

Proposal From:

ROHRER

School & Commercial Bus Sales

In Response to:

Mid Size Medium Duty Transit Vehicles

CFRQ PTR17000000007

BID OPENING: 13:30, Thursday, May 18, 2017

05/18/17 10:58:11
QU Purchasing Division



School & Commercial Bus Sales

May 12, 2017

Melissa Pettrey
Department of Administration
Purchasing Division
2019 Washington Street E
Charleston, WV 25305

Ref: PTR1700000005

Dear Melissa Pettrey:

Rohrer Bus Sales appreciates this opportunity to submit a bid for transit vehicles to the State of West Virginia. Our offerings, a Champion Defender for classes A through G, meets the intent and letter of your specifications as well as amendment #1 with the following documentation, clarifications, deviations and/or explanations per your Required Bid Documentation Checklist.

Mandatory Bid Forms

Enclosure 1 Bid Forms

Includes the Following:

- Bid Form 1
- Bid Form 2
- Bid Form 3
- Bid Form 4
- Bid Form 5
- Bid Form 6
- Bid Form 7
- Bid Form 8
- Bid Form 9
- Bid Form 10
- Bid Document
- Certification Page
- Required Bid Documentation Check List
- Addendum Acknowledgment

Enclosure 2 Exhibit A Pricing Page

Section

Mandatory Documentation

- 3.5 Engine ISB-6.7. The Cummins ISB 6.7L Engine will be provided. It is a diesel engine with 240 HP @ 2300 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM. Literature can be found at Enclosure 3. The engine has a 3 Year/ 200,000 mile warranty.
- 3.5.13 The High Idle System to be provided is the Intermotive Gateway 805. Literature can be found at Enclosure 4. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.6 Transmission- The Allison B220 Automatic Transmission with Park Pawl is the transmission to be provided. Literature can be found at Enclosure 5. The Warranty is three years/ unlimited miles.
- 3.8.38 Back Up Camera- An REI Back Up Camera System is to be provided. It includes Camera and a 7" LCD screen. Literature and can be found at Enclosure 6. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.7.15 Tire Information- Michelin XZE 245/70R19.5 16 Ply Radial Tires are to be provided on the vehicle. The spare tire to be provided will also be a Michelin XZE 245/70R19.5 16 Ply Radial Tire. Literature and can be found Enclosure 7. Limited Warranty from Michelin against side wall defects.
- 3.8.1 Electrical System- Champion's Power Distribution Center will be used for the Fuse Panel. A description of the Fuse Panel can be found Enclosure 8. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment. An electronic copy as well as two 11"x17" laminated print copies of the As Built Schematics will be provided with each vehicle. For information on the Electrical system please see Enclosure 8. Minimum warranty –3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.8.3 Alternator- The Alternator to be provided is the Leece-Neville 12V 320Amp 4962PA Pad Mount Alternator. It is equipped with an Integral Rectifier. Literature and can be found at Enclosure 9. The warranty is covered under the Add On warranty and is 3 years /36,000 miles.
- 3.9.1 Auxiliary Heaters- Two (2) Pro Air 65,000 BTU Heaters will be provided with a circulation pump. Literature and can be found on at Enclosure 10. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.9.6 A/C Compressor- Two (2) TM-21 Compressors will be provided. Literature and can be found at Enclosure 11. ACT Warranty – 2 years / Unlimited miles.
- 3.9.7 A/C Condenser- One (1) CS-2 Condenser and 1 CS-3 Condenser by ACT will be provided. Literature and can be found at Enclosure 12. ACT Warranty – 2 years / Unlimited miles.

- 3.9.8 & 11 Rear Evaporators-One (1) EZ-91 Rear Evaporator and One (1) EZ-3 Side Mount Evaporator by ACT will be provided. Literature and can be found Enclosure 13. ACT Warranty – 2 years / Unlimited miles.
- 3.12.9 Water Testing Procedure is located at Enclosure 14.
- 3.15.4.1 A chart of available vinyl colors is provided Enclosure 15.
- 9.9.7 Undercoating/ Rust Proofing System- Tectyl 121B will be used for Undercoating the proposed bus. Technical Data and Application procedure can be found at Enclosure 16. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.12.42 Door Operating Mechanism- An A&M Systems Door header will be used for the door operations mechanism. An Exterior Key Switch will be provided to control the mechanism. The Door Actuator Specifications can be found at Enclosure 17. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.12.30 Stepwell Heater- An UltraHeat, Inc. Step Heater will be provided for the bottom step of the units. Literature and can be found at Enclosure 18. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.12.42 Gerflor Tarabus Flooring will be provided. Flooring Specifications can be found at Enclosure 19. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment. Color Selections for Gerflor Flooring can be found at Enclosure 20. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment
- 3.15 Passenger seats- The Passenger Seating package is to include the following seat types: Double ICS Seat, Feather Weight Mid High Seats, Feather Weight High Back Seats, and BV Notchback Foldaway Seats. Options to include ABS Seat Backs (where available) Aisle side US Armrest, Grab Handles on all seats except rear Row, and level 3.5 fabric. Brochures for the seating package can be found at Enclosure 21. The Warranty on the seats by Freedman Seating is 3 Years/36,000 miles on the fabric and 5 years/unlimited miles on the Frame.
- 3.15.10 High Back Driver's Seat with Arm Rest. This seat will be covered in Level 4 fabric. A brochure can be found Enclosure 22.
- 3.20.1 Exterior Mirrors- The Exterior Mirrors to be provided are the Rosco Heated Remote Mirrors for the S2. Documentation is located at Enclosure 23. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.20.1 Roof Hatch- Two (2) Transpec 1900 Standard Vent Model Emergency Roof Hatches will be provided. Literature and can be found at Enclosure 24. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.16 Mobility Aid Securement- Q'Straint 8100 Deluxe securement systems will be provided for each of the Wheel Chair Positions along with sixteen (16) 16" quick straps. A brochure for this securement system is located at Enclosure 25. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.

- 3.24 Strap Storage- 2 Q-Straint Securement Storage bags will be provided. Information on the bags is at Enclosure 26. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.14 Wheelchair Lift Lift-The Braun Century 2 Model NCL1000 will be provided. The Platform on this lift has a Clear Width of 34” and a Clear Length of 51”. A brochure and specifications for this lift can be found on at Enclosure 27. The Warranty from the Braun Corporation will be Three Years/10,000 cycles for parts and labor. It also carries a 5 Year/ 15,000 cycle powertrain warranty which covers Cable, Cylinder, Flow Control, Gear Box, Motor, Pump, Hydraulic Hose and Fittings.
- 3.23 AM/FM Radio/CD Stereo- An REI Clock Radio will be provided. Literature and can be found at Enclosure 28. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 9.39 Rohrer Bus Sales understands they are responsible to coordinate and help conduct 2 all day training sessions per year for the duration of the contract. It is Rohrer’s responsibility to coordinate component representatives to assist in the training (i.e. wheelchair lift, securement systems and air-conditioning) The Division of Public Transit has in the past arranged for suitable location, scheduled the training and publicized training event state wide.
- 3.26.3 Farebox Provision to be provided will be a Ground and Ignition Prewire with a Stanchion mounted to the right of the Driver’s Seat, beside the driver’s modesty panel. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.26.1 Destination Signs-The Transign Destinator Destination sign will be Provided. The Front Sign display area will be 16x160 and the Side Sign display area will be 14x72. Warranty Statement, Sign Dimensions, Controller layout, Internet Programming Instructions, Operation Instructions and Programming Instructions can all be found at Enclosure 29. The warranty on this sign is a limited Lifetime warranty.
- 3.26.4 PA System-An REI Public Address System will be provided with Boom Microphone and Foot Pedal Control. Literature can be found at Enclosure 30.
- 3.8.19 Strobe Light to be provided is Low Profile Strobe 6810. Literature and can be found on at Enclosure 31. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 3.26.6 Security Cameras An Angel Trax Hybrid Vault DVR system with dual 500 GB Hard Drives, six (6) color dome cameras, and 17” Monitor will be provided per bus. Literature and can be found on at Enclosure 32. Minimum warranty – 3 years / 36,000 miles falls under Champion Add-on equipment.
- 5.12.1 Warranty on Completed Vehicle- The warranty on the complete vehicle is 3 years/36,000 miles.
- 5.12.2 Warranty on Basic Vehicle Structure-The Basic Body Vehicle Structure Warranty is 5 years/75,000 miles. The warranty on the frame suspension system is 3 years/36,000 miles.

5.12.4 Warranty per specs on subsystems and components:

Engine	Three (3) Years or 200,000 Miles
Transmission	Three (3) Years or 200,000 Miles
Drive Axle	Three (3) Years or 50,000 Miles
Brake System	Three (3) Years or 36,000 Miles, Excluding Friction Material
Body Structure	Five (5) Years or 75,000 Miles
Air Conditioning	Two (2) Years/Unlimited Miles
Wheel Chair Lift System	Two (2) Years
All Add On Components	Three (3) Years, 36,000 Miles

6.1.2 Rohrer Bus understands and has provided 2 completed bids in binder form with one marked for WVDPT

9.3.1 Please see the separate complete Mechanical Description along with and Chassis Description of each Class of vehicles at the following Enclosures:

Enclosure 33	Class A- Mechanical Description Class A- Chassis Description
Enclosure 34	Class B- Mechanical Description Class B- Chassis Description
Enclosure 35	Class C- Mechanical Description Class C- Chassis Description
Enclosure 36	Class D- Mechanical Description Class D- Chassis Description
Enclosure 37	Class E- Mechanical Description Class E- Chassis Description
Enclosure 38	Class F- Mechanical Description Class F- Chassis Description
Enclosure 39	Class G- Mechanical Description Class G- Chassis Description

14 Floor Plans for each class of vehicle can be found at the following Enclosures:

Enclosure 40	Class A- Floor Plan
Enclosure 41	Class B- Floor Plan
Enclosure 42	Class C- Floor Plan
Enclosure 43	Class D- Floor Plan
Enclosure 44	Class E- Floor Plan
Enclosure 45	Class F- Floor Plan
Enclosure 46	Class G- Floor Plan

- 9.3.3 Curb Weight and GVWR of each class of vehicle can be found with their associated floorplans at the following Enclosures:

Enclosure 40	Class A- Floor Plan
Enclosure 41	Class B- Floor Plan
Enclosure 42	Class C- Floor Plan
Enclosure 43	Class D- Floor Plan
Enclosure 44	Class E- Floor Plan
Enclosure 45	Class F- Floor Plan
Enclosure 46	Class G- Floor Plan

- 3.28.1 A chart of available vinyl colors is provided Enclosure 15. For paint colors any commercially available paint code that is provided can be matched and utilized.

- 9.3.8 Conversion Location

CHAMPION BUS, INC.
331 Graham Road
Imlay City, Michigan 48444

- 9.3.9 References:

Greater Roanoke Transit Company DBA/ Valley Metro
Tiffany Ollie
1108 Campbell Avenue S.E., 2nd Floor Roanoke, VA 24013
Phone (540)982-0305, Ext. 116
tollie@valleymetro.com

Freedom Transit
Tammy Sullivan
50 E Chestnut Street
Washington PA 15301
(724) 229-2827
tammy@freedom-transit.org

TANK
Andrew Aiello
General Manager
3375 Madison Pike Ft. Wright, KY 41017
Ph: (859) 814-2143
aaello@tankbus.org
www.tankbus.org

NJ Transit
Irene Felcon
1 Penn Plaza East Newark, NJ 07105
(973) 491-7354
ifelcon@njtransit.com

PA Department of General Services
Alfonzo Robinson
Commodity Specialist
555 Walnut Street Harrisburg, PA 17101
(717)346-8181
arobinson@pa.gov

Altoona Test can be located at Enclosure 47.

Please contact us immediately at 1.800.735.3900 if any additional documentation is required.
Thanks again for your consideration!

Sincerely,
Andrew Clawson
Account Representative



ROHRER
1.800.735.3900 x 4152
410.980.1906 Cell
717.957.4884 Fax
aclawson@rohrerbus.com



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

State of West Virginia
Request for Quotation
36 — Vehicles

Proc Folder: 291915

Doc Description: Mid Size Medium duty Transit Vehicle

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2017-04-28	2017-05-18 13:30:00	CRFQ 0805 PTR1700000007	1

BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Name, Address and Telephone Number:

FOR INFORMATION CONTACT THE BUYER

Melissa Pettrey
(304) 558-0094
melissa.k.pettrey@wv.gov

Signature X

FEIN # 23-2059976

DATE May 12, 2017

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

ADDITIONAL INFORMATION:**Request For Quotation**

The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Department of Transportation, Division of Public Transit, to establish an open-end contract for Mid-Sized Medium Duty Transit Vehicles per the Specifications, Terms & Conditions and the Pricing information as attached.

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE PUBLIC TRANSIT DIVISION OF BLDG 5 RM 650 1900 KANAWHA BLVD E CHARLESTON WV25305-0432 US		AUTHORIZED RECEIVER PUBLIC TRANSIT DIVISION OF BLDG 5 RM 650 1900 KANAWHA BLVD E CHARLESTON WV 25305-0432 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Mid Size Medium duty Transit Vehicle	0.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description :

Mid Size Medium duty Transit Vehicle

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.

AA Regional Manager
 (Name, Title)
Andrew Clawson Regional Manager
 (Printed Name and Title)
2075 B West Main Street, Waynesboro, VA 229080
 (Address)
410-980-1906/ 717-957-4884
 (Phone Number) / (Fax Number)
aclawson@rohrerbus.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.

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
 (Company)
AA Regional Manager
 (Authorized Signature) (Representative Name, Title)

Andrew Clawson Regional Manager
 (Printed Name and Title of Authorized Representative)

May 5, 2017
 (Date)

410-980-1906/717-957-4883
 (Phone Number) (Fax Number)

**REQUEST FOR QUOTATATION
Mid-Size Medium Duty Transit Vehicles**

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determined by multiplying the number of actual man-hours' straight wage rate plus 53 percent fringe benefits, plus the cost of towing in the vehicle if such action was necessary. These wage and fringe benefit rates shall not exceed the rates in effect in the Recipient Agency's service garage at the time the defect correction is made.

12.10.6 Reimbursement For Parts. The Recipient Agency shall be reimbursed by the Vendor for defective parts that must be replaced to correct the defect. The reimbursement shall include taxes where applicable and 10 percent handling cost.

12.11 Delivery Payment/Risk of Loss: Standard order delivery shall be F.O.B. destination to the Agency's designated location. Vendor shall include the cost of standard order delivery charges in its bid pricing/discount and is not permitted to charge the Agency separately for such delivery.

13.0 MISCELLANEOUS:

13.1 No Substitutions: Vendor shall supply only Contract Items submitted in response to the RFQ unless a contract modification is approved in accordance with the provisions contained in this Contract.

13.2 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.

Contract Manager: Andrew Clawson
Telephone Number: 410-980-1906
Fax Number: 717-957-4884
Email Address: aclawson@rohrerbus.com

13.3 Federal funding for this project is being provided by the Federal Transit Administration through CFDA 20.500 for Sec 5309, CFDA 20.509 for Sec 5311 and CFDA 20.506 for Sec 5339 to cover 80% of the project cost.

**REQUEST FOR QUOTATATION
Mid-Size Medium Duty Transit Vehicles**

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BID FORM #1

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: Allied Freightliner, LLC

Address: 1375 Route 52

Kenova, WV 25530

Telephone: 304-453-6154

Name: Matheny Motor Truck Company

Address: 4125 12t Ave.

Nitro, WV 25143

Telephone: 304-769-5860

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

Name: Rohrer Bus Sales

Address: 1515 State Road

Duncannon, PA 17020

Telephone: 1-800-735-3900

Name: Allied Freightliner, LLC

Address: 1375 Route 52

Kenova, WV

Telephone: 304-453-6154

**REQUEST FOR QUOTATATION
Mid-Size Medium Duty Transit Vehicles**

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BID FORM #2

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

The Vendor certifies that the vehicles proposed:

ARE X 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.

May 12, 2017

Date



Authorized Signature

Regional Manager

Title

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
Company Name

REQUEST FOR QUOTATION
Mid-Size Medium Duty Transit Vehicles

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BID FORM #3

DISADVANTAGED BUSINESS ENTERPRISE
VENDORS/ MANUFACTURERS CERTIFICATION

MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

(Check appropriate statement)

_____ The Vendor, if a transit vehicle manufacturer, 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.

X The Vendor, if a non-manufacturing supplier, 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.

5/12/17

Date


Authorized Signature

Regional Manager

Title

Rohrer Enterprises, Inc. DBA Rohrer Bus Sales
Company Name

**REQUEST FOR QUOTATATION
Mid-Size Medium Duty Transit Vehicles**

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BID FORM #4

**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:

May 5, 2017

Date



Authorized Signature

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
Company Name

Andrew Clawson
Name

Regional 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

**REQUEST FOR QUOTATION
Mid-Size Medium Duty Transit Vehicles**

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BID FORM #5

**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.

May 12, 2017

Date



Authorized Signature

Regional Manager

Title

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
Company Name

REQUEST FOR QUOTATION
Mid-Size Medium Duty Transit Vehicles

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BID FORM #6
U.S. Comptroller's Debarment List Certification
MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

Rohrer Enterprises, Inc DBA/ Rohrer Bus Sales hereby certifies that it

 IS or

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

May 12, 2017

Date



Authorized Signature

Regional Manager

Title

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
Company Name

BID FORM #7

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),

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales (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),
Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales, 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 ET SEQ. ARE APPLICABLE THERETO.


Regional Manager
Signature and Title of Authorized Official


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.

May 12, 2017

Date


Authorized Signature

Regional Manager

Title

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
Company Name

SPECIFICATION COMPLIANCE

NOTE: Please check 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.

 X 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 any person for influence or attempt to influence an officer or employee of any Federal agency, a Member of 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 loan insurance, or the extension, continuation, renewal, amendment, or modification of any Federal grant, loan (including a line of credit), cooperative agreement, loan guarantee, or loan insurance.
2. If any funds other than Federal appropriated funds have been or will be paid to any person to influence or attempt to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or any employee of a Member of Congress in connection with any application for a Federal grant, loan (including a line of credit), cooperative agreement, loan guarantee, or loan insurance, the undersigned assures that it will complete and submit Standard Form-LLL, "Disclosure of Lobbying 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 a Federal grant, loan (including a line of credit), cooperative agreement, loan guarantee, or loan insurance for a transaction covered by 31 U.S.C. 1352. The undersigned also understands that any person who fails to file a required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

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

May 12, 2017

Date



Authorized Signature

Regional Manager

Title

BID FORM #10

MANDATORY BID FORM – MUST BE SUBMITTED WITH BID

**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 financial Assistance may subject the undersigned to civil penalties as outlined in the Department of Transportation's regulation 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.

May 12, 2017

Date



Authorized Signature

Regional Manager

Title

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales

Company Name

REQUIRED BID DOCUMENTATION CHECKLIST

Model Year: 2017 Model: Champion Defender

Mandatory Bid Forms – must be submitted with bid:

- ☒ Bid Form #1: Locations of Technical Service Representatives
and Parts Distribution Centers
- ☒ Bid Form #2: Certification for Air & Water Pollution
- ☒ Bid Form #3: Disadvantaged Business Enterprise Vendors/Manufacturers Certification
- ☒ Bid Form #4: Buy America Certification Rolling Stock
- ☒ Bid Form #5: Federal Motor Vehicle Safety Standards Certification
- ☒ Bid Form #6: U.S. Comptroller's Debarment List Certification
- ☒ Bid Form #7: Certification of Primary Participant Regarding
Debarment, Suspension, and Other Responsibility Matters
- ☒ Bid Form #8: Vendor's Certification of Understanding and Acceptance
- ☒ Bid Form #9: Certification of Restrictions on Lobbying
- ☒ Bid Form #10: Certification of Compliance with FTA's Bus Testing Requirements
- ☒ Exhibit A Pricing Page (8.2)

Documentation – to be submitted with bid:

Referenced

- X 3.5 Engine: An ISB-10 Engine (6.7 liter) with EGR and Diesel Particulate Filter exhaust system – provide product description, warranty information and product literature.
- X 3.5.13 High Idle System: provide product description, warranty information and product literature.
- X 3.6 Transmission (separate cooling system): provide product description, warranty information and product literature.
- X 3.8.38 Back Up Camera System: provide product description, warranty information and product literature.
- X 3.7.15 Tires: provide product description, warranty information and product literature.
- X 3.8.3 Alternator: provide product description, warranty information and product literature.
- X 3.12.9 Water Testing: provide details of water testing procedures.
- X 3.15.4.1 Exterior Vinyl Colors: provide samples/chart of available colors.
- X 9.9.7 Undercoating and Rustproofing: provide product description, warranty information and literature.
- X 3.12.23 Ambulatory Passenger Entrance/Exit: provide location, size, door operating details.
- X 3.12.30 Stepwell Heater: provide product description, warranty information and product literature.
- X 3.12.42 Floor Covering: provide samples of floor covering and colors to be provided.
- X 3.15 Seating: provide product description, warranty information, product literature and color charts for all of the seating products to be utilized. **Proposed floor plans.**
- X 3.1510 Driver's Seat: provide description of product.
- X 3.20.1 Exterior Mirrors: provide product description, warranty information and product literature.
- X 3.10 Roof Hatch: provide product description, warranty information and product literature.
- X 3.16 Mobility and Securement System: provide product description, warranty information and product literature.

REQUEST FOR QUOTATION
Mid-Size Medium Duty Transit Vehicles

129

-
- X 3.24 Strap/Buckle Storage: provide description and location of product.
- X 3.14 Wheelchair Lift: provide Make, Model #, product description, warranty information and product literature.
- X 3.23 AM/FM Radio/CD: provide product description, warranty information and product literature.
- X 9.39 Training: submit letter of understanding to the terms in this Section.
- X 3.26.3 Fare box Provisions: provide description of proposed location.
- X 3.26.1 Destination Signs: provide product description, warranty information and product literature.
- X 3.26.4 PA System: provide product description and product literature.
- X 3.8.19 Strobe Light: provide product description and product literature.
- X 3.26.6 Security Cameras: provide product description, warranty information and product literature.
- X 5.12.1 Warranty on complete vehicle.
- X 5.12.2 Warranty on Basic Vehicle Structure.
- X 5.12.4 Warranty: warranties to be provided on subsystems and components.
- X 6.1.2 Complete two (2) bids in binder form – one (1) marked for DPT.
- X 9.3.1 Complete mechanical description of vehicle, its construction and equipment including manufacturer's model name and /or number. Include description of front and rear air conditioning and heat systems.
- X 14 Proposed interior floor plans, showing detailed dimensions including the location of the wheelchair securement system and stanchions.
- X 9.3.3 Curb weight (empty weight) and gross vehicle weight rating (GVWR) of vehicle.
- X 3.28.1 Samples or paint charts of available exterior paint colors and vinyl.
- X 9.3.8 Identification of the conversion location of the van.
- X 9.3.9 A list of five (5) users names, addresses, emails and telephone numbers who have been provided similar equipment by the Vendor.
- X No Debt Affidavit
- X Addendum Acknowledgement

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 exceeds 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: Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales

Authorized Signature:  Date: May 13, 2017

State of Virginia

County of Augusta, to-wit:

Taken, subscribed, and sworn to before me this 13th day of May, 2017.

My Commission expires Sept. 30th, 2021.

AFFIX SEAL HERE

NOTARY PUBLIC

Deanna Christine Heline

Purchasing Affidavit (Revised 08/01/2015)

DEANNA CHRISTINE HELINE
NOTARY PUBLIC
Commonwealth of Virginia
Reg. #7728408
My Commission Expires Sept. 30, 2021

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: **PTR1700000007**

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)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> 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.

Rohrer Enterprises, Inc. DBA/ Rohrer Bus Sales
Company


Authorized Signature

May 12, 2017
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

Exhibit A PRICING PAGE

Mid-Sized Medium Duty Transit Vehicles- Diesel

VENDOR NAME: ROHRER BUS SALES

Manufacturer/ Brand: Champion

Model % Number: Defender

Class	Item Description	Unit Price Per Vehicle	Estimated Quantity	Extended Price
A	Bus; Rear Air Suspension	\$ 123,840.00	10	\$1,238,400.00
B	Bus; Rear Air Suspension; Extended length +4	\$ 126,670.00	10	\$1,266,700.00
C	Bus; Rear Air Suspension; Extended length +8	\$ 128,790.00	10	\$1,287,900.00
D	Bus, Automatic Tire Chain Devices; full bus paint	\$ 126,960.00	5	\$634,800.00
E	Bus, Automatic Tire Chain Device; Extended length +4, full bus paint	\$ 129,890.00	5	\$649,450.00
F	Bus, Automatic Tire Chains Device; Extended length +8, full bus paint	\$ 132,380.00	5	\$661,900.00
G	Bus; Automatic Tire Chain Device: full bus paint;	\$ 126,960.00	5	\$634,800.00
			TOTAL	\$6,373,950.00

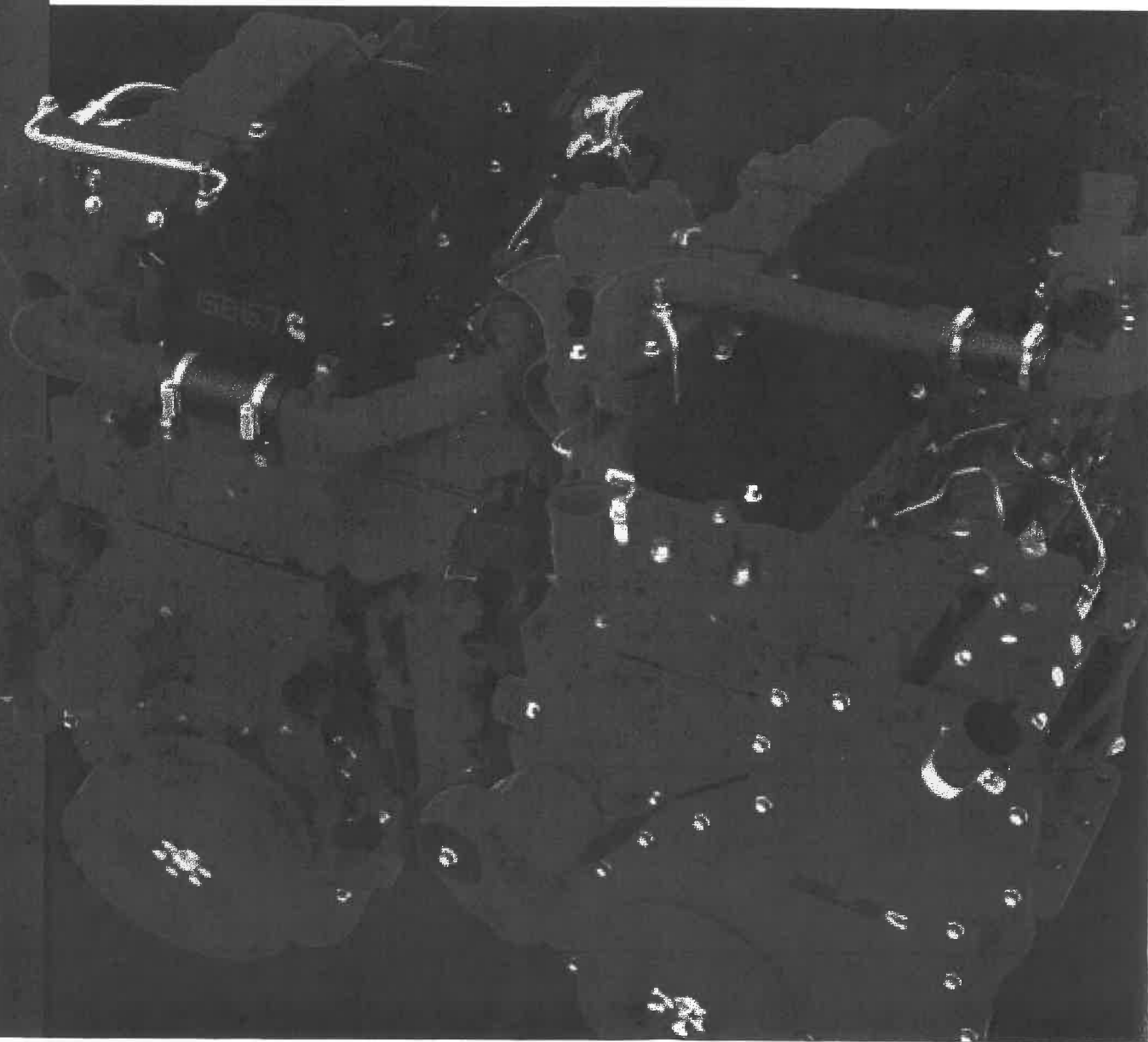
Pricing Page: Complete the form provided. Please note that these are only estimated quantiles and do not reflect any guarantee of purchase. The Agency may purchase more or less as needed.

Vendor should type or clearly print the information into the Pricing Page to prevent errors in the evaluation. If Vendor is submitting bid on line, Vendor must submit Pricing Page as an attachment. TOTAL BID AMOUNT is the amount vendor is to enter into wvOASIS commodity line when submitting. Notwithstanding the foregoing, the Purchasing Division may correct errors at its discretion.



Every™ Coverage.

North American Truck Coverages
For 2013 ISL9 And ISB6.7 Engines.



Every™ Confidence.

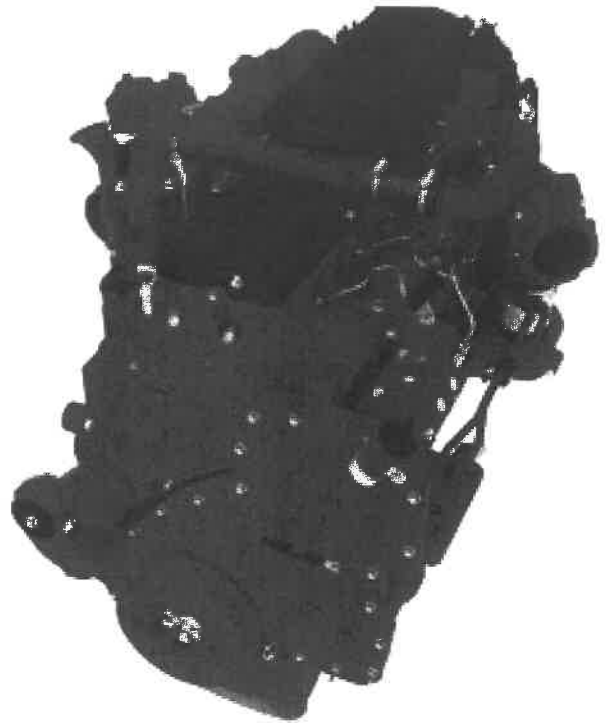
You can have confidence knowing that your Cummins 2013 engine is backed by the total coverage of Cummins base and extended warranty coverage plans.

Every major component from the air handling to the exhaust aftertreatment* – including those in the Cummins Aftertreatment System – is included under the base warranty.

In addition to the base warranty, Cummins offers a selection of extended coverage plans that provide extra protection for your business against major unexpected repair expenses. These protection plans provide financial peace of mind, insuring you against unforeseen expenses for years to come. And they can be included in the financing of your new truck for just dollars a day.

Cummins extended coverage plans are honored at all authorized Cummins service locations and backed by Cummins Care. No matter where your business takes you, you've always got a Cummins-authorized service facility nearby, with over 3,500 locations in North America. So you can be assured that every contingency is covered. Best of all, those facilities will handle every bit of paperwork associated with your warranty repair.

*Does not include air cleaner, intake pipes, exhaust pipes or mounting hardware



ISL9 Base Warranty.

The ISL9 base warranty is good for 2 years/250,000 miles (402,336 km), whichever occurs first, and includes virtually everything at no additional cost:

2-Year/250,000-Mile (402,336 km) Coverage

- 100 percent parts and labor on warrantable failures*
- Travel or towing when an engine is disabled by a warrantable failure (from date of delivery through the first year)
- Consumables not reusable due to covered failure
- No deductible
- Includes aftertreatment

*Warrantable failures are those due to defects in Cummins material or factory workmanship.

ISB6.7 Base Warranty.

Cummins 6-cylinder ISB6.7 engine has coverage similar to that of the ISL9, except there is no mileage restriction. The ISB6.7 warranty is good for 2 years with unlimited mileage.

2-Year/Unlimited-Mileage Coverage

- 100 percent parts and labor on warrantable failures*

- Travel or towing when an engine is disabled by a warrantable failure (from date of delivery through the first year)

- Consumables not reusable due to covered failure

- No deductible

- Includes aftertreatment



*Warrantable failures are those due to defects in Cummins material or factory workmanship.

Extended Coverage Means Added Security.

A Cummins Protection Plan is the most important travel insurance you can buy. Not only will it protect your business from unexpected expenses, but it will also ensure that you'll always get quality Cummins parts and professional Cummins service. There are two plans to choose from for ISL9 and ISB6.7 engines.

Protection Plan 1

Security is knowing that you are protected by comprehensive protection, with options ranging from 3 to 5 years and 100,000 to 300,000 miles (160,934-482,803 km).

- Internal components and major engine systems including the turbocharger, water pump and fuel injectors and, new for 2013, the air compressor, fuel pump and select engine sensors
- Registered parts and labor on covered failures

Protection Plan 2

Cummins Internal Protection Plan 2 covers you against major repair costs down the road, with registered parts and labor on major components and your choice of long-term options from 3 to 7 years and 100,000 to 300,000 miles (160,934-482,803 km).

- Internal components and major engine systems
- Registered parts and labor on covered failures

Aftertreatment Extended Coverage*

Extended coverage is also available for your Cummins Aftertreatment System. Options range from 3 to 5 years and 100,000 to 300,000 miles (160,934-482,803 km).

The coverage includes Cummins-supplied aftertreatment components, including:

- Diesel Oxidation Catalyst (DOC), Diesel Particulate Filter (DPF) and Selective Catalytic Reduction (SCR) assemblies
- Diesel Exhaust Fluid (DEF) dosing system
- Aftertreatment controls
- Ammonia sensor

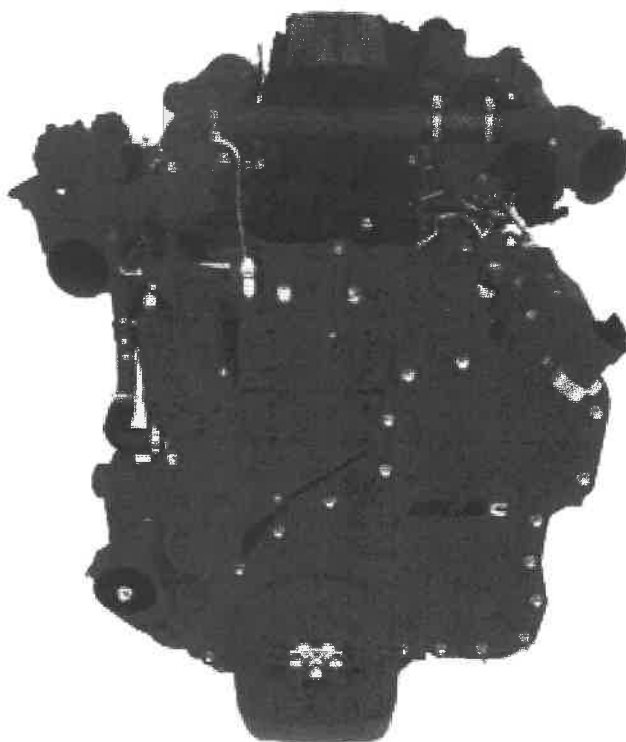
*Protection Plan 1 EPA 2013 of equal duration is required prior to the purchase of the Aftertreatment Extended Coverage.

2013 ISL9 And ISB6.7 Extended Coverage Terms*

SCR Assembly	Aftertreatment Extended Coverage**		
Decomposition Reactor			
Mid-Bed Ammonia Sensor			
DPF Assembly			
Fuel Pump			
Air Compressor			
Select Engine Sensors			
Water Pump			
Turbo			
Fuel Injectors			
EGR Cooler, EGR Valve, EGR Mixer	Protection Plan 1	Options are available up to 5 years/ 300,000 miles (482,803 km)	
Cylinder Head Assembly			
ECM			
Pistons, Rings and Liners			
Lube Oil Cooler Assembly			
Cylinder Block Assembly			
Crankshaft Assemblies			
Front Gear Cover			
Oil Pan			
Connecting Rod Assembly			
Lube Pump Assembly			
Camshaft Assembly and Bushings			
Brake Housing, Bushings, Rocker Levers, Roller Pin, Roller, Crosshead Pin, Crosshead, Including Mounting Hardware and Gaskets			
Engine Cylinder Block Casting			
Engine Main Bearing Bolts			
Engine Cylinder Head Casting			
Engine Cylinder Head Capscrews			
Engine Crankshaft Forging			
Engine Camshaft Forging			
Cam Follower Housing			
Cam Follower Assemblies			
Engine Connecting Rods and Caps			
Engine Connecting Rod Bolts			
Intake Manifold Castings			
Rocker Lever Housings			
Rocker Lever Assembly			
Gear Train Gears			
	Protection Plan 2	Options are available up to 7 years/ 300,000 miles (482,803 km)	

*Terms and conditions are subject to change.

**Protection Plan 1 EPA 2013 of equal duration is required prior to the purchase of the Aftertreatment Extended Coverage.



Leave Every Detail To Us.

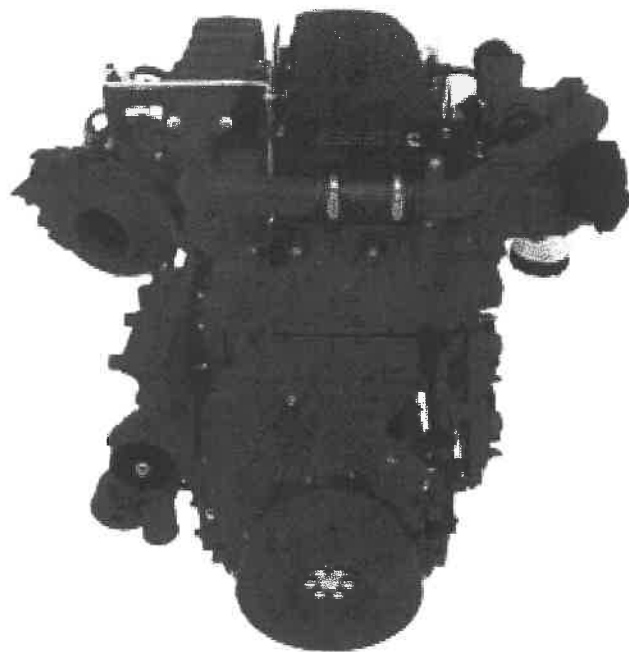
For complete coverage details, including pricing, contact your local Cummins distributor or OEM dealer.

Ordering Cummins extended coverage is easy. Your local Cummins distributor or dealer can handle it for you when you buy your new ISL9- or ISB6.7- powered truck and include it in your financing, or you can buy it separately later on for up to 18 months*.

If you experience a service need during the coverage period, call Cummins Care toll-free at 1-800-DIESELS™ (1-800-343-7357). Our Cummins Care representatives are standing by, every hour of every day, and they will check with nearby authorized Cummins distributors and dealers to locate a facility with an available technician and the right diagnostic tools to handle your equipment repair. Your Cummins representative will help get you to the nearest available location – with 3,500 authorized locations, there's sure to be one close by.

Simply show the servicing distributor/dealer your extended coverage certificate, and he or she will handle all the necessary paperwork and repairs to get you back on the road as quickly as possible.

*After 12 months, a small administrative fee may be applied.





An ISO 9001:2008 Registered Company

GTWY805

2010-2013 Ford F650/750 (diesel only)

2010-2013 Freightliner M2/S2

(See ILISC805 for International Chassis)

Contact InterMotive for additional vehicle applications.

Introduction

The Gateway 805 is a wheel chair lift interlock and Fast Idle system for Medium Duty J1939 vehicles. It is intended to prevent driving the vehicle when the wheel chair lift is deployed. It can optionally also lock the vehicle down when the passenger door is open. GTWY805 provides system status via a dash mounted LED panel, and may be used on either hydraulic or air brake chassis. It also has the ability to program and control most Allison transmission's Range Inhibit function.

The GTWY805 **must** secure the vehicle in one of three ways: 1) Activate a Shift Lock Solenoid that will physically prevent shifting out of Park, 2) use the Range Inhibit output to prevent the transmission from engaging in a drive gear, or 3) activate a Park Brake Lock Solenoid that will prevent the air Park Brake from being released once applied. The GTWY805 **must not** use an air dump solenoid that could apply the vehicle's air brakes when activated.

GTWY 805 Add-On Options

In addition to Interlock and Fast Idle features, InterMotive offers the following options:

- **GTWY805-D** - Gateway with Door Ajar Display Panel (Page 3).
- **GTWY805-M** - Gateway with Merlin. See LED display panel instructions (Page 3).
- **GTWY805-P2** - Gateway with Plug and Play J1939 data link harness.

Installation Instructions

Disconnect vehicle battery before proceeding with installation.



WARNING

Disconnect the battery to prevent setting a check engine light.

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

It is important to avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Also avoid radio frequency energy from antenna's or inverters next to the module. Finally, avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

GTWY805 Module

Remove the lower dash panel below the steering column and find a suitable location to mount the module. Do not actually mount the module until all wire harnesses are routed and secure. The last step of the installation is to mount the module. It is recommended the module be mounted with two screws, however 2-sided foam tape or Velcro may also be used. Ensure harnesses are routed such that the tilt steering column does not contact them in the full down position. When installing the harnesses, leave several inches of take-out so the module can be removed if necessary.

InterMotive Inc.
13395 New Airport Road
Auburn, CA 95602

Phone: (530)-823-1048
Fax: (530)-823-1516
Page 1 of 12

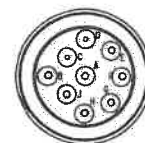
www.intermotive.net
products@intermotive.net
GTWY805-060713-INS

J1939 Data Link Harness (Blunt Cut non-Plug and Play option)

Note: If using the optional P2 Data Link Harness, skip to next section

Important: On the following wires use solder and electrical tape to make all of the connections.

1. Locate the vehicle's J1939 Connector. It will be mounted below the lower left dash panel. Remove the J1939 Connector from the mounting bracket.
2. Locate Pin A of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Black wire from the GTWY805 Data Link Harness.
3. Locate Pin B of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Red wire from the GTWY805 Data Link Harness.
4. Locate Pin C of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Yellow wire from the GTWY805 Data Link Harness.
5. Locate Pin D of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Green wire from the GTWY805 Data Link Harness.
6. Plug the free end of the Data Link harness into the mating 6-pin connector on the GTWY805 module.
7. Secure the GTWY805 Data Link harness so that it does not hang below the lower dash panel.

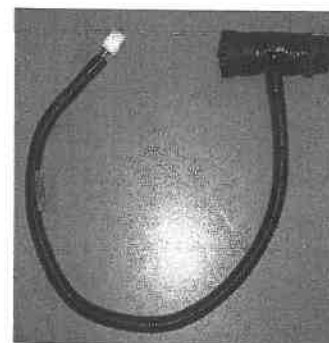


Back of the connector



J1939 Data Link Harness (Optional P2 Data Link Harness)

1. Locate the vehicle's J1939 Connector. It will be mounted below the lower left dash panel.
2. Remove the J1939 Connector from the mounting bracket.
3. Connect the GTWY805 Data Link harness J1939 female connector to the vehicle's male J1939 connector.
4. Mount the GTWY805 Data Link harness J1939 male connector to the vehicle's J1939 connector mounting bracket.
5. Plug the free end of the Data Link harness into the mating 6-pin connector on the GTWY805 module.
6. Secure the GTWY805 Data Link harness so that it does not hang below the lower dash panel.



LED Display Panel

1. Locate a suitable position on the dashboard within view of the driver for mounting the LED Display Panel. The length of the display harness is 40". This is the maximum distance the display panel can be mounted from the GTWY805 module.
2. Drill a 5/8" hole in the dashboard where the center of the display will be located, being careful not to damage anything behind the dashboard.
3. Attach the 4 Pin LED display harness to the GTWY805 Module's 4-pin connector. (Note: on vehicles with Merlin systems, a "Y" harness is provided which also connects to the MIM401-A1 module. See MIM401-A1 instructions.
4. Run the free end of the display harness under the dash and out through the 5/8" hole.
5. Attach the end of the display harness to the LED Display Panel.
6. Ensure panel is level, and secure using the supplied screws.



Door Ajar Display Panel (-D option)

If a Door Ajar Display Panel is used, a pre-crimped green wire is included with the panel which may be inserted into the GTWY805 12 pin connector Pin #5. When connected to the passenger door ajar switch, this will cause the Door Ajar LEDs to flash when the passenger door is open. The crimped pin on the green wire MUST be oriented correctly as it is plugged into the Molex connector housing. Observe the orientation on the existing pins in the connector, and match this orientation.



1. Install Door Ajar Panel per instructions above
2. Attach the free end of the green wire to the passenger door switch that provides a ground when the door is open.
3. If you wish the passenger door to shift/brake lock the vehicle when the passenger door is open, also connect this passenger door wire to the module's pin #11 Vehicle Lock Request input.

See System Operating Instructions pages for descriptions of LED indicators meanings.

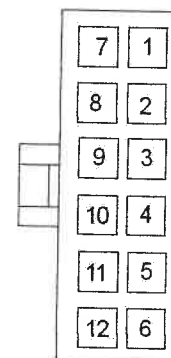
Control Outputs, Input, and Lift Inhibit Connections - 12-pin I/O Connector

The GTWY805 provides three ground side configurable outputs and one configurable input/output. The outputs can provide vehicle information and are configured per customer requirements at InterMotive prior to shipping. These outputs can be used to control upfitter circuits and can sink up to 1/2 amp each. The input pin can be connected to a ground side switch to activate Fast Idle or the Vehicle Lock output.

A 12 pin mating connector and seven terminals are provided. To use any of these outputs, properly crimp a provided connector terminal to the installer supplied wire using the correct crimping tool (Molex Part# 11-01-0197), and insert into the correct connector pin housing. The pin MUST be properly oriented for it to fully seat and click into place. The largest wire that can be used with these terminals is 16 AWG. Snap this connector into the GTWY805 module's 12-pin connector.

12-pin connector pin out definition

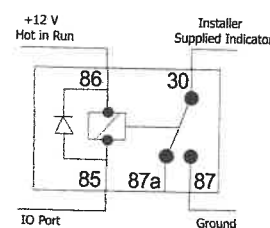
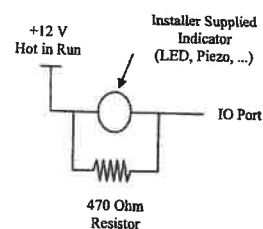
- Pin #1 - Orange - Warning Buzzer 12V Output. See below
- Pin #2 - Yellow - Range Inhibit/Shift Lock 1/2A Output (Active High/Low Configurable)
- Pin #3 - I/O Port Pin #2 - Configured Low True 1/2A Output (Default: RPM>400)
- Pin #4 - I/O Port Pin #3 - Configured Low True 1/2A Output (Default: Park Brake Input)
- Pin #5 - Green - Door Ajar Input (Use with Door Ajar Panel) flashes Door Ajar on panel
- Pin #6 - Not Used
- Pin #7 - Red - From Pin #12
- Pin #8 - Blue - Park Brake Lock 12V 1/2A Output
- Pin #9 - I/O Port Pin #1 - Configured Low True 1/2A Output (Default: VSS>70)
- Pin #10 - I/O Port Pin #4 - Configured I/O Pin (Default: Fast Idle Request Input, low true)
- Pin #11 - Vehicle Lock Request Input. Active Low (GND) locks shifter or Park Brake.
- Pin #12 - Red - To Pin #7



Back of the Connector

Note: When using the I/O port outputs to drive installer supplied low current devices, such as LEDs or Piezo buzzers, a small amount of leakage current when the pin is inactive may cause the external low current device to activate. This is indicated by the LED turning on dimly or the Piezo buzzer sounding faintly when the output is inactive (Conditions not met).

To correct this, install a 470 Ohm 1W resistor across the low current device. Digikey Part # 470WCT-ND. Or, drive a relay with the I/O output to switch ground to the low current device. Digikey Part # PB682-ND.



Warning Indicator Beeper

The beeper will sound when certain safety conditions are violated, such as removing Park Brake while the wheel chair lift is in use.

1. Choose a location to mount the warning beeper. You can either drill a 1 1/8" hole to mount the beeper, or secure it up under the dash. If drilling, be careful not to damage anything behind the dashboard.
2. Attach the beeper Black wire eyelet to a ground source.
3. I bezel mounting, secure the beeper into the hole with the supplied nut and rubber washer.

The beeper face can be rotated to control the volume.



Locking the Vehicle down with GTWY805

The GTWY805 requires an installer or OEM supplied vehicle locking mechanism (i.e. a Park Brake Lock solenoid or Shift Lock solenoid). This device must allow GTWY805 to prevent the vehicle from moving when the wheel chair lift door is open. This can be done by locking the air Park Brake on so it cannot be released, or locking the shifter so it cannot be shifted out of Park, or enabling Range Inhibit on the TCM so it cannot be shifted into gear. **GTWY805 must NOT be wired to activate air brakes, but can be used to prevent the air Park Brakes from being released, once set.**

CAUTION: On vehicles without a Park position or Park Pawl, the vehicle might still roll in Neutral if the Range Inhibit method is used by itself.

There are two outputs GTWY805 can use to secure a vehicle via the 12 pin connector 1/2A outputs.

- Pin #2 Yellow wire is a configurable low/high true output intended for driving a Shift Lock solenoid or Range Inhibit input to an Allison transmission. For this output to be asserted the vehicle must be stationary, in Park(/Neutral if no Park), and a vehicle lock trigger (Lift Door or Shift Lock Request input) must be active. This output will also be asserted if the Park Brake is set (prevents driving with Park Brake on). The default sense of this output allows it to be connected directly to the Allison Range Inhibit input (output high to prevent shifting). This output may also be used to control a Shift Lock solenoid, and may be inverted if desired (see later).
- Pin #8 blue wire is a 12V output intended for Park Brake locking mechanisms. For this output to be asserted the vehicle must be stationary in Park/Neutral with Park Brake set and a vehicle lock trigger must be active (Lift Door or Shift Lock Request input).

Locking down using the Park Brake Lock output with air Park Brakes

Attach the GTWY805 Park Brake Lock pin #8(of 12) Blue wire to an installer supplied wire that runs to the Park Brake locking system. This should be wired to prevent air pressure from releasing the Park Brake, but only when it's set. This can be done with an air blocking solenoid and pressure switch to ensure GTWY805 can only prevent the air Park Brake from being released by the dashboard control if the Park Brake is already set. The idea is to prevent undesired release of the Park Brake during wheel chair lift operations. GTWY805 will flash the Vehicle Lock icon on the LED panel if it detects this output becomes disconnected from it's load. This is a safety feature to alert the driver that the vehicle may not be properly "locked."

DO NOT connect this output to an air dump solenoid or equivalent that would allow GTWY805 to apply the brakes. This output should be used only to lock the park brake on once it's applied by the driver.

Locking down using the Range Inhibit/Shift Lock output with a Shift Lock solenoid

1. Attach the GTWY805 Pin #2(of 12) Yellow wire to an installer supplied wire that runs to the shift locking mechanism. By default, this output provides 12V@1/2A max to lock the shifter.
2. If an active low signal is desired, perform the following procedure:
 - With the Park Brake set, turn the Key On with the Engine Off.
 - Put the module in Test mode by applying a ground wire to the "TEST" pad of the module. Several of the LEDs on the module will start to flash as confirmation.
 - Quickly press and release the Service Brake 3 times.
 - Press and release the Accelerator Pedal (must be pressed to the floor) 2 times.
 - Press and release the Service Brake 3 times.



If successful, the Park Brake and vehicle lock LED's on the dash panel will flash. They will flash three times if the output is active low and five times if the output is active high.

Note: If no LED's flash, then the sequence was not recognized and should be retried after waiting 10 seconds.

Locking down using Allison's Range Inhibit

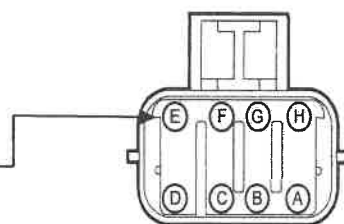
The GTWY805 can operate in conjunction with the Allison transmission Range Inhibit feature. This feature allows the GTWY805 to inhibit the transmission's ability to shift into gear during wheel chair lift operation. The GTWY805 12 pin connector Pin #2 Yellow wire configured as a **high true** output must be connected to the Allison Transmission Control Module for the function to operate, and the Allison transmission must have this feature enabled (see later on how to program the transmission). Some examples of these connections follow.

CAUTION: The Range Inhibit Feature does not lock the transmission in Park, it will only prevent shifting into gear. If the transmission is in Neutral the vehicle may roll even when Range Inhibit is active.

2010 F650/750

1. Locate the C314 Transmission Body Builder connector on the left side of the engine.
2. Attach the GTWY805 12 pin connector Pin #2 Yellow wire to an installer supplied wire, that runs through the firewall, that is connected to the C314 Transmission Body Builder connector Pin E Gray/Yellow wire.

