

The following documentation is an electronicallysubmitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at *wvOASIS.gov*. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at *WVPurchasing.gov* with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

WOAS	IS	Jump to: FORMS 🟦 🙆 🐼 Home 🔑 Personalize 🚳 Accessibility 🛜 App Help 🐔 About [
Welcome, Lu Anne Cottrill		Procurement Budgeting Accounts Receivable Accounts Payable
Solicitation Response(SR) Dept: 080	05 ID: ESR05031700000005278 Ver.: 1 Function: New	W Phase: Final Modified by batch , 05/03/2017
Header () 31		
		🗮 List View
General Information Contact	Default Values Discount Document Information	
Procurement Folder:	184616	SO Doc Code: CRFQ
Procurement Type:	Central Master Agreement	SO Dept: 0805
Vendor ID:	VS0000011255	SO Doc ID: PTR1700000005
Legal Name:	CREATIVE BUS SALES INC	Published Date: 4/20/17
Alias/DBA:		Close Date: 5/3/17
Total Bid:	\$0.00	Close Time: 13:30
Response Date:	05/03/2017	Status: Closed
Response Time:	13:04	Solicitation Description: Addendum No. 1. 138" Wheel base DRW Cutaway Vehicle
		Total of Header Attachments: 31
4		Total of All Attachments: 31



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

### State of West Virginia Solicitation Response

Pro	Proc Folder: 184616					
Soli	Solicitation Description : Addendum No. 1. 138" Wheel base DRW Cutaway Vehicle					
Pro	Proc Type : Central Master Agreement					
Date issued	Solicitation Closes	Solicitation Response	Version			
	2017-05-03 13:30:00	SR 0805 ESR0503170000005278	1			

VENDOR				
VS0000011255				
CREATIVE BUS SALES INC				
Solicitation Number:	CRFQ	0805	PTR170000005	

 Total Bid :
 \$0.00
 Response Date:
 2017-05-03
 Response Time:
 13:04:20

Comments:

FOR INFORMATION CONTACT THE BUYER			
Melissa Pettrey			
(304) 558-0094 melissa.k.pettrey@wv.gov			
Signature on File	FEIN #	DATE	
All offers subject to all terms and conditions contained	d in this solicitation		

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	for Mid Sized light duty buses	0.00000	EA	\$1.000000	\$0.00
Comm Code	Manufacturer	Specification		Model #	
25101502					
Extended De	scription : 138" Wheelbase Dual F	Rear Wheel Narrow	Body Cutawa	ay vehicles.	

Comments: See Bid Response Sheet for pricing of each floorplan layout.

### Letter of Qualifications



#### **Responder Information**

Creative Bus Sales, Inc. 28293 Clay Street Elkhart, IN 46517 Mike Wilson – Regional Sales Manager (800) 862-5478 – Phone (574) 830-0063 - Fax mikew@creativebussales.com

### **Company History - Bidders Qualifications**

Creative Bus Sales, Inc. began serving the needs of California transportation providers in 1980 under the name of Creative Transportation Services, Inc. (CTS). In 1980, CTS was sold and became Creative Bus Sales, Inc. Tony Matijevich subsequently purchased Creative in 1993. Prior to the purchase Tony was the President of ElDorado National, the largest manufacturer of small and mid-size buses in the nation. Under the current leadership and vision, Creative Bus Sales has become the largest volume small and mid-size bus dealership in the United States. Creative is unique in the bus industry as a dealer that focuses only on the needs of the commercial bus customer.

#### **Creative Family of Companies Include:**

Creative Bus Sales - Chino, California Creative Bus Sales - Atlantic Beach, Florida Creative Bus Sales - Phoenix, Arizona Creative Bus Sales - Irving, Texas Creative Collision and Paint-Chino, California Green Alternative Systems- Chicago, IL Creative Bus Sales- Tulsa, OK Creative Bus Sales- Jacksonville, FL Creative Bus Sale- Portland, OR El Dorado Bus Sales - San Mateo, California Green Alternative Systems -Elkhart, Indiana Creative Bus Sales -Albuquerque, New Mexico Creative Fleet Leasing - Chino, California Green Alternative Systems – Brooklyn, NY Green Alternative Systems- Yorba, CA Creative Bus Sales- Orlando, FL Creative Bus Sales- Colorado Springs, CO Creative Bus Sales- Seattle, WA

Creative Bus Sales was incorporated in the State of California in 1993 under the current ownership. Creative Bus Sales has had no judgments, litigation, licensing violations or other violations outstanding or resolved against it within the past five (5) years.

**Background** Creative Bus Sales is the largest commercial bus dealership in the United States and sells, delivers and services hundreds of buses per year to agencies and companies in California and throughout the United States. Creative Bus Sales has held several State Contracts over the last 17 years and has delivered several thousand State contract vehicles during this time.

### Experience ( a partial listing of significant projects)

Significant Transit Projects Completed Over the Last 4-5 Years

ОСТА	Over 950 Paratransit Buses
City of Los Angeles	Over 500 Paratransit Buses
Caltrans Division of Mass Transit	Over 2,000 Paratransit Buses
RTC Las Vegas	Over 400 Paratransit and Transit Buses
Access Services	Over 700 Paratransit Mini Vans
Dallas DART	398 Paratransit Buses
Montgomery County, MD.	93 Paratransit Buses

### Notices should be sent c/o:

Mike Wilson – Regional Manage	er Creative Bus Sa	les, Inc.	28293 Clay Street, Elkhart IN 46517
(800) 862-5478 – Phone	(574) 830-0063 – Fax	mikew(	@creativebussales.com

**Preparer:** Marcus Hoffman, Transit Bid Manager for Creative Bus Sales, Inc. is the preparer of this proposal.

**<u>Flexible Scope</u>**: Creative Bus Sales, Inc. is committed to flexibility in the products and services offered in the contract upon request by the State.

**Independent Pricing:** Creative Bus Sales, Inc. certifies that in connection with this Contract the prices proposed have been arrived at without consultation, communication or agreement for the purpose of restricting competition.

**Signer(s):** Each person signing this proposal and/or addenda is the person responsible for or authorized to make decisions as to the prices quoted in the cost proposal and has not participated and will not participate in any action contrary to those stated above.

Key Personnel: Project Manager – Matt Mashuda is the proposed Project Manager for this contract.

#### Organization and Key Staff Members Assigned to This Contract:

Creative Bus Sales, Inc. currently employs over 250 employees in all locations.

Tony Matijevich, President Terry McCrea, Chief Financial Officer TJ Matijevich, VP Sales/General Manager Mike Wilson, Regional Sales Manager Marcus Hoffman, Transit Bid Manager Matt Mashuda, Transit Sales Carl Henderson, Eastern Corporate Operations & Service Manager Jason Hohalek, Corporate Warranty Manager Keith Grube, Corporate Parts Manager

**Project Team:** Matt Mashuda, Project Manager will be responsible for the day-to-day maintenance of this contract. Some or all of the above mentioned personnel will be utilized as needed during the course of this project.

**<u>Consent</u>**: Creative Bus Sales, Inc. if awarded a contract will not assign any part of its interest in the agreement without prior consent of the State.

Acceptance of Terms: Creative Bus Sales, Inc. accepts the Contract Terms and Conditions.

**<u>RFP Response</u>**: Our understanding of the scope of work pertaining to this RFP solicitation and components includes but not limited to:

<u>Customer Service</u> Capabilities: Our service locations or are located within 5 hours of all recipients locations. Technical assistance is provided on the day of the phone call. We are exclusively able to direct factory personnel from any discipline including engineering, manufacturing, parts, service and management, in response to your need at the time. No delay in problem resolution due to out of state factory personnel availability is experienced. Swift and accurate resolutions to issues and needs are achieved through factory personnel directly reviewing issues, "first hand", as they are presented.

Creative has excellent relations with all major component manufacturers. Creative's service technicians and supervisory team are certified by John Deere, Cummins, A/C Carrier, Trans Air, Thermo King, Ricon, and Braun. Service technicians are graduates of the Automotive Technical College and Automotive Service Excellence (ASE) Master Technicians. Creative's parts service department is dedicated solely to the service and support of commercial and transit buses and does not service any other type of equipment, school buses or trucks. Such focus insures an unmatched level of competency in the industry. Technical assistance can be provided immediately during business hours by contacting Creative Bus Sales service technicians. Complete description of warranty policy and procedures can be provided upon award.

### List of Centers

One call to our Warranty Administration team will facilitate the best warranty option. Creative Bus Sales is an authorized repair facility. They have the authority to make on the spot decisions regarding warranty repairs. As needed, local to the end user warranty repair facilities will be authorized to perform the required repair.

### **Spare Parts and Inventory Levels**

A critical part of the project is a quick response time to service assistance and parts supply. Both of these items are provided from locations in Arizona, California, Florida, Indiana, and Texas. Once again, one call to our Parts network will facilitate the end users needs.

Creative Bus Sales provides parts supply and aftermarket support from five of our facilities. Over \$10,000,000 worth of inventory is maintained at all times. Parts department personnel have over sixty years of experience in this field. Most parts can be shipped within twenty-four hours of order. Complete description of parts policy and procedures can be provided upon award.

### Inspection procedures

Each vehicle will have a PDI (Pre-Delivery Inspection) performed before final delivery to the end customer. Any deficiency noted shall be repaired before delivery. All documents required under the contract shall be provided upon delivery or pickup. This pre-delivery inspection will be in addition to inspections performed by the manufacturer and/or line inspectors hired by the end user.

### **Cutoff Dates**

CBS agrees to comply with this section. Model year cutoffs are well communicated by the OEM's and chassis dealers alike. We generally receive 60 - 90 days' notice and will promptly notify the agency promptly.

Sincerely,

Marcus Hoffman Transit Sales Creative Bus Sales, Inc. **DESIGNATED CONTACT:** Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Mike Wilson, Regional Sales Manager (Name, Title) (Printed Name and Title) 28293 Clay Street Elkhart IN 46517 (Address) 877-686-9448 574-830-0063 (Phone Number) / (Fax Number) mikew@creativebussales.com (email address)

**CERTIFICATION AND SIGNATURE:** By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Creative Bus Sales, Inc.

(Company)

(Authorized Signature) (Representative Name, Title)

Marcus Hoffman, Transit Bid Manager

(Printed Name and Title of Authorized Representative)

5/2/17

(Date)

602-437-2255 602-437-2758

(Phone Number) (Fax Number)

- **21.1.1** Failure to provide Contract Items in accordance with the requirements c obtained herein.
- **21.1.2** Failure to comply with other specifications and requirements contained herein.
- **21.1.3** Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.
- 21.1.4 Failure to remedy deficient performance upon request.
- 21.2 The Following remedies shall be available to Agency upon default.
- **21.2.1** Immediate cancellation of the Contract.
- **21.2.2** Immediate cancellation of one or more release orders issued under this Contract.
- 21.2.3 Any other remedies available in law or equity.

#### 22. MISCELLANEOUS:

- **22.1** No Substitutions: Vendor shall supply only Vehicles as submitted in response to the Solicitation unless a contract modification is approved in accordance with the provisions contained in this Contract.
- 22.2 Vendor Supply: Vendor must carry sufficient inventory of the Contract Items being offered to fulfill its obligations under this Contract. By signing its bid, Vendor certifies that it can supply the Contract Items contained in its bid response.
- 22.3 Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

<b>Contract Manager:</b>	Mike Wilson
Telephone Number	877-686-9448
<b>Fax Number:</b> <sup>5</sup>	74-830-0063
Email Address: n	nikew@creativebussales.com

### 22.4 NOTIFICATION OF FEDERAL PARTICIPATION

### MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

Location(s) of the Technical Service Representative(s) and parts distribution center(s) closest or in the State of West Virginia.

Location(s) of the technical service representative(s).

Name: Creative Bus Sales - Elkhart IN

Address: 28293 Clay Street Elkhart IN 46517

Contact: Mike Wilson or Curt Smith

Telephone: 877-686-9448

Name: Creative Bus Sales - Marietta

Address: 800 Pickens Drive Ext NE Marietta GA 30062

Contact: Carl Henderson Eastern Service Manager

Telephone: \_\_\_\_\_\_770-422-8920

Location(s) of parts distribution center(s).

Name: Creative Bus Sales - Elkhart IN

Address: 28293 Clay Street Elkhart IN 46517

**Telephone:** \_\_\_\_\_877-686-9448

Name: Creative Bus Sales - Part Distribution Warehouse

Address: 3832 East Roeser Phoenix AZ 85040

**Telephone:** 602-437-0016

Revised 10/17/14

## **CERTIFICATION FOR AIR & WATER POLLUTION MANDATORY BID FORM – MUST BE SUBMITTED WITH BID**

The Vendor certifies that the vehicles proposed:

**ARE**  $\underline{\times}$  in compliance with the regulations in 40 CFR Part 85, 40 CFR Part 86, 40 CFR Part 600, Clean Water Act and the air/water pollution criteria established by the Environmental Protection Agency of the United States Government.

**ARE NOT** \_\_\_\_\_\_ in compliance with the regulations in 40 CFR Part 85, 40 CFR Part 86, 40 CFR Part 600, Clean Water Act and the air/water pollution criteria established by the Environmental Protection Agency of the United States Government.

5/2/17 Date Authorized Signature

Transit Bid Manager

Title

Creative Bus Sales, Inc.

Company Name

## DISADVANTAGED VEHICLEINESS ENTERPRISE VENDORS/ MANUFACTURERS CERTIFICATION

### MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

### (Check appropriate statement)

- The Vendor, <u>if a transit vehicle manufacturer</u>, hereby certifies that it has complied with the requirements of 49 CFR Section 26.49 by submitting an annual DBE goal to the Federal Transit Administration (FTA). The goal has either been approved or not disapproved by FTA.
- $\stackrel{\times}{}$  The Vendor, <u>if a non-manufacturing supplier</u>, hereby certifies that the manufacturer of the transit vehicle to be supplied has complied with the above-referenced requirement of 49 CFR Section 26.49.

5/7/17

Date	
MARIA	
Authorized Signature	

Transit Bid Manager

Title

Creative Bus Sales, Inc.

Company Name

## BUY AMERICA CERTIFICATION ROLLING STOCK MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

### **Certificate of Compliance**

The bidder or offeror hereby certifies that it will comply with the requirements of section 165(b) (3), of the Surface Transportation Assistance Act of 1982, as amended, and the applicable regulations of 49 CFR 661.11:

5/2/17

-, ,	
Date Date	/
MAL	
Authorized City	
Authorized Signature	

Creative Bus Sales, Inc.

**Company Name** 

Marcus Hoffman

Name

Transit Bid Manager

Title

### **Certificate for Non-Compliance**

The bidder or offeror hereby certifies that it cannot comply with the requirements of section 165(b) (3) of the Surface Transportation Assistance Act of 1982, as amended, but may qualify for an exception to the requirement consistent with section 165(b) (2) or (b) (4) of the Surface Transportation Assistance Act, as amended, and the applicable regulations in 49 CFR 661.7.

Date

Authorized Signature

**Company Name** 

Name

Title

Revised 10/17/14

## FEDERAL MOTOR VEHICLE SAFETY STANDARDS CERTIFICATION

## MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

The vendor hereby certifies that it shall submit, as required by Title 49 of the CFR, Part 663 - Subpart D, it's self-certification information stating that the vehicle(s) will comply with the relevant Federal Motor Vehicle Safety Standards issued by the National Highway Traffic Safety Administration in Title 49 of the Code of Federal Regulations, Part 571.

5/2/17
Date
math
Authorized Signature
Transit Bid Manager
Title
Creative Bus Sales, Inc.
Company Name

### BID FORM #6 U.S. Comptroller's Debarment List Certification

## **MANDATORY BID FORM – MUST BE SUBMITTED WITH BID**

Creative Bus	Sales,	Inc.	hereby certifies that it

X IS or

**IS NOT** (specify one) included on the. U.S. GSA's debarment and suspension information available at <u>https://www.sam.gov</u>.

5/2/17

Date	
Marel	
Authorized Stenature	

Authorized Signature

Transit Bid Manager

Title

Creative Bus Sales, Inc.

### Company Name

Creative Bus Sales is listed under SAM.GOV as an eligible vendor available for use in Federal Funded projects.

The statement selected above was a little confusing on what should have been selected.

Please accept this statement as clarification to the above selection.

### MANDATORY BID FORM -- MUST BE SUBMITTED WITH BID

## **CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS**

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract), Creative Bus Sales, Inc. (COMPANY NAME) certifies

to the best of its knowledge and belief, that it and its principals:

- 1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- 2. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.
- 3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (2) of this certification; and
- 4. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

If the primary participant (applicant for an FTA grant, or cooperative agreement, or potential third party contractor) is unable to certify to any of the statements in this certification, the participant shall attach an explanation to this certification.)

THE PRIMARY PARTICIPANT (APPLICANT FOR AN FTA GRANT OR COOPERATIVE AGREEMENT, OR POTENTIAL CONTRACTOR FOR A MAJOR THIRD PARTY CONTRACT),

<u>Creative Bus Sales, Inc./Marcus Hoffman</u>, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. SECTIONS 3801 <u>ET SEQ</u>. ARE APPLICABLE THERETO.

Transit Bid Manager

Signature and Title of Authorized Official

Revised 10/17/14

## BID FORM #8 MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

## VENDOR'S CERTIFICATION OF UNDERSTANDING AND ACCEPTANCE

The Vendor hereby certifies that all Technical Specifications and Contract Terms and Conditions have been carefully reviewed, are fully understood and shall be adhered to in performance and completion of any contract resulting from this bid.

5/2/17
Date
matt
Authorized Signature
Transit Bid Manager
Title
Question Due Gales Tue
creative Bus Sales, Inc.
Company Name

## SPECIFICATION COMPLIANCE

NOTE: <u>Please check</u> if what is offered is in exact compliance with specifications. Any discrepancies must be listed as an attachment to the bid proposal. Exact dimensions and/or descriptions must be provided as a part of the Vendor's bid proposal when submitted.

- \_\_\_\_\_ Bid proposal submitted meets and/or exceeds all specification requirements.
- \_\_\_\_\_ Bid proposal submitted contains deviations from specification requirements. Detailed descriptions of these deviations have been provided with this bid proposal.

## BID FORM #9 MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

### **CERTIFICATION OF RESTRICTIONS ON LOBBYING**

The undersigned (Vendor, Contractor) certifies, to the best of his or her knowledge and belief, that:

- 1. No Federal appropriated funds have been paid or will be paid by or on behalf of the undersigned, to an person for influence or attempt to influence an officer or employee of any Federal agency, a Member Congress, an officer or employee of Congress, or an employee of a Member of Congress regarding the award of a Federal grant, loan (including a line of credit), cooperative agreement, loan guarantee, or le insurance, or the extension, continuation, renewal, amendment, or modification of any Federal grant, l (including a line of credit), cooperative agreement, loan insurance.
- 2. If any funds other than Federal appropriated funds have been or will be paid to any person to influence attempt to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of a Member of Congress in connection with any application a Federal grant, loan (including a line of credit), cooperative agreement, loan guarantee, or loan insura the undersigned assures that it will complete and submit Standard Form-LLL, "Disclosure of Lobbyin Activities," Rev. 7-97; and
- 3. The undersigned understands that the language of this certification shall be included in the award documents for all sub awards at all tiers (including subcontracts, sub grants, sub agreements. and contracts under grants, loans (including a line of credit), cooperative agreements, loan guarantees, and loan insurance.

Undersigned understands that this certification is a material representation of fact upon which reliance is placed by the Federal government and that submission of this certification is a prerequisite for providing Federal grant, loan (including a line of credit), cooperative agreement, loan guarantee, or loan insurance a transaction covered by 31 U.S.C. 1352. The undersigned also understands that any person who fails to a required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100 for each such failure.

The (Vendor, Contractor) \_\_\_\_\_\_Creative Bus Sales, Inc. \_\_\_\_\_, certifies or affirms the truthf and accuracy of each statement of its certification and disclosure, if any. In addition, the (Vendor, Contra understands and agrees that the provisions of 31 U.S.C. §§ 3801, et seq., apply to this certification and disclosure.

5/2/17 Date Mgnature

Transit Bid Manager

Title

## CERTIFICATION OF COMPLIANCE WITH FTA'S BUS TESTING REQUIREMENTS

The undersigned (Vendor/Manufacturer) certifies that the vehicle offered in this procurement complies with 49 U.S.C. 5318, as amended by MAP-21, and FTA regulations, "Bus Testing," 49 CFR Part 665.

The undersigned understands that misrepresenting the testing status of a vehicle acquired with Federal finan assistance may subject the undersigned to civil penalties as outlined in the Department of Transportation's re on Program Fraud Civil Remedies, 49 CFR Part 31. In addition, the undersigned understands that FTA may suspend or debar a manufacturer under the procedures in 49 CFR Part 29.

5/2/17

Date

Authorized Signature

Transit Bid Manager

Title

Creative Bus Sales, Inc.

**Company Name** 

Revised 10/27/2014



U.S. Department of Transportation Federal Transit Administration 1200 New Jersey Avenue SE Washington, D.C. 20590

September 18, 2009

Vince Cline Design Engineer Glaval Bus 914 County Road 1 North Elkhart, IN 46514

Dear Mr. Cline:

This is in response to your letter dated April 16, 2009, in which you requested assistance from the Federal Transit Administration (FTA) concerning the applicability of the Bus Testing Regulation (49 CFR Part 665) to a version of the Glaval Sport (Primetime) bus model built on the Ford E-Series chassis. Your letter states that:

- Glaval has had its 96-inch wide Universal model built on a Ford E-Series chassis tested at the Altoona Bus Testing Center (Altoona) in the 5-year/150,000-mile service life category (Report No. PTI-BT-R9910). The Universal model also completed partial testing (Structural Durability and Reliability) in the 7-year/200,000-mile service life category (Report No. PTI-BT-R0122-P).
- Glaval has had its 84-inch wide Sport model built on a GM chassis tested at Altoona in the 5year/150,000-mile service life category (Report No. PTI-BT-R0805).
- Glaval now proposes to offer a version of the 84-inch wide Sport model on the Ford E-Series chassis, which will be "built with the same concepts" as the version tested on the GM chassis. This version was to have been called Primetime, however you subsequently advised FTA that Glaval has since decided to call this model Sport also.

You have asked FTA to "grandfather" the Sport/Primetime model built on the Ford E-Series chassis from additional Altoona testing based on its similarity to previously-tested models.

FTA has reviewed your request and accompanying documentation and has determined that **no additional testing** will be required for the Sport/Primetime bus model built on the Ford E-Series chassis, provided that it is offered in no higher than the 5-year/150,000-mile service life category. This determination is based on the following conclusions drawn from information submitted by Glaval or contained in our files:

- The Glaval Sport bus model built on a GM chassis has been tested at Altoona (Report No. PTI-BT-R0805). Consequently, the Sport is eligible for Partial Testing procedures; only those tests in which significantly different data may be expected would need to be repeated.
- The Ford E-Series chassis has been evaluated at Altoona with the Glaval Universal bus model, as well as numerous other bus models built by various manufacturers.
- Under FTA's "family of vehicles" concept, outlined in FTA's November 3, 1993 Federal Register notice, FTA generally permits a manufacturer of a bus body that has been tested on one unmodified third-party chassis to offer the same or closely related body built on another similar unmodified third-party chassis that has been tested at Altoona (on one of its own buses or on a competitor's similar bus), without requiring additional testing. This generally includes changes in bus length, such as from one standard wheelbase offering to another.
- The family of vehicles concept does not apply to buses in the 7-year or higher service life categories.

Before final acceptance (i.e., the release of FTA funds by a grantee) of a bus, the grantee must certify that it possesses the applicable Bus Testing Report(s) for that bus model. In the case of the Glaval Sport built on the E-Series chassis, Glaval would need to provide report number PTI-BT-R0805 on the Sport with GM chassis, as well as report number PTI-BT-R9910 of a bus built on the Ford chassis (a report including the chassis data from another manufacturer's similar size and weight bus built on the Ford chassis would also be acceptable).

This determination is based on the changes detailed in your letter or mentioned above. Should you make any other changes to the vehicle, additional testing may be required. If you require any further assistance with this or other matters concerning bus testing, I encourage you to consult the resources provided at <u>www.fta.dot.gov/bustesting</u>. If you still have questions after checking this website, please feel free to contact me at the address above, or by e-mail (<u>marcel.belanger@dot.gov</u>), fax (202-366-3765), or telephone (202-366-0725).

Sincerely, Boy

Marcel Belanger Bus Testing Program Manager Office of Mobility Innovation, TRI-12

O:\TRI\BUSTEST\GLAVAL\Glaval 041609 - Sport or Primetime on Ford E-Series.doc

## **STURAA TEST**

## 5 YEAR

## 150,000 MILE BUS

## from

## **GLAVAL CORPORATION**

## MODEL UNIVERSAL

## **AUGUST 1999**

## PTI-BT-R9910-13-99



## The Pennsylvania Transportation Institute

201 Research Office Building The Pennsylvania State University University Park, PA 16802 (814) 865-1891

## **Bus Testing and Research Center**

6th Avenue and 45th Street (8 Altoona, PA 16602

(814) 949-7944

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## **EXECUTIVE SUMMARY**

Glaval Bus submitted a model Universal, diesel powered 26 seat/25-foot bus, for a 5 year/150,000 mile STURAA test. The odometer reading at the time of delivery was 493.0 miles. Testing started on May 11, 1999, and was completed on July 19. 1999. The Check-In section of the report provides a description of the bus and specifies its major components.

The primary part of the test program is the Structural Durability Test, which also provides the information for the Maintainability and Reliability results. The Structural Durability Test started on May 20, 1999 and was completed on July 9, 1999.

The interior of the bus is configured with seating for 26 passengers including the driver. Additionally, free floor space will accommodate 10 standing passengers resulting in a potential load of 36 persons. At 150 lbs per person, this load results in a total vehicle weight of 15,340 lbs and exceeds the GAWR of the rear axle (9,450 lbs). In order to avoid exceeding the axle weight ratings, ballast simulating all 10 standing passengers (1,500 lbs) and 1 rear seated passenger (150 lbs) was removed. Elimination of this ballast resulted in an adjusted gross vehicle weight of 13,730 lbs. The adjusted weight was used for both the GVW and middle SLW segments of the Structural Durability Test. The final segment of the test was performed at a CW of 10,110 lbs. Durability driving resulted in several failures that required unscheduled maintenance. A description of failures, and a complete and detailed listing of scheduled and unscheduled maintenance, is provided in the Maintainability section of this report.

The 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.

The Reliability Section compiles failures that occurred during structural durability testing. Breakdowns are classified according to subsystems. The data in this section are arranged so that those subsystems with more frequent problems are apparent. Also the problems are listed by class as defined in Section 2. The test bus encountered no Class 1 or Class 2 failures. Of the eight reported failures, seven were Class 3 and one was Class 4.

The Safety Test, a double-lane change maneuver was safely performed in both righthand and left-hand directions up to a maximum test speed of 45 mph. The performance of the bus is illustrated by a speed vs. time plot. Acceleration and gradeability test data are provided in Section 4, Performance. The average time to obtain 50 mph was 18.55 seconds. The Shakedown Test produced a maximum final loaded deflection of 0.069 inches under a distributed static load of 13,500 lbs. The test resulted in essentially no permanent deflection of the structure. The Distortion Test was completed with all subsystems, doors and escape mechanism operating properly. No water leakage was observed during the test. Due to the lack of tow eyes or tow hooks the Static Towing Test was not performed. The Dynamic Towing Test was performed by means of a front lift tow. The towing interface was accomplished by chaining to the front axle. The bus was towed without incident and no damage resulted from the test. The manufacturer does not recommend towing the bus from the rear, therefore a rear test was not performed. The Jacking and Hoisting Tests were performed without incident. The bus was found to be stable on the jack stands and the minimum jacking clearance, measured with a tire deflated, was 8.5 inches.

A Fuel Economy Test was run on simulated central business district, arterial, and commuter courses. The results were 6.64 mpg, 7.03 mpg, and 11.76 mpg respectively; with an overall average of 7.72 mpg.

A series of Interior and Exterior Noise Tests was performed. This data is listed in Section 7.1 and 7.2 respectively.

## ABBREVIATIONS

ABTC	-	Altoona Bus Test Center
A/C	-	air conditioner
ADB	-	advance design bus
ATA-MC	-	The Maintenance Council of the American Trucking Association
CBD	-	central business district
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
DIR	-	test director
DR	-	bus driver
EPA	-	Environmental Protection Agency
FFS	-	free floor space (floor area available to standees, excluding ingress/egress areas, area under seats, area occupied by feet of seated passengers, and the vestibule area)
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
MECH	-	bus mechanic
mpg	-	miles per gallon
mph	-	miles per hour
PM	-	Preventive maintenance
PTI	-	Pennsylvania Transportation Institute
rpm	-	revolutions per minute
SAE	-	Society of Automotive Engineers
SCH	-	test scheduler
SEC	-	secretary
SLW	-	seated load weight (curb weight plus 150 lb for every designed passenger seating position and for the driver)
STURAA	-	Surface Transportation and Uniform Relocation Assistance Act
TD	-	test driver
TECH	-	test technician
ТМ	-	track manager
ТР	-	test personnel

## **TEST BUS CHECK-IN**

### I. OBJECTIVE

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

### II. TEST DESCRIPTION

The test consists of assigning a NBM 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 must certify 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 has a front door located to the rear of the front axle. (Note; this test bus was not equipped with a handicap device). The engine type is a diesel fueled Ford Power Stroke 7.3L. The transmission is a Ford E 40 D.

The measured curb weight is 4,140 lb for the front axle and 5,970 lb for the rear axle. These combined weights provide a total measured curb weight of 10,110 lb. The interior of the bus is configured with seating for 26 passengers including the driver. Additionally, free floor space will accommodate 10 standing passengers resulting in a potential load of 36 persons. At 150 lbs per person, this load results in a total vehicle weight of 15,340 lbs and exceeds the GAWR of the rear axle (9,450 lbs). This value was used for all static tests. In order to avoid exceeding the axle weight ratings, ballast simulating all 10 standing passengers (1,500 lbs) and 1 rear seated passenger (150 lb) was removed. Elimination of this ballast resulted in an adjusted gross vehicle weight of 13,730 lbs. The adjusted weight was used for both the GVW and SLW segments of the Structural Durability Test.

### **VEHICLE DATA FORM**

Bus Number: 9910	Arrival Date: 5-11-99
Bus Manufacturer: Glaval Bus Ind.	Vehicle Identification Number (VIN): 1FDWE40F0XHA40528
Model Number: Universal	Date: 5-11-99
Personnel: S.C.	

WEIGHT: \*Values in the parentheses indicate the adjusted weights necessary to avoid exceeding the GAWR. These values were used for all dynamic testing. Individual Wheel Reactions:

Weights (lb)	Front Axle		Middle Axle		Rear Axle	
	Right	Left	Right	Left	Right	Left
CW	2,000	2,140	N/A	N/A	3,120	2,850
SLW	2,080	2,290	N/A	N/A	4,860	4,500
GVW	(2,080) 2,050	(2,290) 2,310	N/A	N/A	(4,860) 5,690	(4,500) 5,290

Total Weight Details:

Weight (lb)	CW	SLW	GVW	GAWR
Front Axle	4,140	4,370	(4,370) 4,360	4,600
Middle Axle	N/A	N/A	N/A	N/A
Rear Axle	5,970	9,360	(9,360) 10,980	9,450
Total	10,110	13,730	(13,730) 15,340	GVWR: 14,000

Dimensions:

Length (ft/in)	25.0 / 4.3
Width (in)	96.0
Height (in)	111.0
Front Overhang (in)	30.3
Rear Overhang (in)	88.0
Wheel Base (in)	186.0
Wheel Track (in)	Front: 67.0
	Rear: 77.8

Bus Number: 9910	Date: 5-11-99

## CLEARANCES:

Lowest Point Outside Front Axle	Location: Steering stabilizer Clearance(in): 11.1	
Lowest Point Outside Rear Axle	Location: Fuel tank support Clearance(in): 13.5	
Lowest Point between Axles	Location: Entry door	Clearance(in): 8.7
Ground Clearance at the center (in)	13.7	
Front Approach Angle (deg)	24.6	
Rear Approach Angle (deg)	8.8	
Ramp Clearance Angle (deg)	13.5	
Aisle Width (in)	14.0	
Inside Standing Height at Center Aisle (ft)	76.8	

## BODY DETAILS:

Body Structural Type	Integral			
Frame Material	Steel			
Body Material	Steel and fiberglass			
Floor Material	Plywood			
Roof Material	Steel and fiberglass			
Windows Type	Fixed	⊠ Movable		
Window Mfg./Model No.	Safety Inc. / M282			
Number of Doors	<u>1</u> Front	<u>0</u> Rear		
Mfr. / Model No.	Glaval / 32-manual			
Dimension of Each Door (in)	Front-30.5 x 83.5	Rear- N/A		
Passenger Seat Type	Cantilever	⊠ Pedestal	□ Other	
Mfr. / Model No.	Freedman Seating Co. / NA			
Driver Seat Type	□ Air	□ Spring	⊠ Other (Cushion)	
Mfr. / Model No.	Freedman / BFDf1			

Bus Number: 9910	Date: 5-11-99
Bus Number. 9910	Dale. 5-11-99

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BODY DETAILS (Contd..)

Free Floor Space ( ft <sup>2</sup> )	15.0				
Height of Each Step at Normal Position (in)	Front 1. <u>11.1</u>	2. <u>7.8</u>	3. <u>7.9</u>	4. <u>N/A</u>	
	Middle 1. <u>N/A</u>	2. <u>N/A</u>	3. <u>N/A</u>	4. <u>N/A</u>	
	Rear 1. <u>N/A</u>	2. <u>N/A</u>	3. <u>N/A</u>	4. <u>N/A</u>	
Step Elevation Change - Kneeling (in)	N/A				

### ENGINE

Туре	⊠ C.I.	□ Alternate Fuel	
	□ S.I.	□ Other (explain)	
Mfr. / Model No.	Ford Power Stroke /	7.3L	
Location	⊠ Front	□ Rear	□ Other (explain)
Fuel Type	Gasoline		□ Methanol
	⊠ Diesel		□ Other (explain)
Fuel Tank Capacity (indicate units)	35.0 gals.		
Fuel Induction Type	⊠ Injected	□ Carburetion	
Fuel Injector Mfr. / Model No.	Ford Power Stroke / 7.3L		
Carburetor Mfr. / Model No.	N/A		
Fuel Pump Mfr. / Model No.	Ford Power Stroke / 7.3L		
Alternator (Generator) Mfr. / Model No.	Penntex Ind. / PX-520		
Maximum Rated Output (Volts / Amps)	14 / 200		
Air Compressor Mfr. / Model No.	N/A		
Maximum Capacity (ft <sup>3</sup> / min)	N/A		
Starter Type	⊠ Electrical	Pneumatic	□ Other (explain)

Starter Mfr. / Model No.	Ford / Ford-Motorcraft	
Bus Number: 9910		Date: 5-11-99

### TRANSMISSION

Transmission Type	□ Manual	Automatic	
Mfr. / Model No.	Ford / E40D		
Control Type	⊠ Mechanical	Electrical	□ Other (explain)
Torque Convertor Mfr. / Model No.	Ford / E40D		
Integral Retarder Mfr. / Model No.	N/A		

### SUSPENSION

Number of Axles	2		
Front Axle Type	⊠ Independent	Beam Axle	
Mfr. / Model No.	Ford / Twin I-Beam		
Axle Ratio (if driven)	N/A		
Suspension Type	🗆 Air	⊠ Spring	□ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / CK1432	:F	
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.	Ford / 9450		
Axle Ratio (if driven)	4.10		
Suspension Type	🗆 Air	⊠ Spring	□ Other (explain)
No. of Shock Absorbers	2		

Mfr. / Model No.

Motorcraft / CK08R2G

Bus Number: 9910	Date: 5-11-99

WHEELS & TIRES

Front	Wheel Mfr./ Model No.	Accuride / NA
	Tire Mfr./ Model No.	Firestone LT225/75R16
Rear	Wheel Mfr./ Model No.	Accuride / NA
	Tire Mfr./ Model No.	Firestone LT225/75R16

### BRAKES

Front Axle Brakes Type	□ Cam	🗵 Disc	□ Other (explain)	
Mfr. / Model No.	Kelsey Hayes / KH12795101			
Middle Axle Brakes Type	□ Cam	□ Disc	□ Other (explain)	
Mfr. / Model No.	N/A			
Rear Axle Brakes Type	□ Cam	区 Disc	□ Other (explain)	
Mfr. / Model No.	Kelsey Hayes / KH12068401			
Retarder Type	N/A			
Mfr. / Model No.	N/A			

### HVAC

Heating System Type	□ Air	⊠ Water	□ Other
Capacity (Btu/hr)	65,000		
Mfr. / Model No.	Pro Air / 65K		
Air Conditioner	⊠ Yes	□ No	
Location	Front-dash Rear-	roof mount	
Capacity (Btu/hr)	67,000		
A/C Compressor Mfr. / Model No.	Carrier / CM-3		

## STEERING

Steering Gear Box Type	Hydraulic gear
Mfr. / Model No.	Ford / Power
Steering Wheel Diameter	15.4

Number of turns (lock to lock)	4	
Bus Number: 9910	Date: 5-11-99	

#### OTHERS

Wheel Chair Ramps	Location: N/A	Туре: N/А
Wheel Chair Lifts	Location: N/A	Type: N/A
Mfr. / Model No.	N/A	
Emergency Exit	Location: Windows Doors	Number: 3 1

### CAPACITIES

Fuel Tank Capacity (gallons)	35.0
Engine Crankcase Capacity (gallons)	3.5
Transmission Capacity (gallons)	4.0
Differential Capacity (gallons)	0.5
Cooling System Capacity (gallons)	7.5
Power Steering Fluid Capacity (Quarts)	1.5

### VEHICLE DATA FORM

Bus Number: 9910	Date: 5-11-99
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F

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

Part Number	Description Qty.	
N/A	N/A	N/A

### COMPONENT/SUBSYSTEM INSPECTION FORM

Bus Number: 9910			Date: 5-11-99	
Subsystem	Checked	T	Comments	
Air Conditioning Heating and Ventilation	✓			
Body and Sheet Metal	✓	Left side	Left side rear view mirror damaged when received.	
Frame	✓			
Steering	✓			
Suspension	~			
Interior/Seating	~			
Axles	~			
Brakes	~			
Tires/Wheels	~			
Exhaust	✓	1		
Fuel System	✓			
Power Plant	✓			
Accessories	✓			
Lift System	N/A			
Interior Fasteners	✓			
Batteries	~			

# **CHECK - IN**



GLAVAL'S MODEL UNIVERSAL


# 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 is checked, and where accessibility is restricted the subsystem is noted along with the reason for the restriction.

### 1.1-III. DISCUSSION

The components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems) along with all other components were found to be readily accessible and no restrictions were noted.

## ACCESSIBILITY DATA FORM

Bus Number: 9910

Date: 5-12-99

Component	Checked	Comments
ENGINE :		
Oil Dipstick	✓	
Oil Filler Hole	✓	
Oil Drain Plug	✓	
Oil Filter	✓	
Fuel Filter	✓	
Air Filter	~	Limited access to the top of engine
Belts	~	
Coolant Level	✓	
Coolant Filler Hole	✓	
Coolant Drain	✓	
Spark / Glow Plugs	✓	
Alternator	✓	
Diagnostic Interface Connector	✓	
TRANSMISSION :		
Fluid Dip-Stick	✓	
Filler Hole	✓	
Drain Plug	N/A	
SUSPENSION :		
Bushings	✓	
Shock Absorbers	✓	
Air Springs	✓	
Leveling Valves	N/A	
Grease Fittings	✓	

## ACCESSIBILITY DATA FORM

Bus Number: 9910

Date: 5-12-99

Component	Checked	Comments
HVAC :		
A/C Compressor	✓	
Filters	~	
Fans	~	
ELECTRICAL SYSTEM :		
Fuses	$\checkmark$	
Batteries	~	Aux. Battery has limited removal access.
Voltage regulator	N/A	
Voltage Convertors	✓	
Lighting	✓	
MISCELLANEOUS :		
Brakes	✓	
Handicap Lifts/Ramps	N/A	
Instruments	✓	
Axles	✓	
Exhaust	✓	
Fuel System	✓	
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 will be conducted by operating the NBM and collecting the following data on work order forms and a driver log.

- 1. Unscheduled Maintenance
  - a. Bus number
  - b. Date
  - c. Mileage
  - d. Description of malfunction
  - e. Location of malfunction (e.g., in service or undergoing inspection)
  - f. Repair action and parts used
  - g. Man-hours required
- 2. Scheduled Maintenance
  - a. Bus number
  - b. Date
  - c. Mileage
  - d. Engine running time (if available)
  - e. Results of scheduled inspections
  - f. Description of malfunction (if any)
  - g. Repair action and parts used (if any)
  - h. Man-hours required

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

### A. Service

- 1. Fueling
- 2. Consumable checks
- 3. Interior cleaning
- B. Preventive Maintenance
  - 4. Brake adjustments
  - 5. Lubrication
  - 6. 3,000 mi (or equivalent) inspection
  - 7. Oil and filter change inspection

- 8. Major inspection
- 9. 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

### 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. Table 1 is a list of the lubricating products used in servicing. Finally, the Unscheduled Maintenance List along with Unscheduled Maintenance 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 occurred, a description of the malfunction and repair, and the time required to perform the repair.

#### (Page 1 of 1) SCHEDULED MAINTENANCE Glavel 9910

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
05-25-99	729	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
06-02-99	1,598	P.M. / Inspection Fuel Economy Prep.	Linkage, tie rods, universals/u-joints all lubed. Oil changed. Oil, fuel, and air filters changed. Transmission oil and filter changed.	8.00	8.00
06-15-99	3,052	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
07-02-99	3,798	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
07-14-99	6,772	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00

### Table 1. STANDARD LUBRICANTS

The following is a list of Texaco lubricant products used in bus testing conducted by the Penn State University Altoona Bus Testing Center:

<u>ITEM</u>	PRODUCT CODE	TEXACO DESCRIPTION
Engine oil	#2112	URSA Super Plus SAE 30
Transmission	oil #1866	Automatic Trans Fluid Mercon/Dexron II Multipurpose
Gear oil	#2316	Multigear Lubricant EP SAE 80W90
Wheel bearin Chassis grea	g & #1935 se	Starplex II

# 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 will involve components that may be expected to fail or require replacement during the service life of the bus. In addition, any component that fails during the NBM testing is 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

During the test, several additional components were removed for repair or replacement. Following is a list of components and total repair/replacement time.

### MAN HOURS

Right side rear view mirror.

0.5

At the end of the test, the remaining items on the list were removed and replaced. The transmission assembly took 9.0 man-hours (two men 4.5 hrs) to remove and replace. The time required for repair/replacement of the four remaining components is given on the following Repair and/or Replacement Form.

### **REPLACEMENT AND/OR REPAIR FORM**

Subsystem	Replacement Time
Transmission	9.0 man hours
Wiper Motor	0.7 man hours
Starter	0.7 man hours
Alternator	0.7 man hours
Batteries	0.5 man 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, man-hours to repair, and hours out of service are recorded on the Reliability Data Form.

### **CLASS OF FAILURES**

Classes of failures are described below:

- (a) <u>Class 1: Physical Safety</u>. A failure that could lead directly to passenger or driver injury and represents a severe crash situation.
- (b) <u>Class 2: Road Call</u>. A failure resulting in an enroute interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.
- © <u>Class 3: Bus Change</u>. 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) <u>Class 4: Bad Order</u>. 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 is accumulated during the Structural Durability Test. The following Reliability Data Form lists all unscheduled repairs under classes as defined above. These classifications are somewhat subjective as the test is performed on a test track with careful inspections every two hours. However, even on the road, there is considerable latitude on deciding how to handle many failures. The Unscheduled Repair List is also attached to provide a reference for the repairs that are included in the Reliability Data Forms.

The classification of repairs according to subsystem is intended to emphasize those systems which had persistent minor or more serious problems. There were no Class 1 or 2 failures. Of the seven Class 3 failures, four occurred in the exhaust system, and one each with the body, engine and frame. These, and the one remaining Class 4 failure are available for review in the Unscheduled Maintenance List, located in Section 5.7 Structural Durability.

