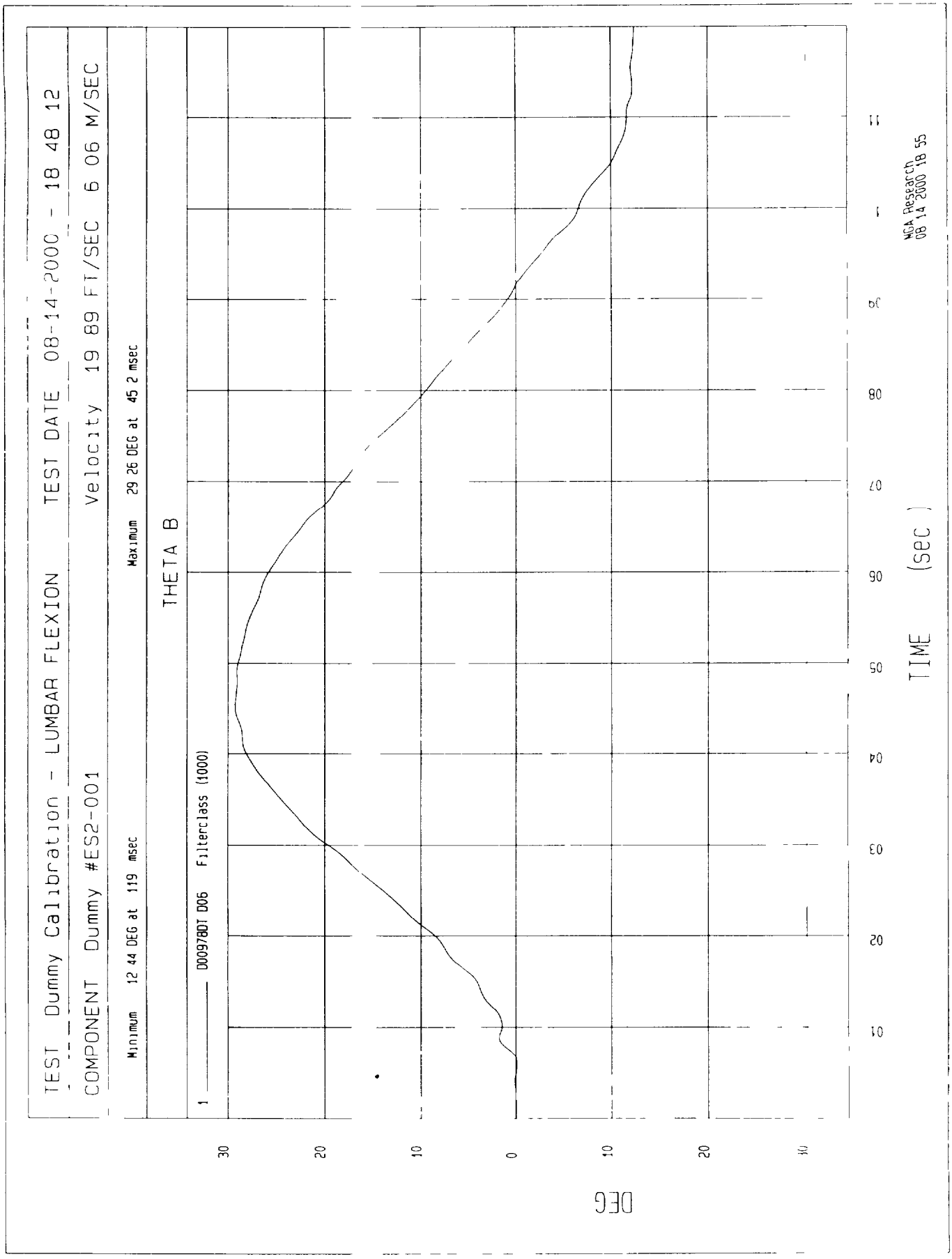
Technician: _____

Approved By David Winkelbauer


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 18 48 12
COMPONENT Dummy #ES2-001 Velocity 19 893 FT/SEC 6 06 M/SEC
Minimum - 28 92 G S at 9 9 msec Maximum 4 45 G S at 37 msec
PENDULUM ACCELERATION
1 ——— 00097BAT A04
MGA Research 08 14 2000 18 54
TIME (sec)
G's
-10
0
10
20
30
40
0
10
20
30
40
50
60
70
80
90


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 18 48 12
COMPONENT Dummy #ES2-001 Velocity 19 89 FT/SEC 6 06 M/SEC
Minimum 19 10 DEG at 115 msec
Maximum 51 94 DEG at 47 6 msec
FLEXION ANGLE
1 _____ 000978DT D08 Filterclass (1000)
DEG
60
40
20
0
20
40
60
TIME (sec)
MGA Research
08 14 2000 18 55


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 18 48 12
COMPONENT Dummy #ES2-001 Velocity 19 89 FT/SEC 6 06 M/SEC
Minimum 12 29 DEG at 115 msec Maximum 33 05 DEG at 47 9 msec
THETA A
1 ——— D0097BDT D05 Filterclass (1000)
MGA Research 08 14 2000 18 55
DEG
TIME (sec)
30
20
10
0
10
20
30
0
01
02
03
04
05
06
07
08
09
10
11


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 18 48 12
COMPONENT Dummy #ES2-001 Velocity 19 89 FT/SEC 6 06 M/SEC
Minimum 12 44 DEG at 119 msec Maximum 29 26 DEG at 45 2 msec
THETA B
1 ——— 000978DT D06 Filterclass (1000)
DEG
30
20
10
0
10
20
TIME (SEC)
MGA Research
08 14 2000 18 55

MGA RESEARCH CORPORATION

PELVIS TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-001

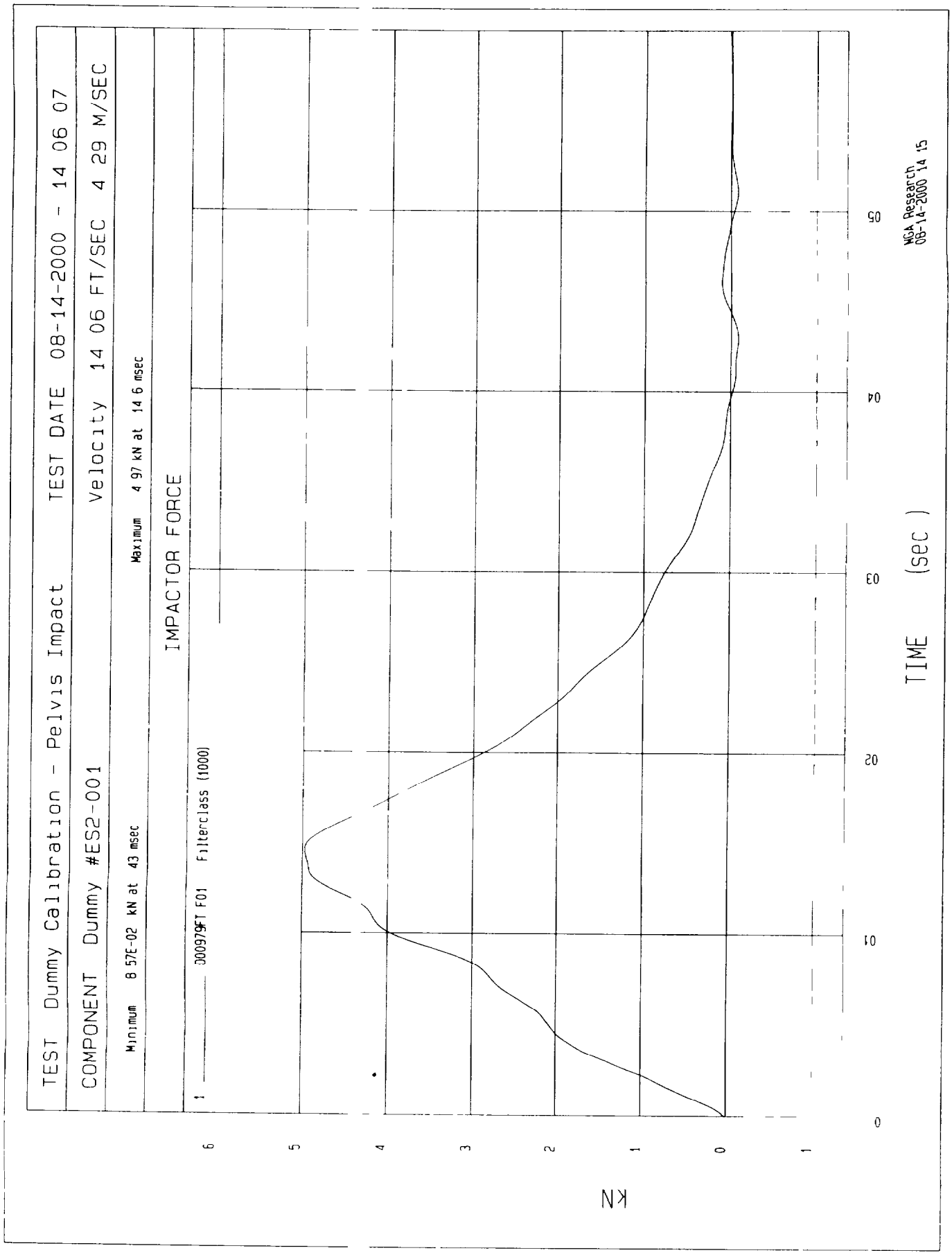
Test Number D00979

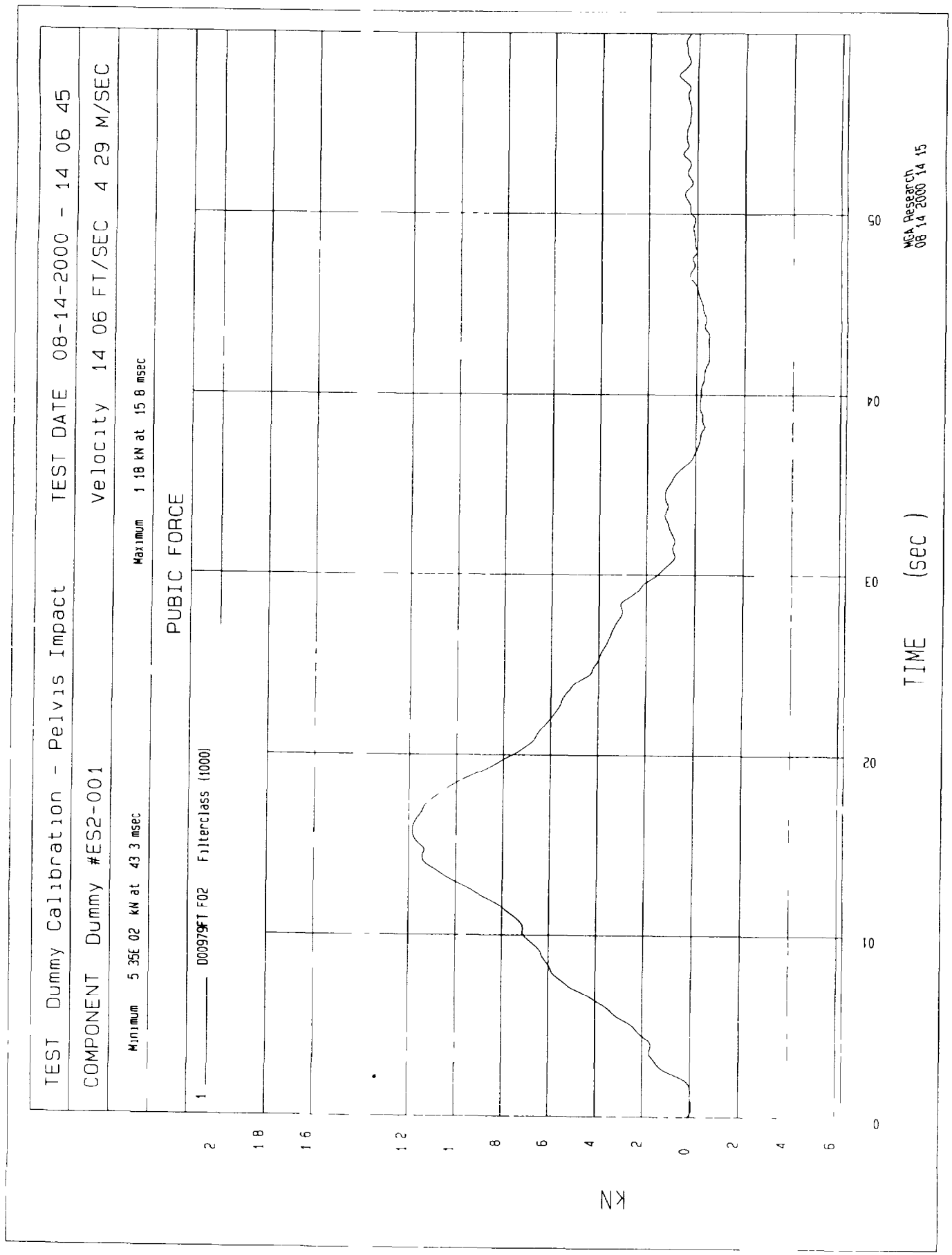
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Pendulum Speed	4 2 – 4 4 m/s	4 3
Maximum Impactor Force	4 4 – 5 1 kN	5 0
Time of Max Impactor Force	10 3 – 15 5 ms	14.6
Maximum Pubic Force	1 04 – 1 64 kN	1 18
Time of Max Pubic Force	9 9 – 15 9 ms	15.8

TEST MEETS SPECIFICATIONS

Technician _____

Approved By David Winkelbauer


TEST Dummy Calibration - Pelvis Impact
TEST DATE 08-14-2000 - 14 06 07
COMPONENT Dummy #ES2-001
Velocity 14 06 FT/SEC 4 29 M/SEC
Minimum 8 57E-02 kN at 43 msec
Maximum 4 97 kN at 14 6 msec
IMPACTOR FORCE
1 ——— 300979FT F01 Filterclass (1000)
MGA Research
08-14-2000 14 15
kN
TIME (sec)
6
5
4
3
2
1
0
1
0
10
20
30
40
50


TEST Dummy Calibration - Pelvis Impact TEST DATE 08-14-2000 - 14 06 45
COMPONENT Dummy #ES2-001 Velocity 14 06 FT/SEC 4 29 M/SEC
Minimum 5 35E 02 kN at 43 3 msec Maximum 1 18 kN at 15 8 msec
PUBIC FORCE
1 D0097SF1 F02 Filterclass (1000)
KN
TIME (SEC)
MGA Research 08 14 2000 14 15

CERTIFICATION DATA

Dummy Serial Number ES2-002

Calibration Test Results Summary

Dummy Serial Number ES2-002

Pre-Test Calibration

External Dimensions	The dummy passed all external dimension requirements
Head Drop Test	The head passed all drop test requirements.
Neck Pendulum Test	The neck did not pass all impact test requirements.
Shoulder Impact Test	The shoulder passed all impact test requirements
Rib Tests	All ribs did not pass all impact test requirements
Abdomen Test	The abdomen passed all impact test requirements
Lumbar Spine Test	The lumbar spine passed all impact test requirements
Pelvis Test:	The pelvis passed all impact test requirements

