REPORT NUMBER: 111SB-MGA-2011-004

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 111SB SCHOOL BUS REARVIEW MIRRORS

2010 STARTRANS MFSAB SCHOOL BUS
NHTSA NO.: CA0900

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

TEST DATES: JULY 25, 2011 – AUGUST 11, 2011

FINAL REPORT DATE: AUGUST 15, 2011

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: August 11, 2011
Eric Peschman, Project Engineer

Reviewed by: _____ Date: August 11, 2011
Michael Janovicz, Program Manager

FINAL REPORT ACCEPTED BY:

_____

8/15/11

Date of Acceptance

Technical Report Documentation Page

1. Report No. 111SB-MGA-2011-004	*2. Government Accession No.*	*3. Recipient's Catalog No.*	
4. Title and Subtitle Final Report of FMVSS 111 Compliance Testing of 2010 StarTrans MFSAB School Bus NHTSA No.: CA0900		*5. Report Date* August 15, 2011 *6. Performing Organization Code* MGA	
7. Author(s) Eric Peschman, Project Engineer Michael Janovicz, Program Manager		*8. Performing Organization Report No.* 111SB-MGA-2011-004	
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 07/25/11 – 08/11/11 *14. Sponsoring Agency Code* NVS-220	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject 2010 StarTrans MFSAB School Bus, NHTSA No.: CA0900, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-111SB-00 for the determination of FMVSS 111 compliance. Test Failure: See Section 2, Test Data Summary. See Section 9, Laboratory Notice of Test Failure.			
17. Key Words Compliance Testing Safety Engineering FMVSS 111		*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* 40	22. Price

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2010 StarTrans MFSAB School Bus, NHTSA No.: CA0900, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedure TP-111SB-00 to determine compliance to the requirements of Federal Motor Vehicle Safety Standard (FMVSS) 111SB, “School Bus Rearview Mirrors.”

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 2010 StarTrans MFSAB School Bus, NHTSA No.: CA0900, does not appear to meet all of the requirements of FMVSS 111SB. The test failures are listed below.

Failure 1

FMVSS 111 Requirement: Paragraph S9.3(c): "Each school bus which has a mirror installed in compliance with S9.3(a) that has an average radius of curvature of less than 889 mm, as determined under S12, shall have a label visible to the seated driver. The label shall be printed in a type face and color that are clear and conspicuous. The label shall state the following: 'USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION.'"

There is no label present and visible to the seated driver in the vehicle as required for buses having system B mirrors with an average radius of curvature of less than 889 mm.

SECTION 3

COMPLIANCE TEST DATA

FMVSS 111SB – SCHOOL BUS REARVIEW MIRRORS

TEST SUMMARY DATA SHEET

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

SYSTEM A MIRRORS

A. DRIVER SIDE MIRROR NO. 3 – UNIT MAGNIFICATION

	Pass/Fail	Comments
Mounting	**PASS**	--
Field of View	**PASS**	--
Surface Area	**PASS**	--
Reflectance	**PASS**	--
Unit Magnification	**PASS**	--

B. PASSENGER SIDE MIRROR NO. 4 – UNIT MAGNIFICATION

	Pass/Fail	Comments
Mounting	**PASS**	--
Field of View	**PASS**	--
Surface Area	**PASS**	--
Reflectance	**PASS**	--
Unit Magnification	**PASS**	--

C. DRIVER SIDE MIRROR NO. 5 – CONVEX

	Pass/Fail	Comments
Mounting	**PASS**	--
Field of View	**PASS**	--
Reflectance	**PASS**	--

D. PASSENGER SIDE MIRROR NO. 6 – CONVEX

	Pass/Fail	Comments
Mounting	**PASS**	--
Field of View	**PASS**	--
Reflectance	**PASS**	--

SECTION 3

COMPLIANCE TEST DATA

FMVSS 111SB – SCHOOL BUS REARVIEW MIRRORS

TEST SUMMARY DATA SHEET

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

SYSTEM B MIRRORS

E. DRIVER SIDE FRONT MIRROR NO. 1 – CROSSVIEW / CONVEX

	Pass/Fail	Comments
Mounting	**PASS**	--
Field of View	**PASS**	--
Overlap with System A	**PASS**	--
Distance to Eye Point	**PASS**	--
No Surface Discontinuities	**PASS**	--
Surface Area	**PASS**	--
If Convex – Radius of Curvature	**PASS**	--
Radius of Curvature Label	**FAIL**	See Section 6
Arc Separation	**PASS**	--
Reflectance	**PASS**	--

