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OASIS
Procurement
Budgeting
Accounts Receivable
Accounts Payable
Header @ 24
List View
General Information
Contact
Default Values
Discount
Document Information
Clarification Request
Procurement Folder:
Procurement Type: Central Master Agreement
Vendor ID:
Legal Name: WESTERN RESERVE COACH SALES INC
Alias/DBA:
Total Bid:
Response Date:
Response Time:
Responded By User ID:
First Name:
Last Name:
Email:
Phone:
SO Doc Code: CRFQ
SO Dept:
SO Doc ID:
Published Date:
Close Date:
Close Time:
Status: Closed
Solicitation Description: ADA Compliant Lowered Floor Minivans
Total of Header Attachments: 24
Total of All Attachments: 24

Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Solicitation Response

Proc Folder:	1511486
Solicitation Description:	ADA Compliant Lowered Floor Minivans
Proc Type:	Central Master Agreement

Solicitation Closes	Solicitation Response	Version
2025-04-16 13:30	SR 0810 ESR04012500000005859	1

VENDOR

000000109546
WESTERN RESERVE COACH SALES INC

Solicitation Number: CRFQ 0810 DMT2500000006

Total Bid: 2659650 **Response Date:** 2025-04-16 **Response Time:** 11:45:16

Comments:

FOR INFORMATION CONTACT THE BUYER
John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor
Signature X **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	ADA Lowered Floor Minivans	35.00000	EA	75990.000000	2659650.00

Comm Code	Manufacturer	Specification	Model #
25101502			

Commodity Line Comments: 75990 CLASS A
NO BID CLASS B
77490 CLASS C
NO BID CLASS D

Extended Description:

To establish an open-ended contract for ADA Lowered Floor Minivans. Classes A and B will not possess graphics. Classes C and D will possess 5310 graphics.

Chrysler Voyager	Side Entry Base Conversion
1	CHRYSLER PACIFICA OR VOYAGER SIDE ENTRY • FOLD OUT RAMP • MOBILITY CONVERSION • CROSSWIND • ADA COMPLIANT• MANUAL RAMP • INTERLOCK • REMOVEABLE FRONT SEATS •
1	**Included Options**
1	WALL POUCH - HEAVY DUTY - INSTALLED TO THE VEHICLE - Q-STRAINT
1	AMF BRUNS SILVER SERIES, K350226-1000HL
1	SECOND ROW DOUBLE FLIP SEAT, WITH INTEGRATED 3PT BELTS IN TEIR 1 BLACK VINYL, DRIVER'S SIDE
1	**INTERIOR**
1	EMERGENCY REAR HATCH RELEASE PULL CABLE MANUAL DOOR
1	STATE CERTIFIED WEIGHT CERTIFICATE
1	BELT CUTTER
1	911 EMERGENCY DOT KIT INCLUDES: 5LB FIRE EXTINGUISHER (INSTALLED), BASIC FIRST AID KIT , ROAD TRIANGLES
1	**WARRANTY**
1	SIDE ENTRY VAN STANDARD CONVERSION WARRANTY 3YRS / 36,000 MILES PARTS & LABOR
1	**ADDITIONAL OPTIONS**
1	15 Person First Aid Kit
1	Body Spill Kit
1	Jumper Cables
1	Interior decals
1	Exterior Decals
1	Angel Trax Camera System

Buy America Documentation

FR Conversions
1231 Tech Court
Westminster, MD 21157

Item	Description	Subassembly	Description	Lower level assembly	Description	Manufacturer	Location	Total Value	% of total	Sub-Components Percentage Buy America Compliant	**Precent of Total Compliant**
Completed FR CONVERSIONS Side Entry	Pacifica /Voyager Side Entry Conversion 2017-2024 MANUAL BI-FOLD RAMP ADA COMPLIANT 56" OPENING VOYAGER LX FCA MODLE (RUCL53)					FR Conversions	Westminster MD	$ 69,150.00	100.00%	75.68%	**75.68%**
		Rolling Chassis	Chrysler Pacifica / Voyager RUCL53 with the 27 W Touring Package. (LX)			FCA	Windsor ON	$40,700.00	58.86%	61.95%	**36.46%**
		Pacifica / Voyager Side Entry	Pacifica /Voyager Side Entry Conversion, 2017-2024 FOLD OUT RAMP CONVERSION ADA 56" OPENING WITH MANUAL BIFOLD RAMP			FR Conversions	Westminster MD	$28,450.00	41.14%	95.33%	**39.22%**
				110267	FRONT FLOOR WELDMENT CHRY PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		11.67%	100.00%	11.67%
				110275-01	CHRY PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		7.95%	100.00%	7.95%
				BA-00502	CHRY PACIFICA / VOYAGER Side Entry Station 2 welding kit	FR Conversions	Westminster MD		0.97%	100.00%	0.97%
				BA-00500	CHRY PACIFICA / VOYAGER Side Entry 6.25" front suspension drop kit	FR Conversions	Westminster MD		5.19%	100.00%	5.19%
				110418	TANK STRUCTURE WELDMENT CHRY PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		9.42%	100.00%	9.42%
				110430	STRINGER WELDMENT, CHRY PACIFICA / VOYAGER, SIDE ENTRY	FR Conversions	Westminster MD		2.04%	100.00%	2.04%
				110056	PLASTIC COVER, DS,SEAT BASES,PACIFICA SIDE ENTRY	Northern Plastics	Detroit MI		8.99%	100.00%	8.99%
				BA-00501	CHRY PACIFICA / VOYAGER Side Entry 6.25" Rear suspension drop kit	FR Conversions	Westminster MD		6.81%	100.00%	6.81%
				BA-00503	CHRY PACIFICA / VOYAGER Side Entry AC & Brake Line Kit	Bergaflex	Flint MI		3.36%	100.00%	3.36%
				BA-00506	CHRY PACIFICA / VOYAGER Side Entry Electrical Install kit Includes all wire harnesses.	FR Conversions	Westminster MD		5.35%	100.00%	5.35%
				110501	FOLDING RAMP ASSEMBLY,PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		5.56%	100.00%	5.56%
				110014	SEAT BASE WELDMENT,SEAT BASES,PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		13.22%	100.00%	13.22%
				110007	FOOT PLATE,SEAT BASES,PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		2.70%	100.00%	2.70%
				110259	DOOR WALL, DS & PS , PACIFICA / VOYAGER SIDE ENTRY	FR Conversions	Westminster MD		3.89%	100.00%	3.89%
				110201-01	FLOOR AND FLOORING ASSEMBLY	FR Conversions	Westminster MD		3.50%	100.00%	3.50%
					TRACK AND RESTRAINT ASSEMBLY	Q'straint	Oakland Park FL		4.70%	100.00%	4.70%
					Direct final assembly labor (not counted towards buy America)	FR Conversions	Westminster MD		4.67%	0.00%	
									100.00%		95.33%
								$28,450.00			

FEDERAL TRANSIT BUS TEST

Performed for the Federal Transit Administration U.S. DOT
In accordance with 49 CFR, Part 665

Manufacturer: FR Conversions, Inc.
Model: 2017 Chrysler Pacifica Touring L Side Entry

Tested in Service-Life Category
4 Year / 100,000 Miles

July 2021

Report Number: LTI-BT-R2020-12

The Thomas D. Larson
Pennsylvania Transportation Institute
201 Transportation Research Building
The Pennsylvania State University
University Park, PA 16802
(814) 865-1891

Bus Testing and Research Center
2237 Plank Road
Duncansville, PA 16635
(814) 695-3404

PennState
College of Engineering

LTI BUS RESEARCH
AND TESTING CENTER

FEDERAL TRANSIT BUS TEST

Performed for the Federal Transit Administration, U.S. DOT
1200 New Jersey Avenue, SE
Washington, DC 20590

In accordance with 49 CFR Part, 665

Manufacturer: FR Conversions, Inc.
Manufacturer's address: 1231 Tech Court
Westminster, MD 21157

Model: 2017 Chrysler Pacifica Touring L Side Entry

Tested in Service-Life Category
4 Year / 100,000 Miles

Report Number: LTI-BT-R2020-12

David Klinikowski	Director, Bus Research and Testing Center	July 21st, 2021
Quality Authorization	*Title*	*Date*

TABLE OF CONTENTS

EXECUTIVE SUMMARY

TEST HIGHLIGHTS

The information in this report pertains only to this specific bus, as received from the manufacturer for testing.

The Check-In section of the report provides a description of the bus and specifies its major components. The following table gives the salient specifications.

Manufacturer	FR Conversions, Inc.
Model	2017 Chrysler Pacifica Touring L Side Entry
Chassis Make/Model	Chrysler / Pacifica Touring L
Chassis Modified	Yes
Length	16 feet, 11 inches
Fuel	Gasoline
Service Life	4 years / 100,000 miles
Number of Seats (including driver)	3 and 1 wheelchair
Manufacturer-Designated Standing Passenger Capacity	No Standees
Gross Vehicle Weight used for testing	5,900 lb.
Gross Vehicle Weight Rating	6,005 lb.
Mileage at Delivery	1,684 mi
Test Start Date	November 23, 2020
Test Completion Date	June 7, 2021

The measured curb weight was 2,570 lb. for the front axle and 2,290 lb. for the rear axle. These combined weights provided a total measured curb weight of 4,860 lb. There are 4 seats including the driver and one wheelchair position. There is no free floor space for standing passengers due to this vehicle being a minivan. However, loading was limited to 3 seats including the driver due to weight ratings. Therefore, the gross load represents seated passengers only, for a total of 4 passengers, including the driver. Gross load is calculated as (150 lb. x 3) + (600 lb. x 1) = 1,050 lb. At full declared capacity, the measured gross vehicle weight was 5,900 lb. It is noted that this vehicle did not have a right front passenger seat installed. With the front passenger seat installed and/or the use of the third seating position in the rear seat, the vehicle would exceed the weight rating.

This bus has a modified chassis. The OEM chassis was removed and lowered from just in front of the front seats, to the front of the rearmost seat in order to accommodate the wheelchair and ramp.

BUS TESTING BACKGROUND

On August 1, 2016, FTA announced a final rule for bus testing for improving the process of ensuring the safety and reliability of new transit buses. The rule satisfies requirements in MAP-21 to establish minimum performance standards, a standardized scoring system, and a pass-fail threshold based on the score.

FTA's Bus Testing Program (often referred to as "Altoona Testing" due to the location of the main testing center) tests new transit bus models for:

- Maintainability
- Reliability
- Safety
- Performance (including Braking Performance)
- Structural Integrity (including Structural Durability)
- Fuel Economy (Energy Efficiency and Range, for electric buses)
- Noise
- Emissions

Bus models that fail to meet one or more minimum performance standards will "fail" their test and thus be ineligible for purchase with FTA funds until the failures are resolved and validated through further testing. FTA will use this authority to make sure defects are corrected before a bus model can be acquired with FTA funding.

In each application to FTA for the purchase or lease of any new bus model, or any bus model with a major change in configuration or components to be acquired or leased with funds obligated by the FTA, the recipient shall certify that it has received the appropriate full Bus Testing Report and any applicable partial testing report(s) before final acceptance of the first vehicle. In dealing with a bus manufacturer or dealer, the recipient shall be responsible for determining whether a vehicle to be acquired requires full testing or partial testing or has already satisfied the requirements of this part. A bus manufacturer or recipient may request guidance from FTA in making these determinations.

The purpose of the testing is intended set a "Pass/Fail" standard and grade the performance of the buses in order to provide performance information to the transit authorities that can be used in their purchase or lease decisions. The intent of this report is to provide the grantee a relative measure of the performance of a particular model of transit bus against a standard of performance. The passing of this test should ensure a vehicle has a high probability of meeting its service life in the category it was tested.

The data included in this test report and other applicable reports should be reviewed to choose the most suitable bus for a grantee's operation. A higher scoring bus is not necessarily the best bus for a given application. For example, a bus with a powerful engine may score well because of its performance and gradeability, but another bus with a smaller and more fuel-efficient engine could be a better choice for applications in mostly flat areas. It is the responsibility of the grantee to ensure the proper test report or applicable partial report is in their possession and has been thoroughly reviewed.

The score sheet for the subject vehicle of this test report is provided below. **This bus passed the Altoona test, with an aggregate score of 92.8.**

FR Conversions, Inc. Bus # 2020-12									
Test category		Standard	Base Pts.	Bonus Pts.	Range	Range	Test Data	Score	FAIL
1. Maintainability	Unscheduled maint.	< 125 hours	2	14	0	125	2	15.78	
2. Reliability	# Class 2 failures	< 2 Uncorrected	2	6	0	2	0	8.00	
3. Safety	Hazards	No uncorrected Class 1	10	0	P	F	P	10.00	
	Stability	Lane change, 45 mph?	2.5	0	P	F	P	2.50	
	Braking	< 158 feet at 45mph	0.5	2	80	158	88.6	2.28	
		Holds Lane, Split coeffient	2.5	0	P	F	P	2.50	
		Parking brake, 20% grade	2.5	0	P	F	P	2.50	
4. Performance	Acceleration 0-30 mph	less than 30 sec	1.5	0	P	F	P	1.50	
	Gradeability 2.5%	more than 40 mph	1.5	0	P	F	P	1.50	
	Gradeability 10%	more than 10 mph	2	0	P	F	P	2.00	
5. Structural Integrity	Distortion	Exits are operational	1	0	P	F	P	1.00	
	Static Towing	No significant deformation	1	0	P	F	P	0.00	
	Dynamic Towing	Towable with std. wrecker	1	0	P	F	P	1.00	
	Jacking	Liftable with std. jack	1	0	P	F	P	1.00	
	Hoisting	Stable on jacks	1	0	P	F	P	1.00	
	Durability-Structural	No uncorrected failures	13	0	P	F	P	13.00	
	Durability-Powertrain	No uncorrected failures	12	0	P	F	P	12.00	
6. Fuel Economy	Liquid fuels	1-13mpg	1	6	1	13	13.8	7.00	
	CNG	10-50 scf/mi			10	50	NA	0.00	
	Hydrogen	15-98 cf/mi			15	98	NA	0.00	
	Electric	1-3 kWh/mi			1	3	NA	0.00	
7. Noise	Int. Noise (0-35 mph)	less than 80 db	0.5	3	30	80	77.7	0.64	
	Ext. Noise (0-35 mph)	less than 83 db	0.5	3	50	83	73.9	1.33	
8. Emissions	CO_2	0-4000 g/mi	1	4	0	4000	654	4.35	
	CO	0-20 g/mi		0.4	0	20	0.3	0.39	
	Total hydrocarbon	0-3 g/mi		0.4	0	3	0.03	0.40	
	NMHC	0-3 g/mi		0.4	0	3	0.02	0.40	
	Nitrogen oxides	0-3 g/mi		0.4	0	2	0.03	0.39	
	Particulates	0-0.1 g/m		0.4	0	0.1	0	0.40	
Total			60	40				92.8	

Note: The use of the scoring system is not mandatory for procurement. It is only necessary that the bus being procured has received a passing score.

ABBREVIATIONS AND ACRONYMS

ABS - anti-skid braking system
ABTC - Altoona Bus Test Center
A/C - air conditioner, or air conditioning
AC - alternating current
ADA - American Disability Act
CDCTS - chassis dynamometer test control system
CVS - constant volume sampling
CW - curb weight (bus weight including maximum fuel, oil, and coolant; but without passengers or driver)
dB(A) - decibels with reference to 0.0002 microbar as measured on the "A" scale
DC - direct current
DIR - test director
DR - bus driver
EPA - Environmental Protection Agency
GAWR – gross axle weight rating
GVL - gross vehicle load (150 lb. for every designed passenger seating position, for the driver, and for each 1.5 sq ft of free floor space)
GVW - gross vehicle weight (curb weight plus gross vehicle load)
GVWR - gross vehicle weight rating
HD-UDDS – Heavy Duty-Urban Dynamometer Driving Schedule
LTI - Larson Transportation Institute
mpg - miles per gallon
mph - miles per hour
PM - Preventive maintenance
PSTT - Penn State Test Track
rpm - revolutions per minute
SAE - Society of Automotive Engineers
SCF - Standard cubic foot
SCH - test scheduler
SA - staff assistant
SLW - seated load weight (curb weight plus 150 lb. for every designed passenger seating position and for the driver)
TD - test driver
TECH - test technician
TM - track manager
TP - test personnel
Wh - Watt hour

TEST BUS CHECK-IN

I. OBJECTIVE

The objective of this task is to log in the test bus, assign a bus number, complete the vehicle data form, and perform a safety check.

II. TEST DESCRIPTION

The test consisted of assigning a bus test number to the bus, cleaning the bus, completing the vehicle data form, obtaining any special information and tools from the manufacturer, determining a testing schedule, performing an initial safety check, and performing the manufacturer's recommended preventive maintenance. The bus manufacturer certified that the bus meets all Federal regulations.

III. DISCUSSION

The check-in procedure is used to identify in detail the major components and configuration of the bus.

The test bus consisted of a FR Conversions, Inc., 2017 Chrysler Pacifica Touring L Side Entry bus model. The bus has a front, streetside driver's door and a front curbside passenger door behind the front axle. There are sliding passenger doors on both the streetside and curbside that are forward of the rear axle. The curbside sliding door is equipped with a manual fold out FR Conversions 111500 model ramp. There is also a rear hatch at the back of the van. Power is provided by a gasoline fueled, FCA US LLC OEM 3.6 litre engine coupled to Chrysler OEM transmission.

The measured curb weight was 2,570 lb. for the front axle and 2,290 lb. for the rear axle. These combined weights provided a total measured curb weight of 4,860 lb. There are 4 seats including the driver and one wheelchair position. There is no free floor space for standing passengers due to this vehicle being a minivan. However, loading was limited to 3 seats including the driver due to weight ratings. Therefore, the gross load represents seated passengers only, for a total of 4 passengers, including the driver. Gross load is calculated as (150 lb. x 3) + (600 lb. x 1) = 1,050 lb. At full declared capacity, the measured gross vehicle weight was 5,900 lb. It is noted that this vehicle did not have a right front passenger seat installed. With the front passenger seat installed and/or the use of the third seating position in the rear seat, the vehicle would exceed the weight rating.