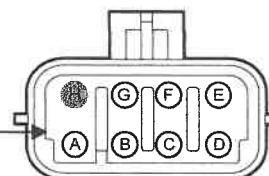
Front of the C314 Transmission Body Builder Connector



2011-2013 F650/750

1. Locate the C3618 Transmission Body Builder connector on the left side of the engine.
2. Attach the GTWY805 12 pin connector Pin #2 Yellow wire to an installer supplied wire, that runs through the firewall, that is connected to the C3618 Transmission Body Builder connector Pin A Gray/Yellow wire.

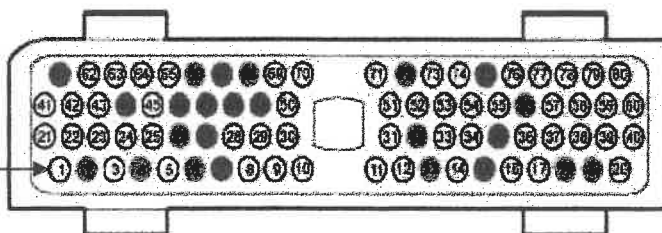
Front of the C3618 Transmission Body Builder Connector



Freightliner M2 Series

1. Locate the Allison Transmission Control Module connector.
2. Attach the GTWY805 12 pin connector Pin #2 Yellow wire to an installer supplied wire that runs to the Transmission Control Module. Attach the wire to the Allison Transmission Control Module connector Pin #1 Gray/Yellow wire.

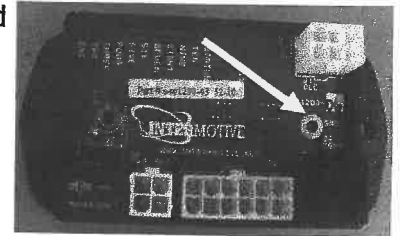
Front of the Allison Transmission Control Module Connector



Allison Range Inhibit Programming Sequence

A functional change was made to the GTWY805 starting with firmware v1.10. The module no longer automatically configures the Allison transmission to support the Range Inhibit input and Park output features. These functions can still be enabled by the GTWY805 by performing the following procedure:

1. With the module installed, engine Off, turn the key to "RUN", and wait for the panel to prove out.
2. Set the Park Brake.
3. Put the module in Test mode by applying a ground wire to the "TEST" pad of the module. When in Test mode, several of the LEDs on the module will start to flash.
4. Press and fully release the Service Brake 5 times within 10 seconds.
5. Immediately tap the accelerator pedal once.



Once the above sequence is executed, the green Lift Power LED will flash on the panel. This indicates that the range inhibit is now enabled. If the red Park LED, Lift Door Open, and the PB LED flash, then the transmission was not successfully programmed. If no LED's flash, then the sequence was not recognized and should be re-attempted after waiting 10 seconds.

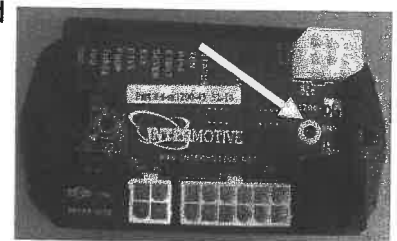
Once the procedure is successfully completed on a vehicle, the Allison programming portion of the Gateway 805 will only work on that particular VIN.

Note: To disable the Allison transmission inhibit feature, repeat the steps above. When the sequence is correctly executed, the Green Lift Power LED and the Red Lift Door Open LED will flash. If no LED's flash, then the sequence was not recognized and should be re-attempted after waiting 10 seconds.

Vehicle Lock LED Programming Sequence

By default the Vehicle Lock LED on the dash panel will track the Pin #8 Park Brake Lock output. If this output is not used and instead the Pin #2 Shift Lock or Range Inhibit output is used the LED will not accurately indicate when the vehicle is locked. The following programming sequence will toggle the Vehicle Lock LED tracking between Pin #2 Shift Lock/Range Inhibit output and Pin #8 Park Brake Lock output.

1. With the module installed, engine Off, turn the key to "RUN", and wait for the panel to prove out.
2. Set the Park Brake.
3. Put the module in Test mode by applying a ground wire to the "TEST" pad of the module. When in Test mode, several of the LEDs on the module will start to flash.
4. Press and hold the Service Brake.
5. Press and release the Accelerator Pedal (must be pressed to the floor) 2 times.
6. Release the Service Brake.
7. Press and release the Service Brake 3 times.



If successful, two LEDs will flash on the LIN Panel. The Park Brake and Park LEDs will flash five times if the Vehicle Lock LED is tracking the Pin #2 Shift Lock/Range Inhibit output. The Park Brake and Vehicle Secure LEDs will flash five times to indicate that the Vehicle Lock LED is tracking the Pin #8 Park Brake Lock output.

Note: If no LED's flash, then the sequence was not recognized and should be retried after waiting 10 seconds.

Eaton Transmission Discrete Park/Neutral Input

A functional change was made to the GTWY805 in firmware v2.12. This change allowed the Gateway 805 to read the Park/Neutral input discretely instead of over the vehicle CAN network.

Firmware 3.01 and higher

The Eaton transmission data will be determined from the network. No programming sequence is necessary. The Discrete Park/Neutral input is no longer used.

Lift Connector 4-pin

This 12" harness contains the circuits listed below. One end plugs into the GTWY805 module and the other end provides a Molex MLX connector which is intended to plug into the wheel chair lift harness. A mating harness can be fabricated by the installer. The mating connector is Molex Part # 0050841040. The mating terminals are Molex Part # 0002081003. We recommended using Molex terminal extractor tool Part # 0011010168 and Molex hand crimp tool # 0638116800.

Vehicle Secure/Lift Enable Circuit (output) - Connect the Vehicle Secure Orange wire from pin #2 of the white 4-pin Lift connector to the Vehicle Secure (Lift Enable) input on the lift. The Vehicle Secure circuit must only activate the Vehicle Secure input on the lift and must not draw more than 8A (see lift manufacturers installation instructions). **Note:** Do not power any other loads (ie: lights, motors, etc.) from this circuit that increase the current draw to greater than 8A. The "Lightening Bolt" icon on the LED panel is on when this output is active.

Vehicle Secure/Lift Enable Circuit (input) - Connect the Yellow wire from pin #4 of the white 4-pin Lift connector to an appropriately fused ignition power source (Hot in Run). The fuse should support a current draw of 8A.

Lift Inhibit (input) - Since this circuit generally does not connect to the wheel chair lift, no wire is provided in the lift harness. A lift inhibit (or lift enable) switch can be connected to this connector location by crimping one of the provided Molex terminals to a wire and inserting it into the empty pin #1 cavity of this connector. Connecting this wire to a grounding switch will prevent GTWY805 from supplying power to the Vehicle Secure Output, thus disabling the lift.

Lift Door Circuit (input) - Locate the vehicle's lift door switch circuit. Connect the Gray wire from pin #3 of the white 4-pin Lift connector to this circuit. **Note:** the lift door switch must provide a ground when the door is open/ajar. A switch that provides 12V when the door is open will not operate correctly. Plug the White 4-pin connector from the Lift Harness into the GTWY805 module.

GTWY805 Module Mounting

Ensure all harnesses are properly connected and routed and are not hanging below the dash area. Mount the module as described on Page One and secure using supplied screws or double sided tape.

Reconnect vehicle battery

Post Installation Testing

Lift Interlock

1. With the transmission in Park, Park Brake set, start the engine, noting the GTWY805 LED panel.
Note: In vehicles without Park use Neutral.
 2. When the ignition key is turned on, all LED's will turn on for approximately 2 seconds then back off. The Park LED (P) will illuminate when the transmission is in Park/Neutral, and the Park Brake LED (PB) will illuminate when Park Brake is set. Verify these LEDs are tracking properly.
 3. Verify the Lift Door LED illuminates when the Wheel Chair Lift Door is opened. The optional Door Ajar Display panel will illuminate in red when the lift door is open, and flash red when the passenger door alone is open (if so wired).
 4. With the vehicle in Park, Park Brake set, Lift Door open, Lift Inhibit not grounded, verify that the Vehicle Secure/Lift Power LED (lightening icon) is on, and that the Lift operates. If the Lift does not operate, check the GTWY805 LIFT connector J6. Pin 4 Yellow wire should have 12V (Lift power input), and pin 2 Orange wire should have 12V (Vehicle Secure/Lift Power output).
 5. With the vehicle in Park, Park Brake set, Lift Door open, Lift Inhibit not grounded, confirm the vehicle can not be moved. Either the transmission can not be shifted from Park, or the Park Brake can not be released, depending on the installation. It is recommended that GTWY805 does not rely solely on the Range Inhibit function of the transmission, as this can allow the vehicle to be shifted into neutral, allowing the vehicle to roll with the lift deployed.
- Note: as a safety feature, closing the lift door does NOT release Vehicle Lock. The Park Brake must be released and the Service Brake must be applied to release Vehicle Lock.

Do not place vehicle in service without the Shift Interlock working properly!

Fast Idle (optional AFIS-Advanced Fast Idle System)

The Fast Idle function has several "auto triggers" that will increase engine RPM. These include low battery voltage and an external switch input on pin #10 of the 12 Pin connector (I/O 4).

1. Place vehicle in Park. Manually engage Fast Idle by pressing and releasing the Yellow Engage button on the LED panel. The Green LED will light and the engine RPM will increase in 100 RPM increments each time the button is pressed/released, up to 1500 RPM for Gas, 1200 RPM for Diesel.
2. Press the Service Brake for 1 second. Fast idle will temporarily disengage anytime the Service Brake is pushed, but will automatically reengage after approximately 2 seconds once the Service Brake is released.
3. Exit Fast Idle mode by pressing the Service Brake and the Yellow Manual Engage button together. Fast Idle will cancel and the Green LED will turn off. This disables Fast Idle until the key or transmission range is cycled.
4. Shut down the engine and verify that all LED's turn off, which may take up to a minute. Do not activate any vehicle controls during this time (windows, mirrors, doors, etc.)



The AFIS option of GTWY805 is properly installed only if it passes all of the above steps.

If the GTWY805 fails any step in the Post Installation Test, review the installation instructions and check all connections. If necessary, call InterMotive Technical Support at (530) 823-1048.



An ISO 9001:2008 Registered Company

GTWY805 System Operating Instructions

2010-2013: Ford F650/750 (diesel only), Freightliner M2/S2

Gateway 805 Operation:

The Gateway 805 is a wheel chair lift interlock system which is intended to prevent driving the vehicle when the wheel chair lift is deployed. Gateway 805 also optionally provides an engine Fast Idle system. An LED display panel, usually mounted on the dashboard provides system status.

Gateway 805 initializes when the vehicle ignition is turned on. During initialization, the LED display panel performs a prove-out for 2 seconds. After the initialization, the system collects vehicle data by monitoring the J1939 data port. It uses this information to perform all of its control logic. When the Gateway 805 module has been running and the vehicle ignition is turned to the off or accessory positions, the module goes into a low current "sleep" mode. This may take anywhere from several seconds to a minute.

Lift Operation

Wheel chair lift operation will only be allowed when all of the following conditions are met:

- Vehicle transmission range in Park (or Neutral if the vehicle lacks a Park position).
- The Park Brake is applied.
- The vehicle ignition is on (Engine on or off).
- The Lift Door is open.
- Lift inhibit switch (if equipped) is not activated. (Optional wheelchair lift inhibit/enable switch).

Once the wheel chair lift door is open, GTWY805 will not allow the vehicle to be driven. If the vehicle is not in a secure state, GTWY805 will not allow the lift to be operated. When lift operations are completed, and the lift door is closed, the driver must press Service Brake and release Park Brake before the vehicle can be driven.

LED Panel—The LED panel provides the following vehicle status (left to right) when the key is on.

Fast Idle Engage button - Push for 1/4 second to manually engage Fast Idle.

Fast Idle Engaged status - indicates when GTWY805 is commanding engine Fast Idle.

Vehicle Secure - (Lightning Icon) Illuminates Green when lift is enabled. All conditions for lift operation have been met.

Door Open - (not available on "Door Ajar" panels) - Illuminates Red when lift door is open.

Park Brake - Solid Red when Park Brake is set. Flashes when the Park Brake is not set and lift door is open.

Park - Solid Red when in Park (neutral without a park position). Flashes when not in Park and lift door open.

Vehicle Lock - Illuminates in Red when the Park Brake and/or transmission shifter is locked. If other systems in the vehicle are tied into this input, the LED will also illuminate. If the Vehicle Lock LED is illuminated, the driver will not be able to drive or move the vehicle. Flashes when an output is not properly connected. Vehicle must be serviced as soon as possible.

Door Ajar - (Door Ajar Panel only) - Solid Red when the lift door is open, flashes when the passenger door alone is open.

The lower backlit Icons on the Panel will remain illuminated whenever GTWY805 is awake. There are no lower backlit Icons on the Door Ajar Panel. The module will stay awake for several minutes after the ignition is turned off.

System Operating Instructions (continued)

Beeper

The warning beeper will sound when attempting to operate the wheel chair lift when one of the safety conditions is not met, such as opening the lift door while not in Park (neutral if no Park), or not having the Park Brake set, or if vehicle motion is detected (rolling). Beeper volume can be adjusted by rotating the bezel on the beeper. Beeper location is determined by bus manufacturer.

Advanced Fast-Idle Option

Fast Idle is an **automatic** system that increases the engine's idle speed under certain circumstances. Fast Idle does not engage when the transmission is in Drive, only when the vehicle is stopped in Park/Neutral. Fast Idle may occur to "Charge Protect" the vehicle batteries, or to enhance the vehicle's air conditioning, etc. Fast Idle will only occur when all of the following safety conditions are met:

- Vehicle NOT moving (speed = 0 MPH).
- Service Brake NOT pressed.
- Vehicle Transmission Range in Park (or Neutral with the Park Brake applied, if vehicle lacks a Park position).
- RPM inside of safe operating range.
- Transmission Fluid Temperature below 250° F.
- Engine Coolant Temperature below 230° F.

Control/Display Panel:

The left side of the Control/Display Panel consists of one LED and a Manual Engage button. The Green LED will illuminate when Fast Idle is in progress. In addition to coming on automatically, Fast Idle can be manually engaged by pushing and releasing the Yellow ENGAGE button.

Manual Fast Idle Start Triggers:

Manual Engage - Press for 1/4 second.

Merlin Multiplex Network Command. (If vehicle equipped with Merlin system).

Fast Idle Input - Other vehicle systems may request Fast Idle, such as rear coach air conditioning.

Fast Idle Disengagement Triggers:

Service Brake pressed.

Merlin Multiplex Network Command.

Vehicle moving (speed > 0 MPH).

Vehicle Transmission Range not in Park (or not in Neutral with the park brake applied, if vehicle lacks a Park position).

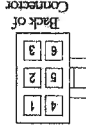
RPM above safe operating range.

Transmission Fluid Temperature above 250° F.

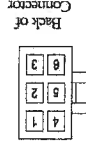
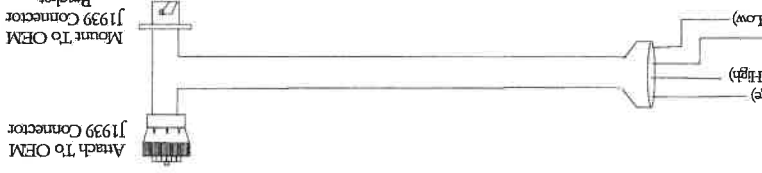
Engine Coolant Temperature above 230° F.

Note: Fast idle will temporarily disengage when the Service Brake pedal is depressed, but will automatically reengage after approximately 2 seconds once the pedal is released. Fast idle may be manually cancelled by depressing the Service Brake pedal while simultaneously pressing the manual engage button.

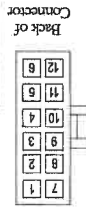
Optional P2 Data Link Harness



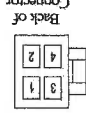
Part# s-h 59bx
1 RED
2 YELLOW (1939 CAN 1 High)
3 Not Used
4 BLACK (Ground)
5 GREEN (1939 CAN 1 Low)
6 Not Used



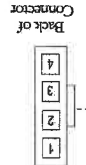
Part# s-h 59ax
1 RED
2 YELLOW (1939 CAN 1 High)
3 Not Used
4 BLACK (Ground)
5 GREEN (1939 CAN 1 Low)
6 Not Used



Part# s-h 60ax
1 RED
2 YELLOW
3 Not Used
4 GREEN
5 Not Used
6 RED
7 RED
8 BLUE
9 RED
10 RED
11 RED
12 RED

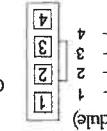
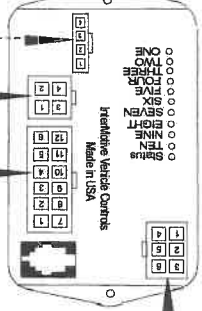


Part# s-h 34a1
1 RED
2 GRAY
3 GRAY
4 YELLOW

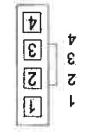


Part# s-h 32-d1
1 BLUE
2 YELLOW (SV)
3 WHITE (LIN)
4 RED (12V)

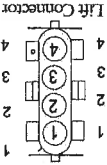
GTWY 805
s-m 1200-35



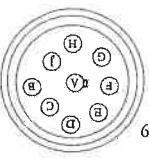
Part# s-h 32c1 (With MIM Module)
1 BLUE (Ground)
2 YELLOW (SV)
3 WHITE (LIN)
4 RED (Battery Voltage)



Part# s-h 32d1 (Without MIM Module)
1 BLUE (Ground)
2 YELLOW (SV)
3 WHITE (LIN)
4 RED (12V)



1 ORANGE (Lift Power/Vehicle Secure Output)
2 YELLOW (Lift Hot in run and crank)
3 Not Used
4 GRAY (Lift Door Input)
5 (Lift Inhibit Input) (Optional)
6 (Lift Enable Output)
7 (Lift Door Input)
8 (Lift Inhibit Input)
9 (Vehicle Lock Request) (Optional)
10 (Default VSS > 70)
11 (Default Fast Idle Request)
12 (Vehicle Lock Request) (Optional)



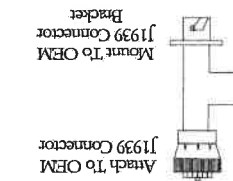
Front of 1939
Connector



1 RED (12V Run and Crank)
2 BLACK (Ground)
3 YELLOW (1939 CAN 1 High)
4 GREEN (1939 CAN 1 Low)
5 (Shift Lock/Range Inhibit Output)
6 (Default Park Brake Input)
7 (Default RPM > 400)
8 (Shift Lock/Range Inhibit Output)
9 (Waiting Buzzer Output)
10 (Door Ajar Input) (With Door Ajar Option)
11 (Shift Lock/Range Inhibit Output)
12 (Park Brake Lock Output)

Attach To OEM
1939 Connector

Part# r-im-alarm



LED Display with AFIS
Part# s-e 02x
LED Display without AFIS
Part# s-e 01x
Door Ajar LED Display with AFIS
Part# s-e 04x
Door Ajar LED Display
Part# s-e 03x

Submit product registration at www.intermotive.net

If the GTWY805 fails any step in the Post Installation Test, review the installation instructions and check all connections. If necessary, call

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The World's Leading Bus Transmission Series

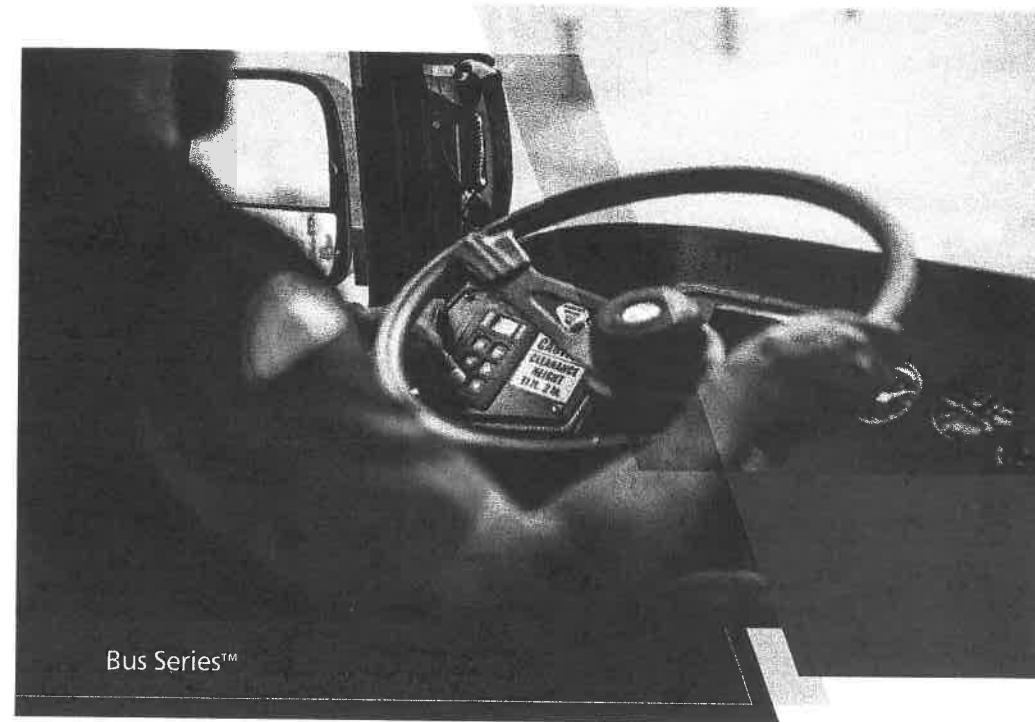
Around The Corner And Around The World



A World Of Support

From our headquarters in Indianapolis, Indiana, USA, to our manufacturing plants in Hungary and India, to approximately 1,400 Allison Authorized Distributors and Dealers around the globe, you are never far from the products, training, service and support you demand.

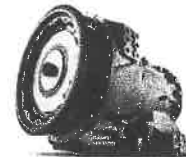
Our support starts from the moment an Allison transmission is specified. We work with you to ensure that the model and ratings fit your engine to create a tailored package of powerful performance and reliable efficiency. When you need parts or service, you can count on global access to factory-trained specialists and Allison Genuine Parts™.



Bus Series™

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Indianapolis, Indiana, USA, 46222-3271
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Allison Bus Series™ Models Are Now Available
With FuelSense® and xFE Technology

Proven Reliability And Durability

- Allison fully automatic transmissions are built to last and require minimal service—meaning not only lower maintenance costs, but also more time on the road. Our commercial-duty automatic transmissions are designed for durability to handle the frequent starts, stops and high mileage demands that buses place on components.

FUELSENSE®

More Fuel Efficient With xFE

With xFE, Allison has taken fuel economy to the next level. xFE is another in a string of innovative, fuel-saving ideas from Allison, a leader in bus transmission technology. New gear ratios allow the torque converter to lock up at lower speeds, improving fuel economy up to seven percent in xFE-equipped vehicles.

This seven percent improvement in fuel economy is in addition to the already greater efficiency created by Allison's FuelSense®, a unique package of software and electronic controls that supports an advanced array of features. The combination of these packages provides a substantial fuel economy advantage.

Dynamic Shift Sensing	Automatically selects between lower/higher speed shift schedules based on the vehicle's actual payload and the grade on which it is operating. This optimizes fuel economy while maintaining superior performance.
EcoCal	Provides lower shift points to get into lock up as soon as possible, providing necessary performance without shift cycling.
Neutral at Stop	Automatically eliminates the load on the engine when the vehicle is a full stop to save fuel and reduce overall emissions.
Acceleration Rate Management	Mitigates aggressive driving practices by automatically controlling engine torque based on the vehicle's grade and load.
5th Generation Electronic Controls	Allison 5th Generation Electronic Controls offer an enhanced array of smart controls designed to increase fuel economy and fuel efficiency for the specific needs of buses.

Results depend on duty-cycle. xFE provides maximum fuel savings in high start-stop duty-cycles with low average speeds. Contact your Allison representative to ensure xFE is the best choice for your specific need.

Making Natural Gas More Efficient

Allison Automatics are perfectly suited to natural gas engines in the heavy start-stop cycle of city and transit buses. The inherent benefits of Allison's Continuous Power Technology™, featuring full-power shifts and a patented torque converter, realize the best performance and most efficient use of fuel from buses. Natural gas engines are more responsive when joined to an Allison Automatic.

Proven Dependable And Efficient Hybrid Systems

The Allison Hybrid H 40/50 EP™ systems feature a two-mode split parallel architecture—a pure mechanical path and a pure electric path—to achieve the highest energy efficiency. The technology operates automatically as a series or parallel hybrid, improving fuel consumption by up to 25 percent over a typical bus. Additionally, its regenerative braking capability can significantly extend the brake change interval by as much as 350 percent.



Driven To Exceed

Our commitment to understand and satisfy your needs drives us to constantly analyze, refine and improve our products and their features. Nothing else delivers the durability, productivity and fuel economy of an Allison fully automatic transmission.

When it comes to transit and charter bus applications, Allison Bus Series™ transmissions help keep your vehicles and your business on schedule with maximum efficiency, improved vehicle performance, safer driver operation and better passenger comfort.



The Power Of The Torque Converter

Allison's torque converter smoothly multiplies engine torque, delivering more power to the wheels. By multiplying the engine power, drivers get increased performance, faster acceleration and greater operational flexibility. An Allison Automatic eliminates power interrupts so you can accomplish more, even with a smaller engine.



B 210, B 220, B 295



B 300, B 400,
B 3400 xFE



B 500

Increased Safety

Since gear shifting is automatic, drivers are better able to concentrate on the task at hand... getting riders safely to the next stop.

Comprehensive Coverage

All Allison Bus Series™ models offer comprehensive coverage with 100% parts and labor. Coverage may vary by model and application. Contact your local Allison representative for details.

Easy Maintenance

A fully automatic transmission from Allison, a trusted brand around the world, is the best way to keep your fleet on the road while reducing total cost of ownership. With extended periods between scheduled maintenance and a proven track record of reliability, Allison puts you in control of your fleet and your budget.

Prognostics	Calibrated to the vehicle's particular operating requirements, Allison prognostics monitor various operating parameters to determine and alert when service is due. This eliminates unnecessary oil and filter changes and provides maximum transmission protection.
Retarder Benefits	Allison's integral hydraulic retarder complements and enhances vehicle service brake performance. It reduces braking distance, while offering full integration with the Anti-Lock Braking System, Engine Braking Systems and cruise control systems. In stop-and-go driving, the transmission retarder may be automatically activated at various levels, each time the vehicle brakes are in use, extending service brake life.
Secondary Shift Schedule	Allows driver to select between two pre-programmed shift patterns, quickly and easily, to match driving conditions.
Direction Change Enabled	Prohibits shifts from Neutral to Drive or Reverse without first pressing a dash switch or applying the service brakes.
Auxiliary Function Range Inhibit	Will not allow transmission to shift into forward or reverse unless the service brakes are applied.



Ratings And Specifications

Bus Series™

RATINGS										
MODEL	SERIAL NUMBER	RATIO	PARK PAWL	MAX INPUT POWER ¹ w/o SEM hp (kW)	MAX INPUT POWER w/SEM TORQUE LIMITING ^{1,2} hp (kW)	MAX INPUT TORQUE ¹ w/o SEM lb-ft (N·m)	MAX INPUT TORQUE w/SEM TORQUE LIMITING ^{1,3} lb-ft (N·m)	MAX TURBINE TORQUE ¹ lb-ft (N·m)	MAX GVW lbs (kg)	MAX GCW lbs (kg)
B 210	6310	Close Ratio	No	230 (172)	270 (201)	520 (705)	575 (780)	850 (1152)	29,000 (13,150)	29,000 (13,150)
- Transit										
B 220	6310	Close Ratio	Yes	230 (172)	270 (201)	520 (705)	575 (780)	850 (1152)	29,000 (13,150)	29,000 (13,150)
- Transit										
B 295	6510	Close Ratio	N/A	230 (172)	N/A	620 (841)	N/A	1370 (1857)	33,000 (14,968)	33,000 (14,968)
- Transit										
B 300	6510	Close Ratio	N/A	280 (209)	N/A	735 (997)	N/A	1370 (1857)	38,000 (17,236)	38,000 (17,236)
- Transit										
B 400	6510	Close Ratio	N/A	300 (224)	N/A	925 (1254)	N/A	1370 (1857)	45,000 (20,412)	45,000 (20,412)
- Tour Coach										
B 3400 xFE	6510	Close Ratio	N/A	330 (246)	N/A	1000 (1356)	N/A	1600 (2170)	45,000 (20,412)	45,000 (20,412)
- Transit										
B 500	6610	Close Ratio	N/A	300 (224)	N/A	925 (1254)	N/A	1370 (1857)	45,000 (20,412)	45,000 (20,412)
- Transit										
- Intercity Coach		Close Ratio	N/A	420 (313)	N/A	1300 (1763)	N/A	2450 (3322)	—	—
- Intercity Coach										

1 Gross ratings as defined by ISO 1585 or SAE J1995. 2 SEM = engine controls with Shift Energy Management. 3 Turbine torque limit based on ISCAAN standard deductions.

GEAR RATIOS – TORQUE CONVERTER MULTIPLICATION NOT INCLUDED								
MODEL	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	REVERSE
B 210	3.10:1	1.81:1	1.41:1	1.00:1	0.71:1	0.61:1	—	-4.49:1
B 220	3.10:1	1.81:1	1.41:1	1.00:1	0.71:1	0.61:1	—	-4.49:1
B 295	3.10:1	1.81:1	1.41:1	1.00:1	0.71:1	0.61:1	—	-4.49:1
B 300	3.49:1	1.86:1	1.41:1	1.00:1	0.75:1	0.65:1	—	-5.03:1
B 400	3.49:1	1.86:1	1.41:1	1.00:1	0.75:1	0.65:1	—	-5.03:1
B 3400 xFE	3.49:1	2.03:1	1.47:1	1.00:1	0.69:1	0.59:1	—	-3.80:1
B 500	3.51:1	1.91:1	1.43:1	1.00:1	0.74:1	0.64:1	—	-4.80:1

ENGINE SPEEDS			
MODEL	FULL LOAD GOVERNED SPEED Min-Max (rpm)	IDLE SPEED IN DRIVE Min-Max (rpm)	OUTPUT SHAFT SPEEDS (rpm)
B 210/220	2200-3800	500-820	4500
B 295	2200-5000	500-820	5000
B 300/400	1950-2800	500-800	3600 ¹
B 3400 xFE	1950-2800	500-800	3600 ¹
B 500	1700-2300	500-800	—

1 Retarder-equipped models only.

OIL SYSTEM				
MODEL	CAPACITY ¹ quarts (liters)	MAIN CIRCUIT FILTER	LOBE CIRCUIT FILTER	ELECTRONIC OIL LEVEL SENSOR (OLS)
B 210/220	Spin-On Canister			
- Standard Oil Sump	13.7 ² (13.0) ²			
- Shallow Oil Sump	11.6 ² (11.0) ²			
B 300/400	Integral			
- Deep Oil Sump w/ PTO	29.75 ² (28.1) ²			
- Deep Oil Sump w/o PTO	29 ² (27.4) ²			
- Shallow Sump w/o PTO	26.75 ² (25.3) ²			
- Shallow Oil Sump w/o PTO	26 ² (24.6) ²			
B 3400 xFE	Integral			
- Deep Oil Sump w/ PTO	29.75 ² (28.1) ²			
- Deep Oil Sump w/o PTO	29 ² (27.4) ²			
- Shallow Sump w/o PTO	26.75 ² (25.3) ²			
- Shallow Oil Sump w/o PTO	26 ² (24.6) ²			
B 500	Integral			
- Deep Oil Sump and PTO	51 ² (48) ²			
- Deep Oil Sump	48 ² (45) ²			
- Shallow Oil Sump and PTO	43 ² (41) ²			
- Shallow Oil Sump	40 ² (38) ²			

Recommended oil types for all models are Allison Approved TES 295² transmission fluid.

1 Transmission only. Does not include cooler hoses or fittings. 2 Amount of oil necessary to fill a dry transmission.

TORQUE CONVERTER SPECIFICATIONS		
MODEL	TORQUE CONVERTER	NOMINAL STATE TORQUE
B 210/220	TC-210	2.05
	TC-211	1.91
	TC-221	1.73
	TC-222	1.58
B 300/400 B 3400 xFE	TC-411	2.71
	TC-413	2.44
	TC-415	2.35
	TC-417	2.20
	TC-418	1.98
	TC-419	2.02
B 500	TC-421	1.77
	TC-521	2.42
	TC-531	2.34
	TC-541	1.90
	TC-551	1.79
	TC-561	1.58
	TC-571	1.62

STANDARD POWER TAKEOFF – CONTINUOUS OPERATION				
MODEL	MOUNTING PAD POSITIONS VIEWED FROM REAR	DRIVE GEAR RATING WITH ONE PTO lb-ft (N·m)	DRIVE GEAR RATING WITH TWO PTOS lb-ft (N·m)	DRIVE
B 210 ¹	3 and 9 o'clock	250 (339)	200 ² (271) ³	Turbine
B 220 ¹	3 and 9 o'clock	250 (339)	200 ² (271) ³	Turbine
B 300 ¹	4 and 8 o'clock	485 (660)	685 ² (930) ³	Engine
B 3400 xFE ¹	4 and 8 o'clock	485 (660)	685 ² (930) ³	Engine
B 400 ¹	4 and 8 o'clock	485 (660)	685 ² (930) ³	Engine
B 500 ¹	1 and 8 o'clock	685 (930)	1175 (1595)	Engine

1 PTO-delete option available. 2 Rating per PTO. 3 Total on the drive gear.

OPTIONAL RETARDER PROVISION — INTEGRAL HYDRAULIC TYPE		
MODEL	TORQUE CAPACITY lb-ft (N·m)	POWER CAPACITY hp (kW)
B 300/400		
- High	1600 (2170)	600 (447)
- Medium	1300 (1763)	500 (373)
- Low	1100 (1490)	400 (298)
- Very Low	811 (1100)	—
- Ultra Low	533 (750)	—
B 3400 xFE		
- High	1600 (2170)	600 (447)
- Medium	1300 (1763)	500 (373)
- Low	1100 (1490)	400 (298)
- Very Low	811 (1100)	—
- Ultra Low	533 (750)	—
B 500		
- High	2000 (2712)	600 (447)
- Medium	1600 (2170)	600 (447)
- Low	1300 (1763)	500 (373)

PHYSICAL DESCRIPTION				
MODEL	LENGTH in (mm)	DEPTH ¹ w/DEEP OIL PAN/SUMP in (mm)	DEPTH ² w/SHALLOW OIL PAN/SUMP in (mm)	DRY WEIGHT lbs (kg)
B 210/220				
- SAE No. 3 mounting	28.01 (711.4)	11.22 (285.1)	10.71 (272.0)	323 (146.5)
- SAE No. 2 mounting	28.39 (721.1)	11.22 (285.1)	10.71 (272.0)	323 (146.5)
B 300/400				
- Basic model	28.3 (718.7)	12.90 (327.7)	11.14 (283.1)	535 (243)
- With PTO only	32.5 (825.4)	12.90 (327.7)	11.14 (283.1)	575 (261)
- With retarder only	28.29 (718.5)	12.90 (327.7)	11.14 (283.1)	615 (279)
- With PTO & retarder	32.49 (825.4)	12.90 (327.7)	11.14 (283.1)	655 (298)
B 3400 xFE				
- Basic model	28.3 (718.7)	12.90 (327.7)	11.14 (283.1)	535 (243)
- With PTO only	32.5 (825.4)	12.90 (327.7)	11.14 (283.1)	575 (261)
- With retarder only	28.29 (718.5)	12.90 (327.7)	11.14 (283.1)	615 (279)
- With PTO & retarder	32.49 (825.4)	12.90 (327.7)	11.14 (283.1)	655 (298)
B 500				
- Basic model	30.54 (775.8)	14.75 (374.7)	13.29 (337.6)	831 (377)
- With PTO only	33.41 (848.7)	14.75 (374.7)	13.29 (337.6)	893 (405)
- With retarder only	33.54 (775.7)	14.75 (374.7)	13.29 (337.6)	906 (411)
- With PTO & retarder	33.41 (848.7)	14.75 (374.7)	13.29 (337.6)	968 (439)

1 Length measured from flywheel housing to end of output shaft. 2 Depth measured below transmission centerline.



OUR PRODUCTS →

SCHOOL BUS

TRANSIT

MOTOR COACH

SHUTTLE BUS

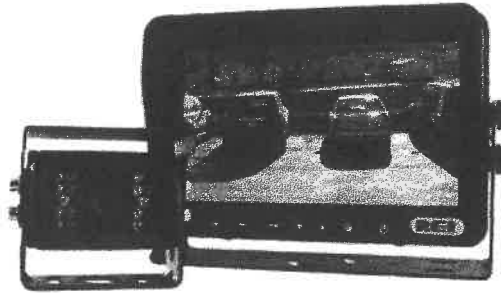
Products

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AG/CONSTRUCTION

Our Products



Part No. 760923

7" LCD w/1 Camera Input, 1 Minibox Camera and 65' Camera Cable...Single Camera View

Features:

System - Main Components:

710346 - 7" Monitor

710311 - Minibox Camera

512369 - 65' Camera Cable

Monitor Features:

- Hi-res digital 7" LCD screen
- Automatic color optimizing
- Manual or automatic camera selection
- Auto power on (standby mode)
- LED back-lit controls
- Auto day/night brightness modes
- Wide viewing angle
- Removable sun visor included
- A/V output

Camera Features:

- Excellent low light performance
- Electronic shutter and auto white balance for sunlight compensation
- Quality Sony CCD color optics
- Night vision IR LEDs, visible range up to 45'
- Built-in heater
- Cast aluminum housing

[View Catalog](#)

XZE®

A premium all-position radial with extra-wide, extra-deep tread designed to help deliver our best wear in high scrub applications.



- Beefy, buttressed shoulders help resist tearing and accelerated wear in high scrub applications.
- Extra strong curb guards help protect sidewalls against most impacts and abrasions for long casing life.
- Groove bottom protectors help deliver additional defense against stone drilling.
- Application specific, high scrub compound (chip and cut resistant in versions with * designation) make the XZE our longest wearing regional steer tire.
- Deep, wide tread and optimized footprint shape help deliver long, even tread wear.

Specifications for Tread Design: XZE®

Size	Load Range	Catalog Number	Tread Depth 32nds	Max Speed mph	Loaded Radius		Overall Diameter		Overall Width		Approved Rims	Min. Dual Spacing		Revs per Mile	Max. Tire Load Single				Max. Tire Load Dual			
					in.	mm.	in.	mm.	in.	mm.		in.	m		lbs.	psi	kg.	kPa	lbs.	psi	kg.	kPa
225/70R19.5	F	81473	17	75	14.9	378	32.2	819	8.9	227	6.00, 6.75	9.7	246	646	3640	95	1650	660	3415	95	1550	660
225/70R19.5	G	91043	17	75	14.9	378	32.2	819	8.9	227	6.00, 6.75	9.7	246	646	3970	110	1800	760	3750	110	1700	760
245/70R19.5	H	75997	18	75	15.6	396	33.6	853	9.7	247	6.75, 7.50	10.7	272	619	4940	120	2240	830	4675	120	2120	830
9R22.5	F	75473	18	75	17.8	452	38.2	970	8.9	226	6.00, 7.50, 6.75	10.0	254	543	4540	105	2060	720	4300	105	1950	720
10R22.5	F	79883	21	75	18.7	475	40.1	1018	10.2	259	6.75, 8.25, 7.50	11.1	282	517	5205	100	2360	690	4940	100	2240	690
10R22.5	G	99141	21	75	18.7	475	40.1	1018	10.2	259	6.75, 8.25, 7.50	11.1	282	517	5675	115	2575	790	5355	115	2430	790
235/80R22.5	G	88749	19	75	17.4	443	37.4	949	9.3	236	6.75, 7.50	10.3	262	555	4675	110	2120	760	4410	110	2000	760
255/80R22.5	G	94390	20	75	17.9	455	38.5	979	10.0	254	7.50, 8.25	11.3	287	538	5205	110	2360	760	4805	110	2180	760
275/80R22.5	H	01637	22	75	18.7	475	40.2	1022	11.1	282	8.25, 7.50	12.2	311	516	7160	120	3250	830	6610	120	3000	830

Note: Rim listed first is the measuring rim.

Exceeding the lawful speed limit is neither recommended nor endorsed.

Overall widths will change 0.1 inch (2.5 mm) for each 1/4 inch change in rim width. Minimum dual spacing should be adjusted accordingly.

Michelin® tires and tubes are subject to a continuous development program. Michelin North America, Inc. reserves the right to change product specifications at any time without notice or obligations.

Please consult rim manufacturer's load and inflation limits. Never exceed rim manufacturer's limits without permission of component manufacturer.

WARNING! SERIOUS INJURY MAY RESULT FROM:

*TIRE FAILURE DUE TO UNDERINFLATION/OVERLOADING OR MISAPPLICATION -- FOLLOW TIRE PLACARD INSTRUCTIONS IN VEHICLE. CHECK INFLATION PRESSURE FREQUENTLY WITH AN ACCURATE GAUGE
*EXPLOSION OF TIRE/RIM ASSEMBLY DUE TO IMPROPER MOUNTING -- ONLY SPECIALLY TRAINED PERSONS SHOULD MOUNT TIRES. WHEN MOUNTING, USE SAFETY CAGE AND CLIP-ON EXTENSION AIR HOSE TO INFLATE.

CONSULT OWNER'S MANUAL FOR ADDITIONAL SAFETY INFORMATION

Load and Inflation Tables: XZE®

S = Single configuration, or 2 tires per axle.

D = Dual configuration, or 4 tires per axle.

225/70R19.5 LRF

PSI		65	70	75	80	85	90	95	MAXIMUM LOAD AND PRESSURE ON SIDEWALL			
kPa		450	480	520	550	590	620	660				
LBS	SINGLE	5510	5790	6080	6390	6630	6900	7280	S	3640	LBS at	95 PSI
	DUAL	10400	10880	11440	12000	12460	12980	13660	D	3415	LBS at	95 PSI
KG	SINGLE	2500	2620	2760	2900	3000	3140	3300	S	1650	KG at	660 kPa
	DUAL	4720	4920	5200	5440	5640	5880	6200	D	1550	KG at	660 kPa

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

225/70R19.5 LRG

PSI		65	70	75	80	85	90	95	100	105	110	MAXIMUM LOAD AND PRESSURE ON SIDEWALL
kPa		450	480	520	550	590	620	660	690	720	760	
LBS	SINGLE	5510	5790	6080	6390	6630	6900	7280	7430	7690	7940	S 3970 LBS at 110 PSI
	DUAL	10400	10880	11440	12000	12460	12980	13660	13960	14460	15000	D 3750 LBS at 110 PSI
KG	SINGLE	2500	2620	2760	2900	3000	3140	3300	3380	3480	3600	S 1800 KG at 760 kPa
	DUAL	4720	4920	5200	5440	5640	5880	6200	6320	6560	6800	D 1700 KG at 760 kPa

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

245/70R19.5 LRH

PSI		75	80	85	90	95	100	105	110	115	120	MAXIMUM LOAD AND PRESSURE ON SIDEWALL
kPa		520	550	590	620	660	690	720	760	790	830	
LBS	SINGLE	6780	7140	7500	7850	8200	8540	8880	9220	9550	9880	S 4940 LBS at 120 PSI
	DUAL	12840	13520	14200	14860	15520	16160	16800	17440	18080	18700	D 4675 LBS at 120 PSI
KG	SINGLE	3080	3220	3400	3540	3720	3860	4000	4180	4300	4480	S 2240 KG at 830 kPa
	DUAL	5840	6120	6440	6720	7040	7320	7560	7920	8160	8480	D 2120 KG at 830 kPa

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

9R22.5 LRF

PSI		70	75	80	85	90	95	100	105		MAXIMUM LOAD AND PRESSURE ON SIDEWALL
kPa		480	520	550	590	620	660	690	720		
LBS	SINGLE	6740	7120	7460	7780	8160	8470	8780	9080	S	4540 LBS at 105 PSI
	DUAL	13080	13640	14200	14760	15440	16020	16600	17200	D	4300 LBS at 105 PSI
KG	SINGLE	3060	3230	3380	3520	3700	3840	3980	4120	S	2060 KG at 720 kPa
	DUAL	5920	6200	6440	6680	7000	7280	7560	7800	D	1950 KG at 720 kPa

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

10R22.5 LRF

PSI		70	75	80	85	90	95	100	MAXIMUM LOAD AND PRESSURE ON SIDEWALL			
kPa		480	520	550	590	620	660	690				
LBS	SINGLE	8160	8560	8960	9350	9700	10050	10410	S 5205 LBS at 100 PSI			
	DUAL	15440	16180	16920	17640	18340	19040	19760	D 4940 LBS at 100 PSI			
KG	SINGLE	3700	3880	4060	4240	4400	4560	4720	S 2360 KG at 690 kPa			
	DUAL	7000	7320	7640	8000	8320	8640	8960	D 2240 KG at 690 kPa			

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

10R22.5 LRG

PSI		70	75	80	85	90	95	100	105	110	115	MAXIMUM LOAD AND PRESSURE ON SIDEWALL
kPa		480	520	550	590	620	660	690	720	760	790	
LBS	SINGLE	8160	8560	8960	9350	9700	10050	10410	10720	11030	11350	
	DUAL	15440	16180	16920	17640	18340	19040	19760	20300	20840	21420	
KG	SINGLE	3700	3880	4060	4240	4400	4560	4720	4860	5000	5150	
	DUAL	7000	7320	7640	8000	8320	8640	8960	9200	9440	9720	
S 5675 LBS at 115 PSI												
D 5355 LBS at 115 PSI												
S 2575 KG at 790 kPa												
D 2430 KG at 790 kPa												

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

235/80R22.5 LRG

PSI		70	75	80	85	90	95	100	105	110	MAXIMUM LOAD AND PRESSURE ON SIDEWALL
kPa		480	520	550	590	620	660	690	720	760	
LBS	SINGLE	6940	7290	7720	7950	8280	8600	8910	9220	9350	
	DUAL	12640	13260	14100	14460	15060	15880	16220	16780	17640	
KG	SINGLE	3140	3300	3500	3600	3760	3900	4040	4180	4240	
	DUAL	5720	6000	6400	6560	6840	7200	7360	7600	8000	

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

255/80R22.5 LRG

PSI		70	75	80	85	90	95	100	105	110		MAXIMUM LOAD AND PRESSURE ON SIDEWALL				
kPa		480	520	550	590	620	660	690	720	760						
LBS	SINGLE	7750	8140	8600	8880	9240	9610	9950	10300	10410		S	5205	LBS at	110	PSI
	DUAL	14100	14820	15440	16160	16820	17640	18100	18740	19220		D	4805	LBS at	110	PSI
KG	SINGLE	3520	3700	3900	4020	4200	4360	4520	4680	4720		S	2360	KG at	760	kPa
	DUAL	6400	6720	7000	7320	7640	8000	8200	8520	8720		D	2180	KG at	760	kPa

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

275/80R22.5 LRH

PSI		75	80	85	90	95	100	105	110	115	120	MAXIMUM LOAD AND PRESSURE ON SIDEWALL	
kPa		520	550	590	620	660	690	720	760	790	830		
LBS	SINGLE	9830	10350	10870	11380	11880	12380	12870	13360	13840	14320	S	7160 LBS at 120 PSI
	DUAL	18160	19120	20060	21000	21940	22860	23760	24660	25560	26440	D	6610 LBS at 120 PSI
KG	SINGLE	4480	4680	4940	5140	5420	5600	5800	6060	6240	6500	S	3250 KG at 830 kPa
	DUAL	8240	8640	9120	9520	10000	10360	10720	11200	11520	12000	D	3000 KG at 830 kPa

If you require information on this tire for RV purposes please go to www.michelinrvtires.com

Industry load and inflation standards are in a constant state of change, and Michelin continually updates its product information to reflect these changes. Printed material may not reflect the latest load and inflation standards.

NOTE: Never exceed the wheel manufacturer's maximum air pressure limitation.