F. PASSENGER SIDE FRONT MIRROR NO. 2 – CROSSVIEW / CONVEX

	Pass/Fail	Comments
Mounting	**PASS**	--
Field of View	**PASS**	--
Overlap with System A	**PASS**	--
Distance to Eye Point	**PASS**	--
No Surface Discontinuities	**PASS**	--
Surface Area	**PASS**	--
If Convex – Radius of Curvature	**PASS**	--
Radius of Curvature Label	**FAIL**	See Section 6
Arc Separation	**PASS**	--
Reflectance	**PASS**	--

FMVSS 111SB – DATA SHEET 1

SCHOOL BUS INSPECTION AND IDENTIFICATION

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

GENERAL VEHICLE IDENTIFICATION

School Bus Manufacturer	StarTrans	Date of Mfg.	10/2010
Chassis Manufacturer	General Motors	Date of Mfg.	11/2009
GVWR (kg)	6,441	GAWR Front (kg)	2,087
VIN	1GB9G5AG4A1118869	GAWR Rear (kg)	4,354

DESCRIPTION OF MIRRORS

Mirror No.	Type			Description	Manufacturer
	Unit Mag.	Convex	Cross View		
1		X	X	Driver Side	Rosco Mirror
2		X	X	Passenger Side	
3	X			Driver Side	
4	X			Passenger Side	
5		X		Driver Side	
6		X		Passenger Side	

Recorded By: _____

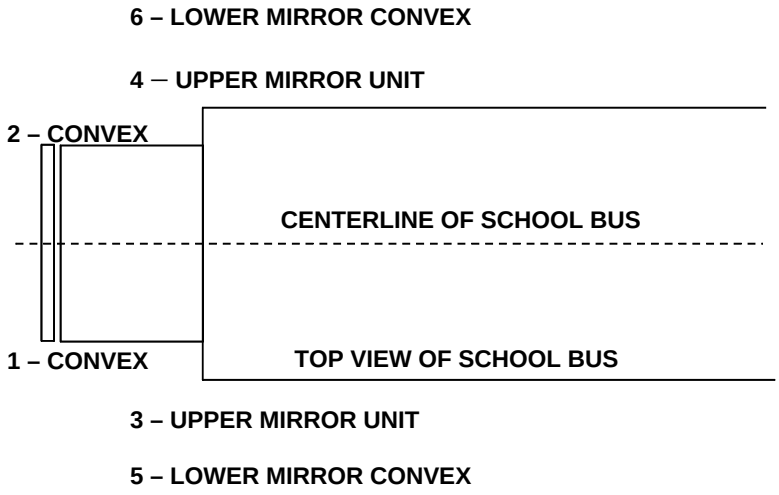
Approved By: _____ Date: July 25, 2011

FMVSS 111SB – DATA SHEET 2

MIRROR LOCATION AND FIELD OF VIEW

Test Vehicle:	**2010 StarTrans MFSAB School Bus**	NHTSA No.:	**CA0900**
Test Lab:	**MGA Research Corporation**	Test Dates:	**07/25/11 – 08/11/11**

MIRROR DIAGRAM



Mirror No.	Type	Mirror System	Cylinders Viewed (Entire Top Surface)
1	CROSSVIEW / CONVEX	B	B, C, E, F, H, I, J, L, M
2	CROSSVIEW / CONVEX	B	A, B, D, E, F, G, H, I, K, N, O, P
3	UNIT MAGNIFICATION	A	61 Meter Indicator
4	UNIT MAGNIFICATION	A	61 Meter Indicator
5	CONVEX	A	L, M
6	CONVEX	A	N, O

