REPORT NUMBER: 222-MGA-2009-003

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 222 SCHOOL BUS PASSENGER SEATING AND CRASH PROTECTION

BLUE BIRD BODY COMPANY
2009 BLUE BIRD MICRO BIRD SCHOOL BUS
NHTSA NO.: C90902

PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105

TEST DATES: JANUARY 27, 2009 – MAY 13, 2009

FINAL REPORT DATE: DECEMBER 1, 2009

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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Prepared by: _____ Date: December 1, 2009
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Reviewed by: _____ Date: December 1, 2009
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FINAL REPORT ACCEPTED BY:

_____
December 04, 2009
Date of Acceptance

Technical Report Documentation Page

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15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject 2009 Blue Bird Micro Bird School Bus, NHTSA No. C90902, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-222-03 for the determination of FMVSS 222 compliance. Data sheet 7 is omitted from this report as the barrier deflection requirements are not applicable to school buses with a GVWR ≤ 10,000 lbs. Test Failure: See Section 2, Test Data Summary. See Section 9, Laboratory Notice of Test Failure.			
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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2009 Blue Bird Micro Bird School Bus, NHTSA No.: C90902, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-222-03 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 222, “School Bus Passenger Seating and Crash Protection”.

This program is sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No.: DTNH22-08-D-00075.

SECTION 2
TEST DATA SUMMARY

The passenger seating and crash protection tests were conducted during January through May 2009. All tests were conducted by MGA Research Corporation at the Wisconsin Operations. The test vehicle, 2009 Blue Bird Micro Bird School Bus, NHTSA No.: C90902, did not appear to meet all the requirements of FMVSS 222. The test failures are listed below.

Failure 1

FMVSS Requirement Paragraph S5.3.2.2: *Leg Protection zone,* "When any point on the rear surface of that part of a seat back or restraining barrier within any zone specified in S5.3.2.1 is impacted from any direction at 4.9 m/s by the knee form specified in S6.7, the resisting force of the impacted material shall not exceed 2,669 N and the contact area on the knee form surface shall not be less than 1,935 mm^2."

During the dynamic knee impact test on Barrier No. B1, the resistive force exceeded the limit of 2669 N for impact locations B1 K5 and B1 K6.

SECTION 2 (CONTINUED)

TEST DATA SUMMARY

LINEAR AND AREA MEASUREMENTS

Seat to seat/barrier spacing was checked on all seats and found to be 531 mm or less as shown on Data Sheet No. 1.

The seat back height and front surface area of Seat Nos. S1 and S8 were measured in accordance with Section 12.1 of OVSC TP-222-03. As shown in Data Sheet No. 2 for S1 and S8, the seat back area is greater than ninety percent of the seat bench width multiplied by 508.

The restraining barrier position and projected rear surface area of Barrier Nos. B1 and B8 were measured in accordance with OVSC TP-222-03. As shown in Data Sheet No. 6 for B1 and B8, the surface area of each barrier is equal to or greater than the surface area of the seat back located to the rear of it.

SEAT CUSHION RETENTION

Seat Nos. S1 and S8 were tested in accordance with Section 12.3 of OVSC TP-222-03. Seat cushion weight was 3.2 kg for both cushions S1 and S8. The maximum force reached for S1 was 175 N and 177 N for S8. For S1, the lower time limit boundary (t1) was approximately 3 seconds with approximate load duration of 16 seconds. For S8, the lower time limit boundary (t1) was approximately 4 seconds with approximate load duration of 12 seconds. As shown in Data Sheet No. 3, the seat cushions tested complied with all requirements.

SEAT BACK FORCE/DEFLECTION TEST - FORWARD

Seat No. S2 was tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 866 mm. “W” was calculated to be 2.272 and rounded to the nearest whole number (2). The seating reference point (SRP) was 474 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 58.7 mm on S2. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier was 356 mm. The stroke rate of the upper loading bar was determined by the test engineer to be 14.4 mm/sec. The location of the upper loading bar was 406 mm above the SRP. The tests were concluded when the maximum deflection of 356 mm was reached in which the seat back absorbed 1661 joules. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 904 joules. As shown on Data Sheet No. 4, S2 did meet the force deflection forward requirements.

SECTION 2 (CONTINUED)
TEST DATA SUMMARY

SEAT BACK FORCE/DEFLECTION TEST - FORWARD

Seat No. S7 was tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 866 mm. “W” was calculated to be 2.272 and rounded to the nearest whole number (2). The seating reference point (SRP) was 474 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 60 mm on S7. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier was 356 mm. The stroke rate of the upper loading bar was determined by the test engineer to be 14.4 mm/sec. The location of the upper loading bar was 406 mm above the SRP. The tests were concluded when the maximum deflection of 356 mm was reached in which the seat back absorbed 1568 joules. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 904 joules. As shown on Data Sheet No. 4, S7 did meet the force deflection forward requirements.

SEAT BACK FORCE/DEFLECTION TEST - REARWARD

Seat No. S3 was tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 866 mm for S3. “W” was calculated to be 2.272 and rounded to the nearest whole number (2). The seating reference point (SRP) was 474 mm above the bus floor. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier was 254 mm. The stroke rate of the upper loading bar was determined by the test engineer to be 8.76 mm/sec for S3. The location of the loading bar was 343 mm above the SRP. The test was stopped when the maximum deflection of the seat back of 254 mm was achieved. The minimum required area under the force versus deflection curve of the loading bar was 316W or 632 joules. As shown in Data Sheet No. 5, S3 did meet the force deflection rearward requirements.

KNEE FORM IMPACT ZONE TESTS

Seat Nos. S1 and S8, and Barrier No. B1 were tested in accordance with Section 12.7 of OVSC TP-222-03. The mass of the knee form was 4.52 kg. All knee form contact area criteria and maximum resistive force criteria were not met for the seats and barrier. For S1, the impact locations K1 and K4 were not considered for the resistive force requirement due to the speeds for those impacts being above the specified requirements. For B1, the impact locations K5 and K6 exceeded the maximum resistive force. Data from these tests are presented in Data Sheet No. 10.

HEAD FORM IMPACT ZONE TESTS

Seat Nos. S1 and S8, and Barrier No. B1 were tested in accordance with Section 12.6 of OVSC TP-222-03. The mass of the head form was 5.20 kg. All head form contact area, impact energy, and head injury criteria was met for the seats. The barrier also met the head form contact area, impact energy, and head injury criteria; however, only a single impact energy test was performed. Data from these tests are presented in Data Sheet Nos. 8 and 9.

Testing of the barrier was discontinued at the request of the COTR due to its failure to meet the knee impact requirements in previous tests. The testing was stopped in an effort to preserve the barrier for post-test inspection.

SEAT BELT ANCHORAGES

Seat belt anchorages for Seat No. S4 were tested in accordance with Appendix A of OVSC TP-222-03. S4 is located as shown in Section 8, Bus Floor Plan.

Seat belt anchorages and specially made high strength webbing straps were used to conduct the test. The seat belt anchor points met the required load of 22,000 N for each. Data from this test are presented in Data Sheet No. 11.

ADMINISTRATIVE DATA SHEET

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

INCOMPLETE VEHICLE (IF APPLICABLE)

Manufacturer:	Ford Motor Company
Model:	E-350
VIN:	1FDDE35L19DA17396
Build Date:	10/08
Certification Date:	10/08

COMPLETED VEHICLE (SCHOOL BUS)

Manufacturer:	Blue Bird Body Company
Make/Model:	Micro Bird
VIN:	1FDDE35L19DA17396
NHTSA No.:	C90902
Color:	Yellow
GVWR:	4,356 kg / 9,600 lbs
Build Date:	12/08
Certification Date:	12/08

DATES

Vehicle Receipt:	12/29/2008
Start of Compliance Test:	01/27/2009
Completion of Compliance Test:	05/13/2009

COMPLIANCE TEST:
All tests were performed in accordance with the references outlined in TP-222-03.

Recorded By: _____

Approved By: _____ Date: 11/19/2009

GENERAL TEST DATA SHEET

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SCHOOL BUS IDENTIFICATION

Model Year/Mfr./Make/Model:	2009/ Blue Bird Micro Bird
Passenger Capacity:	(1 Driver, 16 Passengers)
NHTSA No.:	C90902
VIN:	1FDDE35L19DA17396
Conventional or Forward Control:	Conventional Control
GAWR (Certification Label) FRONT:	1,838 kg / 4,050 lbs
GAWR (Certification Label) REAR:	2,760 kg / 6,084 lbs
GVWR (Certification Label) TOTAL:	4,356 kg / 9,600 lbs

TEST CONDITIONS

Date(s) of Test:	01/27/2009 – 05/13/2009
Ambient Temperature (°C):	21
Required Temperature Range:	0°C to 32°C

SEAT IDENTIFICATION

Seat Manufacturer:	Bluebird Body Company
Model Name & Number:	
Description of Seats:	Seat frames are constructed of 1 inch square welded steel tubing. The seat back has a 22 gauge (0.027 inches) steel pan welded to the tubing and is covered with 30 mm of soft foam. The outer main uprights of the seat back frame are covered by 45 mm Styrofoam. The seat cushion is constructed of 12 mm plywood and 125 mm foam pad. The seat back and cushion are wrapped with 0.5 mm of vinyl.

SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2009 Blue Bird Micro Bird School Bus, NHTSA No. C90902.

DATA SHEET 1

SEAT TO SEAT/BARRIER SPACING

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER	MEASUREMENT OF SPACING FROM SRP FORWARD TO SEAT/BARIER (mm)	REQMT ≤ 610 MM (≤ 24") CLASS 1 BUSES ONLY PASS/FAIL
S1	**531**	**PASS**
S2	**531**	**PASS**
S3	**475**	**PASS**
S4	**492**	**PASS**
S5	**472**	**PASS**
S6	**475**	**PASS**
S7	**425**	**PASS**
S8	**500**	**PASS**

COMMENTS: None

Recorded By: _____

Approved By: _____ Date: 01/28/2009

DATA SHEET 2

SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S1

		PASS/FAIL
1.	Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2) Yes – Pass; No – Fail	**PASS**

2. Measure the seat back front projected area in a vertical plane bound by horizontal planes through the SRP and 508 mm above the SRP according to the following procedure:

   Width, a = 757 mm; width, b = 858 mm; radius = 7,200 mm

   Area = ½ (a+b) x 508 mm = 410,210 mm^2 – * 7,200 mm^2 = 403,010 mm^2

3. Measure the seat cushion width - W1 = 872 mm

   If the seat cushion is not rectangular, measure the cushion at the forward most edge and the rearward most edge, average the widths, and use the average width as W1.

4. Calculate the following: 0.9 x W1 x 508 mm = 398,678 mm^2

		PASS/FAIL
5.	Is item 2 greater than item 4? (S5.1.2) Yes – Pass; No – Fail	**PASS**

NOTE: For a seat back or a seat cushion that has a nonsymmetrical shape or has a large radius at the corner, the above described measuring method must be modified as required to obtain accurate area measurements.

COMMENTS: * Denotes area outside of radius.

Recorded By: Brian Roach

Approved By: Michael Janosz Date: 01/28/2009

DATA SHEET 2

SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S8

		PASS/FAIL
1.	Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2) Yes – Pass; No – Fail	**PASS**

2. Measure the seat back front projected area in a vertical plane bound by horizontal planes through the SRP and 508 mm above the SRP according to the following procedure:

   Width, a = 757 mm; width, b = 858 mm; radius = 7,200 mm

   Area = ½ (a+b) x 508 mm = 410,210 mm^2 – * 7,200 mm^2 = 403,010 mm^2

3. Measure the seat cushion width - W1 = 872 mm

   If the seat cushion is not rectangular, measure the cushion at the forward most edge and the rearward most edge, average the widths, and use the average width as W1.

4. Calculate the following: 0.9 x W1 x 508 mm = 398,678 mm^2

		PASS/FAIL
5.	Is item 2 greater than item 4? (S5.1.2) Yes – Pass; No – Fail	**PASS**

NOTE: For a seat back or a seat cushion that has a nonsymmetrical shape or has a large radius at the corner, the above described measuring method must be modified as required to obtain accurate area measurements.

COMMENTS: * Denotes area outside of radius.

Recorded By: Brian Roach

Approved By: Michael Janosz Date: 01/28/2009

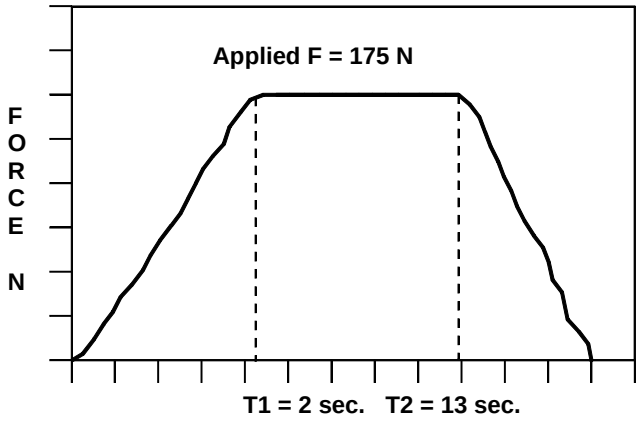
DATA SHEET 3

SEAT CUSHION RETENTION TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S1

1. Cushion Weight/Mass = 3.2 kg
2. Cushion Weight x 5 = F = 157 N (S5.1.5)
3. Complete the following force/time graph:



F must be 5 x Cushion Weight; t1 and t2 must be according to the following expressions: T1=>1 sec., <5 sec., t2 = t1 + 5 sec., + 0 sec. and -0.10 sec.

		PASS/FAIL
4.	Did seat cushion separate from the seat structure at any attachment point? (S5.1.5) Yes – Fail; No – Pass	**PASS**

DESCRIBE SEAT CUSHION ATTACHMENTS: Two metal clips in the front and two locking levers in the rear.

COMMENTS: None

Recorded By: _____

Approved By: _____ Date: 04/08/2009

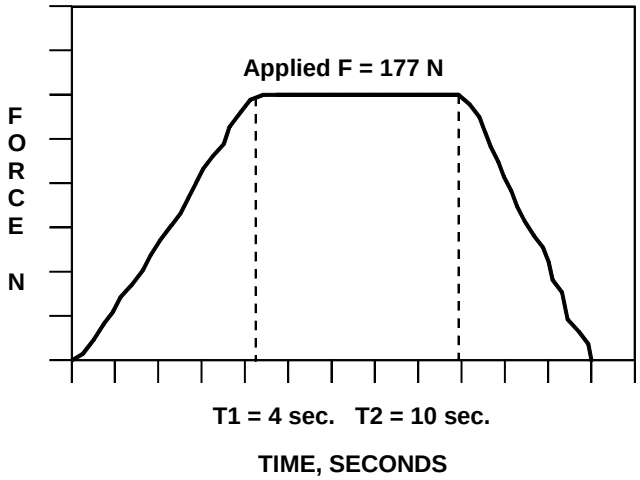
DATA SHEET 3

SEAT CUSHION RETENTION TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S8

1. Cushion Weight/Mass = 3.2 kg
2. Cushion Weight x 5 = F = 157 N (S5.1.5)
3. Complete the following force/time graph:



F must be 5 x Cushion Weight; t1 and t2 must be according to the following expressions: T1=>1 sec., <5 sec., t2 = t1 + 5 sec., + 0 sec. and -0.10 sec.

		PASS/FAIL
4.	Did seat cushion separate from the seat structure at any attachment point? (S5.1.5) Yes – Fail; No – Pass	**PASS**

DESCRIBE SEAT CUSHION ATTACHMENTS: Two metal clips in the front and two locking levers in the rear.

COMMENTS: None

Recorded By: _____

Approved By: _____ Date: 04/08/2009

DATA SHEET 4

SEAT BACK FORCE DEFLECTION TEST - FORWARD

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S7

1. Seat Bench Width = 866 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (2)
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 474 mm Above Floor, 240 mm from the leg bolt hole.
2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 749 mm
   Seat Back width at SRP = 850 mm
3. Include x-y plot of Force vs. Time for the lower loading bar.
4. Deflection of the seat back at conclusion of lower bar loading (1557 W Newtons position) = 60 mm.
5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm of less) (S5.1.3)
6. Seat back movement rate selected by the test engineer = 14.4 mm/sec
7. Location of upper loading bar is in a horizontal plane 406 mm above the SRP. (Requirement: 406 mm) (S5.1.3.3). Length of upper loading bar = 635 mm. Width of seat back at 406 mm above SRP = 734 mm.
8. Reason for stopping seat back deflection:
   ___ Reached deflection determined in Item 6 above (if less than 356 mm)
   _X_ Reached 356 mm maximum allowed deflection (Actual deflection was 358 mm)
   ___ Separation was about to occur
9. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.

DATA SHEET 4 (CONTINUED)

SEAT BACK FORCE DEFLECTION TEST – FORWARD

		PASS/FAIL
10.	Is the seat in its final deflected position within 102 mm of the next seat or barrier? Yes – Fail; No – Pass	**PASS**

		PASS/FAIL
11.	Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3) Yes – Pass; No – Fail	**PASS**

12. Include a deflection vs. time plot for the upper loading bar.
13. The area within the force vs. deflection curve = 1,568 joules
14. 452W = 904 joules (S5.1.3.4)

		PASS/FAIL
15.	Is item 13 greater than or equal to item 14? (S5.1.3.4) Yes – Pass; No – Fail	**PASS**

COMMENTS: Forward deflection curve exited boundaries on low end.

Recorded By: _____

Approved By: _____ Date: 05/11/2009

DATA SHEET 4

SEAT BACK FORCE DEFLECTION TEST – FORWARD

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S2

1. Seat Bench Width = 866 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (2)
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 474 mm Above Floor, 240 mm.
2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 749 mm
   Seat Back width at SRP = 850 mm
3. Include x-y plot of Force vs. Time for the lower loading bar.
4. Deflection of the seat back at conclusion of lower bar loading (1557 W Newtons position) = 58.7 mm.
5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm or less) (S5.1.3)
6. Seat back movement rate selected by the test engineer = 14.4 mm/sec
7. Location of upper loading bar is in a horizontal plane 406 mm above the SRP. (Requirement: 406 mm) (S5.1.3.3). Length of upper loading bar = 635 mm. Width of seat back at 406 mm above SRP = 734 mm.
8. Reason for stopping seat back deflection:
   ___ Reached deflection determined in Item 6 above (if less than 356 mm)
   _X_ Reached 356 mm maximum allowed deflection (Actual deflection was 356 mm)
   ___ Separation was about to occur
9. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.

DATA SHEET 4 (CONTINUED)

SEAT BACK FORCE DEFLECTION TEST – FORWARD

		PASS/FAIL
10.	Is the seat in its final deflected position within 102 mm of the next seat or barrier? Yes – Fail; No – Pass	**PASS**

		PASS/FAIL
11.	Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3) Yes – Pass; No – Fail	**PASS**

12. Include a deflection vs. time plot for the upper loading bar.
13. The area within the force vs. deflection curve = 1,661 joules
14. 452W = 904 joules (S5.1.3.4)

		PASS/FAIL
15.	Is item 13 greater than or equal to item 14? (S5.1.3.4) Yes – Pass; No – Fail	**PASS**

COMMENTS: None

Recorded By: _____

Approved By: _____ Date: 2/5/2009

DATA SHEET 5

SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S3

1. Seat Bench Width = 866 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (2)
2. Location of the loading bar is in a horizontal plane 343 mm above the SRP of the test seat. (Requirement: 343 mm above the SRP) (S5.1.4.1)
   Length of loading bar = 674 mm
   Width of seat back at 343 mm above SRP = 780 mm
3. Deflection of seat back at 222 N preload = 28.2 mm
4. Maximum deflection allowed without moving the seat back to within 102 mm of another seat = 254 mm (maximum allowed = 254 mm) (S5.1.4)
5. Seat back movement rate selected by the test engineer = 8.76 mm / sec
6. Reason for stopping deflection:
   __ Reached deflection determined in Item 4 above (if less than 254 mm)
   X Reached 254 mm maximum allowed deflection (Actual deflection was 255 mm)
   ___Separation was about to occur
7. Include the x-y plot of force vs. deflection for the loading bar with boundaries of Figure 18 (OVSC TP-222-3) superimposed.

		PASS/FAIL
8.	Does the force vs. deflection plot lie within the boundaries of Figure 18? (OVSC TP-222-03) Yes – Pass; No – Fail	**PASS**

9. Include a deflection vs. time plot for the upper loading bar.
10. 316W = 632 joules
11. The area within the force vs. deflection curve = 1,190 joules

		PASS/FAIL
12.	Is item 11 greater than or equal to item 10? (S5.1.4.2) Yes – Pass; No – Fail	**PASS**

COMMENTS: None

Recorded By: _____

Approved By: _____ Date: 05/12/2009

DATA SHEET 6

RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S1

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T= 531 mm.

		PASS/FAIL
2.	Is distance T equal to or less than 610 mm? (S5.2) Yes – Pass; No – Fail	**PASS**

3. Measure distance D at top (t) and bottom (b) of barrier.

D_t = 100 mm D_b = 0 mm

4. Measure distance C at top (t) and bottom (b) of seat back.

C_t = 100 mm C_b = 0 mm

		PASS/FAIL
5.	Is D_t equal to or less than C_t? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
6.	Is D_b equal to or less than C_b? Yes – Pass; No – Fail	**PASS**

7. Measure distance E at top of barrier and bottom of barrier.

E_t = 695 mm E_b = 854 mm

8. Measure distance A at top of seat back and bottom of seat.

A_t = 677 mm A_b = 851 mm

		PASS/FAIL
9.	Is distance $E_t + D_t$ equal to or greater than distance $A_t + C_t$? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
10.	Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$? Yes – Pass; No – Fail	**PASS**

11. Measure distance U at inboard (i) and outboard (o) side of barrier.

U_i = 343 mm U_o = 347 mm

12. Measure distance V at inboard (i) and outboard (o) sides of seat.

V_i = 355 mm V_o = 366 mm

DATA SHEET 6 (CONTINUED)

RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

		PASS/FAIL
13.	Is U_i equal to or less than V_i? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
14.	Is U_o equal to or less than V_o? Yes – Pass; No – Fail	**PASS**

15. Measure distance S at inboard (I) and outboard (o) side of barrier.

    S_i = 642 mm S_o = 651 mm

16. Measure distance W at inboard (i) and outboard (o) sides of seat.

    W_i = 620 mm W_o = 611 mm

		PASS/FAIL
17.	Is $S_i + U_i$ equal to or greater than $W_i + V_i$? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
18.	Is $S_o + U_o$ equal to or greater than $W_o + V_o$? Yes – Pass; No – Fail	**PASS**

19. Compute area (W x A) = 470,242 mm^2

20. Compute area (E x S) = 500,714.25 mm^2

		PASS/FAIL
21.	Is (W x A) equal to or less than (E x S)? Yes – Pass; No – Fail	**PASS**

COMMENTS: None

Recorded By: Brian Rouhana

Approved By: Michael Janosz Date: 01/28/2009

DATA SHEET 6

RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

BARRIER NUMBER: B8

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T= 531 mm.

		PASS/FAIL
2.	Is distance T equal to or less than 610 mm? (S5.2) Yes – Pass; No – Fail	**PASS**

3. Measure distance D at top (t) and bottom (b) of barrier.

   D_t = 106 mm D_b = 0 mm

4. Measure distance C at top (t) and bottom (b) of seat back.

   C_t = 108 mm C_b = 0 mm

		PASS/FAIL
5.	Is D_t equal to or less than C_t? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
6.	Is D_b equal to or less than C_b? Yes – Pass; No – Fail	**PASS**

7. Measure distance E at top of barrier and bottom of barrier.

   E_t = 706 mm E_b = 846 mm

8. Measure distance A at top of seat back and bottom of seat.

   A_t = 702 mm A_b = 841 mm

		PASS/FAIL
9.	Is distance $E_t + D_t$ equal to or greater than distance $A_t + C_t$? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
10.	Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$? Yes – Pass; No – Fail	**PASS**

11. Measure distance U at inboard (i) and outboard (o) side of barrier.

    U_i = 340 mm U_o = 339 mm

12. Measure distance V at inboard (i) and outboard (o) sides of seat.

    V_i = 345 mm V_o = 372 mm

DATA SHEET 6 (CONTINUED)

RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

		PASS/FAIL
13.	Is U_i equal to or less than V_i? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
14.	Is U_o equal to or less than V_o? Yes – Pass; No – Fail	**PASS**

15. Measure distance S at inboard (I) and outboard (o) side of barrier.

    S_i = 645 mm S_o = 654 mm

16. Measure distance W at inboard (i) and outboard (o) sides of seat.

    W_i = 615 mm W_o = 603 mm

		PASS/FAIL
17.	Is $S_i + U_i$ equal to or greater than $W_i + V_i$? Yes – Pass; No – Fail	**PASS**

		PASS/FAIL
18.	Is $S_o + U_o$ equal to or greater than $W_o + V_o$? Yes – Pass; No – Fail	**PASS**

19. Compute area (W x A) = 469,844 mm^2

20. Compute area (E x S) = 504,012 mm^2

		PASS/FAIL
21.	Is (W x A) equal to or less than (E x S)? Yes – Pass; No – Fail	**PASS**

COMMENTS: None

Recorded By: Brian Roach

Approved By: Michael Janosz Date: 01/28/2009

DATA SHEET 8

HEAD FORM IMPACT CONTACT AREA REQUIREMENT

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S1

REAR SURFACE

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H1, H2, H3, H4, H5, H6, and H7 in the appropriate location.
3. Define and mark on graphic above, the plane of reference for head form impact angle:

   0° = Parallel with Floor, (+) is Up, (-) is Down

   X = From Inboard Edge of Seat

   Y = Measured Vertically from the SRP

DATA SHEET 8 (CONTINUED)

HEAD FORM IMPACT CONTACT AREA REQUIREMENT

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)
Head Impact & Test #	Location (a)			Speed Trap Impact Velocity** mps	Derived Velocity mps	Contact Area (CA) mm^2	CA ≥ 1935 mm^2	
	X	Y	Angle				Yes-Pass	No-Fail
H1	-489	424	0	1.59	2.11	4720	PASS	
H2	-364	423	0	1.60	1.65	5200	PASS	
H3	-254	422	0	1.60	1.12	5300	PASS	
H4	-151	424	0	1.60	1.89	5350	PASS	
H5	-524	309	0	1.55	1.77	5450	PASS	
H6	-418	311	0	1.57	1.57	5050	PASS	
H7	-311	309	0	1.60	1.56	5270	PASS	

* Contact Velocity from Item 7 below

** Velocity Range = 1.52 mps, +0.08, -0 mps

5. Attach Contact Area Prints.
6. Attach acceleration versus time plots for each impact.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

Comments: (a) All coordinate measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the seat. For Seat No. S1 the reference point is on the right side of the seat.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 8

HEAD FORM IMPACT CONTACT AREA REQUIREMENT

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

BARRIER NUMBER: B1

REAR SURFACE

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H1, H2, H3, H4 and H5 in the appropriate location.
3. Define and mark on graphic above, the plane of reference for head form impact angle:

0° = Parallel with Floor, (+) is Up, (-) is Down

X = From Inboard Edge of Seat

Y = Measured Vertically from the SRP

DATA SHEET 8 (CONTINUED)

HEAD FORM IMPACT CONTACT AREA REQUIREMENT

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)
Head Impact & Test #	Location (a)			Speed Trap Impact Velocity** mps	Derived Velocity mps	Contact Area (CA) mm^2	CA ≥ 1935 mm^2	
	X	Y	Angle				Yes-Pass	No-Fail
H1	-672	432	0	1.55	1.76	5310	PASS	
H2	-576	438	0	1.56	1.68	4470	PASS	
H3	-463	436	0	1.56	2.16	3950	PASS	
H4	-656	336	0	1.57	1.49	5160	PASS	
H5	-542	335	0	1.56	1.64	4610	PASS	

* Contact Velocity from Item 7 below

** Velocity Range = 1.52 mps, +0.08, -0 mps

5. Attach Contact Area Prints.
6. Attach acceleration versus time plots for each impact.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the barrier. For Barrier No. B1 the reference point is on the right side of the barrier.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 9

HEAD FORM IMPACT ENERGY REQUIREMENT

Test Vehicle:	**2009 BLUE BIRD MICRO BIRD SCHOOL BUS**	NHTSA No.:	**C90902**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Dates:	**01/27/09 – 05/13/09**

SEAT NUMBER: S8

REAR SURFACE

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H8, H9, H10, H12, H13 and H14 in the appropriate location.
3. Define the plane of reference for knee form impact angle:

   0° = Parallel with Floor, (+) is Up, (-) is Down

   X = From Inboard Edge of the Seat

   Y = Measured Vertically from the SRP

DATA SHEET 9 (CONTINUED)

HEAD FORM IMPACT ENERGY REQUIREMENT

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Head impact & Test #	Location			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Max HIC	Energy Req'd Joules	Column 5 < 1000		Column 6 > 4.5 Joules	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
H8	448	404	0	6.63	7.03	144	7.10	PASS		PASS	
H9	327	409	0	6.69	6.76	132	7.68	PASS		PASS	
H10	222	402	0	6.67	6.71	131	6.51	PASS		PASS	
H12	394	312	0	6.69	6.84	184	8.76	PASS		PASS	
H13	288	312	0	6.63	6.36	169	11.49	PASS		PASS	
H14	167	311	0	6.68	6.63	145	12.89	PASS		PASS	

* Impact velocity from item No. 6 below

** Impact velocity range = 6.69 mps, +0, -0.08 mps

5. Attach acceleration versus time plots for each impact.
6. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the seat. For Seat No. S8 the reference point is on the left side of the seat.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 9

HEAD FORM IMPACT ENERGY REQUIREMENT

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

BARRIER NUMBER: B1

REAR SURFACE

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H8 in the appropriate location.
3. Define the plane of reference for knee form impact angle:

   0° = Parallel with Floor, (+) is Up, (-) is Down

   X = From Inboard Edge of the Seat

   Y = Measured Vertically from the SRP

DATA SHEET 9 (CONTINUED)

HEAD FORM IMPACT ENERGY REQUIREMENT

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Head impact & Test #	Location			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Max HIC	Energy Req'd Joules	Column 5 < 1000		Column 6 > 4.5 Joules	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
H8	-321	436	0	6.63	6.43	161	4.86	PASS		PASS	

* Impact velocity from item No. 6 below

** Impact velocity range = 4.86 mps, +0.08, -0 mps for contact area, +0, -0.08 mps for force

5. Attach acceleration versus time plots for each impact.
6. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the barrier.

(b) Testing was discontinued after H8 at the request of the COTR due to a previous non-compliance on Barrier No. B1.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 10

KNEE FORM IMPACT TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S1

REAR SURFACE

1. Locate x-y reference point on sketch above for knee form impact locations. (Label the positive and negative directions, if applicable)
2. Identify knee form impact location on sketch by placing K1, K2, K3, K4, K5, K6, K7, and K8 in the appropriate location.
3. Define the plane of reference for knee form impact angle:
   0° = Parallel with Floor, (+) is Up, (-) is Down
   X = From Inboard Edge of the Seat
   Y = Measured Vertically from the SRP

DATA SHEET 10 (CONTINUED)

KNEE FORM IMPACT TEST

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Knee impact & Test #	Location (a)			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Cont. Area mm^2	Resist Force (N)	Column 5 > 1935 mm^2		Column 6 < 2669N	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
K1***	-540	236	0	4.92	4.98	2870	2685	PASS			
K2	-426	235	0	4.88	5.11	2990	2634	PASS			
K3	-314	237	0	4.88	4.64	2940	2237	PASS			
K4***	-199	236	0	4.88	5.17	3190	2797	PASS			
K5	-84	237	0	4.86	5.12		2272			PASS	
K6	-540	104	0	4.86	4.24		2043			PASS	
K7	-426	107	0	4.85	4.58		2070			PASS	
K8	-316	108	0	4.86	4.33		1991			PASS	

* Impact velocity from item No. 7 below

** Impact velocity range = 4.86 mps, +0.08, -0 mps for contact area, +0, -0.08 mps for force

*** It was concluded through post-test analysis that the knee impact velocities were in excess of that required by FMVSS No. 222, S5.3.2.2. Therefore, the resistive forces recorded for K1 and K4 do not indicate test failures. The velocities indicated by the speed trap were lower than the true velocities due to longitudinal movement of the speed trap. Only knee impact tests on Seat No. S1 were affected.

5. Attach Contact Area Prints for K1, K2, K3 and K4.
6. Attach acceleration versus time plots for each impact.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time for each impact K1 through K8.
8. Attach force vs. time plots for K5, K6, K7, and K8.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the seat.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 10

KNEE FORM IMPACT TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT NUMBER: S8

REAR SURFACE

1. Locate x-y reference point on sketch above for knee form impact locations. (Label the positive and negative directions, if applicable)
2. Identify knee form impact location on sketch by placing K9, K10, and K11 in the appropriate location.
3. Define the plane of reference for knee form impact angle:

   0° = Parallel with Floor, (+) is Up, (-) is Down

   X = From Inboard Edge of the Seat

   Y = Measured Vertically from the SRP

DATA SHEET 10 (CONTINUED)

KNEE FORM IMPACT TEST

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Knee impact & Test #	Location (a)			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Cont. Area mm^2	Resist Force (N)	Column 5 > 1935 mm^2		Column 6 < 2669N	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
K9	206	102	0	4.79	4.56		2212			PASS	
K10	89	102	0	4.86	5.11		2348			PASS	
K11	156	236	0	4.82	4.81		2068			PASS	

* Impact velocity from item No. 7 below

** Impact velocity range = 4.86 mps, +0.08, -0 mps for contact area, +0, -0.08 mps for force

5. Attach acceleration versus time plots for each impact.
6. Attach force vs. time plots for K9, K10 and K11.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time for each impact K9 through K11.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the seat.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 10

KNEE FORM IMPACT TEST

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

BARRIER NUMBER: B1

REAR SURFACE

1. Locate x-y reference point on sketch above for knee form impact locations. (Label the positive and negative directions, if applicable)
2. Identify knee form impact location on sketch by placing K1, K2, K3, K4, K5, and K6 in the appropriate location.
3. Define the plane of reference for knee form impact angle:

   0° = Parallel with Floor, (+) is Up, (-) is Down

   X = From Inboard Edge of the Seat

   Y = Measured Vertically from the SRP

DATA SHEET 10 (CONTINUED)

KNEE FORM IMPACT TEST

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Knee impact & Test #	Location (a)			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Cont. Area mm^2	Resist Force (N)	Column 5 > 1935 mm^2		Column 6 < 2669N	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
K1	-669	229	0	4.93	4.73	3450	2522	PASS			
K2	-538	233	0	4.92	5.06	3200	2458	PASS			
K3	-411	236	0	4.91	4.73	3110	2837	PASS			
K5	-304	232	0	4.89	4.51		4658				FAIL
K6	-301	130	0	4.90	4.70		3992				FAIL

* Impact velocity from item No. 7 below

** Impact velocity range = 4.86 mps, +0.08, -0 mps for contact area, +0, -0.08 mps for force

5. Attach Contact Area Prints for K1, K2 and K3.
6. Attach acceleration versus time plots for each impact.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time for each impact K1 through K6.
8. Attach force vs. time plots for K5 and K6.

Comments: (a) All coordinate measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the barrier.

Recorded By: _____

Approved By: _____ Date: 03/04/2009

DATA SHEET 11

SEAT BELT ASSEMBLY ANCHORAGES

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

SEAT LOCATION: S4

		PASS/FAIL
1.	Are all seat belt assembly anchorages designed for forward facing occupant position? Yes – Pass; No – Fail	**PASS**

Seat Location	Seating Location	Anchor Type	Measured Spacing (mm) *	Measured Angle **	Load Application Angle (degrees)	
					Side View Horizontal Load Angle	Plan View From Vehicle Center Line
S4	Left	1	334	74.4°	10.4°	0°
	Right	1	335	74.5°	10.3°	0°

*The spacing for an individual seat belt assembly anchorage shall be at least 165mm apart as measured between the vertical center lines of the bolt holes.

**Specified angle range above horizontal to be 20° to 75°.

Seat Location	Seating Location	Required Load (Newtons)	Actual Max. Test Load (Newtons)	Pass/Fail	Comment
S4	Left	22,000	22,127	**PASS**	NONE
	Right	22,000	22,092	**PASS**	NONE

COMMENTS: None

Recorded By: _____

Approved By: _____ Date: 05/13/2009

DATA SHEET B1

SEAT BELT CHECK

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

1. No. of designated seating positions (DSP): 16, plus driver
2. Type of seat belt at each passenger DSP (571.208 S4.1.2.1, S4.1.2.2, S4.1.2.3)

Belt Type (Type 1 or 2 Required)								
Seat No.	S1	S2	S3	S4	S5	S6	S7	S8
DSP #1 Inboard	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1
DSP #2 Outboard	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1

3. Type of retractor at each passenger DSP: (571.208 S7.1.1.2)

Retractor Type (Manual, ALR, ELR)								
Seat No.	S1	S2	S3	S4	S5	S6	S7	S8
DSP #1 Inboard	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual
DSP #2 Outboard	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual

4. Single point, push-button, accessible latch release at each passenger DSP (571.208 S7.2(c))

Pass: single point push-button Fail: not single point push-button

Seat No.	S1	S2	S3	S4	S5	S6	S7	S8
DSP #1 Inboard	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**
DSP #2 Outboard	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**

DATA SHEET B1 (CONTINUED)

SEAT BELT CHECK

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

5. Latch plate and buckle must not pass through conduit or guide between seat cushion and seat back at each passenger DSP. (571.208 S7.4.6)

Pass: latch plate and/or buckle will not fit through conduit or guide

Fail: latch plate and/or buckle will fit through conduit or guide

Seat No.	S1	S2	S3	S4	S5	S6	S7	S8
DSP #1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
DSP #2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

6. Either the latch plate, buckle, or webbing must stay on top or above the seat when the seat belt is unbuckled and the remaining two parts must stay accessible at each passenger DSP. (571.208 S7.4.6)

Pass: the seat belt meets the above requirements

Fail: the seat belt does not meet the above requirements

Seat No.	S1	S2	S3	S4	S5	S6	S7	S8
DSP #1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
DSP #2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

7. Seat belt fit test dummies

		Manufacturer	Serial Number
7.1	50% 6-Year old Child	FTSS	111
7.2	5% Adult Female	FTSS	511
7.3	50% Adult Male	FTSS	312
7.4	95% Adult Male	Denton	9566

DATA SHEET B1 (CONTINUED)

SEAT BELT CHECK

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

8. Seat belt must fit persons whose dimensions range from those of a 50th percentile 6-year old child to those of a 95th percentile adult male. (571.208 S7.1.1)

Two seats checked

Pass: snug fitting seat belt Fail: loose fitting seat belt

Seat No.		S4	S5
DSP #1	50% C	PASS	PASS
	95% AM	PASS	PASS
DSP #2	50% C	PASS	PASS
	95% AM	PASS	PASS

9. Driver's Seat (Not part of FMVSS 222)

Belt Type	2
Automatic Restraint	No
Type of Automatic Restraint (if applicable)	

Pass: snug fitting seat belt Fail: loose fitting seat belt

5% AF	PASS
95% AM	PASS

COMMENTS: None

Recorded By: _____

Approved By: _____ DATE: 5/13/2009

DATA SHEET B2

SEAT BELT WARNING SYSTEM CHECK

Test Vehicle: **2009 BLUE BIRD MICRO BIRD SCHOOL BUS** NHTSA No.: **C90902**
Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **01/27/09 – 05/13/09**

X	1.	The occupant is in the driver's seat.
X	2.	The seat belt is in the stowed position.
X	3.	The key is in the "on" or "start" position.
X	4.	The time duration of the audible signal beginning with key "on" or "start" is
X		Seconds: 5
X	5.	The occupant is in the driver's seat.
X	6.	The seat belt is in the stowed position.
X	7.	The key is in the "on" or "start" position.
X	8.	The time duration of the warning light beginning with key "on" or "start" is
X		Seconds: 65
X	9.	The occupant is in the driver's seat.
X	10.	The seat belt is in the latched position and with at least 4 inches of belt webbing extended.
X	11.	The key is in the "on" or "start" position.
X	12.	The time duration of the warning light beginning with key "on" or "start" is
X		Seconds: 0
X	13.	Complete the following table with the data from 4, 8, and 12 to determine which option is used.
X	14.	Record exactly the wording of the visual seat belt warning system:
X		Symbol

		Warning light	Warning light specification	Audible signal	Audible signal specification*
S7.3 (a)(1)	Belt stowed & key on or start	Item 8: Stays On	60 seconds minimum	Item 4: 5	4 to 8 seconds
S7.3 (a)(2)	Belt latched & key on or start	Item 12: 0	Passive Belts Not Required		
	Belt stowed & key on or start	Item 8: Stays On	4 to 8 seconds	Item 4: 5	4 to 8 seconds

* 49 USCS @ 30124 does NOT allow an audible signal to operate for more than 8 seconds.
A voluntary audible signal after the 4 to 8 second required signal may be provided. It must be differentiated from the required signal (5/25/2001 legal interpretation to Longacre and Associates).

Comments: A Ford E-350 Chassis from a 2009 TransTech Rondak bus was used.

