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REPORT NO. 208-MGA-98-004

SAFETY COMPLIANCE TESTING FOR FMVSS 208
OCCUPANT CRASH PROTECTION
(SLED TEST)

Ford Motor Company
1998 Ford Taurus 4 Door
NHTSA NO. CW0204

MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: March 5, 1998

Report Date: March 16, 1998

Final Report

Prepared For:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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SECTION 1
PURPOSE AND TEST PROCEDURE

PURPOSE

This sled test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by MGA Research Corporation (MGA) under Contract No. DTNH22-93-D-21089. The purpose of this test was to determine whether the subject vehicle, a 1998 Ford Taurus 4 Door, NHTSA No. CW0204, meets the performance requirements of FMVSS 208, "Occupant Crash Protection". The compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-208S-00 dated June 17, 1997.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208S-00 dated June 17, 1997. Data was obtained relative to FMVSS 208, "Occupant Crash Protection".

The test vehicle was instrumented with four (4) accelerometers to measure longitudinal axis accelerations.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (ATDs). The dummies were positioned in the front outboard seating positions according to the dummy placement procedures specified in Appendix B of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations; a chest potentiometer to measure longitudinal deflection; an upper neck load cell to measure longitudinal, lateral, and vertical neck forces and moments; and left and right femur load cells to measure axial forces.

The thirty-seven (37) data channels were multiplexed and recorded on five IBM PC compatible computers with Metrabyte DAS-16F A/D converter boards. The data was digitally sampled at 10,000 samples per second and processed per Section 11.7 through 11.9 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and six (6) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by the real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2. The FMVSS 208 data is presented in Section 3. The vehicle, occupant, and camera measurements are presented in Section 4. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the manufacturer's vehicle information.

SECTION 2
COMPLIANCE DATA SUMMARY

TEST RESULTS SUMMARY

This sled test was conducted at MGA Research Corporation on March 5, 1998.

The test vehicle, a 1998 Ford Taurus 4 Door, NHTSA No. CW0204, appeared to comply with the performance requirements of FMVSS 208. The Head Injury Criteria (HIC) calculations were less than 1000, the chest resultant accelerations did not exceed 60 g's. The compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 E dummies seated in the front outboard designated seating positions. For each Part 572 E dummy, the chest deflection did not exceed 3.0 inches. For each Part 572E dummy, the maximum peak flexion bending moment about the occipital condyle did not exceed 190 N-m. The maximum peak extension bending moment did not exceed 57 N-m. The maximum peak axial tension did not exceed 3300 N. The maximum peak axial compression did not exceed 4000 N. The maximum peak fore and aft shear did not exceed 3100 N. The vehicle's restraint system met the applicable comfort and convenience requirements.

The test vehicle was equipped with an airbag and a Type 2 seat belt in the front outboard designated seating positions. Both dummies were restrained only by the airbag during the test.

The driver's HIC was 221. The maximum peak flexion bending moment about the occipital condyle was 29.2 N-m, the maximum peak extension bending moment was 7.6 N-m, the maximum peak axial tension was 1287.6 N, the maximum peak axial compression was 745.7 N, the maximum peak fore/aft shear was 845.7 N. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 39 g's. The driver's chest maximum deflection was 0.7 inches. The driver's left and right femur maximum compressive forces were 1200 pounds and 1457 pounds, respectively.

The right front passenger's HIC was 197. The maximum peak flexion bending moment about the occipital condyle was 39.8 N-m, the maximum peak extension bending moment was 17.9 N-m, the maximum peak axial tension was 1054.8 N, the maximum peak axial compression

was 354.1 N, the maximum peak fore/aft shear was 1294.0 N. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 34 g's. The right front passenger's chest maximum deflection was 0.7 inches. The right front passenger's left and right femur maximum compressive forces were 1071 pounds and 1090 pounds, respectively.

TEST NOTES

TABLE 1 SLED TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

Vehicle NHTSA No.: CW0204 Test Type: Sled Test

Test Date: March 5, 1998 Time: 11:53 a.m. Temp: 70°F

Vehicle Test Weight: 3839 lbs.

Sled Velocity Change: 29.7 mph

Airbag Fire Time: 19 msec

Dummies:	Driver	Passenger
Dummy Type	<u>Part 572E</u>	<u>Part 572E</u>
Serial Number	<u>403</u>	<u>401</u>
Restraint System	<u>Airbag</u>	<u>Airbag</u>
No. of Data Channels	<u>15</u>	<u>15</u>

Number of Cameras: 1 Real Time

6 High Speed

Door Opening Data:	Left Front: <u>Opened</u>	Left Rear: <u>Opened</u>
	Right Front: <u>Opened</u>	Right Rear: <u>Opened</u>

Front Seat(s) Data:	Driver	Passenger
Seat Track Failure	<u>0 in.</u>	<u>0 in.</u>
Seat Back Failure	<u>None</u>	<u>None</u>

Visible Dummy Contact Points:	Driver	Passenger
Head	<u>Airbag, Visor, Headrest</u>	<u>Airbag, Visor</u>
Chest	<u>Airbag</u>	<u>Airbag</u>
Left Knee	<u>Instrument Panel</u>	<u>Glovebox</u>
Right Knee	<u>Instrument Panel</u>	<u>Glovebox</u>

TABLE 2 GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No: CW0204 VIN: 1FAFP52U7WG139115 Body Color: Silver

Engine: 6 Cylinders; C.I.D.; 3.0 liters; CC

 Gas; Diesel; Turbocharged

 Longitudinal; X Transverse

Transmission: 4 Speed; Manual; X Automatic; X Overdrive

Final Drive: X Front Wheel; Rear Wheel; Four Wheel

Major Option: X A/C; X P/S; X P/B; X P/wdo; X P/door locks;

 X P/seats; X Tilt Wheel; Anti-skid Brakes; Cruise Control

Date Received: 2/06/98; Odometer Reading: 22 miles

Dealer's Name/Address: Geneva Lakes Ford Inc.
W2542 Highway 120
Lake Geneva, WI 53147

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Ford Motor Company

Date of Manufacture: 11/97; VIN: 1FAFP52U7WG139115

GVWR: 4687 lbs; GAWR Front: 2647 lbs. GAWR Rear: 2065 lbs.

DATA FROM TIRE PLACARD:

Tire Pressure with maximum capacity vehicle load: Front 33 psi Rear 33 psi

Recommended Tire Size: P205/65R15

Recommended Cold Tire Pressure: Front 33 psi; Rear 33 psi

Tires on Vehicle: P205/65R15; Manufacturer: General

Type of Spare Tire: Spacesaver

Number of Occupants: 3 Front; 3 Rear; 3rd Seat; 6 TOTAL

Type of Front Seats: Bucket; Bench; X Split Bench

Type of Front Seat Back: Fixed; X Adj. With; X Lever; Rot. Knob Power

TABLE 2 GENERAL TEST AND VEHICLE PARAMETER DATA (Cont.)

VEHICLE CAPACITY WEIGHT (VCW) = 1100 lbs.
No. Of Occupants x 150 lbs = 900 lbs.
Rated Cargo/Luggage Weight (RCWL) = 200 lbs.

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER

(WITH MAXIMUM FLUIDS) = UDW:

Right Front = 1068 lbs Right Rear = 575 lbs
Left Front = 1064 lbs Left Rear = 576 lbs
TOTAL FRONT WEIGHT = 2132 lbs (65 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1151 lbs (35 % of Total Vehicle Weight)
TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 3283 lbs

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO WEIGHT:

Right Front = 1163 lbs Right Rear = 763 lbs
Left Front = 1149 lbs Left Rear = 764 lbs
TOTAL FRONT WEIGHT = 2312 lbs (60 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1527 lbs (40 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 3839 lbs

VEHICLE ATTITUDE:

Delivered Door Sill Angle: 0.2°
Fully Loaded Door Sill Angle: 0.5°
Test Door Sill Angle: 0.2°
Wheel Base: 108.5 in

Fuel System Capacity From Owner's Manual = 16.0 gallons
Usable Capacity Figure Furnished by COTR = 16.0 gallons

TABLE 3 VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

Vehicle NHTSA No.: CW0204; Test Date: March 5, 1998

ACCELEROMETER LOCATION (inches)				
	Description	X	Y	Z
1	Engine	30.9	0	33.3
2	Left B-Post	94.9	26.8	9.4
3	Right B-Post	94.3	26.8	9.3
4	Rear Axle	144.3	1.4 R	10.6

Reference: X = Front of Sled Carriage
 Y = Centerline of Sled Carriage
 Z = Top of Sled Carriage

ACCELEROMETER DATA SUMMARY					
No.	DESCRIPTION	MAXIMUM (g's)	TIME (msec)	MINIMUM (g's)	TIME (msec)
1	Engine	4.6	125	21.8	42
2	Left B-Post	3.7	122	20.6	42
3	Right B-Post	2.3	123	19.8	49
4	Rear Axle	2.2	120	18.7	53

TABLE 4 REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

Contract Number: DTNH22-93-D-21089

From: MGA Research Corporation To: Mr. Charles Case, COTR
 5000 Warren Road Office of Vehicle Safety Compliance
 Burlington, WI 53105

The following vehicle has been subjected to testing for FMVSS 208. The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. The vehicle was again inspected after the above test had been conducted, and all changes were noted below. The final condition of the vehicle was also noted in detail.

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door
 Vehicle NHTSA No.: CW0204 Body Color: Silver Frost
 VIN: 1FAFP52U7WG139115 Cost: \$18,795
 Odometer: Arrival Date: 2/06/98 Reading: 22 miles
 Completion Date: 3/05/98 Reading: 24 miles
 Engine: 6 Cylinders; 3.0 Liters; Gas; Diesel
 Transmission: 4 Speed; Manual; X Automatic
 Final Drive: X Front Wheel; Rear Wheel; Four Wheel
 Tire Size: P205/65R15; Manufacturer: General

Air Conditioner	<u>Yes</u>	Console	<u>Yes</u>	Brakes	<u>Power</u>
Tinted Glass	<u>No</u>	Tachometer	<u>Yes</u>	Front	<u>Disc</u>
Power Steering	<u>Yes</u>	Cruise Control	<u>No</u>	Rear	<u>Drum</u>
Power Windows	<u>Yes</u>	Rear Window Def.	<u>Yes</u>	Front Seats	<u>Split Bench</u>
Power Door Locks	<u>Yes</u>	Sun/Moon Roof	<u>No</u>	Seat Type	
Radio	<u>Yes</u>	T-Top	<u>No</u>	Front	<u>Adjustable</u>
Clock	<u>Yes</u>	Tilt Steering Wheel	<u>Yes</u>	Rear	<u>Non-Adjustable</u>
Roof Rack	<u>No</u>	Other Options:	<u>No</u>	No. of Seats	<u>5</u>

Equipment that is no longer on the vehicle as noted above: Spare tire, jack, rear seats, taillights, rear speakers, rear cargo area trim, rear deck lid.

Explanation:

Items removed to allow installation of data acquisition system.

Vehicle Condition:

The vehicle was subjected to a sled test. The engine, suspension, and exhaust system have been fixed and have numerous beams and brackets welded to them. A steel framework is attached to the vehicle. Various interior and exterior portions of the vehicle have been painted and have had holes drilled to facilitate attachment of instrumentation. Various body parts have been removed. THE VEHICLE IS FOR SALVAGE ONLY AND IS NOT TO BE REPAIRED FOR HIGHWAY USE.

SECTION 3
SUMMARY OF RESULTS FOR FMVSS 208

TABLE 5 FMVSS 208 OCCUPANT INJURY CRITERIA

Veh. Yr./Make/Model/Body Style: 1998/Ford/Taurus/4 Door

Veh. NHTSA No.: CW0204 Test Date: March 5, 1998

MAXIMUM ACCELERATION VALUES: (g's)	DRIVER DUMMY #403	PASSENGER DUMMY #401
Head Channel X	-36.2	-38.5
Head Channel Y	-10.4	2.3
Head Channel Z	11.6	21.9
HEAD RESULTANT	37.6	38.5
Chest Channel X	-38.5	-31.7
Chest Channel Y	7.1	-3.2
Chest Channel Z	16.6	20.1
CHEST RESULTANT	39.9	36.3

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	221	197
t ₁ = (msec)	85.2	82.9
t ₂ = (msec)	121.2	118.9

[The maximum time interval from t₁ to t₂ is 36 milliseconds.]

CHEST INJURY CRITERIA (CLIP) VALUES: (g's)

CLIP	39	34
t ¹ = (msec)	92.7	92.2
t ² = (msec)	95.8	95.3
CHEST DEFLECTION (in)	0.7	0.7

TABLE 5 FMVSS 208 OCCUPANT INJURY CRITERIA (Cont.)

Veh. Yr./Make/Model/Body Style:1998/Ford/Taurus/4 Door

Veh. NHTSA No.:CW0204 Test Date:March 5, 1998

MAX. COMPRESSIVE FEMUR FORCES:	Units (lbs)	
	DRIVER DUMMY #403	PASSENGER DUMMY #401
Left Side (lbs)	1200	1071
Right Side (lbs)	1457	1090

NECK FORCES:

Neck Force X (N)	845.7	1294.0
Neck Force Y (N)	212.7	-105.9
Neck Force Z (N)	1287.6	1054.8

NECK MOMENTS:

Neck Moment X (N-m)	-14.3	7.7
Neck Moment Y (N-m)	38.6	62.3
Neck Moment Z (N-m)	11.6	13.6

TABLE 5 FMVSS 208 OCCUPANT INJURY CRITERIA (Cont.)

NECK INJURY CRITERIA:	DRIVER DUMMY #403	PASSENGER DUMMY #401
Peak Flexion Bending Moment about the Occipital Condyle (N-m)	29.2	39.8
Peak Extension Bending Moment about the Occipital Condyle (N-m)	7.6	17.9
Peak Axial Tension (N)	1287.6	1054.8
Peak Axial Compression (N)	745.7	354.1
Peak Fore Shear (N)	845.7	1294.0
Peak Aft Shear (N)	161.4	225.3

TABLE 6 DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head impacted the airbag and visor with the dummy's head rotating rearward. The driver dummy was restrained by the airbag. The dummy rebounded rearward into the seat back with the dummy's head contacting the head restraint. The driver dummy came to rest in the seat.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the dashboard. The dummy's head impacted the airbag and visor with the dummy's head rotating rearward. The right front passenger dummy was restrained by the airbag. The right front passenger dummy came to rest in the seat.

TABLE 7 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS

Vehicle Year/Make/Model/Body Style:1998/Ford/Taurus/4 Door

NHTSA No.:CW0204; Date of Comfort/Convenience Check: March 3, 1998

Technician Performing Check: Al Chalmers

GVWR: 4687 lbs

Automatic seat belts installed in any vehicle, other than a walk-in van-type vehicle which has a gross vehicle weight rating of 10,000 pounds or less, and is manufactured on or after September 1, 1986, shall meet the requirements for convenience hooks, webbing tension relieving devices, and belt contact force.

Manual seat belts installed for compliance with this standard in front outboard designated seating positions of any vehicle, other than a walk-in van-type vehicle which has a gross vehicle rating of 10,000 pounds or less, and is manufactured on or after September 1, 1989, shall meet the requirements for belt contact force, plate access, retraction and seat belt guides, and hardware.

VEHICLE EQUIPMENT:

The vehicle's front outboard seating positions were equipped with manual Type 2 seat belts which must comply with the dynamic test requirements of S5.1; requirements for webbing tension-relieving devices (S7.4.2), belt contact force (S7.4.3), latchplate access (S7.4.4), retraction (S7.4.5), and seat belt guides and hardware (S7.4.6) apply.

CONVENIENCE HOOKS (S7.4.1):

Not applicable, the vehicle was not equipped with automatic seat belts.

WEBBING TENSION-RELIEVING DEVICE (S7.4.2)

The seat belt assembly on the front outboard seating positions did not have webbing tension-relieving devices.

TABLE 7 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS (Cont.)

BELT CONTACT FORCE (S7.4.3)

The belt contact force on the chest of the test dummy was 0.2 pounds.

LATCHPLATE ACCESS (S7.4.4)

The seat belt latchplates, in their normal stowed position, were within the reach envelope. The clearance test block moved unhindered to the latchplate or buckle.

RETRACTION (S7.4.5)

The seat belt automatically retracted when the seat belt latchplate was released.

The stowed seat belt webbing and hardware were not pinched when the door was closed.

SEAT BELT GUIDES AND HARDWARE (S7.4.6)

The seat cushion was movable, but the seat back did not serve as a function other than seating.

The seat was not removable.

The seat was not movable so that the space formerly occupied by the seat could be used for a secondary function.

Note: If the seat or seat cushion is removable or if the seat is movable so that the space formerly occupied by the seat can be used for a secondary function, the seat belt guides and hardware requirements do not apply.

TABLE 7 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS (Cont.)

SEAT BELT GUIDES AND HARDWARE (S7.4.6) (Cont.)

The webbing was not designed to pass through the seat cushion or between the cushion and seat back.

The remaining two parts (the seat belt latchplate and the buckle) were accessible under normal conditions.

The latchplate and buckle did not pass through the guides provided and fall behind the seat when the belt was completely retracted (or detached if not retractable) and the seat was moved to any position.

TABLE 7 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY

FRONT OUTBOARD DESIGNATED SEATING POSITIONS (Cont.)

FMVSS 208 SEAT BELT WARNING SYSTEM CHECK

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No.: CW0204;

Technician: Al Chalmers;

Date: March 3, 1998

Complete the following to determine which seat belt warning system option (S7.3(a)(1) or S7.3(a)(2)) is used. (Manufacturers may use either option.)

A. With occupant in driver's position and lap belt in stowed position and ignition switch placed in "Start/On" position:

A.1 S7.3(a)(1)

Time duration of audible warning signal = 6 seconds
(4 to 8 seconds)

Time duration of reminder light operation = 60 seconds
(no less than 60 seconds)

A.2 S7.3(a)(2)

Time duration of audible warning signal = seconds
(4 to 8 seconds)(see 49 USCS @ 30124)

Time duration of reminder light operation = seconds
(4 to 8 seconds)

B. With occupant in driver's position and lap belt in use and ignition switch placed in "Start/On" position:

B.1 S7.3(a)(1)

Time duration of audible warning signal = 0 seconds
(audible warning not required)

Time duration of reminder light operation = 2 seconds
(reminder light not required)

B.2 S7.3(a)(2)

Time duration of audible warning signal = seconds
(audible warning not required)

Time duration of reminder light operation = seconds
(4 to 8 seconds)

A. Note wording of visual warning: ()Fasten seat belt ()Fasten Belt
(X)Symbol 101

TABLE 7 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS (Cont.)

FMVSS 208 READINESS INDICATOR (S4.5.2)

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No.: CW0204;

Technician: Al Chalmers ;

Date: March 3, 1998

An occupant restraint system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. A totally mechanical system is exempt from this requirement.

(11/8/94 legal interpretation)

1. Is the system totally mechanical? Yes No
(If YES this Data Sheet is complete.)

2. Describe the location of the readiness indicator: In the instrument cluster gauge area

3. Is the readiness indicator clearly visible to the driver?
 Yes-Pass No-FAIL

4. Is a list of the elements in the occupant restraint system, being monitored by the readiness indicator, provided?
 Yes-Pass No-FAIL

TABLE 7 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS (Cont.)

FMVSS 208 REAR OUTBOARD SEATING POSITION SEAT BELTS

Vehicle Year/Make/Model/Body Style:1998/Ford/Taurus/4 Door

NHTSA No.:CW0204; Technician: Al Chalmers; Date: March 3, 1998

1. Do all rear outboard seating positions have type 2 seat belts?
(X)Yes ()No

If NO, describe the seat belt installed, the seat location, and any other information about the seat that would explain why a type 2 belt was not installed.

TABLE 8 LAP BELT LOCKABILITY

Passenger cars, trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. (S7.1.1.5)

Complete one of these forms for **each** designated seating position with forward-facing seats, other than the driver's seat, or seats that can be adjusted to forward-facing **and** that has seat belt retractors that are not automatic locking retractors. (S7.1.1.5(c))

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No.: CW0204;

Technician: Al Chalmers;

Date: March 3, 1998

Designated Seating Position Tested: Right Front Outboard

1. Record the seating position. Right Front Outboard
(Any position is acceptable.)
2. Buckle the seat belt.
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature.
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle.
(X) Yes-Pass () No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing.
(X) Yes-Pass () No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?
(X) Yes, go to 6.1 () No, go to 7.
 - 6.1 If yes, does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system.
(X) Yes-Pass () No-FAIL
7. Locate a reference point A on the seat belt buckle.

TABLE 8 LAP BELT LOCKABILITY (Cont.)

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly.
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system.
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly.
Measured distance between A and B is 53 inches.
11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing.
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal.
The measured force application angle = 14 degrees.

Webbing Tension Pull Device

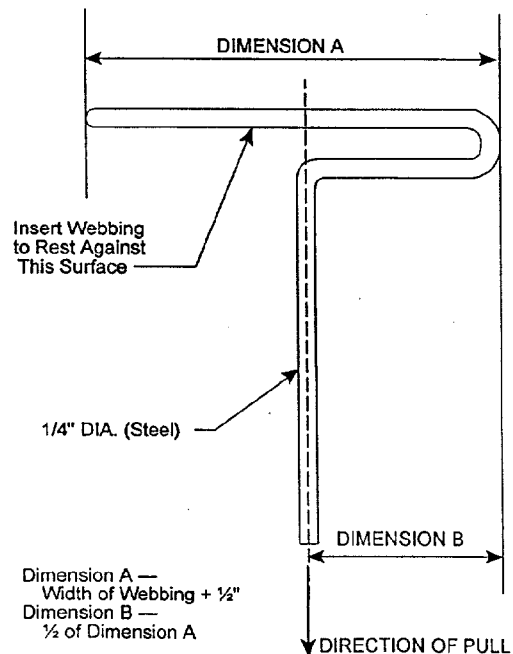


FIGURE 5

TABLE 8 LAP BELT LOCKABILITY (Cont.)

13. The length between points A and B along the longitudinal centerline of the webbing while the preload is being applied.
Measured distance between A and B is 47.25 inches.
14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing.
Record onset rate: 18 lb/sec.
Record the distance between points A and B: 47.25 inches
15. Subtract the measurement in 14 from the measurement in 13. Is the difference 2 inches or less? 14-13 = 0 inches (X)Yes-Pass () No-FAIL
16. Subtract the measurement in 10 from the measurement in 14. Is the difference 3 inches or more? 10-14 = 5.75 inches (X)Yes-Pass () No-FAIL

TABLE 8 LAP BELT LOCKABILITY (Cont.)

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No.: CW0204;

Technician: Al Chalmers;

Date: March 3, 1998

Designated Seating Position Tested: Left Rear Outboard

1. Record the seating position. Left Rear Outboard
(Any position is acceptable.)
2. Buckle the seat belt.
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature.
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle.
(X) Yes-Pass () No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing.
(X) Yes-Pass () No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?
(X) Yes, go to 6.1 () No, go to 7.
 - 6.1 If yes, does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system.
(X) Yes-Pass () No-FAIL
7. Locate a reference point A on the seat belt buckle.

TABLE 8 LAP BELT LOCKABILITY (Cont.)

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly.
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system.
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly.
Measured distance between A and B is 55.1 inches.
11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing.
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal.
The measured force application angle = 9 degrees.

Webbing Tension Pull Device

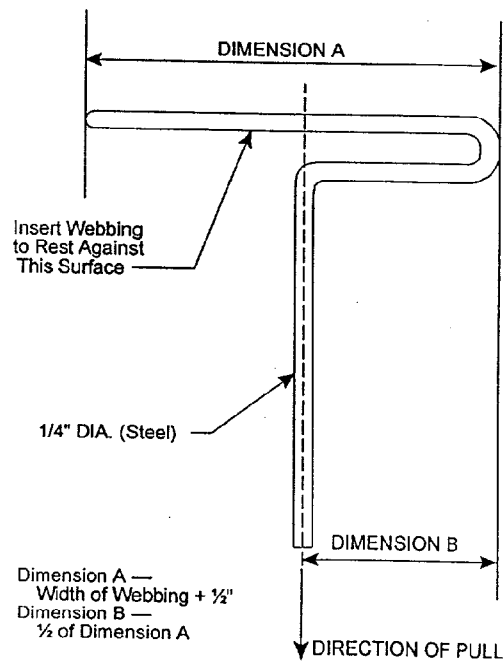


FIGURE 5

TABLE 8 LAP BELT LOCKABILITY (Cont.)

13. The length between points A and B along the longitudinal centerline of the webbing while the preload is being applied.
Measured distance between A and B is 48.5 inches.
14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing.
Record onset rate: 10 lb/sec.
Record the distance between points A and B: 48.5 inches
15. Subtract the measurement in 14 from the measurement in 13. Is the difference 2 inches or less? 14-13 = 0 inches (X)Yes-Pass () No-FAIL
16. Subtract the measurement in 10 from the measurement in 14. Is the difference 3 inches or more? 10-14 = 6.6 inches (X)Yes-Pass () No-FAIL

TABLE 8 LAP BELT LOCKABILITY (Cont.)

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No.: CW0204;

Technician: Al Chalmers ;

Date: March 3, 1998

Designated Seating Position Tested: Center Rear Outboard

1. Record the seating position. Center Rear Outboard
(Any position is acceptable.)
2. Buckle the seat belt.
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature.
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle.
(X)Yes-Pass () No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing.
(X)Yes-Pass () No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing? (X)Yes, go to 6.1 () No, go to 7.
 - 6.1 If yes, does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system.
(X)Yes-Pass () No-FAIL
7. Locate a reference point A on the seat belt buckle.

TABLE 8 LAP BELT LOCKABILITY (Cont.)

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly.
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system.
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly.
Measured distance between A and B is 48.5 inches.
11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing.
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal.
The measured force application angle = 10 degrees.

Webbing Tension Pull Device

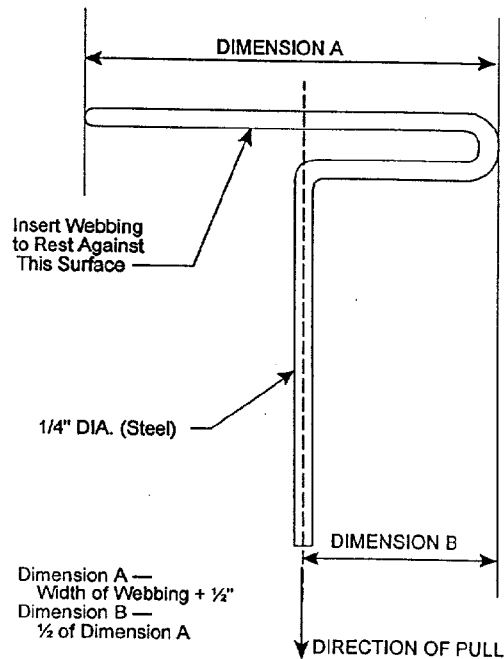


FIGURE 5

TABLE 8 LAP BELT LOCKABILITY (Cont.)

13. The length between points A and B along the longitudinal centerline of the webbing while the preload is being applied.
Measured distance between A and B is 38 inches.
14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing.
Record onset rate: 12 lb/sec.
Record the distance between points A and B: 38.1 inches
15. Subtract the measurement in 14 from the measurement in 13. Is the difference 2 inches or less? $14-13 = \underline{0.1 \text{ inches}}$ Yes-Pass No-FAIL
16. Subtract the measurement in 10 from the measurement in 14. Is the difference 3 inches or more? $10-14 = \underline{10.4 \text{ inches}}$ Yes-Pass No-FAIL

TABLE 8 LAP BELT LOCKABILITY (Cont.)

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

NHTSA No.: CW0204;

Technician: Al Chalmers;

Date: March 3, 1998

Designated Seating Position Tested: Right Rear Outboard

1. Record the seating position. Right Rear Outboard
(Any position is acceptable.)
2. Buckle the seat belt.
3. Complete any procedures recommended in the vehicle owner's manual to activate any locking feature.
4. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT have to be attached by the vehicle user to the seat belt webbing, retractor, or any other part of the vehicle.
(X) Yes-Pass () No-FAIL
5. Does the lap belt portion of the seat belt in the forward-facing seat or seat that can be adjusted to forward-facing consist of a locking device that does NOT require inverting, twisting or deforming of the belt webbing.
(X) Yes-Pass () No-FAIL
6. Does the vehicle user need to take some action to activate the locking feature on the lap belt portion of the seat belt in any forward-facing seat or seat that can be adjusted to forward-facing?
(X) Yes, go to 6.1 () No, go to 7.
 - 6.1 If yes, does the vehicle owner's manual include a description in words and/or diagrams describing how to activate the locking feature so that the seat belt assembly can tightly secure a child restraint system and how to deactivate the locking feature to remove the child restraint system.
(X) Yes-Pass () No-FAIL
7. Locate a reference point A on the seat belt buckle.

TABLE 8 LAP BELT LOCKABILITY (Cont.)

8. Locate a reference point B on the attachment hardware or retractor assembly at the other end of the lap belt or lap belt portion of the seat belt assembly.
9. Adjust the lap belt or lap belt portion of the seat belt assembly according to any procedures recommended in the vehicle owner's manual to activate any locking feature so that the webbing between points A and B is at the maximum length allowed by the belt system.
10. Measure and record the distance between points A and B along the longitudinal centerline of the webbing for the lap belt or lap belt portion of the seat belt assembly.
Measured distance between A and B is 59.5 inches.
11. Readjust the belt system so that the webbing between points A and B is at any length that is 5 inches or more shorter than the maximum length of the webbing.
12. To the lap belt or lap belt portion of the seat belt assembly, apply a preload of 10 pounds using the webbing tension pull device. Apply the load in a vertical plane parallel to the longitudinal axis of the vehicle and passing through the seating reference point of the designated seating position. Apply the preload in a horizontal direction toward the front of the vehicle with a force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal.
The measured force application angle = 10 degrees.

Webbing Tension Pull Device

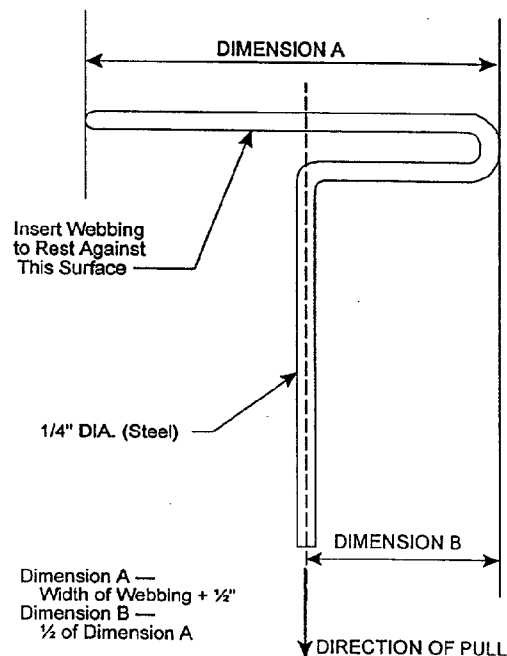


FIGURE 5

TABLE 8 LAP BELT LOCKABILITY (Cont.)

13. The length between points A and B along the longitudinal centerline of the webbing while the preload is being applied.
Measured distance between A and B is 54.5 inches.
14. Increase the load to 50 pounds at a rate of no more than 50 pounds per second. Attain the load in not more than 5 seconds. (If webbing sensitive emergency locking retractors are installed as part of the lap belt or lap belt portion of the seat belt assembly, apply the load at a rate less than the threshold value for lock-up specified by the manufacturer.) Maintain the load for at least 5 seconds. Measure and record the distance between points A and B along the longitudinal centerline of the webbing.
Record onset rate: 10 lb/sec.
Record the distance between points A and B: 54.5 inches
15. Subtract the measurement in 14 from the measurement in 13. Is the difference 2 inches or less? 14-13 = 0 inches (X)Yes-Pass () No-FAIL
16. Subtract the measurement in 10 from the measurement in 14. Is the difference 3 inches or more? 10-14 = 5 inches (X)Yes-Pass () No-FAIL

TABLE 9 AIR BAG LABELS

Vehicle Year/Make/Model/Body Style:1998/Ford/Taurus/4 Door

NHTSA No.:CW0204;

Technician: Al Chalmers ;

Date: March 3, 1998

1. Air bag maintenance label and owner's manual instructions:
 - 1.1. Does the manufacturer recommend periodic maintenance or replacement of the airbag? Yes, go to 1.2 No, go to 2
 - 1.2. Does the vehicle have a maintenance or replacement label? Yes-Pass No-FAIL
 - 1.3. Does the label contain one of the following?
 Yes-Pass No-FAIL
Schedule on label specifies month and year
Schedule on label specifies vehicle mileage
Schedule on label specifies interval measured from date on certification label
 - 1.4. Is the label permanently affixed within the passenger compartment? Yes-Pass No-FAIL
 - 1.5. Is the label lettered in English? Yes-Pass No-FAIL
 - 1.6. Is the label in block capitals and numerals? Yes-Pass No-FAIL
 - 1.7. Are the letters and numerals at least 3/32 inches high? Yes-Pass No-FAIL
 - 1.8. Does the owner's manual set forth the recommended schedule for maintenance or replacement? Yes-Pass No-FAIL
2. Does the owner's manual:
 - 2.1. Include a description of the vehicle's airbag system in an easily understandable format? Yes-Pass No-FAIL
 - 2.2. Include a statement that the vehicle is equipped with an airbag and a lap/shoulder belt at the front outboard seating positions? Yes-Pass No-FAIL

TABLE 9 AIR BAG LABELS (Cont.)

- 2.3 Include a statement that the air bag is a supplemental restraint at the front outboard seating positions?
(X)Yes-Pass ()No-FAIL
- 2.4 Emphasize that all occupants, including the driver, should always wear their seat belts whether or not an airbag is also provided at their seating positions to minimize the risk of severe injury or death in the event of a crash?
(X)Yes-Pass ()No-FAIL
- 2.5 Provide any necessary precautions regarding the proper positioning of occupants, including children, at seating positions equipped with air bags to insure maximum safety protection for those occupants?
(X)Yes-Pass ()No-FAIL
- 2.6 Explain that no objects should be placed over or near the air bag on the steering wheel or on the instrument panel, because any such objects could cause harm if the vehicle is in a crash severe enough to cause the air bag to inflate?
(X)Yes-Pass ()No-FAIL
3. Does the vehicle:
- 3.1. Provide an automatic means to ensure that the airbag does not deploy when a child seat or child with a total mass of 30 kg or less is present on the front outboard passenger? ()Yes (X)No
- 3.2. Incorporate sensors, other than or in addition to weight sensors, which automatically prevent the passenger air bag from deploying in situations in which it might have an adverse effect on infants in rear-facing child seats, and unbelted or improperly belted children? ()Yes-Pass (X)No
- 3.3. have a passenger air bag designed to deploy in a manner that does not create a risk of serious injury to infants in rear-facing child seats, and unbelted or improperly belted children? ()Yes (X)No

TABLE 9 AIR BAG LABELS (Cont.)

If yes to 3.1, or 3.2, or 3.3, the vehicle is not required to have a sunvisor warning label, an airbag alert label or a label on the dash and this check sheet is complete. If no to 3.1, 3.2, and 3.3, go to 4.

4. Sun Visor Warning Label

4.1. Is the label permanently affixed (may be permanent marking or molding) to either side of the sunvisor at each front outboard seating position with an airbag?

Driver Side - Yes-Pass No-FAIL

Passenger Side - Yes-Pass No-FAIL

4.2. Does the label conform in content (vehicles without back seats may omit the statement: "The back seat is the safest place for children.") to either label shown on the next page as appropriate at each front outboard seating position with an air bag?

4.2.1 **Dual air bags:** Not Applicable

Driver Side - Yes No-FAIL

Passenger Side - Yes No-FAIL

4.2.2 **Vehicle with driver air bag ONLY - either 3.2.1 or 3.2.2 is applicable, not both.**

4.2.2.1 Does the label conform in content to either label shown on the following page as appropriate?

Not Applicable

Driver Side - Yes-Pass No-FAIL

4.2.2.2 Does the label conform in content to the first label shown on the following page where the label can be modified to omit the pictogram and the message text may read:

TABLE 9 AIR BAG LABELS (Cont.)

DEATH or SERIOUS INJURY can occur.

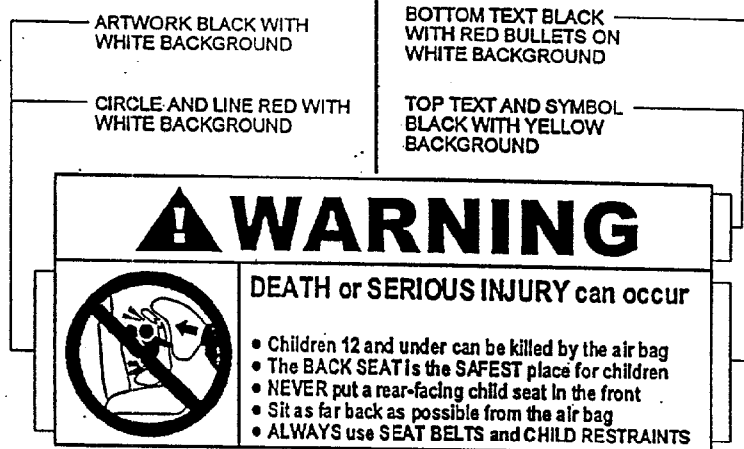
- Sit as far back as possible from the air bag.
- ALWAYS use SEAT BELTS and CHILD RESTRAINTS
- The BACK SEAT is the SAFEST place for children.

(X) Not Applicable

Driver Side - () Yes-Pass () No-FAIL

SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION

LABEL OUTLINE, VERTICAL AND HORIZONTAL LINE BLACK



SUN VISOR LABEL VISIBLE WHEN VISOR IS IN DOWN POSITION

LABEL OUTLINE, VERTICAL AND HORIZONTAL LINE BLACK

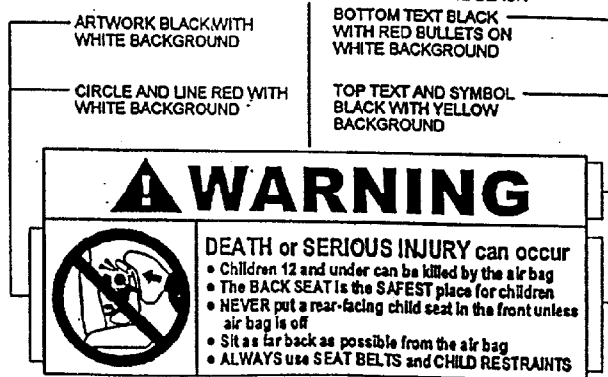


TABLE 9 AIR BAG LABELS (Cont.)

- 4.3 Is the label heading area yellow with the word “warning” and the alert symbol in black?
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL
- 4.4 Is the message white with black text?
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL
- 4.5 Is the message area at least 30 cm²? Actual message area: 32 cm²
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL
- 4.6 Is the pictogram black with a red circle and slash on a white background?
For vehicles with driver side air bag ONLY () Not Applicable
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL
- 4.7 Is the pictogram at least 30 mm in diameter? Actual diameter: 30 mm
For vehicles with driver side air bag ONLY () Not Applicable
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL
- 4.8 Is the same side of the sun visor to which the sun visor label is affixed free of other information with the exception of an air bag maintenance label?
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL
- 4.9 Is the sun visor free of other information about air bags or the need to wear seat belts with the exception of the air bag alert label or the utility vehicle label?
Driver Side - (X)Yes-Pass ()No-FAIL
Passenger Side - (X)Yes-Pass ()No-FAIL

TABLE 9 AIR BAG LABELS (Cont.)

