

REPORT NUMBER: 217-MGA-2009-004

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 217
SCHOOL BUS EMERGENCY EXITS AND WINDOW
RETENTION AND RELEASE**

**COLLINS BUS CORPORATION
2008 COLLINS GRAND BANTAM SCHOOL BUS
NHTSA NO.: C80900**

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



TEST DATES: JUNE 8, 2009 – JUNE 9, 2009

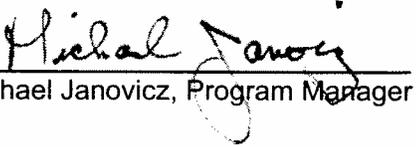
FINAL REPORT DATE: OCTOBER 20, 2010

FINAL REPORT

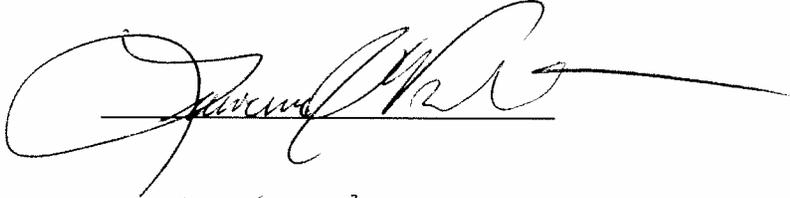
**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NVS-220
1200 NEW JERSEY AVENUE, S.E.
WASHINGTON, D.C. 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:  Date: June 26, 2009
Eric Peschman, Project Engineer

Reviewed by:  Date: June 26, 2009
Michael Janovicz, Program Manager

Final Report Accepted By:


10/20/2010
Date of Acceptance

Technical Report Documentation Page

1. Report No. 217-MGA-2009-004		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 217 Compliance Testing of 2008 Collins Grand Bantam School Bus NHTSA No.: C80900				5. Report Date October 20, 2010	
				6. Performing Organization Code MGA	
7. Author(s) Eric Peschman, Project Engineer Michael Janovicz, Program Manager				8. Performing Organization Report No. 217-MGA-2009-004	
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-08-D-00075	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance Mail Code: (NVS-220) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590				13. Type of Report and Period Covered Final Report 6/2/09 – 6/26/09	
				14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes					
16. Abstract Compliance tests were conducted on the subject 2008 Collins Grand Bantam School Bus, NHTSA No.: C80900, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-217-06 for the determination of FMVSS 217 compliance. Test failures were as follows: None					
17. Key Words Compliance Testing Safety Engineering FMVSS 217				18. Distribution Statement Copies of this report are available from: NHTSA Technical Information Services (TIS) Mail Code: NPO-411 1200 New Jersey Avenue, S.E. Washington, D.C. 20590 Fax No.: (202) 493-2833 E-mail: tis@dot.gov	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 52	22. Price

TABLE OF CONTENTS

<u>Section</u>		<u>Page No</u>
1	Purpose of Compliance Test	1
2	Test Data Summary	2
	Data Sheet 1 - Test Summary	3
3	Compliance Test Data	4
	Data Sheet 2 - Provision of Emergency Exits	5
	Data Sheet 3 - Emergency Exit Door Operational Requirements	7
	Data Sheet 4 - Emergency Exit Identification and Labeling	8
	Data Sheet 5 - Tape Reflectivity Test	11
	Data Sheet 6 - Force Tests to Unlatch the Emergency Exit	12
	Data Sheet 7 - Force Tests for Open the Emergency Exit	14
	Data Sheet 8 - Emergency Exit Extension	16
	Data Sheet 9 - Window Retention Test	17
4	Instrumentation and Equipment List	20
5	Photographs	21
6	Test Plots	45

SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a MY 2008 Collins Grand Bantam School Bus, NHTSA No.: C80900, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-217-06 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 217, "School Bus Emergency Exits and Window Retention and Release".

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

SECTION 2
TEST DATA SUMMARY

Based on the tests performed, the MY 2008 Collins Grand Bantam School Bus, NHTSA No.: C80900, appeared to meet the requirements of FMVSS 217. See Data Sheet 1 for Test Summary on the following page.

**DATA SHEET 1
TEST SUMMARY**

GENERAL VEHICLE IDENTIFICATION

Model Year/Mfr. /Make/Model:	2008 Collins Grand Bantam	
NHTSA No.:	C80900	
GVWR:	5,579 kg / 12,300 lbs	
Build Date for Bus Chassis:	03/08	
VIN:	1GDJG31K981197124	
Seating Capacity:	(1 Driver, 22 Passengers)	
Type of Bus:	School Bus	
Tire Pressure from tire placard (at capacity):	Front: 448 kPa	Rear: 448 kPa
Odometer Reading:	2295 Miles	

	Pass/Fail
S5.1 WINDOW RETENTION	Pass
S5.2 PROVISION OF EMERGENCY EXITS	Pass
Meets minimum exit provisions	Pass
Meets all other exit requirements	Pass
Meets requirements for additional exits	Pass
S5.2.3.1.A EMERGENCY EXIT DOOR OPERATIONAL REQUIREMENTS	Pass
S5.3 EMERGENCY EXIT RELEASE	Pass
Forces to unlatch the emergency exits	Pass
Forces to open the emergency exits	Pass
S5.4 EMERGENCY EXIT OPENING	Pass
S5.5 EMERGENCY EXIT LABELING AND IDENTIFICATION	Pass
S5.5 TAPE REFLECTIVITY (49CFR 571.131)	Not Tested