Champion Electrical Manual 2008

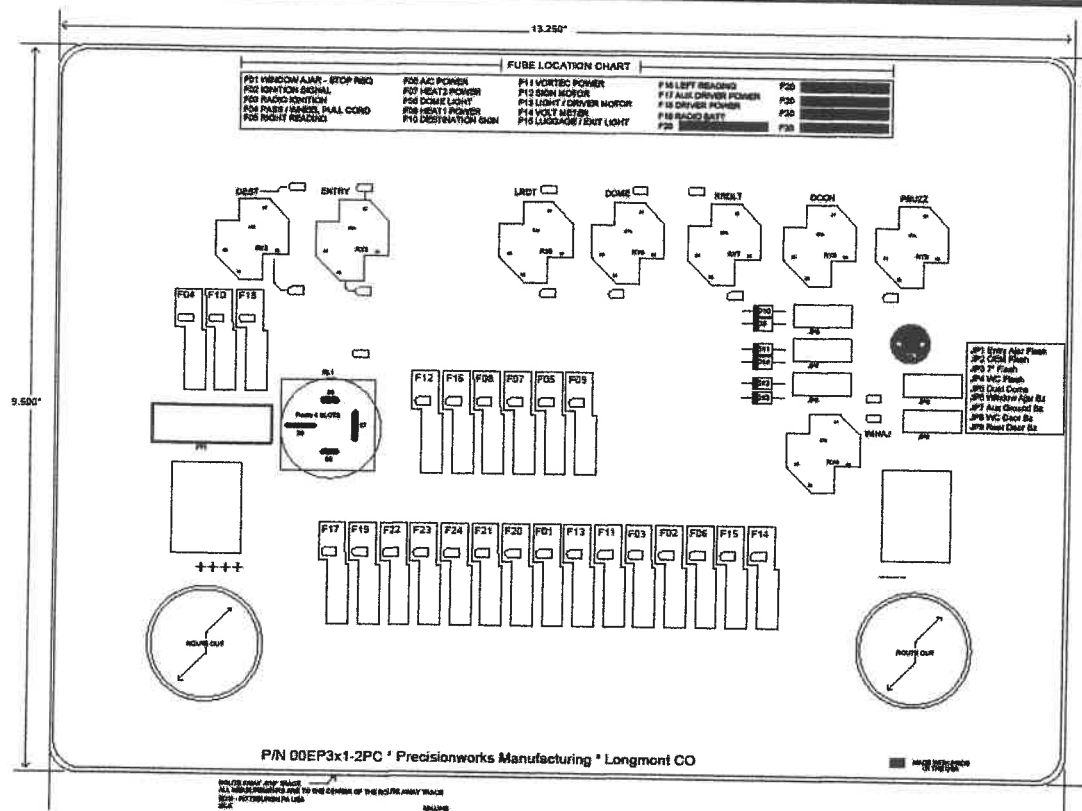
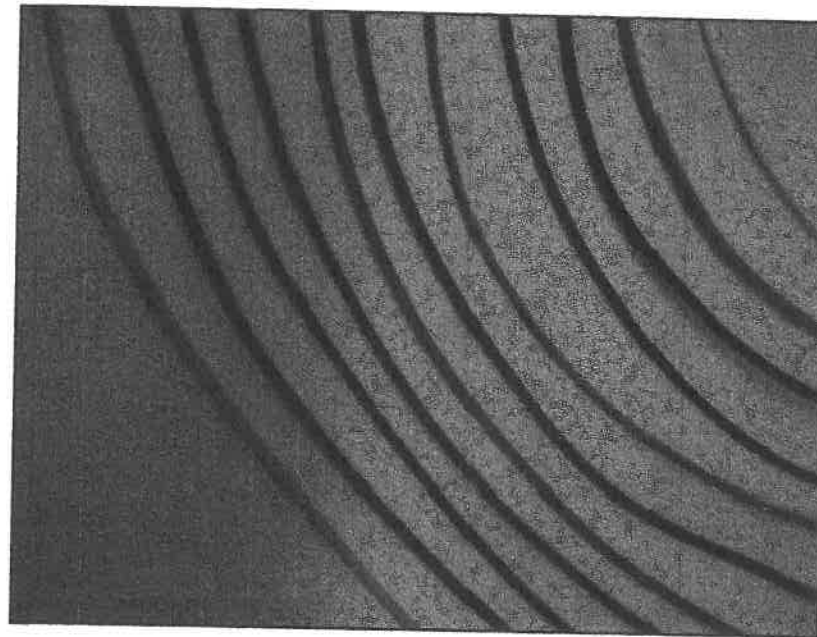


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Wire Stamping and Coding

Color Codes	
T	Tan
I	Pink
Y	Yellow
O	Orange
E	Grey
W	White
K	Black
B	Blue
R	Red
P	Purple
G	Green
N	Brown



Wire Stamping and Coding

STAMPING CODES									
AC	Air Conditioner	CH	Chime	FD	Field	LO	Low	PW	Power
AJ	Ajar	CB	Circuit Breaker	FO	Fluorescent	LT	Light	PA	Public Address
AL	Alarm	CI	Cigarette	FT	Front	LU	Laminator	PR	Pressure
AS	Accessory	DF	Defrost	FE	Fuel	LV	Lavatory	PU	Pump
AT	Actuator	DK	Docking	GR	Ground	LTR	Lighter	RE	Rear
AR	Air	DM	Dome	GA	Gauge	MC	Micro	RA	Radio
AX	Auxiliary	DA	Dash	GE	Generator	MD	Medium	RD	Reading
AU	Auto	DN	Destination	GU	Guard	MK	Marker	RM	Remote
ALT	Alternator	DR	Door	HD	Head	MR	Mirror	RL	Relay
AM	Amber	DS	Disconnect	HI	High	MS	Master	RQ	Request
BK	Brake	DV	Driver	HL	Hold	MT	Mid Turn	RS	Reset
BU	Back-up	DE	Deceleration	HT	Heat	MY	Memory	RT	Right
BX	Box	EG	Energize	HO	Hood	ME	Meter	RG	Regulator
BZ	Buzzer	EN	Entry	HR	Hour	MA	Main	SA	Safety
BR	Braun	EX	Exit	ID	Idle	MO	Motor	SG	Signal
BT	Battery	ENG	Engine	IG	Ignition	NU	Neutral	SL	Solenoid
CD	Cord	ED	Edge	IL	Interlock	OF	Off	SN	Sign
CG	Cargo	FA	Fare	IN	Interlock	OH	Overhead	SP	Spare
CN	Control	FH	Fresh	IM	Illumination	OP	Open	SR	Sensor
CL	Close	FU	Full	IS	Isolation	OI	Oil	ST	Starter
CC	Circuit	FN	Fan	IT	Interrupt	OR	Override	SW	Switch
CS	Constant	FR	Frost	KN	Kneeler	PG	Plug	SH	Shot
CT	Clutch	FS	Fast	LF	Left	PK	Park	SO	Stop
CR	Courtesy	FI	Fire	LG	Luggage	PL	Pull	SE	step
CO	Cut out	FL	Flasher	LI	Lift	PN	Panel	SV	Sensitive
CM	Compressor	FG	Fog	LM	Limit	PS	Passenger	STA	Stator

Wire Stamping and Coding

WHITE			PINK			BLACK		
01	W	DRIVER FAN LOW	01	I	DOOR MOTOR	03	K	SINGLE CONDENSER
02	W	DRIVER FAN HIGH	04	I	RIGHT READING LIGHT	04	K	HOOD LIGHT
03	W	DUAL CONDENSOR	07	I	EXIT LIGHT	07	K	IN GEAR
04	W	MOTOR GROUND	08	I	WHEELCHAIR SWITCH	08	K	DOVE LIGHT
05	W	OIL	08A	I	WHEELCHAIR SWITCH	09	K	STOP REQUEST
06	W	12V STARTER	09	I	ENTRY DOOR	09 A	K	STOP REQUEST
07	W	TEMP	11	I	WHEELCHAIR ALARM	11	K	TAG AXLE VACUUM
09	W	DOOR CLOSE	12	I	BRAUN INTERLOCK SL	12	K	RAMP STOW
11	W	STOP REQUEST	16	I	ALTERNATOR IGNITION	20	K	DEFROST POWER
13	W	DRIVER LIGHT	23	I	PULL CORD			
18	W	BUZZER ALARM	23A	I	PULL CORD			
25	W	AIR CONDITIONER	24	I	WINDOW AJAR			
30	W	ENGINE KILL						
31	W	ENGINE KILL						
BROWN			GRAY			BLUE		
02	N	DOOR MOTOR	01	E	DASH LIGHT	02	B	COMPRESSION AMPLIFIER
06	N	LOW AIR	03	E	LUGGAGE DOOR AJAR	03	B	SINGLE COMPRESSO
07	N	MAP LIGHT	10	E	WHEELCHAIR DOOR SL	04	B	READING LIGHT
09	N	MARKER LIGHT	14	E	DESTINATION SIGN	08	B	COURTESY LIGHT
11	N	12V RUN	14A	E	HOOD LIGHT	09	B	BRAKE LIGHT
24	N	FARE BOX	15	E	LUGGAGE LIGHT	10	B	WHEELCHAIR DOOR
			29	E	DOCKING LIGHT	12	B	STOP REQUEST
						15	B	TRANSMISSION HOLD

Wire Stamping and Coding

RED	YELLOW	ORANGE	PURPLE
02 R DOME LIGHT POWER	01 Y 12V BATTERY	04 O HEATER #2 HIGH	02 P AUXILIARY POWER
04 R HEATER #2 POWER	04 Y HEATER #2 MEDIUM	05 O HEATER VALVE	03 P DUAL COMPRESSOR
05 R LEFT READING LIGHT	05 Y SIGH MOTOR	06 O TAG AXLE POWER	04 P HEATER #2 LOW
06 R VOLT METER	07 Y HEATER #1 MEDIUM	07 O HEATER #1 HIGH	06 P PUBLIC ADDRESS POWER
07 R HEATER #1 POWER	09 Y DOOR OPEN	08 O TM SWITCH	07 P HEATER #1 LOW
08 R RIGHT READING LIGHT	10 Y OEM COURTESY LIGHT	09 O STEP LIGHT	09 P IGNITION SIGNAL
09 R DOOR POWER	18 Y LEFT TURN SIGNAL	10 O WHEELCHAIR DOOR	10 P IGNITION INTERLOCK POWER
10 R AUXILIARY DOOR POWER	19 Y 7" LIGHT	10A O AJAR LIGHT	12 P PASSENGER SIGNAL
11 R RADIO IGNITION	19A Y FRONT 7" LIGHT	12 O PULL CORD	13 P DRIVER DOME LIGHT
12 R RADIO BATTERY	20 Y FRONT FO	12A O PULL CORD	15 P PARK BRAKE
13 R DESTINATION SIGN	21 Y MEDIUM FO	13 O WHEELCHAIR POWER	18 P 7" LIGHT
15 R TM SOLENOID POWER	22 Y REAR FO	16 O VORTEC SL SIGNAL	19 P IGNITION SIGNAL
18 R RIGHT TURN SIGNAL	23 Y WINDOW AJAR	18 O 7" LIGHT	20 P IGNITION SIGNAL
23 R PASSENGER PULL CORD	24 Y WINDOW AJAR	18A O REAR 7" LIGHT	21 P DRIVER FAN
23A R PASSENGER PULL CORD	25 Y BUZZER GROUND	21 O IGNITION LOW	22 P DRIVER FAN
24 R WINDOW AJAR	26 Y IGNITION LOW	22 O IGNITION LOW	29 P TEMPERATURE ALARM
25 R WHEELCHAIR PULL CORD	27 Y IGNITION LOW		30 P OIL ALARM
25A R WHEELCHAIR PULL CORD	30 Y STARTER DISABLE		
30 R RAMP DEPLOY	31 Y STARTER DISABLE		

Wire Stamping and Coding

TAN			Green		
03	T	LUGGAGE LIGHT	No Stamping Required.		
04	T	LUGGAGE LIGHT SWITCH	May be coded with the letter "G" and a		
05	T	RUN ACCESSORIES	suffix of manufacturers specifications.		
07	T	PASSENGER SIGNAL			
08	T	LIFT LIGHT			
15	T	TM ENTRY			
25	T	IL ALARM SIGNAL	SPEAKERS (TAGS)		
27	T	TELMA	28	P	RT REAR SPEAKER
STRIPED			28	P/K	RT REAR SPEAKER
02	W/B	DRIVER THERMOSTAT	28	G	LEFT REAR SPEAKER
03	K/W	AC DEM THERMOSTAT	28	G/K	LEFT REAR SPEAKER
03	E/W	DUAL AC OEM THERMOSTAT	28	E	RIGHT FRONT SPEAKER
03	O/W	A/C FAN HI SPEED	28	E/K	RIGHT FRONT SPEAKER
03	R/W	A/C FAN LOW SPEED	28	W	LEFT FRONT SPEAKER
03	W/B	A/C FAN POWER	28	W/K	LEFT FRONT SPEAKER
03	Y/W	A/C FAN MEDIUM SPEED	SPK5C	EXTERNAL SPEAKER	
12	I	BRAUN INTERLOCK SL	SPK5T	EXTERNAL SPEAKER	
16	I	ALTERNATOR IGNITION	SPK6C	RE PUBLIC ADDRESS SPEAKER	
23	I	PULL CORD	SPK6T	RE PUBLIC ADDRESS SPEAKER	
23A	I	PULL CORD	SPK7C	FT PUBLIC ADDRESS SPEAKER	
24	I	WINDOW AJAR	SPK7T	FT PUBLIC ADDRESS SPEAKER	

Connector Locations

Connector	Function	Harness	Location
C 100	Console	Front Floor	Right side of the engine access cover
C 100A	Console	Front Floor	Right side of the engine access cover
C 100B	Console	Front Floor	Right side of the engine access cover
C 100C	Console	Front Floor	Right side of the engine access cover
C 101	Entry Feed	Front Floor	Behind electrical center panel
C 102	Front Cap	Front Floor	Behind electrical center panel
C 103	RH O/H	Front Floor	Behind electrical center panel
C 104	RH O/H	Front Floor	Behind electrical center panel
C 105	LHI Dome Lights	Left Overhead	Above entry door behind cover
C 106	Rear Cap	RH O/H	Passenger side rear corner
C 107	Heater 1	RH O/H	Behind electrical center panel
C 108	Heater 2	Front Floor	Behind electrical center panel
C 109	LHI Interior Lights	RH O/H	Above entry door behind cover
C 110	RH Interior Lights	RH O/H	Above entry door behind cover
C 111	Rear Cap	RH O/H	Passenger side rear corner
C 112	Tag Axle	Rear Cap	Driver side rear corner
C 113	Electric Door Motor	Entry Door	Above entry door behind cover
C 114	Floor Courtesy Lights	RH O/H	Above entry door behind cover
C 115	Restroom	Rear Cap	Driver side rear corner
C 116	Rmt. Entry Door	Entry Feed	Above entry door behind cover
C 117	RH/LH Reading Lights	Int. Lt.	Above entry door behind cover
C 118	RH/LH Dome Lights	Int. Lt.	Above entry door behind cover
C 119	I/P	Rear Evap AE	Behind driver switch panel
C 120	Engine Alarm	Front Floor & I/P AE	Behind driver switch panel
C 121	Tap Relay Row	Front Cap	On main electrical panel

Connector Locations

Connector	Function	Wiring	Location
C 122	Entry Door	Front Floor AEN	Above entry door behind cover
C 123	I/P to RH O/H	I/P AE	Behind driver switch panel
C 124	Left Front Speaker	Front Cap	Driver side wing panel
C125	Trans Interlock	Front Floor (Not AT/AL)	not used
C126	Trans Interlock	Front Floor	not used
C127	Fuse Block	Front Cap	above driver wing pad
C128	Fuse Block	Front Cap	above driver wing pad
C129	Right Front Speaker	Front Cap	right side top of front cap
C130	Sensitive Edge	Entry Door	above entry door behind cover
C131	Park Brake/Low Air	Front Floor / I/P AE	center dash behind radio
C132	Rear Door Ajar	Front Floor	center rear of rear cap
C133	Window Ajar	Front Floor / I/P AE	behind electrical center panel
C134	Pass Pull Cord	Front Floor / I/P AE	behind electrical center panel
C135	WC Pull Cord	Front Floor / I/P AE	behind electrical center panel
C136	EN DR AR VL		not used
C137	Radio	Front Floor	center dash behind radio
C138	LH Exit Lights	Left Overhead	driver side rear corner
C139	Ramp	Entry Feed - AA	behind electrical center panel
C140	RH Brake & Tail	Rear Cap	passenger side rear middle
C141	RH Mid Turn/Marker	Rear Cap	passenger side rear middle
C142	RH Turn	Rear Cap	passenger side rear middle
C143	RH Brake & Tail	Rear Cap	passenger side rear middle
C144	RH Back-up	Rear Cap	passenger side rear middle
C145	CTR Brake	Rear Cap	top center rear
C146	LH Brake & Tail	Rear Cap	passenger side left middle

Connector Locations

Connector	Function	Harness	Location
C147	LH Mid Turn/Marker	Rear Cap	passenger side left middle
C148	LH Turn	Rear Cap	passenger side left middle
C149	LH Brake & Tail	Rear Cap	passenger side left middle
C150	LH Back-up	Rear Cap	passenger side left middle
C151	RH Pwr.	Rear Cap	not used
C152	LH Pwr.	Rear Cap	not used
C153	Tag Light	Rear Cap	driver side bottom rear corner
C154	RH Dome Lights	Front Cap	above entry door behind cover
C155	Rear Brake	Front Floor	behind electrical center panel
C156	Engine & STR Kill	Front Floor	behind electrical center panel
C157	RH Exit Lights	Front Cap	above entry door behind cover
C158	Right Rear Speaker	Rear Cap	passenger side rear corner
C159	Left Rear Speaker	Rear Cap	driver side rear corner
C160	Tow Plug	Rear Cap	driver side bottom rear corner
C161	Ford Connector	Rear Cap	driver side bottom rear corner
C162	Entry Door	Entry Feed	above entry door behind cover
C163	Lift Door	Entry Feed	above entry door behind cover
C164	I/P	Entry Feed AE	behind driver switch panel
C165	Step Well Light	Entry Feed	below entry door sides
C166	Tag Light	Rear Cap	driver side bottom rear corner
C167	Engine & STR Kill	Front Floor	behind electrical center panel
C168	Farebox	Front Floor	behind electrical center panel
C169	Reverse Alarm	Rear Cap	driver side bottom rear corner
C170	Rear Door Switch	Rear Cap	Center top of rear cap
C171	Grounds	Rear Cap	driver side bottom rear corner

Connector Locations

Connector	Function	Harness	Location
C172	RH Rear 7" Light	Rear Cap	passenger side top rear corner
C173	LH Rear 7" Light	Rear Cap	driver side top rear corner
C174	Grounds	Front Cap	above entry door behind cover
C175	RH Pass Pull Cord	Rear Cap	passenger side rear corner
C176	LH Pass Pull Cord	Rear Cap	driver side rear corner
C178	PA/Radio	Front Floor	behind electrical center panel
C180	RH WC Pull Cord	Rear Cap	passenger side rear corner
C181	LH WC Pull Cord	Rear Cap	driver side rear corner
C188	Ign. Sol	Front Floor	behind electrical center panel
C189	Rear WDO Exit Light	Rear Cap	Center top of rear cap
C190	Marker Light	Front & Rear Caps	top of rear cap
C191	RH Front 7" Light	Front Cap	passenger side top front corner
C192	LH Front 7" Light	Front Cap	driver side top front corner
C194	Dest. Sign	Front Cap	driver side top front corner
C195	Stop Reg. Sign	Front Cap	driver side top front corner
C196	RH Window Ajar	Rear Cap	passenger side rear corner
C197	I/P	Front Cap AE	behind electrical center panel
C198	LH Window Ajar	Rear Cap	driver side rear corner
C199	Rear Window Ajar	Rear Cap	Center top of rear cap
C200	Rear Luggage Light	Rear Cap	Center top of rear cap

Connector Locations

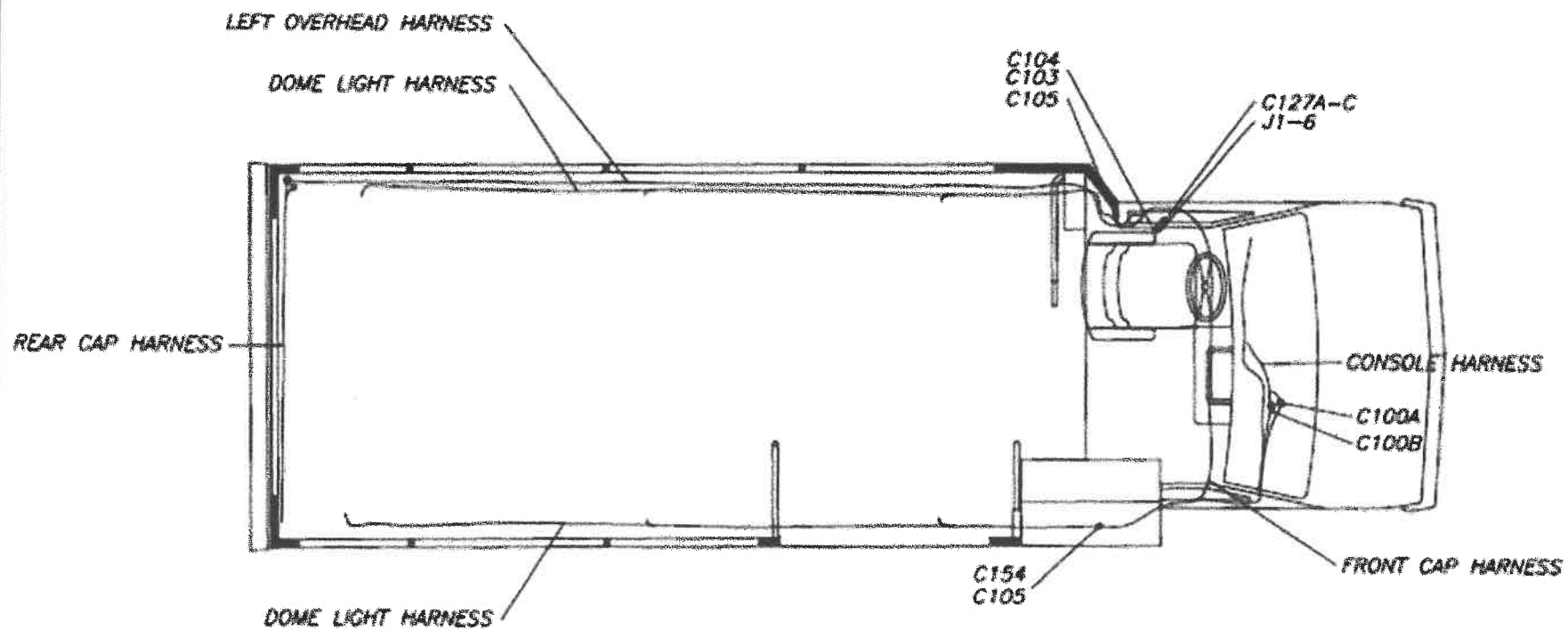
Troubleshooting

1. **RED LED** is on if the item is "in use" and the fuse is blown.
2. **YELLOW LED** is on if the "switch" is activated.
3. **GREEN LED** means the relay is fine.

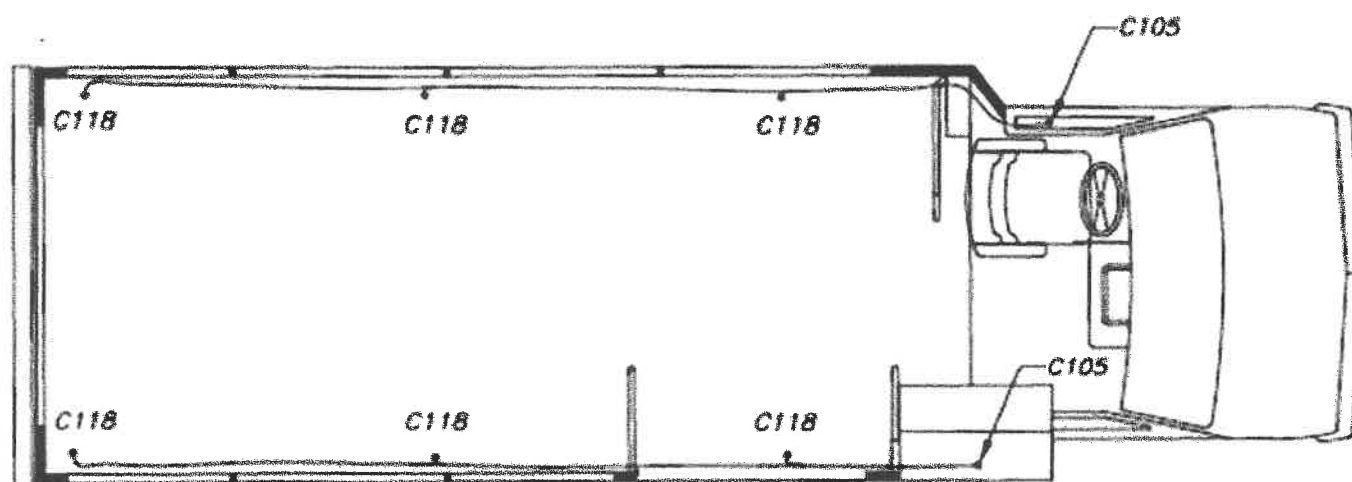
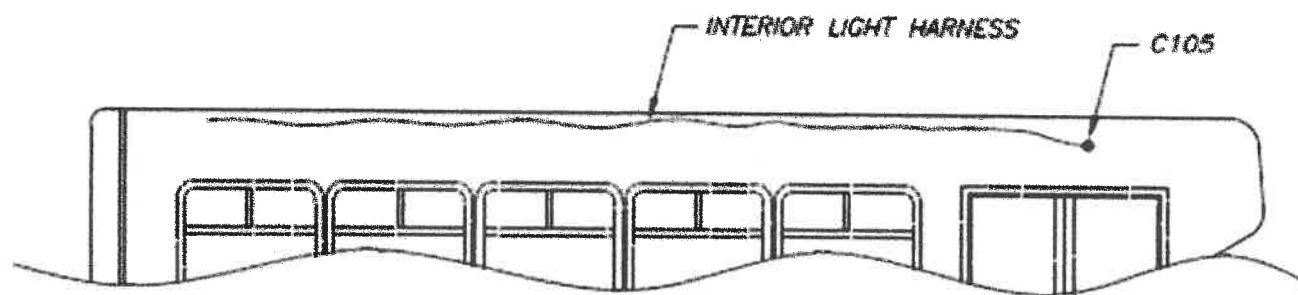
To Troubleshoot the board:

- Make sure you have the activation ground or power to the item in question.
 - If it is missing then the problem is in the wiring and not the power center.
- If the inputs are there and the output is missing, disconnect the output connector.
- Check for power or ground on the output (whichever is required).
 - If it exists then the problem is not the power center.

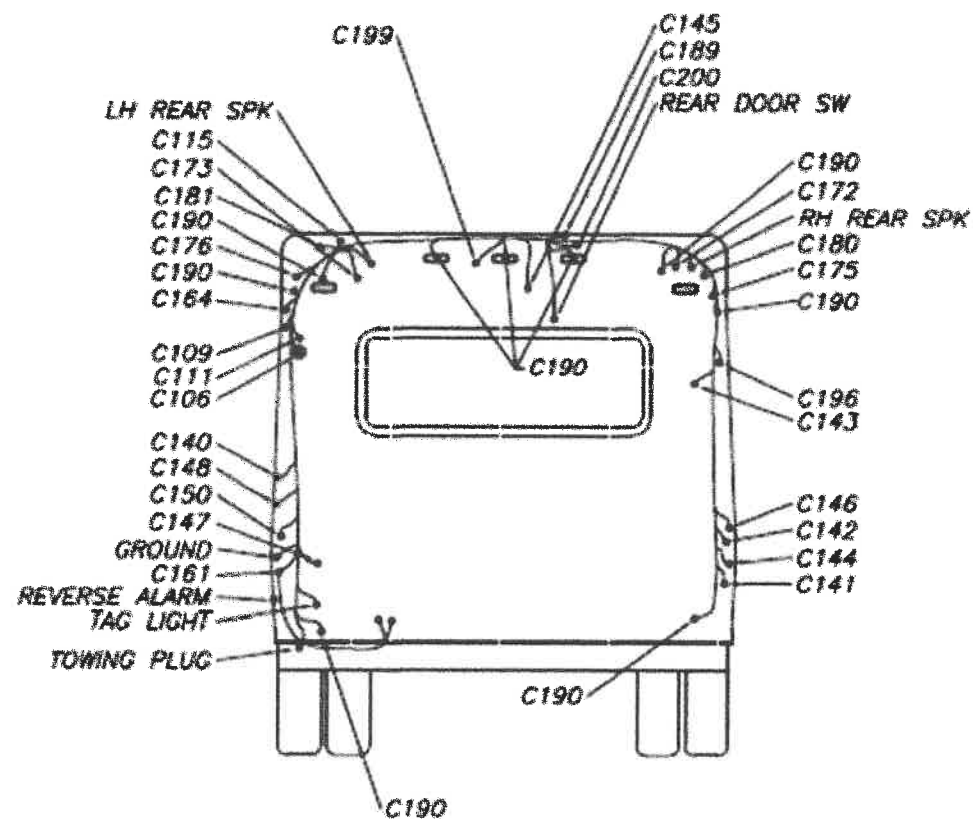
MAIN HARNESSES



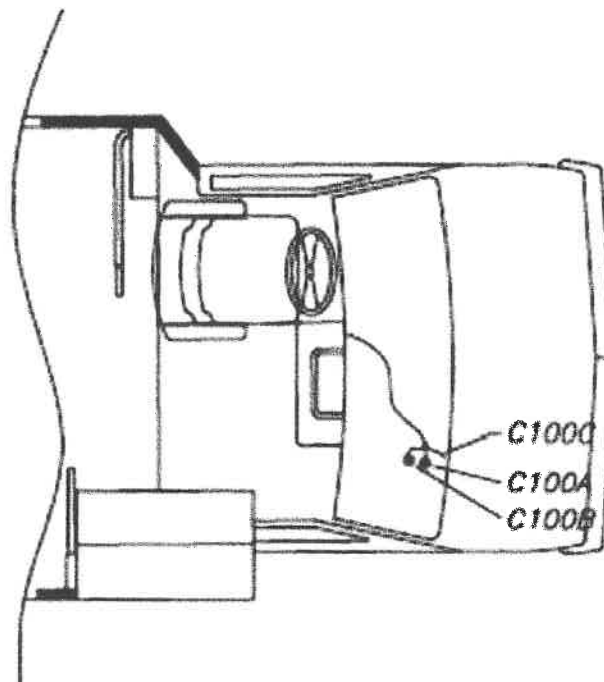
INTERIOR LIGHTS



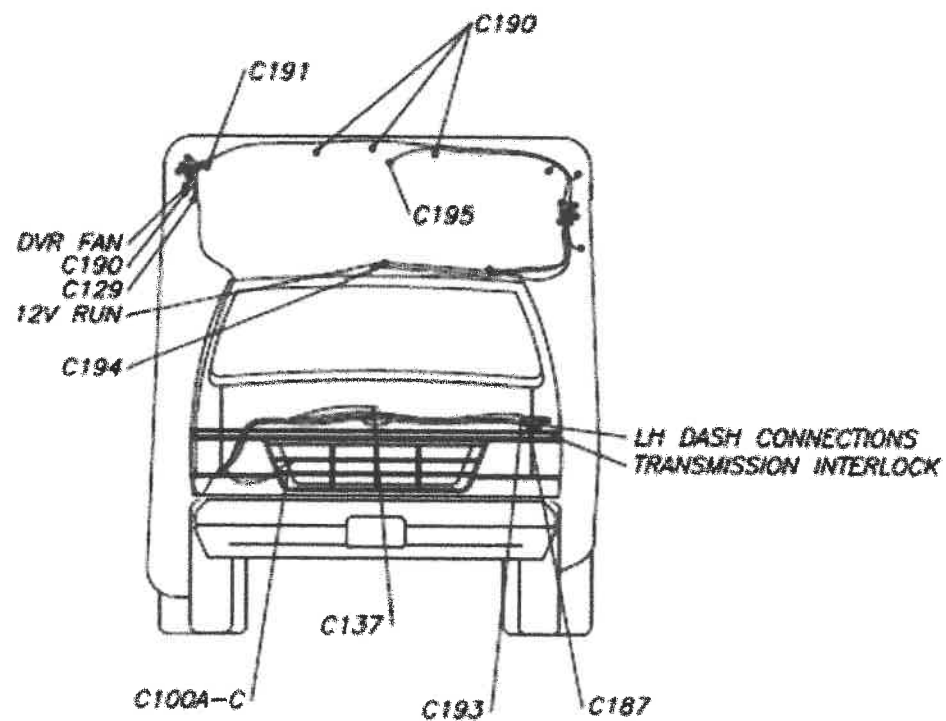
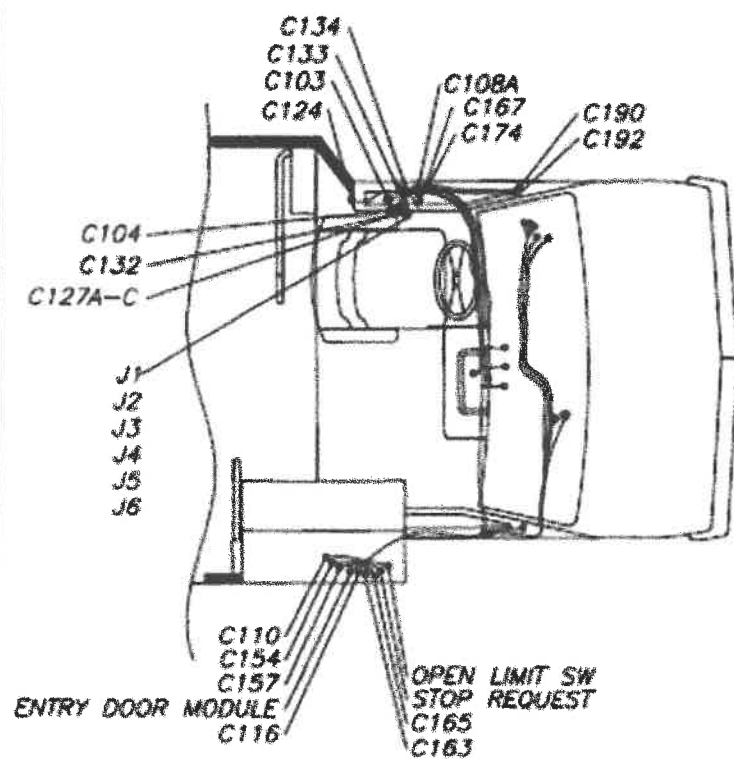
REAR CAP



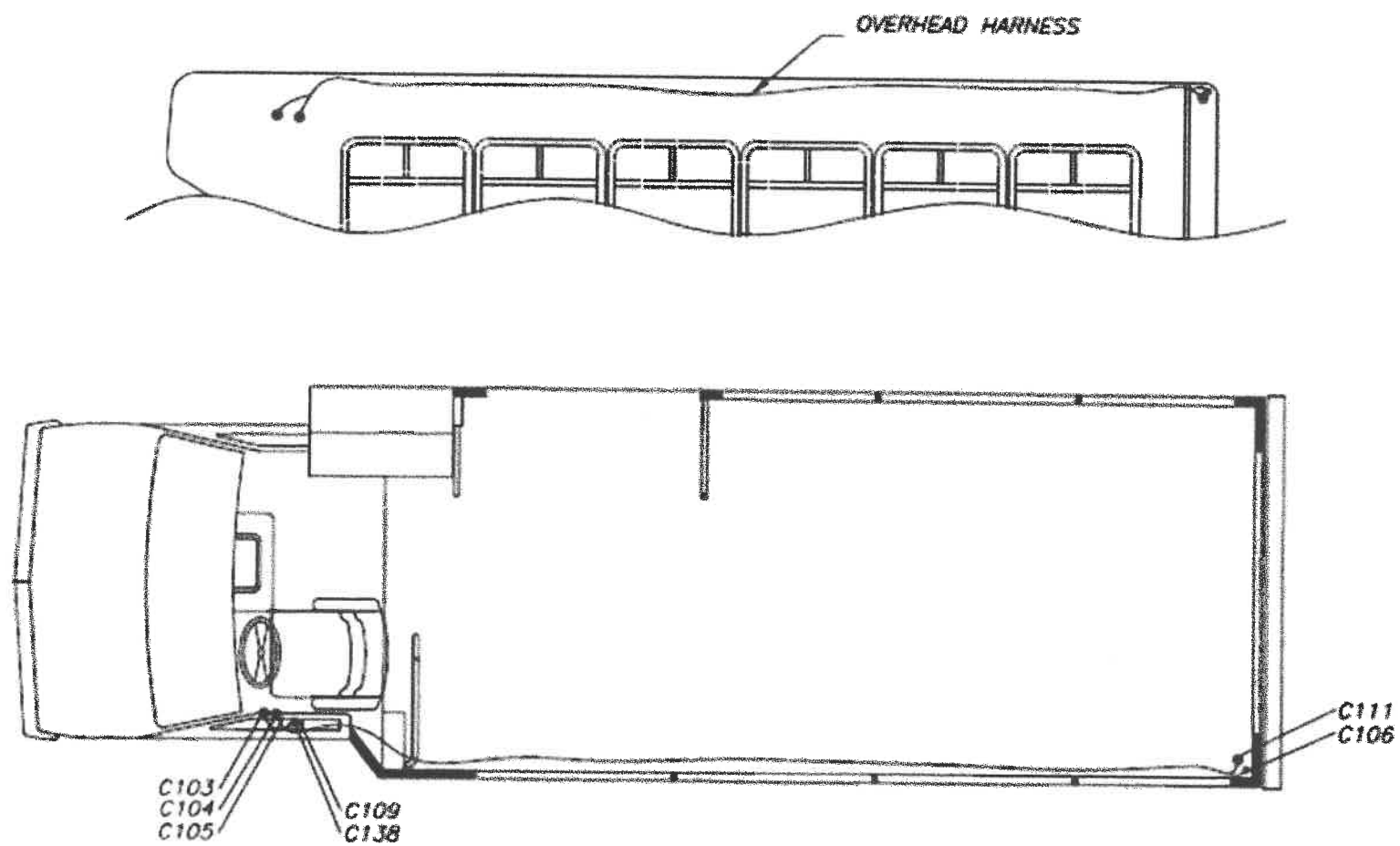
CONSOLE



FRONT CAP



OVERHEAD



Power Distribution Center:

The body builder power distribution center must use connector plug in type or equivalent for easy removal or testing. It must be made of a heavy duty type printed circuit card with all base components located on the front of the card including all interior light relays, master relay, destination sign, master breaker and fuses. It must include an 80 amp non replaceable relay to minimize resistance for the ignition circuits including a 50 amp maxi fuse. All of the relays must be removable for replacement except the primary 80 amp relay and shall be +12v DC. All fuses shall be standard automotive type with the ability to upgrade to auto or manual reset circuit breakers upon request. LED lights shall be included for troubleshooting. Red LED indicates a fuse is blown and in use while a green LED indicates the relay is good and a yellow LED to indicate a signal wire is active. All grounds must use a connector plug in type at the electrical center for common grounding location and can only use single wire termination for each ground wire. All options included on the panel must be reversible by the use of a standard blade type fuse to communize parts. These options will be marked as Jumpers and shall be considered low current. The card shall contain a single common buzzer utilizing these jumpers. The buzzer shall have the ability to activate when lift door is open, rear door is open, entry door is open, window is open and an auxiliary input for other requested items.

The power distribution center must include all major options to be adapted directly to the main card. These must be included on 3 distinct cards listed as stop request module, heater module and flasher module. All cards shall contain LED lights for troubleshooting. The cards below shall not use any harness or wires to connect to the main card. They shall use metal type standoffs to carry the circuit with screws.

- A. The stop request card shall include 2 different tones for passenger and ambulatory passengers per ADA requirements including a remote mounted speaker. A reset of the card must be included for entry door cycle or switch in the driver console.
- B. The heater module must have the ability to relay 2 separate heaters with independent high and low speeds. An output shall be included that is common for any heater output to be used for a water valve or pump.
- C. The flasher module shall contain options for OEM lights or body builder added lights through the use of jumpers. Options will include lift door open, rear door open, entry door open and an auxiliary input to activate for additional requested options. All jumpers shall be standard blade type fuses to standardize parts.

Wiring Harness:

General purpose wiring shall be cross-linked polyolefin insulated and shall meet SAE standards J1127 & J1128 types SGX and GXL. Wires shall be stamped every 6" and stamping shall be opposite color of wire to allow easy reading (dark wire uses white ink, light wires use dark ink). Multiple colors are required for different circuits and can be done through solid colors or colors with stripes. One color harnesses are not allowed. All harnesses shall contain a protective barrier through the use of loom, grommets, wire ties and insulated clamps. Routing shall be used as to best protect the harness.

Protective covering shall be rated for the area of routing. Temperature, liquids and chafing shall be considered. All connectors shall be plug in type and keyed connectors with locks meeting SAE automotive standards. Dielectric grease shall be used on all exterior connections. All primary harness connectors shall be color coded for ease of removal and assembly. The harness shall include all options available on the primary power distribution center and the use of add on modules. This allows multiple spare circuits. The harness shall be split into sections for easy replacement with one single harness for the rear, body and front of the vehicle. All connectors must be accessible.

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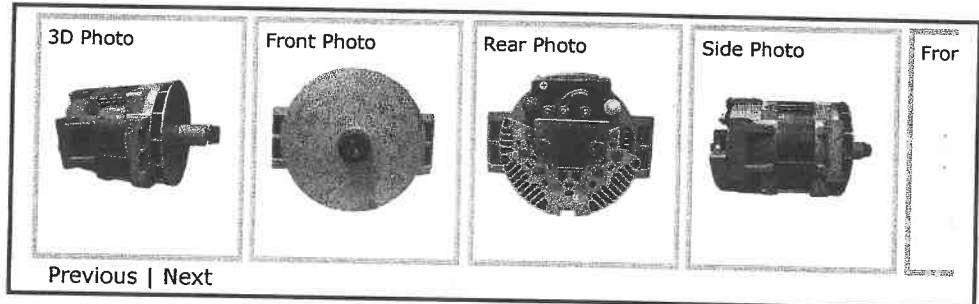
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A0014962PA - High Output Alternator



Product Specifications

Spec	Value
Item number	A0014962PA
Sales number	4962PA
Series number	4800-4900
Notes	320 AMP PAD MOUNT SELF EXCITE FIX VOLTAGE, -40C TO +110C
System voltage	12
Output	320
Mounting style	PAD
Dimensions in	INCHES
Rotation	CLOCKWISE
Housing coating	RAW
UL Approved	No
Mounting bolt size	F .417-.427 R .489-.479
Positive stud size	5/16-18 UNC
Negative stud size	3/8-16 UNC
Rectifier location	INTERNAL
Shaft diameter	7/8 INCH
Excitation type	
Regulator location	Integral
Regulator number	R240105747
Diode trio	No
Pulley included	No
Lamp driver	No
Adjustable regulator	No
Remote sense	No
Smart check	No
Batteryless	No

Similar Product

We have another model that is equivalent to A0014962PA	
A0014962PAH	Remove Woodruff Key From Shaft

Availability

Region	Priority / Status
USA / Canada	Medium (B)
United Kingdom / Europe	Limited (W)

Product status

Status	Number
Equivalent to	A0014962PAH

Technical Bulletins

Title / Link	Description
4000 Series Maintenance Manual	Service manual for the 4000 series alternators with internal regulators and rectifiers TSM1001_4000_Series_Int_Reg_and_Rectifier_Service-Manual.pdf (5.8 mb)
4000 Series Maintenance Manual - French Language Version	French version of the 4000 Series internal regulator and rectified alternators service manual. TSM1001_FR_4000_Series_Int_Reg_and_Rectifier_Service-Manual.pdf (5.9 mb)
4000 Series Pad Mount Alternators Hardware	Hardware kit for the 4000 Series Pad Mount alternators. TSB-3005_4000PAD-hardware.pdf (1.6 mb)
4900 Series Rear Housing Configurations	Through-bolt changes on the 4900 series alternator rear housing configurations. TSB-1047_4900_T-bolt.pdf (432 kb)
Brush Inspection and Replacement Procedure	Brush inspection and replacement procedure for 2500, 2800, 4800 and 4900 series alternators TSB-1061_Brush_Insection_and_Replacement.pdf (898 kb)
Convert 4000 series alternators to solid lead frames	Detailed instructions for converting 4000 series alternators with separate rectifier systems to the new solid lead frame rectifiers. TSB-1062_4000-series-solid-lead-frame.pdf (2.9 mb)
Pad Type Mounting Recommendations	Recommended mounting and bracket design for pad mount alternators. TSB-1049_Pad_Type_Mounting_Recommendations.pdf (519 kb)
Wire Identification Chart For R240 Regulators	Wire Identification chart for R240 Regulators for 4800-4900 series alternators TSB-1134_R240_Regulator_Wire_ID_Chart.pdf (85 kb)

Parts Breakdown

Title / Link	Description
4000 Series Pad Mount Service Parts List	Service parts list for the 4000 series alternator pad mount models. SP1009-4000-Pad-parts-list-web.pdf (2.9 mb)

Literature

Title / Link	Description
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175 to 185 amp update	Updated to 185 amp alternators, vs 175 amp alternators. FL1083_175Amp_to_185Amp.pdf (870 kb)
4000 Series High Amp Alternators	4000 Series High Amp alternators for all applications. FL1165_4000_Series_Alternator_Flyer.pdf (645 kb)
4000 Series High Amp Fire Truck Alts	4000 Series high amp alternators for fire truck applications FL1162_4000_Series_FireTruck_Alternator_Flyer.pdf (1.7 mb)
Bus and Coach Application Catalogue	Bus and coach application catalogue for alternators and starter motors. PP4042_BusCoach_Catalogue.pdf (7.8 mb)
School Bus Informational Flyer	Severe Duty Alternators and Starters that apply to the school bus applications School_Bus_Application_FL1212.pdf (1.1 mb)

Numbers Our Customers Use

Company	Part number
BLUE BIRD BODY CO	00098359
DAIMLER TRUCKS NORTH AMERICA	LN 4962PA
DOMETIC CORP	710035096
FERRARA FIRE APPARATUS, INC	310000019
FWD CORPORATION	P2112500
INTERNATIONAL TRUCK & ENGINE	ZLN4962PA
MACK TRUCKS INC 2742	21080399
MACK TRUCKS INC 2742	5034-4962PA
MACK TRUCKS INC 2742	5034-A0014962PA
PIERCE MANUFACTURING INC	A0014962PA
SPARTAN MOTORS INC	0765-GG1
THOMAS BUILT BUSES INC	61210310
VOLVO NORTH AMERICAN CORP.	LN 4962PA

Cross Reference Numbers

Company	Part number	Comment
DELCO REMY	8600298	

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Heater 465 - 50 000 510

Product Code: 50 000 510



Description

Heater, 465 65,000 BTU Plastic / 475 75m BTU Plastic

- Size 9.375"x21.5"x9.5" 15lbs
- 640CFM / 65,000BTU
- 9.8 Amps 12v

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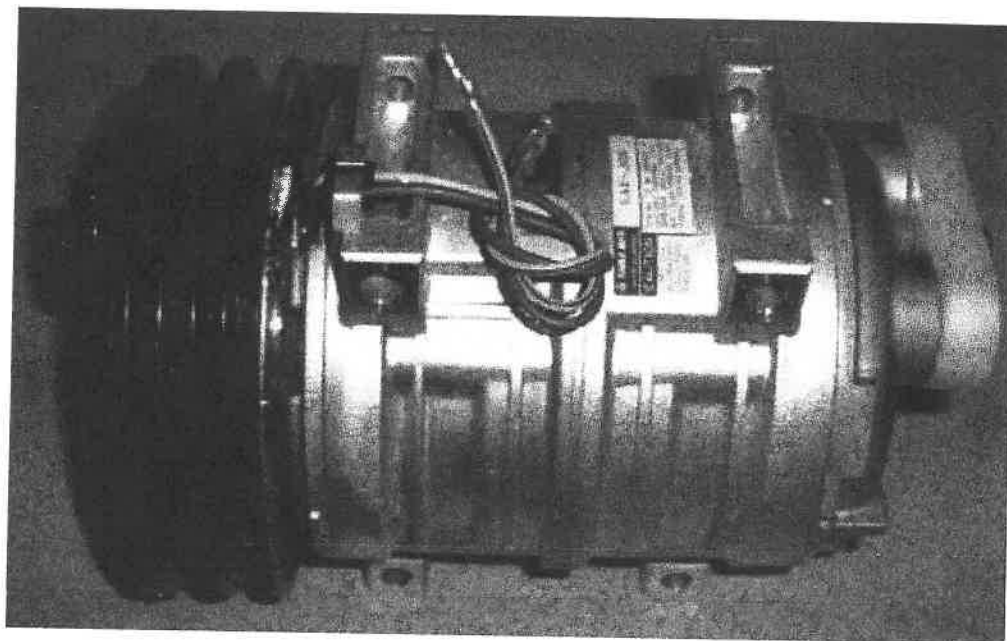
28731 County Road 6
Elkhart, IN 46514
Ph : (574) 264-5494
Toll Free : 800-338-8544
Fx : (574) 264-2194

WESTERN DIVISION

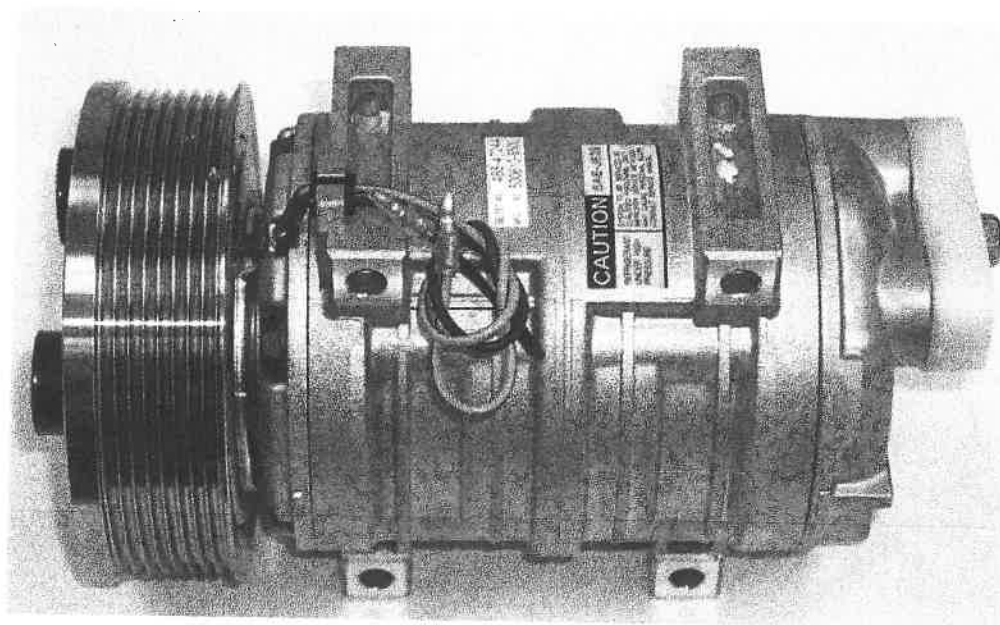
2260-C S. Archibald Ave.
Ontario, California 91761
Ph : (909) 930-6224
Fx : (909) 930-6226

TM-21 COMPRESSOR

ACT P/N	CARRIER P/N	TRANS/AIR P/N	DESCRIPTION
400-044	-	-	COMPRESSOR, TM-21, 2A GR, 12V, NO HEAD, DIRECT MOUNT

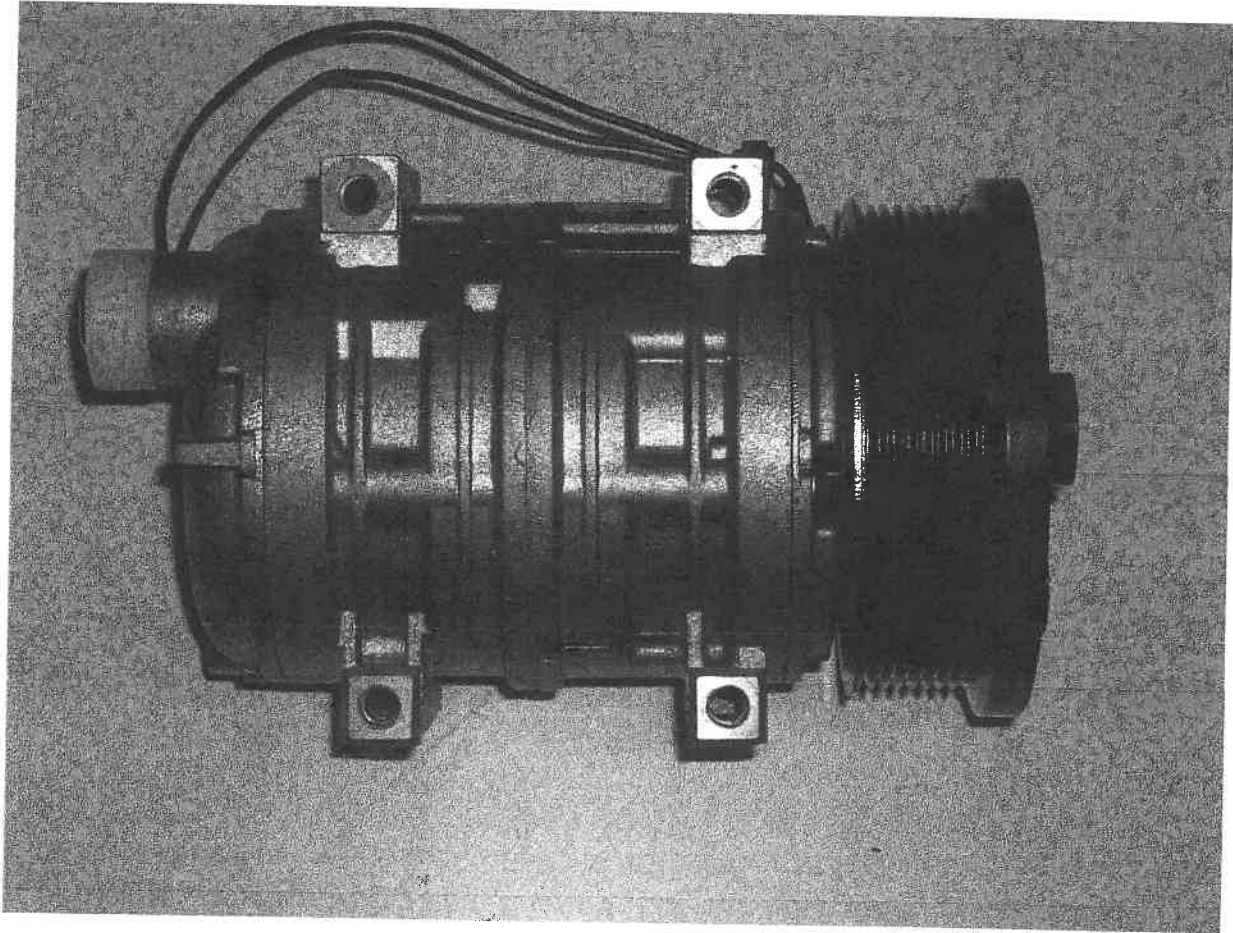


ACT P/N	CARRIER P/N	TRANS/AIR P/N	DESCRIPTION
400-045	-	-	COMPRESSOR, TM-21, 8 GR, 12V, NO HEAD DIRECT MOUNT, 12V, (GOLD CLUTCH)



TM-21 COMPRESSOR

ACT P/N	CARRIER P/N	TRANS/AIR P/N	DESCRIPTION
400-047	-	-	COMPRESSOR, TM-21, 8 GR, BOLT-ON, NO HEAD
			DIRECT MOUNT, 12V, (BLACK CLUTCH)
400-098			COMP., TM-21, 10 GR., 12V (NOT SHOWN)
			DIRECT MOUNT, NO HEAD, R134a



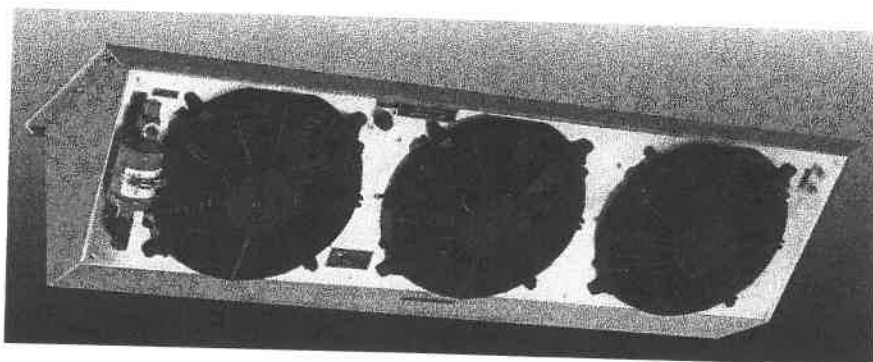
BUS AIR CONDITIONING

ACT^{BY} PROAIR

CS-3 CONDENSER

THE A.C.T. **CS-3** CONDENSER IS DESIGNED FOR SKIRT MOUNT APPLICATIONS. WE HAVE MANUFACTURED THIS CONDENSER SPECIFICALLY FOR THE TRANSPORTATION INDUSTRY.

IT'S LOW PROFILE, LIGHT WEIGHT ALUMINUM STRUCTURE, ENHANCED AIRFLOW, PERFORMANCE, SERVICEABILITY, AND INSTALLATION EASE ARE THE RESULT OF MANY YEARS' EXPERIENCE IN THIS INDUSTRY.