MGA RESEARCH CORPORATION

HEAD DROP TEST

EUROSID 2 DUMMY

Date: August 14, 2000

Dummy Serial Number ES2-002

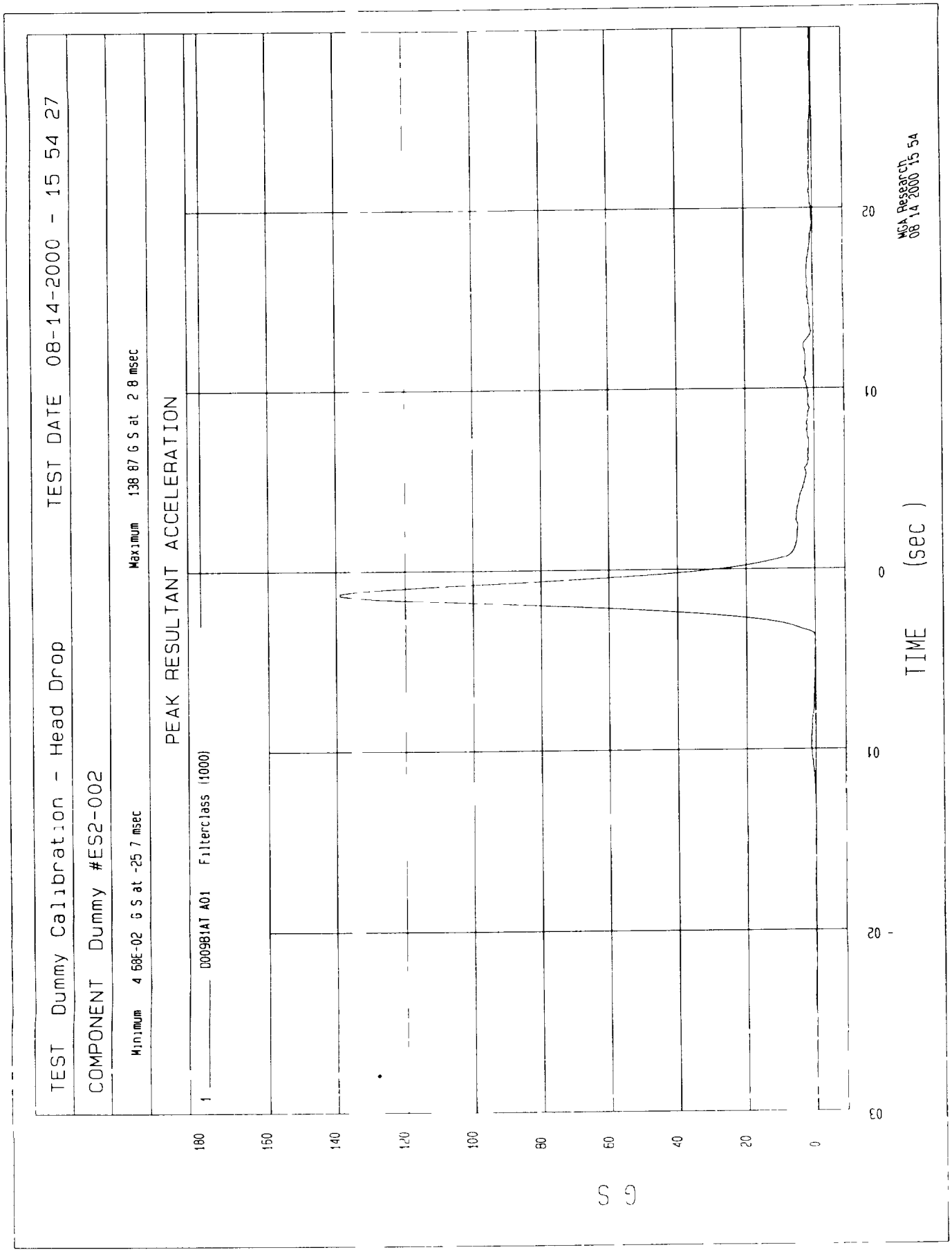
Test Number D00981

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Peak Resultant Acceleration	100 – 150 g's	139
Time of Max. Res Acceleration		2 8 ms

TEST MEETS SPECIFICATIONS

Technician _____

Approved By David Winkelbauer


TEST Dummy Calibration - Head Drop
TEST DATE 08-14-2000 - 15 54 27
COMPONENT Dummy #ES2-002
Minimum 4 68E-02 G S at -25 7 msec
Maximum 138 87 G S at 2 8 msec
PEAK RESULTANT ACCELERATION
1 D009B1AT A01 Filterclass (1000)
180
160
140
120
100
80
60
40
20
0
G S
-20
0
20
40
60
80
100
TIME (sec)
MGA Research
08 14 2000 15 54

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NECK PENDULUM TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-002

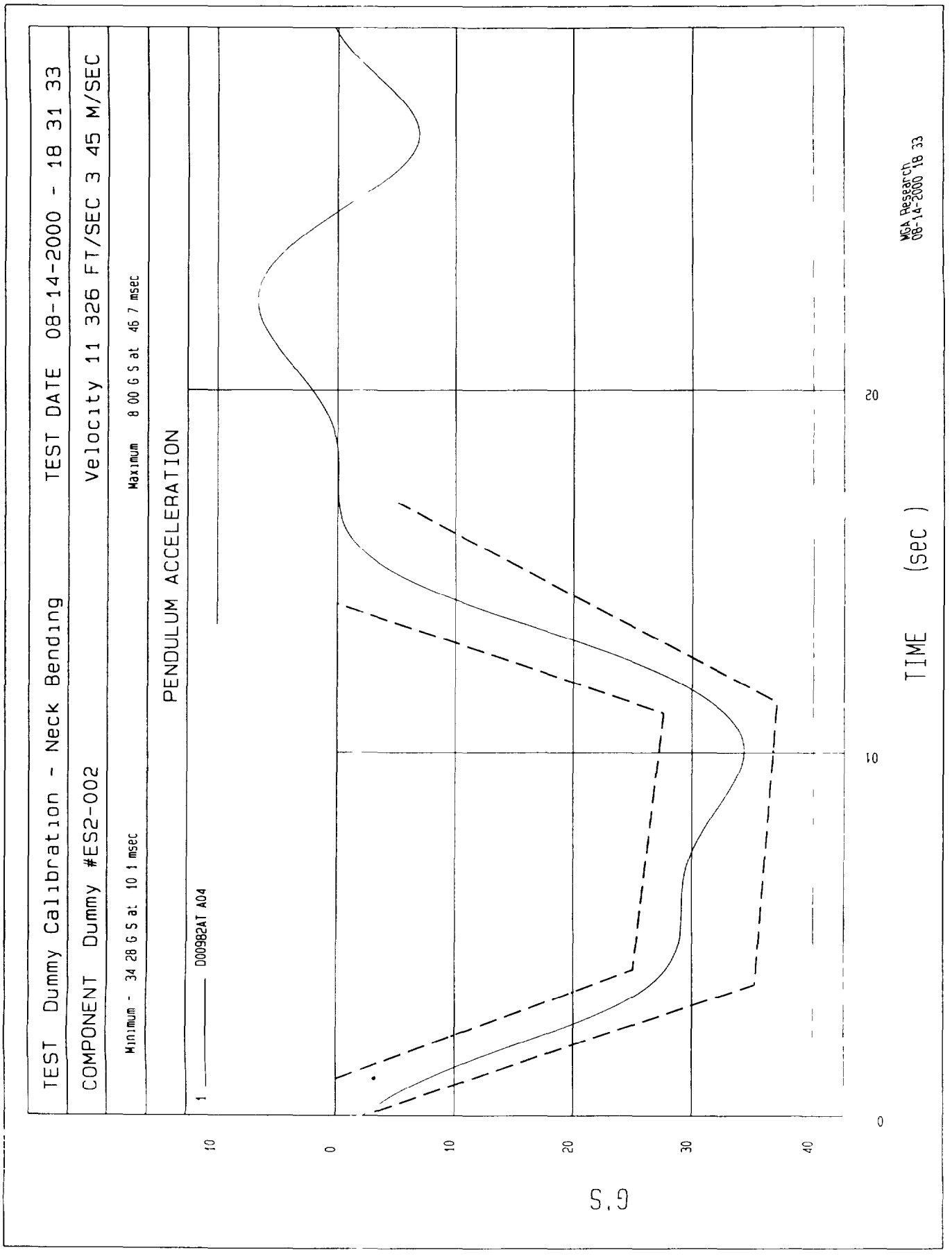
Test Number D00982

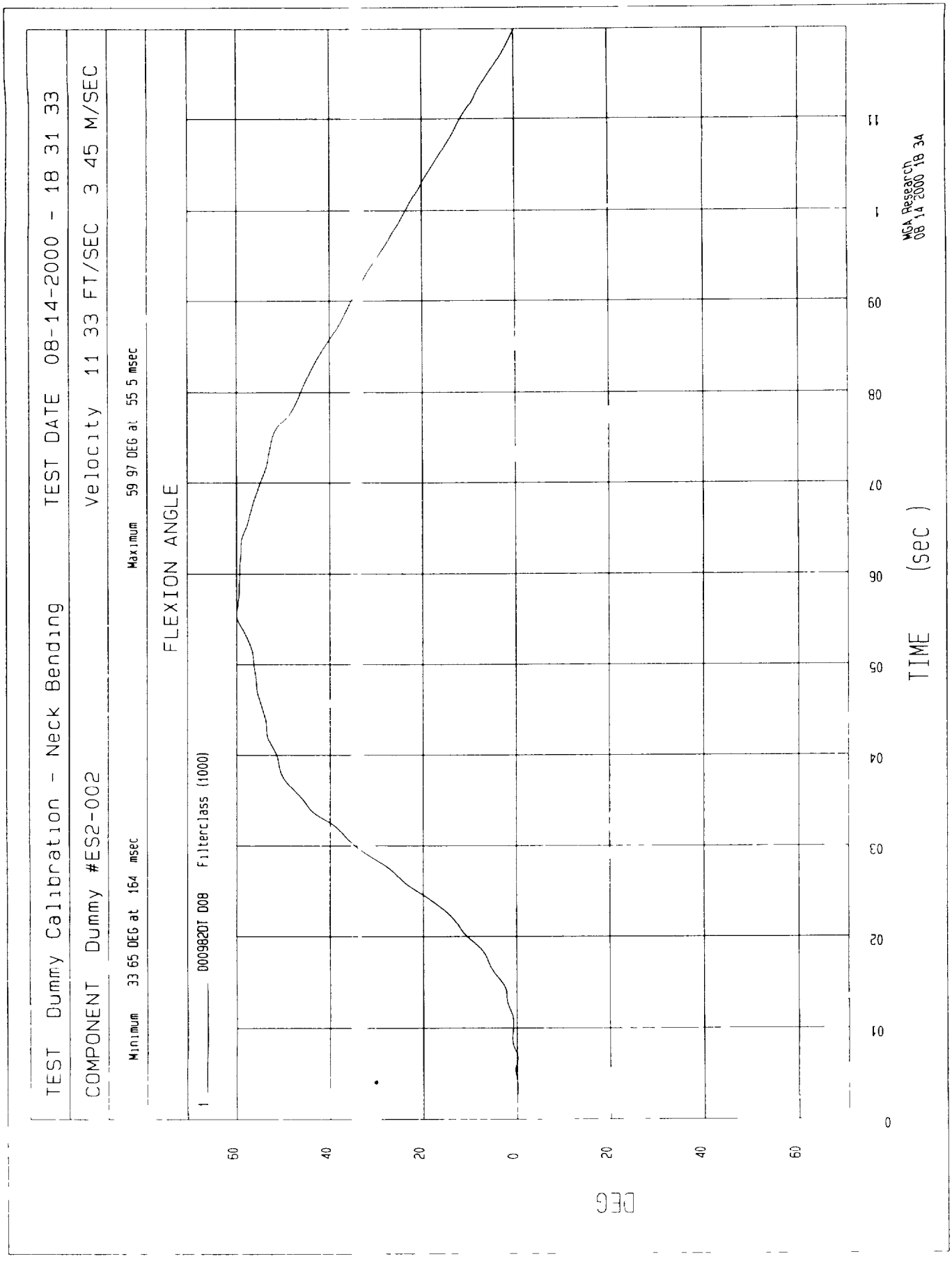
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	22
Relative Humidity (%)	10 – 70	54
Pendulum Speed	3 3 - 3 5	3.5
Max. Pendulum Acceleration		-34 3 g's
Time Max Pendulum Acceleration		10 1 ms
Maximum Flexion Angle	51.0 – 59 0 deg	60 0 *
Time of Max Flexion Angle	53.0 – 65 0 ms	55.5
Maximum Angle Theta (A)	32 5 – 36.5 deg	35 0
Time of Max. Theta (A)	54 0 – 64.0 ms	54 7
Maximum Angle Theta (B)	28 0 – 32.0 deg	31 5
Time of Max. Theta (B)	54 0 – 64.0 ms	55 1

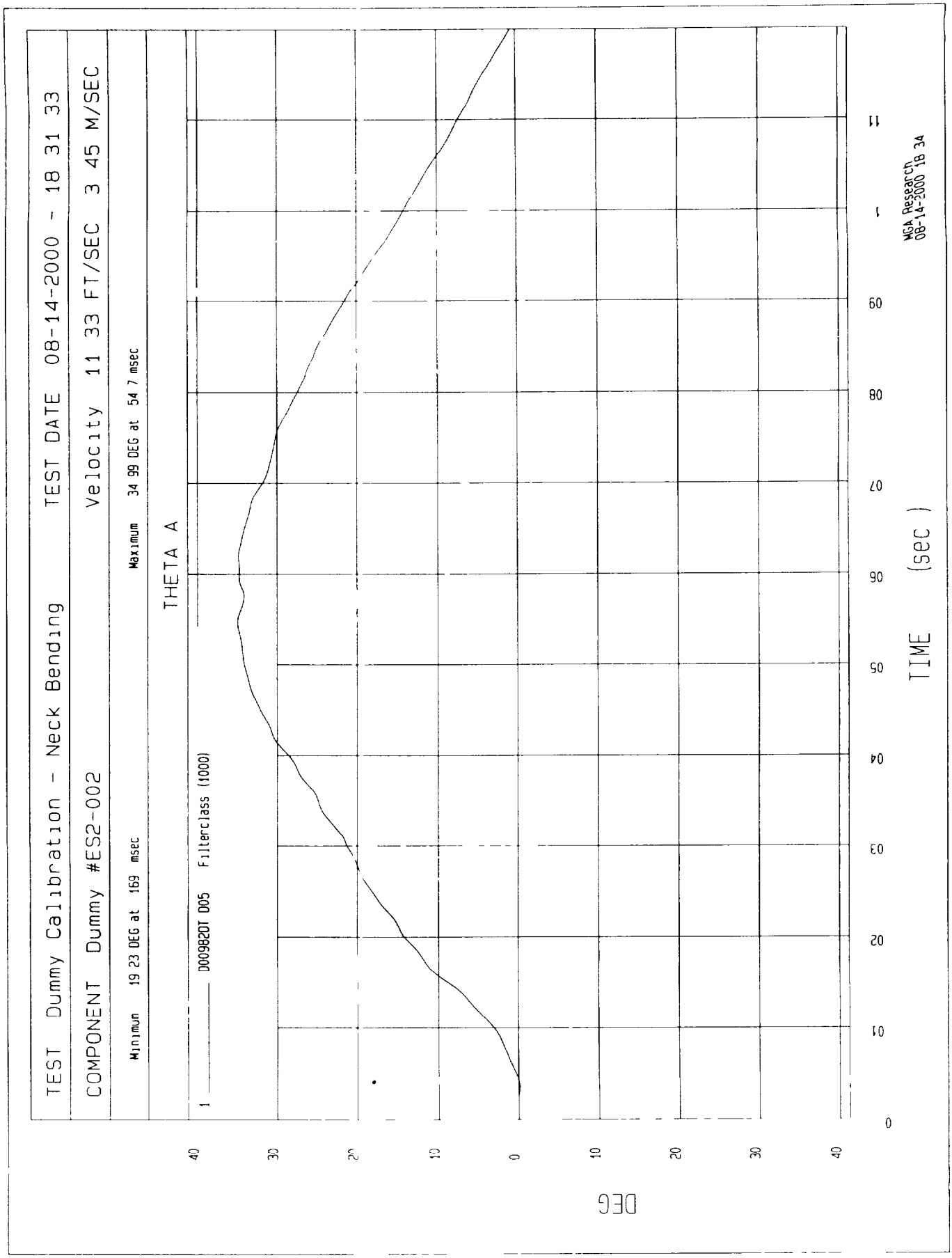
* DID NOT MEET SPECIFICATIONS

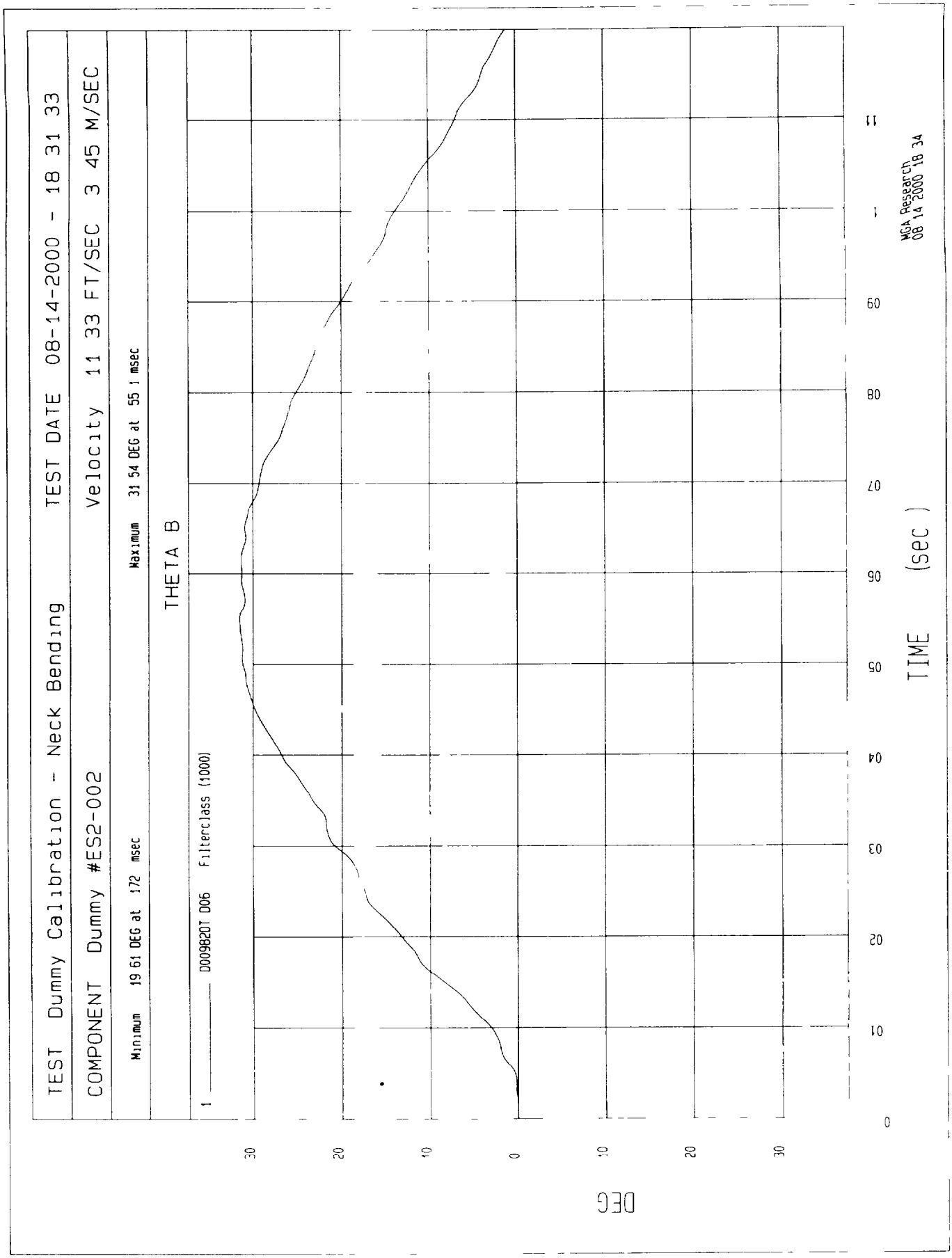
Technician: 

