

THE STATE OF SOUTH CAROLINA  
In the Court of Appeals

APPEAL FROM BAMBERG COUNTY  
Court Of Common Pleas

RECEIVED

MAR 29 2013

The Honorable Doyet A. Early III, Circuit Court Judge

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

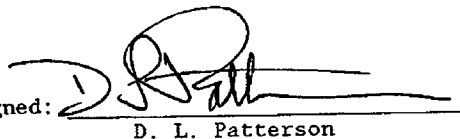
Conclusions:

- . 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 in lieu of a static rollover.
- . This test vehicle did not meet the Door Openability Corp Guideline requirements.

Concurred:

  
R. N. Hazzard

Signed:

  
D. L. Patterson

CRTS 0007277

SUMMARY OF TEST RESULTS CRASH 7277

Requirements

Performance

FMVSS 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 7277

Requirements

Performance

FMVSS 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
<b>Static Rollover</b>				
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 #7277

Test 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.	Frnt. 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



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Engineering Technology Services Office  
Car Product Development

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Schedule No. <u>7-7-12</u>
Retain Until <u>2010</u>

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*  
L. M. Johnson  
Product Test Engineer

CRTS 0007277

PRODUCED BY FORD  
1332

## 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

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 <sub>1</sub>	69 ms	125 ms
t <sub>2</sub>	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.

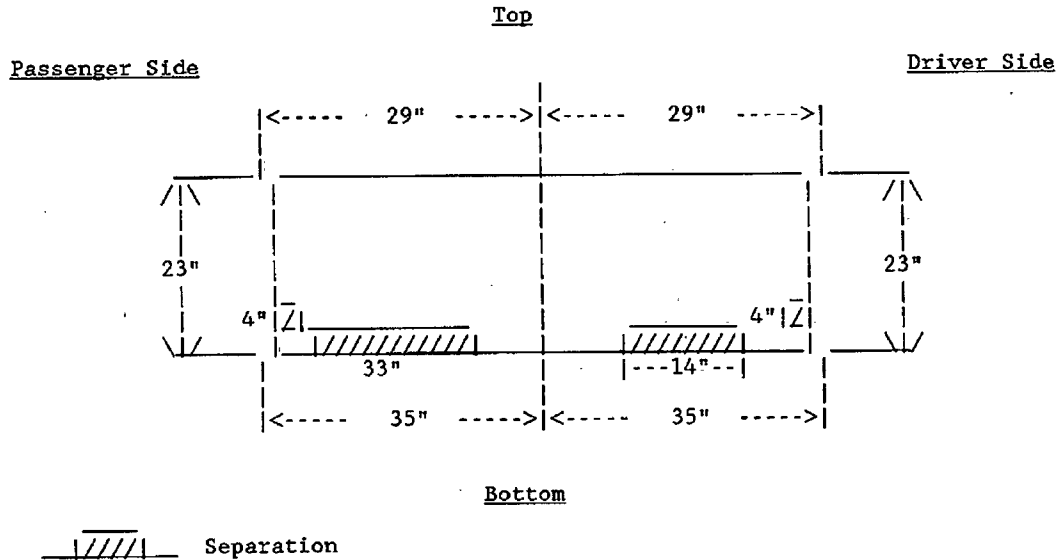
TEST RESULTS: (CONT'D)

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)

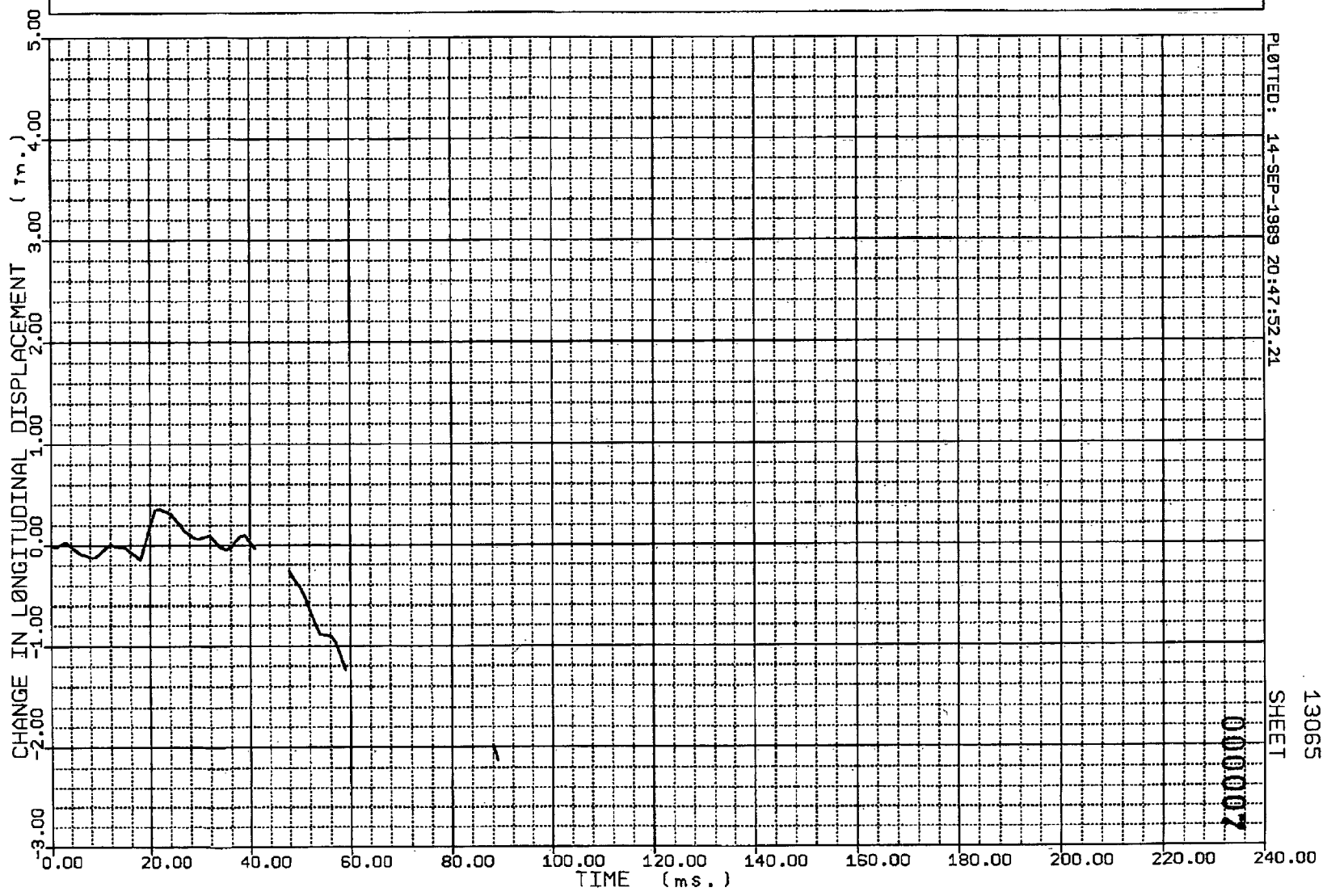
Time histories of the vehicle accelerations and other instrumentation are included in this report.

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				



PLOTTED: 14-SEP-1989 20:47:52.21

13065 SHEET

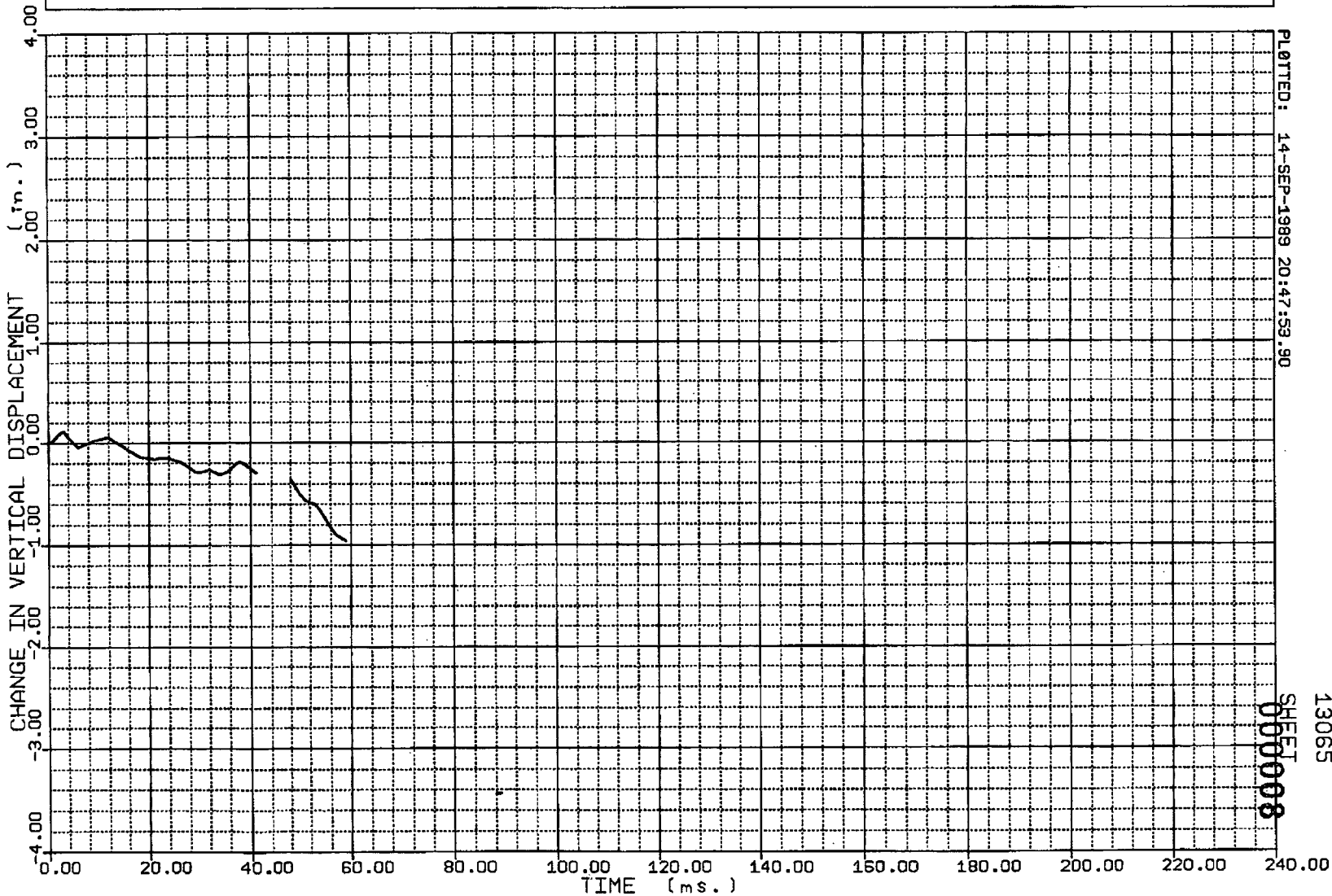
000007

CRIS 0007277

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1338

Y - AXIS: ST. COLUMN HUB WRT L/RÖCKER AT SEAT BÖLT MAX = 0.1176 at 3.00 MIN = -3.442 at 88.00

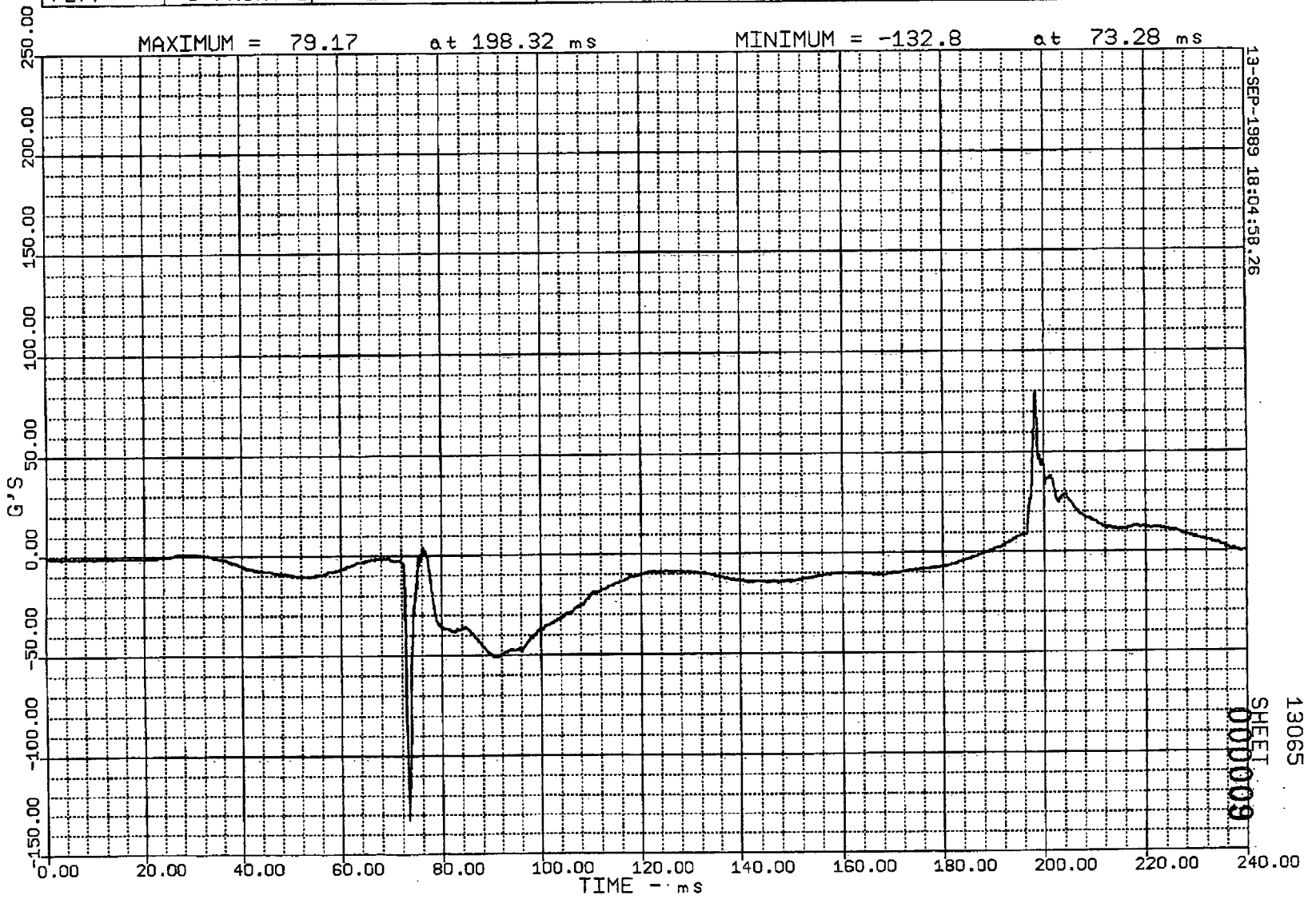
RUN NÖ.	FACILITY	TEST ÖRDER NÖ.	FILM ANALYSIS METHÖD	PITCH CÖRRECTION
7277	BARRIER	13065	SCALE	APPLIED



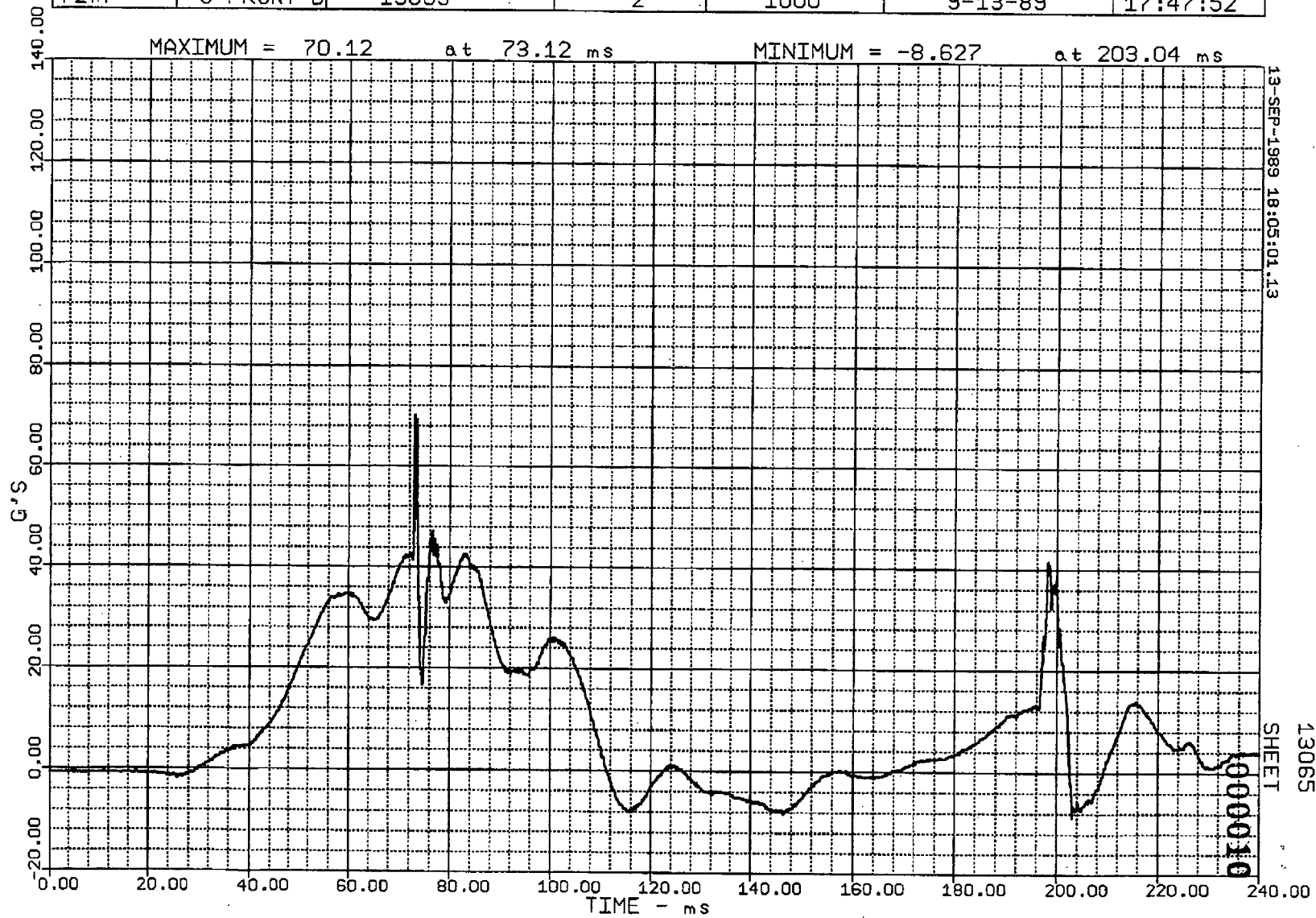
CRIS 0007277

PRODUCED BY FORD  
1339

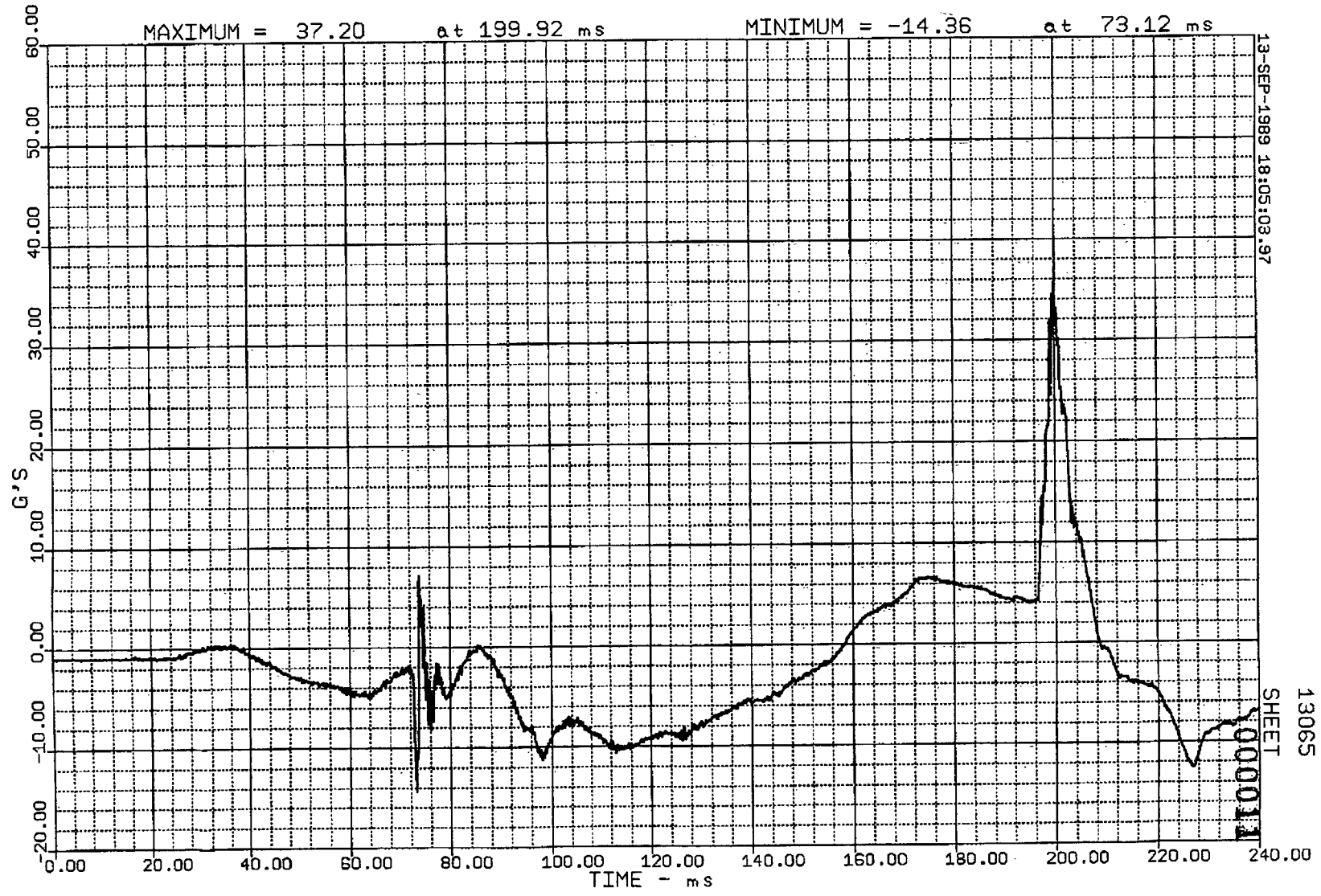
LØNG L/F DUMMY HEAD C.G.				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	1	1000	9-13-89	17:47:52



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



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	

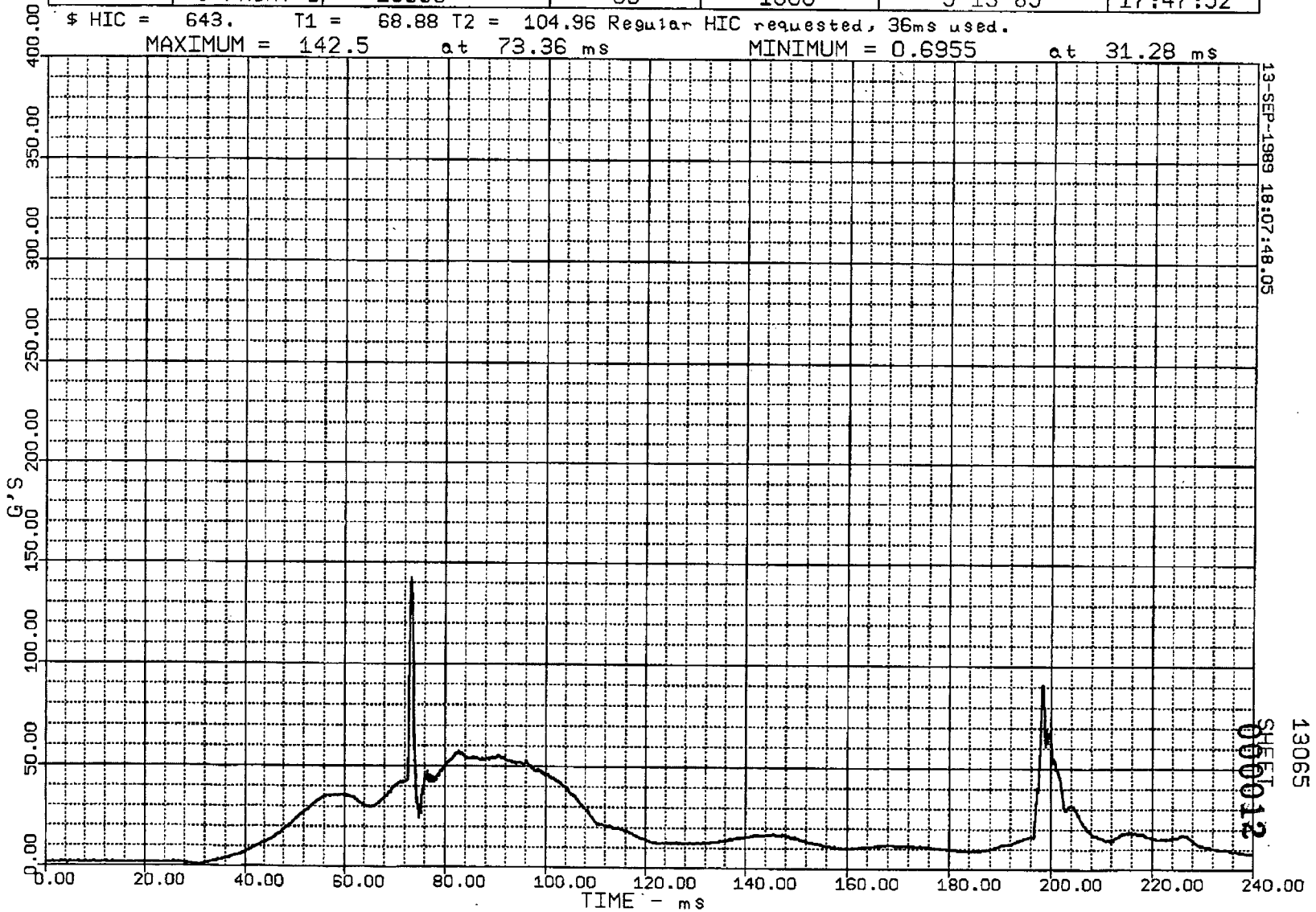


CRIS 0007277  
 PRODUCED BY FORD  
 1342

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



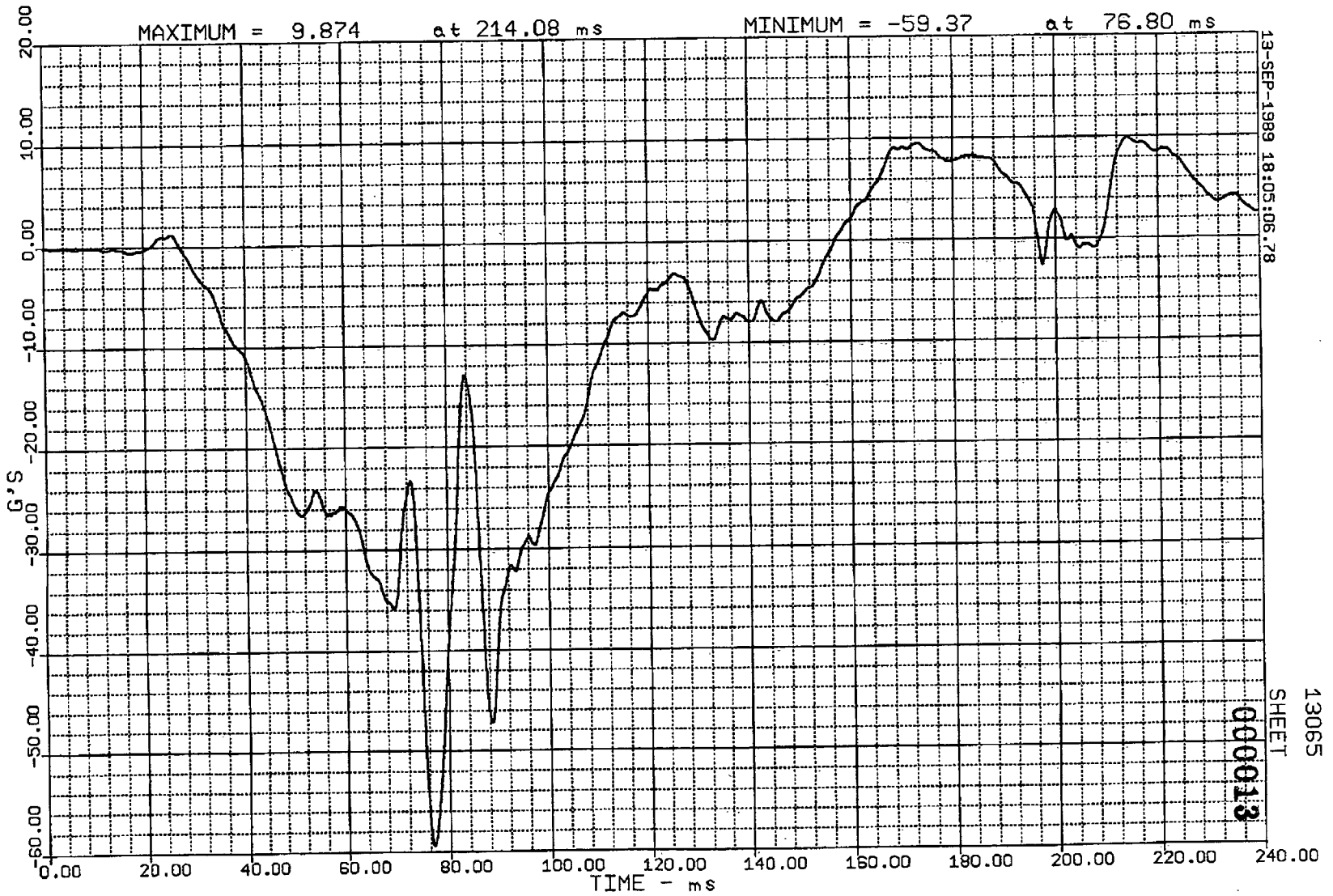
13-SEP-1989 18:07:48.05

SHEET  
000012  
13065

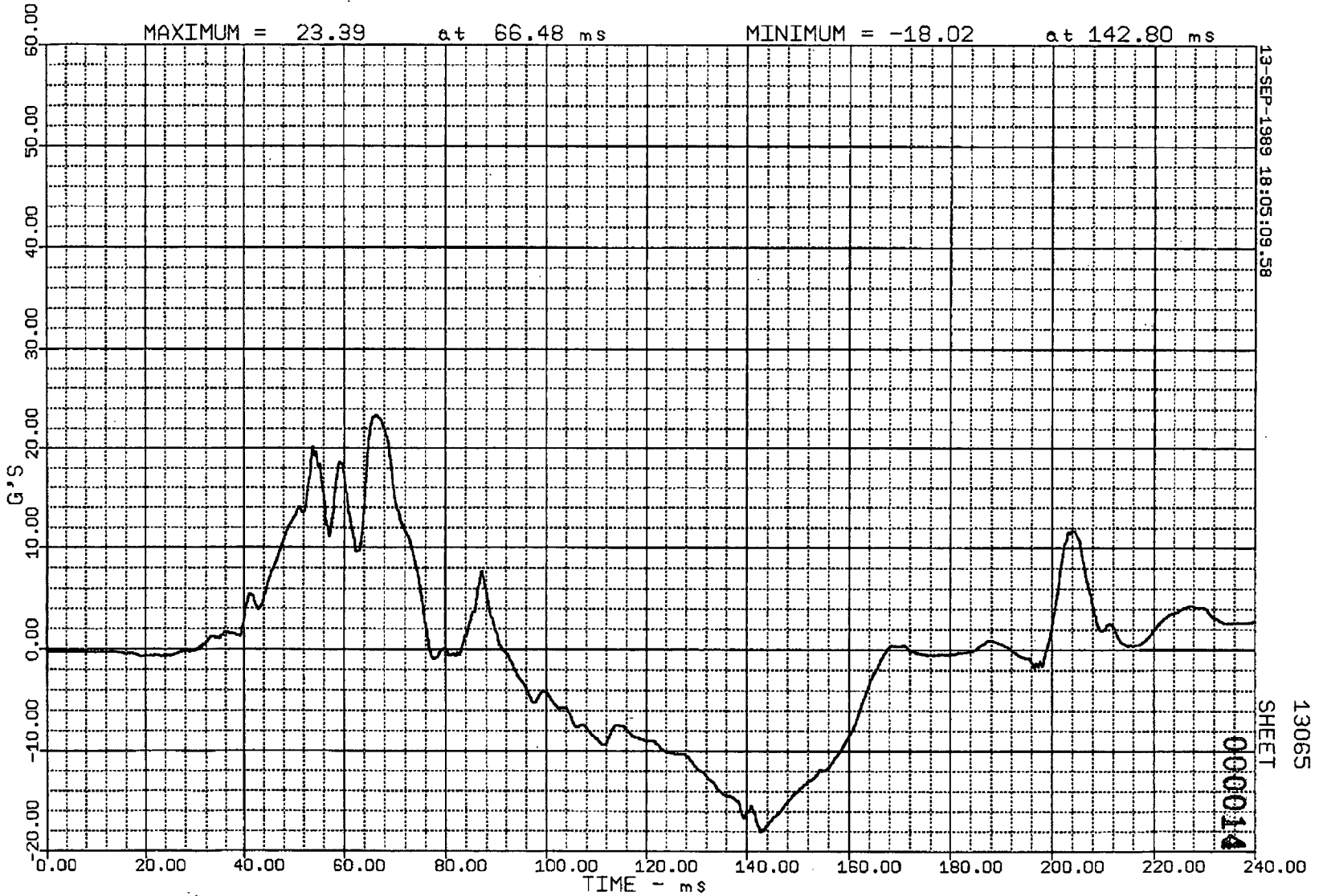
CRIS 0007277

PRODUCED BY FORD  
1343

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



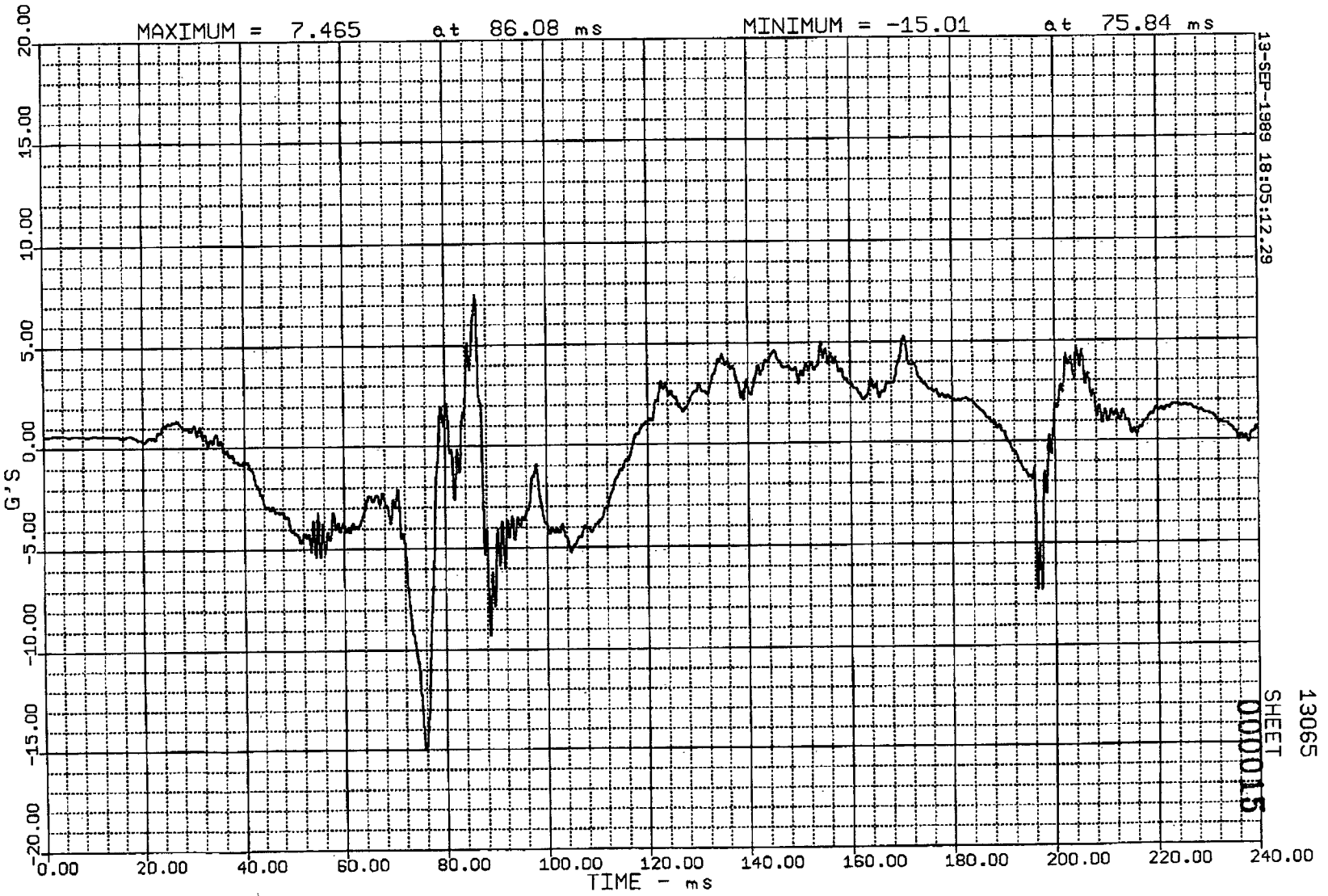
VERT L/F DUMMY CHEST			199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	5	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1345

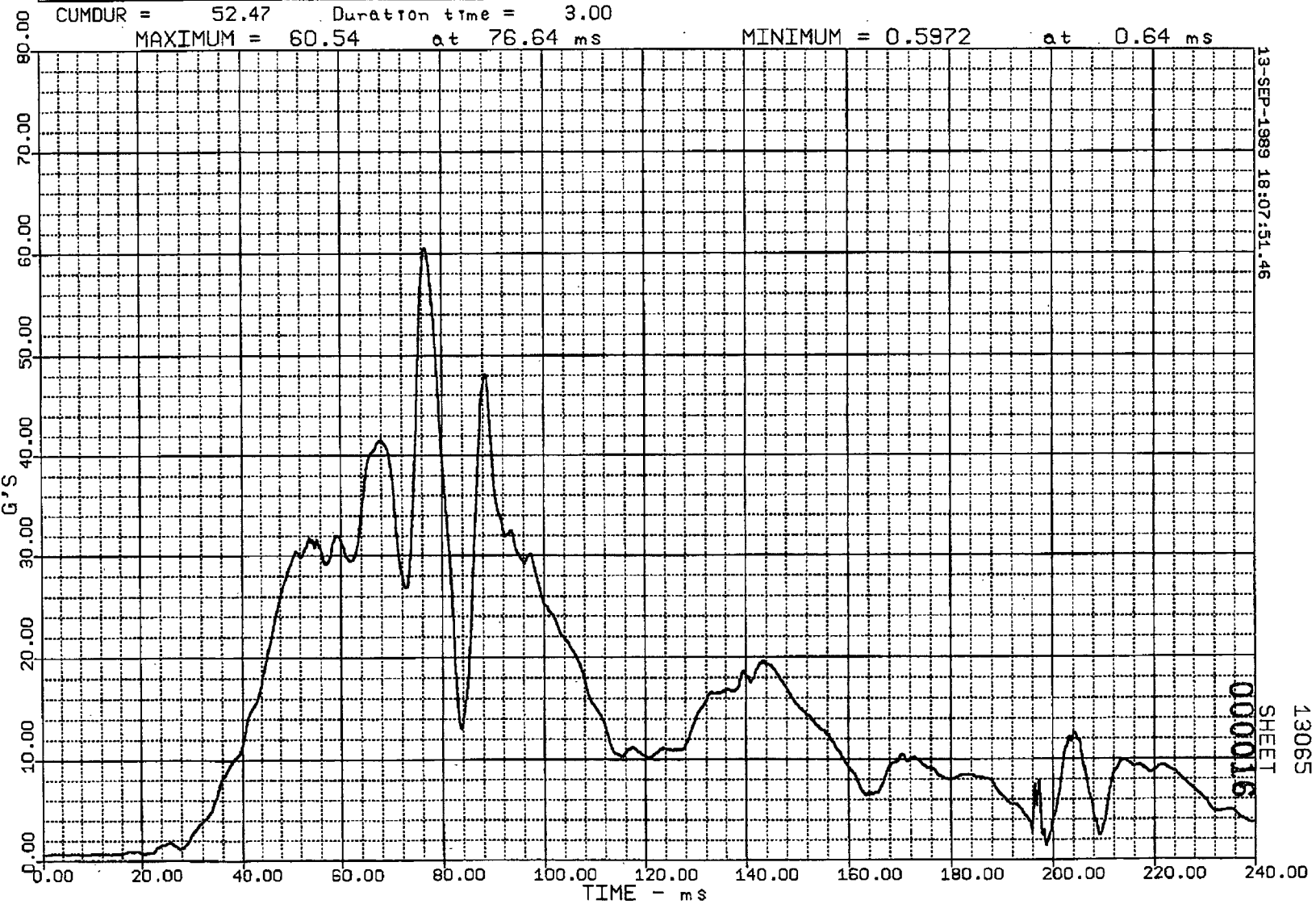
LAT	L/F DUMMY CHEST			199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	6	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1346

RES. L/F DUMMY CHEST			199200		TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT 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 NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	8	600	9-13-89	17:47:52



13-SEP-1989 18:05:15.08

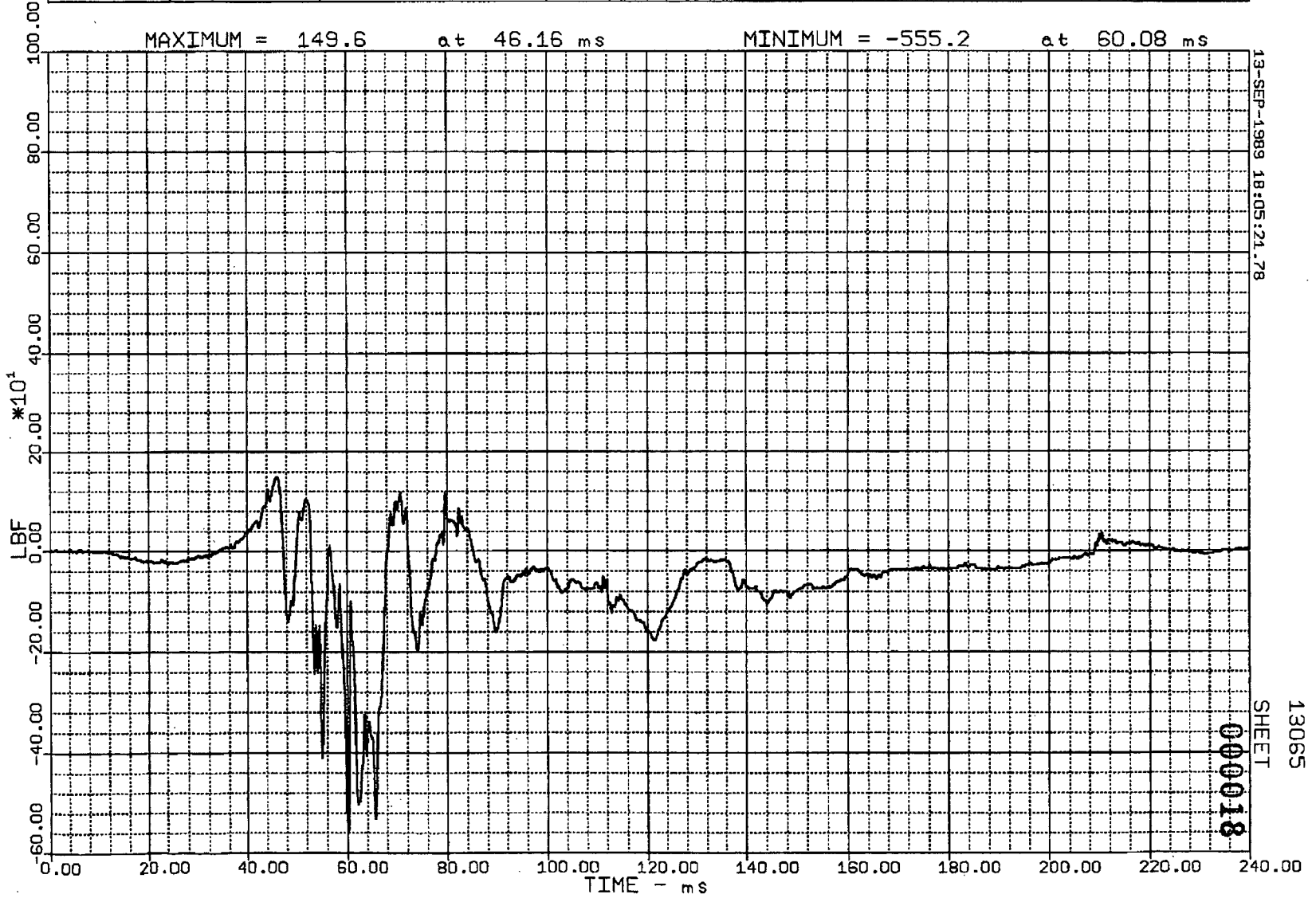
000017

13065 SHEET

CRTS 0007277

PRODUCED BY FORD  
1348

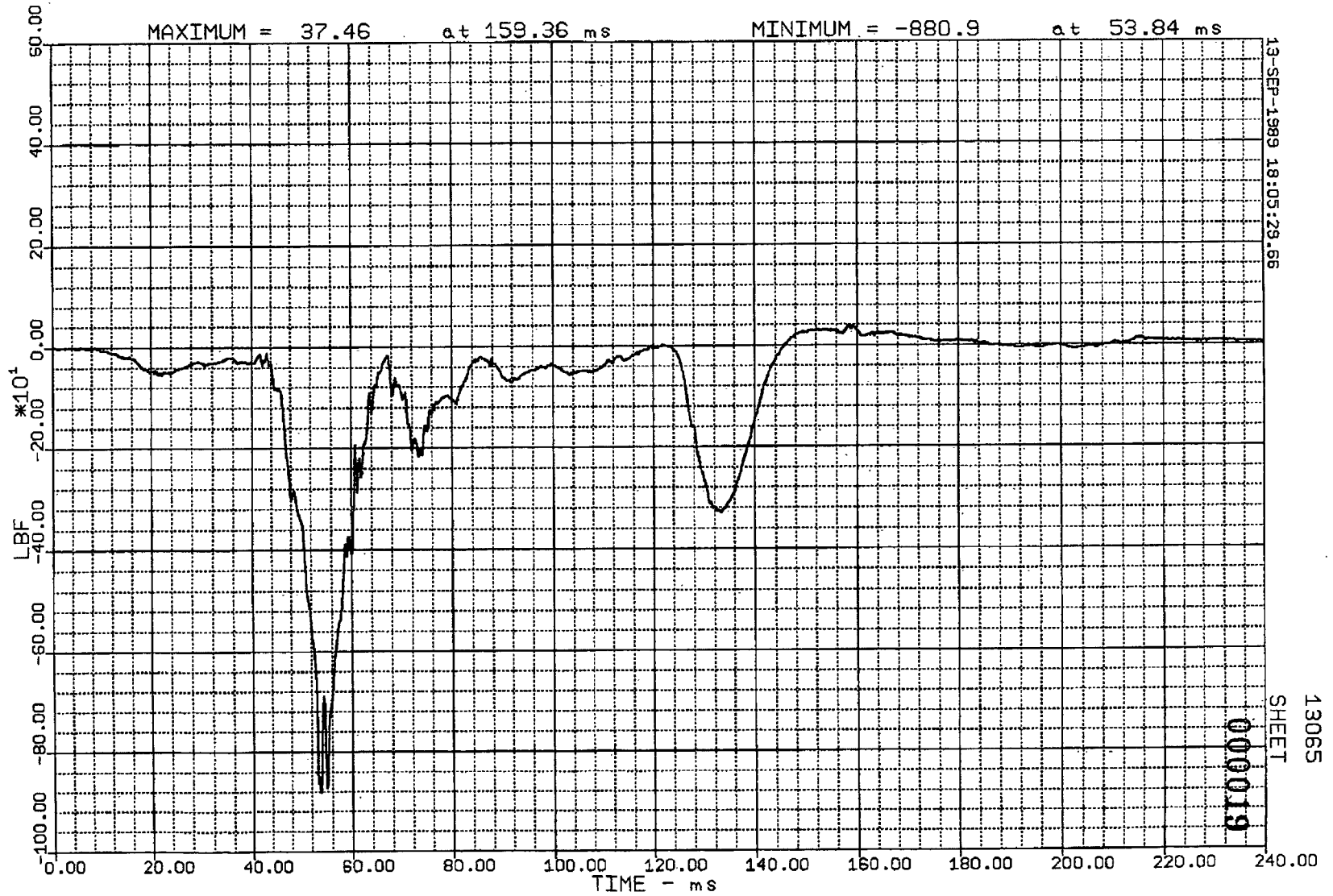
AXIAL L/F DUMMY R/FEMUR LOAD B#1				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	10	600	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1349

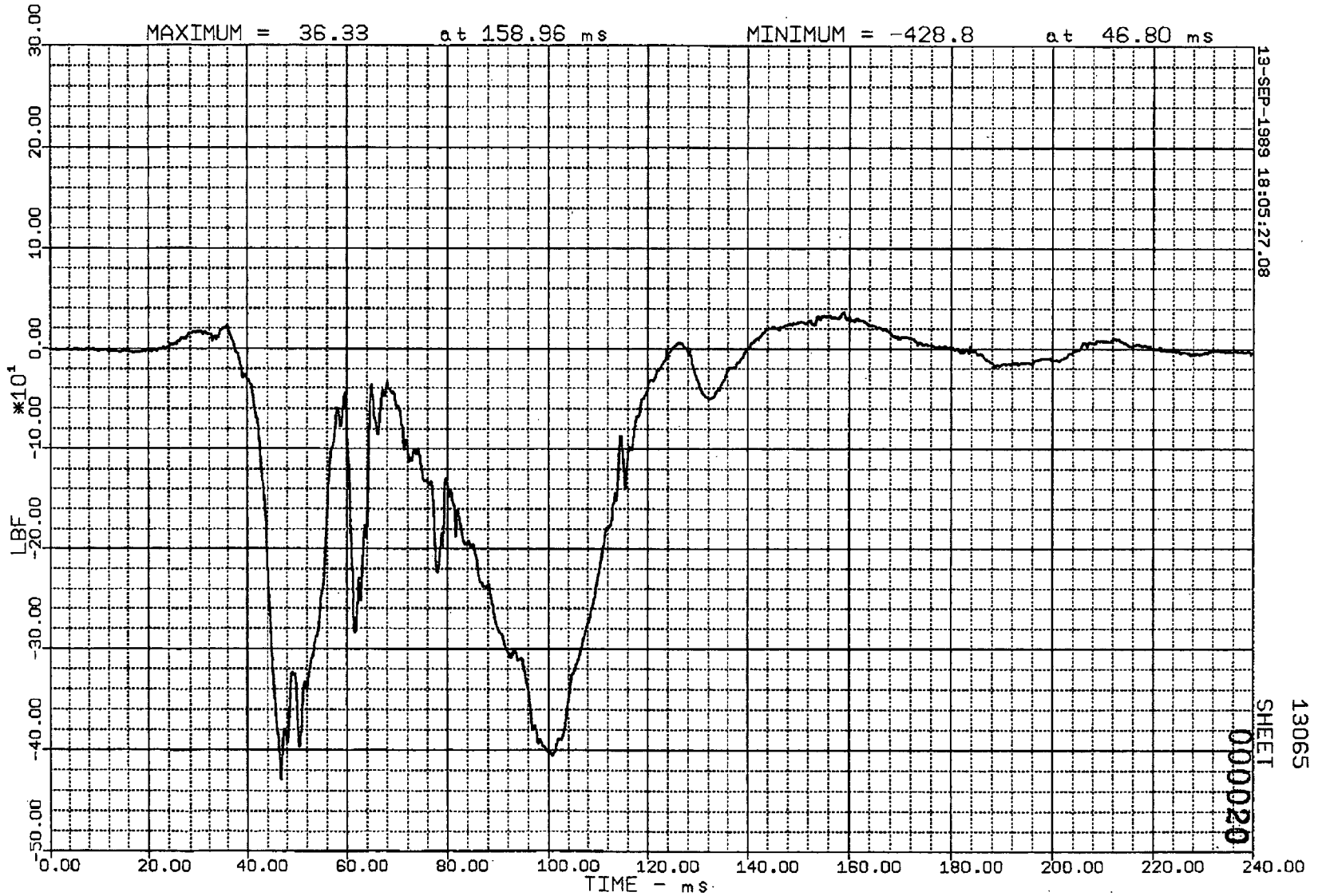
Fz	L/F DUMMY L/UP/TIBIA LOAD			199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	14	600	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD  
1350

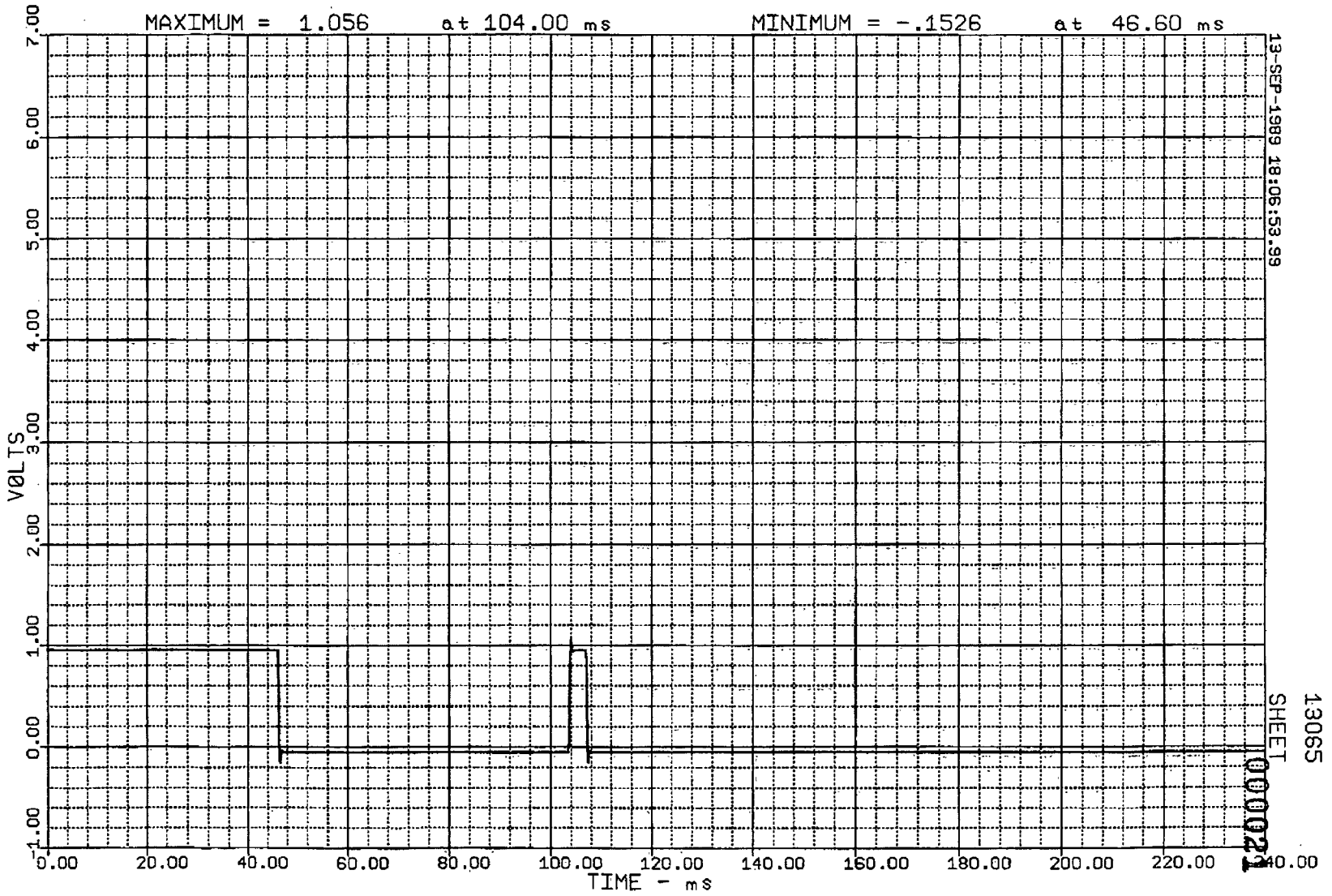
F <sub>z</sub> L/F DUMMY R/UP/TIBIA LOAD		199200		TARGET		
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	13	600	9-13-89	17:47:52



