

THE STATE OF SOUTH CAROLINA
In the Court of Appeals

APPEAL FROM BAMBERG COUNTY
Court Of Common Pleas

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The Honorable Doyet A. Early III, Circuit Court Judge

SS COURT OF APPEALS

Case No: 2008-CP-05-235

Laura Riley as the Personal Representative
of the Estate of Benjamin Riley Respondent,

v.

Ford Motor Company Appellant.

RECORD ON APPEAL – VOLUME IV

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ATTORNEYS FOR APPELLANT

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Inter Office

Truck Operations

September 14, 1989

LIGHT TRUCK TEST SUMMARY OF CRASH 7277

To: S. von Foerster
B. Miller
J. Seisser

cc: H. K. Singh
R. I. Liljestrand
J. I. Goodman
D. G. Wheatley

Program: 1992 F-SERIES/BRONCO 208 DEVELOPMENT

Test Parameters:

- . Vehicle Model - F-150 4X4 (92 Mechanical Development Vehicle)
- . Vehicle No. - 308T173 FBMP01
- . Test Weight Condition - 33% Options
- . Crash Mode - Frontal
- . Impact Speed - 35 MPH

Objective: To Evaluate the Dynamic Impact Performance of the Subject Vehicle
Relative to:

- . FMVSS 204 - Steering Control Rearward Displacement (Docket 78-16; Notice 6, effective 9-1-91)
- . FMVSS 208 - Occupant Crash Protection (Docket No. 71-14; Notice 53, effective date 9-1-91)
- . FMVSS 212 - Windshield Mounting (Docket 62-20; Notice 6, effective 9-1-78)
- . FMVSS 301 - Fuel System Integrity (Docket 73-20; Notice 9, effective 9-1-76)
- . Door Openability

Conclusions:

- . This test vehicle met the requirements of FMVSS 204.
- . This test vehicle did not meet the requirements of FMVSS 212.
- . This test vehicle did not meet all the FMVSS 208 Injury Criteria Corporate Objectives. FMVSS 208 Injury Criteria results are summarized on sheet 2.
- . This test vehicle met the at impact requirements of FMVSS 301. A post impact pressure check was made inlieu of a static rollover.
- . This test vehicle did not meet the Door Openability Corp Guideline requirements.

Concurred:

R. N. Hazzard

Signed:

D. L. Patterson

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SUMMARY OF TEST RESULTS CRASH 7277RequirementsPerformanceFMVSS 204

Steering wheel nut rearward displacement shall not exceed 5" WRT vehicle reference target.	Steering wheel nut maximum rearward displacement was 2.1" at 89 ms WRT the Left Front Seat Bolt Target.
--	---

FMVSS 212

75% Minimum retention of windshield periphery during impact at an ambient temperature of 15°F to 100°F.	The windshield maintained 68% retention at ambient temperature
---	--

FMVSS 208

CRITERIA	REQUIREMENT <u>1/</u>	OBJECTIVE <u>2/</u>	DRIVER	PASSENGER
HIC	1000 36 ms CUT-OFF	700 36 ms CUT-OFF	643	436 <u>3/</u>
CHEST G'S	60 G's MAX 3ms CUT-OFF	50 G's MAX 3 ms CUT-OFF	52.5	46.3
FEMURS AXIAL LOAD	2250 lbs MAX COMPRESSION	1600 lbs MAX COMPRESSION		
LEFT			1512	139
RIGHT			555	186

1/ 30 MPH Impact Speed FMVSS 208 Test Requirements.

2/ 35 MPH Impact Speed Corporate Safety Guideline Objectives (average of two (2) tests).

3/ High HIC due to head striking right knee.

DOOR OPENABILITY

DRIVER DOOR.....Openable After Impact Without the Use of Tools
PASSENGER DOOR.....Opened During Impact

TEST RESULTS CRASH 7277RequirementsPerformanceFMVSS 301

Impact & 30 Minute Period Following Impact	Engine Fuel System	M/S Fuel System	A/A Fuel System	Total
Max. fuel loss of 1 oz. by wt. during impact.	0	0	0	0
Max. fuel loss of 5 oz. by wt. during the 5 min. period immediately following cessation of motion.	0	0	0	0
Max. fuel loss of 1 oz. by wt. during any 1 min. interval of the remaining 25 min. of test period.	0	0	0	0
Static Rollover				
Max. fuel loss of 5 oz. by wt. during the 1st 5 min. of testing at each 90° increment.	90° 180° 270° 360°	STATIC ROLLOVER NOT PERFORMED VEHICLE PRESSURE TESTED OKAY		
Max. fuel loss of 1 oz. by wt. during any 1 min. interval of the remaining test period at each 90° increment.	90° 180° 270° 360°			
Leakage Source(s): None				

POST TEST OBSERVATIONS CRASH 7277Frame/Chassis:

- . Front of frame horn convolutions collapsed per design intent.
- . Front horn assemblies rolled inboard.
- . The 1A crossmember attachment brackets separated from the frame horns.
- . The right frame rail folded outboard aft of the transmission crossmember.
- . The left frame rail folded outboard between the radius arm rear mount and the transmission crossmember.

Body:

- . Windshield retention was lost along the lower edge of the windshield.
- . Windshield retention requirements were not met with 51.1% retention.
- . The right front door opened during the crash.
- . Both "B" pillars were deformed in the area of the "D" ring. The deformation was most severe on the right "B" pillar.

Steering Column:

- . Steering column intermediate shaft decoupled during impact per design intent.
- . The steering column shear module tab were broken from the column casting.

Driver Kinematics/Restraints:

- . Driver Belt payout at the D ring was $\approx 2.75"$.
- . Dummy head (chin) contacted the steering wheel upper rim.
- . Driver knees contacted instrument panel adjacent to steering column. The Azdele close out panel was dislodged from its mounts.

Passenger Kinematics/Restraints:

- . Passenger Belt payout at the D ring was $\approx 3"$.
- . Passenger Belt payout at the retractor was $\approx 1"$.
- . The passengers knees pushed the blow molded phase 0 I/P out of head swing impact zone. Head made contact with his knees during the test.

DETAILED SUMMARY OF LIGHT TRUCK CRASH #7277Test Information:

Crash Mode: FRT	Impact Spd: 35.0 MPH
Crash Date: 09/13/89	Rollover Date: N/A

Vehicle Information:

Build No.: FBMP01		Tag #: 308-T-173
Model: F-150 4X4 R/C S/S		Wheelbase: 3378 mm
Engine: 4.9 L EFI	Transmission: M5SR2	Driveline: 1-PIECE
GVWR: 6250 LBS.	Frt. GAWR: 2950 LBS.	Rear GAWR: 3770 LBS.
Bumper types: SIMULATED 92 (FRONT)		NONE (REAR)
Frame Gage: 0.146"		
Tire Size: 235/75R15		

Test Weight:

PROJECTED	ACTUAL
. Front..... 2681	. Front..... 2690
. Rear..... 2294	. Rear..... 2296
. Total 4975	. Total 4986

Instrumentation/Ballast Weight:

- . 150 lbs. instrumentation (estimated)
- . 75 lbs. over rear axle
- . 45 lbs. in engine

Significant Options:

- . Power Steering
- . Power Brakes

Vehicle Collapse:

Dynamic Collapse - Left: 29.4" @ 95 ms	Right: 28.8" @ 98 ms
--	----------------------

FINAL TEST REPORT



Engineering Technology Services Office
Car Product Development

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TO:

R. N. Hazzard

Test Order No.	T-13065
Work Task W. O. No.	T9L13
Test Date	9-13-89
Date Reported	9-30-90
Sheet	1 of 89

SUBJECT:

Crash Test 7277 (90° Front Fixed Barrier Impact at 35.1 ± 0.4 mph, 56.5 ± 0.6 km/h) - 1992 F-150 (4X4) Regular Cab

REQUESTED BY:

Emission, Fuel Economy and Safety Department, Light Truck Engineering Office - D. L. Patterson

OBJECT:

To obtain development data relative to FMVSS 204, 208, 212, 301 and safety design guideline door openability.

SUMMARY OF
TEST RESULTS:

- See Section 1.0 for steering column dynamic rearward displacement data.
- See Section 2.0 for injury criteria data.
- See Section 3.0 for windshield mounting retention data.
- See Section 4.0 for fuel spillage data.
- See Section 5.0 for post-impact door openability data.

Thomas H. Perkins
Concur: T. H. Perkins
Unit Supervisor
Safety Test Engineering Section

L. M. Johnson
Product Test Engineer

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VEHICLE DATA:

Make and Model 1992 F-150 (4X4) Regular Cab

Wheelbase 133.5 in (3378 mm)

ID Numbers 1FTEF14Y7KLA33430, 308-T-173, FBMP01

Power Train 4.9L, EFI, 49 States Engine, 5-Speed Manual Transaxle (M5R2)

Fuel Tank(s) Usable Capacity: 19.0 gal. (71.9L) - Midship
18.2 gal. (68.9L) - Aft Axle
Test Condition: The "run dry" tank(s) were filled with red-dyed Stoddard solvent to 95% of its rated usable capacity.

Front Seat(s) Type: Bench
Cover: Vinyl
Tracks/Position: 2-Way Manual/Design Mid
Seat Backs/Position: Adjustable/19° Rear of Vertical
Head Restraints/Position: None

Restraint System LF & RF: 3-Point Continuous Loop Active Belt

Occupants LF & RF: 50th percentile male, Hybrid II, Instrumented

Test Weight Front: 2690 lb (1220 kg)
Rear: 2296 lb (1041 kg)
Total: 4986 lb (2262 kg)

GVWR 6250 lb (2835 kg)

Tires Front: P235/75R15 35 psi (241 kPa)
Rear: P235/75R15 35 psi (241 kPa)

Spare Tire Mounting Removed

Significant Content or Accessories: Air Conditioning, Power Steering, Power Brakes, Tilt Steering Wheel

CRTS 0007277

GENERAL TEST COMMENTS:

1. Test Procedure

The test was performed according to the following Corporate test procedure(s):

- . Fixed Barrier Collision, ST-14 dated January 16, 1989.
- . CFI and EFI Fuel Systems - Except Front Wheel Drive Vehicles Stoddard Solvent Fill, ST-11 REF. 4 dated November 8, 1982.
- . Occupant Crash Protection, ST-25 dated May 19, 1989.
- . Post-Impact Door Opening Evaluation, Proposal P4-103D dated July 25, 1983.

2. Remarks

Crash movies, pre- and post- crash still photographs of the test vehicle and copies of this report are available only through the Safety Test Engineering Section after permission is obtained from the test requesting department. The negative numbers of the still photographs are CN54017-3718 through -3769.

TEST RESULTS:**1.0 Steering Column Displacement Data (FMVSS 204)**

The maximum measurable dynamic displacement of the upper end of the steering column and shaft relative to the front seat bolt target was: (by Film Analysis - using Scale method)

<u>Direction</u>	<u>in.</u>	<u>(mm)</u>
Horizontally Rearward	2.1	(53.3)
Vertically Upward	3.4	(86.4)
Vertically Downward	0.1	(2.5)

The displacement could not be determined between 41 ms and 48 ms, 59 ms and 88 ms and after 89 ms.

Time-history plots of steering column displacement obtained from Film Analysis are included in this report.

2.0 Occupant Injury Data (FMVSS 208)

	<u>L. F. Dummy</u>	<u>R. F. Dummy</u>
Head Injury Criteria (HIC)	643	436
Interval t ₁	69 ms	125 ms
t ₂	105 ms	128 ms
Chest resultant acceleration level at 3 ms cumulative duration	52 g	46 g
Peak axial compression load:		
Left femur	1512 lb	139 lb
Right femur	555 lb	186 lb
Dummy contained within the vehicle during the crash	Yes	Yes

Time histories of the dummy instrumentation are included in this report.

Time histories of the dummy dynamic displacements obtained from Film Analysis are included in this report.

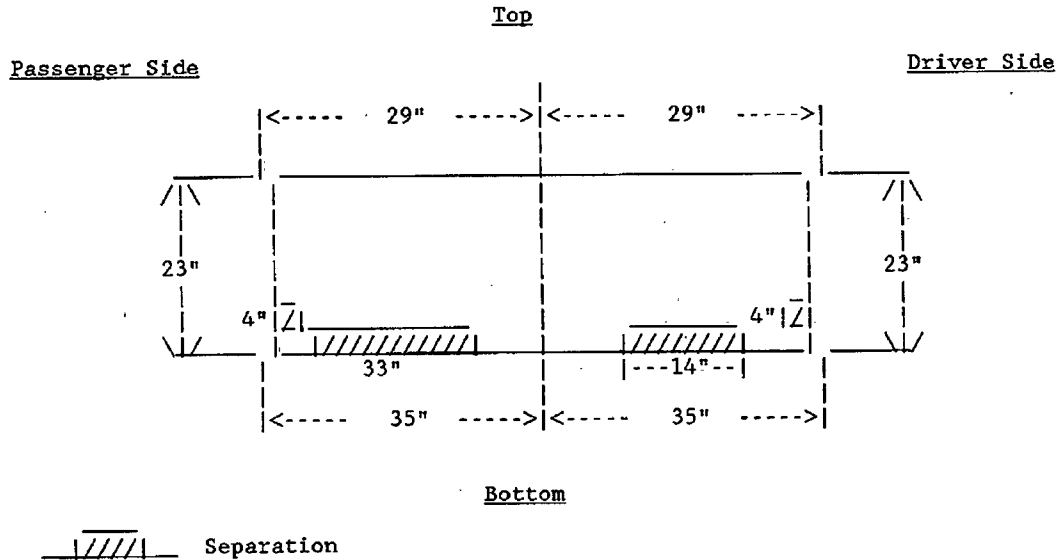
Time histories of any requested derived data (i.e. integrations, etc.) were given to the requester and are not included in this report.

TEST RESULTS: (CONT'D)**3.0 Windshield Mounting Retention (FMVSS 212)**

The total windshield mounting retention at ambient room temperature was 68%.

The driver side windshield mounting retention at ambient room temperature was 79%.

The passenger side windshield mounting retention at ambient room temperature was 57%.

**4.0 Fuel System Integrity (FMVSS 301)**

- . There was no fuel system spillage during or for thirty minutes following impact.
- . The fuel system held pressure during a post-crash pressure check.

5.0 Door Openability

- . The left front door could be unlatched and opened manually following impact.
- . The right front door unlatched at impact and opened manually following impact.

TEST RESULTS: (CONT'D)

7.0 Vehicle Crush and Instrumentation Data

	Maximum Dynamic Longitudinal Crush	
	in.	(mm)
Left Side	29.4	(747)
Right Side	28.8	(732)

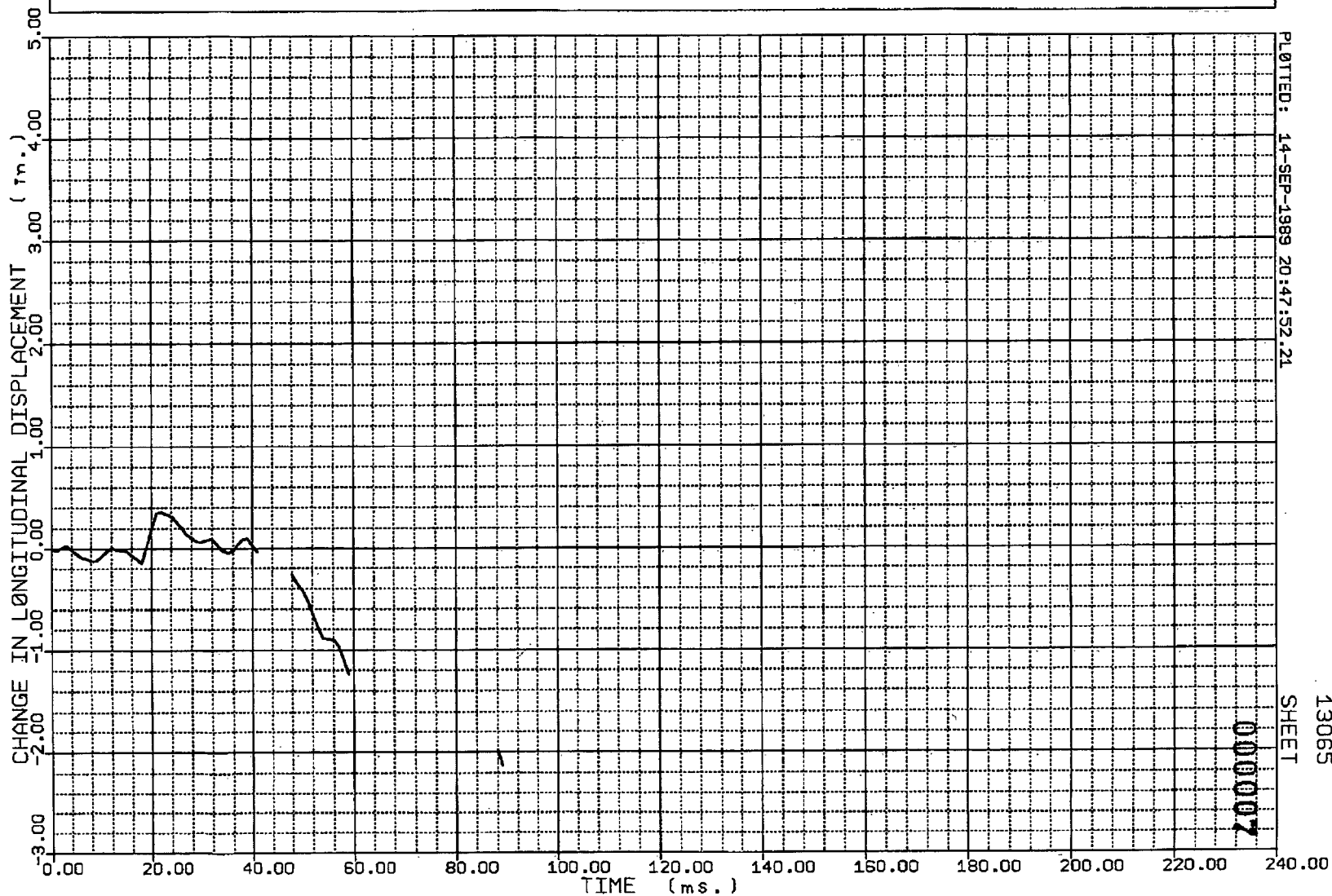
Time histories of the vehicle accelerations and other instrumentation are included in this report.

Time histories of vehicle dynamic displacements obtained from Film Analysis are included in this report.

Static displacements of various body points obtained by Dimensional Analysis are included in this report.

Time histories of any requested derived data (i.e. integrations, etc.) were given to the requester and are not included in this report.

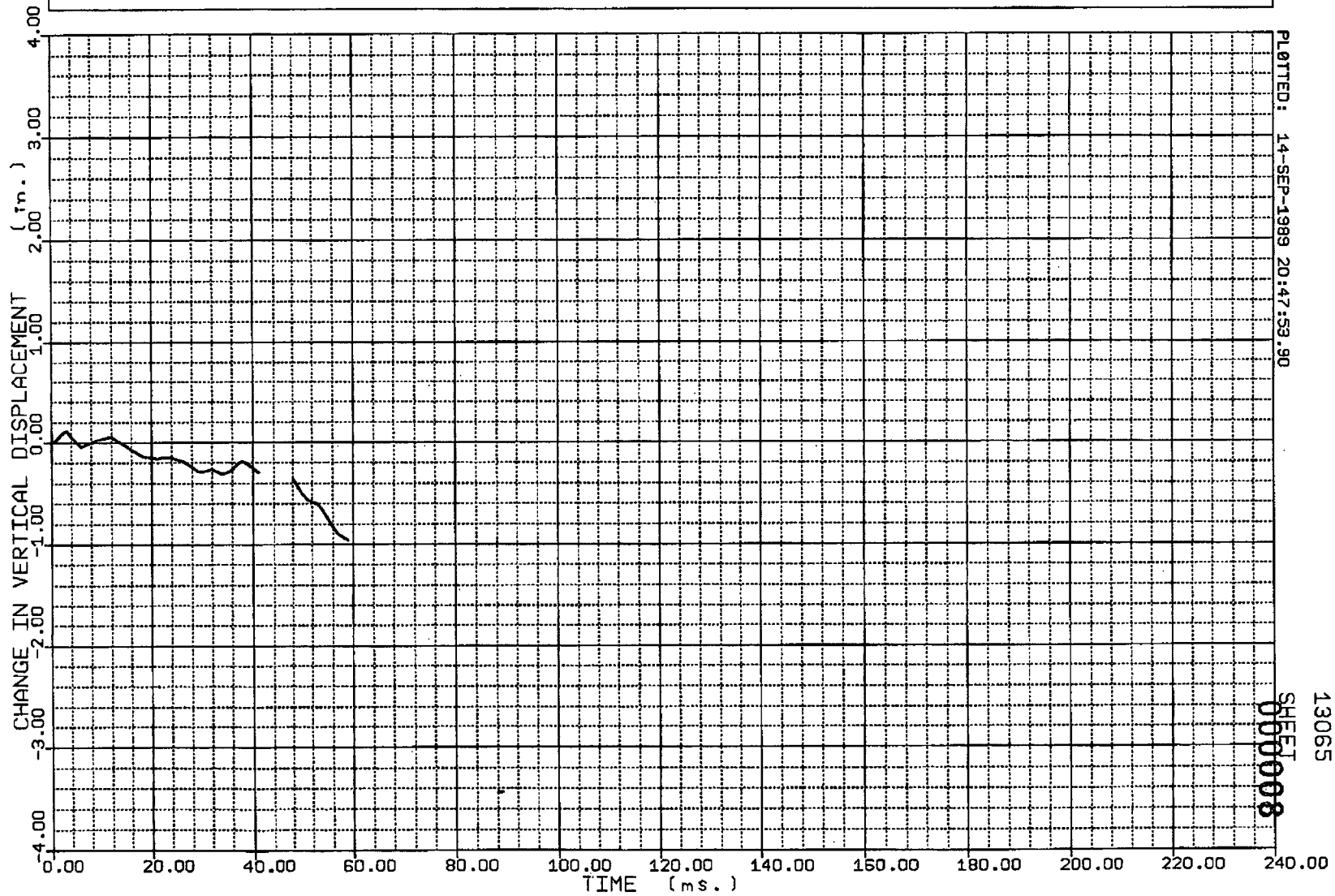
Y - AXIS: ST. COLUMN HUB WRT L/ROCKER AT SEAT BOLT					MAX = 0.3560	at 22.00	MIN = -2.132	at 89.00
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD		PITCH CORRECTION			
7277	BARRIER	13065	SCALE		APPLIED			



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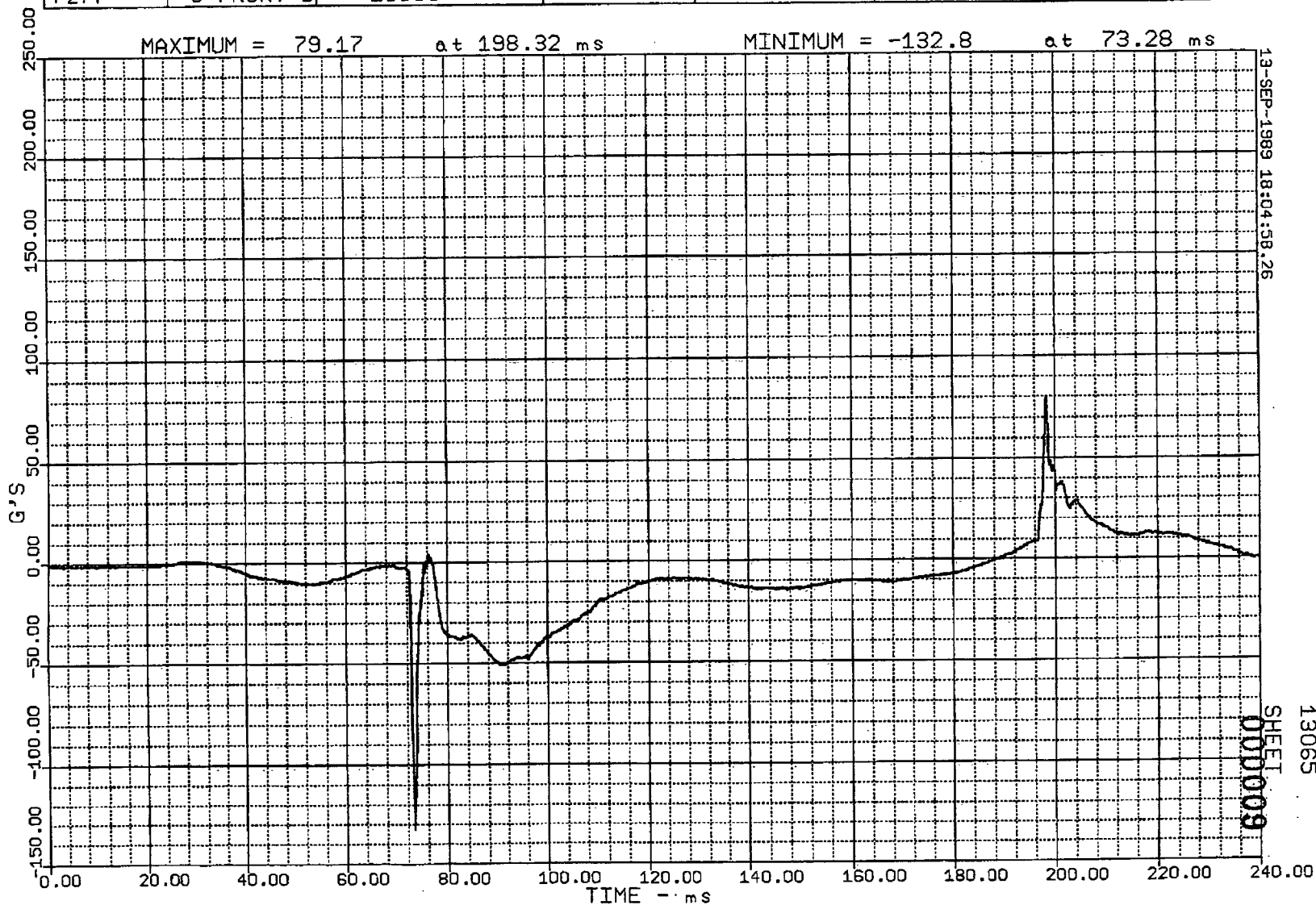
Y - AXIS: ST. COLUMN HUB WRT L/ROCKER AT SEAT BOLT					MAX = 0.1176	at	3.00	MIN = -3.442	at	88.00
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD				PITCH CORRECTION			
7277	BARRIER	13065	SCALE				APPLIED			



CRTS 0007277

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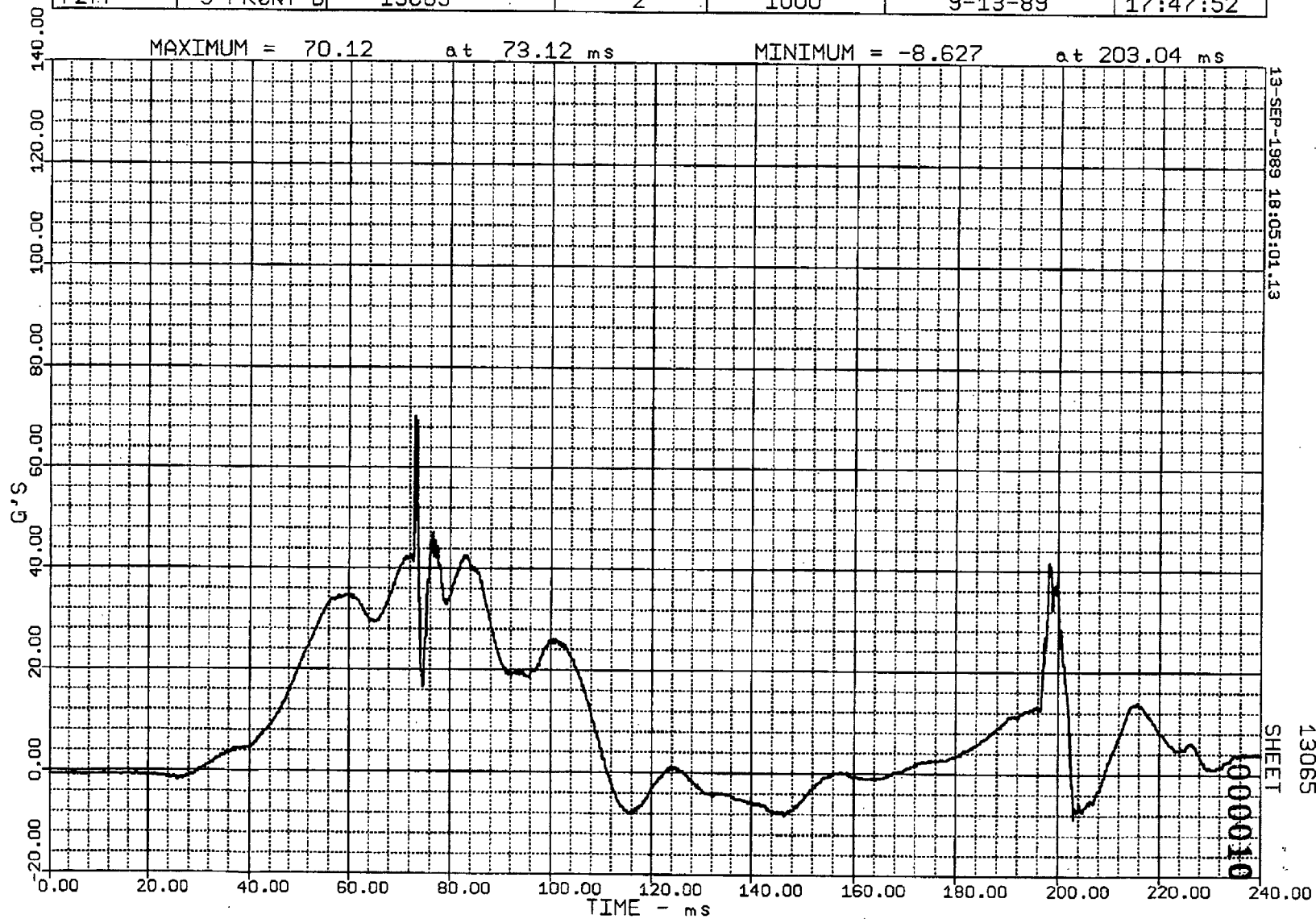
LONG L/F DUMMY HEAD C.G.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	1	1000	9-13-89	17:47:52



CRIS 0007277

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1340

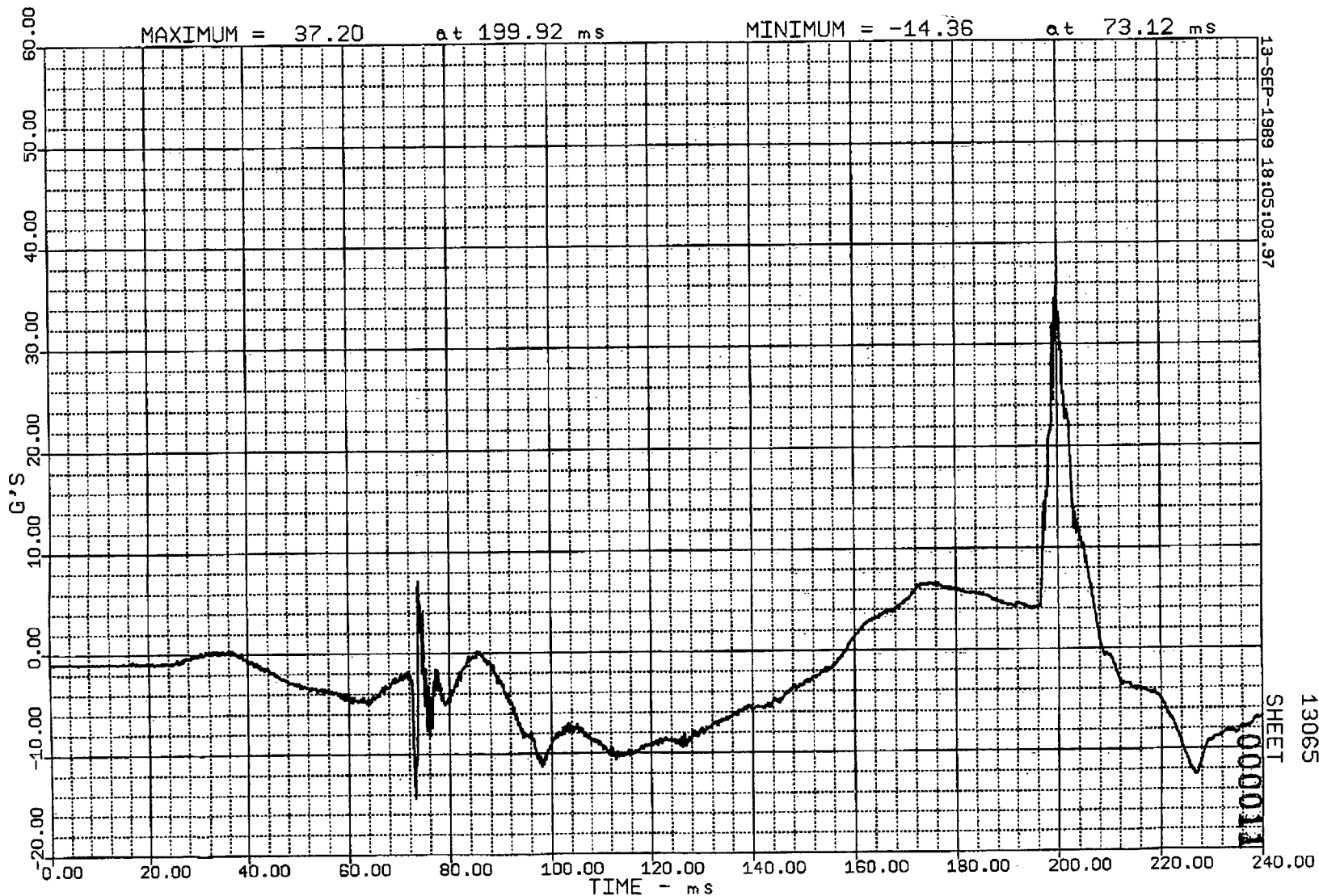
VERT L/F DUMMY HEAD C.G.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	2	1000	9-13-89	17:47:52



CRIS 0007277

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LAT		L/F DUMMY HEAD C.G.		199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRONT B	13065	3	1000	9-13-89	17:47:52	

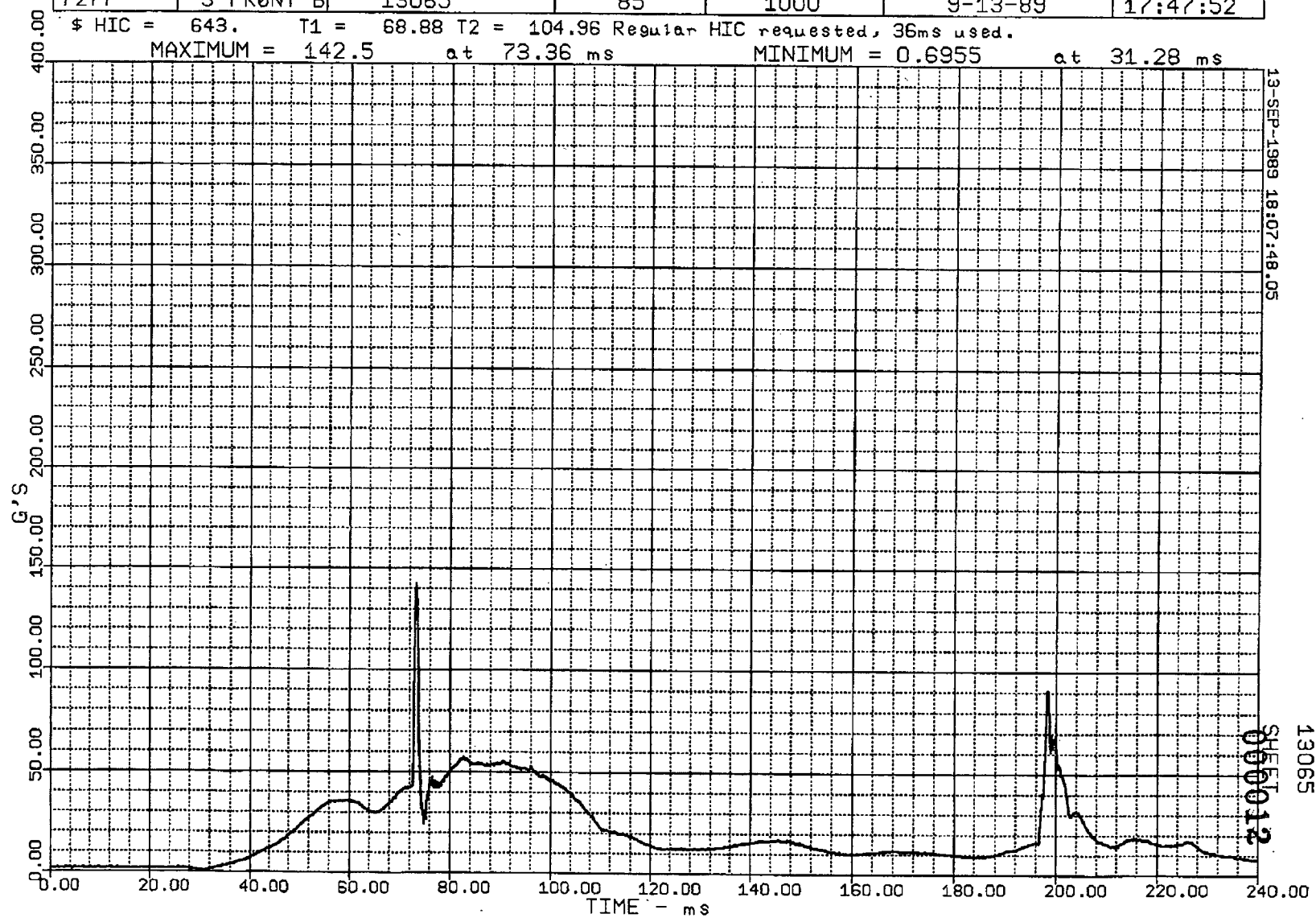


CRTS 0007277

PRODUCED BY FORD
1342

RES. L/F DUMMY HEAD C.G.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	85	1000	9-13-89	17:47:52

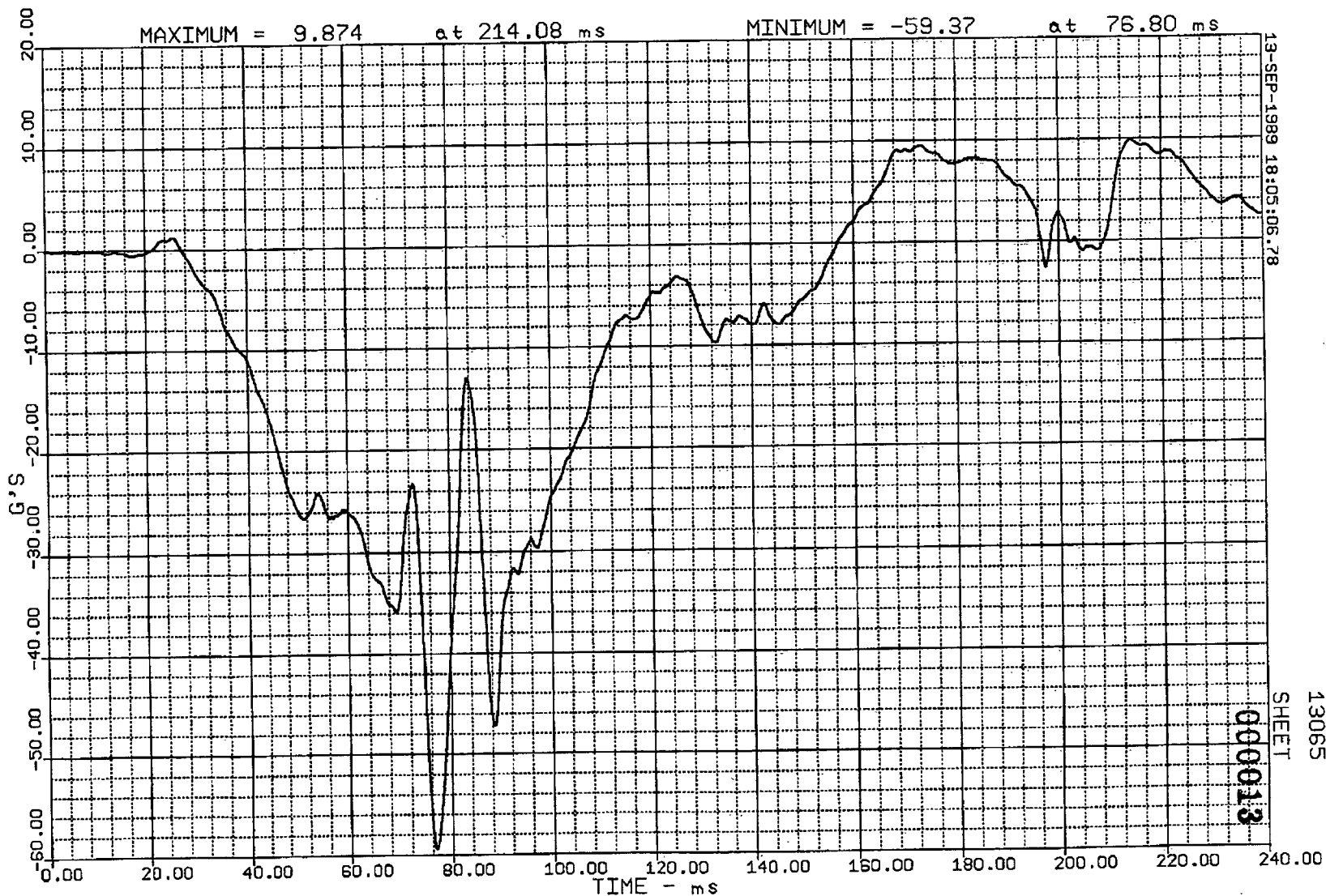
\$ HIC = 643. T1 = 68.88 T2 = 104.96 Regular HIC requested, 36ms used.
 MAXIMUM = 142.5 at 73.36 ms MINIMUM = 0.6955 at 31.28 ms



13-SEP-1989 18:07:48.05

13065
 SHEET
 000012

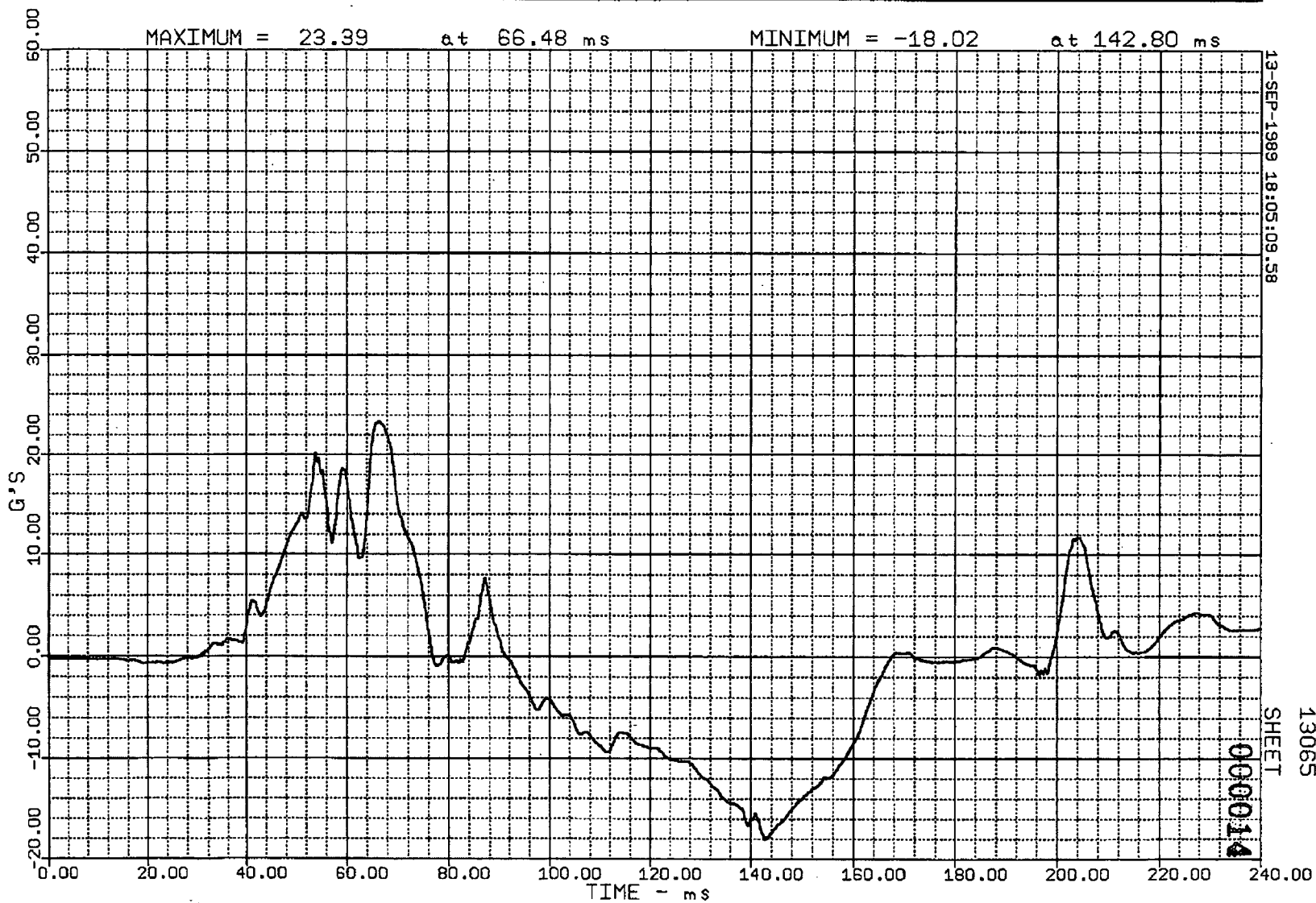
LONG L/F DUMMY CHEST				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	4	180	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1344

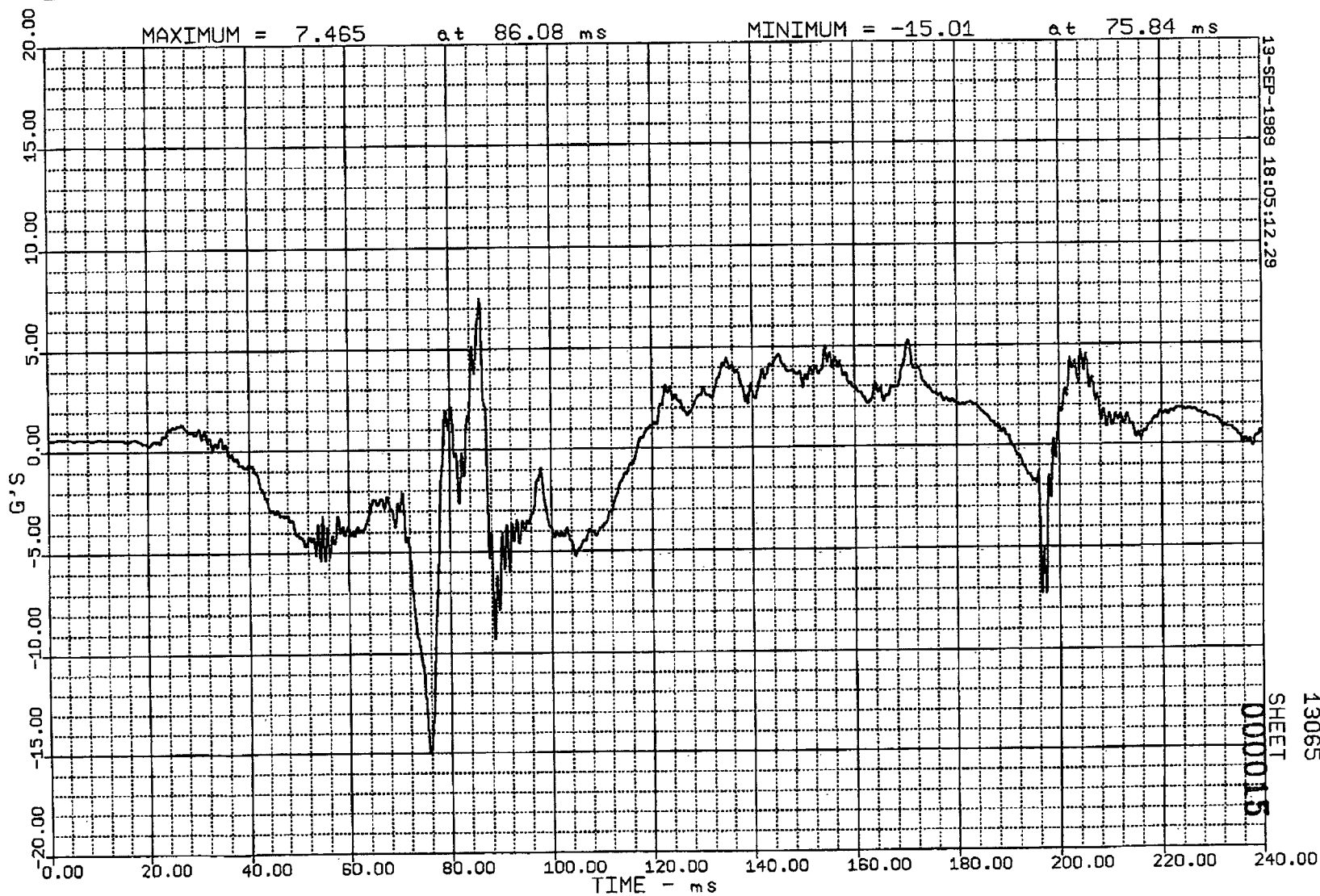
VERT L/F DUMMY CHEST		199200			TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	5	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1345

LAT		L/F DUMMY CHEST		199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRONT B	13065	6	180	9-13-89	17:47:52	



13065

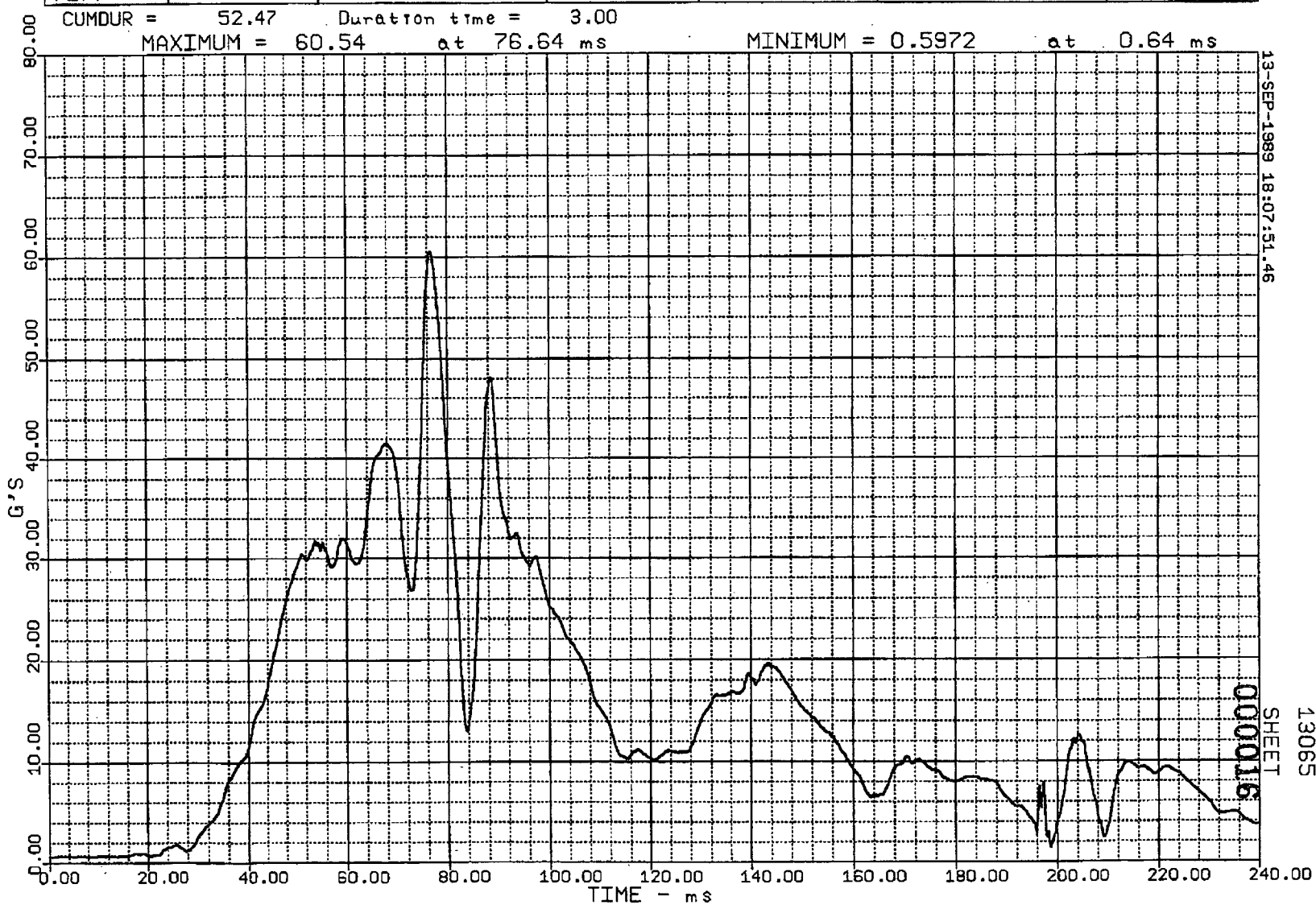
SHEET

000015

CRTS 0007277

PRODUCED BY FORD
1346

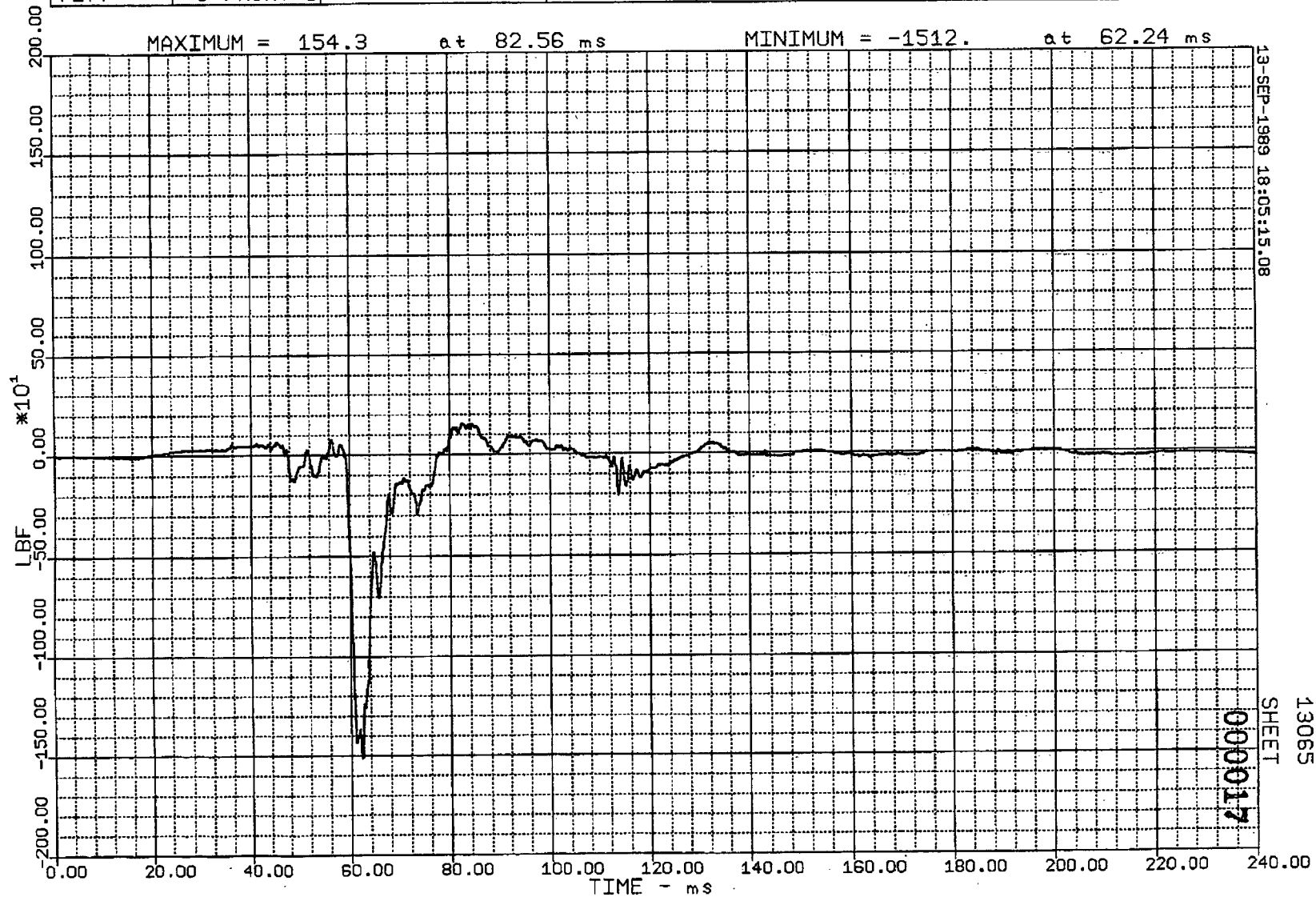
RES.	L/F DUMMY CHEST				199200	TARGET
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	86	180	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
 1347

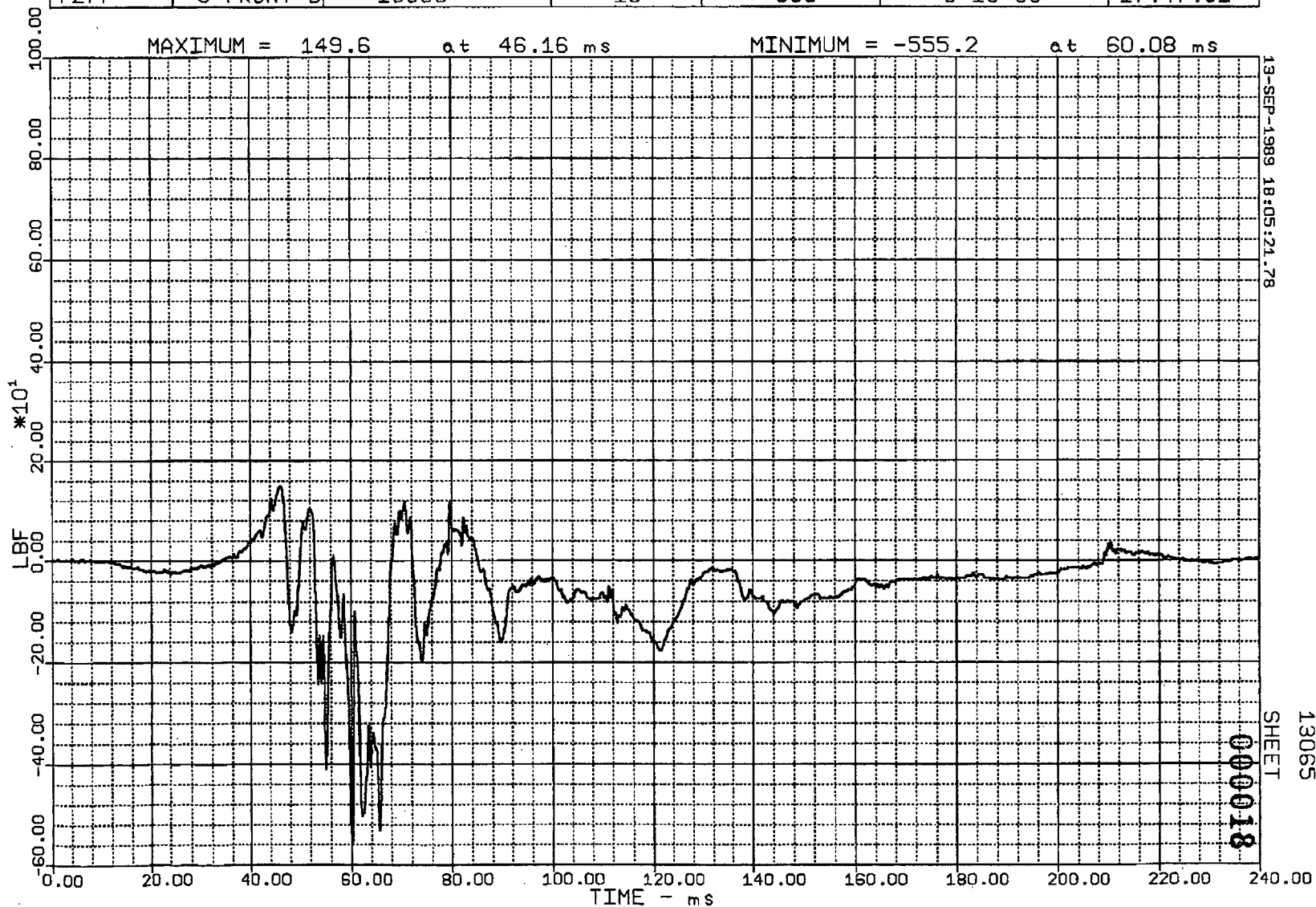
AXIAL L/F DUMMY L/FEMUR LOAD B#1					199200	TARGET
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	8	600	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1348

AXIAL L/F DUMMY R/FEMUR LOAD B#1					199200	TARGET
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	10	600	9-13-89	17:47:52



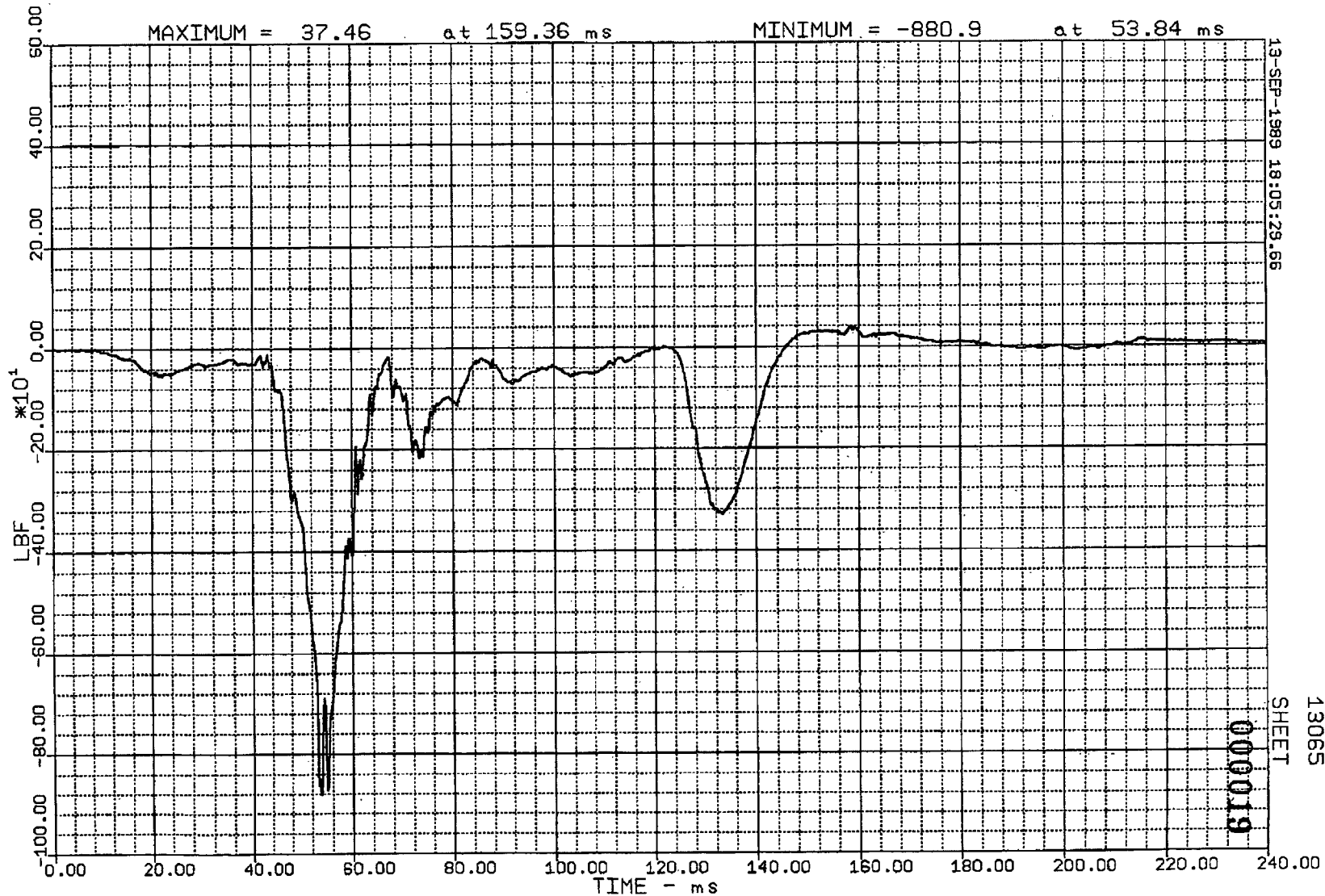
13065

SHEET

CRTS 0007277

PRODUCED BY FORD
1349

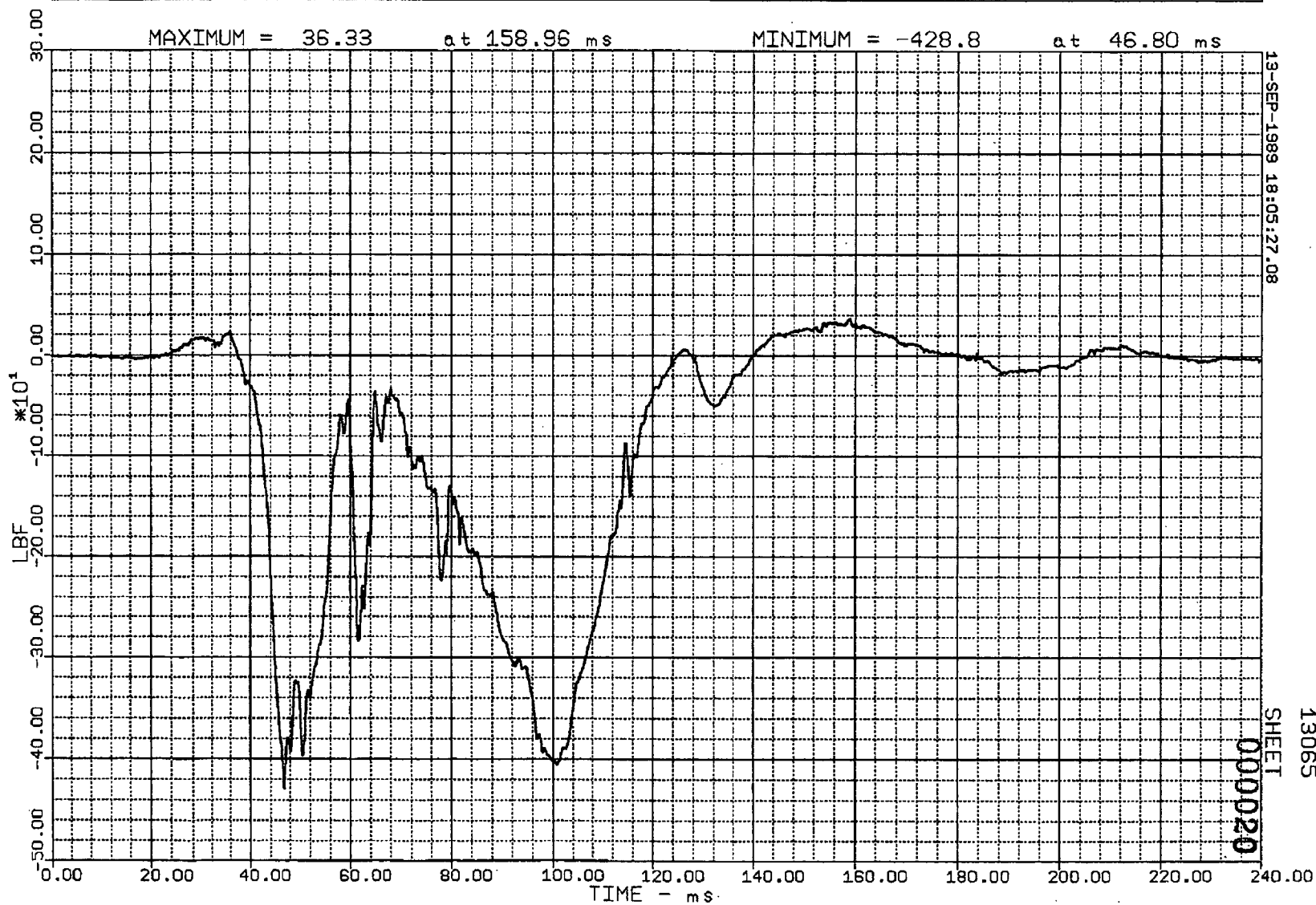
Fz	L/F DUMMY L/UP/TIBIA LOAD				199200	TARGET
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	14	600	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1350

