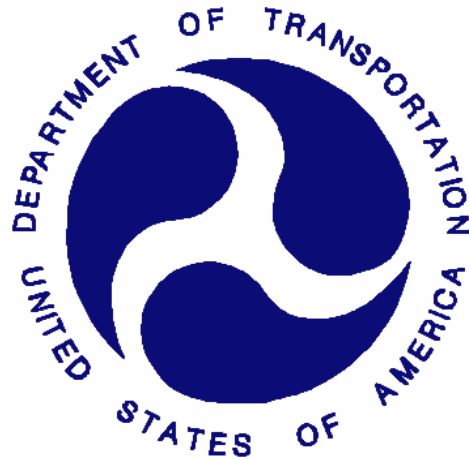


REPORT NUMBER: 221-MGA-2009-006

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO.: 221
SCHOOL BUS BODY JOINT STRENGTH**

**2008 GIRARDIN G5 SCHOOL BUS
NHTSA NO.: C80902**

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




TEST DATE: JANUARY 11, 2011

FINAL REPORT DATE: JANUARY 31, 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**

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16. Abstract Compliance tests were conducted on the subject 2008 Girardin G5 School Bus, NHTSA No.: C80902, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No.: TP-221-03 for the determination of Compliance with FMVSS 221 requirements. Test Failures: None Note: See Test Summary Section for complete details under which compliance was determined.					
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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2008 Girardin G5 School Bus, NHTSA No.: C80902, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-221-03 to determine compliance with the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 221, "School Bus Body Joint Strength".

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

SECTION 2 TEST PROCEDURE

The 2008 Girardin G5 School Bus, NHTSA No.: C80902 was subjected to FMVSS 221 testing.

The joint sample was selected in conjunction with the Contract Officer's Technical Representative (COTR). One 12 x 48 inch sample was selected. It was removed from the bus using a metal shear and/or SawzAll type of cutter.

After the sample area had been removed from the bus, the sample was cut to the specific selected dimensions. The specimen was carefully shaped to the final size using supports as specified in FMVSS 221. Additionally, temperature monitoring stickers were placed at the specified locations of the sample to ensure the sample temperature did not exceed 140°F during the shaping operation.

The sample was tested using the MGA 50,000 pound tensile tester. The force applied was measured directly at the upper clamp. The upper clamp was attached to the load cell and the lower clamp was attached to the load frame.

The gripping devices were fabricated from 3" x 3" angle iron. Slots were milled on the face that mounted to the machine, in order to allow for fore and aft movement of the clamps. This allowed the specimens to be fixtured so that the axis of the test specimen coincided with the centerline axis of the tensile tester heads.

The test specimen was inserted in between the grips, and the grips were then bolted together using 7 size ½" bolts. The bolts were inserted through one grip, through the test specimen, and then through the other grip. This prevented any slipping of the test sample in the grips, while fully distributing the clamping force across the entire end width of the test sample. Post test examination of the specimen indicated that no loads were applied to the clamp mounting holes.

The rate of load application was ¼ inch per minute. The force and displacement were recorded and displacement vs. time was plotted to monitor the displacement rate.

SECTION 3
TEST DATA SUMMARY

One sample was tested for this vehicle. The sample was selected from the interior driver side wall.

Joint Location	Joint Specimen I.D.	Maximum Load (N)	60% of Material Strength (N)	PASS/FAIL
Interior Driver Side Wall	GLSLMI181ARV	15,815	10,963	PASS

The maximum forces measured, and the displacement rate used, are provided in Section 7. The photographs taken from the sample are provided in Section 6 and Section 8.

As a result of the Part 573 report (Defect and Noncompliance Responsibility Report) submitted to NHTSA by Girardin Minibus Inc. regarding compliance to FMVSS 221 of the 2008 Girardin G5 School Bus, the testing detailed in this report was performed after incorporating the remedy listed in section V of the Part 573 report developed by Girardin Minibus Inc.

SECTION 4
COMPLIANCE TEST DATA

The following data sheets document the results of FMVSS 221 testing on the 2008 Girardin G5 School Bus, NHTSA No.: C80902.