### RELIABILITY DATA FORMS

Bus Number: 9910

Date: 7-9-99

Personnel: Bob Reifsteck

reisonner. Bob Kensteck						
		Failur	е Туре		-	
	Class 4 Bad Order	Class 3 Bus Change	Class 2 Road Call	Class 1 Physical Safety		
Subsystems	Mileage	Mileage	Mileage	Mileage	Man Hours	Down Time
Exhaust System		571			1.00	1.00
		2,118			1.00	1.00
		2,531			1.50	1.50
		3,180			6.00	6.00
Body	571				0.50	0.50
		4,586			3.00	3.00
		+				
Engine/Transmission		0			1.00	1.00
Frame		2,720			3.00	3.00
				· · · · · ·		-
					-	
					L	

# 3. SAFETY - A DOUBLE-LANE CHANGE (OBSTACLE AVOIDANCE)

#### 3-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-II. TEST DESCRIPTION

The Safety Test is a vehicle handling and stability test. The bus will be operated at SLW on a smooth and level test track. The bus will be driven through a double lane change course at increasing speed until the test is considered unsafe or a speed of 45 mph is reached. The lane change course will be set up using pylons to mark off two 12 foot center to center lanes with two 100 foot lane change areas 100 feet apart. The bus will begin in one lane, change to the other lane in a 100 foot span, travel 100 feet, and return to the original lane in another 100 foot span. This procedure will be repeated, starting first in the right-hand and then in the left-hand lane.

#### 3-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.

# SAFETY DATA FORM

Bus Number: 9910	Date: 6-23-99
Personnel: B.L., C.S. and R.H.	
Temperature (°F): 75	Humidity (%): 50

Wind Speed (mph): 7

Wind Direction: SW

Barometric Pressure (in.Hg): 30.20

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:			
A safe profile was maintained through all portions of testing.			
Comments of the tire/ground contact patch:			
Tire/ground contact was maintained through all portions of testing.			

# 3. SAFETY



# **RIGHT - HAND APPROACH**



# **LEFT - HAND APPROACH**

## 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 will be operated at SLW on the skid pad at the Test Track Facility. The bus will be accelerated at full throttle from a standstill to a maximum "geared" or "safe" speed as determined by the test driver. The vehicle speed is measured using a Correvit non-contacting speed sensor. The times to reach speed between ten mile per hour increments are measured and recorded using a stopwatch with a lap timer. The time to speed data will be recorded on the Performance Data Form and later used to generate a speed vs time plot and gradeability calculations.

#### 4-III. DISCUSSION

This test consists of three runs in both the clockwise and counterclockwise directions on the Test Track. Velocity versus time data is obtained for each run and results are averaged together to minimize any test variability which might be introduced by wind or other external factors. The test was performed up to a maximum speed of 50 mph. The fitted curve of velocity vs time is attached, followed by the calculated gradeability results. The average time to obtain 50 mph was 18.55 seconds.

## PERFORMANCE DATA FORM

Bus Number: 9910	Date: 6-23-99
Personnel: B.L., C.S. and R.H.	
Temperature (°F): 75	Humidity (%): 50
Wind Direction: SW	Wind Speed (mph): 7
Barometric Pressure (in.Hg): 30.20	
Air Conditioning compressor-OFF	_✓_ Checked
Ventilation fans-ON HIGH	_✓_ Checked
Heater pump motor-Off	_✓_ Checked
Defroster-OFF	_✓_ Checked
Exterior and interior lights-ON	_✓_ Checked
Windows and doors-CLOSED	_✓_ Checked

ACCELERATION, GRADEABILITY, TOP SPEED			
	Counter Clockwise	Recorded Interval Times	
Speed	Run 1	Run 2	Run 3
10 mph	2.92	2.64	2.69
20 mph	5.48	5.42	5.04
30 mph	8.32	8.36	8.19
40 mph	12.85	12.42	12.44
Top Test Speed(mph) 50	19.30	19.26	19.03
	Clockwise Rec	orded Interval Times	
Speed	Run 1	Run 2	Run 3
10 mph	2.86	2.85	2.70
20 mph	5.33	5.07	4.79
30 mph	8.17	8.14	7.82
40 mph	11.92	11.89	11.76
Top Test Speed(mph) 50	18.05	18.04	17.64

#### PERFORMANCE SUMMARY SHEET

BUS MANUFACTURER BUS MODEL	:GLAVEL :UNIVERSAL	BUS NUMBER TEST DATE	:9910 :6/23/99
TEST CONDITIONS :		2	
TEMPERATURE (DEG WIND DIRECTION WIND SPEED (MPH) HUMIDITY (%) BAROMETRIC PRESSU	F ) VRE (IN. HG)	: 75.0 : SW : 7.0 : 50 : 30.2	
VEHICLE SPEED		AVERAGE TIME (SEC)	
(MPH)	CCW DIRECTION	V CW DIRECTION	TOTAL
10.0 20.0 30.0 40.0 50.0 TEST SUMMARY :	2.75 5.31 8.29 12.57 19.20	2.80 5.06 8.04 11.86 17.91	2.78 5.19 8.17 12.21 18.55
VEHICLE SPEED (MPH)	TIME (SEC)	ACCELERATION (FT/SEC^2)	MAX. GRADE (%)
1.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0	.21 1.10 2.30 3.61 5.04 6.63 8.41 10.40 12.66 15.24 18.25	6.8 6.4 5.9 5.4 4.9 4.4 3.9 3.5 3.0 2.6 2.3	21.6 20.3 18.5 16.9 15.3 13.7 12.2 10.8 9.5 8.2 7.0

NOTE : Gradeability results were calculated from performance ---- test data. Actual sustained gradeability performance for vehicles equipped with auto transmission may be lower than the values indicated here.





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## 5. STRUCTURAL INTEGRITY

#### 5.1 STRUCTURAL STRENGTH AND DISTORTION TESTS -STRUCTURAL SHAKEDOWN TEST

#### 5.1-I. DISCUSSION

The objective of this test is to determine certain static characteristics (e.g., bus floor deflection, permanent structural deformation, etc.) under static loading conditions.

#### 5.1-II. TEST DESCRIPTION

In this test, the bus will be isolated from the suspension by blocking the vehicle under the suspension points. The bus will then be loaded and unloaded up to a maximum of three times with a distributed load equal to 2.5 times gross load. Gross load is 150 lb for every designed passenger seating position, for the driver, and for each 1.5 sq ft of free floor space. For a distributed load equal to 2.5 times gross load, place a 375-lb load on each seat and on every 1.5 sq ft of free floor space. The first loading and unloading sequence will "settle" the structure. Bus deflection will be measured at several locations during the loading sequences.

#### 5.1-III. DISCUSSION

This test was performed based on a maximum passenger capacity of 36 people including the driver. The resulting test load is  $(36 \times 375 \text{ lb}) = 13,500 \text{ lb}$ . The load is distributed evenly over the passenger space. Deflection data before and after each loading and unloading sequence is provided on the Structural Shakedown Data Form.

The unloaded height after each test becomes the original height for the next test. Some initial settling is expected due to undercoat compression, etc. After each loading cycle, the deflection of each reference point is determined. The bus is then unloaded and the residual (permanent) deflection is recorded. On the final test, the maximum loaded deflection was 0.069 inches at reference point 4. The maximum permanent deflection after the final loading sequence ranged from -0.001 inches at reference points 2, 3, and 9 to 0.002 inches at reference point 12.

### STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 9910				Date: 5-18-99	
Personnel: B.L., D.L., C	.S. and	М.Н.		Temperature (°F): 66	
Loading Sequence: Test Load (lbs): 13,500	≬1 □	2	3 (check one)		

Indicate Approximate Location of Each Reference Point



Left

#### Top View

Reference Point No.	A (in) Original Height	B (in) Loaded Height	B-A (in) Loaded Deflection	C (in) Unloaded Height	C-A (in) Permanent Deflection
1	0	.065	.057	.009	.001
2	0	.046	.044	.001	001
3	0	.059	.057	.001	001
4	0	.068	.069	001	.000
5	0	.046	.043	.003	.000
6	0	.094	.050	.045	.001
7	0	.083	.048	.036	.001
8	0	.048	.046	.002	.000
9	0	.062	.059	.002	001
10	0	.057	.056	.001	.000
11	0	.047	.047	.000	.000
12	0	.051	.038	.015	.002

# STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 9910					Date: 5-18-99	
Personnel: B.L., D.L., C.S. and M. H.				Temperature (°F): 66		
Loading Sequence: Test Load (lbs): 13,5	□ 1 00	⊠2	□3	(check one)		

Indicate Approximate Location of Each Reference Point



Left

E

Top View

Reference Point No.	A (in) Original Height	B (in) Loaded Height	B-A (in) Loaded Deflection	C (in) Unloaded Height	C-A (in) Permanent Deflection
1	.008	.065	.057	.009	.011
2	.002	.046	.044	.001	001
3	.002	.059	.057	.001	001
4	001	.068	.069	001	.000
5	.003	.046	.043	.003	.000
6	.044	.094	.050	.045	.001
7	.035	.083	.048	.036	.001
8	.002	.048	.046	.002	.000
9	.003	.062	.059	.002	001
10	.001	.057	.056	.001	.000
11	.000	.047	.047	.000	.000
12	.013	.051	.038	.015	.002

# 5.1 STRUCTURAL SHAKEDOWN TEST



**DIAL INDICATORS IN POSITION** 



**TEST BUS LOADED TO 2.5 TIMES GVL** 

# 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 GVWR, each wheel of the bus will be raised (one at a time) to simulate operation over a curb and the following will be 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 will then be 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, and steering 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.

#### DISTORTION TEST INSPECTION FORM

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
I Handicapped Device/ Special Seating	NA
🗵 Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
☑ Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
☑ Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
I Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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	区 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.
☑ Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L. D.L. and M.H.	Temperature(°F): 70

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.
I Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

Wheel Position : (check one)		
All wheels level	□ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	区 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.
I Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
⊠ Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
I Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
I Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
☑ Handicapped Device/ Special Seating	NA
⊠ Undercarriage	No deficiencies.
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
Steering Mechanism	No deficiencies.

Bus Number: 9910	Date: 5-18-99
Personnel: B.L., E.L., D.L. and M.H.	Temperature(°F): 70

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.
☑ Handicapped Device/ Special Seating	NA
⊠ 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 REAR WHEEL 6" LOWER** 



# **LEFT FRONT WHEEL 6" HIGHER**

# 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 is used to apply a static tension load equal to 1.2 times the bus curb weight. The load will be 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 will be recorded.

#### 5.3-III. DISCUSSION

The load-distributing yoke was incorporated as the towing interface between the bus submitted for testing is not equipped with any type of tow eyes or tow hooks; therefore the Static Towing Test was not performed.
## 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 requires the bus be towed at curb weight using the specified equipment and instructions provided by the manufacturer and a heavy-duty wrecker. The bus will be towed for 5 miles at a speed of 20 mph for each recommended towing configuration. After releasing the bus from the wrecker, the bus will be visually inspected for any structural damage or permanent deformation. All doors, windows and passenger escape mechanisms will be inspected for proper operation.

### 5.4-III. DISCUSSION

The bus was towed using a heavy-duty wrecker. The towing interface was accomplished by Chaining to the front axle. A front lift tow was performed with no problems encountered with the towing interface. Rear towing is not recommended by the manufacturer. No damage or deformation was observed during the test.

## DYNAMIC TOWING TEST DATA FORM

Bus Number: 9910	Date: 7-9-99

Personnel: B.L. and R.H.

Temperature (°F): 80	Humidity (%): 42
Wind Direction: NNW	Wind Speed (mph): 6
Barometric Pressure (in. Hg): 30.09	

Inspect tow equipment-bus interface.

**Comments:** A safe and adequate connection was made between the tow equipment and the bus.

Inspect tow equipment-wrecker interface.

Comments: A safe and adequate connection was made between the tow

equipment and the wrecker.

Towing Comments: A front lift tow was performed by chaining to the front axle.

Description and location of any structural damage: None noted.

General Comments: Manufacturer does not recommend towing from the rear.

# **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 are replaced with deflated tire(s) of the appropriate type. A portable hydraulic floor jack is 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) are replaced with the original tire(s) and the jack is lowered. Any structural damage or permanent deformation is recorded on the test data sheet. This procedure is repeated for each corner of the bus.

### 5.5-III. DISCUSSION

The jack used for this test has a minimum height of 8.5 inches. During the deflated portion of the test, the jacking point clearances ranged from 8.5 inches to 16.2 inches. No deformation or damage was observed during testing. A complete listing of jacking point clearances is provided in the Jacking Test Data Form.

Condition	Frame Point Clearance
Front axle - one tire flat	15.5"
Rear axle - one tire flat	16.2"
Rear axle - two tires flat	14.8"

### JACKING CLEARANCE SUMMARY

### **JACKING TEST DATA FORM**

Bus Number: 9910	Date: 5-11-99
Personnel: S.C. and G.F.	Temperature: 70

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

Deflated Tire	Jacking Pad Clearance Body/Frame (in)	Jacking Pad Clearance Axle/Suspension (in)	Comments
Right front	18.1" I 15.5" D	11.4" I 8.5" D	
Left front	18.1" l 15.5" D	11.3" I 8.5" D	
Right rearoutside	16.8" I 16.2" D	11.6" I 11.1" D	
Right rearboth	16.8" l 14.8" D	11.6" I 9.1" D	
Left rearoutside	16.9" l 16.2" D	11.6" I 11.0" D	
Left rearboth	16.9" l 14.8" D	11.6" I 9.2" D	
Right middle or tag outside	NA	NA	
Right middle or tag both	NA	NA	
Left middle or tag outside	NA	NA	
Left middle or tagboth	NA	NA	
Additional comments o	f any deformation or di	ifficulty during jackir	ng:
No damage, deformatio	n or problems were obse	erved.	

# 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 is 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 will be checked for stability on the jack stands and for any damage to the jacking pads or bulkheads. The procedure is repeated for the rear end of the bus. The procedure is then repeated for the front and rear simultaneously.

#### 5.6-III. DISCUSSION

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

The bus easily accommodated the placement of the vehicle lifts and jack stands and the procedure was performed without any instability noted.

## HOISTING TEST DATA FORM

Bus Number: 9910	Date: 5-11-99
Personnel: S.C. and G.S.	Temperature (°F): 72

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 front and rear wheels are supported by the jack stands:
None noted.

# 5.6 HOISTING TEST



**TEST BUS STABLE ON JACK STANDS** 



## 5.7 STRUCTURAL DURABILITY TEST

#### 5.7-I. TEST OBJECTIVE

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

#### 5.7-II. TEST DESCRIPTION

The test vehicle is driven a total of 5,050 miles; approximately 3,750 miles on the Durability Test Track and approximately 1,300 miscellaneous other miles. The test will be conducted with the bus operated under three different loading conditions. The first segment will consist of approximately 2,125 miles with the bus operated at GVW. The second segment will consist of approximately 2,125 miles, will be conducted with the bus loaded to SLW. The remainder of the test, approximately 2,125 miles, will be conducted with the bus loaded to CW. If GVW exceeds the axle design weights, then the load will be adjusted to the axle design weights and the change will be recorded. All subsystems are run during these tests in their normal operating modes. All recommended manufacturers servicing is to be followed and noted on the vehicle maintainability log. Servicing items accelerated by the durability tests will be compressed by 10:1; all others will be done on a 1:1 mi/mi basis. Unscheduled breakdowns and repairs are recorded on the same log as are any unusual occurrences as noted by the driver. Once a week the test vehicle shall be washed down and thoroughly inspected for any signs of failure.

#### 5.7-III. DISCUSSION

The Structural Durability Test was started on May 20, 1999 and was conducted until July 9, 1999. The first 2,125 miles were performed at a GVW of 13,730 lb. In order to avoid exceeding the GAWR of the rear axle (9,450 lbs), ballast for all 10 standing and 1 rear seated passenger was eliminated. The GVW segment was completed on June 4, 1999. The next 800 mile SLW segment was performed at the same 13,730 lbs and completed on June 8, 1999. The final 2,125 mile segment was performed at a CW of 10,110 lb and completed on July 9, 1999.

The 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 Test Track Facility and Durability Test Track are attached for reference. The amplitude and profile for each element of the durability test track is also included. Finally, a list of unscheduled maintenance is included describing the failures that were encountered along with related photographs during the Structural Durability Test.

#### GLAVAL - TEST BUS # 9910 SUMMARY - MILEAGE DRIVEN

and the second of the data failure as the	TOTAL	TOTAL	** a lister med a statical mentar and had to have diff for a black of the static st
DATE	OTHER MILES	DURABILITY TRACK	TOTAL
05/20/99 TO			
05/26/99	183.00	580.00	763.00
05/27/99 TO			
06/02/99	133.00	526.00	659.00
06/03/99 TO			
06/09/99	153.00	867.00	1,020.00
06/10/99 TO			
06/16/99	242.00	287.00	529.00
06/17/99 TO			12
06/23/99	98.00	61.00	159.00
06/24/99 TO			
06/30/99	245.00	859.00	1,104.00
07/01/99 TO			
07/07/99	198.00	570.00	768.00
07/08/99 TO			
07/14/99	277.00	0.00	277.00
TOTAL	1,529.00	3,750.00	5,279.00

Mo	onday through Frida	ау
	HOUR	ACTION
Shift 1	midnight	D
	1:40 am	C
	1:50 am	В
	2:00 am	D
	3:35 am	С
	3:45 am	В
	4:05 am	D
	5:40 am	С
	5:50 am	В
	6:00 am	D
	7:40 am	С
	7:50 am	F
Shift 2	8:00 am	D
	9:40 am	С
	9:50 am	В
	10:00 am	D
	11:35 am	С
	11:45 am	В
	12:05 pm	D
	1:40 pm	С
	1:50 pm	В
	2:00 pm	D
	3:40 pm	С
	3:50 pm	F
Shift 3	4:00 pm	D
	5:40 pm	С
	5:50 pm	В
	6:00 pm	D
	7:40 pm	С
	7:50 pm	В
	8:05 pm	D
	9:40 pm	С
	9:50 pm	В
	10:00 pm	D
	11:40 pm	С
	11:50 pm	F

## Table 4. Driving Schedule for Bus Operation on the Durability Test Track. STANDARD OPERATING SCHEDULE

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



BUS TESTING AND RESEARCH TEST TRACK UNIVERSITY PARK, PA

## "PLAN VIEW OF PENN STATE BUS TESTING AND RESEARCH FACILITY"



# Plan View Vehicle Durability Test Track

The Pennsylvania Transportation Institute Penn State



### (Page 1 of 1) UNSCHEDULED MAINTENANCE Glavel 9910

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
05-19-99	0	The "Service Engine Soon" light is on.	Checked for codes with scanner. Found code PO113 (IAT CKT voltage high). Sensor disconnected, re-connected, code cleared.	1.00	1.00
05-25-99	571	The exhaust pipe has separated.	Repaired with a band clamp.	1.00	1.00
05-25-99	571	The right side rear view mirror was broken upon arrival.	New mirror arrived and was installed.	0.50	0.50
06-08-99	2,118	The rear exhaust pipe hanger is broken.	Hanger welded/repaired and a new hanger added on the tail pipe.	1.00	1.00
06-11-99	2,531	The exhaust system is loose. Hangers are broken.	Installed universal hangers at the tailpipe, muffler and middle pipe. One hanger welded/repaired.	1.50	1.50
06-14-99	2,720	Three, 2" square tube frame cross members are cracked. Two are left side, forward of the rear axle and one is right side, rear of the rear axle.	All cracked cross members welded/repaired.	3.00	3.00
06-24-99	3,180	The entire exhaust system is loose, three hangers are broken.	Removed the exhaust system from the catalytic convertor back. Installed a 6" extension, replaced three broken hangers and added one free floating hanger near the rear of the system.	6.00	6.00
07-02-99	4,586	The roof seam is separating above the entrance door.	Removed hold down straps. Re-drilled holes and installed ten new screws.	3.00	3.00

# **UNSCHEDULED MAINTENANCE**



# CRACKED FRAME CROSS MEMBER (2,720 TEST MILES)

# **UNSCHEDULED MAINTENANCE CONT.**



# BROKEN EXHAUST HANGER (3,180 TEST MILES)



# UNSCHEDULED MAINTENANCE CONT.



# SEPARATED ROOF SEAM ABOVE ENTRANCE DOOR (4,586 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 loop under specified operating conditions. The results of this test will not represent actual mileage but will provide data that can be used by recipients to compare buses tested by this procedure.

#### 6-II. TEST DESCRIPTION

This test requires operation of the bus over a course based on the Transit Coach Operating Duty Cycle (ADB Cycle) at seated load weight using a procedure based on the Fuel Economy Measurement Test (Engineering Type) For Trucks and Buses: SAE 1376 July 82. The procedure has been modified by elimination of the control vehicle and by modifications as described below. The inherent uncertainty and expense of utilizing a control vehicle over the operating life of the facility is impractical.

The fuel economy test will be performed as soon as possible (weather permitting) after the completion of the GVW portion of the structural durability test. It will be conducted on the bus test lane at the Test Track Facility. Signs are erected at carefully measured points which delineate the test course. A test run will comprise 3 CBD phases, 2 Arterial phases, and 1 Commuter phase. An electronic fuel measuring system will indicate the amount of fuel consumed during each phase of the test. The test runs will be repeated until there are at least two runs in both the clockwise and counterclockwise directions in which the fuel consumed for each run is within ± 4 percent of the average total fuel used over the 4 runs. A 20-minute idle consumption test is performed just prior to and immediately after the driven portion of the fuel economy test. The amount of fuel consumed while operating at normal/low idle is recorded on the Fuel Economy Data Form. This set of four valid runs along with idle consumption data comprise a valid test.

The test procedure is the ADB cycle with the following four modifications:

- 1. The ADB cycle is structured as a set number of miles in a fixed time in the following order: CBD, Arterial, CBD, Arterial, CBD, Commuter. A separate idle fuel consumption measurement is performed at the beginning and end of the fuel economy test. This phase sequence permits the reporting of fuel consumption for each of these phases separately, making the data more useful to bus manufacturers and transit properties.
- 2. The operating profile for testing purposes shall consist of simulated transit type service at seated load weight. The three test phases (figure 6-1) are: a central business district (CBD) phase of 2 miles with 7 stops per mile and a top speed of 20 mph; an arterial phase of 2 miles with 2 stops per mile and a top speed of 40 mph; and a commuter phase of 4 miles with 1 stop and a maximum speed of 40 mph. At each designated stop the bus will remain stationary for seven seconds. During this time, the passenger doors shall be opened and closed.
- 3. The individual ADB phases remain unaltered with the exception that 1 mile has been changed to 1 lap on the test track. One lap is equal to 5,042 feet. This change is accommodated by adjusting the cruise distance and time.

4. The acceleration profile, for practical purposes and to achieve better repeatability, has been changed to "full throttle acceleration to cruise speed".

Several changes were made to the Fuel Economy Measurement Test (Engineering Type) For Trucks and Buses: SAE 1376 July 82:

1. Sections 1.1, and 1.2 only apply to diesel, gasoline, methanol, and any other fuel in the liquid state (excluding cryogenic fuels).

1.1 SAE 1376 July 82 requires the use of at least a 16-gal fuel tank. Such a fuel tank when full would weigh approximately 160 lb. It is judged that a 12-gal tank weighing approximately 120 lb will be sufficient for this test and much easier for the technician and test personnel to handle.

1.2 SAE 1376 July 82 mentions the use of a mechanical scale or a flowmeter system. This test procedure uses a load cell readout combination that provides an accuracy of 0.5 percent in weight and permits on-board weighing of the gravimetric tanks at the end of each phase. This modification permits the determination of a fuel economy value for each phase as well as the overall cycle.

2. Section 2.1 applies to compressed natural gas (CNG), liquified natural gas (LNG), cryogenic fuels, and other fuels in the vapor state.

2.1 A laminar type flowmeter will be used to determine the fuel consumption. The pressure and temperature across the flow element will be monitored by the flow computer. The flow computer will use this data to calculate the gas flow rate. The flow computer will also display the flow rate (scfm) as well as the total fuel used (scf). The total fuel used (scf) for each phase will be recorded on the Fuel Economy Data Form.

3. Use both sections 1 and 2 for dual fuel systems.

### FUEL ECONOMY CALCULATION PROCEDURE

### A. For diesel, gasoline, methanol and fuels in the liquid state.

The reported fuel economy is based on the following: measured test quantities-distance traveled (miles) and fuel consumed (pounds); standard reference values-density of water at 60°F (8.3373 lbs/gal) and volumetric heating value of standard fuel; and test fuel specific gravity (unitless) and volumetric heating value (BTU/gal). These combine to give a fuel economy in miles per gallon (mpg) which is corrected to a standard gallon of fuel referenced to water at 60°F. This eliminates fluctuations in fuel economy due to fluctuations in fuel quality. This calculation has been programmed into a computer and the data processing is performed automatically.

The fuel economy correction consists of three steps:

1.) Divide the number of miles of the phase by the number of pounds of fuel consumed

		total miles
phase	miles per phase	per run
CBD	1.9097	5.7291
ART	1.9097	3.8193
COM	3.8193	3.8193

**FEo**<sub>mi/lb</sub> = Observed fuel economy = <u>miles</u> Ib of fuel 2.) Convert the observed fuel economy to miles per gallon [mpg] by multiplying by the specific gravity of the test fuel Gs (referred to water) at 60°F and multiply by the density of water at 60°F

FEompg = FEcmi/lb x Gs x Gw
where Gs = Specific gravity of test fuel at 60°F (referred to water)
Gw = 8.3373 lb/gal

3.) Correct to a standard gallon of fuel by dividing by the volumetric heating value of the test fuel (H) and multiplying by the volumetric heating value of standard reference fuel (Q). Both heating values must have the same units.

where

H = Volumetric heating value of test fuel [BTU/gal]Q = Volumetric heating value of standard reference fuel

Combining steps 1-3 yields

$$=> FEc = \underline{miles} x (Gs x Gw) x \underline{Q}$$
Ibs H

4.) Covert the fuel economy from mpg to an energy equivalent of miles per BTU. Since the number would be extremely small in magnitude, the energy equivalent will be represented as miles/BTUx10<sup>6</sup>.

Eq = Energy equivalent of converting mpg to mile/BTUx $10^6$ .

 $Eq = ((mpg)/(H))x10^{6}$ 

### B. CNG, LNG, cryogenic and other fuels in the vapor state.

The reported fuel economy is based on the following: measured test quantitiesdistance traveled (miles) and fuel consumed (scf); density of test fuel, and volumetric heating value (BTU/lb) of test fuel at standard conditions (P=14.73 psia and T=60 °F). These combine to give a fuel economy in miles per lb. The energy equivalent (mile/BTUx10<sup>6</sup>) will also be provided so that the results can be compared to buses that use other fuels.

1.) Divide the number of miles of the phase by the number of standard cubic feet (scf) of fuel consumed.

		total miles
phase	miles per phase	per run
CBD	1.9097	5.7291
ART	1.9097	3.8193
COM	3.8193	3.8193

**FEo**<sub>mi/scf</sub> = Observed fuel economy = <u>miles</u> scf of fuel

2.) Convert the observed fuel economy to miles per lb by dividing FEo by the density of the test fuel at standard conditions (Lb/ft<sup>3</sup>).

Note: The density of test fuel must be determined at standard conditions as described above. If the density is not defined at the above standard conditions, then a correction will be needed before the fuel economy can be calculated.

FEo<sub>mi/lb</sub> = FEo / Gm

where Gm = Density of test fuel at standard conditions

3.) Convert the observed fuel economy (FEomi/lb) to an energy equivalent of (miles/BTUx10<sup>6</sup>) by dividing the observed fuel economy (FEomi/lb) by the heating value of the test fuel at standard conditions.

 $Eq = ((FEomi/lb)/H)x10^{6}$ 

where

Eq = Energy equivalent of miles/lb to mile/BTUx10<sup>6</sup> H = Volumetric heating value of test fuel at standard conditions

#### 6-III. DISCUSSION

This is a comparative test of fuel economy using number one diesel fuel with a heating value of 20,214.0 btu/lb. The driving cycle consists of Central Business District (CBD), Arterial (ART), and Commuter (COM) phases as described in 6-II. The fuel consumption for each driving cycle and for idle is measured separately. The results are corrected to a reference fuel with a volumetric heating value of 127,700 btu/gal.

An extensive pretest maintenance check is 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. The next sheet shows the correction calculation for the test fuel. The next four Fuel Economy Forms provide the data from the four test runs. Finally, the summary sheet provides the average fuel consumption. The overall average is based on total fuel and total mileage for each phase. The overall average fuel consumption values were; CBD - 6.64 mpg, ART - 7.03 mpg, and COM - 11.76 mpg. Average fuel consumption at idle was 2.78 lb/hr (0.44 gph).

## FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 9910	Date: 6-15-99	SLW (lbs): 13,730
Personnel: S.C., C.S. and E.L.		

FUEL SYSTEM	OK	Date	Initials
Install fuel measurement system	$\checkmark$	6-15-99	S.C.
Replace fuel filter	$\checkmark$	6-15-99	S.C.
Check for fuel leaks	$\checkmark$	6-15-99	S.C.
Specify fuel type (refer to fuel analysis)			
Remarks:			
BRAKES/TIRES	OK	Date	Initials
Inspect hoses	$\checkmark$	6-15-99	S.C.
Inspect brakes	$\checkmark$	6-15-99	S.C.
Relube wheel bearings	$\checkmark$	6-15-99	S.C.
Check tire inflation pressures (mfg. specs.)	$\checkmark$	6-15-99	S.C.
Remarks:			
COOLING SYSTEM	ОК	Date	Initials
Check hoses and connections	$\checkmark$	6-15-99	S.C.
Check system for coolant leaks	$\checkmark$	6-15-99	S.C.
Remarks:			

# FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 2)

Bus Number: 9910	Date: 6-	15-99			
Personnel: S.C., C.S. and E.L.					
ELECTRICAL SYSTEMS		OK	Date	Initials	
Check battery		$\checkmark$	6-15-99	S.C.	
Inspect wiring		$\checkmark$	6-15-99	S.C.	
Inspect terminals		$\checkmark$	6-15-99	S.C.	
Check lighting		$\checkmark$	6-15-99	S.C.	
Remarks:					
DRIVE SYSTEM		OK	Date	Initials	
Drain transmission fluid		$\checkmark$	6-15-99	S.C.	
Replace filter/gasket		$\checkmark$	6-15-99	S.C.	
Check hoses and connections		$\checkmark$	6-15-99	S.C.	
Replace transmission fluid		$\checkmark$	6-15-99	S.C.	
Check for fluid leaks		$\checkmark$	6-15-99	S.C.	
Remarks:					
LUBRICATION		OK	Date	Initials	
Drain crankcase oil		$\checkmark$	6-15-99	E.L.	
Replace filters		$\checkmark$	6-15-99	E.L.	
Replace crankcase oil		$\checkmark$	6-15-99	E.L.	
Check for oil leaks		$\checkmark$	6-15-99	E.L.	
Check oil level			6-15-99	E.L.	
Lube all chassis grease fittings			6-15-99	E.L.	
Lube universal joints		$\checkmark$	6-15-99	E.L.	
Replace differential lube including axles			6-15-99	S.C.	
Remarks:					

## FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 3)

Bus Number: 9910	Date: 6-15-99				
Personnel: S.C., C.S. and E.L.					
EXHAUST/EMISSION SYSTEM	ОК	Date	Initials		
Check for exhaust leaks	$\checkmark$	6-15-99	S.C.		
Remarks:					
		1			
ENGINE	ОК	Date	Initials		
Replace air filter	✓	6-15-99	E.L.		
Inspect air compressor and air system	✓	N/A			
Inspect vacuum system, if applicable	✓	6-15-99	S.C.		
Check and adjust all drive belts	✓	6-15-99	S.C.		
Check cold start assist, if applicable	✓	6-15-99	S.C.		
Remarks:					
STEERING SYSTEM	ОК	Date	Initials		
Check power steering hoses and connectors	✓	6-15-99	S.C.		
Service fluid level	✓	6-15-99	S.C.		
Check power steering operation	✓	6-15-99	S.C.		
Remarks:					
	ОК	Date	Initials		
Ballast bus to seated load weight	✓	6-15-99	S.C.		
TEST DRIVE	OK	Date	Initials		
Check brake operation	$\checkmark$	6-15-99	S.C.		
Check transmission operation ✓ 6-15-99 S.					
Remarks:					

## FUEL ECONOMY PRE-TEST INSPECTION FORM

Bus Number: 9910					
Personnel: B.L., S.C. and R.H.					
PRE WARM-UP	If OK, Initial				
Fuel Economy Pre-Test Maintenance Form is	s complete	B.L.			
Cold tire pressure (psi): Front <u>90</u> Middle <u>N/A</u>	Rear <u>90</u>	B.L.			
Tire wear:		B.L.			
Engine oil level		B.L.			
Engine coolant level		B.L.			
Interior and exterior lights on, evaporator fan	B.L.				
Fuel economy instrumentation installed and	B.L.				
Fuel line no leaks or kinks	B.L.				
Speed measuring system installed on bus. S installed in front of bus and accessible to TE	B.L.				
Bus is loaded to SLW	B.L.				
WARM-UP	If OK, Initial				
Bus driven for at least one hour warm-up		B.L.			
No extensive or black smoke from exhaust		B.L.			
POST WARM-UP	If OK, Initial				
Warm tire pressure (psi): Front <u>90</u> Middle <u>N/</u>	B.L.				
Environmental conditions Average wind speed <12 mph and maximum Ambient temperature between 30°(-1°) and Track surface is dry Track is free of extraneous material and cle interfering traffic	B.L.				

Bus Number: 9910 Manufa		Manufact	Manufacturer: Glaval		Date: 6-17-99		
Run Number: 1	Number: 1 Personnel: B.L, S.C. and R.H.		R.H.				
Test Direction:	⊐CW or ⊠CC\	V Temperat	ure (°F): 61		Humidity (%)	): 52	
SLW (lbs): 13,75	50	Wind Spe	ed (mph) & Dire	ction: N / 5	Barometric F	Pressure (in.H	g): 30.33
Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:41	8:41	22.8	95.20	93.40	1.80
ART #1	0	4:00	4:00	23.3	93.40	91.50	1.90
CBD #2	0	8:43	8:43	23.8	91.50	89.65	1.85
ART #2	0	4:02	4:02	25.0	89.65	87.85	1.80
CBD #3	0	8:46	8:46	25.3	87.85	86.00	1.85
COMMUTER	0	5:54	5:54	25.8	86.00	83.95	2.05
						Total Fu	el = 11.25 lbs
20 minute idle : Total Fuel Used = 1.00 lbs							
Heating Value = 20,214.0 BTU/LB							
Comments:							

Bus Number: 9910 Manufa		Manufact	Manufacturer: Glaval		Date: 6-17-99		
Run Number: 2	nber: 2 Personnel: B.L., S.C. and R.H.						
Test Direction:	⊠CW or □CCV	V Temperat	ure (°F): 66		Humidity (%)	): 50	
SLW (lbs): 13,73	30	Wind Spe	ed (mph) & Dire	ection: NW / 7	Barometric F	<sup>•</sup> ressure (in.H	lg): 30.29
Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:56	8:56	28.1	83.95	82.10	1.85
ART #1	0	4:04	4:04	28.4	82.10	80.45	1.65
CBD #2	0	9:00	9:00	28.6	80.45	78.70	1.75
ART #2	0	4:06	4:06	29.2	78.70	77.05	1.65
CBD #3	0	8:59	8:59	29.5	77.05	75.25	1.80
COMMUTER	0	5:56	5:56	29.3	75.25	73.25	2.00
Total Fuel = 10.70 lbs							
20 minute idle: Total Fuel Used = N/A							
Heating Value = 20,214.0 BTU/LB							
Comments:							

Bus Number: 9910 Manufacture		acturer: Glaval		Date: 6-22-99					
Run Number: 3		Personne	I: B.L., R.H. and	C.S.					
Test Direction:	□CW or □CCV	V Temperat	ure (°F): 78		Humidity (%)	): 42			
SLW (lbs): 13,73	0	Wind Spe	ed (mph) & Dire	ction: Calm	Barometric F	ressure (in.H	g): 30.15		
Cycle Type	Time (min:sec)		Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell F	Reading (lb)	Fuel Used (lbs)
	Start	Finish		Start	Start	Finish			
CBD #1	0	8:40	8:40	30.5	79.05	77.25	1.80		
ART #1	0	3:56	3:56	31.1	77.25	75.60	1.65		
CBD #2	0	8:32	8:32	32.0	75.60	73.85	1.75		
ART #2	0	3:52	3:52	33.2	73.85	72.15	1.70		
CBD #3	0	8:34	8:34	33.7	72.15	70.35	1.80		
COMMUTER	0	5:52	5:52	33.9	70.35	68.35	2.00		
Total Fuel = 10.70 lbs									
20 minute idle: Total Fuel Used = N/A									
Heating Value = 20,214.0 BTU/LB									
Comments:									

Bus Number: 9910 Manufacturer: Glav		urer: Glaval		Date: 6-22-9	9		
Run Number: 4		Personne	Personnel: B.L., R.H. and C.S.				
Test Direction:	⊠CW or □CCV	V Temperat	ure (°F): 80		Humidity (%)	): 40	
SLW (lbs): 13,73	i0	Wind Spe	ed (mph) & Dire	ction: 3 / N	Barometric F	Pressure (in.H	g): 30.17
Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:42	8:42	34.1	68.45	66.60	1.85
ART #1	0	3:55	3:55	34.3	66.60	64.95	1.65
CBD #2	0	8:48	8:48	34.7	64.95	63.15	1.80
ART #2	0	3:56	3:56	35.1	63.15	61.50	1.65
CBD #3	0	8:40	8:40	35.8	61.50	59.75	1.75
COMMUTER	0	5:54	5:54	36.1	59.75	57.65	2.10
Total Fuel = 10.80 lbs							
20 minute idle :	Total Fuel Use	ed = 0.85 lbs					
Heating Value = 20,214.0 BTU/LB							
Comments:							

#### FUEL ECONOMY SUMMARY SHEET

BUS MANUFACTURES BUS MODEL	C :GLAVAL :UNIVERSAL	BUS NUN TEST DA	4BER :9910 ATE :6/17/99	
FUEL TYPE SP. GRAVITY HEATING VALUE Standard Condit: Density of Water	: DIESEL : .8095 : 20214.00 B ions : 60 deg F an c : 8.3373 lb/9	TU/Lb nd 14.7 psi gallon at 60 deg F	7	
CYCLE TOTAL FUR USED (L)	3L TOTAL MILES )	FUEL ECONOMY M/Lb(Measured)	FUEL ECONOMY MPG(Corrected)	
Run # :1, CCW CBD 5.50 ART 3.70 COM 2.05 TOTAL 11.25	5.73 3.82 3.82 13.37	1.04 1.03 1.86 1.19	6.53 6.47 11.68 7.45	
Run # :2, CW CBD 5.40 ART 3.30 COM 2.00 TOTAL 10.70	5.73 3.82 3.82 13.37	1.06 1.16 1.91 1.25	6.65 7.26 11.97 7.83	
Run # :3, CCW CBD 5.35 ART 3.35 COM 2.00 TOTAL 10.70	5.73 3.82 3.82 13.37	1.07 1.14 1.91 1.25	6.71 7.15 11.97 7.83	
Run # :4, CW CBD 5.40 ART 3.30 COM 2.10 TOTAL 10.80	5.73 3.82 3.82 13.37	1.06 1.16 1.82 1.24	6.65 7.26 11.40 7.76	
IDLE CONSUMPTION First 20 Minutes	Data : 1.00 Lb	Last 20 Minute	es Data : .85 L	b
RUN CONSISTENCY:	% Difference fro	om overall average	e of total fuel u	sed
Run 1 : -3.6	Run 2 : 1.5	Run 3 : 1.5	Run 4 : .6	
SUMMARY				
Average Idle Con Average CBD Phas Average Arterial Average Commuter Overall Average Overall Average	sumption e Consumption Phase Consumptio Phase Consumptio Fuel Consumption Fuel Consumption	: .44 G/Hr : 6.64 MPG on : 7.03 MPG on : 11.76 MPG : 7.72 MPG : 56.57 Miles/	' Million BTU	

#### 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 will be measured at several locations with the bus operating under the following three conditions:

- 1. With the bus stationary, a white noise generating system shall provide a uniform sound pressure level equal to 80 dB(A) on the left, exterior side of the bus. The engine and all accessories will be switched off and all openings including doors and windows will be closed. This test will be performed at the ABTC.
- 2. The bus accelerating at full throttle from a standing start to 35 mph on a level pavement. All openings will be closed and all accessories will be operating during the test. This test will be performed at the Test Track Facility.
- 3. The bus will be operated at various speeds from 0 to 55 mph with and without the air conditioning and accessories on. Any audible vibration or rattles will be noted. This test will be performed on the test segment between the Test Track Facility and the ABTC.

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

#### 7.1-III. DISCUSSION

This test is performed in three parts. The first part exposes the exterior of the vehicle to 80 dB(A) on the left side of the bus and the noise transmitted to the interior is measured. The overall average of the six measurements was 46.6 dB(A); ranging from 45.6 dB(A) in line with the middle speaker to 47.4 dB(A) at the driver's seat. The interior ambient noise level for this test was 49.0 dB(A).

The second test measures interior noise during acceleration from 0 to 35 mph. This noise level ranged from 73.6 dB(A) at the rear passenger seats to 77.0 dB(A) at the driver's seat. The overall average was 75.4 dB(A). The interior ambient noise level for this test was 34.0 dB(A).

The third part of the test is to listen for resonant vibrations, rattles, and other noise sources while operating over the road. No vibrations or rattles were noted.

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

Bus Number: 9910	Date: 5-11-99			
Personnel: S.C. and G.S				
Temperature (°F): 68	Humidity (%): 35			
Wind Speed (mph): Calm	Wind Direction: Calm			
Barometric Pressure (in.Hg): 29.98				
Initial Sound Level Meter Calibration: I checked by B.L.				
Interior Ambient Noise Level dB(A): 49.0	Exterior Ambient Noise Level dB(A): 53.7			
Microphone Height During Testing (in): 45				

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	47.4
Front Passenger Seats	47.4
In Line with Front Speaker	46.3
In Line with Middle Speaker	45.6
In Line with Rear Speaker	46.0
Rear Passenger Seats	46.6

Final Sound Level Meter Calibration: 🗵 checked by B.L.

Comments: All readings taken in the center aisle.
### INTERIOR NOISE TEST DATA FORM Test Condition 2: 0 to 35 mph Acceleration Test

Bus Number: 9910	Date: 6-23-99	
Personnel: B.L., C.S. and R.H.		
Temperature (°F): 70	Humidity (%): 53	
Wind Speed (mph): 9	Wind Direction: S	
Barometric Pressure (in.Hg): 30.19		
Initial Sound Level Meter Calibration: 🗵 ch	ecked by B.L.	
Interior Ambient Noise Level dB(A): 34.0	Exterior Ambient Noise Level dB(A): 39.9	
Microphone Height During Testing (in): 45		

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	77.0
Front Passenger Seats	76.4
Middle Passenger Seats	74.5
Rear Passenger Seats	73.6

Final Sound Level Meter Calibration: 🗵 checked by B.L.

**Comments:** All readings taken in the center aisle.

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

Bus Number: 9910	Date: 6-23-99
Personnel: B.L., S.C. and R.H.	
Temperature (°F): 70	Humidity (%): 53
Wind Speed (mph): 9	Wind Direction: S
Barometric Pressure (in.Hg): 30.19	

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

Source of Noise	Location
Engine and Accessories	None noted.
Windows and Doors	None noted.
Seats and Wheel Chair lifts	None noted.

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

## 7.1 INTERIOR NOISE TEST



## **TEST BUS SET-UP FOR 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 will be operated at a SLW in three different conditions using a smooth, straight and level roadway:

- 1. Accelerating at full throttle from a constant speed at or below 35 mph and just prior to transmission upshift.
- 2. Accelerating at full throttle from standstill.
- 3. Stationary, with the engine at low idle, high idle, and wide open throttle.