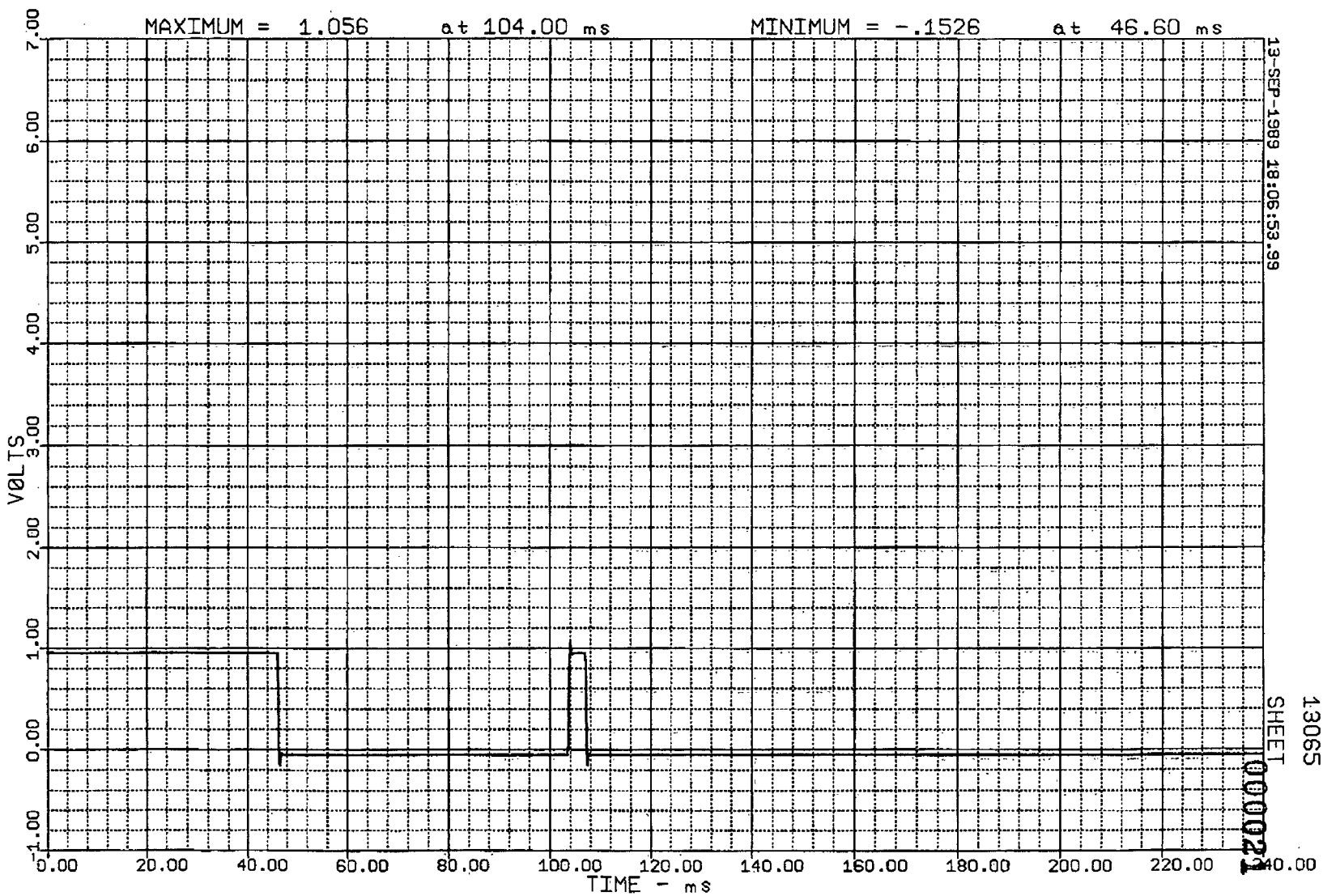
F _z	L/F DUMMY R/UP/TIBIA LOAD			199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	13	600	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1351

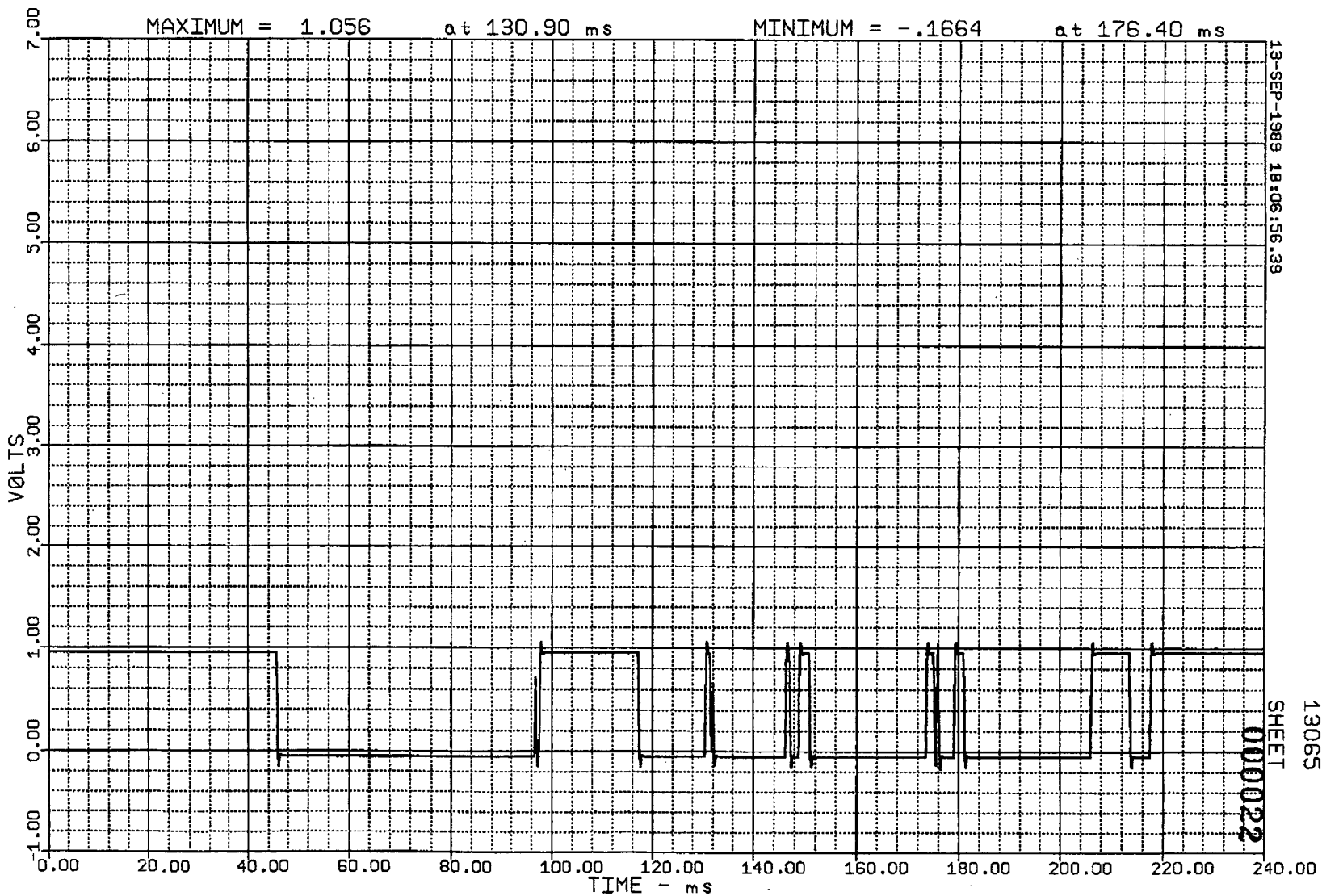
L/R DUMMY L/KNEE SW				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	56	1000	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1352

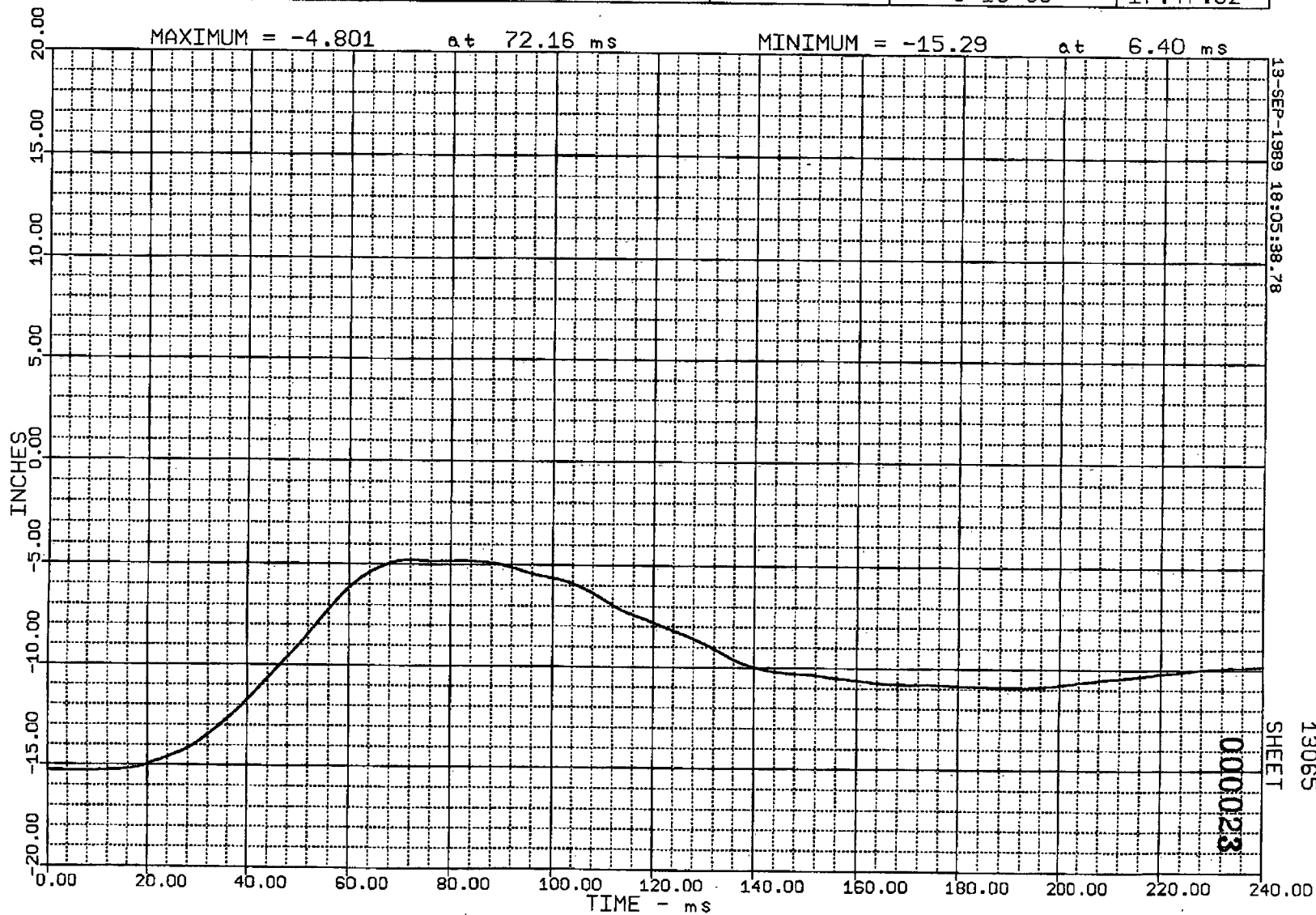
L/R DUMMY R/KNEE SW				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	57	1000	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1353

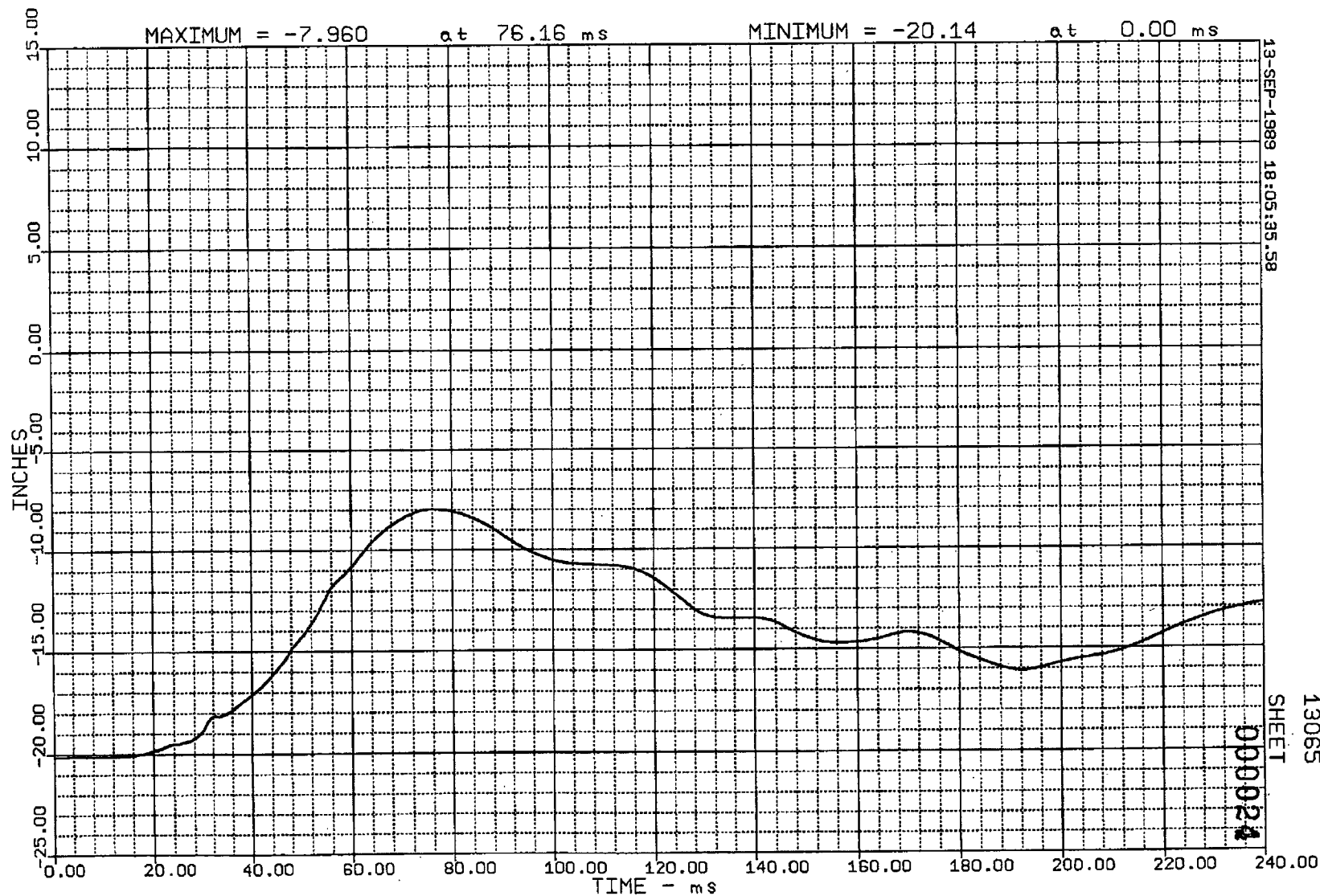
L/F DUMMY L/KNEE S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	17	60	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1354

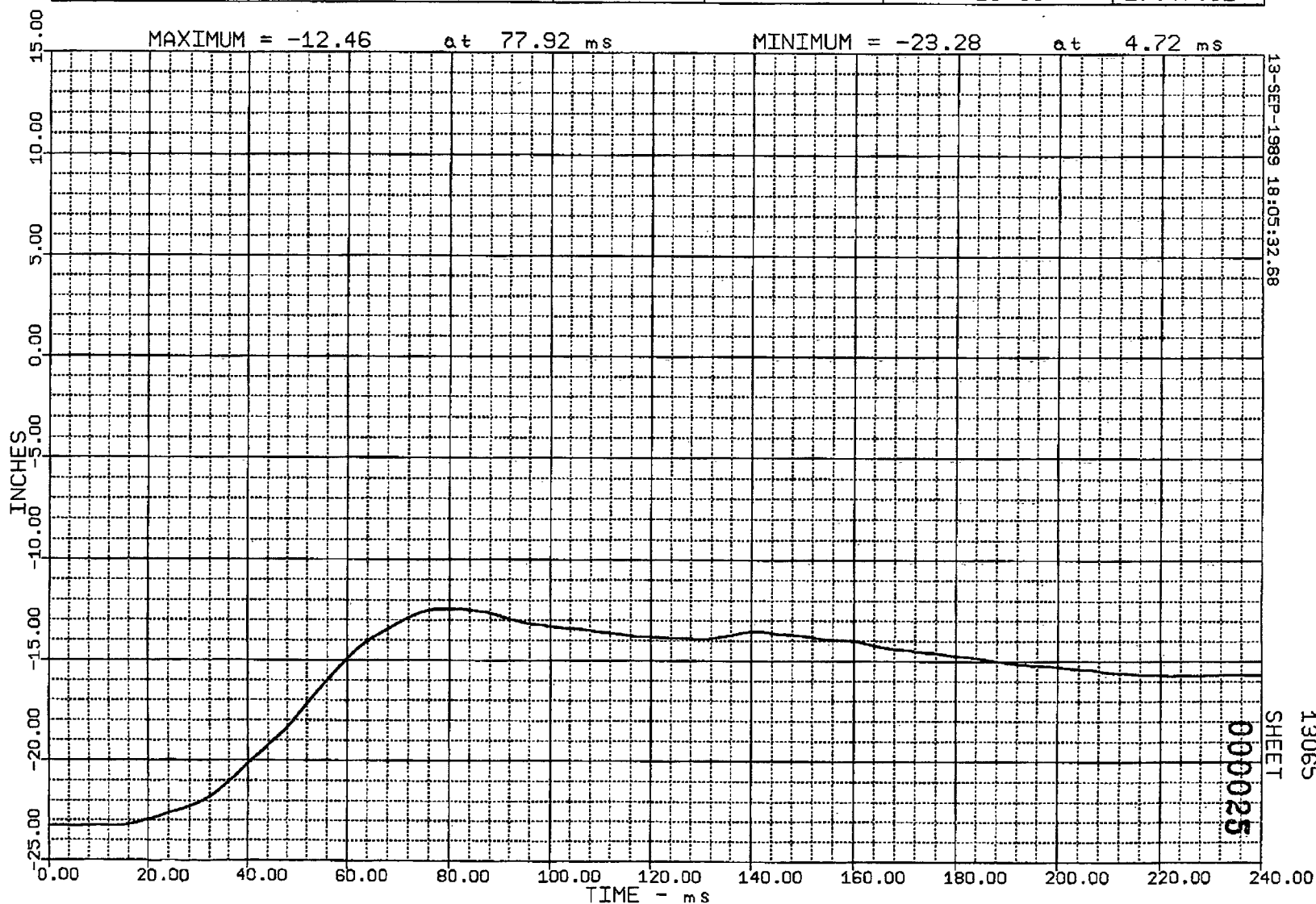
L/F DUMMY R/KNEE S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	16	60	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1355

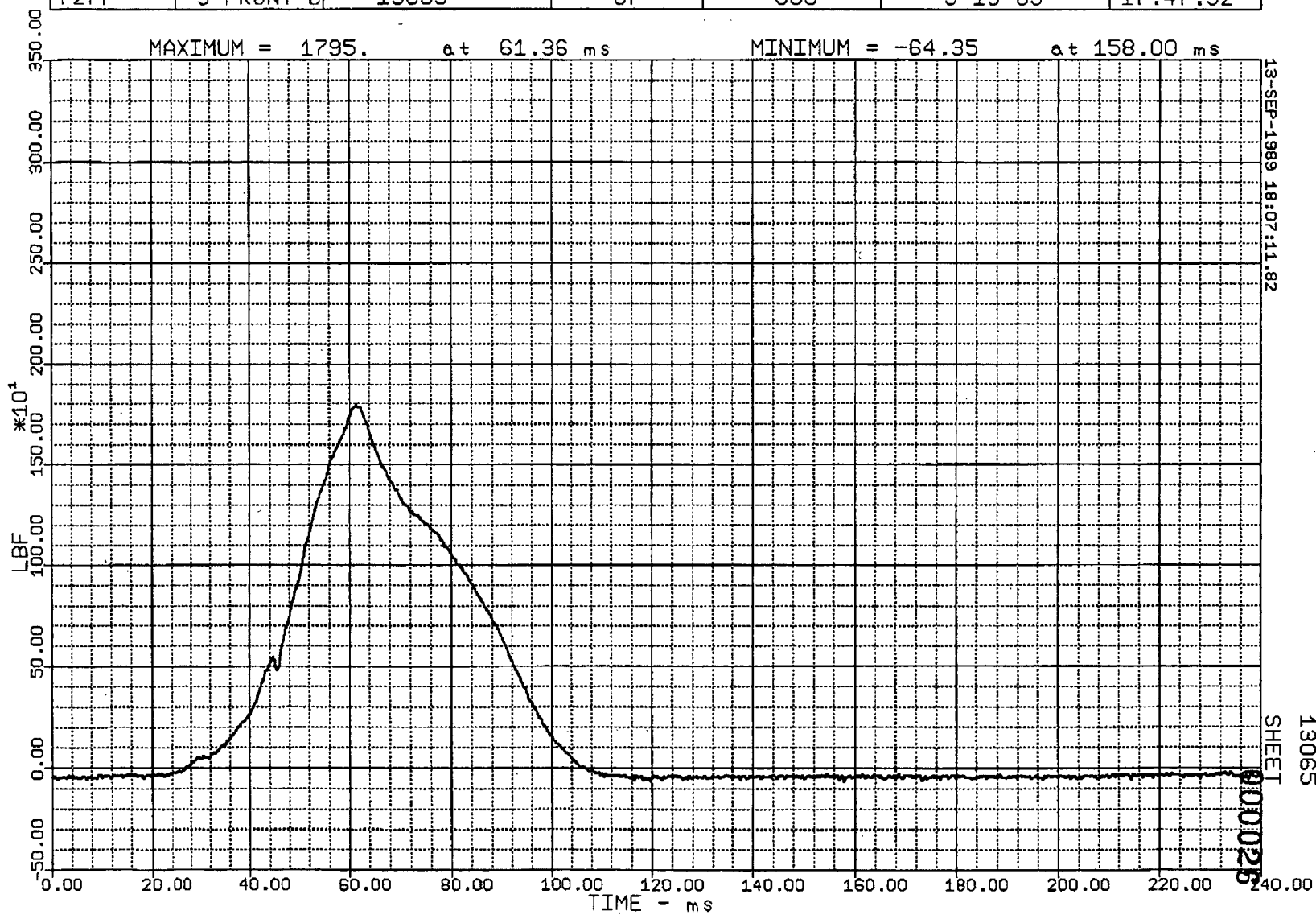
L/F DUMMY PELVIS S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	15	60	9-13-89	17:47:52



CRIS 0007277

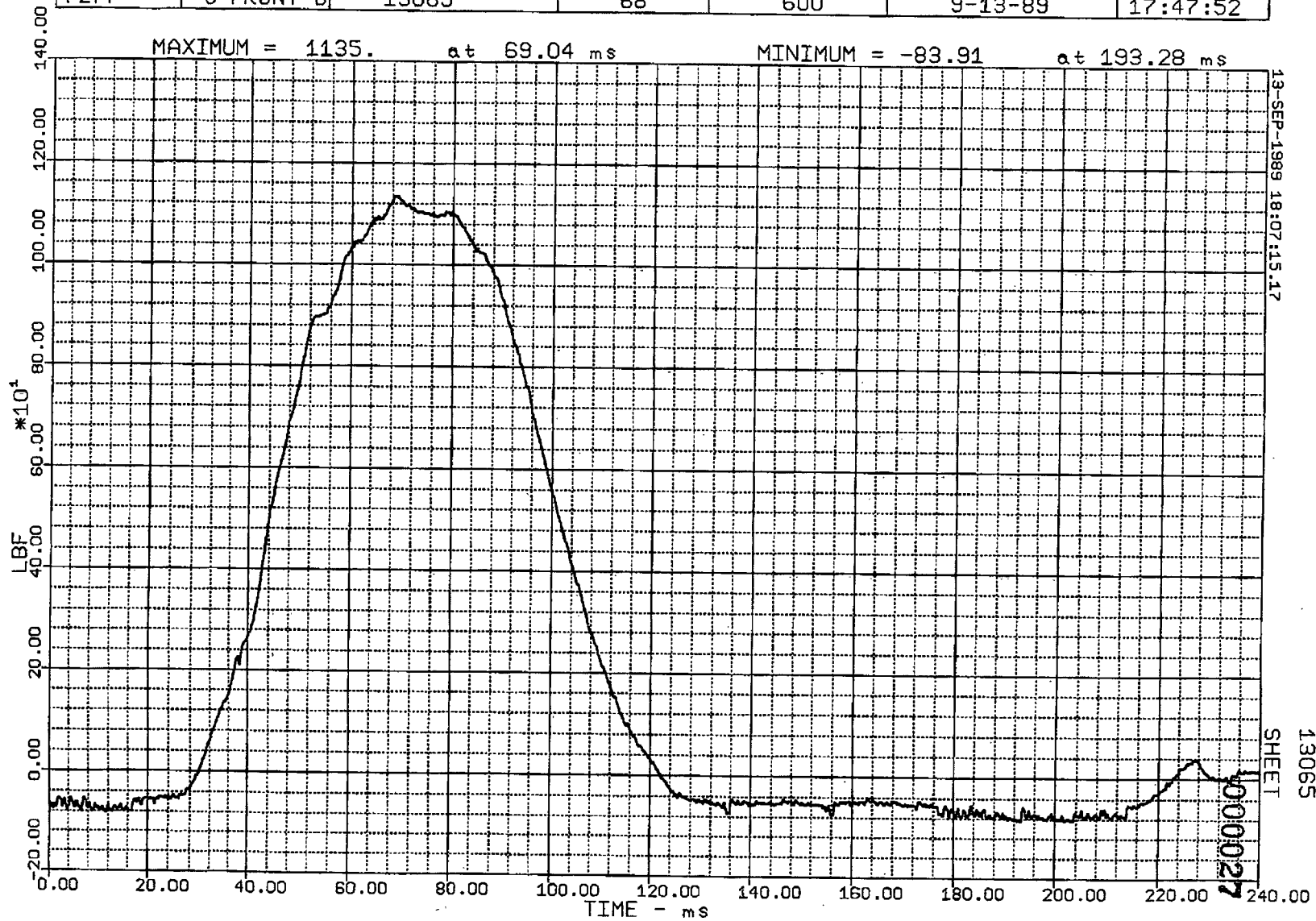
PRODUCED BY FORD
1356

L/R LAP BELT @ ANCHOR				199200	TARGET	
RUN NØ.	FACILITY	TEST ORDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT 8	13065	67	600	9-13-89	17:47:52



CRTS 0007277

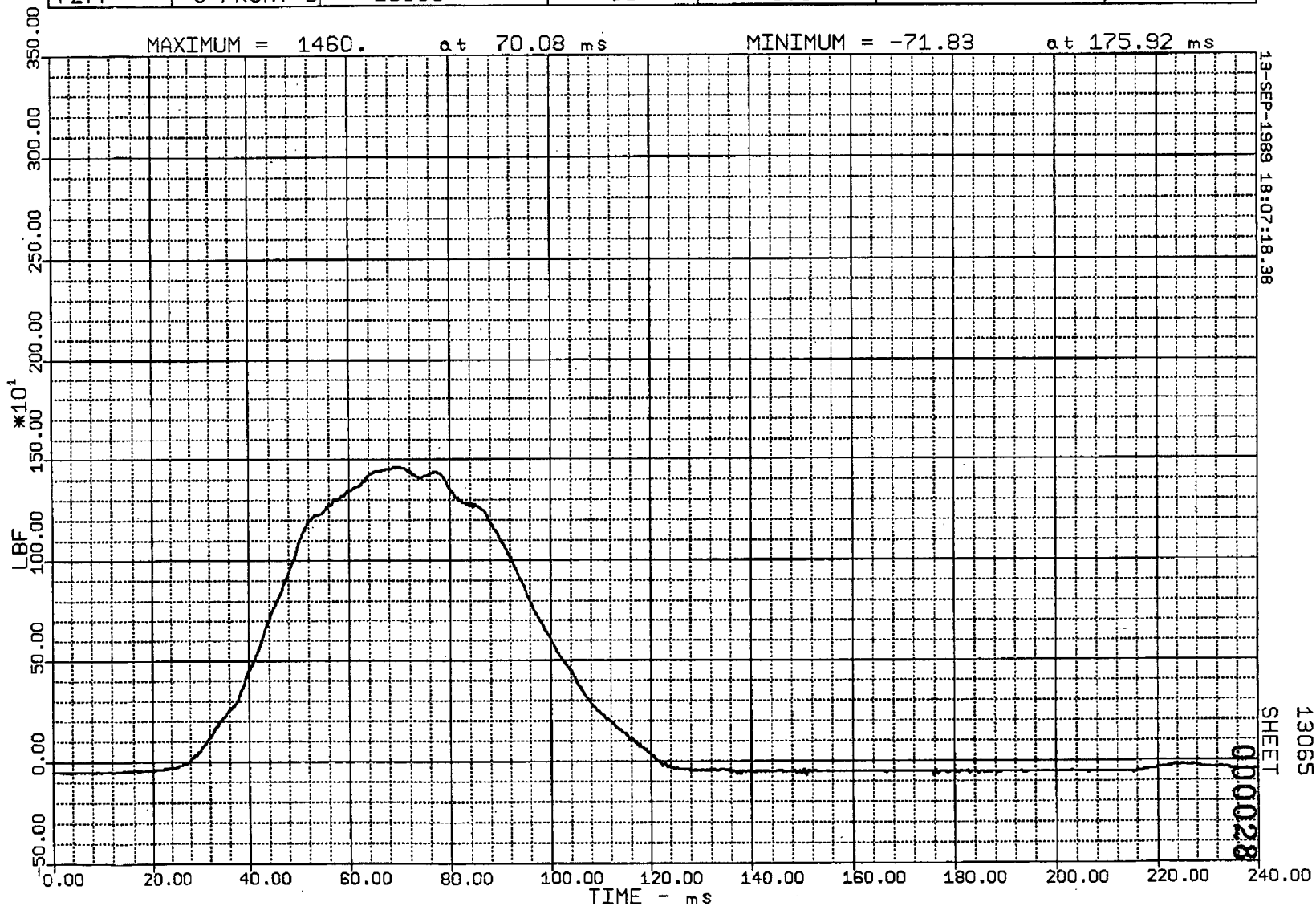
L/F TORSO BELT @ RETRACTOR				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	68	600	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1358

L/F TORSO BELT @ D-RING				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	69	600	9-13-89	17:47:52



CRTS 0007277

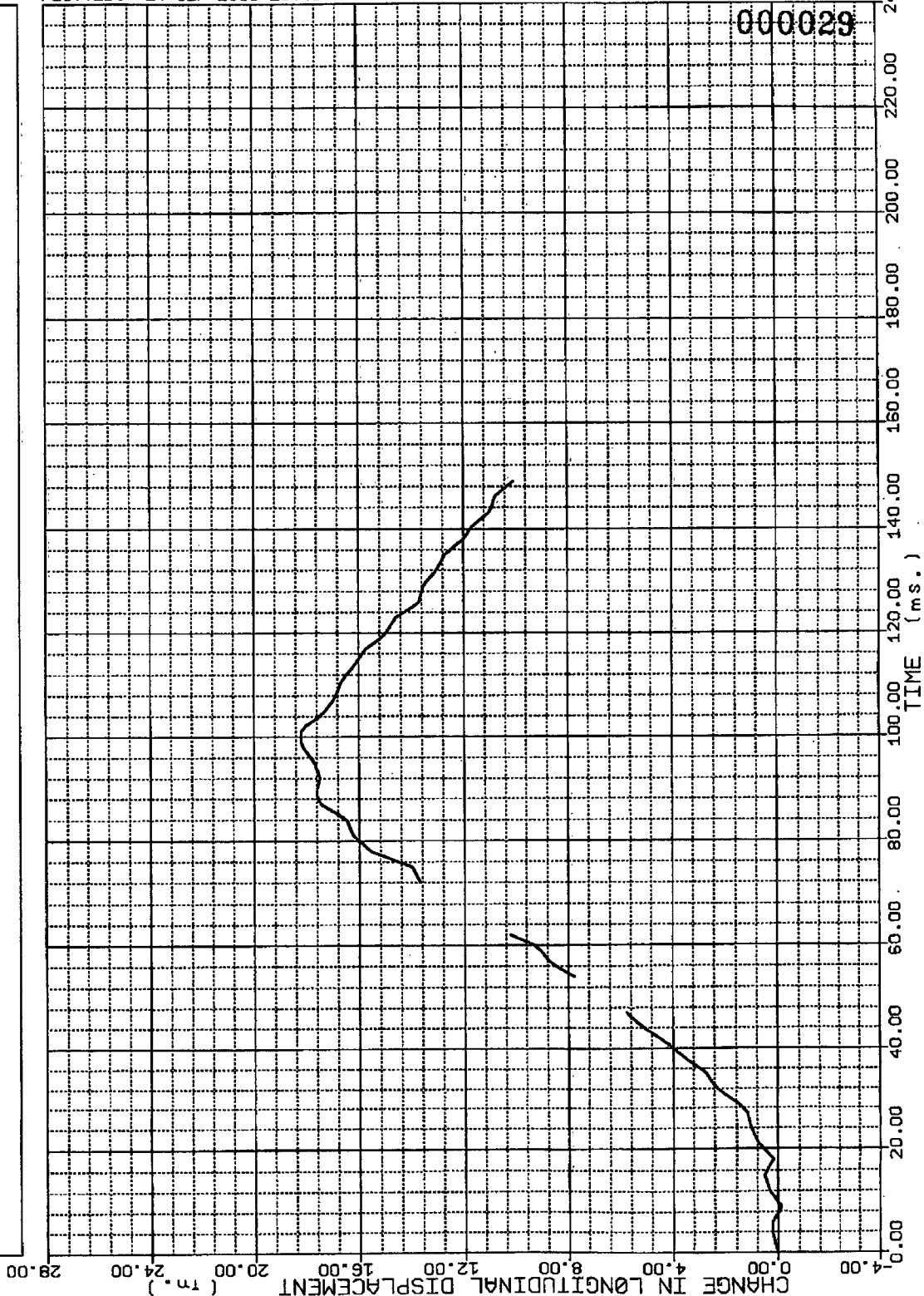
Y - AXIS: L/S HEAD - DRIVER WRT L/ROCKER AT SEAT BOLT				MAX = 18.19	at 101.00	MIN = -.1178	at 9.00
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION			
7277	BARRIER	13065	SCALE	APPLIED			

PLOTTED: 14-SEP-1989 20:48:00.59

13065

SHEET

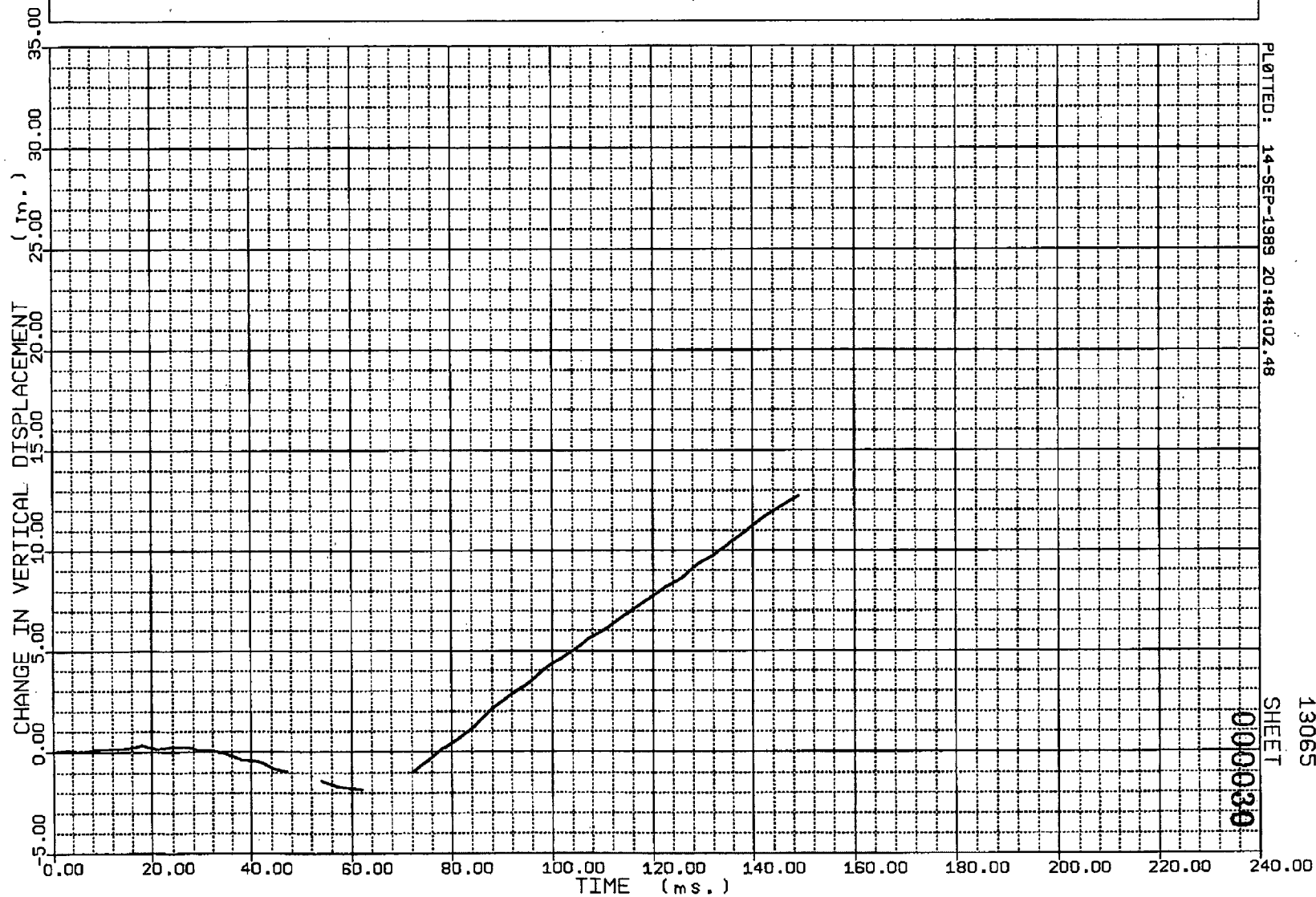
000029



CRTS 0007277

Y - AXIS: L/S HEAD - DRIVER WRT L/ROCKER AT SEAT BOLT MAX = 12.71 at 149.00 MIN = -1.831 at 62.00

RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED

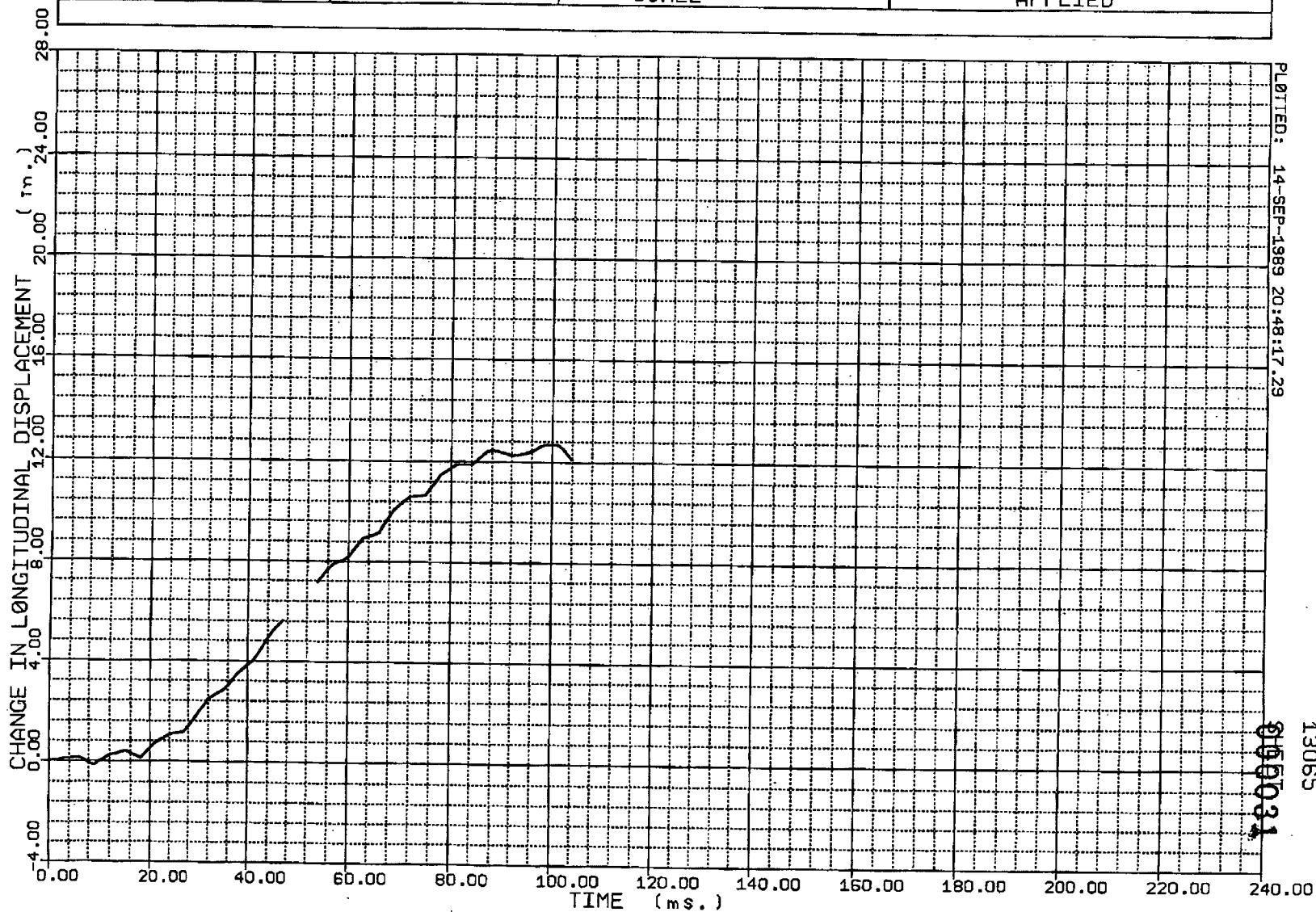


13065
SHEET

CRTS 0007277

PRODUCED BY FORD
1361

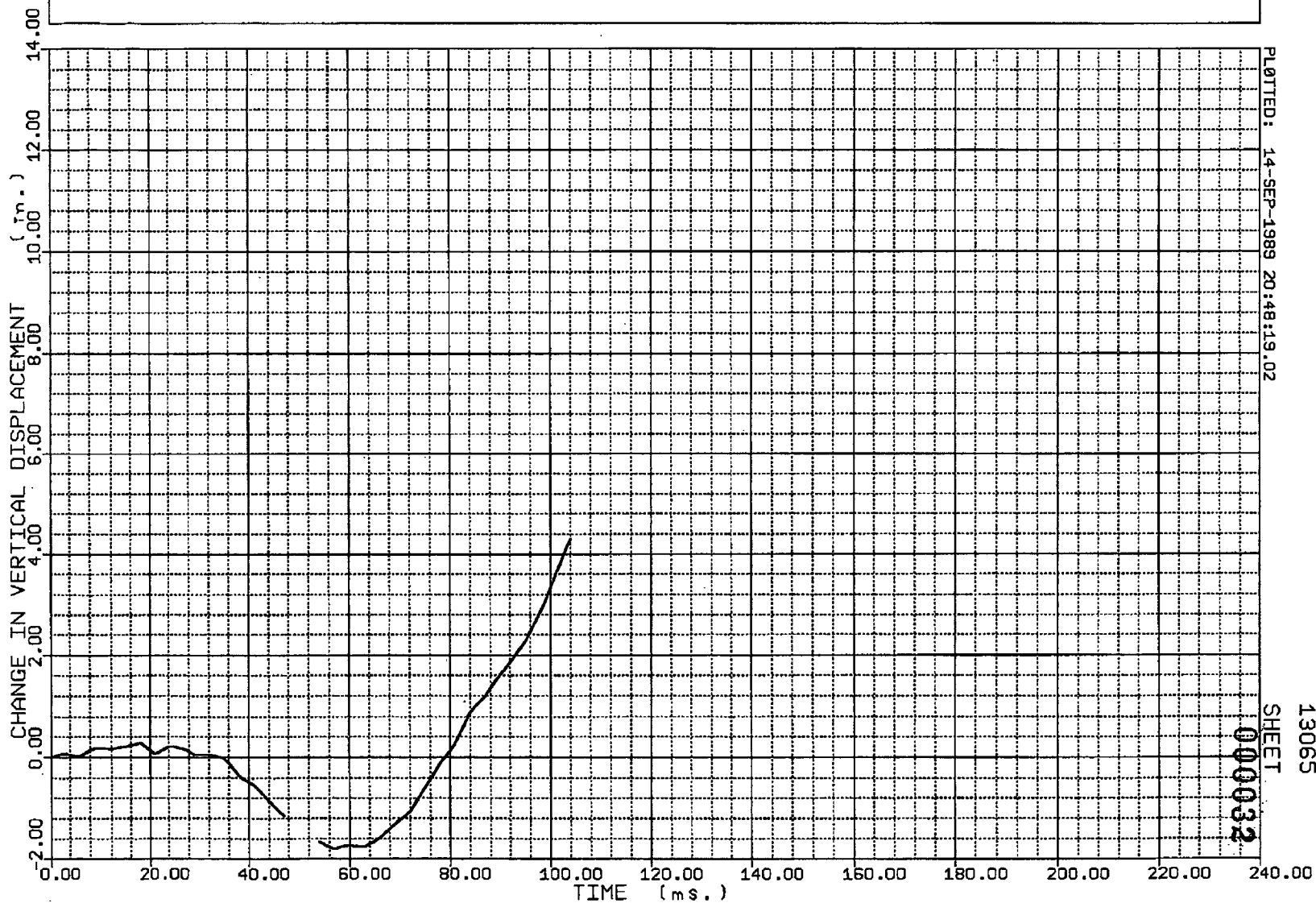
Y - AXIS: L/SHOULDER - DRIVER WRT L/ROCKER AT SEAT BOLT MAX = 12.68 at 99.00 MIN = -.1394 at 9.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED



CRTS 0007277

PRODUCED BY FORD
1362

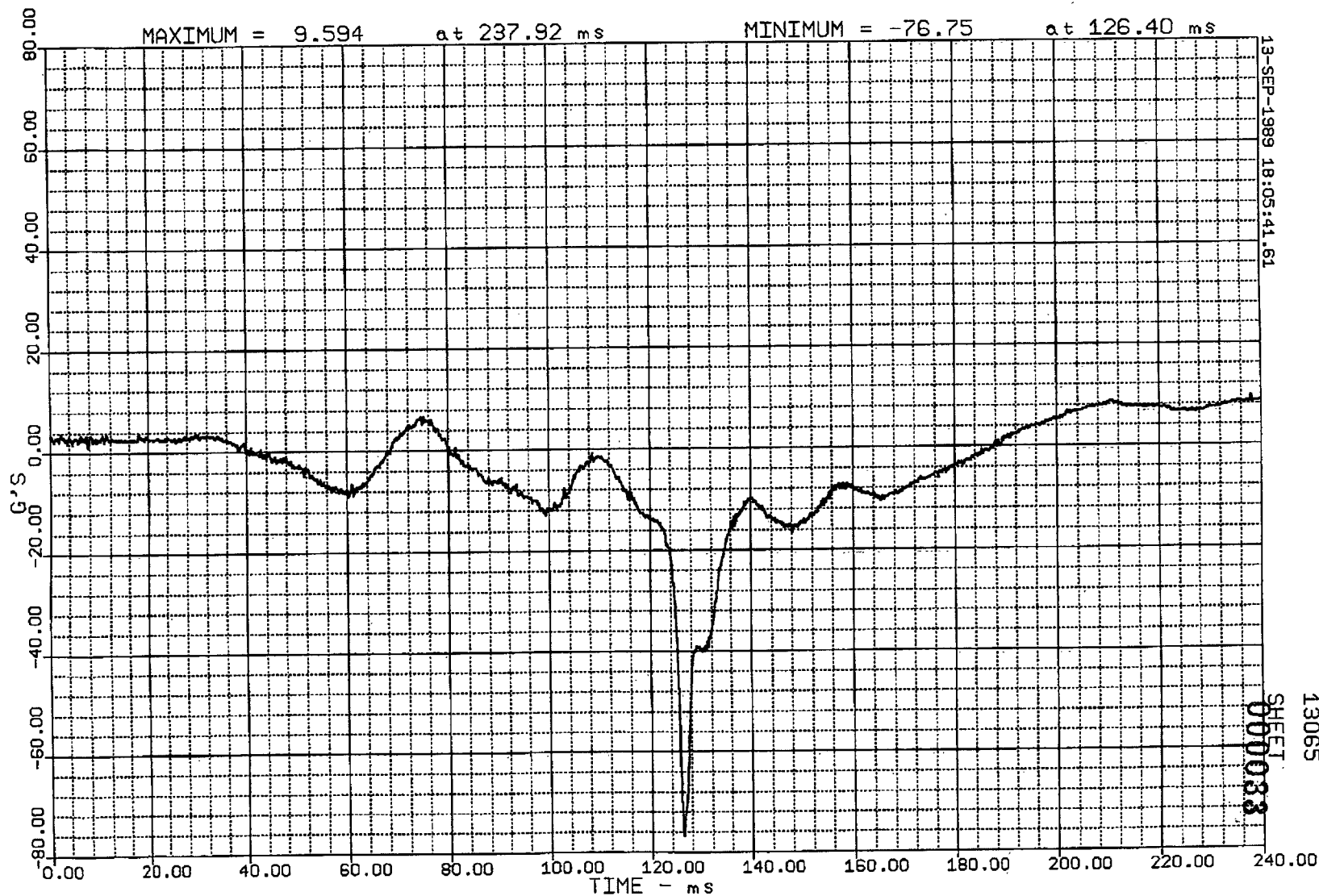
Y - AXIS: L/SHOULDER - DRIVER WRT L/ROCKER AT SEAT BOLT MAX = 4.300 at 104.00 MIN = -1.799 at 57.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED



CRIS 0007277

PRODUCED BY FORD
1363

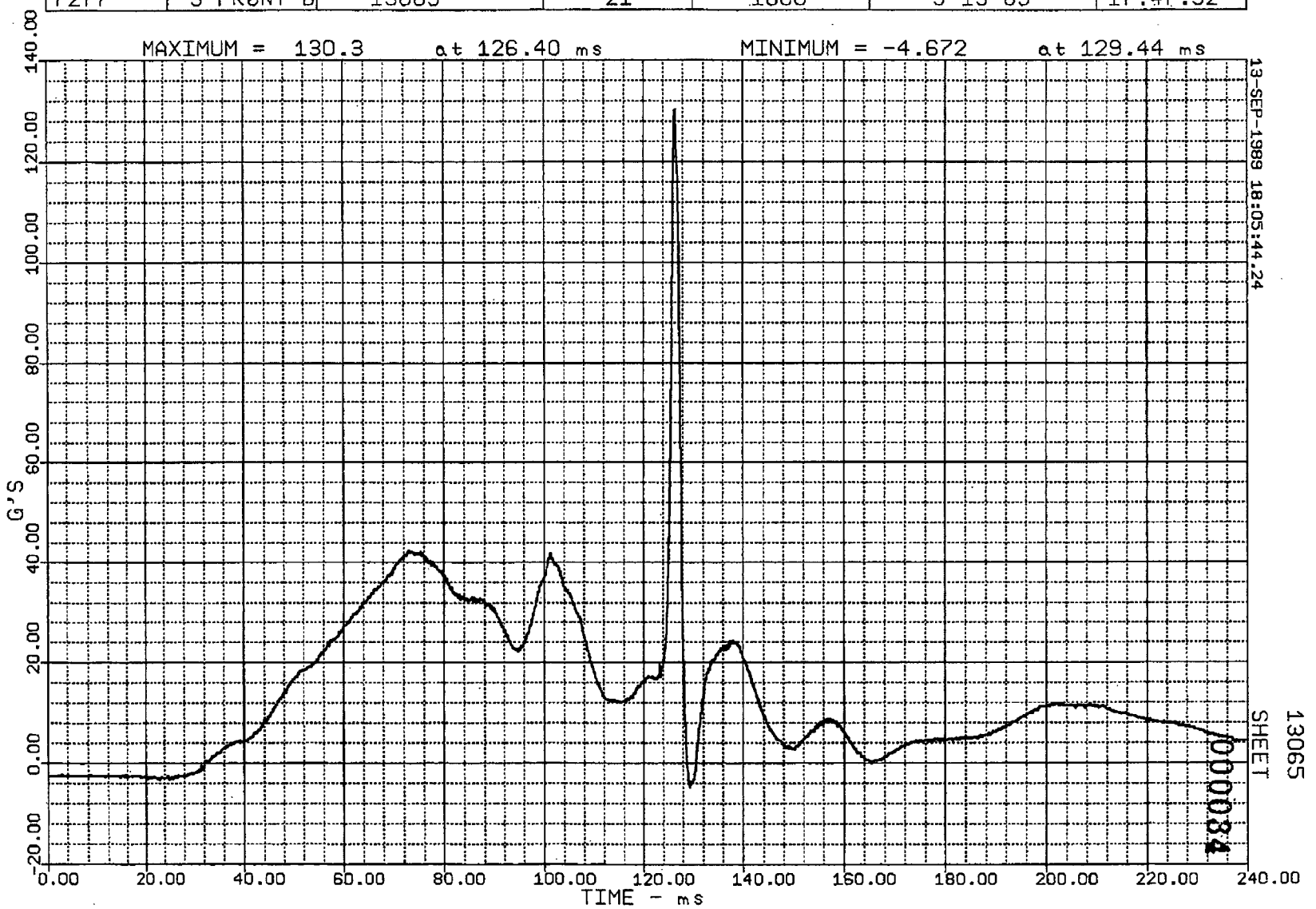
LONG R/F DUMMY HEAD C.G.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	20	1000	9-13-89	17:47:52



CRTS 0007277

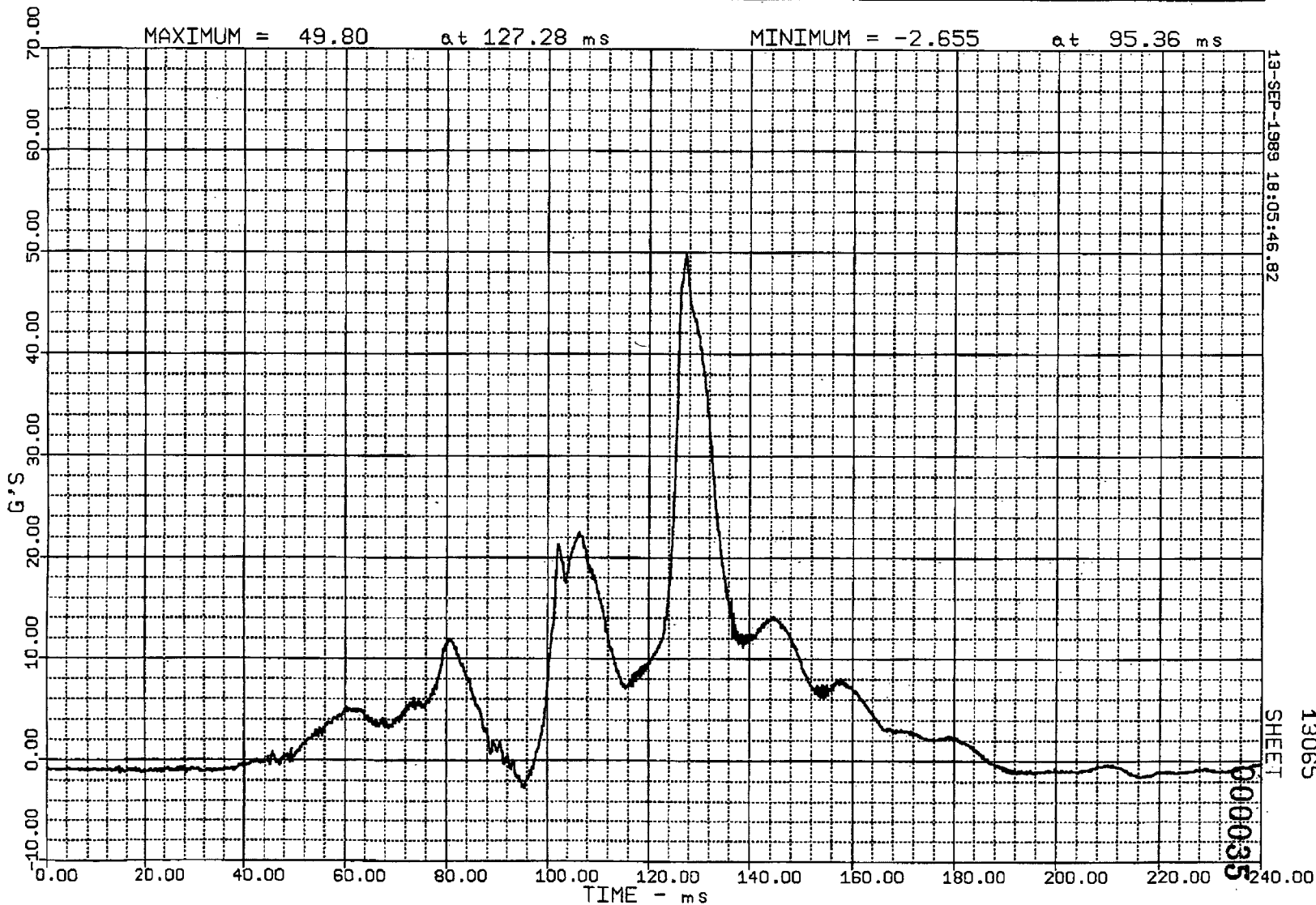
PRODUCED BY FORD
1364

VERT R/F DUMMY HEAD C.G.				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	21	1000	9-13-89	17:47:52



CRTS 0007277

LAT	R/F DUMMY HEAD C.G.				199200	TARGET
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	22	1000	9-13-89	17:47:52

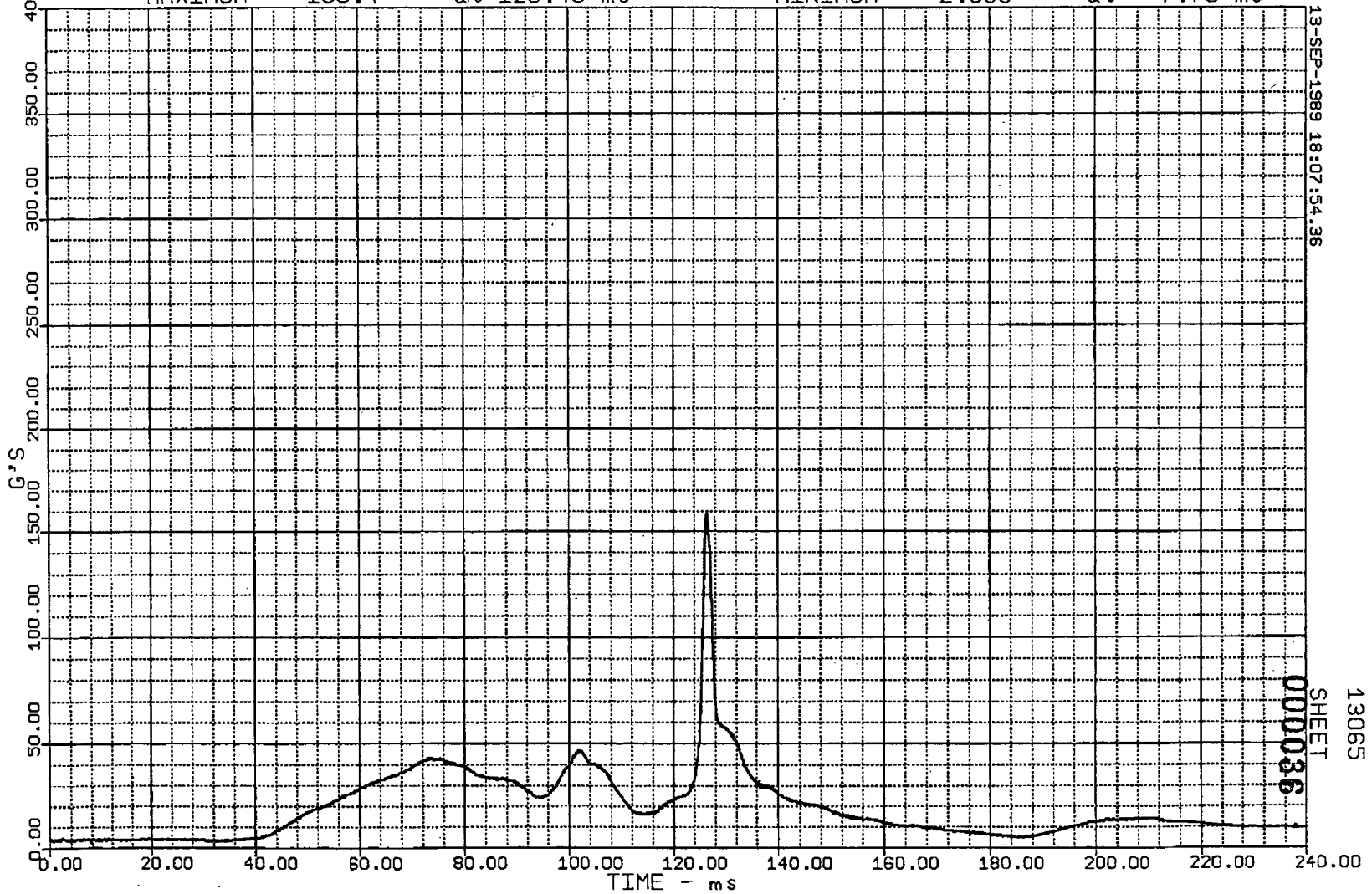


CRTS 0007277

PRODUCED BY FORD
1366

RES. R/F DUMMY HEAD C.G.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	87	1000	9-13-89	17:47:52

\$ HIC = 436. T1 = 125.28 T2 = 127.92 Regular HIC requested, 36ms used.
 MAXIMUM = 158.4 at 126.40 ms MINIMUM = 2.859 at 7.76 ms



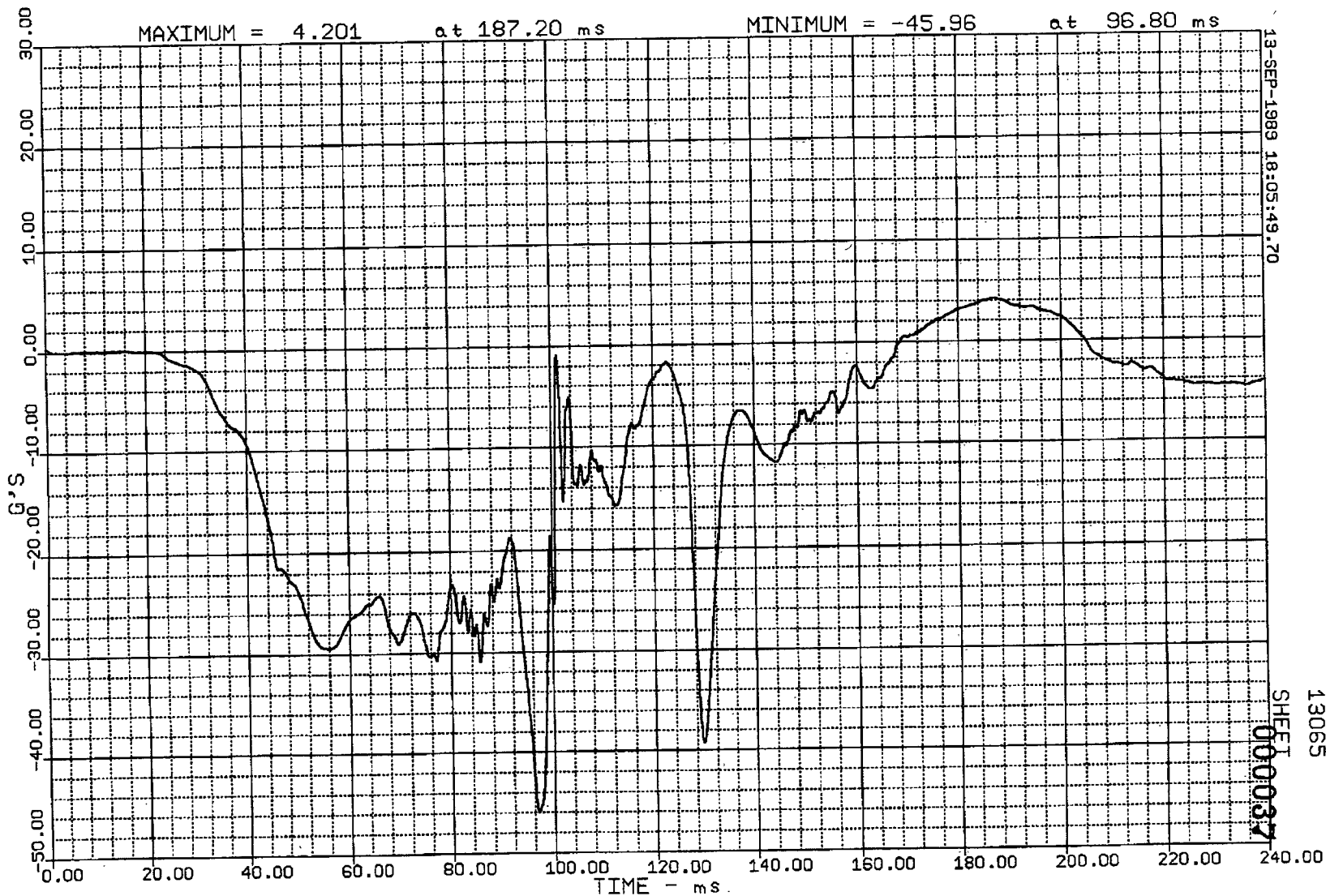
13-SEP-1989 18:07:54.36

13065
 SHEET
 000036

CRTS 0007277

PRODUCED BY FORD
 1367

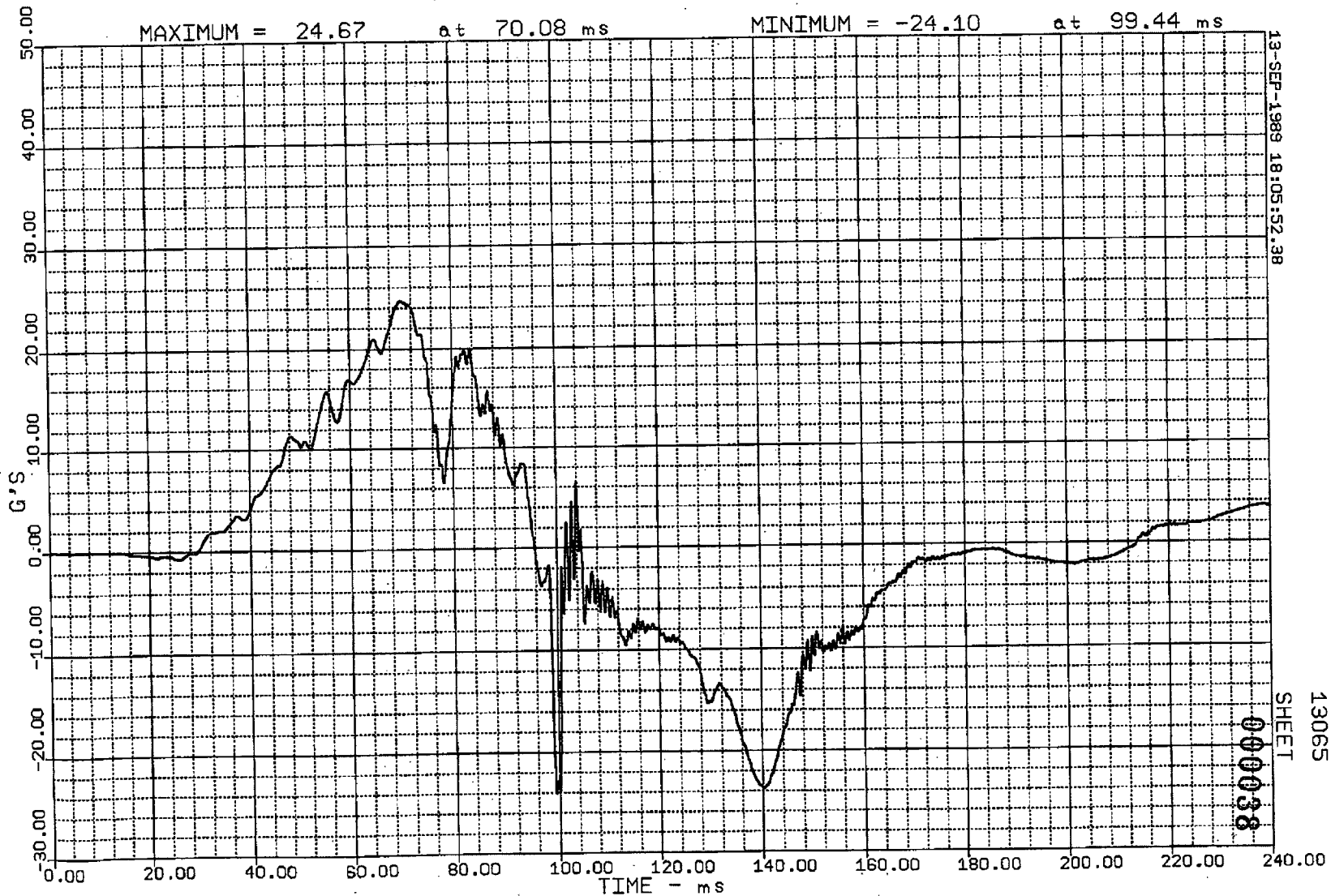
LONG R/F DUMMY CHEST				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	23	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1368

