

DOT HS-800 382  
PB 197 552

# CHILD SEAT AND RESTRAINT SYSTEMS TEST RESULTS

## APPENDIX D

THE UNIVERSITY OF MICHIGAN  
HIGHWAY SAFETY RESEARCH INSTITUTE  
HURON PARKWAY AND BAXTER ROAD  
ANN ARBOR, MICHIGAN 48105

Final Report

October 1970

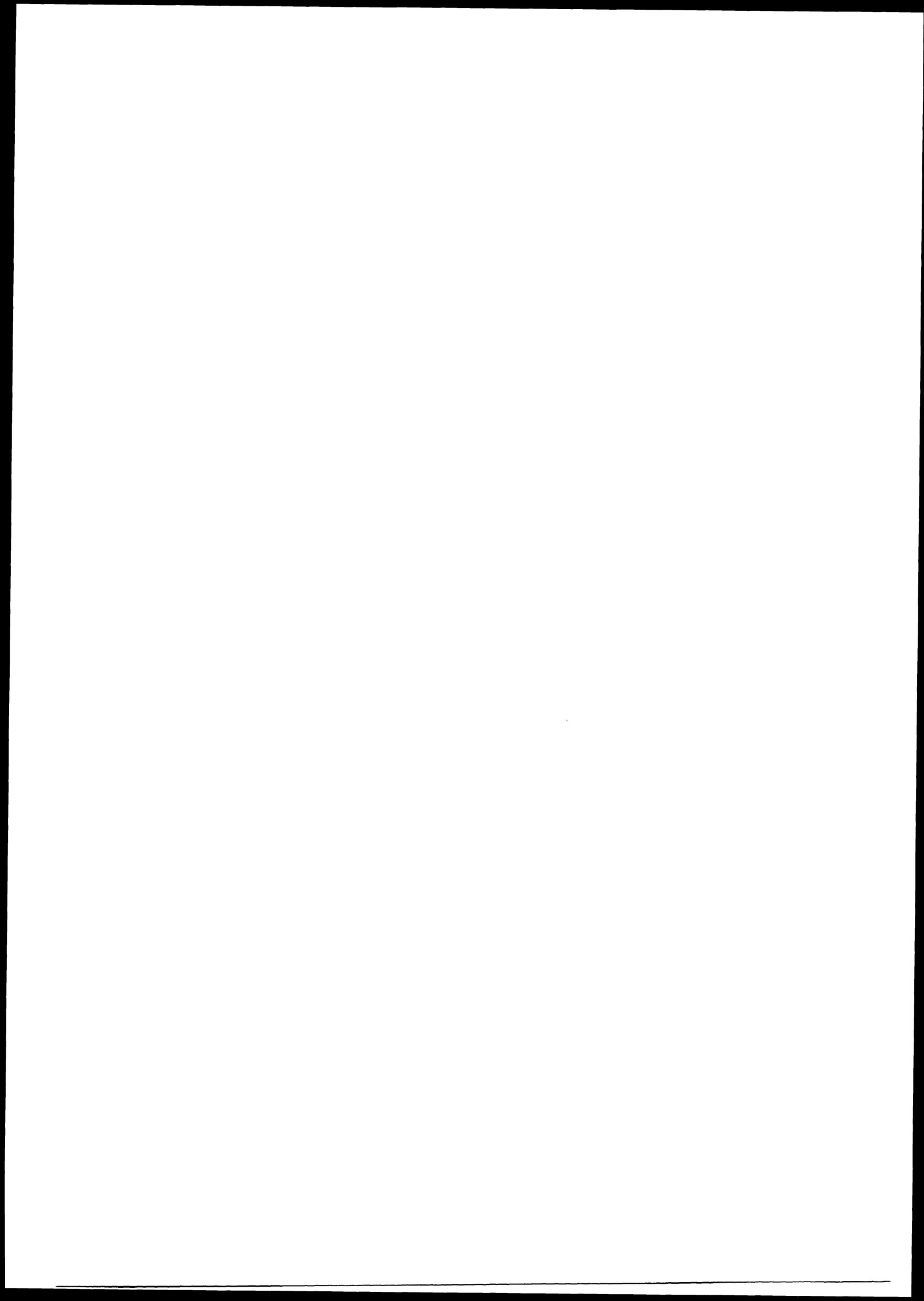
Volume I of III

Contract No. FH-11-6962

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
WASHINGTON, D.C. 20591



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16. Abstract <p>This report contains the data records obtained in a test program studying the safety performance of child car seats and restraint systems. Included with each test result is an HSRI Summary Data Sheet, a copy of an oscillographic record of transducer data and high speed photographic documentation of occupant kinematics. In cases where the oscillographic record or the photographic documentation is missing, the data was not obtained.</p>			
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## ACKNOWLEDGMENTS

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## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-017  
Test Date: 30 January 1969  
Restraint Code No: C-3  
Restraint Description: General Motors Corp. Standard Seat  
  
Dummy: Doll  
Sled Velocity: 16 mph  
Sled G-level: 3 (8)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There was no observable damage to either the dummy or the restraint system.  
No gross excursion was observed.

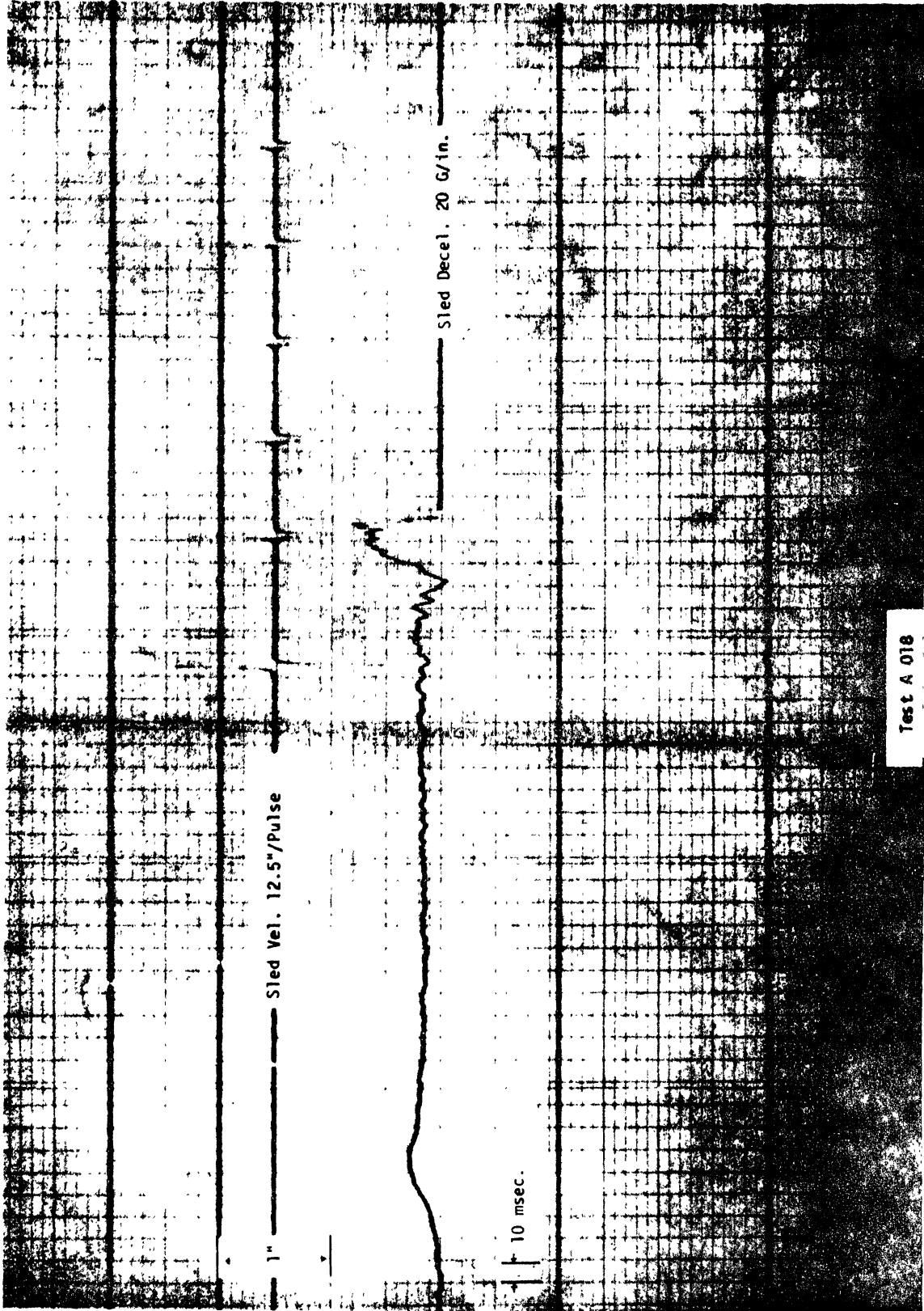
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-018  
Test Date: 30 January 1969  
Restraint Code No: C-31  
Restraint Description: Sears Child's Auto Harness, small

Dummy: Doll  
Sled Velocity: 60 mph  
Sled G-level: 3 (11)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There was no observable damage to the dummy or to the restraint system.  
No gross dummy motions were observed.



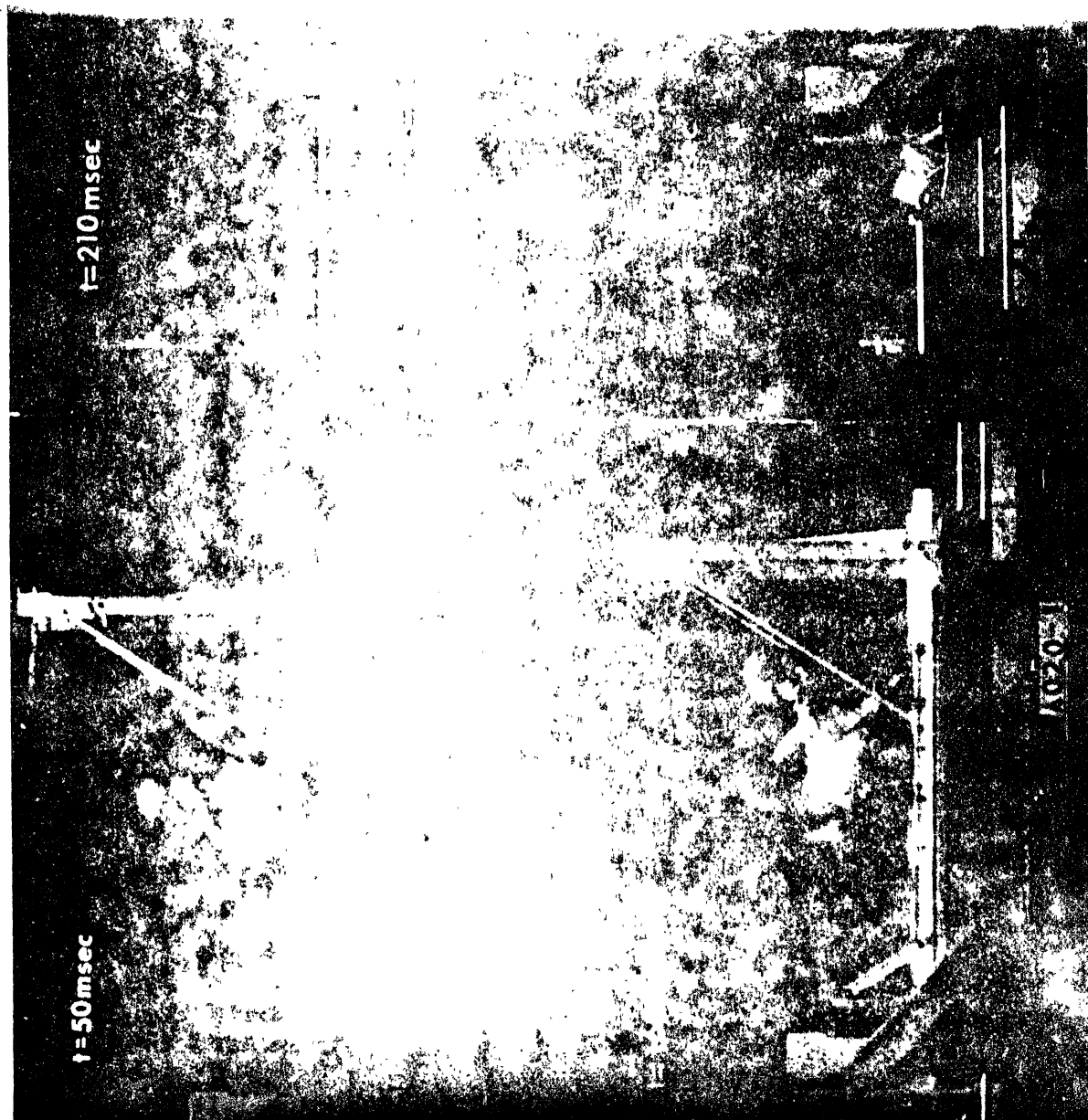
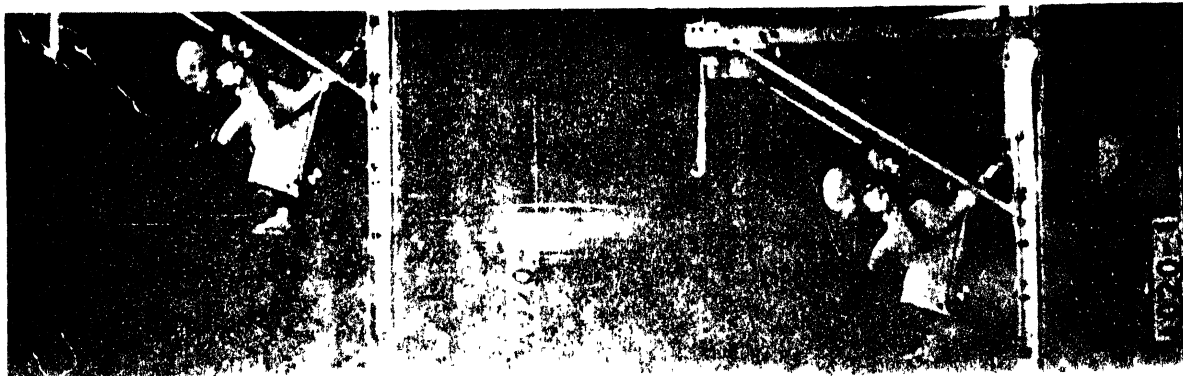
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Test No: A-020  
Test Date: 14 February 1969  
Restraint Code No: C-1  
Restraint Description: Ford Tot-Guard

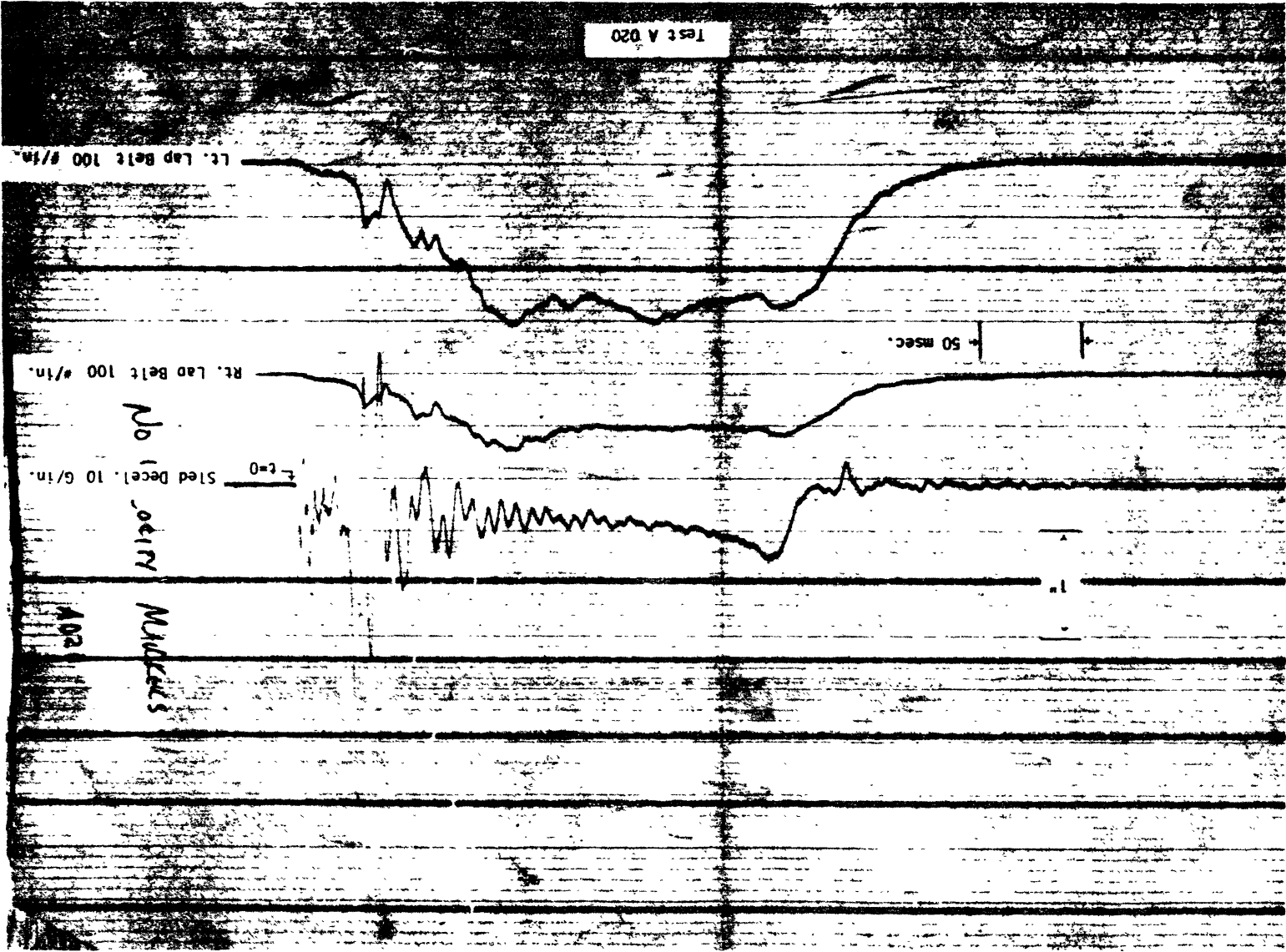
Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 5 (8)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There was no damage observed either to the dummy or to the restraint system. There were no gross motions observed.



Test A 020



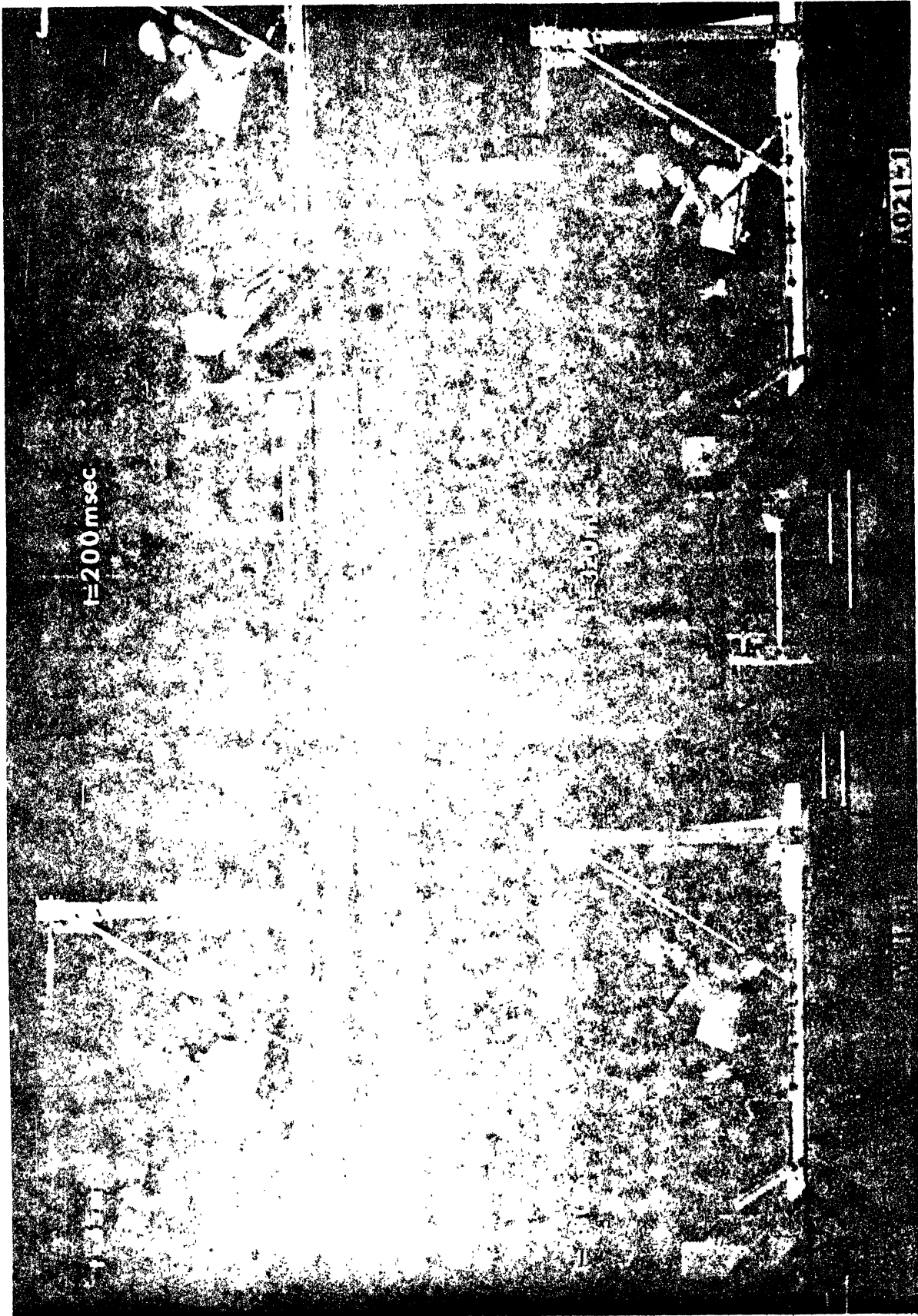
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-021  
Test Date: 14 February 1969  
Restraint Code: C-1  
Restraint Description: Ford Tot-Guard

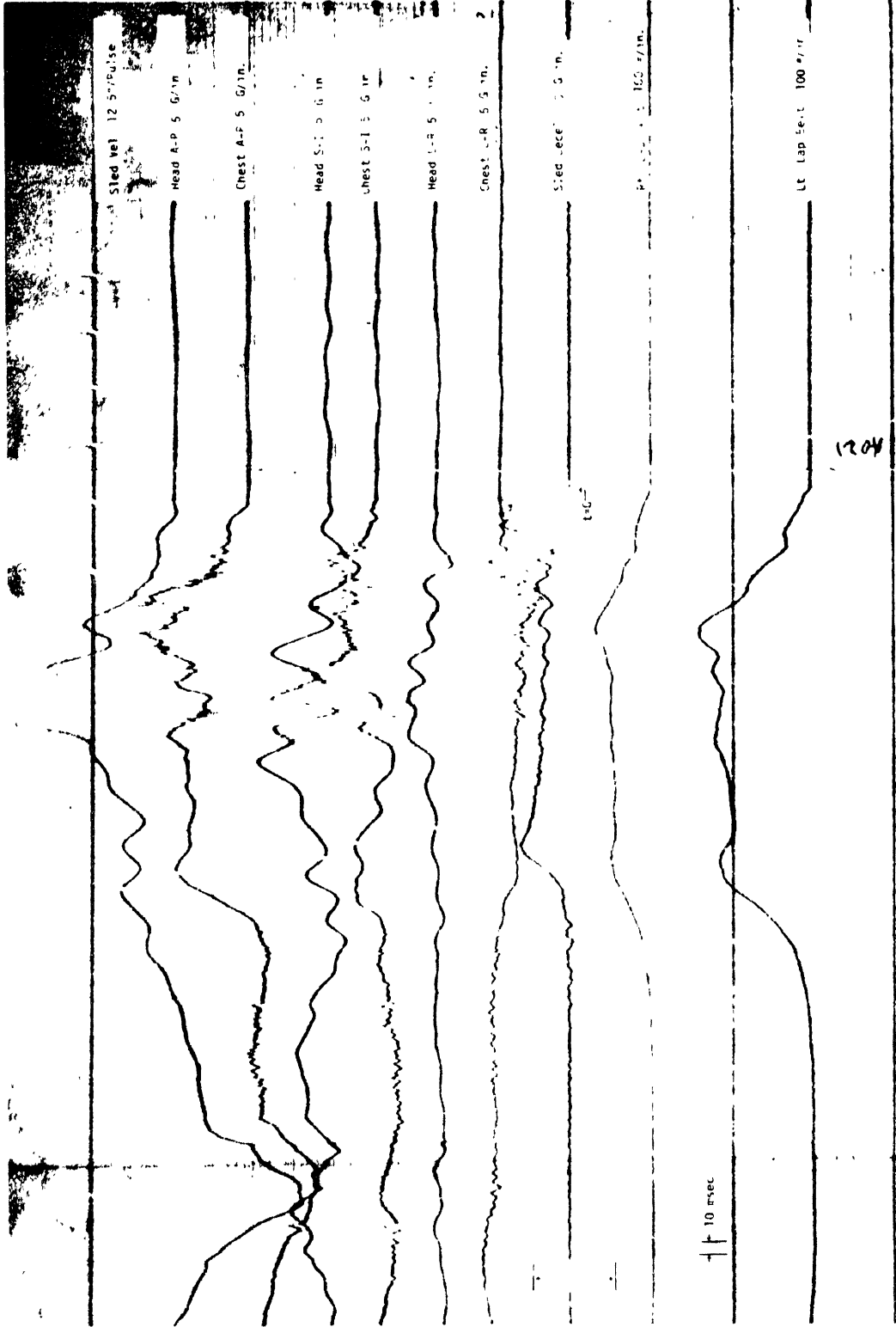
Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 4 (7)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There was no damage observed either to the dummy or to the restraint system. No gross motions were observed.







Test A 021

## HSRI SUMMARY DATA SHEET (FH-11-6962)

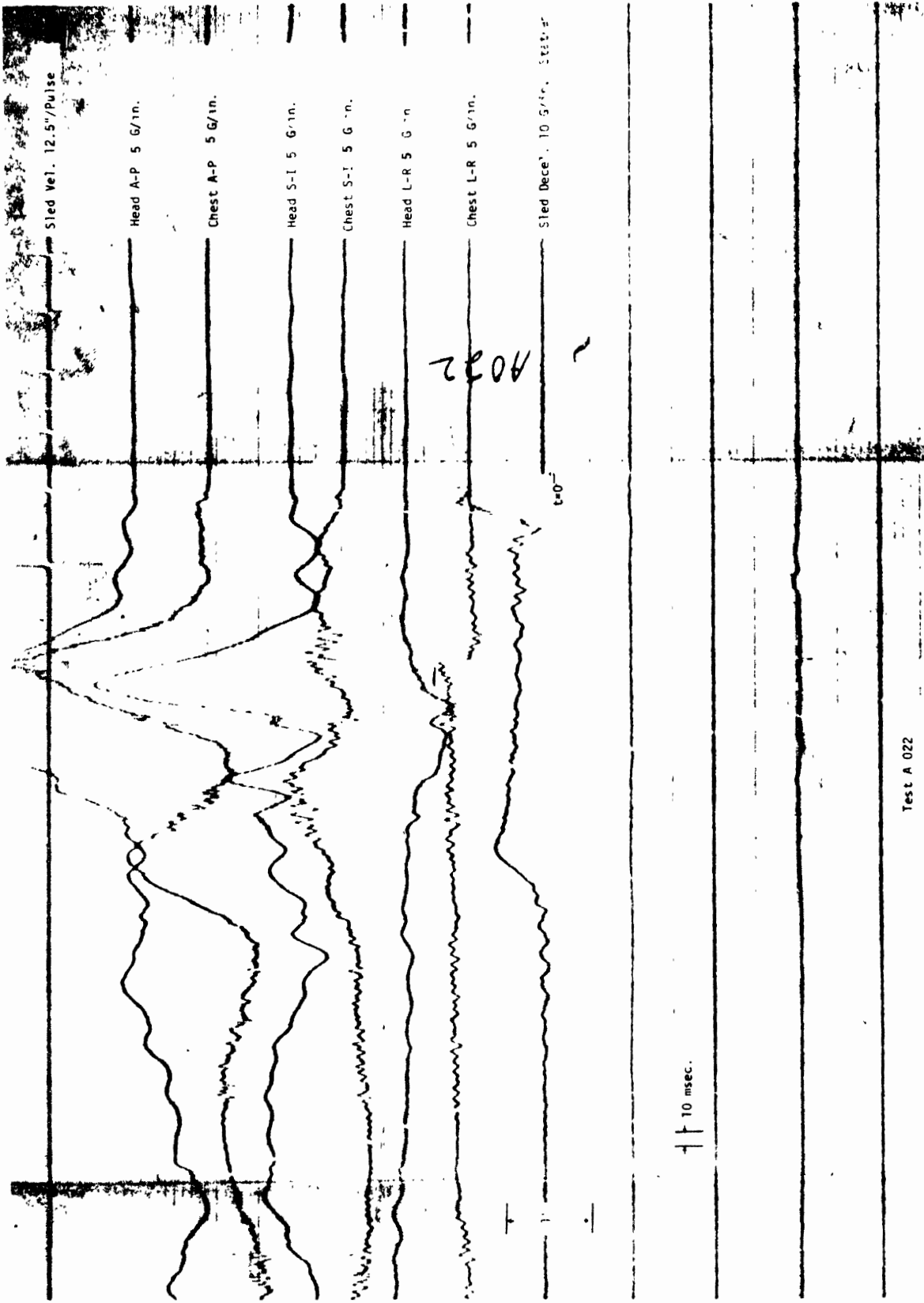
Test No: A-022  
Test Date: 14 February 1969  
Restraint Code No: C-31  
Restraint Description: Sears harness, small

Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 4 (7)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed to either the dummy or the restraint system.  
No gross motions were observed.





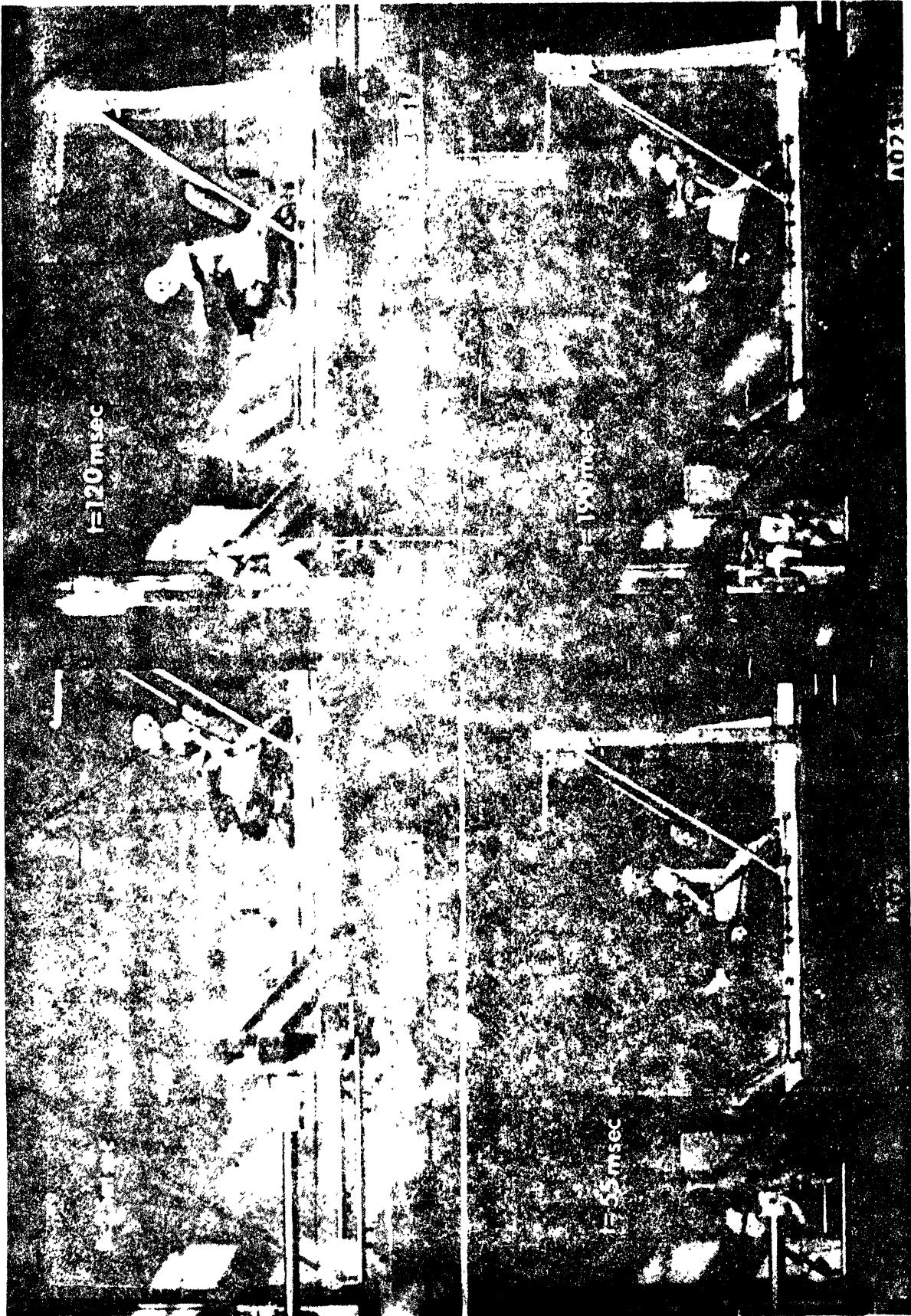
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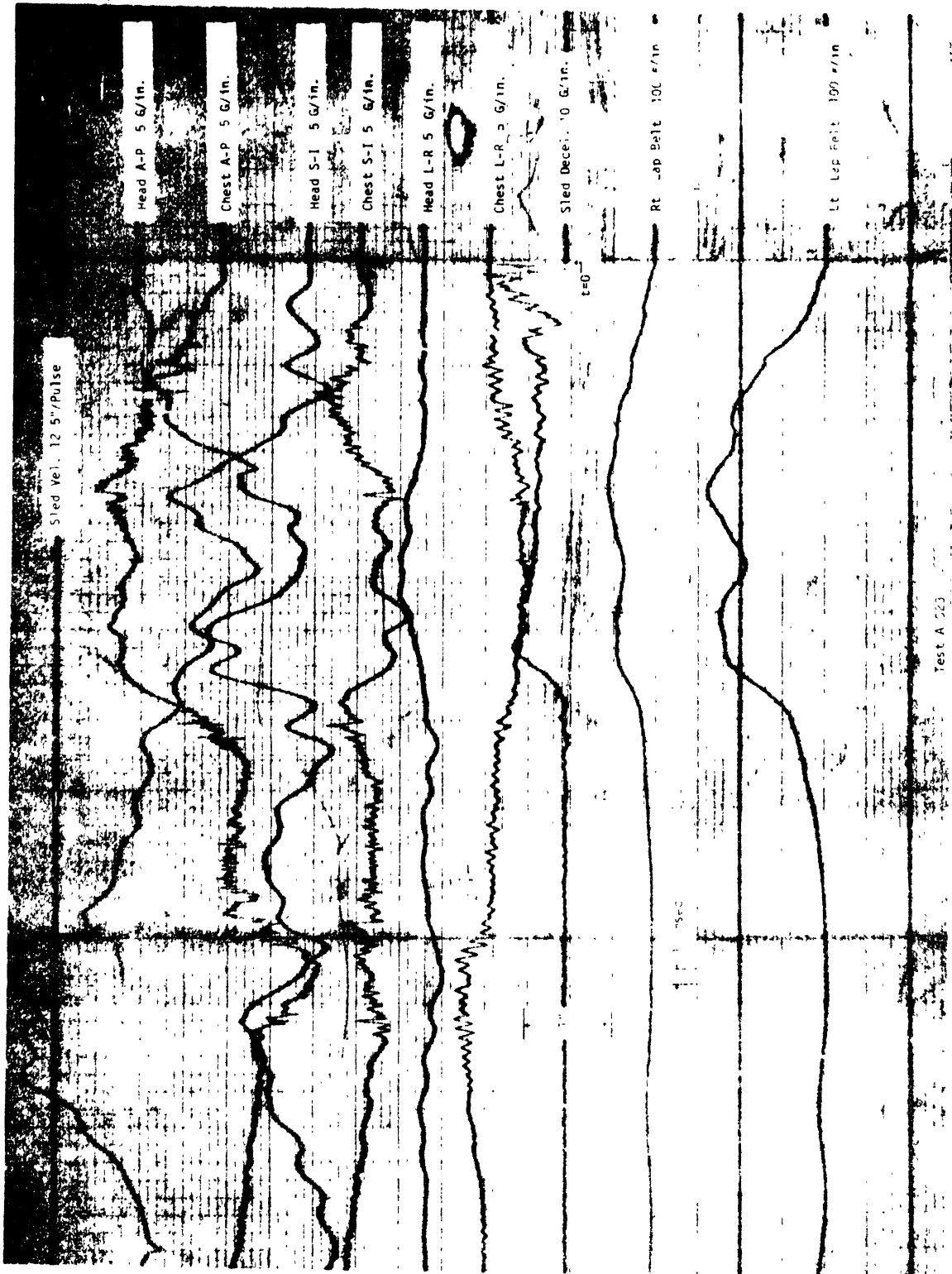
Test No: A-023  
Test Date: 14 February 1969  
Restraint Code No: C-3  
Restraint Description: General Motors Corp. Standard Seat

Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 4 (7)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed either to the dummy or to the restraint system. The head and upper torso of the dummy were observed to pitch forward as the bottom of the child seat dug into the cushion of the adult seat on which it was mounted.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

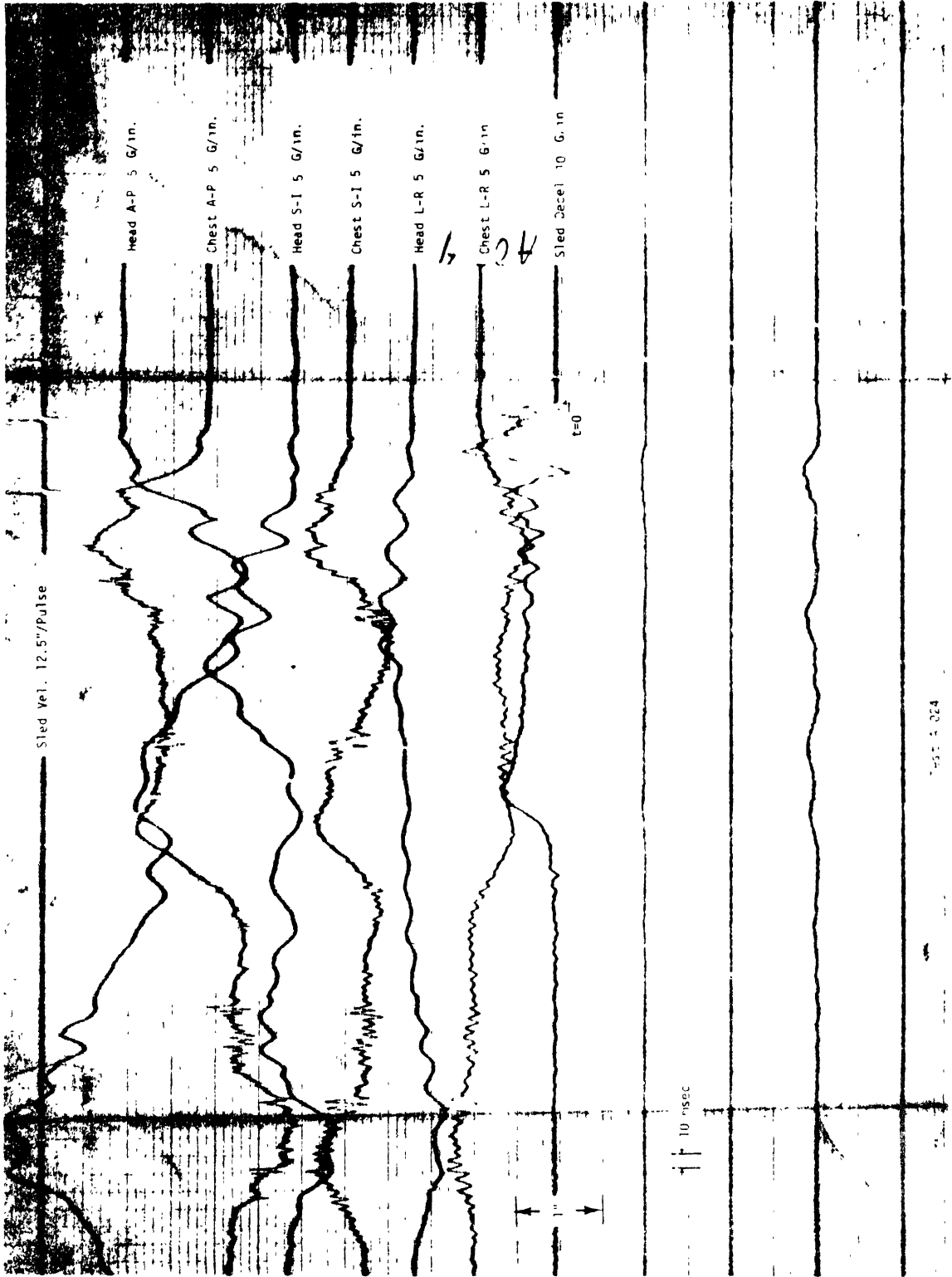
Test No: A-024  
Test Date: 14 February 1969  
Restraint Code No: C-38  
Restraint Description: Wards Harness No. 66B6053

Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 4 (7)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage or gross motion were observed in this test.





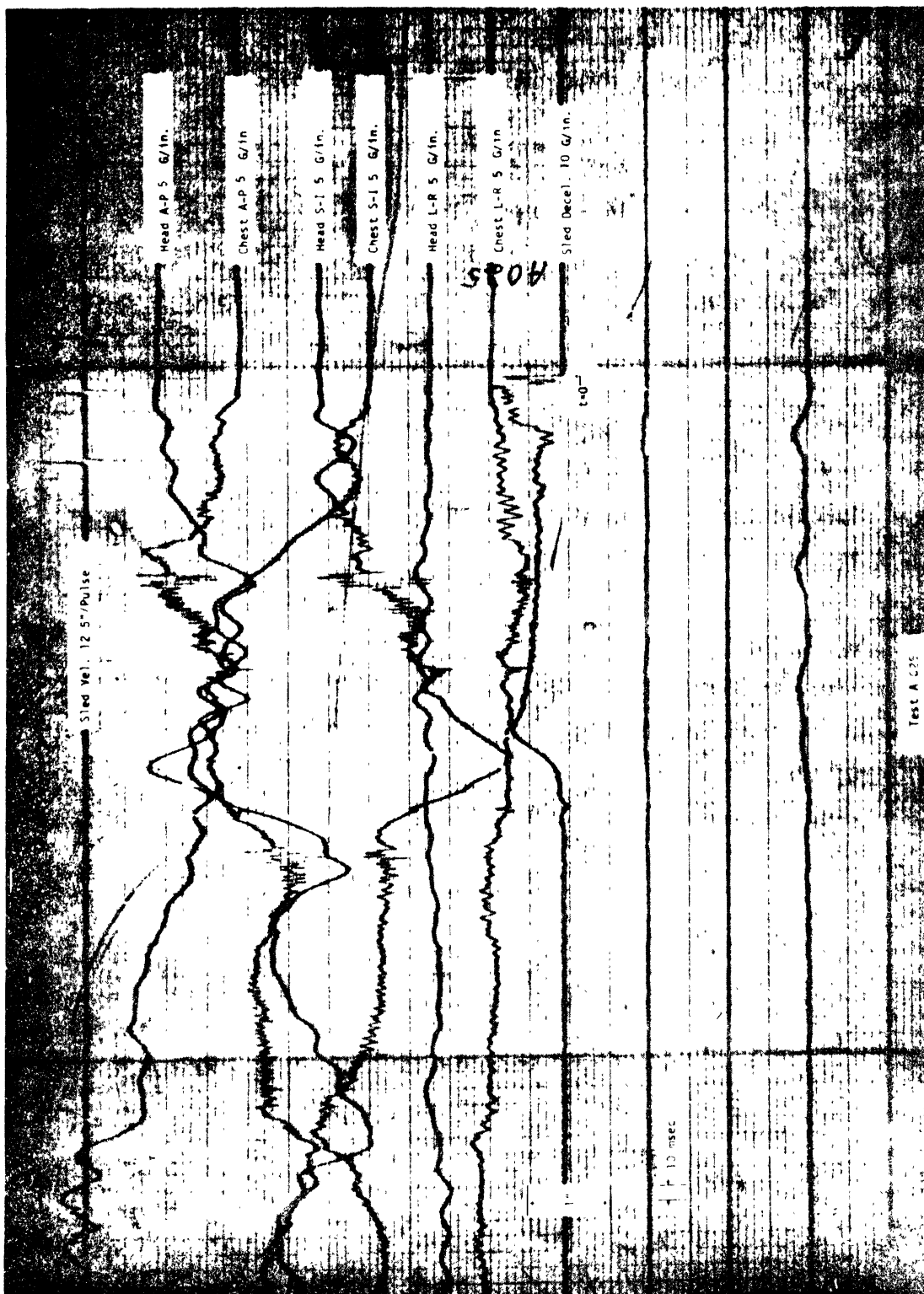
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-025  
Test Date: 14 February 1969  
Restraint Code No: C-12  
Restraint Description: Five-Filer Brothers Bail Seat

Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 4 (7)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

Seat was observed to swing up; however, no damage or gross motions were observed.



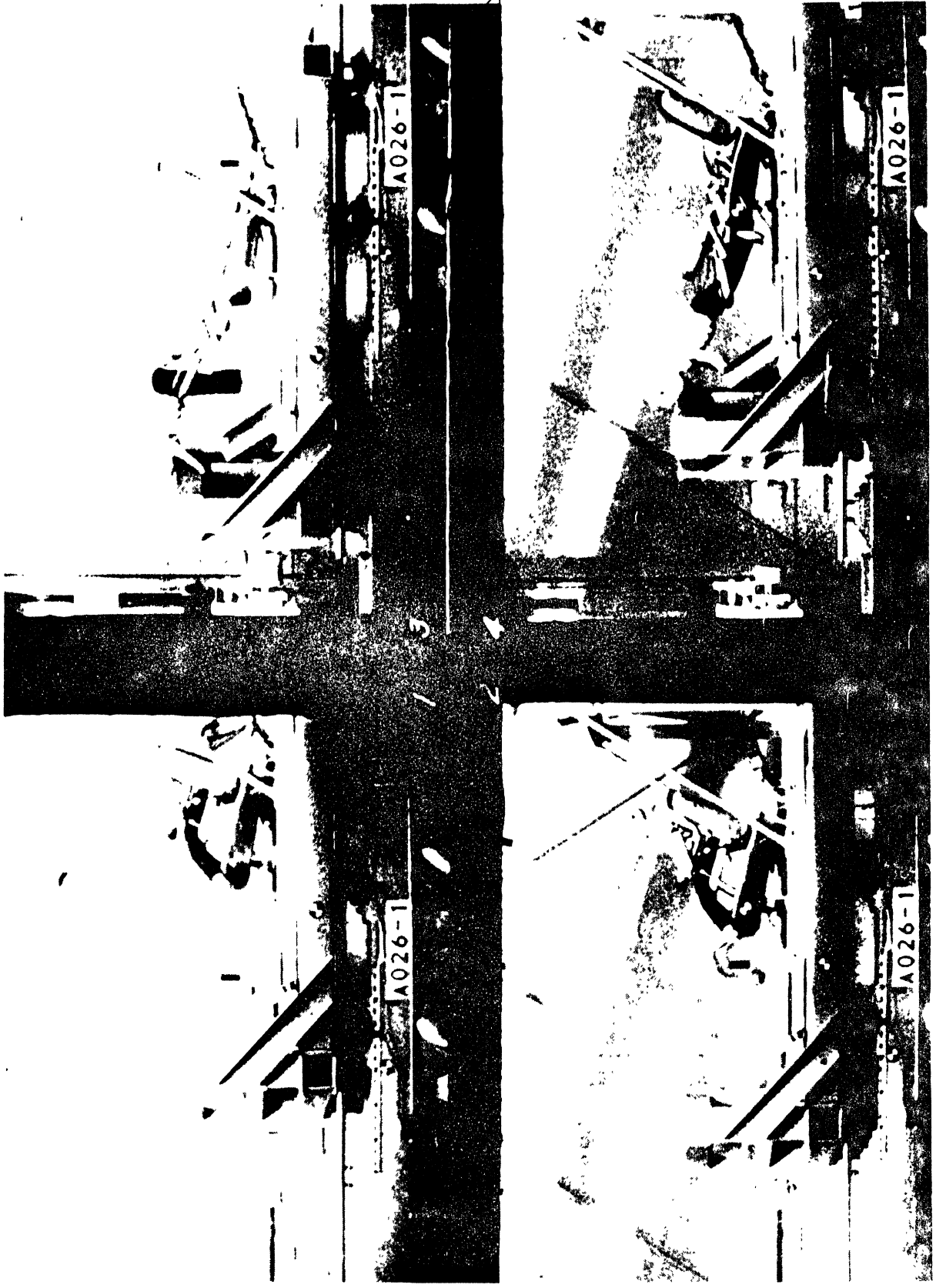
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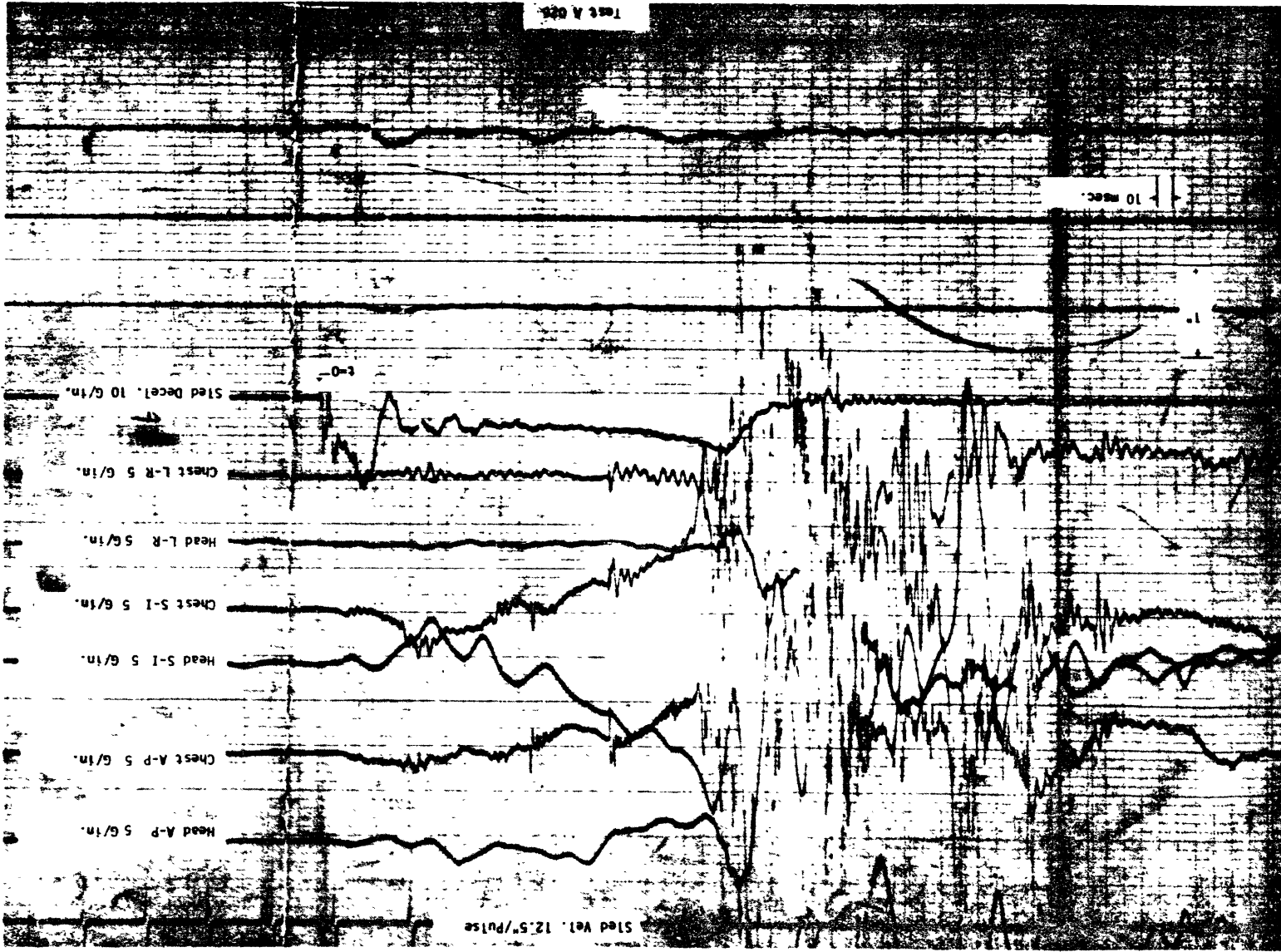
Test No: A-026  
Test Date: 14 February 1969  
Restraint Code No: C-11  
Restraint Description: Five-Filer Brothers Hook Under Seat

Dummy: 3 year  
Sled Velocity: 16 mph  
Sled G-level: 4 (7)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The tubular structure of the seat was observed to fold up as the impact occurred. The dummy was ejected from the seat and violently contacted the sled structure.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-040  
Test Date: 11 March 1969  
Restraint Code No: C-1  
Restraint Description: Ford Tot-Guard

Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 15  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The observed motions of the dummy were minimal.

## HSRI SUMMARY DATA SHEET (FH-11-6962)

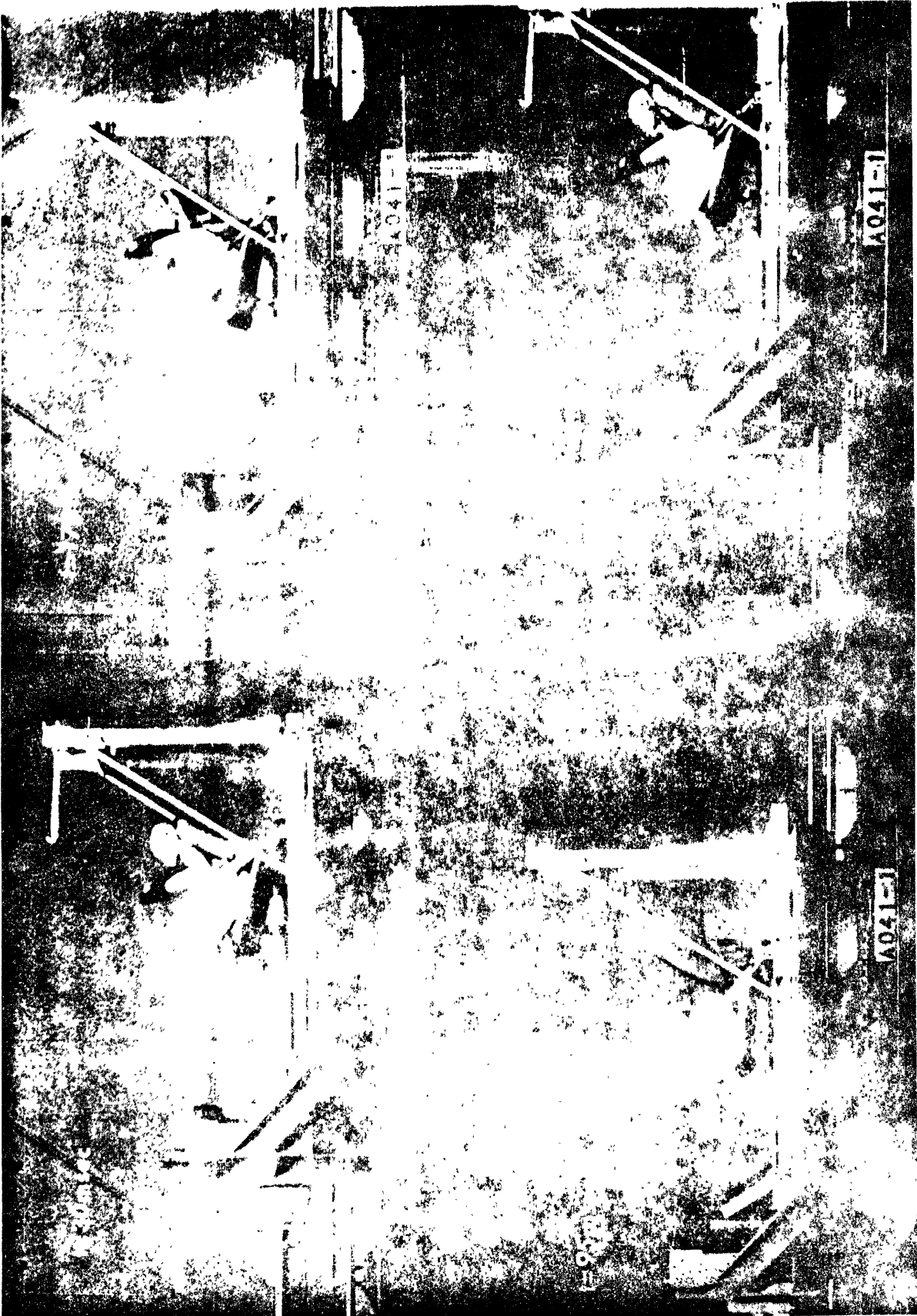
Test No: A-041  
Test Date: 17 March 1969  
Restraint Code No: C-1  
Restraint Description: Ford Tot-Guard

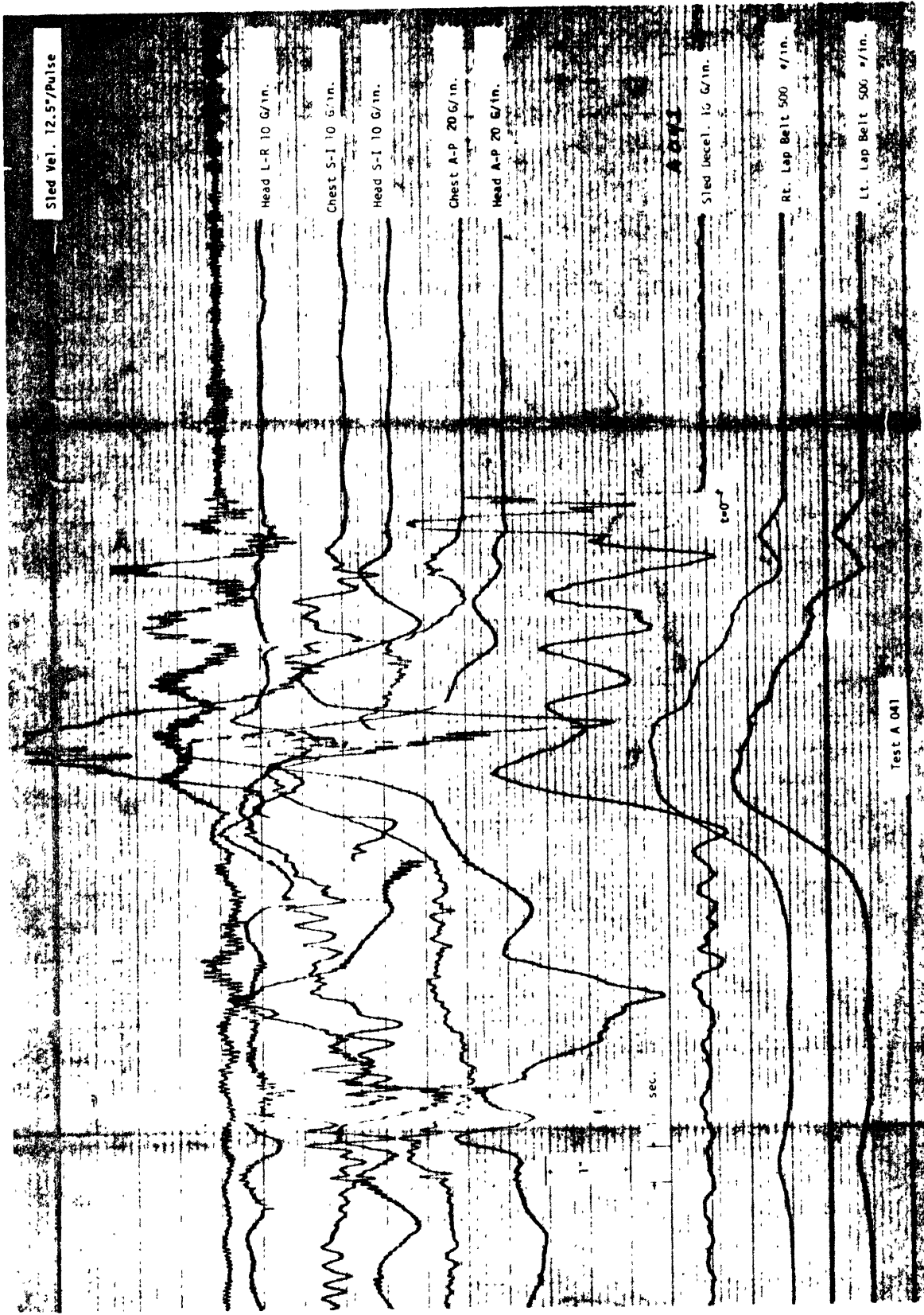
Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 15 (37)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The motions experienced by the dummy were minimal. Head and chest g loadings were quite high.







## HSRI SUMMARY DATA SHEET (FH-11-6962)

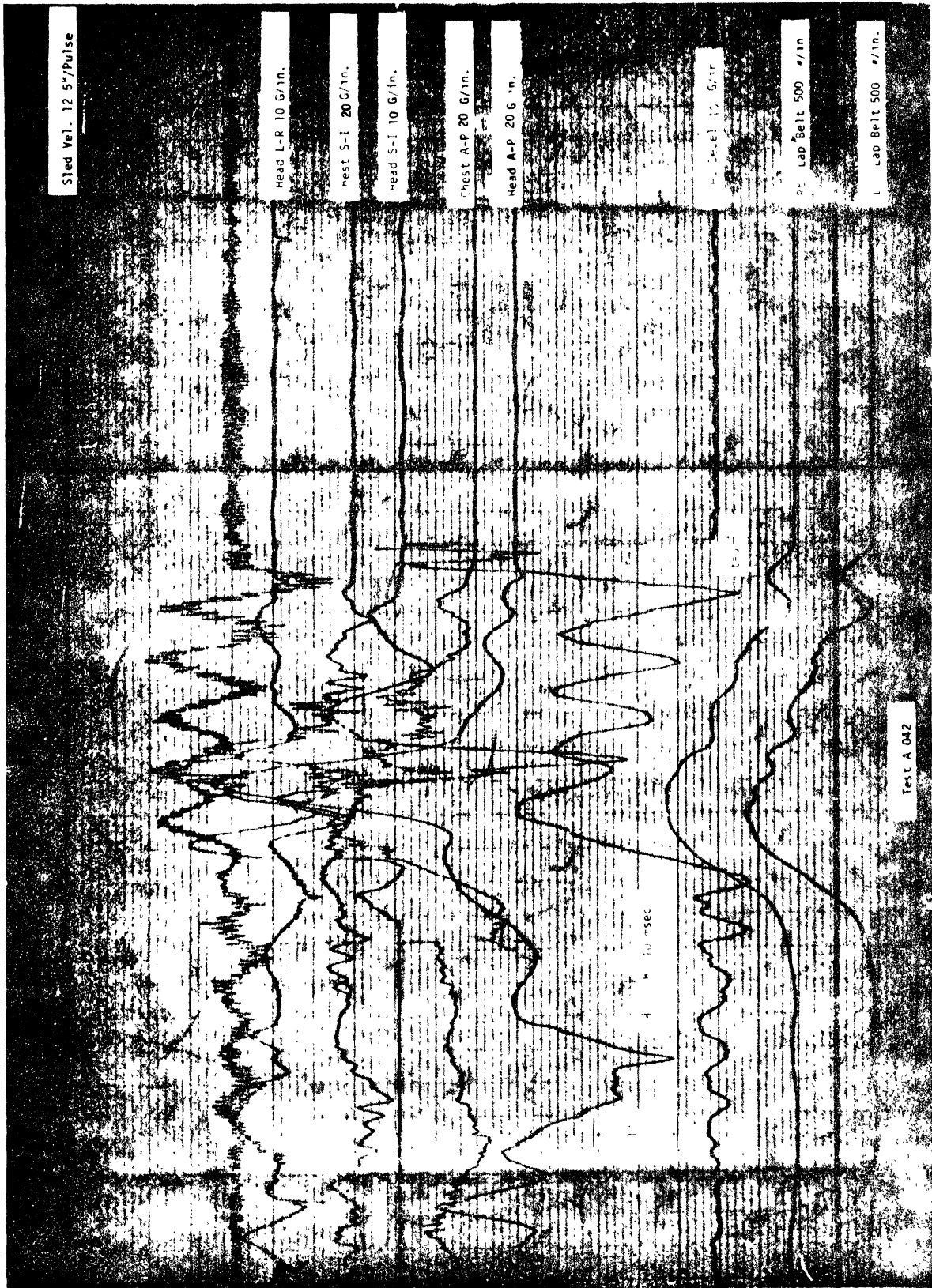
Test No: A-042  
Test Date: 17 March 1969  
Restraint Code No: C-1  
Restraint Description: Ford Tot-Guard

Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 15 (42)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The Tot-Guard was not located properly on the adult seat. Dummy motions were minimal, except that the left leg became detached from the torso of the dummy. Chest and head accelerometer readings were quite high.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

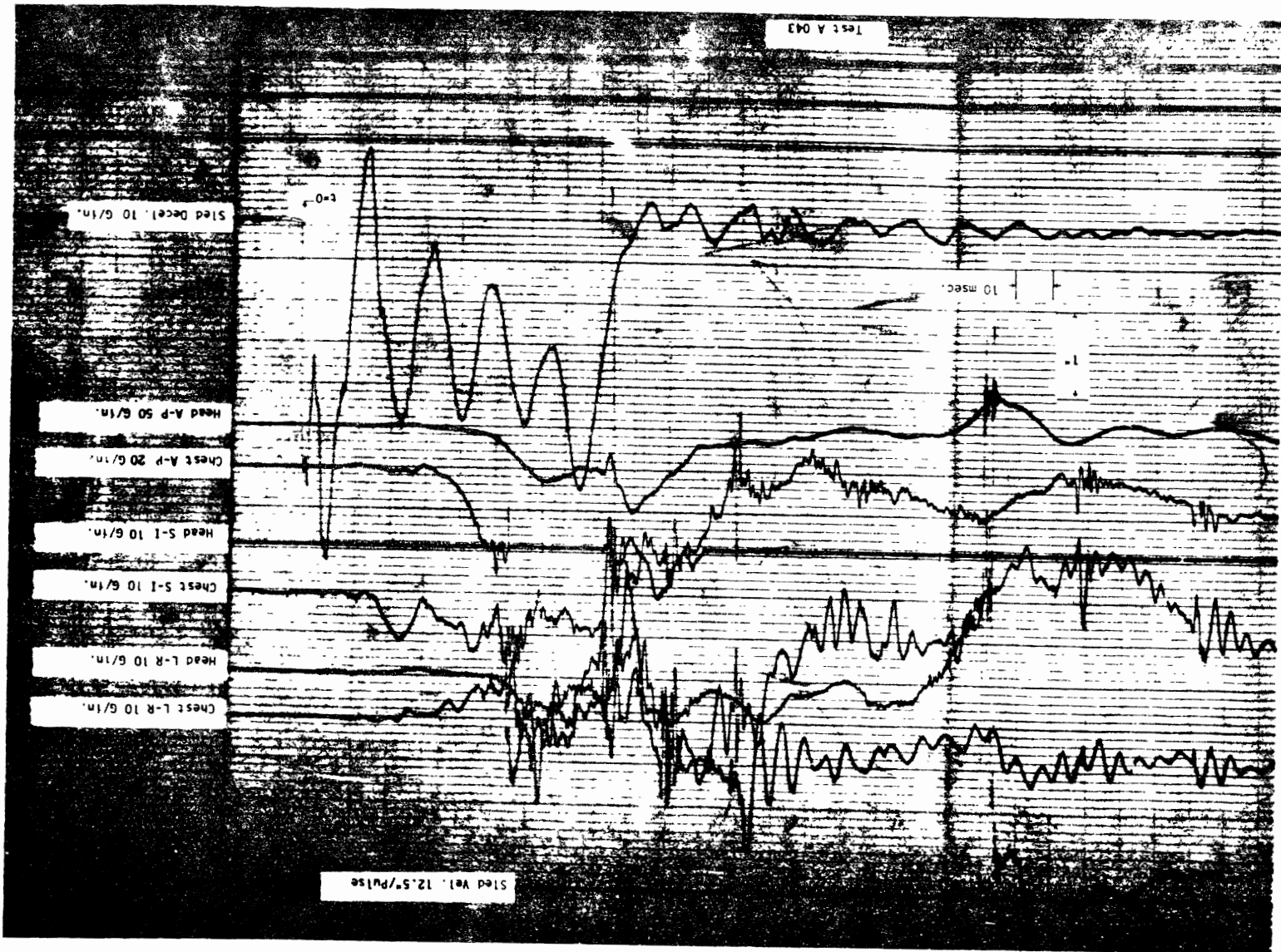
Test No: A-043  
Test Date: 18 March 1969  
Restraint Code No: C-31  
Restraint Description: Small Sears Harness

Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 15 (41)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed to either the dummy or to the restraint system. However, the adult seat back was bent severely by the harness strap which is looped over it. The excursion experienced by the dummy was probably sufficient to allow contact with a vehicle interior.

Test A 043



## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-049  
Test Date: 16 April 1969  
Restraint Code No: C-5  
Restraint Description: Sears Seat No. 5516

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 15 (26)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The head and chest of the dummy were observed to pitch forward over the lap belt and the head pitch down far enough to apparently contact the front of the adult seat.





