#### REPORT NUMBER: 120-MGA-2009-001

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

> IC CORPORATION 2009 IC CORPORATION RE300 SCHOOL BUS NHTSA NO.: C90900

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



#### FINAL REPORT DATE: DECEMBER 3, 2008

**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.

Eric Peschman, Project Engineer Prepared by:

Date: December 3, 2008

Reviewed by: Michael Janovicz, Program Manager

Date: December 3, 2008

FINAL REPORT ACCEPTED BY:

\_<u>December 3, 2008</u>\_\_\_ Date of Acceptance

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<ul> <li>16. Abstract</li> <li>A compliance test was conducted on the subject 2009 IC Corporation RE300 School Bus, NHTSA No.: C90900, 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.</li> <li>Test failures: None</li> </ul>			
17. Kev Words		18. Distribution Sta	tement
		Copies of this report are available from:	
Compliance Testing		NHTSA Technical I	nformation Services
Safety Engineering		(NPO-411)	
FMVSS 120		1200 New Jersey Ave., S.E.	
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# SECTION 1 PURPOSE OF COMPLIANCE TEST

The purpose of this test report is to document the results of tests performed on a MY 2009 IC Corporation RE300 School Bus, NHTSA No.: C90900, 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 2009 IC Corporation RE300 School Bus, NHTSA No.: C90900, 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 Seventy-three passengers (one adult driver and seventy-two 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 and the vehicle labeled tires inflated to the recommended cold inflation pressures have load ratings 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:	2009 IC Corporation RE300	
Incomplete Vehicle Make/Model:		
NHTSA No.:	C90900	
GVWR:	14,424 KG / 31,800 lbs	
Build Date for Bus Chassis:	04/08	
VIN:	4DRBWAAN29A083456	
Designated Seating Capacity:	(1 Driver, 72 Passengers)	
Vehicle Type:	School Bus	
Tire Pressure from certification label (at capacity):	Front: 758 KPa	Rear: 723 KPa
Odometer Reading:	69 Miles	
Dealer Installed Optional Accessories	None Noted	

## SUMMARY

Requirements	Pass/Fail
TIRE AND RIM SELECTION (S5.1)	Pace
Installed tires and rims are suitable for vehicle	F 855
Rim Marking (S5.2)	Pass
Rims contain all required markings of proper dimensions	F 855
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	Fd55
Results:	Deee
Test data indicates compliance with FMVSS 120	Pass

#### **SECTION 3**

#### **COMPLIANCE TEST DATA**

#### **DATA SHEET 1**

## GENERAL TIRE AND RIM DATA

# Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/20/2008

## GENERAL DATA

Tire Type: (Passenger car or other)	Truck/Bus
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)	No, see table below
Number of axles	2
Dual tires on rear axle(s)	Yes

Front Tire Size From Placard	295/75R22.5
Front Tire Size Fitted to the Axles	11R22.5
Rear Tire Size From Placard	10R22.5
Rear Tire Size Fitted to the Axles	11R22.5

## TIRE DATA FROM SIDEWALL

	Right Front
Manufacturer	Hankook
Brand	AH 12
Tire Size	11R22.5
Maximum Tire Load Rating (KG)	Single: 2800 kg Dual: 2650 kg
De-rated Tire Load Rating (KG)	N/A
Maximum Inflation Pressure (KPa)	720
Tire has DOT symbol (Yes/No)	Yes
DOT serial number	DOT T73T NEH0508

#### **MOUNTED TIRE VS. AXLE RATING COMPARISON** (AT SIDEWALL MAXIMUM INFLATION PRESSURE)

	Front Axle	Rear Axle
A. GAWR (KG) from certification label	5,443	8,981
B. (No. of tires) x (tire load rating (KG) from above table)	5,600	10,600
C. Is "B" equal to or greater than "A"? (Yes/No)	Yes	Yes

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

Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/20/2008

	Right Front
A. Source of published dimensions (letter designation)	Т
B. Rim Size	22.5 x 8.25
C. Does rim contain DOT symbol? (Yes/No)	Yes
D. Manufacturer's name, symbol or trademark (copy format)	Accuride
E. Date of manufacture or symbol	01 28 08
Do items A-C appear on weather side of rim? (Yes/No)	Yes
Letter height (not less than 3mm)	4 mm
Lettering (impressed or embossed)	Embossed
Are all rim markings legible? (Yes/No)	Yes
Do all markings comply with requirements? (Yes/No)	Yes
Rims are suitable for tires on vehicles? (Yes/No)	Yes

#### **RIM MARKINGS**

#### **RIM MEASUREMENTS**

	Right Front
Rim width	210 mm
Rim diameter	571 mm
Rim measurements same as rim markings? (Yes/No)	Yes

Requirements	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

essel doll in Tested

Approved By: Hichael Sanoc

Date: October 20, 2008

## DATA SHEET 2

## **CERTIFICATION AND TIRE LABEL INFORMATION**

Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/20/2008

Label Design (Combined Certification and Tire Label):	Yes		
Label Design (Separate Tire Information Label):	No		
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:	Above Windshield on the Driver's Side		

## LABEL INFORMATION

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

GVWR: <u>14,424</u> KG	Front Axle	Rear Axle
Tire Size	295/75R22.5G	10R22.5G
Rim Size	22.5 x 8.25	22.5 x 7.50
Recommended inflation pressure (KPa)	758	723
Are labeled rims suitable for labeled tires (Yes/No) <sup>1</sup>	Yes	Yes
Referenced load rating at label recommended inflation pressure (KG) <sup>1</sup>	2800	2300