DATA SHEET 1
ADMINISTRATIVE DATA SHEET

Test Vehicle: **2008 Girardin G5 School Bus**
Test Lab: **MGA Research Corporation**

NHTSA No.: **C80902**
Test Dates: **01/11/11**

INCOMPLETE VEHICLE (IF APPLICABLE)

Manufacturer:	Ford Motor Company
Model:	G5
VIN:	1FD4E45PX8DB40217
Certification Date:	05/08

COMPLETED VEHICLE (SCHOOL BUS)


Manufacturer:	Girardin Minibus Inc.
Make/Model:	Girardin G5
VIN:	1FD4E45PX8DB40217
NHTSA No.:	C80902
Color:	Yellow
GVWR:	6,373 kg / 14,050 lb
Build Date:	06/08
Certification Date:	05/08


DATES

Vehicle Receipt:	02/19/09
Start of Compliance Test:	01/11/11
Completion of Compliance Test:	01/11/11

COMPLIANCE TEST:

All tests were performed in accordance with the references outlined in TP-221-03.

Recorded By: 

Approved By: 

Date: 01/11/11


DATA SHEET 2
SUMMARY OF DATA


Test Vehicle: **2008 Girardin G5 School Bus**
Test Lab: **MGA Research Corporation**

NHTSA No.: **C80902**
Test Dates: **01/11/11**

Joint Specimen I.D.	Joint Location	Joint Load Reqmt (60%) (N)	Max. Load at Joint Separation (N)	Calculated Material Strength (N)	PASS/ FAIL
GLSLMI181ARV	Interior Driver Side Wall	10,963	15,815	18,272	PASS

Comments: None

Recorded By: 

Approved By: 

Date: 01/11/11

DATA SHEET 3

JOINT STRENGTH WHEN ASTM MATERIAL PROPERTIES ARE KNOWN


Test Vehicle: **2008 Girardin G5 School Bus**
 Test Lab: **MGA Research Corporation**


NHTSA No.: **C80902**
 Test Date: **01/11/11**

Specimen Description:	Interior Driver Side Wall		
Joint Number:	GLSLMI181ARV	Test Number:	Q11012

	Weaker Member	Stronger Member
Material	Embossed Aluminum ANSI H35.1 3003-H14, 0.64 mm	N/A
Tensile Strength (MPa)	144.8	N/A
Gage/Thickness (mm)	0.635	N/A
Fastener Holes (No./Diameter – mm.)	1 / 4.47	N/A
Net Area (Sq. mm.)	126.2	N/A
Material Strength (N)	18,273	N/A
60% of Material Strength (N)	10,963	N/A
Maximum Load From Tensile Test of Joint (N)	15,815	N/A
PASS/FAIL	PASS	N/A

Comments: None

Recorded By: 

Approved By: 

Date: 01/11/11

SECTION 5
INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2008 Girardin G5 School Bus**
Test Lab: **MGA Research Corporation**

NHTSA No.: **C80902**
Test Dates: **01/11/11**

Equipment	Description	Model / Serial No.	Cal. Date	Next Cal. Date
Load Cell	Interface	1210AF-25K-B / 137781	12/16/10	06/16/11
Linear Potentiometer	Ametek	P-25A / 1102-19183	08/10/10	02/10/11
Steel Tape	Stanley	Powerlock / 184	09/23/10	03/23/11
Temp. Stickers	McMaster Carr	60° C / 5952K21	One Time Use	---

**SECTION 6
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Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation
NHTSA No.: C80902
Test Date: 01/11/11



Front View of School Bus

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



Rear View of School Bus

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation
NHTSA No.: C80902
Test Date: 01/11/11



Left Side View of School Bus

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



Right Side View of School Bus

Test Vehicle: 2008 Girardin G5 School Bus NHTSA No.: C80902
Test Lab: MGA Research Corporation Test Date: 01/11/11



