REPORT NUMBER: 131SB-MGA-2009-001

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 131SB SCHOOL BUS PEDESTRIAN SAFETY DEVICES

THOMAS BUILT BUSES
2009 THOMAS MINOTOUR SCHOOL BUS
NHTSA NO.: C90901

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

TEST DATES: SEPTEMBER 8, 2008 – SEPTEMBER 9, 2008

FINAL REPORT DATE: NOVEMBER 6, 2008

FINAL REPORT

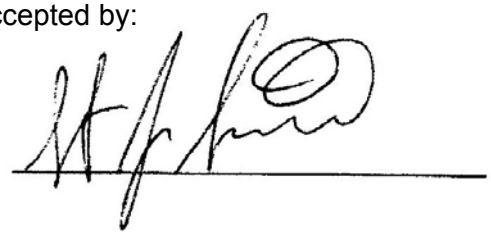
PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NVS-220
1200 NEW JERSEY AVENUE, S.E.
WASHINGTON, D.C. 20590

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.

Prepared by: _____ Date: November 6, 2008
Eric Peschman, Project Engineer

Reviewed by: _____ Date: November 6, 2008
Mike Janovicz, Program Manager

Final report accepted by:



November 6, 2008
Date of Acceptance

Technical Report Documentation Page

1. Report No. 131SB-MGA-2009-001	*2. Government Accession No.*	*3. Recipient's Catalog No.*	
4. Title and Subtitle Final Report of FMVSS 131 Compliance Testing of 2009 Thomas Minotour School Bus NHTSA No.: C90901		*5. Report Date* November 6, 2008 *6. Performing Organization Code* MGA	
7. Author(s) Eric Peschman, Project Engineer Mike Janovicz, Program Manager		*8. Performing Organization Report No.* 131SB-MGA-2009-001	
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 9/23/08 - 10/22/08 *14. Sponsoring Agency Code* NVS-220	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject, 2009 Thomas Minotour School Bus, NHTSA No.: C90901, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-131SB-01 for the determination of FMVSS 131 compliance. Test failures identified were as follows: None			
17. Key Words Safety Bus Compliance Testing Safety Engineering FMVSS 131		*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 Telephone 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* 26	22. Price

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted by the MGA Research Corporation-Wisconsin Operations on a 2009 Thomas Minotour School Bus, NHTSA No.: C90901, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-131SB-01 to determine compliance to the requirements of Federal Motor Vehicle Safety Standard (FMVSS) 131, "School Bus Pedestrian Safety Devices."

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 2009 Thomas Minotour School Bus, NHTSA No.: C90901, appears to meet all of the requirements of FMVSS 131SB. See Test Summary Data Sheets on the following pages.

FMVSS 131SB, SCHOOL BUS PEDESTRIAN SAFETY DEVICES

VEHICLE INFORMATION AND TEST SUMMARY

Test Vehicle: **2009 Thomas Minotour School Bus** NHTSA No.: **C90901**
Test Lab: **MGA Research Corporation** Test Dates: **9/8/08 – 9/9/08**

VIN	1GBHG31C181210142	Chassis Cab	Yes
No. of Stop Signal Arms	1	Rear Engine	No
Pass. Capacity (driver included)	21	Tire Size (on bus)	LT245/75R16
Stop Signal Arm Manufacturer	Specialty Manufacturing Inc.		

DATA FROM CERTIFICATION LABEL

Final Stage Manufacturer	Thomas Built	Date of Mfg.	07/2008
Incomplete Vehicle Manufacturer	Chevrolet	Date of Mfg.	06/2008
GVWR (kg)	4356	GAWR Front (kg)	1860
		GAWR Rear (kg)	2760

TEST SUMMARY

	Pass/Fail or N/A
Dimensional Requirements (S5.1)	**Pass**
Surface Content and Labeling (S5.2)	**Pass**
Conspicuity Requirements (S5.3)	**Pass**
Location and Position Requirements (S5.4)	**Pass**
Arm Operation Requirements (S5.5)	**Pass**

Note: The 2008 Thomas Minotour School Bus was only equipped with one stop signal arm.

SECTION 3
COMPLIANCE TEST DATA

FMVSS 131SB – DATA SHEET 1

DIMENSIONS OF STOP SIGNAL ARM (S5.1)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

"Regular octagon" with diameter of at least 450 mm (point to point).