This bus has a modified chassis. The OEM chassis was removed and lowered from just in front of the front seats, to the front of the rearmost seat in order to accommodate the wheelchair and ramp.

VEHICLE DATA FORM

Bus Number: 2020-12	Date of Check-In: 11/23/2020
Bus Manufacturer: FR Conversions, Inc.	Vehicle Identification Number (VIN): 2C4RC1BG5HR514197
Model Number: Pacifica Touring L	Chassis Mfr./Mod.#: Chrysler / Pacifica Touring L
Personnel: E.D. & S.R.	Starting Odometer Reading: 1,684

WEIGHT:

Individual Wheel Reactions:

Weights (lb.)	Front Axle		Middle Axle		Rear Axle	
	Curb	Street	Curb	Street	Curb	Street
CW	1,280	1,290	N/A	N/A	1,150	1,140
SLW	1,430	1,450	N/A	N/A	1,490	1,530
GVW	1,430	1,450	N/A	N/A	1,490	1,530

Total Weight Details:

Weight (lb.)	CW	SLW	GVW	GAWR
Front Axle	2,570	2,880	2,880	2,950
Middle Axle	N/A	N/A	N/A	N/A
Rear Axle	2,290	3,020	3,200	3,200
Total	4,860	5,900	5,900	GVWR: 6,005 (Declared by Manufacturer)

Dimensions:

Length (ft/in)	16 / 11
Width (in)	80.2
Height (in)	76
Front Overhang (in)	37
Rear Overhang (in)	43
Wheelbase (in)	123
Wheel Track (in)	Front: 67.5
	Middle: N/A
	Rear: 68.5

Bus Number: 2020-12	Date: 11/23/2020

CLEARANCES:

Lowest Point Outside Front Axle	Location: Frame Tubing Clearance(in): 9.8
Lowest Point Outside Rear Axle	Location: Small Exhaust Resonator Clearance(in): 6.5
Lowest Point between Axles	Location: Large Exhaust Resonator Clearance(in): 4.1
Ground Clearance at the center (in)	5.3
Front Approach Angle (deg)*	20.0
Rear Approach Angle (deg)*	17.2
Ramp Clearance Angle (deg)	5.3
Aisle Width (in)	N/A
Inside Standing Height at Center Aisle (in)	N/A

*measurements used to calculate approach and departure angles are taken from the centerline of the axles.

BODY DETAILS:

Body Structural Type	Unibody		
Frame Material	Steel		
Body Material	Steel and Composite		
Floor Material	Steel		
Roof Material	Steel		
Windows Type	■ Fixed	■ Movable	
Window Mfg./Model No.	Mopar / 43R-000184 / DOT 865 FYG M1232 AS3 16		
Number of Doors	2 Front	2 Middle	1 Rear
Mfr. / Model No.	Front: Chrysler / OEM Middle: Chrysler / OEM Rear: Chrysler / OEM		
Dimension of Each Door (in)	Front Left: 42 x 30.4 Front Right: 42 x 30 Middle Left: 28.7 x 56.1 Middle Right: 28.7 x 56.1 Rear Hatch: 46.5 x 37.6		
Passenger Seat Type	☐ Cantilever	■ Pedestal	☐ Other (explain)
Driver Seat Type	☐ Air	■ Spring	■ Other (Adjustable Electric)
Mfr. / Model No.	OEM		
Number of Seats (including Driver)	4 & 1 wheelchair (as delivered) 3 & 1 wheelchair (as tested)		

Bus Number: 2020-12	Date: 11/23/2020

BODY DETAILS (Contd.)

Free Floor Space (ft^2)	N/A
Height of Each Step at Normal Position (in)	Front Left: 1. 9.7 2. 12.5 3. N/A 4. N/A Front Right: 1. 10.2 2. 11.8 3. N/A 4. N/A
	Middle Left: 1. 12.2 2. N/A 3. N/A 4. N/A Middle Right: 1. N/A 2. N/A 3. N/A 4. N/A
	Rear 1. N/A 2. XX 3. XX 4. XX
Step Elevation Change - Kneeling (in)	N/A

ENGINE

Type	☐ C.I.	☐ Alternate Fuel	
	■ S.I.	☐ Other (explain)	
Mfr. / Model No.	FCA US LLC / OEM 3.6 litre		
Location	■ Front	☐ Rear	☐ Other (explain)
Fuel Type	■ Gasoline	☐ CNG	☐ Methanol
	☐ Diesel	☐ LNG	☐ Other (explain)
Alternator (Generator) Mfr./Model No.	Denso / TN421000-7187 / P56029732AB		
Maximum Rated Output (Volts / Amps)	12 / 160 (OEM)		
Air Compressor Mfr. / Model No.	N/A		
Maximum Capacity (ft^3 / min)	N/A		
Starter Type	■ Electrical	☐ Pneumatic	☐ Other (explain)
Starter Mfr. / Model No.	FCA Chrysler / OEM		

Bus Number: 2020-12	Date: 11/23/2020

TRANSMISSION

Transmission Type	☐ Manual	■ Automatic	☐ Load Sensing Adaptive
Mfr. / Model No.	Chrysler / OEM		
Control Type	☐ Mechanical	■ Electrical	☐ Other
Integral Retarder Mfr. / Model No.	☐ Yes	■ No	

SUSPENSION

Number of Axles	2		
Front Axle Type	■ Independent	☐ Beam Axle	
Mfr. / Model No.	Chrysler / OEM		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	■ Spring/Struts	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	ZF / 002827 / 2014		
Middle Axle Type	☐ Independent	☐ Beam Axle	
Mfr. / Model No.	N/A		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	☐ Spring	☐ Other (explain)
No. of Shock Absorbers	N/A		
Mfr. / Model No.	N/A		
Rear Axle Type	■ Independent	☐ Beam Axle	
Mfr. / Model No.	Chrysler OEM (with FR Conversion modifications)		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	■ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	ZF / Reg 002829 / 2014		

Bus Number: 2020-12	Date: 11/23/2020

WHEELS & TIRES

Front	Wheel Mfr./ Model No.	Chrysler / OEM
	Tire Mfr./ Model No.	Bridgestone / Turanza EL 440 / 235 60R 18
Rear	Wheel Mfr./ Model No.	Chrysler / OEM
	Tire Mfr./ Model No.	Bridgestone / Turanza EL 440 / 235 60R 18

BRAKES

Front Axle Brakes Type	☐ Cam	■ Disc	☐ Other (explain)
Mfr. / Model No.	Chrysler / OEM		
Middle Axle Brakes Type	☐ Cam	☐ Disc	☐ Other
Mfr. / Model No.	N/A		
Rear Axle Brakes Type	☐ Cam	■ Disc	☐ Other (explain)
Mfr. / Model No.	Chrysler / OEM		

HVAC

Heating System Type	☐ Air	■Water	☐ Other
Capacity (Btu/hr)	Chrysler / OEM		
Mfr. / Model No.	Chrysler / OEM		
Air Conditioner	■ Yes	☐ No	
Location	Dash		
Capacity (Btu/hr)	Chrysler / OEM		
A/C Compressor Mfr. / Model No.	FCA LLC / P68225206AA / 46177G		

STEERING

Steering Gear Box Type	Electric gear rack and pinion power steering		
Mfr. / Model No.	Chrysler / OEM		
Steering Wheel Diameter	15.2”		
Number of turns (lock to lock)	3		
Control Type	■ Electric	☐ Hydraulic	☐ Other (explain)

Bus Number: 2020-12	Date: 11/23/2020

OTHERS

Wheelchair Ramps	Location: Right side middle passenger door	Type: Manual Fold-out
Wheelchair Lifts	Location: N/A	Type: N/A
Mfr. / Model No.	FR Conversions / 111500	
Emergency Exit	Location: Door Rear Hatch	Number: 4 1

CAPACITIES

Fuel Tank Capacity (gallons)	19
Engine Crankcase Capacity (quarts)	5
Transmission Capacity (gallons)	1.59 (Transaxle)
Differential Capacity (quarts)	N/A
Cooling System Capacity (gallons)	3.28
Power Steering Fluid Capacity (quarts)	Not listed, Fill to line

VEHICLE DATA FORM

Bus Number: 2020-12	Date: 11/23/20

List all spare parts, tools and manuals delivered with the bus.

Part Number	Description	Qty.
N/A	N/A	

COMPONENT/SUBSYSTEM INSPECTION FORM

Bus Number: 2020-12	Date: 11/23/2020

Subsystem	Checked	Initials	Comments
Air Conditioning Heating and Ventilation	✓	E.D.	None noted.
Body and Sheet Metal	✓	E.D.	Scrape on curbside bottom of rear door
Frame	✓	E.D.	None noted.
Steering	✓	E.D.	None noted.
Suspension	✓	E.D.	None noted.
Interior/Seating	✓	E.D.	Missing front passenger seat
Axles	✓	E.D.	None noted.
Brakes	✓	E.D.	None noted.
Tires/Wheels	✓	E.D.	None noted.
Exhaust	✓	E.D.	None noted.
Fuel System	✓	E.D.	None noted.
Power Plant	✓	E.D.	None noted.
Accessories	✓	E.D.	None noted.
ADA Accessible Lift System	N/A	E.D.	None noted.
ADA Accessible Ramp System	✓	E.D.	Manual Fold-out Ramp
Interior Fasteners	✓	E.D.	None noted.
Batteries	✓	E.D.	None noted.

CHECK - IN

FR Conversions, Inc.
2017 Chrysler Pacifica Touring L Side Entry

CHECK - IN CONT.

FR Conversions, Inc.
2017 Chrysler Pacifica Touring L Side Entry

CHECK – IN CONT.

FR CONVERSIONS 111500 MODEL
MANUAL FOLD OUT RAMP

OPERATOR'S AREA

CHECK - IN CONT.

INTERIOR FROM FRONT

INTERIOR FROM REAR

CHECK - IN CONT.

INTERIOR – SIDE ENTRY

VIN TAG

CHECK - IN CONT.

ENGINE COMPARTMENT

CHASSIS MODIFICATION

1. MAINTAINABILITY

1.1 ACCESSIBILITY OF COMPONENTS AND SUBSYSTEMS

1.1-I. TEST OBJECTIVE

The objective of this test is to check the accessibility of components and subsystems.

1.1-II. TEST DESCRIPTION

Accessibility of components and subsystems was checked, and where accessibility was restricted the subsystem was noted along with the reason for the restriction.

1.1-III. DISCUSSION

Accessibility, in general, was adequate. Components covered in Section 1.3 (repair and/or replacement of selected subsystems), along with all other components encountered during testing, were found to be readily accessible and no restrictions were noted.

ACCESSIBILITY DATA FORM

Bus Number: 2020-12	Date: 05/28/2021

Component	Checked	Comments
ENGINE:		
Oil Dipstick	✓	None noted.
Oil Filler Hole	✓	None noted.
Oil Drain Plug	✓	None noted.
Oil Filter	✓	None noted.
Fuel Filter	✓	In fuel tank.
Air Filter	✓	None noted.
Belts	✓	None noted.
Coolant Level	✓	None noted.
Coolant Filler Hole	✓	None noted.
Coolant Drain	✓	None noted.
Spark / Glow Plugs	✓	None noted.
Alternator	✓	None noted.
Diagnostic Interface Connector	✓	None noted.
TRANSMISSION:		
Fluid Dipstick	✓	N/A
Filler Hole	✓	None noted.
Drain Plug	✓	None noted.
SUSPENSION:		
Bushings	✓	None noted.
Shock Absorbers	✓	None noted.
Air Springs	✓	N/A
Leveling Valves	✓	N/A
Grease Fittings	✓	N/A

ACCESSIBILITY DATA FORM

Bus Number: 2020-12	Date: 05/28/2021

Component	Checked	Comments
HVAC:		
A/C Compressor	✓	None noted.
Filters	✓	None noted.
Fans	✓	None noted.
ELECTRICAL SYSTEM:		
Fuses	✓	None noted.
Batteries	✓	None noted.
Voltage regulator	✓	None noted.
Voltage Converters	✓	N/A
Lighting	✓	None noted.
MISCELLANEOUS:		
Brakes	✓	None noted.
ADA Accessible Lifts/Ramps	✓	None noted.
Instruments	✓	None noted.
Axles	✓	None noted.
Exhaust	✓	None noted.
Fuel System	✓	None noted.
OTHERS:		

1.2 SERVICING, PREVENTIVE MAINTENANCE, AND REPAIR AND MAINTENANCE DURING TESTING

1.2-I. TEST OBJECTIVE

The objective of this test is to collect maintenance data about the servicing, preventive maintenance, and repair.

1.2.-II. TEST DESCRIPTION

The test was conducted by operating the bus and collecting the following data on work order forms and a driver log.

1. Scheduled Maintenance
    a. Bus number
    b. Date
    c. Mileage
    d. Results of scheduled inspections
    e. Description of malfunction (if any)
    f. Repair action and parts used (if any)
    g. Man-hours required

2. Unscheduled Maintenance
    a. Bus number
    b. Date
    c. Mileage
    d. Description of malfunction
    e. Place and time of malfunction (e.g., in service or undergoing inspection)
    f. Repair action and parts used
    g. Man-hours required

The bus was operated in accelerated durability service. While typical items are given below, the specific service schedule was that specified by the manufacturer.

A. Service
    1. Fueling
    2. Consumable checks
    3. Interior cleaning

B. Preventive Maintenance
    1. Brake adjustments
    2. Lubrication
    3. 3,000 mi (or manufacturer recommended) inspection

4. Oil and filter change inspection
5. Major inspection
6. Tune-up

C. Periodic Repairs
1. Brake reline*
2. Transmission change
3. Engine change*
4. Windshield wiper motor change
5. Stoplight bulb change*
6. Towing operations
7. Hoisting operations

*These items are attended to if found necessary, while the others in the list are removed/replaced/tested for all buses undergoing a full test.

1.2-III. DISCUSSION

Servicing and preventive maintenance were performed at manufacturer-specified intervals. The following Scheduled Maintenance Form lists the mileage, items serviced, the service interval, and amount of time required to perform the maintenance.

The Unscheduled Maintenance List along with related photographs is included in Section 5.7, Structural Durability. This list supplies information related to failures that occurred during the durability portion of testing. The Unscheduled Maintenance List includes the date and mileage at which the malfunction was detected, a description of the malfunction and repair, and the time required to perform the repair.

(Page 1 of 1)
SCHEDULED MAINTENANCE
FR Conversions, Inc. Bus# 2020-12

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	LABOR HOURS
04/15/21	684	P.M./Inspection	Steering linkage, tie rods, universals/u-joints all checked; all fluids checked. Inspected frame, body and suspension.	4.00	4.00
04/22/21	2,219	P.M./Inspection	Steering linkage, tie rods, universals/u-joints all checked; all fluids checked. Inspected frame, body and suspension.	4.00	4.00
05/04/21	3,708	P.M./Inspection Fuel Economy	Steering linkage, tie rods, universals/u-joints all checked; all fluids checked. Inspected frame, body and suspension. Oil changed. Oil, fuel, and air filters changed. Transmission oil and filter were not changed at this time according to manufacturer's scheduled maintenance requirements. The airbag warning light came on several times while running durability. The light then went out and did not come back on.	8.00	8.00

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS

1.3-I. TEST OBJECTIVE

The objective of this test is to establish the time required to replace and/or repair selected subsystems.

1.3-II. TEST DESCRIPTION

The test involved components that may be expected to fail or require replacement during the service life of the bus. In addition, any component that failed during testing of the bus was added to this list. Components to be included are:

1. Transmission
2. Alternator
3. Starter
4. Batteries
5. Windshield wiper motor

1.3-III. DISCUSSION

At the end of the test, the items on the list were removed and replaced. The engine/transmission assembly took 8.00 labor-hours (1 persons @ 8.00 hrs) to remove and replace. The time required for repair/replacement of the other four components is given on the following Repair and/or Replacement Form.

REPLACEMENT AND/OR REPAIR FORM

Subsystem	Replacement Time
Engine/Transmission	8.00 labor hours
Wiper Motor	0.33 labor hours
Starter	3.00 labor hours
Alternator	3.50 labor hours
Batteries	0.27 labor hours

During the test, additional components were removed for repair or replacement and the details are available in Section 5.7 in Unscheduled Maintenance.

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS

ENGINE/TRANSMISSION REMOVAL AND REPLACEMENT (8.00 LABOR HOURS)

WIPER MOTOR REMOVAL AND REPLACEMENT (0.33 LABOR HOURS)

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS CONT.

STARTER REMOVAL AND REPLACEMENT (3.00 LABOR HOURS)

ALTERNATOR REMOVAL AND REPLACEMENT (3.50 LABOR HOURS)

2. RELIABILITY - DOCUMENTATION OF BREAKDOWN AND REPAIR TIMES DURING TESTING

2-I. TEST OBJECTIVE

The objective of this test is to document unscheduled breakdowns, repairs, down time, and repair time that occur during testing.

2-II. TEST DESCRIPTION

Using the driver log and unscheduled work order forms, all significant breakdowns, repairs, labor-hours to repair, and hours out of service were recorded on the Reliability Data Form.

CLASS OF FAILURES

Classes of failures are described below:

(a) Class 1: Physical Safety. A failure that could lead directly to Injury, a crash and/or significant physical damage.

(b) Class 2: Road Call. A failure resulting in an en-route interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.

(c) Class 3: Bus Change. A failure that requires removal of the bus from service during its assignments. The bus is operable to a rendezvous point with a replacement bus.

(d) Class 4: Bad Order. A failure that does not require removal of the bus from service during its assignments but does degrade coach operation. The failure shall be reported by driver, inspector, or hostler.

2-III. DISCUSSION

A listing of breakdowns and unscheduled repairs was accumulated during the Structural Durability Test. The following Reliability Data Form lists all unscheduled repairs under classes as defined above.

