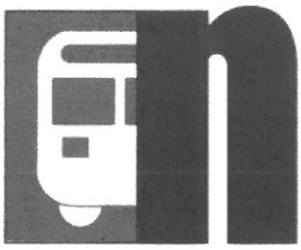
NATIONAL



BUS SALES
MidAtlantic Region

P.O. Box 6549 ■ Marietta, GA 30065-0549
800 Pickens Drive Ext. ■ Marietta, GA 30062
GA - (770) 422-8920 ■ FAX - (770) 422-9007
Toll Free (800) 282-7981 Ext. 59

2075 West Main Street ■ Waynesboro, VA 22930
VA – (540) 943-3430 ■ Cell - (540) 256-3246
Regional Representative - Andrew Clawson

August 21, 2014

Beth Collins
Department of Administration
Purchasing Division
2019 Washington Street, East
P.O. Box 50130
Charleston, WV 25305-0130

Ref: PTR 14046

Dear Beth Collins:

National Bus Sales and Leasing, Inc. appreciates this opportunity to submit a bid for transit vehicles to the State of West Virginia. Our offerings, a Goshen Coach Pacer II mounted on a Ford E-450 with a 6.8L gas engine for Classes A-F, and a Goshen Coach Impulse mounted on a Ford E-450 with a 6.8L gas engine for Classes G-R meets the intent and letter of your specifications with the following documentation, clarifications and/or explanations per your Required Bid Documentation Checklist.

Mandatory Bid Forms

Bid Form 1	Located at Enclosure A.
Bid Form 2	Located at Enclosure B.
Bid Form 3	Located at Enclosure C
Bid Form 4	Located at Enclosure D.
Bid Form 5	Located at Enclosure E.
Bid Form 6	Located at Enclosure F.
Bid Form 6A	Located at Enclosure G.
Bid Form 7	Located at Enclosure H.
Bid Form 8	Located at Enclosure I.
Bid Form 9	Located at Enclosure J.
Copy of Bus Testing STURRA Test	Located at Enclosure K for Classes A-F& Loctated at Enclosure L for Classes G-R.
Water Testing- Details of Process	Located at Enclosure M.
No Debt Affidavit	Located at Enclosure N.
RBDC	Required Bid Document Checklist is located at Enclosure O.
Certification Page	Certification and Signature Page is located at Enclosure P.

Floorplan	Located at Enclosure Q for Classes A-F. Located at Enclosure R for Classes G- L. Locates at Enclosure S for Classes M-R.
Bid Documents	Bid Documents are located at Enclosure T.
Addendum Ack.	Addendum Acknowledgement is located at Enclosure U.
Pricing Page	Located at Enclosure V as well as a convenience copy in the cover of this binder.

Section	**Mandatory Documentation**

3.5 Engine Ford 6.8L V10 Gasoline Engine. Warranty is by Ford Motor Corporation under the power train warranty– 5yr/60,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.5g Cooling system - Gasoline Engine equipped with large capacity radiator and viscous thermostatically activated cooling fan Warranty – 3yr/36,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.5h The High Idle System to be provided is the Intermotive Gateway 805. Literature can be found on the USB drive provided with the bid labeled Intermotive Gateway 805. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.6 Ford OEM 5R110W transmission. Warranty is by Ford Motor Corporation under the power train warranty– 5yr/60,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.6.d Transmission Cooling System- Ford OEM 5R110W transmission comes standard with an in-tank oil cooler and an external auxiliary transmission oil cooler operating on the same principal as the coolant radiator. Warranty – 3yr/36,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.7.1 Heavy Duty Breaks- Ford OEM brakes are four wheel disc type: powered, self-adjusting, dual hydraulic with a brake hydro booster and four wheel anti-lock feature. Warranty – 3yr/36,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.7.3 Suspension System- Ford OEM suspension system includes the following components:

A. 5,000 lb. front coil spring.
B. Multi-leaf, single stage springs rated at Max. Pay load of 9,600 lbs.
C. 21mm front stabilizer bar
D. 1.125" rear stabilizer bar
E. 25mm pressure tube gas filled front and rear shocks

Warranty – 3yr/36,000 miles. For additional information see file on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.7.3 Mor-Ryde Rear Suspension System to be provided- For additional information see file on USB drive provided with the bid labeled Mor-Ryde. Warranty 3yr/70,000 miles

.

3.7a Ford OEM Tires - LT225/75R 16E BSW All Season Tire - Brand TBD. Warranty is limited to manufacturing defect and covered under Ford warranty umbrella. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.8 Electrical System- Ford OEM 12V Electrical system is integrated with a solenoid triggered body electrical system, all 12V circuits with circuit breaker and fuse interface. For additional information see files on USB drive provided with the bid labeled Electrical System Description- Impulse- Ford, Cooper Bussmann VEC, and Electrical Panel Layout. As Built wire schematics (1 Electronic and 2 Laminated Hard Copies) are ordered for each bus as required. Minimum warranty –3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.8.1 Alternator- Alternator for Gas chassis will be ordered from Ford on the E450 chassis. A single 225-amp alternator will be provided. Ford option # - (63N).Warranty – 3yr/36,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.8.2 Batteries- Gasoline chassis has (1) 650 Cold Cranking Amps (CCA) battery and (1) 625 CCA battery for a total of 1275 CCA's to meet WV spec. Only one of the two batteries will be relocated to the slide out battery tray required in the specification due. Warranty 3yr/36,000 miles. For additional information see files on USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.

3.8.3 Exterior Lights-Goshen installs Optronics series of LED lights for its brake, reverse, marker and clearance applications. This brand of light is readily available from any parts supply house catering to trucks and buses. Warranty minimum 3 years/ 36,000 miles. For additional information see file on USB drive provided with the bid labeled Optronics-Goshen Coach Interior & Exterior LED Lights and Optronics Warranty.

3.8.4 Interior Lights- Interior lights are also Optronics LED 2"x 4" clear lense type. This brand of light is readily available from any parts supply house catering to trucks and buses. Warranty minimum 3 Years/36,000 miles. For additional information see file on USB drive provided with the bid labeled Optronics- Goshen Coach Interior & Exterior LED Lights and Optronics Warranty.

3.8.5 Rear Alarm- A ECCO Model 520 97DB back up alarm is to be provided. Literature and can be found on the USB drive provided with the bid labeled ECCO Back Up Alarm. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.8.6 Back Up Camera- Goshen will provide a Rear view safety camera system. Literature and can be found on the USB drive provided with the bid labeled Back Up Camera. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.8.7 Fuse Box Panel- For additional information see files on USB drive provided with the bid labeled Electrical System Description- Impulse- Ford, Cooper Bussmann VEC, and Electrical Panel Layout.

3.9.1 Passenger heating system – Ford OEM dash installed heater is standard with the Ford E450 chassis. Type –thermostat controlled circulating hot-water. Warranty – 3yr/36,000 miles. For additional information see files on USB drive provided with the bid labeled 2014 Ford E-Series Brochure and E Series Cutaway Specifications and Heating System Ford Impulse.

3.9.1b Stepwell Heater- An UltraHeat, Inc. Step Heater will be provided for the bottom step of the units. Literature and can be found on the USB drive provided with the bid Ultra Heat Step Heater. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.9.1c Auxiliary Heaters- A Pro Air 35,000 BTU Heaters will be provided with a circulation pump. Literature and can be found on the USB drive provided with the bid labeled Pro-Air 35K Heater. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.9.2a A/C Cooling System- Ford OEM dash installed air-conditioning is standard with the Ford E450 chassis. Goshen installs the rear AC prior to the interior finish stage of the bus body. For this specification, Freon lines will be connected to an auxiliary compressor in addition to a stand-alone Ford OEM compressor. An ACT ceiling mounted evaporator and a three fan skirt mounted condenser will function independently of the Ford system. Thermostat and fan speed control wiring are remotely located to the driver's area. Warranty is 2 years/Unlimited miles.

3.9.6a A/C Compressor- Ford OEM Compressor plus a TM-16 Compressors will be provided. Literature and can be found on the USB drive provided with the bid labeled ACT50HD. ACT Warranty – 2 years / Unlimited miles.

3.9.2b A/C Condenser- One (1) CS-3 Condenser by ACT will be provided. Literature and can be found on the USB drive provided with the bid labeled ACTcs3. ACT Warranty – 2 years / Unlimited miles.

3.9.2d Rear Evaporators-One (1) EZ-50 Rear Evaporator by ACT will be provided. Literature and can be found on the USB drive provided with the bid labeled ACT ez5. ACT Warranty – 2 years / Unlimited miles.

3.9.2 A/C Hose System- Goodyear Galaxy 4890 SLE A/C Hoses that meet SAE J2064 Type C Class 1 and BurgaClip Fittings will be used for the a/c system. Literature and can be found on the USB drive provided with the bid labeled Burgaflex fittings and Goodyear hoses. Warranty – 2 years / Unlimited miles.

3.10 Roof Hatch- One (1) Transpec 1975 Standard Vent Model Emergency Roof Hatches will be provided. Literature and can be found on the USB drive provided with the bid Transpec Model 1975. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.11.1 Control Panel Locations-The Control Panel will be located with immediate reach of the Driver mounted over the dog box on the Ford OEM Chassis. Please see picture on USB drive provided with the bid labeled Ford Switch Panel. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.11.1 Circulation Fan- KBC Marketing Circulations fans will be provided. A Picture can be found on the USB drive provided with the bid Circulation Fan 1 and 2. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.12.1 Body Construction- Goshen Coach's Body Construction will be followed for each unit. A full description of the body construction can be found on the USB drive provided with the bid labeled Body Construction- Impulse and Body Construction 3D. The Goshen Coach Body Structure Warranty is 6 Year/60,000 mile.

3.12.1 Skirt Panel Seams- The skirt panel Seams will be only be placed above the wheel wells or adjacent to the A/C Skirt Condenser.

3.12.4cDoor 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 on the USB drive provided with the bid labeled A & M Door. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.12.5b Gerfloor Tarabus will be provided where required. Flooring Specifications and Color Selection can be found on the USB drive provided with the bid labeled Tarabus NT with SIC-Specification Sheet, Tarabus 12 years warranty USA and Tarabus Colors .Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment. Gerfloor Tarabus will be provided where required. Contrasting Color Selection can be found on the USB drive provided with the bid labeled Tarabus Colors .Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.12.6 Insulation- Goshen installed insulation is 1.5" thick rigid polystyrene thermal insulation with an R value of 4.6 per inch. See file on the USB drive provided with the bid labeled Polystyrene Insulation for MSDS showing fire retardant properties and non-toxicity.

3.12.7 Bumpers- The Front Bumper will be the Ford OEM Chromed Steel Bumper. Documentation is located on the USB drive provided with the bid labeled 2015 Ford E-Series Brochure and E Series Cutaway Specifications.. The Rear Bumper will be a SMI Energy Absorbing Bumper Additional information can be found on the USB drive provided with the bid labeled SMI Energy Absorbing Medium Duty Bumper. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.13 Lift-The Braun Millennium 2 Model NL917IB-2 will be provided. The Platform on this lift has a Clear Width of 33" and a Clear Length of 51". A brochure and specifications for this lift can be found on the USB drive provided with the bid labeled Braun Millennium 2. 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.

3.13g Interlock System- An Intermotive Gateway 805 will be provided for the interlock system. Literature and can be found on the USB drive provided with the bid labeled Intermotive

Gateway 805. Minimum warranty – 2 years / Unlimited miles falls under Goshen Coach Add-on equipment.

3.14a Passenger seats- The Passenger Seating package is to include the following seat types: Feather Weight Mid High Seats, Options to include ABS Seat Backs (where available) Aisle side US Armrest, Grab Handles on all seats, and level 3.5 fabric. Brochures for the seating package can be found on the USB Drive provided with the bid labeled: Freedman Featherweight Mid-Hi, US Armrest, and Fixed Seat Tests. 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.

3.14b Under Seat Retractor System- The seat belts to be provided will be Freedman Under Seat Retractor. This seat belt complies with FMVSS 210. A description of the Freedman Under Seat Retractor is located on the USB drive provided with the bid labeled Freedman USR.

3.14i Driver's Seat- A Freedman Sport Shield high back seat driver seat shall be provided. The seat will have Level 3 cloth upholstery and a single fold up armrest on the driver's right side. The Ford driver's door provides the second armrest. The seat will be mounted to the Ford OEM pedestal, which meets all FMVSS standards and is electronically linked to the Ford driver restraint system and the Ford air bag system. A description of the Freedman Shield Sport High Back Driver's Seat is located on the USB drive provided with the bid labeled Freedman Sport Shield Driver's Seat.

3.15 Mobility Aid Securement to be provided is Q'Straint. System is –#A1 with fully retractable shoulder belt along with sixteen (8) 16" quick straps. A brochure for this securement system is located on the USB drive provided with the bid and is labeled QRT Deluxe &Standard Systems. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.19a Exterior Mirrors- The Exterior Mirrors to be provided are the Rosco Heated Remote Mirrors for the Ford E-450 series M715. Documentation is located on the USB drive provided with the bid labeled Rosco remote, heated mirrors Ford and Rosco Mirror. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.21 Radio/CD Stereo- A Panasonic AM/FM/CD/MP3 Clock Radio will be provided. Model CQ-CM130U. Literature and can be found on the USB drive provided with the bid labeled Panasonic Radio Manual. Minimum warranty – 3 years / 36,000 miles falls under Goshen Coach Add-on equipment.

3.24 Undercoating -Goshen Coach will apply ZTECH undercoating in accordance with Ford's QVM program. The undercoating will be covered under a separate 5 year limited warranty. Literature and can be found on the USB drive provided with the bid labeled Rustproofing & Undercoating Process.

3.25 Interior Color Schemes:

A. Sidewalls – Grey FRP
B. Pads – Grey Vinyl to match cab
C. Flooring – Blue rubber per RCA enclosure
D. Ceiling – Grey FRP

E. Cab – Grey vinyl

Exterior Colors – The Ford chassis comes standard in Oxford White Clear coat, code YZ. All Goshen exterior body parts match code YZ with the exception of aluminum trim strips, black rubber rear bumper and exterior lights.

3.25.2b Paint Scheme- The Agency's logo and striping scheme will be completed in Avery, 3M or FDC vinyl determined by best match to Agency's color scheme. Non Metallic PPG paint codes will be used to match any Agencies paint needs. A chart of available vinyl colors is provided on the USB drive provided with the bid labeled Vinyl Chart.

4.2.1 ICS Seat- Double ICS Seat to be provided with Level 3.5 Fabric. Brochures for the seat can be found on the USB Drive provided with the bid labeled: Freedman ICS and Fixed Seat Tests. 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.

4.3.1 Security Camera System Security Camera System with Playback System- REI Camera System Bus-Watch series with 4 color cameras will be provided. A brochure for this system is located on the USB drive provided with the bid and is labeled REI Bus Watch. A lap top preloaded with all necessary playback software and manuals will be provided as a playback system.

4.4.1 Security Camera System Security Camera System with Playback System- REI Camera System Bus-Watch series with 4 color cameras will be provided. A brochure for this system is located on the USB drive provided with the bid and is labeled REI Bus Watch.

5.2 National Bus Sales & Leasing ensures that all deliveries will comply with the items in section 5.2.

5.11&5.11.1 Warranty on completed vehicle follows:

Chassis: 3 year or 36,000 miles Bumper to Bumper.
Please refer to the document labeled Ford Warranty Summary for additional coverages on the USB Drive provided with the bid.
Bus Conversion: 3 year or 36,000 miles.
Braun Lift: 3 Year/10,000 Cycles.
Supplemental AC system: 2 years, unlimited miles
Add-on components: Minimum 3 year or 36,000 miles unless stated above
Please see Warranty Statement on the USB drive provided with the bid labeled Warranty Document 3 Year 36K miles.

5.11.2 Warranty on basic vehicle structure

Bus Structure: 6 year or 60,000 miles
Undercoating: 5 year limited
Please see Warranty Statement on the USB drive provided with the bid labeled Warranty Document 3 Year 36K miles Under The section Extended Warranty Structural Items.

5.11.3 & 4.40e Warranty Service and coverage is provided separately for the following bus components: A. Chassis – Nearest Ford dealer that is truck certified (E350/450).

B. Bus Body – Nearest facility authorized by National Bus on behalf of Goshen coach. Note: If repairs required fall within the capability of the transit system, authorization and reimbursement can be made directly to the operator.
C. Major Components – Lift and A/C dealers closest to transit facility.

As a courtesy to the State of West Virginia, the following list of chassis providers is included:

A. Chassis – Northern Panhandle	Sam Yanen Ford
(304) 845 – 4244	Moundsville, WV
B. Chassis – Eastern Panhandle	Kent Parsons Ford
(304) 263 – 3344	Martinsburg, WV
C. Chassis – Central	Chenowith Ford
(304) 623 – 6501	Clarksburg, WV
D. Chassis – Southern	Bert Wolfe Ford
(304) 340 – 7278	Charleston, WV

As a courtesy to the State of West Virginia, the following list of body providers is included:

A. Chassis – Northern Panhandle	National Bus
(800) 282 – 7981	Customer Service Ctr
B. Chassis – Eastern Panhandle	Martz Auto Repair
(304) 267 – 9137	Martinsburg, WV
C. Chassis – Central	Seller's Truck N Auto
(304) 622 – 5876	Clarksburg, WV
D. Chassis – Southern	National Bus
(800) 282 – 7981	Customer Service Ctr

The only authorized full service Braun dealer in the state is:

A. WV Truck and Trailer
Nitro, WV (304) 755 – 0113
B. All other lift repair authorizations require calling Braun directly at 1-800 THE LIFT with problem and lift serial number.

The following are authorized air conditioning repair facilities in the state are:

SELLERS TRUCK 'N' AUTO 1129 E. PIKE ST CLARKSBURG
304-622-5876
MOUNTAINEER THERMO-KING 2252 ROXALANA RD DUNBAR
304-744-7344
FLEET SERVICE CO. 3007 CHAPLINE ST WHEELING
304-232-6140
WEST VIRGINIA TRUCK & TRAILER 1 JAIN DR. CROSS LANES
304-755-0113
HEMLOCK FLEET SERVICE 609 DIVISION ST PARKERSBURG
304-422-3166

6.1.2 We provided 2 completed bids in binder form with one marked for WVDPT

9.3a National 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 National'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.

9.3a Please see the separate complete Mechanical Description and Chassis Description vehicles for each class on the USB Drive Labeled as:

Class A Mechanical Description
Class B Mechanical Description
Class C Mechanical Description
Class D Mechanical Description
Class E Mechanical Description
Class F Mechanical Description
Class G Mechanical Description
Class H Mechanical Description
Class I Mechanical Description
Class J Mechanical Description
Class K Mechanical Description
Class L Mechanical Description
Class M Mechanical Description
Class N Mechanical Description
Class O Mechanical Description
Class P Mechanical Description
Class Q Mechanical Description
Class R Mechanical Description

Class A Chassis Description
Class B Chassis Description
Class C Chassis Description
Class D Chassis Description
Class E Chassis Description
Class F Chassis Description
Class G Chassis Description
Class H Chassis Description
Class I Chassis Description
Class J Chassis Description
Class K Chassis Description
Class L Chassis Description
Class M Chassis Description
Class N Chassis Description
Class O Chassis Description
Class P Chassis Description
Class Q Chassis Description
Class R Chassis Description

For warranty Information Please see Section 5.11.1-5.11.2 of our bid.
For Standard Equipment on please refer to the Goshen Coach Pacer II literature for classes A-F and the Goshen Coach Impulse literature for classes G-R located on the USB drive provided with the bid labeled Pacer II & Impulse. For complete specifications on the Goshen Coach Impulse please refer to the document labeled Impulse Product Spec-Ford on the USB drive provided with the bid.

9.3b Floorplans can be found on the USB Drive and labeled:
Floorplan Classes A-F
Floorplan Classes G-L
Floorplan Classes M-R

9.3c Curb Weight for each class can be found on the USB Drive and labeled:
Curb Weight Classes A-F
Curb Weight Classes G-L
Curb Weight Classes M-R

9.3f Nearest Depot for parts supply:

National Bus Sales & Leasing, Inc.
P.O. Box 6549
Marietta, GA 30065-0549

National Bus Sales & Leasing, Inc.
800 Pickens Drive Ext.
Marietta, GA 30062

9.3g Undercoating -Goshen Coach will apply ZTECH undercoating in accordance with Ford's QVM program. The undercoating will be covered under a separate 5 year limited warranty. Literature and can be found on the USB drive provided with the bid labeled Rustproofing & Undercoating Process.

9.3h Location of Final Assembly:
Goshen Coach
25161 Leer Drive
Elkhart, IN 46514

For description of Final Assembly Operations please refer to document on the USB drive provided with the bid labeled Buy America PTR14046.

9.3i References:

J. Douglas Carter, General Manager
Potomac Valley Transit Authority
(304) 257-1414 work

Josh Baker, CCTM
Coordinator of NRVCS Transit & Facility Services
General Manager of Radford Transit
New River Valley Community Services
Voice: (540) 961-8363

Gary Heinline
New River Valley Senior Services
Phone: 540-994-2611

David Bruffy General Manager
Mountain Line Transit Authority
WORK: (304)296-3680

Carl Musak, Director of Guest Services
The Greenbrier
Phone: (304) 536 - 4954

Please contact us immediately at (800) 282-7981 if any additional documentation is required. Thanks again for your consideration!

