REPORT NUMBER: 120-MGA-07-005

# SAFETY COMPLIANCE TESTING FOR FMVSS NO. 120 TIRE SELECTION AND RIMS FOR MOTOR VEHICLES WITH A GVWR OF MORE THAN 4,536 KG

#### MID BUS INC. 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA NO.: C60901

PREPARED BY:
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5000 WARREN ROAD
BURLINGTON, WI 53105



**FINAL REPORT DATE: JULY 13, 2007** 

#### **FINAL REPORT**

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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OFFICE OF VEHICLE SAFETY COMPLIANCE
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Prepared by: \_\_\_\_\_ Date: July 13, 2007

James Hansen, Project Engineer

Date: July 13, 2007

FINAL REPORT ACCEPTED BY OVSC:

Theren M. Secusto

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15. Supplementary Notes		

#### 15. Supplementary Notes

#### 16. Abstract

A compliance test was conducted on the subject 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901, in accordance with FMVSS 120, "Tire selection and rims for motor vehicles with a GVWR of more than 4,536 kilograms," and TP-120-03. The vehicle was weighed in the unloaded and fully loaded conditions and its tires, rims, and related information were checked.

Test failures: None

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#### TABLE OF CONTENTS

<u>Section</u>		<u>Page No</u>
1	Purpose of Compliance Test	1
2	Test Procedure and Discussion of Results	2
3	Compliance Test Data	4
	Data Sheet 1 - General Tire and Rim Data	4
	Data Sheet 2 - Certification and Tire Label Information	6
	Data Sheet 3 - Weight Distribution	7
4	Instrumentation and Equipment List	9
5	Photographs	12

## SECTION 1 PURPOSE OF COMPLIANCE TEST

The purpose of this test report is to document the results of tests performed on a MY 2006 Mid Bus Guide DW School Bus, NHTSA No.: C60901, in accordance with the requirements stated in Federal Motor Vehicle Safety Standard (FMVSS) No. 120, "Tire selection and rims for motor vehicles with a GVWR of more than 4,536 kilograms."

This standard establishes requirements to ensure that applicable vehicles are equipped with tires of adequate size and load rating and rims of appropriate size and type designation.

#### **SECTION 2**

#### TEST PROCEDURE AND DISCUSSION OF RESULTS

Testing of the 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901 was conducted at MGA Research Corporation in accordance with NHTSA TP-120-03, dated April 10, 2000 and MGA-TP-120-03 dated November 20, 2002. The vehicle mounted tires and rims were surveyed to ensure that the rims were suitable for the tires and that the tires inflated to the maximum inflation pressure stated on the tire sidewall were appropriate for the vehicle's certified Gross Axle Weight Ratings (GAWR). The vehicle certification and tire information labeling was surveyed to ensure that the vehicle manufacturer's recommended rims were suitable for the recommended tires, and that the recommended tires inflated to the recommended inflation pressures stated on the labeling were appropriate for the vehicle's certified GAWRs. The vehicle was ballasted and weighed in three different loading conditions to determine if axle or tire overloading could occur. The three loading conditions were:

- Condition 1 Unloaded Vehicle Weight (UVW).
- Condition 2 Vehicle in Condition 1 state plus the addition of ballast to simulate twenty-eight passengers, (one adult driver, twenty-seven students)
- Condition 3 Vehicle in Condition 2 state plus the addition of ballast to simulate cargo loading. Target vehicle load is the certified gross weight rating (GVWR).

The vehicle mounted tires inflated to the inflation pressure labeled on the tire sidewall have a load rating appropriate to carry the maximum loads as required by FMVSS No. 120. The vehicle rims are suitable for the vehicle tires and contain the required markings.