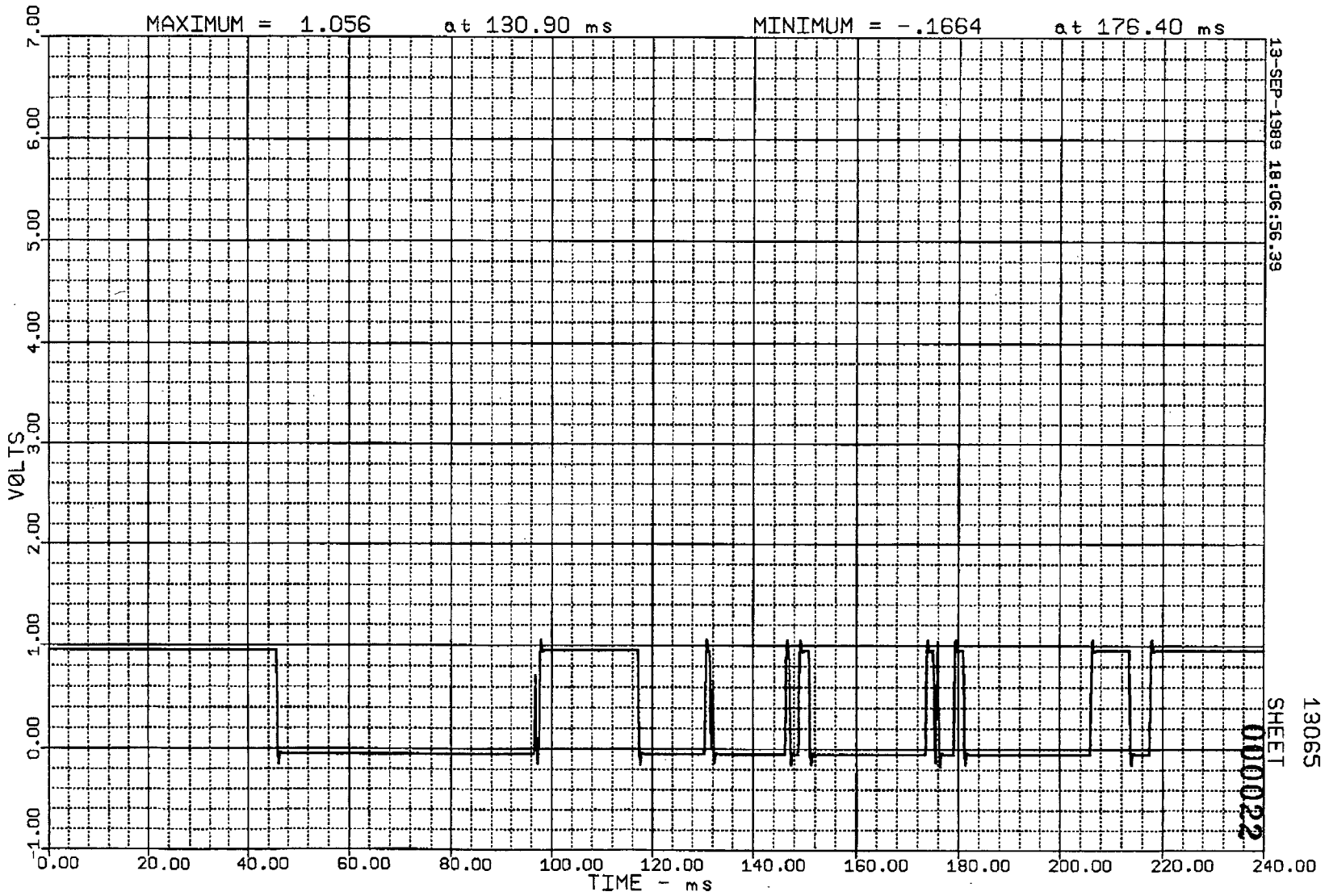
CRTS 0007277

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



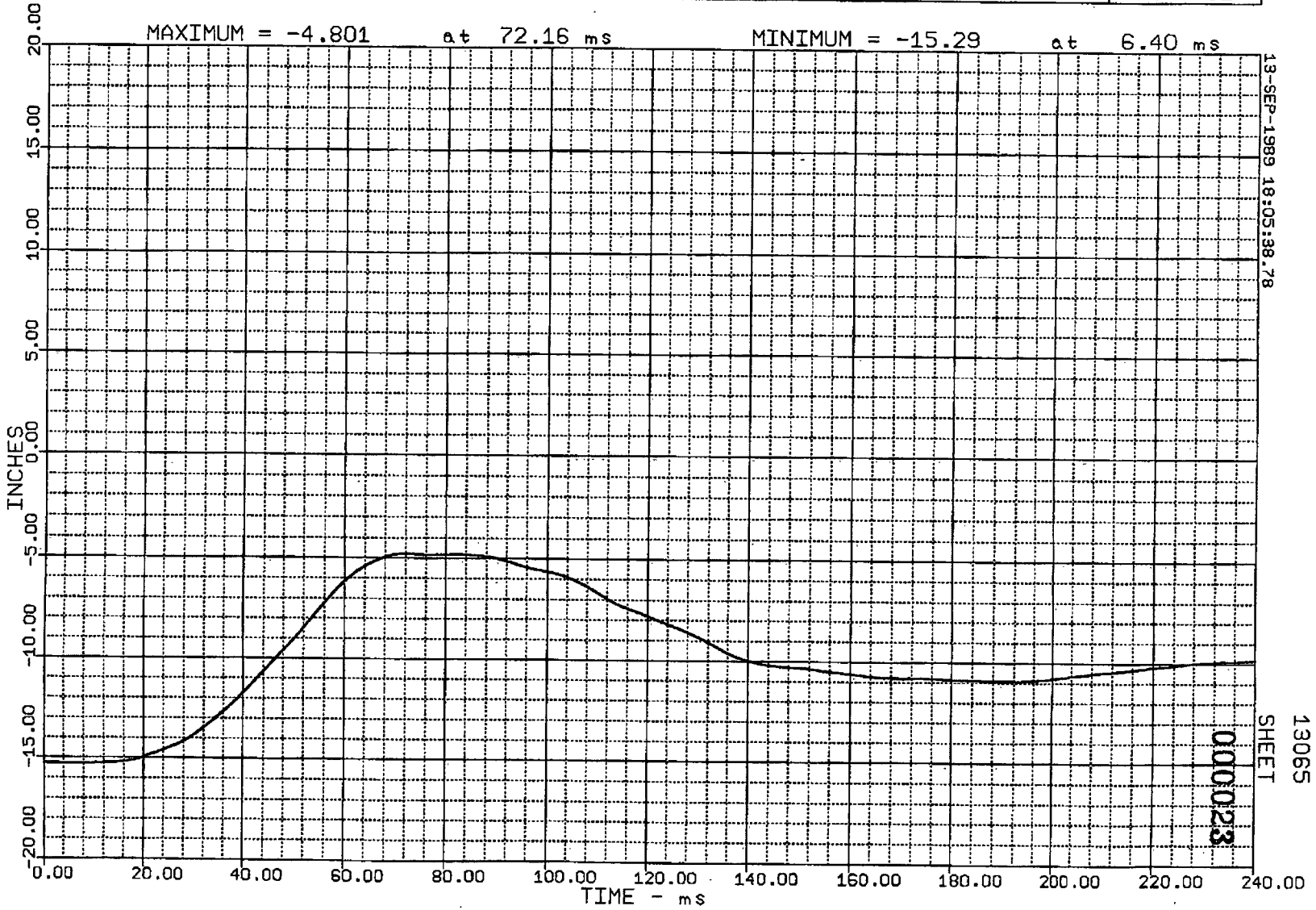
L/R DUMMY R/KNEE SW				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	57	1000	9-13-89	17:47:52



CRTS 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



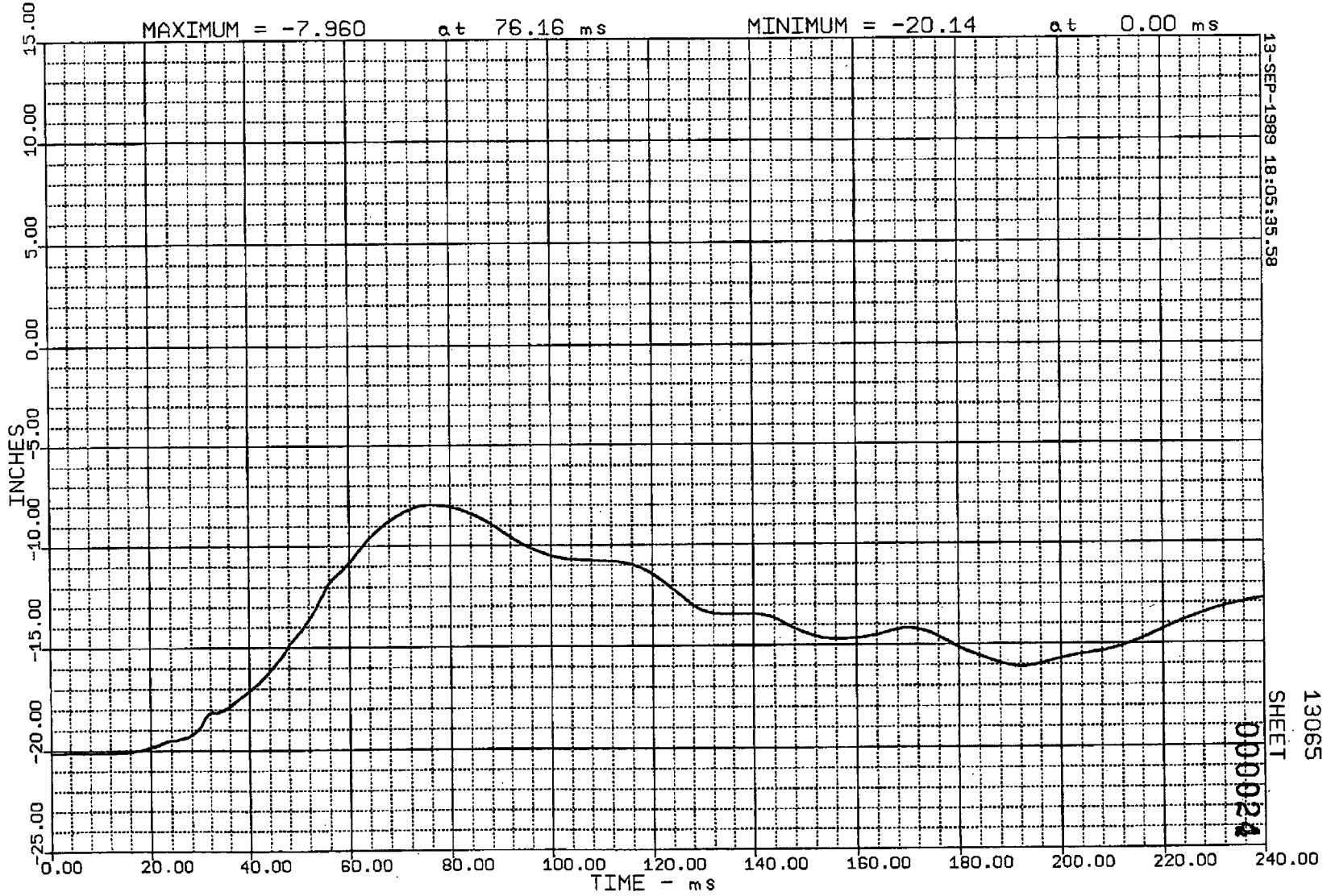
13-SEP-1989 18:05:38.78

13065  
SHEET

CRTS 0007277

PRODUCED BY FORD  
1354

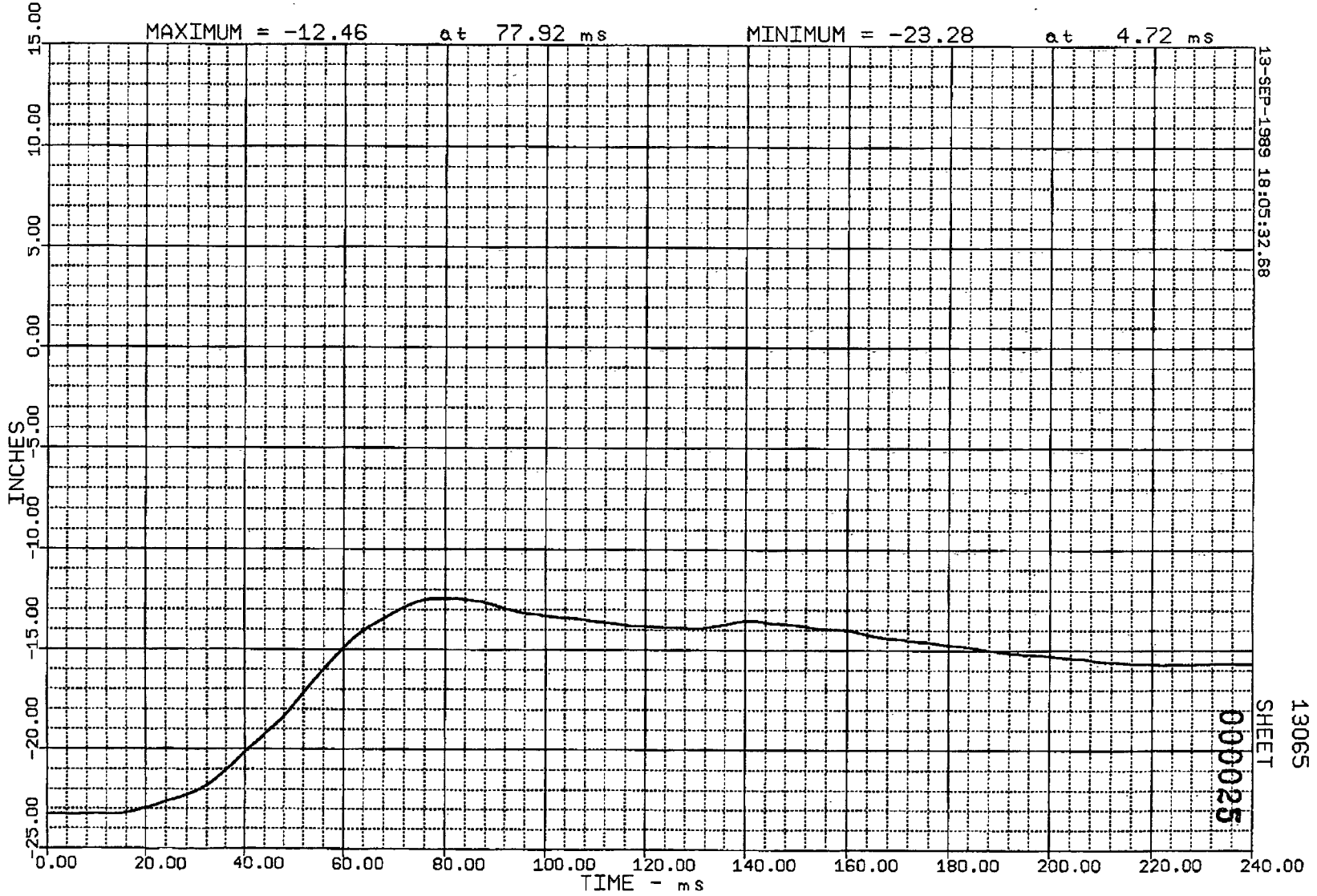
L/F DUMMY R/KNEE S.P.				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	16	60	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD  
1355

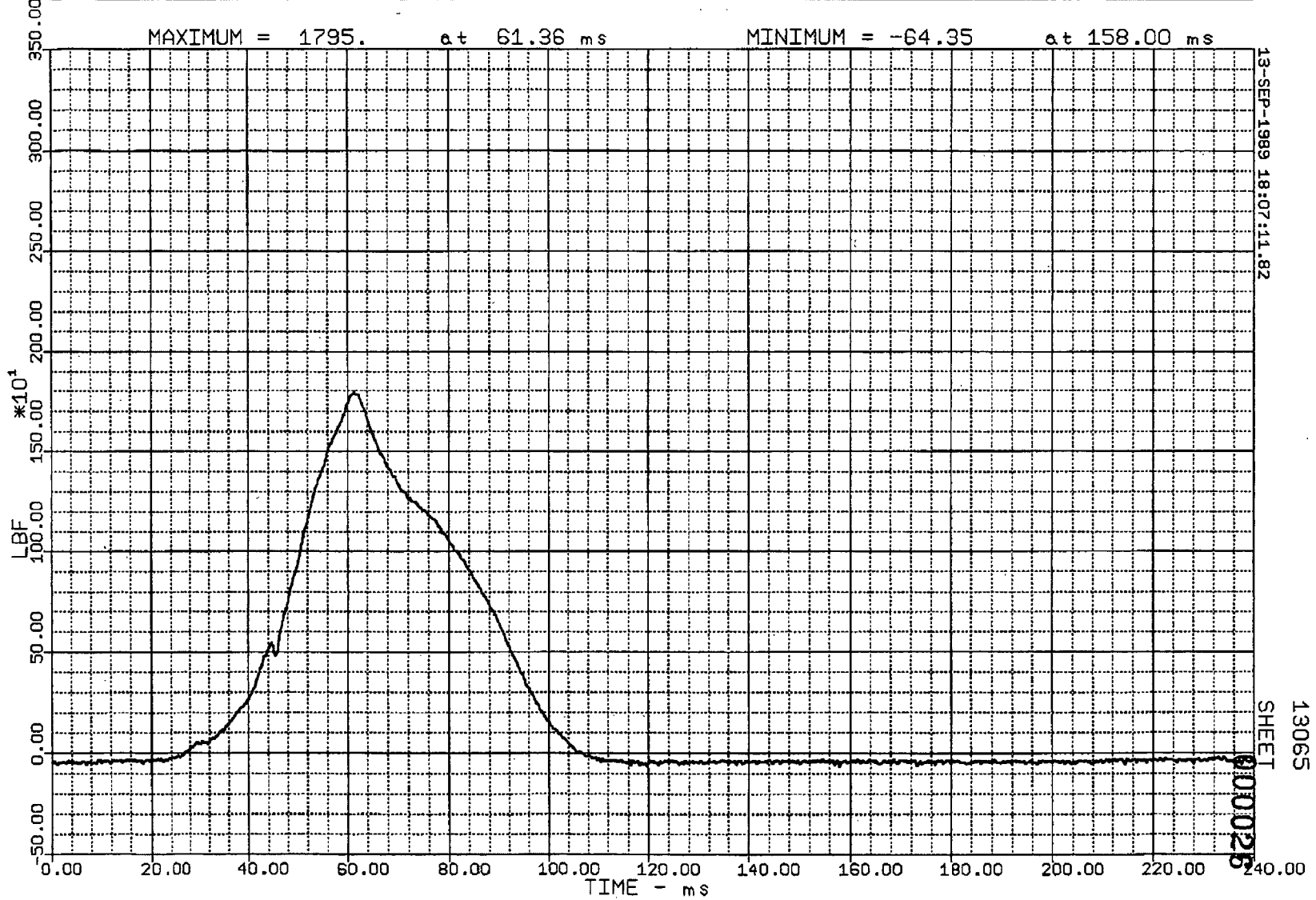
L/F DUMMY PELVIS S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	15	60	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD  
1356

L/R LAP BELT @ ANCHOR				199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRONT 8	13065	67	600	9-13-89	17:47:52	



13-SEP-1989 18:07:11.82

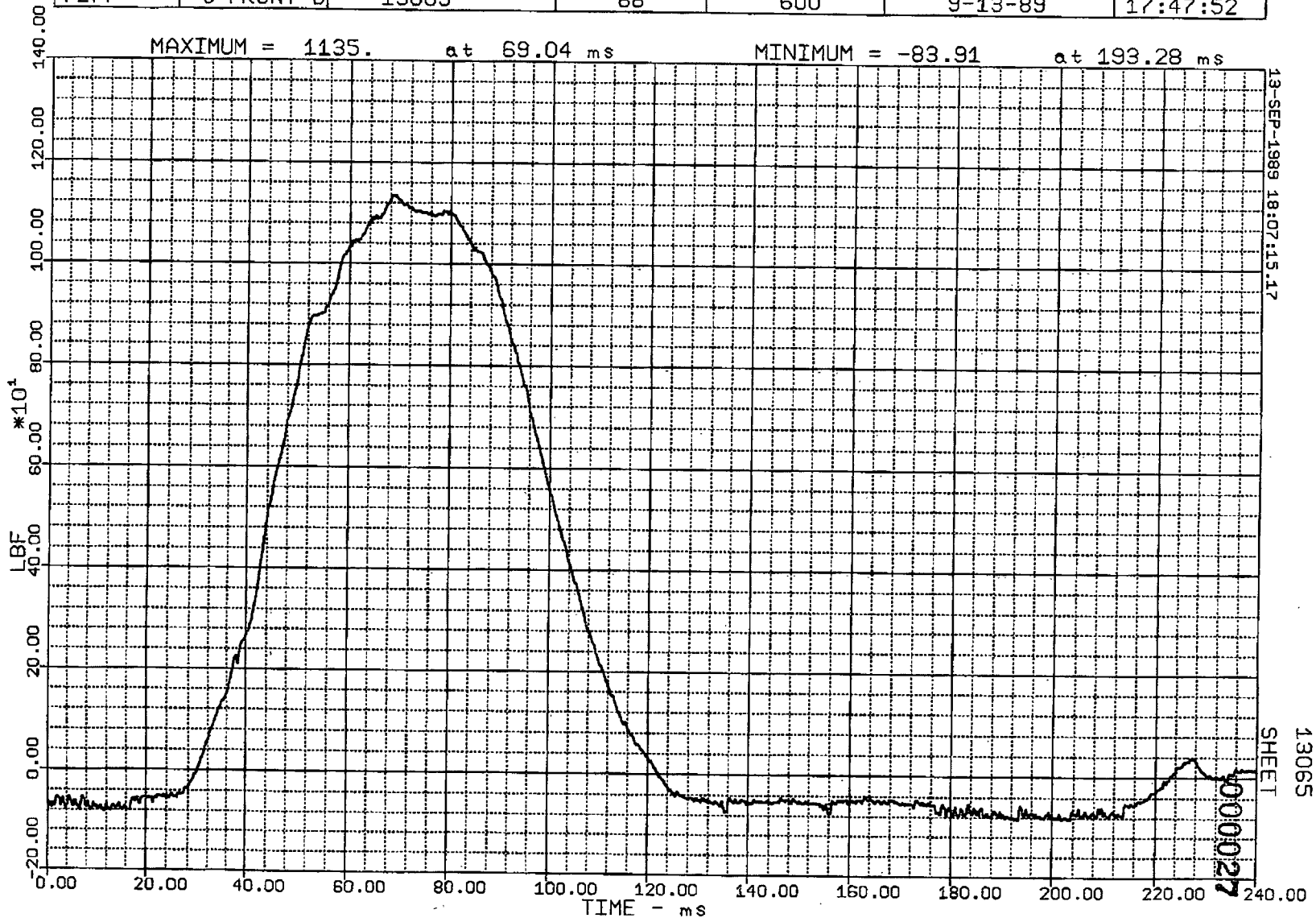
13065 SHEET

000025

CRTS 0007277

PRODUCED BY FORD  
1357

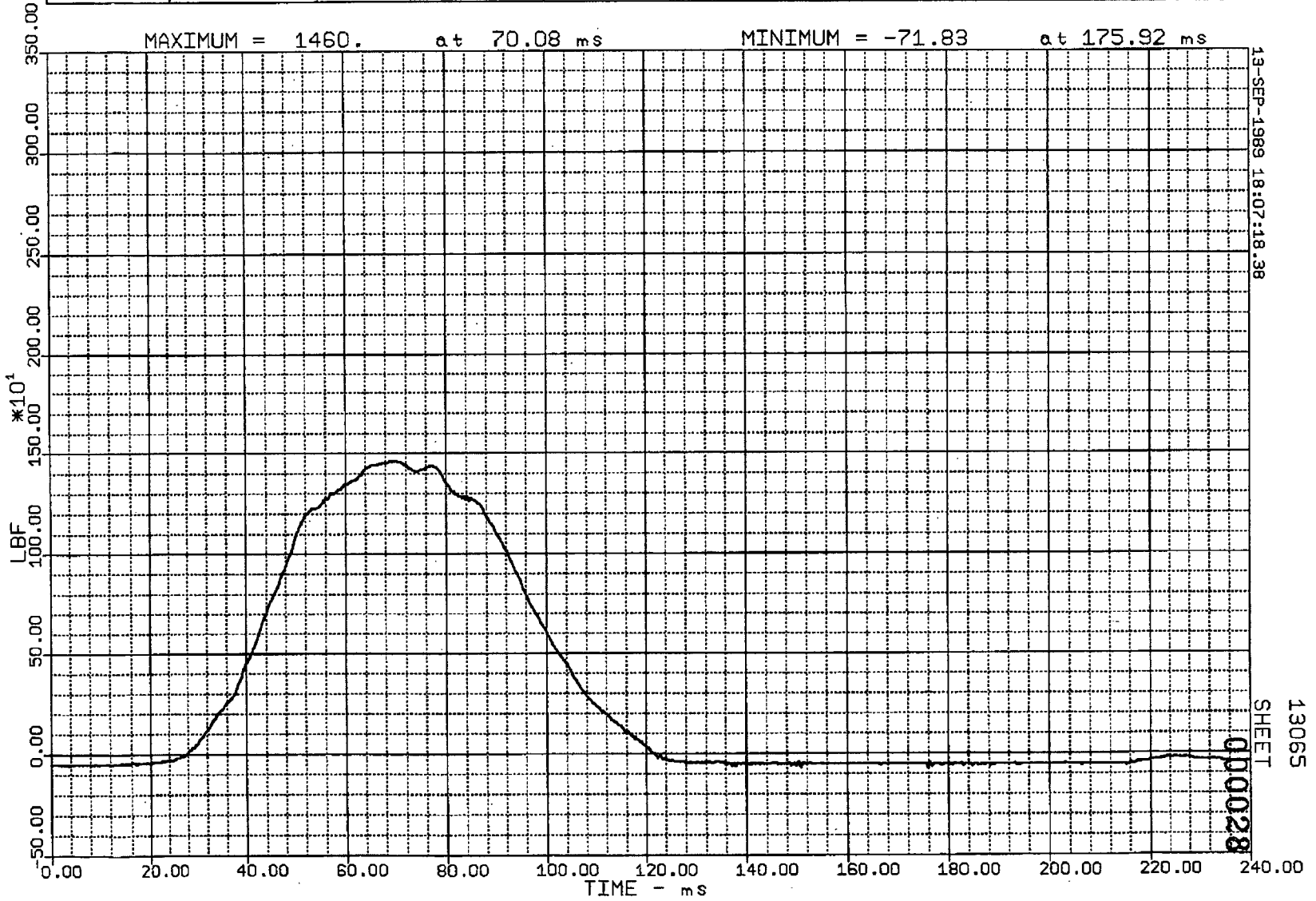
L/F TORSO BELT @ RETRACTOR				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	68	600	9-13-89	17:47:52



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



13-SEP-1989 18:07:18.38

13065 SHEET

000028

CRTS 0007277

PRODUCED BY FORD  
1359

Y - AXIS: L/S HEAD - DRIVER WRT L-ROCKER AT SEAT BOLT MAX = 18.19 at 103.00 MIN = -.1178 at 9.00

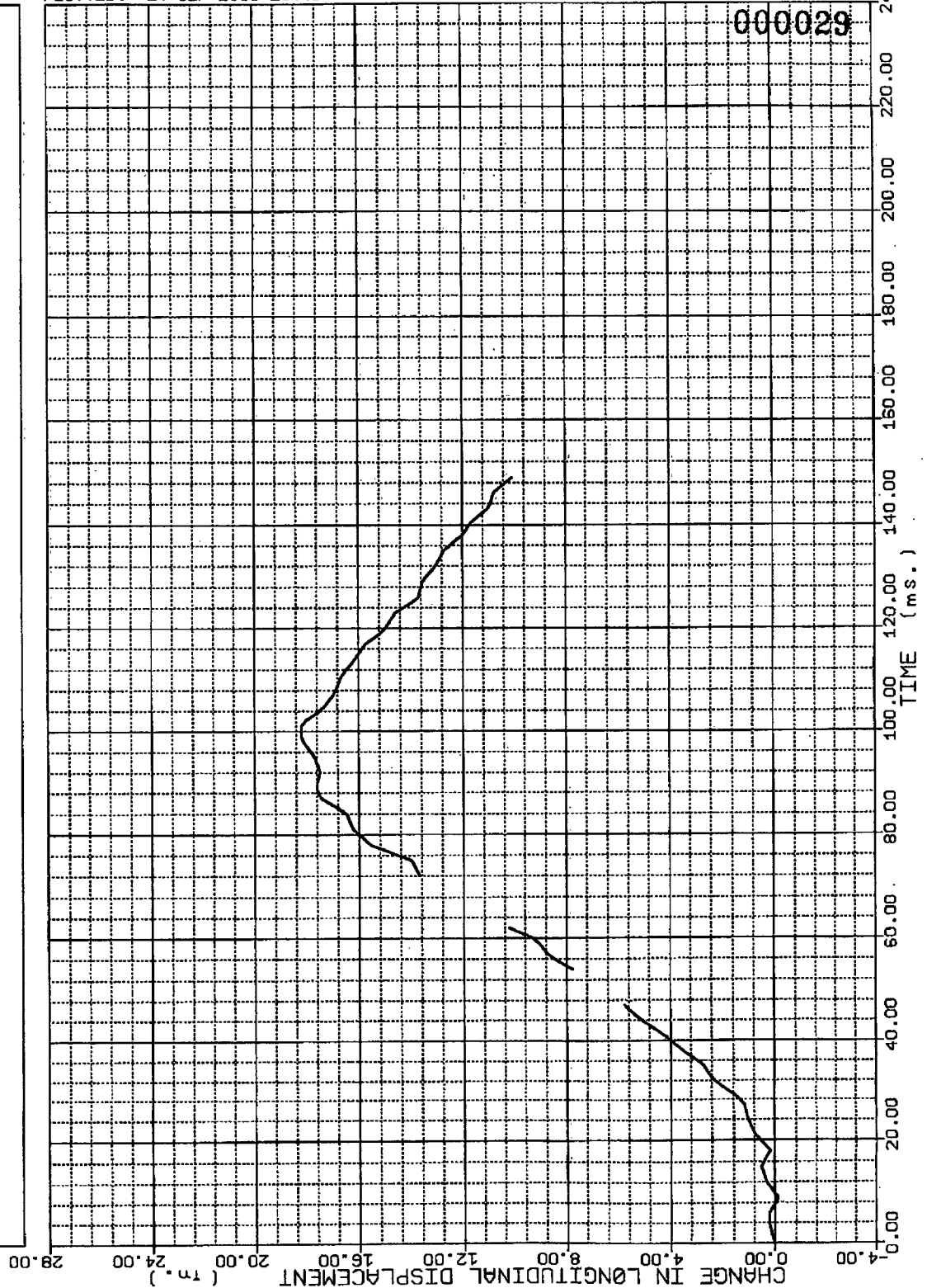
RUN NO.	FACILITY	TEST ORDER NO.	FILM ANALYSIS METHOD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED

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

13065

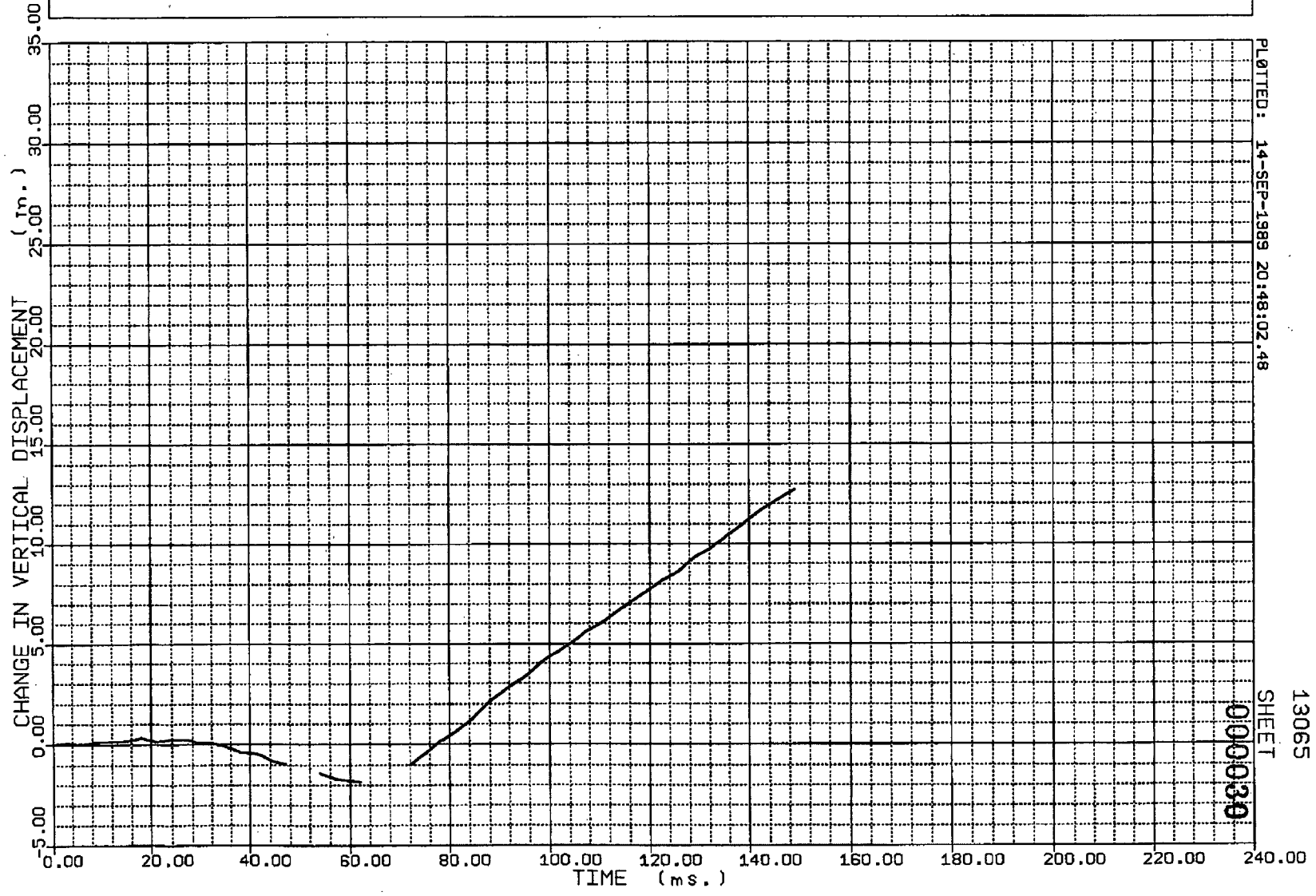
SHEET

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



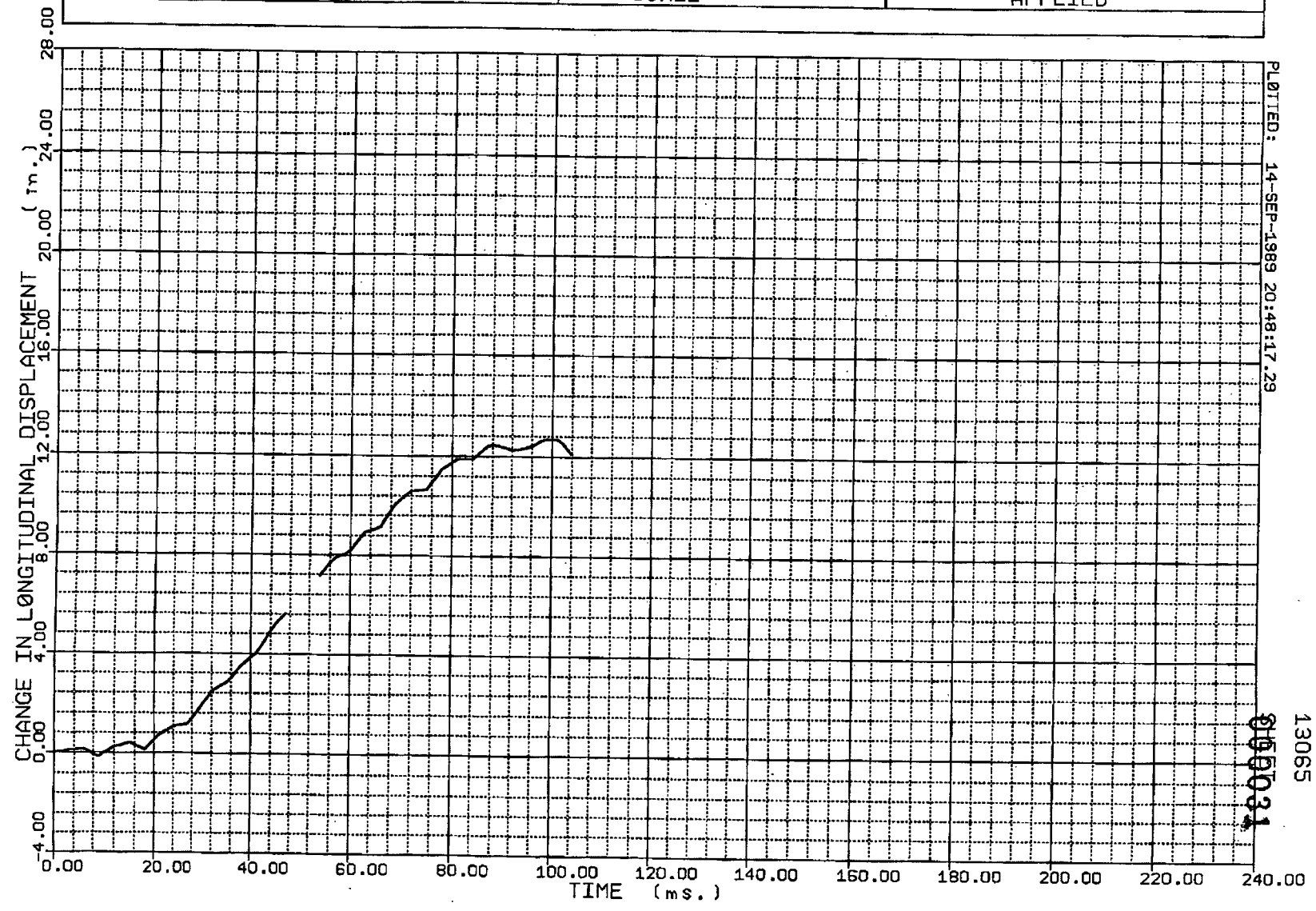
PLOTTED: 14-SEP-1989 20:48:02.48

13065 SHEET 000030

CRTS 0007277

PRODUCED BY FORD  
1361

Y - AXIS: L/SHOULDER - DRIVER WRT L/RÖCKER AT SEAT BÖLT MAX = 12.68 at 99.00 MIN = -.1394 at 9.00				
RUN NÖ.	FACILITY	TEST ÖRDER NÖ.	FILM ANALYSIS METHÖD	PITCH CÖRRECTION
7277	BARRIER	13065	SCALE	APPLIED



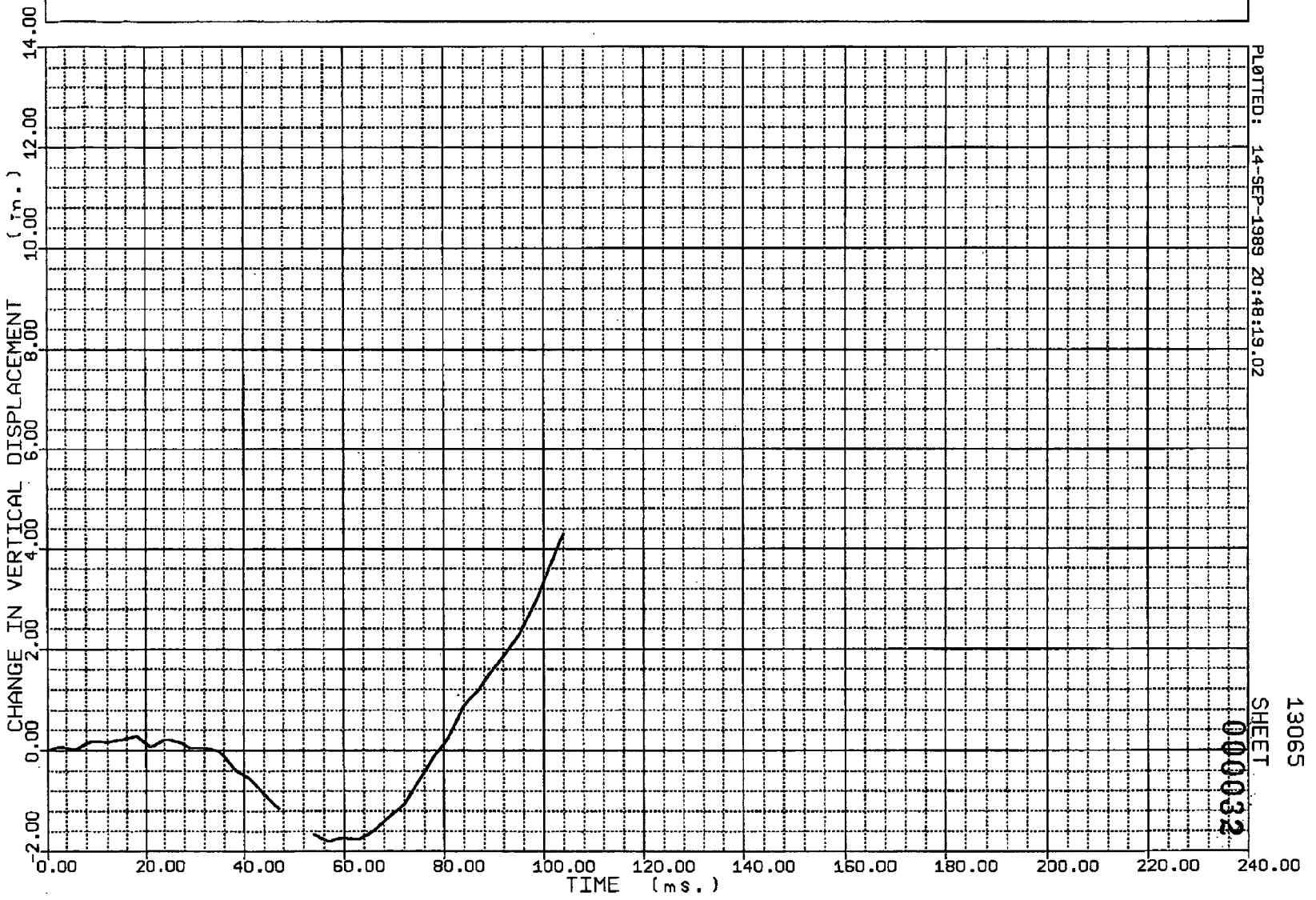
PLOTTED: 14-SEP-1989 20:48:17.29

13065  
000031

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



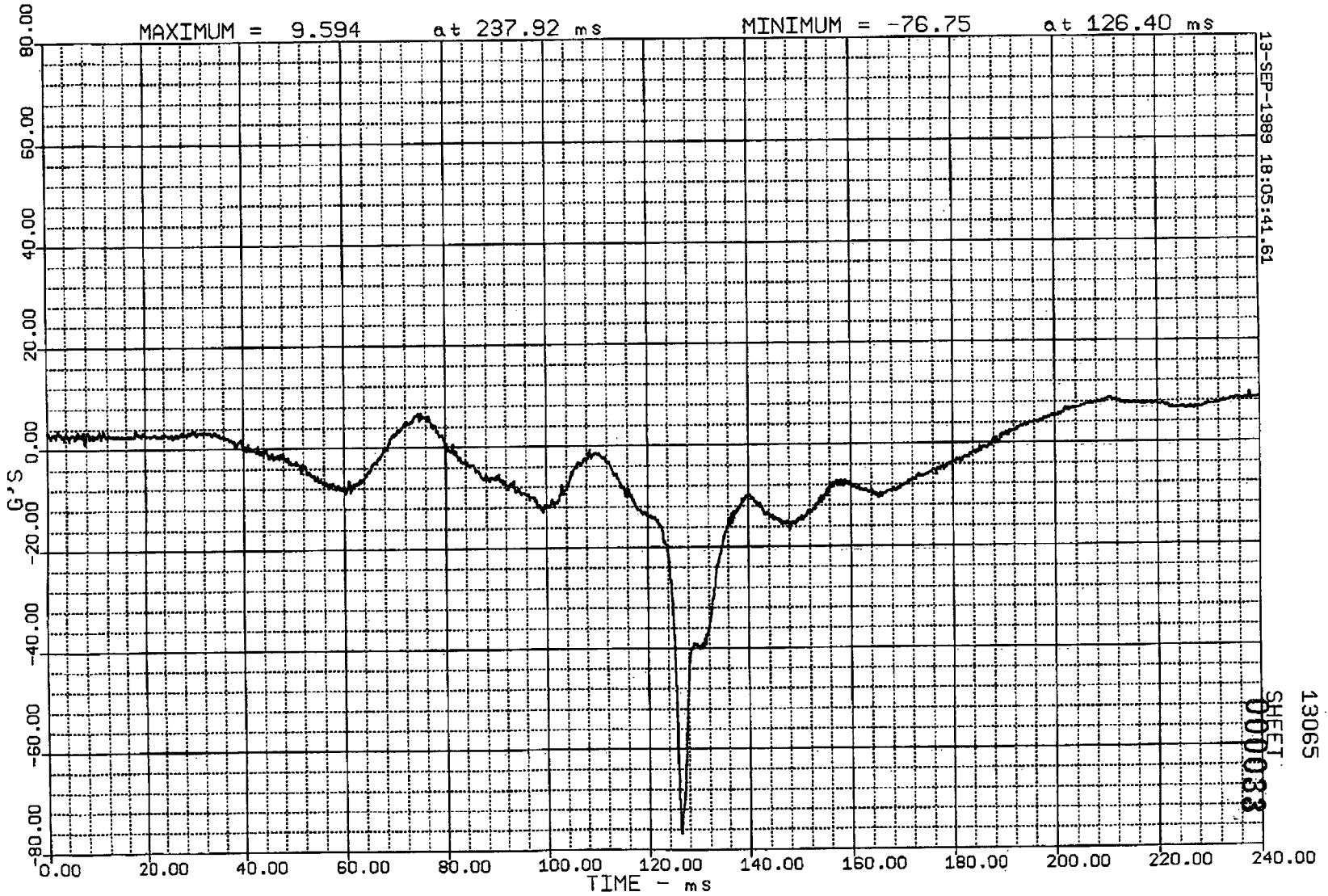
PLOTTED: 14-SEP-1989 20:48:19.02

13065  
SHEET  
000032

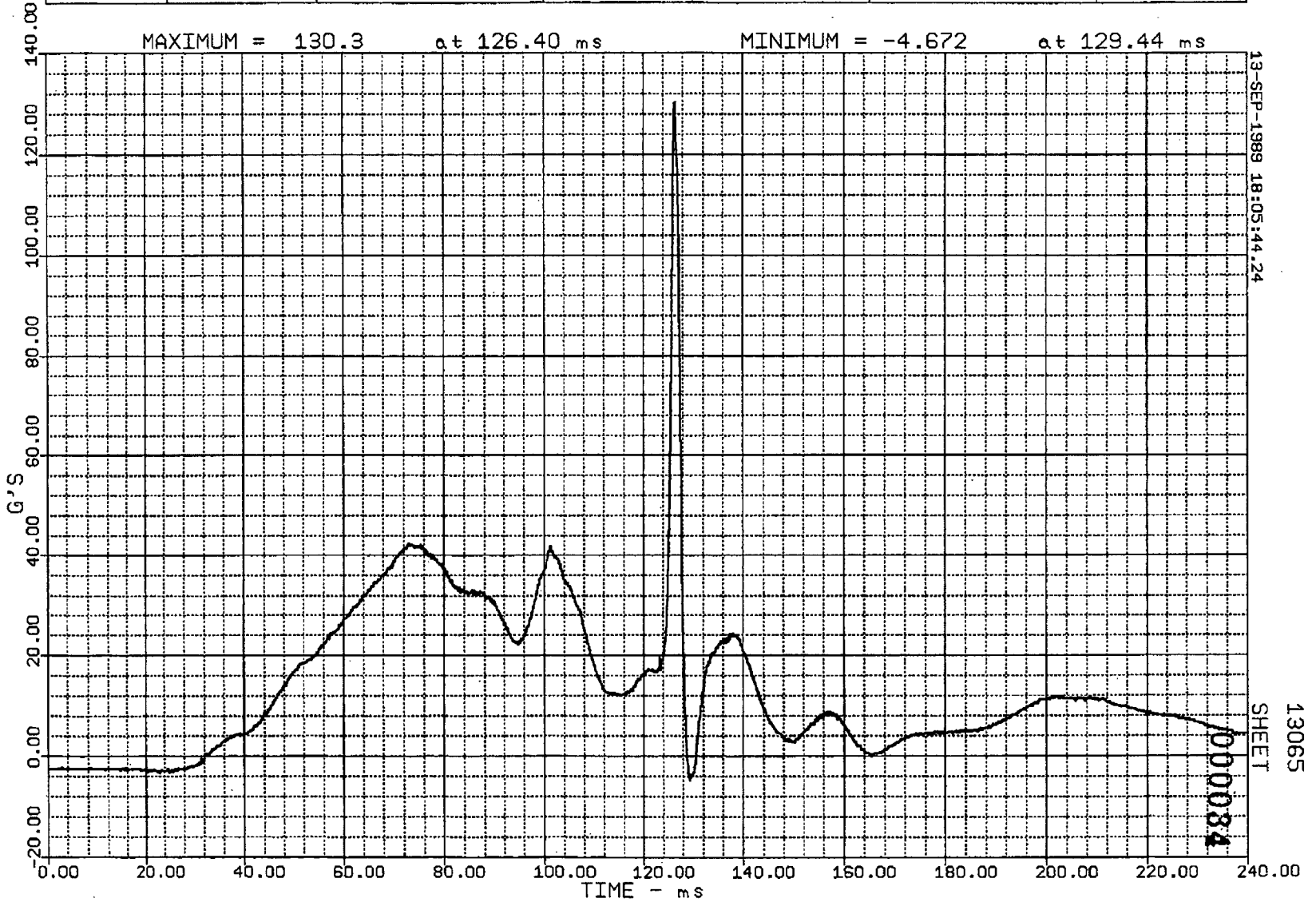
CRIS 0007277

PRODUCED BY FORD  
1363

LONG R/F DUMMY HEAD C.G.				199200	TARGET	
RUN NØ.	FACILITY	TEST ORDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	20	1000	9-13-89	17:47:52



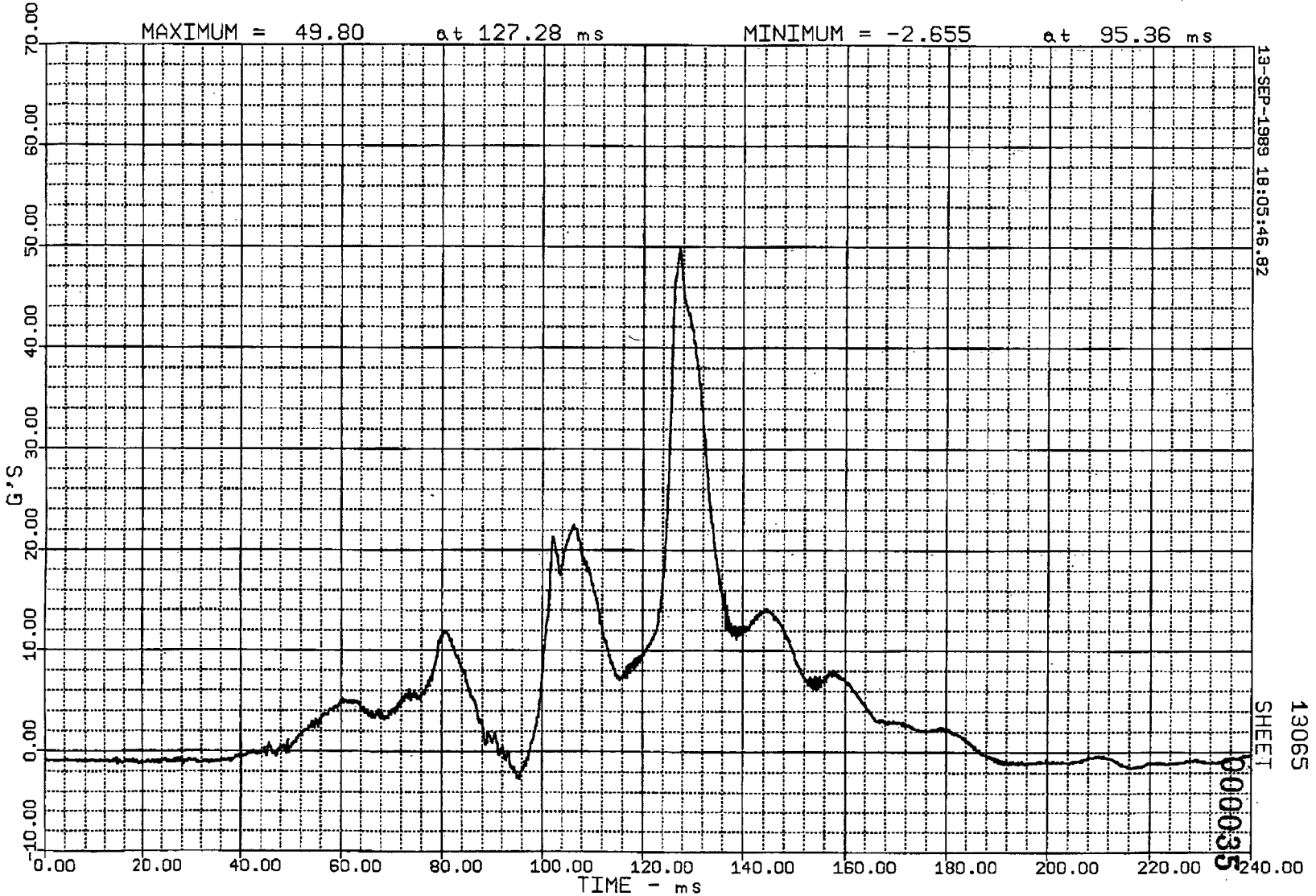
VERT R/F DUMMY HEAD C.G.			199200		TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	21	1000	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1365

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	



13-SEP-1989 18:05:46.82

13065 SHEET

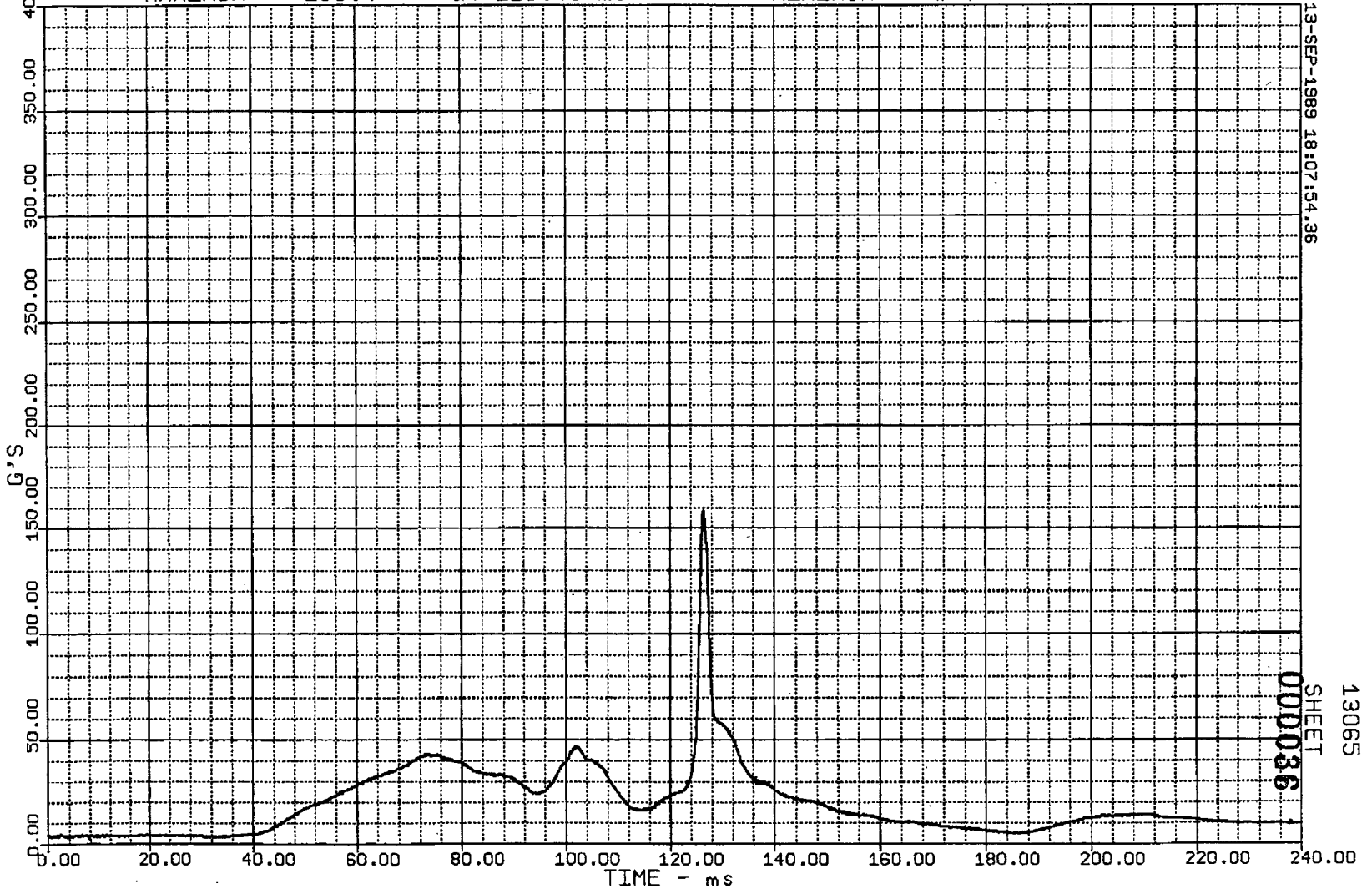
000035

CRTS 0007277

PRODUCED BY FORD  
1366

RES. 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	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