5. Air Bag Alert Label

5.1 Is the Sun Visor Warning Label visible when the sunvisor is in the stowed position?

Driver Side - Yes, go to 6 No

Passenger Side - No air bag Yes No

5.2 Does the label conform in content to the label shown below?

Driver Side - Yes **No-FAIL**

Passenger Side - No air bag Yes-Pass **No-FAIL**

5.3 Is the message area black with yellow text?

Driver Side - Yes-Pass **No-FAIL**

Passenger Side - No air bag Yes-Pass **No-FAIL**

5.4 Is the message area at least 20 cm²? Actual message area: _____ cm²

Driver Side - Yes-Pass **No-FAIL**

Passenger Side - No air bag Yes-Pass **No-FAIL**

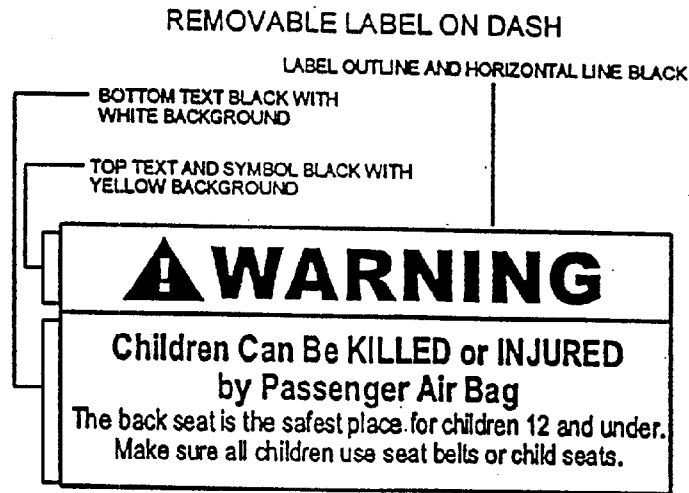
5.5 Is the pictogram black with a red circle and slash on a white background?

For vehicles with driver side air bag ONLY Not Applicable

Yes-Pass **No-FAIL**

TABLE 9 AIR BAG LABELS (Cont.)

- 5.6 Is the pictogram at least 20 mm in diameter? Actual diameter _____ mm
For vehicles with driver side air bag ONLY () Not Applicable
() Yes-Pass () No-FAIL



6. Label On the Dash
- 6.1 Does the vehicle have a passenger side air bag?
(X)Yes () No, check sheet is complete.
- 6.2 Does the vehicle have a label on the dash or steering wheel hub?
(X)Yes-Pass () No-FAIL
- 6.3 Does the label conform in content (vehicles without back seats may omit the statement: "The back seat is the safest place for children 12 and under." to the label shown below. (X)Yes-Pass () No-FAIL
- 6.4 Is the heading area yellow with the word "warning" and the alert symbol in black?
(X)Yes-Pass () No-FAIL

TABLE 9 AIR BAG LABELS (Cont.)

- 6.5 Is the message white with black text? Yes-Pass No-FAIL
- 6.6 Is the message area at least 30 cm²? Actual message area: 83 cm²
 Yes-Pass No-FAIL

SUN VISOR LABEL VISIBLE WHEN VISOR IS IN UP POSITION

CIRCLE AND LINE RED
WITH WHITE BACKGROUND

TEXT YELLOW WITH
BLACK BACKGROUND

ARTWORK BLACK WITH
WHITE BACKGROUND



SECTION 4
OCCUPANT, VEHICLE, AND CAMERA INFORMATION

TABLE 10 SEAT AND STEERING COLUMN POSITIONING DATA

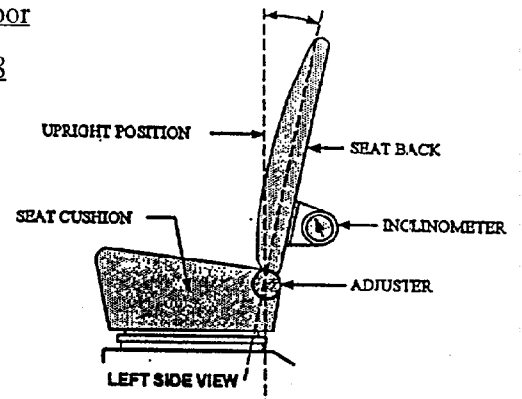
Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

Vehicle NHTSA No.: CW0204 Test Date: March 5, 1998

NOMINAL DESIGN RIDING POSITION:

Driver Seat: Seat Back Angle = 27.8°

Passenger Seat: Seat Back Angle = 27.7°



SEAT FORE AND AFT POSITIONS:

Driver Seat: The seat track had a total position movement of 13 notches and was positioned 7 notches rearward from the foremost position with the forward most locking position as zero.

Passenger Seat: The seat track had a total position movement of 13 notches and was positioned 7 notches rearward from the foremost position with the forward most locking position as zero.

STEERING COLUMN ADJUSTMENTS:

The steering column was placed in the mid position.

FIGURE 1 DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS

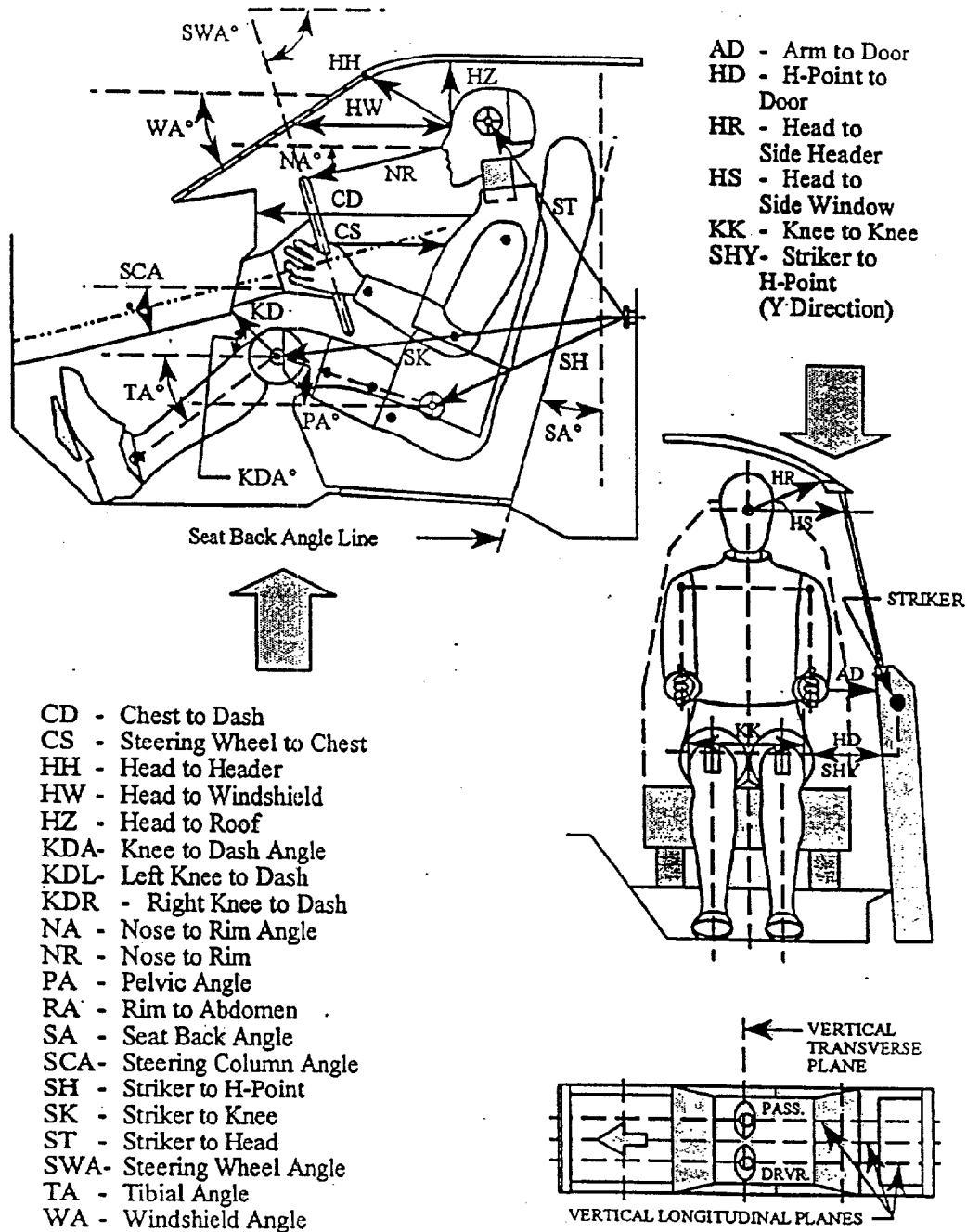


TABLE 11 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

Vehicle Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

Vehicle NHTSA No.: CW0204 Test Date: March 5, 1998

	DRIVER (Serial #403)	PASSENGER (Serial #401)
WA°	25.9°	
SWA°	21.7°	N/A
SCA°	21.9°	N/A
SA°	27.8°	27.7°
HZ	6.6 in.	6.1 in.
HH	11.9 in.	12.1 in.
HW	23.1 in.	22.7 in.
HR	9.2 in.	9.1 in.
NR	14.8 in. Angle (NA) 11.8°	N/A
CD	21.0 in.	19.3 in.
CS	12.0 in.	N/A
RA	7.6 in.	N/A
KDL	6.2 in Angle (KDA) 32.2°	6.1 in.
KDR	5.4 in.	6.3 in. Angle (KDA) 29.2°
PA°	24.5°	24.4°
TA°	45.1°	45.3°
KK	11.8 in.	10.2 in.
ST	21.3 in. Angle 8.2°	22.2 in. Angle 12.1°
SK	23.0 in. Angle 90.0°	23.7 in. Angle 92.3°
SH	8.7 in. Angle 119.5°	8.9 in. Angle 117.1°
SHY	10.9 in.	10.2 in.
HS	12.0 in.	12.1 in.
HD	6.0 in.	5.5 in.
AD	4.8 in.	4.2 in.

FIGURE 2 VEHICLE TARGET LOCATIONS

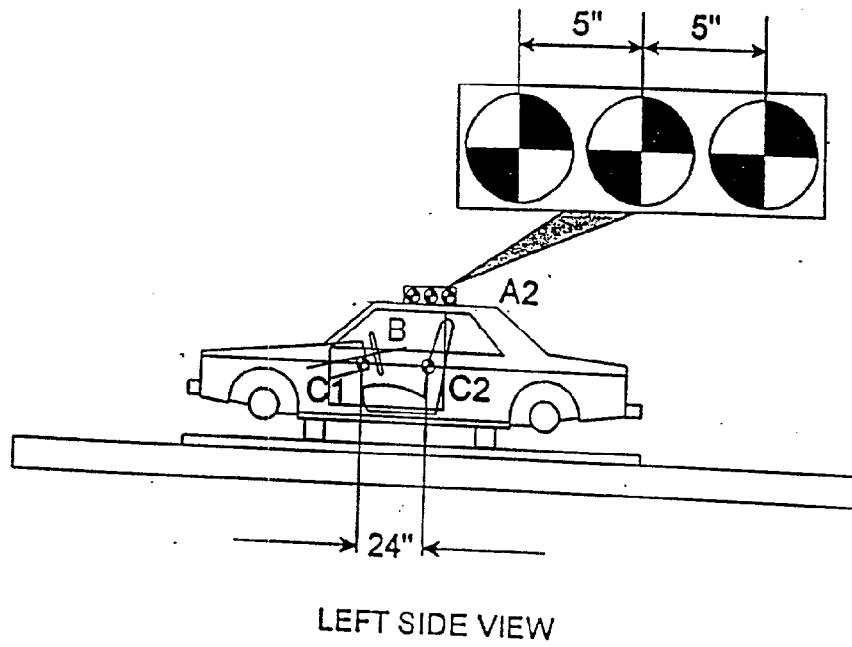
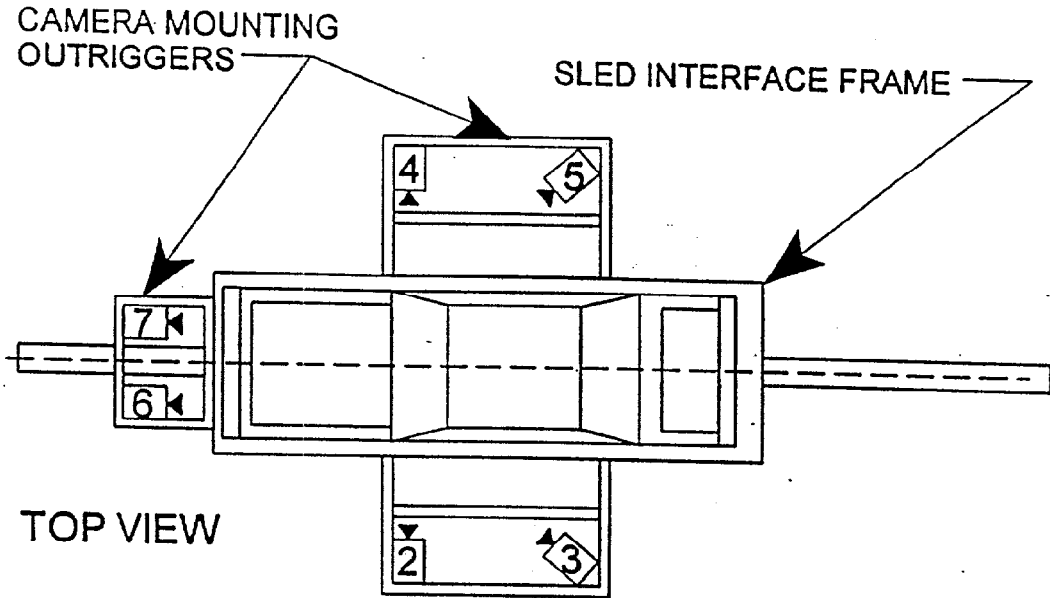


FIGURE 3 CAMERA POSITIONS



TOP VIEW

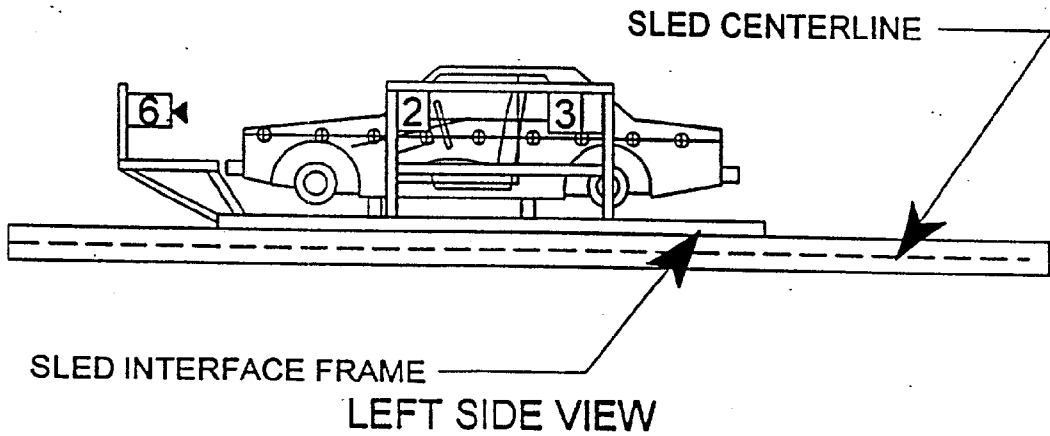
CAMERA FRAME RATES:

#1 = 24 fps

All Others = 1,000 fps



REAL TIME CAMERA



LEFT SIDE VIEW

TABLE 12 CAMERA LOCATIONS

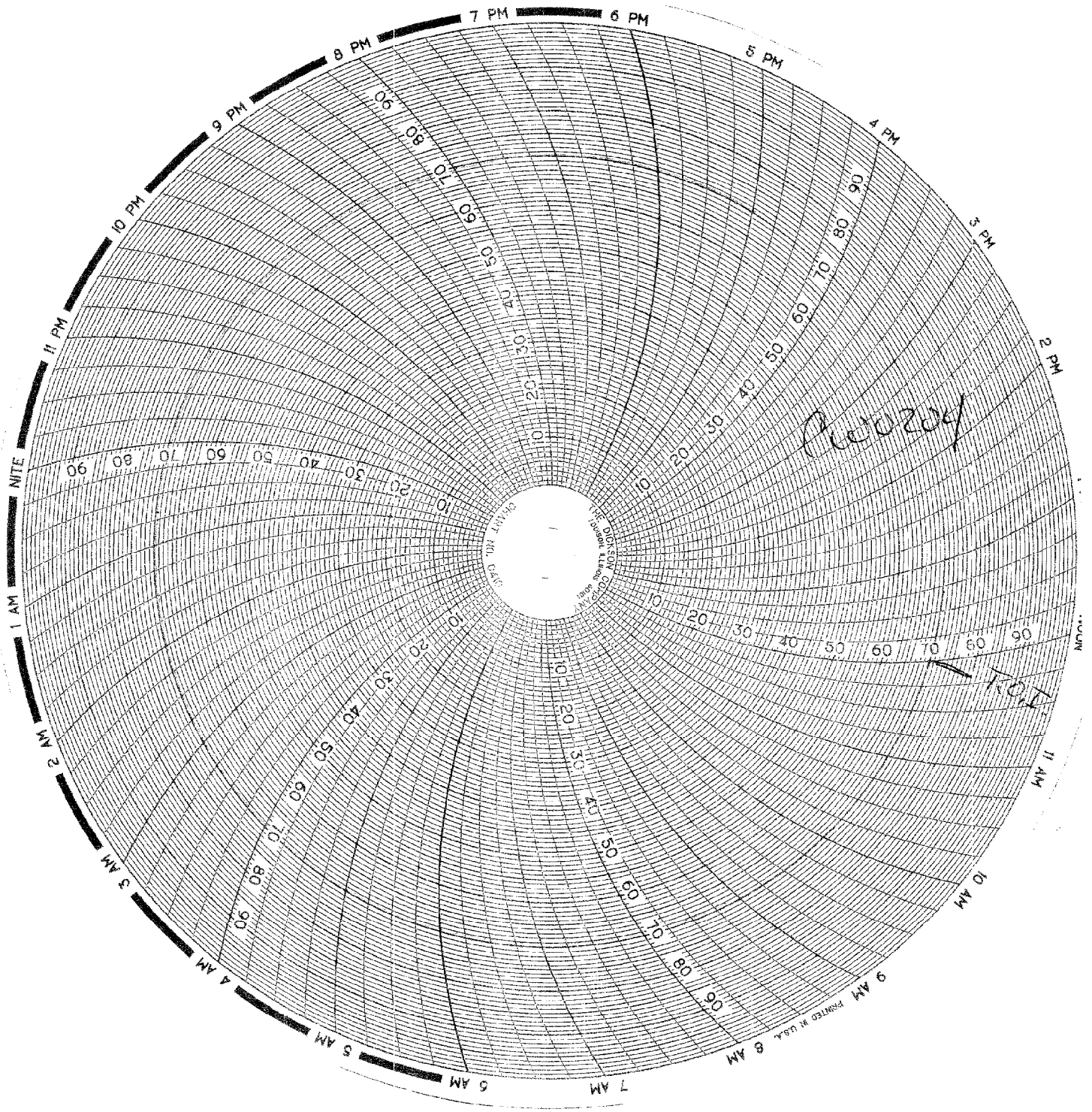
Veh. Year/Make/Model/Body Style: 1998/Ford/Taurus/4 Door

Vehicle NHTSA No.: CW0204; Test Date: March 5, 1998

	VIEW	CAMERA POSITIONS (inches)*			ANGLE (deg)	LENS (mm)	SPEED (fps)
		X	Y	Z			
1	Real-Time (Pre and Post)					10	24
2	Onboard Driver	77.9	90.0	57.4	90	13	1005
3	Onboard Driver Angle	146.1	88.3	66.7		13	733
4	Onboard Passenger	73.1	88.4	57.9	90	13	1026
5	Onboard Passenger Angle	147.3	89.7	67.5		13	870
6	Onboard Windshield Driver	22.2	15.3	61.6		13	1015
7	Onboard Windshield Passenger	22.8	14.2	61.3		13	1005

- * +X = Rearward of the front of the sled carriage
- +Y = Right of the sled carriage longitudinal centerline
- +Z = Above the top of the sled carriage

FIGURE 4 AIR PROBE TEMPERATURE



APPENDIX A
PHOTOGRAPHS

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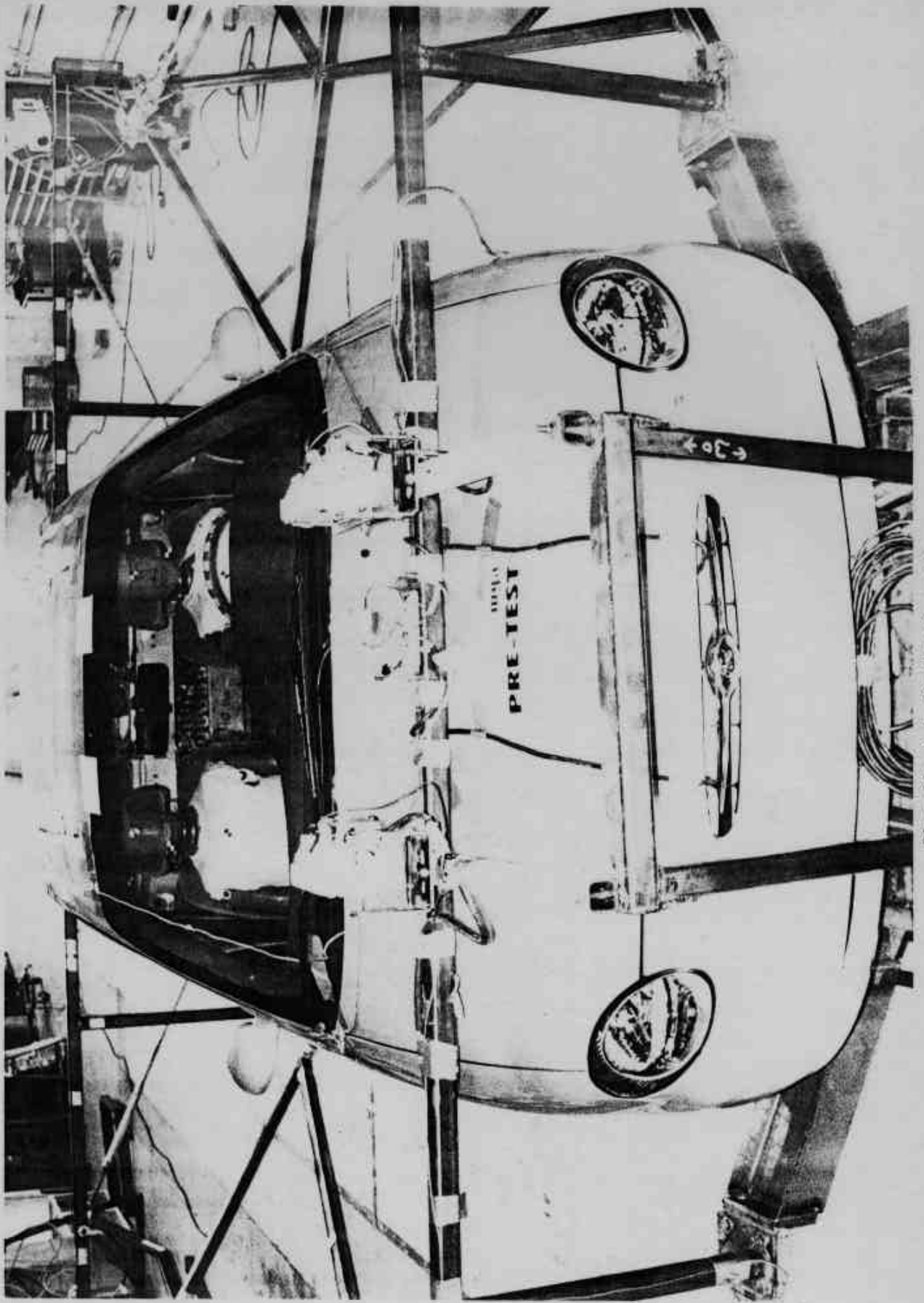


Photo No. A-1 - Pre-Test Front View

A-1

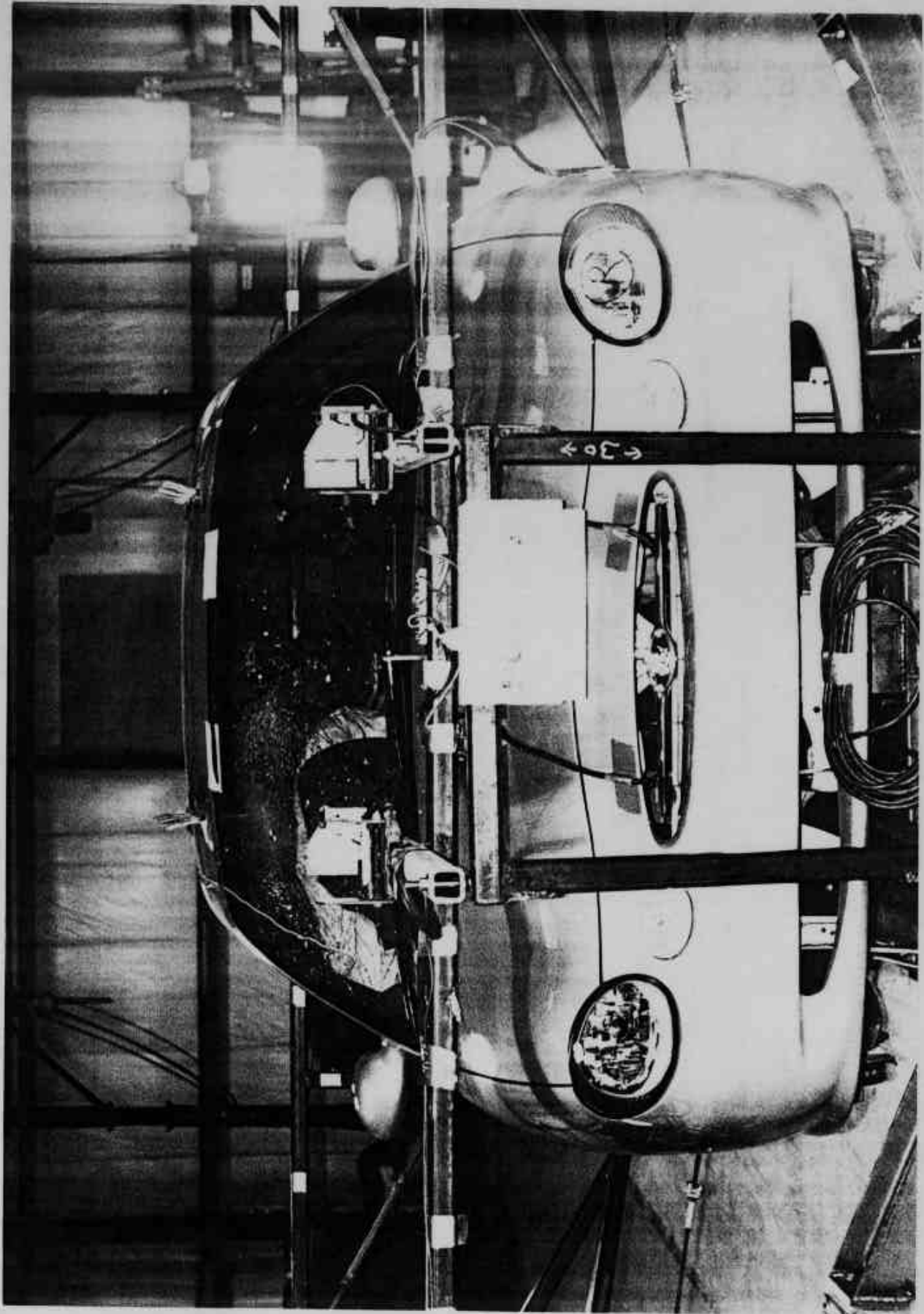
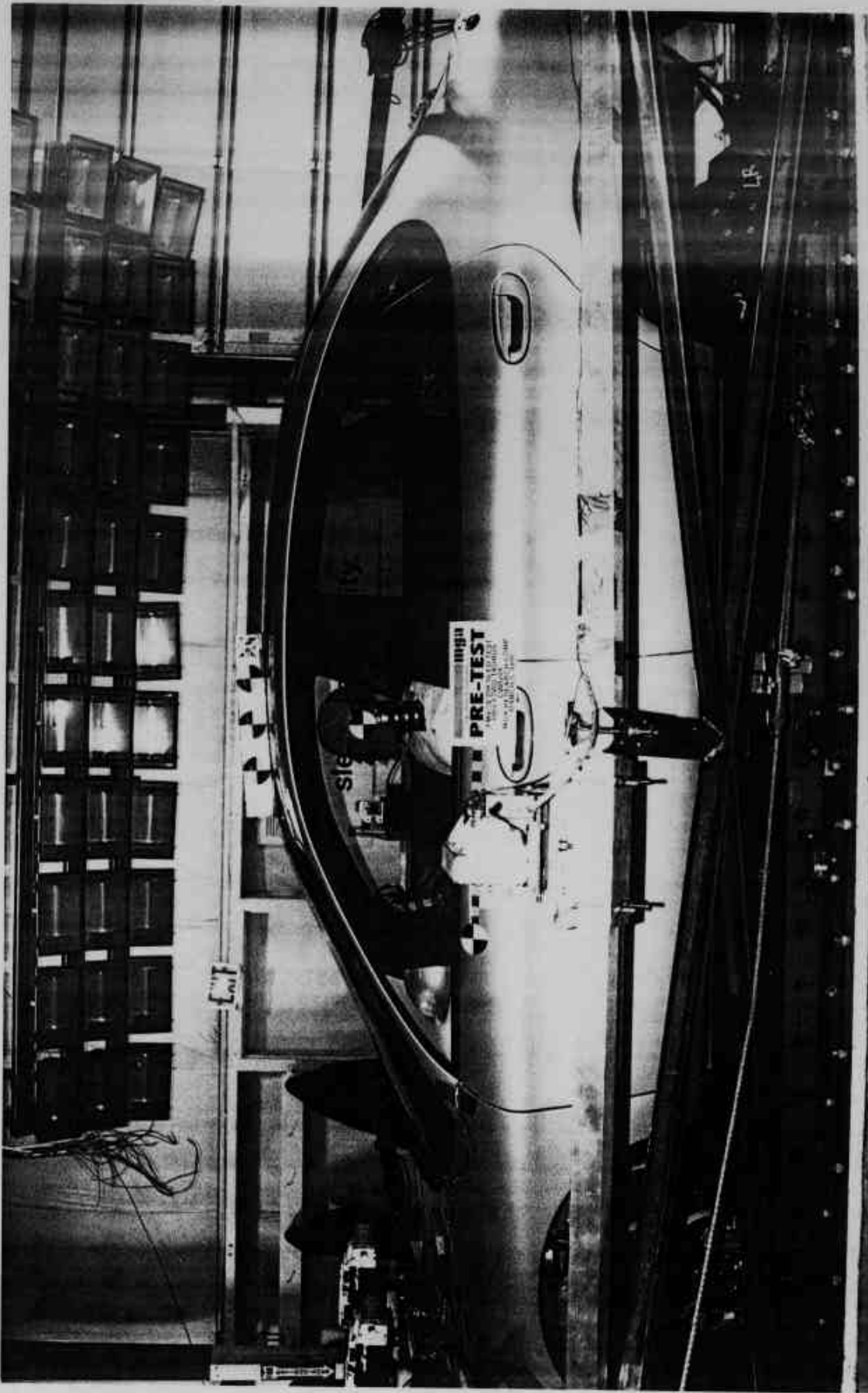


Photo No. A-2 - Post-Test Front View



A-3

Photo No. A-3 - Pre-Test Left Side View

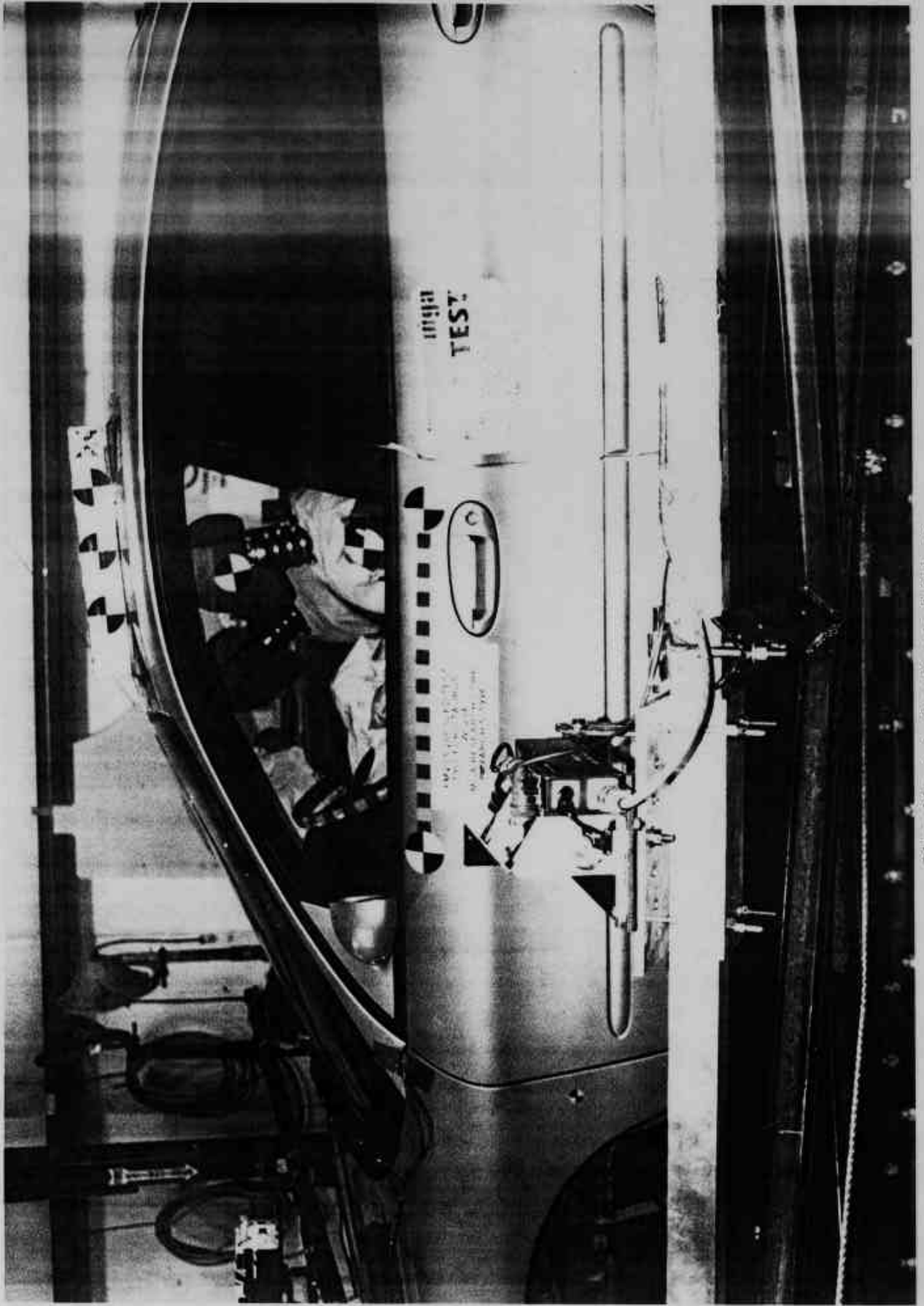


Photo No. A-4 - Post-Test Left Side View

A-4

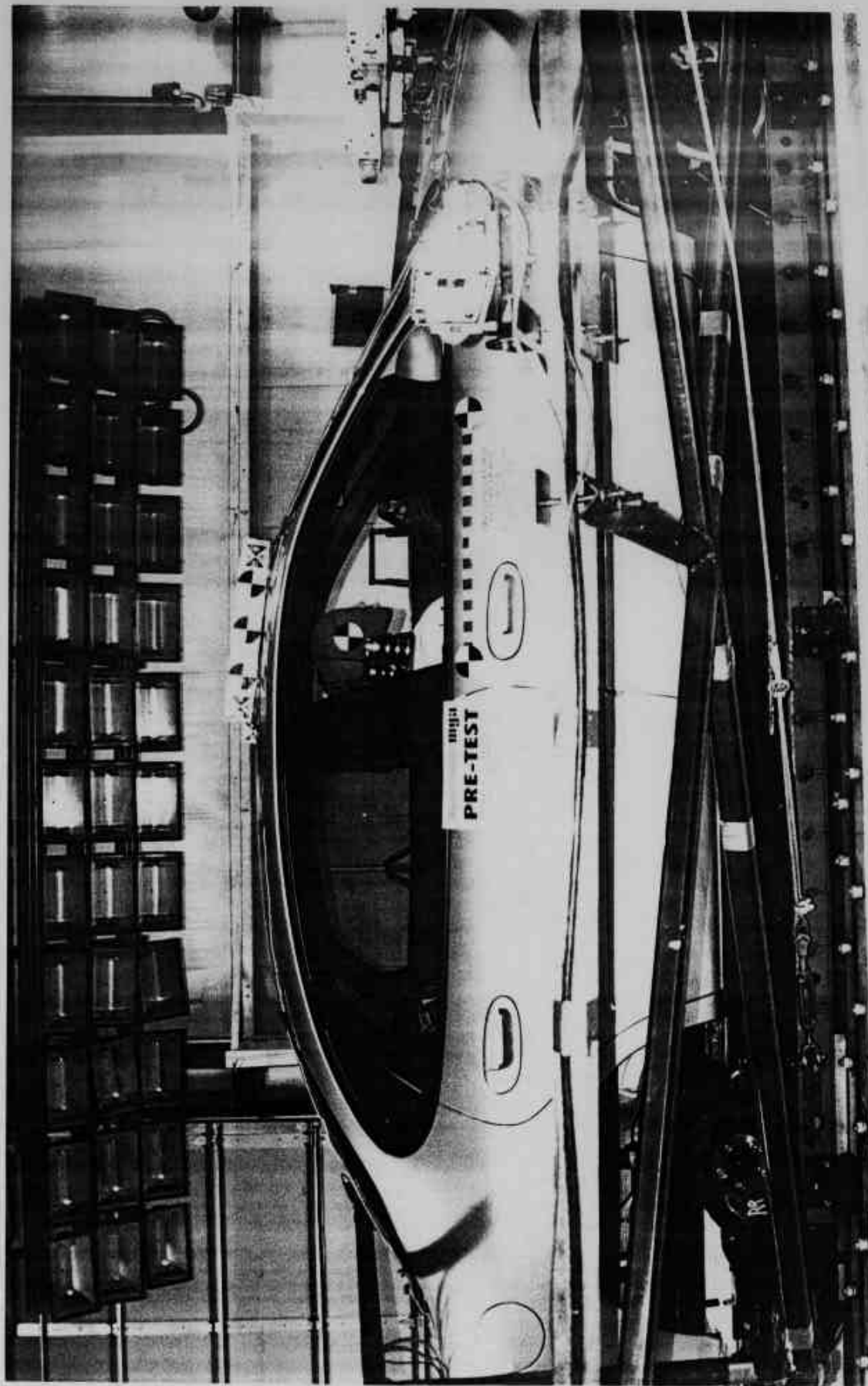
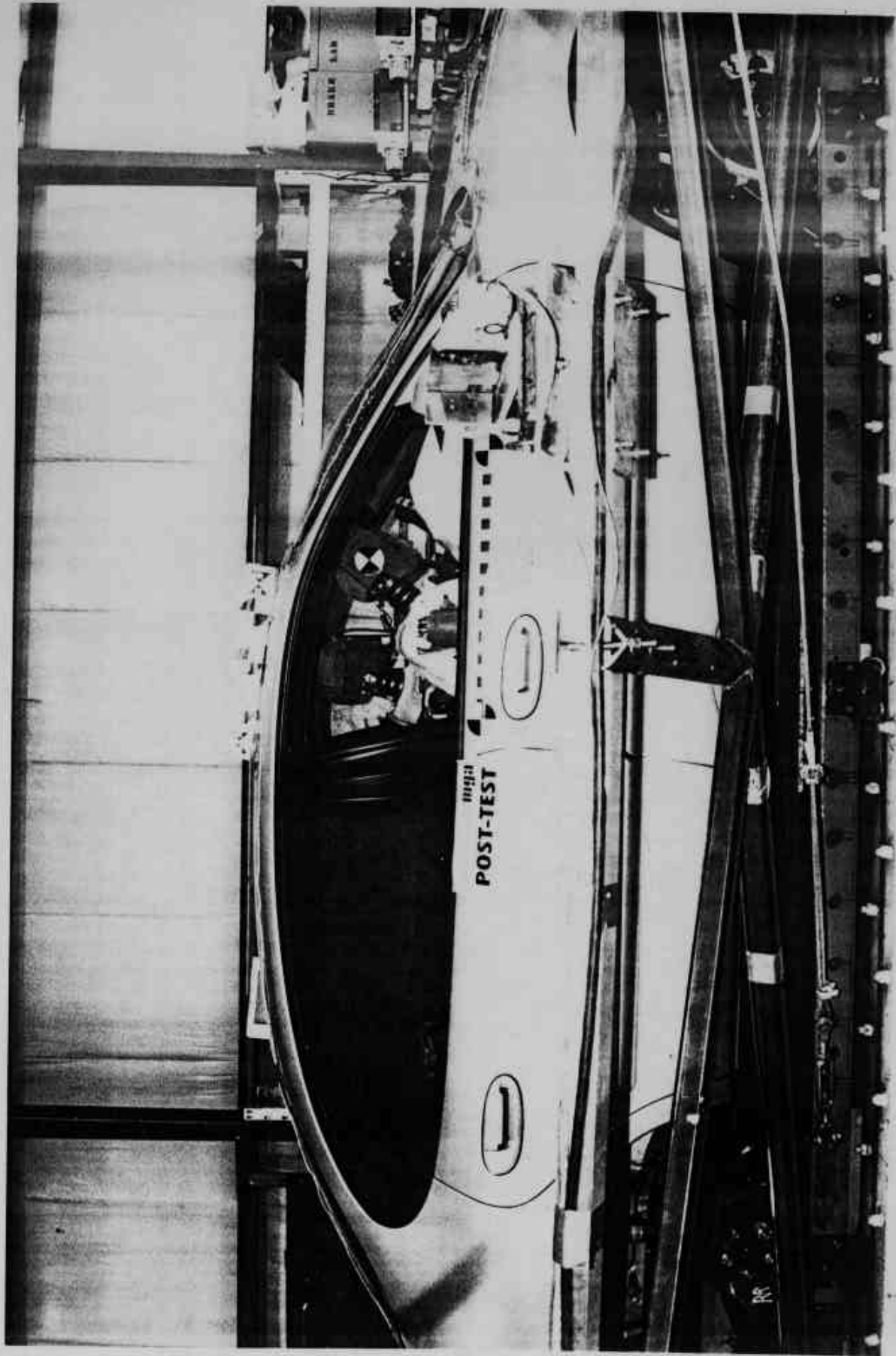