COMMENTS: NONE

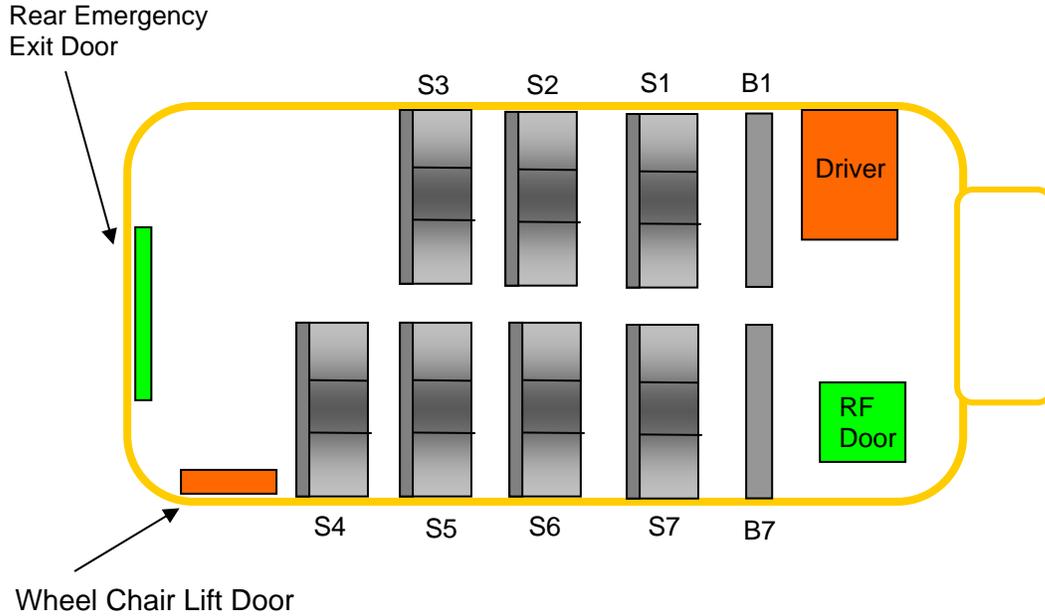
SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2008 Collins Grand Bantam School Bus, NHTSA No.: C80900.

DATA SHEET 2
PROVISION OF EMERGENCY EXITS

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
Test Dates: **06/08/2009 – 06/09/2009**



		Height (mm)	Width (mm)
1	Rear Emergency Window Exit	1369	935

Seating Capacity: 23 (Including Driver)

Requirements (S71.217 S5.2.3.1 (2))	Pass/Fail
No additional exits required for seating capacity of 1-45	Pass

Comments: None

DATA SHEET 2 (CONTINUED)
PROVISION OF EMERGENCY EXITS

	Requirements	Pass/Fail
1	Rear Emergency Door – opens outward and is hinged on the right side (either side, if the bus has a GVWR of 10,000 pounds or less)	Pass
2	Side Emergency Door – hinged on its forward side. No more than one side emergency exit door is located, in whole or in part, within the same post and roof bow panel space.	N/A
3	Rear Push Out Window – provides a minimum opening clearance 41 cm high and 122 cm wide (16" x 48")	N/A
4	Roof Exit – is hinged on its forward side, and operable from both the inside and outside the vehicle	N/A
5	There is an even number of side emergency exit windows on each side of bus.	N/A
6	The bus is not equipped with both sliding and push-out windows, (except for buses equipped with rear push out emergency exit windows).	N/A
7	A right side emergency exit door, if any, is located as near as practicable to the midpoint of the passenger compartment.	N/A

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 3

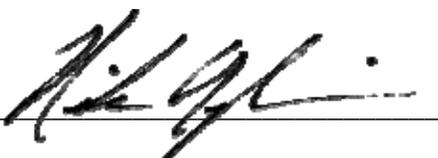
EMERGENCY EXIT DOOR OPERATIONAL REQUIREMENTS

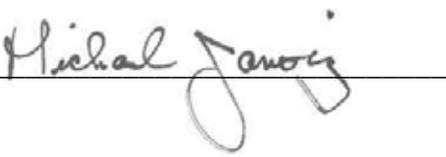
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
Test Dates: **06/08/2009 – 06/09/2009**

	Requirements	Pass/Fail
1	The engine starting system does NOT operate if any Emergency Exit is LOCKED	N/A
2	All Emergency Door and Roof Exits can be released by one person (from inside and outside of bus)	Pass
3	When the Release Mechanism is NOT in the closed position and the vehicle ignition is in the "ON" position, there is a continuous warning sound audible at the Driver's DSP and in the vicinity of the Emergency Door(s) having the unclosed mechanism.	Pass
4	Emergency exit release mechanism does not use remote controls or central power systems	Pass

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 4A

EMERGENCY EXIT IDENTIFICATION AND LABELING

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

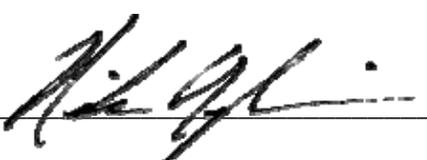
EMERGENCY EXIT LABELING - INTERIOR

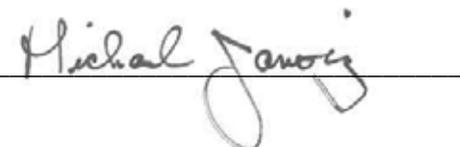
Exit Location	Rear Door
Exit Description	Emergency Door
Letter Height (cm)	5
Background Color	White
Location Inside	Top of Door Window
Pass/Fail	Pass

OPERATING INSTRUCTIONS - INTERIOR

Exit Location	Rear Door
Instructions	1. Lift Handle to Unlatch. 2. Push Door to Open.
Letter Height (cm)	1.1
Letter Color	Red
Background Color	White
Distance From Release (cm)	5
Reflective Tape Color	N/A
Reflective Tape Width (cm)	N/A
Pass/Fail	Pass