In addition, the buses will be tested with and without the air conditioning and all accessories operating. The exterior noise levels will be recorded.

The test site is at the Test Track Facility and the test procedures will be 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 will measure the noise level.

During the test, special attention should be 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 exterior ambient noise level of 38.0 dB(A), the average test result obtained while accelerating from a constant speed was 74.0 dB(A) on the right side and 73.8 dB(A) on the left side.

When accelerating from a standstill with an exterior ambient noise level of 39.2 dB(A), the average of the results obtained were 75.6 dB(A) on the right side and 74.3 dB(A) on the left side.

With the vehicle stationary and the engine, accessories, and air conditioning on, the measurements averaged 61.6 dB(A) at low idle and 76.4 dB(A) at wide open throttle. With the accessories and air conditioning off, the readings averaged .09 dB(A) lower at low idle, and 1.1 dB(A) lower at wide open throttle. The exterior ambient noise level measured during this test was 39.7 dB(A). Note: the test vehicle was not equipped with a fast idle mode, therefore, data for that condition is not available.

### EXTERIOR NOISE TEST DATA FORM Accelerating from Constant Speed

Bus Number: 9910	Date: 6-23-99
Personnel: B.L., C.S. and R.H.	
Temperature (°F): 78	Humidity (%): 47
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.22	
Verify that microphone height is 4 feet, win temperature is between 30°F and 90°F: ⊠	d speed is less than 12 mph and ambient checked by B.L.
Initial Sound Level Meter Calibration: I ch	ecked by B.L.
Exterior Ambient Noise Level dB(A): 38.0	

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	73.6	1	73.5
2	74.0	2	73.6
3	73.5	3	73.4
4	73.9	4	73.6
5	73.2	5	74.0
Average of two highest actual noise levels = 74.0 dB(A)		Average of two highest actual noise levels = 73.8 dB(A)	

Final Sound Level Meter Calibration Check: 🗵 checked by B.L.

Comments:

### EXTERIOR NOISE TEST DATA FORM Accelerating from Standstill

Bus Number: 9910	Date: 6-23-99	
Personnel: B.L., C.S. and R.H.		
Temperature (°F): 78	Humidity (%): 47	
Wind Speed (mph): 5	Wind Direction: SW	
Barometric Pressure (in.Hg): 30.22		
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between $30^{\circ}$ F and $90^{\circ}$ F: $\square$ checked by B.L.		
Initial Sound Level Meter Calibration: I checked by B.L.		
Exterior Ambient Noise Level dB(A): 39.2		

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	76.0	1	73.9
2	75.2	2	73.2
3	73.5	3	73.4
4	73.4	4	73.2
5	73.6	5	74.6
Average of two highest actual noise levels = 75.6 dB(A)		Average of two highes levels = 74.3 dB(A)	t actual noise

Final Sound Level Meter Calibration Check: 🗵 checked by B.L.

Comments:

### EXTERIOR NOISE TEST DATA FORM Stationary

Bus Number: 9910	Date: 6-23-99	
Personnel: B.L., C.S. and R.H.		
Temperature (°F): 78	Humidity (%): 47	
Wind Speed (mph): 5	Wind Direction: SW	
Barometric Pressure (in.Hg): 30.22		
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ⊠ checked by B.L.		
Initial Sound Level Meter Calibration: 🗵 checked by	y B.L.	
Exterior Ambient Noise Level dB(A): 39.7		

Accessories and Air Conditioning ON			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	668	61.6	61.6
High Idle	N/A	N/A	N/A
Wide Open Throttle	3,602	77.5	75.2

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Accessories and Air Conditioning OFF			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Actual
Low Idle	670	61.0	60.4
High Idle	N/A	N/A	N/A
Wide Open Throttle	3,622	76.2	74.3
Final Sound Level Meter Calibration Check: 🗵 checked by B.L.			
Comments:			

### **REQUIRED BID DOCUMENTATION CHECKLIST**

Mode	l Year: 2017	Model: Glaval
Mand	latory Bid Forn	ns – must be submitted with bid:
X	Bid Form #1:	Locations of Technical Service Representatives and Parts Distribution Centers
X	Bid Form #2:	Certification for Air & Water Pollution
X	Bid Form #3:	Disadvantaged Business Enterprise Vendors/Manufacturers Certification The vendor shall also supply with bid FTA TVM DBE Goal Concurrence for the Current Fiscal Year Approval Letter.
<u> </u>	Bid Form #4:	Buy America Certification Rolling Stock Should the Vendor be declared responsive and low bid, pursuant to Pre- Award and Post Delivery Audit Requirements, the Division will require the Vendor to submit documentation (with the bid or prior to any award) that lists:
		1) Component and sub-component parts of the rolling stock to be purchased identified b manufacturer of the parts, their country of origin and cost: and
		<ol> <li>The location of the final assembly point for the rolling stock, including a description of the activities that will take place at the final assembly point and the cost of final assembly.</li> </ol>
	Bid Form #5:	Federal Motor Vehicle Safety Standards Certification Vendor shall also supply with bid a breakdown of FMVSS standards to be met with proposed vehicle.
X	Bid Form #6:	U.S. Comptroller's Debarment List Certification
	Bid Form #7:	Certification of Primary Participant Regarding Debarment, Suspension, and Other Responsibility Matters
X	Bid Form #8:	Vendor's Certification of Understanding and Acceptance
	Bid Form #9:	Certification of Restrictions on Lobbying
X	Bid Form #10 A copy of	: Certification of Compliance with FTA's Vehicle Testing Requirements f the vehicle testing report (if available) shall be included with the bid.
	Exhibit A Pric	ing Page (8)

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	DOCUMENTATION TO BE SUBMITTED WITH BID:
<u>Section</u> <u>Referenced</u>	
3.2	Chassis: include Load leveling System: provide product description, warranty information and product literature.
3.3	Engine: 3.6 Liter V-6 gasoline engine with electronic fuel injection: provide product description, warranty information and product literature.
<u> </u>	Radio: AM/FM Stereo with CD: provide product description, warranty information and product literature.
3.8	Transmission: provide product description, warranty information and product literature.
3.5	Radiator and Cooling System: provide product description, warranty information and product literature.
3.6	High Idle System, provide product description, warranty information and product literature.
<u> </u>	Brakes: provide product description, warranty information and product literature.
4.0	Tilt Wheel, Cruise Control and Power Steering: provide details of water testing procedures.
<u>×</u> 2.16	Wheelbase: provide length of proposed wheelbase.
3.9.4	Rear View Back-Up Camera: provide product description, warranty information and literature.
4.3	Wheels: provide product description, warranty information and product literature.
4.4	Tires: provide product description, warranty information and product literature
<u>x</u> 4.5.6	Battery: provide product description, warranty information and product literature
<u> </u>	Alternator: provide product description, warranty information and product literature
<u>x</u> 5.5	Front and Rear Heating and Air Conditioning: provide product description, warranty information, product literature.
4.8	Body Specifications: provide a description of how conversion will take place and meet the specification requirements. Provide Actual Interior height and Body length of proposed vehicle.
5.0	Sealant, Rustproofing and Undercoating: provide product description, warranty information and product literature.

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<b>5.</b> 1	Passenger Doors and Stepwells: Provide product description, dimensions, description of interlock system of all doors and locks to be provided.
5.8	Flooring: provide a description of product to be used, samples of floor covering, colors to be used and assembly process.
6.1	Seats, Grab Handles, Passenger restraints: provide product description, warranty information and product literature.
<u> </u>	Mobility Aid/ Occupant Restraint Systems: provide product description, warranty information and product literature.
6.13	Training: submit letter of understanding to the terms in this Section.
6.8	Security Cameras System Including Playback: provide product description, warranty information and product literature.
7.12.2	Warranty on Complete Vehicle.
7.12.3	Warranty on Basic Vehicle Structure.
7.12.5	Warranty: warranties to be provide on subsystems and components.
11.3	Complete two (2) bids in binder form -one (1) marked for DPT.
13.2 A	Complete mechanical description of vehicle, its construction and equipment including manufacturer's model name and / or number.
<u> </u>	Proposed interior floor plans, showing detailed dimensions including the location of the wheelchair securement system.
<u> </u>	Curb weight (empty weight) and gross vehicle weight rating (GVWR of vehicle.
13.2 D	Exterior Vinyl Colors: provide samples/chart of available colors.
<u> </u>	Identification of the conversion location of the van and listing of activities to take place at the location.
13.2 I	A list of five (5) users names, addresses, emails and telephone numbers who have been provided similar equipment.
<u>X</u>	No Debt Affidavit
X	Addendum Acknowledgement

### List of Suggested Vendors

Rohrer Vehicle Sales

Creative Bus Sales

All warranty polices shall be from the OEM and repairs shall be made at any authorized OEM warranty repair facility. Creative Bus Sales will comply with all warranties. We acknowledge that our customers may have local shops that they trust and have done work for them in the past. Our customer support, warranty specialists will work with each customer to assure that a quick and complete resolutions is found when warranty work is required. In most cases we are able to establish the repair shop as an authorized warranty repair facility.

Below is a few examples of repair facilities in the regions requested.

	Mechanical	Body Shop	A/C	Wheelchair
				Lift
				Matheny
				Motors
Northern	Ohio Valley Ford	Wheeling Auto	Fleet Service	Mineral
Panhandle	Moundsville	Body	Co. Wheeling	Springs
	Kent Parsons Ford	Matheny Truck	Chandler and	
Eastern Panhandle	Martinsburg	Center	Sons	101 Mobility
				Worldwide
	Turnpike Ford	Matheny Truck	Mountaineer	Equipment
Central WV	Charleston	Center	Thermo King	Charleston
	Mountaineer			Worldwide
	Automotive Beckley	Heritage Truck	Tolands	Fauinment
Southern WV	WV	Center	Beckley	Summit

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CREATIVE BUS SALES









#### QUICK REFERENCE: WARRANTY COVERAGE

This chart gives a general summary of your warranty coverage provided by Ford Motor Company under the **New Vehicle Limited Warranty**. Please refer to the description of warranty coverage for more specific information.

For each type of coverage, the chart shows two measures:



years in service
 miles driven

The measure that occurs first determines how long your coverage lasts. For example: Your Bumper to Bumper Coverage lasts for three years unless you drive more than 36,000 miles before three years elapse. In that case, your coverage ends at 36,000 miles.

For more details on coverage, see:

- What is Covered? (pages 8-12)
- What is Not Covered? (pages 12-15)

#### WHAT IS COVERED?

Your NEW VEHICLE LIMITED WARRANTY gives you specific legal rights. You may have other rights that vary from state to state. Under your New Vehicle Limited Warranty if:

- your Ford vehicle is properly operated and maintained, and



- was taken to a Ford dealership for a warranted repair during the warranty period,

then authorized Ford Motor Company dealers will, without charge, repair, replace, or adjust all parts on your vehicle that malfunction or fail during normal use during the applicable coverage period due to a manufacturing defect in factory-supplied materials or factory workmanship.

This warranty does not mean that each Ford vehicle is defect free. Defects may be unintentionally introduced into vehicles during the design and manufacturing processes and such defects could result in the need for repairs. Ford provides the New Vehicle Limited Warranty only to remedy manufacturing defects that result in vehicle part malfunction or failure during the warranty period.

The remedy under this written warranty, and any implied warranty, is limited to repair, replacement, or adjustment of defective parts. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Ford, through its authorized dealers, is willing and able to repair, replace, or adjust defective parts in the prescribed manner. Ford's liability, if any, shall in no event exceed the cost of correcting manufacturing defects as herein provided and upon expiration of this warranty, any such liability shall terminate.

Conditions that are not covered by the New Vehicle Limited Warranty are described on pages 12-15. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford, at the discretion of Ford or the Ford dealership.

Nothing in this warranty should be construed as requiring defective parts to be replaced with parts of a different type or design than the original part, so long as the vehicle functions properly with the replacement part. Moreover, Ford and its authorized dealers are entitled to a reasonable time and a reasonable number of attempts within which to diagnose and repair any defect covered by this warranty.

In certain instances, Ford may authorize repairs at other than Ford dealer facilities.

Two separate warranties apply to tires on your new vehicle. The New Vehicle Limited Warranty covers tire defects in factory supplied material or workmanship for 100% of labor costs and on a pro rata adjustment basis for parts. (See the reimbursement schedule below).

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For vehicles within the New Vehicle Limited Warranty time in service and mileage coverage period, defective tires will be replaced on a pro rata adjustment basis according to the following mileage-based Reimbursement Schedule:

MILES DRIVEN	PERCENT OF PARTS COVERED BY FORD
1-12,000	100%
12,001-24,000	60%
24,001-36,000	30%

The tire manufacturer also provides you with a separate tire warranty that may extend beyond the New Vehicle Limited Warranty coverage. You will find the manufacturer's tire warranty with the owner literature supplied with your vehicle. You have the option of having a tire warranty repair performed by the tire manufacturer's authorized service center. If you go to a tire service center for a repair covered by the New Vehicle Limited Warranty, you may be charged a prorated amount for wear or other charges. If so, you should present your paid invoice detailing the nature of the charges to any Ford Motor Company dealership for refund consideration. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford. In certain instances, Ford may authorize repairs at other than Ford dealer facilities. Tire replacements under warranty will be made with the same brand and model as originally equipped with the vehicle unless the same brand and model is no longer available, in which case a tire of the same brand, size, load, speed and tread type will be used. In some circumstances, Ford may authorize another brand and/or model to substitute for the original brand and model, even if still available.

Normal tire wear or damage is not reimbursable. See page 15 for details of what is not covered.

## Extended warranty coverage periods are available for certain vehicle parts and conditions. Specifically,

(1) Your vehicle's Powertrain components are covered for five years or 60,000 miles, whichever occurs first. The extended coverage applies to the **Engine:** all internal lubricated parts, cylinder block, cylinder heads, electrical fuel pump, powertrain control module, engine mounts, flywheel, injection pump, manifold (exhaust and intake), manifold bolts, oil pan, oil pump, seals and gaskets, engine thermostat, engine thermostat housing, timing chain cover, timing chain (gears or belt), turbocharger/supercharger unit, valve covers, water pump;



**Transmission:** all internal parts, clutch cover, seals and gaskets, torque converter, transfer case (including all internal parts), transmission case, transmission mounts; **Front-Wheel Drive:** axle shafts, front bearings, seals and gaskets, universal and constant velocity joints; **Rear-Wheel Drive:** axle shafts, rear bearings, center support bearing, drive axle housing (including all internal parts), drive shaft, retainers, supports, seals and gaskets, universal and constant velocity joints. **Four-Wheel/All-Wheel Drive:** axle shafts, bearings (front and rear), center support bearing, drive shafts, final drive housing (including all internal parts), hubs-automatic front locking (four-wheel drive), locking rings (four-wheel drive), seals and gaskets, universal and constant velocity joints.

(2) Your vehicle's safety belts and air bag Supplemental Restraint System (SRS) are covered for an extended Safety Restraint Coverage Period, which lasts for five years or 60,000 miles, whichever occurs first.

(3) Your vehicle's body sheet metal panels are covered for an extended Corrosion Coverage Period, which lasts for five years, regardless of miles driven. The extended warranty coverage only applies if a body sheet metal panel becomes perforated due to corrosion during normal use due to a manufacturing defect in factory-supplied materials or factory workmanship. If aluminum body panels have corrosion or rust damage, and the damage is not the result of abnormal usage, vehicle accident, customer actions and/or extreme environmental conditions, the corrosion or rust damage repairs are covered for 5 years, unlimited miles. For damage caused by airborne material (environmental fallout) where there is no factory-related defect involved and therefore no warranty – our policy is to provide free repair of paint damage due to the airborne material for 12 months or 12,000 miles, whichever occurs first.

(4) Your vehicle's direct injection diesel engine and certain engine components are covered during the PowerStroke Diesel Engine Coverage Period, which lasts for five years or 100,000 miles, whichever occurs first. The following parts are covered during this extended coverage period: the engine, cylinder block, heads and all internal parts, intake and exhaust manifolds, timing gear, harmonic balancer, valve covers, oil pan and pump, water pump, fuel system (excluding fuel lines, fuel tank and frame mounted fuel conditioning module sometimes referred to as the frame mounted pump/filter/water separator or frame mounted fuel filter/water separator), high pressure lines, gaskets and seals, glow plugs, turbocharger, two-stage turbocharger assembly, turbocharger actuator,

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powertrain control module, high pressure fuel injection pump assembly, injectors, injection pressure sensor, fuel rail pressure sensor, exhaust back pressure regulator and sensor, exhaust pressure sensor, manifold pressure sensor, intake air temperature sensor, crankshaft position sensor, camshaft position sensor, accelerator switch.

**NOTE:** Some components may also be covered by the Emissions Warranties. For more information, see pages 17-31.

If you own or lease a 2017-model Next Generation Police Interceptor Vehicle (NGPI), refer to the Warranty Addendum Card that was given to you when you took delivery of your vehicle for further explanation of Amendments to the New Vehicle Limited Warranty. The Warranty Addendum applies only the NGPI vehicles delivered in the State of Florida and New York.

## WHAT IS NOT COVERED UNDER THE NEW VEHICLE LIMITED WARRANTY?

#### Damage Caused By:

- accidents, collision or objects striking the vehicle (including driving through a car wash)
- theft, vandalism, or riot
- fire or explosion
- using contaminated or improper fuel/fluids
- · customer-applied chemicals or accidental spills
- driving through water deep enough to cause water to be ingested into the engine
- misuse of the vehicle, such a driving over curbs, overloading, racing or using the vehicle as a permanent stationary power source

#### Damage Caused by Alteration or Modification

The New Vehicle Limited Warranty does not cover any damage caused by:

- alterations or modifications of the vehicle, including the body, chassis, electronics or their components, after the vehicle leaves the control of Ford Motor Company
- tampering with the vehicle, tampering with the emissions systems or with the other parts that affect these systems (for example, but not limited to exhaust and intake systems)



 the installation or use of a non-Ford Motor Company part or software (other than a certified emissions part or software) or any part or software (Ford or non-Ford) designed for off-road use only installed after the vehicle leaves the control of Ford Motor Company, if the installed part fails or causes a Ford part to fail. Examples include, but are not limited to lift kits, oversized tires, roll bars, cellular phones, alarm systems, automatic starting systems and performance-enhancing powertrain components or software and performance "chips".

Your vehicle may allow, enable or facilitate the use of certain non-Ford Motor Company software. Ford is not responsible for the functionality of such software. Ford may disallow, discontinue or modify your ability to use such software at any time without prior notification or incurring any warranty or other obligation. Non-Ford Motor Company software may be governed by End User License Agreement or warranty provided by the software provider. For Ford Motor Company software see End User License Agreement found in the Owner Manual.

#### Damage Caused by Use and/or the Environment

The New Vehicle Limited Warranty does not cover surface rust, deterioration and damage of paint, trim, upholstery, and other appearance items that result from use and/or exposure to the elements. You, as the owner, are responsible for these items. Some examples are:

- dings, dents
- cuts, burns, punctures or tears
- road salt
- · tree sap, bird and bee droppings
- windstorm, lightening, hail
- earthquake
- freezing, water or flood
- · stone chips, scratches (some examples are on paint and glass)
- windshield stress cracks. However, limited coverage on windshield stress cracks will be provided for the first 12 months or 12,000 miles (which ever occurs first), even though caused by use and/or exposure to the elements.

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#### Maintenance/Wear

The New Vehicle Limited Warranty does not cover: (1) parts and labor needed to maintain the vehicle; and (2) the replacement of parts due to normal wear and tear. You, as the owner, are responsible for these items. See your Owner's Manual. Some examples of maintenance and normal wear are:

oil changes

- clutch linings
  wiper blades\*
- oils, lubricants, other fluids
- oil/air filters
- tire rotation/inflation
- cleaning/polishing
- balancing\*brake pad/lining\*

· wheel alignments and tire

\* Ford will replace or adjust certain maintenance items when necessary, free of charge during a limited period:

- Wiper blade replacements will be provided during the first six months in service, regardless of miles driven.
- Wheel alignments and tire balancing will be provided during the first 12 months or 12,000 miles in service, whichever occurs first.
- Brake pad/lining replacements will be provided during the first 12 months or 18,000 miles in service, whichever occurs first.

#### SYNC Hands-Free Communications and Entertainment System

If your vehicle is equipped with SYNC, the New Vehicle Limited Warranty does not cover repairs under certain conditions, such as failure to provide proper installation environment. The New Vehicle Limited Warranty does not cover repairs of certain damage or loss, such as:

- · Loss of personal recording media, software or data
- Loss, change, or discontinuation of functionality because of:
   system updates to Ford Motor Company software or lack of compatibility with non-Ford Motor Company electronic devices
  - non-Ford Motor Company software, or
  - obsolescence of vehicle software or hardware
  - lack of network coverage or availability
- · Damage caused by:
  - · abnormal use such as insertion of foreign objects, fluid spillage
  - · unauthorized modification to alter functionality or capability
  - computer or internet viruses, bugs, or malware, such as worms, Trojan Horses, cancelbots
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- · installation of unauthorized software, peripherals and attachments
- unauthorized, unapproved and/or incompatible repairs, upgrades and modification
- the defective function or obsolescence of your cellular phone or digital media device (for example, inadequate signal reception by the external antenna, viruses or other software problems)

#### **Tire Wear or Damage**

The New Vehicle Limited Warranty does not cover normal wear or worn out tires. Tires will not be replaced (unless required by a warranty repair) for wear or damage including:

- tire damage from road hazard such as cuts, snags, bruises, bulges, puncture, and impact breaks
- tire damage due to under or over inflation, tire chain use, racing, spinning (as when stuck in snow or mud), improper mounting or dismounting, or tire repair

#### Other Items or Conditions Not Covered

The New Vehicle Limited Warranty does not cover:

- vehicles that have had the odometer disconnected, altered, or inoperative for an extended period of time with the result that the actual mileage cannot be determined
- vehicles that have ever been labeled or branded as dismantled, fire, flood, junk, rebuilt, reconstructed, or salvaged; this will void the New Vehicle Limited Warranty
- vehicles that have been determined to be a total loss by an insurance company; this will void the New Vehicle Limited Warranty
- converted ambulances that are not equipped with the Ford Ambulance Prep Package, see important information about ambulance conversions (page 36)
- Aftermarket parts or components, sometimes installed by Ford Motor Company or an authorized Ford dealership, may not be covered by the New Vehicle Limited Warranty. Any damage caused to Ford components due to the failure of aftermarket parts (other than a certified emissions part) is not covered.

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### 4. In addition ...

#### ROADSIDE SERVICE ASSISTANCE (UNITED STATES, PUERTO RICO, AND U.S. VIRGIN ISLANDS)

Your vehicle is covered by the complimentary Ford Roadside Assistance Program (unless you are driving a daily rental unit). Under this program, Ford will cover:

- Towing to the nearest Ford Motor Company dealership, or towing to your selling dealership if within 35 miles of the disablement
- Flat tire change (vehicle must have useable spare)
- Fuel delivery (limited to two occurrences in a 12-month period up to 2 gal. gas, 5 gal. diesel)
- Jump starts
- · Lock-out assistance (replacement key cost is customer responsibility)
- Winch out services: includes pulling a vehicle within 100 feet of a paved or county maintained road. No recoveries.

The Roadside Assistance Program is separate from the New Vehicle Limited Warranty. It begins at the warranty start date and lasts for five years or 60,000 miles (whichever occurs first). If you need towing beyond the five years or 60,000 miles (whichever occurs first) period, Ford can arrange roadside assistance and charge your credit card. If the reason for the vehicle disablement is later found to be covered by another Ford warranty, Ford will provide a refund for the tow charge under the other warranty, through the dealership.

## For emergency roadside assistance, call 1-800-241-3673, 24 hours a day, 365 days a year.

Ford Rent-A-Car (FRAC) and Dealer Daily Rental (DDR) vehicles that must be towed because a covered repair failed during the warranty coverage period, Ford will cover towing to the nearest Ford Motor Company dealership.

Ford Motor Company reserves the right to modify or discontinue Roadside Assistance at any time. Certain restrictions apply to Roadside Assistance benefits. Call 1-800-241-3673 for further details.



### Explore 2017 Ford Econoline Cutaway



## Starting at<sup>1</sup> \$30,695

Pricing for May 2, 2017 and ZIP 46514 View all offers (/commercial-trucks/e-series-cutaway/2017/pricing-and-incentives/)

Seating for

2

# Power and Handling

http://www.ford.com/commercial-trucks/e-series-cutaway/2017/models/e350-cutaway-drw/ 5/2/2017



# Cutaway? branding=1&lang=en&type=comm)

DISCLOSURES  $\lor$ 

### Popular

Focus (/cars/focus/2017/) Fiesta (/cars/fiesta/2017/) Mustang (/cars/mustang/2017/) F-150 (/trucks/f150/2017/)



## **Selected Options**

Code	Description
Base Vehicle	
E3F	Base Vehicle Price (E3F)
Packages	
780A	Order Code 780A Includes: - Engine: 6.8L EFI Triton V10 - Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul. - 4.56 Axle Ratio Includes vehicle emission control information label with 72 sq ft frontal area restriction. - GVWR: 11,500 lbs Payload Package - Wheels: 16" x 6" White Painted Steel
Powertrain	
99S	Engine: 6.8L EFI Triton V10
44P	Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul.
X85	<b>4.56 Axle Ratio</b> Includes vehicle emission control information label with 72 sq ft frontal area restriction.
20Y	GVWR: 11,500 lbs Payload Package
Wheels & Tires	
T67	Tires: LT225/75Rx16E BSW AS (Fleet)
	NO LONGER AVAILABLE as standard equipment. Fleet only with valid FIN code.
646	Wheels: 16" x 6" White Painted Steel
Seats & Seat Trim	
21S	Captain's Chair Driver Side Only w/o Trim Includes: - No Seat Trim - Passenger Side Air Bag Delete
Х	No Seat Trim
Other Options	
PAINT	Monotone Paint Application
138WB	138" Wheelbase
63N	Extra Heavy-Duty 225-Amps Alternator
634	Dual Heavy-Duty 78-Amp Batteries Includes: - Heavy-Duty 78-Amp Battery Replaces standard 72-amps heavy-duty battery.

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



## Selected Options (cont'd)

60X     Right Hand Door Delete       Deleties passenger side A-piller grab handle, right hand seat belt system and hardwine. passenger side Appiller grab handle, right hand seat belt system and hardwine. passenger side speaker and handline.       41H     Engine Block Heater       513     License Plate Bracket       625     Day/Night Interior Recommend when minimum temperature is 10 degrees Fahrenheir or below.       559     Frame Pucks (Isolators) Includes 12 body mounts.       526     Cruise Control       587     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single diac. Includes 20 board mounts.       678     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single diac. Includes 20 board speakers.       674     4.Speaker Upgrade Package Includes 2 Installed speakers and 2-speakers.       675     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single diac. Includes 2 Installed speakers.       676     Frame Pucks (Isolators) Includes 2 Installed speakers.       677     Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.       648     High Series Exterior Upgrade Package Includes: Pront Chrome Bumper wilkek Lower Fascia Chrome Guine Winkek Lower Fascia Chrome Guine Winkek Lower Fascia Chrome Guine Interview Microt Chrose Interview Parior Chrome Bumper wilkek Lower Fascia Chrome Guine Interview Bumper Strade Basenger Parior Chrome Bumper wilkek Lower Fascia Chrome Guine Interview Basenger Parior Chrome Bumper wilkek Lower Fascia Chrome Guine Interview Basenger Parior Chrome Bumper Wilkek Lower Fascia Chrome Guine Interview Basenger Parior Chrome Bumper Wilkek Low	Code	Description
Deletes passenger side A-piller grab hand, set has update system and handware passenger side speaker and 2 speakers.         411       Engine Block Heater         513       License Plate Bracket         625       Day/Night Interior Rearview Mirror         516       Cruise Control         585       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         586       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         587       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         587       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         588       Strate disa: Indudes a unit industriation and a speakers.         472       Andulance Prep Package Not Required         674       Exterior Mirror Delete         188       High Series Exterior Upgrade Package         162       Vinyl Floor	60X	Right Hand Door Delete
41H       Engine Block Heater         Single element. Recommended when minimum temperature is 10         153       License Plate Bracket         625       Day/Night Interior Rearview Mirror         559       Frame Pucks (Isolators)         1notkines 12 body mounts.       Economic Control         585       Cruise Control         586       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         587       Single disc. Includes audio input jack and 2-speakers.         874       -Speaker Upgrade Package         1not dires 2 installed speakers and 2 boods appeakers.       REQUIRED on orders not destined for ambulance use.         54F       Exterior Mirror Delete         18A       High Series Exterior Upgrade Package         1not dires       -Installed speakers and 2 boods package.         - Front Chrome Bumper willesk Lower Fascia       - Ortorom Grille         54F       Exterior Mirror Delete         18A       High Series Exterior Upgrade Package         - Includes:       - Pront Chrome Bumper willesk Lower Fascia         - Ortorom Grille       - Pront Chrome Bumper willesk Lower Fascia         - Ortorom Grille       - Pront Chrome Bumper willesk Lower Fascia         - Ortorom Crille       - Pront Chrome Bumper willesk Lower Fascia         - Ortorom Edump Debete		Deletes passenger side A-pillar grab handle, right hand seat belt system and hardware, passenger side air bag, under-seat stowage, passenger side sun visor, passenger side speaker and headliner. Includes: - Exterior Mirror Delete
Single element.     Recommended when minimum temperature is 10       153     License Plate Bracket       625     Day/Night Interior Rearview Mirror       559     Frame Pucks (Isolators) Includes 12 body mounts.       525     Cruise Control       586     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.       874     -4-Speaker Upgrade Package Includes 2 mailed speakers and 2 boxed speakers.       472     Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.       54F     Exterior Mirror Delete       18A     High Series Exterior Upgrade Package Includes 2       162     Vinyl Floor Covering       17B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package (LPO)       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package	41H	Engine Block Heater
153License Plate Bracket625Day/Night Interior Rearview Mirror559Frame Pucks (Isolators) Indudes 12 body mounts.625Cruise Control685Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.8744-Speaker Upgrade Package Includes 2 installed speakers and 2 boxed speakers.472Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.54FExterior Mirror Delete18AHigh Series Exterior Upgrade Package Includes: - Frant Chorne Bumper wiblack Lower Fascia - Chrome Bumper wiblack Lower Fascia - Chrome Grille - Durit Chorne Bumper wiblack Lower Fascia - Chrome Grille - Durit Seletcheam wiFixed Lens Headlamps162Vinyl Floor Covering47BShuttle Bus Prep Package - Frame Puck Keeter - Frame Puck S (Isolators) - Keeter Stretion Upgrade Package (LPO) - Indudes 12 body mounts. - Frame Puck (Isolators) - Keeter Durits - Frame Puck (Isolators) - Keeter Stretion Delete57JAuxiliary Heater Connector Package (LPO) - Indudes 12 body mounts. - Frame Puck (Isolators) - Keeter Delete672Auxiliary Heater Connector Package (LPO) - Indudes 12 body mounts. - Frame Puck (Isolators) - Keeter Delete674Auxiliary Heater Connector Package (LPO) - Indudes 12 body mounts. - Frame Puck (Isolators) - Keeter Delete <td></td> <td>Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below.</td>		Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below.
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559     Frame Pucks (Isolators) Includes 12 body mounts.       525     Cruise Control       586     Radic: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.       874     4-Speaker Upgrade Package Includes 2 installed speakers and 2 boxed speakers.       472     Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.       54F     Exterior Mirror Delete       18A     High Series Exterior Upgrade Package Includes:       162     Vinver Grille       47B     Universe Control       54F     Exterior Mirror Delete       162     Vinyl Floor Covering       47B     Shutte Bus Prep Package Includes:       162     Vinyl Floor Covering       47B     Exterior Mirror Delete       57J     Auxiliary Heater Connector Package Includes:       17. Front Chrome Grille     Jual Sealed-Beam w/Fixed Lens Headlamps       57J     Auxiliary Heater Connector Package (LPO) Includes rear fan controls.       672     Maximum Front GAWR: 4600 lbs.       942     Daytime Running Lamps (LPO)       Fleet Options     Engine Consel Cover Delete (LPO)	625	Day/Night Interior Rearview Mirror
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525       Cruise Control         585       Radio: Premium ETR AW/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.         874       4-Speaker Upgrade Package Includes 2 instilled speakers.         472       Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.         54F       Exterior Mirror Delete         18A       High Series Exterior Upgrade Package Includes: - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille         162       Vinyl Floor Covering         47B       Shuttle Bus Prep Package - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille - Pront Chrome Bumper w/Black Lower Fascia - Chrome Bumper w/Black Lower Fascia - Chrome Grille         57J       Shuttle Bus Prep Package - Front Chrome Bumper w/Black Lower Fascia - Front Chrome Bumper w/Black Lower Fascia - Front Dime Bumper w/Black Lower Fascia - Front Dime Bumper with the minimum temperature is 10 degrees Fahrenheit or below. - Front Dime Lamp Delete         57J       Auxiliary Heater Connector Package (LPO) Includes 12 body mounts. - Lower Barket - Front Dime Lamp Delete         57J       Maximum Front GAWR: 4600 lbs.         942       Daytime Running Lamps (LPO)		Includes 12 body mounts.
585     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.       874     4-Speaker Upgrade Package Includes 2 installed speakers and 2 boxed speakers.       47Z     Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.       54F     Exterior Mirror Delete       18A     High Series Exterior Upgrade Package Includes: - Front Chrome Bumper wBlack Lower Fascia - Chrome Grille - Dual Sealed-Beam wFixed Lens Headlamps       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       57J     Includes: - Front Chrome Bumper wBlack Lower Fascia - Chrome Grille - Dual Sealed-Beam wFixed Lens Headlamps       57J     Auxiliary Heater Connector Package (LPO) Includes: - Front Chrome Bumper wBlack Lower Fascia - Chrome Grille - Front Chrome Grille - Front Chrome Bumper wBlack Lower Fascia - Chrome Grille - Front Chrome Bumper wBlack Lower Fascia - Chrome Grille - Front Chrome Bumper wBlack Lower Fascia - Chrome Grille - Front Chrome Lamp Delete       57J     Maximum Front GAWR: 4600 lbs.       942     Daytime Running Lamps (LPO)       Fleet Options     Fleet Options	525	Cruise Control
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47BShuttle Bus Prep PackageIncludes: - Frigh Series Exterior Upgrade Package - Front Chrome Bumper w/Black Lower Fascia - Front Chrome Grille - Dual Sealed-Beam w/Fixed Lens Headlamps - Dual Sealed-Beam w/Fixed Lens Headlamps - Engine Block Heater Single element. Recommended when minimum temperature is 10 degrees Farenheit or below. - Frame Pucks (Isolators) 	162	Vinyl Floor Covering
Includes:       - High Series Exterior Upgrade Package         - High Series Exterior Upgrade Package       - Front Chrome Bumper wBlack Lower Fascia         - Chrome Grille       - Dual Sealed-Beam w/Fixed Lens Headlamps         - Dial Sealed-Beam w/Fixed Lens Headlamps       - Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below.         - Frame Pucks (Isolators)       - Iricludes 12 body mounts.         - Liconse Plate Bracket       - Front Headliner Delete         - Front Dome Lamp Delete       - Front Headliner Delete         - Front Dome Lamp Delete       - Front Dome Lamp Delete         57.J       Auxiliary Heater Connector Package (LPO)         Includes rear fan controls.       -         672       Maximum Front GAWR: 4600 lbs.         942       Daytime Running Lamps (LPO)         Feleet Options         41X       Engine Console Cover Delete (LPO)	47B	Shuttle Bus Prep Package
57JAuxiliary Heater Connector Package (LPO) Includes rear fan controls.672Maximum Front GAWR: 4600 lbs.942Daytime Running Lamps (LPO)Fleet Options41XEngine Console Cover Delete (LPO)		Includes: - High Series Exterior Upgrade Package - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille - Dual Sealed-Beam w/Fixed Lens Headlamps - Engine Block Heater Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below. - Frame Pucks (Isolators) Includes 12 body mounts. - License Plate Bracket - Front Headliner Delete - Front Dome Lamp Delete
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672Maximum Front GAWR: 4600 lbs.942Daytime Running Lamps (LPO)Fleet Options41XEngine Console Cover Delete (LPO)		Includes rear fan controls.
942 Daytime Running Lamps (LPO) Fleet Options 41X Engine Console Cover Delete (LPO)	672	Maximum Front GAWR: 4600 lbs.
41X Engine Console Cover Delete (LPO)	942	Daytime Running Lamps (LPO)
41X Engine Console Cover Delete (LPO)	Fleet Options	
	41X	Engine Console Cover Delete (LPO)

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



## Selected Options (cont'd)

Code	Description
	Fleet only with valid FIN code.
Emissions	
425	50 State Emission System
Interior Colors	
XE_01	Medium Flint
Primary Colors	
YZ_01	Oxford White

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



## WWW.MORRYDE.COM

## **SMOOTHING OUT THE ROUGH SPOTS**

"MOR/ryde really solved a problem for us. Previously we were faced with an expensive upgrade to improve the ride. MOR/ryde's system



is less costly, easy to install and requires minimal maintenance."

- R. Streiff / Senior Analyst, Access Services



# TODAY'S ROADS ARE ROUGHER THAN EVER

That is why today's leading providers of Shuttle and Para-transit services rely on MOR/ryde Suspensions Systems for improved passenger comfort and better protection of their vehicles from the damaging effects of road shock.

At the heart of every MOR/ryde suspension system are unique rubber shear springs. The MOR/ryde suspension works in concert with the existing leaf spring suspension system to provide your riders a softer, smoother, more comfortable ride. Whether it is chuck holes, dirt roads, or railroad tracks you encounter, rubber has a natural tendency to isolate and absorb road shock. So rather than road conditions beating up your bus and your riders, the blows are absorbed by the MOR/ryde suspension system.

The MOR/ryde system can be ordered on new buses from the manufacturer or installed aftermarket on busses equipped with leaf springs in a very cost effective manner. Each system comes with a 3 year/ 70,000 mile warranty and requires minimal maintenance to sustain optimal performance.





MOR/RYDE INTERNATIONAL, INC. 1966 MOYER AVE., ELKHART, IN 46516 (574) 293-1581

#### QUICK REFERENCE: WARRANTY COVERAGE

This chart gives a general summary of your warranty coverage provided by Ford Motor Company under the **New Vehicle Limited Warranty**. Please refer to the description of warranty coverage for more specific information.

For each type of coverage, the chart shows two measures:



years in service
 miles driven

The measure that occurs first determines how long your coverage lasts. For example: Your Bumper to Bumper Coverage lasts for three years unless you drive more than 36,000 miles before three years elapse. In that case, your coverage ends at 36,000 miles.

For more details on coverage, see:

- What is Covered? (pages 8-12)
- What is Not Covered? (pages 12-15)

#### WHAT IS COVERED?

Your NEW VEHICLE LIMITED WARRANTY gives you specific legal rights. You may have other rights that vary from state to state. Under your New Vehicle Limited Warranty if:

- your Ford vehicle is properly operated and maintained, and



- was taken to a Ford dealership for a warranted repair during the warranty period,

then authorized Ford Motor Company dealers will, without charge, repair, replace, or adjust all parts on your vehicle that malfunction or fail during normal use during the applicable coverage period due to a manufacturing defect in factory-supplied materials or factory workmanship.

This warranty does not mean that each Ford vehicle is defect free. Defects may be unintentionally introduced into vehicles during the design and manufacturing processes and such defects could result in the need for repairs. Ford provides the New Vehicle Limited Warranty only to remedy manufacturing defects that result in vehicle part malfunction or failure during the warranty period.

The remedy under this written warranty, and any implied warranty, is limited to repair, replacement, or adjustment of defective parts. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Ford, through its authorized dealers, is willing and able to repair, replace, or adjust defective parts in the prescribed manner. Ford's liability, if any, shall in no event exceed the cost of correcting manufacturing defects as herein provided and upon expiration of this warranty, any such liability shall terminate.

Conditions that are not covered by the New Vehicle Limited Warranty are described on pages 12-15. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford, at the discretion of Ford or the Ford dealership.

Nothing in this warranty should be construed as requiring defective parts to be replaced with parts of a different type or design than the original part, so long as the vehicle functions properly with the replacement part. Moreover, Ford and its authorized dealers are entitled to a reasonable time and a reasonable number of attempts within which to diagnose and repair any defect covered by this warranty.

In certain instances, Ford may authorize repairs at other than Ford dealer facilities.

Two separate warranties apply to tires on your new vehicle. The New Vehicle Limited Warranty covers tire defects in factory supplied material or workmanship for 100% of labor costs and on a pro rata adjustment basis for parts. (See the reimbursement schedule below).

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For vehicles within the New Vehicle Limited Warranty time in service and mileage coverage period, defective tires will be replaced on a pro rata adjustment basis according to the following mileage-based Reimbursement Schedule:

MILES DRIVEN	PERCENT OF PARTS COVERED BY FORD
1-12,000	100%
12,001-24,000	60%
24,001-36,000	30%

The tire manufacturer also provides you with a separate tire warranty that may extend beyond the New Vehicle Limited Warranty coverage. You will find the manufacturer's tire warranty with the owner literature supplied with your vehicle. You have the option of having a tire warranty repair performed by the tire manufacturer's authorized service center. If you go to a tire service center for a repair covered by the New Vehicle Limited Warranty, you may be charged a prorated amount for wear or other charges. If so, you should present your paid invoice detailing the nature of the charges to any Ford Motor Company dealership for refund consideration. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford. In certain instances, Ford may authorize repairs at other than Ford dealer facilities. Tire replacements under warranty will be made with the same brand and model as originally equipped with the vehicle unless the same brand and model is no longer available, in which case a tire of the same brand, size, load, speed and tread type will be used. In some circumstances, Ford may authorize another brand and/or model to substitute for the original brand and model, even if still available.

Normal tire wear or damage is not reimbursable. See page 15 for details of what is not covered.

## Extended warranty coverage periods are available for certain vehicle parts and conditions. Specifically,

(1) Your vehicle's Powertrain components are covered for five years or 60,000 miles, whichever occurs first. The extended coverage applies to the **Engine:** all internal lubricated parts, cylinder block, cylinder heads, electrical fuel pump, powertrain control module, engine mounts, flywheel, injection pump, manifold (exhaust and intake), manifold bolts, oil pan, oil pump, seals and gaskets, engine thermostat, engine thermostat housing, timing chain cover, timing chain (gears or belt), turbocharger/supercharger unit, valve covers, water pump;


**Transmission:** all internal parts, clutch cover, seals and gaskets, torque converter, transfer case (including all internal parts), transmission case, transmission mounts; **Front-Wheel Drive:** axle shafts, front bearings, seals and gaskets, universal and constant velocity joints; **Rear-Wheel Drive:** axle shafts, rear bearings, center support bearing, drive axle housing (including all internal parts), drive shaft, retainers, supports, seals and gaskets, universal and constant velocity joints. **Four-Wheel/All-Wheel Drive:** axle shafts, bearings (front and rear), center support bearing, drive shafts, final drive housing (including all internal parts), hubs-automatic front locking (four-wheel drive), locking rings (four-wheel drive), seals and gaskets, universal and constant velocity joints.

(2) Your vehicle's safety belts and air bag Supplemental Restraint System (SRS) are covered for an extended Safety Restraint Coverage Period, which lasts for five years or 60,000 miles, whichever occurs first.

(3) Your vehicle's body sheet metal panels are covered for an extended Corrosion Coverage Period, which lasts for five years, regardless of miles driven. The extended warranty coverage only applies if a body sheet metal panel becomes perforated due to corrosion during normal use due to a manufacturing defect in factory-supplied materials or factory workmanship. If aluminum body panels have corrosion or rust damage, and the damage is not the result of abnormal usage, vehicle accident, customer actions and/or extreme environmental conditions, the corrosion or rust damage repairs are covered for 5 years, unlimited miles. For damage caused by airborne material (environmental fallout) where there is no factory-related defect involved and therefore no warranty – our policy is to provide free repair of paint damage due to the airborne material for 12 months or 12,000 miles, whichever occurs first.