	Forward Signal Arm (mm)
Diameter 1	495
Diameter 2	495
Diameter 3	495
Diameter 4	495
Range (max. – min.)	0

Requirements	Yes, No, N/A
Are all octagon diameter values ≥ 450 mm?	Yes
Is range of octagon diameter values ≤ 12 mm?	Yes
Are all octagon chord dimensions equal within 6 mm?	Yes

Test Results		Pass/Fail
S5.1	Dimensions of Stop Signal Arm	**Pass**

Tested By: 

Approved By: 

Date: September 8, 2008

FMVSS 131SB – DATA SHEET 2

SURFACE CONTENT AND LABELING (S5.2)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

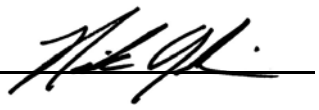
REQUIREMENTS	Forward Signal Arm	
	Front Side	Aft Side
Color RED except for border & legend (Yes/No)	Yes	Yes
Color of border is WHITE (Yes/No)	Yes	Yes
Color of word "STOP" is WHITE (Yes/No)	Yes	Yes
Word "STOP" is in upper case letters (Yes/No)	Yes	Yes
Width of border (≥ 12 mm)	16 mm	15 mm
Percent of border obscured by mounting brackets, clips, or bolts, or other components* (≤ 15%)	0%	11.5%
Height of letters (≥ 150 mm)	180 mm	180 mm
Stroke width of letters (≥ 20 mm)	25 mm	25 mm

* = In addition to area obscured by 2 optional red lamps, if installed.

NOTE:

1. Front side of rearmost signal arm shall not contain any lettering or border.

Test Results		Pass/Fail
S5.2	Surface content and labeling	**Pass**

Tested By: 

Approved By: 

Date: September 8, 2008

FMVSS 131SB – DATA SHEET 3

CONSPICUITY (S5.3)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

The Stop Signal Arm shall comply with either S5.3.1 or S5.3.2, or both.

REFLECTORIZED MATERIAL (S5.3.1)

Requirements	Forward Signal Arm	
	Front Side	Aft Side
Entire surface of stop signal arm reflectorized except for mounting brackets, clips, bolts, or other necessary components. Front side of rearmost stop signal arm must not be reflectorized. (Yes/No)	Yes	Yes
Percent of entire surface obscured by mounting brackets, clips, bolts or other components necessary for mechanical or electrical operation. (7.5% max. each side)	0%	4.19%

FMVSS 131SB – DATA SHEET 3…continued

CONSPICUITY (S5.3)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

OPTIONAL ILLUMINATED LETTERING (S5.3.1.1)

Item	Stop Signal Arm Forward
Does the stop sign(s) have illuminated lettering? If optional illuminated lettering is installed, the following requirements apply in addition to reflectorized surface. (Yes/No)	No

Requirements		Forward Signal Arm	
		Front Side	Aft Side
Only Red lamps used (Yes/No)		N/A	N/A
Red lamps form the complete shape of each letter of the legend. (Yes/No)		N/A	N/A
Red lamps centered within stroke of each letter (Yes/No) or Red lamps outline each letter in immediately surrounding area (Yes/No)		N/A	N/A
The shape of each letter remains constant (Yes/No)		N/A	N/A
Net stroke width ≥ 15 mm (stroke width minus lamp width)	"S"	N/A	N/A
	"T"	N/A	N/A
	"O"	N/A	N/A
	"P"	N/A	N/A
Lamps on each side of the signal arm flash (60-120 flashes/min.)		N/A	N/A
Lamps current "on" time of 30% to 75% of the total flash cycle		N/A	N/A
Total current "on" time for the two terminals shall be between 90-110% of the total flash cycle.		N/A	N/A
If Xenon short-arc lamps – "off" time before each flash of at least 50% of the total flash cycle.		N/A	N/A

FMVSS 131SB – DATA SHEET 3…continued

CONSPICUITY (S5.3)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

RED FLASHING LAMPS (S5.3.2)