Photo No. A-5 - Pre-Test Right Side View

A-5



A-6

Photo No. A-6 - Post-Test Right Side View

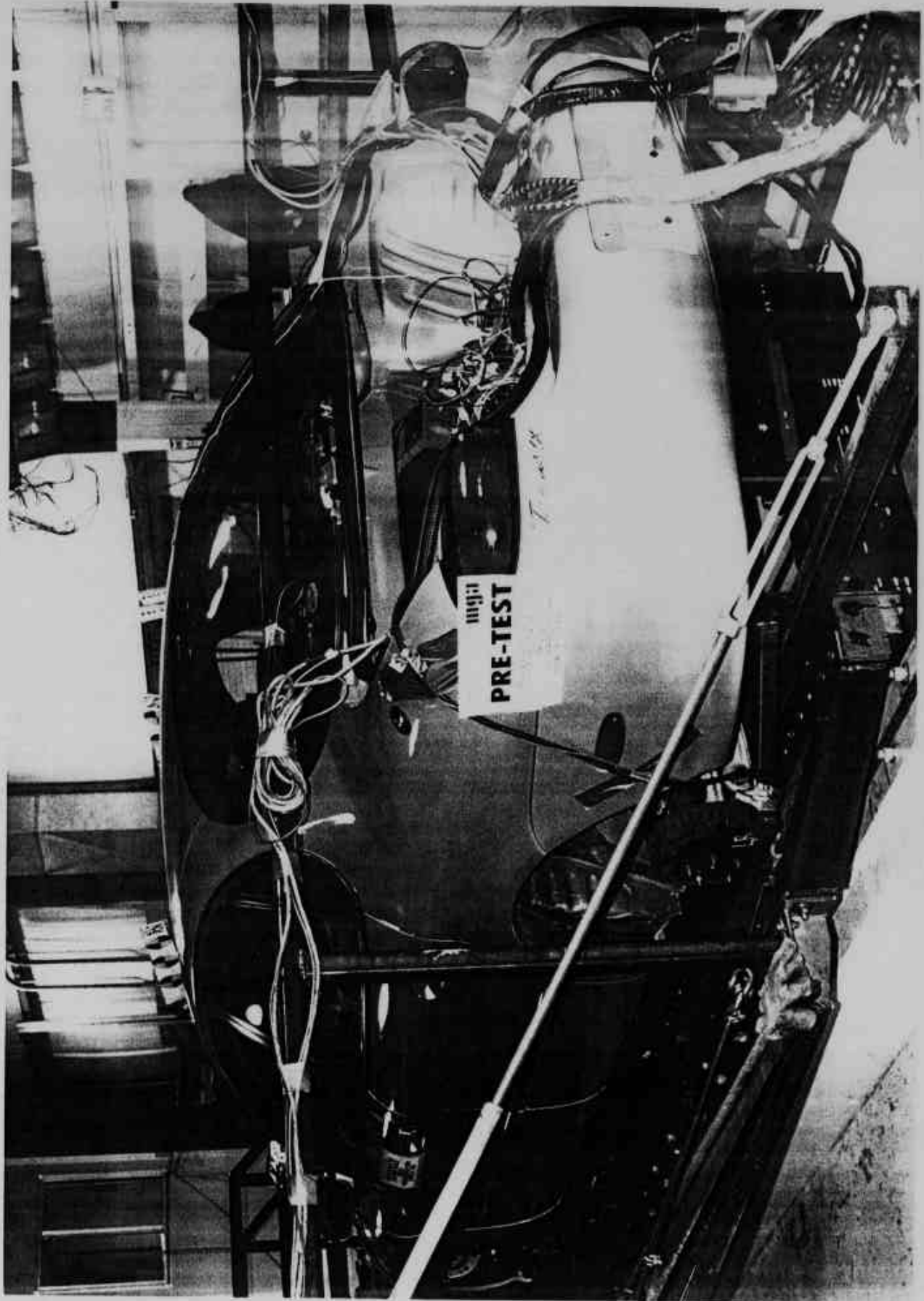


Photo No. A-7 - Pre-Test 3/4 Left Rear View

A-7

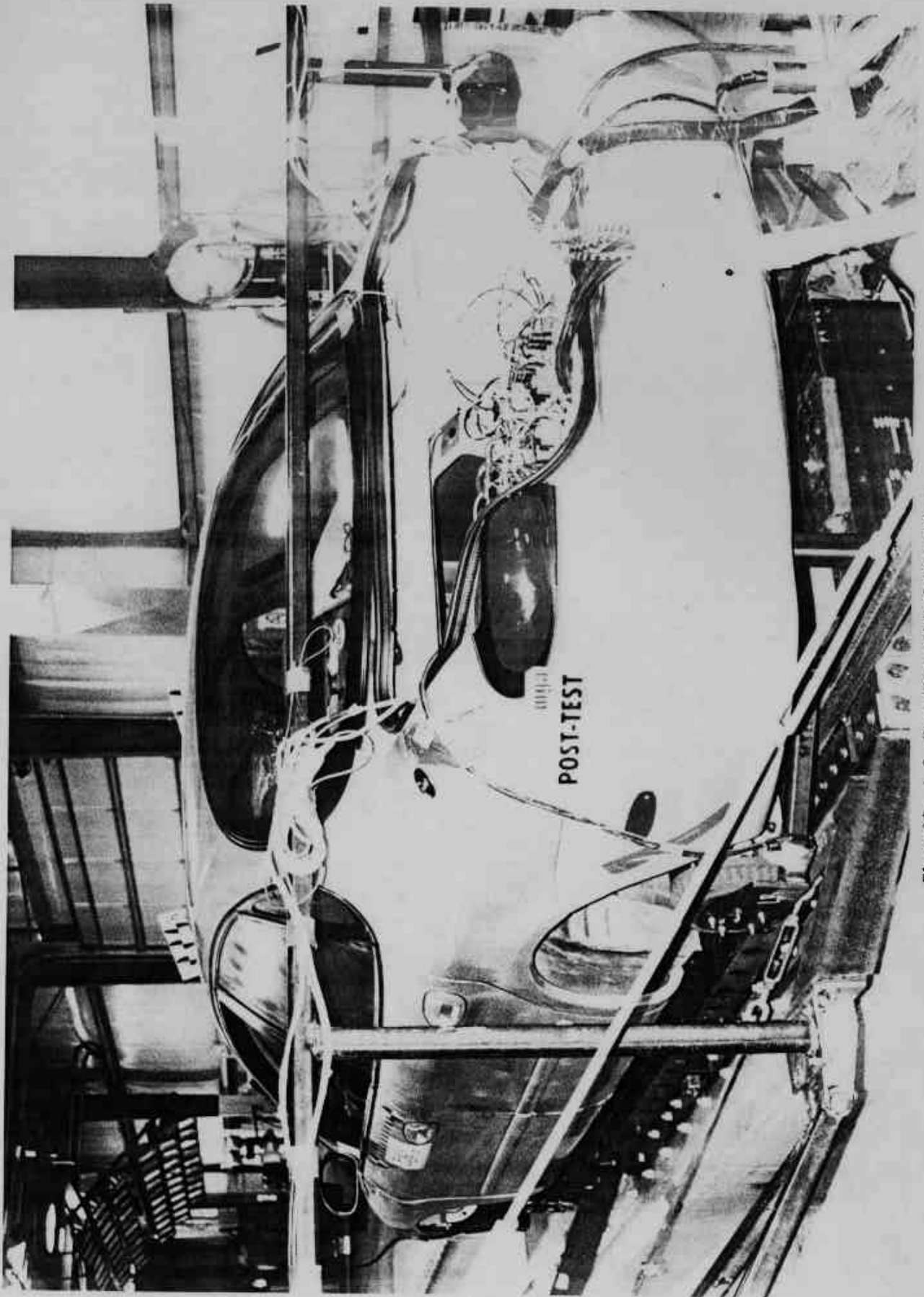


Photo No. A-8 - Post-Test 3/4 Left Rear View

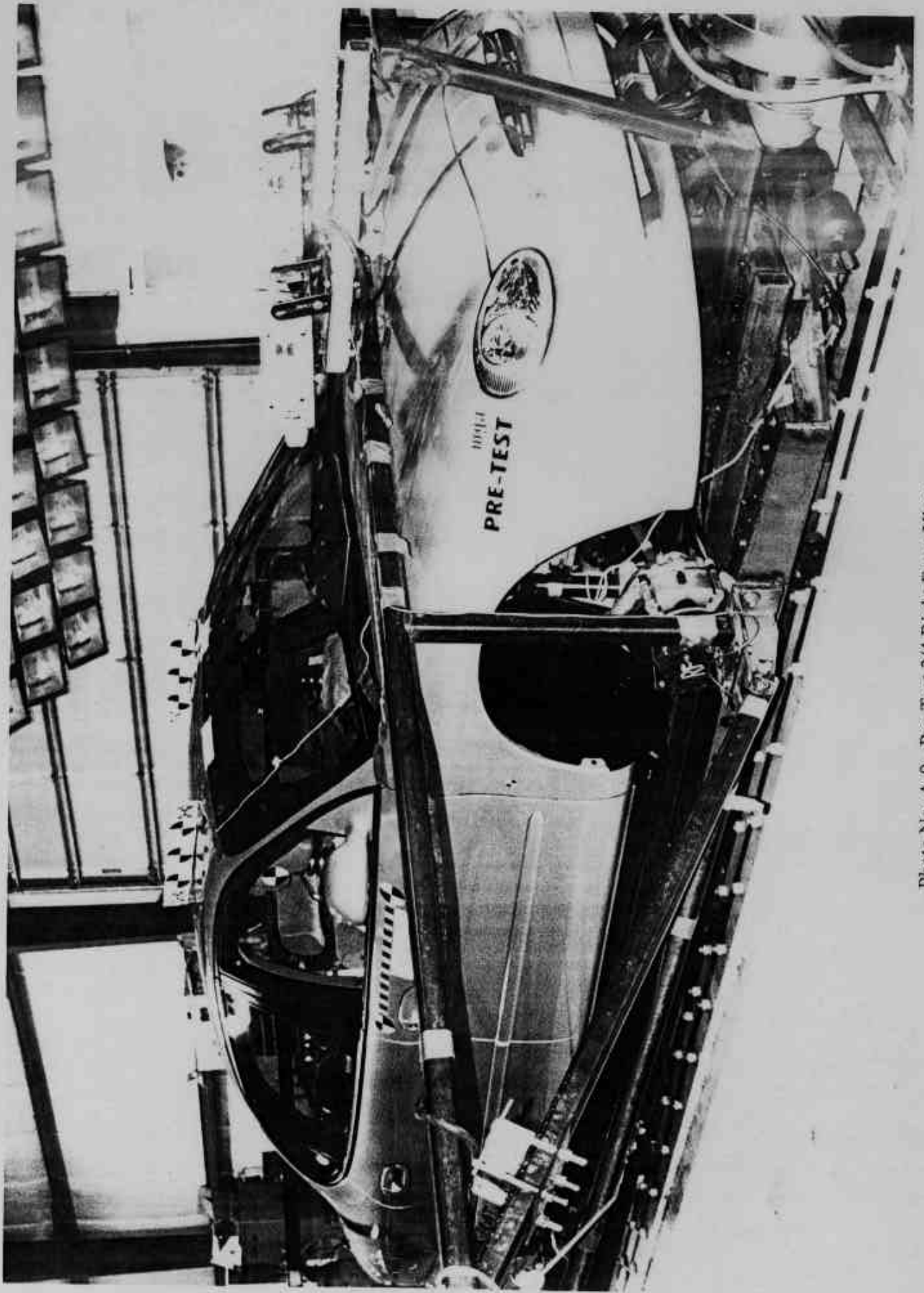


Photo No. A-9 - Pre-Test 3/4 Right Front View

A-9

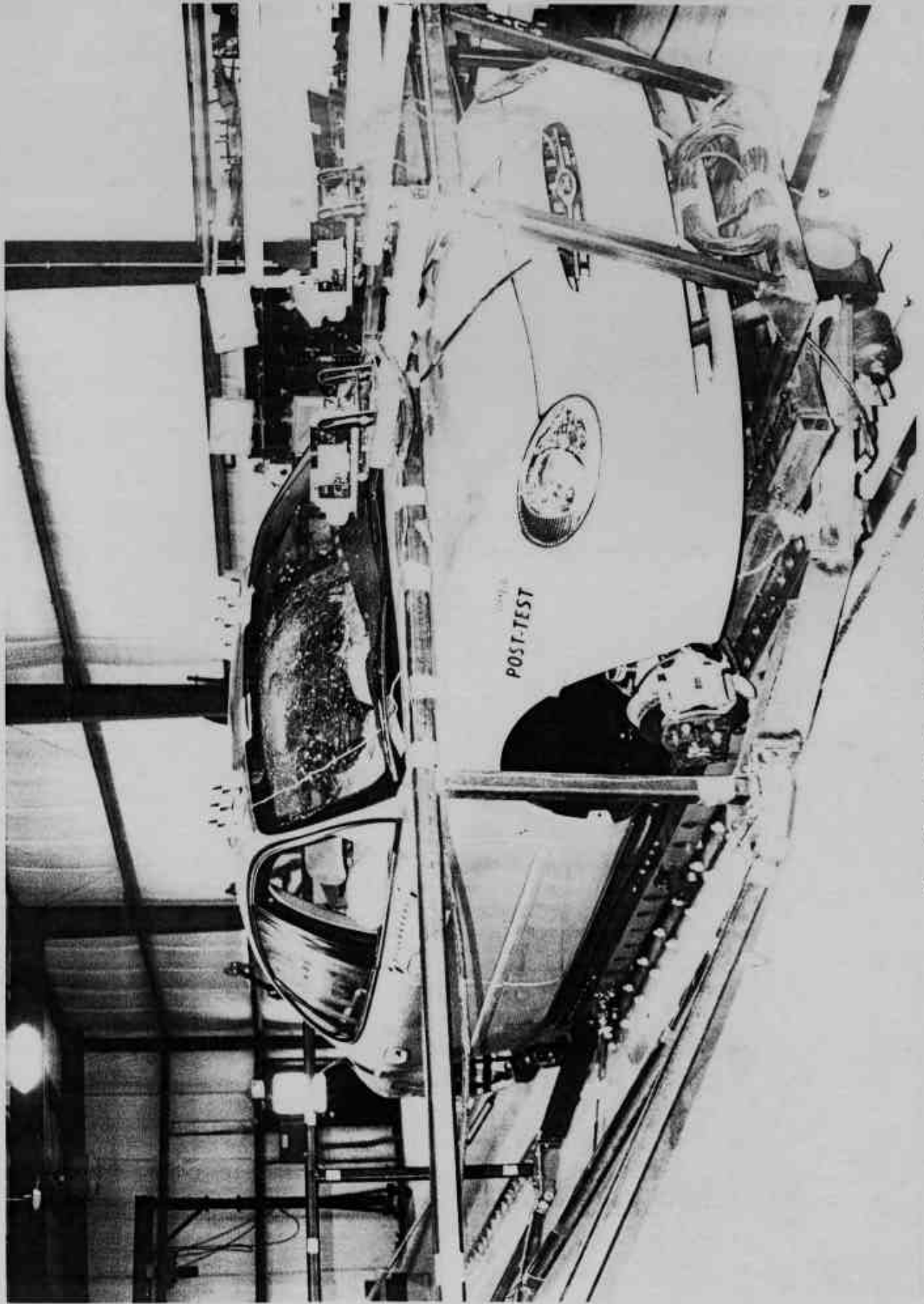


Photo No. A-10 - Post-Test 3/4 Right Front View

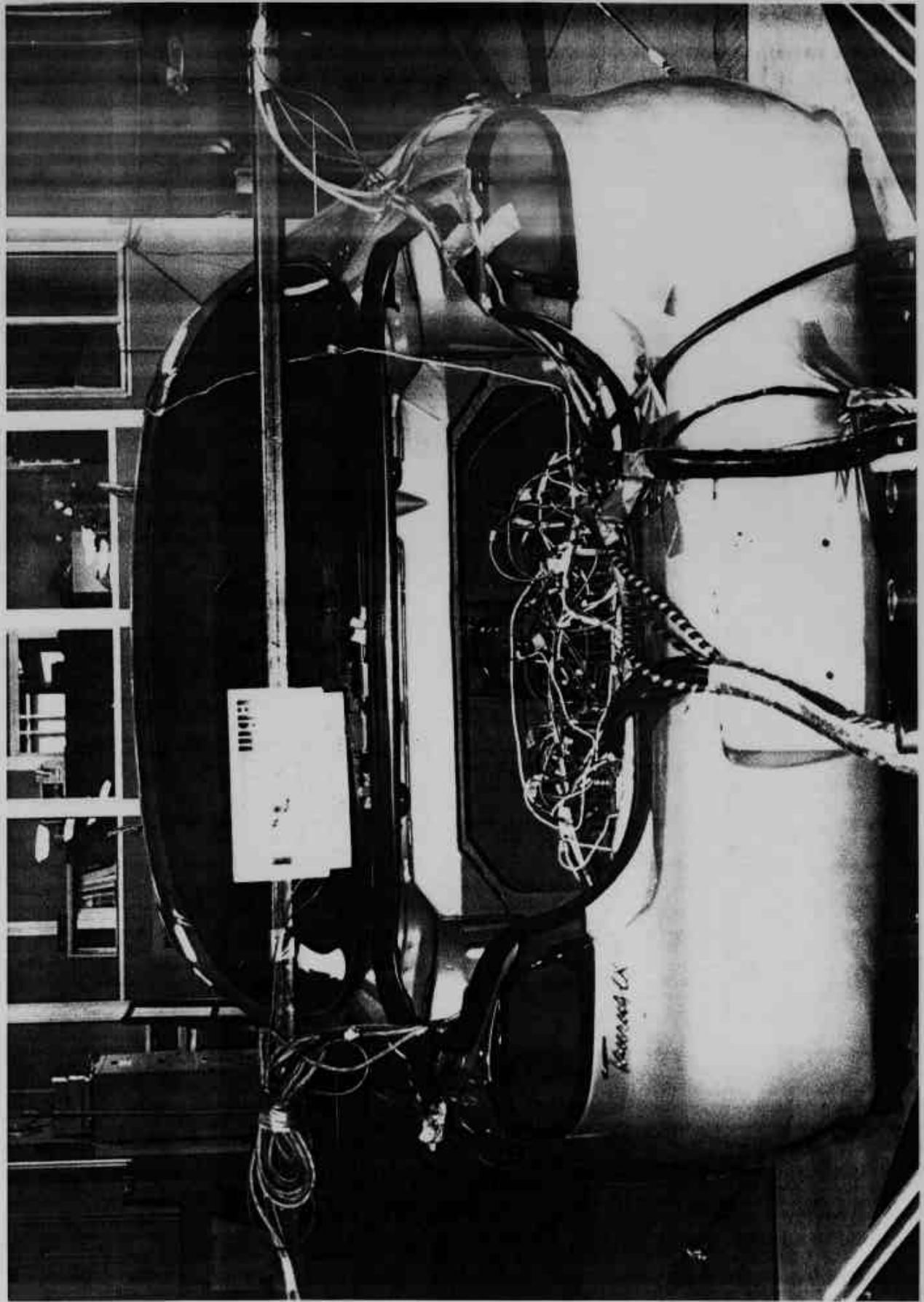


Photo No. A-11 - Pre-Test Rear View

A-11

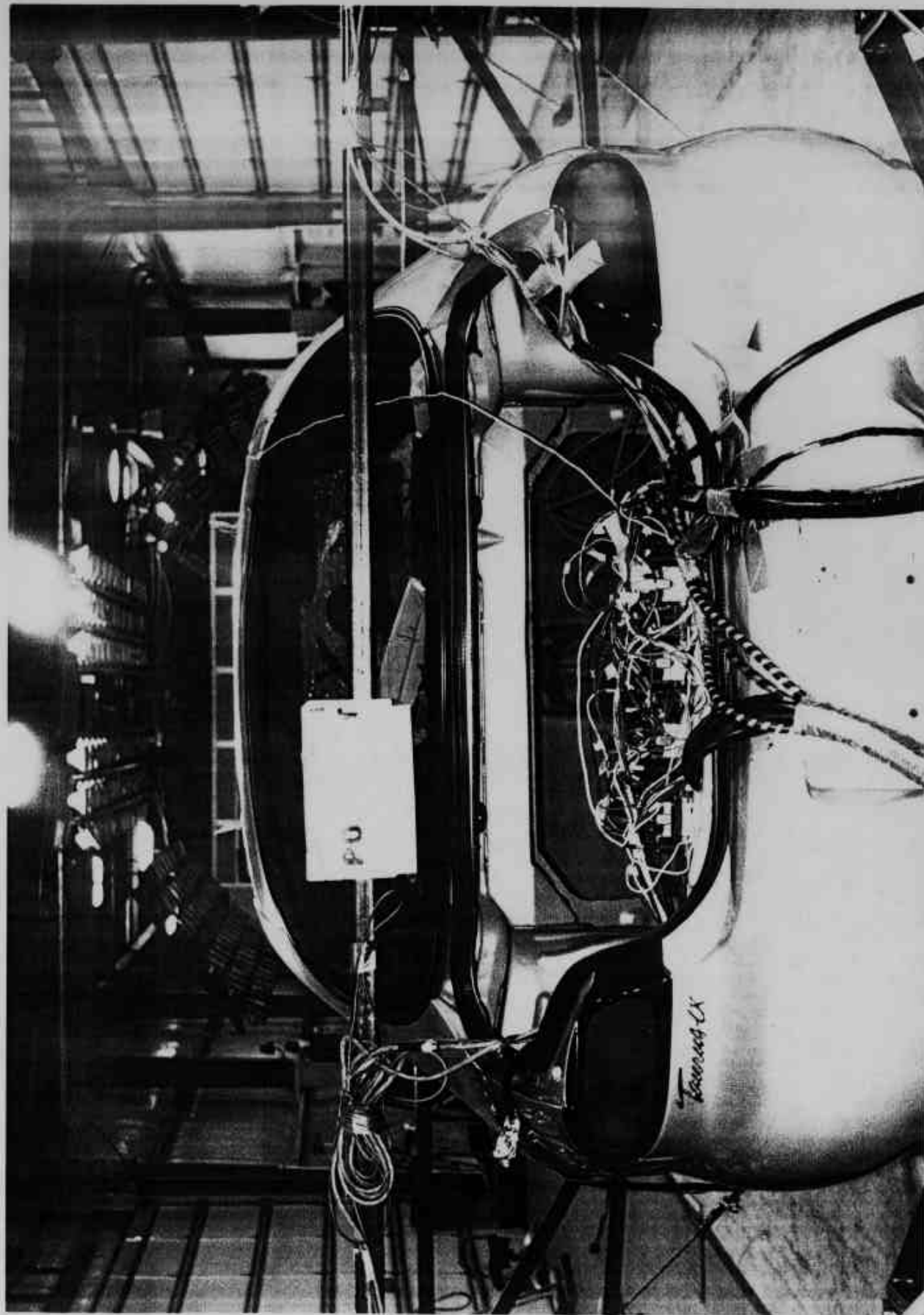


Photo No. A-12 - Post-Test Rear View

A-12

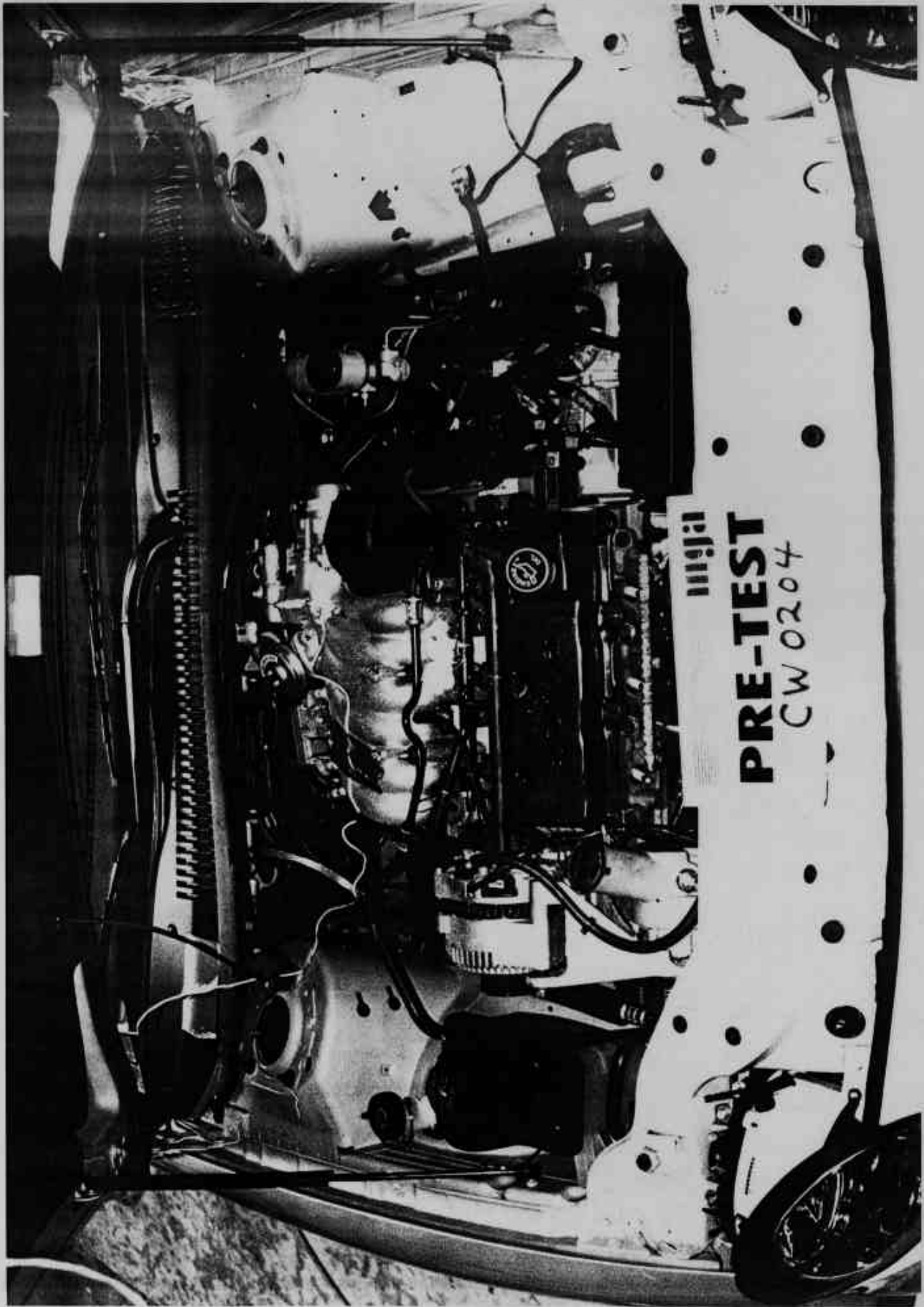


Photo No. A-13 - Pre-Test Engine Compartment View

A-13

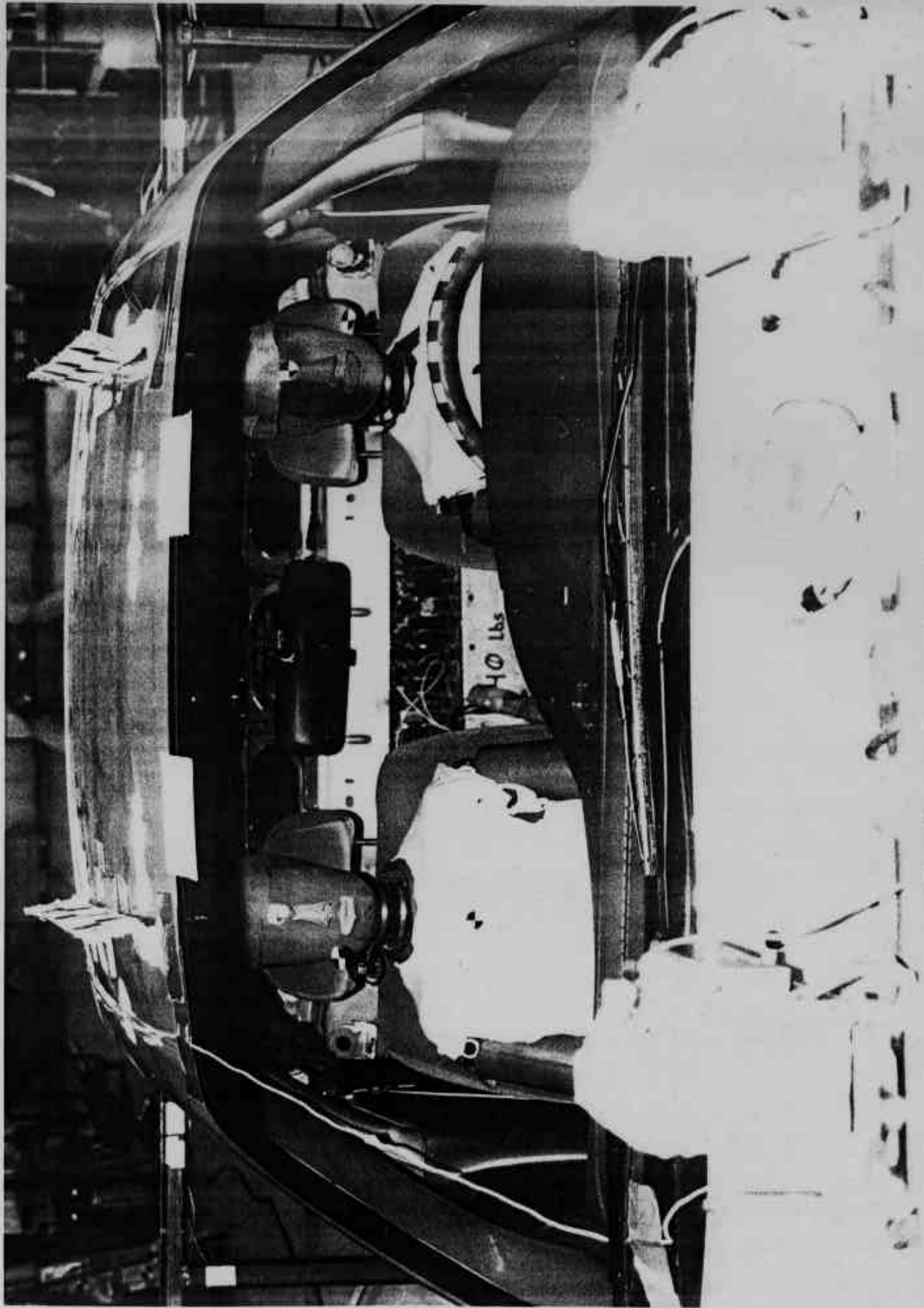


Photo No. A-14 - Pre-Test Windshield View

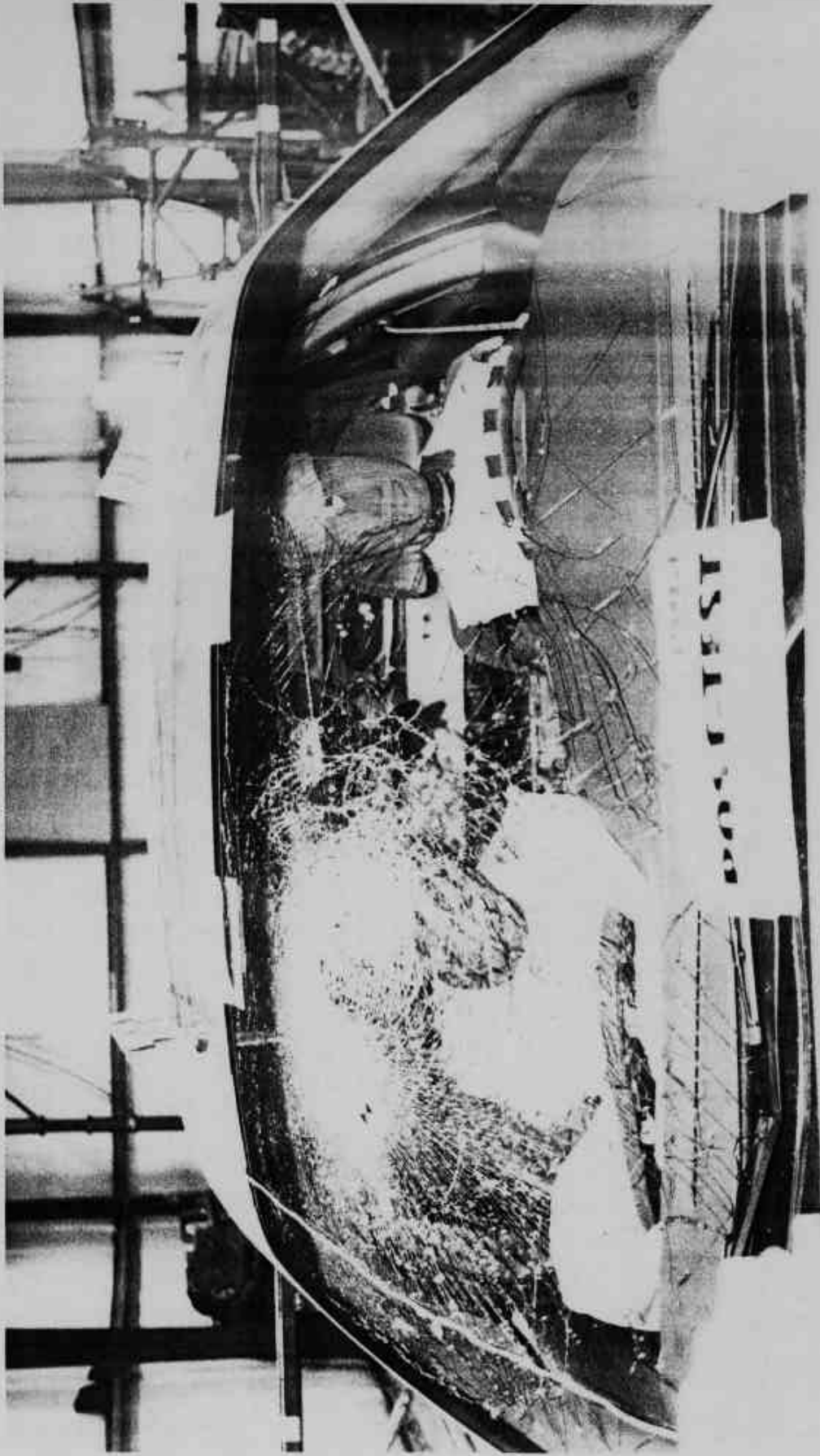


Photo No. A-15 - Post-Test Windshield View

A-15



Photo No. A-16 - Post-Test Driver Dummy Position View



Photo No. A-17 - Pre-Test Driver Dummy Position View (Door Open)

A-17



Photo No. A-18 - Post-Test Driver Dummy Position View (Door Open)