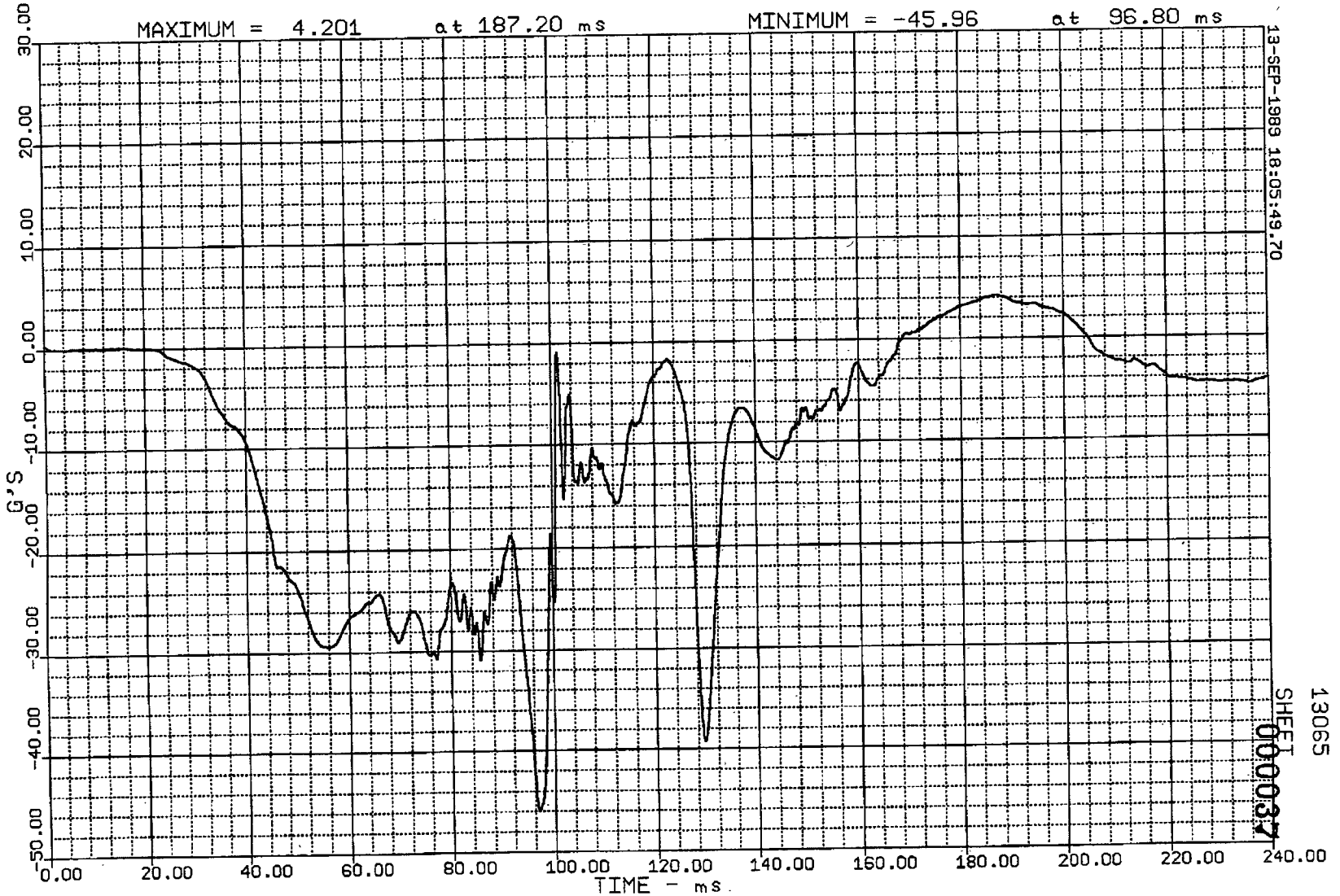
13-SEP-1989 18:07:54.36

13065 SHEET 000036

CRTS 0007277

PRODUCED BY FORD  
1367

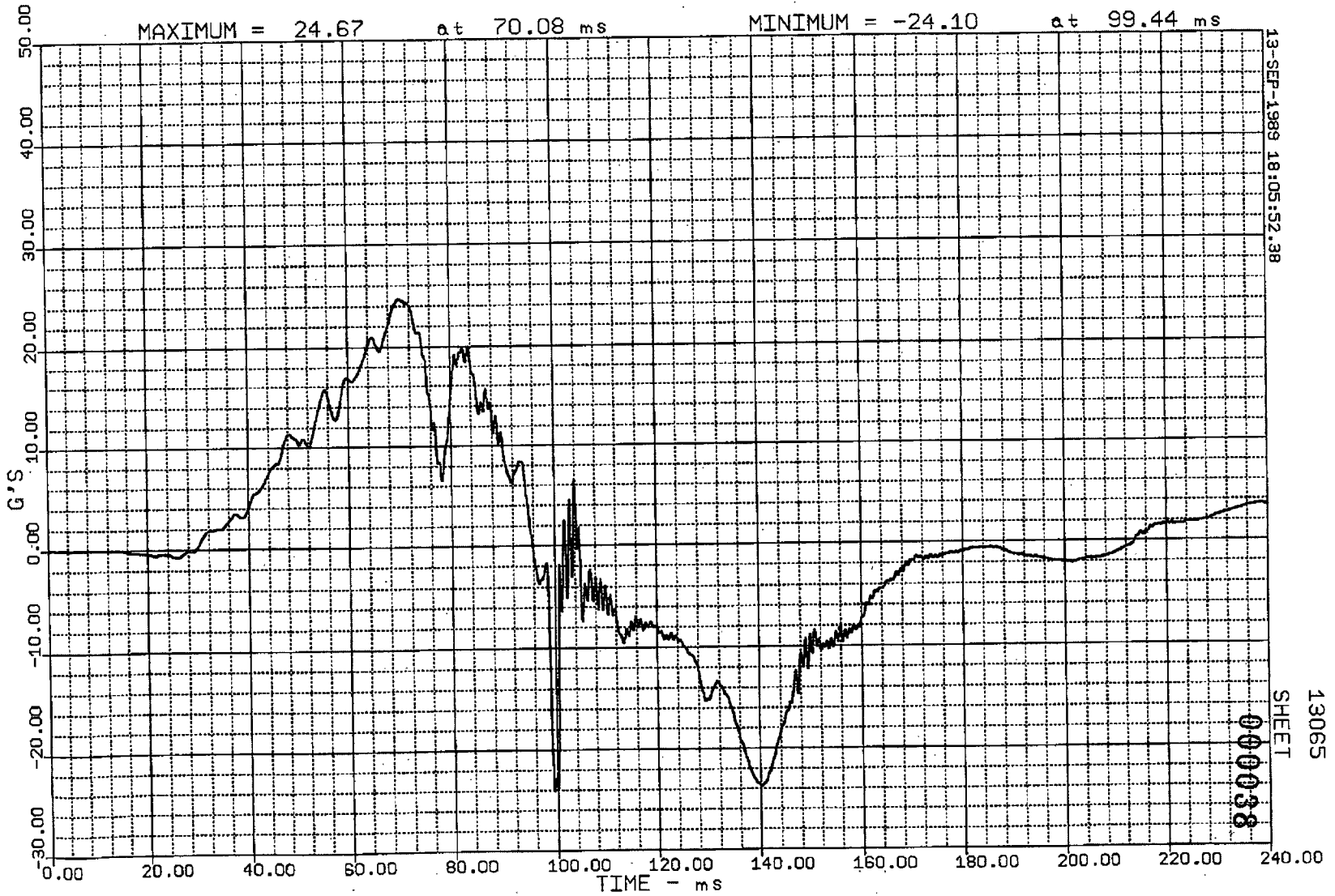
LONG R/F DUMMY CHEST				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	23	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1368

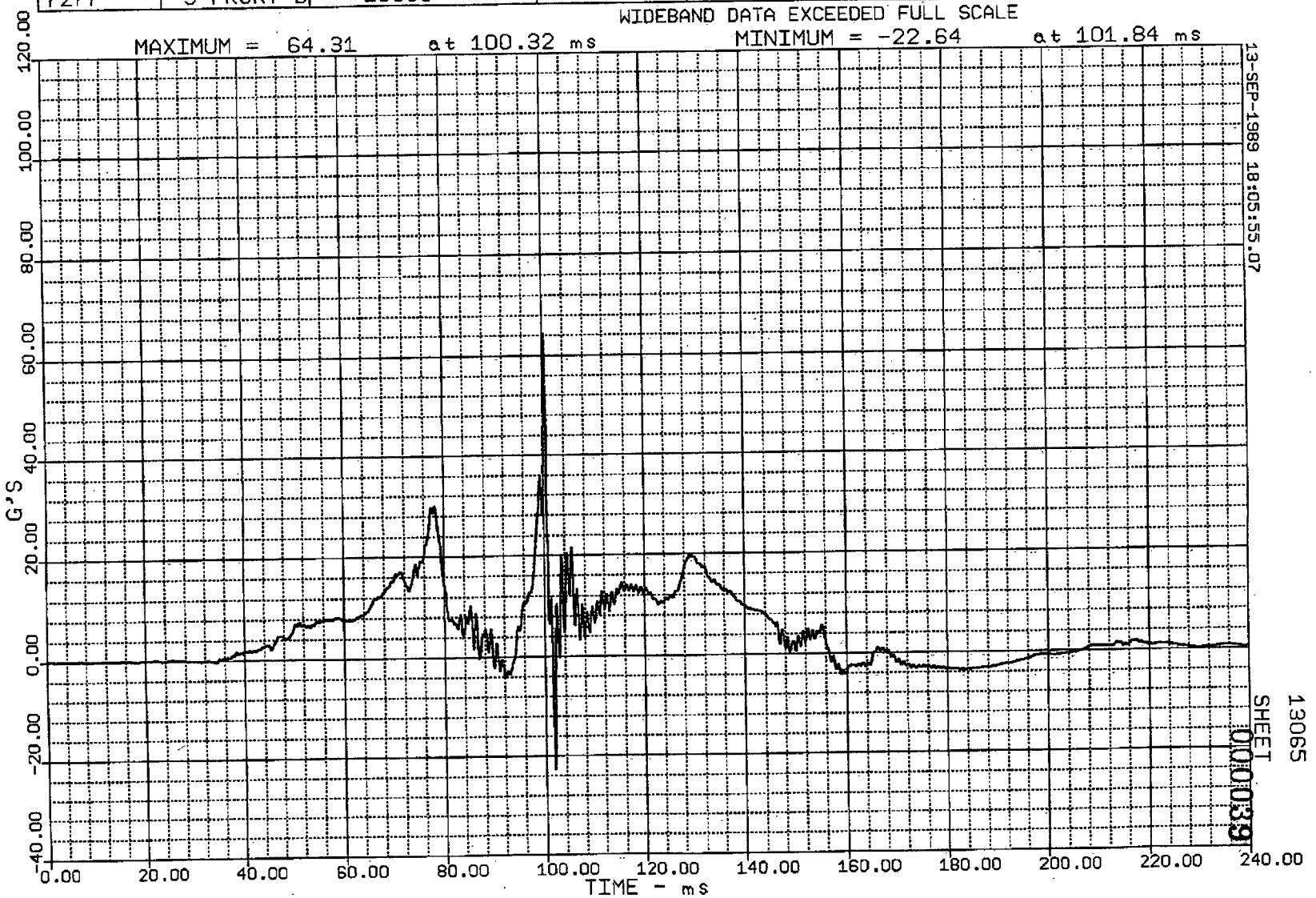
VERT R/F DUMMY CHEST		199200			TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	24	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1369

LAT		R/F DUMMY CHEST		199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRONT B	13065	25	180	9-13-89	17:47:52	



13-SEP-1989 18:05:55.07

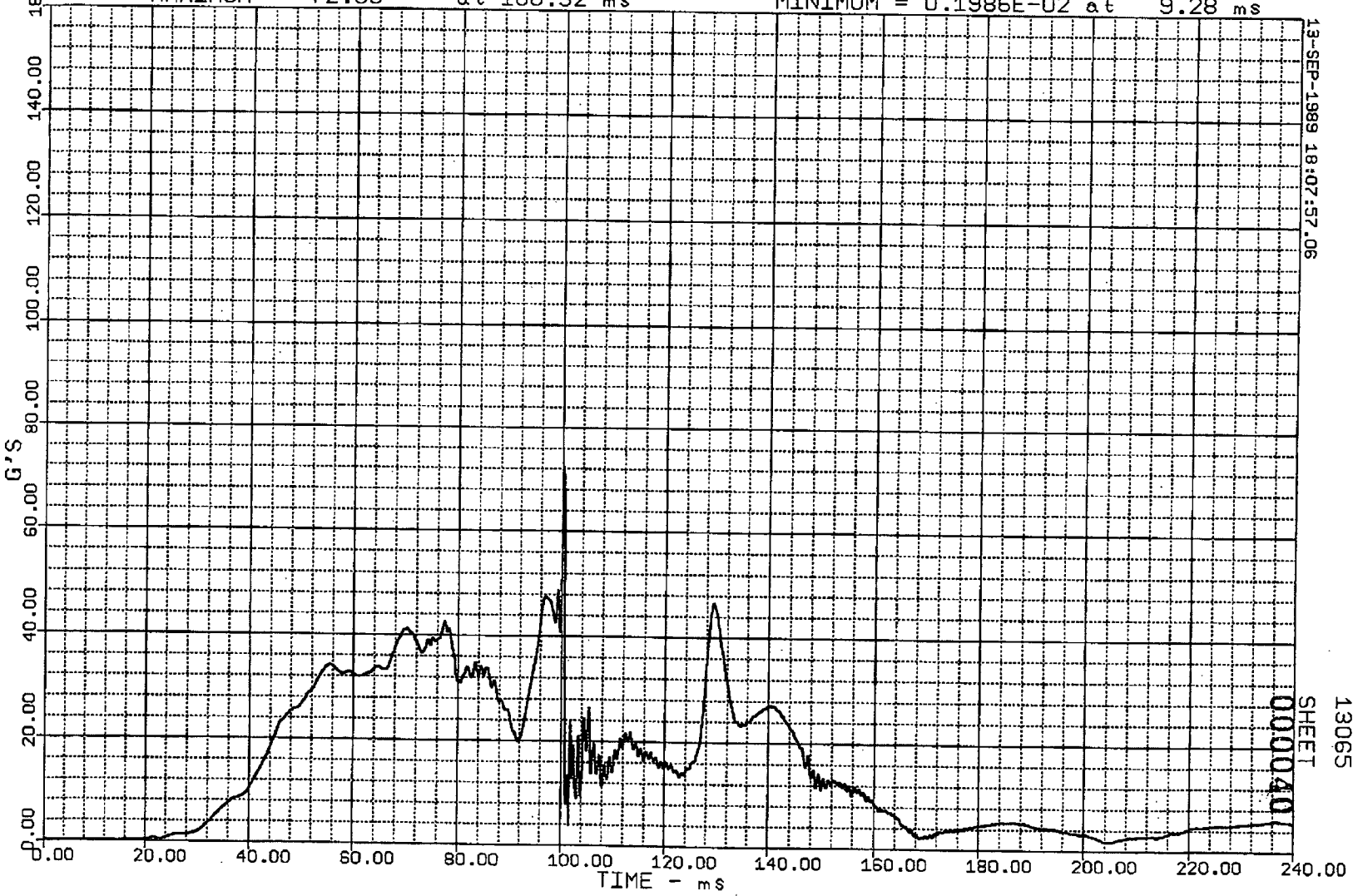
13065  
SHEET  
0000339

CRIS 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 FRØNT 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



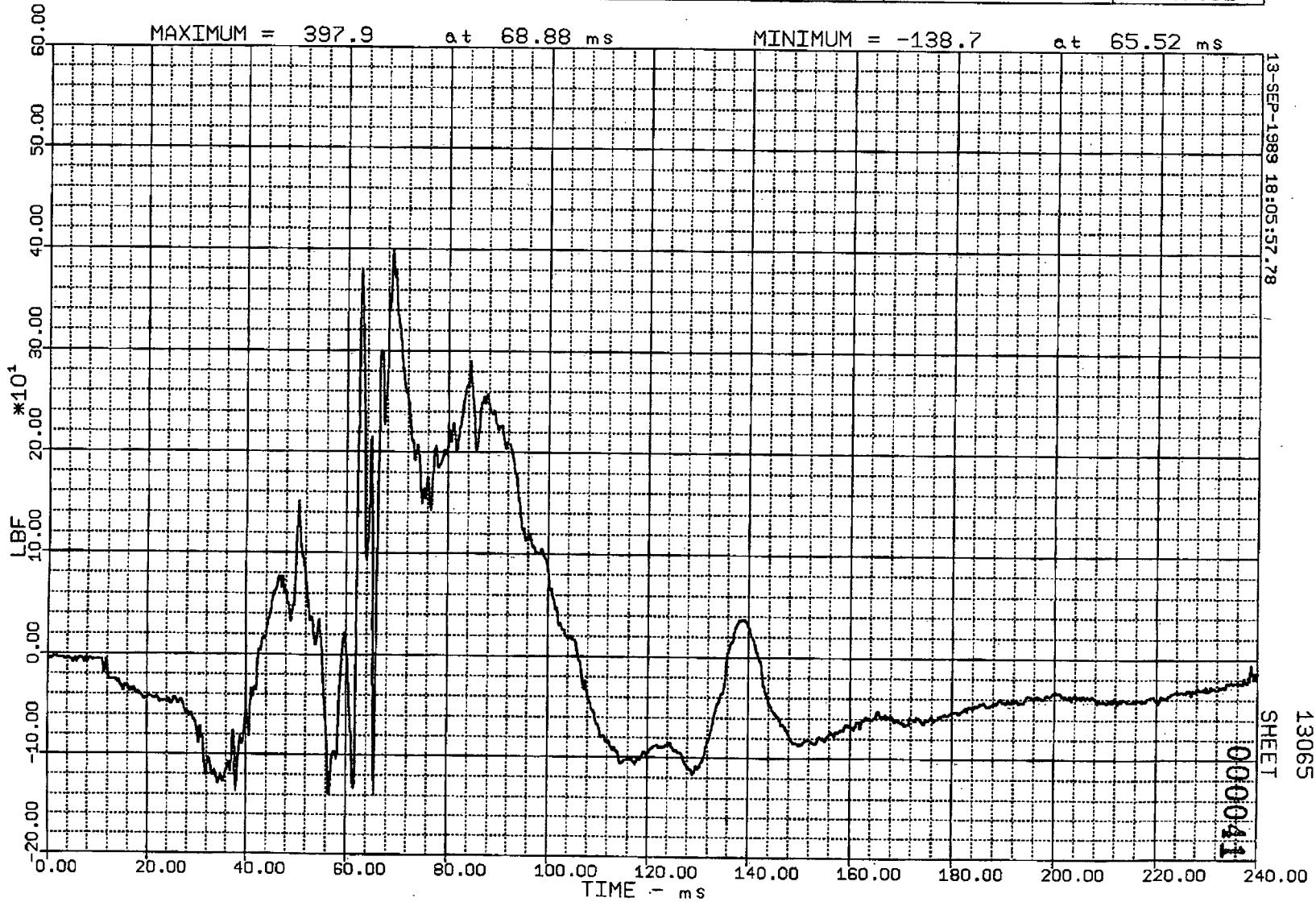
13-SEP-1989 18:07:57.06

13065  
 SHEET  
 000040

CRTS 0007277

PRODUCED BY FORD  
 1371

AXIAL R/F DUMMY L/FEMUR LOAD B#1				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	27	600	9-13-89	17:47:52



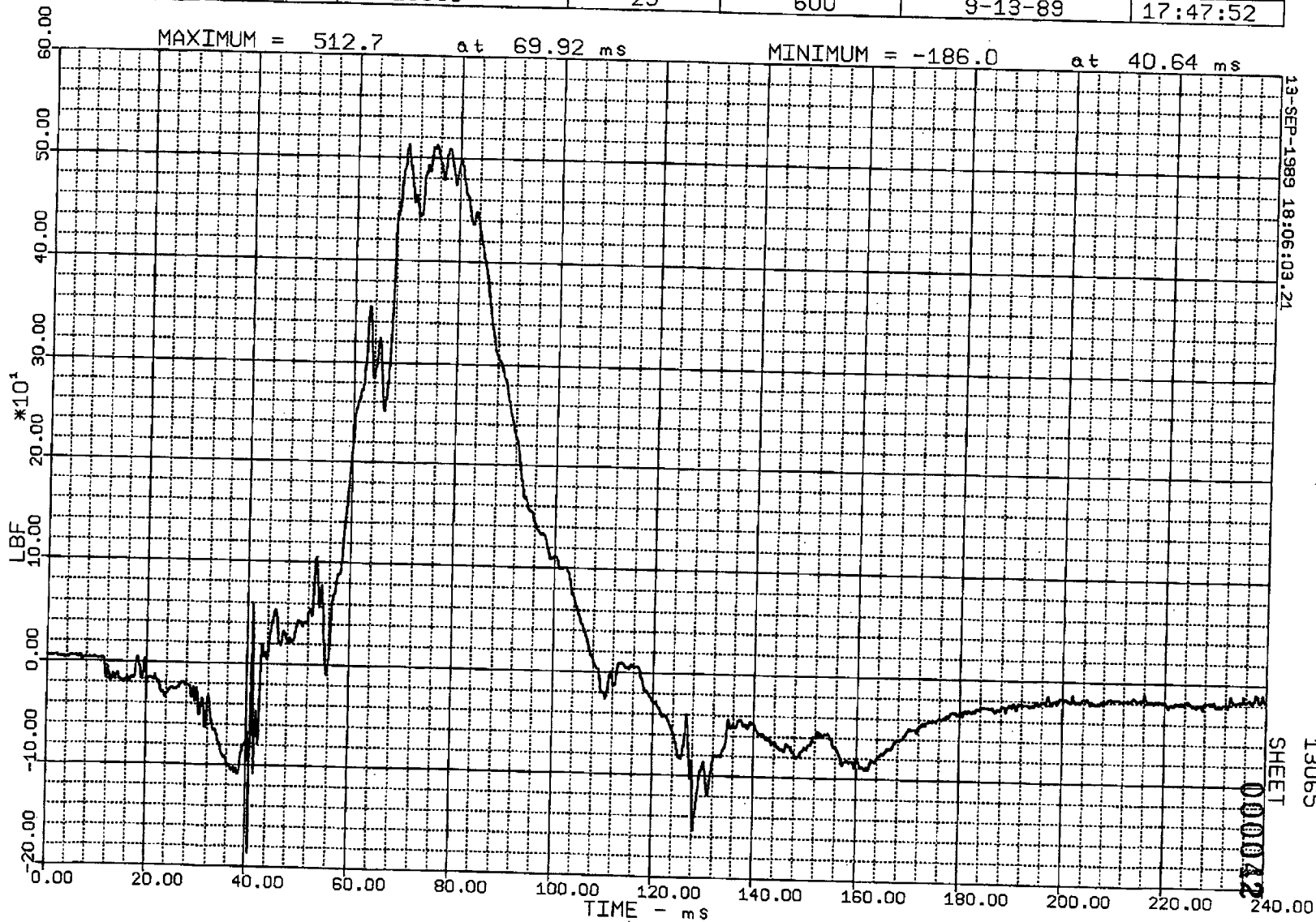
13-SEP-1989 18:05:57.78

13065  
SHEET  
000041

CRTS 0007277

PRODUCED BY FORD  
1372

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



CRIS 0007277

PRODUCED BY FORD  
1373

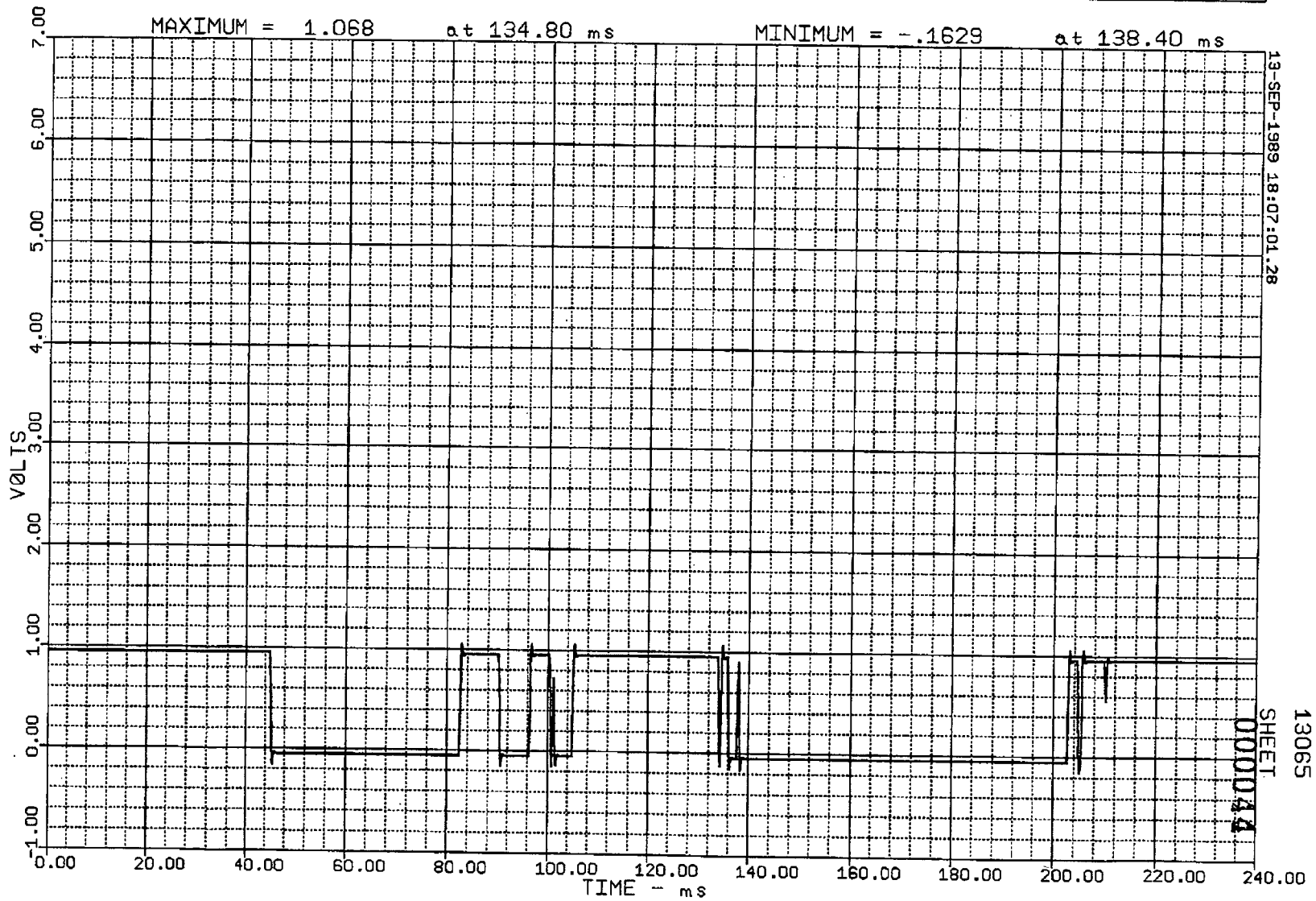
R/F DUMMY L/KNEE SW				199200		TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRØNT B	13065	59	1000	9-13-89	17:47:52	



CRIS 0007277

PRODUCED BY FORD  
1374

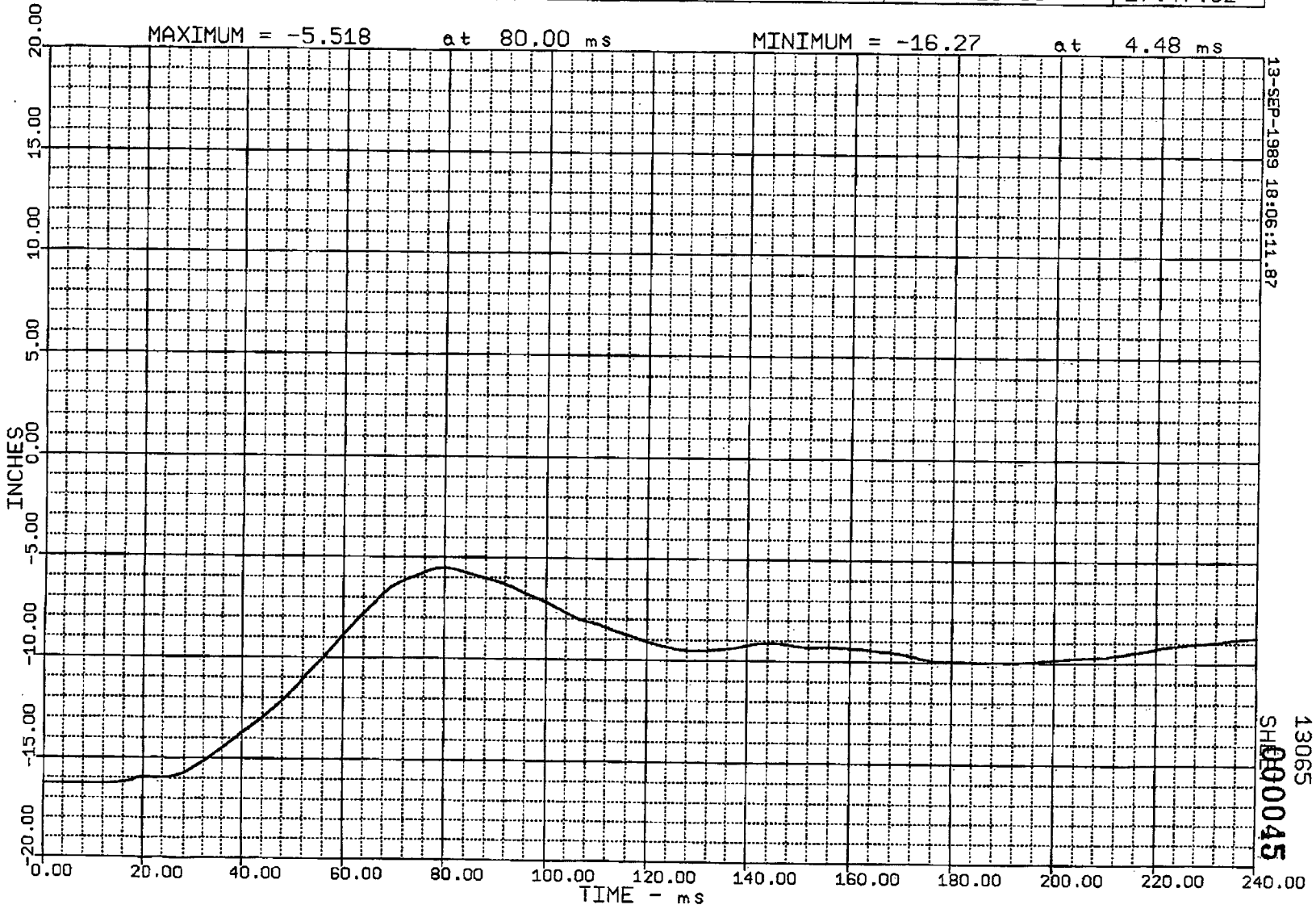
R/F DUMMY R/KNEE SW				199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRONT B	13065	60	1000	9-13-89	17:47:52	



CRTS 0007277

PRODUCED BY FORD  
1375

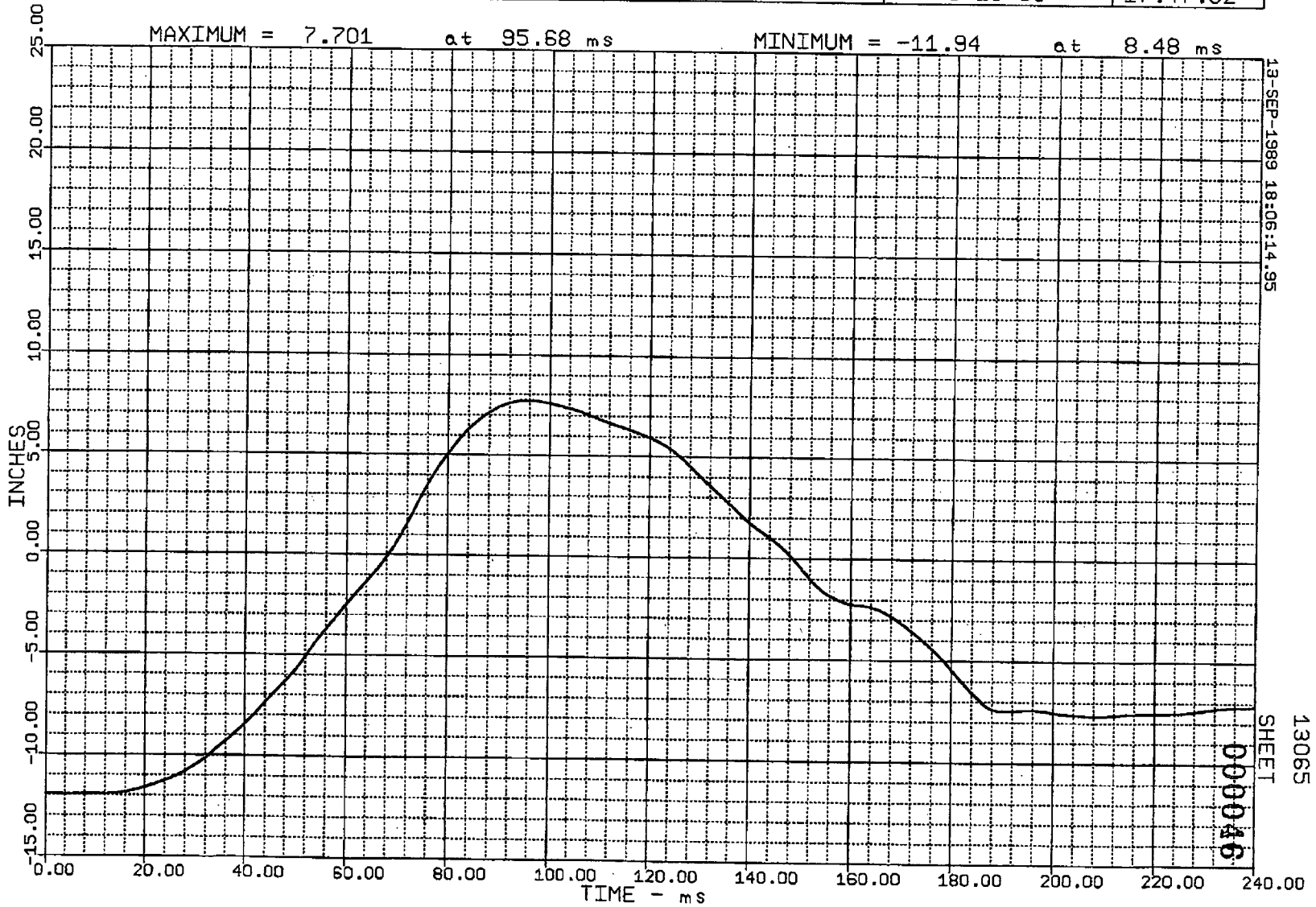
R/F DUMMY L/KNEE S.P.				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	33	60	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1376

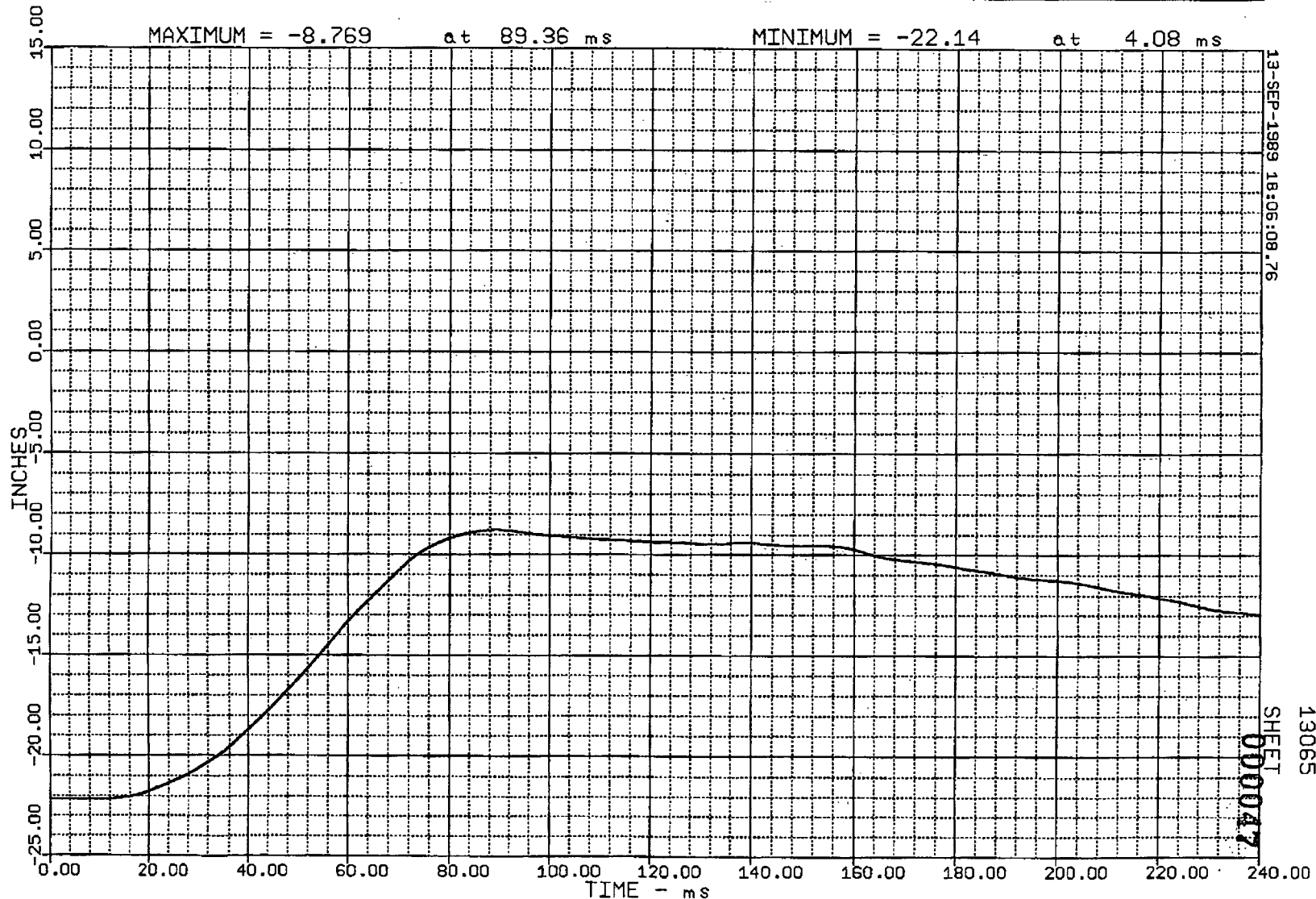
R/F DUMMY R/KNEE S.P.				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	34	60	9-13-89	17:47:52



CRIS 0007277

PRODUCED BY FORD  
1377

R/F DUMMY PELVIS S.P.				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	32	60	9-13-89	17:47:52



13-SEP-1989 18:06:08.76

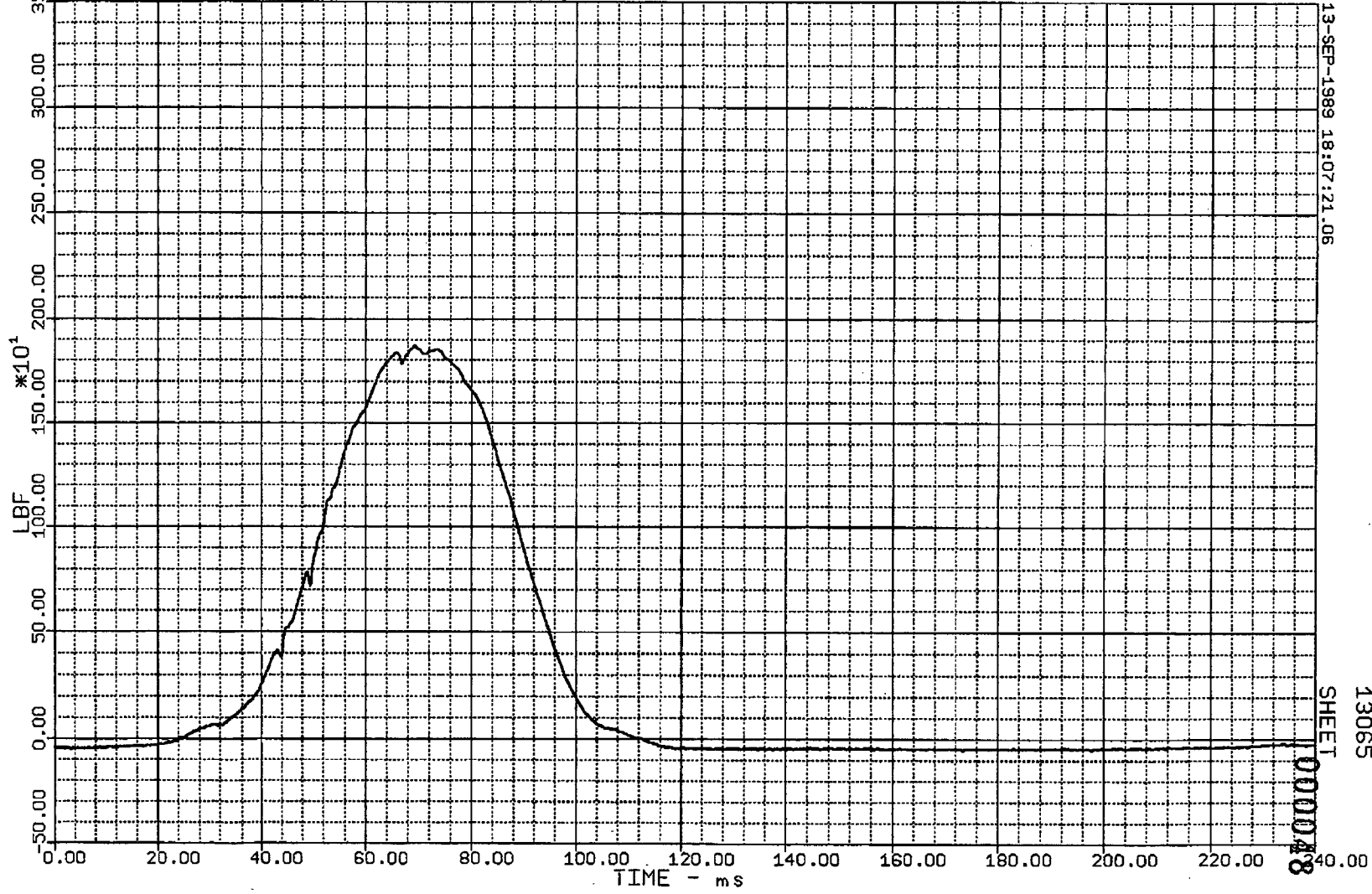
13065  
SHEET  
000047

CRTS 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

MAXIMUM = 1870. at 69.28 ms      MINIMUM = -52.44 at 197.68 ms



13-SEP-1989 18:07:21.08

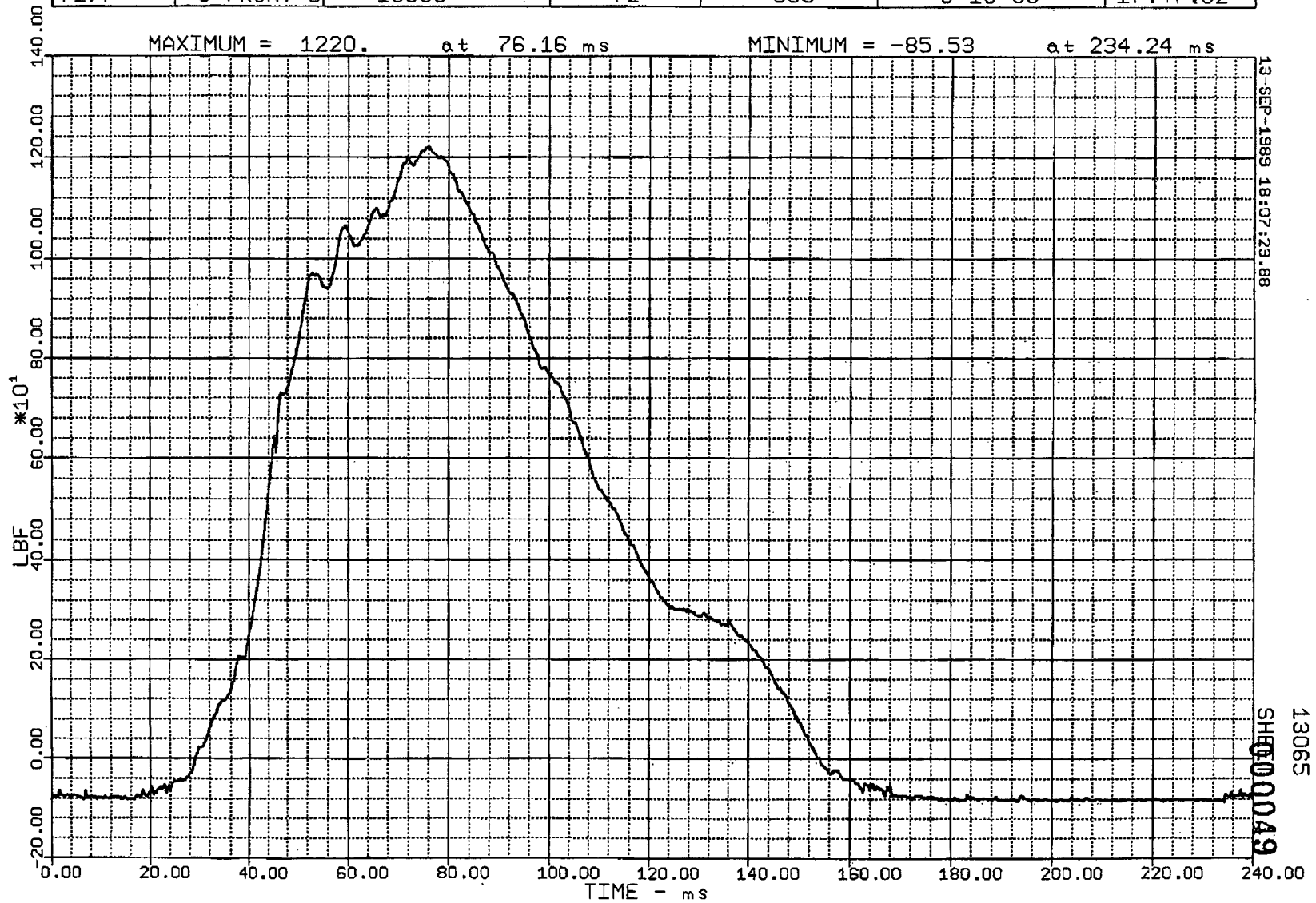
13065 SHEET

000078

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



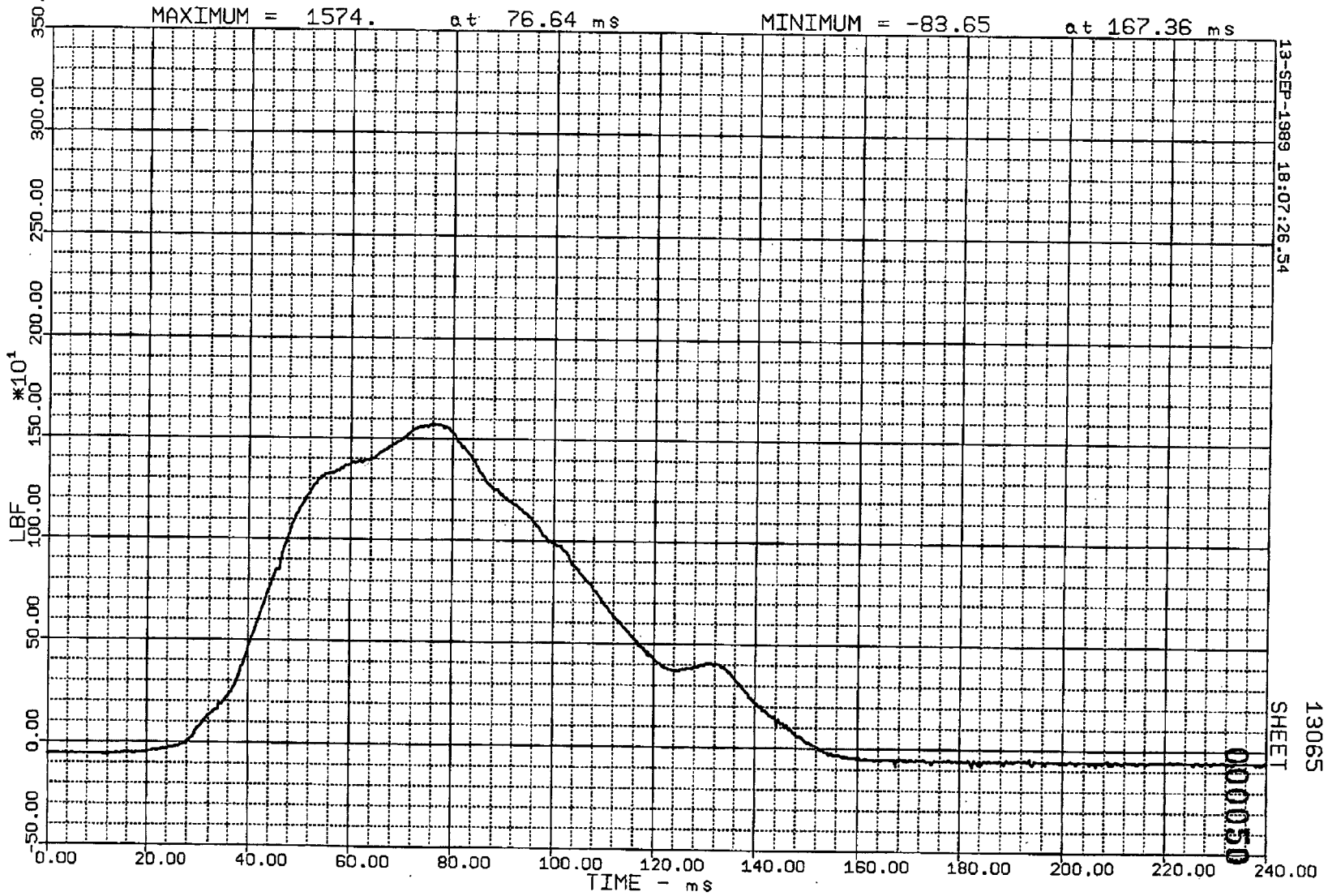
13-SEP-1989 18:07:23.88

13065  
SHE000049

CRTS 0007277

PRODUCED BY FORD  
1380

R/F TORSO BELT @ D-RING				199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME	
7277	S FRØNT B	13065	73	600	9-13-89	17:47:52	



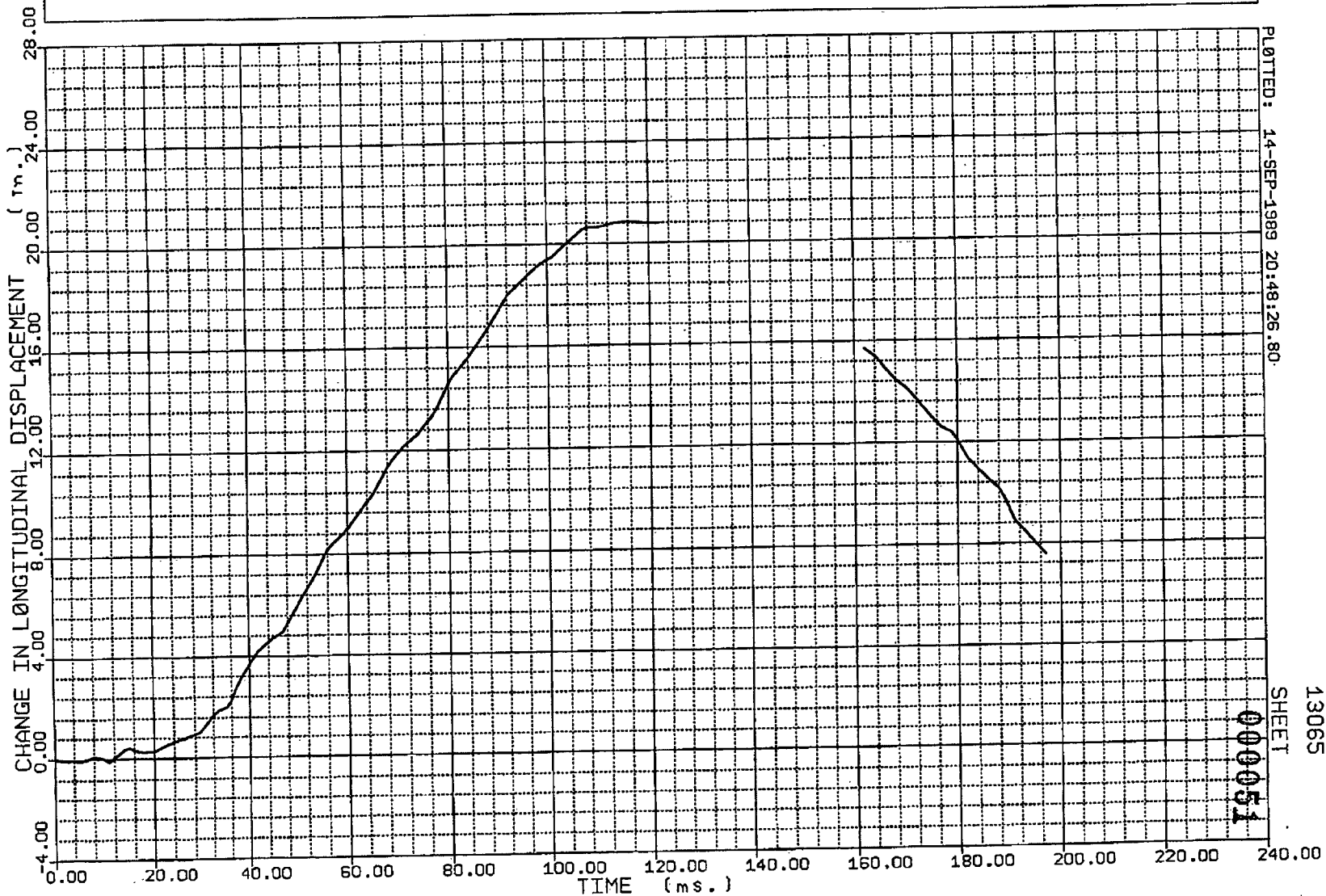
13-SEP-1989 18:07:26.54

13065 SHEET

CRTS 0007277

PRODUCED BY FORD  
1381

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 NØ.	FACILITY	TEST ØRDER NØ.	FILM ANALYSIS METHØD	PITCH CORRECTION
7277	BARRIER	13065	SCALE	APPLIED