Sincerely,

Andrew W. Clawson
Regional Representative
aclawson@nationalbussales.com

BID FORM #1: LOCATION(S) OF THE TECHNICAL SERVICE REPRESENTATIVE(S) MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

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

Name: Andrew Clawson

Address: 51 Ivy Ridge Lane

Fishersville, VA

Telephone: (540)256-3246

Name: Carl Henderson

Address: 800 Pickens Drive Ext.

Marietta, GA

Telephone: 800-282-7981

Name: NBSL- Parts

Address: 800 Pickens Drive Ext.

Marietta, GA

Telephone: 800-282-7981

Name: WBPI- Parts

Address: 51 Ivy Ridge Lane

Fishersville, VA

Telephone: 540-337-0140

REQUEST FOR QUOTATION **PTR14046**
158" Wheelbase Transit Vehicles

BID FORM #2:CERTIFICATION FOR AIR POLLUTION
MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

Pursuant to Section 8.4 of Part 1 of the Procurement, the Vendor certifies that the vehicles proposed:

X **ARE or**

_____**ARE NOT** (specify one)

in compliance with the regulations in 40 CFR Part 85, 40 CFR Part 86, 40 CFR Part 600 and the air pollution criteria established by the Environmental Protection Agency of the United States Government.

8/20/14
Date

Authorized Signature

Regional Representative
Title

National Bus Sales & Leasing
Company Name

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.

8/20/14
Date


Authorized Signature

Regional Representative
Title

National Bus Sales & Leasin
Company Name

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:

8/20/14
Date

Authorized Signature

National Bus Sales & Leasin
Company Name

Andrew Clawson
Name

Regional Representative
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

BID FORM #5: FEDERAL MOTOR VEIDCLE 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.

8/20/14

Date

Authorized Signature

Regional Representative

Title

National Bus Sales & Leasing

Company Name

BID FORM #6--U.S. COMPTROLLER'S DEBARMENT LIST CERTIFICATION
MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

National Bus Sales & Leasing hereby certifies that it

____IS or

X
____IS **NOT** (specify one) included on the. U.S. GSA's debarment and suspension listing at https://www.sam.gov .

8/20/14
Date

Authorized Signature

Regional Representative
Title

National Bus Sales & Leasing
Company Name

BID FORM #6-A: CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSffill.ITY MATTERS MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third party contract) National Bus Sales & Leasin (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.
5. 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), National Bus Sales & Leasing **, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH TillS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. SECTIONS 3801 ET SEQ. ARE APPLICABLE THERETO.**

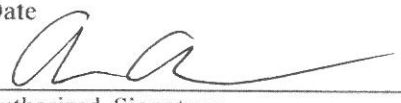
Regional Representative

Signature and Title of Authorized Official

BID FORM #7: VENDOR'S CERTIFICATION OF UNDERSTANDING AND ACCEPTANCE MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

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.

8/20/14
Date



Authorized Signature

Regional Representative
Title

National Bus Sales & Leasing
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.

REQUEST FOR QUOTATION PTR14046
158" Wheelbase Transit Vehicles

BID FORM #8: CERTIFICATION OF COMPLIANCE WITH FTA'S BUS TESTING REQUIREMENTS MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

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 2 CFR Part 1200.

8/20/14
Date

Authorized Signature

Regional Representative
Title

National Bus Sales & Leasing
Company Name

REQUEST FOR QUOTATION PTR14046
158" Wheelbase Transit Vehicles

BID FORM #9: CERTIFICATION OF RESTRICTIONS ON LOBBYING MANDATORY BID FORM-MUST BE SUBMITTED WITH BID

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

a. 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.

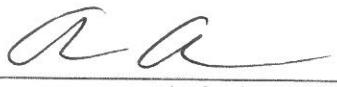
b. If any funds other than Federal appropriated funds have been or will be paid to any person to influence or attempt to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or any employee of a Member of Congress in connection with any application 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

c. The undersigned understands that the language of this certification shall be included in the award documents for all subawards 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) National Bus Sales & Leasing, 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.

8/20/14
Date


Authorized Signature

Regional Representative
Title

STURAA TEST

4 YEAR

100,000 MILE BUS

from

GOSHEN COACH,
DIVISION OF WARRICK INDUSTRIES, INC.

MODEL BUS/BA

MARCH 2000

PTI-BT-R9923-03-00

PENNSTATE

The Pennsylvania Transportation Institute

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

Bus Testing and Research Center

6th Avenue and 45th Street (814) 949-7944
Altoona, PA 16602

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Goshen Coach, Division of Warrick Industries, Inc., submitted a model Bus/BA, diesel powered 14 seat/21-foot bus, for a 4 year/100,000 mile STURAA test. The odometer reading at the time of delivery was 4,364 miles. Testing started on December 6, 1999, and was completed on March 24, 2000. The Check-In section of the report provides a description of the bus and specifies its major components.

The primary part of the test program is the Structural Durability Test, which also provides the information for the Maintainability and Reliability results. The Structural Durability Test started on February 1, 2000 and was completed on February 29, 2000.

The interior of the bus is configured with seating for 14 passengers including the driver. Additionally, free floor space will accommodate 10 standing passengers resulting in a potential load of 24 persons. At 150 lbs per person, this load results in a total vehicle weight of 11,800 lbs and exceeds the GAWR of the rear axle (7,500 lbs). In order to avoid exceeding the axle weight rating, ballast simulating 8 standing passengers (1,200 lbs) was removed. Elimination of the 8 standing passenger positions resulted in an adjusted gross vehicle weight of 10,600 lbs. The adjusted weight was used for the GVWR segment of the Structural Durability Test. The SLW segment of the test was performed at 10,320 lbs and the final segment of the test was performed at a CW of 8,210 lbs. Durability driving resulted in several failures that required unscheduled maintenance. A description of failures, and a complete and detailed listing of scheduled and unscheduled maintenance, is provided in the Maintainability section of this report.

The components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems) were found to be readily accessible and no restrictions were noted. Accessibility issues were encountered in accessing the A/C compressor, the fuel filter and the engine belts.

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

The Safety Test, a double-lane change maneuver 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 14.25 seconds.

The Shakedown Test produced a maximum final loaded deflection of 0.122 inches under a distributed static load of 9,000 lbs. The test resulted in essentially no permanent deflection of the structure. The Distortion Test was completed with all subsystems, doors and escape mechanism operating properly. No water leakage observed during the test. The test bus was not equipped with tow eyes or tow hooks, therefore, the Static Towing was not performed. The Dynamic Towing Test was performed using a front lift tow. The towing interface was accomplished by chaining to the front axle. A rubber cushion was inserted between the tow chains and the front bumper to provide protection. The bus was towed without incident and no damage resulted from the test. The manufacturer does not recommend towing the bus from the rear, therefore a rear test was not performed. The Jacking and Hoisting Tests were performed without incident. The bus was found to be stable on the jack stands and the minimum jacking clearance, measured with a tire deflated, was 9.0 inches.

A Fuel Economy Test was run on simulated central business district, arterial, and commuter courses. The results were 5.63 mpg, 6.58 mpg, and 10.95 mpg respectively; with an overall average of 6.86 mpg.

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

ABBREVIATIONS

ABTC	-	Altoona Bus Test Center
A/C	-	air conditioner
ADB	-	advance design bus
ATA-MC	-	The Maintenance Council of the American Trucking Association
CBD	-	central business district
CW	-	curb weight (bus weight including maximum fuel, oil, and coolant; but without passengers or driver)
dB(A)	-	decibels with reference to 0.0002 micro bar as measured on the "A" scale
DIR	-	test director
DR	-	bus driver
EPA	-	Environmental Protection Agency
FFS	-	free floor space (floor area available to standees, excluding ingress/egress areas, area under seats, area occupied by feet of seated passengers, and the vestibule area)
GVL	-	gross vehicle load (150 lb for every designed passenger seating position, for the driver, and for each 1.5 sq ft of free floor space)
GVW	-	gross vehicle weight (curb weight plus gross vehicle load)
GVWR	-	gross vehicle weight rating
MECH	-	bus mechanic
mpg	-	miles per gallon
mph	-	miles per hour
PM	-	Preventive maintenance
PTI	-	Pennsylvania Transportation Institute
rpm	-	revolutions per minute
SAE	-	Society of Automotive Engineers
SCH	-	test scheduler
SEC	-	secretary
SLW	-	seated load weight (curb weight plus 150 lb for every designed passenger seating position and for the driver)
STURAA	-	Surface Transportation and Uniform Relocation Assistance Act
TD	-	test driver
TECH	-	test technician
TM	-	track manager
TP	-	test personnel

TEST BUS CHECK-IN

I. OBJECTIVE

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

II. TEST DESCRIPTION

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

III. DISCUSSION

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

The test bus, built on a Ford E-350 chassis, has a driver's door and a passenger door located behind the front axle. (Note; this test bus was not equipped with a handicap device). The engine type is a diesel fueled Ford 7.3 L Power Stroke. The transmission is a Ford 4R100.

The interior of the bus is configured with seating for 14 passengers including the driver. Additionally, free floor space will accommodate 10 standing passengers resulting in a potential load of 24 persons. At 150 lbs per person, this load results in a total vehicle weight of 11,800 lbs and exceeds the GAWR of the rear axle (7,500 lbs). In order to avoid exceeding the axle weight rating, ballast simulating 8 standing passengers (1,200 lbs) was removed. Elimination of the 8 passenger positions resulted in an adjusted gross vehicle weight of 10,600 lbs. The SLW segment was performed at 10,320 lbs and the final segment of the test was performed at a CW of 8,210 lbs.

VEHICLE DATA FORM

Bus Number: 9923	Arrival Date: 12-6-99
Bus Manufacturer: Goshen Coach	Vehicle Identification Number (VIN): 1FDWE30F8XB36580
Model Number: Bus/BA	Date: 12-6-99
Personnel: B.L. & S.C.	

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

Individual Wheel Reactions:

Weights (lb)	Front Axle		Middle Axle		Rear Axle	
	Right	Left	Right	Left	Right	Left
CW	1,670	1,670	N/A	N/A	2,440	2,430
SLW	1,560	1,620	N/A	N/A	3,480	3,660
GVW	1,650 (1,550)	1,650 (1,600)	N/A	N/A	4,260 (3,660)	4,240 (3,790)

Total Weight Details:

Weight (lb)	CW	SLW	GVW	GAWR
Front Axle	3,340	3,180	3,300 (3,150)	4,400
Middle Axle	N/A	N/A	N/A	N/A
Rear Axle	4,870	7,140	8,500 (7,450)	7,500
Total	8,210	10,320	11,800 (10,600)	GVWR: 10,700

Dimensions:

Length (ft/in)	21.0 / 1.0
Width (in)	94.00
Height (in)	113.50
Front Overhang (in)	28.00
Rear Overhang (in)	85.25
Wheel Base (in)	139.50
Wheel Track (in)	Front: 68.00
	Rear: 73.50

Bus Number: 9923	Date: 12-6-99

CLEARANCES:

Lowest Point Outside Front Axle	Location: Steering stabilizer	Clearance(in): 12.0
Lowest Point Outside Rear Axle	Location: Tail pipe	Clearance(in): 10.5
Lowest Point between Axles	Location: Step well	Clearance(in): 9.0
Ground Clearance at the center (in)	9.0	
Front Approach Angle (deg)	32.0	
Rear Approach Angle (deg)	11.8	
Ramp Clearance Angle (deg)	7.5	
Aisle Width (in)	23.0	
Inside Standing Height at Center Aisle (ft)	72.3	

BODY DETAILS:

Body Structural Type	Integral		
Frame Material	Steel		
Body Material	Steel, fiberglass & aluminum		
Floor Material	Plywood		
Roof Material	Fiberglass & Aluminum		
Windows Type	☐ Fixed	☒ Movable	
Window Mfg./Model No.	Creation / AS3 M3 ⅛GI		
Number of Doors	1 Front	1 Front passenger	
Mfr. / Model No.	Goshen Coach/N/A		
Dimension of Each Door (in)	Front- 31.5 x 54.3	Rear- 29.7 x 81.5	
Passenger Seat Type	☐ Cantilever	☒ Pedestal	☐ Other
Mfr. / Model No.	Freedman/35630/35631/low back, rigid, featherweight		
Driver Seat Type	☐ Air	☐ Spring	☒ Other (explain)
Mfr. / Model No.	Freedman/30840/high back, recliner, with armrest		
Number of Seats (including Driver)	14		

Bus Number: 9923	Date: 12-6-99

BODY DETAILS (Contd..)

Free Floor Space (ft^2)	16.3			
Height of Each Step at Normal Position (in)	Front	1. 10.7	2. 7.6	3. 7.6	4. 7.6
	Middle	1. N/A	2. N/A	3. N/A	4. N/A
	Rear	1. N/A	2. N/A	3. N/A	4. N/A
Step Elevation Change - Kneeling (in)	1.2			

ENGINE

Type	☒ C.I.	☐ Alternate Fuel	
	☐ S.I.	☐ Other (explain)	
Mfr. / Model No.	Ford / Power Stroke 7.3L		
Location	☒ Front	☐ Rear	☐ Other (explain)
Fuel Type	☐ Gasoline	☐ CNG	☐ Methanol
	☒ Diesel	☐ LNG	☐ Other (explain)
Fuel Tank Capacity (indicate units)	37gals.		
Fuel Induction Type	☒ Injected	☐ Carburetion	
Fuel Injector Mfr. / Model No.	Ford / Power Stroke 7.3L		
Carburetor Mfr. / Model No.	N/A		
Fuel Pump Mfr. / Model No.	Ford / Power Stroke 7.3L		
Alternator (Generator) Mfr. / Model No.	Leece Neville / A0014900JB		
Maximum Rated Output (Volts / Amps)	14 / 200		
Air Compressor Mfr. / Model No.	N/A / 2HAH-19A-M322		
Maximum Capacity (ft^3 / min)	N/A		
Starter Type	☒ Electrical	☐ Pneumatic	☐ Other (explain)
Starter Mfr. / Model No.	Motorcraft / F5TU-11000-AD		

Bus Number: 9923	Date: 12-6-99

TRANSMISSION

Transmission Type	☐ Manual	☒ Automatic	
Mfr. / Model No.	Ford Motor Co. / 4R100		
Control Type	☒ Mechanical	☐ Electrical	☐ Other (explain)
Torque Convertor Mfr. / Model No.	N/A / N/A		
Integral Retarder Mfr. / Model No.	N/A		

SUSPENSION

Number of Axles	2		
Front Axle Type	☒ Independent	☐ Beam Axle	
Mfr. / Model No.	Ford / Twin Eye Beam		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	☒ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / F5UA-18045-NC		
Middle Axle Type	☐ Independent	☐ Beam Axle	
Mfr. / Model No.	N/A		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	☐ Spring	☐ Other (explain)
No. of Shock Absorbers	N/A		
Mfr. / Model No.	N/A		
Rear Axle Type	☐ Independent	☒ Beam Axle	
Mfr. / Model No.	Dana / 60-1U full-floating		
Axle Ratio (if driven)	3.55		
Suspension Type	☒ Air	☐ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / XC25-18088		

Bus Number: 9923	Date: 12-6-99

WHEELS & TIRES

Front	Wheel Mfr./ Model No.	Accuride / F8UA 1015-AA
	Tire Mfr./ Model No.	Firestone / R4S LT225/75R 16
Rear	Wheel Mfr./ Model No.	Accuride / F8UA 1015-AA
	Tire Mfr./ Model No.	Firestone / R4S LT225/75R 16

BRAKES

Front Axle Brakes Type	☐ Cam	☒ Disc	☐ Other (explain)
Mfr. / Model No.	ABS / N/A		
Middle Axle Brakes Type	☐ Cam	☐ Disc	☐ Other (explain)
Mfr. / Model No.	N/A		
Rear Axle Brakes Type	☐ Cam	☒ Disc	☐ Other (explain)
Mfr. / Model No.	ABS /N/A		
Retarder Type	N/A		
Mfr. / Model No.	N/A		

HVAC

Heating System Type	☐ Air	☒ Water	☐ Other
Capacity (Btu/hr)	35,000		
Mfr. / Model No.	Pro-Air/Pro-Air		
Air Conditioner	☒ Yes	☐ No	
Location	Front - dash	Rear - Roof	
Capacity (Btu/hr)	Front - N/A	Rear - 67,000	
A/C Compressor Mfr. / Model No.	Front - N/A	Rear - Carrier / AC55S	

STEERING

Steering Gear Box Type	Hydraulic gear
Mfr. / Model No.	Ford / XR-50
Steering Wheel Diameter	15.4
Number of turns (lock to lock)	4

Bus Number: 9923	Date: 12-6-99

OTHERS

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

CAPACITIES

Fuel Tank Capacity (gallons)	37
Engine Crankcase Capacity (gallons)	3.5
Transmission Capacity (gallons)	4
Differential Capacity (pints)	6.25
Cooling System Capacity (gallons)	5.75
Power Steering Fluid Capacity (gallons)	N/A

VEHICLE DATA FORM

Bus Number: 9923	Date: 12-6-99

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

Part Number	Description	Qty.
N/A	Spare tire mounted	1

COMPONENT/SUBSYSTEM INSPECTION FORM

Bus Number: 9923	Date: 12-6-99

Subsystem	Checked	Comments
Air Conditioning Heating and Ventilation	✓	
Body and Sheet Metal	✓	
Frame	✓	
Steering	✓	
Suspension	✓	
Interior/Seating	✓	
Axles	✓	
Brakes	✓	
Tires/Wheels	✓	
Exhaust	✓	
Fuel System	✓	
Power Plant	✓	
Accessories	✓	
Lift System	N/A	
Interior Fasteners	✓	
Batteries	✓	

CHECK - IN

GOSHEN COACH'S MODEL
BUS/BA

CHECK - IN CONT.

GOSHEN COACH'S MODEL
BUS/BA

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1. MAINTAINABILITY

1.1 ACCESSIBILITY OF COMPONENTS AND SUBSYSTEMS

1.1-I. TEST OBJECTIVE

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

1.1-II. TEST DESCRIPTION

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

1.1-III. DISCUSSION

The components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems) were found to be readily accessible and no restrictions were noted. Accessibility issues were encountered in accessing the A/C compressor, the fuel filter and engine belts.

ACCESSIBILITY DATA FORM

Bus Number: 9923	Date: 3-20-00

Component	Checked	Comments
ENGINE :		
Oil Dipstick	✓	
Oil Filler Hole	✓	
Oil Drain Plug	✓	
Oil Filter	✓	
Fuel Filter	✓	difficult access, top of engine, behind accessories.
Air Filter	✓	
Belts	✓	Air cleaner must be removed to access 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: 9923	Date: 3-20-00

Component	Checked	Comments
HVAC :		
A/C Compressor	✓	Air cleaner must be removed.
Filters	✓	
Fans	✓	
ELECTRICAL SYSTEM :		
Fuses	✓	
Batteries	✓	
Voltage regulator	✓	
Voltage Convertors	✓	
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.

SCHEDULED MAINTENANCE

Goshen Coach 9923

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
02-03-00	323	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
02-10-00	1,408	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
02-22-00	2,991	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
02-29-00	3,720	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
03-01-00	Complete	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:

ITEM	PRODUCT CODE	TEXACO DESCRIPTION
Engine oil	#2112	URSA Super Plus SAE 30
Transmission oil	#1866	Automatic Trans Fluid Mercon/Dexron II Multipurpose
Gear oil	#2316	Multigear Lubricant EP SAE 80W90
Wheel 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, several additional components were removed for repair or replacement. Following is a list of components and total repair/replacement time.