ADVANCED FEATURES

- Highgrade, Lightweight, Rust Proof Aluminum
- Internally Enhanced Copper Tubing Increases System Performance
- Integral Sightglass/Filter Drier and 100% O-Ring Connections For Maximum Leak Protection
- Unequalled Heat Rejection....
 - Lower Cooling Temperatures
 - Lower Head Pressures
- 12 Inch Diameter Fan for Increased Airflow
- Sealed Motor Design
- Two Electrical Connections

OPTIONS

- Condenser or Skirt Mounted Air Inlet Grill
- 12 Volt or 24 Volt Motors
- Winter Protection Kit

**2 YEAR
LIMITED WARRANTY**

AMERICAN COOLING TECHNOLOGY, Inc.

www.actusa.us.com

715 Willow Springs Lane, York, PA 17406

Tel: 717.767.2775 ~ Fax: 717.767.3658

Toll Free: 877.228.4247

SPECIFICATIONS

RATING: Up to 82,000 Btu/Hr

AIRFLOW: 3690 cfm (4703 m3/hr)

AMPERAGE DRAW: 32 Amps @ 13.5 Volts

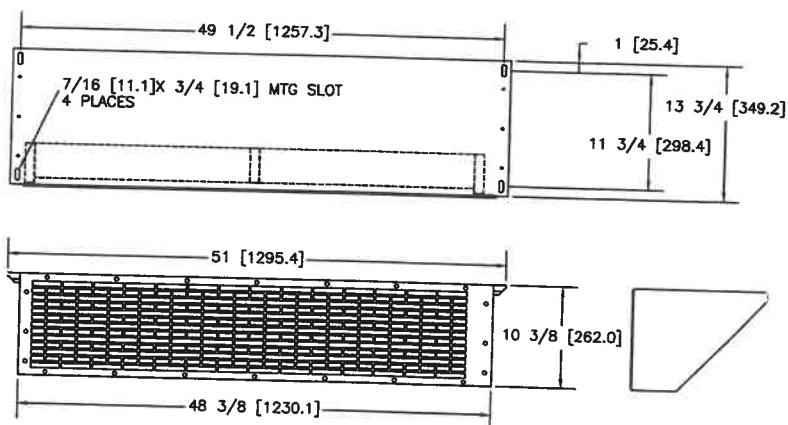
16 Amps @ 27 Volts

CONDENSER FANS: 12 Inch Diameter, Sealed Motors

FILTER DRIER/SIGHTGLASS: 16 Cu. Inch Displacement w/ Moisture Indicator

WEIGHT: 54 lbs.

Specifications subject to change without notice.



ACT^{BY} PROAIR

"SUCCESS THROUGH SIMPLICITY"

RELY ON OUR EXPERIENCE TO PROPERLY APPLY YOUR BUS AIR CONDITIONING SYSTEM

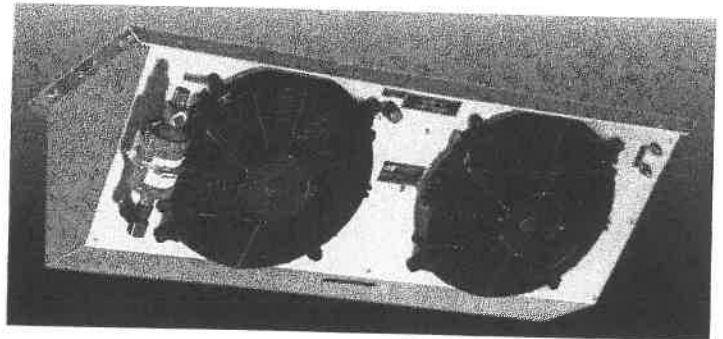
BUS AIR CONDITIONING

ACT^{BY}PROAIR[®]

CS-2 CONDENSER

THE A.C.T. **CS-2** CONDENSER IS DESIGNED FOR SKIRT MOUNT APPLICATIONS. WE HAVE MANUFACTURED THIS CONDENSER SPECIFICALLY FOR THE TRANSPORTATION INDUSTRY.

IT'S LOW PROFILE, LIGHT WEIGHT ALUMINUM STRUCTURE, ENHANCED AIRFLOW, PERFORMANCE, SERVICEABILITY, AND INSTALLATION EASE ARE THE RESULT OF MANY YEARS' EXPERIENCE IN THIS INDUSTRY. THIS CONDENSER IS DESIGNED TO PERFORM IN EXTREME HOT CLIMATES AND THE MOST DEMANDING TRANSIT APPLICATIONS.



ADVANCED FEATURES

- Highgrade, Lightweight, Rust Proof Aluminum Internally Enhanced Copper Tubing Increases System Performance
- Integral Sightglass/Filter Drier and 100% O-Ring Connections For Maximum Leak Protection
- Unequalled Heat Rejection....
 - Lower Cooling Temperatures
 - Lower Head Pressures
- 12 Inch Diameter Fan for Increased Airflow
- Sealed Motor Design
- Two Electrical Connections

OPTIONS

- Condenser or Skirt Mounted Air Inlet Grill
- 12 Volt or 24 Volt Motors
- Winter Protection Kit

**2 YEAR
LIMITED WARRANTY**

AMERICAN COOLING TECHNOLOGY, Inc.

www.actusa.us.com

715 Willow Springs Lane, York, PA 17406
Tel: 717.767.2775 ~ Fax: 717.767.3658

Toll Free: 877.228.4247

SPECIFICATIONS

RATING: 60,000 Btu/Hr

AIRFLOW: 2460 cfm (3136 m3/hr)

AMPERAGE DRAW: 23 Amps @ 13.5 Volts

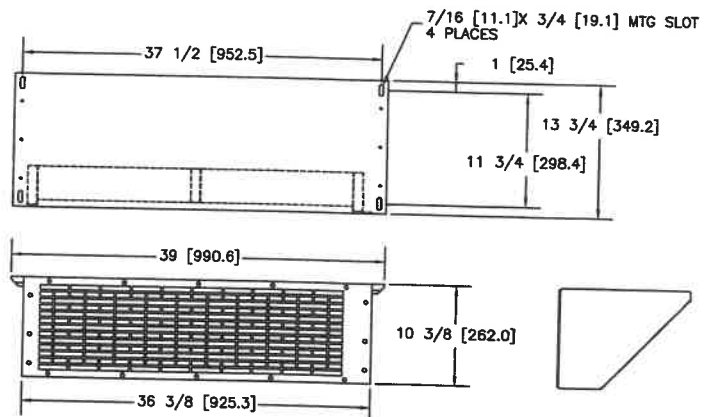
11 Amps @ 27 Volts

CONDENSER FANS: 12 Inch Diameter, Sealed Motors

FILTER DRIER/SIGHTGLASS: 16 Cu. Inch Displacement w/ Moisture Indicator

WEIGHT: 40 lbs.

Specifications subject to change without notice.



ACT^{BY}PROAIR[®]

"SUCCESS THROUGH SIMPLICITY"

RELY ON OUR EXPERIENCE TO PROPERLY APPLY YOUR BUS AIR CONDITIONING SYSTEM

BUS AIR CONDITIONING ACT^{BY} PROAIR[®]

EZ-3 EVAPORATOR

THE A.C.T. **EZ-3** EVAPORATOR IS DESIGNED FOR FREE-BLOW CEILING MOUNT APPLICATIONS (REAR, SIDE, OR FORWARD MOUNT). WE HAVE MANUFACTURED THIS EVAPORATOR SPECIFICALLY FOR THE TRANSPORTATION INDUSTRY.

IT'S ENHANCED PERFORMANCE, SERVICEABILITY, AND INSTALLATION EASE ARE THE RESULT OF MANY YEARS' EXPERIENCE IN THIS INDUSTRY.

ADVANCED FEATURES

- Unique Louver Design Enhances Airflow Throughout The Vehicle
- Pressure Switches Located At The Evaporator For Maximum Compressor Protection
- Internally Enhanced Copper Tubing Coils Increases System Performance
- 100% O-Ring Connections For Maximum Leak Protection
- Super High Blower Speed As Standard Option
- Unitized Drain Pan Construction Eliminates Condensate Problems

OPTIONS

- Grey or White Cover
- Adjustable or Fixed Air Outlet Louvers
- Return Air Thermostat Maximizes Passenger Comfort
- 12 Volt or 24 Volt Motors

**2 YEAR
LIMITED WARRANTY**

AMERICAN COOLING TECHNOLOGY, Inc.

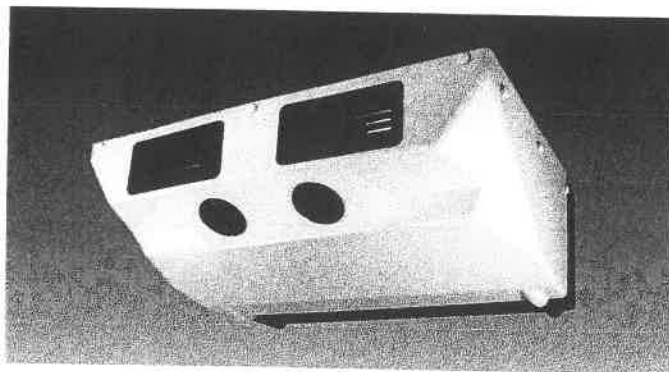
www.actusa.us.com

715 Willow Springs Lane, York, PA 17406

Tel: 717.767.2775 ~ Fax: 717.767.3658

Toll Free: 877.228.4247

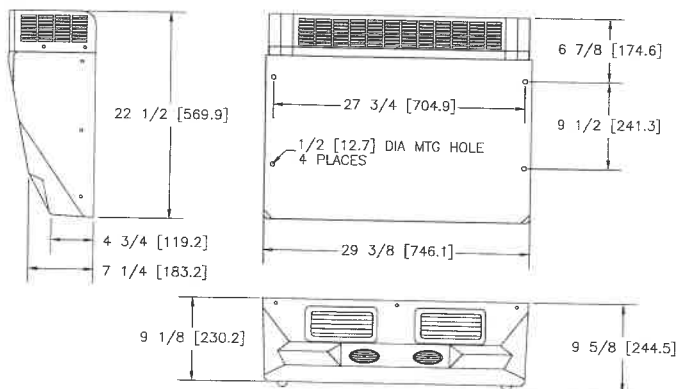
RELY ON OUR EXPERIENCE TO PROPERLY APPLY YOUR BUS AIR CONDITIONING SYSTEM



SPECIFICATIONS

COOLING CAPACITY: 35,000 Btu/Hr
AIRFLOW: 700cfm (1186 m3/hr)
AMPERAGE DRAW: 15 Amps @ 13.5 Volts
7.5 Amps @ 27 Volts
WEIGHT: 37 lbs.
FILTER: Cleanable Aluminum Mesh

Specifications subject to change without notice.



ACT^{BY} PROAIR[®]
"SUCCESS THROUGH SIMPLICITY"

BUS AIR CONDITIONING

ACT^{BY} PROAIR[®]

EZ-91 EVAPORATOR

THE A.C.T. **EZ-91** EVAPORATOR IS DESIGNED FOR CEILING MOUNT APPLICATIONS. THIS HEAVY DUTY EVAPORATOR IS DESIGNED SPECIFICALLY FOR THE TRANSPORTATION INDUSTRY.

IT'S ENHANCED PERFORMANCE, SERVICEABILITY, AND INSTALLATION EASE ARE THE RESULT OF MANY YEARS' EXPERIENCE IN THIS INDUSTRY.

ADVANCED FEATURES

- Single Circuit Coil For Maximum Efficiency.
- Expansion Valve Is Externally Equalized Bolt On Design For Ease of Service.
- Unique Louver Design Enhances Airflow Throughout The Vehicle To Maximize Passenger Comfort.
- Pressure Switches Located At The Evaporator For Maximum Compressor Protection
- Internally Enhanced Rifled Copper Tubing Coils Increases System Performance
- 100% O-Ring Connections For Maximum Leak Protection
- Low Profile Design For Added Headroom.
- Super High Blower Speed A Standard Feature.
- Unitized Powder Coated Steel Drain Pan Construction Eliminates Condensate Problems.

OPTIONS

- 7/8" I.D. #16 Suction Hose
- Heat Coil
- White Covers
- Adjustable or Fixed Louvers
- Plenum Available for Ducted Applications
- 12 Volt or 24 Volt Motors

**2 YEAR
LIMITED WARRANTY**

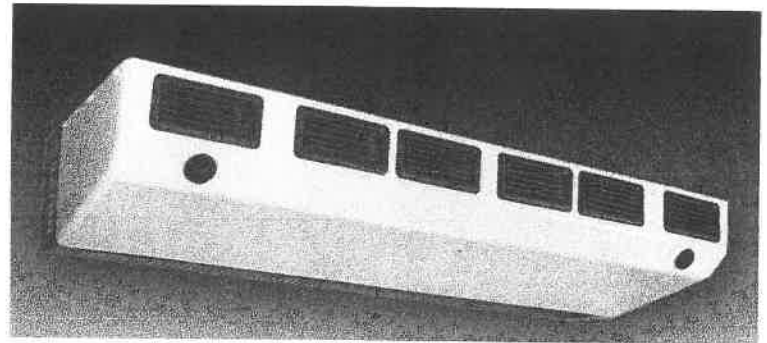
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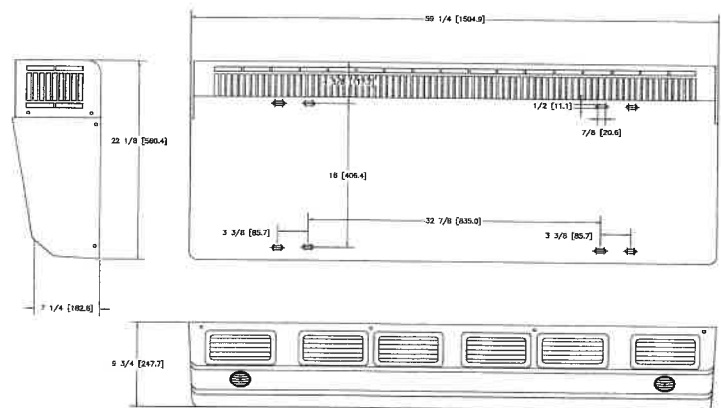
Toll Free: 877.228.4247



SPECIFICATIONS

COOLING CAPACITY: Up to 93,000 Btu/Hr
AIRFLOW: 2400cfm (4081 m3/hr)
AMPERAGE DRAW: 27 Amps @ 13.5 Volts
7.5 Amps @ 27 Volts
WEIGHT: 95 lbs.
FILTER: Cleanable Aluminum Mesh

Specifications subject to change without notice.



ACT^{BY} PROAIR[®]

SUCCESS THROUGH SIMPLICITY

RELY ON OUR EXPERIENCE TO PROPERLY APPLY YOUR BUS AIR CONDITIONING SYSTEM

CHAMPION QUALITY ASSURANCE WATER TEST PROCESS

The following is a description of the current water test procedure for all units produced by Champion Bus, Inc.

FACILITY

- Water test bay: 20' wide x 56' long x 18' high with attached pump room measuring 15' wide x 20' long x 9' high.
- Water jets:
- 5 Lengths of 1½" schedule 80 pipe at 45' long running lengthwise inside the building.
 - 15 Active nozzles per pipe length for a total of 75 nozzles (Model 24.WSQ Nozzles with 110° spray pattern).
 - Water supplied by 3" schedule 80 pipe with 3" schedule 80 pipe headers on each end of system.
 - System supply pump rated at 300 gpm
- Water Pressure:
- System water pressure adjustable up to 45 psi
 - Example: - 20 psi = 3.3 gpm/nozzle
 - 40 psi = 4.4 gpm/nozzle
 - System recovery pump rated at 300 gpm

PROCEDURE

1. **DRIVE VEHICLE INTO BAY.**
2. **ACTIVATE WATER SPRAY. (SYSTEM GOES ON, AUTOMATICALLY)**
- *3. ***LET VEHICLE SET FOR A MINIMUM OF 15 MINUTES PER UNIT. (MORE TIME MAY BE NECESSARY, IF VEHICLE IS SLATED FOR HARSH ENVIRONMENTS. ENGINEERING SHOULD REVIEW AND APPROVE ALL REQUESTS FOR CHANGES TO THIS SYSTEM AND PROCEDURE. USE THE "ECR" SYSTEM FOR REQUESTED CHANGES.)***

*NOTE: Currently, our system pressure, at the main pump is set at 10 psi. this is approximately equivalent to a rainfall of 18" per a 1 hour period.

4. **EXAMINE ALL WINDOWS, DOORS, WHEELWELLS, ESCAPE HATCHES, VENTS, WALLS, CEILING, FLOOR, AND ANY OTHER JOINT FOR WATER LEAKS.**
5. **RECORD RESULTS ON "WATER TEST LOG".**
6. **TURN OFF WATER SPRAY. (SYSTEM SHUTS OFF AUTOMATICALLY.)**
7. **EXIT BOOTH AND RETURN VEHICLE TO REPAIR BAY AND REPAIR ALL LEAKS.**
8. **IF ANY LEAKS WERE FOUND, RETEST VEHICLE (STEPS 1-5).**
9. **PROVIDE COMPLETED "WATER TEST LOG" TO QA PERSON, GROUP 50 (NORTH BLDG) OR GROUP 70 (SOUTH BLDG.) FOR REVIEW AND FILING WITH VEHICLE'S MASTER FILE.**
10. **QA PRODUCTION PERSONNEL SHOULD ALERT ALL GROUPS, OF CONSISTENTLY FOUND, NON-CONFORMING ASSEMBLY CONCERNS.**

HIGH PERFORMANCE OPAQUE SERIES

A8 Opaque

The proven high-performance industry standard for durability and workability. 90 colors to choose from.

DURABILITY: 8-years
CONFORMABILITY: rivets/corrugations, compound curves
PRINTABILITY: CAS, thermal transfer
ADHESIVE: permanent solvent
GLOSS: 90
TYPE: cast vinyl

NEW

EZ indicates that color is also available with EZ-Apply™ technology. Please visit www.signage.averygraphics.com for more information.

Avery Graf
Our versat

A9 Op
Simulations o
Avery Graphic
this film very
50-yard rolls.

White A8001-O EZ	Imitation Gold A8250-O	Warm Red A8305-O	Periwinkle A8510-O	Aquamarine A8633-O
Matte White A8002-O	Parchment A8205-O	Tomato Red A8325-O EZ	Copenhagen A8505-O	Real Teal A8615-O
Clear A8003-O	Almond A8210-O	Fire Red A8345-O	Dark Navy Blue A8597-O	Dark Aqua A8605-O
Matte Clear A8004-O	Beige A8220-O	Cardinal Red A8330-O EZ	Dark Blue A8595-O	Seafoam Green A8603-O
Light Gray A8010-O	Dark Beige A8230-O	Dark Red A8350-O	Light Navy A8590-O	Spectra Everglade A8610-O
Palm Oyster A8020-O	Sandstone A8265-O	Apple Red A8365-O	Shadow Blue A8520-O	Spruce Green A8640-O
Light Ash Gray A8025-O	Buckskin A8270-O	Spectra Red A8360-O	Majestic Blue A8525-O	Teal A8620-O
Slate Gray A8030-O	Camel A8240-O	Burgundy A8370-O EZ	Interstate Blue A8575-O	Dark Teal A8630-O
Medium Gray A8035-O	Putty A8235-O	Burgundy Maroon A8380-O	Sapphire Blue A8580-O EZ	Nautical Blue A8635-O
Pewter A8050-O	Butter A8105-O	Coral A8405-O	Vivid Blue A8570-O EZ	Dark Ivy A8650-O
Dark Blue A8055-O	Canary Yellow A8120-O EZ	Light Magenta A8410-O	Intense Blue A8565-O	Vibrant Green A8655-O
Medium Marine A8060-O	Medium Yellow A8130-O	Blossom A8415-O	Medium Blue A8555-O	Apple Green A8660-O
Battlefield A8070-O	Sunflower A8140-O	Magenta A8430-O	Olympic Blue A8530-O EZ	Kelly Green A8670-O
Matte Black A8080-O	Dark Yellow A8150-O	Raspberry A8435-O	Light Blue A8540-O	Bright Green A8675-O
Black A8090-O	Apricot A8155-O	Plum A8440-O	Peacock Blue A8545-O	Forest Green A8685-O EZ
Black A8100-O	Orange A8160-O	Deep Purple A8450-O	Powder Blue A8550-O	Deep Green A8690-O
Black A8110-O	Bright Orange A8180-O	Purple A8465-O	Butterfly Blue A8552-O	Dark Green A8693-O
Teal A8120-O	Tangerine A8315-O	Lavender A8475-O	Cadet Blue A8515-O	Polo Green A8695-O



Avery Graphics high performance opaque films are now available at one new, low everyday price in 140 colors. Our versatile cast films are the industry standard and our 20 years of experience mean quality and service you can count on.

A9 Opaque PANTONE® Colors

Simulations of PANTONE's most specified opaque colors. Avery Graphics Place-Rite™ repositionable adhesive makes this film very easy to apply. Available in splice-free 10- and 50-yard rolls.

DURABILITY: up to 9-years
CONFORMABILITY: rivets/corrugations, compound curves
PRINTABILITY: CAS, thermal transfer
ADHESIVE: white pigmented Place-Rite™ repositionable adhesive
GLOSS: 90
TYPE: cast vinyl

**A9 OPAQUE NOW
 THE SAME PRICE
 AS A8 OPAQUE**

NEW White PANTONE® A9001-0	Dandelion PANTONE® 123 C A9117-0	PANTONE® Process Cyan C A9583-0
PANTONE® Warm Gray 1 C A9021-0	Sunshine PANTONE® 116 C A9114-0	Blue Jay PANTONE® 299 C A9577-0
PANTONE® Warm Gray 2 C A9022-0	PANTONE® Orange 021 C A9169-0	Wave Blue PANTONE® 285 C A9526-0
PANTONE® Cool Gray 1 C A9061-0	PANTONE® Warm Red C A9323-0	Tropical Blue PANTONE® 279 C A9503-0
PANTONE® Cool Gray 4 C A9064-0	Firecracker PANTONE® 485 C A9321-0	Bayshore PANTONE® 292 C A9557-0
PANTONE® Cool Gray 5 C A9066-0	NEW Holiday Red PANTONE® 1797 C A9305-0	Lakeview PANTONE® 297 C A9576-0
Winter Sky PANTONE® 427 C A9011-0	PANTONE® Red 032 C A9306-0	Baby Blue PANTONE® 277 C A9502-0
Granite PANTONE® 429 C A9012-0	Salsa PANTONE® 185 C A9307-0	Pale Blue PANTONE® 290 C A9556-0
Silver Shimmer PANTONE® 877 C A9069-0	NEW Cranberry PANTONE® 194 C A9335-0	Wildflower PANTONE® 304 C A9581-0
PANTONE® Process Black C A9081-0	PANTONE® Rubine Red C A9347-0	Aqua PANTONE® 333 C A9616-0
Dark Taupe PANTONE® 466 C A9252-0	PANTONE® Process Magenta C A9411-0	PANTONE® Green C A9642-0
Navajo Beige PANTONE® 468 C A9255-0	PANTONE® Violet C A9413-0	Jungle Green PANTONE® 375 C A9634-0
Vanilla PANTONE® 155 C A9251-0	PANTONE® Reflex Blue C A9579-0	Clover Green PANTONE® 354 C A9626-0
Pastel Yellow PANTONE® 100 C A9112-0	PANTONE® Blue 072 C A9501-0	Fern Green PANTONE® 347 C A9617-0
PANTONE® Process Yellow C A9106-0	Midnight Blue PANTONE® 286 C A9528-0	
PANTONE® Yellow C A9107-0	Slate Blue PANTONE® 293 C A9559-0	
PANTONE® Yellow 012 C A9111-0	Peacock PANTONE® 300 C A9578-0	

Within the boundaries of simulating Pantone's bright high chroma colors, A9 Opaque PANTONE Colors have been formulated for maximum opacity. Slight color changes may result from applying over very dark substrates.

Certain PANTONE-identified colors may vary from the PANTONE Color Standards due to end-use technical specifications or limitations in the color capability of this material. The displayed colors are simulations of the identified PANTONE Colors. Refer to current PANTONE MATCHING SYSTEM® Publications to view PANTONE Color Standards. PANTONE® and other Pantone, Inc., trademarks are the property of Pantone, Inc. Portions 2

HIGH PERFORMANCE OPAQUE FILMS



PRODUCT INFORMATION

DAUBERT
CHEMICAL COMPANY, INC.

Tectyl® 121B

Description

TECTYL® 121B is a solvent cutback, thixotropic corrosion preventive compound suitable for complete undercoating for transportation equipment. The cured film is firm, black, resilient,

abrasion resistant, and provides sound deadening. TECTYL® 121B is approved under Federal Specification TT-C-520B.

Laboratory Data

Flash, PMCC*, Minimum
Density, Weight/Gallon @ 77°F (25°C)
Specific Gravity @ 60°F (15.6°C)
Recommended Dry Film Thickness over Metal Profile
Theoretical Coverage @ Recommended DFT
Non-Volatile % by Weight
Non-Volatile % by Volume
Volatile Organic Content (VOC)
Approximate Dry to Touch Time @ 77°F (25°C)
Cure Time
High Temperature Flow Point, Minimum

Typical Properties

106°F
8.5 ± 0.1 lbs./gallon
1.02
15 - 20 mils
45.82 sq. ft./gallon
62 ± 2
50 ± 2
3.4 lbs./gallon
2 - 4 hours
16 - 24 hours
350°F

Accelerated Corrosion Tests:

5% Salt Spray (Hours)
ASTM** B-117 @ Recommended DFT
(4x12x20 gauge C. R. steel
substrate)
100% Relative Humidity (Hours)
ASTM D-1748 @ Recommended DFT
(4x12x20 gauge C. R. steel
substrate)

3672

1500

*PMCC (Penske Martin Closed Cup)

**ASTM (American Society for Testing and Materials)

Surface Preparation

The maximum performance of TECTYL® 121B can be achieved only when the metal surfaces to be protected are clean, dry and free of rust, oil and mill scale. Daubert Chemical Company recommends that the metal substrate temperature be 50-95°F (10-35°C) at the time of product application.

Application

TECTYL® 121B is formulated to be used as supplied. Ensure uniform consistency prior to use. Continued stirring is generally not required. If the product thickens due to cold storage or loss of solvent during use, contact Daubert Chemical Company. DO NOT THIN TECTYL® 121B. Incorrect thinning will affect film build, dry time and product performance. Daubert Chemical Company recommends that the ambient and product temperature be 50 - 95°F (10 - 35°C) at time of application. TECTYL® 121B can be airless spray applied. DO NOT FREEZE TECTYL® 121B.

Removal

TECTYL® 121B can be removed with TECTYL® HPS solventborne thinner, vapor degreasing, hot alkaline wash, or low pressure steam. TECTYL® 121B can be removed from fabrics by normal dry cleaning procedures. Avoid the use of chlorinated or highly aromatic solvents when removing from painted surfaces, as these solvents may adversely affect paint.

Storage

Store TECTYL® 121B at temperatures between 50-95°F (10-35°C). Mild agitation is recommended prior to use.

Caution

Adequate ventilation is required for cure and to ensure against formation of a combustible liquid. THE PARTIALLY CURED FILM SHOULD NOT BE EXPOSED TO IGNITION SOURCES SUCH AS FLARES, FLAMES, SPARKS, EXCESSIVE HEAT, OR TORCHES. Refer to Daubert's Material Safety Data Sheet for additional handling and first aid information.

Note:

The addition of any product over or under this coating is not recommended. The use of additional coatings could result in chemical incompatibility, thus adversely affecting the performance of this coating as stated in the lab data section. If a product other than Daubert Chemical Company's recommended product is required, written authorization must be obtained from Daubert Chemical Company, Inc.

June 30, 2010:kc

CAUTION: The data, statements and recommendations set forth in this product information sheet are based on testing, research and other development work which has been carefully conducted by us, and we believe such data, statements and recommendations will serve as reliable guidelines. However, this product is subject to numerable uses under varying conditions over which we have no control, and accordingly, we do NOT warrant that this product is suitable for any particular use. Users are advised to test the product in advance to make certain it is suitable for their particular production conditions and particular use or uses.

WARRANTY: Daubert Chemical Company, Inc. ("Daubert") warrants all products manufactured by it to be free from defects in material and workmanship. DAUBERT MAKES NO OTHER WARRANTIES, WHETHER, EXPRESSED OR IMPLIED, WITH RESPECT TO SUCH PRODUCTS, AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND IMPLIED WARRANTIES ARISING FROM A COURSE OF DEALING OR USAGE OF TRADE, ARE DISCLAIMED BY DAUBERT. All claims hereunder must be made in writing within 30 days after receipt of the products at the buyer's plant and prior to further processing the products or combining them with other materials or products. Daubert's liability, whether under this warranty or in contract, tort, negligence or otherwise, is limited to the return of the net purchase price paid for any products proven defective or, at Daubert's option, to the repair or replacement of said products upon their return, transportation prepaid, to Daubert. THE REMEDY HEREBY PROVIDED SHALL BE THE EXCLUSIVE AND SOLE REMEDY OF THE BUYER, AND UNDER NO CIRCUMSTANCES SHALL DAUBERT BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. No Daubert representative or other person is authorized to change this warranty in any way or to assume for Daubert any other liability in connection with the sale or use of its products.

REFER TO MATERIAL SAFETY DATA SHEET FOR HEALTH AND SAFETY INFORMATION.

DAUBERT
CHEMICAL COMPANY, INC.

PAGE 2 OF 2

4700 South Central Avenue ■ Chicago, IL 60638 ■ 1-800-688-0459 ■ or 708-496-7350 ■ Fax: 708-496-7367

Visit our web site at www.daubert.com ■ Our e-mail is dauchem@daubert.com





SERVING THE BUS TRANSPORTATION INDUSTRY

November 5, 2007

Door Actuator Specifications

- Actuator built on rugged 11 gage steel base plate and powder coated for superior corrosion protection.
- Precision machined gear set for smooth operation.
- Proprietary 12 VDC drive motor.
- All bearing surfaces fitted with oil-impregnated bronze bushings.
- The interconnect push-pull rods are turnbuckle-style for ease of adjusting although almost never needed after proper installation.
- The motor control PC board is made using solid state, micro chip technology for long in-service potential.
- Motor control PC board uses current sensing to turn off motor when the door reaches the closed position; the use of a closed limit switch is not used. Additionally, the system will also shut down in the event of an object inhibiting the doors from opening thus eliminating undue motor wear.
- The motor control PC board has an adjustment for changing the set point limit to accommodate different load requirements depending on installation requirements.
- The auto-reverse model "feels" an object in the pathway of the door during closing and will automatically re-open the doors preventing damage and injury.
- System is low maintenance once installed and properly adjusted giving hundreds of thousands of cycle potential.
- Key components are easily accessible for ease of maintenance.
- A&M Systems, Inc offers web-based service aids and information for access to the latest service information and parts available.

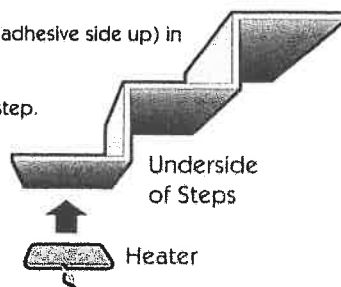
ULTRAHEAT, INC

Your First Step in Safety

Step Heater Models
SH267, SH267a
SH267b, SH 267c

INSTALLATION INSTRUCTIONS

- The SH-267 Step Heater is installed on the bottom side of the entrance step.
- The surface must be clean and dry prior to installation of the heater. Clean the surface where the heater is to be placed with Isopropyl Alcohol just before application of the heater. (Do not use Solvent based cleaners!) Make sure to allow the alcohol to dry completely before placing the heater on the step.
- Peel the release paper from the back of the heater and place it (adhesive side up) in the center of the bottom side of the bottom entrance step.
- Make sure that all parts of the heater contact the surface of the step.
- Wire leads should be connected to a 12 Volt power source with crimp type connectors.
- The heater's power circuit must have an in-line fuse or circuit breaker. Ultra Heat recommends the use of an on/off switch with the use of the SH-267 Step Heater.
- Automotive undercoating can be put on the SH-267 after installation without any adverse effects.

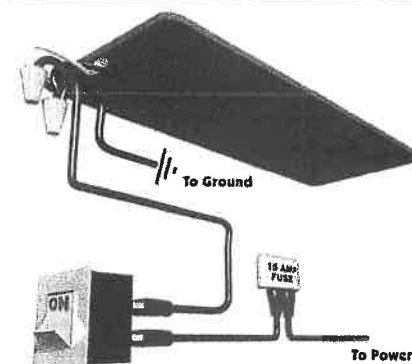


HEATER SPECIFICATIONS

Part #	Voltage	Current Draw	Power Generated	Heat Generated in BTU/HR	Lead	Thermostat
SH-267	13.5 Volts	8.39 Amps	113.27 Watts	386.61	Long	No
SH-267a	13.5 Volts	8.39 Amps	113.27 Watts	386.61	Standard	Yes
SH-267b	13.5 Volts	8.39 Amps	113.27 Watts	386.61	Standard	No
SH-267c	13.5 Volts	8.39 Amps	113.27 Watts	386.61	Long	Yes

Typical Electrical Hook Up

If needed, the solid state heater may be controlled with a thermostat. The Heater is easily installed on the underside of the step, keeping it hidden from sight, and saving it from the wear and tear of years of foot traffic. It is the safest and easiest to use heater on the market.



Talk to an UltraHeat Sales Representative today! Call (574) 522-6594, or Fax us at : (574) 522-1967 or email via: info@ultraheat.com

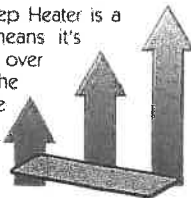
How the UHI Step Heater Works...



Before the Temperature drops to 32°F, activate the heater by simply flipping the switch to "ON". The heater goes to work immediately, warming the step so that even when the temperature falls below freezing, moisture that gathers on the step will be prevented from turning to ice!

With an optional thermostat, the heater automatically turns on at 44°F, and turns off at 64°F.

UltraHeat's Step Heater is a full contact Heater: that means it's designed to spread it's heat over the largest possible area. The Step Heater is placed on the under side of the step so it is not subject to the wear and tear of passenger traffic.



About Ultra Heat Inc.

ULTRAHEAT, INC



Step Heater User Manual

Why Protect your Steps from Freezing?

UltraHeat Inc. has been in business since 1991. From the beginning, we saw the importance of year 'round Bus & Van safety. To help manufacturers, we build reliable heaters for the Bus Industry.

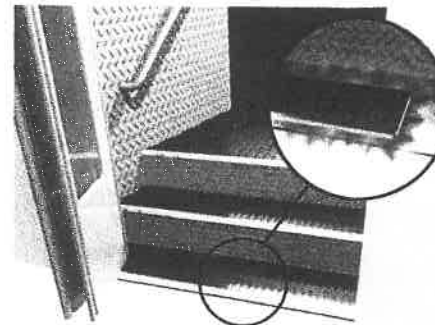
Using an UltraHeat Step Heater can greatly reduce the likelihood of winter-time injuries to your passengers or employees, helping avoid employee time-off or possible legal actions due to injury.

Here are some of the Bus Manufacturers using the Ultra-Heat Step Heater:

O.E.M. Bus Companies which rely on UHI Heaters.

- El Dorado National • Supreme Corporation
- Glaval Bus • Starcraft Automobile
- Coach & Equipment Manufacturing Corp.
- Minnesota Body & Equipment Co.
- Champion Coach • Goshen Coach

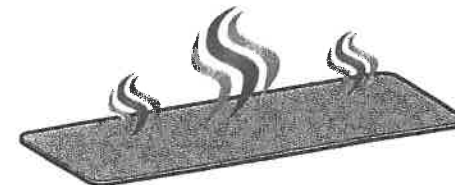
Protect Passengers and Employees with a UHI Step Heater...



...Keeps Steps in Buses and Cargo Vans from Icing Up in Winter...

It's almost a silly question isn't it? When snow and water are carried onto steps in cold temperatures, they freeze to ice! This is a potential hazard that may cause serious injury, especially to children of all ages and older adults.

The UltraHeat Step Heater will protect your passengers (and employees!) from slippery ice build-ups. The Step Heater safely heats the steps so that when they are wet with slush and water, they WILL NOT FREEZE.



UltraHeat Heaters are Easy to Install & Use

1314 Perkins St., Elkhart, IN 46516

Contact us at (574) 522-6594

Fax: (574) 522-1967

email: info@ultraheat.com

www.ultraheat.com

ULTRAHEAT, INC

www.ultraheat.com

UltraHeat is your First Step to Safety!

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
Indentation 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	ΔI = 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)

SIRIUS



NT

6768 Griffon



NT

6782 Dune



NT

6451 Corsaire



NT

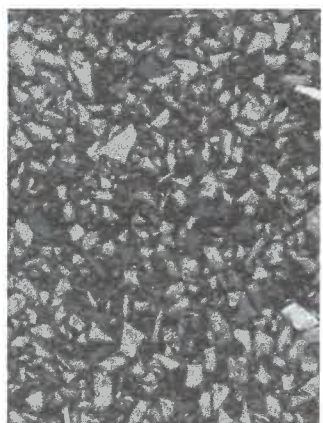
6727 Anthracite



NT

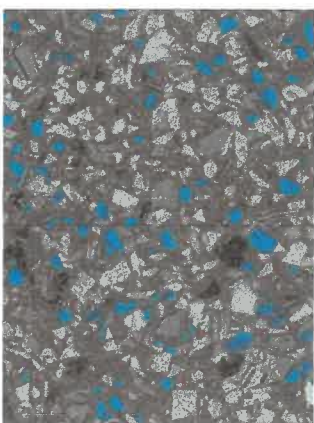
6801 Graphite

APOLLO



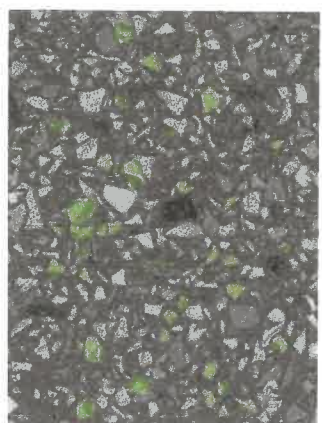
MK
NT

4776 Masan



MK
NT

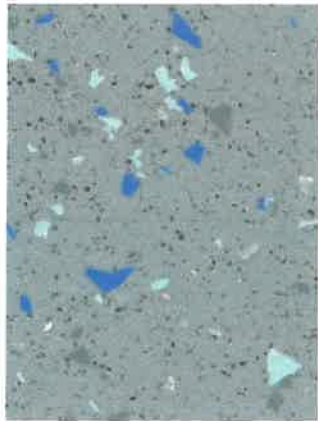
4479 Kilimanjaro



MK
NT

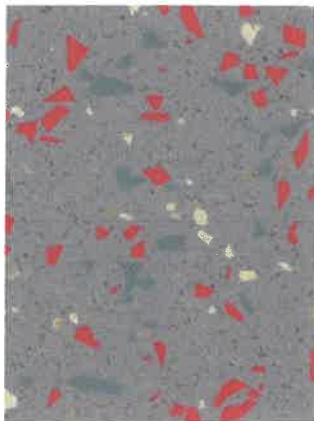
4517 Fuji

HELIOS



MK
NT

8804 Selenium



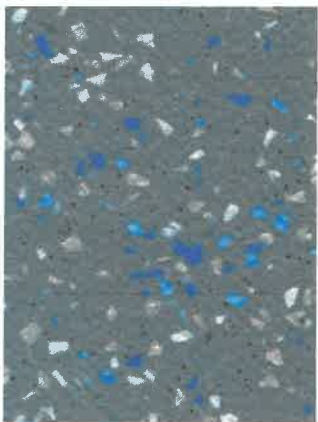
NT

4483 Dubnium



MK
NT

3740 Indium



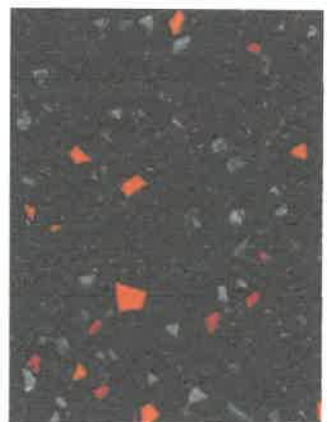
MK
NT

8805 Palladium



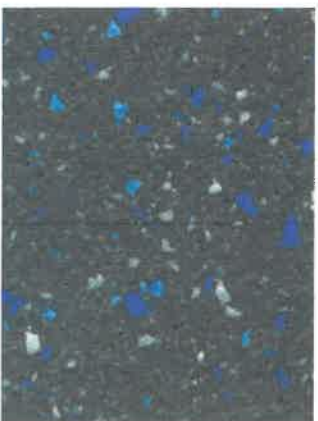
MK
NT

8031 Samarium



MK
NT

8803 Gallium



MK
NT

8806 Rhodium



NT

8486 Vanadium

MK Foam backing
NT Textile backing

FEATHER WEIGHT

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."



Notch-Back, standard Bench-Back and High-Back are shown.

Not Just Seats



THE FEATHER WEIGHT SERIES BY

FREEDMAN

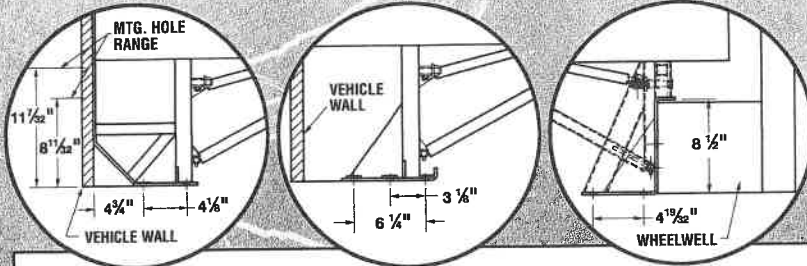
SEATING COMPANY

an ISO 9001:2000 certified company

Seating Solutions™

FEATHER WEIGHT

Foldaway BV & AM STYLES



Standard Features:

- BV Foldaways mount to the vehicle with four bolts to the floor (no wall mount)
- AM Foldaways mount to the vehicle with four bolts to the floor and two to the wall mount
- Seat belt ready (FMVSS 210 compliant with no leg or tether)
- Ultra-thin backrest for added hip-to-knee room and lumbar support
- High quality molded polyurethane seat and back cushions

- Folds up to less than 10" thick when in the stowed position
- Cantilever design provides reduced installation time; no floor cutting for aisle leg and easy vehicle clean up
- Wire mesh grid seat springs for even support
- 2 locking mechanisms to hold seat in stowed position

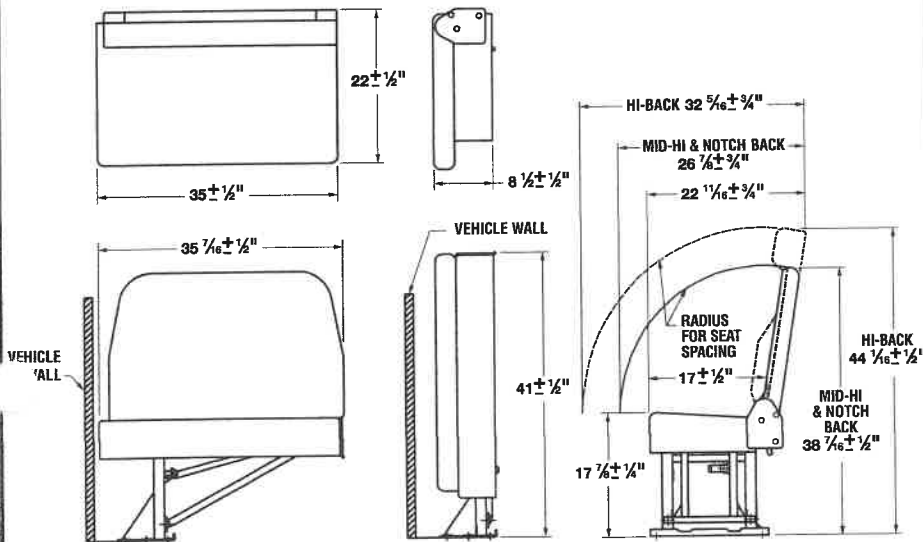
Options:

- Single or double seats
- Bench back, notch back or high back
- Wheel well seats
- Wide variety of vinyl's or cloths
- Molded U.S. arms or upholstered arms
- Black or yellow top grabs (not on high backs)
- Black or yellow corner grabs (black only on high back)
- Vertical stitching
- FTA foam
- ABS backs (Notchback only)
- Adjustable headrests (Single and Notchback only)
- Shrouds to cover the Foldaway when stowed
- USR seat belts (Under Seat Retractors)
- CRS-225 hooks and tethers
- TDSS (Tie Down Storage System)

AM2 Floor/Wall Mount

BV Floor Mount

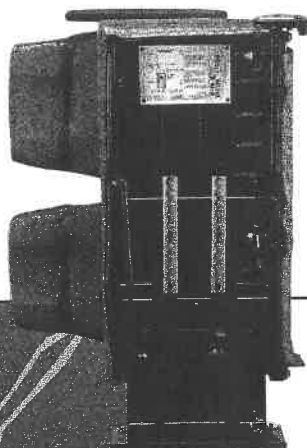
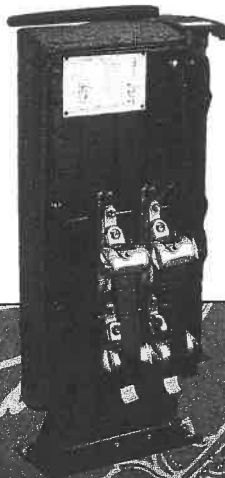
BVWW3 Floor Mount



Corner Grabs

TDSS with belts

TDSS without belts



Belts not included

Not Just Seats



THE FEATHER WEIGHT SERIES BY

FREEDMAN
SEATING COMPANY

an ISO 9001:2000 certified company

4545 W. Augusta Blvd., Chicago, IL 60651
(773) 524-2440 (800) 443-4540 Fax: (773) 252-7450
WWW.FREEDMANSEATING.COM
e-mail: sales@freedmanseat.com

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.

Seating Solutions™

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

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4545 West Augusta Boulevard

Chicago, IL 60651

AN ISO 9001-2008 CERTIFIED COMPANY

PHONE: 800-443-4540

FAX: 773-252-7450

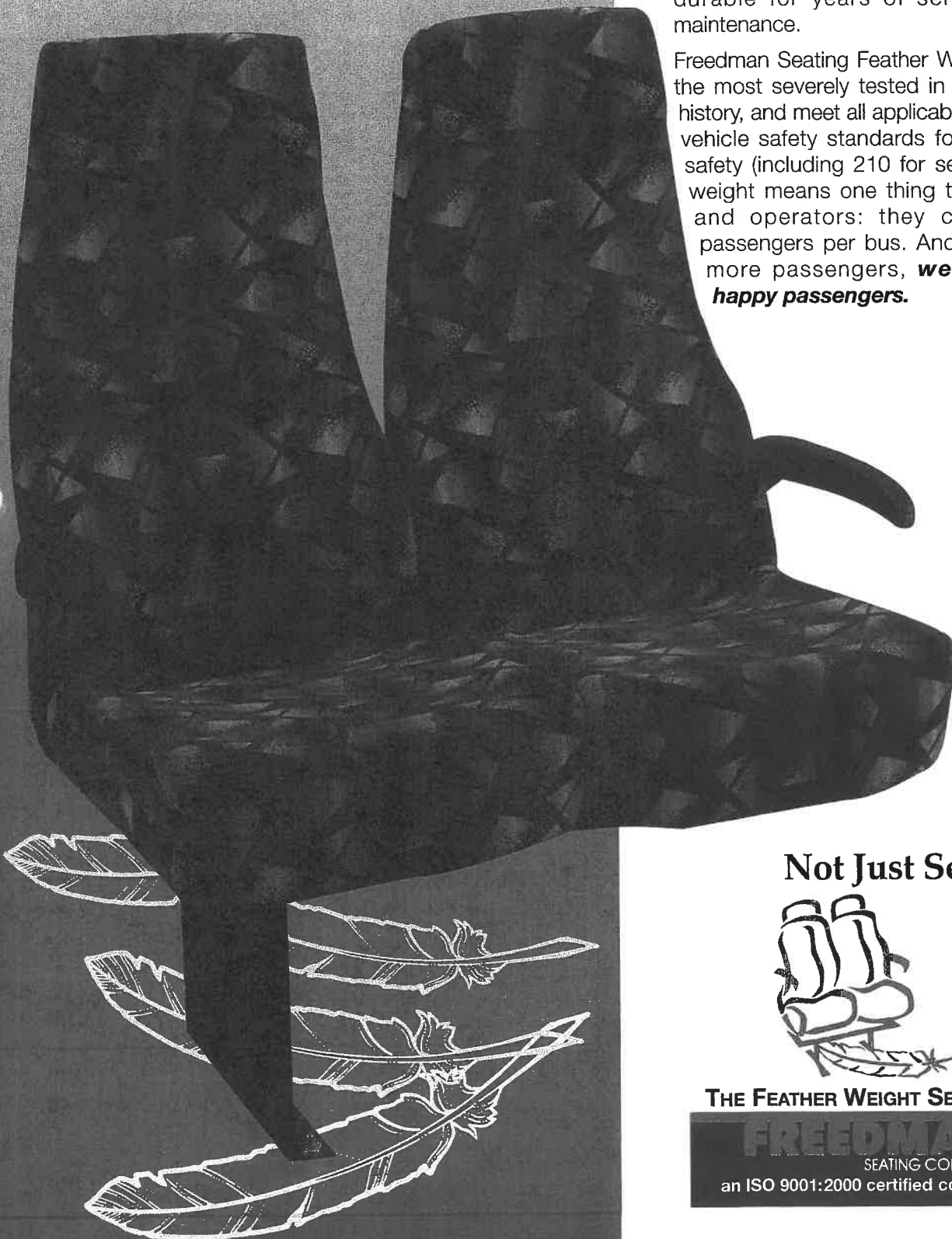
EMAIL: salesinfo@freedmanseat.com

FEATHER WEIGHT

HIGH-BACK SEAT

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 and safety (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.**



Not Just Seats



THE FEATHER WEIGHT SERIES BY

FREEDMAN

SEATING COMPANY

an ISO 9001:2000 certified company

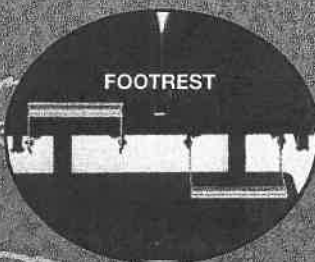
Seating Solutions™

HIGH-BACK SEAT

Feather Weight High-Back features include:

- Feather Weight High-Back options include:**

- Black molded *U.S. Arms* or upholstered flip-up armrests
- Mesh map pockets
- Vertical stitching
- FTA foam
- Snack trays
- Aluminum folding footrests
- Pillow seat cushions
- Pillow headrests
- Side grab rail
- U.S.R.—Under Seat Retractors
- 16" or 19" wide seats available
- Rear row quick disconnect
- CRS-225 hooks and tethers
- Side sliders
- Cup holders
- Seat belt loops



Not Just Seats



THE FEATHER WEIGHT SERIES BY

FREEDMAN
SEATING COMPANY

an ISO 9001:2000 certified company

4545 W. Augusta Blvd., Chicago, IL 60651
(773)524-2440 (800)443-4540 Fax: (773)252-7450
WWW.FREEDMANSEATING.COM
e-mail: sales@freedmanseat.com

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.