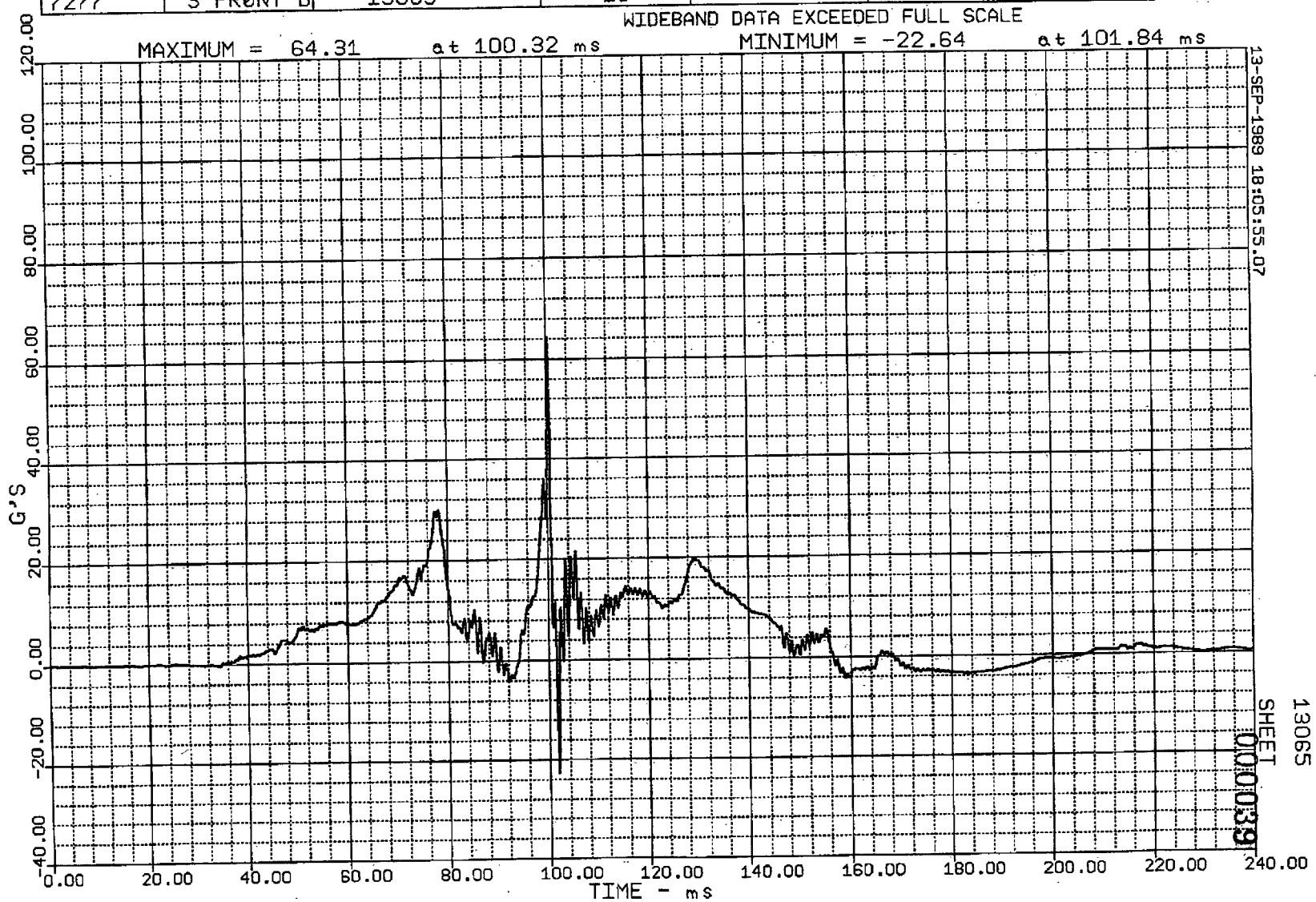
VERT R/F DUMMY CHEST		199200			TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	24	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1369

LAT R/F DUMMY CHEST				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	25	180	9-13-89	17:47:52



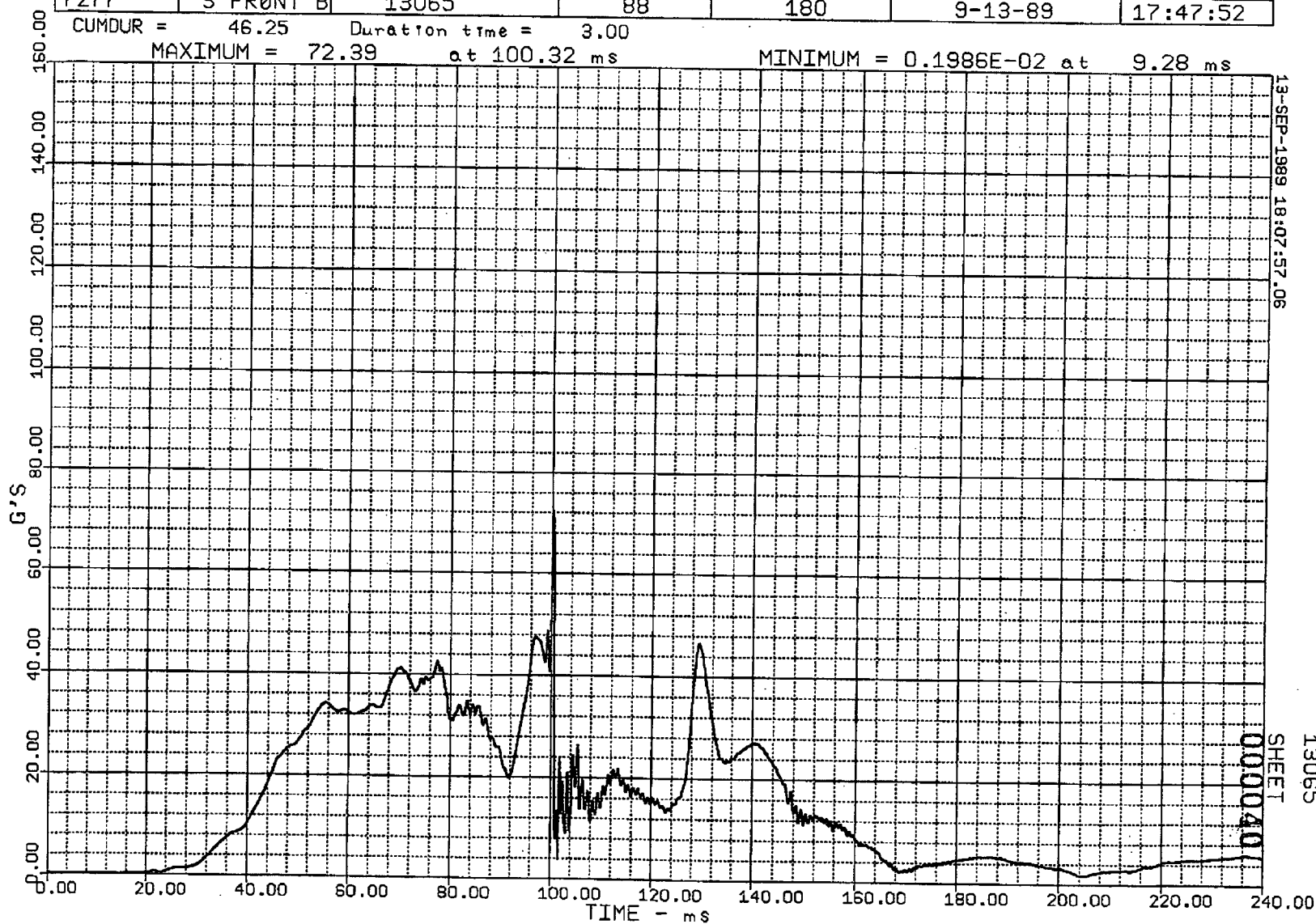
CRTS 0007277

PRODUCED BY FORD
1370

RES. R/F DUMMY CHEST						
			199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	88	180	9-13-89	17:47:52

CUMDUR = 46.25 Duration time = 3.00

MAXIMUM = 72.39 at 100.32 ms MINIMUM = 0.1986E-02 at 9.28 ms



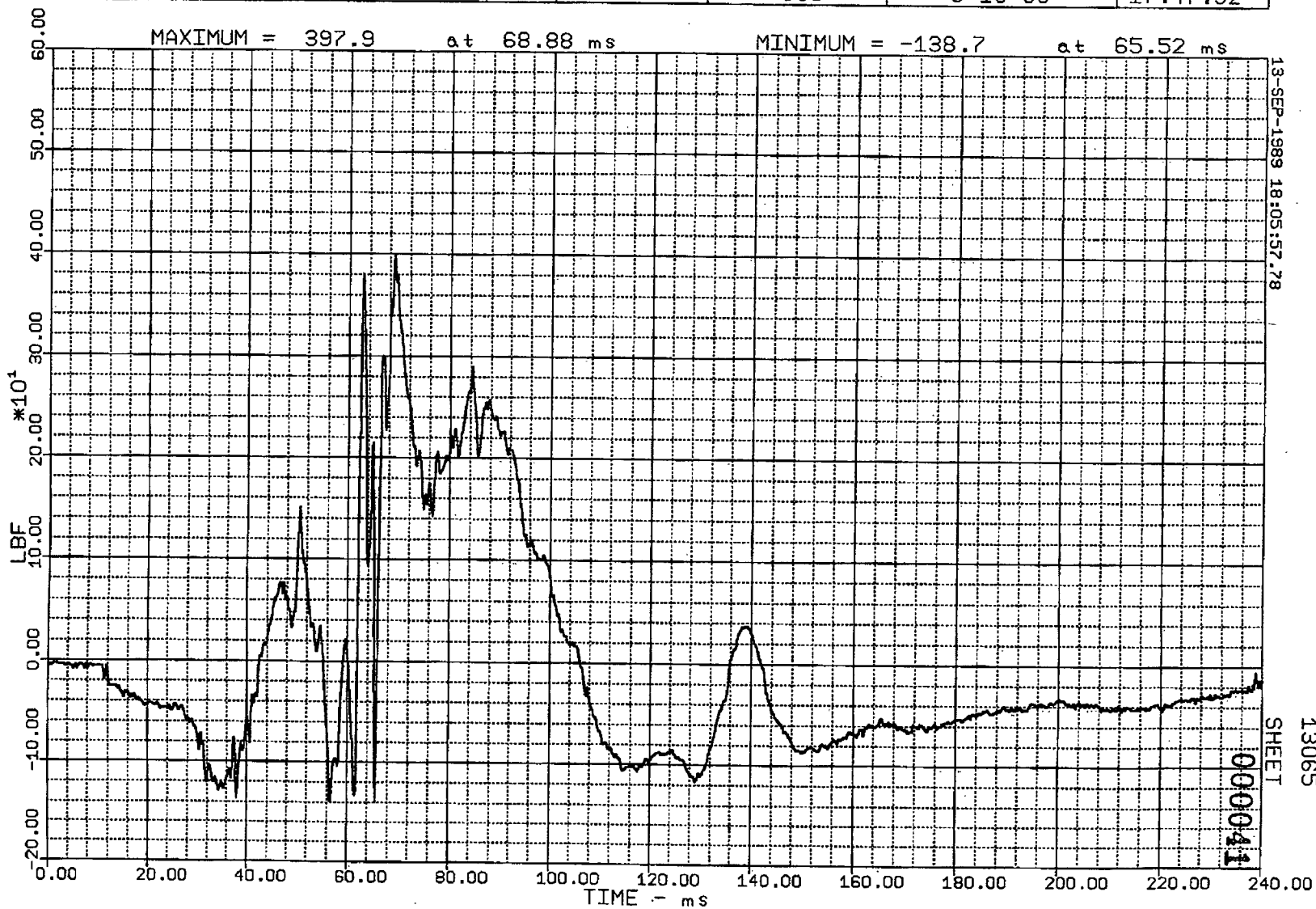
13-SEP-1989 18:07:57.06

13065
SHEET
000040

CRTS 0007277

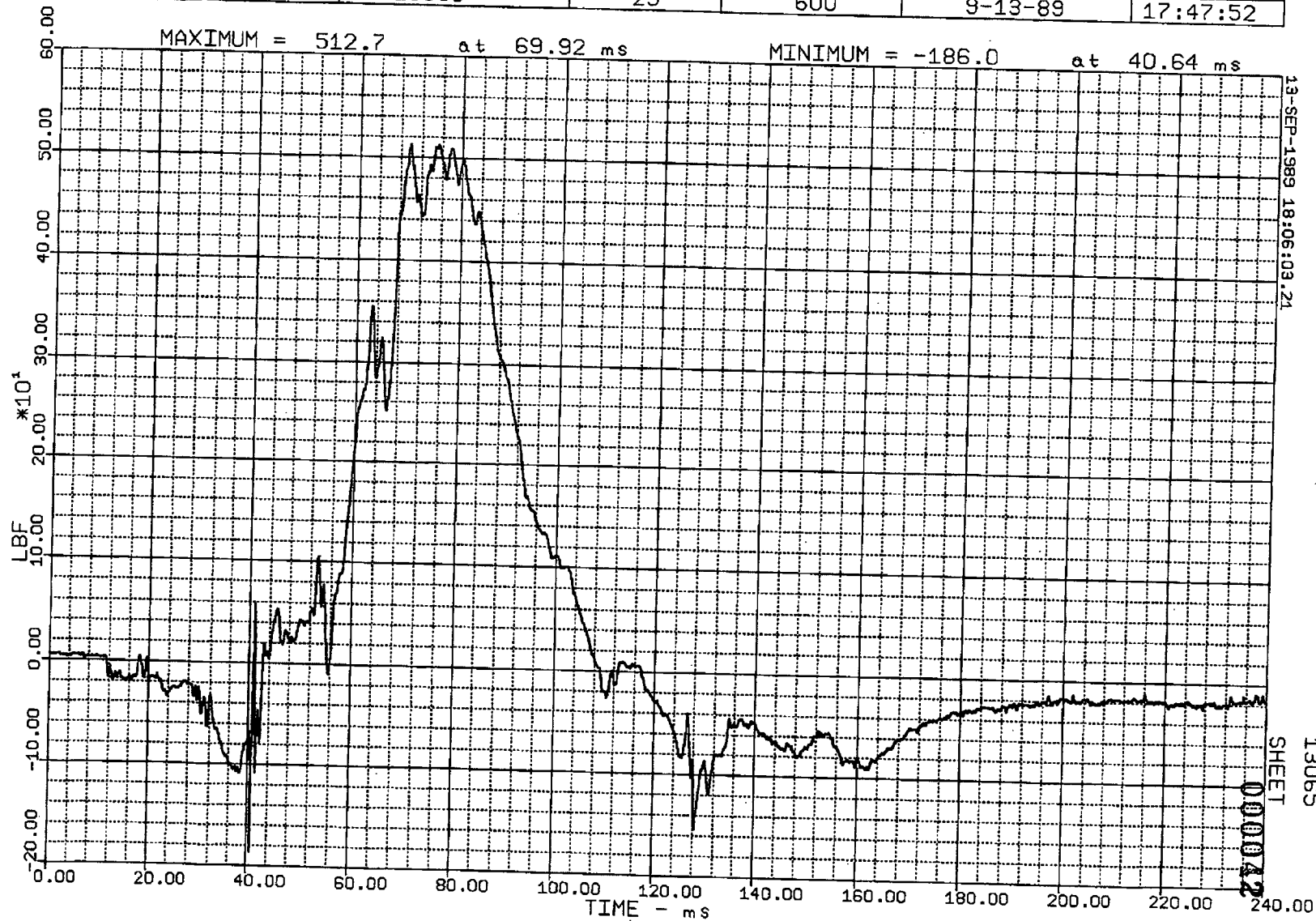
PRODUCED BY FORD
1371

AXIAL R/F DUMMY L/FEMUR LOAD B#1				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	27	600	9-13-89	17:47:52



CRTS 0007277

AXIAL R/F DUMMY R/FEMUR LOAD B#1							
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	199200	FILTER TYPE	TEST DATE	TARGET
7277	S FRONT B	13065	29		600	9-13-89	17:47:52



CRIS 0007277

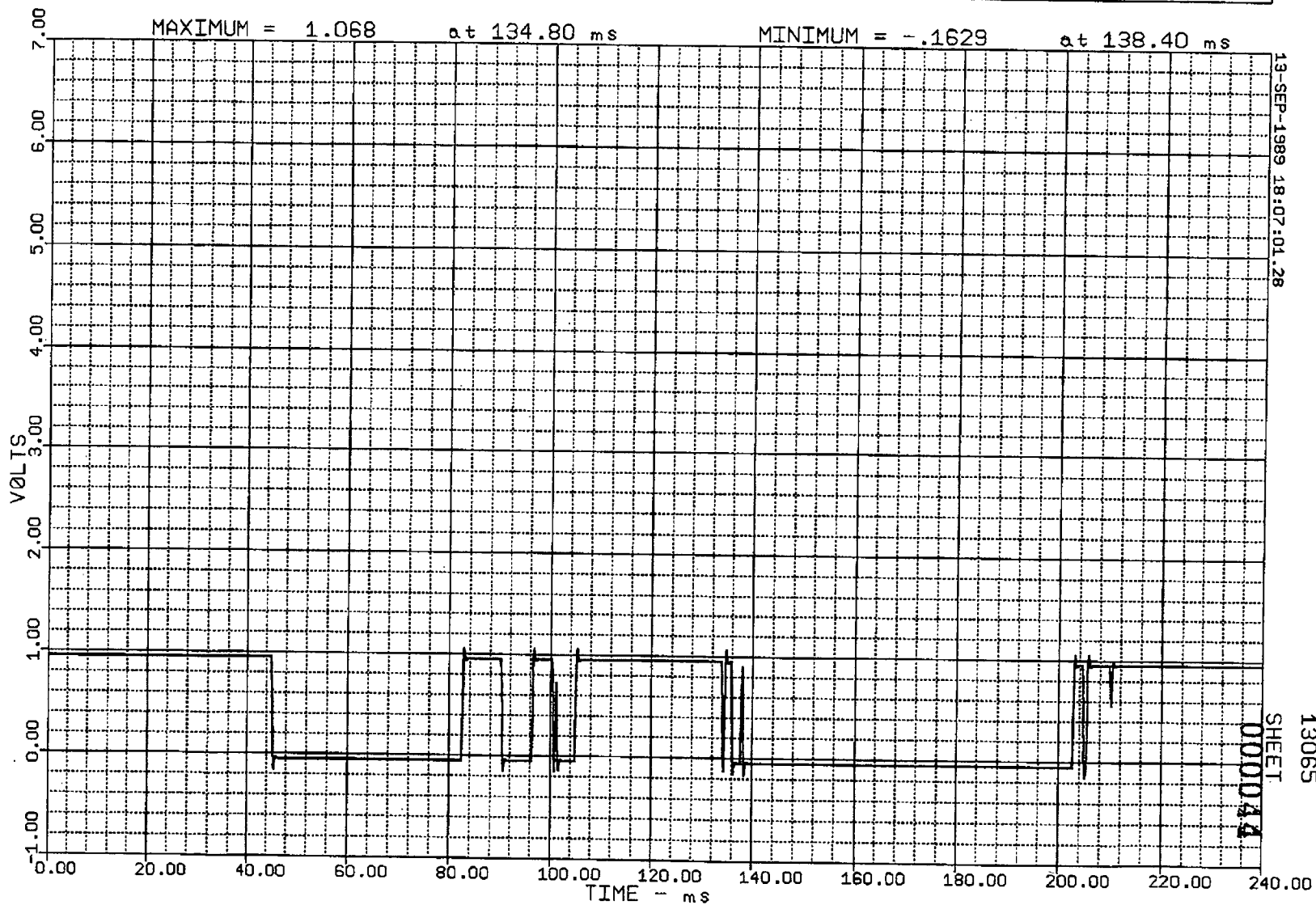
R/F DUMMY L/KNEE SW						
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	59	1000	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1374

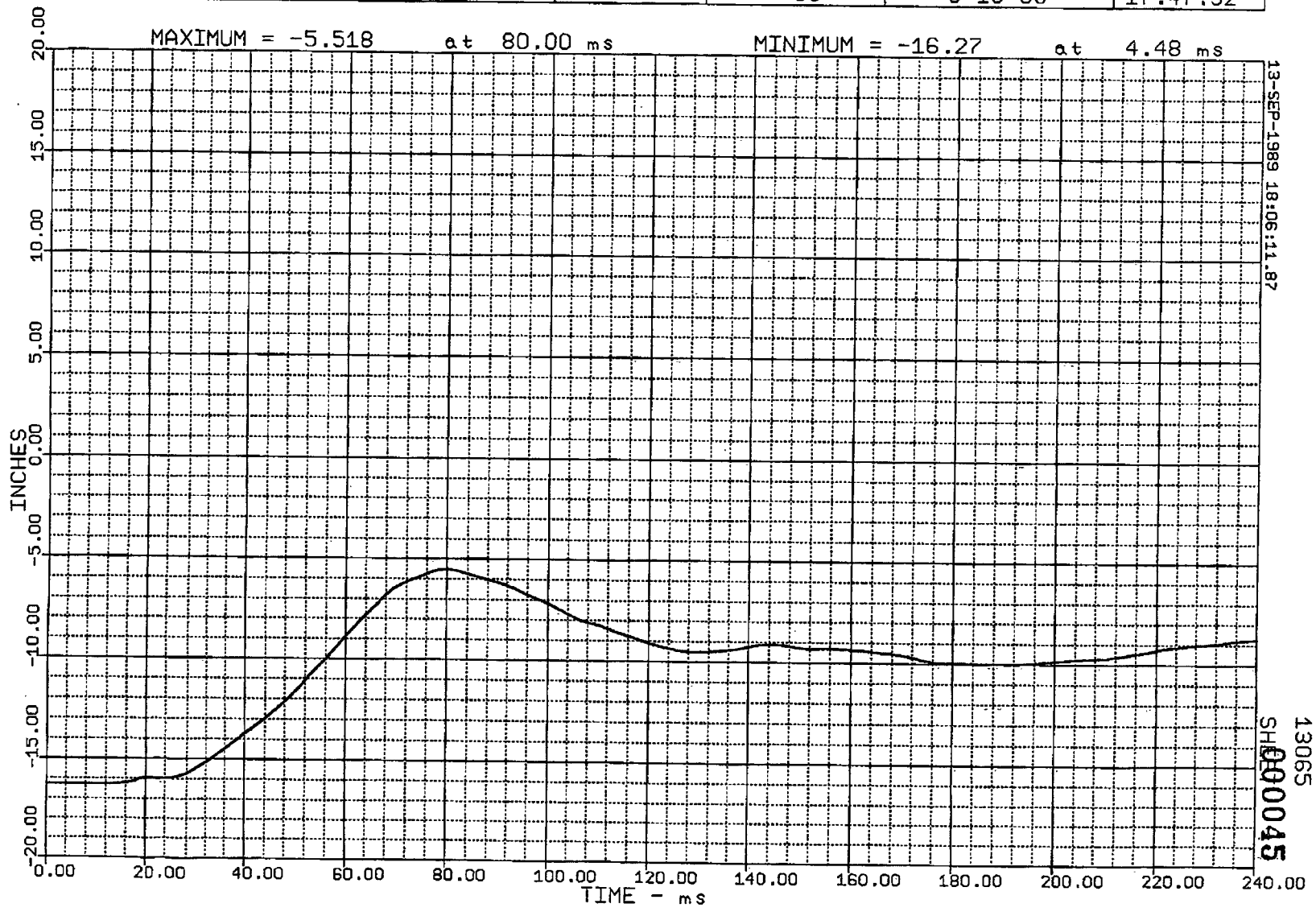
R/F DUMMY R/KNEE SW				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	60	1000	9-13-89	17:47:52



CRTS 0007277

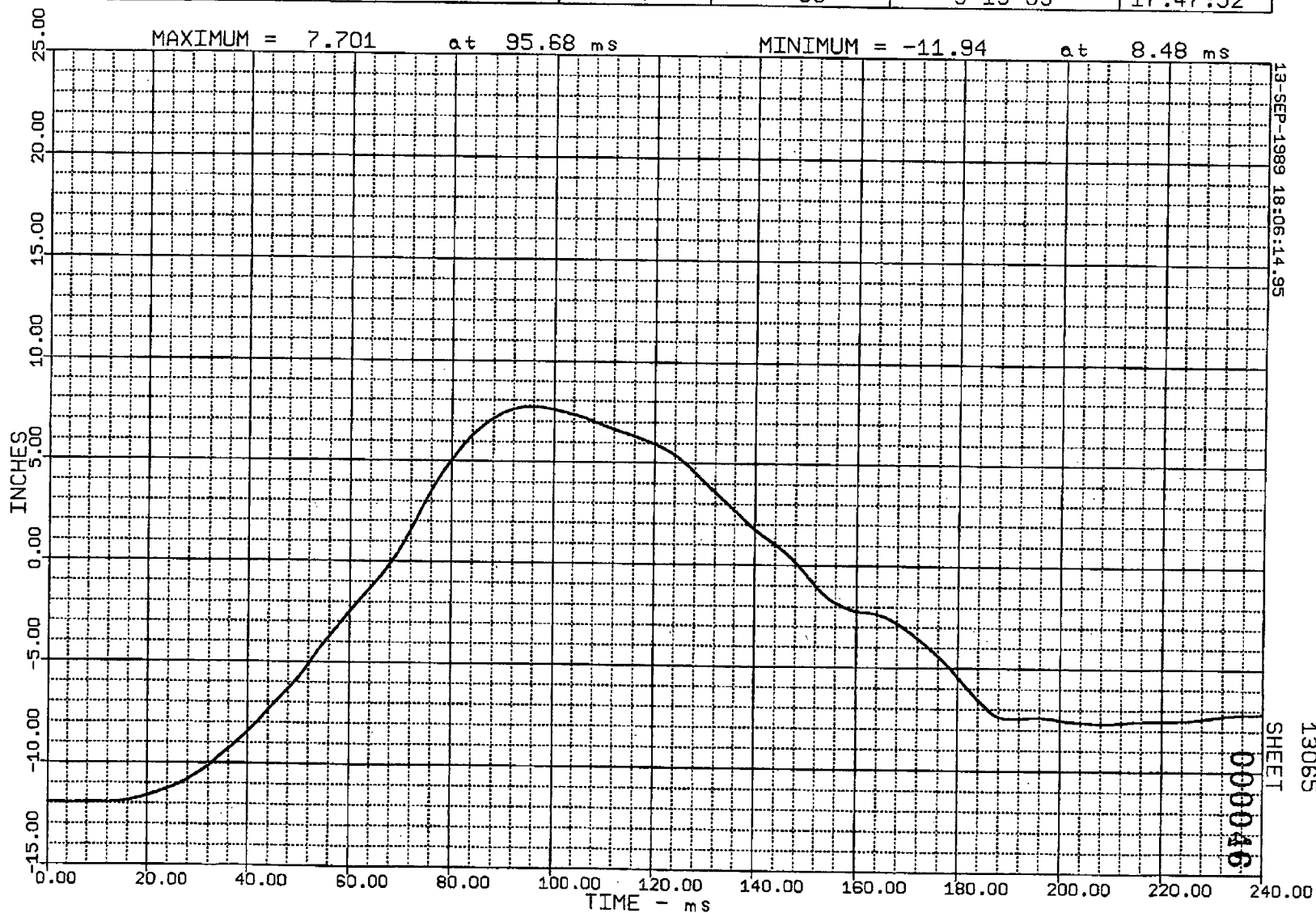
PRODUCED BY FORD
1375

R/F DUMMY L/KNEE S.P.						
				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	33	60	9-13-89	17:47:52



CRTS 0007277

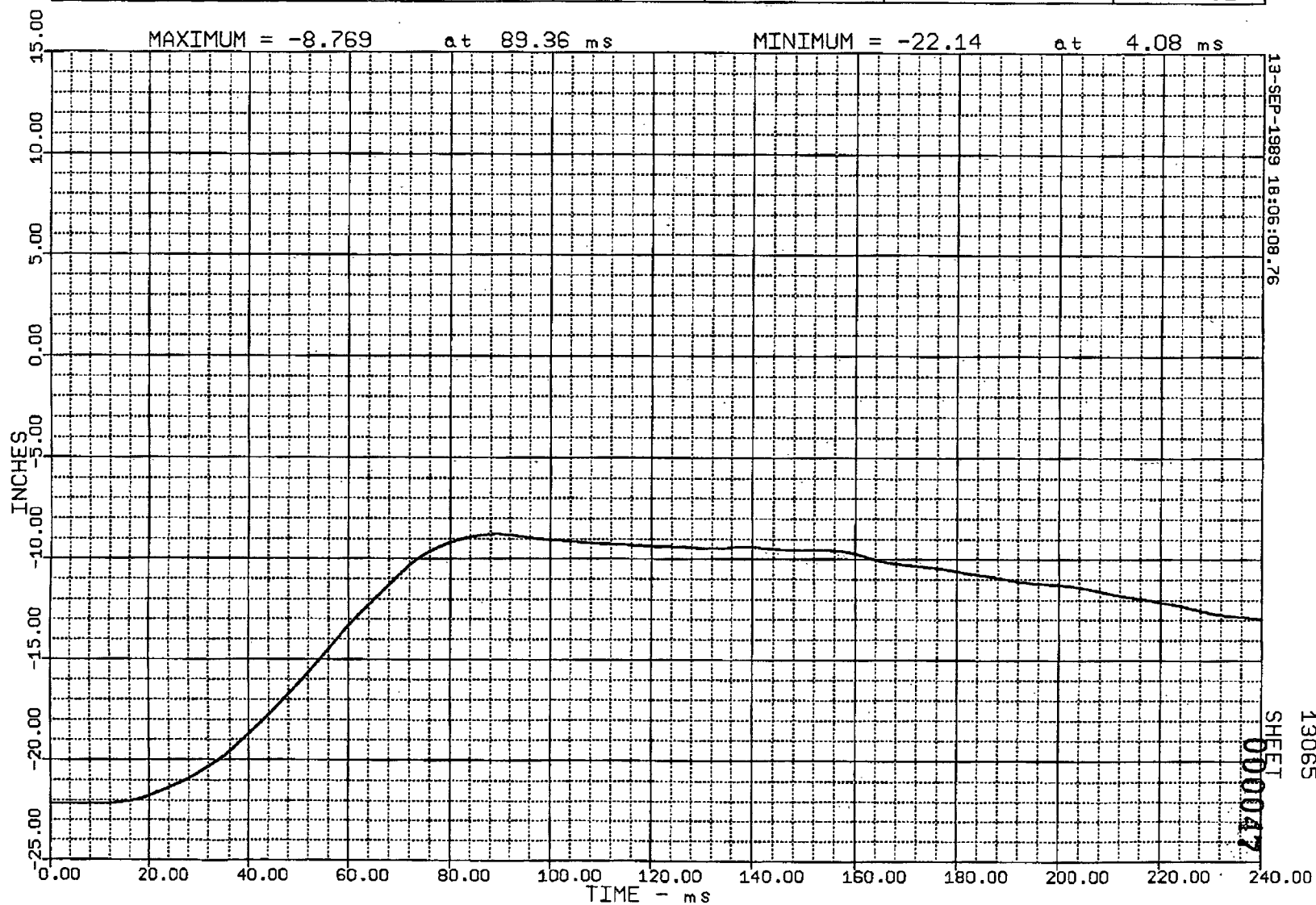
R/F DUMMY R/KNEE S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	34	60	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1377

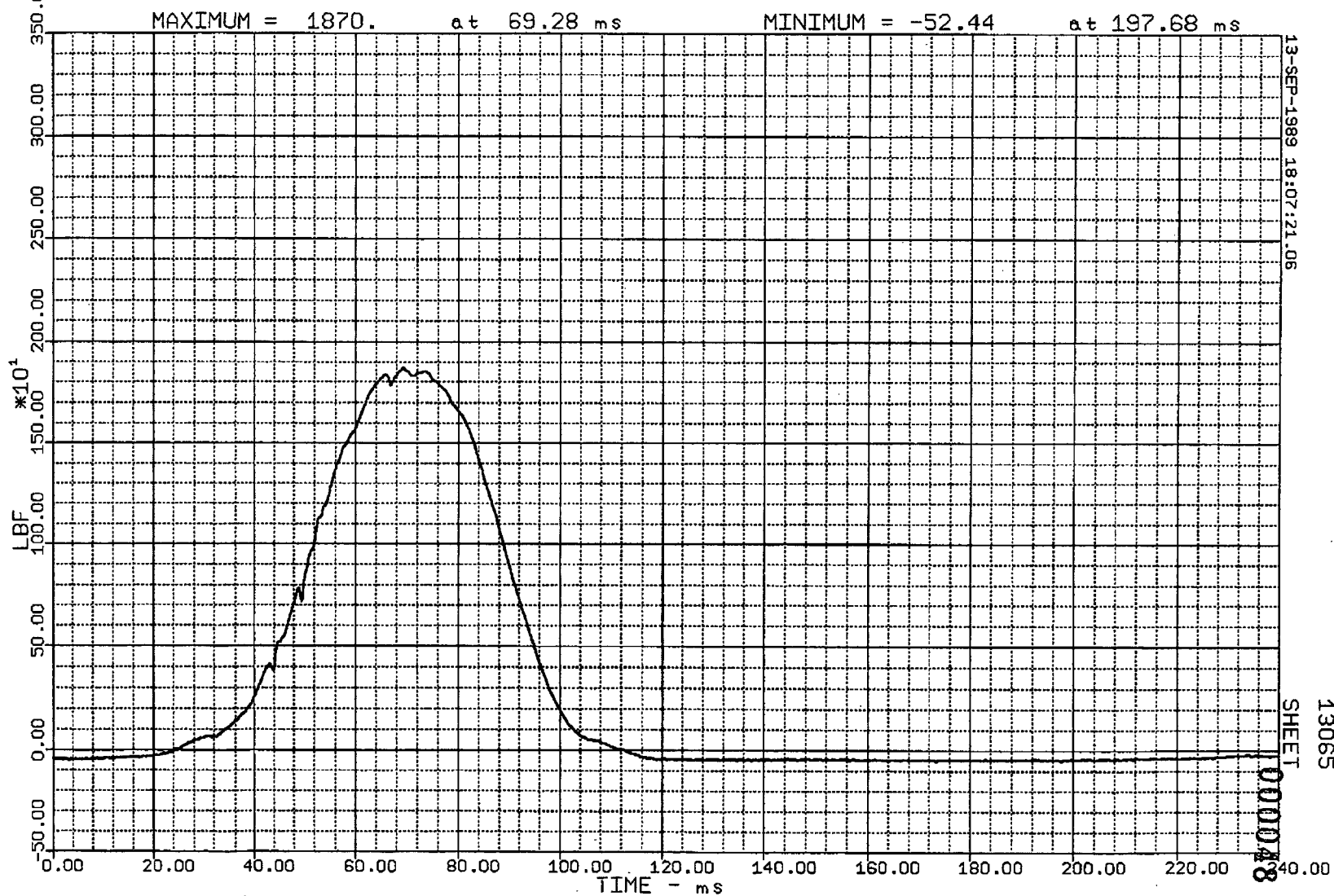
R/F DUMMY PELVIS S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	32	60	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1378

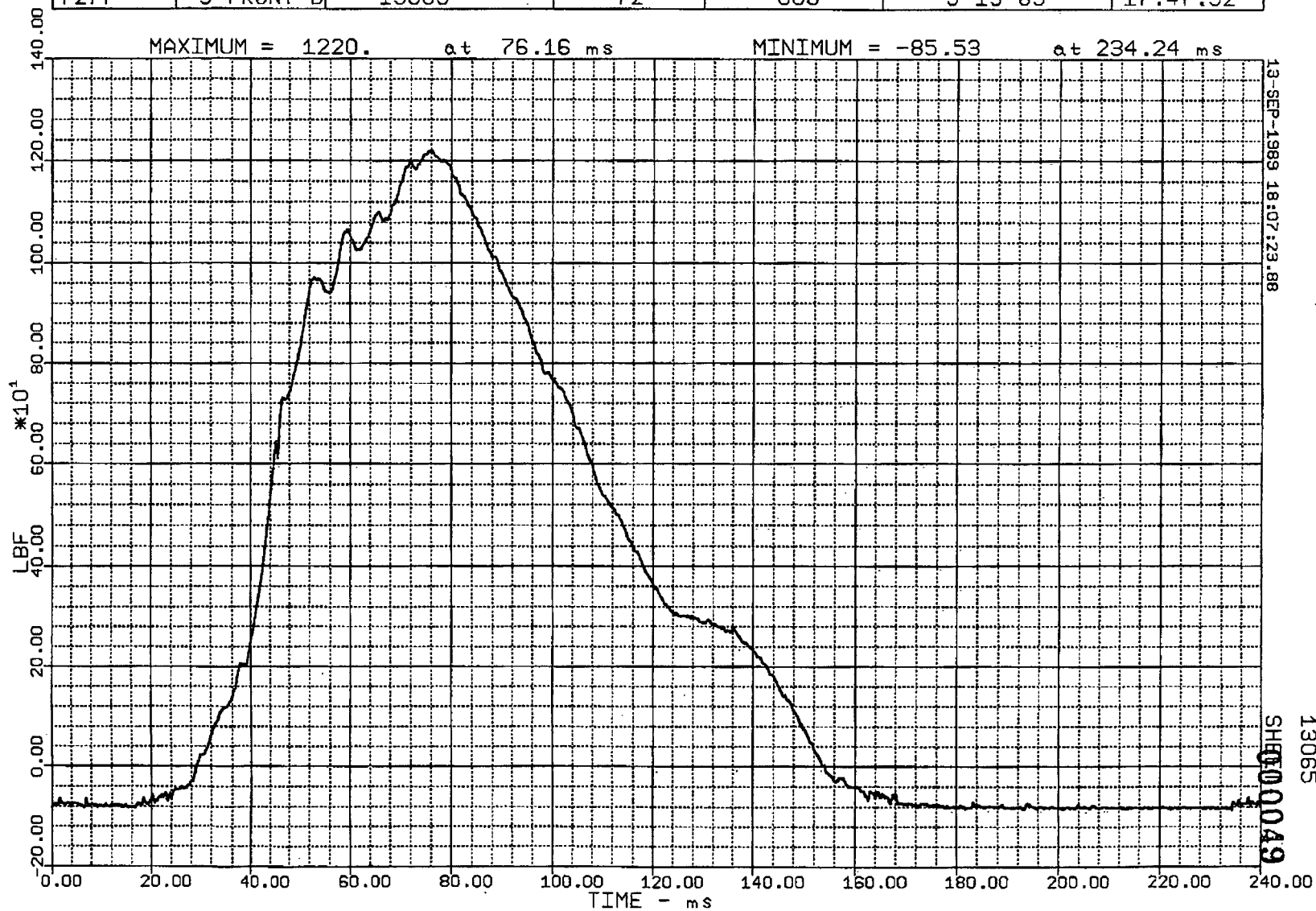
R/F LAP BELT @ ANCHOR				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	71	600	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1379

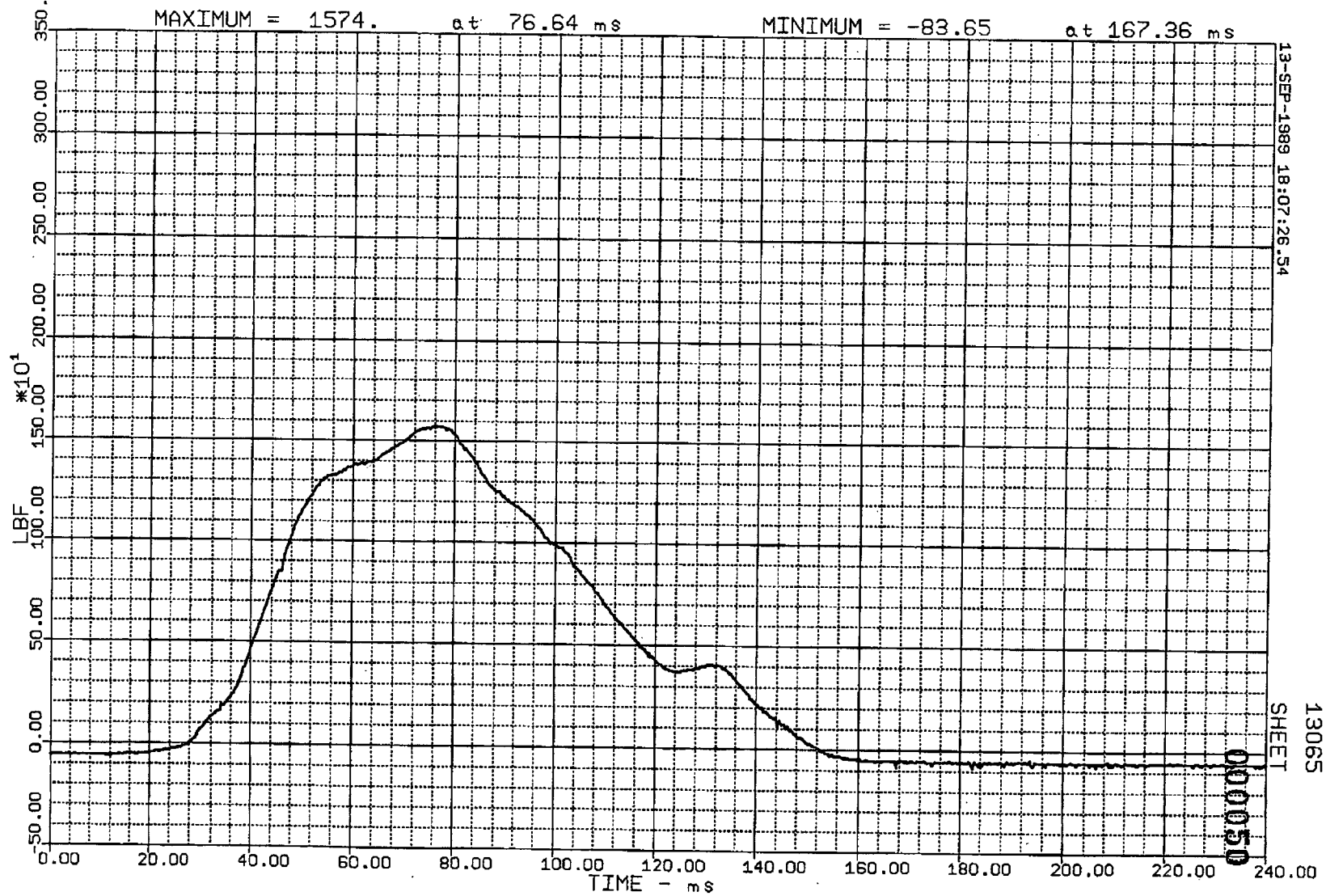
R/F TORSO BELT @ RETRACTOR				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	72	600	9-13-89	17:47:52



CRTS 0007277

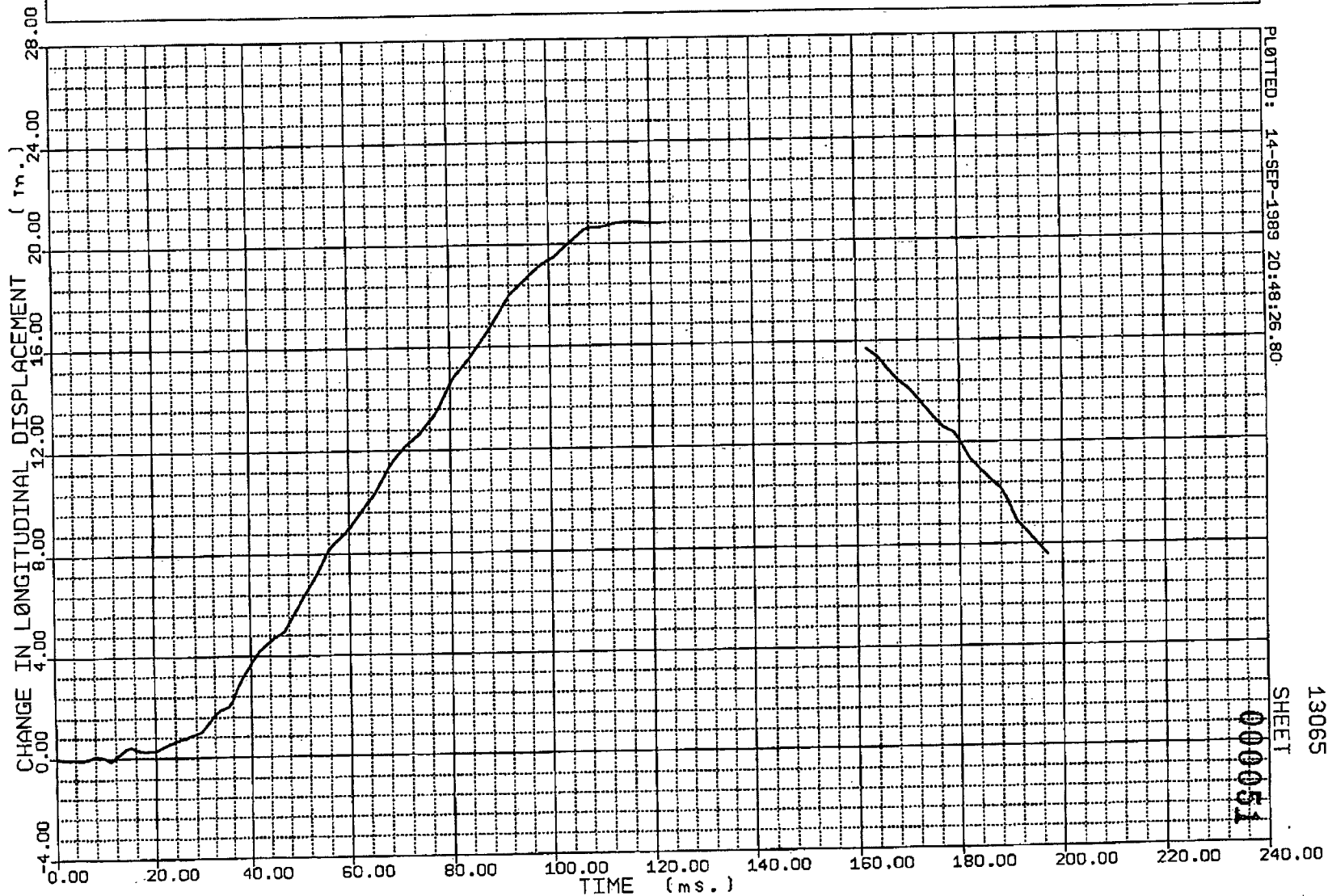
PRODUCED BY FORD
1380

R/F TORSO BELT @ D-RING						
				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	73	600	9-13-89	17:47:52



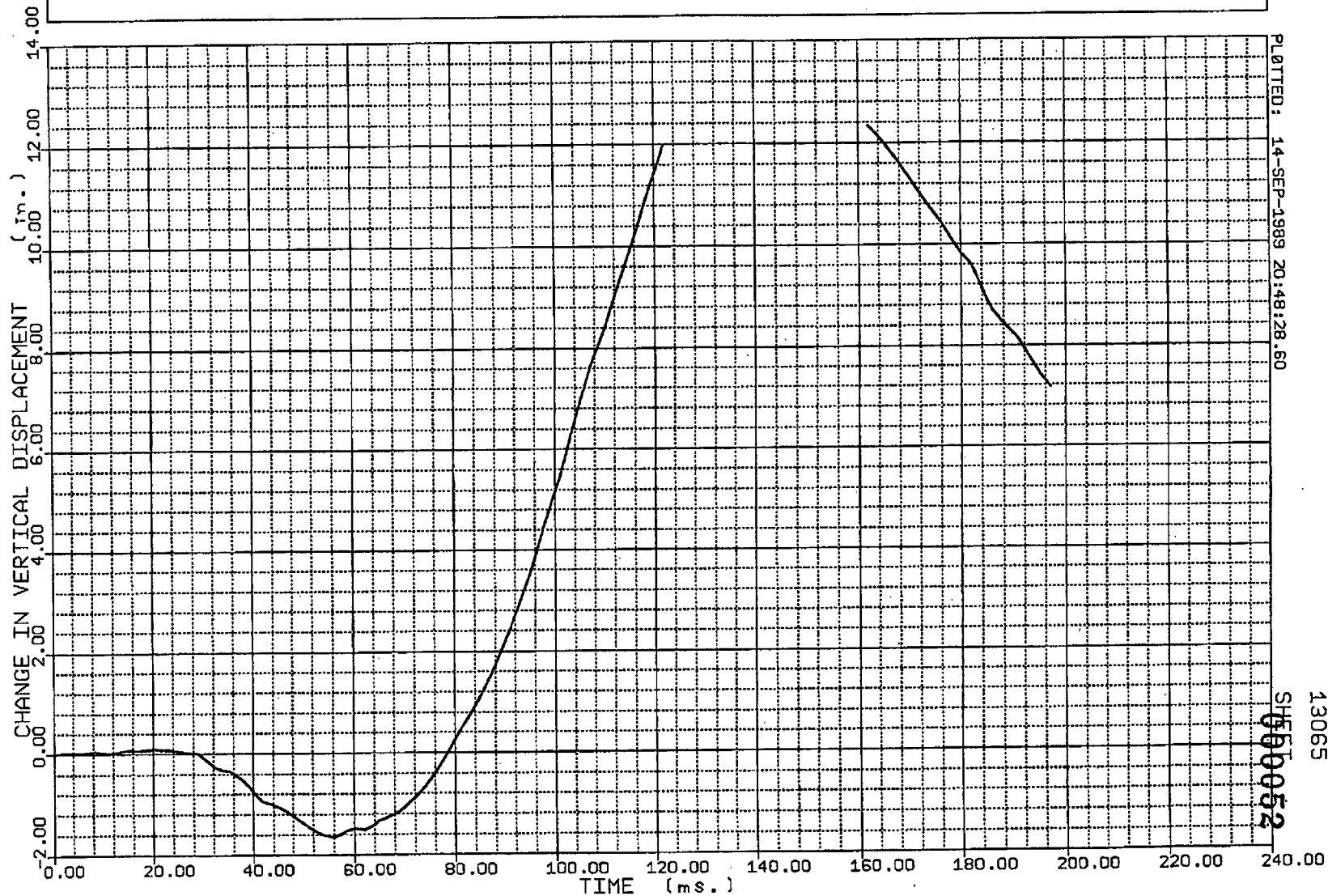
CRTS 0007277

Y - AXIS: R/S HEAD - PASSENGER WRT R/ROCKER AT SEAT BOLT MAX = 20.86 at 116.00 MIN = -.9310E-01 at 11.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED



CRIS 0007277

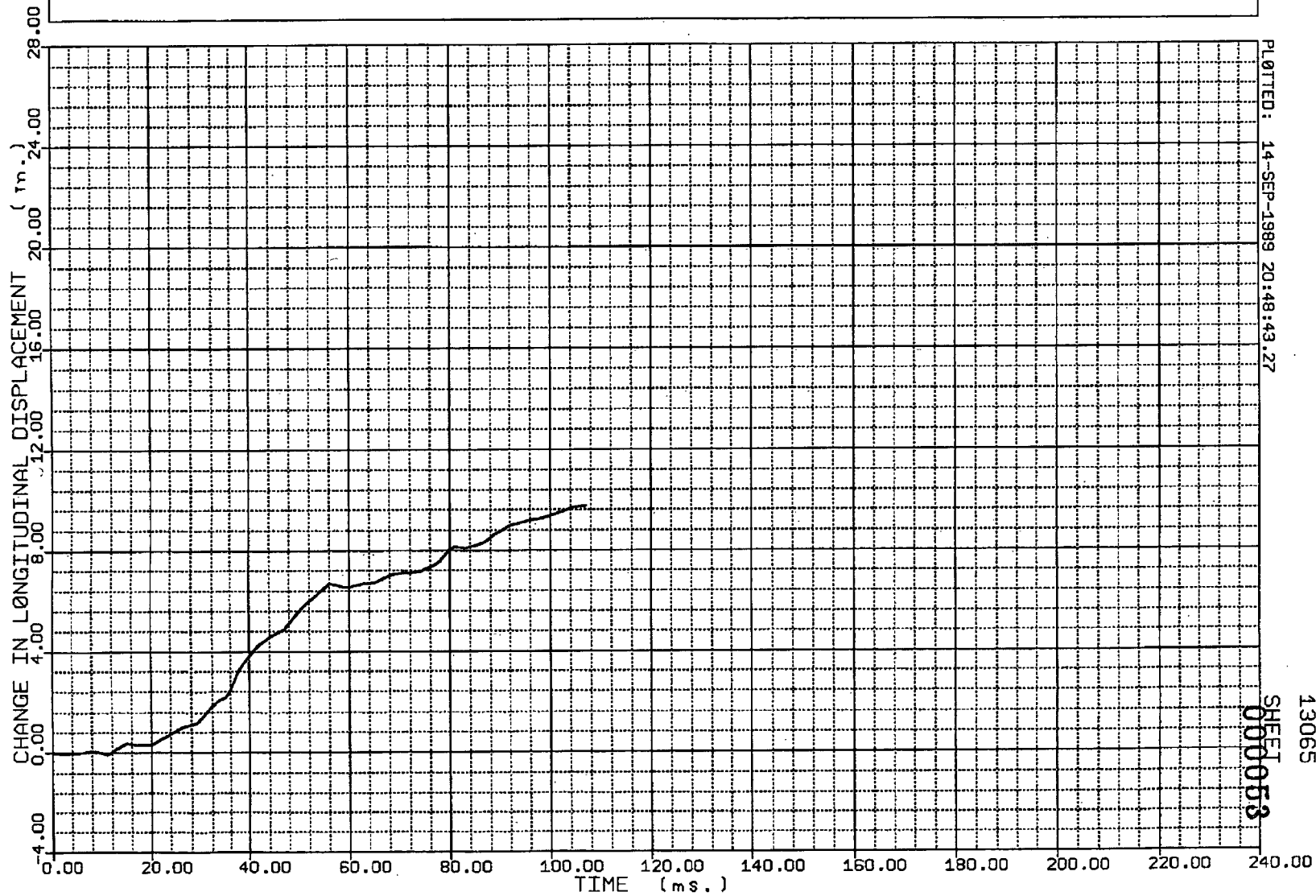
Y - AXIS: R/S HEAD - PASSENGER WRT R/RØCKER AT SEAT BØLT MAX = 12.35 at 162.00 MIN = -1.648 at 56.00				
RUN NØ.	FACILITY	TEST ØRDER NØ.	FILM ANALYSIS METHØD	PITCH CØRRECTION
7277	BARRIER	13065	SCALE	APPLIED



CRIS 0007277

PRODUCED BY FORD
1383

Y - AXIS: R/SHOULDER - PASSENGER WRT R/ROCKER AT SEAT BOLMAX = 9.759 at 107.00 MIN = -.7955E-01 at 11.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED

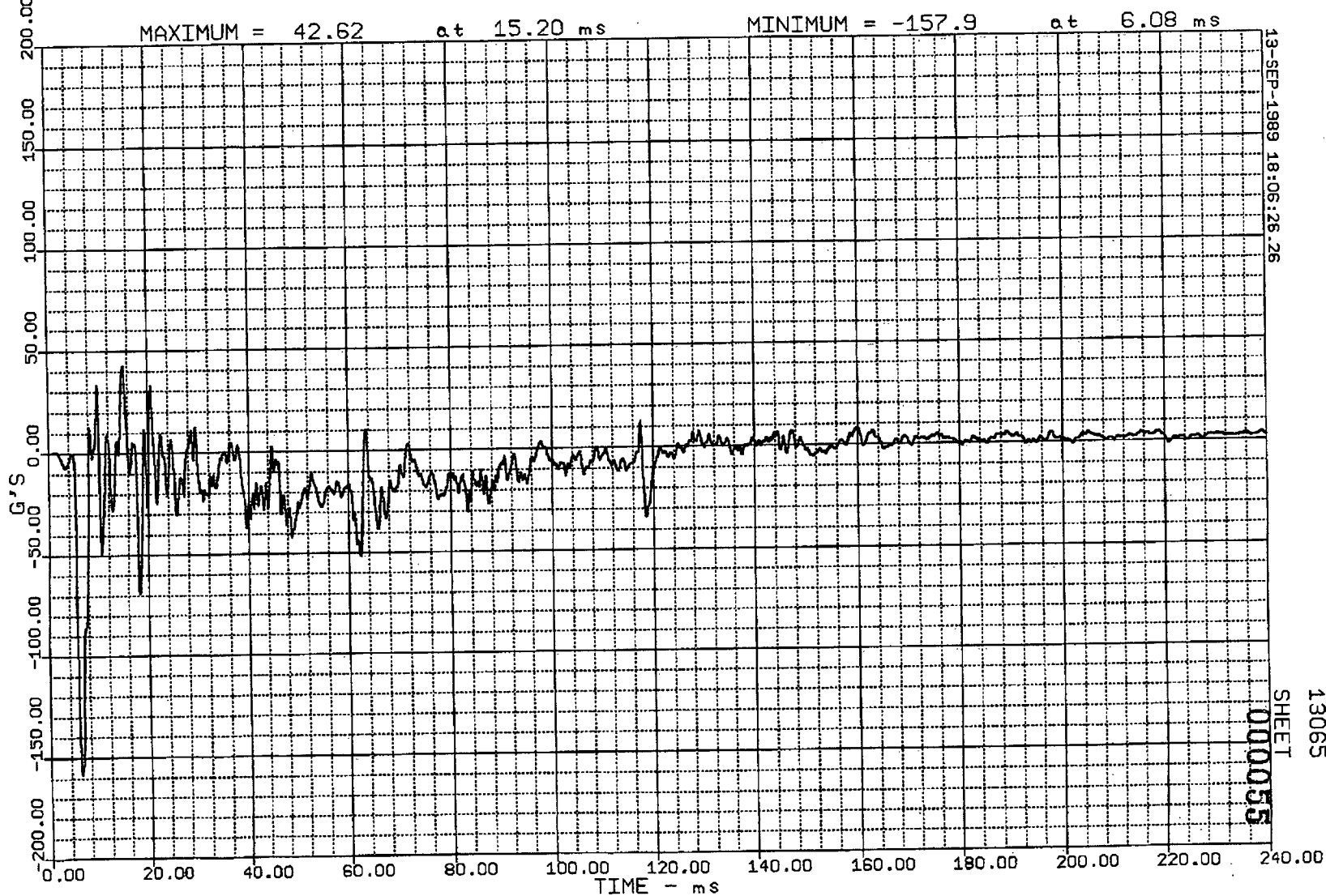


13065
SHEET
000053

CRIS 0007277

PRODUCED BY FORD
1384

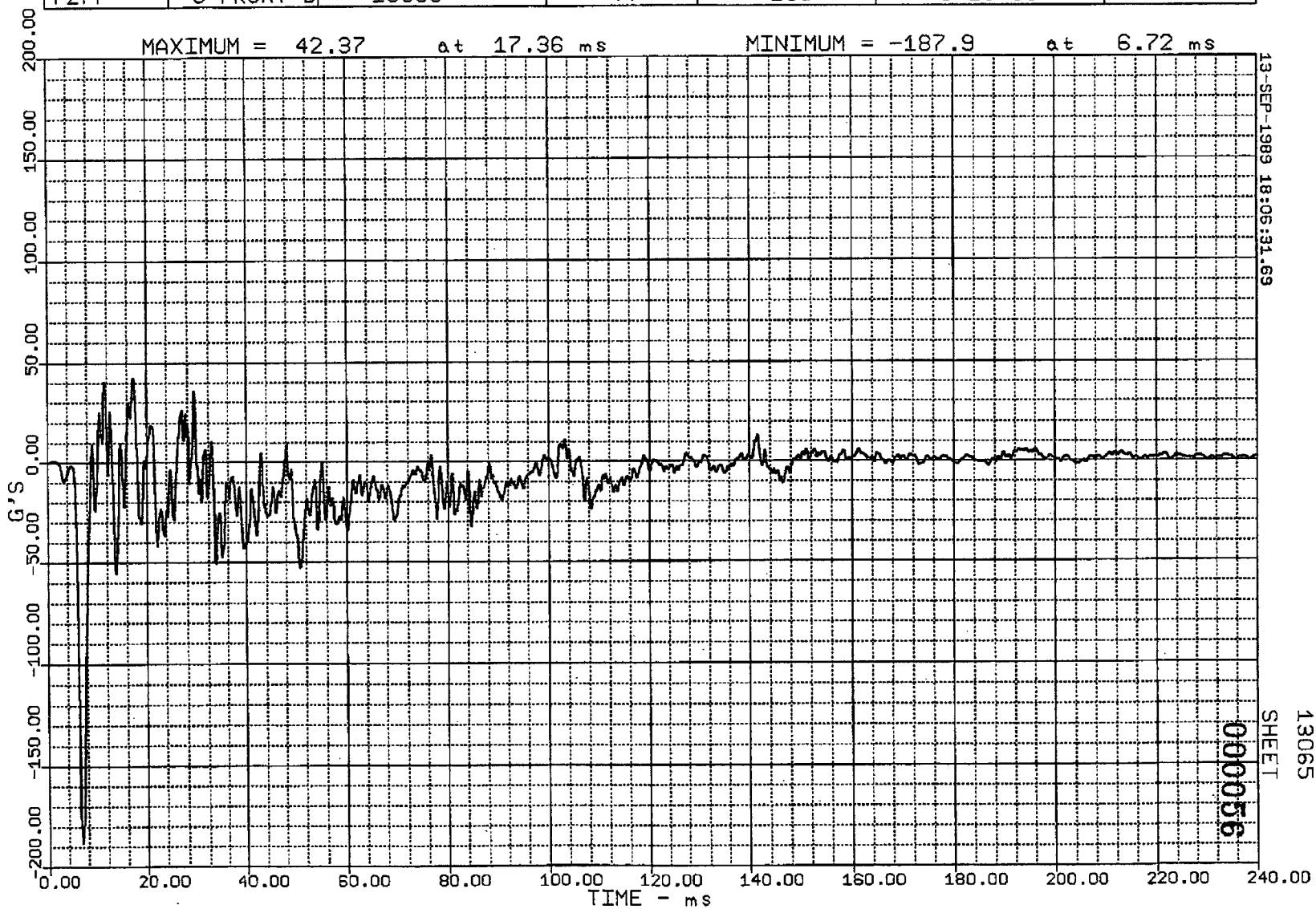
LONG L/FRAME @ B-PILLAR					199200	TARGET
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	41	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1386