Recorded By: _____

Approved By: _____ DATE: 5/13/2009

SECTION 4

INSTRUMENTATION AND EQUIPMENT LIST

Equipment	Description	Model/Serial No.	Cal. Date	Cal. Due Date
Load Cell	Interface	1210AF-5K / 62736	10/28/08	04/28/09
Load Cell	Interface	1210AF-5K / 62736	05/14/09	11/14/09
Load Cell	Interface	1210AF-25K-B / 137778	10/23/08	04/28/09
Load Cell	Interface	1210AF-25K-B / 137778	05/08/09	11/08/09
Inclinometer	Digital Protractor	Pro 360 / Comp Lab / 001	Daily	Daily
Load Cell	Interface	1210AF-300-B / 278321	11/13/08	05/13/09
String Pot.	Ametek	P-30A / 18389	11/13/08	05/13/09
String Pot.	Ametek	P-30A / 18389	05/05/09	11/05/09
Accel.	Entran	ECGS-S425-2000 / Y04628	11/13/08	05/13/09
Accel.	Entran	ECGS-S425-2000 / Y04628	05/05/09	11/05/09
Load Cell	PCB	1315-101-01A / 664	10/01/08	04/01/09
Load Cell	PCB	1315-101-01A / 664	03/24/09	09/24/09
Load Cell	PCB	1315-101-01A / 671	10/01/08	04/01/09
Load Cell	PCB	1315-101-01A / 671	03/24/09	09/24/09
Steel Tape	Stanley	Powerlock / 545	11/11/08	11/11/09
Impact Fixture	MGA	IF2003A	---	---
Camera	Sony	DSC-575	---	---
Planimeter	Sokkia Corp.	Planix5 007319	Daily	Daily
Accelerometer	Entran	G30-N08	11/13/08	05/13/09
Accelerometer	Entran	EGCS-S425-2000 / W04807	10/03/08	04/03/09
Accelerometer	Entran	EGCS-S425-2000 / W04807	05/05/09	11/05/09

SECTION 5

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Test Vehicle:	**2009 BLUE BIRD MICRO BIRD SCHOOL BUS**	NHTSA No.:	**C90902**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Dates:	**01/27/09 – 05/13/09**

Left Side View of School Bus

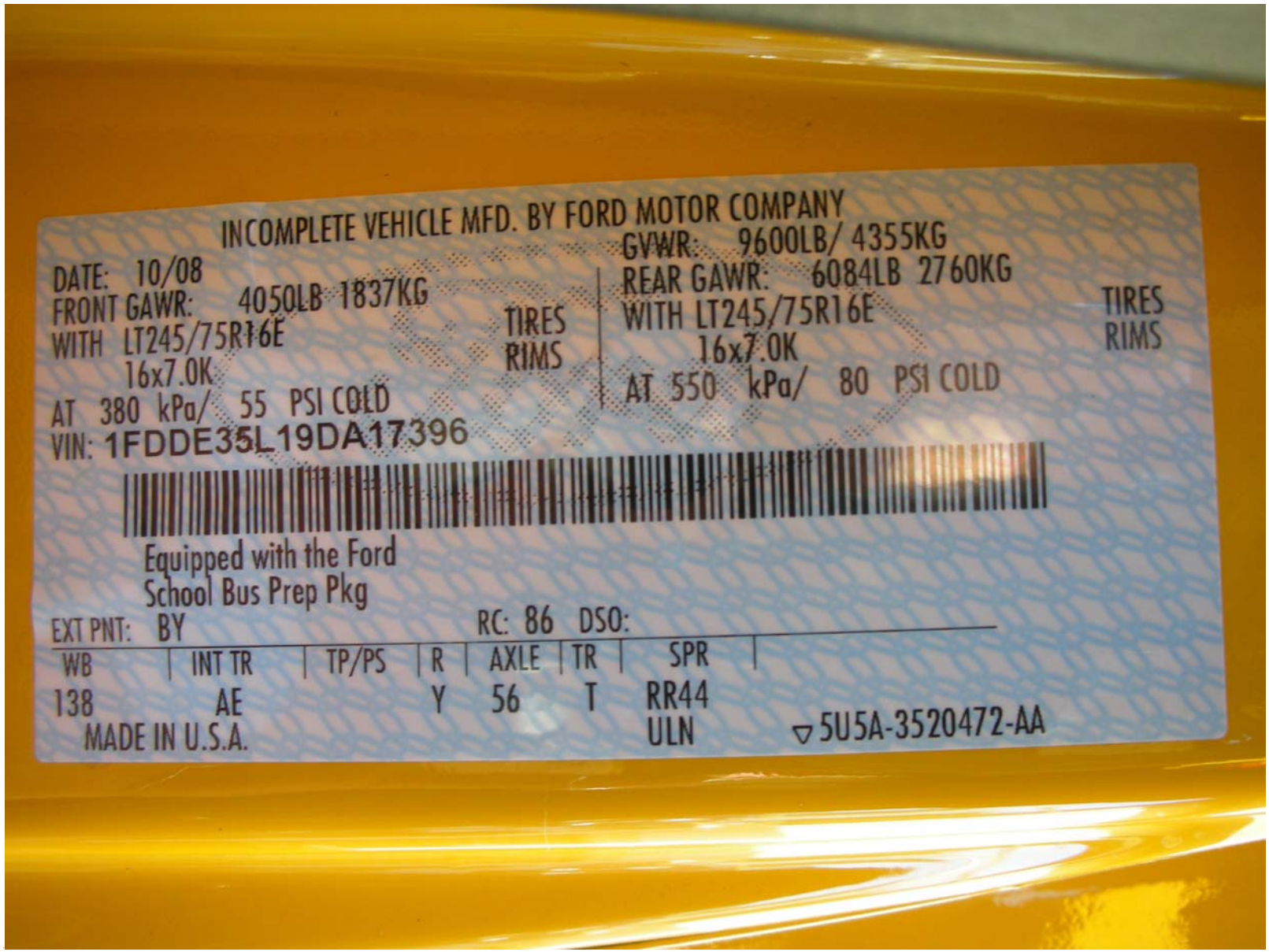
Right Side View of School Bus

Test Vehicle:	**2009 BLUE BIRD MICRO BIRD SCHOOL BUS**	NHTSA No.:	**C90902**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Dates:	**01/27/09 – 05/13/09**

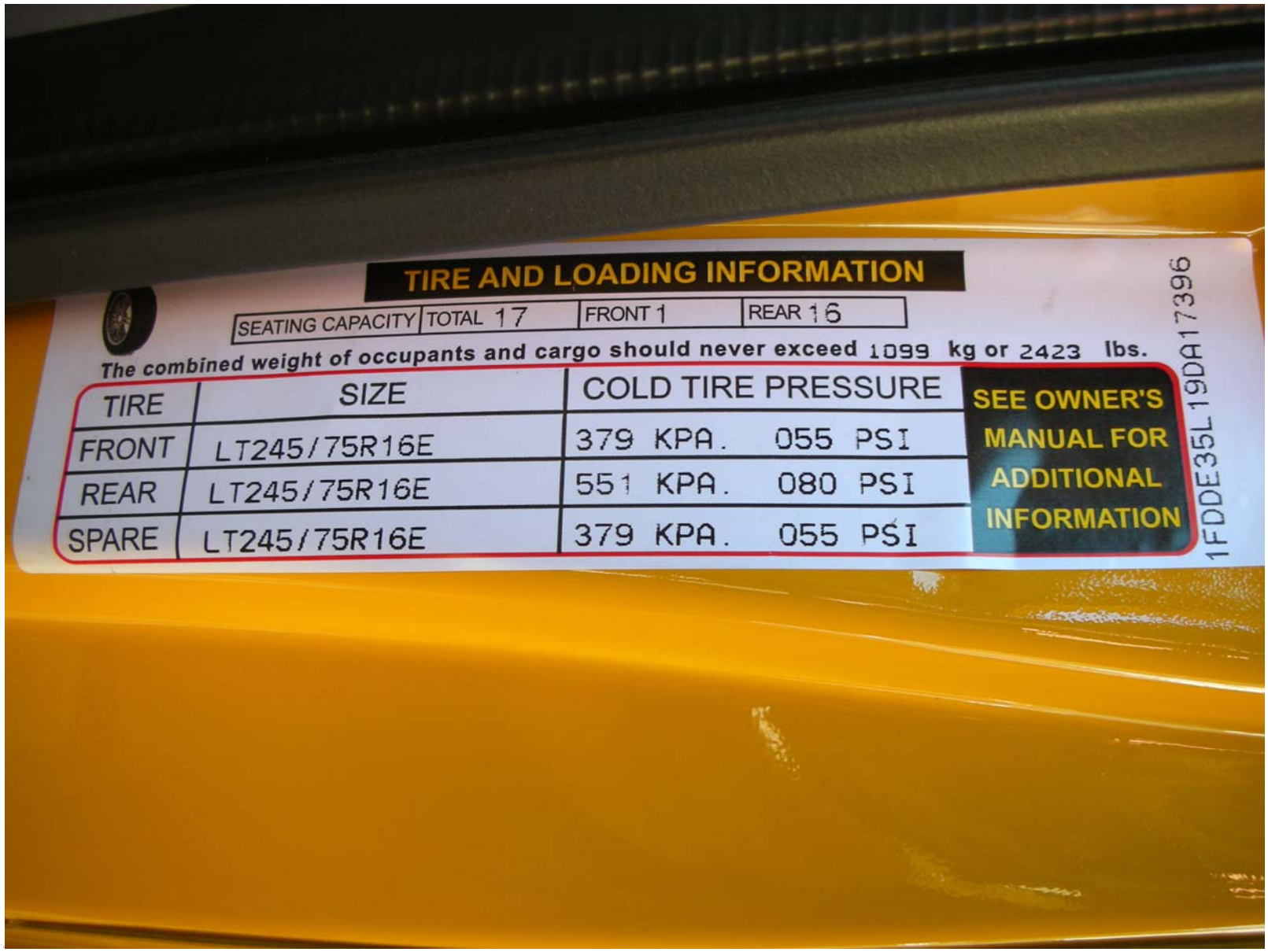
¾ Front View From Left Side of School Bus

Test Vehicle:	**2009 BLUE BIRD MICRO BIRD SCHOOL BUS**	NHTSA No.:	**C90902**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Dates:	**01/27/09 – 05/13/09**

¾ Rear View From Right Side of School Bus



Certification Label

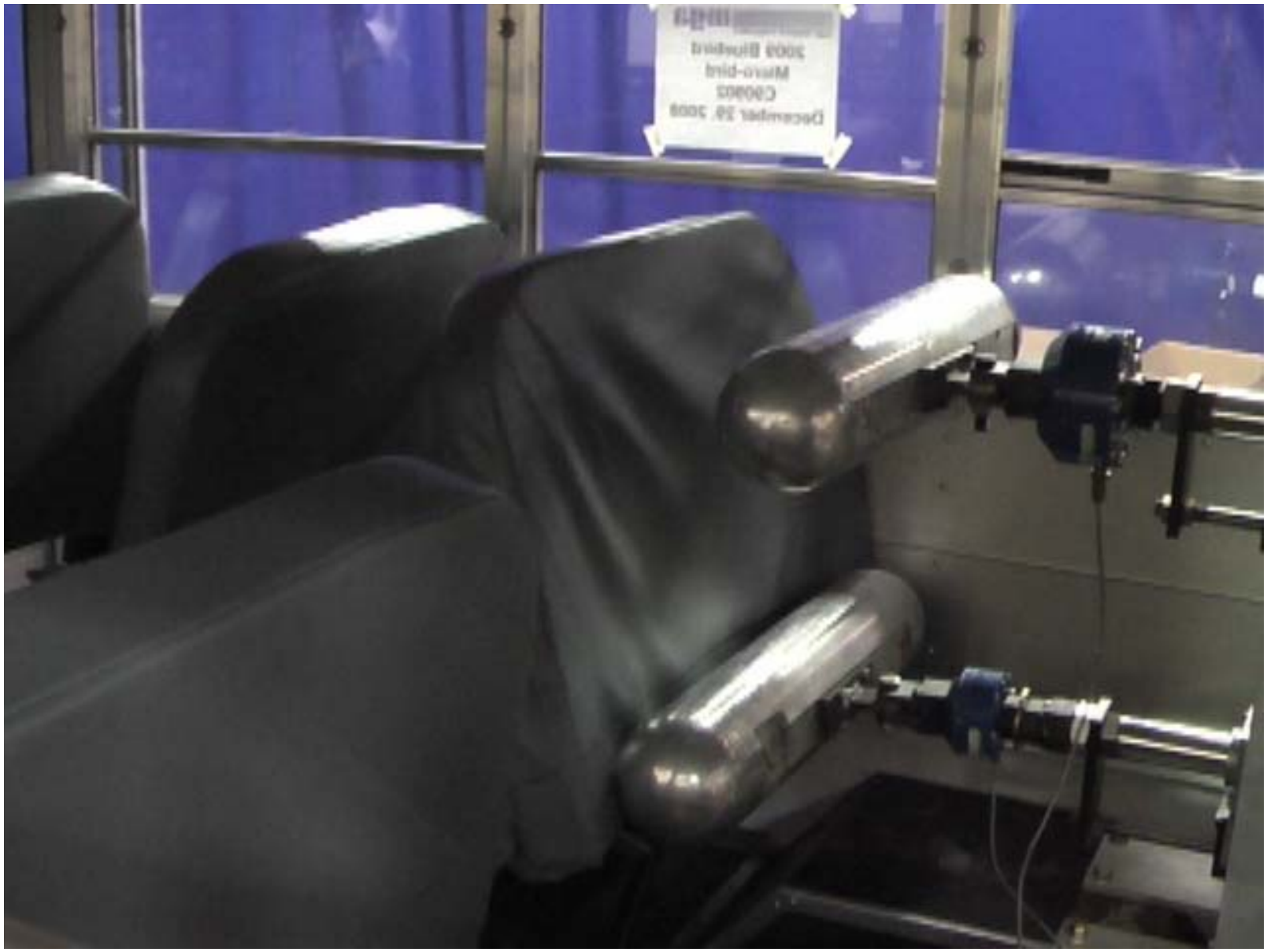


Tire Placard

Vehicle Interior View From Front to Rear

Vehicle Interior View From Rear to Front

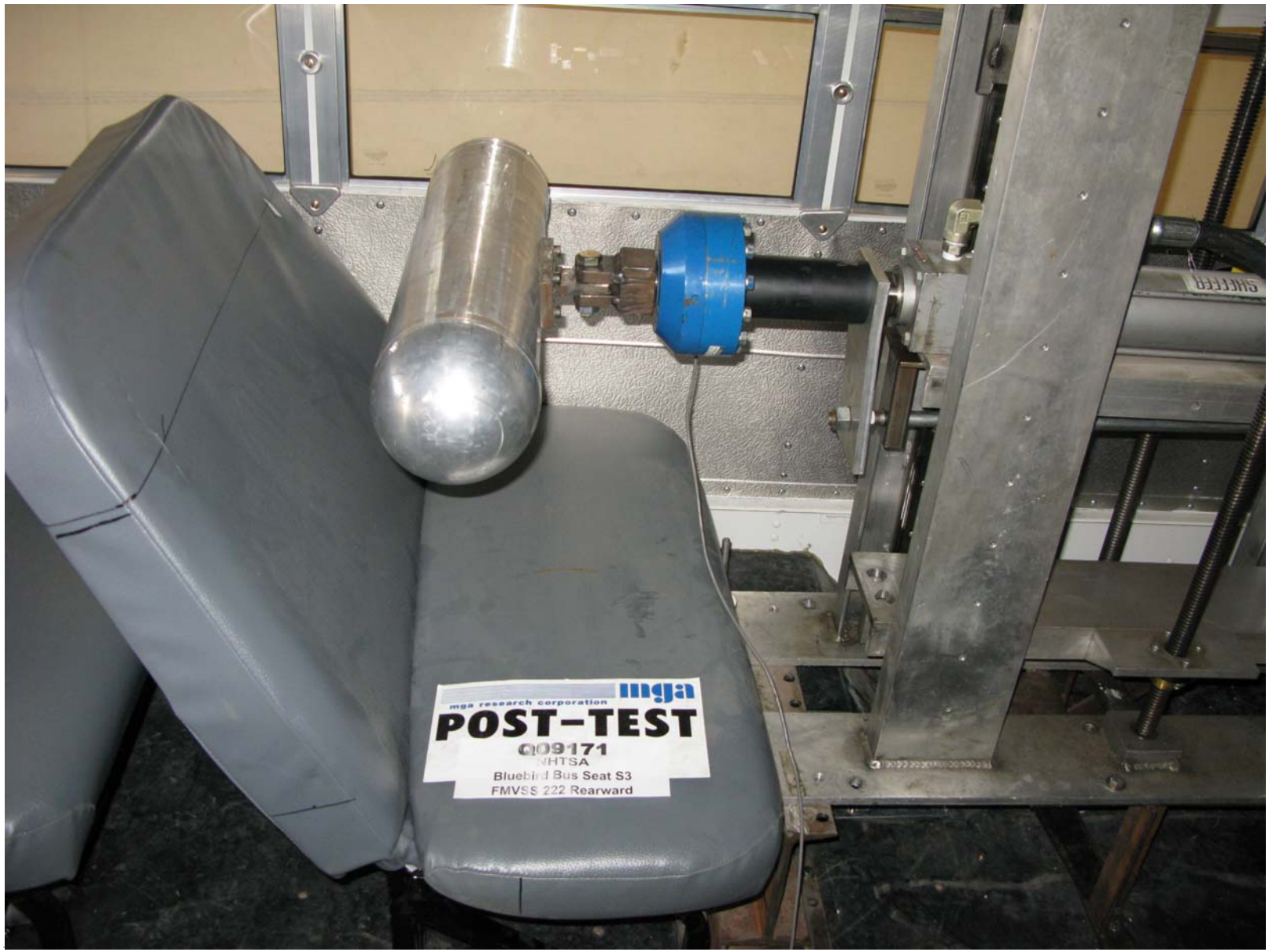
Pre-Test of Seat Cushion Retention Set Up View 1



Post-Test of Seat Back S7 Force Deflection Forward Test

Post-Test of Seat Back S7 Force Deflection Forward Test

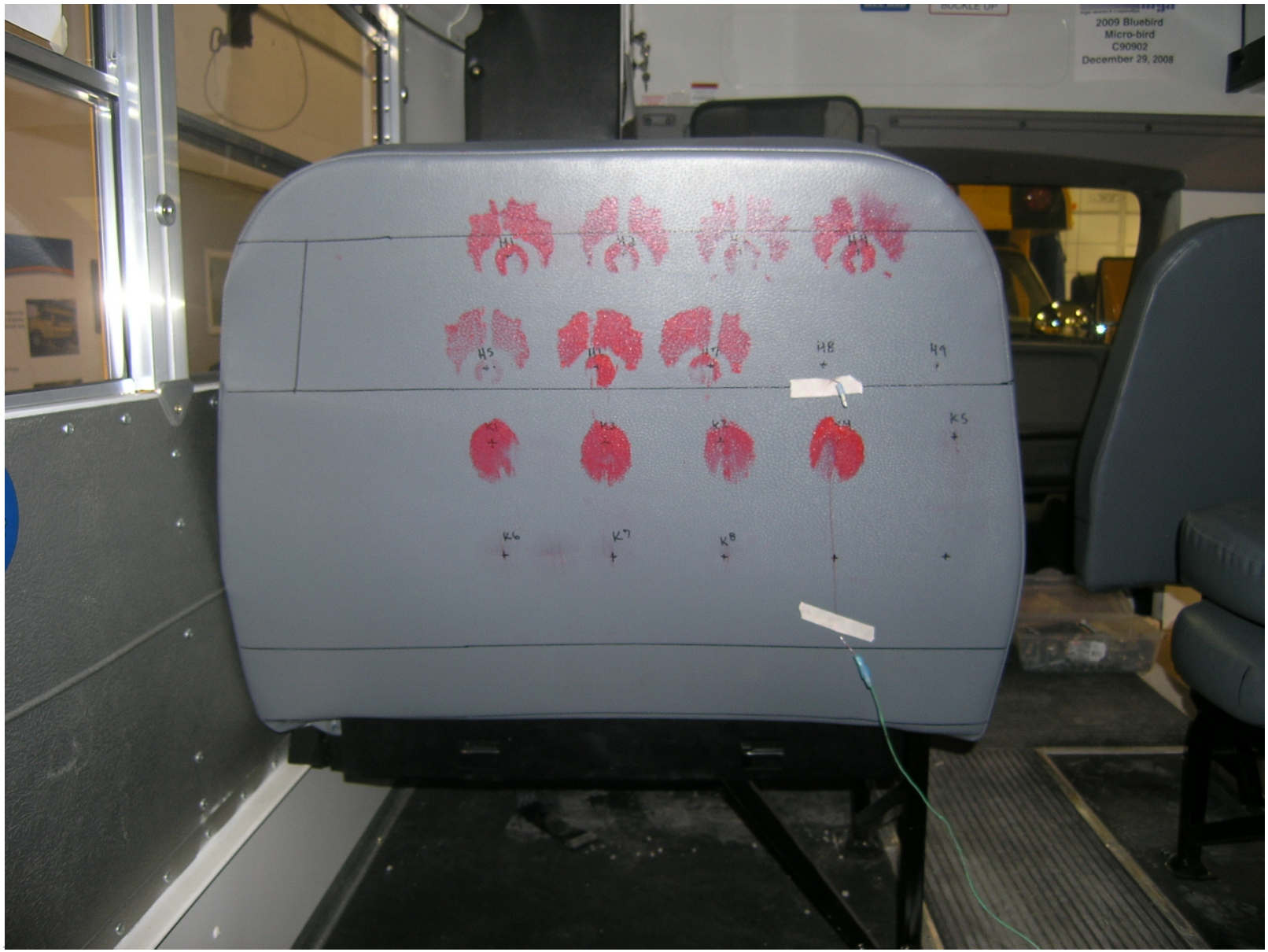
Pre-Test of Seat Back S3 Force Deflection Rearward Test



Post-Test of Seat Back S3 Force Deflection Rearward Test

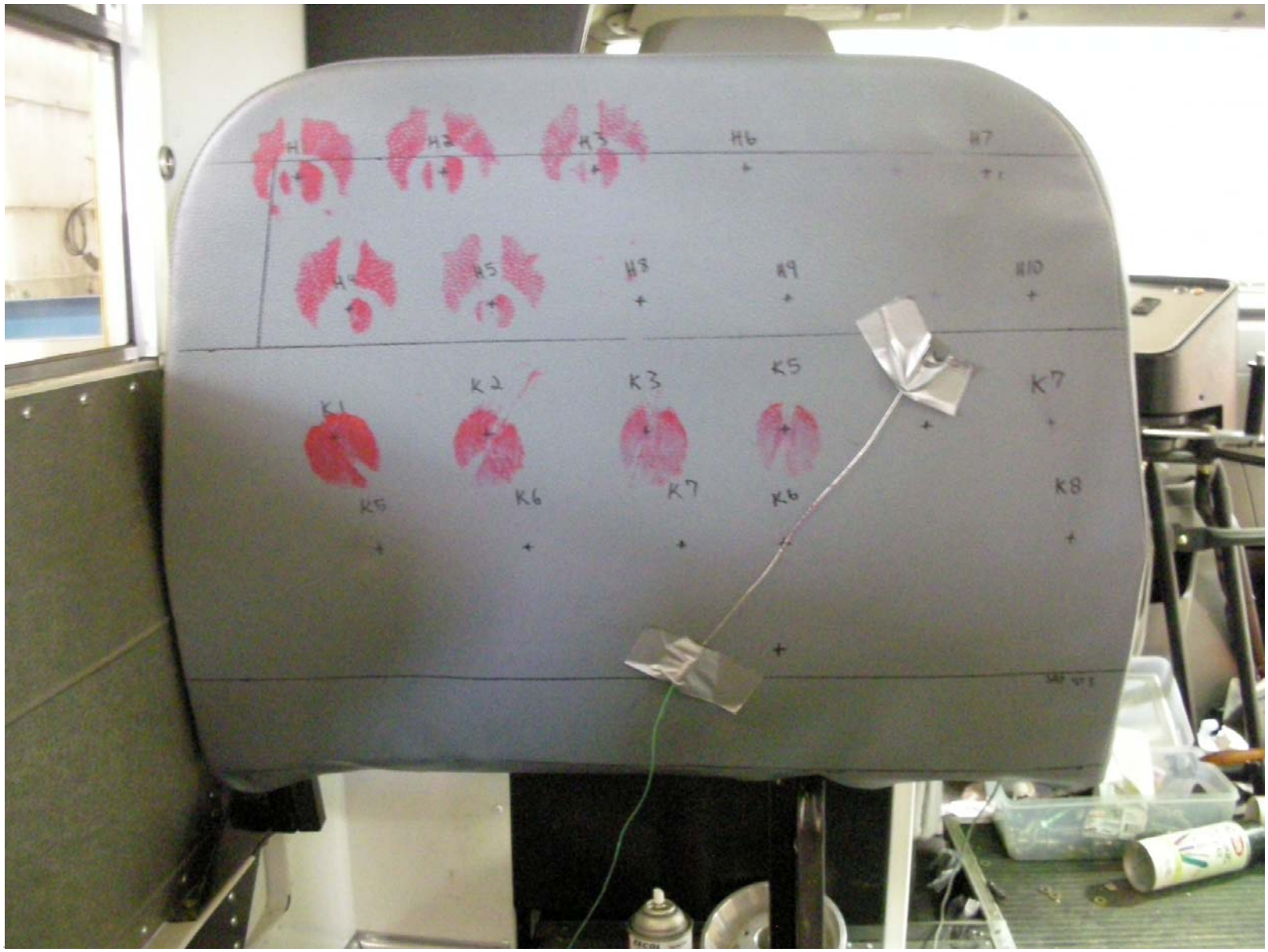
Pre-Test of Seat S4 210 Test

Post-Test of Seat S4 210 Test



Post-Test of Head and Knee Impact Locations on Seat S1

Test Vehicle:	**2009 BLUE BIRD MICRO BIRD SCHOOL BUS**	NHTSA No.:	**C90902**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Dates:	**01/27/09 – 05/13/09**

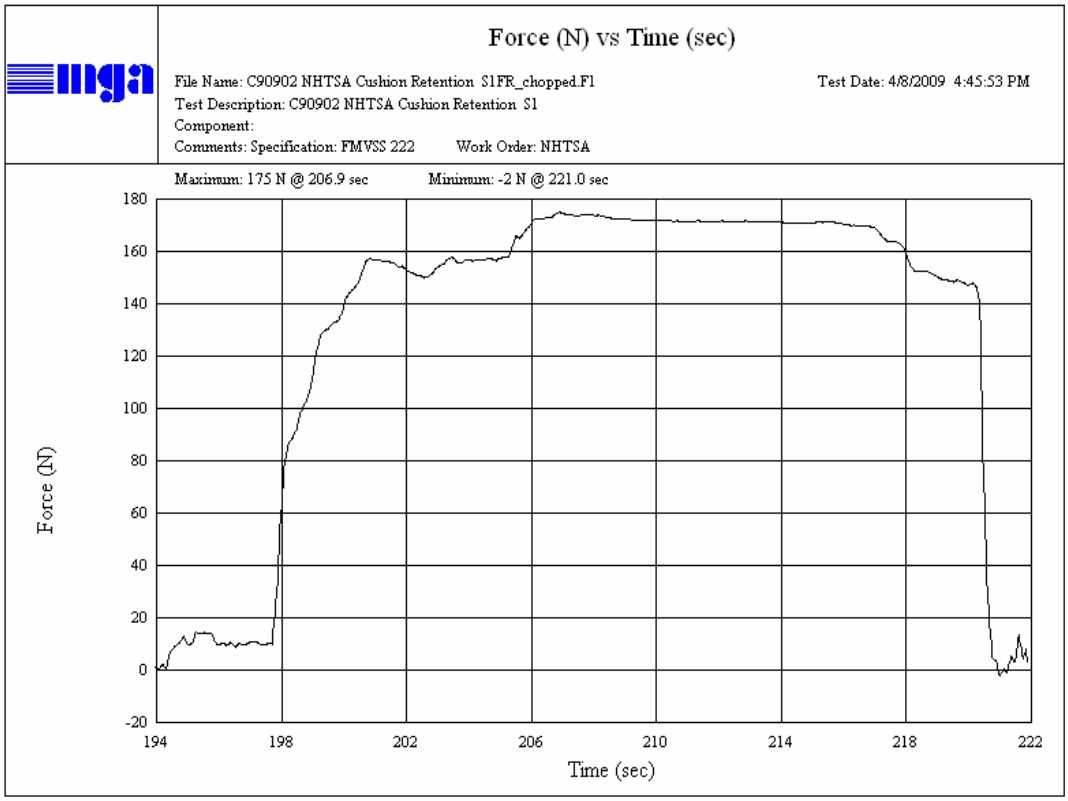


Post-Test of Head and Knee Impact Locations on Barrier B1

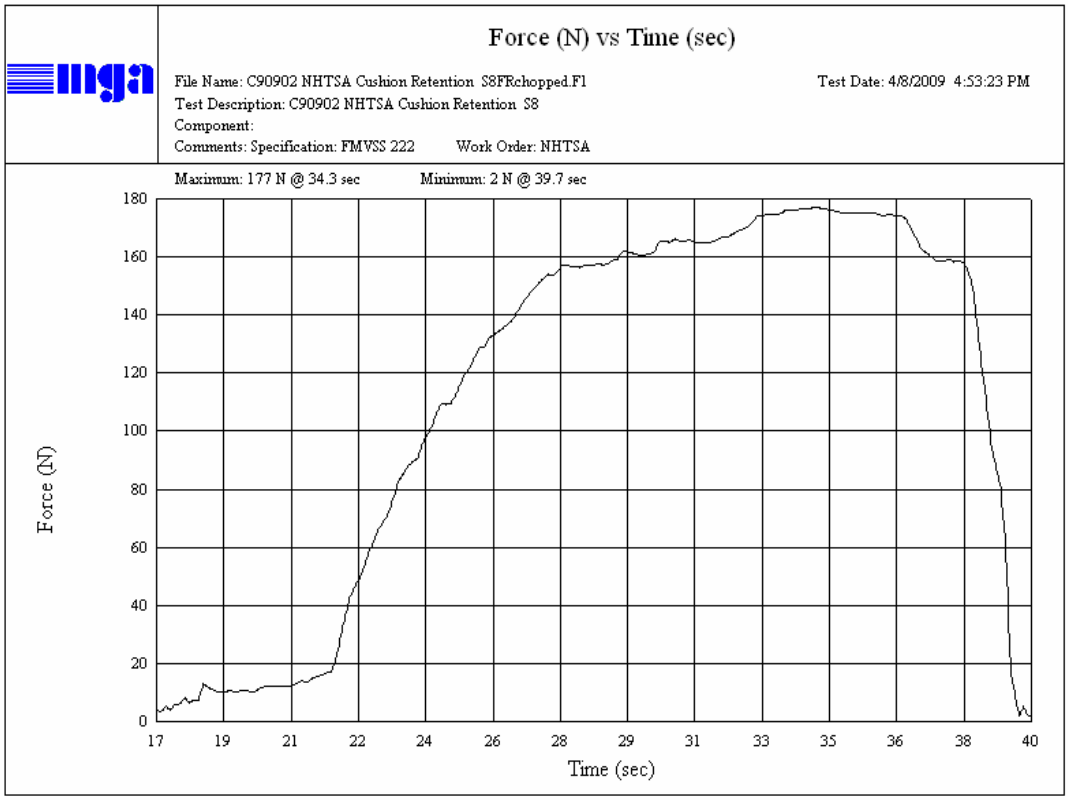
SECTION 6

TEST PLOTS

TABLE OF TEST PLOTS

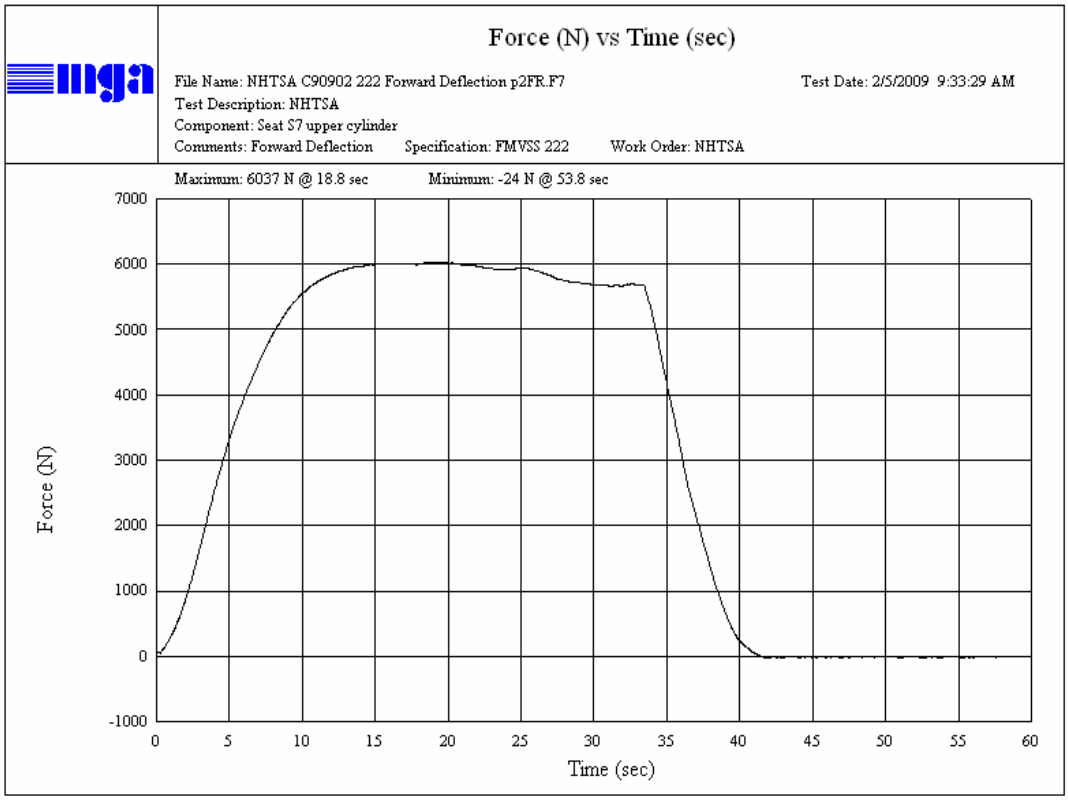


Seat Cushion Retention Seat S1

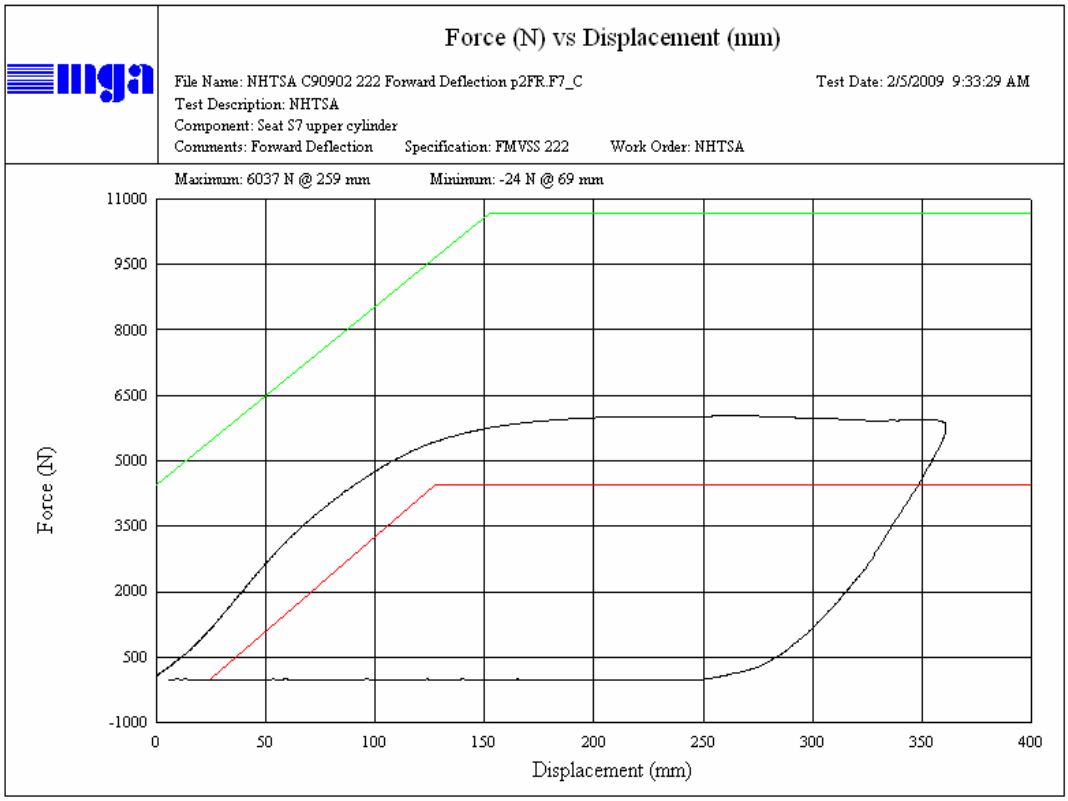


Seat Cushion Retention Seat S8

Seat Back Forward Deflection Seat S7 Upper Cylinder



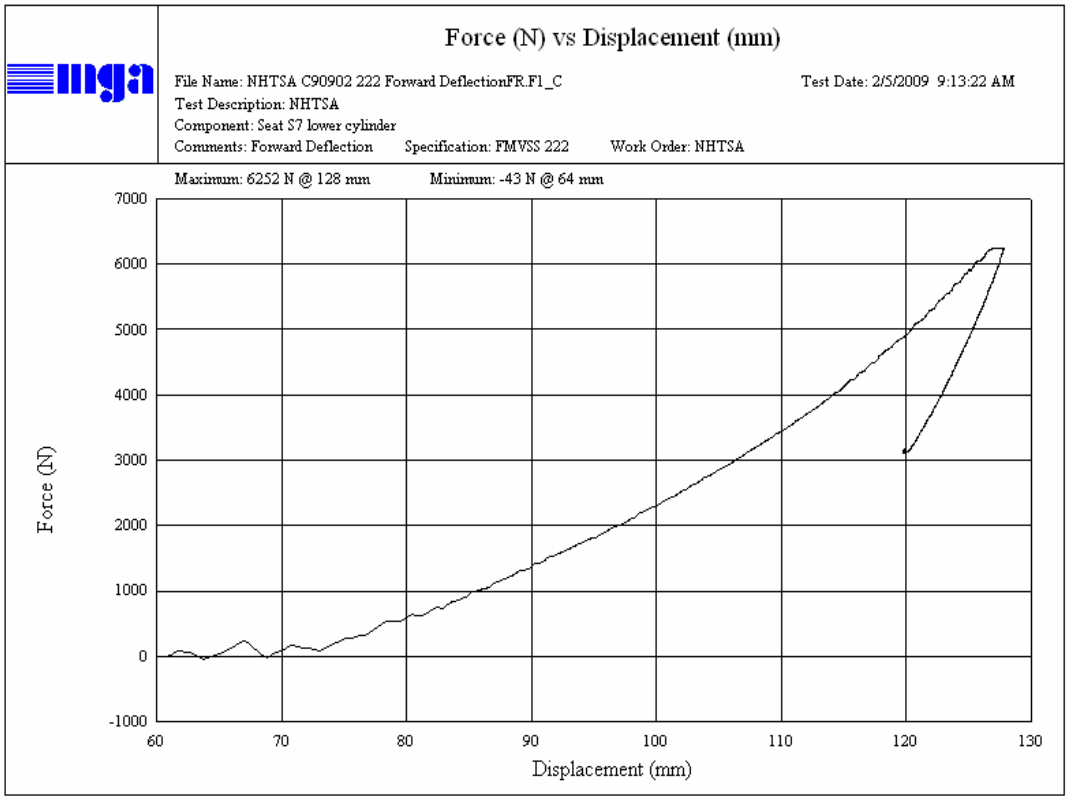
Seat Back Forward Deflection Seat S7 Upper Cylinder



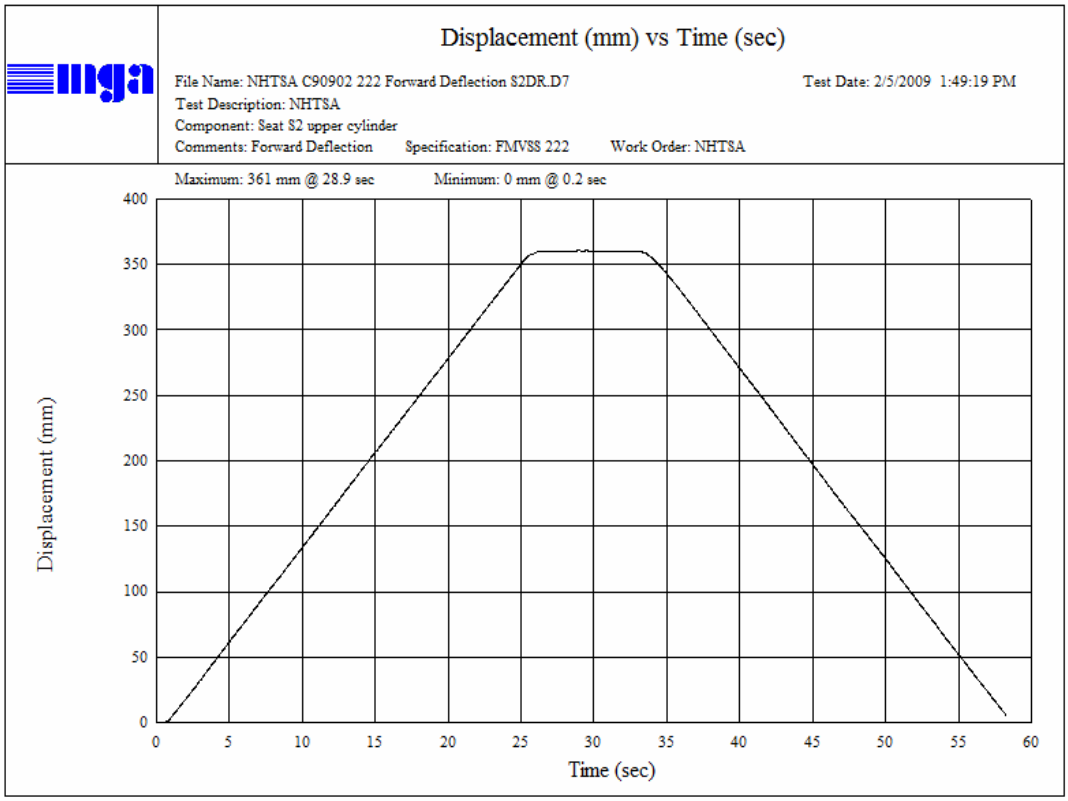
Seat Back Forward Deflection Seat S7 Upper Cylinder

Seat Back Forward Deflection Seat S7 Lower Cylinder

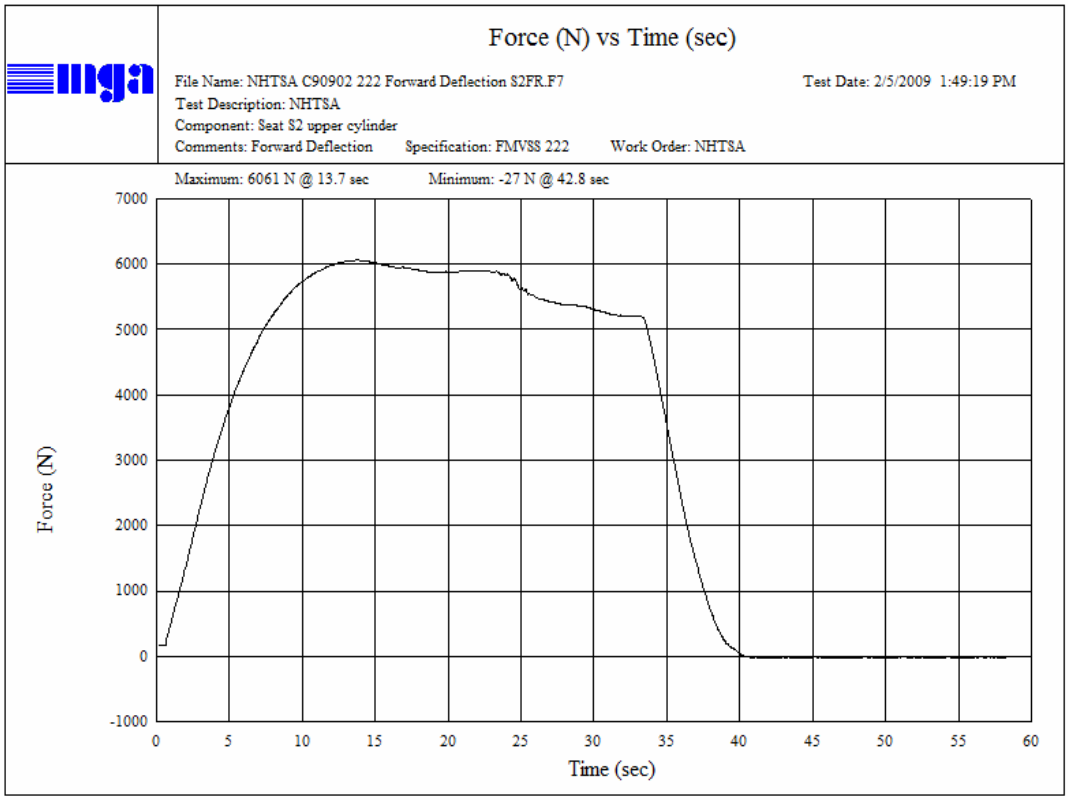
Seat Back Forward Deflection Seat S7 Lower Cylinder



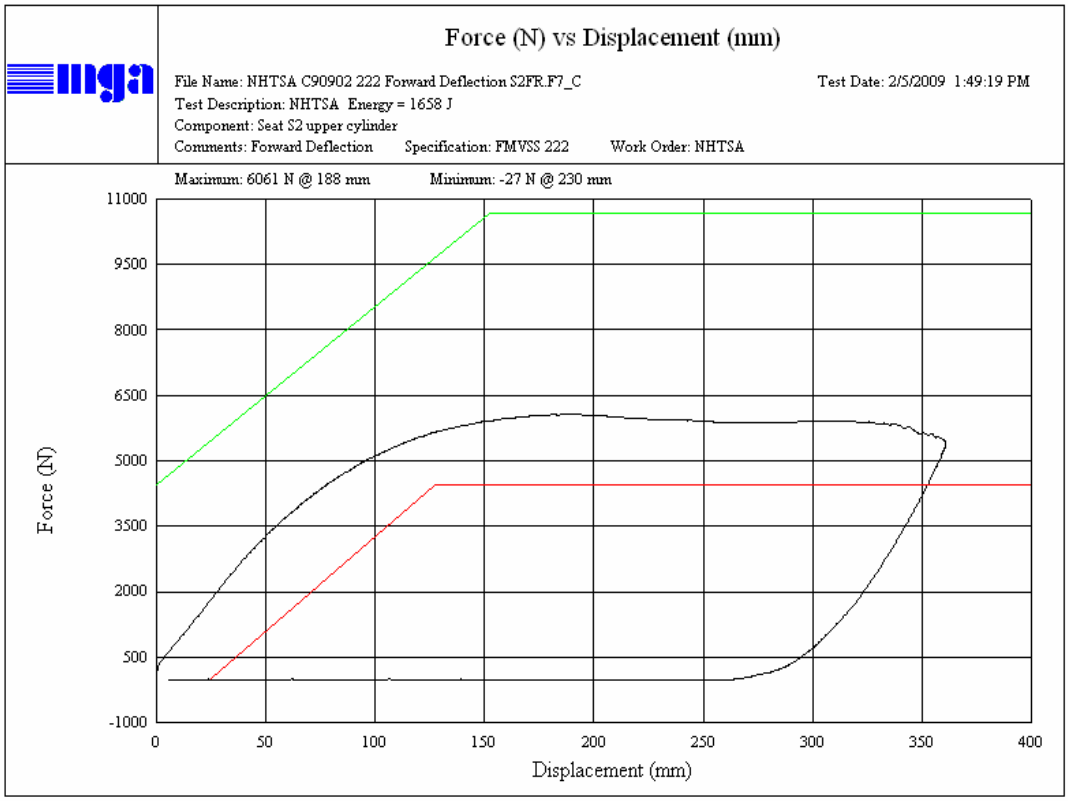
Seat Back Forward Deflection Seat S7 Lower Cylinder