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 4B

EMERGENCY EXIT IDENTIFICATION AND LABELING

Test Vehicle: 2008 COLLINS GRAND BANTAM SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: C80900
Test Dates: 06/08/2009 – 06/09/2009

EMERGENCY EXIT LABELING - EXTERIOR

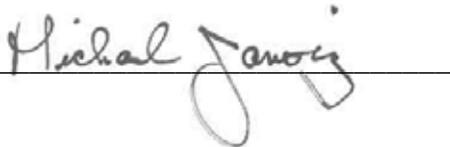
Exit Location	Rear Door
Exit Description	Emergency Door
Letter Height (cm)	5
Background Color	Yellow
Location Outside	Top of Door
Pass/Fail	Pass

OPERATING INSTRUCTIONS - EXTERIOR

Exit Location	Rear Door
Instructions	None
Letter Height (cm)	N/A
Letter Color	N/A
Background Color	Yellow
Distance From Release (cm)	2
Reflective Tape Color	Yellow
Reflective Tape Width (cm)	2.5
Pass/Fail	Pass

Comments: None

Recorded By: 

Approved By: 

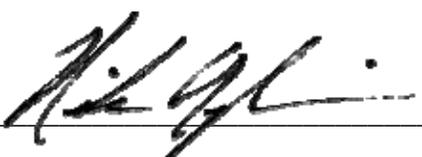
Date: 6/26/2009

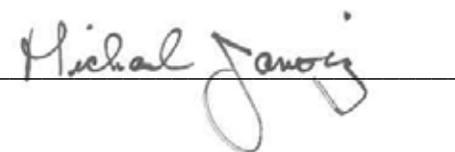
DATA SHEET 4 (CONTINUED)
EMERGENCY EXIT IDENTIFICATION AND LABELING

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS** NHTSA No.: **C80900**
 Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **06/08/2009 – 06/09/2009**

	Requirements	Pass/Fail
1	Each required Emergency Exit is labeled with the words "Emergency Exit" or "Emergency Door" as appropriate in letters at least 5 cm high (2") of a color that contrasts with its background.	Pass
2	Emergency Doors – The designation "Emergency Exit" or "Emergency Door" is located at the top of, or directly above the exit door on both inside and outside surfaces of the bus.	Pass
3	Roof Exits – The designation for roof exits is located on an inside surface of the exit, or within 30 cm (11.8") of the roof exit opening.	N/A
4	Emergency Window Exits – The designation is located at the top of, or directly above, or at the bottom of the emergency window exit on both the inside and outside surfaces of the bus.	N/A
5	Exit Operating Instructions indicate all motions required to unlatch and open the exit, in letters at least 1 cm (.39") high and of a color that contrast with its background and shall be located within 15 cm (5.9") of the release mechanism on the inside surface of the bus.	Pass
6	Each required Emergency Exit opening is outlined around its perimeter with a 2.5 cm (1") wide retroreflective tape of red, white, or yellow color.	Pass

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 5
TAPE RELECTIVITY TEST

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS** NHTSA No.: **C80900**
 Test Lab: **MGA RESEARCH CORPORATION** Test Dates: **06/08/2009 – 06/09/2009**

- _____ Color of retroreflective tape (white, red, or yellow)
- _____ Glass bead retroreflective element material – Fill in Part A
- _____ Prismatic retroreflective element material – Fill in Part B

SPECIFIC INTENSITY PER UNIT AREA
(Candela Per Foot Candle Per Square Foot)

Observation Angle	Entrance Angle	Min. Reqd. Intensity	Recorded Intensity	Pass/Fail
Part A – Glass Bead				
Part B - Prismatic				

This section of tape passes the REFLECTIVITY requirement. Yes___ No___

Comments: **Tape Reflectivity Test Not Performed**

Recorded By: _____

Approved By: _____

Date:

DATA SHEET 6A

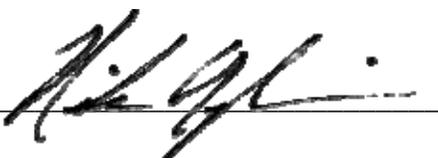
FORCE TESTS TO UNLATCH THE EMERGENCY EXITS - INTERIOR

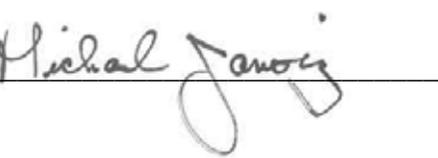
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Release Exit	Actual Motion(s) to Release Exit	Pass/Fail
Rear Door	Exit Door	High	178	1. 23.4	Lift Handle to unlatch	Lift/Rotate Handle to Unlatch	Pass
				2. 23.9			
				3. 22.7			
				Average: 23.3			

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 6B

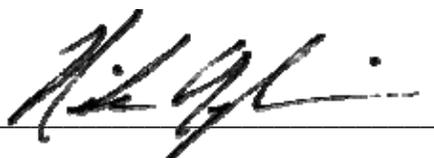
FORCE TESTS TO UNLATCH THE EMERGENCY EXITS - EXTERIOR

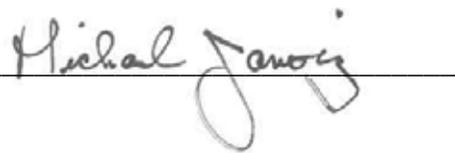
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Release Exit	Actual Motion(s) to Release Exit	Pass/Fail
Rear Door	Exit Door	High	178	1. 131.2	Manufacturer's Discretion	Turn Handle Counter Clock Wise	Pass
				2. 135.9			
				3. 102.7			
				Average: 123.3			