PLOTTED: 14-SEP-1989 20:48:26.80

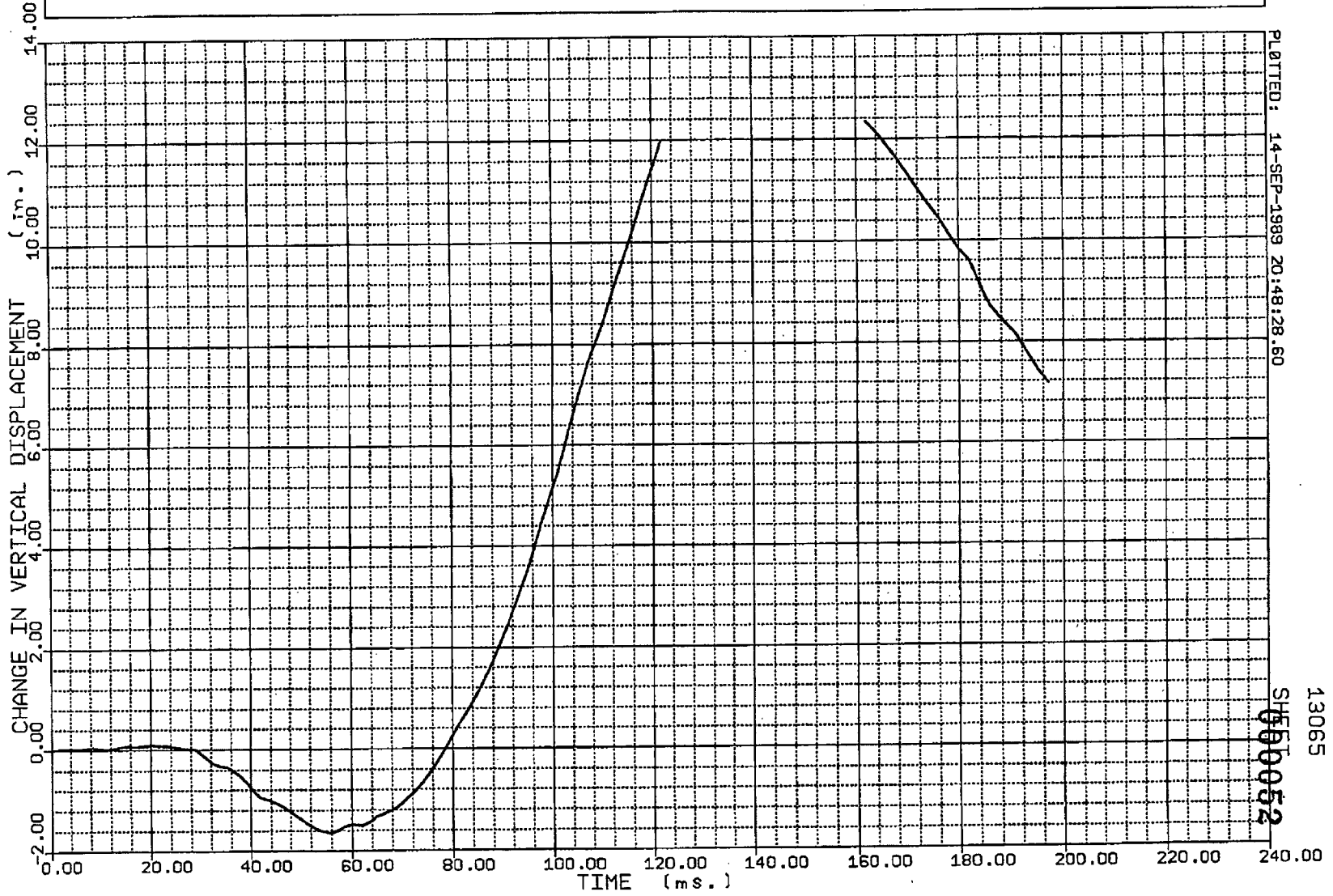
000051  
SHEET  
13065

CRTS 0007277

PRODUCED BY FORD  
1382

Y - AXIS: R/S HEAD - PASSENGER WRT R/RØCKER AT SEAT BØLT MAX = 12.35 at 162.00 MIN = -1.648 at 56.00

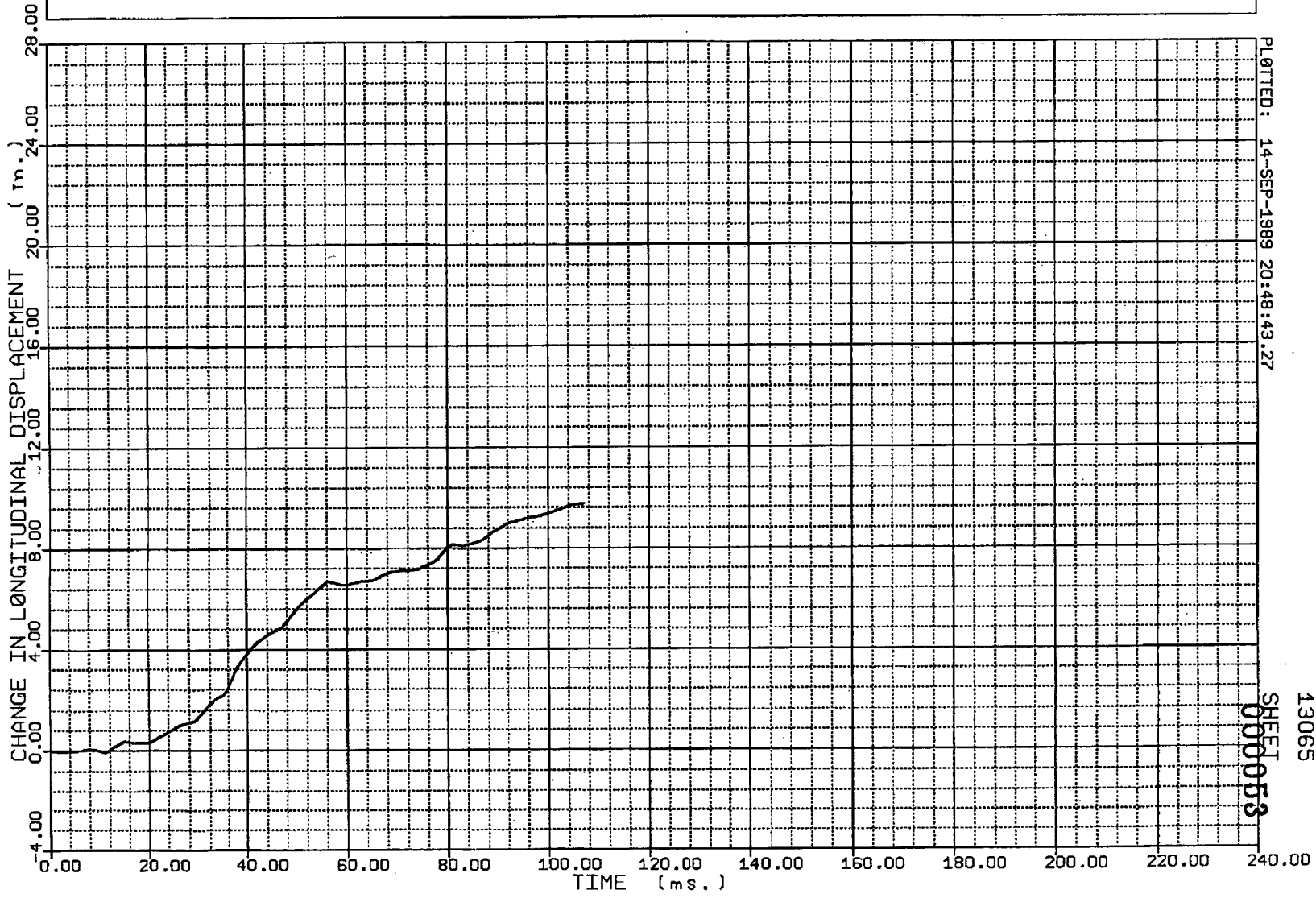
RUN NØ.	FACILITY	TEST ØRDER NØ.	FILM ANALYSIS METHØD	PITCH CØRRECTION
7277	BARRIER	13065	SCALE	APPLIED



CRIS 0007277

PRODUCED BY FORD  
1383

Y - AXIS: R/SHOULDER - PASSENGER WRT R/RÖCKER AT SEAT BÖLMAX = 9.759 at 107.00 MIN = -.7955E-01 at 11.00				
RUN NÖ.	FACILITY	TEST ÖRDER NÖ.	FILM ANALYSIS METHÖD	PITCH CÖRRECTION
7277	BARRIER	13065	SCALE	APPLIED



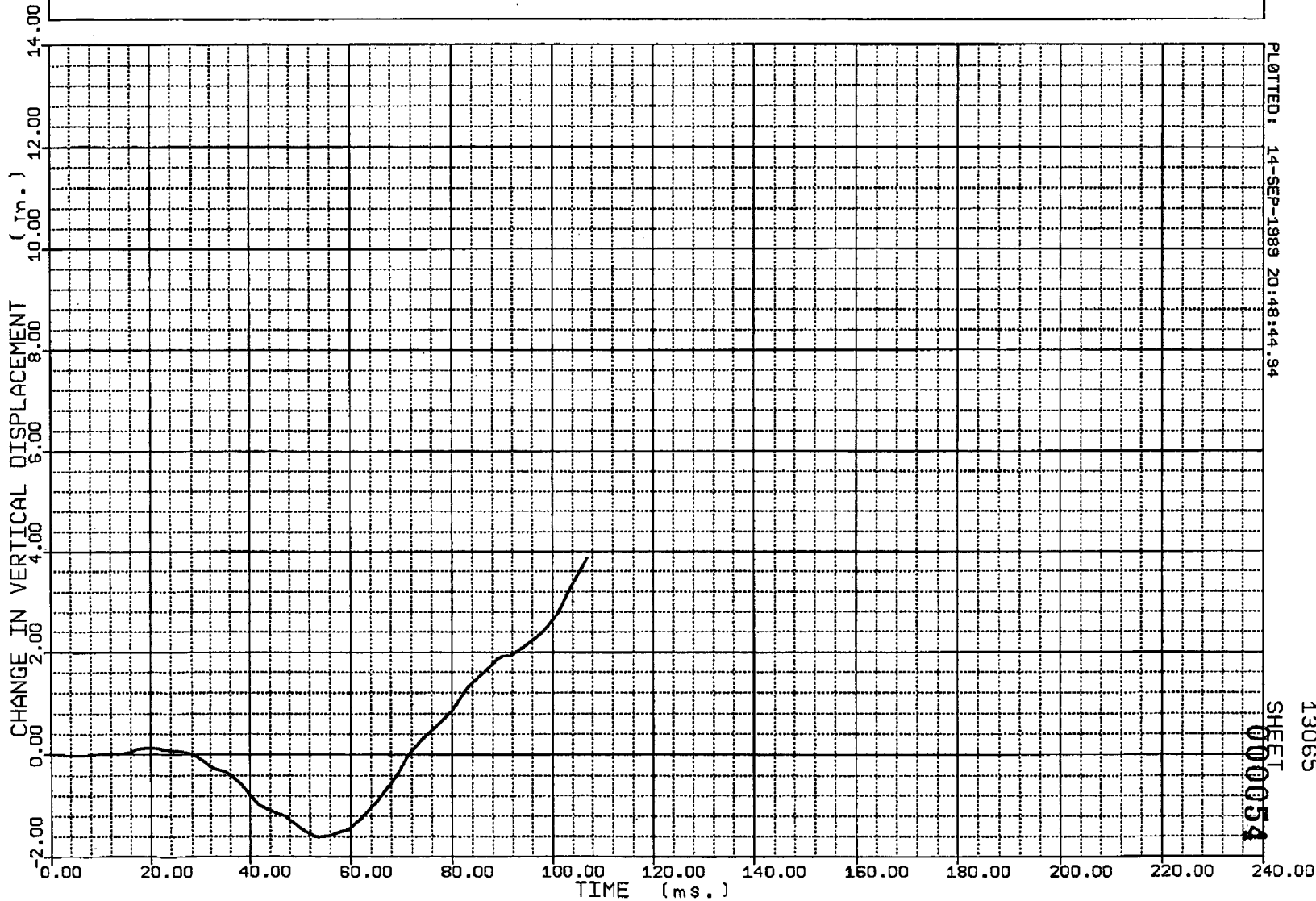
PLOTTED: 14-SEP-1989 20:48:43.27

SHEET  
000053  
13065

CRIS 0007277

PRODUCED BY FORD  
1384

Y - AXIS: R/SHOULDER - PASSENGER WRT R/ROCKER AT SEAT BØLMAX = 3.875 at 107.00 MIN = -1.609 at 54.00				
RUN NØ.	FACILITY	TEST ØRDER NØ.	FILM ANALYSIS METHØD	PITCH CØRRECTION
7277	BARRIER	13065	SCALE	APPLIED



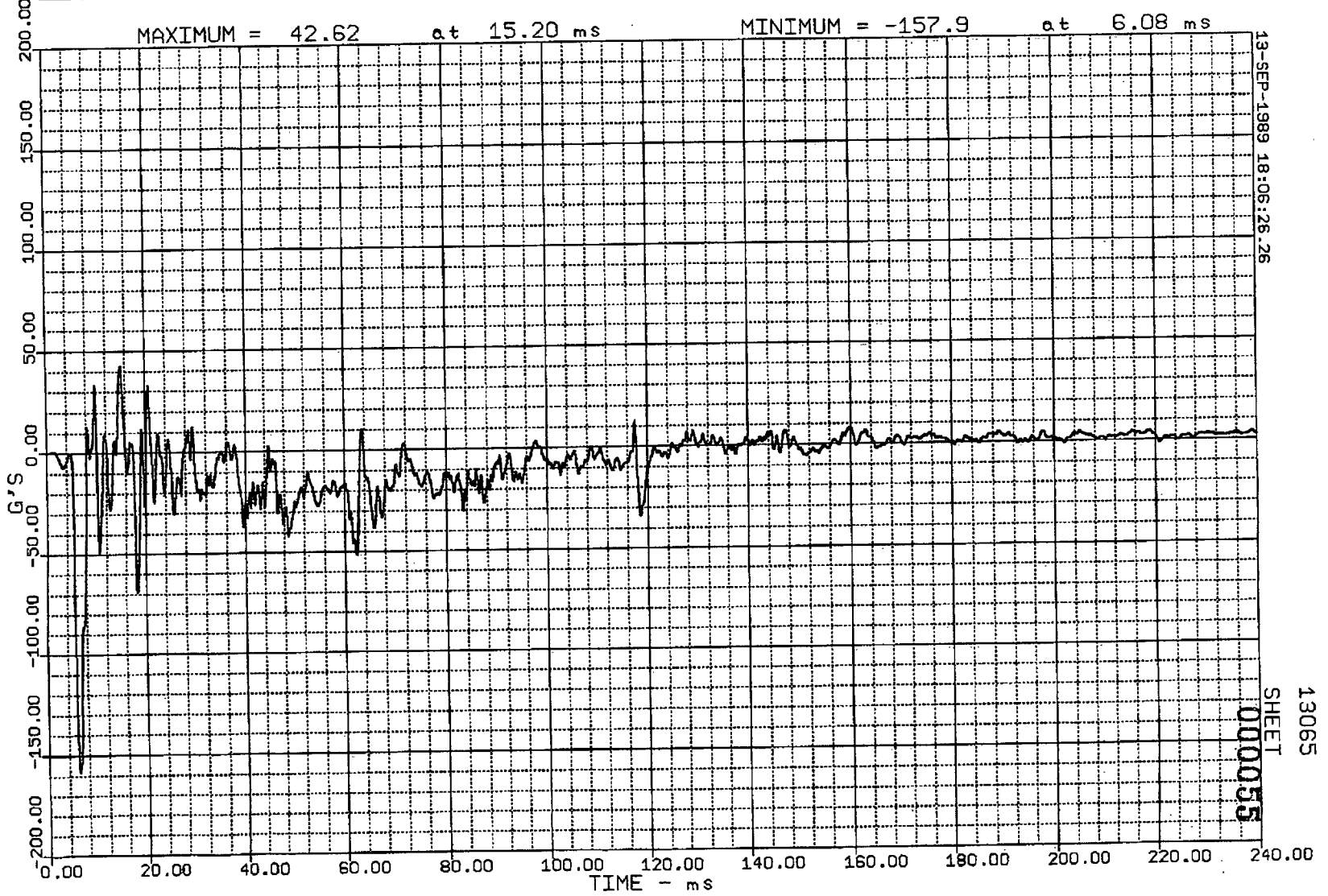
PLOTTED: 14-SEP-1989 20:48:44.94

13065  
SHEET  
000054

CRIS 0007277

PRODUCED BY FORD  
1385

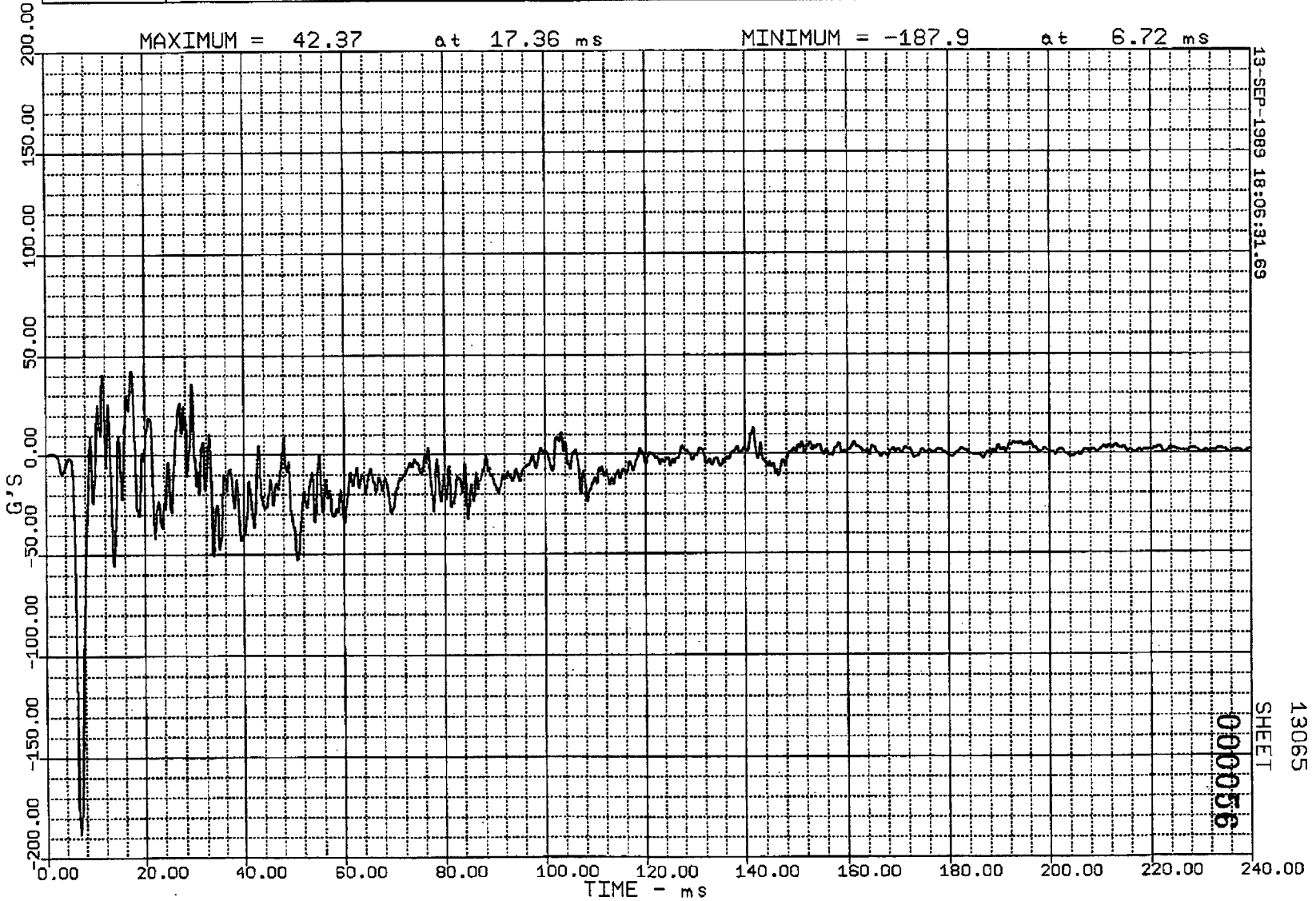
LONG L/FRAME @ B-PILLAR				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	41	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1386

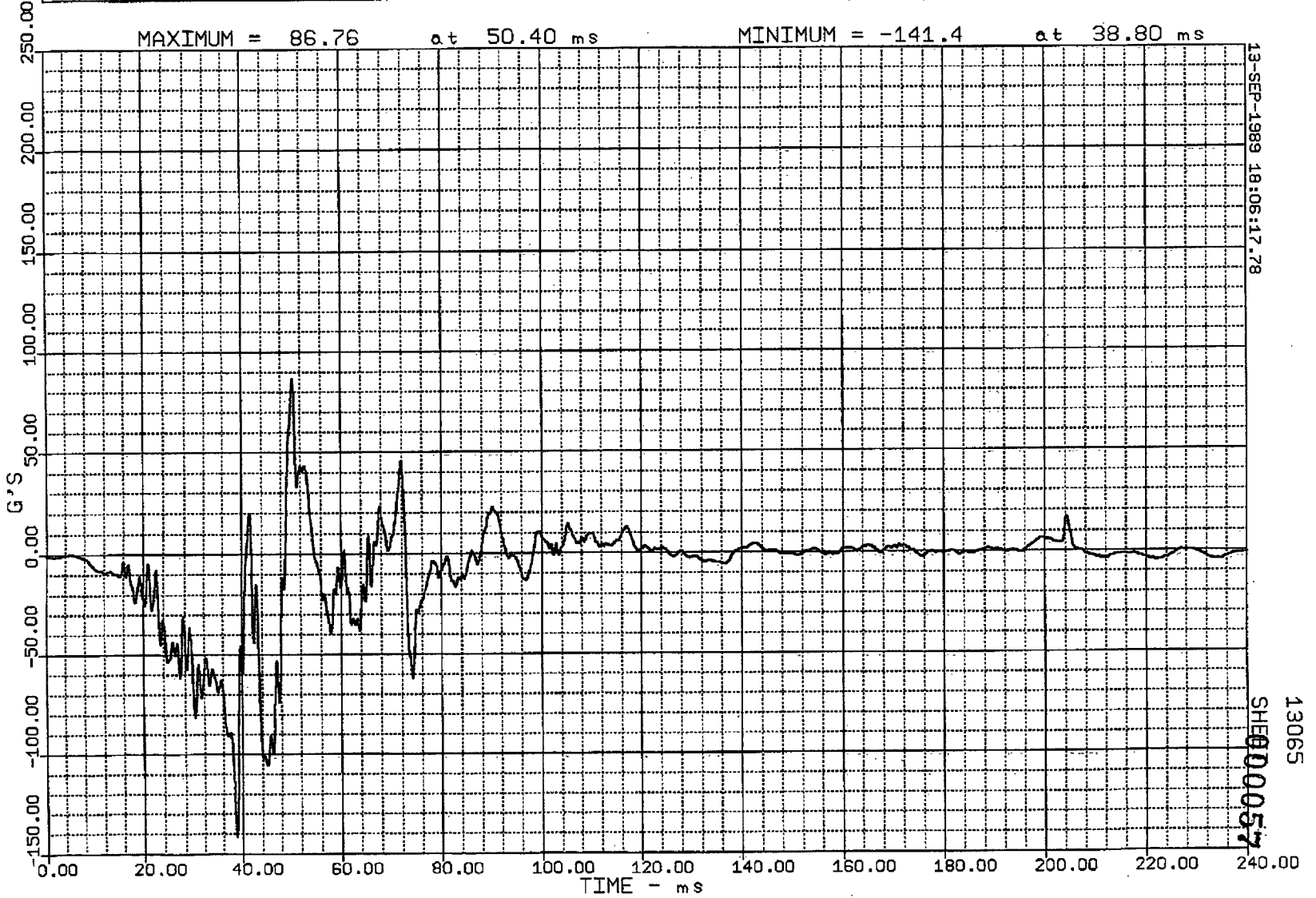
LONG R/FRAME @ B-PILLAR			199200		TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	44	180	9-13-89	17:47:52



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



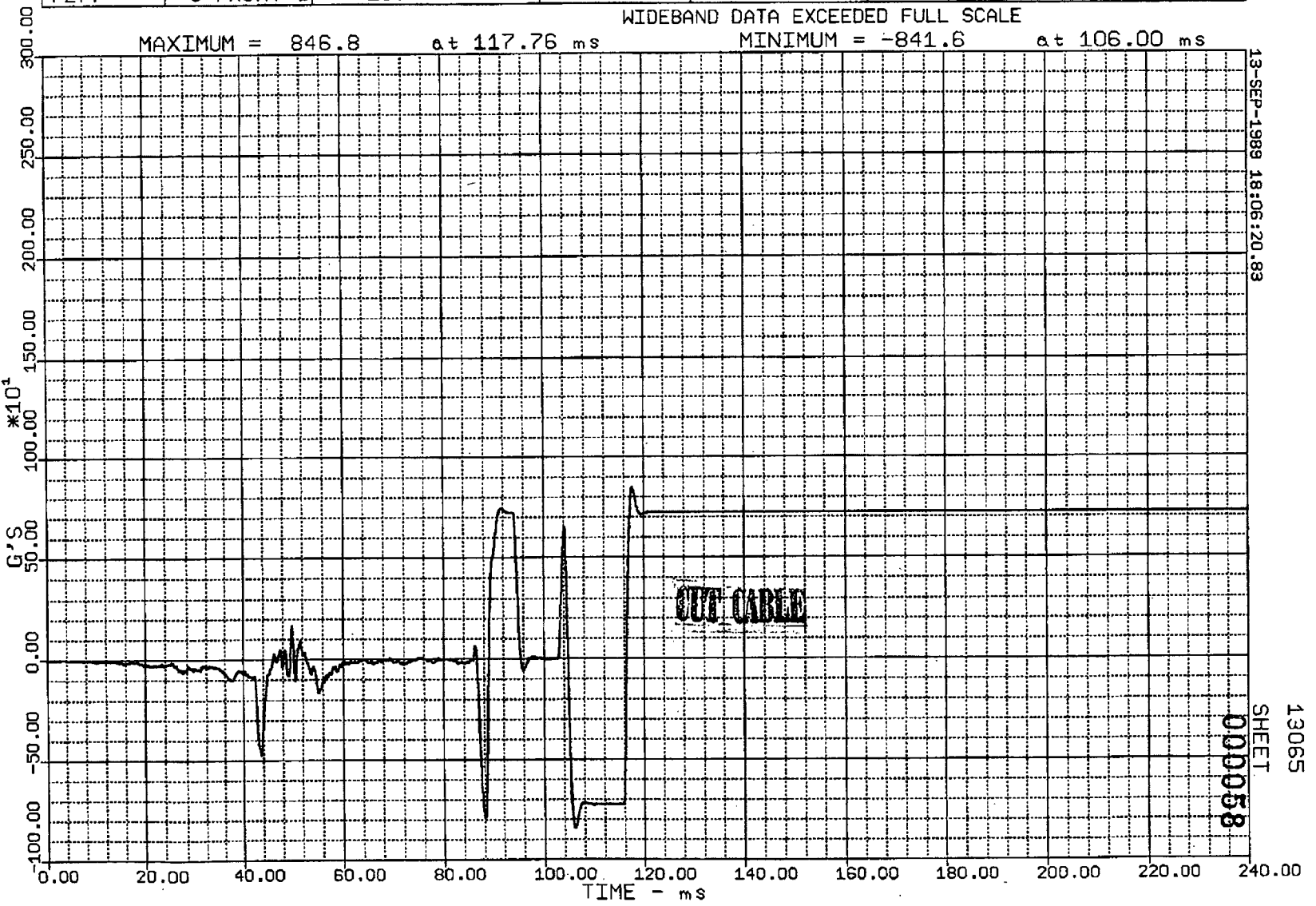
13-SEP-1989 18:06:17.78

13065  
SHE000057

CRIS 0007277

PRODUCED BY FORD  
1388

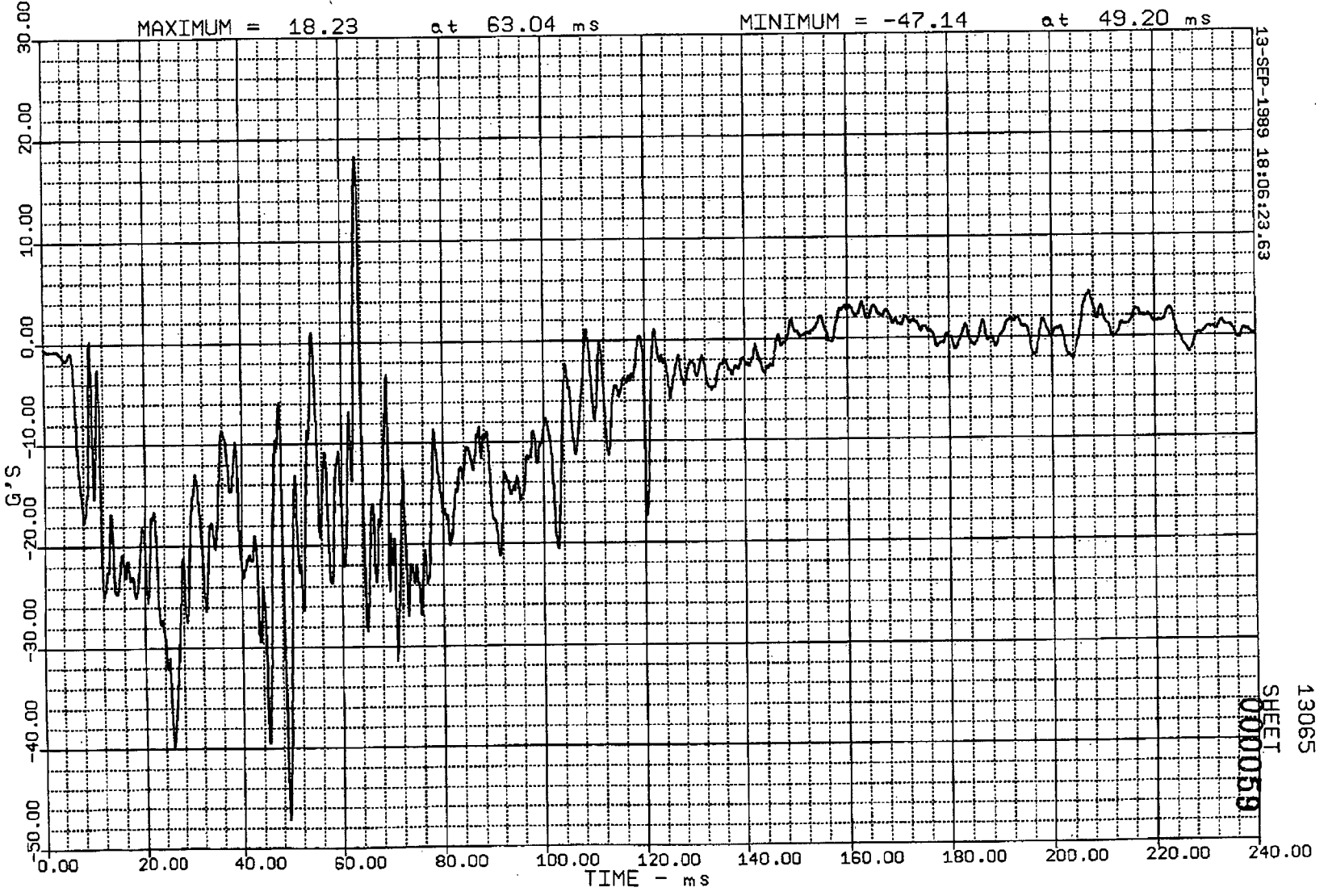
LØNG ENGINE TRANS BØTTØM		199200			TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	38	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1389

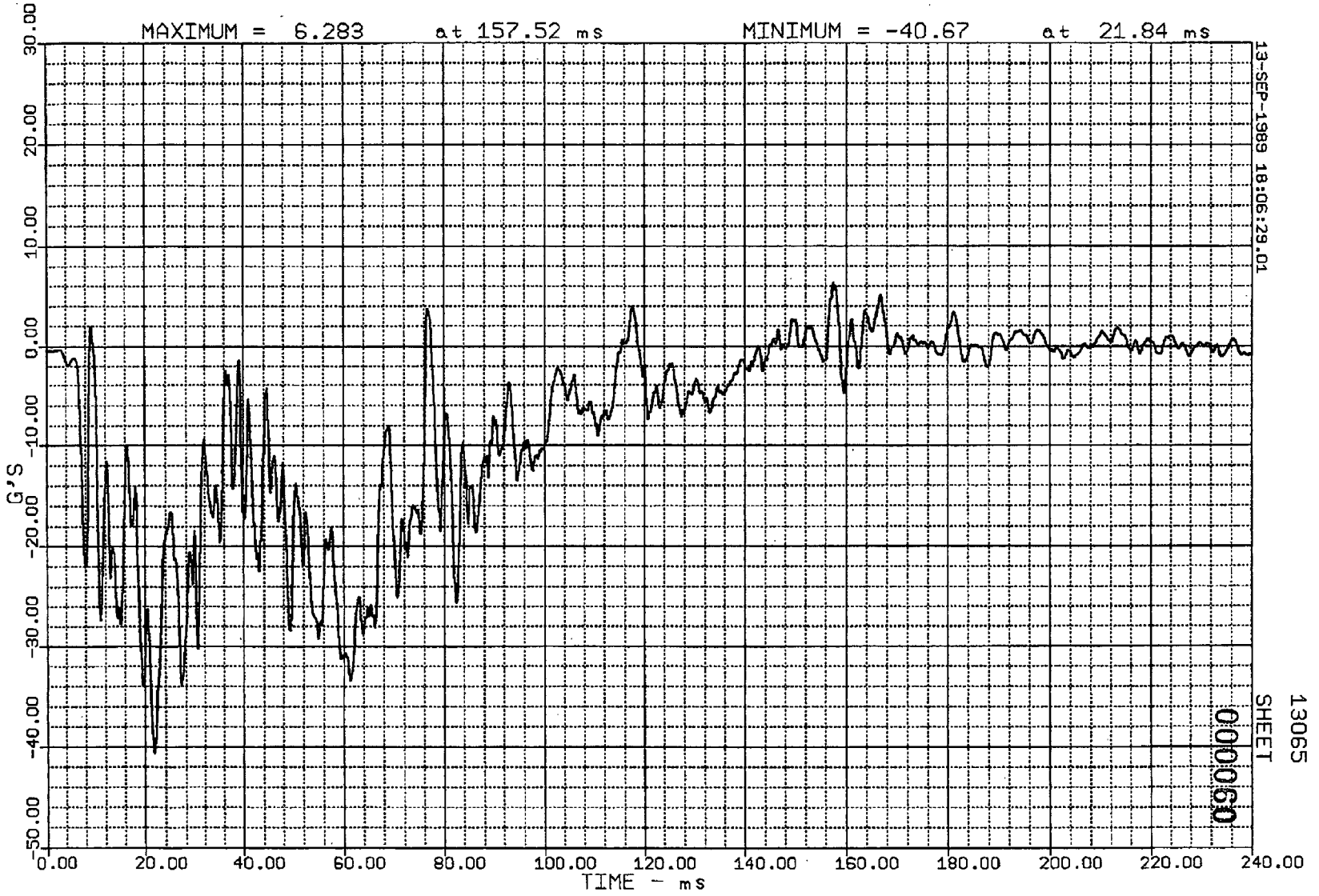
LONG L/RÖCKER @ B-PILLAR				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	40	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1390

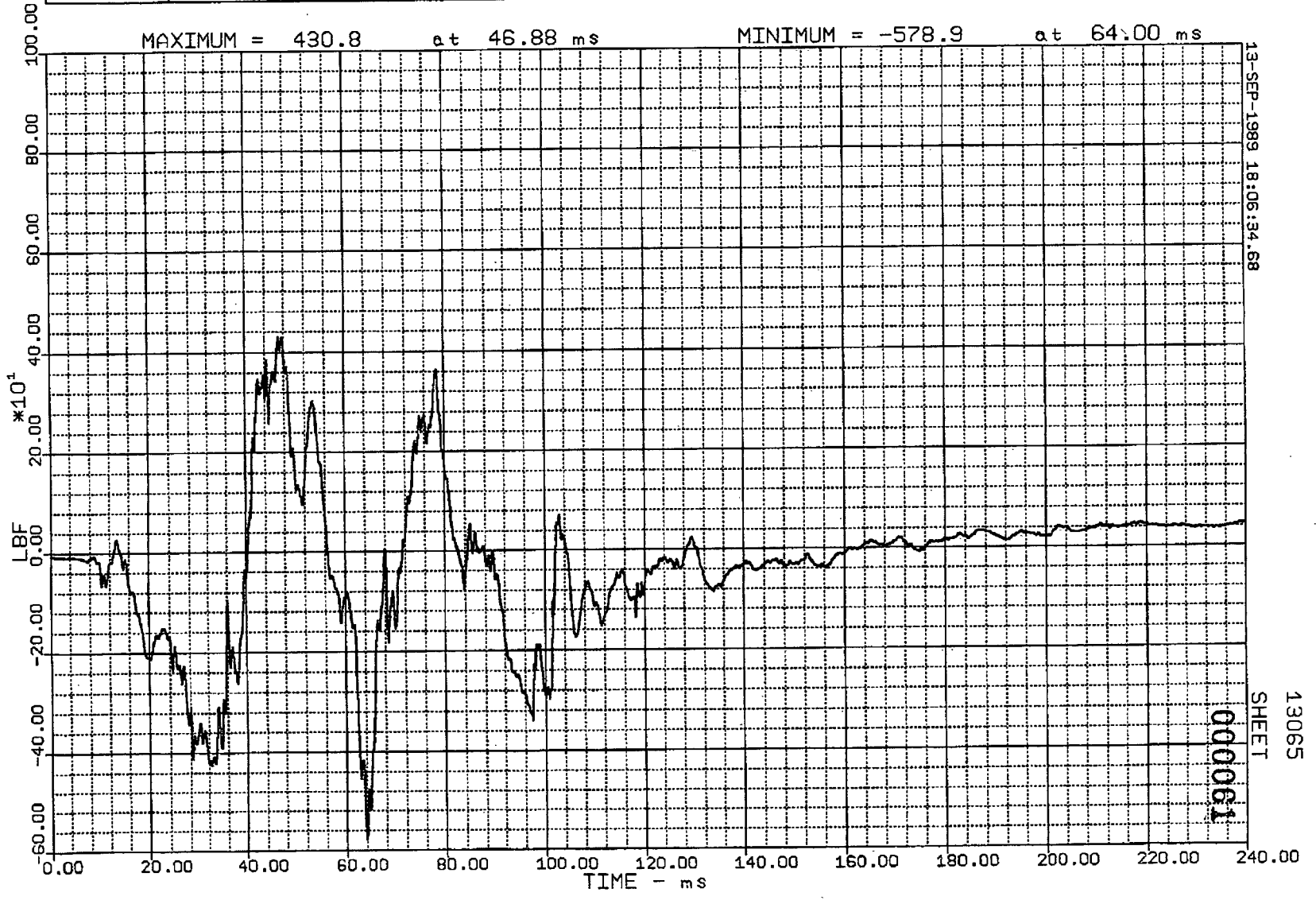
LØNG R/RØCKER @ B-PILLAR			199200		TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	43	180	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1391

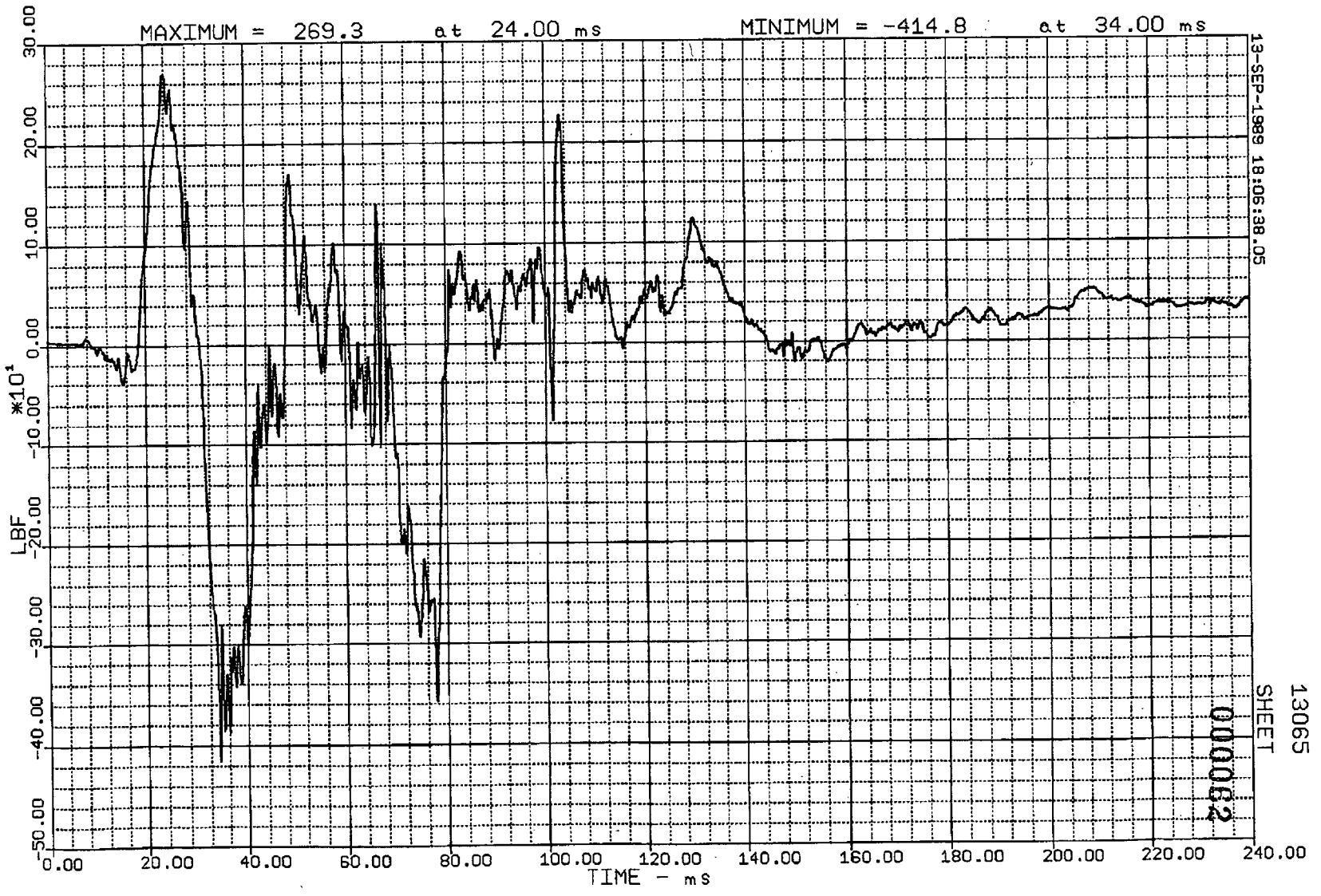
F <sub>x</sub> STEERING COLUMN LOAD CELL				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	46	600	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1392

F <sub>y</sub> STEERING COLUMN LOAD CELL				199200	TARGET	
RUN NØ.	FACILITY	TEST ORDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	47	600	9-13-89	17:47:52

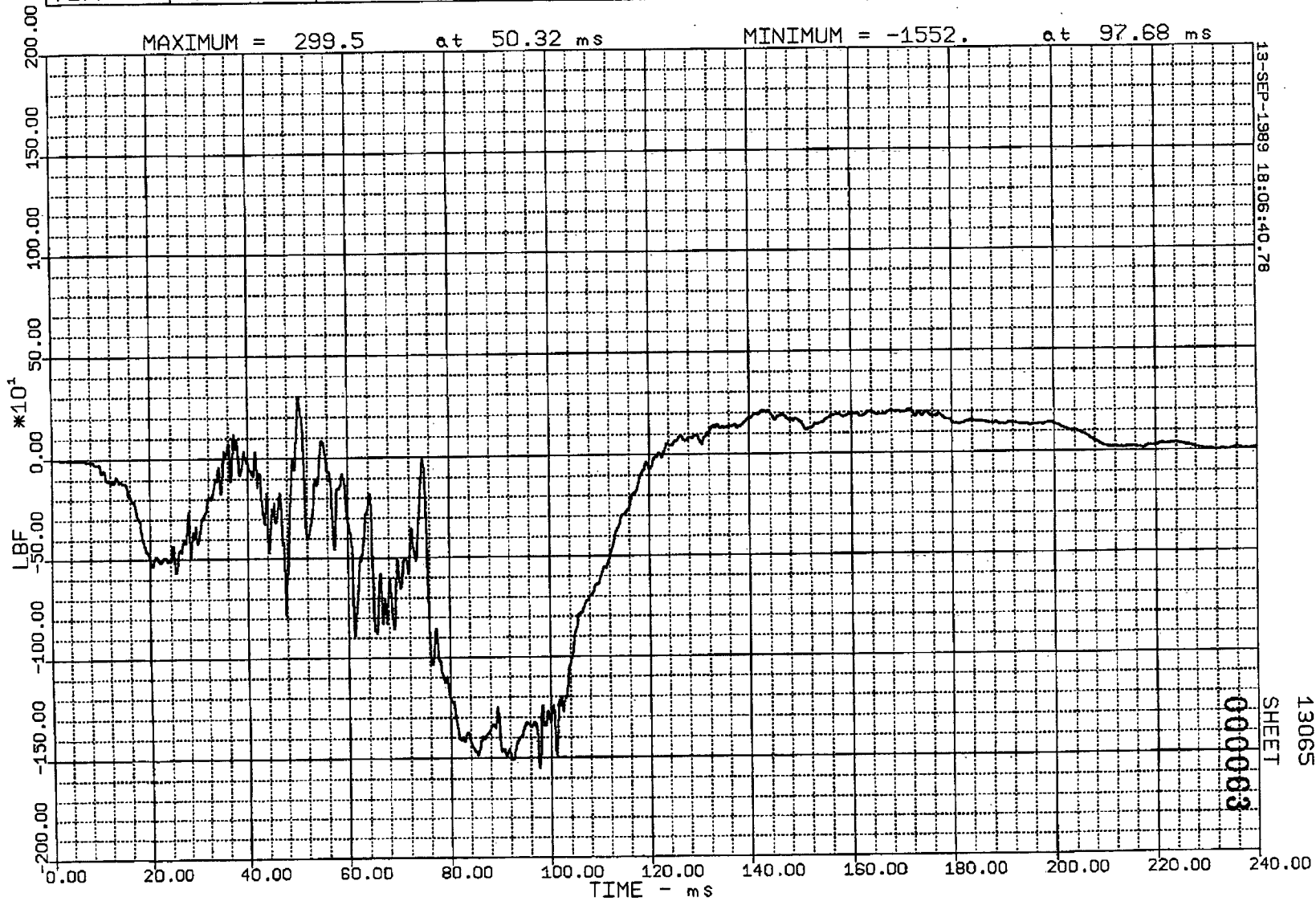


13065  
SHEET

CRTS 0007277

PRODUCED BY FORD  
1393

Fz STEERING COLUMN LOAD CELL		199200		TARGET		
RUN NØ.	FACILITY	TEST ORDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	48	600	9-13-89	17:47:52



13-SEP-1989 18:06:40.78

000083

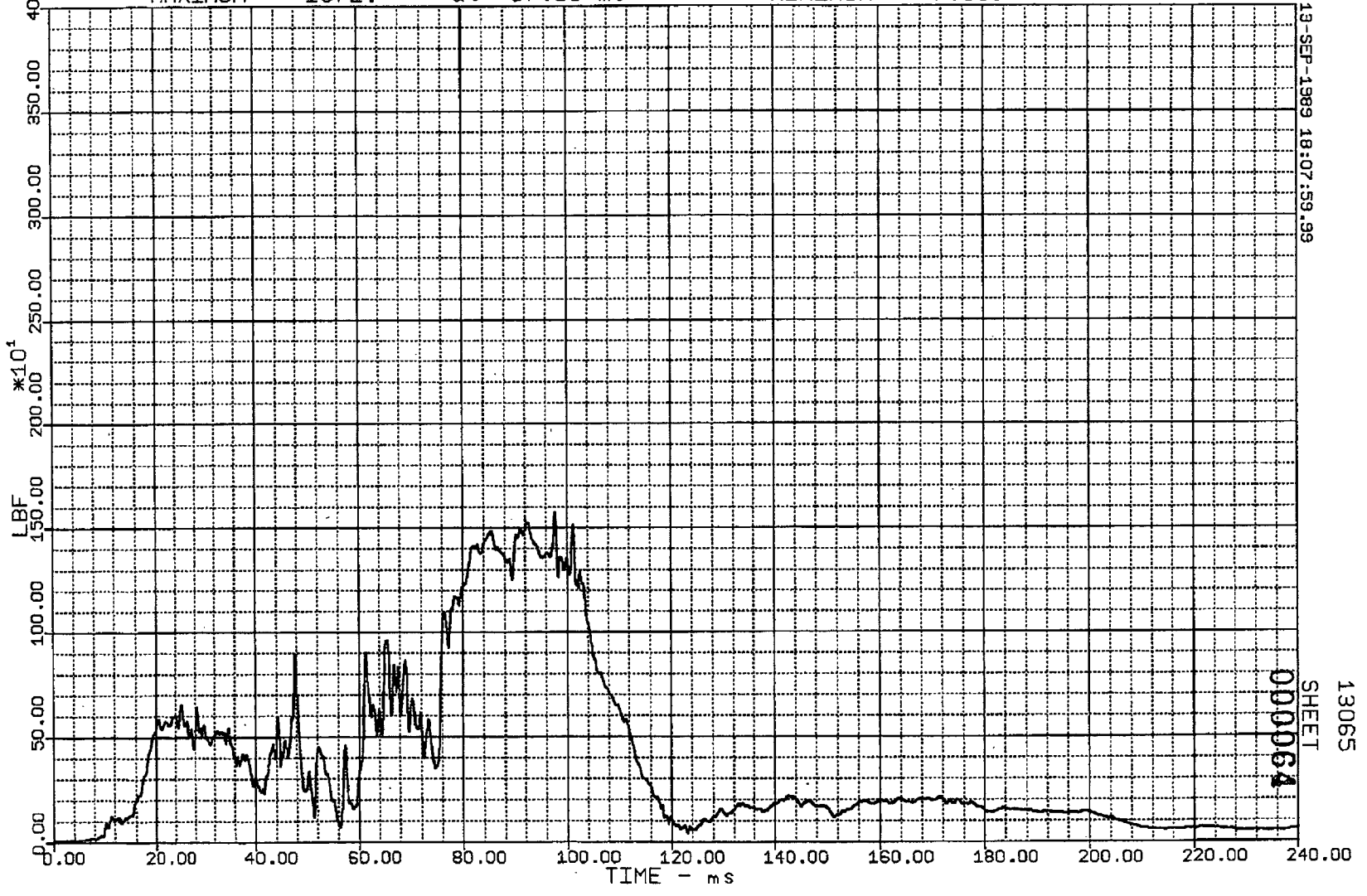
SHEET  
13065

CRTS 0007277

PRODUCED BY FORD  
1394

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

CUMDUR = 1472.73      Duration time = 3.00  
 MAXIMUM = 1572.      at 97.68 ms      MINIMUM = 7.699      at 0.24 ms



13-SEP-1989 18:07:59.99

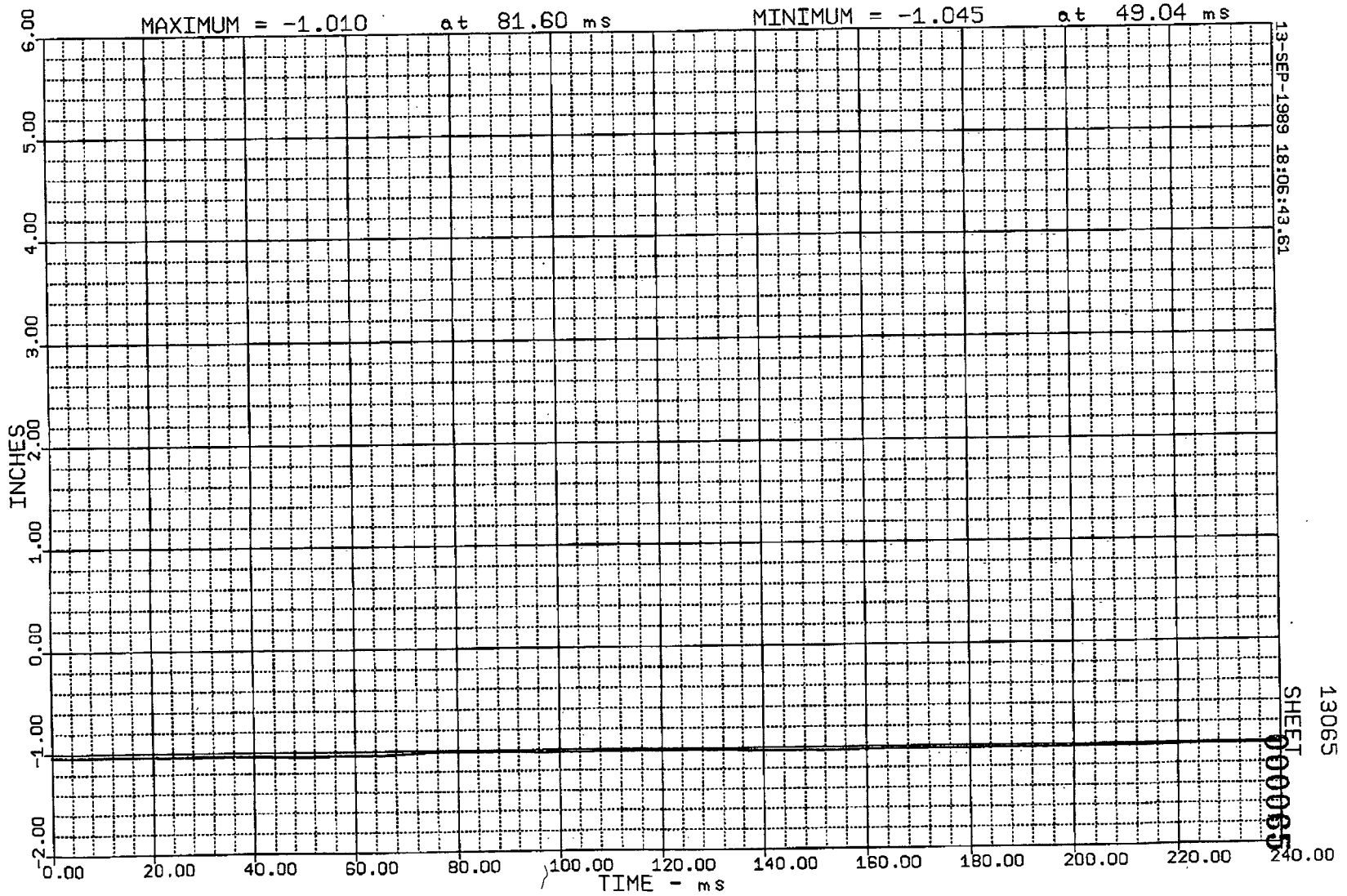
13065 SHEET

000064

CRTS 0007277

PRODUCED BY FORD  
1395

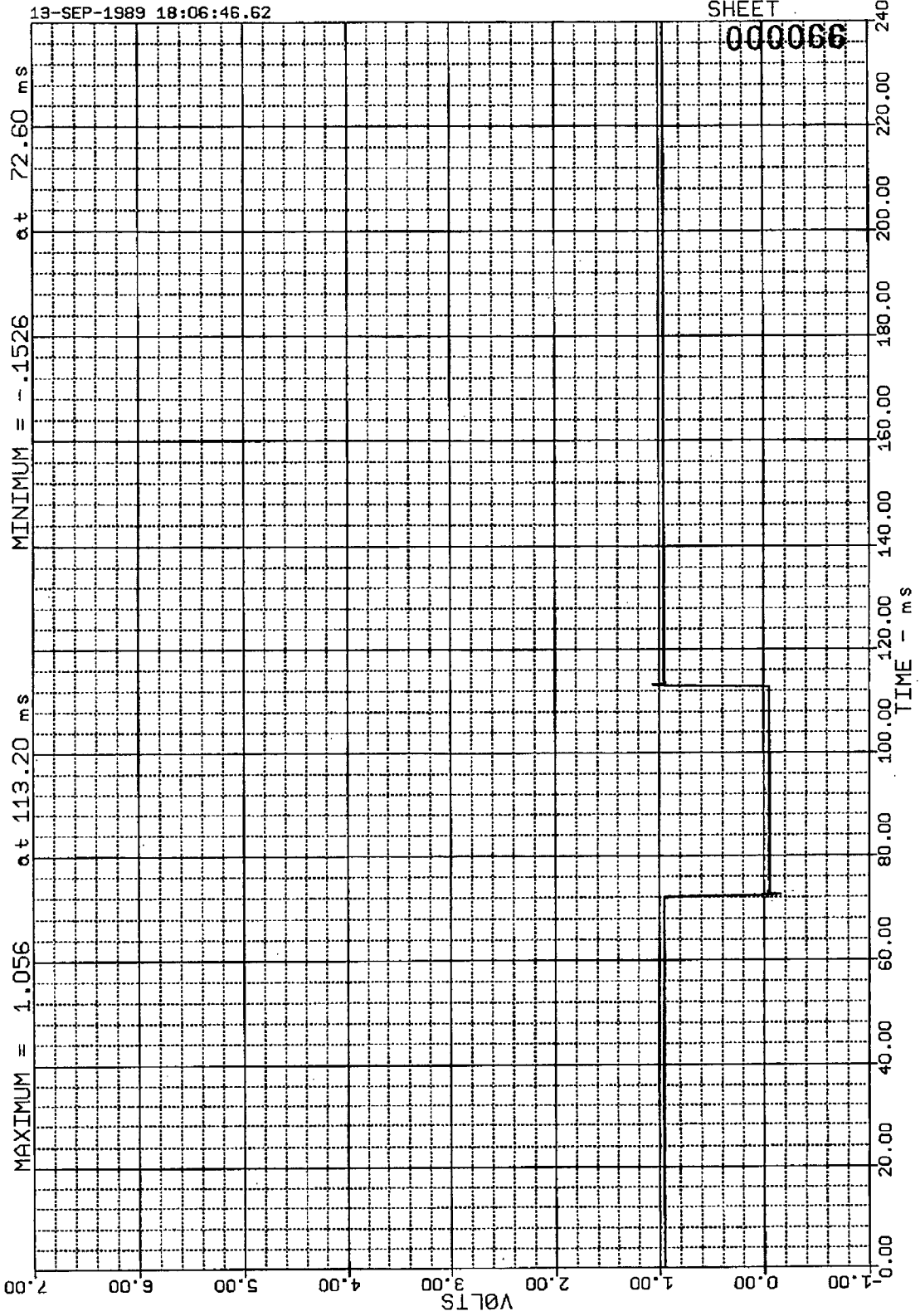
STG COLUMN THRU BRACKET DISP				199200	TARGET	
RUN NØ.	FACILITY	TEST ORDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	50	60	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1396