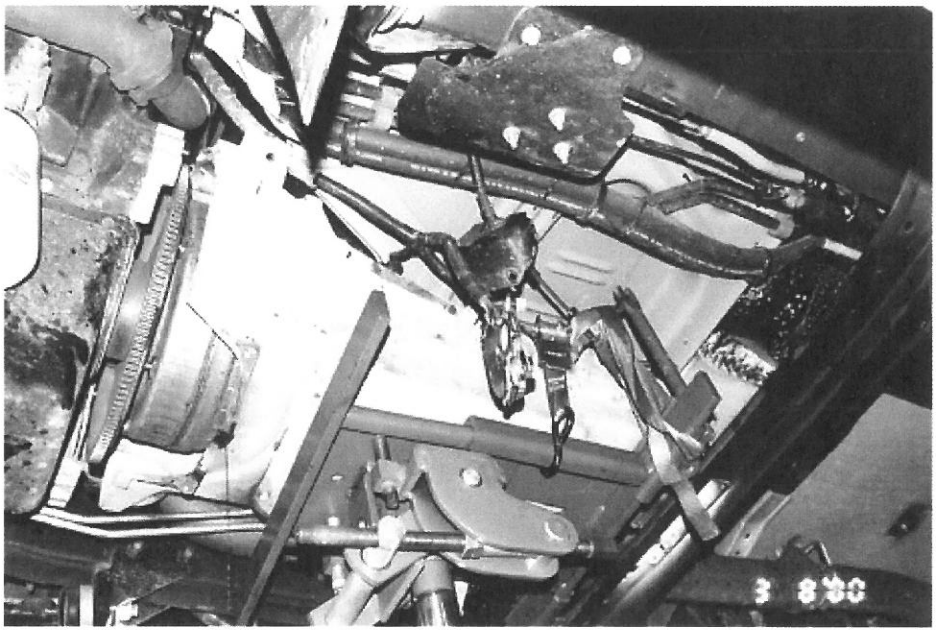
	MAN HOURS
Right outside rear view mirror.	0.50

At the end of the test, the remaining items on the list were removed and replaced. The transmission assembly took 8.0 man-hours (two men 4.0 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	8.0 man hours
Wiper Motor	1.5 man hours
Starter	0.8 man hours
Alternator	1.5 man hours
Batteries	0.5 man hours

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS

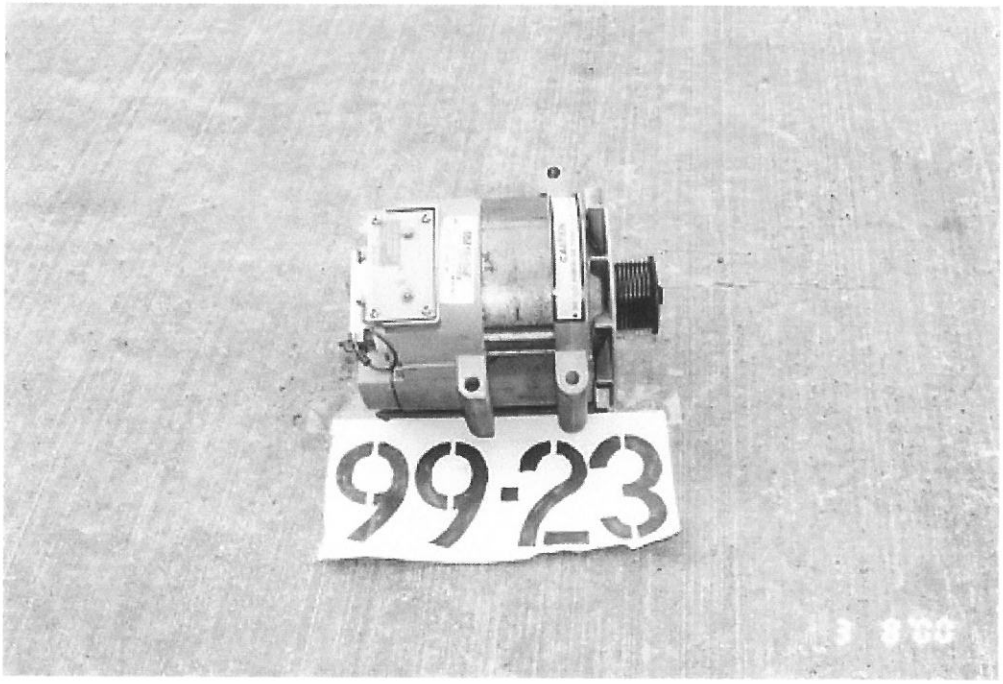


TRANSMISSION REMOVAL AND REPLACEMENT
8.0 MAN HOURS
(2 MEN 4.0 HOURS)

WIPER MOTOR REMOVAL AND REPLACEMENT

(1.5 MAN HOURS)

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS CONT.



ALTERNATOR REMOVAL AND REPLACEMENT (0.8 MAN HOURS)

BATTERY REMOVAL AND REPLACEMENT

(0.5 MAN HOURS)

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

2-I. TEST OBJECTIVE

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

2-II. TEST DESCRIPTION

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

CLASS OF FAILURES

Classes of failures are described below:

(a) 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 enroute 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 2 failures. Of the two reported failures, one was a Class 3 and one a Class 4. These failures are available for review in the Unscheduled Maintenance List, located in Section 5.7 Structural Durability.

RELIABILITY DATA FORMS

Bus Number: 9923	Date: 3-1-00
Personnel: Bob Reifsteck	

	Failure Type					
	Class 4 Bad Order	Class 3 Bus Change	Class 2 Road Call	Class 1 Physical Safety		
Subsystems	Mileage	Mileage	Mileage	Mileage	Man Hours	Down Time
Body	3,244				.50	.50
Exhaust System		1,056			2.00	2.00

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: 9923	Date: 3-1-00
Personnel: B.L. & S.C.	

Temperature (°F): 58	Humidity (%): 65
Wind Direction: Calm	Wind Speed (mph): Calm
Barometric Pressure (in.Hg): 30.10	

SAFETY TEST: DOUBLE LANE CHANGE	
Maximum safe speed tested for double-lane change to left	45 mph
Maximum safe speed tested for double-lane change to right	45 mph
Comments of the position of the bus during the lane change:	
A safe profile was maintained through all portions of testing.	
Comments of the tire/ground contact patch:	
Tire/ground contact was maintained through all portions of testing.	

3. SAFETY

RIGHT - HAND APPROACH

LEFT - HAND APPROACH

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

4-I. TEST OBJECTIVE

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

4-II. TEST DESCRIPTION

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

4-III. DISCUSSION

This test consists of three runs in both the clockwise and counterclockwise directions on the Test Track. Velocity versus time data is obtained for each run and results are averaged together to minimize any test variability which might be introduced by wind or other external factors. The test was performed up to a maximum speed of 50 mph. The fitted curve of velocity vs time is attached, followed by the calculated gradeability results. The average time to obtain 50 mph was 14.25 seconds.

PERFORMANCE DATA FORM

Bus Number: 9923	Date: 3-6-99
Personnel: S.C & E.D.	
Temperature (°F): 44	Humidity (%): 39
Wind Direction: WNW	Wind Speed (mph): 3
Barometric Pressure (in.Hg): 30.21	
Air Conditioning compressor-OFF	✓ Checked
Ventilation fans-ON HIGH	✓ Checked
Heater pump motor-Off	✓ Checked
Defroster-OFF	✓ Checked
Exterior and interior lights-ON	✓ Checked
Windows and doors-CLOSED	✓ Checked

ACCELERATION, GRADEABILITY, TOP SPEED

Counter Clockwise Recorded Interval Times

Speed	Run 1	Run 2	Run 3
10 mph	2.64	2.39	2.35
20 mph	4.58	4.39	4.57
30 mph	7.25	6.85	6.85
40 mph	10.64	10.04	10.15
Top Test Speed(mph) 50	15.17	14.54	14.69

Clockwise Recorded Interval Times

Speed	Run 1	Run 2	Run 3
10 mph	2.17	2.17	2.32
20 mph	4.27	4.58	4.26
30 mph	6.35	6.57	6.51
40 mph	9.48	9.48	9.63
Top Test Speed(mph) 50	13.51	13.51	14.10

PERFORMANCE SUMMARY SHEET

BUS MANUFACTURER :GOSHEN
BUS MODEL :Bus/BA
BUS NUMBER :9923
TEST DATE :03/06/99

TEST CONDITIONS :

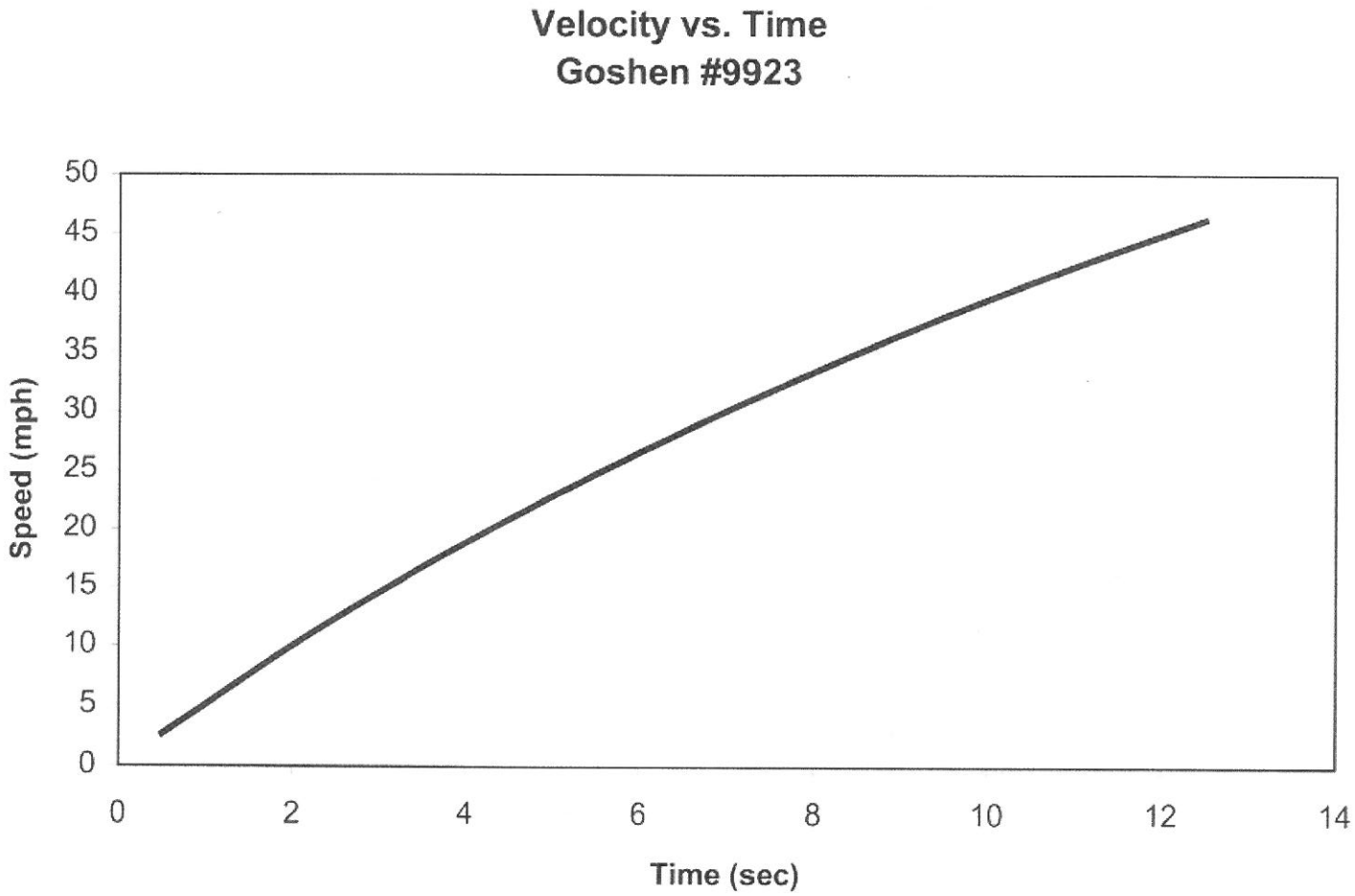
TEMPERATURE (DEG F) : 44.0
WIND DIRECTION : WNW
WIND SPEED (MPH) : 3.0
HUMIDITY (%) : 39
BAROMETRIC PRESSURE (IN. HG) : 30.2

VEHICLE SPEED	AVERAGE TIME (SEC)		
(MPH)	CCW DIRECTION	CW DIRECTION	TOTAL
10.0	2.46	2.22	2.34
20.0	4.51	4.37	4.44
30.0	6.98	6.48	6.73
40.0	10.28	9.53	9.90
50.0	14.80	13.71	14.25

TEST SUMMARY :

VEHICLE SPEED (MPH)	TIME (SEC)	ACCELERATION (FT/SEC^2)	MAX. GRADE (%)
1.0	.19	7.7	24.7
5.0	.97	7.3	23.4
10.0	2.00	6.9	21.9
15.0	3.10	6.4	20.3
20.0	4.29	5.9	18.8
25.0	5.58	5.5	17.3
30.0	6.97	5.0	15.8
35.0	8.50	4.6	14.5
40.0	10.17	4.2	13.1
45.0	12.01	3.8	11.9
50.0	14.05	3.4	10.6

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
Goshen #9923
Speed (mph)
50
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
Time (sec)

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 24 people including the driver. The resulting test load is (24 x 375 lb) = 9,000 lb. The load is distributed evenly over the passenger space. Deflection data before and after each loading and unloading sequence is provided on the Structural Shakedown Data Form.

The unloaded height after each test becomes the original height for the next test. Some initial settling is expected due to undercoat compression, etc. After each loading cycle, the deflection of each reference point is determined. The bus is then unloaded and the residual (permanent) deflection is recorded. On the final test, the maximum loaded deflection was 0.122 inches at reference point 8. The maximum permanent deflection after the final loading sequence ranged from 0.000 inches to 0.001 inches.

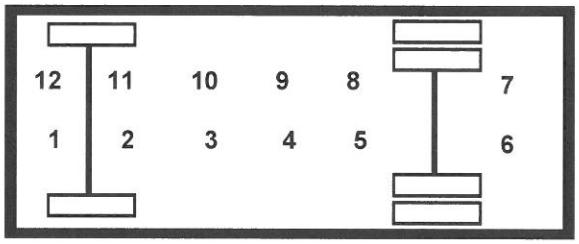
STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 9923	Date: 12-10-99
Personnel: B.L., S.C. & E.L.	Temperature (°F): 69
Loading Sequence: ☒ 1 ☐ 2 ☐ 3 (check one) Test Load (lbs): 9,000	

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	-.048	-.048	.002	.002
2	0	.038	.038	.002	.002
3	0	.077	.077	.009	.009
4	0	.096	.096	.005	.005
5	0	.094	.094	.006	.006
6	0	.085	.085	.008	.008
7	0	.054	.054	-.003	-.003
8	0	.125	.125	.013	.013
9	0	.122	.122	.019	.019
10	0	.104	.104	.010	.01
11	0	.063	.063	.006	.006
12	0	-.060	-.060	.002	.002

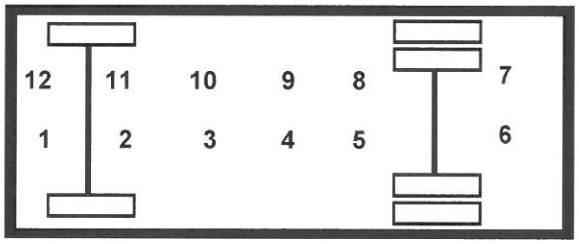
STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 9923	Date: 12-10-99
Personnel: B.L., S.C. & E.L.	Temperature (°F):
Loading Sequence: ☐ 1 ☒ 2 ☐ 3 (check one) Test Load (lbs): 9,000	

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	.002	-.055	-.057	.002	.000
2	.002	.037	.035	.002	.000
3	.009	.075	.066	.009	.000
4	.005	.095	.090	.006	.001
5	.006	.094	.088	.006	.000
6	.008	.094	.086	.008	.000
7	-.003	.057	.060	-.003	.000
8	.013	.135	.122	.014	.001
9	.019	.130	.111	.02	.001
10	.010	.110	.100	.011	.001
11	.006	.067	.061	.006	.000
12	.002	-.057	-.059	.003	.001

5.2 STRUCTURAL STRENGTH AND DISTORTION TESTS - STRUCTURAL DISTORTION

5.2-I. TEST OBJECTIVE

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

5.2-II. TEST DESCRIPTION

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

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

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

5.2-III. DISCUSSION

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

All doors, windows, escape mechanisms, engine, and steering 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F., & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-1-799
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
☒ Windows	No deficiencies.
☒ Front Doors	No deficiencies.
☒ Rear Doors	N/A
☒ Escape Mechanisms/ Roof Vents	No deficiencies.
☒ Engine	No deficiencies.
☒ Handicapped Device/ Special Seating	N/A
☒ 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: 9923	Date: 12-17-99
Personnel: B.L., S.C., G.F. & J.P.	Temperature(°F): 68

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

	Comments
⊠ Windows	No deficiencies.
⊠ Front Doors	No deficiencies.
⊠ Rear Doors	N/A
⊠ Escape Mechanisms/ Roof Vents	No deficiencies.
⊠ Engine	No deficiencies.
⊠ Handicapped Device/ Special Seating	N/A
⊠ Undercarriage	No deficiencies
⊠ Service Doors	No deficiencies.
⊠ Body	No deficiencies.
⊠ Windows/ Body Leakage	No deficiencies.
⊠ Steering Mechanism	No deficiencies.

5.2 STRUCTURAL DISTORTION TEST

RIGHT FRONT 6" LOWER

LEFT REAR 6" HIGHER

5.3 STRUCTURAL STRENGTH AND DISTORTION TESTS - STATIC TOWING TEST

5.3-I. TEST OBJECTIVE

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

5.3-II. TEST DESCRIPTION

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

5.3-III. DISCUSSION

The test bus was not equipped with tow eyes or tow hooks, therefore, the Static Towing Test was not performed.

5.4 STRUCTURAL STRENGTH AND DISTORTION TESTS - DYNAMIC TOWING TEST

5.4-I. TEST OBJECTIVE

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

5.4-II. TEST DESCRIPTION

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

5.4-III. DISCUSSION

The bus was towed using a heavy-duty wrecker. The towing interface was accomplished by chaining to the front axle. A 6" x 6" wooden beam was incorporated to protect the radiator and a rubber pad to protect the bumper. A front lift tow was performed with no damage or deformation observed and no problems were encountered with the towing interface. Rear towing is not recommended by the manufacturer.

DYNAMIC TOWING TEST DATA FORM

Bus Number: 9923	Date: 3-7-99
Personnel: S.C., E.D. & R.H.	

Temperature (°F): 67	Humidity (%): 58
Wind Direction: Calm	Wind Speed (mph): Calm
Barometric Pressure (in.Hg): 30.12	

Inspect tow equipment-bus interface.
Comments: A safe and adequate connection was made between the tow equipment and bus interface.
Inspect tow equipment-wrecker interface.
Comments: A safe and adequate connection was made between the tow equipment and wrecker.
Towing Comments: The test bus was chained by the front axle. A 6" x 6" wooden beam was incorporated to protect the radiator and a rubber pad to protect the bumper.
Description and location of any structural damage: None noted.
General Comments: A front lift tow was performed.

5.4 DYNAMIC TOWING TEST

TOWING INTERFACE

TE ST
BUS IN TOW

5.5 STRUCTURAL STRENGTH AND DISTORTION TESTS - JACKING TEST

5.5-I. TEST OBJECTIVE

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

5.5-II. TEST DESCRIPTION

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

5.5-III. DISCUSSION

The jack used for this test has a minimum height of 8.75 inches. During the deflated portion of the test, the jacking point clearances ranged from 8.1 inches to 17.0 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	16.7"
Rear axle - one tire flat	14.1"
Rear axle - two tires flat	12.8"

JACKING TEST DATA FORM

Bus Number: 9923	Date: 12-7-99
Personnel: B.L. & D.L.	Temperature: 68

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

Deflated Tire	Jacking Pad Clearance Body/Frame (in)	Jacking Pad Clearance Axle/Suspension (in)	Comments
Right front	18.7" I 17.0" D	11.4" I 9.1" D	
Left front	18.5" I 16.7" D	11.4" I 9.0" D	
Right rear--outside	14.3" I 14.1" D	9.0" I 9.7" D	
Right rear--both	14.3" I 12.8" D	9.9" I 8.1" D	
Left rear--outside	14.4" I 14.2" D	9.8" I 9.6" D	
Left rear--both	14.4" I 13.0" D	9.8" I 8.2" D	
Right middle or tag--outside	NA	NA	
Right middle or tag--both	NA	NA	
Left middle or tag--outside	NA	NA	
Left middle or tag--both	NA	NA	

Additional comments of any deformation or difficulty during jacking:
No damage, deformation or problems were observed.

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: 9923	Date: 12-7-99
Personnel: B.L. & D.L.	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 3,800 miles; approximately 2,500 miles on the Durability Test Track and approximately 1,300 miscellaneous other miles. The test will be conducted with the bus operated under three different loading conditions. The first segment will consist of approximately 1,500 miles with the bus operated at GVW. The second segment will consist of approximately 800 miles with the bus operated at SLW. The remainder of the test, approximately 1,500 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 February 1, 2000 and was conducted until February 29, 2000. The first 1,500 miles were performed at a GVW of 10,600 lb. The GVW segment was completed on February 8, 2000. In order to avoid exceeding the axle weight ratings, ballast simulating 8 (1,200 lbs) of the 10 standing passengers was removed. Elimination of the 8 standing passenger positions resulted in the adjusted gross vehicle weight. This reduction in passenger weight was necessary to avoid exceeding the GAWR (7,500 lbs) of the rear axle. The next 800 mile SLW segment was performed at 10,320 lb and completed on February 10, 2000. The final 1,500 mile segment was performed at a CW of 8,210 lb and completed on February 29, 2000.

The mileage summary presents the accumulation of miles during the Structural Durability Test. The driving schedule is included, showing the operating duty cycle. A detailed plan view of the Test Track Facility and Durability Test Track are attached for reference. The amplitude and profile for each element of the durability test track is also included. Finally, a list of unscheduled maintenance is included describing the failures that were encountered along with related photographs during the Structural Durability Test.

GOSHEN - TEST BUS #9923
MILEAGE DRIVEN/RECORDED FROM DRIVERS' LOGS

DATE	TOTAL OTHER MILES	TOTAL DURABILITY TRACK	TOTAL
02/01/00 TO 02/07/00	192.00	602.00	794.00
02/08/00 TO 02/14/00	351.00	851.00	1202.00
02/15/00 TO 02/21/00	305.00	616.00	921.00
02/22/00 TO 02/28/00	320.00	393.00	713.00
02/29/00 TO 03/06/00	132.00	38.00	170.00
TOTAL	1300.00	2500.00	3800.00

Table 4. Driving Schedule for Bus Operation on the Durability Test Track.