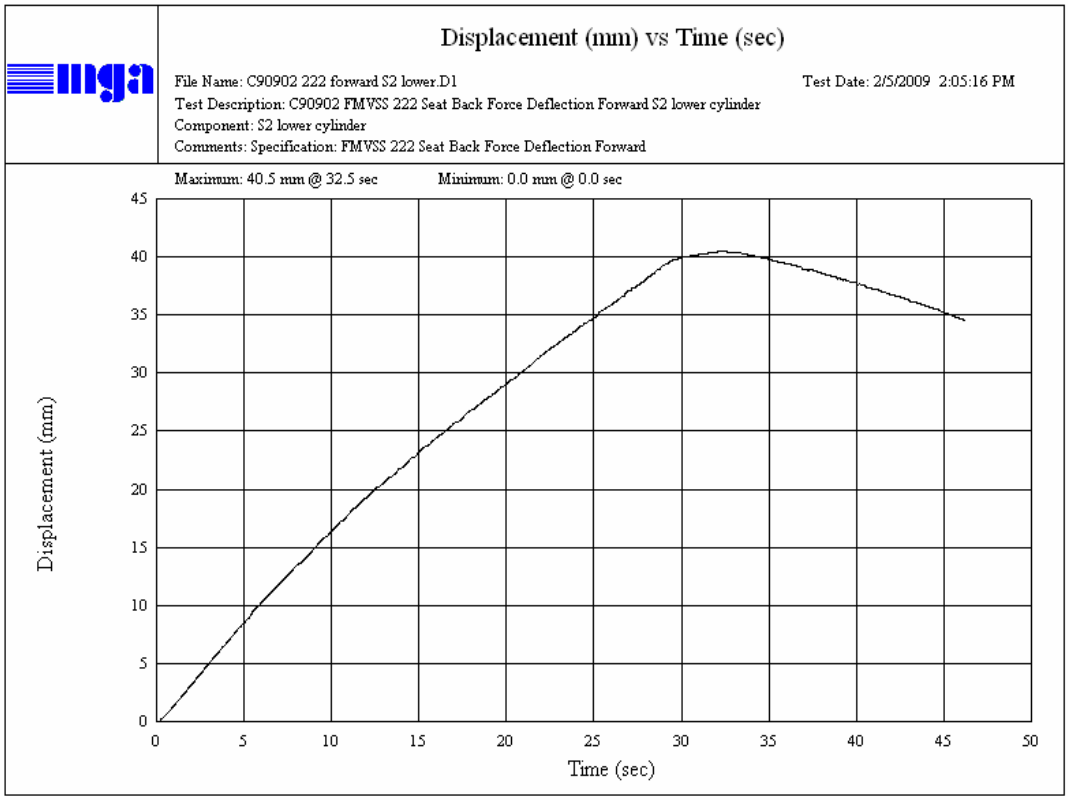
Seat Back Forward Deflection Seat S2 Upper Cylinder



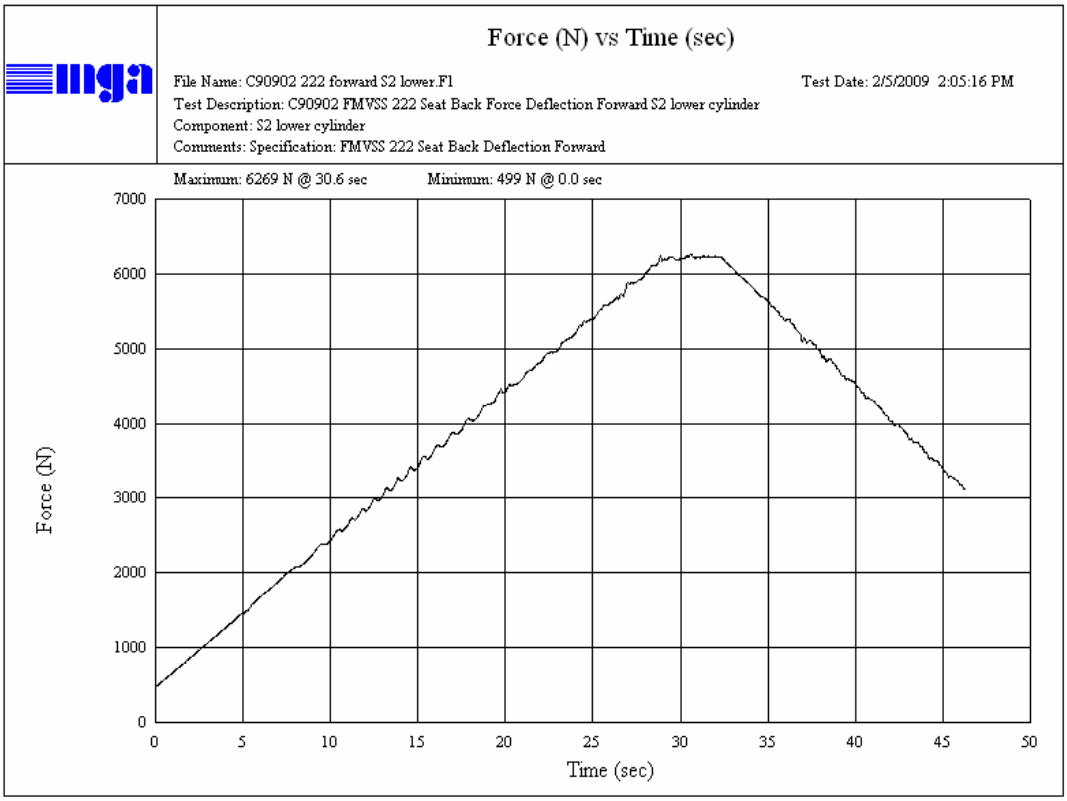
Seat Back Forward Deflection Seat S2 Upper Cylinder



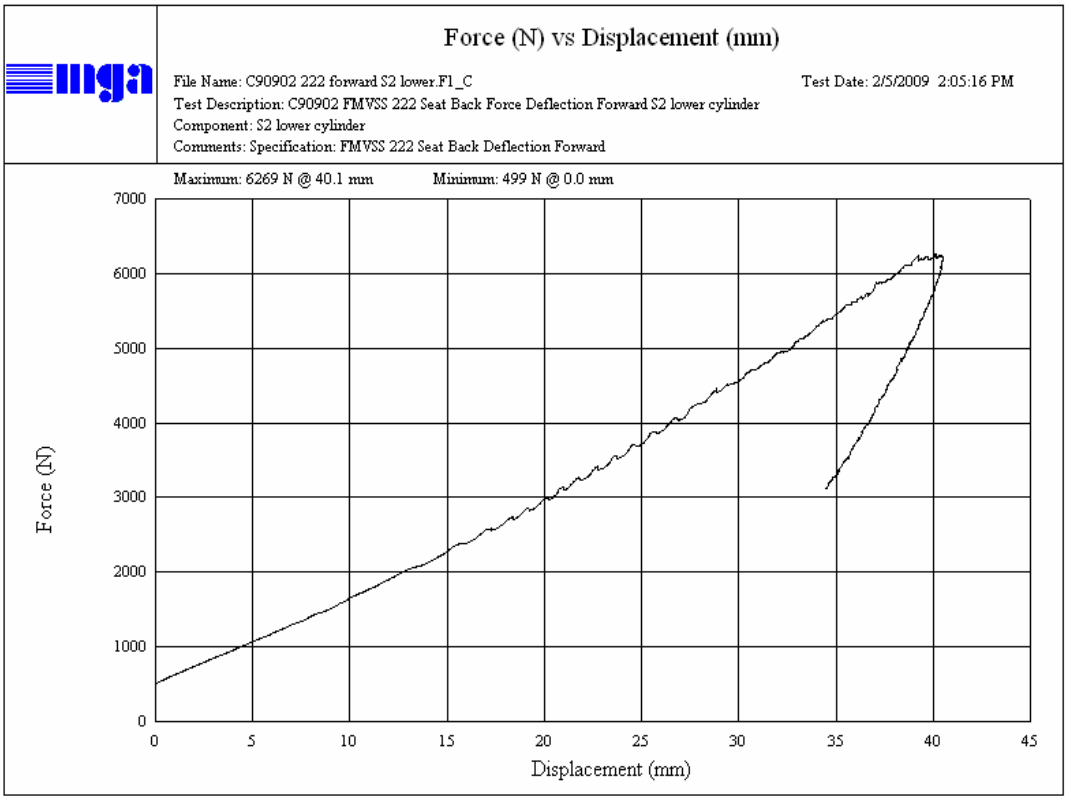
Seat Back Forward Deflection Seat S2 Upper Cylinder



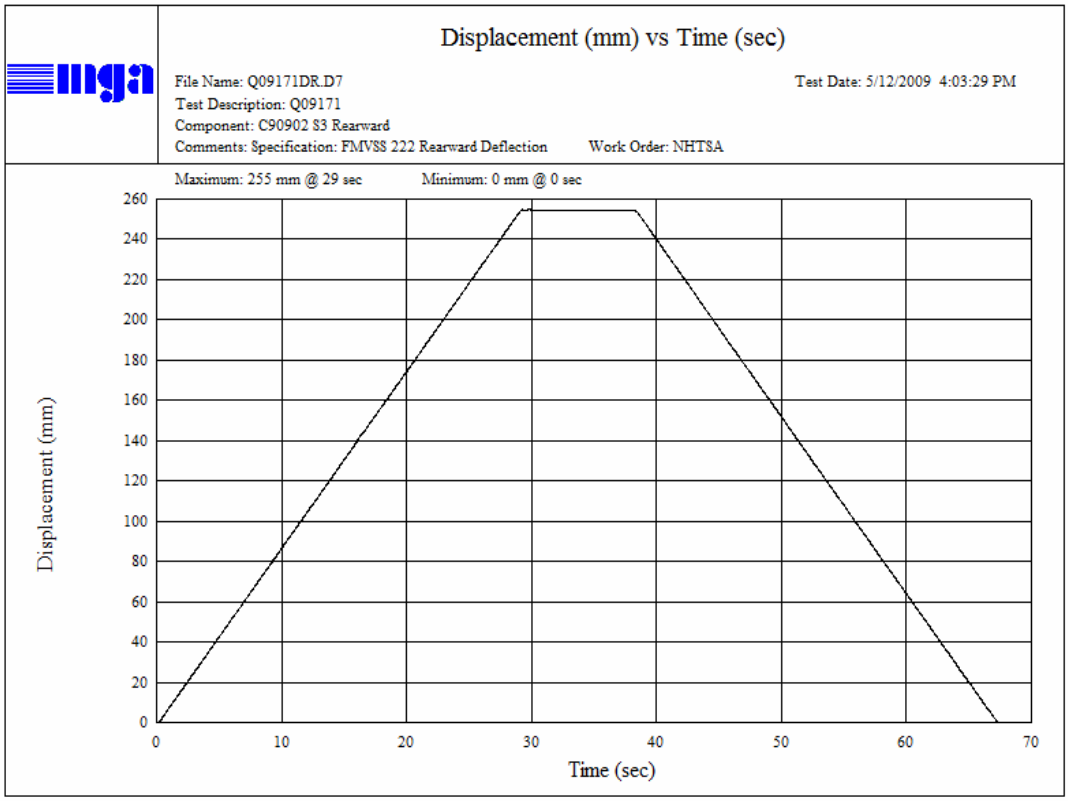
Seat Back Forward Deflection Seat S2 Lower Cylinder



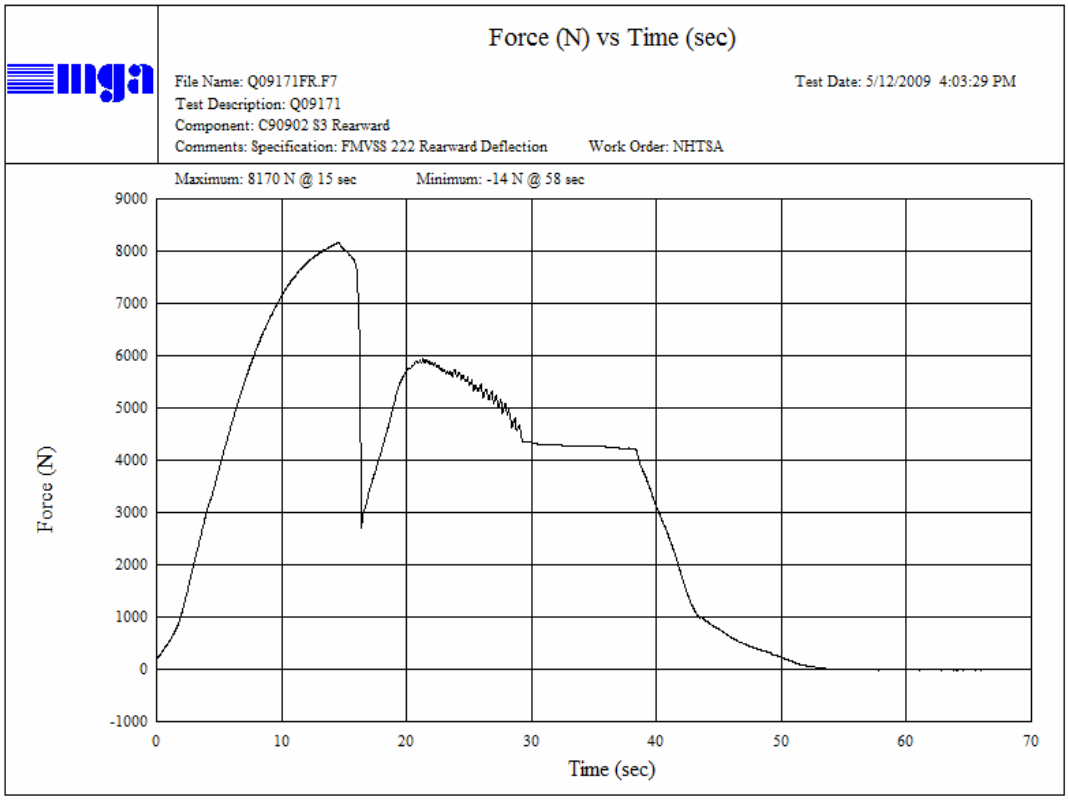
Seat Back Forward Deflection Seat S2 Lower Cylinder



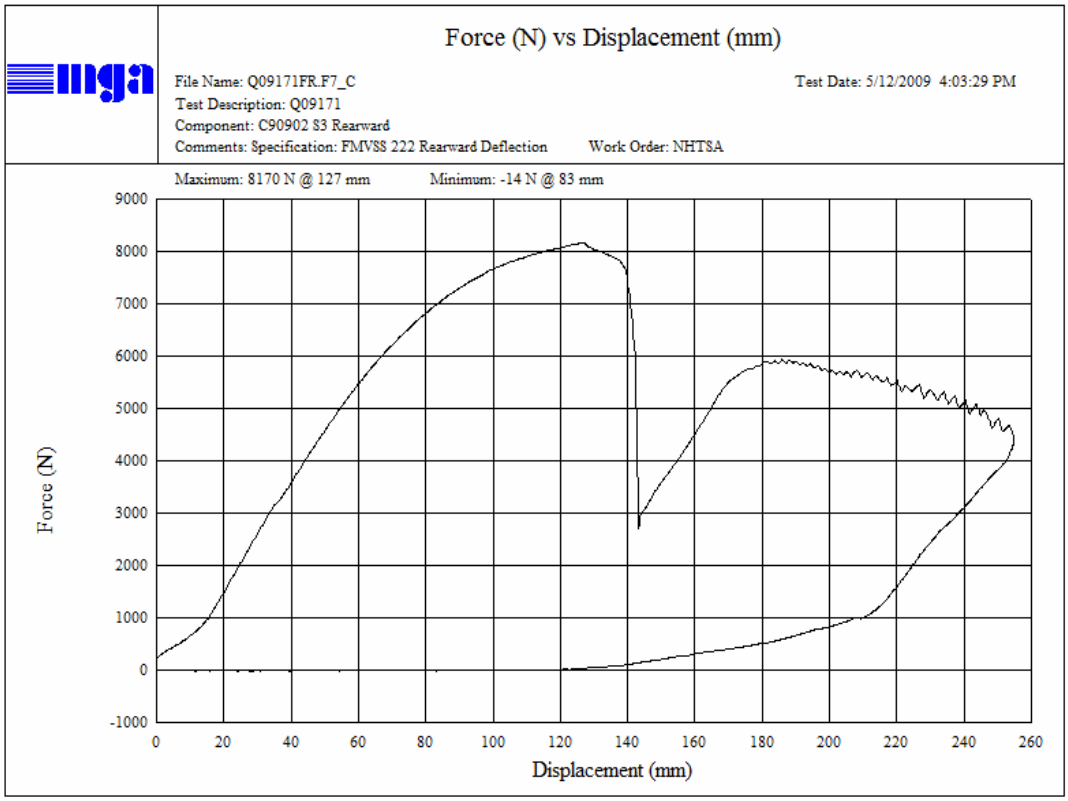
Seat Back Forward Deflection Seat S2 Lower Cylinder



Seat Back Forward Deflection Seat S3 Lower Cylinder



Seat Back Forward Deflection Seat S3 Lower Cylinder



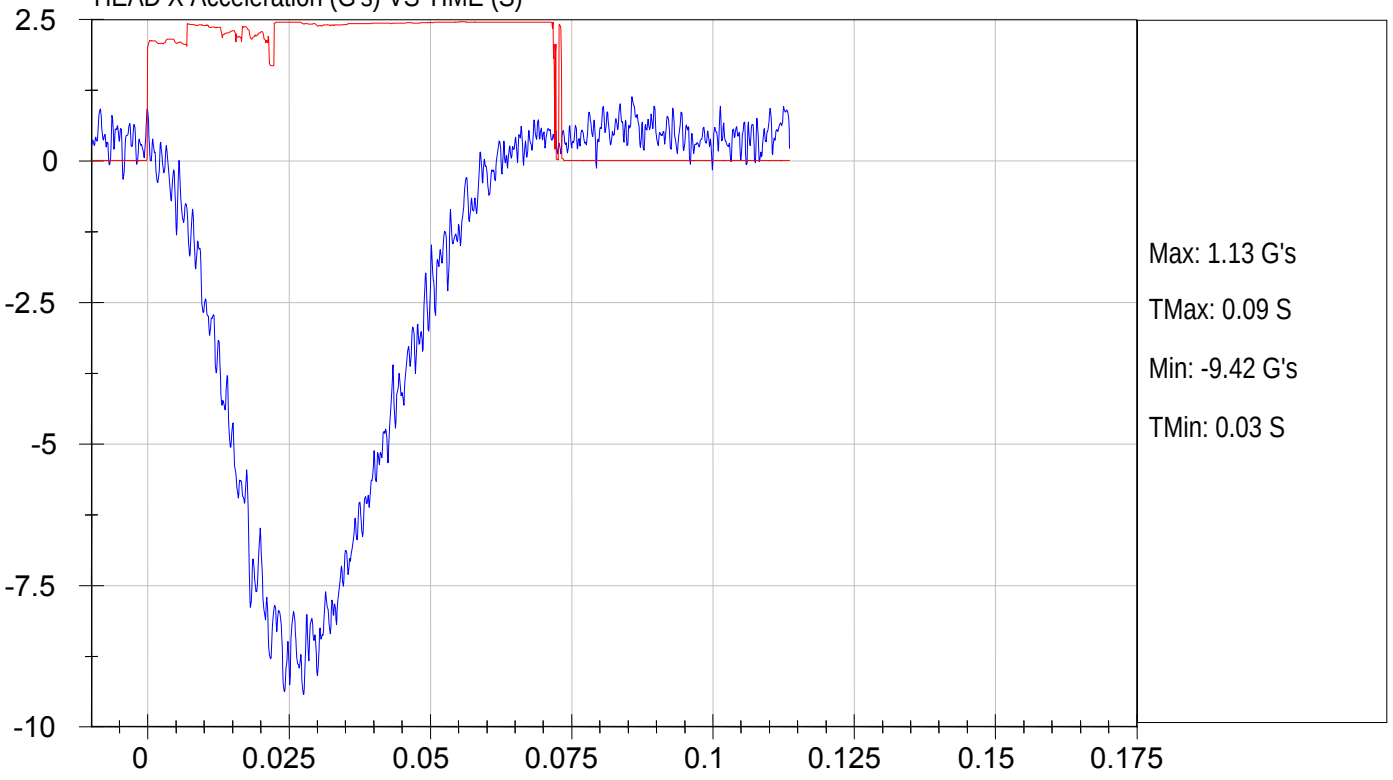
Seat Back Forward Deflection Seat S3 Lower Cylinder

FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: S1 H1

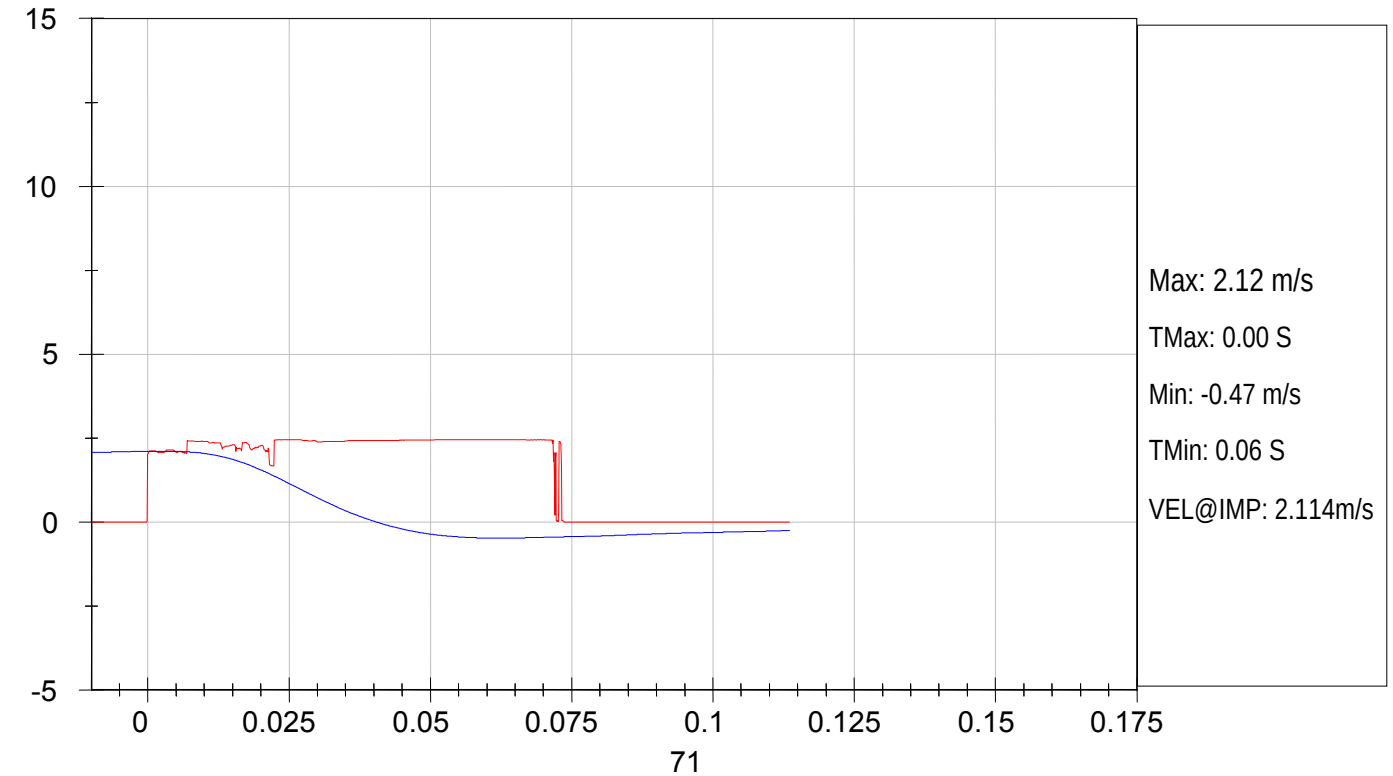
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.59 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 3.98 T1: 14.30 S T2: 43.10 S



VELOCITY X (m/s) VS TIME (S)

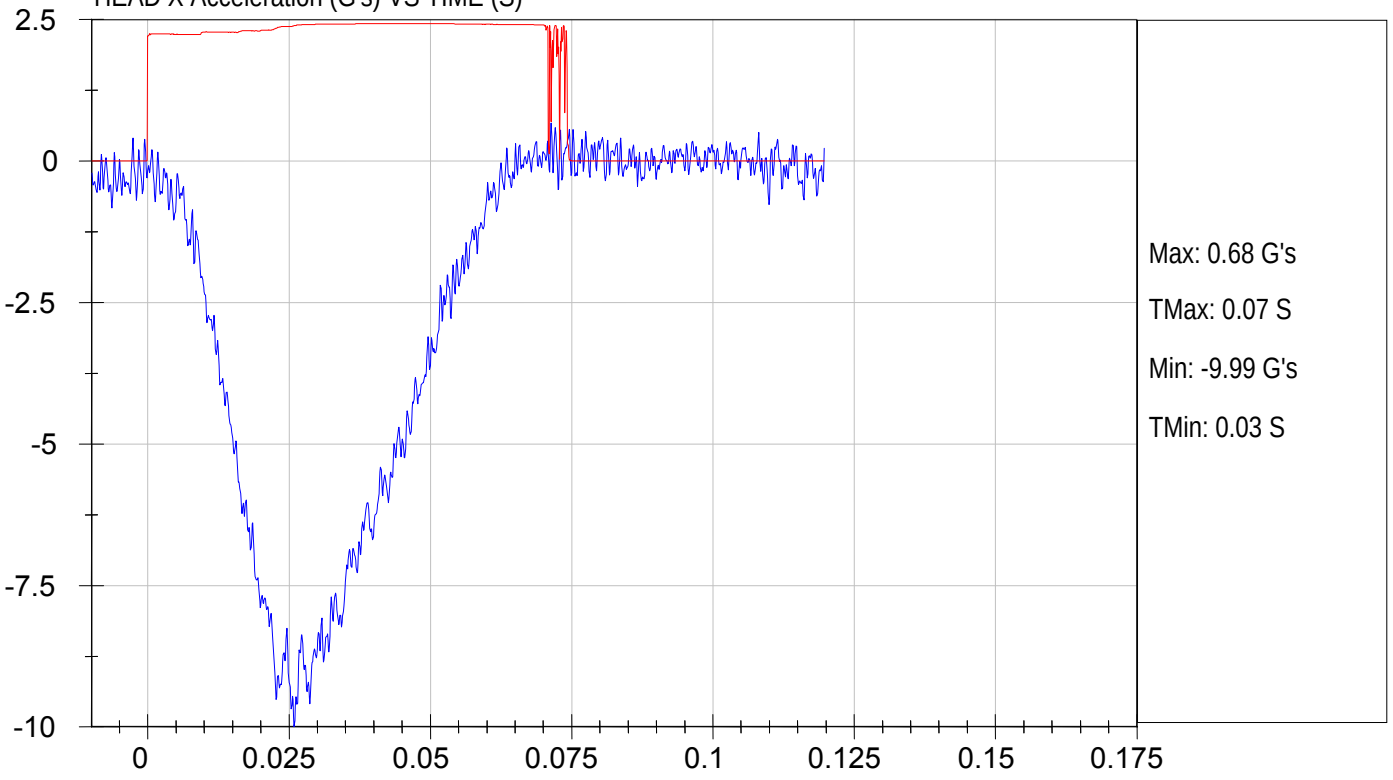


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: S1 H2

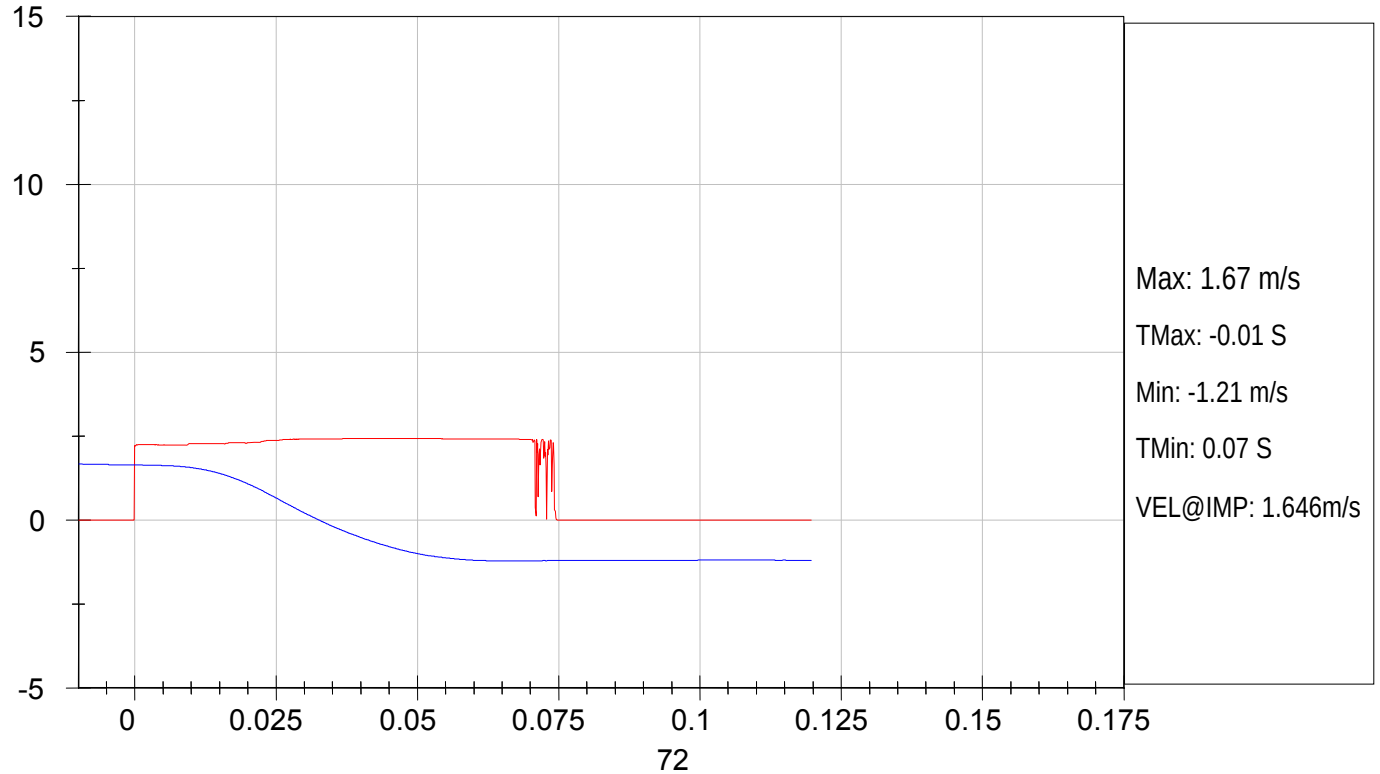
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.60 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 4.53 T1: 14.30 S T2: 46.80 S



VELOCITY X (m/s) VS TIME (S)

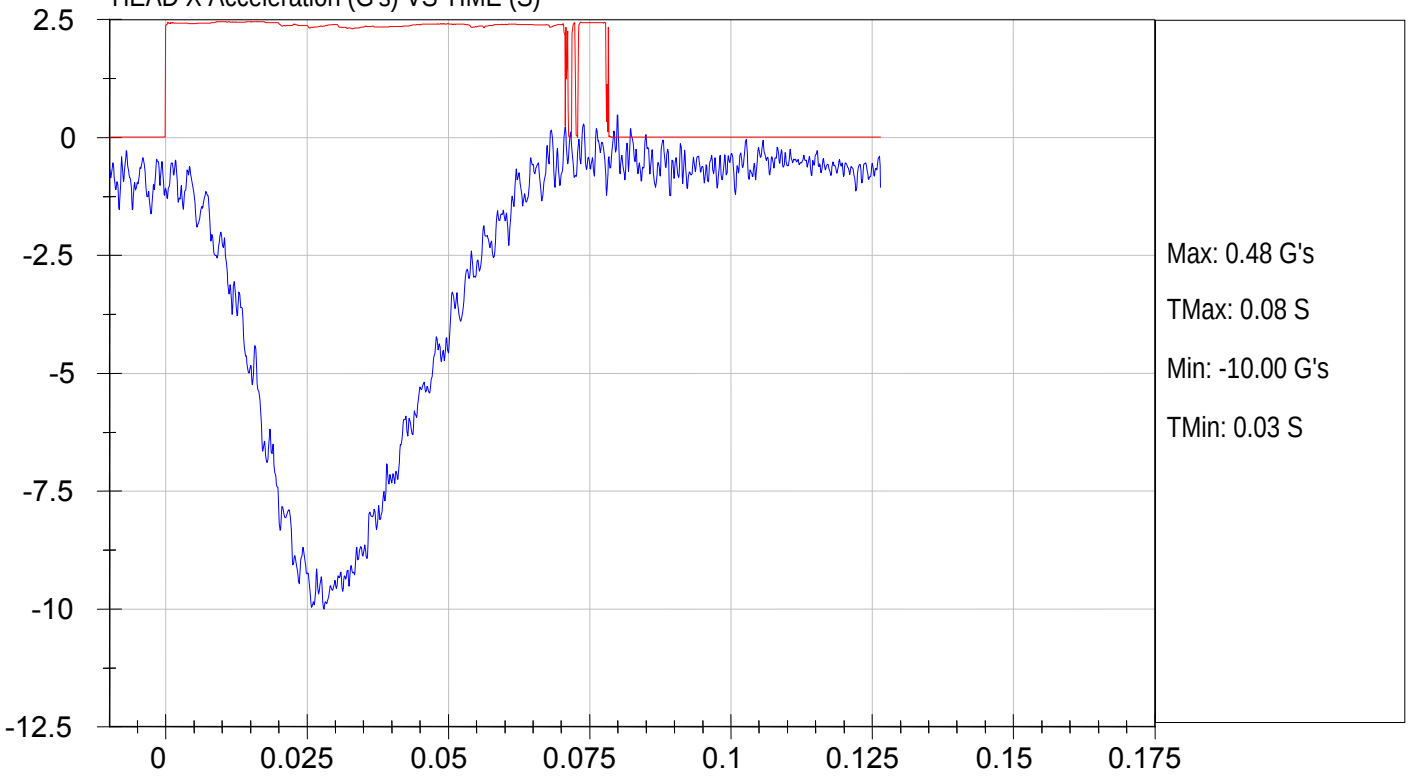


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: S1 H3

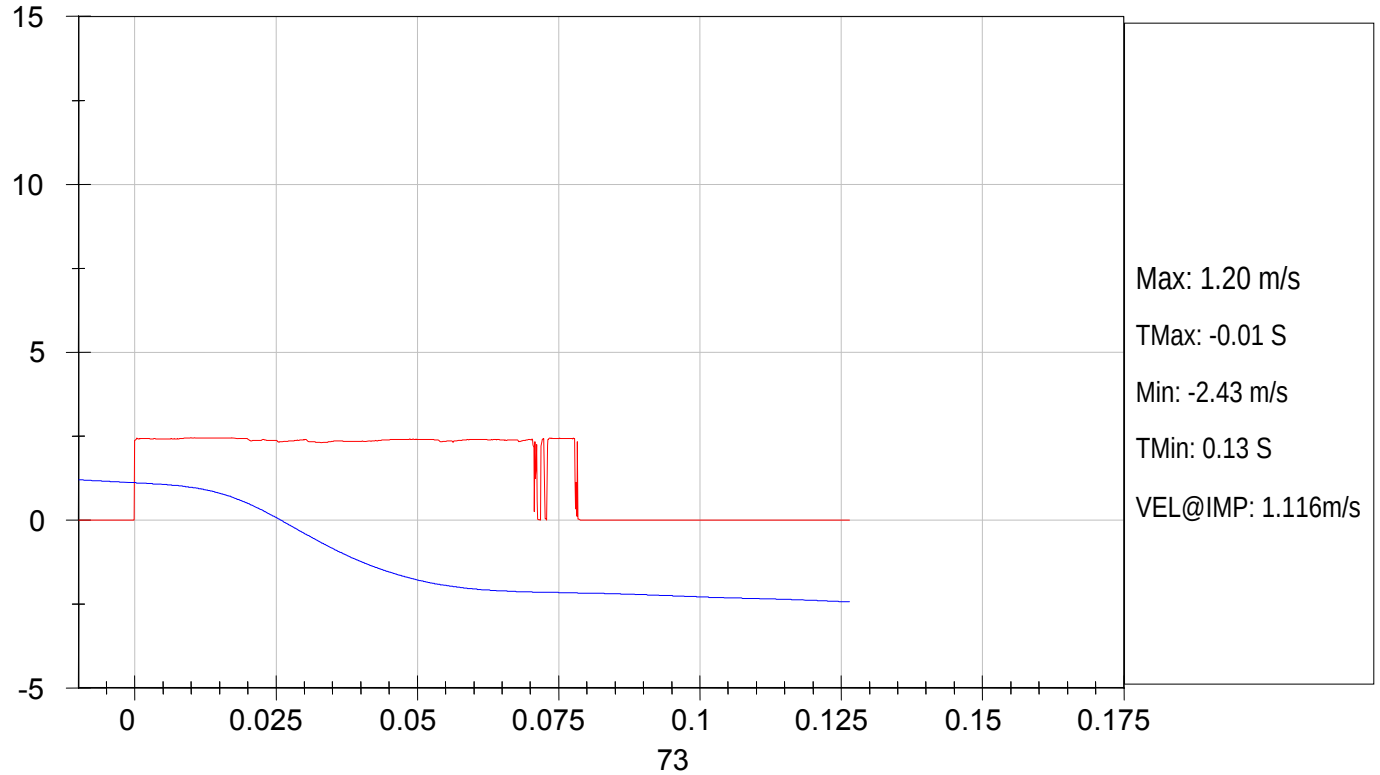
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.60 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 5.45 T1: 14.00 S T2: 47.60 S



VELOCITY X (m/s) VS TIME (S)

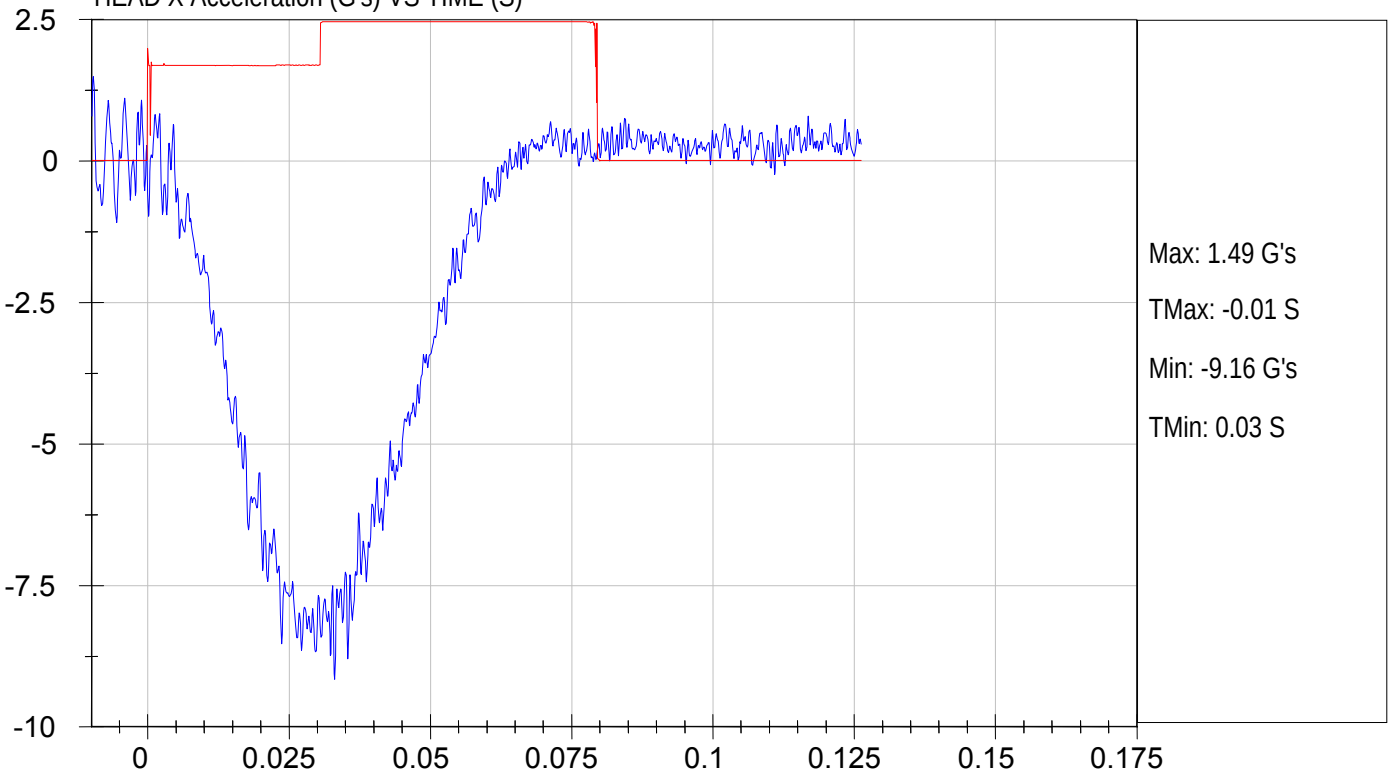


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location S1 H4

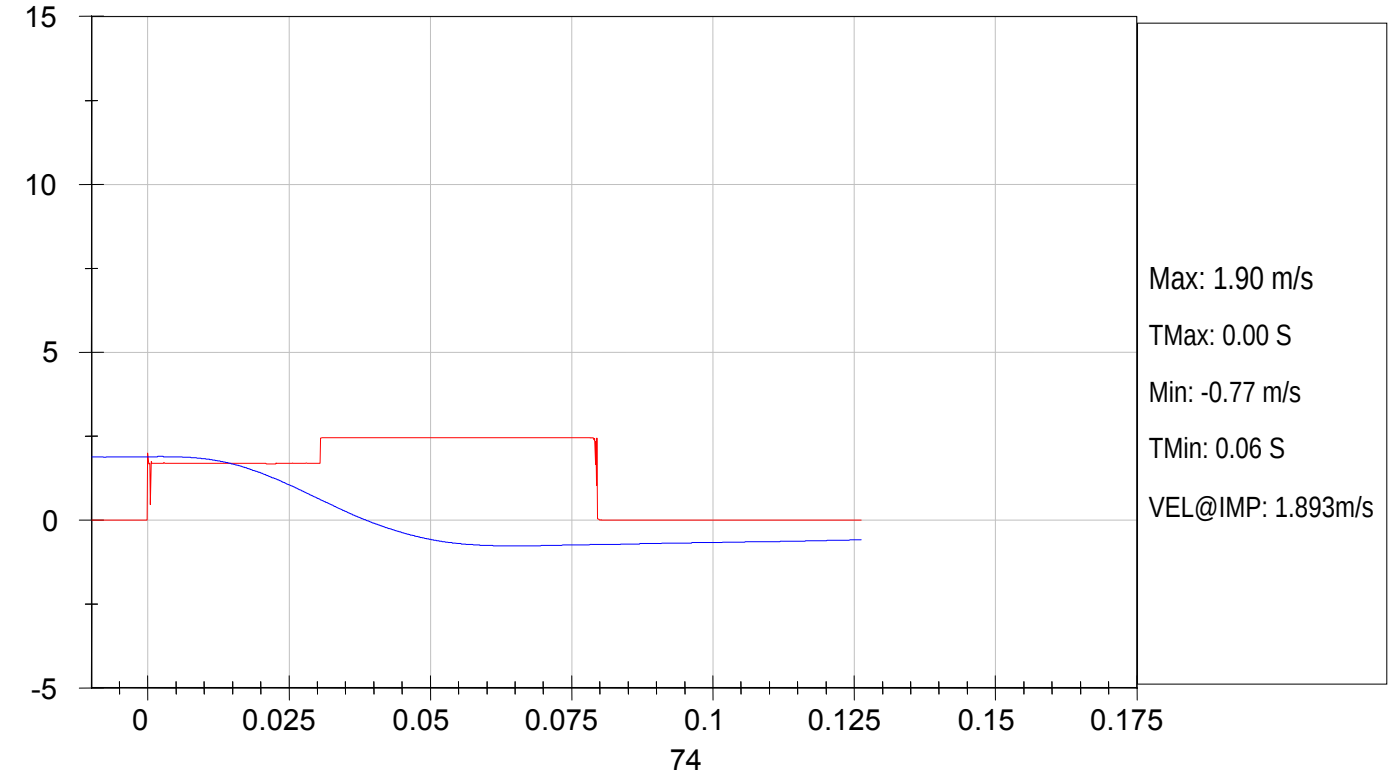
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.60 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 3.87 T1: 14.10 S T2: 48.20 S



VELOCITY X (m/s) VS TIME (S)