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 7A

FORCE TESTS TO OPEN THE EMERGENCY EXITS - INTERIOR

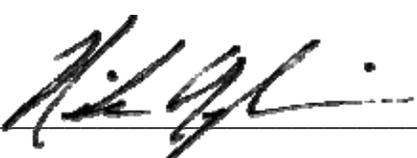
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

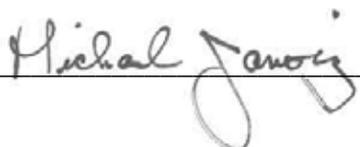
NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Open Exit	Actual Motion(s) to Open Exit	Passage of Ellipsoid or Parallelepiped	Pass/Fail
Rear Door	Exit Door	High	178	1. 13.0	Push Door to Open	Push to Open	114x61x30 Parallelepiped	Pass
				2. 10.8				
				3. 14.9				
				Average: 12.9				

Describe in the comments section if more than one force and motion are required to unlatch the exit.

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 7B

FORCE TESTS TO OPEN THE EMERGENCY EXITS - EXTERIOR

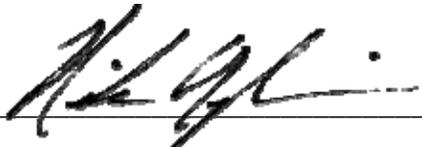
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

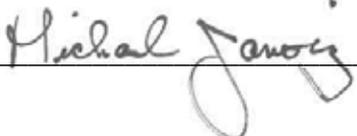
NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

Exit Location	Exit Description	High/Low Force Area	Maximum Force Requirement Newtons	Actual Force Measured (N)	Motion(s) required to Open Exit	Actual Motion(s) to Open Exit	Passage of Ellipsoid or Parallelepiped	Pass/Fail
Rear Door	Exit Door	High	178	4. 11.4	Pull to Open	Pull to Open	114x61x30 Parallelepiped	Pass
				5. 13.0				
				6. 12.7				
				Average: 12.4				

Describe in the comments section if more than one force and motion are required to unlatch the exit.

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

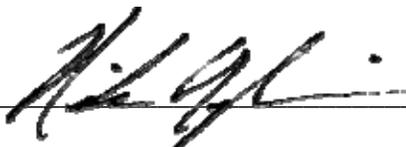
DATA SHEET 8
EMERGENCY EXIT EXTENSION

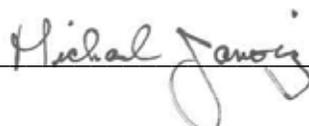
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
Test Dates: **06/08/2009 – 06/09/2009**

	Requirements	Pass/Fail
1	Exit(s) can be extended by a single person.	Pass
2	Each emergency exit door is equipped with a positive door opening device that meets the requirements (outlined in Section S5.4.1 (3) of FMVSS 217).	Pass
3	There is a 30 cm (11.81") wide clear aisle space for each side emergency door exit.	N/A
4	For flip-up seat adjacent to the side emergency door exit it automatically assumes and retain a vertical position when not in use, so that no portion of the seat bottom is within the 30 cm (11.81") aisle clearance space	N/A
5	There is no seat or barrier which extend past the side door opening	N/A
6	There is no obstruction of door latch mechanism for the rear emergency door.	N/A

Comments: None

Recorded By:  _____

Approved By:  _____

Date: 6/26/2009

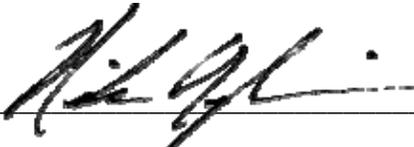
DATA SHEET 9
WINDOW RETENTION TEST

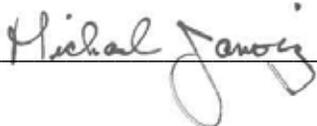
Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
Test Dates: **06/08/2009 – 06/09/2009**

1	Test Window Identification:	Rear Exit Door Upper Window		
2	Provide a detailed description of the window such as fixed, push out, single or double glazed, horizontal or vertical sliding, etc.	Single Glazed Fixed		
3	Provide the horizontal and vertical glazing dimensions for each panel.	880 mm X 555 mm		
4	Did the window pass the retention requirements? Describe how the window structure and glazing withstood the force per the PASS/FAIL criteria:	Window Blow Out at 1550 N PASS		
5	Did the window pass the force tests to unlatch and open the exit after the completion of the retention test?	Unlatch Force Measured (N)	Open Force Measured (N)	Pass/ Fail
		1. 20.1	1. 12.2	Pass
		2. 20.4	2. 10.8	Pass
		3. 19.8	3. 10.7	Pass

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 9 (CONTINUED)

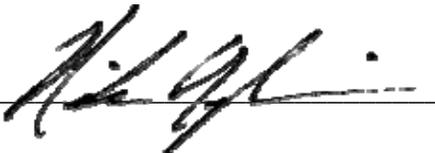
WINDOW RETENTION TEST

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

1	Test Window Identification:	Side Window (Rear Left) Bottom Half		
2	Provide a detailed description of the window such as fixed, push out, single or double glazed, horizontal or vertical sliding, etc.	Single Glaze Vertical Sliding		
3	Provide the horizontal and vertical glazing dimensions for each panel.	665 mm X 317 mm		
4	Did the window pass the retention requirements? Describe how the window structure and glazing withstood the force per the PASS/FAIL criteria:	Max Displacement was Reached PASS		
5	Did the window pass the force tests to unlatch and open the exit after the completion of the retention test?	Unlatch Force Measured (N)	Open Force Measured (N)	Pass/ Fail
		1. N/A	1. N/A	N/A
		2. N/A	2. N/A	N/A
		3. N/A	3. N/A	N/A

Comments: See section 5, page 44, photo number 23. Window bowed away from frame, passed 4" sphere check.