MFD BY: GIRARDIN MINIBUS INC
DRUMMONDVILLE, QUEBEC, CANADA, J2B 6V4



DATE OF MANUFACTURE: JUNE 2008

BODY NUMBER: 08-24233

INC. VEH. MFD. BY: FORD 05/08

GVWR: 14050 LB / 6373 KG

GAWR-FRONT: 4600 LB / 2087 KG WITH: LT225/75R16E

RIMS: 16 X 6.0K AT 450 KPA / 65 PSI COLD SINGLE

GAWR-REAR: 9500 LBS / 4309 KG WITH: LT225/75R16E

RIMS: 16 X 6.0K AT 550 KPA / 80 PSI COLD DUAL

V.I.N.: 1FD4E45PX8DB40217

CLASSIFICATION: SCHOOL BUS

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL
MOTOR VEHICLE SAFETY STANDARDS IN EFFECT
ON THE DATE OF MANUFACTURE SHOWN ABOVE.


MAX. PERMITTED SEATED PASSENGERS INCL. DRIVER: 19

MAX. PERMITTED WHEELCHAIR CAPACITY: 1

Certification Label

Test Vehicle: 2008 Girardin G5 School Bus NHTSA No.: C80902
 Test Lab: MGA Research Corporation Test Date: 01/11/11

INCOMPLETE VEHICLE MFD. BY FORD MOTOR COMPANY

DATE: 05/08	4600LB 2087KG	TIRES	GVWR: 14050LB/ 6373KG
FRONT GAWR:		RIMS	REAR GAWR: 9500LB 4309KG
WITH LT225/75R16E			WITH LT225/75R16E
16x6.0K			16x6.0K
AT 450 kPa/ 65 PSI COLD			AT 550 kPa/ 80 PSI COLD
VIN: 1FD4E45PX8DB40217			

Equipped with the Ford School Bus Prep Pkg

EXT PNT: BY	INT TR	TP/PS	R	AXLE	TR	SPR	8E410
WB			7	82	B	VV77	B05
158	CE					ULN	▽ 5USA-3520472-AA

MADE IN U.S.A.

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation
NHTSA No.: C80902
Test Date: 01/11/11



Vehicle Interior View Front to Rear

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



Vehicle Interior View Rear to Front

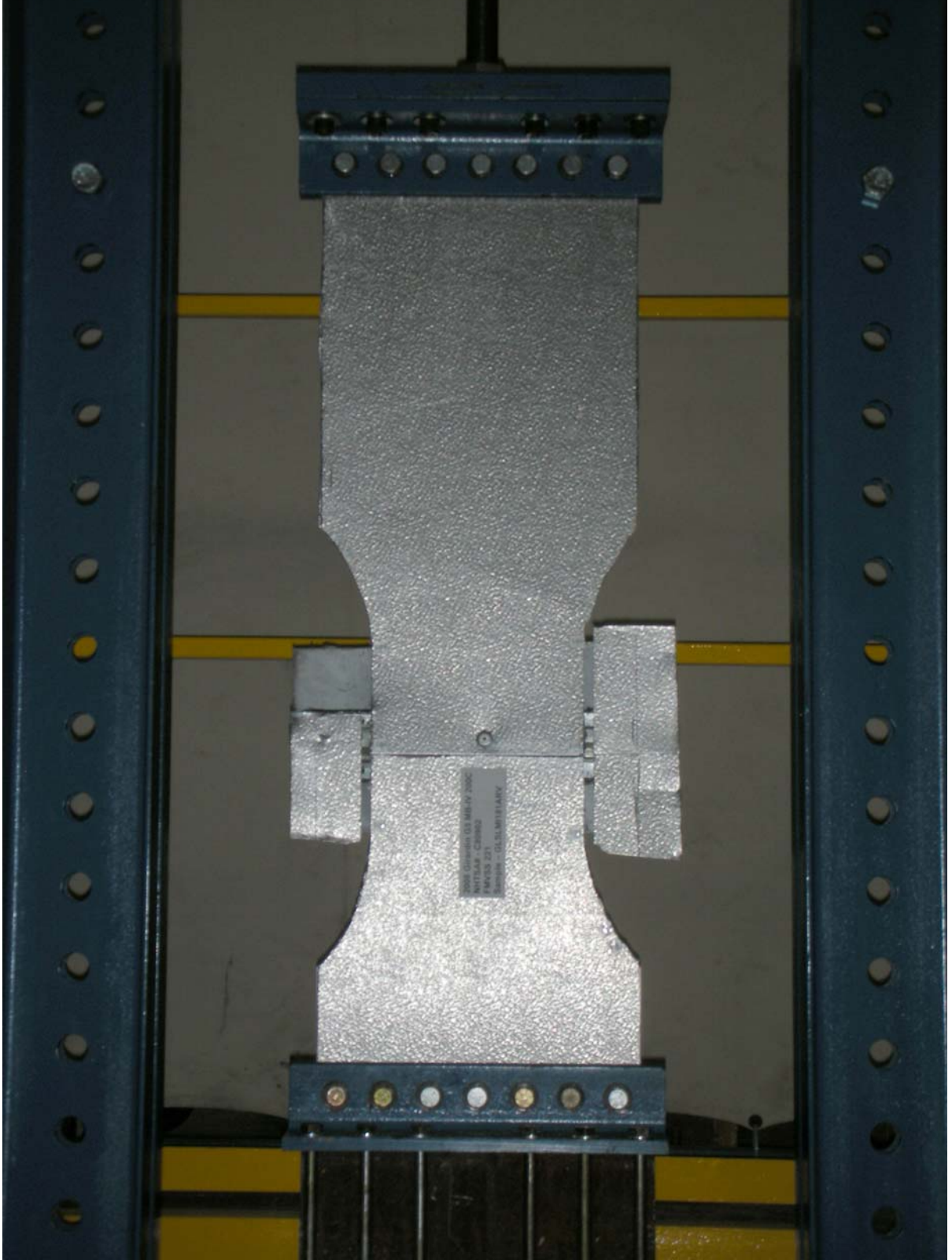
Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