<sup>1</sup> Referenced source for tire/rim match and load rating data: <u>2008 Year Book Tire & Rim Assoc.</u>

## CERTIFICATION/TIRE LABEL MAXIMUM CAPACITY COMPARISON

GVWR: <u>14,424</u> KG	Front axle	Rear Axle
A.GAWR (KG) FROM CERTIFICATION LABEL	(C) 5443	(D) 8981
B.(No. of tires) x (Tire load rating (KG))	5600	9200
Is "B" equal or greater than "A"? (Yes/No)	Yes	Yes
Is (C) plus (D) equal to or greater than GVWR? (Yes/No)	Ye	S

Requirements	Pass/Fail
LABEL INFORMATION (S5.3) Vehicle has proper certification/tire information label. Label tires at recommended inflation pressure and rims are suitable for vehicle.	Pass
$\wedge$	

Tested By 20-

Date: October 20, 2008

Approved By: Hichael San

#### **DATA SHEET 3**

## WEIGHT DISTRIBUTION

Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/24/2008

FLUID LEVELS							
Fuel:	FULL						
Coolant:				FULL			
Other Fluids: Washer fluid, brake	e fluid, etc.			FULL			
	TIRE PRE	SSURE	S				
Tire	Left Front	Right	Front	Left Rear	Right Rear		
Tire Pressure (KPa)	756	75	6	724	724		
OCCUPANT AND CARGO LOADS							
Total Occupant Load (KG): [# of designated seating positions x 68 KG per adult or 54 KG per student]				3956 (1-driver, 72-students)			
Manufacturer's Rated Cargo Load (KG): [If not stated on vehicle or provided in owner's manual leave blank]				N/A			
Certified GVWR - Measured UVW - Total Occupant Load = Rated Cargo Load <u>14,424</u> KG – <u>8,867</u> KG – <u>3,956</u> KG = <u>1,601</u> KG (must be positive)							
Describe Placement of Cargo: Down Center aisle							

#### WEIGHT DISTRIBUTION

ITEM	Tire or Vehicle Rating*	CONDI U\ (K	TION 1 /W G)	CONDI Cond. 1 + ( (K0	FION 2 occupants G)	CONDITION 3 Cond. 2 + cargo (KG)	
	(KG)	Measured	Overload	Measured	Overload	Measured	Overload
Left Front Tire	2,800	1,275	No	2,092	No	2,774	No
Right Front Tire	2,800	1,218	No	1,984	No	2,669	No
Front Axle	5,443	2,493	No	4,076	No	5,443	No
Left Rear Tire	5,300	3,009	No	4,128	No	4,226	No
Right Rear Tire	5,300	3,365	No	4,620	No	4,755	No
Rear Axle	8,981	6,374	No	8,748	No	8,981	No
Total Vehicle	14,424	8,867	No	12,824	No	14,424	No

\* 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:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/24/2008

Requirements	Pass/Fail
Weight Distribution (49 CFR 567 Certification) Vehicle loaded with occupants and cargo does	Pass
not exceed GVWR	

Remarks: None

esebra Tested By

Approved By: Hichael Samo

Date: October 24, 2008

## **SECTION 4**

# INSTRUMENTATION AND EQUIPMENT LIST

# Test Vehicle:<br/>Test Lab:2009 IC CORPORATION RE300 SCHOOL BUS<br/>MGA RESEARCH CORPORATIONNHTSA No.:C90900<br/>Test Date:C90900<br/>10/20/2008

	Digital Caliper	Vehicle Scale	Tape Measure
Make	Mitutoyo	GSE	Stanley
Model	IP 65	465	Powerlock
Serial # (s)	0004174	004804	559
Range	0-150mm	0 to 20,000 lb	0-5 m
Accuracy	.01mm	0.25% static	1 mm
Cal. Date	06/16/08	09/09/08	08/19/08
Cal. Due Date	12/16/08	12/09/08	02/19/09

## SECTION 4...continued

## INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/20/2008

## SCALE CALIBRATION SHEET

TYPE DIGITAL FLOOR		×	CLASS	<u>ш</u>	L	MODEL	465		(	CAPACITY_20	000
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TEST WEIG	SHT CERTIFICATION	1				ESTIMA	TE OF E	NVIRC	NME	NTAL CONDITI	ONS
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Technician's Comments/Obse	ervations/Opinions:	Adu	sted	7	21	brat ion		AP	DC	MAL.	
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Revision - O

Certified Scale Inc. - Quality Procedure Manual - Controlled Document

R-510L1RIC (File #5.10.c)

#### **SECTION 4...continued**

#### INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNHTSA No.:C90900Test Lab:MGA RESEARCH CORPORATIONTest Date:10/20/2008

#### SCALE CALIBRATION SHEET



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**Certification Label** 







NHTSA No.: Test Dates: 2009 IC CORPORATION RE300 SCHOOL BUS MGA RESEARCH CORPORATION Test Vehicle: Test Lab:

C90900

10/20/08 - 10/24/08



Test Vehicle:

Tire Load Ratings









Test Vehicle:2009 IC CORPORATION RE300 SCHOOL BUSNH1Test Lab:MGA RESEARCH CORPORATIONTest

NHTSA No.: C90900 Test Dates: 10/20/08 – 10/24/08





NHTSA No.: C90900 Test Dates: 10/20/08 – 10/24/08