Recorded By: 

Approved By: 

Date: 6/26/2009

DATA SHEET 9 (CONTINUED)
WINDOW RETENTION TEST

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
 Test Dates: **06/08/2009 – 06/09/2009**

1	Test Window Identification:	Side Window (Rear Left) Top Half		
2	Provide a detailed description of the window such as fixed, push out, single or double glazed, horizontal or vertical sliding, etc.	Single Glaze Vertical Sliding		
3	Provide the horizontal and vertical glazing dimensions for each panel.	665 mm X 317 mm		
4	Did the window pass the retention requirements? Describe how the window structure and glazing withstood the force per the PASS/FAIL criteria:	Max Displacement was Reached PASS		
5	Did the window pass the force tests to unlatch and open the exit after the completion of the retention test?	Unlatch Force Measured (N)	Open Force Measured (N)	Pass/ Fail
		1. N/A	1. N/A	N/A
		2. N/A	2. N/A	N/A
		3. N/A	3. N/A	N/A

Comments: None

Recorded By: 

Approved By: 

Date: 6/26/2009

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2008 COLLINS GRAND BANTAM SCHOOL BUS**
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C80900**
Test Dates: **06/08/2009 – 06/09/2009**

Equipment	Description	Model/Serial No.	Cal. Date	Next Cal. Date
Load Cell	Interface	137778A	05/08/09	11/08/09
Inclinometer	Digital Protractor	Pro 360 / Comp Lab	05/13/09	11/13/09
Linear Potentiometer	Ametek	P-40A-HT / 0504-21782	02/06/09	08/06/09
Digital Calipers	Mitutoyo	CD-6" csx/0004174	01/07/09	07/07/09
Steel Tape	Stanley	Powerlock / 428	04/09/09	10/09/09
Ellipsoid	MGA	ELLIP – 1A	When Used	When Used
Parallelepiped	MGA	PARA – 1A	When Used	When Used
Force Gauge	Wagner	2668	01/08/09	07/08/09

SECTION 5
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>No.</u>		<u>Page No.</u>
1	Exterior Front View of School Bus	22
2	Exterior Left Front $\frac{3}{4}$ View of School Bus	23
3	Exterior Right Front $\frac{3}{4}$ View of School Bus	24
4	Exterior Left Side View of School Bus	25
5	Exterior Right Side View of School Bus	26
6	Exterior Left Rear $\frac{3}{4}$ View of School Bus	27
7	Exterior Right Rear $\frac{3}{4}$ View of School Bus	28
8	Exterior Rear View of School Bus	29
9	Certification Label and Tire Placard	30
10	Vehicle Information Label	31
11	Interior Front to Rear View Depicting Seating Arrangement	32
12	Interior Rear to Front View Depicting Seating Arrangement	33
13	Exterior View of Rear Emergency Exit Door	34
14	Interior View of Rear Emergency Exit Door	35
15	Interior View of Rear Emergency Exit Door Instructions	36
16	Rear Emergency Exit Door Parallelepiped Clearance	37
17	Loading Fixture	38
18	Retention Test of Rear Exit Door, Upper Window (Pre-Test)	39
19	Retention Test of Rear Exit Door, Upper Window (Post-Test)	40
20	Retention Test of Left Side Window, Upper Half (Pre-Test)	41
21	Retention Test of Left Side Window, Upper Half (Post-Test)	42
22	Retention Test of Left Side Window, Lower Half (Pre-Test)	43
23	Retention Test of Left Side Window, Lower Half (Post-Test)	44

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Exterior Front View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Exterior Left Front 3/4 View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Exterior Right Front ¾ View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Exterior Left Side View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Exterior Right Side View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus **NHTSA No.:** C80900
Procedure: FMVSS 217 **Test Dates:** 6/8/09-6/9/09



Exterior Left Rear ¾ View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Exterior Right Rear 3/4 View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Exterior Rear View of School Bus

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
 Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Certification Label and Tire Placard

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Vehicle Information Label

Test Vehicle: 2008 Collins Grand Bantam School Bus C80900
Procedure: FMVSS 217 NHTSA No.:
Test Dates: 6/8/09-6/9/09



Interior Front to Rear View Depicting Seating Arrangement

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Interior Rear to Front View Depicting Seating Arrangement

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Exterior View of Rear Emergency Exit Door

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Interior View of Rear Emergency Exit Door

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Interior View of Rear Emergency Exit Door Instructions

Test Vehicle: 2008 Collins Grand Bantam School Bus NHTSA No.: C80900
Procedure: FMVSS 217 Test Dates: 6/8/09-6/9/09



Rear Emergency Exit Door Parallelepiped Clearance

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Loading Fixture

Test Vehicle: 2008 Collins Grand Bantam School Bus C80900
Procedure: FMVSS 217 NHTSA No.:
Test Dates: 6/8/09-6/9/09