Approved By: David Winkelbauer


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 31 33
COMPONENT Dummy #ES2-002
Velocity 11 326 FT/SEC 3 45 M/SEC
Minimum - 34 28 G S at 10 1 msec
Maximum 8 00 G S at 46 7 msec
PENDULUM ACCELERATION
1 D0098AT A04
MGA Research
08-14-2000 18 33
TIME (SEC)
G'S
10
0
10
20
30
40
0
10
20


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 31 33
COMPONENT Dummy #ES2-002
Velocity 11 33 FT/SEC 3 45 M/SEC
Minimum 33 65 DEG at 164 msec
Maximum 59 97 DEG at 55 5 msec
FLEXION ANGLE
1 ——— 000982DT D08 Filterclass (1000)
MGA Research
08 14 2000 18 34
DEG
TIME (sec)
50
40
20
0
20
40
60
0
10
20
30
40
50
60
70
80
90
1
11


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 31 33
COMPONENT Dummy #ES2-002
Velocity 11 33 FT/SEC 3 45 M/SEC
Minimum 19 23 DEG at 169 msec
Maximum 34 99 DEG at 54 7 msec
THETA A
1 D0098207 005 Filterclass (1000)
DEG
TIME (sec)
MGA Research
08-14-2000 18 34


TEST Dummy Calibration - Neck Bending
TEST DATE 08-14-2000 - 18 31 33
COMPONENT Dummy #ES2-002
Velocity 11 33 FT/SEC 3 45 M/SEC
Minimum 19 61 DEG at 172 msec
Maximum 31 54 DEG at 55 1 msec
THETA B
1 D0098207 D06 Filterclass (1000)
DEG
30
20
10
0
10
20
30
TIME (sec)
0
10
02
03
04
05
06
07
08
09
10
11
MGA Research
08 14 2000 18 34

MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-002

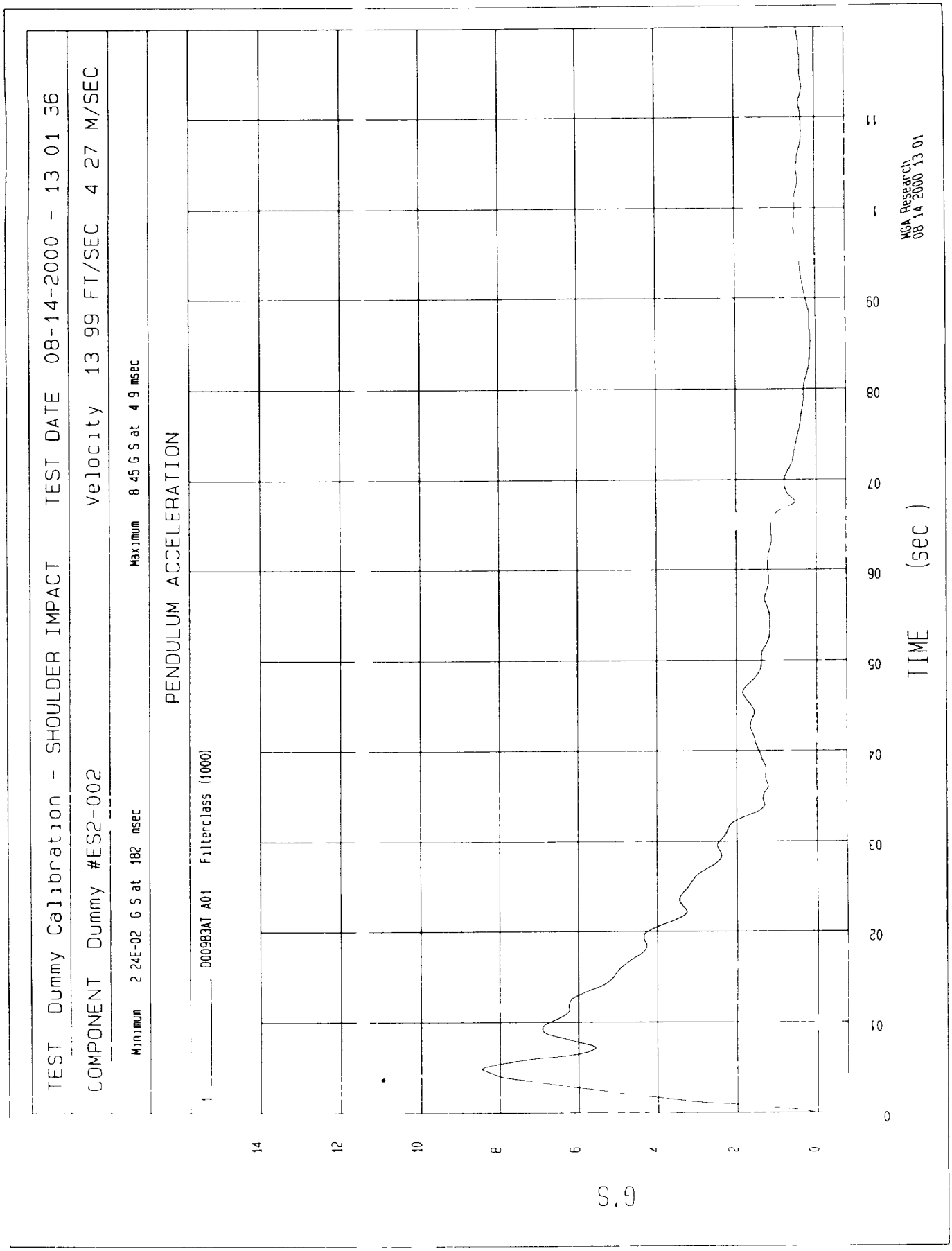
Test Number D00983

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Pendulum Speed	4 2 – 4 4 m/s	4.3
Max Resultant Acceleration	7 5 – 10 5 g's	8.5
Time of Max Pendulum Acceleration		4.9 ms

TEST MEETS SPECIFICATIONS

Technician 

Approved By David Winkelbauer


TEST Dummy Calibration - SHOULDER IMPACT TEST DATE 08-14-2000 - 13 01 36
COMPONENT Dummy #ES2-002 Velocity 13 99 FT/SEC 4 27 M/SEC
Minimum 2 24E-02 G S at 182 msec Maximum 8 45 G S at 4 9 msec
PENDULUM ACCELERATION
1 D009B3AT A01 Filterclass (1000)
14
12
10
8
6
4
2
0
0
10
20
30
40
50
60
70
80
90
100
110
TIME (sec)
MGA Research
08 14 2000 13 01
S.9

MGA RESEARCH CORPORATION

UPPER/MIDDLE/LOWER RIB TESTS

EUROSID 2 DUMMY

Date: August 14, 2000

Dummy Serial Number ES2-002

Test Number. D00984/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Displacement at 2 m/s	23.5 – 27 5 mm	26 6
Displacement at 3 m/s	36 0 – 40 0 mm	39 3
Displacement at 4 m/s	46 0 – 51.0 mm	52 0 *

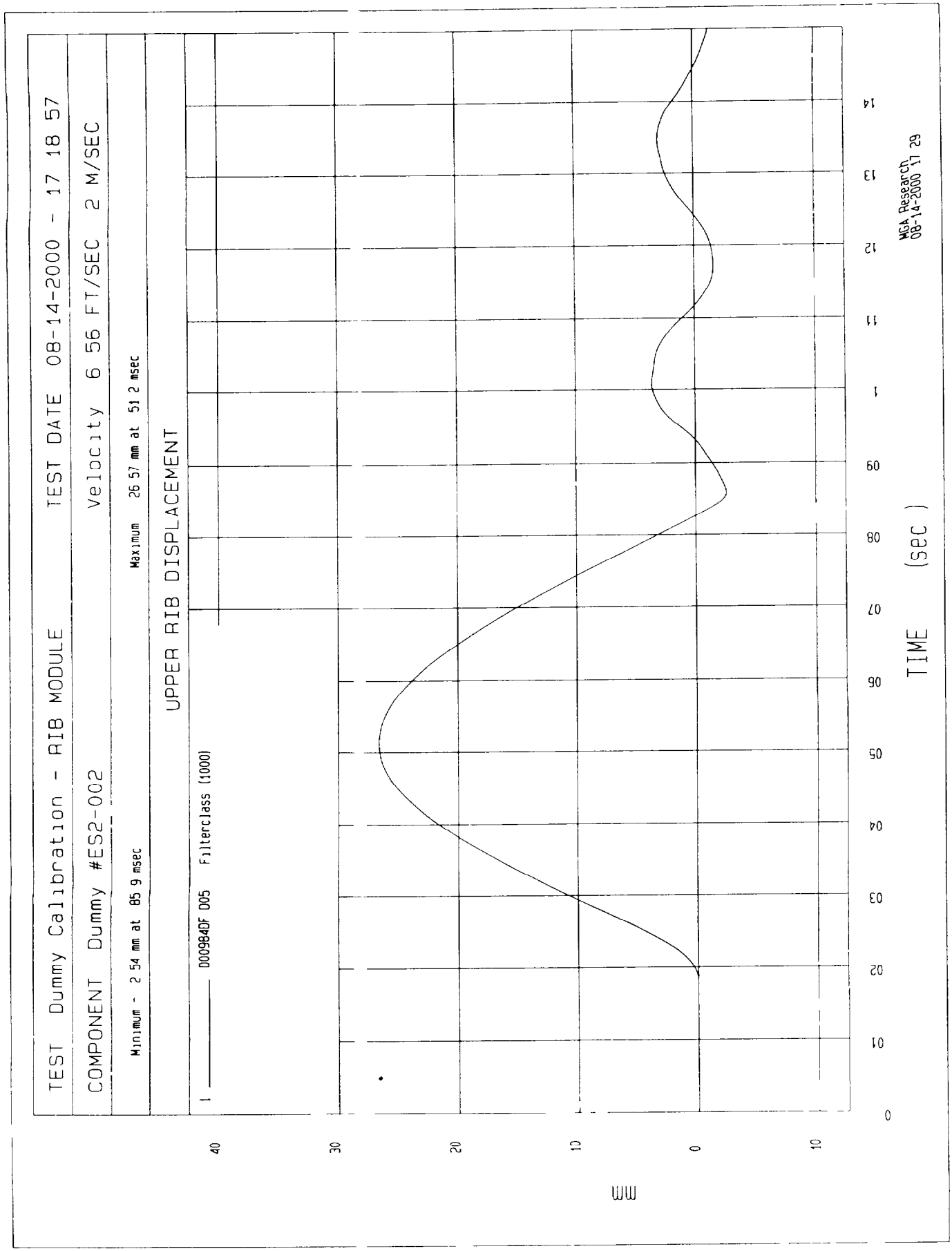
MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Displacement at 2 m/s	23 5 – 27 5 mm	26 1
Displacement at 3 m/s	36 0 – 40 0 mm	38 5
Displacement at 4 m/s	46 0 – 51.0 mm	50 8

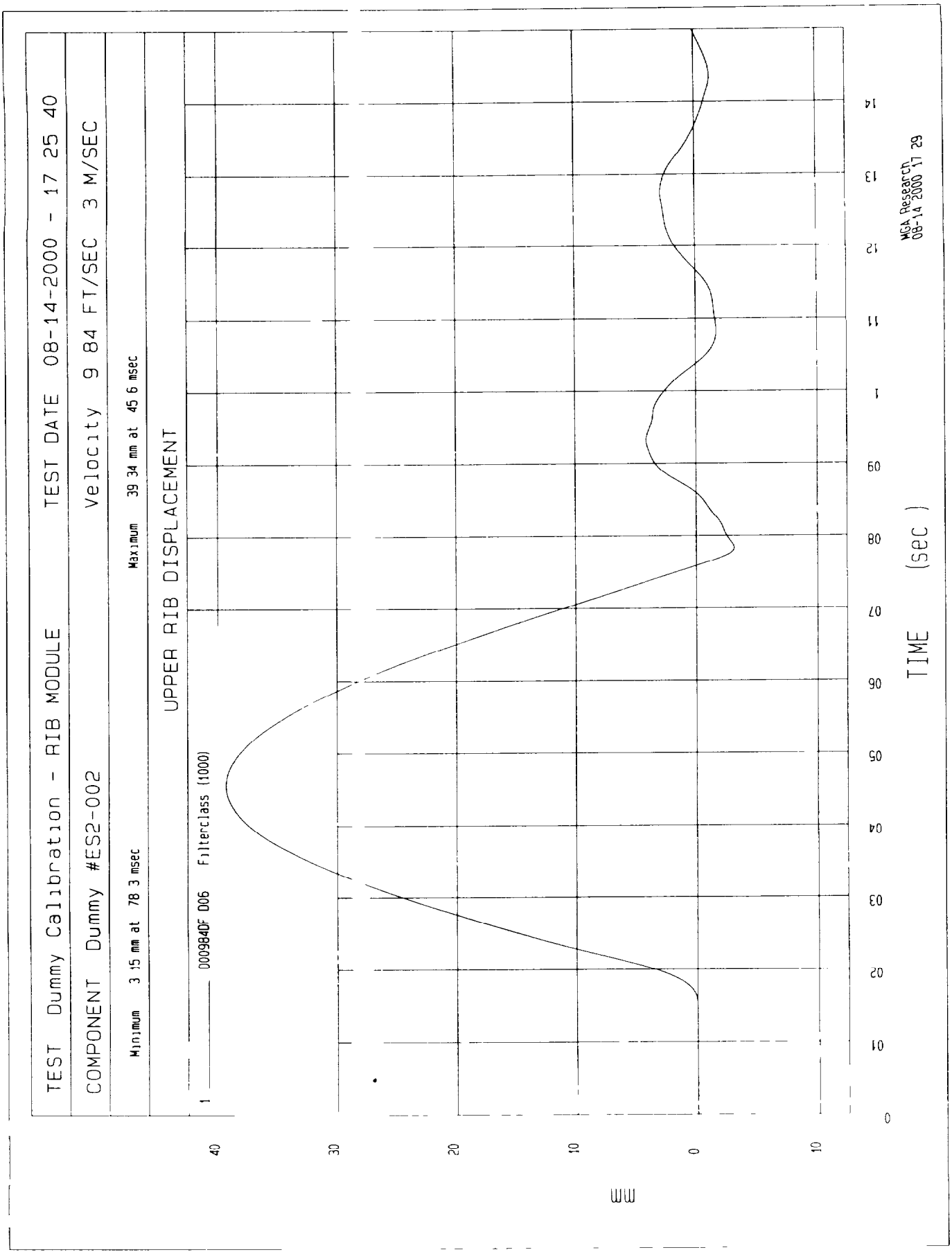
LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Displacement at 2 m/s	23 5 – 27 5 mm	25.1
Displacement at 3 m/s	36.0 – 40 0 mm	38.7
Displacement at 4 m/s	46.0 – 51.0 mm	50.4