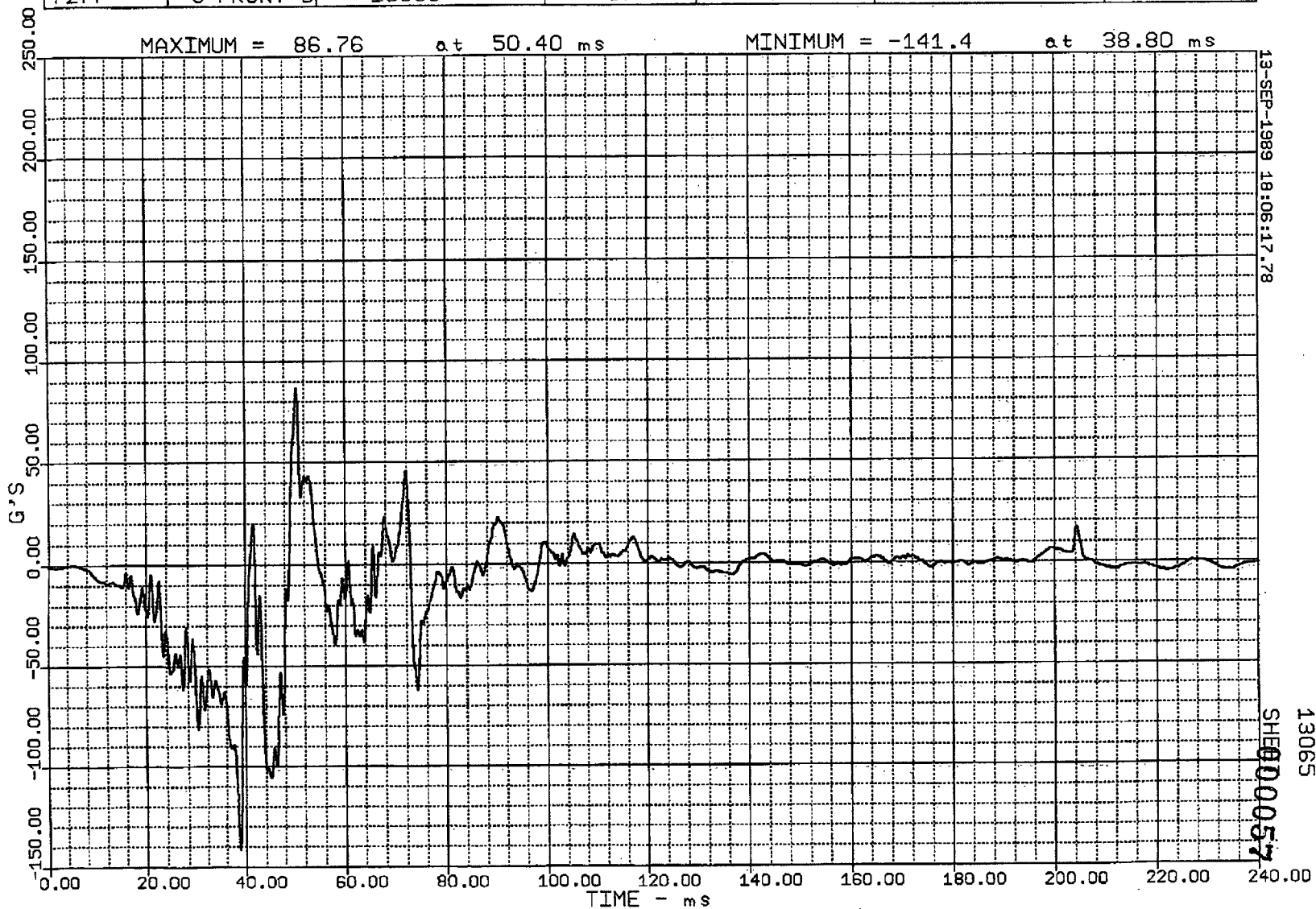
LONG R/F RAME @ B-PILLAR				199200		TARGET
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	44	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1387

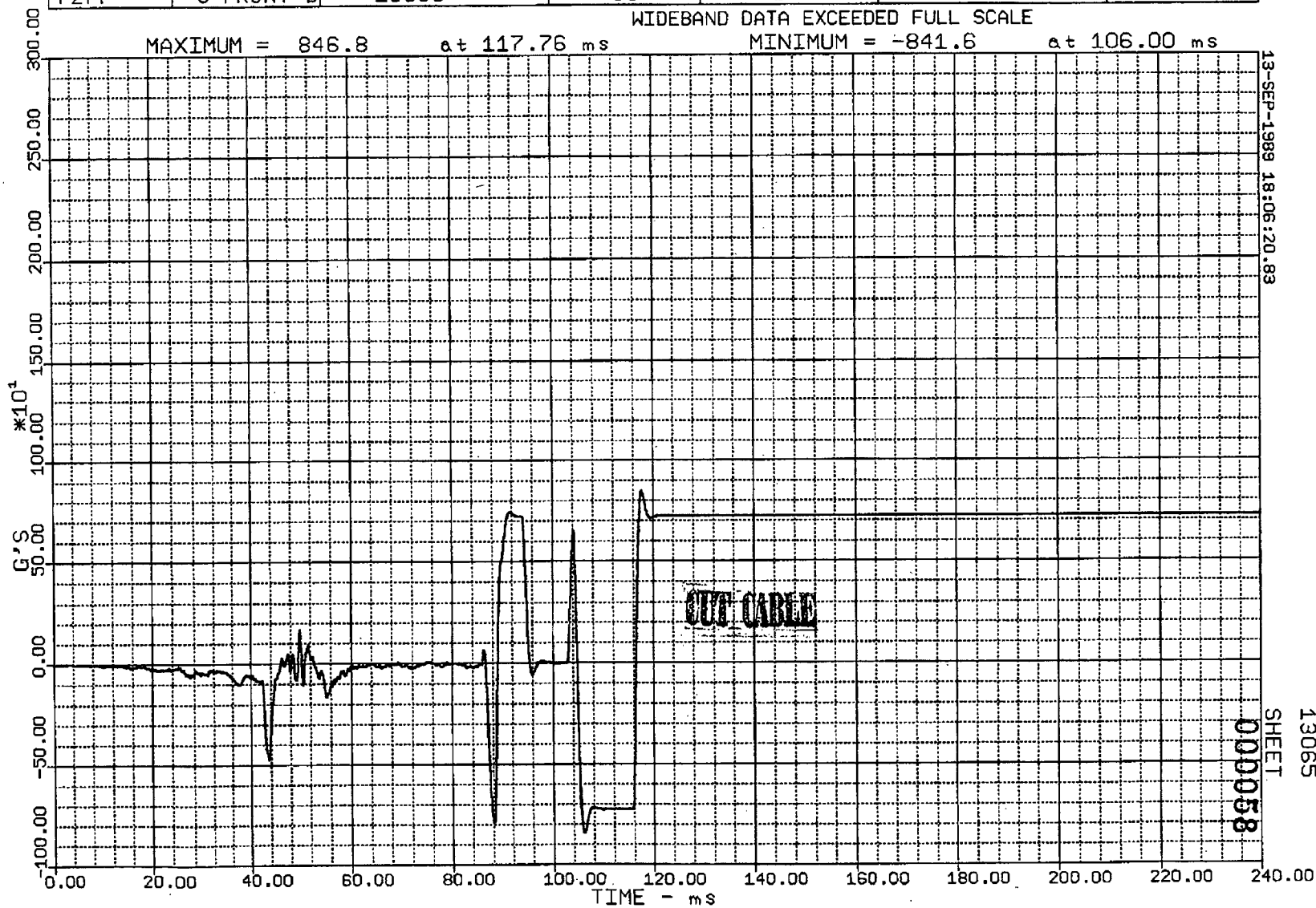
LONG ENGINE TRANS TOP				199200		TARGET
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	37	180	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1388

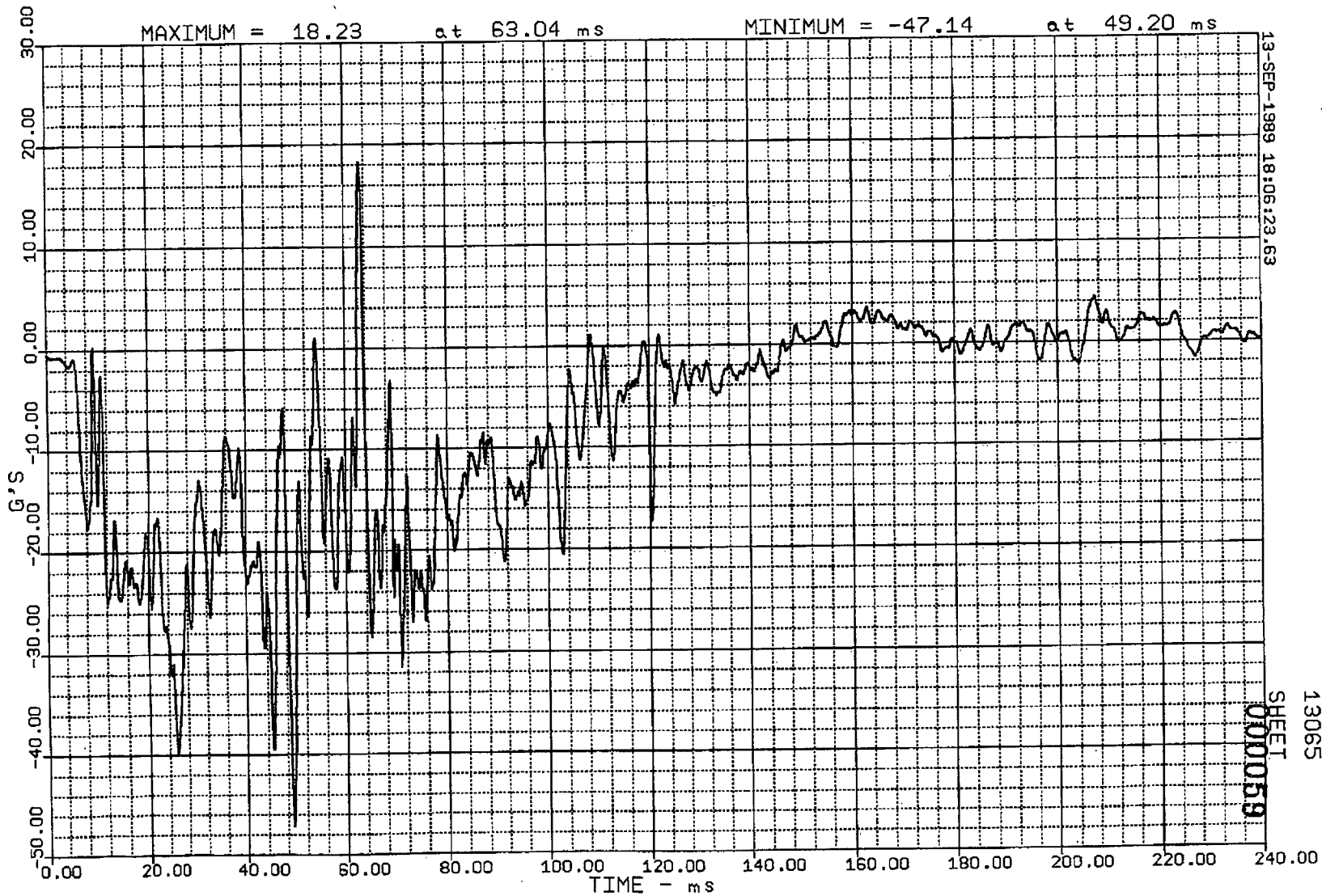
LONG ENGINE TRANS BOTTOM				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	38	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1389

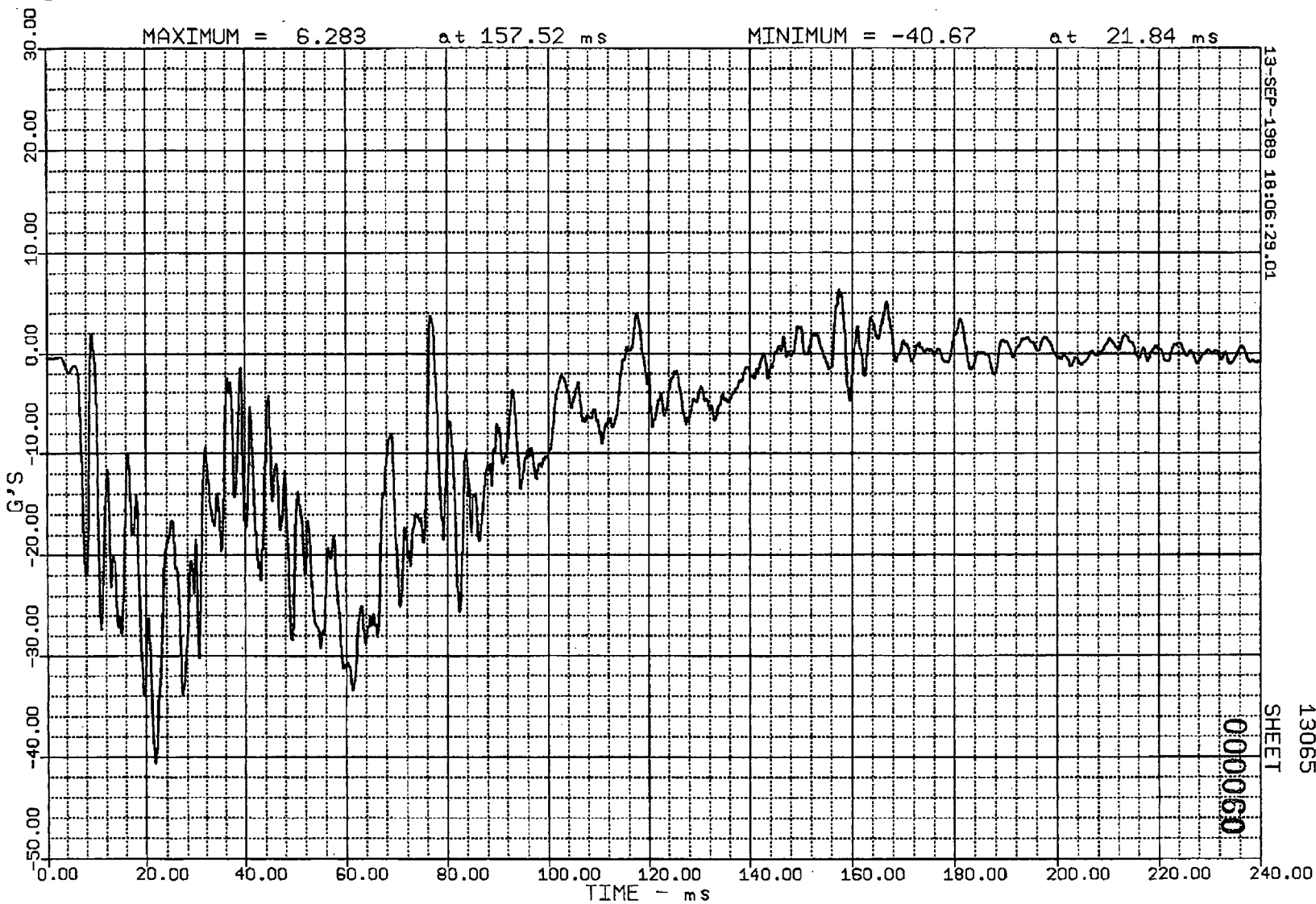
LONG L/RÖCKER @ B-PILLAR					199200	TARGET
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	40	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1390

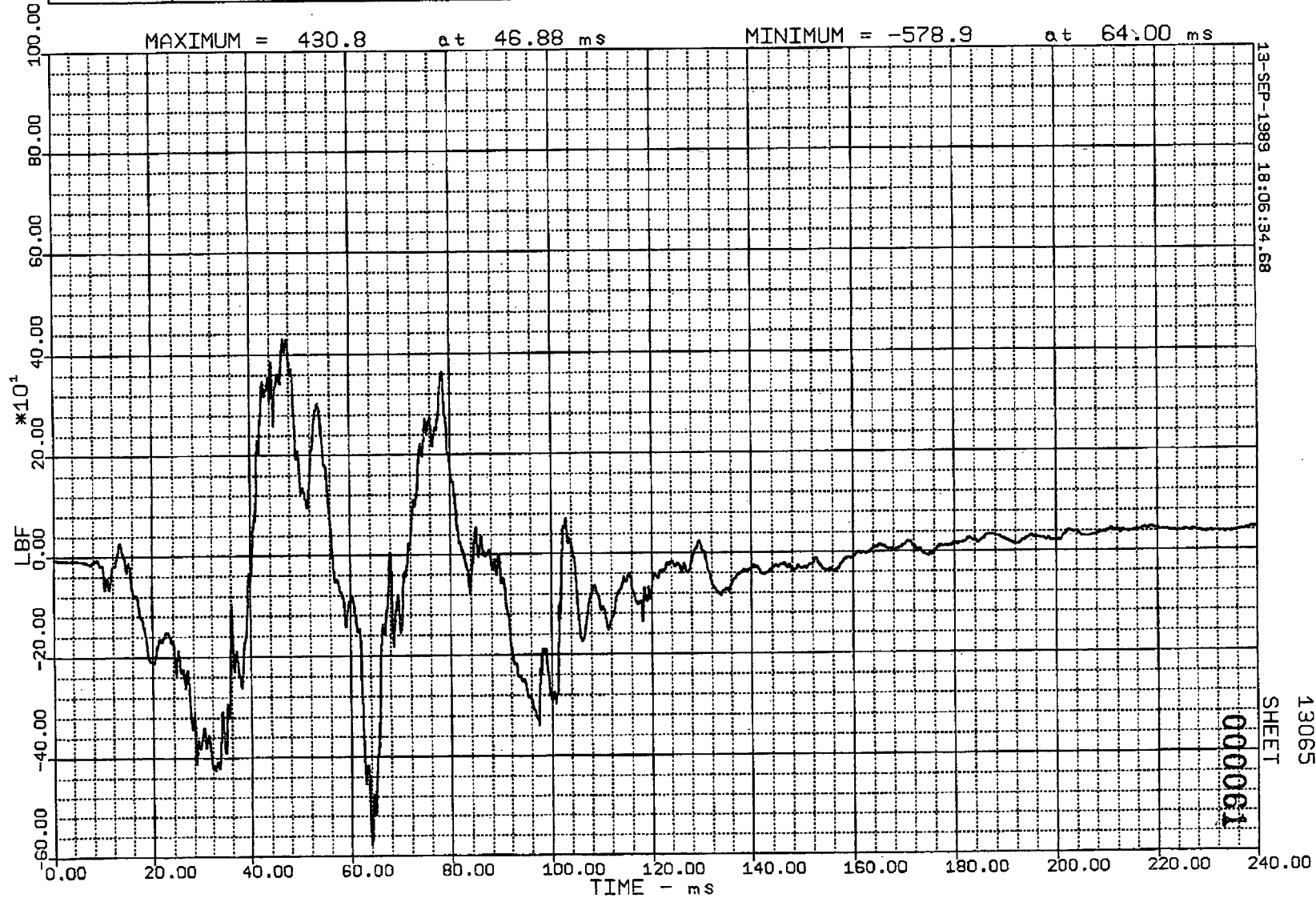
LONG R/RØCKER @ B-PILLAR				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	43	180	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1391

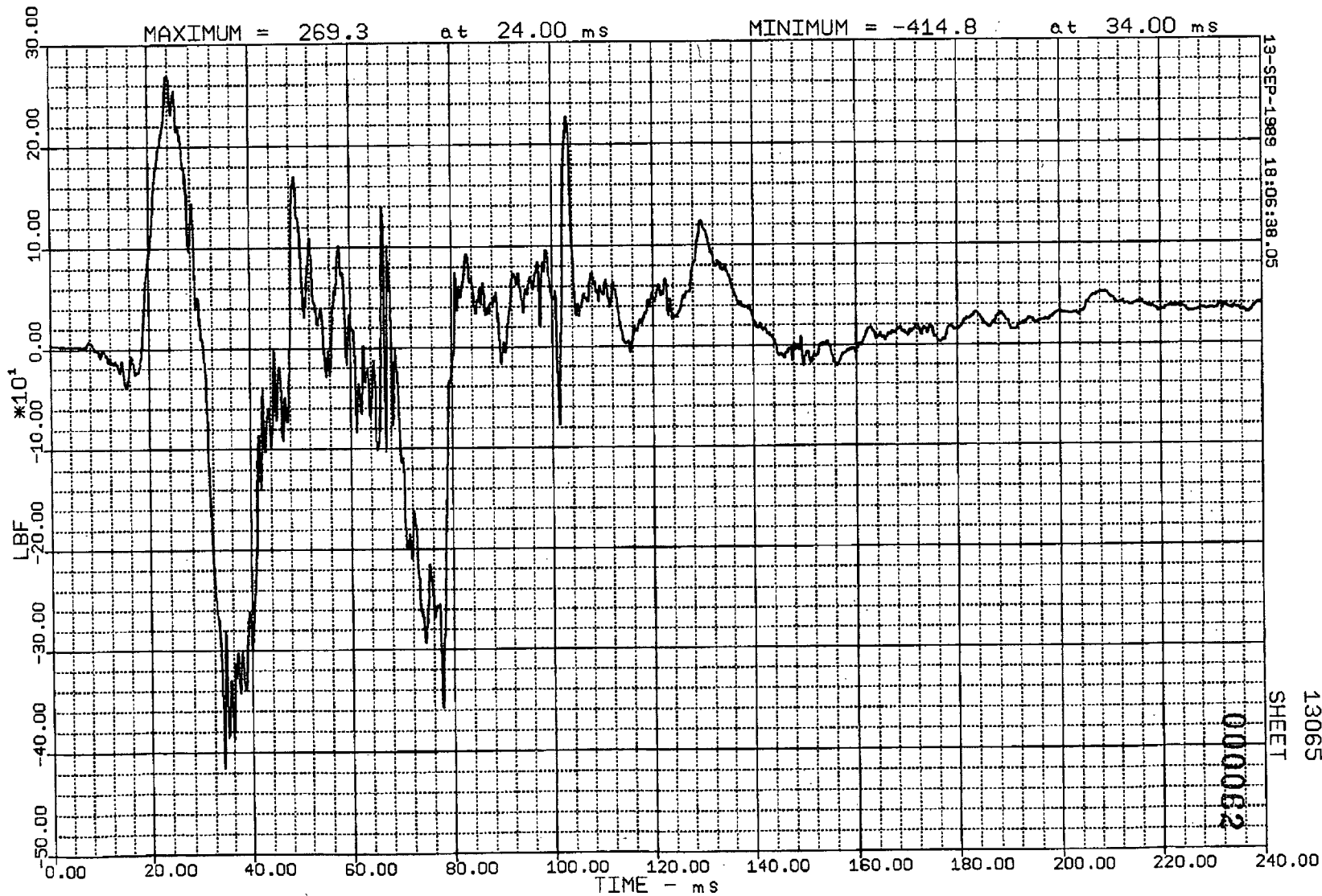
F _x STEERING COLUMN LOAD CELL		199200			TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	46	600	9-13-89	17:47:52



CRTS 0007277

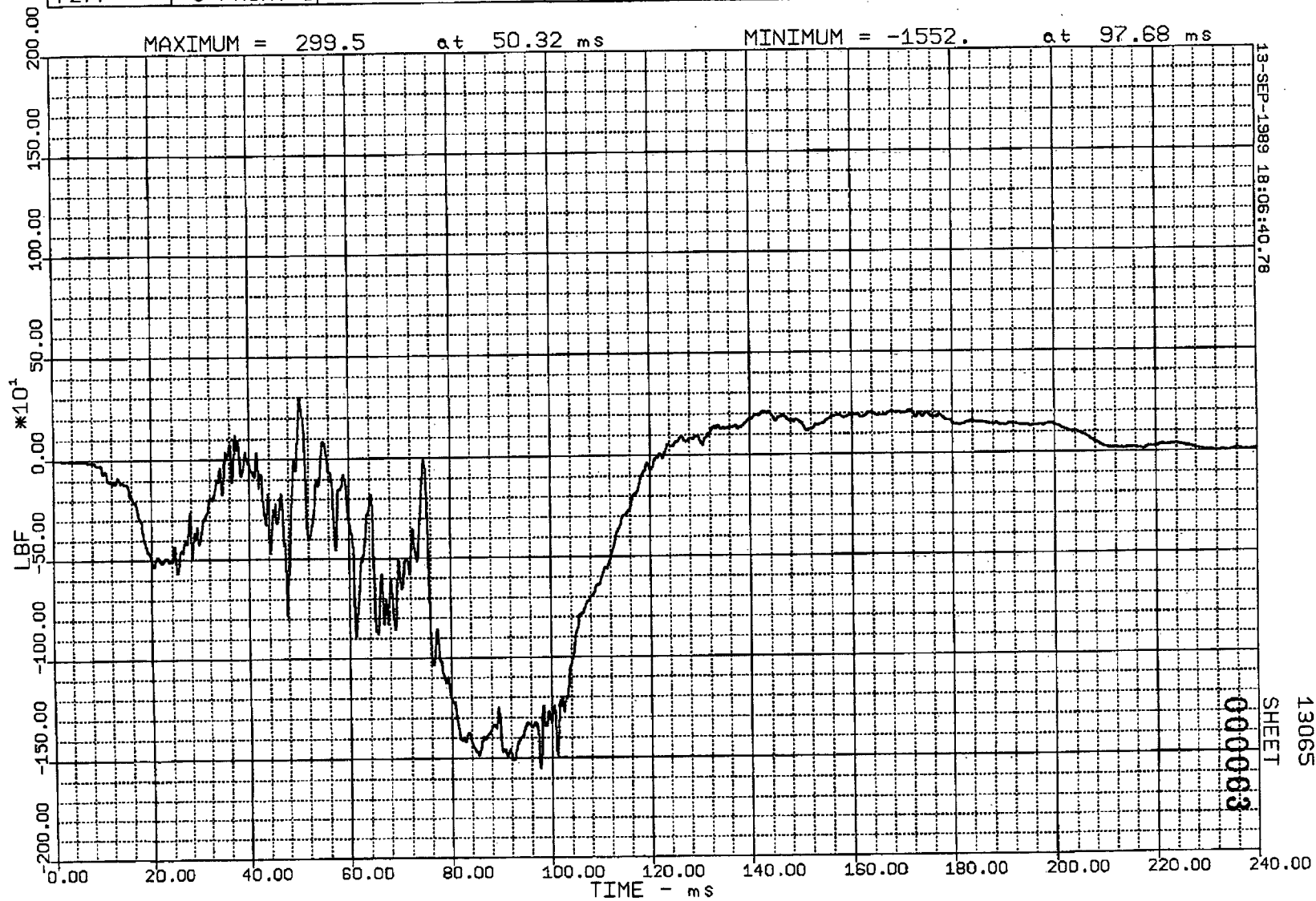
PRODUCED BY FORD
1392

F _y STEERING COLUMN LOAD CELL				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	47	600	9-13-89	17:47:52



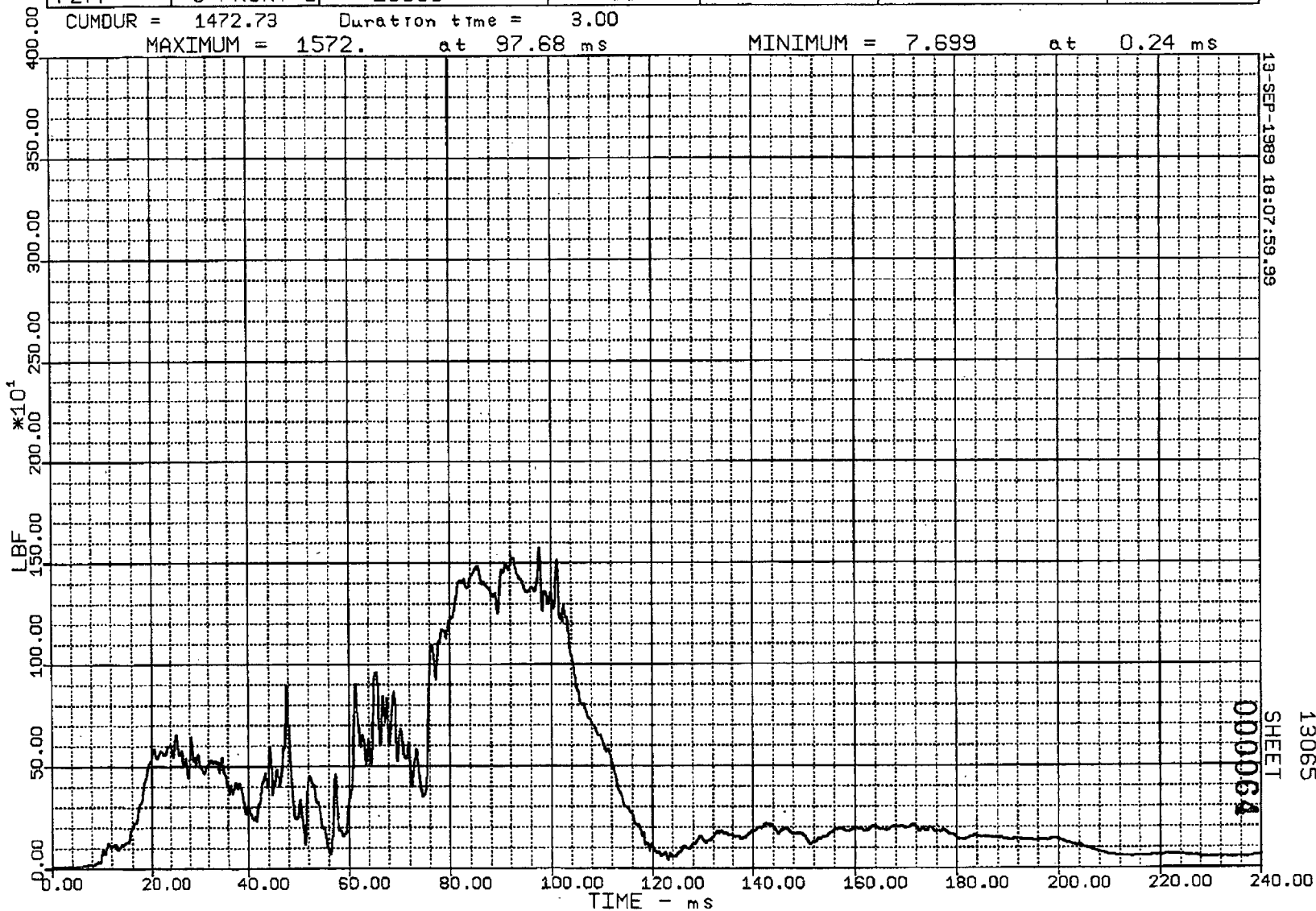
CRTS 0007277

Fz STEERING COLUMN LOAD CELL				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	48	600	9-13-89	17:47:52



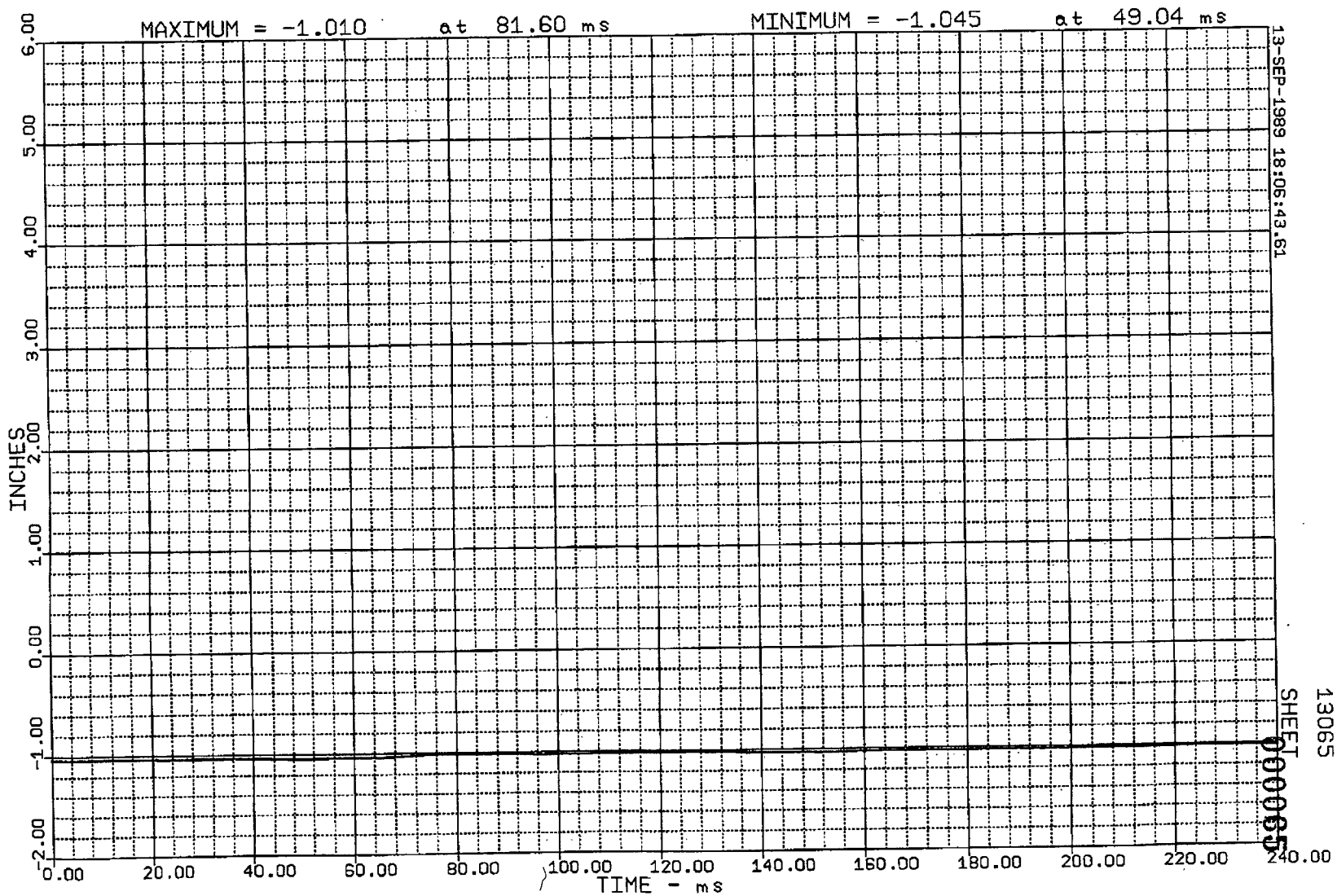
CRTS 0007277

RES. STEERING COLUMN LOAD CELL				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	89	600	9-13-89	17:47:52



CRTS 0007277

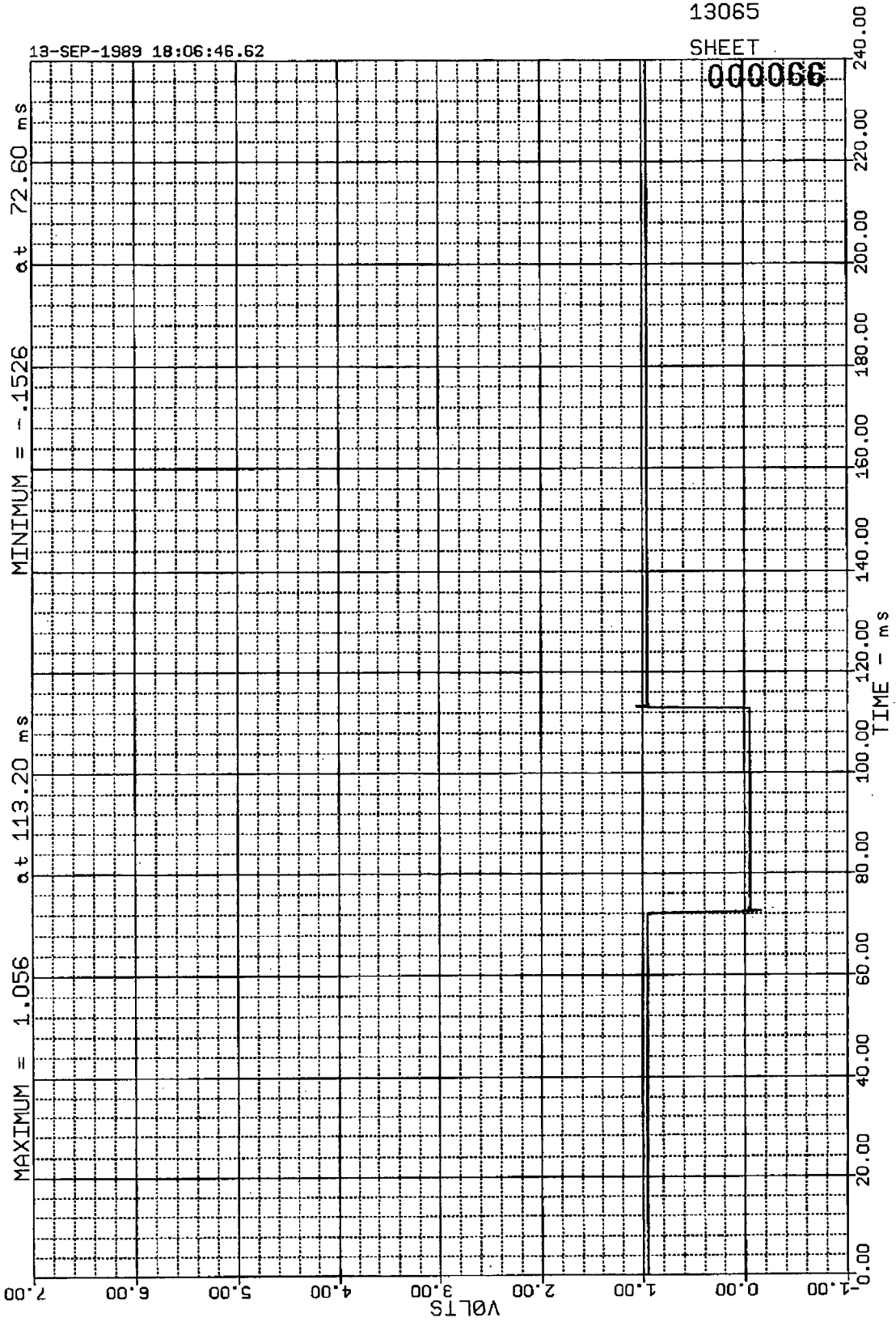
STG COLUMN THRU BRACKET DISP				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	50	60	9-13-89	17:47:52



CRTS 0007277

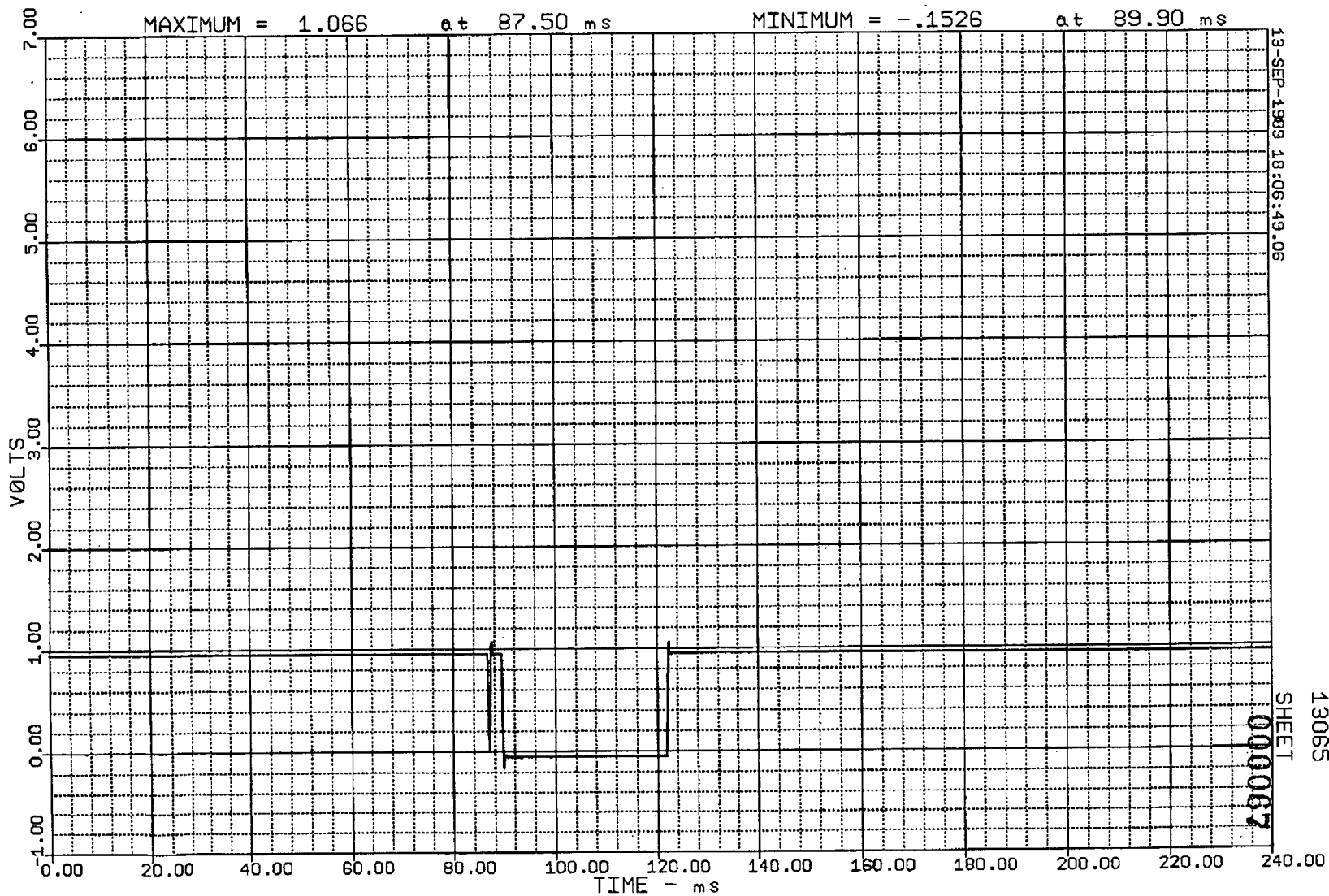
PRODUCED BY FORD
1396

STEERING WHEEL RIM (UPPER) SW					199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRØNT B	13065	52	1000	9-13-89	17:47:52	



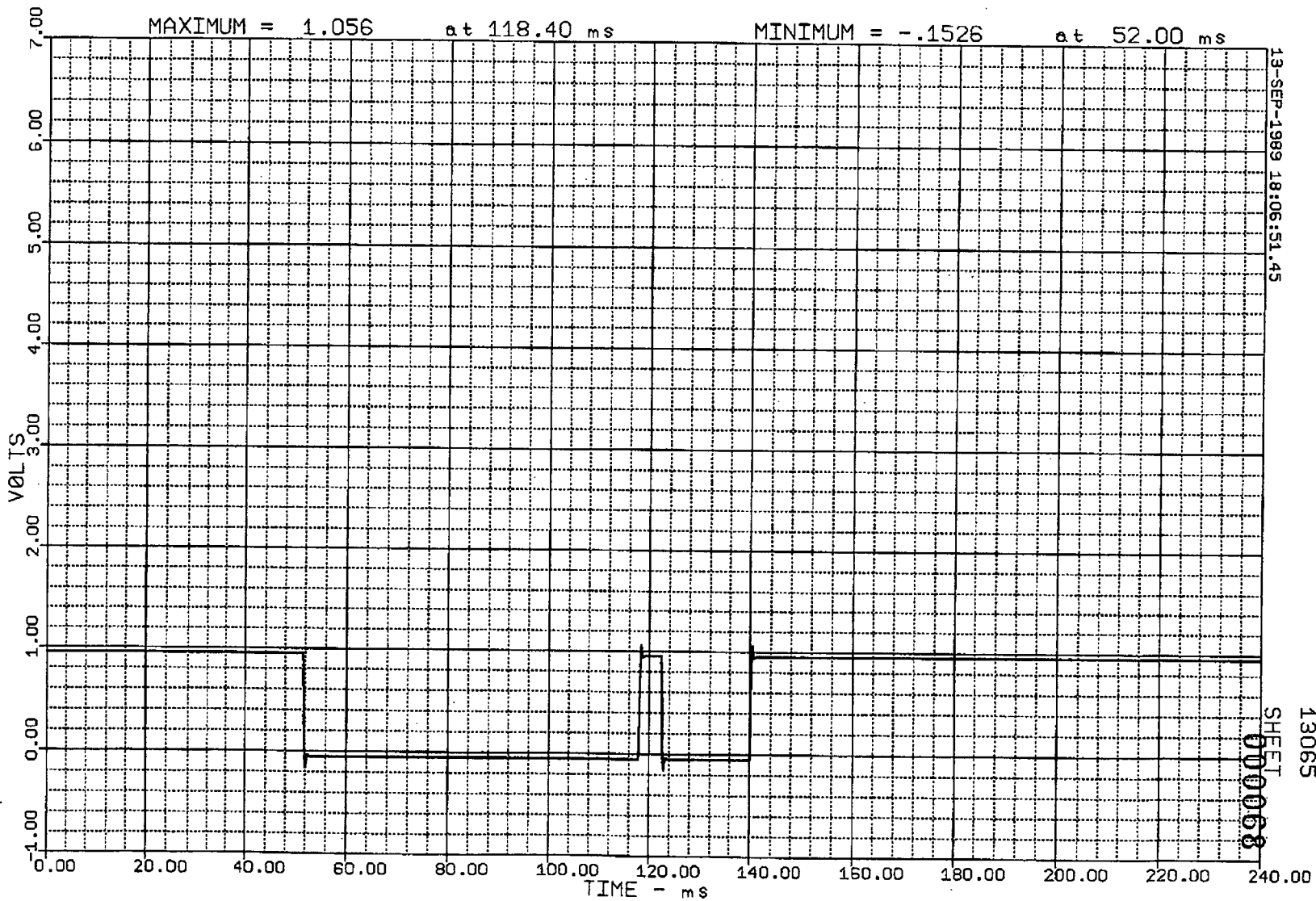
CRTS 0007277

STEERING WHEEL RIM (HUB) SW				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	53	1000	9-13-89	17:47:52



CRTS 0007277

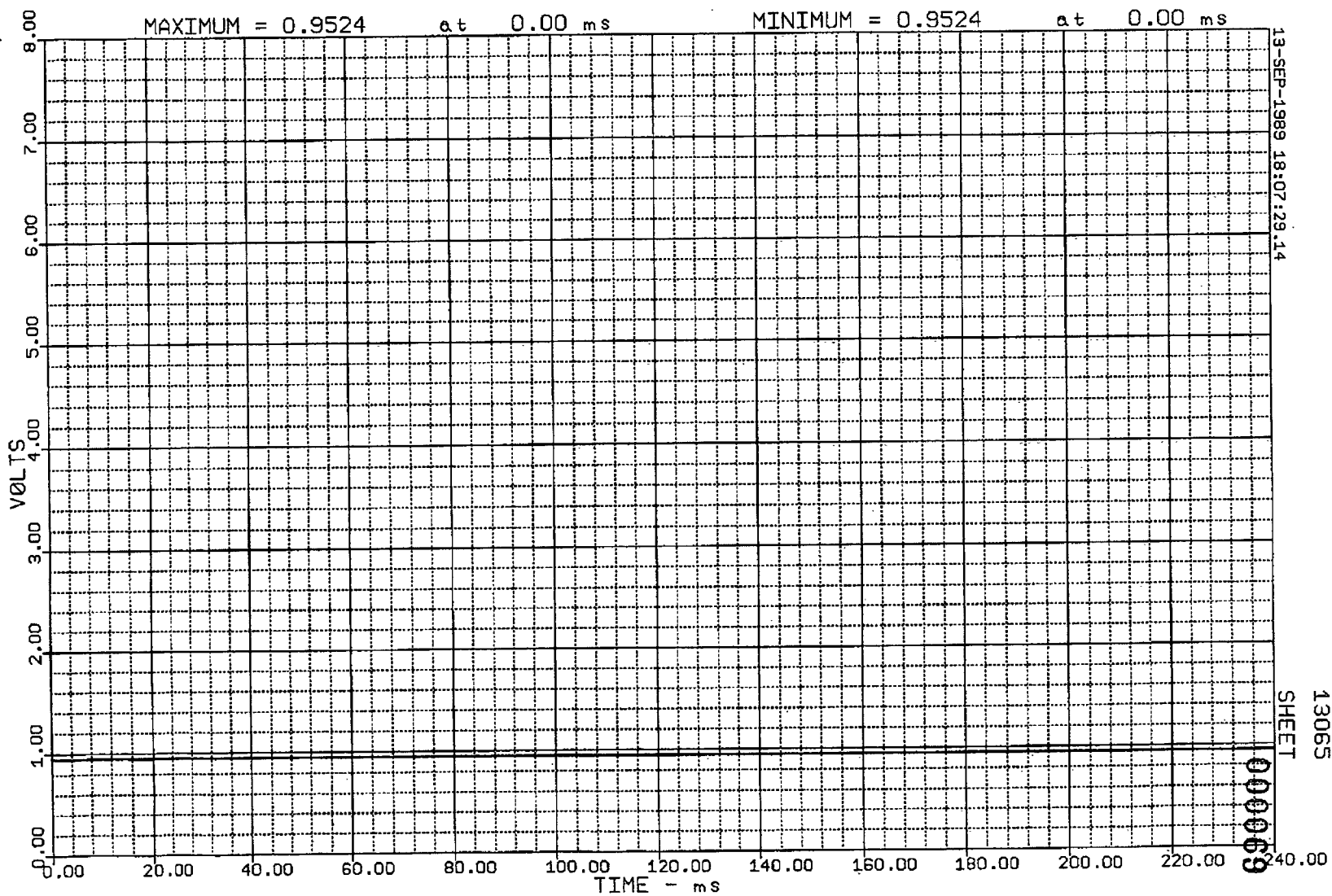
STEERING WHEEL RIM (LOWER) SW				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	54	1000	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1399

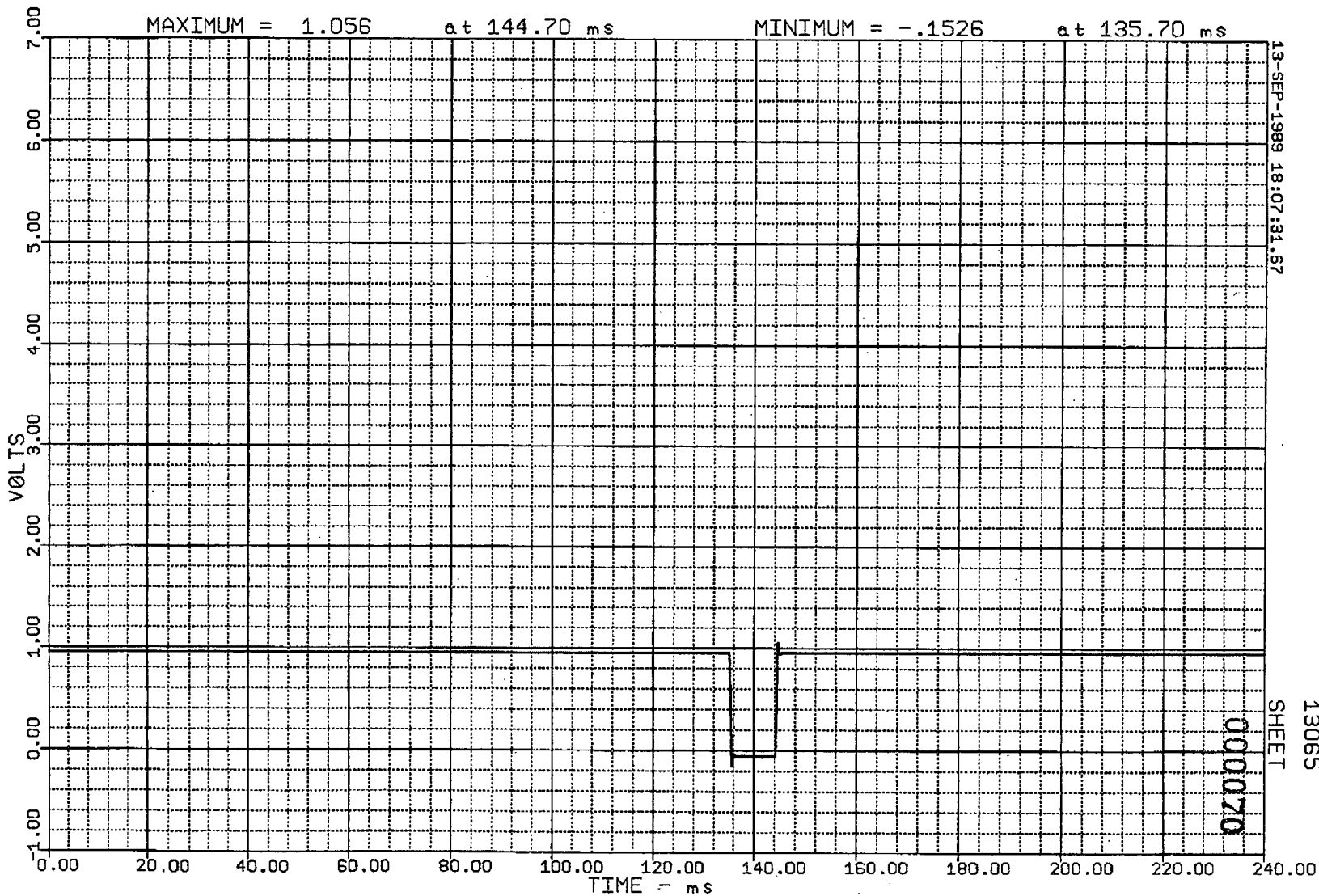
UNDER DRIVER'S SEAT SW #1				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	76	1000	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1400

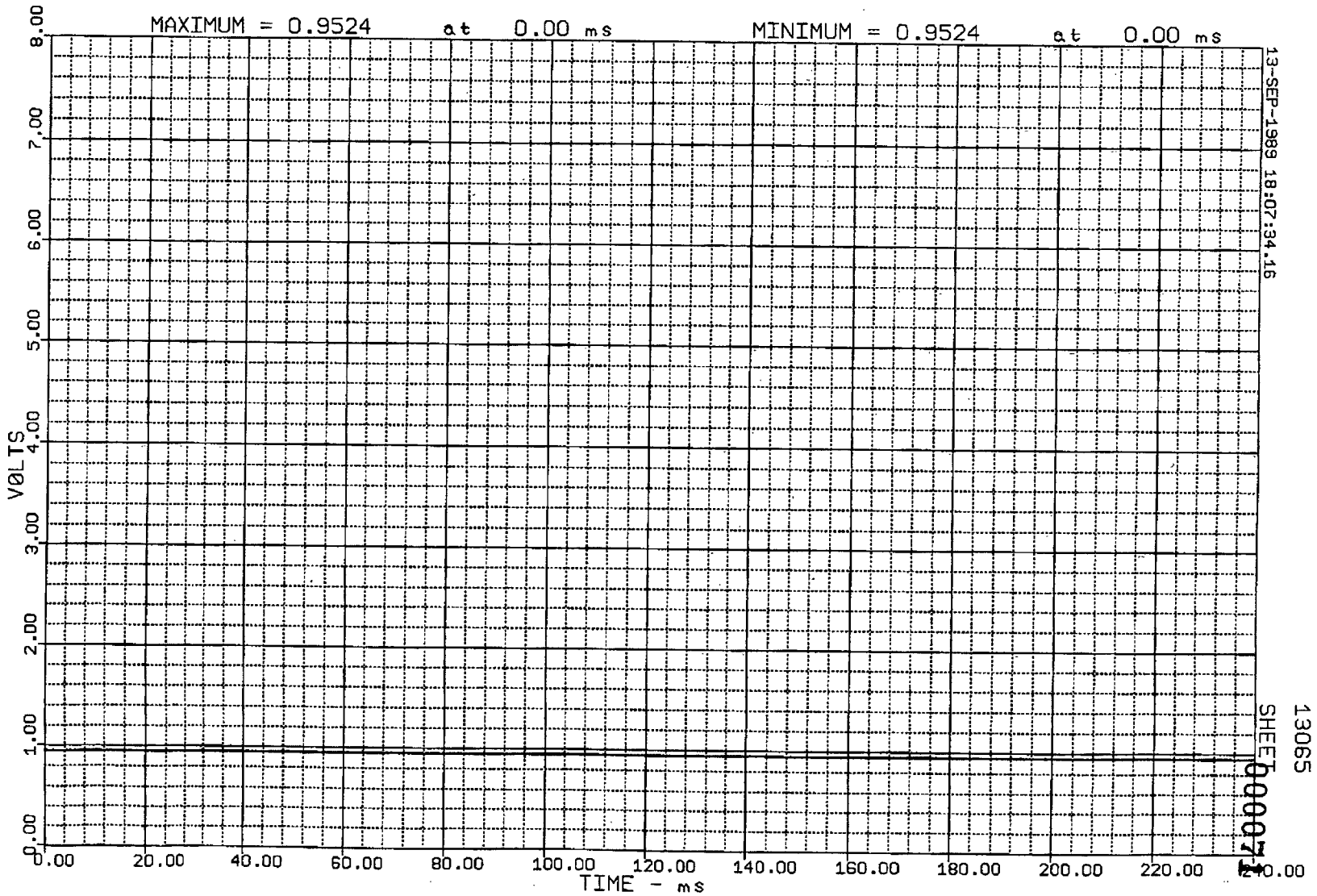
UNDER DRIVER'S SEAT SW #2				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	77	1000	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1401

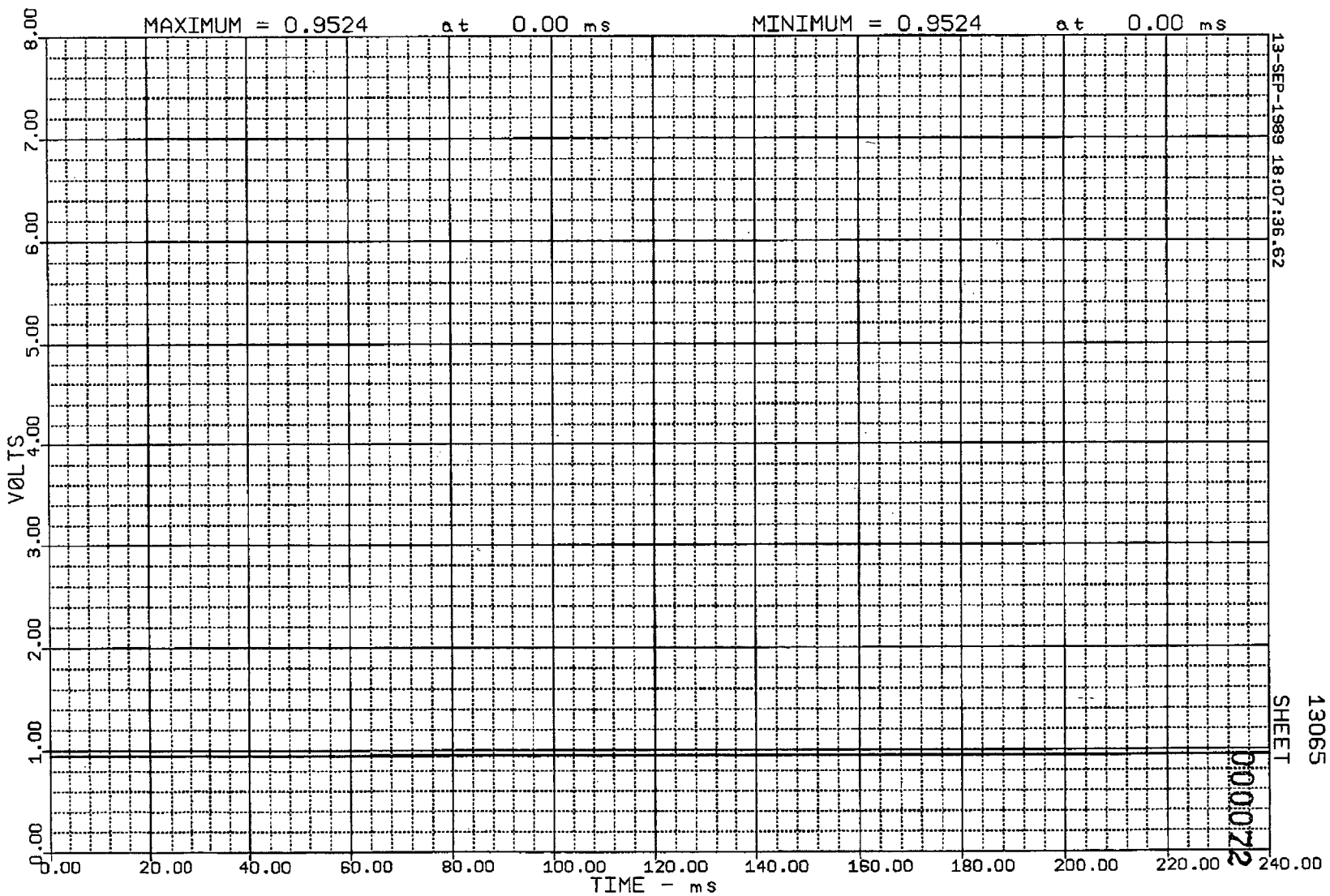
UNDER PASS SEAT SW #1				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	79	1000	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD
1402

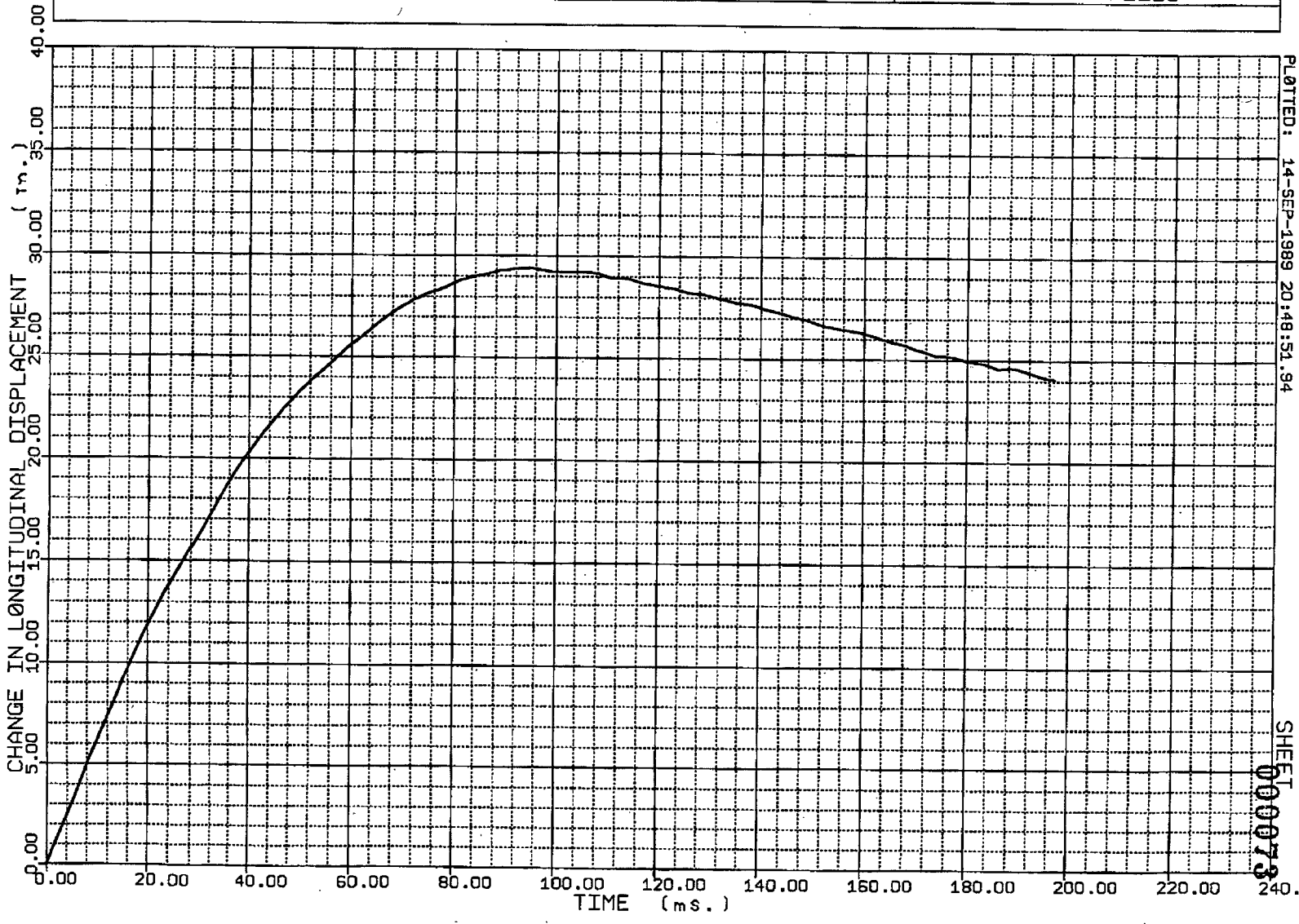
UNDER PASS SEAT SW #2				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	80	1000	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD
1403

Y - AXIS: L/ROCKER AT SEAT BOLT WRT L/GROUND REFERENCE MAX = 29.39 at 95.00 MIN = 0.0000E+00 at 0.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	NOT APPLIED

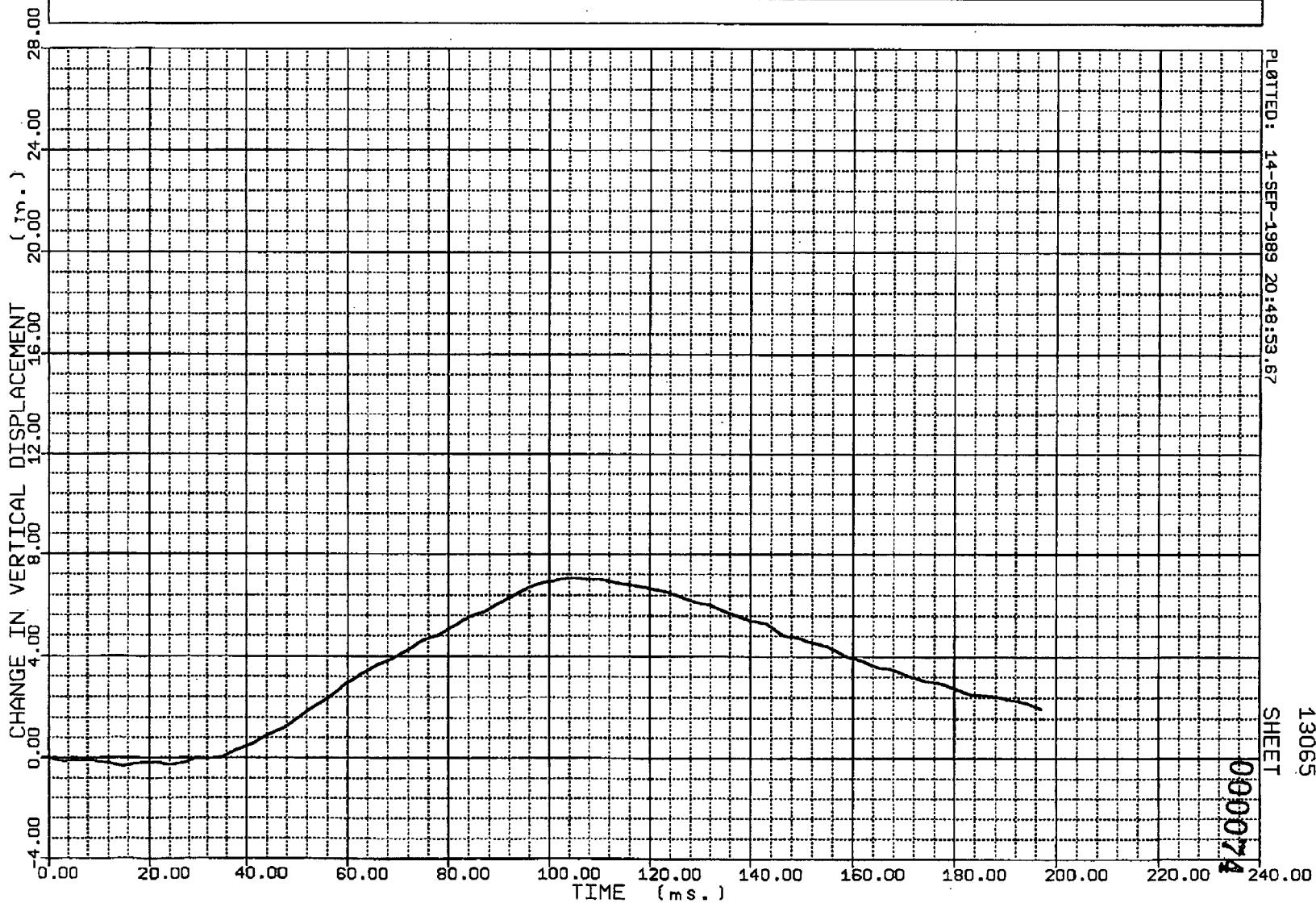


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13065
SHEET
000073

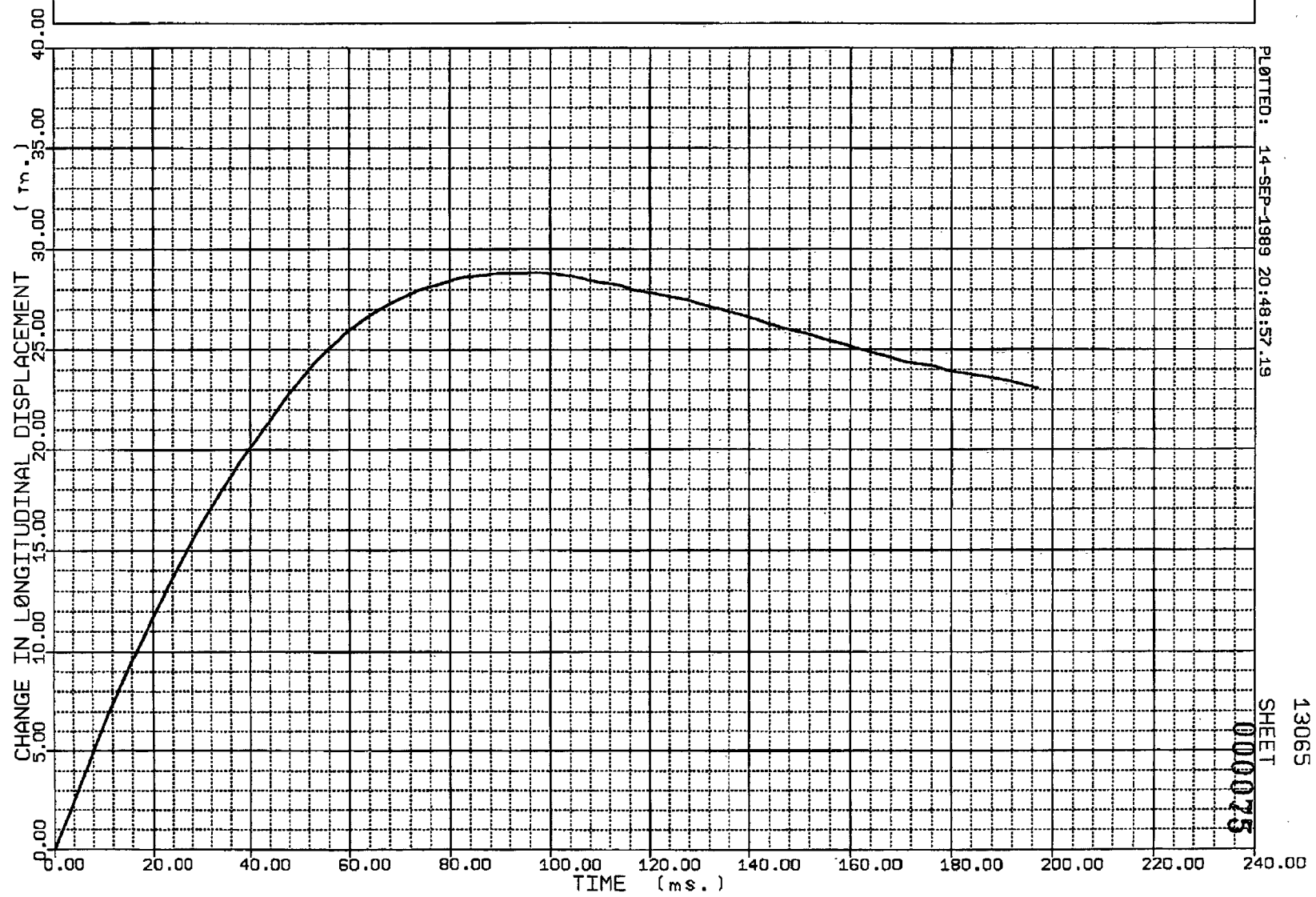
CRIS 0007277

Y - AXIS: L/ROCKER AT SEAT BOLT WRT L/GROUND REFERENCE MAX = 7.060 at 105.00 MIN = -.3318 at 15.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	NOT APPLIED