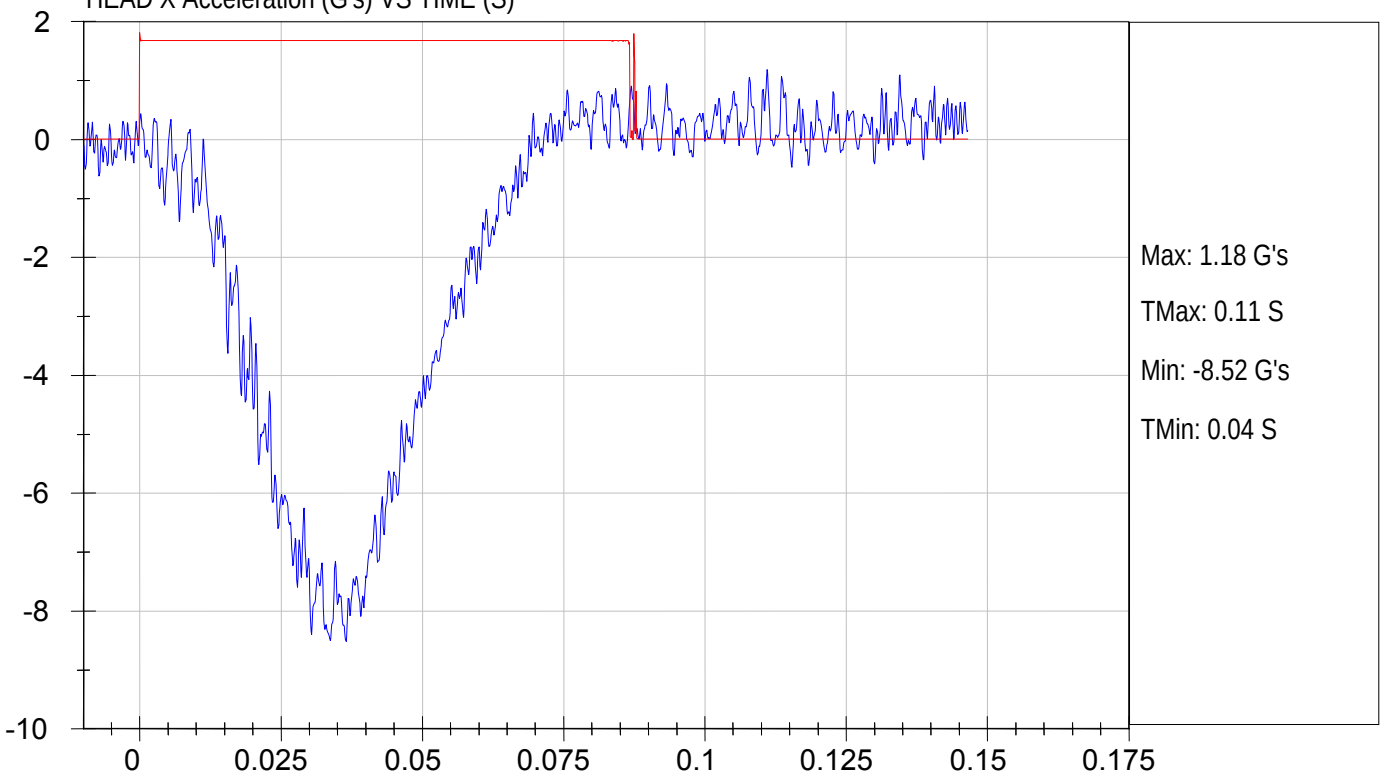


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: S1 H5

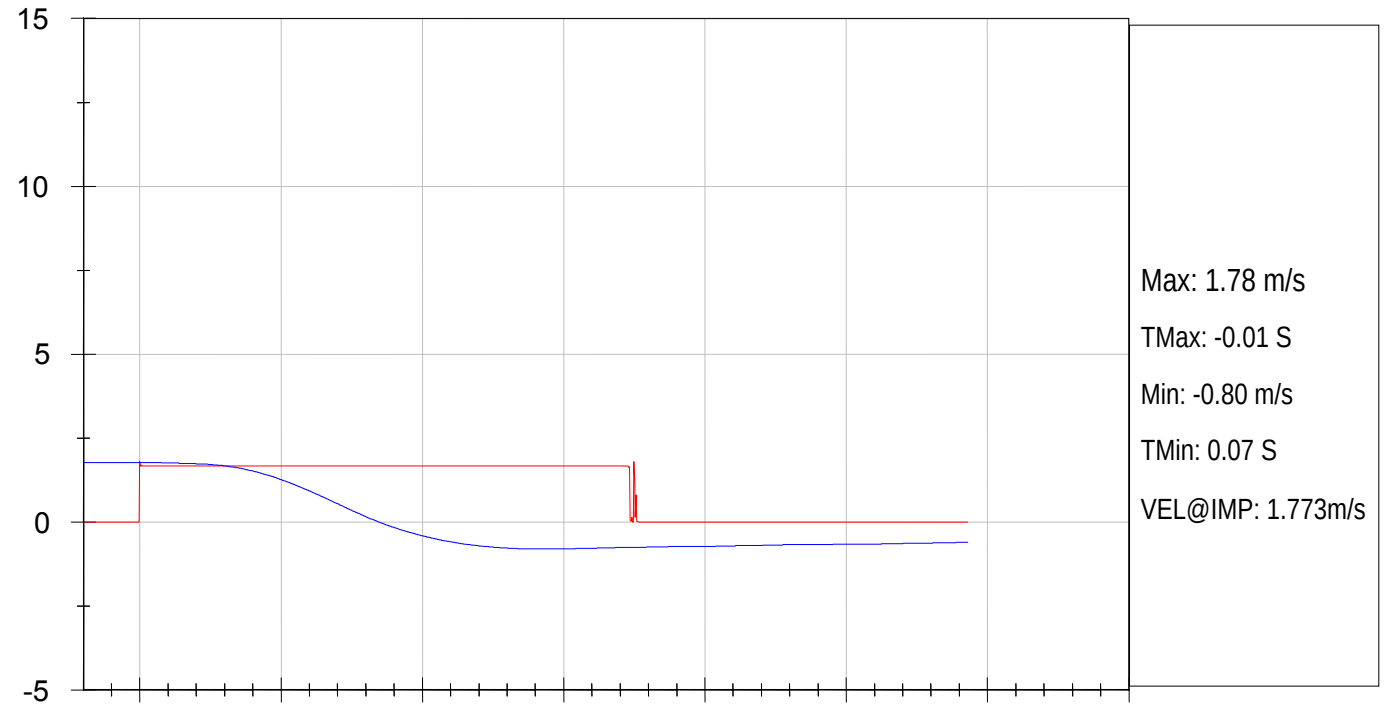
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.55 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 3.32 T1: 17.70 S T2: 52.10 S



VELOCITY X (m/s) VS TIME (S)

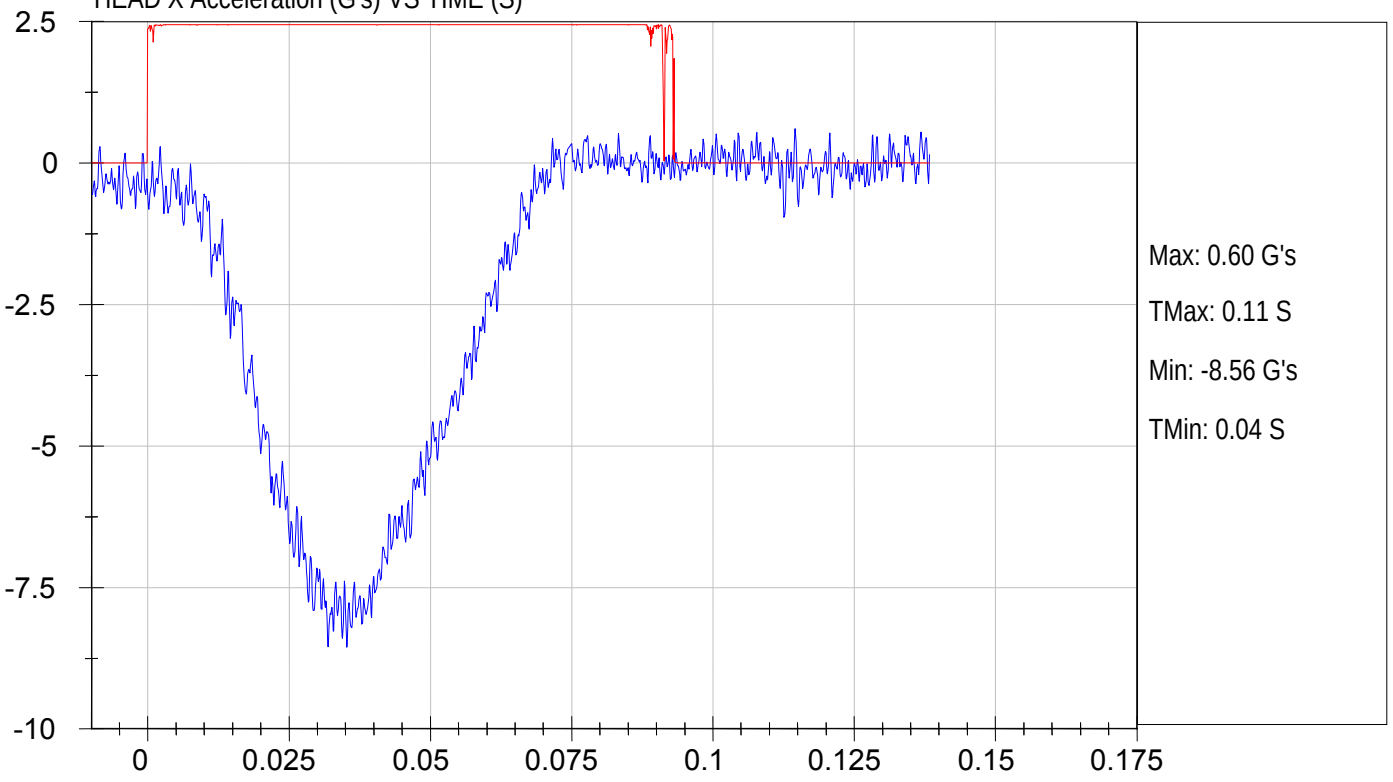


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: S1 H6

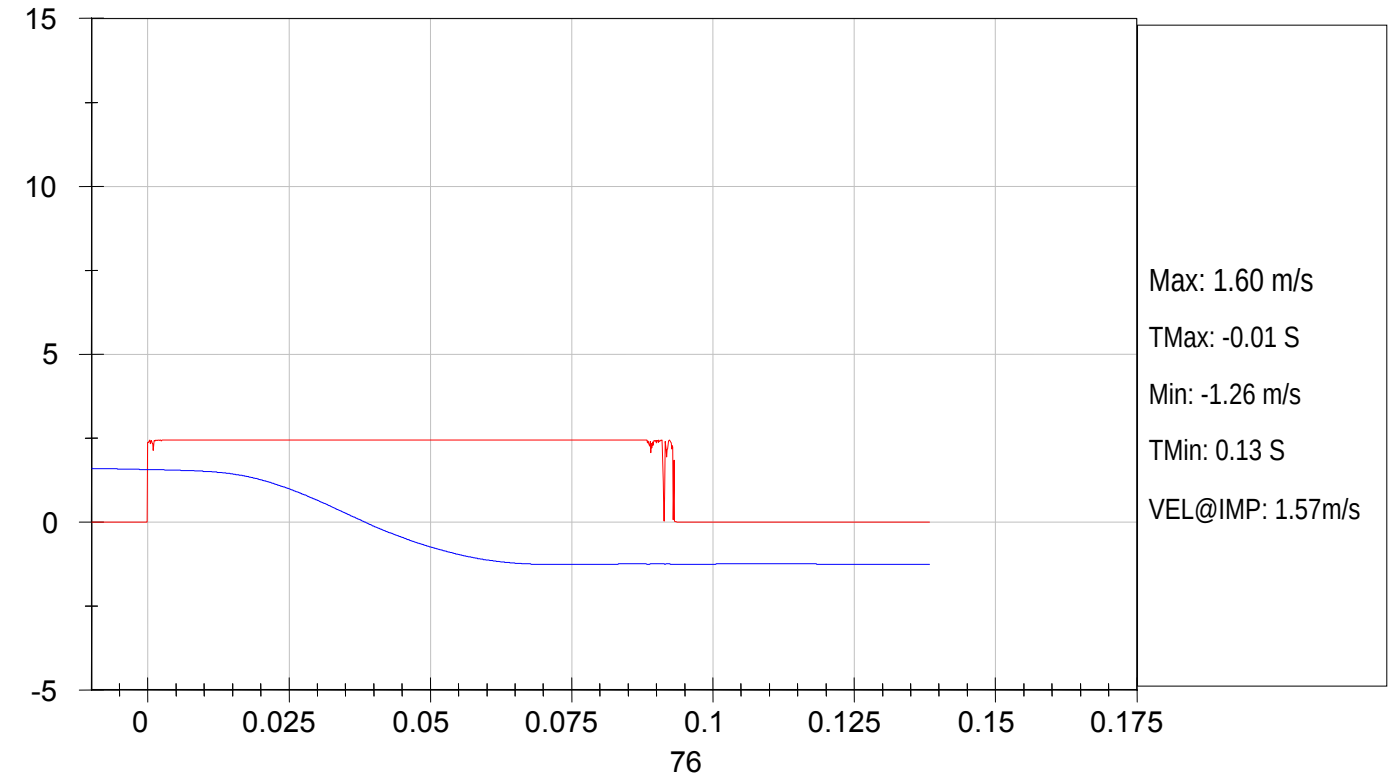
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.57 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 3.76 T1: 19.00 S T2: 55.00 S



VELOCITY X (m/s) VS TIME (S)

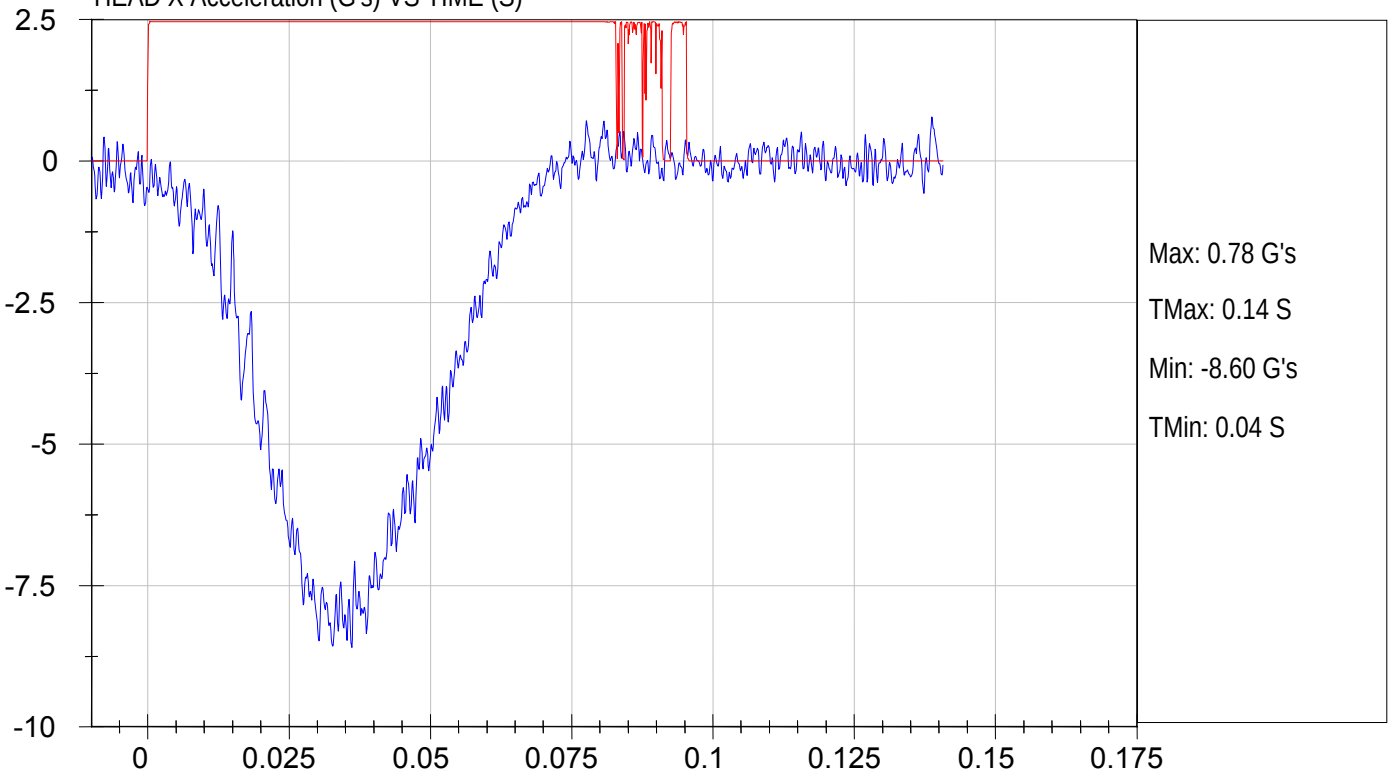


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID:
Location: S1 H7

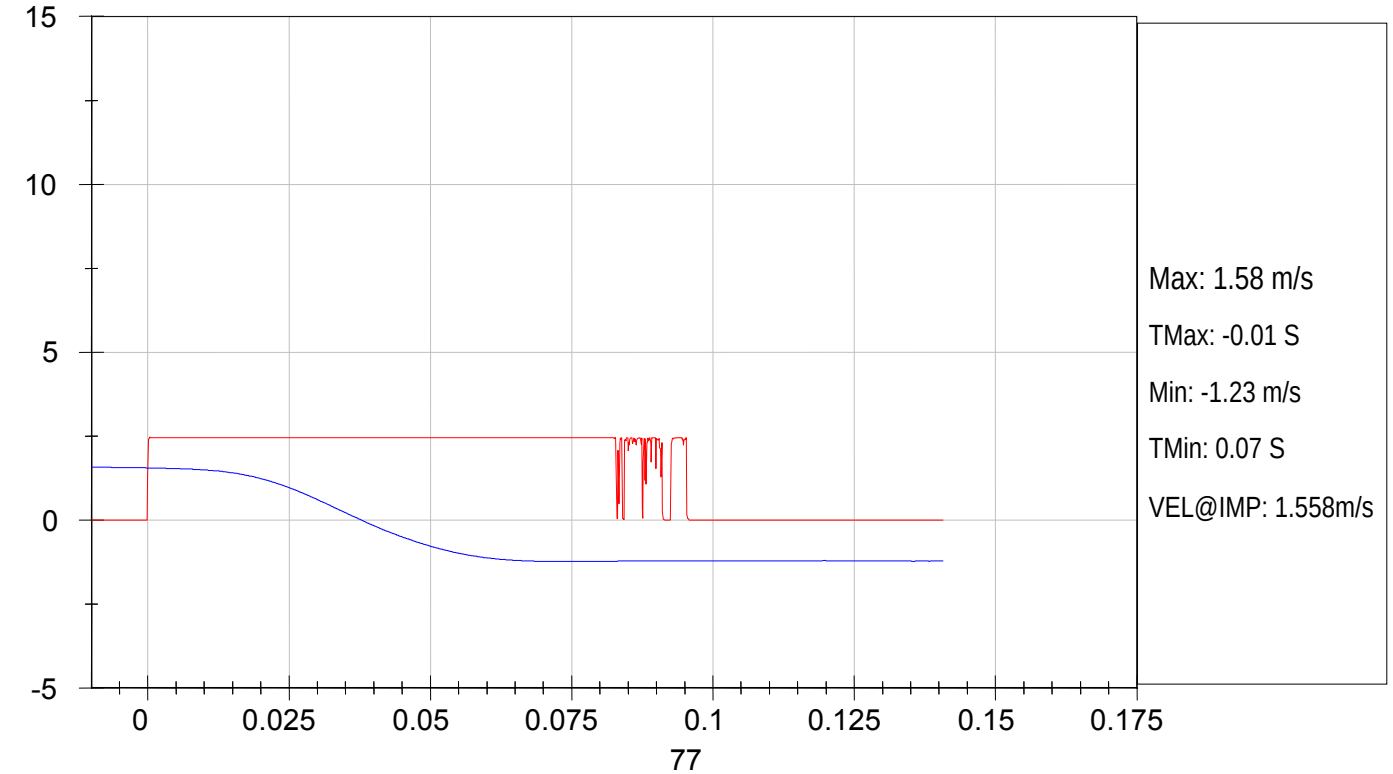
Test Date: 3/4/2009
NHTSA #: C90902
Speed trap: 1.60 m/s

HEAD X Acceleration (G's) VS TIME (S)

HIC 36: 3.77 T1: 18.70 S T2: 53.50 S

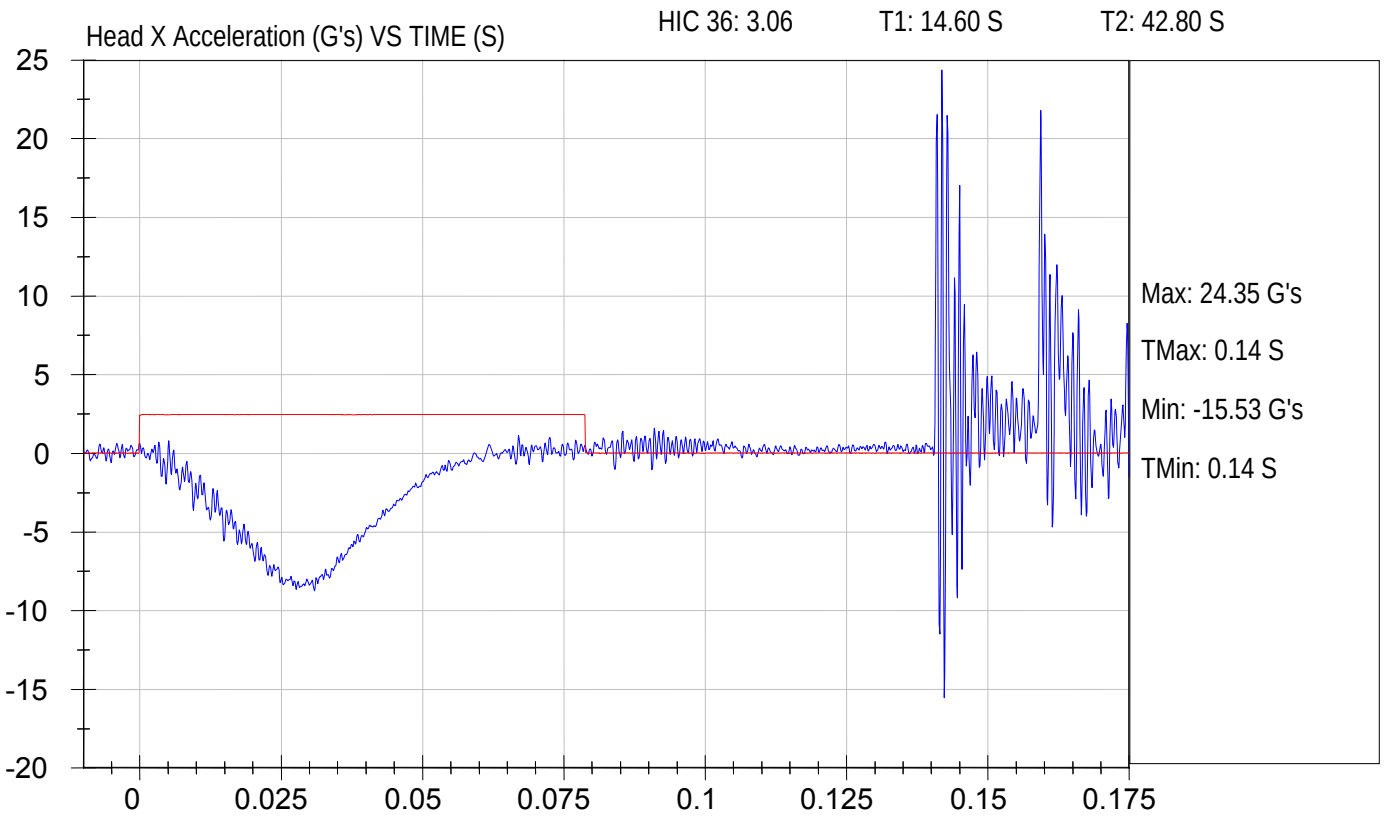


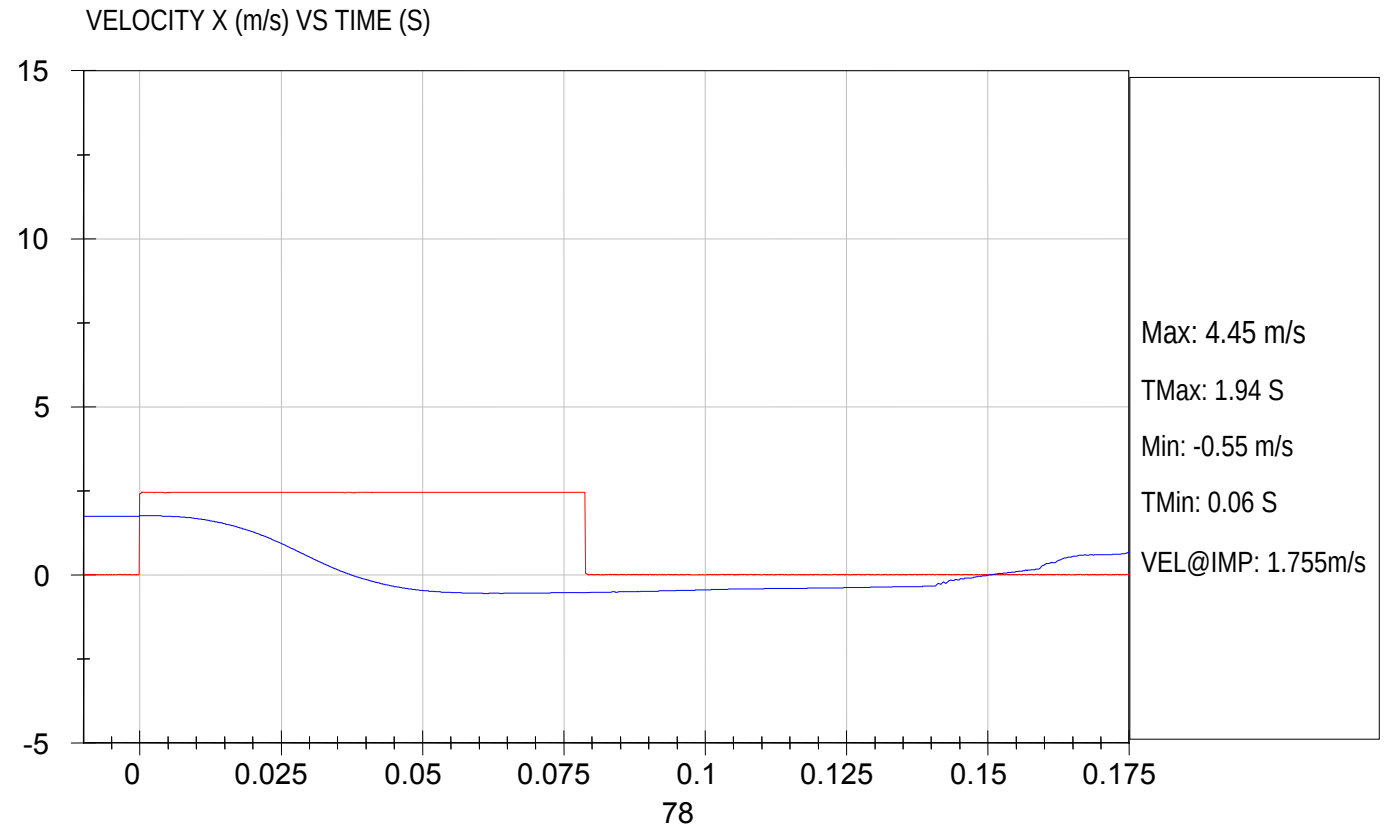
VELOCITY X (m/s) VS TIME (S)



FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: B1 H1

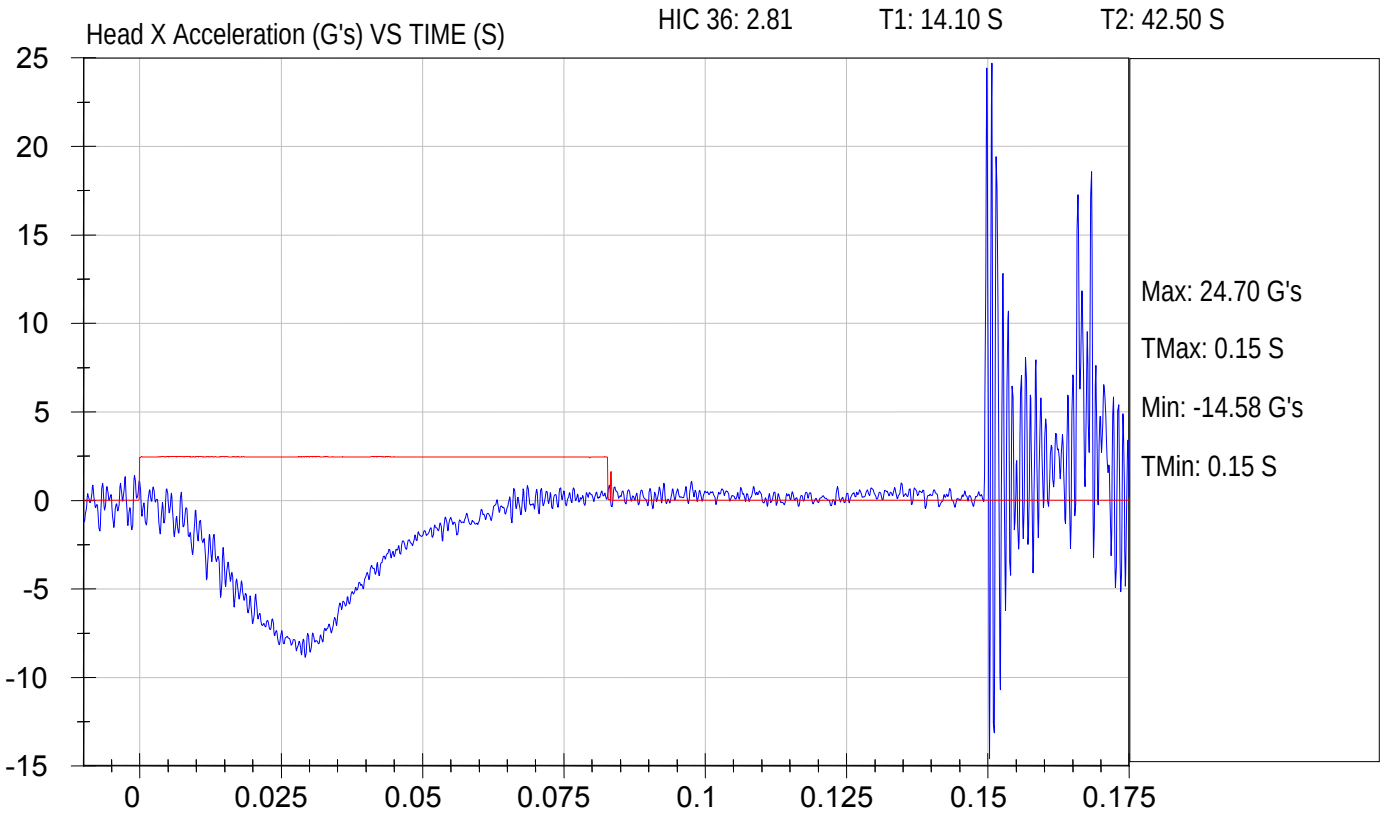
Test Date: 5-4-2009
NHTSA #: C90902

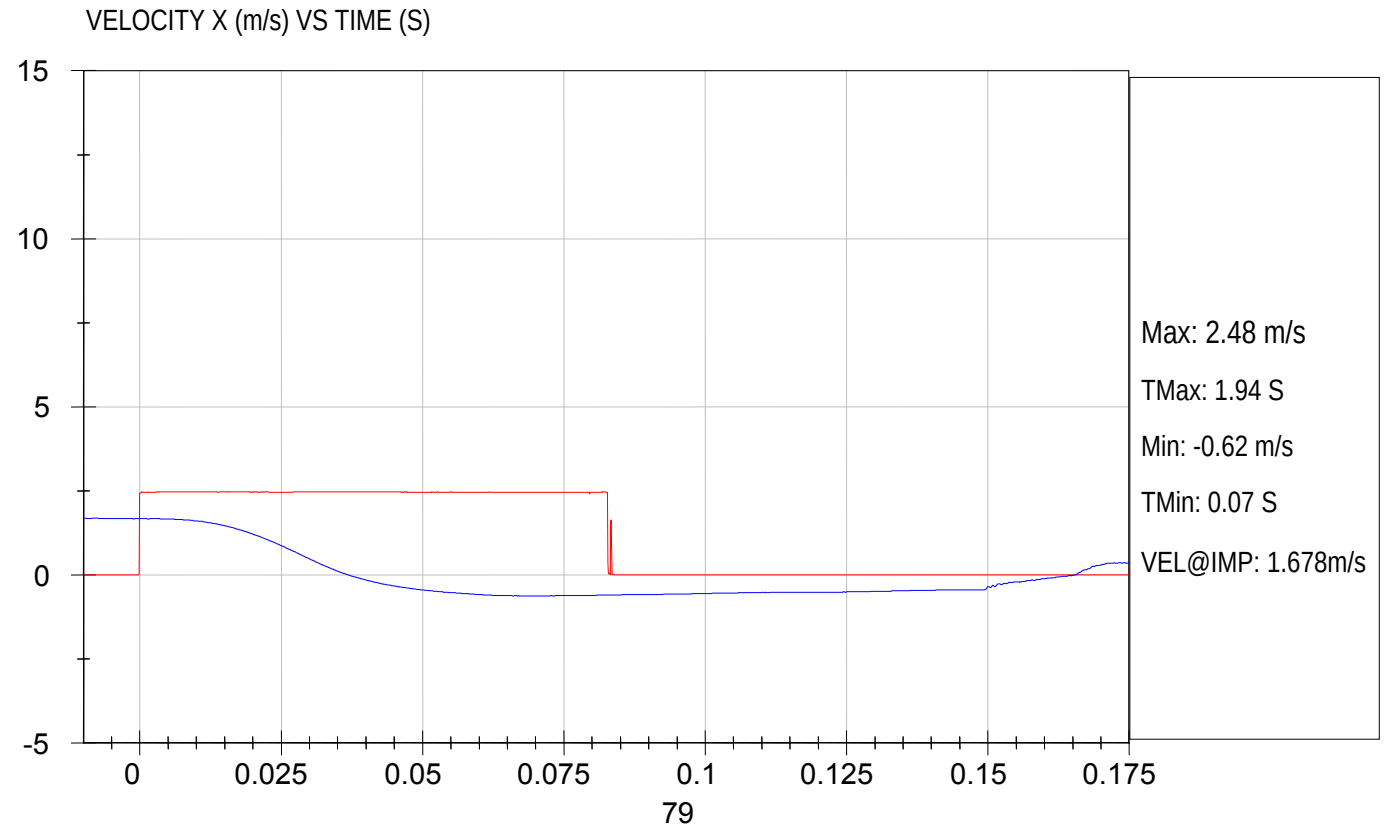




FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: B1 H2

Test Date: 5-4-2009
NHTSA #: C90902



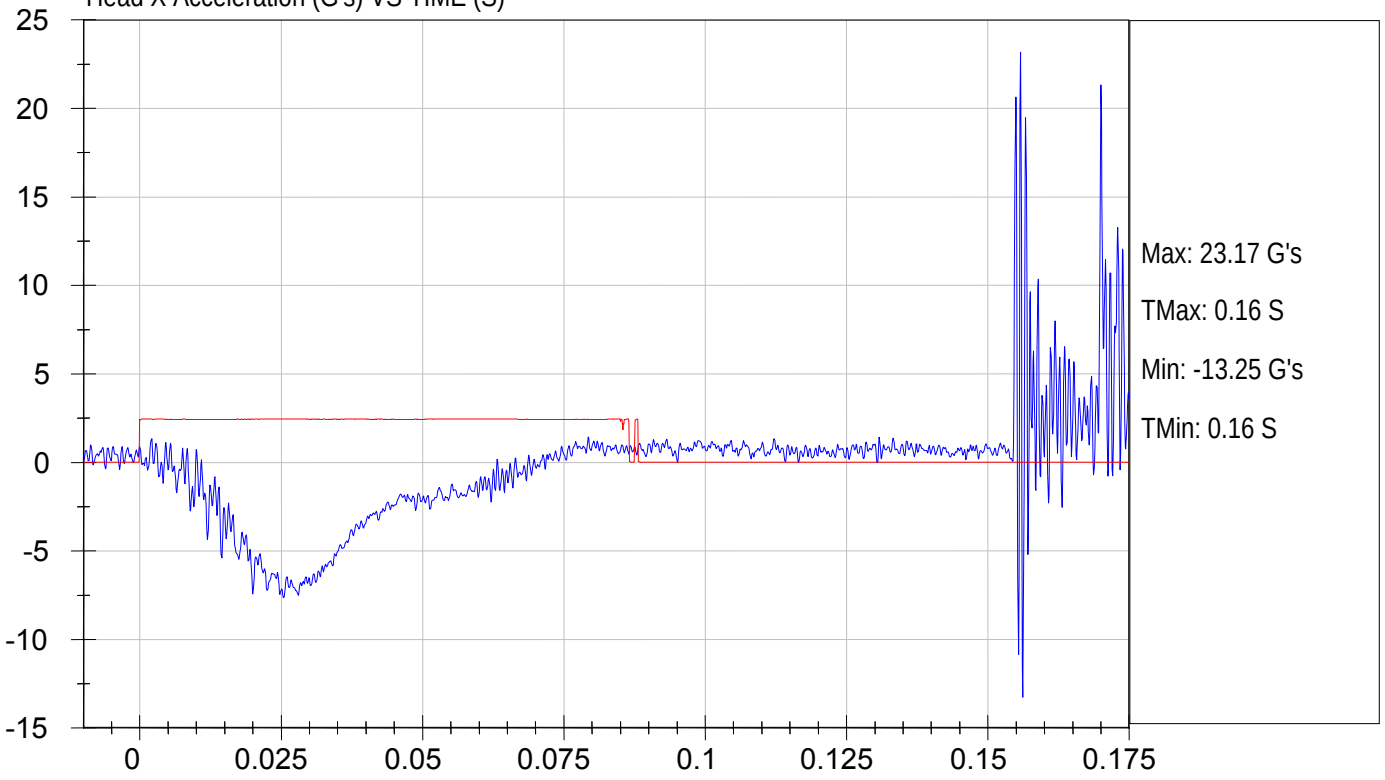


FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: B1 H3

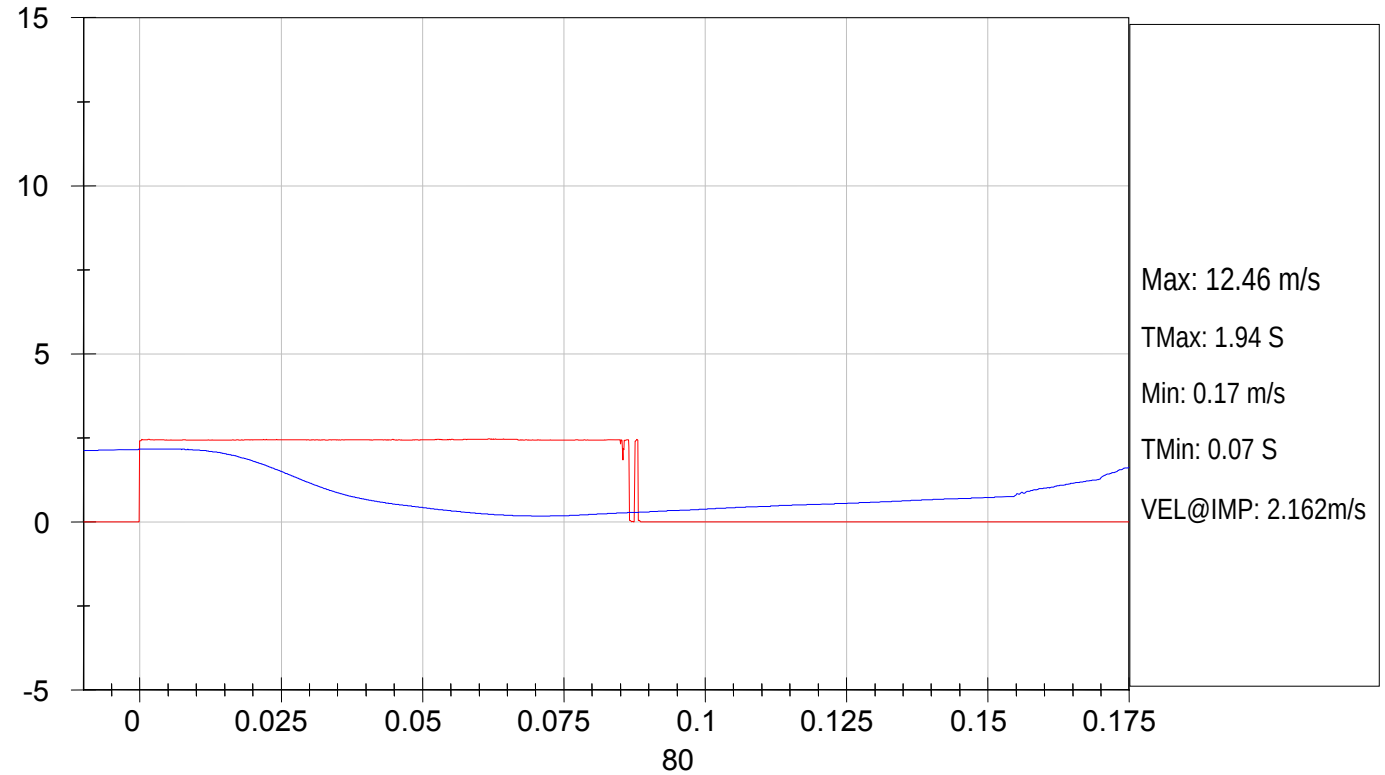
Test Date: 5-4-2009
NHTSA #: C90902

Head X Acceleration (G's) VS TIME (S)