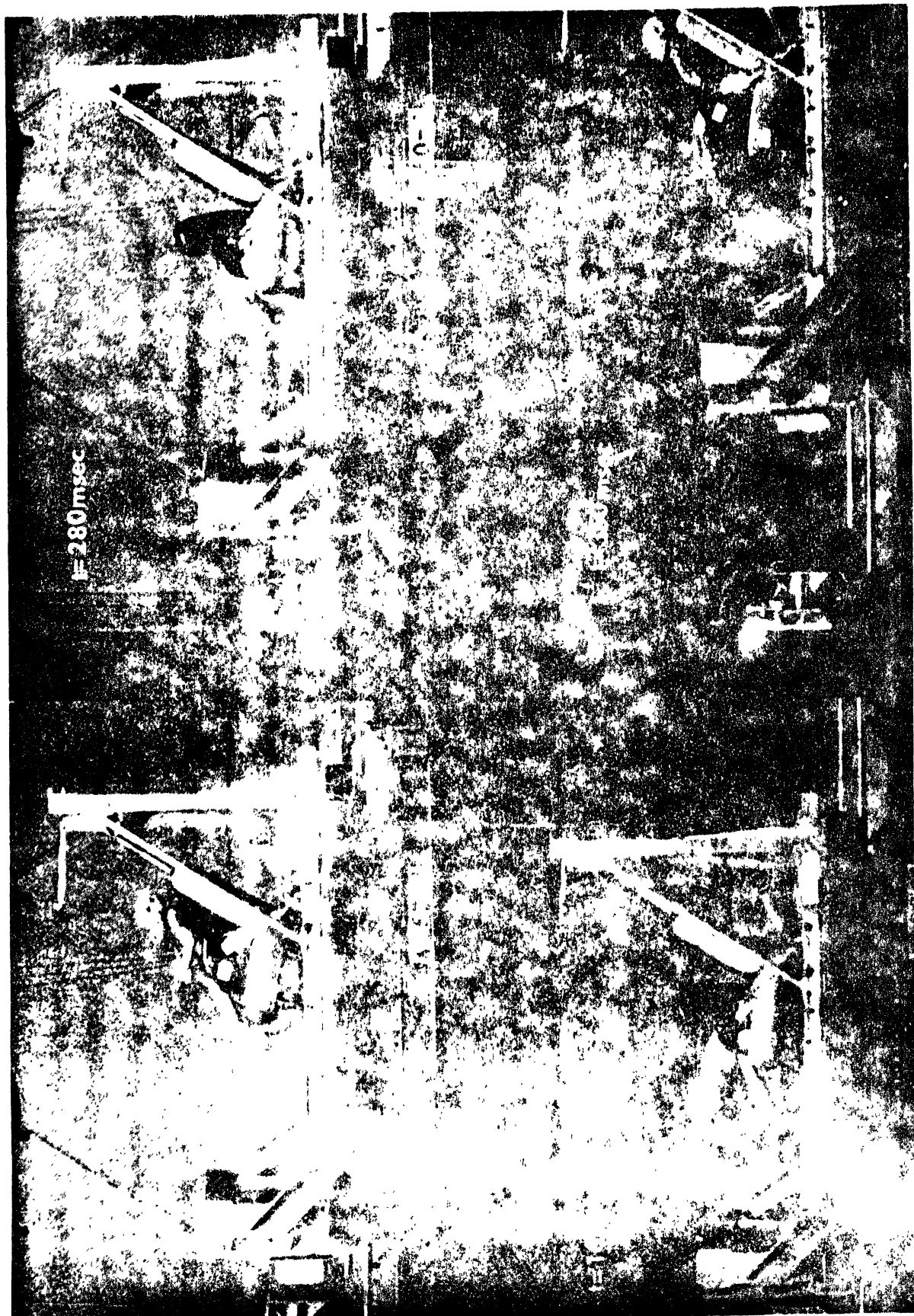
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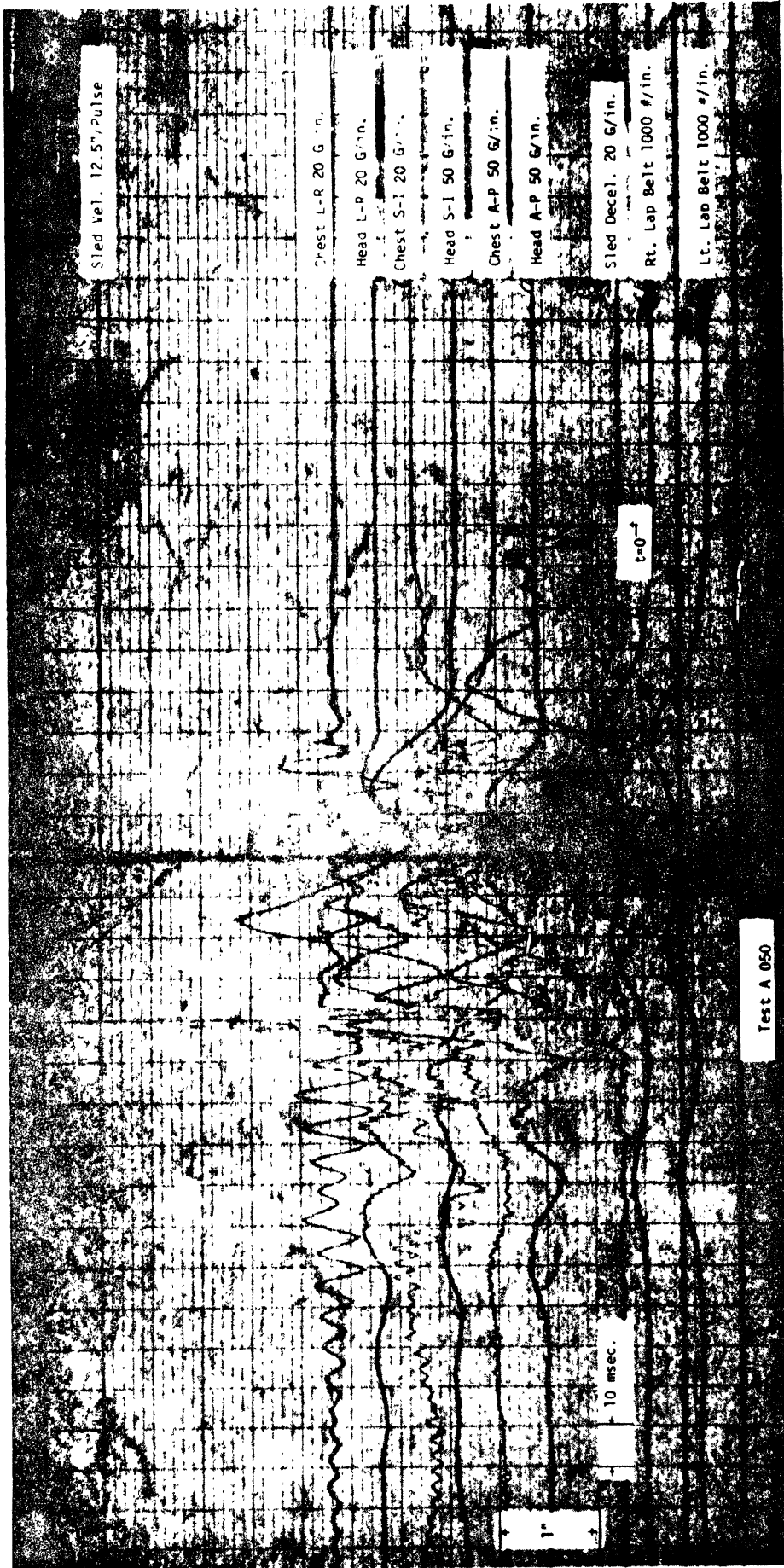
Test No: A-050  
Test Date: 16 April 1969  
Restraint Code No: C-5  
Restraint Description: Sears Seat No. 5516

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18 (32)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed either to the dummy or to the restraint system. However, the head of the dummy experienced very high g loadings. The head of the dummy was observed to pitch forward through a large arc downward until it contacted the front of the adult seat on which the child's seat was mounted.





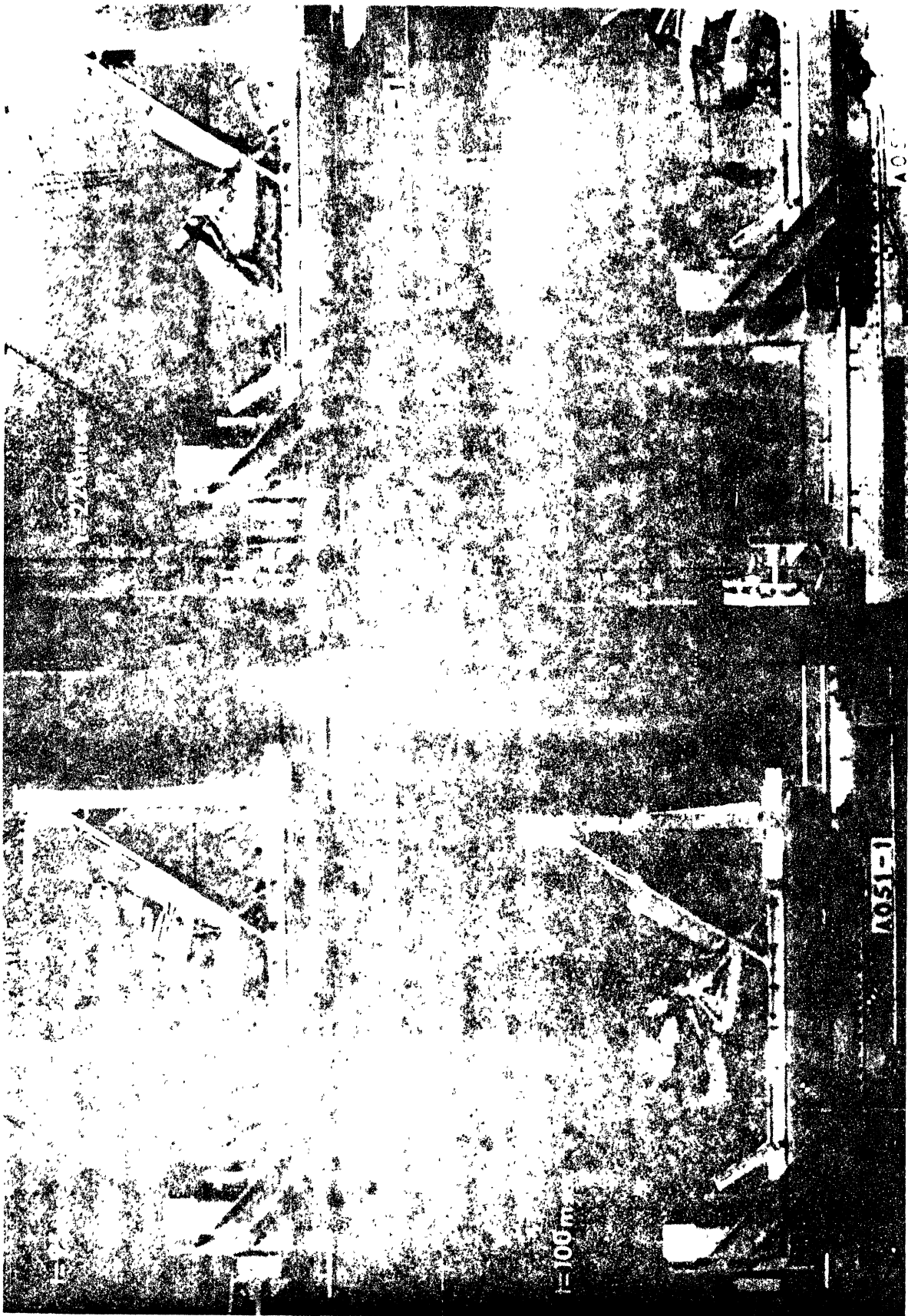
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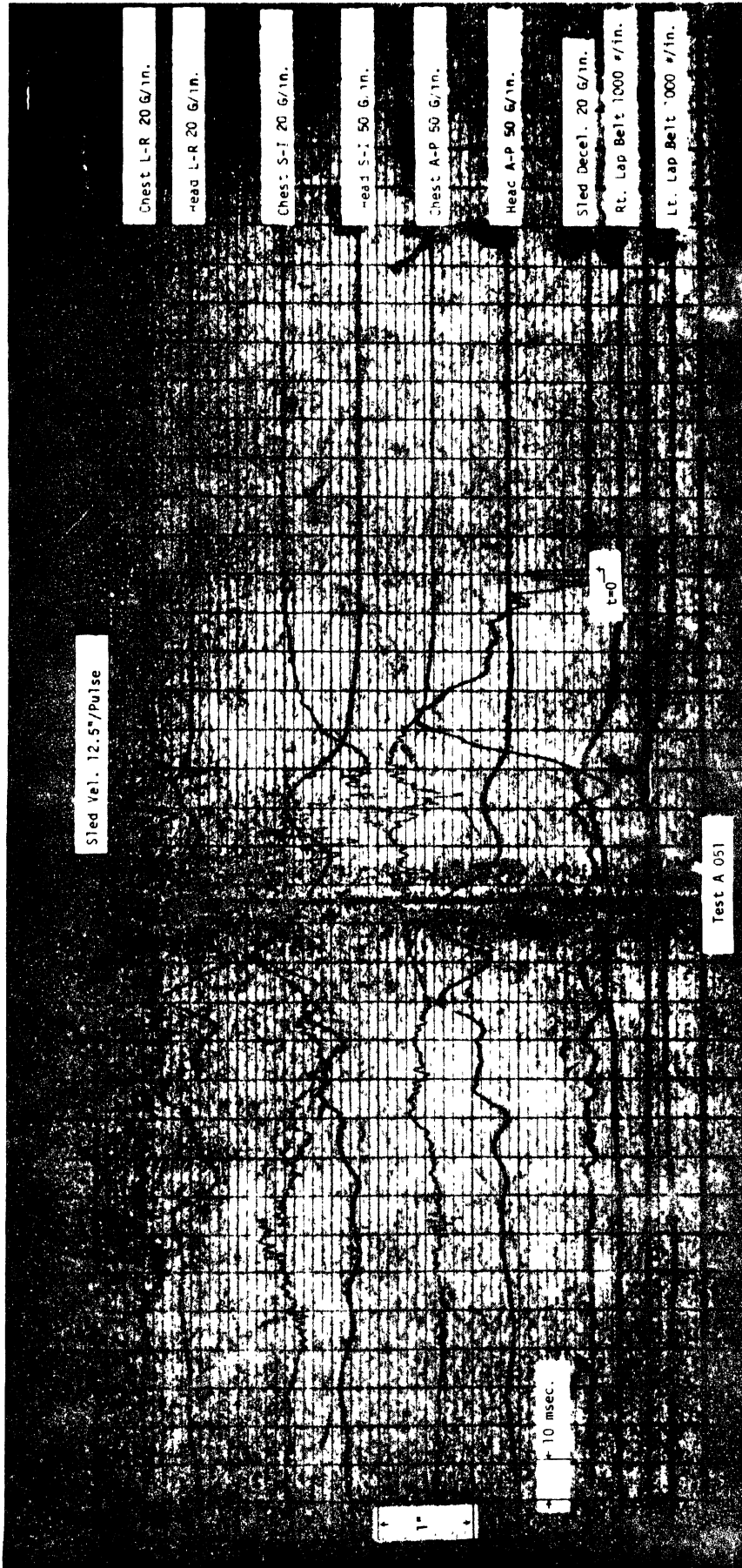
Test No: A-051  
Test Date: 16 April 1969  
Restraint Code No: C-14  
Restraint Description: International Seat, Model No. 4613

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18 (36)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The dummy experienced no damage although the head loads were quite high. The seat was badly damaged in this test. The tubular structure collapsed and was bent severely. The padded rail in front of the dummy was bent. The cross piece to which the seat back was riveted was also bent and the crotch strap snap came loose. The excursion of the dummy was probably sufficient to allow contact with the interior of the vehicle.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

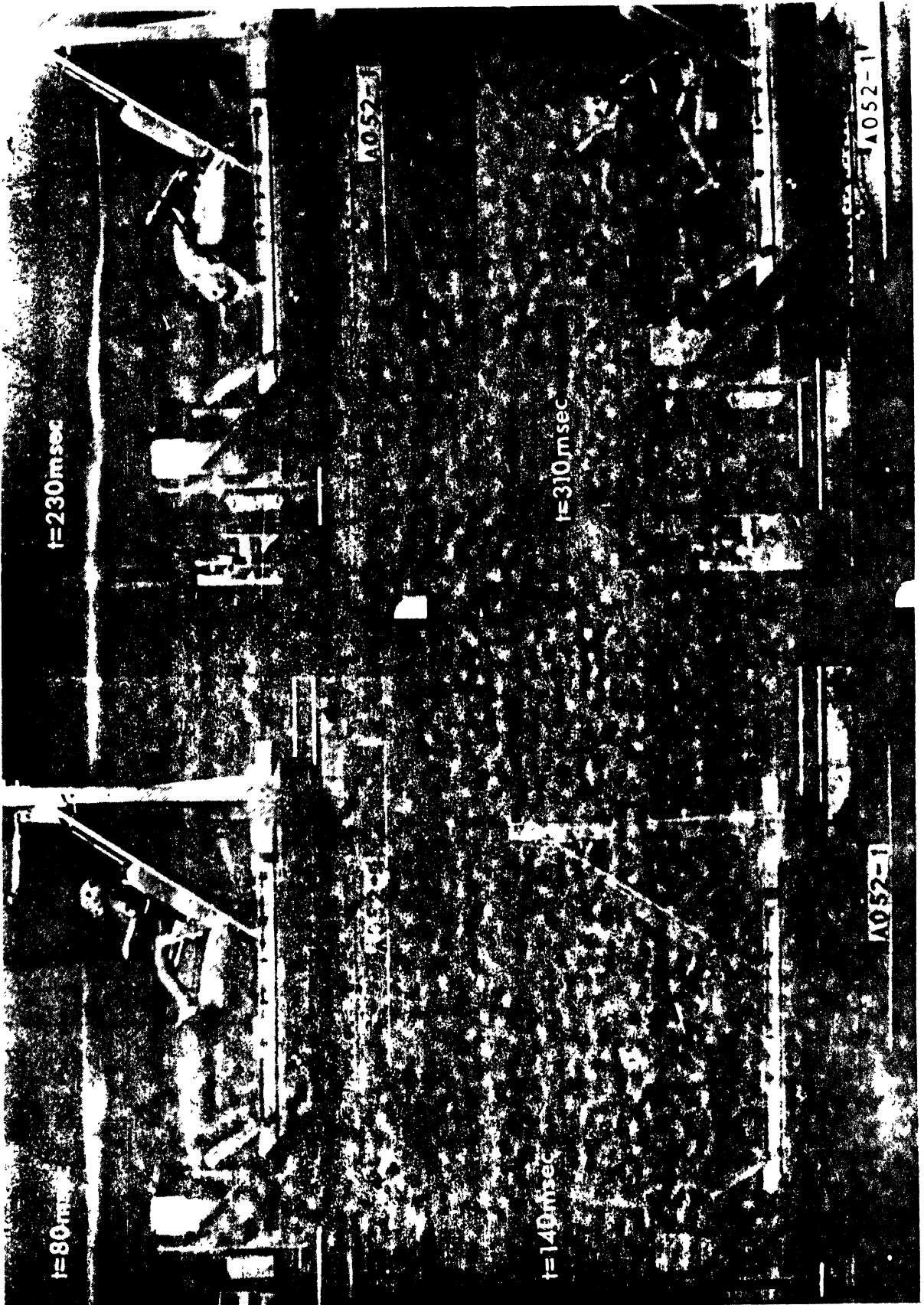
Test No: A-052  
Test Date: 16 April 1969  
Restraint Code No: C-10  
Restraint Description: Century Seat, Model No. 4865

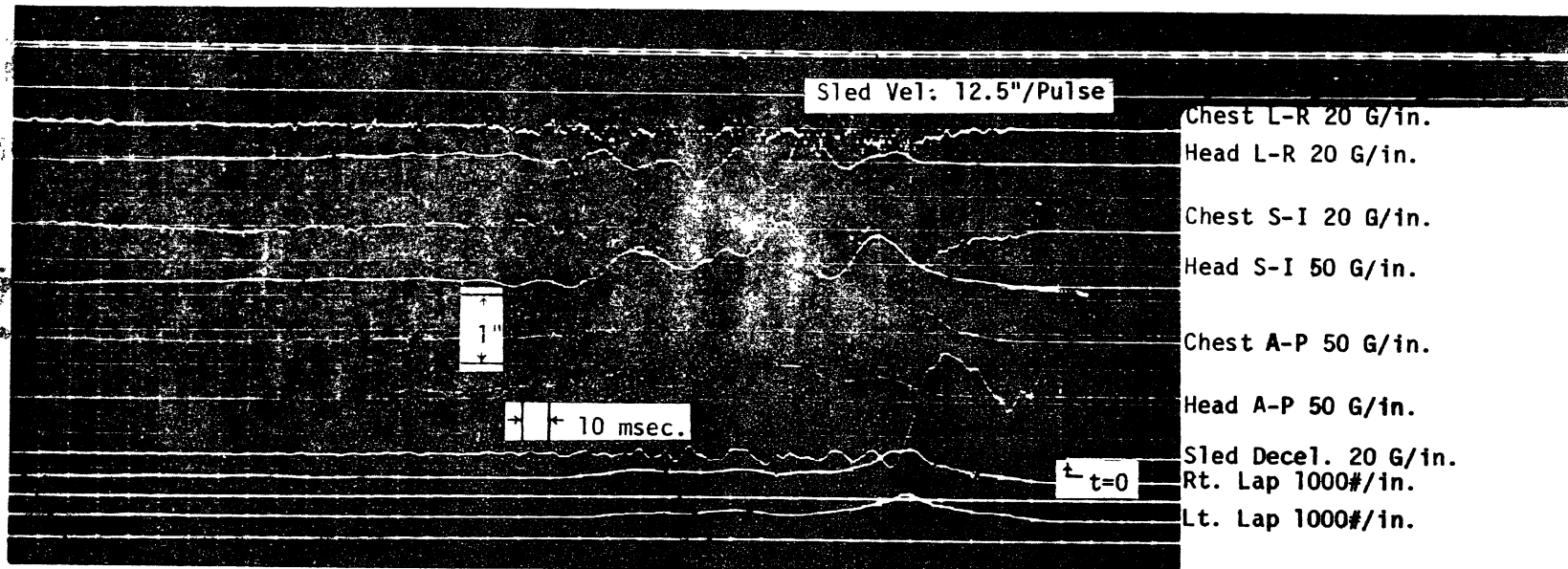
Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 16 (36)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed to the dummy, but excursions in this test were probably sufficient to allow contact with the interior of the vehicle. The seat experienced severe damage due to the collapse of the rear support bars at the rivet holes.







Test A 052

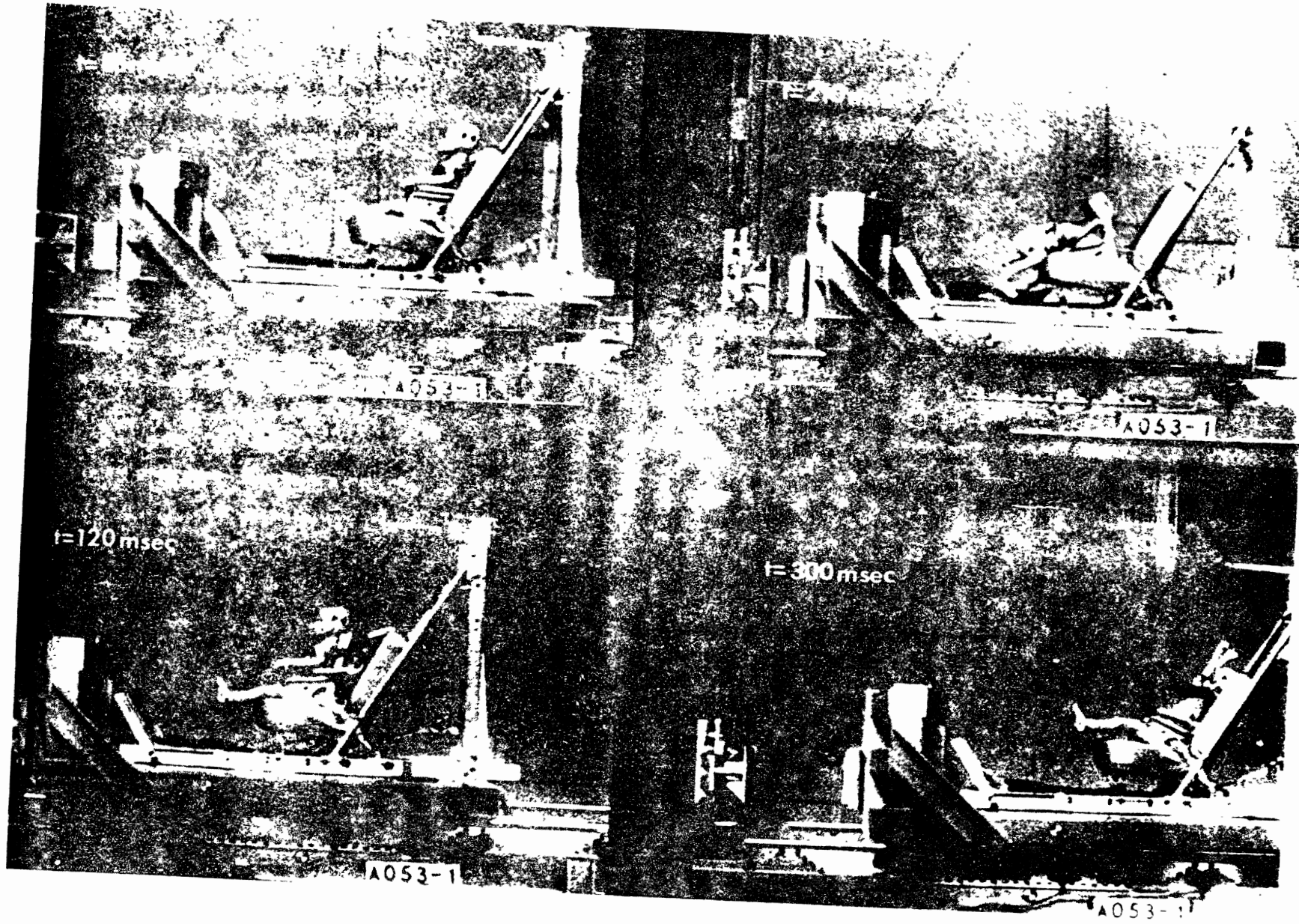
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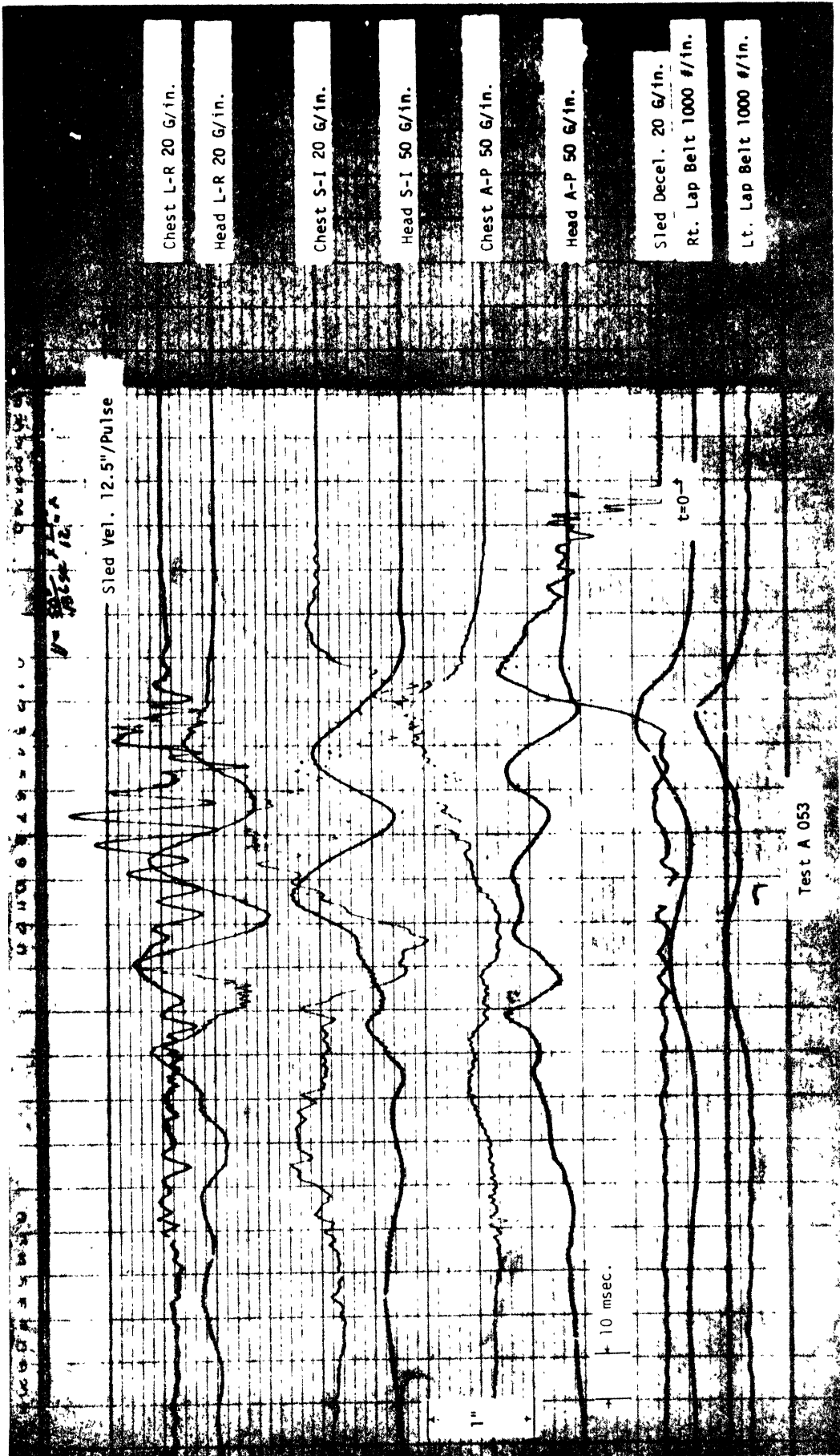
Test No: A-053  
Test Date: 21 April 1969  
Restraint Code No: C-15  
Restraint Description: International Seat No. 4513

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18 (32)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

Both bail hooks on this seat were broken and became unattached from the back of the adult seat. The molded back of the child seat flexed allowing the chest belt to slide up and become disengaged. The upper torso and head of the dummy pitched forward over the padded rail at the front of the seat.





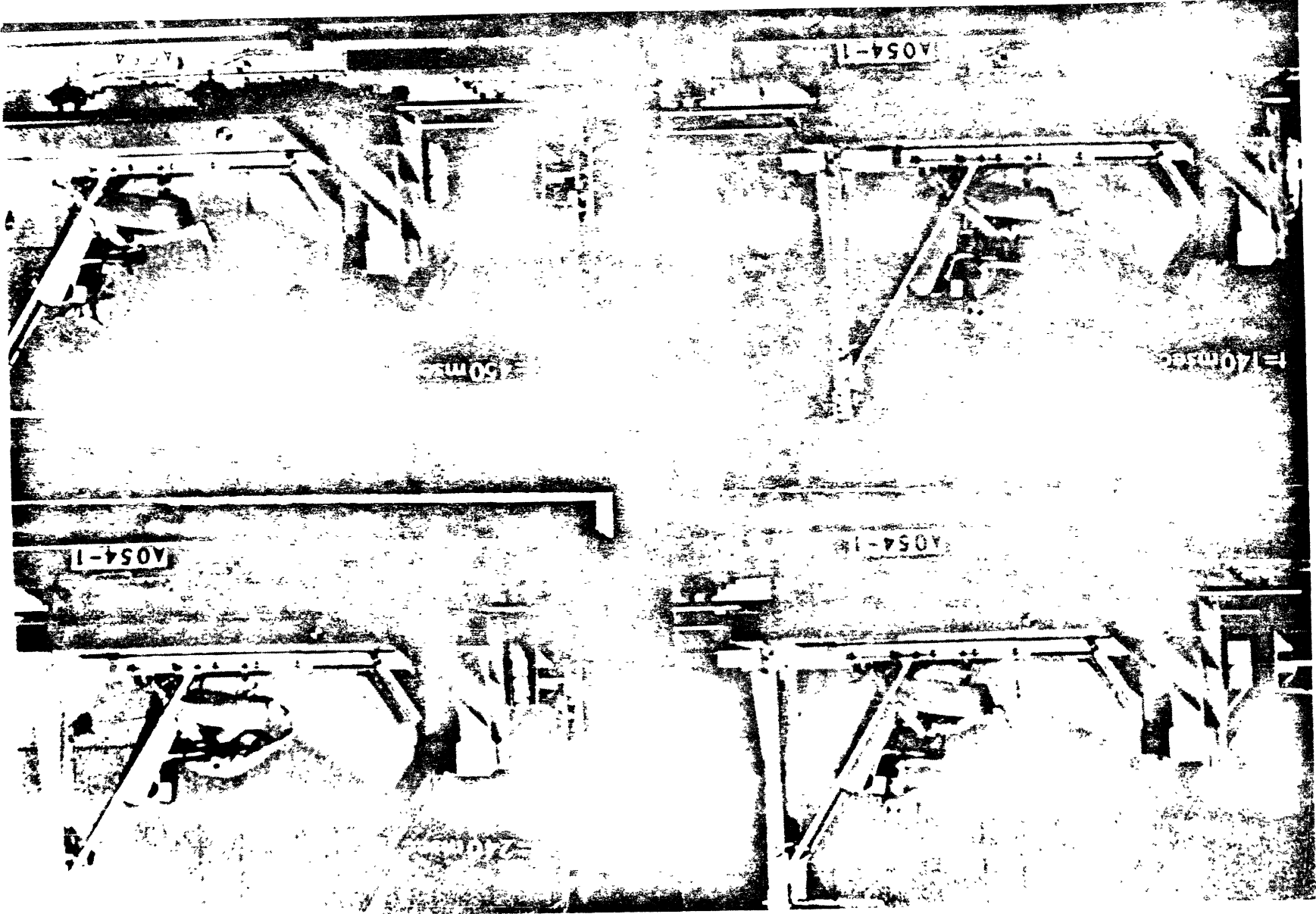
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Test No: A-054  
Test Date: 21 April 1969  
Restraint Code: C-9  
Restraint Description: Century Seat No. 4865

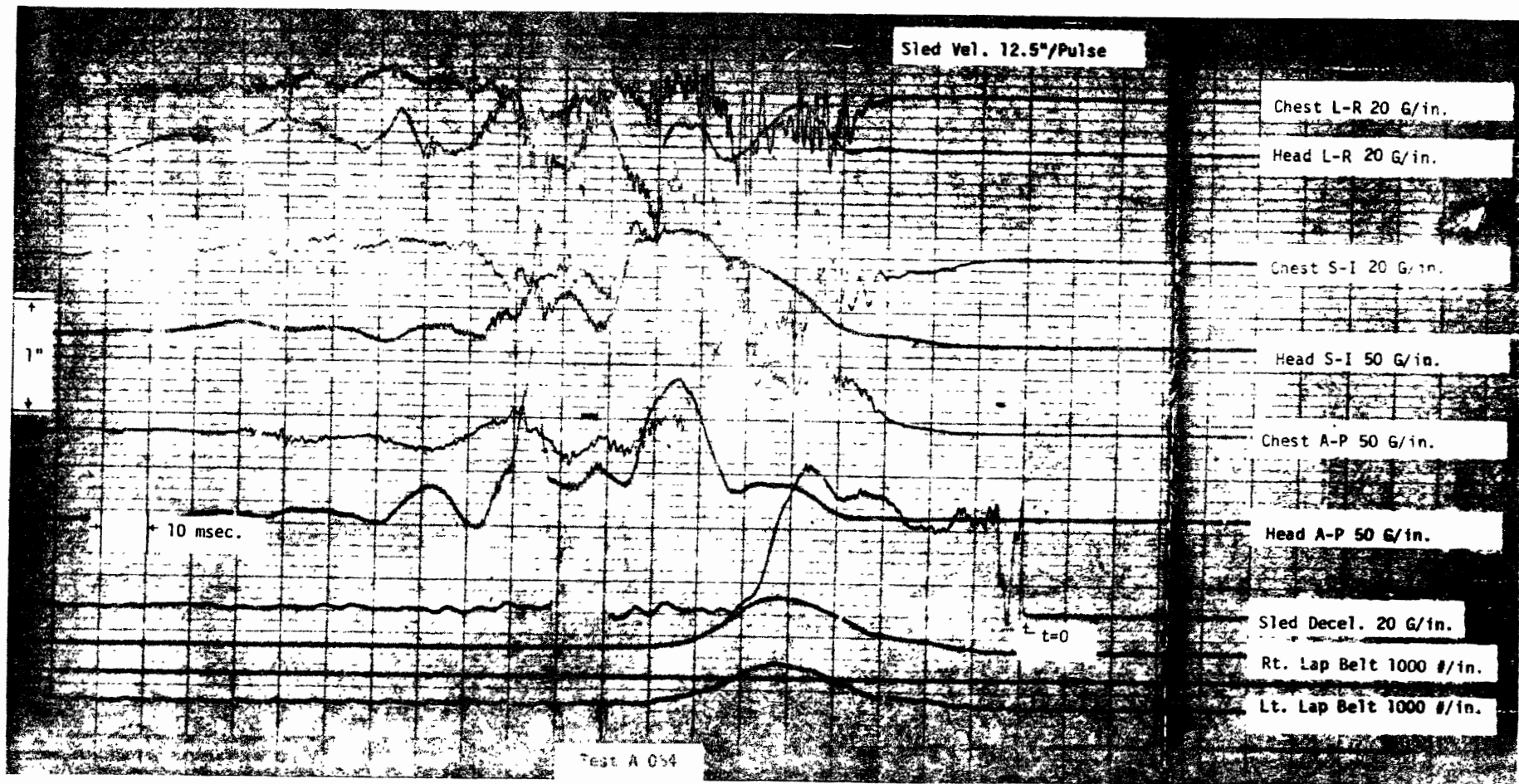
Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18 (28)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The dummy head and chest were observed to pitch over the handrail on the child seat. The seat was damaged to some extent. The left-hand and right-hand bail hooks were bent and straightened out to 112°. Bending was also observed at the pivot pin slot. The integral chest strap on the child seat pulled slack sufficiently so that a fist would fit between the strap and the torso of the dummy. Originally one could insert four fingers side by side in between the dummy chest and the strap. It was also frayed where it had pulled through the buckle. The handrail stops were bent backwards 17° allowing the rail to sag along with the seat and the dummy.