CRTS 0007277

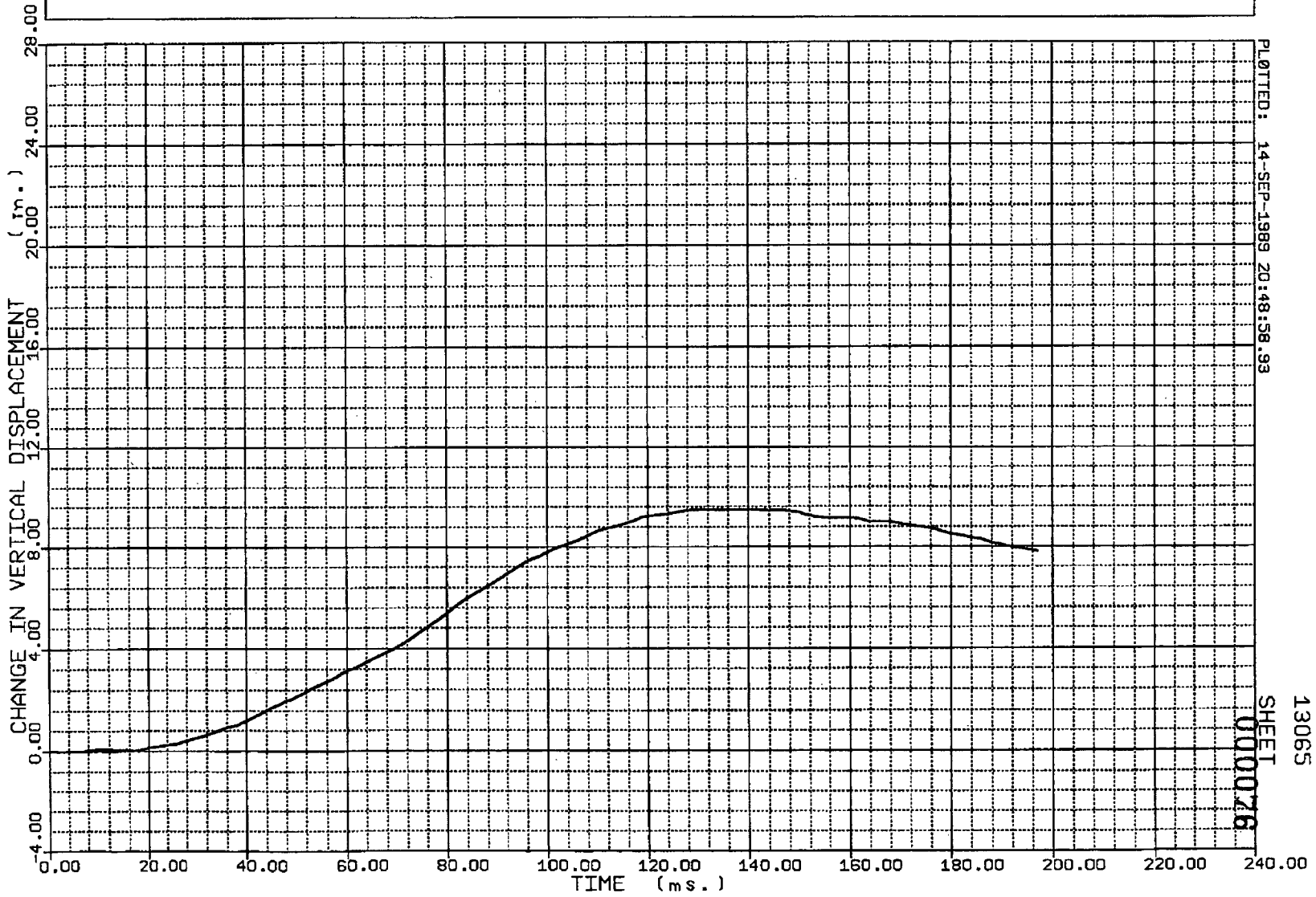
Y - AXIS: R/RØCKER AT SEAT BØLT WRT R/GRØUND REFERENCE MAX = 28.83 at 98.00 MIN = 0.0000E+00 at 0.00				
RUN NØ.	FACILITY	TEST ØRDER NØ.	FILM ANALYSIS METHØD	PITCH CØRRECTION
7277	BARRIER	13065	SCALE	NØT APPLIED



PLØTTED: 14-SEP-1989 20:48:57.19

13065
SHEET
000075

Y - AXIS: R/ROCKER AT SEAT BOLT WRT R/GROUND REFERENCE MAX = 9.495 at 140.00 MIN = -.1185E-01 at 2.00				
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	NOT APPLIED



PLOTTED: 14-SEP-1989 20:48:58.93

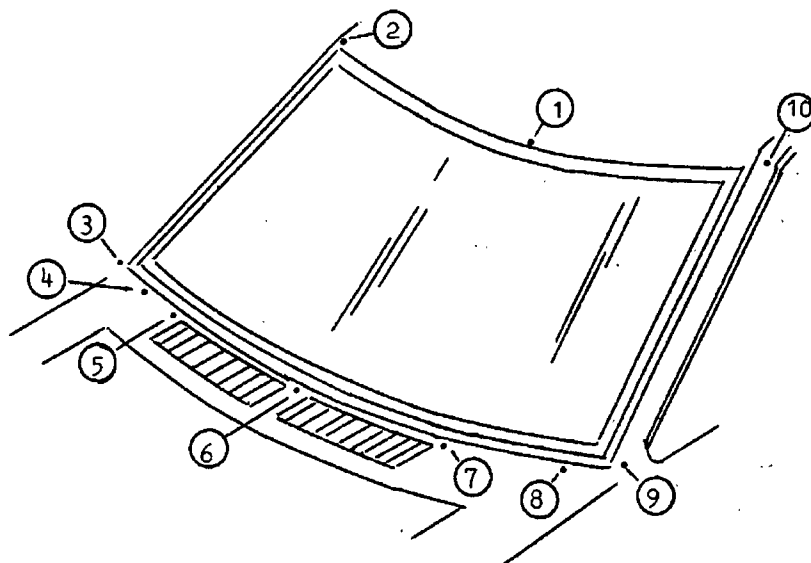
13065
SHEET
000076

CRTS 0007277

T-13065

Sheet

000077

STATIC DISPLACEMENTS - WINDSHIELD OPENING POINTS

T.O. No. 06-4558
 Veh. No. 3087123
 Crash No. 7277
 Veh. Make 92 F-150

POINT LOCATION		INCHES					
		LONG.		LAT.		VERT.	
		FORE	AFT	IN	OUT	UP	DOWN
1	ROOF AT CENTERLINE OF VEHICLE	1.90		.18		2.92	
2	RIGHT "A" PILLAR AT ROOF RAIL	2.50		.02		3.23	
3	RIGHT "A" PILLAR AT BELTLINE	.12		.22		1.26	
4	RIGHT SIDE OF COWL MIDWAY BETWEEN POINTS 3 AND 5		.07		.43	1.88	
5	COWL AT CENTERLINE OF RIGHT OCCUPANT		.75		.04	1.98	
6	COWL AT CENTERLINE OF VEHICLE		2.64		.03	1.95	
7	COWL AT CENTERLINE OF LEFT OCCUPANT		1.17	.28		1.23	
8	LEFT SIDE OF COWL MIDWAY BETWEEN POINTS 7 AND 9	.63		.06		+1.61	
9	LEFT "A" PILLAR AT BELTLINE		.08	.06		1.40	
10	LEFT "A" PILLAR AT ROOF RAIL	1.55			.22		.09

Displacement References: Long.-vertical, lateral plane at the left front seat bolt, Lat.-vertical, longitudinal plane through the longitudinal axis, and Vert.-horizontal plane at the left front seat bolt.

CRTS 0007277

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T-13065

000078

**LIGHT TRUCK SAFETY
DIMENSIONAL ANALYSIS FRAME MEASUREMENTS**

Sheet

T.O. No. 6-4558
 Veh. No. 308T173
 Crash No. 7277
 Veh. Make 92 F-150

Frame Left Side Rail

1. Foremost point
2. Front axle
3. Aft of engine support X/M
4. Radius arm mounting bracket
5. "B" pillar
6. Rear spring front hanger bracket
7. Rear axle
8. Rear spring rear shackle bracket
9. Rearmost point
10. ENGINE ACCE
11. TRANS ACCEL

Before			After			Change		
LONG	LAT	VERT	LONG	LAT	VERT	LONG	LAT	VERT
199.78	19.04	21.89	182.04	17.89	28.00	-17.74	-1.15	+6.11
180.49	18.40	22.27	167.69	17.63	26.65	-12.80	-0.77	+4.38
162.07	16.44	20.84	154.90	12.26	24.26	-7.17	-4.18	+3.42
144.92	17.20	17.56	141.97	16.51	13.38	-2.95	-0.69	-4.18
97.52	18.20	20.54	95.74	17.33	20.45	-1.78	-0.87	-0.09
70.12	18.14	21.23	68.94	17.92	25.63	-1.18	-0.22	+4.40
46.35	18.14	24.20	45.97	18.22	32.37	-0.38	+0.08	+8.17
0.00	18.41	22.45	0.00	18.42	38.42	0.00	+0.01	+15.97
169.13	3.30	48.58						
156.29	2.81	17.07						

Frame Right Side Rail

1. Foremost point
2. Front axle
3. Aft of engine support X/M
4. Radius arm mounting bracket
5. "B" pillar
6. Rear spring front hanger bracket
7. Rear axle
8. Rear spring rear shackle bracket
9. Rearmost point
10. _____
11. _____

199.66	19.55	22.18	179.62	23.02	28.05	-20.04	+3.97	+5.87
178.99	18.89	22.83	169.74	20.61	31.93	-9.25	+1.72	+9.10
161.24	16.81	21.08	156.99	15.78	24.35	-4.75	-1.03	+3.27
144.67	17.41	17.70	141.80	15.64	16.41	-2.87	-1.77	-1.29
97.40	18.73	20.95	95.75	18.68	20.42	-2.65	-0.05	-2.03
69.16	18.66	21.03	67.99	18.78	25.21	-1.17	+0.12	+4.18
46.60	18.74	23.83	46.10	19.08	31.58	-0.50	+0.34	+2.75
0.15	18.41	22.20	-0.39	18.42	37.30	+0.24	+0.01	+15.10

Displacement References: Long. - lateral; vertical plane at the frame side rail foremost or rearmost point; Lat. - vertical, longitudinal plane through the longitudinal axis; and Vert. - horizontal plane at the tire to ground interface.

Negative sign (-) denotes decrease in displacement forward/rearward, inboard, and downward for the longitudinal, lateral, and vertical directions respectively.

(L) or (R) denotes left or right of centerline.

CRTS 0007277

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T-13065

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**LIGHT TRUCK SAFETY
DIMENSIONAL ANALYSIS BODY MEASUREMENTS**

Sheet
T.O. No. G-4558
Veh. No. 308T173
Crash No. 7277
Veh. Make 92 F-150

- Left Side
- A. Front seat bolt target
B. Rear sill target
C. Front sheet metal target
D. "B" pillar target
E. Docket target
F. Rear body target
G. Rear cab target
H. Box/bed target
I. Body side target
J. ROOF TARGET
K. ROCKER A/CCL
L. MASTER C/NOTCH

Before			After			Change		
LONG	LAT	VERT	LONG	LAT	VERT	LONG	LAT	VERT
123.65	36.32	19.00	/	/	/	/	/	/
113.65	36.33	19.00	/	/	/	/	/	/
144.45	34.47	52.82	143.61	34.41	52.76	-0.84	-0.06	-0.06
99.60	35.32	55.58	101.31	35.35	55.59	+1.71	+0.03	+0.01
40.44	39.38	37.18	42.71	38.98	46.42	+2.27	-0.40	+9.24
-41.61	37.22	45.19	-2.27	36.71	62.00	+4.34	-0.51	+16.81
96.94	37.28	45.55	99.60	36.82	46.20	+2.66	-0.46	+0.65
95.59	37.28	45.66	98.57	36.76	45.19	+2.98	-0.52	-0.47
/	/	/	/	/	/	/	/	/
123.64	28.18	74.00	/	/	/	/	/	/
101.43	32.40	19.69	/	/	/	/	/	/
137.05	/	20.90	/	/	/	/	/	/

- Right Side
- A. Front seat bolt target
B. Rear sill target
C. Front sheet metal target
D. "B" pillar target
E. Docket target
F. Rear body target
G. Rear cab target
H. Box/bed target
I. Body side target
J. ROOF TARGET
K. ROCKER A/CCL
L. _____

123.65	36.72	19.00	/	/	/	/	/	/
113.65	36.67	19.00	/	/	/	/	/	/
144.35	34.73	52.84	143.71	34.51	52.64	-0.64	-0.22	-0.20
99.60	35.48	56.00	102.28	35.82	56.12	+2.68	+0.34	+0.12
40.38	39.63	36.78	42.41	39.95	45.15	+2.03	+0.32	+8.37
-5.36	36.74	40.49	-1.42	37.42	60.16	+3.94	+0.68	+15.87
96.90	37.53	45.60	99.49	37.86	46.35	+2.59	+0.33	+0.25
95.05	37.79	45.45	97.68	38.27	45.11	+2.63	+0.48	-0.34
/	/	/	/	/	/	/	/	/
123.65	28.15	74.00	/	/	/	/	/	/
101.27	32.70	19.73	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

Displacement References: Long. - lateral; vertical plane at the frame side rail foremost or rearmost point; Lat. - vertical, longitudinal plane through the longitudinal axis; and Vert. - horizontal plane at the tire to ground interface.

Negative sign (-) denotes decrease in displacement forward/rearward, inboard, and downward for the longitudinal, lateral, and vertical directions respectively.

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Sheet

LIGHT TRUCK SAFETY
DIMENSIONAL ANALYSIS
MISCELLANEOUS MEASUREMENTS

T.O. No. G-4558
Veh. No. 308T173
Crash No. 7277
Veh. Make 92 F-150

	Before			After			Change		
	LONG	LAT	VERT	LONG	LAT	VERT	LONG	LAT	VERT
<u>Miscellaneous Points</u>									
M. Steering gear housing	182.63	12.84	23.00	172.24	14.15	28.37	-10.39	+1.31	+5.39
N. Steering gear coupling	175.18	13.85	30.13	163.86	12.56	35.18	-11.82	-1.29	+5.05
O. Aft axle fuel tank-left side	18.73	14.86	23.00	18.67	14.63	23.26	-0.06	-0.23	+0.26
P. Aft axle fuel tank filler pipe	17.07	36.88	32.12	18.72	36.66	45.71	+1.85	-0.28	+13.29
Q. Midship fuel tank-front	104.61	8.49	17.74	102.76	8.29	16.47	-1.85	-0.20	-1.27
R. Midship fuel tank filler pipe	62.11	37.05	32.31	64.19	36.66	37.65	+1.08	-0.39	+5.34
S. Aft axle fuel tank-right side	18.25	14.04	22.48	18.04	14.65	34.97	-0.21	+0.61	12.49
T. Midship fuel tank-rear	55.84	7.43	16.71	54.48	7.26	23.26	-1.36	-0.17	+6.35
U. Wheelbase-left side	132.60	/	/	128.10	/	/	-4.50	/	/
V. Wheelbase-right side	132.60	/	/	129.31	/	/	-3.29	/	/
W. Bellhsg. insp. plate bolt	153.78	257	18.18	141.97	231	22.13	-11.81	-0.26	+3.95
X. Rear X/M @ vehicle C/L	/	/	/	/	/	/	/	/	/
Y. Overall crush-right	205.74	/	/	181.18	/	/	-24.56	/	/
Z. Overall crush-left	205.97	/	/	182.54	/	/	-23.43	/	/
AA. Overall crush-centerline	206.15	/	/	186.34	/	/	-20.41	/	/
BB. Steering wheel hub nut	132.73	17.93	48.96	122.88	18.01	48.57	-9.85	+0.08	-0.39
CC. Dash panel-left side	155.99	18.38	36.07	149.92	17.10	37.65	-6.07	-1.28	+1.58
DD. Dash panel-right side	154.04	20.27	35.96	150.68	18.77	37.63	-3.36	-1.50	+1.47
EE. Floor pan-left front	147.22	18.92	25.98	145.57	16.60	25.71	-1.65	-2.32	-0.27
FF. Floor pan-center front	146.45	2.17 ^R	34.98	140.06	2.21 ^R	37.17	-6.39	+0.04	+2.19
GG. Floor pan-right front	147.29	20.00	27.12	145.43	18.05	27.08	-1.86	-1.95	-0.04
HH. Instrument panel-left side	135.30	30.43	48.20	127.93	29.07	55.02	-7.37	-1.36	+6.82
II. Instrument panel-right side	136.29	31.64	46.63	135.26	31.76	50.90	-1.03	+0.12	+4.27
JJ. Overall crush-centerline*	/	/	/	/	/	/	/	/	/
KK. <u>4/5 CURVE</u>	202.53	/	/	REMOVED	/	/	/	/	/
LL. <u>1/5 CURVE</u>	202.72	/	/	POST CRASH	/	/	/	/	/

Displacement References: Long. - lateral; vertical plane at the frame side rail foremost or rearmost point; Lat. - vertical, longitudinal plane through the longitudinal axis; and Vert. - horizontal plane at the tire to ground interface.

Negative sign (-) denotes decrease in displacement forward/rearward, inboard, and downward for the longitudinal, lateral, and vertical directions respectively.

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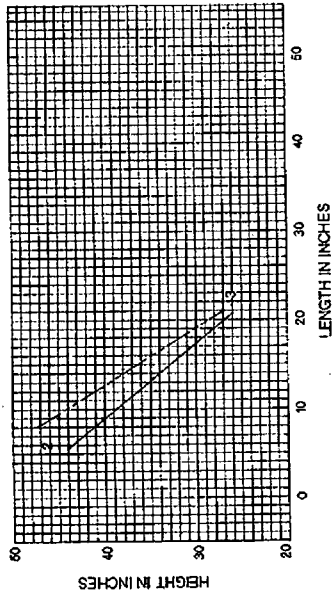
T-13065

000081

T.O. G-4558
VEH. NO. 3081173
92 F-160
CRASH NO. 7277
90° FRONT IMPACT

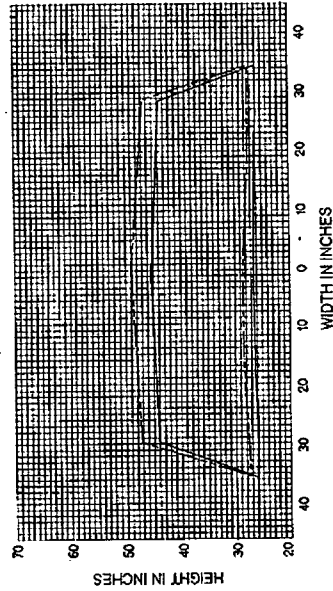
RIGHT SIDE VIEW

BEFORE
AFTER



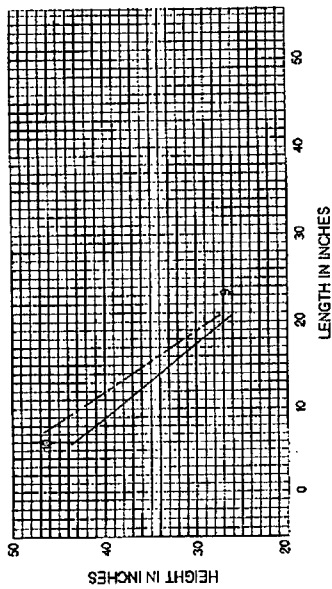
WINDSHIELD FRONT VIEW

BEFORE
AFTER



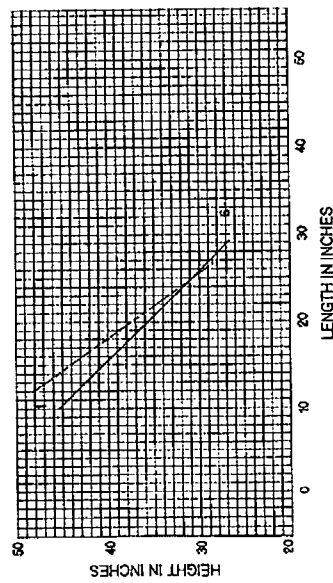
LEFT SIDE VIEW

BEFORE
AFTER



CENTERLINE SIDE VIEW

BEFORE
AFTER

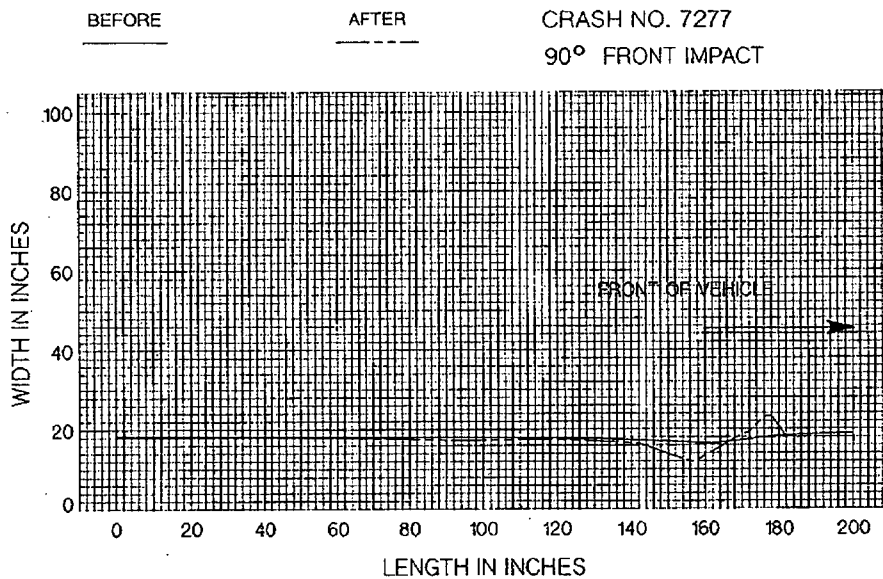


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CRTS 0007277

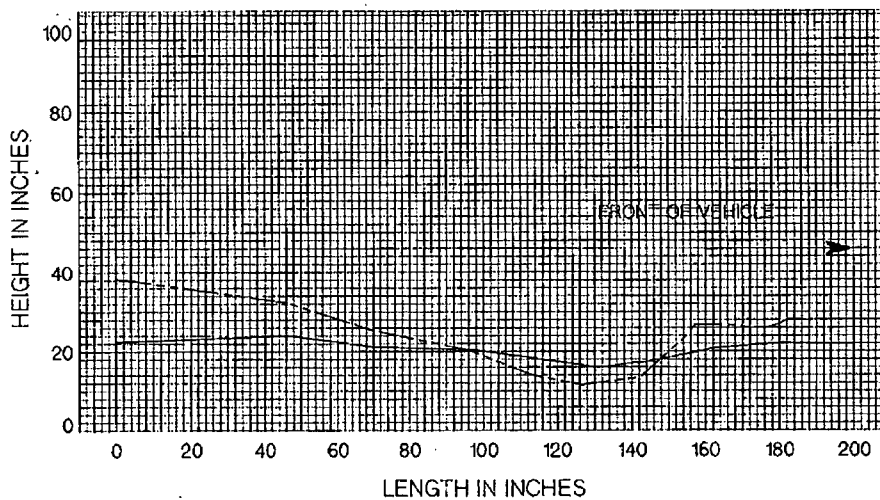
LEFT RAIL PLAN VIEW

T.O. G-4558
VEH. NO. 308T173
92 F-150
CRASH NO. 7277
90° FRONT IMPACT



LEFT RAIL SIDE VIEW

BEFORE AFTER

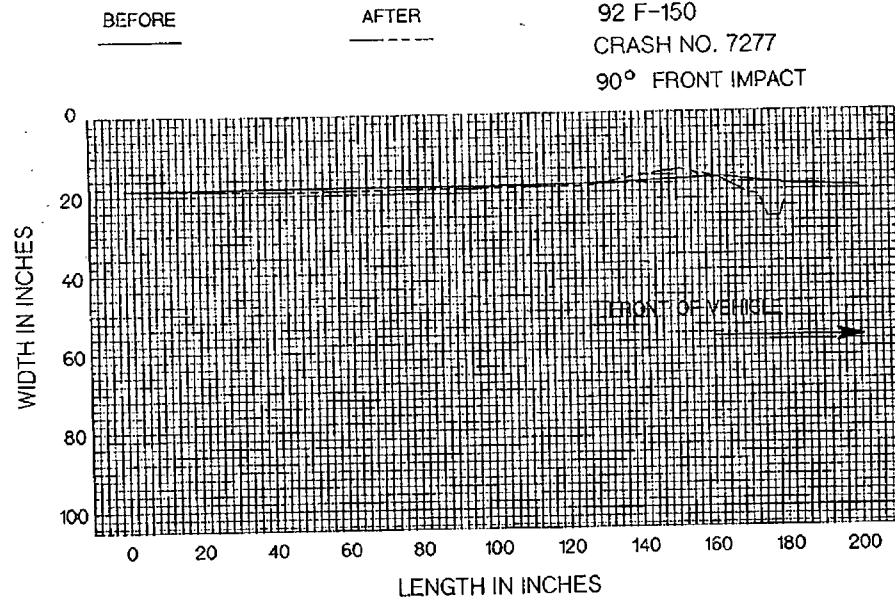


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T-13065

CRTS 0007277

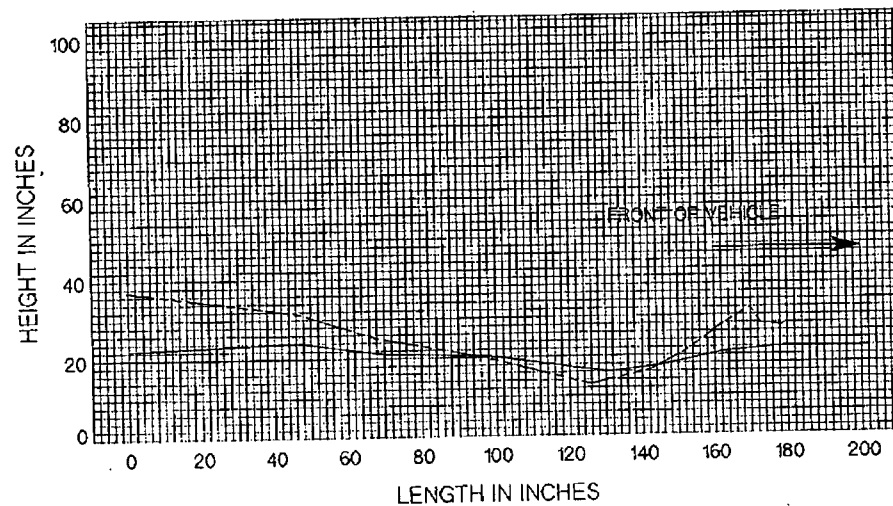
RIGHT RAIL PLAN VIEW

T.O. G-4558
VEH. NO. 308T173
92 F-150
CRASH NO. 7277
90° FRONT IMPACT



RIGHT RAIL SIDE VIEW

BEFORE AFTER



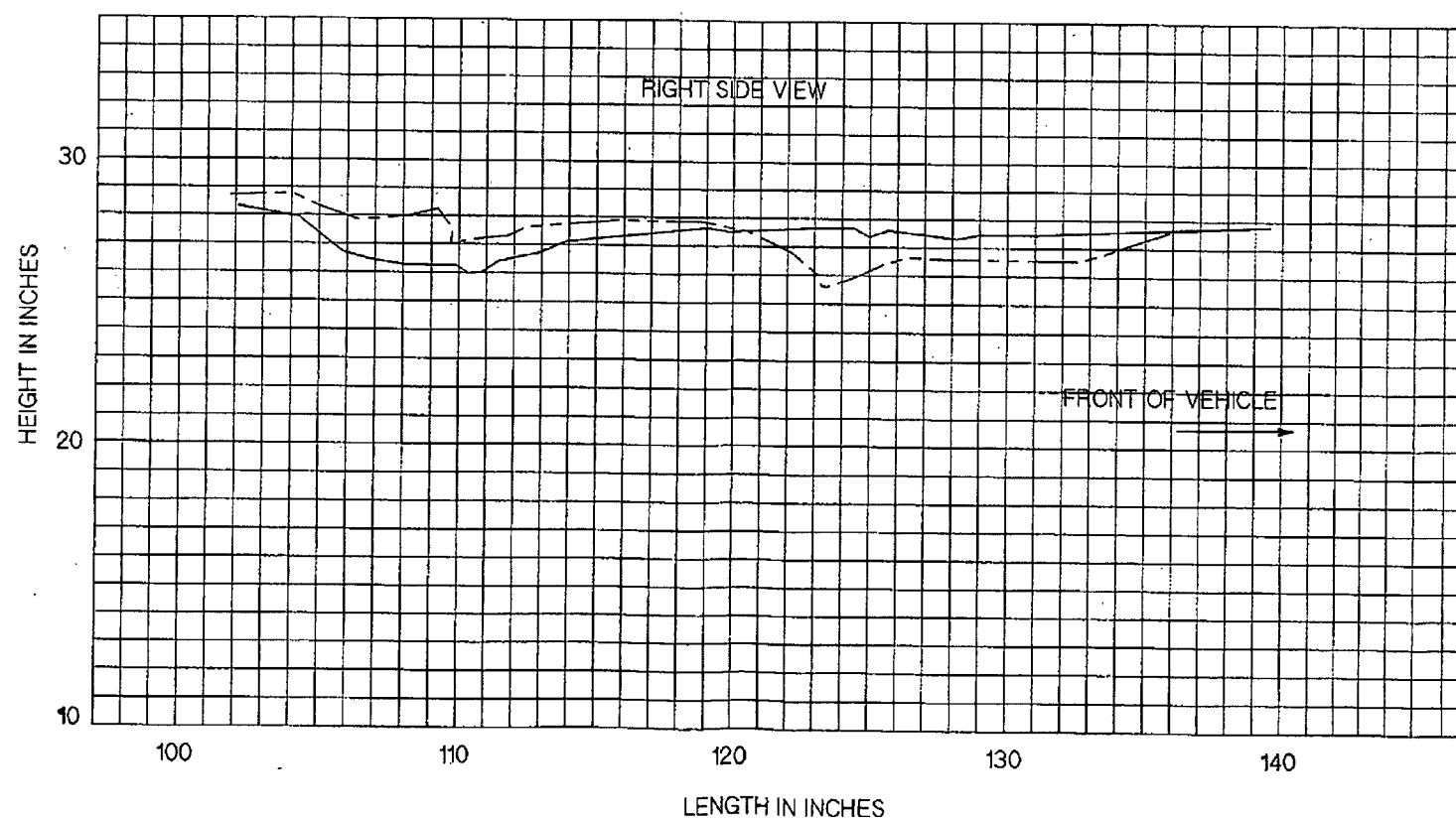
000083
T-1306 S

7-13065
000084

FLOORPAN SECTIONAL
@ L/S INBOARD SEAT BELT MNT.

BEFORE _____
AFTER - - - - -

T.O. G-4558
VEH. NO. 308T173
92 F-150
CRASH NO. 7277
CRASH MODE 90° FRONTAL



CRTS 0007277

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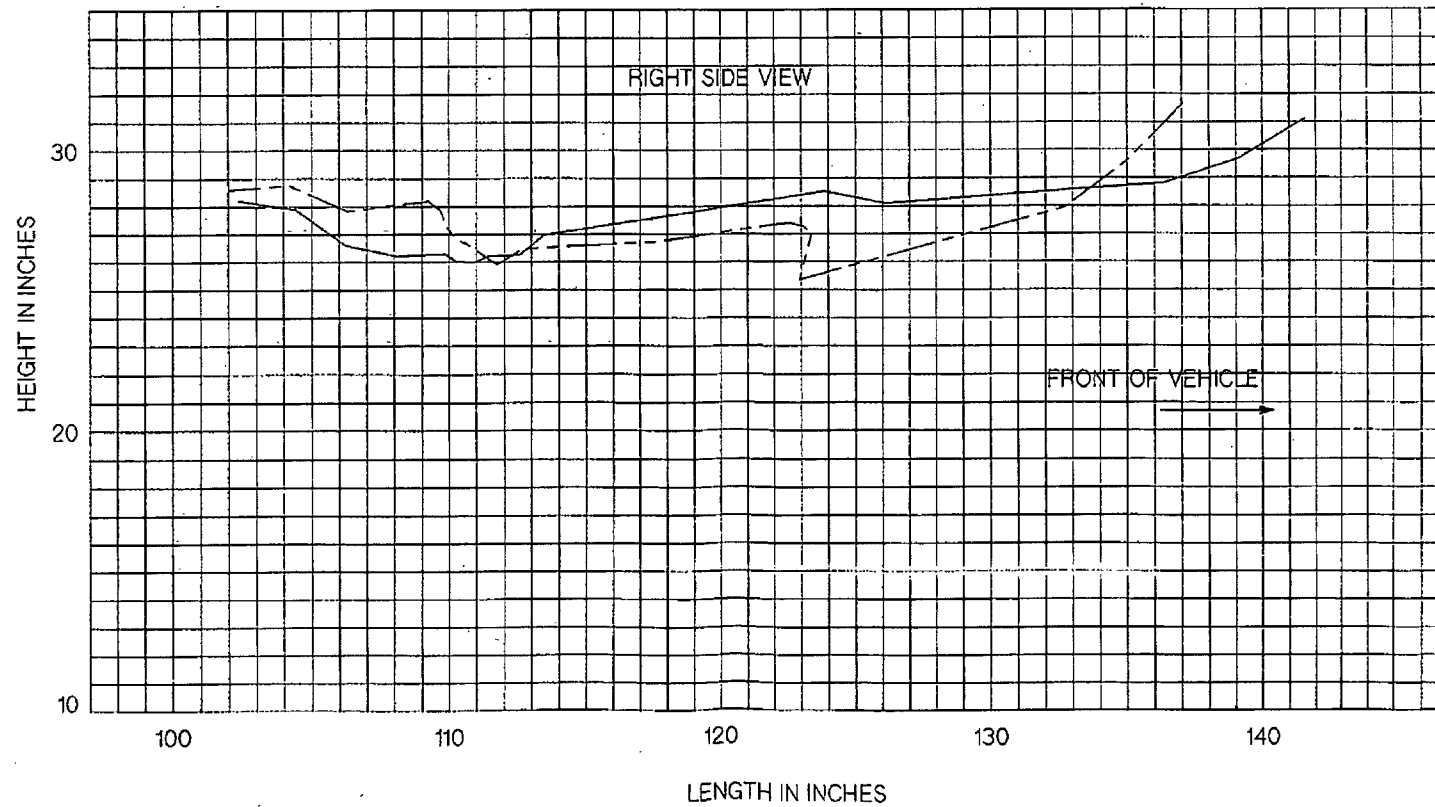
7-13065

000085

FLOORPAN SECTIONAL
@ R/S INBOARD SEAT BELT MNT.

BEFORE _____
AFTER - - - - -

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VEH. NO. 308T173
92 F-150
CRASH NO. 7277
CRASH MODE 90° FRONTAL



CRTS 0007277

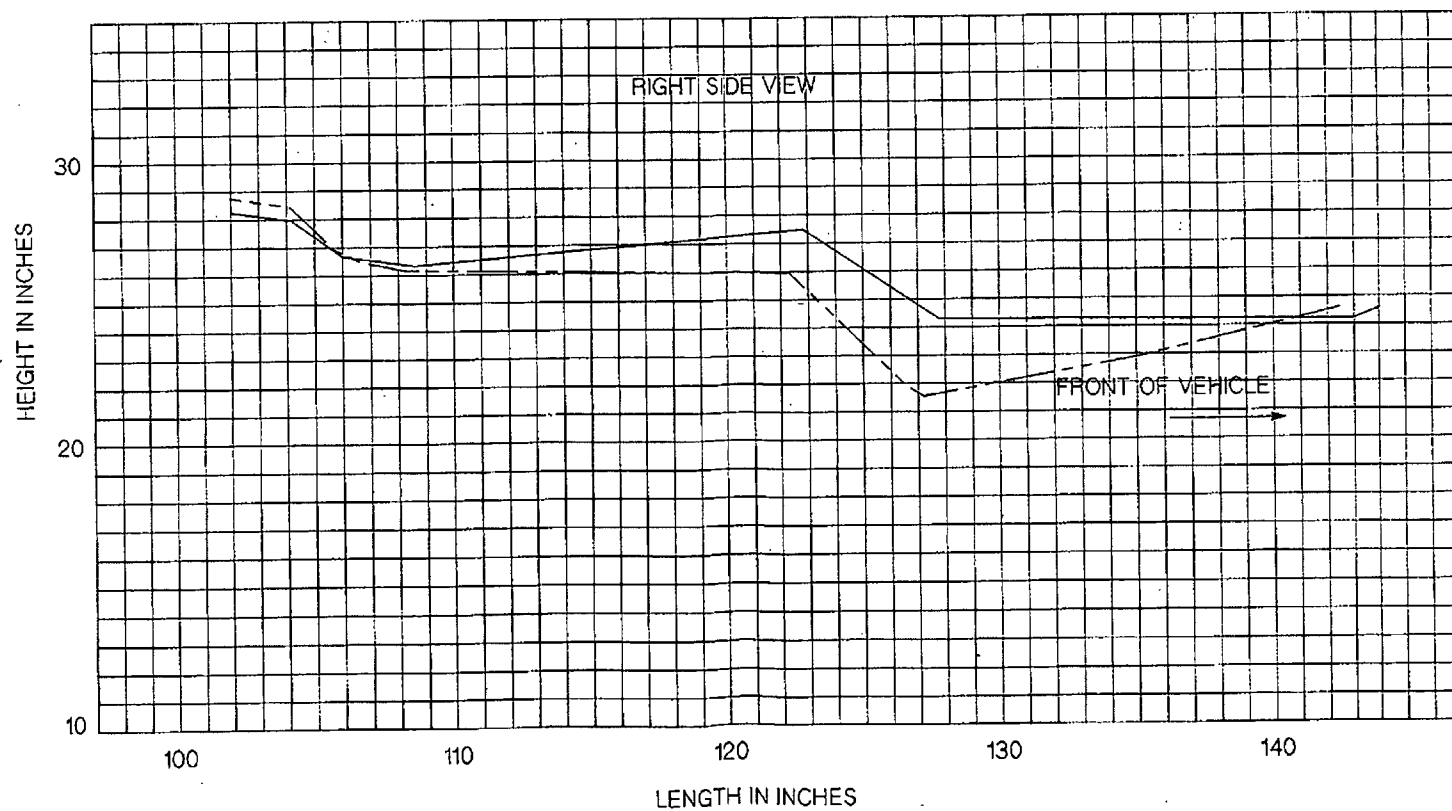
PRODUCED BY FORD
1416

7-1306 S
000086

FLOORPAN SECTIONAL
@ R/S OUTBOARD SEAT MNT.

BEFORE _____
AFTER - - - - -

T.O. G-4558
VEH. NO. 308T173
92 F-150
CRASH NO. 7277
CRASH MODE 90° FRONTAL



CRTS 0007277

PRODUCED BY FORD
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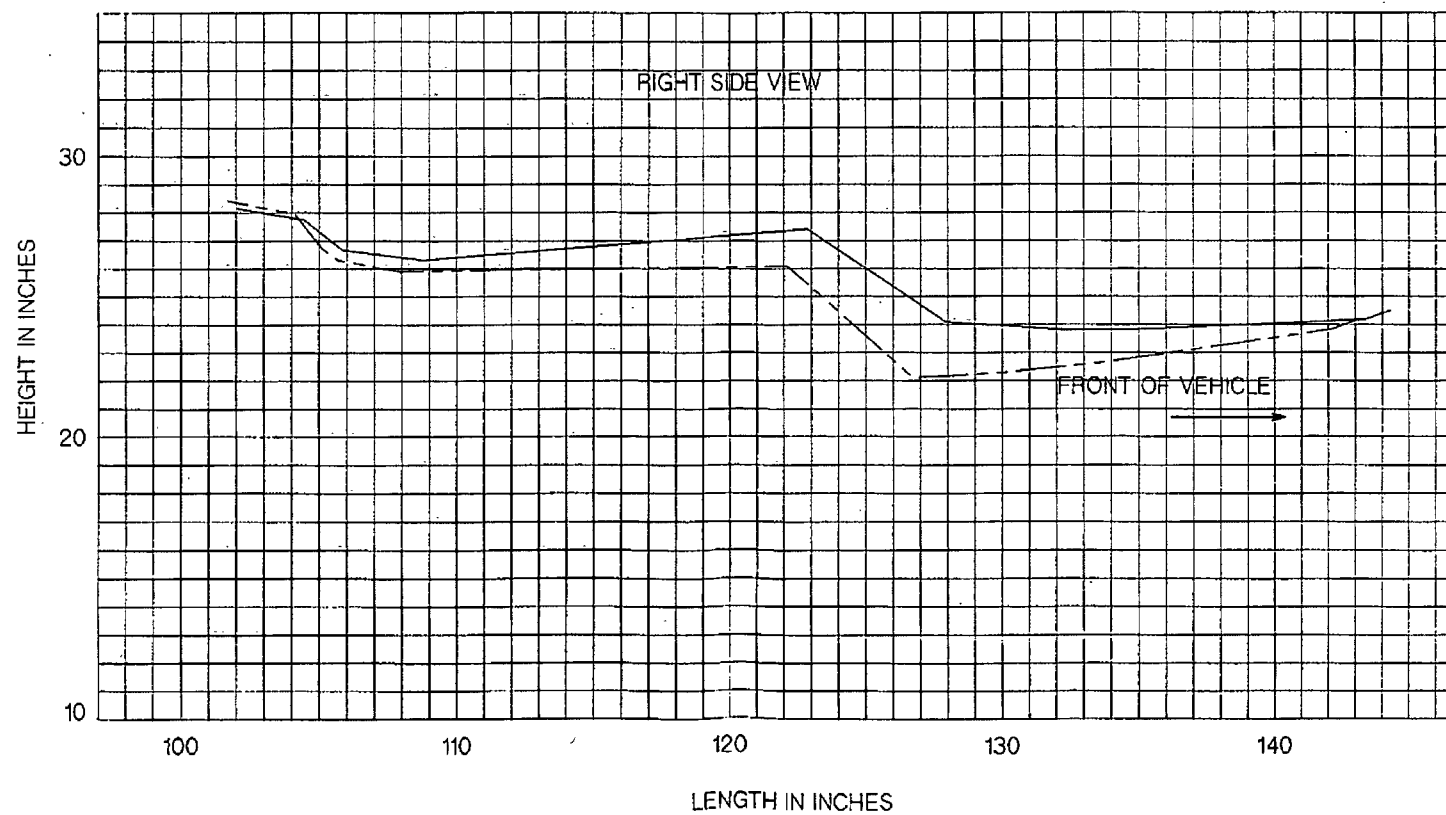
7-13065

000087

FLOORPAN SECTIONAL
@ L/S OUTBOARD SEAT MNT.

BEFORE _____
AFTER - - - - -

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VEH. NO. 308T173
92 F-150
CRASH NO. 7277
CRASH MODE 90° FRONTAL



CRTS 0007277

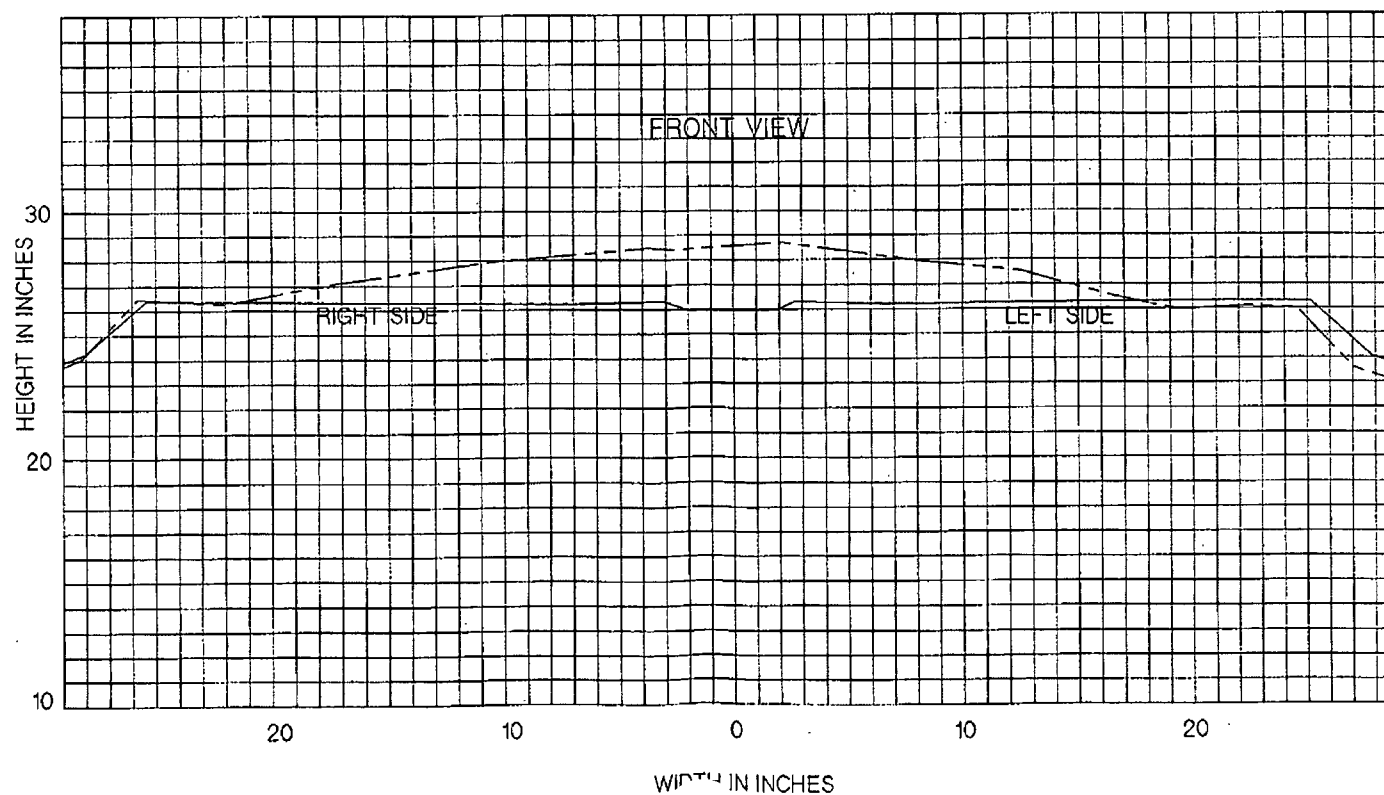
PRODUCED BY FORD
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7-3065
000088

FLOORPAN SECTIONAL
@ REAR SEAT BOLT C/L

BEFORE _____
AFTER -----

T.O. G-4558
VEH. NO. 308T173
92 F-150
CRASH NO. 7277
90° FRONT IMPACT



CRTS 0007277

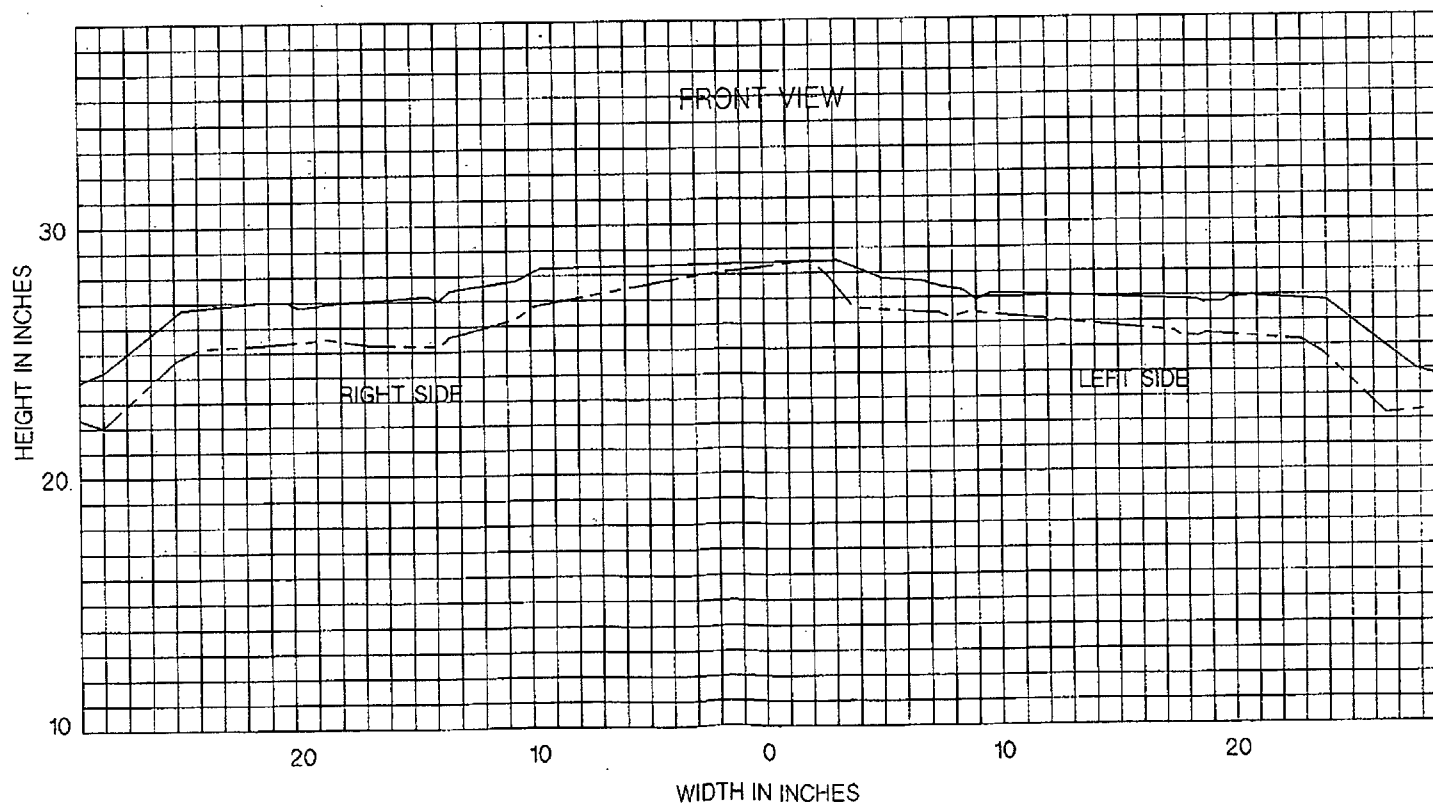
7-13065

000089

FLOORPAN SECTIONAL
@ FRONT SEAT BOLT C/L

BEFORE _____
AFTER -----

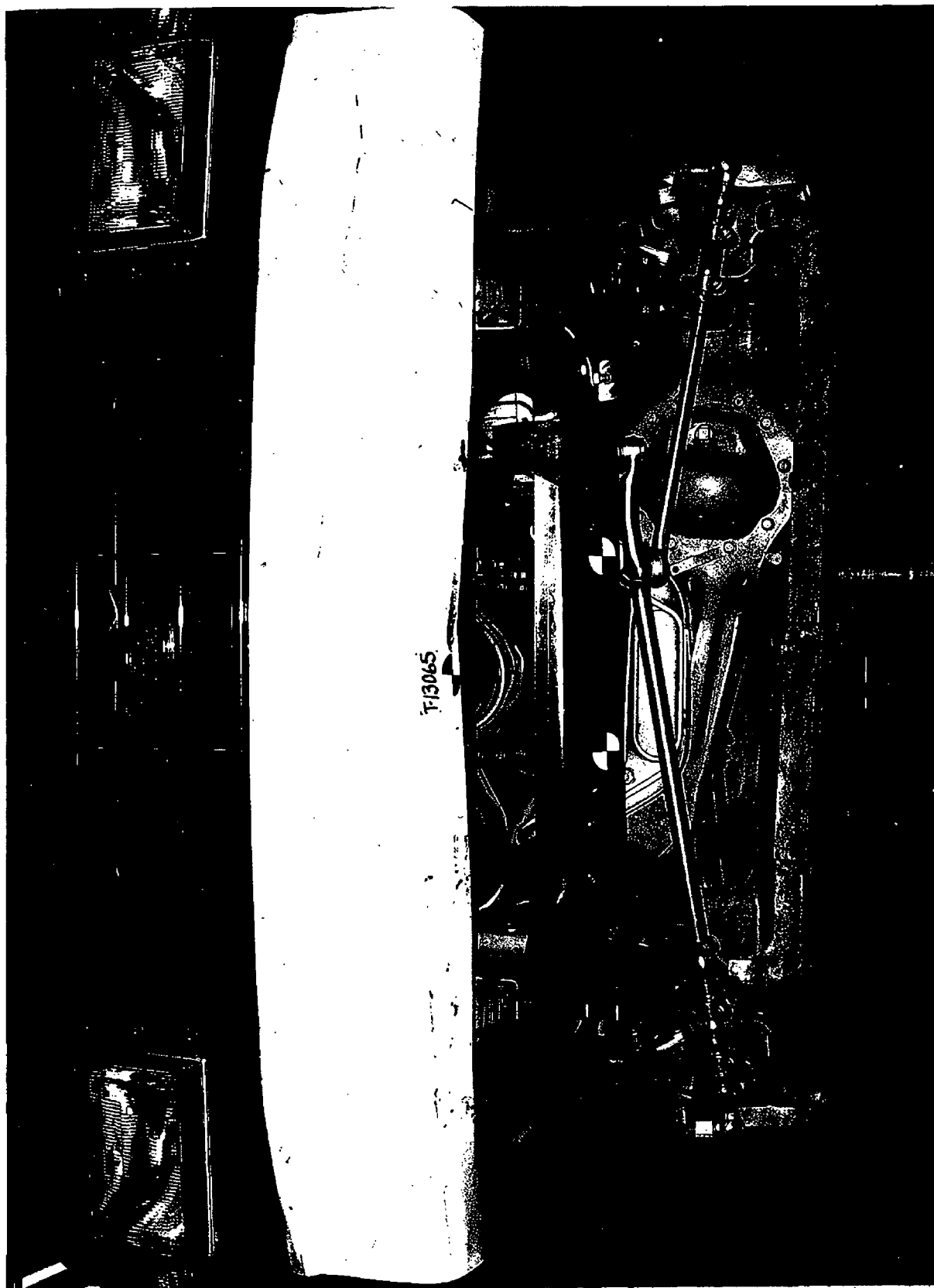
T.O. G-4558
VEH. NO. 308T173
92 F-150
CRASH NO. 7277
90° FRONT IMPACT



CRTS 0007277

PRODUCED BY FORD
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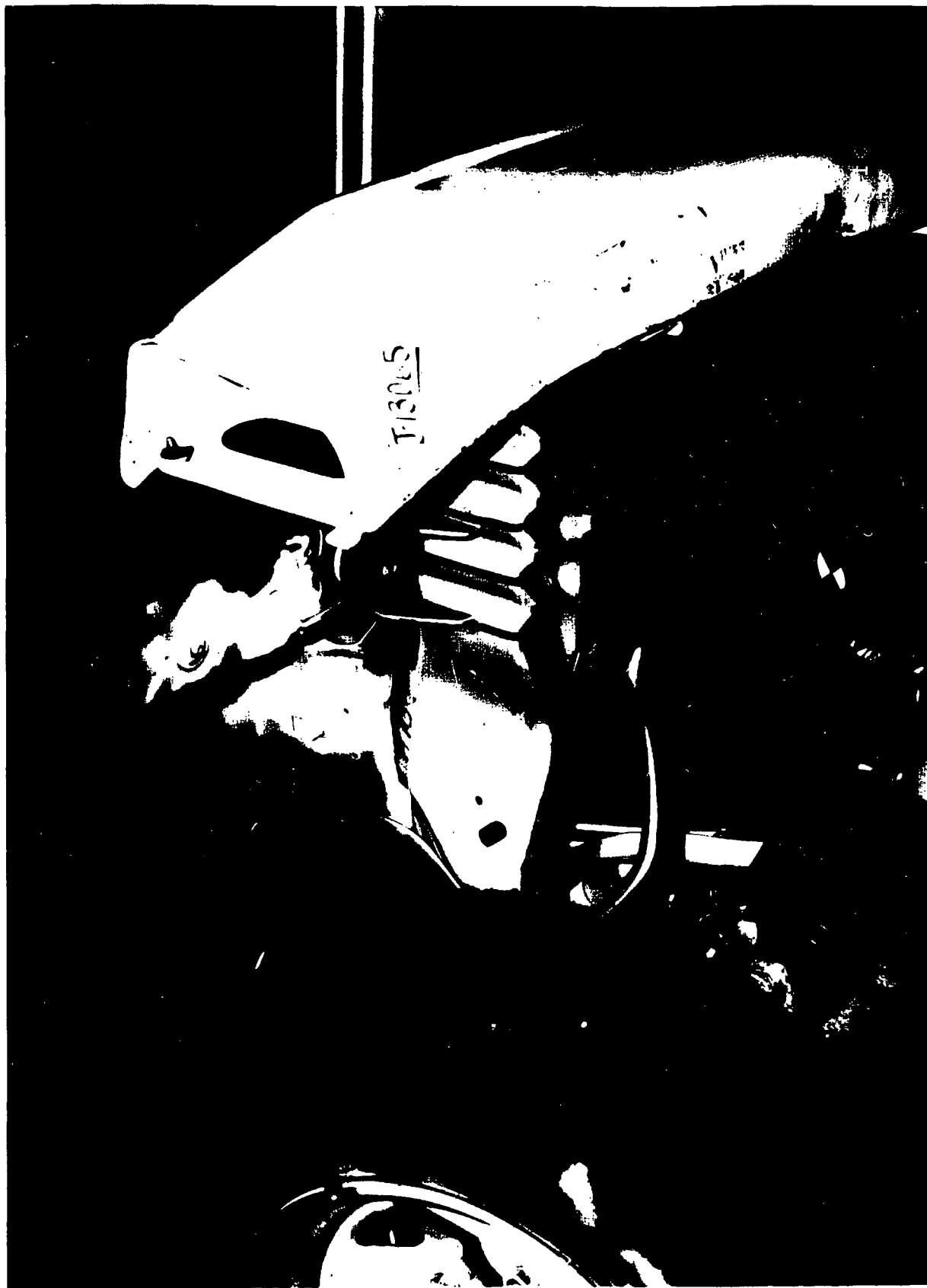
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CN 54017-3719



CRTS 0007277

PRODUCED BY FORD
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CN 54017-3720