Location of Joint ID Number GLSLMI181ARV

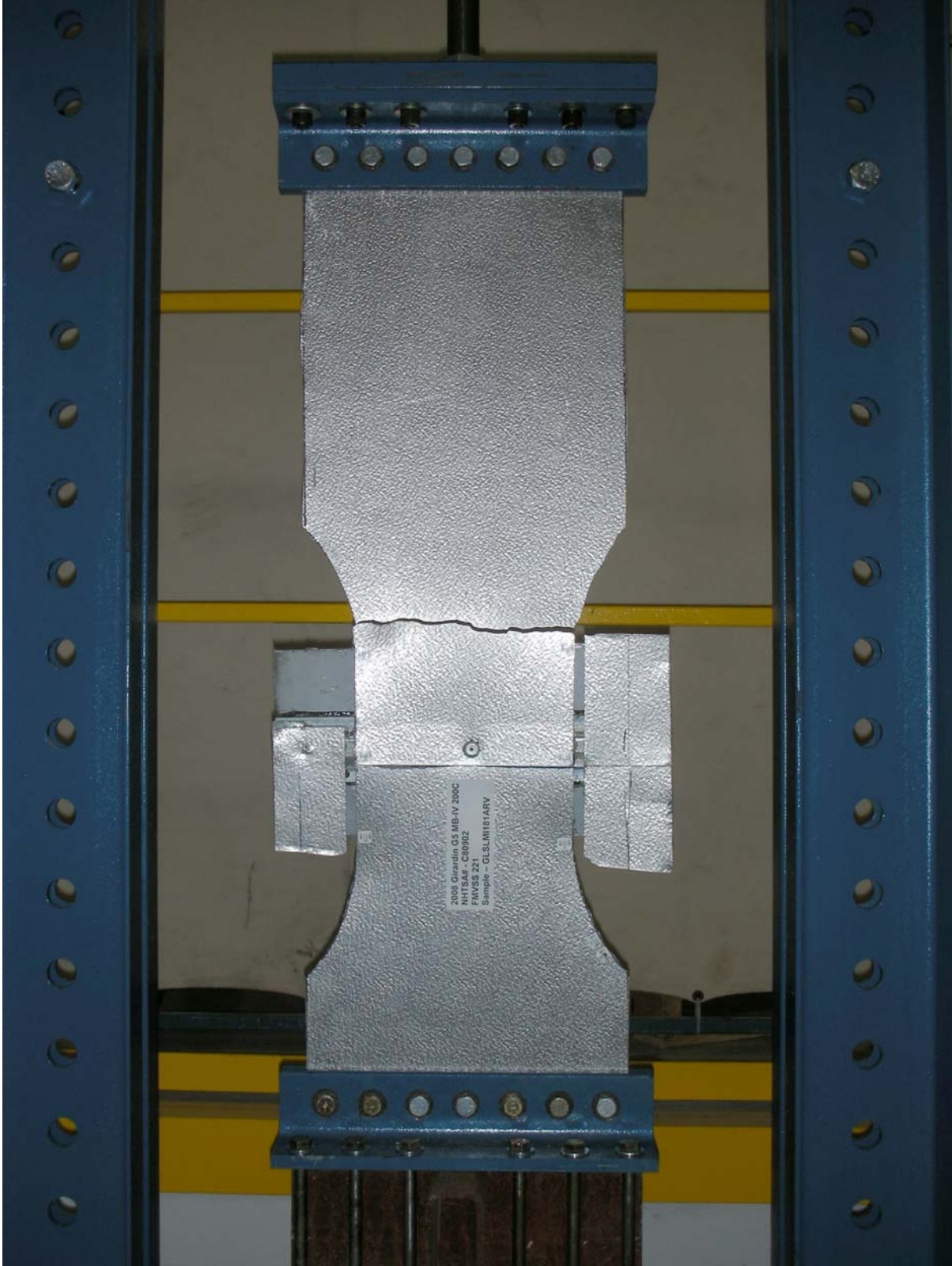
Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation
NHTSA No.: C80902
Test Date: 01/11/11