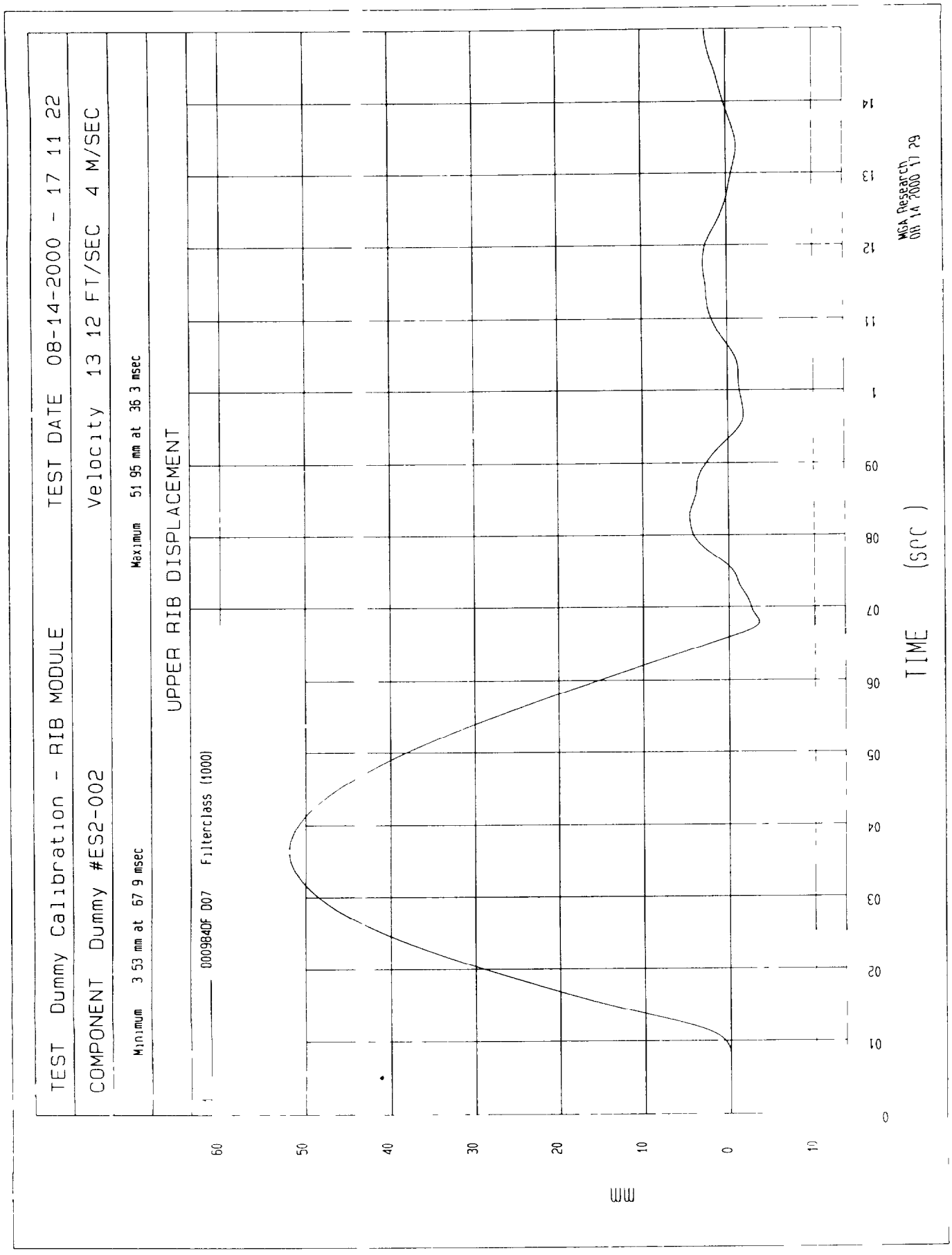
* DID NOT MEET SPECIFICATIONS

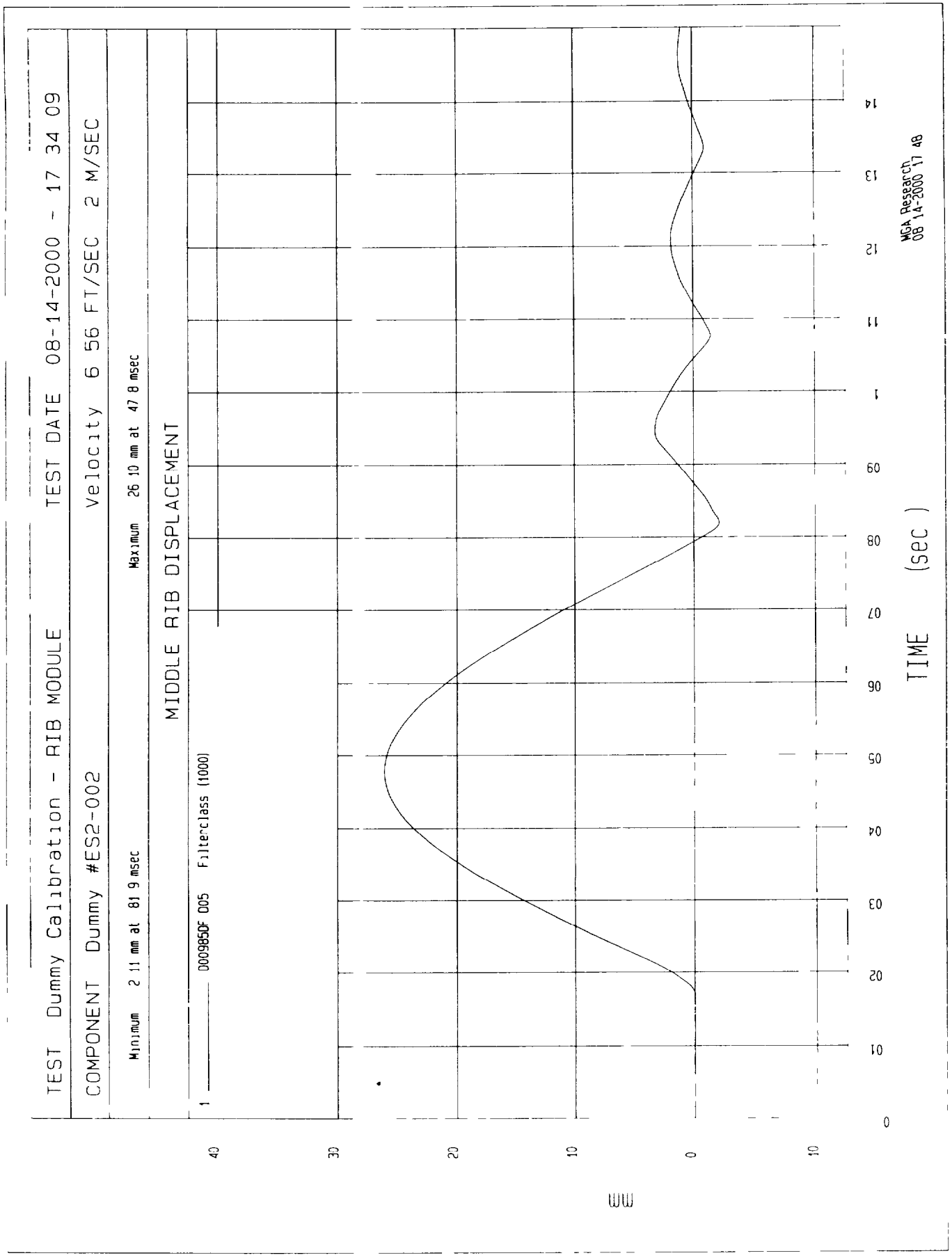
Technician: _____

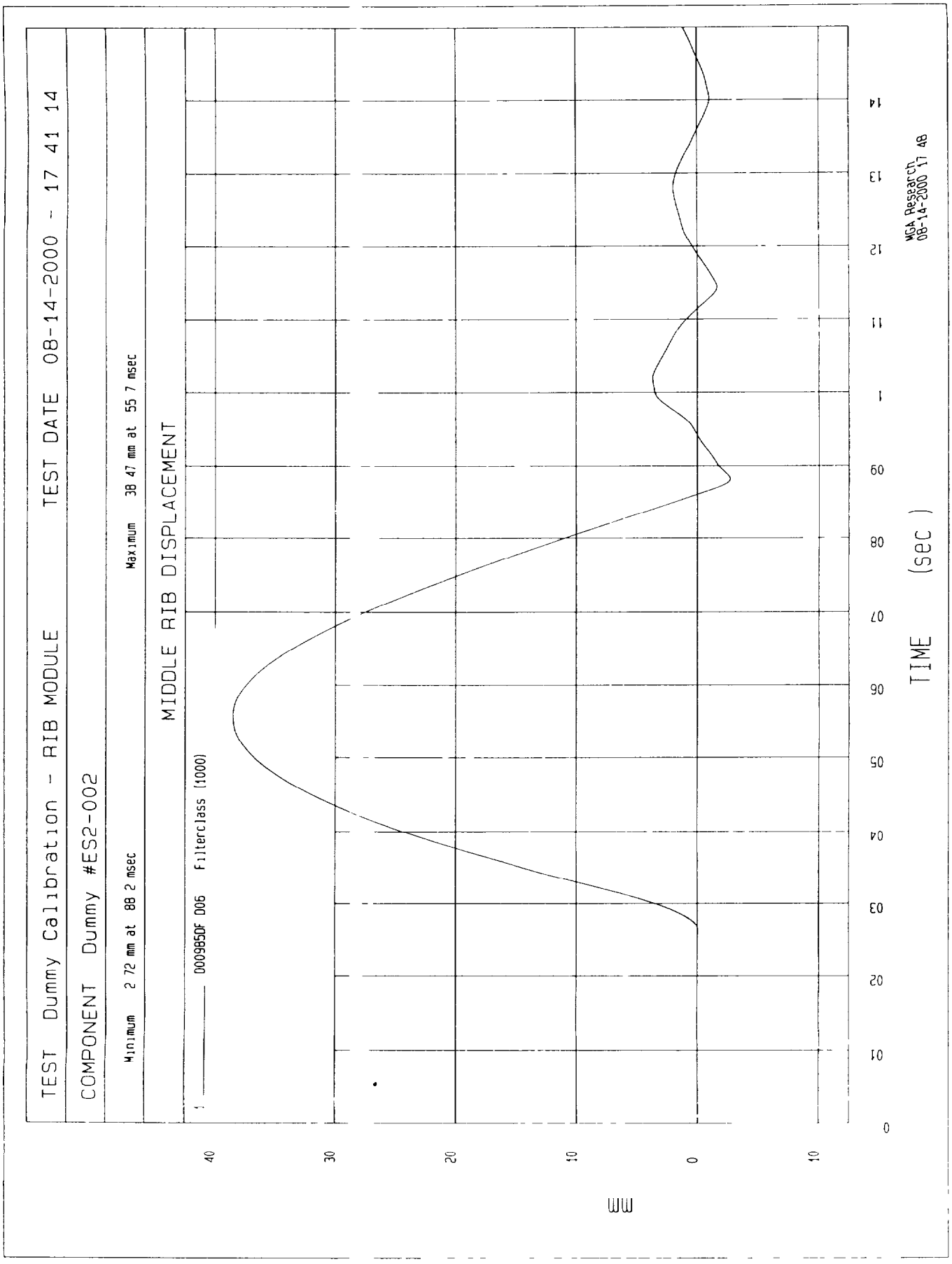
Approved By: _____

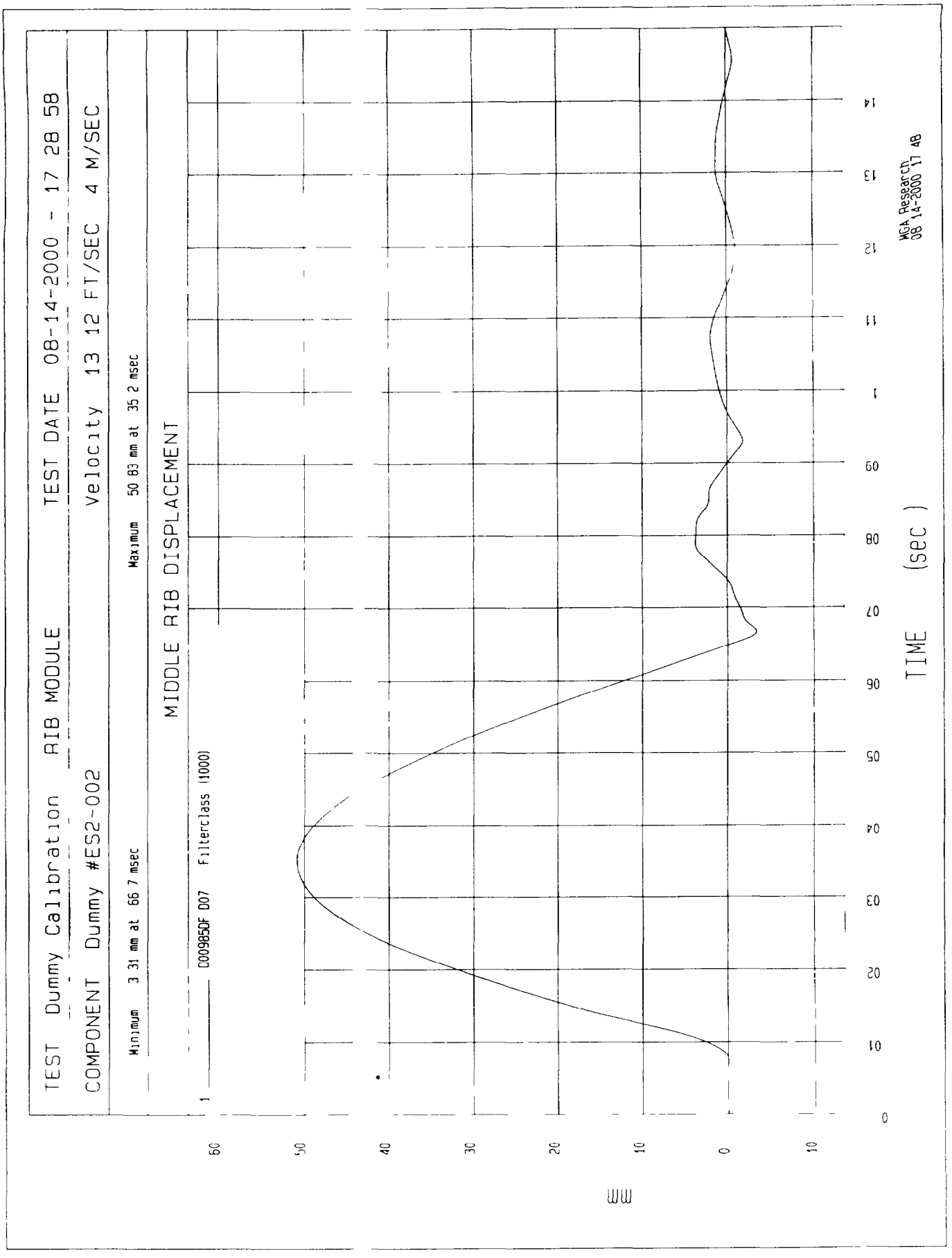

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 18 57
COMPONENT Dummy #ES2-002
Velocity 6 56 FT/SEC 2 M/SEC
Minimum - 2 54 mm at 85 9 msec
Maximum 26 57 mm at 51 2 msec
UPPER RIB DISPLACEMENT
1 ——— 000984DF 005 Filterclass (1000)
MGA Research
08-14-2000 17 29
mm
TIME (sec)
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14