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

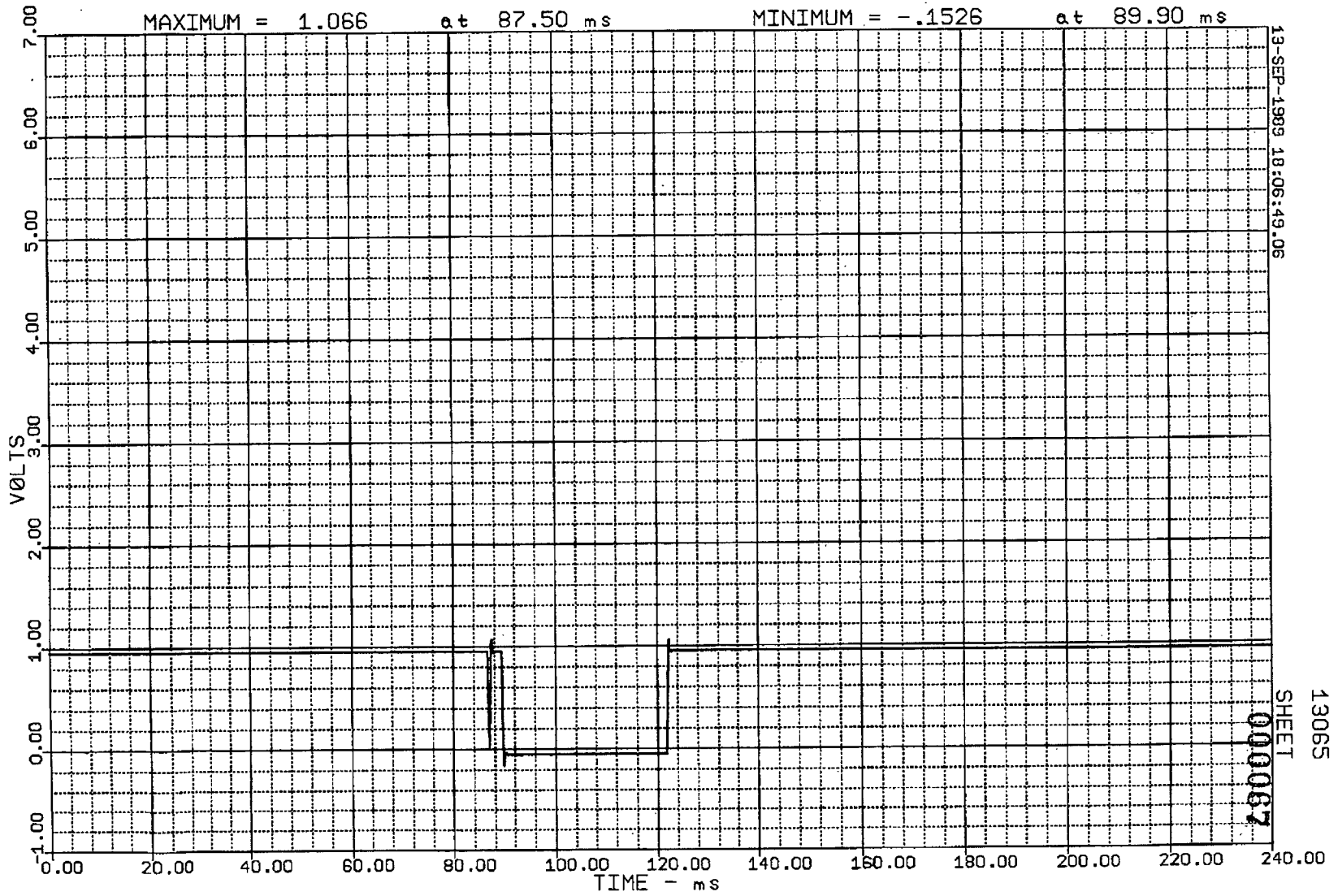


13065

SHEET

CRTS 0007277

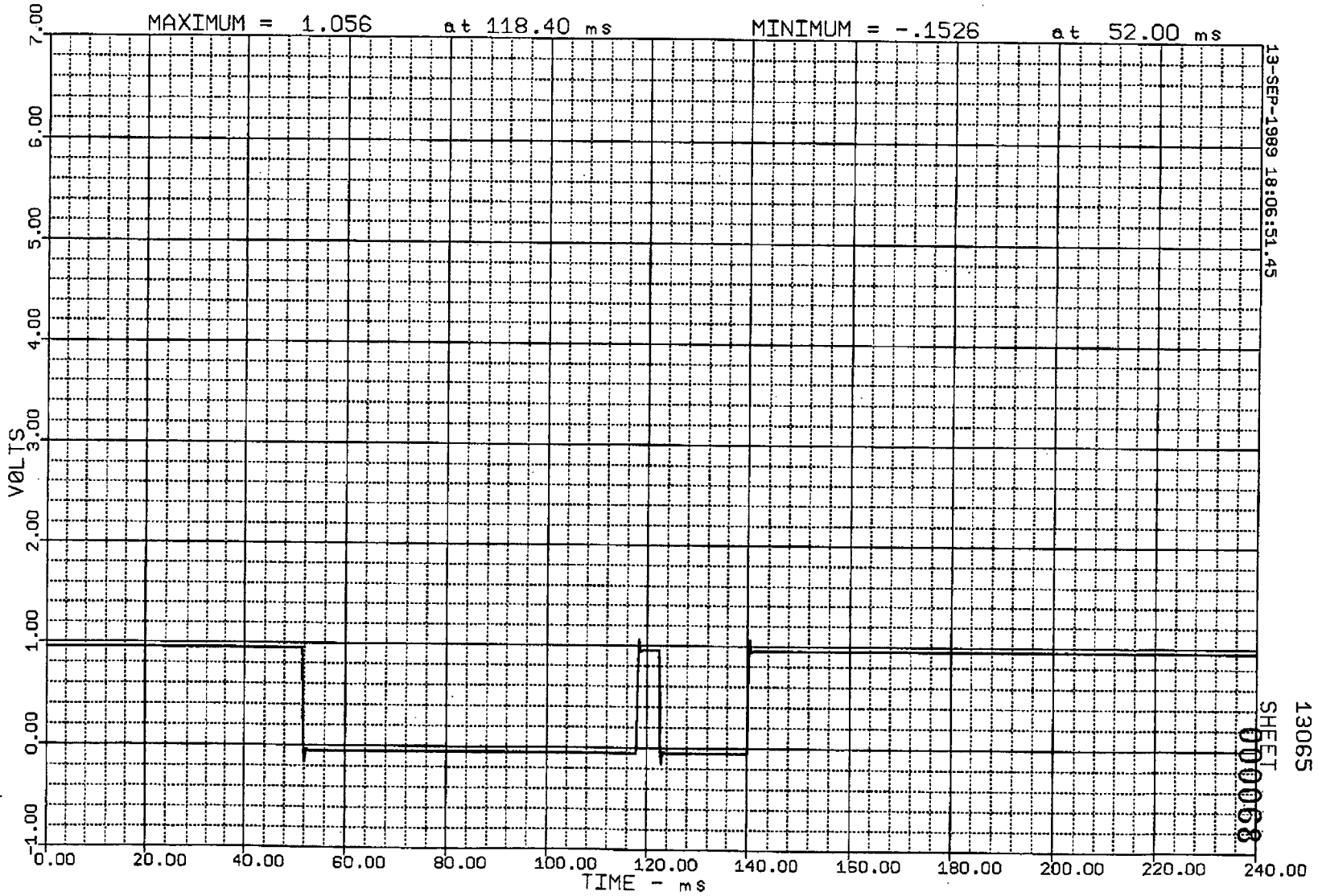
STEERING WHEEL RIM (HUB) SW				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRØNT B	13065	53	1000	9-13-89	17:47:52



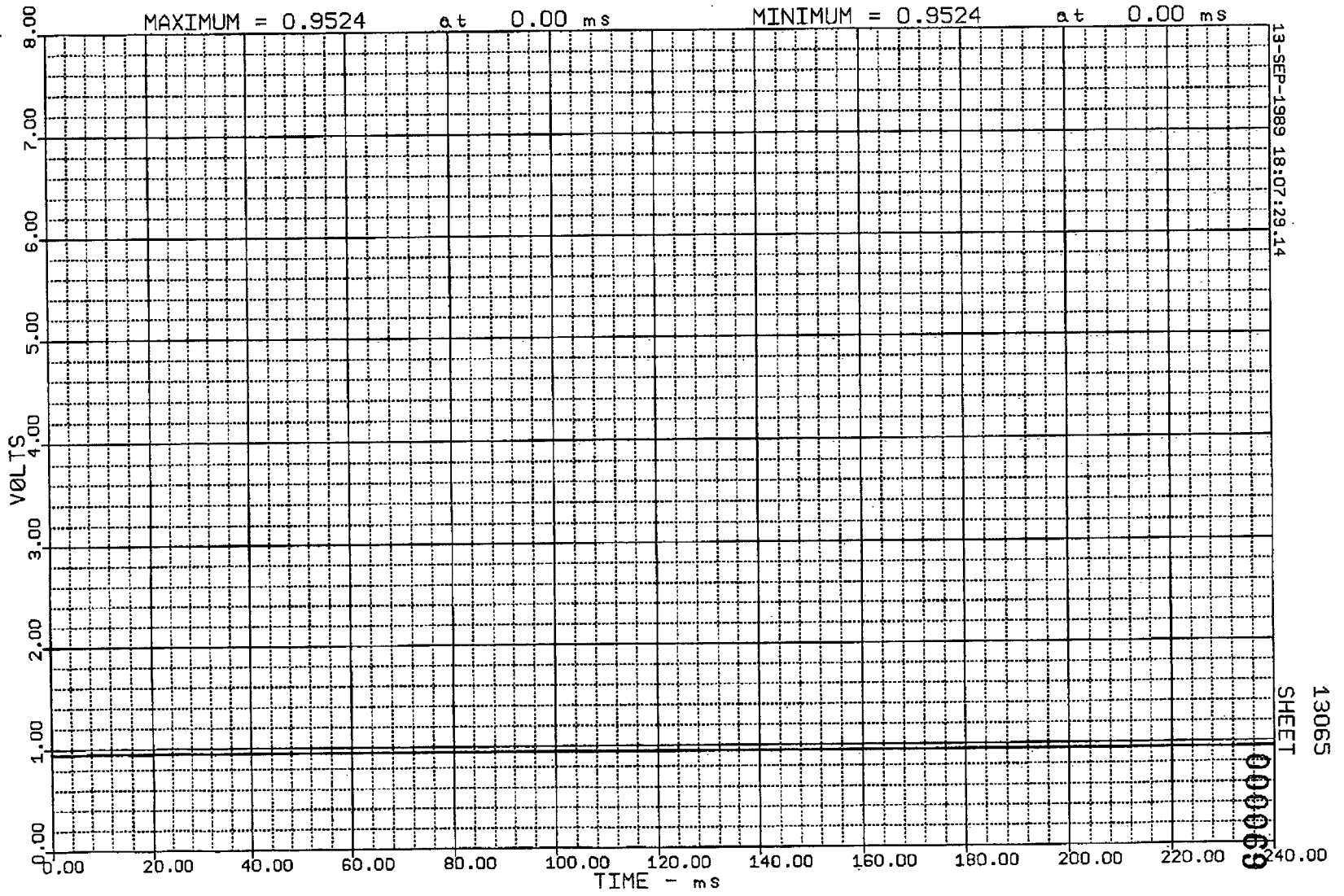
CRTS 0007277

PRODUCED BY FORD  
1398

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



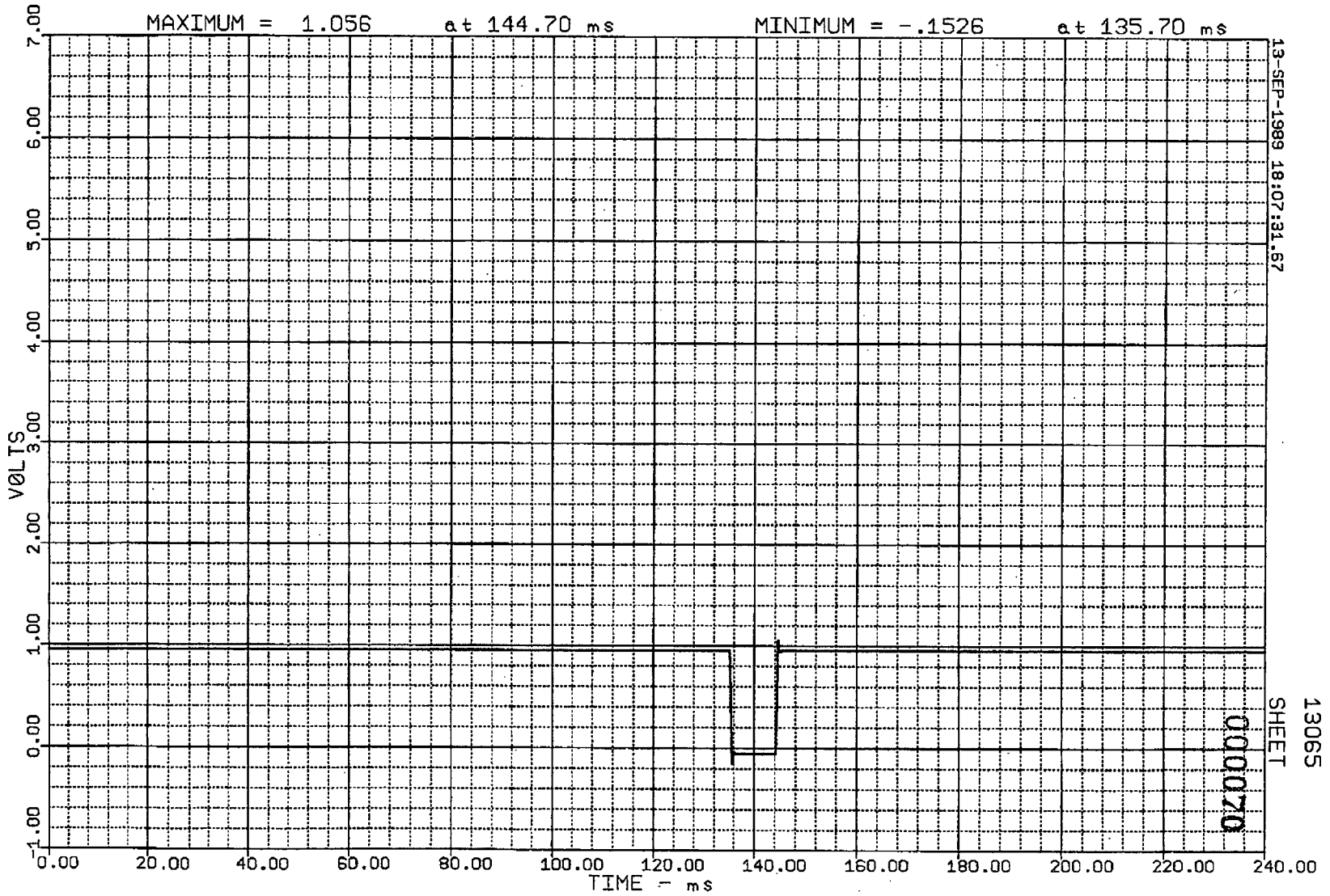
UNDER DRIVER'S SEAT SW #1				199200	TARGET	
RUN NØ.	FACILITY	TEST ØRDER NØ.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	76	1000	9-13-89	17:47:52



CRTS 0007277

PRODUCED BY FORD  
1400

UNDER DRIVER'S SEAT SW #2				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	77	1000	9-13-89	17:47:52

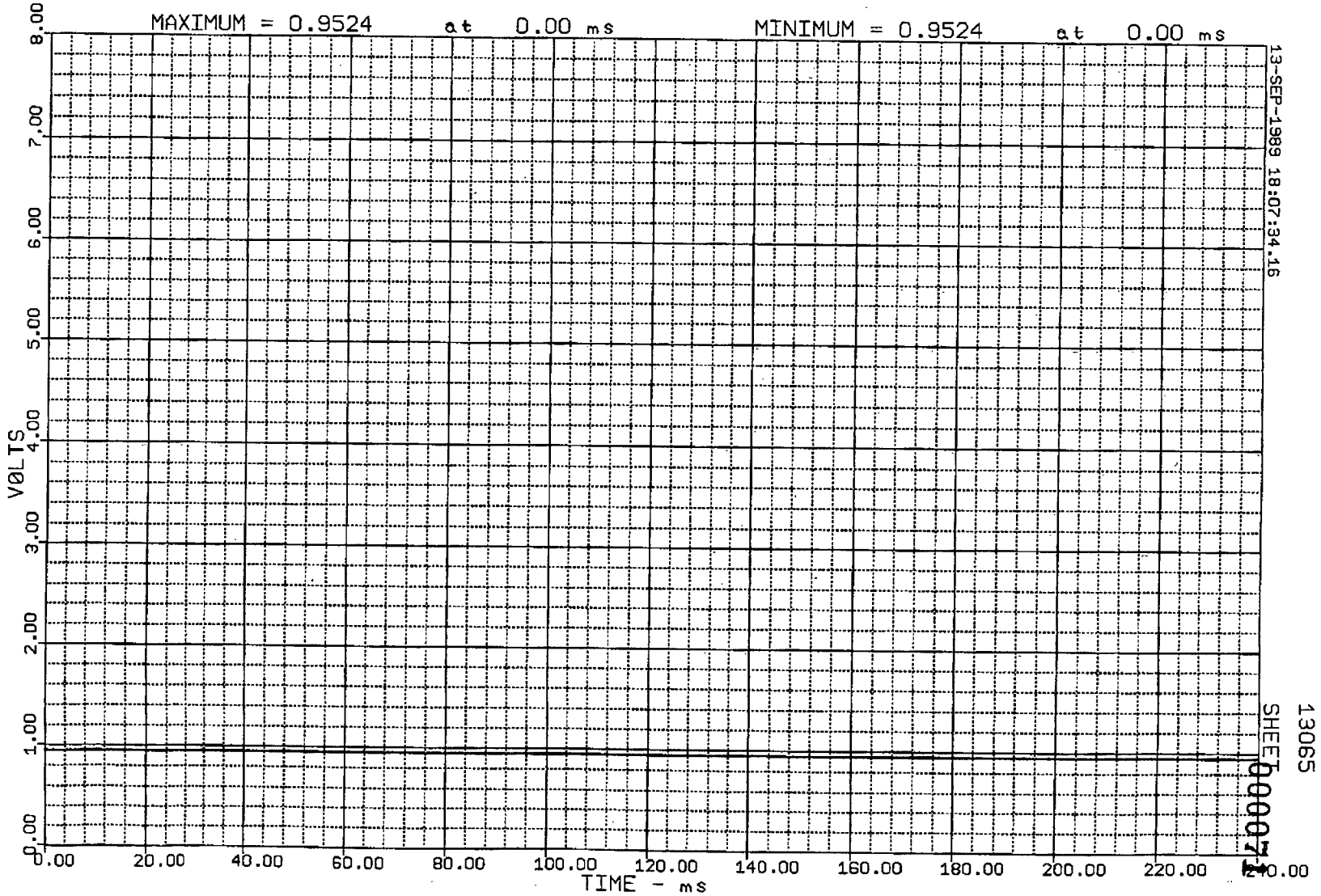


13065  
SHEET

CRTS 0007277

PRODUCED BY FORD  
1401

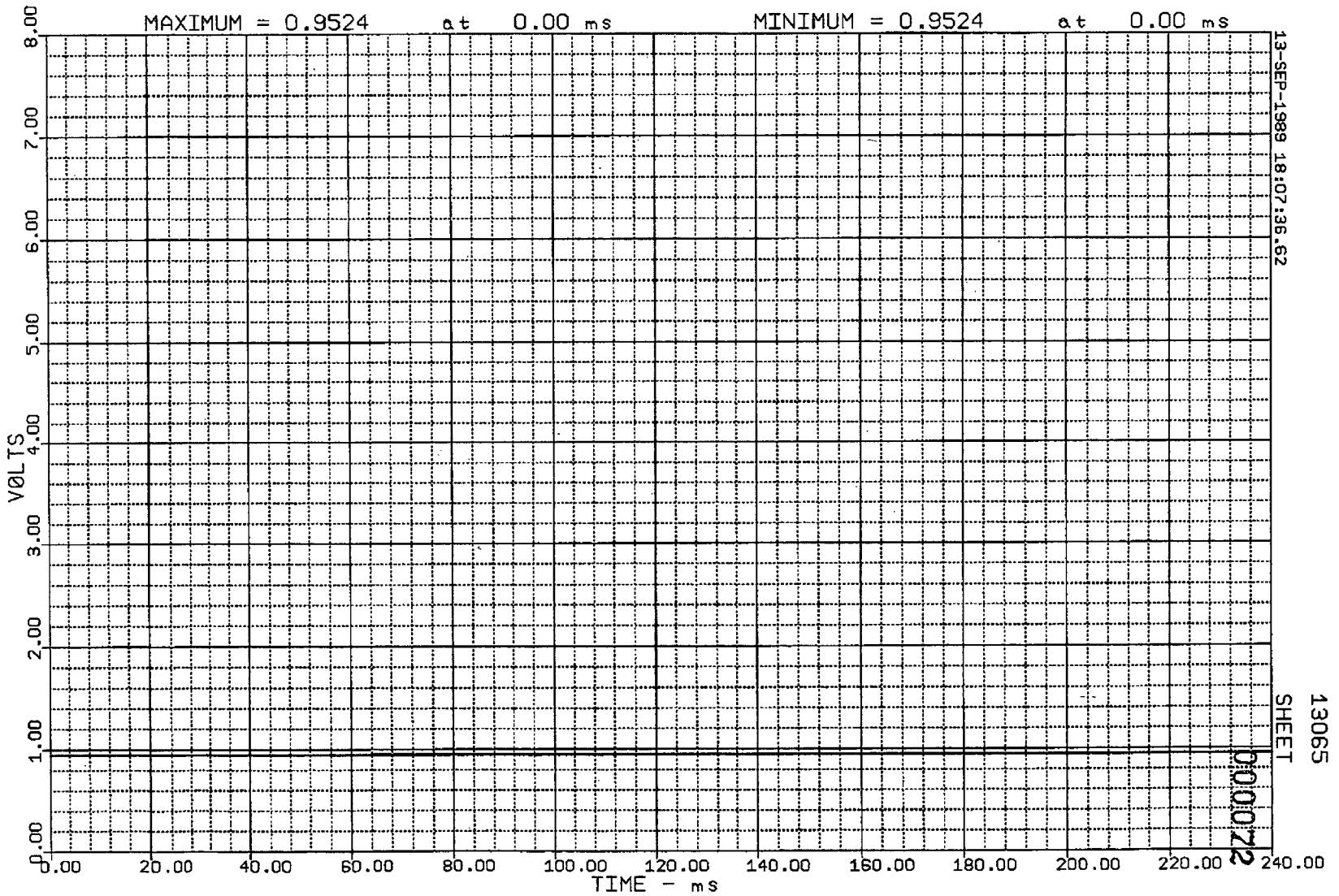
UNDER PASS SEAT SW #1				199200	TARGET	
RUN NO.	FACILITY	TEST ORDER NO.	CHANNEL	FILTER TYPE	TEST DATE	TEST TIME
7277	S FRONT B	13065	79	1000	9-13-89	17:47:52



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



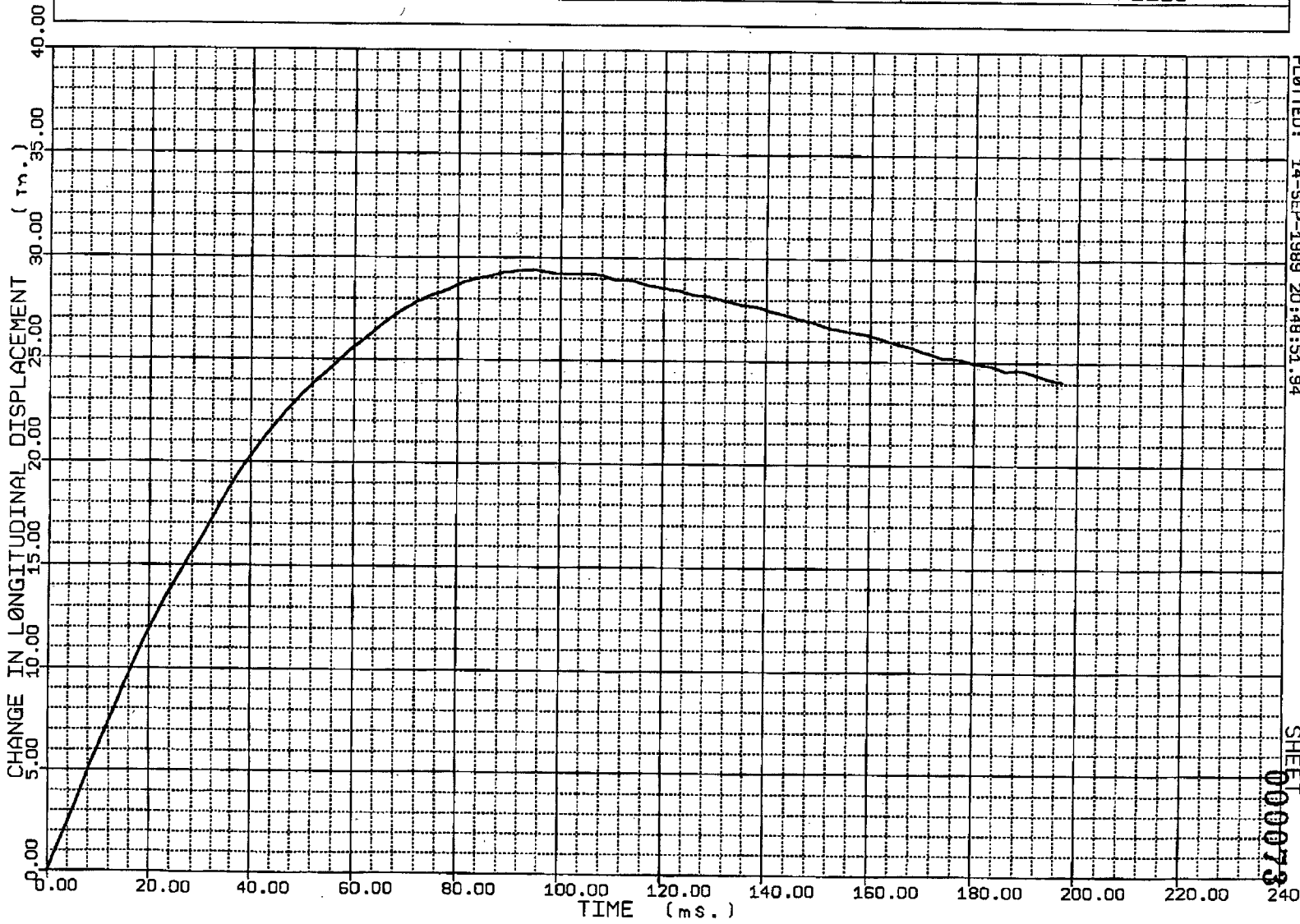
13-SEP-1989 18:07:36.62

13065  
SHEET

CRTS 0007277

PRODUCED BY FORD  
1403

Y - AXIS: L/RØCKER AT SEAT BØLT WRT L/GROUND REFERENCE MAX = 29.39 at 95.00 MIN = 0.0000E+00 at 0.00				
RUN NØ.	FACILITY	TEST ØRDER NØ.	FILM ANALYSIS METHØD	PITCH CØRRECTION
7277	BARRIER	13065	SCALE	NØT APPLIED



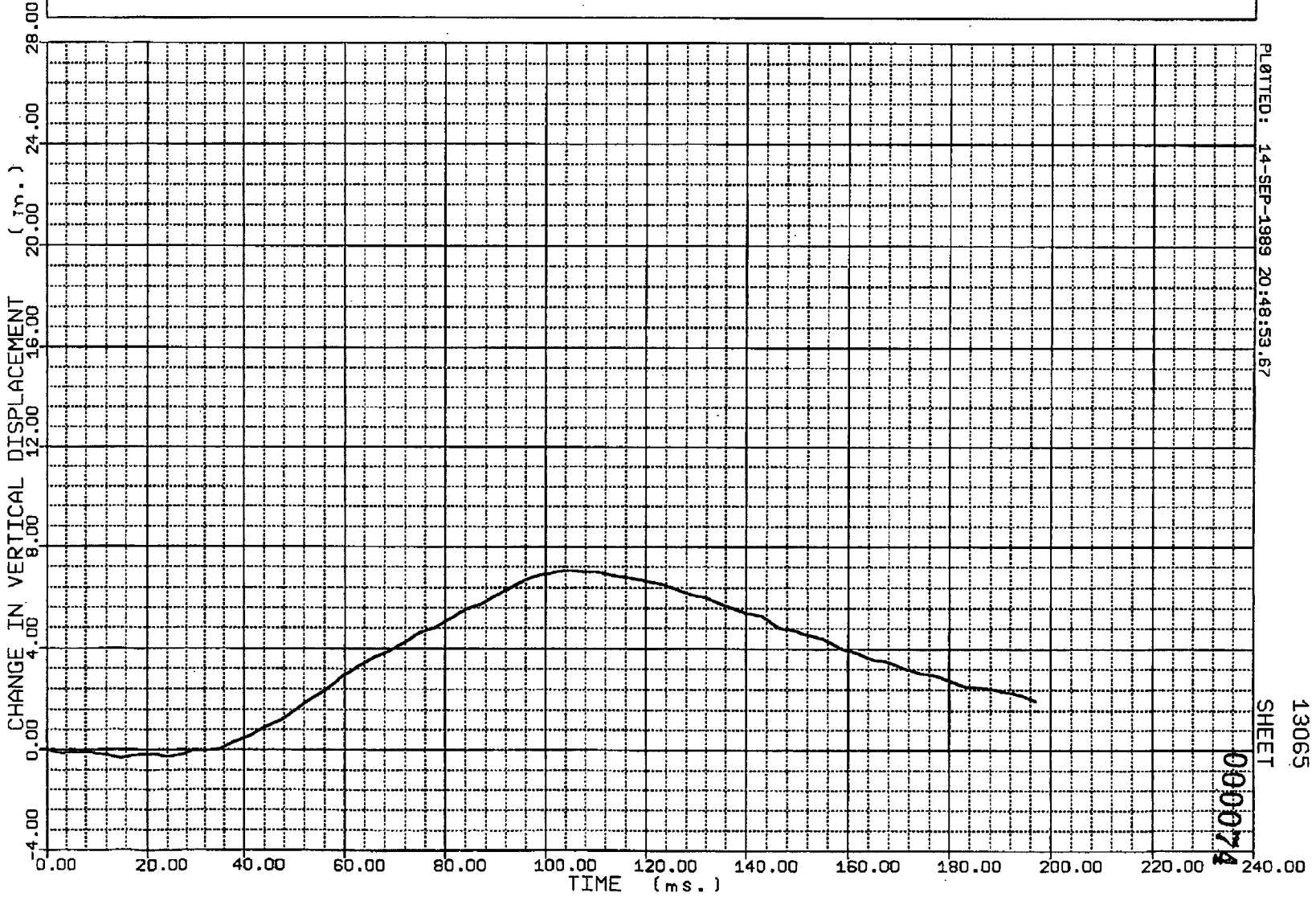
PLØTTED: 14-SEP-1989 20:48:51.94

13065  
SHEET 000073

CRIS 0007277

PRODUCED BY FORD  
1404

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



PLOTTED: 14-SEP-1989 20:48:53.67

13065 SHEET

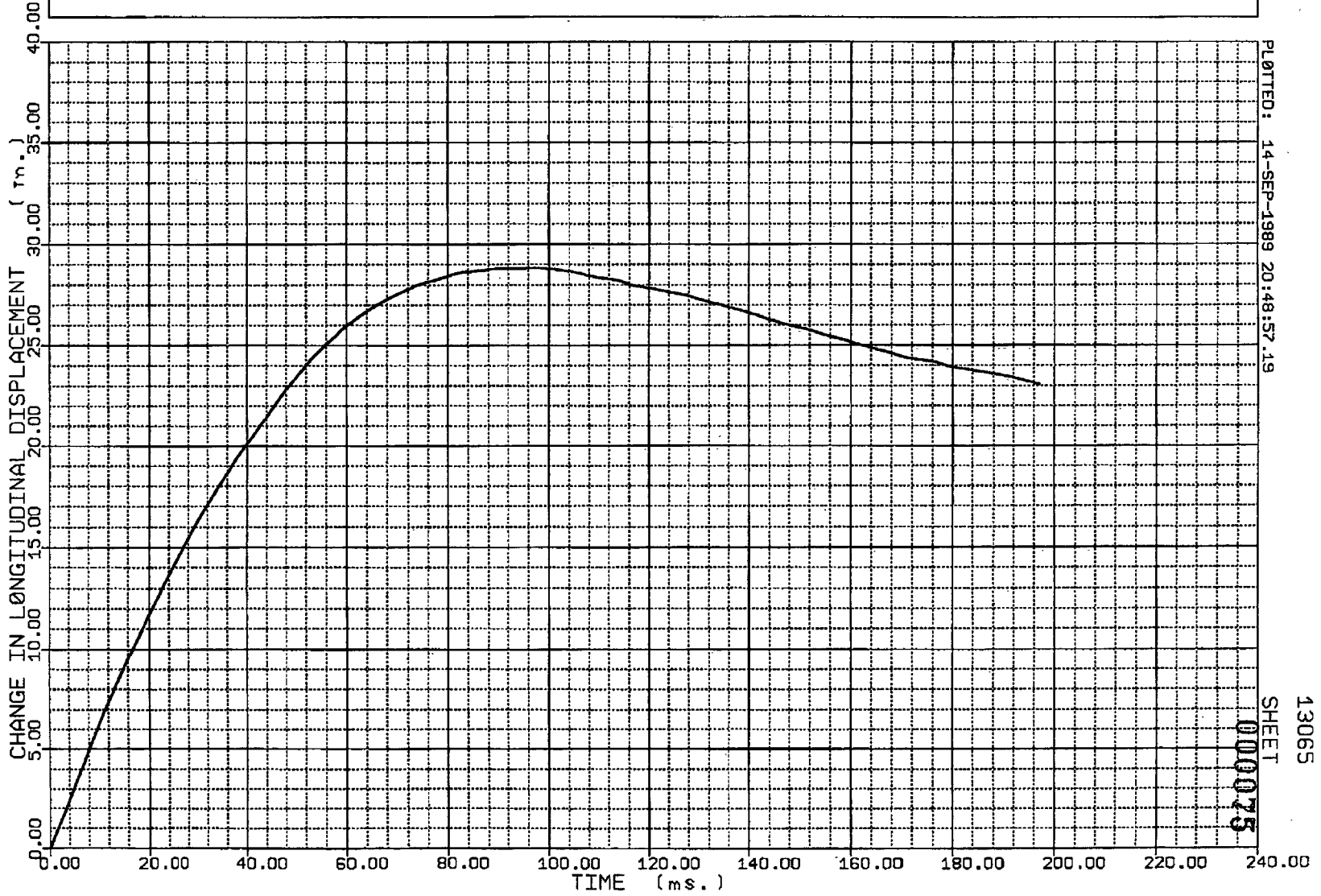
000074

CRTS 0007277

PRODUCED BY FORD  
1405

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



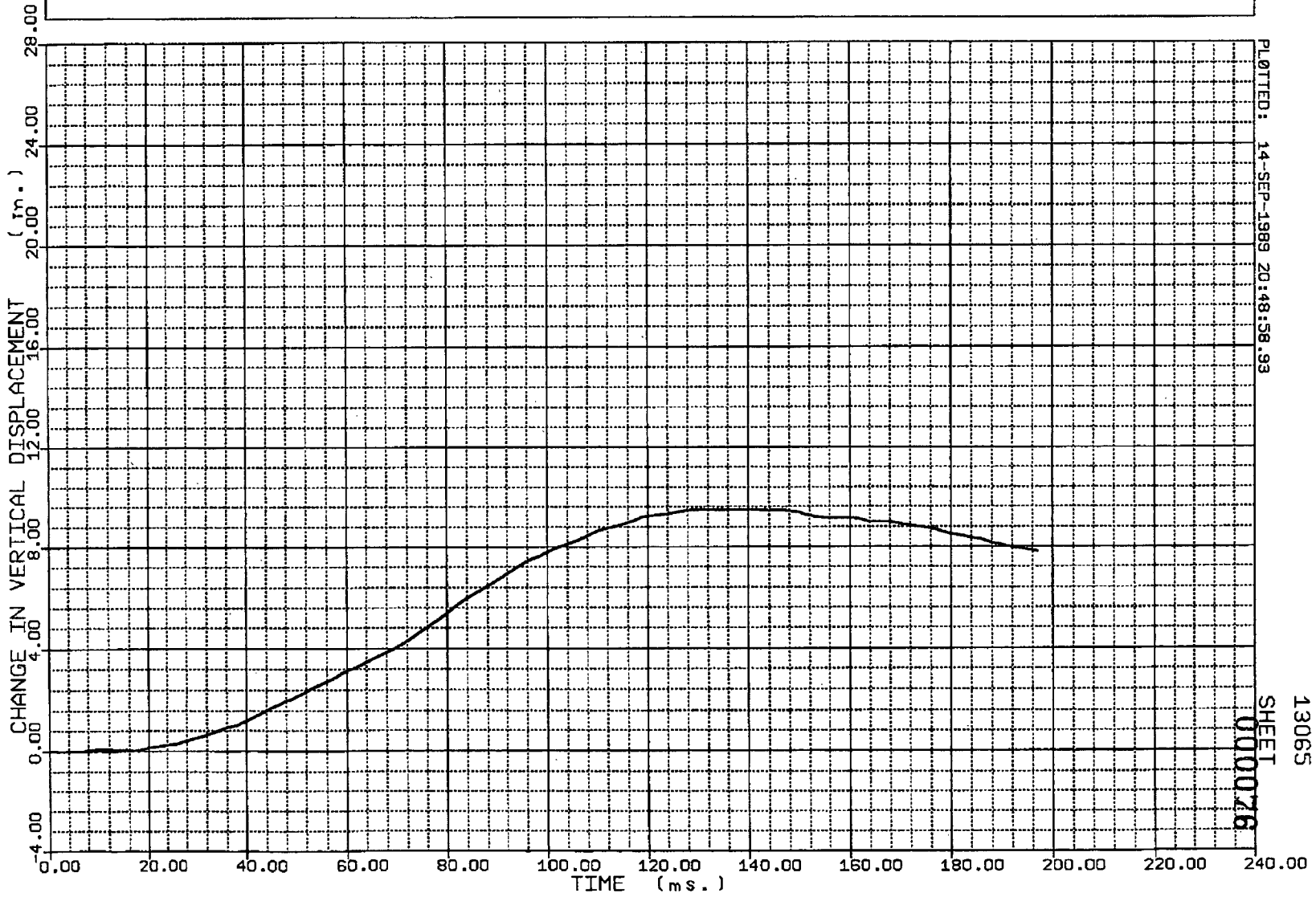
PLØTTED: 14-SEP-1989 20:48:57.19

13065  
SHEET  
000075

CRIS 0007277

PRODUCED BY FORD  
1406

Y - AXIS: R/RÖCKER AT SEAT BÖLT WRT R/GROUND REFERENCE MAX = 9.495 at 140.00 MIN = -.1185E-01 at 2.00				
RUN NÖ.	FACILITY	TEST ÖRDER NÖ.	FILM ANALYSIS METHÖD	PITCH CÖRRECTION
7277	BARRIER	13065	SCALE	NÖT APPLIED



PLÖTTED: 14-SEP-1989 20:48:58.93

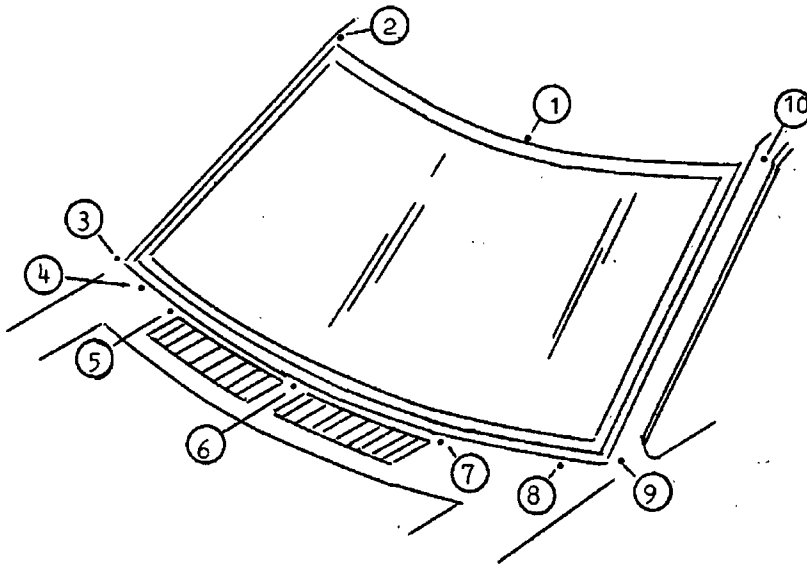
13065  
SHEET  
000078

CRTS 0007277

PRODUCED BY FORD  
1407

T-13065  
 Sheet  
 000077

STATIC DISPLACEMENTS - WINDSHIELD OPENING POINTS



T.O. No. 06-4558  
 Veh. No. 308T123  
 Crash No. 9277  
 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 planes through the longitudinal axis, and Vert.-horizontal  
 plane at the left front seat bolt.

CRTS 0007277

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

	Before			After			Change		
	LONG	LAT	VERT	LONG	LAT	VERT	LONG	LAT	VERT
<u>Frame Left Side Rail</u>									
1. Foremost point	199.78	19.04	21.89	182.04	17.89	28.00	-17.74	-1.15	+6.11
2. Front axle	180.49	18.40	22.27	167.69	17.63	26.65	-12.80	-0.77	+4.38
3. Aft of engine support X/M	162.07	16.44	20.84	154.90	12.26	24.26	-7.17	-4.18	+3.42
4. Radius arm mounting bracket	144.92	17.20	17.56	141.97	16.51	13.38	-2.95	-0.69	-4.18
5. "B" pillar	97.52	18.20	20.54	95.74	17.33	20.45	-1.78	-0.87	-0.09
6. Rear spring front hanger bracket	70.12	18.14	21.23	68.94	17.92	25.63	-1.18	-0.22	+4.40
7. Rear axle	46.35	18.14	24.20	45.97	18.22	32.37	-0.38	+0.08	+8.17
8. Rear spring rear shackle bracket	/	/	/	/	/	/	/	/	/
9. Rearmost point	0.00	18.41	22.45	0.00	18.42	38.42	0.00	+0.01	+15.97
10. <u>ENGINE ACCE</u>	169.13	3.30	48.58	/	/	/	/	/	/
11. <u>TRANS ACCEL</u>	156.29	2.81	17.07	/	/	/	/	/	/

	Before			After			Change		
	LONG	LAT	VERT	LONG	LAT	VERT	LONG	LAT	VERT
<u>Frame Right Side Rail</u>									
1. Foremost point	199.66	19.55	22.18	179.62	23.02	28.05	-20.04	+3.97	+5.87
2. Front axle	178.99	18.89	22.83	169.74	20.61	31.93	-9.25	+1.72	+9.10
3. Aft of engine support X/M	161.24	16.81	21.08	156.99	15.78	24.35	-4.75	-1.03	+3.27
4. Radius arm mounting bracket	144.67	17.41	17.70	141.80	15.64	16.41	-2.87	-1.77	-1.29
5. "B" pillar	97.40	18.73	20.95	95.75	18.68	20.42	-1.65	-0.05	-2.03
6. Rear spring front hanger bracket	69.16	18.66	21.03	67.99	18.78	25.21	-1.17	+0.12	+4.18
7. Rear axle	46.00	18.74	23.83	46.10	19.08	31.58	-0.50	+0.34	+7.75
8. Rear spring rear shackle bracket	/	/	/	/	/	/	/	/	/
9. Rearmost point	0.15	18.41	22.20	-0.39	18.42	37.30	+0.24	+0.01	+15.10
10. _____									
11. _____									

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

T-13065

000079

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 ACCEL
  - 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 ACCEL
  - 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	-2.20
99.00	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	+0.75
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.

CRTS 0007277

T-13065

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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
M. Steering gear housing	182.63	12.84	23.00	172.24	14.15	28.37	-10.39	+1.31	+5.37
N. Steering gear coupling	112.68	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	18.92	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	63.11	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	105.74	/	/	181.18	/	/	-24.56	/	/
Z. Overall crush-left	205.97	/	/	182.54	/	/	-23.43	/	/
AA. Overall crush-centerline	206.75	/	/	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	+1.67
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 <sup>R</sup>	34.98	140.06	2.21 <sup>R</sup>	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>L/S CURVE</u>	202.53	/	/	REMOVED	/	/	/	/	/
LL. <u>R/S 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.

CRTS 0007277

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1411

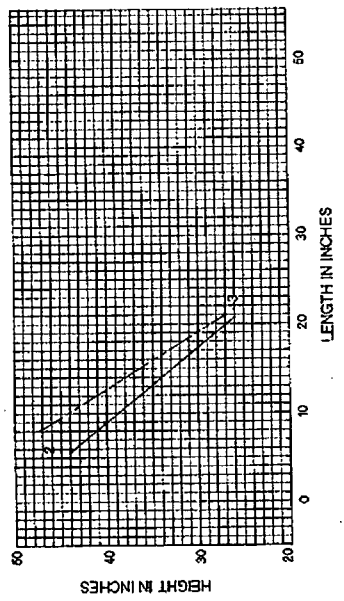
T-13065

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T.O. G-4558  
VEH. NO. 308T173  
92 F-160  
CRASH NO. 7277  
90° FRONT IMPACT

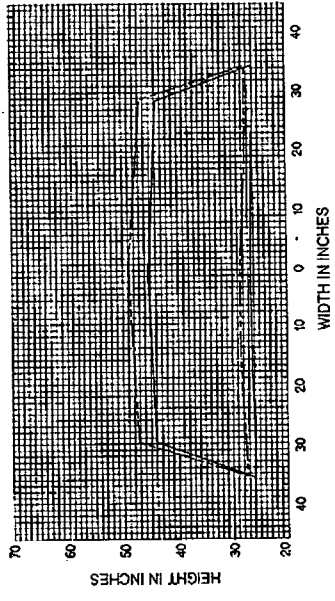
RIGHT  
SIDE VIEW

BEFORE \_\_\_\_\_  
AFTER - - - - -



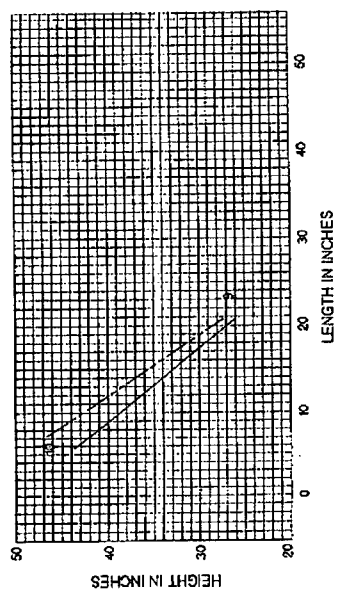
WINDSHIELD  
FRONT VIEW

BEFORE \_\_\_\_\_  
AFTER - - - - -



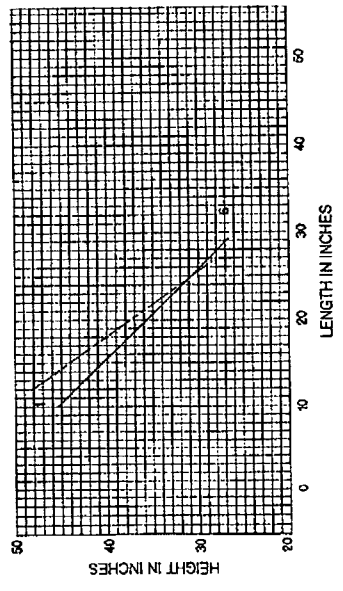
LEFT  
SIDE VIEW

BEFORE \_\_\_\_\_  
AFTER - - - - -



CENTERLINE  
SIDE VIEW

BEFORE \_\_\_\_\_  
AFTER - - - - -



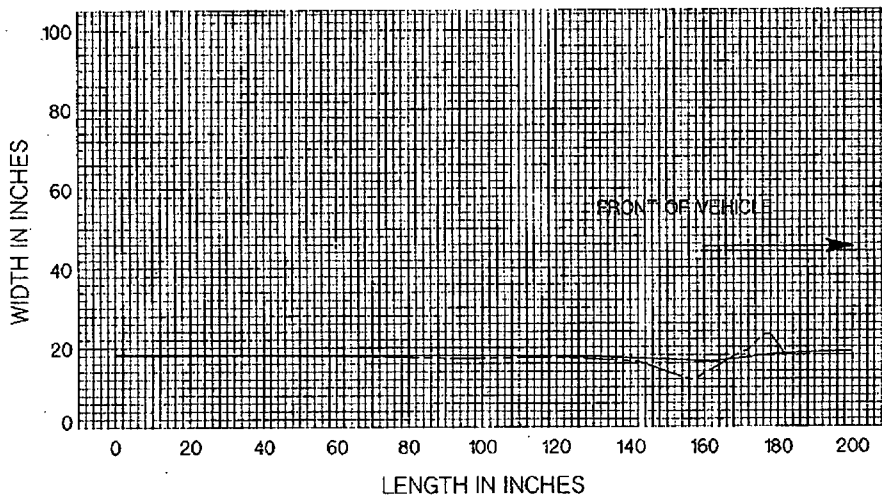
CRTS 0007277

### LEFT RAIL PLAN VIEW

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

BEFORE

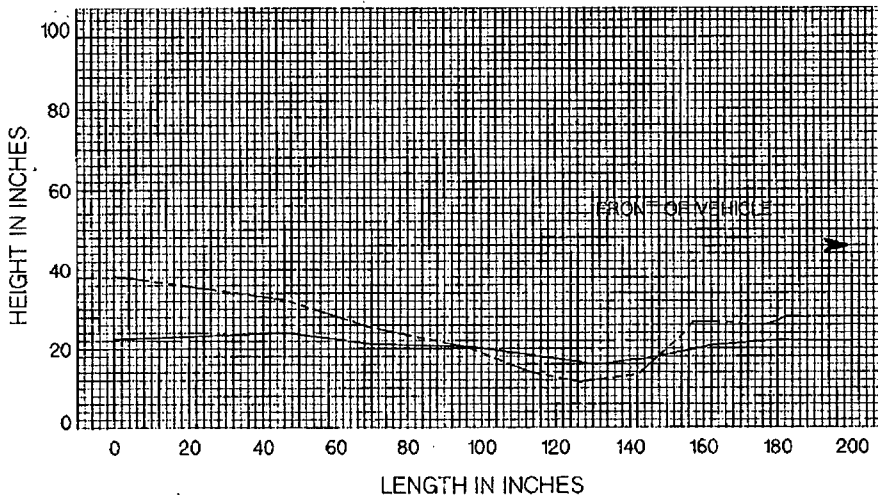
AFTER



### LEFT RAIL SIDE VIEW

BEFORE

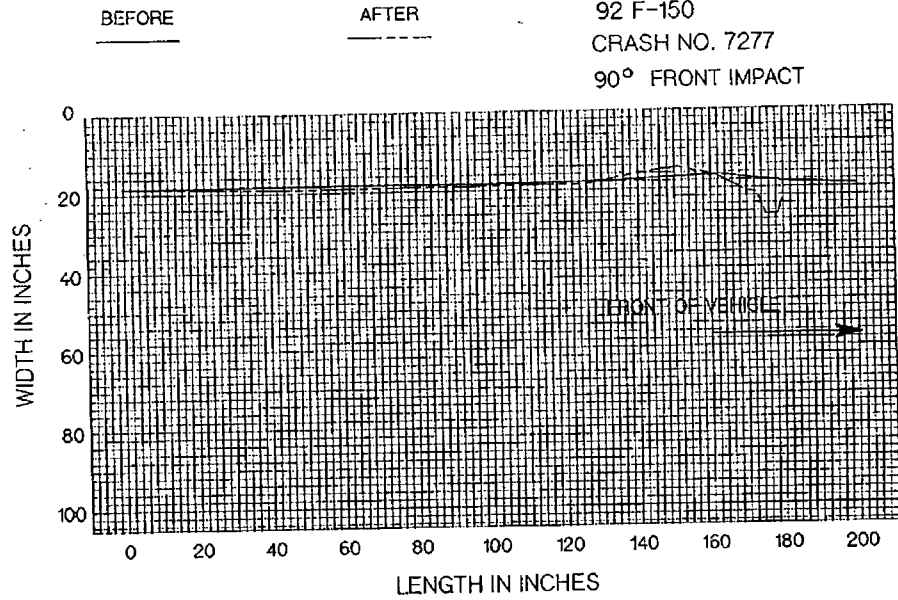
AFTER



T-1306 S  
000082

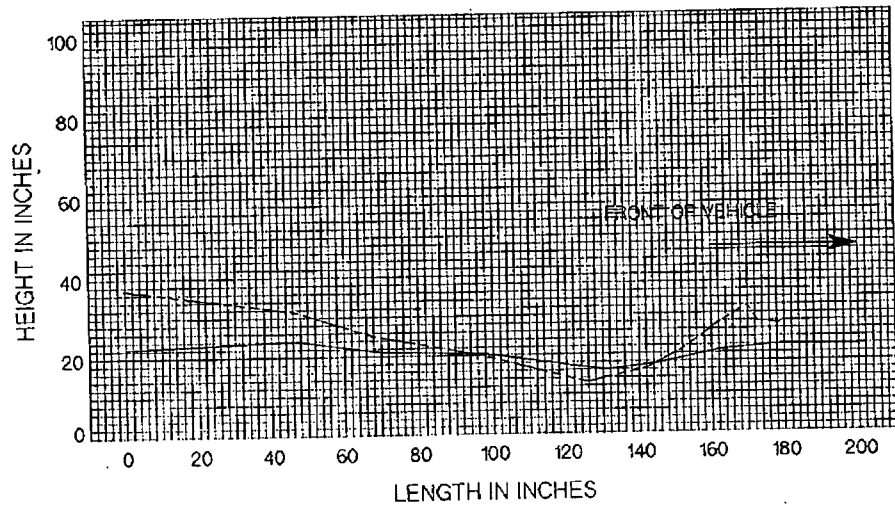
### RIGHT RAIL PLAN VIEW

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



### RIGHT RAIL SIDE VIEW

BEFORE                      AFTER



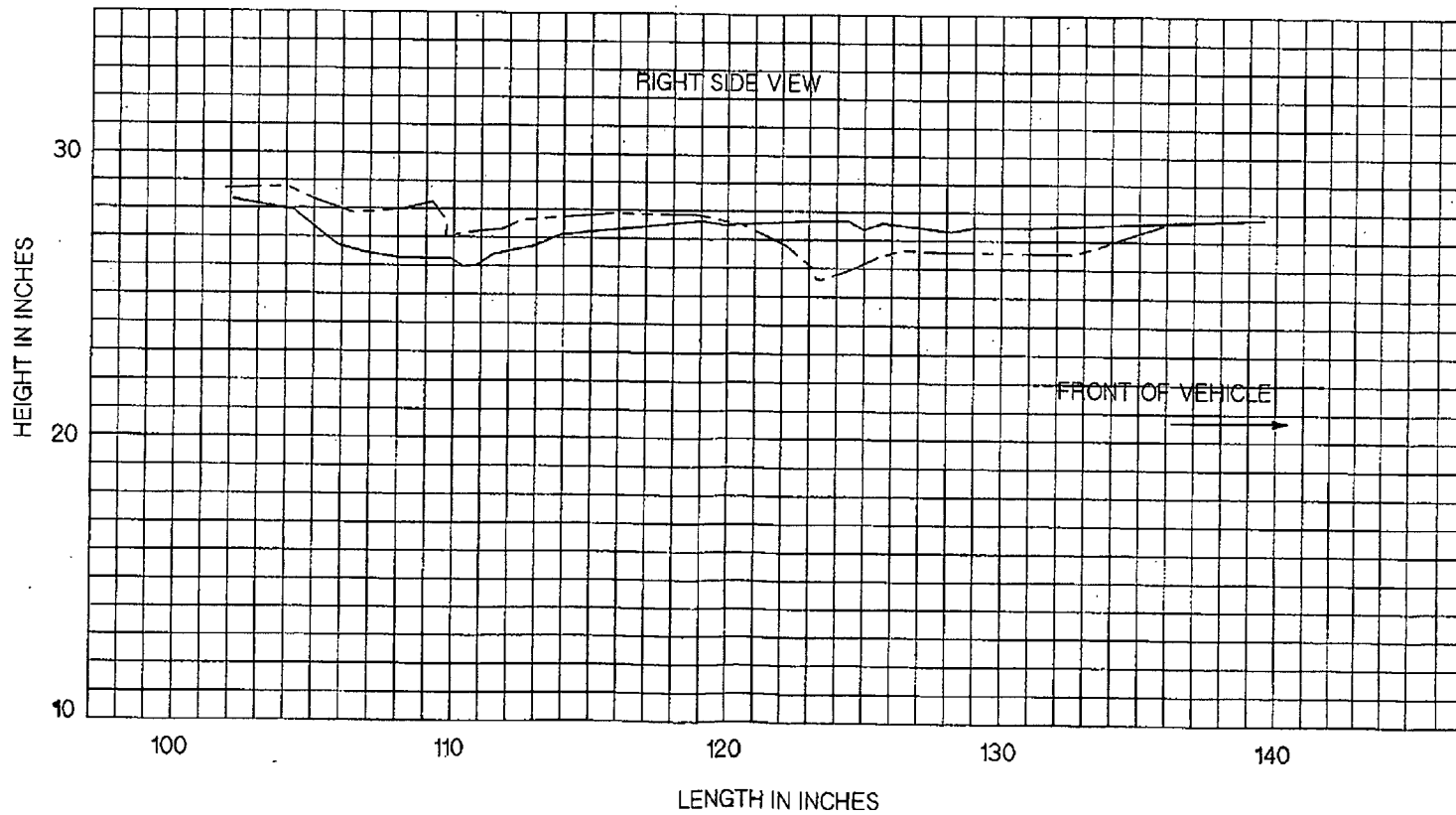
000083  
T-1306 S

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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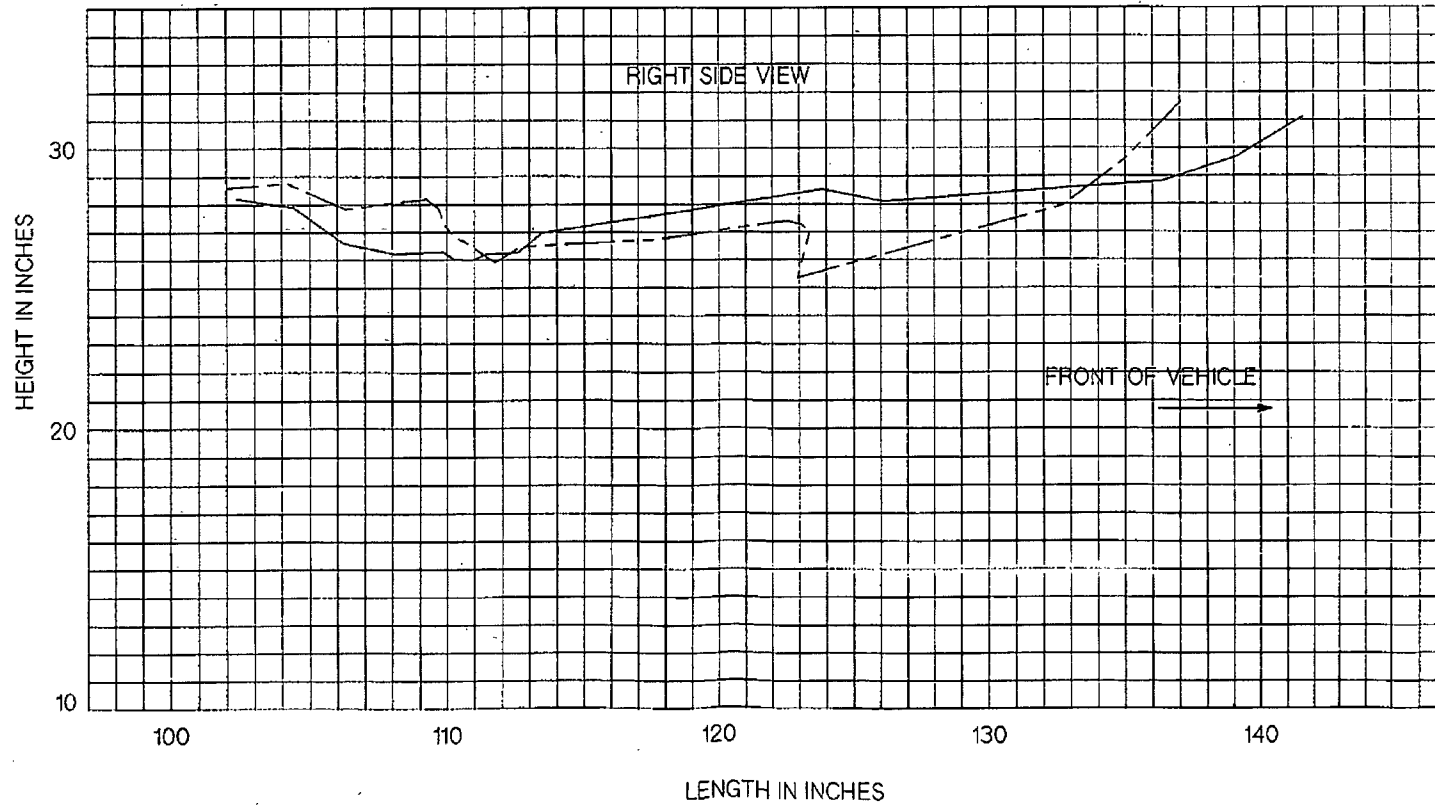
7-13065

000085

FLOORPAN SECTIONAL  
@ R/S INBOARD SEAT BELT MNT.