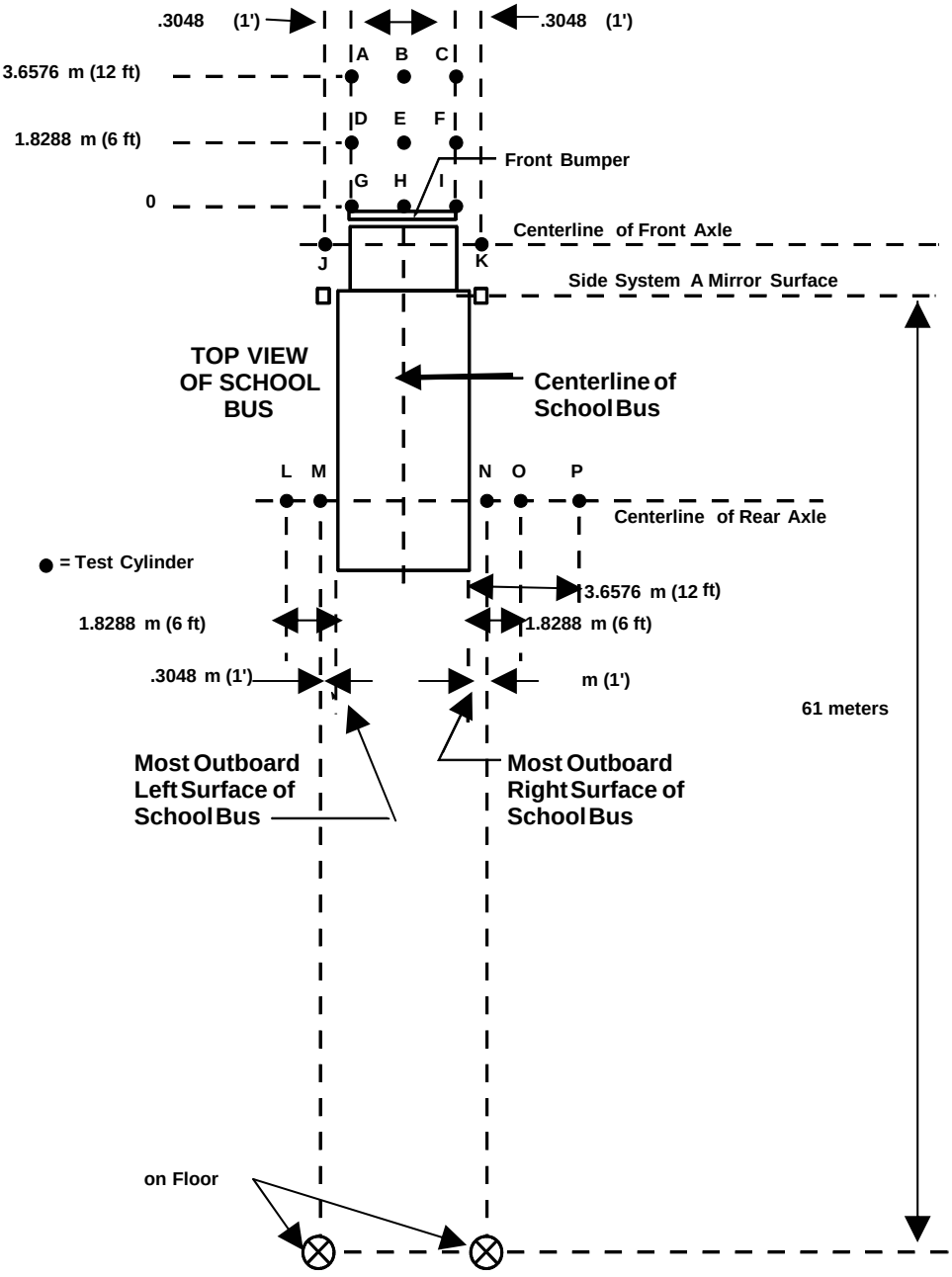
SEE FIGURE ON NEXT PAGE

FMVSS 111SB – DATA SHEET 2

MIRROR LOCATION AND FIELD OF VIEW

Test Vehicle:	**2010 StarTrans MFSAB School Bus**	NHTSA No.:	**CA0900**
Test Lab:	**MGA Research Corporation**	Test Dates:	**07/25/11 – 08/11/11**

MIRROR LOCATIONS OF TEST CYLINDERS AND INDICATOR



NOTES:

1. The cylinders shall be a color which provides a high contrast with the surface on which the bus is parked (S13.1).
2. The cylinders are 0.3048 m high and 0.3048 m in diameter, except for cylinder P which is 0.9144 m high and 0.3048 m in diameter.

FMVSS 111SB – DATA SHEET 2

MIRROR LOCATION AND FIELD OF VIEW

Test Vehicle:	**2010 StarTrans MFSAB School Bus**	NHTSA No.:	**CA0900**
Test Lab:	**MGA Research Corporation**	Test Dates:	**07/25/11 – 08/11/11**

SYSTEM A AND DIRECT VISION

System A Mirrors	PASS/FAIL
Entire top surface of cylinder N and the indicator 61 meters (200 feet) rearward of the mirror surface can be viewed in the photograph:	**PASS**
Entire top surface of cylinder M and indicator 61 meters (200 feet) rearward of the mirror surface can be viewed in the photograph:	**PASS**
Which test cylinders, A through P, can not be photographed directly from the driver's eye location within the semi-circle viewing area using no mirror system?	C, D, E, F, G, H, I, J, K, L, M, N, O, P

Recorded By: _____

Approved By: _____ Date: August 11, 2011

FMVSS 111SB – DATA SHEET 3

ARCS AND DISTANCE OF SYSTEM B

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

SYSTEM B ARC'S AND DISTANCE

Mirror No. (from data sheet 2)	Mirror Location	Distance from the Driver's Eye Point to the Center of the Mirror (cm)	3 Minutes of Arc (mm)	9 Minutes of Arc (mm)
No. 1	1	226.0	1.97	--
No. 2	2	277.7	2.42	7.27