Pre-Test of Joint ID Number GLSLMI181ARV

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



Post-Test of Joint ID Number GLSLMI181ARV

Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



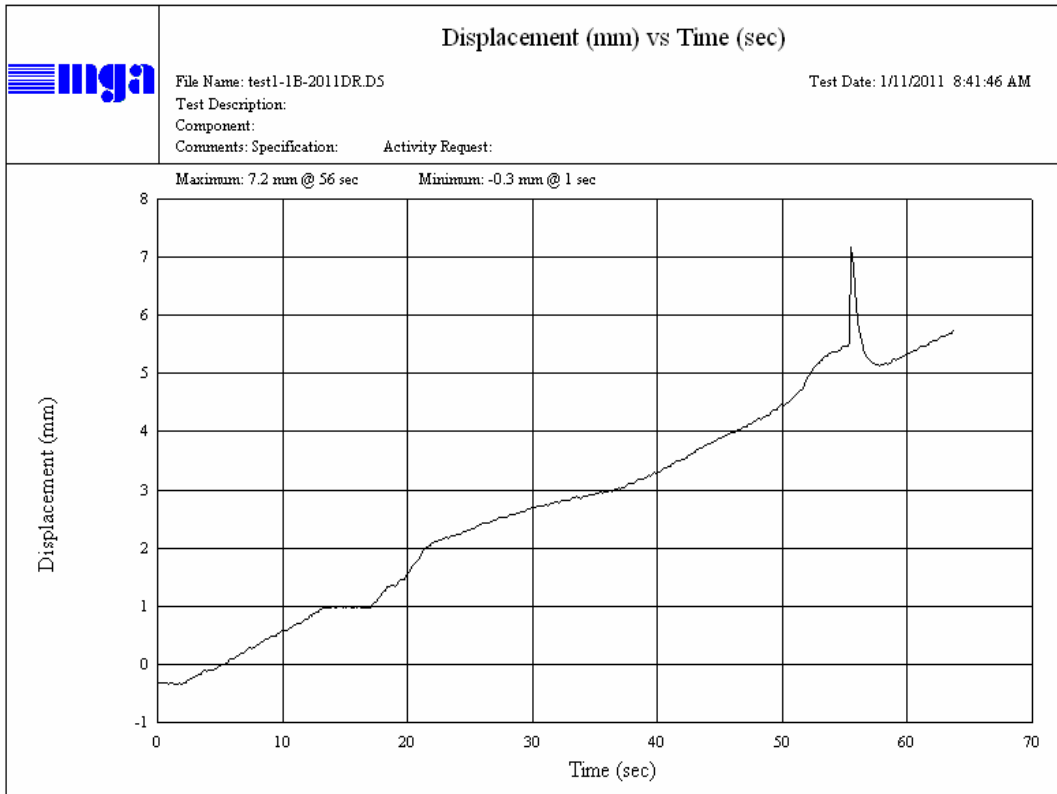
Post-Test of Joint ID Number GLSLM181ARV, Close Up View