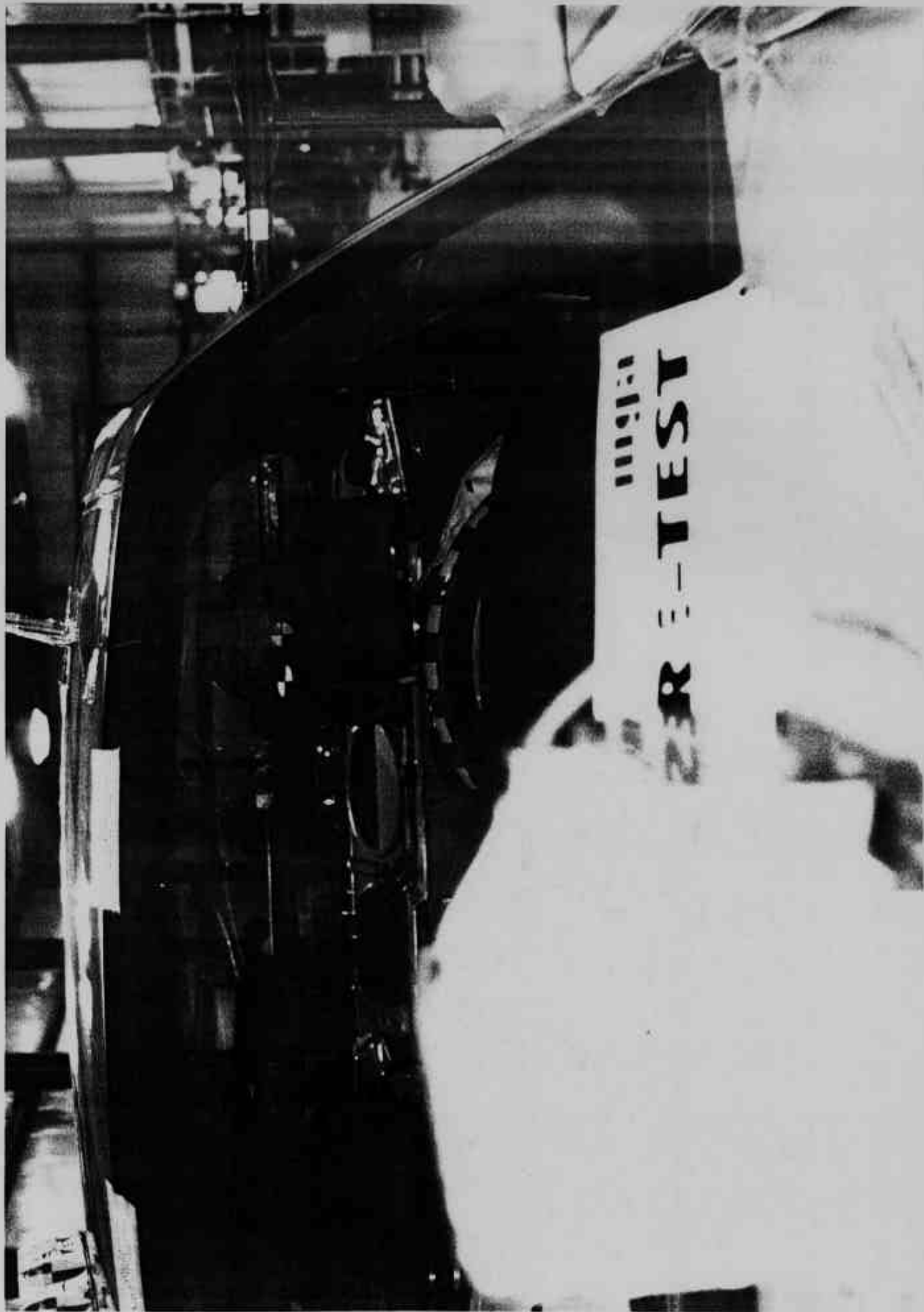


Photo No. A-19 - Pre-Test Driver Windshield View



Photo No. A-20 - Post-Test Driver Windshield View

A-20



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PRE-TEST

**FMVSS 208 SLED TEST
1998 FORD TAURUS**

CW0204

**MGA RESEARCH CORP.
MARCH 5, 1998**

Photo No. A-21 - Pre-Test Driver Seat Position View



A-22

Photo No. A-22 - Post-Test Driver Seat Position View



mga



mga research corporation

PRE-TEST

FMVSS 208 SLED TEST
1998 FORD TAURUS
CW0204

MGA RESEARCH CORP.
MARCH 5, 1998

Photo No. A-23 - Pre-Test Driver Knee Bolster View



Photo No. A-24 - Post-Test Driver Knce Bolster View




POST-TEST
 MVSS 208 SLED TEST
 1998 FORD TAURUS
 CW0204
 MGA RESEARCH CORP.
 MARCH 5, 1998

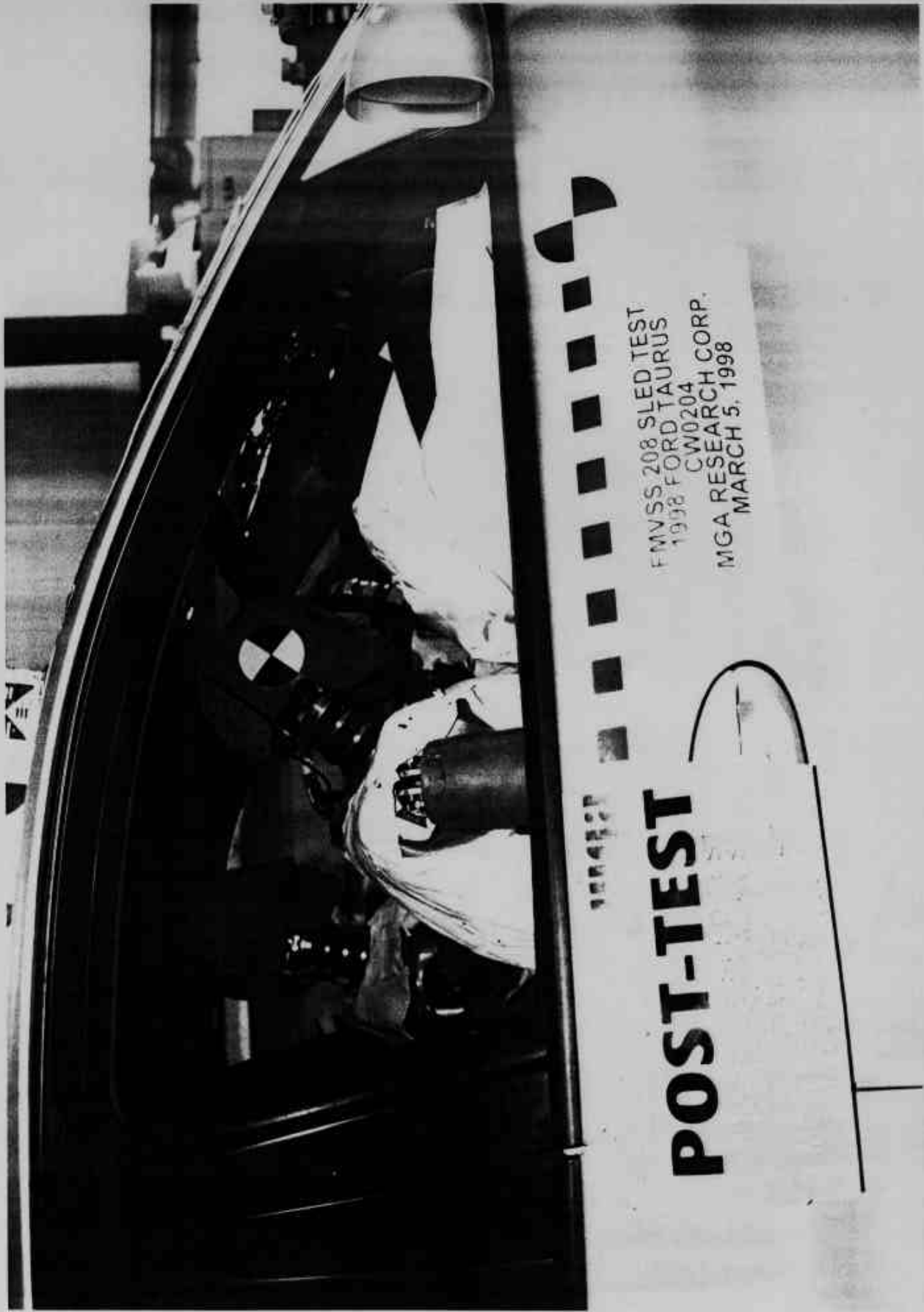
Photo No. A-25 - Post-Test Driver Airbag View



Photo No. A-26 - Post-Test Driver Head Contact View (visor)



Photo No. A-27 - Pre-Test Passenger Dummy Position View



A-28

Photo No. A-28 - Post-Test Passenger Dummy Position View



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PRE-TEST

FMVSS 208 SLED TEST
1998 FORD TAURUS
CW0204
MGA RESEARCH CORP.
MARCH 5, 1998

Photo No. A-29 - Pre-Test Passenger Dummy Position View (Door Open)



Photo No. A-30 - Post-Test Passenger Dummy Position View (Door Open)

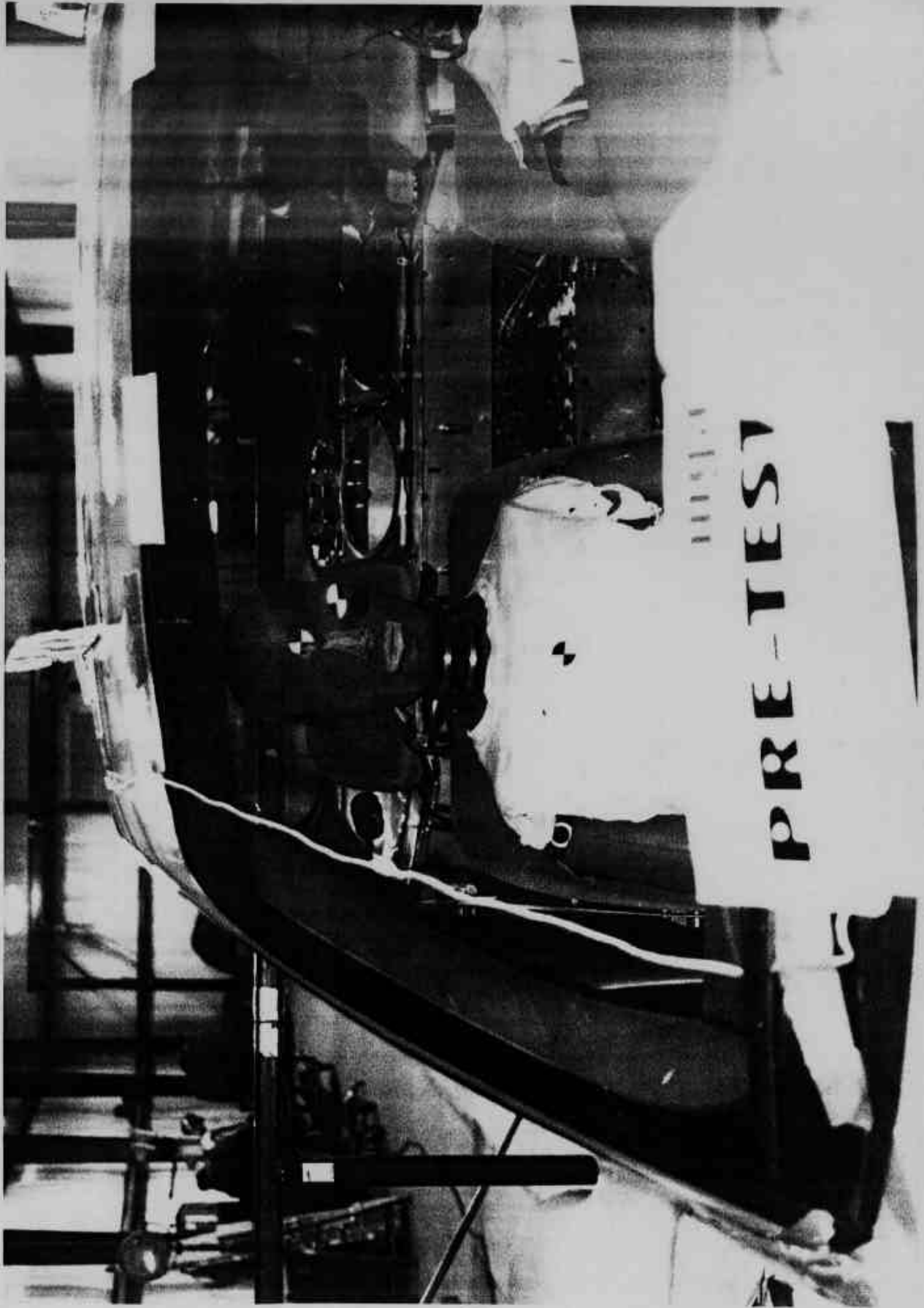


Photo No. A-31 - Pre-Test Passenger Windshield View

A-31

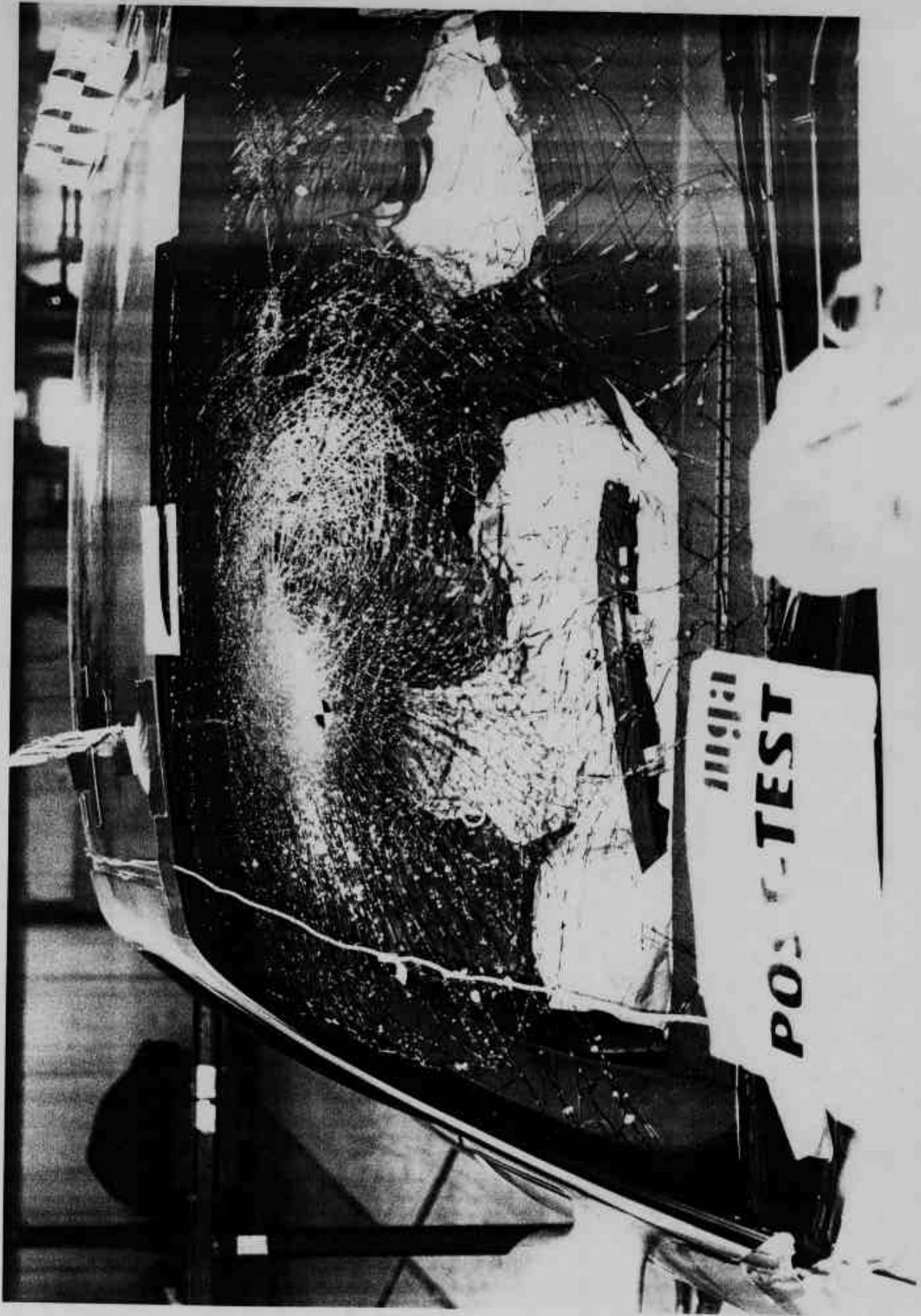


Photo No. A-32 - Post-Test Passenger Windshield View



A-33

Photo No. A-33 - Post-Test Passenger Dummy Seat Position View



Photo No. A-34 - Pre-Test Passenger Dummy Knee Bolster View



A-35

Photo No. A-35 - Post-Test Passenger Dummy Knee Bolster View



Photo No. A-36 - Post-Test Passenger Dummy Airbag View



Photo No. A-37 - Post-Test Passenger Dummy Head Contact View (visor)

MFD. BY FORD MOTOR CO. IN U.S.A.
GVWR: 4687LB/2125KG

DATE: 11/97

FRONT GAWR: 2647LB 1200KG

REAR GAWR: 2065LB 936KG

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1FAFP52U7WG139115

TYPE: PASSENGER

F0183
R0062



EXT PNT: TS JRC: 411D50:
BRKINT TR1TP/PSIRIAXLETTRISPR
A J2 F 3R L LLHH
UPC

VFACIS-EN-11-94

Photo No. A-38 - Vehicle Certification Label

RECOMMENDED TIRE SIZE and INFLATION PRESSURE (COLD)
DIMENSIONS DES PNEUS et PRESSIONS
DE GONFLAGE RECOMMANDÉES (À FROID)

FOR SUSTAINED HIGH SPEED, TRAILER TOWING, RECREATIONAL ACCESSORIES AND TEMPORAL SPARE USAGE — SEE OWNER GUIDE
 HAUTES VITESSES SOUTENUES, REMORQUES, ACCESSOIRES DE LOISIRS ET PNEU DE SECOURS — PRESSIONS, CONSULTEZ LE GUIDE DU PROPRIÉTAIRE

TIRE SIZE	TIRE PRESSURE	
	FRONT/REAR	PSI
P205/65R15 92T* SEDAN	226 kPa	33
P205/65R15 92T* STATION WAGON	213 kPa	31
P225/55ZR16*	220 kPa	32
P225/55ZR16* SPORT	240 kPa	35
TEMPORAL SPARE	415 kPa	60
T135/70R15 T135/80R16		

*MUST BE REPLACED WITH AN EQUIVALENT TIRE SPEED RATIO TIRE

DIMENSIONS DES PNEUS		PRESSION DES PNEUS	
P205/65R15 92T* BERLINES	226 kPa	33	lb/pou
P205/65R15 92T* BERLINES	213 kPa	31	lb/pou
P225/55ZR16*	220 kPa	32	lb/pou
PNEU DE SECOURS PROVISIONNEL	240 kPa	35	lb/pou
T135/70R15 T135/80R16	415 kPa	60	lb/pou

*NE PAS REMPLACER QUE PAR UN PNEU EQUIVALENT EN VITESSE ET EN PNEU

CHARGE TOTALE — OCCUPANTS PLUS MARCHANDS	
MODELES	OCCUPANTS
BERLINES	5
BREAKS	5 or 6
AUT. 3 SEAT	7 or 8

CHARGE TOTALE — OCCUPANTS PLUS MARCHANDS

TOTAL LOAD — OCCUPANTS PLUS LOUJAGE	
MODELS	OCCUPANTS
BERLINES	5 or 6
STATION WAGONS	5 or 6
in third seat	7 or 8

MAXIMUM LOAD
 490 kg (1100) lb
 544 kg (1200) lb

DISTRIBUTION	
FRONT	THIRD SEAT
5	5
5	5
5	5
5	5

LOADING
 100 kg (220) lb
 100 kg (220) lb
 100 kg (220) lb
 100 kg (220) lb

Photo No. A-39 - Tire Placard

APPENDIX B
DATA PLOTS

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TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

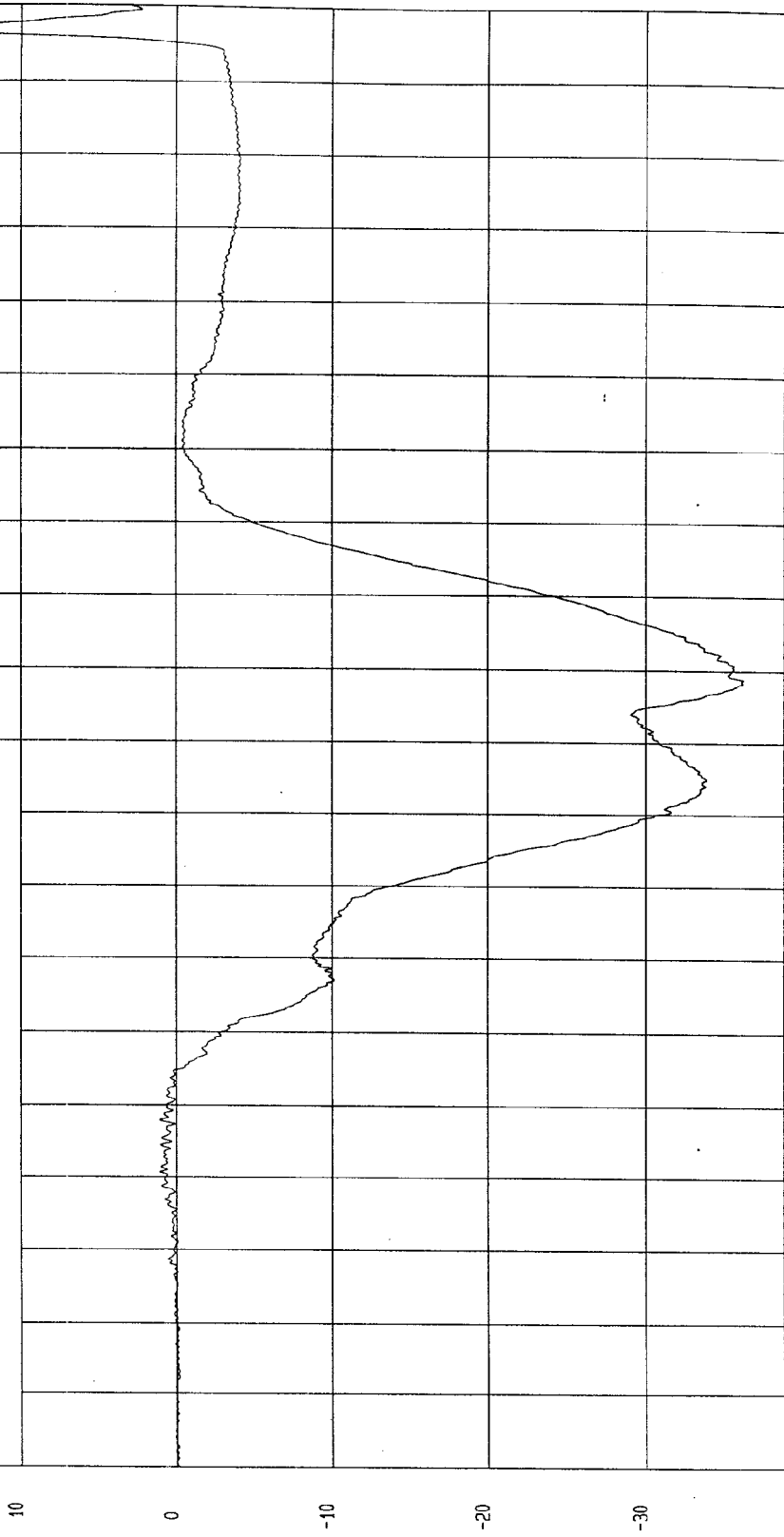
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-36.22919 G'S at 108 msec

YMAX= 15.76623 G'S at 195 msec

DRIVER HEAD X ACCELERATION

1 ——— H98059AF.A06 Filterclass (1000)



MCA Research
03-05-1998 12.09

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

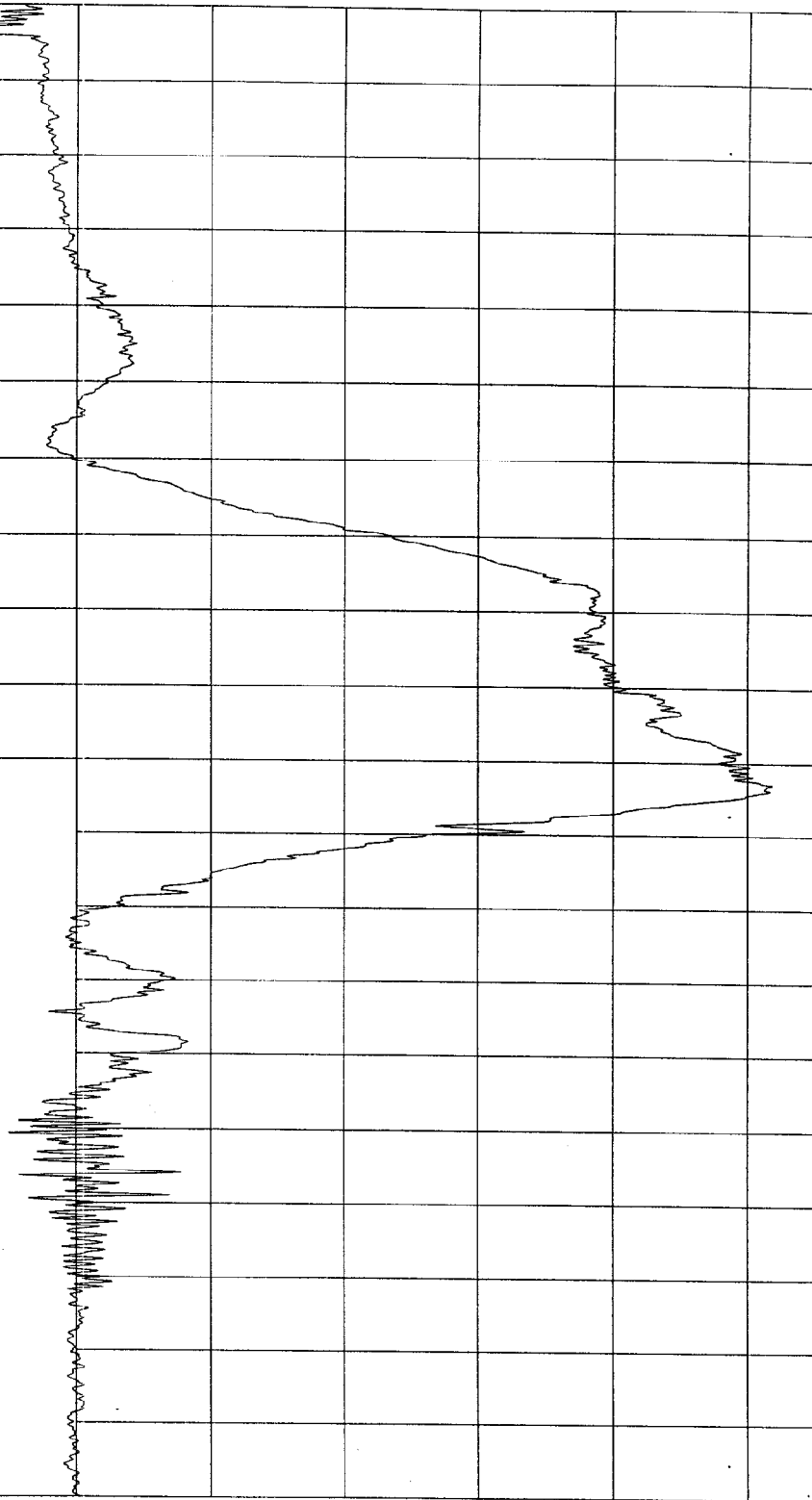
YMIN=-10.37042 G'S at 97 msec

YMAX= 1.907939 G'S at 196 msec

DRIVER HEAD Y ACCELERATION

1 _____ H9805BAF.A08 Filterclass (1000)

2



G.S

TIME (SECONDS)

MGA Research
03-05-1998 12:09

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

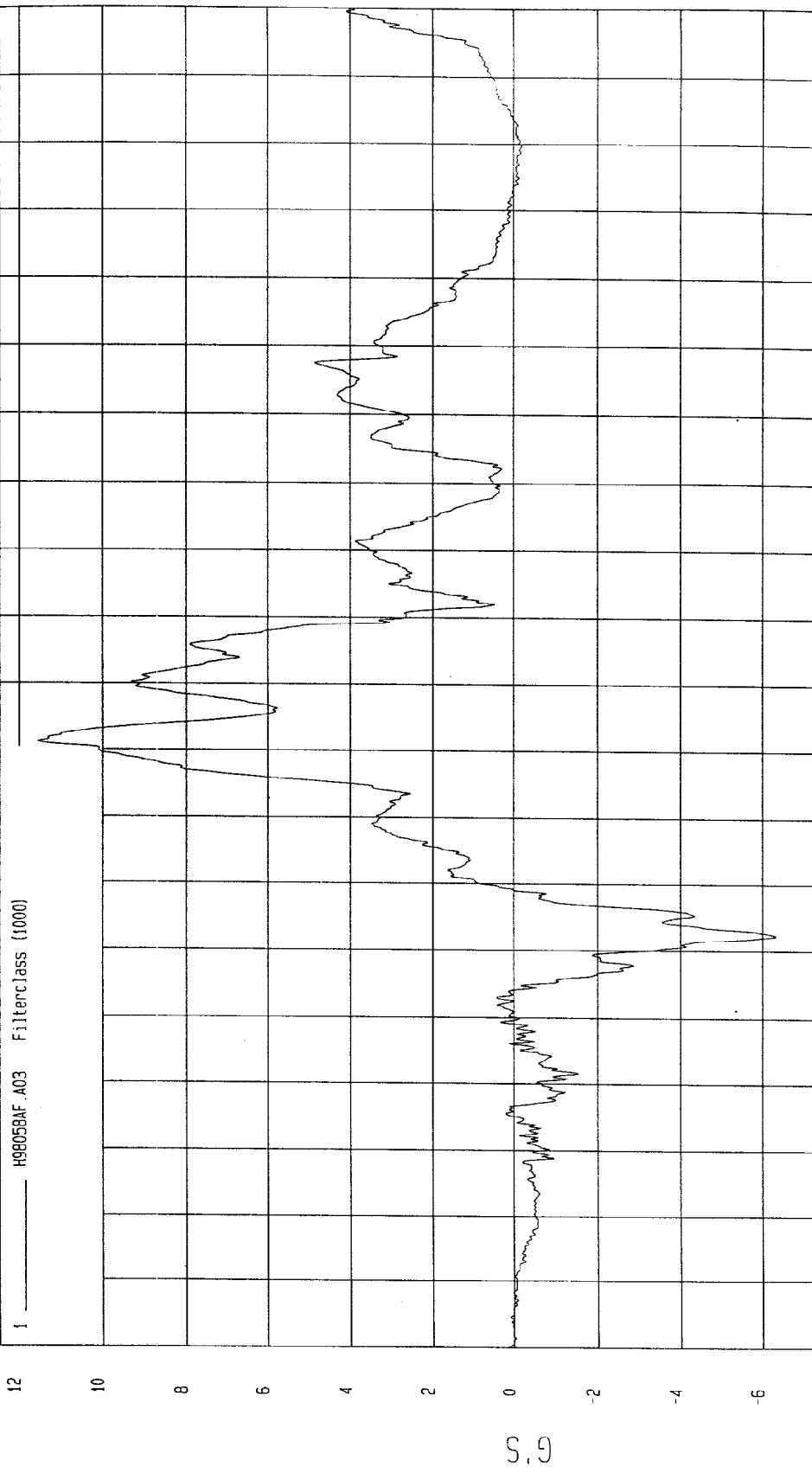
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-6.318528 G'S at 62. msec

YMAX= 11.56282 G'S at 91. msec

DRIVER HEAD Z ACCELERATION

1 _____ H98059AF.A03 Filternclass (1000)



MGA Research
03-05-1998 12:10

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

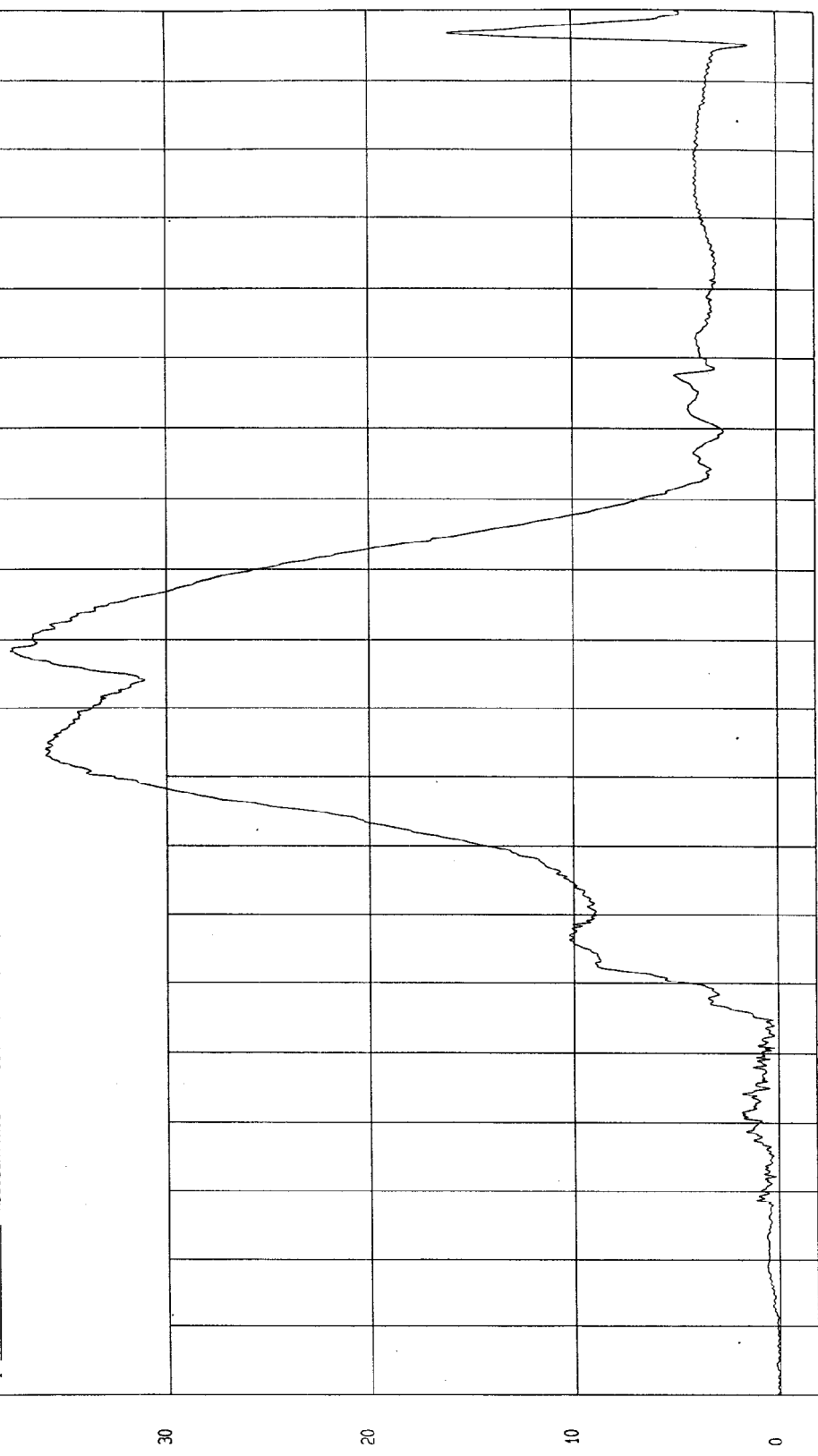
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 37.6284 G'S at 108 msec

YMIN= 2.499595E-02 G'S at 2.1 msec

DRIVER HEAD RESULTANT ACCELERATION

1 _____ H9805BAV.A03 Filterclass (1000)



G.S

MGA Research
03-05-1998 12:11

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

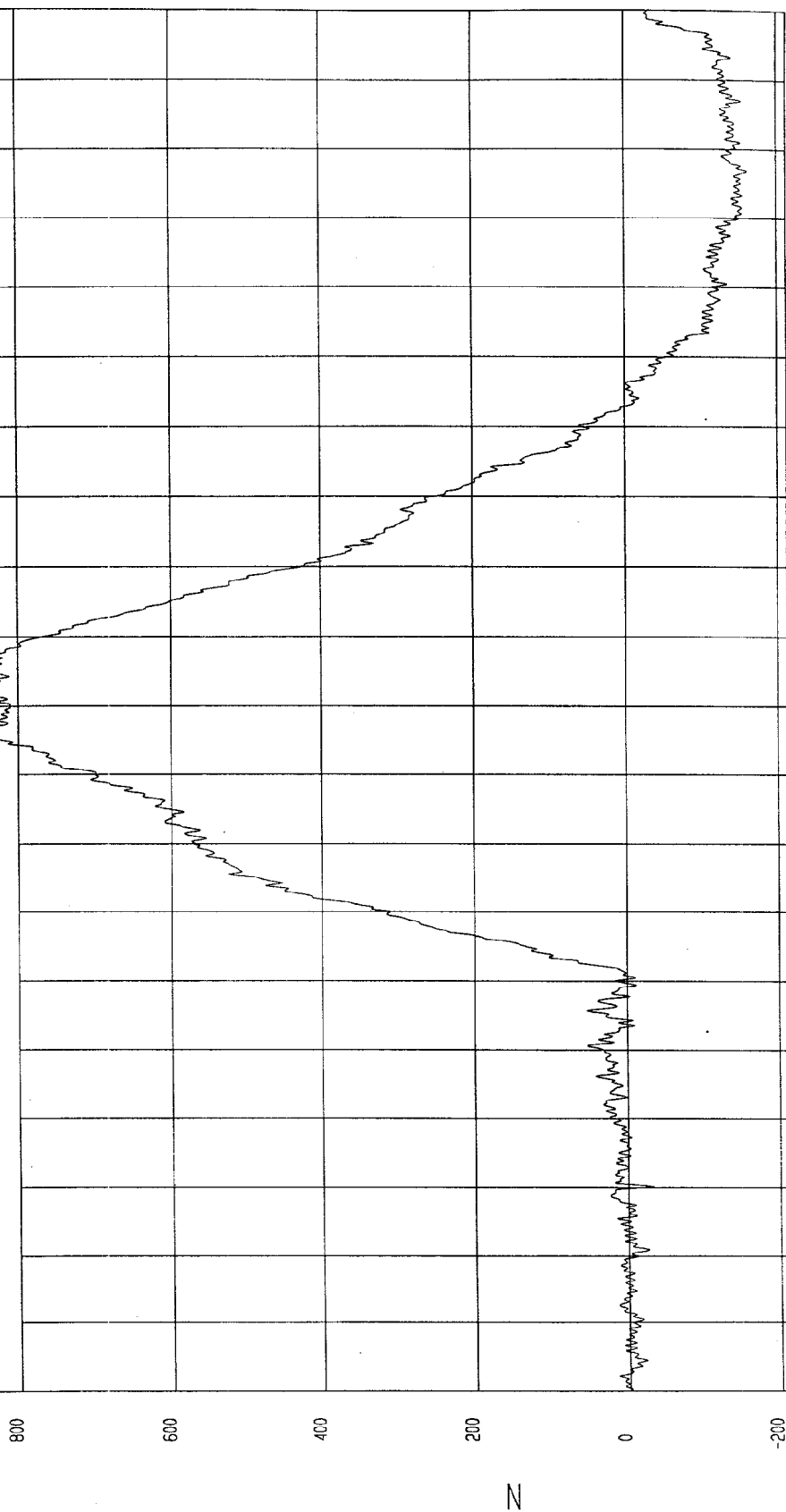
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-161.4366 N at 176 msec

YMAX=845.7208 N at 102 msec

DRIVER NECK FORCE X

1 ——— H98058FF.F21 Filterclass (1000)



MCA Research
03-05-1998 12:11

TIME (SECONDS)

N

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

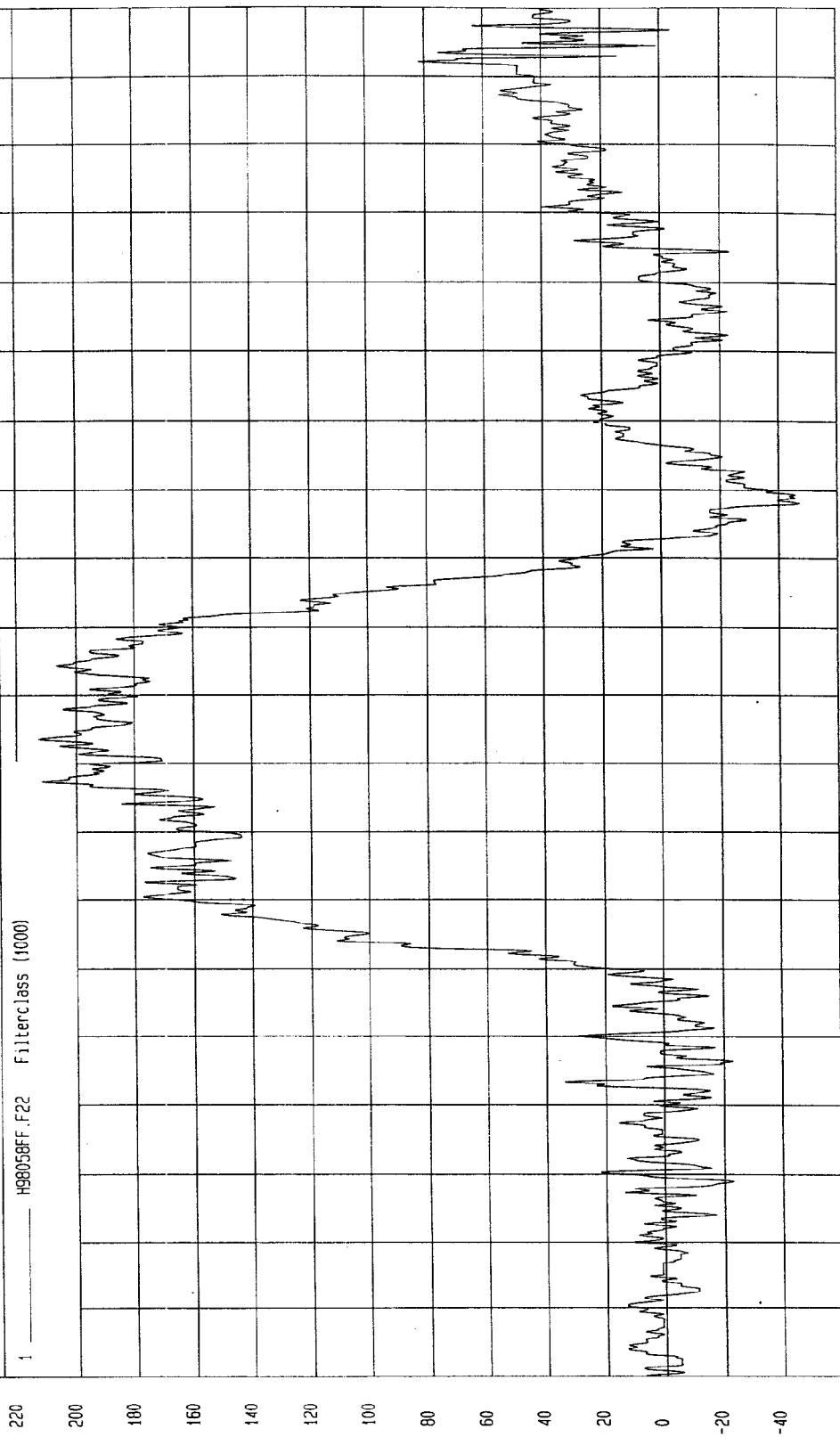
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-46.92339 N at 128 msec