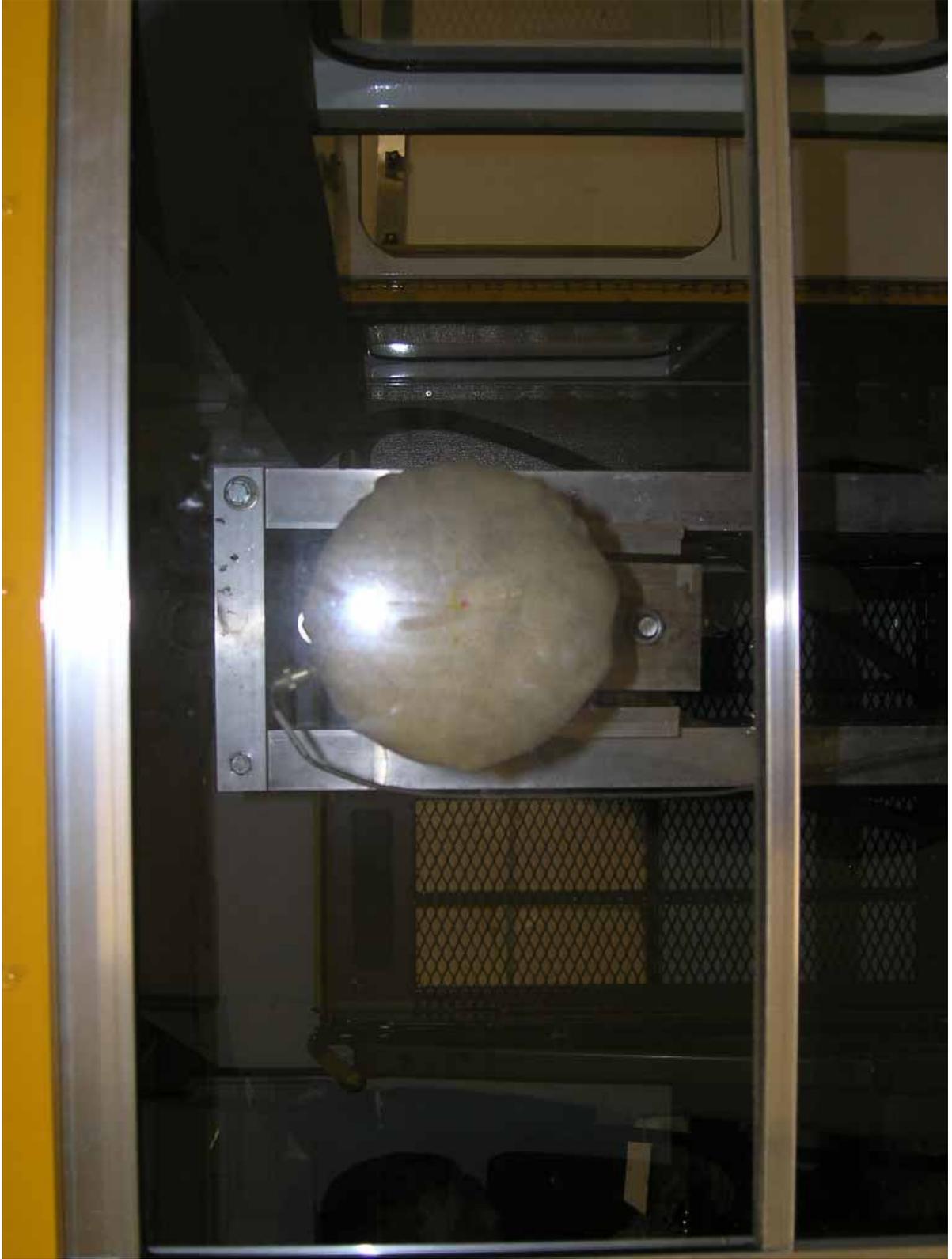
Retention Test of Rear Exit Door, Upper Window (Pre-Test)

Test Vehicle: 2008 Collins Grand Bantam School Bus C80900
Procedure: FMVSS 217 NHTSA No.:
Test Dates: 6/8/09-6/9/09



Retention Test of Rear Exit Door, Upper Window (Post-Test)

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Retention Test of Left Side Window, Upper Half (Pre-Test)

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Retention Test of Left Side Window, Upper Half (Post-Test)

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Retention Test of Left Side Window, Lower Half (Pre-Test)

Test Vehicle: 2008 Collins Grand Bantam School Bus
Procedure: FMVSS 217
NHTSA No.: C80900
Test Dates: 6/8/09-6/9/09



Retention Test of Left Side Window, Lower Half (Post-Test)

SECTION 6
TEST PLOTS

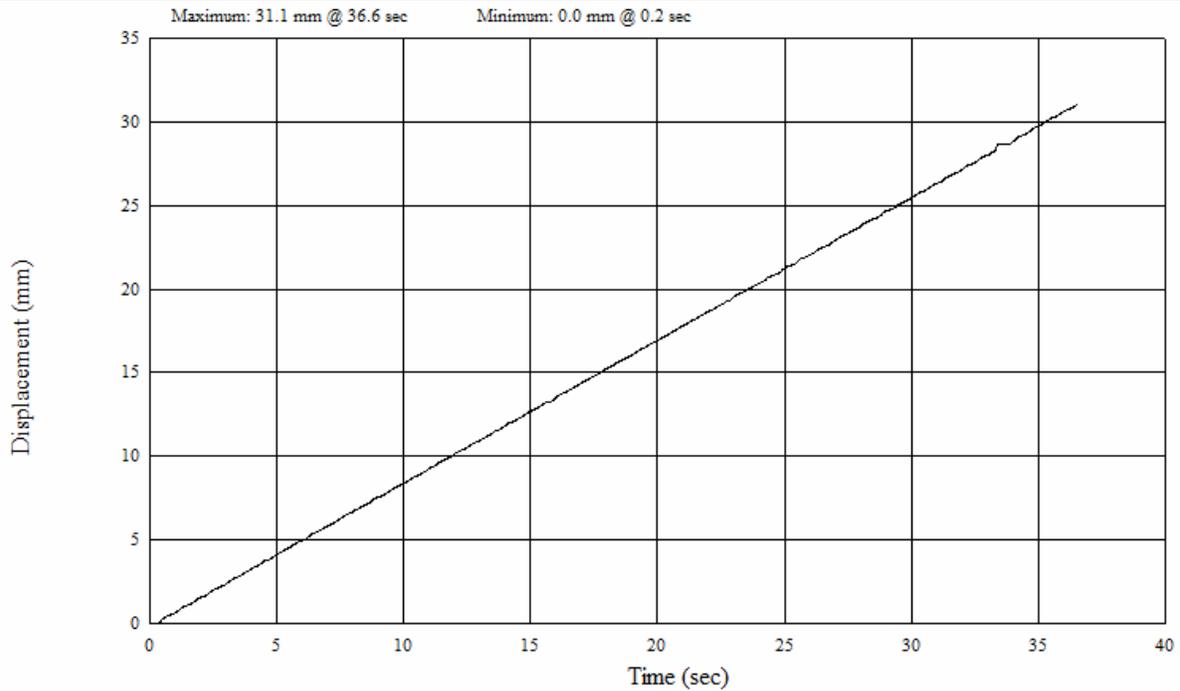
<u>No.</u>		<u>Page No.</u>
1	Rear Exit Door, Upper Window Displacement vs. Time	46
2	Rear Exit Door, Upper Window Force vs. Time	47
3	Left Side Window (Upper Half) Displacement vs. Time	48
4	Left Side Window (Upper Half) Force vs. Time	49
5	Left Side Window (Lower Half) Displacement vs. Time	50
6	Left Side Window (Lower Half) Force vs. Time	51