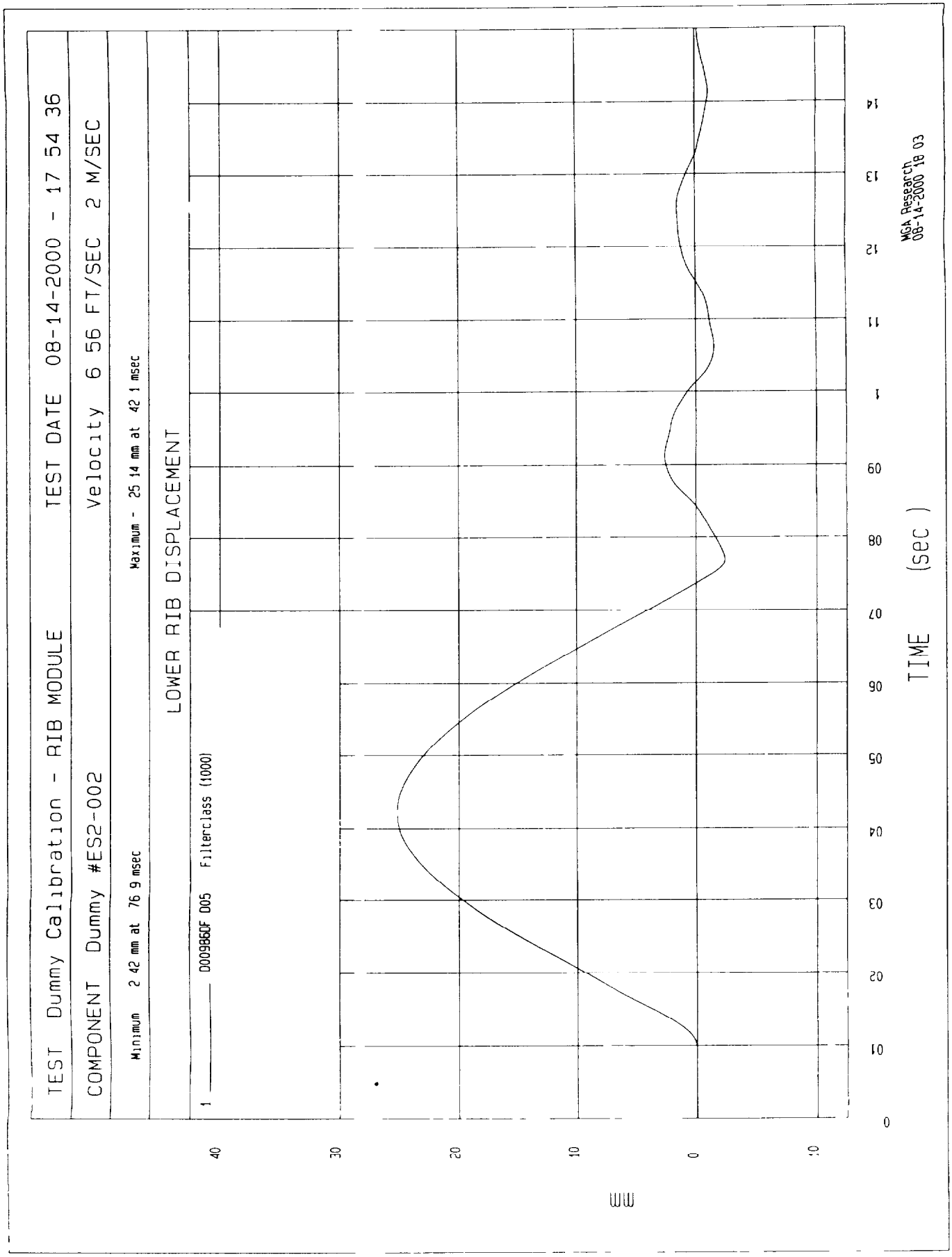

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 25 40
COMPONENT Dummy #ES2-002
Velocity 9 84 FT/SEC 3 M/SEC
Minimum 3 15 mm at 78 3 msec
Maximum 39 34 mm at 45 6 msec
UPPER RIB DISPLACEMENT
1 D009B4DF D06 Filterclass (1000)
MGA Research
08-14 2000 17 29
mm
TIME (sec)
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14

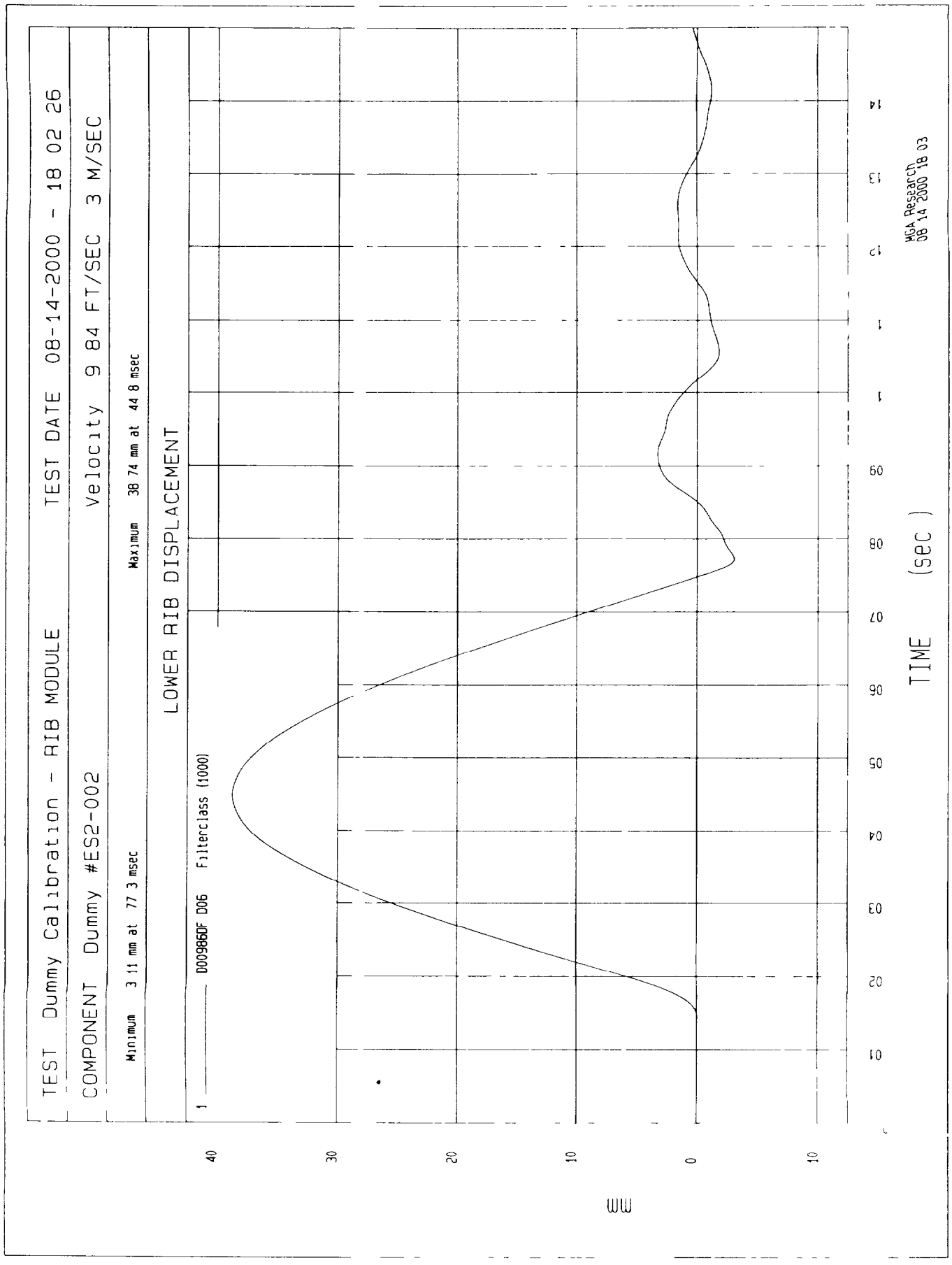

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 11 22
COMPONENT Dummy #ES2-002
Velocity 13 12 FT/SEC 4 M/SEC
Minimum 3 53 mm at 67 9 msec
Maximum 51 95 mm at 36 3 msec
UPPER RIB DISPLACEMENT
1 ——— 000984DF D07 Filterclass (1000)
MM
TIME (SEC)
MGA Research
08/14/2000 17 29

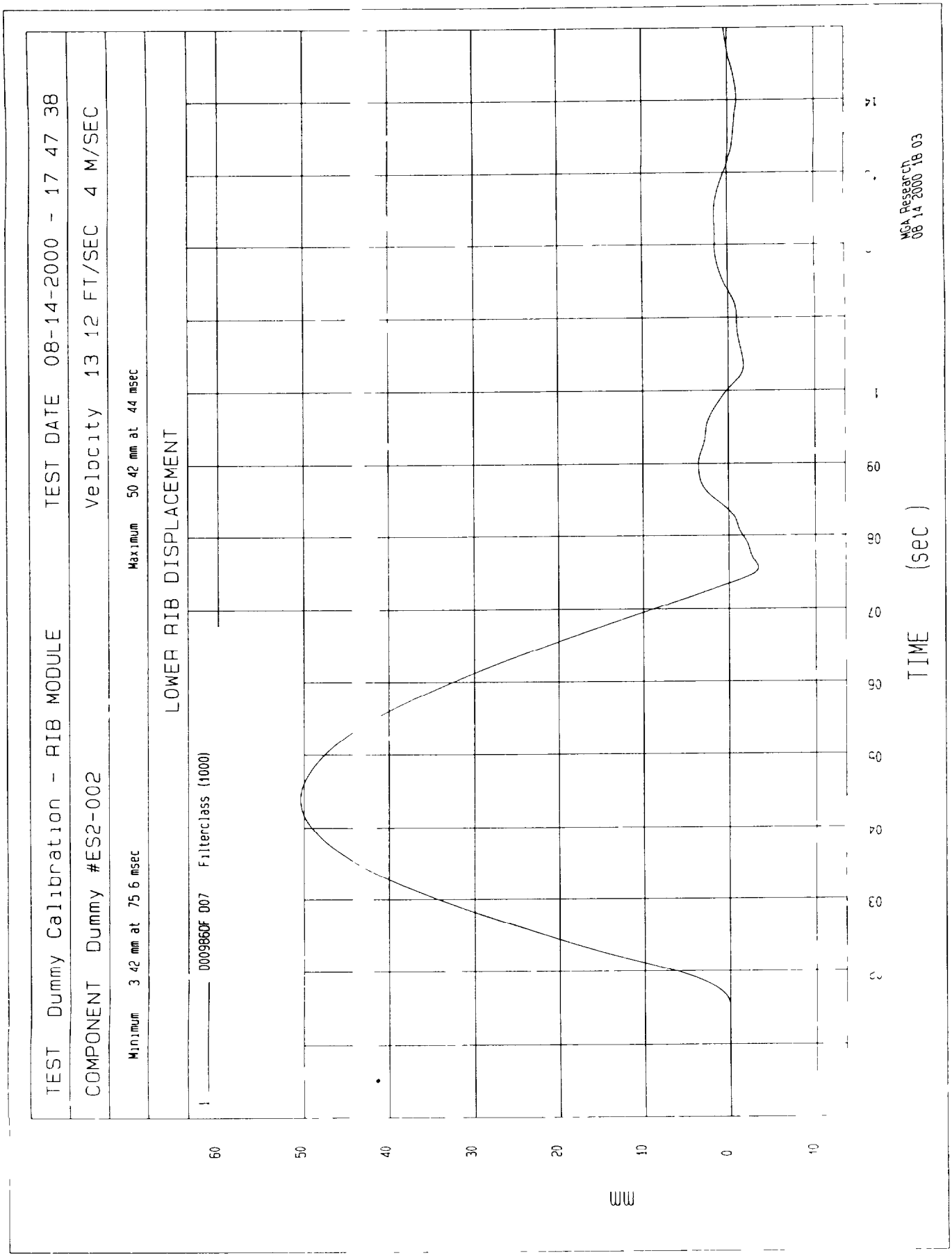

TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 34 09
COMPONENT Dummy #ES2-002
Velocity 6 56 FT/SEC 2 M/SEC
Minimum 2 11 mm at 81 9 msec
Maximum 26 10 mm at 47 8 msec
MIDDLE RIB DISPLACEMENT
1 0009850F 005 Filterclass (1000)
MGA Research
08 14-2000 17 48
mm
TIME (sec)
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 41 14
COMPONENT Dummy #ES2-002
Minimum 2 72 mm at 88 2 msec
Maximum 38 47 mm at 55 7 msec
MIDDLE RIB DISPLACEMENT
1 D009B5DF D06 Filterclass (1000)
MGA Research
08-14-2000 17 48
mm
TIME (sec)
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14


TEST Dummy Calibration RIB MODULE TEST DATE 08-14-2000 - 17 28 58
COMPONENT Dummy #ES2-002 Velocity 13 12 FT/SEC 4 M/SEC
Minimum 3 31 mm at 66 7 msec
Maximum 50 83 mm at 35 2 msec
MIDDLE RIB DISPLACEMENT
1 C0098DF D07 Filterclass (1000)
MGA Research
08 14-2000 17 48
mm
TIME (sec)
60
50
40
30
20
10
0
10
0
01
02
03
04
05
06
07
08
09
10
11
12
13
14


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 54 36
COMPONENT Dummy #ES2-002
Velocity 6 56 FT/SEC 2 M/SEC
Minimum 2 42 mm at 76 9 msec
Maximum - 25 14 mm at 42 1 msec
LOWER RIB DISPLACEMENT
1 D009B6CF 005 Filterclass (1000)
MGA Research
08-14-2000 18 03
mm
TIME (sec)
40
30
20
10
0
-10
0
10
20
30
40
50
60
70
80
90
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 18 02 26
COMPONENT Dummy #ES2-002
Velocity 9 84 FT/SEC 3 M/SEC
Minimum 3 11 mm at 77 3 msec
Maximum 38 74 mm at 44 8 msec
LOWER RIB DISPLACEMENT
1 D00986DF D06 Filterclass (1000)
MGA Research
08 14 2000 18 03
mm
TIME (sec)


TEST Dummy Calibration - RIB MODULE
TEST DATE 08-14-2000 - 17 47 38
COMPONENT Dummy #ES2-002
Velocity 13 12 FT/SEC 4 M/SEC
Minimum 3 42 mm at 75 6 msec
Maximum 50 42 mm at 44 msec
LOWER RIB DISPLACEMENT
1 D009860F D07 Filterclass (1000)
MGA Research
08 14 2000 18 03
mm
TIME (sec)

MGA RESEARCH CORPORATION

ABDOMEN TEST

EUROSID 2 DUMMY

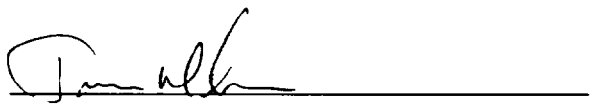
Date: August 14, 2000

Dummy Serial Number ES2-002

Test Number D00987

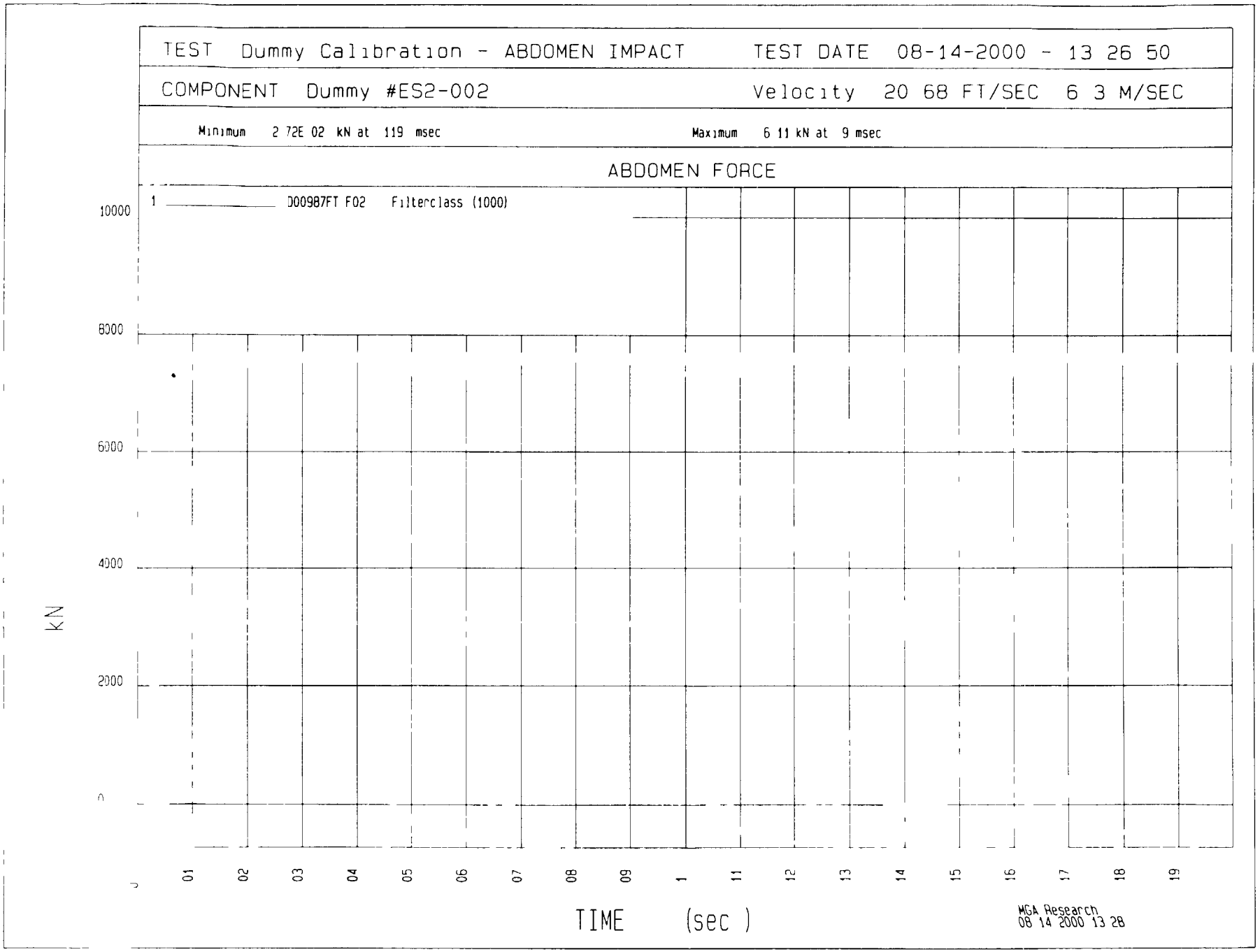
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Probe Speed (m/s)	6 2 – 6 4	6 3
Maximum Impact Force	9 5 – 11 1 kN	11 0
Time of Maximum Force	8.8 – 10 4 ms	9.2
Maximum Total Abdomen Force	5 9 – 7 9 kN	6.1
Time of Max Total Force	8 5 – 10 1 ms	9 0