YMAX= 212.6632 N at 93. msec

DRIVER NECK FORCE Y

1 H98058FF.F22 Filterclass (1000)



MGA Research
03-05-1998 12:11

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

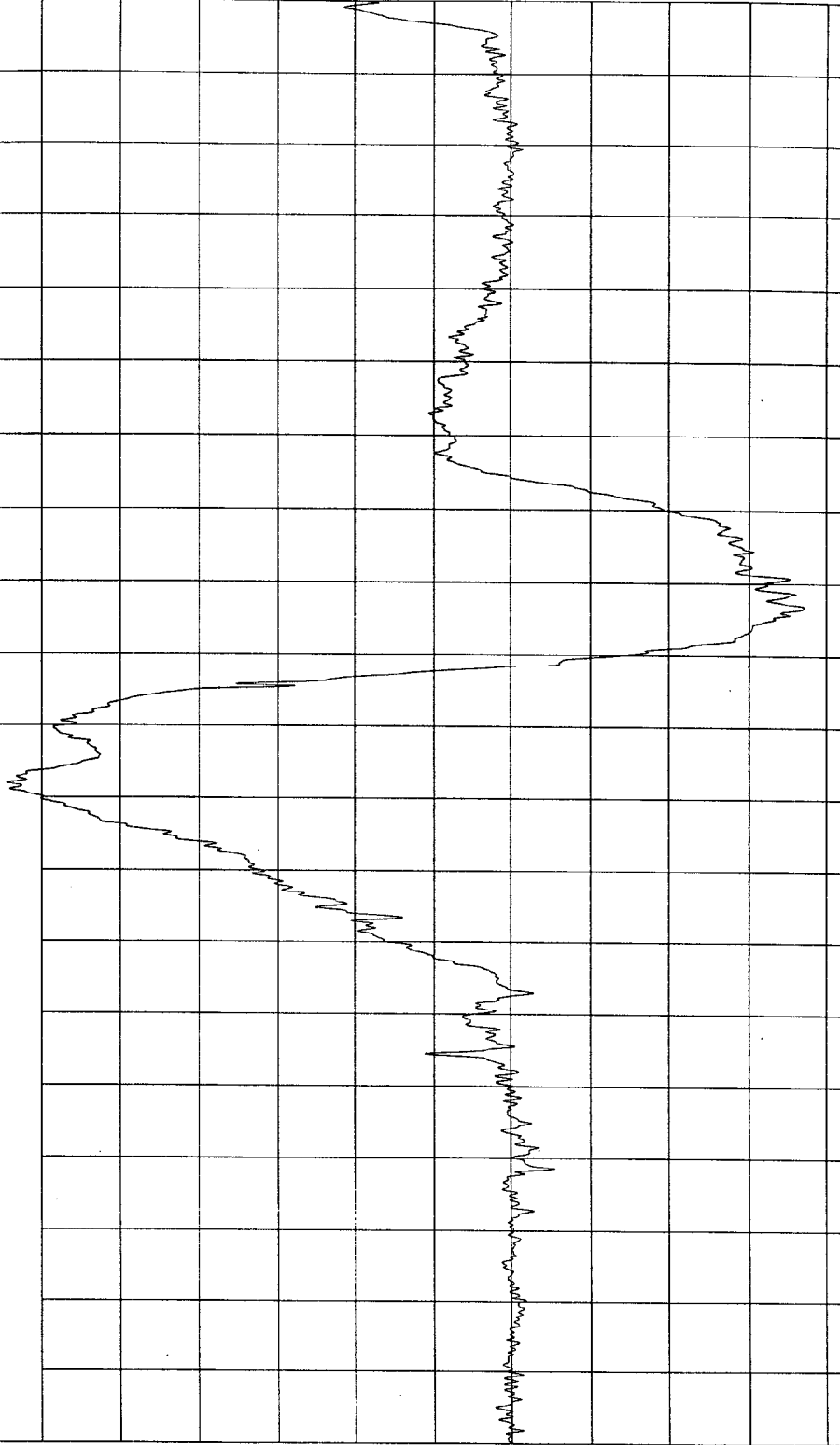
YMIN=-745.7484 N at 116 msec

YMAX=1287.56 N at 92 msec

DRIVER NECK FORCE Z

1 ——— H98058FF.F23 Filterclass (1000)

1200
1000
800
600
400
200
0
-200
-400
-600
-800



MGA Research
03-05-1998 12.12

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

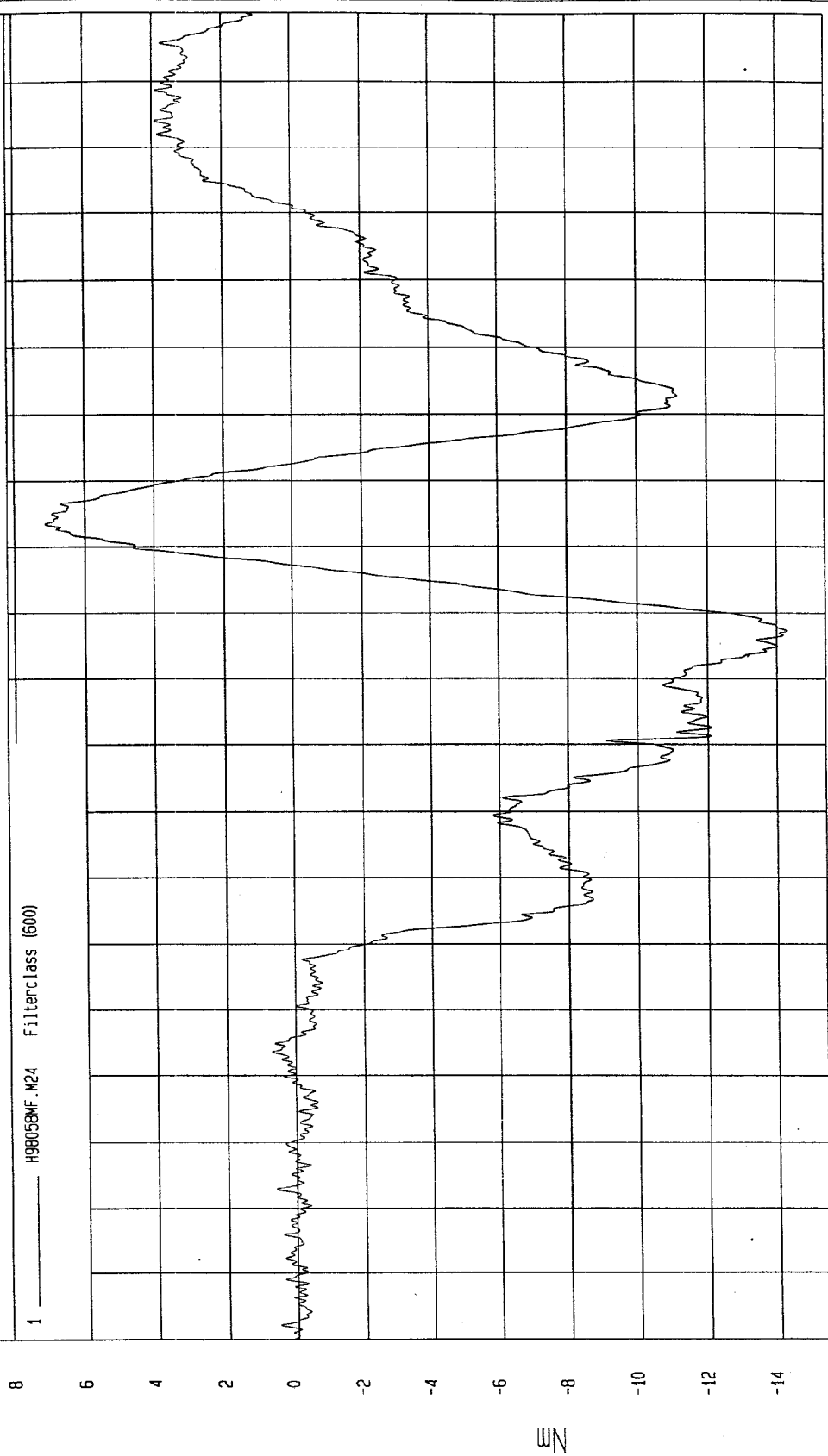
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 7.129271 Nm at 123 msec

YMIN=-14.31789 Nm at 107 msec

DRIVER NECK MOMENT X

1 _____ H98058MF.M24 Filterclass (500)



MEA Research
03-05-1998 12.12

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

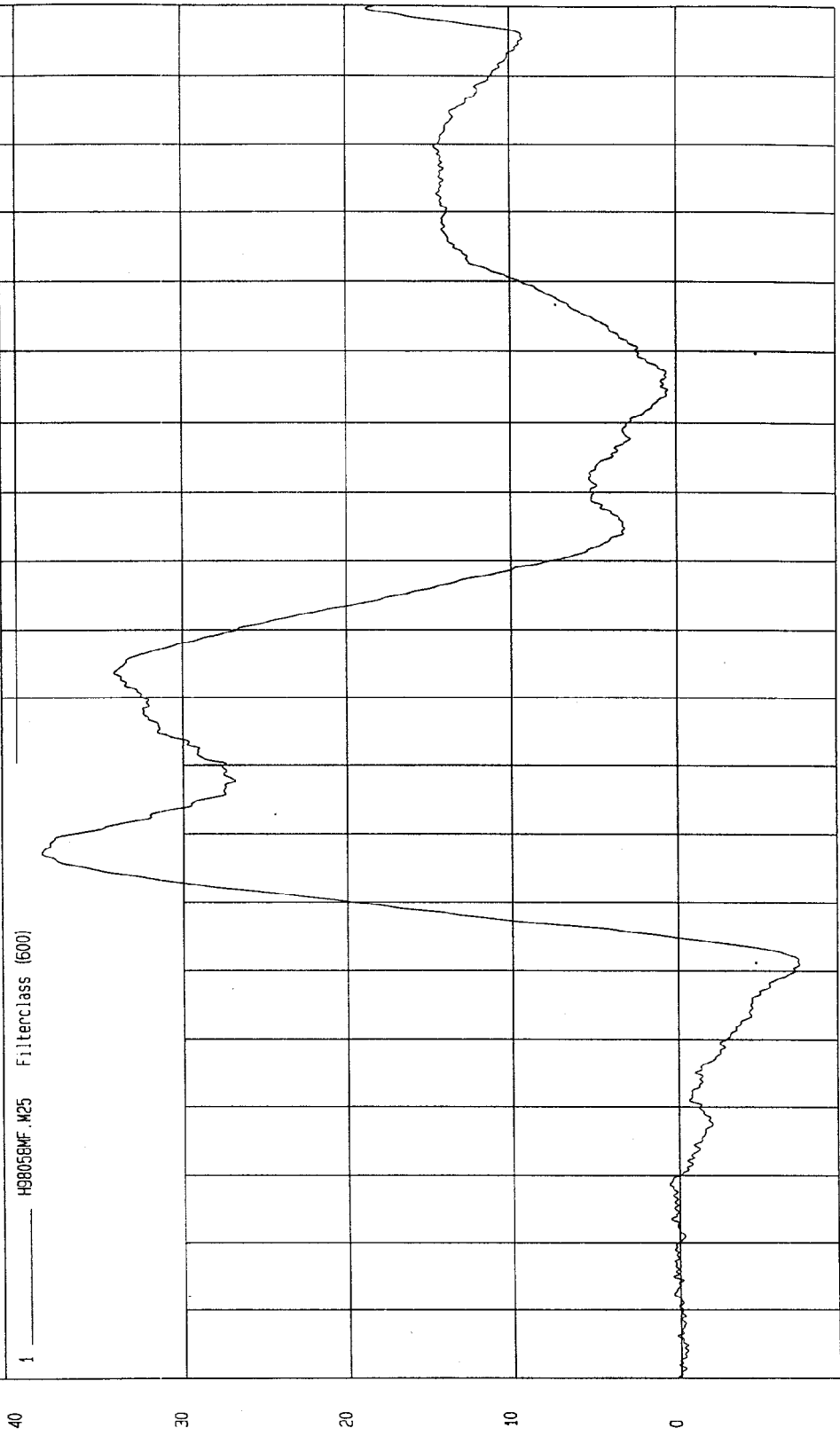
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-7.366599 Nm at 61 msec

YMAX=38.57274 Nm at 77. msec

DRIVER NECK MOMENT Y

1 H98058MF.M25 Filterclass (600)



MGA Research
03-05-1998 12:12

TIME (SECONDS)

Nm

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

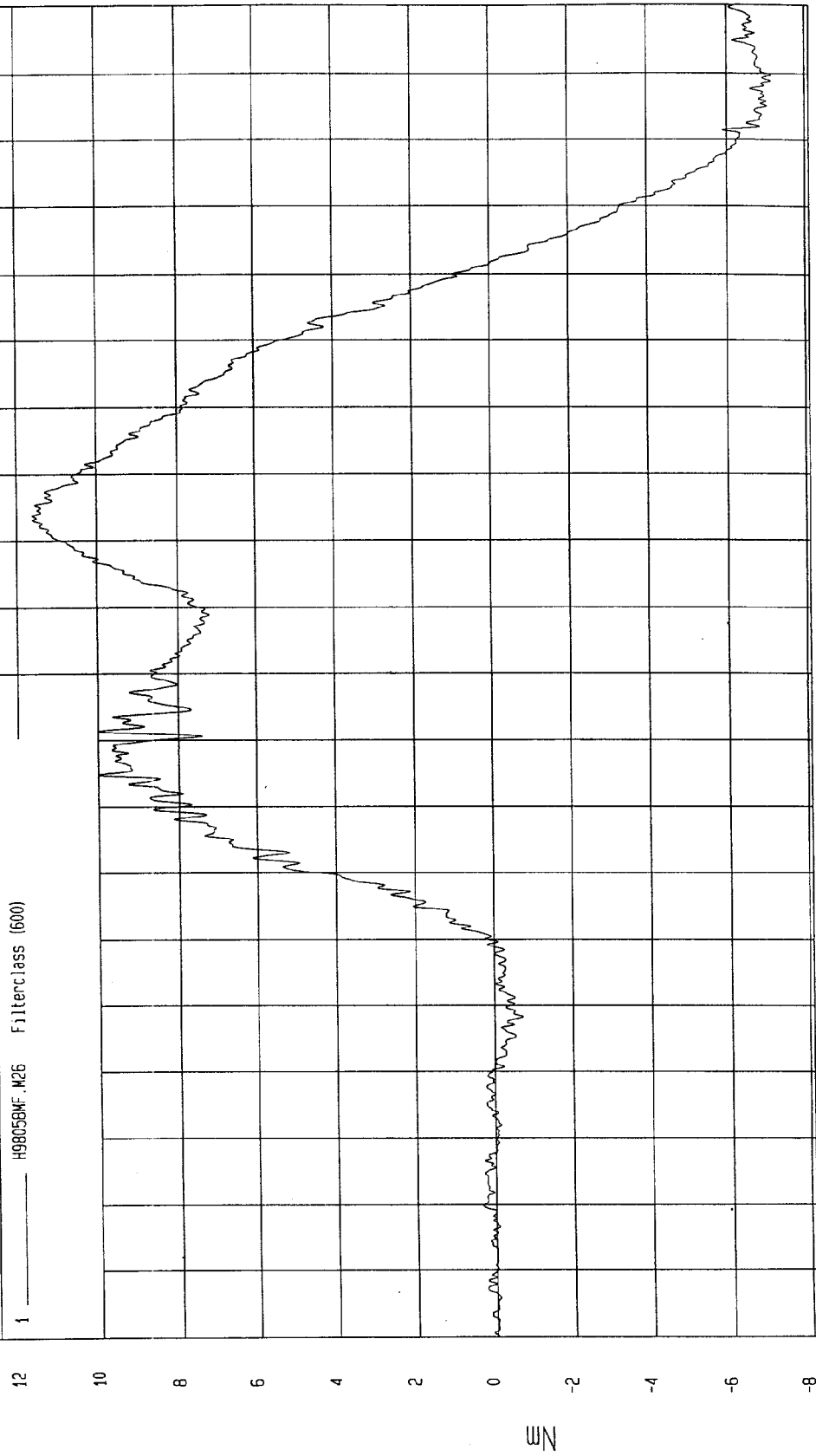
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-7.15969; Nm at 189 msec

YMAX= 11.61747 Nm at 123 msec

DRIVER NECK MOMENT Z

1 H98059MF.M26 Filterclass (600)



MCA Research
03-05-1998 12:13

TIME (SECONDS)

Nm

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

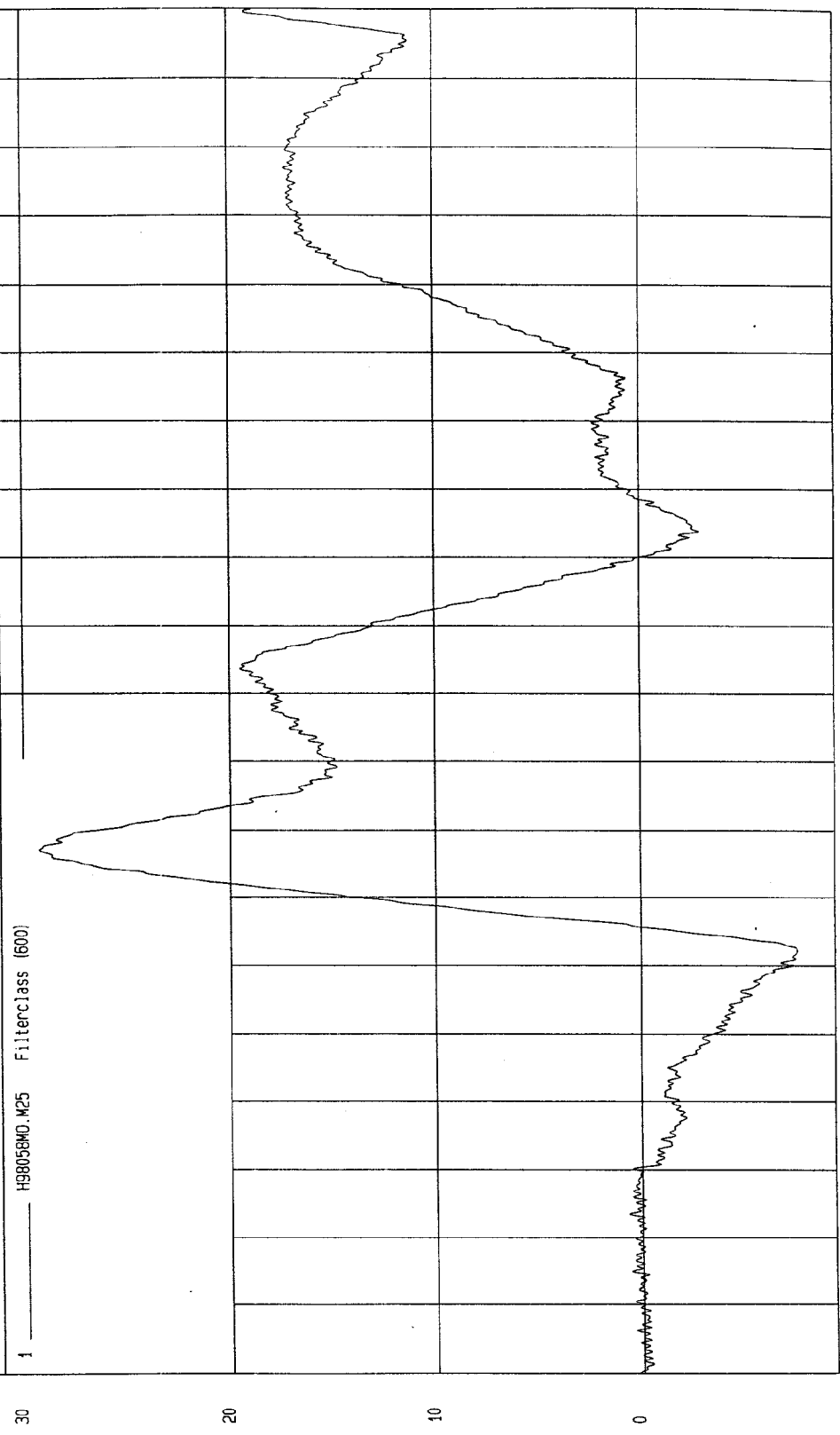
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-7.561842 Nm at 62. msec

YMAX= 29.24302 Nm at 77. msec

DRIVER OCCIPITAL CONDYLE MOMENT Y

1 H98058MO.M25 Filterclass (600)



MCA Research
03-05-1998 12:33

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

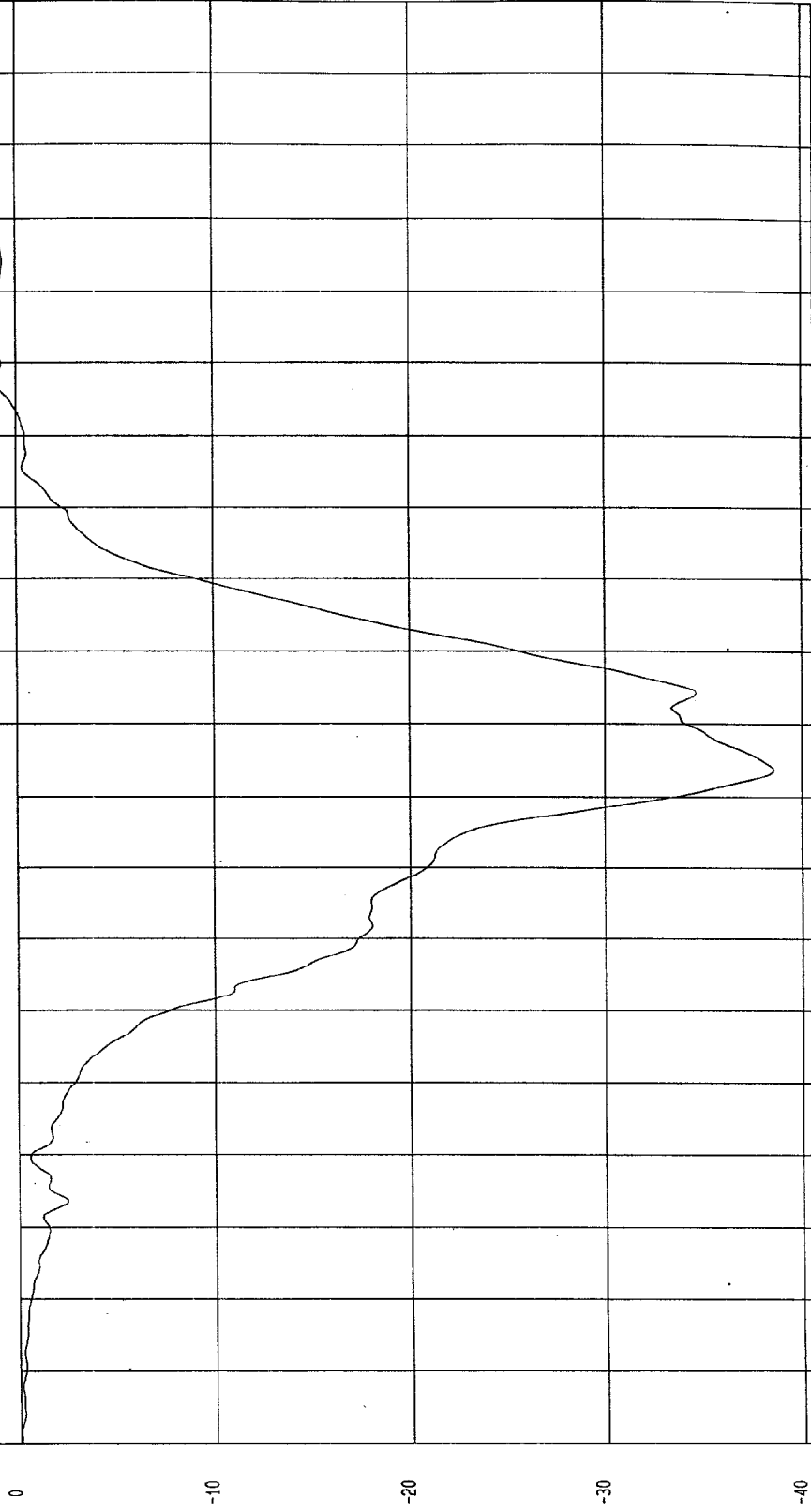
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-38.54518 G'S at 93. msec

YMAX= 2.360528 G'S at 198 msec

DRIVER CHEST X ACCELERATION

1 ——— H98059AF.A12 Filterclass (180)



MCA Research
03-05-1998 12:13

TIME (SECONDS)

G'S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

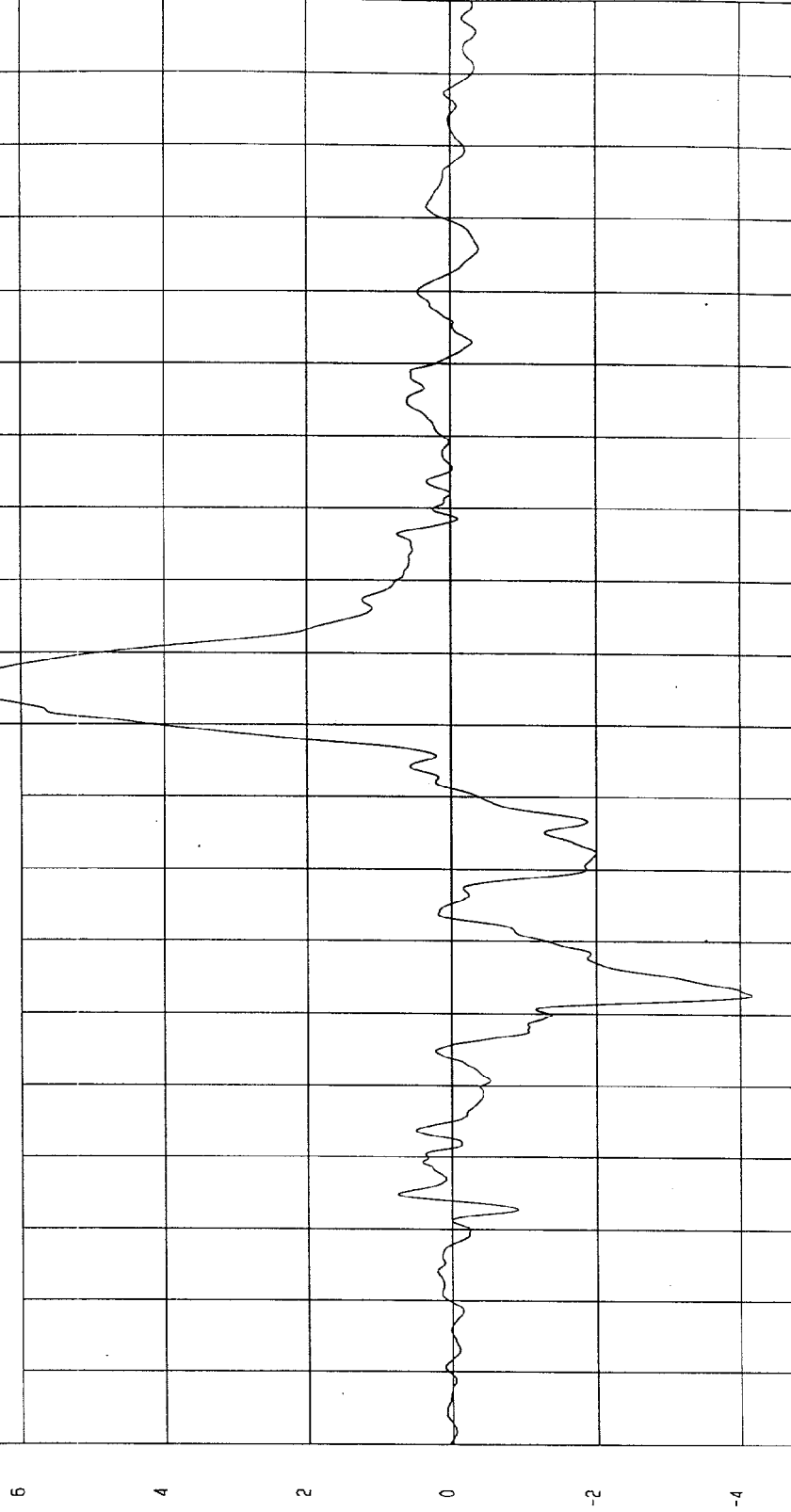
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-4.175523 G'S at 62. msec

YMAX= 7.063802 G'S at 104 msec

DRIVER CHEST Y ACCELERATION

1 ——— H980594F.A13 Filterclass (180)



NBA Research
03-05-1998 12.14

TIME (SECONDS)

G.S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

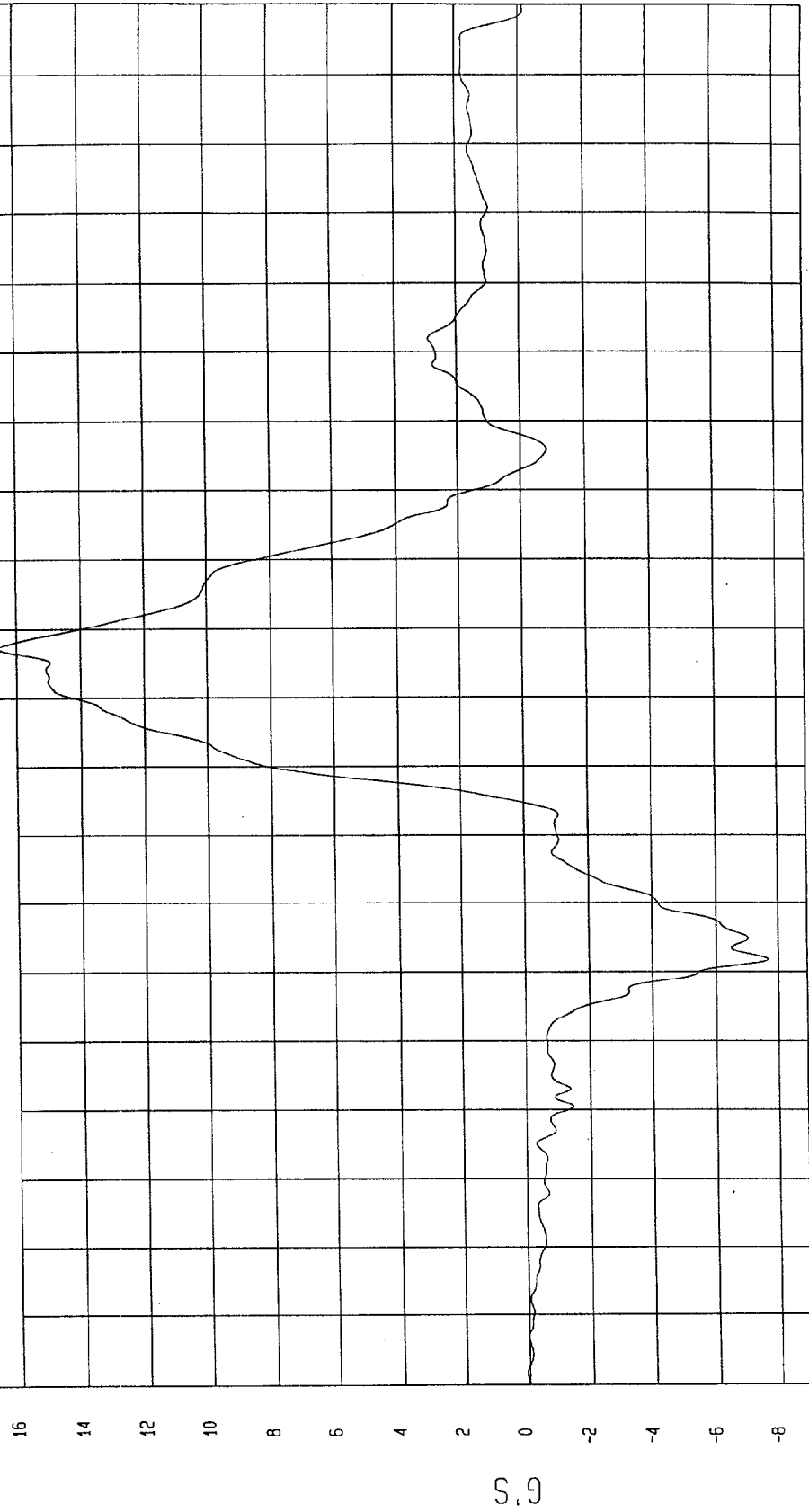
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 16.59146 G'S at 107 msec

YMIN= -7.687139 G'S at 61. msec

DRIVER CHEST Z ACCELERATION

1 H98050MF.A14 FilterClass (180)



MCA Research
03-05-1998 12:14

TIME (SECONDS)

G'S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMIN= 8.633256E-02 G'S at .9 msec

YMAX= 39.87859 G'S at 93. msec

DRIVER CHEST RESULTANT ACCELERATION

1 H98058AV.A12 Filterclass (180)

40

30

20

10

0

G.S

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

TIME (SECONDS)

MGA Research
03-05-1998 12: 15

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

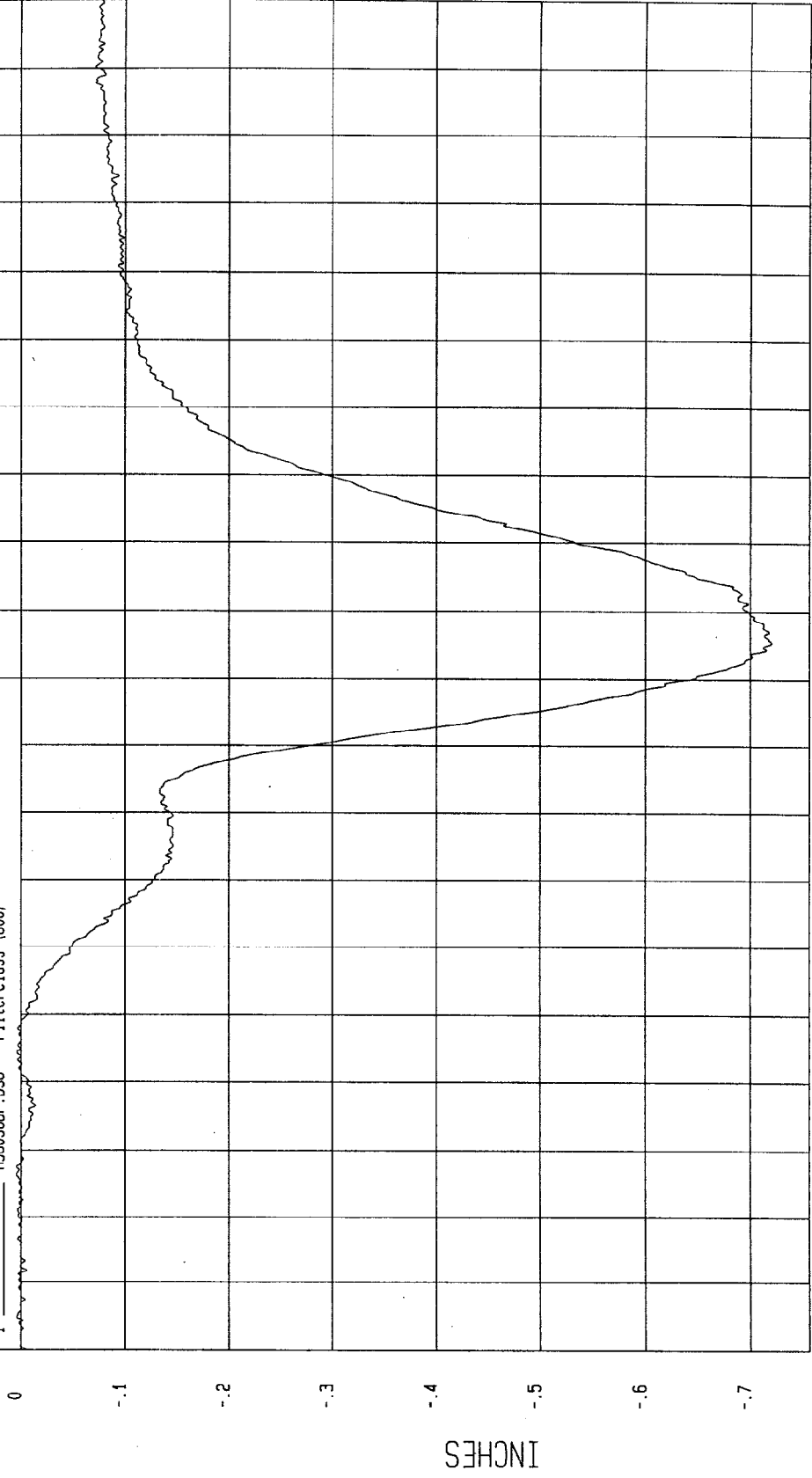
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-.7213089 INCHES at 105 msec

YMAX= 4.537308E-03 INCHES at 27. msec

DRIVER CHEST COMPRESSION

1 H980580F.038 Filterclass (600)



NGA Research
04-16-1998 10:04

TIME SECONDS

INCHES

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-1199.793 LBS at 67. msec

YMAX= 57.78106 LBS at 135 msec

DRIVER LEFT FEMUR FORCE

1 H98058FF.F15 Filterclass (600)

LBS

0
-200
-400
-600
-800
-1000
-1200

0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9

TIME (SECONDS)

MGA Research
03-05-1998 12:15

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

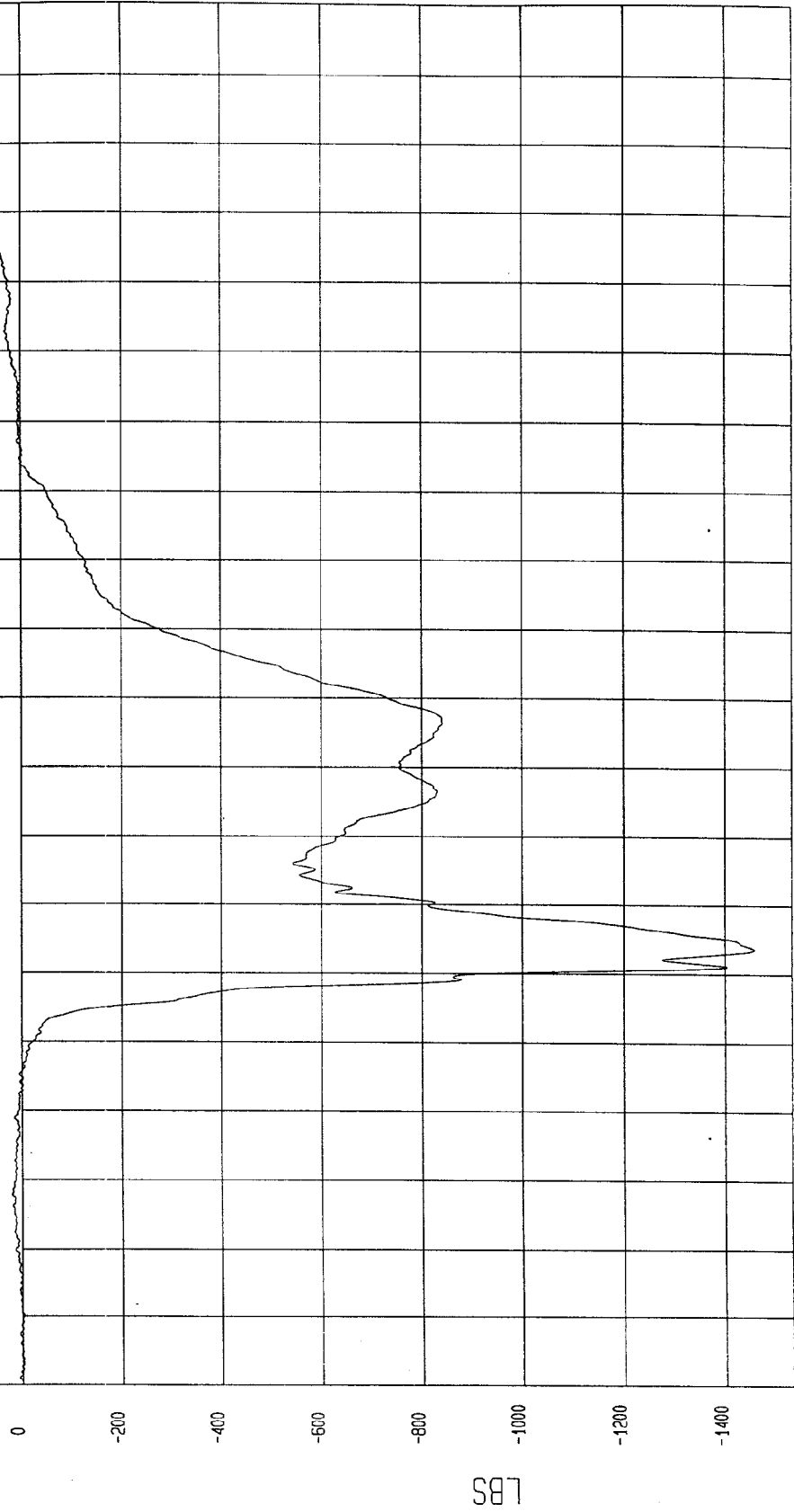
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-1456.868 LBS at 63. msec