Seating Solutions

FEATHER WEIGHT

MID-HI SEAT
"ROCK SOLID"



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 and safety (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.***

Not Just Seats



Seating Solutions™

THE FEATHER WEIGHT SERIES BY

FREEDMAN
SEATING COMPANY

an ISO 9001:2000 certified company



FEATHER WEIGHT

MID-HI SEAT "ROCK SOLID"



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:

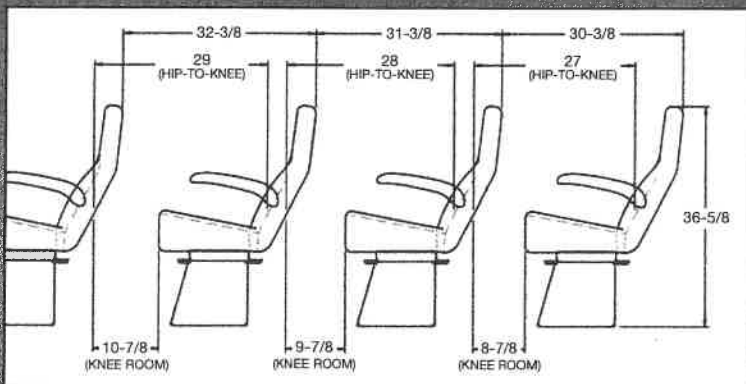
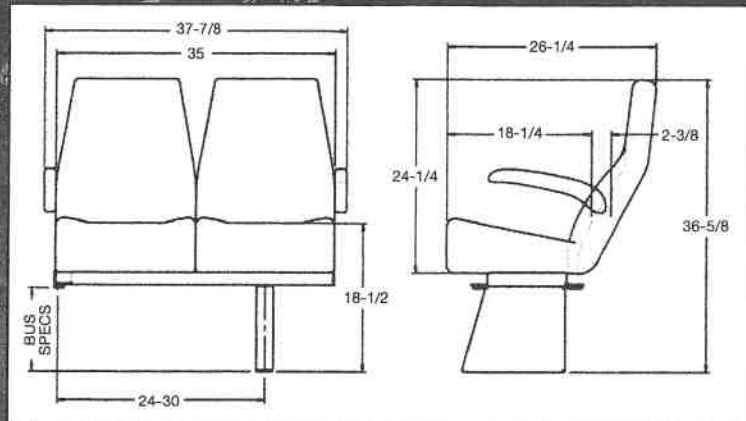
- An ultra-thin *Knee-Saver* type backrest for added hip-to-knee room and lumbar support
- Molded polyurethane seat and back cushions for comfort and long lasting support
- 17½" wide seat cushions
- 22½" back height off the seat cushion, 37" off the floor
- Wire mesh-grid seat springs for even support
- 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:

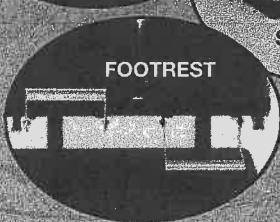
- Black molded U.S. Arms or upholstered flip-up armrests
- Adjustable headrests
- Black or yellow corner AV grab rails
- Black or yellow top AV grab rails
- ABS plastic backs
- Mesh map pockets
- Vertical stitching
- FTA foam
- Snack trays
- Aluminum folding footrests
- Pillow seat cushions
- Rear row 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



OPTIONS



Not Just Seats



Seating Solutions™

FREEDMAN

SEATING COMPANY

an ISO 9001:2000 certified company

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

National Premium 2000 Truck Seat in Black with Dual Arms



Variations



Black



Black & Gray
Leather, Heat



Black & Gray
Leather

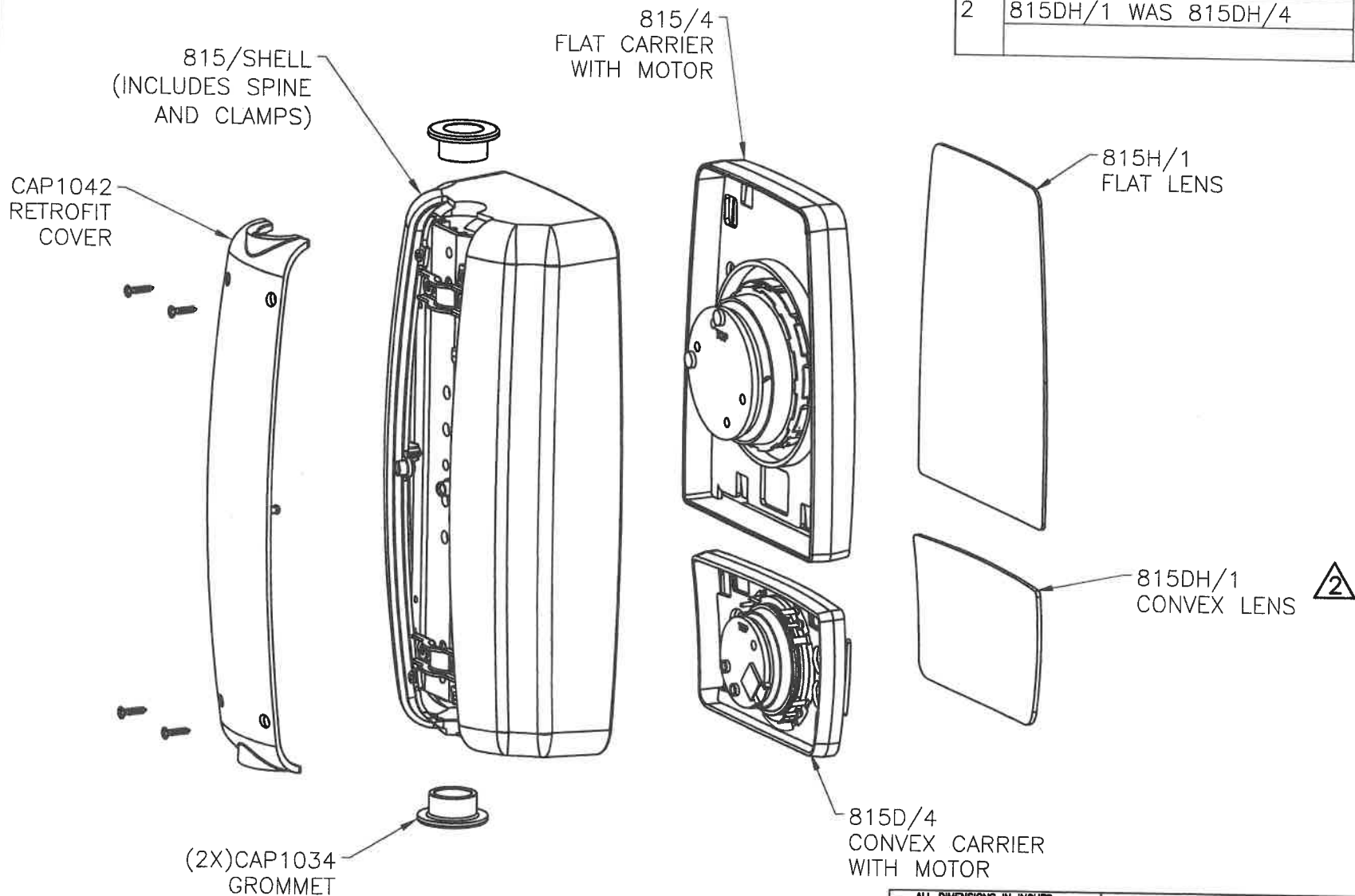
The Premium 2000 seat takes the best selling National 2000 design platform up a notch with enhanced comfort and styling. It utilizes our model 95 air suspension which delivers a great ride with low cost of ownership and millions of miles of real world use. The seat upper features contoured cushion for added comfort and styling along with a multitude of adjustments, many not found on any other brand of seat. The Premium 2000 truck seat comes standard with our exclusive BackCycler system which cyclically inflates and deflates to provide continuous slight movement of the back. This relieves the pain and strain caused from sitting in one position for extended periods of time and can help ensure you achieve maximum uptime.

Features:

- Premium Series Isolating Air Suspension
- Premium HiPro with 6" Ride Zone
- Triple Chamber Air Lumbar Support
- Backcycler System
- Standard Damper
- Extendable Cushion
- Dual Adjustable Position Armrests

Manufacturer Part #: 50060.356B

1 2 3 4 5 6 7 8 9 10 11 12

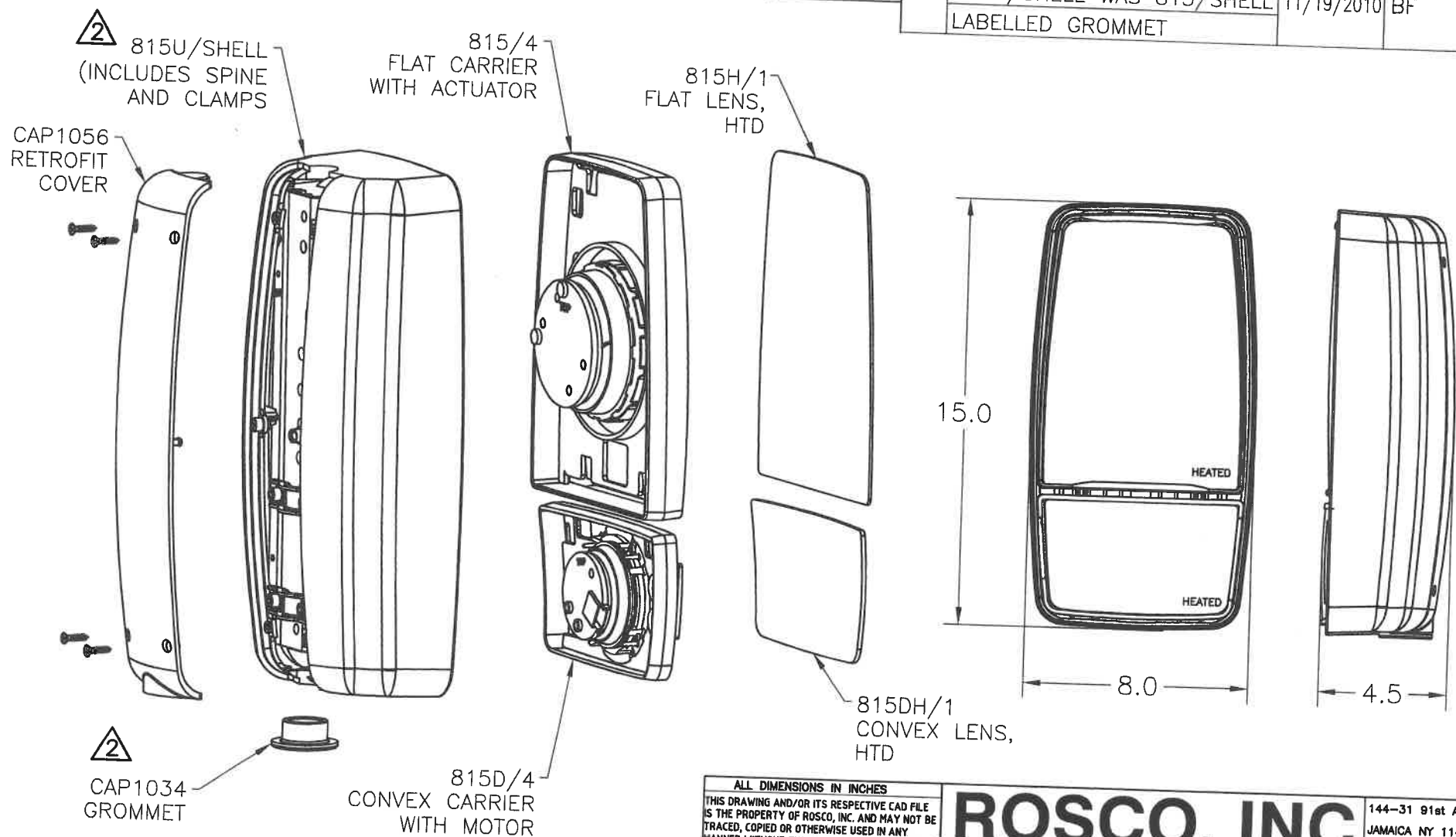


#	DESCRIPTION	DATE	APPROVED
2	815DH/1 WAS 815DH/4	11/26/2012	BF

ALL DIMENSIONS IN INCHES			
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DRAWN 07/12/2007			
CHECK J. SERER			
APPR. BEN ENGLANDER			
ANGULAR TOLERANCES: ±1.5°			
TOLERANCES XIN	TOLERANCES XIN	TOLERANCES XIN	TOLERANCES XIN
0 - 5.99"	0.03	6.00 - 11.99"	0.05
12.00 - 23.99"	0.06	24.00 - 47.99"	0.08
48.00" & UP	0.12		

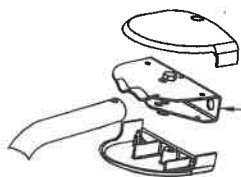
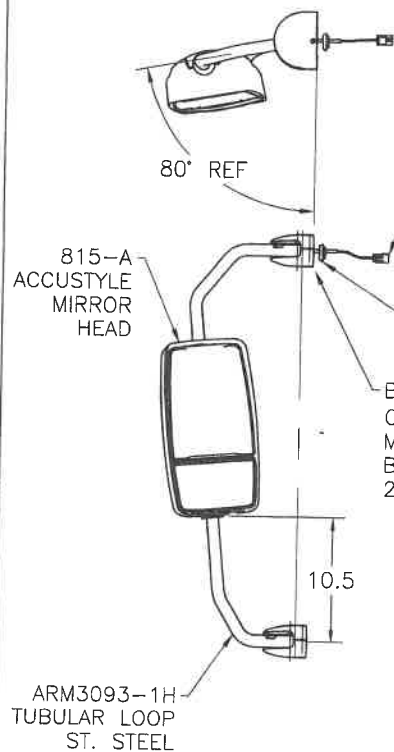
ROSCO, INC			144-31 91st AVE. JAMAICA NY 11435 (718)528-2601	
ACCUSTYLE DUAL MIRROR HEAD HEATED				
SIZE	DRAWN BY	DWG NO	REV	
B	BF	815H_SALES	2	
SCALE		WEIGHT	SHEET	1

#	DESCRIPTION	DATE	APPROVED
ECO#4620	2 815U/SHELL WAS 815/SHELL LABELLED GROMMET	11/19/2010	BF



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DRAWN 7/2/2007			
CHECK J. SERER			
APPR. BEN ENGLANDER			
ANGULAR TOLERANCES: $\pm 1.5^\circ$			
TOLERANCES .XX	TOLERANCES .XXX	TOLERANCES .XXX	TOLERANCES .XXX
0 - 5.99"	0.03	0 - 5.999"	0.010
6.00" - 11.99"	0.05	6.000" - 11.999"	0.015
12.00" - 23.99"	0.06	12.000" - 23.999"	0.020
24.00" - 47.99"	0.08	24.000" - 47.999"	0.025
48.00" & UP	0.12	48.000" & UP	0.030

ROSCO, INC			144-31 91st AVE. JAMAICA NY 11435 (718)526-2601	
ACCUSTYLE 8X15 MIRROR HEAD UPRIGHT MOUNT				
SIZE	DRAWN BY	DWG NO		REV
A	BF	815UH_SALES		2
SCALE		WEIGHT		SHEET 1

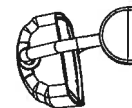


driver side mtg. bracket
mounted in this position
(protrusions up)



DETAIL A
4 PLACES

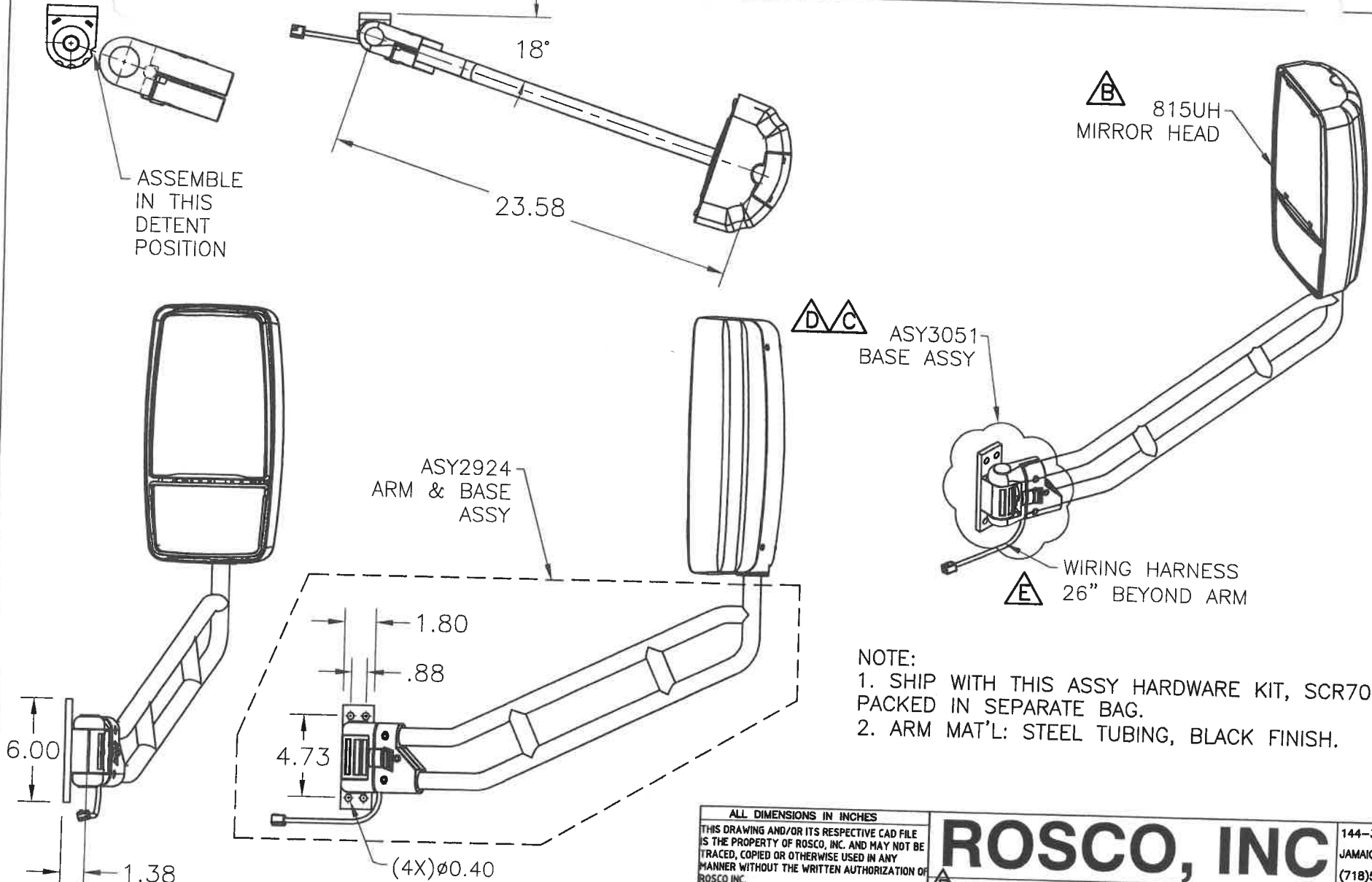
run harness through
center hole



**MIRROR HEAD POSITIONED AS
SHOWN BEFORE SHIPPING**

ECO#4035	A	RELEASE TO PRODUCTION	03/10/2010	AA
#		DESCRIPTION	DATE	APPROVED
IN INCHES .005; .XX ±.03 wise specified			144-31 51st AVE. JAMAICA NY 11430 TEL (718)528-280	
ROSCO, INC				
J. SERER BEN ENGLANDER			ACCUSTYLE MIRROR ASSY, DRIVER SIDE CHAMPION M2 FREIGHTLINER, REMOTE, S/S	
ANCES: ±0.5°				
FOR ITS RESPECTIVE CAD FILE ROSCO, INC. AND MAY NOT OTHERWISE USED IN ANY WRITTEN AUTHORIZATION				
SIZE	DRAWN BY	DWG NO	REV	
B	A.A.	ASM00700047	A	
SCALE	3" = 1'0"	WEIGHT	SHEET	1

ACCUSTYLE MIRROR ASSY, DRIVER SIDE
CHAMPION M2 FREIGHTLINER, REMOTE, S/S

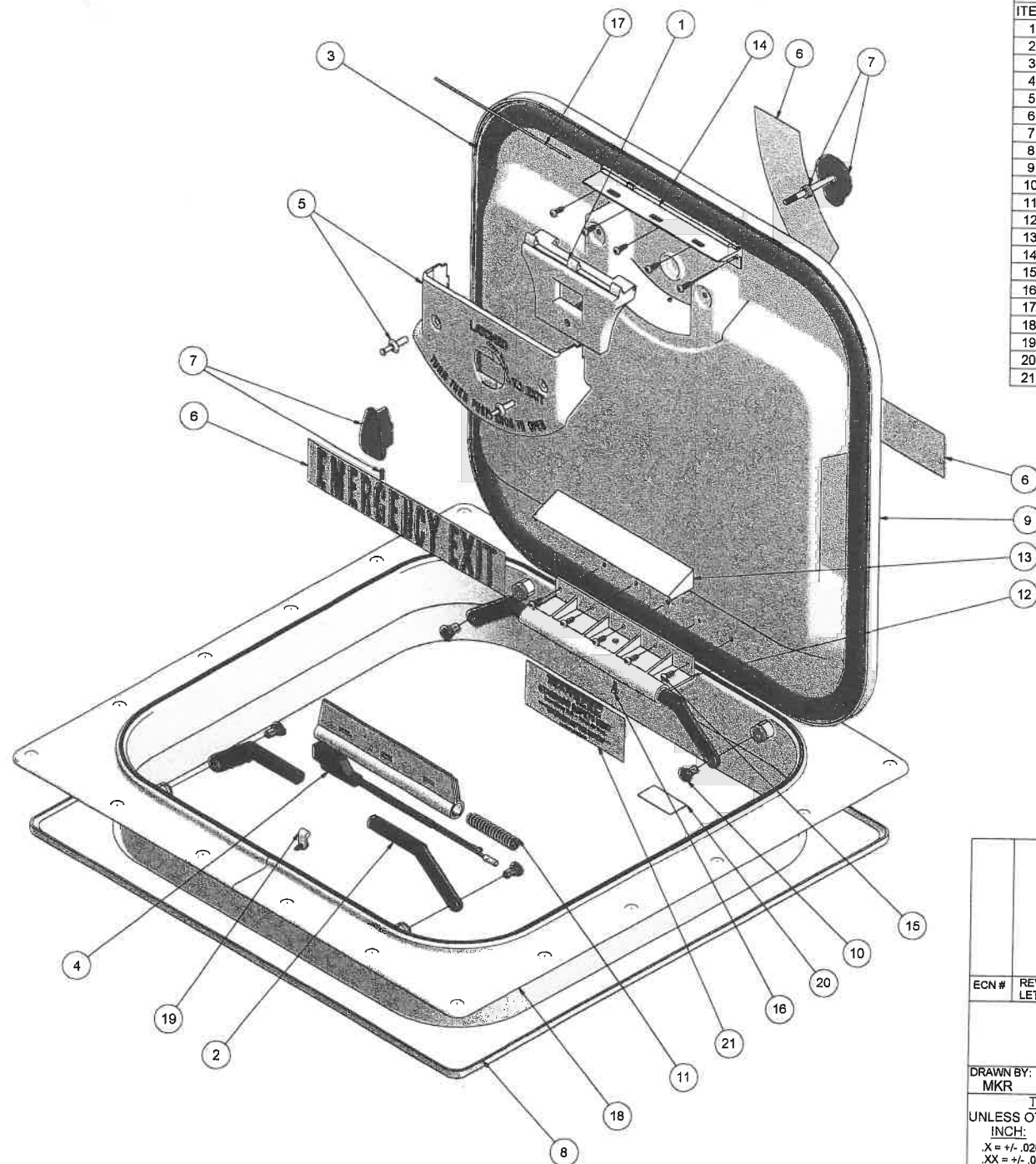


NOTE:
 1. SHIP WITH THIS ASSY HARDWARE KIT, SCR7082, PACKED IN SEPARATE BAG.
 2. ARM MAT'L: STEEL TUBING, BLACK FINISH.

ECO#5664	E	26" BEYOND ARM was 37"	2/13/2012	BF
ECO#4780	D	ASY3051 WAS ASY3046, UPDATED DWG	1/17/2011	BF
ECO#4627	C	ADDED P/N SCR7082 AND ASY3046	11/22/2010	BF
ECO#3806	B	MIRROR HEAD WAS 815H	11/5/2009	BF
#		DESCRIPTION	DATE	APPROVED

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DRAWN 9/17/2009	
CHECK	J. SERER
APPR.	BEN ENGLANDER
ANGULAR TOLERANCES: $\pm 1.5^\circ$	
TOLERANCES XX	TOLERANCES XXXX
0 - 5.99" 0.03	0 - 5.999" 0.010
6.00" - 11.99" 0.05	6.000" - 11.999" 0.015
12.00" - 23.99" 0.06	12.000" - 23.999" 0.020
24.00" - 47.99" 0.08	24.000" - 47.999" 0.025
48.00" & UP 0.12	48.000" & UP 0.030

<h1>ROSCO, INC</h1>		144-31 91st AVE.	
		JAMAICA NY 11435	
		(718)526-2601	
<h2>815UH MIRROR ASSEMBLY, HEATED, REMOTE FREIGHTLINER M2, CHAMPION, RH</h2>			
SIZE	DRAWN BY	DWG NO	REV
A	BF	ASM00700048	E
SCALE		WEIGHT	SHEET 1



Parts List				
ITEM	QTY	PART NUMBER	DESCRIPTION	LID ONLY
1	1	1000-003	RELEASE HANDLE ASSEMBLY (WHITE)	X
2	4	1000-005	LINK AND PLUNGER	X
3	1	1000-017	GASKET KIT-STANDARD	X
4	1	1000-018	RELEASE HINGE WITH ALARM SWITCH	X
5	1	1975-015	RELEASE HINGE SHIELD W/RIVETS (WHITE)	X
6	1	1976-006	DECAL KIT-E (OSR)	X
7	1	1976-014	RELEASE KNOB ASSEMBLY	X
8	1	2220-28-001	#28 TRIM RING	
9	1	1975	SS II COVER W/OSR (WHITE)	X
10	4	2030	BOLT-5/16-18 SPECIAL SHOULDER	
11	4	2040	SPRING-COIL PLUNGER VENT	X
12	1	2050	FIXED HINGE (WHITE)	X
13	1	2055	HINGE COVER (WHITE)	X
14	1	2070	HANDLE BASE (WHITE)	X
15	11	2100	SPECIAL TORX HI/LO SCREW S/S	X*(10)
16	1	2105	SCREW #8 X 1/2 S/S PH FLAT HEAD	X
17	1	2140	PIN-HINGE STAINLESS STEEL	X
18	1	2247	MOUNTING FRAME-#28 LOW PROFILE (WHITE) (PP)	
19	1	2300	NYLON TUBE CLAMP	
20	1	2660	FRONT OF VEHICLE DECAL	
21	1	2688	DECAL-STANDARD SAFETY VENT	

PARTS MARKED X IN LID ONLY ARE FOR PART #1975L-000-111 (LID ONLY)
 *() IS FOR QTY OF LID ONLY

ECN #	REV. LET.	REVISION:	DATE:	BY:	APVD BY:
MATERIAL:					
DRAWN BY: MKR		DATE: 05/29/07			
TOLERANCE: UNLESS OTHERWISE SPECIFIED INCH: .XX = +/- .020 .XX = +/- .010 .XXX = +/- .005 ANGLES = +/- 1 DEG.					
TITLE STANDARD SAFETY VENT II W/#28 MTG, OSR, ARM, & ENG DECALS (WHITE)				PRODUCT: VENTS	
ENG. P.VIDRI MANAGER				DWG NO 1975-028-111	

QRT Deluxe Q8100-A1-L Tie Downs



FEATURES AND BENEFITS

Dual Tightening Knobs

Provides additional tensioning if needed

Foot Release Lever

Easy release eliminates the need to bend down

J-Hook

Reduces twisting of belts and ensures proper securement with a quarter turn accommodating virtually all wheelchair designs

Durable

Constructed from hardened steel and coated in zinc for maximum corrosion resistance

Universal Design

Accommodates virtually all wheelchair designs, including scooters

Accommodates Larger Wheelchairs

Reduced overall retractor length leaves more room for wheelchairs

Low Profile & Compact

No mounting bracket allows retractors to fit under most footrests

Interchangeable

Eliminates confusion; no right, left, front or rear locations

Positive Lock Indicator

Patented feature clearly indicates when fitting is locked in anchorage (L-track application only)

Self-Tensioning

No manual tensioning required. Retractors automatically take up 'slack' to ensure

Automatic, Self-Locking

Allows easy, one-handed hook-up of wheelchairs

wheelchair passenger is
always secured

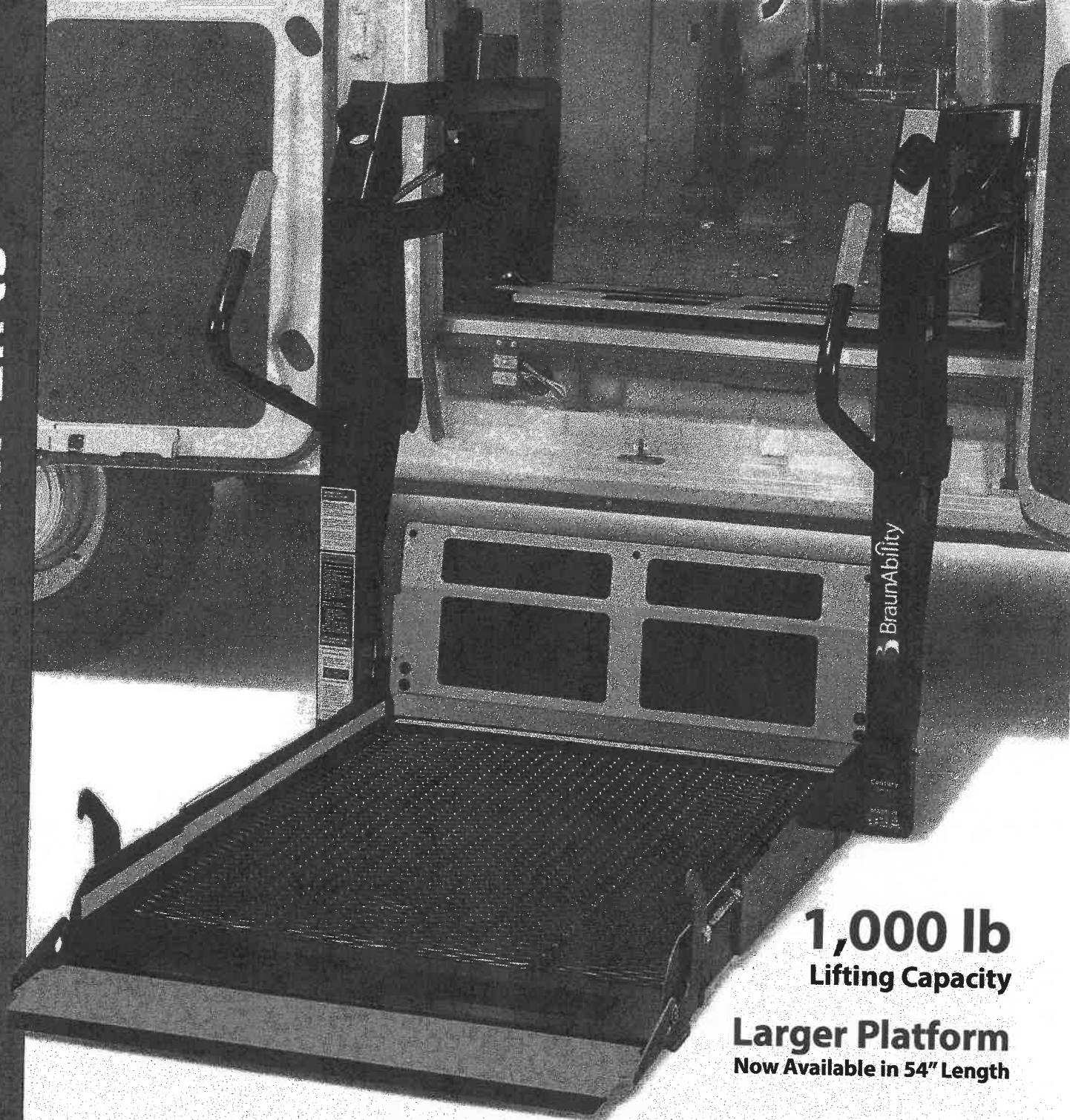
QRT Storage Bag



Storage pouch for securements. Meets FMVSS 302

Commercial Wheelchair Lifts

NCL1000-2 Century Series™



1,000 lb
Lifting Capacity

Larger Platform
Now Available in 54" Length



BraunAbility®

Life is a Moving Experience®

NCL1000-2 Century Series

NCL1000IB3351-2 (33" wide x 51" long platform)

NCL1000IB3451-2 (34" wide x 51" long platform)

NCL1000IB3451HB-2 (34" wide x 51" long platform - with handrail belt)

NCL1000IB3454-2 (34" wide x 54" long platform)

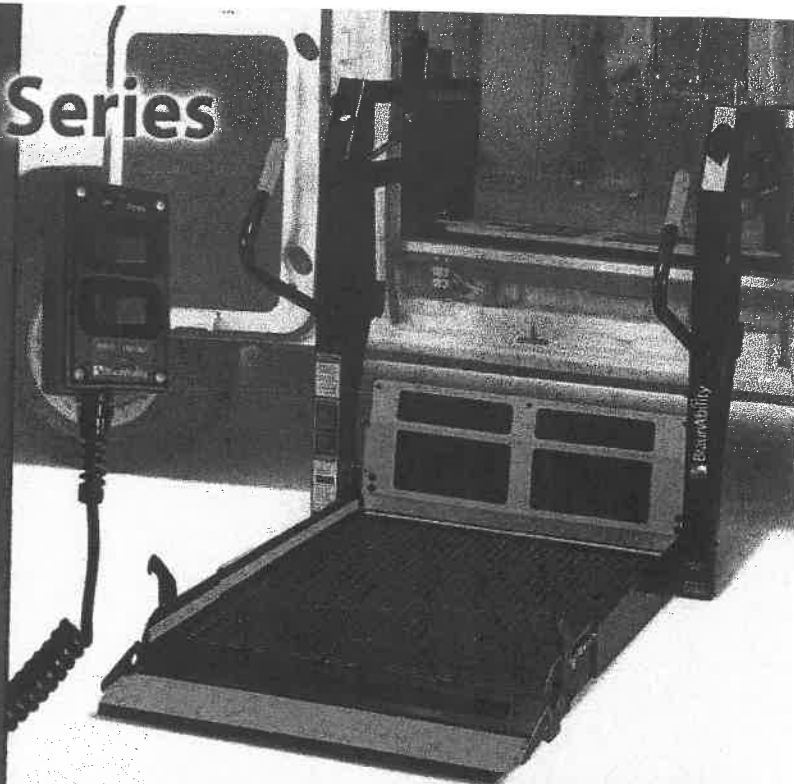
NCL1000IB3454HB-2 (34" wide x 54" long platform - with handrail belt)

Rear pump models listed - all models also available in front pump configuration

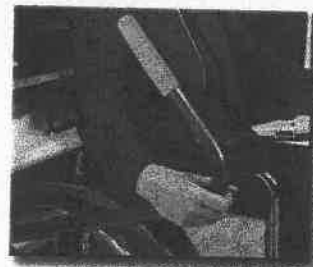
- 1,000 lb lifting capacity
- Fully automatic FMVSS 403 compliant lift, operated by an attendant
- Loading position - either direction
- Interfaces with OEM interlocks
- Long lasting LED lift mounted lights that are active when vehicle interlocks are engaged and lift power switch is on
- Hand-held control box with illuminated functions
- Locking mechanical Inboard Barrier (IB), powder coated yellow for safety and high visibility, prevents operation if occupied
- Pump design prevents platform folding when occupied, quiet operation & low current draw
- Durable redesigned baseplate reduces lift weight and allows for quicker and easier service of hose/wiring
- Easily installed, step-by-step installation instructions, no peripheral hardware required
- Platform movement prevented during unsafe operation
- Gas spring activated outer barrier detects roll stop occupancy as the platform leaves the ground, complete with durable rubber nose guard
- Transition areas marked with durable high-gloss yellow powder coating for safety & visibility
- Side or rear door application
- Dual handrails for security and convenience
- Bridging feature permits the wheelchair user to board the lift from sidewalks or inclines
- Floor to ground travel is 48"
- Integrated back-up pump
- Equipped with an adjustable anti-rattle feature to avoid unpleasant noise in the vehicle during transit
- Durable high-gloss powder coated finish
- Lift-Tite system stows the lift platform securely while the vehicle is in transit
- Pump module with removable cover offers easy access to all components

**MADE IN
USA**

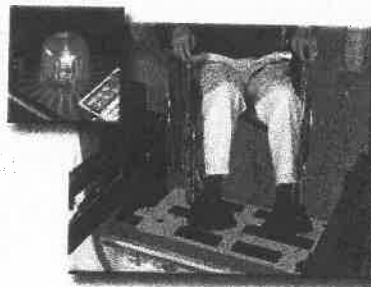
All illustrations, descriptions and specifications in this brochure are based on the latest product information at the time of publication. BraunAbility reserves the right to make changes at any time without notice. © 2016 BraunAbility 400636



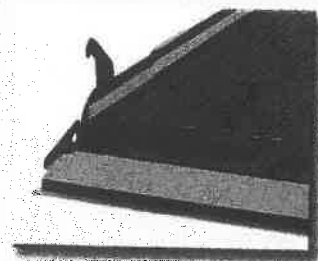
Integrated dual handrails provide added security for wheelchair users and standees



Visual and audible warnings alert both passengers and attendants to unsafe conditions



Gas spring activated outer barrier detects roll stop occupancy as the platform leaves the ground



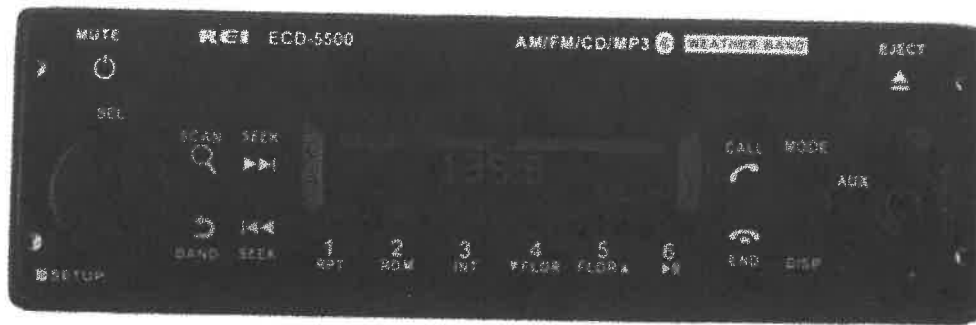
BraunAbility
Life is a Moving Experience®

631 West 11th Street • Winamac, IN 46996

(574) 946-6153 • 1-800-THE-LIFT

www.braunability.com/commercial

AM/FM/CD/MP3 Radio



Part No. 710473

ECD-5500 AM/FM/CD/MP3/WB Stereo Radio

Features:

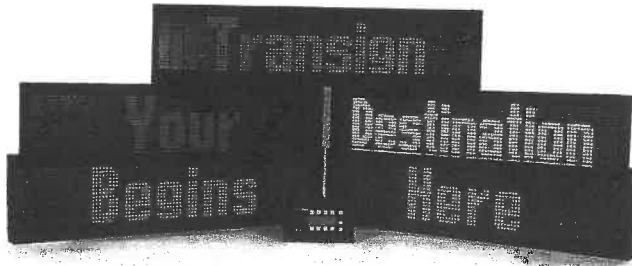
- AM/FM/WB stereo receiver
- 50W x 4
- Preset up to 37 radio stations (18 FM, 12 AM, 7 WB)
- Plays MP3/WMA formats
- Displays ID3 tag information
- Bluetooth® audio streaming and support for hands free calling
- Rear USB type-A input
- 2 AUX inputs (front 3.5mm stereo jack/rear RCA)
- iPod®/iPhone® charging and playback control via USB
- CD player
- User settings stored during power loss
- 30 day clock back-up
- 7 channel NOAA® weather band tuner
- Integrated Bluetooth® microphone w/optional external microphone input
- 10s anti-skip CD mechanism
- USA/EURO radio frequency modes
- Heavy duty construction for tough environments
- Must be paired with the EC-750 Control Module

TRANSIGN

YOUR DESTINATION **BEGINS** HERE



The LED Destinator™ Series - perfect for fleets of all types - is available in a variety of sizes and colors to fit your installation and display needs. These versatile and highly adaptive signs offer full integration into Destination, Route, and Next Stop announcement services, always keeping your customers pointed towards their next destination.

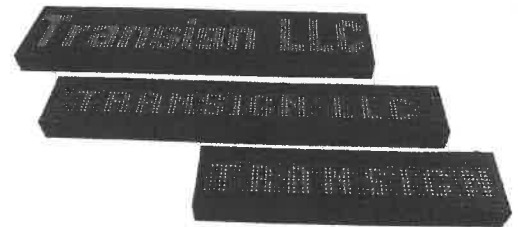


STANDARD FEATURES

- Destination Messages
- Next Stop Announcements
- Public Relations Messaging
- Scrolling/Flashing/Stacked Messages

SOFTWARE AND PROGRAMMING

Our signs and control modules are pre-programmed and include FREE software. Advanced controllers are available for J1708/J1587 system integration and Hands-Free operation, ensuring the safest and most reliable performance for any fleet.



AVAILABLE ADVANCED FEATURES INCLUDE:

- Automated GPS message progression
- Hands-Free operation for safety
- Voice Announcements
- J1708/J1587 integration compatible
- Automatic brightness control
- Basic programming software included (USB)
- Maintenance free- ZERO cost of ownership
- Many OCU options to suit your needs



BUY AMERICA - MADE IN U.S.A.

Using the highest quality parts, our LED Destinator™ Signs are proudly made in Detroit, Michigan USA in full compliance with the **Buy America Act**.

LED DESTINATOR™ WARRANTY INFO

With a lifetime warranty that outlasts the lifetime of most vehicles (100,000 hours at full brightness), our signs will exceed your expectations in reliability and performance.



ABOUT TRANSIGN

Established in 1959, Transign is a leading provider of high-quality signage for the transit industry. We remain committed to providing world-class U.S. based customer service and technical support.

Transign LLC, 281 Collier Rd. - Suite C, Auburn Hills, Michigan 48326
Toll Free: 855.535.7446 | Main: 248.623.6400 | Fax: 248.623.2930
www.transignllc.com

LED Destinator™ Electronic Signs - Dimensions

Signs	Pixel Count H x W (pixels)	Display H x W (in)	Enclosure H x W x D (in)
LD16160	16 x 160	6 1/2 x 63 1/8	9 1/2 x 64 5/8 x 2 3/8
LD16128	16 x 128	6 1/2 x 50 1/2	9 1/2 x 52 x 2 3/8
LD16112	16 x 112	6 1/2 x 44 1/8	9 1/2 x 45 3/4 x 2 3/8
LD1696	16 x 96	6 1/2 x 37 7/8	9 1/2 x 39 3/8 x 2 3/8
LD1680	16 x 80	6 1/2 x 31 5/8	9 1/2 x 33 x 2 3/8
LD1632	16 x 32	6 1/2 x 12 3/4	9 1/2 x 14 x 2 3/8
LD12112	12 x 112	4 7/8 x 44 1/8	8 x 45 3/4 x 2 3/8
LD1280	12 x 80	4 7/8 x 31 5/8	8 x 33 1/8 x 2 3/8
LD1232	12 x 32	4 3/4 x 12 3/4	8 x 14 x 2 3/8
LD896	8 x 96	3 1/4 x 37 7/8	6 3/8 x 39 3/8 x 2 3/8
LD864	8 x 64	3 1/4 x 25 1/4	6 3/8 x 26 3/4 x 2 3/8

Be sure to check out our other great products!

Stop Requested

Stop Request Signs

- Flush, ceiling or surface mount
- Any font/color combination
- Back-lit by efficient LED's



Interior Passenger Information Sign

- Easy to install
- ADA compliant
- LED's rated at 100K hours



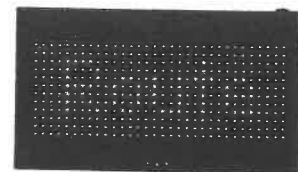
Roller Curtain Signs

- High-res logos & graphics
- Perfect for large fleets
- Virtually maintenance free
- Reliable, efficient LED backlight
- Available in 12 and 24 VDC
- Up to 120 destinations



Run Number Box

- Metal or plastic frame
- Available in 2, 3, or 4 digits
- Easy to read 4" lettering
- Spring loaded return
- Reliable, efficient LED backlight
- Virtually maintenance free



LED Run Number Box

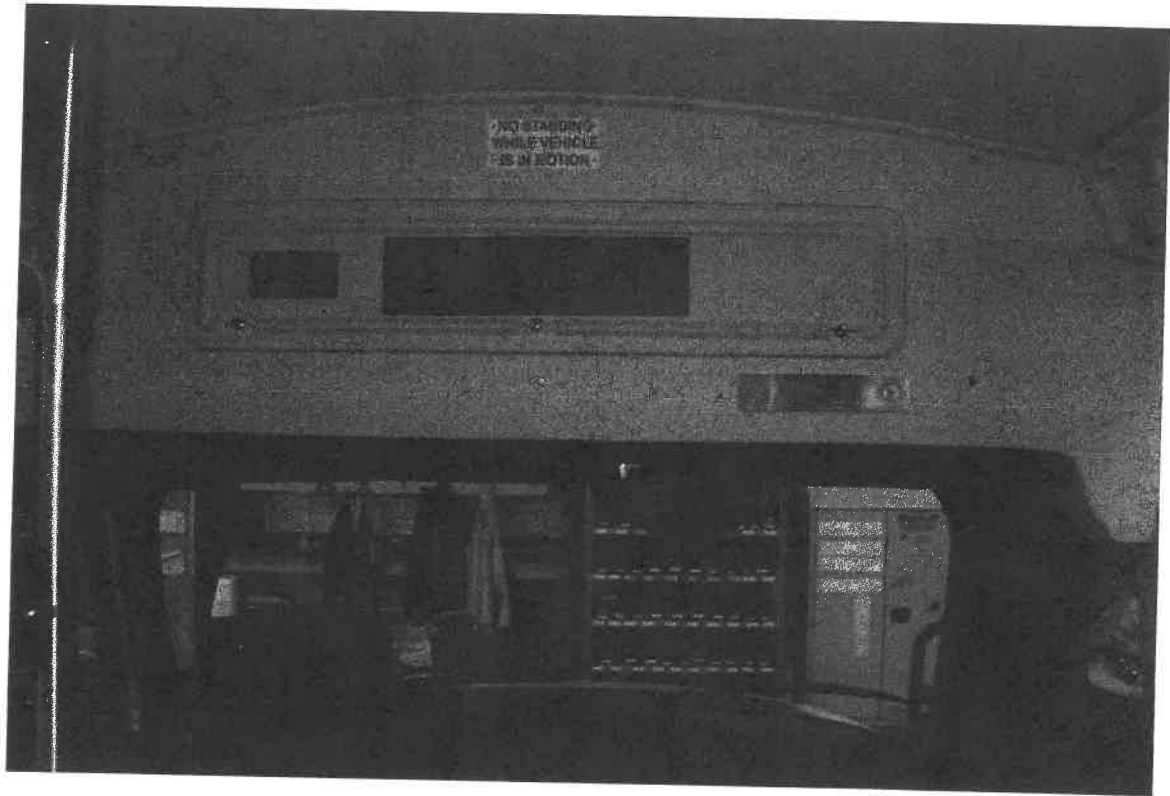
- Steel enclosure
- ADA compliant
- Reliable LED's
- Multiple colors
- Automatic brightness
- 12 and 24 VDC

Join Our Mailing List

www.transignllc.com/subscribe

Transign LLC, 281 Collier Rd. - Suite C, Auburn Hills, Michigan 48326
Toll Free: 855.535.7446 | Main: 248.623.6400 | Fax: 248.623.2930

www.transignllc.com





TRANSIGN LLC – LED Destinator Electronic Signs Warranty Statement

Transign LLC ("Transign") provides the original Buyer of the delivered LED Destinator sign(s) ("Article") a limited warranty subject to the following:

- a) The limited lifetime warranty on LED Destinator signs is valid for the life of the vehicle on which the Articles were first installed, or 100,000 hours of operation, whichever is less.
- b) Transign warrants that the Articles conform to final specifications, drawings and other descriptions agreed to in writing by the Buyer and that the Articles are free from defects in materials and workmanship.
- c) Transign's obligation under this warranty, and the sole and exclusive remedy of the Buyer, its successors or assigns for a breach therefor, is limited to the repair or replacement by Transign without charge of any Article which has been returned to Transign and which is not in accordance with this warranty; provided, however, that:
 - 1) Transign must be notified in writing of the defect or non-conformity and the affected Article returned to Transign within thirty (30) days after discovery of such defect or non-conformity;
 - 2) if Transign is unable to repair or replace defective or non-conforming Articles within a reasonable time after receipt, the Buyer shall be credited for their value at the original purchase price,
 - 3) Transign shall not be responsible for costs of removal and reinstallation; and
 - 4) Buyer shall maintain records, to which Transign is to be given reasonable access, which will accurately reflect operating time and maintenance performed on the Articles and establish the nature of any unsatisfactory condition of the Articles.
- d) Transign shall have the sole right to determine whether returned Articles shall be repaired or replaced.
- e) Unless otherwise agreed, and except as may be necessary to comply with this warranty, Transign reserves the right to make changes in its products without any obligation to incorporate such changes in any product manufactured theretofore.
- f) Transign shall assume the round trip transportation costs for defective or non-conforming Articles to Transign's facilities. If subsequent inspection by Transign discloses that the returned Article does not require repair or replacement, the Buyer will be charged for the round trip shipping costs.
- g) This warranty will not apply if the Article has been subjected to:
 - 1) any maintenance, overhaul, installation, mounting, storage, operation, or use, handling or environment which is improper or not in accordance with Transign's instructions and specifications
 - 2) any alteration, modification, or repair by anyone other than Transign or its authorized representative; or
 - 3) any accident, misuse or neglect after delivery of the Article to Buyer. This warranty shall not apply to any Article to the extent that the defect or non-conformity is attributable to any part not supplied by or approved by Transign and shall not apply to any Article for which Transign has not received payment in full, including interest, if any.
- h) All other representations, warranties and conditions, whether express or implied, statutory or otherwise, such as warranties or conditions, of merchantability or fitness for a particular purpose, are hereby excluded and disclaimed to the extent they exceed the warranty granted herein.

LIMITATION OF LIABILITY: Transign's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the performance or breach thereof, or from the manufacture, sale, delivery, resale, repair or use of any article covered by this warranty statement shall in no case exceed the price allowable to the article which gives rise to the claim. In no event shall Transign be liable for special, incidental or consequential damages (including, but not limited to, loss of profits, personal injury or death). Buyer acknowledges the reasonableness of this limitation of liability.