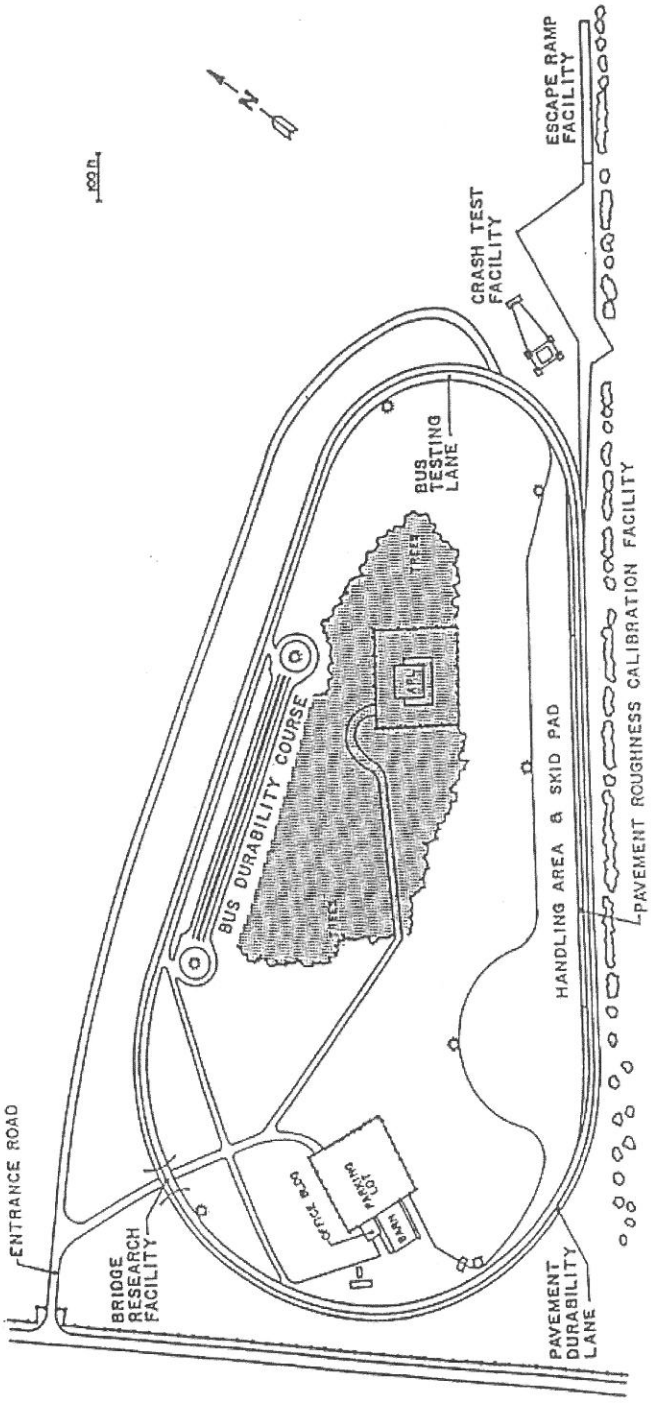
STANDARD OPERATING SCHEDULE

Monday through Friday

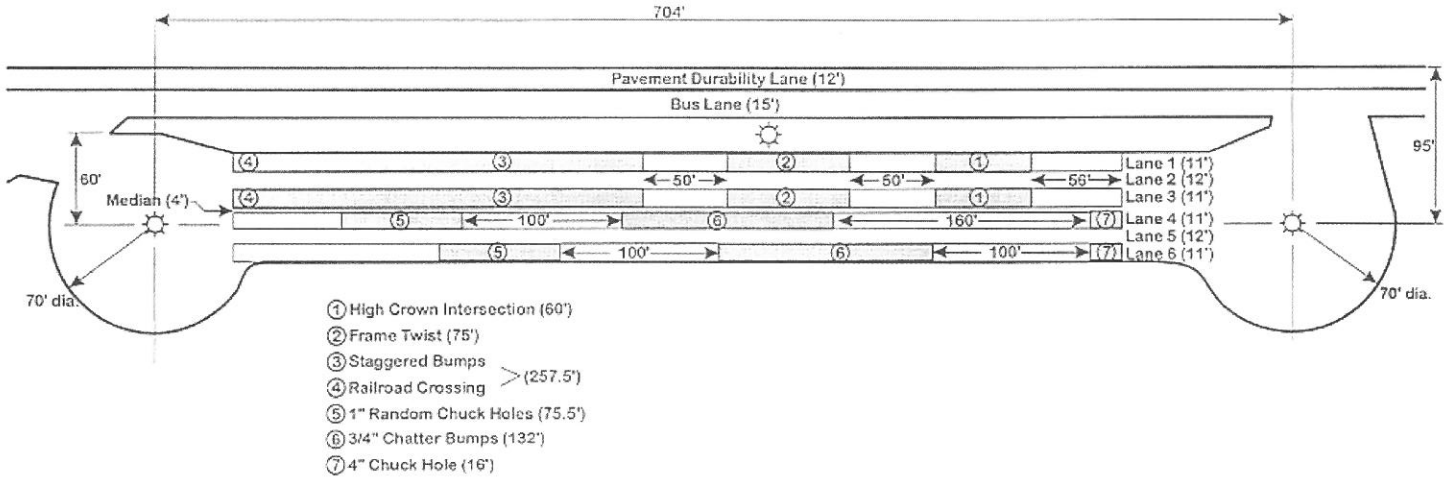
	HOUR	ACTION
Shift 1	midnight	D
	1:40 am	C
	1:50 am	B
	2:00 am	D
	3:35 am	C
	3:45 am	B
	4:05 am	D
	5:40 am	C
	5:50 am	B
	6:00 am	D
	7:40 am	C
	7:50 am	F
Shift 2	8:00 am	D
	9:40 am	C
	9:50 am	B
	10:00 am	D
	11:35 am	C
	11:45 am	B
	12:05 pm	D
	1:40 pm	C
	1:50 pm	B
	2:00 pm	D
	3:40 pm	C
	3:50 pm	F
Shift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



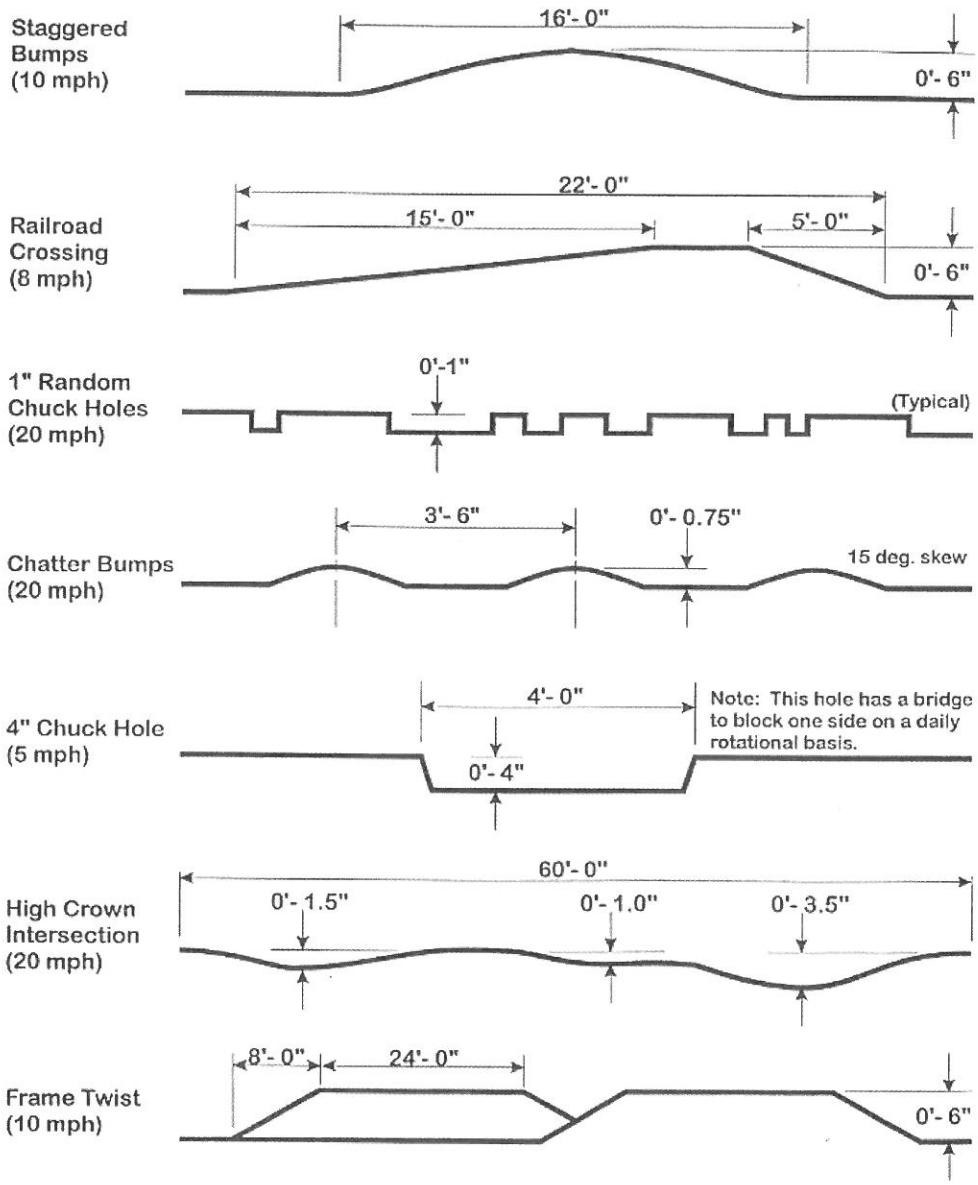
BUS TESTING AND RESEARCH TEST TRACK
UNIVERSITY PARK, PA



Plan View

Vehicle Durability Test Track

The Pennsylvania Transportation Institute
Penn State



Durability Element Profiles

The Pennsylvania Transportation Institute
Penn State

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

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

1. The ADB cycle is structured as a set number of miles in a fixed time in the following order: CBD, Arterial, CBD, Arterial, CBD, Commuter. A separate idle fuel consumption measurement is performed at the beginning and end of the fuel economy test. This phase sequence permits the reporting of fuel consumption for each of these phases separately, making the data more useful to bus manufacturers and transit properties.

2. The operating profile for testing purposes shall consist of simulated transit type service at seated load weight. The three test phases (figure 6-1) are: a central business district (CBD) phase of 2 miles with 7 stops per mile and a top speed of 20 mph; an arterial phase of 2 miles with 2 stops per mile and a top speed of 40 mph; and a commuter phase of 4 miles with 1 stop and a maximum speed of 40 mph. At each designated stop the bus will remain stationary for seven seconds. During this time, the passenger doors shall be opened and closed.

3. The individual ADB phases remain unaltered with the exception that 1 mile has been changed to 1 lap on the PSBRTF track. One lap is equal to 5,042 feet. This change is accommodated by adjusting the cruise distance and time.

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

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

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

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

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

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

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

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

FUEL ECONOMY CALCULATION PROCEDURE

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

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

The fuel economy correction consists of three steps:

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

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

$$\mathbf{FEo_{mi/lb}} = \text{Observed fuel economy} = \frac{\text{miles}}{\text{lb of fuel}}$$

2.) Convert the observed fuel economy to miles per gallon [mpg] by multiplying by the specific gravity of the test fuel Gs (referred to water) at 60°F and multiply by the density of water at 60°F

$$\mathbf{FEo_{mpg}} = \mathbf{FEc_{mi/lb}} \times Gs \times Gw$$

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

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

$$\mathbf{FEc} = \mathbf{FEo_{mpg}} \times \frac{Q}{H}$$

where

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

Combining steps 1-3 yields

$$\Longrightarrow \quad FEc = \frac{\text{miles}}{\text{lbs}} \times (Gs \times Gw) \times \frac{Q}{H}$$

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

Eq = Energy equivalent of converting mpg to mile/BTUx10^6.

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

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

The reported fuel economy is based on the following: measured test 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 °F). These combine to give a fuel economy in miles per lb. The energy equivalent (mile/BTUx10^6) 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

$$\mathbf{FEo_{mi/scf}} = \text{Observed fuel economy} = \frac{\text{miles}}{\text{scf of fuel}}$$

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

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.

$$\mathbf{FEo_{mi/lb}} = FEo / Gm$$

where Gm = Density of test fuel at standard conditions

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

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

where

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

6-III. DISCUSSION

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

An extensive pretest maintenance check is made including the replacement of all lubrication fluids. The details of the pretest maintenance are given in the first three Pretest Maintenance Forms. The fourth sheet shows the Pretest Inspection. The next sheet shows the correction calculation for the test fuel. The next four Fuel Economy Forms provide the data from the four test runs. Finally, the summary sheet provides the average fuel consumption. The overall average is based on total fuel and total mileage for each phase. The overall average fuel consumption values were; CBD - 5.63 mpg, ART - 6.58 mpg, and COM - 10.95 mpg. Average fuel consumption at idle was 3.67 lb/hr (0.59 gph).

FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 9923	Date: 2-24-00	SLW (lbs): 10,320
Personnel: S.C., E.L. & E.D.		

FUEL SYSTEM	OK	Date	Initials
Install fuel measurement system	✓	2-24-00	S.C.
Replace fuel filter	✓	2-24-00	S.C.
Check for fuel leaks	✓	2-24-00	S.C.
Specify fuel type (refer to fuel analysis)	#1 Diesel		
Remarks:			
BRAKES/TIRES	OK	Date	Initials
Inspect hoses	✓	2-24-00	S.C.
Inspect brakes	✓	2-24-00	S.C.
Relube wheel bearings	✓	2-24-00	S.C.
Check tire inflation pressures (mfg. specs.)	✓	2-24-00	S.C.
Remarks:			
COOLING SYSTEM	OK	Date	Initials
Check hoses and connections	✓	2-24-00	S.C.
Check system for coolant leaks	✓	2-24-00	S.C.
Remarks:			

FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 2)

Bus Number: 9923	Date: 2-24-00
Personnel: S.C., E.L. & E.D.	

ELECTRICAL SYSTEMS	OK	Date	Initials
Check battery	✓	2-24-00	S.C.
Inspect wiring	✓	2-24-00	S.C.
Inspect terminals	✓	2-24-00	S.C.
Check lighting	✓	2-24-00	S.C.
Remarks:			

DRIVE SYSTEM	OK	Date	Initials
Drain transmission fluid	✓	2-24-00	S.C.
Replace filter/gasket	✓	2-24-00	S.C.
Check hoses and connections	✓	2-24-00	S.C.
Replace transmission fluid	✓	2-24-00	S.C.
Check for fluid leaks	✓	2-24-00	S.C.
Remarks:			

LUBRICATION	OK	Date	Initials
Drain crankcase oil	✓	2-24-00	S.C.
Replace filters	✓	2-24-00	S.C.
Replace crankcase oil	✓	2-24-00	S.C.
Check for oil leaks	✓	2-24-00	S.C.
Check oil level	✓	2-24-00	S.C.
Lube all chassis grease fittings	✓	2-24-00	S.C.
Lube universal joints	✓	2-24-00	S.C.
Replace differential lube including axles	✓	2-24-00	S.C.
Remarks:			

FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 3)

Bus Number: 9923	Date: 2-24-00		
Personnel: S.C., E.L. & E.D.			
EXHAUST/EMISSION SYSTEM	OK	Date	Initials
Check for exhaust leaks	✓	2-24-00	S.C.
Remarks:			
ENGINE	OK	Date	Initials
Replace air filter	✓	2-24-00	S.C.
Inspect air compressor and air system	✓	2-24-00	S.C.
Inspect vacuum system, if applicable	✓	2-24-00	S.C.
Check and adjust all drive belts	✓	2-24-00	S.C.
Check cold start assist, if applicable	✓	2-24-00	S.C.
Remarks:			
STEERING SYSTEM	OK	Date	Initials
Check power steering hoses and connectors	✓	2-24-00	S.C.
Service fluid level	✓	2-24-00	S.C.
Check power steering operation	✓	2-24-00	S.C.
Remarks:			
	OK	Date	Initials
Ballast bus to seated load weight	✓	2-24-00	S.C.
TEST DRIVE	OK	Date	Initials
Check brake operation	✓	2-24-00	S.C.
Check transmission operation	✓	2-24-00	S.C.
Remarks:			

FUEL ECONOMY PRE-TEST INSPECTION FORM

Bus Number: 9923	Date: 2-29-00
Personnel: B.L. & R.H.	

PRE WARM-UP	If OK, Initial
Fuel Economy Pre-Test Maintenance Form is complete	B.L.
Cold tire pressure (psi): Front 80 Middle N/A Rear 80	B.L.
Tire wear:	B.L.
Engine oil level	B.L.
Engine coolant level	B.L.
Interior and exterior lights on, evaporator fan on	B.L.
Fuel economy instrumentation installed and working properly.	B.L.
Fuel line -- no leaks or kinks	B.L.
Speed measuring system installed on bus. Speed indicator installed in front of bus and accessible to TECH and Driver.	B.L.
Bus is loaded to SLW	B.L.
WARM-UP	**If OK, Initial**
Bus driven for at least one hour warm-up	B.L.
No extensive or black smoke from exhaust	B.L.
POST WARM-UP	**If OK, Initial**
Warm tire pressure (psi): Front 81 Middle N/A Rear 80	B.L.
Environmental conditions Average wind speed <12 mph and maximum gusts <15 mph Ambient temperature between 30°(-1°) and 90°F(32°C) Track surface is dry Track is free of extraneous material and clear of interfering traffic	B.L.

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 9923	Manufacturer: Goshen	Date: 2-29-00
Run Number: 1	Personnel: B.L. & R.H.	
Test Direction: □CW or ⊠CCW	Temperature (°F): 34	Humidity (%): 60
SLW (lbs): 10,320	Wind Speed (mph) & Direction: 7 / WNW	Barometric Pressure (in.Hg): 30.30

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	9:05	9:05	15.4	124.50	122.35	2.15
ART #1	0	3:55	3:55	15.6	122.35	120.55	1.80
CBD #2	0	9:03	9:03	16.0	120.55	118.40	2.15
ART #2	0	3:54	3:54	17.0	118.40	116.55	1.85
CBD #3	0	9:00	9:00	17.6	116.55	114.40	2.10
COMMUTER	0	5:52	5:52	18.7	114.45	112.20	2.25
							Total Fuel = 12.30 lbs

20 minute idle : Total Fuel Used = 1.30 lbs
Heating Value = 20,214.0 BTU/LB
Comments:

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 9923	Manufacturer: Goshen	Date: 2-29-00
Run Number: 2	Personnel: B.L. & R.H.	
Test Direction: ☒CW or ☐CCW	Temperature (°F): 42	Humidity (%): 55
SLW (lbs): 10,320	Wind Speed (mph) & Direction: 5 / NW	Barometric Pressure (in.Hg): 30.31

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	9:07	9:07	20.3	112.75	110.55	2.20
ART #1	0	3:58	3:58	20.8	110.55	108.85	1.70
CBD #2	0	9:01	9:01	21.1	108.85	106.65	2.20
ART #2	0	4:00	4:00	21.6	106.65	104.80	1.85
CBD #3	0	9:00	9:00	22.0	104.80	102.60	2.20
COMMUTER	0	5:58	5:58	22.7	102.60	100.40	2.20
							Total Fuel = 12.35 lbs

20 minute idle: Total Fuel Used = N/A
Heating Value = 20,214.0 BTU/LB
Comments:

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 9923	Manufacturer: Goshen	Date: 2-29-00
Run Number: 3	Personnel: B.L. & R.H.	
Test Direction: □CW or ⊠CCW	Temperature (°F): 46	Humidity (%): 39
SLW (lbs): 10,320	Wind Speed (mph) & Direction: 5 / SW	Barometric Pressure (in.Hg): 30.30

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:58	8:58	23.2	100.4	98.2	2.20
ART #1	0	3:56	3:56	23.7	98.2	96.3	1.90
CBD #2	0	8:57	8:57	23.8	96.3	94.3	2.00
ART #2	0	4:01	4:01	24.0	94.3	92.5	1.80
CBD #3	0	9:01	9:01	24.3	92.5	90.4	2.10
COMMUTER	0	5:56	5:56	24.9	90.4	88.25	2.15
							Total Fuel = 12.15 lbs

20 minute idle: Total Fuel Used = N/A
Heating Value = 20,214.0 BTU/LB
Comments:

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 9923	Manufacturer: Goshen	Date: 2-29-00
Run Number: 4	Personnel: B.L. & R.H.	
Test Direction: ☒CW or ☐CCW	Temperature (°F): 49	Humidity (%): 35
SLW (lbs): 10,320	Wind Speed (mph) & Direction: 3 / S	Barometric Pressure (in.Hg): 33.28

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:52	8:52	24.8	87.65	85.50	2.15
ART #1	0	4:00	4:00	25.1	85.50	83.65	1.85
CBD #2	0	9:01	9:01	25.6	83.65	81.65	2.00
ART #2	0	4:01	4:01	25.9	81.65	79.85	1.80
CBD #3	0	8:58	8:58	26.2	79.85	77.75	2.10
COMMUTER	0	5:59	5:59	26.7	77.75	75.60	2.15
						Total Fuel =	12.05 lbs

20 minute idle : Total Fuel Used = 1.15 lbs
Heating Value = 20,214.0 BTU/LB
Comments:

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 PSBRTF.

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 PSBRTF and the ABTC.