HIC 36: 1.84 T1: 14.20 S T2: 40.10 S

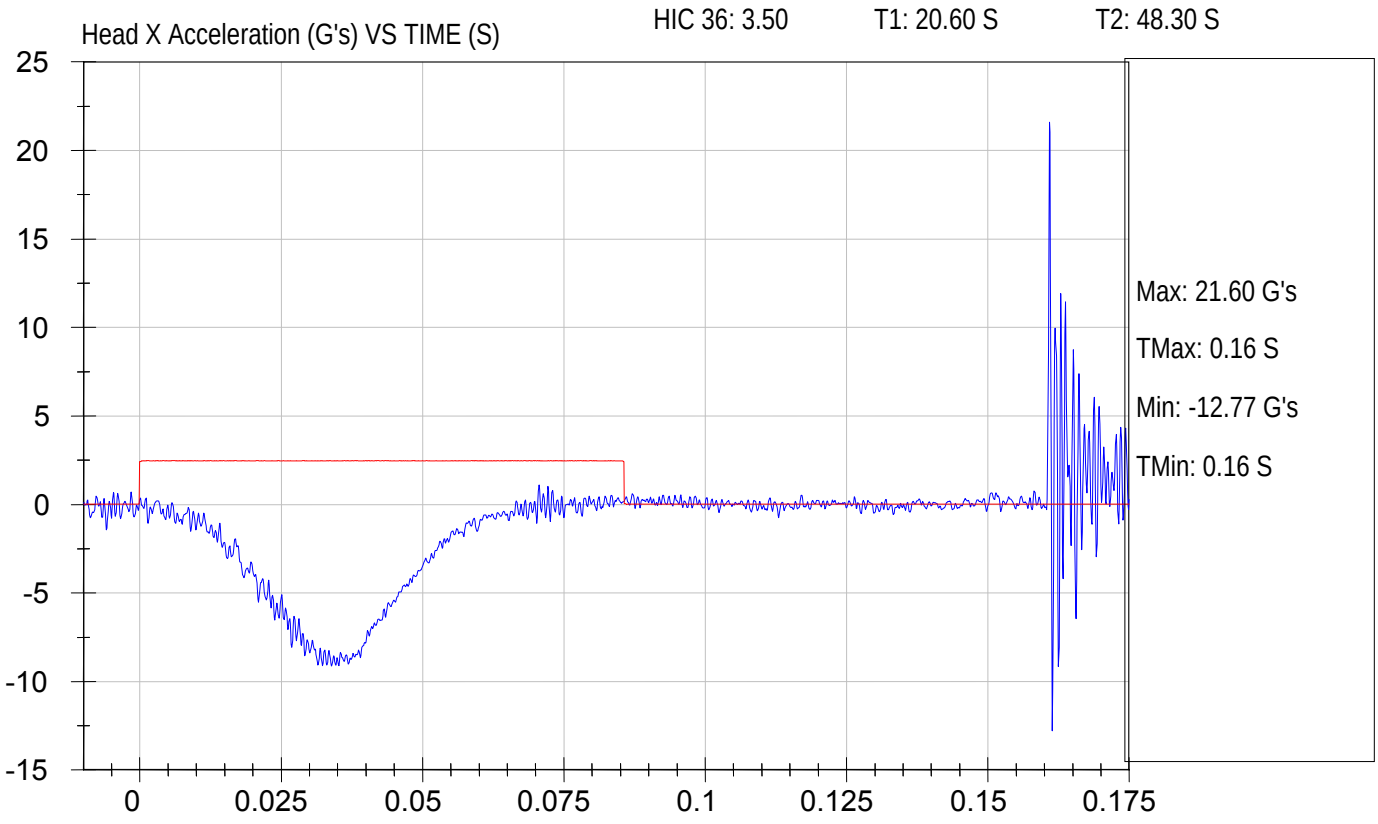


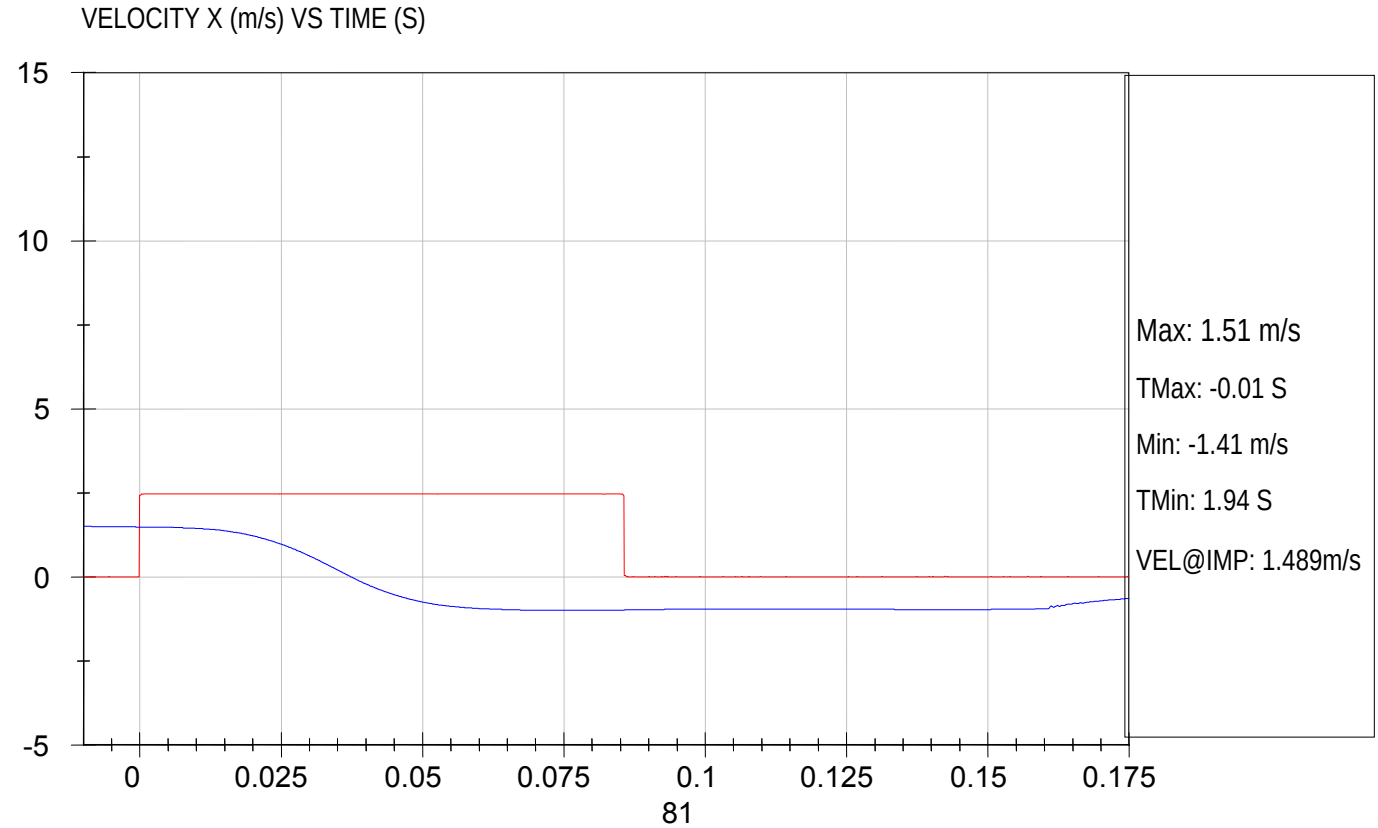
VELOCITY X (m/s) VS TIME (S)



FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: B1 H4

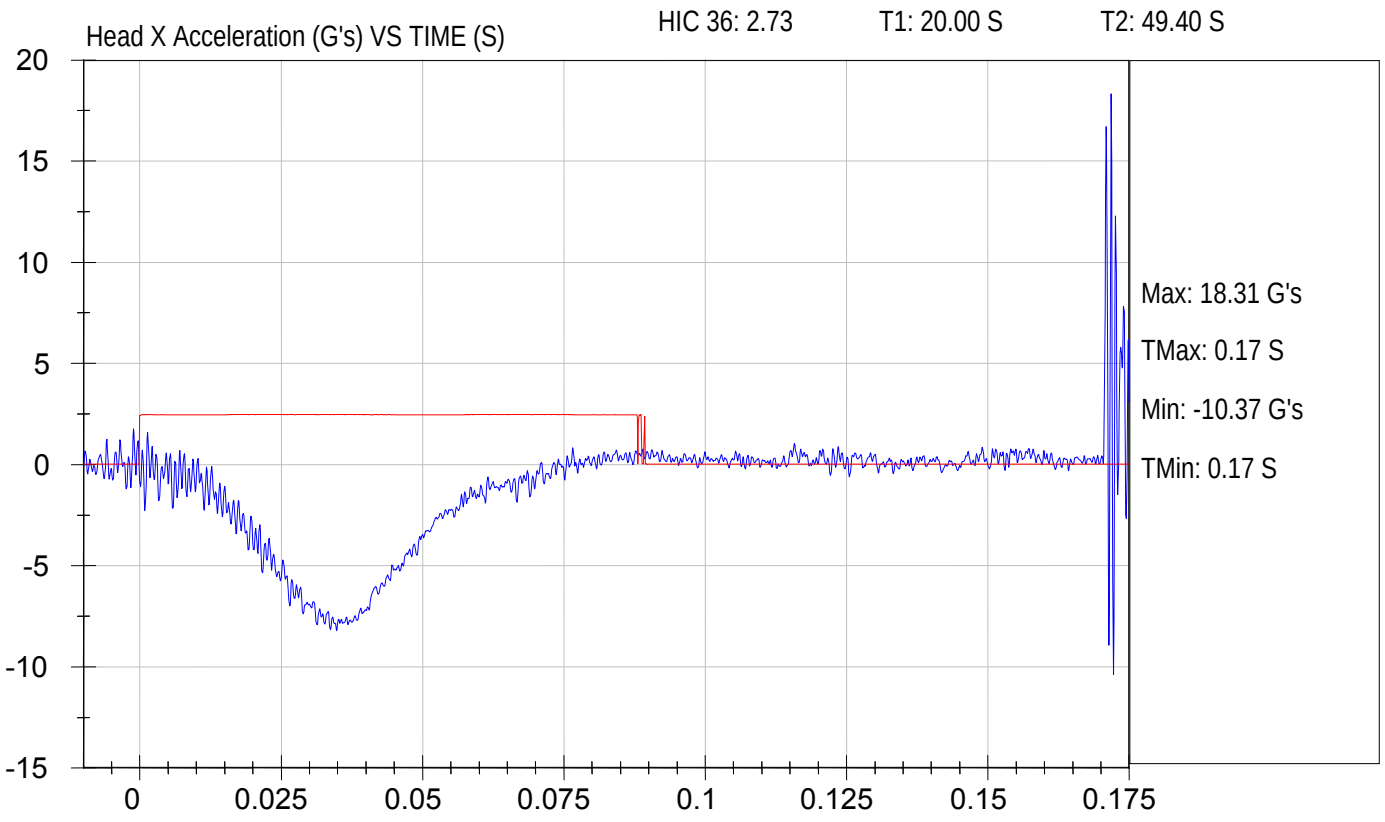
Test Date: 5-4-2009
NHTSA #: C90902

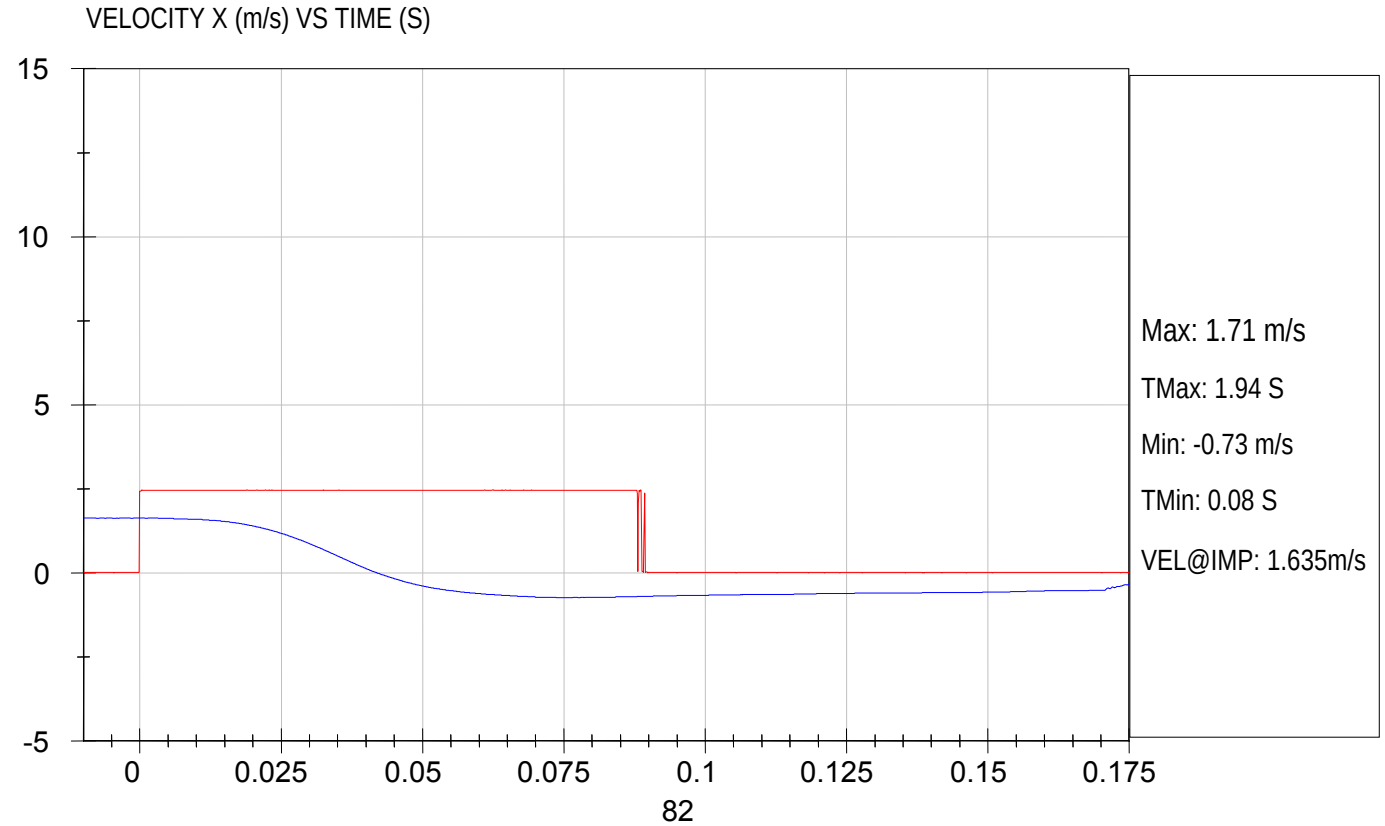




FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: Bluebird Micro Bird
Location: B1 H5

Test Date: 5-4-2009
NHTSA #: C90902





HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Micro Bird

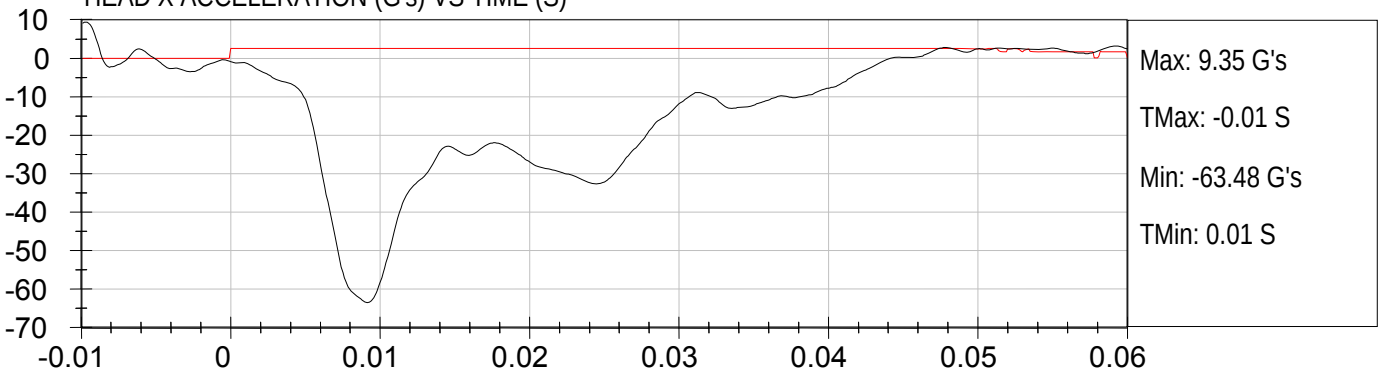
Location: S8 H8

Test Date: 3-19-2009

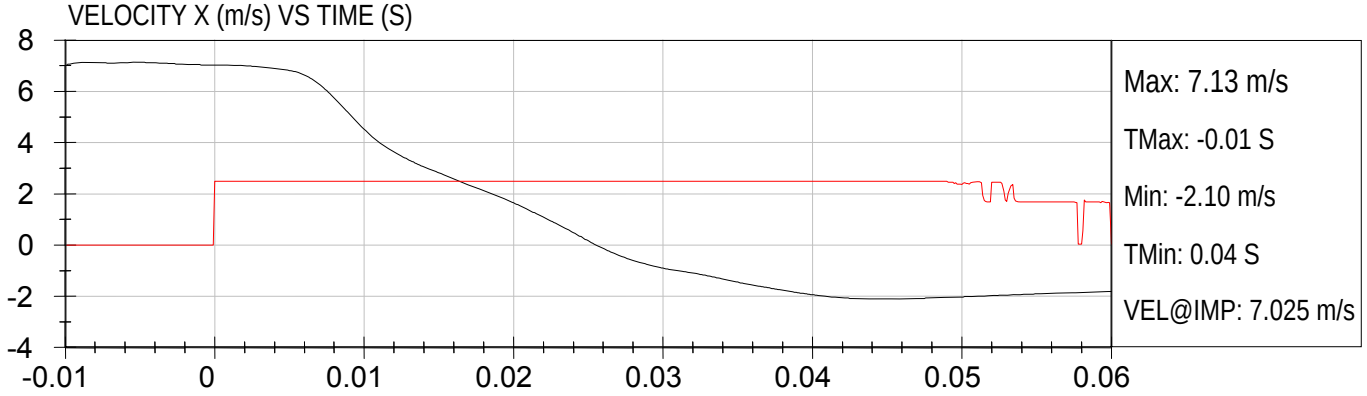
NHTSA#: C90902

Hic: 143.88 T1: 5.60 ms T2: 27.80 ms

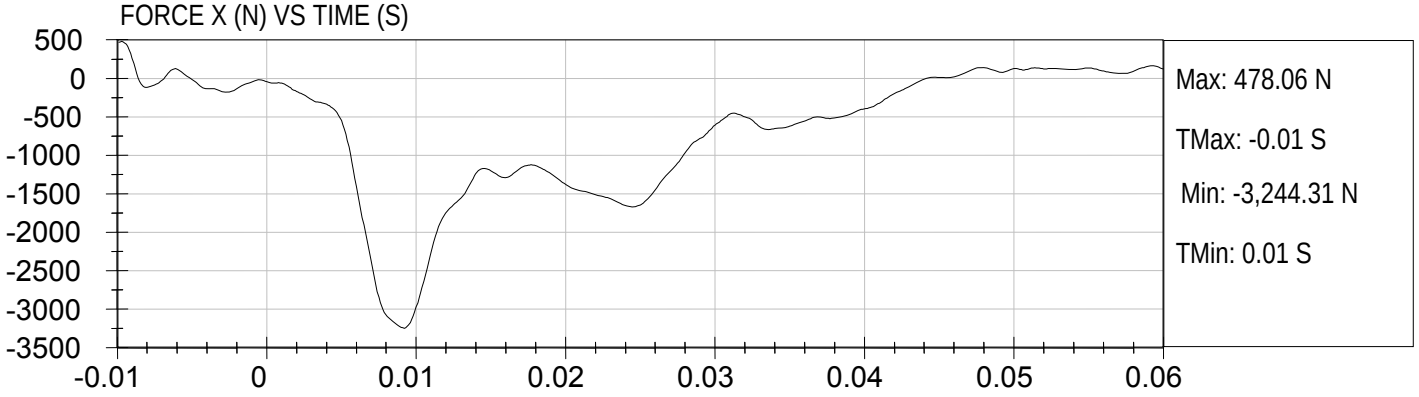
HEAD X ACCELERATION (G's) VS TIME (S)



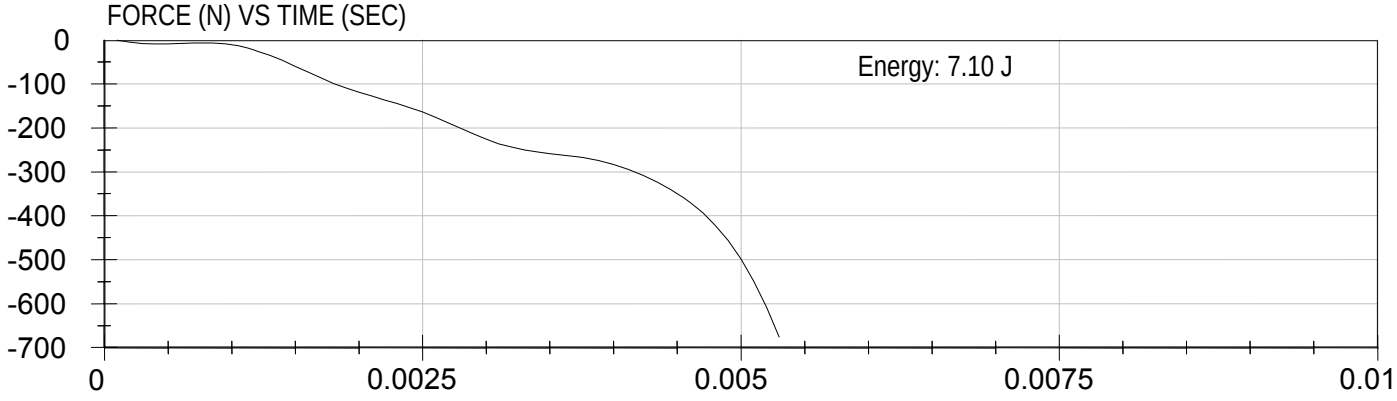
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Micro Bird

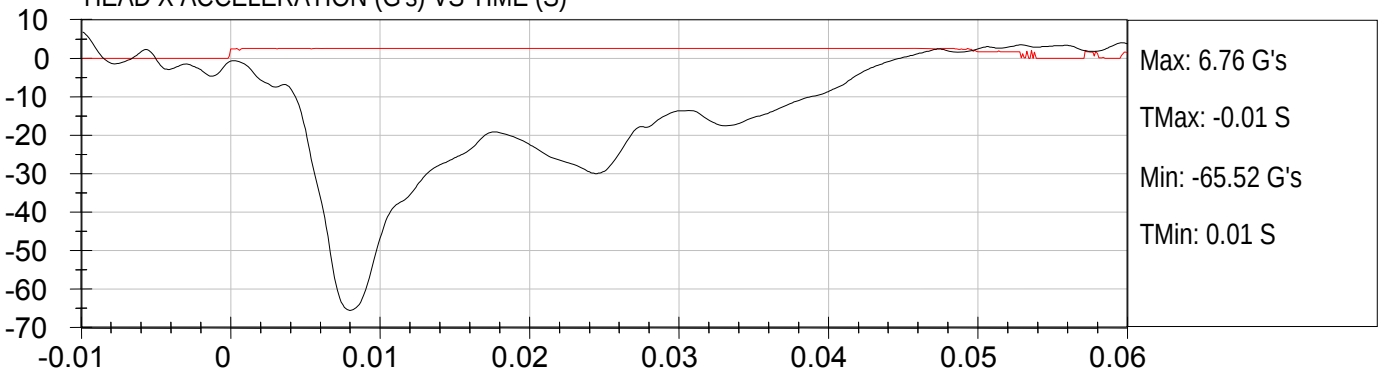
Location: S8 H9

Test Date: 3-19-2009

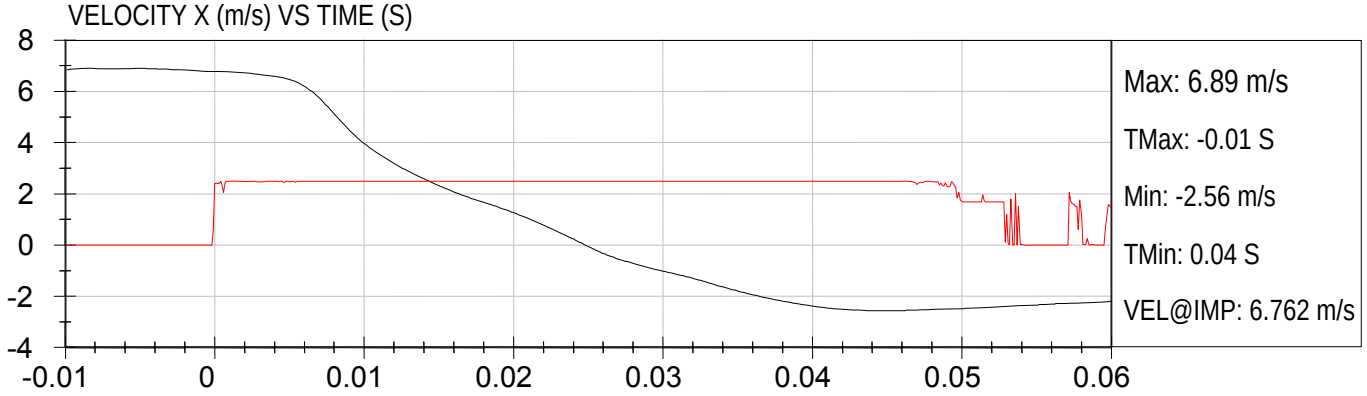
NHTSA#: C90902

Hic: 132.19 T1: 5.10 ms T2: 26.90 ms

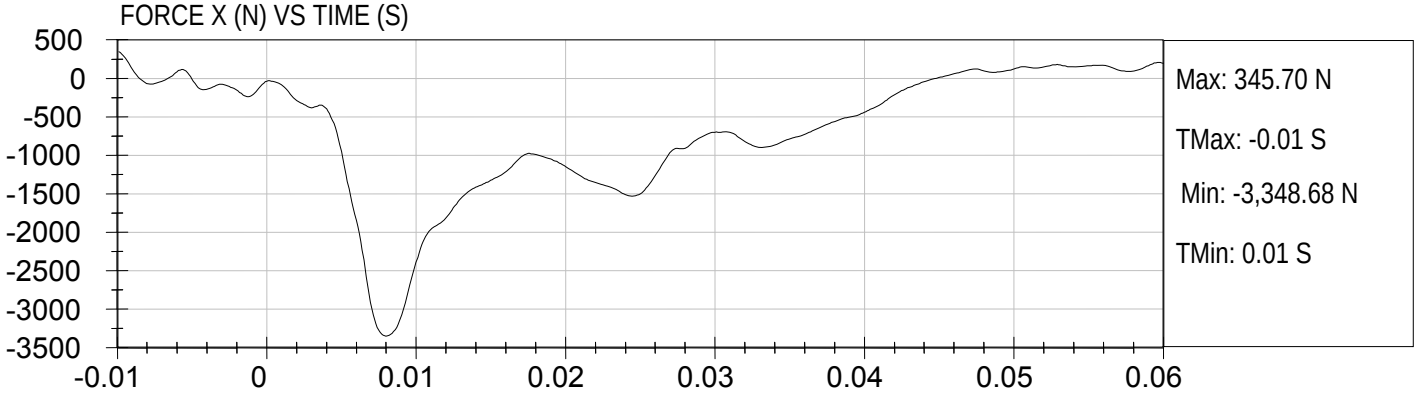
HEAD X ACCELERATION (G's) VS TIME (S)



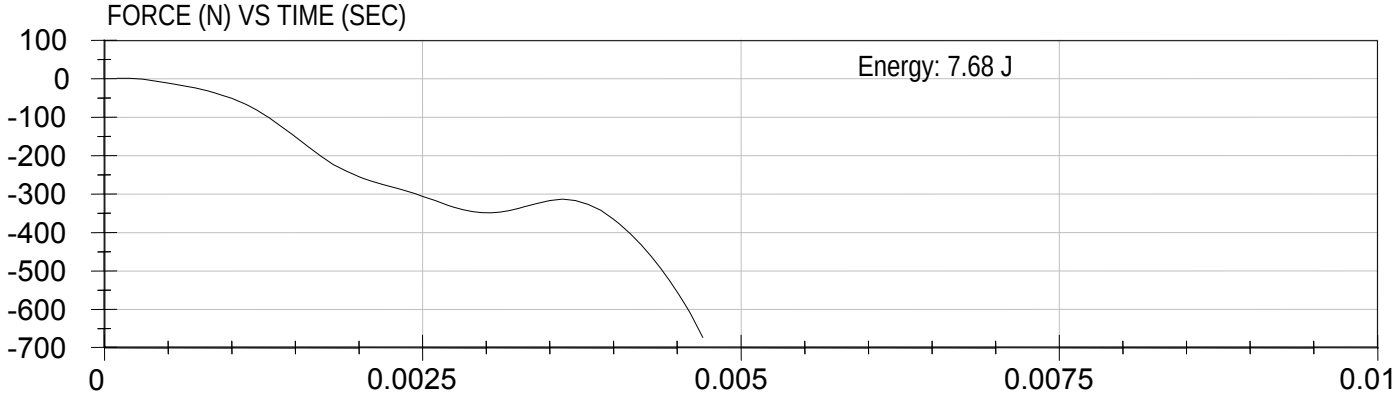
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Micro Bird

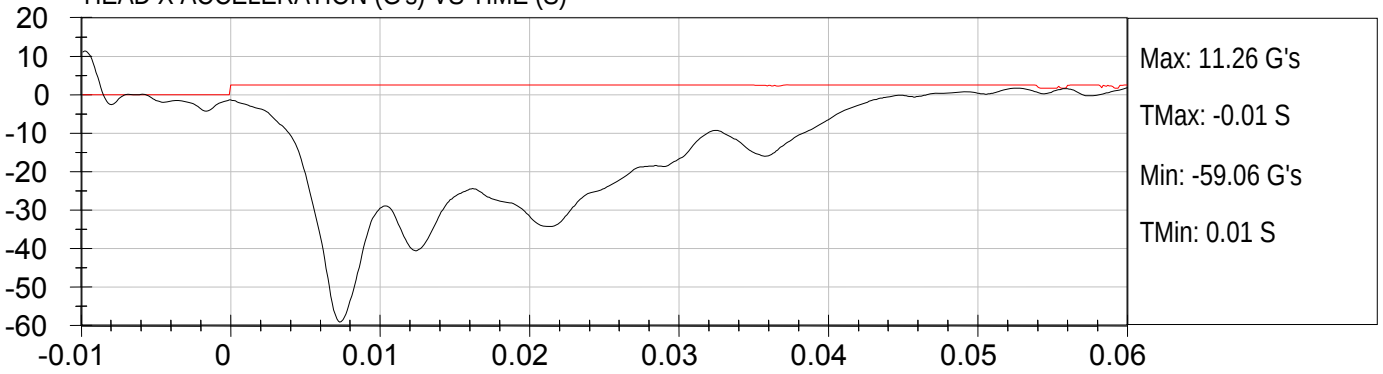
Location: S8 H10

Test Date: 3-20-2009

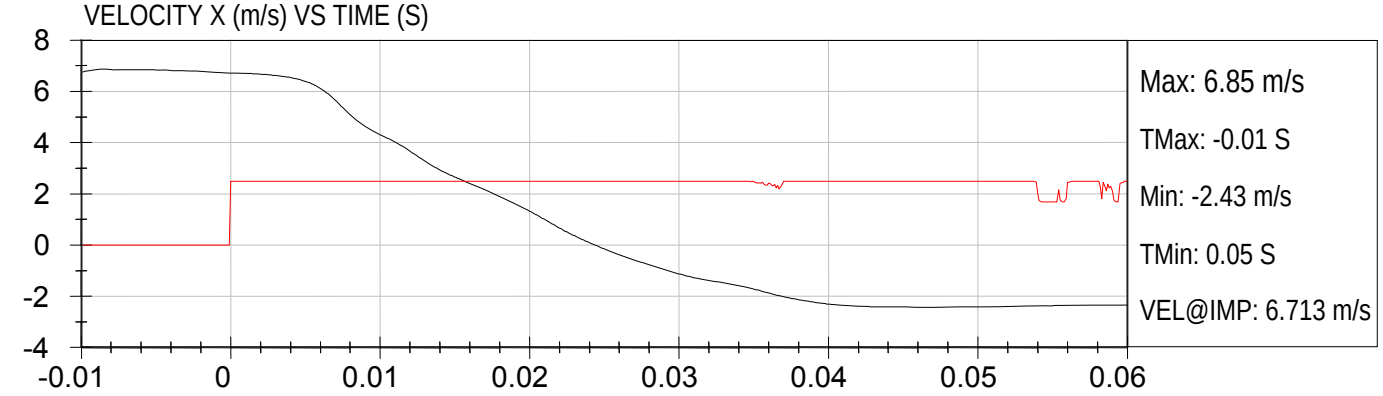
NHTSA#: C90902

Hic: 130.69 T1: 4.90 ms T2: 27.00 ms

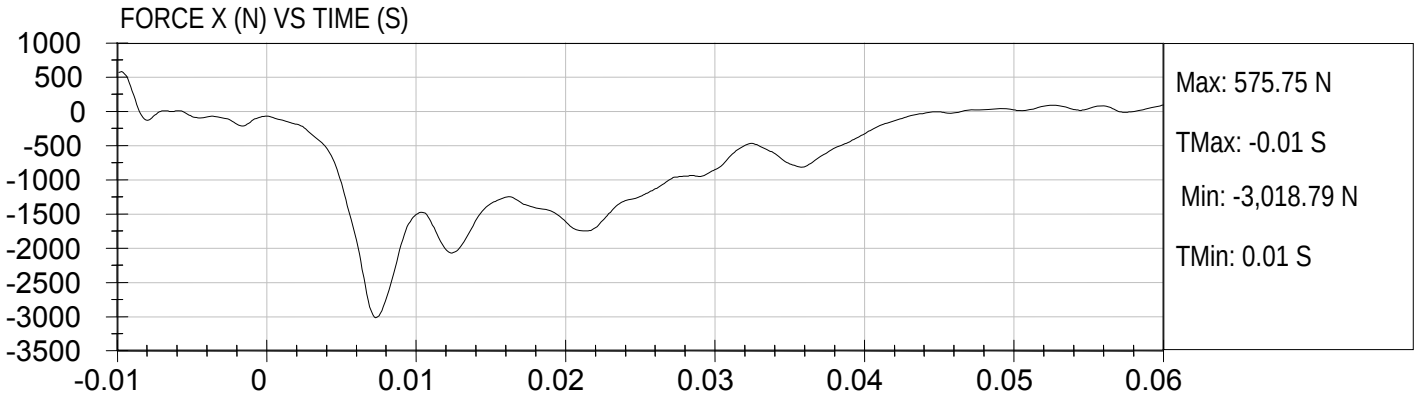
HEAD X ACCELERATION (G's) VS TIME (S)



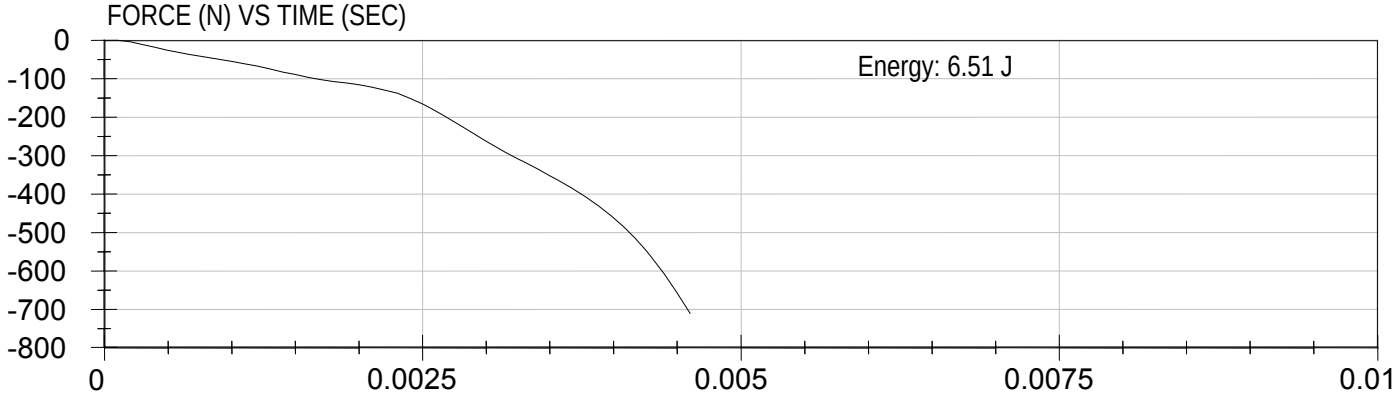
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Micro Bird

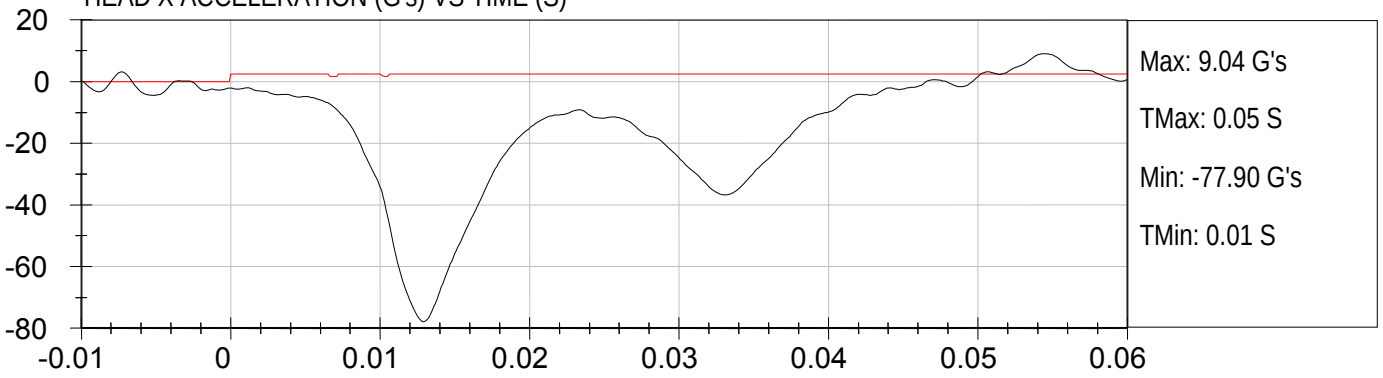
Location: S8 H12

Test Date: 3-21-2009

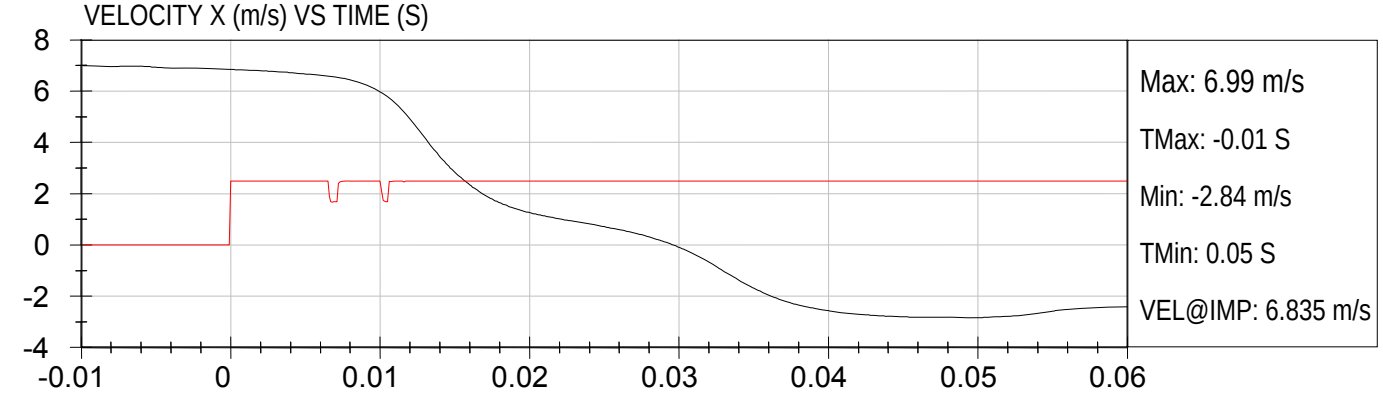
NHTSA#: C90902

Hic: 183.98 T1: 10.10 ms T2: 17.00 ms

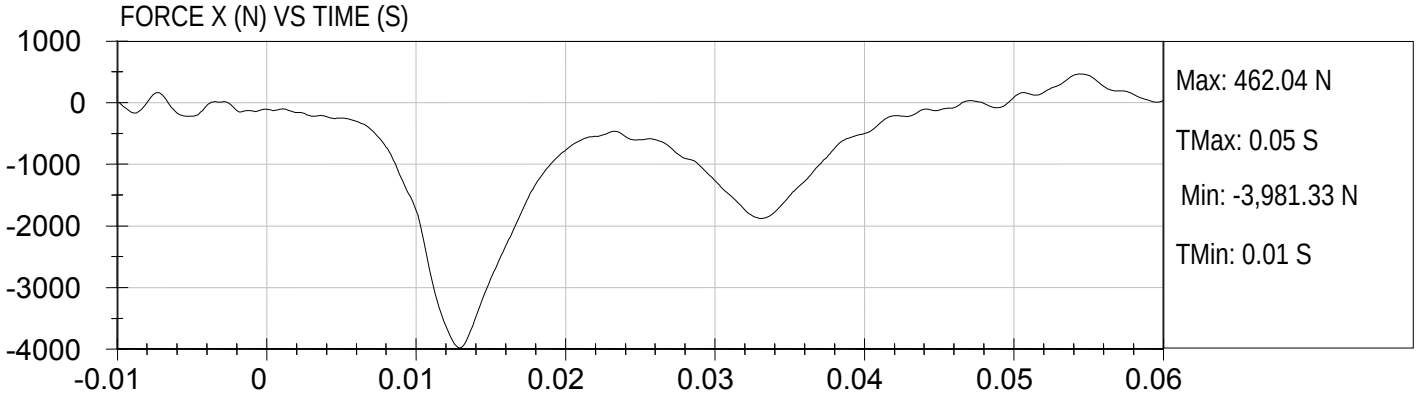
HEAD X ACCELERATION (G's) VS TIME (S)



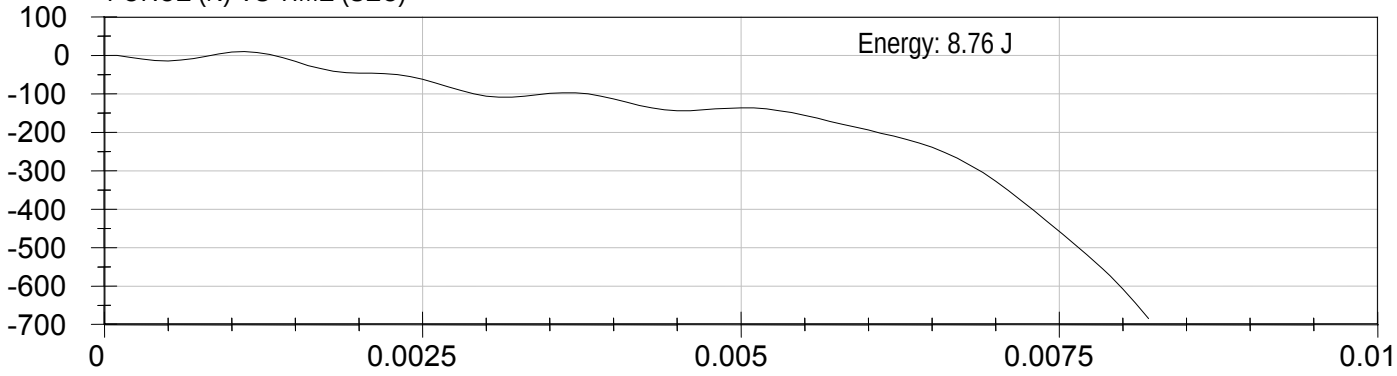
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Micro Bird

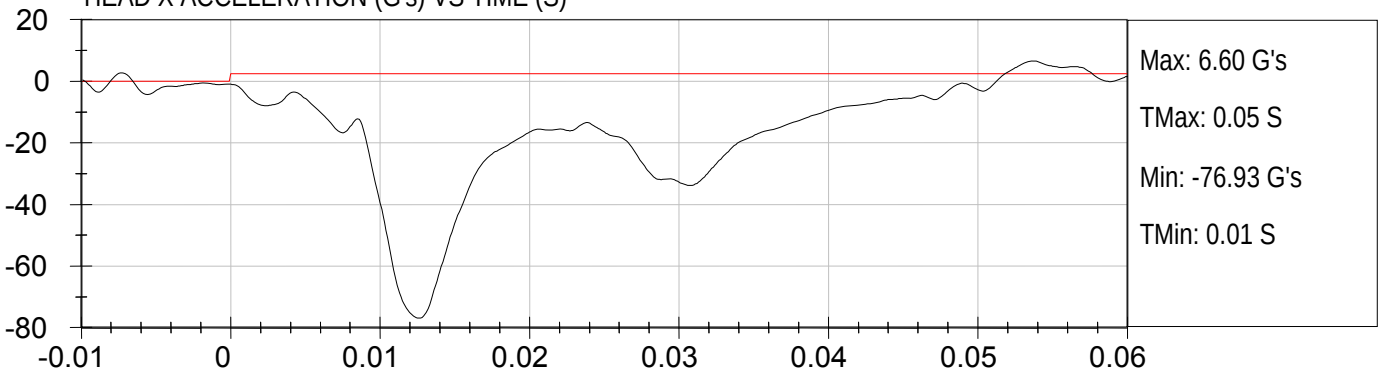
Location: S8 H13

Test Date: 3-24-2009

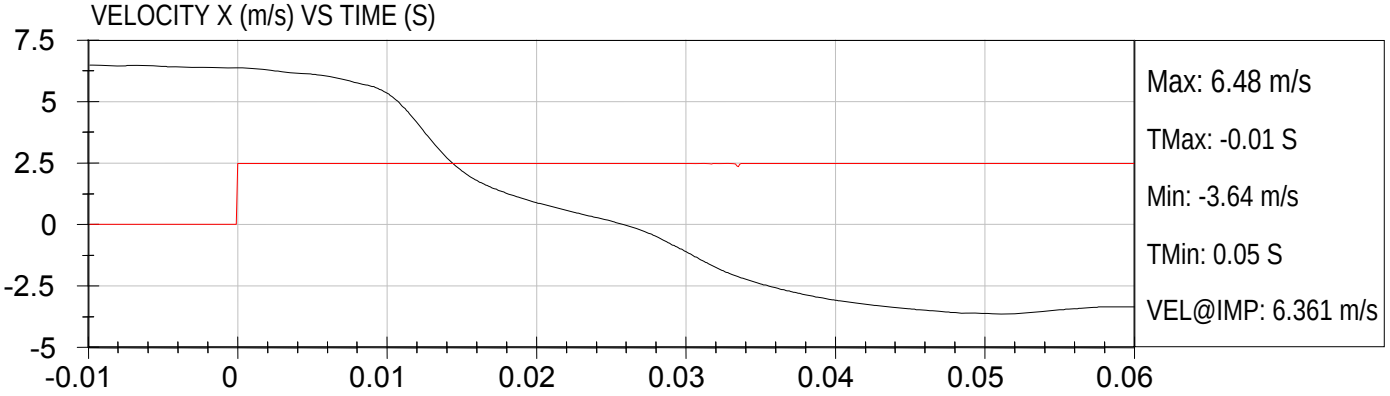
NHTSA#: C90902

Hic: 169.32 T1: 9.80 ms T2: 15.80 ms

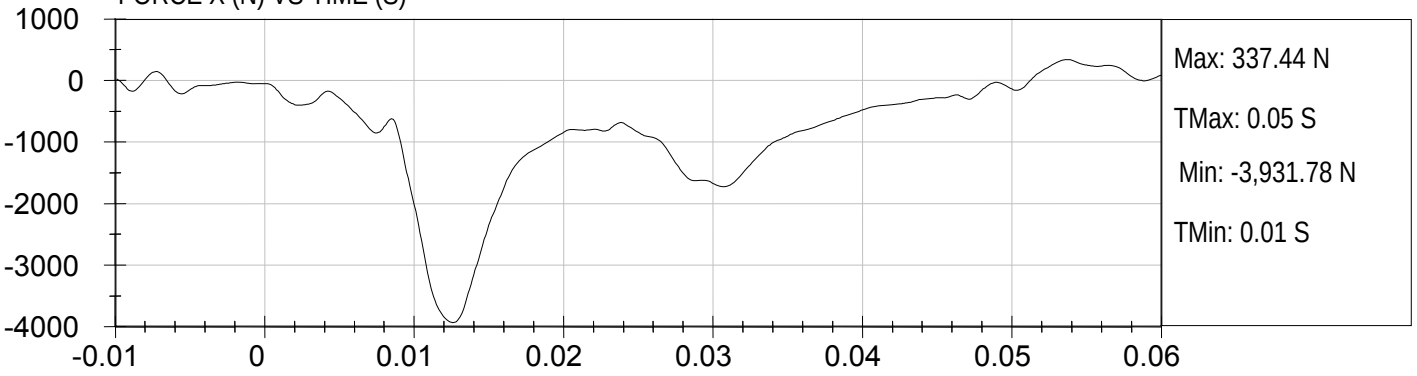
HEAD X ACCELERATION (G's) VS TIME (S)