YMAX= 72.47666 LBS at 190 msec

DRIVER RIGHT FEMUR FORCE

1 H98058F.F16 Filterclass (600)



MGA Research
03-05-1998 12:29

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

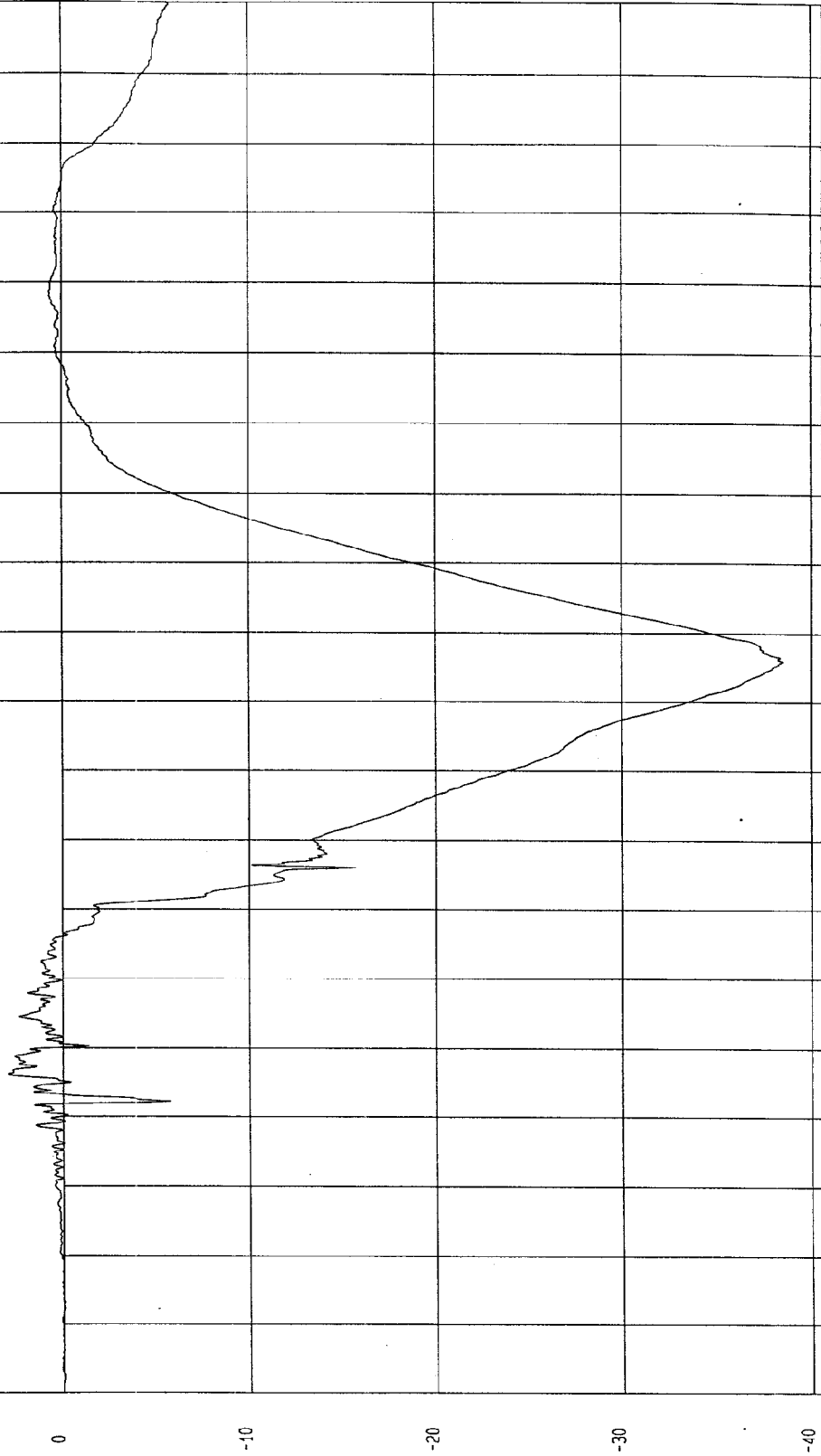
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-38.52451 G'S at 105 msec

YMAX= 2.871845 G'S at 46. msec

PASSENGER HEAD X ACCELERATION

1 H98058AF.A27 Filterclass (1000)



M&A Research
03-05-1998 12:16

TIME (SECONDS)

G.S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

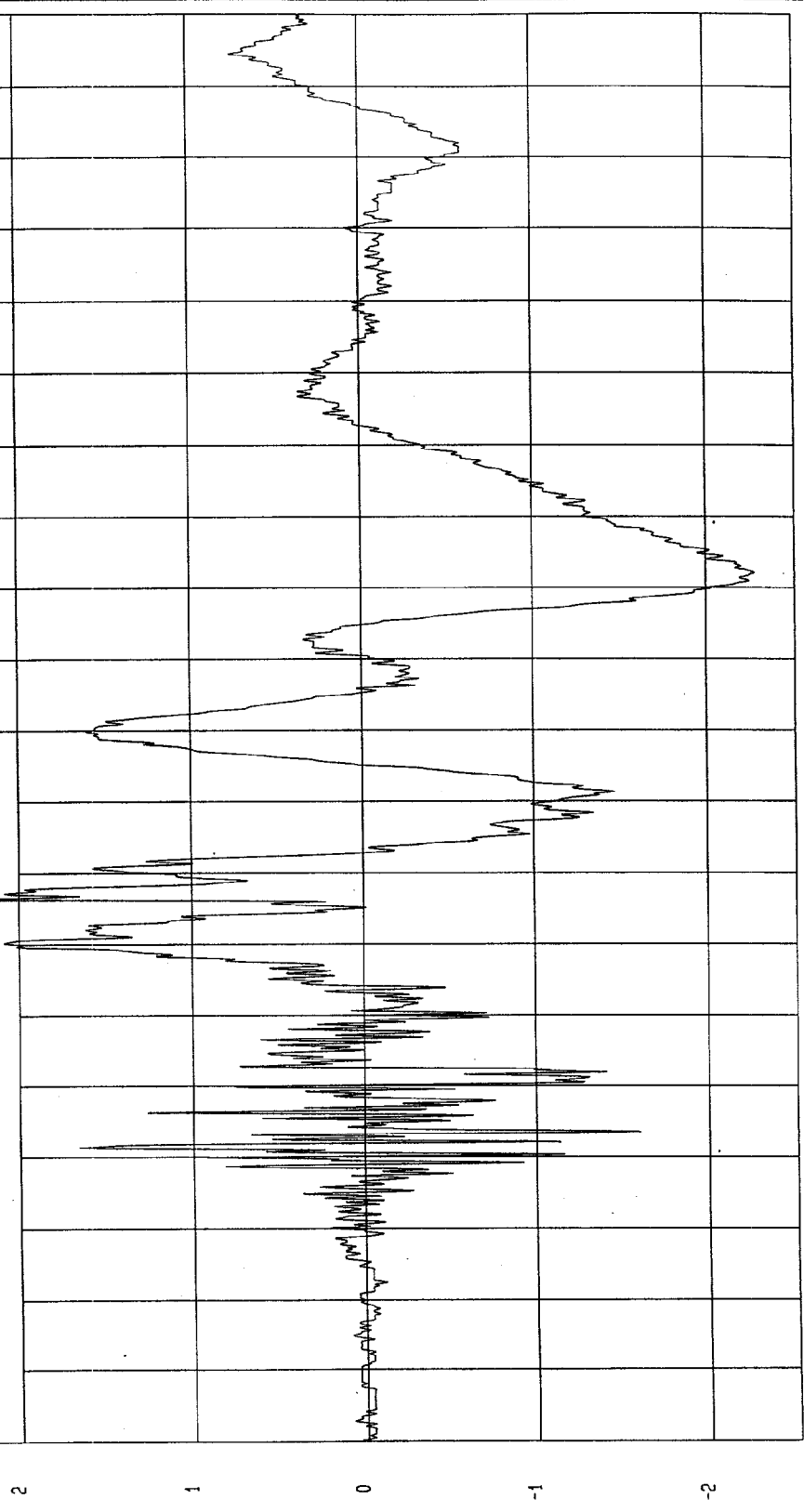
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-2.283375 G'S at 122 msec

YMAX= 2.345728 G'S at 76 msec

PASSENGER HEAD Y ACCELERATION

1 ——— H98056AF.A28 Filterclass (1000)



MCA Research
03-05-1998 12:16

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

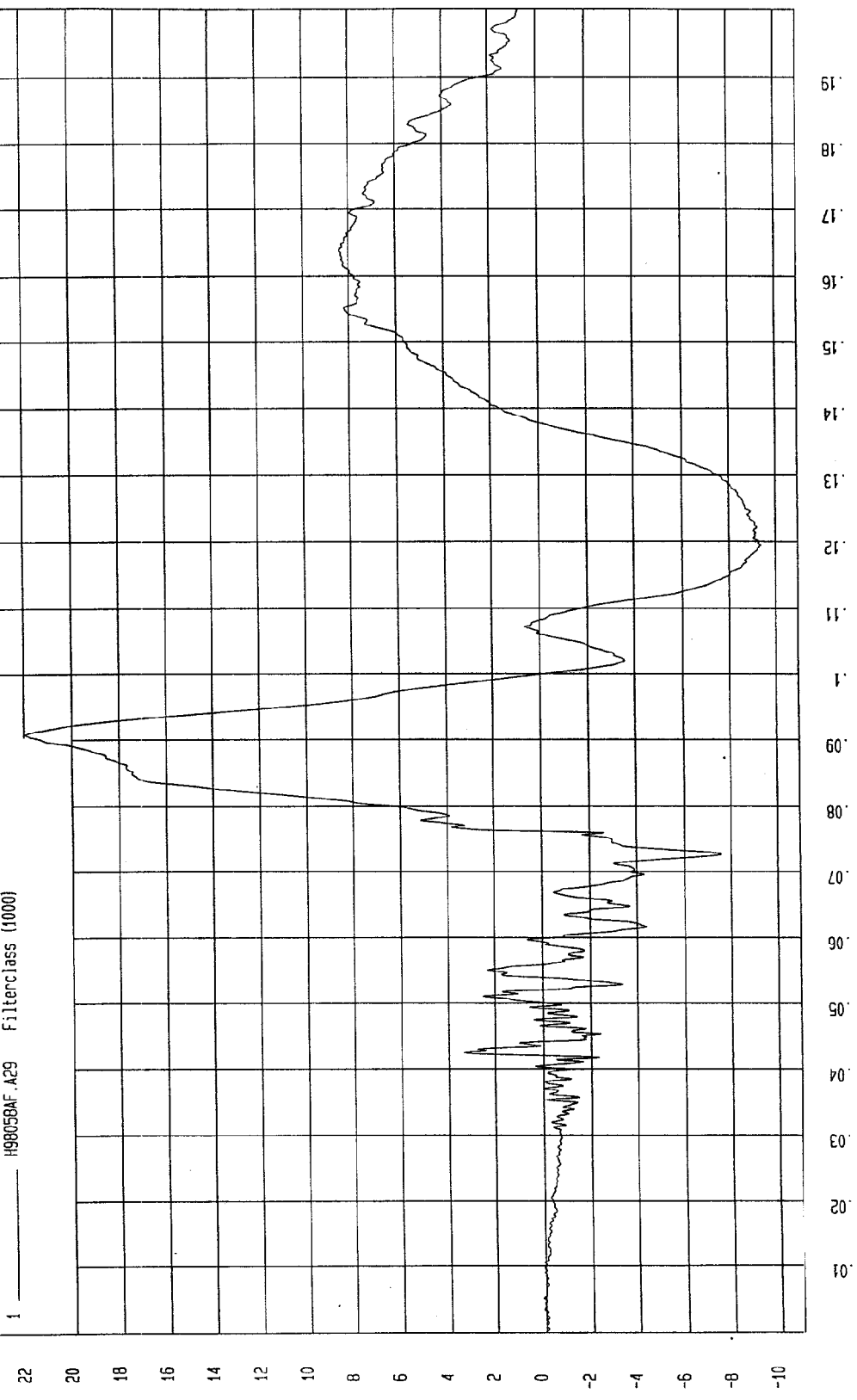
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 21.94526 G'S at 90. msec

YMIN= -9.366538 G'S at 119 msec

PASSENGER HEAD Z ACCELERATION

1 H98058AF.A29 Filterclass (1000)



M&A Research
03-05-1998 12:16

TIME (SECONDS)

G'S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

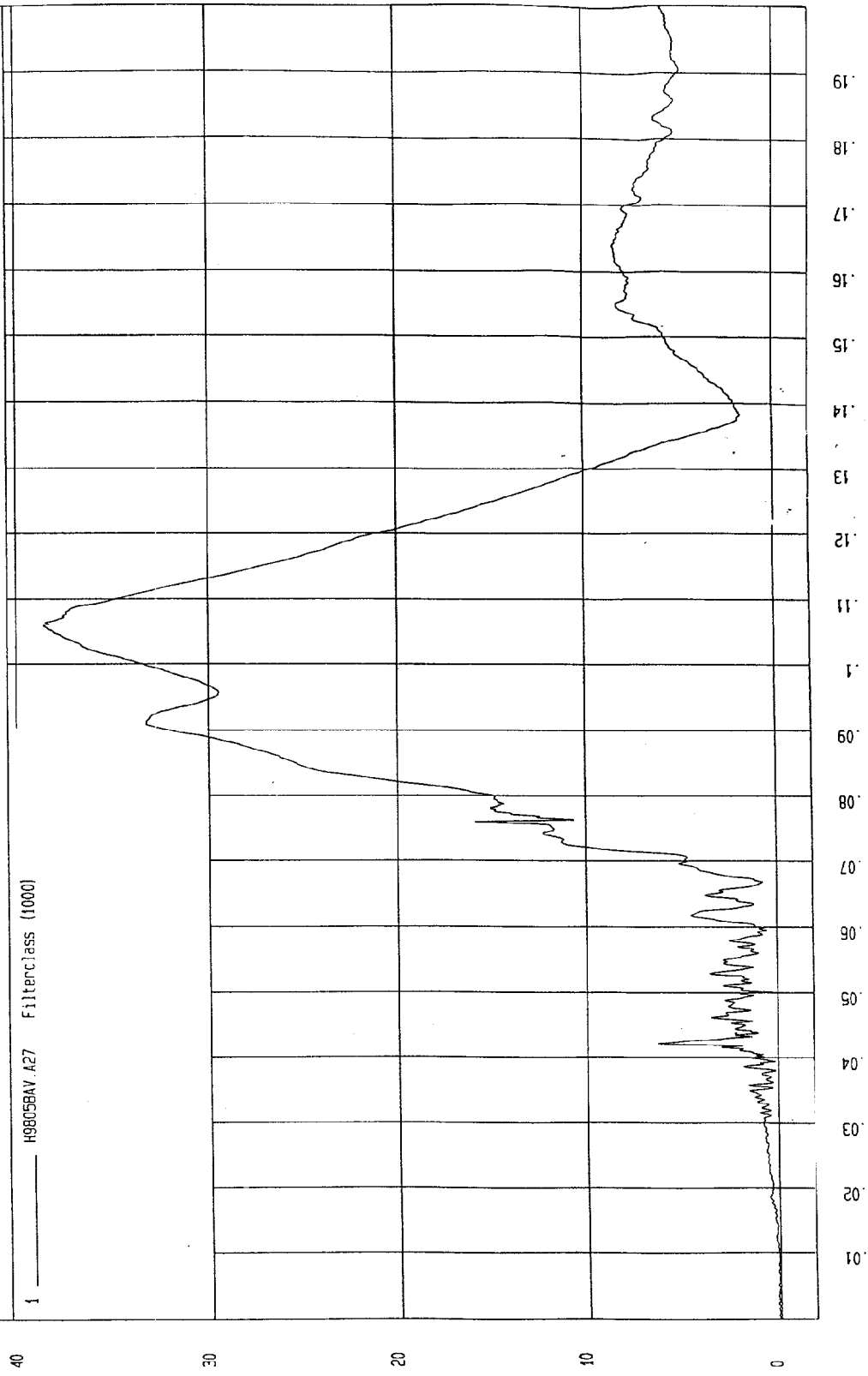
COMPONENT: 1998 FORD TAURUS CW0204

YMIN= 2.529817E-02 G'S at .2 msec

YMAX= 38.525564 G'S at 105 msec

PASSENGER HEAD RESULTANT ACCELERATION

1 H98058AV.A27 Filterclass (1000)



NSA Research
03-05-1998 12:17

TIME (SECONDS)

G.S.

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

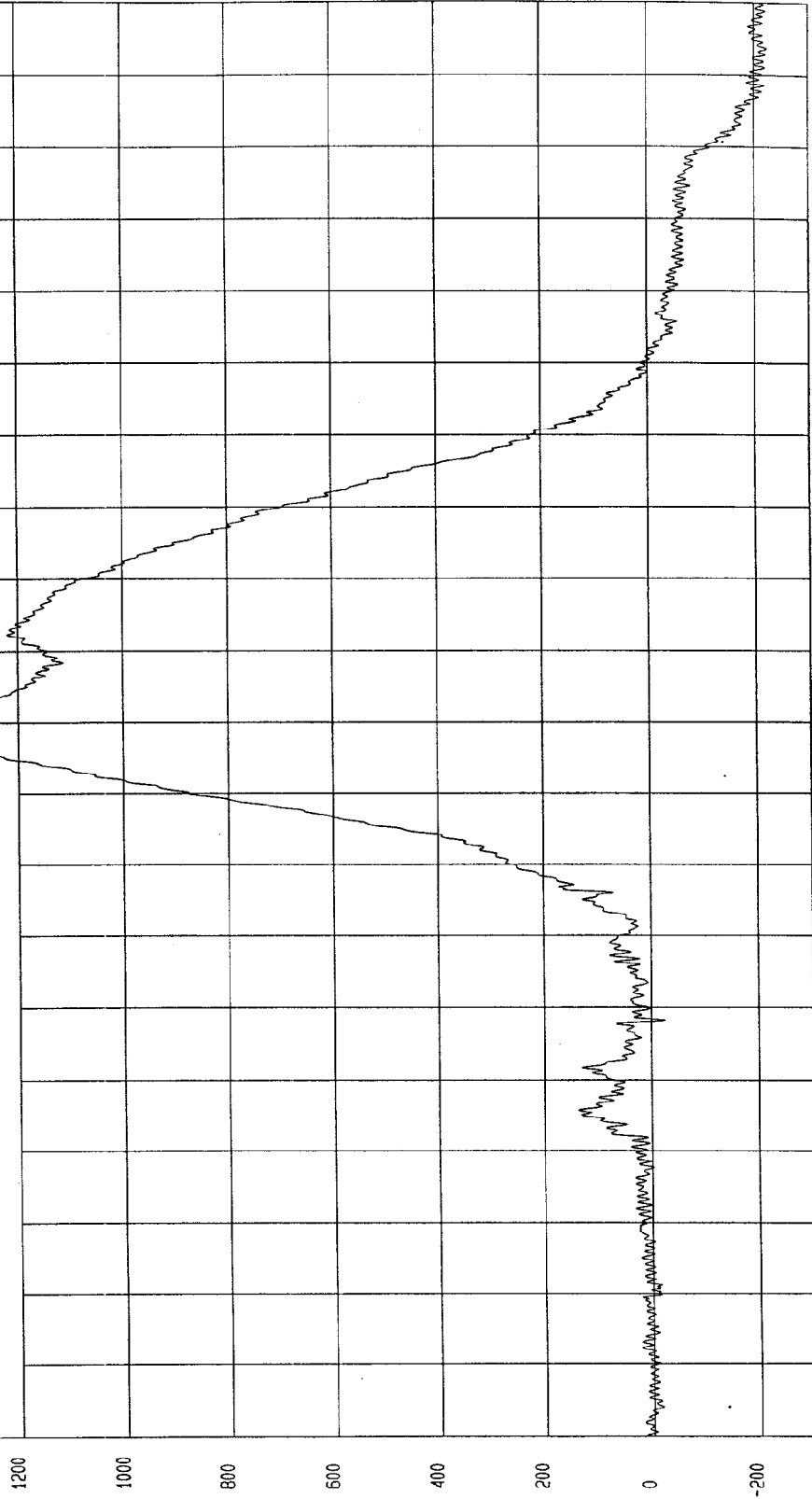
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-225.265 N at 193 msec

YMAX= 1294.041 N at 100 msec

PASSENGER NECK FORCE X

1 ——— H98058FF.F48 Filterclass (1000)



MCA Research
03-05-1998 12:17

TIME (SECONDS)

N

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

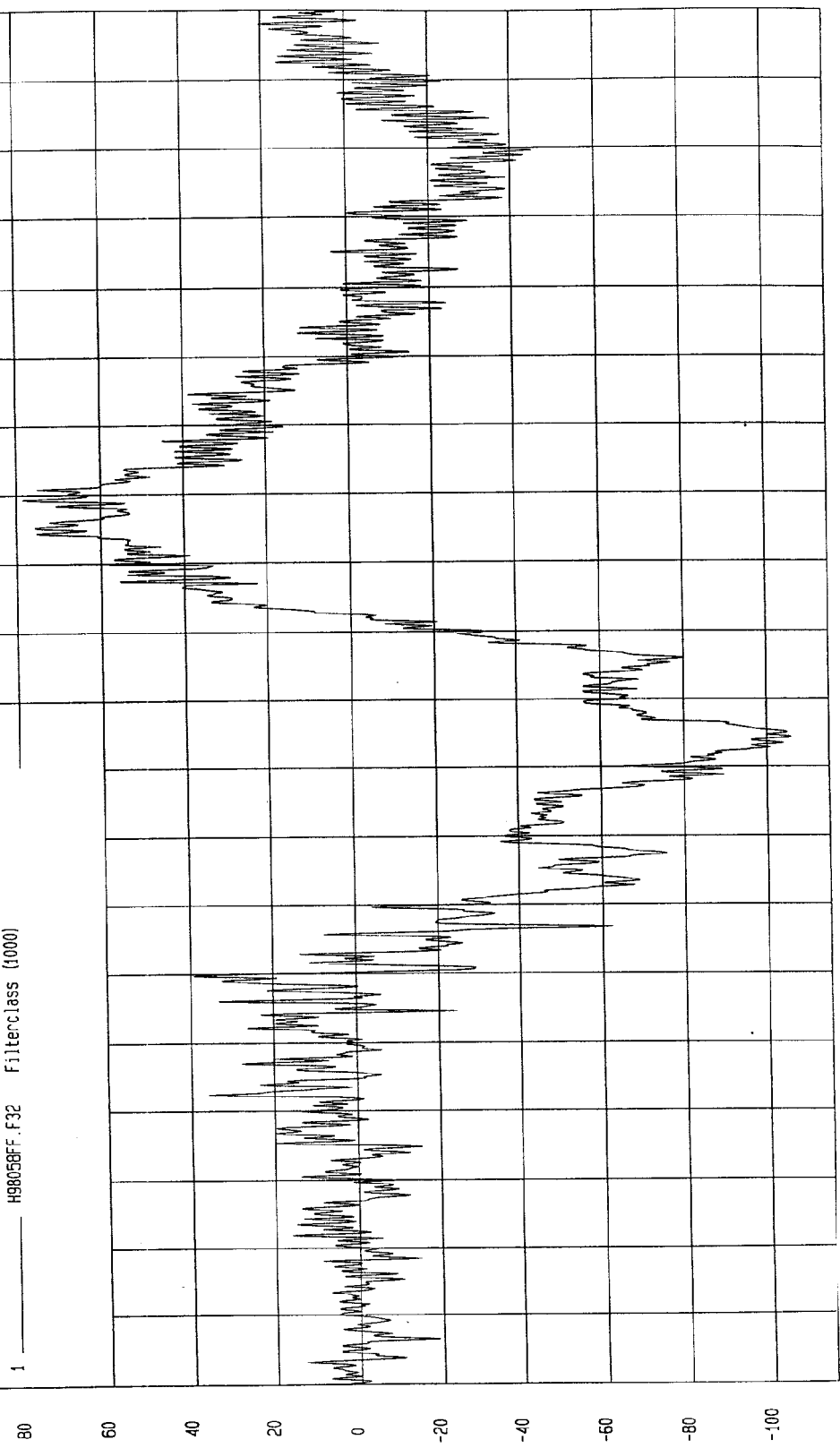
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-105.928 N at 94. msec

YMAX= 78.45861 N at 129 msec

PASSENGER NECK FORCE Y

1 H98058FF.F32 Filterclass (1000)



MCA Research
03-05-1998 12:17

TIME (SECONDS)

N

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

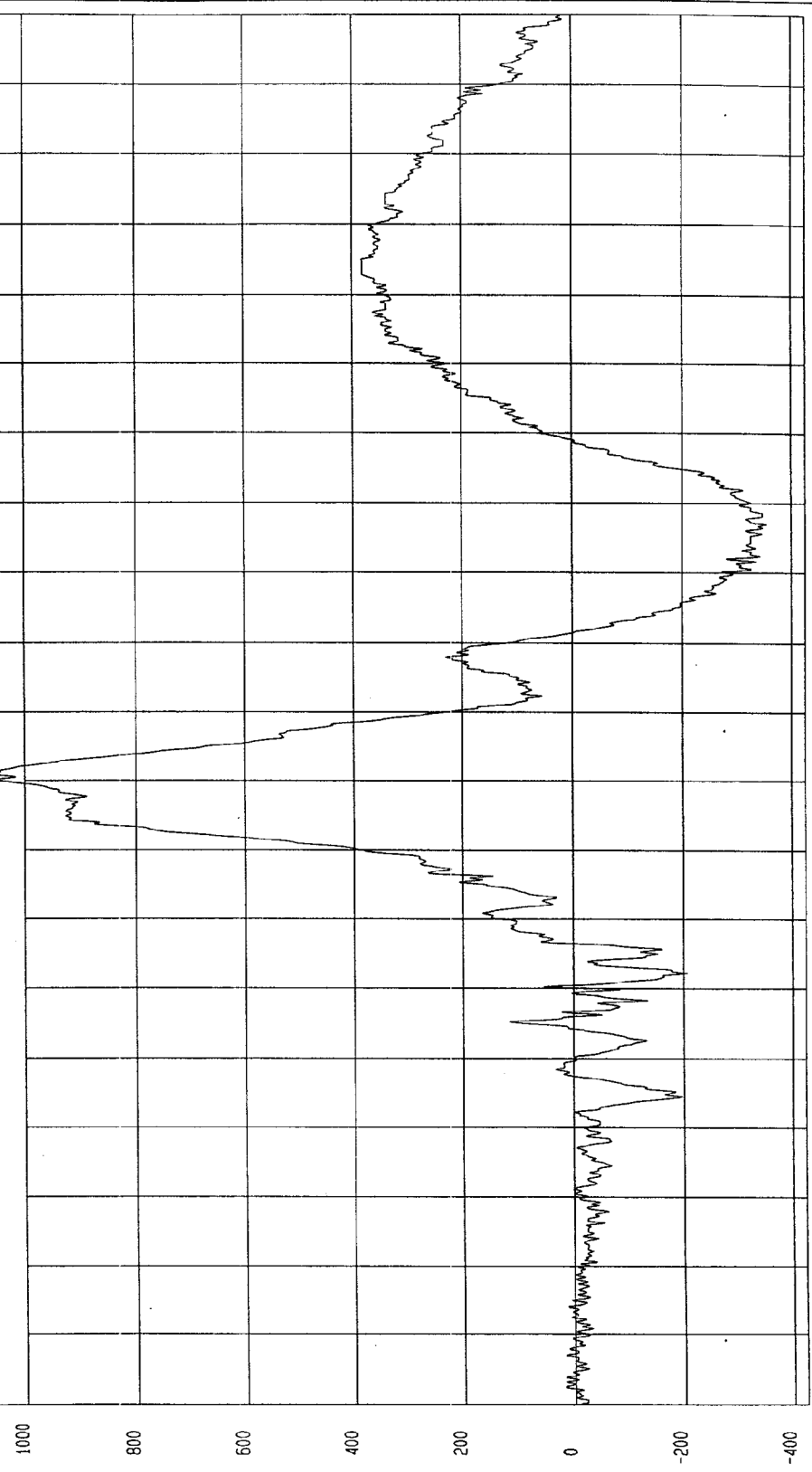
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-354.0603 N at 127 msec

YMAX= 1054.794 N at 90. msec

PASSENGER NECK FORCE Z

1 _____ H98059FF.F33 Filterclass (1000)



NCA Research
03-05-1998 12:18

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-6.674654 NM at 169 msec

YMAX= 7.704256 NM at 74. msec

PASSENGER NECK MOMENT X

1 _____ H98058MF.M34 Filterclass (500)

8

6

4

2

0

-2

-4

-6

NM

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

TIME (SECONDS)

MGA Research
03-05-1998 12.19

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

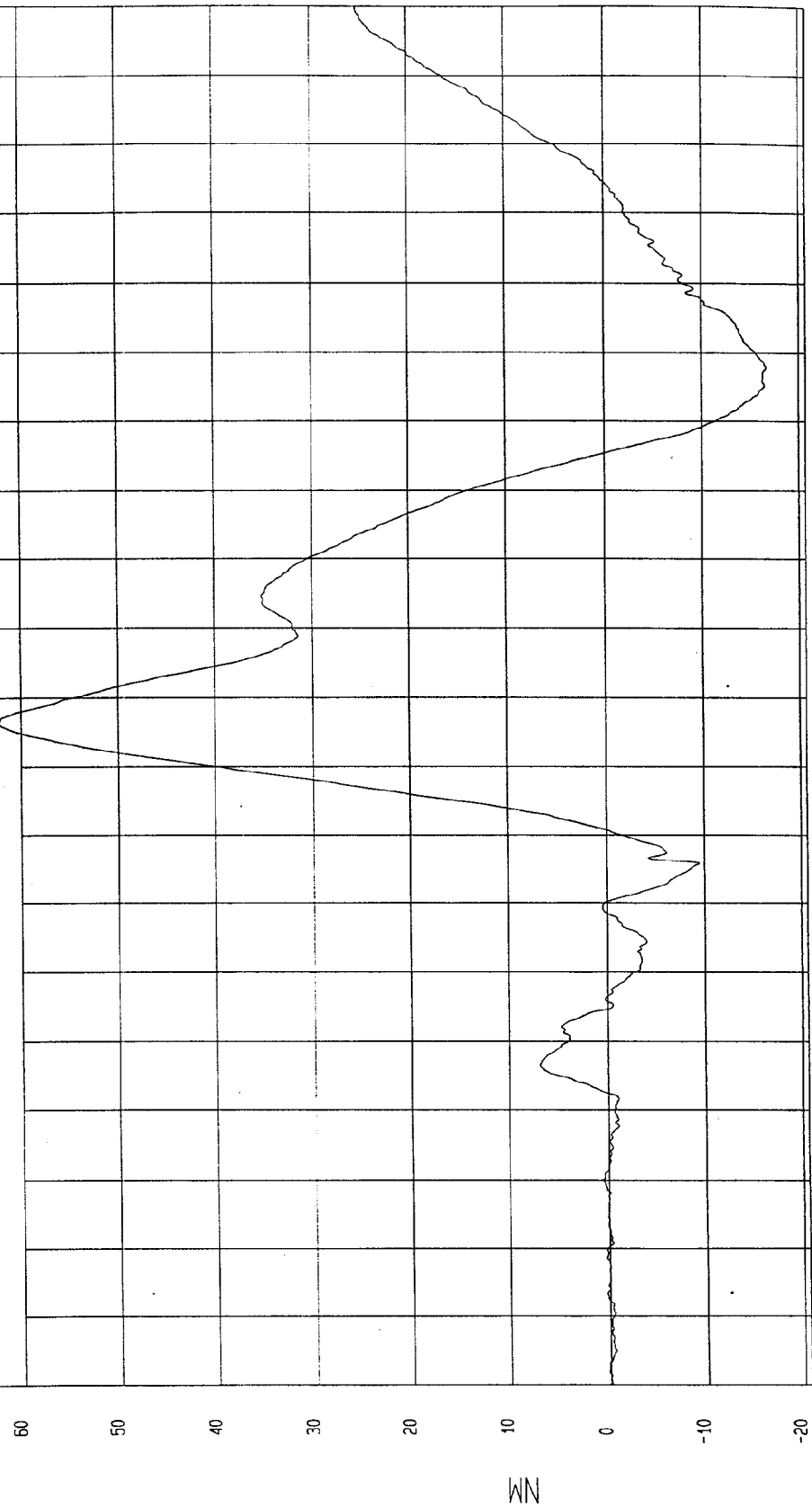
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-16.68771 NM at 147 msec

YMAX= 62.33606 NM at 96. msec

PASSENGER NECK MOMENT Y

1 _____ H98058MF.M35 FilterClass (600)



MGA Research
03-05-1998 12:36

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

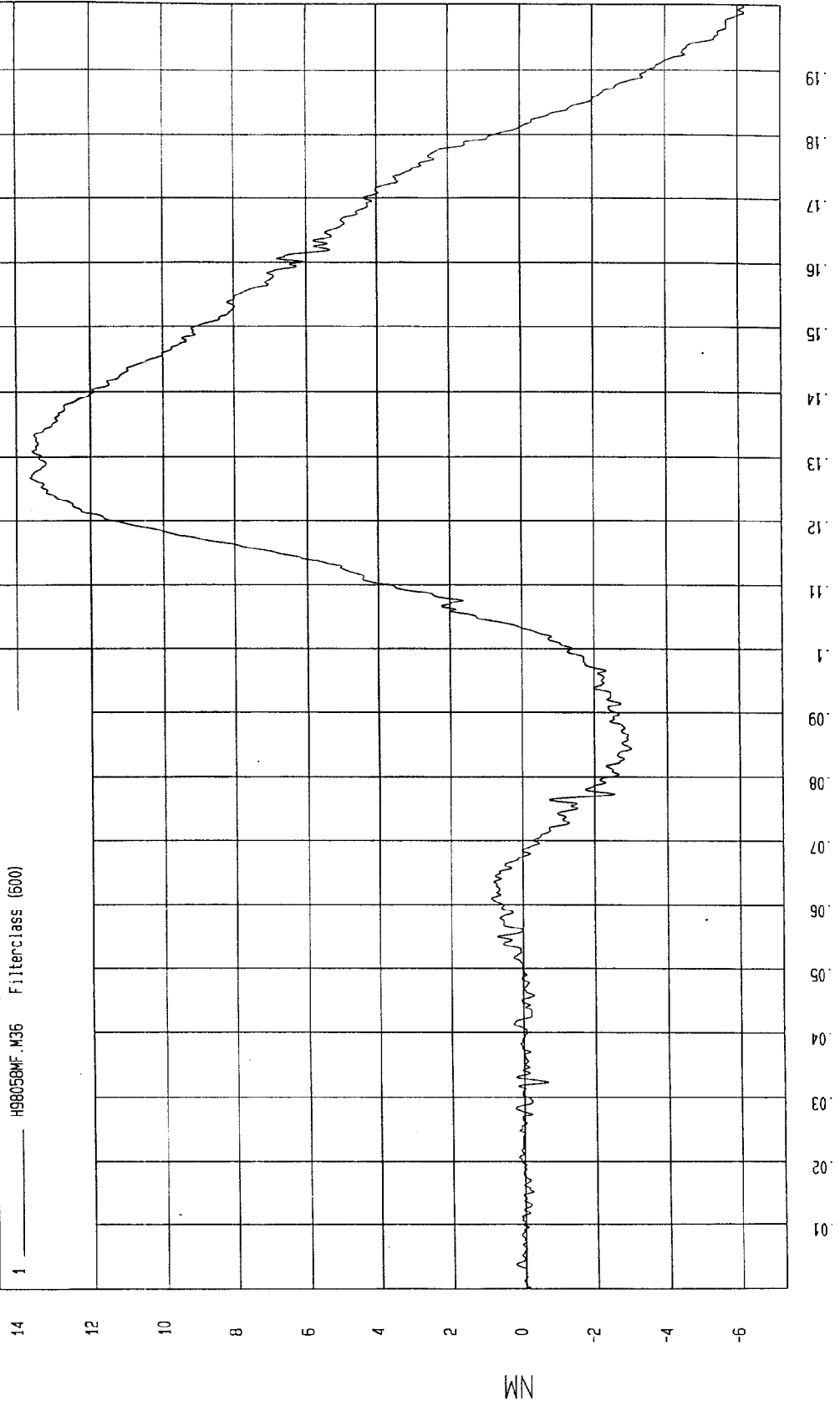
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-6.191431 NM at 199 msec

YMAX= 13.61981 NM at 126 msec

PASSENGER NECK MOMENT Z

1 H98050MF.M36 Filterclass (600)



NGA Research
03-05-1998 12:19

TIME (SECONDS)

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

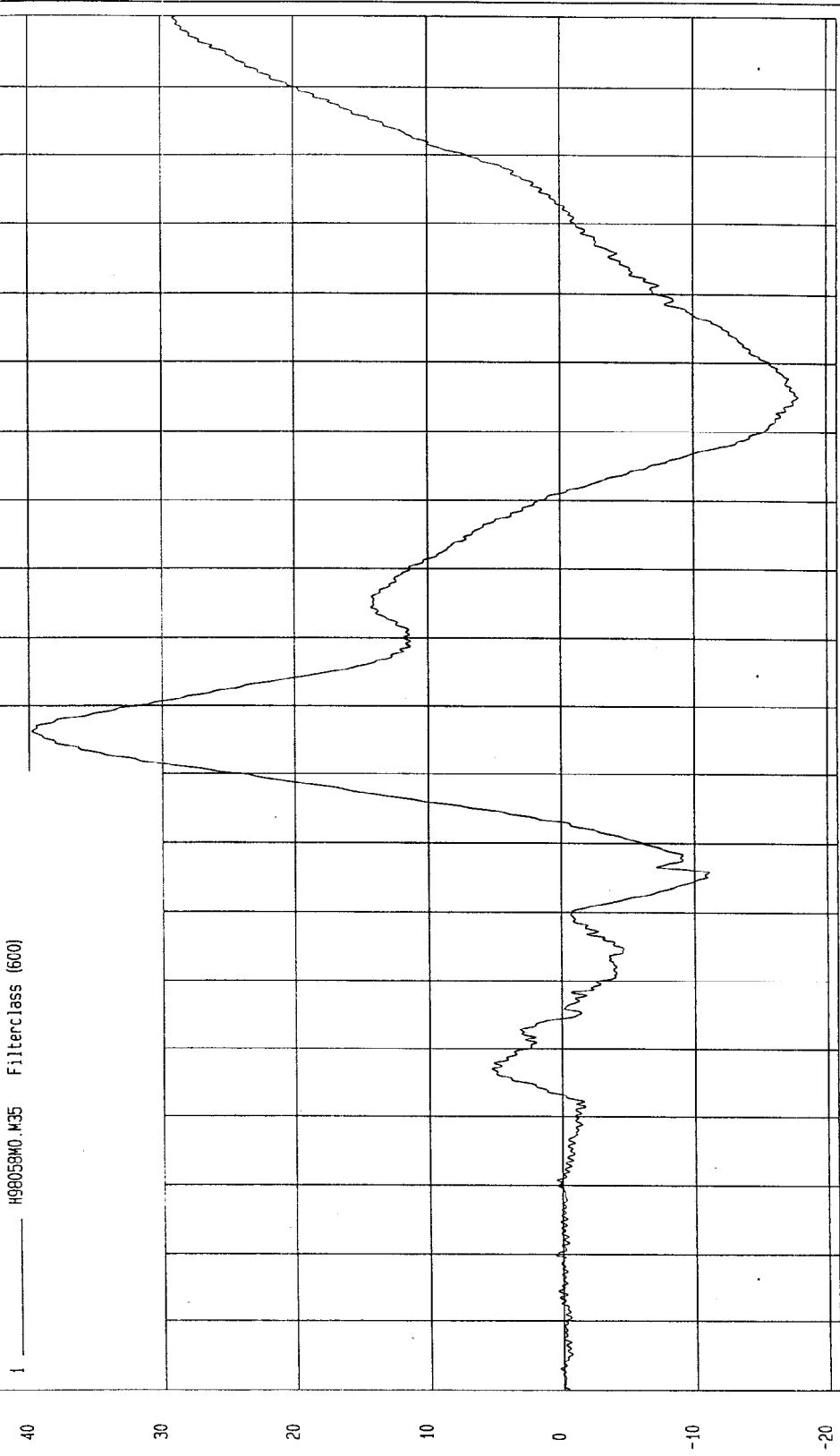
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 39.79838 NM at 96. msec