TEST MEETS SPECIFICATIONS

Technician 

Approved By 


TEST Dummy Calibration - ABDOMEN IMPACT
TEST DATE 08-14-2000 - 13 26 08
COMPONENT Dummy #ES2-002
Velocity 20 68 FT/SEC 6 3 M/SEC
Minimum 6 21E-02 kN at 81 msec
Maximum 11 01 kN at 9 2 msec
PROBE FORCE
1 D00987FT F01 Filterclass (1000)
12
10
8
6
4
2
0
kN
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
TIME (sec)
MGA Research
08 14 2000 13 28


TEST Dummy Calibration - ABDOMEN IMPACT
TEST DATE 08-14-2000 - 13 26 50
COMPONENT Dummy #ES2-002
Velocity 20 68 FT/SEC 6 3 M/SEC
Minimum 2 72E 02 kN at 119 msec
Maximum 6 11 kN at 9 msec
ABDOMEN FORCE
1 D00987FT F02 Filterclass (1000)
10000
8000
6000
4000
2000
0
kN
01
02
03
04
05
06
07
08
09
1
11
12
13
14
15
16
17
18
19
TIME (sec)
MGA Research
08 14 2000 13 28

MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

EUROSID 2 DUMMY

Date August 14, 2000

Dummy Serial Number ES2-002

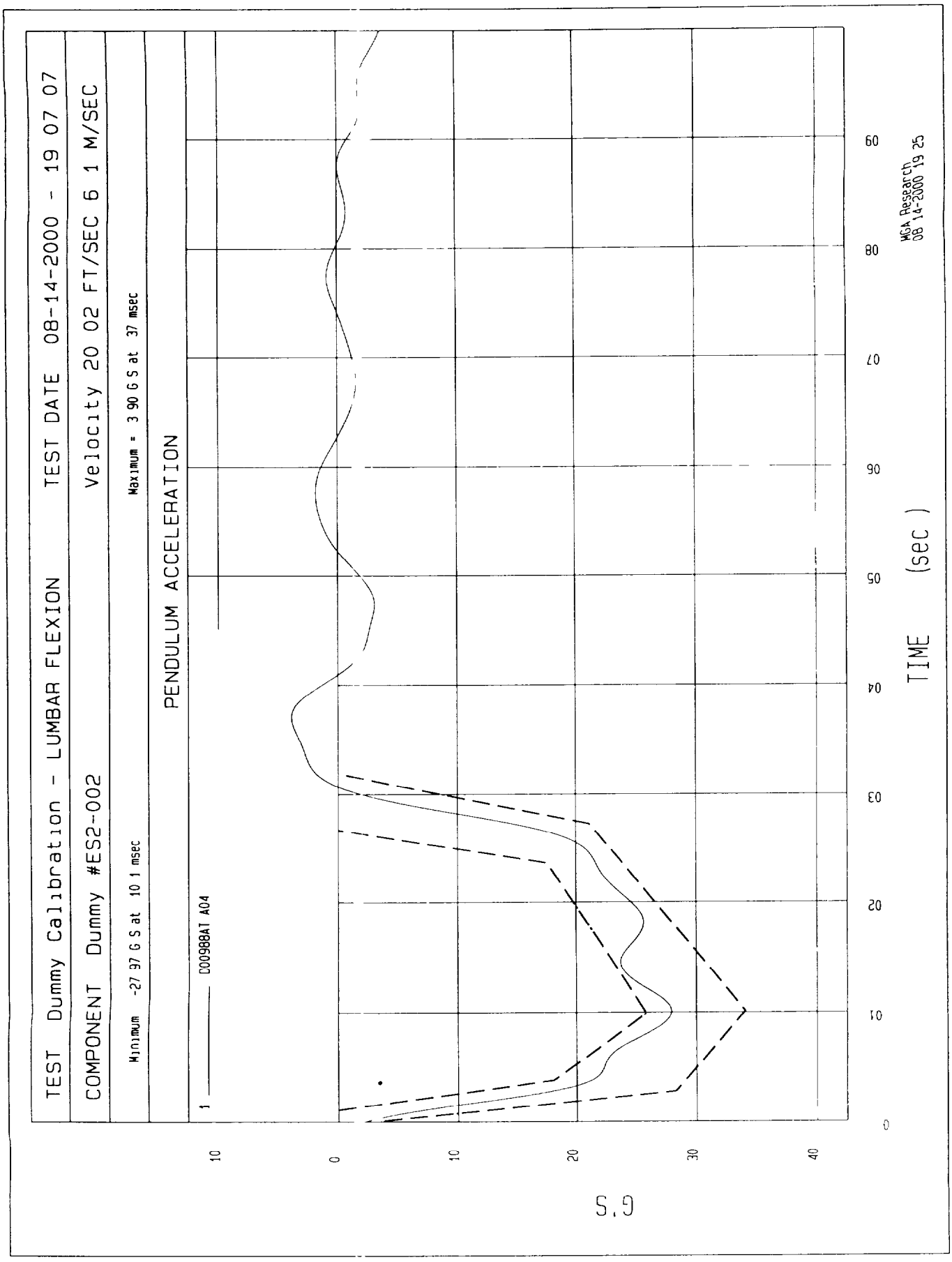
Test Number D00988

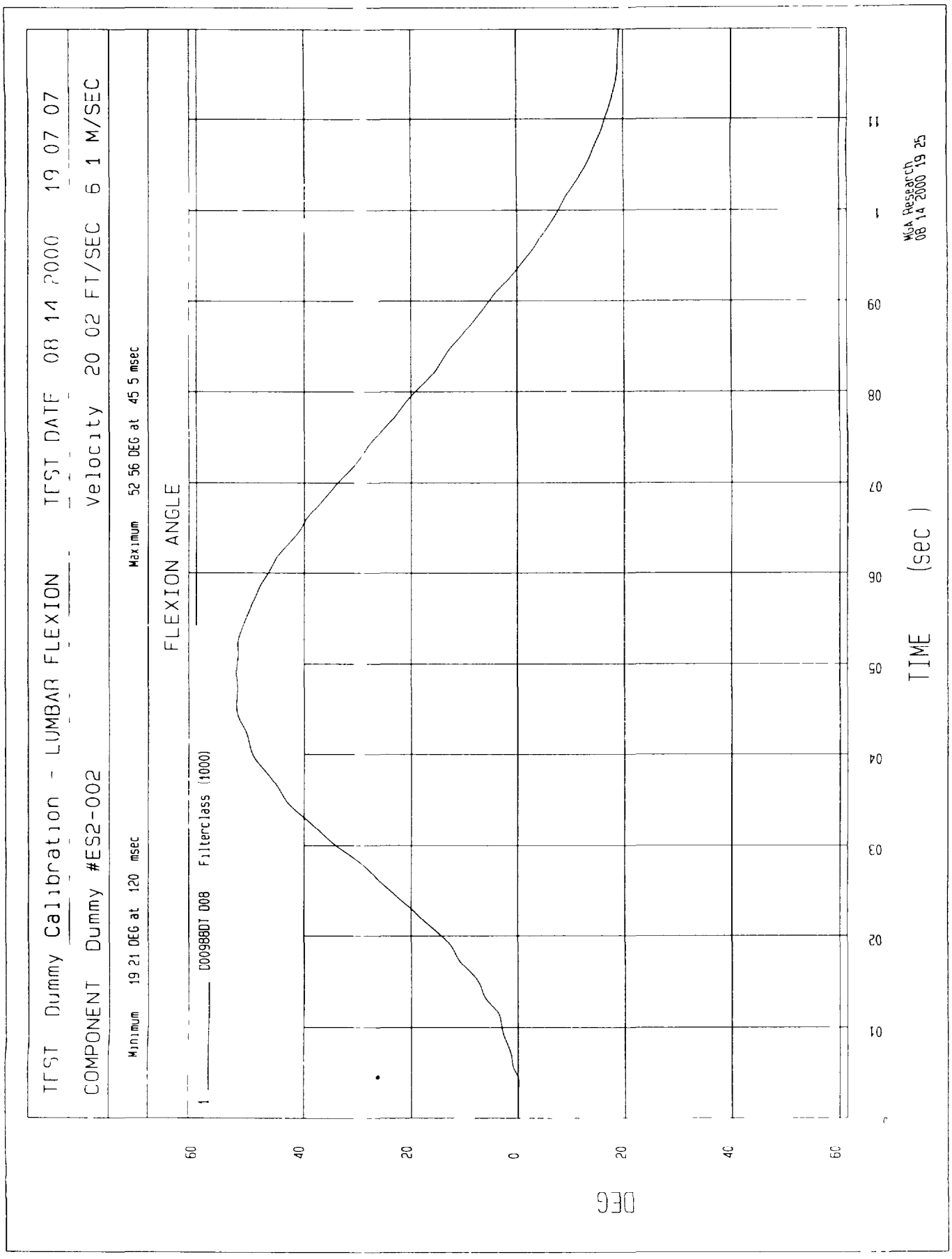
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	22
Relative Humidity (%)	10 – 70	54
Pendulum Speed	5 95 – 6 15 m/s	6 10
Max Pendulum Acceleration		-28 0 g's
Time Max Pendulum Acceleration		10.1 ms
Maximum Flexion Angle	45 0 – 55.0 deg	52.6
Time of Max Flexion Angle	39 0 – 53 0 ms	45 5
Maximum Angle Theta (A)	31.0 – 35 0 deg	33 6
Time of Max Theta (A)	45 0 – 55 0 ms	45 3
Maximum Angle Theta (B)	27 0 – 31 0 deg	29.7
Time of Max Theta (B)	45 0 – 55 0 ms	49.2

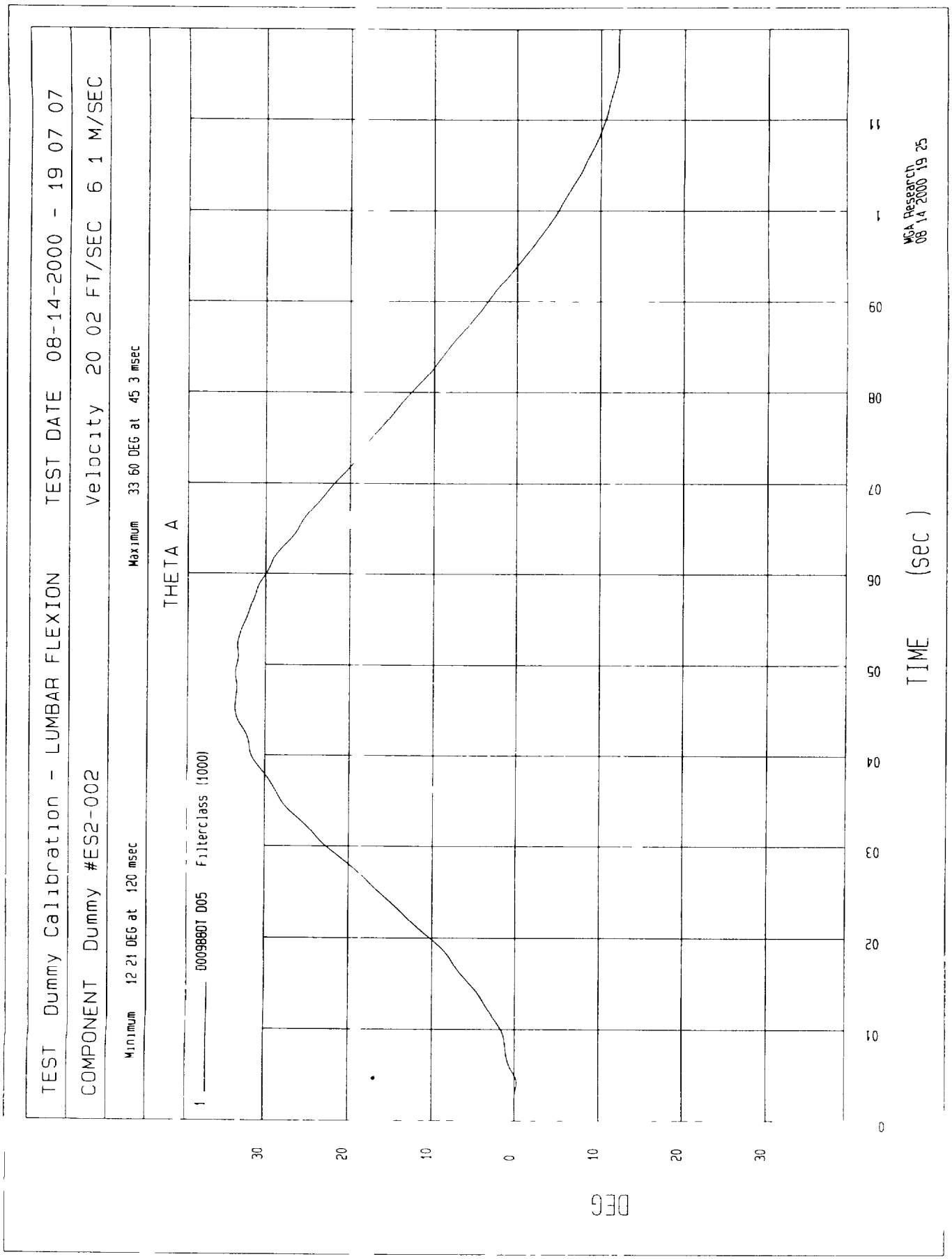
TEST MEETS SPECIFICATIONS

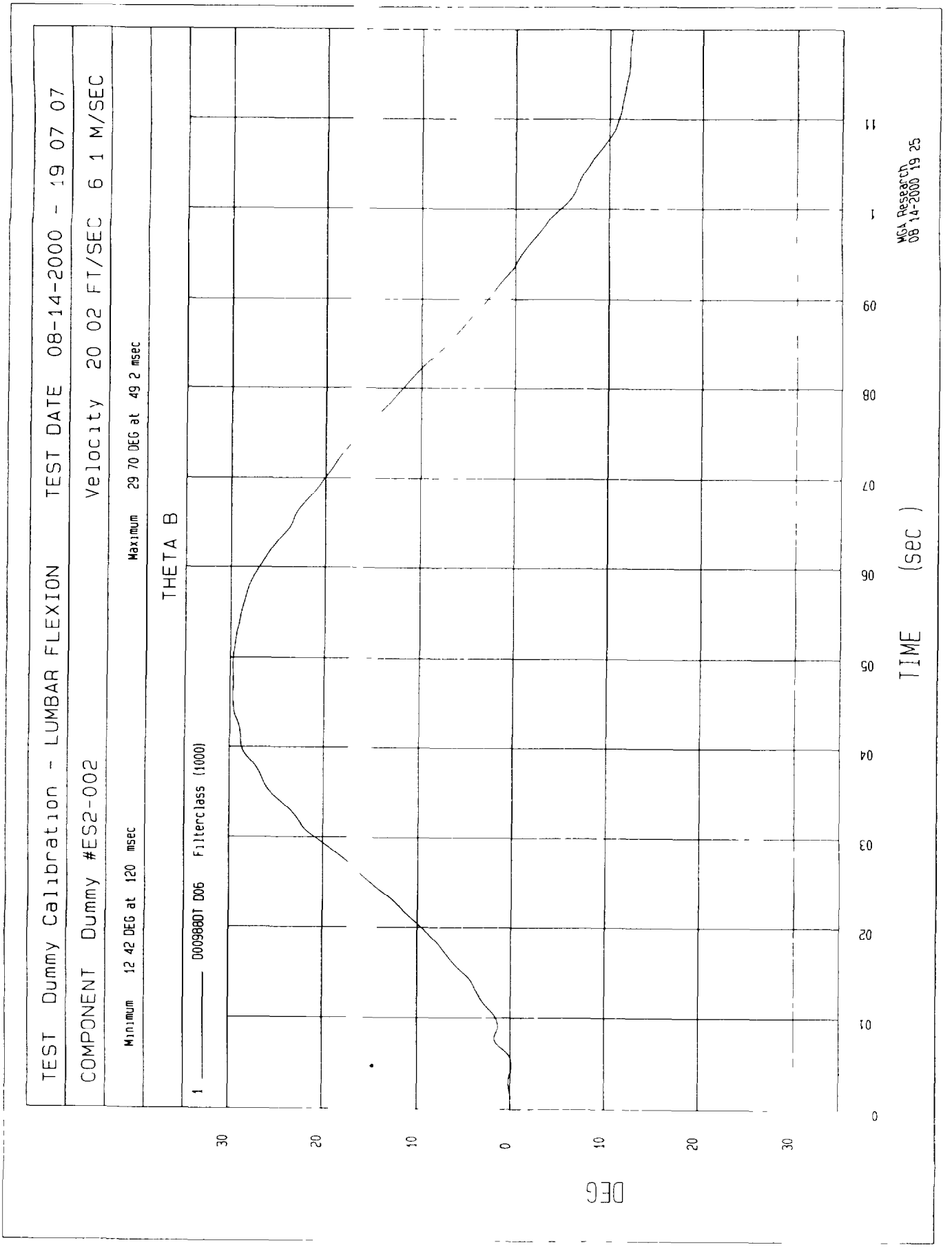
Technician _____

Approved By: David Winkelbauer


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 19 07 07
COMPONENT Dummy #ES2-002 Velocity 20 02 FT/SEC 6 1 M/SEC
Minimum -27 97 G S at 10 1 msec Maximum = 3 90 G S at 37 msec
PENDULUM ACCELERATION
1 C00988A1 A04
MGA Research 08 14-2000 19 25
TIME (sec)
G's
10
0
10
20
30
40
00
01
02
03
04
05
06
07
08
09