SECTION 7
TEST PLOTS

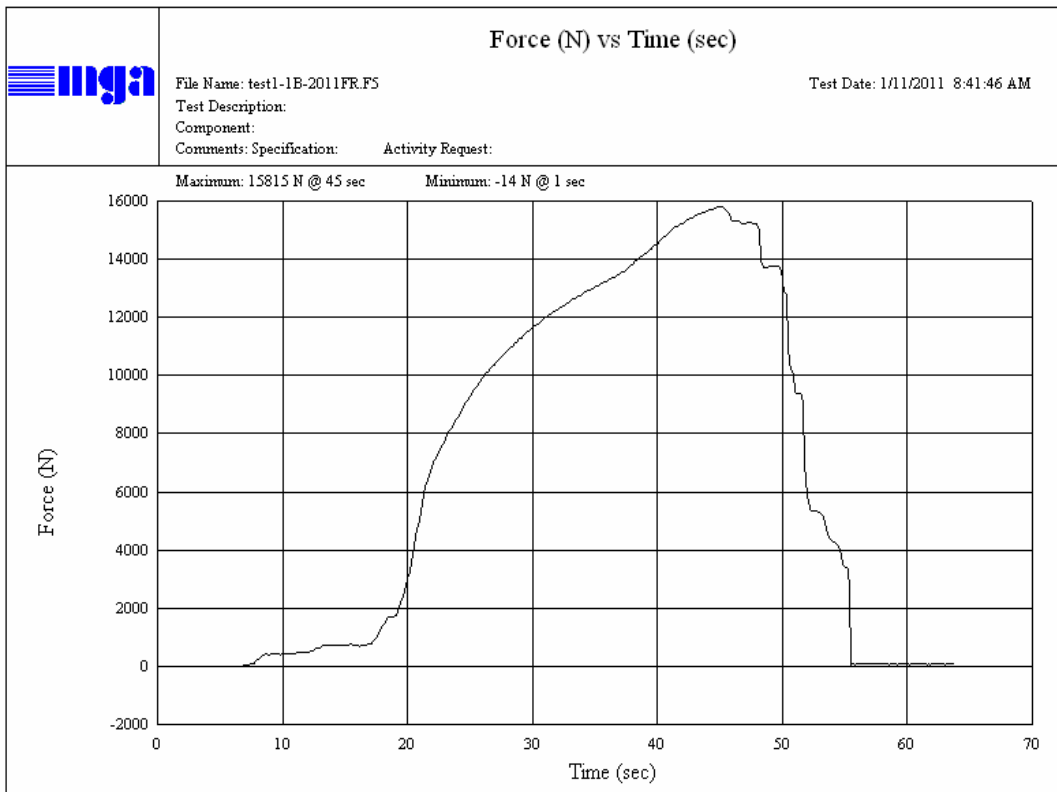
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SECTION 7 TEST PLOTS