YMIN=-17.87015 NM at 145 msec

PASSENGER OCCIPITAL CONDYLE MOMENT Y

H96058M0.M35 Filterclass (600)



TIME (SECONDS)

MSA Research
03-05-1998 12.40

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

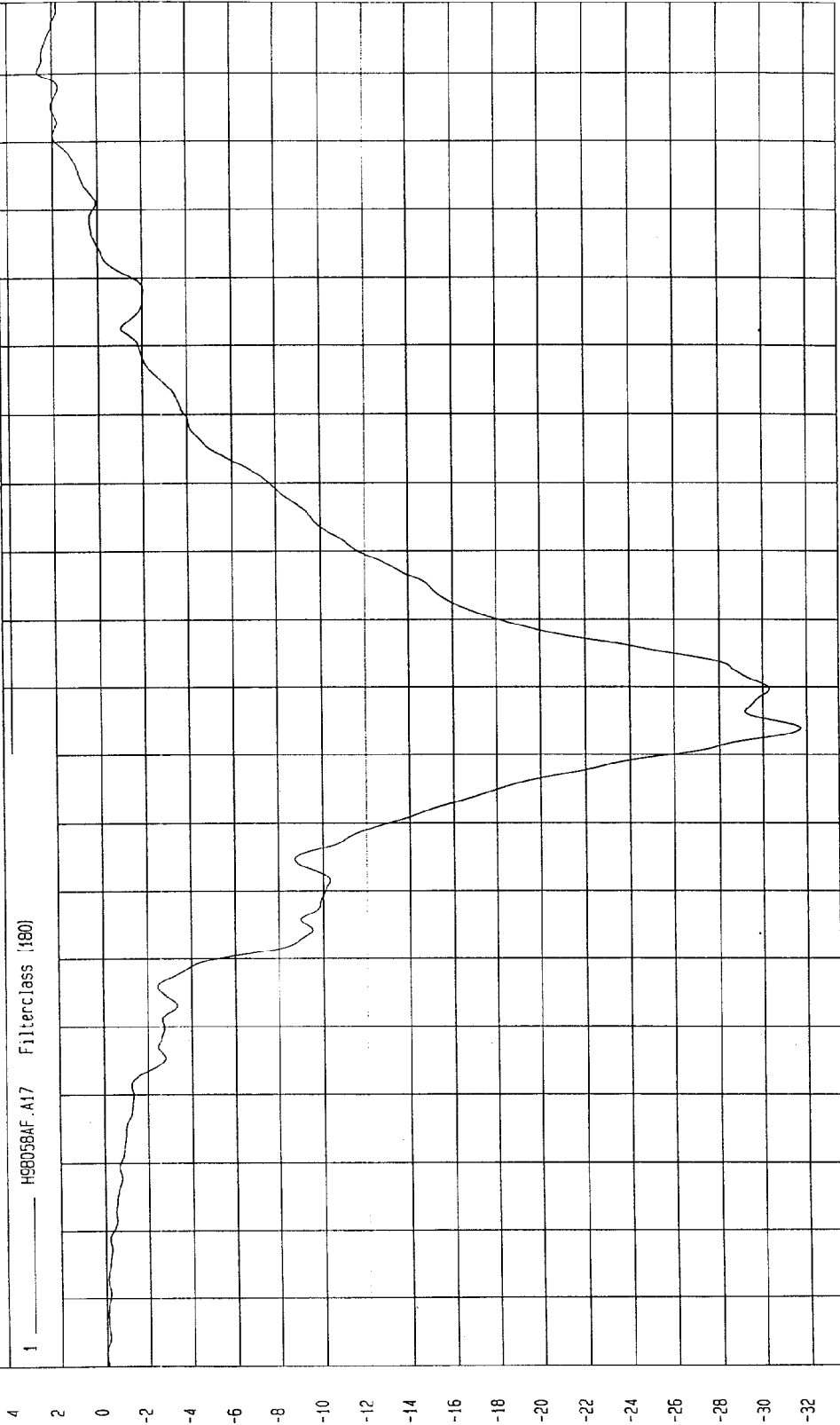
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-31.71923 G'S at 94 msec

YMAX= 2.653204 G'S at 190 msec

PASSENGER CHEST X ACCELERATION

1 H98058AF.A17 Filterclass (180)



MCA Research
03-05-1998 12:20

TIME (SECONDS)

G.S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-3.214883 G'S at 102 msec

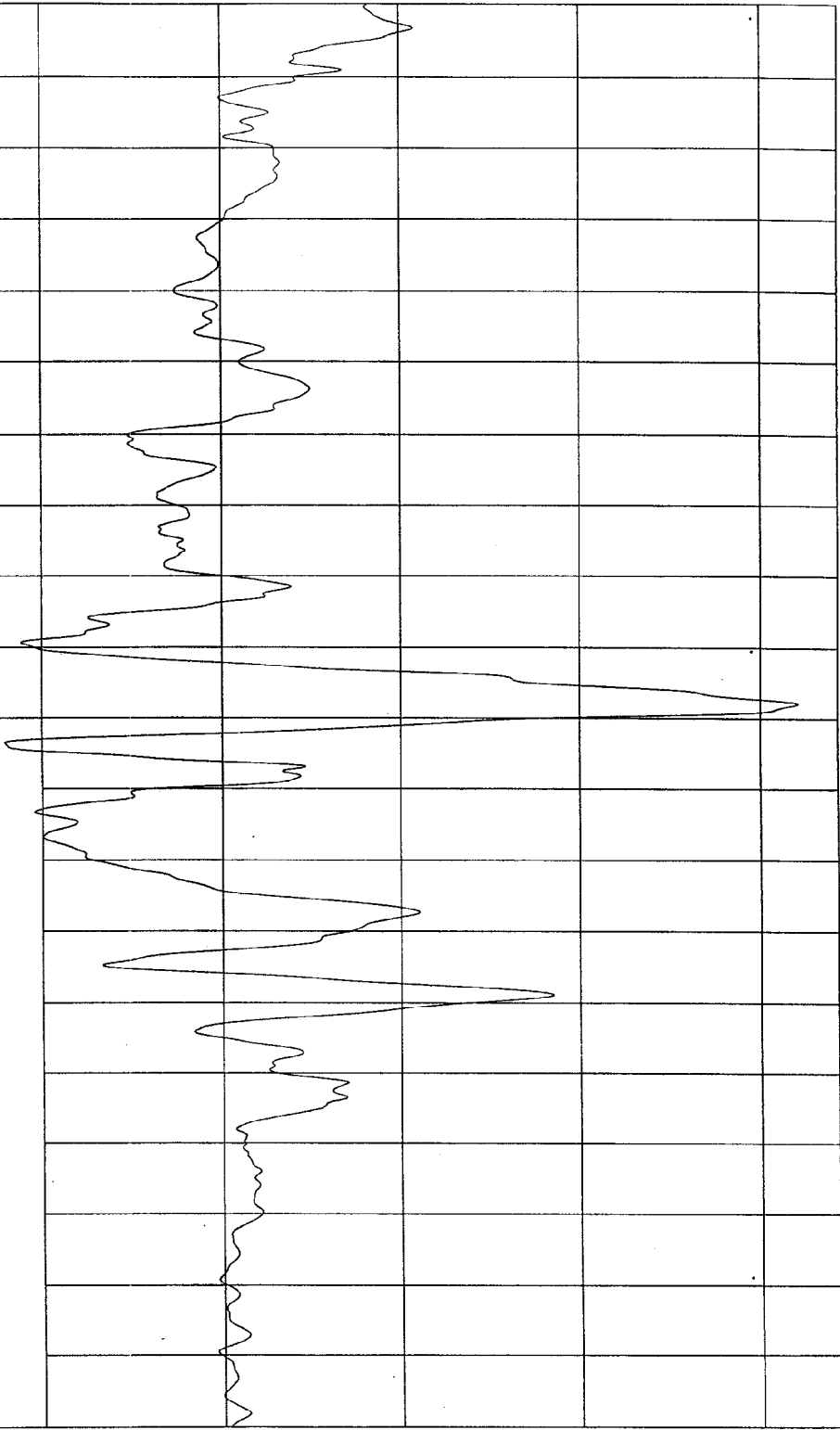
YMAX= 1.204012 G'S at 96 msec

PASSENGER CHEST Y ACCELERATION

1 _____ H98058AF.A42 Filterclass (180)

1
0
-1
-2
-3

G.S



TIME (SECONDS)

0.19

0.18

0.17

0.16

0.15

0.14

0.13

0.12

0.11

0.1

0.09

0.08

0.07

0.06

0.05

0.04

0.03

0.02

0.01

M&A Research
03-05-1998 12:20

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

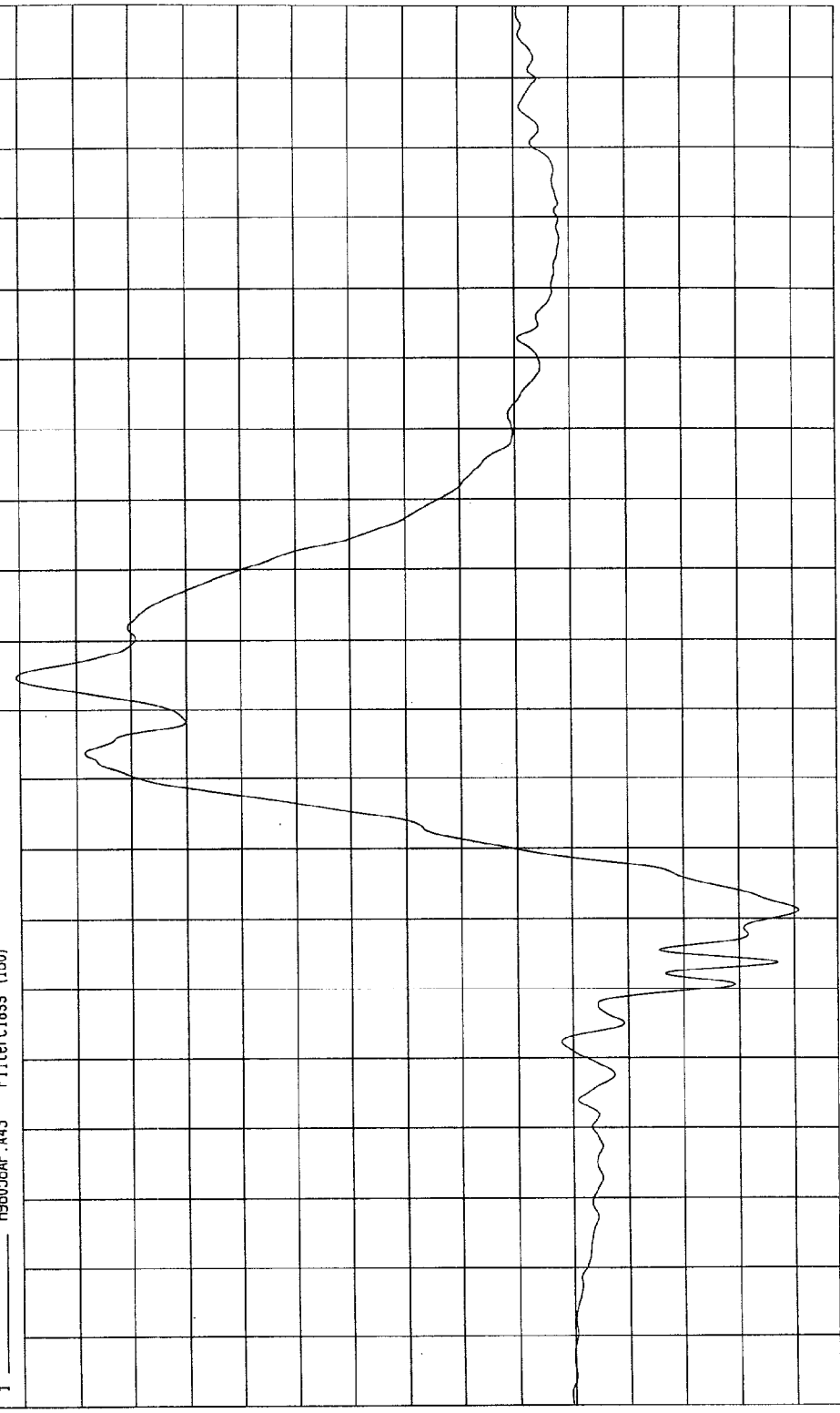
YMIN=-8.161807 G'S at 71. msec

YMAX= 20.13075 G'S at 104 msec

PASSENGER CHEST Z ACCELERATION

1 _____ HB0058AF .A43 Filterclass (480)

G.S



MGA Research
04-16-1998 10.04

TIME (SECONDS)

TEST DATE: 03-05-1998

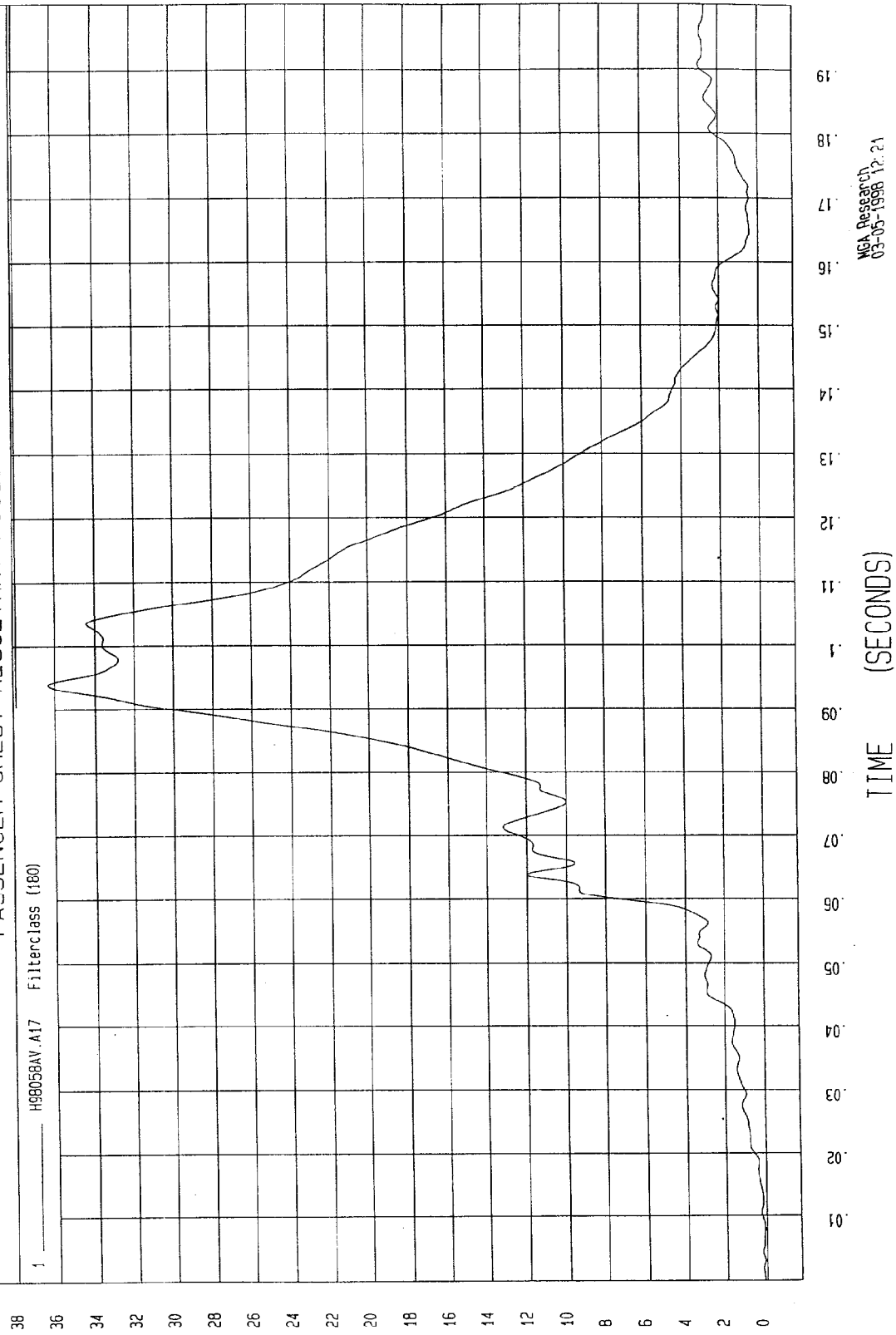
TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 36.32088 6'S at 93. msec

YMIN= 9.59965E-02 6'S at 3 msec

PASSENGER CHEST RESULTANT ACCELERATION



MCA Research
03-05-1998 12:21

TIME (SECONDS)

S.S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

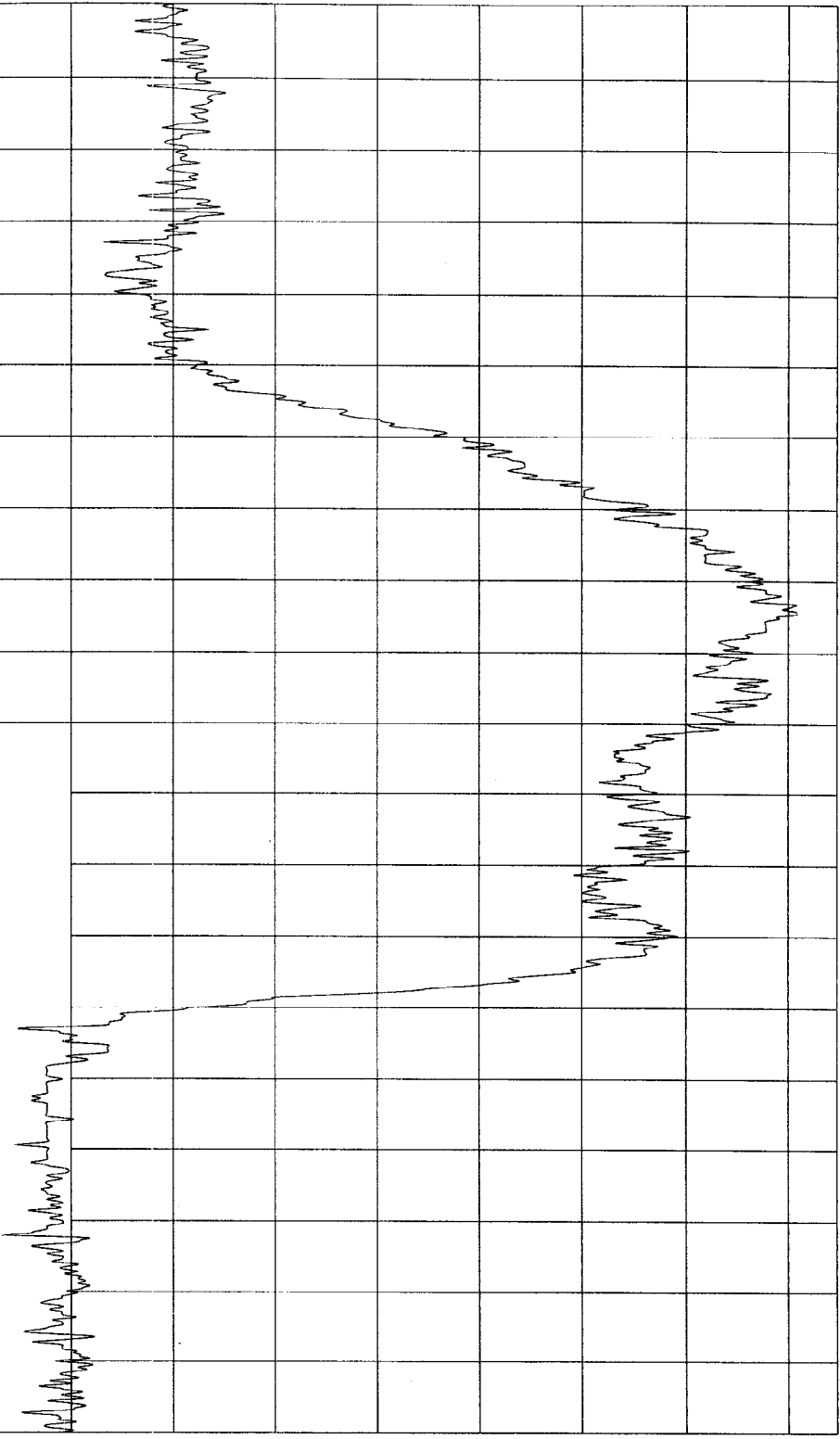
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 6.706017E-02 INCHES at 27. msec

YMIN=-.708315 INCHES at 115 msec

PASSENGER CHEST COMPRESSION

1 H980580F.039 Filterclass (600)



TIME (SECONDS)

MSA Research
04-16-1998 10:05

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

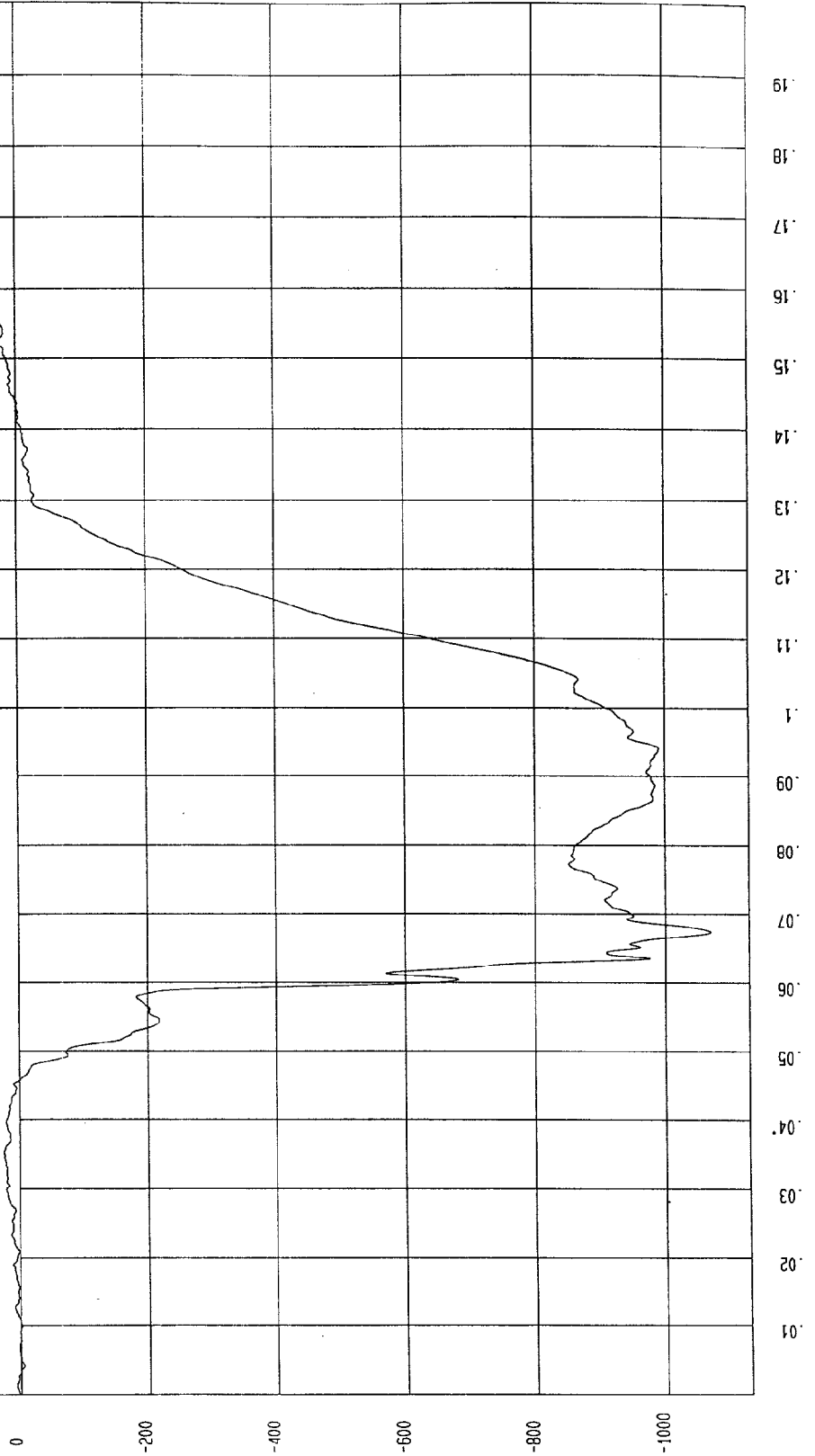
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-1070.918 LBS at 67. msec

YMAX= 117.2434 LBS at 199 msec

PASSENGER LEFT FEMUR FORCE

1 _____ H98058FF.F44 Filterclass (600)



MGA Research
03-05-1998 12:41

TIME (SECONDS)

LBS

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

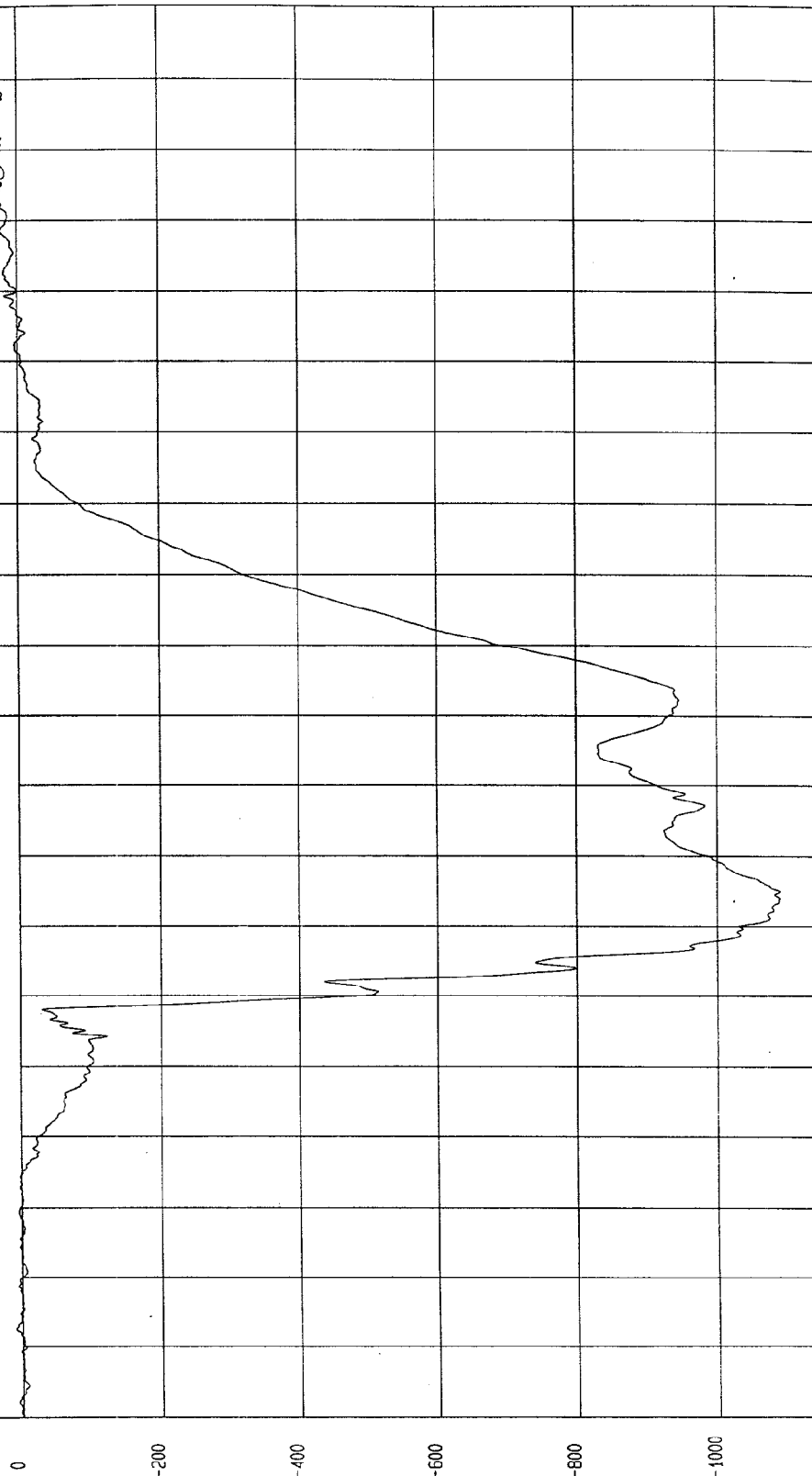
COMPONENT: 1998 FORD TAURUS CW0204

YMAX= 34.90796 LBS at 196 msec

YMIN=-1090.315 LBS at 73. msec

PASSENGER RIGHT FEMUR FORCE

1 H99058FF.F45 Filterclass (600)



MGA Research
03-05-1998 12:42

TIME (SECONDS)

LBS

TEST: FMVSS 208 SLED TEST TEST DATE: 03-05-1998

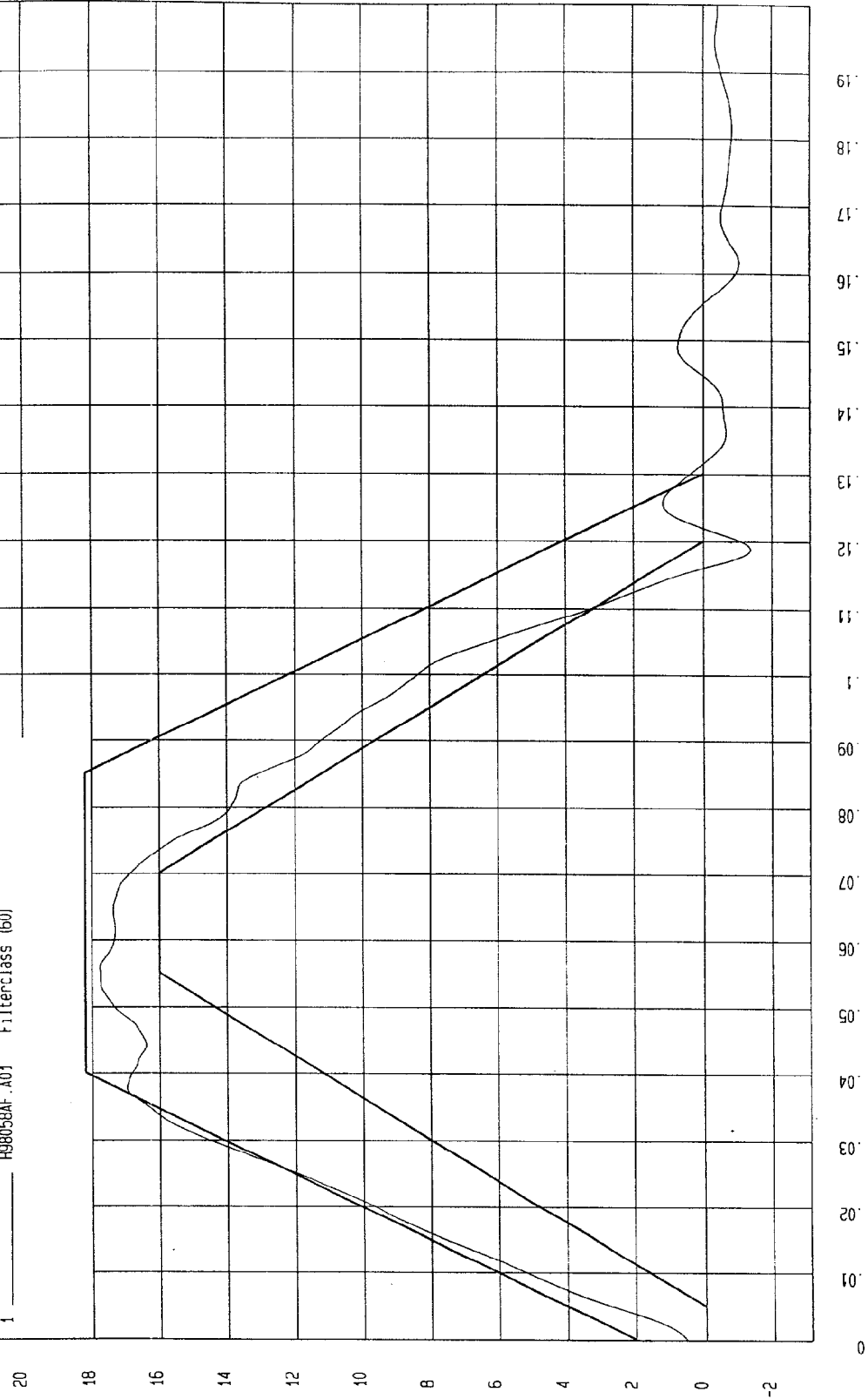
COMPONENT: 1998 FORD TAURUS CW0204

Maximum = 17.76 G'S at 55.9 msec

Minimum = -1.37 G'S at 118.9 msec

SLED ACCELERATION

1 H9805BAF.A01 Filterclass (60)



MCA Research
03-05-1998 12:06

TIME (SECONDS)

G.S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMIN= 0 MPH at 9.9 msec

YMAX= 29.68949 MPH at 132 msec

SLED X VELOCITY

1 H98056A1.V01 Filterclass (100)

30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0

MPH

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9

TIME Seconds

MGA Research
03-05-1998 12:26

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

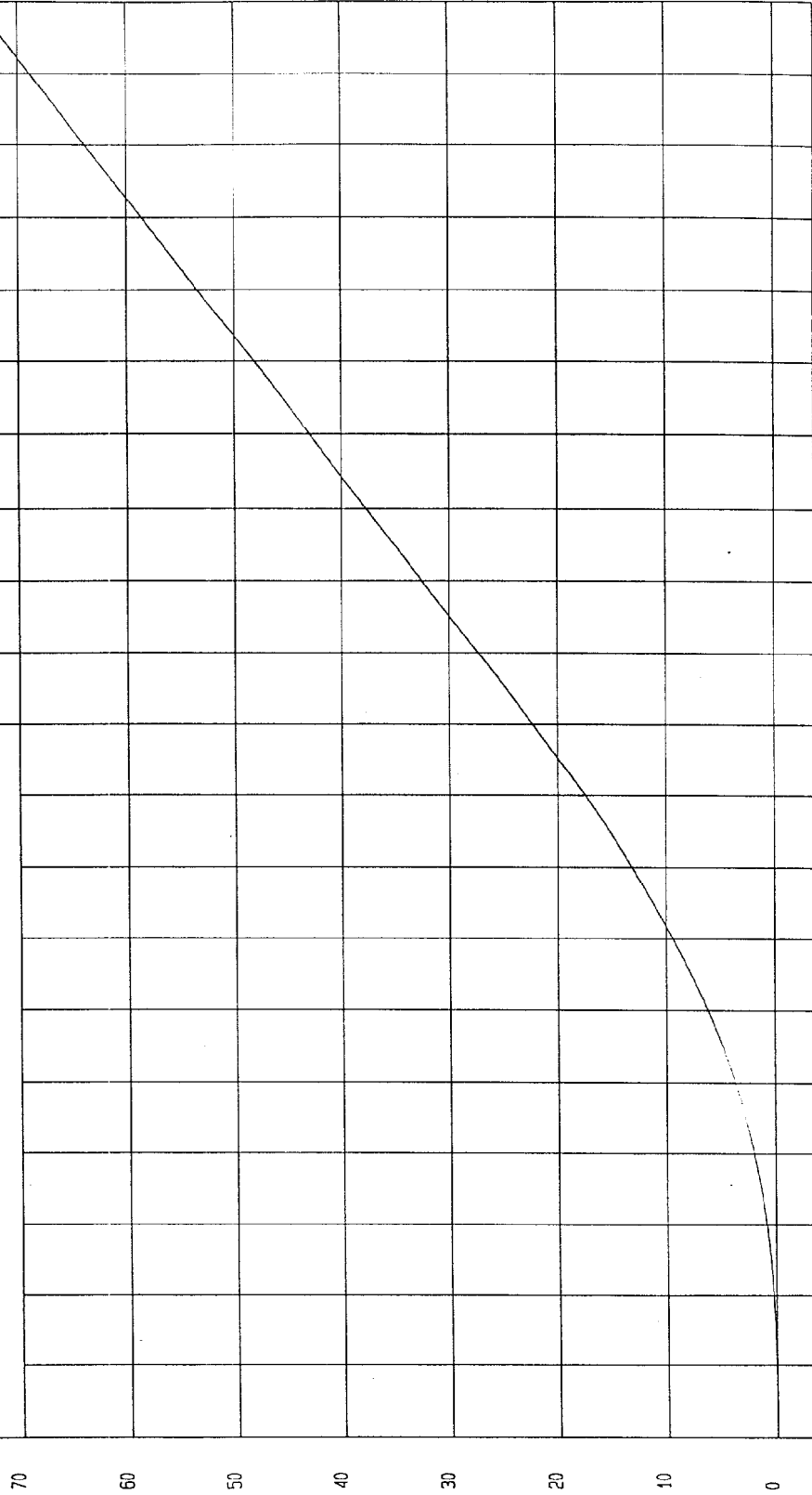
COMPONENT: 1998 FORD TAURUS CW0204

YMIN= 0 IN at 9.9 msec

YMAX= 74.03081 IN at 200 msec

SLED X DISPLACEMENT

1 ——— H98058A1.001 Filterclass (180)