[Home](#) [Contact Us](#) [REI International](#) [Technical Support](#) [Resources](#) [About Us](#)**OUR PRODUCTS →**

Our Products

[SCHOOL BUS](#)[TRANSIT](#)[MOTOR COACH](#)[SHUTTLE BUS](#)[AG/CONSTRUCTION](#)**Part No. 480329**

Slimline 19" Gooseneck Microphone w/15' PA Input Cable (Minifit Molex) and 10' Foot Switch Cable

Features:

- REI gooseneck microphones utilize 1.75" mount bases

Truck-Lite

TRUCK-LITE HIGH QUALITY LIGHTING AND VISIBILITY PRODUCTS

Low & Medium Profile Strobe - 6810

Material:

- Polycarbonate lens & housing
- 18 gauge wire
- >

Light Source:

- Joules: 11 single, 15.5 double, 17.6 quad
- Amps 2 at 12V
- Voltage: 12 - 24V
- Flash Rate per Minute 80 single, 65 double and quad
- Class 1 quad and double flash
- Class 2 single flash

Replacement Parts

- Manufactured before 12/2008:
 - 9705A yellow low profile lens
 - 9710A yellow medium profile lens
 - 8820 flash tube
- 6600PS power supply
- Manufactured after 12/2008:
 - 99221Y yellow low profile lens
 - 99220Y yellow medium profile lens
 - 92726 strobe tube



- Multi-Flash Class 1 and 2 Gas Discharge Strobe
- LED diagnostic indicator
- Electronics sealed in epoxy for increased weather and shock resistance

- Field selectable flash patterns via internal jumper single, double, quad flash
- New improved product features twist on/off lens

Part #	Description	Std Ctn Qty
6810A	Yellow, permanent mount, low profile	1

Warning & Emergency Products

Hybrid Vault™ Mobile DVR

DVR DIMENSIONS & WEIGHT

- Height: 6.25 inches
- Width: 4.13 inches
- DVR Depth: 8.75 inches
- Depth w/ Back Cover: 10.19 inches
- Weight: 6.75 pounds

EIGHT (8) A/V INPUTS

- 8 camera inputs
- 8 audio inputs
- 1 A/V output

STORAGE MEDIA

- Recording medium: two (2) 500GB 2.5" solid-state drives
- Capacity: 1TB (standard) up to 2TB
- USB host: backup video data to standard flash drive from USB host port
- USB slave: backup video data to laptop from USB slave port



INTERFACE

- RJ-45 for network data connection
- RJ-45 remote status indicator (panic button)
- RS232 for expansion
- Male 6 pin DIN port for GPS interface



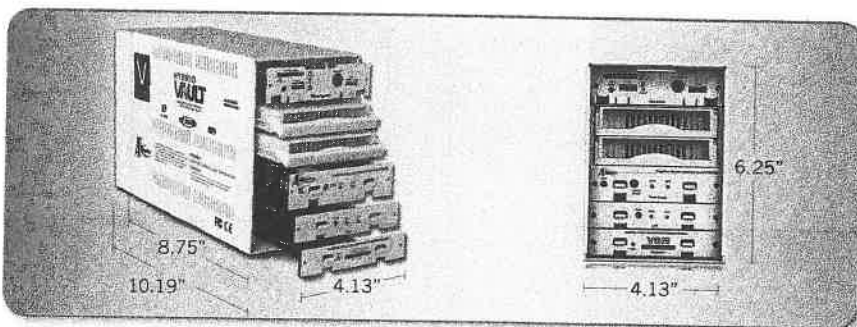
PANIC BUTTON

- The remote status indicator (panic button) can be connected to show DVR status without using a video monitor
- The driver-operated panic button has the following functions:
 - Flashing green LEDs indicate that the unit has power and is recording
 - Event marker (panic button)
- Driver action detection includes 8 signal wires and panic button



ALARMS

- Up to four (4) configurable alarm inputs with rule-based event recording



RECORDING OPTIONS

- Continuous record: the system will record all channels continuously while the vehicle is running (factory setting)
- Alarm record: the system will boot and record when an alarm is triggered
- Motion record: the system will boot and record when the cameras detect motion while the vehicle is running

ELECTRICAL & OPERATING REQUIREMENTS

- 12VDC negative ground
- Auto on/off detection
- Delay off setting (0 - 240 min.)
- Operating voltage: 9 ~ 30 VDC
- Operating temperature: -40°F* ~ 185°F (-40°C* ~ +85°C)
- Power consumption: < 2A

POWER SUPPLY

- Input range: DC9 ~ 30V
- Output range: DC12V/5V/1.8V
- Output current: < 2A
- Low voltage protection
- Auto on/off detection

MOUNTING AND ENCLOSURE

- Removable, shock-mounted
- Vandal-proof case
- Stamped metal, shock-resistant DVR housing

GRAPHICS & COMPRESSION

- Compression format: MJPEG or H4L user selectable
- Record resolution: 720 x 480 NTSC
- Record frame rate: 60fps maximum (MJPEG) / 120fps maximum (H4L)



OPTIONAL COMPONENTS

LAN COMPONENT

- Optional internal 800MHz LAN connectivity allows the DVR to communicate through the optional AP or Cellular Router to transmit data wirelessly over existing wireless LAN and cellular networks

SD DAUGHTERBOARD

- Optional SD Daughterboard component allows the DVR to store its most recently recorded data and footage on a solid-state SD card (SD card sold separately)

VIRTUAL SYNCHRONIZED MAPPING

- Internal Virtual Synchronized Mapping™ module with North American maps
- Includes GPS-C1 antenna
- Embeds GPS tracking information synchronized with recorded video footage



ROHRER

School & Commercial Bus Sales

Class A Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY
- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER
6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED -
REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class A Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 219-S2C FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/AIR SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	WHEEL CHOCKS - SHIP LOOSE
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS
1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"
1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)
1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS

1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDT'L REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT
1	TAG, REFRIDGERANT TAG - METAL
1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAINT, TIEDOWN QRT CBI 3.1 Q8100 TRK
16	STRAP QUICK SURELOK 16" EACH
2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape
2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT

1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	SAFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER
2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL
1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE
1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)
1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT SKIRT ONLY
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR
7	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP

1	ICS DOUBLE, 2-ICS
23	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
23	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)
5	SEAT BELT EXTENSION 24"
9	FREEDMAN US ARM (FLIP UP)
18	PADDED AV GRAB HANDLE TOP BLACK
16	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS, SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

Prepared for:
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Champion Bus
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Phone: (810) 724-1753 ext.371

Freightliner Custom Chassis Corporation

Prepared by:
David Matusz
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1302 SPICEWOOD DRIVE
OKEMOS, MI 48864
Phone: 517-256-1557

A proposal for
Champion Bus: Dealer Copy
West Virginia PTR17*7
Prepared by
Freightliner Custom Chassis
David Matusz

Freightliner Custom Chassis Corp S2C

CHAMPION MY2018 Standard 2B

B6.7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michelins / Steel Wheels

219" wb @ 26,000# GVWR

(F-GAWR: 9,000# / R-GAWR: 17,000#)

TRANSIT Vocation

VERIFY SPECIFICATIONS ARE ACCURATE BEFORE PLACING AN ORDER
A DEALER COPY (without pricing) IS AVAILABLE UPON REQUEST



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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Freightliner Custom Chassis Corporation

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 1302 SPICEWOOD DRIVE
 OKEMOS, MI 48864
 Phone: 517-256-1557

SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		

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Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD

Application Version 9.2.008
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Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
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Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH,FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS

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 Data Version PRL-8H1.031
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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-216	23,000# AIRLINER REAR SUSPENSION WITH CHAIN CLEARANCE
621-007	AIRLINER HIGH POSITION RIDE HEIGHT
888-002	MANUAL DUMP VALVE FOR AIR SUSPENSION W/INDICATOR LIGHT, W/O GAUGE



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Data Code	Description
910-004	DUAL AIR REAR SUSPENSION LEVELING VALVES
87D-001	REAR AIR SUSPENSION DUMP VALVE AUTOFILL W/IGNITION OFF OR >5 MPH WIND LIGHT
630-001	REAR SWAYBAR
439-017	SACHS REAR SHOCK ABSORBERS
Brake System	
018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)
Wheelbase & Frame	
545-555	5550MM (219 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-117	3175MM (125 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



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Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT F/W SEP W/WIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT
Cab Interior	
707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN



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Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	

TOTAL VEHICLE SUMMARY

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.
 If weight is critical, contact Customer Application Engineering.





School & Commercial Bus Sales

Class B Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY

- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER 6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED - REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class B Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 219-S2 FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/AIR SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	WHEEL CHOCKS - SHIP LOOSE
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS
1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"
1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)

1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS
1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDTL REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT
1	TAG, REFRIDGERANT TAG - METAL
1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAINT, TIEDOWN QRT CBI 3.1 Q8100 TRK
16	STRAP QUICK SURELOK 16" EACH

2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape
2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT
1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	AFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER
2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL
1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE
1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)

1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT SKIRT ONLY
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR
9	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP
1	ICS DOUBLE, 2-ICS
27	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
27	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)
5	SEAT BELT EXTENSION 24"
11	FREEDMAN US ARM (FLIP UP)
22	PADDED AV GRAB HANDLE TOP BLACK
20	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS,SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

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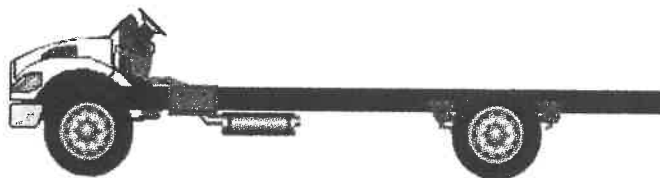
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A proposal for
Champion Bus: Dealer Copy
West Virginia PTR17*7
Prepared by
Freightliner Custom Chassis
David Matusz

Freightliner Custom Chassis Corp S2C

CHAMPION MY2018 Standard 2B
B6. 7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michels / Steel Wheels
219" wb @ 26,000# GVWR
(F-GAWR: 9,000# / R-GAWR: 17,000#)
TRANSIT Vocation

VERIFY SPECIFICATIONS ARE ACCURATE BEFORE PLACING AN ORDER
A DEALER COPY (without pricing) IS AVAILABLE UPON REQUEST



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		

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Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD



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Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
---------	--

Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH,FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS



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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-216	23,000# AIRLINER REAR SUSPENSION WITH CHAIN CLEARANCE
621-007	AIRLINER HIGH POSITION RIDE HEIGHT
888-002	MANUAL DUMP VALVE FOR AIR SUSPENSION W/INDICATOR LIGHT, W/O GAUGE



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Data Code	Description
910-004	DUAL AIR REAR SUSPENSION LEVELING VALVES
87D-001	REAR AIR SUSPENSION DUMP VALVE AUTOFILL W/IGNITION OFF OR >5 MPH W/IND LIGHT
630-001	REAR SWAYBAR
439-017	SACHS REAR SHOCK ABSORBERS

Brake System

018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)

Wheelbase & Frame

545-555	5550MM (219 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-117	3175MM (125 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



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Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT F/W SEP W/WIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT
Cab Interior	
707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN



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Champion Bus
331 Graham Road
PO Box 158
Imlay City, MI 48444
Phone: (810) 724-1753 ext.371

Freightliner Custom Chassis Corporation

Prepared by:
David Matusz
Freightliner Custom Chassis
1302 SPICEWOOD DRIVE
OKEMOS, MI 48864
Phone: 517-256-1557

Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	

TOTAL VEHICLE SUMMARY

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.
 If weight is critical, contact Customer Application Engineering.



ROHRER

School & Commercial Bus Sales

Class C Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY
- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER 6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED - REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class C Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 259-S2 FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/AIR SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	WHEEL CHOCKS - SHIP LOOSE
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS

1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"
1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)
1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS
1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDT'L REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT

1	TAG, REFRIDGERANT TAG - METAL
1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAINT, TIEDOWN QRT CBI 3.1 Q8100 TRK
16	STRAP QUICK SURELOK 16" EACH
2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape
2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT
1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	SAFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER

2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL
1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE
1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)
1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT SKIRT ONLY
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR
11	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP
1	ICS DOUBLE, 2-ICS

31	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
31	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)
5	SEAT BELT EXTENSION 24"
13	FREEDMAN US ARM (FLIP UP)
26	PADDED AV GRAB HANDLE TOP BLACK
24	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS,SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

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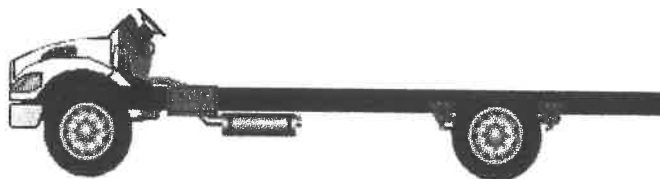
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A proposal for
Champion Bus: Dealer Copy
West Virginia PTR 17*7
Prepared by
Freightliner Custom Chassis
David Matusz

Freightliner Custom Chassis Corp S2C

CHAMPION MY2018 Standard 4B
B6.7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michelins / Steel Wheels
259" wb @ 26,000# GVWR
(F-GAWR: 9,000# / R-GAWR: 17,000#)
TRANSIT Vocation



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std4B.Transit.B240.B220.2...



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SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		

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Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD

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Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
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Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH,FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS

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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-216	23,000# AIRLINER REAR SUSPENSION WITH CHAIN CLEARANCE
621-007	AIRLINER HIGH POSITION RIDE HEIGHT
888-002	MANUAL DUMP VALVE FOR AIR SUSPENSION W/INDICATOR LIGHT, W/O GAUGE



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Data Code	Description
910-004	DUAL AIR REAR SUSPENSION LEVELING VALVES
87D-001	REAR AIR SUSPENSION DUMP VALVE AUTOFILL W/IGNITION OFF OR >5 MPH W/IND LIGHT
630-001	REAR SWAYBAR
439-017	SACHS REAR SHOCK ABSORBERS
Brake System	
018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)
Wheelbase & Frame	
545-657	6575MM (259 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-141	3675MM (145 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



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Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT F/W SEP WWIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT

Cab Interior

707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN

Application Version 9.2.008
 Data Version PRL-8H1.031
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Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	

TOTAL VEHICLE SUMMARY

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.
 If weight is critical, contact Customer Application Engineering.



ROHRER

School & Commercial Bus Sales

Class D Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY

- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER 6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED - REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class D Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 219-S2 FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/SPRING SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	WHEEL CHOCKS - SHIP LOOSE
1	AUTOMATIC TIRE CHAINS
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS

1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"
1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)
1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS
1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDT'L REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT
1	TAG, REFRIDGERANT TAG - METAL

1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAINT, TIEDOWN QRT CBI 3.1 Q8100 TRK
16	STRAP QUICK SURELOK 16" EACH
2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape
2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT
1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	SAFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER
2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL

1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE
1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)
1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT ENTIRE BUS (UNDER 35') INCLUDES 3.9MM NOBLE SELECT FRP ONE COLOR NON-METALLIC (ROOF STAYS WHITE)
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR
7	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP
1	ICS DOUBLE, 2-ICS
23	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
23	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)

5	SEAT BELT EXTENSION 24"
9	FREEDMAN US ARM (FLIP UP)
18	PADDED AV GRAB HANDLE TOP BLACK
16	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS,SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

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A proposal for
Champion Bus: Dealer Copy

West Virginia PTR17*7

Prepared by
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Freightliner Custom Chassis Corp S2C

CHAMPION MY2018 Standard 2B

B6.7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michelins / Steel Wheels

219" wb @ 26,000# GVWR

(F-GAWR: 9,000# / R-GAWR: 17,000#)

TRANSIT Vocation

VERIFY SPECIFICATIONS ARE ACCURATE BEFORE PLACING AN ORDER
A DEALER COPY (without pricing) IS AVAILABLE UPON REQUEST



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		



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 1302 SPICEWOOD DRIVE
 OKEMOS, MI 48864
 Phone: 517-256-1557

Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD



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Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
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Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH,FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS



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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-002	FLAT LEAF SPRING REAR SUSPENSION WITH RADIUS ROD
621-004	SPRING SUSPENSION- 1.50" AXLE SPACE



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Data Code	Description
431-001	STANDARD U-BOLT PAD
623-005	FORE/AFT CONTROL RODS

Brake System

018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)

Wheelbase & Frame

545-555	5550MM (219 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-117	3175MM (125 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



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Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT FMV SEP WMIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT
Cab Interior	
707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN



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Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS

Application Version 9.2.008
 Data Version PRL-8H1.031
 MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	
TOTAL VEHICLE SUMMARY	

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.
 If weight is critical, contact Customer Application Engineering.



ROHRER

School & Commercial Bus Sales

Class E Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY
- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER 6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED - REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class E Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 219-S2 FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/SPRING SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	AUTOMATIC TIRE CHAINS
1	WHEEL CHOCKS - SHIP LOOSE
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS
1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"
1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)

1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS
1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDT'L REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT
1	TAG, REFRIDGERANT TAG - METAL
1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAINT, TIEDOWN QRT CBI 3.1 Q8100 TRK
16	STRAP QUICK SURELOK 16" EACH
2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape

2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT
1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	SAFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER
2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL
1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE
1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)
1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT ENTIRE BUS (UNDER 35') INCLUDES 3.9MM NOBLE SELECT FRP ONE COLOR NON-METALLIC (ROOF STAYS WHITE)
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR

9	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP
1	ICS DOUBLE, 2-ICS
27	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
27	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)
5	SEAT BELT EXTENSION 24"
11	FREEDMAN US ARM (FLIP UP)
22	PADDED AV GRAB HANDLE TOP BLACK
20	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS, SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

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A proposal for
Champion Bus: Dealer Copy

West Virginia PTR17*7

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Freightliner Custom Chassis Corp S2C

CHAMPION MY2018 Standard 2B

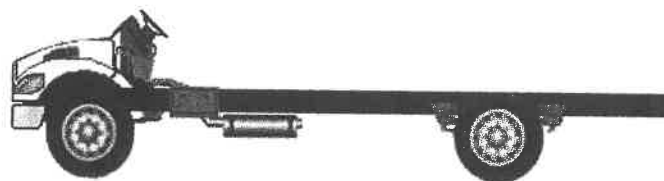
B6.7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michelins / Steel Wheels

219" wb @ 26,000# GVWR

(F-GAWR: 9,000# / R-GAWR: 17,000#)

TRANSIT Vocation

VERIFY SPECIFICATIONS ARE ACCURATE BEFORE PLACING AN ORDER
A DEALER COPY (without pricing) IS AVAILABLE UPON REQUEST



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		

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Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD



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Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
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Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH, FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS

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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-002	FLAT LEAF SPRING REAR SUSPENSION WITH RADIUS ROD
621-004	SPRING SUSPENSION- 1.50" AXLE SPACE



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Data Code	Description
431-001	STANDARD U-BOLT PAD
623-005	FORE/AFT CONTROL RODS

Brake System

018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)

Wheelbase & Frame

545-555	5550MM (219 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-117	3175MM (125 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



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Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT FW SEP WWIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT
Cab Interior	
707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN



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Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	

TOTAL VEHICLE SUMMARY

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.
 If weight is critical, contact Customer Application Engineering.



ROHRER

School & Commercial Bus Sales

Class F Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY
- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER
6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED -
REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class F Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 259-S2 FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/SPRING SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	WHEEL CHOCKS - SHIP LOOSE
1	AUTOMATIC TIRE CHAINS
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS

1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"
1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)
1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS
1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDT'L REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT
1	TAG, REFRIDGERANT TAG - METAL

1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAINT, TIEDOWN QRT CBI 3.1 Q8100 TRK
16	STRAP QUICK SURELOK 16" EACH
2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape
2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT
1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	SAFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER
2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL

1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE
1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)
1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT ENTIRE BUS (UNDER 35') INCLUDES 3.9MM NOBLE SELECT FRP ONE COLOR NON-METALLIC (ROOF STAYS WHITE)
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR
11	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP
1	ICS DOUBLE, 2-ICS
31	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
31	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)

5	SEAT BELT EXTENSION 24"
13	FREEDMAN US ARM (FLIP UP)
26	PADDED AV GRAB HANDLE TOP BLACK
24	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS,SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

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A proposal for
Champion Bus: Dealer Copy

West Virginia PTR 17*7

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Freightliner Custom Chassis Corp S2C

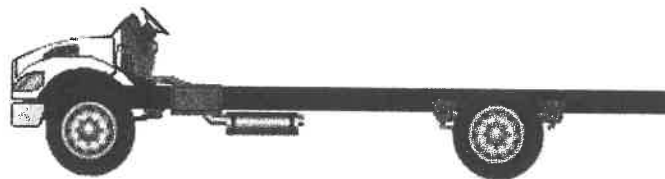
CHAMPION MY2018 Standard 4B

B6.7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michelins / Steel Wheels

259" wb @ 26,000# GVWR

(F-GAWR: 9,000# / R-GAWR: 17,000#)

TRANSIT Vocation



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std4B.Transit.B240.B220.2...



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SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		



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Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD



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Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
---------	--

Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH,FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS



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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-002	FLAT LEAF SPRING REAR SUSPENSION WITH RADIUS ROD
621-004	SPRING SUSPENSION- 1.50" AXLE SPACE



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Data Code	Description
431-001	STANDARD U-BOLT PAD
623-005	FORE/AFT CONTROL RODS

Brake System

018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)

Wheelbase & Frame

545-657	6575MM (259 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-141	3675MM (145 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



Prepared for:
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 Champion Bus
 331 Graham Road
 PO Box 158
 Imlay City, MI 48444
 Phone: (810) 724-1753 ext.371

Freightliner Custom Chassis Corporation

Prepared by:
 David Matusz
 Freightliner Custom Chassis
 1302 SPICEWOOD DRIVE
 OKEMOS, MI 48864
 Phone: 517-256-1557

Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT FW SEP WWIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT

Cab Interior

707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN



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Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	

TOTAL VEHICLE SUMMARY

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.
 If weight is critical, contact Customer Application Engineering.



ROHRER

School & Commercial Bus Sales

Class G Standard Features

SALES OPTIONS OVERRIDE STANDARDS

- *OEM BLOCK HEATER W/PLUG DSL ONLY
- *BATTERY BOX W/SLIDE TRAY POWDER COATED BLACK
- *DUAL BATTERIES - OEM OR AFTERMARKET AS LONG AS BOTH BATTERIES ARE THE SAME
- *30" MANUAL DOOR
- *BLACK STEEL POWDER COATED REAR BUMPER
- *SINGLE STEPWELL LIGHT
- *WHITE STEP NOSINGS
- *LONDON SMOKE INTERIOR
- *CARLSBAD CEILING
- *5/8" CDX PLYWOOD FLOOR
- *ANTI CORROSION PROTECTED STEP WELLS AND WINGS
- *REAR ESCAPE WINDOW
- *INTERIOR DOME LIGHTS
- *ENTRY DOOR STANCHION
- *LEFT AND RIGHT HAND GRABS
- *TRACK SEATING W/TRACK INSERT IN FLOOR ONLY
- *ROOF ONE PIECE COMPOSITE PER LF
- *2.54 FIBERGLASS EXTERIOR SIDEWALLS UP TO BUT NOT INCLUDING 29 FOOT IN LENGTH; 3.9 FIBERGLASS 29 FOOT AND LONGER
- *STEEL SKIRTS
- *30015-SEAL EXPOSED EXT PANEL CUT EDGES-
SEE VWI-2012-0061
- *RUB RAIL FOR 34' AND LONGER BODY
- *PAR-BOND SEALANT ON ROOF S LOCK FOR UNITS 35' AND LONGER
- *FIBERGLASS REAR CAP
- *ELECTRICAL FUSES
- *BLACK RIBBED RUBBER AISLE WITH CARPET UNDER THE SEATS
- *ANGLE CUT RIBBED RUBBER IN ENTRANCE AREA
- *REAR EXHAUST
- *REAR MUD FLAPS
- *TOP T-SLIDER WINDOWS
- *DRIP RAIL OVER PASSENGER WINDOWS
- *ROSCO MANUAL MIRRORS
- *STAINLESS STEEL DEF TANK COVER
6 GALLON TANK - 0423071
- *SIDE DIRECTIONAL LIGHTS (29' OR LONGER)
- *RUST INHIBITOR ON FLOOR FRAME AND SIDEWALLS BELOW WINDOWS
- *FULL BODY UNDERCOATING
- *EVAPORATOR CLOSE OUT PANEL IS REQUIRED WITH ANY A/C PACKAGE WITH A REAR A/C EVAPORATOR
- *ALL BATTERY CABLE TO BE 2/0 SGX
- *WHEN A LIFT IS OPTIONED, PARK BRAKE INTERLOCK VALVES ARE REQUIRED -
REFER TO VWI-2012-0088
- *FOAM INSULATION 1/2" THICK - R VALUE 8
- *S/S FUEL FILL DOOR
- *COAT WELDS ON SKIRTING AND OUTSIDE EDGE OF FLOOR FRAME COATING WITH RUST INHIBITOR

Class G Specifications

DEFENDER (FREIGHTLINER S2)	
1	DEFENDER 219-S2 FREIGHTLINER 6.7L CUMMINS ENGINE
1	2017 FREIGHTLINER S2C w/SPRING SUSPENSION 240HP
1	STICK ON RUBBER RUB RAIL
1	BOLT ON EXHAUST HANGERS (NO WELDING)
1	EXHAUST, STREET SIDE
1	WHEEL CHOCKS - SHIP LOOSE
1	AUTOMATIC TIRE CHAINS
1	ENGINE COMPARTMENT LIGHT LED 12" STRIP
1	EXTENSION, TIRE VALVE STEM
1	SPARE TIRE/WHEEL 19.5" SHIP LOOSE
1	SUSPENSION, CHASSIS FRONT END ALIGNMENT
1	AS BUILT WIRING DIAGRAMS
1	CIRCUIT BREAKERS IN LIEU OF FUSES
1	CLOCK QUARTZ DIGITAL
1	LAMINATED AS BUILTS
2	DEFROST FAN, EACH - 2 required - 1 is in elec package
1	FOG LIGHTS, FRONT BUMPER
1	ANGEL TRAX 6 CAMERA SYSTEM
1	LED INTERIOR LIFT LIGHT
1	FLASHERS TO ACTIVATE WITH LIFT DOOR
1	LIFT MASTER SWITCH W/INDICATOR LIGHT - LIFT DOOR AJAR
1	LIGHT, DOOR AJAR W/BUZZER (REAR DOOR)
1	DAYTIME RUNNING LIGHTS
1	SPERATE BRAKES FROM TUNRS
1	LIGHTS,LED INTERIOR DOME SINGLE EACH OPTRONICS - driver's courtesy center mounted - allow for full movement of sun visor
1	LIGHT,INTERIOR LED 12" STRIP SOUND OFF (8 LIGHTS)
1	LIGHT, REAR CENTER BRAKE "LED"

1	LIGHT, LED RED 4" EXTRA AUX BRAKE (mount just above rear door or window)
1	LIGHTS, LED ALL EXTERIOR STANDARD LIGHTS-INCLUDES SIDE DIRECTIONAL & REAR CENTER BRAKE LIGHT-ALSO INCLUDES GUARDED FRONT CLEARANCE LIGHTS
1	LIGHTS, LED ADA EXTERIOR ONLY
1	LIGHTS, SIDEMARKER LED ONLY - AMBER FRONT, RED REAR - PG 44
1	LIGHT, STROBE-ROOF MOUNTED
2	MASTER DISCONNECT SWITCH (BODY ONLY) - ONE TO CUT OFF SERVICES TO BODY ELECTRICAL PANEL - 2ND TO CUT OFF LIFT & CHASSIS
1	EXTERIOR KEY SWITCH
1	RADIO, AM/FM/CD PLAYER W/ 4 SPEAKERS REI
1	GOOSENECK MIC PA W/FOOTSWITCH REI
1	SPEAKER INTERIOR (4) ADDT'L REI (8 TOTAL) - need two in addition 6 total needed
1	SPEAKER DRIVER'S PREMIUM REI
1	BACK-UP CAMERA SYST 7" MON. & 1 CAM REI
1	RADIO, TWO WAY PREP
1	GERFLOOR FLOORING PER FOOT - blue
1	PLYWOOD, 3/4" MARINE TECH FLOOR
1	YELLOW STANDEE LINE
1	YELLOW STEP EDGE NOSINGS
1	125,000 BTU MAX A/C 6.7 CUMM M2 EM- ACT
1	TAG, REFRIDGERANT TAG - METAL
1	ELECTRIC HEATED ENTRANCE STEP (ONE STEP)
1	HEAT CIRCULATION PUMP
2	HEATER 65, 000 BTU
4	FLAPS, SKIRT MOUNTED CONDENSOR
1	BUMPER, ENERGY ABSORBING REAR (ROMEO RIM)
1	DOOR, ENTRANCE 40" ELECTRIC CUTAWAY W/AUTO REVERSE
1	TRANSIGN,VISTA LED DESTINATION FRT/SIDE
1	LIFT PKG BRAUN NCL1000FIBHB3451-2 403/4
2	POUCH, Q'STRAIT TIEDOWN - BLACK VINYL
1	PRIORITY SEATING SIGN
2	Q-STRAIT, TIEDOWN QRT CBI 3.1 Q8100 TRK

16	STRAP QUICK SURELOK 16" EACH
2	ESCAPE HATCH PRO LO #9245 - needs to be vent/escape
2	FIRE BLANKETS
4	EMERGENCY EXIT INDICATOR LIGHT
1	FRESNAL LENS
1	GRAB RAILS, CEILING
1	KICK OUT WINDOW (ADDITIONAL) - two curbside and two street side - 4 total
1	BIO-KIT, LARGE
1	MIRROR, INTERIOR 6.0" x 16.0"
1	MIRRORS ROSCO HTD/RMT M2
1	SAFETY PACKAGE INCLUDES BACK UP ALARM 5 # FIRE EXTINGUISHER FIRST AID KIT (13 UNIT) REFLECTOR TRIANGLES
1	SEAT BELT WEB CUTTER
2	STANCHION, PADDING BLACK (1 SET)
2	PADDED MODESTY PANEL
1	STANCHION, w/MODESTY/DRIVERS BARRIER
1	BARRIER, PLEXIGLASS
1	DECAL, "NO-SMOKING"
1	DECAL, "SEAT BELT MUST BE WORN AT ALL.."
1	DECAL, "EMERGENCY EQUIPMENT"
1	DECAL, EMERGENCY NUMBERS
1	DECAL, CLEARANCE HEIGHT
1	FAREBOX PREP
1	FAREBOX STANCHION
1	STORAGE COMP. OVER DRIVER 12 X 12 X 20
1	PASSENGER, PULL CORD YELLOW
1	PASSENGER, TOUCH TAPE
1	SIGNAL, CHIME 2-TONE (ADA)
1	SIGNAL, PASSENGER STOP REQUEST BULKHEAD MOUNTED
1	REFLECTIVE TAPE ALL THE WAY AROUND THE VEHICLE

1	NON-STOCK VINYL (PER COLOR) (CALL FOR QUOTE)
1	TOUCH UP PAINT SHIPPED LOOSE IN BUS
1	PAINT ENTIRE BUS (UNDER 35') INCLUDES 3.9MM NOBLE SELECT FRP ONE COLOR NON-METALLIC (ROOF STAYS WHITE)
7	PAINT WHEELS (BOTH SIDES) PER WHEEL
1	MID HI FEATHERWEIGHT RIGID W-DBL T-LEG FOR CENTER REAR
7	MID HI FEATHERWEIGHT RIGID w/T LEG DOUBLE
3	SEAT, 35" FSC TWO STEP FOLDAWAY FLIP
1	ICS DOUBLE, 2-ICS
23	LEVEL 3.5 FABRIC UPGRADE (PER PASSENGER)
1	COVER DRIVER SEAT LEVEL 4
23	SEAT BELT, 2 PT RETRACTABLE (N/A W-PERIMETER SEATS OR FLIP SEATS)
5	SEAT BELT EXTENSION 24"
9	FREEDMAN US ARM (FLIP UP)
18	PADDED AV GRAB HANDLE TOP BLACK
16	ABS FREEDMAN BACK PROTECTOR- NA ON HIGH BACK + ICS
2	FLAPS, SKIRT MOUNTED CONDENSOR GUARD - FRONT + REAR
1	CONSPICUITY TAPE - 2" WIDE - FULL LENGTH

Prepared for:
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A proposal for
Champion Bus: Dealer Copy
West Virginia PTR17*7
Prepared by
Freightliner Custom Chassis
David Matusz

Freightliner Custom Chassis Corp S2C

CHAMPION MY2018 Standard 2B
B6.7-240hp / B220 / HYD Disc Brakes with Air Provision / ADA / 19.5" Michelins / Steel Wheels
219" wb @ 26,000# GVWR
(F-GAWR: 9,000# / R-GAWR: 17,000#)
TRANSIT Vocation

VERIFY SPECIFICATIONS ARE ACCURATE BEFORE PLACING AN ORDER
A DEALER COPY (without pricing) IS AVAILABLE UPON REQUEST



Components shown may not reflect all spec'd options and are not to scale

Application Version 9.2.008
Data Version PRL-8H1.031
MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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SPECIFICATION PROPOSAL

Data Code	Description		
Price Level			
PRL-8H1	FCCC SHUTTLE BUS 2018 DATABOOK (EFF: 03/06/17)		
Data Version			
DRL-031	SPECPRO21 DATA RELEASE VER 031		
Vehicle Configuration			
001-342	S2C 106 CONVENTIONAL CAB AND CHASSIS	5,300	4,100
002-004	SET BACK AXLE - TRUCK		
003-001	LH PRIMARY STEERING LOCATION		
General Service			
A66-99D	EXPECTED FRONT AXLE(S) LOAD : 9000.0 lbs		
A68-99D	EXPECTED REAR DRIVE AXLE(S) LOAD : 17000.0 lbs		
ADJ-99D	GROSS VEHICLE WEIGHT ADJUSTMENT +/- : 0.0 lbs		
A63-99D	EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 26000.0 lbs		
AA1-005	CHASSIS CONFIGURATION		
A85-045	CITY TRANSIT BUS		
AA3-045	CHARTER/SHUTTLE/TRANSIT BUS/MOTOR COACH		
A84-1BU	BUS TRANSPORTATION BUSINESS SEGMENT		
AA4-014	PASSENGERS COMMODITY		
AA6-001	DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)		
AA5-002	TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS		
AB1-008	MAXIMUM 8% EXPECTED GRADE		
AB5-001	SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE		
AF3-039	CHAMPION MOTOR COACH		



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Data Code	Description
Engine	
101-21T	CUM B6.7 240 HP @ 2400 RPM, 2600 GOV, 560 LB/FT @ 1600 RPM
Engine Controls & Parameters	
162-002	IGNITION SWITCH CONTROLLED ENGINE STOP
99D-008	2008 CARB EMISSION CERTIFICATION WITH IDLE SHUTDOWN DISABLED - EXEMPTED
79A-085	85 MPH ROAD SPEED LIMIT
79B-020	CRUISE CONTROL SPEED LIMIT 75 MPH MAX ALLOWED
79G-998	NO IDLE SHUTDOWN CONFIGURATION
79K-017	PTO MODE ENGINE RPM LIMIT - 2300 RPM
79M-001	PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
79P-009	PTO RPM W/CRUISE SET SW - 1200 RPM
79Q-005	PTO RPM WITH CRUISE RESUME SWITCH - 1000 RPM
79S-009	PTO MODE CANCEL VEHICLE SPEED - 0 MPH
79U-006	PTO GOVERNOR RAMP RATE - 200 RPM PER SECOND
79W-001	ONE REMOTE PTO SPEED
79X-009	REMOTE PTO SPEED 1 SETTING - 1200 RPM
80G-002	PTO MINIMUM RPM - 700
80J-002	REGEN INHIBIT SPEED THRESHOLD - 5 MPH
80M-002	ALTERNATE SWITCH SPEED 950 RPM
80N-002	MAXIMUM ENGINE RPM = 2500 ON VSS FAILURE
Engine Equipment	
266-1AH	750 SQUARE INCH DOWNFLOW RADIATOR MOUNTED IN FRONT
105-001	ENGINE MOUNTED OIL CHECK AND FILL
111-001	STANDARD ENGINE OIL
190-001	DONALDSON 1-STAGE AIR CLEANER
188-050	AIR INTAKE THROUGH LH SIDE OF HOOD
189-001	AIR INTAKE PIPING - CLNR TO ENGINE
192-004	AIR CLEANER MOUNTED ON FIREWALL
124-1CE	LN 12V 320 AMP 4962PA PAD MOUNT ALTERNATOR
292-097	(2) ALLIANCE MODEL 1131, GROUP 31, 12V MAINTENANCE FREE 1900 CCA THREADED STUD BATTERIES



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Data Code	Description
290-004	TEMPORARY MOUNTED WOODEN BATTERY BOX MOUNTED ON FRAME
282-045	SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB 62" (1575MM) AFT OF STD
291-001	FRAME GROUND RETURN FOR BATTERY CABLES
293-998	NO BATTERY SHUTOFF SWITCH
107-032	CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
108-002	STD MECH AIR COMP GOV
131-012	STEEL AIR COMPRESSOR DISCHARGE LINE
152-049	ELEC ENG INT WARNING & DERATE PROTECTIONSYS W/SEP LOW COOLANT LVL LIGHT & BUZZER
128-076	CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
28F-002	ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
234-025	HORIZONTAL DIESEL PARTICULATE FILTER AFTERTREATMENT DEVICE
235-076	RH IB FRAME MTD HZ ATD
23U-009	10 GALLON DEF TANK LH FRAME MTD
23C-001	HORIZONTAL SCR CATALYST
23D-001	RH IB FRAME MTD HZ SCR CATALYST
35W-001	EXHAUST MITIGATION DEVICE FTL 4" ID SLIP-FIT
237-072	HORIZONTAL TAILPIPE, EXIT LH REAR OF CHASSIS
273-004	BORG WARNER VISCOUS FAN DRIVE
110-003	CUMMINS SPIN ON FUEL FILTER
118-001	FULL FLOW OIL FILTER
267-001	REMOTE MOUNTED SURGE TANK
103-039	ANTIFREEZE TO -34F, OAT (NITRITE & SILICATE FREE) EXTENDED LIFE COOLANT
171-007	GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
172-016	CONSTANT TORQUE BREEZE CLAMPS ON 1" IN DIA AND GREATER, SS CLAMPS LESS THAN 1"
261-001	STANDARD CHARGE AIR COOLER PLUMBING
270-998	NO OPTIONAL RADIATOR PLUMBING
168-002	LOWER RADIATOR GUARD



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OKEMOS, MI 48864
Phone: 517-256-1557

Data Code	Description
138-010	PHILLIPS-TEMRO 750 WATT/115 VOLT BLOCK HEATER
140-010	CHROME ENGINE HEATER RECEPTACLE TEMPORARILY MOUNTED TO ENGINE
134-001	ALUMINUM FLYWHEEL HOUSING
155-023	NIPPON-DENSO 12V STARTER WITH COPPER CONTACTS

Transmission

342-1MW	ALLISON B220 AUTOMATIC TRANSMISSION WITH PARK PAWL WITHOUT PTO PROVISION
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Transmission Controls & Parameters

353-032	VEHICLE INTERFACE WIRING WITH ADA INTERLOCKS
343-301	PKG 354 - 1K/2K RDS/EVS/HS/MH/PTS/SPS - 5TH GEN
97F-002	ALLISON TRANS - SEM/LRTP REQ
97G-001	TRANS PROG-ENABLED
84C-100	6M1-PRIMARY MODE GEARS
84L-017	DSS, ARM, FS; DSS-DISABLED, ARM-DISABLED, FS-DISABLED
85B-011	RANGE INDICATION,PARK,NEUT
84U-001	SECONDARY MODE INPUT - MODE SWITCH,FOR 1000/2000 PRODUCT FAMILIES ONLY
84W-002	AUX RNG INHIBIT,WIRED
345-036	T-HANDLE CABLE SHIFT CONTROL WITH PARK POSITION FOR INTERNAL PARK PAWL

Transmission Equipment

370-015	WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK
346-001	TRANSMISSION OIL CHECK AND FILL
35T-001	SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

Front Axle & Equipment

400-1A5	DA-F-10.0-3 10,000# FF1 71.5 KPI/3.74DROP SINGLE FRONT AXLE
403-002	NON-ASBESTOS FRONT BRAKE LINING
402-054	BOSCH HYDRAULIC PIN-SLIDE DISC FRONT BRAKES
419-004	FRONT DISC BRAKE ROTORS
418-045	CONMET PRE-SET BEARING IRON FRONT HUBS



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Data Code	Description
409-021	SKF SCOTSEAL PLUS XL FRONT OIL SEALS
408-001	VENTED FRONT HUB CAPS W/WINDOW, CENTER AND SIDE PLUGS - OIL
40T-001	ORGANIC SAE 80/90 FRONT AXLE LUBE
416-022	STANDARD SPINDLE NUTS FOR ALL AXLES
618-002	STANDARD CUPS AND CONES (WHEEL BEARINGS) FRONT AND REAR
536-050	TRW THP-60 POWER STEERING
539-003	POWER STEERING PUMP
534-015	2 QUART SEE THROUGH POWER STEERING RESERVOIR

Front Suspension

620-019	9,000# TAPERLEAF FRONT SUSPENSION
619-005	MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
629-998	NO FRONT SWAYBAR
410-017	SACHS FRONT SHOCK ABSORBERS

Rear Axle & Equipment

420-279	DA-RS-17.0-4 17,000# L-SERIES SINGLE REAR AXLE
421-478	4.78 REAR AXLE RATIO
424-001	IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
386-055	SPL100 DANA SPICER MAIN DRIVELINE WITH HALF ROUND YOKES
41T-001	ORGANIC SAE 80/90 REAR AXLE LUBE
393-001	DRIVELINE GUARD
423-054	BOSCH HYDRAULIC PIN-SLIDE DISC REAR BRAKES
433-002	NON-ASBESTOS REAR BRAKE LINING
451-005	REAR DISC BRAKE ROTORS
440-001	SKF SCOTSEAL CLASSIC REAR OIL SEALS
435-009	REAR AXLE MOUNTED AIR OPERATED DRUM PARK BRAKE

Rear Suspension

622-002	FLAT LEAF SPRING REAR SUSPENSION WITH RADIUS ROD
621-004	SPRING SUSPENSION- 1.50" AXLE SPACE



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Data Code	Description
431-001	STANDARD U-BOLT PAD
623-005	FORE/AFT CONTROL RODS

Brake System

018-003	BOSCH HYDRAULIC BRAKE PACKAGE WITH OPTIONAL AIR SUPPLY
490-032	WABCO HYDRAULIC 4S/4M WITHOUT TRACTION CONTROL
871-011	HYDRAULIC TUBING WITH NYLON AND FABRIC/WIRE BRAID CHASSIS AIR LINES
901-006	HYDRAULIC HOSE/LINE FRONT SERVICE BRAKES
902-006	HYDRAULIC HOSE/LINE REAR SERVICE BRAKES
904-009	NYLON PARKING BRAKE HOSE
46D-002	STANDARD AIR SYSTEM PRESSURE PROTECTION
46E-001	STANDARD AIR MANAGEMENT UNIT
480-083	WABCO SS-1200 PLUS AIR DRYER W/INTEGRAL AIR GOVERNOR AND HEATER
479-003	AIR DRYER MOUNTED INBOARD ON LH RAIL
483-004	WABCO OIL COALESCING FILTER FOR AIR DRYER
460-077	ONE STEEL AIR BRAKE RESERVOIR MTD INSIDE RAIL
477-024	BW DV-2 AUTO DRAIN VALVE WITH HEATER ON ALL TANK(S)

Wheelbase & Frame

545-555	5550MM (219 INCH) WHEELBASE
546-080	5/16X3.00X10-1/8 INCH STEEL FRAME (7.94MMX257.2MM/0.312X10.13 INCH) 80KSI
552-117	3175MM (125 INCH) REAR FRAME OVERHANG
553-001	SQUARE END OF FRAME
550-001	FRONT CLOSING CROSSMEMBER
559-001	STANDARD WEIGHT ENGINE CROSSMEMBER
562-001	STANDARD MIDSHIP #1 CROSSMEMBER(S)
565-001	STANDARD SUSPENSION CROSSMEMBER



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Data Code	Description
Chassis Equipment	
556-1AR	THREE-PIECE 14 INCH CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS
558-001	FRONT TOW HOOKS - FRAME MOUNTED
574-001	BUMPER MOUNTING FOR SINGLE LICENSE PLATE
586-024	FENDER & FRONT OF HOOD MOUNTED FRONT MUDFLAPS
551-006	ZINC PLATED HEX HEADED FRAME FASTENERS
Fuel Tanks	
230-001	60 GALLON/227 LITER RECTANGULAR STEEL FUEL TANK - BETWEEN RAILS
5A3-003	PETROLEUM DIESEL FUEL
205-009	LH SIDEFILL FUEL TANK CAP
122-1J2	DETROIT FW SEP WWIFSENSOR & HAND PRIMER
Tires	
093-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL FRONT TIRES
094-0E5	MICHELIN XZE 245/70R19.5 16 PLY RADIAL REAR TIRES
Hubs	
450-002	GUNITE IRON REAR AXLE HUBS
Wheels	
502-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 5.12 INSET 4-HAND STEEL DISC FRONT WHEELS
505-1EB	ACCURIDE 50180 19.5X6.75 8-HUB PILOT 4-HAND STEEL DISC REAR WHEELS
498-049	FREIGHTLINER VALVE STEMS
Cab Exterior	
829-071	106" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB
651-004	LH CAB DOOR(S) WITH 70 DEGREE DOOR STOP
653-997	OMIT STANDARD RH DOOR ASSEMBLY
655-025	LH CAB DOOR LATCHES WITH MANUAL DOOR LOCKS, NO RH DOOR LOCK
682-085	OPENING IN BACK OF CAB W/TEMPORARY STRUCTURE
650-009	RUBBER CAB MOUNTS
664-001	PLAIN STEP FINISH



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Data Code	Description
644-053	FIBERGLASS HOOD WITH SOFT CLOSE MECHANISM
690-010	ENGINE COMPARTMENT PREMIUM NOISE ABATEMENT AND INSULATION
646-023	HOOD MOUNTED CHROMED PLASTIC GRILLE
65X-003	CHROMED HOOD MOUNTED AIR INTAKE GRILLE
726-002	DUAL ELECTRIC HORNS
657-1A8	ALL UNIT(S) KEYED ALIKE WITH CUSTOMER SPECIFIED KEY NUMBER FT1021
312-038	INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
311-015	DAYTIME RUNNING LIGHTS ON FRONT TURN LAMPS WITH ENGINE RUNNING
294-027	WIRING ONLY WITH SEPARATE STOP AND TURN LIGHT CIRCUITS TO END OF FRAME FOR CUSTOMER FURNISHED LAMPS
300-015	STANDARD FRONT TURN SIGNAL LAMPS
744-1D9	LH ONLY WEST COAST MOLDED-IN COLOR MIRROR
797-001	DOOR MOUNTED MIRRORS
743-1A3	LH 8" MOLDED-IN COLOR CONVEX MIRROR MTD UNDER PRIMARY MIRROR
729-001	STANDARD SIDE/REAR REFLECTORS
677-058	DUAL LEVEL ENTRY STEPS LH ONLY
768-997	OMIT REAR WINDOW(S)
661-020	TINTED DOOR GLASS LH WITH TINTED LH NON-OPERATING WING WINDOWS, NO RH WINDOW
654-024	LH MANUAL WINDOW REGULATOR, NO RH REGULATOR
663-019	1-PIECE TINTED ROPED-IN WINDSHIELD
659-003	1 GALLON WINDSHIELD WASHER RESERVOIR
335-004	UPGRADED CHASSIS MULTIPLEXING UNIT

Cab Interior

707-1AK	OPAL GRAY VINYL INTERIOR
772-006	BLACK MATS WITH SINGLE INSULATION
785-004	DASH MOUNTED ASH TRAY(S) WITHOUT LIGHTER
691-997	OMIT STANDARD FORWARD OVERHEAD CONSOLE
694-010	IN DASH STORAGE BIN

Application Version 9.2.008
 Data Version PRL-8H1.031
 MY18.CHAMP.S2C.Std2B.Transit.B240.B220.2...



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Data Code	Description
742-007	(2) CUP HOLDERS LH AND RH DASH
680-006	GRAY/CHARCOAL FLAT DASH
130-026	(1) SANDEN COMPACT & (1) SELTEC #TM-21 REFRIGERANT COMPRESSOR
700-002	HEATER, DEFROSTER AND AIR CONDITIONER
703-005	MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
698-001	RADIATOR MOUNTED AIR CONDITIONER CONDENSER
702-022	BINARY CONTROL, R-134A WITH DASH AIR CONDITIONER PLUMBED AND SECONDARY COMPRESSOR UNPLUMBED
170-041	ADDITIONAL AUXILIARY LINES WITH MANIFOLD PLUMBING AND COMBINED SHUTOFF TO DASH AND AUXILIARY HEATER
739-034	PREMIUM INSULATION
285-020	SOLID-STATE CIRCUIT PROTECTION, PDMS W/FUSES & BRKRS, PDC W/FUSES & BRKR
324-074	LH/RH DOOR ACTIVATED DOME LT W/3-WAY SW & COURTESY LIGHTS MOUNTED ON ALL DOORS
32H-013	STEPWELL LAMP ON WITH DOOR(S) OPEN
284-023	(1) 12 VOLT POWER SUPPLY IN DASH
756-1D9	PREM HB AIR SUSP ST W/3 CHMBR AIR LMBR, INT CUSH EXT,FWD&RR TILT, ADJ SHK
760-997	OMIT STANDARD FRONT PASSENGER SEAT
757-998	NO SUSPENSION COVER FOR DRIVER SEAT
759-009	INBOARD DRIVER SEAT ARMREST, NO PASSENGER SEAT ARMREST
711-006	LH INTEGRAL DOOR PANEL ARMREST, NO RH ARMREST
758-022	BLACK MORDURA CLOTH DRIVER SEAT COVER
763-031	3 POINT FIXED D-RING RETRACTOR DRIVER SEAT BELT; NO PASSENGER BELT
706-013	MOLDED PLASTIC DOOR PANEL
693-003	PLASTIC MANIFEST BOX - LH DOOR
532-002	ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
540-015	4-SPOKE 18 INCH (450MM) STEERING WHEEL
765-002	DRIVER AND PASSENGER INTERIOR SUN VISORS



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Data Code	Description
Instruments & Controls	
732-004	GRAY DRIVER INSTRUMENT PANEL
734-004	GRAY CENTER INSTRUMENT PANEL
870-001	BLACK GAUGE BEZELS
811-042	ICU3S, 132X48 DISPLAY W/DIAGNOSTICS, 28 LED WRNG LAMPS & DATA LINKED
810-027	ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
812-001	ELECTRONIC 3000 RPM TACHOMETER
840-007	SINGLE AIR PRESSURE GAUGE FOR HYDRAULIC BRAKES WITH AIR PROVISION
852-002	ELECTRIC ENGINE OIL PRESSURE GAUGE
856-001	ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
836-015	DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
844-001	2 INCH ELECTRIC FUEL GAUGE
864-005	TRANSMISSION OIL TEMPERATURE INDICATOR LIGHT
486-001	LOW AIR PRESSURE LIGHT AND BUZZER
830-017	ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY
198-025	INTAKE MOUNTED AIR RESTRICTION INDICATOR WITHOUT GRADUATIONS
149-013	ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
160-025	DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
148-079	PROG RPM CTRL WITH A/C OR 12.75V LOW VOLTAGE AUTO HIGH IDLE
660-008	SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
304-001	MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
882-050	ONE VALVE PARKING BRAKE SYSTEM W/WARNING INDICATOR AND CUSTOMER CONTROLLED PARK BRAKE RELEASE SOLENOID
299-013	SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
298-039	INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS



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Data Code	Description
Design	
065-196	PAINT: ONE SOLID COLOR; BASE/CLEARCOAT
Color	
980-NC8	CAB COLOR A: B9145EB OXFORD WHITE ELITE BC
98A-998	NO GRILLE PAINT
986-019	CHASSIS PAINT: VENDOR BLACK
962-972	POWDER WHITE (N0006EA) FRT WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
966-972	POWDER WHITE (N0006EA) REAR WHEELS/RIMS(PKWHT21, TKWHT21, W, TW)
Basic Chassis Warranty	
995-011	FREIGHTLINER CUSTOM CHASSIS CORPORATION BASIC CHASSIS WARRANTY
Certification / Compliance	
996-001	U.S. FMVSS CERTIFICATION
Sales Programs	
NO SALES PROGRAMS HAVE BEEN SELECTED	

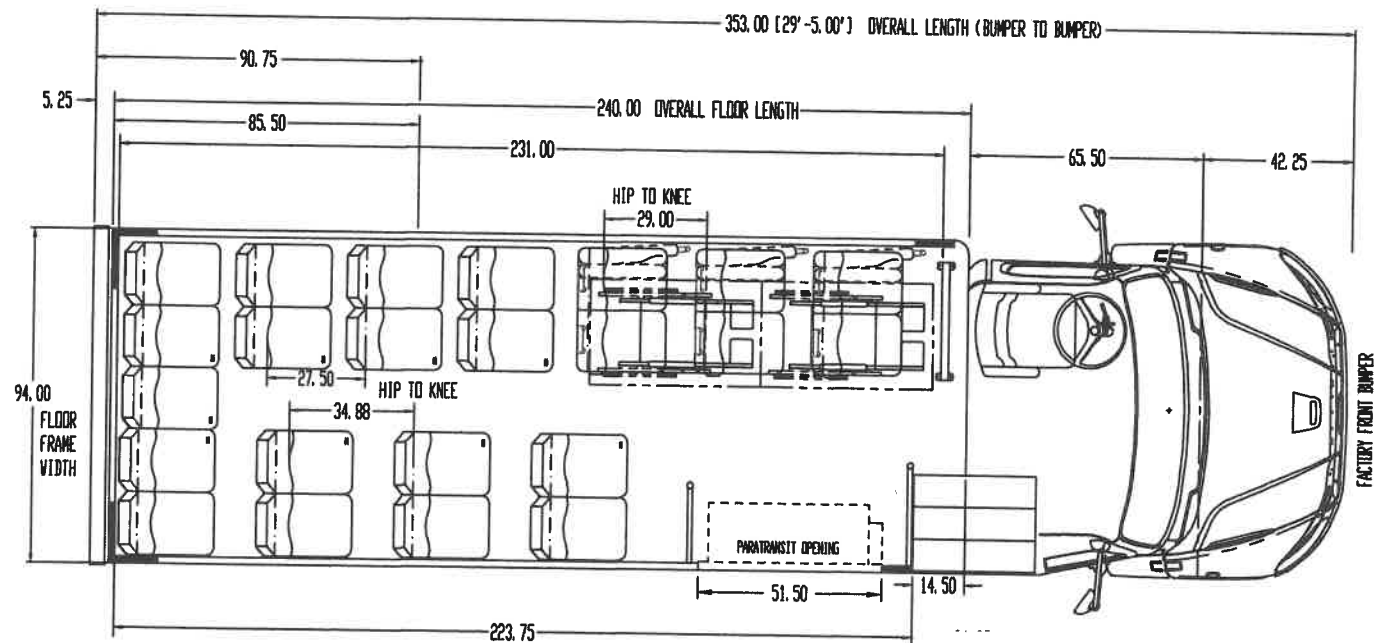
TOTAL VEHICLE SUMMARY

Weight Summary			
	Weight Front	Weight Rear	Total Weight
Factory Weight ⁺	5300 lbs	4100 lbs	9400 lbs
Total Weight ⁺	5300 lbs	4100 lbs	9400 lbs

(+) Weights shown are estimates only.

If weight is critical, contact Customer Application Engineering.