Joint Strength, ID Number GLSLMI181ARV, Displacement vs. Time



Joint Strength, ID Number GLSLMI181ARV, Force vs. Time

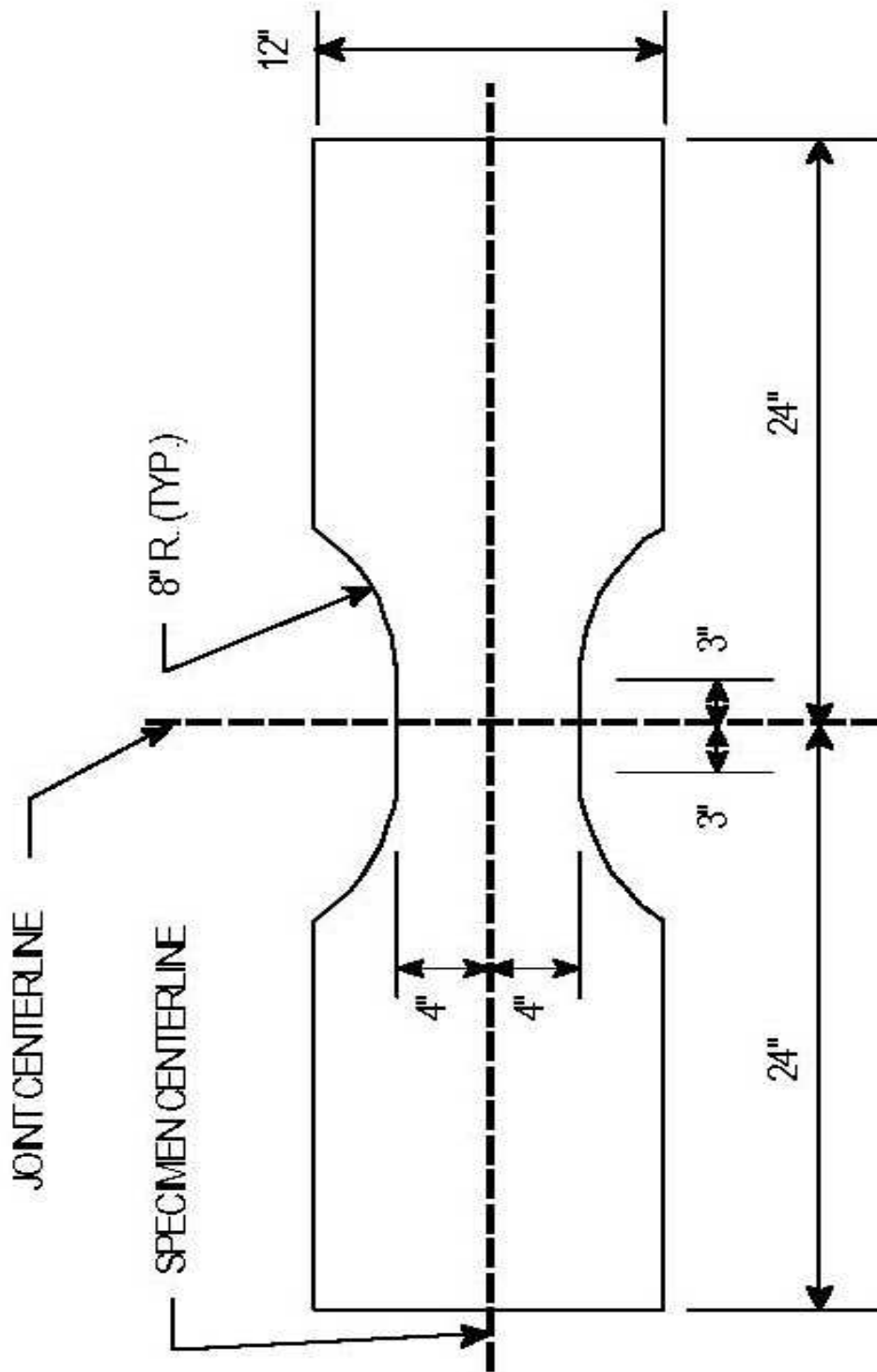
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Test Vehicle: 2008 Girardin G5 School Bus NHTSA No.: C80902
Test Lab: MGA Research Corporation Test Date: 01/11/11

**DIMENSION REQUIREMENTS OF BODY PANEL SPECIMEN
WHOSE JOINT SEGMENT IS 8 INCHES LONG**



Test Vehicle: 2008 Girardin G5 School Bus
Test Lab: MGA Research Corporation

NHTSA No.: C80902
Test Date: 01/11/11



View of Joint ID Number GLSLMI181ARV