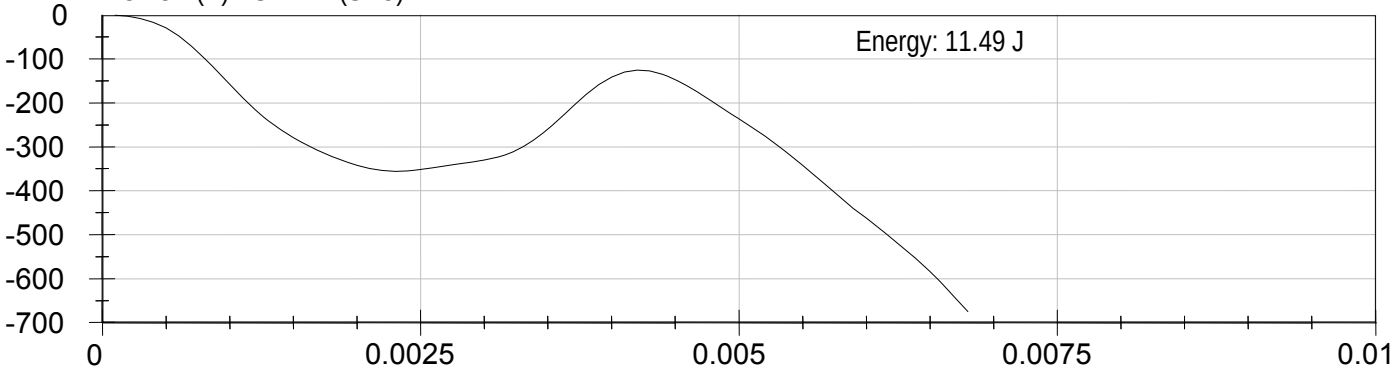
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Micro Bird

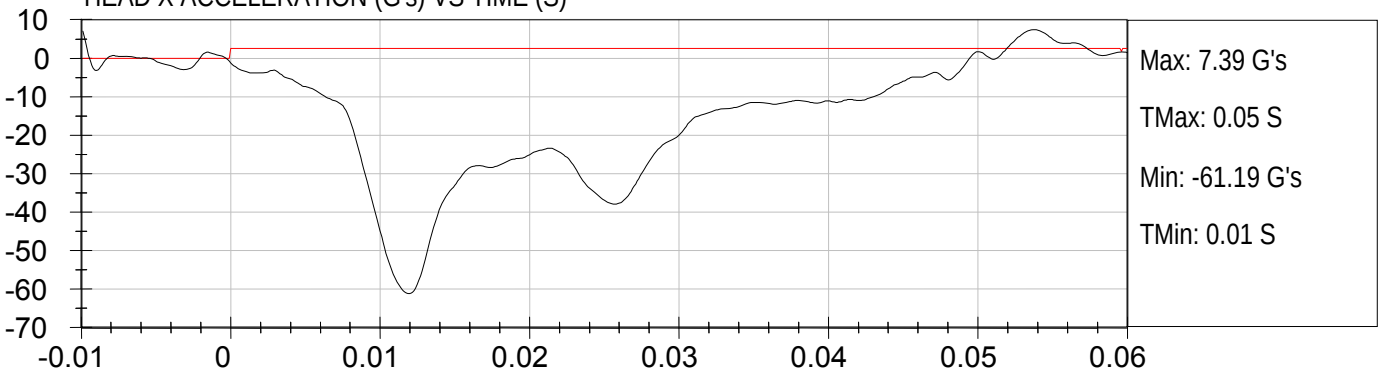
Location: S8 H14

Test Date: 3-20-2009

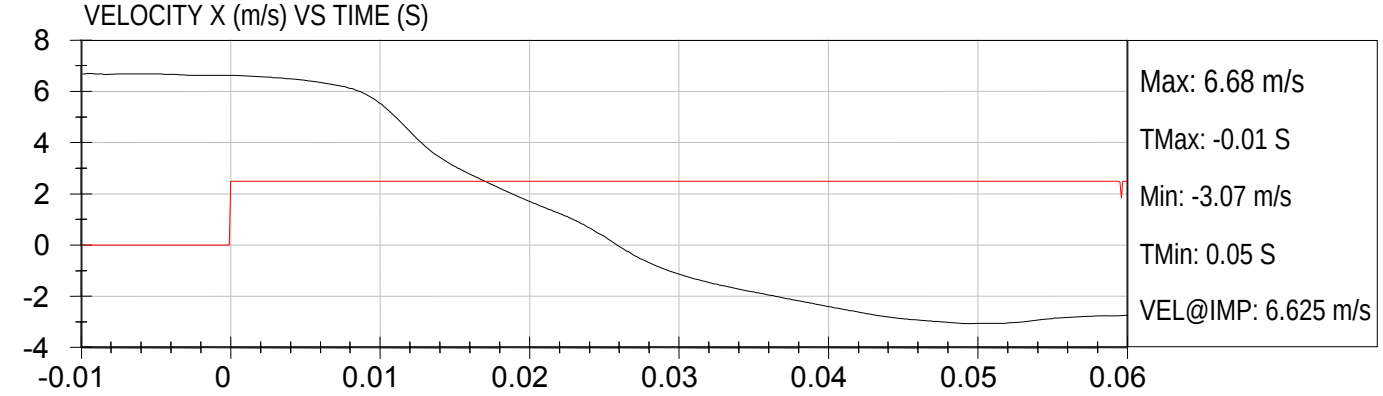
NHTSA#: C90902

Hic: 144.63 T1: 8.30 ms T2: 29.90 ms

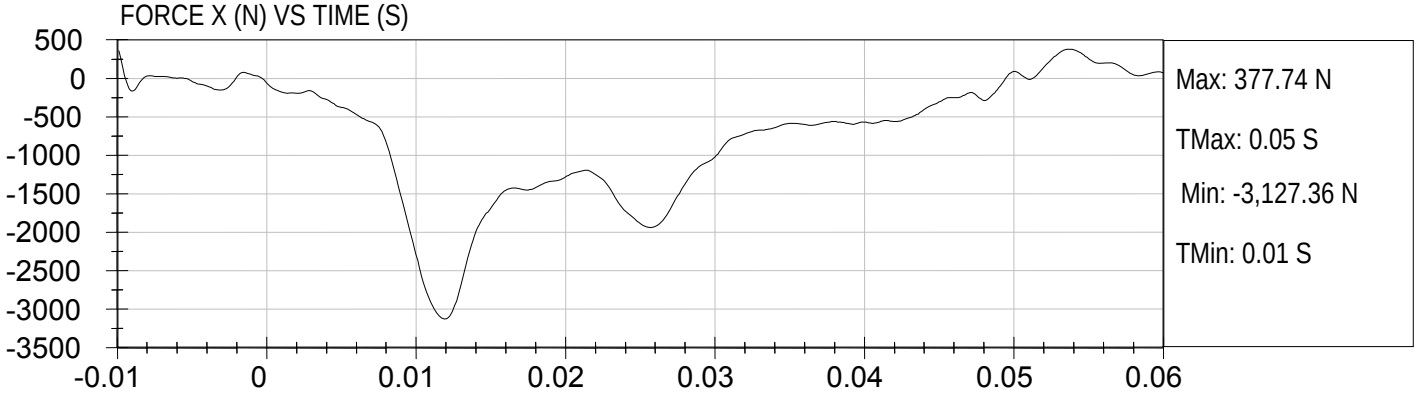
HEAD X ACCELERATION (G's) VS TIME (S)



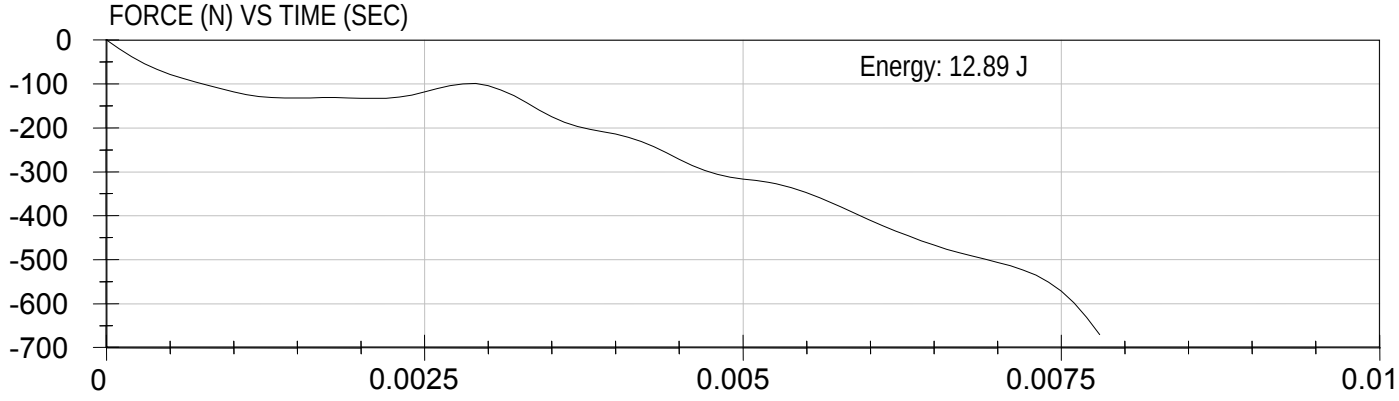
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



HEAD FORM IMPACT (6.69 m/s)

Component ID: Bluebird Microbird

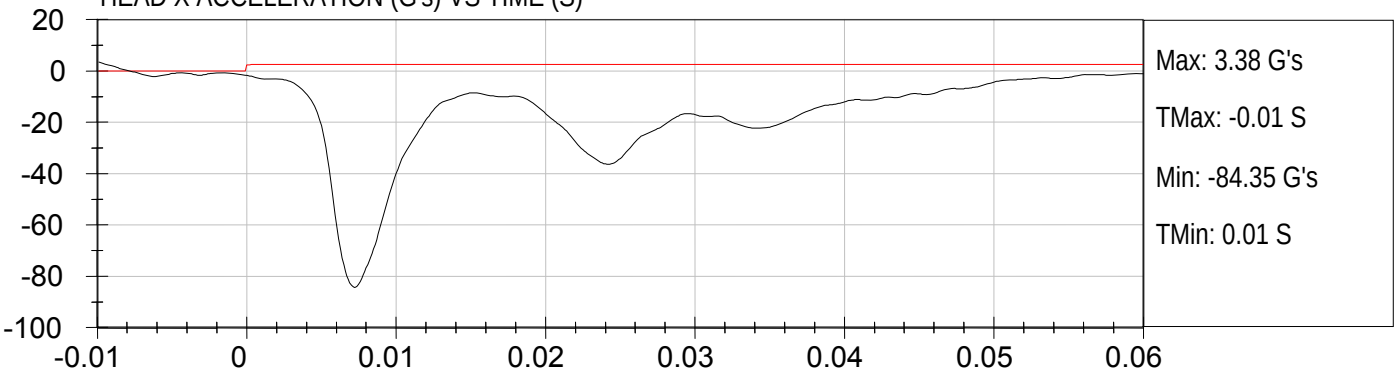
Location: B1 H8

Test Date: 5-4-09

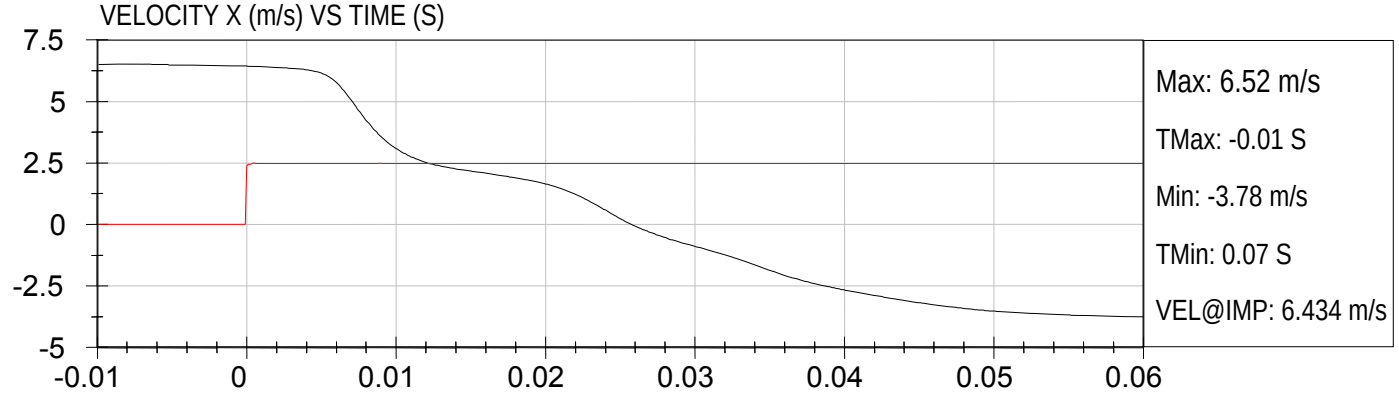
NHTSA#: C90902

Hic: 161.32 T1: 5.60 ms T2: 10.00 ms

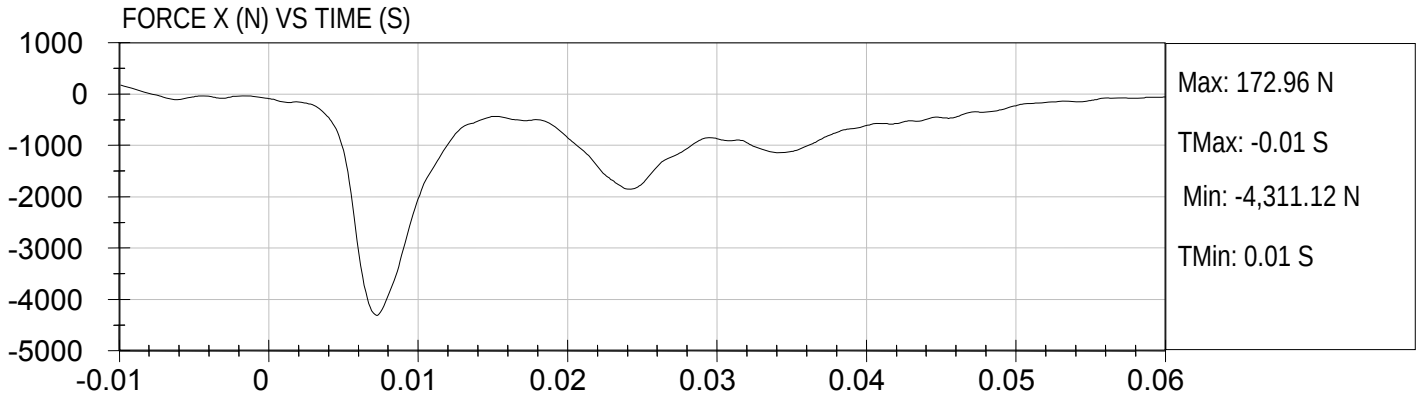
HEAD X ACCELERATION (G's) VS TIME (S)



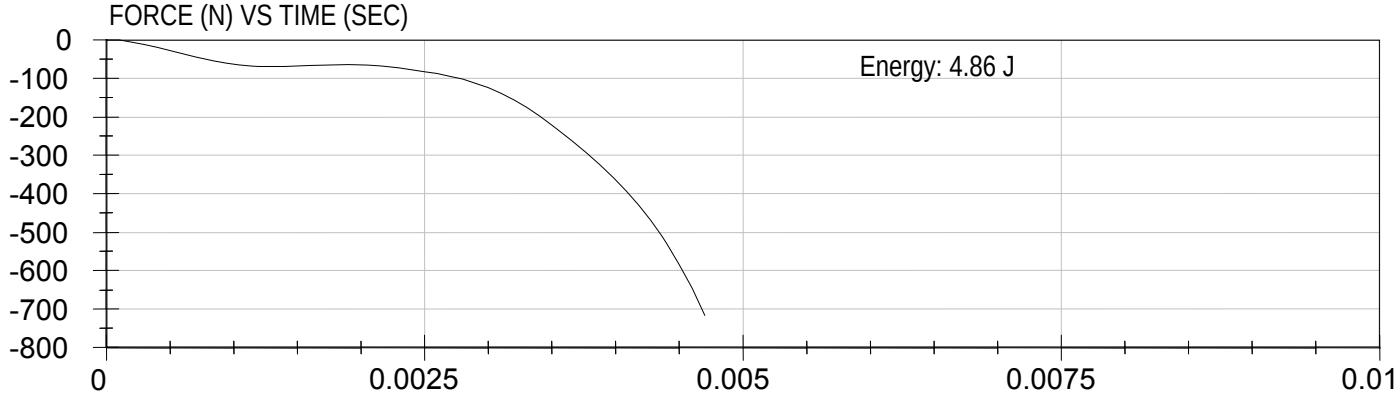
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



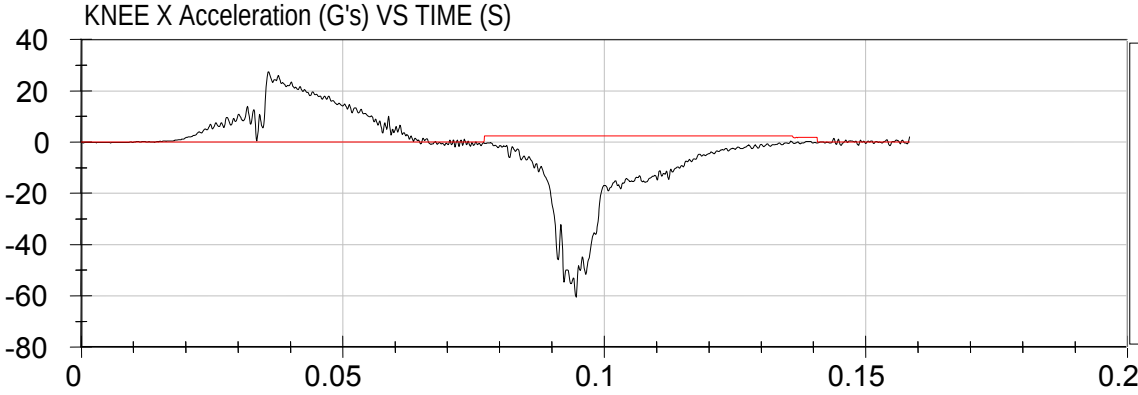
FORCE (N) VS TIME (SEC)



FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K1

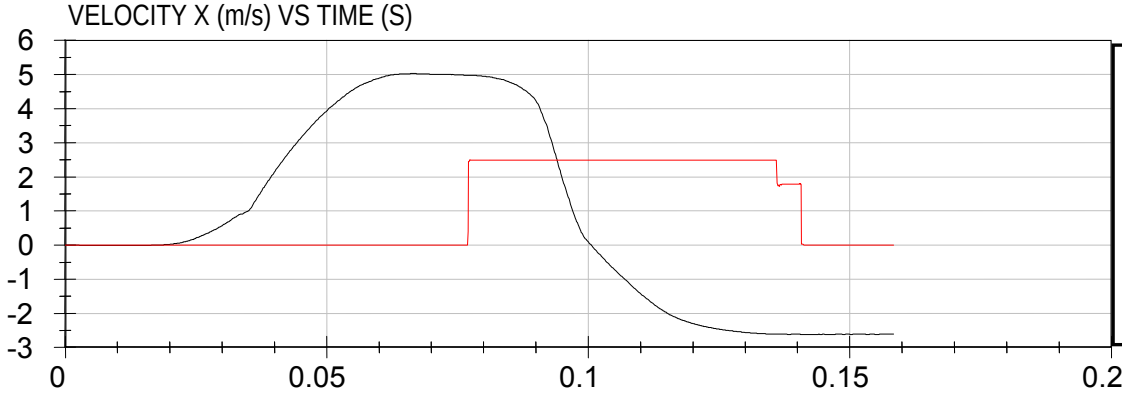
Test Date: 3/4/2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



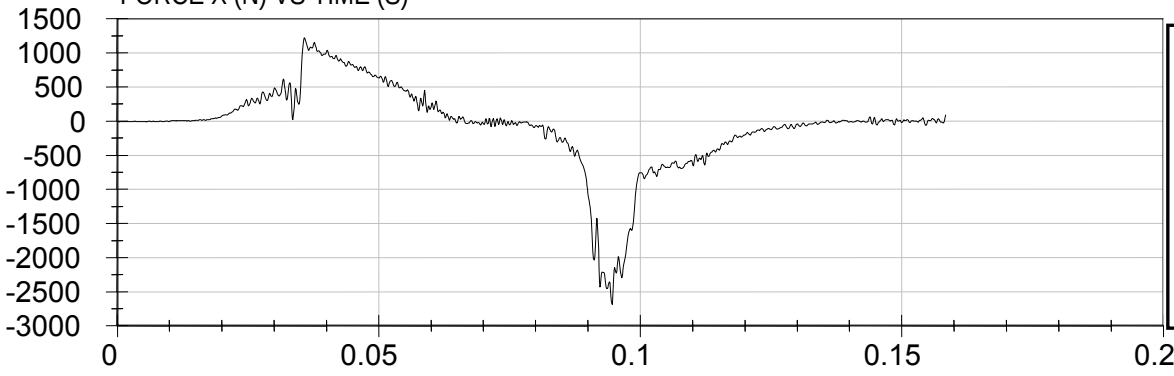
Max: 27.51 G's
TMax: 0.04 s
Min: -60.43 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 5.03 m/s
TMax: 0.07 s
Min: -2.62 m/s
TMin: 0.14 s
VEL@IMP: 4.98 m/s

FORCE X (N) VS TIME (S)

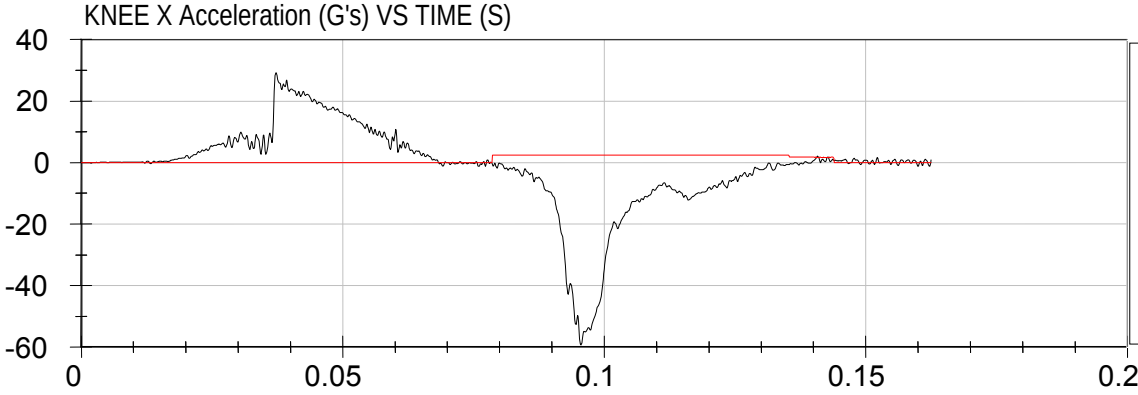


Max: 1,222.61 N
TMax: 0.04 s
Min: -2,685.38 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K2

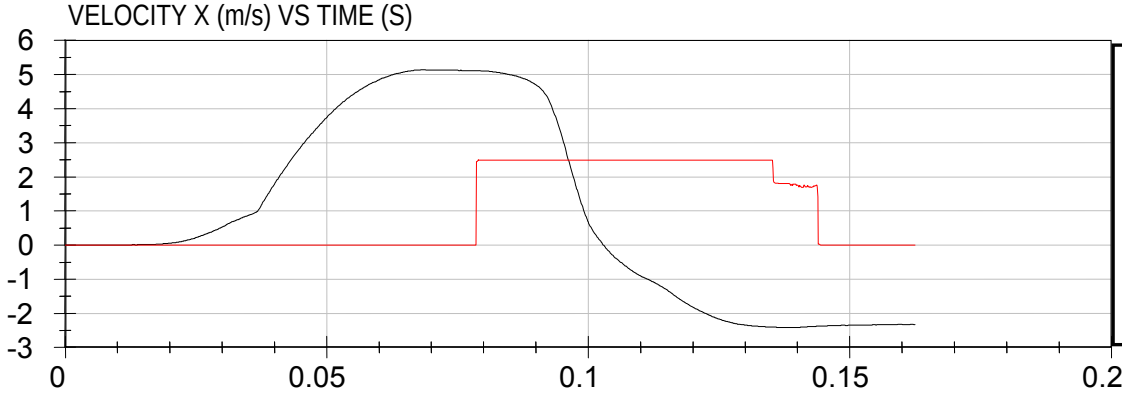
Test Date: 3/4/2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



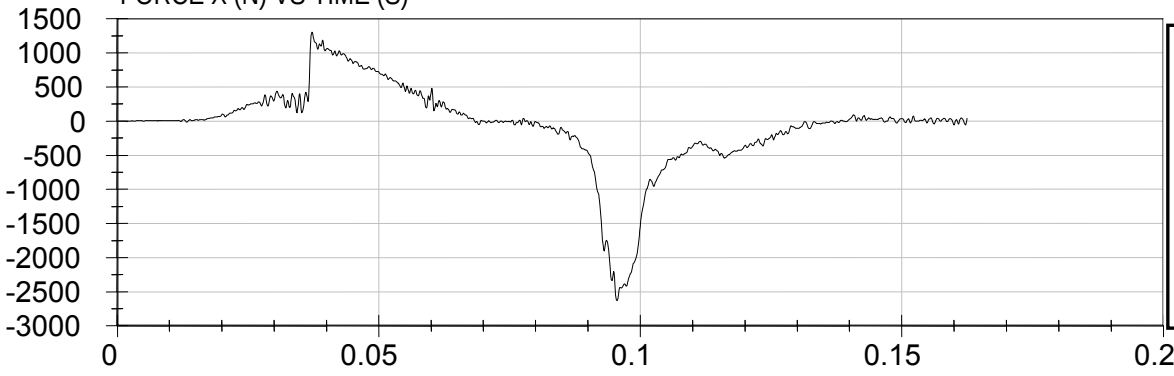
Max: 29.31 G's
TMax: 0.04 s
Min: -59.27 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)



Max: 5.14 m/s
TMax: 0.07 s
Min: -2.42 m/s
TMin: 0.14 s
VEL@IMP: 5.11 m/s

FORCE X (N) VS TIME (S)

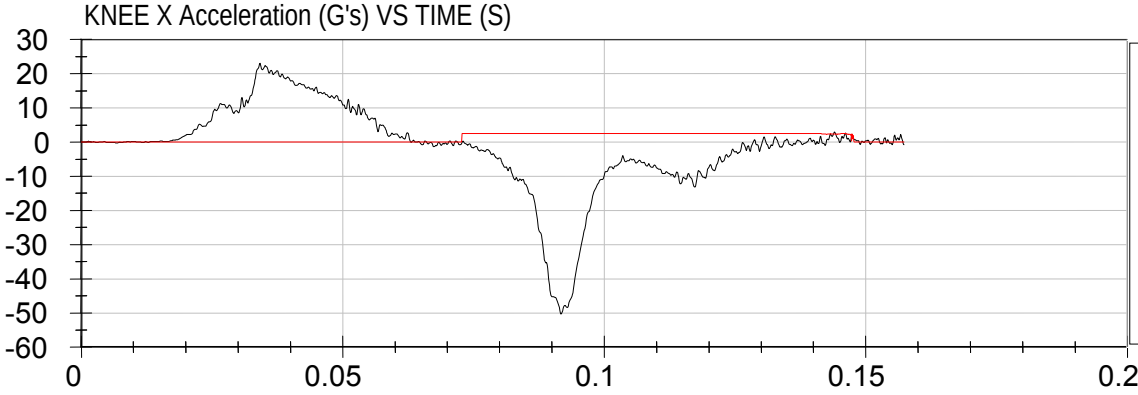


Max: 1,302.63 N
TMax: 0.04 s
Min: -2,634.09 N
TMin: 0.10 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K3

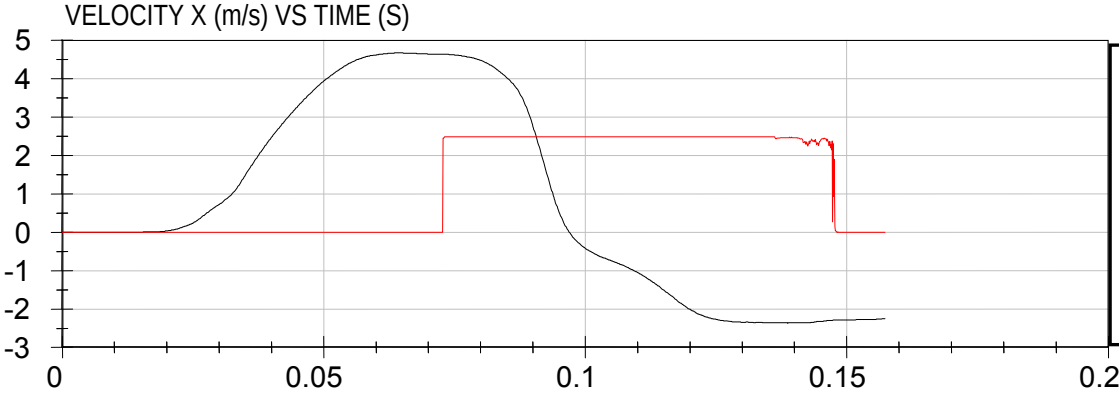
Test Date: 3-12-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



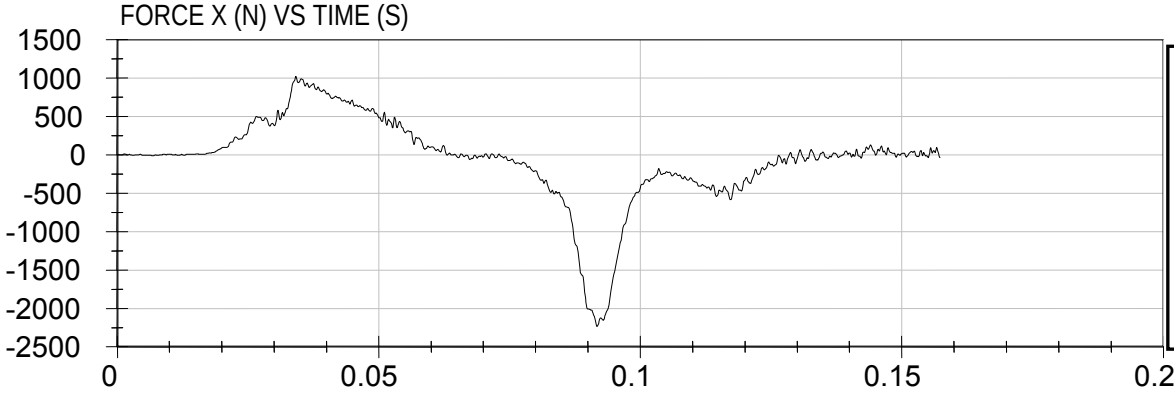
Max: 23.03 G's
TMax: 0.03 s
Min: -50.34 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.67 m/s
TMax: 0.06 s
Min: -2.36 m/s
TMin: 0.14 s
VEL@IMP: 4.64 m/s

FORCE X (N) VS TIME (S)

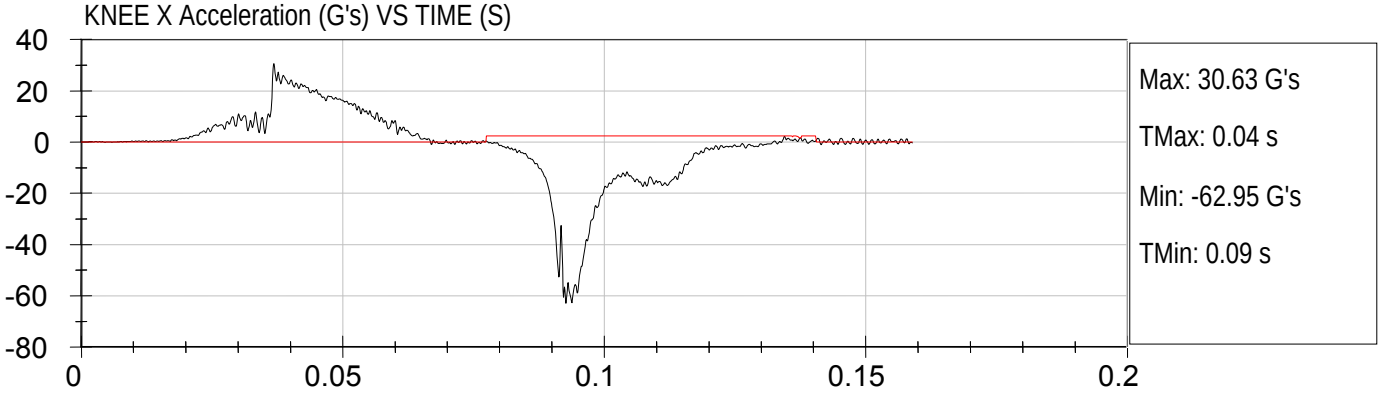


Max: 1,023.28 N
TMax: 0.03 s
Min: -2,237.01 N
TMin: 0.09 s

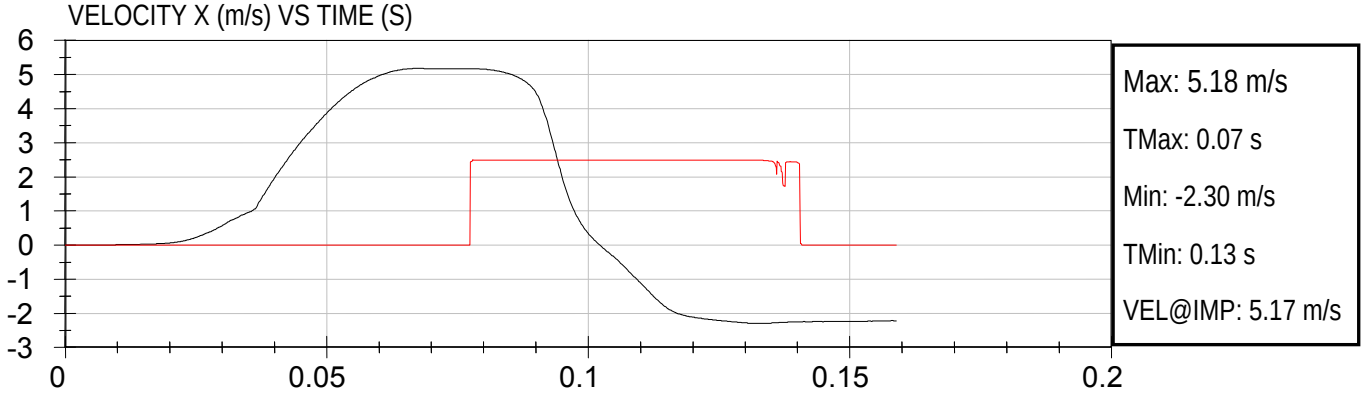
FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K4

Test Date: 3/4/2009
NHTSA #: C90902

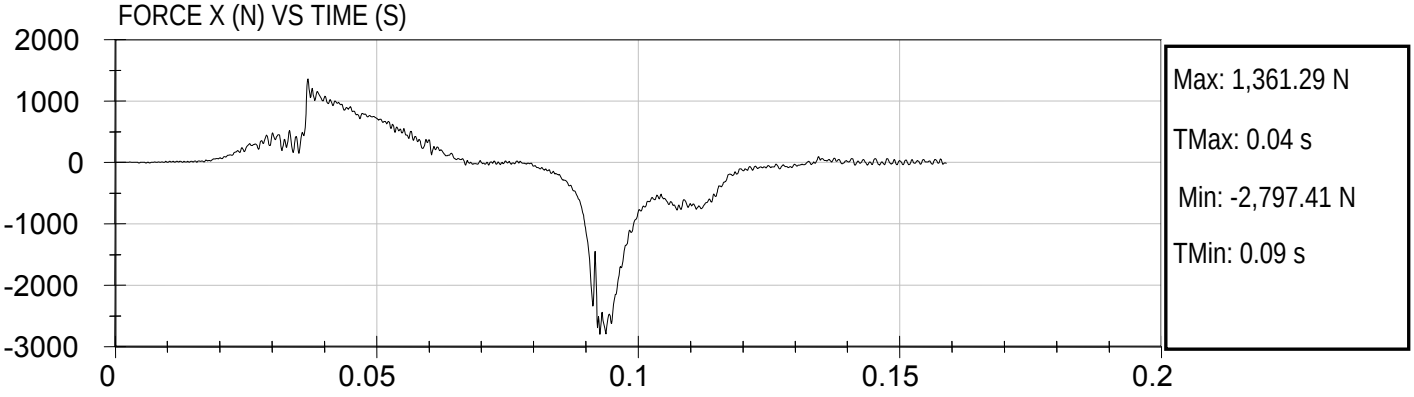
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)



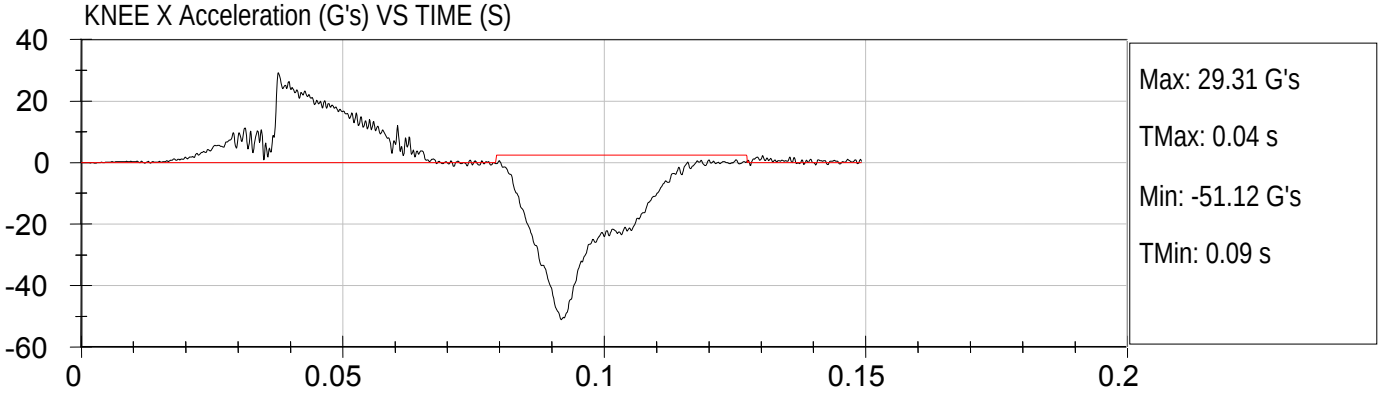
FORCE X (N) VS TIME (S)



FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K5

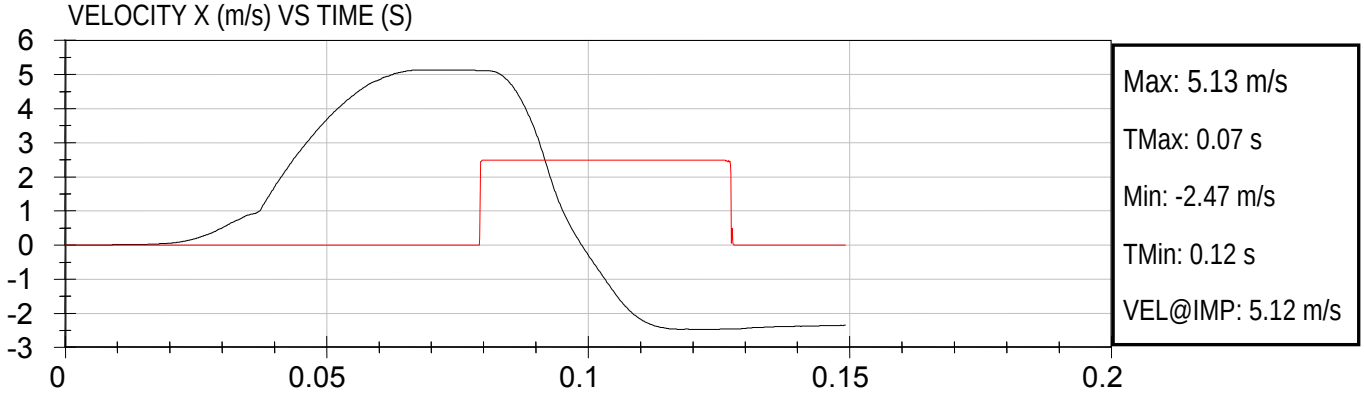
Test Date: 3/4/2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



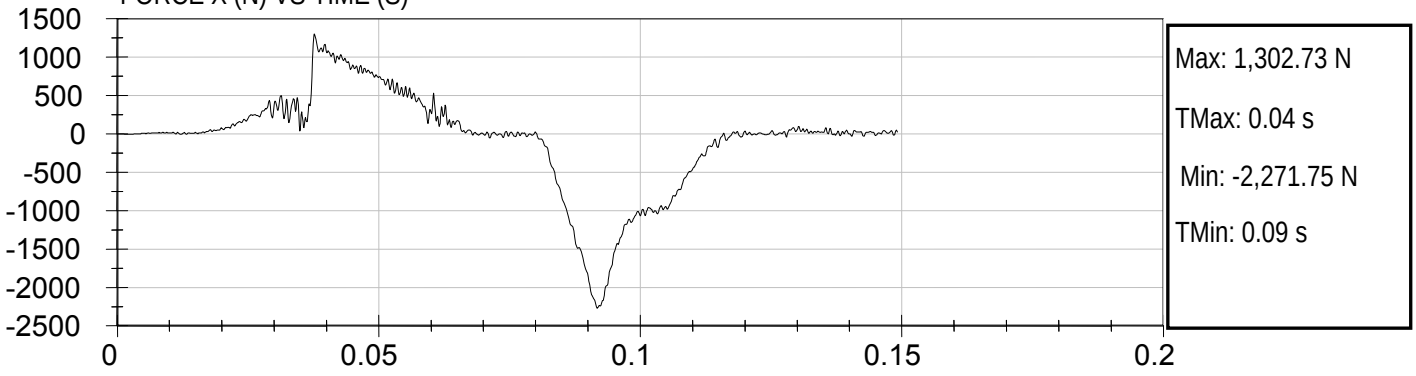
Max: 29.31 G's
TMax: 0.04 s
Min: -51.12 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 5.13 m/s
TMax: 0.07 s
Min: -2.47 m/s
TMin: 0.12 s
VEL@IMP: 5.12 m/s

FORCE X (N) VS TIME (S)