(4) Your vehicle's direct injection diesel engine and certain engine components are covered during the PowerStroke Diesel Engine Coverage Period, which lasts for five years or 100,000 miles, whichever occurs first. The following parts are covered during this extended coverage period: the engine, cylinder block, heads and all internal parts, intake and exhaust manifolds, timing gear, harmonic balancer, valve covers, oil pan and pump, water pump, fuel system (excluding fuel lines, fuel tank and frame mounted fuel conditioning module sometimes referred to as the frame mounted pump/filter/water separator or frame mounted fuel filter/water separator), high pressure lines, gaskets and seals, glow plugs, turbocharger, two-stage turbocharger assembly, turbocharger actuator,

powertrain control module, high pressure fuel injection pump assembly, injectors, injection pressure sensor, fuel rail pressure sensor, exhaust back pressure regulator and sensor, exhaust pressure sensor, manifold pressure sensor, intake air temperature sensor, crankshaft position sensor, camshaft position sensor, accelerator switch.

**NOTE:** Some components may also be covered by the Emissions Warranties. For more information, see pages 17-31.

If you own or lease a 2017-model Next Generation Police Interceptor Vehicle (NGPI), refer to the Warranty Addendum Card that was given to you when you took delivery of your vehicle for further explanation of Amendments to the New Vehicle Limited Warranty. The Warranty Addendum applies only the NGPI vehicles delivered in the State of Florida and New York.

# WHAT IS NOT COVERED UNDER THE NEW VEHICLE LIMITED WARRANTY?

#### Damage Caused By:

- accidents, collision or objects striking the vehicle (including driving through a car wash)
- theft, vandalism, or riot
- fire or explosion
- using contaminated or improper fuel/fluids
- · customer-applied chemicals or accidental spills
- driving through water deep enough to cause water to be ingested into the engine
- misuse of the vehicle, such a driving over curbs, overloading, racing or using the vehicle as a permanent stationary power source

#### Damage Caused by Alteration or Modification

The New Vehicle Limited Warranty does not cover any damage caused by:

- alterations or modifications of the vehicle, including the body, chassis, electronics or their components, after the vehicle leaves the control of Ford Motor Company
- tampering with the vehicle, tampering with the emissions systems or with the other parts that affect these systems (for example, but not limited to exhaust and intake systems)



 the installation or use of a non-Ford Motor Company part or software (other than a certified emissions part or software) or any part or software (Ford or non-Ford) designed for off-road use only installed after the vehicle leaves the control of Ford Motor Company, if the installed part fails or causes a Ford part to fail. Examples include, but are not limited to lift kits, oversized tires, roll bars, cellular phones, alarm systems, automatic starting systems and performance-enhancing powertrain components or software and performance "chips".

Your vehicle may allow, enable or facilitate the use of certain non-Ford Motor Company software. Ford is not responsible for the functionality of such software. Ford may disallow, discontinue or modify your ability to use such software at any time without prior notification or incurring any warranty or other obligation. Non-Ford Motor Company software may be governed by End User License Agreement or warranty provided by the software provider. For Ford Motor Company software see End User License Agreement found in the Owner Manual.

#### Damage Caused by Use and/or the Environment

The New Vehicle Limited Warranty does not cover surface rust, deterioration and damage of paint, trim, upholstery, and other appearance items that result from use and/or exposure to the elements. You, as the owner, are responsible for these items. Some examples are:

- dings, dents
- cuts, burns, punctures or tears
- road salt
- · tree sap, bird and bee droppings
- windstorm, lightening, hail
- earthquake
- freezing, water or flood
- · stone chips, scratches (some examples are on paint and glass)
- windshield stress cracks. However, limited coverage on windshield stress cracks will be provided for the first 12 months or 12,000 miles (which ever occurs first), even though caused by use and/or exposure to the elements.

#### Maintenance/Wear

The New Vehicle Limited Warranty does not cover: (1) parts and labor needed to maintain the vehicle; and (2) the replacement of parts due to normal wear and tear. You, as the owner, are responsible for these items. See your Owner's Manual. Some examples of maintenance and normal wear are:

oil changes

- clutch linings
  wiper blades\*
- oils, lubricants, other fluids
- oil/air filters
- tire rotation/inflation
- cleaning/polishing
- balancing\*brake pad/lining\*

· wheel alignments and tire

\* Ford will replace or adjust certain maintenance items when necessary, free of charge during a limited period:

- Wiper blade replacements will be provided during the first six months in service, regardless of miles driven.
- Wheel alignments and tire balancing will be provided during the first 12 months or 12,000 miles in service, whichever occurs first.
- Brake pad/lining replacements will be provided during the first 12 months or 18,000 miles in service, whichever occurs first.

#### SYNC Hands-Free Communications and Entertainment System

If your vehicle is equipped with SYNC, the New Vehicle Limited Warranty does not cover repairs under certain conditions, such as failure to provide proper installation environment. The New Vehicle Limited Warranty does not cover repairs of certain damage or loss, such as:

- · Loss of personal recording media, software or data
- Loss, change, or discontinuation of functionality because of:
   system updates to Ford Motor Company software or lack of compatibility with non-Ford Motor Company electronic devices
  - non-Ford Motor Company software, or
  - obsolescence of vehicle software or hardware
  - lack of network coverage or availability
- · Damage caused by:
  - · abnormal use such as insertion of foreign objects, fluid spillage
  - · unauthorized modification to alter functionality or capability
  - computer or internet viruses, bugs, or malware, such as worms, Trojan Horses, cancelbots
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- · installation of unauthorized software, peripherals and attachments
- unauthorized, unapproved and/or incompatible repairs, upgrades and modification
- the defective function or obsolescence of your cellular phone or digital media device (for example, inadequate signal reception by the external antenna, viruses or other software problems)

#### **Tire Wear or Damage**

The New Vehicle Limited Warranty does not cover normal wear or worn out tires. Tires will not be replaced (unless required by a warranty repair) for wear or damage including:

- tire damage from road hazard such as cuts, snags, bruises, bulges, puncture, and impact breaks
- tire damage due to under or over inflation, tire chain use, racing, spinning (as when stuck in snow or mud), improper mounting or dismounting, or tire repair

#### Other Items or Conditions Not Covered

The New Vehicle Limited Warranty does not cover:

- vehicles that have had the odometer disconnected, altered, or inoperative for an extended period of time with the result that the actual mileage cannot be determined
- vehicles that have ever been labeled or branded as dismantled, fire, flood, junk, rebuilt, reconstructed, or salvaged; this will void the New Vehicle Limited Warranty
- vehicles that have been determined to be a total loss by an insurance company; this will void the New Vehicle Limited Warranty
- converted ambulances that are not equipped with the Ford Ambulance Prep Package, see important information about ambulance conversions (page 36)
- Aftermarket parts or components, sometimes installed by Ford Motor Company or an authorized Ford dealership, may not be covered by the New Vehicle Limited Warranty. Any damage caused to Ford components due to the failure of aftermarket parts (other than a certified emissions part) is not covered.

### 4. In addition ...

#### ROADSIDE SERVICE ASSISTANCE (UNITED STATES, PUERTO RICO, AND U.S. VIRGIN ISLANDS)

Your vehicle is covered by the complimentary Ford Roadside Assistance Program (unless you are driving a daily rental unit). Under this program, Ford will cover:

- Towing to the nearest Ford Motor Company dealership, or towing to your selling dealership if within 35 miles of the disablement
- Flat tire change (vehicle must have useable spare)
- Fuel delivery (limited to two occurrences in a 12-month period up to 2 gal. gas, 5 gal. diesel)
- Jump starts
- · Lock-out assistance (replacement key cost is customer responsibility)
- Winch out services: includes pulling a vehicle within 100 feet of a paved or county maintained road. No recoveries.

The Roadside Assistance Program is separate from the New Vehicle Limited Warranty. It begins at the warranty start date and lasts for five years or 60,000 miles (whichever occurs first). If you need towing beyond the five years or 60,000 miles (whichever occurs first) period, Ford can arrange roadside assistance and charge your credit card. If the reason for the vehicle disablement is later found to be covered by another Ford warranty, Ford will provide a refund for the tow charge under the other warranty, through the dealership.

# For emergency roadside assistance, call 1-800-241-3673, 24 hours a day, 365 days a year.

Ford Rent-A-Car (FRAC) and Dealer Daily Rental (DDR) vehicles that must be towed because a covered repair failed during the warranty coverage period, Ford will cover towing to the nearest Ford Motor Company dealership.

Ford Motor Company reserves the right to modify or discontinue Roadside Assistance at any time. Certain restrictions apply to Roadside Assistance benefits. Call 1-800-241-3673 for further details.



Explore 2017 Ford Econoline Cutaway



# Starting at<sup>1</sup> \$30,695

Pricing for May 2, 2017 and ZIP 46514 View all offers (/commercial-trucks/e-series-cutaway/2017/pricing-and-incentives/)

Seating for

2

# Power and Handling

http://www.ford.com/commercial-trucks/e-series-cutaway/2017/models/e350-cutaway-drw/ 5/2/2017

## Power Explore 2017 Ford Econoline Cutaway

## Standard

- 6.8L EFI Triton<sup>®</sup> V10 engine with 6-speed Automatic Transmission
- TorqShift  $^{\scriptscriptstyle (\! 8\!)}$  6-Speed Automatic Overdrive with Tow/Haul Mode
- Transmission Auxiliary oil cooler
- 50-State Emissions System
- Alternator 120-Amp
- Battery Maintenance-free, 72-amp
- Auxiliary Fuel Port
- Fuel Tank 40-gallon
- Modified Vehicle Wiring System and Kit

## Optional

- Alternator 155-Amp Heavy Duty
- · Alternator 225-Amp Extra-Heavy-Duty
- Battery Heavy-Duty 78-Amp
- Battery Dual Heavy-Duty, 78-Amp
- Engine Block Heater
- Fuel Tank 55-gallon
- Integrated Trailer Brake Controller
- 6.2L SFI V8 FFV with 6-speed Auto. Transmission

# Handling

## Standard

- Axle Front, twin I-beam
- Axle Rear, full float

## Optional

Traction Control

# Explore 2017 Ford Econoline Cutaway

#### Standard

- Tires LT225/7Rx16E All Season
- 16-inch x 6-inch White-Painted Steel Wheels
- Delete spare tire and wheel
- Wheels Steel valve stems

#### Optional

• Tires - Spare tire & wheel

Interior Features	$\checkmark$
Exterior Features	$\sim$
Safety	$\checkmark$
Packages	$\checkmark$
Specifications	$\checkmark$
Build & Price	

 $\searrow$ 

 Search Inventory

 Explore 2017 Ford Econoline Cutaway

 Request Quote

 (http://whtttp://whtttp://whtttp://whttp://whtttp://whttp://whtttp://whtttp://

DISCLOSURES  $\checkmark$ 

## Popular

Focus (/cars/focus/2017/) Fiesta (/cars/fiesta/2017/) Mustang (/cars/mustang/2017/) F-150 (/trucks/f150/2017/)



## **Selected Options**

Code	Description
Base Vehicle	
E3F	Base Vehicle Price (E3F)
Packages	
780A	Order Code 780A Includes: - Engine: 6.8L EFI Triton V10 - Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul. - 4.56 Axle Ratio Includes vehicle emission control information label with 72 sq ft frontal area restriction. - GVWR: 11,500 lbs Payload Package - Wheels: 16" x 6" White Painted Steel
Powertrain	
99S	Engine: 6.8L EFI Triton V10
44P	Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul.
X85	<b>4.56 Axle Ratio</b> Includes vehicle emission control information label with 72 sq ft frontal area restriction.
20Y	GVWR: 11,500 lbs Payload Package
Wheels & Tires	
T67	Tires: LT225/75Rx16E BSW AS (Fleet)
	NO LONGER AVAILABLE as standard equipment. Fleet only with valid FIN code.
646	Wheels: 16" x 6" White Painted Steel
Seats & Seat Trim	
21S	Captain's Chair Driver Side Only w/o Trim Includes: - No Seat Trim - Passenger Side Air Bag Delete
Х	No Seat Trim
Other Options	
PAINT	Monotone Paint Application
138WB	138" Wheelbase
63N	Extra Heavy-Duty 225-Amps Alternator
634	Dual Heavy-Duty 78-Amp Batteries Includes: - Heavy-Duty 78-Amp Battery Replaces standard 72-amps heavy-duty battery.

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



## Selected Options (cont'd)

Code	Description
60X	Right Hand Door Delete
	Deletes passenger side A-pillar grab handle, right hand seat belt system and hardware, passenger side air bag, under-seat stowage, passenger side sun visor, passenger side speaker and headliner. Includes: - Exterior Mirror Delete
41H	Engine Block Heater
	Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below.
153	License Plate Bracket
625	Day/Night Interior Rearview Mirror
559	Frame Pucks (Isolators)
	Includes 12 body mounts.
525	Cruise Control
585	Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.
874	4-Speaker Upgrade Package
	Includes 2 installed speakers and 2 boxed speakers.
47Z	Ambulance Prep Package Not Required
	REQUIRED on orders not destined for ambulance use.
54F	Exterior Mirror Delete
18A	High Series Exterior Upgrade Package
	Includes: - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille - Dual Sealed-Beam w/Fixed Lens Headlamps
162	Vinyl Floor Covering
47B	Shuttle Bus Prep Package
	Includes: - High Series Exterior Upgrade Package - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille - Dual Sealed-Beam w/Fixed Lens Headlamps - Engine Block Heater Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below. - Frame Pucks (Isolators) Includes 12 body mounts. - License Plate Bracket - Front Headliner Delete - Front Dome Lamp Delete
57J	Auxiliary Heater Connector Package (LPO)
	Includes rear fan controls.
672	Maximum Front GAWR: 4600 lbs.
942	Daytime Running Lamps (LPO)
Fleet Options	
41X	Engine Console Cover Delete (LPO)

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



## Selected Options (cont'd)

Code	Description
	Fleet only with valid FIN code.
Emissions	
425	50 State Emission System
Interior Colors	
XE_01	Medium Flint
Primary Colors	
YZ_01	Oxford White

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.

#### QUICK REFERENCE: WARRANTY COVERAGE

This chart gives a general summary of your warranty coverage provided by Ford Motor Company under the **New Vehicle Limited Warranty**. Please refer to the description of warranty coverage for more specific information.

For each type of coverage, the chart shows two measures:



years in service
 miles driven

The measure that occurs first determines how long your coverage lasts. For example: Your Bumper to Bumper Coverage lasts for three years unless you drive more than 36,000 miles before three years elapse. In that case, your coverage ends at 36,000 miles.

For more details on coverage, see:

- What is Covered? (pages 8-12)
- What is Not Covered? (pages 12-15)

#### WHAT IS COVERED?

Your NEW VEHICLE LIMITED WARRANTY gives you specific legal rights. You may have other rights that vary from state to state. Under your New Vehicle Limited Warranty if:

- your Ford vehicle is properly operated and maintained, and



- was taken to a Ford dealership for a warranted repair during the warranty period,

then authorized Ford Motor Company dealers will, without charge, repair, replace, or adjust all parts on your vehicle that malfunction or fail during normal use during the applicable coverage period due to a manufacturing defect in factory-supplied materials or factory workmanship.

This warranty does not mean that each Ford vehicle is defect free. Defects may be unintentionally introduced into vehicles during the design and manufacturing processes and such defects could result in the need for repairs. Ford provides the New Vehicle Limited Warranty only to remedy manufacturing defects that result in vehicle part malfunction or failure during the warranty period.

The remedy under this written warranty, and any implied warranty, is limited to repair, replacement, or adjustment of defective parts. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Ford, through its authorized dealers, is willing and able to repair, replace, or adjust defective parts in the prescribed manner. Ford's liability, if any, shall in no event exceed the cost of correcting manufacturing defects as herein provided and upon expiration of this warranty, any such liability shall terminate.

Conditions that are not covered by the New Vehicle Limited Warranty are described on pages 12-15. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford, at the discretion of Ford or the Ford dealership.

Nothing in this warranty should be construed as requiring defective parts to be replaced with parts of a different type or design than the original part, so long as the vehicle functions properly with the replacement part. Moreover, Ford and its authorized dealers are entitled to a reasonable time and a reasonable number of attempts within which to diagnose and repair any defect covered by this warranty.

In certain instances, Ford may authorize repairs at other than Ford dealer facilities.

Two separate warranties apply to tires on your new vehicle. The New Vehicle Limited Warranty covers tire defects in factory supplied material or workmanship for 100% of labor costs and on a pro rata adjustment basis for parts. (See the reimbursement schedule below).

For vehicles within the New Vehicle Limited Warranty time in service and mileage coverage period, defective tires will be replaced on a pro rata adjustment basis according to the following mileage-based Reimbursement Schedule:

MILES DRIVEN	PERCENT OF PARTS COVERED BY FORD
1-12,000	100%
12,001-24,000	60%
24,001-36,000	30%

The tire manufacturer also provides you with a separate tire warranty that may extend beyond the New Vehicle Limited Warranty coverage. You will find the manufacturer's tire warranty with the owner literature supplied with your vehicle. You have the option of having a tire warranty repair performed by the tire manufacturer's authorized service center. If you go to a tire service center for a repair covered by the New Vehicle Limited Warranty, you may be charged a prorated amount for wear or other charges. If so, you should present your paid invoice detailing the nature of the charges to any Ford Motor Company dealership for refund consideration. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford. In certain instances, Ford may authorize repairs at other than Ford dealer facilities. Tire replacements under warranty will be made with the same brand and model as originally equipped with the vehicle unless the same brand and model is no longer available, in which case a tire of the same brand, size, load, speed and tread type will be used. In some circumstances, Ford may authorize another brand and/or model to substitute for the original brand and model, even if still available.

Normal tire wear or damage is not reimbursable. See page 15 for details of what is not covered.

# Extended warranty coverage periods are available for certain vehicle parts and conditions. Specifically,

(1) Your vehicle's Powertrain components are covered for five years or 60,000 miles, whichever occurs first. The extended coverage applies to the **Engine:** all internal lubricated parts, cylinder block, cylinder heads, electrical fuel pump, powertrain control module, engine mounts, flywheel, injection pump, manifold (exhaust and intake), manifold bolts, oil pan, oil pump, seals and gaskets, engine thermostat, engine thermostat housing, timing chain cover, timing chain (gears or belt), turbocharger/supercharger unit, valve covers, water pump;



**Transmission:** all internal parts, clutch cover, seals and gaskets, torque converter, transfer case (including all internal parts), transmission case, transmission mounts; **Front-Wheel Drive:** axle shafts, front bearings, seals and gaskets, universal and constant velocity joints; **Rear-Wheel Drive:** axle shafts, rear bearings, center support bearing, drive axle housing (including all internal parts), drive shaft, retainers, supports, seals and gaskets, universal and constant velocity joints. **Four-Wheel/All-Wheel Drive:** axle shafts, bearings (front and rear), center support bearing, drive shafts, final drive housing (including all internal parts), hubs-automatic front locking (four-wheel drive), locking rings (four-wheel drive), seals and gaskets, universal and constant velocity joints.

(2) Your vehicle's safety belts and air bag Supplemental Restraint System (SRS) are covered for an extended Safety Restraint Coverage Period, which lasts for five years or 60,000 miles, whichever occurs first.

(3) Your vehicle's body sheet metal panels are covered for an extended Corrosion Coverage Period, which lasts for five years, regardless of miles driven. The extended warranty coverage only applies if a body sheet metal panel becomes perforated due to corrosion during normal use due to a manufacturing defect in factory-supplied materials or factory workmanship. If aluminum body panels have corrosion or rust damage, and the damage is not the result of abnormal usage, vehicle accident, customer actions and/or extreme environmental conditions, the corrosion or rust damage repairs are covered for 5 years, unlimited miles. For damage caused by airborne material (environmental fallout) where there is no factory-related defect involved and therefore no warranty – our policy is to provide free repair of paint damage due to the airborne material for 12 months or 12,000 miles, whichever occurs first.

(4) Your vehicle's direct injection diesel engine and certain engine components are covered during the PowerStroke Diesel Engine Coverage Period, which lasts for five years or 100,000 miles, whichever occurs first. The following parts are covered during this extended coverage period: the engine, cylinder block, heads and all internal parts, intake and exhaust manifolds, timing gear, harmonic balancer, valve covers, oil pan and pump, water pump, fuel system (excluding fuel lines, fuel tank and frame mounted fuel conditioning module sometimes referred to as the frame mounted pump/filter/water separator or frame mounted fuel filter/water separator), high pressure lines, gaskets and seals, glow plugs, turbocharger, two-stage turbocharger assembly, turbocharger actuator,

powertrain control module, high pressure fuel injection pump assembly, injectors, injection pressure sensor, fuel rail pressure sensor, exhaust back pressure regulator and sensor, exhaust pressure sensor, manifold pressure sensor, intake air temperature sensor, crankshaft position sensor, camshaft position sensor, accelerator switch.

**NOTE:** Some components may also be covered by the Emissions Warranties. For more information, see pages 17-31.

If you own or lease a 2017-model Next Generation Police Interceptor Vehicle (NGPI), refer to the Warranty Addendum Card that was given to you when you took delivery of your vehicle for further explanation of Amendments to the New Vehicle Limited Warranty. The Warranty Addendum applies only the NGPI vehicles delivered in the State of Florida and New York.

# WHAT IS NOT COVERED UNDER THE NEW VEHICLE LIMITED WARRANTY?

#### Damage Caused By:

- accidents, collision or objects striking the vehicle (including driving through a car wash)
- theft, vandalism, or riot
- fire or explosion
- using contaminated or improper fuel/fluids
- · customer-applied chemicals or accidental spills
- driving through water deep enough to cause water to be ingested into the engine
- misuse of the vehicle, such a driving over curbs, overloading, racing or using the vehicle as a permanent stationary power source

#### Damage Caused by Alteration or Modification

The New Vehicle Limited Warranty does not cover any damage caused by:

- alterations or modifications of the vehicle, including the body, chassis, electronics or their components, after the vehicle leaves the control of Ford Motor Company
- tampering with the vehicle, tampering with the emissions systems or with the other parts that affect these systems (for example, but not limited to exhaust and intake systems)



 the installation or use of a non-Ford Motor Company part or software (other than a certified emissions part or software) or any part or software (Ford or non-Ford) designed for off-road use only installed after the vehicle leaves the control of Ford Motor Company, if the installed part fails or causes a Ford part to fail. Examples include, but are not limited to lift kits, oversized tires, roll bars, cellular phones, alarm systems, automatic starting systems and performance-enhancing powertrain components or software and performance "chips".

Your vehicle may allow, enable or facilitate the use of certain non-Ford Motor Company software. Ford is not responsible for the functionality of such software. Ford may disallow, discontinue or modify your ability to use such software at any time without prior notification or incurring any warranty or other obligation. Non-Ford Motor Company software may be governed by End User License Agreement or warranty provided by the software provider. For Ford Motor Company software see End User License Agreement found in the Owner Manual.

#### Damage Caused by Use and/or the Environment

The New Vehicle Limited Warranty does not cover surface rust, deterioration and damage of paint, trim, upholstery, and other appearance items that result from use and/or exposure to the elements. You, as the owner, are responsible for these items. Some examples are:

- dings, dents
- cuts, burns, punctures or tears
- road salt
- · tree sap, bird and bee droppings
- windstorm, lightening, hail
- earthquake
- freezing, water or flood
- · stone chips, scratches (some examples are on paint and glass)
- windshield stress cracks. However, limited coverage on windshield stress cracks will be provided for the first 12 months or 12,000 miles (which ever occurs first), even though caused by use and/or exposure to the elements.

#### Maintenance/Wear

The New Vehicle Limited Warranty does not cover: (1) parts and labor needed to maintain the vehicle; and (2) the replacement of parts due to normal wear and tear. You, as the owner, are responsible for these items. See your Owner's Manual. Some examples of maintenance and normal wear are:

oil changes

- clutch linings
  wiper blades\*
- oils, lubricants, other fluids
- oil/air filters
- tire rotation/inflation
- cleaning/polishing
- balancing\*brake pad/lining\*

· wheel alignments and tire

\* Ford will replace or adjust certain maintenance items when necessary, free of charge during a limited period:

- Wiper blade replacements will be provided during the first six months in service, regardless of miles driven.
- Wheel alignments and tire balancing will be provided during the first 12 months or 12,000 miles in service, whichever occurs first.
- Brake pad/lining replacements will be provided during the first 12 months or 18,000 miles in service, whichever occurs first.

#### SYNC Hands-Free Communications and Entertainment System

If your vehicle is equipped with SYNC, the New Vehicle Limited Warranty does not cover repairs under certain conditions, such as failure to provide proper installation environment. The New Vehicle Limited Warranty does not cover repairs of certain damage or loss, such as:

- · Loss of personal recording media, software or data
- Loss, change, or discontinuation of functionality because of:
   system updates to Ford Motor Company software or lack of compatibility with non-Ford Motor Company electronic devices
  - non-Ford Motor Company software, or
  - obsolescence of vehicle software or hardware
  - lack of network coverage or availability
- · Damage caused by:
  - · abnormal use such as insertion of foreign objects, fluid spillage
  - · unauthorized modification to alter functionality or capability
  - computer or internet viruses, bugs, or malware, such as worms, Trojan Horses, cancelbots
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- · installation of unauthorized software, peripherals and attachments
- unauthorized, unapproved and/or incompatible repairs, upgrades and modification
- the defective function or obsolescence of your cellular phone or digital media device (for example, inadequate signal reception by the external antenna, viruses or other software problems)

#### **Tire Wear or Damage**

The New Vehicle Limited Warranty does not cover normal wear or worn out tires. Tires will not be replaced (unless required by a warranty repair) for wear or damage including:

- tire damage from road hazard such as cuts, snags, bruises, bulges, puncture, and impact breaks
- tire damage due to under or over inflation, tire chain use, racing, spinning (as when stuck in snow or mud), improper mounting or dismounting, or tire repair

#### Other Items or Conditions Not Covered

The New Vehicle Limited Warranty does not cover:

- vehicles that have had the odometer disconnected, altered, or inoperative for an extended period of time with the result that the actual mileage cannot be determined
- vehicles that have ever been labeled or branded as dismantled, fire, flood, junk, rebuilt, reconstructed, or salvaged; this will void the New Vehicle Limited Warranty
- vehicles that have been determined to be a total loss by an insurance company; this will void the New Vehicle Limited Warranty
- converted ambulances that are not equipped with the Ford Ambulance Prep Package, see important information about ambulance conversions (page 36)
- Aftermarket parts or components, sometimes installed by Ford Motor Company or an authorized Ford dealership, may not be covered by the New Vehicle Limited Warranty. Any damage caused to Ford components due to the failure of aftermarket parts (other than a certified emissions part) is not covered.

### 4. In addition ...

#### ROADSIDE SERVICE ASSISTANCE (UNITED STATES, PUERTO RICO, AND U.S. VIRGIN ISLANDS)

Your vehicle is covered by the complimentary Ford Roadside Assistance Program (unless you are driving a daily rental unit). Under this program, Ford will cover:

- Towing to the nearest Ford Motor Company dealership, or towing to your selling dealership if within 35 miles of the disablement
- Flat tire change (vehicle must have useable spare)
- Fuel delivery (limited to two occurrences in a 12-month period up to 2 gal. gas, 5 gal. diesel)
- Jump starts
- · Lock-out assistance (replacement key cost is customer responsibility)
- Winch out services: includes pulling a vehicle within 100 feet of a paved or county maintained road. No recoveries.

The Roadside Assistance Program is separate from the New Vehicle Limited Warranty. It begins at the warranty start date and lasts for five years or 60,000 miles (whichever occurs first). If you need towing beyond the five years or 60,000 miles (whichever occurs first) period, Ford can arrange roadside assistance and charge your credit card. If the reason for the vehicle disablement is later found to be covered by another Ford warranty, Ford will provide a refund for the tow charge under the other warranty, through the dealership.

# For emergency roadside assistance, call 1-800-241-3673, 24 hours a day, 365 days a year.

Ford Rent-A-Car (FRAC) and Dealer Daily Rental (DDR) vehicles that must be towed because a covered repair failed during the warranty coverage period, Ford will cover towing to the nearest Ford Motor Company dealership.

Ford Motor Company reserves the right to modify or discontinue Roadside Assistance at any time. Certain restrictions apply to Roadside Assistance benefits. Call 1-800-241-3673 for further details.





eSourceBook Your source for Ford product info

2017 E-Series Cutaway/Stripped

Chassis

## Specs

Use the menu on the left — or the Menu button on your smartphone — to select and view information related to wheels, exterior colors and interior trim. Key product specifications include vehicle dimensions and capacities, detailed engine information, transmission gear ratios and more.



#### 2017 E-Series Cutaway/Stripped Chassis

### Wheels

Specs

Wheel	Order	Cutaway		Stripped Chassis	
Wheet	Code	E-350	E-450	E-350	E-450
16" Aluminum with Chrome Center Hubcaps (16" x 7") (SRW only)	64F	Optional			
16" Painted Gray Steel (16" x 7") (SRW only)	642	Standard			
16" Painted White Steel (16" x 6") (DRW only)	646	Standard	Standard	Standard	Standard
16" Painted White Steel (16" x 7") (SRW only)	647	Optional			
16" Sport Wheel Cover (SRW only)	614	Optional <sup>(1)</sup>			

(1) Not available with aluminum wheels (64F) and 16" x 7" painted white steel wheels (647).

NOTE: For product features, please see Models & Packages and/or the Dealer Ordering Guide for availability.

#### 2017 E-Series Cutaway/Stripped Color and Trim Availability

Chassis

Specs

		Commercial	Motorhome Package	
	Interior and Seat Color	Medium Flint	Medium Flint	Medium Pebble
Paint Name	Order Code	AE/CE/ME/XE	AE/CE/ME/XE	MW/XW
Blue Jeans — New	NI	-	-	•
Caribou <sup>(1)</sup> — New	Н5	-	-	•
Green Gem <sup>(1)</sup> — New	W6	-	-	•
Ingot Silver <sup>(1)</sup>	UX	-	-	•
Magnetic <sup>(1)</sup> — New	J7	-	-	•
Oxford White	YZ	-	-	-
Race Red — New	PQ	-	-	•
School Bus Yellow <sup>(2)</sup>	Bl	-	-	-
Shadow Black — New	G1	-	-	-

(1) Metallic paint.

(2) Required with School Bus Prep Package. Available on Fleet orders only without School Bus Prep Package. Not available with Multi-function School Activity Bus (MFSAB) Package.

### Interior Trim

#### 2017 E-Series Cutaway/Stripped Chassis

Specs

	Interior and Seat Color Code			
Trim Type	Medium Flint Medium Pebble			
Commercial and Motorhome Prep Package				
Vinyl Buckets	AE			
Cloth Buckets	CE			
Cloth Captain's Chairs	ME	MW		
Seats Not Included	XE	xw		

## Configurations

Specs



Style	Model	Wheelbase (in.)
Cutaway	E-350 SRW	138.0 158.0
	E-350 DRW	138.0 158.0 176.0
	E-450 DRW	158.0 176.0
Stripped Chassis	E-350 DRW	138.0 158.0 176.0
	E-450 DRW	158.0 176.0

Body Dir	nensions —	E-350/E-450
Cutaway	/	

Specs > Dimensions



Series		E-350			E-4	50
		Cutaway			Cutaway	
Model		SRW/DRW	SRW/DRW	DRW	DRW	DRW
Code	Description	1	^	A	A	
Α	Cab Length	92.5	92.5	92.5	92.5	92.5
В	Cab Rear to Rear Axle	80.0	100.0	118.0	100.0	118.0
D	Top of Frame to Top of Cab	54.4	54.4	54.4	58.4	58.4
E	Rear Overhang	68.5	68.5	50.5	68.5	50.5
F	Load Height (Loaded)	25.9/26.2	25.9/26.2	26.2	26.0	26.0
G	Front Overhang	34.6	34.6	34.6	34.6	34.6
н	Wheelbase	138.0	158.0	176.0	158.0	176.0
I	Overall Length	241.1	261.1	261.1	261.1	261.1
J	Cab Height (Curb)	80.4/80.3	80.3/80.2	80.1	80.0	80.0
L	Front Track	69.4	69.4	69.4	69.4	69.4
М	Rear Track Dual — Rear	72.1/75.4	72.1/75.4	75.4	77.7	77.7

NOTE: Front jacking point – located under the front radius arm rearward of the sloped section (use flat space provided).

**NOTE:** Rear jacking point — located under rear axle between U-bolts.

## Interior Dimensions — E-350/E-450 Cutaway

Specs > Dimensions

Series		E-450			
Medal	Cutaway			Cutaway	
Model	SRW/DRW	SRW/DRW	DRW	DRW	DRW
Description					
Head Room (in.)	42.0	42.0	42.0	42.0	42.0
Max. Leg Room (in.)	42.1	42.1	42.1	42.1	42.1
Hip Room (in.)	65.6	65.6	65.6	65.6	65.6
Shoulder Room (in.)	68.1	68.1	68.1	68.1	68.1

Body Dimensions —	E-350/E-450
Stripped Chassis	

Specs > Dimensions



Model		Stripped Chassis		
		E-350	E-350/E-450	E-350/E-450
Series		DRW	DRW	DRW
Code	Description	<u></u>	-	0.
Α	Frame to Front Axle	26.2	26.2	26.2
В	Wheelbase	138.0	158.0	176.0
с	Rear Overhang	68.5	68.5	50.5
D	Load Height (Loaded)	26.2	26.2/26.0	26.2/26.0
E	Overall Length	232.7	252.7	252.7
F	Height at Top of Steering Wheel (Loaded)	71.9	71.9/71.7	71.8/71.7
G	Rear Axle Clearance, Loaded	7.0	7.0	7.0
н	Front Track	69.4	69.4	69.4
I	Rear Track (SRW)	-	-	_
I	Rear Track (DRW)	75.4	75.4/77.7	75.4/77.7

NOTE: Front jacking point – located under the front radius arm rearward of the sloped section (use flat space provided).

**NOTE:** Rear jacking point — located under rear axle between U-bolts.

# GVWR/Payload/Spring & GAWR/Base Curb Weight

#### 2017 E-Series Cutaway/Stripped Chassis

Specs

Model	WB	Engine/ Trans.	Maximum GVWR (lbs.)	Maximum Payload (lbs.)	Spring/GAWR (lbs.) <sup>(1)</sup>		Base Curb Weight (lbs.)		
	(in.)				Front Range MinMax.	Rear	Front	Rear	Total
E-350 Cutaway	138	6.8L/6R140	10,050	5180	4200	6084	2923	1941	4864
	SRW	6.2L/6R140	10,050	5230	4050	6084	2891	1921	4812
	138	6.8L/6R140	11,500	6364	4200-4600	7800	2949	2187	5136
	DRW	6.2L/6R140	11,500	6420	4050-4600	7800	2920	2159	5079
	158	6.8L/6R140	10,050	5120	4200	6084	3022	1906	4928
	SRW	6.2L/6R140	10,050	5190	4200	6084	2915	1937	4852
E-350	158	6.8L/6R140	11,500	6280	4200-4600	7800	3056	2158	5214
Cutaway	DRW	6.2L/6R140	11,500	6370	4050-4600	7800	2997	2130	5127
		6.8L/6R140	12,500	7340	4600-5000	8500	3041	2114	5155
		6.2L/6R140	12,500	7330	4600-5000	8500	3016	2147	5163
	176	6.8L/6R140	12,500	7260	4600-5000	8500	3133	2104	5237
	DRW	6.2L/6R140	12,500	7310	4600-5000	8500	3093	2089	5182
E-350 Stripped Chassis	138	6.8L/6R140	11,500	6870	4400-4600	7800	2421	2204	4625
	DRW	6.2L/6R140	11,500	6979	4200-4600	7800	2343	2178	4521
	158	6.8L/6R140	12,500	7820	4600-5000	8500	2480	2198	4678
	DRW	6.2L/6R140	12,500	7910	4600-5000	8500	2406	2175	4581
	176	6.8L/6R140	12,500	7760	4600-5000	8500	2535	2197	4732
	DRW	6.2L/6R140	12,500	7860	4600-5000	8500	2462	2178	4640
E-450	158	6.8L/6R140	14,200	8750	4600	9600	3042	2404	5446
Cutaway	DRW	6.8L/6R140	14,500	9090	5000	9600	3021	2386	5407
		6.2L/6R140	14,000	8630	4600-5000	9600	3008	2361	5369
	176	6.8L/6R140	14,200	8720	4600	9600	3128	2349	5477
	DRW	6.8L/6R140	14,500	9060	5000	9600	3105	2330	5435
		6.2L/6R140	14,000	8610	4600-5000	9600	3078	2305	5383
E-450	158	6.8L/6R140	14,500	9690	5000	9600	2531	2274	4805
Stripped Chassis	DRW	6.2L/6R140	14,000	9290	4600-5000	9600	2456	2254	4710
	176	6.8L/6R140	14,500	9640	5000	9600	2566	2292	4858

1								L	
	DRW								
		6.2L/6R140	14,000	9230	4600-5000	9600	2490	2272	4762

(1) Gross Axle Weight Rating is determined by the rated capacity of the minimum component of the axle system (axle, wheels, tires) of a specific vehicle. Front and rear GAWRs will, in all cases, sum to a number equal to or greater than the GVWR for the particular vehicle. Maximum loaded vehicle (including passengers, equipment and payload) cannot exceed the GVWR or GAWR (front or rear).

NOTE: Refer to Standard Equipment for Standard Powertrain/Chassis Equipment Specifications.

## Cutaway — Actual Regular Production Option Content Weight

Specs > Option Content Weight

Option Weight	(Front/Total) (lbs.)
REAR DIFFERENTIAL:	<u>^</u>
Limited-slip Rear Axle (E-350 SRW)	(0/7)
Limited-slip Rear Axle (E-350/E-450 DRW)	(0/4)
TIRES (Add tire weight even if specified as standard equipment):	^
LT225/75R16E (DRW)	(0/0)
LT245/75R16E (SRW)	(0/0)
TIRE EQUIPMENT:	^
Spare Tire (LT225/75R16E)	(-5/37)
Spare Tire (LT245/75R16E)	(-6/43)
Spare Wheel	(-5/35)
PACKAGES:	<u>^</u>
Auxiliary Heater Prep Package	(5/9)
Heater & A/C Prep Package	(18/21)
Heater & A/C Prep Package w/Rear Controls	(17/22)
Insulation Package	(1/1)
Power Windows/Locks Group	(9/13)
Seat Prep Package — Driver Only	(-27/-44)
Seat Prep Package — Driver and Passenger	(-57/-95)
Trailer Tow (Class I)	(1/2)
Upgraded Trailer Tow (Class I)	(1/2)
OPTIONS:	°
A/C – Delete	(-51/-49)
Airbag, Passenger Delete	(-9/-11)
Airbag, Passenger Cutoff Switch	(1/1)
Alternator, Extra-heavy-duty	(3/3)
Battery, Heavy-duty/Auxiliary	(29/67)
Bumper, Chrome Front	(5/4)
Captain's Chairs, without Trim	(-3/-5)
Carpeting – Front	(5/8)

Console, Engine Cover Delete	(-9/-11)
Cruise Control	(2/2)
Door Delete, RH (138" WB)	(-58/-82)
Door Delete, RH (158" WB)	(-61/-82)
Door Delete, RH (176" WB)	(-63/-82)
Floor Covering Delete	(-6/-9)
Frame Pucks	(3/6)
Fuel Tank, 40-gallon	(18/-107)
Fuel Tank, 55-gallon	(-18/107)
Headlamps, Halogen Aerodynamic	(4/3)
Headliner Delete	(-2/-4)
Heater, Engine Block	(1/1)
Jack, 2-ton Mechanical (SRW)	(-1/6)
Jack, 4-ton Hydraulic (DRW)	(-2/13)
License Plate Bracket, Front	(1/1)
Mirror, Exterior Delete	(0/0)
Mirror, Interior Day/Night	(1/1)
Mirrors, Trailer Tow — Manual	(16/20)
Mirrors, Trailer Tow — Power	(17/21)
Radio, Premium AM/FM Stereo/CD	(1/1)
Radio, Delete	(-3/-4)
Rear View Camera	(1/1)
Remote Keyless Entry System	(1/1)
Running Boards	(13/27)
Seat, Power Driver's	(6/10)
Seat Delete, Passenger	(-47/-77)
Spacers, Alternate Pattern Frame (138" WB)	(-2/165)
Spacers, Alternate Pattern Frame (158" WB)	(25/165)
Spacers, Alternate Pattern Frame (176" WB)	(42/165)
Spacers, Standard Pattern Frame, Not Included (138" WB)	(8/129)
Spacers, Standard Pattern Frame, Not Included (158" WB)	(8/129)
Spacers, Standard Pattern Frame, Not Included (176" WB)	(44/147)
Speakers, 4	(3/4)

Sun Visor Delete	(-1/-2)
Trailer Brake Controller	(2/2)
Upfitter Switch Pack	(2/2)
Wheels, 16" x 7" Forged Aluminum	(-26/-52)
Wheels, Aluminum Hubcaps	(2/4)
Wheels, Sport Wheel Covers	(2/4)
Line A) Total Actual Option Content Weight: (Front/Total)	/

# GATEWAYA

# High Idle & Lift Interlock With Programmable Load Control

# FEATURES & BENEFITS

- Fully compliant FMVSS 403/404 wheelchair lift interlock
- Dynamic Load Response (DLR) technology– monitors engine RPM & maintains speed at all load conditions
- Charge protect on gas & diesel engines
- Automatic engagement when on A/C command is detected
- Heater Boost for improved cabin heat
   on diesel engines
- Dash-mounted control panel has LEDs to display electrical system, Automatic Fast Idle (AFIS) & Intelligent Lift Interlock System (ILIS) status
- Simple, single-point "Plug & Play" connection.. Super fast installation & No cutting of factory wires
- Solid state microprocessor controller.. No additional solenoids, cables, or brackets
- Capable of providing "Real-Time" chassis data via the CAN Bus
- Diagnostic trouble codes can be retrieved for "hard" faults & intermittent faults in non-volatile memory
- Intermittent Fault Filter (IFF)® technology filters out all erroneous changes in sensor signals
- Multiple & configurable chassis electrical load inputs/outputs



Gateway<sup>AI</sup> Module

# WHY GATEWAY<sup>AI</sup>?

- Gateway<sup>AI</sup> is a fully Compliant FMVSS 403/404 wheelchair interlock & fast idle system all in one, easy to install module!
- Fast Idle- monitors OEM sensor inputs from transmission, engine, charging system, air conditioner, ambient air temperature, & vehicle speed to determine if high idle is needed. Automatically maintained when loads are added or removed such as A/C or wheelchair lift.
- Lift Interlock Controls shift interlock by processing signals from transmission, parking brake and lift door to electronically lock down the vehicles ability to move in unsafe conditions









An ISO 9001:2008 Registered Manufacturer www.InterMotive.net 800-969-6080
# GATEWAY

# Gateway<sup>AI</sup> Options

# THE GATEWAY<sup>AI</sup> PRODUCT FAMILY

## Gateway with BrakeMax Controller

- All of the features of the Gateway/ ILIS plus a controller for Ford & GM vehicles with Tow/ Haul mode. This controller engages the Tow/Haul mode on start-up of the vehicle thereby providing the fleet with maximum "Tow/ Haul" mode benefits without having the driver think about it.
- Gateway with DuraTrans
  - All of the features of the Gateway/ ٠ ILIS plus a controller for Ford & GM vehicles with an Overdrive button. Overdrive is disabled until the vehicle speed reaches 55 MPH. Overdrive will not be disabled until the vehicle speed drops below 30MPH

## Gateway with Merlin

 All of the features of Gateway/ILIS plus the ability of the Merlin Multiplex System to use real-time chassis data to operate coach loads

## Azure Option

ILIS interlock functions for use on an ٠ Azure hybrid electric vehicle



Standard Gateway<sup>AI</sup> LED Panel



## Standard Gateway<sup>AI</sup> Door Ajar LED Panel



## Interlock Only LED Panel



Interlock Only Door Ajar LED Panel

# **SPECIFICATIONS**

**Physical Specifications:** Dimensions: Weight: Operating Temperature: 40°C to 85°C

2.0"W x 4.0"L x 0.9"H 14 lbs

#### **Electrical Specifications** Power Input:

Lift Enable:

+8 to 16 Vdc @ 1 amps for module control +8 to 16 Vdc @ 8 amps for lift enable +12v @ 8 amps Programmable Outputs: Ground @ 0.5 amps each

US Patent No's. 6,594,565 / 6,965,819 / 7,274,980







### LIMITED WARRANTY

#### WARRANTY PERIOD

InterMotive warrants the product for the period of <u>one year</u> from the date the product was shipped from InterMotive (if not registered) or <u>two years</u> from the in-service date (if the warranty registration is completed on-line) for products that fail to function properly under normal use because of a manufacturing defect when installed and operated according to the manufacturer's instructions. The product will be repaired or replaced with a comparable product without charge.