67



Sled Vel. 12.5"/Pulse

- Chest L-R 20 G/in.
- Head L-R 20 G/in.
- Chest S-I 20 G/in.
- Head S-I 50 G/in.
- Chest A-P 50 G/in.
- Head A-P 50 G/in.
- Sled Decel. 20 G/in.
- Rt. Lap Belt 1000 #/in.
- Lt. Lap Belt 1000 #/in.

10 msec.

t=0

Test A 034



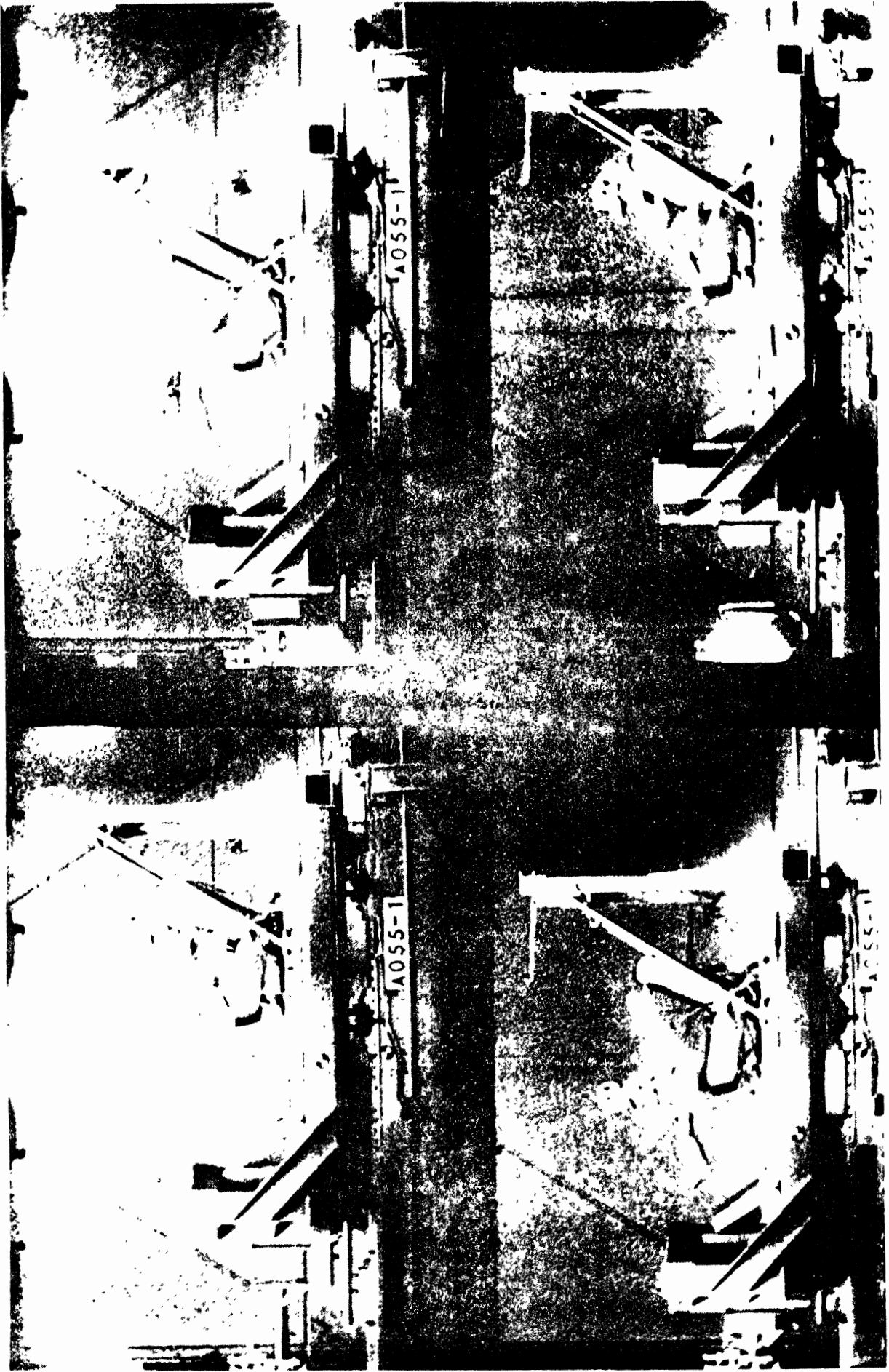
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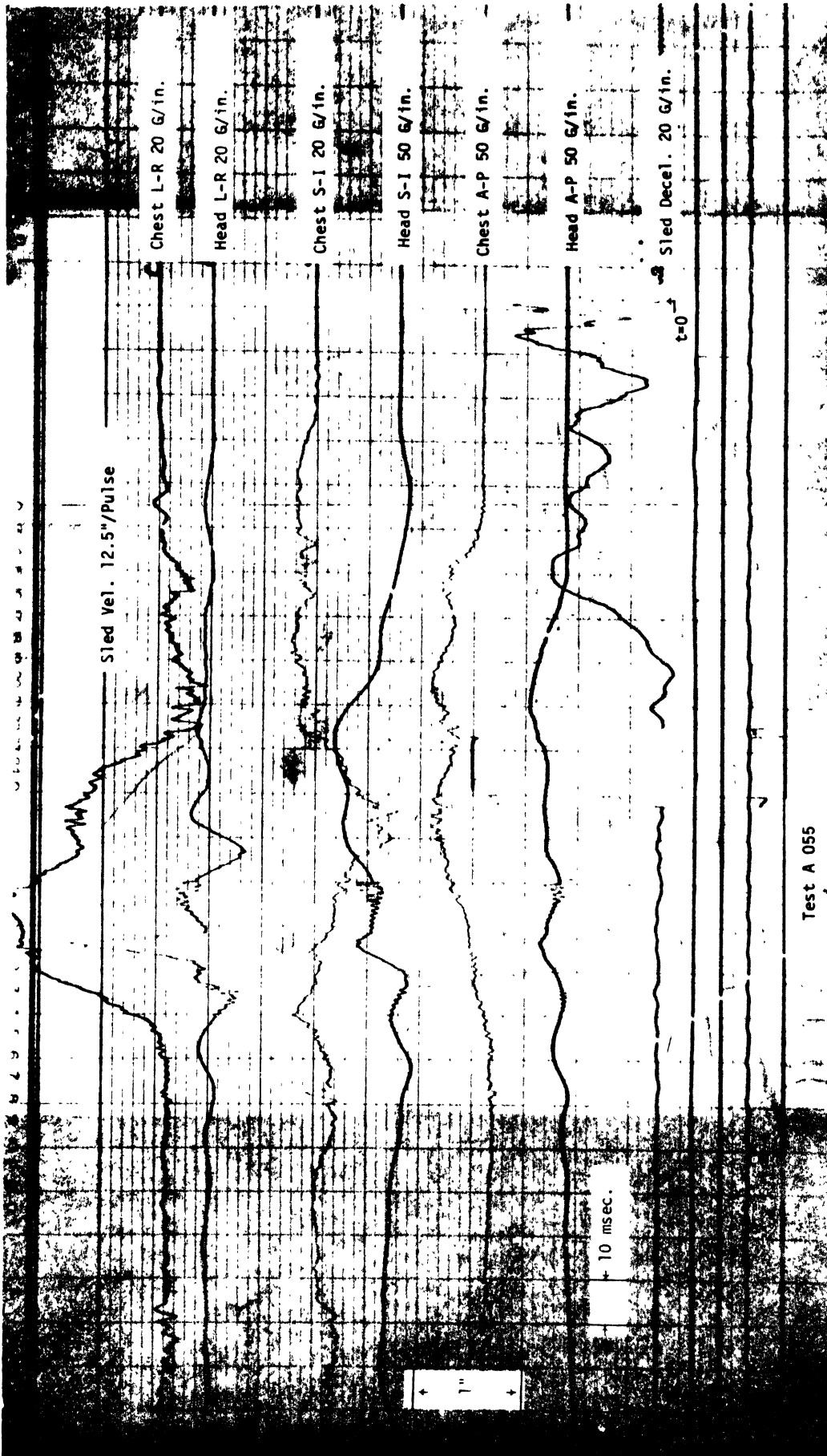
Test No: A-055  
Test Date: 22 April 1969  
Restraint Code No: C-6  
Restraint Description: George B. Walker Safety Seat

Dummy: 3 year  
Sled Velocity: 21 mph  
Sled G-level: 16 (29)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The loadings experienced by the dummy were minimal, probably due to the fact that the excursions were so large that impact with the vehicle interior would be certain. The seat experienced considerable damage. The bail hooks were straightened out as they pulled over the adult seat back. The handrail was bent into an elliptical shape by the impact of the dummy torso. The integral lap belt slipped allowing the lower torso of the dummy to slide forward, apparently due to the belt slipping in the adjusting loop. The crotch strap buckle was bent where it was attached to the handrail. The handrail was buckled downward at the support point approximately two inches forward of the attachment to the seat back. The underside of the bail hooks picked up material from the top of the adult seat as they slipped over the seat back.





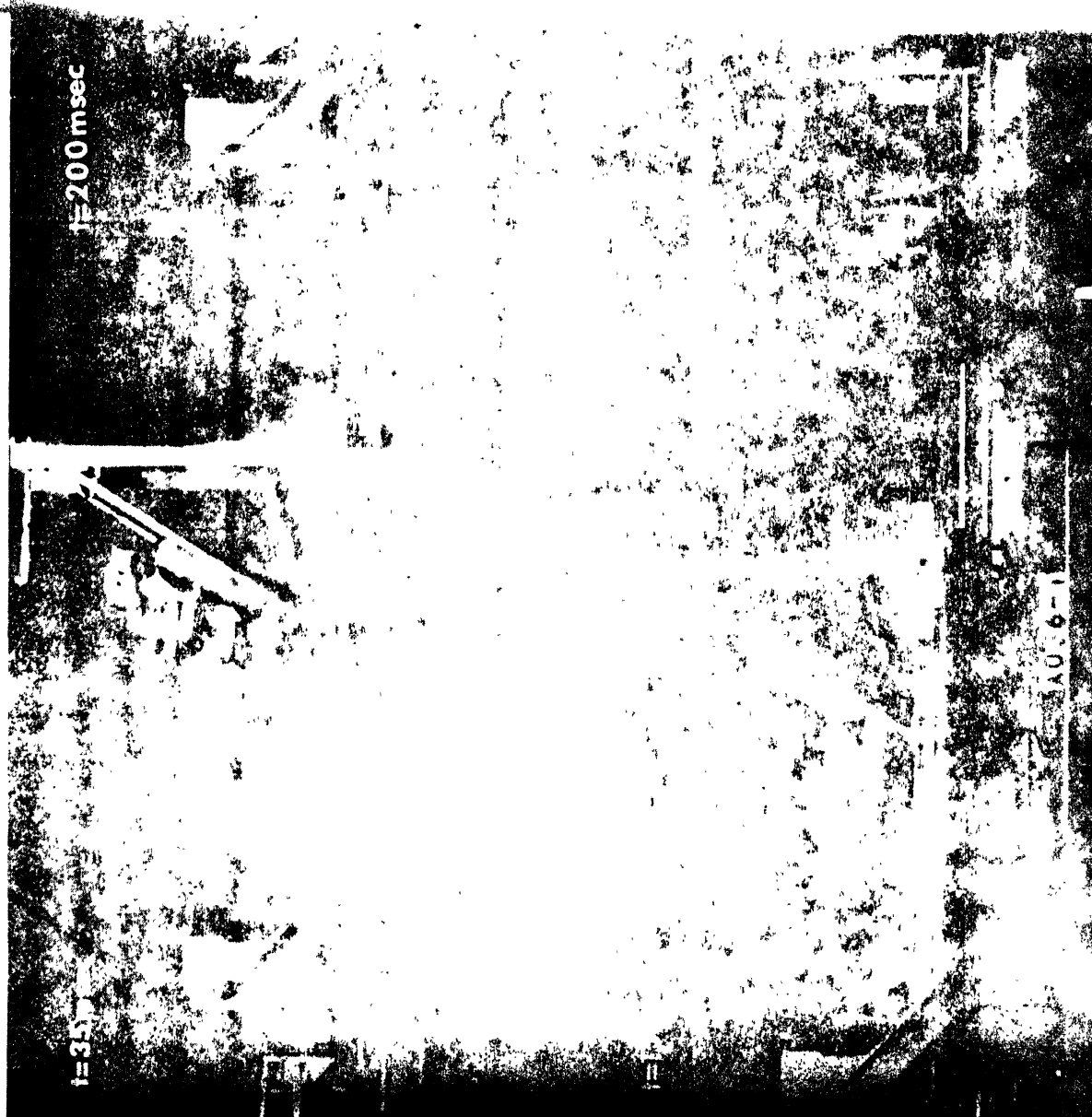
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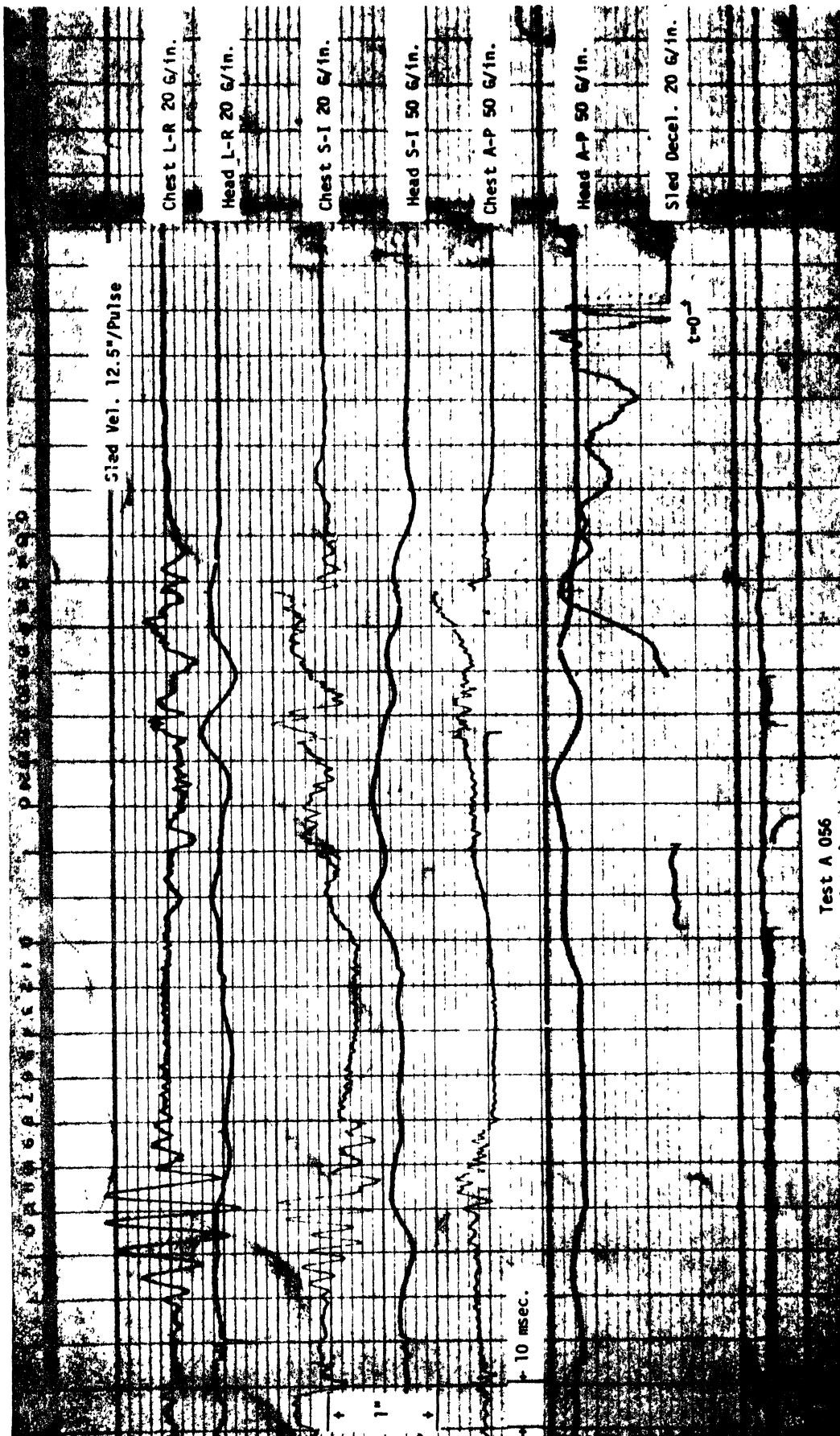
Test No: A-056  
Test Date: 22 April 1969  
Restraint Code No: C-21  
Restraint Description: Bunny Bear Seat No. 3505

Dummy: 3 year  
Sled Velocity: 21 mph  
Sled G-level: 16  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The loadings experienced by the dummy were quite small, however, its excursion was sufficiently large to allow contact with the interior of any vehicle. The seat experienced considerable damage. The belly straps pulled loose at each end because the rivets pulled out. The one-eighth inch by five-eighth inch steel diagonal folding braces supporting the seat back structure collapsed on both sides. The dummy jackknifed and was nearly ejected. The dummy appeared to be restrained by the auxiliary nylon safety straps which are not part of the seat structure.





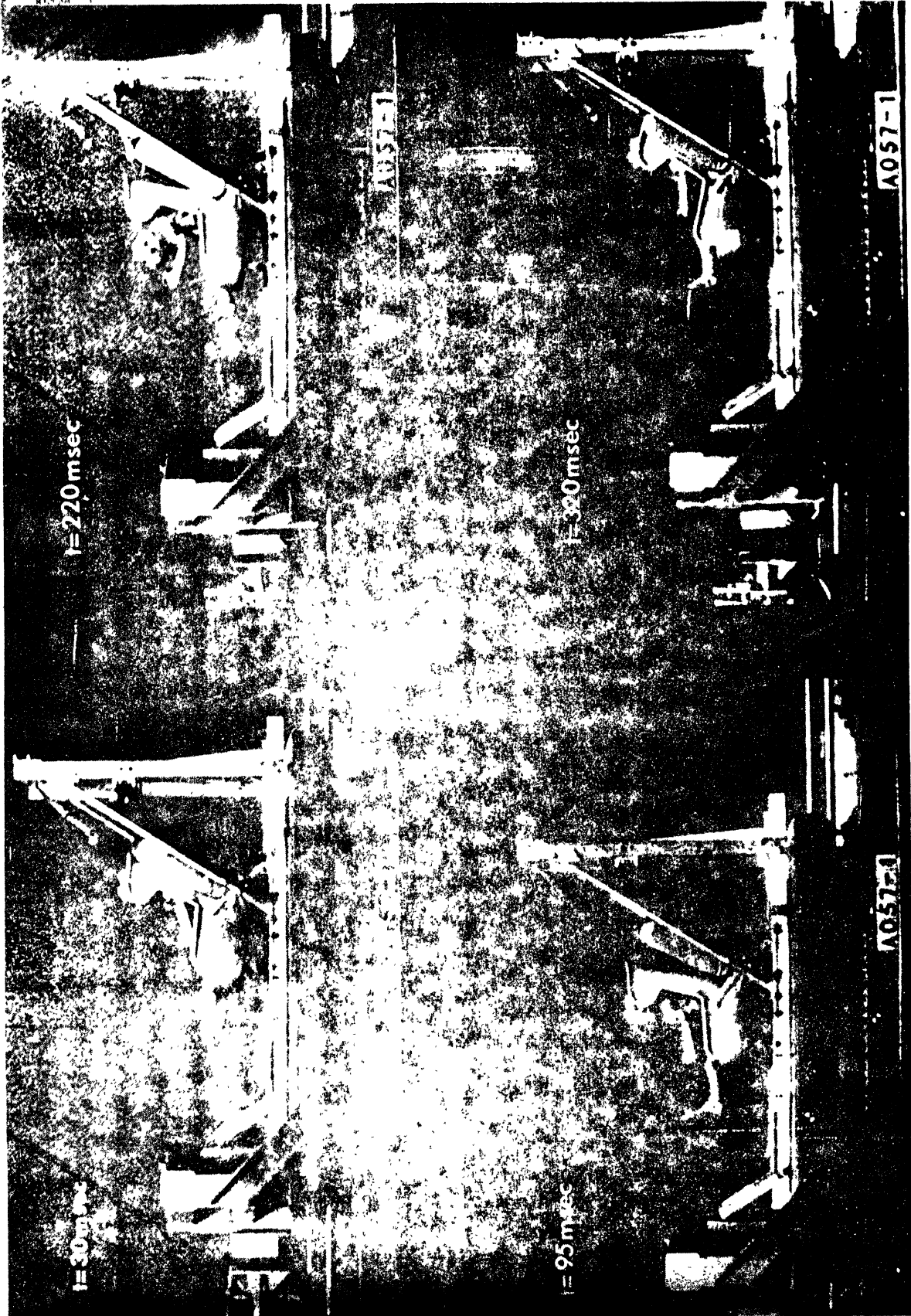
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-057  
Test Date: 23 April 1969  
Restraint Code No: C-16  
Restraint Description: Klippan Child Seat

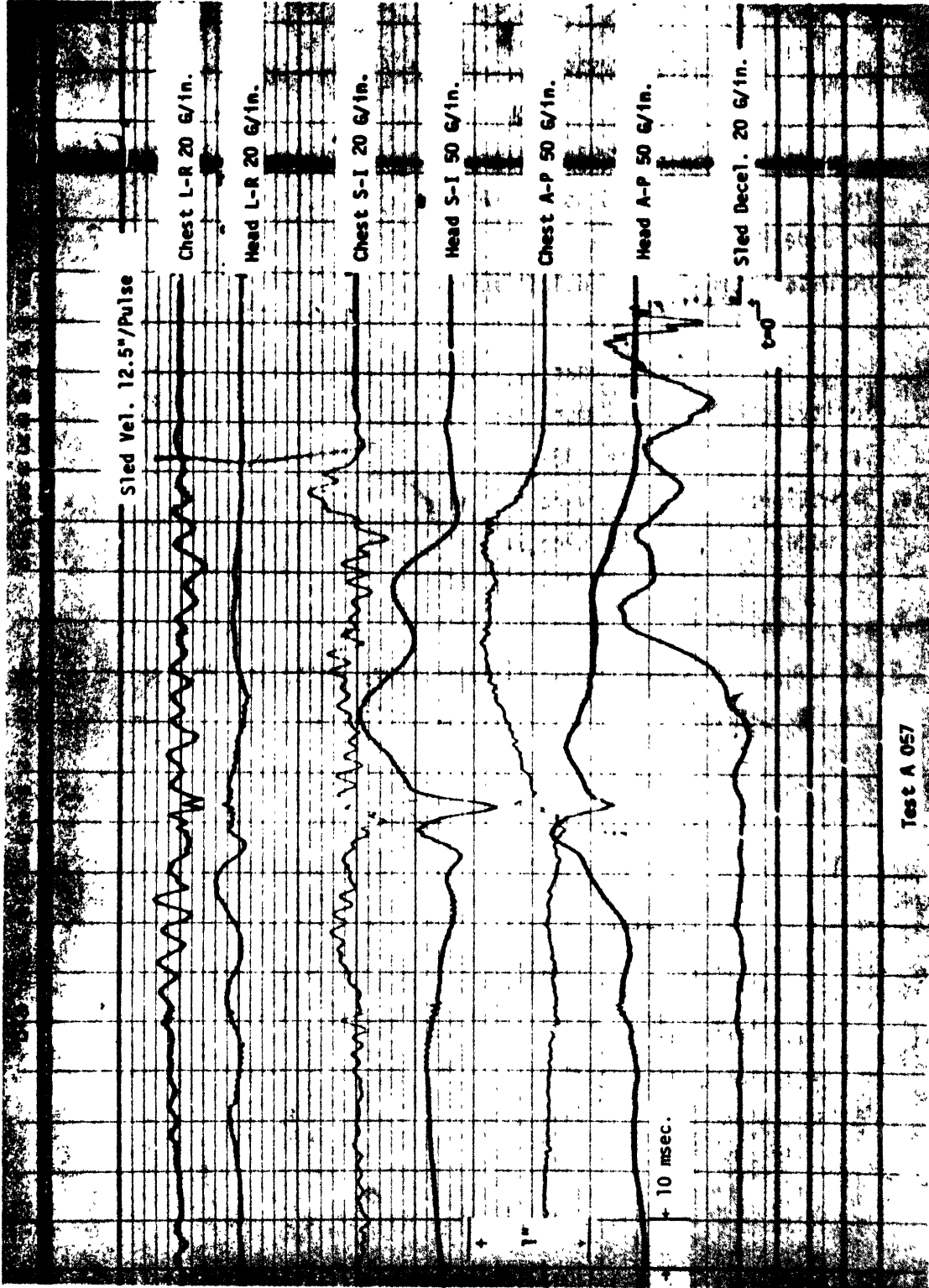
Dummy: 3 year  
Sled Velocity: 21 mph  
Sled G-level: 16  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

Dummy motion was minimal and no damage was observed. The spring shock absorber was badly deformed indicating that considerable energy was absorbed. The fiberglass shell of the seat was fractured at two points where the belts were attached. It was deformed at the rear upper seat restraining strap and also at the location of the right-hand lower restraining strap. The dummy was observed to rebound back into the child seat.







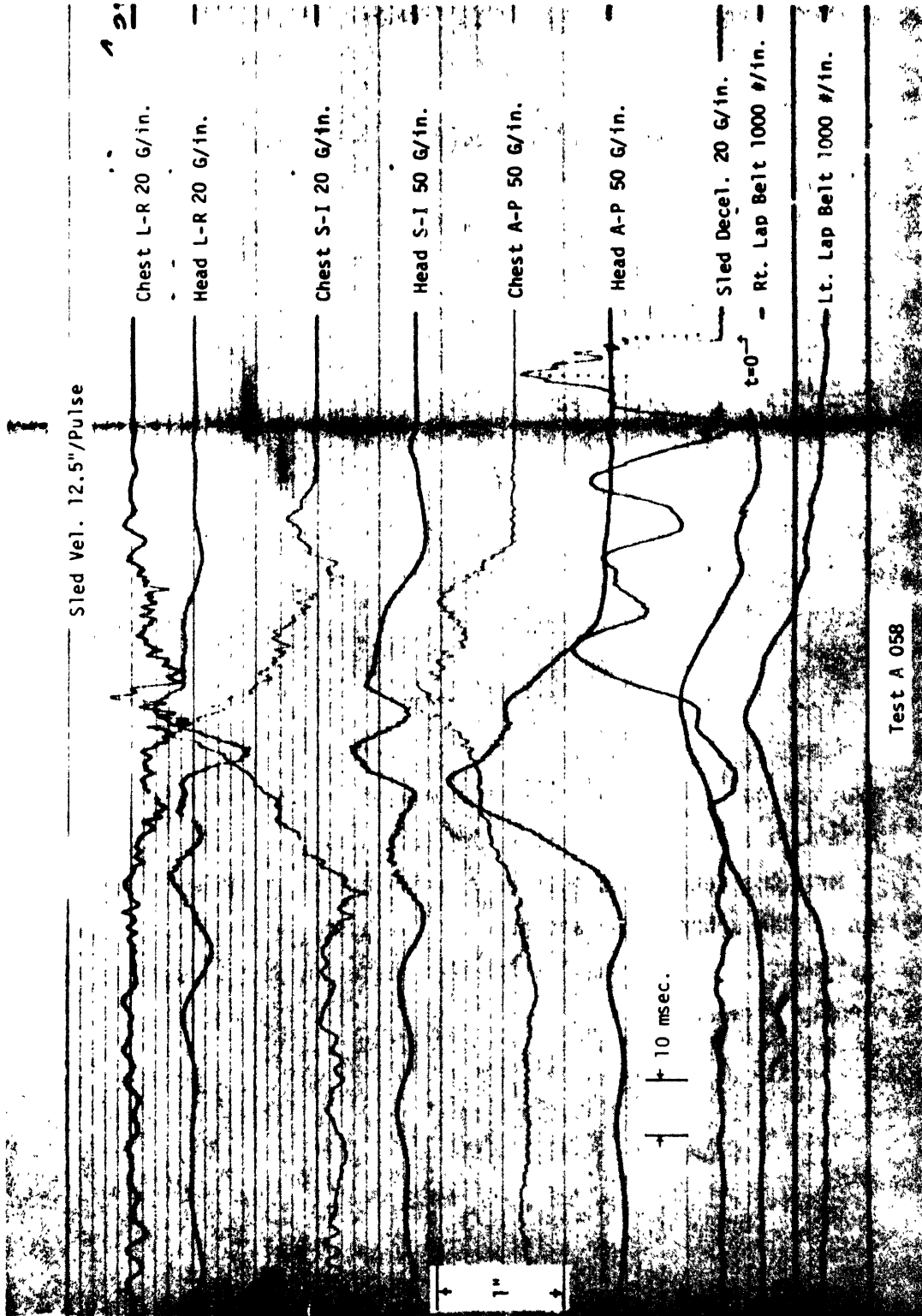
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-058  
Test Date: 28 April 1969  
Restraint Code No: C-1  
Restraint Description: Ford Tot-Guard

Dummy: 3 year  
Sled Velocity: 21 mph  
Sled G-level: 16 (33)  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed either to the dummy or to the restraint system and motion was minimal.



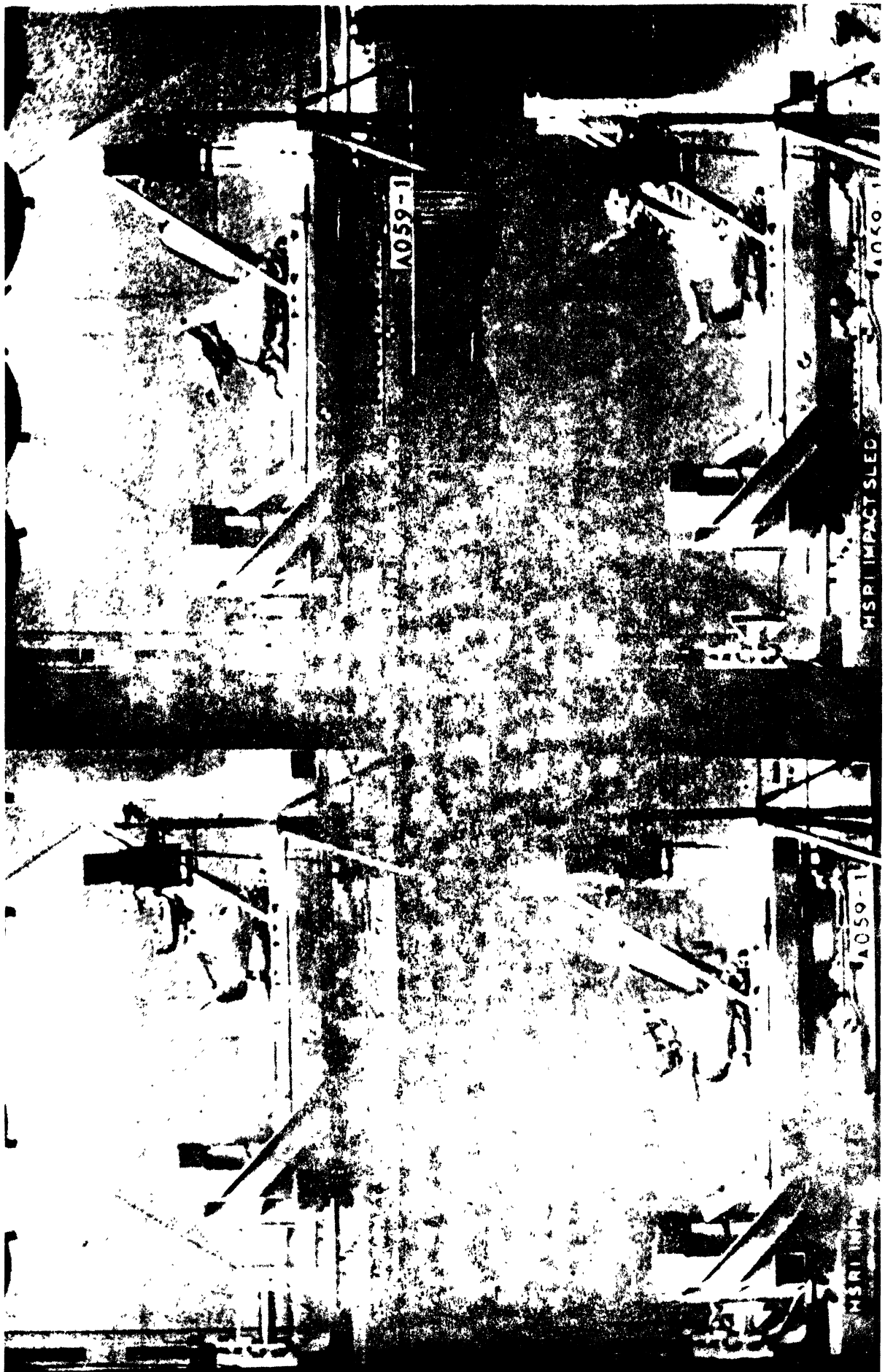
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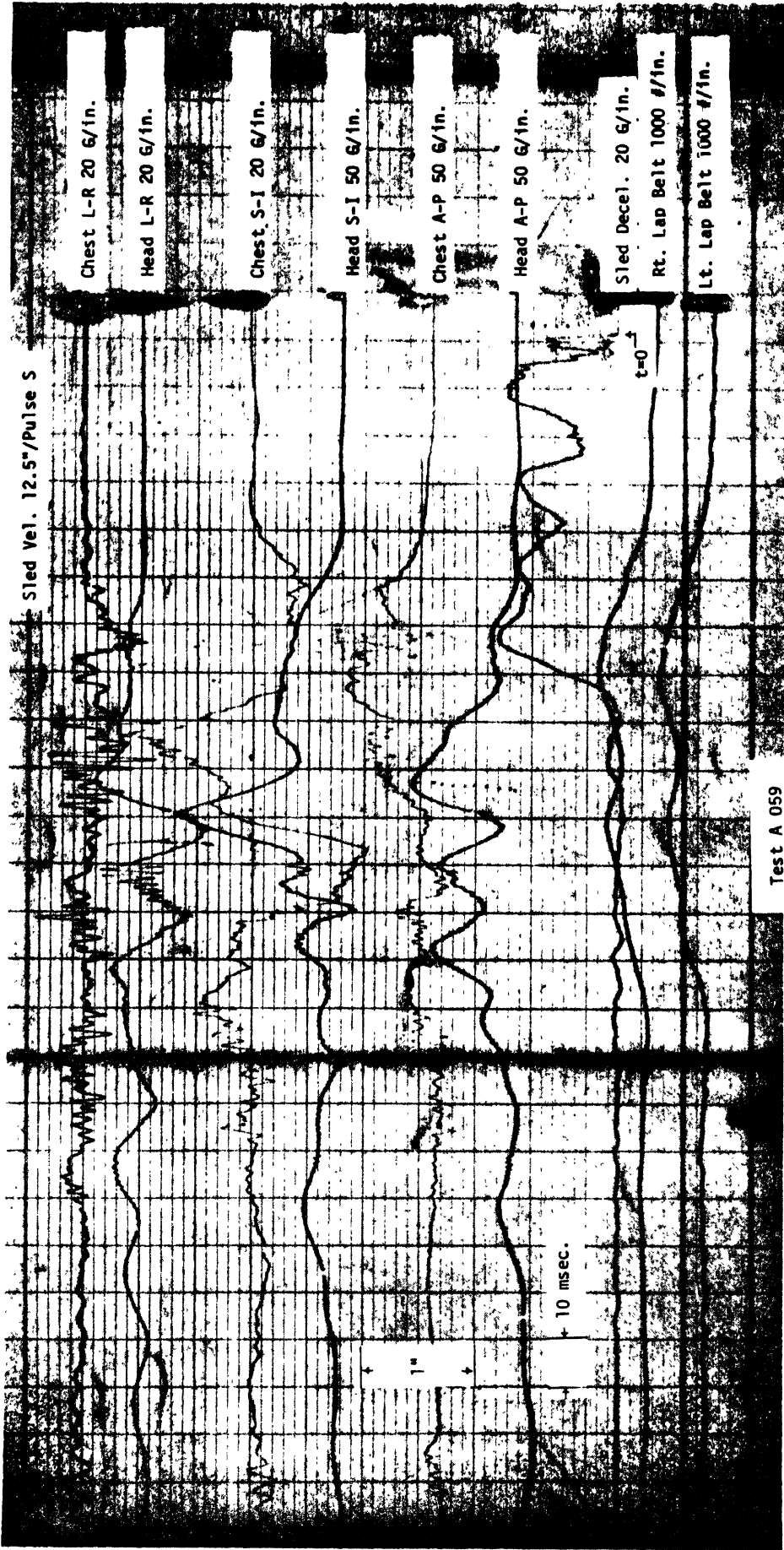
Test No: A-059  
Test Date: 30 April 1969  
Restraint Code No: C-4  
Restraint Description: Sears Seat No. 28A6400C

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 16  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed either to the dummy or to the restraint system. However, the head g loading was quite high. The bottom of this pedestal type seat dug far into the adult seat cushion causing a considerable motion amplification of the upper torso and head of the dummy. The head of the dummy and that portion of the chest which was above the chest restraint strap pitched violently forward.