BEFORE \_\_\_\_\_  
AFTER - - - - -

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



CRTS 0007277

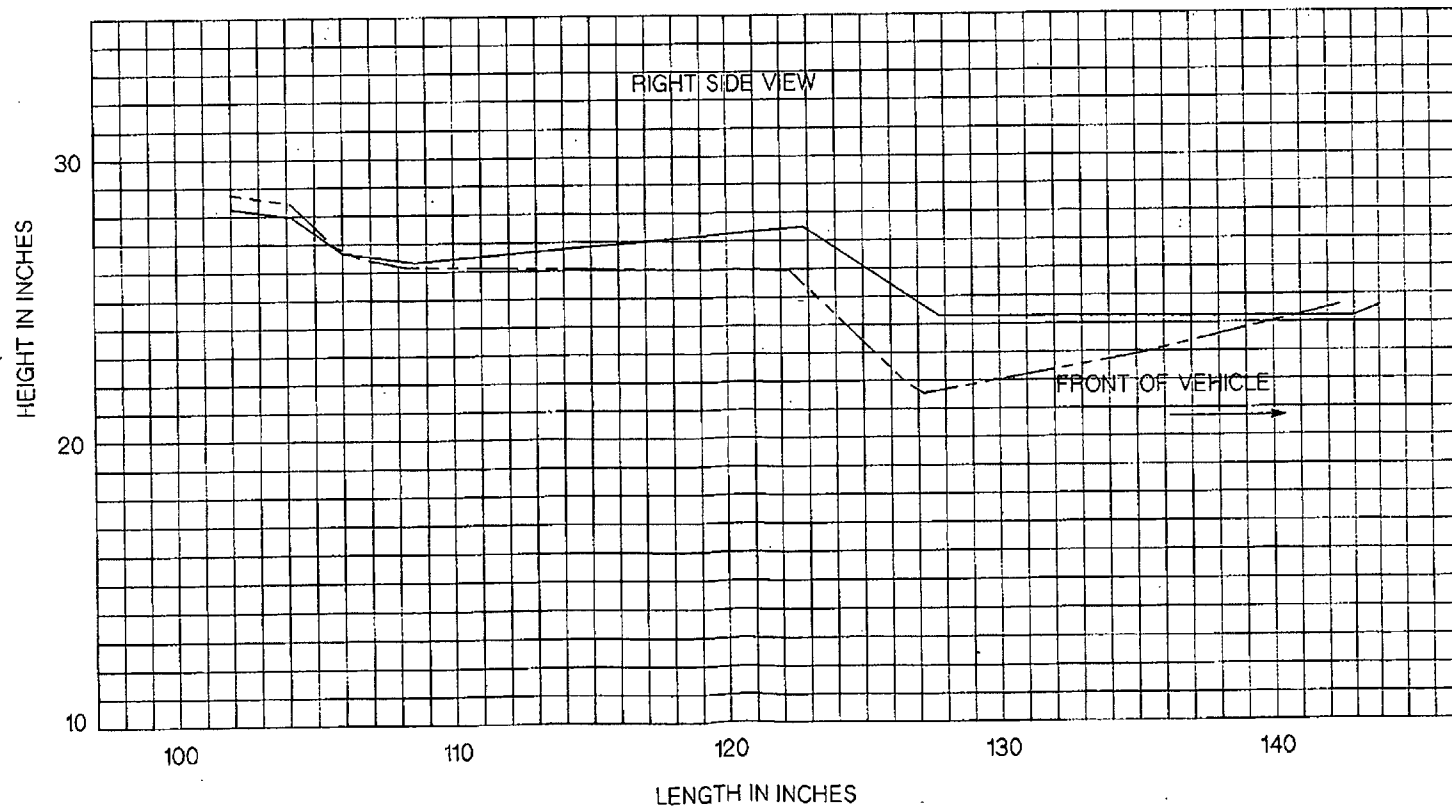
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1416

F-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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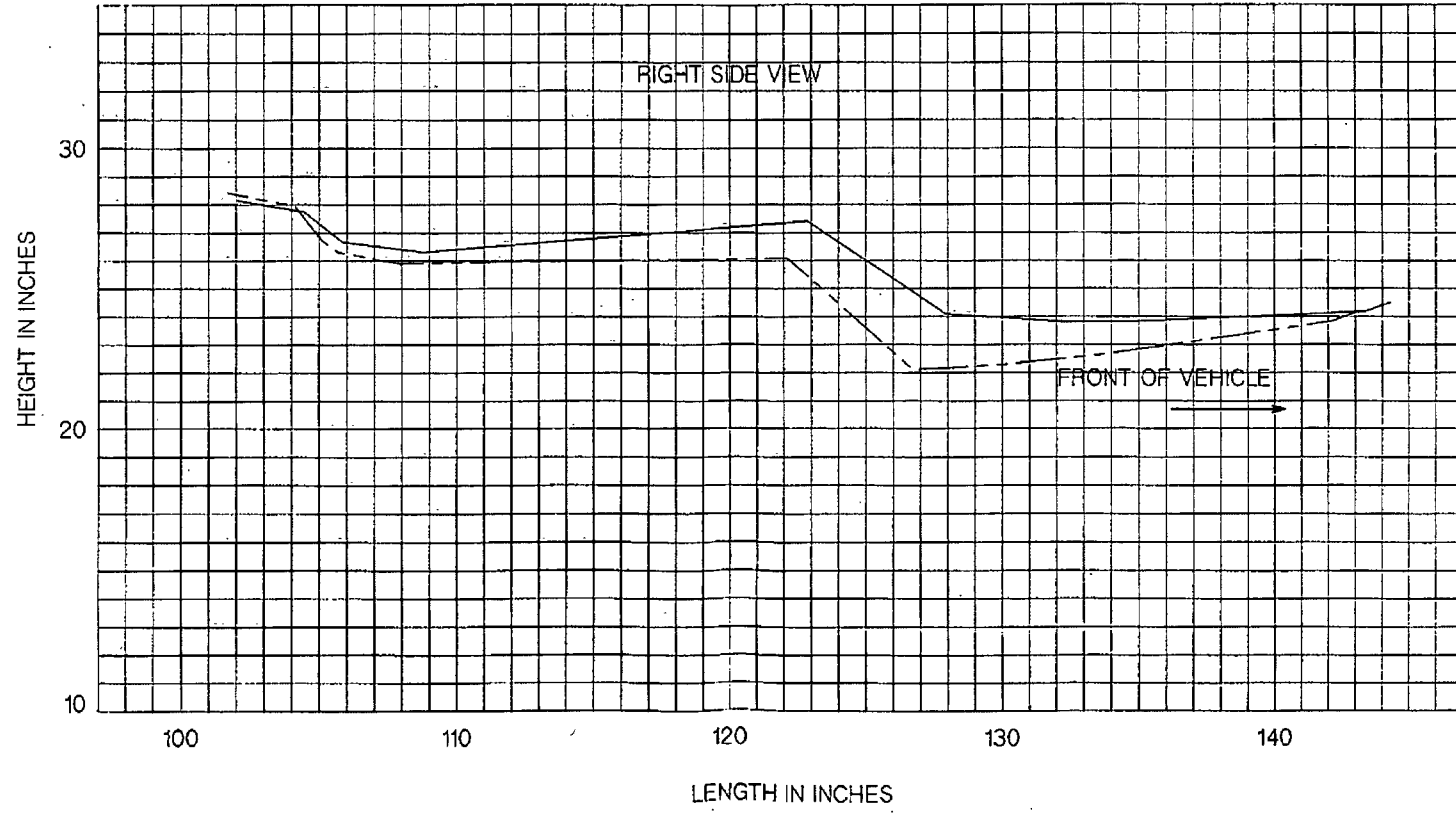
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000087

FLOORPAN SECTIONAL  
@ L/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

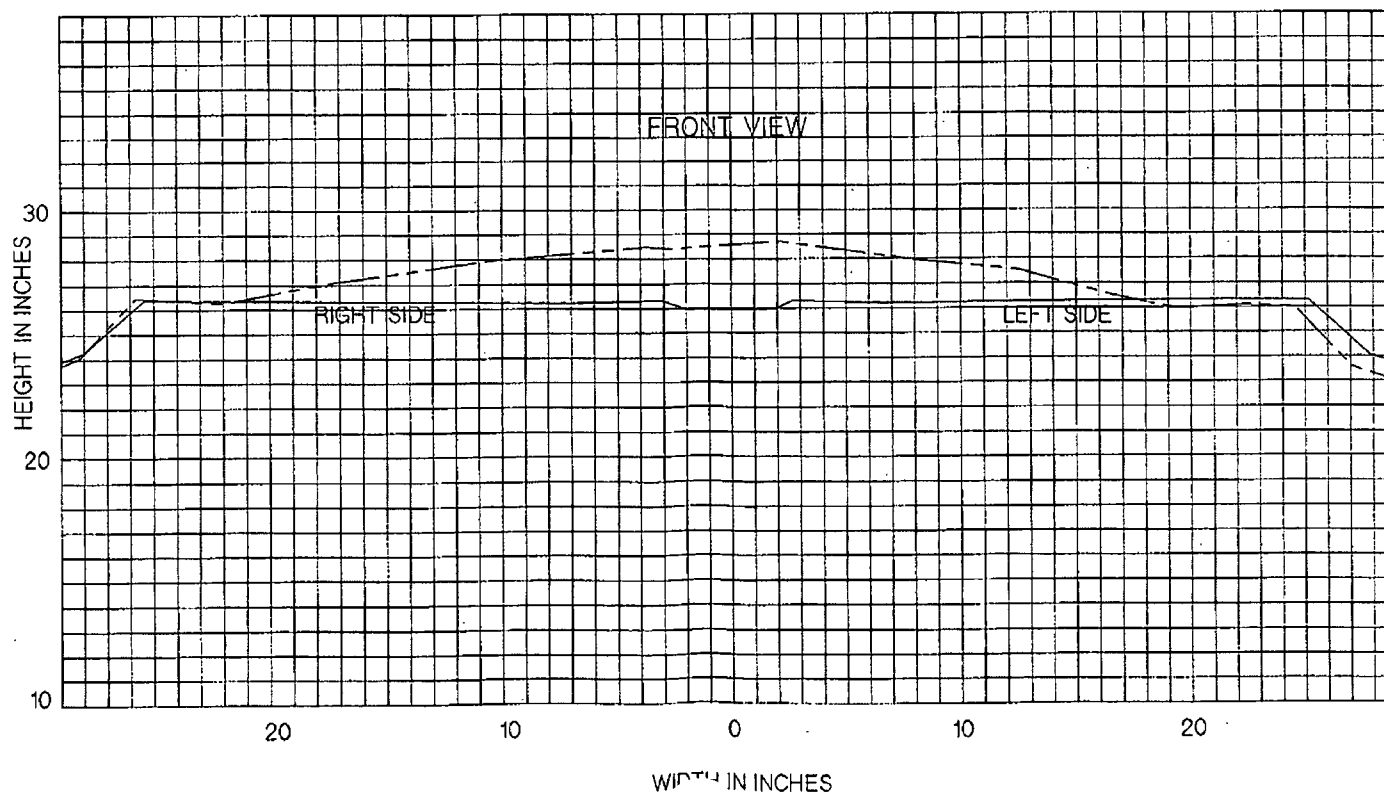
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7-3065  
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FLOORPAN SECTIONAL  
@ REAR SEAT BOLT C/L

BEFORE \_\_\_\_\_  
AFTER - - - - -

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



CRTS 0007277

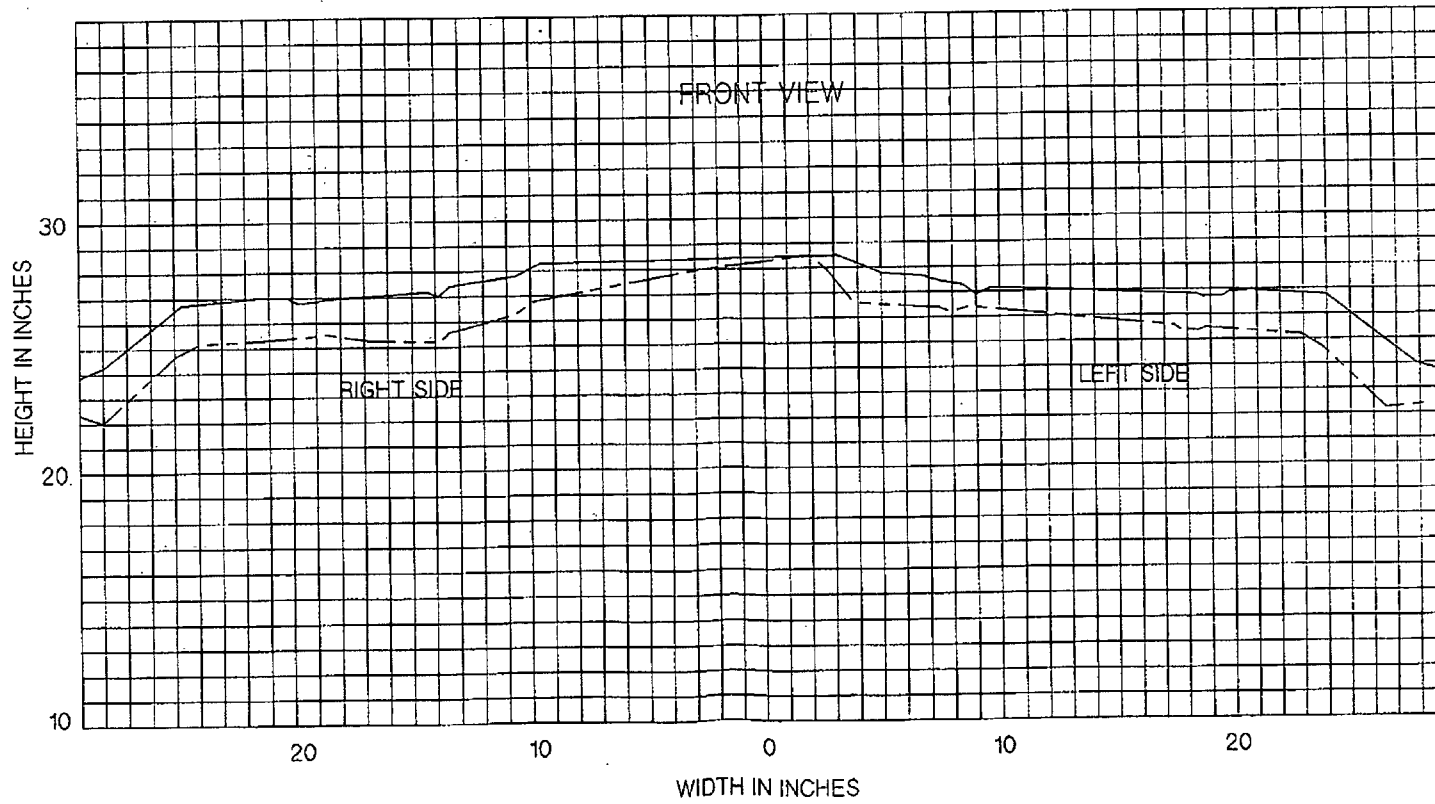
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FLOORPAN SECTIONAL  
@ FRONT SEAT BOLT C/L.

BEFORE \_\_\_\_\_  
AFTER - - - - -

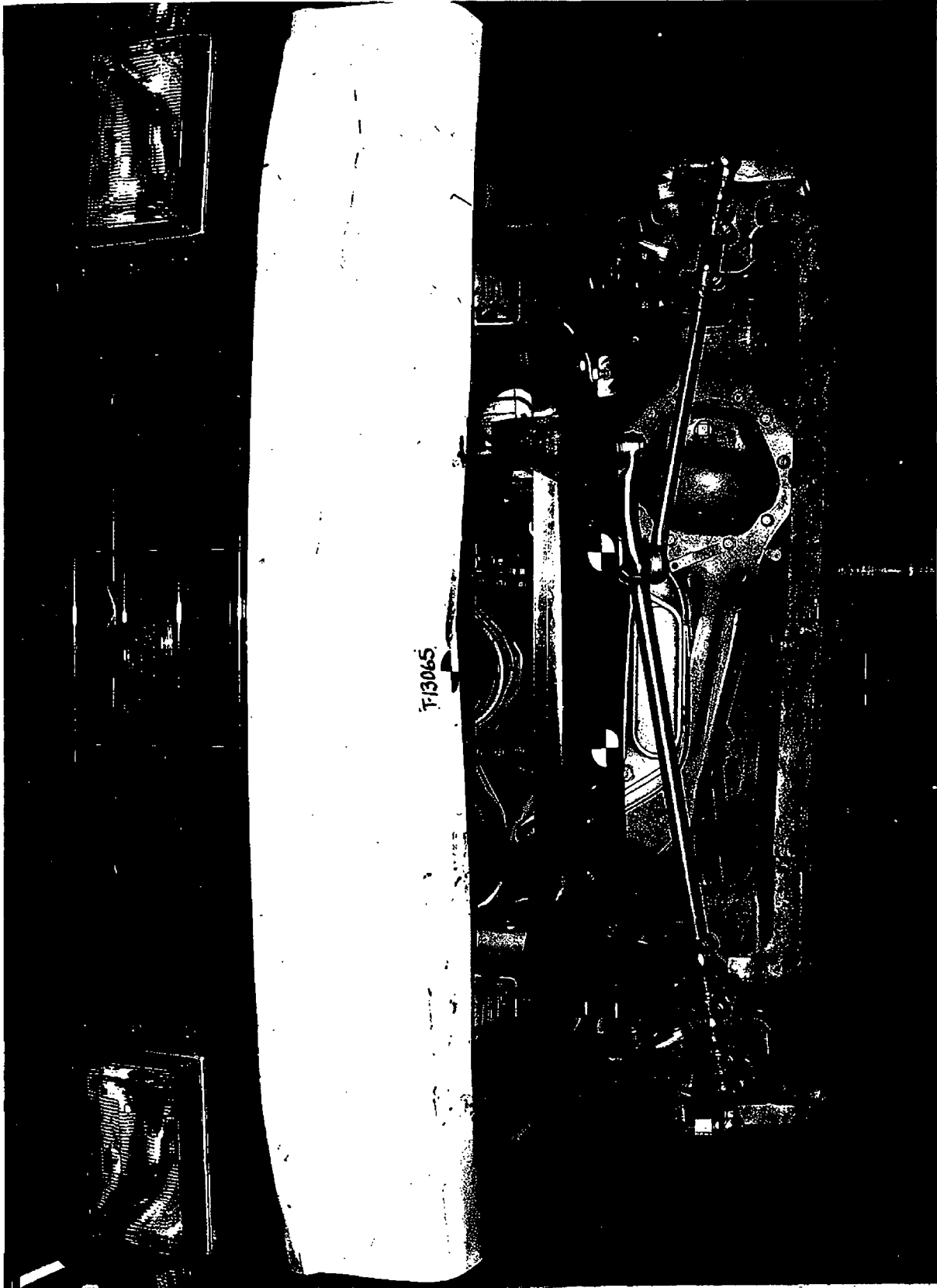
T.O. G-4558  
VEH. NO. 308T173  
92 F-150  
CRASH NO. 7277  
90° FRONT IMPACT



CRTS 0007277

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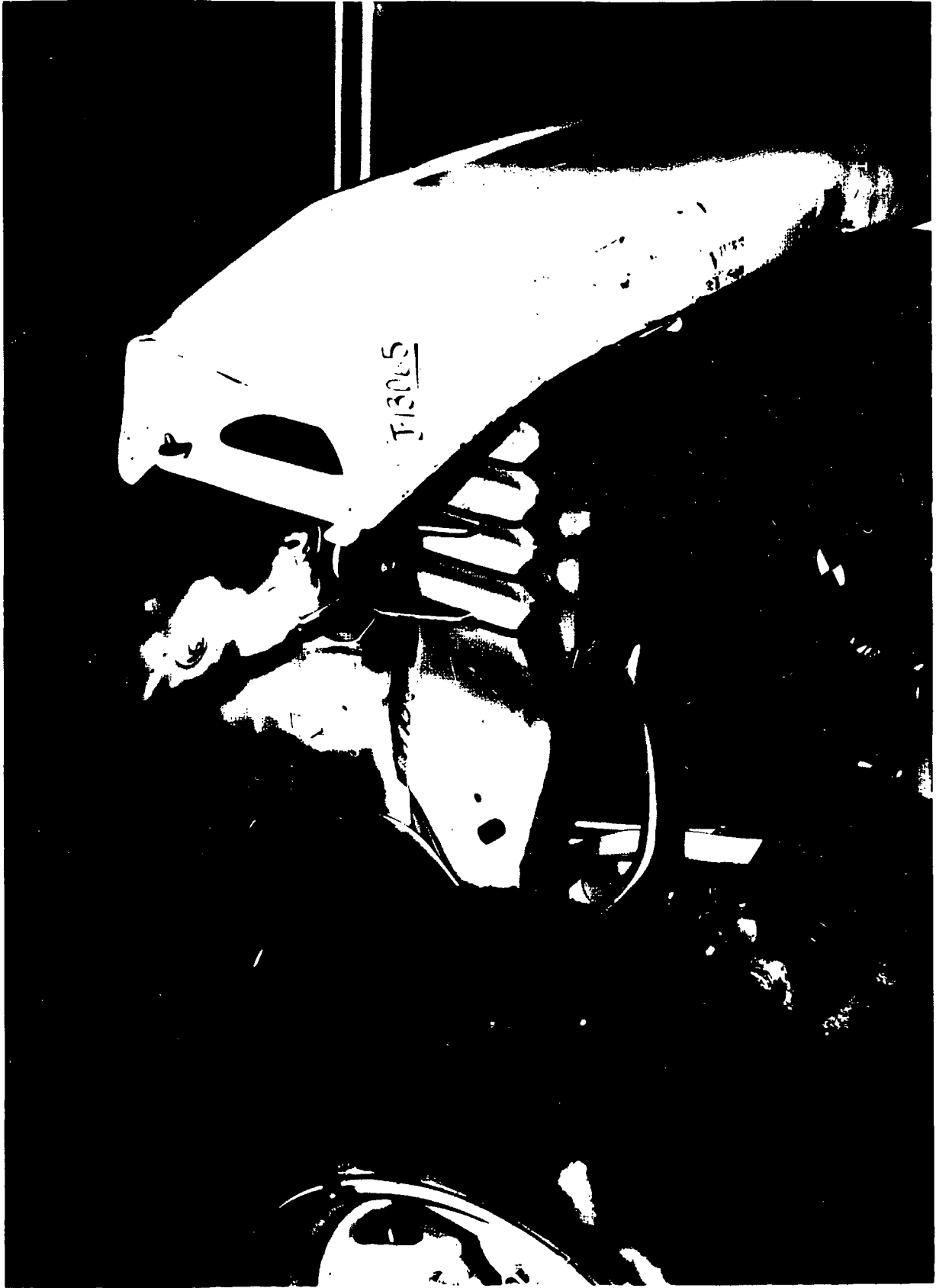
CN 54017-3718



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CN 54017-3719



CRTS 0007277

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CN 54017-3720



CRTS 0007277

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CN 54017-372J



CRTS 0007277

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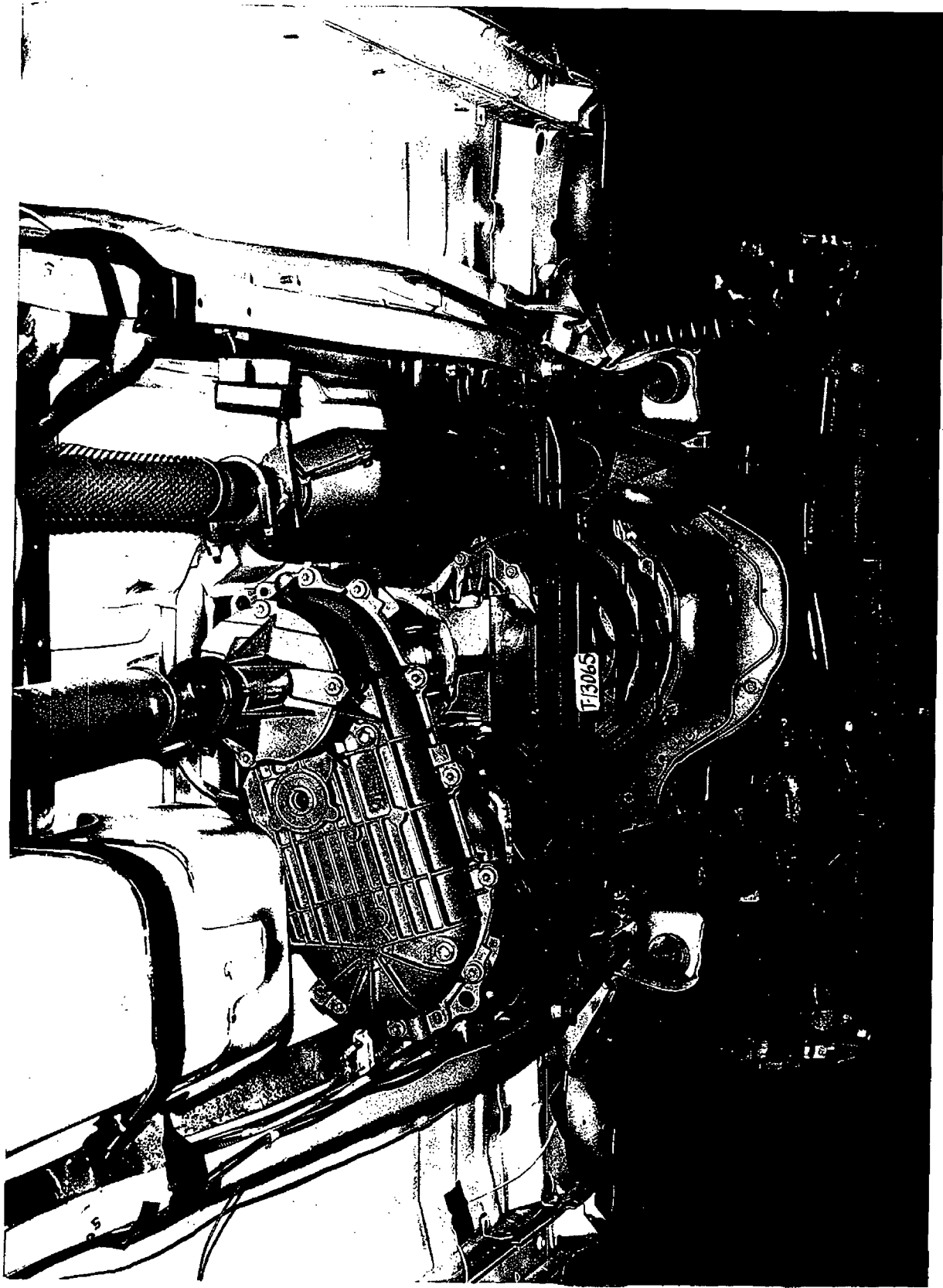
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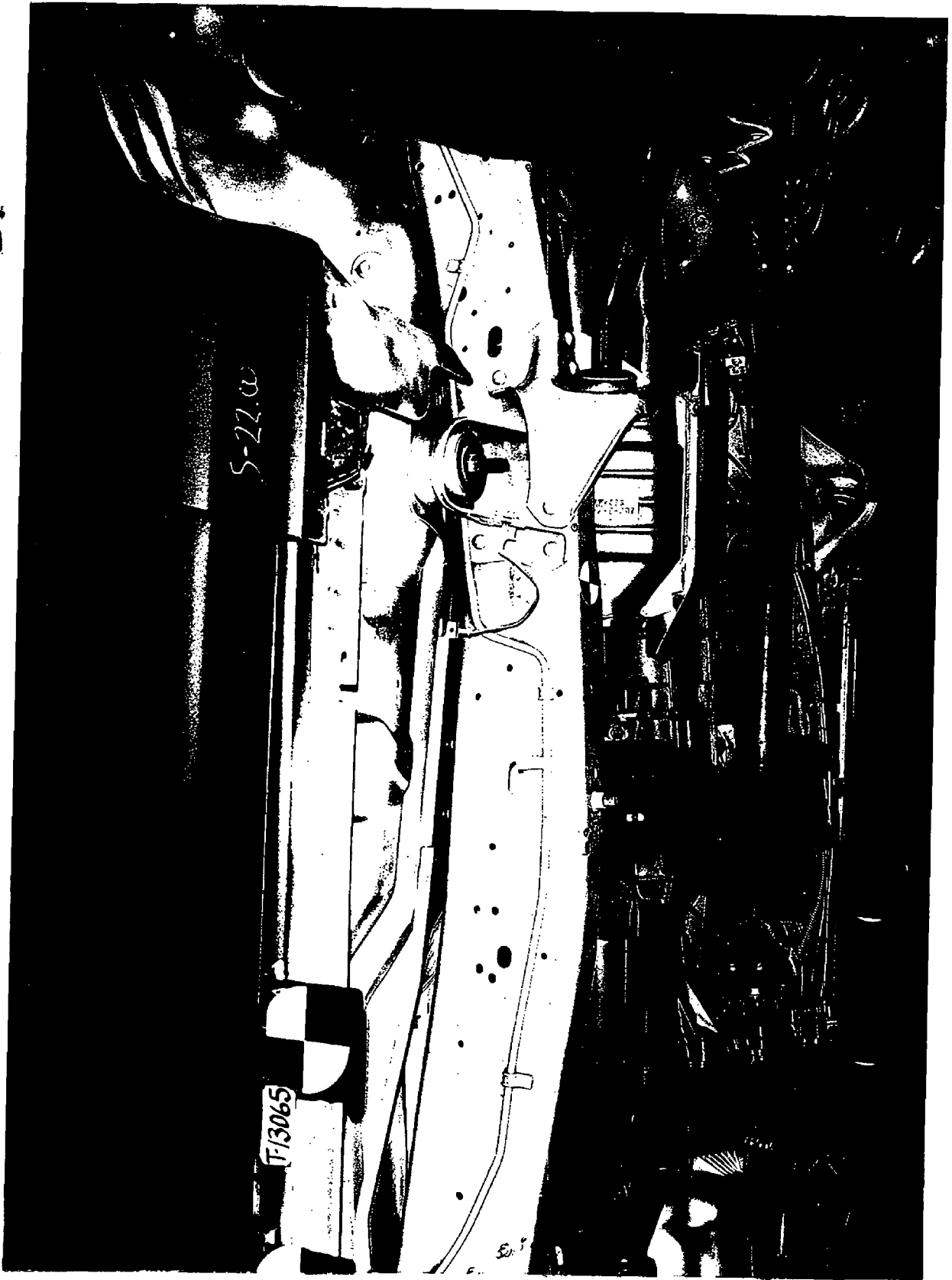
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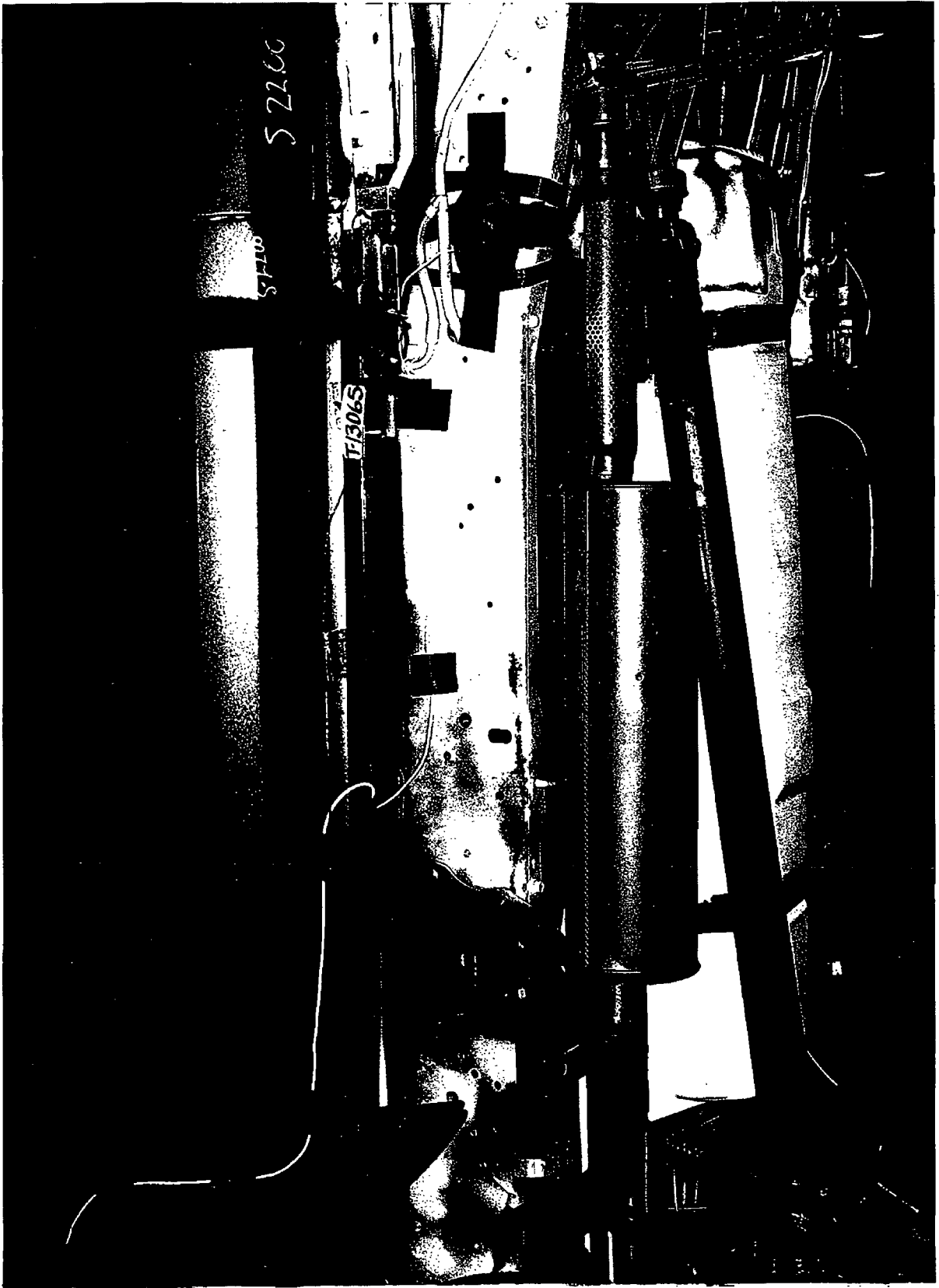
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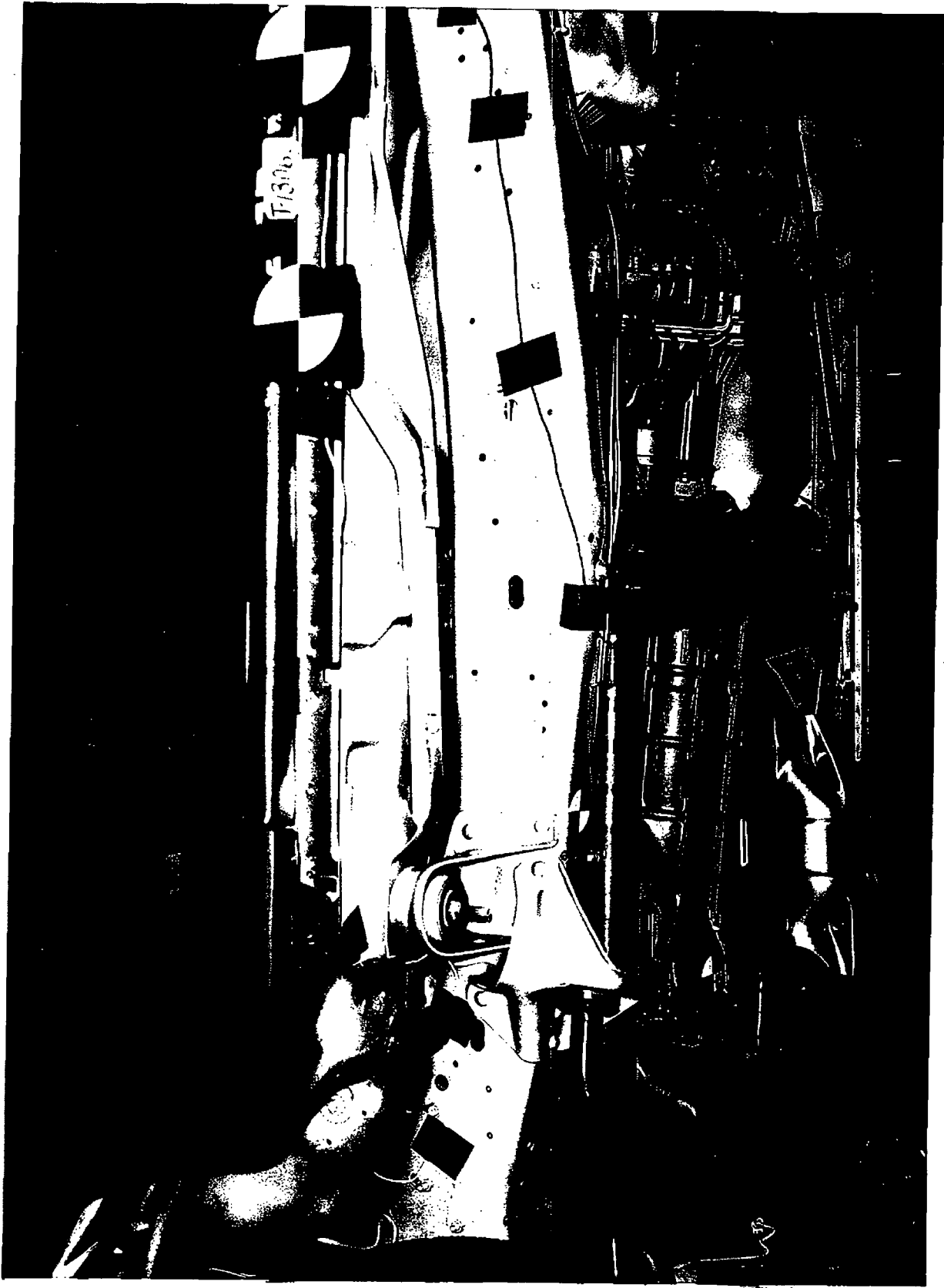
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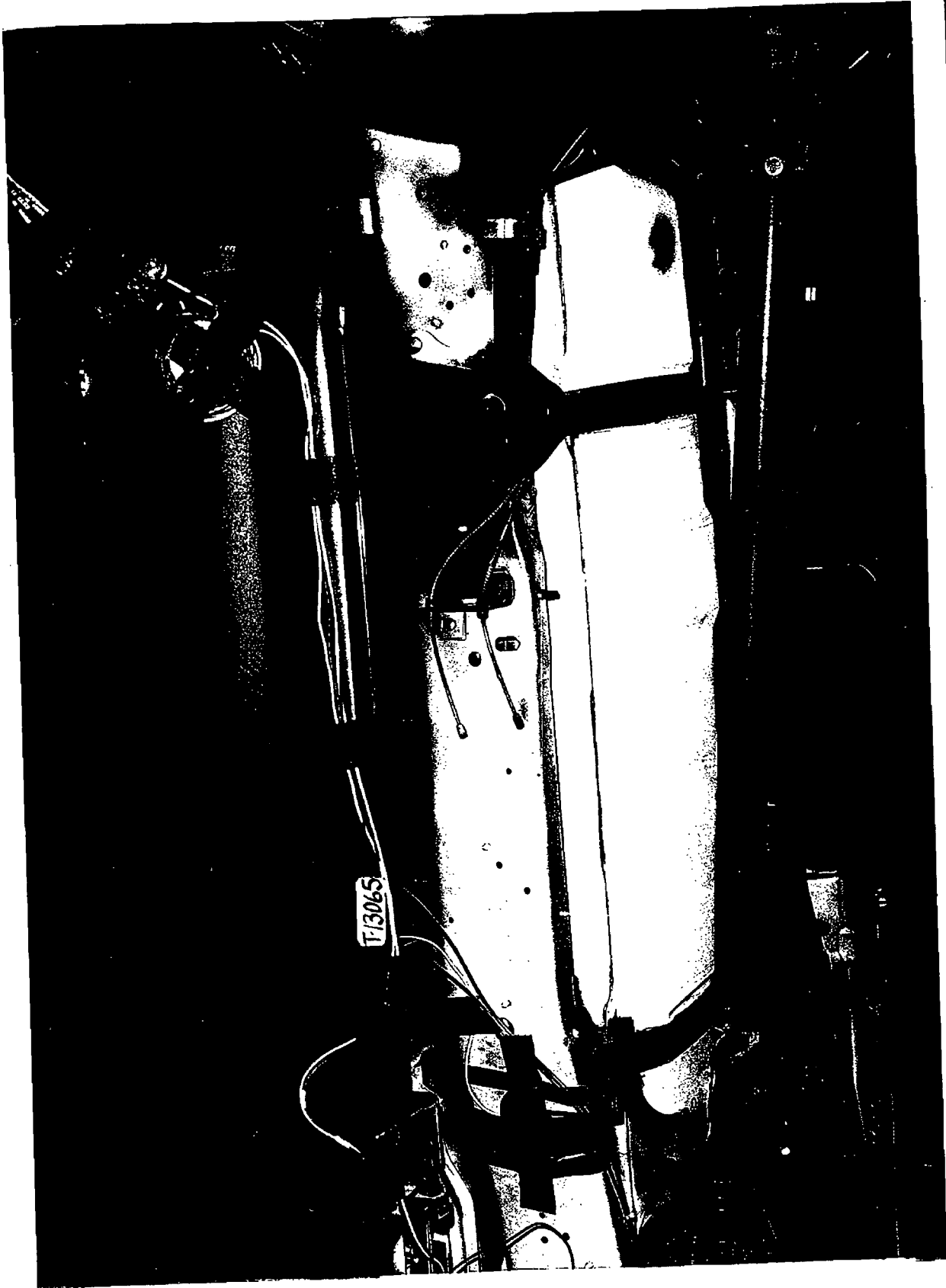
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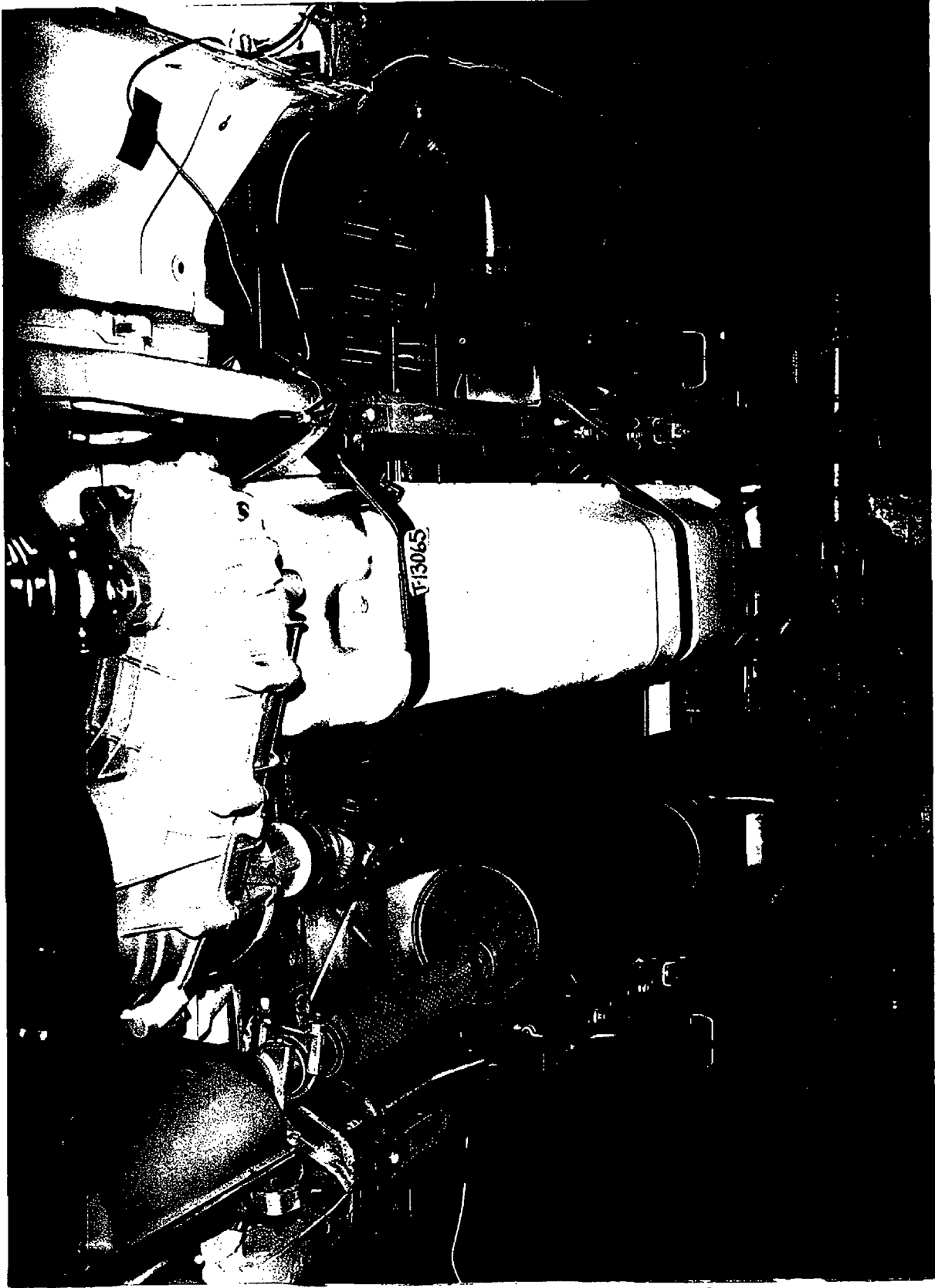
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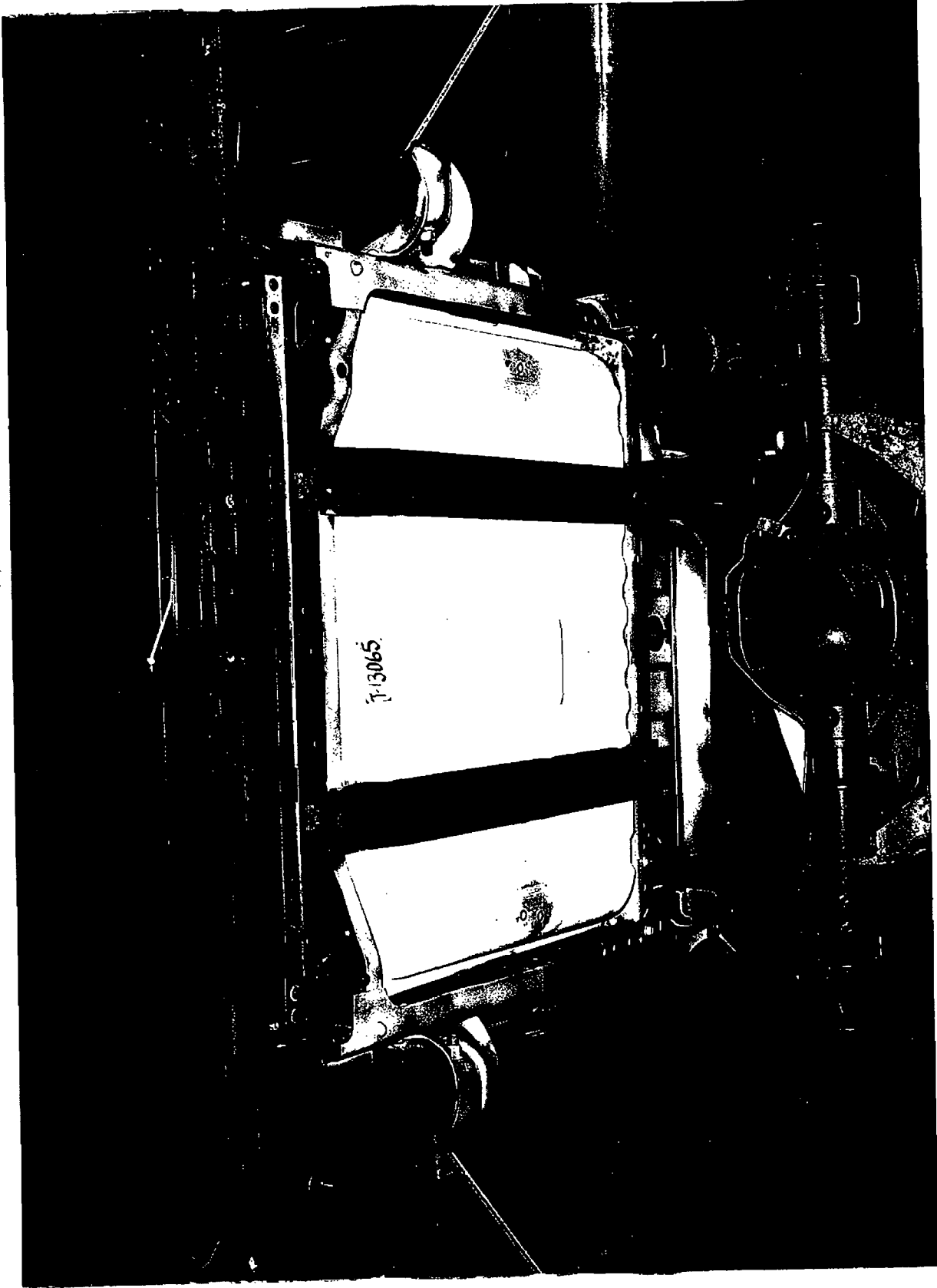
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CN 54017-3729