- Diagnostics A service facility diagnosing, installing, and/or repairing a product must follow the proper InterMotive
  procedures/documents reference www.intermotive.net or call 530-823-1048.
- Labor Reimbursement Contact InterMotive prior to commencing diagnostic/repair for information on allowable labor reimbursements.
- Return Goods Authorization The customer must contact InterMotive with the product serial number and obtain an RGA number prior to shipping the product to InterMotive.
- **Return Packaging**. The part being returned must have the RGA number and a detailed description of the symptom(s) or issue(s) the product is exhibiting attached to it. Packages received without an RGA number written on the outside will be refused delivery and returned to the customer at their expense.
- Shipping Shipping is the initial responsibility of the customer. If the product is determined to be warrantable and is repaired or replaced, InterMotive will pay for shipping to and from the repairing facility for the repaired/replaced product via ground shipping within the U. S. and Canada. If the product does not qualify for a warranty repair or replacement, the customer is responsible for return shipping costs.

#### **LIMITATION ON LIABILITY**

InterMotive will not be liable for personal injury, loss or damage to property or any incidental or consequential loss or expense from property damage due directly or indirectly from the use or installation of this product.



13395 New Airport Rd Suite A, Auburn, CA 95602 Phone: (530) 823-1048 Fax: (530) 823-1516 www.intermotive.net email – customerservice@intermotive.net

#### QUICK REFERENCE: WARRANTY COVERAGE

This chart gives a general summary of your warranty coverage provided by Ford Motor Company under the **New Vehicle Limited Warranty**. Please refer to the description of warranty coverage for more specific information.

For each type of coverage, the chart shows two measures:



years in service
 miles driven

The measure that occurs first determines how long your coverage lasts. For example: Your Bumper to Bumper Coverage lasts for three years unless you drive more than 36,000 miles before three years elapse. In that case, your coverage ends at 36,000 miles.

For more details on coverage, see:

- What is Covered? (pages 8-12)
- What is Not Covered? (pages 12-15)

#### WHAT IS COVERED?

Your NEW VEHICLE LIMITED WARRANTY gives you specific legal rights. You may have other rights that vary from state to state. Under your New Vehicle Limited Warranty if:

- your Ford vehicle is properly operated and maintained, and



- was taken to a Ford dealership for a warranted repair during the warranty period,

then authorized Ford Motor Company dealers will, without charge, repair, replace, or adjust all parts on your vehicle that malfunction or fail during normal use during the applicable coverage period due to a manufacturing defect in factory-supplied materials or factory workmanship.

This warranty does not mean that each Ford vehicle is defect free. Defects may be unintentionally introduced into vehicles during the design and manufacturing processes and such defects could result in the need for repairs. Ford provides the New Vehicle Limited Warranty only to remedy manufacturing defects that result in vehicle part malfunction or failure during the warranty period.

The remedy under this written warranty, and any implied warranty, is limited to repair, replacement, or adjustment of defective parts. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Ford, through its authorized dealers, is willing and able to repair, replace, or adjust defective parts in the prescribed manner. Ford's liability, if any, shall in no event exceed the cost of correcting manufacturing defects as herein provided and upon expiration of this warranty, any such liability shall terminate.

Conditions that are not covered by the New Vehicle Limited Warranty are described on pages 12-15. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford, at the discretion of Ford or the Ford dealership.

Nothing in this warranty should be construed as requiring defective parts to be replaced with parts of a different type or design than the original part, so long as the vehicle functions properly with the replacement part. Moreover, Ford and its authorized dealers are entitled to a reasonable time and a reasonable number of attempts within which to diagnose and repair any defect covered by this warranty.

In certain instances, Ford may authorize repairs at other than Ford dealer facilities.

Two separate warranties apply to tires on your new vehicle. The New Vehicle Limited Warranty covers tire defects in factory supplied material or workmanship for 100% of labor costs and on a pro rata adjustment basis for parts. (See the reimbursement schedule below).

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For vehicles within the New Vehicle Limited Warranty time in service and mileage coverage period, defective tires will be replaced on a pro rata adjustment basis according to the following mileage-based Reimbursement Schedule:

MILES DRIVEN	PERCENT OF PARTS COVERED BY FORD
1-12,000	100%
12,001-24,000	60%
24,001-36,000	30%

The tire manufacturer also provides you with a separate tire warranty that may extend beyond the New Vehicle Limited Warranty coverage. You will find the manufacturer's tire warranty with the owner literature supplied with your vehicle. You have the option of having a tire warranty repair performed by the tire manufacturer's authorized service center. If you go to a tire service center for a repair covered by the New Vehicle Limited Warranty, you may be charged a prorated amount for wear or other charges. If so, you should present your paid invoice detailing the nature of the charges to any Ford Motor Company dealership for refund consideration. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford. In certain instances, Ford may authorize repairs at other than Ford dealer facilities. Tire replacements under warranty will be made with the same brand and model as originally equipped with the vehicle unless the same brand and model is no longer available, in which case a tire of the same brand, size, load, speed and tread type will be used. In some circumstances, Ford may authorize another brand and/or model to substitute for the original brand and model, even if still available.

Normal tire wear or damage is not reimbursable. See page 15 for details of what is not covered.

# Extended warranty coverage periods are available for certain vehicle parts and conditions. Specifically,

(1) Your vehicle's Powertrain components are covered for five years or 60,000 miles, whichever occurs first. The extended coverage applies to the **Engine:** all internal lubricated parts, cylinder block, cylinder heads, electrical fuel pump, powertrain control module, engine mounts, flywheel, injection pump, manifold (exhaust and intake), manifold bolts, oil pan, oil pump, seals and gaskets, engine thermostat, engine thermostat housing, timing chain cover, timing chain (gears or belt), turbocharger/supercharger unit, valve covers, water pump;



**Transmission:** all internal parts, clutch cover, seals and gaskets, torque converter, transfer case (including all internal parts), transmission case, transmission mounts; **Front-Wheel Drive:** axle shafts, front bearings, seals and gaskets, universal and constant velocity joints; **Rear-Wheel Drive:** axle shafts, rear bearings, center support bearing, drive axle housing (including all internal parts), drive shaft, retainers, supports, seals and gaskets, universal and constant velocity joints. **Four-Wheel/All-Wheel Drive:** axle shafts, bearings (front and rear), center support bearing, drive shafts, final drive housing (including all internal parts), hubs-automatic front locking (four-wheel drive), locking rings (four-wheel drive), seals and gaskets, universal and constant velocity joints.

(2) Your vehicle's safety belts and air bag Supplemental Restraint System (SRS) are covered for an extended Safety Restraint Coverage Period, which lasts for five years or 60,000 miles, whichever occurs first.

(3) Your vehicle's body sheet metal panels are covered for an extended Corrosion Coverage Period, which lasts for five years, regardless of miles driven. The extended warranty coverage only applies if a body sheet metal panel becomes perforated due to corrosion during normal use due to a manufacturing defect in factory-supplied materials or factory workmanship. If aluminum body panels have corrosion or rust damage, and the damage is not the result of abnormal usage, vehicle accident, customer actions and/or extreme environmental conditions, the corrosion or rust damage repairs are covered for 5 years, unlimited miles. For damage caused by airborne material (environmental fallout) where there is no factory-related defect involved and therefore no warranty – our policy is to provide free repair of paint damage due to the airborne material for 12 months or 12,000 miles, whichever occurs first.

(4) Your vehicle's direct injection diesel engine and certain engine components are covered during the PowerStroke Diesel Engine Coverage Period, which lasts for five years or 100,000 miles, whichever occurs first. The following parts are covered during this extended coverage period: the engine, cylinder block, heads and all internal parts, intake and exhaust manifolds, timing gear, harmonic balancer, valve covers, oil pan and pump, water pump, fuel system (excluding fuel lines, fuel tank and frame mounted fuel conditioning module sometimes referred to as the frame mounted pump/filter/water separator or frame mounted fuel filter/water separator), high pressure lines, gaskets and seals, glow plugs, turbocharger, two-stage turbocharger assembly, turbocharger actuator,

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powertrain control module, high pressure fuel injection pump assembly, injectors, injection pressure sensor, fuel rail pressure sensor, exhaust back pressure regulator and sensor, exhaust pressure sensor, manifold pressure sensor, intake air temperature sensor, crankshaft position sensor, camshaft position sensor, accelerator switch.

**NOTE:** Some components may also be covered by the Emissions Warranties. For more information, see pages 17-31.

If you own or lease a 2017-model Next Generation Police Interceptor Vehicle (NGPI), refer to the Warranty Addendum Card that was given to you when you took delivery of your vehicle for further explanation of Amendments to the New Vehicle Limited Warranty. The Warranty Addendum applies only the NGPI vehicles delivered in the State of Florida and New York.

# WHAT IS NOT COVERED UNDER THE NEW VEHICLE LIMITED WARRANTY?

#### Damage Caused By:

- accidents, collision or objects striking the vehicle (including driving through a car wash)
- theft, vandalism, or riot
- fire or explosion
- using contaminated or improper fuel/fluids
- · customer-applied chemicals or accidental spills
- driving through water deep enough to cause water to be ingested into the engine
- misuse of the vehicle, such a driving over curbs, overloading, racing or using the vehicle as a permanent stationary power source

#### Damage Caused by Alteration or Modification

The New Vehicle Limited Warranty does not cover any damage caused by:

- alterations or modifications of the vehicle, including the body, chassis, electronics or their components, after the vehicle leaves the control of Ford Motor Company
- tampering with the vehicle, tampering with the emissions systems or with the other parts that affect these systems (for example, but not limited to exhaust and intake systems)



 the installation or use of a non-Ford Motor Company part or software (other than a certified emissions part or software) or any part or software (Ford or non-Ford) designed for off-road use only installed after the vehicle leaves the control of Ford Motor Company, if the installed part fails or causes a Ford part to fail. Examples include, but are not limited to lift kits, oversized tires, roll bars, cellular phones, alarm systems, automatic starting systems and performance-enhancing powertrain components or software and performance "chips".

Your vehicle may allow, enable or facilitate the use of certain non-Ford Motor Company software. Ford is not responsible for the functionality of such software. Ford may disallow, discontinue or modify your ability to use such software at any time without prior notification or incurring any warranty or other obligation. Non-Ford Motor Company software may be governed by End User License Agreement or warranty provided by the software provider. For Ford Motor Company software see End User License Agreement found in the Owner Manual.

#### Damage Caused by Use and/or the Environment

The New Vehicle Limited Warranty does not cover surface rust, deterioration and damage of paint, trim, upholstery, and other appearance items that result from use and/or exposure to the elements. You, as the owner, are responsible for these items. Some examples are:

- dings, dents
- cuts, burns, punctures or tears
- road salt
- · tree sap, bird and bee droppings
- windstorm, lightening, hail
- earthquake
- freezing, water or flood
- · stone chips, scratches (some examples are on paint and glass)
- windshield stress cracks. However, limited coverage on windshield stress cracks will be provided for the first 12 months or 12,000 miles (which ever occurs first), even though caused by use and/or exposure to the elements.

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#### Maintenance/Wear

The New Vehicle Limited Warranty does not cover: (1) parts and labor needed to maintain the vehicle; and (2) the replacement of parts due to normal wear and tear. You, as the owner, are responsible for these items. See your Owner's Manual. Some examples of maintenance and normal wear are:

oil changes

- clutch linings
  wiper blades\*
- oils, lubricants, other fluids
- oil/air filters
- tire rotation/inflation
- cleaning/polishing
- balancing\*brake pad/lining\*

· wheel alignments and tire

\* Ford will replace or adjust certain maintenance items when necessary, free of charge during a limited period:

- Wiper blade replacements will be provided during the first six months in service, regardless of miles driven.
- Wheel alignments and tire balancing will be provided during the first 12 months or 12,000 miles in service, whichever occurs first.
- Brake pad/lining replacements will be provided during the first 12 months or 18,000 miles in service, whichever occurs first.

#### SYNC Hands-Free Communications and Entertainment System

If your vehicle is equipped with SYNC, the New Vehicle Limited Warranty does not cover repairs under certain conditions, such as failure to provide proper installation environment. The New Vehicle Limited Warranty does not cover repairs of certain damage or loss, such as:

- · Loss of personal recording media, software or data
- Loss, change, or discontinuation of functionality because of:
   system updates to Ford Motor Company software or lack of compatibility with non-Ford Motor Company electronic devices
  - non-Ford Motor Company software, or
  - obsolescence of vehicle software or hardware
  - lack of network coverage or availability
- · Damage caused by:
  - · abnormal use such as insertion of foreign objects, fluid spillage
  - · unauthorized modification to alter functionality or capability
  - computer or internet viruses, bugs, or malware, such as worms, Trojan Horses, cancelbots
- 14

- · installation of unauthorized software, peripherals and attachments
- unauthorized, unapproved and/or incompatible repairs, upgrades and modification
- the defective function or obsolescence of your cellular phone or digital media device (for example, inadequate signal reception by the external antenna, viruses or other software problems)

#### **Tire Wear or Damage**

The New Vehicle Limited Warranty does not cover normal wear or worn out tires. Tires will not be replaced (unless required by a warranty repair) for wear or damage including:

- tire damage from road hazard such as cuts, snags, bruises, bulges, puncture, and impact breaks
- tire damage due to under or over inflation, tire chain use, racing, spinning (as when stuck in snow or mud), improper mounting or dismounting, or tire repair

#### Other Items or Conditions Not Covered

The New Vehicle Limited Warranty does not cover:

- vehicles that have had the odometer disconnected, altered, or inoperative for an extended period of time with the result that the actual mileage cannot be determined
- vehicles that have ever been labeled or branded as dismantled, fire, flood, junk, rebuilt, reconstructed, or salvaged; this will void the New Vehicle Limited Warranty
- vehicles that have been determined to be a total loss by an insurance company; this will void the New Vehicle Limited Warranty
- converted ambulances that are not equipped with the Ford Ambulance Prep Package, see important information about ambulance conversions (page 36)
- Aftermarket parts or components, sometimes installed by Ford Motor Company or an authorized Ford dealership, may not be covered by the New Vehicle Limited Warranty. Any damage caused to Ford components due to the failure of aftermarket parts (other than a certified emissions part) is not covered.

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#### 4. In addition ...

#### ROADSIDE SERVICE ASSISTANCE (UNITED STATES, PUERTO RICO, AND U.S. VIRGIN ISLANDS)

Your vehicle is covered by the complimentary Ford Roadside Assistance Program (unless you are driving a daily rental unit). Under this program, Ford will cover:

- Towing to the nearest Ford Motor Company dealership, or towing to your selling dealership if within 35 miles of the disablement
- Flat tire change (vehicle must have useable spare)
- Fuel delivery (limited to two occurrences in a 12-month period up to 2 gal. gas, 5 gal. diesel)
- Jump starts
- · Lock-out assistance (replacement key cost is customer responsibility)
- Winch out services: includes pulling a vehicle within 100 feet of a paved or county maintained road. No recoveries.

The Roadside Assistance Program is separate from the New Vehicle Limited Warranty. It begins at the warranty start date and lasts for five years or 60,000 miles (whichever occurs first). If you need towing beyond the five years or 60,000 miles (whichever occurs first) period, Ford can arrange roadside assistance and charge your credit card. If the reason for the vehicle disablement is later found to be covered by another Ford warranty, Ford will provide a refund for the tow charge under the other warranty, through the dealership.

# For emergency roadside assistance, call 1-800-241-3673, 24 hours a day, 365 days a year.

Ford Rent-A-Car (FRAC) and Dealer Daily Rental (DDR) vehicles that must be towed because a covered repair failed during the warranty coverage period, Ford will cover towing to the nearest Ford Motor Company dealership.

Ford Motor Company reserves the right to modify or discontinue Roadside Assistance at any time. Certain restrictions apply to Roadside Assistance benefits. Call 1-800-241-3673 for further details.



Explore 2017 Ford Econoline Cutaway



# Starting at<sup>1</sup> \$30,695

Pricing for May 2, 2017 and ZIP 46514 View all offers (/commercial-trucks/e-series-cutaway/2017/pricing-and-incentives/)

Seating for

2

# Power and Handling

http://www.ford.com/commercial-trucks/e-series-cutaway/2017/models/e350-cutaway-drw/ 5/2/2017

# Power Explore 2017 Ford Econoline Cutaway

### Standard

- 6.8L EFI Triton<sup>®</sup> V10 engine with 6-speed Automatic Transmission
- TorqShift  $^{\scriptscriptstyle (\! 8\!)}$  6-Speed Automatic Overdrive with Tow/Haul Mode
- Transmission Auxiliary oil cooler
- 50-State Emissions System
- Alternator 120-Amp
- Battery Maintenance-free, 72-amp
- Auxiliary Fuel Port
- Fuel Tank 40-gallon
- Modified Vehicle Wiring System and Kit

### Optional

- Alternator 155-Amp Heavy Duty
- · Alternator 225-Amp Extra-Heavy-Duty
- Battery Heavy-Duty 78-Amp
- Battery Dual Heavy-Duty, 78-Amp
- Engine Block Heater
- Fuel Tank 55-gallon
- Integrated Trailer Brake Controller
- 6.2L SFI V8 FFV with 6-speed Auto. Transmission

# Handling

## Standard

- Axle Front, twin I-beam
- Axle Rear, full float

## Optional

Traction Control

# Explore 2017 Ford Econoline Cutaway

#### Standard

- Tires LT225/7Rx16E All Season
- 16-inch x 6-inch White-Painted Steel Wheels
- Delete spare tire and wheel
- Wheels Steel valve stems

#### Optional

• Tires - Spare tire & wheel

Interior Features	$\checkmark$
Exterior Features	$\sim$
Safety	$\checkmark$
Packages	$\checkmark$
Specifications	$\checkmark$
Build & Price	

 $\searrow$ 

 Search Inventory

 Explore 2017 Ford Econoline Cutaway

 Request Quote

 (http://whtttp://whtttp://whtttp://whttp://whtttp://whttp://whtttp://whtttp://

DISCLOSURES  $\checkmark$ 

#### Popular

Focus (/cars/focus/2017/) Fiesta (/cars/fiesta/2017/) Mustang (/cars/mustang/2017/) F-150 (/trucks/f150/2017/)



# **Selected Options**

Code	Description	
Base Vehicle		
E3F	Base Vehicle Price (E3F)	
Packages		
780A	Order Code 780A Includes: - Engine: 6.8L EFI Triton V10 - Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul. - 4.56 Axle Ratio Includes vehicle emission control information label with 72 sq ft frontal area restriction. - GVWR: 11,500 lbs Payload Package - Wheels: 16" x 6" White Painted Steel	
Powertrain		
99S	Engine: 6.8L EFI Triton V10	
44P	Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul.	
X85	<b>4.56 Axle Ratio</b> Includes vehicle emission control information label with 72 sq ft frontal area restriction.	
20Y	GVWR: 11,500 lbs Payload Package	
Wheels & Tires		
T67	Tires: LT225/75Rx16E BSW AS (Fleet)	
	NO LONGER AVAILABLE as standard equipment. Fleet only with valid FIN code.	
646	Wheels: 16" x 6" White Painted Steel	
Seats & Seat Trim		
21S	Captain's Chair Driver Side Only w/o Trim Includes: - No Seat Trim - Passenger Side Air Bag Delete	
Х	No Seat Trim	
Other Options		
PAINT	Monotone Paint Application	
138WB	138" Wheelbase	
63N	Extra Heavy-Duty 225-Amps Alternator	
634	Dual Heavy-Duty 78-Amp Batteries Includes: - Heavy-Duty 78-Amp Battery Replaces standard 72-amps heavy-duty battery.	

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



# Selected Options (cont'd)

Code	Description
60X	Right Hand Door Delete
	Deletes passenger side A-pillar grab handle, right hand seat belt system and hardware, passenger side air bag, under-seat stowage, passenger side sun visor, passenger side speaker and headliner. Includes: - Exterior Mirror Delete
41H	Engine Block Heater
	Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below.
153	License Plate Bracket
625	Day/Night Interior Rearview Mirror
559	Frame Pucks (Isolators)
	Includes 12 body mounts.
525	Cruise Control
585	Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.
874	4-Speaker Upgrade Package
	Includes 2 installed speakers and 2 boxed speakers.
47Z	Ambulance Prep Package Not Required
	REQUIRED on orders not destined for ambulance use.
54F	Exterior Mirror Delete
18A	High Series Exterior Upgrade Package
	Includes: - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille - Dual Sealed-Beam w/Fixed Lens Headlamps
162	Vinyl Floor Covering
47B	Shuttle Bus Prep Package
	Includes: - High Series Exterior Upgrade Package - Front Chrome Bumper w/Black Lower Fascia - Chrome Grille - Dual Sealed-Beam w/Fixed Lens Headlamps - Engine Block Heater Single element. Recommended when minimum temperature is 10 degrees Fahrenheit or below. - Frame Pucks (Isolators) Includes 12 body mounts. - License Plate Bracket - Front Headliner Delete - Front Dome Lamp Delete
57J	Auxiliary Heater Connector Package (LPO)
	Includes rear fan controls.
672	Maximum Front GAWR: 4600 lbs.
942	Daytime Running Lamps (LPO)
Fleet Options	
41X	Engine Console Cover Delete (LPO)

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



# Selected Options (cont'd)

Code	Description	
	Fleet only with valid FIN code.	
Emissions		
425	50 State Emission System	
Interior Colors		
XE_01	Medium Flint	
Primary Colors		
YZ_01	Oxford White	

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.

# COMMERCIAL GRADE BACKUP CAMERA SYSTEM RVS - 770613





This backup camera system is complete with a crystal clear 7" DIGITAL TFT LCD color monitor with distance grid lines and mirror image capability, a 3 channel multiplexer with automatic system switch, a 130° SHARP® CCD backup camera with 50 foot infra-red night vision and all the wires, connectors and mounts you will need. The rear view camera system is completely weather proof with an IP69K rating, strong and reliable, shock resistant, with a 20G vibration and 100G shock rating (highest in the industry). It comes with a full year warranty.

# BACKUP CAMERA SYSTEM RVS - 770613



COMPLETELY WEATHERPROOF WITH AN IP69K RATING

TFT LCD

16:9 / 500:1

**3 CHANNEL** 

1VP-P, 75Ω

-30°C ~ +80° C AUTO NTSC/PAL

5W

400G

INTERNAL

5G

400CD/m

800 X 3 (RGB) X 480

U:50° D:60° L/R:70°

DC 12V-24V (+/- 10%)

7" (L) X 5" (H) X 1" (D)

0.192 (H) X 0.1805 (V)

- 7" DIGITAL TFT LCD COLOR MONITOR WITH MIRROR IMAGE CAPABILITY
- 1/4 SHARP® COLOR CCD, 250K PIXELS, 2.1 MM WIDE LENS WITH 130° ANGLE
- 3 CHANNELS ALLOWING YOU TO CONNECT ADDITIONAL CAMERAS
- SHOCK RESISTANT WITH A 20G VIBRATION AND 100G IMPACT RATING



# MONITOR

MONITOR TYPE SCREEN SIZE DOT RESOLUTION DISPLAY FORMAT/CONTRAST DISPLAY BRIGHTNESS VIEWING ANGLE VIDEO INPUT VIDEO SOURCE POWER SUPPLY POWER CONSUMPTION OPERATING TEMPERATURE VIDEO SYSTEM OVERALL DIMENSIONS WEIGHT IMPACT RATING DOT PITCH SYNC SYSTEM

# CAMERA

SENSOR PICTURE ELEMENTS GAMMA CORRECTION IMAGE SENSOR

LENS VIEW ANGLE WATERPROOF RATING SYNC SYSTEM INFRA-RED DISTANCE USABLE ILLUMINATION POWER SOURCE S/N RATIO ELECTRONIC IRIS VIDEO OUTPUT IR SWITCH CONTROL VIBRATION AND SHOCK RATING OPERATING TEMPERATURE STORAGE TEMPERATURE NET WEIGHT

1/4" SHARP\* COLOR CCD 250,000 PIXELS R=0.45 TO 1.0 600 TV LINES, PAL: 500 (H) X 582 (V) NTSC: 510 (H) X 492 (V) 2.1MM 130° IP69K INTERNAL SYNCHRONIZATION 50 FEET (18 INFRARED) 0 LUX (IR ON) DC 12V-24V (+/- 10%) MORE THAN 48DB 1/50, 160-1/100,000SEC 1VP - P, 75 Ω ACDS AUTOMATIC CONTROL 20G / 100G -40°C ~ +80°C / RH 95% MAX -40°C ~ +60°C / RH 95% MAX 220Z



#### **One Year Warranty**

Rear View Safety Inc. warrants this product against material defects for a period of one year from date of purchase. We reserve the right to repair or replace any such defective unit at our sole discretion. Rear View Safety Inc. is not responsible for a defect in the system as a result of misuse, improper installation, damage or mishandling of the electronic components. Rear View Safety Inc. is not responsible for consequential damages of any kind.

This warranty is void if: defects in materials or workmanship or damages result from repairs or alterations which have been made or attempted by others or the unauthorized use of nonconforming parts; the damage is due to normal wear and tear, this damage is due to abuse, improper maintenance, neglect or accident; or the damage is due to use of the Rear View Safety Inc. system after partial failure or use with improper accessories.

#### **Installation Warranty**

Rear View Safety Inc. warranties certain install time and costs as follows: 20 minutes to locate and diagnose faulty parts, 20 minutes to replace multiplexer, 20 minutes to diagnose and replace or repair a camera, 20 minutes to diagnose a cable and one hour to replace.



# WATER TEST DOCUMENTATION

The Glaval Bus water test booth offers exceptional performance in the area of water leak detection. With nozzles directed at the roof, sidewalls, and front, nothing goes untouched in our quest for leak elimination. Using both velocity and volume in our test procedure ensures our valuable customers that we are doing the utmost to deliver a leak-free product to them.

The approximately 25' x 45' test facility utilizes 158 nozzles, (5) rows on the front, (12) rows each side, and (4) rows on the roof with 45° angled nozzles at the rear. The test booth includes two recycling tanks and utilizes a 12HP pump with a dual filtering system capable of delivering approximately 30 psi.

The water test runs for a minimum of 15 minutes per a certified timer before the visual inspection begins. The vehicle is then checked by sight and touch at no less than (12) individual inspection points while the water spray is continuing.

A complete passing test document is then signed, dated, and kept on file for review. A copy is available upon request. Visitors are always welcome to witness the test booths whenever they are in operation.





914 County Road 1 North • Elkhart, IN 46514 • 800-445-2825 • 574-262-2212 • Fax: 574-264-4259 • www.glavalbus.com



## THE GLAVAL ADVANTAGE

Glaval utilizes a "Steel-Safe" construction to provide superior structural integrity for maximum safety and impact protection. All body structures are fixture welded including the floor, sidewalls, roof, and the rear wall. All joints are welded to form the structure with the exception of window radius extrusions which are mechanically fastened. Floor, walls and roof are finished to meet G90 specifications for superior rust prevention. No electrical and electronic subsystem or component will generate, or be affected by, electromagnetic interference or radio frequency interference that can disturb the performance of electrical/electronic equipment as defined in SAE J1113.

Glaval's unique body-to-chassis mounting system provides full length isolation of our floor frame and the chassis frame. This process spreads the load of the body evenly across the frame from front to rear for a unified weight load resulting in less stress on the floor structure and chassis frame, reduction of vibration and road noise, and conforms to SAE standard J366. Each vehicle meets air pollution control standards of the US Environmental Protection Agency (EPA) and all applicable state and local regulations at time of manufacturing.

## **CHASSIS SPECIFICATION**

## MANUFACTURER

Ford

#### **STANDARD CHASSIS EQUIPMENT**

- Ford E-350
- o Rear Wheel Drive
- Front Chrome Bumper/Grill w/License Plate Bracket
- Engine Block Heater
- o Front Twin I-Beam I.S. w/Anti-Roll Bar, HD Shocks
- o Rear Rigid Axle Leaf Spring Suspension w/HD Shocks
- o Brakes: 4-Wheel ABS Disc
- Alternator: 225 Amp Extra HD
- OEM Compressor for Dash A/C
- o Tilt Steering Wheel
- o Power Steering
- Cruise Control w/Steering Wheel Controls
- Daytime Running Lights
- Sun visor(s)
- o 11,500 / 12,500 Chassis 40 Gallon Fuel Tank

#### GVWR

11,500# 12,500#

## AXLES

11,500 Chassis: 4,600# Front 17,800# Rear Rigid w/4.56 Ratio 12,500 Chassis: 5,000# Front 18,500# Rear Rigid w/4.56 Ratio

#### **SUSPENSION**

FRONT: Independent Twin I-beam with anti-roll bar, HD shocks and coil springs. REAR: Leaf springs with HD shocks.





#### ENGINE

Front mounted Triton V-10 6.8L SOHC 305 HP @ 4,250 RPM; 420 ft.-lb @ 3,250 RPM; Regular Unleaded Engine is certified to all applicable Federal EPA and State of California (CARB) emissions.

#### **EXHAUST SYSTEM**

Pipe constructed from 3" stainless steel (OEM) and aluminized mild steel. System includes all necessary heat shields and rubberized hangers; exhaust exiting at rear of vehicle.

#### **FUEL TANK**

Single 40 gallon gasoline tank mounted between frame rails.

#### **TIRES & WHEELS**

TIRES (F&R): Michelin LTX 225/75R16 w/AS Tread; BSW WHEELS (F&R): 16x6, 8 Hub Pilot, 4 Hand, Painted White Steel

#### TRANSMISSION

TorqShift 6 Speed Automatic w/Overdrive and Tow-Haul

#### DRIVESHAFT

Minimum 3" diameter driveshaft w/safety retaining loops added to any sections not covered by OEM.

#### STEERING

Chassis comes equipped w/hydraulic power-assist re-circulating ball steering, manual tilt column and urethane steering wheel w/integrated cruise controls.

#### BRAKES

Hydraulic four wheel ABS disc brakes. Parking Brake: Foot operated set, hand release.

#### **DRIVER'S CONTROLS & INSTRUMENTATION**

The driver's area consists of an ergonomically designed dash and console complete with controls and instrumentation. All system control switches are labeled and illuminated.

#### WINDSHIELD WIPERS & WASHER

OEM two speed electric wipers are provided w/variable speed control. Arms and blades are 20" long and park at the lower edge of the windshield and two cowl mounted sprayers are powered by an electric pump.

#### EXTERIOR

#### FLOOR

The floor is constructed from  $2^{"} \times 2^{"} - 13$  ga. galvanized (G90) cross members welded on 24" centers. Two 1 3/4" x 5 3/4" – 11 ga. galvanized longitudinal hat channels run the entire length of the floor and is welded to the cross members. One-piece 14 ga. (minimum) galvanized steel plates are installed over the rear wheels for a flat floor layout; two-piece 14 ga. (minimum) galvanized steel wheel houses are installed for standard floor.

#### SIDEWALLS

The roadside and curbside walls are constructed from 1 1/2" square - 18 ga. galvanized (G90) tubes welded on 24" centers. A modified galvanized C-Channel is welded to the bottom of the wall and a 1 1/2" – 11 ga. galvanized angle is welded at the top. The exterior skin is .024" galvanized steel with white exterior face laminated to 2.7 mm lauan. All wall cavities are filled with 1 1/2" block foam insulation. This insulation meets a value of R-7. The interior panels are 3.2 mm gray vinyl covered lauan. The components are vacuum laminated using water activated urethane adhesive.



#### ROOF

The roof is constructed from 3 1/2" x 1 1/2" - 16 ga. galvanized capped / hat channel bows welded every 24", seated into a 1 1/2" galvanized c-channel bottom rail. The exterior skin is one piece, .065" thick, CosmoLite™ laminated to 2.7 mm lauan. The cavities of the roof structure are filled with expanding spray foam insulation with a value of R-6. The interior panels are 3.2 mm gray vinyl covered lauan. The roof components are compression laminated using water activated urethane adhesive.

#### **REAR WALL**

The rear wall is constructed from 1 1/2" square - 18 ga. galvanized (G90) tubing. The exterior skin is .024" galvanized steel with white exterior face laminated to 2.7 mm lauan. All wall cavities are filled with 1 1/2" block foam insulation with a value of R-7. The interior panels are 3.2 mm gray vinyl covered lauan. The rear wall components are vacuum laminated using water activated urethane adhesive.

#### **FIBERGLASS FRONT**

The front cap consists of three fiberglass components, a front cap, road side transition and curb side mor/view panel. The front cap overlaps the roof and sidewalls and is mechanically fastened at the seams with aluminum trim and vinyl cover.

#### **ABS REAR**

The rear cap consists of three ABS components, a top halo and a vertical chimney on each side. These panels overlap the roof and sidewalls and are mechanically fastened at the seams with an aluminum trim and vinyl cover.

#### ASSEMBLY

The floor structure is bolted through the chassis frame rails. A 1/4" rubber isolator is placed on the top face of the frame rails with the hat channel placed over the rubber. This assembly is fastened together using 1/2"-13 grade 5 bolts torqued to 49-59 ft-lbs. Sidewalls are fastened to the floor structure using 3/8"-16 grade 5 bolts passing through the bottom c-channel into mounting tabs which are welded to the floor cross members every 24". The roof is fastened to the sidewall structures using 3/8"-16 grade 5 bolts passing through the sidewall top angle every 24". The rear wall is welded to the sidewall, roof, and floor structures at mounting tabs located at points around the perimeter of rear wall. The front cap, rear cap and door seams are attached using aluminum trim channel with a white vinyl cover. Any fastener exposed to the elements is constructed of zinc, stainless steel, or black oxide.

## WINDOWS

#### WINDSHIELD

The windshield is a single piece laminated safety glass, rated AS-1.

#### **DRIVER'S WINDOW**

The driver's window is a manual opening, tempered and rated AS-2.

#### **MOR-VIEW WINDOW**

Mor-View is clear, 1/8" thick, tempered, rated AS-2 w/392 sq. in. of clear viewing area.

#### **PASSENGER WINDOWS**

Passenger windows are 1/8" thick transit style tempered glass w/top sliders and 20% light transmitting tint; rated AS-3. The window size is 46 1/2" w x 32 1/2" h. An interior clamp ring and a bulb seal allow a water tight fit. Emergency egress windows are constructed in the same manner but feature a top hinge and heavy duty red handles, which when released allow the window to open. Emergency windows are clearly labeled with operation instructions in a visible location on window. The quantity of egress windows are determined by passenger capacity.



#### **REAR EMERGENCY WINDOW**

The rear emergency window is 1/8" thick with 20% light transmitting tint, rated AS-3. The window size is  $60"w \times 22 1/2"h$ .

#### **DRIP RAIL**

A continuous rain gutter is installed along both sides of vehicle at the wall/roof seam ensuring water is diverted from entrance locations.

#### UNDERCOATING

The underbody is sprayed with a tough, pliable, corrosion protectant with sound deadening properties applied in accordance with the chassis manufacturer's guidelines.

#### DOORS

#### ENTRY

The entry door surround is an integrally welded galvanized construction installed as a single unit. The components utilized to make up the assembly are a minimum 14 ga. with all welds being treated with cold galvanized spray or similar corrosion resistant material. The galvanized metal surround is welded to the walls and floor. The entry door consists of two outward opening panels utilizing a manual controller operable from the drivers seated position. The door is constructed of aluminum extrusions which encapsulate the full-length glass. The glass is 1/8" thick, 70-80% light transmitting tint and rated to AS-2. The doors incorporate center overlapping rubber seals and bottom brush seals. The doors have a clear opening of 30" wide by 82 1/2" tall. Ground to first step is 12 1/2" maximum, 8" riser x 12" deep and 34" wide.

#### LIFT AND/OR REAR DOOR CONSTRUCTION

The door framework is constructed of 1" x 1" and 1" x 1-1/2" aluminum tubing with a 1" x 2" center support. Double lift doors/rear door have an exterior skin of .024" galvanized steel with a white exterior face laminated to 2.7 mm lauan. The single lift door has an exterior skin of .060 white FRP laminated to 2.7 mm lauan. All cavities of the door structure are filled with 1" block foam insulation with R-5 value. All door components are vacuum laminated using water activated urethane adhesive. Interior panels are 3.2 mm gray vinyl covered lauan. There are (2) stainless steel strap hinges per panel attached with stainless fasteners. All hardware is fastened into structural members welded to the inner door frame.

#### LIFT DOOR HARDWARE

Each door panel utilizes a 2-pt locking system.

The lift door single panel has a t-style hold open device and plunger.

The double door option has a t-style hold open device and plunger on one leaf and a gas shock w/cable protector on the other. Window(s) are 1/8" thick tempered glass and have an AS3 rating with 20% light transmitting tint. The single door window is 32 1/2" w x 32 1/2" h, double door window is 11" w x 32 1/2" h.

#### **REAR DOOR HARDWARE**

Rear door may be non-emergency or emergency optioned.

The door panel utilizes either a 2-pt locking or non-locking system. The door has a gas shock w/cable protector. Optional window(s) are 1/8" thick tempered glass and have an AS3 rating with 20% light transmitting tint. The upper window is 22 1/2" w x 32 1/2" h and the lower is 22 1/2" w x 12 1/2" h.

#### INTERIOR

#### CEILIING

The interior liner is installed as a multi-piece design. Aluminum H-rails are mechanically fastened longitudinally to the roof rails running from front to back. A plastic divider bar is placed horizontally across the rear roof bow & mechanically fastened. Depending upon the liner material used, either a



wood strip backer or a double sided foam tape is applied to the back side of the liner. A urethane adhesive is applied to the roof bows. The liner is then placed onto the roof structure & the edges are slid between the plastic divider bars. After all the panels have been placed, they are mechanically fastened into each roof bow. The roof is constructed to prevent vibration, drumming, & flexing.

#### **INTERIOR TRIM**

The cab ceiling liner is constructed in the same manner as the body liner. The front & sides are then trimmed with a combination of ABS & fabric covered plywood.

#### **STANCHIONS**

Stanchion assemblies are constructed from 1 1/4" diameter 18 ga. stainless steel tubes attached to structural members. Stanchions are standard aft of the entry door and aft of a front lift door. A left-side handrail is incorporated into the entry stanchion assembly and is oriented to follow the slope of the steps to assist passengers when entering or exiting the vehicle.

#### **MODESTY PANELS**

Modesty panels are constructed from gray Rontex fabric adhered to a 3/8" thick plywood panel. Exposed panel edges are trimmed with aluminum c-channel and mechanically fastened to the stanchion assembly. A modesty panel is standard aft of the entry door and aft of a front lift door. The panel aft of the entry door is  $13"w \times 21"h$ . The panel aft of the front lift is  $13"w \times 21"h$ .

#### FLOOR

The floor structure is covered with 5/8" thick - 7 ply marine tech plywood, attached using polyurethane adhesive sealant and mechanically fastened into the cross members. The floor structure is sealed to keep outside elements from entering the vehicle using expandable polyurethane spray foam.

#### **FLOOR COVERING**

The floor covering is Gerflor<sup>®</sup>, Sirius Dune, smooth throughout. Floors have full-length cove molding for cleaning ease with rubber extending to the seat track and trimmed with Rontex covered lauan. Entry step nosing is white with Gerflor<sup>®</sup> on the sides and vertical risers.

#### ELECTRICAL

#### **FUSE PANEL**

The electrical system is designed to provide and distribute 12 Volt DC power to all electrical components in the vehicle. The electrical control panel consists of Intermotive's FlexTech PRPC (Programmable Relay Power Center) with built-in relays and fuses. FlexTech PRPC consists of programmable relay power outputs with LED indicators that illuminate green when activated and red when an issue occurs on the circuit. The PRPC also includes 10 separate digital inputs and 8 programmable low-current outputs; 7 sourcing and 1 syncing. Outputs can be configured as momentary, latching, flashing or timed. FlexTech expansion boards are installed pending option content and are located to the left of the main power center. The PRPC also includes built-in diagnostic codes utilizing LED lights that illuminate in multiple patterns which help to reduce diagnostic times. FlexTech expansion boards consist of four 10 amp relay fused outputs, four 1 amp low- current outputs and four active low inputs. FlexTech communicates with Ford through Controller Area Networks (CAN) to provide real time chassis data. The electrical panel is installed for easy access above the driver's seat in a compartment with a hinged door and 1/4 turn latch. A wiring diagram (electrical legend) is installed on the interior of the compartment door.

#### DASHBOARD

The ergonomically designed OEM dashboard incorporates the following items:

- o Instrument cluster
- Headlight switch



- o Dimmer switch
- AC/Heat Controls
- $_{\odot}$   $\,$  Switch panel switches are backlit and clearly marked with permanent labeling
- AM/FM/Single CD w/digital clock and audio input jack (fixed curb side fender mounted antenna)
- Glove box with hinged door and latch
- Four heat/air-conditioning vents
- o Dual 12v outlets

#### ENGINE COVER w/CONSOLE

The removable engine cover includes a center mounted console which incorporates a cup holder; any additional switches/indicator lights required would be mounted to this console on a black ABS plate.

#### **DRIVERS DOOR**

Drivers door includes the following:

- o Manual window crank
- o Manual door lock
- o OEM speaker
- o Dual map pockets

#### BATTERY

Dual 12v, top post, 78A, heavy duty batteries deliver 750 cold cranking amps. Battery #1 is mounted under the hood on curb side, battery #2 mounted on frame rail behind entry door.

#### WIRING

Wiring meets FMVSS and SAE regulations, standards and practices. All wiring is cross-linked polyolefin insulated, colored, numbered, and function coded every 6" for positive identification and meet requirements of SAE J1127 & J1128, types GXL and SGX. All wiring is installed in convoluted, high-temperature (125°C) split loom secured every 12" to structural members to prevent chaffing, cuts, rattling, pinching or damage. All interior connectors are one-way, amp plug-in. All exterior wire harnesses will have Amphenol-Sine AT Series weatherproof connectors and terminals. All exterior electrical terminations will have Dynatex® dielectric grease applied. The exterior of the connectors will be sprayed with NoCo® corrosion resistance spray. Primary distribution center typically offers two (2) available ignition slots and two (2) available battery slots for aftermarket add-ons. All harnesses are terminated to ensure proper installation; male connectors and female terminals.

#### LIGHTING

#### **HEADLAMPS**

Front headlights are OEM Halogen aero-composite with incorporated turn signals and daytime running lights.

#### **EXTERIOR LIGHTING**

All exterior lights are incandescent.

#### **Clearance lights**

- (5) front amber lights
- o (5) rear red lights
- o (2) rear red lower side lights tail lights
- o (2) round amber turn signals
- (2) round red stop lights
- o (2) round white back up lights turn signal lights



o (2) oval side mount turn signals (1) on each side wall

An oval rear center mount red brake light is installed above the rear window/door.

#### **INTERIOR LIGHTING**

Driver's LED dome light is mounted in the cab area. Passenger lightbar LED lights are installed above each window location.

#### STEPWELL LIGHTING

Two LED lights are installed in the entry step well, one on each side.

#### REFLECTORS

Reflectors are installed in the following locations.

- (2) red on the rear bumper or rear wall
- o (2) red one under each lower side marker light
- o (2) amber one under each side turn signal

#### SEATING

#### DRIVER | CO-PILOT SEATING

OEM driver seat is bucket, four-way manual w/recline and armrest. Driver's position includes OEM airbag. Available (optional) driver seats include the FSC Ford, FSC Econo, Sport Shield, Lo-Cam Legacy, USSC G2E and Recaro LXS.