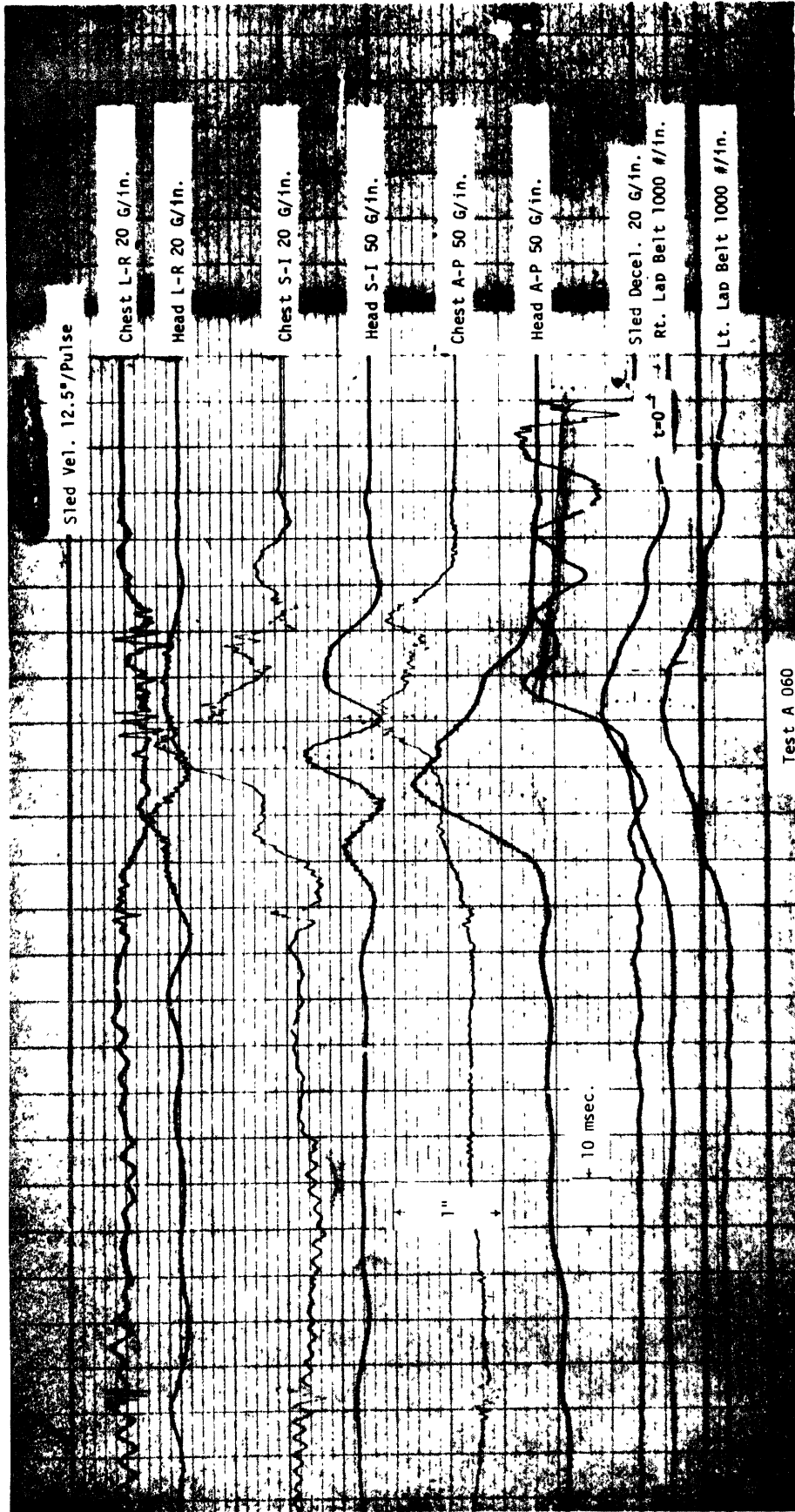
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-060  
Test Date: 1 May 1969  
Restraint Code No: C-1  
Restraint Description: Ford Tot-Guard

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 16  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

Seat belt loadings and accelometer readings for this test were comparable with other tests on this restraint system. No motion pictures were taken.





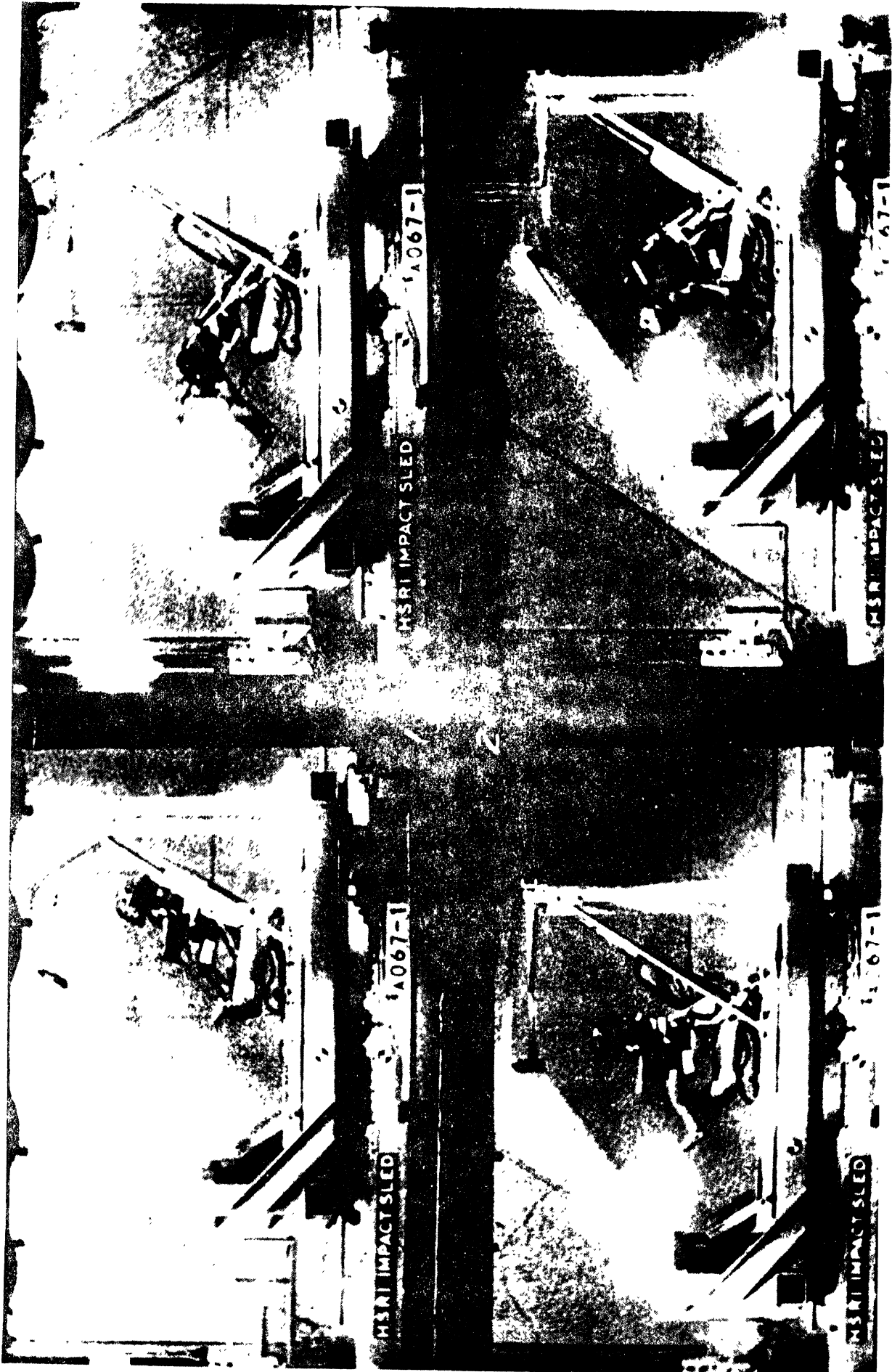
## HSRI SUMMARY DATA SHEET (FH-11-6962)

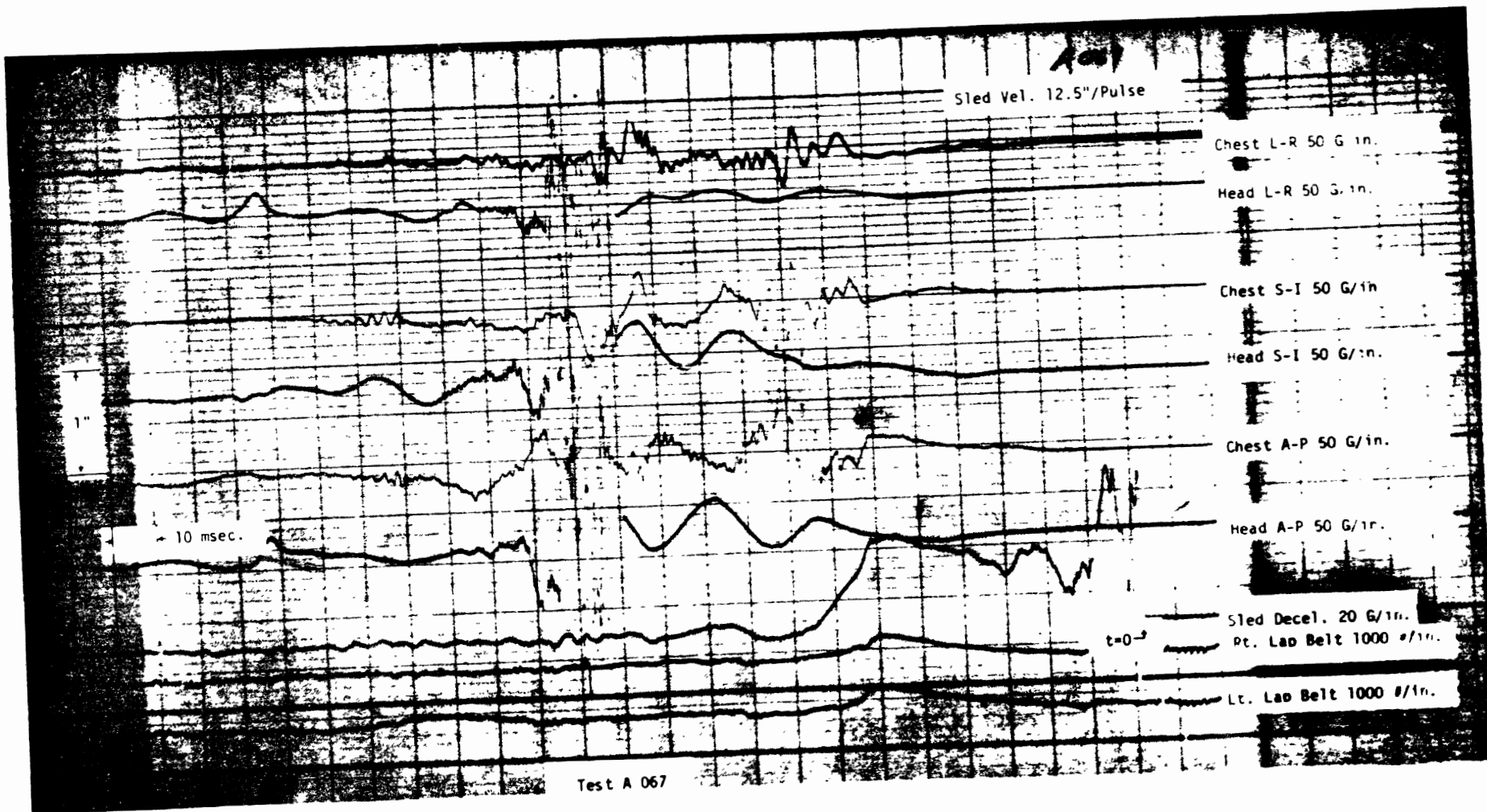
Test No: A-067  
Test Date: 8 May 1969  
Restraint Code No: C-18  
Restraint Description: Stroler Seat No. 587

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was observed to the dummy. However, due to the structural failure of the seat the dummy was ejected and violently contacted the interior of the body buck which was being used in this test. The under structure collapsed as the main tube on the right side of the seat broke at the rivet holes. The straps holding the child's seat to the adult seat held. The restraining strap hook on the child seat failed as the wire straighten and was lost. The handrail came loose.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

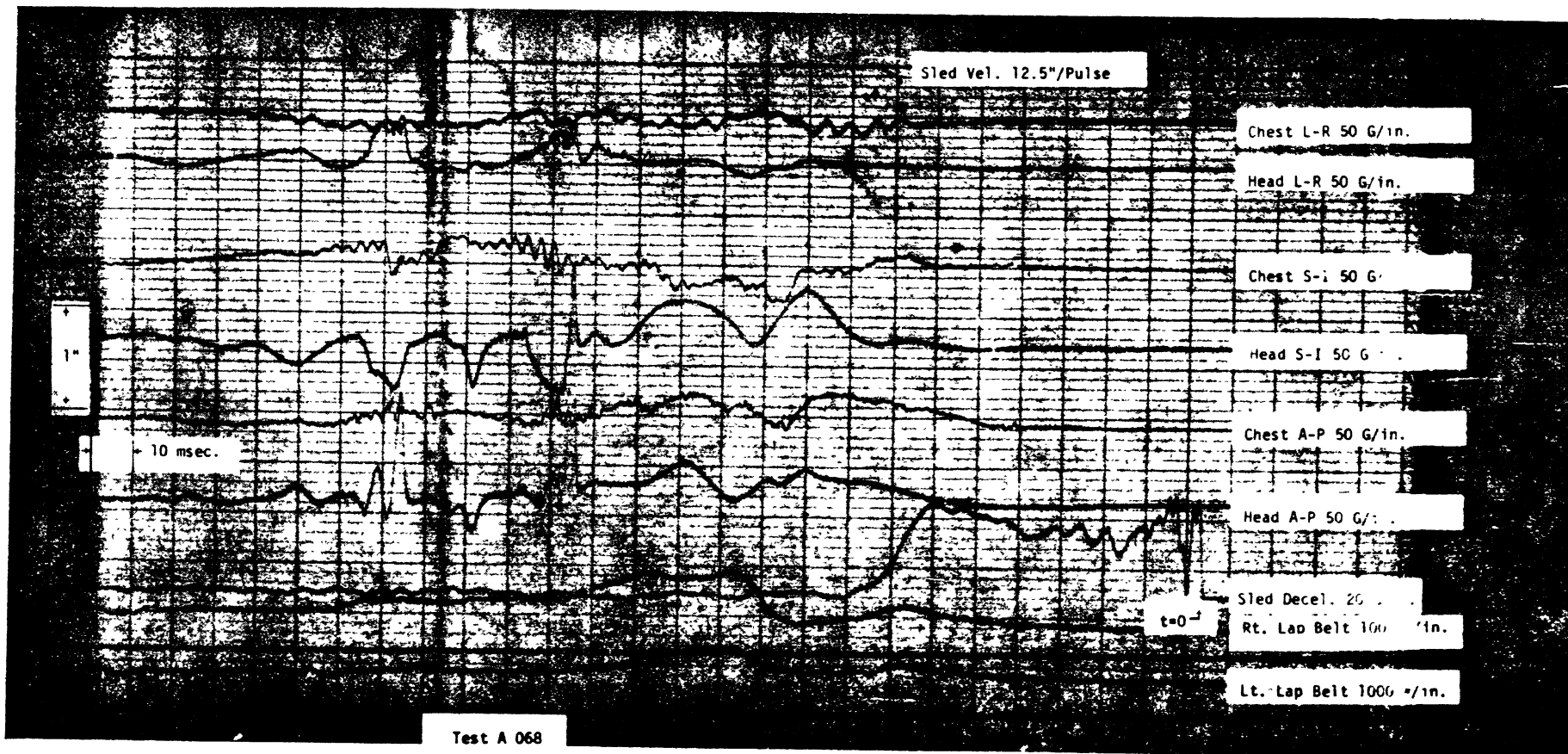
Test No: A-068  
Test Date: 8 May 1969  
Restraint Code No: C-19  
Restraint Description: Strolee Seat No. 589

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The seat structure collapsed allowing the dummy to move forward and contact the body buck. The tubular structures supporting the seat cushion were completely buckled. The chest harness was torn at the lower right attachment point. The right-hand retaining strap of the child's seat was torn by the teeth of the buckle.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-071  
Test Date: 16 May 1969  
Restraint Code No.: C-20  
Restraint Description: Bunny-Bear Seat T8905H

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The loadings experienced by the dummy were quite low. However, the seat structure failed leading to very large dummy excursions. The restraint harness failed so that the dummy's energy was absorbed by the handrail which contacted the dummy's abdomen and the upper torso and legs flexed around the handrail. The right-hand bail hook disengaged from the seat back and the under structure support brace on the right-hand side of the seat collapsed.



Test A 071



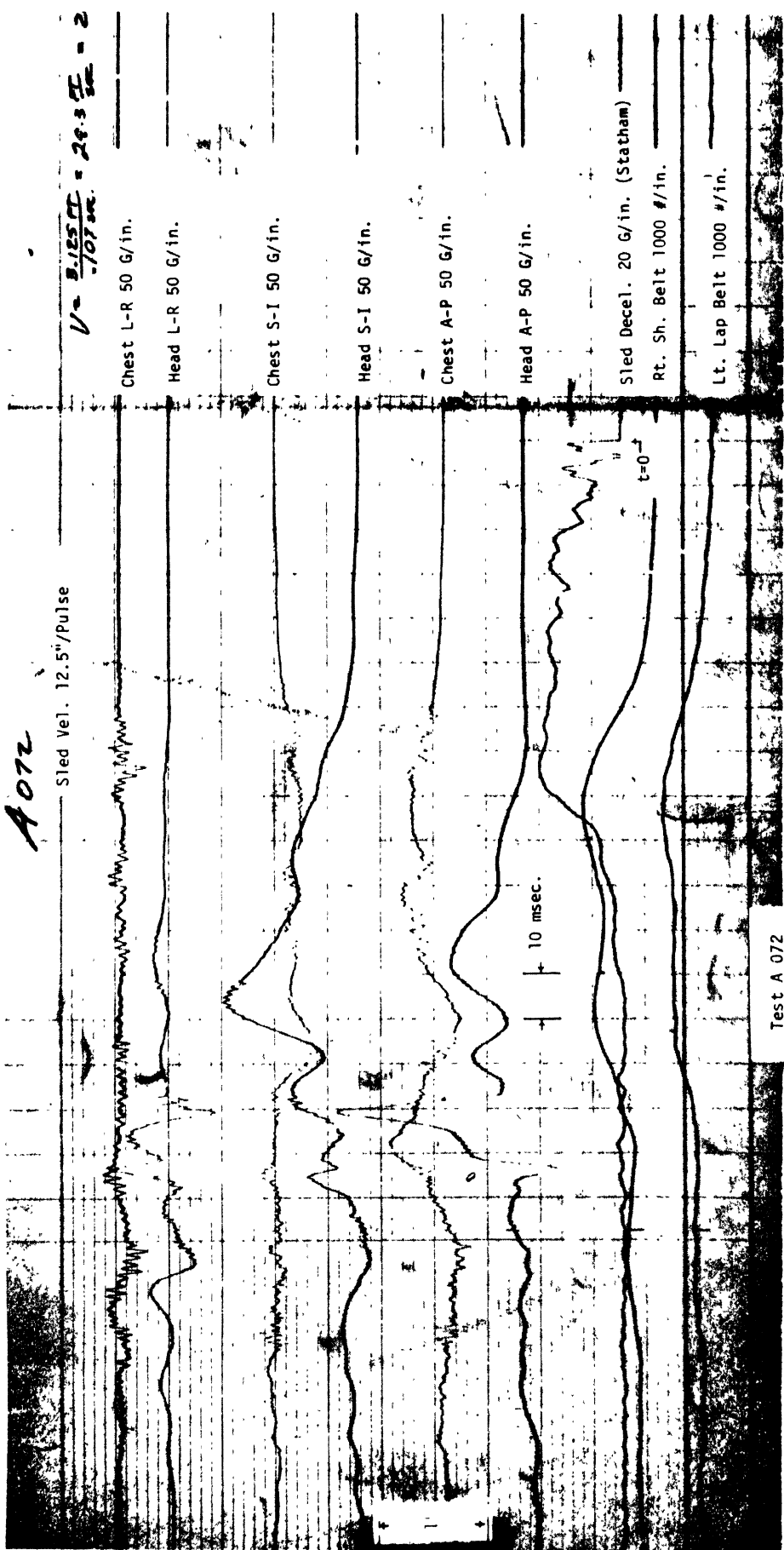
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-072  
Test Date: 19 May 1969  
Restraint Code No.: C-5  
Restraint Description: Sears Seat No. 5516

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage to either the dummy or to the restraint system was observed.  
The dummy experienced a high g loading on the head.



Test A 072

## HSRI SUMMARY DATA SHEET (FH-11-6962)

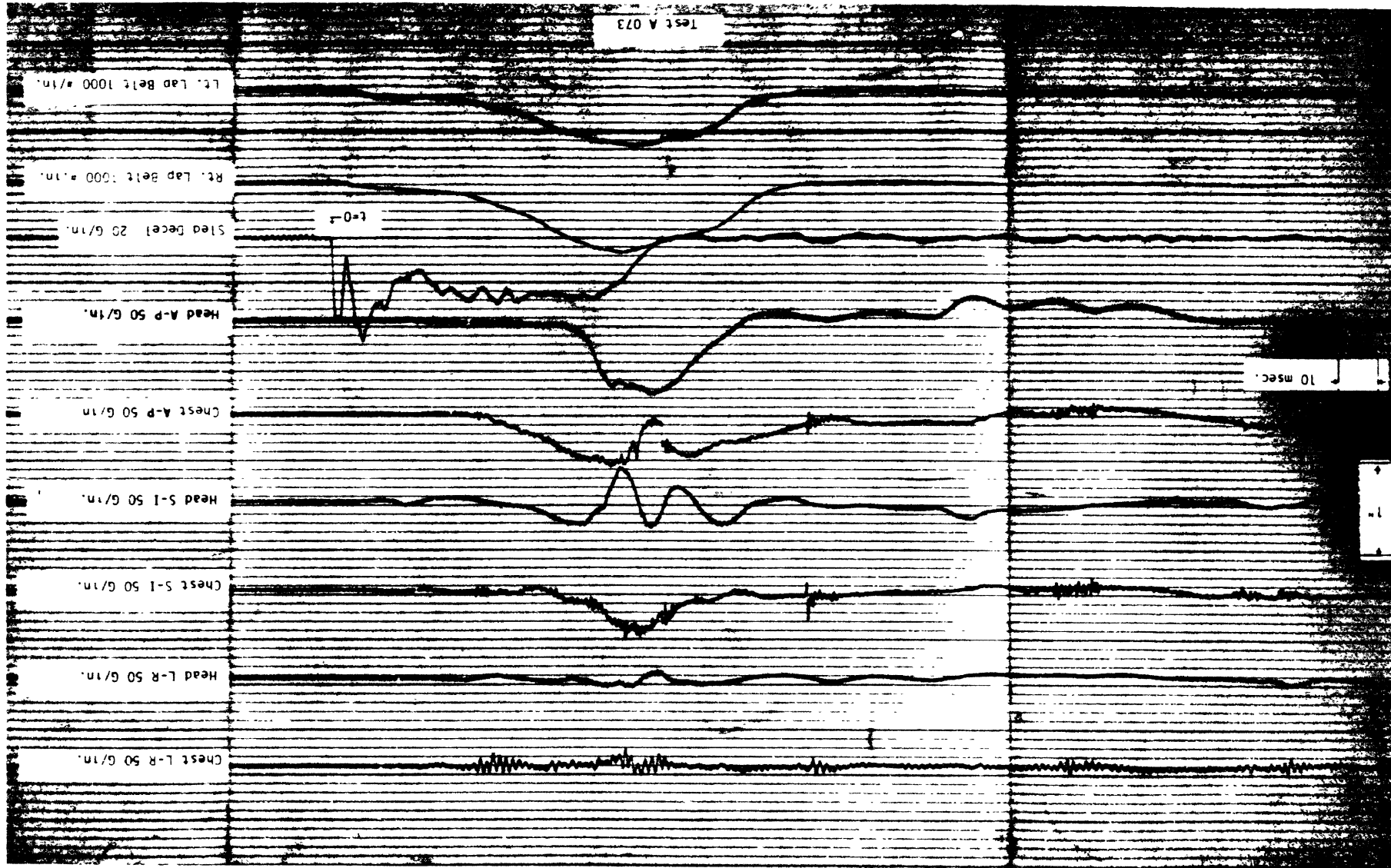
Test No: A-073  
Test Date: 5 June 1969  
Restraint Code No.: C-1  
Restraint Description: Ford Tot-Guard

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation: -

No damage was experienced by either the dummy or the restraint system.  
Seat belt and accelometer readings were quite low.

Test A 073



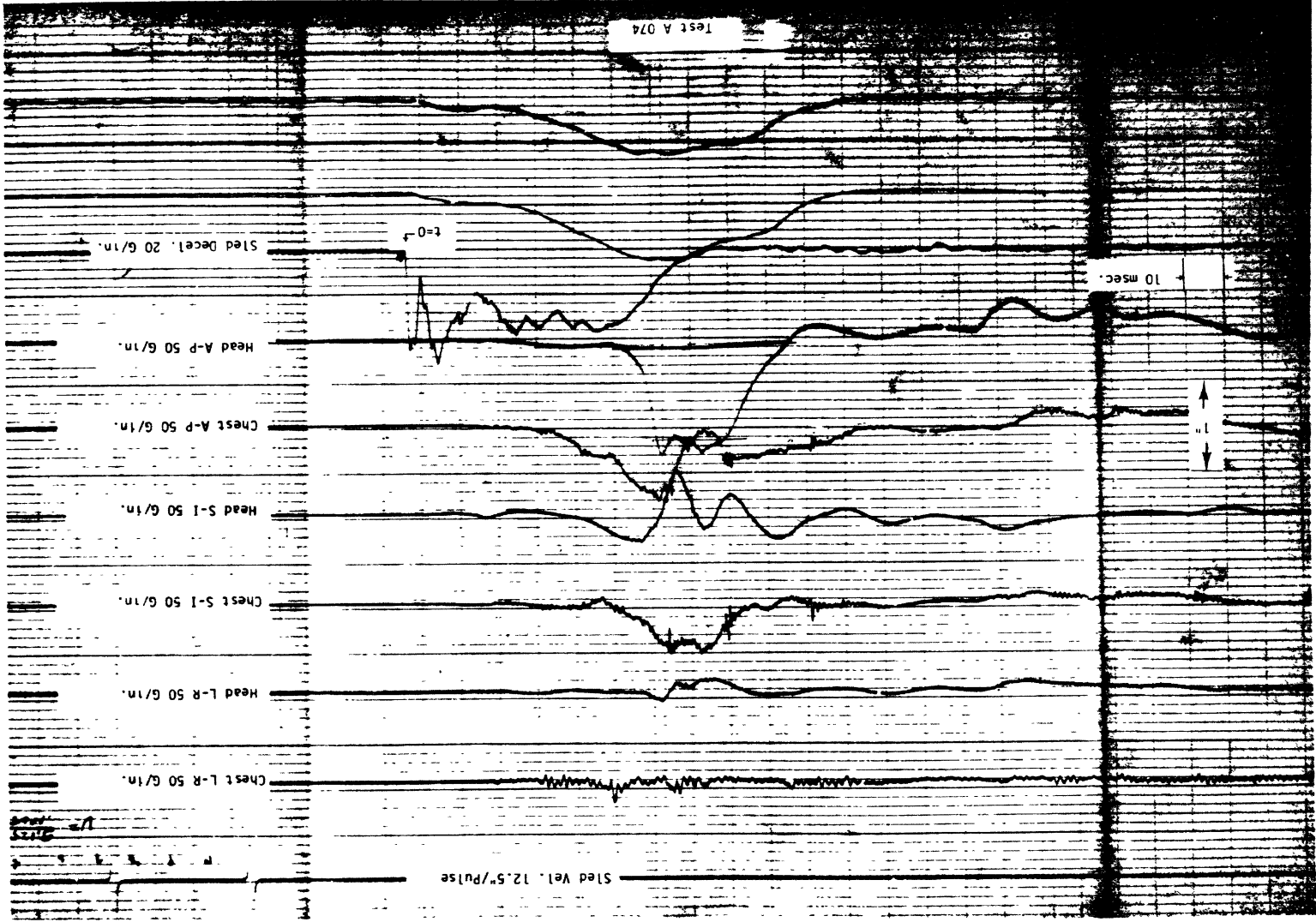
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-074  
Test Date: 6 June 1969  
Restraint Code No.: C-1  
Restraint Description: Ford Tot-Guard

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There was no damage experienced by either the dummy or the restraint system. The seat belt loads were similar in this test to previous tests on this restraint system. However, the accelometer readings experienced by the dummy were somewhat higher than previous tests.