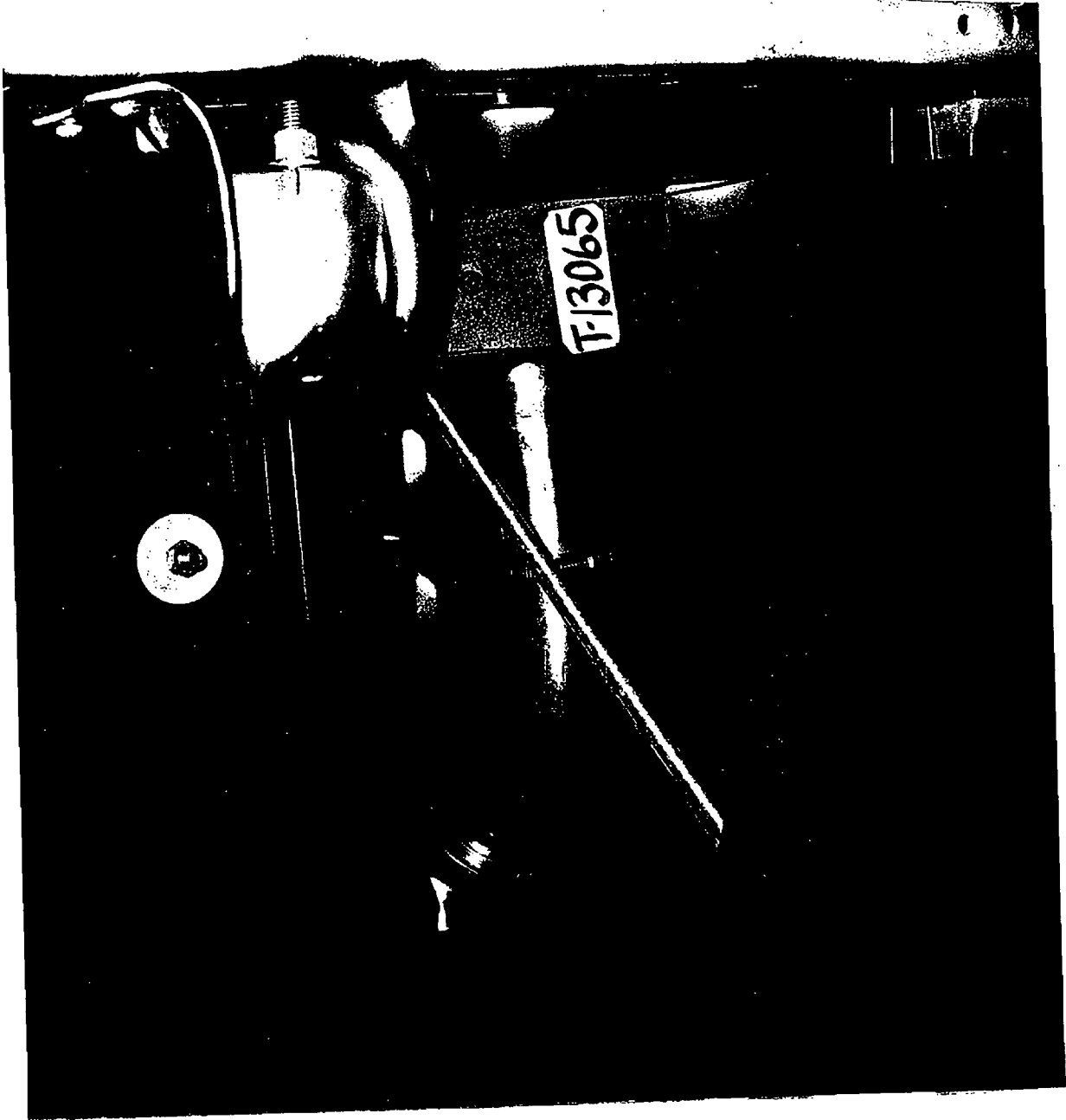


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CN 54017-3730

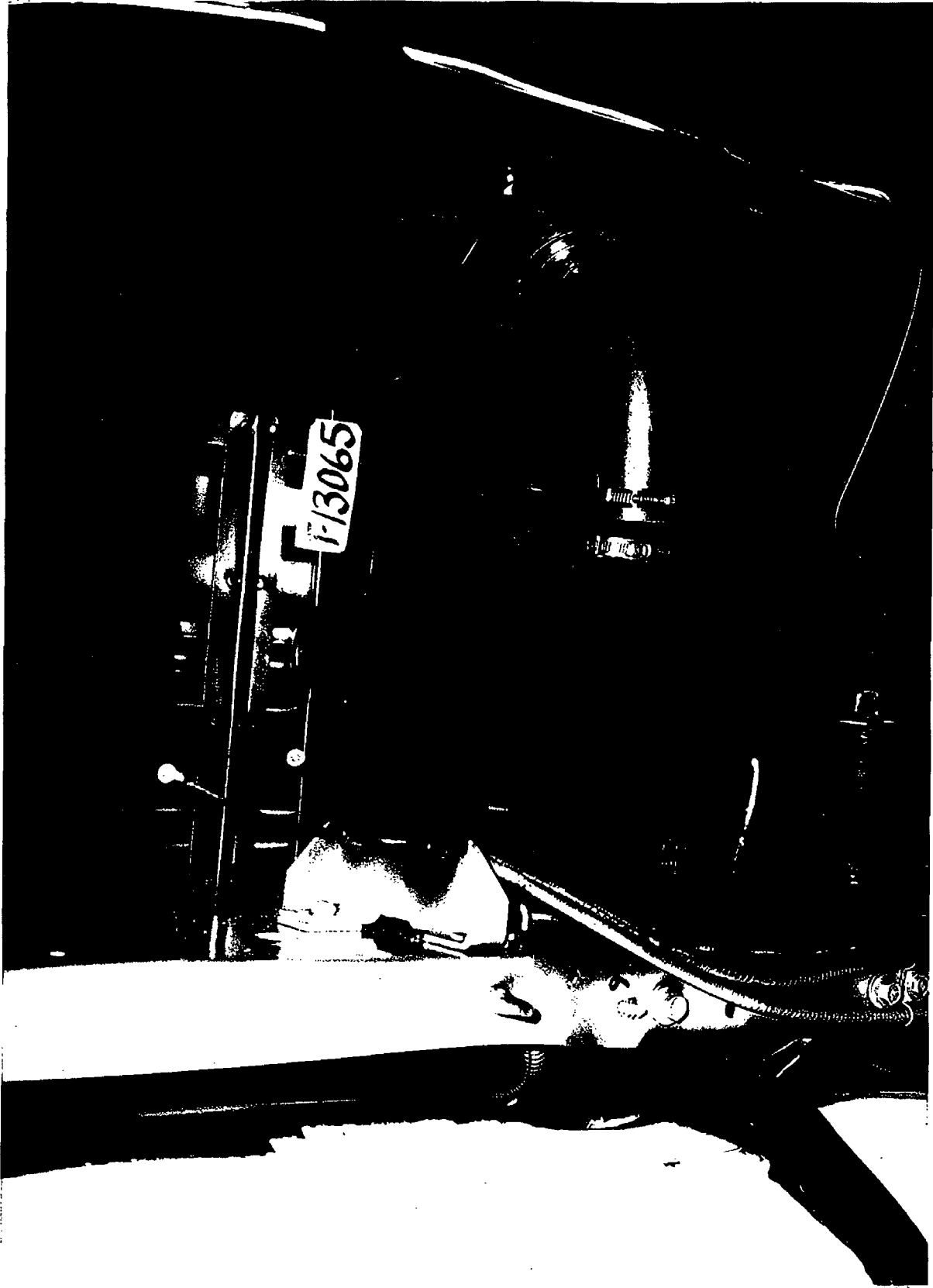
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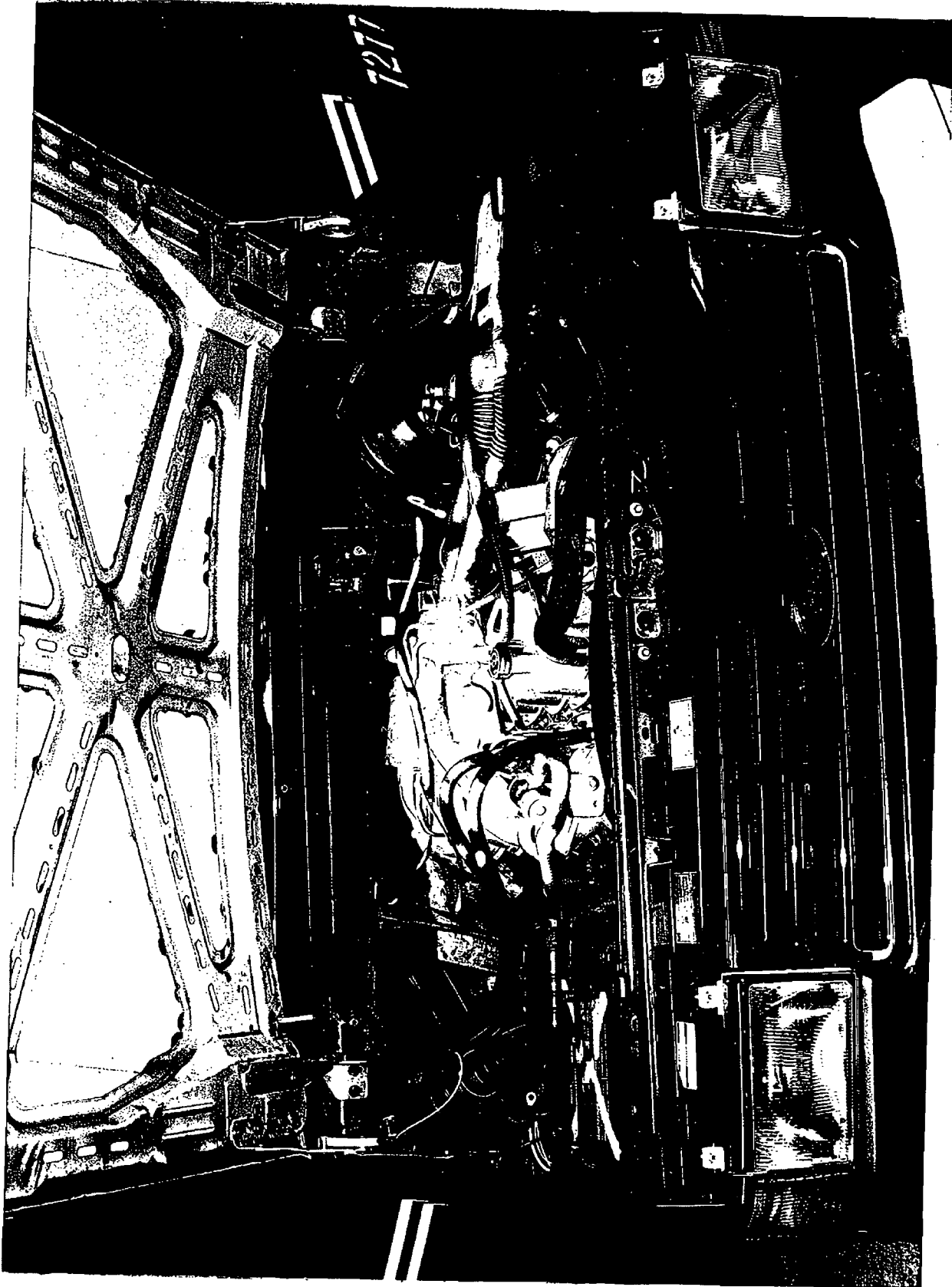
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CN 54017-3732



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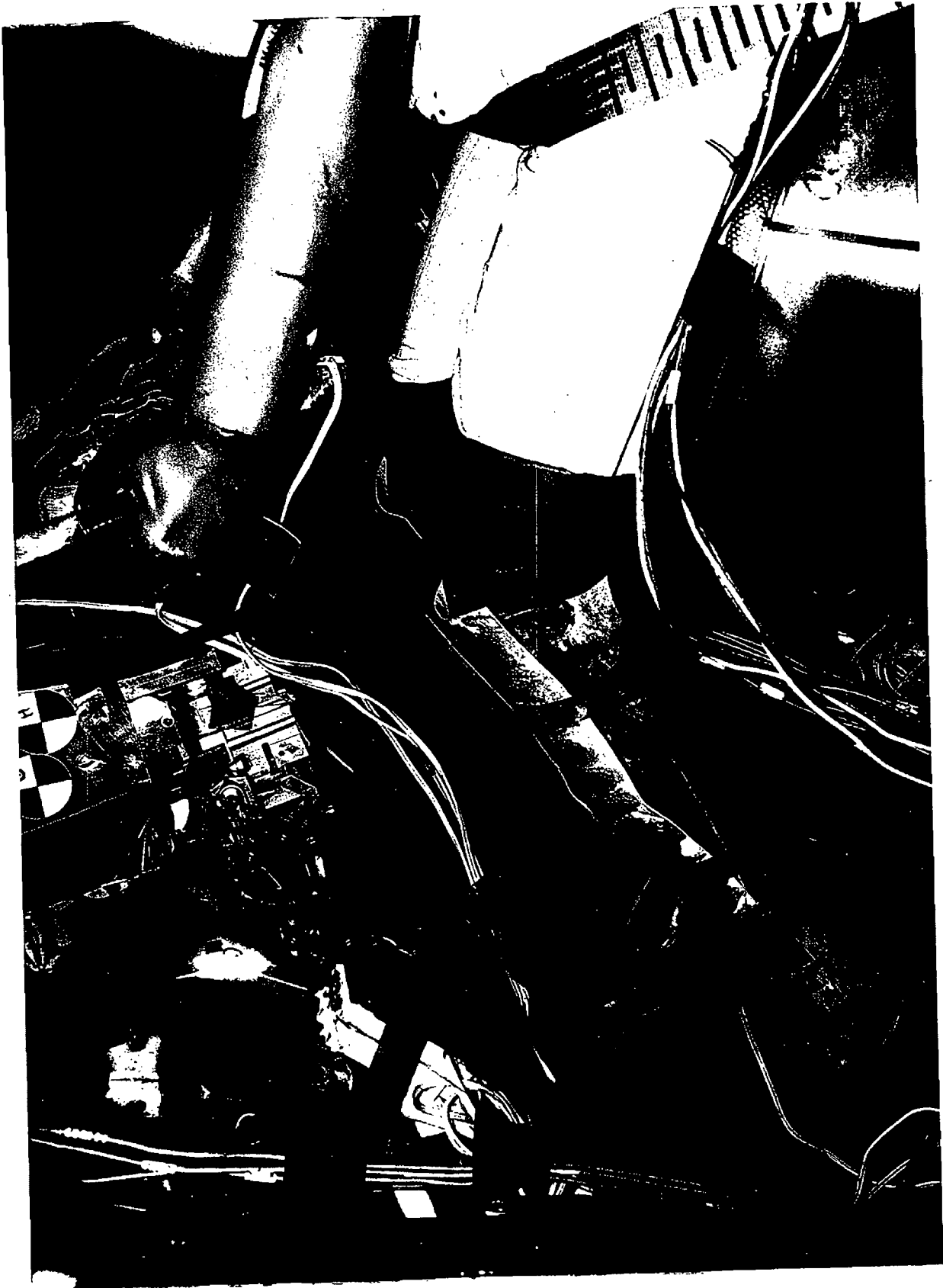
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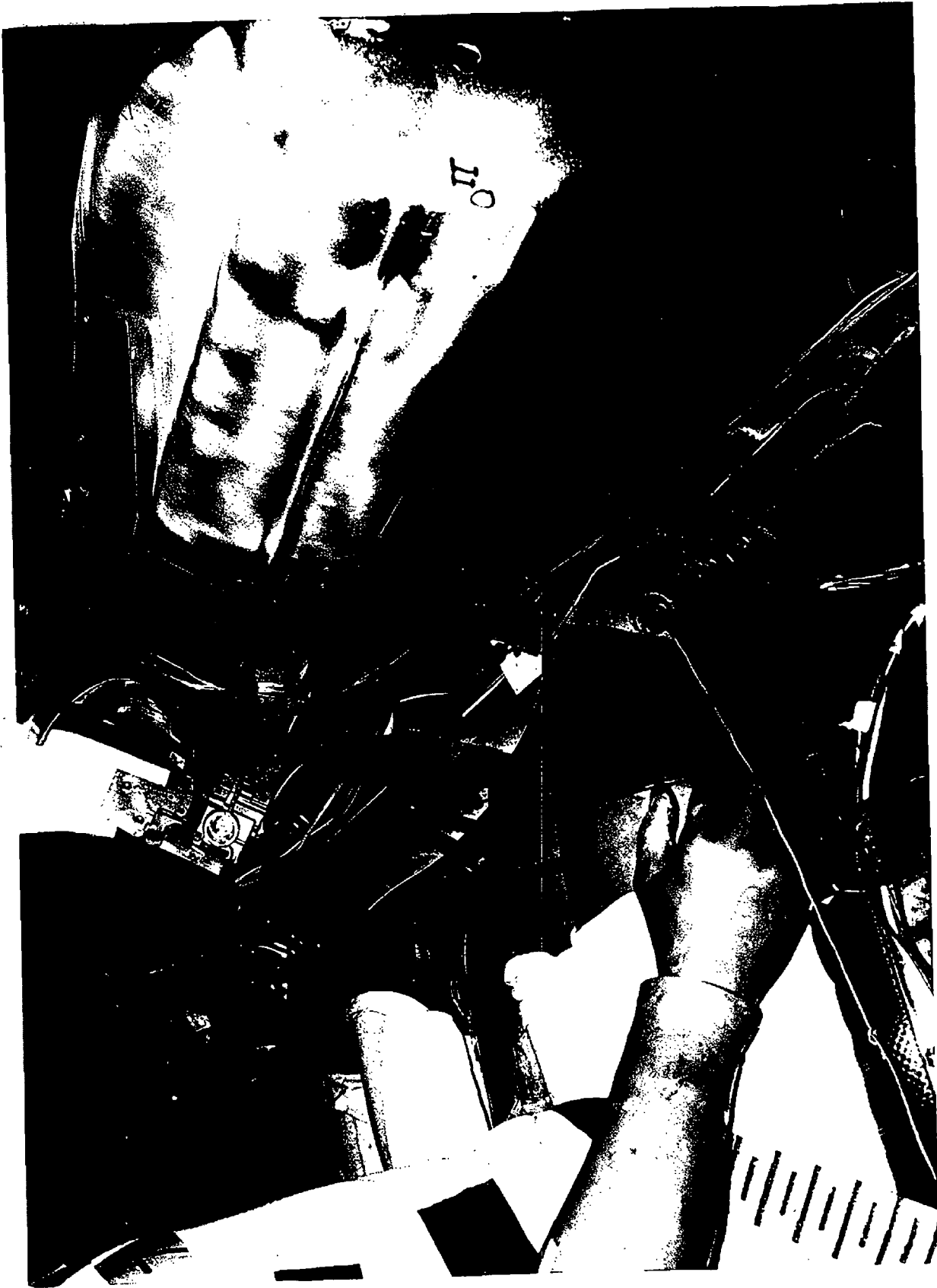
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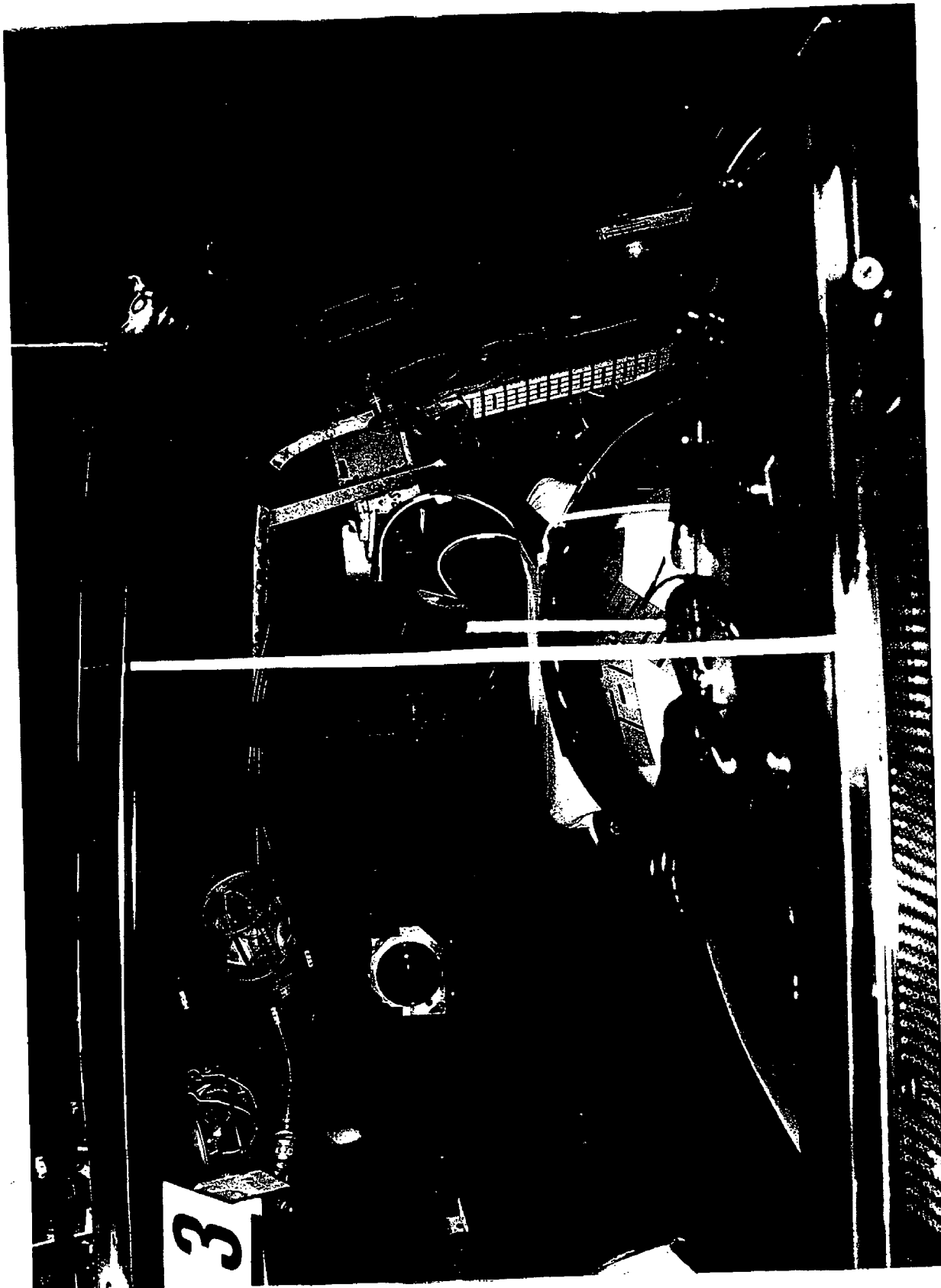
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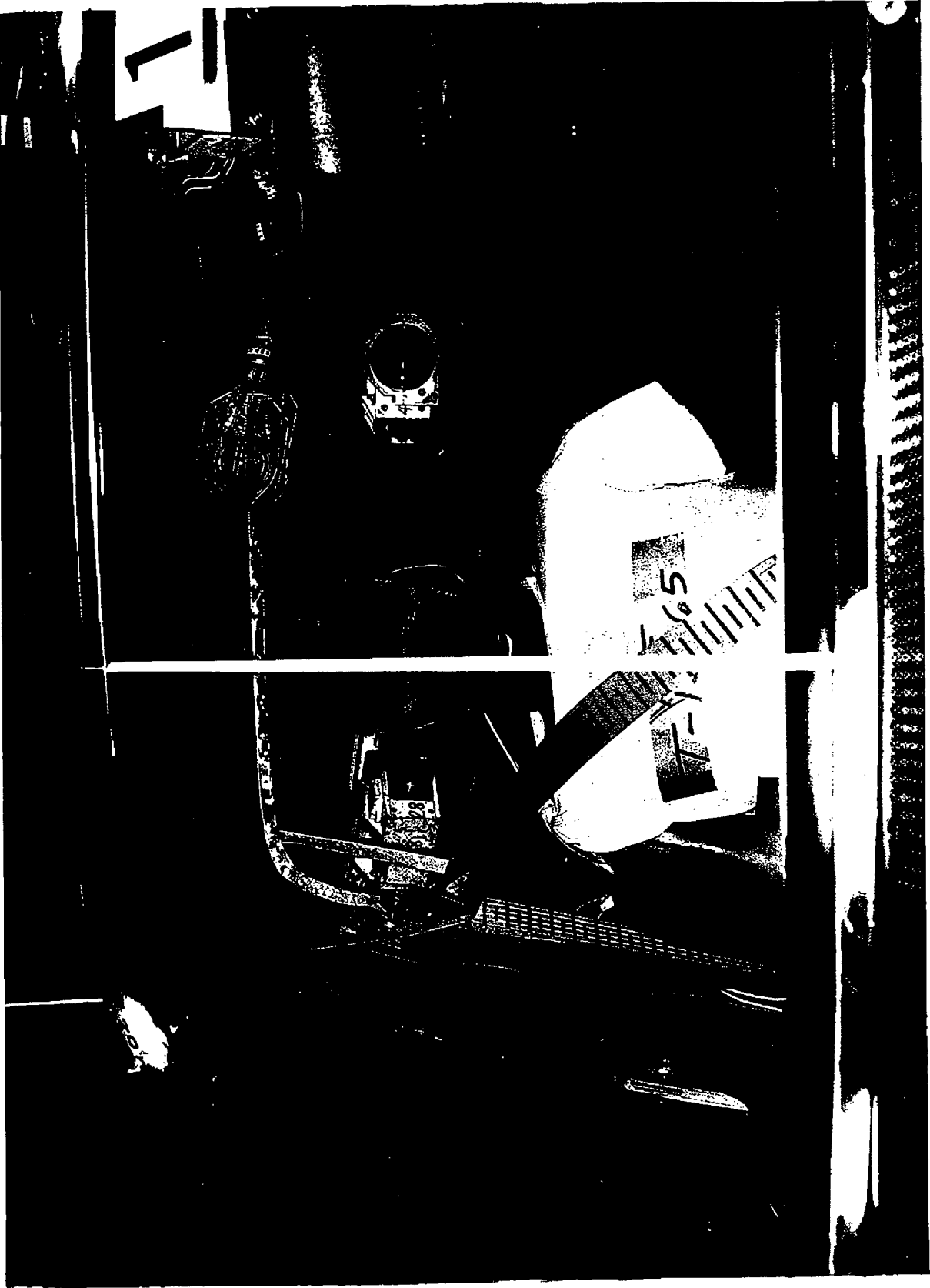
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CRTS 0007277

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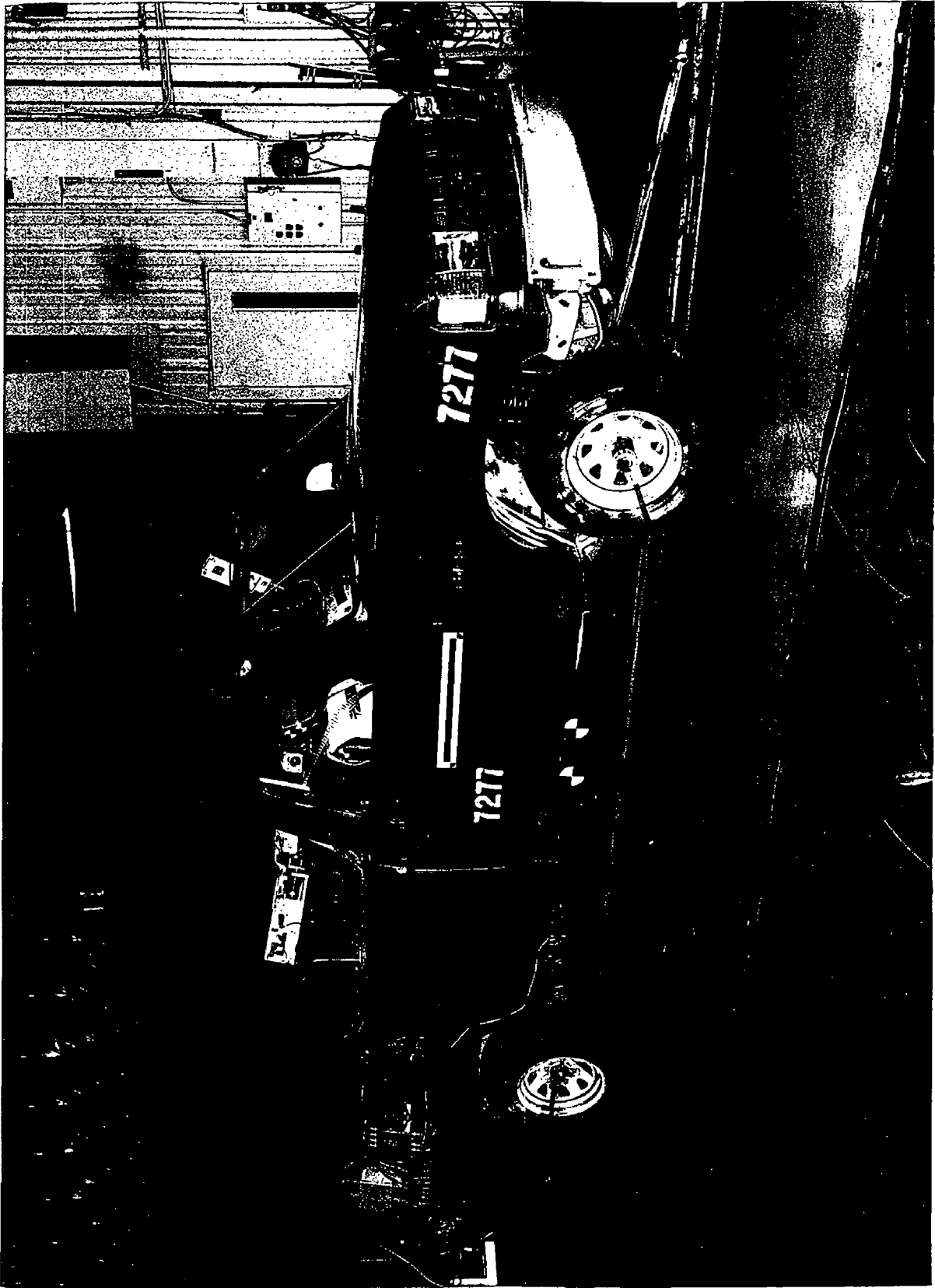
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CRTS 0007277

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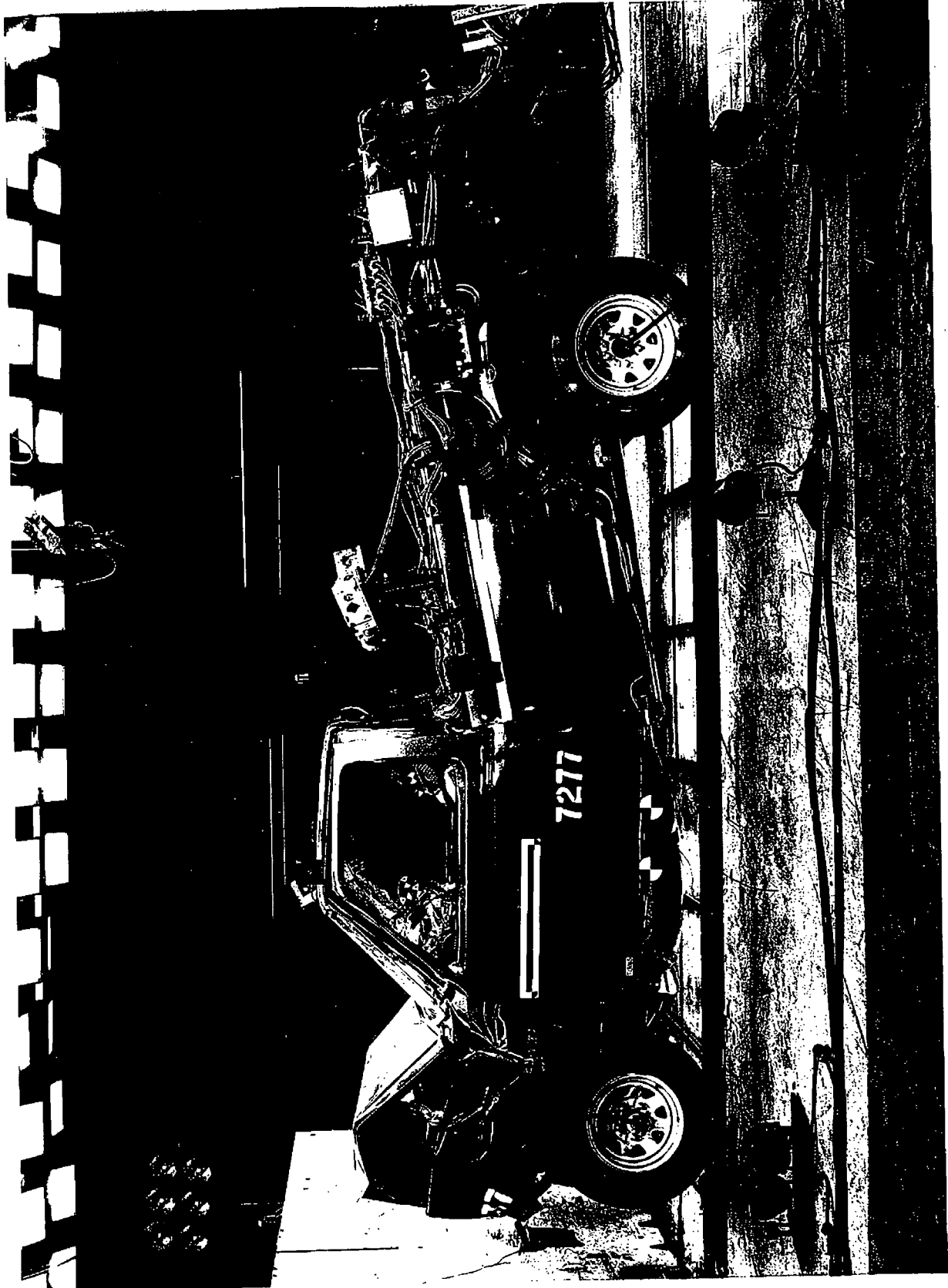
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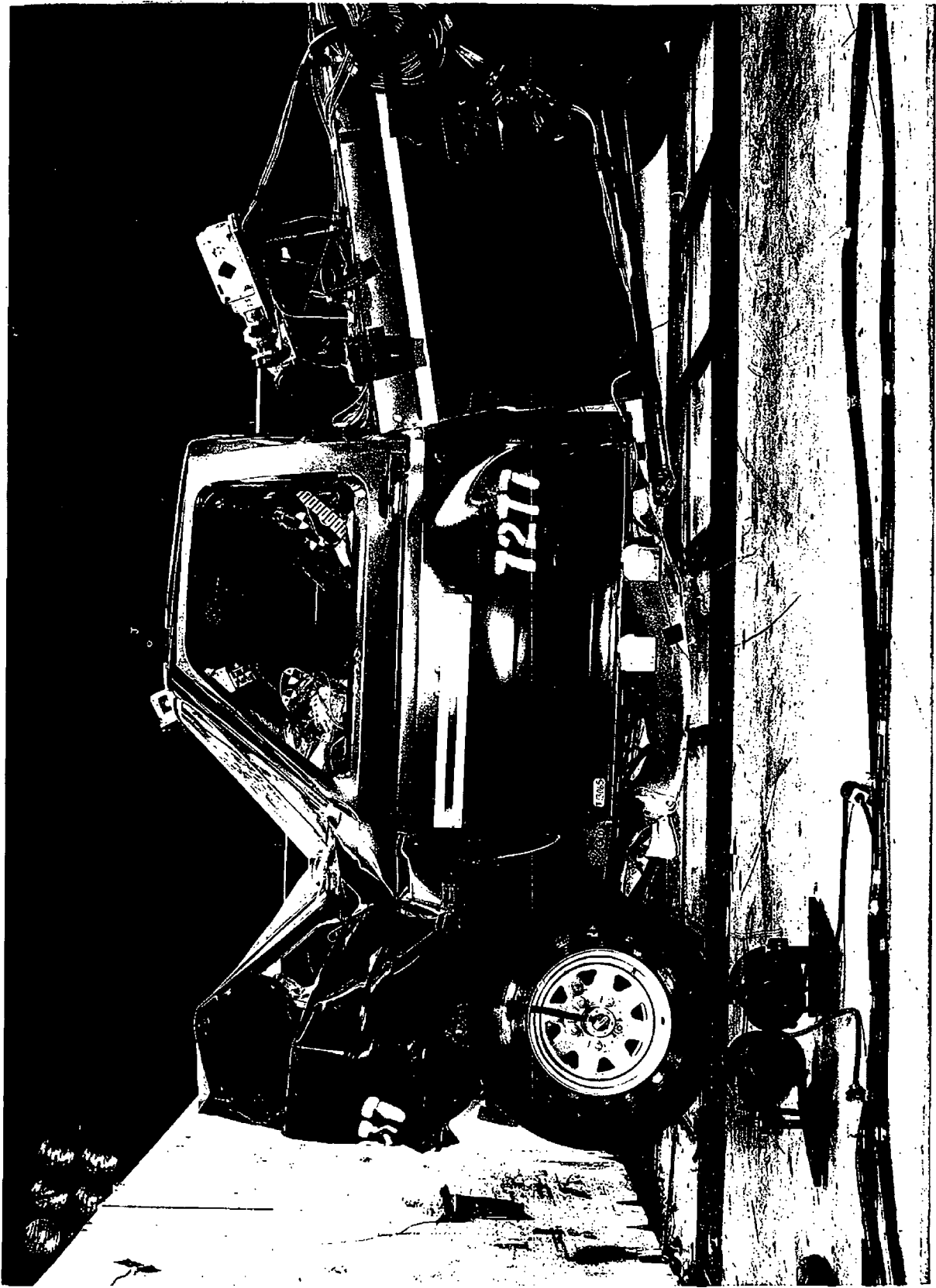
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CRTS 0007277

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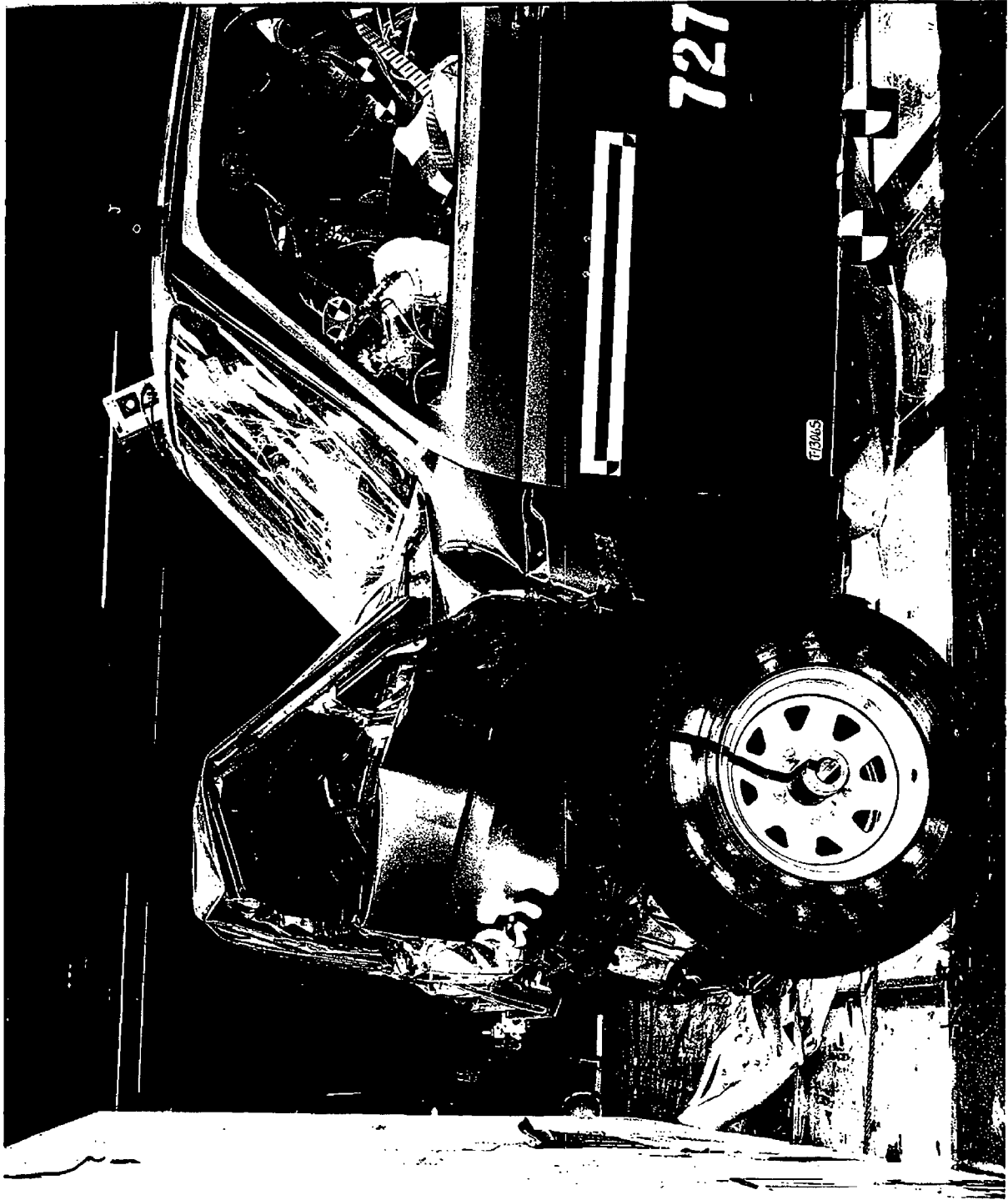
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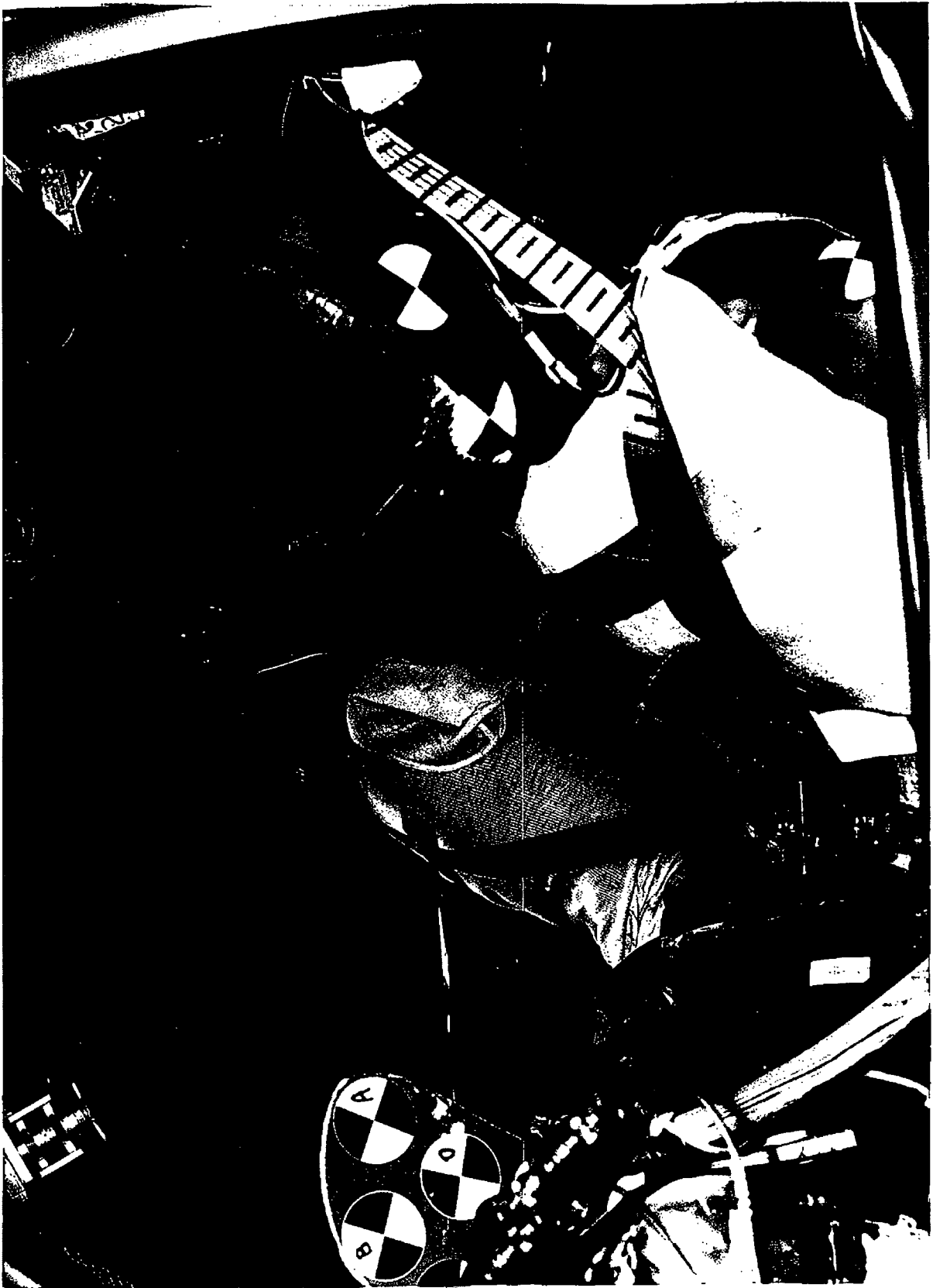
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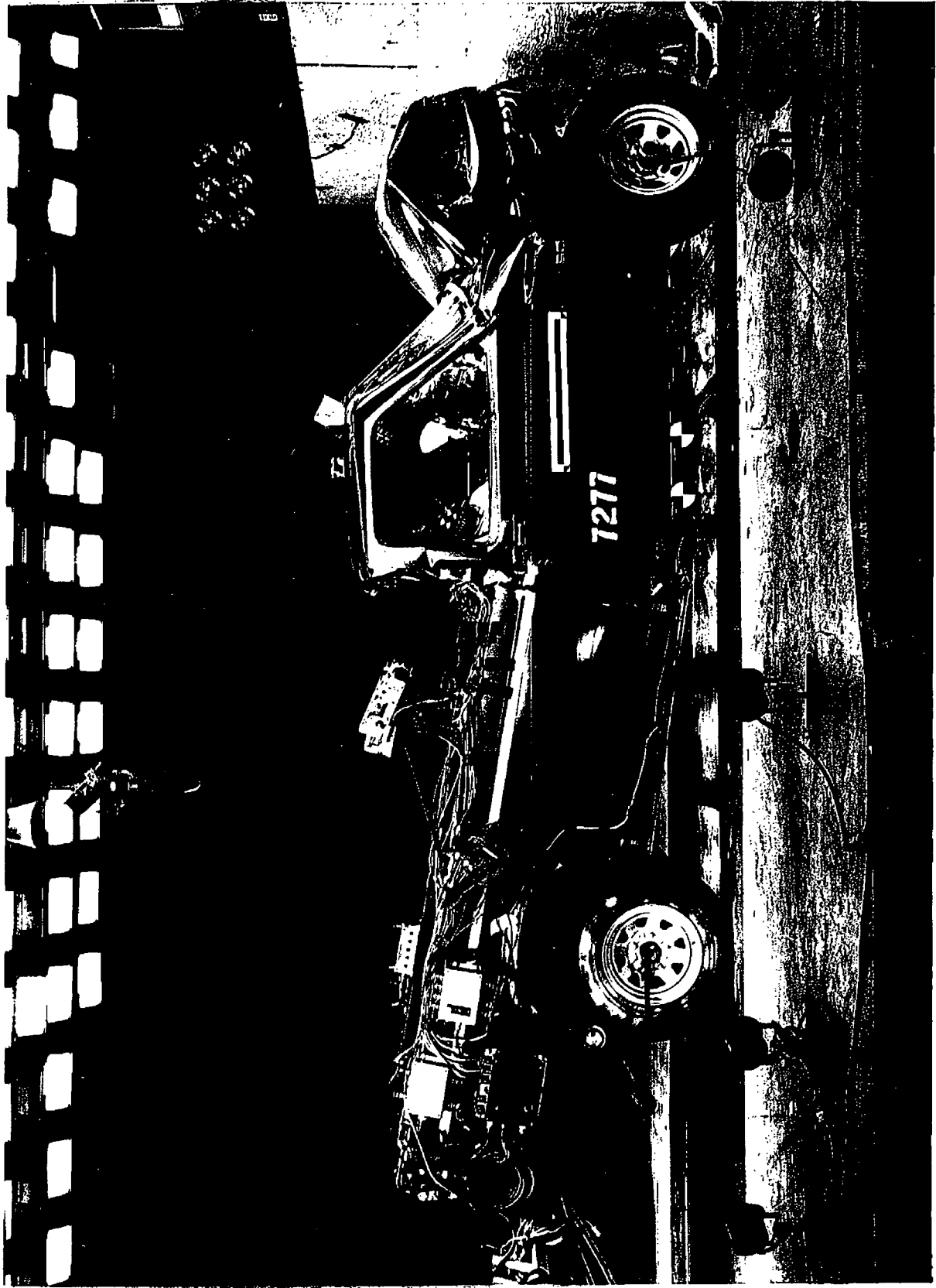
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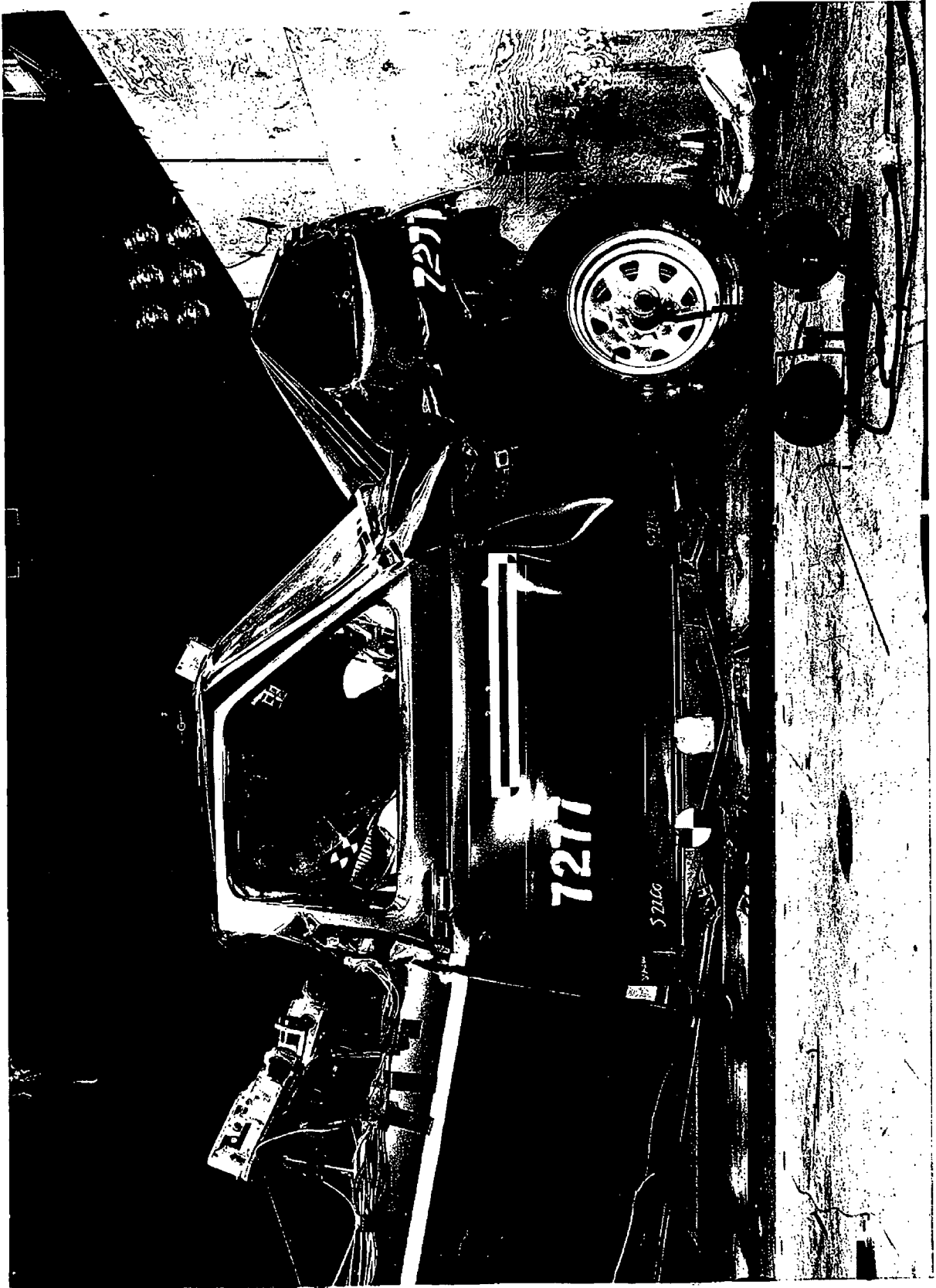
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CIN 54017-3745



CRTS 0007277

PRODUCED BY FORD  
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54017-3086



CRTS 0007277

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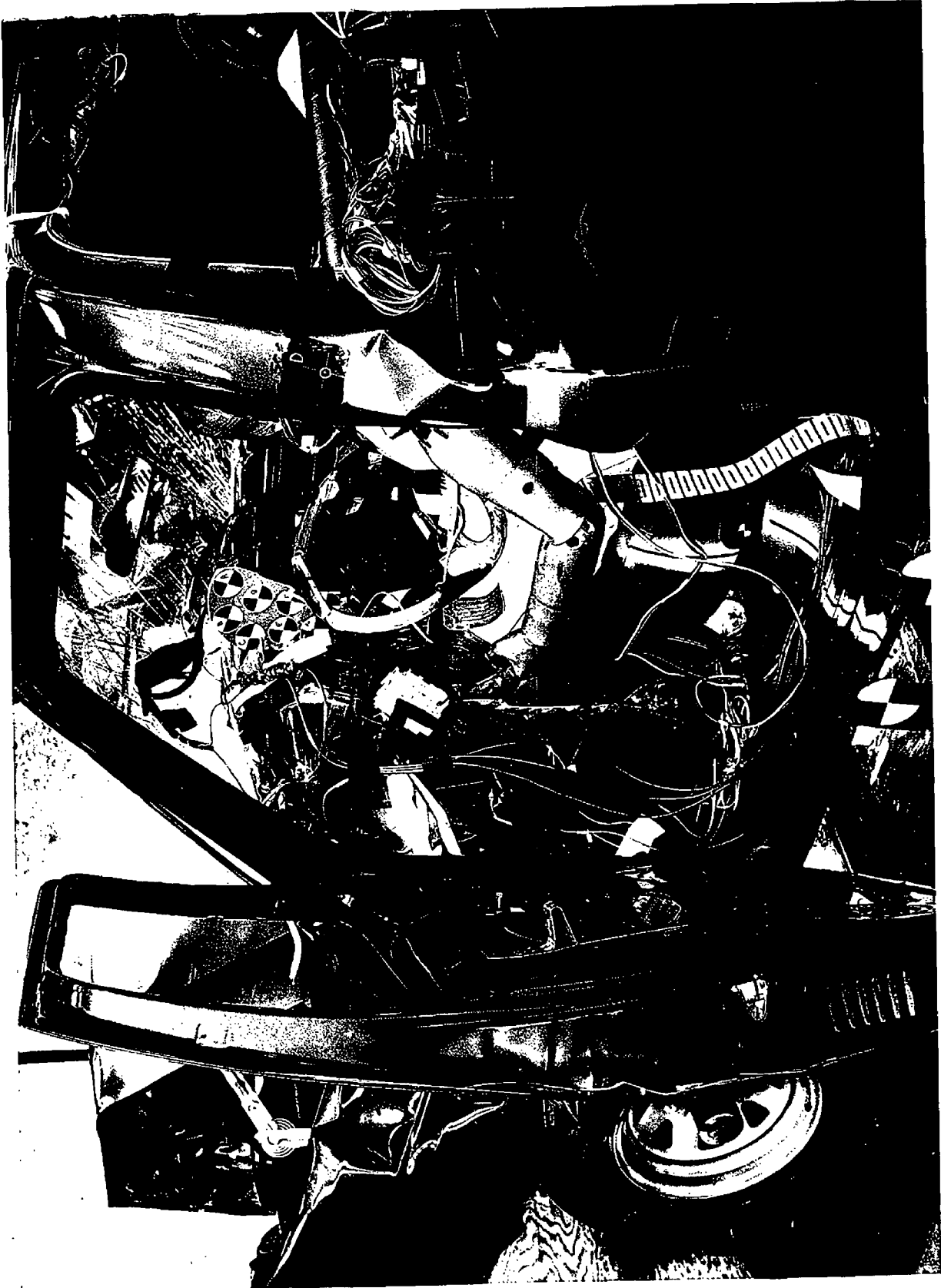
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CRTS 0007277

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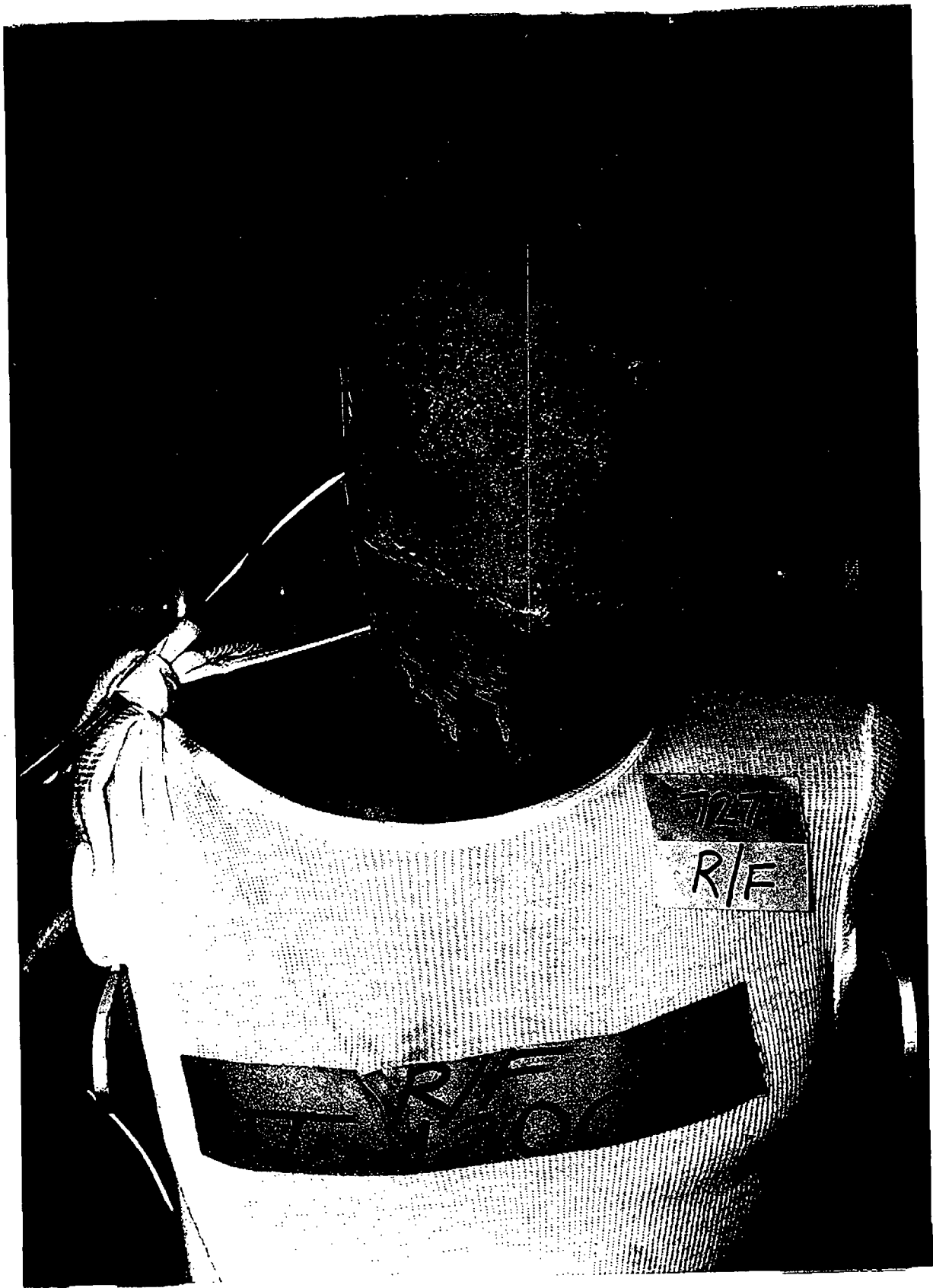
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CRTS 0007277

PRODUCED BY FORD  
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54017-3049