Distance determined in column 3 multiplied by 0.000873 yield 3 minutes of arc, for column 4, for that mirror as viewed from the driver's eye point; the distances determined in column 3 multiplied by 0.002618 yield 9 minutes of arc, for column 5, for that mirror as viewed from the driver's eye point. The minimum distance for any system B mirror between the driver's eye point and the center of the mirror is more than 95 centimeters (37.5 inches):

	Distance	PASS/FAIL
Distance between center of System B mirror No. 1 and driver's eye point > 95 cm Yes = PASS; No = FAIL	226.0 cm	**PASS**
Distance between center of System B mirror No. 2 and driver's eye point > 95 cm Yes = PASS; No = FAIL	277.7 cm	**PASS**

Recorded By: _____

Approved By: _____ Date: July 25, 2011

FMVSS 111SB – DATA SHEET 4

FIELD OF VIEW TEST FOR SYSTEM B

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

		PASS/FAIL
All test cylinders with entire top surface not directly visible from the driver's semi-circle eye location are able to be viewed with System B mirrors from the driver's semi-circle location:		**PASS**
All test cylinders with entire top surface not directly visible from the driver's semi-circle eye location but the image can be viewed with System B mirrors. The image is separated for the edge of the effective mirror surface of the mirror providing that image by a distance of not less than 3 minutes of arc:		**PASS**
If the entire top surface of test cylinder P is not directly visible from the driver's semi-circle eye location, the image can be viewed with System B mirrors from the driver's semi-circle eye location, where the angular size of the shortest dimension of that cylinder's image is not less than 3 minutes of arc, and the angular size of the longest dimension of that cylinder's image is not less than 9 minutes of arc:		**PASS**
Shortest arc length dimension	2.06 mm	
Longest arc length dimension	7.74 mm	
For each of the test cylinders whose entire top surface is not directly visible from the driver's eye location, System B provides a view of the ground that overlaps with the view of the ground provided by System A.		**PASS**

Recorded By: _____

Approved By: _____ Date: July 25, 2011

FMVSS 111SB – DATA SHEET 5

MOUNTING ADEQUACY TEST – ALL MIRRORS

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

MOUNTING SUPPORT OF ALL MIRRORS

Mirror No. (from data sheet 2)	Type	System	Stable Support YES/NO
1	Convex	B	Yes
2	Convex	B	Yes
3	Unit Magnification	A	Yes
4	Unit Magnification	A	Yes
5	Convex	A	Yes
6	Convex	A	Yes

	PASS/FAIL
Outside mirrors free of sharp points or edges that could contribute to pedestrian injury.	**PASS**
System B mirrors have no discontinuities in the slope of the surface of the mirror.	**PASS**

Recorded By: _____

Approved By: _____ Date: July 25, 2011

FMVSS 111SB – DATA SHEET 6

REFLECTANCE TEST – ALL MIRRORS

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

Mirror No.	Type	Light meter reading from calibration (FC)	Light meter reading from light reflected by mirror (FC)	PASS/FAIL	Observations
1	Convex	633.2	500.2	**PASS**	None
2	Convex	629.8	498.2	**PASS**	None
3	Unit Magnification	633.8	506.0	**PASS**	None
4	Unit Magnification	642.8	526.8	**PASS**	None
5	Convex	634.4	449.6	**PASS**	None
6	Convex	633.6	425.8	**PASS**	None

Note: Reflectance % = [Reflectance Reading / Calibration reading] x 100

Minimum Requirement = 35 percent

Mirror No.	Type	Reflectance	Requirement
1	Convex	79%	>35%
2	Convex	79%	>35%
3	Unit Magnification	80%	>35%
4	Unit Magnification	82%	>35%
5	Convex	71%	>35%
6	Convex	67%	>35%

Recorded By: _____

Approved By: _____ Date: July 27, 2011

FMVSS 111SB – DATA SHEET 7

UNIT MAGNIFICATION/CONVEX MIRROR TEST – ALL MIRRORS

Test Vehicle:	**2010 StarTrans MFSAB School Bus**	NHTSA No.:	**CA0900**
Test Lab:	**MGA Research Corporation**	Test Dates:	**07/25/11 – 08/11/11**

CONVERSION DATA TABLE FROM SPHEROMETER DIAL READING TO RADIUS OF CURVATURE

MIRROR NO. 1 (CONVEX)

Test Position	Dial Reading (inches)	Radius of Curvature (mm)	Deviation between the Average Radius of Curvature and the Test Position Radius of Curvature (mm)	Percent Deviation from the Average Radius of Curvature
1	0.05385	133.3	50.92	27.6%
2	0.03595	199.2	-14.91	-8.1%
3	0.02410	296.7	-112.47	-61.0%
4	0.05065	141.7	42.58	23.1%
5	0.05080	141.3	42.99	23.3%
6	0.03525	203.1	-18.85	-10.2%
7	0.02780	257.3	-73.06	-39.7%
8	0.05190	138.3	45.96	24.9%
9	0.05365	133.8	50.42	27.4%
10	0.03620	197.8	-13.54	-7.3%
Avg. Radius of Curvature – The summation of column 3 divided by 10: 184.3 mm			Greatest Percent Deviation from the Average Radius of Curvature, Column 5: -61.0%	

Derived values are rounded for reporting purposes.