						PART NO. CB002748	MATERIAL: FREEDMAN SEATS - HTD HI FEATHERWEIGHT	PURCH./MFG.: MFG
						CHAMPION	TOLERANCES UNLESS OTHERWISE NOTED	TITLE:
						BUS INC.	.XX = .03	FLOORPLAN - 291 FL
							.XXX = .020	23 PASSENGERS & (2) W/C'S
							X" = 1"	MODEL
REV	DATE	ECN	DESC. OF CHANGES	BY	APP'D	ECN # N/A	DO NOT SCALE	SCALE:
								APP'D
								DATE:
								DATE:
								MODEL FREIGHTLINER CHASSIS

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINE DSL	Vehicle Type: DF310 Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS A Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR	REFERENCE UNIT 22589.00
		26000	9880	17500	

Model type **FL** Chassis Code FP #: **CB002748**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)
 ADDED FUEL FROM CALCULATED FUEL SHEET
 EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs) 3600.00
 (150 lbs x 24) (number of designated seating positions)
 WHEEL CHAIRS IF USED X

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY 139.52

ADJUSTED LATERAL CENTER OF GRAVITY -0.16

ADJUSTED REAR WEIGHT 12847.92

ADJUSTED FRONT WEIGHT 7411.58

ADJUSTED 4 CORNER WEIGHT

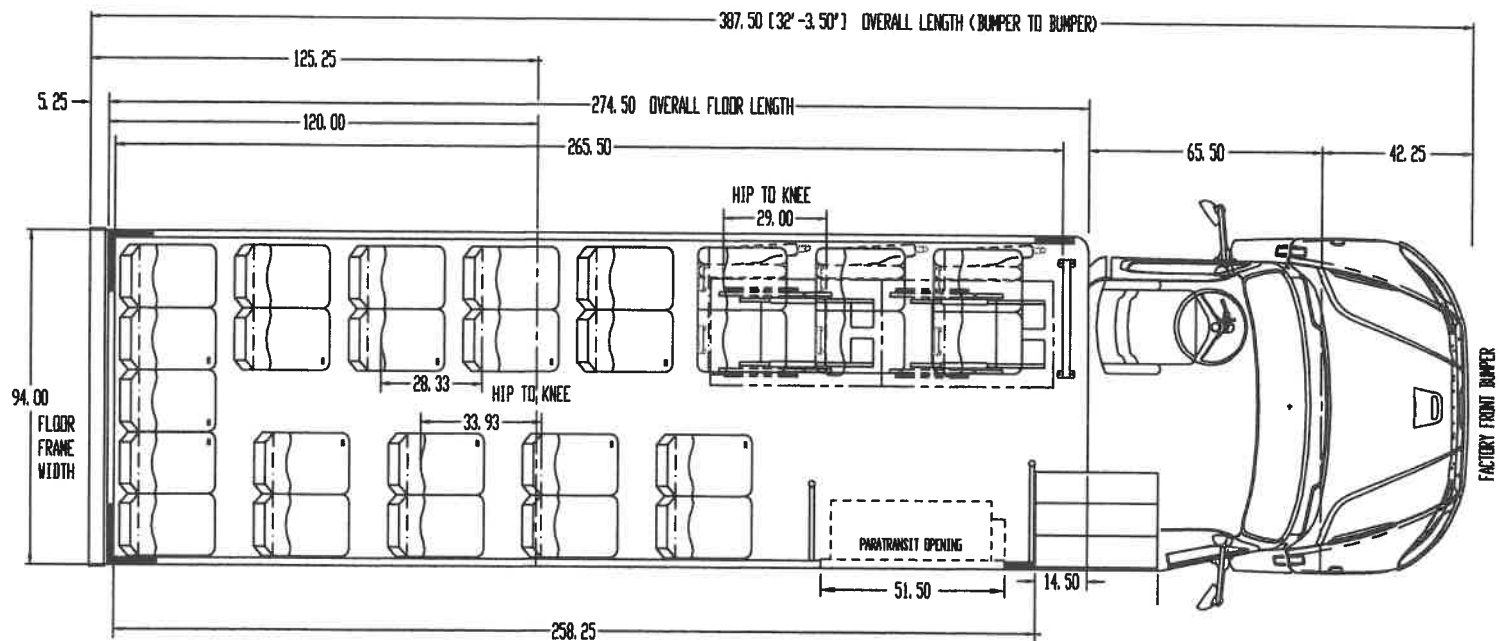
Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3402.00	3490.00	4456.00	4368.00	15716.00
95.45	95.45	35.80	35.80	262.50
21.57	21.57	318.93	318.93	681.00
145.78	139.76	1691.76	1622.71	3600.00
3664.80	3746.78	6502.48	6345.43	20259.50
3664.80	3746.78	6502.48	6345.43	20259.50

TOTAL FRONT	7411.58	2468.42	TOTAL REAR	12847.92	4652.08
IS THE FRONT GAWR OVER	NO	IS THE REAR GAWR OVER	NO		

PASS/FAIL ANALYSIS		Is Lft-Frt/2 Exceeded?	Is Rt-Frt/2 Exceeded?
GVWR (lbs.) 26000.00	LOADED VEHICLE WEIGHT (lbs.) 20259.50	Is GVWR Exceeded? NO	
		5740.50	
Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is (NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.)		N/A lbs..	
The actual completed weight (UVW) of this vehicle is 15978.50 lbs.		Is Maximum UVW Exceeded? NO	

DEFINITIONS	
"UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use.	
"GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM).	
"LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo. Vehicles with tanks for water and/or LP gas must also account for the weight of these fluids in the cargo calculations.	

WV-CLASS A



						PART NO. CB002749	MATERIAL: FREEDMAN SEATS - MID HI FEATHERWEIGHT	PURCH./MFG.: MFG.
						CHAMPION BUS INC.	TOLERANCES UNLESS OTHERWISE NOTED .XX = .03 .XXX = .020 X = 1"	TITLE: FLOORPLAN - 311 FL
						ECN # N/A	DO NOT SCALE	DATE: 1
REV	DATE	ECN	DESC. OF CHANGES	BY	APP'D		SCALE:	DATE:
							APP'D	DATE:
								MODEL FREIGHTLINER CHASSIS

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINE DSL	Vehicle Type: DF310	Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS B	Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR
		26000	9880	17500

REFERENCE UNIT 22589.00

Model type **FL** Chassis Code **FP #: CB002749**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)
 ADDED FUEL FROM CALCULATED FUEL SHEET
 EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs) **4200.00**
 (150 lbs x **28** (number of designated seating positions))
 WHEEL CHAIRS IF USED ☐ X ☐

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY **146.17**

ADJUSTED LATERAL CENTER OF GRAVITY **-0.15**

ADJUSTED REAR WEIGHT **13945.36**

ADJUSTED FRONT WEIGHT **7044.14**

ADJUSTED 4 CORNER WEIGHT

Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3402.00	3490.00	4456.00	4368.00	15716.00
95.45	95.45	35.80	35.80	262.50
-13.43	-13.43	418.93	418.93	811.00
-6.07	-5.85	2143.57	2068.35	4200.00
3477.96	3566.18	7054.29	6891.07	20989.50
3477.96	3566.18	7054.29	6891.07	20989.50

TOTAL FRONT 7044.14 2835.86 **TOTAL REAR** 13945.36 3554.64
 IS THE FRONT GAWR OVER **NO** IS THE REAR GAWR OVER **NO**

PASS/FAIL ANALYSIS	Is Lft-Frt/2 Exceeded?	Is Rt-Frt/2 Exceeded?
GVWR (lbs.) 26000.00	LOADED VEHICLE WEIGHT (lbs.) 20989.50	Is GVWR Exceeded? NO
	5010.50	
Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is N/A lbs.. (NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.)		
The actual completed weight (UVW) of this vehicle is 15978.50 lbs. Is Maximum UVW Exceeded? NO		

DEFINITIONS

"UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use.

"GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM).

"LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo.

Vehicles with tanks for water and/or LP gas must also account for the weight of these fluids in the cargo calculations.

WV-CLASS B

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINER DSL	Vehicle Type: DF350 Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS C Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR	REFERENCE UNIT 20364.00
259.00	26000	9880	17500		

Model type **FL** Chassis Code **FP #: CB002750**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)
 ADDED FUEL FROM CALCULATED FUEL SHEET
 EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs) **4800.00**
 (150 lbs x **32** (number of designated seating positions))
 WHEEL CHAIRS IF USED ☐ X ☐

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY **167.05**

ADJUSTED LATERAL CENTER OF GRAVITY **-1.17**

ADJUSTED REAR WEIGHT **14676.62**

ADJUSTED FRONT WEIGHT **8078.38**

ADJUSTED 4 CORNER WEIGHT

Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3935.00	3790.00	5000.00	4580.00	17305.00
52.05	52.05	52.95	52.95	210.00
-56.82	-56.82	276.82	276.82	440.00
184.32	178.58	2253.21	2183.88	4800.00
4114.56	3963.82	7582.97	7093.64	22755.00

TOTAL FRONT **8078.38** **1801.62** **TOTAL REAR** **14676.62** **2823.38**
 IS THE FRONT GAWR OVER **NO** IS THE REAR GAWR OVER **NO**

PASS/FAIL ANALYSIS GVWR (lbs.) 26000.00 Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is (NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.) The actual completed weight (UVW) of this vehicle is 17515.00 lbs.	Is Lft-Frt/2 Exceeded? Is Rt-Frt/2 Exceeded? LOADED VEHICLE WEIGHT (lbs.) 22755.00 Is GVWR Exceeded? NO 3245.00 N/A lbs.. Is Maximum UVW Exceeded? NO
---	--

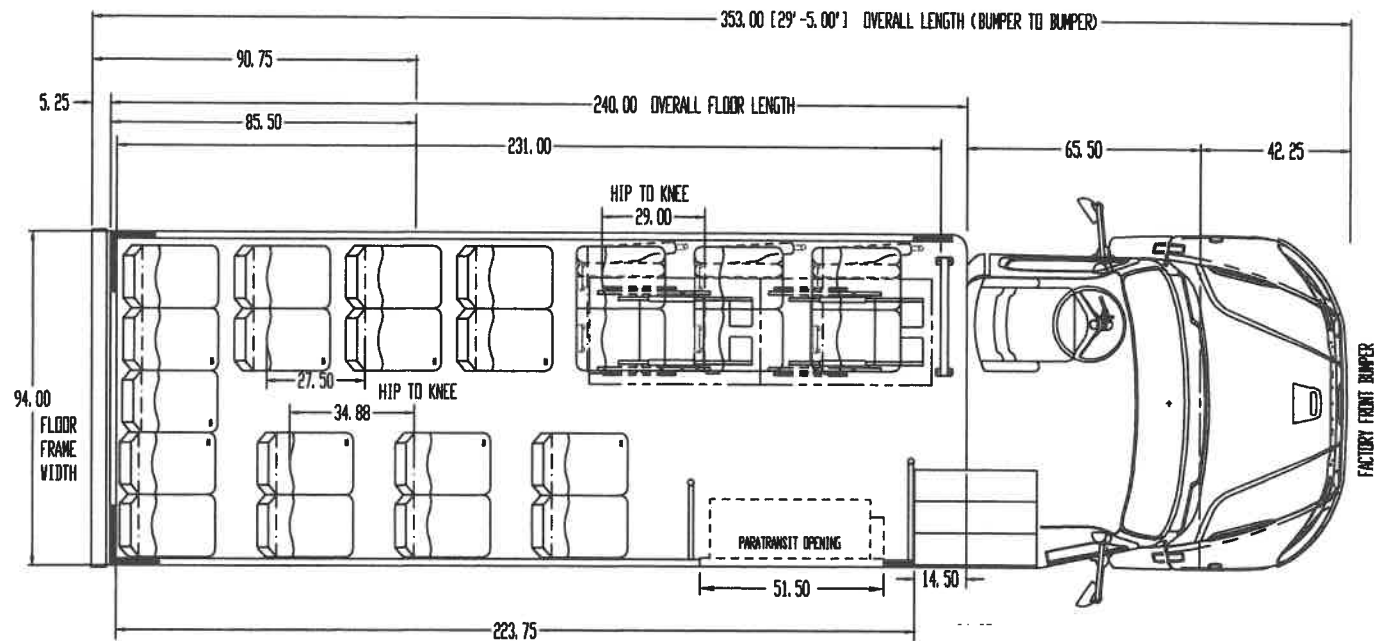
DEFINITIONS

"UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use.

"GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM).

"LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo. Vehicles with tanks for water and/or LP gas must also account for the weight of these fluids in the cargo calculations.

WV-CLASS C



						PART NO. CB002748	MATERIAL: FREEDMAN SEATS - MID HI FEATHERWEIGHT	PURCH./MFG.: MFL
						CHAMPION BUS INC.	TOLERANCES UNLESS OTHERWISE NOTED .XX = .03 .XXX = .020 X" = 1"	TITLE: FLOORPLAN - 291 FL
						ECN # N/A	DO NOT SCALE	23 PASSENGERS & (2) W/C'S
REV	DATE	ECN	DESC. OF CHANGES	BY	APP'D			MODEL FREIGHTLINER CHASSIS

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINE DSL	Vehicle Type: DF310	Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS D	Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR
		26000	9880	17500

REFERENCE UNIT 22589.00

Model type **FL** Chassis Code **FP #: CB002748**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)
 ADDED FUEL FROM CALCULATED FUEL SHEET
 EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs) **3600.00**
 (150 lbs x **24** (number of designated seating positions))
 WHEEL CHAIRS IF USED ☐ X ☐

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY **138.88**

ADJUSTED LATERAL CENTER OF GRAVITY **-0.16**

ADJUSTED REAR WEIGHT **12709.37**

ADJUSTED FRONT WEIGHT **7423.13**

ADJUSTED 4 CORNER WEIGHT

Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3402.00	3490.00	4456.00	4368.00	15716.00
95.45	95.45	35.80	35.80	262.50
27.34	27.34	249.66	249.66	554.00
145.78	139.76	1691.76	1622.71	3600.00
3670.57	3752.55	6433.21	6276.16	20132.50
3670.57	3752.55	6433.21	6276.16	20132.50

TOTAL FRONT **7423.13** **2456.87** **TOTAL REAR** **12709.37** **4790.63**
 IS THE FRONT GAWR OVER **NO** IS THE REAR GAWR OVER **NO**

PASS/FAIL ANALYSIS GVWR (lbs.) 26000.00	Is Lft-Frt/2 Exceeded?	Is Rt-Frt/2 Exceeded?	Is GVWR Exceeded? NO
LOADED VEHICLE WEIGHT (lbs.) 20132.50	5867.50		
Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is N/A lbs.. (NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.)			
The actual completed weight (UVW) of this vehicle is 15978.50 lbs.	Is Maximum UVW Exceeded? NO		

DEFINITIONS "UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use. "GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM). "LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo. Vehicles with tanks for water and/or LP gas must also account for the weight of these fluids in the cargo calculations.
--

WV-CLASS D

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINE® DSL	Vehicle Type: DF310	Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS E	Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR
		26000	9880	17500

REFERENCE UNIT 22589.00

Model type **FL** Chassis Code **FP #: CB002749**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)
ADDED FUEL FROM CALCULATED FUEL SHEET
EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs) **4200.00**
(150 lbs x **28** (number of designated seating positions))
WHEEL CHAIRS IF USED ☐ X ☐

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY **145.60**

ADJUSTED LATERAL CENTER OF GRAVITY **-0.15**

ADJUSTED REAR WEIGHT **13806.82**

ADJUSTED FRONT WEIGHT **7055.68**

ADJUSTED 4 CORNER WEIGHT

Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3402.00	3490.00	4456.00	4368.00	15716.00
95.45	95.45	35.80	35.80	262.50
-7.65	-7.65	349.65	349.65	684.00
-6.07	-5.85	2143.57	2068.35	4200.00
3483.73	3571.95	6985.01	6821.80	20862.50
3483.73	3571.95	6985.01	6821.80	20862.50

TOTAL FRONT 7055.68 2824.32 **TOTAL REAR** 13806.82 3693.18
IS THE FRONT GAWR OVER **NO** IS THE REAR GAWR OVER **NO**

PASS/FAIL ANALYSIS	Is Lft-Frt/2 Exceeded?	Is Rt-Frt/2 Exceeded?
GVWR (lbs.) 26000.00	LOADED VEHICLE WEIGHT (lbs.) 20862.50	Is GVWR Exceeded? NO
Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is N/A lbs. (NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.)		
The actual completed weight (UVW) of this vehicle is 15978.50 lbs.		Is Maximum UVW Exceeded? NO

DEFINITIONS

"UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use.

"GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM).

"LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo. Vehicles with tanks for water and/or LP gas must also account for the weight of these fluids in the cargo calculations.

WV-CLASS E

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINER DSL	Vehicle Type: DF350	Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS F	Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR	REFERENCE UNIT 20364.00
259.00	26000	9880	17500		

Model type **FL** Chassis Code **FP #: CB002750**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)
 ADDED FUEL FROM CALCULATED FUEL SHEET
 EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs) **4800.00**
 (150 lbs x **32** (number of designated seating positions))
 WHEEL CHAIRS IF USED ☐ X ☐

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY **167.18**

ADJUSTED LATERAL CENTER OF GRAVITY **-1.17**

ADJUSTED REAR WEIGHT **14700.63**

ADJUSTED FRONT WEIGHT **8074.37**

ADJUSTED 4 CORNER WEIGHT

Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3935.00	3790.00	5000.00	4580.00	17305.00
52.05	52.05	52.95	52.95	210.00
-58.82	-58.82	288.82	288.82	460.00
184.32	178.58	2253.21	2183.88	4800.00
4112.55	3961.81	7594.98	7105.65	22775.00
4112.55	3961.81	7594.98	7105.65	22775.00

TOTAL FRONT	8074.37	1805.63	TOTAL REAR	14700.63	2799.37
IS THE FRONT GAWR OVER	NO	IS THE REAR GAWR OVER	NO		

PASS/FAIL ANALYSIS GVWR (lbs.) 26000.00	Is Lft-Frt/2 Exceeded? Is Rt-Frt/2 Exceeded?	LOADED VEHICLE WEIGHT (lbs.) 22775.00 3225.00 Is GVWR Exceeded? NO
Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is N/A lbs.. (NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.)		
The actual completed weight (UVW) of this vehicle is 17515.00 lbs. Is Maximum UVW Exceeded? NO		

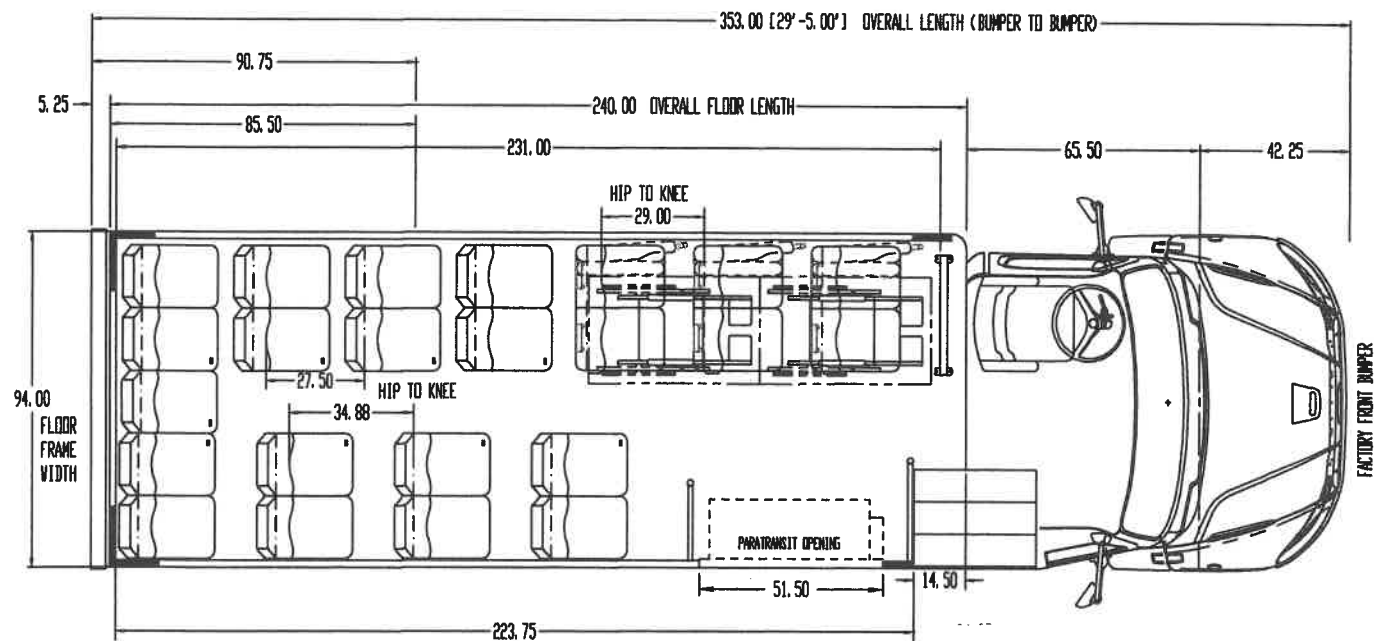
DEFINITIONS

"UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use.

"GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM).

"LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo. Vehicles with tanks for water and/or LP gas must also account for the weight of these fluids in the cargo calculations.

WV-CLASS F



						<div>PART NO. CB002748</div> <div>CHAMPION BUS INC.</div> <div>ECN # N/A</div> <div>DO NOT SCALE</div>	MATERIAL: FREEDMAN SEATS - MID HI FEATHERWEIGHT		PURCH./MFG.: MFG.		
							TOLERANCES UNLESS OTHERWISE NOTED .XX = .03 .XXX = .020 X" = 1"	DRAWN BY	DATE:	TITLE: FLDORPLAN - 291 FL	
								N MYSHER			
								CHK.	DATE:	23 PASSENGERS & (2) W/C'S	
REV	DATE	ECN	DESC. OF CHANGES			BY	APP'D	SCALE:	APP'D	DATE:	MODEL FREIGHTLINER CHASSIS

THEORETICAL WEIGHT ANALYSIS WORKSHEET

(4-CORNER)

Chassis Manufacturer: FREIGHTLINE® DSL	Vehicle Type: DF310	Prepared by: DO
Model Year:	Completed Vehicle Description: WV-CLASS G	Date:

OEM Wheelbase	Modified Wheelbase	OEM GVWR	OEM FRT GAWR	OEM RR GAWR
		26000	9880	17500

REFERENCE UNIT 22589.00

Model type **FL** Chassis Code **FP #: CB002748**

ACTUAL COMPLETED WEIGHT OF VEHICLE (UVW)

ADDED FUEL FROM CALCULATED FUEL SHEET

EXTRAS ADDED AFTER UNIT WAS WEIGHED

WEIGHT OF THE OCCUPANTS (lbs)

3600.00

(150 lbs x **24** (number of designated seating positions))

WHEEL CHAIRS IF USED ☐ X ☐

SUBTOTAL WEIGHT

ADJUSTED HORIZONTAL CENTER OF GRAVITY **138.88**

ADJUSTED LATERAL CENTER OF GRAVITY **-0.16**

ADJUSTED REAR WEIGHT **12709.37**

ADJUSTED FRONT WEIGHT **7423.13**

ADJUSTED 4 CORNER WEIGHT

Lft-Frt (lbs)	Rt-Frt (lbs)	Lft-Rr (lbs)	Rt-Rr (lbs)	Total (lbs)
3402.00	3490.00	4456.00	4368.00	15716.00
95.45	95.45	35.80	35.80	262.50
27.34	27.34	249.66	249.66	554.00
145.78	139.76	1691.76	1622.71	3600.00
3670.57	3752.55	6433.21	6276.16	20132.50
3670.57	3752.55	6433.21	6276.16	20132.50

TOTAL FRONT 7423.13 2456.87 TOTAL REAR 12709.37 4790.63
IS THE FRONT GAWR OVER NO IS THE REAR GAWR OVER NO

PASS/FAIL ANALYSIS	Is Lft-Frt/2 Exceeded?	Is Rt-Frt/2 Exceeded?
GVWR (lbs.) 26000.00	LOADED VEHICLE WEIGHT (lbs.) 20132.50	Is GVWR Exceeded? NO
	5867.50	
Maximum UVW from Tables A & B of the Incomplete Vehicle Manual (IVM) is N/A lbs..		
(NOTE: UVW does not apply to certification of vehicles with a GVWR above 10,000 lbs.)		
The actual completed weight (UVW) of this vehicle is 15978.50 lbs.		Is Maximum UVW Exceeded? NO

DEFINITIONS

"UVW" - Completed weight of the vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are normally removed when the vehicle is not in use.

"GAWR" and "GVWR" are found on the label affixed to the cover of the Incomplete Vehicle Manual (IVM).

"LOADED VEHICLE WEIGHT" - Completed weight of the vehicle with maximum capacities of all fluids necessary for operation of the vehicle plus 150 lbs. (or 70 kg.) for each designated seating position and appropriate allowance for cargo. Vehicles with tanks for water and/or L.P. gas must also account for the weight of these fluids in the cargo calculations.

WV-CLASS G

STURAA TEST

10 YEAR

350,000 MILE BUS

from

**CHAMPION BUS INC.
GENERAL COACH AMERICA INC.**

MODEL DEFENDER

DECEMBER 2009

PTI-BT-R0911

PENNSSTATE



The Thomas D. Larson Transportation Institute

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

Bus Testing and Research Center

2237 Old Route 220 N. (814) 695-3404
Duncansville, PA 16635

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EXECUTIVE SUMMARY

Champion Bus Inc. General Coach America Inc. submitted a model Defender. The bus is built on a Freightliner model Business Class M2 chassis, diesel-powered 29 seat (including the driver) 35-foot bus, for a 10 yr/350,000 mile STURAA test. The odometer reading at the time of delivery was 2,670 miles. Testing started on June 15, 2009 and was completed on November 27, 2009. 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 was started on July 3, 2009 and was completed on November 23, 2009.

The interior of the bus is configured with seating for 29 passengers including the driver plus 2 wheelchair positions. Free floor space will accommodate 20 standing passengers resulting in a potential load of 49 persons plus 2 handicap positions. At 150 lbs per person and 600 lbs per wheelchair position, this load results in a measured gross vehicle weight of 24,540 lbs. The first segment of the Structural Durability Test was performed with the bus loaded to a GVW of 24,540 lbs. The middle segment was performed at a seated load weight of 21,630 lbs and the final segment was performed at a curb weight of 16,440 lbs. Durability driving resulted in unscheduled maintenance and failures that involved a variety of subsystems. A description of failures, and a complete and detailed listing of scheduled and unscheduled maintenance is provided in the Maintainability section of this report.

Accessibility, in general, was adequate, components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems) along with all other components encountered during testing, were found to be readily accessible and no restrictions were noted.

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. The problems are also listed by class as defined in Section 2. The test bus encountered no Class 1 or Class 4 failures. Of the three reported failures, 1 was a Class 2 and two were Class 3.

The Safety Test, (a double-lane change, obstacle avoidance test) was safely performed in both right-hand 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 24.46 seconds.

The Shakedown Test produced a maximum final loaded deflection of 0.274 inches with a permanent set ranging between -0.004 to 0.002 inches under a distributed static load of 19,575 lbs. The Distortion Test was completed with all subsystems, doors and escape mechanisms operating properly. No water leakage was observed throughout the test. All subsystems operated properly.

The Static Towing Test was performed using a target load (towing force) of 19,728 lbs. All four front pulls were completed to the full test load with no damage or deformation observed. The Dynamic Towing Test was performed by means of a front-lift tow. The towing interface was accomplished using a hydraulic under-lift wrecker. 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 also performed without incident. The bus was found to be stable on the jack stands, and the minimum jacking clearance observed with a tire deflated was 5.0 inches.

A Fuel Economy Test was run on simulated central business district, arterial, and commuter courses. The results were 6.39 mpg, 6.86 mpg, and 14.21 mpg respectively; with an overall average of 7.73 mpg.

A series of Interior and Exterior Noise Tests was performed. These data are 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
PSBRTF	- Penn State Bus Research and Testing Facility
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
TM	- track manager
TP	- test personnel

TEST BUS CHECK-IN

I. OBJECTIVE

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

II. TEST DESCRIPTION

The test consists of assigning a bus test number to the bus, cleaning the bus, completing the vehicle data form, obtaining any special information and tools from the manufacturer, determining a testing schedule, performing an initial safety check, and performing the manufacturer's recommended preventive maintenance. The bus manufacturer 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 consists of a Champion Bus Inc., General Coach America Inc., model Defender. The bus is built on a Freightliner model Business Class M2 chassis. The bus has an O.E.M. driver's and a passenger door rear of the front axle and a dedicated handicap entrance equipped with a Braun Corp. model NL919F1BHB-2 handicap lift rear of the rear axle. Power is provided by a diesel-fueled, Mercedes-Benz model OM926 LA engine coupled to an Allison Series 2200 transmission.

The measured curb weight is 7,180 lbs for the front axle and 9,260 lbs for the rear axle. These combined weights provide a total measured curb weight of 16,440 lbs. There are 29 seats including the driver and room for 20 standing passengers plus 2 wheelchair positions bringing the total passenger capacity to 49 plus 2 wheelchair positions. Gross load is $150 \text{ lb} \times 49 = 7,350 \text{ lbs}$ plus 2 wheelchair positions = 8,550 lbs. At full capacity, the measured gross vehicle weight is 24,540 lbs.

VEHICLE DATA FORM

Bus Number: 0911	Arrival Date: 6-15-09
Bus Manufacturer: Champion Bus	Vehicle Identification Number (VIN): 559AM350RLM218504
Model Number: Defender	Date: 6-15-09
Personnel: S.C.	Chassis: Freightliner / Business Class M2

WEIGHT:

Individual Wheel Reactions:

Weights (lb)	Front Axle		Middle Axle		Rear Axle	
	Right	Left	Right	Left	Right	Left
CW	3,550	3,630	N/A	N/A	4,790	4,470
SLW	3,890	4,010	N/A	N/A	6,860	6,870
GVW	4,140	4,280	N/A	N/A	8,090	8,030

Total Weight Details:

Weight (lb)	CW	SLW	GVW	GAWR
Front Axle	7,180	7,900	8,420	9,880
Middle Axle	N/A	N/A	N/A	N/A
Rear Axle	9,260	13,730	16,120	17,500
Total	16,440	21,630	24,540	GWWR: 16,440

Dimensions:

Length (ft/in)	35 / 5.0
Width (in)	96.0
Height (in)	122.0
Front Overhang (in)	41.0
Rear Overhang (in)	125.0
Wheel Base (in)	259.0
Wheel Track (in)	Front: 82.8
	Rear: 72.6

Bus Number: 0911	Date: 6-15-09
------------------	---------------

CLEARANCES:

Lowest Point Outside Front Axle	Location: Oil pan	Clearance(in): 9.6
Lowest Point Outside Rear Axle	Location: Body	Clearance(in): 14.5
Lowest Point between Axles	Location: Step well	Clearance(in): 9.6
Ground Clearance at the center (in)	11.2	
Front Approach Angle (deg)	17.0	
Rear Approach Angle (deg)	11.9	
Ramp Clearance Angle (deg)	4.9	
Aisle Width (in)	18.3	
Inside Standing Height at Center Aisle (in)	77.3	

BODY DETAILS:

Body Structural Type	Integral		
Frame Material	Steel		
Body Material	Steel & fiberglass		
Floor Material	Plywood		
Roof Material	Steel & fiberglass		
Windows Type	<input checked="" type="checkbox"/> Fixed	<input type="checkbox"/> Movable	
Window Mfg./Model No.	Clear Vision / AS3 M30 DOT22		
Number of Doors	<u>1</u> Front	<u>1</u> Rear	<u>1</u> Handicap
Mfr. / Model No.	A & m / 12V Auto Re-open		
Dimension of Each Door (in)	Front-30.8 x90.3	Rear-36.1 x 55.4	Handicap-46.7 x 72.5
Passenger Seat Type	<input type="checkbox"/> Cantilever	<input checked="" type="checkbox"/> Pedestal	<input type="checkbox"/> Other (explain)
Mfr. / Model No.	Freedman Seating Co. / na		
Driver Seat Type	<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Spring	<input type="checkbox"/> Other (explain)
Mfr. / Model No.	Bostrum Seating Inc. / Talladega 910		
Number of Seats (including Driver)	29 + 2 wheelchair positions		

Bus Number: 0911	Date: 6-15-09
------------------	---------------

BODY DETAILS (Contd..)

Free Floor Space (ft ²)	30.5				
Height of Each Step at Normal Position (in)	Front	1. <u>11.2</u>	2. <u>9.0</u>	3. <u>9.0</u>	4. <u>9.1</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

Type	<input checked="" type="checkbox"/> C.I.		<input type="checkbox"/> Alternate Fuel
	<input type="checkbox"/> S.I.		<input type="checkbox"/> Other (explain)
Mfr. / Model No.	Mercedes-Benz / OM926 LA		
Location	<input checked="" type="checkbox"/> Front	<input type="checkbox"/> Rear	<input type="checkbox"/> Other (explain)
Fuel Type	<input type="checkbox"/> Gasoline	<input type="checkbox"/> CNG	<input type="checkbox"/> Methanol
	<input checked="" type="checkbox"/> Diesel	<input type="checkbox"/> LNG	<input type="checkbox"/> Other (explain)
Fuel Tank Capacity (indicate units)	60 gals		
Fuel Induction Type	<input checked="" type="checkbox"/> Injected		<input type="checkbox"/> Carburetion
Fuel Injector Mfr. / Model No.	Mercedes-Benz / OM926 LA		
Carburetor Mfr. / Model No.	N/a		
Fuel Pump Mfr. / Model No.	Mercedes-Benz / OM926 LA		
Alternator (Generator) Mfr. / Model No.	Prestolite Leece-Neville / A0014949		
Maximum Rated Output (Volts / Amps)	14 / 270		
Air Compressor Mfr. / Model No.	Wabco / na		
Maximum Capacity (ft ³ / min)	15.5		
Starter Type	<input checked="" type="checkbox"/> Electrical	<input type="checkbox"/> Pneumatic	<input type="checkbox"/> Other (explain)
Starter Mfr. / Model No.	Delco / 38MT		

Bus Number: 0911	Date: 6-15-09
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TRANSMISSION

Transmission Type	<input type="checkbox"/> Manual	<input checked="" type="checkbox"/> Automatic	
Mfr. / Model No.	Allison Transmission / Series 2200		
Control Type	<input checked="" type="checkbox"/> Mechanical	<input type="checkbox"/> Electrical	<input type="checkbox"/> Other
Torque Converter Mfr. / Model No.	Allison Transmission / Series 2200		
Integral Retarder Mfr. / Model No.	N/A		

SUSPENSION

Number of Axles	2		
Front Axle Type	<input type="checkbox"/> Independent	<input checked="" type="checkbox"/> Beam Axle	
Mfr. / Model No.	Arvin Meritor / MFS10143ANN202		
Axle Ratio (if driven)	N/A		
Suspension Type	<input type="checkbox"/> Air	<input checked="" type="checkbox"/> Spring	<input type="checkbox"/> Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Sachs / 10-13760-000		
Middle Axle Type	<input type="checkbox"/> Independent	<input type="checkbox"/> Beam Axle	
Mfr. / Model No.	N/A		
Axle Ratio (if driven)	N/A		
Suspension Type	<input type="checkbox"/> Air	<input type="checkbox"/> Spring	<input type="checkbox"/> Other (explain)
No. of Shock Absorbers	N/A		
Mfr. / Model No.	N/A		
Rear Axle Type	<input type="checkbox"/> Independent	<input checked="" type="checkbox"/> Beam Axle	
Mfr. / Model No.	Arvin Meritor / ARS-17.5-2		
Axle Ratio (if driven)	4.56		
Suspension Type	<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Spring	<input type="checkbox"/> Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Gabriel / 16-15817-000		

Bus Number: 0911	Date: 6-15-09
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WHEELS & TIRES

Front	Wheel Mfr./ Model No.	Accuride / 19.5 x 7.5
	Tire Mfr./ Model No.	Michelin XZE / 245/70R 19.5
Rear	Wheel Mfr./ Model No.	Accuride / 19.5 x 7.5
	Tire Mfr./ Model No.	Michelin XZE / 245/70R 19.5

BRAKES

Front Axle Brakes Type	<input checked="" type="checkbox"/> Cam	<input type="checkbox"/> Disc	<input type="checkbox"/> Other (explain)
Mfr. / Model No.	Arvin Meritor / Q Plus		
Middle Axle Brakes Type	<input type="checkbox"/> Cam	<input type="checkbox"/> Disc	<input type="checkbox"/> Other (explain)
Mfr. / Model No.	N/A		
Rear Axle Brakes Type	<input checked="" type="checkbox"/> Cam	<input type="checkbox"/> Disc	<input type="checkbox"/> Other (explain)
Mfr. / Model No.	Arvin Meritor / Q Plus		
Retarder Type	N/A		
Mfr. / Model No.	N/A		

HVAC

Heating System Type	<input type="checkbox"/> Air	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> Other
Capacity (Btu/hr)	Dash -na Interior ceiling 130,000		
Mfr. / Model No.	Dash OEM Rear - ACT / ACT50 HD		
Air Conditioner	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Location	Dash & rear interior ceiling		
Capacity (Btu/hr)	70,000		
A/C Compressor Mfr. / Model No.	Dash - Sanden Corp. / U4417 Rear - ACT / ACT50 HD		

STEERING

Steering Gear Box Type	Hydraulic gear
Mfr. / Model No.	TRW / THP Series
Steering Wheel Diameter	17.7
Number of turns (lock to lock)	4.25

Bus Number: 0911	Date: 6-15-09
------------------	---------------

OTHERS

Wheel Chair Ramps	Location: N/A	Type: N/A
Wheel Chair Lifts	Location: Right rear	Type: Hydraulic platform
Mfr. / Model No.	The Braun Corp. / NL919F1BHB-2	
Emergency Exit	Location: Windows Doors Roof hatch	Number: 3 2 1

CAPACITIES

Fuel Tank Capacity (units)	60 gals
Engine Crankcase Capacity (gallons)	7.75
Transmission Capacity (gallons)	3.75
Differential Capacity (gallons)	4.0
Cooling System Capacity (gallons)	8.0
Power Steering Fluid Capacity (quarts)	3.1

VEHICLE DATA FORM

Bus Number: 0911	Date: 6-15-09
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List all spare parts, tools and manuals delivered with the bus.

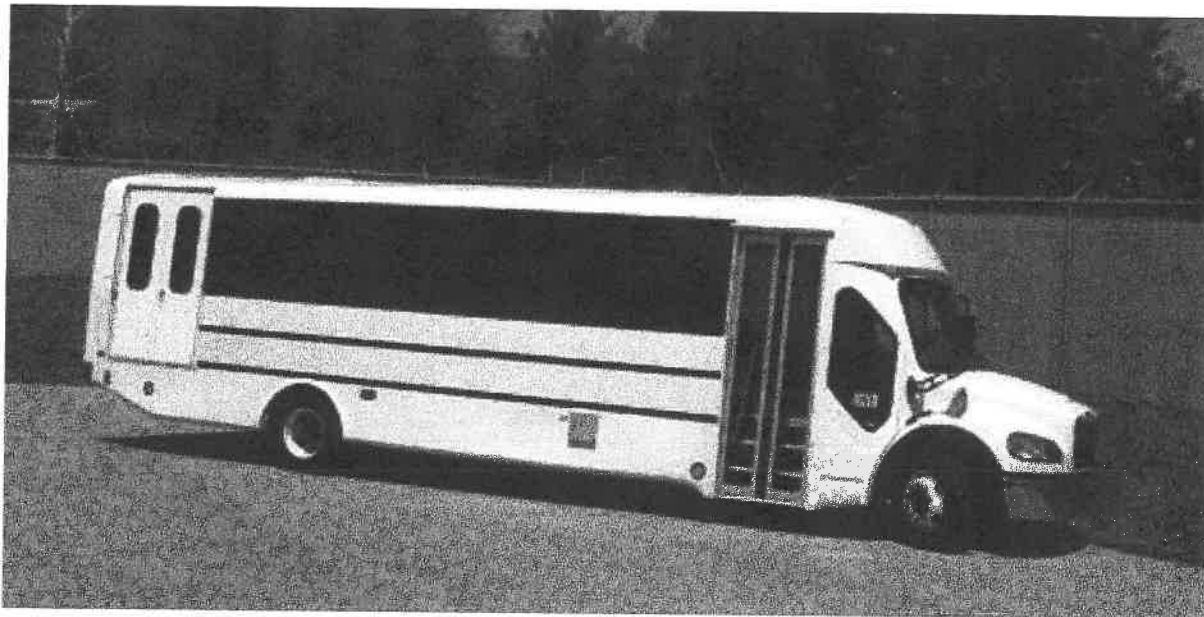
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COMPONENT/SUBSYSTEM INSPECTION FORM

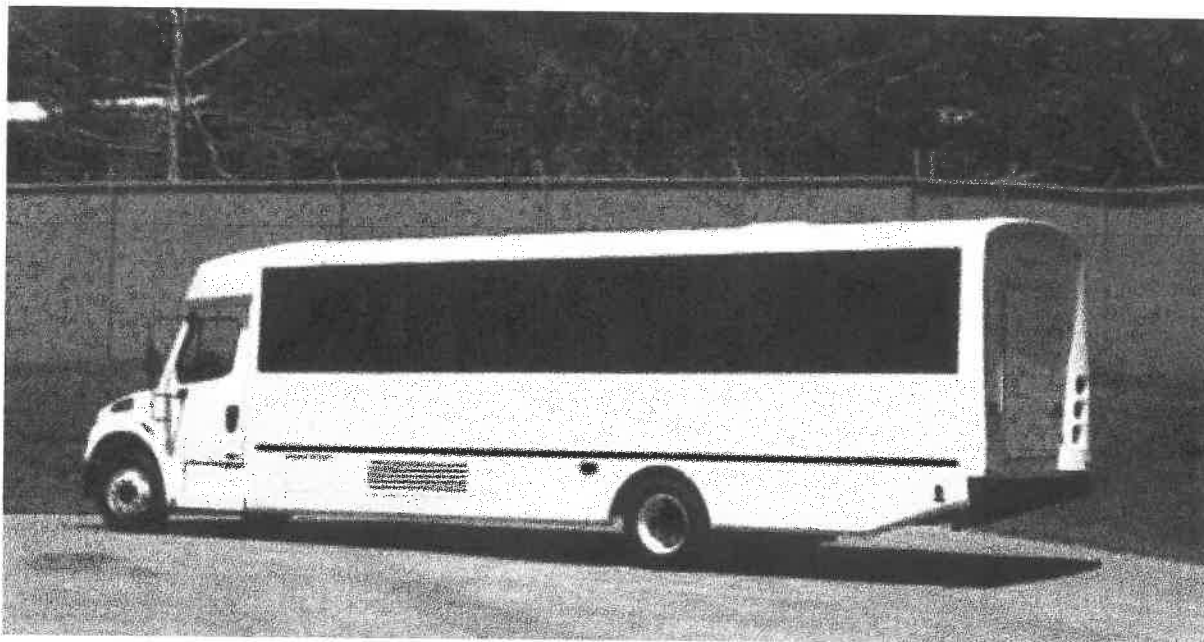
Bus Number: 0911	Date: 6-26-09
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Subsystem	Checked	Comments
Air Conditioning Heating and Ventilation	✓	
Body and Sheet Metal	✓	
Frame	✓	
Steering	✓	
Suspension	✓	
Interior/Seating	✓	
Axles	✓	
Brakes	✓	
Tires/Wheels	✓	
Exhaust	✓	
Fuel System	✓	Diesel
Power Plant	✓	
Accessories	✓	
Lift System	✓	
Interior Fasteners	✓	
Batteries	✓	

CHECK - IN



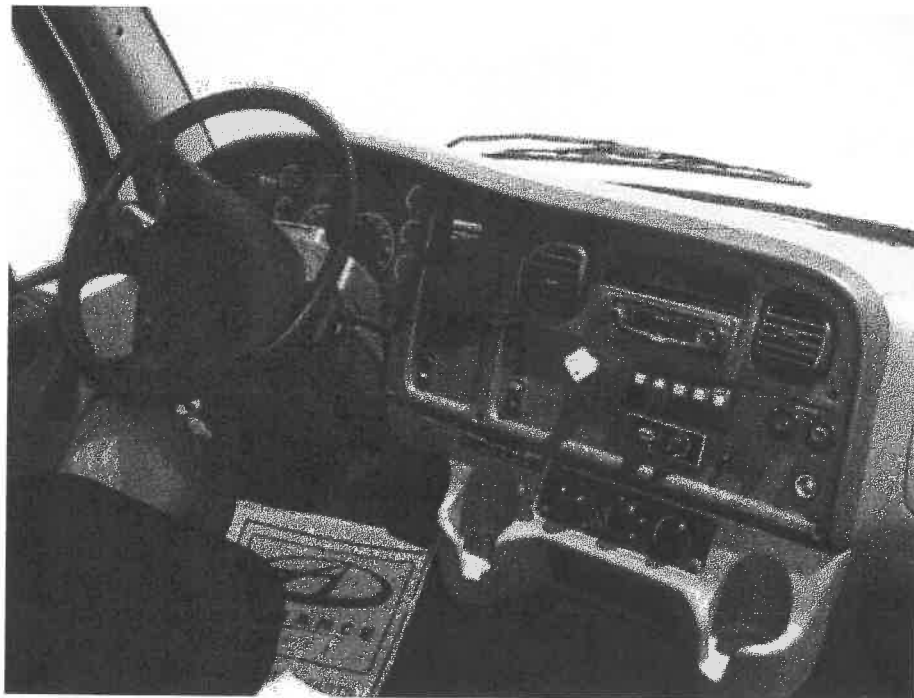
**CHAMPION BUS INC., GENERAL
COACH AMERICA INC. MODEL DEFENDER**



CHECK - IN CONT.



**CHAMPION BUS INC., GENERAL COACH AMERICA
INC., MODEL DEFENDER EQUIPPED WITH A BRAUN
CORP. MODEL NL919F1BHB-2 HANDICAP LIFT**



DRIVER'S STATION

CHECK - IN CONT.



TEST BUS INTERIOR FRONT TO REAR



TEST BUS INTERIOR REAR TO FRONT

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

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

ACCESSIBILITY DATA FORM

Bus Number: 0911	Date: 11-25-09
------------------	----------------

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

ACCESSIBILITY DATA FORM

Bus Number: 0911	Date: 11-25-09
------------------	----------------

Component	Checked	Comments
HVAC :		
A/C Compressor	✓	
Filters	✓	
Fans	✓	
ELECTRICAL SYSTEM :		
Fuses	✓	
Batteries	✓	
Voltage regulator	✓	
Voltage Converters	✓	
Lighting	✓	
MISCELLANEOUS :		
Brakes	✓	
Handicap Lifts/Ramps	✓	
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 2)
SCHEDULED MAINTENANCE
 Champion #0911

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
07-16-09	575	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
08-03-09	1,521	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
08-20-09	2,599	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
09-11-09	3,081	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
09-17-09	3,769	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
09-29-09	5,221	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-19-09	6,642	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00

(Page 2 of 2)
SCHEDULED MAINTENANCE
 Champion #0911

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
10-21-09	6,723	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
10-27-09	7,493	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-03-09	8,545	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-09-09	9,654	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-16-09	11,154	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-23-09	11,255	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>	<u>PRODUCT CODE</u>	<u>TEXACO DESCRIPTION</u>
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 bearing & Chassis grease	#1935	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

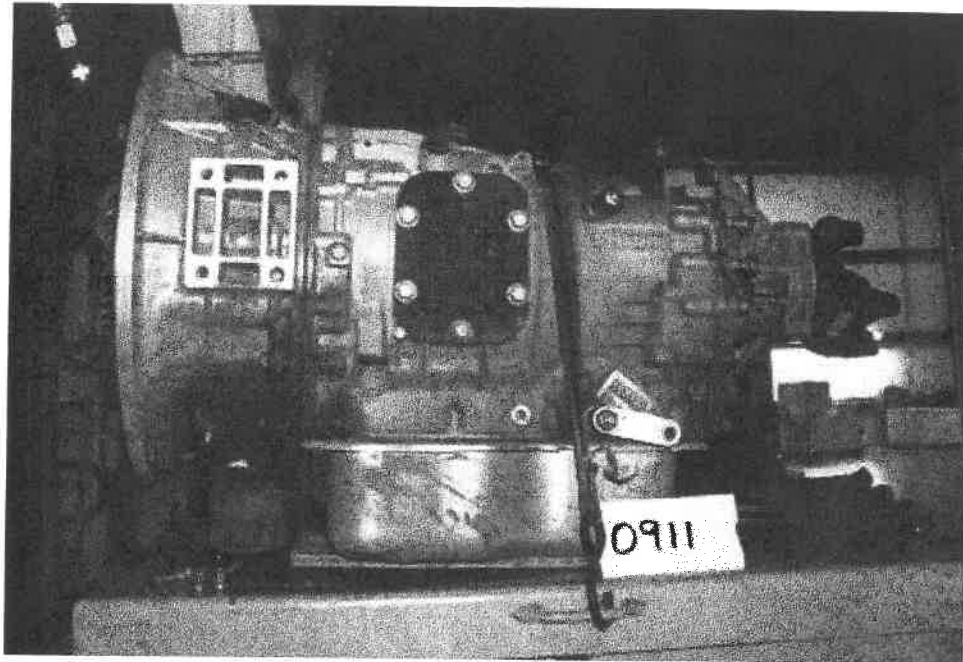
1.3-III. DISCUSSION

During the test no additional components were removed for repair or replacement. At the end of the test, the remaining items on the list were removed and replaced. The transmission assembly took 4.0 man-hours (two men 2.0 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	4.0 man hours
Wiper Motor	0.5 man hours
Starter	0.5 man hours
Alternator	1.0 man hours
Batteries	0.5 man hours

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS

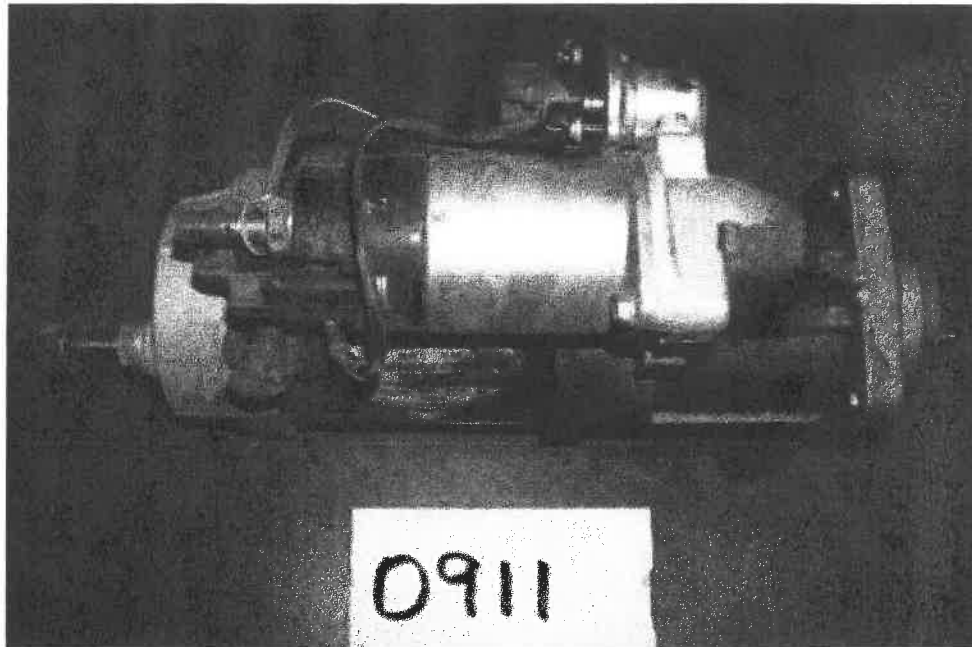


**TRANSMISSION REMOVAL AND REPLACEMENT
(4.0 MAN HOURS)**

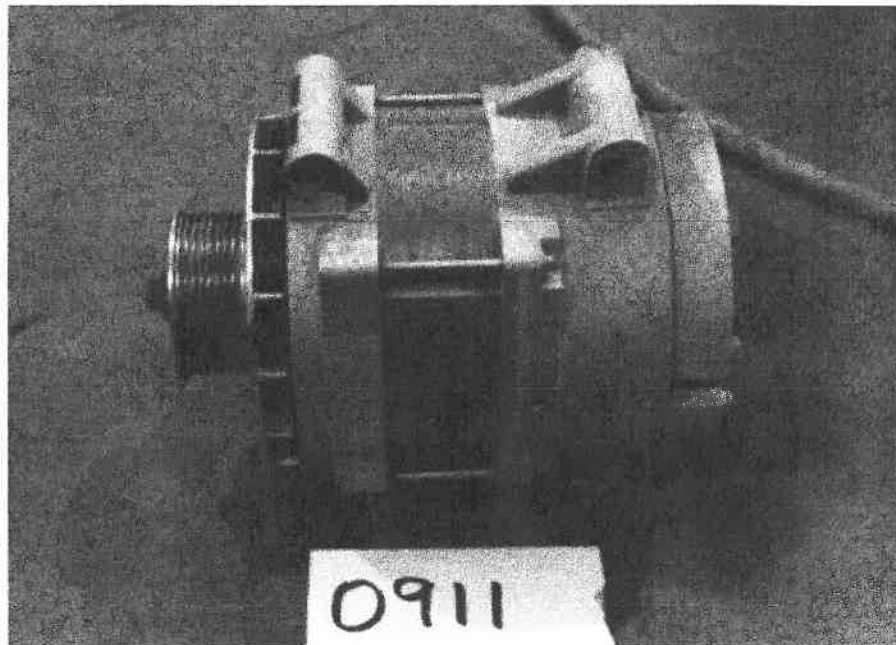


**WIPER MOTOR REMOVAL AND REPLACEMENT
(0.5 MAN HOURS)**

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS CONT.