# SECTION 2...continued TEST PROCEDURE AND DISCUSSION OF RESULTS

Model Year/Mfr. /Make/Model:	2006 Mid Bus Guide DW	
Incomplete Vehicle Make/Model:	Chevrolet / CSD-7450-C-063336	
NHTSA No.:	C60	901
GVWR:	5,579 KG / 12,300 lbs	
Build Date for Bus Chassis:	04/06	
VIN:	1GBJG31U461237309	
Chassis VIN:	1GBJG31U461237309	
Designated Seating Capacity:	(1 Driver, 27 Passengers)	
Vehicle Type:	School Bus	
Tire Pressure from certification label (at capacity):	Front: 450 KPa Rear: 450 KPa	
Odometer Reading:	450 Miles	
Dealer Installed Optional Accessories	None Noted	

#### SUMMARY

Requirements	PASS/FAIL
TIRE AND RIM SELECTION (S5.1)	PASS
Installed tires and rims are suitable for vehicle	PASS
Rim Marking (S5.2)	PASS
Rims contain all required markings of proper dimensions	PASS
LABEL INFORMATION (S5.3)	
Vehicle has proper certification/tire information label. Label tires at	PASS
recommended inflation pressure and rims are suitable for vehicle.	
Weight Distribution (49 CFR 567 Certification)	PASS
Vehicle loaded with occupants and cargo does not exceed GVWR	PASS
Results:	PASS
Test data indicates compliance with FMVSS 120	PASS

#### **SECTION 3**

#### **COMPLIANCE TEST DATA**

### DATA SHEET 1 GENERAL TIRE AND RIM DATA

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA No.: C60901
Test Lab: MGA RESEARCH CORPORATION Test Date: 05/07/07

#### **GENERAL DATA**

Tire Type: (Passenger car or other)	Light Truck
Are the tire and rim sizes the same for all axles, including the spare?	Yes
Does the tire size fitted to the axles appear on the Certification or Tire label? (If NO, describe)	Yes
Number of axles	2
Dual tires on rear axle(s)	Yes

#### TIRE DATA FROM SIDEWALL

	Right Front	Spare
Manufacturer	Uniroyal	N/A
Brand	Laredo	N/A
Tire Size	LT225/75R16	N/A
Maximum Tire Load Rating (KG)	Single: 1060 Dual: 975	N/A
De-rated Tire Load Rating (KG)	N/A	N/A
Maximum Inflation Pressure (KPA)	450	N/A
Tire has DOT symbol (Yes/No)	Yes	N/A
DOT serial number	DOT M31L JH3U 1306	N/A

#### MOUNTED TIRE VS. AXLE RATING COMPARISON

(AT SIDEWALL MAXIMUM INFLATION PRESSURE)

	Front Axle	Rear Axle
A. GAWR (KG) from certification label	1951	3901
B. (No. of tires) x (tire load rating (KG) from above table)	2120	3900
C. Is "B" equal to or greater than "A"? (Yes/No)	Yes	No*

<sup>\*</sup> The rear GAWR, listed in KG, exceeds the tire load rating for this axle by one kilogram. However, when listed in pounds, the GAWR and tire load ratings are equal. The sum of tire load ratings for this axle is 8,600 lbs. The GAWR is 8,600 lbs. Because this is clearly a unit conversion issue, this is not considered a failure.

### DATA SHEET 1...continued GENERAL TIRE AND RIM DATA

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA No.: C60901
Test Lab: MGA RESEARCH CORPORATION Test Date: 05/07/07

#### **RIM MARKINGS**

	Right Front	Spare
A. Source of published dimensions (letter designation)	Т	N/A
B. Rim Size	16 X 6½ J	N/A
C. Does rim contain DOT symbol? (Yes/No)	Yes	N/A
D. Manufacturer's name, symbol or trademark (copy format)	Accuride	N/A
E. Date of manufacture or symbol	01 11 06	N/A
Do items A-C appear on weather side of rim? (Yes/No)	Yes	N/A
Letter height (not less than 3mm)	4 mm	N/A
Lettering (impressed or embossed)	Impressed	N/A
Are all rim markings legible? (Yes/No)	Yes	N/A
Do all markings comply with requirements? (Yes/No)	Yes	N/A
Rims are suitable for tires on vehicles? (Yes/No)	Yes	N/A