Requirements	Forward Signal Arm	
	Front Side	Aft Side
Are the Red Lamps centered on the vertical centerline? (At least 2, enter quantity)	Yes - 2	Yes - 2
Is one lamp at extreme top and another at extreme bottom? (Yes/No)	Yes	Yes
Do the lamps on each side of the signal arm flash alternately? (60-120 flashes/min.) (Yes/No)	Yes - 74	Yes - 74
Lamps current "on" time of 30% to 75% of the total flash cycle. (Yes/No)	NA	NA
Total current "on" time for two terminals shall be between 90 and 110% of the total flash cycle. (Yes/No)	NA	NA
If Xenon short-arc lamps-"off" time before each flash of at least 50% of total flash cycle. (Yes/No)	Yes	Yes
Is there a symbol "DOT" on each lamp lens? (Yes/No) (Not Required)	No	No
Additional markings on lamp lenses	SMC-194 SAE J1133 FMVSS 131	SMC-194 SAE J1133 FMVSS 131

MARKINGS ON THE FLASHER

Make	Specialty MFG Inc.	Serial No.	C 08 22776
Model	5500 M	Date of Mfg.	July 18, 2008

Test Results		Pass/Fail or N/A
S5.3.1	Reflectorized Material	**Pass**
S5.3.1.1	Optional Illuminated Lettering	N/A
S5.3.2	Red Flashing Lamps	**Pass**

Tested By: _____ Approved By: _____

Date: September 8, 2008

FMVSS 131SB – DATA SHEET 4

STOP SIGNAL ARM INSTALLATION (S5.4)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

Dimensions and angles measured with Signal Arm in the extended position.

Requirements	Stop Signal Arm Forward
Signal arm perpendicular to side of bus (Measure angle between vertical plane of side of bus and vertical plane of the signal arm.) 90 ± 5°	87.8°
Top edge of signal arm parallel to horizontal plane (Measure angle between vertical plane of side of bus and the top edge of the signal arm.) 90 ± 5°	89.1°
Top edge of signal arm not more than 152.4 mm from a horizontal plane tangent to lower edge of frame of passenger window immediately behind the driver's window:	
Measure top corner closest to the school bus to the bottom edge of the window.	30 mm
Measure top corner furthest from school bus to the bottom edge of the window.	30 mm
Vertical centerline of signal arm not less than 228.6 mm away from side of bus	364 mm
Stop signal arm(s) installed on left side of bus (Yes, No, or Not Applicable)	Yes

Test Results		Pass/Fail or N/A
S5.4	Stop Signal Arm Installation	**Pass**

Tested By: _____ Approved By: _____

Date: September 8, 2008

FMVSS 131SB – DATA SHEET 5

STOP SIGNAL ARM OPERATION (S5.5)

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

Stop Signal Arm(s) shall be automatically extended, at a minimum, whenever the red signal lamps on the bus required by FMVSS 108 are activated; except that a manual override device may be installed that prevents automatic extension.

Requirements	Stop Signal Arm
	Forward
Signal Arm(s) automatically extended when red lights are activated and override device is not activated. (Yes, No, or Not Applicable)	Yes
If a MANUAL OVERRIDE DEVICE is installed, enter applicable data below:	
Mechanism for activating the override device is within reach of the school bus driver (Yes/No)	N/A
While the override device is activated; there is a continuous or intermittent signal audible to the driver unless equipped with optional cut-off timing device (Measure duration ≥ 10 min.) (Yes/No)	N/A
If audible signal is equipped with optional cut-off timing device, it sounds for at least 60 seconds while the manual override is activated. (Measure 3 times, duration ≥ 60 sec.)	N/A
If audible signal is equipped with optional cut-off timing device, it automatically recycles every time the service entry door is opened while the engine is running and the manual override is engaged. (Recycle 3 times, Yes/No each cycle)	N/A

Describe location and mode of operation of the manual override control, if installed:

No manual override device, which allowed overhead lights to flash and stop signal arm NOT to extend, was installed on this vehicle.

Test Results		Pass/Fail or N/A
S5.5	Stop Signal Arm Operation	**Pass**

Tested By: _____ Approved By: _____

Date: September 8, 2008

SECTION 4

INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle:	**2009 Thomas Minotour School Bus**	NHTSA No.:	**C90901**
Test Lab:	**MGA Research Corporation**	Test Dates:	**9/8/08 – 9/9/08**

Identify the instruments used during this test and record their make, model, serial number, range, accuracy, and calibration date.