**STARTER REMOVAL AND REPLACEMENT
(0.5 MAN HOURS)**



**ALTERNATOR REMOVAL AND REPLACEMENT
(1.0 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) Class 1: Physical Safety. A failure that could lead directly to passenger or driver injury and represents a severe crash situation.
- (b) Class 2: Road Call. A failure resulting in an en route interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.
- (c) Class 3: Bus Change. A failure that requires removal of the bus from service during its assignments. The bus is operable to a rendezvous point with a replacement bus.
- (d) Class 4: Bad Order. A failure that does not require removal of the bus from service during its assignments but does degrade coach operation. The failure shall be reported by driver, inspector, or hostler.

2-III. DISCUSSION

A listing of breakdowns and unscheduled repairs 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 Class 4 failures. The one Class 2 failure was the result of a failed Re-Gen. The two Class 3 failures involved the electrical system. These three failures are available for review in the Unscheduled Maintenance List, located in Section 5.7 Structural Durability.

RELIABILITY DATA FORMS

Bus Number: 0911	Date: 11/23/09
Personnel: Bob Reifsteck	

[illegible]

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: 0911	Date: 10-22-09
Personnel: B.S., B.L. & S.C.	

Temperature (°F): 58	Humidity (%): 66
Wind Direction: SW	Wind Speed (mph): 5
Barometric Pressure (in.Hg): 30.03	

SAFETY TEST: DOUBLE LANE CHANGE	
Maximum safe speed tested for double-lane change to left	45 mph
Maximum safe speed tested for double-lane change to right	45 mph
Comments of the position of the bus during the lane change: 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 PSBRTF. 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 24.46 seconds.

PERFORMANCE DATA FORM

Bus Number: 0911		Date: 10-22-09	
Personnel: B.S., B.L. & S.C.			
Temperature (°F): 58		Humidity (%): 66	
Wind Direction: SW		Wind Speed (mph): 5	
Barometric Pressure (in.Hg): 30.03			
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	4.14	4.98	4.23
20 mph	7.14	7.45	6.98
30 mph	10.57	10.76	11.58
40 mph	16.89	16.04	17.67
Top Test Speed(mph) 50	24.98	23.61	23.33
Clockwise Recorded Interval Times			
Speed	Run 1	Run 2	Run 3
10 mph	5.17	5.07	4.85
20 mph	8.45	8.82	8.26
30 mph	12.61	12.16	11.51
40 mph	16.60	17.98	17.20
Top Test Speed(mph) 50	24.64	25.26	24.95

0911.ACC

PERFORMANCE SUMMARY SHEET

BUS MANUFACTURER :Champion
BUS MODEL :Defender

BUS NUMBER :0911
TEST DATE :10/22/09

TEST CONDITIONS :

TEMPERATURE (DEG F) : 58.0
WIND DIRECTION : SW
WIND SPEED (MPH) : 5.0
HUMIDITY (%) : 66
BAROMETRIC PRESSURE (IN. HG) : 30.0

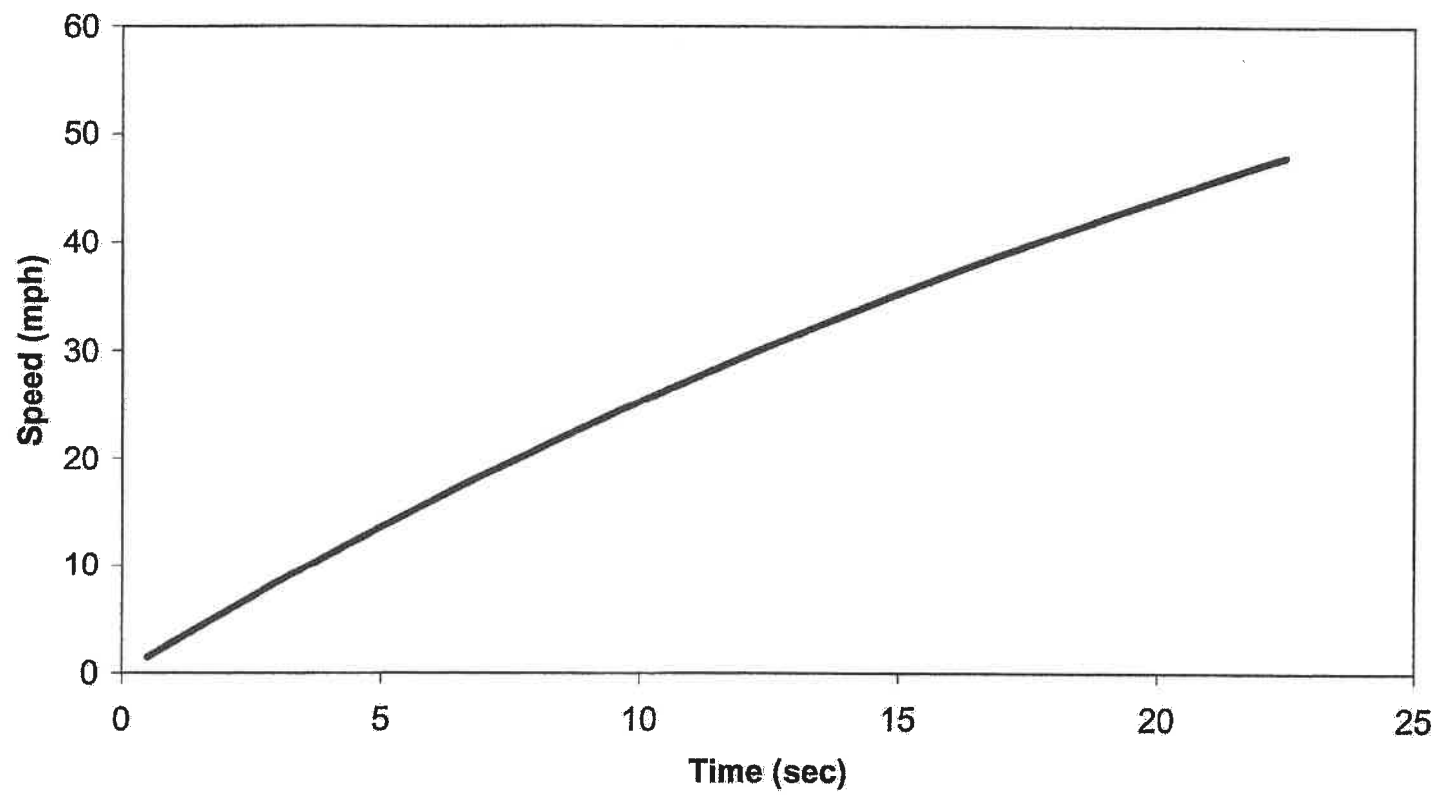
VEHICLE SPEED (MPH)	AVERAGE TIME (SEC)		
	CCW DIRECTION	CW DIRECTION	TOTAL
10.0	4.45	5.03	4.74
20.0	7.19	8.51	7.85
30.0	10.97	12.09	11.53
40.0	16.87	17.26	17.06
50.0	23.97	24.95	24.46

TEST SUMMARY :

VEHICLE SPEED (MPH)	TIME (SEC)	ACCELERATION (FT/SEC^2)	MAX. GRADE (%)
1.0	.34	4.2	13.3
5.0	1.76	4.1	12.7
10.0	3.62	3.8	12.0
15.0	5.59	3.6	11.3
20.0	7.68	3.4	10.6
25.0	9.92	3.2	9.9
30.0	12.31	3.0	9.2
35.0	14.89	2.7	8.6
40.0	17.66	2.5	7.9
45.0	20.67	2.3	7.3
50.0	23.93	2.2	6.7

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.

**Velocity vs. Time
Champion 0911**



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 49 people including the driver plus 2 wheelchair positions. The resulting test load is $(49 \times 375 \text{ lb}) = 18,375 \text{ lbs} + 1,200 \text{ lbs}$ (2 wheelchair positions) = 19,575 lbs. 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 0.274 inches at reference point 9. The maximum permanent deflection after the final loading sequence ranged from -0.004 inches at reference points 1 and 12 to 0.002 inches at reference points 4 and 5.

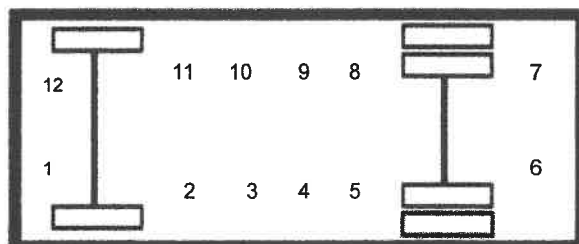
STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 0911	Date: 6-22-09
Personnel: E.D., E.L., P.S. & K.D.	Temperature (°F): 75
Loading Sequence: <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 (check one)	
Test Load (lbs): 19,575	

Indicate Approximate Location of Each Reference Point

Right

Front
of
Bus



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	-.157	-.157	.011	.011
2	0	.135	.135	.018	.018
3	0	.234	.234	.020	.020
4	0	.282	.282	.023	.023
5	0	.239	.239	.022	.022
6	0	.078	.078	.052	.052
7	0	-.040	-.040	-.020	-.020
8	0	.246	.246	.020	.020
9	0	.297	.297	.024	.024
10	0	.251	.251	.022	.022
11	0	.150	.150	.016	.016
12	0	-.197	-.197	.005	.005

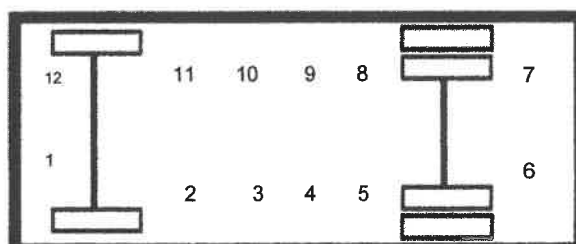
STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 0911	Date: 6-23-09
Personnel: T.S., E.D., E.L. & P.S.	Temperature (°F): 80
Loading Sequence: <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 (check one)	
Test Load (lbs): 19,575	

Indicate Approximate Location of Each Reference Point

Right

Front
of
Bus



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	.011	-.157	-.168	.007	-.004
2	.018	.140	.122	.018	.000
3	.020	.241	.221	.021	.001
4	.023	.291	.268	.025	.002
5	.022	.247	.225	.024	.002
6	.052	.083	.031	.050	-.002
7	-.020	-.051	-.071	-.021	-.001
8	.020	.249	.229	.021	.001
9	.024	.298	.274	.024	.000
10	.022	.250	.228	.021	-.001
11	.016	.149	.133	.014	-.002
12	.005	-.203	-.208	.001	-.004

5.1 STRUCTURAL SHAKEDOWN TEST



**BUS LOADED TO 2.5 TIMES GVL
(19,575 LBS)**

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, steering and handicapped devices operated normally throughout the test. The undercarriage and body indicated no deficiencies. No water leakage was observed during the test. The results of this test are indicated on the following data forms.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input checked="" type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower

	Comments
<input checked="" type="checkbox"/> Windows	No deficiencies.
<input checked="" type="checkbox"/> Front Doors	No deficiencies.
<input checked="" type="checkbox"/> Rear Doors	No deficiencies.
<input checked="" type="checkbox"/> Escape Mechanisms/ Roof Vents	No deficiencies.
<input checked="" type="checkbox"/> Engine	No deficiencies.
<input checked="" type="checkbox"/> Handicapped Device/ Special Seating	No deficiencies.
<input checked="" type="checkbox"/> Undercarriage	No deficiencies.
<input checked="" type="checkbox"/> Service Doors	No deficiencies.
<input checked="" type="checkbox"/> Body	No deficiencies.
<input checked="" type="checkbox"/> Windows/ Body Leakage	No deficiencies.
<input checked="" type="checkbox"/> Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input checked="" type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 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	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input checked="" type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower

	Comments
<input checked="" type="checkbox"/> Windows	No deficiencies.
<input checked="" type="checkbox"/> Front Doors	No deficiencies.
<input checked="" type="checkbox"/> Rear Doors	No deficiencies.
<input checked="" type="checkbox"/> Escape Mechanisms/ Roof Vents	No deficiencies.
<input checked="" type="checkbox"/> Engine	No deficiencies.
<input checked="" type="checkbox"/> Handicapped Device/ Special Seating	No deficiencies.
<input checked="" type="checkbox"/> Undercarriage	No deficiencies.
<input checked="" type="checkbox"/> Service Doors	No deficiencies.
<input checked="" type="checkbox"/> Body	No deficiencies.
<input checked="" type="checkbox"/> Windows/ Body Leakage	No deficiencies.
<input checked="" type="checkbox"/> Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input checked="" type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 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	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input checked="" type="checkbox"/> 6 in higher	<input type="checkbox"/> 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	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input checked="" type="checkbox"/> 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	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input checked="" type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 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	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input checked="" type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower

	Comments
<input checked="" type="checkbox"/> Windows	No deficiencies.
<input checked="" type="checkbox"/> Front Doors	No deficiencies.
<input checked="" type="checkbox"/> Rear Doors	No deficiencies.
<input checked="" type="checkbox"/> Escape Mechanisms/ Roof Vents	No deficiencies.
<input checked="" type="checkbox"/> Engine	No deficiencies.
<input checked="" type="checkbox"/> Handicapped Device/ Special Seating	No deficiencies.
<input checked="" type="checkbox"/> Undercarriage	No deficiencies.
<input checked="" type="checkbox"/> Service Doors	No deficiencies.
<input checked="" type="checkbox"/> Body	No deficiencies.
<input checked="" type="checkbox"/> Windows/ Body Leakage	No deficiencies.
<input checked="" type="checkbox"/> Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input checked="" type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 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	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0911	Date: 6-26-09
Personnel: J.P., E.L., T.S., P.S. & S.C.	Temperature(°F): 71

Wheel Position : (check one)		
All wheels level	<input type="checkbox"/> before	<input checked="" type="checkbox"/> after
Left front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right front	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Right rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower
Left rear	<input type="checkbox"/> 6 in higher	<input type="checkbox"/> 6 in lower

	Comments
<input checked="" type="checkbox"/> Windows	No deficiencies.
<input checked="" type="checkbox"/> Front Doors	No deficiencies.
<input checked="" type="checkbox"/> Rear Doors	No deficiencies.
<input checked="" type="checkbox"/> Escape Mechanisms/ Roof Vents	No deficiencies.
<input checked="" type="checkbox"/> Engine	No deficiencies.
<input checked="" type="checkbox"/> Handicapped Device/ Special Seating	No deficiencies.
<input checked="" type="checkbox"/> Undercarriage	No deficiencies.
<input checked="" type="checkbox"/> Service Doors	No deficiencies.
<input checked="" type="checkbox"/> Body	No deficiencies.
<input checked="" type="checkbox"/> Windows/ Body Leakage	No deficiencies.
<input checked="" type="checkbox"/> Steering Mechanism	No deficiencies.

5.2 STRUCTURAL DISTORTION TEST



RIGHT FRONT WHEEL SIX INCHES HIGHER



LEFT REAR WHEEL SIX INCHES 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 interface between the Static Tow apparatus and the test bus tow hook/eyes. The front test was performed to the full target test load of 19,728 lbs (1.2 x 16,440 lbs CW). No damage or deformation was observed during all four pulls of the test. The manufacturer recommends no towing from the rear, therefore a rear test was not performed.

STATIC TOWING TEST DATA FORM

Bus Number: 0911	Date: 11-19-09
Personnel: B.L., T.S. & S.C.	Temperature (°F): 50

Inspect right front tow hooks and adjoining structure.
Comments: No damage or deformation observed.
Check the torque of all bolts attaching tow hooks and surrounding structure.
Comments: Torques verified.
Inspect left tow hooks and adjoining structure.
Comments: No damage or deformation observed.
Check the torque of all bolts attaching tow hooks and surrounding structure.
Comments: Torques verified.
Inspect right rear tow hooks and adjoining structure.
Comments: N/A
Check the torque of all bolts attaching tow hooks and surrounding structure.
Comments: N/A
Inspect left rear tow hooks and adjoining structure.
Comments: N/A
Check the torque of all bolts attaching tow hooks and surrounding structure.
Comments: N/A
General comments of any other structure deformation or failure: All four front
Pulls were completed to the full target test load of 19,728 lbs. (1.2 x 16,440 lbs CW).
No damage or deformation was observed. Manufacturer recommends no towing
from the rear.

5.3 STATIC TOWING TEST

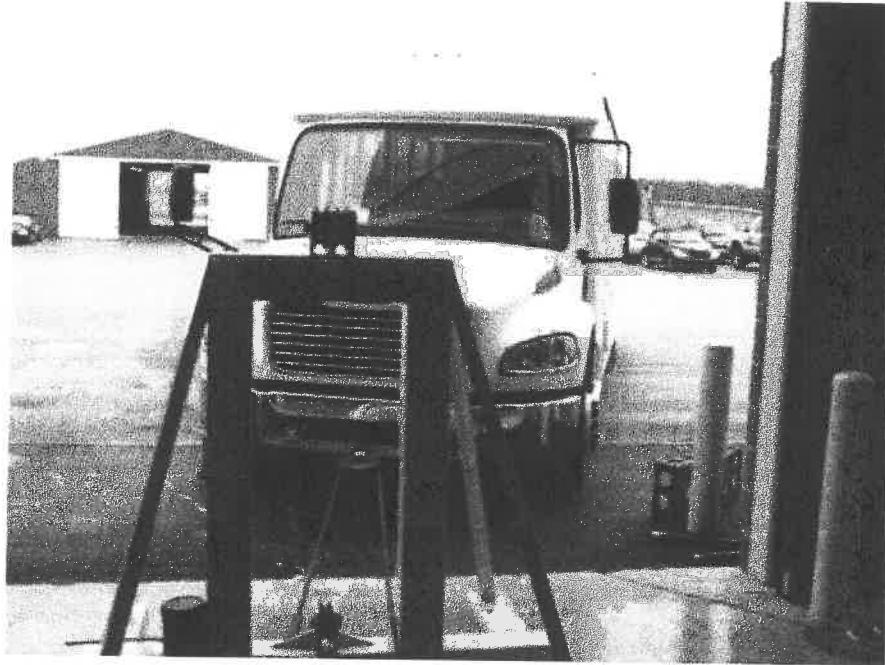


FRONT 20° UPWARD PULL



20° DOWN PULL

5.3 STATIC TOWING TEST CONT.



FRONT 20° LEFT PULL



FRONT 20° RIGHT PULL

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 incorporating a hydraulic under lift. A front lift tow was performed. Rear towing is not recommended. No problems, deformation, or damage was noted during testing.

DYNAMIC TOWING TEST DATA FORM

Bus Number: 0911	Date: 10-7-09
Personnel: S.C. & B.L.	

Temperature (°F): 56	Humidity (%): 63
Wind Direction: SE	Wind Speed (mph): 12
Barometric Pressure (in.Hg): 30.01	

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 incorporating a hydraulic under lift wrecker.
Description and location of any structural damage: None noted.
General Comments: No problems with the tow or towing interface were encountered during the test.

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 hack 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 8.75 inches. During the deflated portion of the test, the jacking point clearances ranged from 5.0 inches to 14.6 inches. No deformation or damage was observed during testing. A complete listing of jacking point clearances is provided in the Jacking Test Data Form.

JACKING CLEARANCE SUMMARY

Condition	Frame Point Clearance
Front axle – one tire flat	8.5"
Rear axle – one tire flat	13.5"
Rear axle – two tires flat	11.2"

JACKING TEST DATA FORM

Bus Number: 0911	Date: 6-17-09
Personnel: E.D. & E.L.	Temperature (°F): 63

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	12.1 " I 8.5 " D	7.2 " I 5.0 " D	
Left front	12.0 " I 8.5 " D	7.2 " I 5.1 " D	
Right rear—outside	13.9 " I 13.5 " D	14.7 " I 14.3 " D	
Right rear—both	13.9 " I 11.2 " D	14.7 " I 12.8 " D	
Left rear—outside	14.1 " I 13.7 " D	15.0 " I 14.6 " D	
Left rear—both	14.1 " I 11.3 " D	15.0 " I 13.0 " 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 tag—both	NA	NA	
Additional comments of any deformation or difficulty during jacking:			
None noted.			

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: 0911	Date: 6-18-09
Personnel: E.D., E.L. & P.S.	Temperature (°F): 68

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.

5.7 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 11,250 miles; approximately 8,750 miles on the PSBRTF Durability Test Track and approximately 2,500 miscellaneous other miles. The test will be conducted with the bus operated under three different loading conditions. The first segment will consist of approximately 4,625 miles with the bus operated at GVW. The second segment will consist of approximately 2,000 miles with the bus operated at SLW. The remainder of the test, approximately 4,625 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 July 3, 2009 and was conducted until November 23, 2009. The first 4,625 miles were performed at a GVW of 24,540 lbs. and completed on September 17, 2009. The next 2,000 mile SLW segment was performed at 21,630 lbs and completed on September 30, 2009, and the final 4,625 mile segment was performed at a CW of 16,440 lbs and completed on November 23, 2009.

The following mileage summary presents the accumulation of miles during the Structural Durability Test. The driving schedule is included, showing the operating duty cycle. A detailed plan view of the Test Track Facility and Durability Test Track are attached for reference. Also, a durability element profile detail shows all the measurements of the different conditions.

Wright Bus- TEST BUS #0911

MILEAGE DRIVEN/RECORDED FROM DRIVER'S LOGS

DATE	TOTAL DURABILITY TRACK	TOTAL OTHER MILES	TOTAL
6-29-09 TO 07/05/09	0.00	45.00	45.00
6-29-09 TO 07/05/09	81.00	3.00	84.00
7-13-09 TO 07/19/09	410.00	36.00	446.00
7-20-09 TO 07/26/09	130.00	6.00	136.00
7-27-09 TO 08/02/09	715.00	49.00	764.00
8-03-09 TO 08/09/09	800.00	40.00	840.00
8-10-09 TO 08/16/09	220.00	41.00	261.00
8-17-09 TO 08/23/09	58.00	3.00	61.00
8-24-09 TO 08/30/09	54.00	1.00	55.00
8-31-09 TO 09/06/09	61.00	4.00	65.00
9-07-09 TO 09/13/09	448.00	20.00	468.00
9-14-09 TO 09/20/09	755.00	40.00	795.00
9-21-09 TO 09/27/09	891.00	51.00	942.00
9-28-09 TO 10/04/09	682.00	31.00	713.00

Wright Bus- TEST BUS #0911
MILEAGE DRIVEN/RECORDED FROM DRIVER'S LOGS

10-05-09 TO 10/11/09	1.00	1.00	2.00
10-12-09 TO 10/18/09	786.00	86.00	872.00
10-19-09 TO 10/25/09	380.00	164.00	544.00
10-26-09 TO 11/01/09	923.00	141.00	1064.00
11-02-09 TO 11/08/09	1273.00	141.00	1414.00
11-09-09 TO 11/15/09	83.00	1500.00	1583.00
11-16-09 TO 11/22/09	0.00	0.00	0.00
11-23-09 TO 11/29/09	0.00	101.00	101.00
TOTAL	8751.00	2504.00	11255.00

Table 4. Driving Schedule for Bus Operation on the Durability Test Track.

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

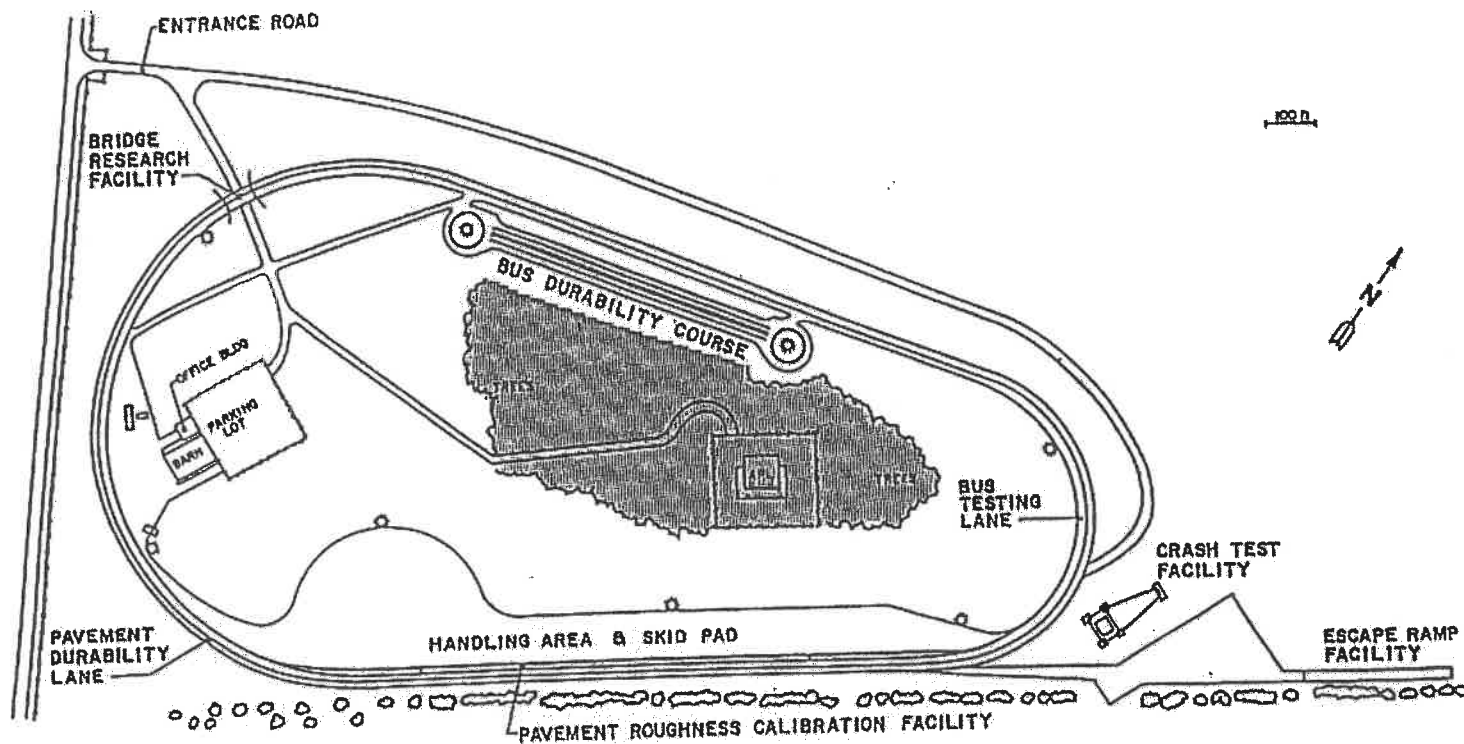
B—Break

C—Cycle all systems five times, visual inspection, driver's log entries

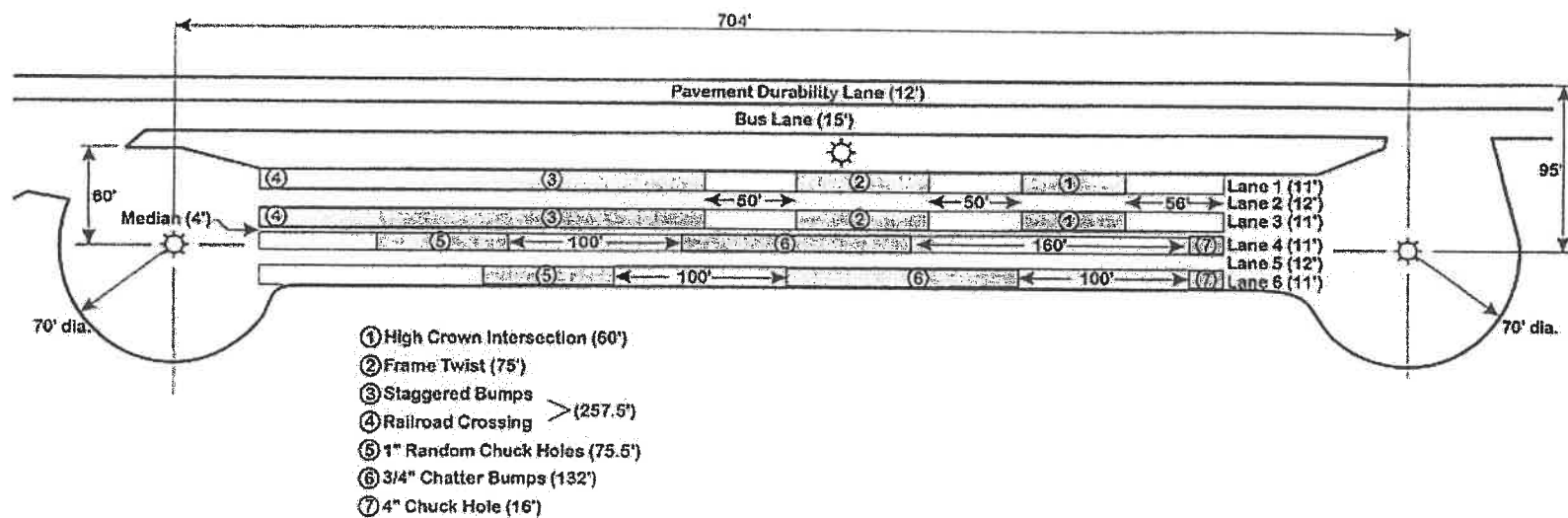
D—Drive bus as specified by procedure

F—Fuel bus, complete driver's log shift entries

**“PLAN VIEW OF PENN STATE BUS TESTING AND
RESEARCH FACILITY”**



**BUS TESTING AND RESEARCH TEST TRACK
UNIVERSITY PARK, PA**

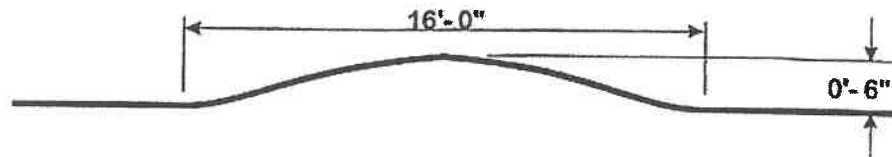


Plan View

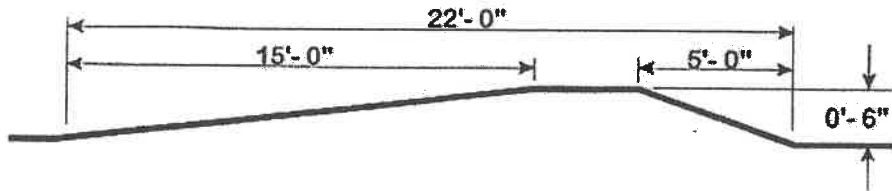
Vehicle Durability Test Track

The Pennsylvania Transportation Institute
Penn State

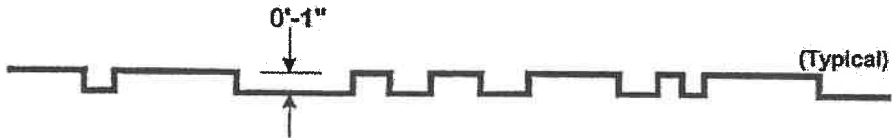
**Staggered
Bumps
(10 mph)**



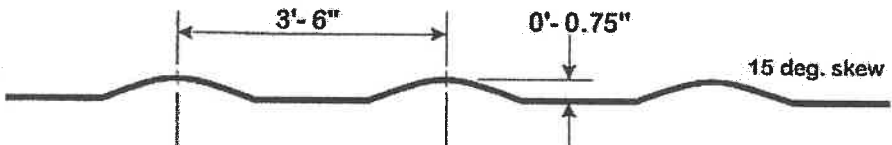
**Railroad
Crossing
(8 mph)**



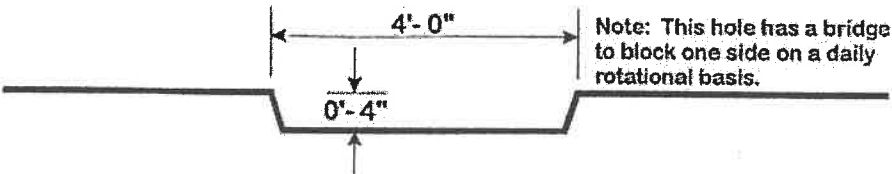
**1" Random
Chuck Holes
(20 mph)**



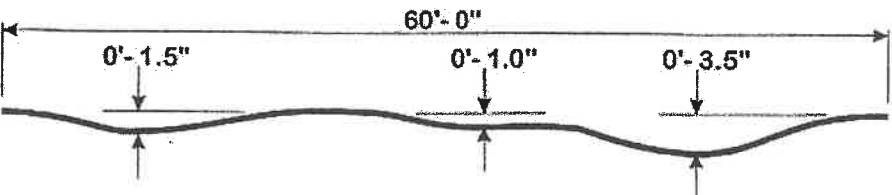
**Chatter Bumps
(20 mph)**



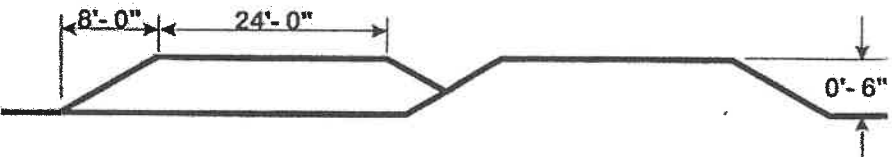
**4" Chuck Hole
(5 mph)**



**High Crown
Intersection
(20 mph)**



**Frame Twist
(10 mph)**



Durability Element Profiles

The Pennsylvania Transportation Institute
Penn State

(Page 1 of 1)

UNSCHEDULED MAINTENANCE

Champion Bus #0911

DATE	TEST MILES	SERVICE	ACTIVITY	MAN HOURS	DOWN TIME
10-07-09	5,677	Bus will not go in to Re-Gen. "Engine shut down" light on.	Towed bus to warranty dealer. Warranty dealer performed "forced" Re-Gen.	4.00	168.00
10-22-09	6,793	The battery hold came loose and wore a hole in the battery.	Replaced damaged battery with used battery. Ordered new battery.	1.00	1.00
10-27-09	7,443	Battery that was ordered on 10/22/09 arrived.	Installed new battery.	1.00	1.00

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 Penn State Test 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, and 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 Penn State 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), liquefied 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 60EF (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 60EF. 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

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

$$FE_{o_{mi/lb}} = \text{Observed fuel economy} = \frac{\text{miles}}{\text{lb of fuel}}$$

- 2.) Convert the observed fuel economy to miles per gallon [mpg] by multiplying by the specific gravity of the test fuel G_s (referred to water) at 60°F and multiply by the density of water at 60°F

$$FE_{o_{mpg}} = FE_{c_{mi/lb}} \times G_s \times G_w$$

where G_s = Specific gravity of test fuel at 60°F (referred to water)
 G_w = 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.

$$FE_c = FE_{o_{mpg}} \times \frac{Q}{H}$$

where

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

Q = Volumetric heating value of standard reference fuel

Combining steps 1-3 yields

$$\Rightarrow FE_c = \frac{\text{miles}}{\text{lbs}} \times (G_s \times G_w) \times \frac{Q}{H}$$

- 4.) Convert 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/BTU $\times 10^6$.

Eq = Energy equivalent of converting mpg to mile/BTU $\times 10^6$.

$$Eq = ((mpg)/(H)) \times 10^6$$

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

The reported fuel economy is based on the following: measured test quantities-- distance 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 $T=60^\circ\text{F}$). These combine to give a fuel economy in miles per lb. The energy equivalent

(mile/BTUx10⁶) 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.

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

$$FEo_{mi/scf} = \text{Observed fuel economy} = \frac{\text{miles}}{\text{scf of fuel}}$$

- 2.) Convert the observed fuel economy to miles per lb by dividing FEO by the density of the test fuel at standard conditions (Lb/ft³).

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.

$$FEo_{mi/lb} = FEO / Gm$$

where Gm = Density of test fuel at standard conditions

- 3.) Convert the observed fuel economy (FEomi/lb) to an energy equivalent of (miles/BTUx10⁶) by dividing the observed fuel economy (FEomi/lb) by the heating value of the test fuel at standard conditions.

$$Eq = ((FEomi/lb)/H) \times 10^6$$

where

Eq = Energy equivalent of miles/lb to mile/BTUx10⁶

H = Volumetric heating value of test fuel at standard conditions

6-III. DISCUSSION

This is a comparative test of fuel economy using diesel fuel with a heating value of 19,631.0 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 127,700.0 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 – 6.39 mpg, ART – 6.86 mpg, and COM – 14.21 mpg. Average fuel consumption at idle was 0.44 gph.

FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 0911	Date: 10-19-09	SLW (lbs): 21,630
Personnel: J.P., B.L. & S.C.		

FUEL SYSTEM	OK	Date	Initials
Install fuel measurement system	✓	10/19/09	S.C.
Replace fuel filter	✓	10/19/09	B.L.
Check for fuel leaks	✓	10/19/09	S.C.
Specify fuel type (refer to fuel analysis)	Diesel		
Remarks: None noted.			
BRAKES/TIRES	OK	Date	Initials
Inspect hoses	✓	10/19/09	J.P.
Inspect brakes	✓	10/19/09	J.P.
Relube wheel bearings	✓	10/19/09	J.P.
Check tire inflation pressures (mfg. specs.)	✓	10/19/09	S.C.
Remarks: None noted.			
COOLING SYSTEM	OK	Date	Initials
Check hoses and connections	✓	10/19/09	S.C.
Check system for coolant leaks	✓	10/19/09	S.C.
Remarks: None noted.			

FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 2)

Bus Number: 0911	Date: 10-19-09		
Personnel: S.C., J.P. & B.L.			
ELECTRICAL SYSTEMS	OK	Date	Initials
Check battery	✓	10/19/09	S.C.
Inspect wiring	✓	10/19/09	S.C.
Inspect terminals	✓	10/19/09	S.C.
Check lighting	✓	10/19/09	S.C.
Remarks: None noted.			
DRIVE SYSTEM	OK	Date	Initials
Drain transmission fluid	✓	10/19/09	J.P.
Replace filter/gasket	✓	10/19/09	J.P.
Check hoses and connections	✓	10/19/09	J.P.
Replace transmission fluid	✓	10/19/09	J.P.
Check for fluid leaks	✓	10/19/09	J.P.
Remarks: None noted.			
LUBRICATION	OK	Date	Initials
Drain crankcase oil	✓	10/19/09	B.L.
Replace filters	✓	10/19/09	B.L.
Replace crankcase oil	✓	10/19/09	B.L.
Check for oil leaks	✓	10/19/09	B.L.
Check oil level	✓	10/19/09	B.L.
Lube all chassis grease fittings	✓	10/19/09	B.L.
Lube universal joints	✓	10/19/09	B.L.
Replace differential lube including axles	✓	10/19/09	B.L.
Remarks: None noted.			

FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 3)

Bus Number: 0911		Date: 10-19-09	
Personnel: S.C.			
EXHAUST/EMISSION SYSTEM	OK	Date	Initials
Check for exhaust leaks	✓	10/19/09	S.C.
Remarks: None noted.			
ENGINE	OK	Date	Initials
Replace air filter	✓	10/19/09	B.L.
Inspect air compressor and air system	✓	10/19/09	B.L.
Inspect vacuum system, if applicable	N/A	10/19/09	B.L.
Check and adjust all drive belts	✓	10/19/09	B.L.
Check cold start assist, if applicable	✓	10/19/09	B.L.
Remarks: None noted.			
STEERING SYSTEM	OK	Date	Initials
Check power steering hoses and connectors	✓	10/19/09	S.C.
Service fluid level	✓	10/19/09	S.C.
Check power steering operation	✓	10/19/09	S.C.
Remarks: None noted.			
	OK	Date	Initials
Ballast bus to seated load weight	✓	10/19/09	S.C.
TEST DRIVE	OK	Date	Initials
Check brake operation	✓	10/19/09	S.C.
Check transmission operation	✓	10/19/09	S.C.
Remarks: None noted.			

FUEL ECONOMY PRE-TEST INSPECTION FORM

Bus Number: 0911	Date: 10-21-09
Personnel:	
PRE WARM-UP	If OK, Initial
Fuel Economy Pre-Test Maintenance Form is complete	S.C.
Cold tire pressure (psi): Front <u>120</u> Middle <u>N/A</u> Rear <u>120</u>	S.C.
Tire wear:	S.C.
Engine oil level	S.C.
Engine coolant level	S.C.
Interior and exterior lights on, evaporator fan on	S.C.
Fuel economy instrumentation installed and working properly.	S.C.
Fuel line -- no leaks or kinks	S.C.
Speed measuring system installed on bus. Speed indicator installed in front of bus and accessible to TECH and Driver.	S.C.
Bus is loaded to SLW	S.C.
WARM-UP	If OK, Initial
Bus driven for at least one hour warm-up	S.C.
No extensive or black smoke from exhaust	S.C.
POST WARM-UP	If OK, Initial
Warm tire pressure (psi): Front <u>125</u> Middle <u>N/A</u> Rear <u>128</u>	S.C.
Environmental conditions Average wind speed <12 mph and maximum gusts <15 mph Ambient temperature between 30°F(-1C°) and 90°F(32°C) Track surface is dry Track is free of extraneous material and clear of interfering traffic	S.C.

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0911		Manufacturer: Champion		Date: 10-20-09	
Run Number: 1		Personnel: B.L., T.S. & S.C.			
Test Direction: <input type="checkbox"/> CW or <input checked="" type="checkbox"/> CCW		Temperature (°F): 62		Humidity (%): 78	
SLW (lbs): 21,630		Wind Speed (mph) & Direction: Calm		Barometric Pressure (in.Hg): 30.15	

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Flow Meter Reading (gals)		Fuel Used (gals)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:25	8:25	27.2	0	.295	.295
ART #1	0	3:53	3:53	30.4	0	.260	.260
CBD #2	0	8:29	8:29	32.4	0	.301	.301
ART #2	0	3:58	3:58	41.8	0	.250	.250
CBD #3	0	8:26	8:26	34.8	0	.309	.309
COMMUTER	0	5:58	8:58	42.2	0	.286	.286
Total Fuel = 1.701 gals							

5 minute idle*: Total Fuel Used = .038 gals *
Heating Value = 19,631.0 BTU/LB
Comments: A 5 minute idle was performed instead of a 20 minute idle due to design. This bus is designed with a "no-idle" 5 minute shutdown.

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0911		Manufacturer: Champion		Date: 10-21-09	
Run Number: 2		Personnel: B.L., B.S. & S.C.			
Test Direction: <input checked="" type="checkbox"/> CW or <input type="checkbox"/> CCW		Temperature (°F): 51		Humidity (%): 72	
SLW (lbs): 21,630		Wind Speed (mph) & Direction: 7 / SW		Barometric Pressure (in.Hg): 30.24	

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Flow Meter Reading (gals)		Fuel Used (gals)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:22	8:22	25.4	0	.302	.302
ART #1	0	3:56	3:56	26.4	0	.266	.266
CBD #2	0	8:25	8:25	26.9	0	.299	.299
ART #2	0	3:55	3:55	27.5	0	.254	.254
CBD #3	0	8:27	8:27	28.6	0	.290	.290
COMMUTER	0	5:56	5:56	27.2	0	.265	.265
Total Fuel = 1.676 gals							

20 minute idle : Total Fuel Used = N/A gals
Heating Value = 19,631.0 BTU/LB
Comments: None noted.

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0911		Manufacturer: Champion		Date: 10-21-09	
Run Number: 3		Personnel: B.S., B.L. & S.C.			
Test Direction: <input type="checkbox"/> CW or <input checked="" type="checkbox"/> CCW		Temperature (°F): 56		Humidity (%): 72	
SLW (lbs): 21,630		Wind Speed (mph) & Direction: 4 / SW		Barometric Pressure (in.Hg): 30.24	

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Flow Meter Reading (gals)		Fuel Used (gals)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:29	8:29	26.8	0	.320	.320
ART #1	0	3:59	3:59	27.6	0	.266	.266
CBD #2	0	8:30	8:30	29.8	0	.320	.320
ART #2	0	4:01	4:01	28.8	0	.253	.253
CBD #3	0	8:27	8:27	30.2	0	.180	.180
COMMUTER	0	6:01	6:01	33.6	0	.194	.194
Total Fuel = 1.533 gals							

20 minute idle : Total Fuel Used = N/A gals
Heating Value = 19,631 BTU/LB
Comments: None noted.

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0911		Manufacturer: Champion		Date: 10-21-09	
Run Number: 4		Personnel: B.S., B.L. & S.C.			
Test Direction: <input checked="" type="checkbox"/> CW or <input type="checkbox"/> CCW		Temperature (°F): 65		Humidity (%): 70	
SLW (lbs): 21,630		Wind Speed (mph) & Direction: 4 / SW		Barometric Pressure (in.Hg): 30.24	

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Flow Meter Reading (gals)		Fuel Used (gals)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:21	8:21	29.2	0	.125	.125
ART #1	0	3:54	3:54	33.7	0	.252	.252
CBD #2	0	8:29	8:29	35.4	0	.294	.294
ART #2	0	3:58	3:58	39.8	0	.252	.252
CBD #3	0	8:29	8:29	47.5	0	.297	.297
COMMUTER	0	6:02	6:02	41.4	0	.269	.269
Total Fuel = 1.489 gals							

5 minute idle*: Total Fuel Used = .035 gals
Heating Value = 19,631.0 BTU/LB
Comments: A 5 minute idle was performed instead of a 20 minute idle due to design. This bus is designed with a "no-idle" 5 minute shutdown.

0911 .ful
FUEL ECONOMY SUMMARY SHEET

BUS MANUFACTURER :Champion	BUS NUMBER :0911
BUS MODEL :Defender	TEST DATE :10/21/09

FUEL TYPE : DIESEL
 SP. GRAVITY : .8400
 HEATING VALUE : 19631.00 BTU/Lb
 FUEL TEMPERATURE : 60.00 deg F
 Standard Conditions : 60 deg F and 14.7 psi
 Density of Water : 8.3373 lb/gallon at 60 deg F

CYCLE	TOTAL FUEL USED(GAL)	TOTAL MILES	FUEL ECONOMY MPG(Measured)	FUEL ECONOMY MPG (Corrected)

Run # :1, CCW				
CBD	.905	5.73	6.331	5.83
ART	.510	3.82	7.490	6.90
COM	.286	3.82	13.357	12.31
TOTAL	1.701	13.37	7.860	7.24
Run # :2, CW				
CBD	.891	5.73	6.431	5.93
ART	.520	3.82	7.346	6.77
COM	.265	3.82	14.415	13.28
TOTAL	1.676	13.37	7.977	7.35
Run # :3, CCW				
CBD	.820	5.73	6.988	6.44
ART	.519	3.82	7.360	6.78
COM	.194	3.82	19.691	18.15
TOTAL	1.533	13.37	8.721	8.04
Run # :4, CW				
CBD	.716	5.73	8.003	7.38
ART	.504	3.82	7.579	6.98
COM	.269	3.82	14.201	13.09
TOTAL	1.489	13.37	8.979	8.27

IDLE CONSUMPTION (MEASURED)

First 20 Minutes Data : .04GAL Last 20 Minutes Data : .04GAL
 Average Idle Consumption : .11GAL/Hr

RUN CONSISTENCY: % Difference from overall average of total fuel used

Run 1 : -6.3 Run 2 : -4.8 Run 3 : 4.2 Run 4 : 6.9

SUMMARY (CORRECTED VALUES)

 Average Idle Consumption : .12 G/Hr
 Average CBD Phase Consumption : 6.39 MPG
 Average Arterial Phase Consumption : 6.86 MPG
 Average Commuter Phase Consumption : 14.21 MPG
 Overall Average Fuel Consumption : 7.73 MPG
 Overall Average Fuel Consumption : 56.20 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 on the track 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 and the Bus Testing Center.

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 80.0 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 43.5 dB(A); ranging from 42.1 dB(A) in line with the middle speaker to 44.8 dB(A) at the driver's seat. The interior ambient noise level for this test was < 34.0 dB(A).

The second test measures interior noise during acceleration from 0 to 35 mph. This noise level ranged from 67.8 dB(A) at the middle passenger seats to 74.3 dB(A) at the driver's seat. The overall average was 70.5 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: 0911	Date: 6-12-09
Personnel: T.S. & S.C.	
Temperature (°F): 71	Humidity (%): 72
Wind Speed (mph): Calm	Wind Direction: Calm
Barometric Pressure (in.Hg): 30.11	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Interior Ambient Noise Level dB(A): < 34.0	Exterior Ambient Noise Level dB(A): 48.5
Microphone Height During Testing (in): 48.0	

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	44.8
Front Passenger Seats	43.6
In Line with Front Speaker	42.1
In Line with Middle Speaker	43.1
In Line with Rear Speaker	43.3
Rear Passenger Seats	43.9

Final Sound Level Meter Calibration: ■ checked by: S.C.

Comments: All readings taken in the center aisle.

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

Bus Number: 0911	Date: 10-22-09
Personnel: B.S., B.L. & S.C.	
Temperature (°F): 61	Humidity (%): 61
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.03	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Interior Ambient Noise Level dB(A): < 34.0	Exterior Ambient Noise Level dB(A): 49.9
Microphone Height During Testing (in): 48.0	

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	74.3
Front Passenger Seats	70.6
Middle Passenger Seats	67.8
Rear Passenger Seats	69.3

Final Sound Level Meter Calibration: ■ checked by: S.C.

Comments: All readings taken in the center aisle.
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INTERIOR NOISE TEST DATA FORM
Test Condition 3: Audible Vibration Test

Bus Number: 0911	Date: 10-22-09
Personnel: B.S., B.L. & S.C.	
Temperature (°F): 61	Humidity (%): 61
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.03	

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 80 dB(A)
INTERIOR NOISE TEST**

7.2 EXTERIOR NOISE TESTS

7.2-I. TEST OBJECTIVE

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

7.2-II. TEST DESCRIPTION

In the exterior noise tests, the bus 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 up shift.
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 PSBRTF 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 41.5 dB(A), the average test result obtained while accelerating from a constant speed was 71.6 dB(A) on the right side and 72.4 dB(A) on the left side.

When accelerating from a standstill with an exterior ambient noise level of 42.5 dB(A), the average of the results obtained were 69.5 dB(A) on the right side and 70.3 dB(A) on the left side.

With the vehicle stationary and the engine, accessories, and air conditioning on, the measurements averaged 62.9 dB(A) at low idle and 75.8 dB(A) at wide open throttle. With the accessories and air conditioning off, the readings averaged 2.6 dB(A) lower at low idle and 0.7 dB(A) lower at wide open throttle. The exterior ambient noise level measured during this test was 41.8 dB(A). Note; this test bus was not equipped with a high idle mode; therefore data for that condition is not available.

EXTERIOR NOISE TEST DATA FORM

Accelerating from Constant Speed

Bus Number: 0911	Date: 10-22-09
Personnel: B.S., B.L. & S.C.	
Temperature (°F): 64	Humidity (%): 61
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.03	
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: S.C.	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Exterior Ambient Noise Level dB(A): 41.5	

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	70.8	1	72.1
2	71.2	2	72.3
3	71.5	3	72.3
4	71.3	4	72.3
5	71.6	5	72.4
Average of two highest actual noise levels = 71.6 dB(A)		Average of two highest actual noise levels = 72.4 dB(A)	
Final Sound Level Meter Calibration Check: ■ checked by: S.C.			
Comments: None noted.			

EXTERIOR NOISE TEST DATA FORM **Accelerating from Standstill**

Bus Number: 0911	Date: 11-22-09
Personnel: B.S., B.L. & S.C.	
Temperature (°F): 64	Humidity (%): 61
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.03	
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: S.C.	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Exterior Ambient Noise Level dB(A): 42.5	

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	69.6	1	70.5
2	69.1	2	69.3
3	69.4	3	69.7
4	69.3	4	70.1
5	68.7	5	69.9
Average of two highest actual noise levels = 69.5 dB(A)		Average of two highest actual noise levels = 70.3 dB(A)	

Final Sound Level Meter Calibration Check: ■ checked by: S.C.
Comments: None noted.

EXTERIOR NOISE TEST DATA FORM

Stationary

Bus Number: 0911		Date: 10-22-09	
Personnel: B.S., B.L. & S.C.			
Temperature (°F): 64		Humidity (%): 61	
Wind Speed (mph): 5		Wind Direction: SW	
Barometric Pressure (in.Hg):		30.03	
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: S.C.			
Initial Sound Level Meter Calibration: ■ checked by: S.C.			
Exterior Ambient Noise Level dB(A): 41.8			
Accessories and Air Conditioning ON			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	798	62.2	63.5
High Idle	N/A	N/A	N/A
Wide Open Throttle	2,675	76.0	75.5
Accessories and Air Conditioning OFF			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	800	59.6	60.9
High Idle	N/A	N/A	N/A
Wide Open Throttle	2,675	75.6	74.5
Final Sound Level Meter Calibration Check: ■ checked by: S.C.			
Comments: None noted.			

7.2 EXTERIOR NOISE TESTS



**TEST BUS UNDERGOING
EXTERIOR NOISE TESTING**