#### **RIM MEASUREMENTS**

	Right Front	Spare
Rim width	165.1 mm	N/A
Rim diameter	406.4 mm	N/A
Rim measurements same as rim markings? (Yes/No)	Yes	N/A

Results	Pass/Fail
TIRE AND RIM SELECTION (S5.1) Installed tires and rims are suitable for vehicle	PASS
Rim Marking (S5.2) Rims contain all required markings of proper dimensions	PASS

Remarks: None

ested: \_\_\_\_\_\_ Approved By: \_\_\_ Hishal >

Date: 05/07/07

### DATA SHEET 2 CERTIFICATION AND TIRE LABEL INFORMATION

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA No.: C60901
Test Lab: MGA RESEARCH CORPORATION Test Date: 05/07/07

#### **LABEL INFORMATION**

Label in English? (Yes/No)	Yes
Block capital letter and numbers are not less than 2.4 mm in height (yes/no):	Yes
Label is permanently affixed; describe method of affixing (rivets, glue, etc.)	Yes/ Glue
Does label text color contrast with background? (yes/no)	Yes
Location of Label(s) on the vehicle:	On the Driver's Side Door

TIRE AND RIM DATA FROM LABEL (FOR EACH GAWR/GVWR)

GVWR: <u>5579</u> KG	Front Axle	Řear Axle
Tire Size	LT225/75R16D	LT225/75R16D
Rim Size	16 X 6½ J	16 X 6½ J
Recommended inflation pressure (KPa)	450	450
Are labeled rims suitable for labeled tires (Yes/No)¹	Yes	Yes
Referenced load rating at label recommended inflation pressure (KG) <sup>1</sup>	1060	975

<sup>&</sup>lt;sup>1</sup> Referenced source for tire/rim match and load rating data: <u>2007 Year Book Tire & Rim Assoc.</u>

#### CERTIFICATION/TIRE LABEL MAXIMUM CAPACITY COMPARISON

GVWR: <u>5579</u> KG	Front axle	Rear Axle
A.GAWR (KG) FROM CERTIFICATION LABEL	(C) 1951	(D) 3901
B.(No. of tires) x (Tire load rating (KG))	2120	3900
Is "B" equal or greater than "A"? (Yes/No)	Yes	No
Is (C) plus (D) equal to or greater than GVWR? (Yes/No)	Ye	S

RESULTS	PASS/FAIL
LABEL INFORMATION (S5.3)	
Vehicle has proper certification/tire information	PASS
label. Label tires at recommended inflation	PA55
pressure and rims are suitable for vehicle.	

Approved By:

Date: 05/07/07

### DATA SHEET 3 WEIGHT DISTRIBUTION

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA No.: C60901
Test Lab: MGA RESEARCH CORPORATION Test Date: 05/07/07

FLUID LEVELS								
Fuel:	FULL							
Coolant:	FULL							
Other Fluids: Washer fluid, brake		FULL						
TIRE PRESSURES								
Tire	Left Front	Left Front Right Front Left Rear Right						
Tire Pressure (KPa)	450	45	50	450	450			
OCCUPANT AND CARGO LOADS								
Total Occupant Load (KG): [# of designated seating position or 54 KG per student]  Manufacturer's Rated Cargo Loa [If not stated on vehicle or provid leave blank]			1526 (1-driver, 27-str	udents)				
Certified GVWR - Measured UVW - Total Occupant Load = Rated Cargo Load 5,579 KG - 3,596 KG - 1,526 KG = 457 KG (must be positive)								
Describe Placement of Cargo:	Describe Placement of Cargo: Down Center aisle							