	Digital Caliper	Inclinometer	Tape Measure
Make	Mitutoyo	Digital Protractor	Stanley
Model	CD-6”6X	Pro 360	Powerlock 3M
Serial # (s)	05389443	001	559
Range	0 to 150 mm	0 to 360 degrees	0 to 8 m
Accuracy	0.01 mm	0.1 degree	1 mm
Cal. Date	01/18/08	04/22/08	08/19/08
Cal. Due	01/18/09	10/22/08	02/19/09

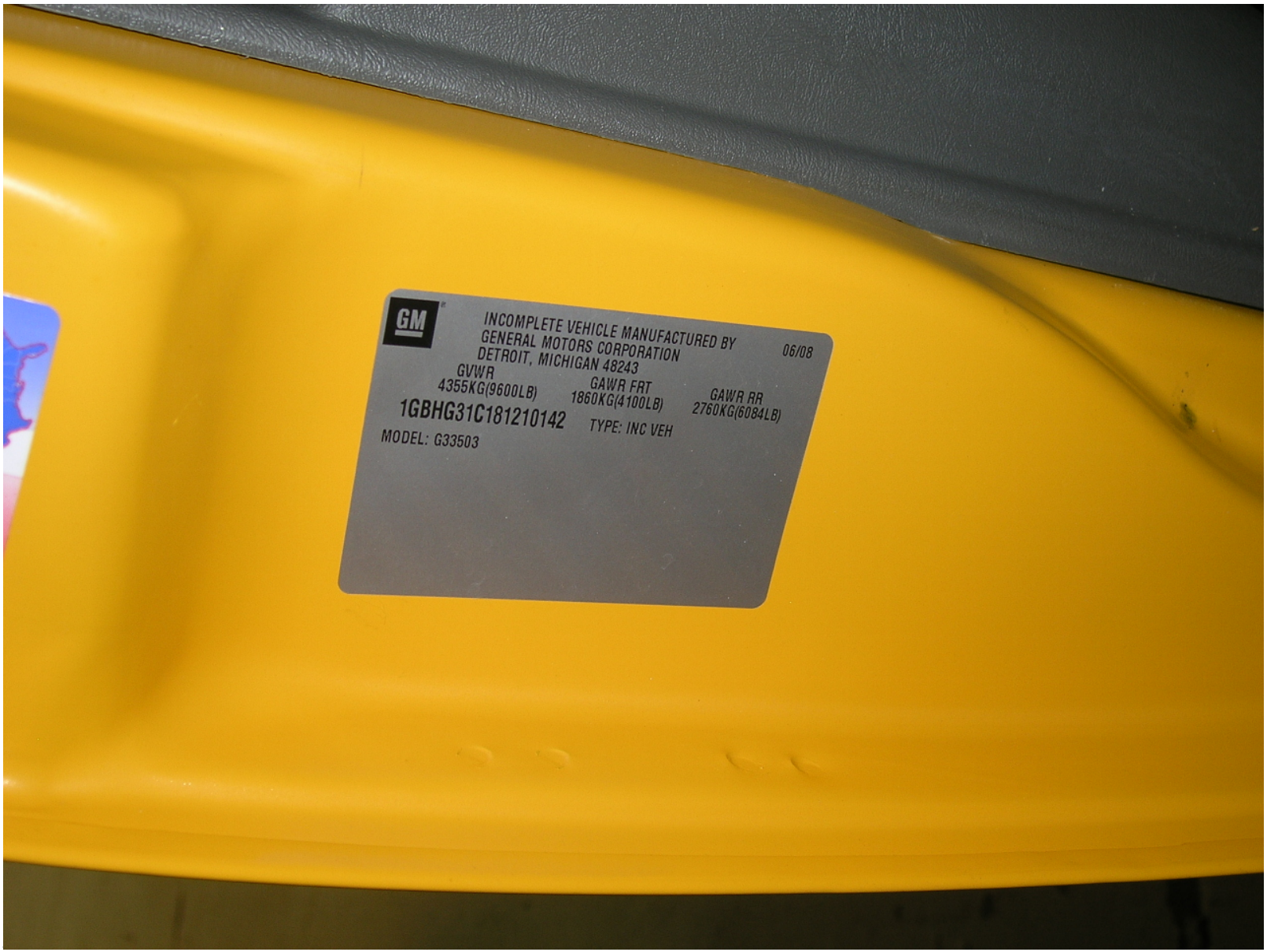
SECTION 5

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