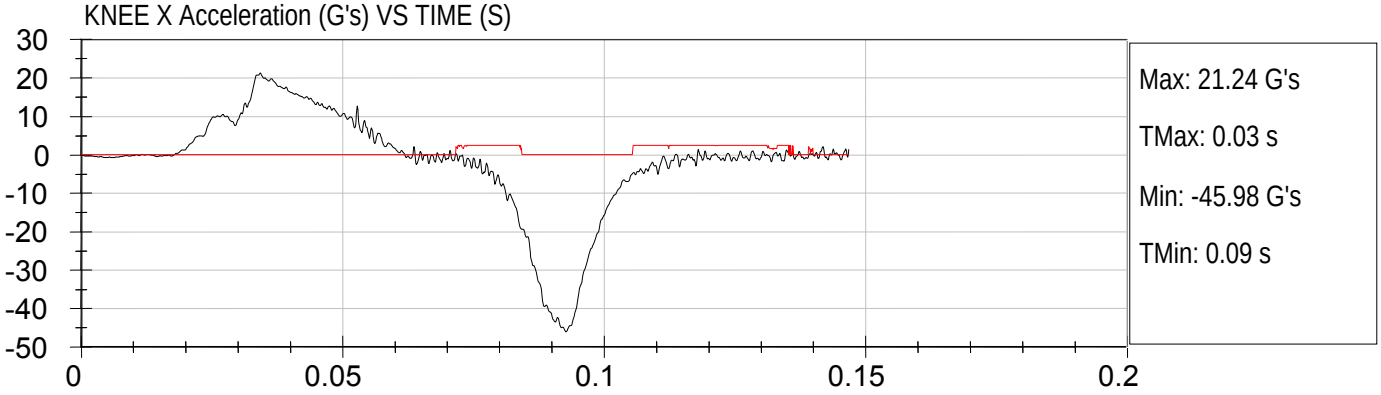


Max: 1,302.73 N
TMax: 0.04 s
Min: -2,271.75 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K6

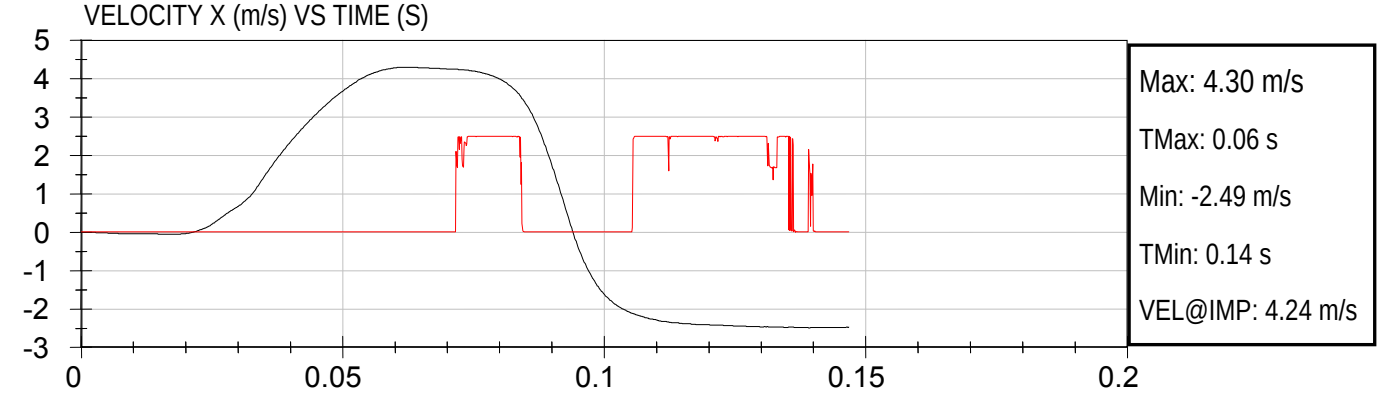
Test Date: 3-12-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



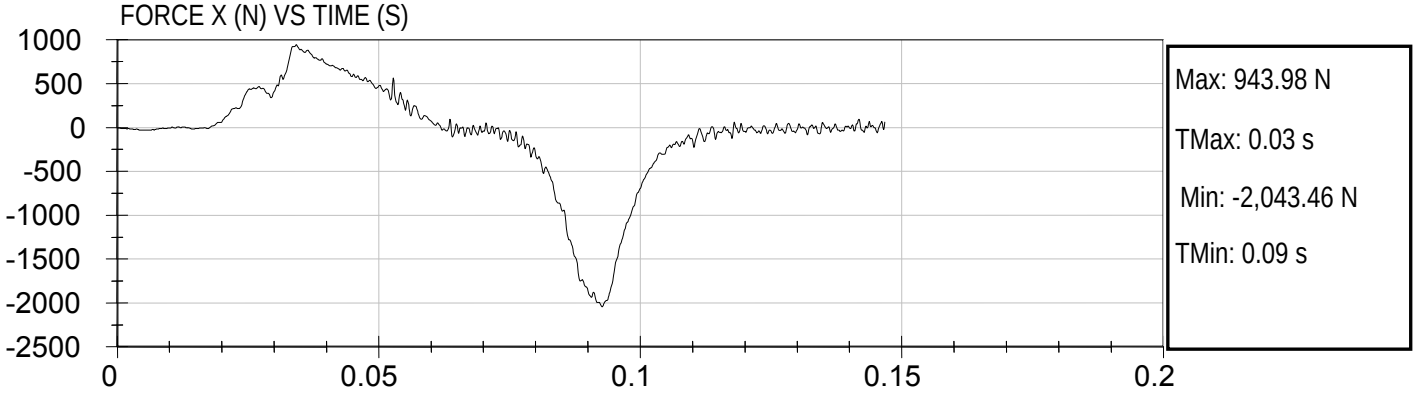
Max: 21.24 G's
TMax: 0.03 s
Min: -45.98 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.30 m/s
TMax: 0.06 s
Min: -2.49 m/s
TMin: 0.14 s
VEL@IMP: 4.24 m/s

FORCE X (N) VS TIME (S)

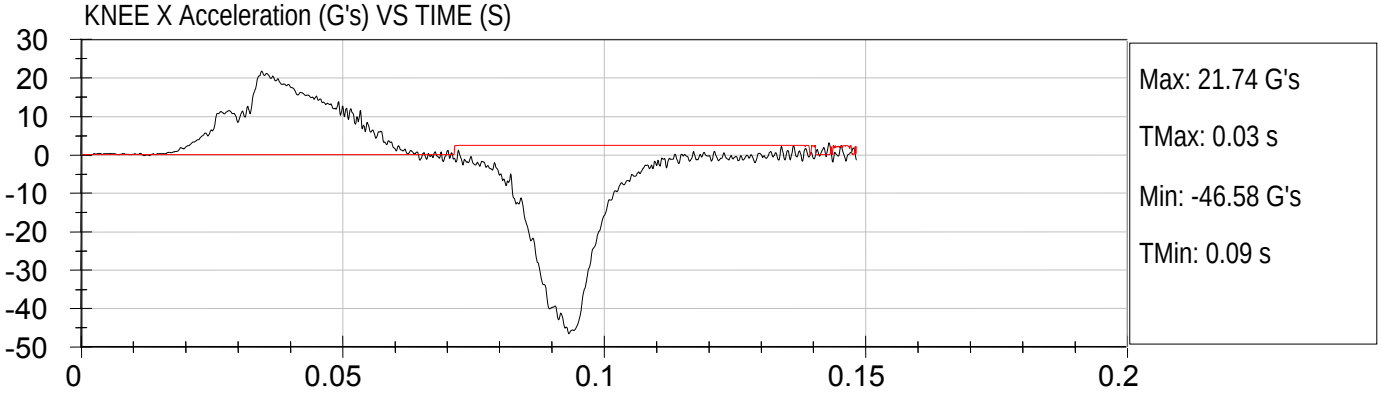


Max: 943.98 N
TMax: 0.03 s
Min: -2,043.46 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K7

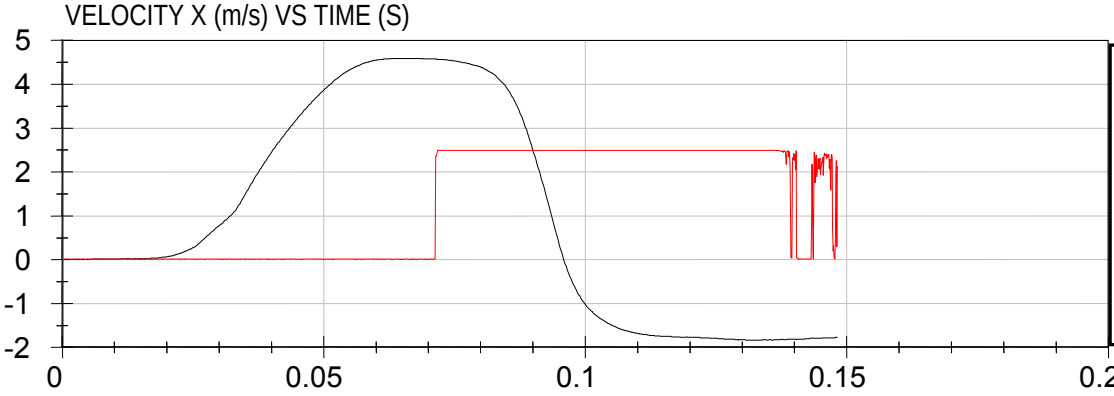
Test Date: 3-12-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



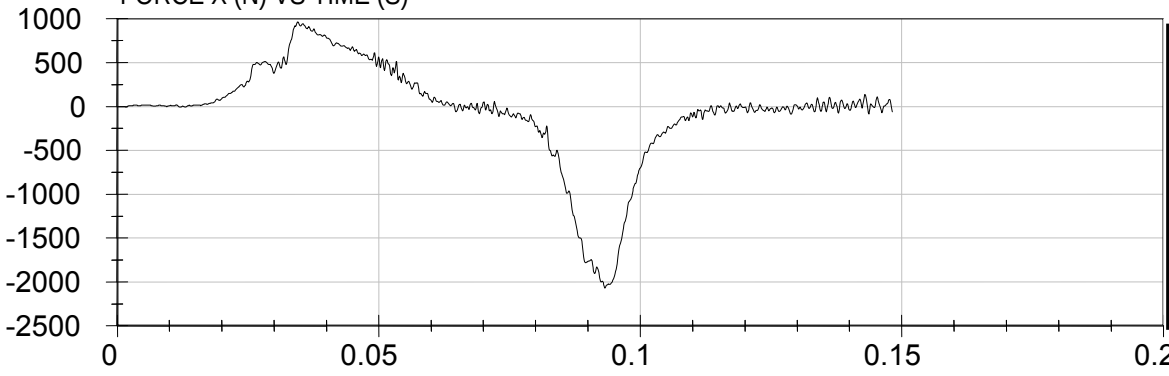
Max: 21.74 G's
TMax: 0.03 s
Min: -46.58 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.59 m/s
TMax: 0.06 s
Min: -1.83 m/s
TMin: 0.13 s
VEL@IMP: 4.58 m/s

FORCE X (N) VS TIME (S)

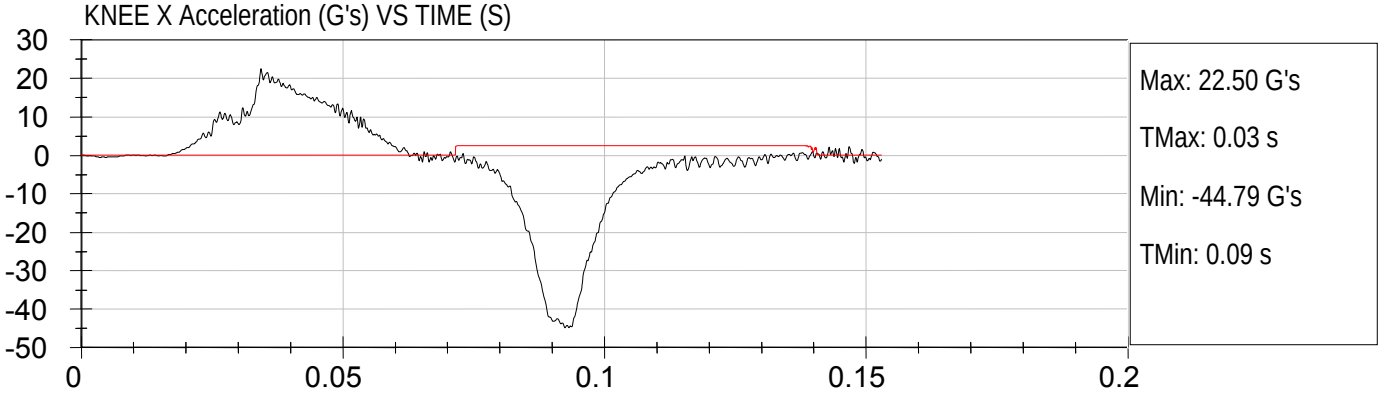


Max: 966.02 N
TMax: 0.03 s
Min: -2,069.97 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S1 K8

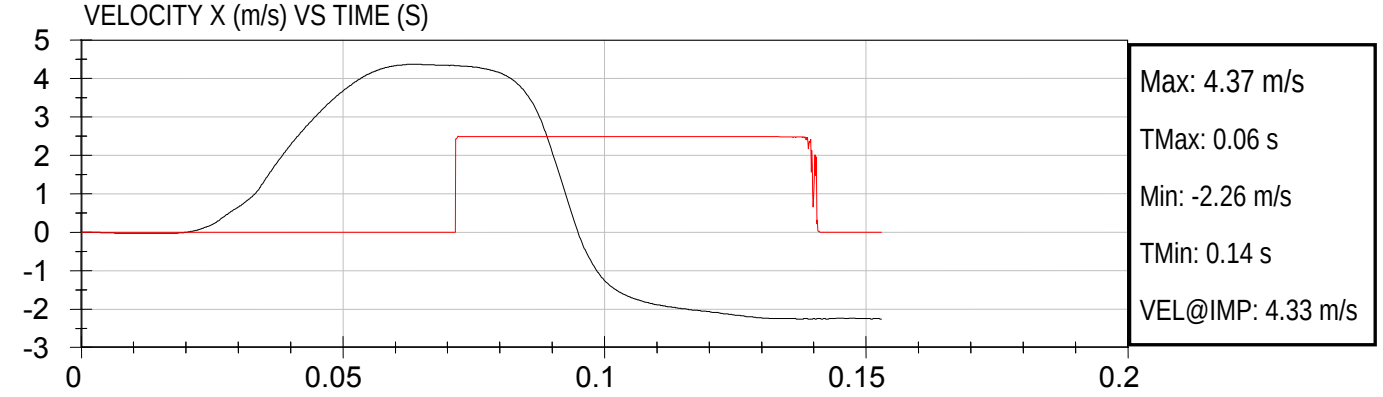
Test Date: 3-12-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



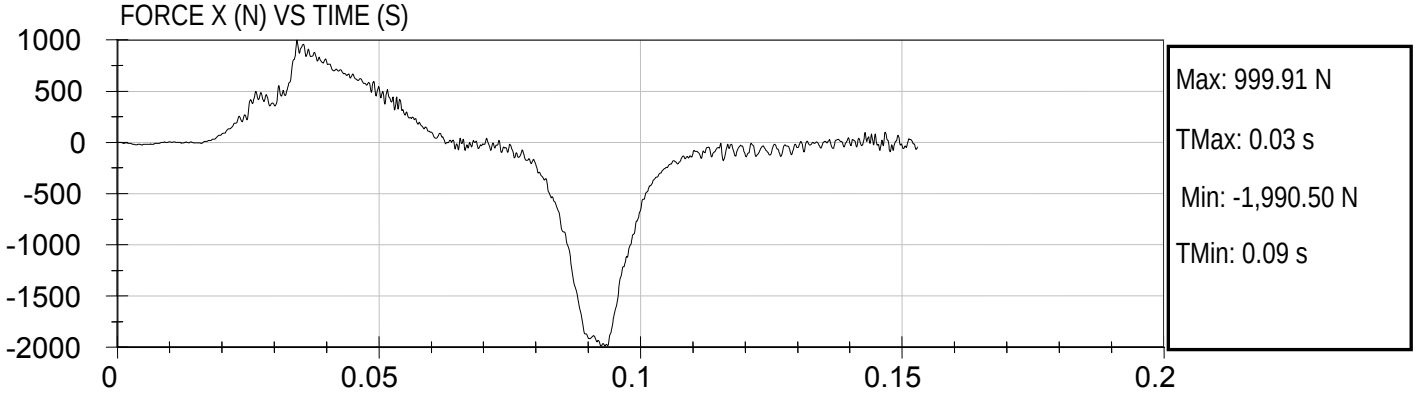
Max: 22.50 G's
TMax: 0.03 s
Min: -44.79 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.37 m/s
TMax: 0.06 s
Min: -2.26 m/s
TMin: 0.14 s
VEL@IMP: 4.33 m/s

FORCE X (N) VS TIME (S)

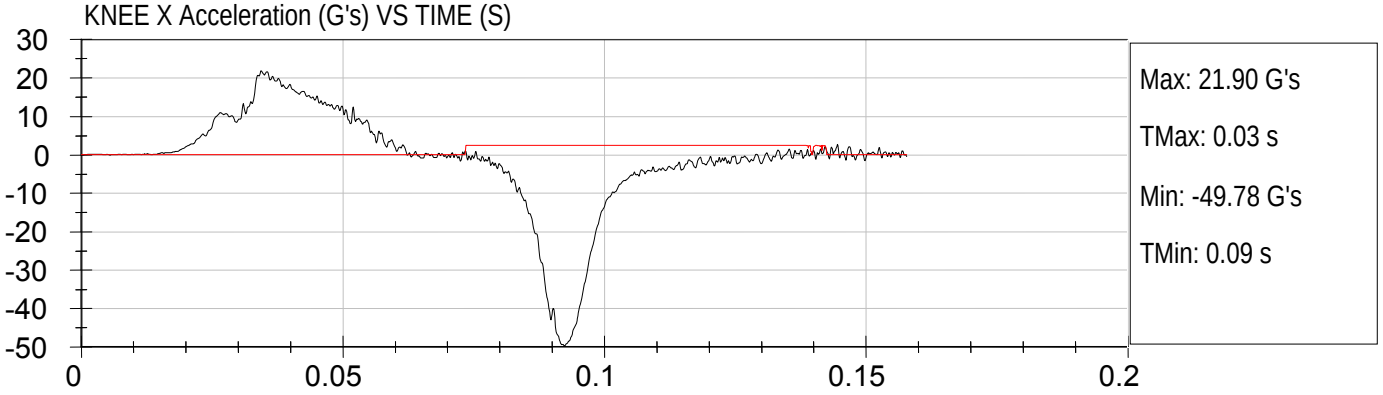


Max: 999.91 N
TMax: 0.03 s
Min: -1,990.50 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S8 K9

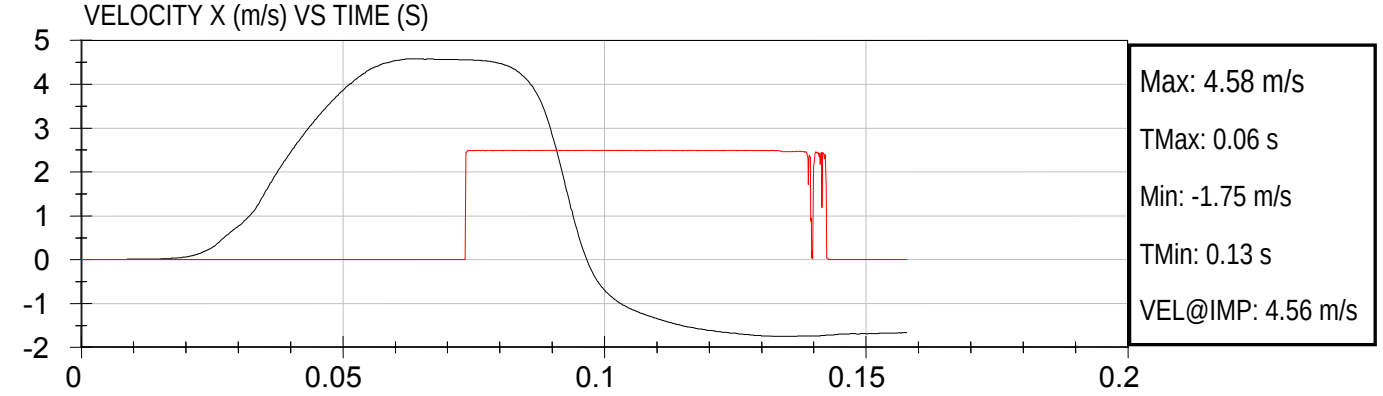
Test Date: 3-12-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



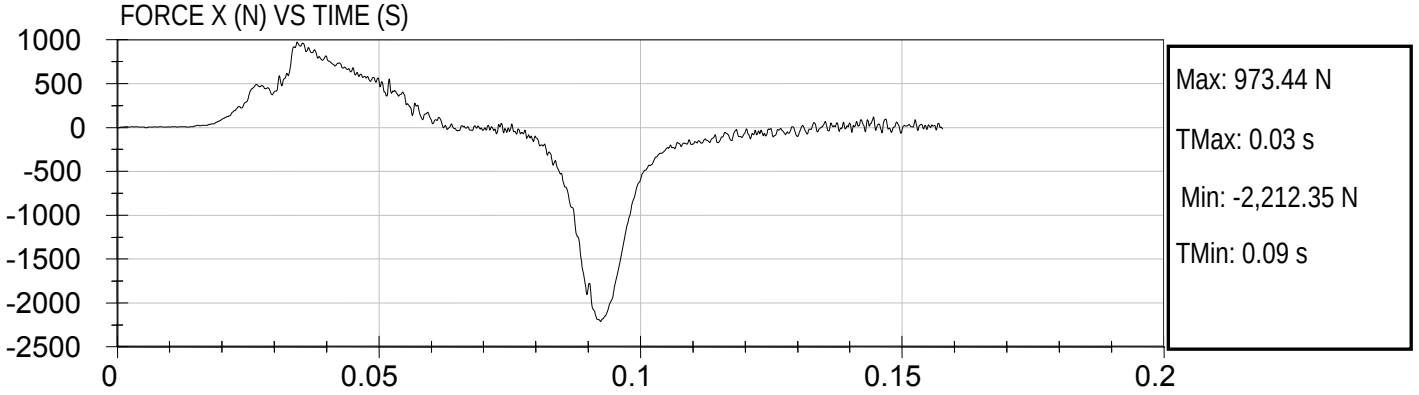
Max: 21.90 G's
TMax: 0.03 s
Min: -49.78 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.58 m/s
TMax: 0.06 s
Min: -1.75 m/s
TMin: 0.13 s
VEL@IMP: 4.56 m/s

FORCE X (N) VS TIME (S)

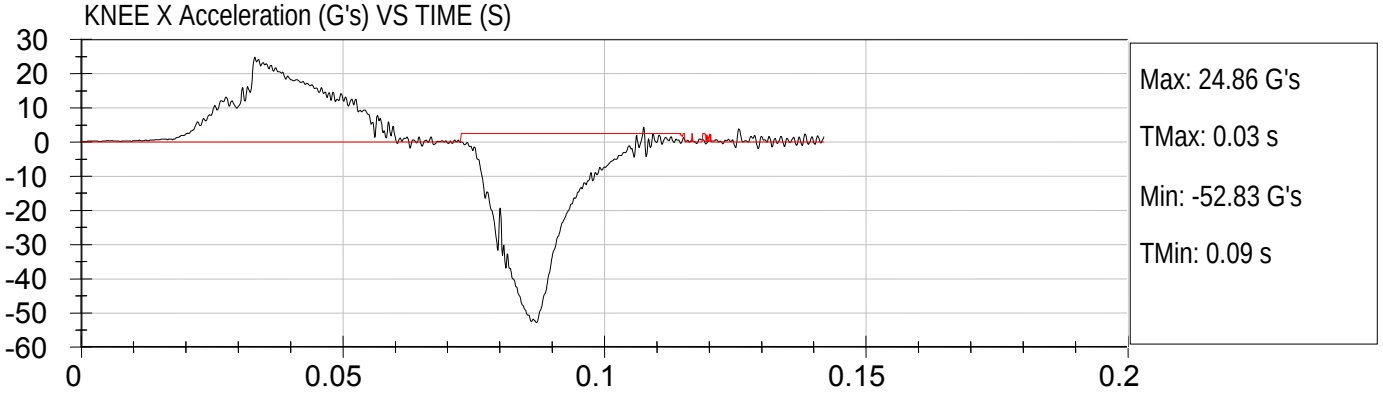


Max: 973.44 N
TMax: 0.03 s
Min: -2,212.35 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S8 K10

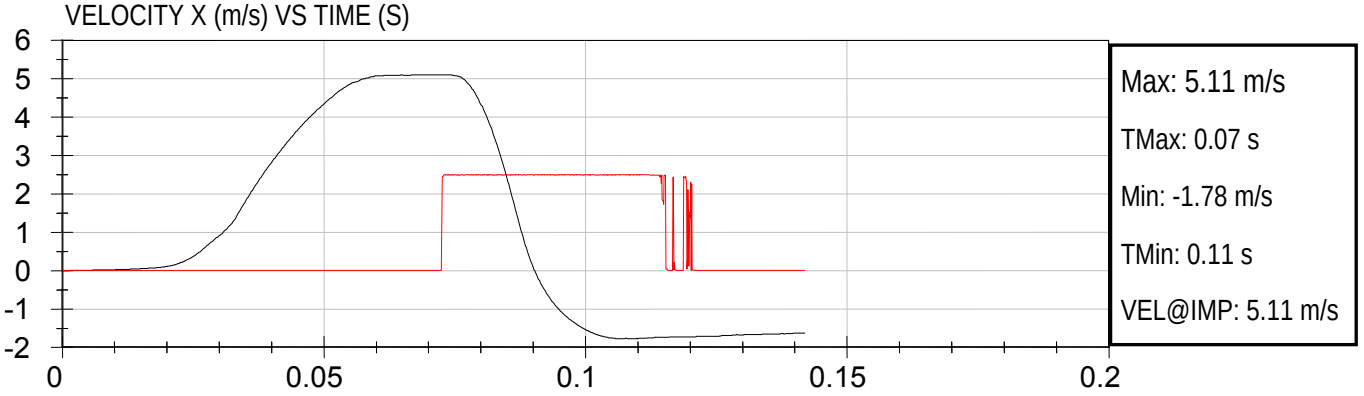
Test Date: 3-10-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



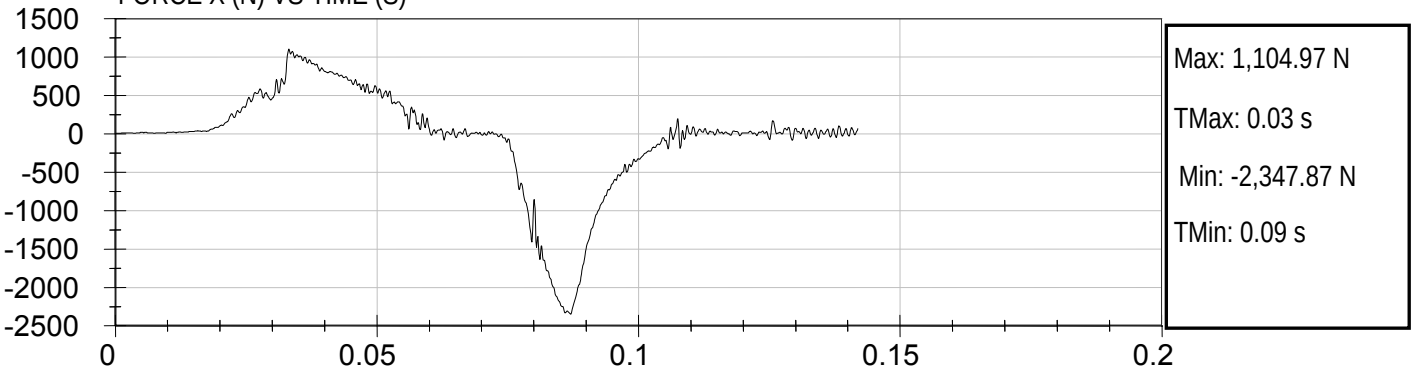
Max: 24.86 G's
TMax: 0.03 s
Min: -52.83 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 5.11 m/s
TMax: 0.07 s
Min: -1.78 m/s
TMin: 0.11 s
VEL@IMP: 5.11 m/s

FORCE X (N) VS TIME (S)

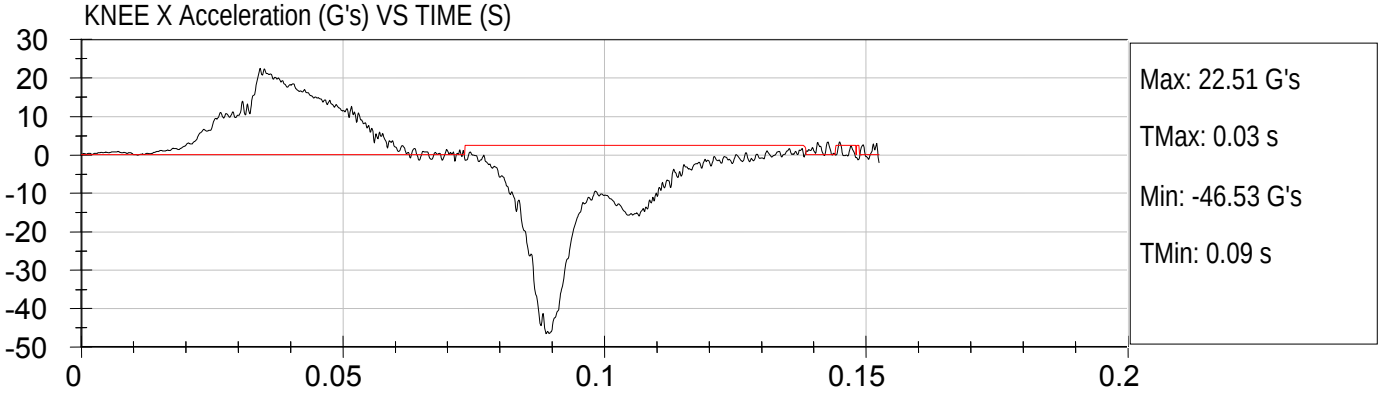


Max: 1,104.97 N
TMax: 0.03 s
Min: -2,347.87 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: S8 K11

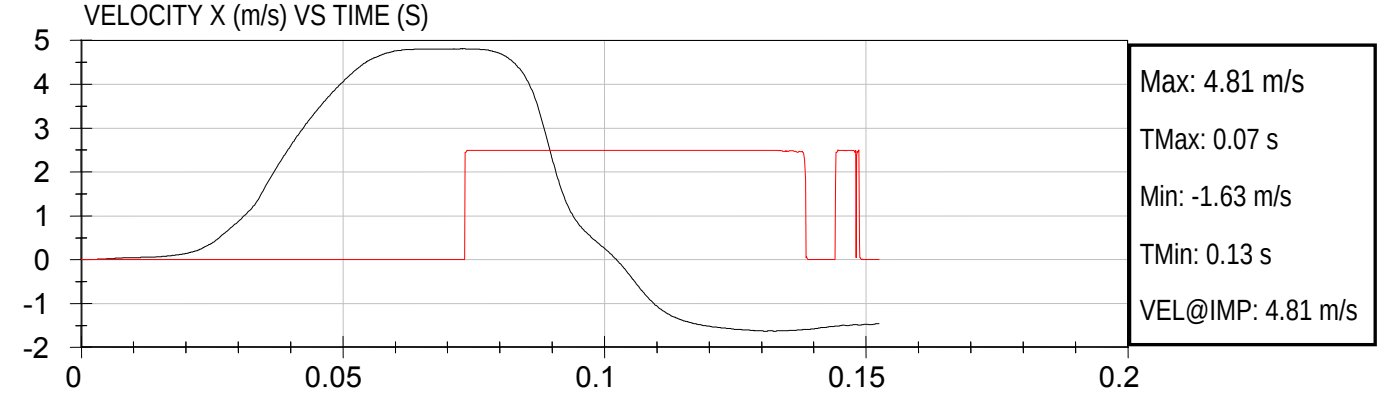
Test Date: 3-12-2009
NHTSA #: C90902

KNEE X Acceleration (G's) VS TIME (S)



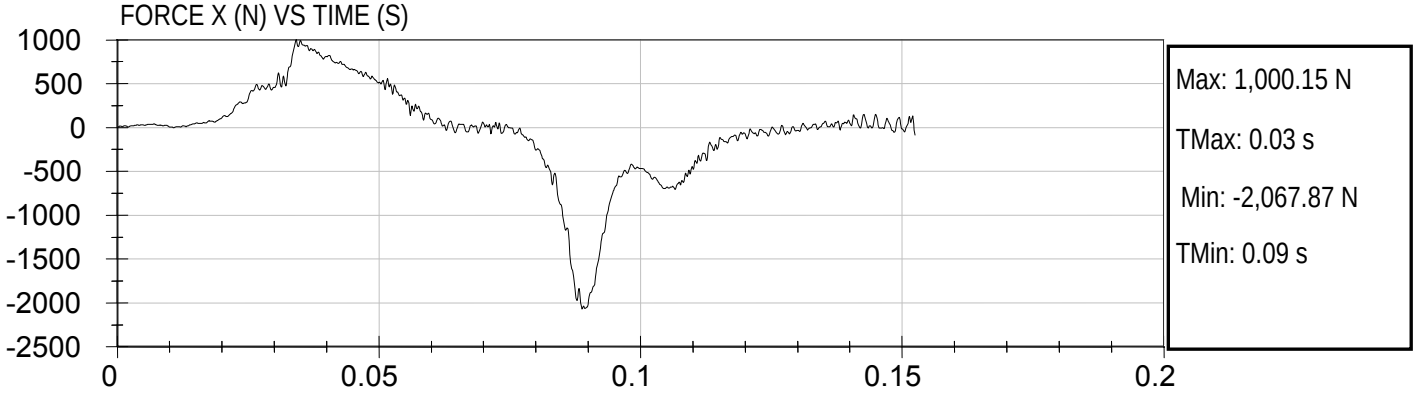
Max: 22.51 G's
TMax: 0.03 s
Min: -46.53 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.81 m/s
TMax: 0.07 s
Min: -1.63 m/s
TMin: 0.13 s
VEL@IMP: 4.81 m/s

FORCE X (N) VS TIME (S)

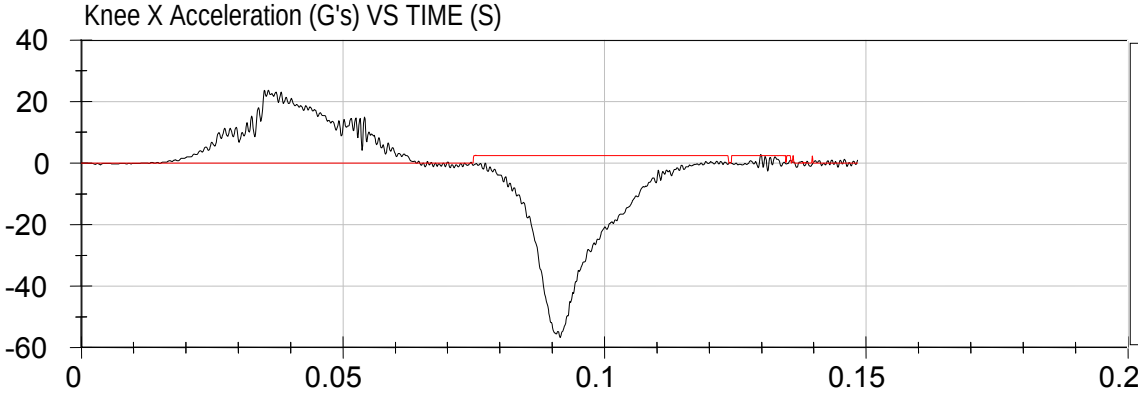


Max: 1,000.15 N
TMax: 0.03 s
Min: -2,067.87 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: B1 K1

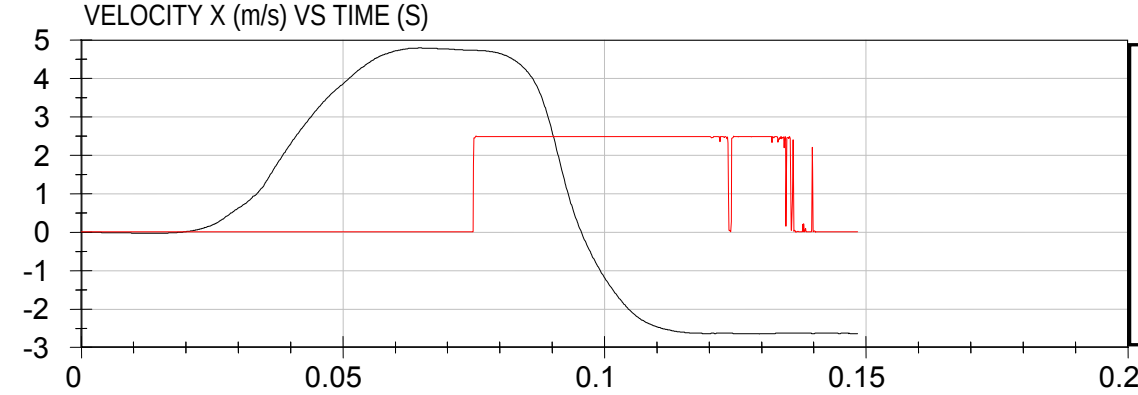
Test Date: 5-4-2009
NHTSA #: C90902

Knee X Acceleration (G's) VS TIME (S)



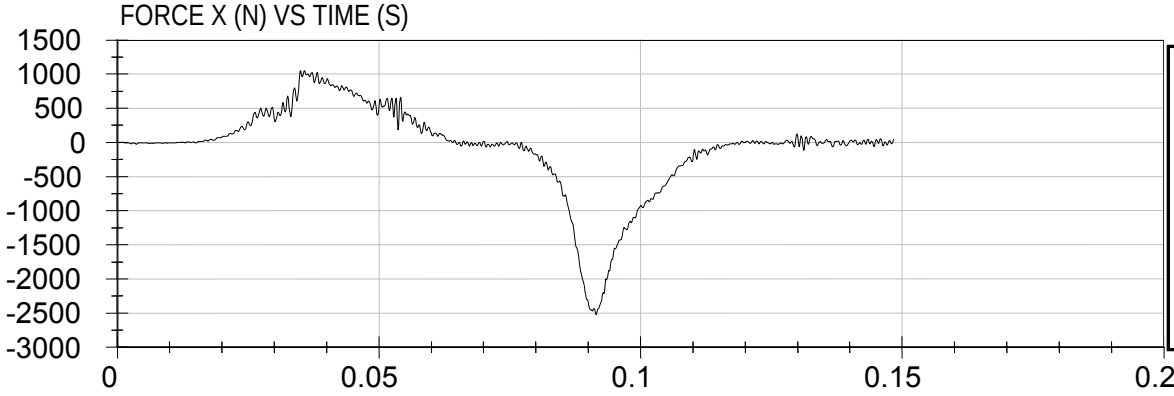
Max: 23.66 G's
TMax: 0.04 s
Min: -56.74 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.79 m/s
TMax: 0.06 s
Min: -2.65 m/s
TMin: 0.13 s
VEL@IMP: 4.73 m/s

FORCE X (N) VS TIME (S)

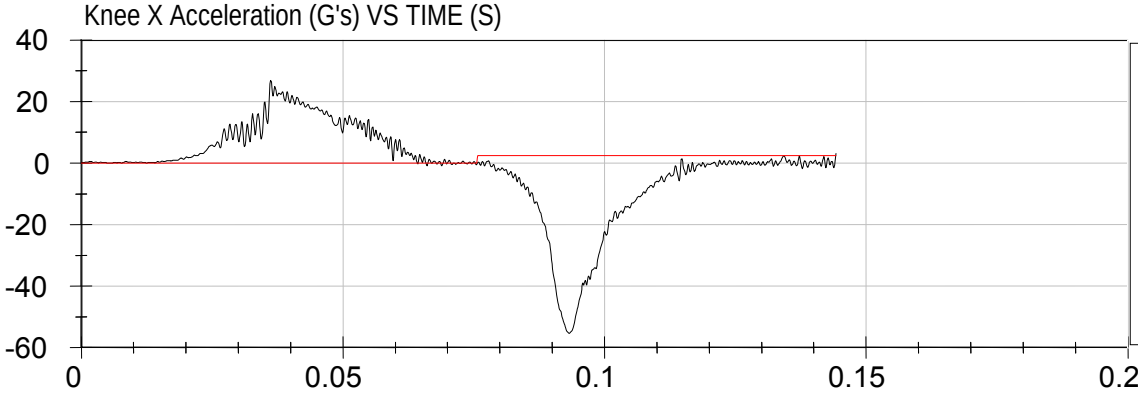


Max: 1,051.32 N
TMax: 0.04 s
Min: -2,521.66 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: B1 K2

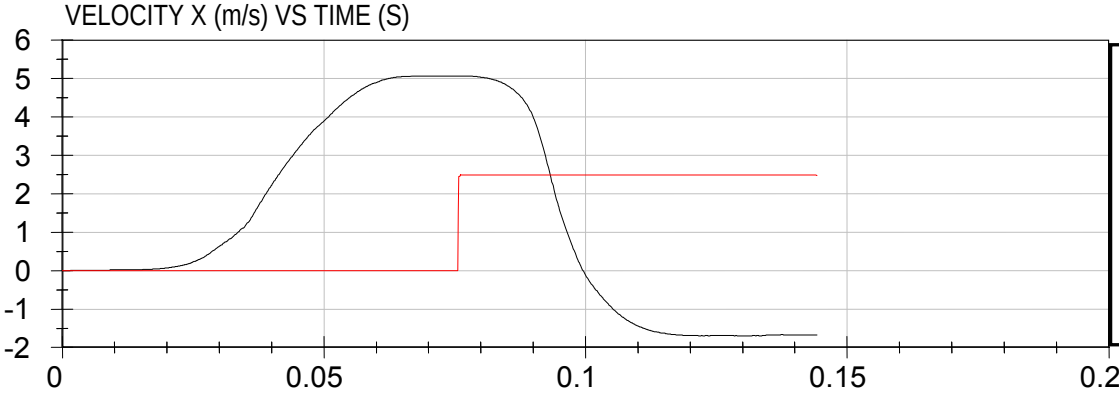
Test Date: 5-4-2009
NHTSA #: C90902

Knee X Acceleration (G's) VS TIME (S)



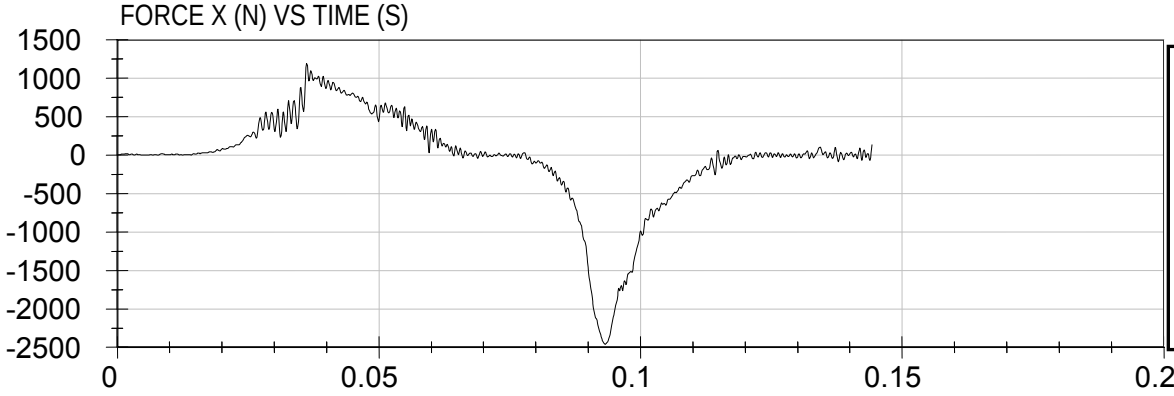
Max: 26.75 G's
TMax: 0.04 s
Min: -55.32 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 5.07 m/s
TMax: 0.07 s
Min: -1.70 m/s
TMin: 0.13 s
VEL@IMP: 5.06 m/s

FORCE X (N) VS TIME (S)

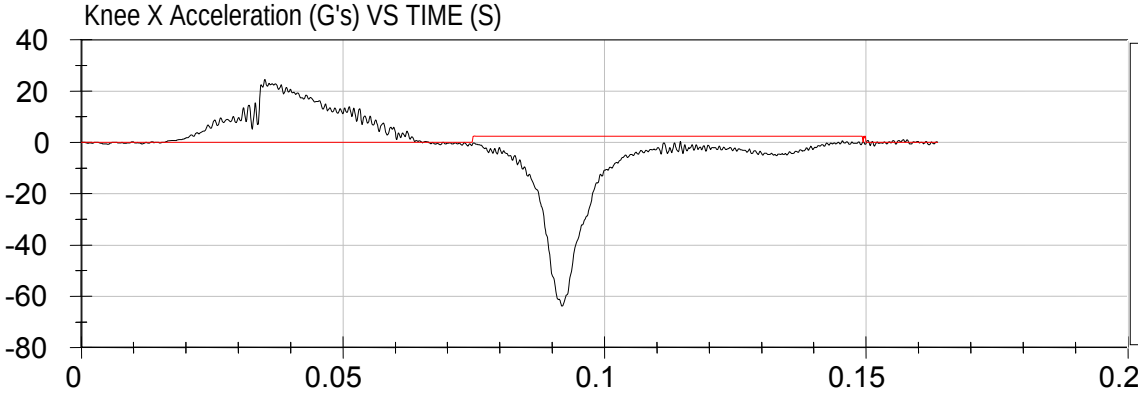


Max: 1,188.88 N
TMax: 0.04 s
Min: -2,458.27 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: B1 K3