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

7.1-III. DISCUSSION

This test is performed in three parts. The first part exposes the exterior of the vehicle to 80 dB(A) on the left side of the bus and the noise transmitted to the interior is measured. The overall average of the six measurements was 47.3 dB(A); ranging from 46.0 dB(A) at the driver's seat to 49.6 dB(A) in line with the front speaker. The interior ambient noise level for this test was 36.6 dB(A).

The second test measures interior noise during acceleration from 0 to 35 mph. This noise level ranged from 70.3 dB(A) at the rear passenger seats to 78.1 dB(A) at the driver's seat. The overall average was 74.1 dB(A). The interior ambient noise level for this test was 48.6 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: 9923	Date: 12-21-99
Personnel: B.L., E.L. & S.C.	
Temperature (°F): 40	Humidity (%): 69
Wind Speed (mph): 6	Wind Direction: N
Barometric Pressure (in.Hg): 29.95	
Initial Sound Level Meter Calibration: ☒ checked by B.L.	
Interior Ambient Noise Level dB(A): 36.6	Exterior Ambient Noise Level dB(A): 55.8
Microphone Height During Testing (in): 45	

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	46.0
Front Passenger Seats	46.7
In Line with Front Speaker	49.6
In Line with Middle Speaker	48.1
In Line with Rear Speaker	47.4
Rear Passenger Seats	46.2

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

Comments: All readings taken in the center aisle.

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

Bus Number: 9923	Date: 3-6-00
Personnel: S.C. & E.D.	
Temperature (°F): 45	Humidity (%): 39
Wind Speed (mph): 3	Wind Direction: WNW
Barometric Pressure (in.Hg): 30.21	
Initial Sound Level Meter Calibration: ☒ checked by B.L.	
Interior Ambient Noise Level dB(A): 48.6	Exterior Ambient Noise Level dB(A): 56.3
Microphone Height During Testing (in): 45	

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	78.1
Front Passenger Seats	74.2
Middle Passenger Seats	73.8
Rear Passenger Seats	70.3

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

Comments: All readings taken in the center aisle.

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

Bus Number: 9923	Date: 3-6-00
Personnel: S.C. & E.D.	
Temperature (°F): 46	Humidity (%): 39
Wind Speed (mph): 3	Wind Direction: WNW
Barometric Pressure (in.Hg): 30.21	

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.

7.2 EXTERIOR NOISE TESTS

7.2-I. TEST OBJECTIVE

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

7.2-II. TEST DESCRIPTION

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

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

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

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

During the test, special attention should be paid to:

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

7.2-III. DISCUSSION

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

With an exterior ambient noise level of 56.3 dB(A), the average test result obtained while accelerating from a constant speed was 77.0 dB(A) on the right side and 77.0 dB(A) on the left side.

When accelerating from a standstill with an exterior ambient noise level of 56.3 dB(A), the average of the results obtained were 77.5 dB(A) on the right side and 77.6 dB(A) on the left side.

With the vehicle stationary and the engine, accessories, and air conditioning on, the measurements averaged 62.6 dB(A) at low idle and 76.4 dB(A) at wide open throttle. With the accessories and air conditioning off, the readings averaged 1.3 dB(A) lower at low idle and 0.2 dB(A) lower at wide open throttle. The exterior ambient noise level measured during this test was 56.3 dB(A). Note: the test vehicle was not equipped with a fast idle mode, therefore, data for that condition is not available.

EXTERIOR NOISE TEST DATA FORM
Accelerating from Constant Speed

Bus Number: 9923	Date: 3-6-00
Personnel: S.C. & E.D.	
Temperature (°F): 46	Humidity (%): 39
Wind Speed (mph): 3	Wind Direction: WNW
Barometric Pressure (in.Hg): 30.21	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ⊠ checked by B.L.	
Initial Sound Level Meter Calibration: ⊠ checked by B.L.	
Exterior Ambient Noise Level dB(A): 56.3	

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	76.0	1	76.2
2	76.3	2	76.2
3	76.4	3	76.5
4	76.9	4	77.2
5	77.1	5	76.8
Average of two highest actual noise levels = 77.0 dB(A)		Average of two highest actual noise levels = 77.0 dB(A)	
Final Sound Level Meter Calibration Check: ⊠ checked by B.L.			
Comments:			

EXTERIOR NOISE TEST DATA FORM
Accelerating from Standstill

Bus Number: 9923	Date: 3-6-00
Personnel: S.C. & E.D.	
Temperature (°F): 46	Humidity (%): 39
Wind Speed (mph): 3	Wind Direction: WNW
Barometric Pressure (in.Hg): 30.21	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ⊠ checked by B.L.	
Initial Sound Level Meter Calibration: ⊠ checked by B.L.	
Exterior Ambient Noise Level dB(A): 56.3	

Accelerating from Standstill Curb (Right) Side		Accelerating from Standstill Street (Left) Side	
Run #	Measured Noise Level dB(A)	Run #	Measured Noise Level dB(A)
1	76.3	1	77.7
2	77.1	2	76.8
3	77.4	3	77.5
4	77.1	4	76.9
5	77.5	5	77.2
Average of two highest actual noise levels = 77.5 dB(A)		Average of two highest actual noise levels = 77.6 dB(A)	

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

EXTERIOR NOISE TEST DATA FORM
Stationary

Bus Number: 9923	Date: 3-6-00
Personnel: S.C. & E.D.	
Temperature (°F): 45	Humidity (%): 39
Wind Speed (mph): 3	Wind Direction: WNW
Barometric Pressure (in.Hg): 30.21	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ⊠ checked by B.L.	
Initial Sound Level Meter Calibration: ⊠ checked by B.L.	
Exterior Ambient Noise Level dB(A): 56.3	

Accessories and Air Conditioning ON			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	677	62.5	62.7
High Idle	N/A	N/A	N/A
Wide Open Throttle	3,605	75.8	76.9

Accessories and Air Conditioning OFF			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Actual
Low Idle	664	61.5	61.0
High Idle	N/A	N/A	N/A
Wide Open Throttle	3,618	75.8	76.5

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

PARTIAL

STURAA TEST

7 YEAR

200,000 MILE BUS
from
GOSHEN COACH

MODEL 2013 IMPULSE

DECEMBER 2013

PTI-BT-R1314-P

PENNSTATE

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Pennsylvania Transportation Institute

201 Transportation Research Building
The Pennsylvania State University
University Park, PA 16802
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Bus Testing and Research Center

2237 Old Route 220 N.
Duncansville, PA 16635
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A2LA ACCREDITED
MECHANICAL TESTING
CERTIFICATE 3172.01

Author:_____ Date:_____

Title: _____

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Goshen Coach submitted a model 2013 Impulse, gasoline-powered 17 seat (including the driver) 26-foot bus, for a partial STURAA Test in the 7 yr. /200,000 mile category. The Federal Transit Administration determined that the following tests would be performed; 1.2 Servicing, Preventive Maintenance, and Repair and Maintenance during Testing, 2. Reliability and 5.7 Structural Durability. Testing started on September 19, 2013 and was completed on November 15, 2013. The Check-In section of the report provides a description of the bus and specifies its major components.

The primary part of this Partial Test is the Structural Durability Test, which also provides the information for the Maintainability and Reliability results. The Structural Durability Test was started on September 23, 2013 and was completed on November 12. 2013.

The interior of the bus is configured with seating for 17 passengers including the driver and 2 wheelchair positions. Note: this test bus is not designed to accommodate standing passengers. At 150 lbs. per person and 600 lbs. per wheelchair position, the load results in a measured gross vehicle weight of 13,130 lbs. The first segment of the Structural Durability Test was performed with the bus loaded to a GVW (Gross Vehicle Load) of 13,130 lbs. Note: due to no standees, GVW and SLW are the same at 13,130 lbs. The middle SLW (Seated Load Weight) segment was performed at 13,130 lbs. and the final segment was performed at a CW (Curb Weight) of 9,560 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.

Effective January 1, 2010, the Federal Transit Administration determined that the total number of simulated passengers used for loading all test vehicles will be based on the full complement of seats and free-floor space available for standing passengers (150 lbs per passenger). The passenger loading used for dynamic testing will not be reduced in order to comply with Gross Axle Weight Ratings (GAWR's) or the Gross Vehicle Weight Ratings (GVWR's) declared by the manufacturer. Cases where the loading exceeds the GAWR and/or the GVWR will be noted accordingly. During the testing program, all test vehicles transported or operated over public roadways will be loaded to comply with the GAWR and GVWR specified by the manufacturer.

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 2 failures. Of the three reported failures, two were Class 3 and one was a Class 4.

ABBREVIATIONS

ABTC	Altoona Bus Test Center
A/C	Air Conditioner
ADB	Advance design bus
CBD	Central business district
CI	Compression ignition
CNG	Compressed natural gas
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)
FTA	Federal Transit Administration
GAWR	Gross axle weight rating
GL	Gross 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
hr	Hour
LNG	Liquefied natural gas
LTI	Larson Transportation Institute
mpg	Miles per gallon
mph	Miles per hour
NBM	New bus models
PSTT	Penn State Test Track
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
SCF	Standard cubic feet
SCFM	Standard cubic feet per minute
SCH	Test scheduler
SA	Staff Assistant
SI	Spark ignition
SLW	Seated load weight (curb weight plus 150 lb for every designated passenger seating position and for the driver)
TD	Test driver
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 Goshen Coach, model 2013 Impulse. The bus has an OEM driver's door and aftermarket passenger door forward of the front axle. A dedicated handicap entrance equipped with a Braun model NCL919FIB-2 hydraulic/electric wheelchair lift is located rear of the rear axle. A cargo/emergency door is centered at the rear of the test bus. Power is provided by a gasoline-fueled, Ford Motor Co. 6.8 L engine coupled to a Ford OEM transmission.

The measured curb weight is 3,490 lbs. for the front axle and 6,070 lbs. for the rear axle. These combined weights provide a total measured curb weight of 9,560 lbs. There are 17 seats including the driver and two wheelchair positions. Note: this test bus is not designed to accommodate standing passengers. The total passenger capacity is 17 seated passengers plus 2 wheelchair positions. Gross load is 150 lbs. x 17 = 2,550 + 2 wheelchair positions (1,200 lbs.) = 3,750 lbs. At full capacity, the measured gross vehicle weight is 13,130 lbs.

VEHICLE DATA FORM

Bus Number: 1314-P	Arrival Date: 9-19-13
Bus Manufacturer: Goshen Coach	Vehicle Identification Number (VIN): 1FDFE4FS0DDB00184
Model Number: 2013 Impulse	Date: 9-19-13
Personnel: T.S. & E.D.	

WEIGHT:

Individual Wheel Reactions:

Weights (lb)	Front Axle		Middle Axle		Rear Axle	
	Right	Left	Right	Left	Right	Left
CW	1,670	1,820	N/A	N/a	2,740	3,330
SLW	1,620	1,980	N/A	N/A	4,640	4,890
GVW	1,620	1,980	N/A	N/A	4,640	4,890

Total Weight Details:

Weight (lb)	CW	SLW	GVW	GAWR
Front Axle	3,490	3,600	3,600	5,000
Middle Axle	N/A	N/A	N/A	N/A
Rear Axle	6,070	9,530	9,530	9,600
Total	9,560	13,130	13,130	GVWR: 14,500

Dimensions:

Length (ft/in)	26 / 6.7
Width (in)	95.0
Height (in)	114.7
Front Overhang (in)	34.5
Rear Overhang (in)	97.2
Wheel Base (in)	187.0
Wheel Track (in)	Front: 68.7
	Rear: 78.1

VEHICLE DATA FORM

Bus Number: 1314-P	Date: 9-19-13

CLEARANCES:

Lowest Point Outside Front Axle	Location: Bumper	Clearance(in): 13.1
Lowest Point Outside Rear Axle	Location: Fuel tank heat shield	Clearance(in): 10.4
Lowest Point between Axles	Location: Step well	Clearance(in): 10.3
Ground Clearance at the center (in)	12.2	
Front Approach Angle (deg)	20.8	
Rear Approach Angle (deg)	8.7	
Ramp Clearance Angle (deg)	7.4	
Aisle Width (in)	17.5	
Inside Standing Height at Center Aisle (in)	79.0	

BODY DETAILS:

Body Structural Type	Integral		
Frame Material	Steel		
Body Material	Fiberglass		
Floor Material	Plywood		
Roof Material	Fiberglass		
Windows Type	■ Fixed	□ Movable	
Window Mfg./Model No.	Cleer Vision / AS3 DOT 960		
Number of Doors	2 Front	2 Rear	
Mfr. / Model No.	Driver's – Ford / OEM Passenger – A & M Systems / FOD 290-L-002939 Handicap – Challenger / OEM Rear center –Challenger/OEM		
Dimension of Each Door (in)	Driver's – 27.1 x 54.6 Passenger – 32.6 x 87.1	Handicap – 44.6 x 69.5 Rear center – 35.3 x 60.7	
Passenger Seat Type	□ Cantilever	■ Pedestal	□ Other (explain)
Mfr. / Model No.	Freedman Seating Co. / OEM		
Driver Seat Type	□ Air	■ Spring	□ Other (explain)
Mfr. / Model No.	Freedman Seating Co. / OEM		
Number of Seats (including Driver)	17 + 2 wheelchair positions		

Bus Number: 1314-P	Date: 9-19-13

BODY DETAILS (Contd..)

Free Floor Space (ft^2)	16.5
Height of Each Step at Normal Position (in)	Front 1. 12.3 2. 9.0 3. 9.0 4. N/A
	Middle 1. N/A 2. N/A 3. N/A 4. N/A
	Rear 1. N/A 2. N/A 3. N/A 4. N/A
Step Elevation Change - Kneeling (in)	N/A

ENGINE

Type	☐ C.I.	☐ Alternate Fuel	
	■ S.I.	☐ Other (explain)	
Mfr. / Model No.	Ford / 6.8 L		
Location	■ Front	☐ Rear	☐ Other (explain)
Fuel Type	■ Gasoline	☐ CNG	☐ Methanol
	☐ Diesel	☐ LNG	☐ Other (explain)
Fuel Tank Capacity (indicate units)	55 gals		
Fuel Induction Type	■ Injected	☐ Carburetion	
Fuel Injector Mfr. / Model No.	Ford / 6.8 L		
Carburetor Mfr. / Model No.	N/A		
Fuel Pump Mfr. / Model No.	Ford / 6.8 L		
Alternator (Generator) Mfr. / Model No.	FoMoCo / TN104210-6630		
Maximum Rated Output (Volts / Amps)	Not available. OEM		
Air Compressor Mfr. / Model No.	N/A		
Maximum Capacity (ft^3 / min)	N/A		
Starter Type	■ Electrical	☐ Pneumatic	☐ Other (explain)
Starter Mfr. / Model No.	FoMoCo / TN348000-0410		

VEHICLE DATA FORM

Bus Number: 1314-P	Date: 9-19-13

TRANSMISSION

Transmission Type	■ Manual	☐ Automatic	
Mfr. / Model No.	FoMoCo / OEM		
Control Type	■ Mechanical	☐ Electrical	☐ Other
Torque Converter Mfr. / Model No.	FoMoCo / OEM		
Integral Retarder Mfr. / Model No.	N/A		

SUSPENSION

Number of Axles	2		
Front Axle Type	■ Independent	☐ Beam Axle	
Mfr. / Model No.	FoMoCo / OEM		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	■ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / H102G2		
Middle Axle Type	☐ Independent	☐ Beam Axle	
Mfr. / Model No.	N/A		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	☐ Spring	☐ Other (explain)
No. of Shock Absorbers	N/A		
Mfr. / Model No.	N/A		
Rear Axle Type	☐ Independent	■ Beam Axle	
Mfr. / Model No.	Dana / M70HD		
Axle Ratio (if driven)	4.56		
Suspension Type	☐ Air	■ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / H123G1		

Bus Number: 1314-P	Date: 9-19-13

WHEELS & TIRES

Front	Wheel Mfr./ Model No.	Ford / 16 x 6
	Tire Mfr./ Model No.	Michelin LT225/75R16
Rear	Wheel Mfr./ Model No.	Ford / 16 x 6
	Tire Mfr./ Model No.	Michelin LT225/75R16

BRAKES

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

HVAC

Heating System Type	☐ Air	■ Water	☐ Other
Capacity (Btu/hr)	65,000		
Mfr. / Model No.	Pro-Air / OEM		
Air Conditioner	■ Yes	☐ No	
Location	Front dash & rear ceiling		
Capacity (Btu/hr)	Front – OEM Rear 70,000		
A/C Compressor Mfr. / Model No.	Front – FoMoCo / 0464 Rear ceiling – Vale / 004875		

STEERING

Steering Gear Box Type	Hydraulic gear
Mfr. / Model No.	FoMoCo / OEM
Steering Wheel Diameter	15.4
Number of turns (lock to lock)	4.0

VEHICLE DATA FORM

Bus Number: 1314-P	Date: 9-19-13

OTHERS

Wheel Chair Ramps	Location: N/A	Type: N/A
Wheel Chair Lifts	Location: Rear	Type: Hydraulic electric platform
Mfr. / Model No.	Braun / NCL919FIB-2	
Emergency Exit	Location: Doors Windows Roof hatch	Number: 3 2 1

CAPACITIES

Fuel Tank Capacity (units)	55.0 gals
Engine Crankcase Capacity (gallons)	1.2
Transmission Capacity (gallons)	Not available. OEM
Differential Capacity (gallons)	1.1
Cooling System Capacity (quarts)	8.6
Power Steering Fluid Capacity (quarts)	Not available. OEM

VEHICLE DATA FORM

Bus Number: 1314-P	Date: 9-19-13

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

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

COMPONENT/SUBSYSTEM INSPECTION FORM

Bus Number: 1314-P	Date: 9-19-13

Subsystem	Checked	Initials	Comments
Air Conditioning Heating and Ventilation	✓		
Body and Sheet Metal	✓		
Frame	✓		
Steering	✓		
Suspension	✓		
Interior/Seating	✓		
Axles	✓		
Brakes	✓		
Tires/Wheels	✓		
Exhaust	✓		
Fuel System	✓		
Power Plant	✓		
Accessories	✓		
Lift System	✓		
Interior Fasteners	✓		
Batteries	✓		

CHECK - IN

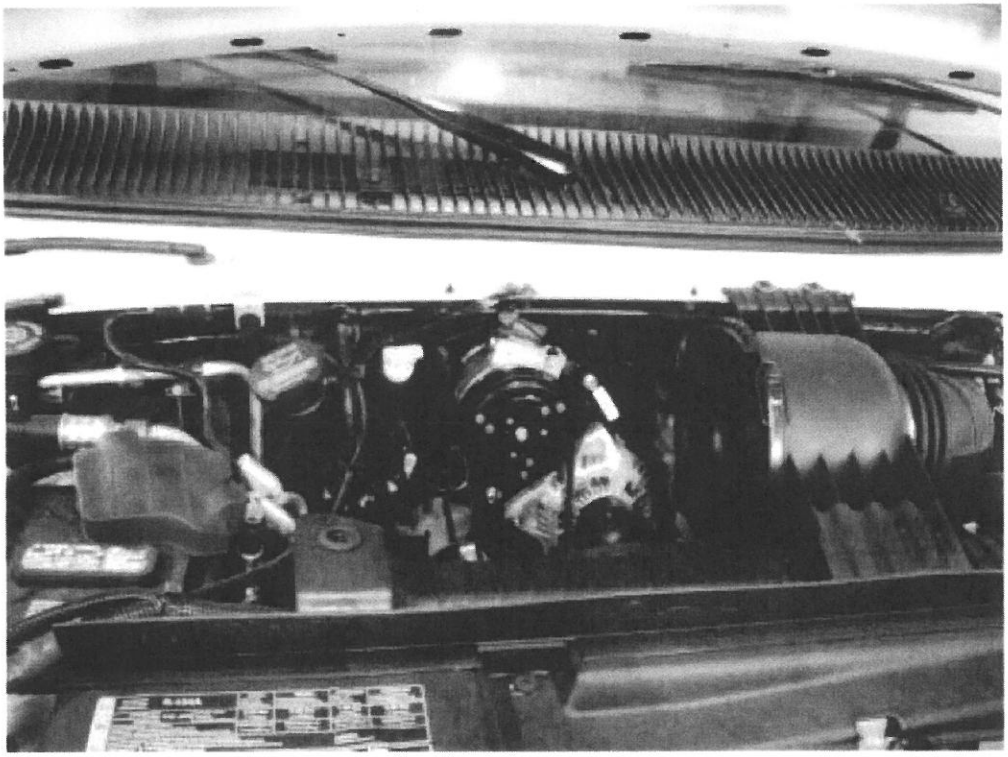
GOSHEN COACH
MODEL 2013 IMPULSE

CHECK - IN CONT.

GOSHEN COACH
MODEL 2013 IMPULSE EQUIPPED WITH A BRAUN MODEL NCL919FIB-2 HANDICAP LIFT

CHECK - IN CONT.