MCA Research
03-05-1998 12:26

TIME Seconds

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

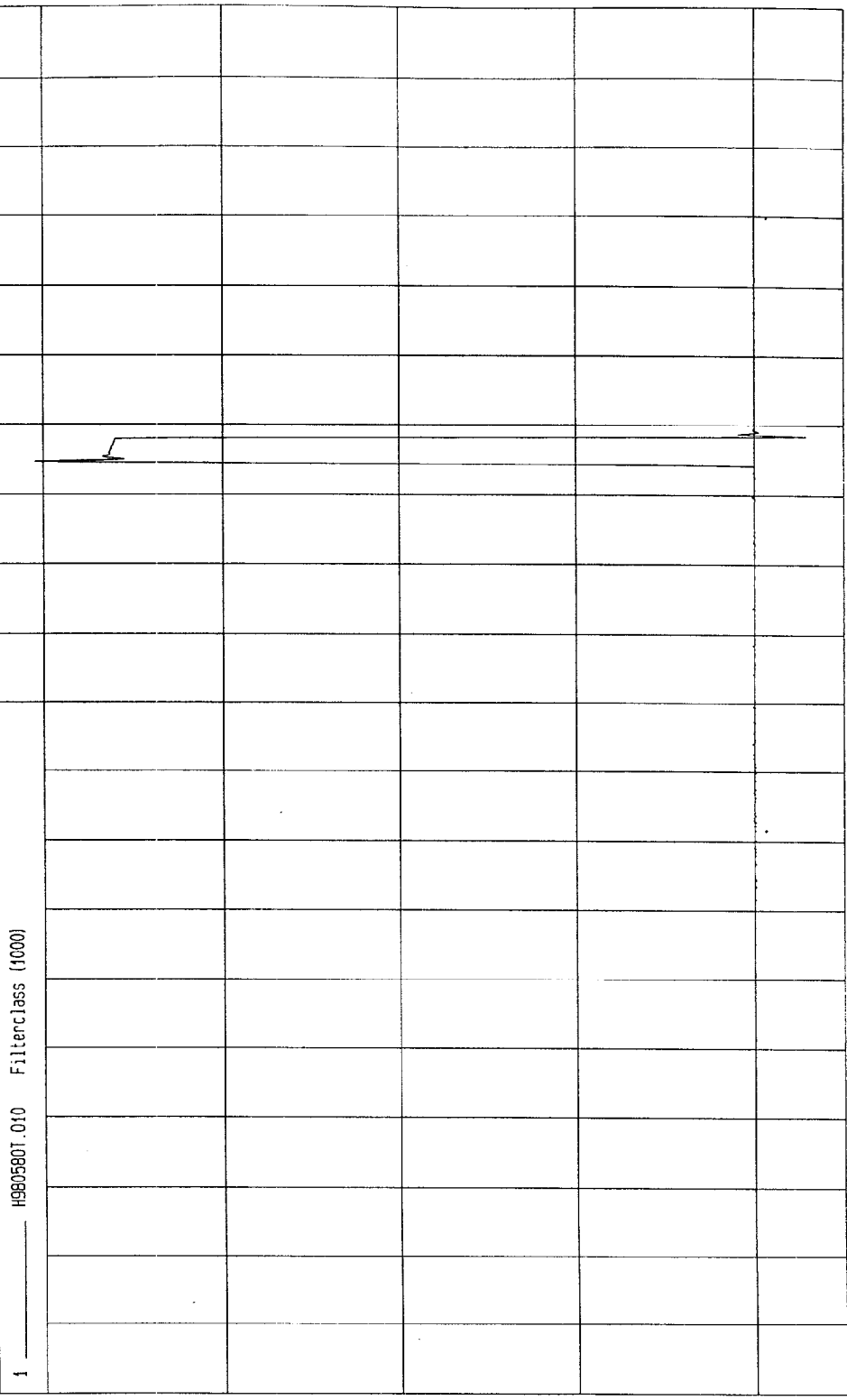
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-.290478 VOLTS at 138 msec

YMAX= 4.0479 VOLTS at 134 msec

1 METER

1 H9905801.010 FilterClass (1000)



TIME (SECONDS)

WGA Research
03-05-1998 12:27

VOLTS

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

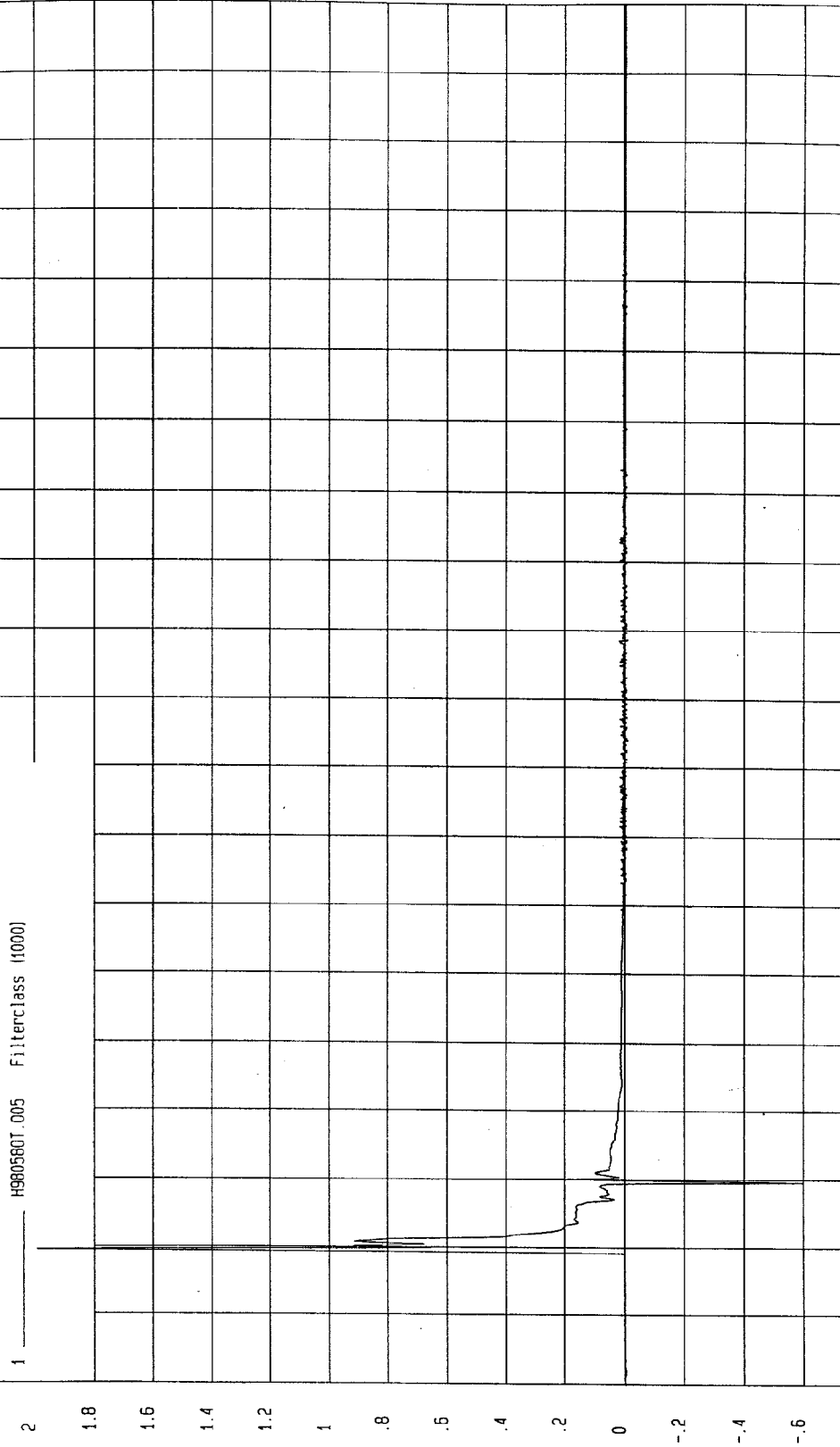
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-.6006353 VOLTS at 29. msec

YMAX= 1.992138 VOLTS at 19. msec

AIRBAG TIMING

1 H980580T.005 Filterclass (1000)



MGA Research
03-05-1998 12: 23

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-20.60178 G'S at 42. msec

YMAX= 3.687356 G'S at 122 msec

LEFT B POST X ACCELERATION

1 H98058AF.A1B Filterclass (60)

4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20

G'S

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9

TIME (SECONDS)

MGA Research
03-05-1998 12:22

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

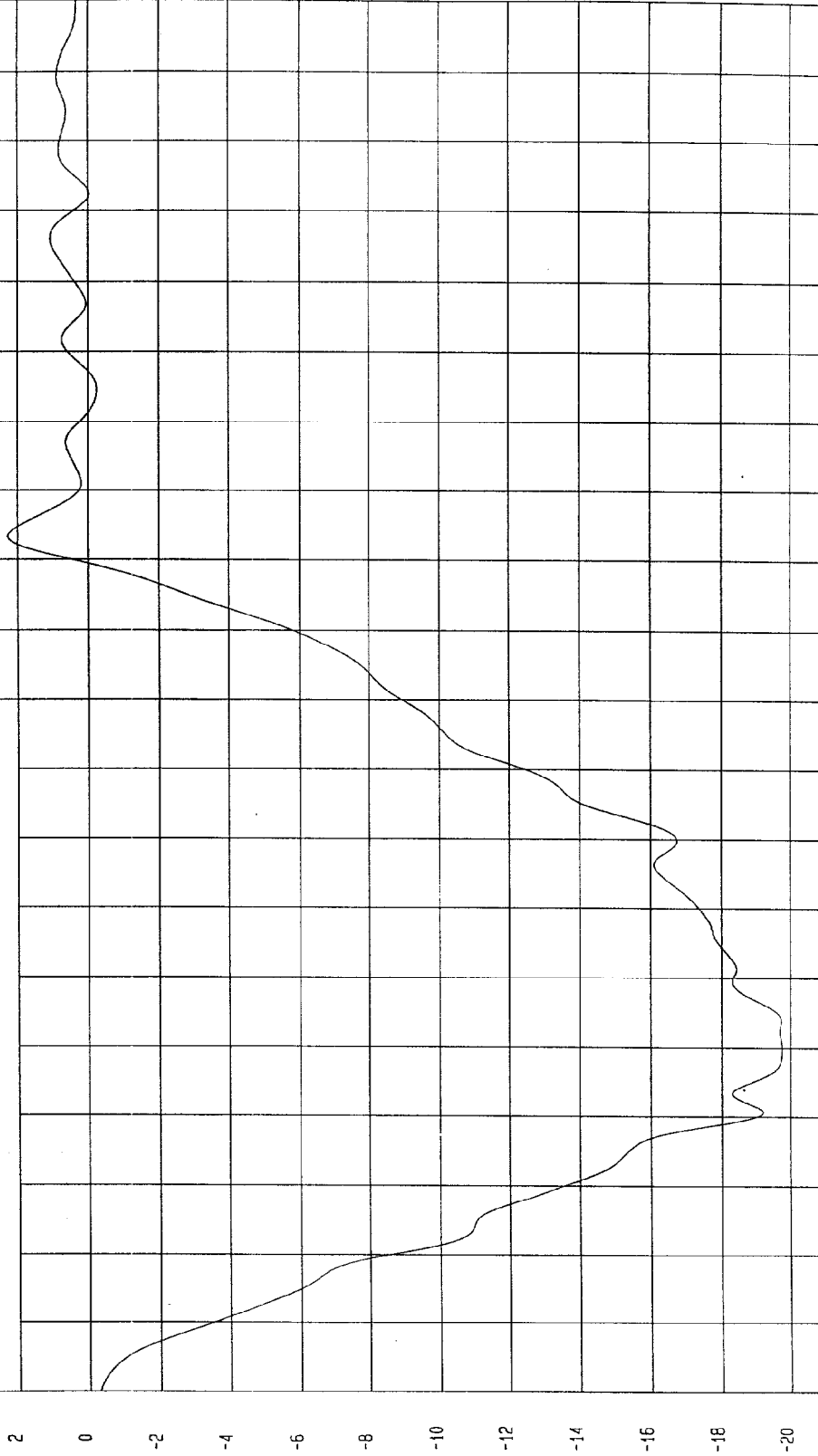
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-19.75648 G'S at 49. msec

YMAX= 2.282979 G'S at 123 msec

RIGHT B POST X ACCELERATION

1 H98058AF.A19 Filterclass (60)



G.S

TIME (SECONDS)

WGA Research
03-05-1998 12: 23

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

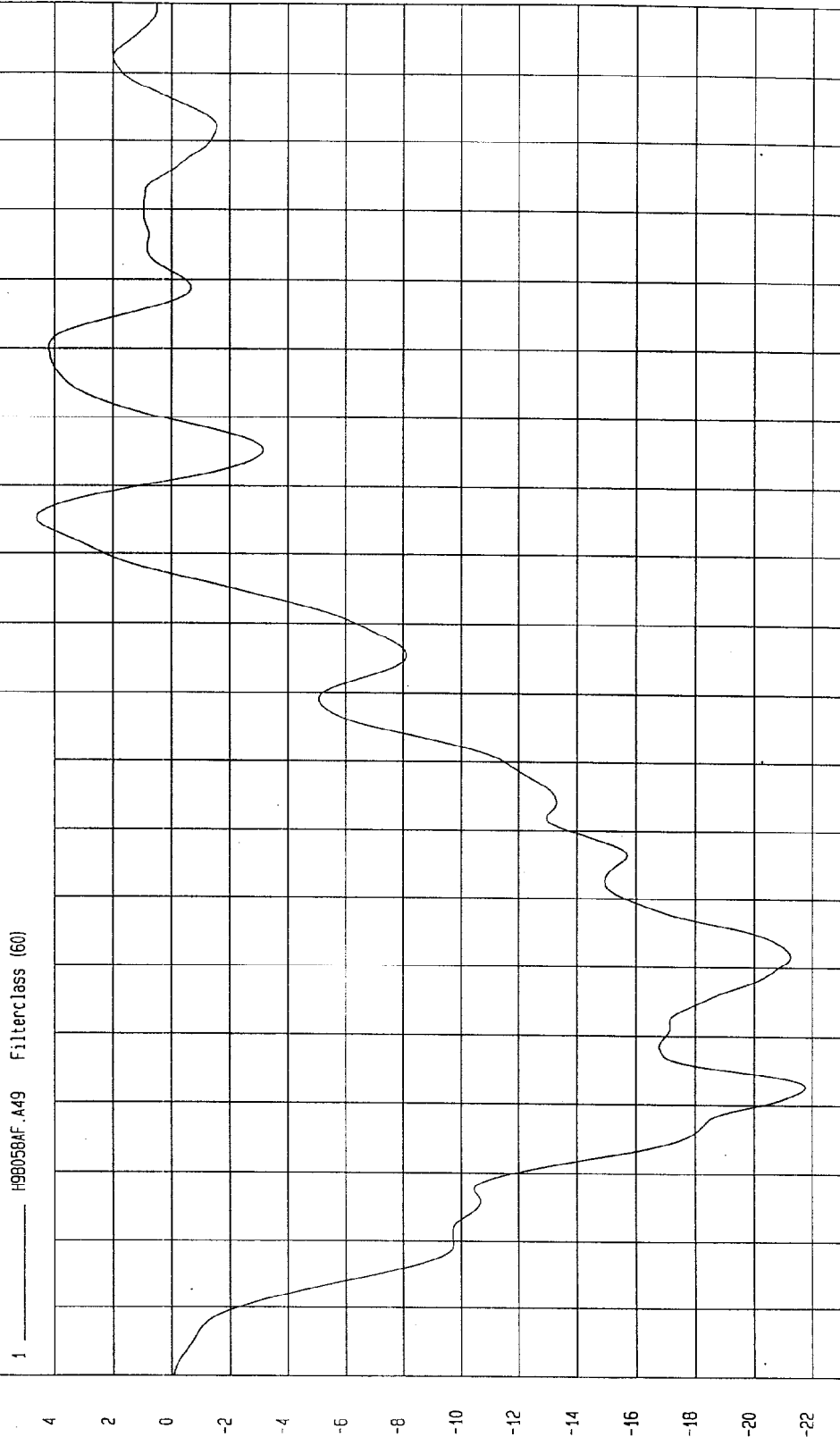
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-21.77453 G'S at 42. msec

YMAX= 4.596987 G'S at 125 msec

ENGINE X ACCELERATION

1 H990584F.A49 Filterclass (60)



MGA Research
03-05-1998 12:46

TIME (SECONDS)

G.S

TEST DATE: 03-05-1998

TEST: FMVSS 208 SLED TEST

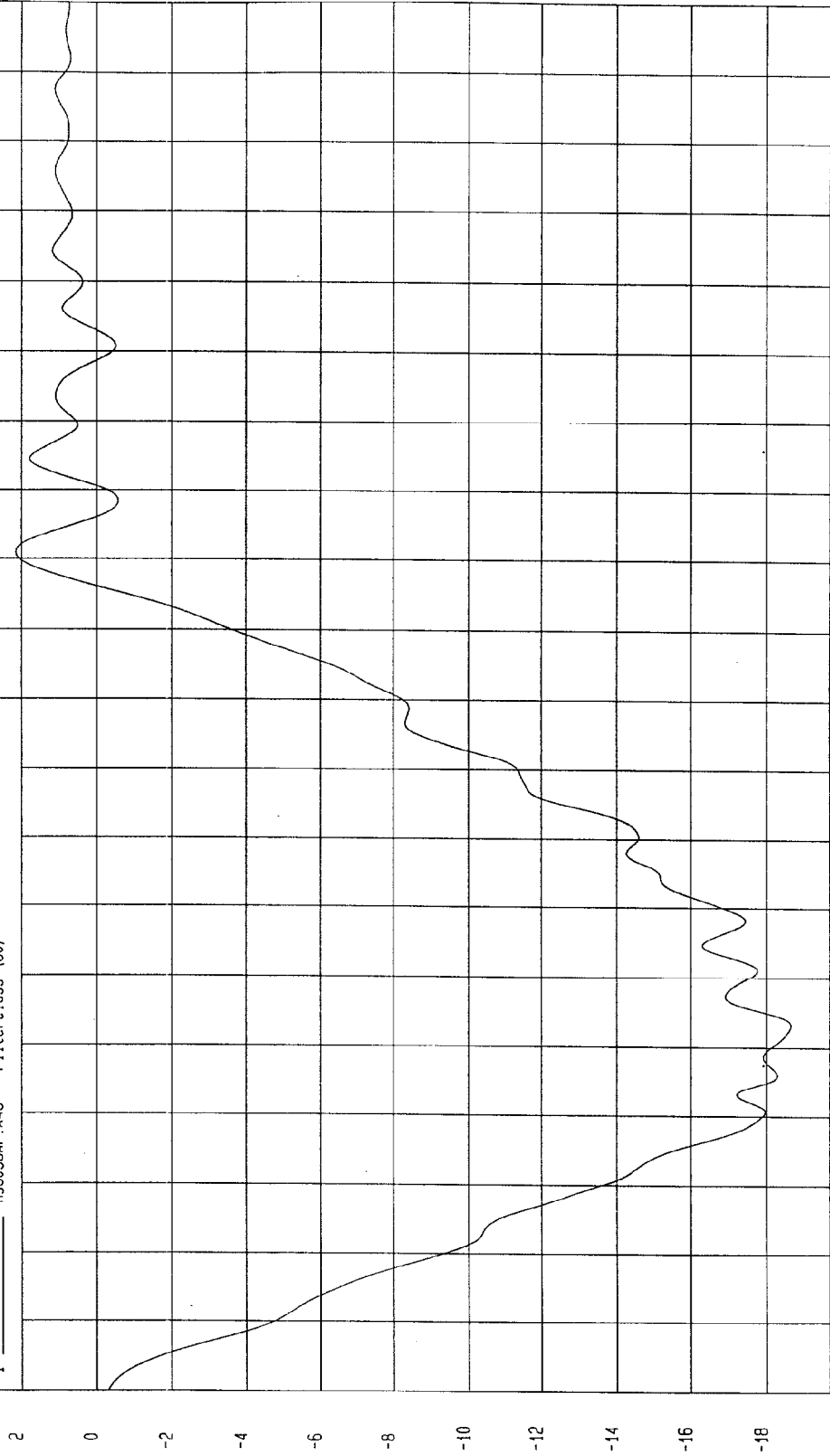
COMPONENT: 1998 FORD TAURUS CW0204

YMIN=-18.6691 G'S at 53. msec

YMAX= 2.150056 G'S at 120 msec

VEHICLE REAR AXLE X ACCELERATION

1 _____ H98058AF.A46 Filterclass (60)



MCA Research
03-05-1998 12:23

APPENDIX C
MANUFACTURER'S VEHICLE INFORMATION



L. W. Camp
Director
Automotive Safety Office
Environmental And Safety Engineering

Ford Motor Company
330 Town Center Drive
Dearborn, Michigan 48126

November 13, 1997

Mr. Harry Thompson
Chief, Vehicle Division
Office of Vehicle Safety Compliance
National Highway Traffic Safety
Administration
400 Seventh Street, S. W.
Washington, D.C. 20590

Dear Mr. Thompson:

Reference: NSA-31CCA/ OA:208970811K

This supplements and completes our October 3, 1997 response to your letter of August 13, 1997, requesting information relative to possible FMVSS 208 testing by OVSC of the 1998 model year Ford Taurus equipped with driver and passenger air bag restraint systems.

By means of this submittal Ford is completing its responses to your request nos. 1 and 6. For your convenience, each portion of your request for which we are submitting information is listed followed by Ford's response.

Request No. 1

"... If the air bags were installed to meet the requirements of S13, please provide a copy of the certification test reports for the frontal/angular barrier impact tests of the automatic restraint system with the manual safety belts fastened and the certification test reports for the sled test with only the automatic restraint system."

Response

Attachments I & II contain copies of those portions of the final test reports, relevant to the requirements of FMVSS No. 208, for Crash Test Numbers 10642 and 10710, respectively: 90 degree front fixed barrier impact tests for these Second Generation air bag equipped vehicles for the automatic restraint system with the manual safety belts fastened. Attachment III contains a copy of those portions of the final test report, relevant to the requirements of FMVSS No. 208, for Sled Test Numbers H18540, H18541, H18542, and H18543: dynamic sled tests utilizing a rigid sled test body buck simulating the Ford Taurus and using only the automatic restraint system (Second Generation Air Bags). This test report, in its entirety, encompassed a series of investigative tests covering a multitude of conditions most of which are outside of the FMVSS 208 parameters, e.g., dummy

November 13, 1997

size/positioning and environmental conditions. The test report information not related to FMVSS No. 208 has been deleted - material deleted on an individual page is noted by brackets.

Ford relied on the information provided in Attachments I, II, and III of this response to demonstrate compliance of the 1998 Ford Taurus equipped with Second Generation driver and right front passenger air bag restraint systems with the requirements of S4.1.5.1(a)(1) and S13 of FMVSS No. 208. Note that the angular requirements were addressed by means of engineering judgment based upon the results of angular tests of vehicles equipped with first generation powered air bags with safety belts unfastened. Also, for the sled tests, as noted in the cover sheet for the sled test report in Attachment III, the sled test data is not in the test report but rather is retained electronically by the Ford Safety Laboratories Department. This data was previously transmitted to you in Attachment I of our October 3, 1997 response concerning this same subject.

Request No. 6

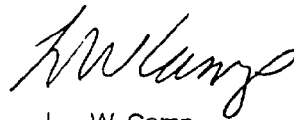
"FMVSS No. 208, S8.1.5, allows the manufacturer the option of having movable vehicle windows and vents placed in the closed position. State whether the vehicle's movable windows and vents were opened or closed for the certification tests."

Response

The positions of moveable windows in fixed barrier crash impact tests, which were relied upon as a basis for certification to FMVSS 208 of 1998 Taurus vehicles, were with all moveable windows and vents fully open for 90 degree perpendicular frontal impacts to facilitate photography, and in the fully closed position for all 30 degree front angular impacts. As indicated in our October 3, 1997 response, Ford prefers that the windows be in the closed (up) position for NHTSA testing.

We believe the information and test reports contained herein are fully responsive to your request. If you have any questions, please call Mr. Roger Kolassa on (313) 337-6969.

Very truly yours,



L. W. Camp

Attachments



L. W. Camp
Director
Automotive Safety Office
Environmental And Safety Engineering

Ford Motor Company
330 Town Center Drive
Dearborn, Michigan 48126

October 3, 1997

Mr. Harry Thompson
Chief, Vehicle Division
Office of Vehicle Safety Compliance
National Highway Traffic Safety
Administration
400 Seventh Street, S. W.
Washington, D.C. 20590

97OCT 6 P1:02
RECEIVED HSA-30

Dear Mr. Thompson:

Reference: NSA-31CCA/OA:208970811K

This is in response to your letter of August 13, 1997, requesting information relative to possible FMVSS 208 testing by OVSC of the 1998 model year Ford Taurus equipped with driver and passenger air bag restraint systems.

By means of this submittal Ford is responding in full to your request nos. 2-5 and 7-13, and in part to your request nos. 1 and 6. We currently estimate that we will be providing the remaining information by November 20, 1997. For your convenience, each request is listed followed by Ford's response.

Request No. 1

"Please inform OVSC if the air bag restraint system is certified to meet the requirements of S4.1.5.1(a)(1) or S13.

If the air bags were installed to meet the requirements of S4.1.5.1(a)(1), please provide a copy of the certification test reports for the frontal/angular barrier impact tests of the automatic restraint system with the manual safety belts unfastened and fastened.

If the air bags were installed to meet the requirements of S13, please provide a copy of the certification test reports for the frontal/angular barrier impact tests of the automatic restraint system with the manual safety belts fastened and the certification test reports for the sled test with only the automatic restraint system."

Response

Ford is installing Second Generation air bags in all 1998 MY vehicles subject to the FMVSS 208 passive restraint requirements. The air bag restraint systems for all 1998 Ford Taurus vehicles incorporated Second Generation air bags and meet the requirements S13 of FMVSS 208.

Test reports demonstrating FMVSS 208 conformance for these Second Generation air bag equipped vehicles for the frontal barrier impact tests of the automatic restraint system with the manual safety belts fastened and test reports for the sled test with only the automatic restraint system will be finalized and provided to you by November 20, 1997. Angular barrier impact tests were not performed on vehicles equipped with Second Generation air bag systems. Rather, engineering judgment based on the results of angular barrier tests of vehicles equipped with First Generation powered air bags with safety belts unfastened was used. A Test Report Data Summary of the frontal barrier and sled tests is provided as Attachment I.

Request No. 2

"If the air bags are or will be depowered or changed from the previous model year, explain the changes."

Response

The Second Generation driver air bag system has a revised inflator for a more shallow rise rate, an uncoated front panel on the bag and (2) 20mm vents. The passenger air bag system has a revised inflator for a more shallow rise rate and a different bag material.

Request No. 3

"If the air bag has been depowered or changed, explain how it can be determined, prior to purchase, that a particular vehicle has a depowered air bag."

Response

Attachment 2 contains a copy of the label affixed to the driver and front passenger side door windows indicating that the vehicle contains Second Generation air bags. Attachment 2 also contains a copy of that portion of the Ford Vehicle Identification Number (VIN) code information pertaining to restraint systems. For 1998 Taurus vehicles, the presence of an "F" in position 4 of the VIN indicates that the vehicle was built with Second Generation air bags. Please note that a few early built vehicles have been equipped with the Second Generation air bags but may not contain this code. The presence of the label in the door windows should be relied on for establishing with certainty the presence of Second Generation air bags.

Request No. 4

"If the vehicle was certified with unrestrained dummies to meet the requirements of S13, describe how to disconnect the air bags from the vehicle sensors and connect them to the triggering mechanism used in the sled test. Describe the method used in certification to determine when to trigger the air bag and the system used to trigger the air bag."

Response

The air bag was disconnected by locating the squib wires going into the air bag and unhooking the connector between the vehicle wiring harness and the air bag. The squib wires are then connected to an extension cable which supplies the firing current from the Programmable Time Fire Unit located in the Hyge sled control room. This system has an arming circuit and variable time delay (adjustable to 0.1 msec) which starts counting once time zero (T=0) has been triggered. At 20 msec after T=0, the Programmable Time Fire Unit sends current through the extension cable and into the air bag squib.

The Programmable Time Fire Unit has the capability of supplying between 12.0 and 12.5 volts with a momentary peak current draw of 20 amps. In testing conducted by Ford, the typical current draw is 3 to 6 amps. The time delay between T=0 and air bag deployment has been determined to be 20 msec. (An accelerometer is used on the sled to actually trigger T=0 when an acceleration of 0.5g is attained on the sled.)

Request No.5

"State for any safety belt system in this vehicle whether or not it is equipped with a tension-relieving device. Provide a copy of the information furnished in accordance with S7.4.2, if the tension-relieving device is used."

Response

Tension-relieving devices are not used in 1998 Taurus safety belt systems.

Request No. 6

"FMVSS No. 208, S8.1.5, allows the manufacturer the option of having movable vehicle windows and vents placed in the closed position. State whether the vehicle's movable windows and vents were opened or closed for the certification tests."

Response

The positions of moveable windows in the crash tests that were relied upon as a basis for certification to FMVSS 208 of 1998 Taurus vehicles will be provided with the test report summaries which will be forwarded to you by November 20, 1997. Ford prefers that the windows be in the closed (up) position for testing.

Request No. 7

" Submit dummy placement measurements, including diagrams or photographs which show exactly where measurements were taken. Enclosed is a diagram of some of OVSC's dummy measurements. Where possible, use the dimension shown in the diagram to provide the individual dummy placement measurements.

State whether the vehicle has a foot rest for the driver."

Response

Attachment 3 contains dummy placement measurements applicable to the 1998 Ford Taurus.

The 1998 Taurus has a foot rest for the driver.

Request No. 8

"Provide the seat positioning, steering column positioning, and fuel tank data on the enclosed form. If more than one front seating configuration, steering column, or fuel tank are available on this vehicle, provide separate information for each."

Response

Attachment 4 contains the NHTSA form enclosed with your letter completed with the requested seat positioning, steering column positioning, and fuel tank data applicable to FMVSS No. 208 testing of the 1998 Taurus.

Request No. 9

"If the vehicle is equipped with adjustable seat [belt] anchorages, provide the manufacturer's nominal design position for a 50th percentile adult male occupant."

Response

The 1998 Taurus vehicles are equipped with adjustable seat belt anchorages. The nominal design position of the D-ring for the 50th percentile adult male occupant is in the mid position.

Request No. 10

"For barrier tests provide the speed at impact, vehicle test weight, and resulting injury criteria (i.e., HIC, chest acceleration, chest compression and femur loads) recorded for all certification tests conducted to meet the requirements of S4.1.5.1(a)(1). For sled tests, provide the resulting injury criteria (i.e., HIC, chest acceleration, chest compression, femur loads, and neck moments and forces) recorded for all certification tests conducted to meet the requirements of S13."

Response

This information is included in a Test Report Summary found in Attachment 1.

Request No. 11

"When vehicle components must be removed to obtain the proper test weight for the barrier test, what components do you recommend for removal and in what priority order do you recommend removal?"

Response

The following is a suggested list of items which may be removed from the test vehicle for the barrier test. The list below is in order of removal priority:

- ◇ Decklid
- ◇ Rear Seat
- ◇ Bumper
- ◇ Interior trim from B-pillar rearward
- ◇ Exhaust system

All onboard instrumentation should be included in the vehicle test weight.

Request No. 12

"If the vehicle uses a pressure vessel to inflate the air bag, provide a copy of the test reports or engineering analysis to demonstrate that it meets all the requirements of S9.1."

Response

Attachment V contains the engineering analyses and the related Autoliv test report data summary demonstrating compliance to S9.1 of FMVSS No. 208 for the 1998 Ford Taurus passenger side air bag system.

Request No. 13

"If the vehicle uses an explosive device to inflate the air bag, provide a copy of the test report or engineering analysis to demonstrate that it meets all the requirements of S9.2 ."

Response

Attachment V contains the engineering analyses and the related Autoliv test report data summary demonstrating compliance to S9.2 of FMVSS No. 208 for the 1998 Taurus driver side air bag system.

We believe the information and test reports contained herein are otherwise fully responsive to your request. If you have any questions, please call Mr. Roger Kolassa on (313) 337-6969.

Very truly yours,



L. W. Camp

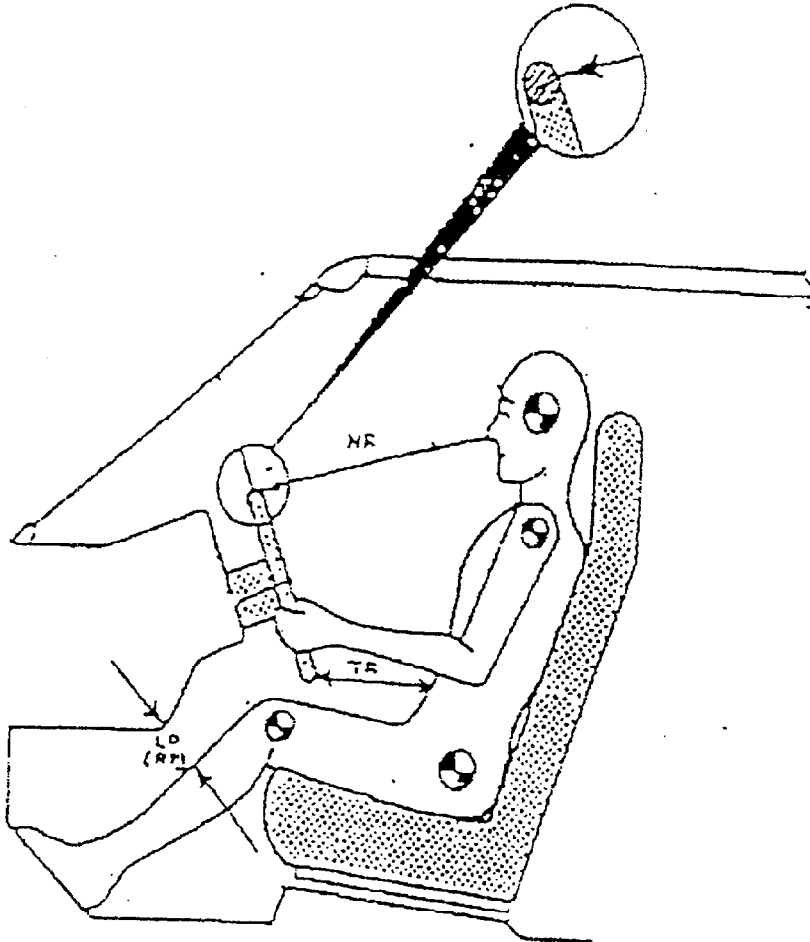
Attachments

DUMMY MEASUREMENT SHEET

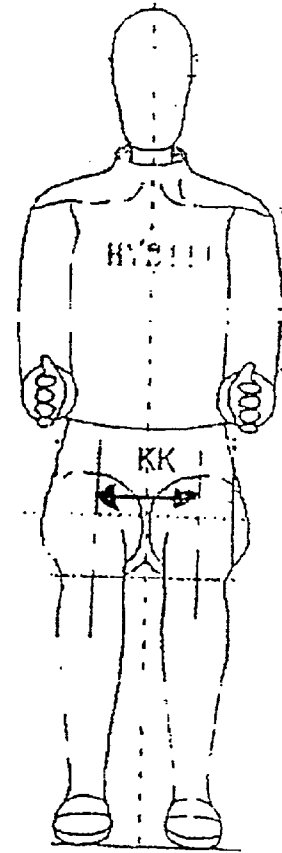
DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY.
REFERENCE DIMENSIONS.

VEHICLE 1998 Taurus

IR# MA 97044



LEFT SIDE VIEW



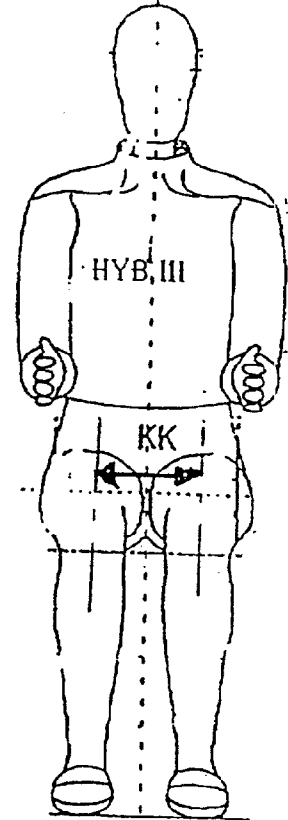
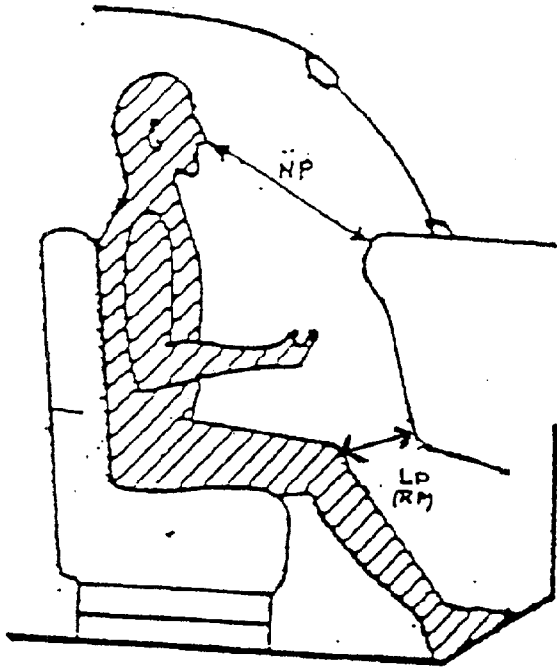
		MEASUREMENTS	
		(All distances in inches)	
		Target	Range
NR	Distance from tip of dummy's nose to top rear surface of steering wheel, rim.	14	+/- 1
TR	Horizontal distance from bottom rear surface of steering wheel rim to dummy's torso.	7.5	+/- 0.5
LP	Perpendicular distance from dummy's left lower leg surface to closest point on instrument panel surface	4	+/- 0.5
RP	Perpendicular distance from dummy's right lower leg surface to closest point on instrument panel surface	4	+/- 0.5
KK	Distance between centerline to centerline of dummy's legs.	9.3	+/- 0.2

DUMMY MEASUREMENT SHEET

PASSENGER DUMMY PLACEMENT REFERENCE DIMENSIONS.

VEHICLE 1998 Taurus

IR# MA 97-044



RIGHT SIDE VIEW

		MEASUREMENTS	
		(All distances in inches)	
		Target	Range
NP	Distance from tip of dummy's nose to closest point on surface of instrument panel.	22	+/- 1
LP	distance from dummy's left knee to closest point on instrument panel surface	3.5	+/- 0.5
RP	distance from dummy's right knee to closest point on instrument panel surface	3.5	+/- 0.5
KK	Distance between centerline to centerline of dummy's legs.	7.8	+/- 0.2

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1998 Ford Taurus
 Vehicle Model & Body Style: (All models)

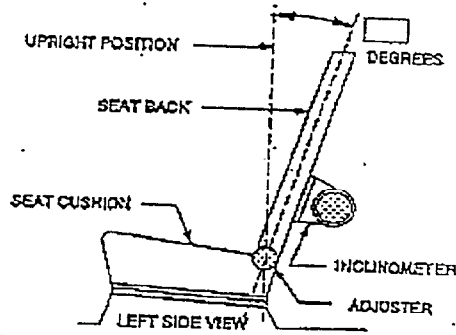
1. NOMINAL DESIGN RIDING POSITION --
 For adjustable driver and passenger seat backs.

Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable.

Seat back angle for driver's seat = 27.8 degrees.

Measurement instructions:

Seat back angle is measured relative to the rocker sill. Remove back panel and position inclinometer as shown in drawing 13 inches above back pivot point on rear outboard seat frame.



Seat back angle for passenger's seat = 27.8 degrees.

Measurement instructions:

Same as driver.

2. SEAT FORE & AFT POSITIONS --

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:

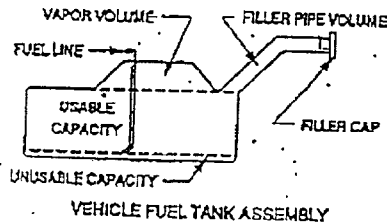
A reference mark is made on the seat. The seat is moved to the full rear position, and a mark is placed on the pedestal or carpet. The procedure is repeated for the full forward position. The distance from full forward to full rear is taken, half the distance is measured and marked on the pedestal. The seat reference is located at the mid position mark. The seat is in the full down position.

Positioning of the passenger's seat (if applicable):

Same as driver.

3. FUEL TANK CAPACITY DATA --

- .1 A. "Usable Capacity" of standard equipment fuel tank = 16 gallons.
- B. "Usable Capacity" of optional equipment fuel tank = N/A gallons.
- C. Capacity used when certification testing to requirements of FMVSS 301 = 16 gallons.



Operational Instructions:

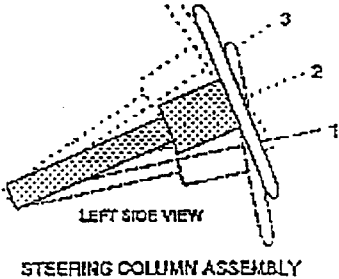
3.2 Amount of Stoddard solvent added to vehicle for certification test = 15.2 gallons

3.3 Is vehicle equipped with electric fuel pump? YES NO

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.
The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation, the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is inactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.

4. STEERING COLUMN ADJUSTMENTS --

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.
If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.



Operational Instructions:

Adjust column to center detent which is 3rd notch of the 5 positions.