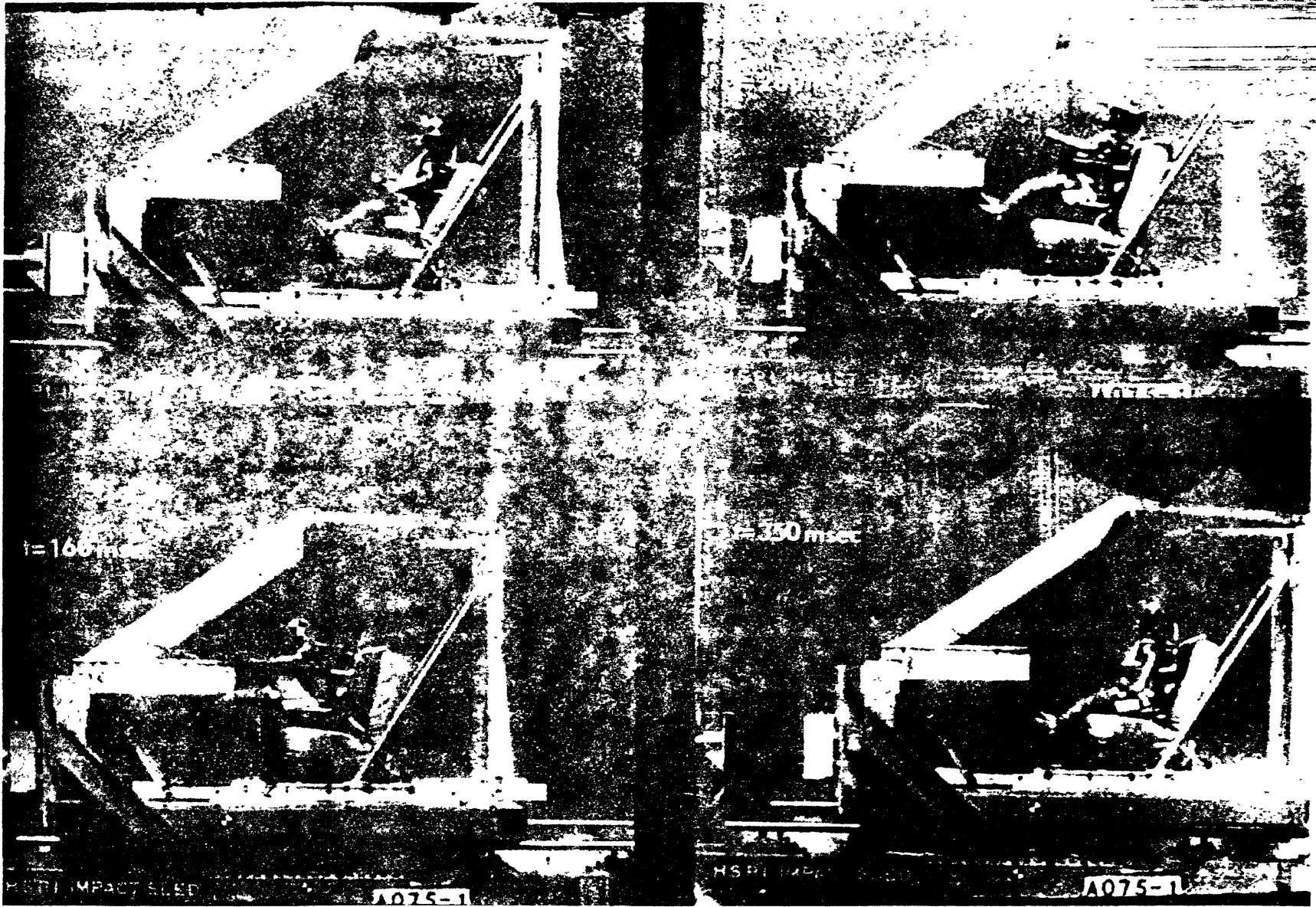
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-075  
Test Date: 6 June 1969  
Restraint Code No.: C-17  
Restraint Description: Strollee Seat No. 509

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The headrest would not stay up behind the dummy's head in the initial test setup due to the lack of support structure. The hooks on the child seat vest-restraint pass over the shoulder and are directed downward to an attachment point on the seat back. It is possible that this could lead to compression of the back of the dummy. This seat, however, is on the small side for a 3-year dummy. There was no damage to the dummy in the test, but the excursion experienced was quite high. The buckle over the right shoulder attaching the vest to the dummy failed. Also the bail hooks on the child's seat were bent during the test.



v=160 m/sec

v=350 m/sec

v=500 m/sec

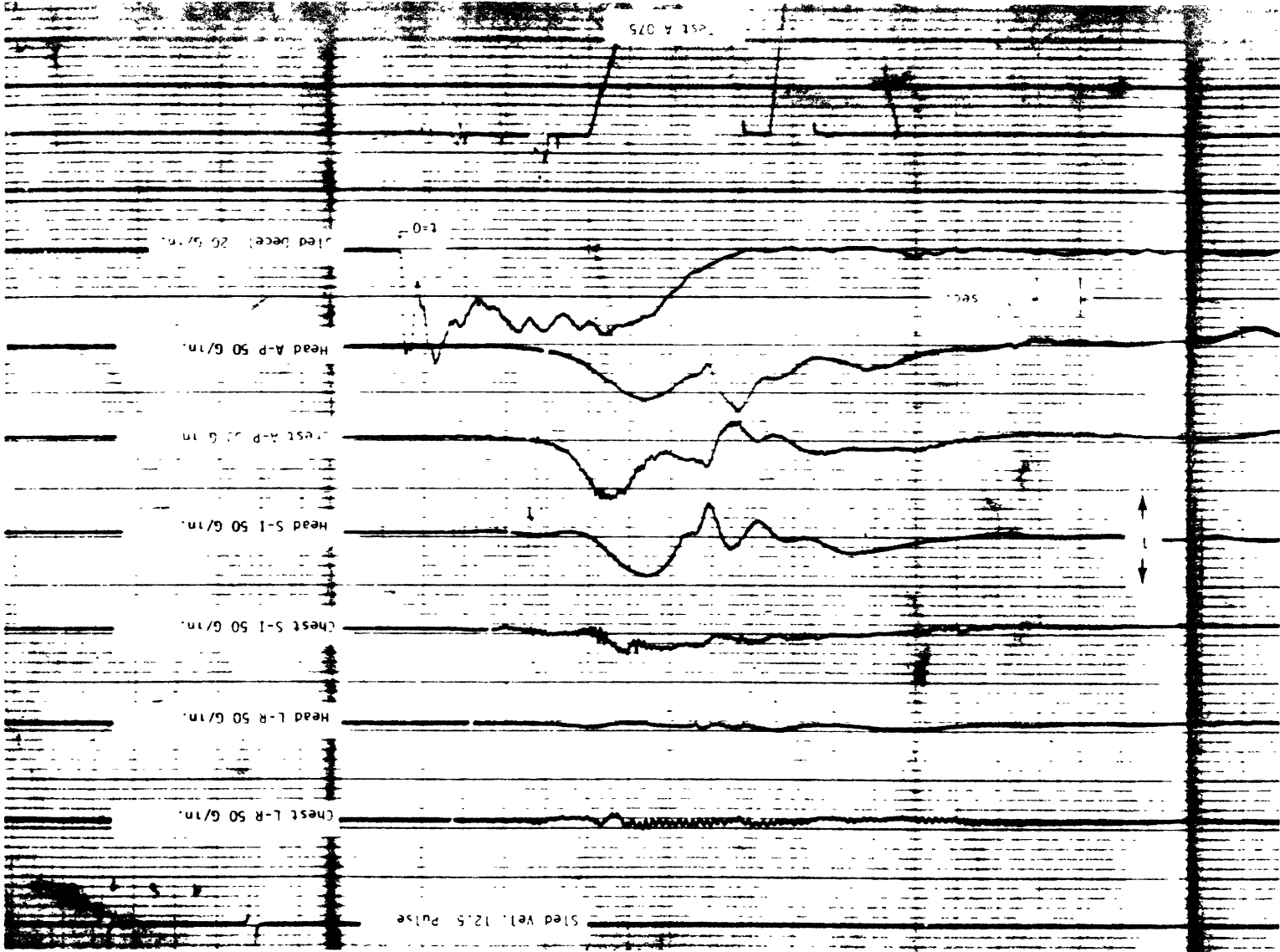
HSPI IMPACT SLED

A075-1

HSPI IMPACT SLED

A075-1





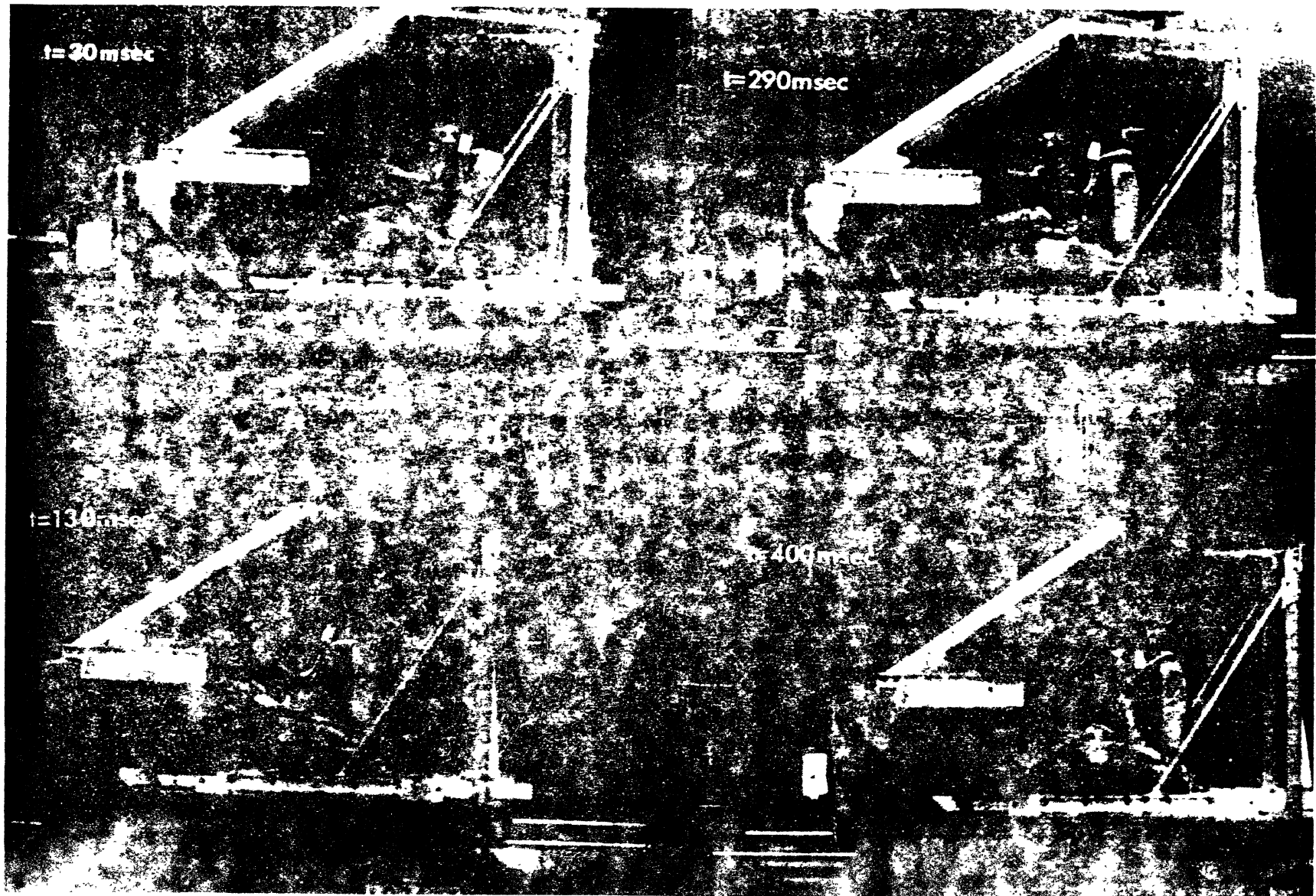
## HSRI SUMMARY DATA SHEET (FH-11-6962)

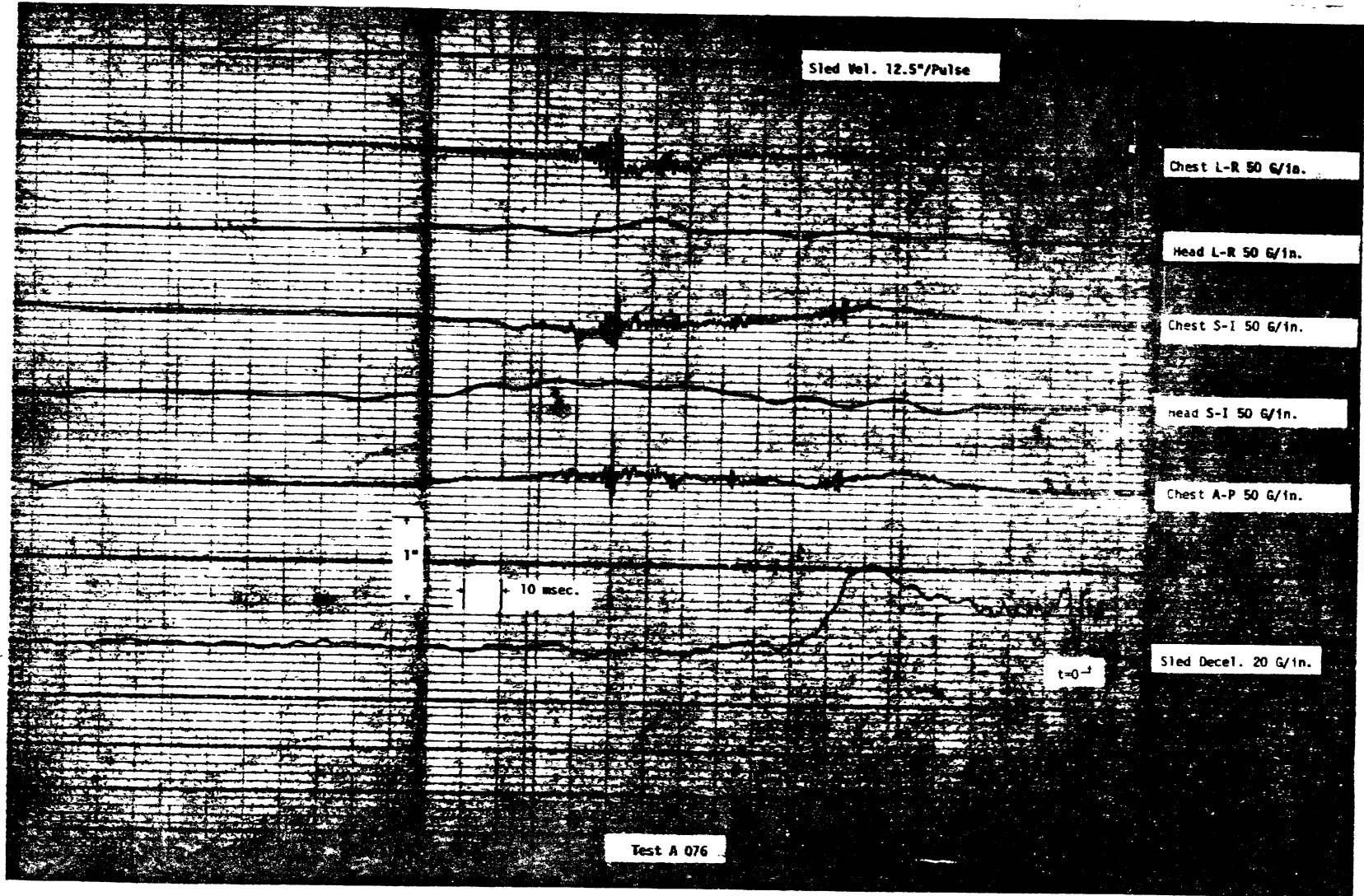
Test No: A-076  
Test Date: 16 June 1969  
Restraint Code No.: C-13  
Restraint Description: Peterson's Swinger Seat Model No. 60EC.

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There was no damage observed to the dummy. The accelerometer readings for the head and chest revealed very low loadings. However, the excursion experienced by the dummy, because the adult seat back was badly deformed during the test due to the force supplied by the bail structures, was quite large even though the dummy did not contact the body buck on which the seat was mounted. The child's seat bails were bent badly. Also the child seat belt slipped in the adjustment buckle.





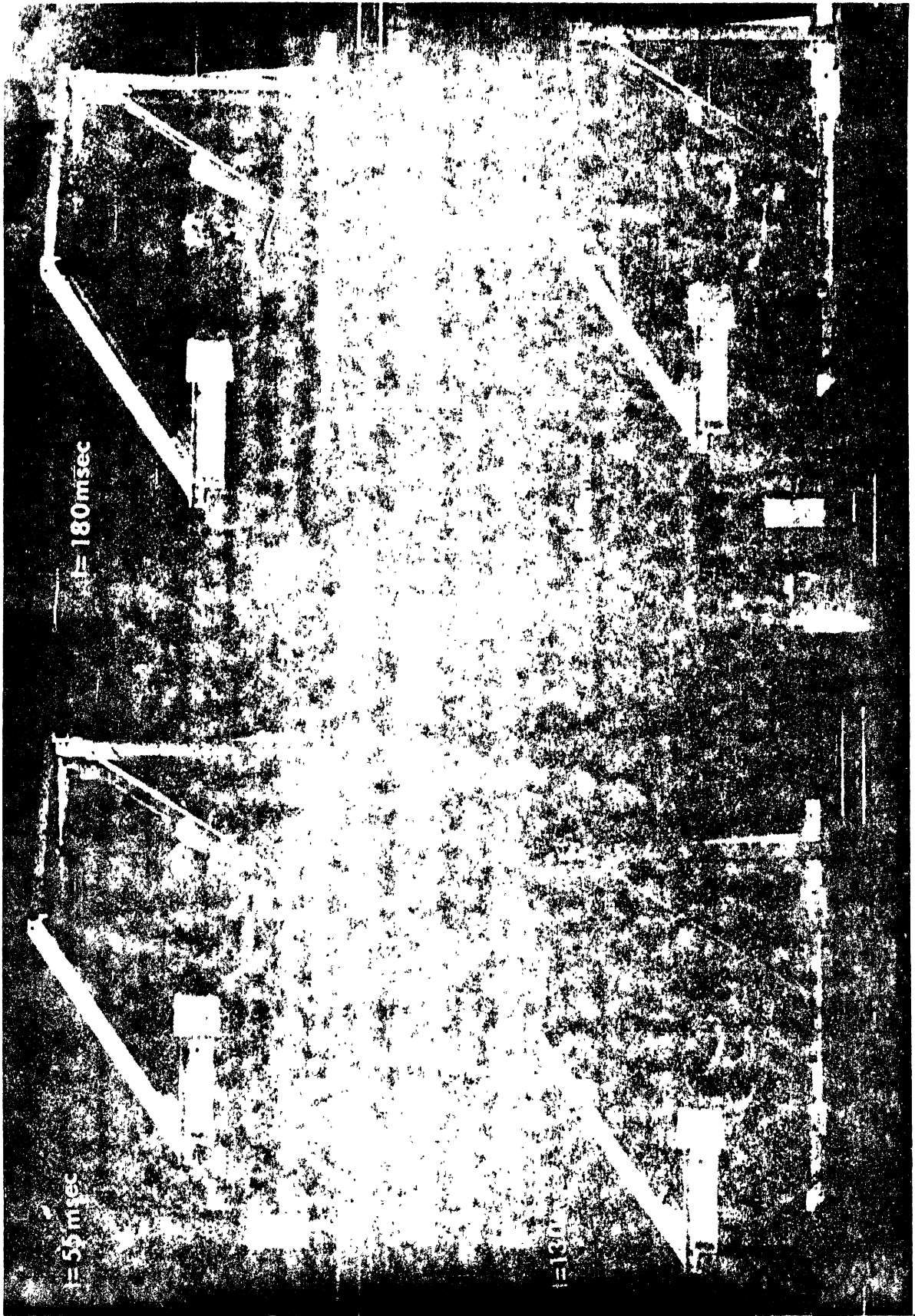
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-078  
Test Date: 23 June 1969  
Restraint Code No.: C-33  
Restraint Description: Voplex Harness C-2000

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

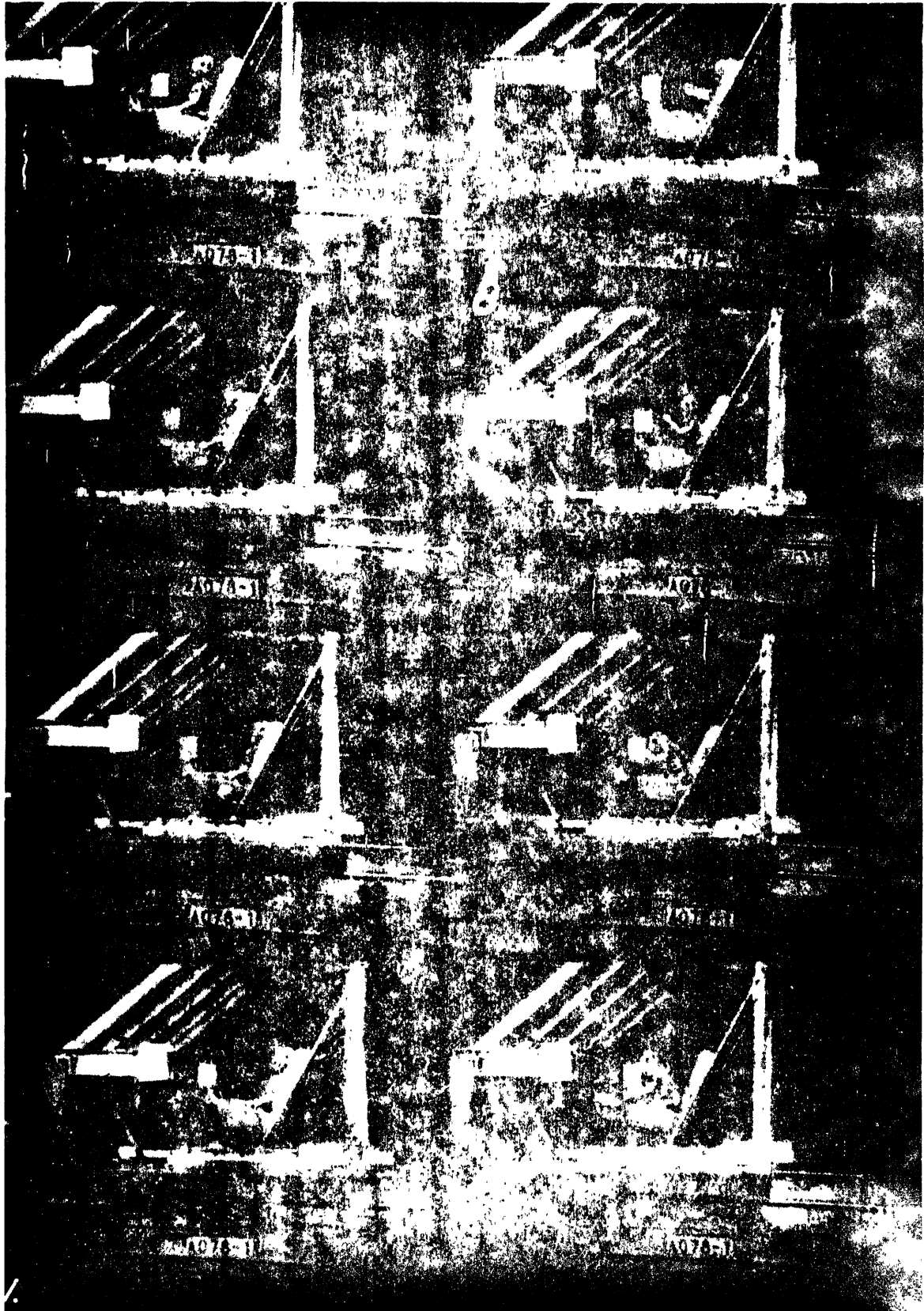
There was no damage apparent to either the dummy or to the restraint system. The excursion experienced to the dummy was minimal. Belt and accelometer readings were low.

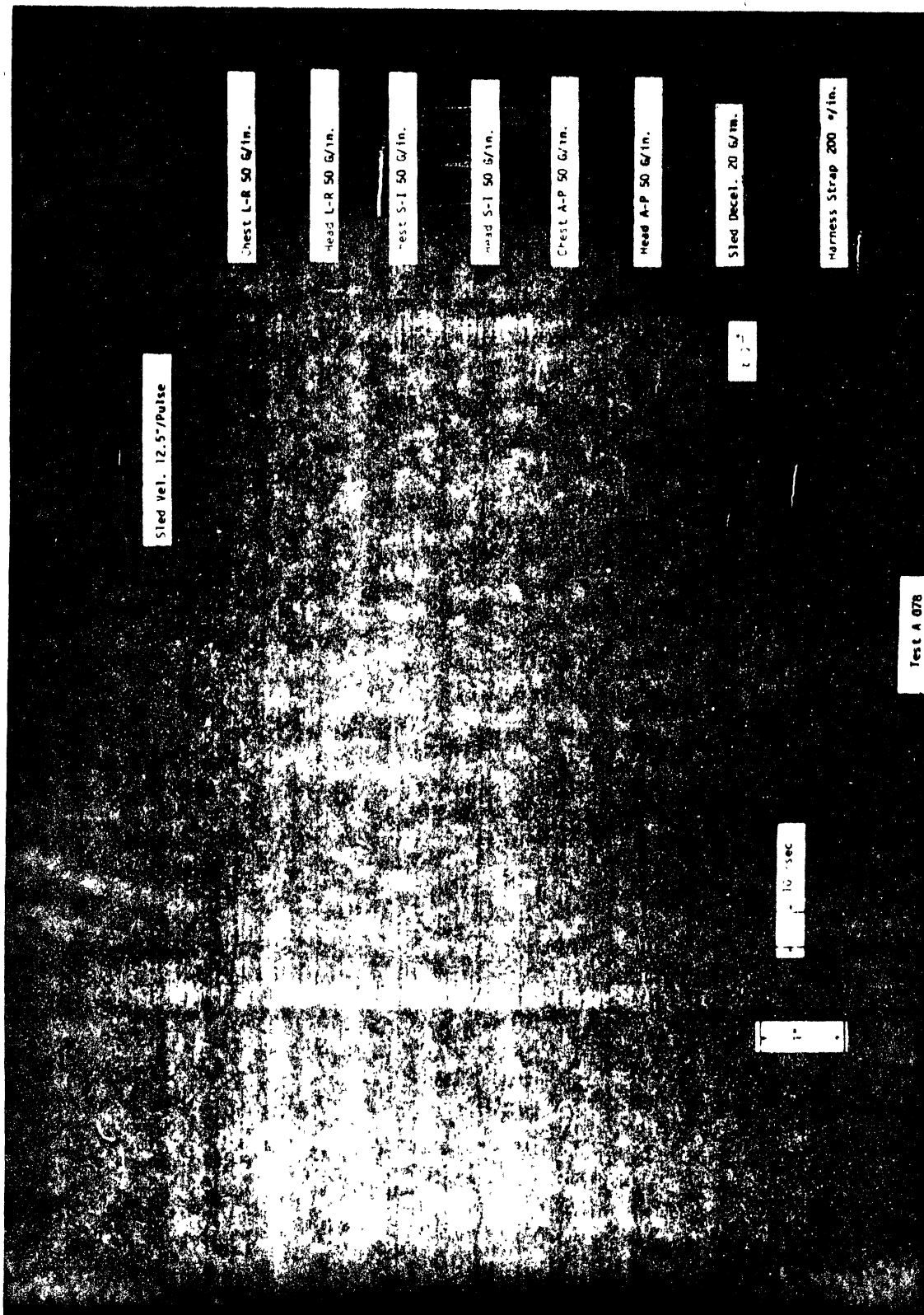


t= 55 msec

t= 180 msec

t= 130 msec





Sled Vel. 12.57/Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Sled Decel. 20 G/in.

Harness Strap 200 g/in.

1.0

10 sec

1"

Test A 078



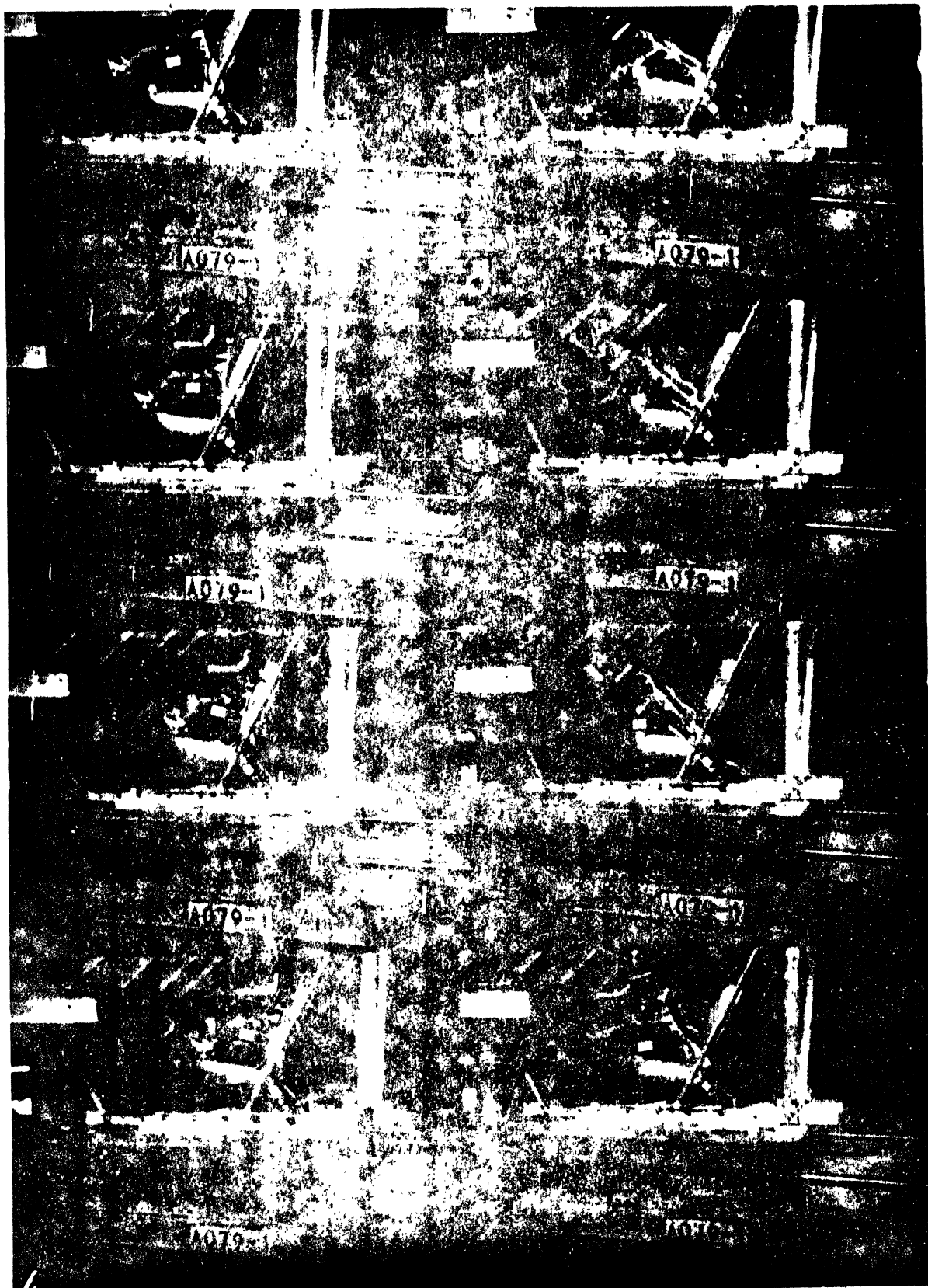
## HSRI SUMMARY DATA SHEET (FH-11-6962)

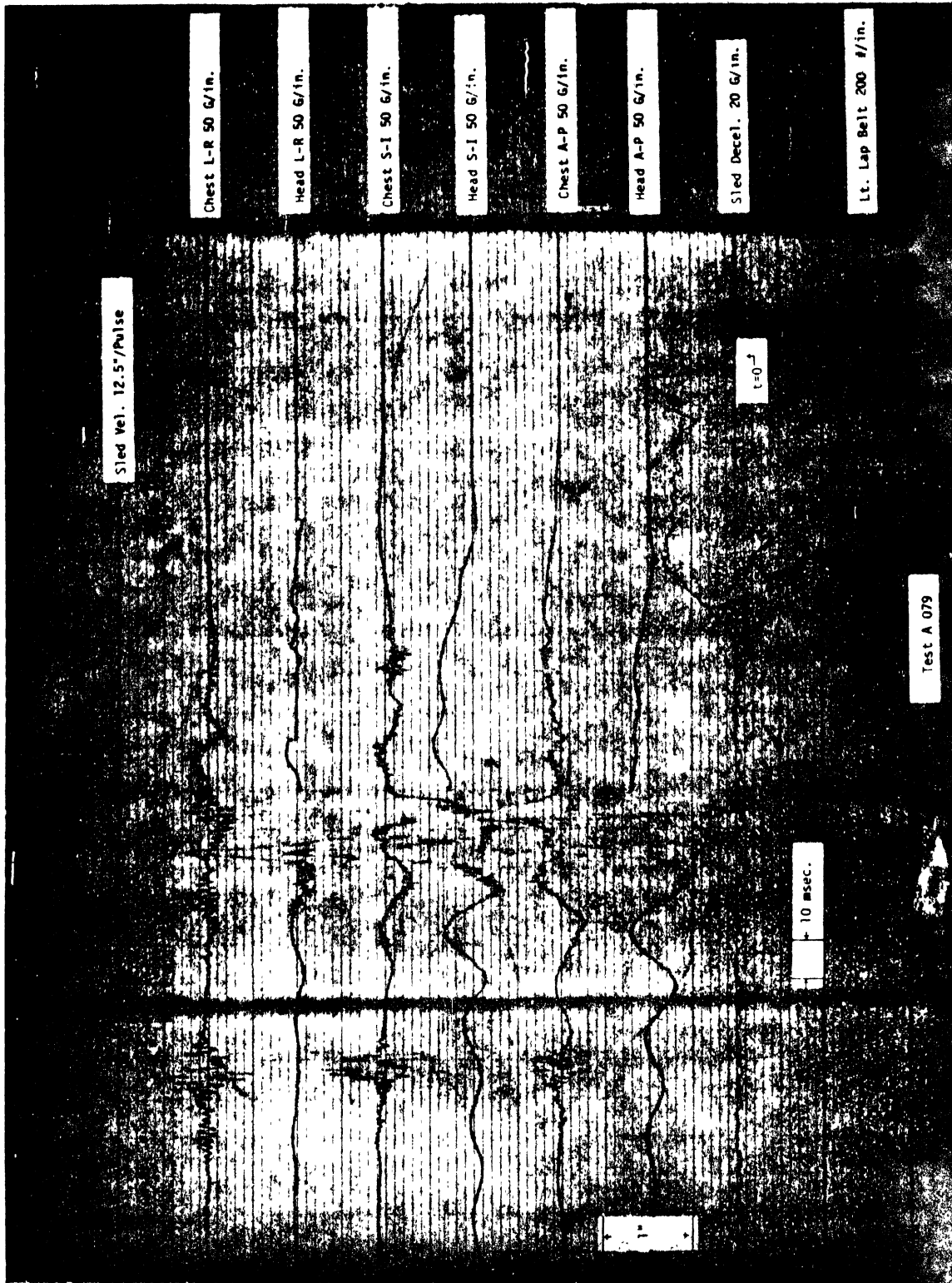
Test No: A-079  
Test Date: 24 June 1969  
Restraint Code No.: C-18  
Restraint Description: Strollee Seat No. 587

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

The under structure of the child's seat collapsed during this test. The one-eighth by five-eighth inch steel braces bent and the rivets broke where they were attached to the tubular feet. The wire restraint belt Y hook came out of the belt. The head of the dummy hit the dashboard on the body buck leading to extremely high g loadings.





Sled Vel. 12.57/Pulse

Chest L-R 50 G/in.

Head L-R 50 G/in.

Chest S-I 50 G/in.

Head S-I 50 G/in.

Chest A-P 50 G/in.

Head A-P 50 G/in.

Sled Decel. 20 G/in.

Lt. Lap Belt 200 #/in.

t=0

10 msec.

Test A 079

1

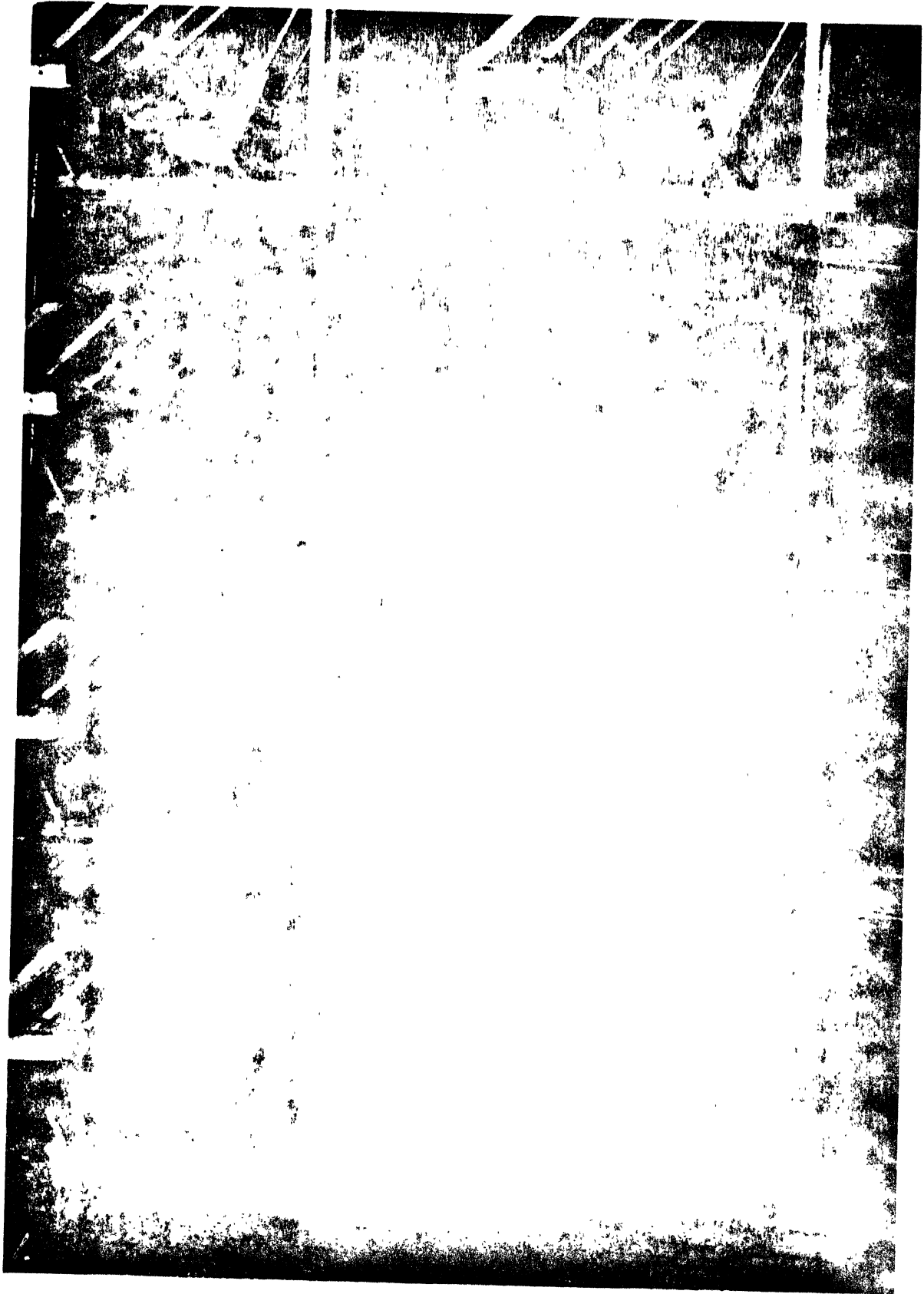
## HSRI SUMMARY DATA SHEET (FH-11-6962)

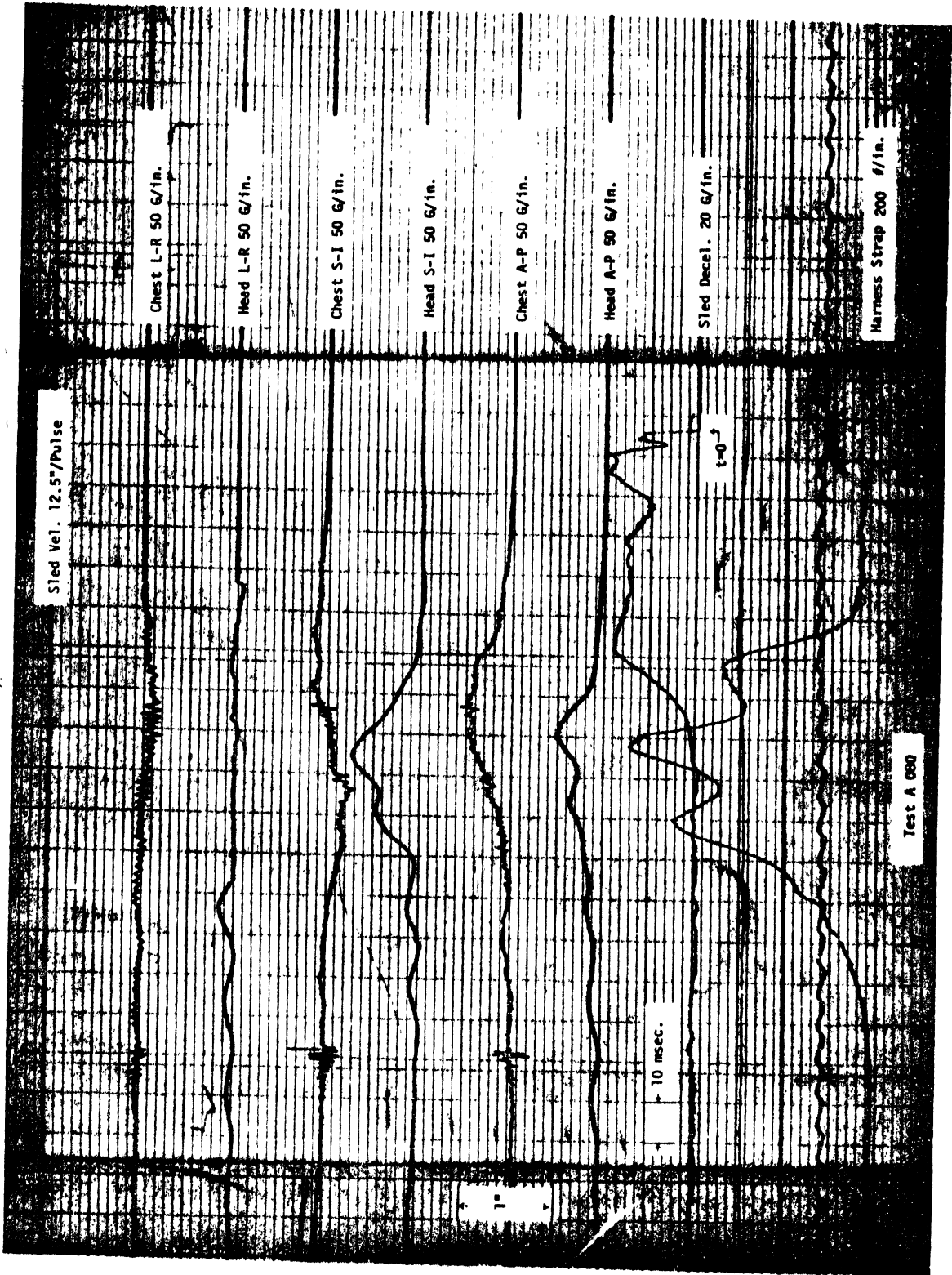
Test No.: A-080  
Test Date: 24 June 1969  
Restraint Code No.: C-30  
Restraint Description: Mark IV Monitor Harness No. 61B12890

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

No damage was experienced either by the dummy or by the restraint system. The loads experienced by the dummy were minimal and its excursion was quite low although the harness did appear to slip down into the abdominal area.





## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-081  
Test Date: 25 June 1969  
Restraint Code No.: C-35  
Restraint Description: American Safety Harness No. CV250

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

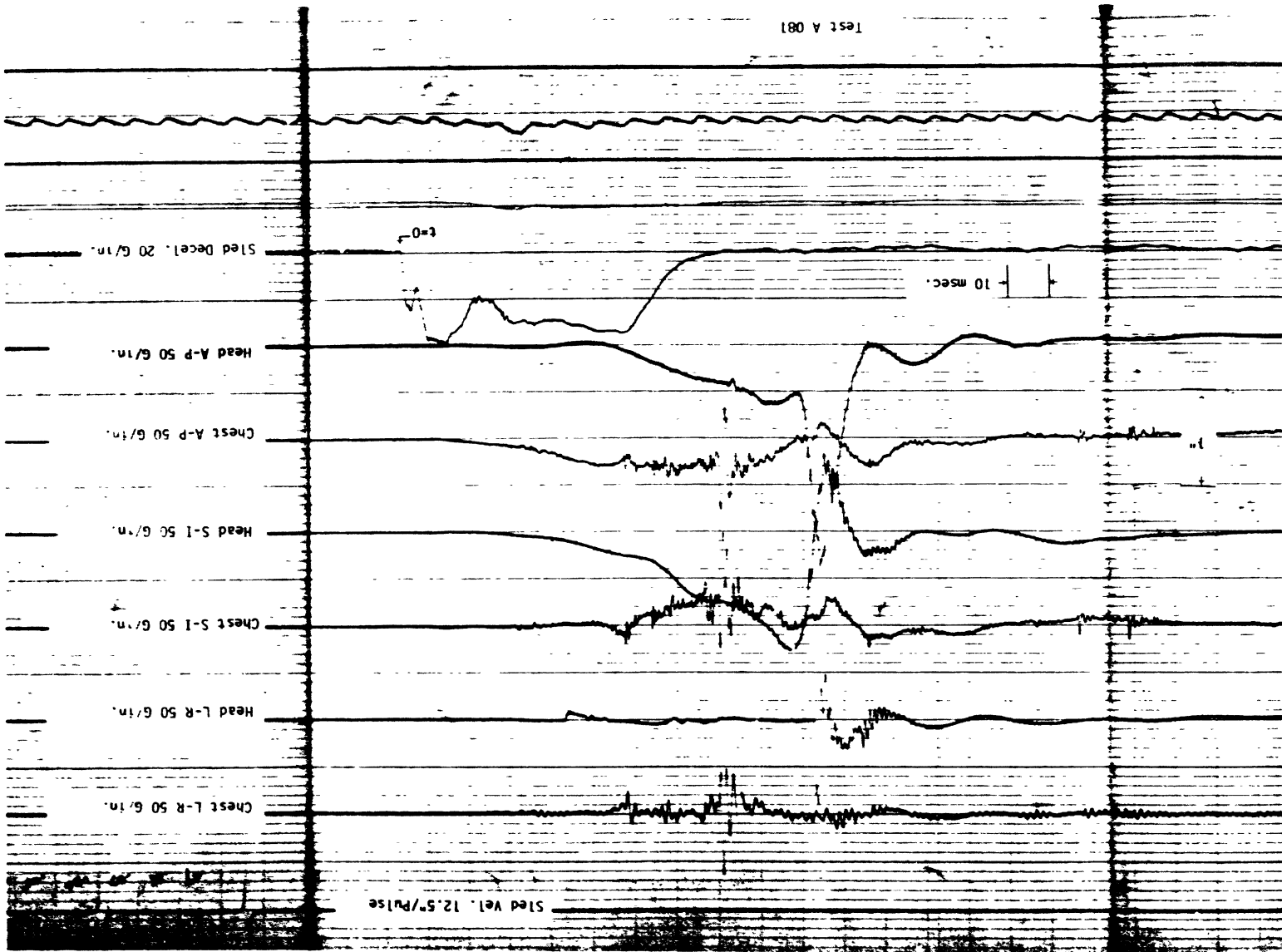
## Test Observation:

No damage was experienced either by the dummy or by the restraint system. The accelerometer readings for the head were quite high. The upper torso and the head of the dummy were observed to pitch forward and jackknife over the restraint system to the extent that the dummy's head touched the adult seat cushion.





Test A 081



Sled Vel. 12.5"/Pulse

## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-082  
Test Date: 25 June 1969  
Restraint Code No.: C-35  
Restraint Description: American Safety Harness No. CV250

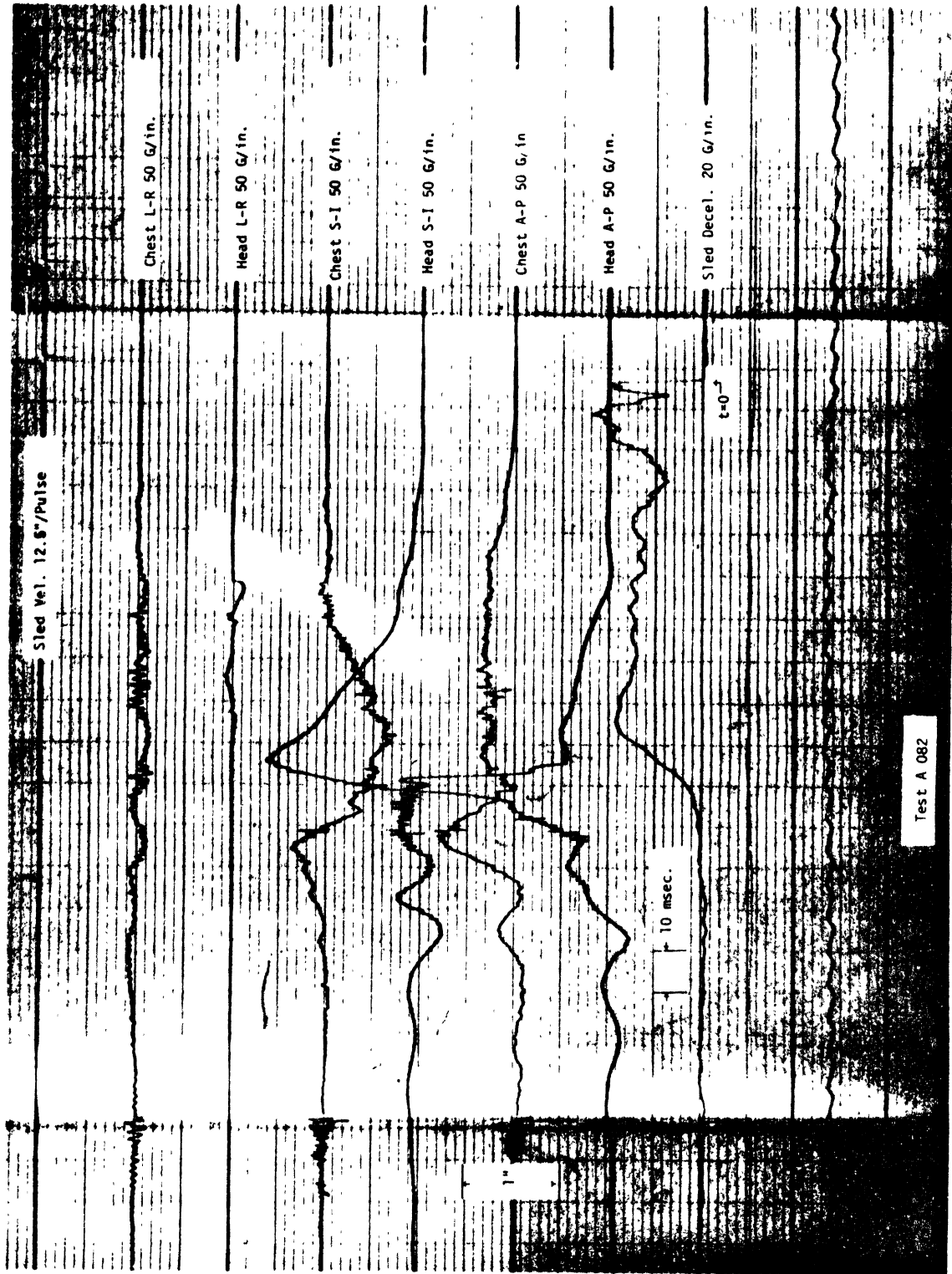
Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 18  
Impact Direction: Forward facing  
Dummy Attitude: Sitting

## Test Observation:

There appeared to be no damage either to the dummy or to the restraint system. The loadings experienced in both the dummy's head and chest were quite high in this test. Again the upper torso and head of the dummy pitched forward and contacted the adult seat cushion.



NOT REPRODUCIBLE



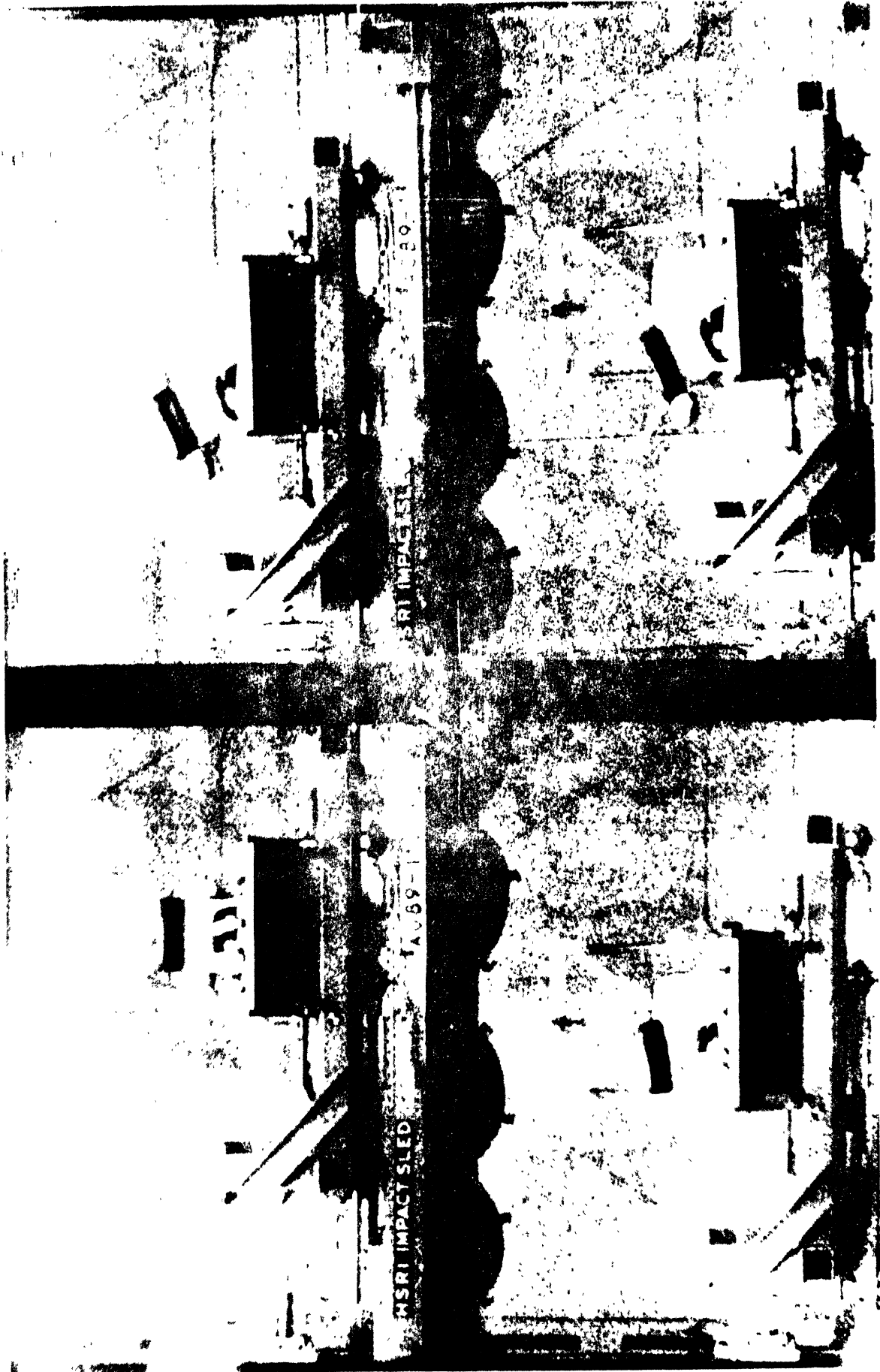
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-089  
Test Date: 3 July 1969  
Restraint Code No.: C-1  
Restraint Description: Ford Tot-Guard

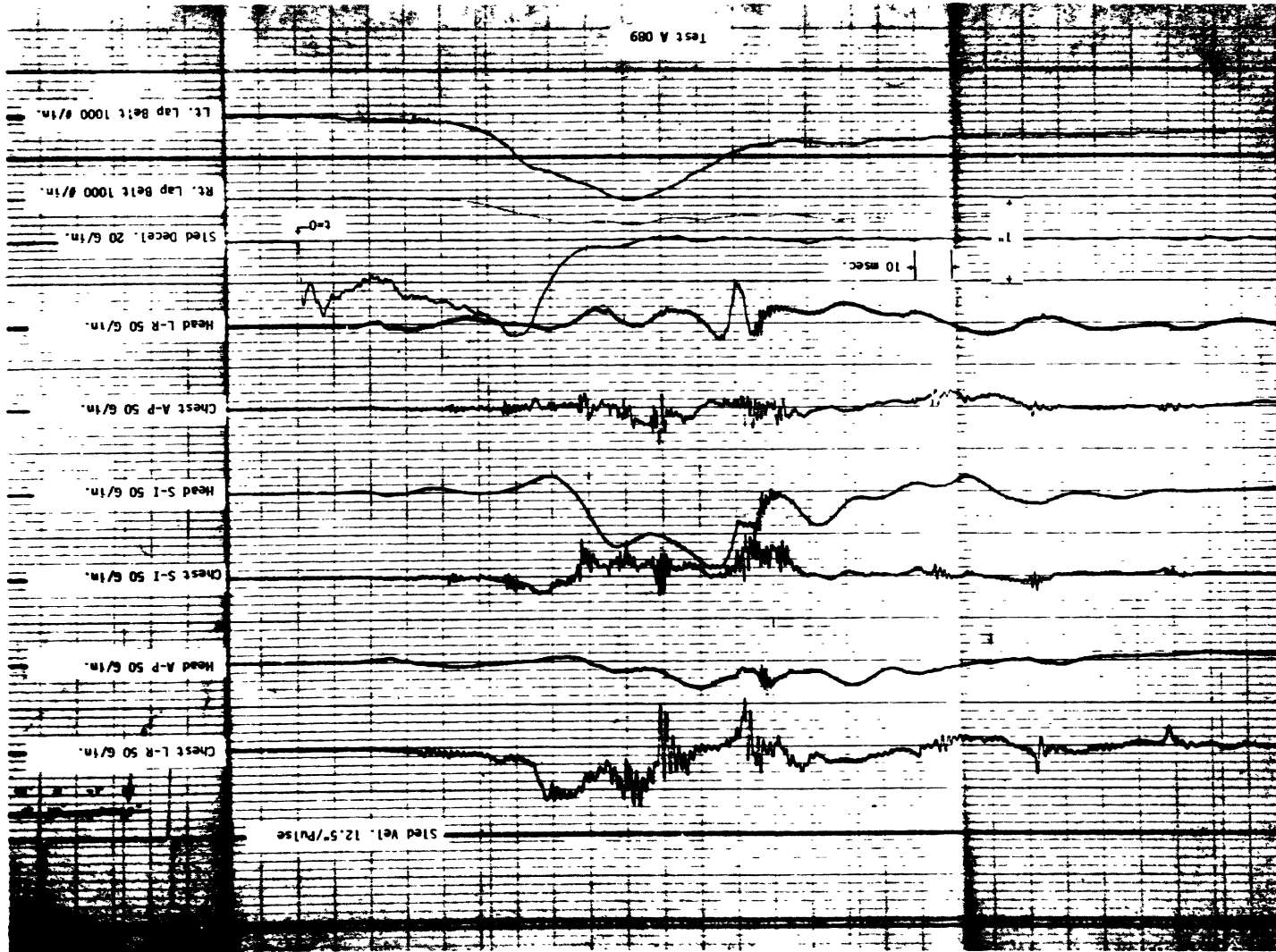
Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Side impact  
Dummy Attitude: Sitting

## Test Observation:

No observable damage was experienced by the dummy. The head superior-inferior and the chest left and right accelerometer readings were quite high. The sideways motion experienced by the head would have allowed contact with any adjacent door structures. The sidewall of the upper section of the restraint system was permanently deformed. This section of the restraint system also slid off the lower seat cushion.



NOT REPRODUCIBLE



## HSRI SUMMARY DATA SHEET (FH-11-6962)

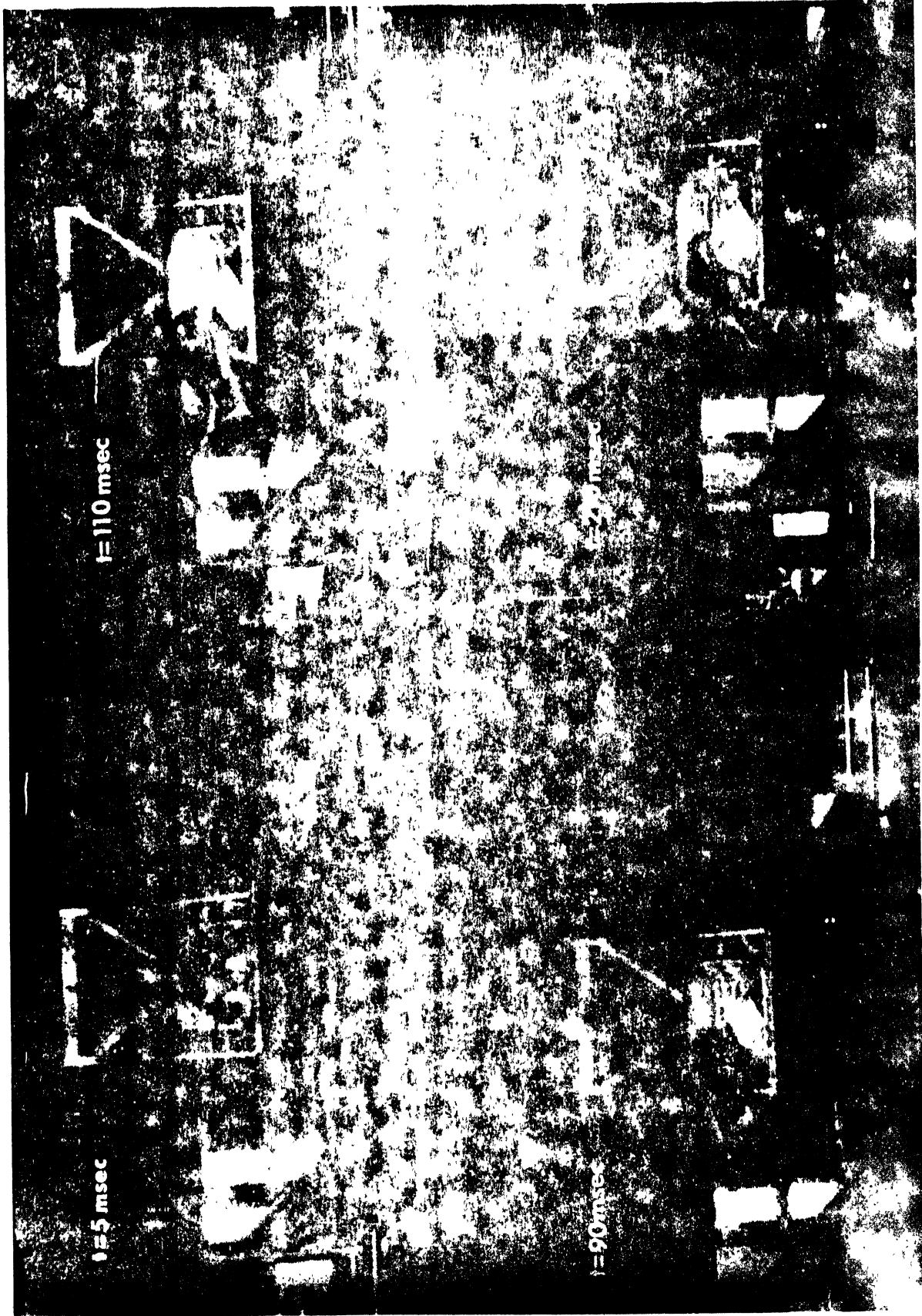
Test No: A-090  
Test Date: 8 July 1969  
Restraint Code No.: C-4  
Restraint Description: Sears Seat No. 28A6400C

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Side facing  
Dummy Attitude: Sitting

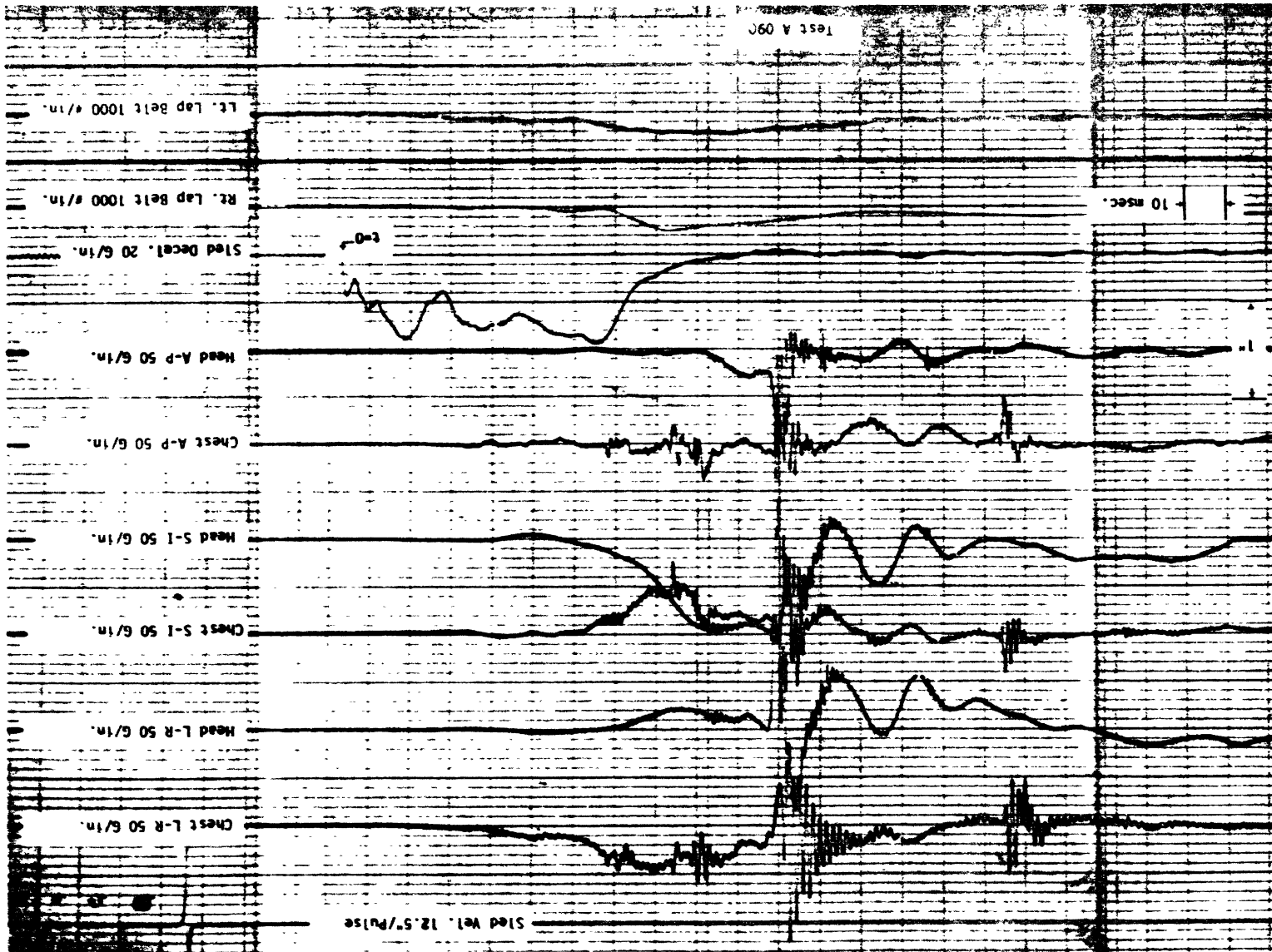
## Test Observation:

No damage was experienced by the dummy. The bottom of the pedestal seat dug into the seat cushion of the adult seat causing the dummy to pitch sideways. Any door structures which would have been present would have been contacted by the dummy head.





Test A 090



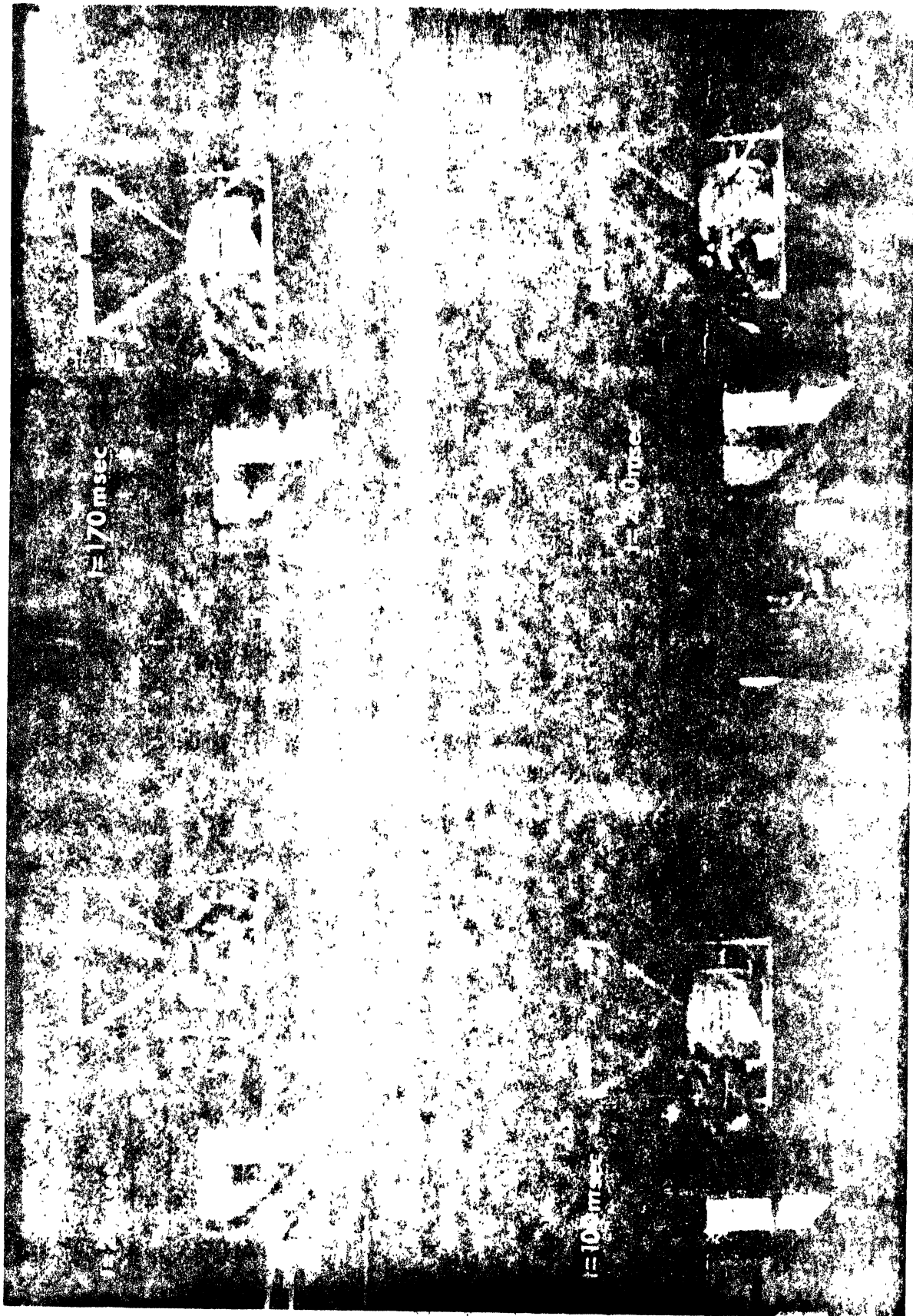
**HSRI SUMMARY DATA SHEET (FH-11-6962)**

**Test No:** A-091  
**Test Date:** 8 July 1969  
**Restraint Code No.:** C-4  
**Restraint Description:** Sears Seat 28A6400C

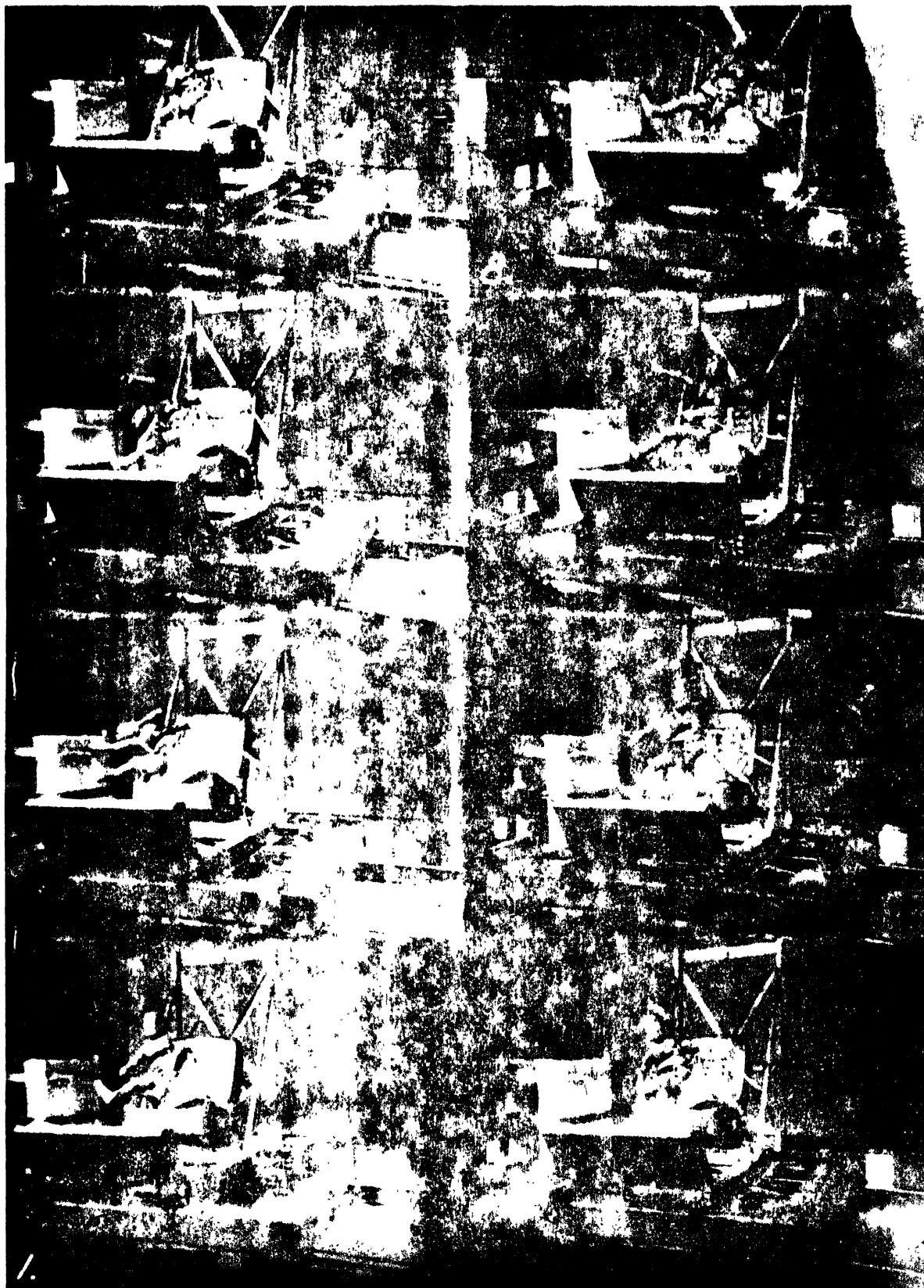
**Dummy:** 3 year  
**Sled Velocity:** 20 mph  
**Sled G-level:** 18  
**Impact Direction:** Side impact  
**Dummy Attitude:** Sitting

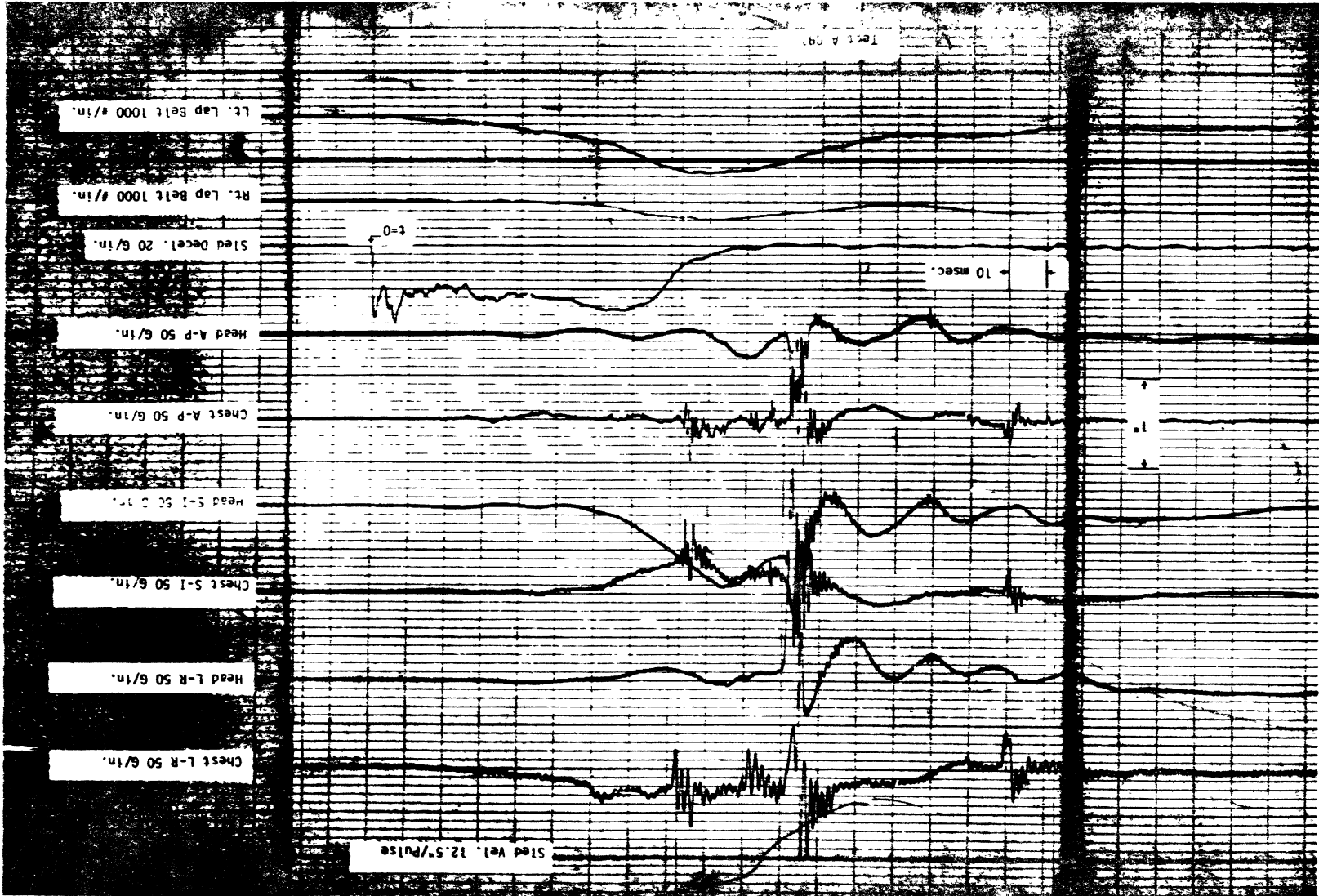
**Test Observation:**

There was no apparent damage to either the dummy or to the restraint system. The dummy received extreme side bending about the mid-torso. The head accelerometer readings were very high. Any vehicle side structures adjacent to the child system would have been contacted.