The classification of repairs according to subsystem is intended to emphasize those systems which had persistent minor or more serious problems. This bus had 2 reported failures. There were no class 1, class 2 or class 4 failures. The two class 3 failures affected the hardware and suspension subsystems. These failures are available for review in the Unscheduled Maintenance List, located in Section 5.7 Structural Durability.

This bus passed the Structural and Powertrain Durability sections of the test.

RELIABILITY DATA FORMS

Bus Number: 2020-12	Date: 07/14/2021
Personnel: B.L.	

	Failure Type					
	Class 4 Bad Order	Class 3 Bus Change	Class 2 Road Call	Class 1 Physical Safety		
Subsystems	Mileage	Mileage	Mileage	Mileage	Labor Hours	Down Time
Hardware/Fasteners		3,445			1.00	1.00
Suspension		3,598			1.00	1.00

3.1 SAFETY - A DOUBLE-LANE CHANGE (OBSTACLE AVOIDANCE)

3.1-I. TEST OBJECTIVE

The objective of this test is to determine handling and stability of the bus by measuring speed through a double lane change test.

3.1-II. TEST DESCRIPTION

The Safety Test consisted of an obstacle avoidance maneuver to evaluate the handling and stability of the bus. The test was conducted at the LTI test track on the vehicle dynamics pad. The bus was driven through a double-lane change course at increasing speeds until the test was determined to be unsafe or a speed of 45 mph is reached. The test is determined unsafe if vehicle handling becomes unstable or if any of the tires lose contact with the pavement.

The layout of the test course was defined by placing pylons along painted guidelines that delineated the course. The guidelines marked off two 12-foot center-to-center lanes. Each lane had two 80 foot long gates with a spacing distance of 80 feet between them. The bus entered the test course in one lane, crossed over to the other lane within the 80 foot gate, traveled for 80 feet, and then returned back into the original lane within the next 80 foot gate. This maneuver was repeated from 20 mph with speed increasing in increments of 5 mph. The test was performed starting from both the right and left lanes.

A test run is considered valid if the bus is able to perform the maneuver at a constant speed without deviating from the test course or striking pylons. If the bus is not able to successfully complete the maneuver due to vehicle instability, the test will be terminated. The highest speed at which the maneuver can be successfully performed up to a maximum speed of 45 mph is recorded on the Safety Data Form.

3.1-III. DISCUSSION

The double-lane change was performed in both right-hand and left-hand directions. The bus was able to safely negotiate the test course in both the right-hand and left-hand directions up to the maximum test speed of 45 mph, and therefore, passed this portion of the test.

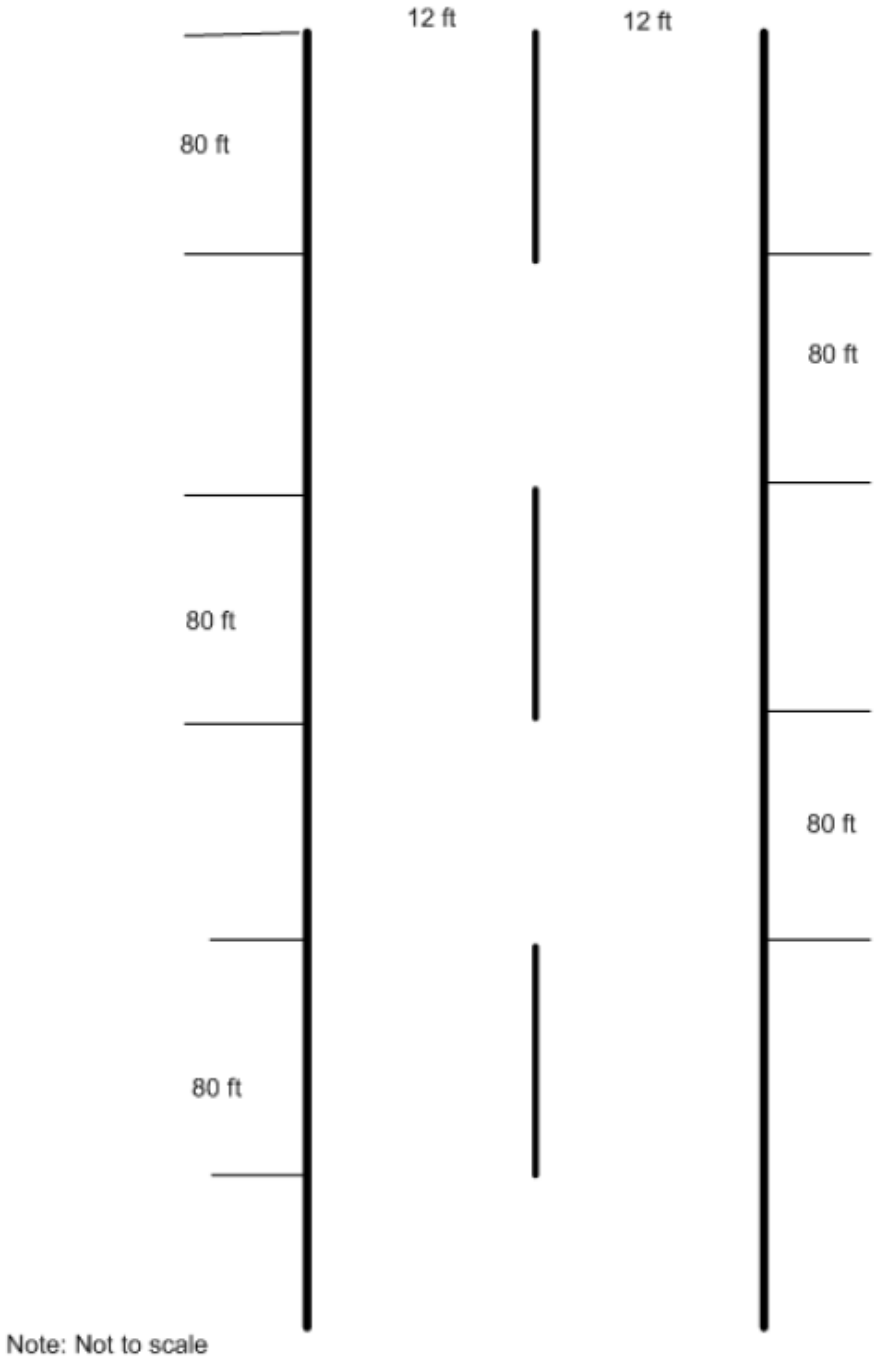


Figure 3.1. Double lane change test course.

SAFETY DATA FORM

Bus Number: 2020-12	Date: 04/27/2021
Personnel: E.D., E.L. & J.M.	

Temperature (°F): 58	Humidity (%): 41
Wind Direction: N/A	Wind Speed (mph): 0
Barometric Pressure (inHg): 30.03	

SAFETY TEST: DOUBLE LANE CHANGE	
Maximum safe speed tested for double-lane change to left	45 mph
Maximum safe speed tested for double-lane change to right	45 mph
Comments of the position of the bus during the lane change:	
Bus maintained an upright position during test.	
Comments of the tire/ground contact patch:	
Tires maintained contact with the ground during test.	

RIGHT - HAND APPROACH

LEFT - HAND APPROACH

3.2 Safety - Braking

3.2 I. TEST OBJECTIVE

The objective of this test is to provide, for comparison purposes, braking performance data on transit buses produced by different manufacturers.

3.2 II. TEST DESCRIPTION

The testing was conducted at the LTI Test Track skid pad area. Brake tests were conducted after completion of the GVW portion of the vehicle durability test. At this point in testing the brakes have been subjected to a large number of braking snubs and will be considered well burnished. For buses that have not completed Durability Testing, the brakes will be burnished according to the test procedure. Testing was performed when the bus was fully loaded at its GVW. All tires on each bus were representative of the tires on the production model vehicle and inflated to the bus manufacturer's specified pressures.

The brake testing procedure is comprised of three phases:

1. Stopping distance tests
    i. Dry surface (high-friction, Skid Number within the range of 70-76)
    ii. Wet surface (low-friction, Skid Number within the range of 30-36)
2. Stability tests
3. Parking brake test

3.2-III. DISCUSSION

The results of the Stopping Distance phase of the Brake Test are available in table 3.2-2. There was no deviation from the test lane during the performance of the Stopping Distance phase.

During the Stability phase of Brake Testing the test bus experienced no deviation from the test lane during both approaches to the Split Friction Road surface.

The Parking Brake phase was completed with the test bus maintaining the parked position for the full five-minute period with no slip or roll observed in both the uphill and downhill positions.

This bus passed all three phases of the Safety –Braking Test.

Table 3.2-1. Braking Test Data Forms

Bus Number: 2020-12	Date: 04/19/2021
Personnel: S.R., T.G., J.M. & M.R.	
Amb. Temperature (ºF): 55	Wind Speed (mph): 5
Wind Direction: WSW	Pavement Temp (°F) Start: 60 End: 66

TIRE INFLATION PRESSURE (psi):

Tire Type: Front: Bridgestone Turanza EL 440 235 60/18
Rear: Bridgestone Turanza EL 440 235 60/18

	Left Tire(s)		Right Tire(s)	
Front	36		36	
	Inner	Outer	Inner	Outer
Middle	N/A	N/A	N/A	N/A
Rear	N/A	36	N/A	36

AXLE LOADS (lb.)

	Left	Right
Front	1,450	1,430
Middle	N/A	N/A
Rear	1,530	1,490

Table 3.2-2. Stopping Distance Test Results Form
(longest stopping distance in each test condition in bold)

Stopping Distance (ft)					
Vehicle Direction	CW	CW	CCW	CCW	
Speed (mph)	Stop 1	Stop 2	Stop 3	Stop 4	**Average**
20 (dry)	21.18	21.02	20.23	**21.74**	21.04
30 (dry)	**44.50**	41.82	43.36	42.31	43.00
40 (dry)	68.02	70.88	**75.21**	72.55	71.67
45 (dry)	88.56	85.14	89.97	**90.56**	88.56
20 (wet)	20.46	22.07	20.23	**22.69**	21.36

Table 3.2-3. Stability Test Results Form

Stability Test Results (Split Friction Road surface)			
Vehicle Direction	Attempt	Did test bus stay in 12' lane? (Yes/No)	Comments
Driver side on high friction	1	Yes	None noted.
	2	Yes	None noted.
Driver side on low friction	1	Yes	None noted.
	2	Yes	None noted.

Table 3.2-4. Parking Brake Test Form

PARKING BRAKE (GVW) – GRADE HOLDING						
Vehicle Direction	Attempt	Hold Time (min)	Slide (in)	Roll (in)	Did Hold	No Hold
Front up	1	5:00	N/A	N/A	✓	
	2	N/A	N/A	N/A		
	3	N/A	N/A	N/A		
Front down	1	5:00	N/A	N/A	✓	
	2	N/A	N/A	N/A		
	3	N/A	N/A	N/A		

Table 3.2-5. Record of All Braking System Faults/Repairs.

Date	Fault/Repair	Description
04/19/21	None noted.	N/A

3.2 Safety - Bus Braking

PARKING BRAKE TEST
PARKING BRAKE HELD FOR 5 MINUTES IN BOTH 20% UP AND 20% DOWN POSITIONS

4. PERFORMANCE - AN ACCELERATION, GRADEABILITY, AND TOP SPEED TEST

4-I. TEST OBJECTIVE

The objective of this test is to determine the acceleration, gradeability, and top speed capabilities of the bus.

4-II. TEST DESCRIPTION

In this test, the bus was operated at SLW on a chassis dynamometer. The procedure dictates that the test bus be accelerated to a maximum "power-limited"/"governed" or maximum "safe" speed not exceeding 80 mph. The maximum power-limited/governed speed, if applicable, is the top speed as limited by the engine control system. The maximum safe speed is defined as the maximum speed that the dynamometer, the tires or other bus components are limited to. The test vehicle speed was measured using a speed encoder built in the chassis dynamometer. The time intervals between 10 mph increments were recorded using a Data Acquisitions System. Time-speed data and the top speed attained were recorded on the Performance Data Form. The recorded data was used to generate a percent grade versus speed table and a speed versus time curve. All the above are available in the following pages.

4-III. DISCUSSION

This test consisted of three runs from standstill to full throttle on the chassis dynamometer. Speed versus time data was obtained for each run and results are averaged to minimize test variability. The test was performed up to a maximum safe speed of 79.7 mph. The calculated gradeability results are attached. The average time to reach 30 mph was 5.9 seconds. The maximum gradeablity at 10 mph was 39.72% and at 40 mph was 16.96%. This bus passed this section of the test.

PERFORMANCE DATA FORM

Bus Number: 2020-12	Date: 05/25/21
Personnel: F.T. & S.I.	
Temperature (°F): 88.6	Humidity (%): 72
Barometric Pressure (inHg): 28.90	

		INITIALS:
Air Conditioning - OFF	✓Checked	F.T.
Heater pump motor - OFF	✓Checked	F.T.
Defroster - OFF	✓ Checked	F.T.
Exterior and interior lights - ON	✓ Checked	F.T.
Windows and doors - CLOSED	✓ Checked	F.T.

ACCELERATION, GRADEABILITY, TOP SPEED

Recorded Interval Times

Speed	Run 1	Run 2	Run 3
10 mph	2.3	2.3	2.2
20 mph	3.8	3.8	3.7
30 mph	6.0	5.9	5.7
40 mph	8.7	8.6	8.3
50 mph	11.3	11.4	11.1
60 mph	14.5	14.9	14.3
70 mph	19.0	19.3	19.0

Maximum Speed (mph): 79.7 (maximum safe dynamometer speed reached)

PERFORMANCE SUMMARY SHEET

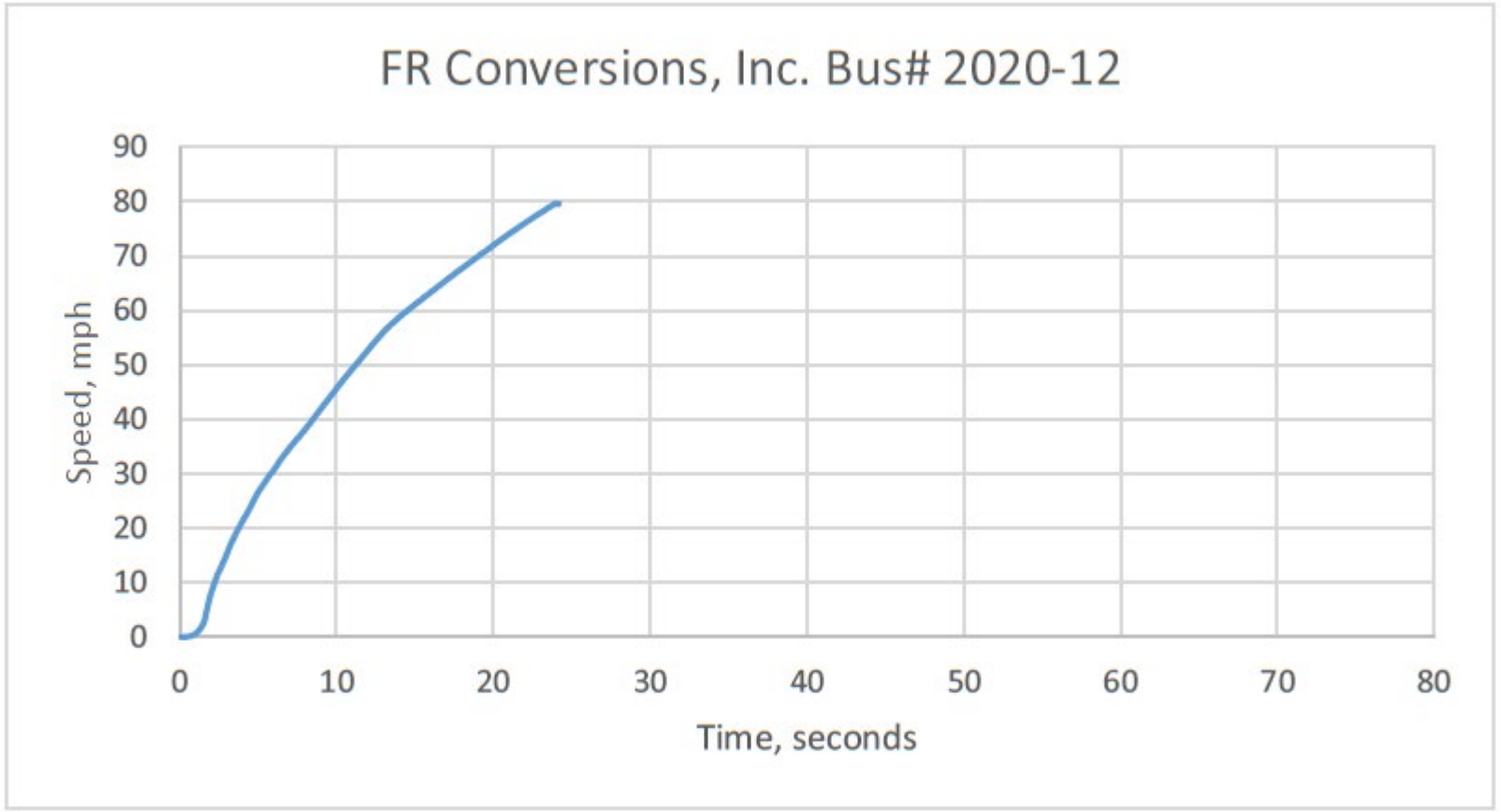
Bus Number: 2020-12	Date: 05/25/2021
Personnel: F.T. & S.I.	