MIRROR NO. 2 (CONVEX)

Test Position	Dial Reading (inches)	Radius of Curvature (mm)	Deviation between the Average Radius of Curvature and the Test Position Radius of Curvature (mm)	Percent Deviation from the Average Radius of Curvature
1	0.05400	133.0	50.44	27.5%
2	0.03615	198.1	-14.65	-8.0%
3	0.02345	304.9	-121.52	-66.3%
4	0.05070	141.6	41.87	22.8%
5	0.05070	141.6	41.87	22.8%
6	0.03540	202.3	-18.83	-10.3%
7	0.05060	141.8	41.6	22.7%
8	0.02980	240.1	-56.68	-30.9%
9	0.05395	133.1	50.32	27.4%
10	0.03620	197.8	-14.38	-7.8%
Avg. Radius of Curvature – The summation of column 3 divided by 10: 183.4 mm			Greatest Percent Deviation from the Average Radius of Curvature, Column 5: -66.3%	

Derived values are rounded for reporting purposes.

FMVSS 111SB – DATA SHEET 7

UNIT MAGNIFICATION/CONVEX MIRROR TEST – ALL MIRRORS

Test Vehicle:	**2010 StarTrans MFSAB School Bus**	NHTSA No.:	**CA0900**
Test Lab:	**MGA Research Corporation**	Test Dates:	**07/25/11 – 08/11/11**

CONVERSION DATA TABLE FROM SPHEROMETER DIAL READING TO RADIUS OF CURVATURE

MIRROR NO. 3 (UNIT MAGNIFICATION)

Test Position	Dial Reading (inches)	Radius of Curvature (mm)	Deviation between the Average Radius of Curvature and the Test Position Radius of Curvature (mm)	Percent Deviation from the Average Radius of Curvature
1	0.00000	N/A	N/A	N/A
2	0.00000	N/A	N/A	N/A
3	0.00000	N/A	N/A	N/A
4	0.00000	N/A	N/A	N/A
5	0.00000	N/A	N/A	N/A
6	0.00000	N/A	N/A	N/A
7	0.00000	N/A	N/A	N/A
8	0.00000	N/A	N/A	N/A
9	0.00000	N/A	N/A	N/A
10	0.00000	N/A	N/A	N/A
Avg. Radius of Curvature – the Summation of Column 3 divided by 10: N/A			Greatest Percent Deviation from the Average Radius of Curvature, Column 5: N/A	

MIRROR NO. 4 (UNIT MAGNIFICATION)

Test Position	Dial Reading (inches)	Radius of Curvature (mm)	Deviation between the Average Radius of Curvature and the Test Position Radius of Curvature (mm)	Percent Deviation from the Average Radius of Curvature
1	0.00000	N/A	N/A	N/A
2	0.00000	N/A	N/A	N/A
3	0.00000	N/A	N/A	N/A
4	0.00000	N/A	N/A	N/A
5	0.00000	N/A	N/A	N/A
6	0.00000	N/A	N/A	N/A
7	0.00000	N/A	N/A	N/A
8	0.00000	N/A	N/A	N/A
9	0.00000	N/A	N/A	N/A
10	0.00000	N/A	N/A	N/A
Avg. Radius of Curvature – the Summation of Column 3 divided by 10: N/A			Greatest Percent Deviation from the Average Radius of Curvature, Column 5: N/A	

FMVSS 111SB – DATA SHEET 7

UNIT MAGNIFICATION/CONVEX MIRROR TEST – ALL MIRRORS

Test Vehicle:	**2010 StarTrans MFSAB School Bus**	NHTSA No.:	**CA0900**
Test Lab:	**MGA Research Corporation**	Test Dates:	**07/25/11 – 08/11/11**

CONVERSION DATA TABLE FROM SPHEROMETER DIAL READING TO RADIUS OF CURVATURE

MIRROR NO. 5 (CONVEX)

Test Position	Dial Reading (inches)	Radius of Curvature (mm)	Deviation between the Average Radius of Curvature and the Test Position Radius of Curvature (mm)	Percent Deviation from the Average Radius of Curvature
1	0.01325	539.3	3.16	0.6%
2	0.01300	549.7	-7.20	-1.3%
3	0.01310	545.5	-3.01	-0.6%
4	0.01355	527.4	15.09	2.8%
5	0.01315	543.4	-0.94	-0.2%
6	0.01340	533.3	9.19	1.7%
7	0.01315	543.4	-0.94	-0.2%
8	0.01315	543.4	-0.94	-0.2%
9	0.01300	549.7	-7.20	-1.3%
10	0.01300	549.7	-7.20	-1.3%
Avg. Radius of Curvature – the Summation of Column 3 divided by 10: 542.5 mm			Greatest Percent Deviation from the Average Radius of Curvature, Column 5: 2.8%	

Derived values are rounded for reporting purposes.