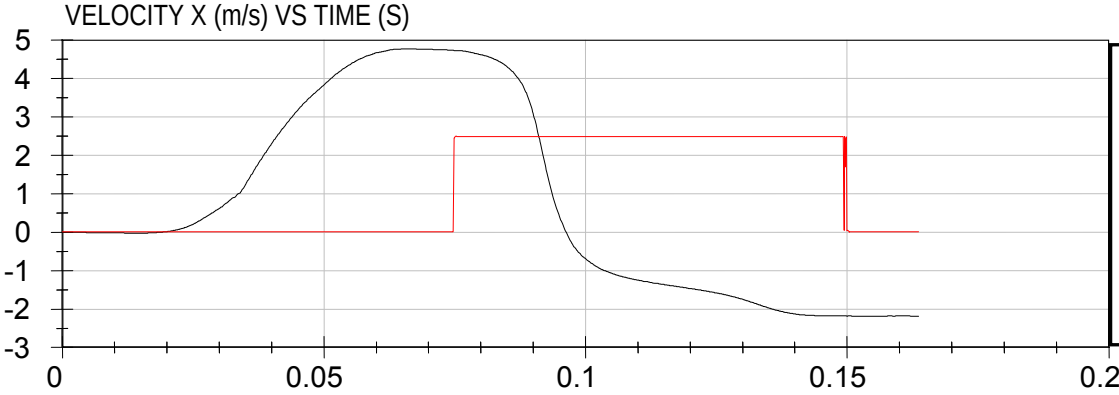
Test Date: 5-4-2009
NHTSA #: C90902

Knee X Acceleration (G's) VS TIME (S)



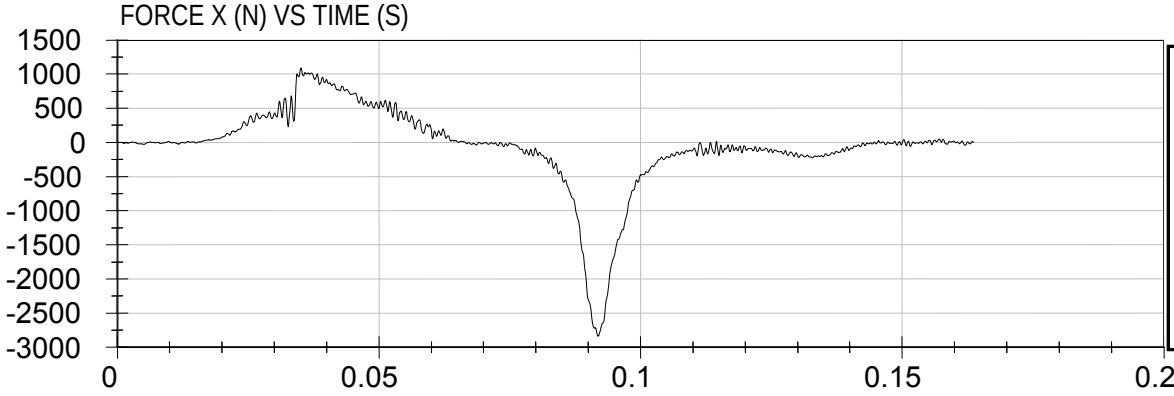
Max: 24.54 G's
TMax: 0.04 s
Min: -63.85 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.77 m/s
TMax: 0.07 s
Min: -2.19 m/s
TMin: 0.15 s
VEL@IMP: 4.73 m/s

FORCE X (N) VS TIME (S)

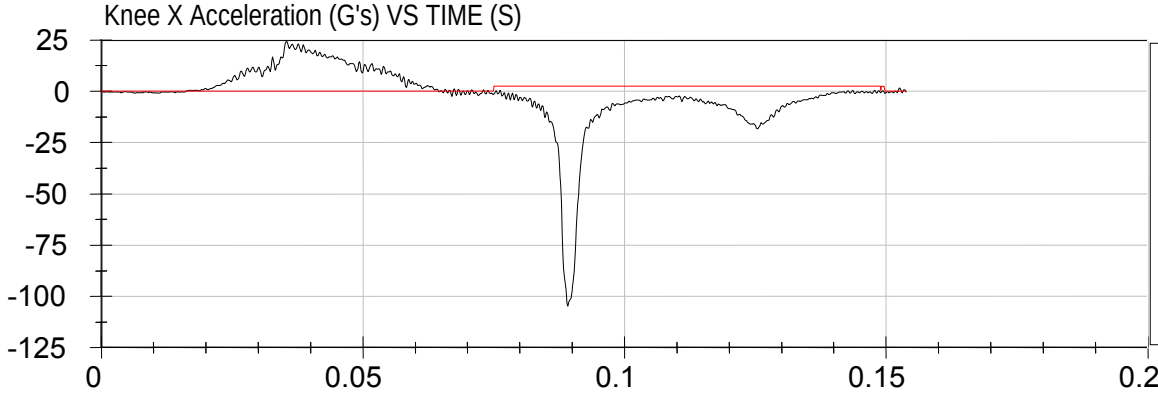


Max: 1,090.69 N
TMax: 0.04 s
Min: -2,837.46 N
TMin: 0.09 s

FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: B1 K5

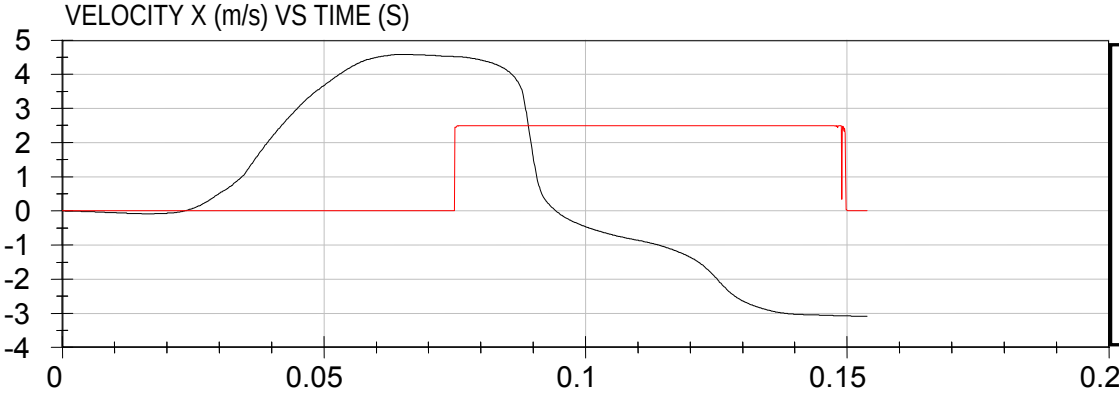
Test Date: 5-4-2009
NHTSA #: C90902

Knee X Acceleration (G's) VS TIME (S)



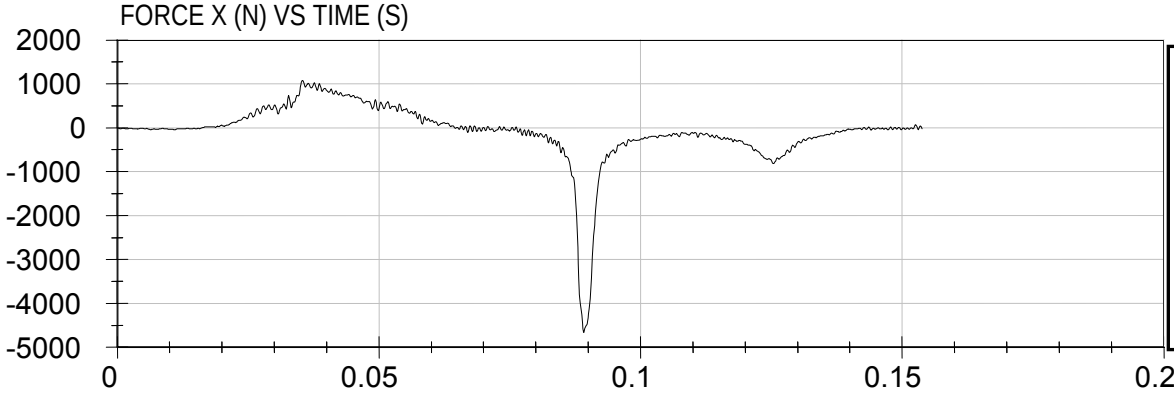
Max: 24.15 G's
TMax: 0.04 s
Min: -104.82 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)



Max: 4.58 m/s
TMax: 0.06 s
Min: -3.09 m/s
TMin: 0.15 s
VEL@IMP: 4.51 m/s

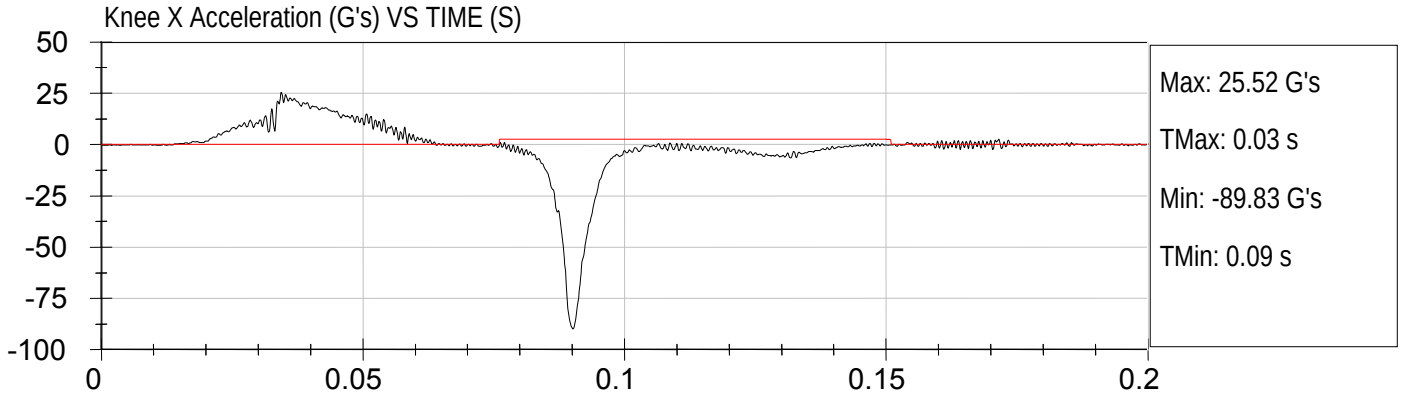
FORCE X (N) VS TIME (S)

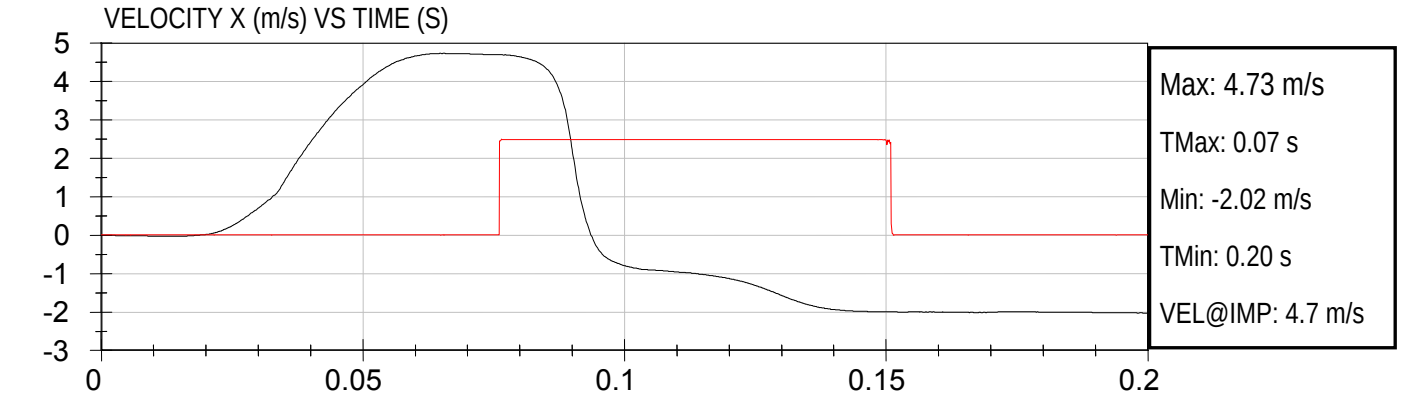


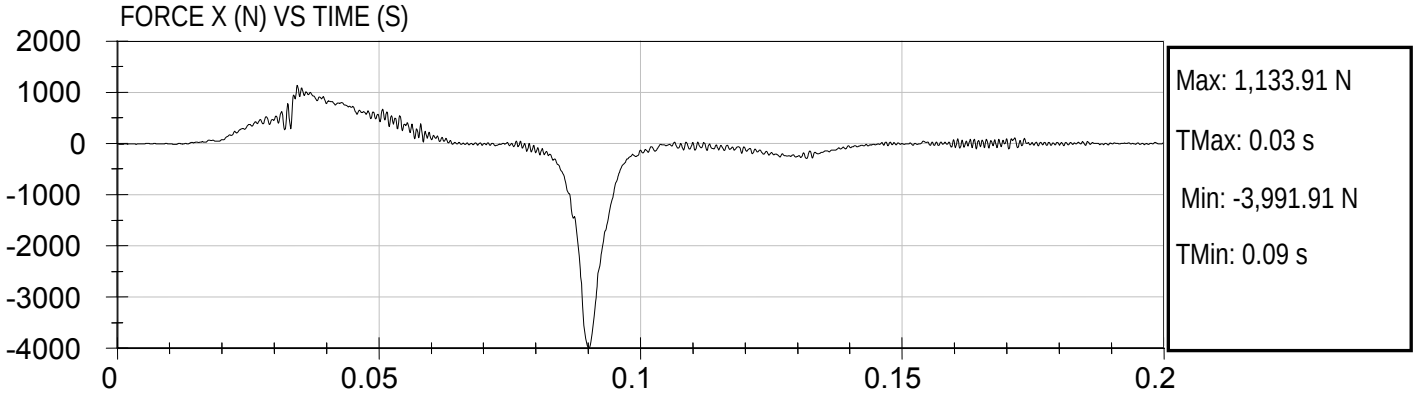
Max: 1,073.20 N
TMax: 0.04 s
Min: -4,658.24 N
TMin: 0.09 s

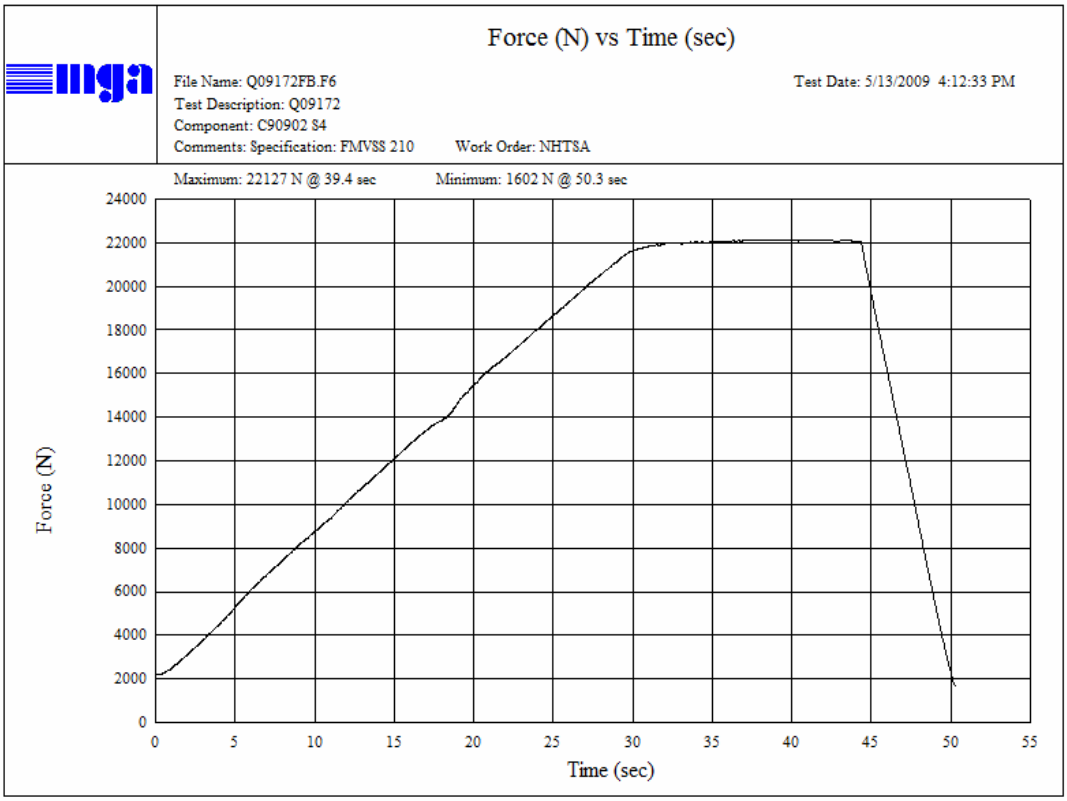
FMVSS 222 KNEE FORM IMPACTS
Component ID: Bluebird Micro Bird
Location: B1 K6

Test Date: 5-4-2009
NHTSA #: C90902

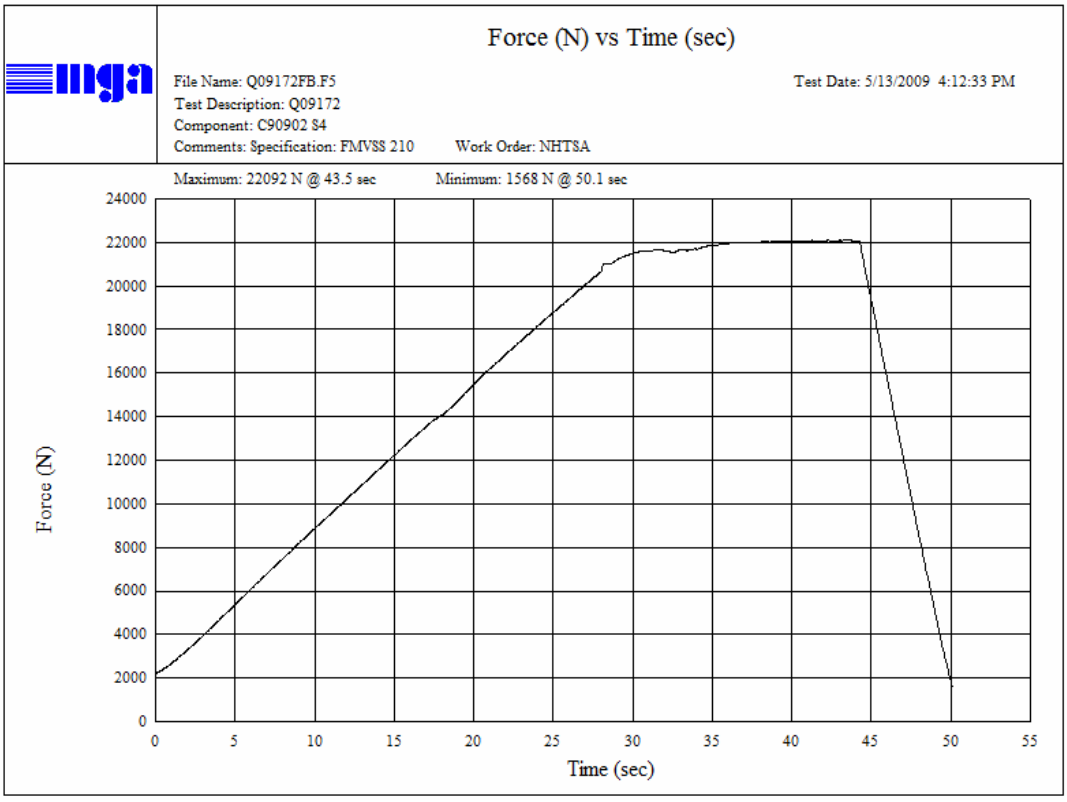








Seat S4 Anchorage Type 1 FMVSS 210

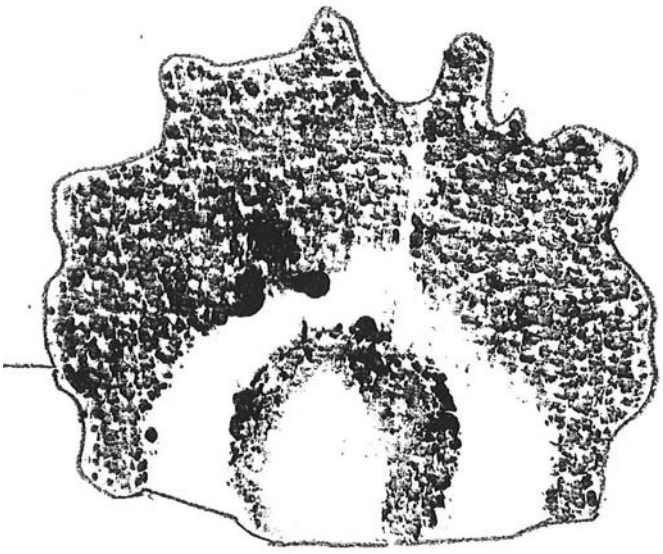


Seat S4 Anchorage Type 1 FMVSS 210

SECTION 7

WELT CONTACT POINTS

H1 / SEAT S1

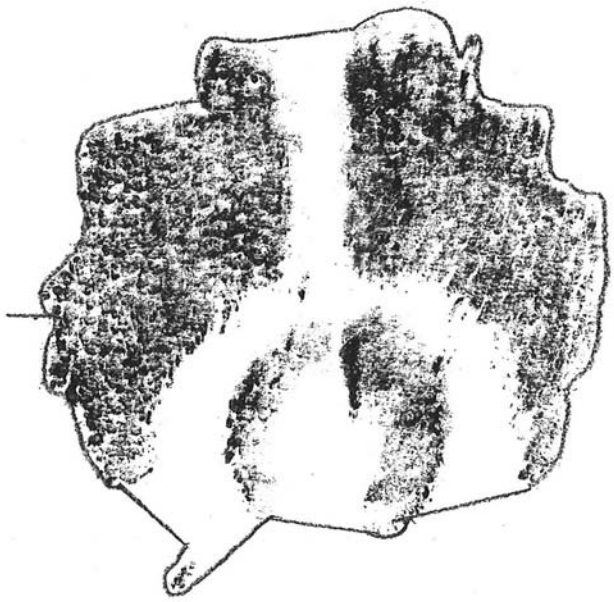


H1 Blue Bird Micro Bird 47.2 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

H2 / SEAT S1

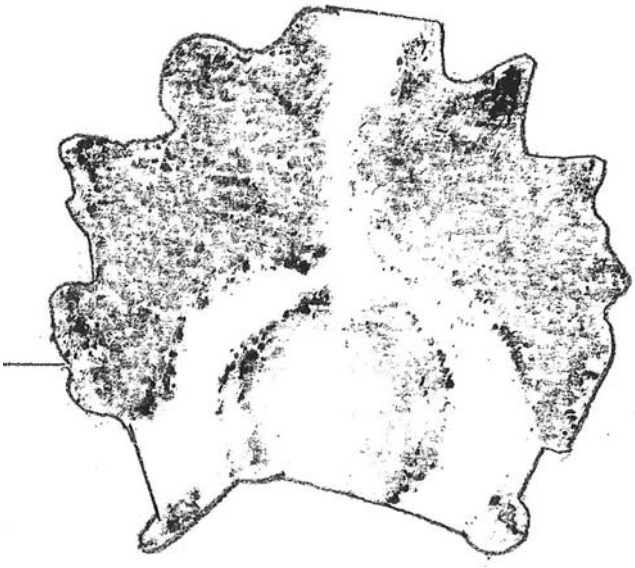


H2 Blue Bird Micro Bird 52.0 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

H3 / SEAT S1

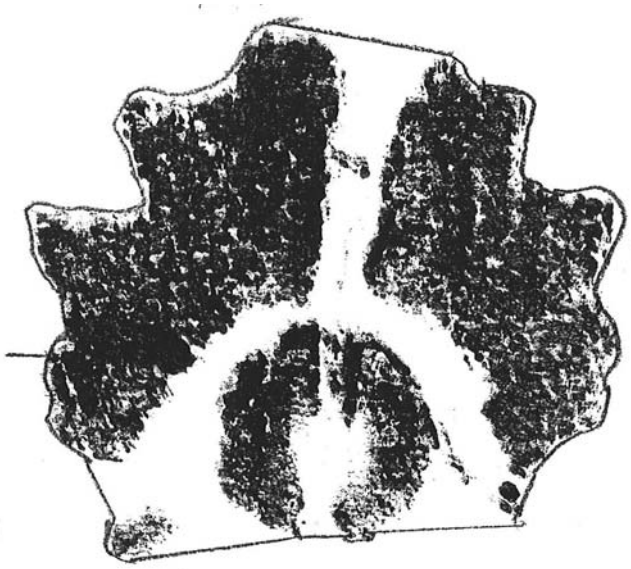


H3 Blue Bird Micro Bird 53.0 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

H4 / SEAT S1

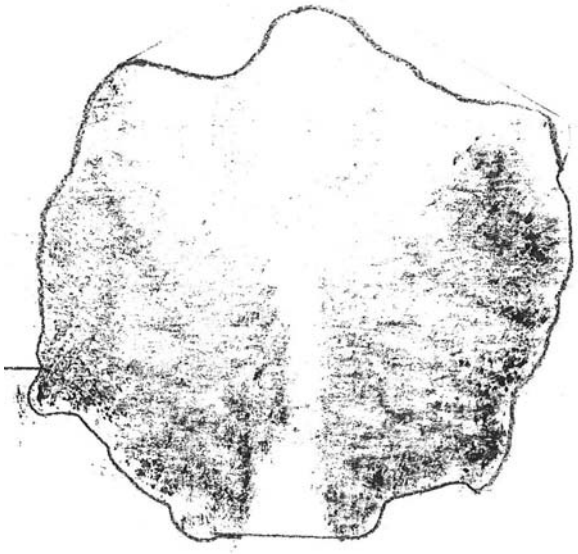


H4 Blue Bird Micro Bird 53.5 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

H5 / SEAT S1

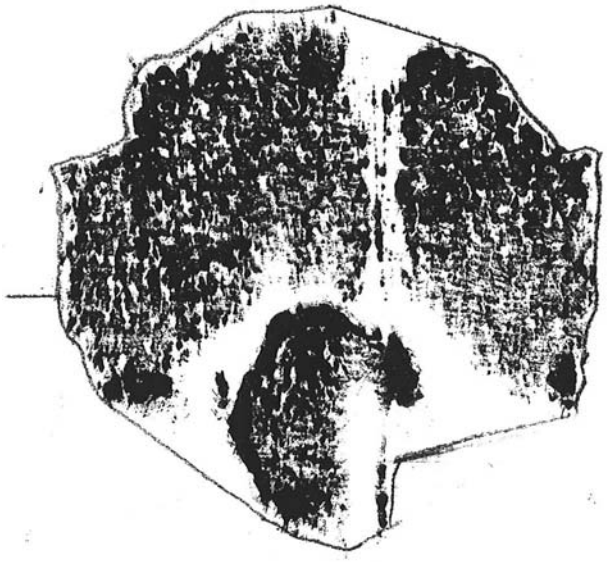


H5 Blue Bird Micro Bird 54.5 cm^2

SECTION 7 (CONTINUED)

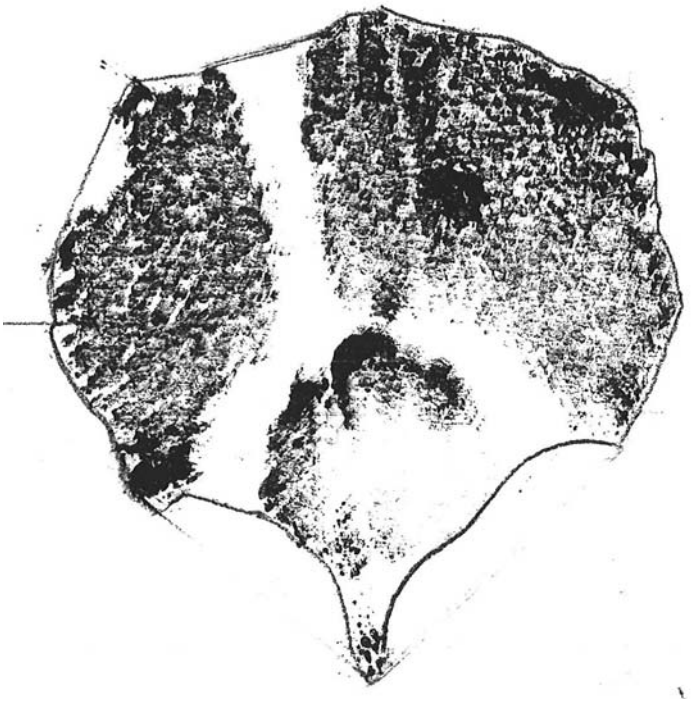
WELT CONTACT POINTS

H6 / SEAT S1



H6 Blue Bird Micro Bird 50.5 cm^2

H7 / SEAT S1

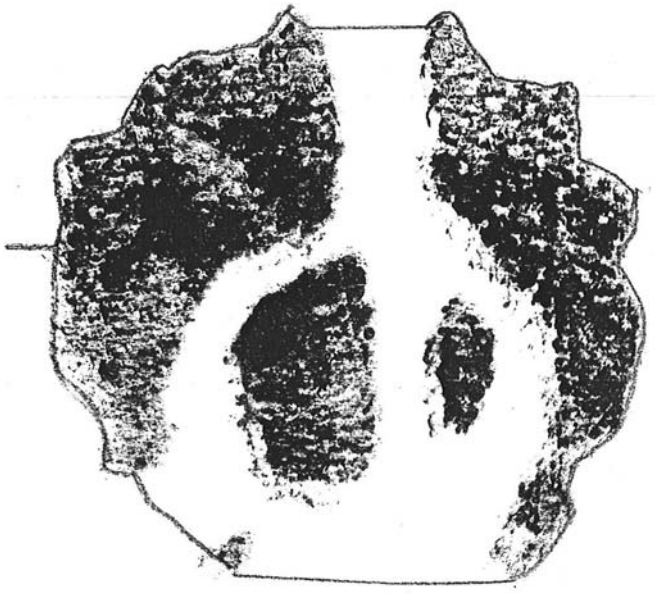


H7 Blue Bird Micro Bird 52.7 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

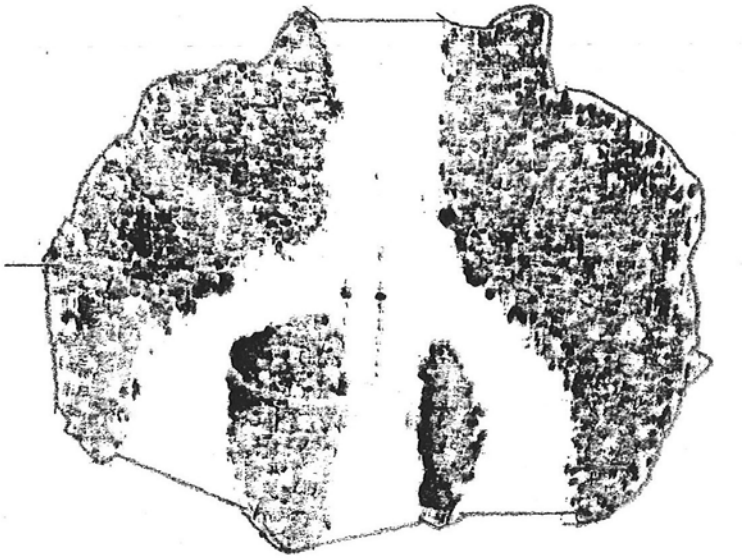
H1 / BARRIER B1



H1 Blue Bird Micro Bird 53.1 cm^2

WELT CONTACT POINTS

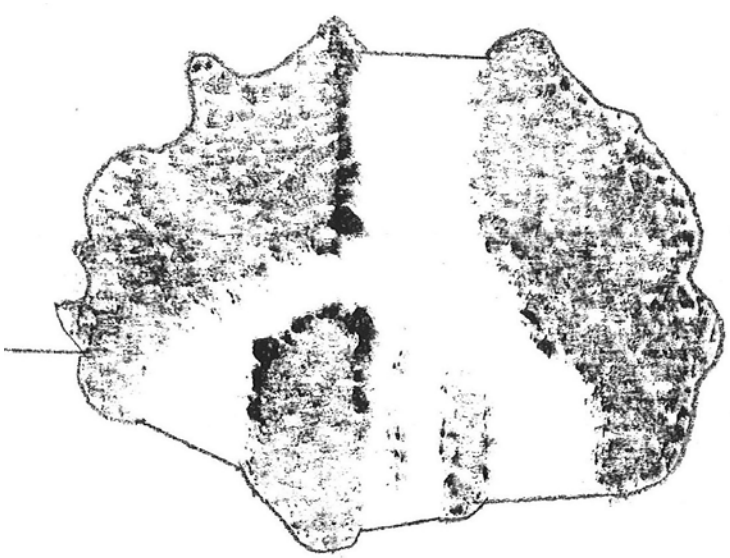
H2 / BARRIER B1



H2 Blue Bird Micro Bird 44.7 cm^2

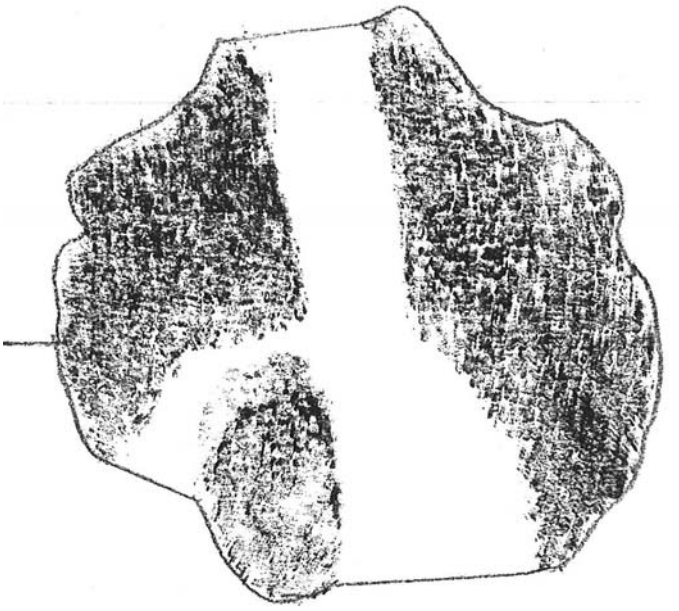
WELT CONTACT POINTS

H3 / BARRIER B1



H3 Blue Bird Micro Bird 39.5 cm^2

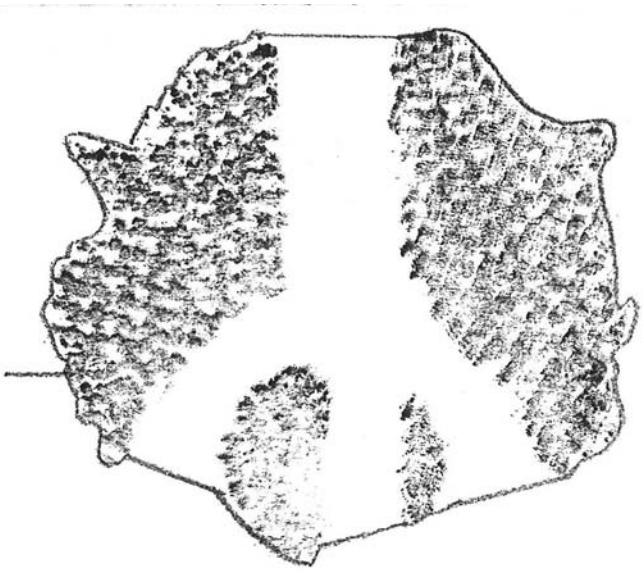
H4 / BARRIER B1



H4 Blue Bird Micro Bird 51.6 cm^2

WELT CONTACT POINTS

H5 / BARRIER B1

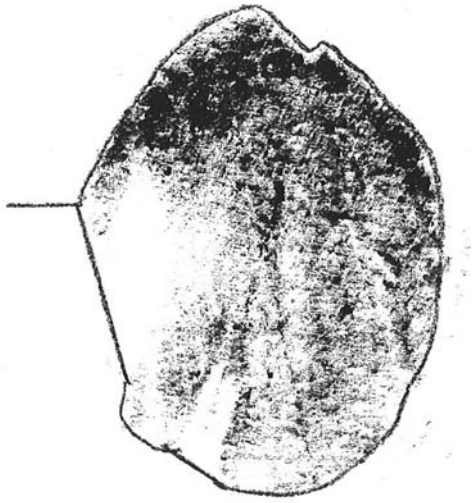


H5 Blue Bird Micro Bird 46.1 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

K1 / SEAT S1

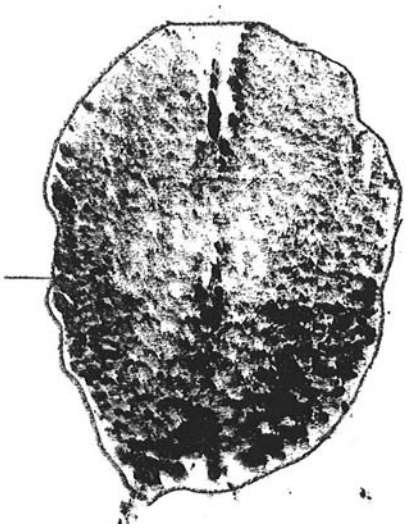


K1 Blue Bird Micro Bird 28.7 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

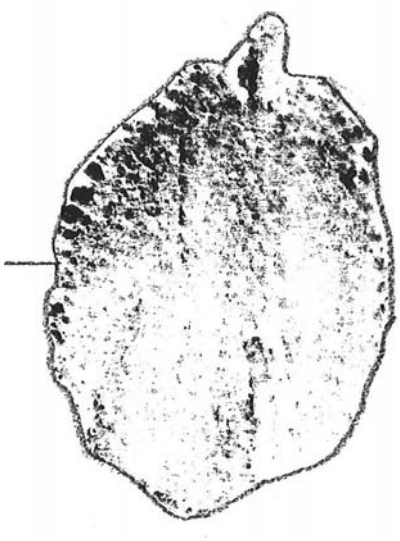
K2 / SEAT S1



K2 Blue Bird Micro Bird 29.9 cm^2

WELT CONTACT POINTS

K3 / SEAT S1

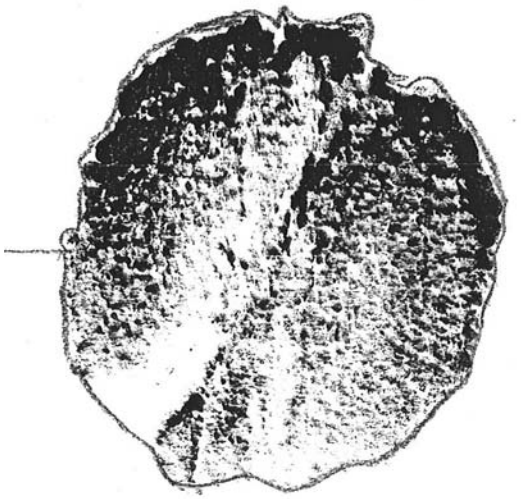


K3 Blue Bird Micro Bird 29.4 cm^2

K4 / SEAT S1

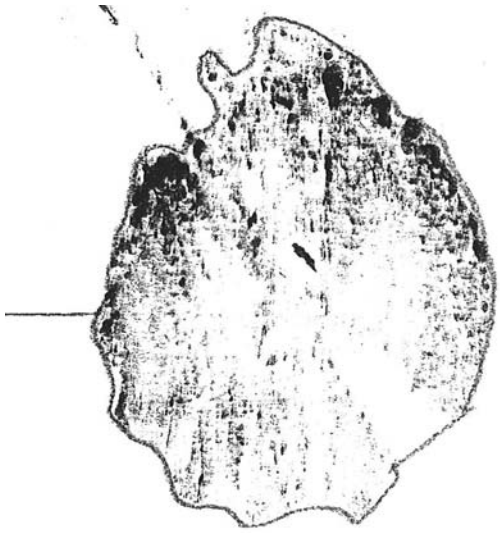
K4 Blue Bird Micro Bird 31.9 cm^2

K1 / BARRIER B1



K1 Blue Bird Micro Bird 34.5 cm^2

K2 / BARRIER B1

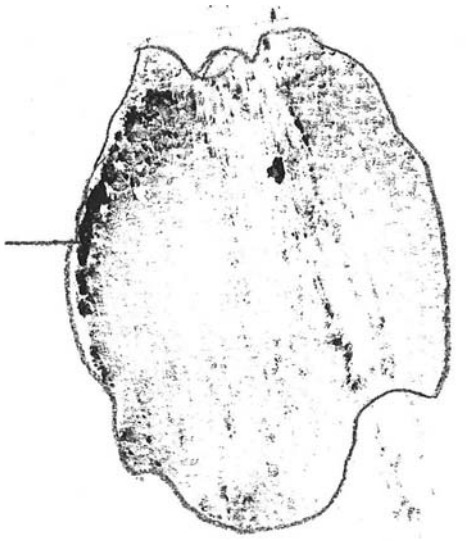


K2 Blue Bird Micro Bird 32.0 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

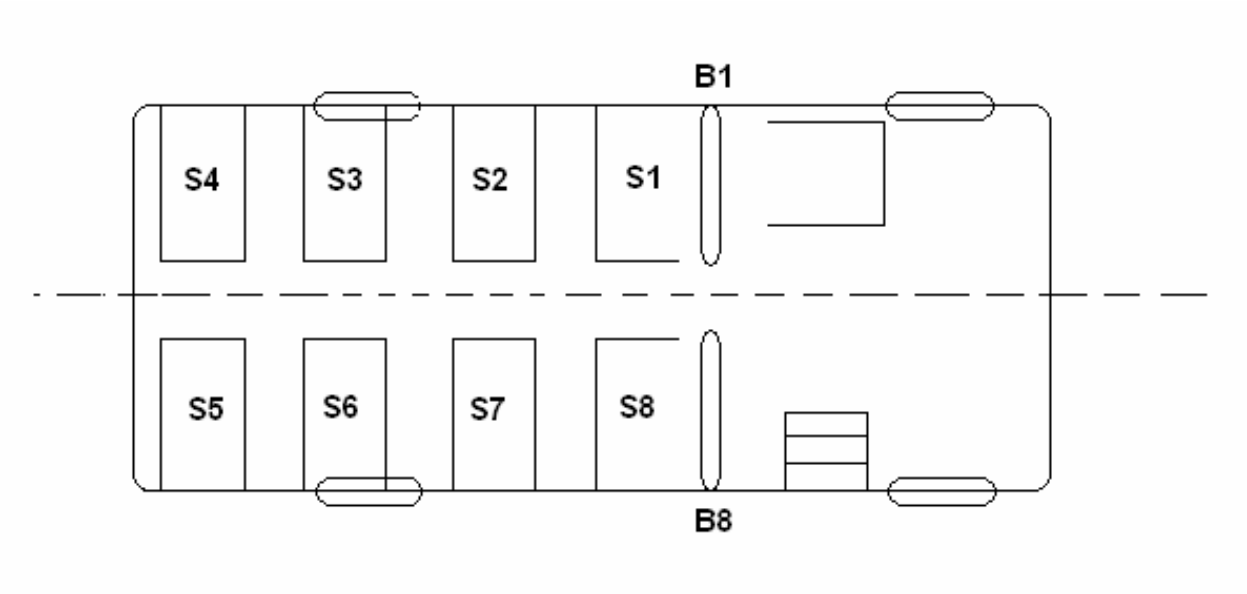
K3 / BARRIER B1



K3 Blue Bird Micro Bird 31.1 cm^2

SECTION 8

BUS FLOOR PLAN



SECTION 9

LABORATORY NOTICE OF TEST FAILURE

LABORATORY NOTICE OF TEST FAILURE TO OVSC

Test Procedure:	FMVSS 222	Test Date:	May 4, 2009
Test Vehicle:	Bluebird Micro bird	Test Lab:	MGA Research Corp.
NHTSA No.:	C90902	Project Engineer:	Eric Peschman
Contract No.:	DTNH22-08-D-00075	Delivery Order No.:	1
MFR.:	Bluebird Body Company	VIN:	1FDDE35L19DA17396
Build Date:	10/08		

TEST FAILURE DESCRIPTION

During the Knee Impact test, the B1 barrier failed to provide the minimum resistive force at impact location K5 as required by S5.3.2.2. A repeat test at location K6 was performed with similar results.

FMVSS REQUIREMENTS DESCRIPTION

Paragraph S5.3.2.2: Leg Protection zone, "When any point on the rear surface of that part of a seat back or restraining barrier within any zone specified in S5.3.2.1 is impacted from any direction at 4.9 m/s by the knee form specified in S6.7, the resisting force of the impacted material shall not exceed 2,669 N and the contact area on the knee form surface shall not be less than 1,935 mm^2."

Remarks: No remarks.

Notification to NHTSA (COTR): Lawrence Valvo

Date: May 4, 2009

By: _____