#### SEAT TRACK

Tracks are installed on the sidewall and floor for seat installation in locations for optioned seating on orders. This track is welded to the sidewall every 24" and floor structures every 6". Slide inserts are placed into this track to secure the seats.

#### **PASSENGER SEATS**

A wide variety of Freedman Seating is available in an array of configurations to meet individual customer needs. Freedman Seating products are designed, built, and tested to meet FMVSS requirements including, but not limited to, FMVSS 207, 208, 210, and 302.

#### SEATBELTS

A 74" manual lap belt is included on passenger seats which meet FMVSS 209, 302 and SAE J386.

#### WHEELCHAIR EQUIPMENT

#### LIFT PLATFORM INSTALLATION

Two seven gauge steel plates are welded to the floor structure to become the lift platform. Galvanized sheet metal is formed to create a pan and placed over the steel plates. Gerflor®, Sirius Dune, is adhesively bonded to this platform for noise reduction and insulation. Aluminum trim is then mechanically fastened to the platform and surround for a clean finished look. No plywood is located between the lift and mounting structure.

#### LIFT DOOR INSTALLATION

The lift frame surround is built into the sidewall assembly structure. The surround is trimmed with aluminum which is adhesively sealed and mechanically fastened. The lift door(s) are attached and fastened into structural steel. Rubber seals are installed around the perimeter of the surround and the entire assembly is sealed.



#### LIFT INSTALLATION

The wheelchair lift is mounted directly to the platform providing superior strength and allowing for constant torque and stability. The lift is installed according to the lift manufacturer's installation instructions. The lift installation meets FMVSS 403 and 404 requirements.

#### L-TRACK INSTALLATION

The plywood decking is routed to recess the L-track flush with the flooring. L-track is installed with Ftype fasteners and standard bolts. The L-tracks are 30" wide, running side to side, per tie-down position unless ordered otherwise. Installation meets both manufacturer's recommended instructions and ADA compliance.

#### MISCELLANEOUS

#### **BUMPERS**

Rear bumper is 10 gauge black powder coated steel with 4ga bumper brackets, mounted directly to the chassis frame structure using 1/2"-13 grade 8 bolts. Front bumper is OEM chrome.

#### SKIRTING

The exterior skirting is .024" galvanized with a white exterior face. Angled skirt braces are welded to the bottom of the cross members. The skirting is then mechanically fastened to the sidewall and bonded to the face and bottom of the skirt braces. The skirt seam is trimmed with an aluminum extrusion w/vinyl cover.

#### **MUD FLAPS**

Mud flaps are installed on the rear wheels allowing for clearance of the tires, exhaust and ground. Mud flaps are fabricated from low density polyethylene and measure 18" w x 24" h. Front mud flaps are OEM measuring 9" w x 18" h.

#### MIRRORS

Exterior side view mirrors are manual, breakaway style, black finish and incorporates both flat and convex mirror surfaces. The road side is door mounted, curb side is fender mounted.

#### PAINT

The exterior finish is white with optional paint schemes/graphics available.

#### **VEHICLE ALIGNMENT**

Front end alignment, Toe-in/Toe-Out, is performed after completing the manufacturing process.

#### **TESTING | CERTIFICATIONS**

- o 5 year/150,000 mile Altoona tested
- o FMVSS & CMVSS compliant
- o ADA, Ford QVM & ISO compliant
- Adheres to chassis body builder guidelines
- o 50 mile road test
- o 15 minute water leak test

#### WARRANTY

Limited warranty is 5 year/100,000 mile. Clarifications and additional warranties listed on a separate warranty document.



# **DIMENSIONAL DATA**

DATA IS APPROXIMATE	AND CAN CHANGE VIA OPTION	CONTENT AND CONTINUAL PROD	UCT IMPROVEMENTS
Length (Feet)	21	22	23
Wheelbase (Inches)	138	158	158
Chassis	E-350	E-350	E-350
GVWR	11,500	12,500	12,500
Turning Radius; Curb (Ft)	24.3	27.4	27.4
Turning Radius - Wall (Ft)	25	28.2	28.2
Passenger Capacity	13	17	17
Approach Angle	22 <u>°</u>	22º	22 <u>°</u>
Break-over Angle	10.7º	9.3⁰	9.3º
Departure Angle	10.5º	11.7º	10 <u>°</u>
Overall Width	84" (Excluding Mirrors/Flairs/Et	c.)	
Overall Height	114" (Excluding Rooftop A/C,	Escape Hatch, Etc.)	
Interior Width	80"		
Interior Height	78.5"		
Aisle Width	21"		
Interior Floor Height F/Ground	28.5"		
Ground To 1st Step	12.5"		
Step Riser	8"		
Step Tread	9.25"		
Step Width	34"		



**PURE ASPHALT** 

MANUFACTURER OF SPECIALTY COATINGS SINCE 1927

3300 W. 31<sup>st</sup> Street CHICAGO, IL 60623 PHONE: 773.247.7030 FAX: 773.247.7066 WWW.PUREASPHALT.COM

# # 7960 Undercoating

PRODUCT

DATA

#### DESCRIPTION

A semi-fluid polymer modified waterborne coating for the protection of metal chassis and other underbody components of mobile homes, trailers, utility bodies, bus bodies, RV's and other vehicles. Provides a tough, pliable rubberized coating for protection against abrasion and corrosion. Resists salt, alkalis and seals out moisture. Affords sound deadening and vibration dampening to metal and fiberglass surfaces. This fast drying coating dries tack free and can be top coated.

#### MATERIALS

# 7960 is composed of an abrasive free material, formulated with an asphalt emulsion, modified polymer additives and inert fillers.

#### APPLICATION

# 7960 can be cold applied with conventional airless spray equipment with a minimum amount of spray back and fogging. #7960 has been formulated for factory "direct to metal" applications to cover, adhere and protect when applied over pickled / oily surfaces and flash rusted metals. Coverage per mil of thickness will be 1600 sq ft. wet film / 800 sq ft per gallon dry film.

#### APPLICATION EQUIPMENT

31:1 Reciprocating pumps with 40 - 50 lbs of air (For Industrial applications w/ large pumps)

Tip sizes .021 - .029 inches

## DRY TIME

# 7960 will dry to light touch in 20-30 min., and fully cure in 24 hrs @ 70F. Product is formulated to achieve early water and freeze resistance that will be indicated by a change of color from shiny dark gray (when first sprayed) to matte black.

#### PHYSICAL PROPERTIES

Color	Black
Weight per Gal.	9.4 lbs +or2
Solids by Volume	50%
% Water	49.5%
Volatiles	50% (includes water)
HAPS Content	None – HAPS free
Flash Point	Not Applicable (water based)
V.O.C. Content	Zero (nominal)
Viscosity	Per customer specification & application equipment
Fed Spec. TTC-520-B	Pass
Bend Resistance ASTM D522	Passes 0.5 inch mandrel bend at 0 $^{\Box}$ F
Salt Spray Resistance (B-117)	Passes 1000 hours minimum

#### PACKAGING

Available in 16-gallon kegs, 55-gallon drums; totes or tankers.

## CARE AND CLEAN UP OF EQUIPMENT

Spray guns, brushes and tools used for application, should be immersed in soapy water or mineral spirits when not in use. Dried material can be removed with mineral spirits.

## PROTECT FROM FREEZING

The information presented herein is based on the data available and is believed to be correct. However, nothing stated in this bulletin is to be taken as a warranty, expressed or implied regarding the accuracy of the information of the use of our product used singly or in conjunction with other products.

**PURE ASPHALT** 

MANUFACTURER OF SPECIALTY COATINGS SINCE 1927

3300 W. 31<sup>ST</sup> STREET CHICAGO, IL 60623 PHONE: 773.247.7030 FAX: 773.247.7066 WWW.PUREASPHALT.COM

This product will be permanently damaged if frozen. Please protect from severe weather. Store in a warm place.

PRODUCT

DATA

# PURE ASPHALT CO SAFETY DATA SHEET (SDS)

# **SECTION 1: IDENTIFICATION**

Product Name	#7960 Und	lercoating	
Other Names	Water based Protective Coating		
	Underbody	y coating	
Use	Water bas	ed protective coating	
-			
Company	Pure Aspha	alt Co.	
	3455 W. 3	1st Place	
	Chicago, IL	. 60623	
	Tel: (773) 2	247-7030	
	Fax: (773)	247-7066	
Emergency Tel.	ChemTrec	800-262-8200	
	SECTI	ON 2: HAZARD(s) IDENTIFICATION	
GHS HAZARD CLASSIFICATION:			
Physical Hazards		None	
Health Hazards		Acute Toxicity-Oral	Category 5
		Acute Toxicity-Inhalation	Category 5
		Skin Corrosion/Irritation	Category 3
		Eye Damage/Irritation	Category 2B
LABEL ELEMENTS:			
Signal Word	Warning		
Hazard Statements	H303:	May be barmful if swallowed	
	H333:	May be harmful if inhaled	
	H316	Causas mild skin irritation	
	нзэр.		
	11520.		
Precautionary statements			
Prevention			
	P264:	Wash thoroughly after handling.	
Response			
	P312:	Call a POISON CENTER or doctor if you feel unwell.	
	P304+312:	IF INHALED: Call a POISON CENTER or doctor/physician if you	ı feel unwell.
	P332+313:	If skin irritation occurs: Get medical advice/attention.	
	_		

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	<ul> <li>P305+351+ IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if</li> <li>338: present and easy to do – continue rinsing.</li> <li>P337+313: If eye irritation persists get medical advice/attention.</li> </ul>
Storage	
Disposal	P501: Dispose of contents and container in accordance with local, regional, national, and international regulation.
Canadian WHMIS	NA
SECTION	3: COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS
Mixture	

Chemical Name	Common Name	CAS number	Percent by weight
Petroleum Asphalt	Asphalt	8052-42-4	30-60%

	SECTION 4: FIRST-AID MEASURES
General Advice	Take off immediately all contaminated clothing. Get Medical advice/attention if you feel unwell. Wash contaminated clothing before reuse.
Inhalation	Remove person to fresh air and keep comfortable for breathing. Get Medical attention if you feel unwell.
Skin	Take off immediately all contaminated clothing and wash it before reuse. Wash with plenty of soap and water. If skin irritation or a rash occurs: Get medical advice/attention.
Еуе	Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do and continue rinsing. If eye irritation persists: Get medical attention.
Ingestion	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Get Medical advice and/or attention if you feel unwell.
Most important symptoms/effects, acute and	Eye irritation. Symptoms may include stinging, tearing, redness, swelling and blurred vision.
delayed	Skin irritation: May cause redness, itching and/or pain. Inhalation of mist/vapors: Prolonged or repeated exposure may cause chronic effects.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.

# SECTION 5: FIRE-FIGHTING MEASURES

This material is water based and is not combustible under normal conditions. If the material is exposed to sufficient heat for sufficient time to evaporate the water, combustion may occur.

Suitable Extinguisher type(s)	Use carbon dioxide (CO2), alcohol foam, water fog or dry chemical to extinguish.
Unsuitable Extinguisher type	Do not use stream or jet of water as this will spread fire.

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Specific hazardous arising from fire.	Vaporized material may form explosive mixture with air. Thermal decomposition (burning) will produce oxides of carbon including carbon monoxide and may also produce irritating, corrosive and/or toxic gases, vapors and fumes.
Special protective equipment for fire fighting.	Self-contained breathing apparatus and full protective gear must be worn in case of fire.
	SECTION 6: ACCIDENTAL RELEASE MEASURES

Leak or spill procedures	Remove all sources of ignition. Provide adequate ventilation.
Containment	Contain and absorb with inert material. (e.g. oil dry, sand)
Cleanup	Dispose in accordance with all local, state and federal regulations.
Precautions	In the event of a large spill, contain material and recover for use if possible. Avoid
	discharge into drains, water courses and the ground.

SECTION 7: HANDLING AND STORAGE		
Storage	Keep away from ignition sources. Keep containers tightly closed. Store in a cool, dry and well ventilated area.	
Handling	Avoid prolonged or repeated skin contact and avoid breathing vapors.	
Incompatible Contaminants	Avoid exposure to oxidizing agents.	

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use with adequate ventilation.
PPE	Eye/Face: Face shield, goggles
	Skin: Chemical protective gloves. Respiratory: Level of exposure needs to be determined. If required, use a particulate
	filter, a NIOSH-approved air purifying respirator with organic vapor cartridge or a
	supplied air respirator.

## **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	
Form	Viscous Liquid
Color	Dark brown to Black
Flammability Limits	
Upper	Not applicable
Lower	Not applicable
Odor	Mild Petroleum Odor
Odor Threshold	Not Determined
Vapor Pressure at 20°C	2.3 kilopascal
рН	8-10
Vapor Density (air=1)	>1
Evaporation Rate	Not Determined
Specific Gravity, 16°C	>1.0
Melting Point/Range	Not applicable
Boiling Point/Range	212°F (100°C)
Solubility	Dispersible
Partition Coefficient	Not Determined
Flash Point	Not applicable
---------------------------	---------------------------------------
Flammability	Nonflammable
Auto ignition Temperature	Not applicable
Decomposition Temperature	Not Determined
Viscosity	Time, temperature and shear dependent

### **SECTION 10: STABILITY AND REACTIVITY**

Reactivity	
Chemical Stability	Stable
Other	
Hazardous Reactions	None known
Polymerization	Will not occur.
<b>Conditions to Avoid</b>	Freezing and boiling
Incompatible Materials	None known
Decomposition Hazards	Combustion products: Oxides of carbon, nitrogen, and sulfur and potentially irritating

### **SECTION 11: TOXICOLOGICAL INFORMATION**

Routes of Exposure					
Inhalation	Excessive inhalation of mist may cause blockage of airways.				
Ingestion	Expect low ingestion hazard. Do NOT induce vomiting.				
Skin Contact	Causes mild skin irritation				
Eye Contact	Causes eye irritation				
Delayed, Immediate, and Long					
Term Exposure	None known				
Carcinogenicity	None of the components of this mixture are considered to be a carcinogen by IARC, ACGIH, NTP, OR OSHA.				
	Bitumen fumes generated at paving temperatures in excess of 250°F (120°C) are classified by IARC as "possibly carcinogenic to humans" (Group 2B) but this product is				
	used at ambient temperatures and does not generate fumes.				
SECTION 12: ECOLOGICAL INFORMATION					
Eco toxicity	This mixture contains components that are potentially toxic to freshwater and saltwater ecosystems.				
Environmental Fate	This material may be harmful to aquatic organisms and may cause long term adverse effects in the aquatic environment.				

### **SECTION 13: DISPOSAL CONSIDERATIONS**

Hazard characteristic and regulatory waste classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper handling and disposition for disposal according to local, state, federal and international regulations.

### **SECTION 14: TRANSPORT INFORMATION**

#### For Industrial/Professional Use Only-Keep out of reach of Children

DOT

No label required. Not regulated for transport.

Proper shipping name: n/a Identification Numbers: n/a Class or Division: n/a Packing Group: n/a Label Codes: n/a Special Provisions: n/a Packaging

Exceptions: n/a Non-Bulk: n/a Bulk: n/a

**Quantity Limitations** 

Passenger Aircraft/Rail: n/a

Cargo Aircraft Only: n/a

Vessel Stowage

Location: n/a Other: n/a

#### Transport in Bulk according to Annex II of MARPOL 73/78 and the IBC Code

### SECTION 15: REGULATORY INFORMATION

TSCA Sara Title III, Section 313 Sara Title III, Section 311, 312 All components are on the TSCA inventory. No, None No, None

### **SECTION 16: OTHER INFORMATION**

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information contained herein.



### **UNDERCOAT DOCUMENTATION**

The Glaval Bus undercoat application protects the vehicles most exposed areas from the likes of moisture, dirt, grime, salt and more. It is partnered with a spray foam designed to make things quieter on the inside of your vehicle. Every Glaval Bus receives this treatment from a technician trained in the application to ensure our valued customers acquire a quality product.

The approximately 35' x 50' bay contains a 4 post mobile lifting system. The body is lifted and various areas are masked off. (fuel fill, mud flaps, wheel wells, etc.) A rust preventative is added to the bottom edge of metal skirts (if applicable). A spray foam is applied for additional noise reduction as well as body seam sealing. The underbody is then sprayed with a tough, pliable, corrosion protectant material which incorporates a sound-deadening property at a pressure of 40 psi. The application runs between 45 minutes to 1 ½ hours based upon vehicle length.

Glaval Bus follows the guidelines established by QVM. No undercoating is sprayed within 12" of the exhaust system or on fuel fill/vent hoses, fuel tank(s), driveshaft, steering dampener, or shock absorbers.

A log is signed, dated, and kept on file for review in the undercoat area. Undercoating and spray foam data are available upon request. Visitors are always welcome to witness the application when in operation.



914 County Road 1 North • Elkhart, IN 46514 • 800-445-2825 • 574-262-2212 • Fax: 574-264-4259 • www.glavalbus.com

## **Limited Warranty**

### For Pure Asphalt Company Undercoating Applied to Glaval Buses

**Warranty:** Pure Asphalt Company warrants that the supplied undercoating has been produced in accordance with all applicable specifications and as properly applied by Glaval Bus will protect the components from rust and abrasion damage for a period of **three (3) Years** from the original sales date.

**Coverage:** In the unlikely event that refurbishing is required due to rust or abrasion damage within the terms of this warranty, Pure Asphalt Co. will provide replacement undercoating, advise the owner of proper refurbishing method and reimburse costs for the reapplication. This warranty applies to the original purchaser/ owner of the bus.

**Limitations:** Damage resulting from misuse, alteration, negligence; additional coatings applied over the factory coating; collision, dents, scratches, trailer modifications, or fair wear and tear; exposure to fire, excessive heat, chemicals, explosion or natural disasters are excluded from this warranty. Incidental and consequential damages or other additional liabilities are not included or covered under this warranty.

**Claim Procedure:** If corrosion or abrasion damage appears to have occurred within the terms of this warranty, owner shall contact Glaval Bus who will in turn notify Pure Asphalt Co. to arrange for refurbishment. Pure Asphalt Company has the right to inspect the vehicle and will make the final determination as to whether the repairs are authorized under this warranty.

Pure Asphalt Company 3300 W. 31<sup>st</sup> St. Chicago, IL 60623 PH: 773-247-7030 Web: pureasphalt.com



# FlexTech SYSTEM



# OVERVIEW

- The FlexTech system is built around a Programmable Relay Power Center
- Uses real-time chassis data to control loads
- Connects electronic modules through the overall vehicle network
- Reduce the need for wiring
- Centralize and improve diagnostic capabilities
- Share information between modules
- Add various smart modules to create an entire custom bus control system

# WHY FLEXTECH

### CONTROL

FlexTech controls loads using real-time chassis data, and eliminates the need for timers, flashers, latching relays, and multi-relay logic.

### CUSTOMIZABLE

Use our graphical interface to customize what FlexTech does.

## CONVENIENCE

FlexTech communicates with Ford, Chevy CAN as well as J1939 to provide real time chassis data. Easy troubleshooting LED notify the driver of any issue.









# PROGRAMMABLE RELAY POWER CENTER (PRPC)

- 8 Programmable relay power outputs
- 10 separate digital inputs
- 8 Programmable low-current outputs, 7 sourcing (0.5 A), 1 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

# SWITCH BACKER BOARD

- Controls system inputs and outputs
- 8 Switches, 8 light outputs, 2 switch backer boards can be used together
- 6 Outputs, 2 (1 A) and 4 (0.5 A)
- Compatible with any brand of switches

# **EXPANSION BOARD**

- 4 10 A relay fused outputs
- 4 1 A low-current outputs
- 4 Active low inputs
- Loads controlled by the PRPC

# OPTIONAL MODULES

- GATEWAY Compliant FMVVS 403/404 wheelchair interlock and high idle system
- AFIS Advanced Fast Idle System with charge protection and optional air conditioning auto trigger







# FLEXTECH<sup>©</sup> System

## **Programmable Electronic Vehicle Control System**

## FEATURES & BENEFITS

- Controls electrical loads using real-time chassis data
- Customized programming using our Graphical User Interface
- "Simple Matter of Programming" Easy to change vehicle operating characteristics at any point in time
- Reduces wiring, complexity & volume
- Eliminates timers, flashers, latching relays & multi-relay logic
- Speeds production line while simplifying installations
- Fast, efficient adoption of unique customer requests without changing wiring or hardware



### **OVERVIEW**

FlexTech© system when used with the Programmable Relay Center with CAN data uses real-time chassis data to control loads.

FlexTech© system connects electronic modules within an automotive environment on a common control network, thereby reducing overall wiring, centralizing & improving diagnostic capabilities, & sharing valuable vehicle information between modules.

The InterMotive FlexTech© System begins with the Programmable Relay Power Center (PRPC). The Switch Backer Board can communicate with the PRPC & control loads. The Expansion board can be added if you need to control more loads. High idle & Interlock capabilities can be added by plugging in a simple LED panel.



# FLEXTECH<sup>©</sup> System

### PROGRAMMABLE RELAY POWER CENTER (PRPC) PROGRAMMABLE RELAY POWER CENTER (PRPC)



### SWITCH BACKER BOARD (SBB)



### EXPANSION BOARD (EXP)



### **OPTIONAL GATEWAY KIT**



- 8 Programmable relay power outputs
- 10 separate digital inputs
- 8 programmable low-current outputs 7 sourcing (0.5 amps), 1 sinking (0.5 amps)
- Outputs can be configured as momentary, latching, flashing or timed
- Easy diagnostics, LED indicators for status of output, blown fuse, ect.
- Piezo buzzer– Programmable audible patters for multiple uses– solid, pulsed
- Easy to program using our Graphical User Interface

### SWITCH BACKER BOARD (SBB)

- Controls system inputs & outputs
- Backlighting with optional dimming
- 8 switches per board (ground inputs)
- 8 Load light outputs (0.5 amps)
- 2 Switch backer boards can be used together
- 6 Outputs- 2 (1.0 Amp), 4 (0.5 Amp)
- Compatible with any brand or style of switches
- Dimensions: 7"L x 2.375"W x 1"H

### **EXPANSION BOARD (EXP)**

- 4– 10 Amp relay fused outputs
- ♦ 4– 1 Amp low-current outputs
- 4 Active low inputs
- Loads controlled by the PRPC
- Dimensions: 3"L x 4"W x 1"H

### **OPTIONAL MODULES**

- Gateway– Compliant FMVSS 403/404 wheelchair interlock & fast idle system
- Gateway with Brakemax Compliant FMVSS 403/404 wheelchair interlock & fast idle system with BrakeMax
- AFIS Advanced fast idle system with charge protect & optional A/C auto trigger







# GATEWAYA

# High Idle & Lift Interlock With Programmable Load Control

# FEATURES & BENEFITS

- Fully compliant FMVSS 403/404 wheelchair lift interlock
- Dynamic Load Response (DLR) technology– monitors engine RPM & maintains speed at all load conditions
- Charge protect on gas & diesel engines
- Automatic engagement when on A/C command is detected
- Heater Boost for improved cabin heat
   on diesel engines
- Dash-mounted control panel has LEDs to display electrical system, Automatic Fast Idle (AFIS) & Intelligent Lift Interlock System (ILIS) status
- Simple, single-point "Plug & Play" connection.. Super fast installation & No cutting of factory wires
- Solid state microprocessor controller.. No additional solenoids, cables, or brackets
- Capable of providing "Real-Time" chassis data via the CAN Bus
- Diagnostic trouble codes can be retrieved for "hard" faults & intermittent faults in non-volatile memory
- Intermittent Fault Filter (IFF)® technology filters out all erroneous changes in sensor signals

Rev. A

 Multiple & configurable chassis electrical load inputs/outputs



Gateway<sup>AI</sup> Module

## WHY GATEWAY<sup>AI</sup>?

- Gateway<sup>AI</sup> is a fully Compliant FMVSS 403/404 wheelchair interlock & fast idle system all in one, easy to install module!
- Fast Idle- monitors OEM sensor inputs from transmission, engine, charging system, air conditioner, ambient air temperature, & vehicle speed to determine if high idle is needed. Automatically maintained when loads are added or removed such as A/C or wheelchair lift.
- Lift Interlock Controls shift interlock by processing signals from transmission, parking brake and lift door to electronically lock down the vehicles ability to move in unsafe conditions







An ISO 9001:2008 Registered Manufacturer www.InterMotive.net 800-969-6080

# GATEWAY

# Gateway<sup>AI</sup> Options

## THE GATEWAY<sup>AI</sup> PRODUCT FAMILY

### Gateway with BrakeMax Controller

- All of the features of the Gateway/ ILIS plus a controller for Ford & GM vehicles with Tow/ Haul mode. This controller engages the Tow/Haul mode on start-up of the vehicle thereby providing the fleet with maximum "Tow/ Haul" mode benefits without having the driver think about it.
- Gateway with DuraTrans
  - All of the features of the Gateway/ ٠ ILIS plus a controller for Ford & GM vehicles with an Overdrive button. Overdrive is disabled until the vehicle speed reaches 55 MPH. Overdrive will not be disabled until the vehicle speed drops below 30MPH

### Gateway with Merlin

 All of the features of Gateway/ILIS plus the ability of the Merlin Multiplex System to use real-time chassis data to operate coach loads

### **Azure Option**

ILIS interlock functions for use on an ٠ Azure hybrid electric vehicle



Standard Gateway<sup>AI</sup> LED Panel



### Standard Gateway<sup>AI</sup> Door Ajar LED Panel



### Interlock Only LED Panel



Interlock Only Door Ajar LED Panel

### **SPECIFICATIONS**

**Physical Specifications:** Dimensions: Weight: Operating Temperature: 40°C to 85°C

2.0"W x 4.0"L x 0.9"H 14 lbs

**Electrical Specifications** Power Input:

Lift Enable:

+8 to 16 Vdc @ 1 amps for module control +8 to 16 Vdc @ 8 amps for lift enable +12v @ 8 amps Programmable Outputs: Ground @ 0.5 amps each

US Patent No's. 6,594,565 / 6,965,819 / 7,274,980







Rev. A

### LIMITED WARRANTY

#### WARRANTY PERIOD

InterMotive warrants the product for the period of <u>one year</u> from the date the product was shipped from InterMotive (if not registered) or <u>two years</u> from the in-service date (if the warranty registration is completed on-line) for products that fail to function properly under normal use because of a manufacturing defect when installed and operated according to the manufacturer's instructions. The product will be repaired or replaced with a comparable product without charge.

- Diagnostics A service facility diagnosing, installing, and/or repairing a product must follow the proper InterMotive
  procedures/documents reference www.intermotive.net or call 530-823-1048.
- Labor Reimbursement Contact InterMotive prior to commencing diagnostic/repair for information on allowable labor reimbursements.
- Return Goods Authorization The customer must contact InterMotive with the product serial number and obtain an RGA number prior to shipping the product to InterMotive.
- **Return Packaging**. The part being returned must have the RGA number and a detailed description of the symptom(s) or issue(s) the product is exhibiting attached to it. Packages received without an RGA number written on the outside will be refused delivery and returned to the customer at their expense.
- Shipping Shipping is the initial responsibility of the customer. If the product is determined to be warrantable and is repaired or replaced, InterMotive will pay for shipping to and from the repairing facility for the repaired/replaced product via ground shipping within the U. S. and Canada. If the product does not qualify for a warranty repair or replacement, the customer is responsible for return shipping costs.

#### **LIMITATION ON LIABILITY**

InterMotive will not be liable for personal injury, loss or damage to property or any incidental or consequential loss or expense from property damage due directly or indirectly from the use or installation of this product.



13395 New Airport Rd Suite A, Auburn, CA 95602 Phone: (530) 823-1048 Fax: (530) 823-1516 www.intermotive.net email – customerservice@intermotive.net 4/16/2015 10:32 AM

## LIFT & REAR DOOR SPECIFICATION



#### LIFT AND/OR REAR DOOR CONSTRUCTION

- The door is constructed of 1" x 1" and 1-1/2" x 1" aluminum tubing with a 1" x 2" center support. Double lift doors and rear door(s) have an exterior skin of .024" galvanized steel with a white exterior face laminated to 2.7 mm lauan. The single lift door has an exterior skin of .060 white FRP laminated to 2.7 mm lauan.
- All cavities of the door structure are filled with 1" block foam insulation. This insulation meets a value of R-5.
- All door components are vacuum laminated using water activated urethane adhesive.
- Interior panels are 3.2 mm gray vinyl covered lauan. There are (2) stainless steel strap hinges per panel and they are attached with stainless fasteners.
- All hardware is fastened into structural members welded to the inner door frame.

#### HARDWARE

- Each door panel utilizes a 2-pt locking system.
- The lift door single panel has a t-style hold open and plunger.
- The double door option has a t-style hold open and plunger on one leaf and a gas shock w/cable protector on the other.
- Window(s) are 1/8" thick tempered glass and have an AS3 rating with 20% light transmitting tint. The single door window is 32 ½" w x 32 ½" h. The double door window is 11" w x 32 ½" h.



Rear door shown w/dual windows



4/16/2015 10:32 AM

# LIFT & REAR DOOR SPECIFICATION

#### Double lift door shown





**Glaval Bus** 

A Division Of Forest River, Inc.

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# ACC Climate Control, Inc.

# **25062 Series Condenser**



### FEATURES:

- Two 11" diameter high performance fans
- · High performance motors with extended brush life
- Highly efficient all aluminum micro channel coil
- Unit is fabricated from galvanealed steel and cover in a corrosion resistant epoxy coating for durability
- Design allows for easy installation without having to cut intakes in the skirt of the bus, on certain applications providing a more aesthetic OEM look to the bus
- An inlet filter on the condenser protects the coil from contaminants



\*In the interest of continual product improvement, specifications may change without notice or, \* obligation to change existing product

### SPECIFICATIONS:

•Up to 67,000 BTU/HR
•Amp Draw (High Speed):
•18 Amps
•12 or 24 Volts
•Dimensions:
•28 1/2"W x 7"H x 14 3/4"D
•Weight: 26lbs

www.accclimatecontrol.com Phone: 800-462-6322 574-264-2190

### KEY COMPONENTS:

•Coil: 11471746A •Fan: 18000003B (2) •Filter: 08813973A

### 435/445 Floor Heater



Perfect for under seat use. Lightweight design. 2 speed motor with 7" fan. Made with high impact Model: Part#: 50 000 508 435

BTU Heating 35,000/CFM 300

Dimensions: 10.5" x 9.5" x 9.375"

4.9 Amps @ 13.5 Volts

Weight: 8 lbs.

Model: 445	Part#: 50 000 509
BTU Heatir 300	ig 45,000/CFM
Dimensions 9.375"	s: 10.5" x 9.5" x

4.9 Amps @ 13.5 Volts

Weight: 9 lbs.

### 455 Ducted Heater

101000

Twin high output blower assembly. Designed for use with floor ducting. Can also be used under seat. 3 speed settings.

Model: 455	Part#: 50 000 115
BTU Heating 650	55,000/CFM
Dimensions:	17.25" x 9.25"

x 8"

16 Amps @ 13.5 Volts

Weight: 19 lbs.

### Air Conditioner







### 23022 Evaporator

- Up to 45,000 BTU/hr
- · (1) dual blower assemblies @ 800 cfm
- 52 lbs



### 25062 Condenser

- 67,000 BTU/hr
- · (2) 11 inch fans
- · 18 amps @ 12 vdc
- · 26 lbs



**ATCO Hose System** 

ATCO 3800 Barrier Hose
 ATCO a/c Series Hybrid Ela

- ATCO a/c Series Hybrid Elastomer Fittings
- · Use with PAG oil
- $\cdot$  Meets SAE-J2064 Specifications



TM-16 Compressor (2 per bus)

 10 cubic inch displacement capacity

· 3 amps @ 12 vdc

## R226216

The R226216 model consists of a 23022 evaporator and a 25062 skirt condenser with (1) TM-16 Compressor, and is rated up to 45,000 BTU/hr (plus the OE Dash a/c capacity). The system is equipped with an orifice tube/accumulator designed for prolonged service life.

The simplified relay board provides system operation with ground leg switching. LEDs for each circuit provide for easy diagnostics of electrical continuity. Parallel flow condensers provide for lighter weight and higher efficiencies over copper tube condensers.

Tied with the OE package, the total system capacity rating is approximately 60,000 BTU/hr.



### AIR CONDITIONING SPECIFICATION

#### Model R226216 (tied into the OEM supplied air conditioning)

This air conditioning system shall be a Model **R226216**.

**Compressor:** (1) TM-16 10.0 CID compressor in addition to the OE Chassis supplied compressor driven off the vehicle engine.

**Evaporator:** One (1) Model 23022 free blow evaporator rated up to 45,000 BTU/hr. The evaporator shall have one (1) dual shaft blower assembly. The motor is minimum three (3) speed continuous duty permanent magnet and utilizes a resistor to limit amperage requirements. Drain pan shall not be part evaporator cover, but shall be part of the evaporator module with drain valleys to insure proper drains of the condensation. The return air filter is located at the coil and is easily accessible for maintenance without removal of the evaporator cover. The evaporator coil is copper tube design with aluminum fins. Evaporator assembly shall be a galvanized design. The evaporator shall utilize and orifice tube in lieu of a thermal expansion valve for a more trouble free operation. The evaporator cover have no sharp edges and must meet FMVSS 302 specification standards. High Pressure and Low Pressure (switch) protection are part of the evaporator assembly to maximize compressor and entire system protection. Evaporator air outlet louvers hall be adjustable to provide maximum directional airflow throughout the vehicle.

**Driver's area in-dash evaporator:** The OE Chassis supplied drivers in-dash evaporator shall be utilized and is independent of the rear passenger area air conditioning system.

**Condenser:** One (1) Model 23062 skirt mounted condenser rated @ 67,000 BTU/hr. The condenser shall have two (2) 11" high performance fan/motor assemblies with extended brush life motors. The coil shall be a parallel flow design for lighter weight and maximum heat rejection efficiency. The condenser assembly shall be designed to distribute air away from the vehicle floor. The condenser is installed in such a manner to assure the entire coil face area is exposed to fresh air from the outside of the vehicle skirt (the skirt of the vehicle will not in any way interfere with direct airflow through the coil). The system design shall use an accumulator with filter desiccant in lieu of a filter drier. The accumulator shall be mounted at the lowest point of the system (on the chassis frame rail) for maximum system protection. In addition, the accumulator shall include an oil pickup tube to insure proper compressor lubrication upon startup of the a/c system. The electrical connections shall be corrosion resistant

This air conditioning system utilizes environmentally friendly R-134A. Refrigerant hoses are ATCO, Air-O-Crimp 3800 Barrier hose with one-piece stainless steel clamps, all designed to meet SAE-J2064.

A three (3) speed fan switch and a rotary thermostat control is included and located in an area easily accessible to the driver. All wiring is color coded. The entire electrical system shall utilize the simplified relay board with ground leg switching. The relay board shall consist of LED's to aid in the diagnosis of electrical continuity. Each circuit shall be protected by individual fuses for greater protection of the relay board components. The system shall be protected with manual reset circuit breakers.

The system shall be supported by a 3 year/75,000 mile warranty, with a minimum of two (2) years unlimited miles. See warranty statement for details.

ACC Climate Control; *A Valeo brand* 22150 Challenger Dr. Elkhart, IN 46514 Phone: 574.264.2190 Toll Free: 800.462.6322 Fax: 574.266.6744 www.accclimatecontrol.com





### 2 Year Unlimited/3 Year 75,000 Mile Limited Warranty

ACC Climate Control, hereinafter referred to as "ACC", warrants its products to the original purchaser, subject to normal use and service, for a period of 24 months w/unlimited mileage or 36 months 75000 miles Part only, and while in possession of the original owner. If the in service date is more than 6 months past the build date the warranty will start at 6 month from the build date.

ACC agrees to repair or replace with a new or repaired part, any part of an ACC unit which, after inspection has proven to fail because of a manufacturing defect, within the warranty period. Replacement of a defective part within the warranty period will include labor for replacement at factory established rates in the first 24 months if performed at any authorized Service Center, part only no labor in the third year if less than 75,000 miles. Compensation at factory established rates for loss of refrigerant will be paid only when caused by a defective part and if the defective part itself was under warranty at the time of failure refrigerant is not covered in the third year.

#### CONDITIONS OF WARRANTY

#### 1. Handling of Warranty Claims.

- A. Should a failure occur to an ACC component under warranty, call ACC at (574) 264-2190 for authorization (**pre-authorization** is required before work is performed) or return the vehicle to the installer or dealer from whom the air conditioning was purchased. Present your copy of the warranty registration card. They will make the necessary repairs to the system or replacement parts as covered by the warranty.
- B. If it is not possible to return to the original dealer, take the vehicle to any convenient ACC dealer and present your Warranty Card. They will contact the factory for authorization for the necessary repairs. Should you be unable to locate an authorized ACC dealer, contact the factory and you will be assisted.
- 2. EXCLUSIONS FROM WARRANTY

THIS WARRANTY SHALL NOT APPLY TO:

- A. Any part or parts of products becoming defective as a result of negligence, accident, or other casualty.
   B. Owner's failure to provide normal maintenance such as lubrication of engine tightening belts cleaning
  - Owner's failure to provide normal maintenance such as lubrication of engine, tightening belts, cleaning coils and return air filters, loss of refrigerant, accumulator/drier replacement, or improper voltage or electrical connections.
- C. Improper installation, repair, or alterations.
- D. Operation in a manner contrary to ACC's printed instructions.
- E. Any parts or products which have been repaired or altered outside of ACC's factory unless specific written authorization for such repair or alteration has been issued by ACC.
- F. Any OEM failures. No additional labor will be allowed for the repair/replacement of OEM failed parts. This warranty does not extend to or include any portions of the vehicle not manufactured by ACC.
- 1. Conditions
  - A. ACC neither assumes nor authorizes any person to assume for it, any obligations or warranty other than stated herein.
     B. ACC reserves the right to make changes in design or improvements of its products or parts thereof without obligations to make
  - Accenter of the restrict of and the restrict of t
  - C. Remedies available to the owner for breach of the A/C Factory Warranty are expressly limited to an action to recover the cost of repairs or replacement due hereunder.
  - D. Repair or replacement of any part or parts of the products under this Warranty shall not extend this Warranty with respect to such repaired or replaced part or parts beyond the warranty period.
  - E. ACC does not warrant the workmanship of the installer and will not bear any cost due to faulty or incorrect installation or shipping damage.
  - F. ACC will not be liable for loss of time, labor, equipment, towing, rental, or other expenses while products are out of service.
     G. ACC shall credit authorized dealers for labor for replacement or repair of defective parts discovered during the warranty period
  - according to the published schedule of labor allowance in the Warranty Policy and Procedures Manual.
  - H. This Warranty shall remain in effect during the warranty period when the equipment is properly installed, serviced and operated under normal conditions according to ACC's instructions.
  - I. Items such as filters, belts, pulleys, , lubricants, etc. are considered expendable and not covered under warranty. Replacement of accumulator/driers and orifice tubes are warrantable only when approved by ACC Climate Control, Inc.
    - All replacement parts are shipped UPS Ground only. Expedited shipping is available at the expense of the purchaser.

ACC DISCLAIMS ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE OF THE VEHICLE, LOSS OF TIME, INCONVENIENCE; EXPENSE FOR TRAVEL, LODGING, LOST INCOME OR REVENUE,

LIMITED TO LOSS OF USE OF THE VEHICLE, LOSS OF TIME, INCONVENIENCE; EXPENSE FOR TRAVEL, LODGING, LOST INCOME OR REVENUE, TRANSPORTATION CHARGES OR LOSS OR DAMAGE OF PERSONAL PROPERTY. SOME STATES DO NOT ALLOW EXCLUSIONS OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSIONS MAY NOT APPLY TO YOU.

THIS WARANTY IS THE ONLY EXPRESSED WARRANTY BY ACC AND NO DEALER OR SERVICE FACILITY IS AUTHORIZED BY ACC TO MODIFY OR EXTEND IT. ANY IMPLIED WARRANTIES, INCLUDING WARRANTY OF FITNESS FOR PARTICULAR PURPOSE, OR WARRANTY OF MERCHANTABILITY, ARE EXPRESSLY LIMITED IN DURATION TO THE SAME PERIOD AS THE EXPRESSED WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON IMPLIED WARRANTIES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. THIS WARRANTY IS NULL AND VOID UNLESS THE WARRANTY REGISTRATION CARD IS COMPLETED AND MAILED TO ACC WITHIN

THIS WARRANTY IS NULL AND VOID UNLESS THE WARRANTY REGISTRATION CARD IS COMPLETED AND MAILED TO ACC WITHIN THIRTY DAYS OF THE DATE OF ORIGINAL RETAIL PURCHASE.IN ADDITION TO THE ABOVE RIGHTS, THE PURCHASER HAS CERTAIN LEGAL REMEDIES PROVIDED BY THE MAGNUSON MOSS WARRANTY ACT, PUBLIC LAW 93-637. YOU MAY ALSO HAVE CERTAIN RIGHTS UNDER STATE LAW.



1-1-2014



# ACC Climate Control, Inc.

### **SPECIFICATIONS:**

- •Permissible Speed:
- 700-6000 RPM
- •Clutch Coil:
- 12VDC-24VDC
- •Rotation:
- Clockwise
- Counterclockwise
- •Displacement:
- + 162.9 CC
- •Refrigerant:
- R-134A
- •Mounting:
- Pad Mount
- Ear Mount
- Rated Capacity:
- 55,000 BTU/HR

www.accclimatecontrol.com Phone: 800-462-6322 574-264-2190

# TM-16 COMPRESSOR









\*In the interest of continual product improvement, specifications may change without notice or, \* obligation to change existing product



**Product Construction** 

# SIRIUS



6768 Griffon



6727 Anthracite







NT

6801 Graphite

# APOLLO



4776 Masan



4479 Kilimanjaro



6451 Corsaire

NT

NT

4517 Fuji



## TARABUS SIRIUS

DESCRIPTION				
Backing		NT		
Thickness		2.25 ± 0.15 mm 0.088 ± 0.006"		
Weight		2.20 ± 0.15 kg/m² 4.05 lb/Sq.Yd		
Roll width		200 cm 6.56'		
Roll length		24 lm 78.72'		
PERFORMANCE				
Dimensional stability	ASTM D 1204	≤ 0.3 %		
Abrasion resistance	ISO 9352 TABER TEST	300 ± 50 mg 0.01 ± 0.002 oz		
Identation resistance	EN 433	≤ 0.2 mm < 0.008"		
Low temperature resistance	D 42 1235 A	- 20°C / -4°F		
Sound Damping Characteristics	ISO 717/2	∆l = 5 dB		
Color fastness	ASTM D 4459	≥7		
Slip resistance	ASTM D 2047	> 0.6		
Fire resistance	FMVSS 302 (ISO 3795/76)	Conform		
	Docket 90a (ASTM E648) (NFPA 253)	Class 1 (CRF> 0.45 W/cm²)		
Resistance to chemicals	EN 423	Unaffected by diluted acids and bases Unaffected by domestic products (excluding solvents for plasticized PVC)		





**FOLDAWAY BV & AM STYLES** 



Freedman Seating gives you the largest selection of Foldaways in the industry. Whether you need space for luggage or wheel chairs, we have the right seat. Easy to install and easier to operate, our Foldaways will provide you with miles and miles of happy riders and drivers. Maybe we should say, "smiles and smiles". Freedman Seating, "Not just seats – seating solutions."





THE FEATHER WEIGHT SERIES BY

Seating Solutions<sup>\*\*</sup>

an ISO 9001:2000 certified company

Notch-Back, standard Bench-Back and High-Back are shown.



# MID-HI SEAT "ROCK SOLID"

FEATER



# Sustainable Seating Solutions

Freedman Seating Company's Feather Weight seats are designed to be like feathers on a bird: light and airy to satisfy weight restrictions and ensure a smooth ride, yet durable for years of service and low maintenance.

Freedman Seating Feather Weight seats are the most severely tested in the company's history, and meet all applicable federal motor vehicle safety standards for strength andsafety (including 210 for seat belts). Less weight means one thing to bus builders and operators: they can get more passengers per bus. And when we say more passengers, we mean more happy passengers.