3/4 Frontal View from Left Side of Vehicle with Stop Signal Arm(s) Extended

Vehicle Certification Label



Manufacturer Information Label

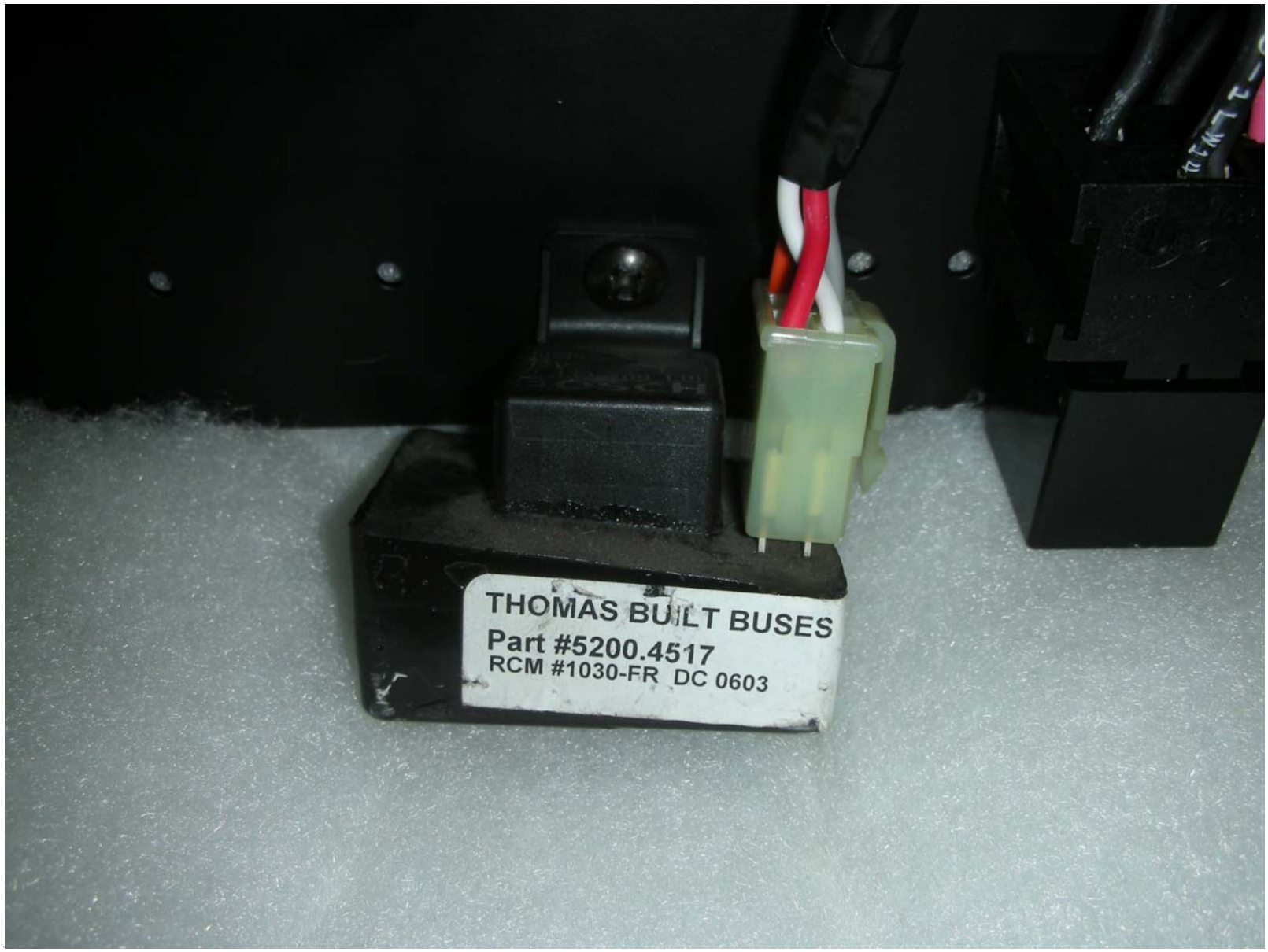
Vehicle Tire Placard

Front Close Up View of Stop Signal Arm

Back Close Up View of Stop Signal Arm

Close Up View of the Switches That Allow Extension of the Stop Signal Arm(s)

Switch Console Relative to the Driver Seating Position



Flasher Unit