Test Conditions:

Temperature (°F): 88.6	Humidity (%): 72
Barometric Pressure (inHg): 28.90	

Test Results:

Vehicle Speed (MPH)	Time (SEC)	Acceleration (FT/SEC^2)	Max. Grade (%)
1.0	1.2	7.02	21.80
5.0	1.7	12.37	38.42
10.0	2.2	12.79	39.72
15.0	3.0	9.44	29.32
20.0	3.8	7.98	24.78
25.0	4.7	7.50	23.29
30.0	5.9	6.09	18.91
35.0	7.1	5.19	16.12
40.0	8.5	5.46	16.96
45.0	9.9	5.42	16.83
50.0	11.3	5.08	15.78
55.0	12.7	4.75	14.75
60.0	14.6	3.37	10.47
65.0	16.8	3.25	10.09
70.00	19.1	3.12	9.69
75.00	21.5	2.90	9.01
79.7	24.2	Maximum Speed	


FR Conversions, Inc. Bus# 2020-12
Speed, mph
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
Time, seconds

5.2 STRUCTURAL STRENGTH AND DISTORTION TESTS - STRUCTURAL DISTORTION

5.2-I. TEST OBJECTIVE

The objective of this test is to observe the operation of the bus subsystems when the bus is placed in a longitudinal twist simulating operation over a curb or through a pothole.

5.2-II. TEST DESCRIPTION

With the bus loaded to GVW, each wheel of the bus was raised (one at a time) to simulate operation over a curb and the following were inspected:

1. Body
2. Windows
3. Doors
4. Roof vents
5. Special seating
6. Undercarriage
7. Engine
8. Service doors
9. Escape hatches
10. Steering mechanism

Each wheel was then lowered (one at a time) to simulate operation through a pothole and the same items inspected.

5.2-III. DISCUSSION

The test sequence was repeated ten times. The first and last test is with all wheels level. The other eight tests are with each wheel 6 inches higher and 6 inches lower than the other three wheels.

All doors, windows, escape mechanisms, engine, steering and ADA accessible devices operated normally throughout the test. The undercarriage and body indicated no deficiencies. No water leakage was observed during the test. The results of this test are indicated on the following data forms. This bus passed this section of the test.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L., T.G. & P.D.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	■ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	■ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	■ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	■ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	■ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	■ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	■ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	■ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	■ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM

(Note: Ten copies of this data sheet are required)

Bus Number: 2020-12	Date: 11/25/2020
Personnel: S.R., E.L. & T.G.	Temperature(°F): 48

Wheel Position: (check one)		
All wheels level	□ before	■ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
Windows	No deficiencies.
Front Doors	No deficiencies.
Rear Doors	No deficiencies.
Escape Mechanisms/ Roof Vents	No deficiencies.
Engine	No deficiencies.
ADA Accessible/ Special Seating	No deficiencies.
Undercarriage	No deficiencies.
Service Doors	No deficiencies.
Body	No deficiencies.
Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

5.2 STRUCTURAL DISTORTION TEST

RIGHT FRONT WHEEL SIX INCHES HIGHER

LEFT REAR WHEEL SIX INCHES LOWER

5.3 STRUCTURAL STRENGTH AND DISTORTION TESTS - STATIC TOWING TEST

5.3-I. TEST OBJECTIVE

The objective of this test is to determine the characteristics of the bus towing mechanisms under static loading conditions.

5.3-II. TEST DESCRIPTION

Utilizing a load-distributing yoke, a hydraulic cylinder was used to apply a static tension load equal to 1.2 times the bus curb weight. The load was applied to both the front and rear, if applicable, towing fixtures at an angle of 20 degrees with the longitudinal axis of the bus, first to one side then the other in the horizontal plane, and then upward and downward in the vertical plane. Any permanent deformation or damage to the tow eyes or adjoining structure was recorded.

5.3-III. DISCUSSION

The test bus submitted for testing was not equipped with any type of tow eyes or tow hooks. Therefore, the static towing test was not performed. This bus is deemed to pass this section of the test, but no points were allotted for this section.

5.4 STRUCTURAL STRENGTH AND DISTORTION TESTS - DYNAMIC TOWING TEST

5.4-I. TEST OBJECTIVE

The objective of this test is to verify the integrity of the towing fixtures and determine the feasibility of towing the bus under manufacturer specified procedures.

5.4-II. TEST DESCRIPTION

This test required the bus to be towed at curb weight using the specified equipment and instructions provided by the manufacturer and a heavy-duty wrecker. The bus was towed for 5 miles at a speed of 20 mph for each recommended towing configuration. After releasing the bus from the wrecker, the bus was visually inspected for any structural damage or permanent deformation. All doors, windows and passenger escape mechanisms were inspected for proper operation.

5.4-III. DISCUSSION

The bus was towed using a heavy-duty wrecker. The towing interface was accomplished by incorporating a hydraulic under-lift. A front lift tow was performed. No problems, deformation, or damage was noted during testing. This bus passed this section of the test.

DYNAMIC TOWING TEST DATA FORM

Bus Number: 2020-12	Date: 04/29/2021
Personnel: E.D. & E.L.	

Temperature (°F): 64	
Wind Direction: SW	Wind Speed (mph): 6

Inspect tow equipment-bus interface.
Comments: There was an adequate connection between tow equipment and bus. A wheel lift was used.
Inspect tow equipment-wrecker interface.
Comments: Tow equipment and wrecker had an adequate connection.
Towing Comments: A full tow was accomplished.
Description and location of any structural damage: None noted.
General Comments: Full tow was completed using a wheel lift.

5.4 DYNAMIC TOWING TEST

TOWING INTERFACE

TEST BUS IN TOW

5.5 STRUCTURAL STRENGTH AND DISTORTION TESTS – JACKING TEST

5.5-I. TEST OBJECTIVE

The objective of this test is to inspect for damage due to the deflated tire and determine the feasibility of jacking the bus with a portable hydraulic jack to a height sufficient to replace a deflated tire.

5.5-II. TEST DESCRIPTION

With the bus at curb weight, the tire(s) at one corner of the bus were replaced with deflated tire(s) of the appropriate type. A portable hydraulic floor jack was then positioned in a manner and location specified by the manufacturer and used to raise the bus to a height sufficient to provide 3-in clearance between the floor and an inflated tire. The deflated tire(s) were replaced with the original tire(s) and the jack was lowered. Any structural damage or permanent deformation was recorded on the test data sheet. This procedure was repeated for each corner of the bus.

5.5-III. DISCUSSION

During the deflated tire portion of the test, the jacking point clearances ranged from 4.3 inches to 9.7 inches. No deformation or damage was observed during testing. A complete listing of jacking point clearances is provided in the Jacking Test Data Form. This bus passed this section of the test.

JACKING CLEARANCE SUMMARY

Condition	Frame Point Clearance
Front axle – one tire flat	4.3
Rear axle – one tire flat	4.6
Rear axle – two tires flat	N/A

JACKING TEST DATA FORM

Bus Number: 2020-12	Date: 11/24/2020
Personnel: E.D.& S.R.	Temperature (°F): 69

Record any permanent deformation or damage to bus as well as any difficulty encountered during jacking procedure.

I= Inflated D= Deflated

Deflated Tire	Jacking Pad Clearance Body/Frame (in)	Jacking Pad Clearance Axle/Suspension (in)	Comments
Right front	6.0“ I 4.3“ D	10.3“ I 8.9” D	Body & Axle
Left front	6.7“ I 4.6“ D	11.5“ I 9.7“ D	Body & Axle
Right rear—outside	6.5“ I 4.6“ D	6.9“ I 5.1“ D	Body & Suspension
Right rear—both	N/A	N/A	N/A
Left rear—outside	6.6“ I 4.8“ D	7.0“ I 5.1“ D	Body & Suspension
Left rear—both	N/A	N/A	N/A
Right middle or tag—outside	N/A	N/A	N/A
Right middle or tag—both	N/A	N/A	N/A
Left middle or tag—outside	N/A	N/A	N/A
Left middle or tag—both	N/A	N/A	N/A

Additional comments of any deformation or difficulty during jacking:

None noted.

5.5 JACKING TEST

JACK IN PLACE - FRONT

JACK IN PLACE - REAR

5.6 STRUCTURAL STRENGTH AND DISTORTION TESTS - HOISTING TEST

5.6-I. TEST OBJECTIVE

The objective of this test is to determine possible damage or deformation caused by the jack/stands.

5.6-II. TEST DESCRIPTION

With the bus at curb weight, the front end of the bus was raised to a height sufficient to allow manufacturer-specified placement of jack stands under the axles or jacking pads independent of the hoist system. The bus was checked for stability on the jack stands and for any damage to the jacking pads or bulkheads. The procedure was repeated for the tag/middle axles (if equipped), and rear end of the bus. The procedure was then repeated for the front, tag/middle (if equipped) axles, and rear simultaneously.

5.6-III. DISCUSSION

The test was conducted using four posts of a six-post electric lift and 19-inch jack stands. The bus was hoisted from the front wheels and then from the rear wheels, and then from the front and rear wheels simultaneously and placed on jack stands.

The bus accommodated the placement of the vehicle lifts and jack stands and the procedure was performed without any instability noted. This bus passed this section of the test.

HOISTING TEST DATA FORM

Bus Number: 2020-12	Date: 11/24/2020
Personnel: E.D. & S.R.	Temperature (°F): 69

Comments of any structural damage to the jacking pads or axles while both the front wheels are supported by the jack stands:
None noted.
Comments of any structural damage to the jacking pads or axles while both the rear wheels are supported by the jack stands:
None noted.
Comments of any structural damage to the jacking pads or axles while both the tag axle wheels are supported by the jack stands:
N/A
Comments of any structural damage to the jacking pads or axles while the front and rear wheels are supported by the jack stands:
None noted.
Comments of any problems or interference placing wheel hoists under wheels:
None noted.

5.6 HOISTING TEST

JACK STANDS IN PLACE – FRONT

JACK STANDS IN PLACE – REAR

5.7 STRUCTURAL DURABILITY TEST

5.7-I. TEST OBJECTIVE

The objective of this test is to perform an accelerated durability test that approximates 25 percent of the service life of the vehicle.

5.7-II. TEST DESCRIPTION

The test vehicle was driven a total of 3,800 miles; approximately 2,500 miles on the LTI Durability Test Track and approximately 1,300 miscellaneous other miles. The test was conducted with the bus operated under three different loading conditions. The first segment consisted of approximately 1,500 miles with the bus operated at GVW. The second segment consisted of approximately 800 miles with the bus operated at SLW. The remainder of the test, approximately 1,500 miles, was conducted with the bus loaded to CW. The loads on both axles and GVW were within their ratings with the bus loaded as specified by the manufacturer. All subsystems were running during these tests in their normal operating modes. All manufacturer-recommended servicing was followed and noted on the vehicle maintainability log. Servicing items accelerated by the durability tests were compressed by 10:1; all others were done on a 1:1 mi/mi basis. Unscheduled breakdowns and repairs were recorded on the same log as are any unusual occurrences as noted by the driver. Once a week the test vehicle was washed down and thoroughly inspected for any signs of failure.

5.7-III. DISCUSSION

The Structural Durability Test was started on April 12, 2021 and was conducted until May 26, 2021. The first 1,500 miles were performed at a GVW of 5,900 lb. and completed on April 16, 2021. The next 800-mile SLW segment was performed at 5,900 lb. and completed on April 22, 2021 and the final 1,500-mile segment was performed at a CW of 4,860 lb. and completed on May 26, 2021.

The following mileage summary presents the accumulation of miles during the Structural Durability Test. The driving schedule is included, showing the operating duty cycle. A detailed plan view of the LTI Test Track Facility and Durability Test Track are attached for reference. Also, a durability element profile detail shows all the measurements of the different conditions. Finally, photographs illustrating some of the failures that were encountered during the Structural Durability Test are included. This bus passed this section of the test, as there were no uncorrected Class 1 or Class 2 failures and the unscheduled maintenance of 2.0 hours was less than 125 hours.

FR Conversions, Inc. Bus # 2020-12

MILEAGE DRIVEN/RECORDED FROM DRIVER'S LOGS

DATE	TOTAL DURABILITY TRACK	TOTAL OTHER MILES	TOTAL
04/12/21 TO 04/18/21	995.00	44.00	1039.00
04/19/21 TO 04/25/21	870.00	763.00	1633.00
04/26/21 TO 05/02/21	580.00	398.00	978.00
05/03/21 TO 05/09/21	55.00	99.00	154.00
05/10/21 TO 05/16/21	0.00	0.00	0.00
05/17/21 TO 05/23/21	0.00	0.00	0.00
05/24/21 TO 05/30/21	0.00	156.00	156.00
Total	2500.00	1460.00	3960.00

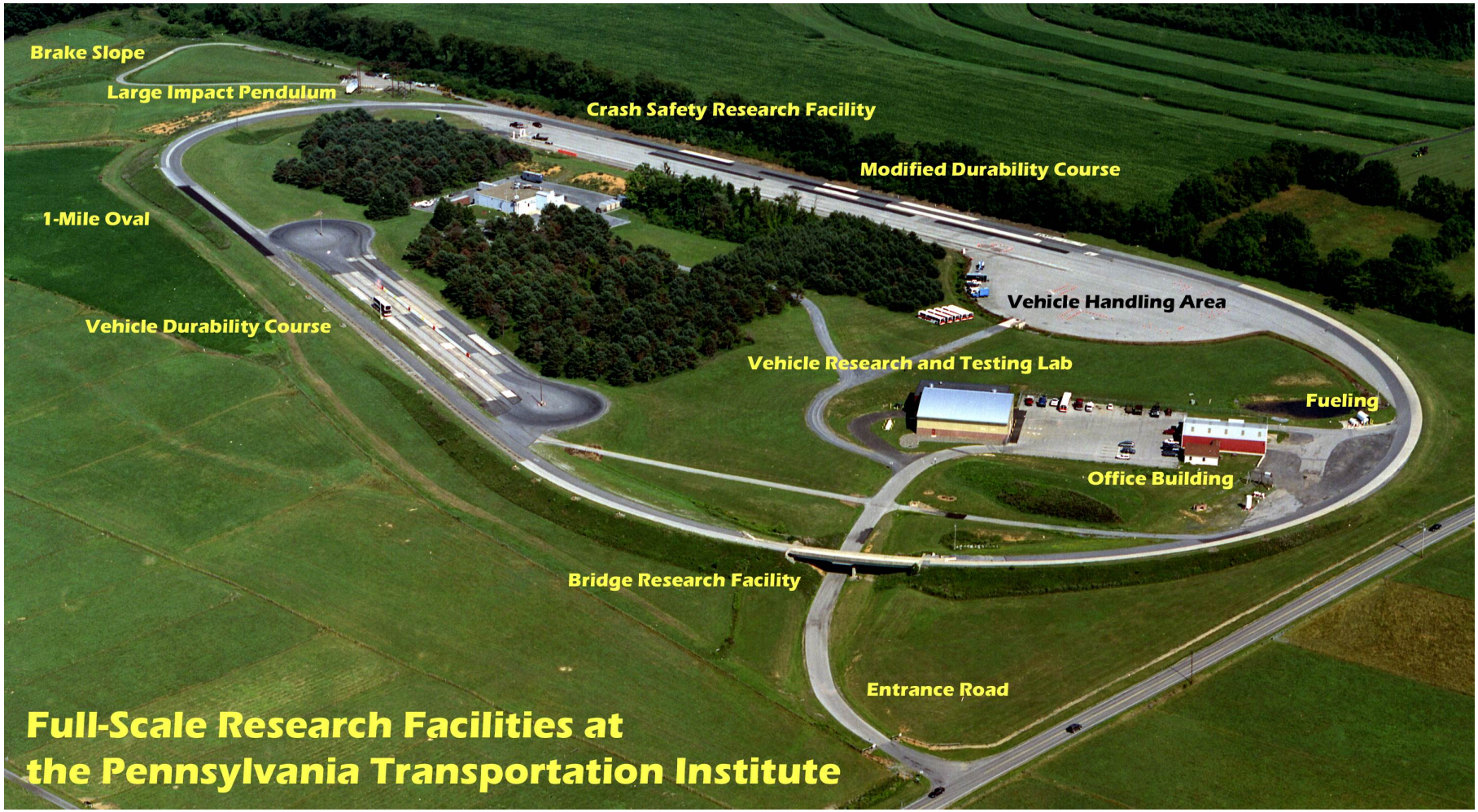
Driving Schedule for Bus Operation on the Durability Test Track.