OPERATOR'S AREA



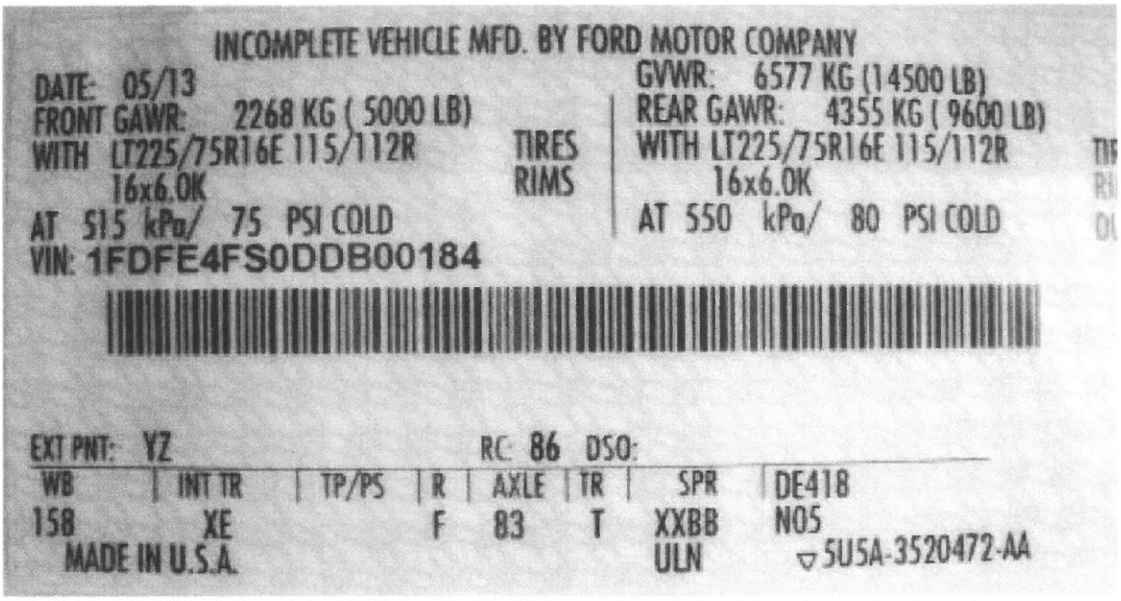
ENGINE COMPARTMENT

CHECK - IN CONT.

INTERIOR VIEW FROM REAR

INTERIOR VIEW FROM FRONT

CHECK - IN CONT.


INCOMPLETE VEHICLE MFD. BY FORD MOTOR COMPANY
DATE: 05/13
FRONT GAWR: 2268 KG (5000 LB)
WITH LT225/75R16E 115/112R
16x6.0K
AT 515 kPa/ 75 PSI COLD
TIRES
RIMS
GVWR: 6577 KG (14500 LB)
REAR GAWR: 4355 KG (9600 LB)
WITH LT225/75R16E 115/112R
16x6.0K
AT 550 kPa/ 80 PSI COLD
VIN: 1FDFE4FS0DDB00184
EXT PNT: YZ
RC: 86 DSO:

WB	INT TR	TP/PS	R	AXLE	TR	SPR	DE418
158	XE		F	83	T	XXBB	N05
MADE IN U.S.A.						ULN	▽5U5A-3520472-AA

VIN TAG

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.

SCHEDULED MAINTENANCE

Goshen Coach Bus #1314

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
09-30-13	937	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-15-13	2,244	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-21-13	3,140	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-29-13	4,250	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-04-13	5,405	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-08-13	6,275	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
11-12-13	7,500	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:

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

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 2 failures. Of the two Class 3 failures, one involved the exhaust system and one with the air conditioning. These, and the one remaining Class 4 failures are available for review in the Unscheduled Maintenance List, located in Section 5.7 Structural Durability.

RELIABILITY DATA FORMS

Bus Number : 1314	Date: 11-17-13
Personnel: Bob Reifsteck	

Failure Type			
Class 4 Bad Order	Class 3 Bus Change	Class 2 Road Call	Class 1 Physical Safety

Subsystems	Mileage	Mileage	Mileage	Mileage	Man Hours	Down Time
Exhaust System		840			1.00	6.00
Wheels/Tires	5,409				4.00	4.00
Air Conditioning		5,936			3.00	16.00

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 7,500 miles; approximately 5,000 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 3,000 miles with the bus operated at GVW. The second segment will consist of approximately 1,500 miles with the bus operated at SLW. The remainder of the test, approximately 3,000 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 September 23, 2013 and was conducted until November 12, 2013. The first 3,000 miles were performed at a GVW of 13,130 lbs. and completed on October 17, 2013. The next 1,500 mile SLW segment was performed at the same 13,130 lbs and completed on October 28, 2013. Note; the test bus was not designed to accommodate standing passengers; therefore GVW and SLW are the same 13,130 lbs. The final 3,000 mile segment was performed at a CW of 9,560 lbs. and completed on November 12, 2013.

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. Finally, photographs illustrating some of the failures that were encountered during the Structural Durability Test are included.

GOSHEN BUS #1314

MILEAGE DRIVEN/RECORDED FROM DRIVER'S LOGS

DATE	TOTAL DURABILITY TRACK	TOTAL OTHER MILES	TOTAL
09/23/13 TO 09/29/13	713.00	82.00	795.00
09/30/13 TO 10/06/13	647.00	127.00	774.00
10/07/13 TO 10/13/13	270.00	283.00	553.00
10/14/13 TO 10/20/13	675.00	283.00	958.00
10/21/13 TO 10/27/13	680.00	128.00	808.00
10/28/13 TO 11/03/13	1219.00	148.00	1367.00
11/04/13 TO 11/10/13	796.00	480.00	1276.00
11/11/13 TO 11/17/13	0.00	969.00	969.00
TOTAL	5000.00	2500.00	7500.00

Table 4. Driving Schedule for Bus Operation on the Durability Test Track.

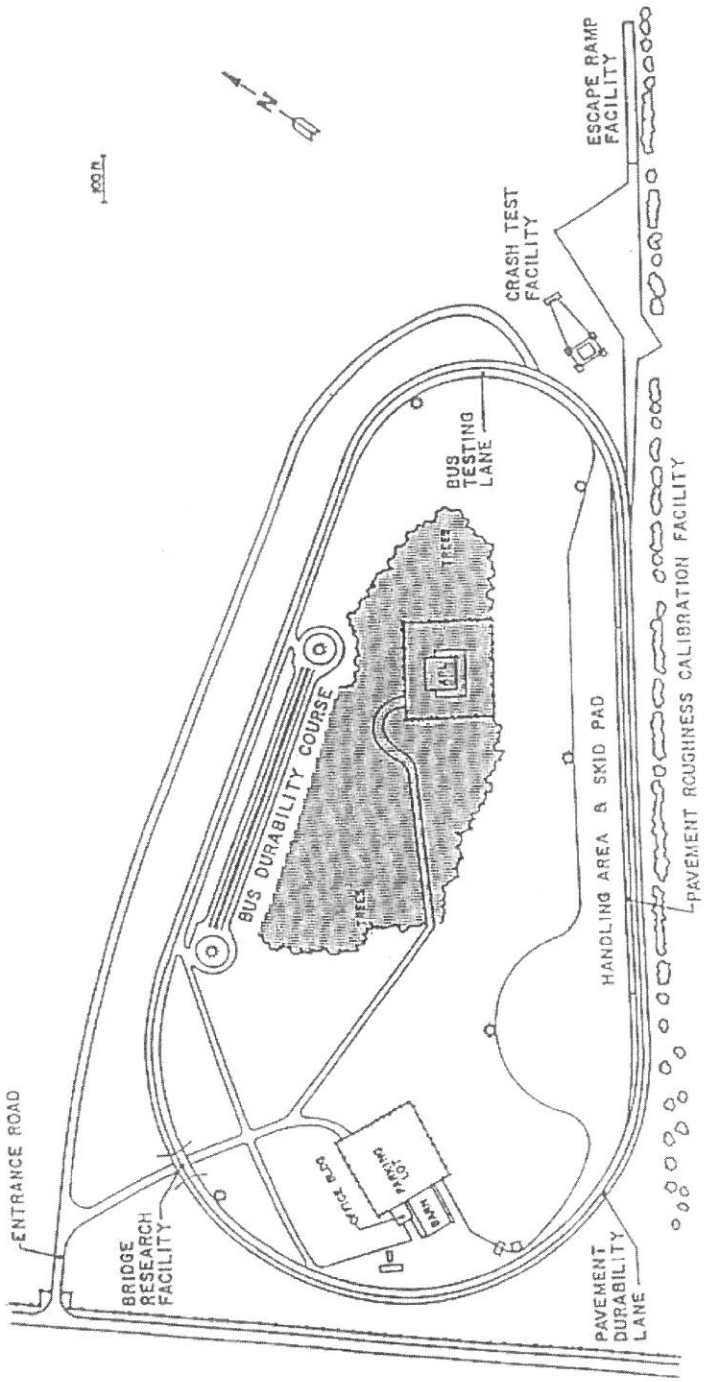
STANDARD OPERATING SCHEDULE

Monday through Friday

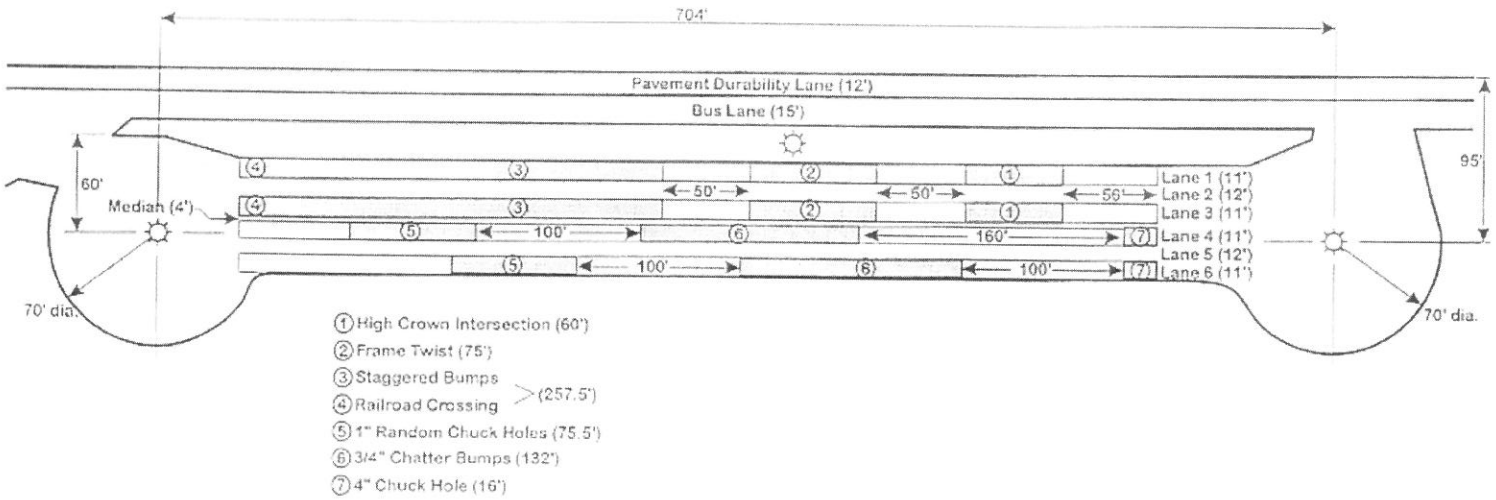
	HOUR	ACTION
Shift 1	midnight	D
	1:40 am	C
	1:50 am	B
	2:00 am	D
	3:35 am	C
	3:45 am	B
	4:05 am	D
	5:40 am	C
	5:50 am	B
	6:00 am	D
	7:40 am	C
	7:50 am	F
Shift 2	8:00 am	D
	9:40 am	C
	9:50 am	B
	10:00 am	D
	11:35 am	C
	11:45 am	B
	12:05 pm	D
	1:40 pm	C
	1:50 pm	B
	2:00 pm	D
	3:40 pm	C
	3:50 pm	F
Shift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



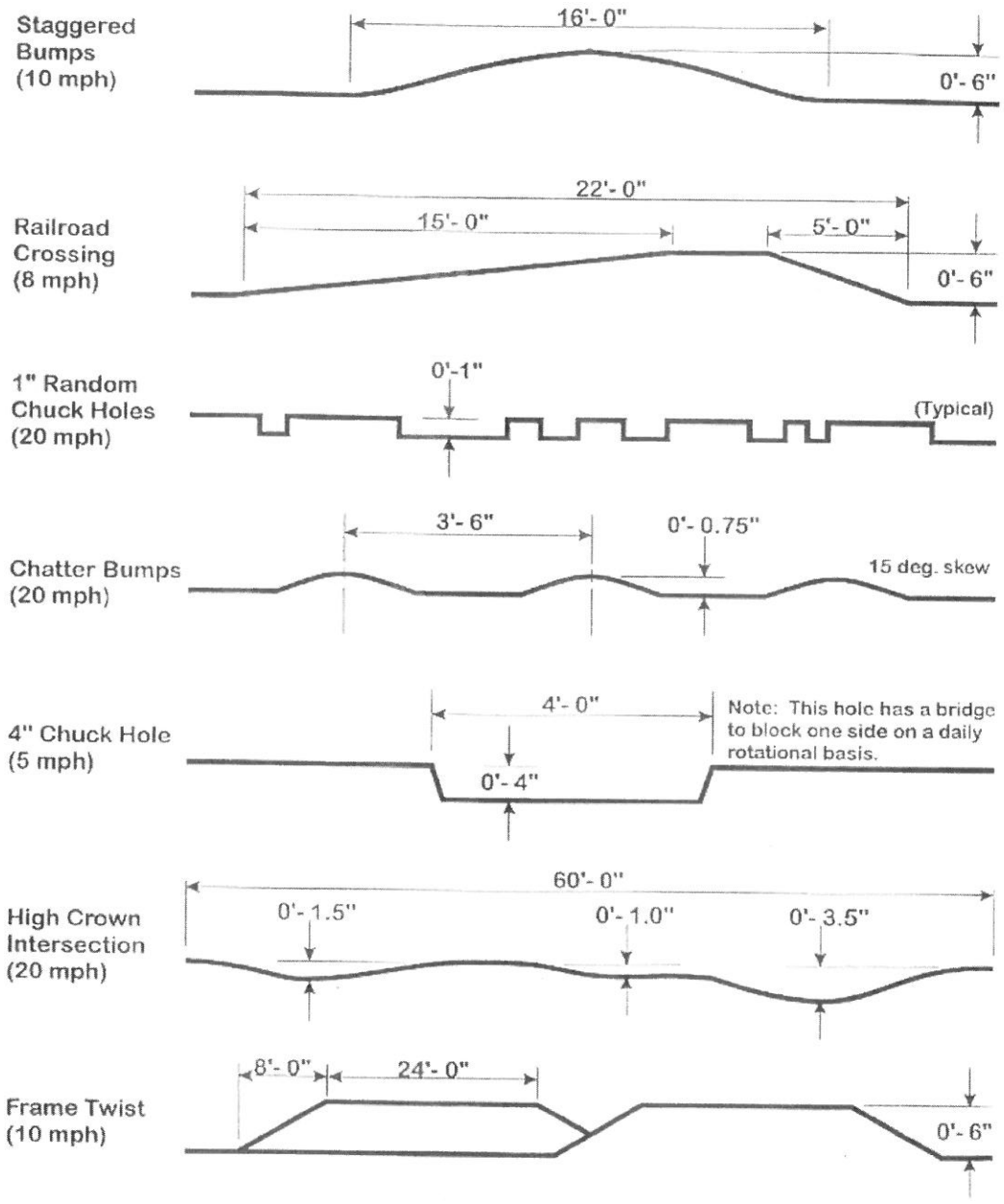
BUS TESTING AND RESEARCH TEST TRACK
UNIVERSITY PARK, PA



Plan View

Vehicle Durability Test Track

The Pennsylvania Transportation Institute
Penn State



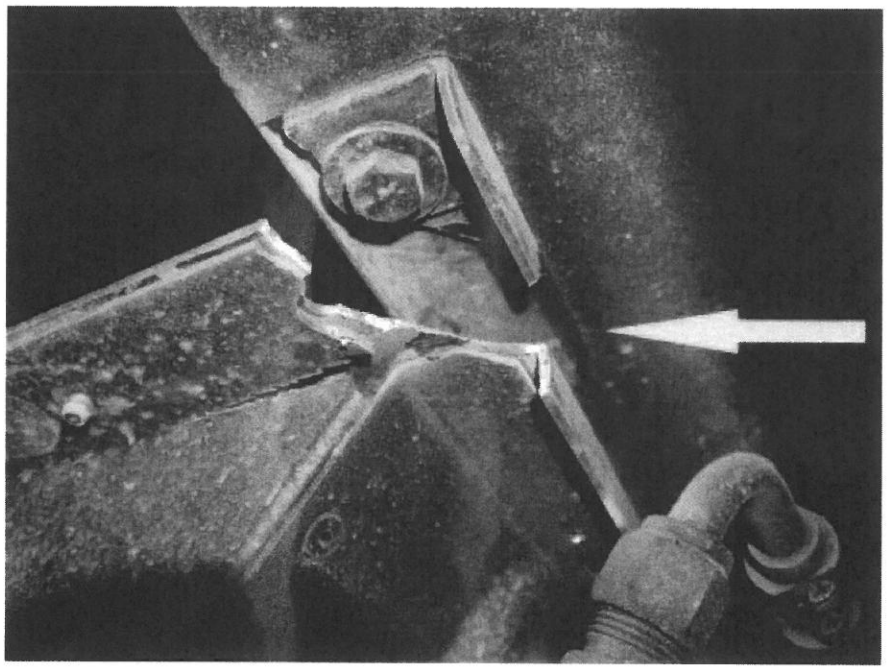
Durability Element Profiles

The Pennsylvania Transportation Institute
Penn State

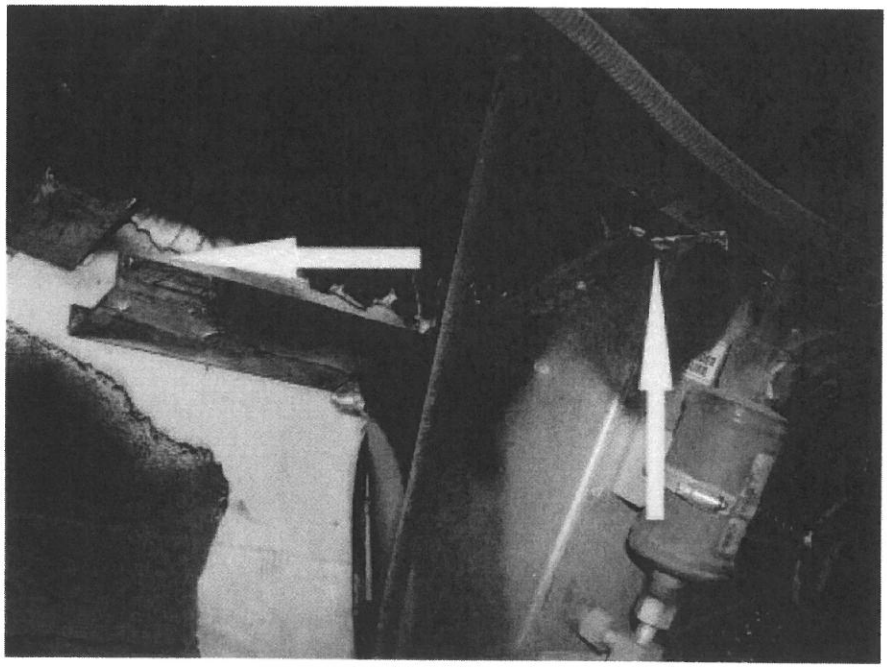
(Page 1 of 1)
UNSCHEDULED MAINTENANCE
Goshen Coach Bus #1314

DATE	TEST MILES	SERVICE	ACTIVITY	MAN HOURS	DOWN TIME
09-30-13	840	The two rear tailpipe hangers are broken.	Replaced two rear tailpipe hangers.	1.00	6.00
11-04-13	5,409	All six tires are worn.	Mounted, balanced and replaced all six tires.	4.00	4.00
11-06-13	5,936	The A/C condenser mounts are cracked.	Welded/repaired mounts.	3.00	16.00

UNSCHEDULED MAINTENANCE



CRACKED/BROKEN A/C CONDENSER MOUNT (5,936 TEST MILES)



GOSHEN COACH
—a THOR company—

25161 Leer Drive Elkhart, IN 46514
Phone: 574.970-6300
FAX: 574.266.5866
www.goshencoach.com

GOSHEN COACH WATER LEAK TESTING FACILITY

The Goshen Coach water test booth consists of 48 exterior nozzles and 16 undercarriage nozzles. Water testing is conducted for 15 minutes per unit. A failure is considered when any trace evidence of water is found inside the unit during the testing period. Any unit failing the test is then retested for an additional 15 minutes after the repair to the failed area is completed. All units must pass the water test. The water test QAV sheet (see attached) must be signed off and will contain information on any area that did not pass testing on previous tests, if necessary.