MIRROR NO. 6 (CONVEX)

Test Position	Dial Reading (inches)	Radius of Curvature (mm)	Deviation between the Average Radius of Curvature and the Test Position Radius of Curvature (mm)	Percent Deviation from the Average Radius of Curvature
1	0.01330	537.3	-1.87	-0.3%
2	0.01360	525.5	9.97	1.9%
3	0.01305	547.6	-12.16	-2.3%
4	0.01385	516.0	19.45	3.6%
5	0.01320	541.4	-5.94	-1.1%
6	0.01310	545.5	-10.07	-1.9%
7	0.01295	551.8	-16.39	-3.1%
8	0.01300	549.7	-14.26	-2.7%
9	0.01360	525.5	9.97	1.9%
10	0.01390	514.1	21.30	4.0%
Avg. Radius of Curvature – the Summation of Column 3 divided by 10: 535.4 mm			Greatest Percent Deviation from the Average Radius of Curvature, Column 5: 4.0%	

Derived values are rounded for reporting purposes.

FMVSS 111SB – DATA SHEET 7

UNIT MAGNIFICATION/CONVEX MIRROR TEST – ALL MIRRORS

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

UNIT MAGNIFICATION IN SYSTEM A

	PASS/FAIL
At least one System A Mirror on the left and right sides of the bus is unit magnification - (0 Radius of Curvature)	**PASS**

AVERAGE RADIUS OF CURVATURE OF CONVEX MIRRORS USED IN SYSTEM B

Mirror No.	Radius of Curvature	If needed, wording printed properly* PASS/FAIL
1	184.3 mm	**FAIL**
2	183.4 mm	**FAIL**

* If any of the Convex Mirrors in System B have an average radius of curvature less than 889 mm, then the following words must be printed on a label in type face and colors that are clear and conspicuous to the driver:

"USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING, IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION."

No label present. See Section 6.

Recorded By: 

Approved By:  Date: July 27, 2011

FMVSS 111SB – DATA SHEET 8

MIRROR REFLECTIVE SURFACE AREA TEST – SYSTEMS A AND B

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

DATA TABLE FOR SURFACE AREA

System A Mirrors Mirror No.	Area	Requirement Min. 323 cm²	PASS/FAIL
3	385.5 cm^2	323 cm^2	**PASS**
4	384.6 cm^2	323 cm^2	**PASS**
System B Mirrors Mirror No.	Area	Requirement Min. 258 cm²	PASS/FAIL
1	577.6 cm^2	258 cm^2	**PASS**
2	577.8 cm^2	258 cm^2	**PASS**

Recorded By: _____

Approved By: _____ Date: July 27, 2011

SECTION 4

INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2010 StarTrans MFSAB School Bus** NHTSA No.: **CA0900**
Test Lab: **MGA Research Corporation** Test Dates: **07/25/11 – 08/11/11**

	Digital Caliper	Light Meter	Tape Measure	Spherometer
Make	Starrett	AEMC	Stanley	MGA
Model	F2730-0	CA813	Powerlock 3M	001
Serial No.	021484579	04L1017Y	588	001
Range	0-50.8 mm	2000fc, 2000lux	0 to 8 m	2.25×10^{13} $(cm * Hz^{1/2}) \div W$
Accuracy	.001 mm	0.0 fc or 0.01 lux	1 mm	1.1×10^{-13} $W/H^{1/2}$
Cal. Date	01/31/2011	08/16/2010	03/24/2011	01/31/2011
Cal. Due Date	07/31/2011	08/16/2011	09/24/2011	07/31/2011

SECTION 5
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Test Vehicle: **2010 StarTrans MFSAB School Bus**
Test Lab: **MGA Research Corporation**