CRTS 0007277

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CN 54017-3721



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PRODUCED BY FORD
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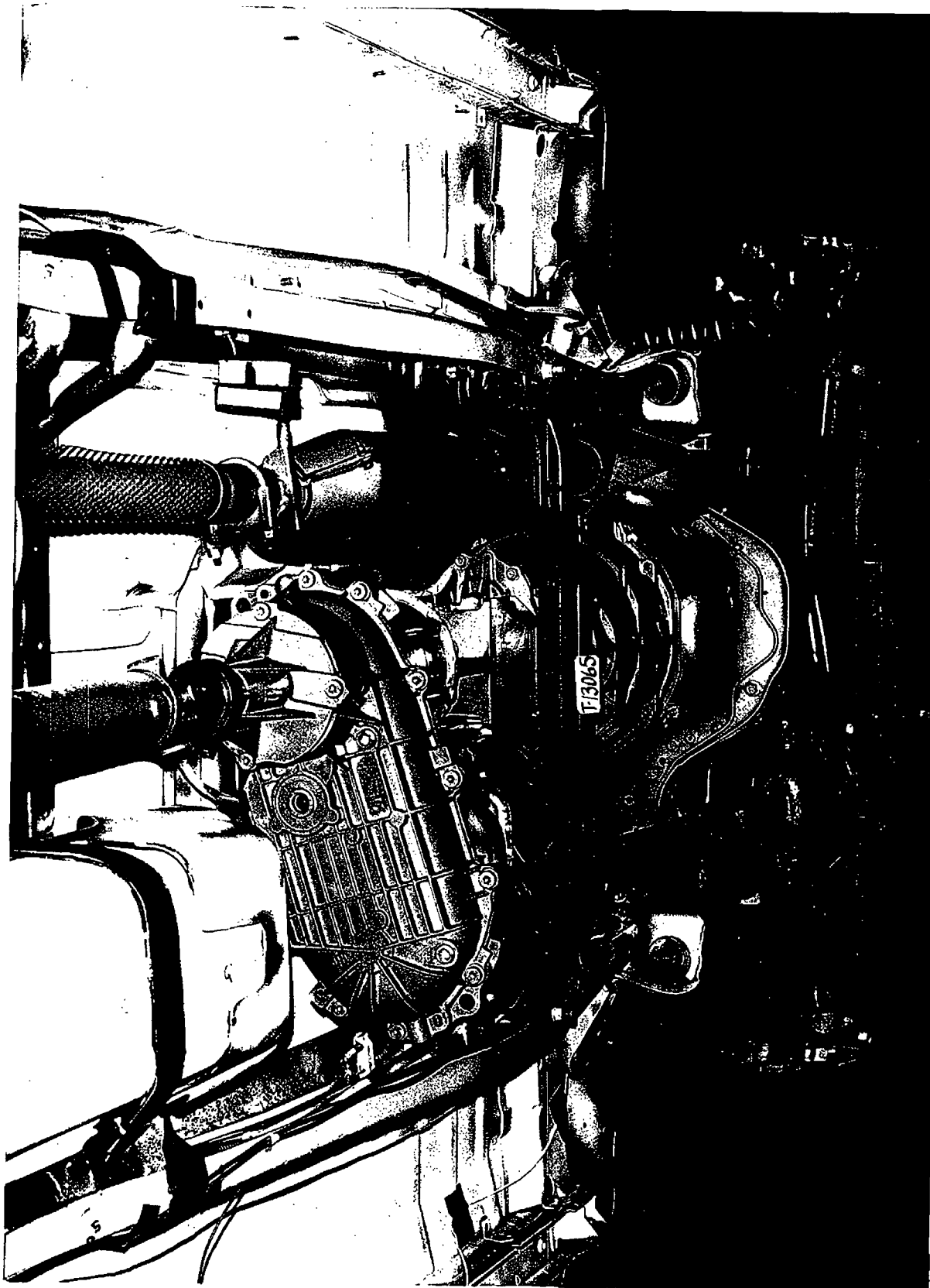
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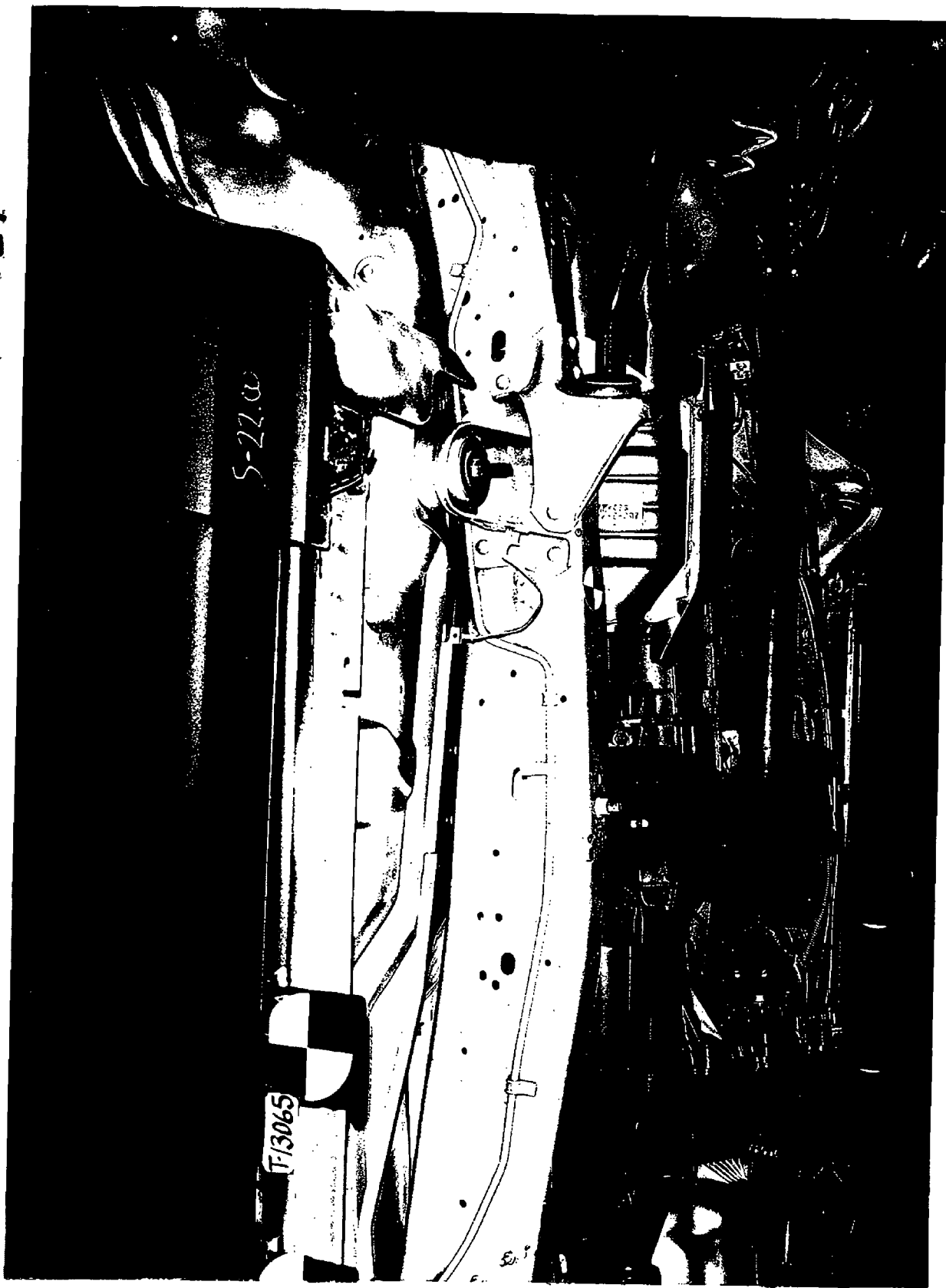
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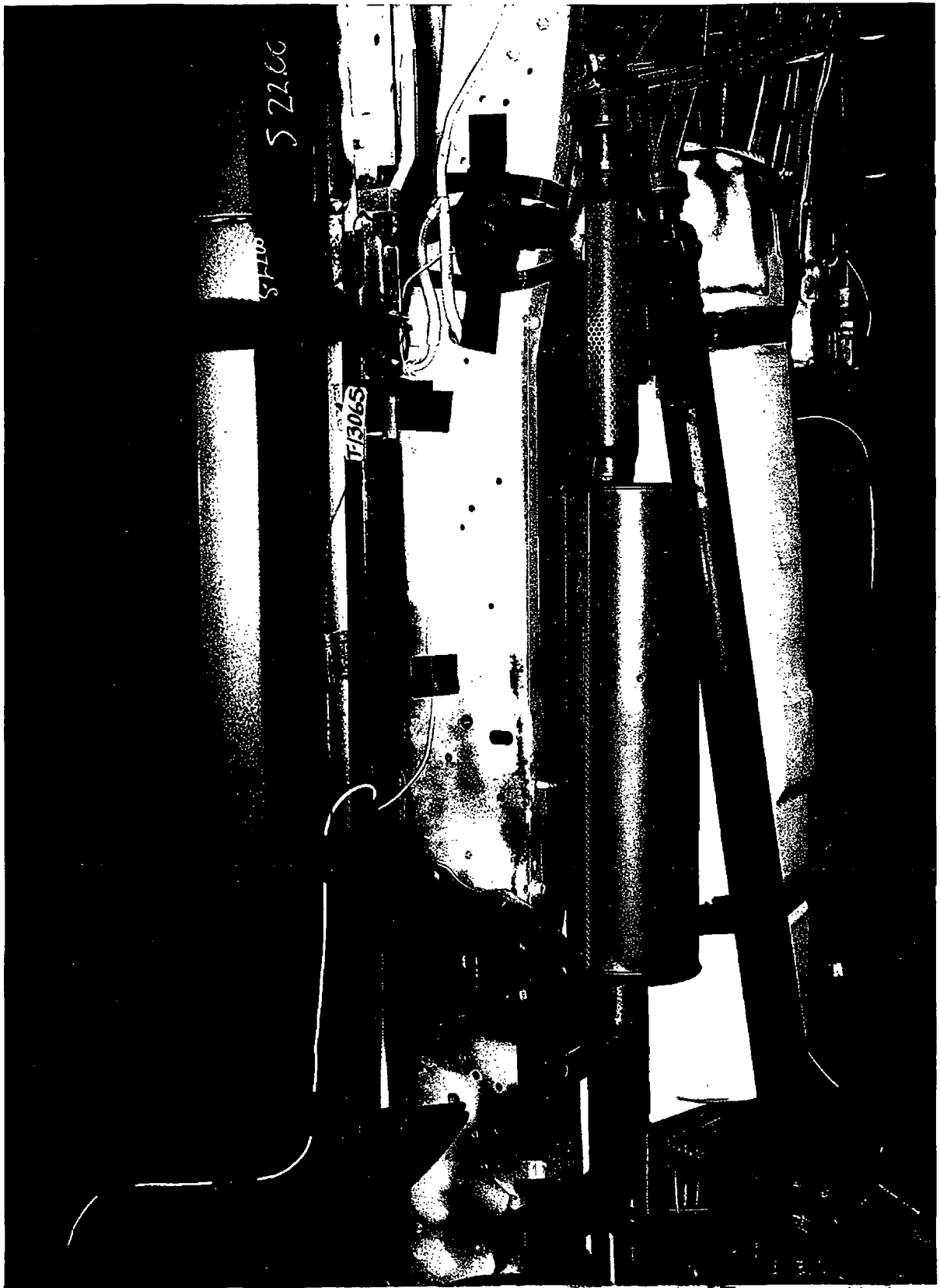
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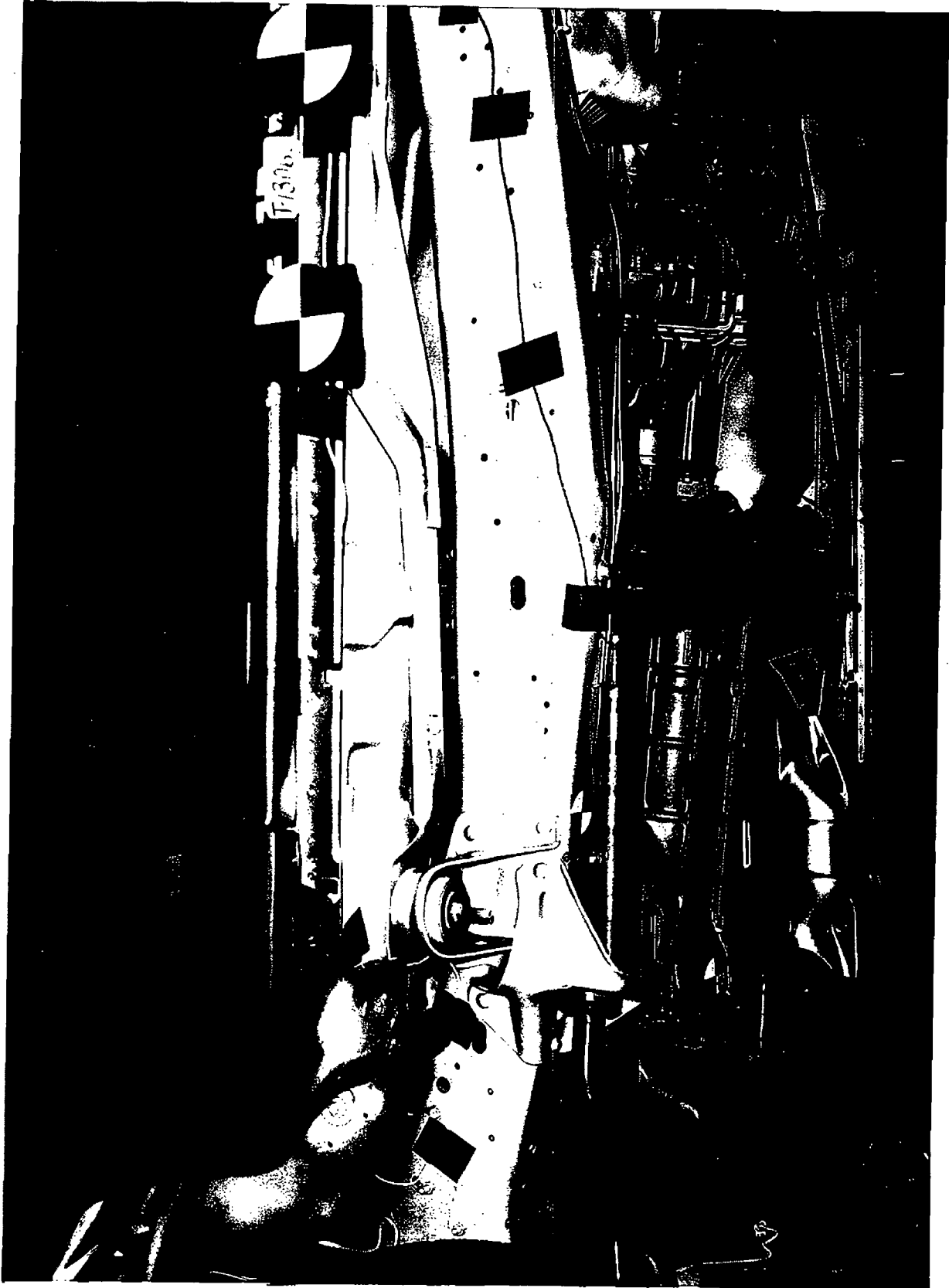
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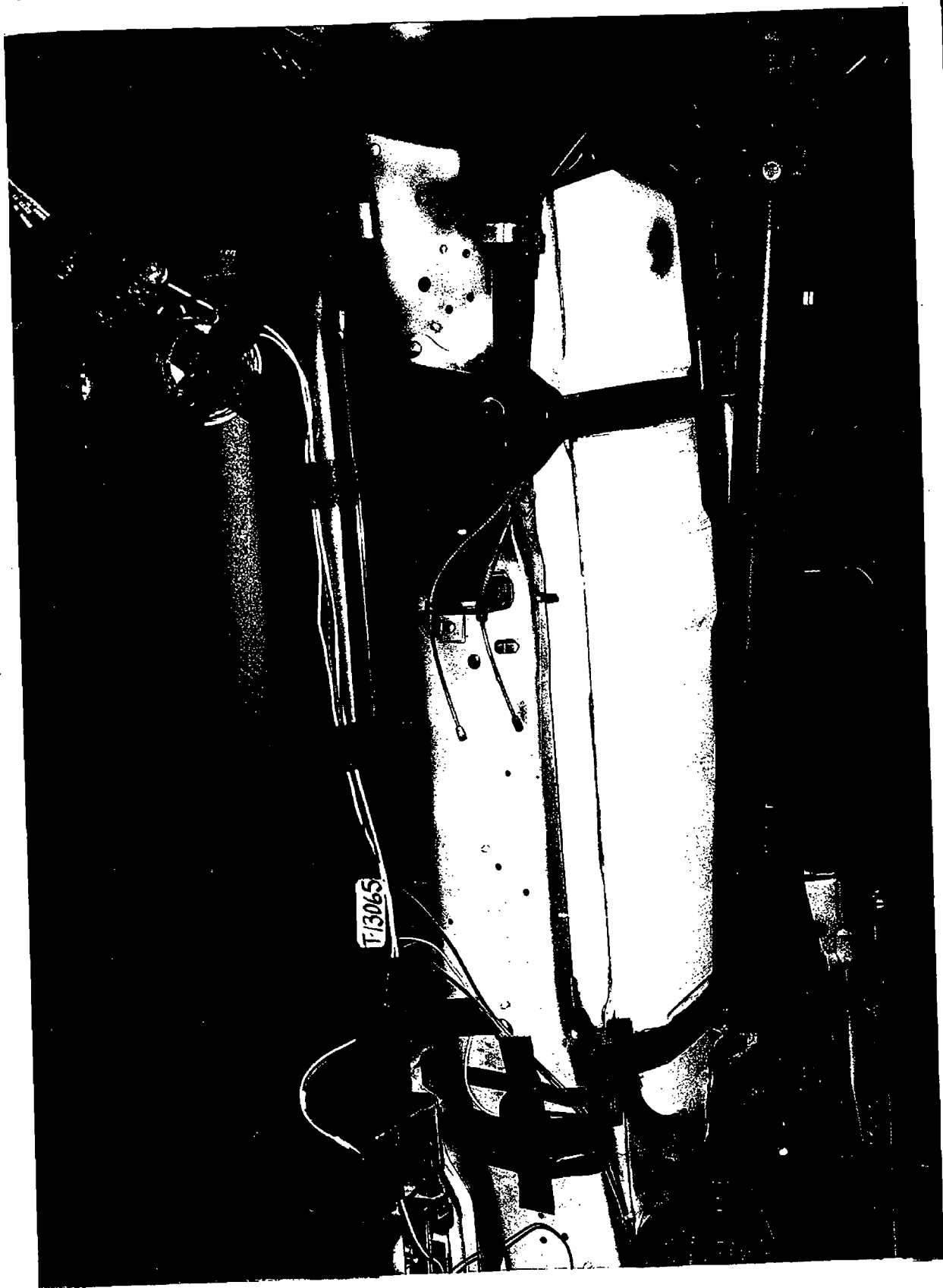
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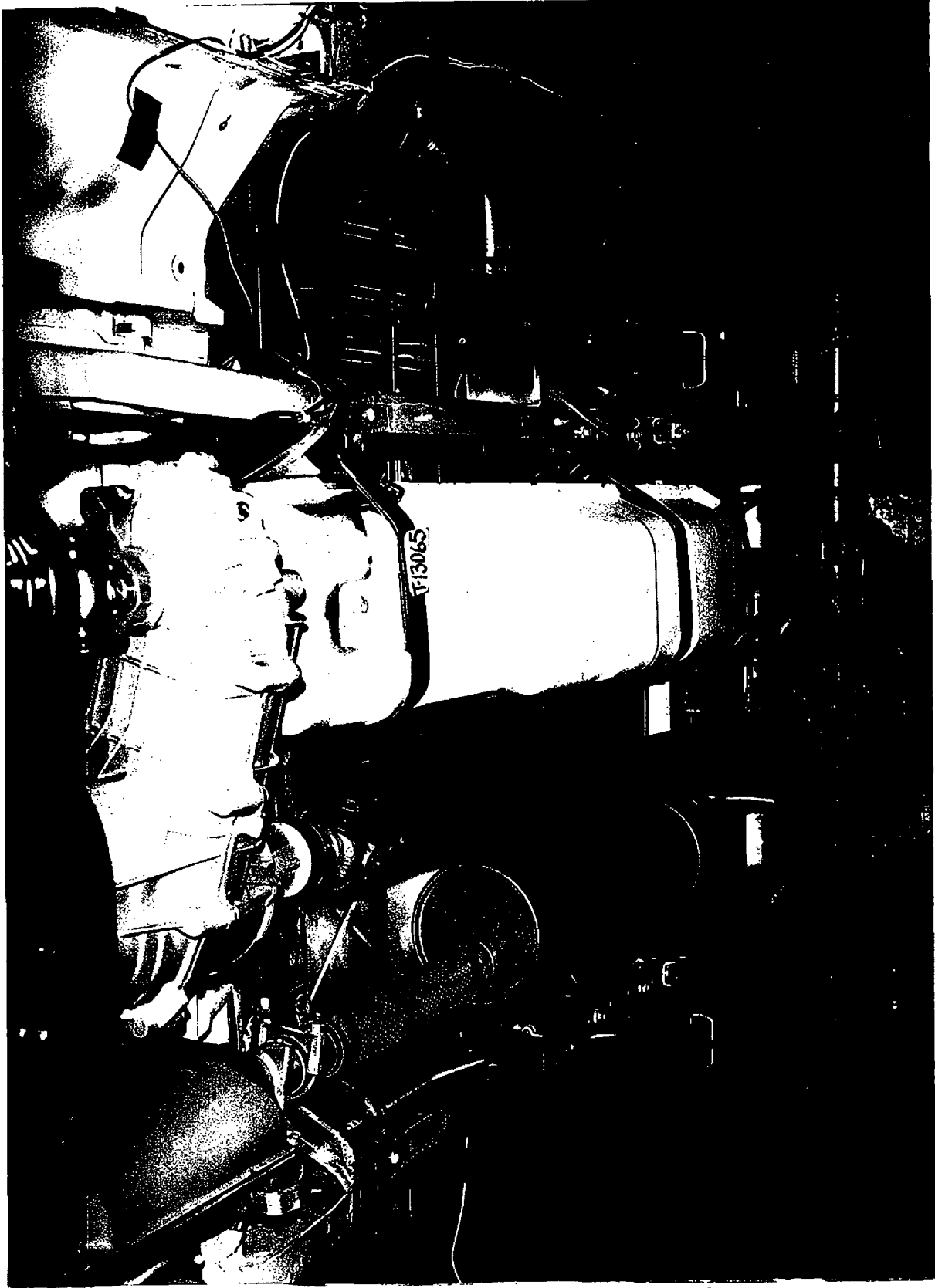
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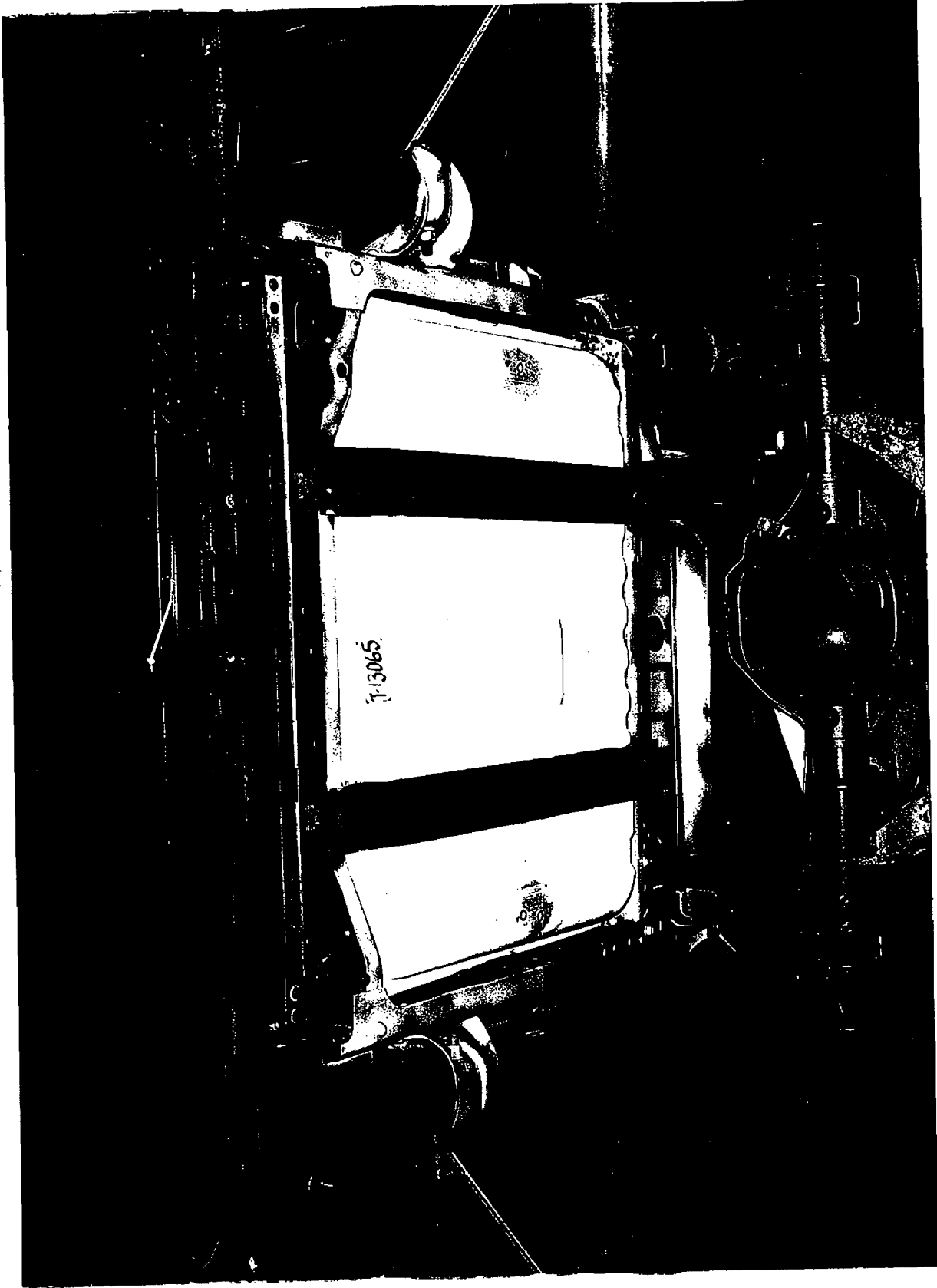
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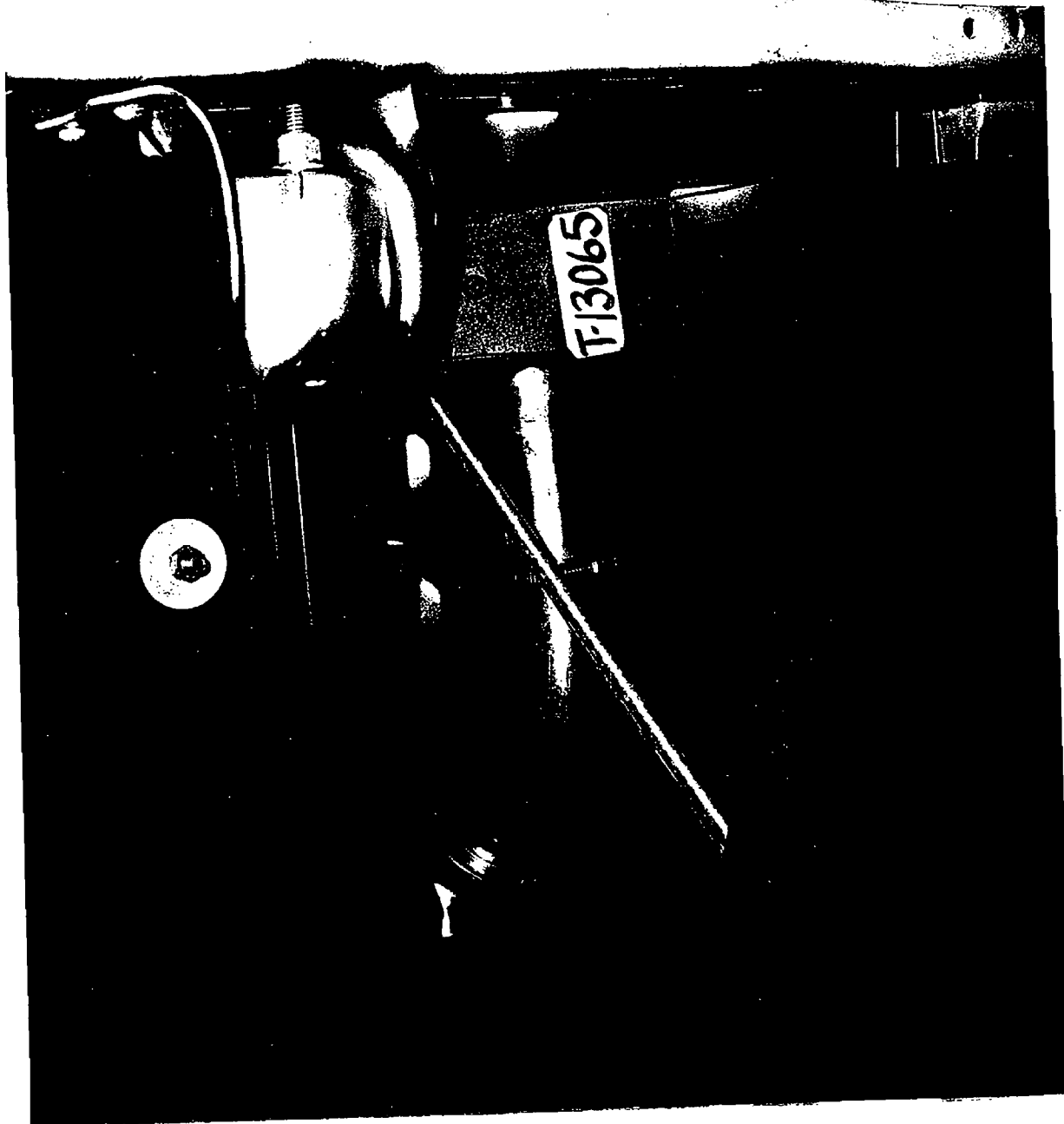
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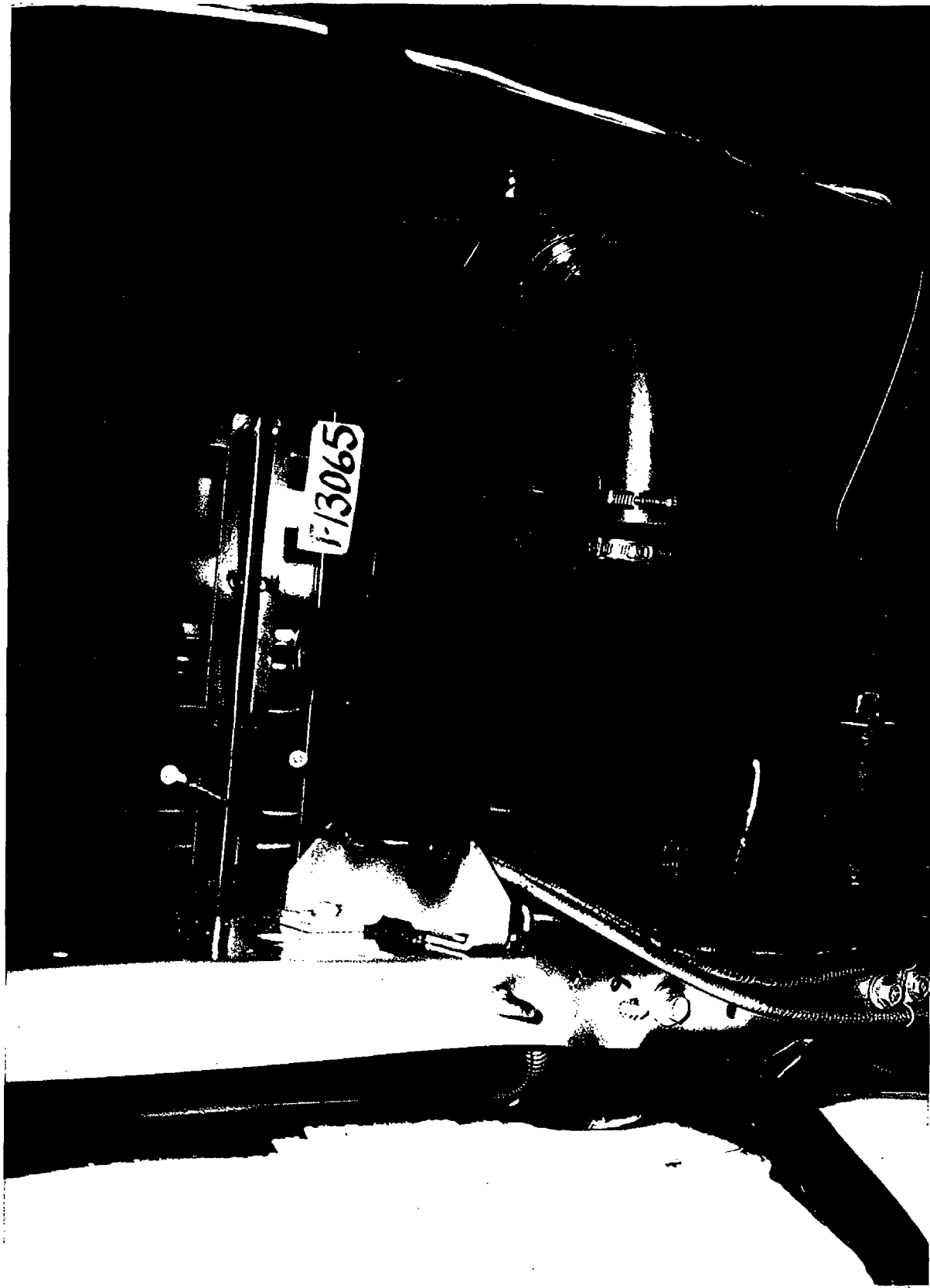
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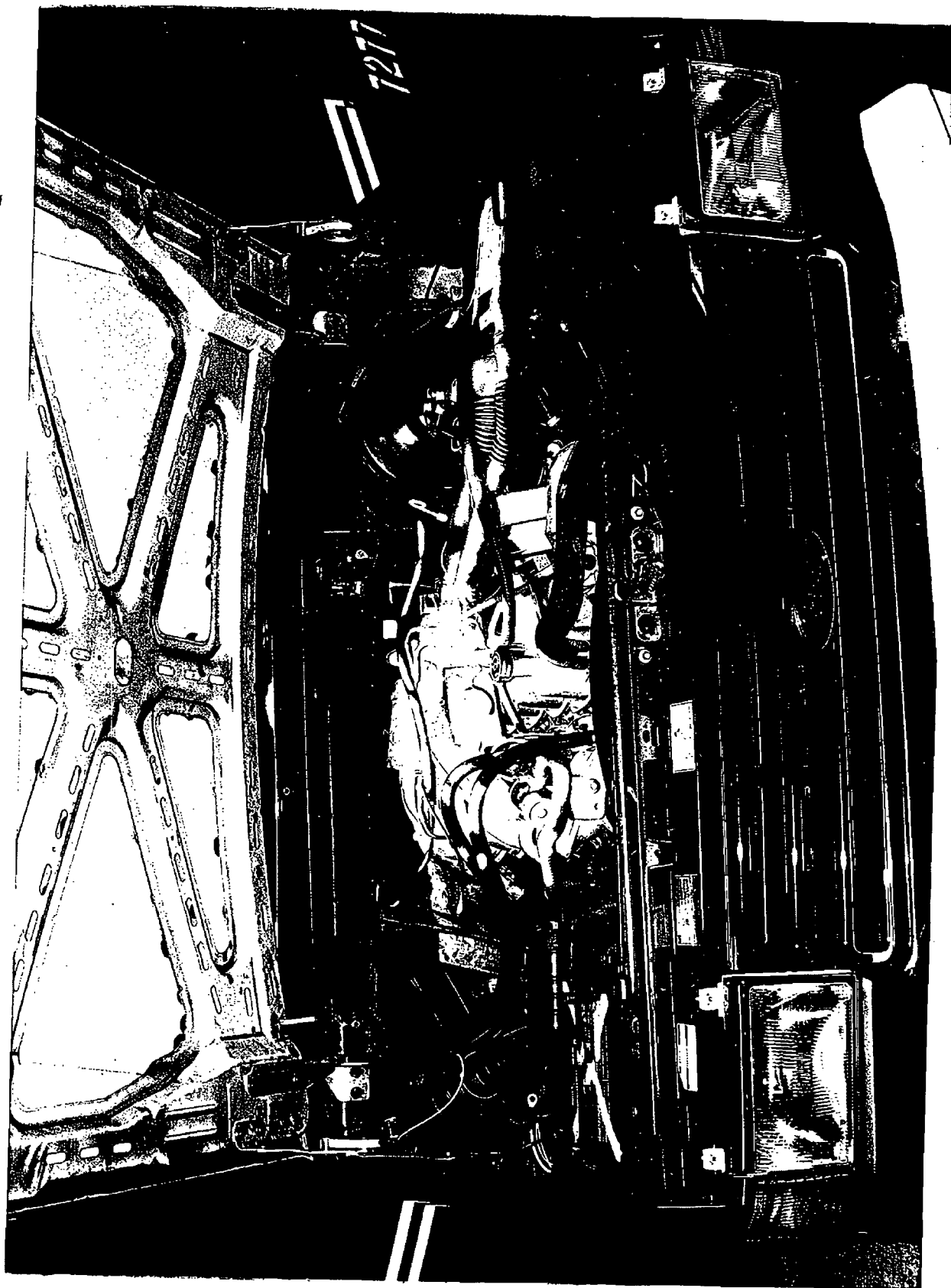
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CN 54017-3732



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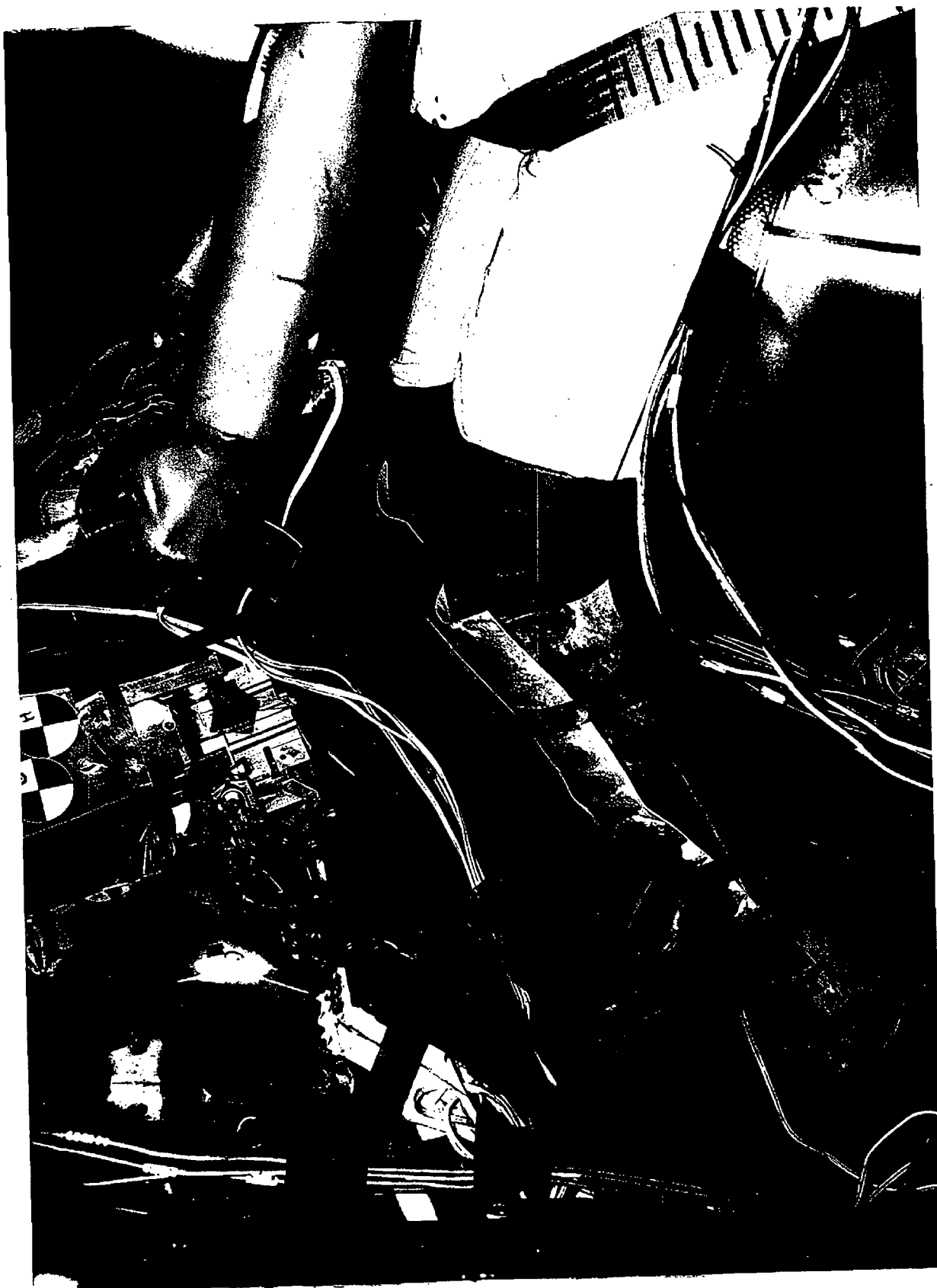
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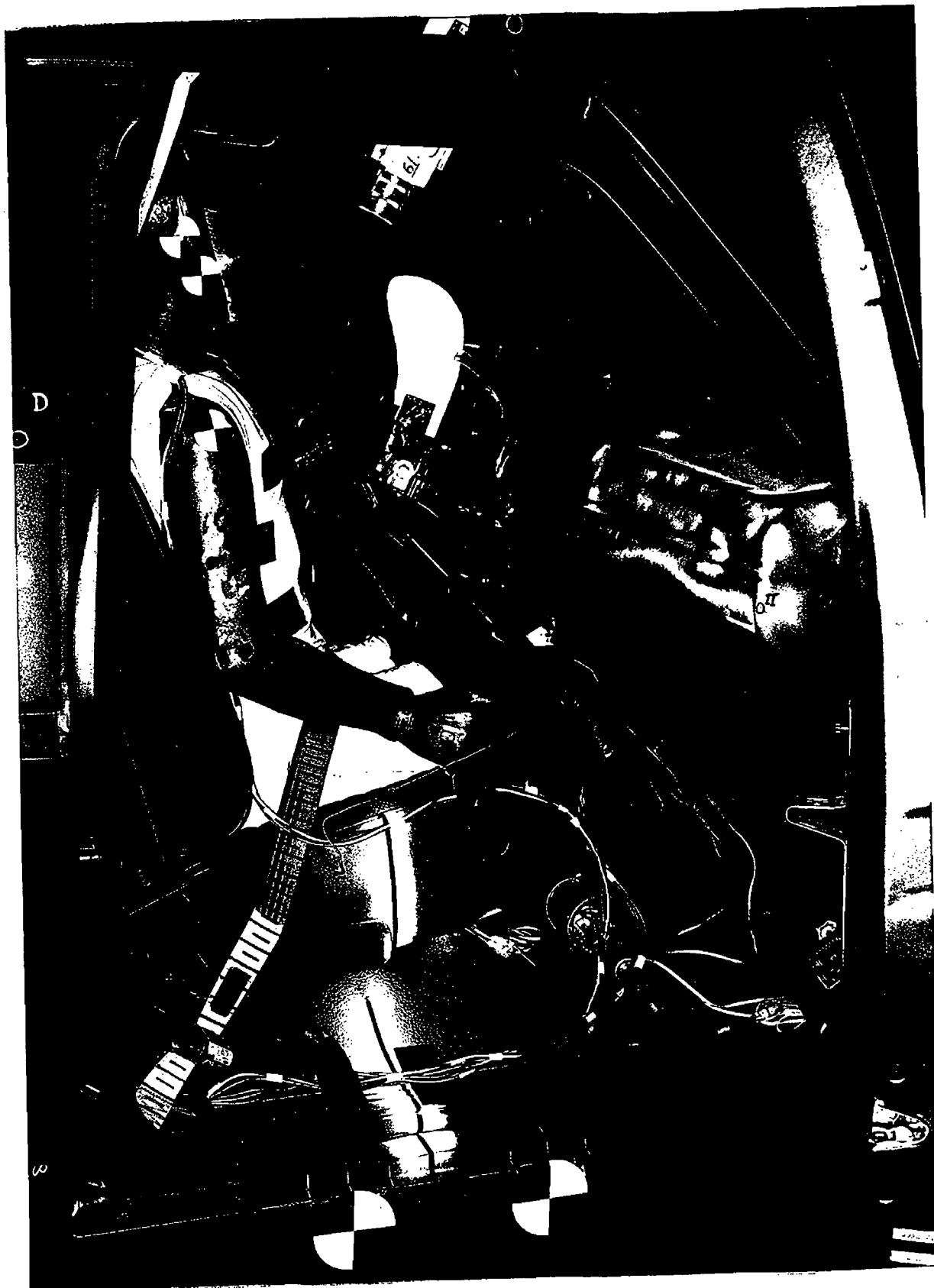
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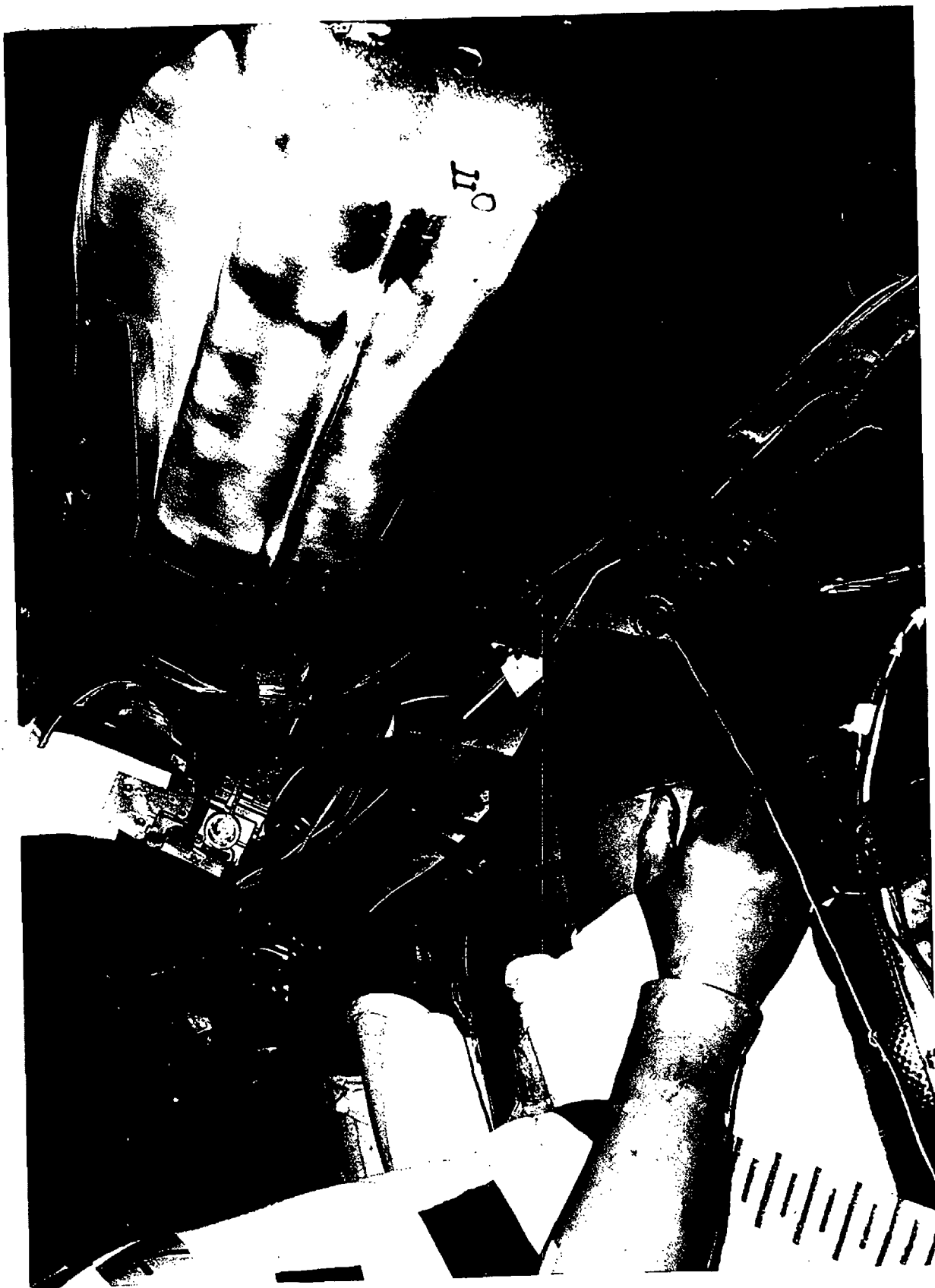
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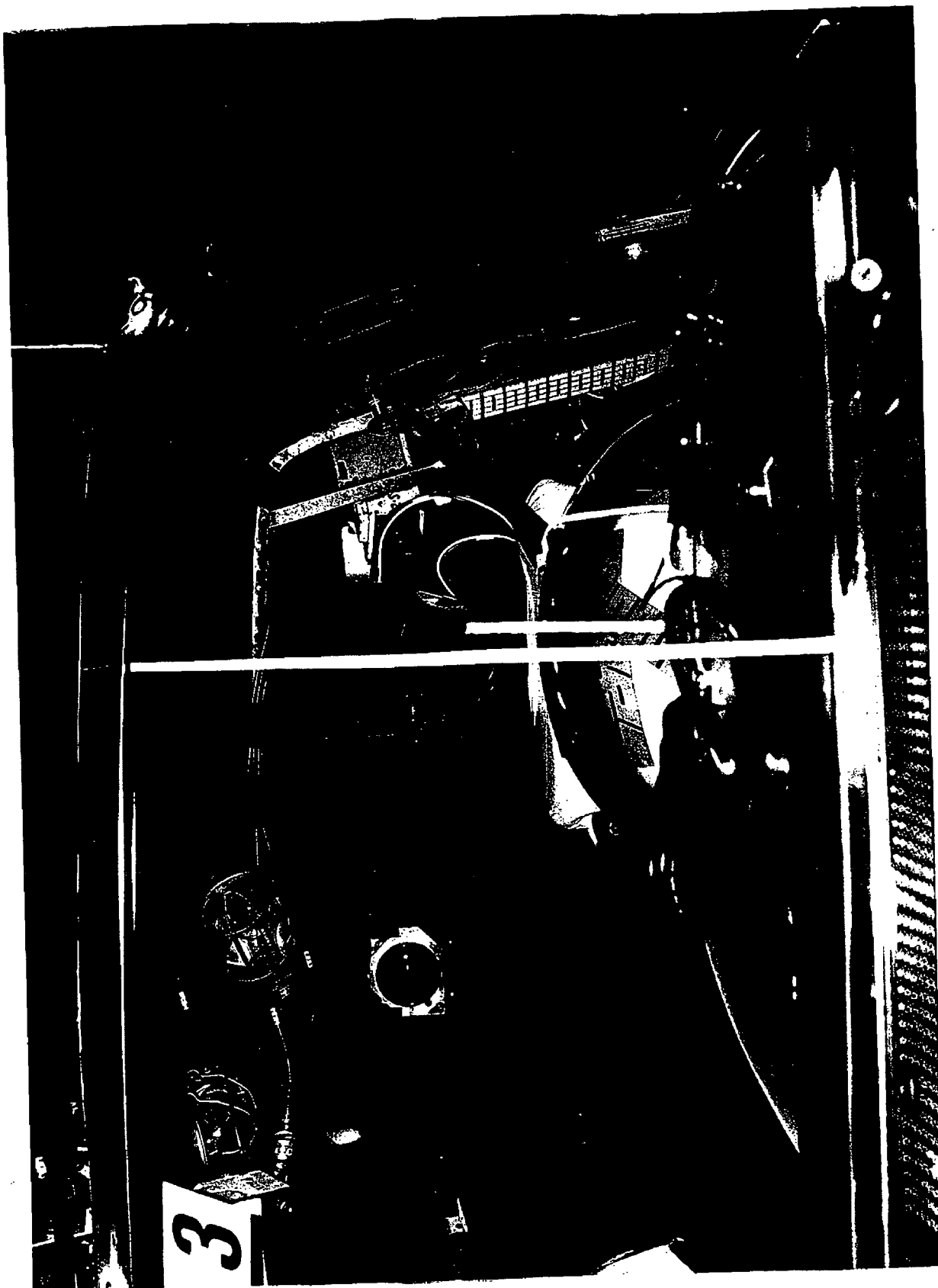
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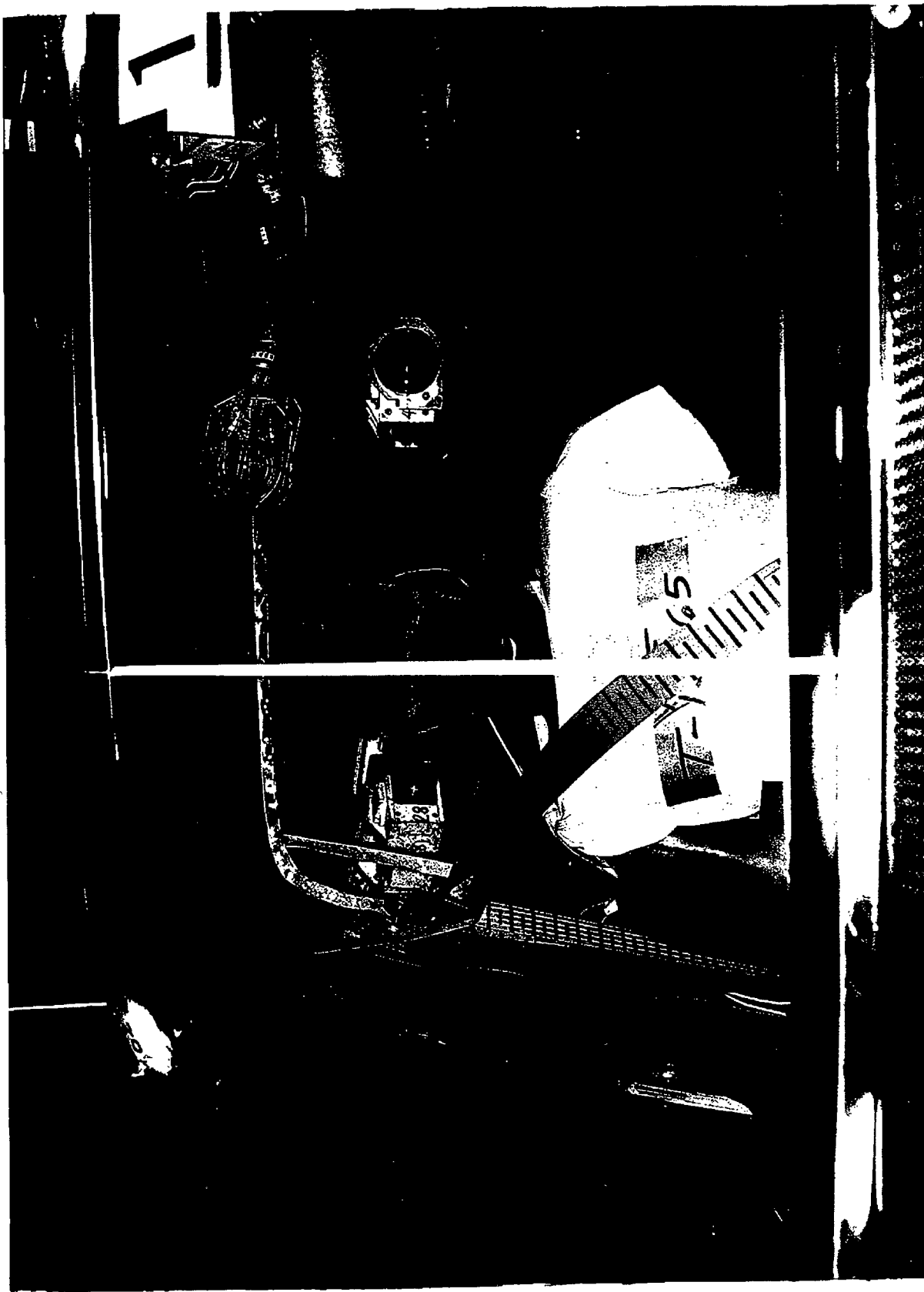
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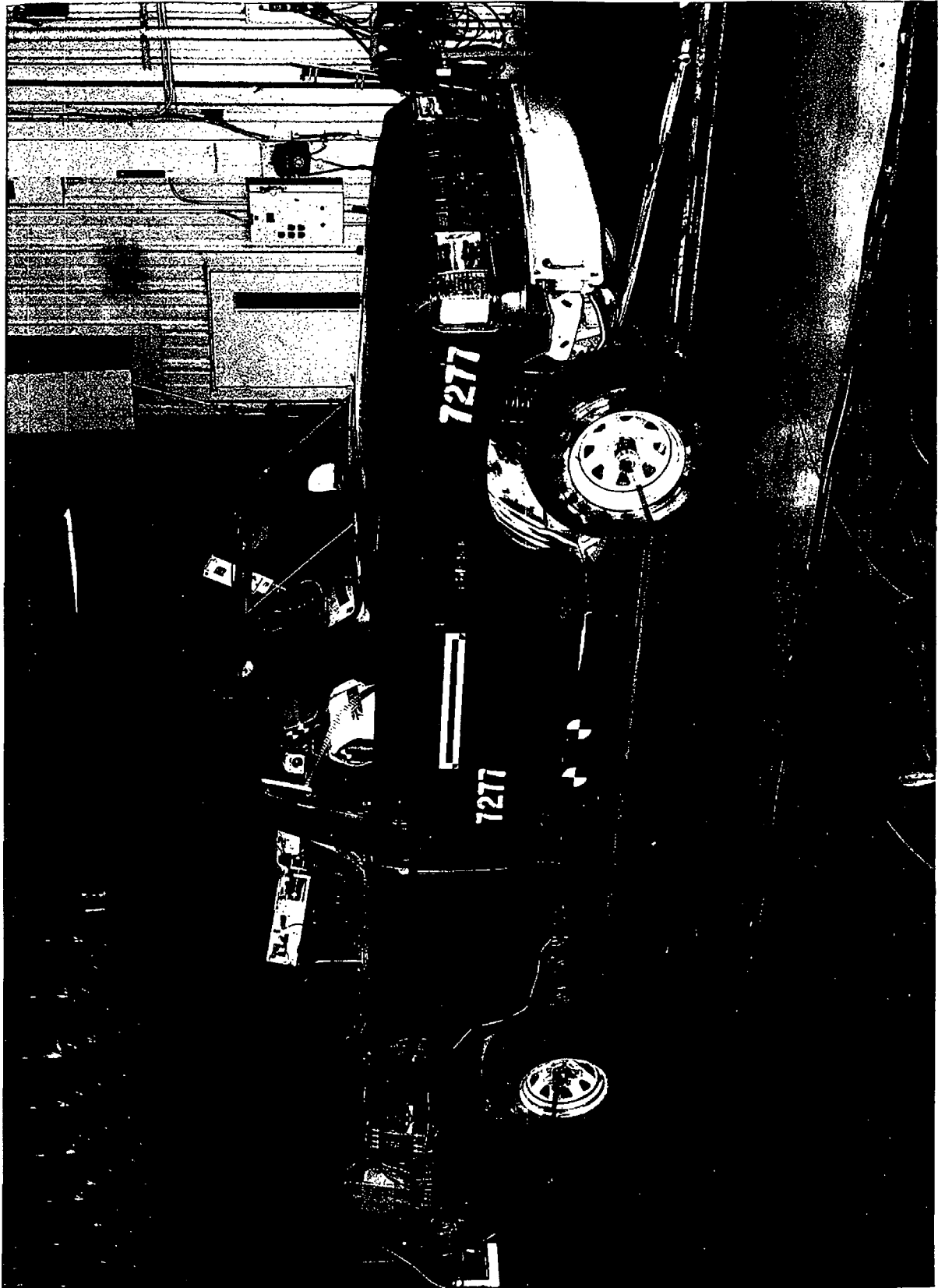
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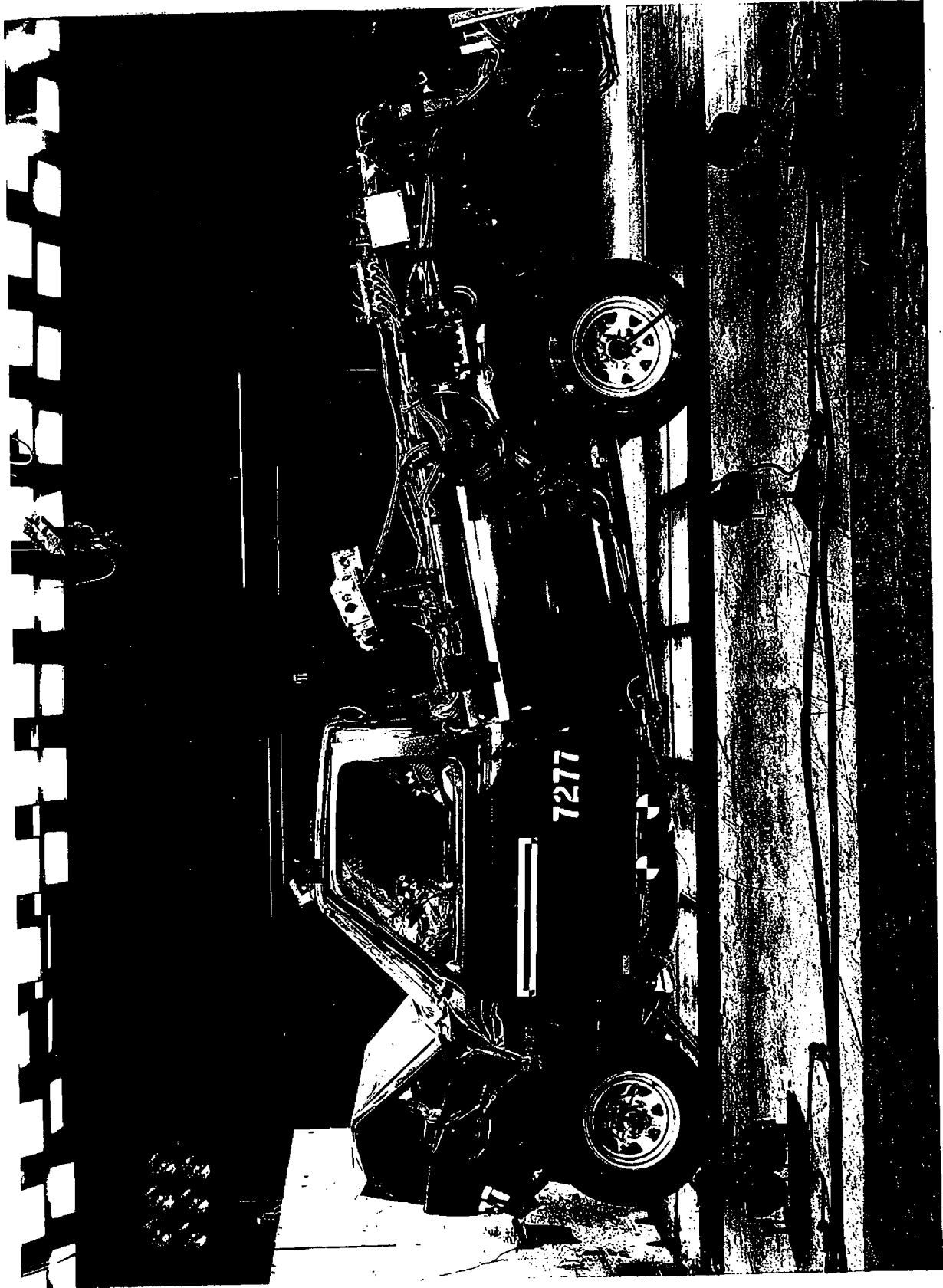
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CN 54017-3740