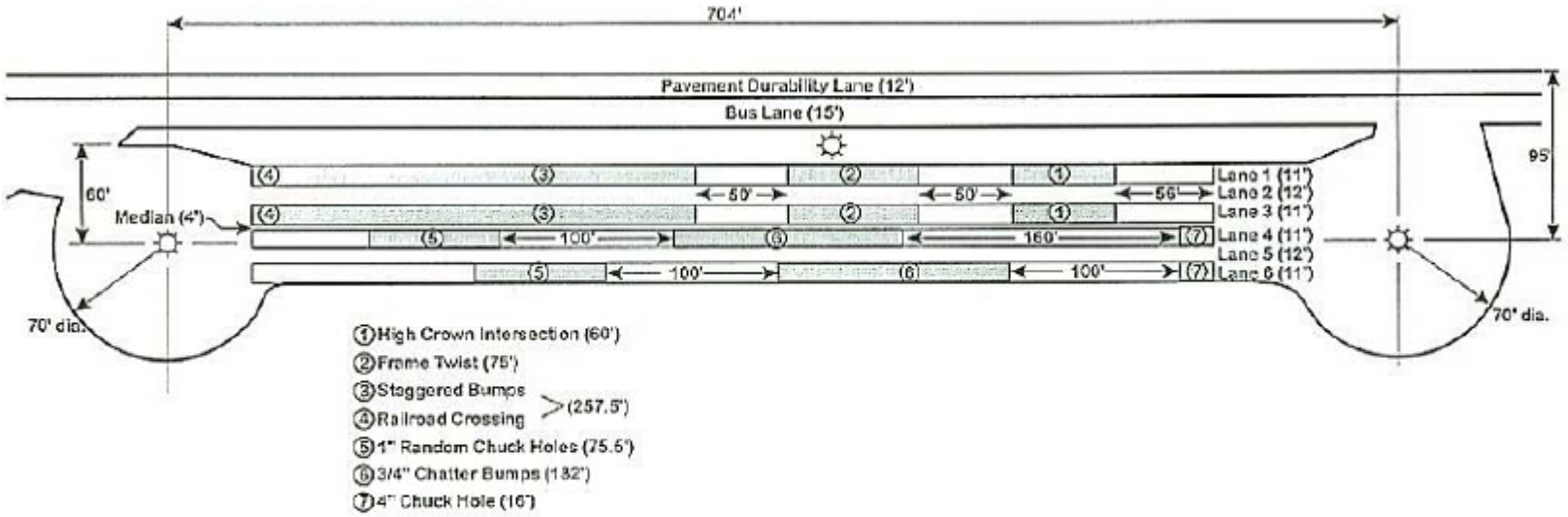
STANDARD OPERATING SCHEDULE

Monday through Friday

	HOUR	ACTION
Shift 1	midnight	D
	1:40 am	C
	1:50 am	B
	2:00 am	D
	3:35 am	C
	3:45 am	B
	4:05 am	D
	5:40 am	C
	5:50 am	B
	6:00 am	D
	7:40 am	C
	7:50 am	F
Shift 2	8:00 am	D
	9:40 am	C
	9:50 am	B
	10:00 am	D
	11:35 am	C
	11:45 am	B
	12:05 pm	D
	1:40 pm	C
	1:50 pm	B
	2:00 pm	D
	3:40 pm	C
	3:50 pm	F
Shift 3	4:00 pm	D
	5:40 pm	C
	5:50 pm	B
	6:00 pm	D
	7:40 pm	C
	7:50 pm	B
	8:05 pm	D
	9:40 pm	C
	9:50 pm	B
	10:00 pm	D
	11:40 pm	C
	11:50 pm	F

B—Break
C----Cycle all systems five times, visual inspection, driver's log entries
D—Drive bus as specified by procedure
F----Fuel bus, complete driver's log shift entries


Brake Slope
Large Impact Pendulum
Crash Safety Research Facility
Modified Durability Course
1-Mile Oval
Vehicle Handling Area
Vehicle Durability Course
Vehicle Research and Testing Lab
Fueling
Office Building
Bridge Research Facility
Entrance Road
Full-Scale Research Facilities at
the Pennsylvania Transportation Institute



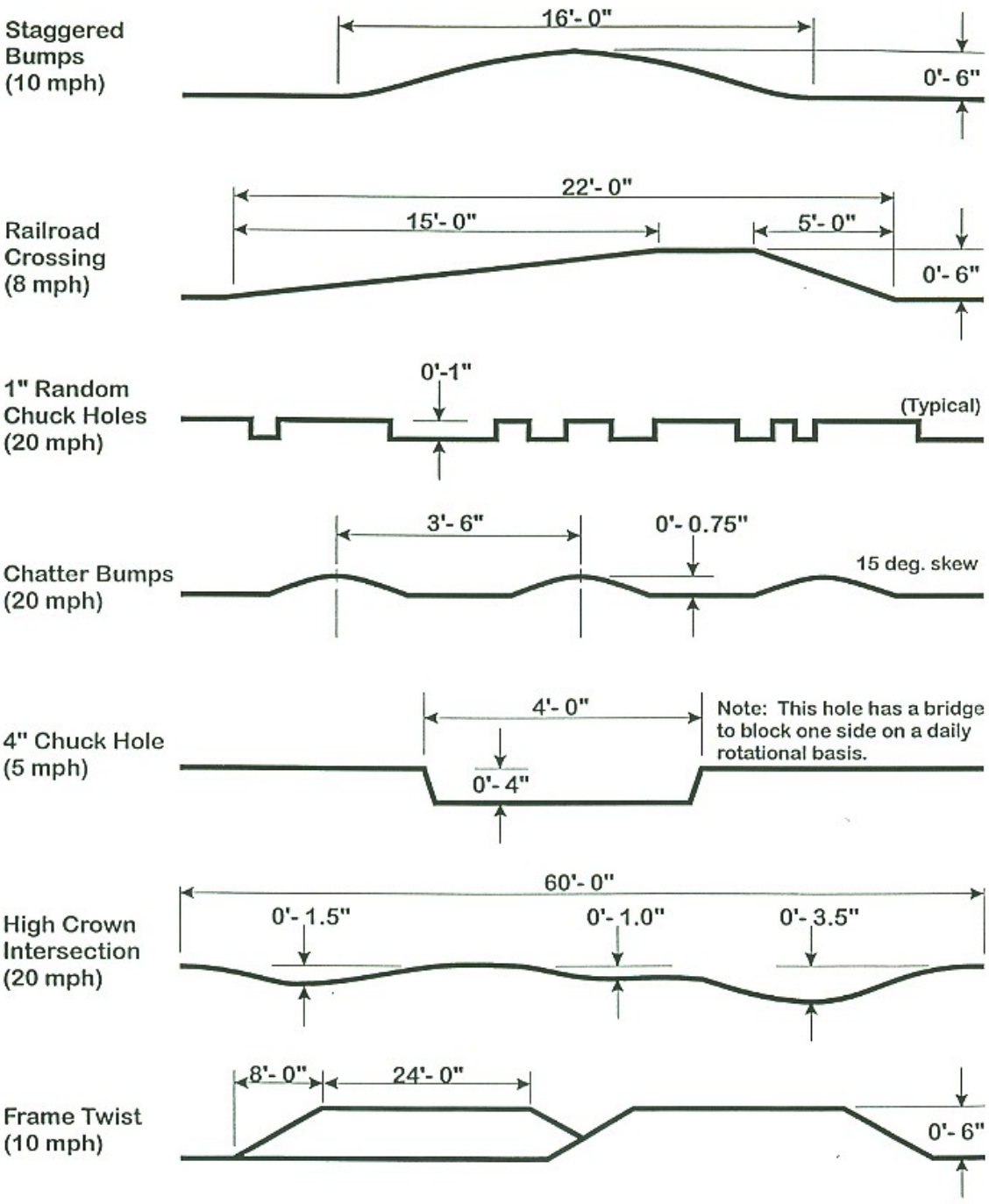
Plan View

Vehicle Durability Test Track

Track 1 (Track 2 has similar layout)

The Larson Transportation Institute

Penn State

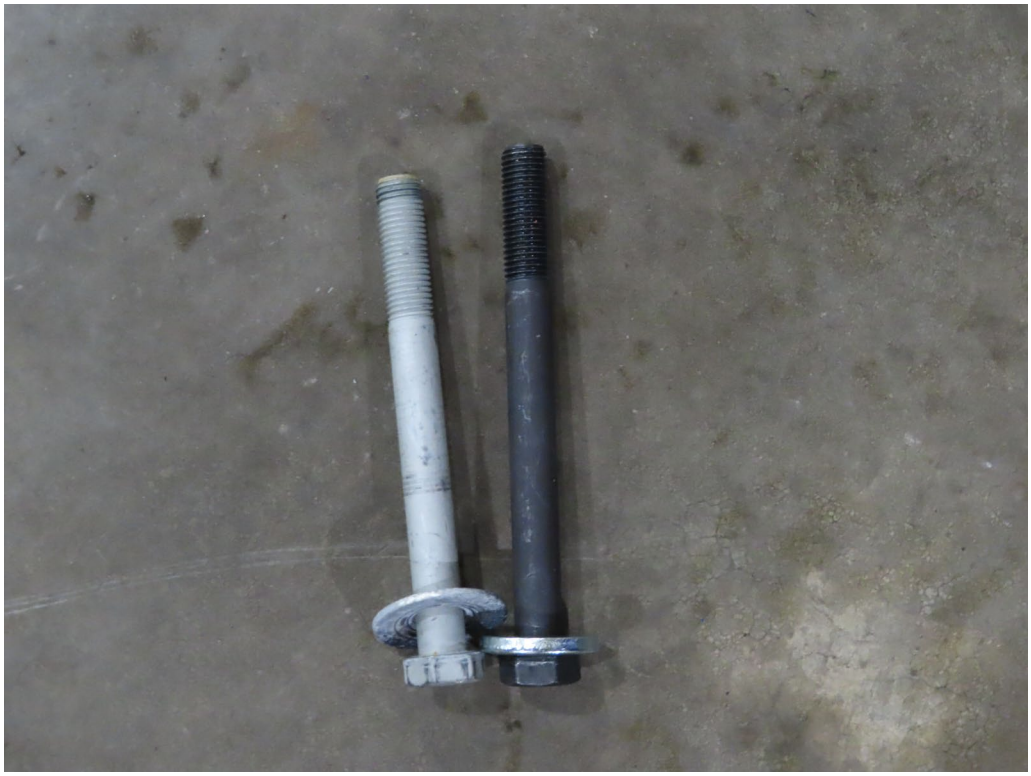


Durability Element Profiles

The Pennsylvania Transportation Institute
Penn State

Unscheduled Maintenance
FR Conversions, Inc. Bus# 2020-12
(Page 1 of 1)

Date	Test Miles	Issue	Action	Labor Hours	Sub-system	Class
04/29/21	3,445	A bolt was found on the durability track while running durability. Front subframe bolts fell out.	Removed and replaced front subframe bolts and washers (Washers were thicker than original washers and bolts were slightly longer) Installed lock tight to bolts, torqued to 70 ft.lb. per manufacturer specs. (There are 6 bolts in the front subframe only replaced the rear two bolts, the front 4 bolts are a different size) Checked torque on all 6 bolts.	1.00	Hardware / fasteners	3
04/30/21	3,598	Outer tire wear on both front tires.	Four wheel alignment was performed.	1.00	Suspension	3



REPLACED FRONT SUBFAME BOLTS AND WASHERS
(3,445 TEST MILES)

REPLACED FRONT SUBFAME BOLTS AND WASHERS
(3,445 TEST MILES)

6. FUEL ECONOMY TEST - A FUEL CONSUMPTION TEST USING AN APPROPRIATE OPERATING CYCLE

6-I. TEST OBJECTIVE

The objective of this test is to provide accurate comparable fuel consumption data on transit buses produced by different manufacturers. This fuel economy test bears no relation to the calculations done by the Environmental Protection Agency (EPA) to determine levels for the Corporate Average Fuel Economy Program. EPA's calculations are based on tests conducted under laboratory conditions intended to simulate city and highway driving. This fuel economy test, as designated here, is a measurement of the fuel expended by a vehicle traveling a specified test operating profile, under specified operating conditions that are typical of transit bus operation. The results of this test may not represent actual mileage in transit service but will provide data that can be used by FTA Grantees to compare the efficiency of buses tested using this procedure.

6-II. TEST DESCRIPTION

This test was performed in the emissions bay of the LTI Vehicle Testing Laboratory. The Laboratory is equipped with a Schenk Pegasus 300 HP, large-roll (72-inch diameter) chassis dynamometer suitable for heavy-vehicle emissions testing. The driving cycles are the Manhattan cycle, a low average speed, highly transient urban cycle (Figure 1), the Orange County Bus Cycle, a medium average speed transient urban cycle (Figure 2), and the EPA HD-UDDS Cycle, which consists of urban and highway driving segments (Figure 3). A fuel economy test was comprised of two runs for the three different driving cycles, and the average value was reported.

The test procedure for liquid-fueled buses such as this one uses a calibrated flowmeter system and/or a calibrated fuel weighing scale. The flowmeter system utilizes a precise four-piston positive displacement flow meter. The weighing scale system includes heat exchangers to maintain temperature in diesel and common-rail injection systems.

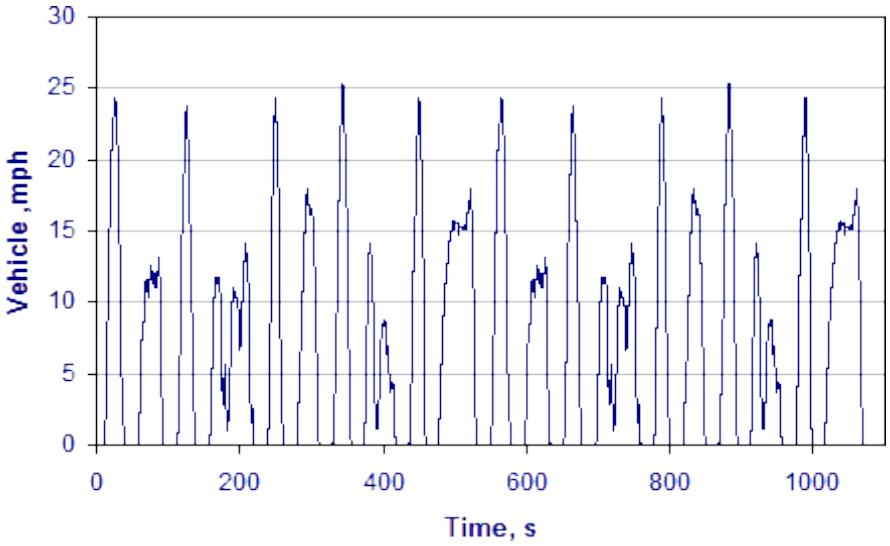


Figure 1. Manhattan Driving Cycle (duration 1089 sec, Maximum speed 25.4 mph, average speed 6.8 mph)

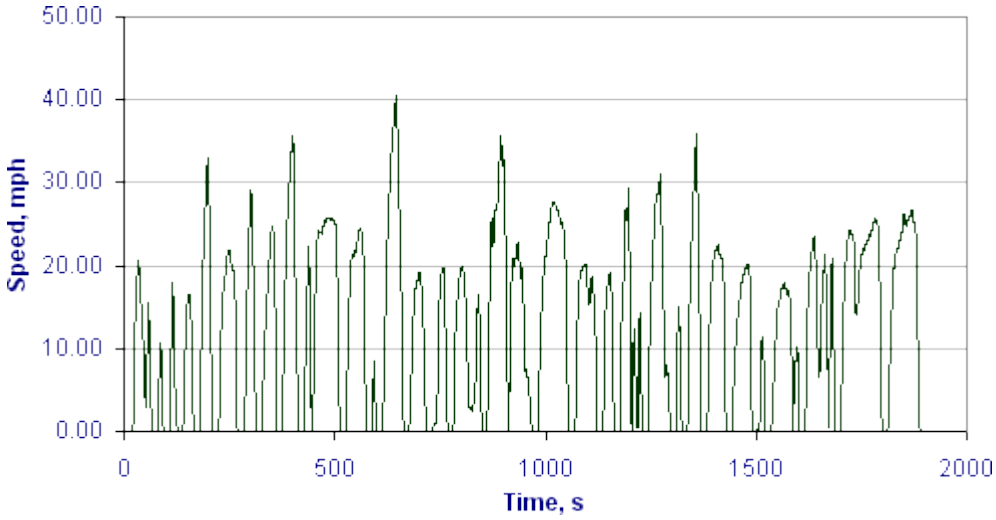


Figure 2. Orange County Bus Cycle (Duration 1909 Sec, Maximum Speed 41 mph, Average Speed 12 mph).

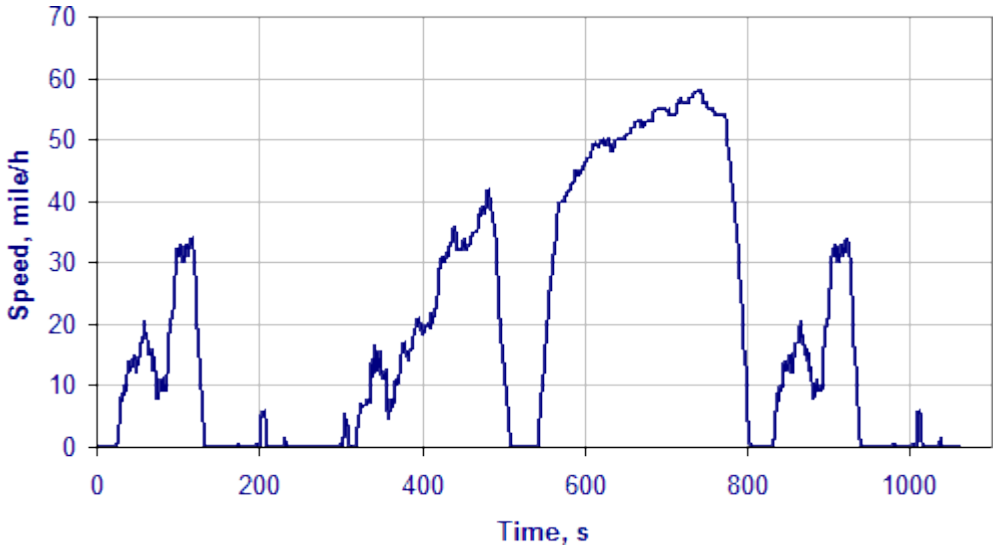


Figure 3. HD-UDDS Cycle (duration 1060 seconds, Maximum Speed 58 mph, Average Speed 18.86 mph).

6-III. DISCUSSION

The driving cycle consists of three simulated transit driving cycles: Manhattan, Orange County Bus Cycle and the HD-UDDS, as described in 6-II. The fuel consumption for each driving cycle and idle was measured.

An extensive pretest maintenance check was made including the replacement of all lubrication fluids. The details of the pretest maintenance are given in the first three Pretest Maintenance Forms. The fourth sheet shows the Pretest Inspection Form. Finally, the summary sheet provides the average fuel consumption for the three test cycles and for a 20-minute idle. **The average fuel consumption for the Manhattan, OCBC and the HD-UDDS were 10.2 mpg, 14.9 mpg and 16.4 mpg respectively. For idle, the fuel consumption was 0.39 gal/hr**.

FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 2020-12	Date: 05/04/2021	SLW (lb.): 5,900
Personnel: T.S. & E.L.		

FUEL SYSTEM	OK
Install fuel measurement system	✓
Replace fuel filter	N/A
Check for fuel leaks	✓
Specify fuel type (Gasoline)	✓
Remarks: None noted.	
BRAKES/TIRES	OK
Inspect hoses	✓
Inspect brakes	✓
Check tire inflation pressures (mfg. specs.)	✓
Check tire wear (less than 50%)	✓
Remarks: None noted.	
COOLING SYSTEM	OK
Check hoses and connections	✓
Check system for coolant leaks	✓
Remarks: None noted.	

FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 2020-12	Date: 05/04/2021
Personnel: T.S. & E.L.	

ELECTRICAL SYSTEMS	OK
Check battery	✓
Inspect wiring	✓
Inspect terminals	✓
Check lighting	✓
Remarks: None noted.	

DRIVE SYSTEM	OK
Drain transmission fluid (Transaxle)	N/A
Replace filter/gasket	N/A
Check hoses and connections	✓
Replace transmission fluid	N/A
Check for fluid leaks	✓
Remarks: Refer to manufacturer's service specifications for service intervals	

LUBRICATION	OK
Drain crankcase oil	✓
Replace filters	✓
Replace crankcase oil	✓
Check for oil leaks	✓
Check oil level	✓
Lube all chassis grease fittings	N/A
Lube universal joints	N/A
Replace differential lube including axles	N/A
Remarks: No differential; front wheel drive	

FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 2020-12	Date: 05/04/2021
Personnel: T.S. & E.L.	

EXHAUST/EMISSION SYSTEM	OK
Check for exhaust leaks	✓
Remarks: None noted.	

ENGINE	OK
Replace air filter	✓
Inspect air compressor and air system	N/A
Inspect vacuum system, if applicable	✓
Check and adjust all drive belts	✓
Check cold start assist, if applicable	N/A
Remarks: None noted.	

STEERING SYSTEM	OK
Check power steering hoses and connectors	N/A
Service fluid level	N/A
Check power steering operation	✓
Remarks: Electric steering system	

	OK
Ballast bus to seated load weight during coast down	✓

TEST DRIVE	OK
Check brake operation	✓
Check transmission operation	✓
Remarks: None noted.	

FUEL ECONOMY PRE-TEST INSPECTION FORM

Bus Number: 2020-12	Date: 05/05/21
Personnel: T.S.	

PRE-WARM-UP	If OK, Initial
Fuel Economy Pre-Test Maintenance Form is complete	T.S.
Cold tire pressure (psi): Front 36 Middle N/A Rear 36	T.S.
Engine oil level	T.S.
Engine coolant level	T.S.
Fuel economy instrumentation installed and working properly.	T.S.
Fuel line -- no leaks or kinks	T.S.
Bus is loaded to SLW during coast down	T.S.
WARM-UP	**If OK, Initial**
Air conditioning off	F.T.
Interior and exterior lights on	F.T.
Defroster off	F.T.
Windows and doors closed	F.T.
Do not drive with left foot on brake	F.T.

FUEL ECONOMY DATA FORM
(Gaseous and Liquid fuels)

Bus Number: 2020-12	Manufacturer: FR Conversions	Date: 05/25/21
Fuel Type: Gasoline	Personnel: F.T., J.S., D.B. & S.I.	
Temperature (°F): 86.9	Humidity (%): 69.5	Barometric Pressure (inHg): 28.9
SLW (lb.): 5,900		

Cycle	Manhattan	Orange County	HD-UDDS	Idle
Fuel Consumption mpg	10.2	14.9	16.4	0.39 G/hr

Comments: None noted.

7. NOISE

7.1 INTERIOR NOISE AND VIBRATION TESTS

7.1-I. TEST OBJECTIVE

The objective of these tests is to measure and record interior noise levels and check for audible vibration under various operating conditions.

7.1-II. TEST DESCRIPTION

During this series of tests, the interior noise level was measured at several locations with the bus operating under the following three conditions:

1. With the bus stationary, a white noise generating system provided a uniform sound pressure level equal to 80 dB(A) on the left, exterior side of the bus. The engine and all accessories were switched off and all openings including doors and windows were closed. This test was performed at the LTI Test Track Facility.

2. The bus was accelerated at full throttle from a standing start to 35 mph on a level pavement. All openings were closed and all accessories were operating during the test. This test was performed on the track at the LTI Test Track Facility.

3. The bus was operated at various speeds from 0 to 55 mph with and without the air conditioning and accessories on. Any audible vibration or rattles were noted. This test was performed on the test segment between the LTI Test Track and the Bus Testing Center.

All tests were performed in an area free from extraneous sound-making sources or reflecting surfaces. The ambient sound level as well as the surrounding weather conditions were recorded in the test data.

7.1-III. DISCUSSION

For the first part, the overall average of the six measurements was 41.4 dB(A); ranging from 40.6 dB(A) at the front passenger seats to 42.1 dB(A) at the driver's seat. The interior ambient noise level for this test was less than 30 dB(A).

For the second part, the interior noise level ranged from 76.3 dB(A) at the rear passenger seats to 77.7 dB(A) at the middle passenger seats. The overall average was 76.8 dB(A). The interior ambient noise level for this test was less than 30 dB(A).

No vibrations or rattles were noted during the third part of this test. This bus passed this section of the test.

INTERIOR NOISE TEST DATA FORM
Test Condition 1: 80 dB(A) Stationary White Noise

Bus Number: 2020-12	Date: 05/04/2021
Personnel: T.S. & E.L.	
Temperature (°F): 70	Humidity (%): 81
Wind Speed (mph): 8	Wind Direction: SW
Barometric Pressure (inHg): 29.73	
Interior Ambient Noise Level dB(A): less than 30	Exterior Ambient Noise Level dB(A): 41.2
Microphone Height During Testing (in): 47.25	

Reading Location	Measured Sound Level dB(A)
Driver's Seat	42.1
Front Passenger Seats	40.6
In Line with Front Speaker	41.4
In Line with Middle Speaker	41.3
In Line with Rear Speaker	41.4
Rear Passenger Seats	41.1

Comments: None noted.

INTERIOR NOISE TEST DATA FORM
Test Condition 2: 0 to 35 mph Acceleration Test

Bus Number: 2020-12	Date: 04/27/2021
Personnel: E.D., E.L. & J.M.	
Temperature (°F): 60	Humidity (%): 41
Wind Speed (mph): 0	Wind Direction: N/A
Barometric Pressure (inHg): 30.03	
Interior Ambient Noise Level dB(A): Less than 30	Exterior Ambient Noise Level dB(A): 34.4
Microphone Height During Testing (in): 52.0	

Reading Location	Measured Sound Level dB(A)
Driver's Seat	76.6
Front Passenger Seats	76.6
Middle Passenger Seats	77.7
Rear Passenger Seats	76.3

Comments: None noted.

INTERIOR NOISE TEST DATA FORM
Test Condition 3: Audible Vibration Test

Bus Number: 2020-12	Date: 04/27/2021
Personnel: E.D. & M.H.	
Temperature (°F): 67	

Describe the following possible sources of noise and give the relative location on the bus.

Source of Noise	Location	Description of Noise
Engine and Accessories	None	None
Windows and Doors	None	None
Seats and Wheelchair lifts	None	None
Other	None	None

Comment on any other vibration or noise source which may have occurred
that is not described above: None noted.
Comments: None noted.

7.1 INTERIOR NOISE TEST

TEST BUS SET-UP FOR 80 dB(A)
INTERIOR NOISE TEST

7.2 EXTERIOR NOISE TESTS

7.2-I. TEST OBJECTIVE

The objective of this test is to record exterior noise levels when a bus is operated under various conditions.

7.2-II. TEST DESCRIPTION

In the exterior noise tests, the bus was operated at a SLW in three different conditions using a smooth, straight and level roadway:

1. Accelerating at full throttle from a constant speed starting from 35 mph.

2. Accelerating at full throttle from standstill.

3. Stationary, with the engine at low idle, high idle, and wide-open throttle, where applicable. In addition, the bus was tested with and without the air conditioning operating.

The test site is at the Larson Transportation Institute Test Track and the test procedures were performed in accordance with SAE Standards SAE J366b, Exterior Sound Level for Heavy Trucks and Buses. The test site is an open space free of large reflecting surfaces. A noise meter placed at a specified location outside the bus was used to measure the noise level.

During the test, special attention was paid to:

1. The test site characteristics regarding parked vehicles, signboards, buildings, or other sound-reflecting surfaces
2. Proper usage of all test equipment including set-up and calibration
3. The ambient sound level

7.2-III. DISCUSSION

The Exterior Noise Test determines the noise level generated by the vehicle under different driving conditions and at stationary low and high idle, with and without air conditioning and accessories operating. The test site is a large, level, bituminous paved area with no reflecting surfaces nearby.

With an outside ambient noise level of 39.6 dB(A), the average of the two highest readings obtained while accelerating from a constant speed was 74.0 dB(A) on the right side and 71.9 dB(A) on the left side.

When accelerating from a standstill with an exterior ambient noise level of 39.6 dB(A), the average of the two highest readings obtained were 73.9 dB(A) on the right side and 71.3 dB(A) on the left side.

With the vehicle stationary and the engine, accessories, and air conditioning on, the measurements averaged 44.2 dB(A) at low idle and 59.2 dB(A) at wide open throttle. With the accessories and air conditioning off, the readings averaged 43.8 dB(A) at low idle and 59.0 dB(A) at wide open throttle. The exterior ambient noise level measured during this test was 35.0 dB(A). This bus passed this section of the test.

EXTERIOR NOISE TEST DATA FORM
Accelerating from Constant Speed

Bus Number: 2020-12	Date: 04/27/2021
Personnel: E.D., J.M., E.L. & M.H.	
Temperature (°F): 66	Humidity (%): 37
Wind Speed (mph): 6	Wind Direction: SW
Barometric Pressure (inHg): 29.98	

Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ■

Initial Sound Level Meter Calibration: 94.0 dB(A)

Exterior Ambient Noise Level: 39.6 dB(A)

Accelerating from Constant Speed Curb (Right) Side		Accelerating from Constant Speed Street (Left) Side	
Run #	Measured Noise Level dB(A)	Run #	Measured Noise Level dB(A)
1	68.6	1	68.9
2	73.6	2	72.0
3	68.1	3	71.7
4	68.1	4	N/A
5	74.3	5	N/A
6	N/A	6	N/A
7	N/A	7	N/A
8	N/A	8	N/A
9	N/A	9	N/A
10	N/A	10	N/A
Average of two highest actual noise levels = 74.0 dB(A)		Average of two highest actual noise levels = 71.9 dB(A)	

Final Sound Level Meter Calibration Check: 94.0 dB(A)

Comments: None noted.

EXTERIOR NOISE TEST DATA FORM
Accelerating from Standstill

Bus Number: 2020-12	Date: 04/27/21
Personnel: E.D., E.L., J.M. & M.H.	
Temperature (°F): 66	Humidity (%): 37
Wind Speed (mph): 6	Wind Direction: SW
Barometric Pressure (inHg): 29.98	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ■	
Initial Sound Level Meter Calibration: 94.0 dB(A)	
Exterior Ambient Noise Level: 39.6 dB(A)	

Accelerating from Standstill Curb (Right) Side		Accelerating from Standstill Street (Left) Side	
Run #	Measured Noise Level dB(A)	Run #	Measured Noise Level dB(A)
1	73.7	1	72.1
2	74.0	2	70.4
3	N/A	3	N/A
4	N/A	4	N/A
5	N/A	5	N/A
6	N/A	6	N/A
7	N/A	7	N/A
8	N/A	8	N/A
9	N/A	9	N/A
10	N/A	10	N/A
Average of two highest actual noise levels = 73.9 dB(A)		Average of two highest actual noise levels = 71.3 dB(A)	

Final Sound Level Meter Calibration Check: 94.0 dB(A)
Comments: None noted.

EXTERIOR NOISE TEST DATA FORM
Stationary

Bus Number: 2020-12	Date: 04/27/2021
Personnel: E.D., J.M., E.L. & M.H.	
Temperature (°F): 60	Humidity (%): 36
Wind Speed (mph): 4	Wind Direction: S
Barometric Pressure (inHg): 30.01	
Initial Sound Level Meter Calibration: 94.0 dB(A)	
Exterior Ambient Noise Level: 35.0 dB(A)	

Air Conditioning ON

Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	650	43.6	44.7
High Idle	N/A	N/A	N/A
Wide Open Throttle	3100	59.3	59.1

Air Conditioning OFF

Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	625	42.5	45.0
High Idle	N/A	N/A	N/A
Wide Open Throttle	3100	59.0	58.9

Final Sound Level Meter Calibration Check: 94.0 dB(A)

Comments: None noted.

7.2 EXTERIOR NOISE TESTS

TEST BUS UNDERGOING EXTERIOR NOISE TESTING

8.0 EMISSIONS TEST – DYNAMOMETER-BASED EMISSIONS TEST USING TRANSIT DRIVING CYCLES

8-I. TEST OBJECTIVE

The objective of this test is to provide comparable emissions data on transit buses produced by different manufacturers. This chassis-based emissions test bears no relation to engine certification testing performed for compliance with the Environmental Protection Agency (EPA) regulation. EPA's certification tests are performed on an engine by itself on a dynamometer operating under the Federal Test Protocol.

The Bus Testing Center emissions test is a measurement of the gaseous engine emissions CO, CO2, NOx, HC and particulates (diesel vehicles) produced by a complete vehicle operating on a large-roll chassis dynamometer. The test is performed for three differed driving cycles intended to simulate a range of transit operating environments. The test is performed under laboratory conditions in compliance with EPA 1065 and SAE J2711. The results of this test may not represent actual in-service vehicle emissions but will provide data that can be used by recipients to compare the emissions of buses tested under a range of consistent operating conditions.

8-II. TEST DESCRIPTION

This test was performed in the emissions bay of the LTI Vehicle Testing Laboratory. The Laboratory is equipped with a Schenk Pegasus 300 HP, large-roll (72-inch diameter) chassis dynamometer suitable for heavy-vehicle emissions testing. The emissions laboratory provides capability for testing heavy-duty diesel, gasoline, and alternative-fueled buses for a variety of tailpipe emissions including particulate matter, oxides of nitrogen, carbon monoxide, carbon dioxide, and hydrocarbons. It is equipped with a Horiba full-scale dilution tunnel and a constant volume sampling (CVS) emissions measurement system. The system includes Horiba Mexa 7400 Series gas analyzers and a Horiba HF47 Particulate Sampling System. Test operation is automated using Horiba CDTCS software. The computer-controlled dynamometer is capable of simulating over-the-road operation for a variety of vehicles and driving cycles.

The emissions test was performed as soon as practical after the completion of the GVW portion of the structural durability test. The driving cycles are the Manhattan cycle, a low average speed, highly transient urban cycle (Figure 1), the Orange County Bus Cycle, a medium average speed transient urban cycle (Figure 2), and the EPA HD-UDDS Cycle, which consists of urban and highway driving segments (Figure 3). An emissions test was comprised of two runs for each of the three different driving cycles, and the average values were reported.

Test results reported include the average grams per mile value for each of the gaseous emissions of carbon dioxide, carbon monoxide, oxides of nitrogen, total hydrocarbons and non-methane hydrocarbons. In addition, emissions of particulate matter will also be reported for diesel fuel buses. Testing is performed in accordance with EPA CFR49, Part 1065 and SAE J2711 as practically determined by the FTA Emissions Testing Protocol developed by West Virginia University and Penn State University.