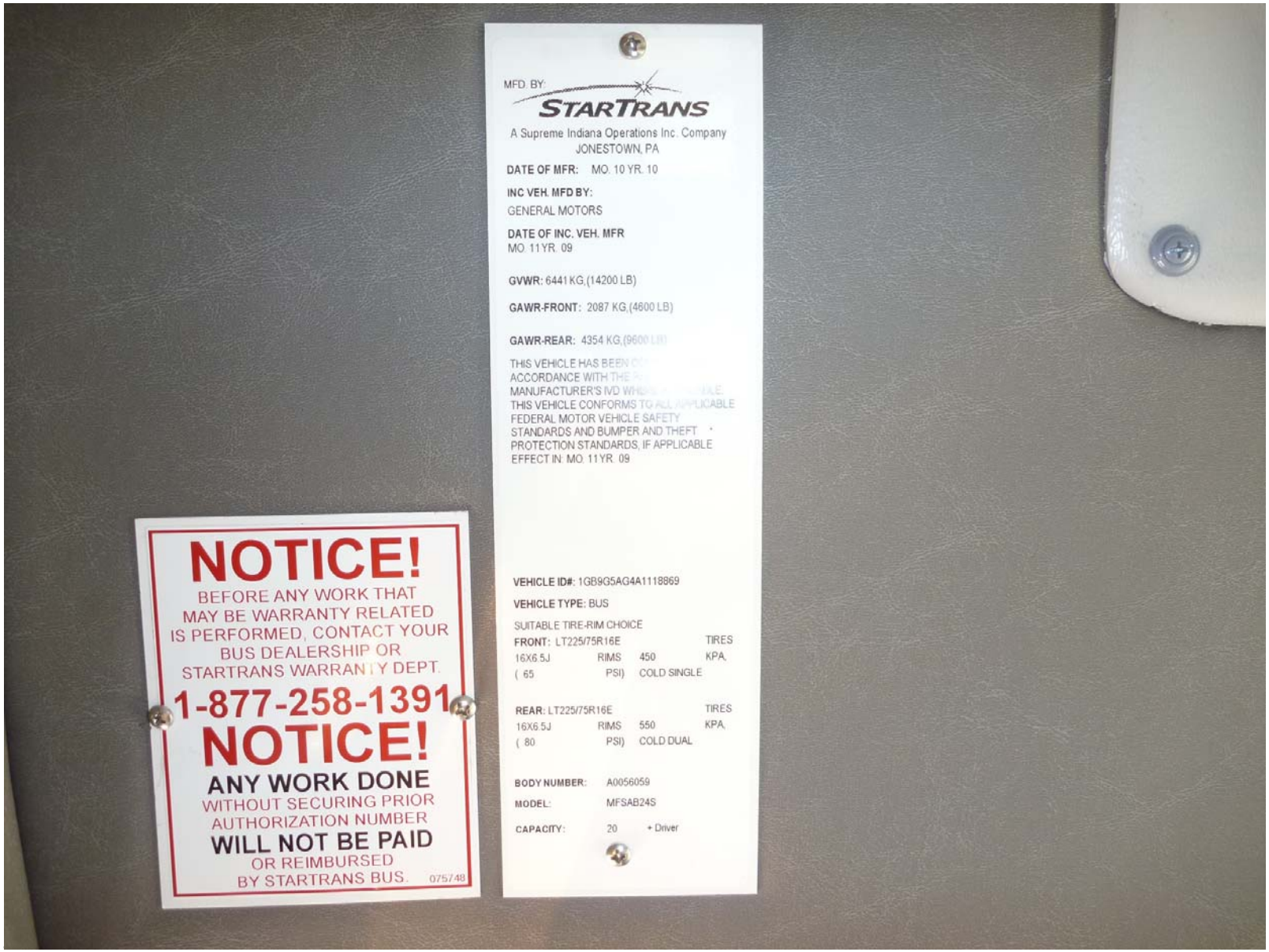
NHTSA No.: **CA0900**
Test Dates: **07/25/11 – 08/11/11**