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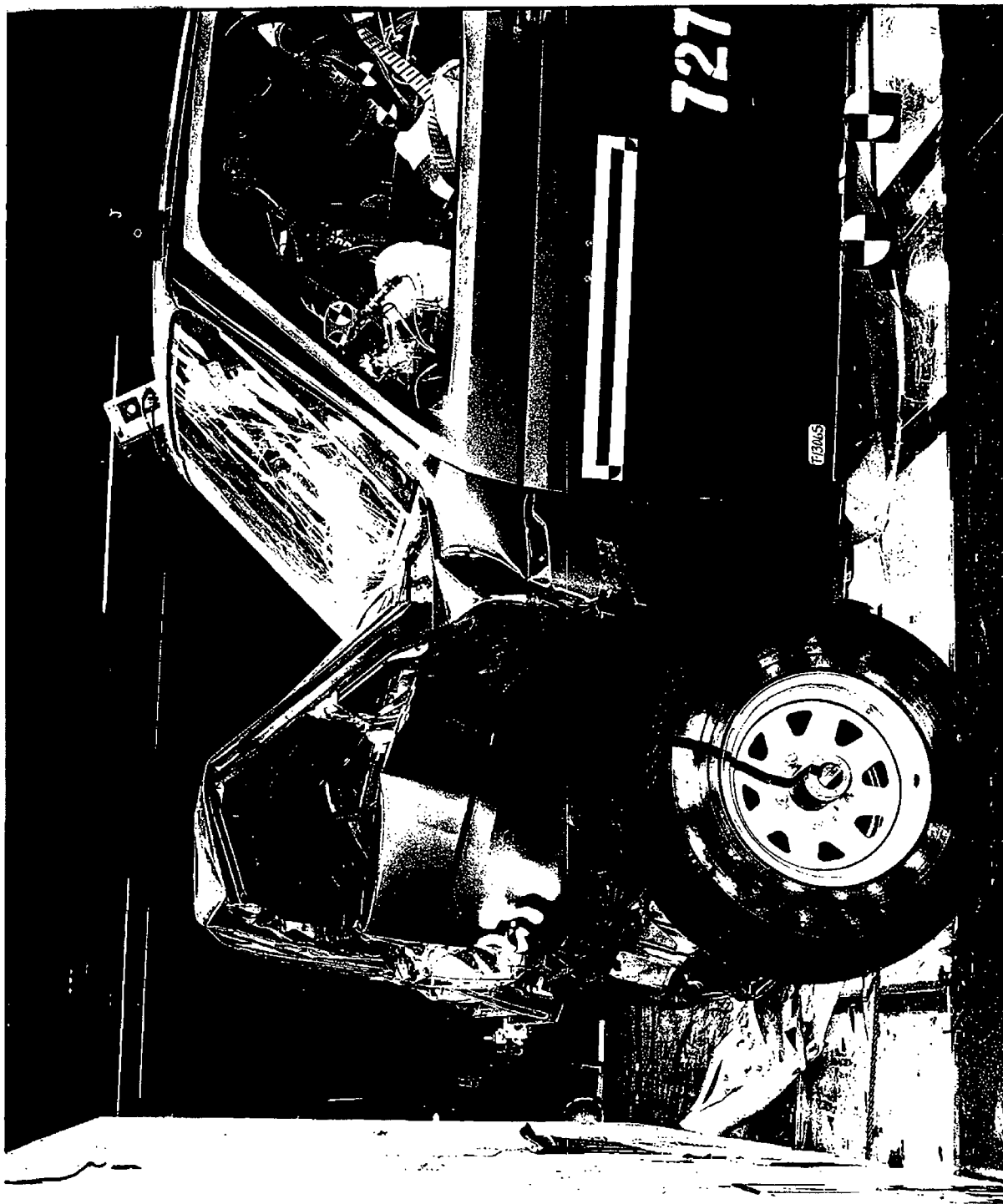
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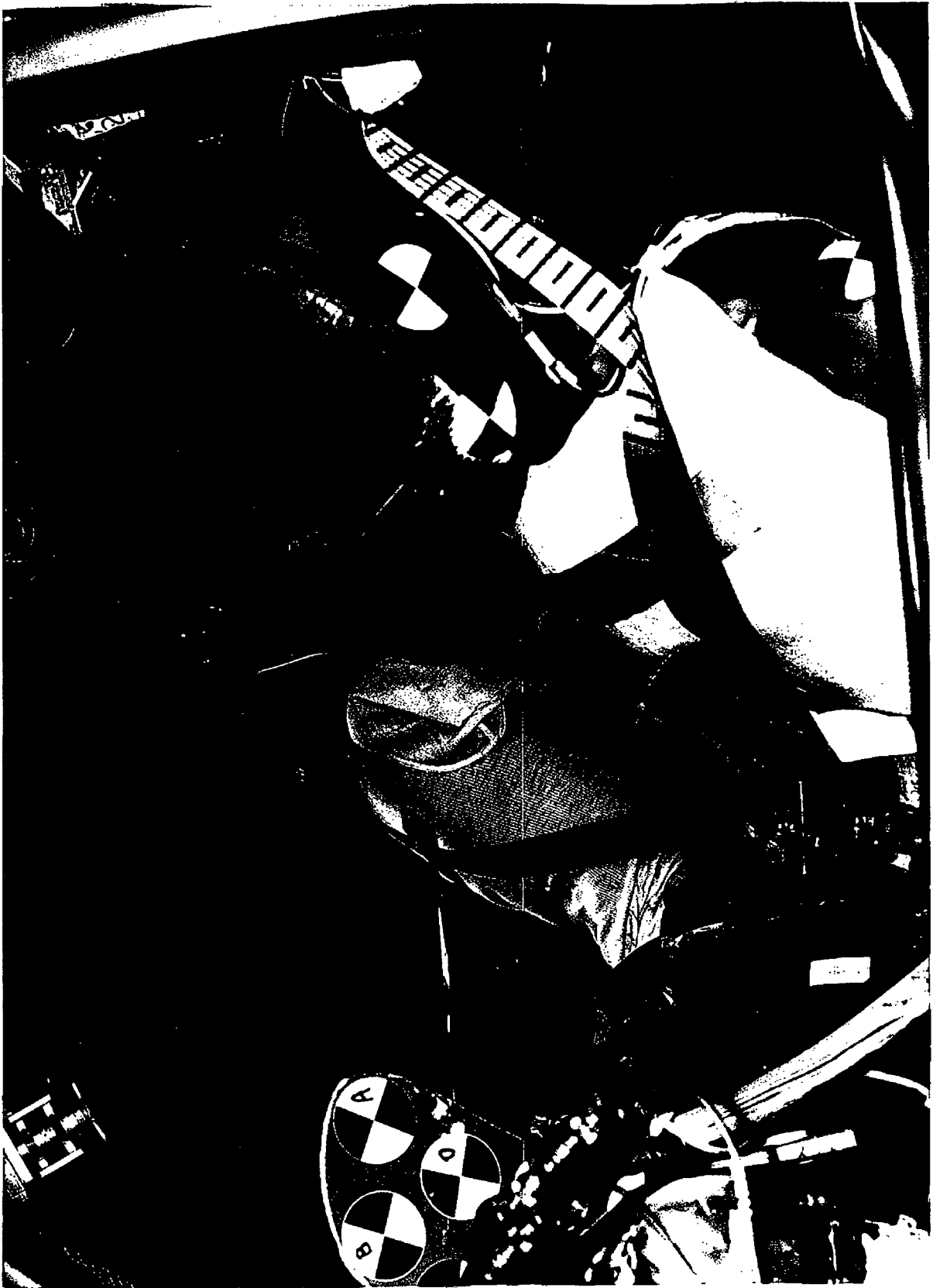
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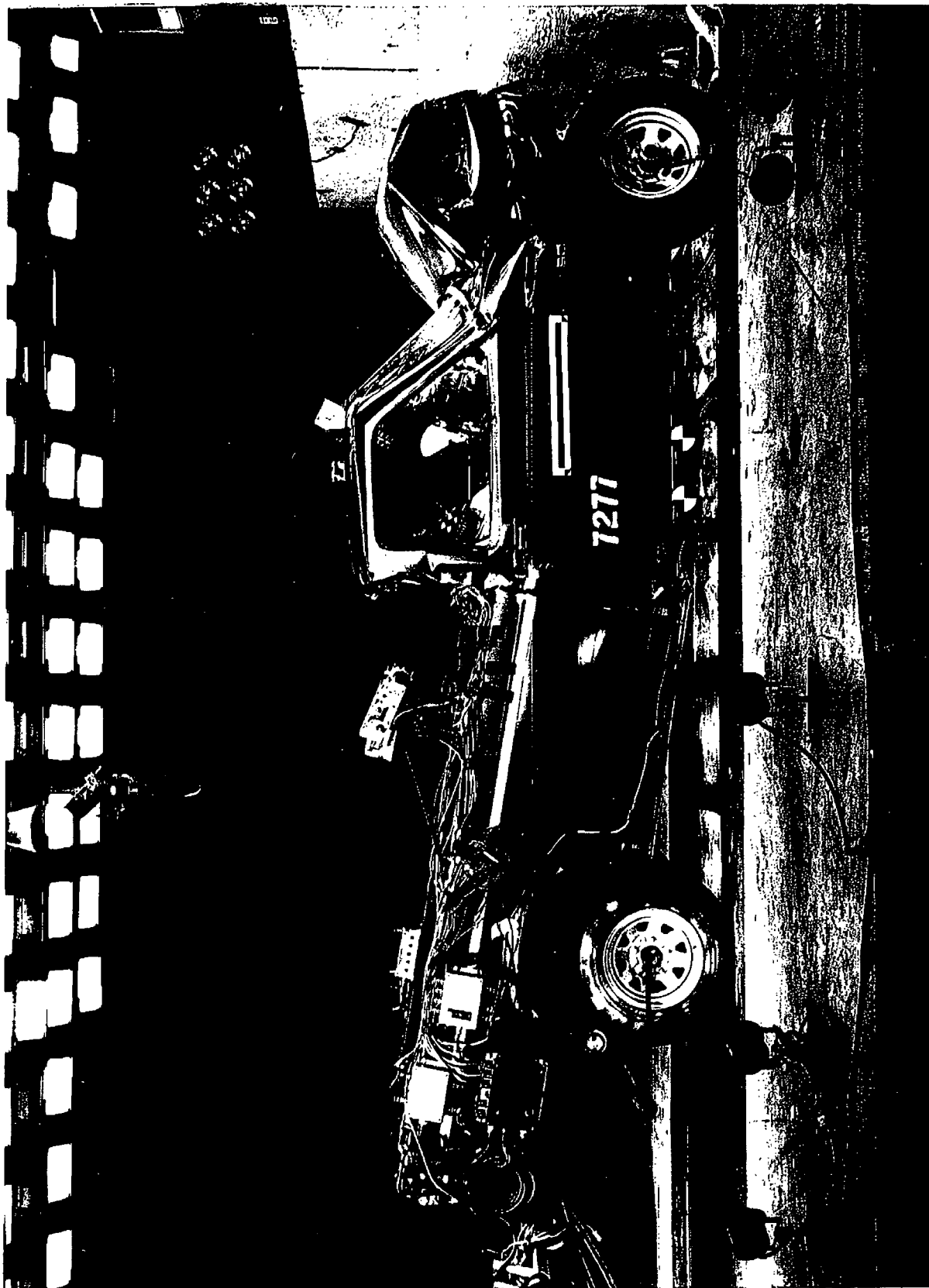
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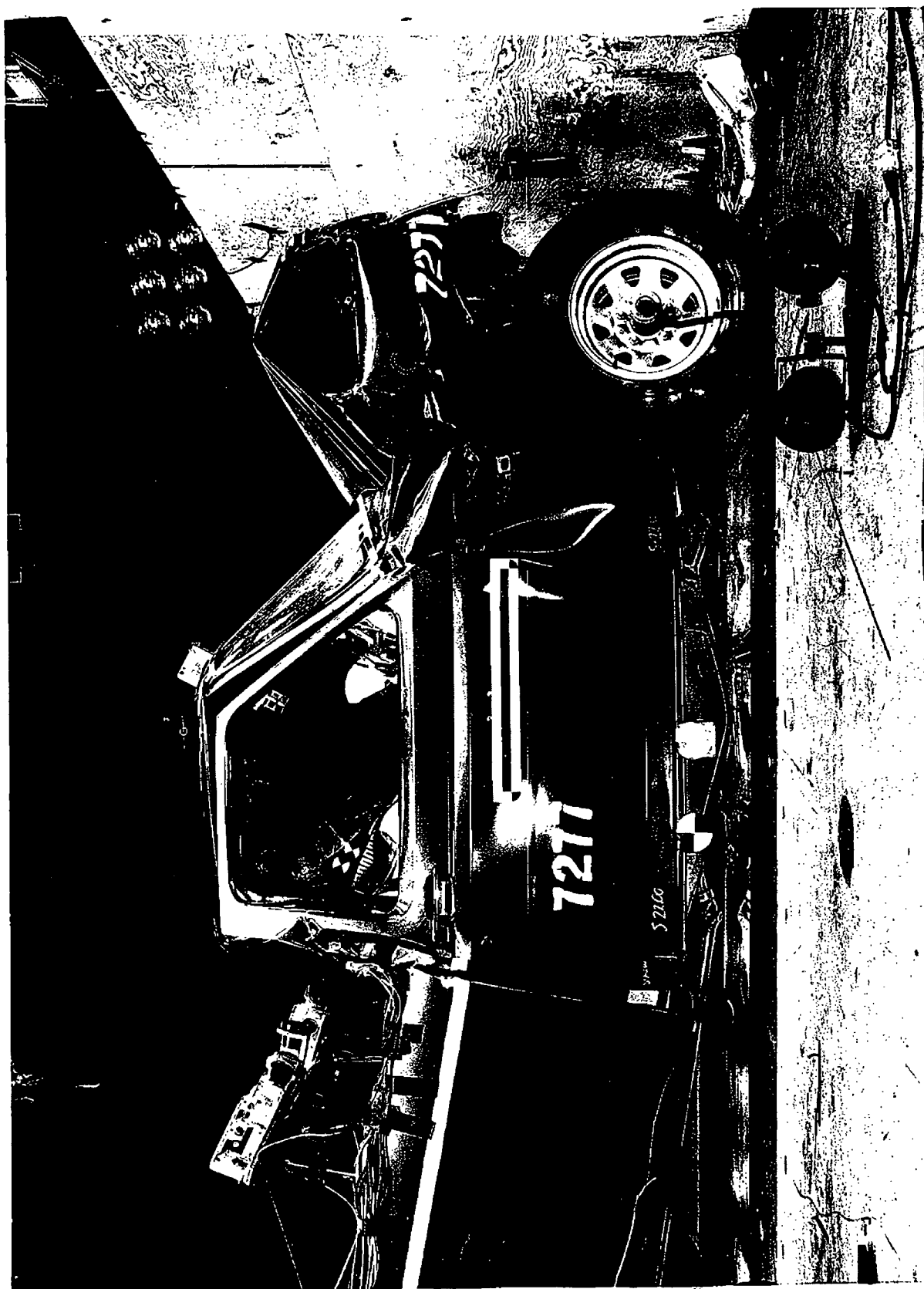
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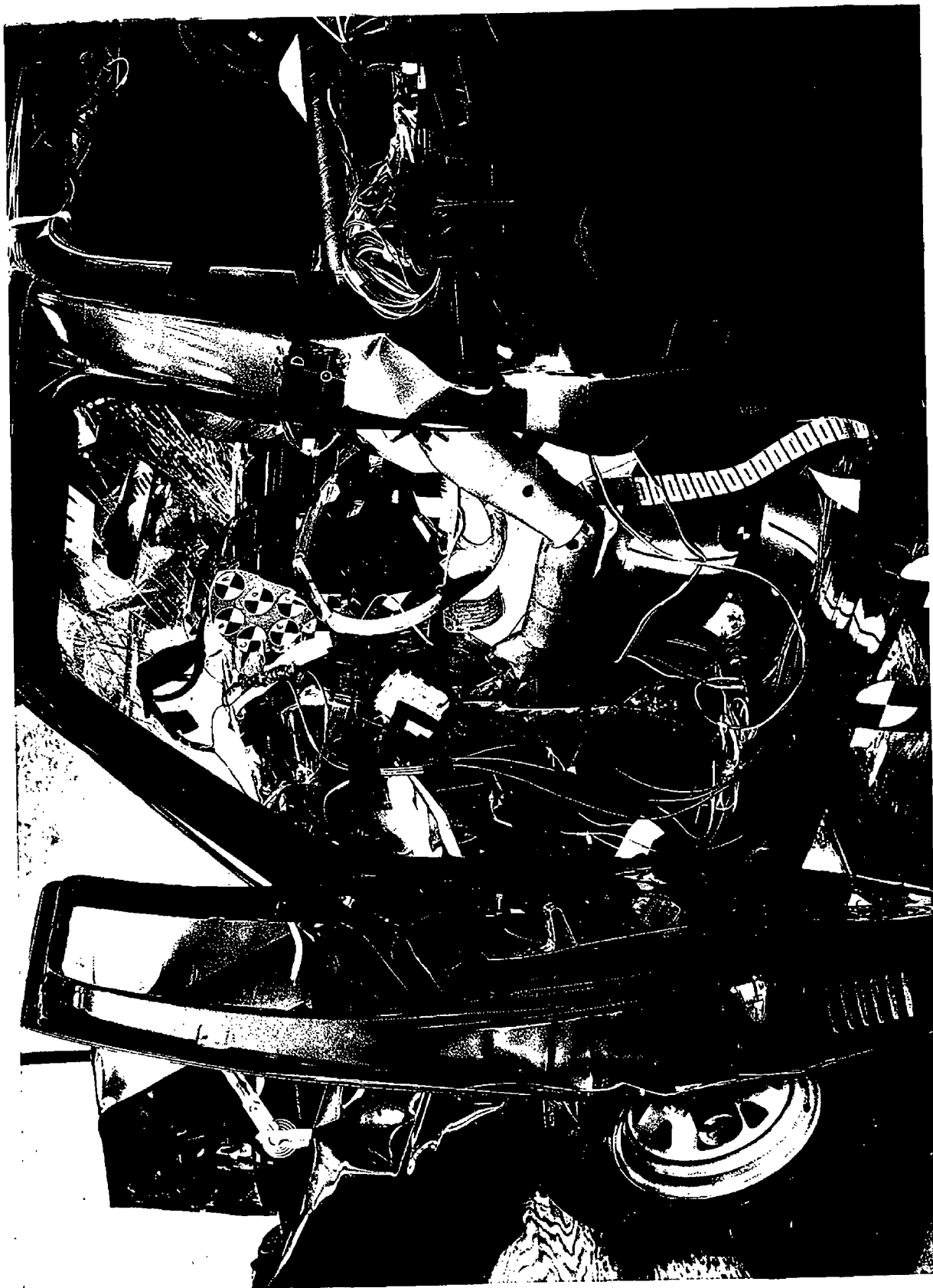
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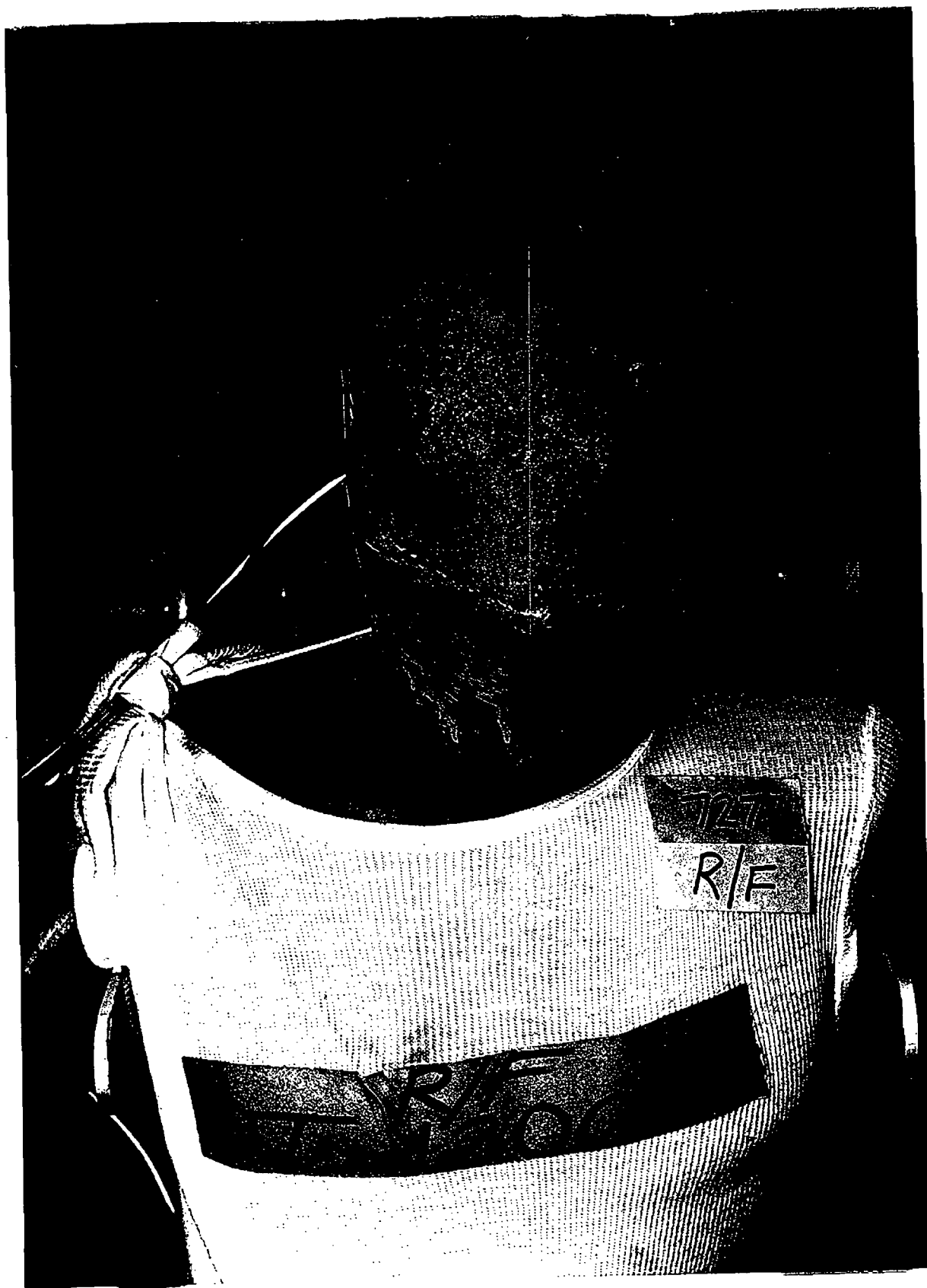


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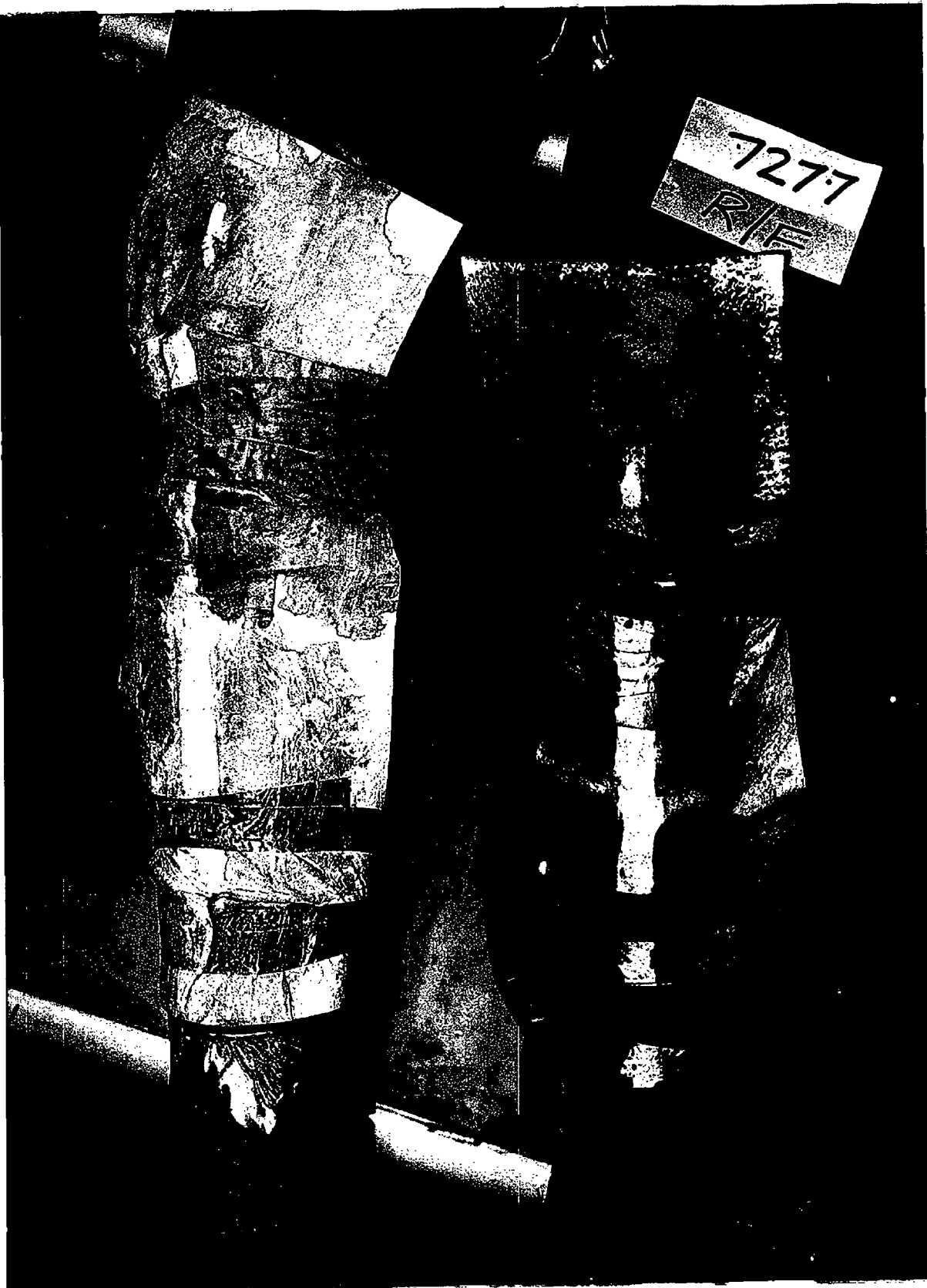
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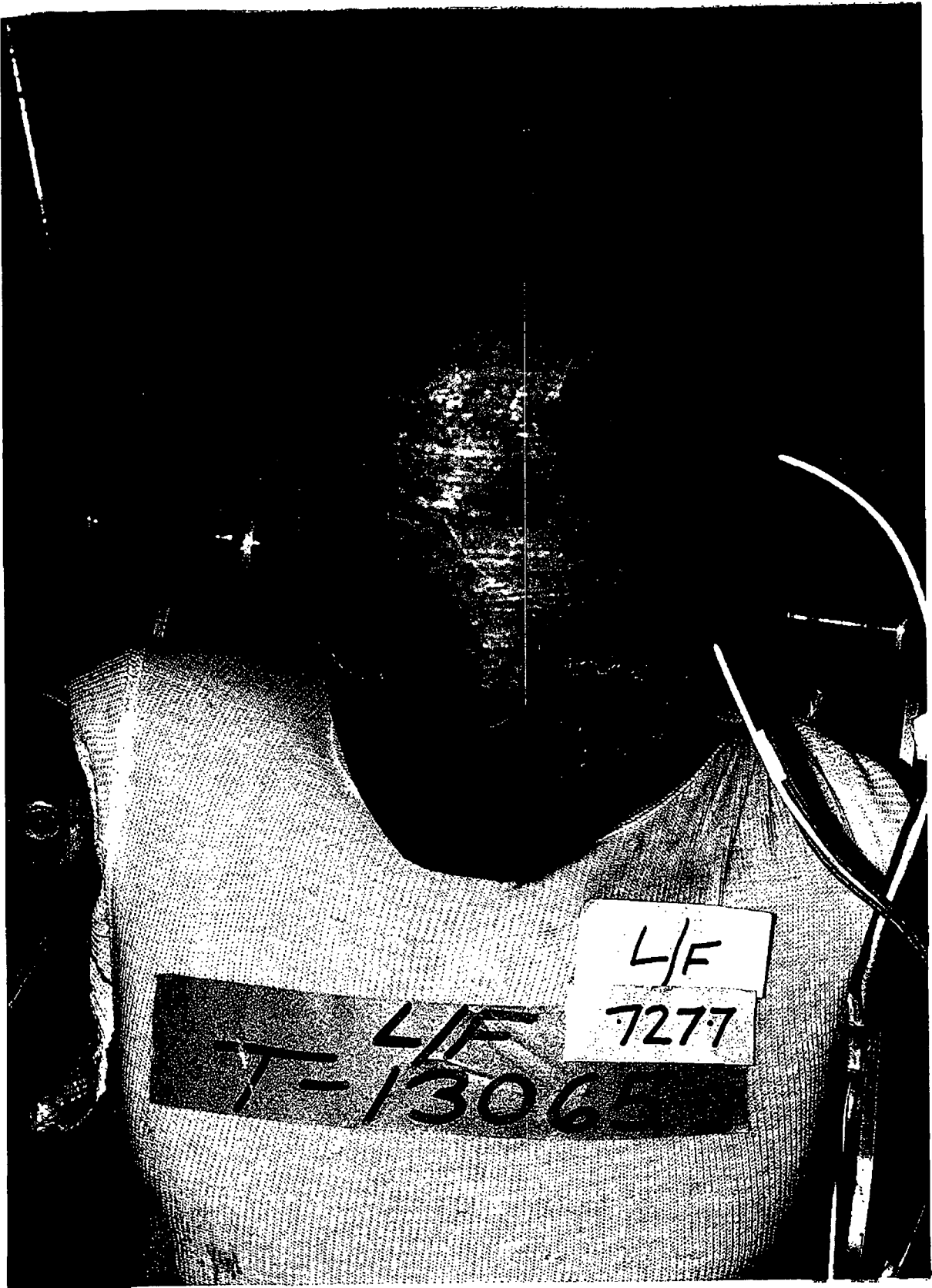
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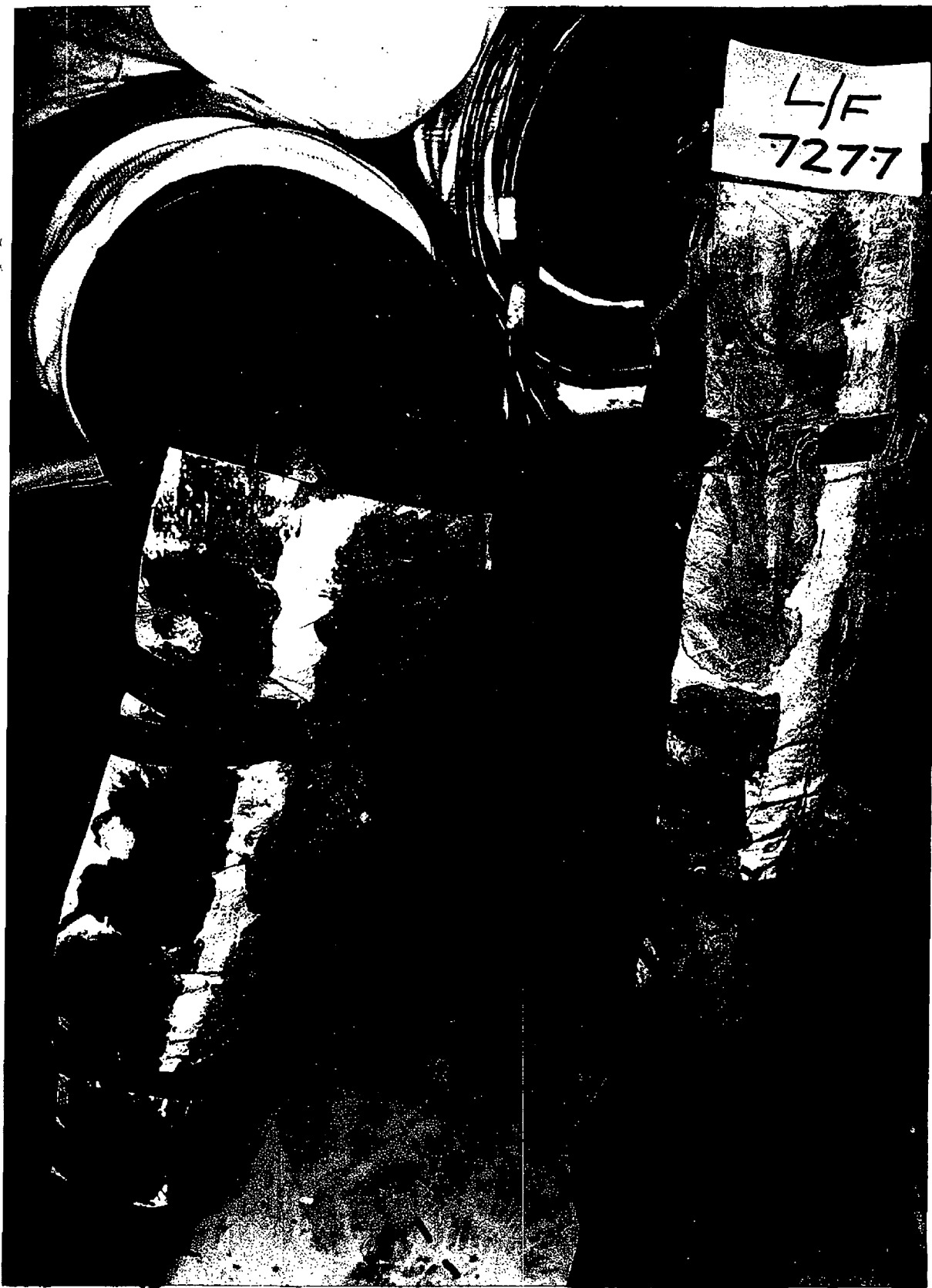
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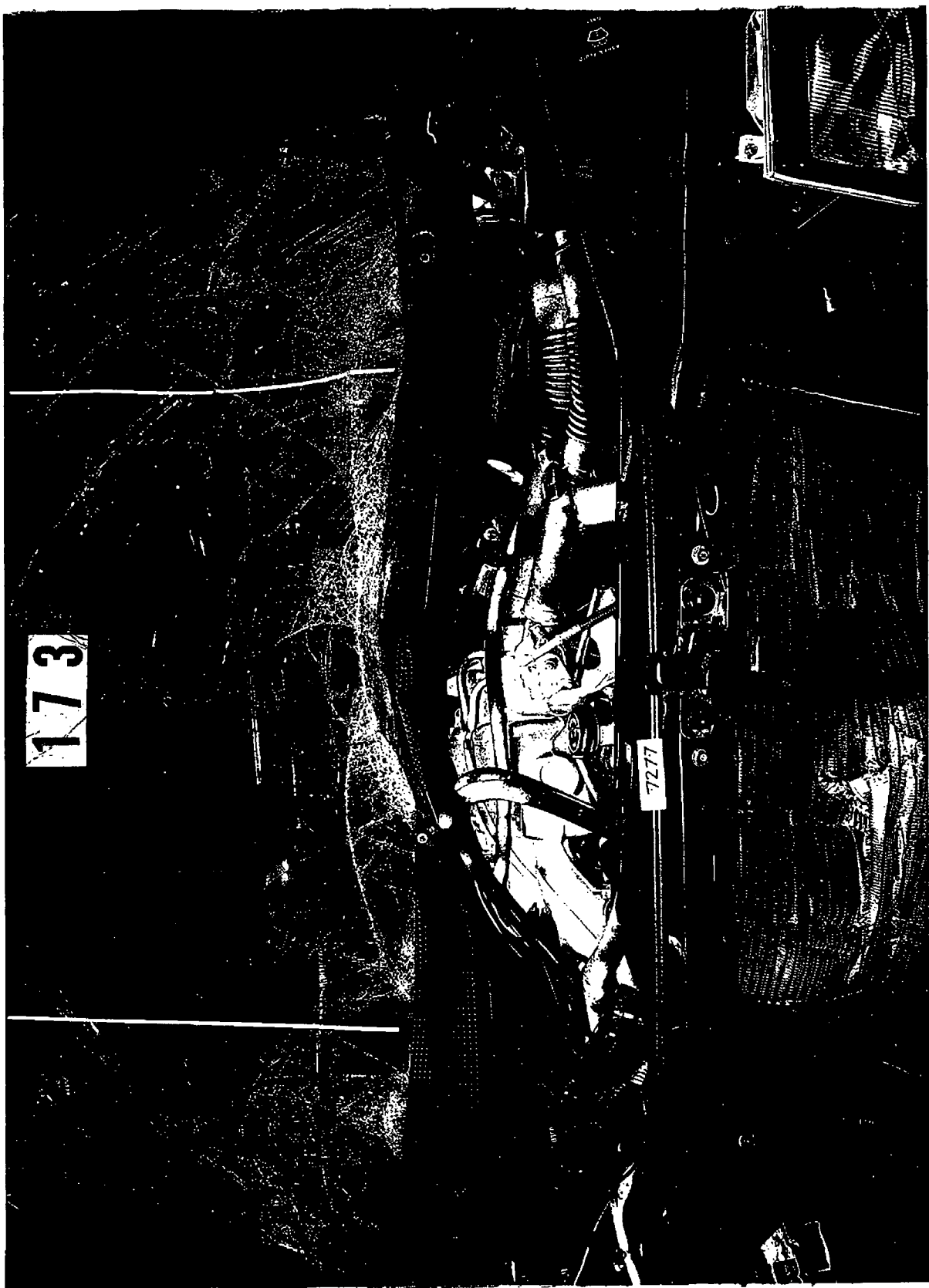


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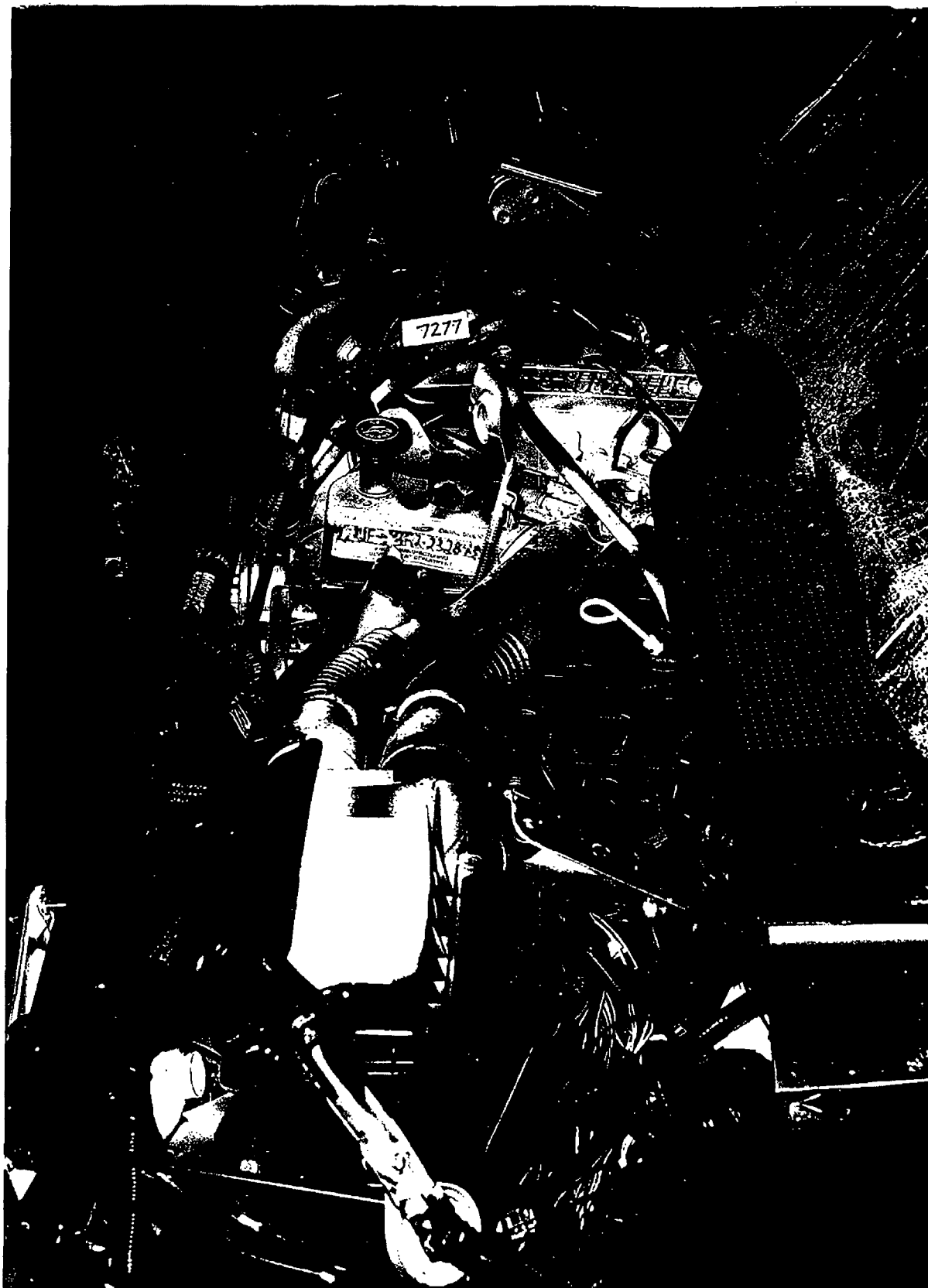
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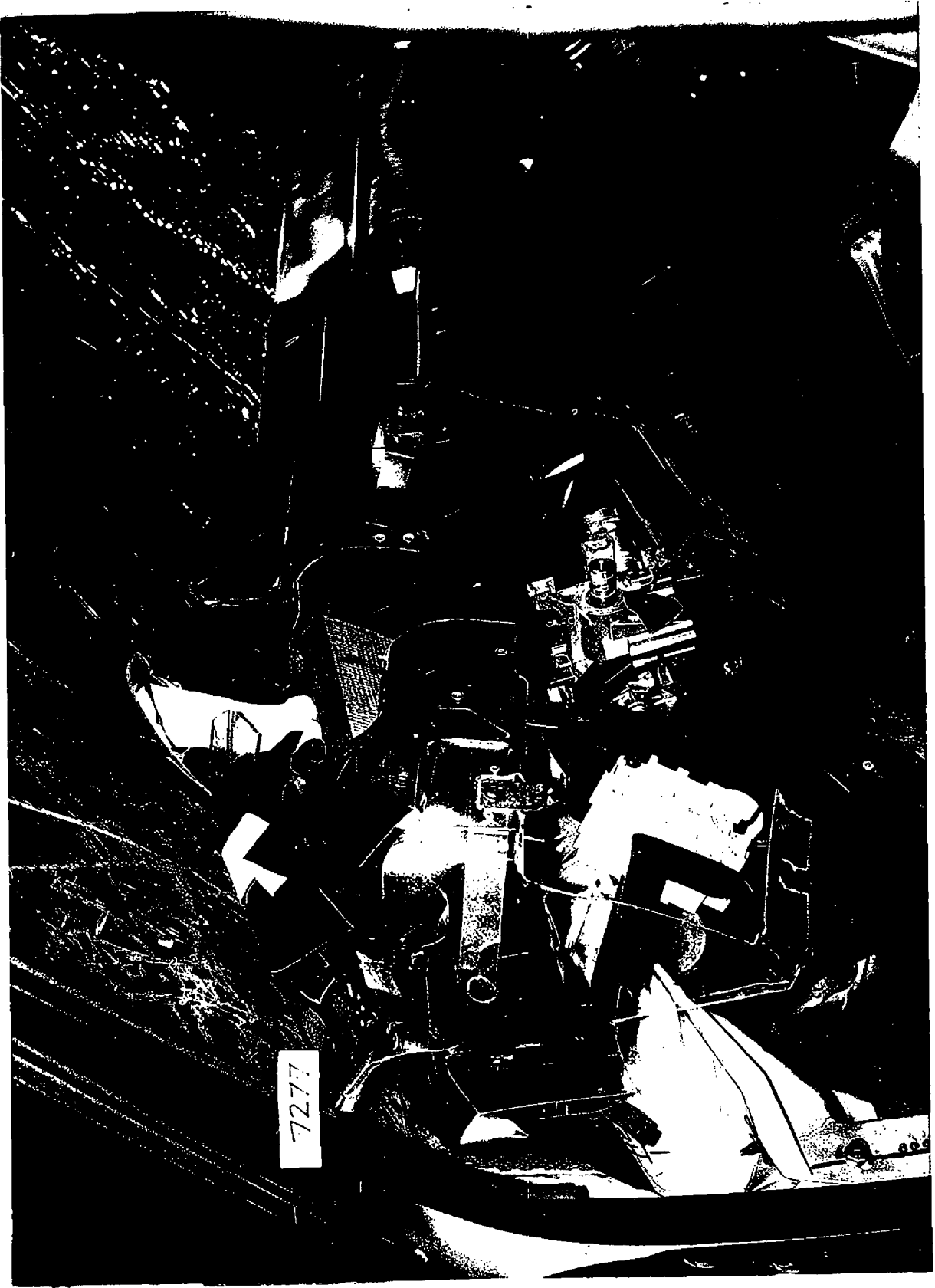
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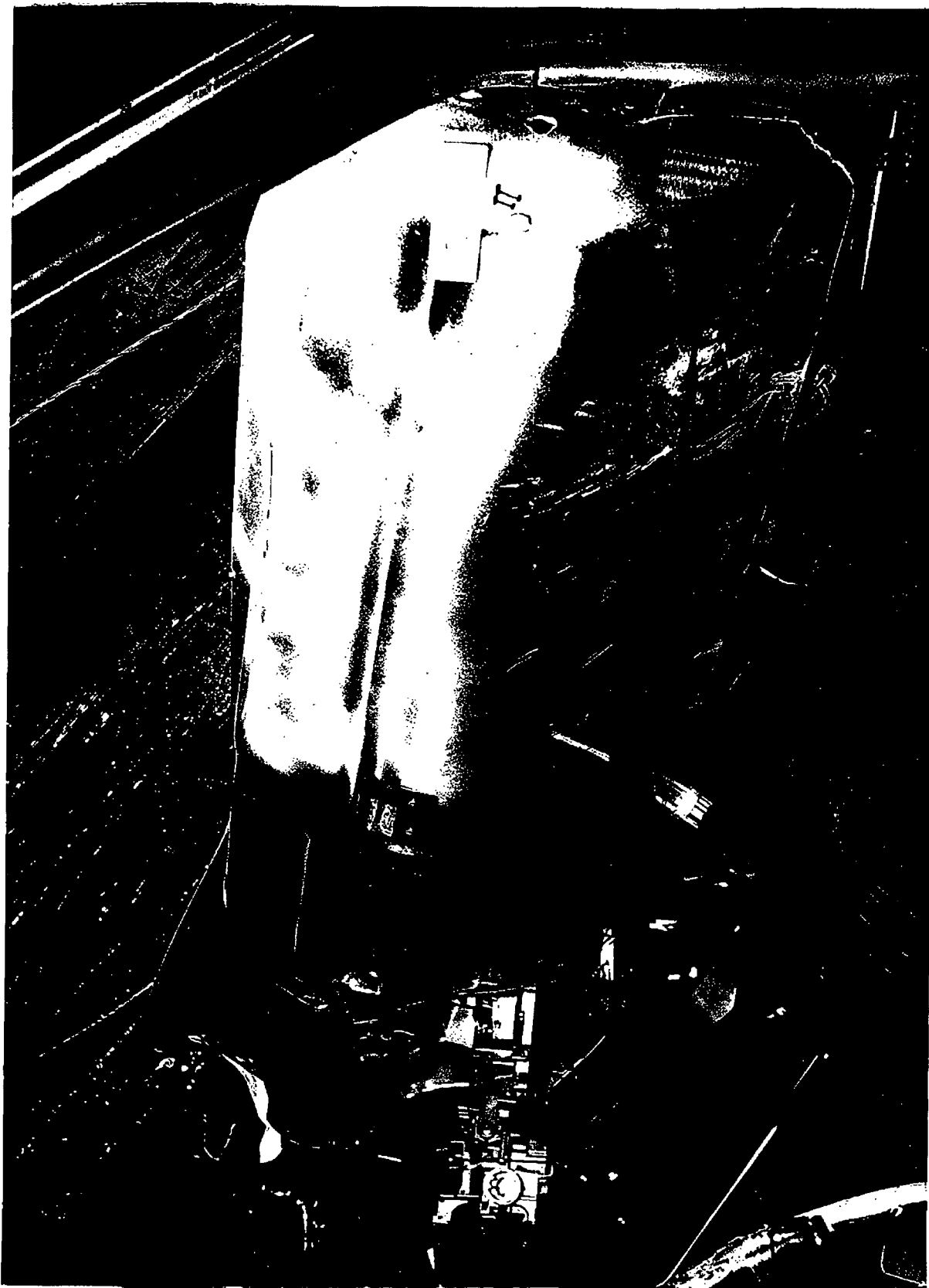
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CIN 54017-3759



CRTS 0007277

PRODUCED BY FORD
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54017-8058



CRTS 0007277

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CN 54017-3759



CRTS 0007277

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54017-3760



CRTS 0007277

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54017-3761



CRTS 0007277

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CN 54017-3762



CRTS 0007277

PRODUCED BY FORD
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CN 54017-3763



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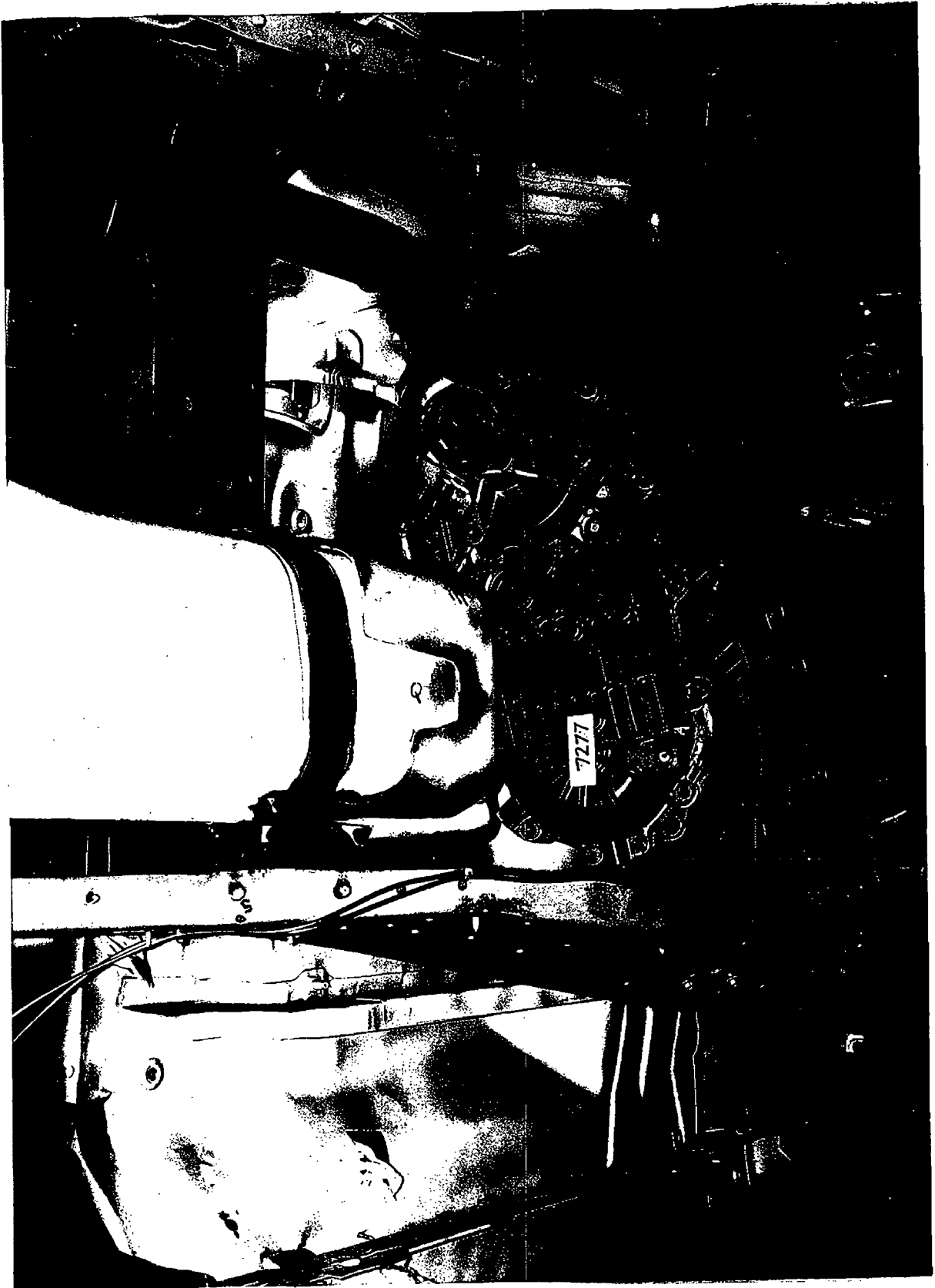
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CRTS 0007277

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CRTS 0007277

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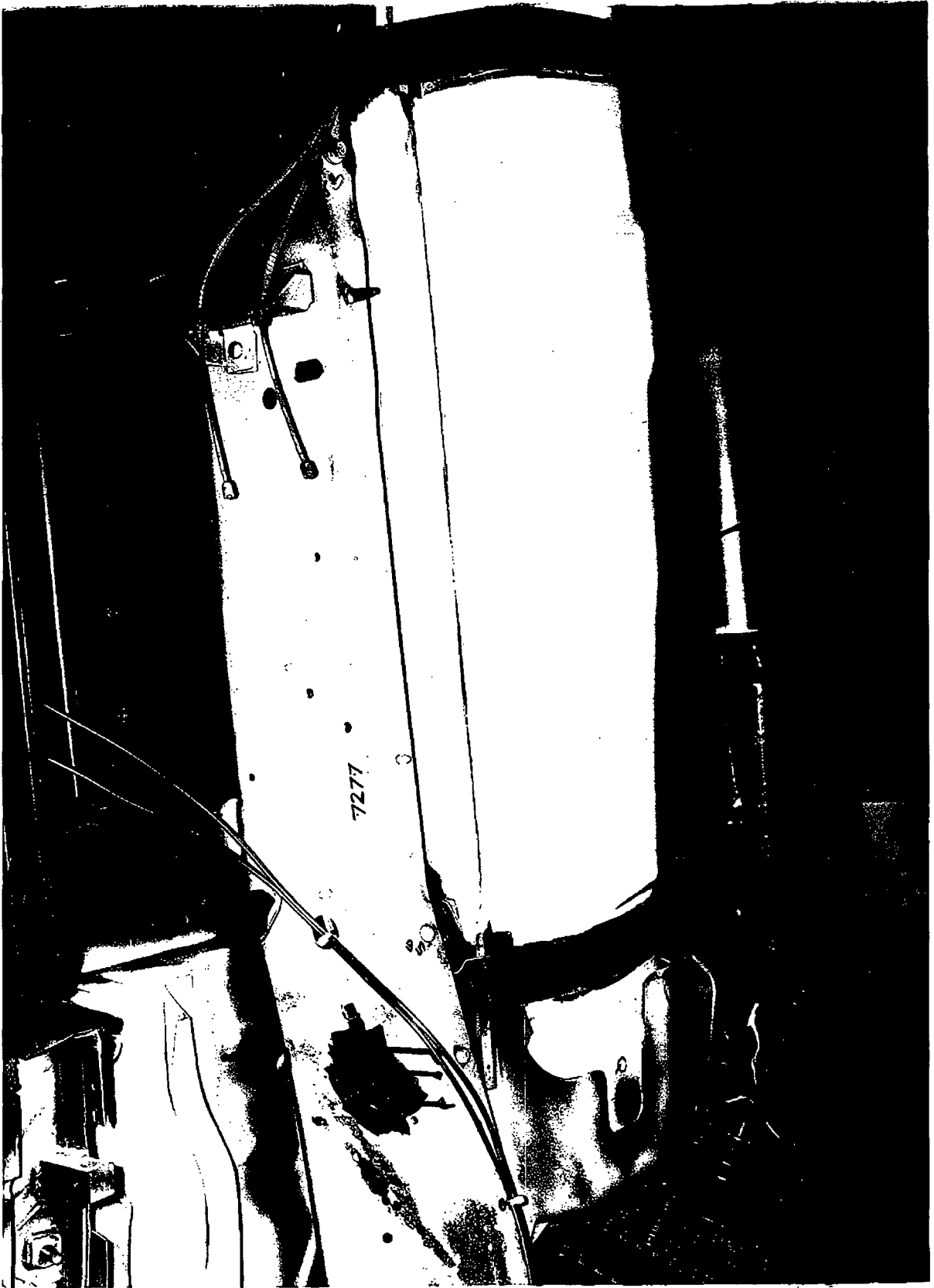
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CN 54017-3762



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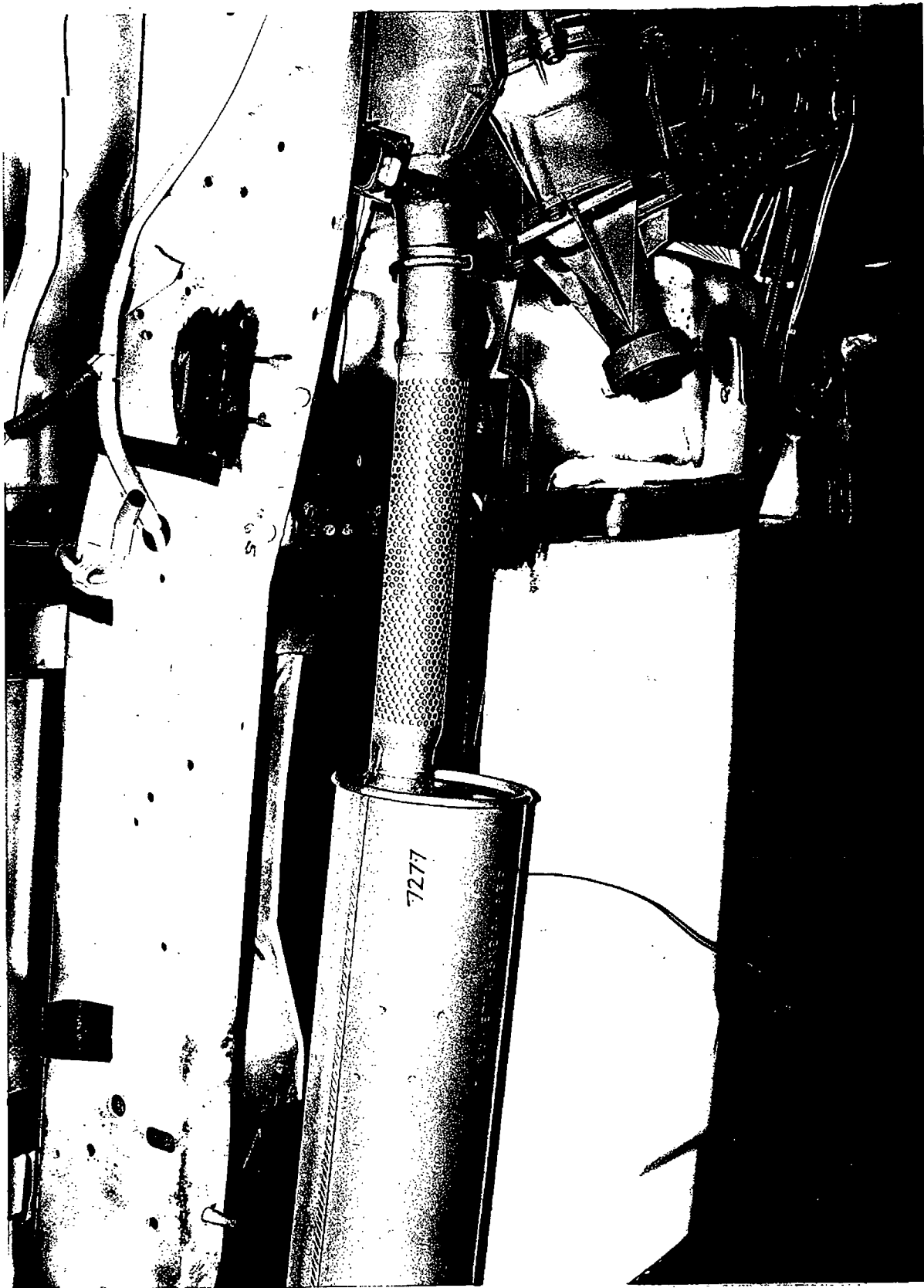
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CRTS 0007277

PRODUCED BY FORD
1471

CN 54017-3769



CRTS 0007277

PRODUCED BY FORD
1472



Test Authorization

TEST ORDER NUMBER T-13065

TO: Mr. J. Vella

cc: O. M. Jacques

REQUEST DATE

08/16/89

REQUEST COMPLETION DATE

A.S.A.P.

REQUEST NUMBER

PROBLEM NUMBER

REQUESTING ACTIVITY

LIGHT TRUCK SAFETY PROGRAMS

TITLE OF TEST

OCCUPANT INJURY CRITERIA 35 MPH FRT IMPACT @ 33% OPTION WEIGHT

PARTS DUE DATE

AVAILABLE

TYPE OF TEST

☒ VEHICLE ☐ BENCH
☐ LABORATORY ☐ OTHER

VEHICLE NUMBER OR OTHER IDENTIFICATION

1992 F-150 4X4 R/C 3378mm WB.
FBNP01 308T173 R2401

VEHICLE MODEL & YEAR

1992 F-150 4X4 LWB

PRODUCT OR ENG. LETTER

ENGINE NO. DISP. CARB.

4.9L EFI

TRANSMISSION

M5R2

AXLE RATIO

N/A

TEST CONDUCTED TO CERTIFY
CONTROL ITEM COMPLIANCE
WITH GOVERNMENT REGULA-
TIONS?☐ YES ☒ NO

DISPOSITION OF PARTS

SAVE 1 YEAR FROM MONTH OF CRASH

PROCUREMENT REQUIRED?

☐ YES ☒ NO
IF YES, GIVE ROUTING CODE:

TYPE OF FUEL

STODDARD

CONVERTER

IGNITION TIMING

CRANKCASE OIL AND CAPACITY

-

TIRE SIZE AND PLY RATING

P235/75R15

REPORT CATEGORIES

☒ ENGINEERING
☒ DATA
☒ RAW DATA

MAIL REPORT TO:

ROOM 244

VEHICLE TEST WEIGHT

FRONT 2681 REAR 2294 TOTAL 4975

TIRE PRESSURE

FRONT 35 REAR 35

BLDG. P & A Bldg.

1. OBJECT OF TEST 2. TEST PROCEDURE 3. ITEMS TO BE TESTED (NAME, PART NOS., QUANTITY)

1. Evaluate the crash performance of a F-150 4X4 with respect to:

- Occupant injury criteria requirements (reference FMVSS 208)
- Steering column intrusion (reference FMVSS 204)
- Windshield retention (reference FMVSS 212)
- Fuel System Integrity (reference FMVSS 301) - No post Crash Static RollOver. Pressure Check Only
- Door Openability

2. 35 MPH Frontal impact per procedure ST-14.

3. 1992 F-150 4X4 (Development Mechanical Prototype)

4.9L EFI engine
M5R2 Transmission
3378mm WheelBase
6250 lb. GVWR
33% option weight condition
50th percentile HYBRID II driver & passenger
19.0 Gal MidShip Fuel Tank
18.2 Gal Aft Axle Fuel Tank

DISPOSE of Copies
(Black Stamped) by:RETAIN Record Copy
(Red Stamped) Thru:

Schedule Number:

2009

2-7-12

REQUESTING SECT. NO.

K7914

WORK ORDER/WORK TASK

T9L13

ISSUED/REQUESTED BY

D. L. Patterson

PHONE

29765

APPROVALS

R. W. H.

TEST TYPE

RISK

SIGN-OFF DATE

REQUESTOR DO NOT WRITE BELOW THIS LINE

WORK STANDARDS NUMBER

00.00-1R-001

TITLE

MANDATORY

TEST ORDER NO. T-13065
CATEGORY 1
RESP. SECTION 2620
EST. COMP. DATE 12/15/89

OPTIONAL

PED L
TEST ENGR'S. INIT. LJS
UNIT CODE THP
TEST ORDER DATE 9/5/89
USER CODE
PROD. CODE

PERFORMING SECTION HOURS MATERIAL COST \$ \$ PARTS DUE DATE EST. START DATE EST. COMP. DATE STATUS %COMPLETE

TOTAL

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I. Dimensional Analysis

- A. Standard frame and body points
- B. Overall static crush
- C. Seat back angle
- D. Seat drop, verify H-point location or design drawing within $\pm 1/2$ inch. (seat to be in design mid-point).
- E. Floorpan deformation longitudinally and laterally through the seat track mountingbolt holes.
- F. Position of master control notch relative to other control points.
- G. Position seat (in design mid-position) WRT to vehicle.
- H. Reference front seat bolt hole wrt fiducial mark (RH & LH side).
- I. Restraint system mounting bolts @ Retractor and D-Ring sling (x,y,z directions).

FOR SCALES AND FILTERING. PLEASE REFER TO ATTACHED SET UP SHEETS (ATTACHED)

II. Acceleration Measurements (DO NOT WELD to frame, OK to weld to body).

- ✓A. L&R frame rail @ "B-post"
- ✓B. Engine and trans accel (lower engine mounting)
- ✓C. Engine and trans accel (upper engine mounting)
- ✓D. L&R rocker @ "B-post"
- ✓E. Steering column triaxial load cell (please prove plot of resultant load)
- ✓F. LVDT to monitor steering col. stroking.

III. Dummy Instrumentation (HyBrid III Driver and HyBrid II Passenger)

- ✓✓A. Head accels (Triax & Resultant), HIC (floating method, and 36ms cutoff).
- ✓✓B. Chest accels (Triax & Resultant, including 3ms cumulative duration routine)
- ✓✓C. Left and right femur loads *✓ - 1/2 inch*
- ✓✓D. Left and right tibia loads (Driver)
- ✓✓E. String pots behind seat to dummy lower torso (Driver/Passenger)
- ✓✓F. String pots to dummy knees (Driver/Passenger)

IV. Contact Switches

- A. BARRIER T-0
- ✓B. TOP, BOTTOM and HUB of steering wheel.
- ✓C. L&R KNEE contact (Driver & Passenger)

V. Restraint System Loads (Driver & Passenger)

- ✓A. Lap Belt @ Outboard Anchor. Locate between anchor and seat as close as possible to anchor.
- ✓B. Torso Belt @ Retractor
- C. Torso Belt between D-Ring and Shoulder. Locate transducer no more than 1" from "D" ring and support with masking tape

VI. Data Analysis

REFER TO ATTACHED PLOTS REQUIRED SHEET

*1/2 - 1/2 - FOUR SWITCHES UNDER FRONT
SEAT PER REQUEST OF DP*

CRTS 0007277

VII. Film Analysis - SEE ATTACHED FILM ANALYSIS SHEET

- A. "Dummy head and shoulder kinematics" - displacements and velocity. Targets must be visible at T-0
- B. Dynamic collapse of left and right side corrected for rotation and pitch
- C. Steering Column Displacement - SCALE METHOD
- D. Belt payout at "D" ring (Driver & Passenger)

VIII. Typical Still Photographs

IX. High Speed Camera Coverage

A. On Board

- Criss Cross viewing dummy kinematics (2)
- Criss Cross viewing belt payout at "D"-rings (wide angle) (2)
- Center viewing instrument panel (wide angle) (1)
- Behind seat viewing Right side retractor (1)
- -Windshield header pointing downward viewing inboard buckle ends (2)

B. Pit Coverage

- Criss Cross on front frame horns to #1 X/M
- Criss Cross on frame rails #1 crossmember to trans X/M
- Criss Cross on frame rails aft of trans. crossmember

C. Ground Based

- 2 side view - close in on ground angled upward (front frame horn collapse)
- 1 overhead - overall vehicle
- 2 side view - overall vehicle RHS and LHS
- Coverage for steering column dynamics
- Forward side view - dummy kinematics -RHS and LHS
- Over the shoulder using high tripods Left & Right Side.
- Thru the windshield from cameras mounted on top of barrier to view occupant containment
- Provide camera coverage for steering column resection method as backup only

ALL FILM SEQUENCES TO BE IN NORMAL REFERENCE WRT GROUND

X. Special Prep Requirements

1. Use standard dummy positioning targets as requested by B&CE
Provide requestor with copy of the seating position measurements
2. Do not tape dummy hands to steering wheel
3. Tape windshield centerline of vehicle and seating position
4. Special targeting of steering column, and dummy in support of film analysis requirements
5. Stripe belts in 1 inch increments (including lap belt at retractor)
6. Determined design mid-position of seat travel and mark track and seat.
7. Paint frame rails (YELLOW), bumper, radiator, radius arms, engine crossmember and engine contrasting colors.
8. Remove the 3 front plexiglas panels to aid in underbody film coverage and analysis.

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FRAME RAILS MUST BE PAINTED YELLOW

Please provide five (5) copies of high speed film and still photographs. Provide six (6) copies of data. Jessie Eiland, Restraints Engineering receives one set of data including film and photos. All others to D.L. Patterson

THIS INFORMATION IS REQUIRED ON AN ASAP BASIS

Write the test data requested below to Multics ID
>udd>BE-IDAADV>crash_data

**C - - - - 1 Long. accel at "B" pillar (average left & right 60 Hz filter)
C - - - - 2 1st Integration of above curve
C - - - - 3 2nd Integration of above curve
C - - - - 4 Component & Resultant Chest accels. (Driver & Pass. 600 Hz filter)
C - - - - 5 Component & Resultant Head accels. (Driver & Pass. 1000 Hz filter)
C - - - - 5 All Belt Loads (Driver & Passenger 1000 Hz filter)
C - - - - 6 Head Trajectory (Driver & Passenger film analysis)

** To be filled in by the crash number

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TEST INSTRUMENTATION SHEET

DATE _____
VEHICLE _____ TEST ORDER NO. _____
TECHNICIAN _____ ENGINEER _____

NO.	ORIENTATION TRANSDUCER LOCATION	FULL SCALE VALUES			TAPE FREQ	
		Long	Vert	Lat	Rec.	Play back
1	L Rocker @ B-Post	100 g			10K	60 & 180
1	R Rocker @ B-Post	100 g			10K	60 & 180
2	Top and Bottom of Engine	300 g			10K	60 & 180
1	L Frame Rail @ B-Post	300 g			10K	60 & 180
1	R Frame Rail @ B-Post	300 g			10K	60 & 180
2	Long L&R "B" pillar	300 g			10K	60 & 180
2	LT and RT Torso Belt @ Retractor	3000 lbs			10K	60
2	LT and RT Torso Belt @ D-Ring	3000 lbs			10K	60
2	LT and RT Lap Belt @ Outboard Anchor	3000 lbs			10K	60
6	LT & RT Dummy Head	250 g	250 g	100 g	10K	1000
6	LT & RT Dummy Chest	150 g	150 g	150 g	10K	180
4	LT & RT Dummy L & R Femur Loads (F)		3000 lbs		10K	600
4	LT Dummy L & R Tibia Loads (F)		3000 lbs		10K	600
1	LVDI on Steering Column				10K	60
3	Triaxial Load Cell @ Top of Str Col.				10K	600
<u>CONTACT SWITCHES</u>						
4	LT & RT Dummy Knees				10K	1000
3	Top , Bottom and Hub of steering wheel				10K	1000
<u>STRING POTS</u>						
4	LT & RT Dummy Knees				10K	60
2	LT & RT Dummy Lower Torso				10K	60

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JOB INSTRUCTION SHEET
Data Analysis Unit

Test Number _____ Date _____

Plots Required X T.O. Number _____

Engineer _____ Job Assigned To: _____

Data Channels	Position	Filter Req'd	Duration	1st Integrat.	2nd Integrat.	Comments	
HEAD	LF X	RF X	Class 1000	Long <u>X</u> Vert <u>X</u> Start <u>0</u> Lat <u>X</u> End <u>240</u> Res <u>X</u>	Long <u>-</u> Vert <u>-</u> Lat <u>-</u> Res <u>X</u>	Long <u>-</u> Vert <u>-</u> Lat <u>-</u> Res <u>X</u>	Calculate HIC both and without 36ms cut-off.
CHEST	LF X	RF X	Class 180	Long <u>X</u> Vert <u>X</u> Start <u>0</u> Lat <u>X</u> End <u>240</u> Res <u>X</u>	Res <u>X</u>	Res <u>X</u>	Calculate CUM DUR with 3ms cut-off.
FEMUR	LF X	RF X	Class 600	Ax'1 <u>X</u> Start <u>0</u>			
TIBIA	X		600	Ax'1 <u>X</u> End <u>240</u>			
BELTS	LF	RF	Class				
TORSO RET	X	X	60	Ax'1 <u>X</u> Start <u>0</u>			
LAP O/B	X	X	60	Ax'1 <u>X</u> End <u>240</u>			
"D" RING	X	X	60	Ax'1 <u>X</u>			
ROCKERS	LF & RF X	X	Class 60 & 180	Long <u>X</u> Start <u>0</u>	Long <u>X</u>	Long <u>X</u>	
FRAME	X	X	60 & 180	Long <u>X</u> End <u>240</u>	Long <u>X</u>	Long <u>X</u>	
ENGINE	X	X	60 & 180	Long <u>X</u>	Long <u>X</u>	Long <u>X</u>	
SIGNATURE LEFT			Class 35 & 60	Long <u>X</u> Start <u>0</u>	Long <u>X</u>	Long <u>X</u>	
SIGNATURE RIGHT			35 & 60	Long <u>X</u> End <u>240</u>	Long <u>X</u>	Long <u>X</u>	
SIGNATURE AVERAGE			35 & 60	Long <u>X</u>	Long <u>X</u>	Long <u>X</u>	
Contact Switches			Class 1000				
LVDT on Stg. Col.			Class 60				
Pelvic String Pots			60				
Triaxial Load Cell			Class 600	F _x <u>X</u> F _y <u>X</u> F _z <u>X</u> Res <u>X</u>			

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FILM ANALYSIS REQUEST

Crash No.	_____	Test Type	_____
Test Order No.	_____	Development	<u>X</u>
Test Engineer	_____	Vehicle	_____
Test Date	_____		

ANALYSIS REQUIREMENT

	TIME MS/IN	LONG DISP IN/IN	VERT DISP IN/IN	LAT DISP IN/IN
<u>Steering Column</u> WRT Vehicle Reference				
Scale Method Phantom Pt. <u>X</u> Direct _	20	1	1	1
Resect Method Phantom Pt. <u>X</u> Direct _				

NOTE: Only do Resection if scale method is Unacceptable

Vehicle WRT Ground

Rocker At B-Post Left <u>X</u> Right <u>X</u>	20	4	4
---	----	---	---

<u>LF/RF Belt Pay-out @ "D" Ring vs time</u>	20	.5 in.
--	----	--------

Dummy Components WRT Vehicle Reference

	TIME MS/IN	LONG DISP IN/IN	VERT DISP IN/IN
L/Front <u>X</u> R/Front <u>X</u>			
Head Vert vs Long		2	2
Head	20	4	2
Shoulder (if viewable)	20	4	2

	Time	LONG VEL	VERT VEL	VELOCITY
Other: Head Velocity	20	10 ft/sec	10 ft/sec	Resultant
Shoulder Velocity	20	10 ft/sec	10 ft/sec	Resultant
Steering Column Velocity	20	10 ft/sec	10 ft/sec	Resultant

	Time	LONG ACC	VERT ACC	ACCELERATION
Head Acceleration	20	Auto	Auto	Resultant

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PLOTS REQUIRED

Provide single plots, using the vertical scales (per 2cm) below, for a duration of 240 ms.

	Long	Vert	Lat	Reslt	Reslt 1st Int	Reslt 2nd Int
1) LF/RF Head Acceleration	20 g	20 g	10 g	20 g	10 fps	2 in
2) LF/RF Chest Acceleration	20 g	20 g	10 g	20 g	10 fps	2 in
3) Lt/Rt Rocker	10 g					
4) Frame Accels	10 g					
5) Steering Column LVDT	.4 in					
Accel 1st Int 2nd Int Ave only Ave only						
6) Engine Longitudinal	50 g					
7) Rocker (Lt, Rt & Avg)	10 g	10 fps	10 in			
8) Signature (Lt, Rt & Avg)	10 g	10 fps	5 in			
Force						
9) LF/RF Dummy - (Rt/Lt) Femur	300 lbs.					
10) LF Dummy - (Rt/Lt) Tibia	300 lbs.					
11) LF/RF Retract. D-Ring	300 lbs.					
12) LF/RF Torso Belt Loads	300 lbs.					
13) LF/RF Lap Belt Loads	300 lbs.					
Displacement						
14) Steering Column stroke		2 in.				
15) LF/RF Pelvic String Pots		2 in.				
16) LF/RF Knee (Lt/Rt) String Pots		2 in.				
<u>Crossplots</u>						
15) Average Crash Signature (positive y-axis) vs the 2nd integration of the Average Crash Signature (pos. x-axis)		10 g/inch "Y" axis 4 inches/inch "X" axis				

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Dummy & Restraint Requirements

Dummy Type

	<u>Driver</u>	<u>Passenger</u>
Percentile Size:	50th	50th
Type:	HyBrid II	HyBrid II

Preparation

1. Put 1" stripes on the belts from the shoulder to the location to be viewed by the cameras. Do not use solvent based paint.
2. Measure belt on spool after positioning belt on dummy.
3. Paint chamois on dummy's head with poster paints. Coverage to be complete on both left and right side of face.
 - .. Use one light color above the nose
 - .. Use contrasting light color below the nose
 - .. Reverse the color scheme on the opposite side dummy
4. Paint chamois on dummy's knees using four light colored poster paints. Use different colors than those used on the head.
 - .. Use one color above the knee
 - .. Use a contrasting color below the knee bottom
 - .. On opposite knee repeat the above using two remaining colors
5. Place two (2) targets on each dummy's head so that rotation and translation WRT the center of gravity can be measured. Targets must be visible at T-0.