Seating Solutions ...

THE FEATHER WEIGHT SERIES BY FREEDMAN SEATING COMPANY an ISO 9001:2000 certified company

# FEATHER WEIGHT MID-HI SEAT "ROCK SOLID"







4545 W. Augusta Blvd., Chicago, IL 60651 (773)524-2440 (800)443-4540 Fax (773)252-7450 e-mail: sales@freedmanseat.com WWW.FREEDMANSEATING.COM

# Sustainable Seating Solutions

Whether your bus is for tour/charter, para-transit, or shuttle, Feather Weight Mid-Hi works for you. Optional adjustable headrests and reclining back-rests give you luxuries for long journeys, while grab rails and ABS plastic backs provide the function and safety required for shorter trips. The ultra-thin backrest gives outstanding support and creates more hip-to-knee room than any other seat in its class. The steel frame system meets or exceeds all applicable government standards for safety and durability. And, it's light as a feather!

### Feather Weight Mid-Hi features include:

- An ultra-thin *Knee-Saver* type backrest for added hip-to-knee room and lumbar support
- Molded polyurethane seat and back cushions for comfort and long lasting support
- 17½" wide seat cushions
- $22\frac{1}{2}$ " back height off the seat cushion, 37" off the floor
- Wire mesh-grid seat springs for even support
- FMVSS 210 compliance–all *Feather Weight* seats are seat belt ready
- Transit style-rigid backrests (starting weight without options-43 lbs.)
- Touring style-reclining backrests (starting weight without options-47 lbs.)
- Covers that can be removed and replaced easily and without the use of special tools

#### Feather Weight Mid-Hi options include:

- Black molded *U.S. Arms* or upholstered flip-up armrests
- Adjustable headrests
- Black or yellow corner AV grab rails
- Black or yellow top AV grab rails
- ABS plastic backs
- Mesh map pockets
- Vertical stitching
- FTA foam
- Snack trays
- Aluminum folding footrests
- Pillow seat cushions
- Rear row quick disconnect
- Side sliders
- 16", 18" or 19" wide seats available
- Rigid or reclining backrests
- Seat belts
  - Non-retracting seat belts
    - Retracting seat belts
    - USR (Under Seat Retractors)
- S3 Bio-Cushions (Made with vegetable oil)
- A wide variety of cloths and vinyls
- S3 cloths (Made with recycled yarn)

We are constantly updating and improving our seats; therefore we reserve the right to change or modify specifications or materials without notice. All Freedman Seating Company seats meet or exceed FMVS standards.

ISO 9001:2000 registered



### The Freedman USR (Under Seat Retractor)

The Freedman U.S.R. (Under Seat Retractor) is our solution to your seat belt needs. Our system places the seat belts right where you expect them. No more belts falling to the floor.

- Designed to be FMVSS 210 compliant (forward facing seats only)
- · Works on forward facing Feather Weight frames
- Can be added to existing Feather Weight frames
- · Light weight and durable
- · All belts are permanently kept in the correct position
- · Belts stay off floor

© 2017 Freedman Seating Company	PHONE:	800-443-4540
4545 West Augusta Boulevard	FAX:	773-252-7450
Chicago, IL 60651	EMAIL:	info@freedmanseating.com
AN ISO 9001-2008 CERTIFIED COMPANY		

# **EREEDINAN** SEATING COMPANY

### **Passenger Seats Limited Warranty & Sales Terms**

#### WARRANTY:

Freedman Seating Company warrants to the original buyer that its Passenger Seats are free from defects in material and workmanship for the following components:

- Metal Components Five (5) years
- Plastic Components Three (3) years
- Moving Components Three (3) years
- Gas Shock Components One (1) year
- Upholstered Components (foam) Two (2) years

Cover Warranty is for defects in the material or sewing and is limited to replacement covers. It does not include labor:

- One (1) year for Level #1 in-stock FSC material and perforated vinyl
- Two (2) years for Level #3 in-stock FSC material and higher
- No warranty for COM (Customer Own/supplied Material)

The warranty period begins at time of sales to customer or 180 days after shipment from the Freedman Seating

Company's factory to the customer, whichever occurs first.

#### NON-PRORATED REPLACEMENT:

In the event that a warranty-covered failure should occur within the warranty period, Freedman Seating Company will repair or replace the seat without charge and without prorating, at Freedman Seating Company's option. This is the sole and exclusive remedy for breach of any warranty. Any replacement seat or part is only covered by this warranty for the remainder of warranty period applicable to the original seat.

#### EXCLUSIONS:

This warranty specifically excludes foam, upholstery material, belts, and items exposed to normal wear and tear such as metal finish and paint and does not apply to any seat that is damaged as result of accident, derailment, improper installation, structural defects, intentional damage, abuse, vandalism, negligence, misuse, improper operating conditions, lack of maintenance, or extreme natural phenomena. Seats exposed to toxic or corrosive materials are excluded from this warranty. Seats exposed to cleaning solutions that are not listed on the Freedman Seating Company Cleaning Guide are excluded from this warranty. This warranty is provided directly to the purchaser only and does not extend to any subsequent party and is solely for the Freedman Seating Company product as it is originally manufactured.

#### INCIDENTAL, CONSEQUENTIAL DAMAGES, & LIMITATIONS:

This warranty shall be in lieu of any other warranty or terms, expressed warranty or terms, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. The purchaser's sole and exclusive remedy against Freedman Seating Company shall be for the repair and replacement of the defective product as provided herein. No other remedy; including but not limited to incidental or consequential damages for lost profits, lost sales, injury to person or property, shipping, freight, installation, removal, or any other incidental or consequential loss shall be available to the purchaser.

#### All reports, claims, or notices required by the warranty to be provided to Freedman Seating Company must be in writing and delivered to: Attention – Freedman Seating Company, Warranty Claim Department, 4545 W. Augusta Blvd., Chicago, IL 60630. Repairs being claimed for warranty must be sent to Freedman Seating Company for prior approval and warranty acceptance before any warranty claims can be made. Parts being claimed for warranty must be sent to Freedman Seating Company for prior approval and warranty

acceptance before any warranty claims can be made.

#### INSPECTION AND VERIFICATION:

The owner must provide access to the failed seat so that Freedman Seating Company's authorized representative can perform an onsite inspection. Alternatively, Freedman Seating Company may ask the owner to ship the failed seat to Freedman Seating Company's laboratory for inspection. Within 30 days of the inspection, either on-site or in the laboratory, Freedman Seating Company will render an opinion as to whether or not the claimed failure is covered by the warranty.

#### GENERAL MAINTENANCE:

Freedman Seating Company provides the proper maintenance instructions, as well as recommended service intervals with each seat. Warranty is contingent upon documented performance of recommended maintenance and service. All replacement parts should be recommended or authorized Freedman Seating Company components. Failure to purchase proper components will null and void the warranty.

#### DESIGN:

Freedman Seating Company reserves the right to modify parts and design specifications without notice as long as the seats meet general specifications, unless otherwise committed per contract. In case further non-conforming changes have to be incorporated, Freedman Seating Company will submit such changes to customer for prior approval.

#### OTHER:

The terms and warranty are contingent upon customers meeting agreed upon payment terms as specified in Freedman Seating Company proposals. Terms and warranty supersede any other terms including but not limited to customer terms printed on the back of Purchase Orders, listed on websites, or other sources from customers.

Warranty - Passenger Seats 1-15

# AL700 Titan Series Systems

With its distinctive blue webbing and highly-visible, yellow "locked" indicator tag, the AL700 Titan Retractor Series lets operators know when the retractor is in locked mode. This auto-tension, auto-lock wheelchair securement system allows operators to quickly secure a wheelchair in seconds — with only one hand. The Titan Retractor System has a low-profile bracket and a sleeker, cleaner retractor case with a stud fitting to attach the occupant restraint system.



# Accessories

### AL701051

### Series L Connector Assembly Kit

This kit converts AL700 Titan Series wheelchair tie-down retractor assemblies to a Series L Track application.



### AL701052

### Series A Connector Assembly Kit

This kit converts AL700 Titan Series wheelchair tie-down retractor assemblies to a Series A Track application.



### AL701053 Solo Cleat Connector Assembly Kit

This kit converts AL700 Titan Series wheelchair tie-down retractor assemblies to a Solo Cleat fitting application.


# Standards Compliance

AL700 Titan Series Systems when properly used with a complete Sure-Lok System, comprised of wheelchair tie-down, a complete occupant restraint system (including lap and shoulder belt), track and anchorages are designed to meet the following requirements where applicable:

- 30mph/20g Impact Test Criteria
   per SAE J2249
- 30mph/20g Impact Test Criteria per Canadian Z605 Standard
- 30mph/20g Impact Test Criteria per National Standards for School Buses
- 30mph/20g Impact Test Criteria per ISO 10542 Standard
- 49 CFR Part 38 Americans with Disabilities Act (ADA)
- 49 CFR Part 571.222 (FMVSS 222) School Bus Passenger Seating and Crash Protection
- FMVSS 302 Flammability Test

Certificates of Conformance available upon request.





- 1. The AL700 Titan Series retractors have distinctive blue webbing and a highly-visible, yellow "locked" indicator tag, letting operators know when the retractor is in locked mode.
- S-hook configuration makes it easy for operators to quickly secure a wheelchair in seconds — with only one hand — and keeps webbing flat and untwisted when properly attached to the wheelchair.
- **3.** The low-profile bracket on the AL700 Titan Series retractor is close to the ground and the chrome-plated case provides a cleaner, sleeker appearance.
- 4. Titan's low-profile design minimizes interference with most wheelchairs. With the auto-tensioning feature, webbing automatically retracts into the housing and stays off the floor keeping it cleaner and longer lasting.
- **5.** The stud fitting, located at the top of the retractor case, provides an easy attachment point for integrated occupant restraint systems.

**WARNING** Always secure the occupant in the vehicle with a complete Sure-Lok Occupant Restraint System, consisting of lap and shoulder belts. Secure the wheelchair in the vehicle with a Sure-Lok Wheelchair Tie-Down System.

# AL700 Titan Series Systems

Determine which Titan Retractor System is right for you. Select the Floor Anchor type you have or want installed. Then just order the corresponding kit part number. It's that easy. Retractor assembly part numbers are listed in the chart below and retractor kit part numbers are in the charts on the opposite page. For more information on occupant restraints, refer to pages 16-21.



# EXAMPLE OF KIT AL712S-4C





FLOOR ANCHOR TYPE	ATTACHMENT STYLE	KIT PN	PN IN KIT	QTY	OCCUPANT RESTRAINT
L TRACK	S-HOOK	AL712S-4C	AL700855S AL700907S AL700727HA	2 2 1	
A TRACK	S-HOOK	AL715S-4C	AL700857S AL700925S AL700727HA	2 2 1	
SOLO	S-HOOK	AL760S-4C	AL700944S AL700945S AL700727HA FE200922	2 2 1 4	AL700727HA

# TITAN RETRACTOR KITS WITH OCCUPANT RESTRAINTS

					4
L TRACK	S-HOOK	AL712S-4C-7	AL700855S AL700907S AL700868-4	2 2 1	AL700868-4
					<i>/</i>

# TITAN RETRACTOR KITS WITHOUT OCCUPANT RESTRAINTS

FLOOR ANCHOR TYPE	ATTACHMENT STYLE	KIT PN	PN IN KIT	QTY	OCCUPANT RESTRAINT
L TRACK	S-HOOK	AL727S-4C	AL700855S AL700907S	2 2	For available Occupant Restraints, refer to pages 16-21.
A TRACK	S-HOOK	AL728S-4C	AL700857S AL700925S	2 2	Always secure the occupant in the vehicle with a complete Sure-Lok Occupant
SOLO	S-HOOK	AL761S-4C	AL700944S AL700945S FE200922	2 2 4	Hestrant System, consisting of lap and shoulder belts. Secure the wheelchair in the vehicle with a Sure-Lok Wheelchair Tie-Down System.

# Vulcan<sup>™</sup> Series HD2500V ▼ 2.5mm 1080P Camera

## CAMERA FEATURES

The versatile Anvil<sup>™</sup> HD2500V camera from AngelTrax features a fully articulated lens casing, adjustable vertically and horizontally, to obtain wide-angle views of the vehicle's interior or exterior and surroundings. Equipped with Super Infrared, automated white balance and digital noise reduction, the Anvil HD2500V camera is capable of capturing astonishingly clear high-definition images day or night.

#### DIMENSIONS

- Height: 1.5 inches
- Width: 3.4 inches
- Depth: 2.9 inches
- Weight: 0.6 pounds

#### LENS

- 2.5mm focal length
- 3MP
- CMOS sensor
- Fully articulated lens casing for image orientation

#### MINIMUM ILLUMINATION

- Color: 1.0 Lux
- B/W: 0.5 Lux
- Sens-up x 60: 0.02 Lux

#### ELECTRONIC SHUTTER

- NTSC: 1/60s · 1/50,000s
- PAL: 1/50s · 1/50,000s

#### INFRARED

- Super IR circuit design for auto-exposure control when IR is ON
- Super IR: 98 · 164 feet

#### DAY AND NIGHT

• External sensor for auto switch between day and night modes

#### IMAGE CONTROL

- Digital Wide Dynamic Range (DWDR)
- Auto Tracking White Balance (ATW)
- Automatic Gain Control: High



SIGNAL TO NOISE RATIO • S/N > 50db

#### VIDEO OUTPUT LEVEL

1.0 Vp·p (75 composite)

AUTOMATIC GAIN CONTROL
• Auto

VIDEO COMPRESSION • H.264

IMAGE RESOLUTION • NTSC: 1920 x 1080

IMAGE FRAME RATE • 1920 x 1080@25/30fps

# FRAME INTEGRATION • Sens-up: Low

AUDIO • Built-in

# OPERATING CONDITIONS

-40°F ~ +158°F (-40° C ~ +70°C)

POWER SUPPLY • DC 12V ± 10%

IP RATING

• IP66

#### HOUSING/CASING MATERIAL

- Steel
- Anti-vibration
- Vandal-resistant



1/2017 · Specifications, features and applications of use are subject to change without notice.



# Vulcan<sup>™</sup> Series HD3600V ▼ 3.6mm 1080P Camera

## CAMERA FEATURES

The versatile Anvil<sup>™</sup> HD3600V camera from AngelTrax features a fully articulated lens casing, adjustable vertically and horizontally, to obtain the desired view of the vehicle's interior or exterior and surroundings. Equipped with Super Infrared, automated white balance and digital noise reduction, the Anvil HD3600V camera is capable of capturing astonishingly clear high-definition images day or night.

#### DIMENSIONS

- Height: 1.5 inches
- Width: 3.4 inches
- Depth: 2.9 inches
- Weight: 0.6 pounds

#### LENS

- 3.6mm focal length
- 3MP
- CMOS sensor
- Fully articulated lens casing for image orientation

#### MINIMUM ILLUMINATION

- Color: 1.0 Lux
- B/W: 0.5 Lux
- Sens-up x 60: 0.02 Lux

#### ELECTRONIC SHUTTER

- NTSC: 1/60s · 1/50,000s
- PAL: 1/50s · 1/50,000s

#### INFRARED

- Super IR circuit design for auto-exposure control when IR is ON
- Super IR: 98 · 164 feet

#### DAY AND NIGHT

• External sensor for auto switch between day and night modes

#### IMAGE CONTROL

- Digital Wide Dynamic Range (DWDR)
- Auto Tracking White Balance (ATW)
- Automatic Gain Control: High



SIGNAL TO NOISE RATIO • S/N > 50db

#### VIDEO OUTPUT LEVEL

1.0 Vp-p (75 composite)

AUTOMATIC GAIN CONTROL
• Auto

VIDEO COMPRESSION • H.264

IMAGE RESOLUTION • NTSC: 1920 x 1080

IMAGE FRAME RATE • 1920 x 1080@25/30fps

# FRAME INTEGRATION • Sens-up: Low

AUDIO • Built-in

# OPERATING CONDITIONS

-40°F ~ +158°F (-40° C ~ +70°C)

POWER SUPPLY • DC 12V ± 10%

IP RATING

• IP66

#### HOUSING/CASING MATERIAL

- Steel
- Anti-vibration
- Vandal-resistant



 $1/2017\cdot$  Specifications, features and applications of use are subject to change without notice.



# Vulcan<sup>™</sup> Series V12 HD/IP Mobile DVR

#### 12-CHANNEL DVR

#### DIMENSIONS

- Height: 3.5 inches
- Width: 8.7 inches
- Depth: 11.6 inches
- Weight: 5.7 pounds

#### TWELVE (12) A/V INPUTS

8 channels D1, WD1, 720P, or up to 1080P
 + 4 channels IP up to 1080P

#### VIDEO OUTPUTS

2 channels

#### AUDIO OUTPUTS

2 channels

#### CAMERA COMPATIBILITY

- 8 channels D1, WD1, 720P, or up to 1080P (see NTSC)
- 4 channels IP up to 1080P

#### STORAGE MEDIA

#### **RECORDING MEDIUM**

• One (1) 2.5" SATA hard drive and one (1) optional solid-state SD card

#### CAPACITY

 1TB (standard) up to 2TB (capable) (optional) 64GB SD card up to 512GB

#### **RECORDING OPTIONS**

 SD card slot for redundant and sequential recording

#### INTERFACE

#### NETWORK DATA CONNECTION • One RJ45 x 1 (10/100 M/1000M)

- EXPANSION
- RS232 × 2, RS485 × 2

#### **GPS INTERFACE**

• Built-in, compatible with optional GPS antenna

#### DRIVER ACTION DETECTION

#### PANIC BUTTON

- The remote status indicator (panic button) can be connected to show DVR power/record status without using a video monitor
- The driver-operated panic button has the following functions:
  - Solid green LED indicates that the unit has power and is recording
  - Event marker (panic button)

#### DRIVER ACTION DETECTION WIRES

• 8 signal wires individually programmable to indicate alarm or event



#### BUILT-IN G-FORCE SENSOR

#### COMPRESSION FORMAT

- Video: H.264
- Audio: ADPCM, G.711A G.711U

#### **RECORD RESOLUTION**

#### NTSC

 1080P, 720P, WD1(928X480), WHD1(928X240), WCIF(464X240), D1(704x480), HD1(704x240), CIF(352x240)

#### PAL

 1080P, 720P, WD1(928X576), WHD1(928X288), WCIF(464X288), D1(704X576), HD1(704x288), CIF(352x288)

#### **RECORDING OPTIONS**

- **Continuous record:** System will record all channels continuously while vehicle is running (factory setting).
- Alarm record: System will record when an alarm is triggered.
- Motion record: System will record when the cameras detect motion while vehicle is running.
- Schedule record: System will boot and record according to user-selectable schedule.

#### ELECTRICAL & OPERATING REQUIREMENTS

#### AUTO ON/OFF DETECTION

ACC detection

#### DELAY OFF SETTING • user selectable

OPERATING VOLTAGE • 8~36VDC

#### 0 00000

OPERATING TEMPERATURE • -14°F (-25°C) ~ +158°F (+70°C); -40°F (-40°C) ~ +158°F (+70°C) with heater

#### POWER CONSUMPTION

• 0W-105.3W

#### POWER SUPPLY

#### INPUT RANGE

• DC 8-36V

#### OUTPUT RANGE • DC5V/DC12V

# OUTPUT CURRENT

5V@500mA, 12V@500mA

#### **BUILT-IN POWER PROTECTION**

#### LOW VOLTAGE PROTECTION

• User selectable and programmed at installation

#### HOUSING/CASING

- Removable, shock-mounted
- · Vandal-resistant locking front cover
- Shock-resistant: MIL-STD-810F
- Aluminum
- Optional fan with filter, removable for cleaning

#### BUILT-IN WI-FI MODULE

#### **OPTIONAL COMPONENTS**

- VIRTUAL SYNCHRONIZED MAPPING • External Virtual Synchronized Mapping<sup>™</sup>
- module with North American maps
- Includes GPSV1 antenna
- Embeds GPS tracking information synchronized with recorded video footage

#### **GPS ANTENNA**

#### FIREPROOF BOX BACKUP

#### CELLULAR MODEM





- s ·
  - Removable
     will record all
     Vandal-res

# Vulcan<sup>™</sup> Series HD2500V ▼ 2.5mm 1080P Camera

## CAMERA FEATURES

The versatile Anvil<sup>™</sup> HD2500V camera from AngelTrax features a fully articulated lens casing, adjustable vertically and horizontally, to obtain wide-angle views of the vehicle's interior or exterior and surroundings. Equipped with Super Infrared, automated white balance and digital noise reduction, the Anvil HD2500V camera is capable of capturing astonishingly clear high-definition images day or night.

#### DIMENSIONS

- Height: 1.5 inches
- Width: 3.4 inches
- Depth: 2.9 inches
- Weight: 0.6 pounds

#### LENS

- 2.5mm focal length
- 3MP
- CMOS sensor
- Fully articulated lens casing for image orientation

#### MINIMUM ILLUMINATION

- Color: 1.0 Lux
- B/W: 0.5 Lux
- Sens-up x 60: 0.02 Lux

#### ELECTRONIC SHUTTER

- NTSC: 1/60s · 1/50,000s
- PAL: 1/50s · 1/50,000s

#### INFRARED

- Super IR circuit design for auto-exposure control when IR is ON
- Super IR: 98 · 164 feet

#### DAY AND NIGHT

• External sensor for auto switch between day and night modes

#### IMAGE CONTROL

- Digital Wide Dynamic Range (DWDR)
- Auto Tracking White Balance (ATW)
- Automatic Gain Control: High



SIGNAL TO NOISE RATIO • S/N > 50db

#### VIDEO OUTPUT LEVEL

1.0 Vp·p (75 composite)

AUTOMATIC GAIN CONTROL
• Auto

VIDEO COMPRESSION • H.264

IMAGE RESOLUTION • NTSC: 1920 x 1080

IMAGE FRAME RATE • 1920 x 1080@25/30fps

# FRAME INTEGRATION • Sens-up: Low

AUDIO • Built-in

# OPERATING CONDITIONS

-40°F ~ +158°F (-40° C ~ +70°C)

POWER SUPPLY • DC 12V ± 10%

IP RATING

• IP66

#### HOUSING/CASING MATERIAL

- Steel
- Anti-vibration
- Vandal-resistant



1/2017 · Specifications, features and applications of use are subject to change without notice.



# Vulcan<sup>™</sup> Series HD3600V ▼ 3.6mm 1080P Camera

## CAMERA FEATURES

The versatile Anvil<sup>™</sup> HD3600V camera from AngelTrax features a fully articulated lens casing, adjustable vertically and horizontally, to obtain the desired view of the vehicle's interior or exterior and surroundings. Equipped with Super Infrared, automated white balance and digital noise reduction, the Anvil HD3600V camera is capable of capturing astonishingly clear high-definition images day or night.

#### DIMENSIONS

- Height: 1.5 inches
- Width: 3.4 inches
- Depth: 2.9 inches
- Weight: 0.6 pounds

#### LENS

- 3.6mm focal length
- 3MP
- CMOS sensor
- Fully articulated lens casing for image orientation

#### MINIMUM ILLUMINATION

- Color: 1.0 Lux
- B/W: 0.5 Lux
- Sens-up x 60: 0.02 Lux

#### ELECTRONIC SHUTTER

- NTSC: 1/60s · 1/50,000s
- PAL: 1/50s · 1/50,000s

#### INFRARED

- Super IR circuit design for auto-exposure control when IR is ON
- Super IR: 98 · 164 feet

#### DAY AND NIGHT

• External sensor for auto switch between day and night modes

#### IMAGE CONTROL

- Digital Wide Dynamic Range (DWDR)
- Auto Tracking White Balance (ATW)
- Automatic Gain Control: High



SIGNAL TO NOISE RATIO • S/N > 50db

#### VIDEO OUTPUT LEVEL

1.0 Vp-p (75 composite)

AUTOMATIC GAIN CONTROL
• Auto

VIDEO COMPRESSION • H.264

IMAGE RESOLUTION • NTSC: 1920 x 1080

IMAGE FRAME RATE • 1920 x 1080@25/30fps

# FRAME INTEGRATION • Sens-up: Low

AUDIO • Built-in

# OPERATING CONDITIONS

-40°F ~ +158°F (-40° C ~ +70°C)

POWER SUPPLY • DC 12V ± 10%

IP RATING

• IP66

#### HOUSING/CASING MATERIAL

- Steel
- Anti-vibration
- Vandal-resistant



 $1/2017\cdot$  Specifications, features and applications of use are subject to change without notice.



# Vulcan<sup>™</sup> Series V12 HD/IP Mobile DVR

#### 12-CHANNEL DVR

#### DIMENSIONS

- Height: 3.5 inches
- Width: 8.7 inches
- Depth: 11.6 inches
- Weight: 5.7 pounds

#### TWELVE (12) A/V INPUTS

8 channels D1, WD1, 720P, or up to 1080P
 + 4 channels IP up to 1080P

#### VIDEO OUTPUTS

2 channels

#### AUDIO OUTPUTS

2 channels

#### CAMERA COMPATIBILITY

- 8 channels D1, WD1, 720P, or up to 1080P (see NTSC)
- 4 channels IP up to 1080P

#### STORAGE MEDIA

#### **RECORDING MEDIUM**

• One (1) 2.5" SATA hard drive and one (1) optional solid-state SD card

#### CAPACITY

 1TB (standard) up to 2TB (capable) (optional) 64GB SD card up to 512GB

#### **RECORDING OPTIONS**

 SD card slot for redundant and sequential recording

#### INTERFACE

#### NETWORK DATA CONNECTION • One RJ45 x 1 (10/100 M/1000M)

- EXPANSION
- RS232 × 2, RS485 × 2

#### **GPS INTERFACE**

• Built-in, compatible with optional GPS antenna

#### DRIVER ACTION DETECTION

#### PANIC BUTTON

- The remote status indicator (panic button) can be connected to show DVR power/record status without using a video monitor
- The driver-operated panic button has the following functions:
  - Solid green LED indicates that the unit has power and is recording
  - Event marker (panic button)

#### DRIVER ACTION DETECTION WIRES

• 8 signal wires individually programmable to indicate alarm or event



#### BUILT-IN G-FORCE SENSOR

#### COMPRESSION FORMAT

- Video: H.264
- Audio: ADPCM, G.711A G.711U

#### **RECORD RESOLUTION**

#### NTSC

 1080P, 720P, WD1(928X480), WHD1(928X240), WCIF(464X240), D1(704x480), HD1(704x240), CIF(352x240)

#### PAL

 1080P, 720P, WD1(928X576), WHD1(928X288), WCIF(464X288), D1(704X576), HD1(704x288), CIF(352x288)

#### **RECORDING OPTIONS**

- **Continuous record:** System will record all channels continuously while vehicle is running (factory setting).
- Alarm record: System will record when an alarm is triggered.
- Motion record: System will record when the cameras detect motion while vehicle is running.
- Schedule record: System will boot and record according to user-selectable schedule.

#### ELECTRICAL & OPERATING REQUIREMENTS

#### AUTO ON/OFF DETECTION

ACC detection

#### DELAY OFF SETTING • user selectable

OPERATING VOLTAGE • 8~36VDC

#### 0 00000

OPERATING TEMPERATURE • -14°F (-25°C) ~ +158°F (+70°C); -40°F (-40°C) ~ +158°F (+70°C) with heater

#### POWER CONSUMPTION

• 0W-105.3W

#### POWER SUPPLY

#### INPUT RANGE

• DC 8-36V

#### OUTPUT RANGE • DC5V/DC12V

# OUTPUT CURRENT

5V@500mA, 12V@500mA

#### **BUILT-IN POWER PROTECTION**

#### LOW VOLTAGE PROTECTION

• User selectable and programmed at installation

#### HOUSING/CASING

- Removable, shock-mounted
- · Vandal-resistant locking front cover
- Shock-resistant: MIL-STD-810F
- Aluminum
- Optional fan with filter, removable for cleaning

#### BUILT-IN WI-FI MODULE

#### **OPTIONAL COMPONENTS**

- VIRTUAL SYNCHRONIZED MAPPING • External Virtual Synchronized Mapping<sup>™</sup>
- module with North American maps
- Includes GPSV1 antenna
- Embeds GPS tracking information synchronized with recorded video footage

#### **GPS ANTENNA**

#### FIREPROOF BOX BACKUP

#### CELLULAR MODEM





- s ·
  - Removable
     will record all
     Vandal-res

#### QUICK REFERENCE: WARRANTY COVERAGE

This chart gives a general summary of your warranty coverage provided by Ford Motor Company under the **New Vehicle Limited Warranty**. Please refer to the description of warranty coverage for more specific information.

For each type of coverage, the chart shows two measures:



years in service
 miles driven

The measure that occurs first determines how long your coverage lasts. For example: Your Bumper to Bumper Coverage lasts for three years unless you drive more than 36,000 miles before three years elapse. In that case, your coverage ends at 36,000 miles.

For more details on coverage, see:

- What is Covered? (pages 8-12)
- What is Not Covered? (pages 12-15)

#### WHAT IS COVERED?

Your NEW VEHICLE LIMITED WARRANTY gives you specific legal rights. You may have other rights that vary from state to state. Under your New Vehicle Limited Warranty if:

- your Ford vehicle is properly operated and maintained, and



- was taken to a Ford dealership for a warranted repair during the warranty period,

then authorized Ford Motor Company dealers will, without charge, repair, replace, or adjust all parts on your vehicle that malfunction or fail during normal use during the applicable coverage period due to a manufacturing defect in factory-supplied materials or factory workmanship.

This warranty does not mean that each Ford vehicle is defect free. Defects may be unintentionally introduced into vehicles during the design and manufacturing processes and such defects could result in the need for repairs. Ford provides the New Vehicle Limited Warranty only to remedy manufacturing defects that result in vehicle part malfunction or failure during the warranty period.

The remedy under this written warranty, and any implied warranty, is limited to repair, replacement, or adjustment of defective parts. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Ford, through its authorized dealers, is willing and able to repair, replace, or adjust defective parts in the prescribed manner. Ford's liability, if any, shall in no event exceed the cost of correcting manufacturing defects as herein provided and upon expiration of this warranty, any such liability shall terminate.

Conditions that are not covered by the New Vehicle Limited Warranty are described on pages 12-15. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford, at the discretion of Ford or the Ford dealership.

Nothing in this warranty should be construed as requiring defective parts to be replaced with parts of a different type or design than the original part, so long as the vehicle functions properly with the replacement part. Moreover, Ford and its authorized dealers are entitled to a reasonable time and a reasonable number of attempts within which to diagnose and repair any defect covered by this warranty.

In certain instances, Ford may authorize repairs at other than Ford dealer facilities.

Two separate warranties apply to tires on your new vehicle. The New Vehicle Limited Warranty covers tire defects in factory supplied material or workmanship for 100% of labor costs and on a pro rata adjustment basis for parts. (See the reimbursement schedule below).

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For vehicles within the New Vehicle Limited Warranty time in service and mileage coverage period, defective tires will be replaced on a pro rata adjustment basis according to the following mileage-based Reimbursement Schedule:

MILES DRIVEN	PERCENT OF PARTS COVERED BY FORD
1-12,000	100%
12,001-24,000	60%
24,001-36,000	30%

The tire manufacturer also provides you with a separate tire warranty that may extend beyond the New Vehicle Limited Warranty coverage. You will find the manufacturer's tire warranty with the owner literature supplied with your vehicle. You have the option of having a tire warranty repair performed by the tire manufacturer's authorized service center. If you go to a tire service center for a repair covered by the New Vehicle Limited Warranty, you may be charged a prorated amount for wear or other charges. If so, you should present your paid invoice detailing the nature of the charges to any Ford Motor Company dealership for refund consideration. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford. In certain instances, Ford may authorize repairs at other than Ford dealer facilities. Tire replacements under warranty will be made with the same brand and model as originally equipped with the vehicle unless the same brand and model is no longer available, in which case a tire of the same brand, size, load, speed and tread type will be used. In some circumstances, Ford may authorize another brand and/or model to substitute for the original brand and model, even if still available.

Normal tire wear or damage is not reimbursable. See page 15 for details of what is not covered.

# Extended warranty coverage periods are available for certain vehicle parts and conditions. Specifically,

(1) Your vehicle's Powertrain components are covered for five years or 60,000 miles, whichever occurs first. The extended coverage applies to the **Engine:** all internal lubricated parts, cylinder block, cylinder heads, electrical fuel pump, powertrain control module, engine mounts, flywheel, injection pump, manifold (exhaust and intake), manifold bolts, oil pan, oil pump, seals and gaskets, engine thermostat, engine thermostat housing, timing chain cover, timing chain (gears or belt), turbocharger/supercharger unit, valve covers, water pump;



**Transmission:** all internal parts, clutch cover, seals and gaskets, torque converter, transfer case (including all internal parts), transmission case, transmission mounts; **Front-Wheel Drive:** axle shafts, front bearings, seals and gaskets, universal and constant velocity joints; **Rear-Wheel Drive:** axle shafts, rear bearings, center support bearing, drive axle housing (including all internal parts), drive shaft, retainers, supports, seals and gaskets, universal and constant velocity joints. **Four-Wheel/All-Wheel Drive:** axle shafts, bearings (front and rear), center support bearing, drive shafts, final drive housing (including all internal parts), hubs-automatic front locking (four-wheel drive), locking rings (four-wheel drive), seals and gaskets, universal and constant velocity joints.

(2) Your vehicle's safety belts and air bag Supplemental Restraint System (SRS) are covered for an extended Safety Restraint Coverage Period, which lasts for five years or 60,000 miles, whichever occurs first.

(3) Your vehicle's body sheet metal panels are covered for an extended Corrosion Coverage Period, which lasts for five years, regardless of miles driven. The extended warranty coverage only applies if a body sheet metal panel becomes perforated due to corrosion during normal use due to a manufacturing defect in factory-supplied materials or factory workmanship. If aluminum body panels have corrosion or rust damage, and the damage is not the result of abnormal usage, vehicle accident, customer actions and/or extreme environmental conditions, the corrosion or rust damage repairs are covered for 5 years, unlimited miles. For damage caused by airborne material (environmental fallout) where there is no factory-related defect involved and therefore no warranty – our policy is to provide free repair of paint damage due to the airborne material for 12 months or 12,000 miles, whichever occurs first.

(4) Your vehicle's direct injection diesel engine and certain engine components are covered during the PowerStroke Diesel Engine Coverage Period, which lasts for five years or 100,000 miles, whichever occurs first. The following parts are covered during this extended coverage period: the engine, cylinder block, heads and all internal parts, intake and exhaust manifolds, timing gear, harmonic balancer, valve covers, oil pan and pump, water pump, fuel system (excluding fuel lines, fuel tank and frame mounted fuel conditioning module sometimes referred to as the frame mounted pump/filter/water separator or frame mounted fuel filter/water separator), high pressure lines, gaskets and seals, glow plugs, turbocharger, two-stage turbocharger assembly, turbocharger actuator,

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powertrain control module, high pressure fuel injection pump assembly, injectors, injection pressure sensor, fuel rail pressure sensor, exhaust back pressure regulator and sensor, exhaust pressure sensor, manifold pressure sensor, intake air temperature sensor, crankshaft position sensor, camshaft position sensor, accelerator switch.

**NOTE:** Some components may also be covered by the Emissions Warranties. For more information, see pages 17-31.

If you own or lease a 2017-model Next Generation Police Interceptor Vehicle (NGPI), refer to the Warranty Addendum Card that was given to you when you took delivery of your vehicle for further explanation of Amendments to the New Vehicle Limited Warranty. The Warranty Addendum applies only the NGPI vehicles delivered in the State of Florida and New York.

# WHAT IS NOT COVERED UNDER THE NEW VEHICLE LIMITED WARRANTY?

#### Damage Caused By:

- accidents, collision or objects striking the vehicle (including driving through a car wash)
- theft, vandalism, or riot
- fire or explosion
- using contaminated or improper fuel/fluids
- · customer-applied chemicals or accidental spills
- driving through water deep enough to cause water to be ingested into the engine
- misuse of the vehicle, such a driving over curbs, overloading, racing or using the vehicle as a permanent stationary power source

#### Damage Caused by Alteration or Modification

The New Vehicle Limited Warranty does not cover any damage caused by:

- alterations or modifications of the vehicle, including the body, chassis, electronics or their components, after the vehicle leaves the control of Ford Motor Company
- tampering with the vehicle, tampering with the emissions systems or with the other parts that affect these systems (for example, but not limited to exhaust and intake systems)



 the installation or use of a non-Ford Motor Company part or software (other than a certified emissions part or software) or any part or software (Ford or non-Ford) designed for off-road use only installed after the vehicle leaves the control of Ford Motor Company, if the installed part fails or causes a Ford part to fail. Examples include, but are not limited to lift kits, oversized tires, roll bars, cellular phones, alarm systems, automatic starting systems and performance-enhancing powertrain components or software and performance "chips".

Your vehicle may allow, enable or facilitate the use of certain non-Ford Motor Company software. Ford is not responsible for the functionality of such software. Ford may disallow, discontinue or modify your ability to use such software at any time without prior notification or incurring any warranty or other obligation. Non-Ford Motor Company software may be governed by End User License Agreement or warranty provided by the software provider. For Ford Motor Company software see End User License Agreement found in the Owner Manual.

#### Damage Caused by Use and/or the Environment

The New Vehicle Limited Warranty does not cover surface rust, deterioration and damage of paint, trim, upholstery, and other appearance items that result from use and/or exposure to the elements. You, as the owner, are responsible for these items. Some examples are:

- dings, dents
- cuts, burns, punctures or tears
- road salt
- · tree sap, bird and bee droppings
- windstorm, lightening, hail
- earthquake
- freezing, water or flood
- · stone chips, scratches (some examples are on paint and glass)
- windshield stress cracks. However, limited coverage on windshield stress cracks will be provided for the first 12 months or 12,000 miles (which ever occurs first), even though caused by use and/or exposure to the elements.

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#### Maintenance/Wear

The New Vehicle Limited Warranty does not cover: (1) parts and labor needed to maintain the vehicle; and (2) the replacement of parts due to normal wear and tear. You, as the owner, are responsible for these items. See your Owner's Manual. Some examples of maintenance and normal wear are:

oil changes

- clutch linings
  wiper blades\*
- oils, lubricants, other fluids
- oil/air filters
- tire rotation/inflation
- cleaning/polishing
- balancing\*brake pad/lining\*

· wheel alignments and tire

\* Ford will replace or adjust certain maintenance items when necessary, free of charge during a limited period:

- Wiper blade replacements will be provided during the first six months in service, regardless of miles driven.
- Wheel alignments and tire balancing will be provided during the first 12 months or 12,000 miles in service, whichever occurs first.
- Brake pad/lining replacements will be provided during the first 12 months or 18,000 miles in service, whichever occurs first.

#### SYNC Hands-Free Communications and Entertainment System

If your vehicle is equipped with SYNC, the New Vehicle Limited Warranty does not cover repairs under certain conditions, such as failure to provide proper installation environment. The New Vehicle Limited Warranty does not cover repairs of certain damage or loss, such as:

- · Loss of personal recording media, software or data
- Loss, change, or discontinuation of functionality because of:
   system updates to Ford Motor Company software or lack of compatibility with non-Ford Motor Company electronic devices
  - non-Ford Motor Company software, or
  - obsolescence of vehicle software or hardware
  - lack of network coverage or availability
- · Damage caused by:
  - · abnormal use such as insertion of foreign objects, fluid spillage
  - · unauthorized modification to alter functionality or capability
  - computer or internet viruses, bugs, or malware, such as worms, Trojan Horses, cancelbots
- 14

- · installation of unauthorized software, peripherals and attachments
- unauthorized, unapproved and/or incompatible repairs, upgrades and modification
- the defective function or obsolescence of your cellular phone or digital media device (for example, inadequate signal reception by the external antenna, viruses or other software problems)

#### **Tire Wear or Damage**

The New Vehicle Limited Warranty does not cover normal wear or worn out tires. Tires will not be replaced (unless required by a warranty repair) for wear or damage including:

- tire damage from road hazard such as cuts, snags, bruises, bulges, puncture, and impact breaks
- tire damage due to under or over inflation, tire chain use, racing, spinning (as when stuck in snow or mud), improper mounting or dismounting, or tire repair

#### Other Items or Conditions Not Covered

The New Vehicle Limited Warranty does not cover:

- vehicles that have had the odometer disconnected, altered, or inoperative for an extended period of time with the result that the actual mileage cannot be determined
- vehicles that have ever been labeled or branded as dismantled, fire, flood, junk, rebuilt, reconstructed, or salvaged; this will void the New Vehicle Limited Warranty
- vehicles that have been determined to be a total loss by an insurance company; this will void the New Vehicle Limited Warranty
- converted ambulances that are not equipped with the Ford Ambulance Prep Package, see important information about ambulance conversions (page 36)
- Aftermarket parts or components, sometimes installed by Ford Motor Company or an authorized Ford dealership, may not be covered by the New Vehicle Limited Warranty. Any damage caused to Ford components due to the failure of aftermarket parts (other than a certified emissions part) is not covered.

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## 4. In addition ...

#### ROADSIDE SERVICE ASSISTANCE (UNITED STATES, PUERTO RICO, AND U.S. VIRGIN ISLANDS)

Your vehicle is covered by the complimentary Ford Roadside Assistance Program (unless you are driving a daily rental unit). Under this program, Ford will cover:

- Towing to the nearest Ford Motor Company dealership, or towing to your selling dealership if within 35 miles of the disablement
- Flat tire change (vehicle must have useable spare)
- Fuel delivery (limited to two occurrences in a 12-month period up to 2 gal. gas, 5 gal. diesel)
- Jump starts
- · Lock-out assistance (replacement key cost is customer responsibility)
- Winch out services: includes pulling a vehicle within 100 feet of a paved or county maintained road. No recoveries.

The Roadside Assistance Program is separate from the New Vehicle Limited Warranty. It begins at the warranty start date and lasts for five years or 60,000 miles (whichever occurs first). If you need towing beyond the five years or 60,000 miles (whichever occurs first) period, Ford can arrange roadside assistance and charge your credit card. If the reason for the vehicle disablement is later found to be covered by another Ford warranty, Ford will provide a refund for the tow charge under the other warranty, through the dealership.

# For emergency roadside assistance, call 1-800-241-3673, 24 hours a day, 365 days a year.

Ford Rent-A-Car (FRAC) and Dealer Daily Rental (DDR) vehicles that must be towed because a covered repair failed during the warranty coverage period, Ford will cover towing to the nearest Ford Motor Company dealership.

Ford Motor Company reserves the right to modify or discontinue Roadside Assistance at any time. Certain restrictions apply to Roadside Assistance benefits. Call 1-800-241-3673 for further details.