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08 14 2000 19 07 07
COMPONENT Dummy #ES2-002 Velocity 20 02 FT/SEC 6 1 M/SEC
Minimum 19 21 DEG at 120 msec
Maximum 52 56 DEG at 45 5 msec
FLEXION ANGLE
1 D0098BDT D0B Filterclass (1000)
DEG
60
40
20
0
20
40
60
TIME (sec)
0
01
02
03
04
05
06
07
08
09
10
11
MGA Research
08 14 2000 19 25


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 19 07 07
COMPONENT Dummy #ES2-002 Velocity 20 02 FT/SEC 6 1 M/SEC
Minimum 12 21 DEG at 120 msec
Maximum 33 60 DEG at 45 3 msec
THETA A
1 D0098BDT D05 Filterclass (1000)
DEG
30
20
10
0
10
20
30
TIME (sec)
0
01
02
03
04
05
06
07
08
09
10
11
MGA Research
08 14 2000 19 25


TEST Dummy Calibration - LUMBAR FLEXION TEST DATE 08-14-2000 - 19 07 07
COMPONENT Dummy #ES2-002 Velocity 20 02 FT/SEC 6 1 M/SEC
Minimum 12 42 DEG at 120 msec
Maximum 29 70 DEG at 49 2 msec
THETA B
1 D0098BDT D06 Filterclass (1000)
DEG
30
20
10
0
10
20
30
TIME (sec)
0
10
20
30
40
50
60
70
80
90
1
11
MGA Research
08 14-2000 19 25

MGA RESEARCH CORPORATION

PELVIS TEST

EUROSID 2 DUMMY

Date: August 14, 2000

Dummy Serial Number ES2-002

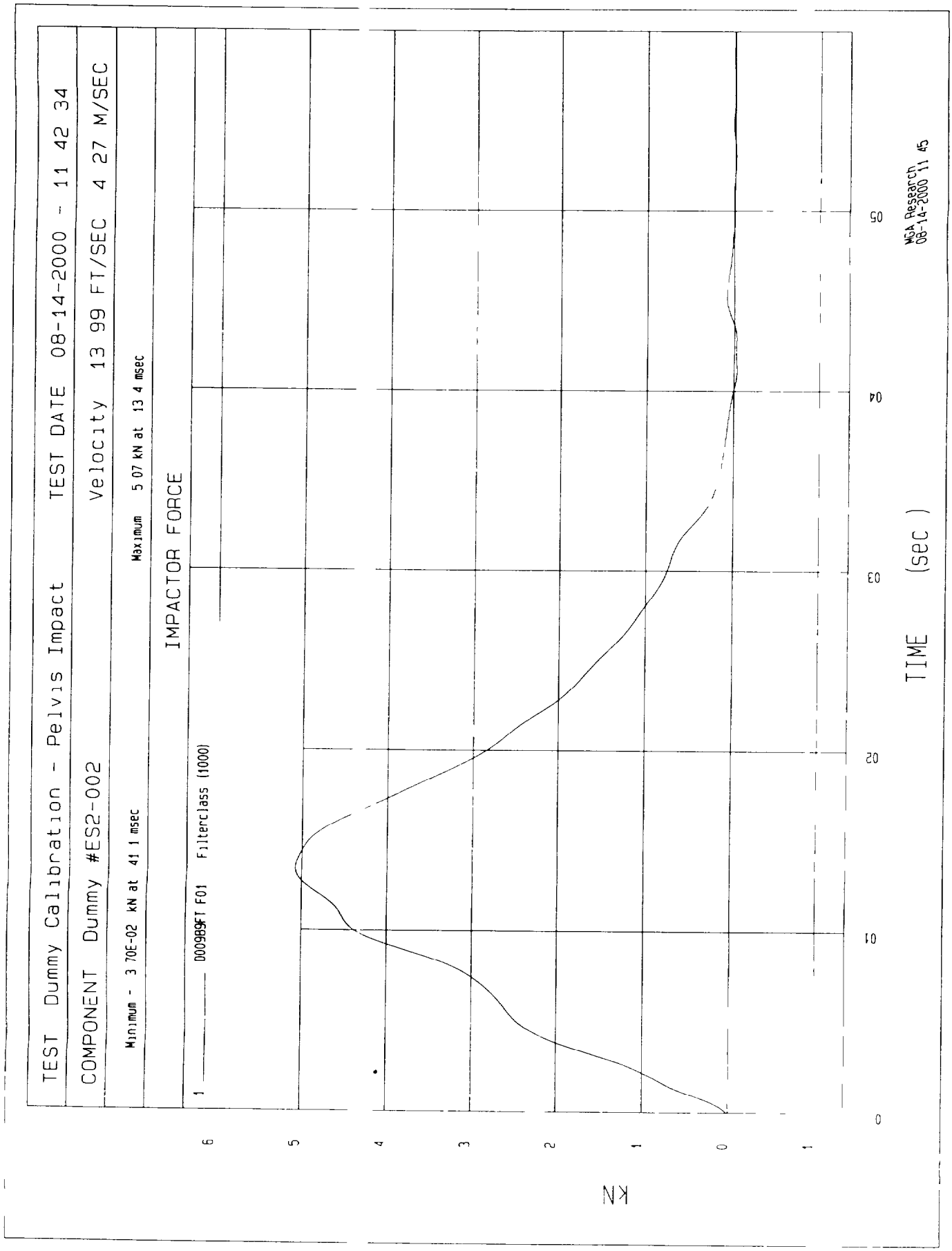
Test Number D00989

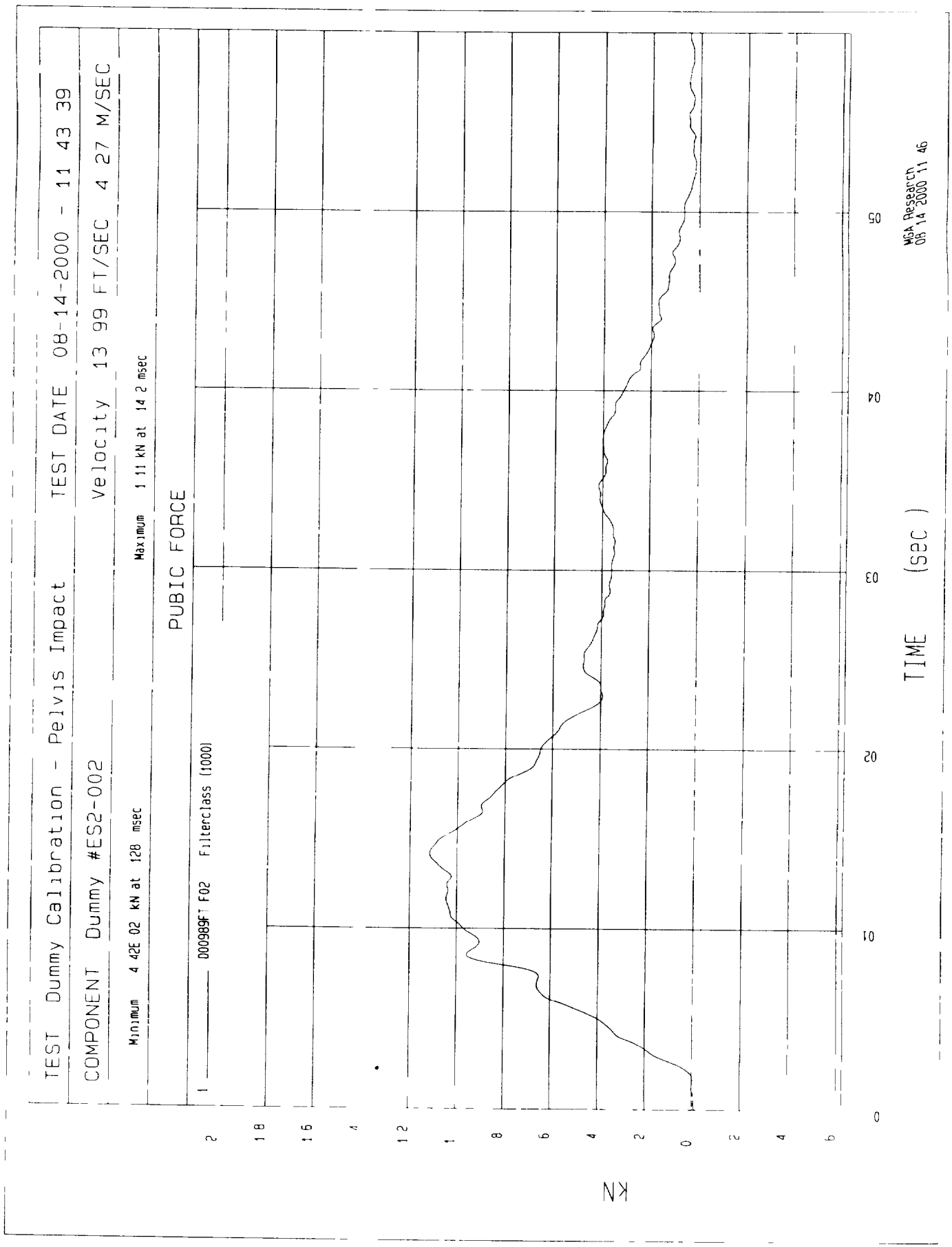
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21
Relative Humidity (%)	10 – 70	54
Pendulum Speed	4 2 – 4 4 m/s	4.3
Maximum Impactor Force	4 4 – 5 1 kN	5.1
Time of Max Impactor Force	10.3 – 15 5 ms	13 4
Maximum Pubic Force	1 04 – 1 64 kN	1.11
Time of Max Pubic Force	9.9 – 15 9 ms	14 2

TEST MEETS SPECIFICATIONS

Technician. _____

Approved By David Winkelbauer

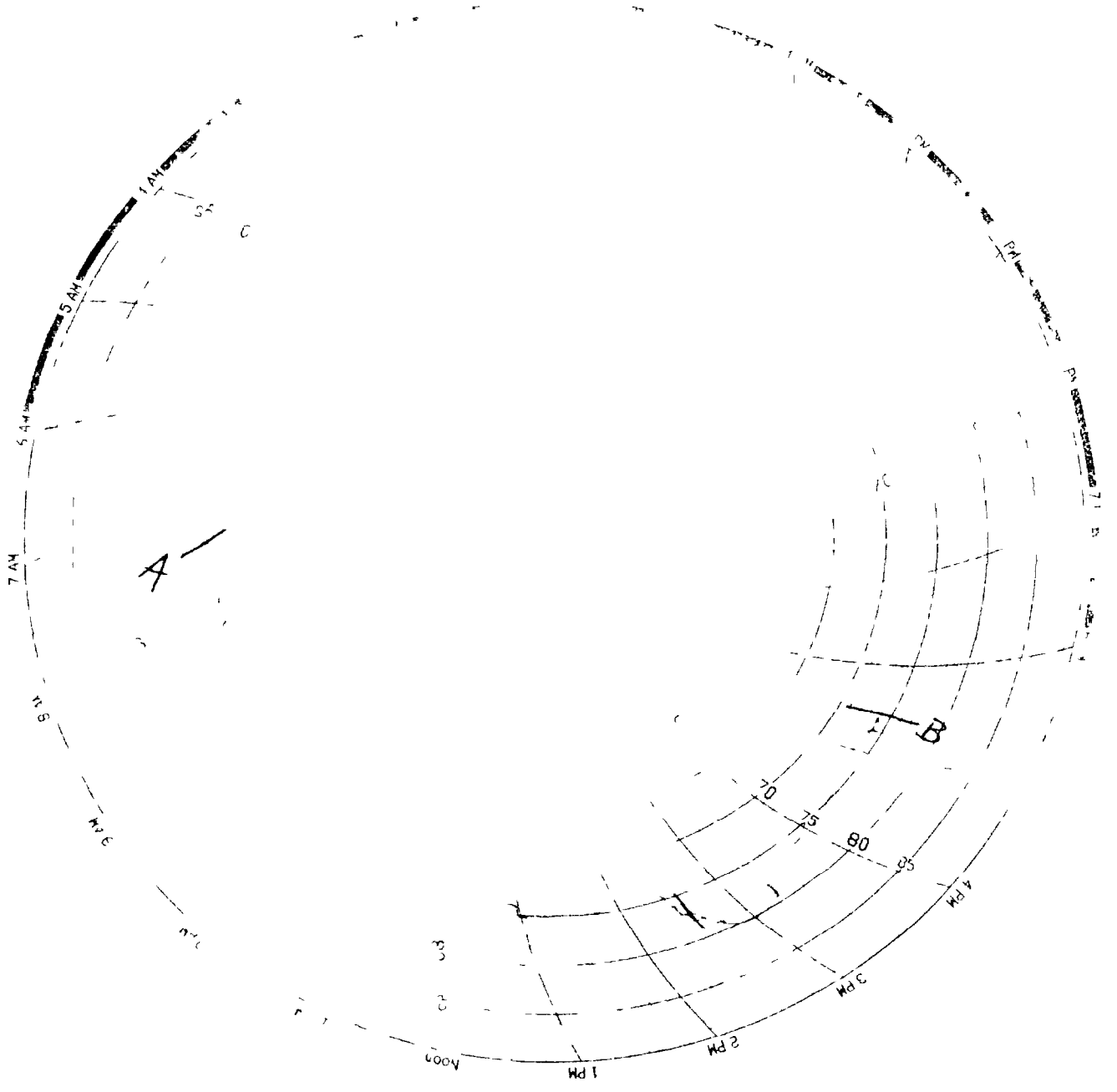

TEST Dummy Calibration - Pelvis Impact TEST DATE 08-14-2000 - 11 42 34
COMPONENT Dummy #ES2-002 Velocity 13 99 FT/SEC 4 27 M/SEC
Minimum - 3 70E-02 kN at 41 1 msec Maximum 5 07 kN at 13 4 msec
IMPACTOR FORCE
1 D0098FT F01 Filterclass (1000)
KN
TIME (sec)
MGA Research 08-14-2000 11 45


TEST Dummy Calibration - Pelvis Impact
TEST DATE 08-14-2000 - 11 43 39
COMPONENT Dummy #ES2-002
Velocity 13 99 FT/SEC 4 27 M/SEC
Minimum 4 42E 02 kN at 128 msec
Maximum 1 11 kN at 14 2 msec
PUBIC FORCE
1 D00989T F02 Filterclass (1000)
KN
TIME (sec)
MGA Research
08 14 2000 11 46