#### **WEIGHT DISTRIBUTION**

ITEM	Tire or Vehicle Rating*	UVW Cond. 1 + occupants Cond. 2 +		Cond. 1 + occupants		Cond. 1 + occupants Cond. 2 + cargo		+ cargo
	(KG)	Measured Overload Measured Overload		Overload	Measured	Overload		
Left Front Tire	1060	728	No	752	No	760	No	
Right Front Tire	1060	734	No	798	No	808	No	
Front Axle	1951	1462	No	1550	No	1568	No	
Left Rear Tire	1950	1094	No	1784	No	2004	Yes	
Right Rear Tire	1950	1040	No	1802	No	2002	Yes	
Rear Axle	3901	2134	No	3586	No	4006	Yes	
Total Vehicle	5579	3596	No	5136	No	5574	No	

<sup>\*</sup> Vehicle and axle weight ratings (GVWR & GAWR) are located on the vehicle certification label plate. Vehicle tire load ratings are based upon the inflation pressure specified on the certification label plate for each respective axle, as determined from the appropriate tire manufacturer's specification table.

### DATA SHEET 3...continued WEIGHT DISTRIBUTION

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA No.: C60901
Test Lab: MGA RESEARCH CORPORATION Test Date: 05/07/07

RESULTS	PASS/FAIL
Weight Distribution (49 CFR 567 Certification) Vehicle loaded with occupants and cargo does not exceed GVWR	PASS

Remarks: None

Tested By:

Approved By:

Date: <u>05/07/07</u>

# SECTION 4 INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION NHTSA No.: C60901
Test Date: 05/07/07

	Digital Caliper	Vehicle Scale	Tape Measure
Make	Mitutoyo	GSE	Stanley
Model	CD-6" CS	Pro-Weigh 84	Powerlock
Serial # (s)	0441288	004804	SN 278
Range	0-150mm	0 to 20,000 lb	0-8 m
Accuracy	.01mm	0.25% static	1 mm
Cal. Date	09/11/06	09/11/06	09/26/07
Cal. Due Date	09/11/07	09/11/07	03/26/07

# SECTION 4...continued INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS NHTSA No.: C60901
Test Lab: MGA RESEARCH CORPORATION Test Date: 05/07/07

#### **SCALE CALIBRATION SHEET**

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# SECTION 4...continued INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION NHTSA No.: C60901
Test Date: 05/07/07