Displacement (mm) vs Time (sec)

File Name: Q09190DR.D7
Test Description: Q09190
Component: C80900 Rear Emergency Exit W1
Comments: Specification: FMVSS 217 Work Order: NHTSA

Test Date: 6/8/2009 2:35:10 PM



Force (N) vs Time (sec)

File Name: Q09190FR.F7
Test Description: Q09190
Component: C80900 Rear Emergency Exit W1
Comments: Specification: FMVSS 217 Work Order: NHTSA

Test Date: 6/8/2009 2:35:10 PM





Displacement (mm) vs Time (sec)

File Name: Q09191DR.D7

Test Date: 6/9/2009 11:23:07 AM

Test Description: Q09191

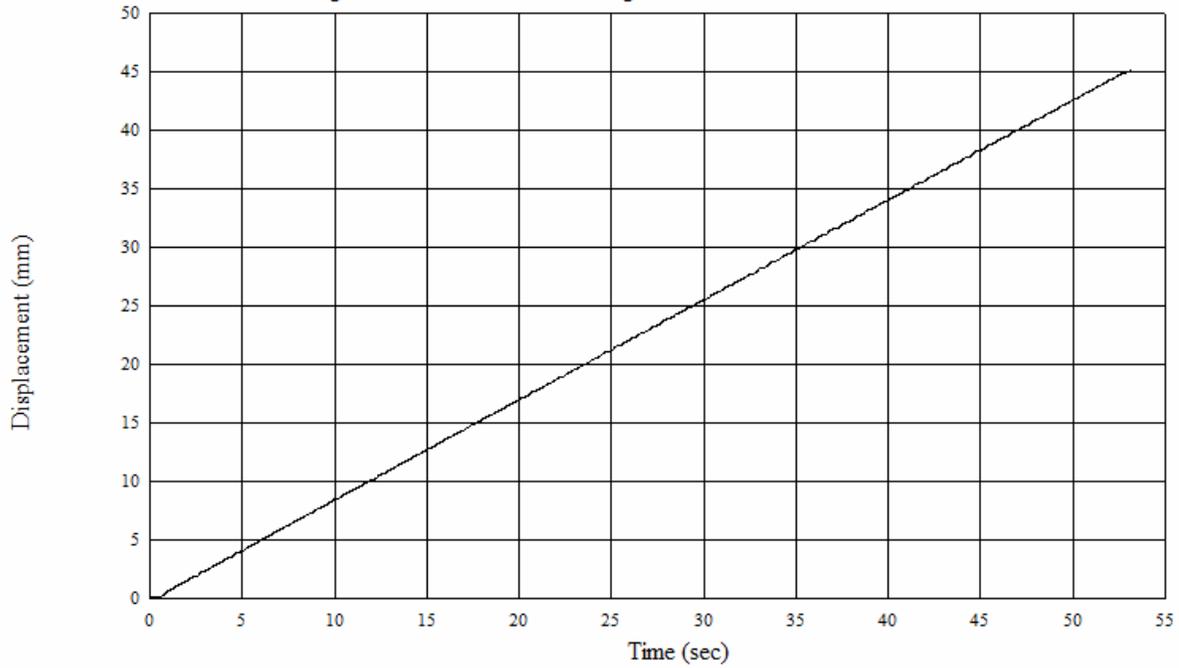
Component: Window Retention Upper Side Window

Comments: C80900 Collins Bantam

Specification: FMVSS 217

Work Order: NHTSA

Maximum: 45.1 mm @ 53.1 sec Minimum: 0.1 mm @ 0.2 sec



Force (N) vs Time (sec)