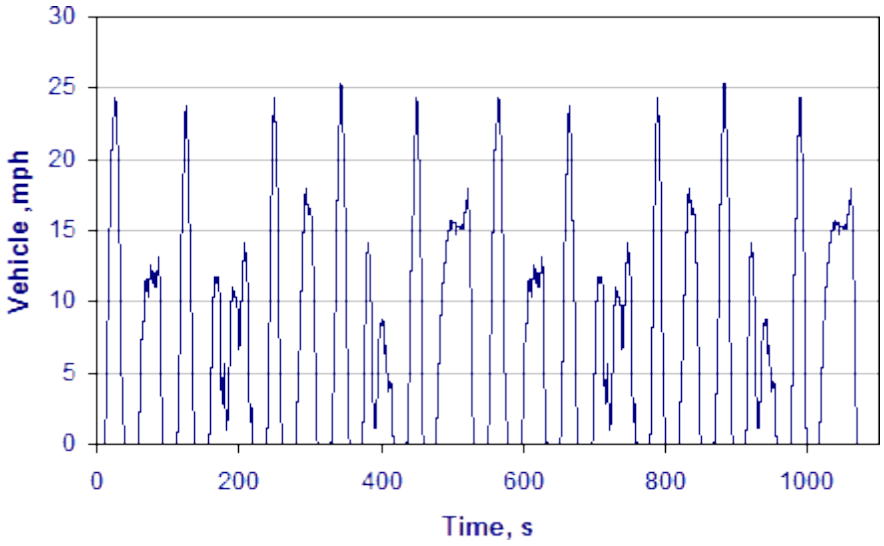


***Figure 8.1**. Manhattan Driving Cycle (Duration 1089 sec, Maximum Speed 25.4 mph, Average Speed 6.8 mph)*

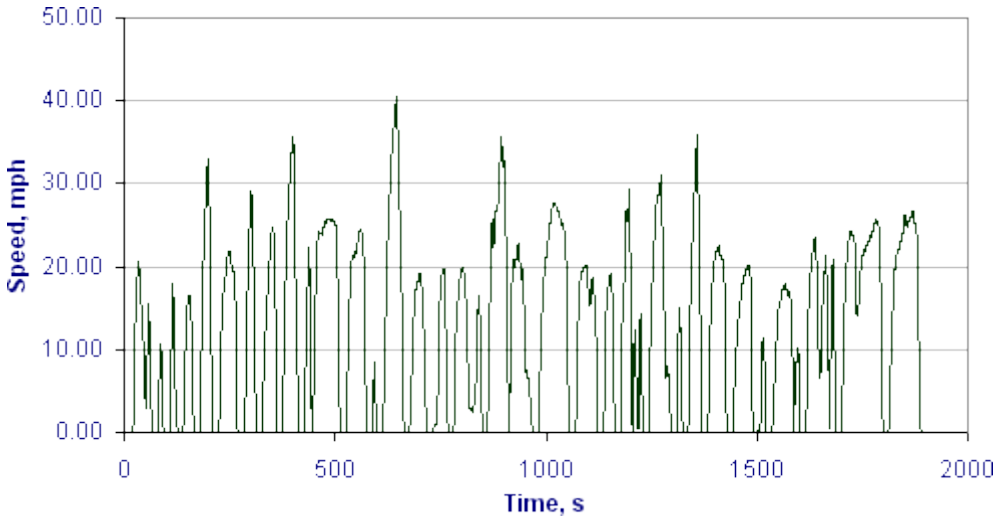


***Figure 8.2**. Orange County Bus Cycle (Duration 1909 Sec, Maximum Speed 41 mph, Average Speed 12 mph)*

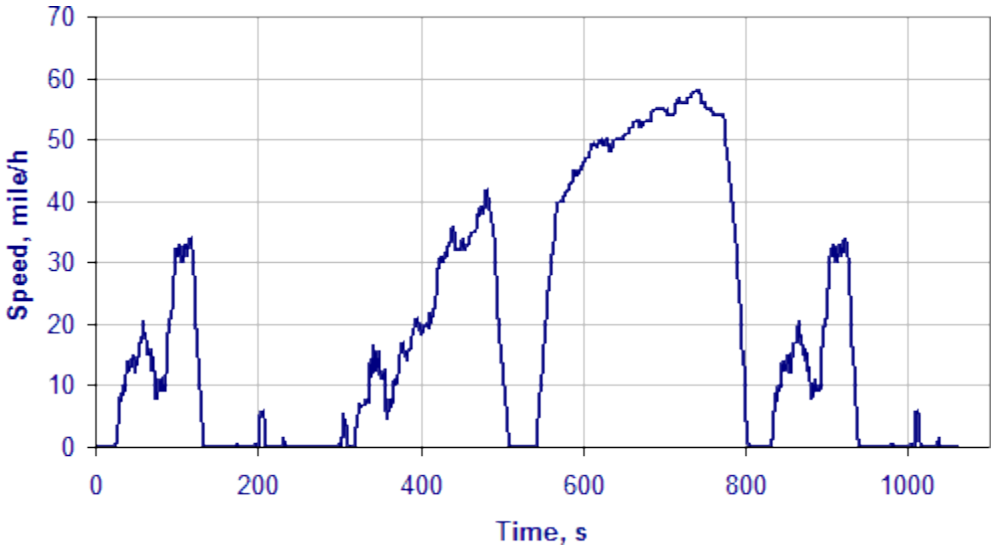


***Figure 8.3**. HD-UDDS Cycle (Duration 1060 seconds, Maximum Speed 58 mph, Average Speed 18.86 mph)*

8-III. TEST ARTICLE

The test article is a FR Conversions, Inc. 2017 Chrysler Pacifica Touring L Side Entry model transit bus equipped with a gasoline fueled FCA US LLC / OEM 3.6 litre motor. The bus was tested on May 25, 2021 with the odometer reading 6,892 miles.

8-IV. TEST EQUIPMENT

Testing was performed in the LTI Vehicle Testing Laboratory emissions testing bay. The test bay is equipped with a Schenk Pegasus 72-inch, large-roll chassis dynamometer. The dynamometer is electronically controlled to account for vehicle road-load characteristics and for simulating the inertia characteristics of the vehicle. Power to the roller is supplied and absorbed through an electronically controlled 3-phase ac motor. Absorbed power is returned to the electrical grid.

Vehicle exhaust is collected by a Horiba CVS, full-flow dilution tunnel. The system has separate tunnels for diesel and gasoline/natural gas fueled vehicles. In the case of diesel vehicles, particulate emissions are measured gravimetrically using 47mm Teflon filters. These filters are housed in a Horiba HF47 particulate sampler, per EPA 1065 test procedures. Heated gaseous emissions of hydrocarbons and NOx are sampled by Horiba heated oven analyzers.

Gaseous emissions for CO, CO2 and cold NOx are measured using a Horiba Mexa 7400 series gas analyzer. System operation, including the operation of the chassis dynamometer, and all calculations are controlled by a Dell workstation running Horiba CDCTS test control software. Particulate Filters are weighed in a glove box using a Sartorius microbalance accurate to 1 microgram.

8-V. TEST PREPARATION AND PROCEDURES

The test bus was prepared for emissions testing in accordance with the Fuel Economy Pre-Test Maintenance Form. (In the event that fuel economy test was performed immediately prior to emissions testing this step does not have to be repeated.) This is done to ensure that the bus is tested in optimum operating condition. The manufacturer-specified preventive maintenance shall be performed before this test. The ABS system is disabled for operation on the chassis dynamometer. Any manufacturer-recommended changes to the pre-test maintenance procedure must be noted on the revision sheet. The Fuel Economy Pre-Test Inspection Form will also be completed before performing the Emissions test. Both the Fuel Economy Pre-Test Maintenance Form and the Fuel Economy Pre-Test Inspection Form are found in section 6, Fuel Economy Test.

Prior to performing the emissions test, each bus is evaluated to determine its road-load characteristics using coast-down techniques in accordance with SAE J1263. This data is used to program the chassis dynamometer to accurately simulate over-the-road operation of the bus.

Warm-up consisted of driving the bus for 20 minutes at approximately 40 mph on the chassis dynamometer. During emissions testing, the test driver followed the prescribed driving cycle by watching the speed trace and instructions on the Horiba Drivers-Aid monitor which is placed in front of the windshield. The CDCTS computer monitored the test and collected data for calculation of emissions at the end of the test.

This bus was tested for emissions at seated load weight. The emissions data was obtained at the following conditions:

1. Air conditioning off
2. Heater off
3. Defroster off
4. Exterior and interior lights on
5. Windows and Doors closed
6. Seated load weight

The test tanks or the bus fuel tank(s) were filled prior to the fuel economy test with gasoline.

8-VI. DISCUSSION

Table 8.1 provides the emissions testing results on a grams per mile basis for each of the exhaust constituents measured and for each driving cycle performed.

TABLE 8.1 Emissions Test Results

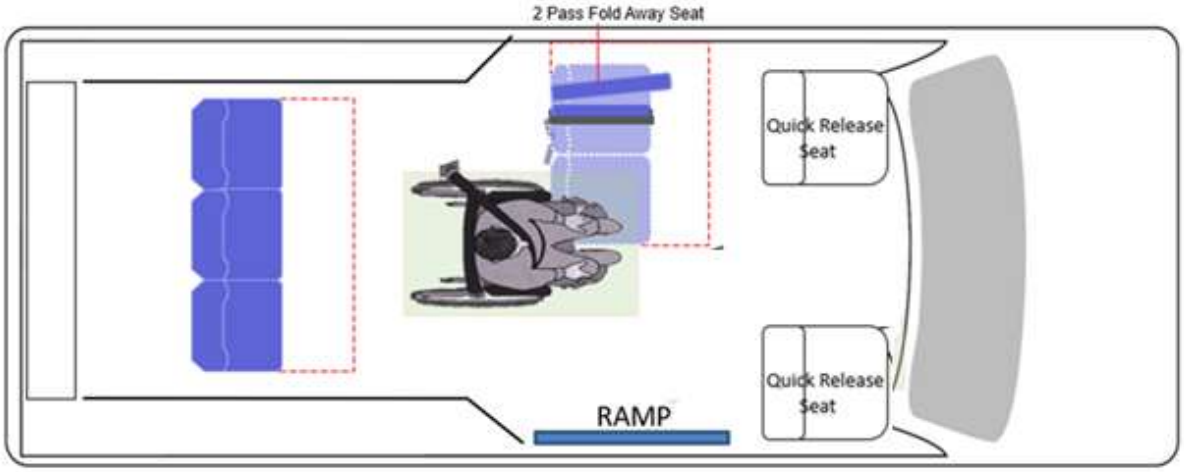
Test Completed at SLW: 5,900 lb.			
Driving Cycle	**Manhattan**	**Orange County Bus**	**UDDS**
CO_2, gm/mi	860	577	526
CO, gm/mi	0.19	0.35	0.35
THC, gm/mi	0.02	0.02	0.04
NMHC, gm/mi	0.01	0.02	0.03
NO_x, gm/mi	0.03	0.02	0.04
Particulates. gm/mi	N/A	N/A	N/A

8. EMISSIONS TEST

BUS TESTED ON CHASSIS DYNAMOMETER FOR PERFORMANCE, FUEL ECONOMY AND EMISSIONS

4 Passenger
1WC
1-Driver

FR Conversions
ADA Voyager Van Floor Plan
Side Entry



FR CONVERSIONS

CONVERSION SPECIFICATIONS

Side-Entry Minivan

Chrysler Pacifica

- ✓ ***Quality mobility vans*** *for the commercial passenger transportation or paratransit markets*
- ✓ *Crosswind Model constructed on a* ***Chrysler Pacifica*** *chassis starting at the 2021 model year*
- ✓ *Offers the versatility of transporting* ***six passengers*** *(including driver and one wheelchair)*

TUB *59" wide x 91.5" long*	Inside conversion space built to accommodate maximum versatility. Allows for easy turning of standard wheelchairs for easy ingress and egress. Standard LED lighting throughout the lower cabin provides an upscale aesthetic and illumination for easier securement in low-light conditions.
RAMP *30" wide x 52 1/2" long*	Manual, spring-assisted ramp features a texturized, powder-coated, diamond pattern surface to reduce slips and increase traction. 9% grade exceeds the 14% ADA requirement, assisting with ease of entry.
SEATING *OEM*	Optional mid-cabin foldaway bench seat for two passengers occupies area of the middle wheelchair position.
SIDE ENTRY *56" high*	Door height from floor to opening (straight drop) meets ADA requirement of 56 inches.
FLOORING *2.2-mm thick*	A unique weld process ensures a lifelong even floor. The standard Altro upscale floor covering with a burnt wood grain finish helps prevent slipping, is easy to clean, and is extremely durable.
RESTRAINTS *"L" track system*	Includes "L" track floor sections thoughtfully installed throughout the cabin to allow for maximum versatility of securement positions and devices.
FUEL SYSTEM *OEM tank with T1 supplied custom lines and fittings*	Maintains the original manufacturer's fuel tank assembly with Tier 1 OEM sourced fuel lines to perfectly match the original design with the new dimensions and placement within the modified vehicle.

SAFETY

Our vehicles are crash tested (FMVSS:214, FMVSS:301) and meet or exceed all ADA requirements and Federal Highway Safety Standards. Our vehicles are Altoona Tested to ensure reliability and durability, and CARB-compliant to meet stringent emissions standards.

WARRANTY

All conversions include a 3-year/ 36,000-mile conversion warranty.

CERTIFICATIONS

Our taxi conversions are approved by transit authorities in New York City, Boston, D.C. and Philadelphia.

MEMBERSHIPS

We are proud members of National Mobility Equipment Dealers Association (NMEDA) as a Manufacturer Member, and listed with the National Highway Transportation Safety Administration (NHTSA).

CONVERSION SPECIFICATIONS

Side Entry Interior Features

>> Powder-coated, texturized ramp surface reduces slips and improves traction.

>> ADA ramp is positioned at a 9%-grade (without kneeling) for ease of wheelchair loading.

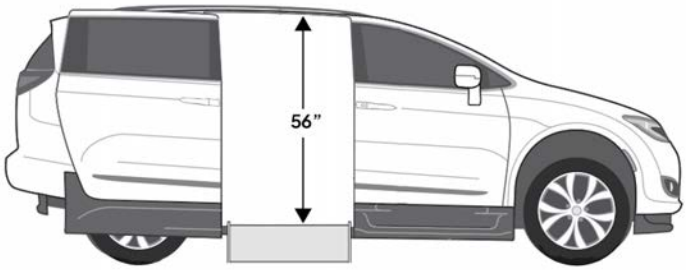
>> ADA ramp has a 1,000 lb. weight capacity, tested to 3X the load rating.

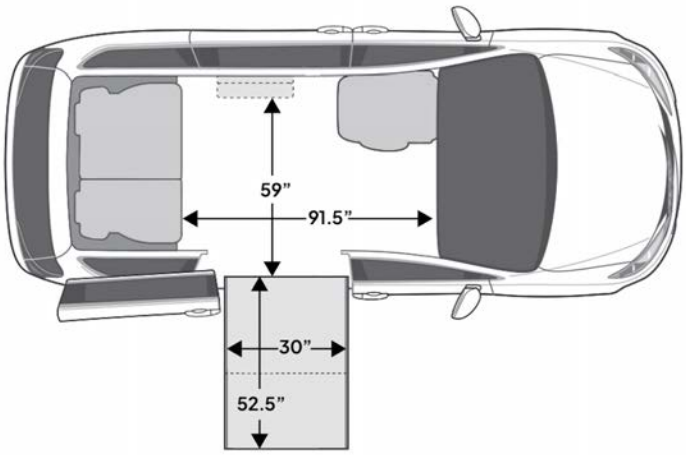
>> Second-row Freedman aftermarket two pass flip seat optional.

>> Easy out front passenger seats.

>> Unique cantilever design greatly enhances effective mid-cabin room for wheelchair maneuverability.

Conversion Specifications





ADA	Meets or Exceeds all
Crash Tested	FMVSS:214, FMVSS:301
Pull Tested	"L" Tracks / Seats / Bases
Altoona Tested	4 Year/100K mile STURRA
NHTSA Listed	
CARB Compliant	
Buy America Compliant	

Conversion Specifications:

Passengers	4 Ambulatory 2 Wheelchairs*
Payload	1180 lbs.
Fuel	19 gallons
	OEM Fuel Cell

*Up to 6 ambulatory passengers with optional mid-row flip seat.
* 2 Wheelchairs with removed front seat

Mobility Conversion Minimum Specifications:

Door/ Side Width	32"
Door/ Side Height	56"
Interior Height	59.75"
Floor Length	90"
Floor Width	61"
Securement	"L Track" Throughout

Wheelchair Capacity	2
ADA Compliant Without Kneeling	

Ramp:

Ramp Length	52.5"
Ramp Width	30"
Ramp Angle	15% (no kneel required)
Ramp Capacity	1000 Lbs.

Manual Bi-Fold
Spring-assisted
Anti-Rattle Tensioner and Magnet
Permanent Texturized Non-Slip Finish
3- Gauge Aluminum Powder Coated
LED Lighting

See "Ramp Notes" below

Conversion:

All Structural Components Powder Coated
Sealed Fasteners Throughout
Minimally Altered Suspension (Custom Cast Trailing Arms)
Side Steps 450 Lbs. 4" x 27"
Color Matched, Steel Supported, HDP Ground Effects, Riveted, Readily Replaceable
Independent, Sealed Aluminum Door Extensions, Replaceable (no weld)
Commercial Woodgrain Altro 2.2mm Flooring
OEM Color Matched (Blue) LED Interior Floor Lighting Throughout
Removeable Driver & Passenger Front Seats
Rear Passenger Flip Down Comfort Footrest
Exhaust 303 Polished Stainless-Steel, Bolt Together Modular Construction for Easy Repair or Replacement of Parts

Trunk Kit:

Inflatable Spare Tire Kit
OEM Air Compressor

Minimum Clearances:

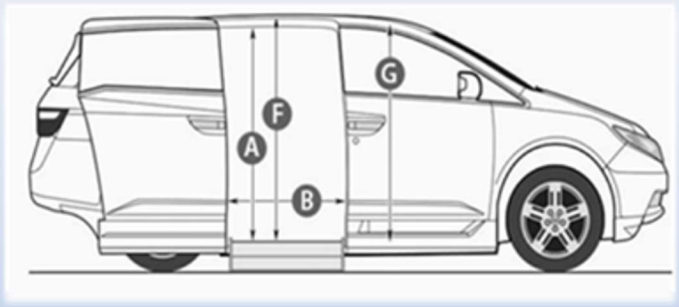
Lowest Point Outside Front Axle Location 9.8"
Lowest Point Outside Rear Axle 6.5"
Lowest Point between Axles 4.1"
Ground Clearance at Center 5.3"
Front Approach Angle ** 20.0◦
Rear Approach Angle ** 17.2◦
Ramp Clearance Angle 15◦ (ADA w/o Kneel)
**As measured from the centerline of the axles

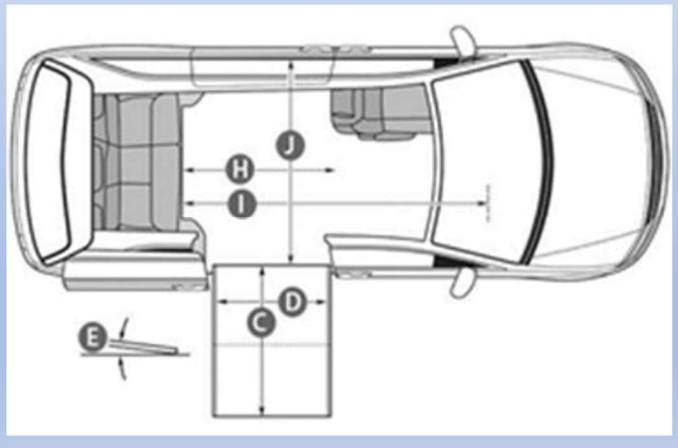
Dimensions

Length	16' 7.25"	Curb Weight	4,860 Lbs.
Width	80.25"	SLW / GVW	5,900 Lbs.
Height	76"	GAWR	6,050 Lbs. Declared
Wheelbase	121.7"		

Warranty:

3 Year 36,000 Miles Conversion***
3 Year 36,000 Miles Chassis
5 Year 100,000 Miles Powertrain
***see Options for Extensions up to 5/100,000





A. 56"
B. 32"
C. 52 ½ "
D. 30"
E. 15%
F. 59"
G. 59"
H. 54"
I. 90"
J. 61"

Ramp Notes:

FR Conversions' Manual Bi-Fold Ramp for Side Entry ADA Conversion:
*Proprietary Heavy Duty Transit-Rated, 3 Gauge (5.83mm) Powder Coated Aluminum/Non-Skid grit *1,000 Rating, ADA compliant *Industrial continuous hinge *Counter-balanced, Clock-spring Assisted, EZ deploy and EZ Stow. *Rugged Bi-Fold all manual operation for zero maintenance. *Exclusive Stowed Ramp Securement (SRS) that eliminates rattles and noise while driving.
For rigorous and demanding Transit environments, the FR Conversions fixed TR (Transit- Rated) Ramp is much more dependable and durable than a Swing-Away Ramp. With the new minivans having dual power sliding doors, the Operator can easily and quickly deploy the ramp to assist less-able Ambulatory and Mobility device passengers alike, from either side. The need for the Swing-Out feature was negated years ago when the streetside sliding doors became standard, first as manual, and now as power. This ramp has simpler operation, lower maintenance, and rugged structure.