2

Explore 2017 Ford Econoline Cutaway



# Starting at<sup>1</sup> \$30,695

Pricing for May 2, 2017 and ZIP 46514 View all offers (/commercial-trucks/e-series-cutaway/2017/pricing-and-incentives/)

Seating for

# Power and Handling

# Interior Features

http://www.ford.com/commercial-trucks/e-series-cutaway/2017/models/e350-cutaway-drw/ 5/2/2017

# Explore 2017 Ford Econoline Cutaway Seating

## Standard

Front buckets

## Optional

- Dual Cloth Captain's Chairs
- Dual Captain's Chairs (without trim)
- 6-way Power Driver Seat adjuster
- Seats Delete passenger
- · Cloth Captain's Chairs
- Captain's Chairs Driver Side Only Mid Series Cloth
- Manual Pedestal with 2-way Adjuster
- Power Seat Prep Package (Motorhome / Shuttle Bus)
- Seat Prep Package Manual with 2-way Adjuster (Shuttle Bus)
- Seat Prep Package Power (Shuttle Bus)

# **Entertainment Systems**

## Standard

Electronic AM/FM with Clock and Audio Input Jack

## Optional

- Premium Electronic AM/FM/CD with Clock and Audio Input Jack
- SiriusXM<sup>®</sup> Radio
- Voice-activated SYNC<sup>®</sup>
- Audio Delete
- Audio 2-speaker prep package
- Audio 4-speaker prep package
- Audio 4-speaker upgrade

# Explore 2017 Ford Econoline Cutaway Comfort and Convenience

## Standard

- Front Air Conditioning
- Front-Door Trim Panels with Integrated Map Compartment
- Slimline Engine Cover Console
- · Instrument Panel Color-keyed with tachometer
- Powerpoints Dual 12-volt in instrument panel, single in glove box
- Mirrors Interior, NOT INCLUDED
- Sun Visors
- Vinyl flooring Front row
- · Step Well Pads Black plastic
- Horn Electric, dual note
- Lighting Front dome lamp
- Windshield Wipers Interval

#### Optional

- · Air Conditioning Delete
- Auxiliary Heater/AC Connector Package with Rear Controls
- B-Pillar Trim Kit
- Ford Telematics<sup>™</sup> powered by Telogis<sup>®</sup>
- Cruise Control
- Electronic Message Center
- Power Windows and Locks Group
- 110V A/C Outlet
- High Capacity Upfitter Switches
- Mirror Inside Day/Night rearview mirror

# **Exterior Features**

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DISCLOSURES  $\lor$ 



# **Selected Options**

Code	Description
Base Vehicle	
E3F	Base Vehicle Price (E3F)
Packages	
780A	Order Code 780A Includes: - Engine: 6.8L EFI Triton V10 - Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul. - 4.56 Axle Ratio Includes vehicle emission control information label with 72 sq ft frontal area restriction. - GVWR: 11,500 lbs Payload Package - Wheels: 16" x 6" White Painted Steel
Powertrain	
99S	Engine: 6.8L EFI Triton V10
44P	Transmission: Electronic 6-Speed Automatic w/OD Includes tow haul.
X85	<b>4.56 Axle Ratio</b> Includes vehicle emission control information label with 72 sq ft frontal area restriction.
20Y	GVWR: 11,500 lbs Payload Package
Wheels & Tires	
T67	Tires: LT225/75Rx16E BSW AS (Fleet)
	NO LONGER AVAILABLE as standard equipment. Fleet only with valid FIN code.
646	Wheels: 16" x 6" White Painted Steel
Seats & Seat Trim	
21S	Captain's Chair Driver Side Only w/o Trim Includes: - No Seat Trim - Passenger Side Air Bag Delete
Х	No Seat Trim
Other Options	
PAINT	Monotone Paint Application
138WB	138" Wheelbase
63N	Extra Heavy-Duty 225-Amps Alternator
634	Dual Heavy-Duty 78-Amp Batteries Includes: - Heavy-Duty 78-Amp Battery Replaces standard 72-amps heavy-duty battery.

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



# Selected Options (cont'd)

60X     Right Hand Door Delete       Deleties passenger side A-piller grab handle, right hand seat belt system and hardwine. passenger side Appiller grab handle, right hand seat belt system and hardwine. passenger side speaker and handline.       41H     Engine Block Heater       513     License Plate Bracket       625     Day/Night Interior Recommend when minimum temperature is 10 degrees Fahrenheir or below.       559     Frame Pucks (Isolators) Includes 12 body mounts.       526     Cruise Control       587     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single diac. Includes 20 board mounts.       678     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single diac. Includes 20 board speakers.       674     4.Speaker Upgrade Package Includes 2 Installed speakers and 2-speakers.       675     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single diac. Includes 20 board speakers.       676     Frame Pucks (Isolators) Includes 2 Installed speakers and 2-speakers.       677     Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.       648     High Series Exterior Upgrade Package Includes: Pront Chrome Bumper wilkek Lower Fascia Chrome Guine Winkek Lower Fascia Chrome Guine Infraed Lans Headings Single diamer, Recommende when minimum temperature is 10 diago Single diamer, Recommende when minimum temperature is 10 diago Single diamer, Recommende when minimum temperature is 10 diago Single diamer, Recommende diago Single diago Chrome Guine Infraed Lans Headings Single diamer, Recommende destined Single dinterit, Recommende destined Single diamer, Recommende des	Code	Description
Deletes passenger side A-piller grab hand, set has update system and handware passenger side speaker and 2 speakers.         411       Engine Block Heater         513       License Plate Bracket         625       Day/Night Interior Rearview Mirror         516       Cruise Control         585       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         586       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         587       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         587       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         588       Strate disa: Indudes a unit industriation and basen and a speakers.         472       Andbalance Prep Package Not Required         589       Exterior Mirror Delete         180       High Series Exterior Upgrade Package         162	60X	Right Hand Door Delete
41H       Engine Block Heater         Single element. Recommended when minimum temperature is 10         153       License Plate Bracket         625       Day/Night Interior Rearview Mirror         559       Frame Pucks (Isolators)         1notkines 12 body mounts.       Economic Control         585       Cruise Control         586       Radio: Premium ETR AM/FM Stereo/Digital Clock/CD         587       Single disc. Includes audio input jack and 2-speakers.         874       -Speaker Upgrade Package         1not dires 2 installed speakers and 2 boods appeakers.       REQUIRED on orders not destined for ambulance use.         54F       Exterior Mirror Delete         18A       High Series Exterior Upgrade Package         1not dires       -Installed speakers and 2 boods peakers.         54F       Exterior Mirror Delete         18A       High Series Exterior Upgrade Package         162       Vinyl Foor Covering         47B       Shuttle Bus Prep Package         162       Vingle Series Exterior Upgrade Package (LPO)         163       Antildes rat fan controls.         671       Antildes rat fan controls.         672       Maximum Front Galwer, Secies         673       Antildes rat fan controls.         67		Deletes passenger side A-pillar grab handle, right hand seat belt system and hardware, passenger side air bag, under-seat stowage, passenger side sun visor, passenger side speaker and headliner. Includes: - Exterior Mirror Delete
Single element.     Recommended when minimum temperature is 10       153     License Plate Bracket       625     Day/Night Interior Rearview Mirror       559     Frame Pucks (Isolators) Includes 12 body mounts.       525     Cruise Control       586     Radio: Premium ETR AM/FM Stereo/Digital Clock/CD Single disc. Includes audio input jack and 2-speakers.       874     -4-Speaker Upgrade Package Includes 2 mailed speakers and 2 boxed speakers.       472     Ambulance Prep Package Not Required REQUIRED on orders not destined for ambulance use.       54F     Exterior Mirror Delete       18A     High Series Exterior Upgrade Package Includes 2       162     Vinyl Floor Covering       17B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package (LPO)       162     Vinyl Floor Covering       47B     Shuttle Bus Prep Package	41H	Engine Block Heater
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41X Engine Console Cover Delete (LPO)	Fleet Options	
	41X	Engine Console Cover Delete (LPO)

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



# Selected Options (cont'd)

Code	Description
	Fleet only with valid FIN code.
Emissions	
425	50 State Emission System
Interior Colors	
XE_01	Medium Flint
Primary Colors	
YZ_01	Oxford White

Prices and content availability as shown are subject to change and should be treated as estimates only. Actual base vehicle, package and option pricing may vary from this estimate because of special local pricing, availability or pricing adjustments not reflected in the dealer's computer system. See salesperson for the most current information.



# Limited Warranty and Owners Information

# GLAVAL BUS LIMITED WARRANTY AND CUSTOMER INFORMATION

GLAVAL BUS Commitment
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# **GLAVAL BUS Commitment**

We are committed to supplying you with a bus that has been designed and manufactured using quality materials and the finest workmanship available to our industry.

We focus on providing the highest standards of quality control over every component that goes into your bus to ensure maximum safety and reliability. Due to our commitment and focus we are able to provide you with one of the longest warranties in the industry.

## About this Booklet

This booklet explains in detail the warranty coverage for your bus. This booklet also explains **Owner Assistance** information and information regarding alternative **Dispute Resolution**.

Please note that other warranty coverage's are provided by the chassis and/or other component manufacturers. Review the other manufacturers' warranty manuals for their particular warranty coverage. Refer to **Other Warranties That May Apply**.

We ask that you keep this booklet in your bus for reference and to be available to any repair facility that is providing warranty service. We also ask that you pass this manual on to any future owners.

# Warranty Registration Notice

As an Owner your Warranty Registration Start Form must be completed, signed and mailed to GLAVAL BUS. If you do not remember signing the warranty card during the initial delivery please contact your dealer.

The warranty registration helps ensure that we can find you in the event that either GLAVAL BUS or a Component Manufacturer needs to contact you. We must have the company name, owner's name, street address, city, state/province, zip/postal code and telephone number.

This signed form **must** be returned to GLAVAL BUS Warranty Department **before** the GLAVAL BUS Limited Warranty will be in affect.

Note: The GLAVAL BUS Limited Warranty is one of the many express warranties that accompany your bus and are included within your packet of information. Please review the information to be sure you are properly registered with the manufacturers of the chassis and other components. Refer to **Other Warranties That May Apply**.

# Warranty Start Date

<u>For a new bus</u> the Warranty Start Date for the GLAVAL BUS Limited Warranty is the day you take delivery of your new bus.

<u>For a GLAVAL BUS Demo</u> the Warranty Start Date for the GLAVAL BUS Limited Warranty is the day you take delivery. However, the Manufacturers' warranties for other components will run from the original in service date for the bus.

*For a GLAVAL BUS Dealer Demo* the Warranty Start Date for the GLAVAL BUS Limited Warranty is the day the Dealer put the bus into service.

## Who Warrants the Bus

Each new bus body is warranted by the manufacturer and installer of the body: GLAVAL BUS, Division of Forest River, Inc., hereinafter referred to as GLAVAL BUS, 914 County Road 1 North, Elkhart, Indiana; and is administered by the GLAVAL BUS Customer Service Department, Elkhart, Indiana 46514.

## Who Is Covered

GLAVAL BUS, the warrantor, extends this limited warranty to the original and any subsequent owners of the bus during the WARRANTY PERIOD.

## What Is Covered

GLAVAL BUS warrants that each new bus body will be free from defects in any materials or workmanship supplied or performed by GLAVAL BUS that occur under normal use within the applicable warranty period and subject to certain limitations and exclusions as specified in this limited warranty.

# Refer to items under **Other Warranties That May Apply**, **Exclusions and Limitations** and **Limits of Warranty**.

Replacement parts provided under the terms of the warranty will whenever possible, match original equipment. When necessary, GLAVAL BUS will substitute parts of comparable function and value. Defective items may be replaced with new, remanufactured, reconditioned or repaired components.

# Warranty Period

The GLAVAL BUS Limited Warranty is for a period of five (5) years from the date of first delivery or 100,000 miles, whichever occurs first, **except** for other coverage's listed under this paragraph and items listed under Other Warranties That May Apply, Exclusions and Limitations and Limits of Warranty.

**Paint and/or Tape application**, if performed by GLAVAL BUS, is warranted to be free of substantial defects in workmanship and materials provided by GLAVAL BUS for **1 year (12 months)** from date of first delivery.

**Exterior Body parts** are warranted against rust-through due to improper application or assembly for two (2) years from date of first delivery, regardless of mileage.

## **Other Warranties That May Apply**

The bus's engine, chassis, drive train, suspension system, battery, and other chassis components are covered by a separate warranty offered by the chassis manufacturer and are administered by the chassis manufacturer's authorized dealers. The tire manufacturer separately warrants tires.

Other components throughout the bus may also be covered by separate warranties from the component manufacturer(s) and administered by the manufacturer(s) and/or their authorized dealers.

If you do not understand the different warranty cards and registrations supplied with your bus please contact your dealer for assistance.

**Examples of the other manufacturer warranties.** These are subject to change per the manufacturer and there may be others.

Elec. Components Limited Warranty	1 year	Unlimited mileage
Alternators Limited Warranty	1 year	Unlimited mileage
Air Conditioning Limited Warranty	2 year	Unlimited mileage
Heater(s) Limited Warranty	2 year	Unlimited mileage
Electric Door Limited Warranty	1 year	Unlimited mileage
Wheelchair lift		
Braun Limited Warranty	3 year	Unlimited mileage
Ricon Limited Warranty	5 year	Unlimited mileage
Wheelchair tie down	90 days	Unlimited mileage

# What Is Not Covered

As stated previously, GLAVAL BUS does not warrant the base vehicle engine, chassis, drive train, suspension system, battery, and other chassis components. These components are covered by a separate warranty offered by the chassis manufacturer and administered by the chassis manufacturer's authorized dealers. The tire manufacturer separately warrants tires.

GLAVAL BUS does not cover any accessory covered by a separate warranty offered and administered by the component manufacturer. Examples of these are listed in "Other Warranties That May Apply."

All items are subject to the terms set forth under "Exclusions and Limitations" and "Limits of Warranty."

## **Exclusions and Limitations**

The GLAVAL BUS Limited Warranty specifically does not extend to the following:

## Components that have been Altered, Modified or Substituted

Components or systems which have been modified, altered, substituted or repaired by unauthorized personnel without the written authorization of GLAVAL BUS.

Contact GLAVAL BUS Customer Service before you make any changes to your bus.

#### Damages resulting from Overloading

Damages that may occur as the result of overloading or uneven weight distribution, including damages to the chassis, frame, and other parts or components, will not be covered and can invalidate portions of the GLAVAL BUS Limited Warranty.

**Note:** To avoid damage when loading make sure the weight is evenly distributed throughout the unit.

#### **Deterioration from Normal Wear and Tear**

Deterioration from normal wear and tear is not covered including, but not limited to, wear and tear to the interior seating, flooring, facing of fabrics, carpeting or windows and exterior body panels, lights, trim, mirrors and other accessories.

## Maintenance and Consumable Items

The GLAVAL BUS Limited Warranty does not cover parts and/or consumables needed to maintain the bus including, but not limited to, light bulbs, fuses, wiper blades, batteries, etc.

## Damages Caused by Lack of Maintenance

Damages caused by failure to perform regular and reasonable preventive maintenance are not covered including, but not limited to,

- Failure to maintain the paint and/or finishes which can result in rust or corrosion.
- Failure to maintain and flush the underbody to remove salt and other road chemicals which can result in rust or corrosion.
- Failure to yearly inspect undercoating and to replace gouged or missing areas which can result in rust or corrosion.
- Failure to yearly inspect and repair exterior caulk and sealant resulting in leaks.

## Damages resulting from Accidents, Abuse or Misuse

Your warranty does not cover damages caused by driver, other people in or around the bus and/or road situations including, but not limited to,

- Accidents, collisions or objects striking the bus (including power washers)
- Negligence
- Theft, vandalism
- Customer applied chemicals or accidental spills.
- Misuse (driving over curbs, etc) or otherwise using the bus in a manner other than its intended purpose.

## Damages caused by the Environment

Damages or surface corrosion caused by the environment, exposure to road chemicals or exposure to the elements are not covered including, but not limited to,

- Acid rain, air borne fallout, road salt or other road condition chemicals.
- Tree sap, bird and bee droppings, tree damage
- Natural disasters, flood, fire or explosion, lightning, hail, freezing conditions, or windstorms
- · Acts of war or riot

## Damages caused by Road Hazard

Road hazard damage is not covered. It may be necessary for the owner to check and adjust the chassis alignment due to rough road conditions, or hitting curbs, pots holes, etc.

The need for a front suspension alignment is maintenance and not covered under the GLAVAL BUS Limited Warranty.

Stones or rocks and other items hitting into glass and/or the body causing cosmetic damage and/or surface corrosion are not covered.

## **Other Expenses**

GLAVAL BUS does not cover the costs of loss of vehicle use, rental vehicle, interim transportation, storage, payment for loss of time or pay, lost revenue or profits, lodging, meals, transporting of the bus to an appropriate Warranty Service Location for service, travel costs, downtime, or any other incidental or consequential damages or expenses or inconvenience incurred while your bus is out of service due to warranty repair work.

# LIMITS OF WARRANTY

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF ANY KIND WHETHER WRITTEN, ORAL, OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IT CANNOT BE AMENDED BY ANY DEALERSHIP, SALESPERSON OR AGENT. THE SOLE OBLIGATION OF GLAVAL BUS UNDER THIS WARRANTY SHALL BE TO REPAIR OR REPLACE AT THE DISCRETION OF GLAVAL BUS, ANY DEFECTIVE COMPONENT OR PART.

# PURCHASER'S EXCLUSIVE REMEDY

THIS WARRANTY SHALL BE THE OWNER'S SOLE AND EXCLUSIVE REMEDY AGAINST GLAVAL BUS, WHETHER IN CONTRACT, UNDER STATUTE (INCLUDING STATUTORY PROVISIONS AS TO CONDITIONS AS TO QUALITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF GOODS SUPPLIED PURSUANT TO THE CONTRACT OF SALE), WARRANTY, TORT, STRICT LIABILITY OR ANY OTHER LEGAL THEORY.
## LIMITATION OF LIABILITY

THE LIABILITY OF GLAVAL BUS UNDER THIS WARRANTY IS LIMITED TO THE COST TO REPAIR OR REPLACE, IN THE SOLE DISCRETION OF GLAVAL BUS, THE DEFECTIVE COMPONENT OR PART, WHICH IN NO EVENT SHALL EXCEED THE FAIR MARKET VALUE OF THE BUS AT THE TIME THE DEFECT IS DISCOVERED. IN NO EVENT SHALL GLAVAL BUS BE LIABLE ON A CLAIM OF ANY KIND FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO INJURIES TO PERSONS OR DAMAGE TO PROPERTY, LOSS OF PROFITS OR ANTICIPATED PROFITS, OR ANY LOSS OF VEHICLE USE, RESULTING FROM THE OWNERSHIP OR USE OF THE BUS.

## DISPUTE RESOLUTION

Should you be unable to resolve a disagreement with your dealer regarding your right to pursue warranty coverage for a needed repair, contact the GLAVAL BUS Customer Service Manager (see address on page 8). If a dispute about warranty service arises between GLAVAL BUS and you, the owner, the disagreement will be resolved in accordance with the customary procedures of the American Arbitration Association relating to commercial transactions, or the dispute will be made up of one member appointed by GLAVAL BUS, one member appointed by the complainant/ owner, and one member from the arbitrators group mentioned above. Any and all legal remedies shall be available to the owner after pursuing this informal dispute resolution if a ruling is entered against GLAVAL BUS and GLAVAL BUS fails to abide the ruling. The expenses of the arbitration will be paid by the party against whom the arbitrator(s) rule.

## FEDERAL COMPLIANCE

THE TERMS OF THE WARRANTOR'S UNDERTAKING EXPRESSED IN THIS LIMITED WARRANTY ARE DRAFTED TO COMPLY WITH THE MAGNUSEN MOSS WARRANTY LEGISLATION, P.L. 93-637 OF 1974, AND OTHER APPLICABLE LAW. ANY WARRANTY PROVISIONS PROMULGATED BY THE FEDERAL TRADE COMMISSION PURSUANT TO RULES OR ANY OTHER LAW RELATIVE THERETO ARE EXPRESSLY INCORPORATED HEREIN. TO THE EXTENT ANY PROVISIONS OF THIS LIMITED WARRANTY ARE INCONSISTENT WITH STATE LAWS, ONLY THOSE PARTS INCONSISTENT ARE VOID.

## Who Performs Warranty Service

You need to be aware that not all dealers and/or repair facilities are equipped to understand a bus body and/or features.

To obtain warranty service, contact or visit the dealership where you originally purchased your vehicle. Your dealer should be able to meet your service needs or can refer you to another GLAVAL BUS warranty service facility. If you need assistance in locating a servicing dealer and/or repair facility contact GLAVAL BUS Customer Service Department listed below.

## Who Pays For Warranty Repairs

When you have warranty work performed by a GLAVAL BUS dealer or a GLAVAL BUS repair facility you will not be charged for the repairs.

Your claim must be made within 30 days of the discovery of the defect. Based on the determination of GLAVAL BUS, and subject to the terms of the warranty, the warranty repair work will be authorized by GLAVAL BUS.

If you prefer a non GLAVAL BUS service facility, or a GLAVAL BUS service center is not available, you may be required to initially pay for the repairs.

**Please Note:** In the case that you need to stop at or rely on a non GLAVAL BUS repair facility, **before** the repair is started, have the facility call GLAVAL BUS for assistance and authorization. Unauthorized repairs amount could alter your reimbursement.

Once the job is complete send a copy of the paid repair order either by mail or fax along with the authorization number for reimbursement. See below for contact information.

## **Owner Assistance**

Should you ever encounter a problem or issue that is not resolved to your satisfaction with either your dealer or repair facility please contact GLAVAL BUS Customer Service.

Please have available the Vehicle Identification Number or the GLAVAL BUS Unit number when calling and/or include with any written correspondence.

GLAVAL BUS Customer Service 914 County Road #1 North· Elkhart, IN 46514 Phone: 1-800-445-2825 or 574-262-2212 • Fax: 574-264-9036

If we can not resolve the issue to your satisfaction please follow the steps outlined under **Dispute Resolution** on page 7.

WEIGHT ANALYSIS
class A

	INPUT AREAS=						FUEL LOAD ADJ.	DATA (F.L.A.)			
	VEHICLE DESCR	IPTION:	CHASSIS	UNIT #	MODEL:	FUEL TYPE:	FUEL CAP.	FUEL WGT PEF	R GAL.		
	4 Pass, 2 W/C, R	ear Lilft	E350		21' Primetime	Gas	55	6.17			
	WHEELBASE	PER IN. VALUE CALC.		AXLE V	VEIGHTS		FUEL AMT.	WGT OF FUEL	FUEL A	DJ. AMT.	
	138	0.72		LEFT FRONT	RIGHT FRONT		0.25	339.35	-84	1.84	
A	XLE CAPACITIES		2940	1470	1470		FUEL TANK CENTER		DEA	ALER	
FRONT	REAR	TOTAL		LEFT REAR	RIGHT REAR		167		C	BS	
4050	7800	11500	4640	2320	2320						
LEFT (ROADSIDE)							RIGHT	(CURBSIDE)			
	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	
DRIVER	44.0625	150	31.93%	102.11	47.89	139.7	175	101.23%	0.00	0.00	1 Pass
2 Pass	90.25	350	65.40%	121.11	228.89	139.7	175	101.23%	-2.16	177.16	1 Pass
2 Pass	121.5	350	88.04%	41.85	308.15	190.5	175	138.04%	-66.58	241.58	1 Pass
2 Pass	153	350	110.87%	-38.04	388.04	190.5	175	138.04%	-66.58	241.58	1 Pass
2 Pass	153	350	110.87%	-38.04	388.04	190.25	500	137.86%	-189.31	689.31	Lift + Door
Hatch	153	10	110.87%	-1.09	11.09			0.00%	0.00	0.00	
Stanchion / Mod Panel	66	20	47.83%	10.43	9.57			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
	TOTAL PASSEN	GER LOAD		198.32	1381.68				-324.62	1349.62	2605.00
	AXLE WEIGHTS			1470.00	2320.00				1470.00	2320.00	7580.00
				FDONT				-			
			1000	FRUNT	REAR	LEFT/RIGHT TOTALS	LEFT/RIGHT%'S				
			LEFI	1641.58	3855.68	5497.26	0.527				
			RIGHT	1118.64	3823.62	4942.26	0.473				
		FRT	/ REAR TOTALS	2760.22	7679.30	10439.51					
		AX	LE CAPACITIES	4050	7800	11500					
		AVAILAB	LE CAPACITIES	1289.78	120.70	1060.49					



WEIGHT ANALYSIS
class B

	INPUT AREAS=						FUEL LOAD ADJ.	DATA (F.L.A.)			
	VEHICLE DESCR	RIPTION:	CHASSIS	UNIT #	MODEL:	FUEL TYPE:	FUEL CAP.	FUEL WGT PER	R GAL.		
	4 Pass, 2 W/C, R	ear Lilft	E350		21' Primetime	Gas	55	6.17			
	WHEELBASE	PER IN. VALUE CALC.		AXLE V	WEIGHTS		FUEL AMT.	WGT OF FUEL	FUEL A	DJ. AMT.	
	138	0.72		LEFT FRONT	RIGHT FRONT		0.25	339.35	-84	1.84	
A	XLE CAPACITIES	5	2940	1470	1470		FUEL TANK CENTER		DEA	ALER	
FRONT	REAR	TOTAL		LEFT REAR	RIGHT REAR		167		C	BS	
4050	7800	11500	4640	2320	2320						
		LEFT (ROADS	IDE)				RIGHT	(CURBSIDE)			
	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	
DRIVER	44.0625	150	31.93%	102.11	47.89			0.00%	0.00	0.00	
2 Pass	90.25	350	65.40%	121.11	228.89	139.7	175	101.23%	-2.16	177.16	1 Pass
2 Pass	121.5	350	88.04%	41.85	308.15	190.5	175	138.04%	-66.58	241.58	1 Pass
W/C	153	300	110.87%	-32.61	332.61			0.00%	0.00	0.00	
Hatch	153	10	110.87%	-1.09	11.09	190.25	500	137.86%	-189.31	689.31	Lift + Door
Stanchion / Mod Panel	66	20	47.83%	10.43	9.57			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
	TOTAL PASSEN	GER LOAD		241.80	938.20				-258.04	1108.04	2030.00
	AXLE WEIGHTS			1470.00	2320.00				1470.00	2320.00	7580.00
				FRONT	REAR	LEFT/RIGHT TOTALS	LEFT/RIGHT %'S				
			LEFT	1685.06	3412.20	5097.26	0.517				
			RIGHT	1185.21	3582.04	4767.26	0.483				
		FRT	/ REAR TOTALS	2870.27	6994.24	9864.51					
		AX	LE CAPACITIES	4050	7800	11500					
		AVAILAB	LE CAPACITIES	1179.73	805.76	1635.49					



WEIGHT ANALYSIS
class c

	INPUT AREAS=						FUEL LOAD ADJ.	DATA (F.L.A.)			
	VEHICLE DESCR	RIPTION:	CHASSIS	UNIT #	MODEL:	FUEL TYPE:	FUEL CAP.	FUEL WGT PEF	R GAL.		
	4 Pass, 2 W/C, R	ear Lilft	E350		21' Primetime	Gas	55	6.17			
	WHEELBASE	PER IN. VALUE CALC.		AXLE V	VEIGHTS		FUEL AMT.	WGT OF FUEL	FUEL A	DJ. AMT.	
	138	0.72		LEFT FRONT	<b>RIGHT FRONT</b>		0.25	339.35	-84	1.84	
A	XLE CAPACITIES	5	2940	1470	1470		FUEL TANK CENTER		DEA	ALER	
FRONT	REAR	TOTAL		LEFT REAR	RIGHT REAR		167		C	BS	
4050	7800	11500	4640	2320	2320						
		LEFT (ROADS	IDE)				RIGH1	(CURBSIDE)			
	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	
DRIVER	44.0625	150	31.93%	102.11	47.89			0.00%	0.00	0.00	
2 Pass	90.25	350	65.40%	121.11	228.89	139.7	175	101.23%	-2.16	177.16	1 Pass
W/C	121.5	300	88.04%	35.87	264.13	190.5	175	138.04%	-66.58	241.58	1 Pass
W/C	153	300	110.87%	-32.61	332.61			0.00%	0.00	0.00	
Hatch	153	10	110.87%	-1.09	11.09	190.25	500	137.86%	-189.31	689.31	Lift + Door
Stanchion / Mod Panel	66	20	47.83%	10.43	9.57			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
	TOTAL PASSEN	GER LOAD		235.82	894.18				-258.04	1108.04	1980.00
	AXLE WEIGHTS			1470.00	2320.00				1470.00	2320.00	7580.00
-											
				FRONT	REAR	LEFT/RIGHT TOTALS	LEFT/RIGHT %'S				
			LEFT	1679.08	3368.18	5047.26	0.514				
			RIGHT	1185.21	3582.04	4767.26	0.486				
		FRT	REAR TOTALS	2864.29	6950.22	9814.51					
		AX	LE CAPACITIES	4050	7800	11500					
		AVAILAB	LE CAPACITIES	1185.71	849.78	1685.49					



WEIGHT ANALYSIS
class D

	INPUT AREAS=						FUEL LOAD ADJ.	DATA (F.L.A.)			1
	VEHICLE DESCR	RIPTION:	CHASSIS	UNIT #	MODEL:	FUEL TYPE:	FUEL CAP.	FUEL WGT PEF	R GAL.		
	4 Pass, 2 W/C, Re	ear Lilft	E350		23' Primetime	Gas	55	6.17			
	WHEELBASE	PER IN. VALUE CALC.		AXLE V	WEIGHTS		FUEL AMT.	WGT OF FUEL	FUEL A	DJ. AMT.	
	158	0.63		LEFT FRONT	<b>RIGHT FRONT</b>		0.25	339.35	-84	1.84	
A	XLE CAPACITIES	5	2940	1470	1470		FUEL TANK CENTER		DEA	ALER	
FRONT	REAR	TOTAL		LEFT REAR	RIGHT REAR		167		C	BS	
4600	7800	12500	4640	2320	2320						
		LEFT (ROADS	IDE)				RIGHT	(CURBSIDE)			
	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	DISTANCE (IN.)	WEIGHT (LBS.)	% REAR AXLE	FRONT	REAR	
DRIVER	44.0625	150	27.89%	108.17	41.83			0.00%	0.00	0.00	
W/C	90.25	350	57.12%	150.08	199.92	139.7	175	88.42%	20.27	154.73	1 Pass
W/C	121.5	350	76.90%	80.85	269.15	190.5	175	120.57%	-36.00	211.00	1 Pass
W/C	153	350	96.84%	11.08	338.92			0.00%	0.00	0.00	
Stanchion / Mod Panel	153	10	96.84%	0.32	9.68	190.25	500	120.41%	-102.06	602.06	Lift + Door
Hatch	66	20	41.77%	11.65	8.35			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
			0.00%	0.00	0.00			0.00%	0.00	0.00	
	TOTAL PASSEN	GER LOAD		362.14	867.86				-117.78	967.78	2080.00
	AXLE WEIGHTS			1470.00	2320.00				1470.00	2320.00	7580.00
				FRONT	REAR	LEFT/RIGHT TOTALS	LEFT/RIGHT %'S				
			LEFI	1824.89	3322.36	5147.26	0.519				
			RIGHT	1344.97	3422.29	4767.26	0.481				
		FRT	REAR TOTALS	3169.86	6744.65	9914.51					
		AX	LE CAPACITIES	4600	8500	12500					
		AVAILAB	LE CAPACITIES	1430.14	1755.35	2585.49					



<b>GENI</b> HIGH PERFORMANCE	OPAQUE SER	RIES	
A9 PA	Opaque Choose from 120 high p standard colors includin PANTONE's most specifi	performance industry g 24 matched to ed colors.	
CON	DURABILITY FORMABILITY PRINTABILITY ADHESIVE GLOSS TYPE Up to 9-year rivets/corrugations, con CAS, thermal transfer permanent solvent 90 cast vinyl	npound curves / White and Black now 10-year dura	are ible.
A900 	/hite 1-0 BL	Sunshine Yellow PANTONE®116 C A9114-0	
W 0069	True Terra Cotta Vhite A9260-O 5-O BL	Medium Yellow A9130-0	
Matte W A900	/hite Imitation Gold Gold GL A9250-O	Sunflower A9140-O	
A900	lear Parchment 3-0 A9205-0	Dark Yellow A9150-0	
Matte C <b>A900</b>	Llear Almond 4-0 A9210-0	Apricot A9155-O	
PANTC Warm Gray <b>A902</b>	Navajo Beige V 2 C PANTONE*468 C A9255-0	Orange A9160-0	
Light ( A901	Gray Beige O-O A9220-O	PANTONE* Orange 021 C A9169-0 ■ * ◆	
Palm Oy A902	yster Dark Beige 0-0 A9230-0	Bright Orange A9180-O	
Light A902	Ash Dark Taupe Gray PANTONE*466 C 49252-0 ■+◆	Tangerine A9315-O	
Slate A903	Gray Sandstone A9265-O	Warm Red A9304-O	
Mec A903	dium Buckskin Gray A9270-O 15-O	Luminous Red A9318-0	
Pe A905	wter Camel A9240-0	PANTONE® Red 032 C <b>A9306-0</b> ■ ★ ◆	
Silver Shin PANTONE®8 <b>A906</b>	Putty 77 C A9235-0 59-0	Real Red A9317-O	
Dark A905	Gray PANTONE® 55-0 Process Yellow C A9106-0	Firecracker PANTONE®485 C A9321-0 ■ × ◆	
Mer Marine A906	dium Gray Sio-O A9102-O	Holiday Red PANTONE*1797 C A9305-0 III + ◆	
Matte E A908	Black Butter 80-0 A9105-0	Tomato Red A9325-O	
A909 	Black Lemon Zest PANTONE*109 C A9113-0 ■ * ◆	Fire Red A9345-0	E.S
B A925	rown 95-0 895-0 895-0 89120-0 822	Cardinal Red A9330-0	

Avery Graphics high performance opaque films are now available in 120 colors including 20 that are also available with Avery Dennison's Easy Apply™ technology. Our A7 Opaque cast film in 12 colors is a great alternative to our industry standard high performance film.





#### Final Assembly Location

Glaval Bus 914 County Road #1 North Elkhart, In 46515

### Final Assembly Manufacturing Activities Performed

Glaval Bus interconnects the OEM chassis incomplete vehicle consisting of but not limited to engine, transmission, axles, cooling system, heating system, air conditioning system and braking system with our bus body design consisting of but not limited to items and processes listed below. Glaval Bus creates an end product through many manufacturing processes starting with an incomplete vehicle and after adding many different elements and components completes the vehicle as a passenger Bus.

### **Chassis Cab Alterations**

- Remove Chassis Components (Place in Dunnage Box for Re-Installation)
  - Driver and Passenger Seats
  - Remove Seat Belts
  - Remove Sun Visors and Courtesy Light
  - Remove Front Marker Lights
- Rear cab panel sheet metal cut out
- Cab roof panel sheet metal cut out (Removing area to allow more head room)
- Apply Rust Proofing to Cut Edges
- Rear Frame Extensions Added

### Floor Assembly and Installation

- Cut all steel for floor assembly
- Weld all steel for floor assembly
- Install floor assembly onto chassis (floor bolted to chassis)

#### Wall Assembly and Installation

- Cut all steel for wall assembly (roadside and curbside)
- Weld all steel for wall assembly (roadside and curbside)
- Laminate interior, exterior and insulation in a vacuum press (roadside and curbside)
- Install wall assemblies to floor assembly (walls bolted to floor assembly)

#### **Roof Assembly and Installation**

- Cut all steel for roof assembly
- Weld all steel for roof assembly
- Laminate interior, exterior and insulation in a compression press
- Install roof assembly to wall assemblies (roof bolted to wall assemblies)

#### Connection of Body Structure to Chassis Cab

- Install steel tube supports along cab "B" pillar (tubes bolted to "B" Pillar)
- Install steel structure above chassis cab (Upper roof support)
- Install Passenger steps / entry way
- Install steel structure and sheet metal for lower skirt panels
- Installation of plywood flooring
- Installation of flooring (Gerflor, RCA, Altro, etc.)

#### **Exterior ABS and Fiberglass**

- Install Front Overhead Cap (fiberglass)
- Install Driver's Side Transition (fiberglass)
- Install Passenger Side Transition (fiberglass)
- Install Rear ABS Caps (3-5 pieces)

#### **Electrical, Heating and Air Conditioning**

- Install wiring harnesses for:
  - Interior lighting
  - o Heaters
  - Speakers
  - Destination Signs
  - o Entrance Doors
  - Wheelchair Lift
  - o Interlocks (for wheelchair lifts & emergency rear doors)
  - o Front and Rear marker/clearance lights
  - Rear Stop, Tail and Turn Lights
- Installation of all Electrical items, same as harness requirements
- Install hoses for auxiliary heaters
- Install auxiliary heaters and controls
- Install hoses for auxiliary air conditioning
  - Install auxiliary air conditioning system/s
    - o Condensers
    - o Evaporators
    - Compressors (engine mounted) requires modification of chassis engine components like compressor mount, belts, tensioners, etc.
    - Operation Controls
    - Charge and Test System

#### Passenger Seating, ADA components, Doors, Windows

- Installation of Seats may include
  - Armrests
  - Headrests
  - Grab Handles
  - Footrests
- Installation of Wheelchair Tie-Downs and Belts
- Installation of Wheelchair Lift
- Installation of Wheelchair Lift Doors (built in-house)
- Installation of Emergency Rear Door (built in-house)
- Installation of Passenger Entry Doors, Step Treads and Door Seals
- Installation or Overhead Grab Rails

- Installation of Entry Grab Rails and Modesty Panels (built in-house)
- Installation of Windows in Walls, Doors and Transitions
- Install Rear Bumper
- Re-Installation of Parts From Dunnage Box

#### **Destination Signage and Interior Panels**

- Installation of Front Destination Sign (requires window installed in front Fiberglass cap)
- Side Destination Sign
- Controller (ODK) if applicable
- Installation of Interior Panels
  - o "B" Pillar
  - o Mor/View Panel
  - o Windshield Liner
  - o Front Vertical
  - Entry Door Header
  - $\circ \quad \text{Entry Door Surround} \\$
  - o Light Bar Panels
  - o Finish Trim work

#### **Inspections / Testing/Final Finish**

- Inspections performed in three places online
- Inspection performed in Final Finish
- Underbody Sealants Applied
- Front End Alignment (Toe-In / Toe-Out)
- Headlights Aimed
- Unit Weighed and Federal Tags Applied
- Test Drive and Road Inspections Performed
- Water Test Performed
- Paint and Body Damage Repair
- Cleaned and Detailed Inside and Out
- Graphics and Decals Applied
- After all Inspection Write-Ups are Corrected Unit Is Released for Shipment



# LIGHT DUTY TRANSIT REFERENCES

AGENCY: ADDRESS: PHONE: CONTACT: EMAIL: PROCUREMENT:	RTC of S. NEVADA LAS VEGAS, NV 702-676-1956 STEPHEN GEBHARD GebhardS@rtcsnv.com 385+ LIGHT DUTY FORD <b>First year built for RTC-Vegas was 2012.</b> Glaval has maintained a contract with UTA from 2013 to 2017's current contract. 350+ LIGHT DUTY FORD TRANSIT BUSES
AGENCY: ADDRESS: TELEPHONE: CONTACT: EMAIL: PROCUREMENT:	UTAH TRANSIT AUTHORITY SALT LAKE CITY, UT 84130 801-287-5312 BEN ADAMS Badams@rideuta.com 300+ LIGHT DUTY FORD TRANSIT BUSES <b>First year built for UTA was 2006</b> . Glaval has maintained a contract with UTA from 2006 to 2017's current contract. Multiple vehicles have been built and delivered.
AGENCY: ADDRESS: TELEPHONE: CONTACT: EMAIL: PROCUREMENT:	VIA METROPOLITAN SAN ANTONIO, TX 78212 505-404-2274 GARY GLASCOCK gary.glasscock@viainfo.net 124 LIGHT DUTY CHEVY TRANSIT BUSES First year built for VIA was 2013. Glaval has delivered 124 light duty cutaway transit buses.
AGENCY: ADDRESS: TELEPHONE: CONTACT: EMAIL: PROCUREMENT:	SUN VAN TUCSON, AZ 85713 520-798-1000 KEVIN FAULKNER Kevin.Faulkner@tucsonaz.gov 90+ LIGHT DUTY FORD TRANSIT BUSES <b>First year built for Sun Van was 2014.</b> Glaval has maintained a contract with Sun Van from 2013 to 2017's current contract.



# LIGHT DUTY TRANSIT REFERENCES

AGENCY:METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITYADDRESS:ATLANTA, GA 30318TELEPHONE:404-848-4010CONTACT:STEVE PERRYEMAIL:Sperry@itsmarta.comPROCUREMENT:118 LIGHT DUTY FORD TRANSIT BUSESFirst year built for MARTA was 2014. Glaval has maintained a contract with MARTA from 2013<br/>to 2017's current contract.

### ADDENDUM ACKNOWLEDGEMENT FORM SOLICITATION NO.: PTR1700000005

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received: (Check the box next to each addendum received)

Addendum No. 1
Addendum No. 2
Addendum No. 3
Addendum No. 4
Addendum No. 5

Addendum No. 6 Addendum No. 7 Addendum No. 8 Addendum No. 9 Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Creative Bus Sales, Inc.	
Company	
Authorized Signature	
5/2/17	

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

## STATE OF WEST VIRGINIA Purchasing Division PURCHASING AFFIDAVIT

**MANDATE:** Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

**EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

#### **DEFINITIONS:**

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

#### WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name:Creative Bus Sales, Inc.
Authorized Signature:
State ofArizona
County of, to-wit:
Taken, subscribed, and sworn to before me this $2$ day of <u>May</u> , 2017.
My Commission expires December 14th, 2020
AFFIX SEAL HERE NOTARY PUBLIC July Cary
PAULA J DONG Notary Public - Arizona Maricopa County My Comm. Expires Dec 14, 2020



5/3/2017

## Re: PTR170000005 - 6.13 Training

Creative Bus Sales has read section 6.13 Training, and understands the requirements. If awarded, Creative Bus Sales will, at its own expense, conduct two one day training sessions at two different locations. The Division will arrange a venue and registration.

Qualified instructors will perform training geared towards both drivers and mechanics. The agenda for the trainings will include all requirements listed in section 6.13.

Sincerely,

Marcus Hoffman Transit Bid Manager (602) 571-4475 marcush@creativebussales.com

#### REQUEST FOR QUOTATION 138" Wheelbase Dual Rear Wheel (DRW) Narrow Body Cutaway Vehicle Exhibit A

CLASS	ITEM DESCRIPTION	UNIT PRICE PER VEHICLE	ESTIMATED QUANTITY	EXTENDED PRICE
A	Vehicle Non-Accessible / Paratransit Package	\$53,731.00	2	\$107,462.00
В	Vehicle with One Wheelchair (WC) Positions/ Paratransit Package	\$59,543.00	2	\$119,086.00
С	Vehicle with Two Wheelchair (WC) Position / Paratransit Package	\$60,548.00	2	\$121,096.00
D	Vehicle/Extended Length/ Front Lift / 3 WC Positions	\$61,108.00	2	\$122,216.00
E	Vehicle/ One Wheelchair (WC)/ Fixed Route Package	\$63,867.00	2	\$127,734.00
F	Vehicle/Two WC / Fixed Route Package	\$68,168.00	2	\$136,336.00
G	Vehicle/ Extended Length / Front Lift / Three Wheelchair Positions/ Fixed Route Package	\$66,956.00	2	\$133,912.00
Н	Vehicle/ One WC Position / Fixed Route Package / Full Bus Paint	\$66,135.00	2	\$132,270.00
I	Vehicle / 2 WC Positions / Fixed Route Package / Full Bus Paint	\$70,438.00	2	\$140,876.00
J	Vehicle / Extended Length / Front Lift / Three WC Positions/ Full Bus Paint	\$69,405.00	2	\$138,810.00
К	Vehicle/One WC/Fixed Route Package/ Three Quarter Body Paint with Expanded Graphics Vehicle Skirt Painting	\$65,737.00	2	\$131,474.00
L	Vehicle/Two WC/Fixed Route Package/ Three Quarter Body Paint with Expanded Graphics Vehicle Skirt Painting	\$70,051.00	2	\$140,102.00
М	Vehicle/ Extended Length/ Front Lift / Three WC/Fixed Route Package/ Three Quarter Body Paint with Expanded Graphics	\$69,018.00	2	\$138,036.00
Ν	Vehicle/One WC/Fixed Route Package/ Vehicle Skirt Painting	65240	2	\$130,480.00
0	Vehicle / Two WC Position/ Fixed Route Package / Vehicle Skirt Painting	64221	2	\$128,442.00
Р	Vehicle / Extended Length / Front Lift / Fixed Route Package / Vehicle Skirt Painting	67323	2	\$134,646.00
Q	Vehicle / One WC Position / Paratransit Package Security Camera	63781	2	\$127,562.00
R	Vehicle Two WC Position / Paratransit Package / Security Camera System System	63553	2	\$127,106.00
S	Vehicle / Extended Length / Front Lift / Paratransit Package / Security Camera System	65142	2	\$130,284.00
	TOTAL BID FOR EVALUATION			\$2,467,930.00
	*Complete form provided.			
	*Please note these are only estimated quantities and do not reflect any guarantee of purchase.			
	*The DPT may purchase more or less as needed.			
	*Please do not alter pricing page.			