NOT REPRODUCIBLE





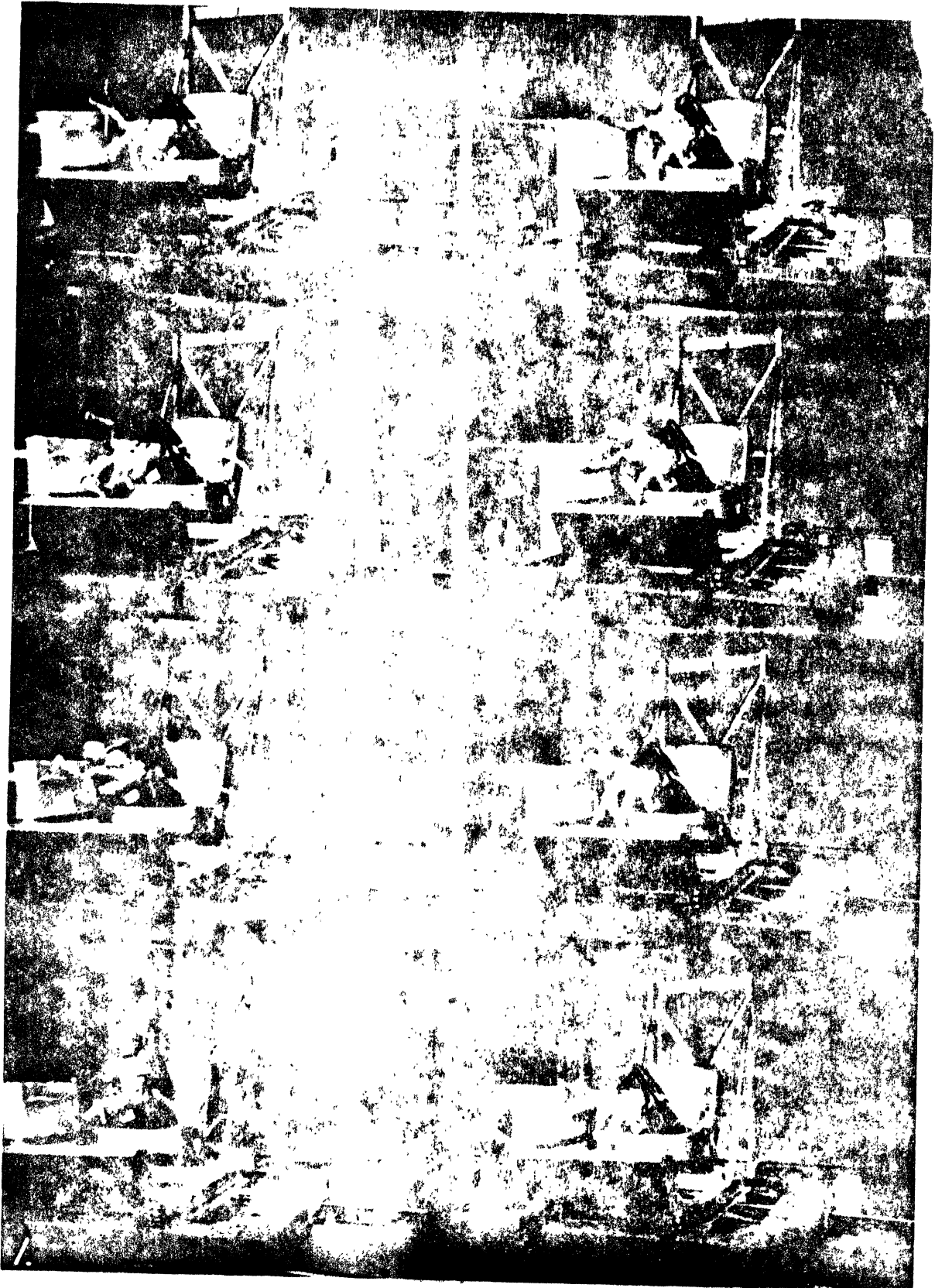
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-092  
Test Date: 9 July 1969  
Restraint Code No.: C-5  
Restraint Description: Sears Seat No. 5516

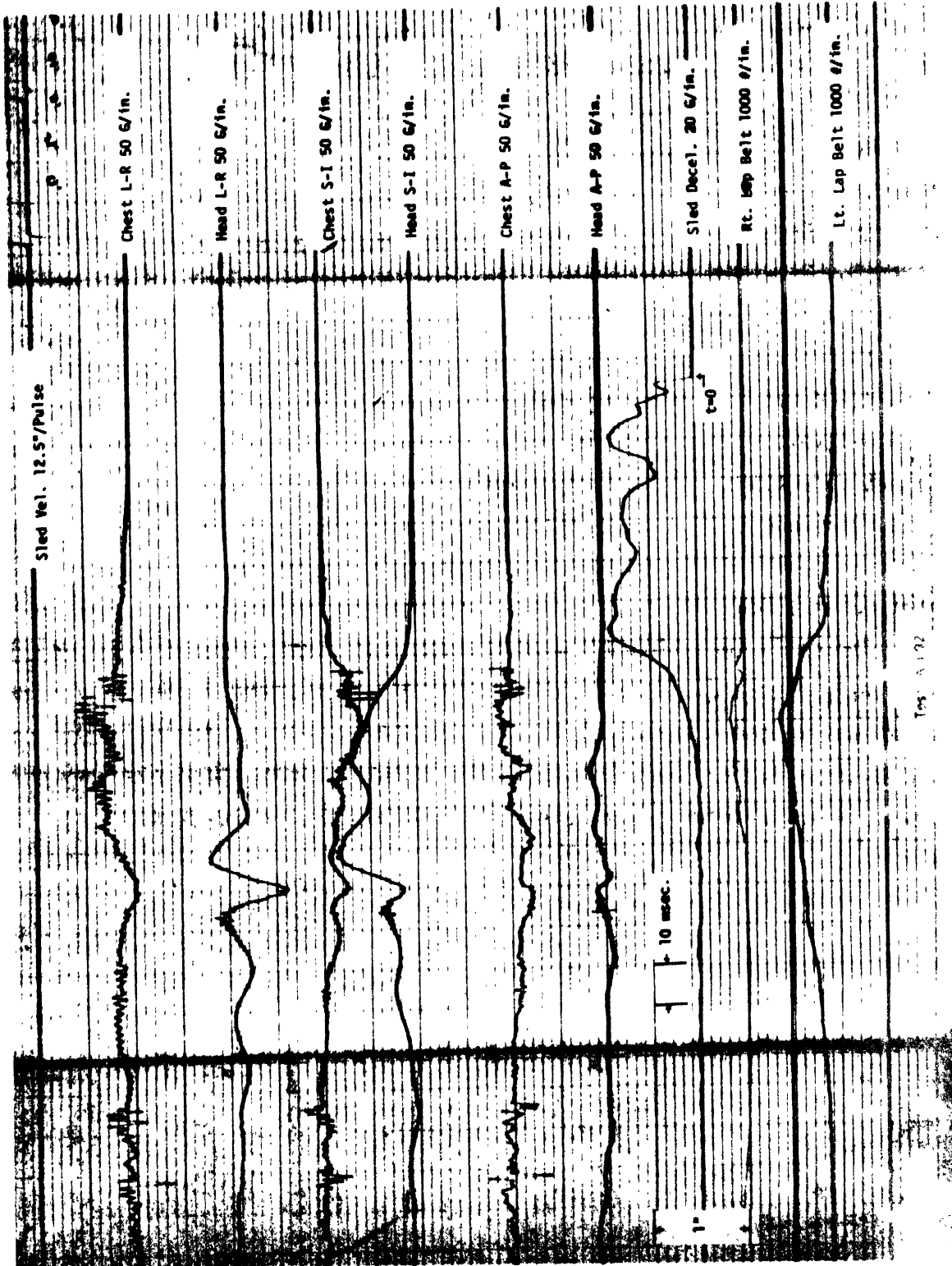
Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Side impact  
Dummy Attitude: Sitting

## Test Observation:

The restraint system and dummy received no damage. Accelerometers mounted in the head and chest indicated moderate g levels. The dummy jackknifed to the side and would have contacted any adjacent door structures. The head pitched downward to a level near the seat cushion.







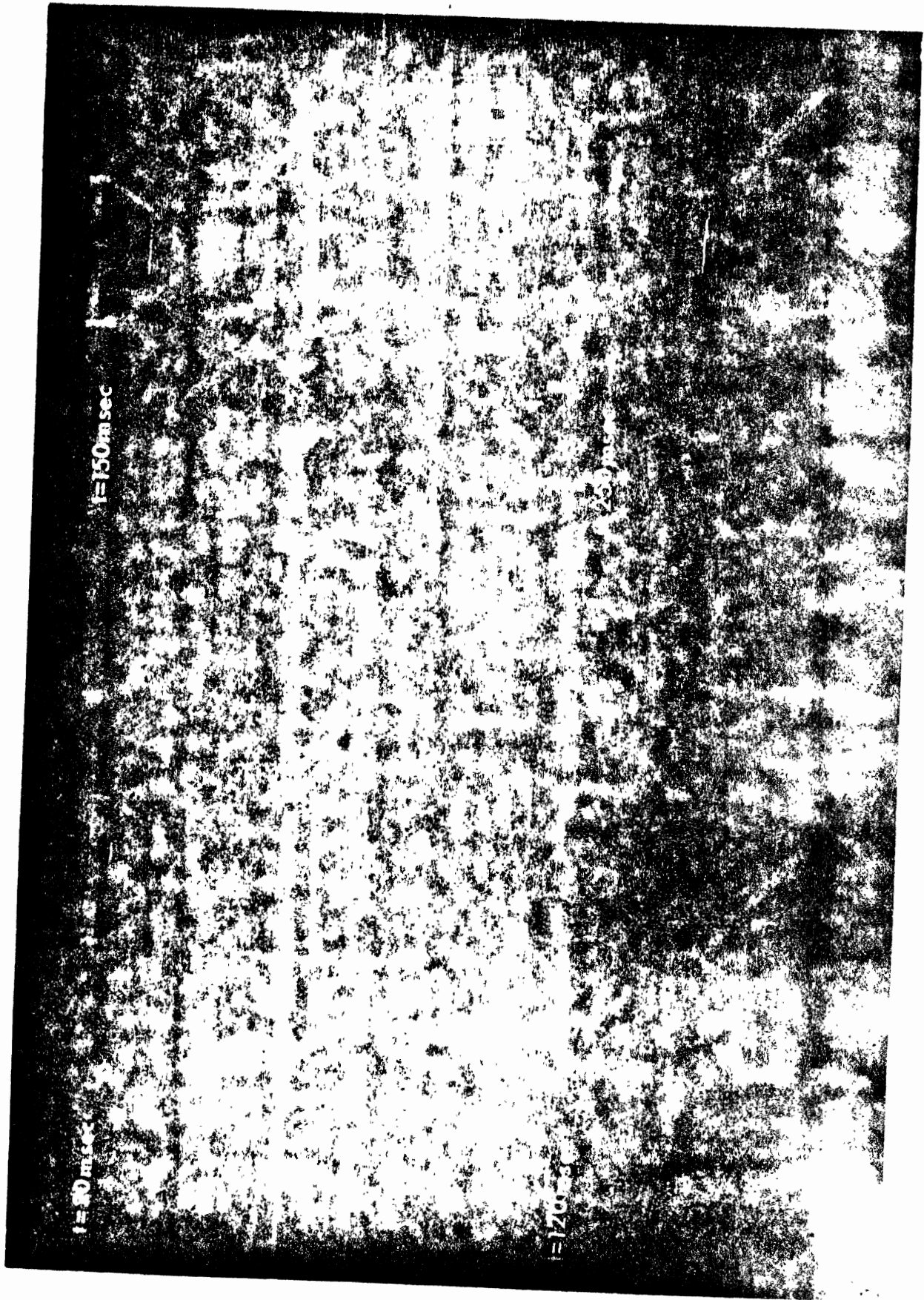
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-093  
Test Date: 10 July 1969  
Restraint Code No.: C-5  
Restraint Description: Sears Seat No. 5516

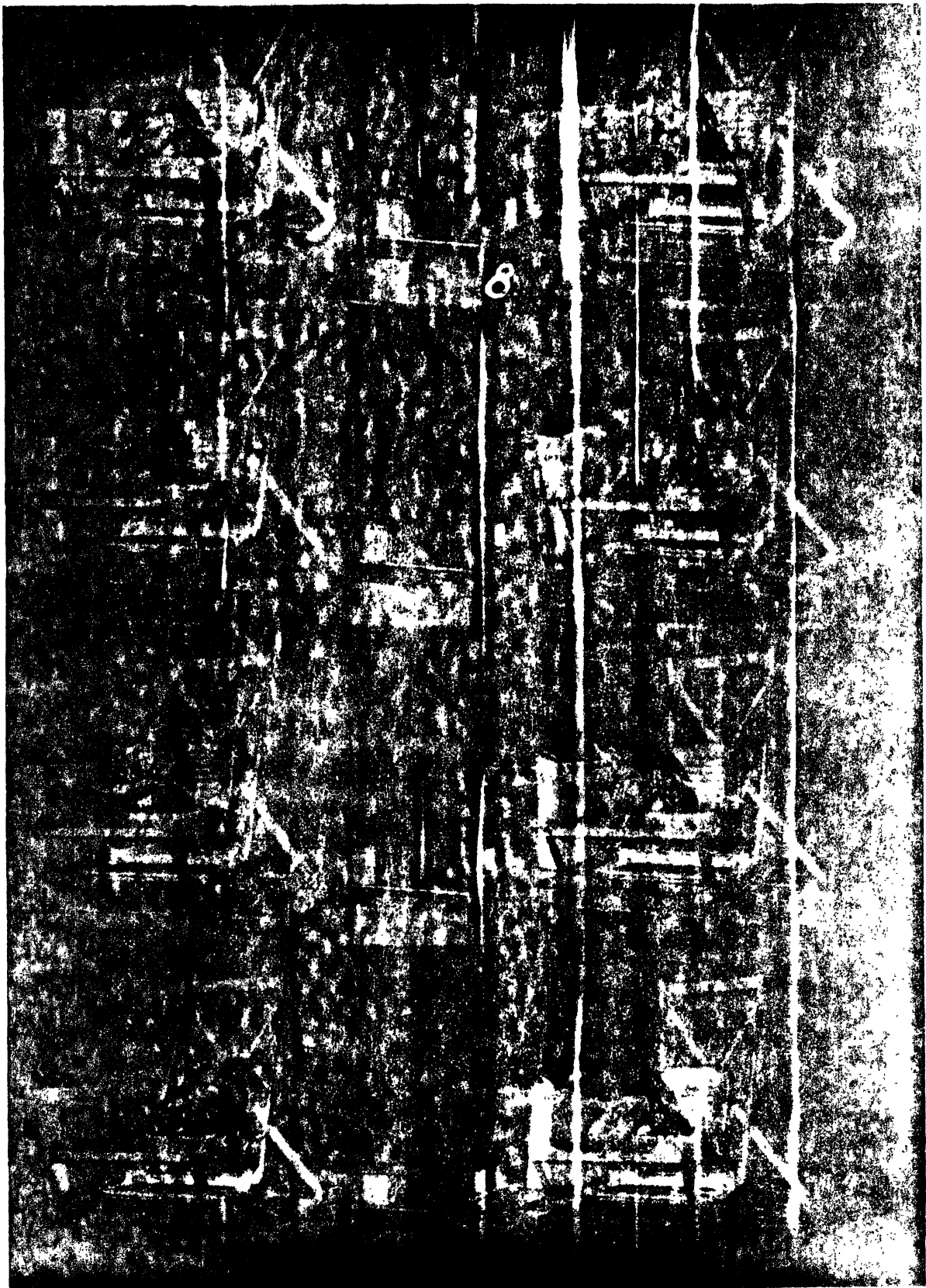
Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 18  
Impact Direction: Side impact  
Dummy Attitude: Sitting

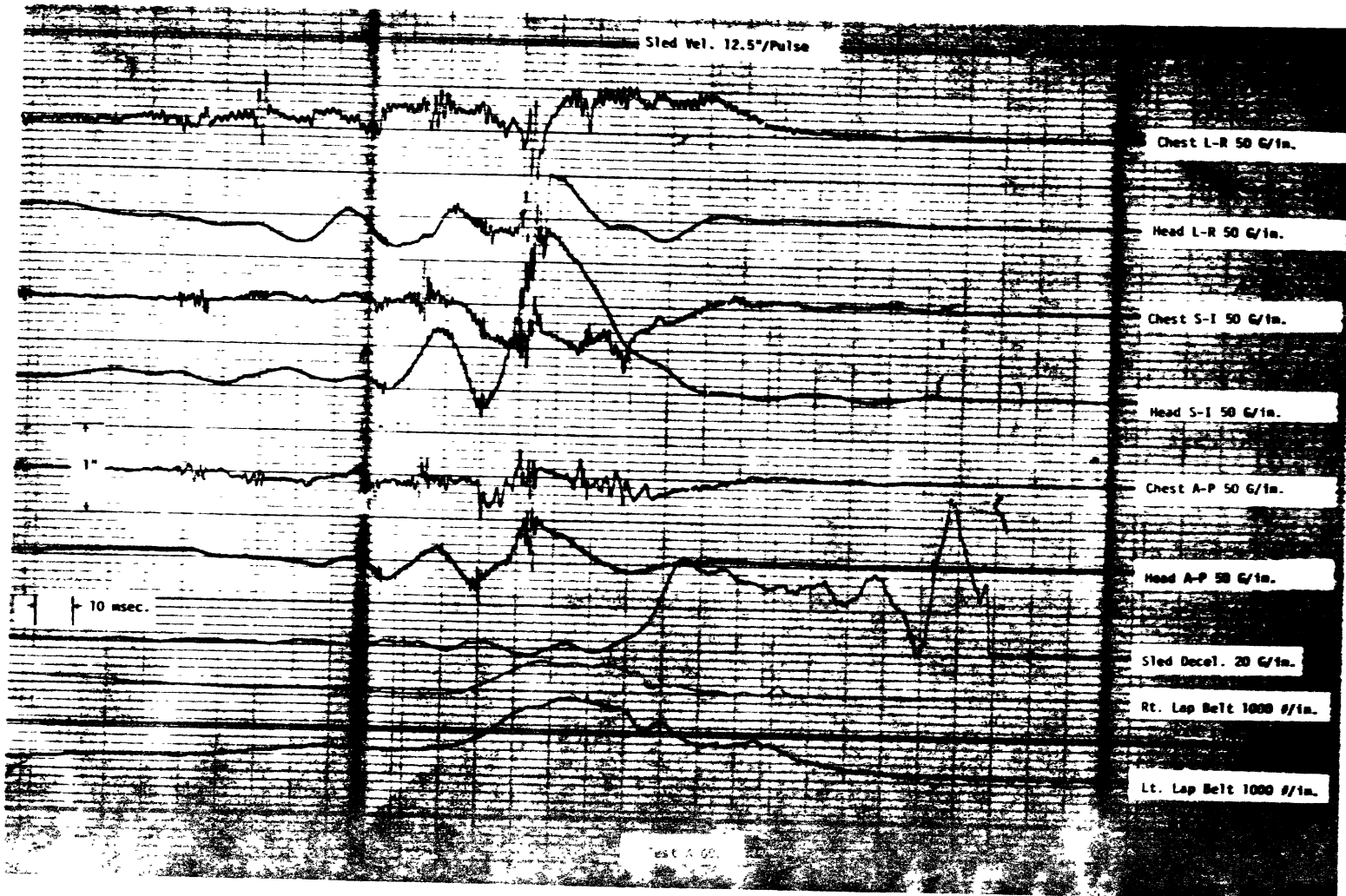
## Test Observation:

The child seat tipped toward the door structures and the dummy pitched violently downward and would have contacted any adjacent structures. The dummy was wedged extremely tightly under the lap belt. The left thigh would probably have been abraded badly in actual case. Both the head and chest superior-inferior accelerometers readings were quite high.



NOT REPRODUCIBLE





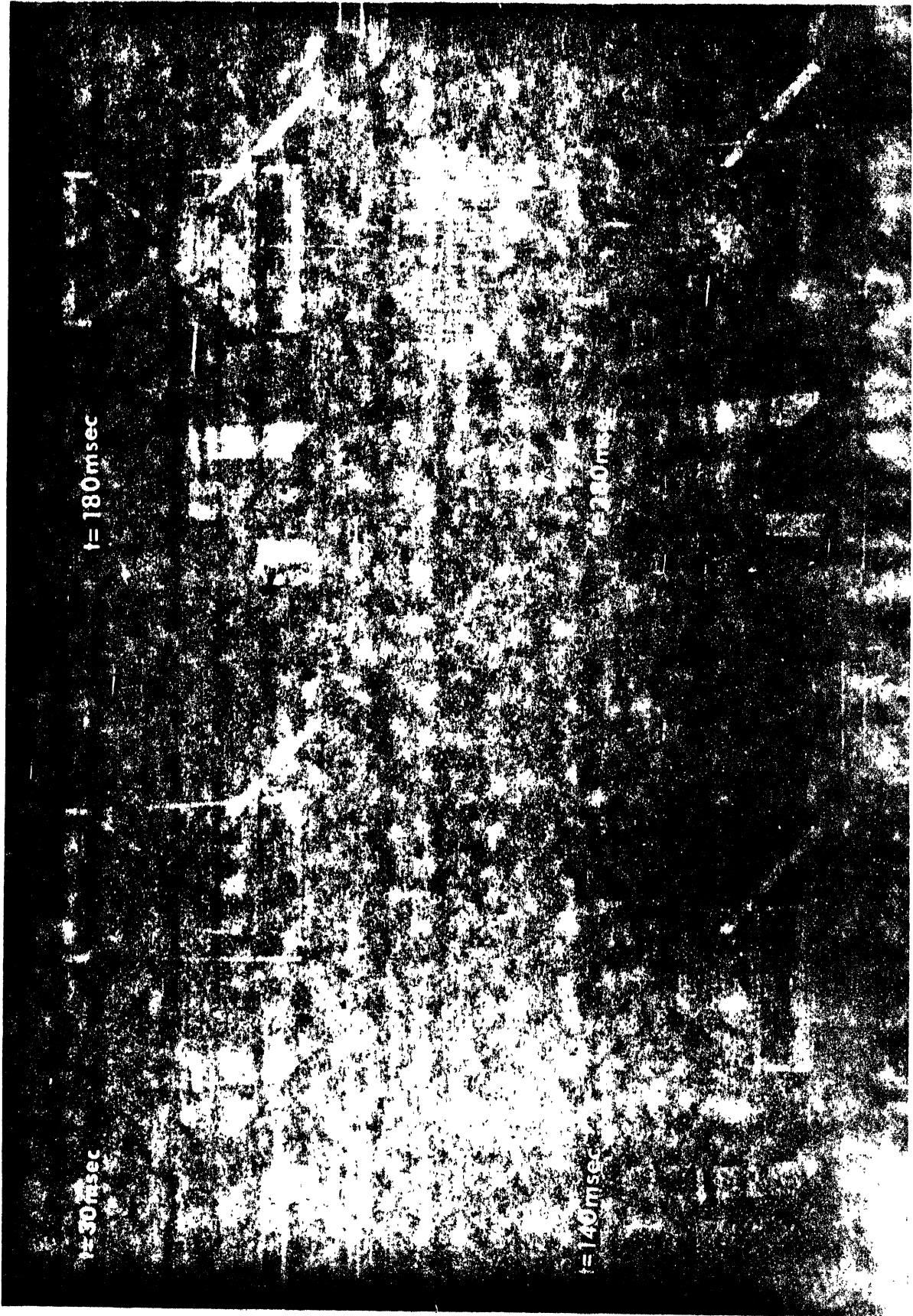
## HSRI SUMMARY DATA SHEET (FH-11-6962)

Test No: A-094  
Test Date: 10 July 1969  
Restraint Code No.: C-4  
Restraint Description: Sears Seat No. 28A6400C

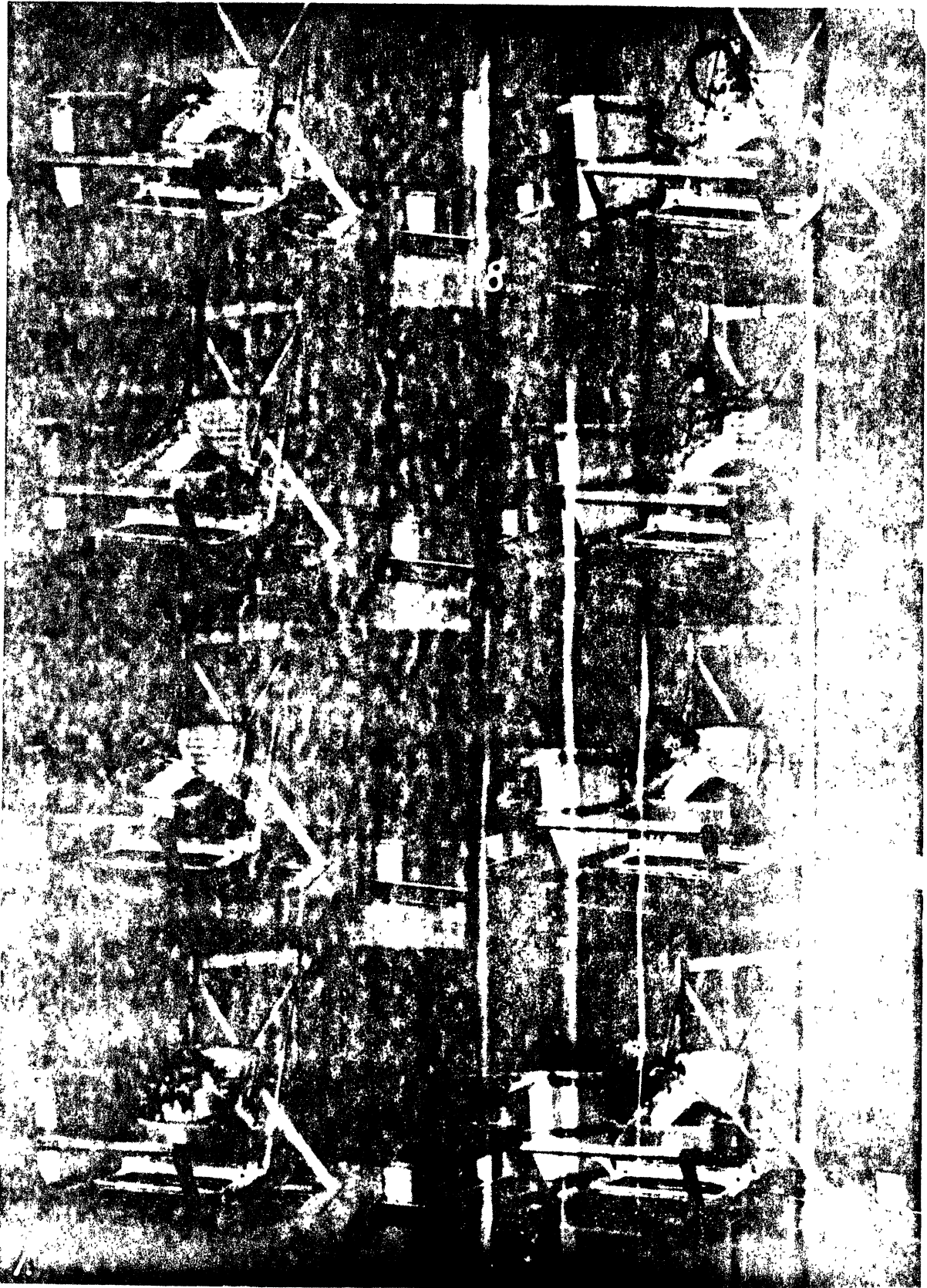
Dummy: 3 year  
Sled Velocity: 30 mph  
Sled G-level: 18  
Impact Direction: Side impact  
Dummy Attitude: Sitting

## Test Observation:

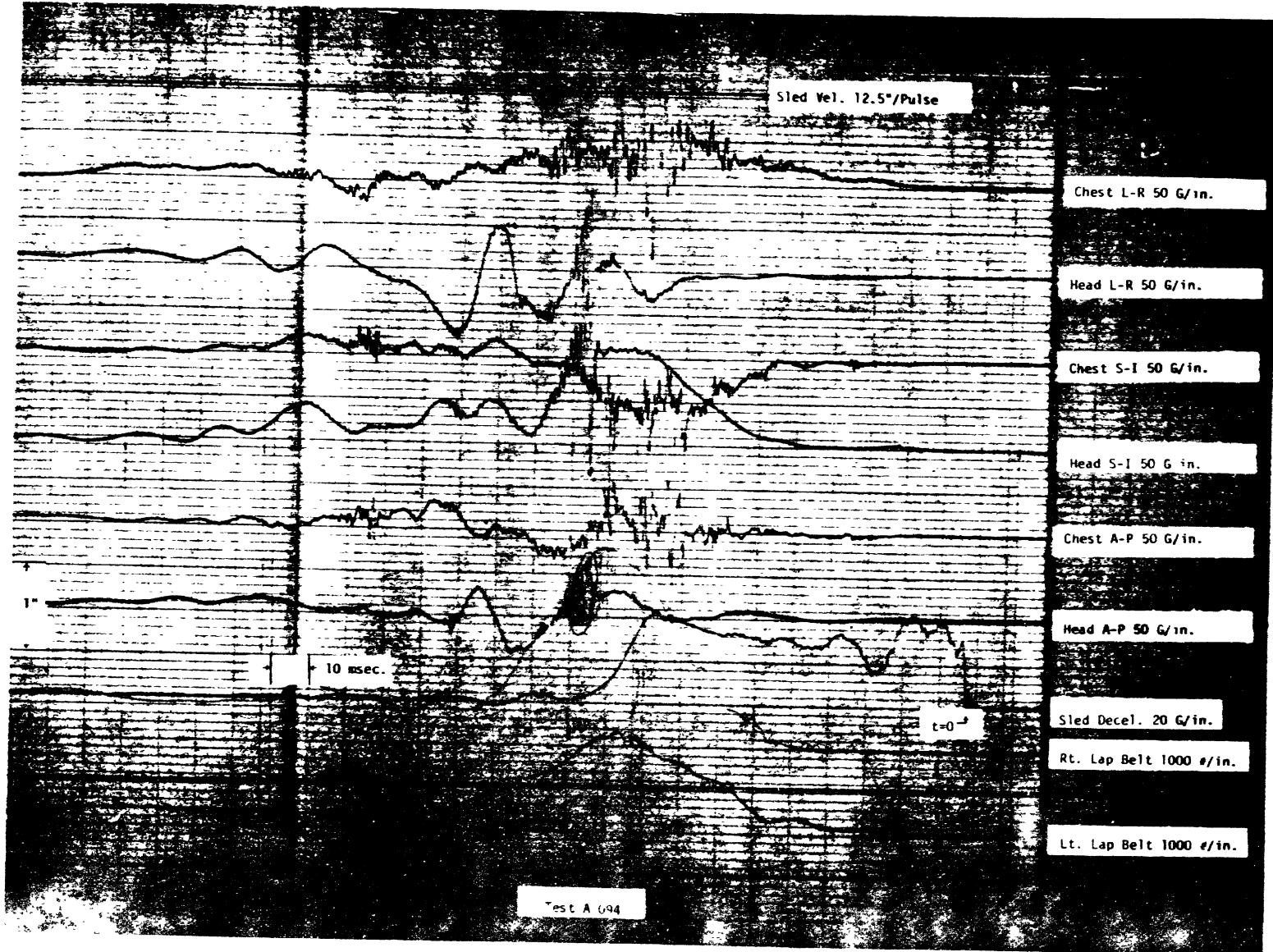
The dummy pitched violently toward the side of the seat structure. The right arm of the dummy flew off. The lap belt loadings were extremely high within 1150 and 2300 lbs being recorded on the two sides of the belt.



NOT REPRODUCIBLE







HSRI SUMMARY DATA SHEET (FH-11-0902)

Test No: A-095  
Test Date: 11 July 1969  
Restraint Code No.: C-16  
Restraint Description: Klippan Safety Seat

Dummy: 3 year  
Sled Velocity: 20 mph  
Sled G-level: 18  
Impact Direction: Side Impact  
Dummy Attitude: Sitting

Test Observation:

The dummy received an extremely gentle ride in this test. However, the left hand strap retaining the Klippan seat to the adult seat tore out of the molded resin fiberglass shell. The spring on the upper rear retaining strap was deformed somewhat. The seat needs better anchoring of the side retaining straps. Unfortunately both the seat and the dummy were ejected in this test.



NOT REPRODUCIBLE