CRTS 0007277

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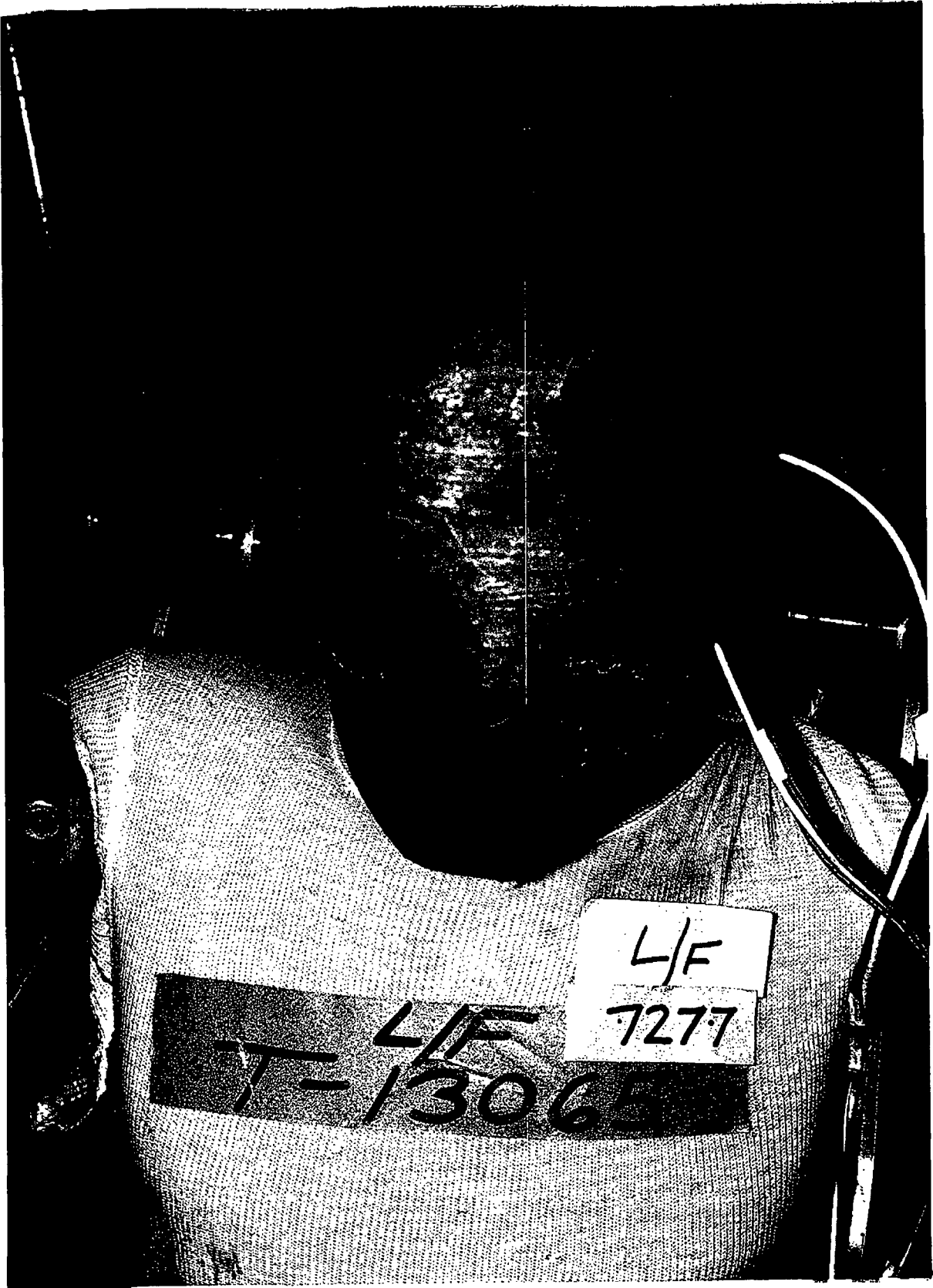
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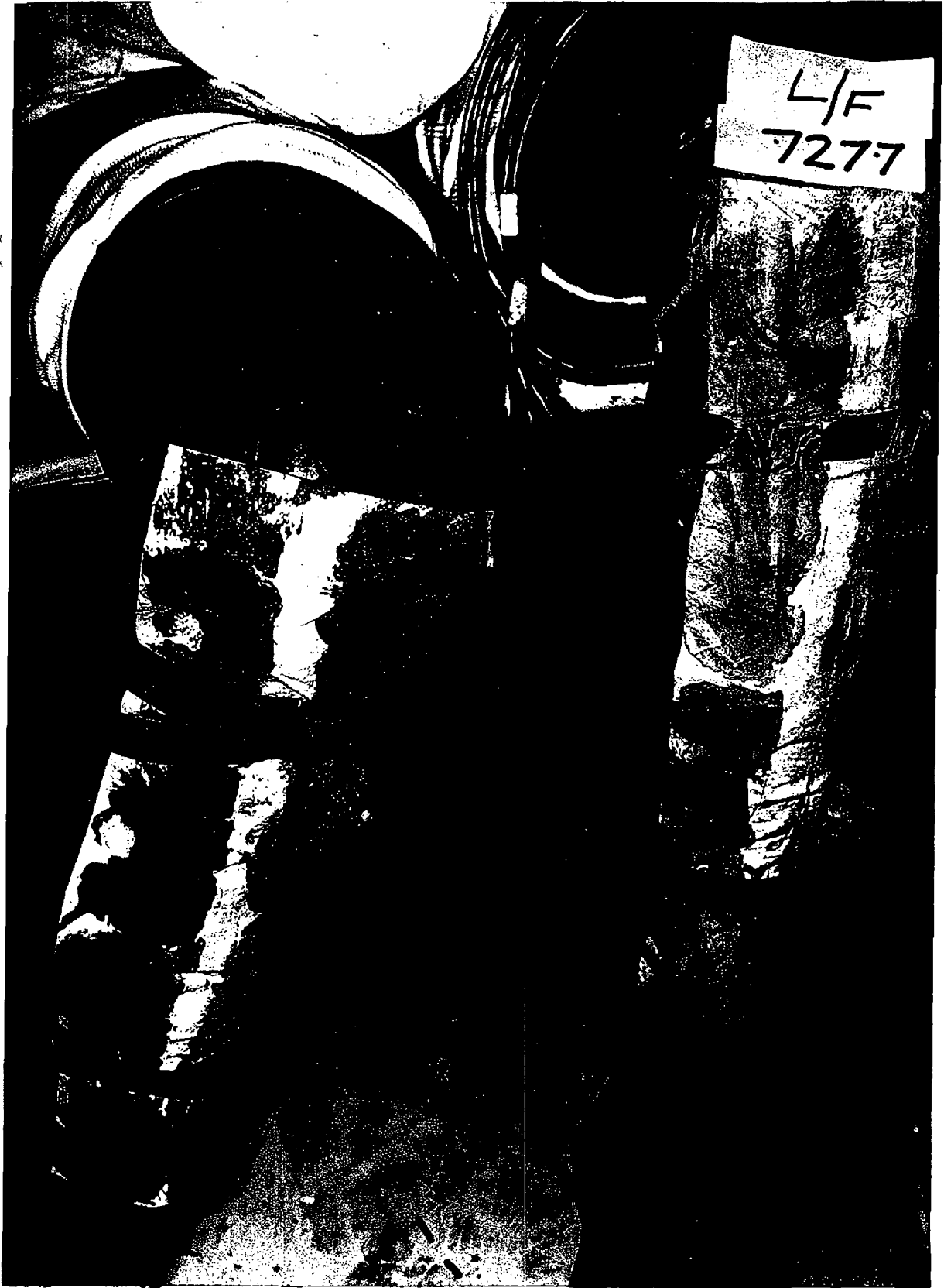
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CRTS 0007277

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CV 54017-3762

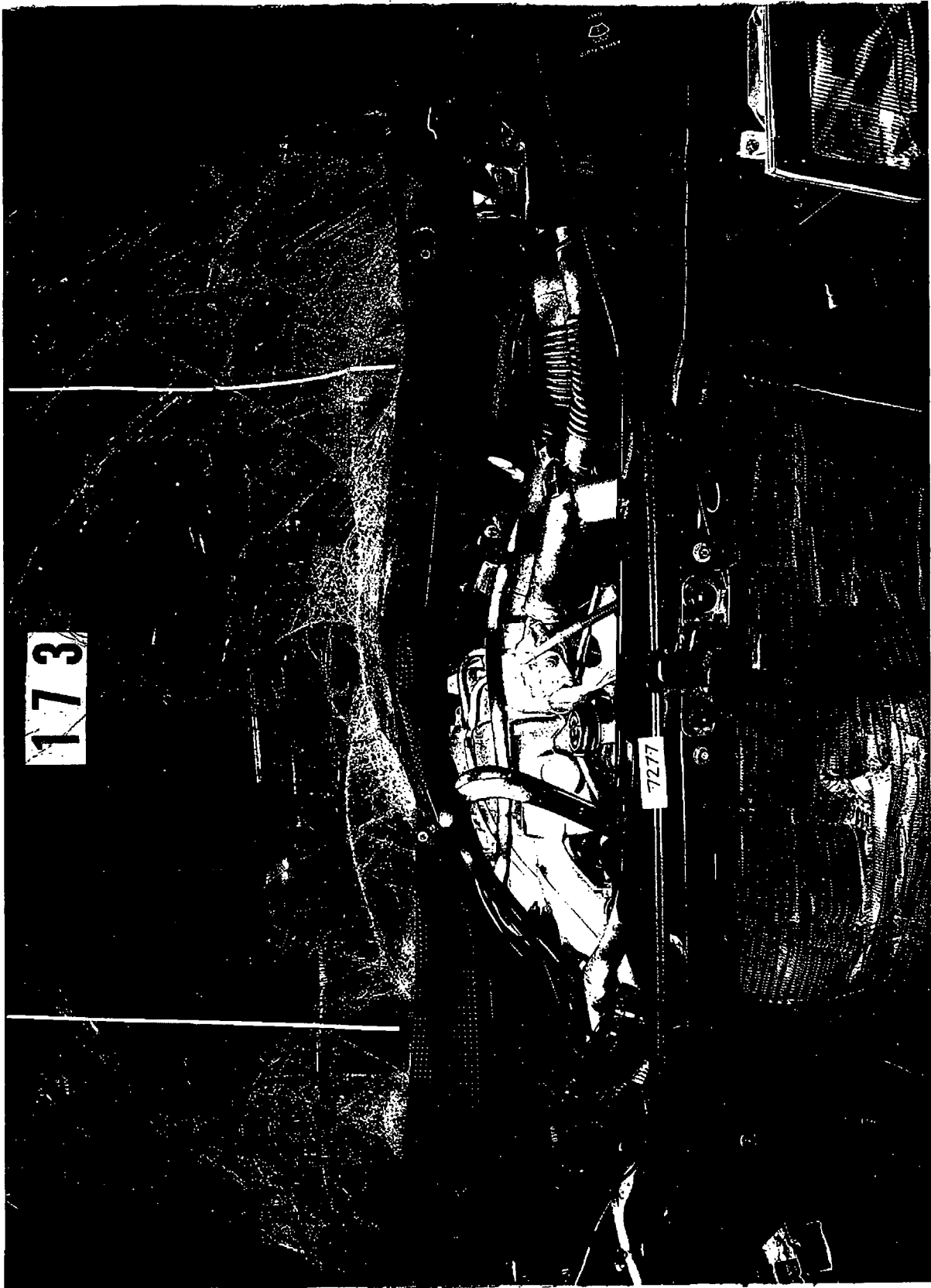


CRTS 0007277

PRODUCED BY FORD  
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CR 54017-3753

173



CRTS 0007277

PRODUCED BY FORD  
1456

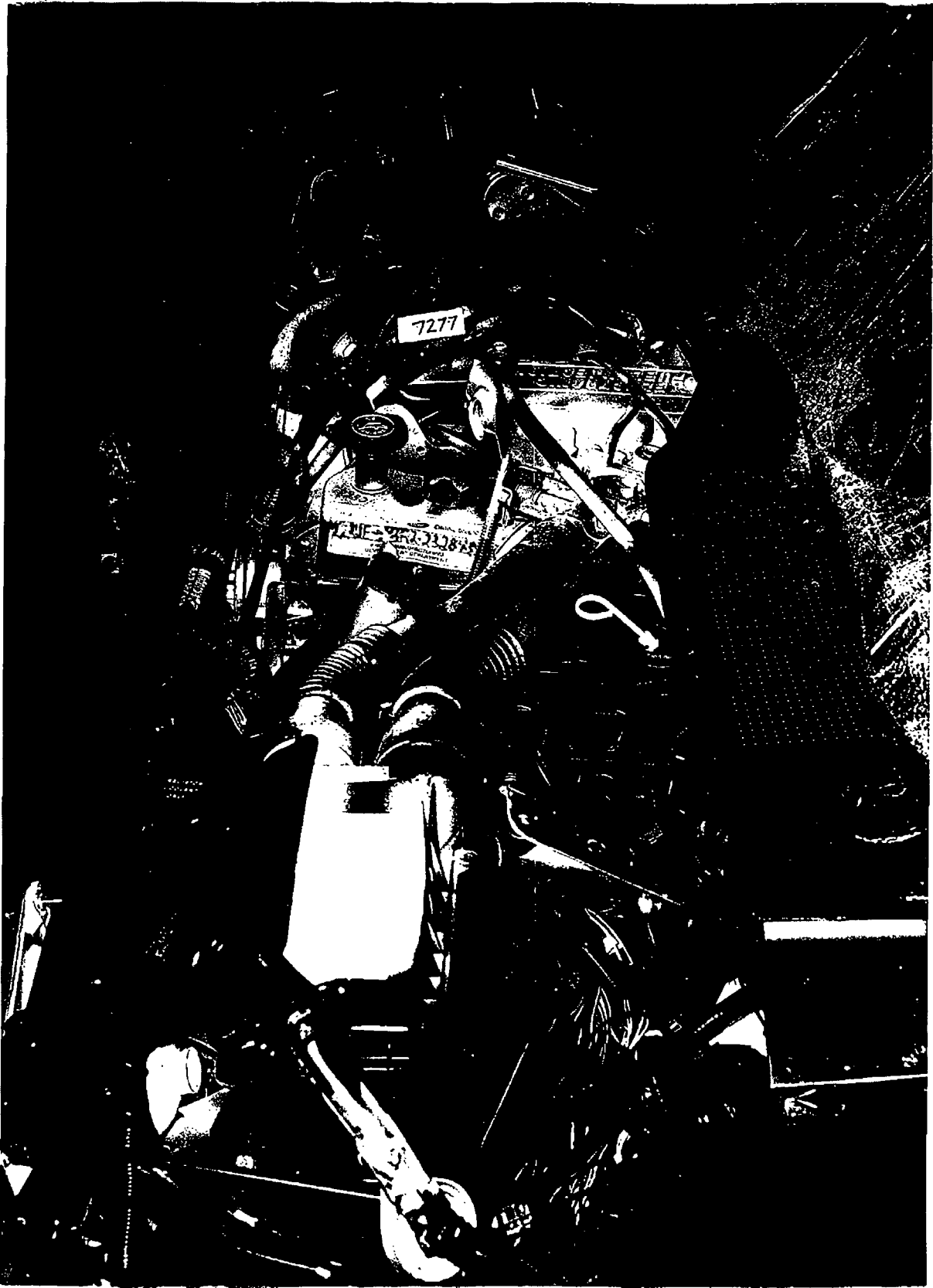
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CRTS 0007277

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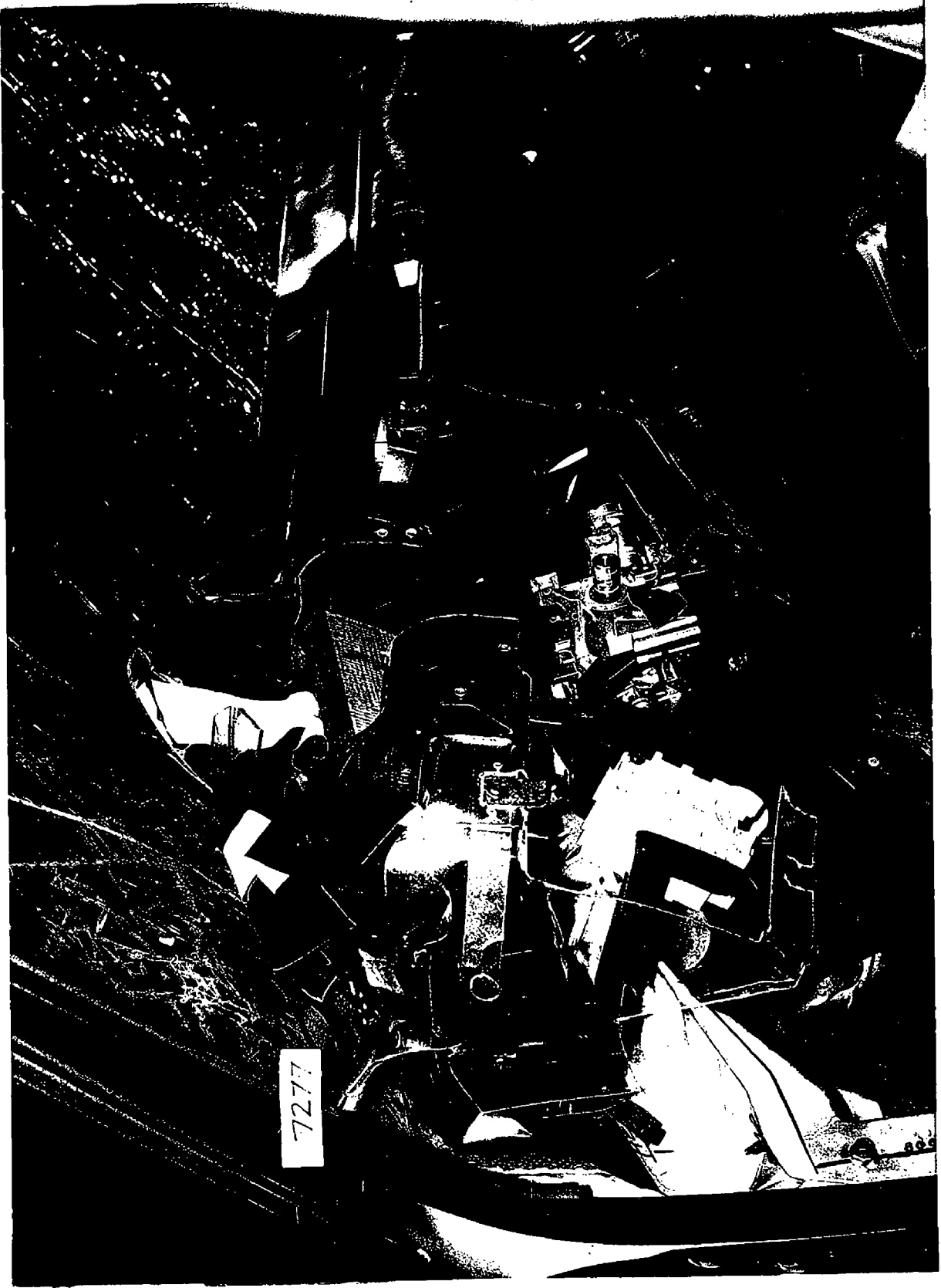
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CRTS 0007277

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1458

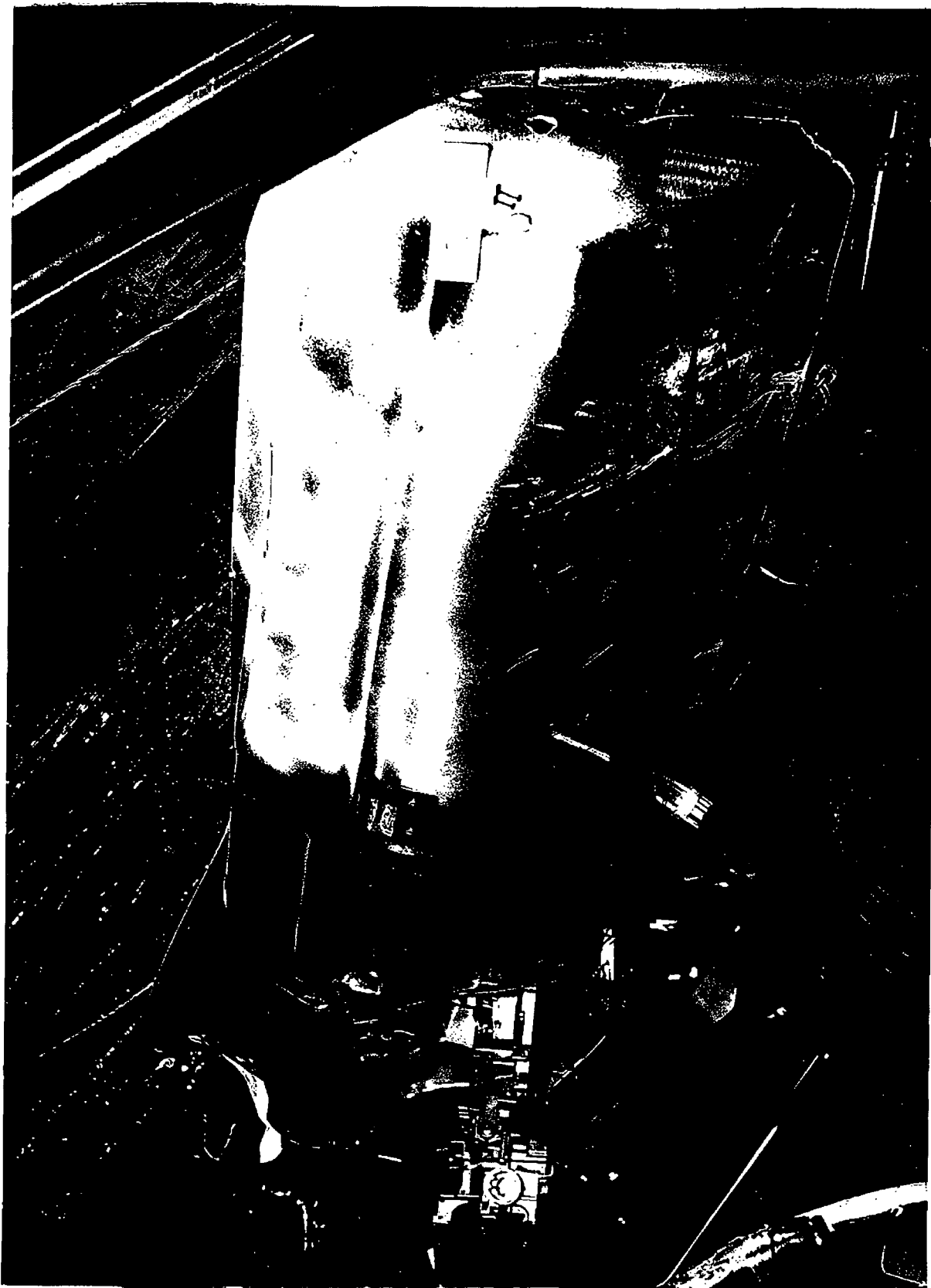
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CRTS 0007277

PRODUCED BY FORD  
1459

CIN 54017-3759



CRTS 0007277

PRODUCED BY FORD  
1460

OM 54017-8058



CRTS 0007277

PRODUCED BY FORD  
1461

CN 54017-3759



CRTS 0007277

PRODUCED BY FORD  
1462

54017-3760



CRTS 0007277

PRODUCED BY FORD  
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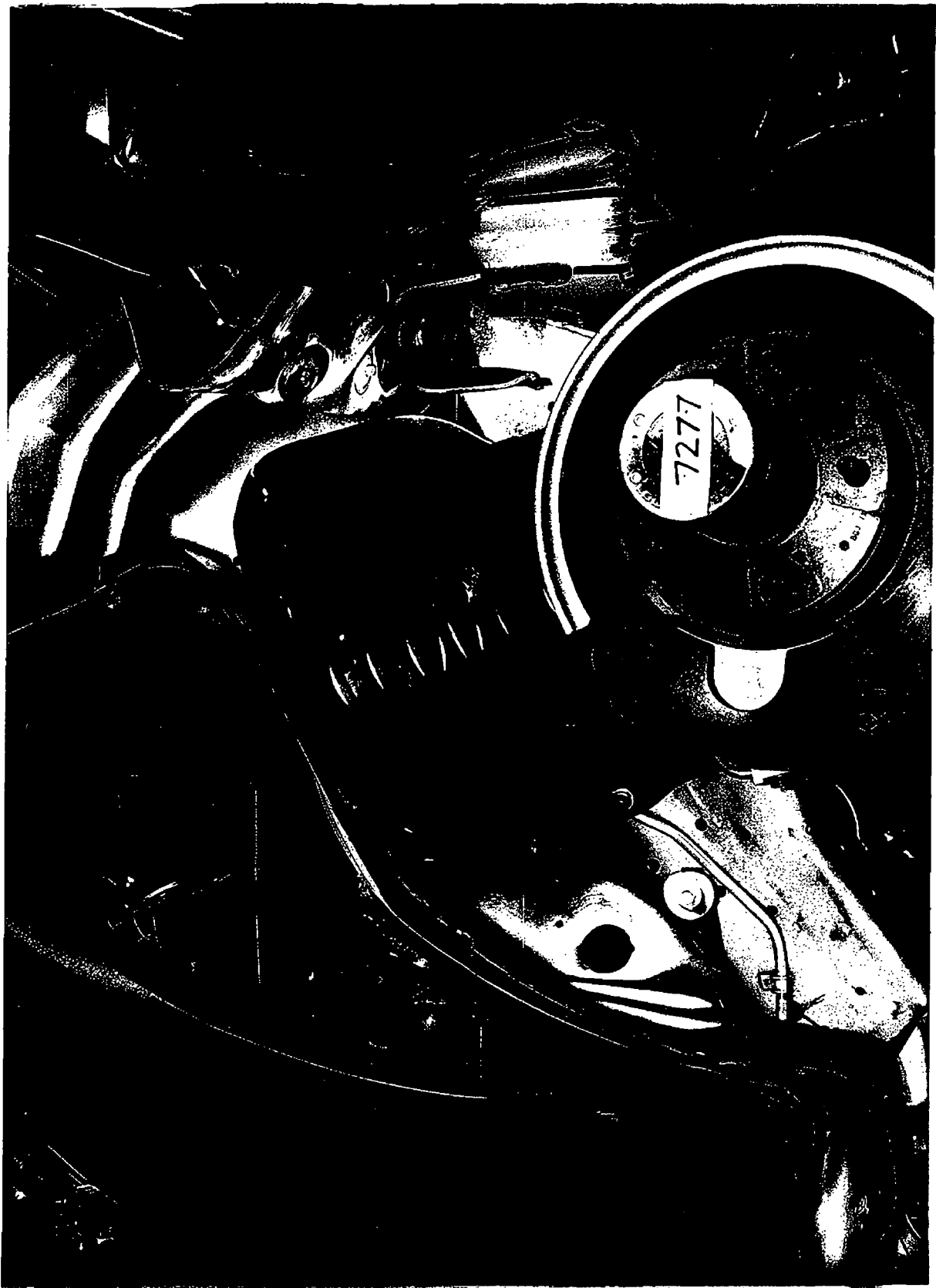
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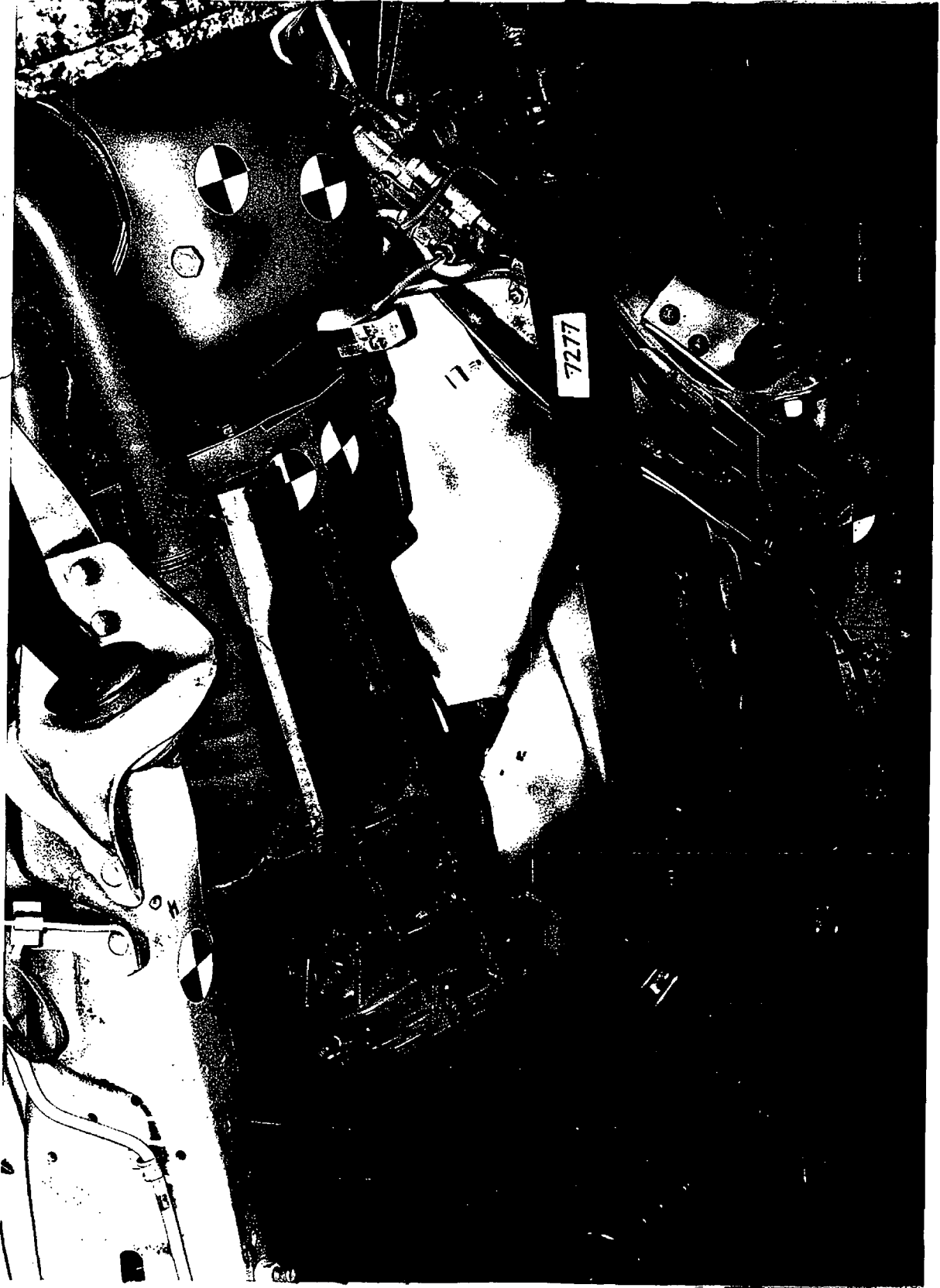
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CRTS 0007277

PRODUCED BY FORD  
1465

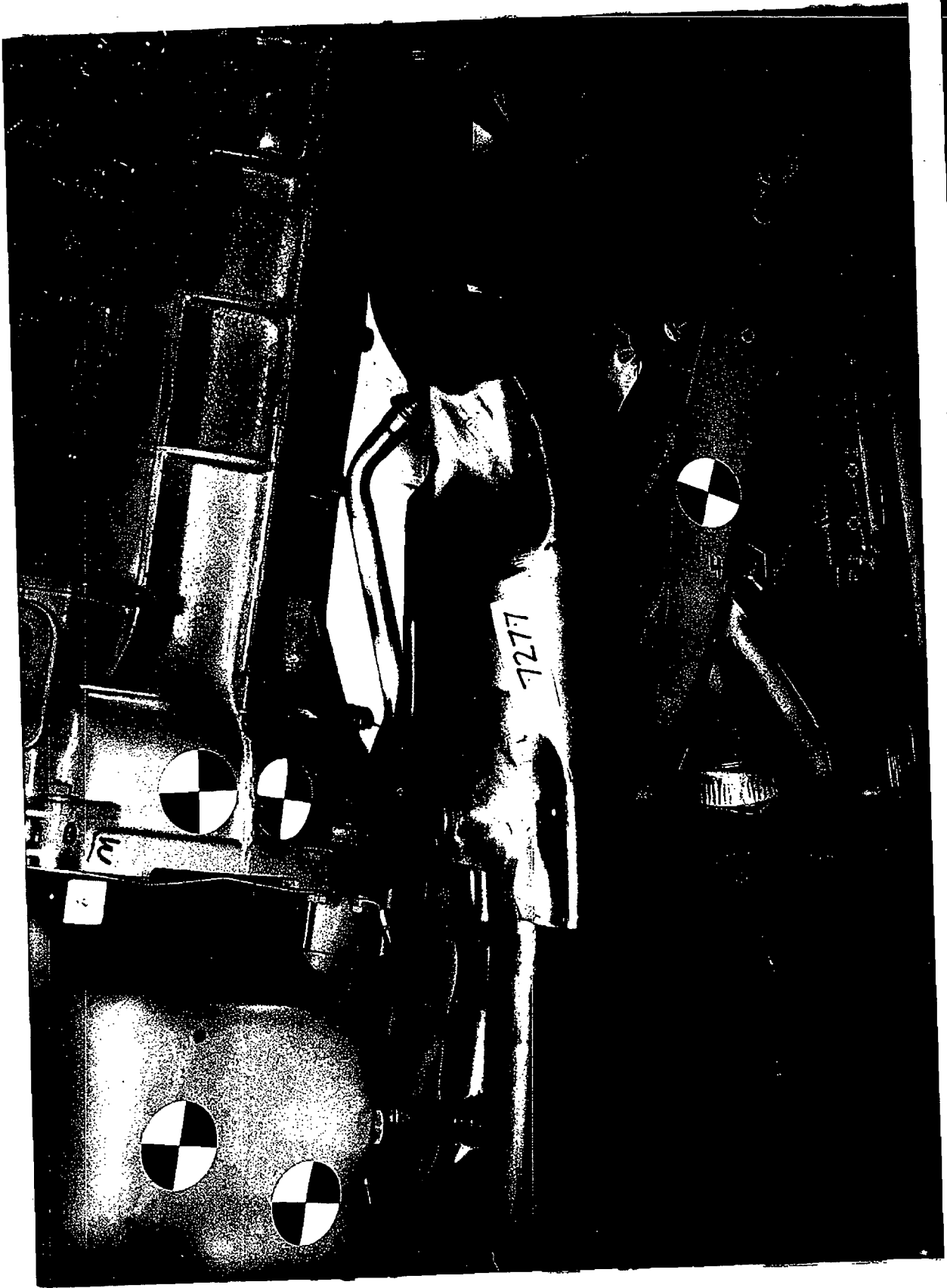
CN 54017-3763



CRTS 0007277

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1466

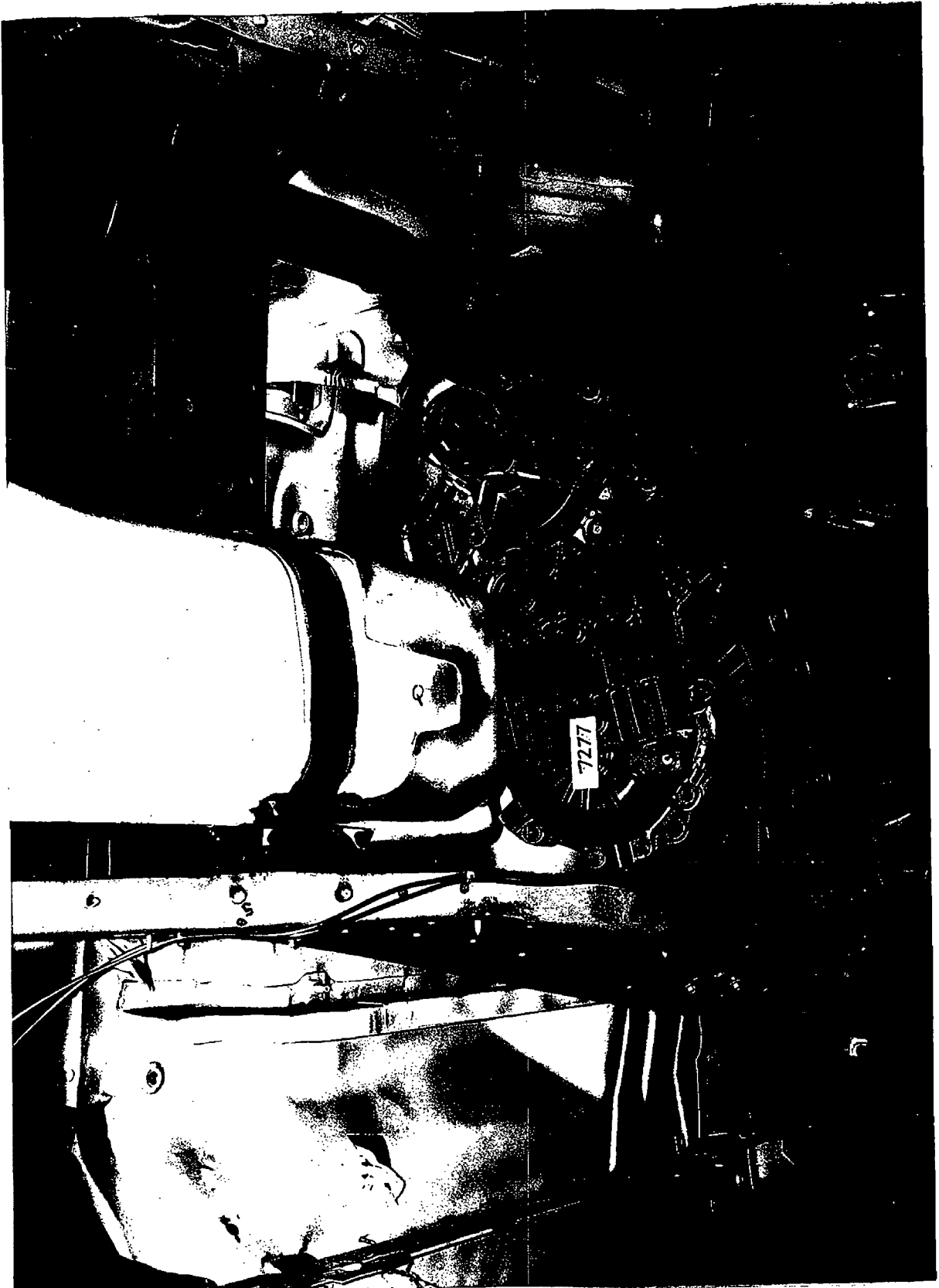
Q1 54017-3764



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1467

54017-3765



CRTS 0007277

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1468

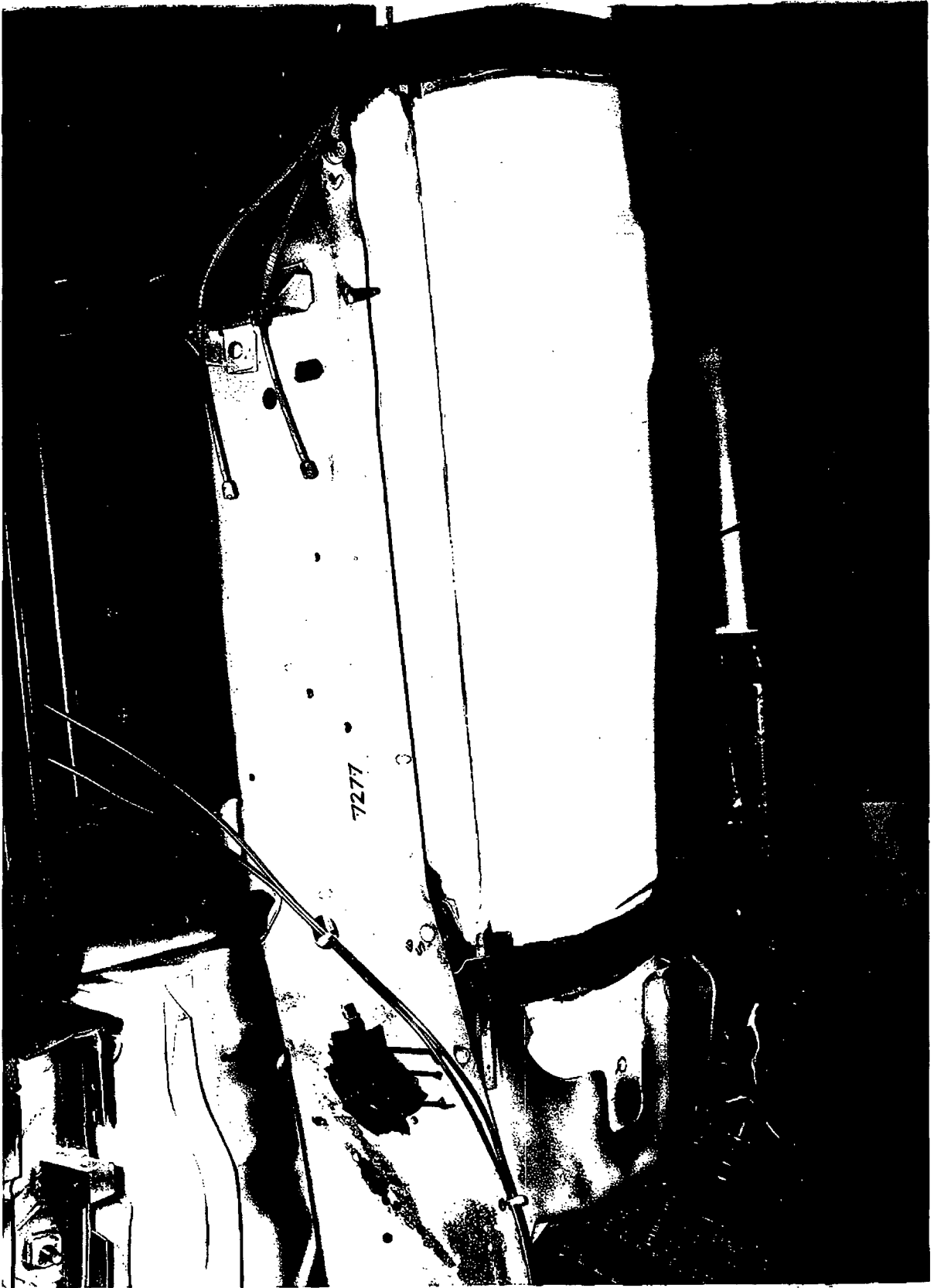
54017-3766



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1469

CN 54017-3762



CRTS 0007277

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1470

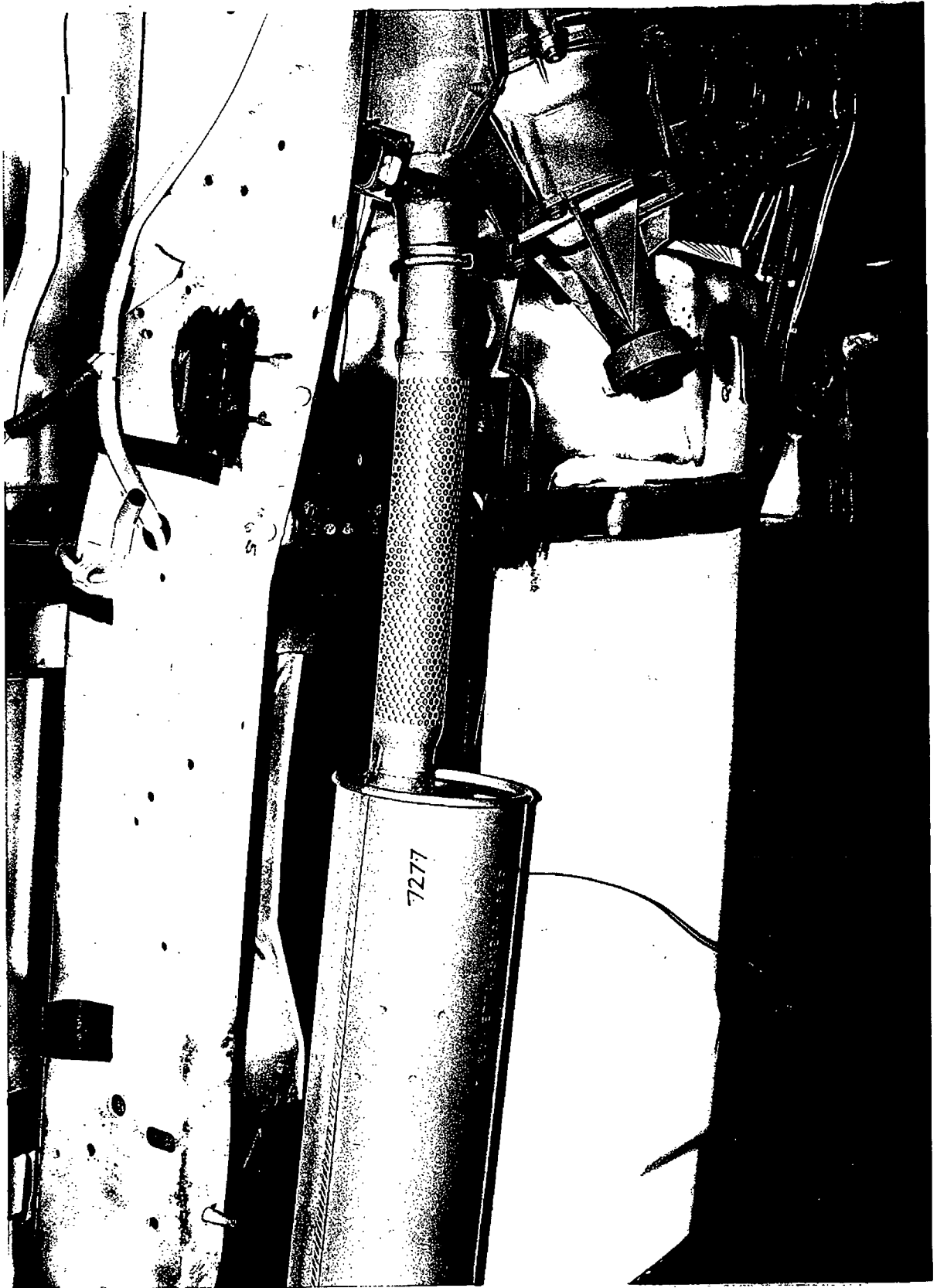
CN 54017-3768



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1471

CIN 54017-3769



7277

CRTS 0007277

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1472



Test Authorization

TEST ORDER NUMBER T-13065

TO: Mr. J. Vella

cc: O. M. Jacques

3833

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 <input checked="" type="checkbox"/> VEHICLE <input type="checkbox"/> BENCH <input type="checkbox"/> LABORATORY <input type="checkbox"/> 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
ENGINE NO. DISP. CARB. 4.9L EFI	TRANSMISSION M5R2	AXLE RATIO N/A	PRODUCT OR ENG. LETTER
TYPE OF FUEL STODDARD	CONVERTER	IGNITION TIMING	DISPOSITION OF PARTS SAVE 1 YEAR FROM MONTH OF CRASH
CRANKCASE OIL AND CAPACITY		TIRE SIZE AND PLY RATING P235/75R15	PROCUREMENT REQUIRED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, GIVE ROUTING CODE:
VEHICLE TEST WEIGHT FRONT 2681 REAR 2294 TOTAL 4975	TIRE PRESSURE FRONT 35 REAR 35	REPORT CATEGORIES <input checked="" type="checkbox"/> ENGINEERING <input checked="" type="checkbox"/> DATA <input checked="" type="checkbox"/> RAW DATA	MAIL REPORT TO: ROOM 244 BLDG. P & A Bldg.

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

- 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
- 35 MPH Frontal impact per procedure ST-14.
- 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:	2009
Schedule Number:	2-7-12

*D. L. Patterson* *Ronald D. Huggins*

REQUESTING SECT. NO. K7914	WORK ORDER/WORK TASK T9L13	ISSUED/REQUESTED BY D. L. Patterson	PHONE 29765	APPROVALS R. N. H.	TEST TYPE	RISK	SIGN-OFF DATE
-------------------------------	-------------------------------	--	----------------	-----------------------	-----------	------	---------------

REQUESTOR DO NOT WRITE BELOW THIS LINE									
WORK STANDARDS NUMBER 00.00-1R-001				TITLE					
MANDATORY				OPTIONAL					
TEST ORDER NO. T-13065	CATAGORY 1	RESP. SECTION 2620	EST. COMP. DATE 12/15/89	PEO L	TEST ENG'RS. INIT. LJ	UNIT CODE THP	TEST ORDER DATE 9/5/89	USER CODE	PROD. CODE
PERFORMING SECTION	HOURS	MATERIAL COST \$	COMP. COST \$	PARTS DUE DATE	EST. START DATE	EST. COMP. DATE	STATUS	%COMPLETE	
TOTAL		\$	\$						

CRTS 0007277

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
- 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 - FOUR SWITCHES UNDER FRONT  
SEAT FOR 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	LVDT on Steering Column				10K	60
3	Triaxial Load Cell @ Top of Str Col.				10K	600

CONTACT SWITCHES

4 LT & RT Dummy Knees 10K 1000  
3 Top, Bottom and Hub of steering wheel 10K 1000

STRING POTS

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 Axis	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 TIBIA	LF X RF X	Class 600	Ax'1 <u>X</u> Start <u>0</u> Ax'1 <u>X</u> End <u>240</u>			
BELTS TORSO RET LAP O/B "D" RING	LF X RF X X X	Class 60	Ax'1 <u>X</u> Start <u>0</u> Ax'1 <u>X</u> End <u>240</u> Ax'1 <u>X</u>			
ROCKERS FRAME ENGINE	LF & RF X X X	Class 60 & 180	Long <u>X</u> Start <u>0</u> Long <u>X</u> End <u>240</u> Long <u>X</u>	Long <u>X</u> Long <u>X</u> Long <u>X</u>	Long <u>X</u> Long <u>X</u> Long <u>X</u>	
SIGNATURE LEFT SIGNATURE RIGHT SIGNATURE AVERAGE		Class 35 & 60	Long <u>X</u> Start <u>0</u> Long <u>X</u> End <u>240</u> Long <u>X</u>	Long <u>X</u> Long <u>X</u> Long <u>X</u>	Long <u>X</u> Long <u>X</u> Long <u>X</u>	
Contact Switches		Class 1000				
LVDT on Stg. Col. Pelvic String Pots		Class 60				
Triaxial Load Cell		Class 600	F <sub>x</sub> <u>X</u> F <sub>y</sub> <u>X</u> F <sub>z</sub> <u>X</u> Res <u>X</u>			

FILM ANALYSIS REQUEST

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

ANALYSIS REQUIREMENT

	TIME MS/IN	PLOTS REQUIRED		
		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	LONG VEL	VERT VEL	VELOCITY
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

PLOTS REQUIRED

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

	Long	Vert	Lat	Reslt	Reslt	Reslt
					1st Int	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					
<b>Accel</b>						
		1st Int	2nd Int			
		<u>Ave only</u>	<u>Ave only</u>			
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			
<b>Force</b>						
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.					
<b>Displacement</b>						
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

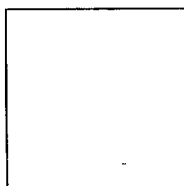
DUMMY MEASUREMENTS  
PLEASE FILL OUT THIS SHEET COMPLETELY

# 19-3 (A23153)  
Sheet 14 of 14

T-13065  
C-7277

	Driver			Passenger		
	Standard	Initial	Final	Standard	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 $\phi$	19°			20°		
BELT	25"			23.5"		

CRTS 0007277



**Teknacon**

**ANDREW N. GILBERG**

**Education:** Rensselaer Polytechnic Institute 1970  
Troy, NY, BS in  
Engineering Science  
University of Michigan, Ann Arbor 1971  
MS in Mechanical Engineering

**Employment:** Highway Safety Research Institute 1970-71  
Ann Arbor, Research Assistant  
Ford Motor Company 1971-72  
Research Engineer C  
Competition Press and Autoweek 1972-73  
Magazine, Engineering Editor  
Ford Motor Company 1973-78  
Research Engineer A  
Versitech Corporation 1979-82  
Senior Project Engineer  
Forensic Engineering, Inc. 1982-86  
Project Manager  
Teknacon Corporation 1986-  
Owner and General Manager

**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 1969  
Society of Automotive Engineers (SAE) 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

Kimberly Ann Collins, MD  
Curriculum Vitae  
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### **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 Eills: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”, 3<sup>rd</sup> 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”, 4<sup>th</sup> 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, 5<sup>th</sup> 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.
- “Aorto-esophageal 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, 6<sup>th</sup> Annual”, Co-director, Orlando, Florida, December 4-7, 2002.
- “The Basics of Pediatric Forensic Pathology”, Pediatric Forensic Issues Conference, 6<sup>th</sup> 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, 6<sup>th</sup> 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”, 19<sup>th</sup> 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.

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**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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Collins KA. Osteopetrosis, College of American Pathologists Autopsy APEX 1999; AU-B11.

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Bennett AT, Collins KA. Abdominal Pain. Arch Pathol Lab Med 2000;124:1089-1090.

Collins KA. Osteoclastic Giant Cell Tumor of the Pancreas. College of American Pathologists Autopsy APEX 2000; AU-B7.

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Bennett AT, Collins KA. Elderly Suicide: A 10-year Retrospective Study. *Am J Forensic Med Pathol* 2001;22(2):169-172.

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Bennett AT, Collins KA. An Unusual Case of Anaphylaxis: Mold in Pancake Mix. *Am J Forensic Med Pathol* 2001;22(3):292-295.

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**PUBLICATIONS (CONTINUED):**

Collins KA, Cina SJ. "Ancillary Studies for the Autopsy". Chapter 24 in Autopsy Performance and Reporting, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 229-238.

Collins KA, Bennett, AT. "Metaplastic Bone Formation in the Lung". College of American Pathologists Autopsy APEX 2001;AU-A3:13-15.

Davis GJ, Collins KA. "The Autopsy in Medical Education". Chapter 34 in Autopsy Performance and Reporting, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 329-334.

Collins KA, Grear S. "Public Education to Revitalize the Autopsy". Chapter 6 in Autopsy Performance and Reporting, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 47-54.

Lantz PE, Collins KA. "Photography in Autopsy Pathology". Chapter 26 in Autopsy Performance and Reporting, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 245-256.

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Collins KA. "Sex-Related Deaths". Chapter 27 in Handbook of Forensic Pathology, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 243-256.

Collins KA, Bennett AT. "Elder Abuse". Chapter 28 in Handbook of Forensic Pathology, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 257-264.

Collins KA. "Sudden Infant Death Syndrome". Chapter 11 in Handbook of Forensic Pathology, 2<sup>nd</sup> edition, College of American Pathologists, Northfield, Illinois, 2003; 105-110.

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Collins KA, White WL, Shogreen MR. The Use of Polymerase Chain Reaction to Detect Evidence of Y Chromosome-Positive Cells in Cases of Sexual Assault. *Modern Pathology* 1997; 10(1):181A.

Revised: May 4, 2011

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**CURRICULUM VITAE**

**EDUCATION:**

MASTER OF SCIENCE	1995	Biomedical Engineering University of Alabama Birmingham Birmingham, Alabama
BACHELOR OF SCIENCE	1991	Industrial Engineering University of Alabama Tuscaloosa, Alabama
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**  
**Senior Associate and**  
**Biomechanical Engineering Consultant**  
**Alpharetta, GA 30004**

- 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.

**PAPERS**

"A NASS-Based Investigation of Pelvic Injury Within The Motor Vehicle Crash Environment". Lewis, Jr., PR; Molz, FJ; Schmidtke, SZ; Bidez, MW.; The 40<sup>th</sup> Stapp Car Crash Conference, November 4-6, 1996, Albuquerque, NM.

"Head & Spine Injuries in Roof Crush and Rollover Accidents". Burton, Joseph L. and Lewis, Jr., Paul R.; AIEG Spring Seminar, May 9, 1997, Atlanta, GA.

"Belt Integrated Vehicular Seat Rear Impact Studies". Kenneth J. Saczalski, Ph.D., Joseph L. Burton, M.D., Paul R. Lewis, Jr., Todd K. Saczalski, Peter E. Baray. Seoul 2000 FISITA World Automotive Congress, Paper #F2000G279, June 12-15, 2000, Seoul, Korea.

"Air Bag Injuries to Infants, Children and Small Adults". Joseph L. Burton, M.D., Paul R. Lewis, Jr.; Proceedings of the American Academy of Forensic Sciences 53<sup>rd</sup> Annual Meeting, Paper G-96, February 23, 2001, Seattle, Washington.

"Evaluation of Rear Impact Seat System Performance Using a Combined Load Neck Injury Criteria and Hybrid III Surrogates". Kenneth J. Saczalski, Ph.D., Joseph L. Burton, M.D., Paul R. Lewis, Jr., Todd K. Saczalski, and Peter E. Baray; ASME International Congress and Exposition, November 11-16, 2001, New York, NY.

"Post Collision Vehicular Fires – Determination of Probability of Occupant Survival Post Impact". Burton, Joseph L. and Lewis, Jr., Paul R.; 54<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences, Abstract No. 531, February 11-16, 2002.

“Study of Seat System Performance Related to Injury of Rear Seated Children & Infants in Rear Impacts”. Kenneth J. Saczalski, Ph.D., Joseph L. Burton, M.D., Paul R. Lewis, Jr., Todd K. Saczalski, and Peter E. Baray. Proceedings of IMECE2002 ASME International Mechanical Engineering Congress & Exposition, Paper No. IMECE2002-33517, November 17-22, 2002, New Orleans, LA.

“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.; 40<sup>th</sup> 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; 47<sup>th</sup> 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 40<sup>th</sup> 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". 53<sup>rd</sup> 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; 65<sup>th</sup> 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 <sup>th</sup> Annual International Workshop on Human Subjects for Biomechanical Research, NHTSA, Albuquerque, NM
November 4-6, 1996	40 <sup>th</sup> 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 <sup>st</sup> STAPP Car Crash Conference, Society of Automotive Engineers, Orlando, FL
November 15, 1997	25 <sup>th</sup> 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 <sup>rd</sup> Annual Meeting, Seattle, WA
February 11-16, 2002	American Academy of Forensic Sciences 54 <sup>th</sup> Annual Meeting, Atlanta, GA
October 15-18, 2006	50 <sup>th</sup> 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

COURT'S 14  
EXHIBIT NO. \_\_\_\_\_  
IDENTIFICATION/EVIDENCE  
DKT. # 08  
DATE: \_\_\_\_\_

THE STATE OF SOUTH CAROLINA  
In the Court of Appeals

RECEIVED

MAR 29 2013

APPEAL FROM BAMBERG COUNTY  
Court Of Common Pleas

SC COURT OF APPEALS

The Honorable Doyet A. Early III, Circuit Court Judge

Case No: 2008-CP-05-235

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.

*Curtis L. Ott by JWH and p...*

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March 29, 2013

THE STATE OF SOUTH CAROLINA  
In the Court of Appeals

RECEIVED

MAR 29 2013

SC Court of Appeals

APPEAL FROM BAMBERG COUNTY  
Court Of Common Pleas

Doyet A. Early, II, Circuit Court Judge

Case No: 2008-CP-05-00235

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

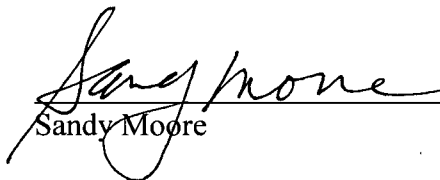
v.

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  
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Daniel E. Henderson  
Matthew V. Creech  
Peters, Murdaugh, Parker, Eltzroth & Detrick, P.A.  
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