2025 Voyager Standard Equipment

CHRYSLER Pacifica Touring
Exterior Color: Bright White w/ Clear–Coat
Interior Color: Black / Alloy / Black
Premium Cloth Bucket Seats
3.6L V6 24V VVT Engine
9–Speed ESS Automatic Transmission

STANDARD EQUIPMENT

FUNCTIONAL/SAFETY FEATURES
Adaptive Cruise Control with Stop and Go
ParkSense® Rear Park–Assist with Stop
Blind–Spot and Rear Cross–Path Detection
Lane–Departure Warning Plus
Full–Speed Forward–Collision Warning Plus
Pedestrian Emergency Braking
Advanced Brake–Assist
Rain–Sensitive Windshield Wipers
ParkView® Rear Back–Up Camera
Advanced Multistage Front Air Bags
Driver Inflatable Knee–Bolster Air Bag
Passenger Inflatable Knee–Bolster Air Bag
Supplemental Side–Curtain All–Rows Air Bags
Supplemental Front Seat–Mounted Side Air Bags
LATCH–Ready Child–Seat Anchor System
Sentry Key® Theft Deterrent System
Electronic Stability Control
Remote Start System
Remote Proximity Keyless Entry for All Doors

INTERIOR FEATURES
2nd and 3rd–Row Stow 'n Go® Seats with Easy–Tilt
Heated Front Seats
Heated Steering Wheel
8–Way Power Adjustable Driver Seat
Driver Seat Auto Advance 'n Return
Full–Length Upgraded Floor Console
Air Conditioning with 3–Zone Automatic Temp Control
Power Front Windows with 1–Touch Up / Down
Uconnect® 5 with 10.1–Inch Touch Screen Display
Google Android Auto™
Apple CarPlay®
6 Speakers
Handsfree Phone and Audio
Automatic High–Beam Headlamp–Control
SiriusXM® with 3–Month Radio Sub

EXTERIOR FEATURES
17–Inch x 7.0–Inch Aluminum Wheels
235/65R17 BSW All–Season Tires
Bi–Function LED Projector Headlamps
Front LED Fog Lamps
LED Tail Lamps
Power Liftgate
Power Sliding Doors
Gloss–Black Power Mirrors
Exterior Mirrors with Supplemental Signals

OPTIONAL EQUIPMENT
Customer Preferred Package 27W

WARRANTY COVERAGE
5–year. or 100,000–mile Powertrain Limited Warranty.
3–year or 36,000–mile Basic Limited Warranty.
3–year or 36,000–mile Conversion Warranty.

FlexTech

INTERMOTIVE VEHICLE CONTROLS

An ISO 9001:2015 Registered Company

FlexTech™

Programmable Electrical System

Overview

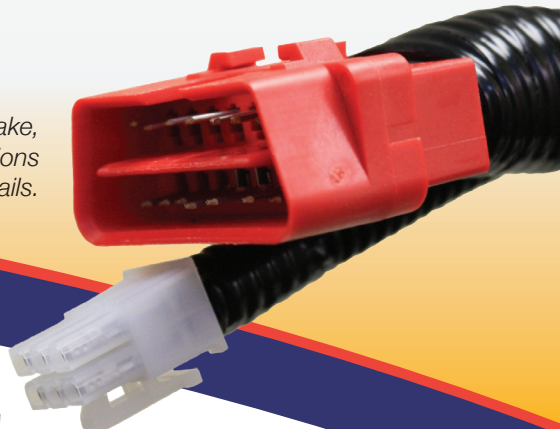
- Foundation of the system is a Programmable Relay Power Center
- Can add optional modules to create an entire custom control system
- Connects electronic modules through the overall vehicle network, reducing the need for wiring
- Uses real-time chassis data to control loads
- Simple plug and play connections to the OEM chassis

Features

- Centralizes and improves diagnostic capabilities; eliminates the need for timers, flashers, latching relays and multi-relay logic
- Access to InterMotive's graphical interface allows for customization of the entire system
- Communicates with Ford and Chevy CAN as well as J1939
- Warning LEDs offer easy troubleshooting
- Utilizes Upfitter Interface Module® technology
- Includes Intermittent Fault Filter™ (IFF) technology to eliminate false readings

Watch FlexTech in action

Product features may vary by make, model or year. See instructions for complete details.



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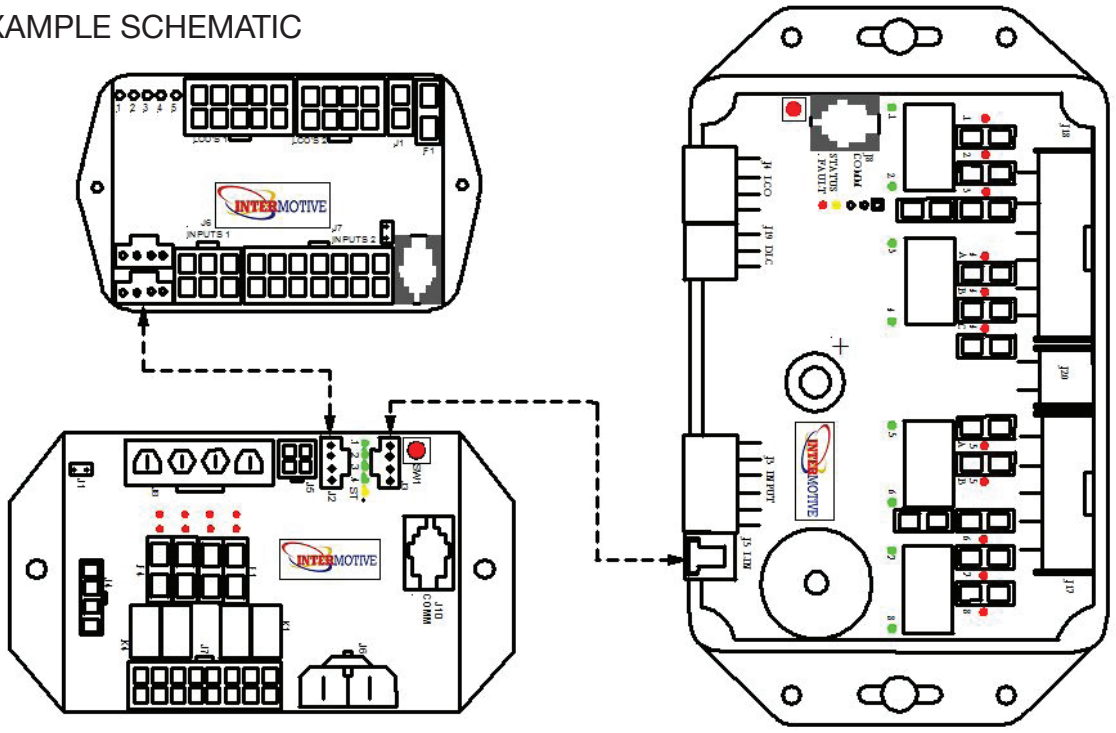
Details

EXAMPLE SCHEMATIC



COMPONENTS

Programmable Relay Power Board (PRPC)

- Eight programmable relay power outputs
- Ten separate digital inputs
- Eight programmable low-current outputs: Seven sourcing (0.5 A), one sinking (0.5 A)
- Outputs can be configured as momentary, latching, flashing or timed
- Easy diagnostics with LED indicators
- Programmable audible patterns for multiple uses

Expansion Board (Optional)

- Four 10 A relay fused outputs
- Four 1 A low-current outputs
- Four active low outputs
- Loads controlled by the PRPC

Switch Backer Board, SBB4/SBB8 (Optional)

- Controls system inputs and outputs
- Four or eight switches and light outputs
- Two switch backer boards of either size can be used together
- Six outputs: Two 1 A and four 0.5 A
- Compatible with any brand of switches

Other Module Options

- Gateway: Compliant FMVVS 403/404 wheelchair interlock and high idle system
- Advanced Fast Idle System (AFIS): Adjustable system with battery charge protection and optional air conditioning auto trigger
- BrakeMax: Tow haul mode for reduced brake wear and increased transmission durability for heavily loaded vehicles

REV_AF
U.S. Patent #9,469,261

QRT®-1 SERIES

MAX / DELUXE / STANDARD
4-POINT SECUREMENT
WHEELCHAIR RETRACTORS

QRT®-1 SERIES

The Securement System That Changed Everything

The original 4-point wheelchair securement system, QRT-1 Series retractors defined the way passenger safety devices are designed and tested.

With a range of 3 different options to fit every need and every budget, the QRT-1 Series of retractors offer easy to use, effective 4-Point securement of wheelchairs for virtually any vehicle application.

QRT **MAX**

FULLY AUTOMATIC, premium knobless retractor that allows for one-handed operation.

QRT **DELUXE**

SELF-LOCKING & SELF-TENSIONING retractor with ergonomic housing and dual tensioning knobs.

QRT **STANDARD**

SEMI-AUTOMATIC retractor that meets all industry standards and specifications.

More than 30 years ago, Q'STRAINT introduced the world's first fully integrated 4-Point wheelchair passenger securement system, now an industry standard the world over. **The QRT line of retractors are the linchpin of that system.**

Every QRT retractor is fully ADA complaint, and meets or exceeds all standards and regulations, including:

- SAE J2249, ISO 10542,
- FMVSS 209, 302, 210, 222
- CMVSS 209
- CSA Z605
- and 30mph/20g crash testing

Anchorage Options

All QRT-1 Series Retractors are compatible with L-Track, L-Pockets and Slide 'N Click anchorages, or may be directly mounted to vehicle floors, seat legs or barriers.

L-TRACK / L-POCKETS

For kits that use L-Track or L-Pocket anchorages, QRT Series retractors feature our patented Positive Lock Indicator (PLI) that clearly indicates when the fitting is locked in the anchorage.

SLIDE 'N CLICK

For kits that include Slide 'N Click anchorages, QRT Series retractors feature a single-bolt SNC assembly and plunger that allows a full 360° rotation, eliminating anchorage alignment guesswork.

QRT-1 SERIES FEATURES COMPARISON

	MAX	DLX	STD
Knobless, One-Handed Operation. No knobs to interfere with wheels and footrests.	●		
Dual Tensioning Knobs. Provides additional tensioning if needed.		●	
Single Tensioning Knob. Provides additional tensioning if needed.			●
Automatic, Self-Locking. Allows easy, one-handed hook-up.	●	●	
Self-Tensioning. Retractors automatically take up 'slack'.	●	●	
Positive Lock Indicator. Patented feature clearly indicates when fitting is locked in anchorage.	●	●	●
Interchangeable. Eliminates confusion: no right, left, front or rear locations.	●	●	●
Low Profile & Compact. Elimination of mounting bracket allows retractors to fit under most footrests.	●	●	●
Accommodates Larger Wheelchairs. Reduced overall length leaves more room for wheelchairs.	●	●	
Ultra-Durable. Hardened steel and coated zinc for maximum corrosion resistance.	●	●	●
Universal Design. Accommodates virtually all wheelchair designs, including scooters.	●	●	●
J-Hook. Reduces twisting of belts and ensures proper securement for all wheelchair designs.	●	●	●
Foot Release Lever. Easy release eliminates the stress of bending down.	●	●	●

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PRODUCT LIMITED WARRANTY

Q'STRAINT provides limited warranty coverage on Q'STRAINT products (the "Products") as described in this Limited Warranty. For customers in the U.S.: this warranty gives you specific legal rights; you also may have other rights, which vary from state to state. For customers in the European Union: the purchaser may have additional legal rights under applicable national legislation governing the sale of consumer goods, and those rights (if applicable) are not affected by this warranty.

COVERED PRODUCTS AND LIMITATIONS:

Q'STRAINT's limited warranty coverage applies only to factory defects in materials and workmanship in the Products as follows:

- **QUANTUM** – 3 years* or 10,000 cycles.
- **Q'POD, Q'STRAINT ONE, QRT-3 Series, QRT-5 Series** – 5 years* limited warranty coverage.
- **QRT Max, QRT Deluxe, QLK-150, Q'UBE** – 3 years* limited warranty coverage.
- **QRT Standard, Q-5000, M-Series, QLK-110, INQLINE, INQLINE Loader** – 2 years* limited warranty coverage.
- **OMNI Floor** – 3 years/40,000 mile* limited warranty coverage.
- **All other Products** – 1 year limited warranty coverage.

***Only valid if product is registered with Q'STRAINT.** Otherwise a 1 year limited warranty applies to all products.

Each of the warranty coverage periods runs from the date the Products are shipped from Q'STRAINT, and applies only to warranted defects that first manifest themselves and are reported to Q'STRAINT within the applicable warranty period. Q'STRAINT retains the right to determine to its reasonable satisfaction whether any claimed defect is covered by this warranty.

CERTAIN ITEMS ARE EXCLUDED FROM WARRANTY COVERAGE BY Q'STRAINT, AND THIS LIMITED WARRANTY COVERAGE DOES NOT APPLY TO:

1. Products which are not installed and maintained in accordance with Q'STRAINT's instructions.
2. Products which are subject to misuse, abuse, accident, negligence, or exposure to the elements or chemicals.
3. Products which are altered or not repaired by a Q'STRAINT authorized repair service.
4. Normal wear and tear, and routine maintenance.
5. Products which are not used in applications or in a manner approved by Q'STRAINT.

ALL STATUTORY OR IMPLIED WARRANTIES (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), CONDITIONS AND GUARANTIES ARE EXCLUDED AND DISCLAIMED TO THE FULLEST EXTENT ALLOWED BY LAW. If any implied warranties, conditions or guarantees are required under applicable law, they are limited to the minimum duration allowed by law (not longer than the duration of the applicable express limited warranty coverage). For customers in the U.S.: some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

REMEDIES UNDER THIS LIMITED WARRANTY

If a defect covered by this warranty occurs, Q'STRAINT (or one of its authorized dealers, as determined by Q'STRAINT) will repair or replace the defective Products, in its sole discretion. This "repair or replacement" remedy is the **exclusive remedy** under this warranty. Q'STRAINT has **no responsibility or liability for any incidental or consequential damages**, such as loss of use, interest or finance charges, the cost of repairs by unauthorized repair services, depreciation, etc., all of which are specifically **excluded and disclaimed** from this warranty. For customers in the U.S.: some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

RESPONSIBILITY OF PURCHASER

1. Any claims under this limited warranty must be made to Q'STRAINT within fifteen (15) days after the defect first arises.
2. The Products must be returned to Q'STRAINT (or its authorized repair facility, as determined by Q'STRAINT) within the warranty period for inspection and warranty service. The expense of disassembly, returning the Products for warranty service, and of returning the Products to the owner and reassembly after any warranty service has been completed, is the responsibility of the owner and will not be reimbursed by Q'STRAINT. Contact Q'STRAINT Customer Service for information on how to return Products.
3. If your Product includes a registration form it must be returned to Q'STRAINT within thirty (30) days after the Products are delivered to the purchaser.

Q'STRAINT reserves the right to improve its products through changes in design or materials without being obligated to the owners of other Products.
Q'STRAINT may be contacted at **800-987-9987** or via email at customersatisfaction@qstraint.com.

Warranty

☑ FR Conversions Inc. to provide Bumper to Bumper parts and labor warranty for any mechanical defect relating to this vehicle for 30 days from the date of delivery or 1,000 miles; whichever is less. In the event of an alleged claim during the warranty period, the original owner should contact FR Conversions Inc. to obtain information with respect to warranty service. *Any work done without prior approval may not be covered.*

☑ FR Conversions Inc. to provide a limited warranty on its modifications. FR Conversions Inc. warrants that its modification is free from defects in material and workmanship according to the terms herein. This limited warranty commences on the day the vehicle is delivered to the original owner of the modified vehicle. FR Conversions Inc. warrants that it will repair or replace, free of charge, any proven defect of its modification of an FR Conversions Inc. vehicle for a term of three (3) years from the date of purchase or thirty-six thousand (36,000) miles beyond the odometer reading as of the date the FR Conversions Inc. vehicle is delivered to the original owner; whichever occurs first. This limited warranty only applies to a defect of an FR Conversions Inc. modification that occurs under normal conditions of use and service, proves to be a defect in material or workmanship, becomes apparent while the original owner of the FR Conversions Inc. vehicle remains the owner of the FR Conversions Inc. vehicle and impairs functionality of the modification. In the event of an alleged defect in the modification during the warranty period, the original owner should contact FR Conversions Inc. to obtain information with respect to warranty service. *Any work done without prior approval may not be covered.* For modified vehicles only: *This vehicle has been modified in compliance with 49 CFR 595.6 and is in compliance with all federal motor vehicle safety standards in effect at the time of its original manufacture.*

ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY LIMITED TO THE SAME DURATION OF TIME AS THE EXPRESS WRITTEN WARRANTY ABOVE STATED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. ORIGINAL OWNER SHALL NOT BE ENTITLED TO RECOVER FROM FR CONVERSIONS INC. ANY CONSEQUENTIAL DAMAGES, DAMAGES TO PROPERTY, DAMAGES FOR LOSS OF USE, LOSS OF TIME, LOSS OF PROFITS, OR INCOME, OR ANY OTHER INCIDENTAL DAMAGES, SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Vin# 2C4RC1AG4LR266521

Corporate Representative