File Name: Q09191FR.F7

Test Date: 6/9/2009 11:23:07 AM

Test Description: Q09191

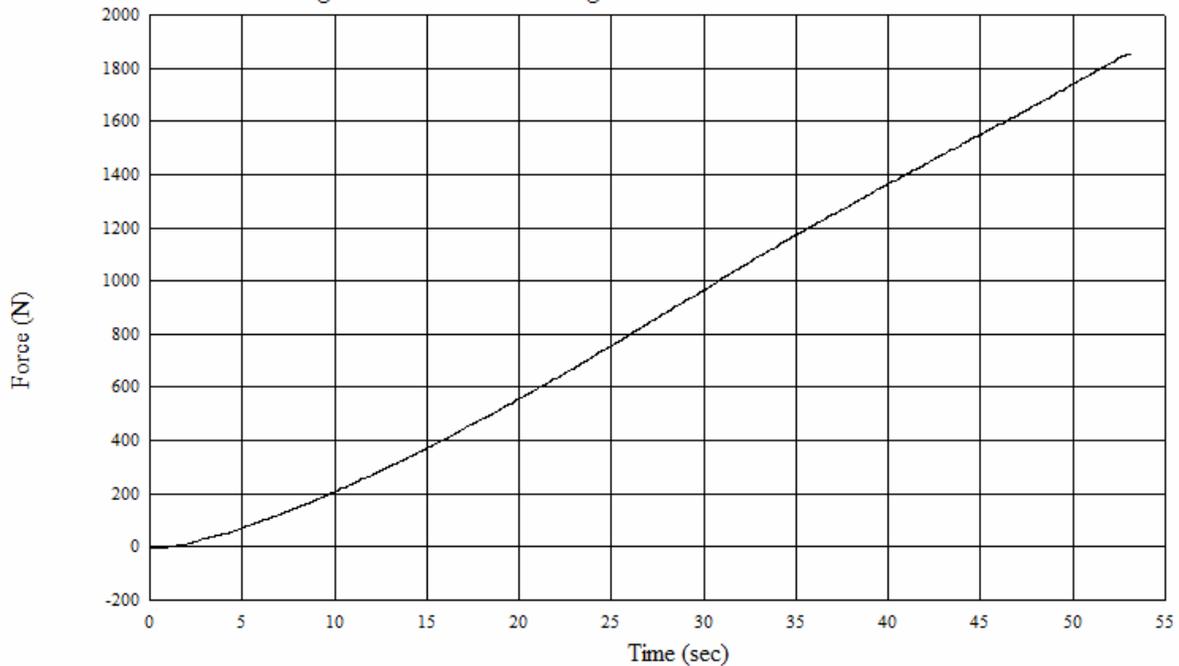
Component: Window Retention Upper Side Window

Comments: C80900 Collins Bantam

Specification: FMVSS 217

Work Order: NHTSA

Maximum: 1853 N @ 53.1 sec Minimum: -5 N @ 0.2 sec





Displacement (mm) vs Time (sec)

File Name: Q09192DR.D7

Test Date: 6/9/2009 1:40:07 PM

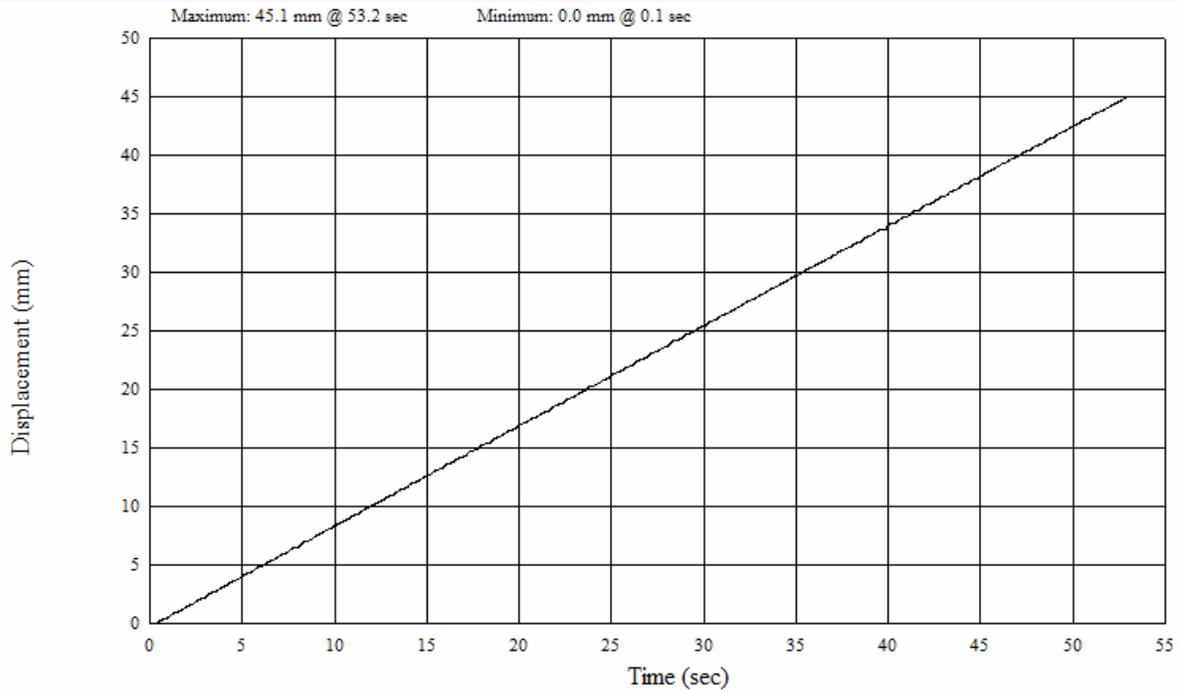
Test Description: Q09192

Component: Window Retention Lower Side Window

Comments: C80900 Collins Bantam

Specification: FMVSS 217

Work Order: NHTSA



Force (N) vs Time (sec)

File Name: Q09192FR.F7

Test Date: 6/9/2009 1:40:07 PM

Test Description: Q09192

Component: Window Retention Lower Side Window

Comments: C80900 Collins Bantam

Specification: FMVSS 217

Work Order: NHTSA