The pump used in the system is a 10 hp, 3450 rpm motor producing the following statistics with the current set up:
Part # 15F Rain Bird MPR 30 Degree Nozzles allow 3.3 GPM per nozzle @ 48 nozzles produce 158.4 GPM
(64 nozzles with undercarriage produce 211.2 GPM)
Water pressure: 25 PSI minimum

Test document attached

Ph: 574-206-2476 Fax: 574-266-5866 Email: mleroy@goshencoach.com

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FAX: 574.266.5866
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QAV QUALITY ASSURANCE VERIFICATION

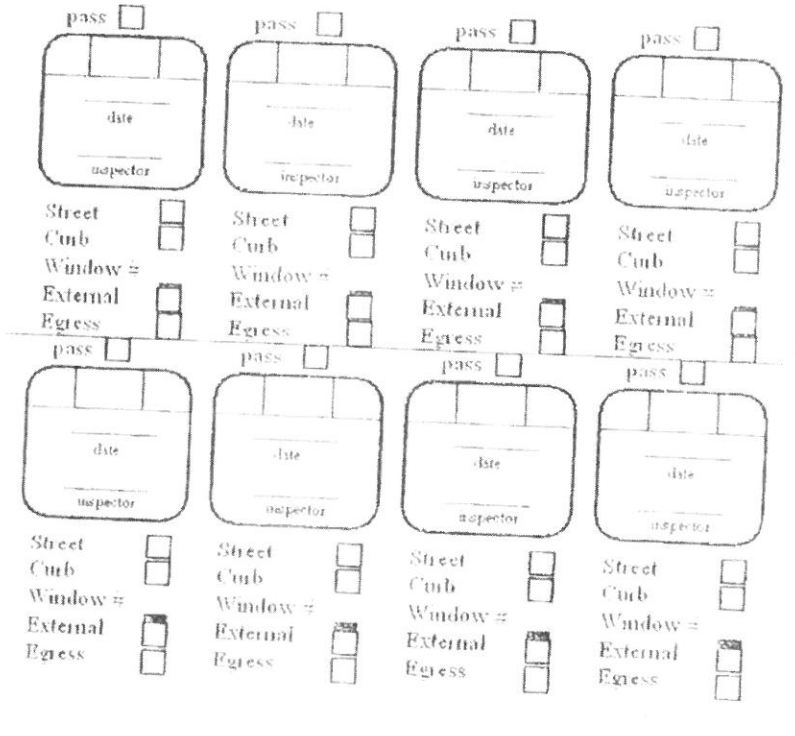
GOSHEN COACH —a THOR company—

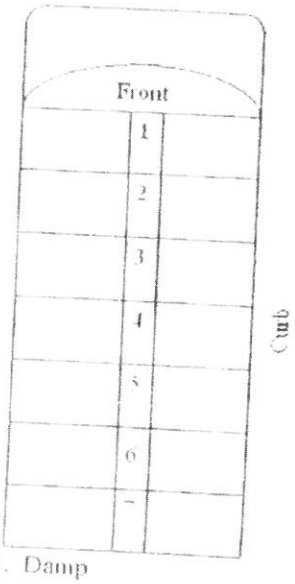
AUDIT DESCRIPTION: UNIT WATER TEST ▽ D0513 Critical Element

UNIT NUMBER: DRIVER'S RELEASE SIGNATURE & DATE:

Thor Company
Office of Standards & Compliance
Quality Systems Department-Goshen Coach

Date	Unit #	Model	Water Pressure	Duration	Tested by	Pass





1. Damp
2. Drop
3. Drip
4. Sm Stream
5. Lg Stream

Ph: 574-206-2476 Fax: 574-266-5866 Email: mleroy@goshencoach.com

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www.goshencoach.com

Test #	Description of Leak	Repaired by	Passed by

The above specified transit bus has successfully passed the prescribed water spray test with no detected leakage in critical areas.

Approving Signature of Tester

Ph: 574-206-2476 Fax: 574-266-5866 Email: mleroy@goshencoach.com

RFQ No. PTR14046

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: National Bus Sales & Leasing

Authorized Signature: _____ Date: 8/20/14

State of Virginia

County of Augusta, to-wit:

Taken, subscribed, and sworn to before me this 20th day of August, 2014.

My Commission expires 9/30/18, 2018.

AFFIX SEAL HERE

NOTARY PUBLIC _____

KELLY S. KOOGLER
NOTARY PUBLIC
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES SEPT. 30, 2018
COMMISSION # 7024006

REQUEST FOR QUOTATION PTR14046
158" Wheelbase Transit Vehicles

REQUIRED BID DOCUMENTATION CHECKLIST

Model Year: 2015 Model: Pacer II & Impulse

Manufacturer: Goshen Coah

Mandatory Bid Forms-must be submitted with bid

X	Bid form 1 LOCATION(S) OF THE TECHNICAL SERVICE REPRESENTATIVE(S)
X	Bid form 2 CERTIFICATION FOR AIR POLLUTION
X	Bid form 3 DISADVANTAGED BUSINESS ENTERPRISE VENDORS/MANUFACTURERS CERTIFICATION
X	Bid form 4 BUY AMERICA CERTIFICATION ROLLING STOCK
X	Bid form 5 FEDERAL MOTOR VEIDCLE SAFETY STANDARDS CERTIFICATION
X	Bid form 6 U.S. COMPTROLLER'S DEBARMENT LIST CERTIFICATION
X	Bid form 6A CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIDILITY MATIERS
X	Bid form 7 VENDOR'S CERTIFICATION OF UNDERSTANDING AND ACCEPTANCE
X	Bid form 8 CERTIFICATION OF COMPLIANCE WITH FTA'S BUS TESTING REQUIREMENTS
X	COPY OF RELEVANT BUS TESTING REPORT- 3.4 STURAA TEST- 4 Years; 3.12.1g Water Testing- details of process; 3.14Seating Diagram- provide proposed seating diagram
X	Bid form 9 CERTIFICATION OF RESTRICTIONS ON LOBBYING
X	Pricing page

Mandatory Documentation-must be submitted within 48 hours of request

Section Referenced	
X 3.5	Engine: V-10 heavy duty gasoline engine- provide description, warranty, and literature
X 3.5g	Engine cooling system- provide description, warranty, and Literature
X 3.5h	High Idle System- provide description, warranty, and literature
X 3.6	Transmission- provide description, warranty, and literature

X 3.6d	Transmission Cooling System- provide description, warranty, and literature
X 3.7.1	Heavy Duty Brakes- provide description, warranty, and literature
X 3.7.3	Suspension System- provide description, warranty, and literature
X 3.7.3	MOR/Ryde Suspension System- provide description, warranty, and literature
X 3.7.a	Tire Information- provide description, warranty, and literature
X 3.8	Electrical System- provide description, warranty, and literature
X 3.8.1	Alternator- specify the rectifier, method of installation, provide warranty and literature
X 3.8.2	Batteries- specify type and capacity
X 3.8.3	Exterior Lights -LED Lights- provide description, warranty, and literature
X 3.8.4	Interior Lights- provide description/details
X 3.8.5	Rear Alarm- provide description, warranty, and literature
X 3.8.6	Backup camera- provide description, warranty, and literature
X 3.8.7	Fuse box panel- provide description/details
X 3.9.1	Heating System- provide description, warranty and literature
X 3.9.1b	Stepwell Heater- provide description, warranty and literature
X 3.9.1c	Auxiliary Heaters- provide description, warranty and literature
X 3.9.2a	A/C Cooling System- provide description, warranty and literature
X 3.9.6a	A/C Compressor- provide description, warranty and literature
X 3.9.2b	A/C Condenser Information- provide description, warranty and literature
X 3.9.2d	Evaporator- provide description, warranty and literature
X 3.9.2	A/C Hose System- provide description, warranty and literature
X 3.10	Roof Hatch- provide description, warranty and literature
X 3.11.1	Control Panel Location- submit details
X 3.11.1	Circulation Fan- provide description, warranty and literature
X 3.12.1	Body Construction- provide description of body construction including materials, methods of joining and assembling components or subassemblies and method of attachment of the body to the chassis, warranty and literature

REQUEST FOR QUOTATION **PTR14046**
158" Wheelbase Transit Vehicles

X 3.12.1	Provide proof that skirt panel seams below floorline will be placed only above wheel wells or adjacent to *AIC* skirt condenser
X 3.12.4c	Door Operating Mechanism- provide description/ details
X 3.12.5b	Sample of Flooring- provide colors per specifications, warranty and literature
X 3.12.6	Insulation- provide proof of insulation requirement per spec.
X 3.12.7	Bumpers- provide description, warranty and literature
X 3.13	Lift- provide details, model #, warranty and literature. Provide information and literature that lift will meet the NHTSA platform lift requirements.
X 3.13g	Interlock System- provide description, warranty and literature
X 3.14a	Passenger Seats- provide details for all proposed including flip up seats and ABS Knee Saver backs
X 3.14b	Under Seat Retractor System- provide description, warranty, literature and FMVSS 210 Report Certification
X 3.14i	Driver's Seat- provide description, warranty and literature
X 3.15	Mobility Aid Securement- provide details of proposed system, warranty, and literature
X 3.19a	Exterior Mirrors- provide description, warranty and literature
X 3.21	Radio/CD Stereo- provide description, provide warranty and literature
X 3.24	Undercoating/Rust proofing- provide description, warranty, literature and application process
X 3.25	Interior and Exterior Color Schemes- provide details of schemes available
X 3.25.2b	Paint Scheme- provide sample of vinyl chart to be used
X 4.2.1	Child Restraint Seat- provide description, warranty and literature
X 4.3.1	Security Cameras- provide description, warranty and literature
X 4.4.1	Security Cameras- provide description, warranty and literature
X 5.2	Items in sections a-1 provide proof of compliance
X 5.11	Warranty per specs on subsystems and components
X 5.11.1	Warranty on completed vehicle

REQUEST FOR QUOTATION **PTR14046**
158" Wheelbase Transit Vehicles

X 5.11.2	Warranty on Basic Vehicle Structure
X 5.11.3 & 4.40e	Warranty Locations- A description of how and by whom warranty service will be provided in four (4) areas of WV to cover both Mechanical and body work. Provide vendor who will do warranty of both chassis and body, including bus body, air conditioning and wheelchair lifts. Four areas of WV include: Northern Panhandle, Eastern Panhandle Central WV and Southern WV
X 6.1.2	Complete (2) bids in binder form-(1) Marked for WVDPT
X 9.3a	Training- submit letter of understanding to the terms in this section
X 9.3a	Complete Mechanical Description of Vehicle, its construction and equipment including manufacturer's model, model name and/or number and model year Include Warranty Information
X 9.3b	Proposed Floorplans
X 9.3c	Curb Weight (empty weight and Gross Vehicle Weight Rating (GVWR) of vehicle
X 9.3f	Location of nearest depot which will furnish a complete supply of parts and components for the repair and maintenance of the vehicle to be supplied
X 9.3g	Description of the undercoating/rust proofing system, including warranty to be provided
X 9.3h	Location of assembly
X 9.3i	List of five users names, addresses and telephone numbers to whom your company has provided similar equipment
X	No Debt Affidavit
X	Pricing Page

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

National Bus Sales & Leasing

(Company)

(Authorized Signature)

Andrew Clawson, Regional Representative

(Representative Name, Title)

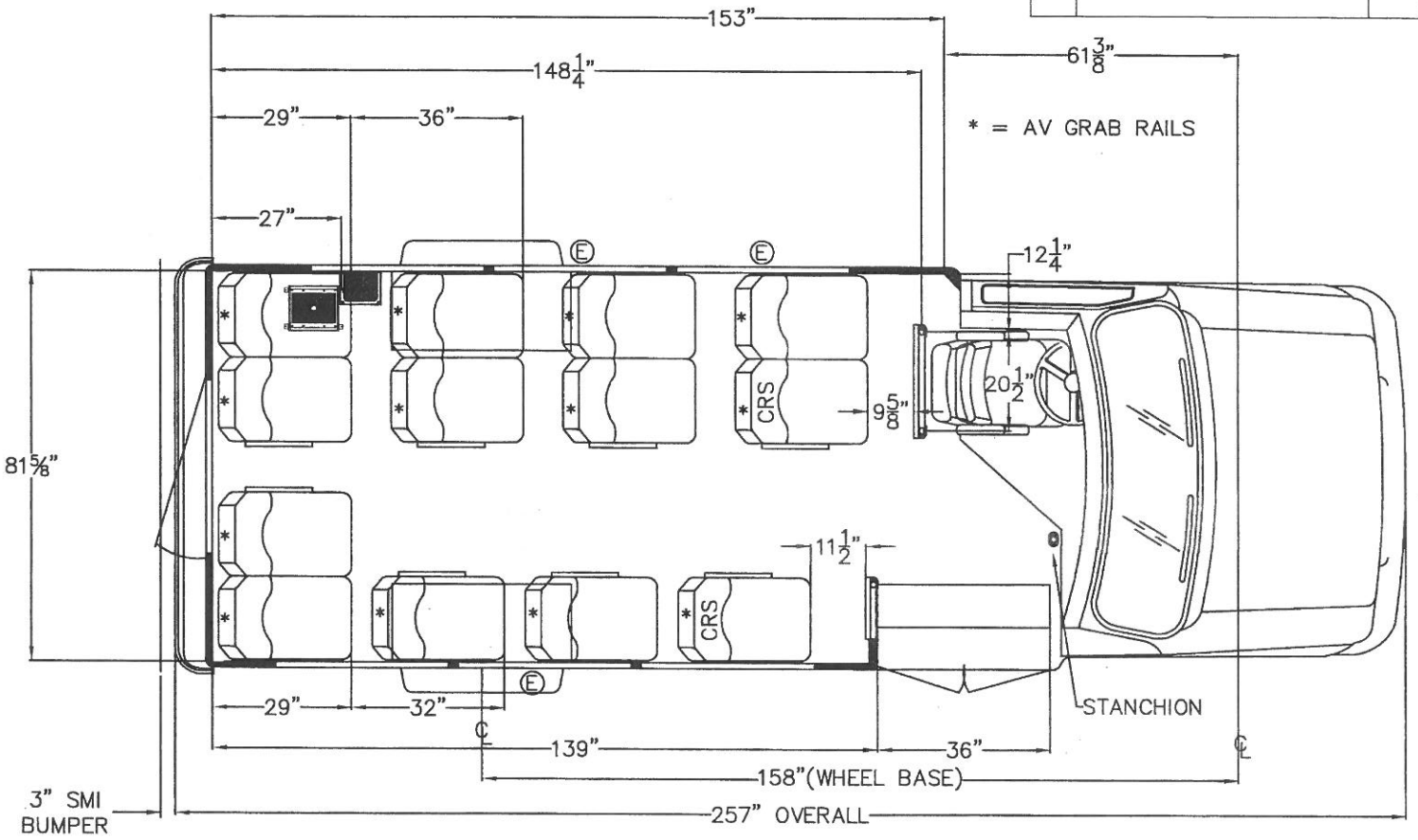
(540)256-3246 (770)422-9007

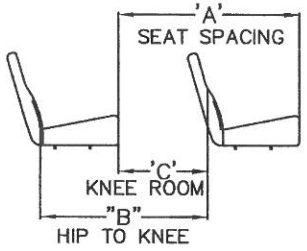
(Phone Number) (Fax Number)

8/20/14

(Date)

Rev.	Revision Description	By	D.	ECN / PPCN
A	DR & REL	ARS	1/17/12	N/A





SEAT STYLE	SEAT SPACING 'A'	HIP-TO-KNEE 'B'	KNEE ROOM 'C'
MID-HI	36"	32-5/8"	14-1/2"
MID-HI	32"	28-5/8"	10-1/2"

CLASS A, B, C, D, E, F

DO NOT SCALE

Drawing Name / Description:
FLOOR PLAN, PACER 13P/158WB/257BDY

SIZE A

Tolerances:
+/- 1/16"
+/- 1*
Unless Noted Otherwise

GOSHEN COACH
Committed to making people ahead >>>
25161 Leer Drive
Elkhart, IN 46514
(574) 970-6300

Reference:

Drawing Number/GC Part Number: 0130623

Revision: A

Scale:	Units:	Drawn:	Date:
N/A	INCHES	ARS	1/17/12

Class Code:

File location:

GOSHEN COACH

Committed to moving people ahead >>>

WEIGHT ANALYSIS WORKSHEET

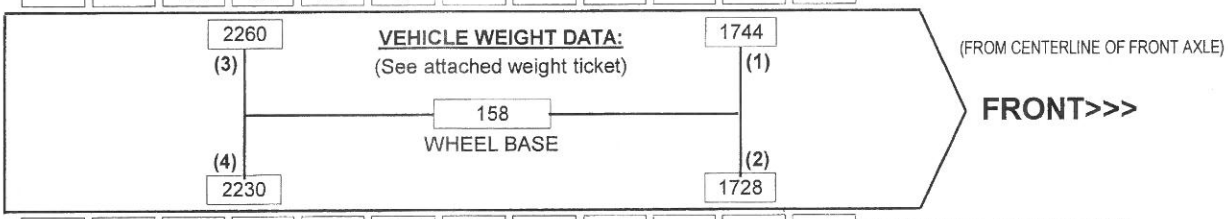
ESTIMATED

F/P NO:	REF NO:	UNIT NO:
0130623	30987	**11793**
UNIT SERIES NO's:		DATE:
		7/25/2014

VEHICLE DESCRIPTION:			MODEL NO:	MODEL YR:	# SEATING POSITIONS
PACER II 257" FORD -- 13P			P2F257-E456	2014	14 (INC. DRIVER SEAT)
CHASSIS DESCRIPTION:	**ENGINE:**	**WHEELBASE:**	**TIRE SIZE:**	**FUEL TANK:**	**FUEL LEVEL:**
Ford E450 158"WB, 6.8L Gas, 14,500 GVWR	6.8L (425CID) EFI V10	158	LT225/75R16E	55 Gal. Rear Tank @ 178"	1/4

VEHICLE LOAD DISTRIBUTION

(L)	(K)	(J)	(I)	(H)	(G)	(F)	(E)	(D)	(C)	(B)	(A)	"STREETSIDE"
		300	300	300	300						150	PASSENGER & LUGGAGE LOAD
												SEAT WEIGHT
		195	159	123	87						45	DISTANCE



(X)	(W)	(V)	(U)	(T)	(S)	(R)	(Q)	(P)	(O)	(N)	(M)	"CURBSIDE"
		300	150	150	150							PASSENGER & LUGGAGE LOAD
					36							SEAT WEIGHT
		195	163	131	99							DISTANCE (FROM CENTERLINE OF FRONT AXLE

VEHICLE WEIGHT DATA:

	FRONT WEIGHTS			REAR WEIGHTS				
	LEFT	RIGHT	TOTAL	LEFT	RIGHT	TOTAL	TOTAL	NOTES:
Actual Completed Weight Of Vehicle	1744	1728	3472	2260	2230	4490	7962	
FUEL LOAD ADJUSTMENT:	-16	-16	-32	142	142	285	253	
VEHICLE CONFIGURATION ADJUSTMENTS:	-4	9	5	52	75	127	132	
UNLOADED VEHICLE WEIGHT:	1724	1721	3445	2454	2447	4902	8347	
WEIGHT OF THE OCCUPANTS & LUGGAGE:	236	7	243	1114	743	1857	2100	
LOADED VEHICLE WEIGHT:	1960	1728	3688	3568	3190	6759	10447	
AVAILABLE EXCESS CARGO CAPACITY:	720	952	1312	1372	1750	2841	4053	
GROSS VEHICLE WEIGHT RATINGS:	**2680**	**2680**	**5000**	**4940**	**4940**	**9600**	**14500**	
IS THE WEIGHT RATING EXCEEDED?	NO	NO	NO	NO	NO	NO	NO	