Three-Quarter Left Front View of School Bus

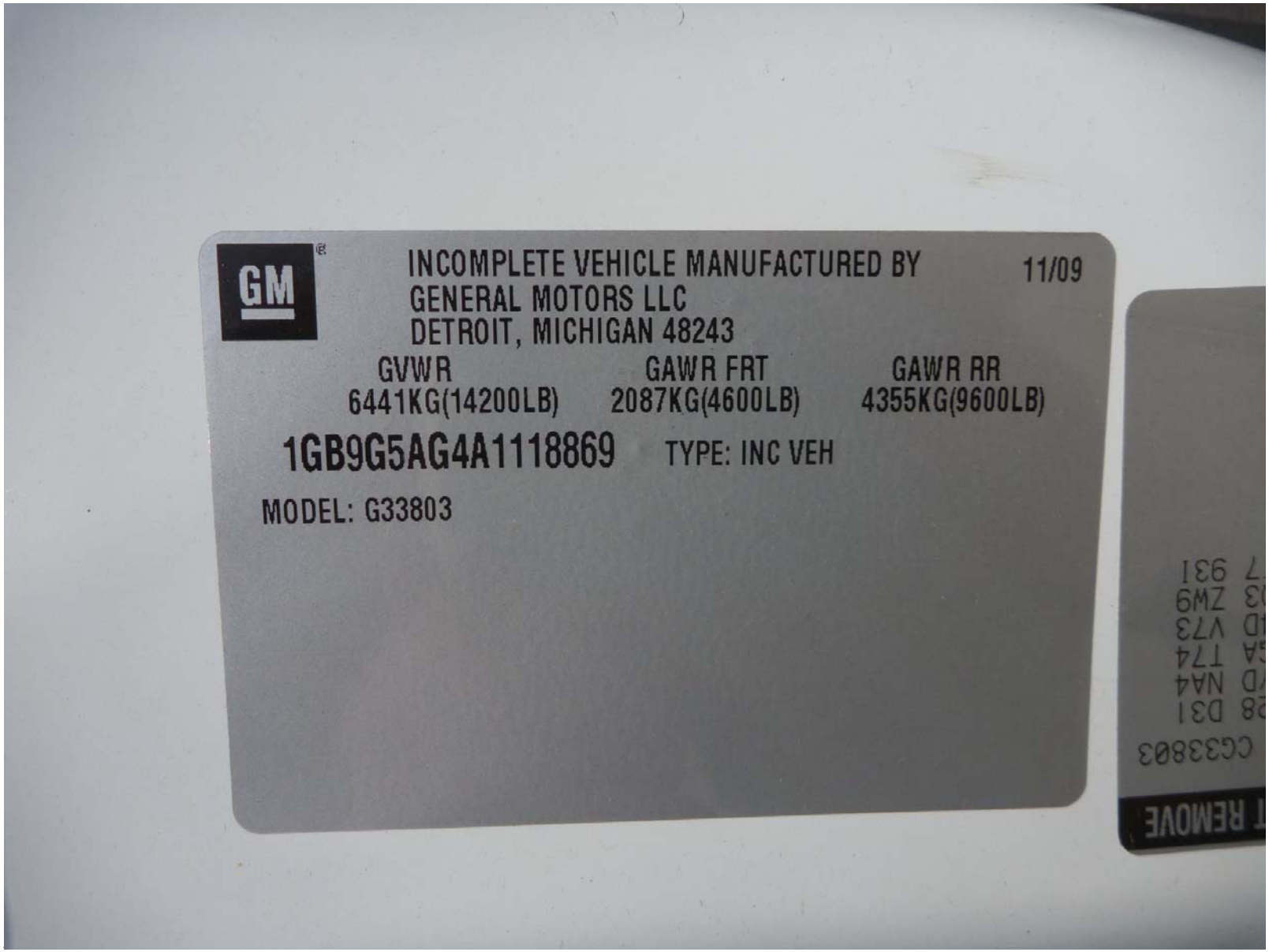
Test Vehicle: **2010 StarTrans MFSAB School Bus**
Test Lab: **MGA Research Corporation**

NHTSA No.: **CA0900**
Test Dates: **07/25/11 – 08/11/11**

Three-Quarter Left Rear View of School Bus



Vehicle Certification Label



Incomplete Vehicle Information Label

Driver's Side Rearview Mirror and Left Front Convex Mirror and Mountings

Passenger's Side Rearview Mirror and Right Front Convex Mirror and Mountings

Field of View Instrument Setup

Field of View Instrument Setup (Side View)

Mirror No. 1 System B Field of View

Mirror No. 2 System B Field of View

Mirror No. 3 and No. 5 System A Field of View

Mirror No. 4 and No. 6 System A Field of View

View of Cylinder Setup from Front

Three-Quarter Right Front View of Cylinder Setup

Front View Looking Thru the Windshield View of Cylinder Setup

Reflectance Test Set-up

SECTION 6

LABORATORY NOTICE OF TEST FAILURE TO OVSC

mga research corporation

LABORATORY NOTICE OF TEST FAILURE TO OVSC

Test Procedure:	FMVSS 111	Test Date:	07/27/11
Test Vehicle:	2010 StarTrans MFSAB	Test Lab:	MGA Research Corp.
NHTSA No.:	CA0900	Project Engineer:	Eric Peschman
Contract No.:	DTNH22-08-D-00075	Delivery Order No.:	3
MFR.:	StarTrans	VIN:	1GB9G5AG4A1118869
Build Date:	11/09		

TEST FAILURE DESCRIPTION

There is no label present and visible to the seated driver in the vehicle as required for buses having system B mirrors with an average radius of curvature of less than 889 mm.

FMVSS REQUIREMENTS DESCRIPTION

Paragraph S9.3(c): "Each school bus which has a mirror installed in compliance with S9.3(a) that has an average radius of curvature of less than 889 mm, as determined under S12, shall have a label visible to the seated driver. The label shall be printed in a type face and color that are clear and conspicuous. The label shall state the following:

'USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION.'"

Remarks: No remarks.

Notification to NHTSA (COTR): Lawrence Valvo

Date: 07/27/11

By: _____