VEHICLE AND DUMMY TEMPERATURE

A= Dummies installed in vehicle

B= Test conducted



APPENDIX D – CALIBRATION INFORMATION

ES-2 INSTRUMENT CALIBRATION DATA

DRIVER	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	J13930	Endevco	June 2, 2000
Head Y Accelerometer	J13631	Endevco	June 2, 2000
Head Z Accelerometer	J13990	Endevco	June 2, 2000
Upper Neck Load Cell	076	Denton	November 1, 1999
Lower Neck Load Cell	102	First Technologies	December 21, 1999
Shoulder Load Cell	104	First Technologies	February 17, 2000
Shoulder Rotation	001	Space Age Controls	August 1, 2000
Upper Spine X Accelerometer	J13710	Endevco	June 1, 2000
Upper Spine Y Accelerometer	J13547	Endevco	June 1, 2000
Upper Spine Z Accelerometer	J13705	Endevco	June 1, 2000
Upper Rib Y Accelerometer	J11625	Endevco	June 1, 2000
Mid Rib Y Accelerometer	J10730	Endevco	June 1, 2000
Lower Rib Y Accelerometer	J11014	Endevco	June 1, 2000
Upper Rib Displacement	ES2-001UR	Data Systems	March 1, 2000
Mid Rib Displacement	ES2-001MR	Data Systems	March 1, 2000
Lower Rib Displacement	ES2-001LR	Data Systems	March 1, 2000
Lower Spine X Accelerometer	J11046	Endevco	June 1, 2000
Lower Spine Y Accelerometer	J11784	Endevco	June 1, 2000
Lower Spine Z Accelerometer	J11047	Endevco	June 1, 2000
Torso Load Cell	096	Denton	November 1, 1999
T-12 Load Cell	078	Denton	October 29, 1999
Abdomen Front Load Cell	692	Denton	March 1, 2000
Abdomen Mid Load Cell	702	Denton	March 1, 2000
Abdomen Rear Load Cell	706	Denton	March 1, 2000
Pubic Symphysis Load Cell	144	Denton	June 7, 2000
Pelvis X Accelerometer	ALDM8	Endevco	July 12, 2000
Pelvis Y Accelerometer	ALDC3	Endevco	July 12, 2000
Pelvis Z Accelerometer	ALA92	Endevco	July 12, 2000
Right Femur Load Cell	121	First Technologies	July 13, 2000
Left Femur Load Cell	124	First Technologies	July 13, 2000

ES-2 INSTRUMENT CALIBRATION DATA

LEFT REAR PASSENGER	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	AMR94	Endevco	June 1, 2000
Head Y Accelerometer	AMTB1	Endevco	June 1, 2000
Head Z Accelerometer	AC9B7	Endevco	June 1, 2000
Upper Neck Load Cell	079	Denton	December 10, 1999
Lower Neck Load Cell	103	First Technologies	July 14, 2000
Shoulder Load Cell	108	First Technologies	March 16, 2000
Shoulder Rotation	002	Space Age Controls	August 1, 2000
Upper Spine X Accelerometer	J14896	Endevco	July 7, 2000
Upper Spine Y Accelerometer	J14771	Endevco	July 7, 2000
Upper Spine Z Accelerometer	J14774	Endevco	July 7, 2000
Upper Rib Y Accelerometer	AHTN3	Endevco	July 7, 2000
Mid Rib Y Accelerometer	AHT12	Endevco	July 7, 2000
Lower Rib Y Accelerometer	AH0C3	Endevco	July 7, 2000
Upper Rib Displacement	ES2-002UR	Data Systems	March 1, 2000
Mid Rib Displacement	ES2-002UR	Data Systems	March 1, 2000
Lower Rib Displacement	ES2-002UR	Data Systems	March 1, 2000
Lower Spine X Accelerometer	J13653	Endevco	June 2, 2000
Lower Spine Y Accelerometer	J13713	Endevco	June 2, 2000
Lower Spine Z Accelerometer	J13649	Endevco	June 2, 2000
Torso Load Cell	100	Denton	December 10, 1999
T-12 Load Cell	079	Denton	June 2, 2000
Abdomen Front Load Cell	110	First Technologies	July 11, 2000
Abdomen Mid Load Cell	111	First Technologies	March 1, 2000
Abdomen Rear Load Cell	112	First Technologies	March 1, 2000
Pubic Symphysis Load Cell	108	First Technologies	November 1, 1999
Pelvis X Accelerometer	AGRW3	Endevco	June 2, 2000
Pelvis Y Accelerometer	AHY71	Endevco	June 2, 2000
Pelvis Z Accelerometer	AMPY0	Endevco	June 2, 2000
Right Femur Load Cell	125	First Technologies	July 13, 2000
Left Femur Load Cell	126	First Technologies	July 13, 2000

VEHICLE INSTRUMENT CALIBRATION DATA

	VEHICLE ACCELEROMETERS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Right Front Sill X	J10-E12	Entran	February 11, 2000
Right Front Sill Y	D05-R11	Entran	May 18, 2000
Right Front Sill Z	G13-B03	Entran	March 17, 2000
Right Rear Sill X	G01-J04	Entran	June 2, 2000
Right Rear Sill Y	J10-E03	Entran	March 16, 2000
Right Rear Sill Z	A09-G02	Entran	February 11, 2000
Left Front Sill Y	E10-F07	Entran	August 8, 2000
Left Rear Sill Y	I18-E05	Entran	April 7, 2000
Floorpan @ Rear Axle X	D05-R10	Entran	July 11, 2000
Floorpan @ Rear Axle Y	G01-J09	Entran	July 11, 2000
Floorpan @ Rear Axle Z	F20-G06	Entran	July 11, 2000
Left Mid A Post Y	C18-G12	Entran	August 8, 2000
Left Lower A Post Y	F20-G03	Entran	August 8, 2000
Left Upper B Post Y	H02-J06	Entran	June 2, 2000
Left Mid B Post Y	E10-F19	Entran	August 8, 2000
Left Lower B Post Y	E13-D06	Entran	August 8, 2000
Driver Seat Track Y	I26-D11	Entran	February 11, 2000
Right Rear Occupant Compartment Y	K11-G07	Entran	August 8, 2000
Vehicle CG X	C25-A06	Entran	May 18, 2000
Vehicle CG Y	H02-J04	Entran	March 20, 2000
Vehicle CG Z	F07-A24	Entran	February 11, 2000
Left Front Door Upper Y	E10-F17	Entran	February 11, 2000
Left Front Door Mid Y	D05-R20	Entran	May 18, 2000
Left Front Door Lower Y	F12-G08	Entran	June 2, 2000

Note All Entran accelerometers are Model No EGE-72.

VEHICLE INSTRUMENT CALIBRATION DATA

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Left Front Door Rear Lower Y	K11-J12	Entran	June 2, 2000
Left Rear Door Upper Y	K16-X05	Entran	August 8, 2000
Left Rear Door Mid Y	F18-G08	Entran	June 2, 2000
Left Rear Door Lower Y	G01-J19	Entran	August 8, 2000
Left Rear Door Rear Lower Y	D05-R25	Entran	August 8, 2000

Note: All Entran accelerometers are Model No. EGE-72

APPENDIX E – PROCEDURE USED FOR ES-2 POSITIONING

APPENDIX E – PROCEDURE USED FOR ES-2 POSITIONING

Installation of the Side-Impact Dummy (recommended practice)

1 GENERAL

1.1 The dummy to be used for the following installation procedure is described in Annex 6 to this regulation

1.2 Adjust the knee joints so that they just support the leg when it is extended horizontally (1 to 2 g)

1 3 Clothe the dummy in form fitting cotton stretch mid-calf length pants. Each foot is equipped with a shoe

2. INSTALLATION

2 1 Place the dummy in the outboard front seat of the impact side as described in the test specifications

2 2 The mid-sagittal plane of the dummy shall coincide with the centerplane of the occupant (as determined according to Annex 3, paragraph 2 8) with a tolerance of 2°

2 3 The pelvis of the dummy shall be positioned according to the following:

2 3 1 The pelvis pitch angle shall be 20 0° +/- 2.5°.

2 3 2 A line passing through the dummy H-points shall pass through an imaginary circle in the mid-sagittal plane of the dummy. This circle has a radius of 10 mm and is located 20 mm horizontally forward and 5 mm vertically above the reference H-point, determined by the 3D H-point machine.

2 4 The upper torso of the dummy shall be positioned according to the following·

2 4 1 The upper torso shall be bent forward and then laid back against the seat back The shoulder of the dummy shall be set fully rearward

2 4 2 The torso reference line pitch angle shall be 25.0° +/- 2.5°. The torso reference line is defined as the thoracic spine center line.

2 5 The arms shall be positioned in such a way that the angle between the projection of the arm centerline on the mid-sagittal plane of the dummy and the torso reference line is 40° +/- 5°

2.6 For the driver's seating position, without inducing pelvis or torso movement, place the right foot of the dummy on the undepressed accelerator pedal with the heel resting as far forward as possible on the floorpan Set the left foot perpendicular to the lower leg with the heel resting on the floorpan in the same lateral line as the right heel. Set the knees of the dummy such that their outside surfaces are 150 +/- 10 mm from the plane of symmetry of the dummy. If possible, within these constraints, place the thighs of the dummy in contact with the seat cushion

2.7 For other seating positions, without inducing pelvis or torso movement, place the heels of the dummy as far forward as possible on the floorpan without compressing the seat cushion more than the compression due to the weight of the leg Set the knees of the dummy such that their outside surfaces are 150 +/- 10 mm from the plane of symmetry of the dummy.

APPENDIX F – ES-2 PEAK REPONSES

DRIVER (ES-2) PEAK RESPONSE TABLE

Location	Peak Values (G's)				
	Class	Axis	Units	Peak	Time (msec)
Head	1000	X	G	-20.21	58
	1000	Y	G	70 64	56
	1000	Z	G	-26 02	61
	1000	RES	G	74 99	58
Head Injury Criteria (HIC)				294	
Upper Neck Force	1000	X	N	-538.06	58
	1000	Y	N	276 65	132
	1000	Z	N	1387 94	61
	1000	RES	N	1471.23	61
Upper Neck Moment	600	X	Nm	-117.94	58
	600	Y	Nm	-73.33	61
	600	Z	Nm	37.65	85
	600	RES	Nm	137.76	60
Lower Neck Force	1000	X	N	468 55	60
	1000	Y	N	-72.31	42
	1000	Z	N	-1447	61
	1000	RES	N	1514.96	61
Lower Neck Moment	600	X	Nm	-81.75	60
	600	Y	Nm	-51.98	60
	600	Z	Nm	-39.69	87
	600	RES	Nm	97.36	60
Shoulder Force	1000	X	N	272 95	35
	1000	Y	N	518.04	48
	1000	Z	N	1287	49
	1000	RES	N	1385.5	49

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values (G's)				
	Class	Axis	Units	Peak	Time (msec)
Upper Spine	180	X	G	-14.4	48
	180	Y	G	55.83	48
	180	Z	G	6.2	60
Lower Spine	180	X	G	-7.84	35
	180	Y	G	53.81	40
	180	Z	G	-7.22	49
Upper Rib	180	Y	G	151.44	39
Mid Rib	180	Y	G	139.18	36
Lower Rib	180	Y	G	194.24	70
Upper Rib Deflection	180	Y	mm	-39.18	53
Mid Rib Deflection	180	Y	mm	-39.77	53
Lower Rib Deflection	180	Y	mm	-37.15	50
Upper Rib VC	180	Y	m/sec	0.66	43
Mid Rib VC	180	Y	m/sec	0.58	40
Lower Rib VC	180	Y	m/sec	0.59	40
Torso Force	600	X	N	432.95	44
	600	Y	N	-511.34	59
Torso Moment	600	Y	Nm	23.28	43
	600	Z	Nm	24.37	44
T12 Force	600	X	N	-471.5	47
	600	Y	N	2194.16	39
T12 Moment	600	X	Nm	-141.69	40
	600	Y	Nm	47.05	59

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values (G's)				
	Class	Axis	Units	Peak	Time (msec)
Abdomen Front Force	600	Y	N	548 62	49
Abdomen Mid Force	600	Y	N	574 85	32
Abdomen Rear Force	600	Y	N	584.09	31
Abdomen Summed Force	600	Y	N	1551.06	48
Pubic Symphysis Force	600	Y	N	-926.93	34
Right Femur Force	600	X	N	-386.94	42
	600	Y	N	1407 58	50
	600	Z	N	-1023 52	47
	600	RES	N	1756.33	50
Right Femur Moment	600	X	Nm	125 63	44
	600	Y	Nm	-51.76	54
	600	Z	Nm	-14.94	62
	600	RES	Nm	126 74	44
Left Femur Force	600	X	N	-419 16	55
	600	Y	N	1407.34	40
	600	Z	N	-828 33	44
	600	RES	N	1629.58	41
Left Femur Moment	600	X	Nm	-174 04	41
	600	Y	Nm	-44 9	55
	600	Z	Nm	16.33	29
	600	RES	Nm	174.19	41
Pelvis	1000	X	G	-29.57	28
	1000	Y	G	82 17	31
	1000	Z	G	-15.43	44

PASSENGER (ES-2) PEAK RESPONSE TABLE

Location	Peak Values (G's)				
	Class	Axis	Units	Peak	Time (msec)
Head	1000	X	G	-39.01	57
	1000	Y	G	32.56	57
	1000	Z	G	20.85	57
	1000	RES	G	50.29	57
Head Injury Criteria (HIC)				119	
Upper Neck Force	1000	X	N	-349.52	57
	1000	Y	N	-886.96	83
	1000	Z	N	1900 36	66
	1000	RES	N	2004.09	67
Upper Neck Moment	600	X	Nm	-76 51	63
	600	Y	Nm	60.74	72
	600	Z	Nm	-39 56	64
	600	RES	Nm	97.71	64
Lower Neck Force	1000	X	N	-724.79	97
	1000	Y	N	-1410.92	64
	1000	Z	N	-1850.19	68
	1000	RES	N	2250.43	67
Lower Neck Moment	600	X	Nm	-63.38	81
	600	Y	Nm	-49.79	65
	600	Z	Nm	-32.74	83
	600	RES	Nm	79.4	82
Shoulder Force	1000	X	N	548.51	56
	1000	Y	N	1134.19	57
	1000	Z	N	2117.79	59
	1000	RES	N	2430	58

PASSENGER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values (G's)				
	Class	Axis	Units	Peak	Time (msec)
Upper Spine	180	X	G	-16.76	57
	180	Y	G	41.01	56
	180	Z	G	-71.5	40
Lower Spine	180	X	G	-17 22	53
	180	Y	G	52 77	46
	180	Z	G	-9.03	53
Upper Rib	180	Y	G	46.29	52
Mid Rib	180	Y	G	66.02	49
Lower Rib	180	Y	G	77.11	49
Upper Rib Deflection	180	Y	mm	-22.82	83
Mid Rib Deflection	180	Y	mm	-22 75	60
Lower Rib Deflection	180	Y	mm	-16.9	58
Upper Rib VC	180	Y	m/sec	0.17	55
Mid Rib VC	180	Y	m/sec	0 23	53
Lower Rib VC	180	Y	m/sec	0.14	53
Torso Force	600	X	N	1412.73	100
	600	Y	N	-503 51	102
Torso Moment	600	Y	Nm	-99.11	101
	600	Z	Nm	-54.94	101
T12 Force	600	X	N	-597.24	46
	600	Y	N	2447 77	51
T12 Moment	600	X	Nm	-261.58	46
	600	Y	Nm	-153.12	47

PASSENGER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values (G's)				
	Class	Axis	Units	Peak	Time (msec)
Abdomen Front Force	600	Y	N	1309.7	46
Abdomen Mid Force	600	Y	N	698.02	46
Abdomen Rear Force	600	Y	N	408.55	49
Abdomen Summed Force	600	Y	N	2294 23	45
Pubic Symphysis Force	600	Y	N	-2375.33	45
Right Femur Force	600	X	N	-339.11	48
	600	Y	N	-1206	44
	600	Z	N	-1551.25	43
	600	RES	N	1882 32	44
Right Femur Moment	600	X	Nm	-169 2	44
	600	Y	Nm	-64.28	48
	600	Z	Nm	-19.08	48
	600	RES	Nm	176.72	44
Left Femur Force	600	X	N	-499.81	44
	600	Y	N	-785.01	31
	600	Z	N	-585.7	41
	600	RES	N	2310.68	44
Left Femur Moment	600	X	Nm	-214.83	30
	600	Y	Nm	87.63	44
	600	Z	Nm	29.3	45
	600	RES	Nm	220.22	30
Pelvis	1000	X	G	-33.48	45
	1000	Y	G	65.42	39
	1000	Z	G	-21.81	45