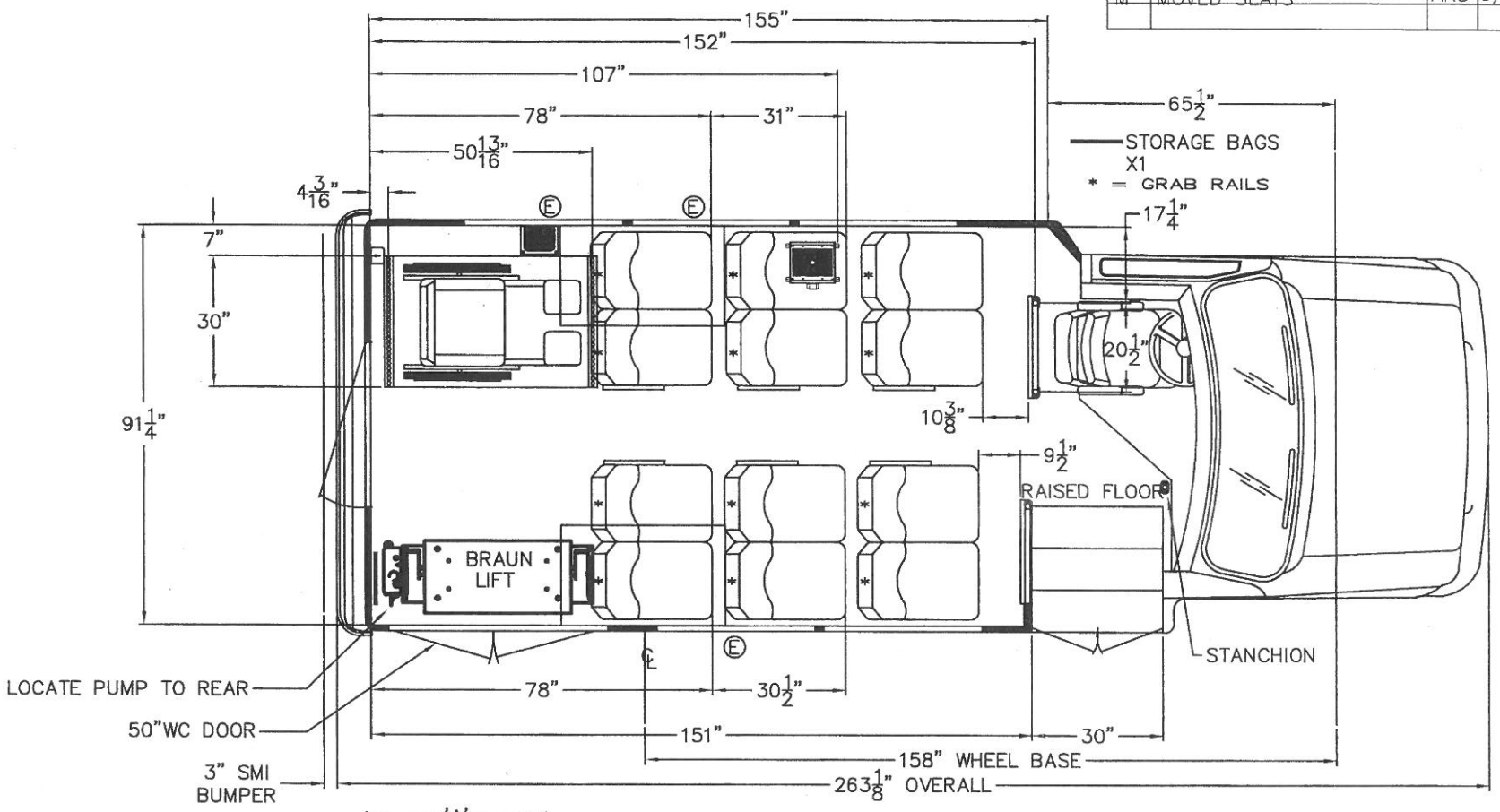
PREPARED BY: Ron Pickens

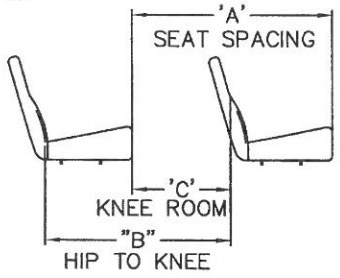
SIGNATURE: _____

DATE: 7/25/2014

NOTE: TH LOORPLAN REQUIRES BLACK RUBBER FENDER FLARES

Rev.	Revision Description	By		ECN / PPCN
L	ADDED DBL SEAT	ARS	8/7/14	N/A
M	MOVED SEATS	ARS	8/7/14	N/A





SEAT STYLE	SEAT SPACING 'A'	HIP-TO-KNEE 'B'	KNEE ROOM 'C'
MID HI	31"	27-5/8"	9-1/2"
MID HI	30-1/2"	27-1/8"	9"

CLASS G, H, I, J, K, L

DO NOT SCALE

Drawing Name / Description:
FLOOR PLAN, GCII/IMPULSE, FORD 12P/1WC/158WB/263BDY

SIZE A

Tolerances:
+/- 1/16"
+/- 1*
Unless Noted Otherwise

GOSHEN COACH
Committed to moving people ahead >>>
25161 Leer Drive
Elkhart, IN 46514
(574) 970-6300

Reference:

Drawing Number/GC Part Number: 0124972

Revision: M

Scale:	Units:	Drawn:	Date:
N/A	INCHES	RRP	01/10/08

Class Code:

Sheet of 1

File location: FP/2008/GCII/158/263/R-LIFT

GOSHEN COACH

Committed to moving people ahead >>>

WEIGHT ANALYSIS WORKSHEET

ESTIMATED

F/P NO:	REF NO:	UNIT NO:
0124972M	32995	**11794**
UNIT SERIES NO's:		DATE:
		7/25/2014

VEHICLE DESCRIPTION:			MODEL NO:	MODEL YR:	# SEATING POSITIONS
GCII 263" FORD -- 12P/1WC			GCF263-E456	2014	11 (INC. DRIVER SEAT)
CHASSIS DESCRIPTION:	**ENGINE:**	**WHEELBASE:**	**TIRE SIZE:**	**FUEL TANK:**	**FUEL LEVEL:**
Ford E450 158"WB, 6.8L Gas, 14,500 GVWR	6.8L (425CID) EFI V10	158	LT225/75R16E	55 Gal. Rear Tank @ 178"	3/16

VEHICLE LOAD DISTRIBUTION

(L)	(K)	(J)	(I)	(H)	(G)	(F)	(E)	(D)	(C)	(B)	(A)	"STREETSIDE"
					200		300	300	300		150	PASSENGER & LUGGAGE LOAD
												SEAT WEIGHT
					198		153	122	91		45	DISTANCE

						0	300	300	300			PASSENGER & LUGGAGE LOAD
							60					SEAT WEIGHT
						198	153	122	92			DISTANCE (FROM CENTERLINE OF FRONT AXLE
(X)	(W)	(V)	(U)	(T)	(S)	(R)	(Q)	(P)	(O)	(N)	(M)	"CURBSIDE"

(3) 2638 — (1) 1638 — (FROM CENTERLINE OF FRONT AXLE)

158 WHEEL BASE

FRONT>>>

(4) 3198 — (2) 1772

VEHICLE WEIGHT DATA: (See attached weight ticket)

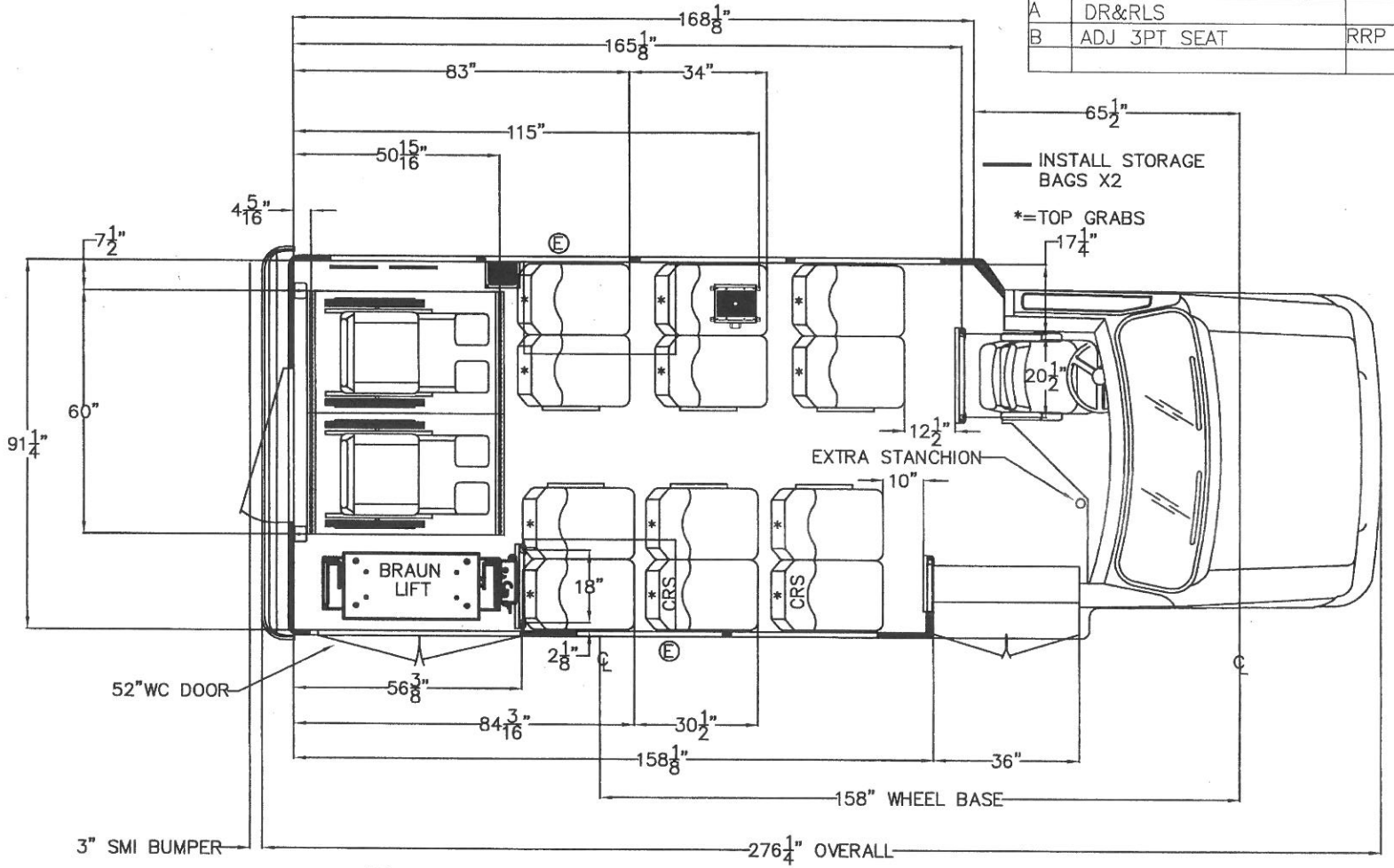
VEHICLE WEIGHT DATA:	FRONT WEIGHTS LEFT	FRONT WEIGHTS RIGHT	FRONT WEIGHTS TOTAL	REAR WEIGHTS LEFT	REAR WEIGHTS RIGHT	REAR WEIGHTS TOTAL	TOTAL	NOTES:
Actual Completed Weight Of Vehicle	1638	1772	3410	2638	3198	5836	9246	
FUEL LOAD ADJUSTMENT:	-17	-17	-35	154	154	309	274	
VEHICLE CONFIGURATION ADJUSTMENTS:	0	2	2	0	58	58	60	
UNLOADED VEHICLE WEIGHT:	1621	1757	3377	2792	3410	6203	9580	
WEIGHT OF THE OCCUPANTS & LUGGAGE:	262	203	465	988	697	1685	2150	
LOADED VEHICLE WEIGHT:	1882	1960	3842	3781	4107	7888	11730	
AVAILABLE EXCESS CARGO CAPACITY:	798	720	1158	1159	833	1712	2770	
GROSS VEHICLE WEIGHT RATINGS:	**2680**	**2680**	**5000**	**4940**	**4940**	**9600**	**14500**	
IS THE WEIGHT RATING EXCEEDED?	NO	NO	NO	NO	NO	NO	NO	

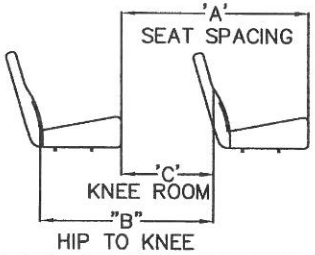
PREPARED BY: Andy Snell

SIGNATURE: AKS

DATE: 7/25/2014

Rev.	Revision Description	By		ECN / PPCN
A	DR&RLS			
B	ADJ 3PT SEAT	RRP	12/17/07	





SEAT STYLE	SEAT SPACING 'A'	HIP-TO-KNEE 'B'	KNEE ROOM 'C'
MID-HI	34"	30-5/8"	12-1/2"
MID-HI	30-1/2"	27-1/8"	9"

CLASS M, N, O, P, Q, R

DO NOT SCALE

Drawing Name / Description:

FLOOR PLAN, GCII/IMPULSE/12P/2WC/158WB/276BDY

SIZE A

Tolerances:
+/- 1/16"
+/- 1*
Unless Noted Otherwise

GOSHEN COACH
Committed to moving people ahead >>>
25161 Leer Drive
Elkhart, IN 46514
(574) 970-6300

Reference:

Drawing Number/GC Part Number: 0124813

Revision: B

Scale:	Units:	Drawn:	Date:
N/A	INCHES	JH	12/04/07

Class Code:

Sheet of

File location: G:FP/GCII/158/276

GOSHEN COACH

Committed to moving people ahead >>>

WEIGHT ANALYSIS WORKSHEET

ESTIMATED

F/P NO:	REF NO:	UNIT NO:
0124813B	33490	**11795**
UNIT SERIES NO's:		DATE:
		7/25/2014

VEHICLE DESCRIPTION:			MODEL NO:	MODEL YR:	# SEATING POSITIONS
IMPULSE 276" FORD -- 12P/2WC			GIF276-E456	2014	13 (INC. DRIVER SEAT)
CHASSIS DESCRIPTION:	**ENGINE:**	**WHEELBASE:**	**TIRE SIZE:**	**FUEL TANK:**	**FUEL LEVEL:**
Ford E450 158"WB, 6.8L Gas, 14,500 GVWR	6.8L (425CID) EFI V10	158	LT225/75R16E	55 Gal. Rear Tank @ 178"	1/8

VEHICLE LOAD DISTRIBUTION

(L)	(K)	(J)	(I)	(H)	(G)	(F)	(E)	(D)	(C)	(B)	(A)	"STREETSIDE"
					300		300	300	300		150	PASSENGER & LUGGAGE LOAD
												SEAT WEIGHT
					211		161	127	93		45	DISTANCE

(3) 2452 — (1) 1666

VEHICLE WEIGHT DATA:
(See attached weight ticket)

158
WHEEL BASE

(4) 3048 — (2) 1632

(FROM CENTERLINE OF FRONT AXLE)

FRONT>>>

(X)	(W)	(V)	(U)	(T)	(S)	(R)	(Q)	(P)	(O)	(N)	(M)	"CURBSIDE"
				300			300	300	300			PASSENGER & LUGGAGE LOAD
												SEAT WEIGHT
				211			159	128	97			DISTANCE (FROM CENTERLINE OF FRONT AXLE

VEHICLE WEIGHT DATA:

	FRONT WEIGHTS LEFT	FRONT WEIGHTS RIGHT	FRONT WEIGHTS TOTAL	REAR WEIGHTS LEFT	REAR WEIGHTS RIGHT	REAR WEIGHTS TOTAL	TOTAL	NOTES:
Actual Completed Weight Of Vehicle	1666	1632	3298	2452	3048	5500	8798	
FUEL LOAD ADJUSTMENT:	-19	-19	-37	166	166	332	295	
VEHICLE CONFIGURATION ADJUSTMENTS:	-7	-7	-15	130	130	261	246	
UNLOADED VEHICLE WEIGHT:	1640	1606	3246	2748	3344	6093	9339	
WEIGHT OF THE OCCUPANTS & LUGGAGE:	183	70	253	1167	1130	2297	2550	
LOADED VEHICLE WEIGHT:	1823	1676	3500	3915	4474	8389	11889	
AVAILABLE EXCESS CARGO CAPACITY:	857	1004	1500	1025	466	1211	2611	
GROSS VEHICLE WEIGHT RATINGS:	**2680**	**2680**	**5000**	**4940**	**4940**	**9600**	**14500**	
IS THE WEIGHT RATING EXCEEDED?	NO	NO	NO	NO	NO	NO	NO	

PREPARED BY: Ron Pickens

SIGNATURE: _____

DATE: 7/25/2014

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

Solicitation

NUMBER	PAGE
PTR14046	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
BETH COLLINS
304-558-2157

RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR
National Bus Sales & Leasing
P.O. Box 6549
Marietta, GA 30065

SHIP TO
DIVISION OF PUBLIC TRANSIT

BUILDING 5, ROOM 906
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
25305-0432 304-558-0428

DATE PRINTED
06/23/2014

BID OPENING DATE: 08/05/2014 BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		557-05	Please See Pricing Page	Please See Pricing Page

CONTRACT TO PROVIDE 158" WHEELBASE TRANSIT BUSES

REQUEST FOR QUOTATION
(RFQ)

THE WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, THE WEST VIRGINIA DIVISION OF PUBLIC TRANSIT, IS SOLICITING BIDS FOR AN OPEN END CONTRACT FOR ONE (1) TO THIRTY-SIX (36) WHEELBASE CUTAWAY BUSES WITH AIR CONDITIONING, ADA COMPLIANT LIFTS, AND WHEELCHAIR SECUREMENT SYSTEMS, PER THE ATTACHED SPECIFICATIONS.

****** THIS IS THE END OF RFQ PTR14046 ****** TOTAL: Please See Pricing Page

SIGNATURE	TELEPHONE	DATE
	(540)256-3246	8/20/14
TITLE Regional Represntative	FEIN 58-1216021	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

Contract Manager: Andrew Clawson
Telephone Number: 540-256-3246
Fax Number: 770-422-9007
Email Address: aclawson@nationalbussales.com

12.3 Federal funding for this project is being provided by the Federal Transit Administration through CFDA 20.513 for Sec 5310, CFDA 20.509 for Sec 5311 and CFDA 20.526 for Sec 5339 to cover 80% of the project cost.

12.4 REQUIRED BID FORMS

The following certifications must be properly **completed and furnished by the bidder as part of the bid**. Failure to submit any of these certifications **shall** deem the bid **non-responsive.**

A required documentation checklist has been provided for bidder's usage.

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

Solicitation

NUMBER	PAGE
PTR14046	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
BETH COLLINS
304-558-2157

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE
National Bus Sales & Leasing
P.O. Box 6549
Marietta, GA 30065

SHIP TO
DIVISION OF PUBLIC TRANSIT

BUILDING 5, ROOM 906
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
25305-0432 304-558-0428

DATE PRINTED
07/31/2014

BID OPENING DATE: 08/21/2014 BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
	ADDENDUM NO.01					
	THIS ADDENDUM IS ISSUED TO MODIFY THE ORIGINAL SOLICITATION PER THE ATTACHED DOCUMENTATION.					
0001	1	EA		557-05	Please See Pricing Page	Please See Pricing Page
	CONTRACT TO PROVIDE 158" WHEELBASE TRANSIT BUSES					
	****** THIS IS THE END OF RFQ PTR14046 ****** TOTAL:					Please See Pricing Page

SIGNATURE [signature] TELEPHONE (540)256-3246 DATE 8/20/14

TITLE Regional Representative FEIN 58-1216021 ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: 01

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)

[X]	Addendum No. 1	[ ]	Addendum No. 6
[ ]	Addendum No. 2	[ ]	Addendum No. 7
[ ]	Addendum No. 3	[ ]	Addendum No. 8
[ ]	Addendum No. 4	[ ]	Addendum No. 9
[ ]	Addendum No. 5	[ ]	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.

National Bus Sales & Leasin

Company

Authorized Signature

8/20/14

Date

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

REQUEST FOR QUOTATION

Exhibit A

PTR14046 158" Wheelbase Transit Vehicles

Option	Item Description	Unit Price Per Vehicle	Estimated Quantity	Extended Price
A	Non-Accessible Bus	51946	2	103892
B	Non-Accessible Bus, child restraint	52563	2	105126
C	Non-Accessible Bus, security camera system with playback	54346	2	108692
D	Non-Accessible Bus, cameras	53696	2	107392
E	Non-Accessible Bus, security camera system with playback, child restraint	54963	2	109926
F	Non-Accessible Bus, security cameras, child restraint	54313	2	108626
G	Bus with one wheelchair (W/C) position	56442	2	112884
H	Bus,1W/C position, child restraint	57059	2	114118
I	Bus, 1W/C position, security camera system with playblack	58842	2	117684
J	Bus,1 W/C position, cameras	58192	2	116384
K	Bus, 1W/C position, security camera system with playback, child restraint	59459	2	118918
L	Bus, 1 W/C position, security cameras, child restraint	58809	2	117618
M	Bus with two wheelchair (W/C) positions	56732	2	113464
N	Bus,2 W/C positions, child restraint	57349	2	114698
O	Bus, 2W/C positions, security camera system with playback	59132	2	118264
P	Bus, 2 W/C positions, cameras	58482	2	116964
Q	Bus, 2W/C positions, security camera system with playback, child restraint	59749	2	119498
R	Bus, 2 W/C positions, security cameras, child restraint	59099	2	118198
	Total Bid For Evaluation:			2042346

*Complete form provided.

*Please note these are only estimated quantities and do not reflect any guarantee of purchase.

*The Agency may purchase more or less as needed.

*The awards may be made to multiple vendors.

*Please do not alter pricing page.

REQUEST FOR QUOTATION

Exhibit A

PTR14046 158" Wheelbase Transit Vehicles

Option	Item Description	Unit Price Per Vehicle	Estimated Quantity	Extended Price
A	Non-Accessible Bus	51946	2	103892
B	Non-Accessible Bus, child restraint	52563	2	105126
C	Non-Accessible Bus, security camera system with playback	54346	2	108692
D	Non-Accessible Bus, cameras	53696	2	107392
E	Non-Accessible Bus, security camera system with playback, child restraint	54963	2	109926
F	Non-Accessible Bus, security cameras, child restraint	54313	2	108626
G	Bus with one wheelchair (W/C) position	56442	2	112884
H	Bus,1W/C position, child restraint	57059	2	114118
I	Bus, 1W/C position, security camera system with playblack	58842	2	117684
J	Bus,1 W/C position, cameras	58192	2	116384
K	Bus, 1W/C position, security camera system with playback, child restraint	59459	2	118918
L	Bus, 1 W/C position, security cameras, child restraint	58809	2	117618
M	Bus with two wheelchair (W/C) positions	56732	2	113464
N	Bus,2 W/C positions, child restraint	57349	2	114698
O	Bus, 2W/C positions, security camera system with playback	59132	2	118264
P	Bus, 2 W/C positions, cameras	58482	2	116964
Q	Bus, 2W/C positions, security camera system with playback, child restraint	59749	2	119498
R	Bus, 2 W/C positions, security cameras, child restraint	59099	2	118198
	Total Bid For Evaluation:			2042346

*Complete form provided.
*Please note these are only estimated quantities and do not reflect any guarantee of purchase.
*The Agency may purchase more or less as needed.
*The awards may be made to multiple vendors.
*Please do not alter pricing page.