Positioning

Position dummies per ST 25. Record dimensions and provide requester with positioning information.

Please provide copies of dummy positioning sheets as part of data pack.

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AEROSTAR TA

DUMMY MEASUREMENTS

PLEASE FILL OUT THIS SHEET COMPLETELY

19-3 (A23153)

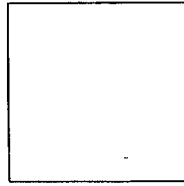
Sheet 14 of 14

T-13065
C-7277

	Standard	Driver Initial	Final	Standard	Passenger Initial	Final
Roof rail target WRT						
Fiducial Mark						
Long						
Vert						
LAT						
Rocker Dummy Target WRT						
Fiducial Mark						
Long						
Vert						
Lat						
Head WRT						
Roof Rail Target						
Long	14.3			13.8		
Vert	9.6			9.8		
Lat	8.3			8.0		
Shoulder WRT						
Roof Rail Target						
Long	15.7			13.1		
Vert	18.1			18.5		
Lat	3.3			2.0		
H-Point WRT						
Rocker Dummy Target						
Long	9.9			9.7		
Vert	18.7			19.5		
Lat	11.6			11.7		
Outboard Knee Bolt						
Long	6.0			6.2		
Vert	21.2			21.8		
Lat	11.9			12.2		
Leg to Instrument Panel						
Left	4.7			5.6		
Right	5.5			5.7		
Rocker Targets to Ground						
Front	16.7			16.9		
Rear	16.7			17.0		
Nose to:						
Steering Wheel	16.0			25.2		
Instrument Panel						
Steering Wheel to:						
Torso	6.9					
Top of Legs	2.5					
Knee bolts (outside to outside)	14.3			12.0		
DELVIC	19°			20°		
BELT	25"			23.5		

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Teknacon

ANDREW N. GILBERG

Education:	Rensselaer Polytechnic Institute Troy, NY, BS in Engineering Science University of Michigan, Ann Arbor MS in Mechanical Engineering	1970 1971
Employment:	Highway Safety Research Institute Ann Arbor, Research Assistant Ford Motor Company Research Engineer C Competition Press and Autoweek Magazine, Engineering Editor Ford Motor Company Research Engineer A Versitech Corporation Senior Project Engineer Forensic Engineering, Inc. Project Manager Teknacon Corporation Owner and General Manager	1970-71 1971-72 1972-73 1973-78 1979-82 1982-86 1986-
Experience:	Automotive engineering - passenger cars, light and heavy trucks, recreational vehicles, racing cars, motorcycles Vehicle accident reconstruction Automotive and heavy equipment fire analysis Field testing of vehicles Computer simulation of vehicle dynamics Driver behavior and human factors research Safety research Product evaluation, product test and technical analysis Construction, maintenance and repair of motor vehicles	
Registration:	Professional Engineer, Georgia #12978	1981
Memberships:	Tau Beta Pi, engineering honor society Society of Automotive Engineers (SAE)	1969 1979
Honors:	Westinghouse Science Talent Search Winner	

CURRICULUM VITAE

NAME Kimberly Ann Collins, MD

ADDRESS


Wadmalaw Island, SC 29487
Telephone: (843) 557-1935, (843) 214-0378
E-mail: kimcollinsmd@gmail.com

PERSONAL INFORMATION

BIRTHPLACE AND DATE Atlanta, Georgia - December 3, 1963

CITIZENSHIP United States

EDUCATION

1981-1985 University of Georgia
Athens, Georgia
BS, Microbiology
(Magna cum Laude, Phi Beta Kappa)

1985-1989 Medical College of Georgia
Augusta, Georgia MD

WORK EXPERIENCE

1988-1989	Gracewood State School and Hospital, Augusta, Georgia, Extern
1989 (Spring)	Medical College of Georgia, Autopsy Service
1988-1989	Research with R. Melcher, M.D.: The Relationship Between Strokes and Seizures, Medical College of Georgia
1988-1989	Research with R. Baisden, M.D.: The Effect of Fat Soluble Substrates on the Growth of Tumor Cell Cultures, Medical College of Georgia

POSTDOCTORAL TRAINING

1989-1994	Resident in Pathology (Anatomic & Clinical) North Carolina Baptist Hospital, Bowman Gray School of Medicine, Winston-Salem, North Carolina
1993-1994	National Health Laboratories Winston-Salem, North Carolina
1993-1994	Medical Examiner, State of North Carolina
1994-1995	Fellow in Forensic Pathology Medical University of South Carolina Charleston, South Carolina

EMPLOYMENT

Instructor in Pathology and Laboratory Medicine, Medical University of South Carolina, Charleston, South Carolina, 1995-1997

Assistant Professor in Pathology and Laboratory Medicine, Medical University of South Carolina, Charleston, South Carolina, 1997-1999

EMPLOYMENT (CONTINUED):

Associate Professor in Pathology and Laboratory Medicine, Medical University of South Carolina, Charleston, South Carolina, 1999-2003

Professor in Pathology and Laboratory Medicine, Medical University of South Carolina, Charleston, South Carolina, 2003-2008

Co-Director Pathology Education Division, Medical and Dental School, Medical University of South Carolina, 2000-2008

Chief Deputy Medical Examiner, Charleston County, 1995-1998

Chief Medical Examiner, Charleston County, 1998-2001

Forensic Pathology Section, Medical University of South Carolina, Director, 1998-2006

Forensic Pathology Fellowship Director, Medical University of South Carolina, 1998-2006

Autopsy Pathology Section, Medical University of South Carolina, Director, 2000-2006

Careers in Medicine, Medical University of South Carolina, Co-Director, 2006-2008

Career Development, Medical University of South Carolina, Co-Director, 2006-2008

Forensic Pathologist, Fulton County Medical Examiner's Office, Atlanta, GA, 2008-present

Emory University School of Medicine, Department of Pathology and Laboratory Medicine staff, 2008-present

GRANTS

1994-1995

Pathology/Biology Section of the American Academy of Forensic Sciences: "Identification of Sperm and Non-Sperm Male Epithelial Cells in Cervicovaginal Smears Using Novel Molecular-Cytogenetic Technique: Application in Alleged Sexual Assault Cases." Primary Investigator: Kim Collins, M.D. 1994-1995, \$1,800

1994-1995

Clifton Brooks, Jr. Medical Research Fellowship Primary Investigators: Kim A. Collins, M.D. and Wain White, M.D., \$25,000

PROFESSIONAL LICENSURE

North Carolina Medical License, #93-00066
South Carolina Medical License, #17218
Georgia Medical License, #061222

PROFESSIONAL CERTIFICATION

Anatomic Pathology Board Certification, American Board of Pathology, 1995
Clinical Pathology Board Certification, American Board of Pathology, 1995
Forensic Pathology Board Certification, American Board of Pathology, 1996

PROFESSIONAL MEMBERSHIPS

Diplomat of the American Board of Pathology, Anatomic and Clinical Pathology
Diplomat of the American Board of Pathology, Forensic Pathology
American Medical Association
College of American Pathologists
 Chair, Residents Forum, 1993-1994
 Resident Forum Executive Committee, 1991-1995
 CAP Residents Forum - American Medical Association Delegate, 1991-1993
 Liaison, Curriculum Committee of the PRODS
 North Carolina Resident Delegate, 1990-1991
 Environment, Health, and Safety Resource Committee, 1991-1993
 Resident Recruitment and Retention Committee, Vice Chair, 1992-1994
 Finance Committee, 1993-1994
 CAP Strategic Planning Committee, 1993- 1997
 Residents and Young Physicians Committee, 1993-1994
 Forensics Committee, 1993-1994
 Autopsy Committee, 1996-2009, Vice Chair 2001-2004, Chair 2004-2007
 Education Committee, 2000-2002
 Council on Public Affairs, 2000-2004
 Public and Patient Relations Committee, 2004-2005
 Public Affairs Committee, 2005-2010
 Member and Public Communications Committee, 2011
 Ad Hoc Committee on New and Emerging Technologies, 2006-2007
 Residents, Young Pathologists, and General Membership Committee, 1997-2002, Chair
 Membership Committee, 2002-2003, Chair
 College of American Pathologists Residents Forum Advisor, 1997-2003
 CAP Laboratory Accreditation Program Inspector
 State Commissioner for CAP Laboratory Accreditation Program, 1998-2004
 CAP Fellow Member Delegate to the CAP House of Delegates, South Carolina, 1997-present
 HOD Nominating Committee Chair, 2006
 CAP Foundation Board of Directors, 1999-2007
 Vice President 2005-2007
 CAP Nominating Committee, 2000 and 2008

PROFESSIONAL MEMBERSHIPS (CONTINUED):

Information Science and Technology Committee, 2001-2003
Committee on Organ and Tissue Procurement, 2001-2003
CAP Liaison to Association of Pathology Chairs Graduate Medical Education Committee, 2001-2006
CAP Liaison to Association of Pathology Chairs Autopsy Committee, 2002
North Carolina Delegate to the AMA-RPS, 1993
American Academy of Forensic Sciences
Pathology/Biology Section Program Director 2007-8
Pathology/Biology Section Secretary, 2009-10
Pathology/Biology Section Chair, 2010 - present
National Association of Medical Examiners
South Carolina Liaison, 2001 - present
Strategic Planning Committee, 2002
Subcommittee on Assistance to the NAME Membership, 2002
Education, Program, and Publications Committee, 2010-present
Forensic Fellow In-Service exam subcommittee, 2010-present
Ad hoc committee on International Relations, 2010-present
Ad hoc committee on Organ and Tissue Procurement, 2010-present
Board of Directors, 2010 - present
Southern Medical Association
American Society of Clinical Pathologists
ASCP Advisory Council, 1998-2004
United States and Canadian Academy of Pathology
Forensic Evening Seminar Director, 2005-2007
International Academy of Pathology
Forensic Seminar Director, Athens Greece, 2008
South Carolina Medical Association, Delegate, 1999-2008
South Carolina Society of Pathologists, Treasurer, 1998-1999
South Carolina Society of Pathologists, President-Elect, 1999-2001
South Carolina Society of Pathologists, President, 2001-2004
National Medical Examiner/Coroner Advisory Committee for the American Red Cross, 1999-2005. Chair 200-2003.
Musculoskeletal Transplant Foundation, Medical Examiner/Coroner Advisory Committee, 2006 - present
Life Point Organ and Tissue Procurement Advisory Board, South Carolina, 2009-present

EDITORIAL BOARDS

Archives of Pathology and Laboratory Medicine, 2003 – present
Section Editor, Autopsy Pathology, 2005-present
American Journal of Forensic Medicine and Pathology, 2004 - present
eMedicine, 2008-present, Autopsy Section Editor
Journal of Forensic Sciences, 2010-present
Journal of Forensic Science, Medicine, and Pathology, 2010 - present

EDITORIAL POSITIONS

Section Editor, Autopsy Pathology, *Archives of Pathology and Laboratory Medicine*
Section Chief Editor, Autopsy Pathology, *eMedicine*

Review manuscripts for publication:

American Society of Clinical Pathologists
Southern Medical Journal
Archives of Pathology and Laboratory Medicine
Pediatrics
American Journal of Forensic Medicine and Pathology
American Journal of Clinical Forensic Medicine
Clinical Infectious Diseases
National Institute of Justice, Forensic Science Research and Development Peer Reviewer, 2005-2006
Journal of Forensic Sciences
Journal of Forensic Science, Medicine, and Pathology

UNIVERSITY COMMITTEES

College of Medicine Faculty Advisor, 1998-1999, 2003-2008
College of Medicine Admissions Committee, 1999-2008
MUSC Blood and Tissue Utilization Committee, 2000-2006
MUSC Internal Residency Review Committee, 2001-2003
MUSC Autopsy QA Committee for Clinicopathological Correlation, 2000-2006
College of Medicine Curriculum Committee, 2000-2008
College of Medicine Progress Committee, 2000-2004
Faculty Development Committee, Department of Pathology and Laboratory Medicine, 1999-2006
Pathology and Laboratory Medicine Faculty Advisor (Zaloga:2001-3, Eason:2001-3, Van Ells:2001-2007, Rose:2006-2008, Havard:2006-2008)
JCAHO Special Function Laboratory Survey and Inspection Committee, 2002
MUSC Point of Care Testing, Medical Director, 2002-2006
Performance Improvement Committee, Chair, 2002-2006

HONORS AND AWARDS

UNDERGRADUATE

- Phi Beta Kappa
- "Jasper Dorsey Outstanding Student Award," 1983-1984, University of Georgia
- Phi Kappa Phi National Honor Society
- Student Government, University of Georgia
- Student Union, University of Georgia
- American Leadership Study Group
- United States Friendship Force, US Ambassador
- Omicron Delta Kappa Leadership Society
- Mortar Board National Honor Society
- Angel Flight - Air Force R.O.T.C., University of Georgia Southeastern Area Officer
- Outstanding Justice: Student Judiciary, University of Georgia
- Who's Who Among American College Students (1983-85)

MEDICAL SCHOOL

- MENSA Scholarship Recipient
- United Methodist Church Scholarship Recipient
- Outstanding Service, Medical College of Georgia (1988-89)

RESIDENCY/FELLOWSHIP

- Southern Medical Association, "Physician-In-Training Award" First Place, 1993-1994
- American Academy of Forensic Sciences, "Best Resident Research Paper," First Place, 1994
- "The Warren R. Lang, M.D., Resident Physician Award" of the American Society of Cytopathology, First Place, 1994
- "The New Frontiers in Cytology Award" of the American Society of Cytopathology, First Place, 1994

FACULTY

- Pathology Resident Teaching Award, Medical University of South Carolina, 1996-1997
- Faculty Excellence Award, MUSC College of Medicine, 1996-1997
- Faculty Excellence Award, MUSC, College of Medicine, Outstanding Professor runner-up, 2001
- Outstanding Basic Science Professor, MUSC School of Dentistry, 2001
- Golden Apple Award, American Medical Student Association, School of Medicine, 2001
- Health Sciences Foundation Teaching Excellence Award Nominee, 2001
- Strathmore's Who's Who, 2002-present
- President's Award, National Association of Medical Examiners, 2001
- President's Honor, College of American Pathologists, 2001

HONORS AND AWARDS (CONTINUED):

- Faculty Excellence Award, MUSC College of Medicine, 2002
- Best Lecture Award, Medical College of Georgia, 2002-2003
- ASDA Basic Science Teacher of the Year Award, Nominee, 2003-2004
- College of American Pathologists Resident Advocate Award, 2004
- Faculty Excellence Award, MUSC College of Medicine, 2004
- Health Sciences Foundation Teaching Excellence Award Nominee, 2004
- Golden Apple Award, American Medical Student Association, School of Medicine, 2004
- Faculty Excellence Award, MUSC College of Medicine, Nominee, 2004-2005
- Faculty Excellence Award, MUSC College of Medicine, 2005-2006
- ASDA Basic Science Teacher of the Year Award, 2005-2006
- Oath Ceremony Speaker, MUSC College of Medicine, 5-18-06
- Golden Apple Award, American Medical Student Association, School of Medicine, 2006
- Faculty Excellence Award, MUSC College of Medicine, 2006-2007
- Faculty Excellence Award, MUSC College of Medicine, 2007-2008
- ASDA Basic Science Teacher of the Year Award, 2007-2008
- Dove Award, LifePoint Organ and Tissue Procurement, 2008
- College of American Pathologists Distinguished Patient Care Award, 2008
- College of American Pathologists Foundation Lansky Award, 2008
- College of American Pathologists William H. Kuehn, PhD Outstanding Communicator Award, 2010

COMMUNITY SERVICE/HONORS

Charleston County School District High School Mentor Program 1995-1996.

"The Role of the Medical Examiner", Berkeley-Dorchester Underwriters Association, Summerville, South Carolina, November 16, 1995.

"Forensic Pathology", The Sertoma Club, Charleston, South Carolina, November 20, 1995.

"Violent Deaths," Roper-Berkeley Leadership Conference, Leiber Correctional Facility, Ridgeville, South Carolina, April 3, 1996.

"The Role of the Forensic Pathologist", Rotary International, Charleston, South Carolina, April 16, 1996.

"Homicide, Suicide, and Time of Death: Responsibilities of the Coroner", South Carolina Coroner's Association, Chesterfield, South Carolina, May 7, 1996.

Recognition of Appreciation from the South Carolina Coroner's Association, May 7, 1996.

"Sudden Infant Death Syndrome", CBS Health Connection Television Broadcast, Charleston, South Carolina, September 27, 1996.

"Forensic Pathology For First Responders", Emergency Responders Appreciation Day, Aiken, South Carolina, October 4, 1996.

"Weapons Awareness", South Carolina Department of Probation, Parole, and Pardon Services, Charleston, South Carolina, October 11, 1996.

Charleston County School District Mentor Program, 1996-1997, Adrie Sims.

"Forensic Pathology and Violent Death", Myrtle Beach High School and Medical University of South Carolina Public Relations, December 3, 1996.

"Violence In Our Society", C.E. Williams Middle School, Charleston, South Carolina, January 24, 1997.

"Violence, Forensic Pathology, and Our Youth", Brentwood Middle School, Charleston, South Carolina, February 26th, 1997.

"When The Crying Stops: Partners In Preventing Infant Deaths", East Cooper Hospital, Mount Pleasant, South Carolina, April 1, 1997.

"Violence In Our Society", Union Middle School, Charleston, South Carolina, April 3, 1997.

COMMUNITY SERVICE/HONORS (CONTINUED):

"Shaken Baby Syndrome", CBS Health Connection Television Broadcast, Charleston, South Carolina, April 17, 1997.

"Weapons Awareness", South Carolina Department of Probation, Parole, and Pardon Services, Charleston, South Carolina, April 18, 1997.

"Science and Your Profession", Alice Birney School, North Charleston, South Carolina, April 18, 1997.

"When The Crying Stops: Partners in Preventing Infant Deaths", Mount Pleasant Exchange Club, Mount Pleasant, South Carolina, April 23, 1997.

"Pediatric Deaths: Roper Hospital Training", Roper Hospital, Charleston, South Carolina, April 23, 1997.

"Domestic Violence", Rotary Club, Beaufort, South Carolina, May 6, 1997.

"Forensic Pathology Today", Berkeley County School System, Charleston, South Carolina, May 21, 1997.

"Weapons Awareness", South Carolina Department of Probation, Parole, and Pardon Services, Charleston, South Carolina, May 23, 1997.

"Weapons Awareness", South Carolina Department of Probation, Parole, and Pardon Services, Charleston, South Carolina, July 11, 1997.

"Overlaying", CBS Health Connection Television Broadcast, Charleston, South Carolina, July 25, 1997.

"Death by Drowning", Department of Natural Resources, James Island, South Carolina, March 16, 1998.

"Forensic Pathology Update", Rotary Club of St. Andrews, Charleston, South Carolina, May 14, 1998.

"The Role of the Medical Examiner", Tri-County Communicators-Dispatch Association, Charleston, South Carolina, May 27, 1998.

"Atherosclerotic Heart Disease", American Heart Association, American Heart Walk Recruitment Leader Kick-off, Charleston, South Carolina, August 13, 1998.

"Forensic Pathology", Academy of the Arts, Science, and Technology, Charleston, South Carolina, September 22, 1998.

COMMUNITY SERVICE/HONORS (CONTINUED):

Charleston County School District Mentor Program, 1997-1998, Tia Smalls.

"Sexually Transmitted Diseases", Radio Interview, Washington, DC for South Carolina Broadcasting, October 20, 1998.

"Forensic Pathology", Fort Dorchester High School, November 13, 1998.

National Medical Examiner/Coroner Advisory Committee for the American Red Cross, Las Vegas, Nevada, February 24-25, 1999.

"Forensic Fair - First Annual", Trident Technical College Palmer Campus, Charleston, South Carolina, March 11-12, 1999.

"Violence and Forensic Pathology", Maury Povich Show, Charleston, South Carolina, March 25, 1999.

"Breast Carcinoma", Hometown Radio Interviews, CAP Council on Public Affairs, Orlando, Florida, April 12-13, 1999.

"Forensic Pathology", Fort Dorchester School, Charleston, South Carolina, April 27, 1999.

Charleston County School District Mentor Program, 1999, Laura Hatcher.

"Forensic Pathology and the Combined Coroner-Medical Examiner System", Russian Ambassadors/Russian Leadership Program, United States Library of Congress, Charleston, South Carolina, August 5, 1999.

"Shaken Baby Syndrome...A Multidisciplinary Perspective", County Directors and Supervisors Conference for Department of Social Services, Hilton Head, South Carolina, September 2, 1999.

"Pap Smears Save Lives", Hometown Radio Interviews, CAP Council on Public Affairs, New Orleans, Louisiana, September 28, 1999.

"Forensic Pathology", Maury Povich Show, Charleston, South Carolina, October 28, 1999.

"Forensic Pathology", Phenix Center, Manning School District, Charleston, South Carolina, October 28, 1999.

"The Risk Factors of SIDS", ABC Charleston, October 29, 1999.

"SIDS... Sleeping Environment and Other Risk Factors", CBS Charleston 'Noonday', Mount Pleasant, South Carolina, December 9, 1999.

COMMUNITY SERVICE/HONORS (CONTINUED):

"End Result" Program with South Carolina Probation and Parole, 1998-1999.

"Forensic Pathology and the Autopsy", Medical Technology School Tour, Charleston, South Carolina, January 20, 2000.

"Pathology: The Autopsy and Forensics", Charleston Southern University, Department of Anthropology, Charleston, South Carolina, January 27, 2000.

"Forensic Pathology and Forensic Science", Saturday Scholars Program, Charleston, South Carolina, January 29, 2000.

"The Medical Examiner and the Coroner", Academic Magnet High School, North Charleston, South Carolina, February 2, 2000.

"Child Abuse and Neglect", East Cooper Hospital Department of Nursing, Mount Pleasant, South Carolina, April 3, 2000.

"Sudden Infant Death Syndrome", Hometown Radio Interviews, Boston, Massachusetts, April 11, 2000.

"Drug-Related Deaths", American Red Cross Tissue Procurement, Columbia, South Carolina, June 21, 2000.

"Alcohol and Teen Driving" College of American Pathologists Council on Public Affairs Video News Release (VNR), national distribution and broadcast, Charleston, South Carolina, taping April 19, 2001.

Wofford College Interim Program Mentor, January 2002, Katie Sellars

College of Charleston Internship Mentor, 2002, Chris Grivas

College of Charleston Internship Mentor, 2002, Jessica Bruhm

College of Charleston Internship Mentor, 2002, Aaron Otte

College of Charleston Internship Mentor, 2003 (spring), Candace Moorer

College of Charleston Internship Mentor, 2003 (spring), Betsy Brabham

College of Charleston Internship Mentor, 2003 (fall), Kimberly Steele

Trident Technical College Internship Mentor, 2004 (winter, spring), Christine Kinney

COMMUNITY SERVICE/HONORS (CONTINUED):

College of Charleston Internship Mentor, 2005-2006, Ansley

College of Charleston Internship Mentor, Colin Clarke, 2005-2006

College of Charleston Internship Mentor, Jackie Ong, 2005-2006

College of Charleston Internship Mentor, Sarah Bjorkman, 2007

Citadel Military College Mentor, Aaron Kelly, 2007-2008

"Religious Perspectives and the Autopsy", Coastal Crisis Chaplaincy, Charleston, South Carolina, May 3, 2006.

"Blood Donation", Hometown Radio Interviews, Boston, Massachusetts, May 18, 2006

"Gun Safety", College of American Pathologists Public Affairs Committee Video News Release (VNR), national distribution and broadcast, taping May 25, 2006

"Breast Cancer", Radio Interviews, College of American Pathologists, 2007

Satellite media tour on breast cancer, live broadcast from Chicago, Illinois, October 2007

"Breast Cancer" radio interview through the College of American Pathologists, 2008

Satellite Media Tour, Breast Cancer, live broadcast from Chicago, Illinois, national distribution, October 2009

Teaching at Capers Preparatory Christian Academy, Johns Island, South Carolina, 2009-present

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS

"Infiltrating Angiolipoma of the Vulva," Southern Medical Association, George Papanicolaou Memorial Seminar in Gynecologic Pathology, Atlanta, Georgia, November 1991.

"Extragenital Germ Cell Tumors: A Fine Needle Aspiration Biopsy Study," American Society of Cytology, Los Angeles, California, November 6, 1991.

"Atypical Lymphocytosis in Ascitic Fluid in Young Children - A Potential Diagnostic Challenge," American Society of Cytology, Quebec City, Canada, October 1, 1992.

"The Cytologic Evaluation of Lipid-Laden Alveolar Macrophages as an Indicator of Aspiration Pneumonia in Young Children," American Society of Cytology, Quebec City, Canada, October 1, 1992.

"Primary Malignant Melanoma of the Uterus," Southern Medical Association, George Papanicolaou Memorial Seminar in Gynecologic Pathology, San Antonio, Texas, November 14, 1992.

"A Retrospective and Prospective Study of Cerebral Tissue Pulmonary Embolization in Severe Head Trauma," American Academy of Forensic Sciences, Boston, Massachusetts, February 18, 1993.

"Interpretation of Fatal Multiple and Exiting Gunshot Wounds by Trauma Specialists," American Academy of Forensic Sciences, Boston, Massachusetts, February 18, 1993.

"The Accuracy of Clinical Evaluations of Gunshot Wounds," North Carolina Medicolegal Seminar, Chapel Hill, North Carolina, June 26, 1993.

"What Makes A Residency Program Attractive to Residents," Association of Pathology Chairmen/PRODS Conference, Aspen, Colorado, July 28, 1993.

"An Unusual Case of Maternal-Fetal Death Due to Vaginal Insufflation of Cocaine," National Association of Medical Examiners, Fort Worth, Texas, September 13, 1993.

"Death by Bull-Edger: An Unusual Homicide Utilizing a Woodworking Implement," National Association of Medical Examiners, Fort Worth, Texas, September 13, 1993.

"Identification of Male Cells Using FISH with Y-probes in Cervicovaginal Smears in Alleged Sexual Assault Cases," American Society of Human Genetics, New Orleans, Louisiana, October, 6, 1993.

"History of United States Pathology," Seminar Moderator, College of American Pathologists, Orlando, Florida, October 16, 1993.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"An Introduction to Laboratory Management," Seminar Moderator, College of American Pathologists, Orlando, Florida, October 17, 1993.

"An Unusual Case of Angiotropic Large Cell Lymphoma," Southern Medical Association, New Orleans, Louisiana, October 28, 1993.

"Identification of Male Cells Using FISH with Y-probes in Cervicovaginal Smears in Alleged Sexual Assault Cases," American Society of Human Genetics, New Orleans, Louisiana, 1993.

"Sneddon-Wilkinson Disease: Clinical and Histopathologic Features of This Controversial Entity," Southern Medical Association, New Orleans, Louisiana, October 28, 1993.

"Fine Needle Aspiration Biopsy of Hepatic Lymphomas: Cytomorphology and Ancillary Studies," American Society of Cytology, Houston, Texas, November 3, 1993.

"Residents Forum Update," CAP Leadership Conference, Miami, Florida, January 15, 1994.

"Resident Issues in Pathology - Training, Recruitment/Retention, Organized Medicine," Texas Society of Pathologists, Austin, Texas, January 28, 1994.

"Identification of Sperm and Non-Sperm Male Cells in Cervicovaginal Smears Using Fluorescence In Situ Hybridization: Applications in Alleged Sexual Assault Cases," American Academy of Forensic Sciences, San Antonio, Texas, February 17, 1994.

"The Presence of Bcl-2 Protein Precedes ICAM-1 Expression in Early Evolving Malignant Melanoma," International Academy of Pathology, San Francisco, California, March 15, 1994.

"The Use of Cytogenetics in Forensics," University of California, San Francisco, California, March 16, 1994.

"Physician Liability and Courtroom Testimony," Seminar Moderator, College of American Pathologists, Seattle, Washington, April 9, 1994.

"Legislative Update: CAP and Washington, D.C.," Seminar Moderator, College of American Pathologists, Seattle, Washington, April 10, 1994.

"Contract Negotiations," Seminar Moderator, College of American Pathologists, Seattle, Washington, April 10, 1994.

"Application of Molecular Cytogenetics to Cervicovaginal Smears in Alleged Sexual Assault Cases," American Society of Cytology, Chicago, Illinois, November 2, 1994.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"South Carolina: A Dual Medical Examiner-Coroner System: Does It Work?" American Academy of Forensic Sciences, Seattle, Washington, February 16, 1995.

"Fluorescence In Situ Hybridization: A New Technique to Detect Male Cells in Cervicovaginal Smears From Sexual Assault Victims," International Academy of Pathology, Toronto, Canada, March 13, 1995.

"Duct Tape Tales," National Association of Medical Examiners, San Diego, California, October 1995.

"A Decade of Drug Overdose Deaths at the Medical University of South Carolina," National Association of Medical Examiners, San Diego, California, October 1995.

"Gas Embolism Due to a Hepatic Abscess Caused by Clostridium perfringens," American Academy of Forensic Sciences, Nashville, Tennessee, February 22, 1996.

"Sudden Death in an Infant After Swallowing 'Crack' Cocaine", American Academy of Forensic Sciences, Nashville, Tennessee, February 22, 1996.

"New Developments in SIDS and Child Abuse", Forensic Pathology Seminar, Charleston, South Carolina, May 19, 1996.

"Forensic Pathology: Violent Death, Trace Evidence, and Scene Investigation," Governor's Program, Charleston, South Carolina, June 1996.

"Forensic Pathology: Cause of Death, Manner of Death, and Trauma," University of South Carolina, Department of Anthropology, Columbia, South Carolina, July 1, 1996.

"Overview and Update of Forensic Pathology," Florence-Darlington Technical College Seminar, Charleston, South Carolina, July 19, 1996.

"Analysis of Childhood Deaths in South Carolina", National Association of Medical Examiners, Traverse City, Michigan, September 14, 1996.

"Crack Cocaine as it Relates to a Child's Death," International Association of Forensic Nurses, Kansas City, Missouri, November 3, 1996.

"The Use of Review Teams as an Investigative Tool in Children's Deaths," International Association of Forensic Nurses, Kansas City, Missouri, November 3, 1996.

"Forensic Pathology- Using Medical Science To Develop Evidence Used To Solve Crimes", South Carolina Probation and Parole Association, Myrtle Beach, South Carolina, November 7, 1996.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Coroner Training: "Forensic Pathology", Criminal Justice Academy, Columbia, South Carolina, November 29, 1996.

"Youthful Offenders, Violence, and Forensic Pathology," American Medical Association and The Charleston Marine Institute, Charleston, South Carolina, December 7, 1996.

"Pediatric Homicide by Shaking: A Ten Year Retrospective Study", American Academy of Forensic Sciences, New York, New York, February 21, 1997.

Sudden Unexpected Death Resulting From an Anomalous Left Coronary Artery", American Academy of Forensic Sciences, New York, New York, February 21, 1997.

"A Decade of SIDS: The MUSC Experience", American Academy of Forensic Sciences, New York, New York, February 21, 1997.

"Speedballing With Needle Embolization: Case Study and Review of the Literature", American Academy of Forensic Sciences, New York, New York, February 21, 1997.

"Pediatric Forensic Pathology" Pathology/Biology Section, Seminar Moderator, American Academy of Forensic Sciences, New York, New York, February 21, 1997.

"Sudden Infant Death Syndrome: A Ten Year Retrospective Study of Pulmonary Histopathology", United States and Canadian Division of the International Academy of Pathology, Orlando, Florida, March 3, 1997.

"The Use of Polymerase Chain Reaction To Detect Evidence of Y Chromosome-Positive Cells in Cases of Sexual Assault", United States and Canadian Division of the International Academy of Pathology, Orlando, Florida, March 5, 1997.

"Pediatric Forensic Pathology", University of South Carolina School of Law, Columbia, South Carolina, April 16, 1997.

"Pediatric Forensic Deaths", Medical University of South Carolina Pediatric Grand Rounds, Charleston, South Carolina, April 25, 1997.

"Elder Abuse: A Ten Year Retrospective Study at the Medical University of South Carolina", National Association of Medical Examiners, Baltimore, Maryland, September 13, 1997.

"A Decade of Pediatric Homicide: A Retrospective Study at the Medical University of South Carolina", National Association of Medical Examiners, Baltimore, Maryland, September 13, 1997.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Death by No-Doz Overdose", National Association of Medical Examiners, Baltimore, Maryland, September 13, 1997.

"Forensics", South Carolina Probation and Parole Association---Tri-Association Conference, Myrtle Beach, South Carolina, November 11, 1997.

"SIDS and Child Abuse", South Carolina Coroners Association, Columbia, South Carolina, May 6, 1997.

"When The Crying Stops", Navy Hospital, North Charleston, South Carolina, May 21, 1997.

"Pediatric Forensic Pathology", Pediatric Grand Rounds, Roper Hospital, Charleston, South Carolina, May 22, 1997.

"In The Wink Of The Eye", International Association of Forensic Nurses, Irvine, California, September 28, 1997.

"Child Beating: Death by Soft Tissue Damage and Hemorrhage", Conference on Child Maltreatment, San Diego, California, January 29, 1998.

"Pediatric Homicide by Shaking: A Ten Year Retrospective Study", Conference on Child Maltreatment, San Diego, California, January 29, 1998.

"Shaken Baby Syndrome?...Or Accident?", 1998 Forensic Seminar, Medical University of South Carolina, Charleston, South Carolina, March 22, 1998.

"Domestic Violence: Recognition, Documentation, and Reporting", Alabama Dental Association, Vail, Colorado, March 31, 1998.

"Speaking Before Groups," College of American Pathologists, Los Angeles, California, April 5, 1998.

"Forensic Nursing in the Emergency Room", Low Country Emergency Nurses Association, Charleston, South Carolina, May 20, 1998.

"Charleston and Low Country Forensics", International Association of Coroners and Medical Examiners, Charleston, South Carolina, June 16, 1998.

"Shaken Baby Syndrome: A Ten Year Retrospective Study", National Shaken Baby Conference, Salt Lake City, Utah, September 14, 1998.

"Speaking Before Groups", College of American Pathologists, Washington, DC, October 18, 1998.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Pierre W. Keitges, MD, Memorial Program on Medical Ethics", Washington, DC, October 19, 1998.

"Photography and the Pathologist", College of American Pathologists, Washington, DC, October 21, 1998.

"Suicide Under the Age of Eighteen: A Ten Year Retrospective Study", National Association of Medical Examiners, Albuquerque, New Mexico, November 2, 1998.

"The Suicide That Wasn't", National Association of Medical Examiners, Albuquerque, New Mexico, November 3, 1998.

"Fire Deaths and Self-Immolation: An Eleven Year Review, 1986-1996", National Association of Medical Examiners, November 3, 1998.

"Identification of Female Cells in Postcoital Penile Swabs Using Fluorescence in situ hybridization and PCR: Application in Sexual Assault", American Academy of Forensic Sciences, Orlando, Florida, February 19, 1999.

"Suicide: A Ten Year Retrospective Study", American Academy of Forensic Sciences, Orlando, Florida, February 19, 1999.

"Child Beating: The Examination of Death By Soft Tissue Hemorrhage", American Academy of Forensic Sciences, Orlando, Florida, February 19, 1999.

"A Ten Year Retrospective Study of Drowning Deaths", American Academy of Forensic Sciences, Orlando, Florida, February 19, 1999.

"Overview of Forensic Pathology", Carolina Clinical Connection '99, Charleston, South Carolina, March 26, 1999.

"Meet the Experts: Discussions in Pathology", College of American Pathologists, Orlando, Florida, April 12, 1999.

"Breast Cancer", Hometown Radio Interview for South Carolina Broadcasting, Orlando, Florida, April 12, 1999.

"Back To Sleep: SIDS and Risk Factors", North Charleston, South Carolina, June 4, 1999.

"Benign or Malignant? The Borderline Lesions of Medicolegal Diagnostics", College of American Pathologists, New Orleans, Louisiana, September 26, 1999.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Speaking Before Groups", College of American Pathologists, New Orleans, Louisiana, September 26, 1999.

"Improper Airbag Deployment in a Motor Vehicle Traffic Fatality", National Association of Medical Examiners, Minneapolis, Minnesota, October 18, 1999.

"Elderly Suicide: A Ten Year Retrospective Study", National Association of Medical Examiners, Minneapolis, Minnesota, October 18, 1999.

"Sudden Death in a Three Year Old: A Case of Primary Pulmonary Hypertension", National Association of Medical Examiners, Minneapolis, Minnesota, October 18, 1999.

"Multifactorial Analysis of Gunshot Wounds to the Head with Attention to Anatomic Location", National Association of Medical Examiners, Minneapolis, Minnesota, October 18, 1999.

"Pediatric Toxicologic Deaths: A Ten Year Retrospective Study", National Association of Medical Examiners, Minneapolis, Minnesota, October 19, 1999.

"Persistence of Spermatozoa and Prostatic Acid Phosphatase in Specimens from Deceased Individuals Over Varied Postmortem Intervals", National Association of Medical Examiners, Minneapolis, Minnesota, October 19, 1999.

"Beginning the Job Search", Virtual Management College Audio Conference, November 9, 1999.

"Pediatric Forensic Issues Conference", 3rd Annual, Co-Director, Orlando, Florida, December 1-4, 1999.

"SIDS, Overlaying and Suffocation", Pediatric Forensic Issues Conference, Orlando, Florida, December 3, 1999.

"Pediatric Neglect", Pediatric Forensic Issues Conference, Orlando, Florida, December 4, 1999.

"The Roles of the Pathologist in Forensics", Criminal Justice Academy, South Carolina Law Enforcement, Columbia, South Carolina, February 22, 2000.

"Expert Panel Discussion on Elder Abuse and Neglect", Nursing Home Abuse and Neglect Prevention Conference, United States Department of Justice, Columbia, South Carolina, February 23, 2000.

"Fused Vertebrae: Skeletal Manifestations of Psoriasis Used to Corroborate Radiographic Identification", American Academy of Forensic Sciences, Reno, Nevada, February 24, 2000.

"Neonatal Poisoning: Accident or Homicide? Case Report and Review of the Literature", American Academy of Forensic Sciences, Reno, Nevada, February 25, 2000.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Ancillary Procedures: Getting the Most out of the Autopsy", College of American Pathologists, Boston, Massachusetts, April 8, 2000.

"Fetal Death: A Ten Year Retrospective Study", National Association of Medical Examiners, Indianapolis, Indiana, September 18, 2000.

"An Unusual Case of Anaphylaxis: Mold in Pancake Mix", National Association of Medical Examiners, Indianapolis, Indiana, September 18, 2000.

"Death By Overlaying and Wedging: A 15 Year Retrospective Study", National Association of Medical Examiners, Indianapolis, Indiana, September 18, 2000.

"Breast Bud Hemorrhage in a Neonate", National Association of Medical Examiners, Indianapolis, Indiana, September 19, 2000.

"Speaking Before Groups", College of American Pathologists, October 15, 2000.

"So Now You've Been Offered a Job", Moderator/Facilitator, College of American Pathologists, October 15, 2000.

"Pediatric Forensic Issues Conference", 4th Annual, Co-director, Las Vegas, Nevada, December 4-7, 2000. SIDS, Overlaying, and Suffocation", Pediatric Forensic Issues Conference, Las Vegas, Nevada, December 6, 2000.

"Pediatric Neglect", Pediatric Forensic Issues Conference, Las Vegas, Nevada, December 6, 2000.

"Pediatric and Elder Death Investigation Seminar", Chesterfield Law Enforcement and Emergency Medical Responders, Chesterfield, South Carolina, January 23, 2001.

"Forensic Pathology: Update and Overview", Medical College of Georgia, Augusta, Georgia, February 16, 2001.

"College of American Pathologists Laboratory Accreditation Program Inspector Training Seminar", Charleston, South Carolina, May 31, 2001.

"Planning the Job Search", Virtual Management College of the College of American Pathologists, Audioconference, October 9, 2001.

"Forensic Pathology: The Next Generation. The Academic Forensic Pathologist", National Association of Medical Examiners, Richmond, Virginia, October 12, 2001.

"Accidental Deaths in Children", National Association of Medical Examiners, Richmond, Virginia, October 15, 2001.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

“Sudden Death Due to Airway Fibrin Clot: Case Report and Review of Airway Obstructions”, National Association of Medical Examiners, Richmond, Virginia, October 15, 2001.

“Sudden Death to Asphyxia by Esophageal Polyp: Case Report and Review of the Literature”, National Association of Medical Examiners, Richmond, Virginia, October 15, 2001.

“Twenty-six Years of Fatal Pediatric Burns”, National Association of Medical Examiners, Richmond, Virginia, October 15, 2001.

“The Perinatal Decedent: Viability, Postmortem Artifact, and Trauma”, National Association of Medical Examiners, Richmond, Virginia, October 15, 2001.

“Elderly Homicide: A Retrospective Study 1985-2000”, National Association of Medical Examiners, Richmond, Virginia, October 17, 2001.

“Responding to Disaster: Lessons Learned”, College of American Pathologists and the American Society of Clinical Pathology Joint Annual Meeting, Philadelphia, Pennsylvania, October 20, 2001.

“Shaken Baby Syndrome and BAPP”, College of American pathologist and the American Society of Clinical Pathologists Joint Annual Meeting, Philadelphia, Pennsylvania, October 20, 2001.

“Elder Abuse”, College of American Pathologists and the American Society of Clinical Pathology Joint Annual Meeting, Philadelphia, Pennsylvania, October 21, 2001.

“Speaking Before Groups”, College of American Pathologists and the American Society of Clinical Pathology Joint Annual Meeting, Philadelphia, Pennsylvania, October 21, 2001.

“Pierre W. Keitges, MD Memorial Program on Ethics: Issues Surrounding Organ and Tissue Procurement and Donation”, College of American Pathologists and the American Society of Clinical Pathology Joint Annual Meeting, Philadelphia, Pennsylvania, October 22, 2001.

“Pediatric Forensic Pathology”, Armed Forces Institute of Pathology Forensic Course, Faculty, Bethesda, Maryland, November 16, 2001.

Pediatric Forensic Issues Conference, 5th Annual, Co-Director, Orlando, Florida, December 3-6, 2001.

“Perinatal and Neonatal Death”, Pediatric Forensic Issues Conference, Orlando, Florida, December 3, 2001.

“Cardiopulmonary Resuscitation Injuries vs. Blunt Force Trauma”, Pediatric Forensic Issues Conference, Orlando, Florida, December 4, 2001.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

- "Pediatric Neglect", Pediatric Forensic Issues Conference, Orlando, Florida, December 5, 2001.
- "Fetal Death", Pediatric Forensic Issues Conference, Orlando, Florida, December 6, 2001.
- "Differential Diagnosis in Forensic Pathology", Short Course, United States and Canadian Academy of Pathology, Chicago, Illinois, February 28, 2002.
- "The Role of Radiology in Forensic Pathology", South Carolina Society of Radiologic Technologists, Charleston, South Carolina, March 1, 2002.
- "Forensic Pathology: a Focus on Domestic Violence", Medical Views Southern Vistas Conference, Charleston, South Carolina, April 6, 2002.
- "Pseudo-Elder Abuse: A Case of Vertebral Artery Laceration", National Association of Medical Examiners, Shreveport, Louisiana, September 30, 2002.
- "Aortoesophageal Fistula due to Ingestion of a Small Round Object", National Association of Medical Examiners, Shreveport, Louisiana, October 1, 2002.
- "Now That You've Passed the Boards", College of American Pathologists, Washington, DC, October 12, 2002.
- "Speaking Before Groups", College of American Pathologists, Washington, DC, October 13, 2002.
- "Achievement of Competency", College of American Pathologists, Washington, DC, October 14, 2002.
- "Women in Pathology", College of American Pathologists, Washington, DC, October 14, 2002.
- "Forensic Pathology", Medical College of Georgia, Augusta, Georgia, October 25, 2002.
- "Pediatric Forensic Pathology", Armed Forces Institute of Pathology Forensic Course, Faculty, Bethesda, Maryland, November 22, 2002.
- "Pediatric Forensic Issues Conference, 6th Annual", Co-director, Orlando, Florida, December 4-7, 2002.
- "The Basics of Pediatric Forensic Pathology", Pediatric Forensic Issues Conference, 6th Annual, Orlando, Florida, December 4, 2002.
- "Differential Diagnosis in Forensic Pathology", Short Course, United States and Canadian Academy of Pathology, Washington, DC, March 28, 2003.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Pathologic Findings in Malignant Hyperthermia: A Case Report and Review of the Literature", National Association of Medical Examiners, San Jose, California, September 22, 2003.

"Childhood Panhypopituitarism Presenting as Child Abuse: A Case Report and Review of the Literature", National Association of Medical Examiners, San Jose, California, September 22, 2003.

"Pediatric Forensic Pathology", Armed Forces Institute of Pathology Forensic Course, Faculty, Rockville, Maryland, November 21, 2003.

"Pediatric Forensic Issues Conference, 6th Annual", Co-director, Orlando, Florida, December 3-6, 2003.

"Differential Diagnosis in Forensic Pathology", Short Course, United States and Canadian Academy of Pathology, Vancouver, BC, March 12, 2004.

"Pediatric Homicidal Burns: a Retrospective Study", American Academy of Forensic Sciences, Dallas, Texas, February 20, 2004.

"Pediatric Toxicology and Pharmacokinetics", American Academy of Forensic Sciences, Dallas, Texas, February 20, 2004.

"Unusual Cases of Ethanol Overdose: Deaths Following Treatment for Hypertrophic Cardiomyopathy", National Association of Medical Examiners, Nashville, Tennessee, September 11, 2004.

"Fentanyl Toxicity Due to Improper Placement of the Fentanyl Patch", National Association of Medical Examiners, Nashville, Tennessee, September 11, 2004.

"New Ancillary Studies in Amniotic Fluid Embolism: A Case Report and Review of the Literature", National Association of Medical Examiners, Nashville, Tennessee, September 13, 2004.

"Pregnancy Associated Deaths: A 15 Year Retrospective Study", National Association of Medical Examiners, Nashville, Tennessee, September 13, 2004.

"The Natural Autopsy: A 15 Year Retrospective Study", National Association of Medical Examiners, Nashville, Tennessee, September 13, 2004.

"A 25-Year Retrospective Review of Deaths Due to Child Neglect", National Association of Medical Examiners, Nashville, Tennessee, September 13, 2004.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Cardiac Injury Secondary to Motor Vehicle Collision: A 15 Year Retrospective Study at the Medical University of South Carolina", National Association of Medical Examiners, Nashville, Tennessee, September 13, 2004.

"Pediatric Forensic Pathology", Armed Forces Institute of Pathology Forensic Course, Faculty, Rockville, Maryland, November 19, 2004.

"Pediatric Forensic Pathology", Medical College of Georgia, Department of Pathology, Augusta, Georgia, October 13, 2004.

"Spokesperson Training", College of American Pathologists, Chicago, Illinois, November 20, 2004.

"Pediatric Forensic Issues Conference", Course Co-Director, Orlando, Florida, December 1-4, 2004.

"Ancillary Studies in the Pediatric Autopsy", Pediatric Forensic Issues Conference, Orlando, Florida, December 1, 2004.

"Pediatric Pharmacokinetics", Pediatric Forensic Issues Conference, Orlando, Florida, December 2, 2004.

"Courtroom Testimony", Pediatric Forensic Issues Conference, Orlando, Florida, December 3, 2004.

"Soft Tissue Trauma", Pediatric Forensic Issues Conference, Orlando, Florida, December 4, 2004.

"Cardiopulmonary Resuscitation Injuries", Pediatric Forensic Issues Conference, Orlando, Florida, December 4, 2004.

"Challenges in Pediatric Toxicology", National Association of Medical Examiners, New Orleans, Louisiana, February 22, 2005.

"Adolescent Death: A 15-Year Retrospective Study", American Academy of Forensic Sciences, New Orleans, Louisiana, February 24, 2005.

"The Tragic Voyage of the Morning Dew", Last Word Society, American Academy of Forensic Sciences, New Orleans, Louisiana, February 24, 2005.

"The History of Warfare: An Overview", United States and Canadian Academy of Pathology, Forensic Evening Session, San Antonio, Texas, March 1, 2005.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Forensic Evening Session", Moderator, United States and Canadian Academy of Pathology, Forensic Evening Session, San Antonio, Texas, March 1, 2005.

"Differential Diagnosis in Forensic Medicine", United States and Canadian Academy of Pathology, Short Course, San Antonio, Texas, March 3, 2005.

"Basic Forensic Pathology", Charleston School of Law, Charleston, South Carolina, April 2005.

"Fatal Birth Trauma due to Undiagnosed Abdominal Teratoma: Case Report and Review of the Literature" National Association of Medical Examiners, Los Angeles, California, October 15, 2005.

"An Unusual Gross Presentation of Inflicted Head Trauma", National Association of Medical Examiners, Los Angeles, California, October 17, 2005.

"Adolescent Death", Pediatric Forensic Issues Conference, Anaheim, California, December 1, 2005.

"Birth Trauma", Pediatric Forensic Issues Conference, Anaheim, California, December 2, 2005.

Co-Director, Pediatric Forensic Issues Conference, Anaheim, California, November 30-December 3, 2005.

"Forensic Identification" and Forensic Evening Session Moderator, United States and Canadian Academy of Pathology, Atlanta, Georgia, February 15, 2006.

"Taser Death", American Academy of Forensic Sciences, Seattle, Washington, February 23, 2006.

"Basic Forensic Pathology", Medical College of Georgia, Augusta, Georgia, February 23, 2006.

"Elder Abuse", Medical College of Georgia, Augusta, Georgia, February 23, 2006.

"Adolescent Death", South Carolina Society of Radiologic Technologists, Charleston, South Carolina, March 9, 2006.

"Elder Maltreatment", South Carolina Society of Radiologic Technologists, Charleston, South Carolina, March 9, 2006.

"Pediatric Autopsy for the Practicing Pathologist", College of American Pathologists, CAP'06 annual meeting, San Diego, California, September 10, 2006.

"Atraumatic Cardiac Deaths in the Pediatric Population: A 15-Year Review", National Association of Medical Examiners, San Antonio, Texas, October 15, 2006.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Left Atrial Myocardial Infarction and Sudden Death: Review of the Literature and Approach to the Autopsy", National Association of Medical Examiners, San Antonio, Texas, October 15, 2006.

"Intentionally-Induced Premature Labor Using Black-Market Misoprostol: A Case Report and Review of the Literature", National Association of Medical Examiners, San Antonio, Texas, October 16, 2006.

"Death by Wax Bullet", National Association of Medical Examiners, San Antonio, Texas, October 16, 2006.

"Pediatric Forensic Pathology", Armed Forces Institute of Pathology Basic Forensic Pathology Course, Faculty, Rockville, Maryland, November 3, 2006.

Co-Director, Pediatric Forensic Issues Conference, Orlando, Florida, December 6-9, 2006.

"Adolescent Death, the Choking Game, and Russian Roulette", Pediatric Forensic Issues Conference, Orlando, Florida, December 6, 2006.

"Birth Injuries and Trauma", Pediatric Forensic Issues Conference, Orlando, Florida, December 7, 2006.

"Basic Forensic Pathology, Pediatric Forensic Pathology, and Elder Maltreatment", Medical College of Georgia, Augusta, Georgia, February 12, 2007.

"The Role of Postmortem Cardiac Enzymes in the Diagnosis of Acute Cardiac Deaths", American Academy of Forensic Sciences, San Antonio, Texas, February 21, 2007.

"Child Maltreatment", South Carolina Professional Society on the Abuse of Children, Greenville, South Carolina, April 12, 2007.

"Career Planning as a Required Medical School Course: The MUSC Experience", Careers in Medicine Professional Development Conference: Peaks of Excellence, Association of American Medical Colleges, Salt Lake City, Utah, June 11, 2007.

"Organ and Tissue Donation in Forensic Cases", South Carolina Coroner's Association 2007 Training Conference, Pawley's Island, South Carolina, June 14, 2007.

"Adolescent Deaths and the Roulettes", Masters Conference for Advanced Death Investigation, St. Louis, Missouri, July 24, 2007.

"Pediatric Autopsy for the Practicing Pathologist", College of American Pathologist' Annual Meeting, Chicago, Illinois, October 1, 2007.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Elder Abuse Pilot Training", National College of District Attorneys, Orlando, Florida, October 28, 2007.

"Pediatric Forensic Pathology", 2008 Pediatric Intersession, Medical College of Georgia, Augusta, Georgia, January 7, 2008.

"Current Topics in Pediatric Forensic Medicine: Beyond Abusive Head Trauma", American Academy of Forensic Sciences, Washington, DC, February 18, 2008.

"Cardiovascular Trauma in Motor Vehicle Collisions: A 20 Year Retrospective Study and Review of the Literature", American Academy of Forensic Sciences, Washington, DC, February 21, 2008.

Multidisciplinary Session "Medical Devices and Their Impact on Death Investigations", Moderator, American Academy of Forensic Sciences, Washington, DC, February 21, 2008.

"Cytomegalovirus Enteritis with Profuse Gastrointestinal Bleeding diagnosed at Autopsy: A Case Report and Review of the Literature", American Academy of Forensic Sciences, Washington, DC, February 21, 2008.

"Primitive Neuroectodermal Tumor (PNET) Masquerading as Non-Accidental Head Trauma in and Infant: Lessons for Multiple Disciplines", American Academy of Forensic Sciences, Washington, DC, February 22, 2008.

"Medical Aspects of Fatal Child Maltreatment", Fatal Child Maltreatment Investigation Course, South Carolina Law Enforcement Division and the University of South Carolina Children's Law Center, Columbia, South Carolina, March 12, 2008.

"Organ and Tissue Donation in Forensic Cases", South Carolina Coroner's Association 2008 Training Conference, Pawley's Island, South Carolina, June 18, 2008.

"Elder Abuse Pilot Training", National College of District Attorneys, Columbia, South Carolina, September 23, 2008.

"Pediatric Forensic Medicine" Workshop, American Academy of Forensic Sciences, Denver, Colorado, February 16, 2009.

"High Impact Communications", College of American Pathologists CAP'09 Annual Meeting, Chicago, Illinois, September 2009.

"Elder Abuse" National College of District Attorneys, Columbia, South Carolina, September 2009.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Spokesperson Training", Faculty, College of American Pathologists, Chicago, Illinois, December 2009.

"Love and a Bullet", American Academy of Forensic Sciences, Seattle, Washington, February 26, 2010.

"Forensic Pathology in cases of Alleged Sexual Molestation", The Defense of Child Molestation Cases in Georgia, Georgia Association of Criminal Defense Lawyers, Atlanta, Georgia, March 5, 2010.

"An Overview of Forensic Pathology", Medical College of Georgia, Augusta, Georgia, March 12, 2010.

"Pediatric Homicide", New York State Association of Coroners and Medical Examiners, Binghamton, New York, March 20, 2010.

"Issues in Pediatric Forensic Pathology", Toronto, Canada, March 27, 2010.

"Pediatric Forensic Pathology: Basic Knowledge and New Information", 2010 Sara Schuh Child Abuse Conference, Charleston, South Carolina, April 30, 2010.

"Pediatric Forensic Pathology and Sexual Abuse", 2010 SELETS Conference (Southeastern Law Enforcement Training Seminars), Lawrenceburg, Tennessee, June 1, 2010.

"Pediatric Forensic Pathology", South Carolina Coroner's Association, Litchfield Beach, South Carolina, June 25, 2010.

"High Impact Communication Made Easy", College of American Pathologists CAP'10, Chicago, Illinois, September 27, 2010.

"Tissue Procurement in Forensic Cases and the Medical Examiner Release of Tissues for Transplantation: The United States View", 19th Annual Congress of the European Association of Tissue Banks, Berlin, Germany, November 3, 2010.

"College of American Pathologists Spokesperson Training", Faculty, Chicago, Illinois, December 4, 2010.

"Elder Maltreatment in Institutions", Elder Justice Seminar, National Advocacy Center, Columbia, South Carolina, January 5, 2011.

"Organ and Tissue Procurement in Forensic Cases", SC Coroner Training, Criminal Justice Academy, Columbia, South Carolina, January 7, 2011.

"Overview of Forensic Pathology", Medical College of Georgia, Augusta, Georgia, March 11, 2011.

LECTURES, SPEECHES, EXHIBITS, RESEARCH PRESENTED, FILMS (CONT.):

"Medical Examiners, Transplant Professionals, and Supportive Public Policy: A Partnership for Life", American Association of Tissue Banks, Austin, Texas, March 28, 2011.

"Prosecution of Elder Abuse Cases", National District Attorneys Association, Columbia, South Carolina, May 3, 2011.

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MASTER OF SCIENCE	1995	Biomedical Engineering University of Alabama Birmingham Birmingham, Alabama
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POST GRADUATE EDUCATION	9/96-9/98	Internship Forensic Pathology and Medicine Office of the Medical Examiner Metropolitan Atlanta, Georgia

PROFESSIONAL EXPERIENCE:

Burton & Associates
Forensic Investigator and Primary
Biomechanical Engineering Consultant
Alpharetta, GA 30004

- Provide expertise in biomedical/mechanical engineering related to injury causation, prevention and control, and occupant kinematics.
- Conducted on scene and follow up investigation of traffic fatalities, homicides, suicides and natural death.
- Conducted post mortem examinations, autopsies and exhumations of victims to determine cause and manner of injuries and/or death.
- Review radiology studies and films.
- Involved in the investigation of approximately 3000 vehicle accidents with fatality or significant injuries since 1995.

Paul R Lewis & Associates
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Biomechanical Engineering Consultant
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- Researched and prepared technical support issues regarding injury causation, prevention and control, occupant kinematics and accident reconstruction.
- Conducted post traffic crash vehicle inspections.
- Facilitated exemplar vehicle and surrogate testing.

PUBLICATIONS/PRESENTATIONS:

ABSTRACTS

Lewis, Jr., PR; Molz, FJ; Schmidtke, SZ; Bidez, MW. "A NASS-Based Investigation of Pelvic Injury Within The Motor Vehicle Crash Environment". Surgery of The Pelvis and Acetabulum: The Third International Consensus. October 1996, Pittsburgh, PA, Albany College, The University of Alabama Birmingham School of Medicine, Duquesne University.

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"Experimental Injury Study of Children Seated Behind Collapsing Front Seats in Rear Impacts". Kenneth J. Saczalski, Anthony Sances, Joseph L. Burton and Paul R. Lewis, Jr.; 40th International ISA Biomedical Sciences Instrumentation Symposium, Biloxi, Mississippi, April 11-13, 2003.

"Experimental Verification of Biomechanical Occupant Response Predictions for Front & Rear Seated Passengers Subjected to Rear Impacts". Kenneth J. Saczalski, Jay Saul, Joseph Lawson Burton M.D. & Paul R. Lewis, Jr.; 2003 Digital Human Modeling For Design and Engineering Conference & Exhibition, June 16-19, 2003, Montreal, Canada; Society of Automotive Engineers, SAE Paper No. 2003-03-2205.

"Occupant Kinematics with Child Safety Seats Tested Under Real World Conditions". Gary R. Whitman, John Yannacone, Joseph Burton, Paul Lewis, Jr. and Dennis F. Shanahan; 47th Annual Proceedings of the Association For The Advancement of Automotive Medicine, September 22-24, 2003.

"Biomechanical Study of Rear Child Chest Injury Measures Related to Collapsing Front Seats in Rear Impacts". Kenneth J. Saczalski, Anthony Sances, Srirangam Kumaresan, Steve Meyer, Joseph L. Burton and Paul R. Lewis, Jr.; Proceedings of IMECE'03, 2003 ASME International Mechanical Engineering Congress, November 15-21, 2003, Washington, D.C., Paper No. IMECE2003-43061.

"Experimental Analysis of Head and Neck Loads for the Out-of-Position Occupant with Single and Dual-Stage Depowered Airbags". Craig A. Good, Marshal H. Paulo and Paul R. Lewis, Jr.; SAE 2004 World Congress & Exposition, March 8-11, 2004, Society of Automotive Engineers, SAE Paper No. 2004-01-0311.

"An Experimental Method for Multi-Variable Analysis of Vehicle Safety Systems and Application to Front Seats & Rear Occupant Interaction in Rear Impacts". Kenneth J. Saczalski, Srirangam Kumaresan, Anthony Sances, Joseph L. Burton and Paul R. Lewis, Jr.; Proceedings of IMECE04, 2004 ASME International Mechanical Engineering Congress and Exposition, November 13-20, 2004, Anaheim, California, Paper No. IMECE2004-60785.

"Computer Simulation of Rear Impact Biomechanical Occupant Response Predictions for Front & Rear Seated Passengers". Kenneth J. Saczalski, Ph.D., Jay Saul, Anthony Sances, Srirangam Kumaresan, Ph.D., Joseph L. Burton, M.D., Paul R. Lewis, Jr. Paper No. F2004U065, 2004 FISITA World Automotive Congress in Barcelona, Spain.

"Multivariate Head Injury Threshold Measures for Various Sized Children Seated behind Vehicle Seats in Rear Impacts". Kenneth J. Saczalski, Ph.D., Anthony Sances, Srirangam Kumaresan, Ph.D., M. Pozzi, MS, Todd K. Saczalski, Joseph L. Burton, M.D., Paul R. Lewis, Jr. ISA 2004, Volume 449, pages 381-386.

"Biomechanical Analysis and Injury Prevention in Off-Highway Vehicular Crashes" Joe Burton, Sri Kumar, Paul Lewis, Jr., Lou D'Aulerio, Michael Kleinberger, Daniel Strickland. Rocky Mountain Bioengineering Symposium & International ISA Biomedical Sciences Instrumentation Symposium. April 9-11, 2010 Laramie, Wyoming.

PRESENTATIONS

Lewis, Jr., PR; Molz, FJ; Schmidtke, SZ; Bidez, MW. "A NASS-Based Investigation of Pelvic Injury Within The Motor Vehicle Crash Environment". The 40th Stapp Car Crash Conference, November 5, 1996, Albuquerque, NM.

"Biomechanics, Reconstructing Injuries, Vehicle Inspections and Witness Marks". Motor Vehicle Products Liability Seminar. May 15, 1998, Little Rock, Arkansas.

"Airbags: History, Function and Injuries". AIEG Auto Focus 1998 Seminar. September 25, 1998, San Francisco, California.

"Airbag Injuries to Infants, Children and Small Adults". 53rd Annual Meeting of the American Academy of Forensic Sciences. February 23, 2001, Seattle, Washington.

"Biomechanics-Kinematics Conscious Pain and Suffering". AIEG Auto Focus 2010 October 21, 2010, Sante Fe, New Mexico.

POSTER PRESENTATIONS

"A NASS-Based Investigation of Pelvic Injury Within The Motor Vehicle Crash Environment", Jorge Alonso, M.D.; Paul R. Lewis, Jr.; Fred Molz; Salena Schmidtke and Martha W. Bidez; 65th Annual Meeting of the American Academy of Orthopedic Surgeons, New Orleans, LA; March 22, 1998.

PROFESSIONAL DEVELOPMENT:

September 9-11, 1992

1992 International Conference on the Biomechanics of Impacts; International Research Council on Biokinetics of Impacts, Verona, Italy

September 23, 1992

Vehicle Rollover TOPTEC, Society of Automotive Engineers, Phoenix, AZ

November 3, 1996	24 th Annual International Workshop on Human Subjects for Biomechanical Research, NHTSA, Albuquerque, NM
November 4-6, 1996	40 th STAPP Car Crash Conference, Society of Automotive Engineers, Albuquerque, NM
November 12, 1997	Second Child Occupant Protection Symposium, Society of Automotive Engineers and AAAM, Orlando, FL
November 13-14, 1997	41 st STAPP Car Crash Conference, Society of Automotive Engineers, Orlando, FL
November 15, 1997	25 th Annual International Workshop on Human Subjects for Biomechanical Research, NHTSA, Orlando, FL
April 2-3, 1998 Vehicle Product	ABA Seminar, Emerging Issues in Motor Liability Litigation, Phoenix, AZ
May 15, 1998	Motor Vehicle Products Liability Seminar. Little Rock, AR
August 13-14, 1998	The Biomechanics of Impact -- Understanding the Limits of Human Tolerance, Association for the Advancement of Automotive Medicine, Captiva Island, FL
December 7-11, 1998	Police and Medicolegal Investigation of Death, Miami-Dade County Medical Examiners Dept., Miami, FL
February 19-23, 2001	American Academy of Forensic Sciences 53 rd Annual Meeting, Seattle, WA
February 11-16, 2002	American Academy of Forensic Sciences 54 th Annual Meeting, Atlanta, GA
October 15-18, 2006	50 th Association for the Advancement of Automotive Medicine Annual Scientific Conference, Chicago, IL
July 18-20, 2007	Emergency World Summit on Roof Crush

Hyatt Regency, Washington on Capitol Hill,
Washington, D.C.

September 27-29, 2010

National Crash Analysis(NCAC)Conference
U.S. Department of Transportation/Federal
Highway Administration and the National
Highway Safety Administration.
George Washington University Ashburn VA

PROFESSIONAL ORGANIZATIONS:

American Association of Safety Engineers (AASE)
American Society of Mechanical Engineers (ASME)
Association for the Advancement of Automotive Medicine (AAAM)
Biomedical Engineering Society (BMES)
Institute for Industrial Engineering (IIE)
Society of Automotive Engineers (SAE)

Are the actual damages [#]
per year or lump sum?

Lump Sum
DAE-60



THE STATE OF SOUTH CAROLINA
In the Court of Appeals

APPEAL FROM BAMBERG COUNTY
Court Of Common Pleas

The Honorable Doyet A. Early III, Circuit Court Judge

Case No: 2008-CP-05-235

RECEIVED

MAR 29 2013

SC COURT OF APPEALS

Laura Riley as the Personal Representative
of the Estate of Benjamin Riley Respondent,

v.

Ford Motor Company Appellant.

CERTIFICATE OF COMPLIANCE

The undersigned counsel hereby certifies, pursuant to South Carolina Court of Appeals Rule 210(g), that Record on Appeal contains all material proposed to be included by any of the parties and no other material and it also complies with the August 13, 2007 Order of the South Carolina Supreme Court.

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March 29, 2013

THE STATE OF SOUTH CAROLINA
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APPEAL FROM BAMBERG COUNTY
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Doyet A. Early, II, Circuit Court Judge

Case No: 2008-CP-05-00235

RECEIVED

MAR 29 2013

SC Court of Appeals

Laura Riley as the Personal Representative
of the Estate of Benjamin Riley Respondent,

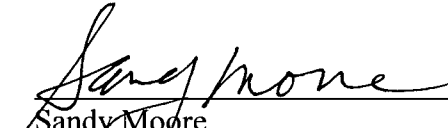
v.

Ford Motor Company Appellant.

PROOF OF SERVICE

I, Sandy Moore, the undersigned employee of Gallivan, White & Boyd, P.A.,
attorneys for the Appellant, do hereby certify that I have served a copy of the foregoing
Record on Appeal in connection with the above-referenced case by mailing a copy of
the same on March 25, 2013, by United States Mail, postage prepaid, to the following
address:

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