#### **SCALE CALIBRATION SHEET**

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PLEASE REFER TO TEST JUSTIFICATION AND UNC		RT OF SCALE MAIN	NTENANCE		NUMBERS C		SC 01			s C 34
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THERE WAS NO DEVIATION II				_	# NUMBERS /J	-	100		VSZA.	,,,,
DEVIATION FROM PROCEDUR				SUB	STITUTION LOA		<b>1</b>		CONDITI	ONC
	T CERTIFICATIO			+			1000000000	NMENTAL		
LEASE REFER TO TEST STANDARD TRACEABILITY		OF SCALE MAINTE	NANCE	1	perature <u>US</u>			UOW A	r movemer	nt universal
ND CALIBRATION PROCEDURE MANUAL; SERIAL				Vibra	tion Minimal				D CONTR	ACTOR
VISUAL INSPEC	TION	Accept	Ruscr	۱.	LOCATION					
FUNCTIONALITY; as left		1	-		This test was cond					
REPEATABILITY/SENSITIVITY; a	sieft	1	-	_	his test was cond				unty, iocate	udl.
PHYSICAL CONDITION; as left	-		-	-	Subcontracted to:	, Burningi	on, vvi	55105	-	
SUITABILITY FOR INTENDED US	iE	- V								
			NAL TES	RES	JLTS ***		141	В		
		FOUND		C C E	As LE	FT T	c c	, E	TOLER	ANCES
TEST POINT	EXPECTED VALUE	MEASURED VALUE	ERROR	1:	VALUE	ERROR	1;	LO	v Limit	HIGH LIMIT
		///	/ sc	ALE #2	////	//		///	///	
DISTRIBUTION		1000	0	1	1000	0	1		995	1005
DISTRIBUTION		20D	0	1	2000	0	$\vee$		1995	2005
DISTRIBUTION		3005	5	14	3600	0	1/	-	2990	3010
DISTRIBUTION		4605	5	14	400	0	1		3990	4010
DISTRIBUTION		50/0	10	1	5280	0	1	_	4990	5010
DISTRIBUTION		14,020	20	1	10000	0	1		9980	10,020
DISTRIBUTION	15,000	15,030	30	$ \cdot $	15,000	0	10		14,970	15,030
DISTRIBUTION	18,000	18,035	35	-	18,000	0	$\vdash$	+-	17,960	18,040
								M.W.		
////////		///		(2) OF	11 1		AΕ	PRO	VED	
/			NAL CO					_		
As FOUND: ACCEPT		AS LEFT: A			REJECT L			PENDING:		
			MATED		AINTY AND CON					
ESTIMATED UNCERTAINTY OF					I TYPE EVALUA					
UNCERTAINTY OF THIS CALIBI	RATION IS UNKNOV	N BY STATIS			7 . /	QUAL TO	0 ±50%	OF THE MI	NIMUM VAL	JD DIVISION.
Technician's Comments/Observ	rations/Opinions:	teste	21, C	les	ned sit	adi	stee	colil	rstron	١,
tested for as &	ft reau	ts								
** 7:10 05000	IS APPLICABLE ONLY	TO THE DEVICE	E IDENTI	EIED IN T	HE LOCATION SEC	CIEIED A	SPART	OF THIS REI	ORT. **	MGA2 - NM:6/0
he serial number of this report i	s <u>091(06MGA</u>	<i>01</i> т	his repo	ort may	not be duplical	ed with	out wr	itten conse	ent of Cert	tified Scale Inc
his report, page $(2)$ of $(2)$ v					1	Certifie	d Scale	Inc. Repres	entative	
lext scheduled Full Calibration is	adua (1917)	1887		Next F	Preventive Mai	ntenano	e visit	is due	10	THE

#### **SECTION 5**

#### **PHOTOGRAPHS**

#### **TABLE OF PHOTOGRAPHS**

<u>No.</u>		<u>Page No.</u>
1	Three-Quarter Frontal View of Left Side of Vehicle	13
2	Three-Quarter Rear View of Left Side of Vehicle	14
3	Certification Label	15
4	Tire Manufacturer	16
5	Tire Model Number	17
6	Tire DOT Serial Number	18
7	Tire Load Ratings and Tire Size Designation	19
8	Rim Manufacturer	20
9	Rim DOT and Source of Published Information	21
10	Rim Size	22
11	Date of Manufacture Markings	23
12	Vehicle on Scales Doing Measurement of Front Axle Loads	24
13	Vehicle on Scales Doing Measurement of Rear Axle Loads	25
14	Simulated Occupant Loading	26
15	Simulated Cargo Loading	27



Three-Quarter Frontal View of Left Side of Vehicle



Three-Quarter Rear View of Left Side of Vehicle





Tire Manufacturer

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: **C60901**Test Date: **05/07/07** 



Tire Model Number

Test Vehicle: 2000 Test Lab: MGA

2006 MID BUS GUIDE DW SCHOOL BUS MGA RESEARCH CORPORATION

NHTSA No.: **C60901**Test Date: **05/07/07** 



Tire DOT Serial Number



Tire Load Ratings and Tire Size Designation

Test Vehicle: Test Lab: 2006 MID BUS GUIDE DW SCHOOL BUS MGA RESEARCH CORPORATION

NHTSA No.: Test Date: C60901 05/07/07



Rim Manufacturer



Rim DOT and Source of Published Information



Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: **C60901** Test Date: **05/07/07** 



Date of Manufacture Markings

Test Vehicle: 2006 MID BUS GUIDE DW SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION

NHTSA No.: **C60901**Test Date: **05/07/07** 



Vehicle on Scales Doing Measurement of Front Axle Loads



Vehicle on Scales Doing Measurement of Rear Axle Loads



Simulated Occupant Loading

